REQUEST FOR COMMITTEE ACTION

HENDERSON COUNTY
TECHINCAL REVIEW COMMITTEE

MEETING DATE: February 1, 2022

SUBJECT: Combined Master and Development for Rugby Ridge Major Subdivision (2022-M01)

STAFF CONTACT: Matt Champion, Zoning Administrator

ATTACHMENTS:
1. Staff Report
2. Combined Master & Development Plan
3. Formerly Approved Rugby Ridge Master & Development Plan

SUMMARY OF REQUEST:

HST Development, LLC submitted a subdivision application for Northview Subdivision, formerly Rugby Ridge Subdivision. Attached to the application is a Combined Master and Development Plan for the 36.98-acre project site. The site is located off North Rugby Road (S.R. 1365). The applicant is proposing a total of 26 lots that will be used for single-family residential purposes. The project is partially within the Upper French Broad River (WS-IV PA) water supply watershed district. The site is not located within the flood hazard area. The project site is currently zoned Residential Two (R2) and meets the standard density requirements. A subdivision local road is proposed to serve the site with the name Rugby Ridge Drive. A combination of public and private water systems is proposed with individual septic systems on all lots.

TECHNICAL REVIEW COMMITTEE ACTION REQUESTED:

Staff has found that the Combined Master and Development Plan appears to meet the standards of the subdivision regulations of Chapter 42, Henderson County Land Development Code (LDC).

Suggested Motion: I move that the TRC (approve, approve with conditions, or deny) the Combined Master and Development plan based on the conditions noted in the staff report and any conditions discussed by the TRC.

Henderson County Planning Department Staff Report

Combined Master and Development Plan
Northview (2022-M01)

Property Owner(s): HST Development, LLC
Applicant: Todd Trace (Agent for Owner)
PIN: 9651-20-2892

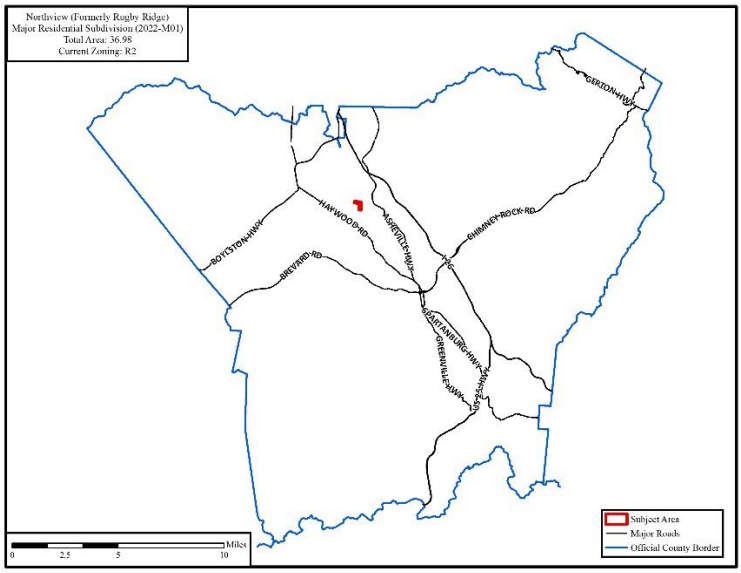
Master Plan Comments:

According to Chapter 42, Henderson County Land Development Code (LDC) §42-341, the purpose of a Master Plan is to provide general information about the proposed development to allow for an assessment of its impact on the orderly growth and development of the County, environmental quality, land values, natural features identified on the site analysis sketch and the County's roads and governmental services. During the review of the Combined the Master and Development Plan, the Technical Review Committee should take into consideration: applicable recommendations of the *Henderson County Comprehensive Plan*, the potential use of the land to be subdivided, and the impact of the subdivision and proposed use whether residential, commercial, or industrial.

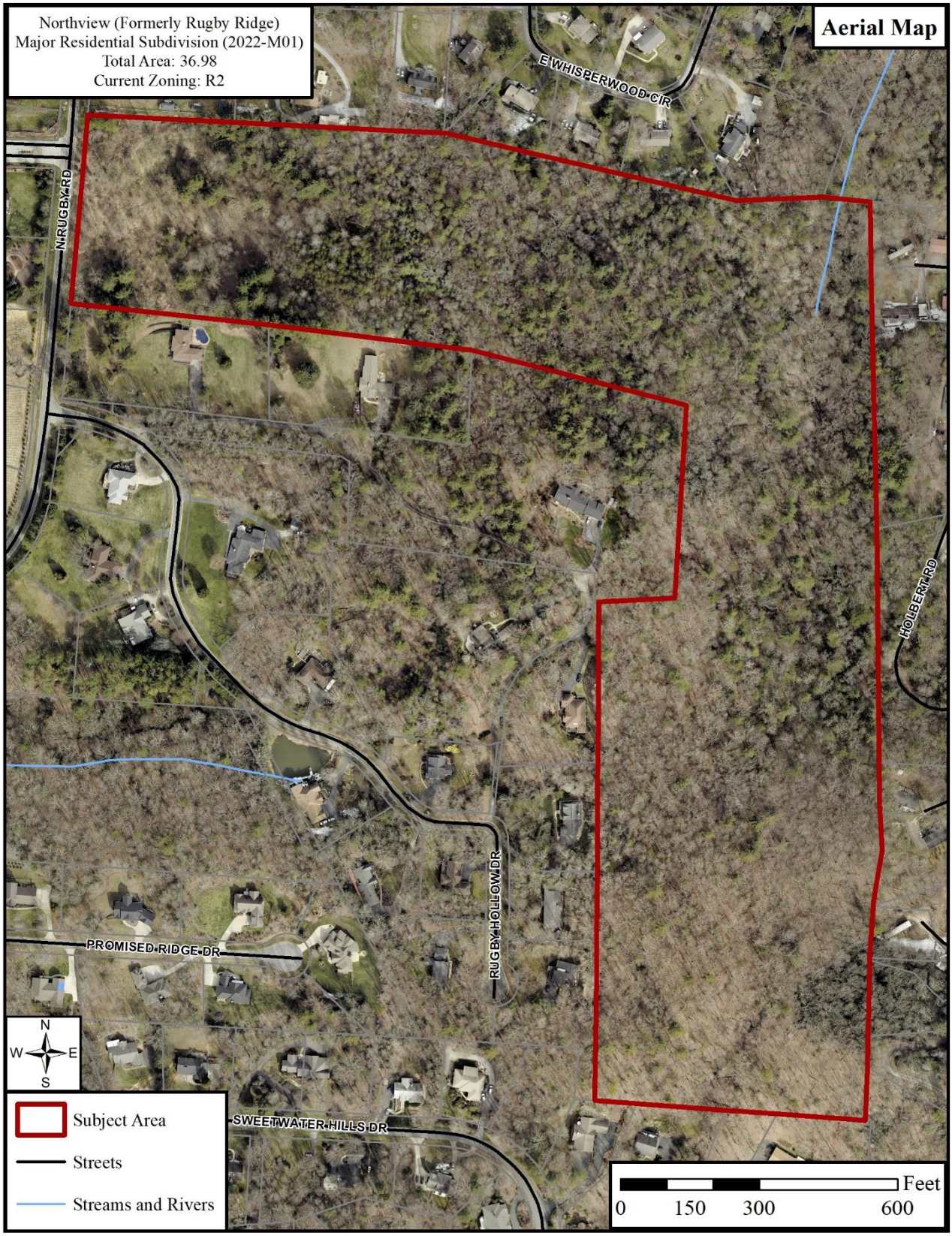
When reviewing the Combined Master and Development Plan it is important to consider that, due to severe topographic conditions, inadequate road access, distance from services, unique natural areas, soils that do not easily support soil drainage systems and/or the proximity to existing and incompatible land uses/zoning, all land may not be suitable to be subdivided for the purpose of dense development (LDC §42-75).

Staff has reviewed the submitted Combined Master and Development Plan for the Northview Major Subdivision, taking into consideration the recommendations of the *Henderson County Comprehensive Plan*, and reviewing the plan for conformance with Henderson County Land Development Code. Staff offers the following comments:

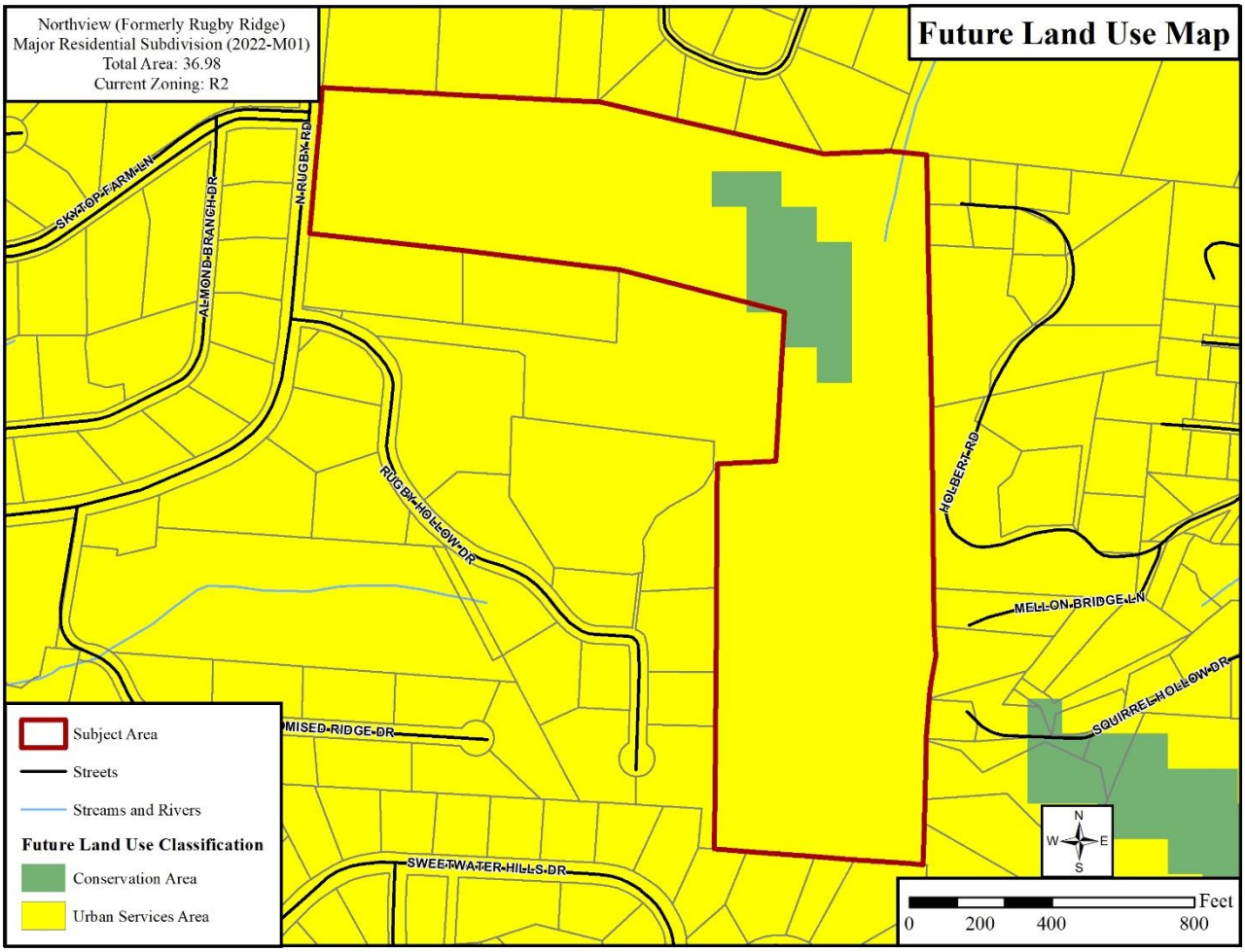
Map A: County Context



Map B: Aerial Imagery

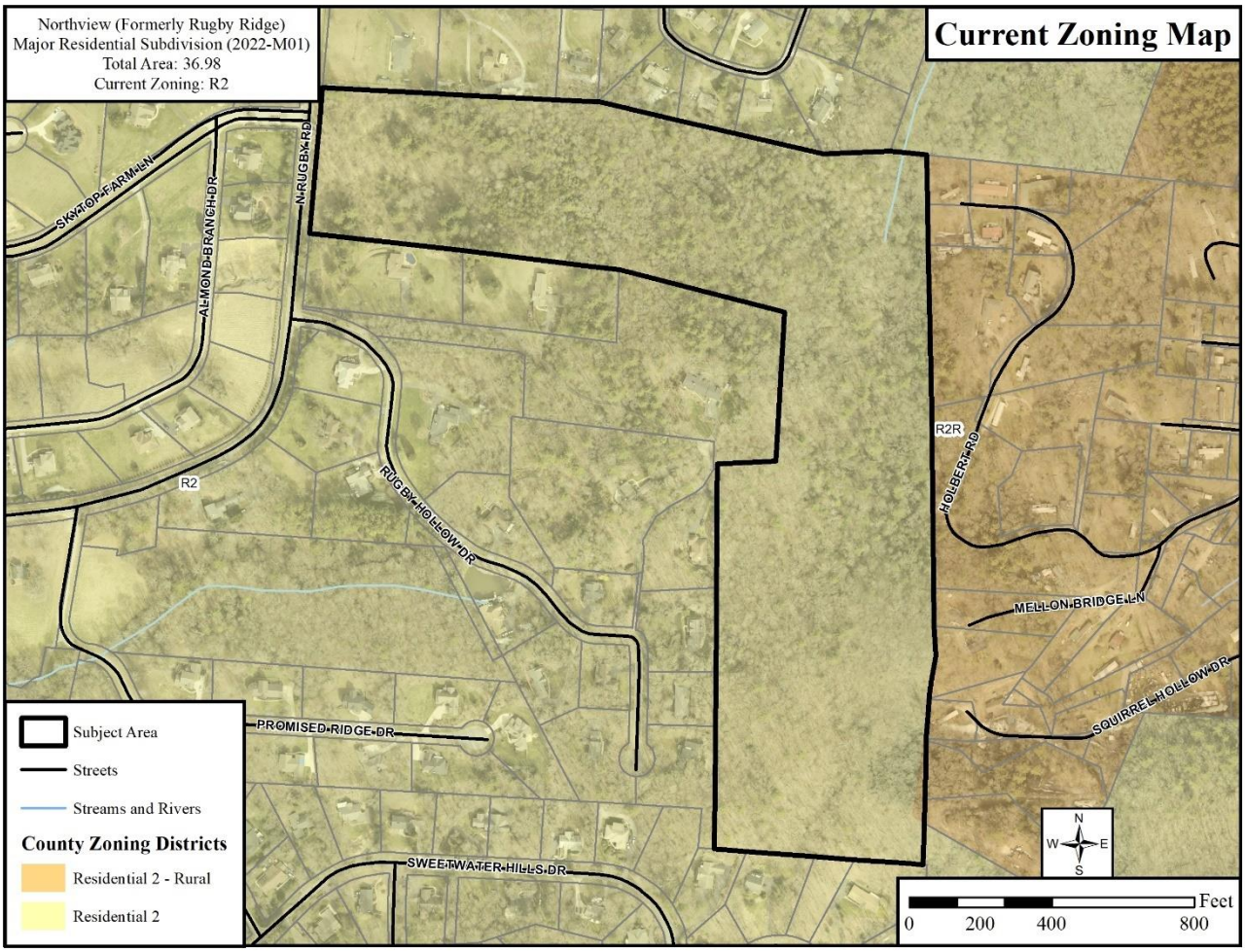


Map C: County Comprehensive Plan Future Land Use Map



1. **Henderson County Comprehensive Plan (CCP).** The Future Land Use Map of the CCP shows the Subject Area as being located within the Urban Services Area with a pocket of Conservation Area within it.
    a. **Urban Services Area:** "The Urban Services Area is that area within which most urban services and urban-scale development is currently concentrated, and within which such development should generally be concentrated through the Henderson County Comprehensive Plan."
    b. **Conservation Area:** "This category includes land areas that are intended to remain largely in their natural state, with only limited development. Such areas should be targeted for protection through regulations and incentives."

Map D: Official Zoning Map



2. Chapter 42, Henderson County Land Development Code (LDC). According to Chapter 42, Henderson County Land Development Code (LDC) and its Official Zoning Map adopted September 19, 2007 (as amended), the proposed project site is located within the Residential District Two (R2) (See Map D: Official Zoning Map).

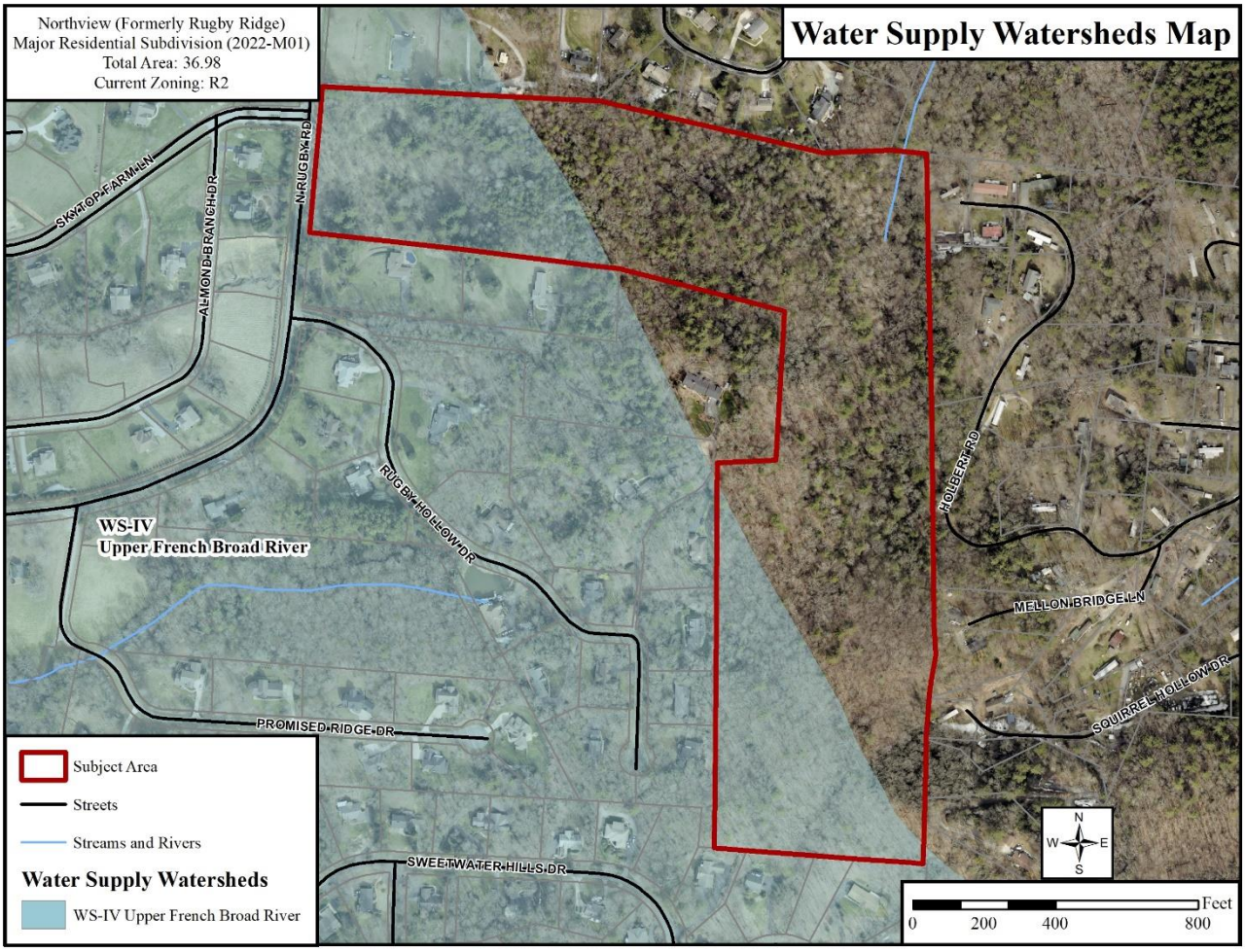
a. **Residential Two (R2)**: "The purpose of Residential District Two (R2) is to foster orderly growth where the *principal use* of land is residential. The intent of this district is to allow for low to medium density *residential development* consistent with the recommendations of the *Comprehensive Plan*. It is also the intent of this district to allow for flexibility in the continuation of existing nonresidential *uses.* This general *use district* is typically meant to be utilized in areas designated as Transitional (RTA) in the *Comprehensive Plan*."

a. R2 allows for a standard density of 1 unit per acre and a maximum density of 2 units per acre. The Combined Master and Development plan for Rugby Ridge Subdivision proposes a density of 0.70 units per acre.

3. **Water and Sewer Availability.** The applicant proposes connection to public water system for first 12 lots and individual wells on lots 7-20. The City of Hendersonville water system runs along North Rugby Rd at the entrance of the proposed subdivision. The applicant proposed the utilization of private individual septic systems for the project site.

4. **Proposed Access.** The subdivision is to be served by a subdivision local road with a 45' right-of-way and 20' wide asphalt travel surface with 6' shoulders on each side. The roadway width will taper down to 18' with 6' shoulders to serve the remaining lots at the end of the subdivision. The 45' right-of-way will not taper. The road will conclude with a cul-de-sac. The road grade does not exceed 15%. The road name "Rugby Ridge Drive" has been pre-approved by the Property Addressing Coordinator.

Map E: Water Supply Watershed



5. **Water Supply Watershed:** The project site is partially in the Upper French Broad River watershed WS-IV PA.
    a. The low-density option allows for average lot size of 20,000SQFT minimum or maximum of 24% built-upon area. This proposed subdivision will meet these requirements for Water Supply Watershed protection regulations.

6. Project Proposal Summary:

- 26 Lots
- 0.70 units per acre density
- 3,200 linear feet of proposed roads (Rugby Ridge Drive)
- Combination of connection to public water and individual wells
- Individual septic systems

Master Plan Comments:

1. **Soil Erosion and Sedimentation Control Plan.** The Applicant shall submit written notice from the appropriate local agencies verifying that an Erosion and Sedimentation Control Plan has been received or a written notice from a professional land surveyor, engineer, landscape architect, architect, or professional planner certifying that no plan is required (LDC §42-113B).

2. **Water Quality.** The Applicant shall submit written notice from the appropriate local agencies verifying that a Stormwater Management Permit has been received (LDC §42-95E).

3. **Water Supply Watershed.** The Applicant must adhere to the water supply watershed regulations pertaining to subdivisions and storm water management regulations since the Subject Area is found within the Water Supply Watershed WS-IV (LDC §42-60D(3)(g) and §42-60D(4)(a)).

4. **Private Roads.** Private roads shall be constructed in accordance with the Private Subdivision Local Road standards stated in Chapter 42 (LDC§42-109).

5. **Public Roads.** The final plat(s) must indicate that the proposed road (Rugby Ridge Drive) has been designed and constructed in accordance with State Road Standards and has been offered dedication to the public.

6. **Road Name Approval.** Proposed road names for a private and/or public road shall be preapproved by Henderson County in accordance with Chapter 42 of the Henderson County Code, Property Addressing (LDC §42-98). The applicant has previously reserved the road name associated with the original approval known as Rugby Ridge. The names of the road should be confirmed with the Master and Development Plan approval. If the proposed road name is to change, the applicant must reserve a new road name that is required to be shown on the final plat.

7. **Shoulder Stabilization.** All areas disturbed by the construction of a public road, including cut and fill slopes, shoulders and ditch banks, shall be seeded to stabilize the soil and prevent erosion. Seeding should be done as soon as feasible after road construction (LDC §42-97).

8. **Road Drainage, Culverts and Shoulder Stabilization.** Road or drainage structures shall be constructed in accordance with state roads standards. Road drainage side ditches shall be constructed with sufficient depth and width to carry the expected volume of storm water runoff (LDC §42-100). All areas disturbed by the construction of a public road, including cut and fill slopes, shoulders and ditch banks, shall be seeded to stabilize the soil and prevent erosion. Seeding should be done as soon as feasible after road construction (LDC §42-97).

9. **Miscellaneous Advisory Provisions.** The Applicant should become familiar with the Miscellaneous Advisory Provisions of Chapter 42 (LDC §42-87).

10. **NCDOT Driveway Permit.** An NCDOT Driveway Permit is required for the proposed private, paved road, to access the site. Design should meet requirements of NCDOT.

11. **Final Plat Requirements.** The Final Plat(s) must meet the requirements provided by the Planning Department whenever a subdivision of land occurs (LDC §42-343).

Application No. _____

HENDERSON COUNTY
SUBDIVISION APPLICATION FORM
(Please fill out all applicable items)

SUBDIVISION INFORMATION

Subdivision Name: Northview (formerly Rugby Ridge)

Subdivision Type (Circle One): **Major** Minor Non-Standard Special

Proposed Use of Property (Circle One): **Residential** Commercial Industrial

Conservation Subdivision: Yes **No**

Gated entrance to property: Yes **No**

Existing Number of Lots: 1

Total Number of Proposed Lots: 26

Total Number Proposed Units: 26

Proposed Density (units per acre): 0.70

Road System: ( ) Public (X) Private ( ) Combination Public and Private

Water System: (X) Individual ( ) Community (X) Municipal

Sewer System: (X) Individual ( ) Community ( ) Municipal

PARCEL INFORMATION

PIN: 9651-20-2892 Total Acreage: 36.98 Deed Book/Page: 3733/65 Township Hendersonville

Location of property to be divided: Entrance is located on North Rugby Road directly across from the entrance to Sky Top Farm

Zoning District: R2R Fire District: Mountain Home

Water Supply Watershed: Y School District: West

Any portion of property within or containing the following:

Floodplain or floodway: Yes **No** Perennial streams: Yes **No**

Protected mountain ridges: Yes **No** Cemetery: Yes **No**

Within ½ mile of a Farmland Preservation District: Yes **No**

Adjacent to a Farmland Preservation District: Yes **No**

CONTACT INFORMATION

Property Owner:

Name: HST Development, LLC Phone: 828-674-5664

Address: PO Box 1028 City, State, Zip: Mountain Home, NC 28758

Applicant:

Name: HST Development, LLC Phone: 828-674-5664

Address: PO Box 1028 City, State, Zip: Mountain Home, NC 28758

Agent: Agent Form (Circle One): Yes **No**

Name: _____ Phone: _____

Address: _____ City, State, Zip: _____

Plan Preparer:

Name: Will Buie - WGLA Engineering Phone: 828-687-7177 ext 302

Address: 724 5th Avenue West City, State, Zip: Hendersonville, NC 28739

I certify that the information shown above is true and accurate and is in conformance with the Subdivision regulations of Henderson County.

Todd Trace _____ 1/20/22

Print Applicant (Owner or Agent) Signature Applicant (Owner or Agent) Date

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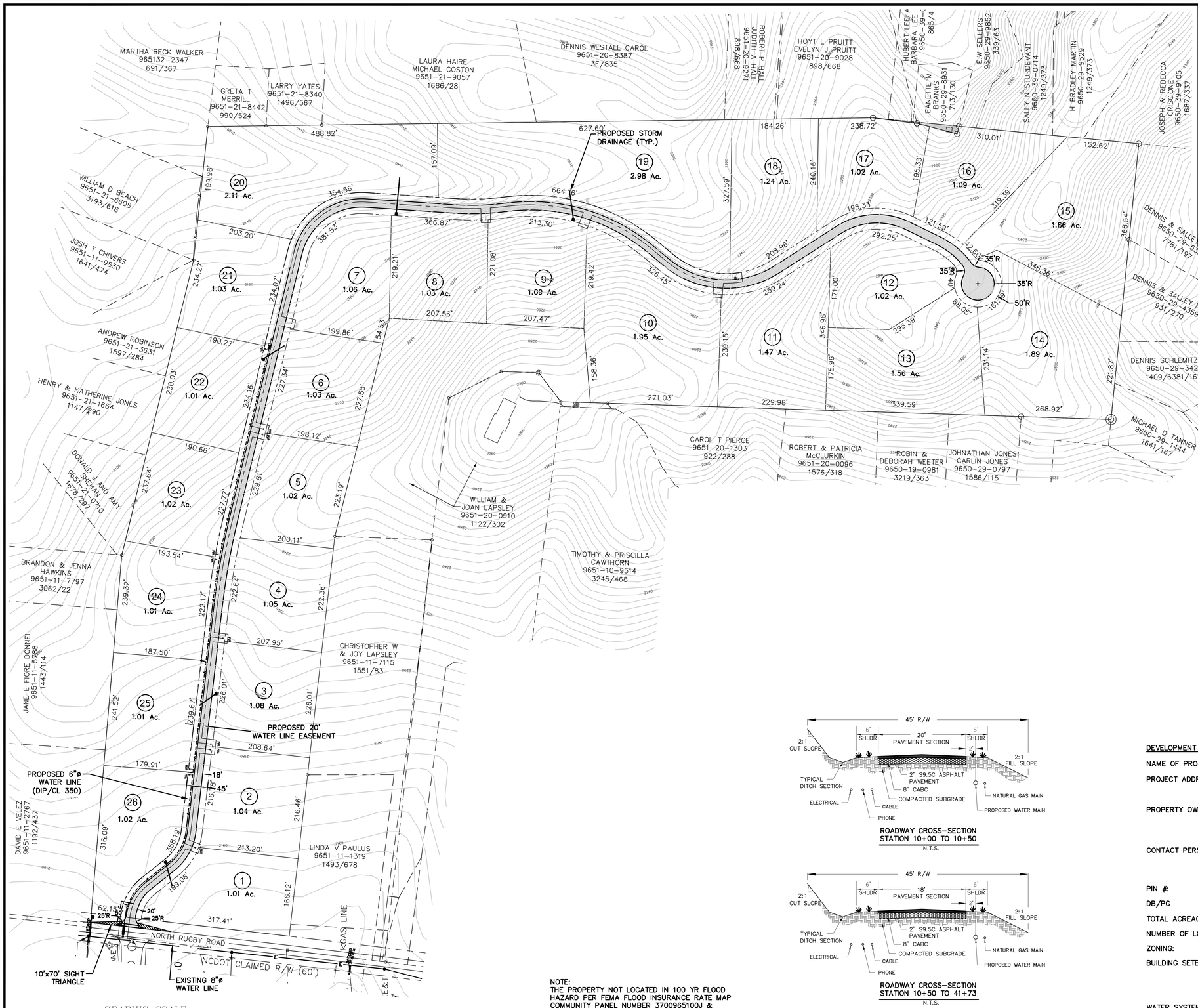
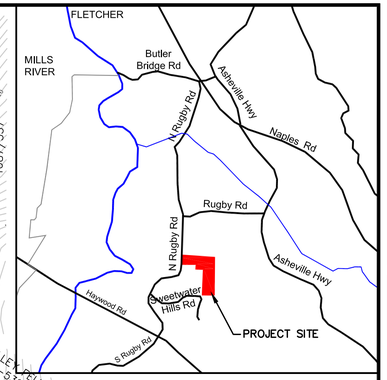
County Use Only

Fee: $_____ Paid: _____ Method: _____ Final Plat Approved On: _____





LOCATION MAP
N.T.S.

ROADWAY CROSS-SECTION
STATION 10+00 TO 10+50
N.T.S.

ROADWAY CROSS-SECTION
STATION 10+50 TO 41+73
N.T.S.

NOTE:
THE PROPERTY NOT LOCATED IN 100 YR FLOOD HAZARD PER FEMA FLOOD INSURANCE RATE MAP COMMUNITY PANEL NUMBER 3700965100J & 3700965000J EFFECTIVE DATE 10/02/08.

DEVELOPMENT BLOCK:

NAME OF PROJECT: NORTHVIEW SUBDIVISION (Formerly Rugby Ridge)

PROJECT ADDRESS: NORTH RUGBY ROAD
HENDERSONVILLE, NC

PROPERTY OWNER: HST DEVELOPMENT, LLC
PO BOX 1028
MOUNTAIN HOME, NC 28758

CONTACT PERSON: TODD TRACE
HST DEVELOPMENT, LLC

PIN #:	9651-20-2892
DB/PG	3733/65
TOTAL ACREAGE:	36.98± ACRES
NUMBER OF LOTS:	26
ZONING:	R2 (RESIDENTIAL DISTRICT 2)
BUILDING SETBACKS:	15-20' FRONT R/W 10' SIDE 10' REAR
WATER SYSTEM:	(PUBLIC) CITY OF HENDERSONVILLE & PRIVATE WELLS
SEWER SYSTEM:	(PRIVATE)

WGLA Engineering
WGLA ENGINEERING, PLLC
724 5th AVENUE WEST
HENDERSONVILLE, NC 28739
(828) 687-7177
WGLA.COM
NC LICENSE P-1342

Northview Subdivision

Hendersonville Township
Henderson County
North Carolina

Preliminary Not For Construction

REVISIONS	
DATE	DESCRIPTION

Know what's below. Call before you dig.

PROJECT NUMBER:	21195
DATE:	1-20-22
DRAWN BY:	KHC
CHECKED BY:	WRB

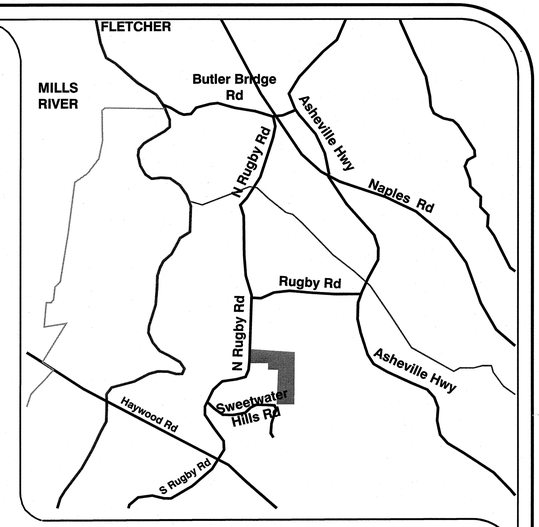
Proposed Site Development Plan

C-100

SCALE: 1"=100'

RUGBY RIDGE

SITE IMPROVEMENTS
HENDERSON COUNTY, NORTH CAROLINA



LOCATION MAP
N.T.S.

INDEX

SHEET NO.	DESCRIPTION
C-100	PROPOSED SITE DEVELOPMENT
C-200	PROPOSED DEVELOPMENT MASTER PLAN
C-201	PROPOSED ROAD PLAN & PROFILE
C-202	PROPOSED ROAD PLAN & PROFILE
C-203	PROPOSED ROAD PLAN & PROFILE
C-300	PROPOSED STORMWATER DRAINAGE PLAN and EROSION & SEDIMENTATION CONTROL PLAN
C-301	GRADING & EROSION CONTROL DETAILS
C-302	GRADING & EROSION CONTROL DETAILS
C-302	GRADING & EROSION CONTROL DETAILS
C-304	STORM DRAINAGE DETAILS
C-400	WATER SYSTEM DETAILS

William G. Lapsley P.E.

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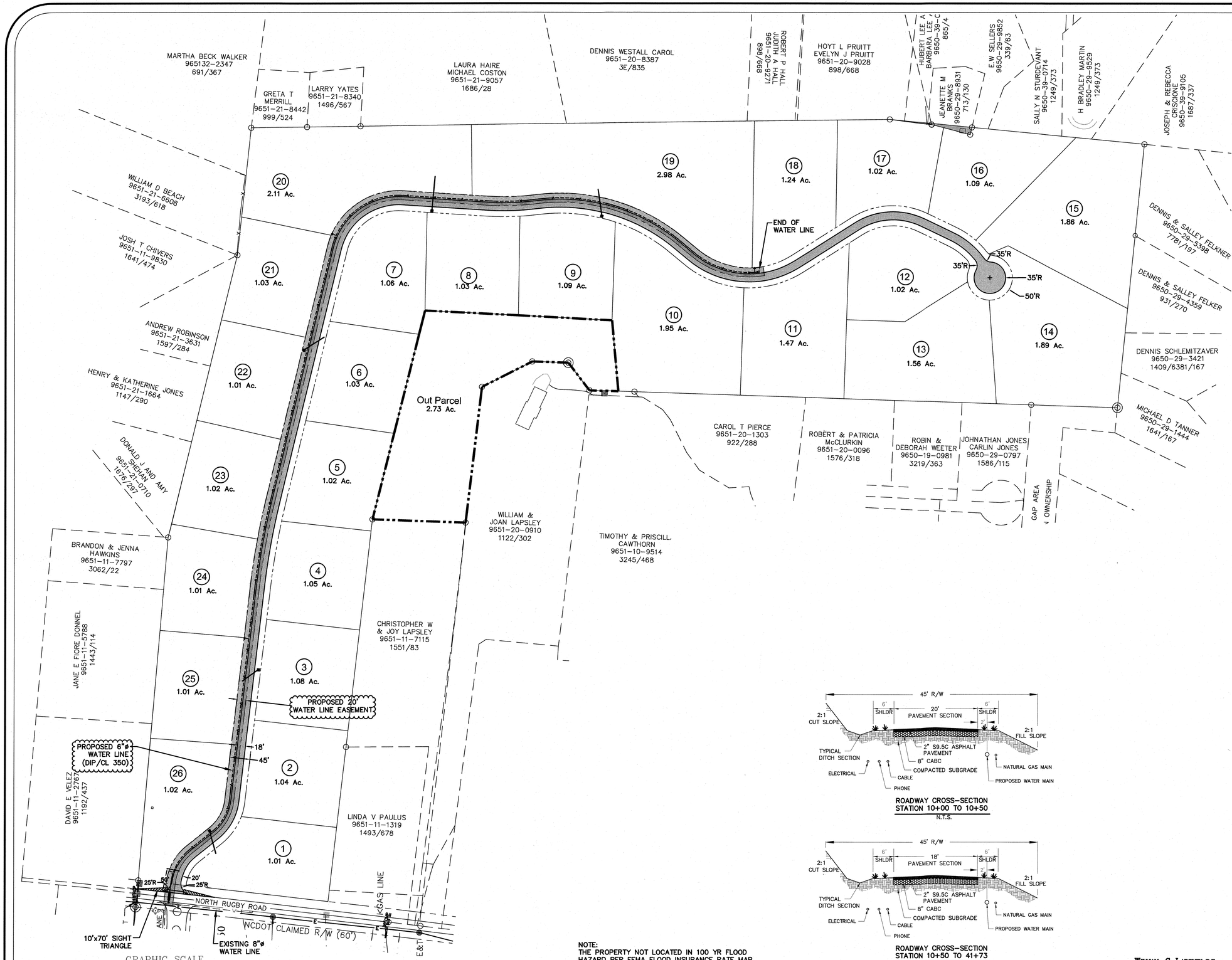
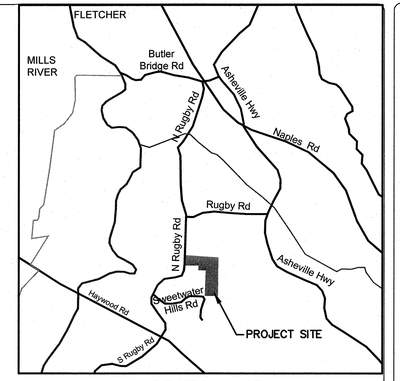
Hendersonville, North Carolina 28791
(828) 779-5046
wlapsley48@gmail.com





LOCATION MAP
N.T.S.

ROADWAY CROSS-SECTION
STATION 10+00 TO 10+50
N.T.S.

ROADWAY CROSS-SECTION
STATION 10+50 TO 41+73
N.T.S.

NOTE:
THE PROPERTY NOT LOCATED IN 100 YR FLOOD HAZARD PER FEMA FLOOD INSURANCE RATE MAP COMMUNITY PANEL NUMBER 370125 0080B & 370125 0085B EFFECTIVE DATE MARCH 1, 1982.

DEVELOPMENT BLOCK:

NAME OF PROJECT: RUGBY RIDGE

PROJECT ADDRESS: NORTH RUGBY ROAD
HENDERSONVILLE, NC

PROPERTY OWNER: H BRADLEY MARTIN
300 CRESCENT COURT
DALLAS TX, 75201
HENDERSONVILLE, NORTH CAROLINA 28792

CONTACT PERSON: WILLIAM G. LAPSLEY, PE
109 RUGBY HOLLOW DRIVE
HENDERSONVILLE, NC 28791
828-779-5046

PIN #: 9654-21-3066

DB/PG 1122/304

TOTAL ACREAGE: 39.03± ACRES

NUMBER OF LOTS: 26

ZONING: R2 (RESIDENTIAL DISTRICT 2)

BUILDING SETBACKS:
15-20' FRONT R/W
10' SIDE
10' REAR

WATER SYSTEM: (PUBLIC) CITY OF HENDERSONVILLE & PRIVATE WELLS

SEWER SYSTEM: (PRIVATE)

Know what's below. Call before you dig.

WILLIAM G. LAPSLEY P.E.
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Hendersonville, North Carolina 28791
(828) 891-8292 (828) 779-5046
wlapsley46@wgla.com

Revisions	
9/1/19	WATER

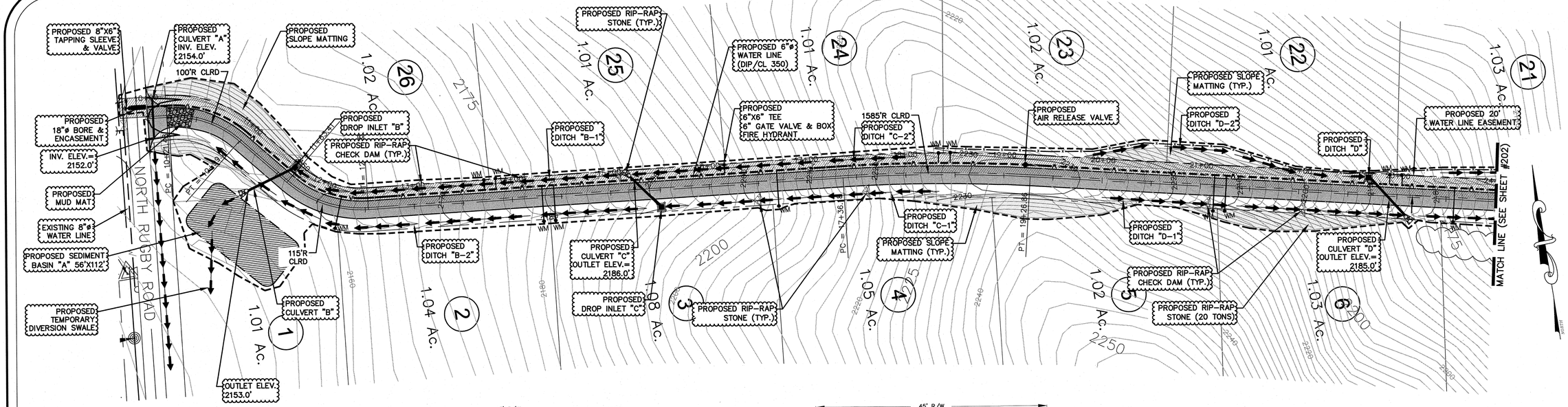
date: 9/18
job: 18161
drawn: KHC

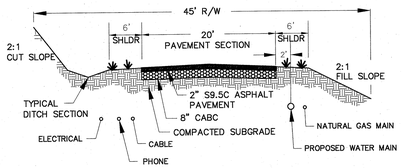
sheet C-100

WILLIAM G. LAPSLEY P.E.
HENDERSONVILLE, NORTH CAROLINA

RUGBY RIDGE
HENDERSONVILLE TOWNSHIP
HENDERSON COUNTY
NORTH CAROLINA

PROPOSED
SITE DEVELOPMENT PLAN





ROADWAY CROSS-SECTION
STATION 10+00 TO 10+50
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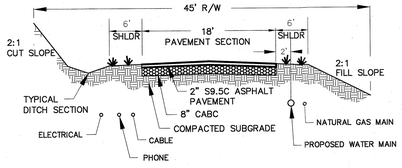
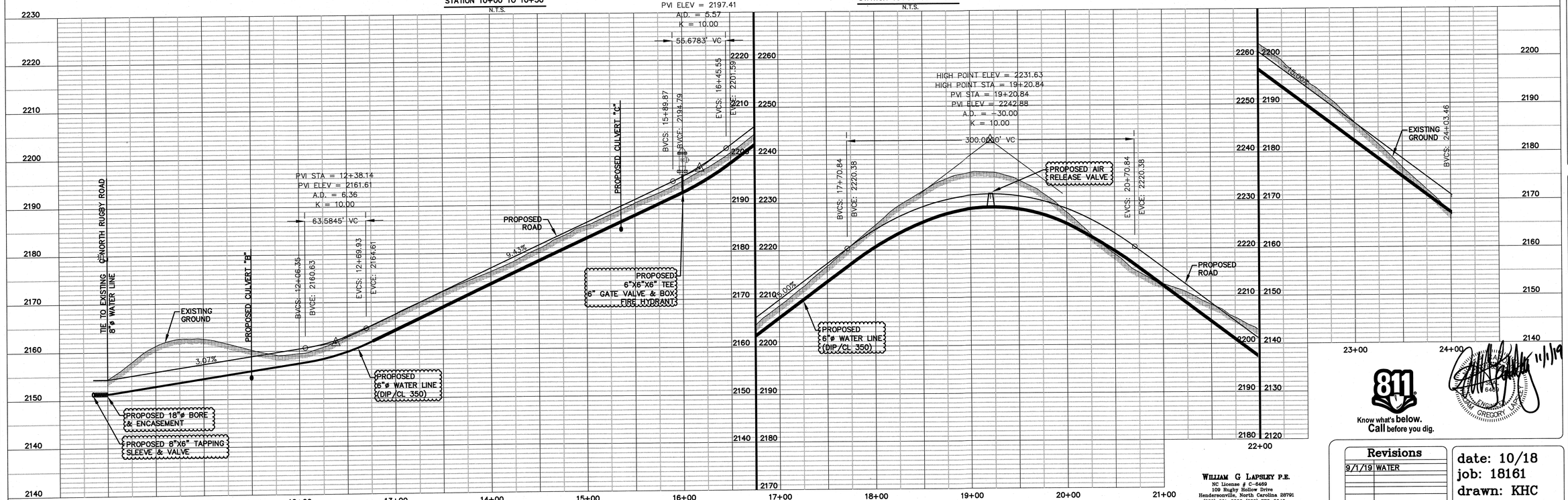


ROADWAY CROSS-SECTION
STATION 10+50 TO 41+73
N.T.S.

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



811 Know what's below. Call before you dig.

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Revisions	
9/1/19	WATER

date: 10/18
job: 18161
drawn: KHC

sheet C-201

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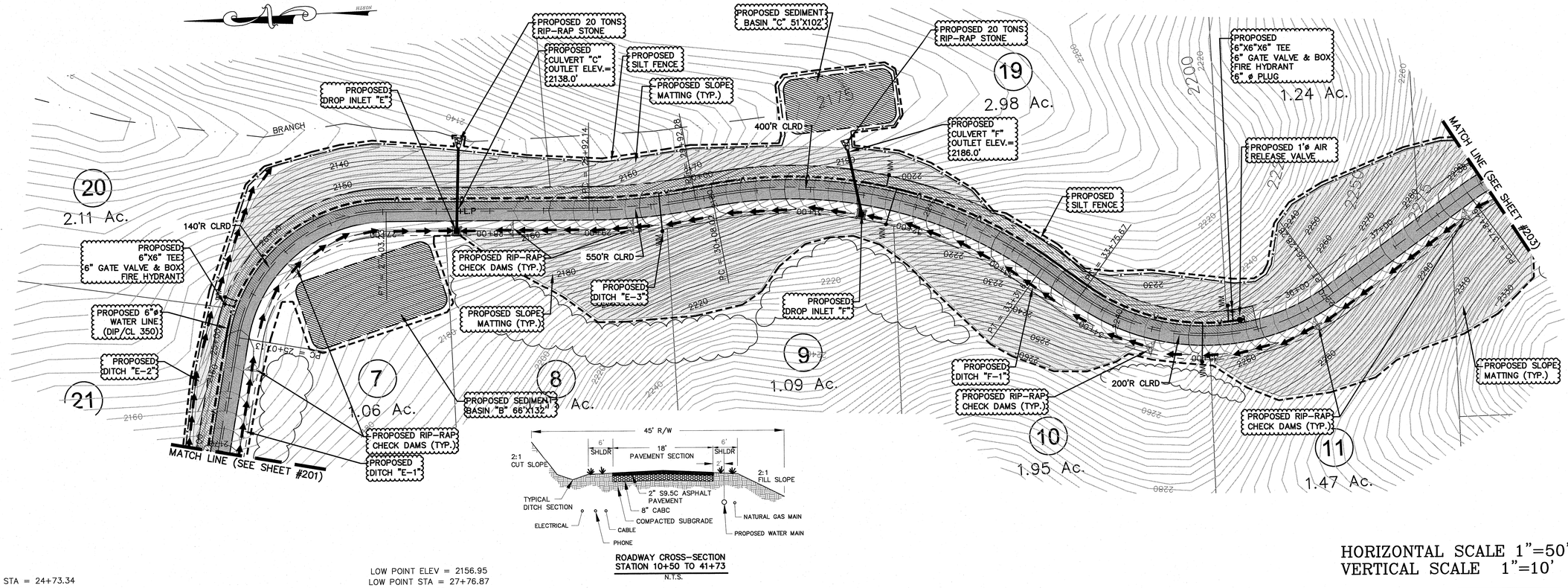
RUGBY RIDGE
HENDERSONVILLE TOWNSHIP
HENDERSON COUNTY
NORTH CAROLINA

PROPOSED
ROAD PROFILE
STATION 10+00 TO 24+00



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11/1/19

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Revisions
9/1/19 WATER

date: 10/18
job: 18161
drawn: KHC

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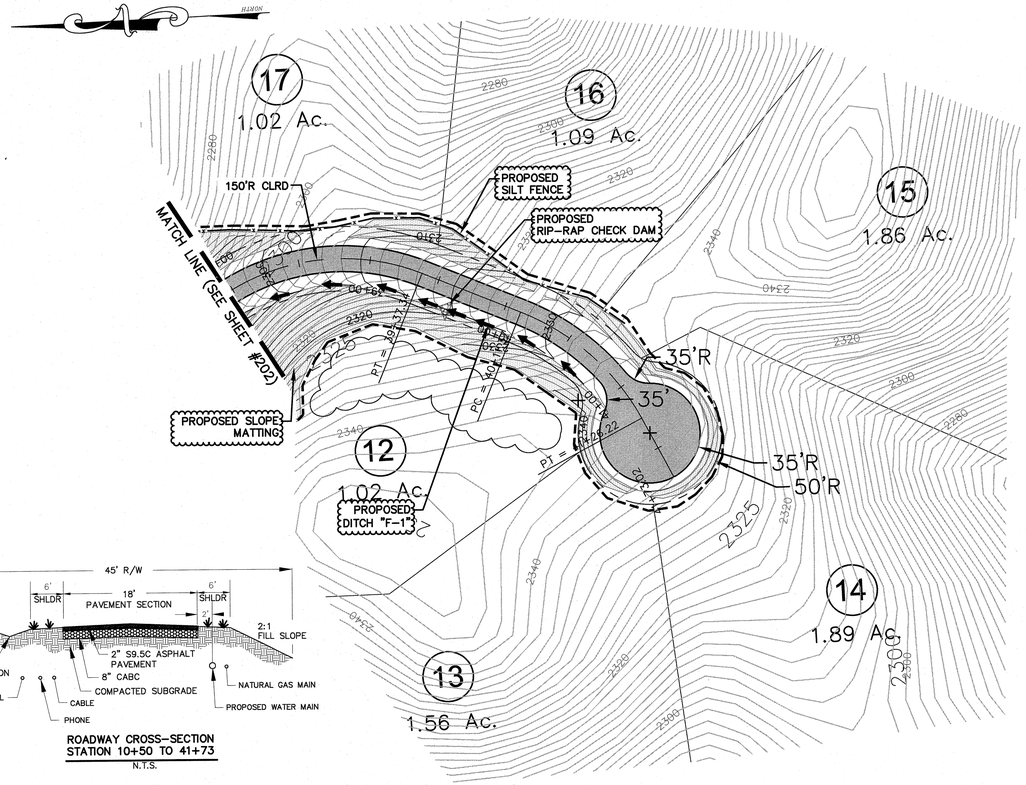
HENDERSONVILLE, NORTH CAROLINA

RUGBY RIDGE
HENDERSONVILLE TOWNSHIP
HENDERSON COUNTY
NORTH CAROLINA

PROPOSED
ROAD PROFILE
STATION 24+00 TO 38+00

sheet
C-202



ROADWAY CROSS-SECTION
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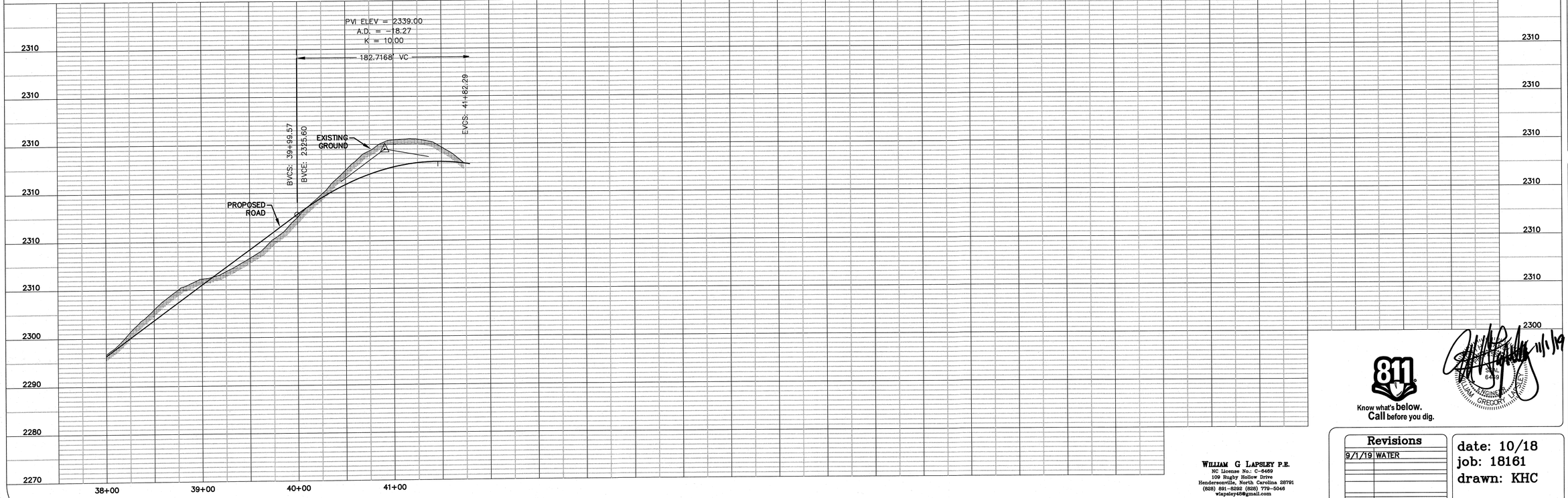
HORIZONTAL SCALE 1"=50'
VERTICAL SCALE 1"=10'



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Revisions	
9/1/19	WATER

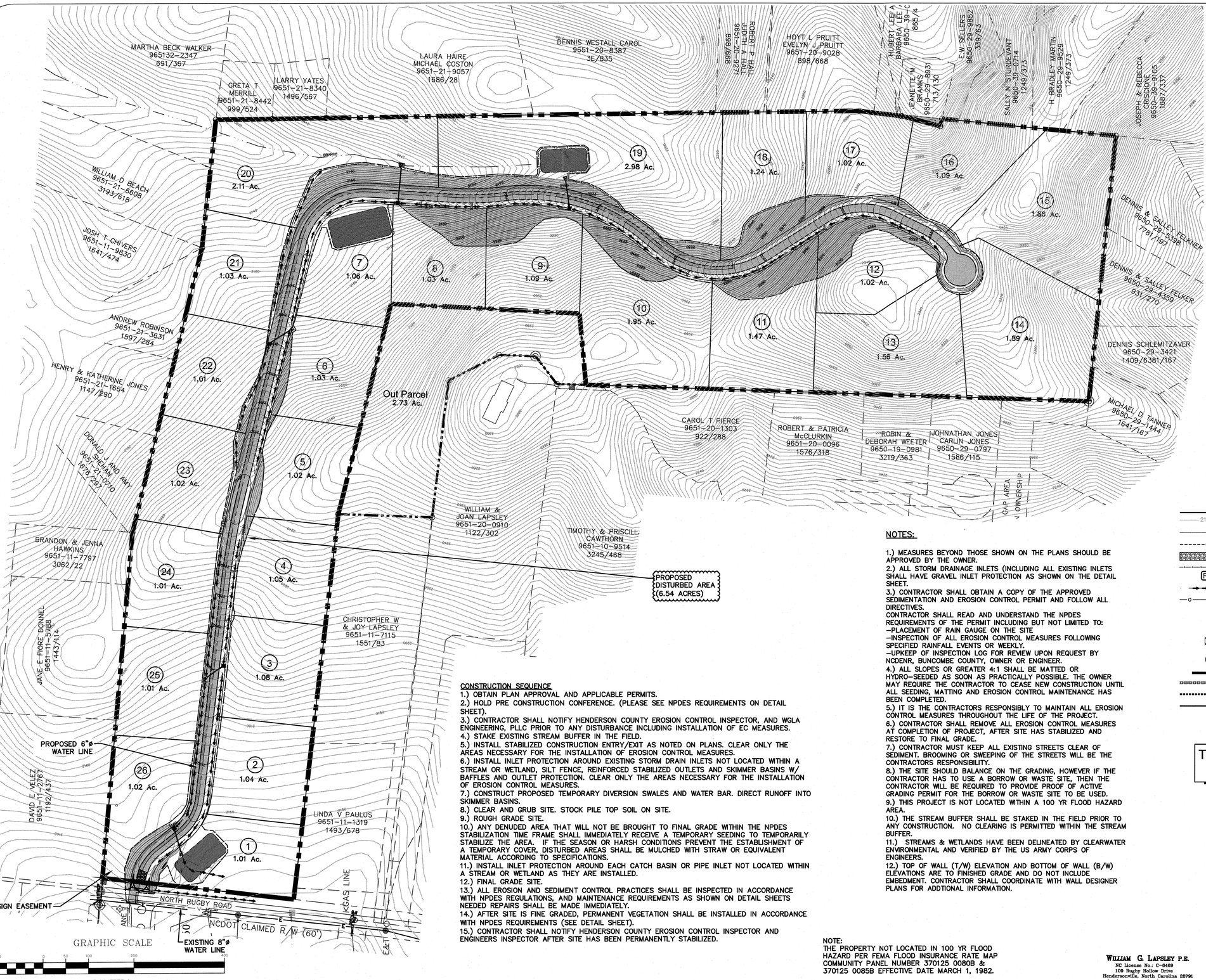
date: 10/18
job: 18161
drawn: KHC

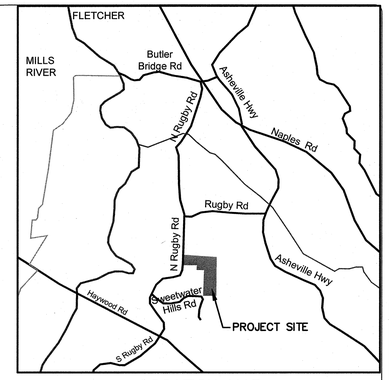
sheet C-203

WILLIAM G. LAPSLEY P.E.
HENDERSONVILLE, NORTH CAROLINA

RUGBY RIDGE
HENDERSONVILLE TOWNSHIP
HENDERSON COUNTY
NORTH CAROLINA

PROPOSED
ROAD PROFILE
STATION 38+00 TO 41+73





LOCATION MAP
N.T.S.

NOTES:

1.) MEASURES BEYOND THOSE SHOWN ON THE PLANS SHOULD BE APPROVED BY THE OWNER.
2.) ALL STORM DRAINAGE INLETS (INCLUDING ALL EXISTING INLETS SHALL HAVE GRAVEL INLET PROTECTION AS SHOWN ON THE DETAIL SHEET.
3.) CONTRACTOR SHALL OBTAIN A COPY OF THE APPROVED SEDIMENTATION AND EROSION CONTROL PERMIT AND FOLLOW ALL DIRECTIVES.
CONTRACTOR SHALL READ AND UNDERSTAND THE NPDES REQUIREMENTS OF THE PERMIT INCLUDING BUT NOT LIMITED TO:
–PLACEMENT OF RAIN GAUGE ON THE SITE
–INSPECTION OF ALL EROSION CONTROL MEASURES FOLLOWING SPECIFIED RAINFALL EVENTS OR WEEKLY.
–UPKEEP OF INSPECTION LOG FOR REVIEW UPON REQUEST BY NCDENR, BUNCOMBE COUNTY, OWNER OR ENGINEER.
4.) ALL SLOPES OR GREATER 4:1 SHALL BE MATTED OR HYDRO–SEEDED AS SOON AS PRACTICALLY POSSIBLE. THE OWNER MAY REQUIRE THE CONTRACTOR TO CEASE NEW CONSTRUCTION UNTIL ALL SEEDING, MATTING AND EROSION CONTROL MAINTENANCE HAS BEEN COMPLETED.
5.) IT IS THE CONTRACTORS RESPONSIBLY TO MAINTAIN ALL EROSION CONTROL MEASURES THROUGHOUT THE LIFE OF THE PROJECT.
6.) CONTRACTOR SHALL REMOVE ALL EROSION CONTROL MEASURES AT COMPLETION OF PROJECT, AFTER SITE HAS STABILIZED AND RESTORE TO FINAL GRADE.
7.) CONTRACTOR MUST KEEP ALL EXISTING STREETS CLEAR OF SEDIMENT. BROOMING OR SWEEPING OF THE STREETS WILL BE THE CONTRACTORS RESPONSIBILITY.
8.) THE SITE SHOULD BALANCE ON THE GRADING, HOWEVER IF THE CONTRACTOR HAS TO USE A BORROW OR WASTE SITE, THEN THE CONTRACTOR WILL BE REQUIRED TO PROVIDE PROOF OF ACTIVE GRADING PERMIT FOR THE BORROW OR WASTE SITE TO BE USED.
9.) THIS PROJECT IS NOT LOCATED WITHIN A 100 YR FLOOD HAZARD AREA.
10.) THE STREAM BUFFER SHALL BE STAKED IN THE FIELD PRIOR TO ANY CONSTRUCTION. NO CLEARING IS PERMITTED WITHIN THE STREAM BUFFER.
11.) STREAMS & WETLANDS HAVE BEEN DELINEATED BY CLEARWATER ENVIRONMENTAL AND VERIFIED BY THE US ARMY CORPS OF ENGINEERS.
12.) TOP OF WALL (T/W) ELEVATION AND BOTTOM OF WALL (B/W) ELEVATIONS ARE TO FINISHED GRADE AND DO NOT INCLUDE EMBEDMENT. CONTRACTOR SHALL COORDINATE WITH WALL DESIGNER PLANS FOR ADDTIONAL INFORMATION.

CONSTRUCTION SEQUENCE

1.) OBTAIN PLAN APPROVAL AND APPLICABLE PERMITS.
2.) HOLD PRE CONSTRUCTION CONFERENCE. (PLEASE SEE NPDES REQUIREMENTS ON DETAIL SHEET).
3.) CONTRACTOR SHALL NOTIFY HENDERSON COUNTY EROSION CONTROL INSPECTOR, AND WGLA ENGINEERING, PLLC PRIOR TO ANY DISTURBANCE INCLUDING INSTALLATION OF EC MEASURES.
4.) STAKE EXISTING STREAM BUFFER IN THE FIELD.
5.) INSTALL STABILIZED CONSTRUCTION ENTRY/EXIT AS NOTED ON PLANS. CLEAR ONLY THE AREAS NECESSARY FOR THE INSTALLATION OF EROSION CONTROL MEASURES.
6.) INSTALL INLET PROTECTION AROUND EXISTING STORM DRAIN INLETS NOT LOCATED WITHIN A STREAM OR WETLAND, SILT FENCE, REINFORCED STABILIZED OUTLETS AND SKIMMER BASINS W/ BAFFLES AND OUTLET PROTECTION. CLEAR ONLY THE AREAS NECESSARY FOR THE INSTALLATION OF EROSION CONTROL MEASURES.
7.) CONSTRUCT PROPOSED TEMPORARY DIVERSION SWALES AND WATER BAR. DIRECT RUNOFF INTO SKIMMER BASINS.
8.) CLEAR AND GRUB SITE. STOCK PILE TOP SOIL ON SITE.
9.) ROUGH GRADE SITE.
10.) ANY DENUDED AREA THAT WILL NOT BE BROUGHT TO FINAL GRADE WITHIN THE NPDES STABILIZATION TIME FRAME SHALL IMMEDIATELY RECEIVE A TEMPORARY SEEDING TO TEMPORARILY STABILIZE THE AREA. IF THE SEASON OR HARSH CONDITIONS PREVENT THE ESTABLISHMENT OF A TEMPORARY COVER, DISTURBED AREAS SHALL BE MULCHED WITH STRAW OR EQUIVALENT MATERIAL ACCORDING TO SPECIFICATIONS.
11.) INSTALL INLET PROTECTION AROUND EACH CATCH BASIN OR PIPE INLET NOT LOCATED WITHIN A STREAM OR WETLAND AS THEY ARE INSTALLED.
12.) FINAL GRADE SITE.
13.) ALL EROSION AND SEDIMENT CONTROL PRACTICES SHALL BE INSPECTED IN ACCORDANCE WITH NPDES REGULATIONS, AND MAINTENANCE REQUIREMENTS AS SHOWN ON DETAIL SHEETS NEEDED REPAIRS SHALL BE MADE IMMEDIATELY.
14.) AFTER SITE IS FINE GRADED, PERMANENT VEGETATION SHALL BE INSTALLED IN ACCORDANCE WITH NPDES REQUIREMENTS (SEE DETAIL SHEET).
15.) CONTRACTOR SHALL NOTIFY HENDERSON COUNTY EROSION CONTROL INSPECTOR AND ENGINEERS INSPECTOR AFTER SITE HAS BEEN PERMANENTLY STABILIZED.

NOTE:
THE PROPERTY NOT LOCATED IN 100 YR FLOOD HAZARD PER FEMA FLOOD INSURANCE RATE MAP COMMUNITY PANEL NUMBER 370125 0080B & 370125 0085B EFFECTIVE DATE MARCH 1, 1982.

LEGEND

2130	EXISTING 2' CONTOUR
	PROPOSED 2' CONTOUR
	PROPOSED LIMIT OF DISTURBED AREA
	PROPOSED GRAVEL CONSTRUCTION ENTRANCE
	PROPOSED SILT FENCE
RSO	PROPOSED REINFORCED STABILIZED OUTLET
	PROPOSED SWALES
	PROPOSED BAFFLE
	PROPOSED INLET PROTECTION
	PROPOSED OUTLET PROTECTION
	PROPOSED NCDOT SILT BASIN TYPE 'B' W/ NCDOT SILT CHECK TYPE 'B'
	PROPOSED ROCK PIPE INLET PROTECTION
WB	PROPOSED WATER BAR
	EXISTING CULVERT
	EXISTING CULVERT
	PROPOSED CULVERT

TOTAL DISTURBED AREA
6.54± ACRES

Know what's below.
Call before you dig.

11/1/19

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Revisions

date: 9/18
job: 18161
drawn: KHC

sheet C–300

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NORTH CAROLINA

PROPOSED
STORMWATER DRAINAGE PLAN
EROSION AND SEDIMENTATION
CONTROL PLAN

2. Ensure that posts for sediment fences are 1.33 lb/linear ft steel with a minimum length of 5 feet. Make sure that steel posts have projections to facilitate fastening the fabric.

3. For reinforcement of standard strength filter fabric, use wire fence with a minimum 14 gauge and a maximum mesh spacing of 6 inches.

Table 6.62b Specifications For Sediment Fence Fabric

Temporary Silt Fence Material Property Requirements					
	Test Material	Units	Supported[1] Silt Fence	Un-Supported[1] Silt Fence	Type of Value
Grab Strength	ASTM D 4632	N (lbs)			
Machine Direction			400	550	MARV
			(90)	(90)	
X-Machine Direction			400	450	MARV
			(90)	(90)	
Permittivity[2]	ASTM D 4491	sec-1	0.05	0.05	MARV
Apparent Opening Size[2]	ASTM D 4751	mm	0.60	0.60	Max. ARV[3]
		(US Sieve #)	(30)	(30)	
Ultraviolet Stability	ASTM D 4355	% Retained Strength	70% after 500h of exposure	70% after 500h of exposure	Typical

[1] Silt Fence support shall consist of 14 gage steel wire with a mesh spacing of 150 mm (6 inches), or prefabricated polymer mesh of equivalent strength.
[2] These default values are based on empirical evidence with a variety of sediment. For environmentally sensitive areas, a review of previous experience and/or site or regionally specific geotextile tests in accordance with Test Method D 5141 should be performed by the agency to confirm suitability of these requirements.
[3] As measured in accordance with Test Method D 4632.

CONSTRUCTION

1. Construct the sediment barrier of standard strength or extra strength synthetic filter fabrics.

2. Ensure that the height of the sediment fence does not exceed 24 inches above the ground surface. (Higher fences may impound volumes of water sufficient to cause failure of the structure.)

3. Construct the filter fabric from a continuous roll cut to the length of the barrier to avoid joints. When joints are necessary, securely fasten the filter cloth only at a support post with 4 feet minimum overlap to the next post.

4. Support standard strength filter fabric by wire mesh fastened securely to the **upslope** side of the posts. Extend the wire mesh support to the bottom of the trench. Fasten the wire reinforcement, then fabric on the upslope side of the fence post. Wire or plastic zip ties should have minimum 50 pound tensile strength.

5. When a wire mesh support fence is used, space posts a maximum of 8 feet apart. Support posts should be driven securely into the ground a minimum of 24 inches.

6. Extra strength filter fabric with 6 feet post spacing does not require wire mesh support fence. Securely fasten the filter fabric directly to posts. Wire or plastic zip ties should have minimum 50 pound tensile strength.

7. Excavate a trench approximately 4 inches wide and 8 inches deep along the proposed line of posts and upslope from the barrier (Figure 6.62a).

8. Place 12 inches of the fabric along the bottom and side of the trench.

9. Backfill the trench with soil placed over the filter fabric and compact. Thorough compaction of the backfill is critical to silt fence performance.

10. Do not attach filter fabric to existing trees.

SEDIMENT FENCE INSTALLATION USING THE SLICING METHOD
Instead of excavating a trench, placing fabric and then backfilling trench, sediment fence may be installed using specially designed equipment that inserts the fabric into a cut sliced in the ground with a disc (Figure 6.62b).

Installation Specifications

1. The base of both end posts should be at least one foot higher than the middle of the fence. Check with a level if necessary.

2. Install posts 4 feet apart in critical areas and 6 feet apart on standard applications.

3. Install posts 2 feet deep on the downstream side of the silt fence, and as close as possible to the fabric, enabling posts to support the fabric from upstream water pressure.

4. Install posts with the nipples facing away from the silt fabric.

5. Attach the fabric to each post with three ties, all spaced within the top 8 inches of the fabric. Attach each tie diagonally 45 degrees through the fabric, with each puncture at least 1 inch vertically apart. Also, each tie should be positioned to hang on a post nipple when tightened to prevent sagging.

6. Wrap approximately 6 inches of fabric around the end posts and secure with 3 ties.

7. No more than 24 inches of a 36 inch fabric is allowed above ground level.

8. The installation should be checked and corrected for any deviations before compaction.

9. Compaction is vitally important for effective results. Compact the soil immediately next to the silt fence fabric with the front wheel of the tractor, skid steer, or roller exerting at least 60 pounds per square inch. Compact the upstream side first, and then each side twice for a total of 4 trips.

MAINTENANCE:
INSPECT SEDIMENT FENCES A T LEAST ONCE A WEEK AND AFTER EACH RAINFALL. MAKE ANY REQUIRED REPAIRS IMMEDIATELY. SHOULD THE FABRIC OF A SEDIMENT FENCE COLLAPSE, TEAR, DECOMPOSE OR BECOME INEFFECTIVE, REPLACE IT PROMPTLY. REMOVE SEDIMENT DEPOSIT AS NECESSARY TO PROVIDE ADEQUATE STORAGE VOLUME FOR THE NEXT RAIN AND TO REDUCE PRESSURE ON THE FENCE. TAKE CARE TO AVOID UNDERMINING THE FENCE DURING CLEANOUT. REMOVE ALL FENCING MATERIALS AND UNSTABLE SEDIMENT DEPOSITS AND BRING THE AREA TO GRADE AND STABILIZE IT AFTER THE CONTRIBUTING DRAINAGE AREA HAS BEEN PROPERLY STABILIZED.

SILT FENCE
NOT TO SCALE

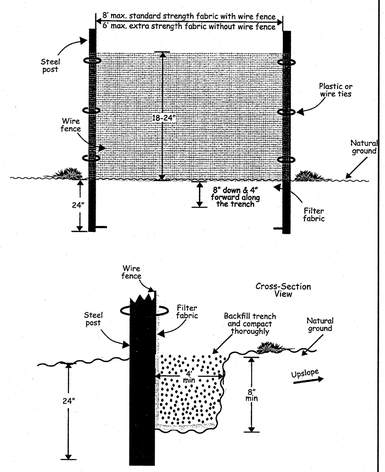


Figure 6.62a Installation detail of a sediment fence.

Sediment Fence (Silt Fence)

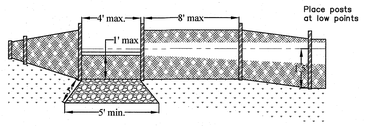
Reinforced, Stabilized Outlets

Any outlet where storm flow bypass occurs must be stabilized against erosion.

Set outlet elevation so that water depth cannot exceed 1.5 ft at the lowest point along the fenceline.

Set fabric height at 1 ft maximum between support posts spaced no more than 3 ft apart. Install a horizontal brace between the support posts to serve as an overflow and to support top of fabric. Provide a riprap splash pad.

Excavate foundation for the splash pad a minimum 5 ft wide, 1 ft deep, and 5 ft long on level grade. The finished surface of the riprap should blend with surrounding area, allowing no overfall. The area around the pad must be stable.



Perspective of reinforced stabilized outlet for sediment fence.

Construction

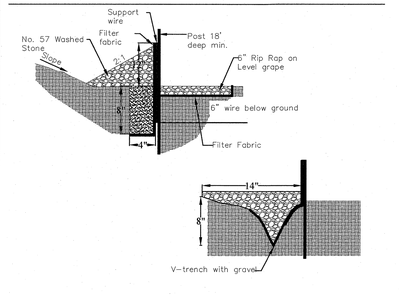
Dig a trench approximate 8 inches deep and 4 inches wide, or a V-trench, in the line of the fence.

Drive posts securely, at lest 18 inches into the ground, on the down slope side of the trench. Space posts a maximum of without support wire. Adjust spacing to place posts at low points along the fence line.

fasten support wire fence to upslope side of posts, extending 6 inches into the trench.

Attach continuous length of fabric to upslope side of fence posts. Avoid joints, particularly at low points in the fence line. Where joints are necessary, fasten fabric securely to support posts and overlap to the next post.

No.	Weir	Splash Pad Width	Splash Pad Length



Detail of sediment fence Installation

Place the bottom 1 ft of fabric in 8–inch deep trench lapping toward the upslope side. Backfill with compacted earth or gravel as shown in Figure 6.62d.

To reduce maintenance, excavate a shallow sediment storage area on upslope side of fence where sedimentation is expected. Provide good access to deposition areas for cleanout and maintenance.

Allow for safe bypass of storm flow to prevent overtapping failure of fence.

DO NOT install sediment fence across intermittent or permanent streams, channels, or any location where concentrated flow is anticipated.

MAINTENANCE:
INSPECT SEDIMENT FENCES A T LEAST ONCE A WEEK AND AFTER EACH RAINFALL. MAKE ANY REQUIRED REPAIRS IMMEDIATELY.SHOULD THE FABRIC OF A SEDIMENT FENCE COLLAPSE, TEAR, DECOMPOSE OR BECOME INEFFECTIVE, REPLACE IT PROMPTLY.REMOVE SEDIMENT DEPOSIT AS NECESSARY TO PROVIDE ADEQUATE STORAGE VOLUME FOR THE NEXT RAIN AND TO REDUCE PRESSURE ON THE FENCE. TAKE CARE TO AVOID UNDERMINING THE FENCE DURING CLEANOUT. REMOVE ALL FENCING MATERIALS AND UNSTABLE SEDIMENT DEPOSITS AND BRING THE AREA TO GRADE AND STABILIZE IT AFTER THE CONTRIBUTING DRAINAGE AREA HAS BEEN PROPERLY STABILIZED.

6.55 **ROCK PIPE INLET PROTECTION**

Definition — A horseshoe shaped rock dam structure at a pipe inlet with a sediment storage area around the ouside perimeter of the structure.

Purpose — To prevent sediment from entering, accumulating in and being transferred by a culvert or storm drainage system prior to stabilization of the disturbed drainage area. This practice allows early use of the storm drainage system.

Conditions Where Practice Applies — Rock pipe inlet protection may be used at pipes with a maximum diameter of 36 inches. This inlet protection may be used to supplement additional sediment traps or basins at the pipe outlet, or used in combination with an excavated sediment storage area to serve as a temporary sediment trap. Pipe inlet protection should be provided to protect the storm drainage system and downstream areas from sedimentation until permanent stabilization of the disturbed drainage area.

Do not install this measure in an intermittent or perenial stream.

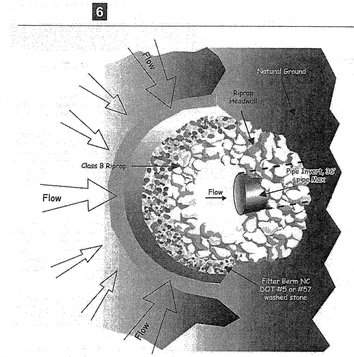
Planning Considerations — When construction on a project reaches a stage where culverts and other storm drainage structures are installed and many areas are brought to the desired grade, there is a need to protect the points where runoff can leave the site through culverts or storm drains. Similar to drop and curb inlets, culverts receiving runoff from disturbed areas can convey large amounts of sediment to lakes or streams. Even if the pipe discharges into a sediment trap or basin, the pipe or pipe system itself may clog with sediment.

Design Criteria — When used in combination with an excavated sediment storage area to serve as a temporary sediment trap, the design criteria for temporary sediment traps must be satisfied. The maximum drainage area should be 5 acres, and 3600 cubic feet of sediment storage per acre of disturbed drainage area should be provided.

The minimum stone height should be 2 feet, with side slopes no steeper than 2:1. The stone "horseshoe" around the pipe inlet should be constructed of Class B or Class I riprap, with a minimum crest width of 3 feet. The outside face of the riprap should be coved with a 12-inch thick layer of #5 or #57 washed stone.

In preparing plans for rock pipe inlet protection, it is important to protect the embankment over the pipe from overtopping. The top of the stone should be a minimum of 1 foot below the top of the fill over the pipe. The stone should tie into the fill on both sides of the pipe. The inside toe of the stone should be no closer than 2 feet from the culvert opening to allow passage of high flows.

The sediment storage area should be excavated upstream of the rock pipe inlet protection, with a minimum depth of 18 inches below grade.



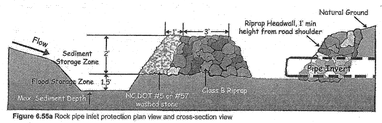


Figure 6.55a Rock pipe inlet protection plan view and cross-section view

Construction Specifications

1. Clear the area of all debris that might hinder excavation and disposal of spoil.

2. Install the Class B or Class I riprap in a semi-circle around the pipe inlet. The stone should be built up higher on each end where it ties into the embankment. The minimum crest width of the riprap should be 3 feet, with a minimum bottom width of 11 feet. The minimum height should be 2 feet, but also 1 foot lower than the shoulder of the embankment or diversions.

3. A 1 foot thick layer of NC DOT #5 or #57 stone should be placed on the outside slope of the riprap.

4. The sediment storage area should be excavated around the outside of the stone horseshoe 18 inches below natural grade.

5. When the contributing drainage area has been stabilized, fill depression and establish final grading elevations, compact area properly, and stabilize with ground cover.

Maintenance — Inspect rock pipe inlet protection at least weekly and after each significant (½ inch or greater) rainfall event and repair immediately. Remove sediment and restore the sediment storage area to its original dimensions when the sediment has accumulated to one-half the design depth of the trap. Place the sediment that is removed in the designated disposal area and replace the contaminated port of the gravel facing.

Check the structure for damage. Any riprap displaced from the stone horseshoe must be replaced immediately.

After all the sediment-producing areas have been permanently stabilized, remove the structure and all the unstable sediment. Smooth the area to blend with the adjoining areas and provide permanent ground cover (*Surface Stabilization*).

References

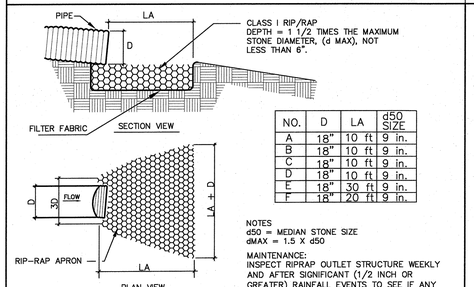
Inlet protection
6.52, Block and Gravel Inlet Protection (Temporary)

Sediment Trap and Barriers
6.60, Temporary Sediment Trap

Surface Stabilization
6.15, Riprap

North Carolina Department of Transportation
Erosion & Sedimentation Guidelines for Division Maintenance Operation, 1993.

Virginia Erosion and Sediment Control Handbook, 1992. STD & SPEC 3.08, Culvert Inlet Protection. pages III-46 - III-51 (Culvert Inlets Sediment Trap).



TYPICAL PIPE OUTLET
N.T.S.

NO.	D	LA	d50 SIZE
A	18"	10 ft	9 in.
B	18"	10 ft	9 in.
C	18"	10 ft	9 in.
D	18"	10 ft	9 in.
E	18"	30 ft	9 in.
F	18"	20 ft	9 in.

NOTES
d50 = MEDIAN STONE SIZE
dMAX = 1.5 X d50

MAINTENANCE:
INSPECT RIPRAP OUTLET STRUCTURE WEEKLY AND AFTER SIGNIFICANT (1/2 INCH OR GREATER) RAINFALL EVENTS TO SEE IF ANY EROSION AROUND OR BELOW THE RIPRAP HAS TAKEN PLACE, OR IF STONES HAVE BEEN DISLODGED. IMMEDIATLEY MAKE ALL NEEDED REPAIRS TO PREVENT FURTHUR DAMAGE.

SKIMMER BASIN BAFFLE DETAIL
N.T.S.

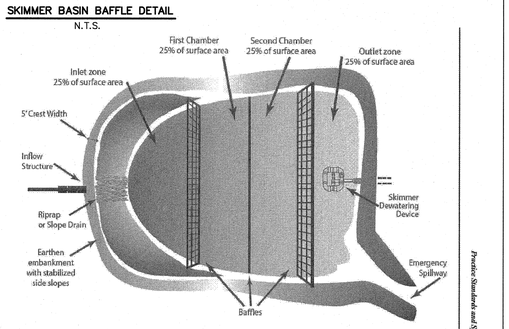
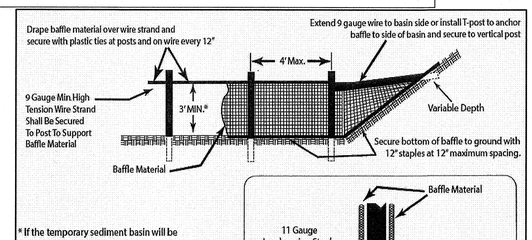


Figure 6.65a Porous baffles in a sediment basin. The flow is distributed evenly across the basin to reduce flow rates and turbulence, resulting in greater sediment retention.

BAFFLE SPACING	
BASIN	BAFFLE SPACING
A	28 ft.
B	33 ft.
C	25 ft.



* If the temporary sediment basin will be converted to a permanent stormwater basin of greater depth, the baffle height should be based on the pool depth during use as a temporary sediment basin.

Note: Install three (3) coir fiber baffles in basins at drainage outlets with a spacing of 1/4 the basin length. Two (2) coir fiber baffles can be installed in the basins less than 20 ft. in length with a spacing of 1/3 the basin length.

Figure 6.65b Coir Fiber Baffle Detail
Cross section of a porous baffle in a sediment basin.

Know what's below. Call before you dig.

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Revisions

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job: 18161
drawn: KHC

sheet C-301

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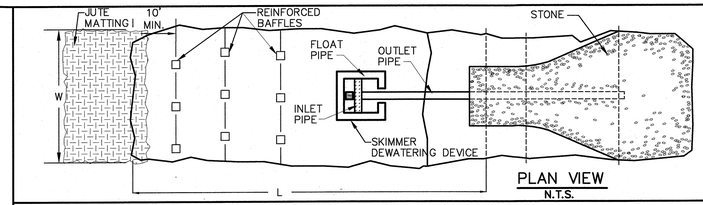
NORTH CAROLINA

PROPOSED
EROSION AND SEDIMENTATION
CONTROL PLAN DETAILS

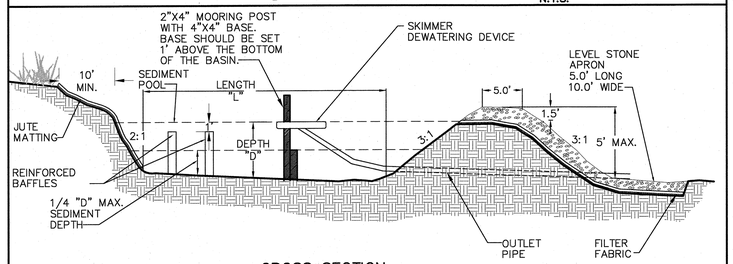
MAINTENANCE:
INSPECT TEMPORARY SKIMMER SEDIMENT BASIN(S) AT LEAST WEEKLY AND AFTER EACH SIGNIFICANT (1/2 INCH OR GREATER) RAINFALL EVENT AND REPAIR IMMEDIATELY. REMOVE SEDIMENT AND RESTORE THE BASIN TO ITS ORIGINAL DIMENSIONS WHEN IT ACCUMULATES TO ONE-HALF THE DESIGN DEPTH. PULL THE SKIMMER TO ONE SIDE SO THAT THE SEDIMENT UNDERNEATH IT CAN BE EXCAVATED. EXCAVATE TYHE SEDIMENT FROM THE ENTIRE BASIN, NOT JUST AROUND THE SKIMMER OR FIRST CELL. MAKE SURE VEGETATION GROWING IN THE BASIN DOES NOT HOLD DOWN THE SKIMMER. PLACE REMOVED SEDIMENT IN AN AREA WITH SEDIMENT CONTROLS.
REPAIR THE BAFFLES IF THEY ARE DAMAGED. RE-ANCHOR THE BAFFLES IF WATER IS FLOWING UNDERNEATH OR AROUND THEM.
IF THE SKIMMER IS CLOGGED WITH TRASH AND/OR THERE IS WATER IN THE BASIN, USUALLY JERKING ON THE ROPE WILL MAKE THE SKIMMER BOB UP AND DOWN AND DISLODGE THE DEBRIS AND RESTORE FLOW. IF THIS DOES NOT WORK, PULL THE SKIMMER OVER TO THE SIDE OF THE BASIN AND REMOVE THE DEDRIS. ALSO CHECK THE ORIFICE INSIDE THE SKIMMER TO SEE IF IT IS CLOGGED; IF SO REMOVE THE DERIS. IF THE SKIMMER ARM OR BARREL PIPE IS CLOGGED, THE ORFICE CAN BE REMOVED AND THE OBSTRUCTION CLEARED WITH A PLUMBER'S SNAKE OR BY FLUSHING WITH WATER. BE SURE AND REPLACE THE ORIFICE BEFORE REPOSITIONING THE SKIMMER.
CHECK THE EMBANKMENT, SPILLWAYS AND OUTLET FOR EROSION DAMAGE, AND INSPECT THE EMBANKMENT FOR PIPING AND SETTLEMENT. MAKE ALL NECESSARY REPAIRS IMMEDIATELY. REMOVE ALL TRASH AND OTHER DEBRIS FROM THE RISER AND POOL AREA.

CONSTRUCTION SPECIFICATIONS

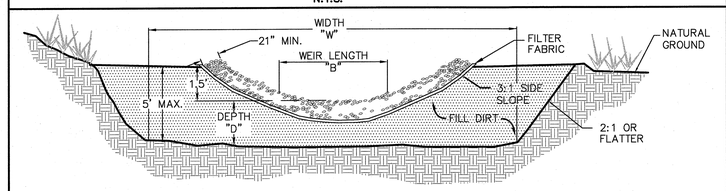
1. CLEAR GRUB & STRIP THE AREA UNDER THE EMBANKMENT OF ALL VEGETATION AND ROOT MAT.
2. CLEAR BASIN AREA.
3. USE FILL MATERIAL FREE OF ROOTS, WOODY VEGETATION AND ORGANIC MATTER. PLACE FILL IN LIFTS NOT TO EXCEED 9" AND MACHINE COMPACT.
4. CONSTRUCT BERM AND STONE SPILLWAY TO DIMENSIONS, SLOPES AND ELEVATIONS SHOWN.
5. ENSURE THAT THE SPILLWAY CREST IS LEVEL AT LEAST 1.5' BELOW THE TOP OF THE BERM AT ALL POINTS.
6. STONE USED FOR SPILLWAY SECTION & LEVEL STONE APRON CLASS "B" EROSION CONTROL STONE.
7. STONE USED ON INSIDE SPILLWAY FACE TO CONTROL DRAINAGE – D.O.T. #57 WASHED STONE.
8. EXTEND STONE OUTLET SECTION ON ZERO GRADE WITH TOP ELEVATION OF STONE LEVEL WITH BOTTOM OF DRAIN.
9. ENSURE THAT THE TOP OF THE DAM AT ALL POINTS IS 0.5' ABOVE NATURAL SURROUNDING GROUND.
10. STABILIZE THE EMBANKMENT AND ALL DISTURBED AREA ABOVE THE SEDIMENT POOL AS SHOWN IN THE PLANS



PLAN VIEW
N.T.S.



CROSS SECTION
N.T.S.



STONE SECTION
N.T.S.

TEMPORARY SKIMMER SEDIMENT BASIN
N.T.S.

NOTE: 1.) ALL VALUES FOR "L", "W", "D" & "B" ARE IN FEET.
2.) FLOAT PIPE SIZE IS EQUAL TO THE INLET PIPE SIZE.

BASIN	"L"	"W"	"D"	"B"	SURFACE AREA	VOLUME	SKIMMER SIZE	ORIFICE SIZE	BOTTOM ELEV	BERM ELEV.	10YR ELEV.
A	112 FT	56 FT	2 FT	8 FT	6,272 SF	12,544 CF	2 ½"	2"	2152	2155	2152
B	132 FT	66 FT	2 FT	10 FT	8,712 SF	17,424 CF	2 ½"	2 ½"	2162	2165	2164
C	102 FT	51 FT	2 FT	8 FT	5,202 SF	10,404 CF	2 ½"	2"	2178	2181	2180

NCDENR Self Inspection Program for Erosion and Sedimentation Control

Effective October 1, 2010, persons conducting land disturbing activities larger than one acre must inspect their project after each phase of the project, and document the inspection in writing.

1. The financially responsible party, landowner or their agent may conduct the inspection.
2. Allerosion and sedimentation control measures, including sedimentation control basins, sedimentation traps, sedimentation ponds, rock dams, temporary diversions, temporary slope drains, rock check dams, sediment fence or barriers, all forms of inlet protection, storm drainage facilities, energy dissipaters, and stabilization methods of open channels must be inspected.
3. The need for ground cover should alsobe checked. Temporary or permanent ground cover must be provided on exposed graded slopes and fills within 21 calendar days of the completion of a phase of grading. Permanent ground cover must be provided within 15 working days or 90 calendar days (60 days in HQW zones), whichever term is shorter, upon the completion of construction or development.
4. Theactual dimensions (length and width) of the basins have to be checked, usually with a tape measure, and compared to the idmensions on the approved plan. Only relative elevations, comparing the bottom and top elevations are necessary.
5. A significant deviation means an omission, alteration or relocation of an erosion or sedimentation control measure that prevents the measure from performing as intended. If the approved erosion and sedimentation control plan cannot be followed, a revised plan should be submitted for review.
6. Use the formf'SelfInspection Report for Land Disturbing Activity as Required by NCGS-113A 54.1" It can be completed by hand or completed as an Excel spreadsheet. An alternative is to make notations on the copy of the approved erosion and sedimentation control plan that is kept on the project site. Rule 15A NCAC 04B. 0131 states that," documentation shall be accomplished by initialing and dating each measure or practice shown on a copy of the approved erosion and sedimentation control plan or by completing, dating and signing an inspection report that lists each measure, practice or device shown on the approved erosion and sedimentation control plan."
7. NPDES Self-Monitoring Report may only be used to report that the maintenance and repair requirements for all temporary and permanent erosion and sedimentation control measures, practices and devices have been performed.
8. Unlike the NPDES Self Monitoring Report, the Self Inspection Report for Land Disturbing Activity does not have to be weekly. Rather, this report is completed after each phase of the approved erosion and sedimentation control plan is complete. Not every project will have all the possible phases, but the list of phases includes the following:
   Installation of perimeter erosion and sediment control measures;
   Clearing and grubbing of existing ground cover;
   Completion of any phase of grading of slopes or fills;
   Installation of storm drainage facilities;
   Completion of construction or development;
   Establishment of permanent ground cover sufficient to restrain erosion.
9. Do not mail the report. The records must be made available to the erosion control inspector at the site. Any documentation of inspections that occur on a copy of the approved erosion and sedimentation control plan shall occur on a single copy of the plan and that plan shall be made available on the site. Any inspection reports shall also be made available on the site.

GENERAL CONSTRUCTION NOTES

1. All work and construction activities on the project site shall comply with all applicable OSHA regulations and requirements. It is the Contractor's responsibility to maintain a safe work site.
2. The Engineer and Owner reserve the right to modify project work items (including grading) as deemed necessary for the successful completion of the project. The Contractor may suggest adjustments to grading or other work items to be approved by the Engineer or Owner.
3. The Contractor shall comply with the Geotechnical Report for the placement of fill and compaction requirements. If no report is available, the following minimum standards shall apply:

Placement of fill:

A. Place the material in successive horizontal layers not exceeding 8" for the full width of the cross section.
B. Fill shall be placed only when it is within 3% of its optimum moisture content as determined by a Standard Proctor ASTM D 698.
C. Each layer of fill shall be spread evenly and shall be compacted to its specified density as determined by Standard Proctor ASTM D 698 before new layers are placed and compacted.
D. Sloped ground surfaces steeper than one vertical to four horizontal, on which fill is to be placed, shall be stepped or benched such that fill material will bond to the existing surfaces.
E. Embankment slopes shall be constructed by filling one (1) foot beyond the proposed finished slope surface for each lift. Compaction equipment shall work to the edge of each lift. After the entire fill is placed and compacted, the outside foot of the slope shall be trimmed to the design slope with a dozer. Unless indicated on the drawings, no fill slopes shall be steeper than 2 horizontal to 1 vertical.

Compaction:

A. Structural Fill Under Buildings and Within 10' of Building Perimeter: 100% of Standard Proctor the entire depth of fill.
B. Under Walks, Drives, Pads, and Paved Areas: 95% of Standard Proctor except 100% of Standard Proctor in the upper 2'.
C. Under Lawns and Planting Areas Beyond 10' from Building: 95% of Standard Proctor
D. Backfill in Trenches: Comply with compaction requirements for the area through which the trench runs.

4. All erosion control devices such as silt fences, diversions, sediment traps, etc. shall be maintained in workable conditions for the life of the project and shall be removed at the completion of the project only with the engineer's approval. See the NPDES requirements on this plan sheet for more detail. If during the life of the project a storm causes soil erosion which changes the finished grades or creates "gullies" and "washed areas", these shall be repaired by the Contractor at no extra cost. The Contractor shall adhere to the approved erosion control plan and take any additional measures necessary to prevent sediment from leaving the site.
5. Disposable Materials:
   A. Clearing and grubbing wastes shall be removed from the site and properly disposed of by the contractor at their expense, unless otherwise specified.
   B. Solid wastes to be removed such as sidewalks, curbs, pavement, etc. may be placed in specified disposal areas if permitted by the appropriate agencies and approved by the Owner. This material shall be spread and mixed with dirt eliminating all voids. This material shall have a minimum cover of 2'. The Contractor shall maintain specified compaction requirements in these areas. When disposal sites are not provided, the Contractor shall remove this waste from the site and properly dispose of it at their expense.
   C. Abandoned utilities such as culverts, water pipe, hydrants, casting, pipe appurtenances, utility poles, etc. shall be the property of the specified utility agency or company having jurisdiction. Before the Contractor can remove, destroy, salvage, re-use, sell or store for their own use any abandoned utility, they must present to the owner written permission from the utility involved.
   D. Unless otherwise noted on the plans, burning will not be allowed on this project. Should burning be allowed by the owner, it is the Contractor's responsibility to obtain all necessary permits (at their expense) and follow all applicable rules and regulations.
6. Unless otherwise specified, all base, paving, curbing and other concrete work shall conform to the local municipality or NCDOT specifications for construction. All water and sewer construction shall conform to the local utility requirements and/or the NCDENR minimum standards.
7. In the event excessive ground water or springs are encountered within the limits of construction, the Contractor shall install necessary underdrains and stone as directed by the Engineer. All work shall be paid based upon the unit prices unless otherwise specified.
8. The Contractor is responsible for the coordination of adjustment of all utility surface accesses (including manhole covers, valve boxes, etc.) whether he performs the work or the utility company performs the work.
9. The Contractor shall control all "dust" by periodic watering and shall provide access at all times for property owners within the project and for emergency vehicles. All open ditches and hazardous areas shall be clearly marked in accordance with OSHA regulations.
10. All areas of exposed soil shall be seeded, fertilized and mulched according to the specifications. The finished surface shall be to grade and smooth, free of all rocks larger than 3" equipment tracks, dirt clods, bumps, ridges, and gouges prior to seeding. The surface shall be loosened to a depth of 1"+/- to accept seed. The Contractor shall not proceed with seeding operations without first obtaining the Engineer's approval of the graded surface. All seeding shall be performed by a mechanical "hydro-seeder". The Engineer prior to seeding must approve hand seeding on any area.

SEEDING SPECIFICATIONS

I. TEMPORARY COVER
A. LIME & FERTILIZER – CONTRACTOR SHALL FURNISH AND APPLY LIME AND FERTILIZER TO THE SOIL AS REQUIRED TO PROVIDE SATISFACTORY CONDITIONS FOR SEED GERMINATION. AN APPLICATION RATE OF 2000 LBS PER ACRE OF GROUND AGRICULTURAL LIME AND 750 LBS/ACRE OF FERTILIZER (10-10-10).
THESE MATERIALS SHALL BE SPREAD UNIFORMLY OVER THE AREA TO BE PLANTED. THE SOIL SHALL BE TILLED TO A DEPTH OF 3 – 4 INCHES WITH EQUIPMENT APPROVED BY THE ENGINEER.
B. TEMPORARY COVER
SEEDING – CONTRACTOR SHALL SELECT A QUICK GROWING GRASS WITH HIGH SEEDING VIGOR THAT IS SUITED TO THE AREA, THE TIME OF PLANTING, AND THAT WILL NOT INTERFERE WITH PLANTS TO BE SOWN LATER FOR PERMANENT COVER.
MAY THROUGH AUGUST
SUNDANGRASS OR GERMAN MILLET — 50 LB/AC. 40 LB/AC.
SEPT. THROUGH APRIL
RYEGRAIN — 120 LBS./AC.
ALL SEEDS SHALL HAVE BEEN TESTED NOT MORE THAN 6 MONTHS PRIOR TO THE DATE OF SEEDING.
CONTRACTORS SHALL APPLY SEED UNIFORMLY BY HAND, CYCLONE SEEDER, DRILL, CULTIPACKER SEEDER, OR HYDRAULICALLY.
A SLURRY MIXTURE OF WATER, FERTILIZER, SEED, AND CELLULOSE FIBER MULCH IS ACCEPTABLE ON THIS PROJECT.
C. MULCHING – IN ORDER TO REDUCE DAMAGE FROM WATER RUN-OFF AND IMPROVE MOISTURE CONDITIONS FOR SEEDLINGS, A MULCH MATERIAL SHALL BE FURNISHED WHEN TEMPORARY SEEDING IS TO BE DONE. ACCEPTABLE MATERIALS ARE
A. DRY UNCHOPPED, UNWEATHERED SMALL GRAIN STRAW OR HAY FREE OF SEEDS OF COMPETING PLANTS – 1-2 TON/ACRE.
B. WOOD FIBER (EXCELSIOR)
C. WOOD CELLULOSE FIBER – 500 LBS./ACRE WITHOUT STRAW
D. JUTE MATTING –

II. PERMANENT COVER
A: CONTRACTOR SHALL FURNISH AND APPLY 90 LBS./1000 S.F. OF GROUND AGRICULTURAL LIME (2 TONS PER ACRE), 25 LBS./1000 S.F. OF FERTILIZER (10-10-10) (1000 LBS. PER ACRE), AND 2.3 LBS./1000 S.F. KENTUCKY 31 TALL FESCUE (100 LBS. PER ACRE) IN THE MANNER DESCRIBED ABOVE IN PARTS 1,2 & 3. APPLY NURSE CROP AS FOLLOWS:
MAY 1– AUG. 15 – 10 LBS./AC. GERMAN MILLET OR 15 LBS./AC. SUNDANGRASS
AUG 15 – MAY 1 – 40 LBS./AC. RYE (GRAIN)
B. SEEDING DATES: KY.31 TALL FESCUE
AUG. 20 – SEPT. 15
MARCH 1 – MAY1 (BELOW 2500' ELEVATION)
JULY 15 – AUG. 30
MARCH 5 – MAY 15
C. MULCHING (ABOVE 2500' ELEVATION)
APPLY 4,000 LB PER ACRE OF GRAIN STRAW SUITABLY TACKED DOWN.
ADD NETTING TO STEEP SLOPES AND STAPLE PER MANUFACTURERS RECOMMENDATIONS.

EROSION CONTROL CONSTRUCTION SEQUENCE

1. OBTAIN PLAN APPROVAL AND APPLICABLE PERMITS
2. HOLD PRE CONSTRUCTION CONFERENCE. (PLEASE SEE NPDES REQUIREMENTS ON THIS SHEET) CONTRACTOR SHALL NOTIFY ARO LQ INSPECTOR PRIOR TO ANY DISTURBANCE, INCLUDING INSTALLATION OF EC MEASURES.
3. INSTALL STABILIZED CONSTRUCTION ENTRY/EXIT AND ROCK PIPE INLET PROTECTION..
4. INSTALL SILT FENCE, TEMPORARY DIVERSIONS, SKIMMER BASINS AND REINFORCED STABILIZED OUTLETS AS SHOWN ON PLANS. CLEAR ONLY THE AREAS NECESSARY FOR THE INSTALLATION OF EROSION CONTROL MEASURES.
5. CLEAR AND GRUB SITE.
6. ROUGH GRADE SITE AND REMOVE EXCESS SOIL FROM SITE.
7. ANY DENUDED AREA THAT WILL NOT BE BROUGHT TO FINAL GRADE WITHIN THE NPDES STABILIZATION TIME FRAME SHALL IMMEDIATELY RECEIVE A TEMPORARY SEEDING TO TEMPORARILY STABILIZE THE AREA. IF THE SEASON OR HARSH CONDITIONS PREVENT THE ESTABLISHMENT OF A TEMPORARY COVER, DISTURBED AREAS SHALL BE MULCHED WITH STRAW OR EQUIVALENT MATERIAL ACCORDING TO SPECIFICATIONS.
9. FINAL GRADE SITE.
10. ALL EROSION AND SEDIMENT CONTROL PRACTICES SHALL BE INSPECTED IN ACCORDANCE WITH NPDES REGULATIONS, NEEDED REPAIRS SHALL BE MADE IMMEDIATELY.
11. AFTER SITE IS FINE GRADED, PERMANENT VEGETATION SHALL BE INSTALLED IN ACCORDANCE WITH NPDES REQUIREMENTS (SEE THIS SHEET)
12. CONTRACTOR SHALL NOTIFY ARO LQ INSPECTOR AFTER SITE HAS BEEN PERMANENTLY STABILIZED.

Know what's below. Call before you dig.

11/1/19

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Revisions

date: 9/18
job: 18161
drawn: KHC

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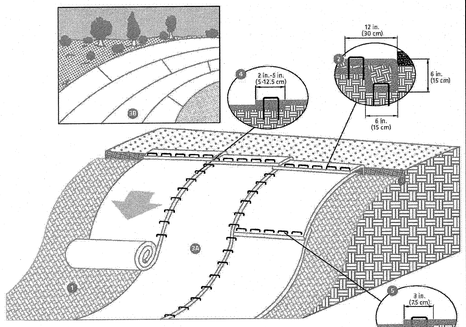
HENDERSON COUNTY
NORTH CAROLINA

PROPOSED
EROSION AND SEDIMENTATION
CONTROL PLAN DETAILS

sheet
C-302

Slope Installation

The following slope guide outlines general recommendations for installing RollMax® System temporary and/or permanent RECPs on sloping applications. Consult the staple pattern guide (Figure 1) for fastener spacing recommendations based on the slope severity.



Drawings Not To Scale

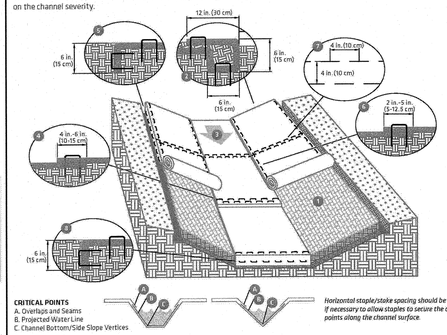
SLOPE INSTALLATION STEPS

1. Prepare soil before installing RECPs, including any necessary application of lime, fertilizer and seed.
2. Begin at the top of the slope by anchoring the RECPs in a 6 in. (15 cm) deep x 6 in. (15 cm) wide trench with approximately 12 in. (30 cm) of RECPs extended beyond the upslope portion of the trench. Anchor the RECPs with a row of staples/stakes approximately 12 in. (30 cm) apart in the bottom of the trench. Backfill and compact the trench after stapling. Apply seed to the compacted soil and fold the remaining 12 in. (30 cm) portion of RECPs back over the seed and compacted soil. Secure RECPs over compacted soil with a row of staples/stakes spaced approximately 12 in. (30 cm) apart across the width of the RECPs.
3. Roll the RECPs (3A) down or (3B) horizontally across the slope. RECPs will unroll with appropriate side against the soil surface. All RECPs must be securely fastened to soil surface by placing staples/stakes in appropriate locations as shown in the staple pattern guide.
4. The edges of parallel RECPs must be stapled with an approximately 2 in.-5 in. (5-12.5 cm) overlap depending on the RECP type.
5. Consecutive RECPs spliced down the slope must be end-over-end (shingle style) with an approximate 3 in. (7.5 cm) overlap. Staple through overlapped area, approximately 12 in. (30 cm) apart across entire RECPs width.*

***NOTE:** In adverse soil conditions longer staples/stakes or earth anchors may be necessary to properly secure the RECPs.*

Channel Installation

The following channel guide outlines general recommendations for installing RollMax System temporary and/or permanent RECPs in concentrated flow applications. Consult the staple pattern guide (Figure 1) for fastener spacing recommendations based on the channel severity.



CRITICAL POINTS
A. Overlaps and Seams
B. Projected Water Line
C. Channel Bottom/Side Slope Vertices

Drawings Not To Scale

Horizontal staple/stake spacing should be altered if necessary to allow staples to secure the critical points along the channel surface.

CHANNEL INSTALLATION STEPS

1. Prepare soil before installing RECPs, including any necessary application of lime, fertilizer and seed.
2. Begin at the top of the channel by anchoring the RECPs in a 6 in. (15 cm) deep x 6 in. (15 cm) wide trench with approximately 12 in. (30 cm) of RECPs extended beyond the upslope portion of the trench. For supplemental scour protection, use RevetMax® System ShoreMax® Mat at the channel/culvert outlet as needed. Anchor the RECPs with a row of staples/stakes approximately 12 in. (30 cm) apart in the bottom of the trench. Backfill and compact the trench after stapling. Apply seed to the compacted soil and fold the remaining 12 in. (30 cm) portion of RECPs back over the seed and compacted soil. Secure RECPs over compacted soil with a row of staples/stakes spaced approximately 12 in. (30 cm) apart across the width of the RECPs.
3. Roll center RECPs in direction of water flow in bottom of channel. RECPs will unroll with appropriate side against the soil surface. All RECPs must be securely fastened to soil surface by placing staples/stakes in appropriate locations as shown in the staple pattern guide.
4. Place consecutive RECPs end-over-end (shingle style) with a 4 in.-6 in. (10-15 cm) overlap. Use a double row of staples staggered 4 in. (10 cm) apart and 4 in. (10 cm) on center to secure RECPs.
5. Full-length edge of RECPs at top of side slopes must be anchored with a row of staples/stakes approximately 12 in. (30 cm) apart in a 6 in. (15 cm) deep x 6 in. (15 cm) wide trench. Backfill and compact the trench after stapling.
6. Adjacent RECPs must be overlapped approximately 2 in.-5 in. (5-12.5 cm) (depending on RECP type) and stapled*
7. In high flow channel applications a staple check slot is recommended at 30 to 40 ft (9-12 m) intervals. Use a double row of staples staggered 4 in. (10 cm) apart and 4 in. (10 cm) on center over entire width of the channel.
8. The terminal end of the RECPs must be anchored with a row of staples/stakes approximately 12 in. (30 cm) apart in a 6 in. (15 cm) deep x 6 in. (15 cm) wide trench. Backfill and compact the trench after stapling.

***NOTE:** In adverse soil conditions longer staples/stakes or earth anchors may be necessary to properly secure the RECPs.*

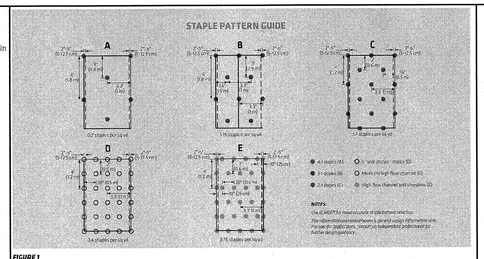


FIGURE 1

MAINTENANCE:
INSPECT ROLLED EROSION CONTROL PRODUCTS AT LEAST WEEKLY AND SFTER EACH SIGNIFICANT (1/2 INCH OR GREATER) RAIN FALL EVENT
REPAIR IMMEDIATELY.
GOOD CONTRAT WITH TEH GROUND MUST BE MAINTAINED, AND EROSION MUST NOT OCCUR BENEATH THE RECP.
ANY AREAS OF THE RECP THAT ARE DAMAGED OR NOT IN CLOSE CONTACT WITH THE GROUND SHALL BE REPAIRED AND STAPLED BY MANUFACTORS RECOMMENDATIONS.
IF EROSION OCCURS DUE TO POORLY CONTROLLED DRAINAGE, THE PROBLEM SHALL BE FIXED AND TEH ERODED AREA PROTECTED. MONITOR AND REPAIR THE RECP AS NECESSARY UNTIL GROUNG COVER IS ESTABLISHED.

MATTING DETAIL
N.T.S.

WATER BARS

Practice Standards and Specifications

N.T.S.

6.23 **RIGHT-OF-WAY DIVERSIONS (Water Bars)**

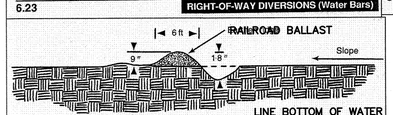


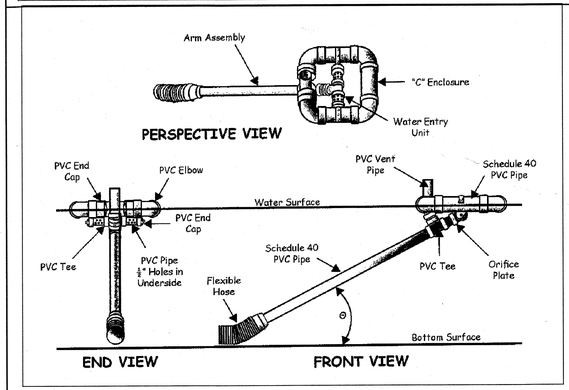
Figure 6.23b Section view of a water bar.

Construction Specifications

1. Install the diversion as soon as the right-of-way has been cleared and graded.
2. Disk the base for the constructed ridge before placing fill.
3. Track the ridge to compact it to the design cross section.
4. Locate the outlet on an undisturbed area. Adjust field spacing of the diversion to use the most stable outlet areas. When natural areas are not deemed satisfactory, provide outlet protection (Practices 6.40, *Level Spreader*, and 6.41, *Outlet Stabilization Structure*).
5. Immediately seed and mulch the portions of the diversions not subject to construction traffic. Stabilize with gravel areas to be crossed by vehicles.

Maintenance

Periodically inspect right-of-way diversions for wear and after every heavy rainfall for erosion damage. Immediately remove sediment from the flow area and repair the dike. Check outlet areas and make timely repairs as needed. When permanent road drainage is established and the area above the temporary right-of-way diversions is permanently stabilized, remove the dike and fill the channel to blend with the natural ground, and appropriately stabilize the disturbed area.



SKIMMER DETAIL
N.T.S.

TEMPORARY GRAVEL CONSTRUCTION ENTRANCE/EXIT

6.06

Definition A graveled area or pad located at points where vehicles enter and leave a construction site.

Purpose To provide a buffer area where vehicles can drop their mud and sediment to avoid transporting it onto public roads, to control erosion from surface runoff and to help control dust.

Conditions Where Practice Applies Wherever traffic will be leaving a construction site and moving directly onto a public road or other paved off-site area. Construction plans should limit traffic to properly constructed entrances.

Design Criteria **Aggregate Size**—Use 2-3 inch washed stone.

Dimensions of gravel pad—
Thickness: 6 inches minimum
Width: 12-ft minimum or full width at all points of the vehicular entrance and exit area, whichever is greater
Length: 50-ft minimum

Location—Locate construction entrances and exists to limit sediment from leaving the site and to provide for maximum utility by all construction vehicles (Figure 6.06a). Avoid steep grades and entrances at curves in public roads.

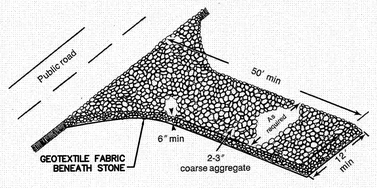


Figure 6.06a Gravel entrance/exit keeps sediment from leaving the construction site (modified from Va SWCC).

August 4, 2011

Major Elements of DWQ Construction General Permit

This document contains the major elements of the recently-revised North Carolina Division of Water Quality (DWQ) Construction General Permit (NCG01) with emphasis placed on those elements that differ from the previous permit (expiration on August 2, 2011). Since the summary list below cannot contain details of every change, the complete Permit should be used to assure full implementation. See: http://portal.ncdenr.org/web/wq/ws/su/construction

1) Ground Stabilization*

Site Area Description	Stabilization Time Frame	Stabilization Time Frame Exceptions
• Perimeter dikes, swales, ditches and slopes	7 days	None
• High Quality Water (HQW) Zones	7 days	None
• Slopes steeper than 3:1	7 days	If slopes are 10' or less in length and are not steeper than 2:1, 14 days are allowed.
• Slopes 3:1 or flatter	14 days	7-days for slopes greater than 50 feet in length
• All other areas with slopes flatter than 4:1	14 days	None (except for perimeters and HQW Zones)

* "Extensions of time may be approved by the permitting authority based on weather or other site-specific conditions that make compliance impracticable." (Section II.B(2)(b))

The major change in the Permit from the previous one is the shorter times to apply ground stabilization such as mulch, wheat straw, or grasses. The NC laws and rules relating to the Sediment Act require, in most places, ground stabilization within 21 days. Based on the new EPA requirements and 9-months' work with a permit advisory group, CTAG, the Division and EPA-developed permit, now contains requirements for ground cover within 14, and in some places, 7 days.

2) Building Wastes Handling

- No paint or liquid wastes in stream or storm drains
- Dedicated areas for demolition, construction and other wastes must be located 50' from storm drains and streams unless no reasonable alternatives available.
- Earthen-material stockpiles must be located 50' from storm drains and streams unless no reasonable alternatives available.
- Concrete materials must be controlled to avoid contact with surface waters, wetlands, or buffers.

3) Discharges to Federally-listed Waters

- Requirements are the same as in previous permit.
- The permit allows reduction from the 20 acre minimum if the Director of DWQ determines that other BMPs provide equivalent protection.

August 4, 2011

Major Elements of DWQ Construction General Permit- Continued

4) Inspections

- Same weekly inspection requirements
- Same rain gauge & inspections after 0.5" rain event
- Inspections are only required during "normal business hours"
- Inspection reports must be available on-site during business hours unless a site-specific exemption is approved.
- Records must be kept for 3 years and available upon request.
- Electronically-available records may be substituted under certain conditions.

5) Implementation of New Permit Conditions

- Projects permitted under the previous permit can continue to follow the previously-permitted conditions.
- Complete applications received prior to August 3, 2011 can follow conditions of approved application.
- Applications received after August 2, 2011 must comply with new permit conditions.

6) Conditions in Erosion & Sedimentation Control Plans*

- Designation on the plans where the 7 and 14-day ground stabilization requirements of the NPDES permit apply
- Designation on the plans where basins that comply with the surface-withdrawal requirements of the NPDES permit are located.

7) Building Wastes Handling

- No paint or liquid wastes in stream or storm drains
- Dedicated areas for demolition, construction and other wastes located 50' from storm drains and streams unless no reasonable alternatives are available.
- Earthen-material stockpiles located 50' from storm drains unless no reasonable alternatives available.
- Concrete materials must be controlled to avoid contact with surface waters, wetlands, or buffers.

8) Sediment Basins

- Outlet structures must withdraw from basin surface unless drainage area is less than 1 acre.
- Use only DWQ-approved flocculants.

* In order for the E&SC Plan to satisfy the conditions of the Construction General permit, it must identify areas where the ground stabilization requirements apply and the location of the basins where the surface-withdrawal requirements apply.

Document prepared by the Division of Water Quality

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11/1/19

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PROPOSED
EROSION AND SEDIMENTATION
CONTROL PLAN DETAILS

Revisions

date: 9/18
job: 18161
drawn: KHC

sheet C-303

GENERAL NOTES:

1. WATER CONSTRUCTION ON THIS SITE IS AUTHORIZED BY PERMITS ISSUED BY THE NORTH CAROLINA DEPARTMENT OF ENVIRONMENTAL QUALITY (NCDEQ) AND AUTHORIZED BY THE CITY OF HENDERSONVILLE. THE WORK IS SUBJECT TO INSPECTIONS AT ALL TIMES BY REPRESENTATIVES OF NCDEQ, THE CITY OF HENDERSONVILLE, THE OWNER OR THE ENGINEER. THE PERMITS REQUIRE CERTIFICATION OF COMPLETION OF THE WATER SYSTEMS BY THE ENGINEER AND THE APPLICANT PRIOR TO ISSUANCE OF FINAL OPERATION APPROVAL.
2. MATERIALS AND INSTALLATION FOR WATER CONSTRUCTION SHALL CONFORM TO THE LATEST VERSIONS OF CITY SPECIFICATION AND DETAILS AND AWWA STANDARDS AND REQUIREMENTS.
3. CONTRACTOR SHALL NOTIFY NC811 & APPROPRIATE UTILITIES AGENCIES PRIOR TO PERFORMING ANY WORK.
4. REGULAR WORKING HOURS SHALL BE FROM 7:00 AM TO 5:00 PM MONDAY THROUGH FRIDAY, EXCEPT IN CASES OF EMERGENCY OR OTHERWISE APPROVED IN WRITING BY THE CITY OR AUTHORIZED REPRESENTATIVES. THE CONTRACTOR SHALL ENSURE THE CONSTRUCTION SITE IS SAFE FOR ANY PERSONS WHO MAY BE ON SITE DURING NON-WORKING HOURS.
5. ALL PERSONS SHALL BE COURTEOUS AND RESPECTFUL TO THE PUBLIC. CURSING OUR FOUL LANGUAGE IS NOT PERMITTED AND WILL NOT BE TOLERATED.
6. THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING TRAFFIC CONTROL ON ALL ROADWAYS DURING THE PROJECT. THE CONTRACTOR SHALL NOTIFY LOCAL EMERGENCY, SCHOOL AND OTHER NECESSARY AUTHORITIES PRIOR TO ANY STREET CLOSING OR TRAFFIC CHANGE.
7. THE CONTRACTOR AT HIS OWN EXPENSE SHALL KEEP THE CONSTRUCTION SITE AND ADJACENT PUBLIC AND PRIVATE ROADWAYS CLEAN DURING THE PROJECT. THE CONTRACTOR IS ALSO RESPONSIBLE FOR CONTROLLING DUST WITHIN THE PROJECT AREA.
8. THE CONTRACTOR IS RESPONSIBLE FOR ALL CONSTRUCTION IN ACCORDANCE WITH THE LINES, GRADES AND ELEVATIONS SHOWN ON THE PLANS OR AS GIVEN BY THE ENGINEER IN THE FIELD.
9. CONTRACTOR SHALL VERIFY THE EXACT LOCATION AND THE ELEVATION FOR ALL UTILITIES, DRAINAGE AND OTHER UNDERGROUND FACILITIES BOTH EXISTING AND PROPOSED, AND SHALL NOTIFY THE ENGINEER OF ANY DISCREPANCIES OR CONFLICTS PRIOR TO CONSTRUCTION.
10. CONTRACTOR SHALL PROTECT EXISTING UTILITIES DURING CONSTRUCTION. REPAIRS SHALL BE MADE IN ACCORDANCE WITH APPLICABLE STANDARDS OF APPROPRIATE AGENCIES AT THE CONTRACTOR'S EXPENSE.
11. DURING CONSTRUCTION THE CONTRACTOR SHALL MAINTAIN THE OPERATION OF EXISTING UTILITIES WITH THE LEAST AMOUNT OF SERVICE INTERRUPTION POSSIBLE IN COORDINATION WITH THE CITY OF HENDERSONVILLE. CONTINUOUS SERVICE, PUBLIC HEALTH AND SAFETY CONSIDERATIONS SHALL EXCEED ALL OTHERS AND CONTRACTOR'S SCHEDULE, PLANS AND WORK SHALL AT ALL TIMES BE SUBJECT TO ALTERATION AND REVISION IF NECESSARY FOR THESE CONSIDERATIONS.
12. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE TEMPORARY OR PERMANENT RELOCATION OF STRUCTURES AND UTILITIES, INCLUDING BUT NOT LIMITED TO POLES, SIGNS, FENCES, HYDRANTS, VALVES, PIPING, CONDUITS AND DRAINS THAT INTERFERE WITH THE POSITIONING OF THE WORK AS SHOWN ON THE DRAWINGS.
13. CONTRACTOR SHALL BE REQUIRED TO CONFORM AND COMPLY WITH ALL RESTRICTIONS AND EASEMENT CONDITIONS AND IS RESPONSIBLE FOR ALL RELATED INCIDENTAL COSTS INVOLVED.
14. EXISTING WATER SERVICES SHALL BE REPLACED TO THE EXISTING METER UNLESS OTHERWISE APPROVED IN WRITING BY THE CITY. SPLICING OF THE WATER SERVICE ON THE DOWNSTREAM SIDE OF THE METER IS NOT PERMITTED.
15. ALL DISTURBED AREAS, INCLUDING BUT NOT LIMITED TO ASPHALT, CONCRETE, DRIVEWAYS, ROADS, LANDSCAPING, SHALL BE REPAIRED TO EQUAL OR BETTER CONDITION THAN THE ORIGINAL SITE. GRASS AND LANDSCAPED AREAS FILL MATERIAL MUST BE REPLACED IN TRENCH TO GRADE AS SOON AS WATERLINE CONSTRUCTION ALLOWS. ADEQUATE SEEDING AND STRAW OR MULCH SHALL THEN BE APPLIED TO THE DISTURBED TRENCH AREA. ADDITIONAL FILL AND SITE RESTORATION MAY BE REQUIRED WITHIN THE WARRANTY PERIOD AT THE CITY'S DISCRETION.
16. CONTRACTOR SHALL PROVIDE EROSION CONTROL DEVICES TO CONTROL RUNOFF AS REQUIRED. THE CONTRACTOR IS RESPONSIBLE FOR ANY FINES THAT MAY BE LEVIED DUE TO RUNOFF FROM CONSTRUCTION.
17. IT IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR TO FOLLOW ALL APPLICABLE FEDERAL, STATE AND LOCAL HEALTH AND SAFETY REGULATIONS PERTAINING TO CONSTRUCTION OPERATIONS.
18. ALL WATER MAINS SHALL HAVE 3 FEET MINIMUM COVER.
19. INSTALL FERROUS PIPING FOR BOTH WATER AND SEWER WITHIN 10 FT. OF A CROSSING IF:

19.1. SEWER LINE CROSSES OVER WATER, OR
19.2. VERTICAL CLEARANCE BETWEEN WATER AND SEWER IS LESS THAN 18 INCHES.
19.3. MAINTAIN 10 FEET HORIZONTAL SEPARATION BETWEEN SEWER AND WATER MAINS UNLESS LAID IN SEPARATE TRENCHES WITH THE BOTTOM OF THE WATER LINE AT LEAST 18 INCHES ABOVE THE TOP OF THE SEWER LINE OR USE FERROUS MATERIAL FOR BOTH WATER AND SEWER.

20. MAINTAIN 18 INCHES VERTICAL SEPARATION BETWEEN STORM DRAIN AND WATER, OR INSTALL FERROUS MATERIAL WATER LINE WITHIN 10 FEET EACH SIDE OF CROSSING.
21. TAPS GREATER THAN ONE-INCH IN DIAMETER IN EXISTING, ACTIVE WATER MAIN ARE TO BE PERFORMED BY THE CITY UNLESS OTHERWISE APPROVED IN WRITING BY THE CITY. TAPS IN NEW CONSTRUCTION ARE TO BE PERFORMED BY THE CONTRACTOR IN ACCORDANCE WITH CITY REQUIREMENTS.
22. ALL WATER METERS WILL BE SET BY CITY STAFF UNLESS THE CONTRACTOR IS GRANTED WRITTEN PERMISSION BY THE CITY.

22.1. THE CONTRACTOR WILL PROVIDE THE CITY NOTICE OF 10 WORKING DAYS MINIMUM PRIOR TO THE DATE OF METER INSTALLATION.
22.2. THE CONTRACTOR WILL PROVIDE A LICENSED PLUMBER DURING THE METER INSTALLATION TO VERIFY LINE SERVICES IN ALL MULTI-METER BOXES.

23. ALL PUBLIC WATER MAIN CONSTRUCTION SHALL BE PERFORMED BY A NORTH CAROLINA LICENSED UTILITY CONTRACTOR.
24. ALL WATER APPURTENANCES ARE TO BE MADE USING LEAD FREE MATERIALS. PIPE, FITTINGS, VALVES, HYDRANTS, PIPE CLAMPS, RESTRAINTS, FLANGES, CASTINGS, REBAR, HATCHES, INLETS, METER BOXES AND ALL OTHER CAST IRON COMPONENTS SHALL BE MANUFACTURED IN THE USA.
25. RESTRAINED JOINTS BY AN APPROVED PIPE MANUFACTURER ARE TO BE USED FOR ALL PUBLIC WATER LINES WHERE THRUST RESTRAINING IS REQUIRED IN ACCORDANCE WITH THE PLANS AND MANUFACTURER'S SPECIFICATION. CONCRETE THRUST BLOCKS ARE PERMITTED ONLY WHERE CONNECTIONS ARE MADE TO EXISTING WATER LINES OR WHERE THE USE OF MECHANICAL RESTRAINT IS NOT FEASIBLE.
26. ALL FIRE HYDRANTS, VAULTS, BACKFLOW PREVENTERS, HOT BOXES AND WATER METERS ARE TO BE INSTALLED ON RELATIVELY FLAT AREAS OUTSIDE OF PAVEMENT.
27. TAMPERING WITH OR ILLEGAL USE OF THE PUBLIC WATER SUPPLY WILL RESULT IN SUSPENSION OF WATER SERVICE, INCLUDING DOMESTIC AND COMMERCIAL, UNTIL FINAL APPROVAL BY THE CITY IS ISSUED. A PERSON FOUND TO BE USING WATER ILLEGALLY , SHALL BE SUBJECT TO PENALTIES OR FINES, AS PRESCRIBED AND APPROVED BY CITY COUNCIL.

TESTING & INSPECTION:

1. NOTIFY THE CITY OF HENDERSONVILLE AND ENGINEER AT LEAST 5 WORKING DAYS BEFORE STARTING CONSTRUCTION OF WATER FACILITIES TO SCHEDULE A PRE-CONSTRUCTION CONFERENCE. THE ENGINEER SHALL PERIODICALLY INSPECT THE PROGRESS OF INSTALLATION AT A MINIMUM AND SHALL COMPLETE A FINAL WATER CERTIFICATION.
2. ALL CHANGES TO THE APPROVED CONSTRUCTION PLANS AND SUBMITTALS MUST BE APPROVED IN WRITING BY THE CITY PRIOR TO IMPLEMENTATION IN THE FIELD.
3. THE CONTRACTOR SHALL FURNISH SECURE AND PROVIDE ALL NECESSARY TESTING MATERIALS, EQUIPMENT, LABOR. THE CONTRACTOR SHALL COORDINATE TESTING, FLUSHING, DISINFECTION, AND BACTERIOLOGICAL SAMPLING WITH CITY INSPECTOR.
4. THE ENGINEER OR CONTRACTOR SHALL NOTIFY THE CITY CONSTRUCTION INSPECTORS 72 HOURS (MINIMUM) PRIOR TO ANY WATER MAIN OR TESTING OPERATIONS. AT A MINIMUM CITY STAFF SHALL BE NOTIFIED PRIOR TO TAPS, TESTING, FLUSHING, DISINFECTION, AND SAMPLING.
5. PRESSURE TEST WATER MAINS TO 200 PSI MIN. FOR A MINIMUM OF TWO HOURS IN ACCORDANCE WITH CITY REQUIREMENTS AND AWWA C600.
6. DISINFECT WATER LINES AND PROVIDE ACCEPTABLE BACTERIOLOGICAL TEST FROM A CERTIFIED TESTING LABORATORY IN ACCORDANCE WITH CITY REQUIREMENTS AND AWWA C651. THE CONTRACTOR MAY ELECT TO USE THE CITY'S CERTIFIED TESTING LABORATORY.
7. PRIVATELY OWNED FIRE SYSTEMS SHALL BE APPROVED BY THE APPROPRIATE LOCAL PERMITTING AUTHORITY. THE CITY ENGINEERING OR WATER AND SEWER DEPARTMENTS ARE NOT RESPONSIBLE FOR ENSURING COMPLIANCE WITH APPROPRIATE FIRE PROTECTION REGULATIONS. THE CITY DOES NOT PROVIDE ANY GUARANTEE OF ITS WATER SYSTEM'S CAPABILITY TO DELIVER WATER FLOW AND RESIDUAL PRESSURE THE FIRE PERMITTING AUTHORITY MAY REQUIRE.
8. ALL BACKFLOW PREVENTION ASSEMBLIES SHALL BE USC APPROVED AND REVIEWED BY THE CITY'S. PROTECTION OF THE PUBLIC WATER DISTRIBUTION SYSTEM SHALL BE ASSURED BY INSPECTION OF THE INSTALLATION AND TESTING OF BACKFLOW PREVENTION DEVICES IN ACCORDANCE WITH APPROPRIATE LOCAL, STATE, AND FEDERAL REGULATIONS.
9. CONSTRUCTION WATER SOURCING MUST BE APPROVED IN WRITING BY THE CITY. CONSTRUCTION WATER CONNECTIONS SHALL BE PAIRED WITH AN IRRIGATION METER AND APPROVED BACKFLOW PREVENTION ASSEMBLY. THIS ASSEMBLY INSTALLATION MUST BE TESTED BY A LICENSED PLUMBER AND TEST RESULTS SUBMITTED TO THE CITY BEFORE USE OF CONSTRUCTION WATER.
10. SECURE FINAL WRITTEN ACCEPTANCE FROM THE CITY OF HENDERSONVILLE PRIOR TO ACTIVATION OF THE SYSTEM. WATER SERVICE WILL NOT BE PROVIDED UNTIL WRITTEN ACCEPTANCE OF THE SYSTEM IS ISSUED BY THE CITY.
11. THE ENGINEER SHALL SUPPLY THE CITY WITH FINAL AS-BUILT DRAWINGS AND COMPLETE ALL PROJECT CLOSE OUT REQUIREMENTS.

DISCLAIMER:

THE STANDARD WATER DETAILS ARE FOR THE SOLE USE OF PROJECTS DIRECTLY FOR, OR THOSE PROJECTS IN WHICH OWNERSHIP WILL BE TRANSFERRED TO THE CITY OF HENDERSONVILLE. THESE TYPICALS ARE INTENDED TO SHOW THE CITY OF HENDERSONVILLE'S EXPECTATIONS FOR THE GENERAL LAYOUT, ARRANGEMENT, AND THE QUALITY OF EQUIPMENT AND MATERIALS FOR WATER DISTRIBUTION SYSTEM ITEMS AND THEIR RELATED APPURTENANCES. IT REMAINS THE SOLE RESPONSIBILITY OF THE ENGINEER IN RESPONSIBLE CHARGE (ERC) OF EACH APPLICATION TO DETERMINE, DESIGN TO, AND CERTIFY TO THE DESIGN PARAMETERS FOR EACH INSTALLATION. THE ERC MUST ALSO ENSURE THE DESIGN COMPLIES WITH THE MINIMUM DESIGN CRITERIA OF NC DIVISION OF ENVIRONMENTAL QUALITY AND ALL LOCAL AND STATE LAWS AND REGULATIONS.

DATE: 03/14/2019 — WD DWG. NO. 1
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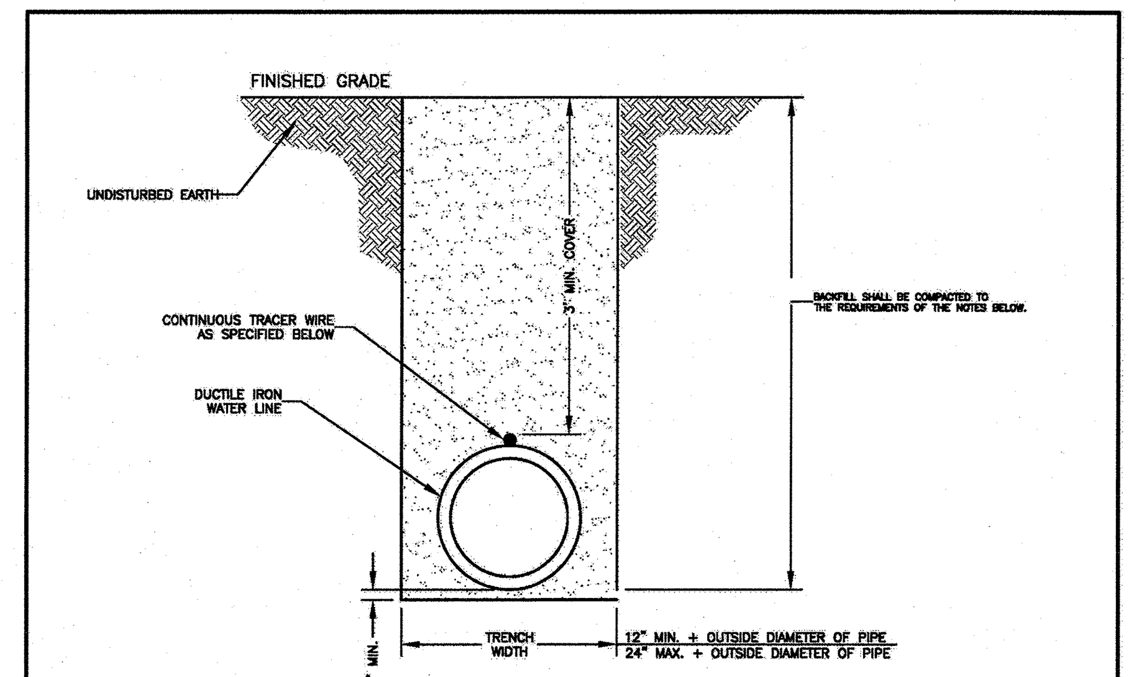
6/21/2019 10:13:20 AM

WATER DETAILS
GENERAL NOTES



NOTES:

1. TRENCHES EXCAVATED OUTSIDE EXISTING ROAD AND RAILWAY RIGHTS-OF-WAY SHALL BE BE BACKFILLED WITH COMMON BACKFILL MATERIAL CONSISTING OF EXCAVATED MATERIALS EXCEPT HIGHLY ORGANIC SILTS AND CLAYS AND TAMPED THOROUGHLY. FILL SHALL BE DEPOSITED IN SUCCESSIVE, UNIFORM, APPROXIMATELY HORIZONTAL LAYERS. MATERIAL SHALL BE FREE OF ROOTS, STONES, AND DEBRIS. ALL MATERIAL SHALL HAVE AN IN-PLACE DENSITY OF AT LEAST 85% OF MAXIMUM DRY DENSITY (STANDARD PROCTOR) OR AS APPROVED BY THE ENGINEER. COMMON BACKFILL SHALL NOT CONTAIN STONE BLOCKS, BROKEN CONCRETE, MASONRY RUBBLE, OR OTHER SIMILAR MATERIALS. IT SHALL HAVE PHYSICAL PROPERTIES SUCH THAT IT CAN BE READILY SPREAD AND COMPACTED DURING FILLING. SNOW, ICE, AND FROZEN SOIL WILL NOT BE PERMITTED.

   WHERE EXCAVATED MATERIAL, AFTER REMOVAL OF ROCKS, STUMPS, PLANT MATERIAL, AND OTHER EXTRANEOUS MATERIAL AND PROPER DEWATERING, DRYING, PROTECTION, AND STORAGE OF THE EXCAVATION BY THE CONTRACTOR, CANNOT BE PREPARED TO MEET THE REQUIREMENTS FOR COMMON BACKFILL, DUE TO THE NATURE OF THE MATERIAL (E.G., EXCESSIVE ROCK, MUCK, ORGANICS, CLAY, SILT, OR OTHER MATERIAL), AND AS DETERMINED BY THE ENGINEER, THE UNACCEPTABLE EXCAVATION SHALL BE REMOVED FROM THE SITE AND DISPOSED OF BY THE CONTRACTOR AND REPLACED BY IMPORTED BACKFILL MEETING THE REQUIREMENTS OF STRUCTURAL BACKFILL. IMPORTED STRUCTURAL BACKFILL SHALL BE FREE OF ORGANICS, ROOTS OR OTHER DELETERIOUS MATERIALS AND SHALL NOT CONTAIN MORE THAN FIVE PERCENT (BY WEIGHT) ORGANIC MATERIAL, HAVE A PLASTICITY INDEX (PI) GREATER THAN 25, OR HAVE A MAXIMUM DRY DENSITY LESS THAN 90 POUNDS PER CUBIC FOOT. IMPORTED STRUCTURAL FILL SHOULD CONSIST OF MATERIAL CLASSIFIED AS ML, CL, SC, OR SM, OR BETTER PER ASTM D-2487 AND BE CAPABLE OF BEING COMPACTED TO 85% STANDARD PROCTOR.

2. THE WATER LINE SHALL HAVE A MINIMUM OF 3' OF COVER AT FINISHED GRADE.

   TRACER WIRE WILL BE A 19 GAUGE, TIN COATED, COPPER CONDUCTOR WITH POLYETHYLENE INSULATION. CORE MATERIAL COMPRISED OF HIGH-TENACITY, WOVEN POLYESTER WITH WATER BLOCKING YARNS ENCAPSULATED IN 30 MIL. BLUE HDPE JACKET PROVIDING CORROSION RESISTANCE, FLEXIBILITY, IMPACT STRENGTH AND 1800 LBS. TENSILE STRENGTH. TRACER WIRE WILL NOT CONDUCT AN ELECTRICAL CURRENT WHEN STRUCK BY LIGHTNING AND IS DESIGNED FOR DIRECT BURY AND DIRECTIONAL BORING APPLICATIONS. WHEN SPLICES AND LATERAL CONNECTIONS ARE MADE, ONLY GEL FILLED CONNECTORS DESIGNED FOR WIRE WITH WOVEN POLYESTER FIBER CORE ARE TO BE USED. TRACER WIRE AND CONNECTORS SHALL BE TRACE-SAFE® WATER BLOCKING TRACER WIRE AND RELATED CONNECTORS, MANUFACTURED BY NEPTCO, INC., OR EQUIVALENT APPROVED BY ENGINEER, AND PRODUCED IN THE UNITED STATES OF AMERICA.

   TRACER WIRE SHALL BE EXTENDED ALONG ALL WATER LINES, FITTINGS, VALVES, SERVICES, AND HYDRANTS. LOCATING CLIPS SHALL BE PROVIDED AT ALL VALVES, HYDRANT VALVES AND METER BOXES. THE CONTRACTOR SHALL DUCT TAPE TRACER WIRE ON CROWN OF WATER LINE EVERY FIVE FEET.

DATE: 01/12/2019 — WD DWG. NO. 2
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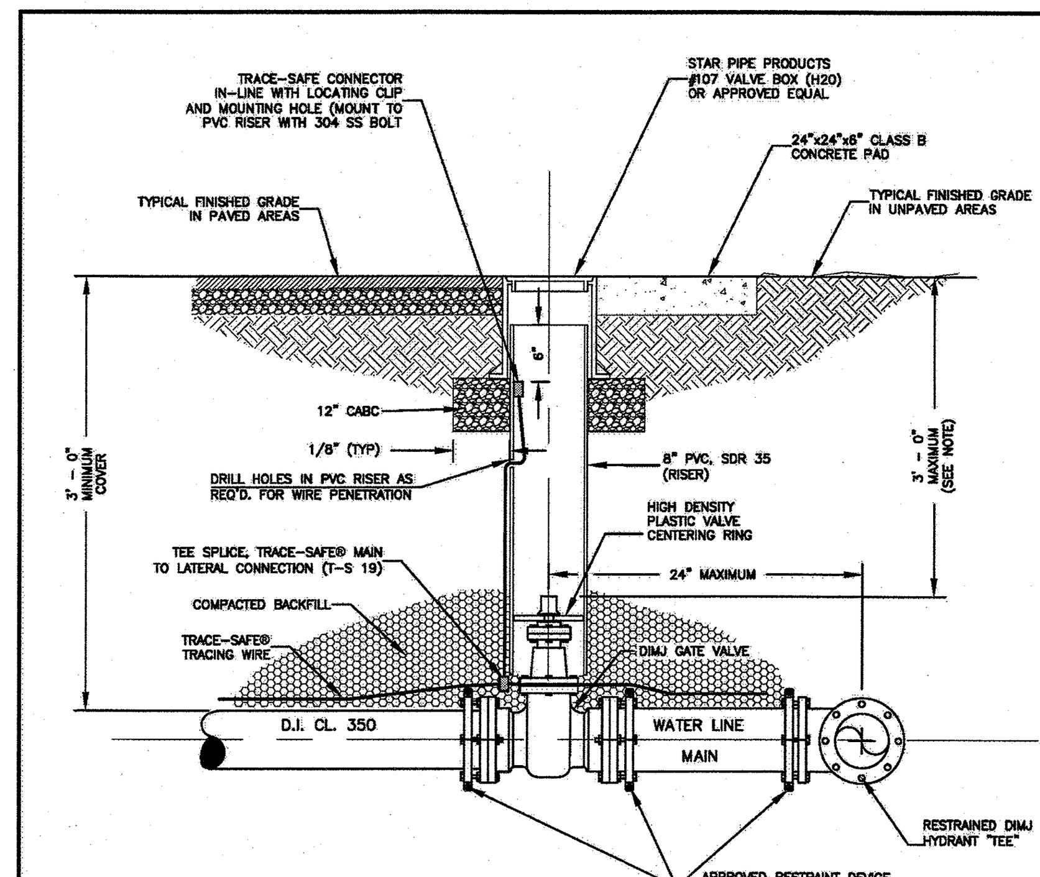
WATER TRENCH CONSTRUCTION
OUTSIDE PAVEMENT



NOTES:

1. TOP OF COVER SHALL BE STAMPED "WATER"
2. VALVE PAD REQUIREMENTS SHALL NOT BE APPLICABLE FOR PAVED SURFACES.
3. PAVEMENT REPAIR SHALL MATCH EXISTING ROAD PAVING SECTION. SEE NCDOT ASPHALT REPAIR DETAIL # 654.01.
4. WHEN OPERATING NUT DEPTH EXCEEDS 3'-0" BELOW FINISHED GRADE, PROVIDE EXTENSION STEM WITH STANDARD 2" SQUARE OPERATING NUT. TOP OF NUT SHALL BE WITHIN 5" TO 9" OF FINISHED GRADE.
5. TRACER WIRE WILL BE A 19 GAUGE, TIN COATED, COPPER CONDUCTOR WITH POLYETHYLENE INSULATION. CORE MATERIAL COMPRISED OF HIGH-TENACITY, WOVEN POLYESTER WITH WATER BLOCKING YARNS ENCAPSULATED IN 30 MIL. BLUE HDPE JACKET PROVIDING CORROSION RESISTANCE, FLEXIBILITY, IMPACT STRENGTH AND 1800 LBS. TENSILE STRENGTH. TRACER WIRE WILL NOT CONDUCT AN ELECTRICAL CURRENT WHEN STRUCK BY LIGHTNING AND IS DESIGNED FOR DIRECT BURY AND DIRECTIONAL BORING APPLICATIONS. WHEN SPLICES AND LATERAL CONNECTIONS ARE MADE, ONLY GEL FILLED CONNECTORS DESIGNED FOR WIRE WITH WOVEN POLYESTER FIBER CORE ARE TO BE USED. TRACER WIRE AND CONNECTORS SHALL BE TRACE-SAFE® WATER BLOCKING TRACER WIRE AND RELATED CONNECTORS, MANUFACTURED BY NEPTCO, INC., OR APPROVED EQUIVALENT, AND PRODUCED IN THE UNITED STATES OF AMERICA.

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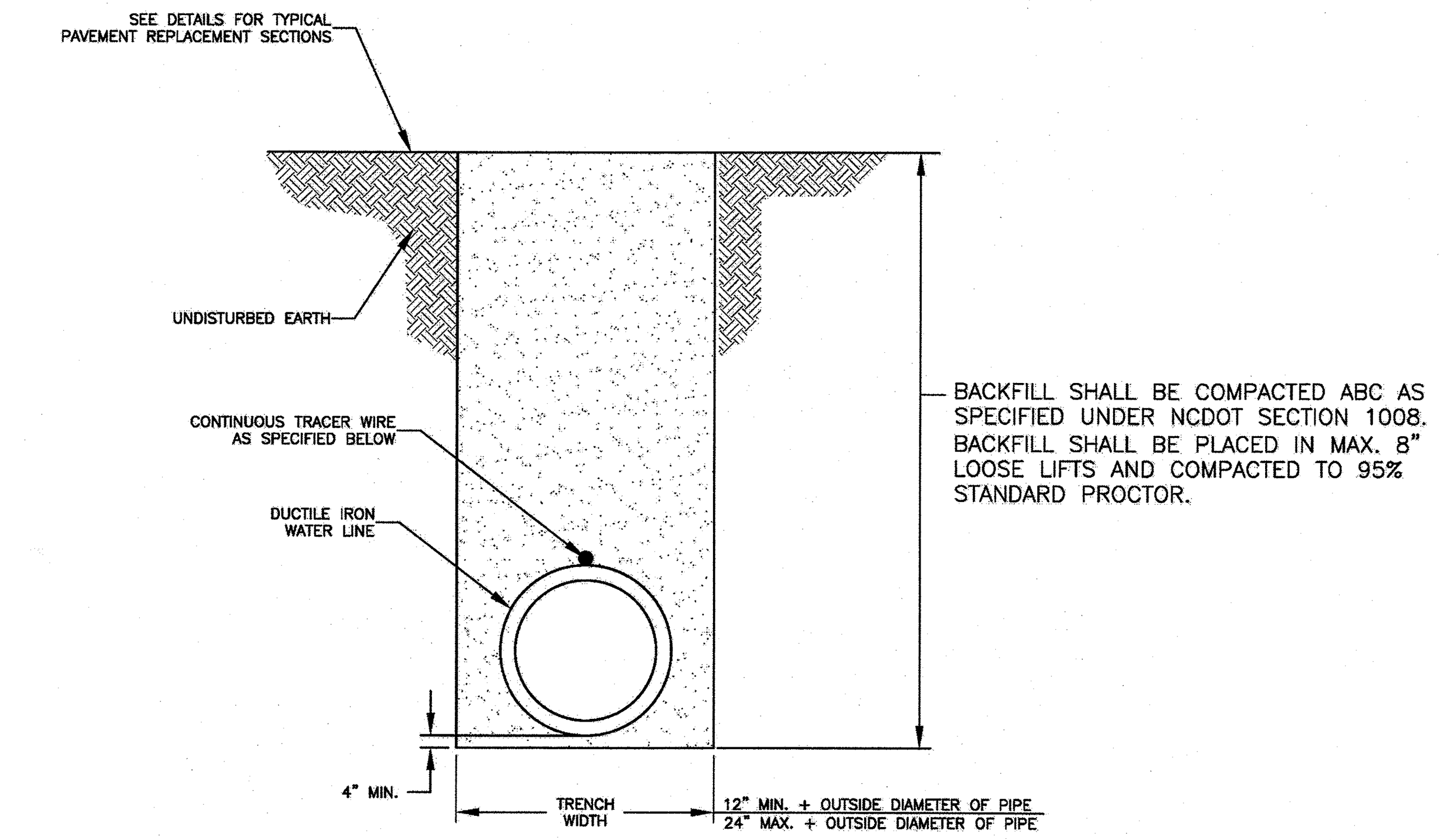
VALVE INSTALLATION DETAIL



NOTES:

1. THIS TRENCH BACKFILL DETAIL APPLIES TO AREAS UNDER PAVEMENT AND AREAS WHERE THE TRENCH IS WITHIN FIVE (5) FEET OF THE EDGE OF PAVEMENT.
2. COMPACTION OF THE BACKFILL SHALL BE ACHIEVED THROUGH THE USE OF AN APPROVED VIBRATORY PLATE TAMPER OR ROLLER.
3. COMPACTION TESTING OF THE BACKFILL SHALL BE PROVIDED, DIRECTED AND COORDINATED BY THE OWNER. INTERVALS OF TESTING SHALL BE AT THE TOTAL DISCRETION OF THE OWNER AND MAY BE CHANGED AT ANY TIME.

   IF A TEST DOES NOT PASS, THE CONTRACTOR SHALL REMOVE THE DEFECTIVE BACKFILL, REDO THE WORK AND THE AREA WILL BE RETESTED. THE CONTRACTOR SHALL BE AWARE OF THE LEVEL OF COMPACTION REQUIRED.

   IF THE WORK IS SUSPECT TO BE DEFECTIVE BY THE OWNER, THE WORK SHALL BE RETESTED.

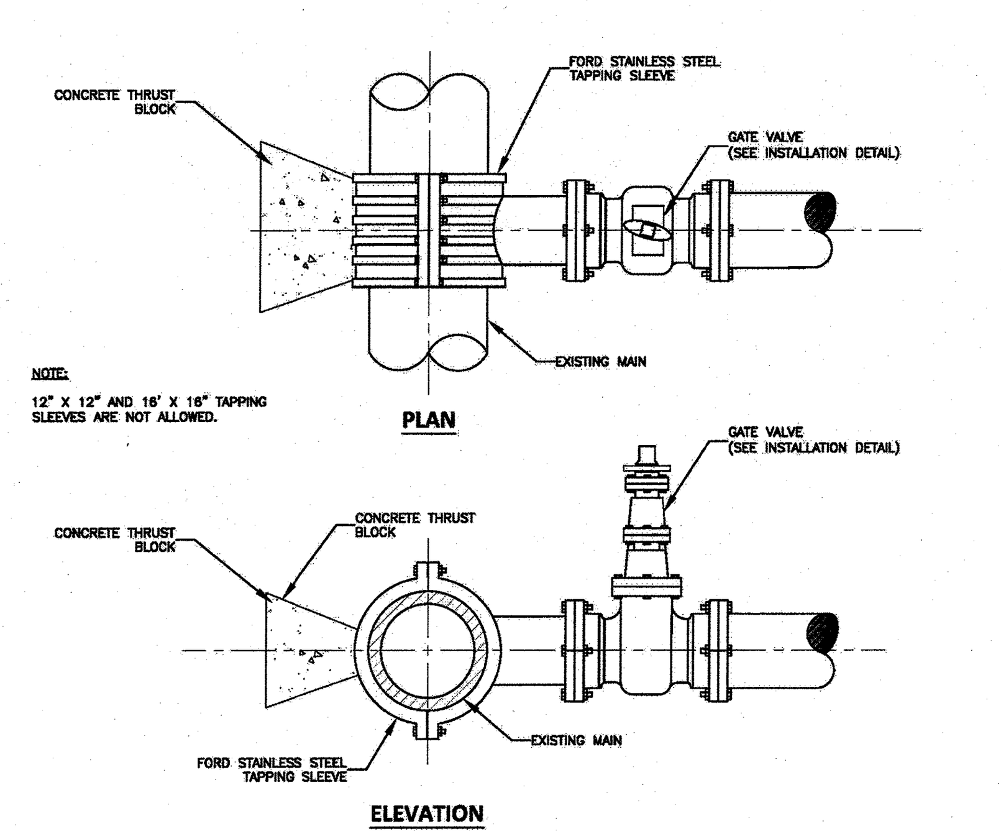
   THE WATER CONTENT OF THE BACKFILL MATERIAL SHALL ALSO BE TESTED AND RECORDED FOR EACH TEST COMPLETED. THE CONTRACTOR WILL BE ALLOWED TO ADD WATER TO THE BACKFILL MATERIAL IN ORDER TO OBTAIN THE OPTIMUM WATER CONTENT. HOWEVER, THE CONTRACTOR WILL NOT BE ALLOWED TO UTILIZE THE ADDITION OF WATER AS A MEANS OF COMPACTION. FURTHERMORE, SHOULD THE BACKFILL MATERIAL BE FOUND TO HAVE WATER CONTENT RATIOS WHICH IN THE OPINION OF THE ENGINEER OR THE OWNER PREVENTS THE APPROPRIATE COMPACTION OF THE TRENCH, THE CONTRACTOR SHALL REMOVE ALL DEFECTIVE MATERIAL AND UNDERTAKE THE NECESSARY CORRECTIVE WORK.

4. THE WATER LINE SHALL HAVE A MINIMUM OF 3' OF COVER AT FINISHED GRADE.
5. TRACER WIRE WILL BE A 19 GAUGE, TIN COATED, COPPER CONDUCTOR WITH POLYETHYLENE INSULATION. CORE MATERIAL COMPRISED OF HIGH-TENACITY, WOVEN POLYESTER WITH WATER BLOCKING YARNS ENCAPSULATED IN 30 MIL. BLUE HDPE JACKET PROVIDING CORROSION RESISTANCE, FLEXIBILITY, IMPACT STRENGTH AND 1800 LBS. TENSILE STRENGTH. TRACER WIRE WILL NOT CONDUCT AN ELECTRICAL CURRENT WHEN STRUCK BY LIGHTNING AND IS DESIGNED FOR DIRECT BURY AND DIRECTIONAL BORING APPLICATIONS. WHEN SPLICES AND LATERAL CONNECTIONS ARE MADE, ONLY GEL FILLED CONNECTORS DESIGNED FOR WIRE WITH WOVEN POLYESTER FIBER CORE ARE TO BE USED. TRACER WIRE AND CONNECTORS SHALL BE TRACE-SAFE® WATER BLOCKING TRACER WIRE AND RELATED CONNECTORS, MANUFACTURED BY NEPTCO, INC. AND PRODUCED IN THE UNITED STATES OF AMERICA.

   TRACER WIRE SHALL BE EXTENDED ALONG ALL WATER LINES, FITTINGS, VALVES, SERVICES, AND HYDRANTS. LOCATING CLIPS SHALL BE PROVIDED AT ALL VALVES, HYDRANT VALVES AND METER BOXES. THE CONTRACTOR SHALL DUCT TAPE TRACER WIRE ON CROWN OF WATER LINE EVERY FIVE FEET.

WATER TRENCH CONSTRUCTION
UNDER PAVEMENT

NOT TO SCALE



NOTE:

12" X 12" AND 16' X 16" TAPPING SLEEVES ARE NOT ALLOWED.

NOTE:

12" X 12" AND 16' X 16" TAPPING SLEEVES ARE NOT ALLOWED.

TABLE A-1

TBD

NOTE:

1. CONCRETE SHALL BE 3000 PSI.
2. CONCRETE SHALL NOT CONTACT BOLTS OR ENDS OF MECHANICAL JOINT FITTINGS BY THE INSTALLATION OF POLYETHYLENE FILM PLACED BETWEEN THE FITTINGS AND POURED CONCRETE.
3. SEE TABLE A-1 FOR AREA OF CONCRETE REQUIRED FOR MAIN SIZED 6-INCH THROUGH 16-INCH.

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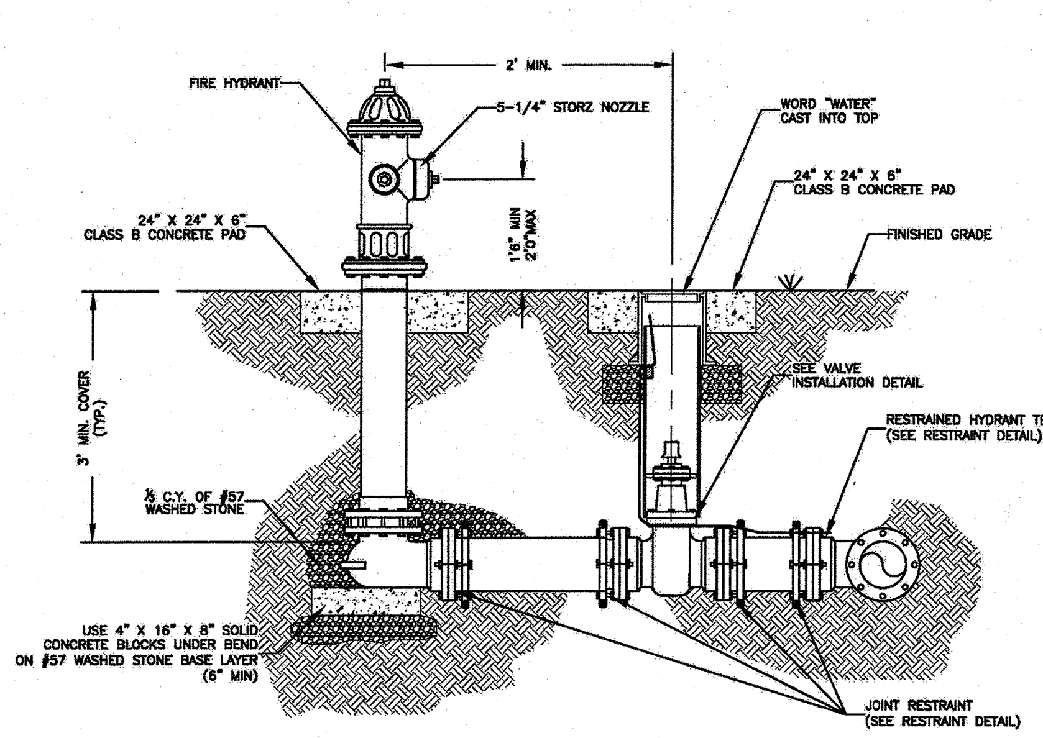
STANDARD TAPPING SLEEVE
AND VALVE ASSEMBLY



NOTES:

1. FIRE HYDRANTS SHALL BE RATED TO A MINIMUM 250 PSI WORKING PRESSURE IN ACCORDACE WITH AWWA C-502 UNLESS SPECIFIED AS 350 PSI BY THE CITY. HYDRANTS SHALL HAVE A 5¼-INCH BARREL AND STORZ CONNECTION.
2. ALL VALVES AND HYDRANTS SHALL HAVE M. J. CONNECTIONS WITH IRON RETAINING GLAND M.J. RESTRAINT.
3. FIRE HYDRANT SHALL BE FACTORY PAINTED YELLOW, WITH FIELD PAINTED TOUCH-UP, BEFORE PROJECT IS ACCEPTED.
4. HYDRANT VALVE SHALL BE PLACED AS CLOSE AS POSSIBLE TO THE MAIN, BUT DO NOT PLACE VALVE IN PROPOSED OR EXISTING CURB AND GUTTER. IF THE STREET IS SOIL AND NO PAVING IS TO BE DONE AT THIS TIME, THE LOCATION OF THE VALVE IS TO BE DETERMINED BY THE ENGINEER.
5. FIRE HYDRANTS SHALL BE PLACED AS DIRECTED BY THE ENGINEER.
6. HYDRANT BRANCH SHALL NOT BE BACK FILLED UNTIL INSPECTED AND APPROVED BY THE ENGINEER.
7. GATE VALVE AND BOX SHALL BE IN ACCORDANCE WITH STANDARD DETAIL.
8. HYDRANT EXTENSIONS AND/OR OFFSETS SHALL BE APPROVED BY THE ENGINEER.
9. FIRE HYDRANTS WHICH HAVE BEEN INSTALLED MUST BE TAGGED "OUT OF SERVICE" AND BAGGED, UTILIZING A RED CANVAS BAG WITH WHITE LETTERING, UNTIL SUCH TIME AS THE WATER MAIN TO WHICH CONNECTED IS DISINFECTED AND CONNECTED TO THE ACTIVE WATER SYSTEM.

DATE: 04/24/2019 — WD DWG. NO. 12
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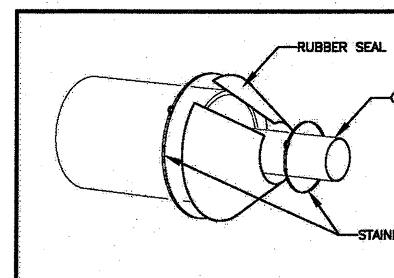
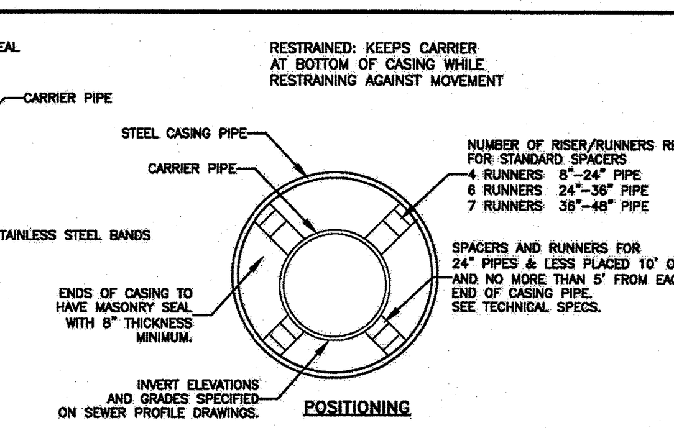
FIRE HYDRANT
STANDARD INSTALLATION
DETAIL



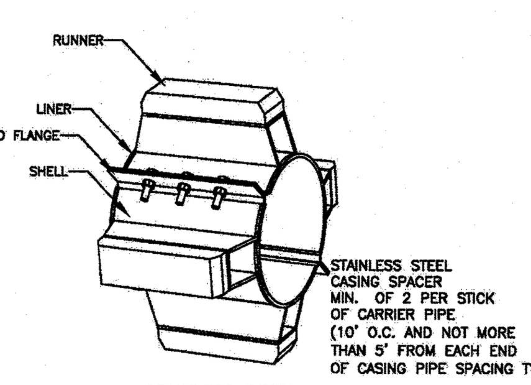
CASING END SEAL



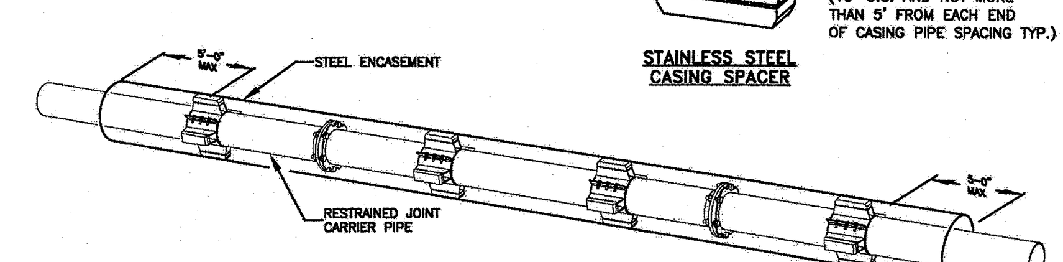
POSITIONING

NOTES:

1. RESTRAINED POSITIONING TO BE USED AT ALL TIMES.
2. CARRIER PIPE JOINTS SHALL BE MECHANICALLY RESTRAINED, DUCTILE IRON OR C900 PVC ONLY.
3. STAINLESS STEEL CASING SPACERS SHALL BE STYLE CCS AS MANUFACTURED BY CASCADE WATERWORKS MFG. CO. OF YORKVILLE, IL OR ENGINEER APPROVED EQUIVALENT.
4. CASING END SEAL SHALL BE STYLE CCES AS MANUFACTURED BY CASCADE WATERWORKS MFG. CO. OF YORKVILLE, IL OR ENGINEER APPROVED EQUIVALENT.



STAINLESS STEEL CASING SPACER



CASING SPACER PLACEMENT DIAGRAM

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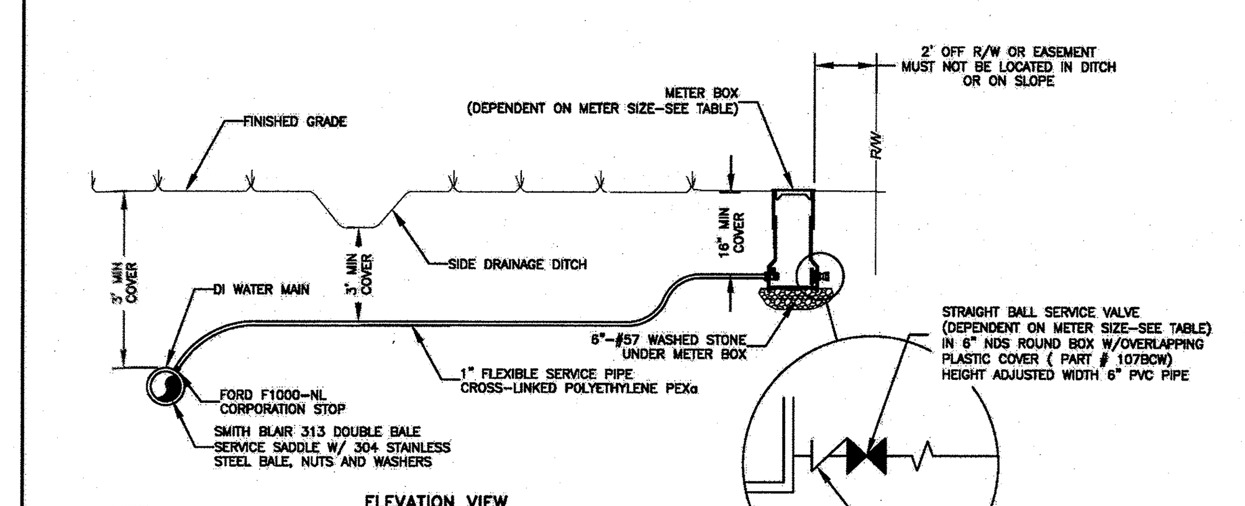
CARRIER PIPE IN STEEL ENCASEMENT
DETAIL

METER SIZE	METER BOX SIZE	METER BOX	STRAIGHT BALL SERVICE VALVE	STRAIGHT DUAL CARTRIDGE CHECK VALVE
3/4" *	3/4"	FORD CB111-233-NL	FORD B81-233W-NL	HHC81-333-NL
1"	1"	FORD CB111-444-L-T-NL	FORD B81-344W-NL	HHC81-444-NL

* REQUIRES REDUCER L84-34G NL



ELEVATION VIEW

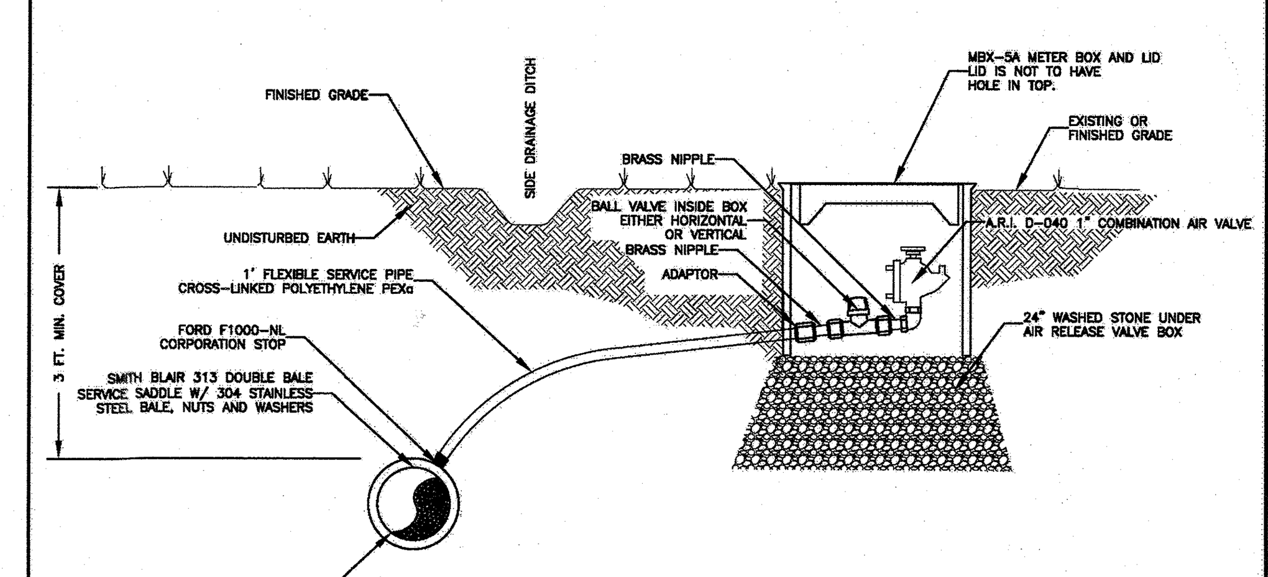
NOTES:

1. THE CITY OF HENDERSONVILLE SHALL INSTALL WATER METERS.
2. NO METERS WILL BE INSTALLED NOR WATER SERVICE PROVIDED, UNTIL A WRITTEN FINAL ACCEPTANCE OF THE SYSTEM IS ISSUED BY THE CITY.
3. METER BOX SHALL BE BITUMINOUS COATED, CAST IRON BASE, INNER BARREL, AND OUTER BARREL WITH 1-7/8" TOUCH-READ HOLE IN LID.
4. EXTEND TRACER WIRE FROM MAIN TO METER BOX. WIRE NOT SHOWN FOR CLARITY. TRACER WIRE WILL BE A 19 GAUGE, TIN COATED, COPPER CONDUCTOR WITH POLYETHYLENE INSULATION. CORE MATERIAL COMPRISED OF HIGH-TENACITY, WOVEN POLYESTER WITH WATER BLOCKING YARNS ENCAPSULATED IN 30 MIL. BLUE HDPE JACKET; PROVIDING CORROSION RESISTANCE, FLEXIBILITY, IMPACT STRENGTH AND 1800 LBS. TENSILE STRENGTH. TRACER WIRE WILL NOT CONDUCT AN ELECTRICAL CURRENT WHEN STRUCK BY LIGHTNING AND IS DESIGNED FOR DIRECT BURY AND DIRECTIONAL BORING APPLICATIONS. WHEN SPLICES AND LATERAL CONNECTIONS ARE MADE, ONLY GEL FILLED CONNECTORS DESIGNED FOR WIRE WITH WOVEN POLYESTER FIBER CORE ARE TO BE USED. TRACER WIRE SHALL BE TERMINATED IN METER BOX AT MOUNTED TRACE-SAFE® LOCATING CLIP, MOUNTED A MAXIMUM OF 3" FROM TOP OF BOX WITH 304 SS BOLT. TRACER WIRE AND CONNECTORS SHALL BE TRACE-SAFE® WATER BLOCKING TRACER WIRE AND RELATED CONNECTORS, MANUFACTURED BY NEPTCO, INC., OR EQUIVALENT APPROVED BY ENGINEER, AND PRODUCED IN THE UNITED STATES OF AMERICA.

6/21/2019 10:13:30 AM

DATE: 04/29/2019 — WD DWG. NO. 8
SCALE: NOT TO SCALE
City of Hendersonville Engineering Department
305 Williams Street
Hendersonville, NC 28792
(828) 697-3000 (office)
www.cityofhendersonville.org

MINIMUM SERVICE LINE:
1" SERVICE LATERAL INSTALLATION



NOTES:

1. PIPE AND FITTINGS SIZE SHALL MATCH THE SIZE OF THE PROPOSED AIR RELEASE VALVE TO BE INSTALLED.
2. LOCATION TO BE THE SAME AS METER BOX DETAILS.
3. TRACER WIRE NOT SHOWN FOR CLARITY. TRACER WIRE SHALL BE CONNECTED TO WATER MAIN TRACER USING CONNECTORS APPROVED BY THE MANUFACTURERS. (SEE VALVE BOX INSTALLATION)
4. ACTUAL LOCATION OF AIR RELEASE VALVE SHALL BE COORDINATED WITH THE CITY AND PROPERTY OWNER.

6/21/2019 10:13:29 AM

DATE: 04/08/2019 — WD DWG. NO. 7
SCALE: NOT TO SCALE
City of Hendersonville Engineering Department
305 Williams Street
Hendersonville, NC 28792
(828) 697-3000 (office)
www.cityofhendersonville.org

STANDARD AIR RELEASE VALVE
INSTALLATION DETAIL

811 Know what's below. Call before you dig.

11/1/19

WILLIAM G. LAPSLEY P.E.
NC License No.: C-6469
109 Rugby Hollow Drive
Hendersonville, North Carolina 28791
(828) 891-8292 (828) 779-5046
wlapsley48@wgla.com

Revisions	
9/1/19	WATER

date: 9/18
job: 18161
drawn: KHC

WILLIAM G. LAPSLEY P.E.
HENDERSONVILLE, NORTH CAROLINA

RUGBY RIDGE
HENDERSONVILLE TOWNSHIP
HENDERSON COUNTY
NORTH CAROLINA

WATER SYSTEM DETAILS

sheet C-400