STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

ROY COOPER
GOVERNOR

JAMES H. TROGDON, III
SECRETARY

February 12, 2020

MEMORANDUM TO: Mr. Pat Ivey, P.E.
Division 9 Engineer

FROM: Philip S. Harris, III, P.E., Manager
for Environmental Analysis Unit
Carla Dagnino

SUBJECT: Forsyth County, Winston Salem Northern Beltway; Section U-2579AB; Modification for Smith Creek Relocation; FA No. 0074229; WBS No. 34839.3.11

Attached are the U.S. Army Corps of Engineers and N.C. Division of Water Resources Permits. All environmental permits have been received for the construction of the Smith Creek Relocation on the B Section of the Winston-Salem Northern Beltway.

A copy of this permit package is posted on the NCDOT website at:
https://xfer.services.ncdot.gov/pdea/PermIssued/

cc: w/o attachment (see website for attachments)

Mr. Ron Davenport, P.E. Contracts Management
Ms. Amy Euliss, Division 9 Environmental Officer
Dr. Majed Al-Ghandour, P.E., Programming and TIP
Ms. Laura Sutton, P.E., Roadway Design
Mr. Byron Sanders, Jr., P.E., Utilities Unit
Mr. Stephen Morgan, P.E., Hydraulics
Mr. Mark Staley, Roadside Environmental
Mr. Lamar Sylvester, P.E., State Construction Engineer
Ms. Cheterra Sheff, Single Audit Compliance
Ms. Beth Harmon, Division of Mitigation Services
Mr. Byron Moore, PE, Monitoring and Stewardship

Mailing Address:
NC DEPARTMENT OF TRANSPORTATION
ENVIRONMENTAL ANALYSIS UNIT
1598 MAIL SERVICE CENTER
RALEIGH NC 27699-1598

Telephone: (919) 707-6000
Customer Service: 1-877-368-4968
Website: www.ncdot.gov

Location:
1000 BIRCH RIDGE DRIVE
RALEIGH NC 27610

PROJECT COMMITMENTS

T.I.P Project No. U-2579BA
Winston Salem Beltway Section B
Modification for Smith Creek Stream Relocation
Forsyth County
Federal Aid Project No. 0074229
WBS Element 34839.3.11

COMMITMENTS FROM PERMITTING

Division Construction, EAU – Monitoring and Stewardship

USACE Condition 1.
Construction Plans: All work authorized by this permit must be performed in strict compliance with the attached plans, Sheets 1-18, dated 14 January 2020. The permit also includes the implementation of the attached Stream Relocation/Monitoring plan for the relocations of Smith Creek, the unnamed tributary to Smith Creek, and the establishment of a riparian vegetated corridor in and near the relocated stream sites. Any modification to the attached stream relocation plans must be approved by the U.S. Army Corps of Engineers (Corps) prior to any active construction in waters or wetlands.

USACE Email clarification to Condition 1 (see attached email from USACE to Division dated February 5, 2020)
Stream relocation will require some slight modifications due to conditions they find as they are doing the work – and the As-builts will document this. However, they still need to meet the intent and overall approach that they have proposed. So a large alteration from their plan might need more formal coordination with the USACE prior to completing the work.

NCDWR Condition 1
Mitigation requirements related to the impacted channel will be determined following the monitoring period of the relocated channel as outlined in the submitted plan. As indicated in the application natural stream design (NSD) credits may be issued if monitoring data indicates criteria have been met.

NCDWR Condition 2
Channel relocations (2,127 linear feet for Smith Creek, Site 28; and 384 linear feet for UT Smith Creek, Site 28A) will be constructed in a dry work area and stabilized before stream flows are diverted. Channel relocations should be completed and stabilized prior to diverting water into the new channel to the extent practicable. Whenever possible, channel relocations shall be allowed to stabilize for an entire growing season. NCDWR staff shall be contacted prior to diverting water into the new channels. Annual monitoring shall occur as described in the monitoring plan. [15A NCAC 02H .0506(b)(3)]

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

January 29, 2020

Regulatory Division

Action ID: SAW-2008-03183, NCDOT/U-2579B, Winston-Salem Northern Beltway, from US 158 to I-40B/US 421, Smith Creek Relocation, Modification to Individual Permit issued October 17, 2019

Philip S. Harris, III, P.E., CPM
North Carolina Department of Transportation
Environmental Analysis
1598 Mail Service Center
Raleigh, North Carolina 27699-1598

Dear Mr. Harris:

Reference the Department of the Army (DA) permit issued on October 17, 2019, to the North Carolina Department of Transportation (NCDOT) for impacts associated with the new location project identified as U-2579B, Winston-Salem Northern Beltway. The 4.06 mile, three-lane divided facility would extend from US 158 to I-40B/US 421 near Winston Salem, Forsyth County, North Carolina. Coordinates (in decimal degrees) for the site are 36.1178° N, -80.1380° W. The project occurs in the Yadkin River Basin (8-digit Cataloging Unit 03040101). Also reference U.S. Army Corps of Engineers (Corps') modifications dated July 2, 2014 and February 21, 2019. The current standard permit expires on December 31, 2022.

On October 21, 2019, the U.S. Army Corps of Engineers (Corps) received a request to modify the above referenced permit to include the relocation of 1,711 linear feet of Smith Creek (Site 28) and the relocation of 80 linear feet of an unnamed tributary to Smith Creek (Site 28A). The modification also included the draining, excavating and filling of two (2) aquaculture ponds measuring 1.62 acres and 6.20 acres, (Sites 28B and 28C). Constructability constraints associated with a deceleration lane for the Winston-Salem Northern Beltway necessitate the relocations of the creeks, as well as the decommissioning of two aquaculture ponds. The newly relocated Smith Creek will measure 2,127 linear feet and the newly relocated unnamed tributary will measure 384

linear feet. NCDOT will use natural channel design and riparian plantings over the relocation site.

These stream relocation changes bring the U-2579B project impact totals to: 12,492 linear feet of permanent stream channel impacts, 1,570 linear feet of temporary stream impacts, and the draining, excavating and filling of 7.82 acres of aquaculture ponds (permanent impact). There are no changes to the permitted permanent wetland impact(s) of 1.96 acres.

A Public Notice describing this proposal was issued for a 15-day comment period. No substantial concerns or comments were received from this notice. Therefore, the Corps has completed the evaluation of your request and has determined that it is appropriate and reasonable. Consequently, the permit is modified as requested and shown on the enclosed plans, Sheets 1-18, dated 14 January 2020. The permit also includes the implementation of the monitoring plan for the relocations of Smith Creek, the unnamed tributary to Smith Creek, and the establishment of a riparian vegetated corridor in and near the relocated stream sites.

For your information, the following special condition from the original authorization has been updated to include the new stream relocation requirements using natural channel design and the establishment of a riparian vegetated buffer around the relocated stream channels:

1. Construction Plans: All work authorized by this permit must be performed in strict compliance with the attached plans, Sheets 1-18, dated 14 January 2020. The permit also includes the implementation of the attached Stream Relocation/monitoring plan for the relocations of Smith Creek, the unnamed tributary to Smith Creek, and the establishment of a riparian vegetated corridor in and near the relocated stream sites. Any modification to the attached stream relocation plans must be approved by the U.S. Army Corps of Engineers (Corps) prior to any active construction in waters or wetlands.

If you object to this decision, you may request an administrative appeal under Corps regulations at 33 CFR Part 331. Enclosed you will find a Notification of Appeal Process (NAP) fact sheet and request for appeal (RFA) form. If you request to appeal this decision you must submit a completed RFA form to the following address:

District Engineer, Wilmington Regulatory Division
Attn: Nicholle Braspennickx
69 Darlington Avenue
Wilmington, North Carolina 28403

In order for an RFA to be accepted by the Corps, the Corps must determine that it is complete, that it meets the criteria for appeal under 33 CFR part 331.5, and that it has been received by the Division Office within 60 days of the date of the NAP. Should you decide to submit an RFA form, it must be received at the above address by March 30, 2020.

It is not necessary to submit an RFA form to the Division Office if you do not object to the decision in contained in this correspondence.

All other conditions of the permit, including the permit expiration date of December 31, 2022, remain in effect, as written. Should you have any questions, contact Ms. Nicholle Braspennickx, Charlotte Regulatory Office, via email at: Nicholle.M.Braspennickx@usace.army.mil or by telephone at (704)510-0162.

FOR THE COMMANDER

Enclosures:

Monte Matthews
Lead Project Manager
Wilmington District

Electronic Copy Furnished with enclosures:

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

Ms. Amy Euliss
North Carolina Department of Transportation
375 Silas Creek Parkway
Winston-Salem, North Carolina 27127-7167

Electronic Copy Furnished without enclosures:

Mr. David Wanucha
North Carolina Department of Environmental Quality
Division of Water Resources
450 West Hanes Mill Road, Suite 300
Winston-Salem, North Carolina 27105

Ms. Claire Ellwanger
U.S. Fish and Wildlife Services
Asheville Ecological Service Field Office
160 Zillicoa Street
Asheville, North Carolina 28801

Mr. Todd Bowers
Oceans, Wetlands and Streams Protection Branch
Wetlands and Streams Regulatory Section
U.S. Environmental Protection Agency-Region 4
Sam Nunn Atlanta Federal Center
61 Forsyth Street, SW
Atlanta, Georgia 30303-8931

Ms. Marla Chambers
Division of Inland Fisheries
North Carolina Wildlife Resources Commission
7121 Mail Service Center

Raleigh, North Carolina 27699-1721

Smith Creek Stream Relocation Plan: U2579B

Site Summary

Smith Creek runs parallel to existing west bound Business 40 just east of the interchange with the Winston Salem Northern Beltway in Forsyth County. There are two active fish hatchery ponds on the north side of Smith Creek. Construction of the deceleration lane from Business 40 onto the Winston Salem Northern Beltway resulted in a need to widen the highway toward Smith Creek. In the 2014 permit application, the plans called for armoring Smith Creek with a series of retaining walls and rip rap bank stabilization. Following the initial survey work in 2008, high stormwater flows have accelerated erosion along Smith Creek between Business 40 and the two fish hatchery ponds. The stream bank erosion was further accelerated when the area received several large rain events in 2018. As a result, Smith Creek has migrated closer to existing Business 40, making it impossible to construct the series of retaining walls and rip rap bank stabilization without jeopardizing the fish hatchery ponds. NCDOT has explored a culvert running the distance of Smith Creek. However due to cost, constructability and long-term maintenance concerns, NCDOT has opted to drain the two fish hatchery ponds and relocate Smith Creek and an Unnamed Tributary to Smith Creek into new channels. The relocated channels have been designed using natural channel techniques, maximizing floodplain width for long term stability. A riparian buffer will be planted utilizing native riparian vegetation, including herbaceous plants, shrubs and trees. A monitoring plan for the stream relocation and vegetation success is detailed below (see sections titled "Stream Assessment Success Criteria" and "Vegetation Success"). The area will be held under NCDOT Right of Way and a Control of Access fence will be erected around the site.

Water Access for Existing Fish Hatchery

The two fish hatchery ponds that will be drained for the stream relocation are part of a larger fish hatchery operation. Currently, the property owner utilizes an existing dam in Smith Creek, just downstream of the existing culvert under Business 40, to keep his ponds at full capacity for aquaculture operations. There is currently an 8-inch pipe that runs from the dam to fill the series of three ponds. Two of the three ponds will be removed to relocate the stream. Since the NCDOT project will remove the inline dam and impact the 8-inch pipe, we needed to provide the property owner a means to access water to fill his remaining pond that is equivalent to his existing operation. NCDOT has reviewed a couple of different methods to maintain water access. One method included an installation of a stream bypass structure which sends water into a pipe that runs the length of the stream relocation. This method was determined infeasible due to maintenance concerns associated with the long flat slope of the proposed pipe. Instead, NCDOT has decided to install an instream vault downstream of the project area where the property owner can place a pump as needed to fill the ponds.

NCDOT has investigated the amount of water that is currently being taken from Smith Creek to determine if the property owner's existing methods are in compliance with North Carolina General Statute §143-215.22H(b1). This statute requires 'any person who with draws or transfers 1,000,000 gallons per day' to register and report their withdrawal with the North Carolina Department of Environmental Quality (NCDEQ). If the property owner took two weeks to fill the ponds utilizing the 8" pipe he currently has, then he would remove 230,037 gallons per day. In conversations with the property owner, he fills the pond over a five-week period. The property owner is not currently registered, nor is does NCDOT believe he is required to be registered with the NCDEQ. Since NCDOT's project is going to decrease the amount of water the property owner needs by decreasing the number of ponds, the amount of water being removed from Smith Creek will decrease, and not change his need to register with NCDEQ. If his operations change in the future, it will be the property owner's responsibility to coordinate with NCDEQ.

Stream Assessment Success Criteria

The stream relocation site shall be monitored for five years or until success criteria are satisfied. Monitoring protocols shall follow the Monitoring Level I outlined in the Stream Mitigation Guidelines, April 2003. NCDOT will evaluate the success of the stream relocation project based on guidance provided by the Stream Mitigation Guidelines disseminated by the United States Army Corps of Engineers-Wilmington District. The survey of channel dimension will consist of permanent cross sections placed at six (6) cross sections (three riffles and three pools). Annual photographs showing both banks and upstream and downstream views will be taken from permanent, mapped photo points. The survey of the longitudinal profile will cover a cumulative total of approximately 2,471 linear feet of channel (2,127' for Smith Creek and 344' for the unnamed tributary. The entire restored length of stream will be investigated for channel stability and in-stream structure functionality. Any evidence of channel instability will be identified, mapped and photographed. Pebble counts shall not be conducted. In the event that success criteria are not being met, remedial measures will be coordinated with resource agencies. The monitoring shall be conducted annually for a minimum of five (5) years after final planting. The monitoring results shall be submitted to resource agencies in a final report within sixty (60) days after completing monitoring. After 5 years, the NCDOT shall contact resource agencies to schedule a site visit to "close out" the mitigation site if the site has met success criteria. If success is not met, NCDOT will make necessary adjustments to the site or pay mitigation fees to cover the impacts.

Vegetation Success

The success of vegetation and plantings will be measured through stem counts. Permanent quadrants will be used to sample the riparian buffer and restoration wetlands. Survival of the live stakes will be determined by visual observation throughout the five-year monitoring period.

Bare root vegetation will be evaluated using three (3) staked survival plots. Plots will be 50ft. by 50ft. If site conditions prevent a 50ft. by 50ft. plot, then the plot will have varying dimensions to encompass an area of 2,500 ft^2. All flagged stems will be counted in those plots. Success will be defined as 320 stems per acre after three years and 260 stems per acre after five years. All vegetation monitoring will be conducted during the growing season.

Appropriate measures will be taken to control nuisance vegetation during the monitoring period if it affects the success of the planted vegetation.

Functional Assessment: Pre and Post construction

A NCSAM form was completed for Smith Creek and the UT to Smith Creek. The forms have been attached to this Stream Relocation plan and are labeled Appendix 1. Smith Creek was divided into 3 sections, labeled SA-1, SA-2 and SA-3. SA-1 and 3 received an overall score of low, while SA-2 received a score of medium. The UT-1 to Smith Creek was assessed in its entirety within the project footprint and received an overall score of low.

A NCSAM form will be completed after the monitoring period in order to compare the potential functional uplift to pre-project conditions. It was decided with input from NCDOT, USACE, NCDWR, and NCWRC that the form will not be used to determine success of the site, but rather it will be used for comparison of pre and post project functions.

From:	Braspennickx, Nicholle M CIV USARMY CESAW (US)
To:	Euliss, Amy
Cc:	Dagnino, Carla S; Moore, Byron G
Subject:	RE: [External] U-2579B, W-SNB, from US 158 to I-40B/US421, Smith Cr. relocation Modification to individual permit
Date:	Wednesday, February 5, 2020 9:02:41 AM

I forwarded your email to Monte w/ my recommendation that for stream relocation and or stream restoration -- there will be slight variations.. and as-built submittals are often accepted. Here is the Wilmington District Response to your question:

stream relocation will require some slight modifications due to conditions they find as they are doing the work - and the As-builts will document this. However, they still need to meet the intent and overall approach that they have proposed...so a large alteration from their plan might need more formal coordination with you prior to completing the work.

Sincerely,

Nicholle B.
704-510-0162

-----Original Message-----
From: Euliss, Amy [mailto:aeuliss@ncdot.gov]
Sent: Monday, February 3, 2020 9:15 AM
To: Braspennickx, Nicholle M CIV USARMY CESAW (US) <Nicholle.M.Braspennickx@usace.army.mil>
Cc: Dagnino, Carla S <cdagnino@ncdot.gov>; Moore, Byron G <bgmoore@ncdot.gov>
Subject: [Non-DoD Source] RE: [External] U-2579B, W-SNB, from US 158 to I-40B/US421, Smith Cr. relocation Modification to individual permit

Nicholle,

Regarding condition no. 1, its NCDOT's standard practice to field adjust the plans as needed on stream restoration plans, and submit As Built plans to DWR and the USACE for minor changes needed during construction. Any major changes to the plans we would consult prior to the action. Can you confirm that condition no. 1 would allow us to do so? Thanks.

Amy

-----Original Message-----
From: Braspennickx, Nicholle M CIV USARMY CESAW (US) <Nicholle.M.Braspennickx@usace.army.mil>
Sent: Wednesday, January 29, 2020 4:25 PM
To: Euliss, Amy <aeuliss@ncdot.gov>; Dagnino, Carla S <cdagnino@ncdot.gov>; Wanucha, Dave <dave.wanucha@ncdenr.gov>; Cheely, Erin K <ekcheely@ncdot.gov>
Cc: Chambers, Marla J <marla.chambers@ncwildlife.org>
Subject: [External] U-2579B, W-SNB, from US 158 to I-40B/US421, Smith Cr. relocation Modification to individual permit

Hello,

Attached is the modification for U-2579B, W-S NB from US 158 to I-40B/US 421 with attachments. I hope this flies.. then I'm going to send more copies to folks w/o attachments. The request for modification was received on October 17, 2019. New information was submitted in October and then in January.

Sincerely,

Nicholle Braspennickx
U.S. Army Corps of Engineers
Regulatory Project Manager
Charlotte Regulatory Office
Desk: 704-510-0162

ROY COOPER
Governor
MICHAEL S. REGAN
Secretary
S. DANIEL SMITH
Director

NORTH CAROLINA
Environmental Quality

February 3, 2020

Mr. Philip S. Harris, III, P.E., CPM
NC Department of Transportation
Environmental Analysis Unit
1598 MSC
Raleigh, NC 27699-1598

Subject: Modification to the 401 Water Quality Certification Pursuant to Section 401 of the Federal Clean Water Act with ADDITIONAL CONDITIONS for improvements to Winston Salem Northern Beltway Eastern Section from US 158 to I-40 Bus/US 421 in Forsyth County, WBS Element No. 34839.2.10, TIP Project No. U-2579B; NCDWR Project No. 20140090 v7.

Dear Mr. Harris:

Attached hereto is a modification of Certification No. 3987 issued to The North Carolina Department of Transportation (NCDOT) originally dated April 11, 2014 and modified (with revisions) dated July 28, 2014 (v2); subsequently modified (via field modifications) on June 11, 2015 (v3), and on August 8, 2017 (v4); modified again on December 17, 2018 (v5); and, renewed/modified (with revision) on October 14, 2019 (v6).

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

Sincerely,

DocuSigned by:
Amy Chapman
9C9886312DCD474...

Linda Culpepper, Director
Division of Water Resources

Attachments

Electronic copy only distribution:
Nicholle Braspennickx, US Army Corps of Engineers, Charlotte Field Office
Carla Dagnino, NC Department of Transportation
Amanetta Somerville, US Environmental Protection Agency
Claire Ellwanger, US Fish and Wildlife Service
Marla Chambers, NC Wildlife Resources Commission
Amy Euliss, NC Department of Transportation, Division 9
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 1,791 linear feet of jurisdictional streams in Forsyth County. Additional new open water impacts (pond draining) amount to 7.82 acres. The project shall be constructed pursuant to the modification dated received October 21, 2019 and subsequent information received on January 29, 2020. The authorized impacts are as described below:

Perennial Stream Impacts in the Yadkin Pee Dee River Basin

Site	Permanent Fill (linear ft)			New Permanent Impacts Total (linear feet)	Temporary Impacts (linear ft)	New Temporary Impacts Total (linear ft)	Stream Impacts Requiring Additional Mitigation (linear ft)
	Culvert	Fill	Bank Stabilization	Bank Stabilization	Fill	Fill	
23, Current impacts	151	-	36	-	121	-	-
23, New impacts	-	-	plus 19	55	minus 91	30	-
28, Current impacts	598	-	194	-	127	-	-
28, New impacts	-	1,711	minus 62	132	minus 127	0	1,711*
28A, Brand New impacts	-	80	-	-	-	-	-

Total New Stream Impact: 1,791 linear feet

**Mitigation requirements to be determined following the monitoring period per the submitted plan.*

Open Water (Ponds) Impacts in the Yadkin Pee Dee River Basin

Site	Permanent Fill in Open Waters (ac)	Temporary Fill in Open Waters (ac)	Total Fill in Open Waters (ac)
28B	1.62	-	1.62
28C	6.20	-	6.20
Total	7.82	-	7.82

Total Open Water Impact for Project: 7.82 acres.

The application provides adequate assurance that the discharge of fill material into the waters of the Yadkin Pee Dee 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 modification application dated October 21, 2019 and subsequent information received on January 29, 2020. All of the authorized activities and conditions that pertain to the original Water Quality Certification dated April 11, 2014 and modified (with revisions) dated July 28, 2014 (v2); subsequently modified (via field modifications) on June 11, 2015 (v3), and on August 8, 2017 (v4); modified again on December 17, 2018 (v5); and, renewed/modified (with revision) on October 14, 2019 (v6), still apply except where superseded by this Certification.

Should your project change, you are required to notify the NCDWR and submit a new application. If the property is sold, the new owner must be given a copy of this Certification and approval letter and is thereby responsible for complying with all the conditions. If any additional wetland impacts, or stream impacts, for this project (now or in the future) exceed one acre or 300 linear feet, respectively, additional compensatory mitigation may be required as described in 15A NCAC 2H .0506 (h) (6) and (7). For this approval to remain valid, you are required to comply with all the conditions listed below. In addition, you should obtain all other federal, state or local permits before proceeding with your project including (but not limited to) Sediment and Erosion control, Coastal Stormwater, Non-discharge and Water Supply watershed regulations. This Certification shall expire on the same day as the expiration date of the corresponding Corps of Engineers Permit.

Condition(s) of Certification:

1. Mitigation requirements related to the impacted channel will be determined following the monitoring period of the relocated channel as outlined in the submitted plan. As indicated in your application, natural stream design (NSD) credits may be issued if monitoring data indicates criteria have been met.

2. Channel relocations (2,127 linear feet for Smith Creek, Site 28; and, 384 linear feet for UT to Smith Creek, Site 28A) will be constructed in a dry work area and stabilized before stream flows are diverted. Channel relocations should be completed and stabilized prior to diverting water into the new channel to the extent practicable. Whenever possible, channel relocations shall be allowed to stabilize for an entire growing season. NCDWR staff shall be contacted prior to diverting water into the new channels. Annual monitoring shall occur as described in the monitoring plan. [15A NCAC 02H .0506(b)(3)

3. This approval is only valid for the purpose and design that you submitted in your request for modification dated October 21, 2019 and subsequent information received on January 29, 2020. This Certification shall expire upon the expiration of the 404 permit.

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.

If you wish to contest any statement in the attached Certification you must file a petition for an administrative hearing. You may obtain the petition form from the office of Administrative hearings. You must file the petition with the office of Administrative Hearings within sixty (60) days of receipt of this notice. A petition is considered filed when it is received in the office of Administrative Hearings during normal office hours. The Office of Administrative Hearings accepts filings Monday through Friday between the hours of 8:00am and 5:00pm, except for official state holidays. The original and one (1) copy of the petition must be filed with the Office of Administrative Hearings.

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

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

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

Mr. Bill F. Lane, General Counsel
Department of Environmental Quality
1601 Mail Service Center

This the 3rd day of February 2020

DIVISION OF WATER RESOURCES

DocuSigned by:
Amy Chapman
9C9886312DCD474...

S. Daniel Smith, Director

WQC No. 3987

ROY COOPER
Governor
MICHAEL S. REGAN
Secretary
S. DANIEL SMITH
Director

NORTH CAROLINA
Environmental Quality

NCDWR Project No.: _____ **County:** _____

Applicant: _____

Project Name: _____

Date of Issuance of 401 Water Quality Certification: _____

Certificate of Completion
Upon completion of all work approved within the 401 Water Quality Certification or applicable Buffer Rules, and any subsequent modifications, the applicant is required to return this certificate to the 401 Transportation Permitting Unit, North Carolina Division of Water Resources, 1617 Mail Service Center, Raleigh, NC, 27699-1617. This form may be returned to NCDWR by the applicant, the applicant's authorized agent, **or** the project engineer. It is not necessary to send certificates from all of these.

Applicant's Certification

I, _____, hereby state that, to the best of my abilities, due care and diligence was used in the observation of the construction such that the construction was observed to be built within substantial compliance and intent of the 401 Water Quality Certification and Buffer Rules, the approved plans and specifications, and other supporting materials.

Signature: _____ Date: _____

Agent's Certification

I, _____, hereby state that, to the best of my abilities, due care and diligence was used in the observation of the construction such that the construction was observed to be built within substantial compliance and intent of the 401 Water Quality Certification and Buffer Rules, the approved plans and specifications, and other supporting materials.

Signature: _____ Date:_____

Engineer's Certification

_____ Partial _____ Final

I, _____, as a duly registered Professional Engineer in the State of North Carolina, having been authorized to observe (periodically, weekly, full time) the construction of the project for the Permittee hereby state that, to the best of my abilities, due care and diligence was used in the observation of the construction such that the construction was observed to be built within substantial compliance and intent of the 401 Water Quality Certification and Buffer Rules, the approved plans and specifications, and other supporting materials.

Signature _____ Registration No. _____
Date _____

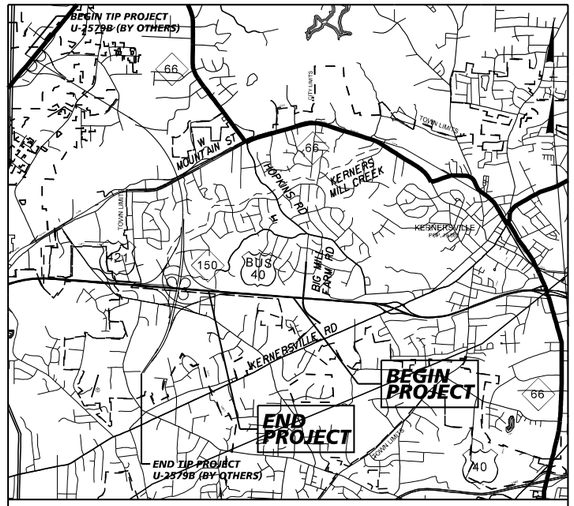
09/08/99

TIP PROJECT: U-2579BA

CONTRACT:

1/14/2020

See Sheet 1B For Conventional Plan Sheet Symbols



VICINITY MAP

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

FORSYTH COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-2579BA	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
34839.1.10		P.E.
34839.3.11		CONST.

LOCATION: US 421/I-40 BUS/NC 150 IN KERNERSVILLE FROM THE WINSTON-SALEM NORTHERN BELTWAY (FUTURE I-74) TO WEST OF S MAIN STREET

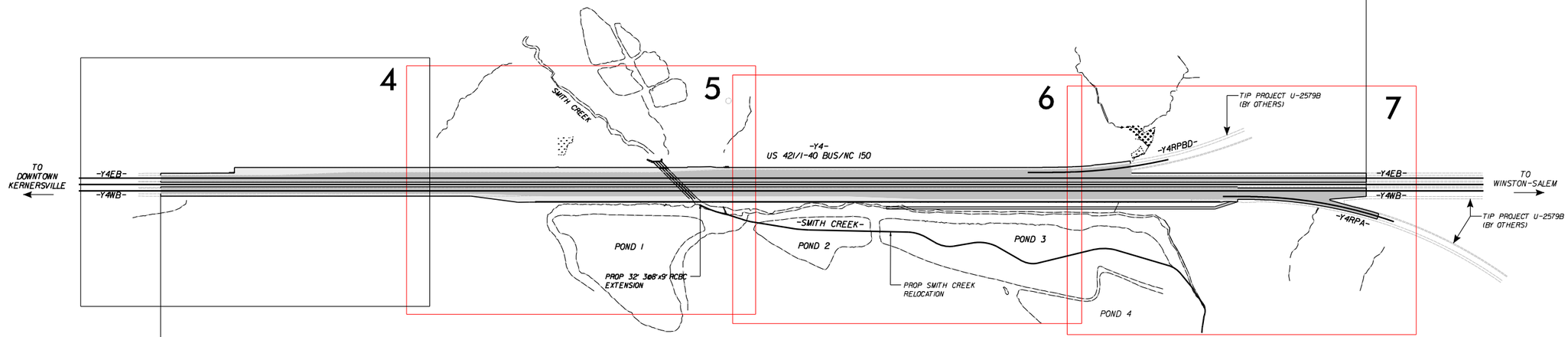
TYPE OF WORK: GRADING, DRAINAGE, PAVING, AND CULVERT

NAD 83/95

JANUARY 14, 2020
PERMIT DRAWING
SHEET 1 OF 18

PERMIT DRAWING MODIFICATION FOR U-2579B

END TIP PROJECT U-2579BA
TIE TO TIP PROJECT U-2579B (BY OTHERS)
-Y4EB- POT Sta. 75+00.00 (U-2579BA) =
-Y4EB- POT Sta. 75+00.00 (U-2579B)
-Y4WB- POT Sta. 75+00.00 (U-2579BA) =
-Y4WB- POT Sta. 75+00.00 (U-2579B)



BEGIN TIP PROJECT U-2579BA
TIE TO TIP PROJECT U-5760 (BY OTHERS)
-Y4EB- POT Sta. 23+50.00 (U-2579B) =
-Y4WB- POT Sta. 23+50.00 (U-2579B) =
-Y1- POT Sta. 56+50.00 (U-5760)

CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD III
THIS PROJECT IS WITHIN THE MUNICIPAL BOUNDARIES OF THE TOWN OF KERNERSVILLE
THIS IS A CONTROLLED-ACCESS PROJECT WITH ACCESS LIMITED TO POINTS AS SHOWN ON THE PLANS

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

GRAPHIC SCALES

50 25 0 50 100
PLANS

50 25 0 50 100
PROFILE (HORIZONTAL)

5 2.5 0 5 10
PROFILE (VERTICAL)

DESIGN DATA

AADT 2020 = 57,600
AADT 2040 = 77,900
K = 9%
D = 65%
T = 7%*
V = 65 MPH
* (TTST 4% + DUAL 3%)
FUNCTIONAL CLASSIFICATION: URBAN FREEWAY REGIONAL TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT U-2579BA = 0.975 MILES
TOTAL LENGTH TIP PROJECT U-2579BA = 0.975 MILES

PLANS PREPARED FOR THE NCDOT BY: Kimley»Horn

2018 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: N/A

LETTING DATE: APRIL 21, 2020

DAN ROBINSON, P.E.
PROJECT ENGINEER

RHODES S. HUNT, P.E.
PROJECT DESIGN ENGINEER

JESSICA EARLEY, P.E.
PROJECT EXECUTIVE NCDOT PRIORITY PROJECTS TEAM

HYDRAULICS ENGINEER

SIGNATURE: P.E.

ROADWAY DESIGN ENGINEER

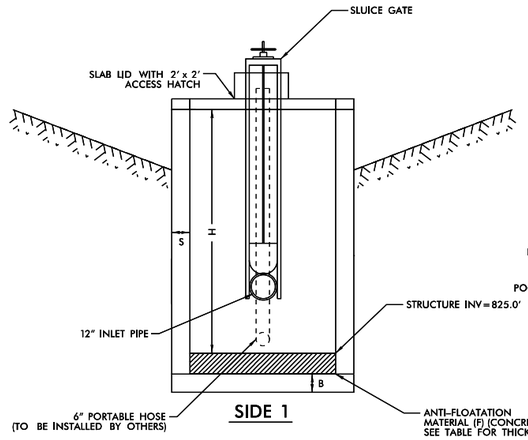
SIGNATURE: P.E.

STATE OF NORTH CAROLINA • DEPARTMENT OF TRANSPORTATION

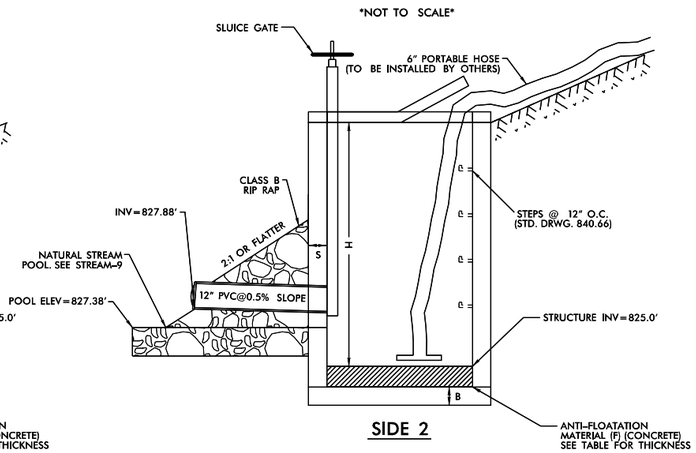
5/14/99

DETAIL
STREAM INTAKE VAULT
(SEE SPECIAL PROVISIONS)

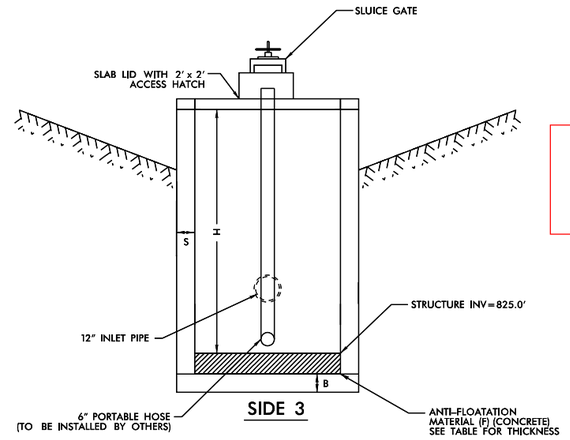
NOT TO SCALE



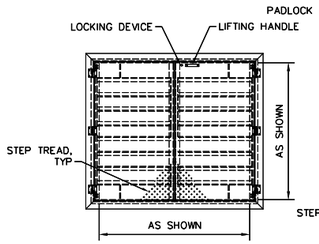
SIDE 1



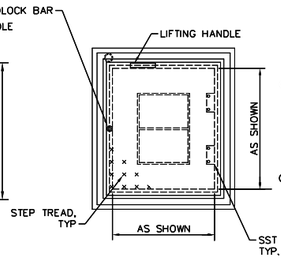
SIDE 2



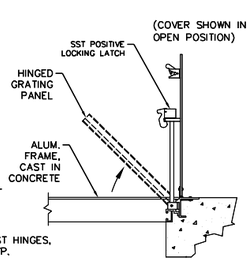
SIDE 3



DOUBLE DOOR



SINGLE DOOR

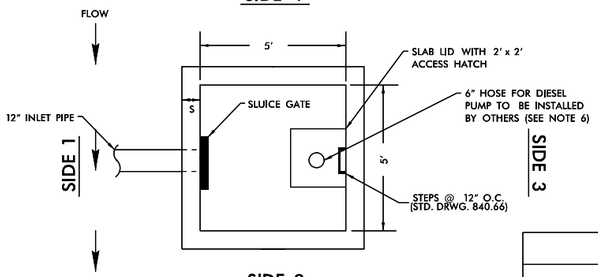


HATCH PROFILE

NOTES:
1. ALL HATCH COMPONENTS SHALL BE SST OR ALUMINUM.
2. HATCHES SHALL BE WATERPROOF AND RATED FOR 300PSF.
3. EXPOSED HARDWARE SHALL BE TAMPER-PROOF.
4. FALL PROTECTION SHALL BE IN ACCORDANCE WITH OSHA REQUIREMENTS.
5. CONTRACTOR SHALL CONFIRM THAT DIMENSIONS ARE ADEQUATE FOR INSTALLATION, REMOVAL, AND MAINTENANCE OF EQUIPMENT WITH EQUIPMENT MANUFACTURERS.

ACCESS HATCH
NOT TO SCALE

SIDE 4



SIDE 2

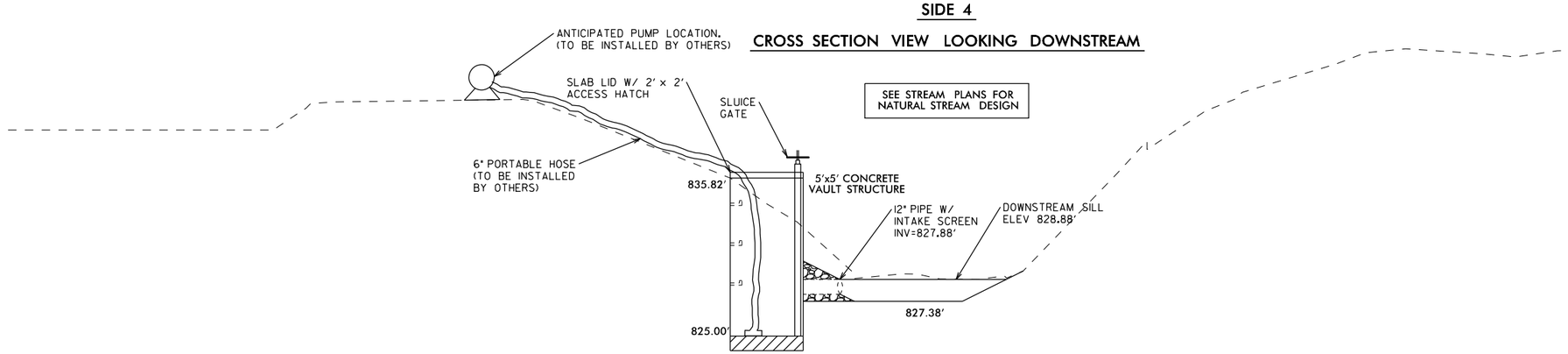
PLAN VIEW

NOTES:
1. SLUICE GATE IS FOR INTAKE VAULT AND SHOULD REMAIN CLOSED DURING NORMAL OPERATION.
2. SLUICE GATE SHALL PROVIDE WATERTIGHT SEAL. PROVIDE ADEQUATE CLEARANCE FOR INTAKE VAULT OPERATION.
3. SELECT BOX STANDARD AS REQUIRED TO ACCOMMODATE SLUICE GATE AND SLAB LID WITH ACCESS HATCH.
4. ENSURE ACCESS HATCH OPENS FREELY AND WITHOUT INTERFERENCE WITH SLUICE GATE.
5. ADJUST FOOTER DIMENSIONS AS NEEDED FOR ANTI-FLOTATION. FOOTER DIMENSIONS CAN BE 5' x 5' x 9' DEEP OR 8' x 8' x 4' DEEP. ANTI-FLOATATION MATERIAL IS REQUIRED AND SHALL BE CONCRETE.
6. NOT IN CONTRACT. SEE SPECIAL PROVISIONS.

MINIMUM DIMENSIONS FOR STREAM INTAKE VAULT							
STATION	S (INCHES) 6" MIN.	B (INCHES) 6" MIN.	BASIN BOTTOM MINIMUM ELEV.	TOP ELEVATION CONTROL STRUCTURE	INV. ELEVATION CONTROL STRUCTURE	ANTI-FLOATATION MATERIAL (F) THICKNESS FEET [5]	CTL. STR. DIMENSIONS (W x L x H)
31+69.64 –SMITH CREEK–	6	6	825.00'	835.82'	827.88'	9.0'	5' X 5' X 10.82'

SIDE 4

CROSS SECTION VIEW LOOKING DOWNSTREAM



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RALEIGH, NC 27601

RIGHT-OF-WAY REV.

CONST. REV.

PROJECT REFERENCE NO.	SHEET NO.
U-2579BA	2C-2
R/W SHEET NO.	
HYDRAULIC DESIGN ENGINEER	

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JANUARY 14, 2020
PERMIT DRAWING
SHEET 2 OF 18

1/23/2020
U-2579ba_stream_dtl.dgn

5/14/99

NOTE:
THE DETAILS BELOW REPRESENT A PRECAST CONCRETE GRAVITY WALL WITH NATURAL BOULDER APPEARANCE ALONG FACE (PER PLANS). THIS PRODUCT OR A COMPARABLE PRODUCT CAN BE UTILIZED ON THIS PROJECT. A PRODUCT SUBMITTAL AND DESIGN TO BE APPROVED BY THE ENGINEER WILL BE REQUIRED.

JANUARY 14, 2020
PERMIT DRAWING
SHEET 3 OF 18

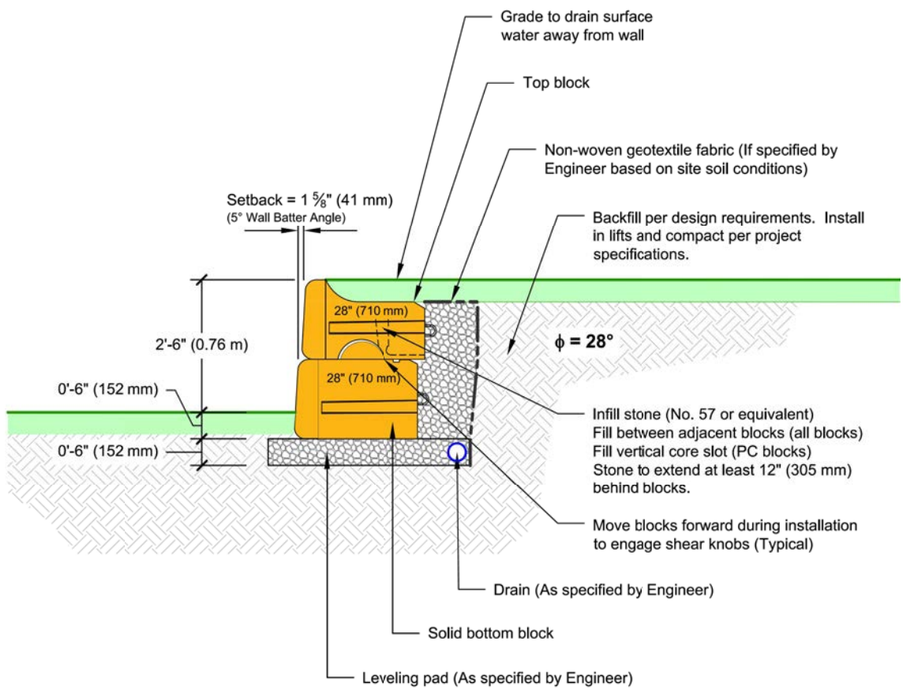
PROJECT REFERENCE NO.	SHEET NO.
U-2579BA	2C-3

$\phi = 28°$ | SILTY SAND or CLAYEY SAND

LOAD CONDITION A | NO LIVE LOAD SURCHARGE, NO BACK SLOPE, NO TOE SLOPE

2 BLO2K HIGH SECTION
(2) 28" (710 mm) Blocks

PRELIMINARY
Professional Engineering Design Required for Construction



This drawing is for reference only. Determination of the suitability and/or manner of use of any details contained in this document is the sole responsibility of the design engineer of record. Final project designs, including all construction details, shall be prepared by a licensed professional engineer using the actual conditions of the proposed site. Final wall design must address both internal and external drainage and all moces of wall stability.

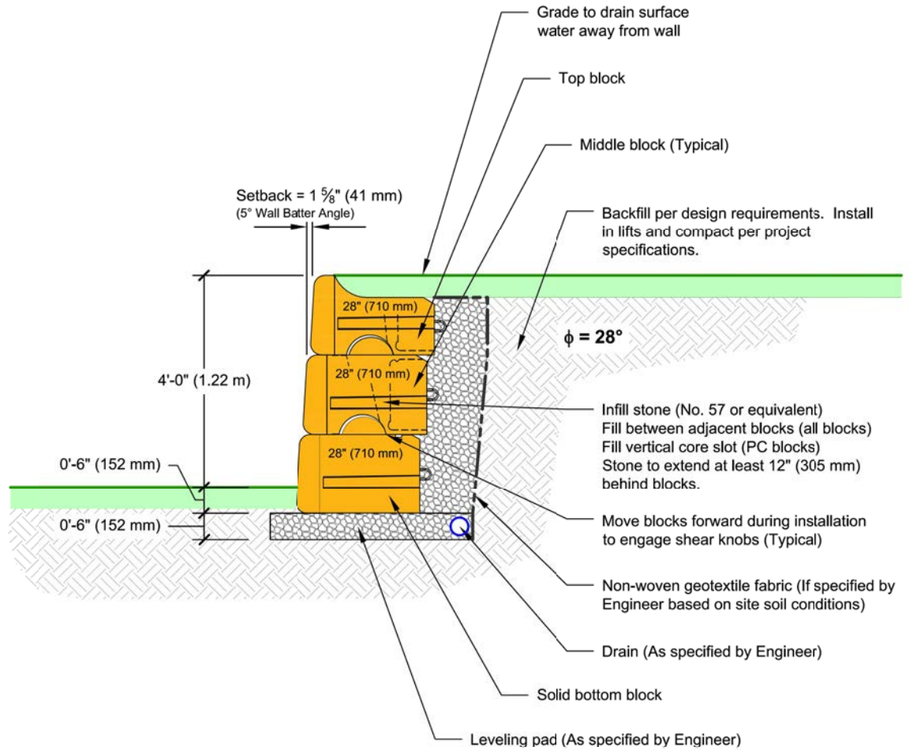
DRAWN BY:	TITLE: **Preliminary Wall Section** Silty Sand or Clayey Sand, $\phi = 28°$ No Live Load Surcharge, No Back Slope, No Toe Slope	
APPROVED BY:		
DATE:		
SHEET:	FILE: A_28_B_28_36_cad.dwg	

$\phi = 28°$ | SILTY SAND or CLAYEY SAND

LOAD CONDITION A | NO LIVE LOAD SURCHARGE, NO BACK SLOPE, NO TOE SLOPE

3 BLOCK HIGH SECTION
(3) 28" (710 mm) Blocks

PRELIMINARY
Professional Engineering Design Required for Construction



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DRAWN BY:	TITLE: **Preliminary Wall Section** Silty Sand or Clayey Sand, $\phi = 28°$ No Live Load Surcharge, No Back Slope, No Toe Slope	
APPROVED BY:		
DATE:		
SHEET:	FILE: A_30_B_28_54_cad.dwg	

1/14/2020
U-2579BA_bo_stream_dtl.dgn

5/14/99

NOTE:
THE DETAILS BELOW REPRESENT A PRECAST CONCRETE GRAVITY WALL WITH NATURAL BOULDER APPEARANCE ALONG FACE (PER PLANS). THIS PRODUCT OR A COMPARABLE PRODUCT CAN BE UTILIZED ON THIS PROJECT. A PRODUCT SUBMITTAL AND DESIGN TO BE APPROVED BY THE ENGINEER WILL BE REQUIRED.

JANUARY 14, 2020
PERMIT DRAWING
SHEET 4 OF 18

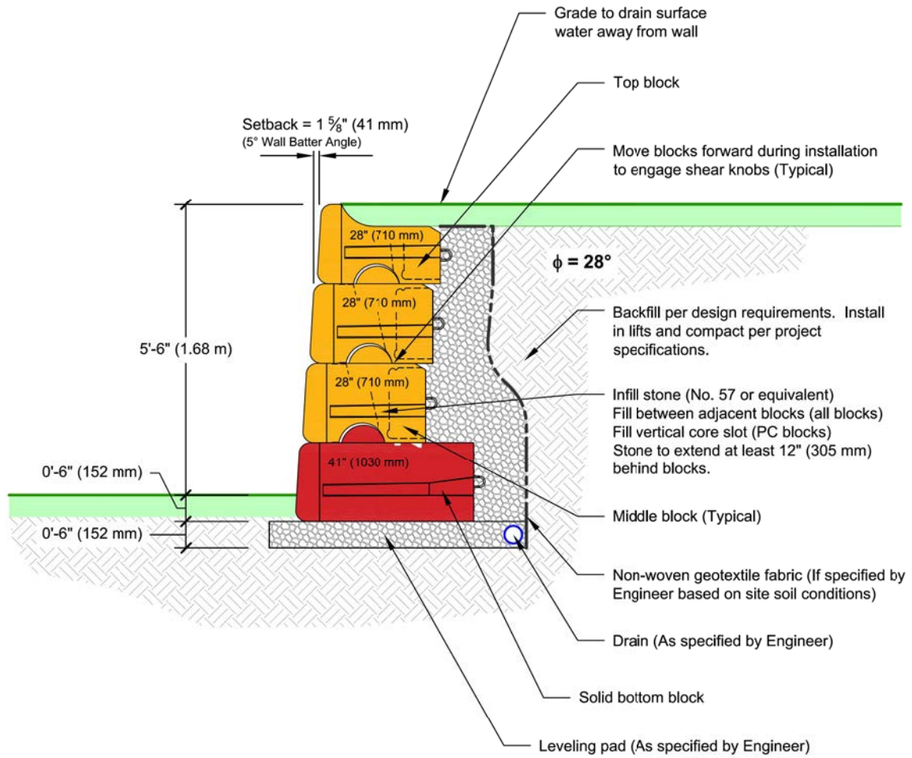
PROJECT REFERENCE NO.	SHEET NO.
U-2579BA	2C-4

$\phi = 28°$ | SILTY SAND or CLAYEY SAND

LOAD CONDITION A | NO LIVE LOAD SURCHARGE, NO BACK SLOPE, NO TOE SLOPE

4 BLOCK HIGH SECTION
(3) 28" (710 mm) Blocks
(1) 41" (1030 mm) Block

PRELIMINARY
Professional Engineering Design Required for Construction



This drawing is for reference only. Determination of the suitability and/or manner of use of any details contained in this document is the sole responsibility of the design engineer of record. Final project designs, including all construction details, shall be prepared by a licensed professional engineer using the actual conditions of the proposed site. Final wall design must address both internal and external drainage and all modes of wall stability.

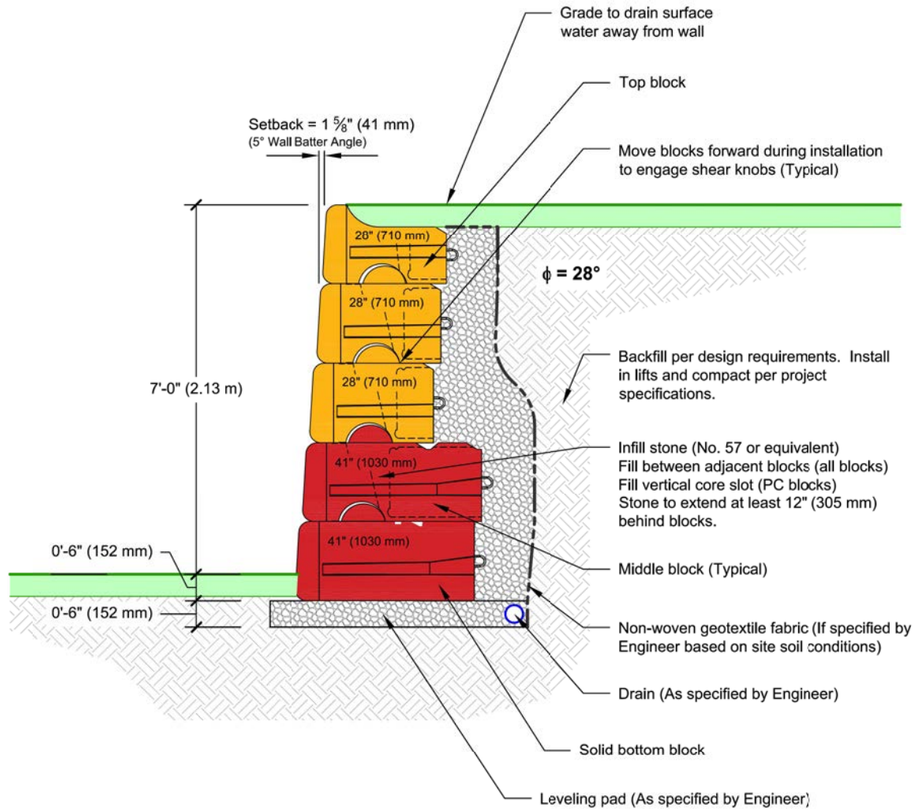
DRAWN BY:	TITLE: **Preliminary Wall Section**
APPROVED BY:	Silty Sand or Clayey Sand, $\phi = 28°$
DATE:	No Live Load Surcharge, No Back Slope, No Toe Slope
SHEET:	FILE: A_28_B_41_72_cad.dwg

$\phi = 28°$ | SILTY SAND or CLAYEY SAND

LOAD CONDITION A | NO LIVE LOAD SURCHARGE, NO BACK SLOPE, NO TOE SLOPE

5 BLOCK HIGH SECTION
(3) 28" (710 mm) Blocks
(2) 41" (1030 mm) Blocks

PRELIMINARY
Professional Engineering Design Required for Construction



This drawing is for reference only. Determination of the suitability and/or manner of use of any details contained in this document is the sole responsibility of the design engineer of record. Final project designs, including all construction details, shall be prepared by a licensed professional engineer using the actual conditions of the proposed site. Final wall design must address both internal and external drainage and all modes of wall stability.

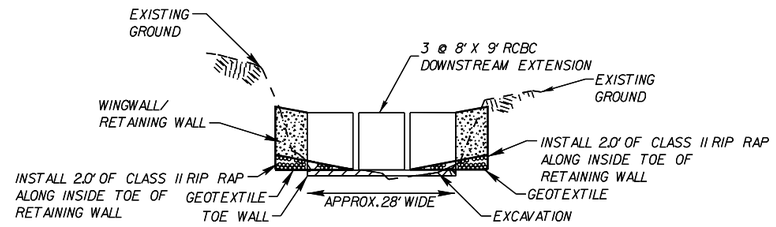
DRAWN BY:	TITLE: **Preliminary Wall Section**
APPROVED BY:	Silty Sand or Clayey Sand, $\phi = 28°$
DATE:	No Live Load Surcharge, No Back Slope, No Toe Slope
SHEET:	FILE: A_28_B_41_90_cad.dwg

1/14/2020
U-2579BA_bo_stream_dtl.dgn

8/17/99

REVISIONS

DETAIL 1
OUTLET CHANNEL IMPROVEMENTS



STA. 46+50 –Y4– (RT)

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RIGHT-OF-WAY REV.
CONST. REV.

PROJECT REFERENCE NO.	SHEET NO.
U-2579BA	2D-1

HYDRAULICS ENGINEER

JANUARY 14, 2020
PERMIT DRAWING
SHEET 5 OF 18

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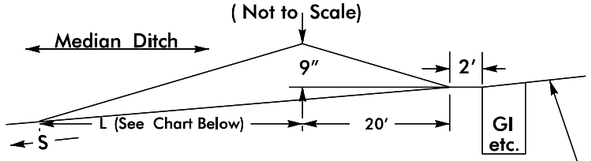
DETAIL 2
FALSE SUMP
(Not to Scale)

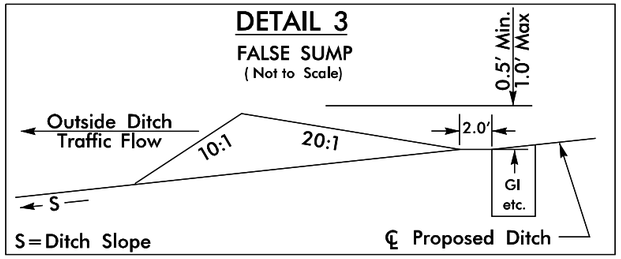


S = Ditch Slope ℄ Proposed Ditch

Ditch Grade	L	Ditch Grade	L
0.0% To 2.0%	20'	Over 4.0% To 6.0%	40'
Over 2.0% To 4.0%	30'	Over 6.0%	50'

STA. 29+21 –Y4– (CL), STA. 33+50 –Y4– (CL)
STA. 36+49 –Y4– (CL), STA. 39+49 –Y4– (CL)
STA. 43+14 –Y4– (CL), STA. 46+63 –Y4– (CL)
STA. 50+14 –Y4– (CL), STA. 52+64 –Y4– (CL)
STA. 56+37 –Y4– (CL), STA. 57+43 –Y4– (CL)
STA. 60+79 –Y4– (CL), STA. 63+21 –Y4– (CL)
STA. 67+22 –Y4– (CL), STA. 71+21 –Y4– (CL)

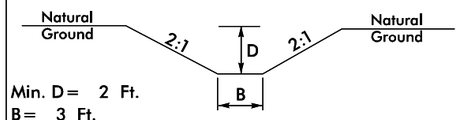
DETAIL 3
FALSE SUMP
(Not to Scale)



S = Ditch Slope ℄ Proposed Ditch

STA. 29+02 –Y4– (RT)
STA. 32+14 –Y4– (RT)
STA. 33+68 –Y4– (RT)
STA. 38+89 –Y4– (RT)
STA. 40+39 –Y4– (RT)

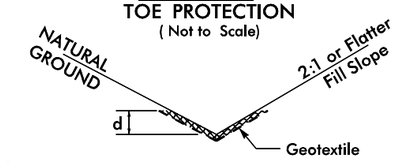
DETAIL 4
STANDARD BASE DITCH
(Not to Scale)



Min. D = 2 Ft.
B = 3 Ft.

FROM STA. 32+25 TO 32+70 –Y4– (RT)

DETAIL 5
TOE PROTECTION
(Not to Scale)

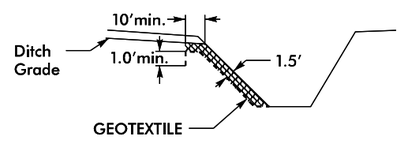


d = 1 Ft.

Type of Liner = Class 'B' Rip–Rap

FROM STA. 40+30 TO 46+30 –Y4– (RT)

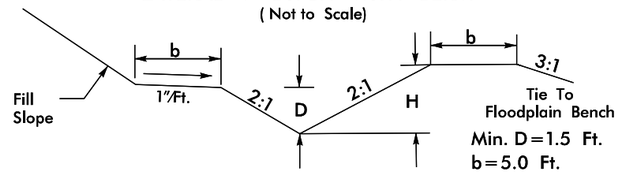
DETAIL 6
RIP RAP AT EMBANKMENT
(Not to Scale)



Type of Liner = Class II Rip–Rap

STA. 57+27 –Y4– (RT)
STA. 64+65 –Y4– (RT)

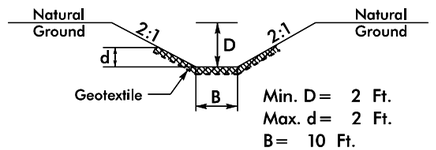
DETAIL 7
LATERAL 'V' DITCH WITH BERM
(Not to Scale)



Min. D = 1.5 Ft.
b = 5.0 Ft.
H = 3.0 Ft.

FROM STA 57+50 TO 64+00 –Y4– (RT)

DETAIL 8
STANDARD BASE DITCH
(Not to Scale)

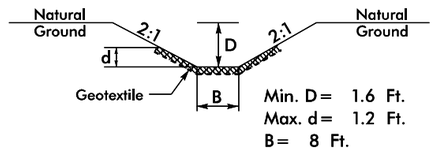


Min. D = 2 Ft.
Max. d = 2 Ft.
B = 10 Ft.

Type of Liner = CLASS 'I' Rip–Rap

FROM STA. 64+00 TO STA. 64+65 –Y4– (RT)

DETAIL 9
STANDARD BASE DITCH
(Not to Scale)



Min. D = 1.6 Ft.
Max. d = 1.2 Ft.
B = 8 Ft.

Type of Liner = CLASS 'I' Rip–Rap

FROM STA. 56+00 TO STA. 57+27 –Y4– (RT)

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RIGHT-OF-WAY REV.

CONST. REV.

PROJECT REFERENCE NO.	SHEET NO.
U-2579BA	2D-2
R/W SHEET NO.	
HYDRAULIC DESIGN ENGINEER	

JANUARY 14, 2020
PERMIT DRAWING
SHEET 6 OF 18

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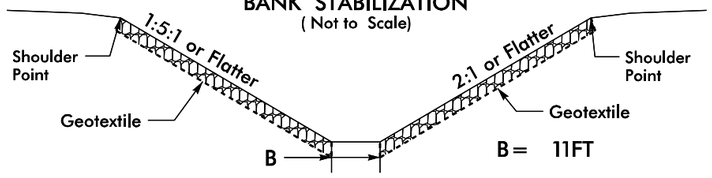
DETAIL
BANK STABILIZATION
(Not to Scale)

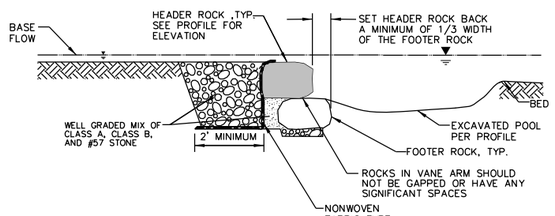
STREAMBANK SLOPES TO BE GRADED PER STREAM TYPICAL SECTIONS



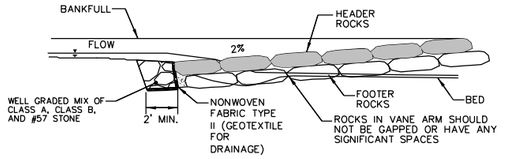
B = 11FT

Type of Liner = Class I Rip-Rap

FROM 30+15 STA. TO 32+73 STA. –SMITH CREEK– (LT)
FROM 31+60 STA. TO 32+73 STA. –SMITH CREEK– (RT)

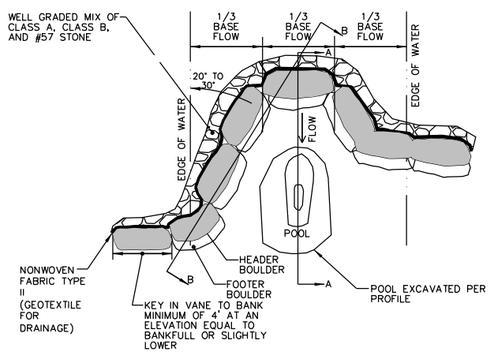


SECTION A-A



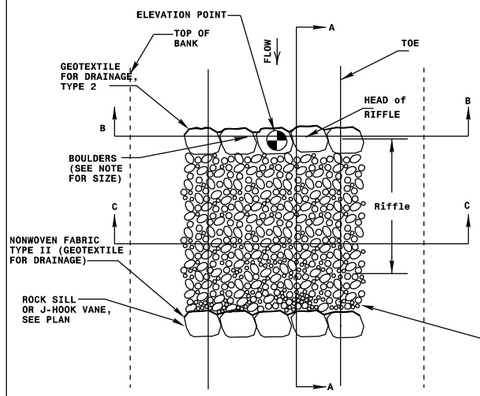
SECTION B-B

NOTES:
1. DEEPEST PART OF POOL TO BE IN LINE WITH WHERE VANE ARM TIES INTO THE BANK.
2. POOL DEPTH SHOULD BE ACCORDING PROFILE AND TYPICAL SECTIONS.
3. BOULDERS SHALL HAVE A MEAN DIAMETER OF 30"

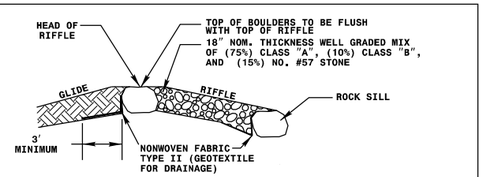


PLAN VIEW

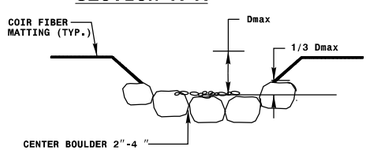
J-HOOK VANE DETAIL
NOT TO SCALE



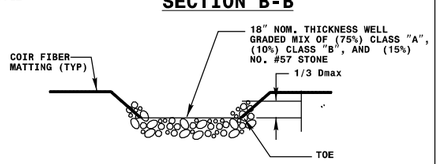
PLAN VIEW



SECTION A-A



SECTION B-B

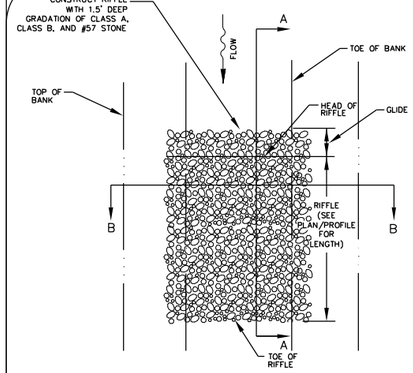


SECTION C-C

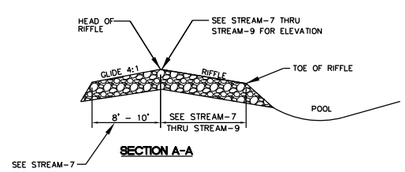
NOTE:
1. BOULDERS SHOULD BE NATIVE STONES OR SHOT ROCK, ANGULAR AND OBLONG, WITH A MEAN DIAMETER OF 30"

REACH	
Wbkf (ft)	28.8
Dmax (ft)	2.3

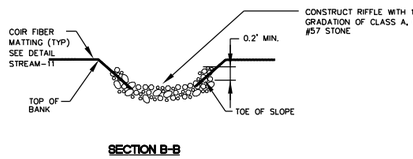
ROCK SILL DETAIL
NOT TO SCALE



PLAN VIEW



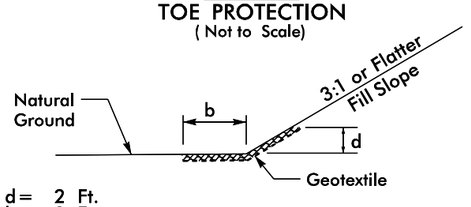
SECTION A-A



SECTION B-B

CONSTRUCTED RIFFLE
NOT TO SCALE

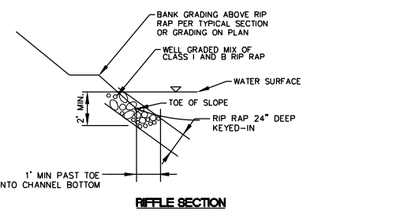
DETAIL
TOE PROTECTION
(Not to Scale)



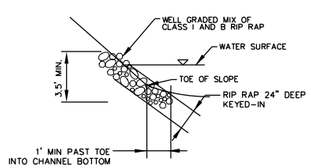
d = 2 Ft.
b = 2 Ft.

Type of Liner = Class I Rip-Rap

FROM 23+50 STA. TO 31+60 STA.
–SMITH CREEK–



RIFFLE SECTION



POOL SECTION

ROCK TOE PROTECTION
NOT TO SCALE

1/23/2020
U-2579ba_stream_dtl.dgn

5/14/99

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RIGHT-OF-WAY REV.

CONST. REV.

PROJECT REFERENCE NO.	SHEET NO.
U-2579BA	2D-3
R/W SHEET NO.	
HYDRAULIC DESIGN ENGINEER	

JANUARY 14, 2020
PERMIT DRAWING
SHEET 7 OF 18

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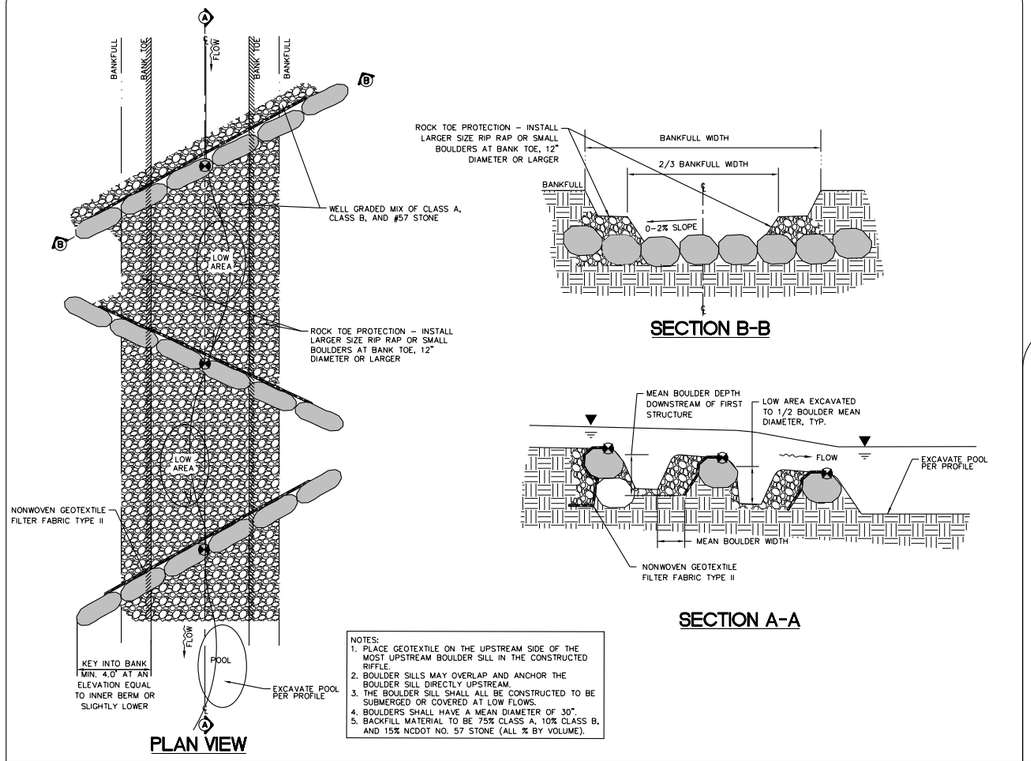


PLAN VIEW

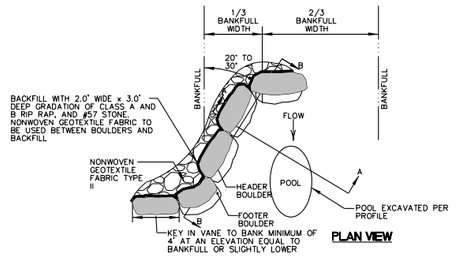
SECTION B-B

SECTION A-A

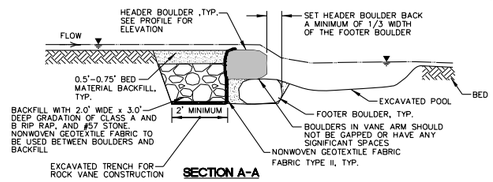
NOTES:
1. PLACE GEOTEXTILE ON THE UPSTREAM SIDE OF THE MOST UPSTREAM BOULDER SILL IN THE CONSTRUCTED RIFFLE.
2. BOULDER SILLS MAY OVERLAP AND ANCHOR THE BOULDER SILL DIRECTLY UPSTREAM.
3. THE BOULDER SILL SHALL ALL BE CONSTRUCTED TO BE SUBMERGED OR COVERED AT LOW FLOWS.
4. BOULDERS SHALL HAVE A MEAN DIAMETER OF 30".
5. BACKFILL MATERIAL TO BE 75% CLASS A, 10% CLASS B, AND 15% NCDOT NO. 57 STONE (ALL % BY VOLUME).

BOULDER ROCK AND ROLL RIFFLE

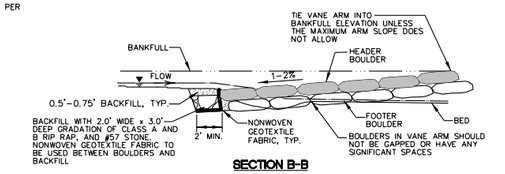
NOT TO SCALE



PLAN VIEW



SECTION A-A

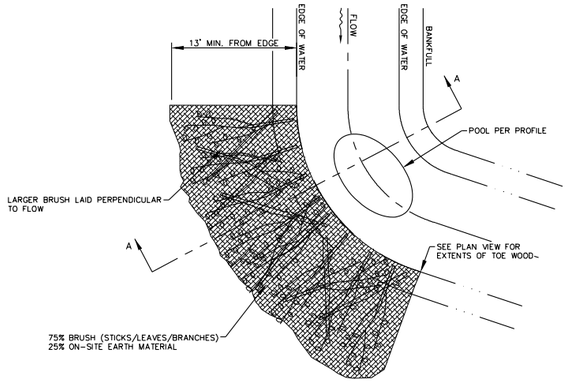


SECTION B-B

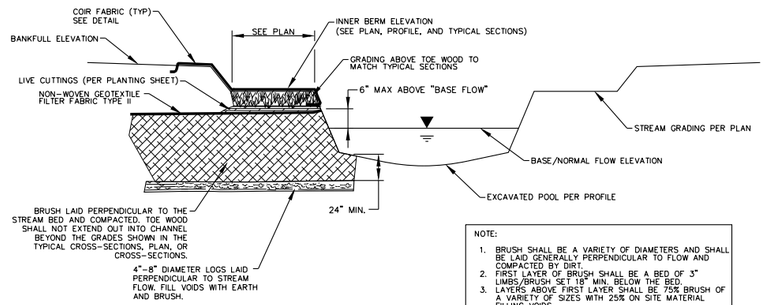
NOTES:
1. DEEPEST PART OF POOL TO BE IN LINE WITH WHERE VANE ARM TIES INTO BANKFULL.
2. DO NOT EXCAVATE POOL TOO CLOSE (1-2')TO FOOTER ROCK.
3. CLASS "A" STONE CAN BE USED TO REDUCE VOIDS BETWEEN HEADERS AND FOOTERS. BOULDERS SHOULD NOT HAVE GAPS.
4. COMPACT BANKFULL TO EXTENT POSSIBLE OR AT THE DIRECTION OF THE ENGINEER.
5. POOL DEPTH SHOULD BE ACCORDING TO PROFILE.
6. BOULDERS SHALL HAVE A MEAN DIAMETER OF 30".

ROCK VANE DETAIL

NOT TO SCALE



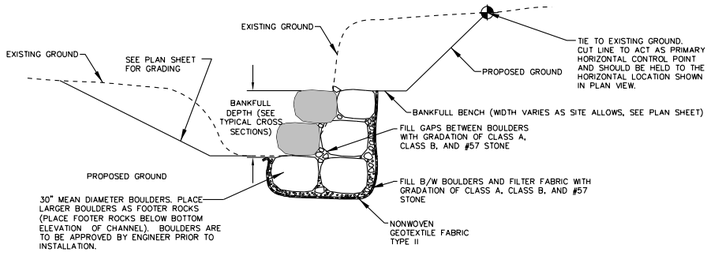
PLAN VIEW



NOTE:
1. BRUSH SHALL BE A VARIETY OF DIAMETERS AND SHALL BE LAID GENERALLY PERPENDICULAR TO FLOW AND COMPACTED BY DIRT.
2. FIRST LAYER OF BRUSH SHALL BE A BED OF 3" LIMBS/BRUSH SET 18" MIN. BELOW THE BED.
3. LAYERS ABOVE FIRST LAYER SHALL BE 75% BRUSH OF A VARIETY OF SIZES WITH 25% ON SITE MATERIAL FILLING VOIDS.
4. BRUSH BROUGHT UP IN LIFTS.
5. GRADING ABOVE THE TOE WOOD PER THE TYPICAL SECTION AND/OR GRADING PLAN.

TOE WOOD PROTECTION

NOT TO SCALE



BOULDER TOE PROTECTION

NOT TO SCALE

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5/14/99

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RIGHT-OF-WAY REV.
CONST. REV.

PROJECT REFERENCE NO.	SHEET NO.
U-2579BA	2D-4
R/W SHEET NO.	
HYDRAULIC DESIGN ENGINEER	

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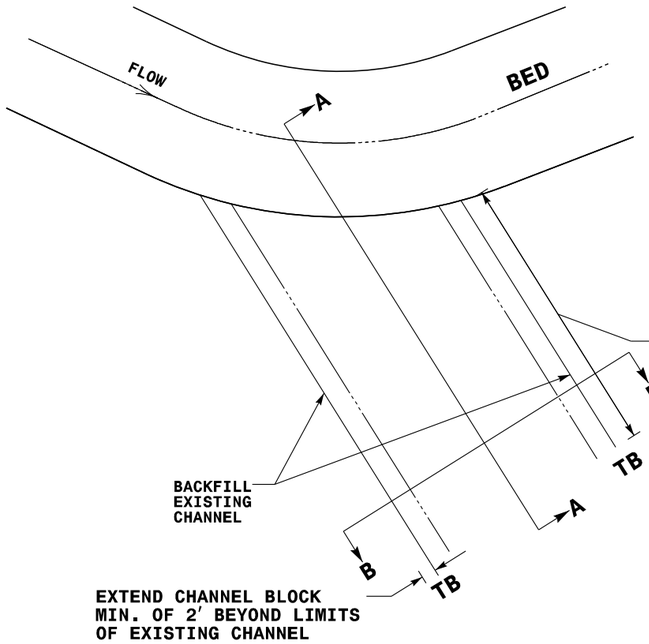
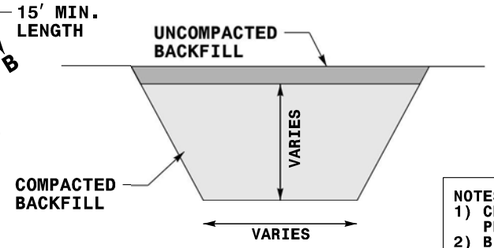
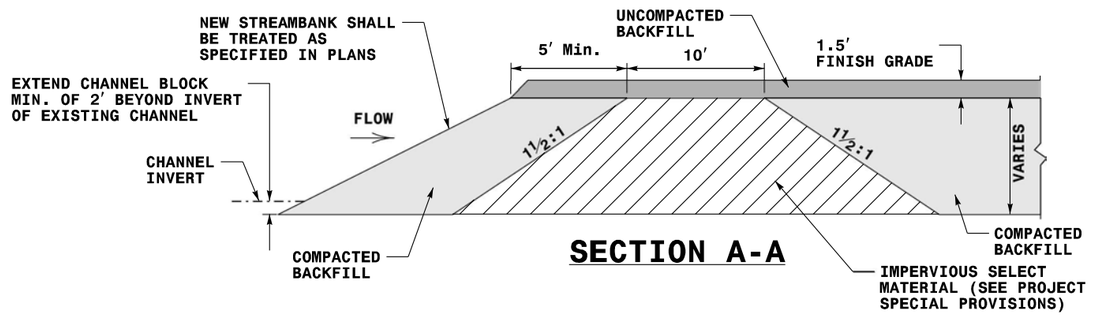
SHEET 8 OF 18



PLAN VIEW



SECTION B-B

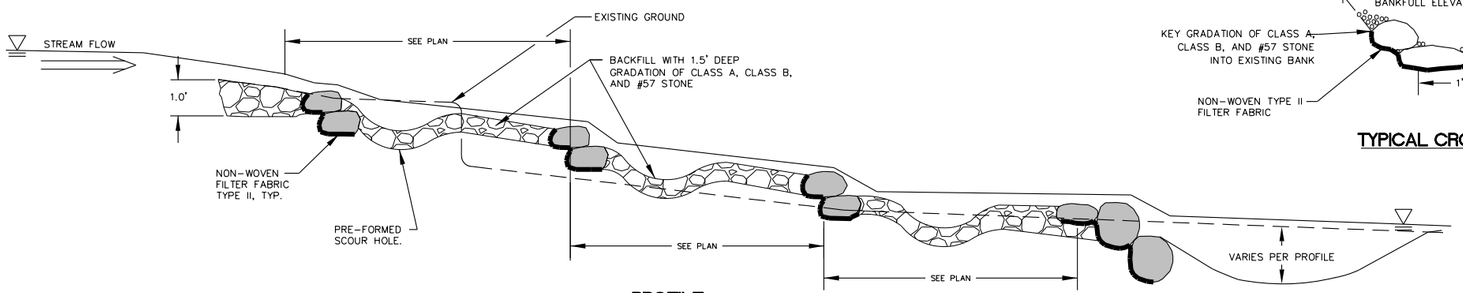


SECTION A-A

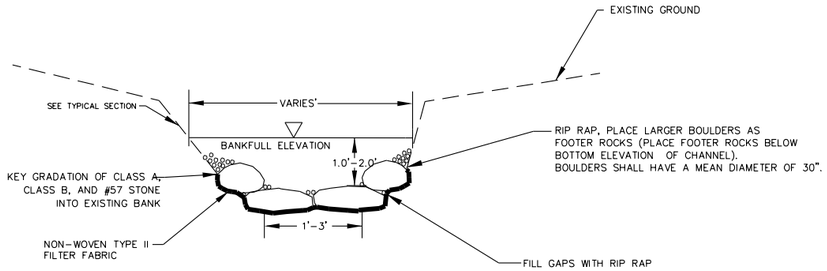
STREAM PLUG

NOT TO SCALE

NOTES:
1) CHANNEL BLOCK SHALL BE INSTALLED IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS.
2) BLOCK SHOULD BE INSTALLED AT THE INTERFACE BETWEEN EXISTING CHANNEL AND PROPOSED CHANNEL.
3) BOTTOM OF BLOCK SHOULD BE A MINIMUM OF 2' BELOW THE INVERT OF THE EXISTING CHANNEL.
4) BLOCK SHOULD EXTEND A MINIMUM OF 2' BEYOND THE LIMITS OF THE EXISTING STREAM CHANNEL.
5) INSTALL EROSION CONTROL MATTING AND SEED IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS IMMEDIATELY AFTER GRADING.
6) COMPACT BACKFILL TO EXTENT POSSIBLE OR AT THE DIRECTION OF THE ENGINEER.



PROFILE



TYPICAL CROSS SECTION

ROCK STEP POOL

NOT TO SCALE

1/14/2020
U-2579BA_stream_dtl.dgn

PROJECT REFERENCE NO.	SHEET NO.
34833933 (EWSB4 (U-2579BA))	2G-1

GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 028893 ENGINEER MICHAEL H. STEPHENS

SIGNATURE DATE | SIGNATURE DATE

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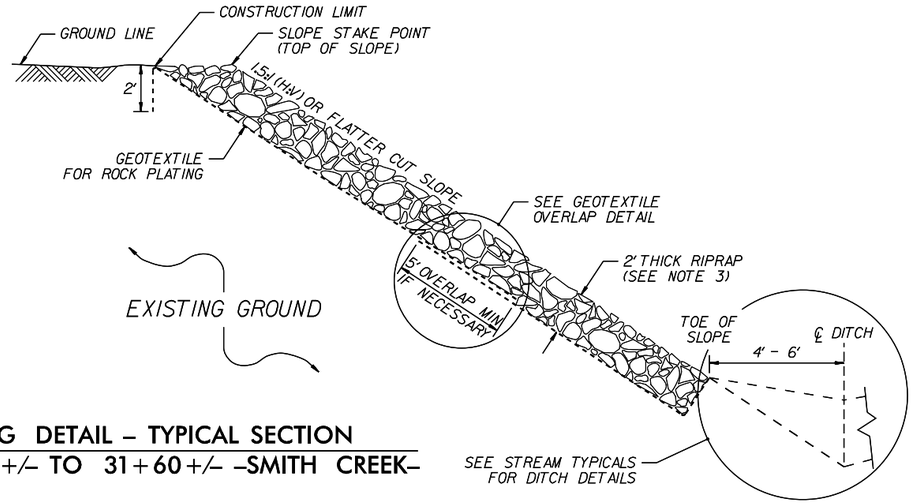
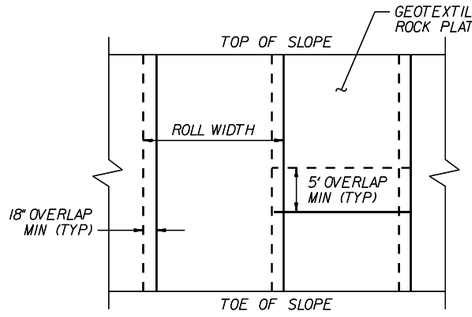
JANUARY 14, 2020
PERMIT DRAWING
SHEET 9 OF 18



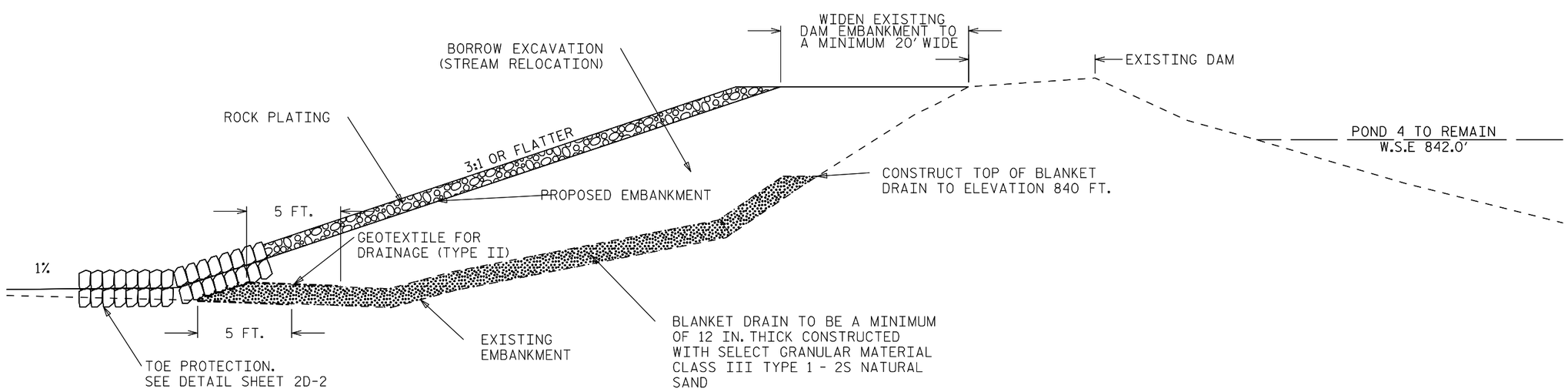
ROCK PLATING DETAIL – TYPICAL SECTION
FROM STA. 23+50 +/– TO 31+60 +/– –SMITH CREEK–



GEOTEXTILE OVERLAP DETAIL
(PLAN VIEW)

NOTES:

1. SEE STREAM PLANS FOR ROCK PLATING LOCATIONS.
2. FOR STANDARD ROCK PLATING, SEE SECTION 275.01 OF THE STANDARD SPECIFICATIONS.
3. USE CLASS 2 RIPRAP.



DAM EMBANKMENT WIDENING DETAIL
FROM STA. 23+50+/- TO 31+60+/- -SMITH CREEK-

ESTIMATED QUANTITES

PAY ITEM	PAY UNIT
SELECT GRANULAR MATERIAL, CLASS III	1,350 CY
BORROW EXCAVATION (STREAM RELOCATION)	2,750 CY
GEOTEXTILE FOR DRAINAGE (TYPE II)	1,050 SY
ROCK PLATING	3,750 SY

NOTES:
1) FOR DAM EMBANKMENT WIDENING, SEE DAM EMBANKMENT WIDENING PROVISION.

PREPARED BY: MHS	DATE: 10/17/19
REVIEWED BY: ENW	DATE: 10/17/19

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

DAM EMBANKMENT WIDENING DETAIL

REVISIONS

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

PERMIT DRAWING MODIFICATION LEGEND

- TS TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER
- S S — DENOTES IMPACTS IN SURFACE WATER (CULVERT IMPACTS)
- S S — DENOTES IMPACTS IN SURFACE WATER (STREAMBANK STABILIZATION)
- S S — DENOTES IMPACTS IN SURFACE WATER (FILL IN STREAM)
- P P — DENOTES IMPACTS IN SURFACE WATER (POND)

JANUARY 14, 2020
PERMIT DRAWING SHEET 10 OF 18

PERMIT DRAWING MODIFICATION FOR SITE 23 AND 28

PREVIOUS U-2579B SHEET 25/26

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RIGHT-OF-WAY REV.

CONST. REV.

PROJECT REFERENCE NO.	SHEET NO.
U-2579BA	5
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

8/17/99

REVISIONS

MATCHLINE –Y4 STA. 34+50 SHEET 4

MATCHLINE –Y4– STA. 48+50 SHEET 6

NAD 83/95

SITE 23 (PERMIT MOD)

SITE 23A

SITE 23A

SITE 22

SITE 23

SITE 23B

SITE 23 (PERMIT MOD)

SITE 28 (PERMIT MOD)

SITE 28A (PERMIT MOD)

FORSYTH COUNTY
TOWN OF KERNERSVILLE

CONVERT OTCB TO 2GI
RETAIN
REMOVE
REMOVE EX DI
N 85° 33' 45.8" W
COLLAR
REMOVE FES
JB W/MH COVER
PLUG, FILL, AND ABANDON
15" CMP W/ 2 ELBOWS
2GI
2GI-A
FS
18" 42° RCP-IV
42" RCP-IV
48" RCP-IV
30" RCP-IV
60° CHL
15" RCP-IV
BEGIN SBG –Y4WB– STA 39+50 RT
TOE PROTECTION W/ CLASS B RIPRAP EST 130 TONS EST 265 SY GFD SEE DETAIL 5/SHEET 2D-1
PROPOSED 32' 3@8'x9' RCBC DOWNSTREAM EXTENSION SEE CULVERT PLANS C01-1 THRU C01-10
RETAIN EXISTING SS MH AND USE CAUTION WHEN INSTALLING CHANNEL IMPROVEMENTS
OUTLET CHANNEL IMPROVEMENTS CLASS II RIP RAP EST 150 TONS EST 170 SY GFD SEE DETAIL/SHEET 2D-1
TDE ACQUIRED WITH TIP PROJECT U-2579B
R/W ACQUIRED WITH TIP PROJECT U-2579B
REMOVE EXIST STONE WALL
RIP RAP
SCOUR HOLE
POND W.E. 859.7 FISH HATCHERY
PAVED SHOULDER

NOTE :
FOR - Y4EB - PROFILE SEE SHEET 8
FOR - Y4WB - PROFILE SEE SHEET 10
FOR CULVERT PLANS SEE C01-1 THRU C01-10

8/17/99

REVISIONS

PERMIT DRAWING MODIFICATION LEGEND

- TS TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER
- S S — DENOTES IMPACTS IN SURFACE WATER (CULVERT IMPACTS)
- S S — DENOTES IMPACTS IN SURFACE WATER (STREAMBANK STABILIZATION)
- S S — DENOTES IMPACTS IN SURFACE WATER (FILL IN STREAM)
- P P — DENOTES IMPACTS IN SURFACE WATER (POND)

JANUARY 14, 2020
PERMIT DRAWING SHEET 11 OF 18

PERMIT DRAWING MODIFICATION FOR SITE 23 AND 28

PREVIOUS U-2579B SHEET 25/26

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RIGHT-OF-WAY REV.

CONST. REV.

PROJECT REFERENCE NO.	SHEET NO.
U-2579BA	5
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

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MATCHLINE -Y4 STA. 34+50 SHEET 4

MATCHLINE -Y4- STA. 48+50 SHEET 6

SITE 22

SITE 23 (PERMIT MOD)

SITE 23A

SITE 23B

SITE 28 (PERMIT MOD)

SITE 28A (PERMIT MOD)

FORSYTH COUNTY
TOWN OF KERNERSVILLE

N 85° 33' 45.8" W

CONVERT OTCB TO 2GI

RETAIN

REMOVE FES

COLLAR

JB W/MH COVER

BEGIN SBG -Y4WB- STA. 39+50 RT

TOE PROTECTION W/ CLASS B RIPRAP EST 130 TONS EST 265 SY GFD SEE DETAIL 5/SHEET 2D-1

PLUG, FILL, AND ABANDON

REMOVE EX DI

PROPOSED 32' 3@8'x9' RCBC DOWNSTREAM EXTENSION SEE CULVERT PLANS C01-1 THRU C01-10

RETAIN EXISTING SS MH AND USE CAUTION WHEN INSTALLING CHANNEL IMPROVEMENTS

OUTLET CHANNEL IMPROVEMENTS CLASS II RIP RAP EST 150 TONS EST 170 SY GFD SEE DETAIL/SHEET 2D-1

TDE ACQUIRED WITH TIP PROJECT U-2579B

R/W ACQUIRED WITH TIP PROJECT U-2579B

REMOVE EXIST STONE WALL

SCOUR HOLE

RIP RAP

POND W.E. 859.7 FISH HATCHERY

PAVED SHOULDER

NOTE :
FOR - Y4EB - PROFILE SEE SHEET 8
FOR - Y4WB - PROFILE SEE SHEET 10
FOR CULVERT PLANS SEE C01-1 THRU C01-10

8/17/99

REVISIONS

PERMIT DRAWING MODIFICATION LEGEND

DENOTES IMPACTS IN SURFACE WATER (FILL IN STREAM)

DENOTES IMPACTS IN SURFACE WATER (POND)

JANUARY 14, 2020
PERMIT DRAWING
SHEET 12 OF 18

PERMIT DRAWING MODIFICATION FOR SITE 28

PREVIOUS U-2579B SHEET 26/27

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RIGHT-OF-WAY REV.

CONST. REV.

PROJECT REFERENCE NO.	SHEET NO.
U-2579BA	6
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

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NAD 83/95

MATCHLINE –Y4– STA. 48+50 SHEET 5

MATCHLINE –Y4– STA. 62+50 SHEET 7

50 55 60

96" CHL & 3SBW
CONC BLD
MTL

RIP RAP

18" RCP RETAIN

30" RETAIN

24" RCP

30" RCP

RETAIN

PLUG, FILL, AND ABANDON

REMOVE

2GI

N 85° 33' 45.8" W

15" RCP-IV

18" RCP-IV

3GI-A

GRADE TO DRAIN

REMOVE EX. DI

20" WELDED STEEL TRENCHLESS INSTALLATION

COLLAR

CONVERT OTCB TO 2GI

RETAIN

REMOVE FES

REMOVE APPROXIMATELY 40 LF OF EXISTING 18" RCP AND TIE TO 2GI

24" RCP-IV

36" RCP-IV

18" CMP W/ ELBOWS

SCRUB

SMITH CREEK

SEE STREAM RELOCATION PLANS

SITE 28

BEGIN DITCH
STA. 56+00 -Y4-
ELEV. = 836.0'

STANDARD 6' BASE DITCH
SEE DETAIL 9/SHEET 20-1
CLASS I RIP RAP
EST 120 TONS
EST 270 SY GFD

EMBANKMENT PROTECTION
CLASS I RIP RAP
EST 10 TONS
EST 20 SY GFD
SEE DETAIL 6/SHEET 28-1

SPECIAL LATERAL V DITCH
SEE DETAIL 7/SHEET 20-1

CLASS B RIP RAP
EST 3 TONS
EST 10 SY GFD

END DITCH
STA. 57+77 -Y4-
ELEV. = 834.0'

W.E. 843.3'

R/W ACQUIRED WITH TIP PROJECT U-2579B

SITE 28A (PERMIT MOD)

SITE 28B (PERMIT MOD)

SITE 28 (PERMIT MOD)

SITE 28C (PERMIT MOD)

PAVED SHOULDER

NOTE :
FOR -Y4EB- PROFILE SEE SHEET 9
FOR -Y4WB- PROFILE SEE SHEET 11
FOR -Y4RPBD- PROFILE SEE SHEET 12

8/17/99

REVISIONS

PERMIT DRAWING MODIFICATION LEGEND

DENOTES IMPACTS IN SURFACE WATER (FILL IN STREAM)

DENOTES IMPACTS IN SURFACE WATER (POND)

JANUARY 14, 2020
PERMIT DRAWING
SHEET 13 OF 18

PERMIT DRAWING MODIFICATION FOR SITE 28

PREVIOUS U-2579B SHEET 26/27

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CONST. REV.

PROJECT REFERENCE NO.	SHEET NO.
U-2579BA	6
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

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NAD 83/95

MATCHLINE -Y4- STA. 48+50 SHEET 5

MATCHLINE -Y4- STA. 62+50 SHEET 7

SMITH CREEK

SITE 28

SEE STREAM RELOCATION PLANS

RIP RAP

96" CHL & 35SW CONC. BLD.

MTL

N 85° 33' 45.8" W

REMOVE

RETAIN

PLUG, FILL, AND ABANDON

GRADE TO DRAIN

REMOVE EX. DI

20" WELDED STEEL TRENCHLESS INSTALLATION

COLLAR

CONVERT OTCB TO 2GI

REMOVE FES

REMOVE APPROXIMATELY 10 LF OF EXISTING 18" RCP AND TIE TO 2GI

BEGIN DITCH STA. 56+00.00 -Y4- ELEV. = 834.0

STANDARD 8' BASE DITCH SEE DETAIL 9/SHEET 20 CLASS I RIP RAP EST 120 TONS EST 290 SY GFD

EMBANKMENT PROTECTION CLASS I RIP RAP EST 100 TONS EST 20 SY GFD SEE DETAIL 4/SHEET 20-1

SPECIAL LATERAL V DITCH SEE DETAIL 7/SHEET 20-1

CLASS B RIP RAP EST 3 TONS EST 10 SY GFD

CLASS I RIP RAP EST 3 TONS EST 10 SY GFD

END DITCH STA. 57+27.27 -Y4- ELEV. = 832.0

R/W ACQUIRED WITH TIP PROJECT U-2579B

SITE 28A (PERMIT MOD)

SITE 28B (PERMIT MOD)

SITE 28 (PERMIT MOD)

SITE 28C (PERMIT MOD)

PAVED SHOULDER

NOTE :
FOR -Y4EB- PROFILE SEE SHEET 9
FOR -Y4WB- PROFILE SEE SHEET 11
FOR -Y4RPBD- PROFILE SEE SHEET 12

5/14/99

REVISIONS

PERMIT DRAWING MODIFICATION LEGEND

DENOTES IMPACTS IN SURFACE WATER (FILL IN STREAM)

DENOTES IMPACTS IN SURFACE WATER (POND)

DENOTES IMPACTS IN SURFACE WATER (STREAMBANK STABILIZATION)

JANUARY 14, 2020
PERMIT DRAWING
SHEET 14 OF 18

PERMIT DRAWING MODIFICATION FOR SITE 28

PREVIOUS U-2579B SHEET 27

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RIGHT-OF-WAY REV.

CONST. REV.

PROJECT REFERENCE NO.	SHEET NO.
U-2579BA	7
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

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MATCHLINE -Y4- STA.62+50 SHEET 6

NAD 83/95

SITE 24A

SITE 24

SITE 24B

SITE 30

SITE 25

-Y4RPBD- CS Sta. 84+04.51

-Y4RPBD- POC Sta. 80+00.00

HW FOURTH COUNTY DOWN OF KERNERSVILLE

NOISE WALL

I-40 BUS EBL US 421 SBL 24' BST

I-40 BUS WBL US 421 NBL 24' BST

N 85° 33' 45.8" W

REMOVE

RETAIN

PLUG, FILL, AND ABANDON

REMOVE FES

COLLAR

2GI

15" RCP-IV

30" RCP-IV

SCRUB

COLLAR & EXTEND

END SBG -Y4WB- STA 68+75 RT

Copy OTCB To 2GI

-Y4RPA- ST Sta. 41+41.74 = -Y4WB- POT Sta.68+87.73 (24' RT)

-Y4RPA- CS Sta. 39+41.74

-Y4RPA- POC Sta. 34+00.00

SITE 28 (PERMIT MOD)

SITE 28C (PERMIT MOD)

SITE 28 (PERMIT MOD)

R/W ACQUIRED WITH TIP PROJECT U-2579B

TDE ACQUIRED WITH TIP PROJECT U-2579B

TEMPORARY EASEMENT REQUIRED FOR STREAM BANK RESTORATION

POND W.E. 836.3

W.E.8420 POND

UPPER ANDLE LAKE

SMITH CREEK

DOWN DITCH STA. 64+20.00 -Y4- ELEV.=853.00

STANDARD 10' BASE DITCH SEE DETAIL SHEET 40-1

END DITCH STA. 64+68.74 ELEV. 850.88

CLASS 1 RIP RAP EST 1 TONS EST 70 SY GFD

CLASS B RIP RAP EST 5 TONS EST 40 SY GFD SUPPLEMENTAL WATER & EROSION CONTROL MEASURES

CLASS 1 RIP RAP EST 12 TONS EST 120.8 SY GFD

SEE DRAINAGE RELOCATION PLANS

ENBANKMENT PROTECTION CLASS 1 RIP RAP EST 10 TONS EST 78 SY GFD SEE DETAIL SHEET 30-1

PAVED SHOULDER

NOTE :
FOR -Y4EB- PROFILE SEE SHEET 9
FOR -Y4WB- PROFILE SEE SHEET 11
FOR -Y4RPA- AND -Y4RPBD- PROFILES SEE SHEET 12

5/14/99

REVISIONS

PERMIT DRAWING MODIFICATION LEGEND

DENOTES IMPACTS IN SURFACE WATER (FILL IN STREAM)

DENOTES IMPACTS IN SURFACE WATER (POND)

DENOTES IMPACTS IN SURFACE WATER (STREAMBANK STABILIZATION)

JANUARY 14, 2020
PERMIT DRAWING
SHEET 15 OF 18

PERMIT DRAWING MODIFICATION FOR SITE 28

PREVIOUS U-2579B SHEET 27

Kimley»Horn ©2019
421 FAYETTEVILLE STREET, SUITE 600
RALEIGH, NC 27601

RIGHT-OF-WAY REV.

CONST. REV.

PROJECT REFERENCE NO.	SHEET NO.
U-2579BA	7
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

MATCHLINE -Y4- STA.62+50 SHEET 6

SITE 24A

SITE 24

-Y4RPBD- CS Sta. 84+04.51

-Y4RPBD- POC Sta. 80+00.00

FORSYTH COUNTY
TOWN OF KERNERSVILLE

I-40 BUS EBL US 421 SBL 24' BST

I-40 BUS WBL US 421 NBL 24' BST

REMOVE

RETAIN

PLUG, FILL, AND ABANDON

COLLAR

REMOVE FES

2GI

15" RCP-IV

30" RCP-IV

COLLAR & EXTEND

SCRUB

ENDWALL

N 85° 33' 45.8" W

END SBG -Y4WB- STA 68+75 RT

SITE 22

SITE 30

CLASS B RIP RAP
EST 5 TONS
EST 70 SY GFD
SUPPLEMENTAL WORK WITH CONTRACT
EST 40 TONS CLASS A RIP RAP
EST 12 TONS CLASS I RIP RAP
EST 120 SY GFD

SEE STREAM RELOCATION PLANS

EARTH DITCH
STA 64+00 RT
ELEV =831.99

STANDARD 10' BACK DITCH
SEE DETAIL SHEET 20
CLASS I RIP RAP
EST 120 TONS
EST 400 SY GFD
END DITCH
STA 64+68 RT
ELEV 840.88

SMITH CREEK

ENCAPSULATED PROTECTION
CLASS I RIP RAP
EST 10 TONS
EST 30 SY GFD
SEE DETAIL SHEET 20

RW ACQUIRED WITH TIP PROJECT U-2579B

SITE 28C (PERMIT MOD)

SITE 28 (PERMIT MOD)

TDE ACQUIRED WITH TIP PROJECT U-2579B

TEMPORARY EASEMENT REQUIRED FOR STREAM BANK RESTORATION

POND W.E. 838.3

POND W.E. 842.0

-Y4RPA- ST Sta. 41+41.74 = -Y4WB- POT Sta. 68+87.73 (24' RT)

-Y4RPA- CS Sta. 39+41.74

-Y4RPA- POC Sta. 34+00.00

SITE 25

SITE 28 (PERMIT MOD)

Copy OTCB To 2GI

NAD 83/95

PAVED SHOULDER

NOTE :
FOR -Y4EB- PROFILE SEE SHEET 9
FOR -Y4WB- PROFILE SEE SHEET 11
FOR -Y4RPA- AND -Y4RPBD- PROFILES SEE SHEET 12

WETLAND PERMIT IMPACT SUMMARY

Site No.	Station (From/To)	Structure Size / Type	WETLAND IMPACTS: Permanent Fill In Wetlands (ac)	Temp Fill In Wetlands (ac)	Excavation in Wetlands (ac)	Mechanized Clearing in Wetlands (ac)	Hand Clearing in wetlands (ac)	SURFACE WATER IMPACTS: Permanent SW impacts (ac)	Temporary SW impacts (ac)	Existing Channel Impacts Permanent (ft)	Existing Channel Impacts Temp. (ft)	Natural Stream Design (ft)
1	28+00 -Y-	ROAD FILL	0.03		<0.01	0.02		0.02		142		
2	16+00 -Y1 RPD-	ROAD FILL - INTERMITTENT						0.01		109		
		ROAD FILL - PERENNIAL						0.02		208		
		STREAMBANK STABILIZATION						<0.01	<0.01	10	37	
3	21+56-25+22 -Y1-	2 @ 7' x 6' RCBC						0.06	<0.01	438	33	
3A	17+36-21+53 -Y1-	DETOUR - ROAD FILL							0.08		545	
3B	20+55-21+32 -Y1-	DETOUR - ROAD FILL							0.03		194	
4	501+51-503+21 -L-	ROAD FILL						0.03	<0.01	493	18	
		STREAMBANK STABILIZATION						<0.01	<0.01	9	31	
5	503+85-507+80 -L-	ROAD FILL						0.05	<0.01	740	22	
5A	507+39-509+64 -L-	ROAD FILL						0.01		306		
6	523+00 -L-	ROAD FILL	0.03			<0.01		0.02	<0.01	312	42	
7	527+00 -L-	ROAD FILL	0.52			0.01						
		ROAD FILL - POND						0.59				
8	559-75 -L-	2 @ 10' x 6' RCBC						0.06	<0.01	442	53	
		STREAMBANK STABILIZATION						<0.01	<0.01	58	44	
9	560+75 -L-	ROAD FILL	0.03			0.01						
10	560+50-568+74 -L-	ROAD FILL	0.01					0.07	<0.01	783	22	
10A	566+84-572+75 -L-	ROAD FILL						0.05		684		
11	615+00 -L-	3 @ 10' x 9' RCBC						0.43	0.02	808	57	
11A	19+76-21+44 -Y4RPBD-	CHANNEL CHANGE						0.08	0.01	223	41	
12	15+84-18+86 -Y4RPBD-	CHANNEL CHANGE						0.01	0.02	88	205	
TOTALS:			0.62	0.00	< 0.01	0.05		1.53	0.19	5,853	1,344	

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

U-2579 B Forsyth County
Winston Salem Northern Beltway
(Eastern Section) (Future I-74)

SHEET 62 of 64

JANUARY 14, 2020
PERMIT DRAWING
SHEET 16 OF 18

WETLAND PERMIT IMPACT SUMMARY

			WETLAND IMPACTS					SURFACE WATER IMPACTS				
Site No.	Station (From/To)	Structure Size / Type	Permanent Fill In Wetlands (ac)	Temp Fill In Wetlands (ac)	Excavation in Wetlands (ac)	Mechanized Clearing in Wetlands (ac)	Hand Clearing in wetlands (ac)	Permanent SW impacts (ac)	Temporary SW impacts (ac)	Existing Channel Impacts Permanent (ft)	Existing Channel Impacts Temp. (ft)	Natural Stream Design (ft)
13	20+00-21+40 -Y4RPBD-	ROAD FILL	0.33									
14	629+95-635+90 -L-	ROAD FILL	0.04					0.05		688		
15	636+32-641+55 -L-	ROAD FILL	0.18					0.04		332		
		ROAD FILL-POND						2.38				
15A	644+00-645+00 -L-	ROAD FILL						<0.01		108		
16	643+56-644+61 -L-	ROAD FILL						<0.01		104		
		ROAD FILL-POND						0.16				
17	663+65-667+00 -L-	ROAD FILL	0.09			<0.01		0.06		928		
18	667+15 -L-	3 @ 12' x 10' RCBC						0.06	0.02	377	67	
		STREAMBANK STABILIZATION						0.02	0.01	80	59	
19	668+50 -L-	ROAD FILL	0.47			0.01						
20	687+80-691+59 -L-	ROAD FILL						0.03		163		
		ROAD FILL-POND						0.85				450
21	22+50 -Y1-	ROAD FILL	0.02									
22	40+50 -Y4-	OUTLET PAD	0.01									
~~23~~	~~45+65 -Y4-~~	~~CULVERT EXTENSION~~						~~0.06~~	~~0.01~~	~~100~~	~~32~~	
		~~STREAMBANK STABILIZATION~~						~~0.02~~	~~0.06~~	~~54~~	~~89~~	
23A	44+95-45+18 -Y4-	ROAD FILL						<0.01		57		
23B	45+07-46+34 -Y4-	ROAD FILL						0.01		135		
24	80+73-81+57 -Y4RPBD-	ROAD FILL						0.02		202		
24A	80+50-81+51 -Y4RPBD-	ROAD FILL	0.06									
25	37+31 -Y4RPA-	30" RCP						<0.01		73		
		STREAMBANK STABILIZATION						<0.01	<0.01	21	16	
TOTALS:			1.20			0.02		3.67	0.03	3,268	142	450

11/19/2018 Revisions shown in red text.

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

U-2579 B Forsyth County
Winston Salem Northern Beltway
(Eastern Section) (Future I-74)

SHEET 63 of 64

JANUARY 14, 2020
PERMIT DRAWING
SHEET 17 OF 18

WETLAND AND SURACE WATER IMPACTS SUMMARY

Site No.	Station (From/To)	Structure Size / Type	WETLAND IMPACTS: Permanent Fill In Wetlands (ac)	Temp. Fill In Wetlands (ac)	Excavation in Wetlands (ac)	Mechanized Clearing in Wetlands (ac)	Hand Clearing in Wetlands (ac)	SURFACE WATER IMPACTS: Permanent SW impacts (ac)	Temp. SW impacts (ac)	Existing Channel Impacts Permanent (ft)	Existing Channel Impacts Temp. (ft)	Natural Stream Design (ft)
26	29+16-31+12 -4RPC-	ROAD FILL-POND						0.38				
27A	104+63 - 107+53-Y4-	ROAD FILL						0.02		205		
27B	107+60 -Y4-	42" WELDED STEEL	0.05					0.01	< 0.01	130	14	
27C	107+58 - 108+44 -Y4-	30" RCP						< 0.01		116		
~~28~~	~~50+50 -56+00 -Y4- Rt~~	~~STREAMBANK STABILIZATION~~						~~0.02~~	~~0.15~~	~~365~~	~~188~~	
29	145+62 -Y4-	ROAD FILL				< 0.01						
30	64+34 -Y4-	STREAMBANK STABILIZATION						< 0.01		28		
31	557+28 -L-	STREAMBANK STABILIZATION						< 0.01		21		
2018 Permit Modifications												
23	44+10 to 47+96 -Y4-	3 @ 8' x 9' RCBC EXTENSION						0.06		151		
		STREAMBANK STABILIZATION						0.02	0.01	55	30	
28	47+96 to 56+84 -Y4-	2 @ 10' x 10' RCBC and 1 @ 10' x 8' RCBC						0.50		2233		2085
		SMITH CREEK RELOCATION IN TDE (SEE PERMIT SHEET 7)						0.01		76		42
		STREAMBANK STABILIZATION IN TDE (SEE PERMIT SHEET 7)						0.03		132		
28A	48+16 to 48+65 -Y4-	UT TO SMITH CREEK RELOCATION						0.01		80		384
28B	48+84 to 53+86 -Y4-	DRAIN POND						1.62				
28C	54+20 to 67+00 -Y4-	DRAIN POND						6.20				
09/18/2019 Permit Modifications												
8A		STREAM RELOCATION								144	40	
SUBTOTALS, THIS PAGE:			0.05			< 0.01		8.87	0.01	3371	84	2511
SUBTOTALS, PAGE 1			0.62		< 0.01	0.05		1.53	0.19	5853	1344	
SUBTOTALS, PAGE 2			1.20			0.02		3.67	0.03	3268	142	450
TOTALS:			1.87		< 0.01	0.08		14.07	0.23	12492	1570	2961

11/19/2018 Revisions shown in red text.

10/1/2019 Revisions shown in green text.

12/13/2019 Revisions shown in orange text.

09/18/2019 Revisions shown in blue text.

Revised 2018 Feb

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

U-2579 B Forsyth County
Winston Salem Northern Beltway
(Eastern Section) (Future I-74)

SHEET 64 OF 64

JANUARY 14, 2020
PERMIT DRAWING
SHEET 18 OF 18

PROJECT REFERENCE NO.	SHEET NO.
U-2579B	RF-1
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PLANTING ZONE DESCRIPTIONS AND NOTES

ZONE 1 - LIVE STAKE PLANTINGS

LOCATION DESCRIPTION;

LOWER GRADED BANKS LOCATED BETWEEN NORMAL WATER ELEVATION AND BANKFULL ELEVATION.

APPLICATION;

1. AMEND SOIL AS DESCRIBED IN SPECIAL CONDITIONS. SOIL AMENDMENT SHALL BE SUITABLE FOR STREAM BANK APPLICATION, SO THAT AMENDMENTS ARE RESISTANT TO FREQUENT WATER INUNDATION.
2. APPLY TEMPORARY SEED AND PERMANENT SEED MIXTURES PER TABLE 2 THIS SHEET AND THE SPECIAL PROVISIONS.
3. APPLY WHEAT STRAW MULCH PER GENERAL NOTES THIS SHEET AND THE SPECIAL PROVISIONS.
4. INSTALL COIR FIBER MATTING PER THE COIR FIBER MATTING DETAIL ON ALL NEWLY GRADED STREAM BANK SLOPES.
5. INSTALL LIVE STAKE PLANTINGS IN ACCORDANCE WITH TABLE 1, LIVE STAKE DETAIL THIS SHEET, AND THE SPECIAL PROVISIONS.

ZONE 2 - RIPARIAN PLANTINGS

LOCATION DESCRIPTION;

AREAS ABOVE BANKFULL.

APPLICATION;

1. AMEND SOIL AS DESCRIBED IN SPECIAL CONDITIONS. SOIL AMENDMENT SHALL BE SUITABLE FOR STREAM BANK APPLICATION, SO THAT AMENDMENTS ARE RESISTANT TO FREQUENT WATER INUNDATION.
2. APPLY TEMPORARY SEED AND PERMANENT SEED MIXTURES PER TABLE 2 THIS SHEET AND THE SPECIAL PROVISIONS.
3. APPLY WHEAT STRAW MULCH PER GENERAL NOTES THIS SHEET AND THE SPECIAL PROVISIONS.
4. INSTALL COIR FIBER MATTING ON ALL NEWLY GRADED OR DISTURBED SLOPES STEEPER THAN 1%.
5. INSTALL BARE ROOT PLANTINGS IN ACCORDANCE WITH TABLE 1, BARE ROOT DETAIL THIS SHEET, AND THE SPECIAL PROVISIONS.

TABLE 1: TREES AND SHRUBS PLANTING TABLE [4]

SCIENTIFIC NAME	COMMOM NAME	TYPE [1]	MIN/MAX COMPOSITION OF EACH ZONE	PLANT SPACING	
				FEET ON CENTER [2]	NUMBER PER 1 ACRE [3]
ZONE 1					
Salix nigra	Black Willow	LS	20/50	2-3	10890
Sambucus canadensis	Elderberry	LS	20/50		
Cornus amomum	Silky Dogwood	LS	20/50		
ZONE 2					
Betula nigra	River Birch	B	10/30	6-10	680
Cornus amomum	Silky Dogwood	B	10/30		
Platanus occidentalis	Sycamore	B	10/30		
Liriodendron tulipifera	Yellow poplar	B	10/30		
Quercus lyrata	Overcup Oak	B	10/30		
Quercus phellos	Willow Oak	B	10/30		
Quercus michauxii	Swamp Chestnut Oak	B	10/30		

1. LS = LIVE STAKE, B = BARE ROOT SEEDLING
2. AVERAGE FEET ON CENTER SPACING
3. AVERAGE NUMBER PER 1 ACRE OF PLANTING ZONE
4. PLANT SPECIES TO BE PLANTED BASED ON AVAILABILITY

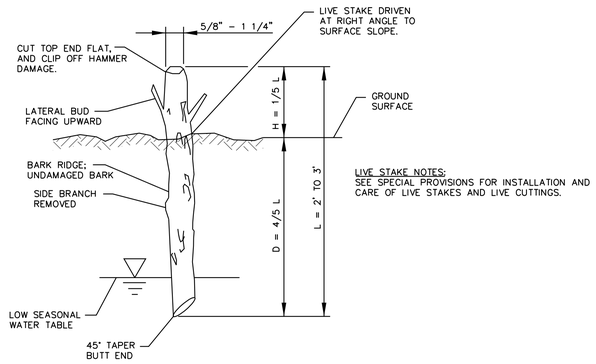
GENERAL NOTES

TEMPORARY PLANTING AND PERMANENT SEEDING SHALL OCCUR IMMEDIATLEY AFTER CONSTRUCTION TO STABILIZE AREAS OF BARE SOIL. PERMANENT PLANTINGS SHALL BE COMPLETED BETWEEN NOVEMBER 15 AND MARCH 1. HOWEVER, PLANTING MAY OCCUR OUTSIDE THIS WINDOW AS APPROVED BY DESIGN ENGINEER.

*SEE NCDOT SPECIAL PROVISION FOR STABILIZATION REQUIREMENTS FOR TEMPORARY SEED MIX, FERTILIZER APPLICATION RATES, AND OTHER PLANTING DETAILS.

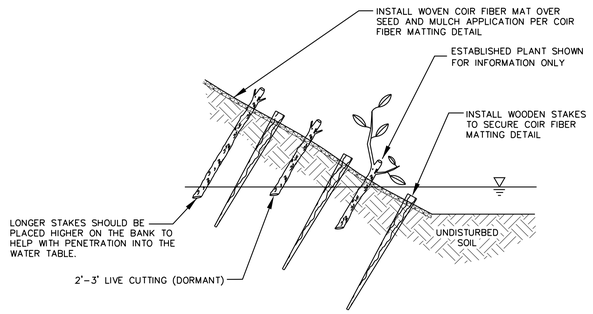
TABLE 2: PERMANENT SEED MIXTURE [1]

COMMON NAME	LBS/ACRE
AUGUST 1 - JUNE 1	
Creeping Red Fescue	18
Big Bluestem	8
Indiangrass	6
Switchgrass	4
Rye Grain	35
*Fertilizer	500
Limestone	4000
MAY 1 - SEPTEMBER 1	
Creeping Red Fescue	18
Big Bluestem	8
Indiangrass	6
Switchgrass	4
German or Browntop Millet	25
*Fertilizer	500
Limestone	4000



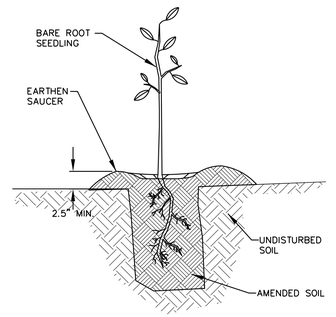
LIVE STAKE NOTES;
SEE SPECIAL PROVISIONS FOR INSTALLATION AND CARE OF LIVE STAKES AND LIVE CUTTINGS.

LIVE STAKE DETAIL
NOT TO SCALE



LIVE STAKE INSTALLATION
NOT TO SCALE

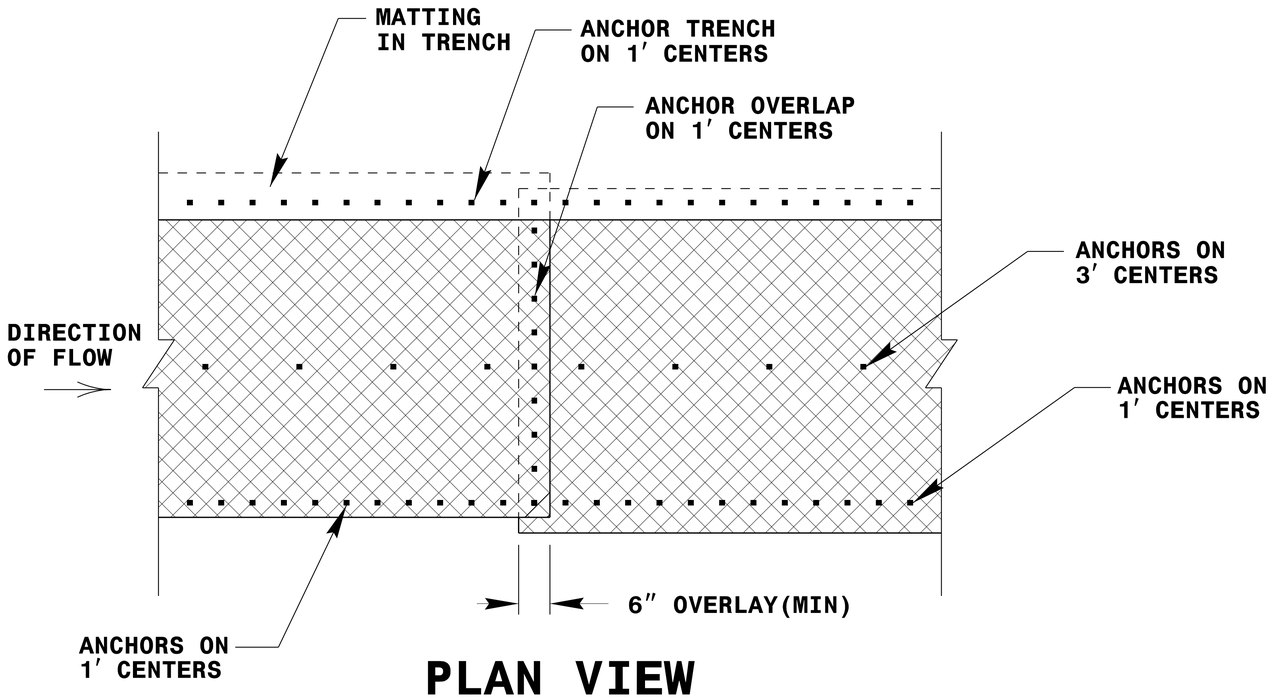
BARE ROOT NOTES;
SEE SPECIAL PROVISIONS FOR INSTALLATION AND CARE OF BARE ROOT PLANTINGS.



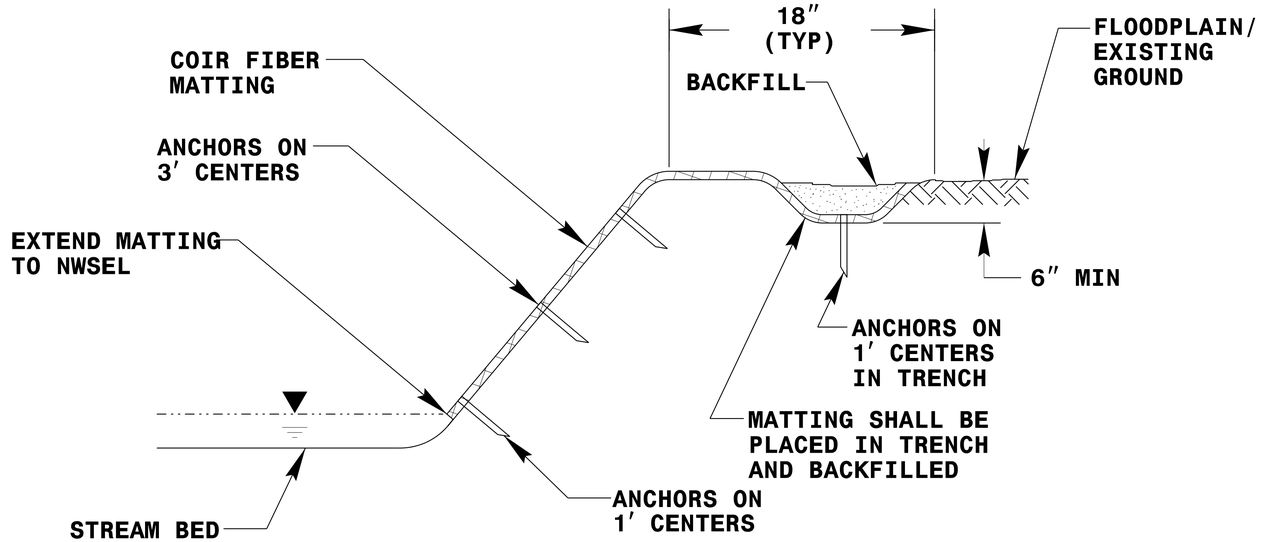
BARE ROOT PLANTING
NOT TO SCALE

STREAMBANK REFORESTATION
DETAIL SHEET 1 OF 2

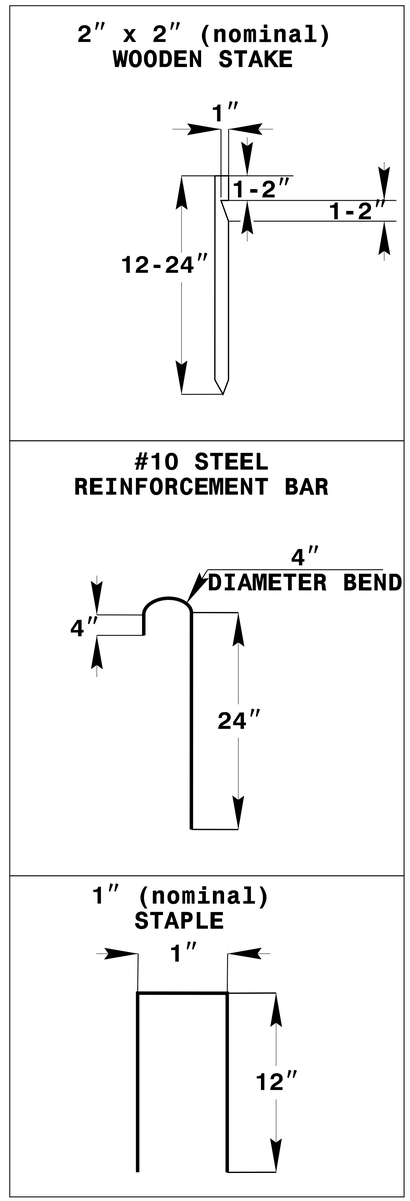
PROJECT REFERENCE NO.	SHEET NO.
U-2579B	RF-2
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER



PLAN VIEW



TYPICAL CROSS SECTION



ANCHOR OPTIONS

COIR FIBER MATTING DETAIL

NOT TO SCALE

STREAMBANK REFORESTATION
DETAIL SHEET 2 OF 2
N.C.D.O.T. - ROADSIDE ENVIRONMENTAL UNIT

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421 FAYETTEVILLE STREET, SUITE 600
RALEIGH, NC 27601

RIGHT-OF-WAY REV.

CONST. REV.

PROJECT REFERENCE NO.	SHEET NO.
U-2579B	PLANTING-1
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

5/14/99

REVISIONS

Sta.10+00

Sta.12+00

Sta.14+00

NO LIVE STAKES OR BARE ROOTS TO BE PLANTED IN FOOTPRINT SHOWN

TDE

TDE

RW

NO LIVE STAKES OR BARE ROOTS TO BE PLANTED NEAR WALL IN FOOTPRINT SHOWN

Sta.60+00

Sta.62+00

CA

127Z

RONALD LEE ANGEL SR.

Sta.14+55.44

Sta.63+59.43

RW

Sta.16+00

MATCHLINE SEE PLANTING-2

ISFD

36" CONC

WHITE WALNUT, LLC
DB 2858 PG 267
PB 42 PG 137

20' STORM SEWER EASEMENT PB 42 PG 137

55' PLASTIC

PLANTING LEGEND

ZONE 1: LIVE STAKE PLANTINGS

ZONE 2: RIPARIAN PLANTINGS

SEE RF-1 AND RF-2 FOR DETAILS

30 15 0 30 60

PLANS

10/28/2019

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421 FAYETTEVILLE STREET, SUITE 600
RALEIGH, NC 27601

RIGHT-OF-WAY REV.

CONST. REV.

PROJECT REFERENCE NO.	SHEET NO.
U-2579B	PLANTING-2
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

REVISIONS

MATCHLINE SEE STREAM PLANTING-1

MATCHLINE SEE PLANTING-3

REMOVE

Sta.18+00

Sta.20+00

Sta.22+00

Sta.24+00

NO LIVE STAKES OR BARE ROOTS TO BE PLANTED ON DAM BERM

20' SANITARY SEWER EASEMENT

WHITE WALNUT, LLC
DB 2858 PG 0267

PLANTING LEGEND

ZONE 1: LIVE STAKE PLANTINGS

ZONE 2: RIPARIAN PLANTINGS

SEE RF-1 AND RF-2 FOR DETAILS

30 15 0 30 60

PLANS

Kimley»Horn ©2018

421 FAYETTEVILLE STREET, SUITE 600
RALEIGH, NC 27601

RIGHT-OF-WAY REV.

CONST. REV.

PROJECT REFERENCE NO.	SHEET NO.
U-2579B	PLANTING-3
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

REVISIONS

MATCHLINE SEE PLANTING-2

MATCHLINE SEE PLANTING-4

PLANTING LEGEND

ZONE 1: LIVE STAKE PLANTINGS

ZONE 2: RIPARIAN PLANTINGS

SEE RF-1 AND RF-2 FOR DETAILS

I-40 BUS EBL US 421 SBL 2W BST

I-40 BUS WBL US 421 NBL 2W BST

9' BST

BST

MTL

SCRUB

JS

TB

RW

CA

127Z

Sta. 26+00

Sta. 28+00

Sta. 30+00

TDE

DAM

NO LIVE STAKES OR BARE ROOTS TO BE PLANTED ON DAM BERM

W.E. 8420 POND

UPPER ANGEL LAKE

472.19'

S 78°47'03" E

30 15 0 30 60

PLANS

Kimley»Horn
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421 FAYETTEVILLE STREET, SUITE 600
RALEIGH, NC 27601

RIGHT-OF-WAY REV.

CONST. REV.

PROJECT REFERENCE NO.	SHEET NO.
U-2579B	PLANTING-4

ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

REVISIONS

PLANTING LEGEND

ZONE 1: LIVE STAKE PLANTINGS

ZONE 2: RIPARIAN PLANTINGS

SEE RF-1 AND RF-2 FOR DETAILS

126Z
JEFFREY WAYNE MASTEN

127Z
RONALD LEE ANGEL SR.

133
ROBERT JOSEPH DICKEY TRUSTEE
PHYLLIS JOAN GARDNER DICKEY TRUSTEE
DB 2661 PG 2035

MATCHLINE SEE PLANTING-3

R/W MON

214.42'
S 85°40'37" E

N 02°43'37" W 60.79'

190.00'
N 85°40'37" W

S 19°05'36" E 199.28'

EXISTING R/W

SCRUB

POND
W.E. 838.3

POND
W.E. 838.3

JS MIT

TDE

N 04°42'28" E 413.21'

S 85°50'48" E 356.38'

30 15 0 30 60
PLANS