REQUEST FOR BOARD ACTION

Henderson County
Board of Commissioners

Meeting Date: March 19, 2008

Subject: Water Line Extension – The Sanctuary at Mills River

Attachments: Vicinity Map
Engineer's Report
Project Summary
Project Map
County Review Sheet

Summary of Request:

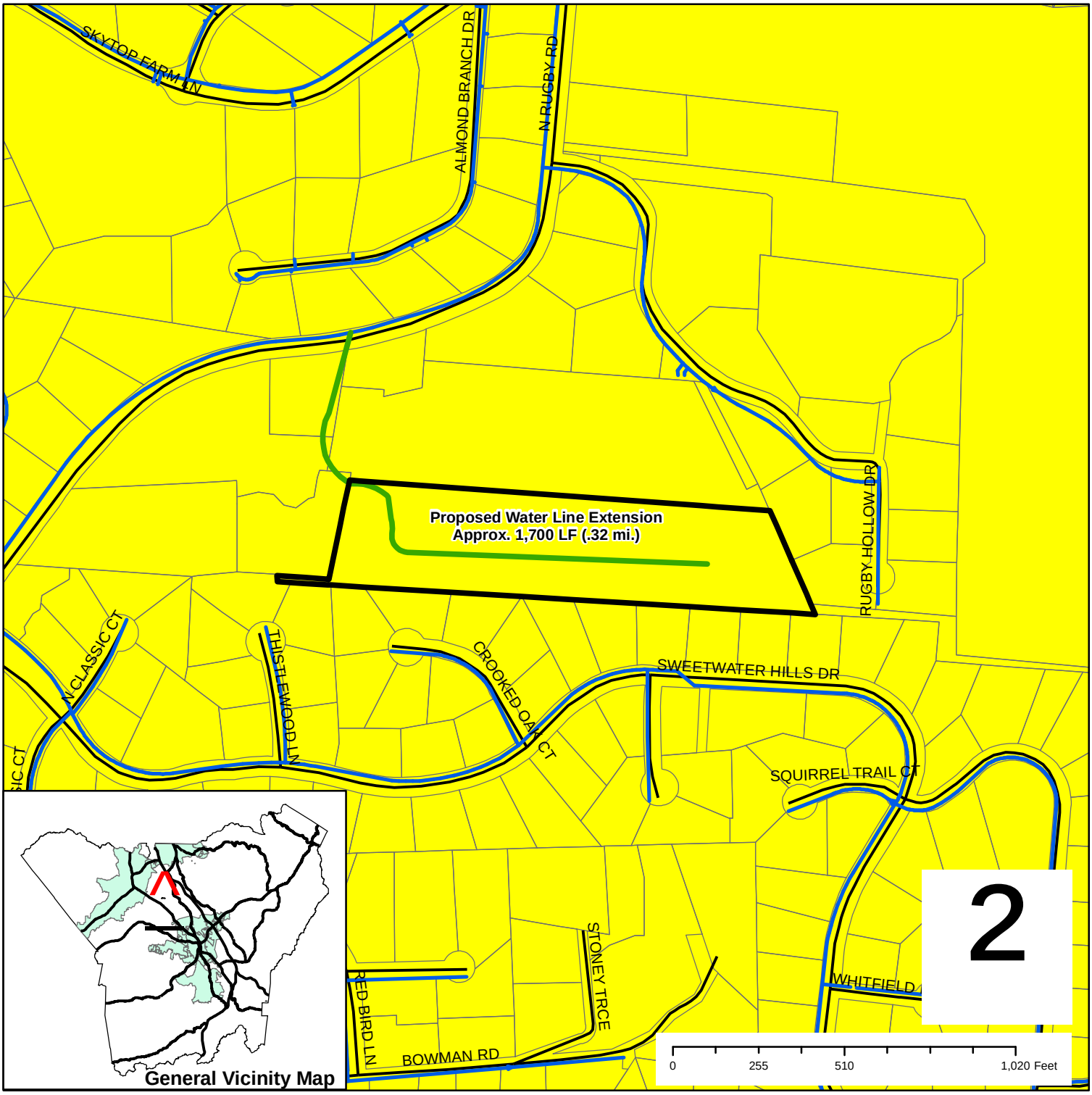
The City of Hendersonville has requested that the County comment on the proposed water line extension for the Sanctuary at Mills River. The proposed water line is 1,700 linear feet and includes two fire hydrants. Its location within the urban services area is consistent with the Henderson County 2020 Comprehensive Plan. A City of Hendersonville Project Summary Sheet, with supporting documents and County Review Sheet with Staff comments, are attached for Board review and action.

Board Action Request:

Action by the Board of Commissioners is needed to either grant or deny this request. If the Board decides to approve the requested extension the following motion has been provided.

Suggested Motion:

I move that the Board approve the Sanctuary at Mills River water line extension and direct Staff to convey the County's comments to the City of Hendersonville.



Sanctuary at Mills River

OWNER/DEVELOPER: M & M Land Developers of WNC, LLC
AGENT: Mark Gibbs
CURRENT ZONING: R-2
SEWER SYSTEM: Private
ROAD SYSTEM: Public

Legend

- The Sanctuary at Mills River
- Proposed Water Line Extension
- Existing Hendersonville Water Line
- Streets
- Parcels
- Urban Services Area

Map Created by the Henderson County Planning Department on 3/3/2008
See Master Plan for exact location of project.

William G. Lapsley & Associates, P.A.

Consulting Civil Engineers and Land Planners

William G. Lapsley, P.E.
William R. Buie, P.E.
G. Thomas Jones III, P.E.
Donald L. Hunley, P.E.

TO: Lee Smith, Utilities Director
Water & Sewer Department
City of Hendersonville

FROM: ***William G. Lapsley,PE***

DATE: **Thursday, February 21, 2008**

SUBJECT: ***The Sanctuary at Mills River***
PIN # 9650-19-0825
WATER UTILITY EXTENSION

An extension of the existing water main(s) located ***on North Rugby Road*** is required to provide water service to the above referenced project. This project is proposed to be a **single family residential** development. The water extension will serve a total of ***ten (10) units.*** The proposed site is currently owned and being developed by:

Mark Gibbs, Manager Member
M & M Land Developer's of WNC, LLC
3702 Spartanburg Highway
Hendersonville, North Carolina 28731
William G. Lapsley, PE
828-687-7177
wlapsley@wgla.com

The sewer service for this project will be provided by *individual on-site septic systems.*

At the present time, Mark Gibbs will be responsible for signing the Water Utility Extension Agreement (WUEA) with the City of Hendersonville.

The project will consist of ***approximately 1,700 LF of 8 inch(180 LF),6 inch(1,000 LF), and 2 inch(500 LF) diameter water lines, 8 inch(1 EA), 6 inch(2 EA) and 2 inch (1 EA) gate valves, fire hydrants (2 ea-500 gpm),air release valve(1 EA) and 2 inch flush hydrant(1 EA). There will be ten (10) water services with an estimated domestic water supply demand of 50 gpm.*** For more information regarding this proposed project see the accompanying preliminary plans.

This project is estimated to be completed ***60*** days after final grading has been completed, assuming favorable weather conditions. I, or an authorized representative of my company, will be observing and monitoring the progress of construction for this project. Should you have any questions, concerns or comments regarding this project please feel free to contact me.

Two Town Square Boulevard, Suite 320, Biltmore Park, Asheville, NC 28803 Website: www.wgla.com Ph: 828-687-7177 Facsimile: 828-687-7178

ENGINEER'S REPORT
THE SANCTUARY AT MILLS RIVER
WATER SYSTEM IMPROVEMENTS

FEBRUARY, 2008

1. NAME AND ADDRESS OF APPLICANT

City of Hendersonville
P.O. Box 1670
Hendersonville, NC 28793

2. PROJECT DESCRIPTION AND INTRODUCTION

This project is located off of North Rugby Road in Henderson County. The proposed development covers approximately 11 acres. Individual water meter service connections will be provided for each lot. The proposed water line extension will include approximately 1700 lf of 8"Ø, 6"Ø and 2"Ø water mains (DIP/CL350 & PVC/DR13.5); 8"Ø gate valve (1 each), 6" gate valve (2 ea), 2"Ø gate valve (1 ea), two (2) fire hydrants, air release valve (1 ea) and 2"Ø flush hydrant (1 ea.).

3. DESCRIPTION OF FUTURE SERVICE AREAS

The service area for this project is approximately 11 acres. The existing water supply at this site is adequate to meet the project needs.

4. PRESENT AND ANTICIPATED WATER DEMANDS

This water system will serve ten (10) single family homes. The anticipated water usage is 4,000 gallons per day. (10 ea. @ 400 gpd)

5. CHARACTER OF THE SOURCE OF SUPPLY

The water supply for this project is from the City of Hendersonville Water Treatment Plant.

6. AGREEMENTS TO PURCHASE WATER

Not Applicable

7. USEFUL LIFE OF FACILITIES

The useful life of the water line for this project is expected to be 50 years minimum.

8. MAXIMUM DAILY TREATED WATER SUPPLY AND MAXIUMUM DAILY DEMAND

The maximum daily treated water supply for the City of Hendersonville water plant is 12 MGD. The average demand is 7.2 MGD, with a daily peak (for the year) of 9.5 MGD.

9. IDENTIFICATION & DESCRIPTION OF THE SERVICE AREA

The service area for this project is the Sanctuary at Mills River Subdivision.

10. CONSIDERATION OF ALTERNATIVES TO CONSTRUCTING A NEW WATER SYSTEM

Not Applicable

11. POPULATION RECORDS AND TRENDS

According to the Office of State Planning, the population of the City of Hendersonville in 1998 was 9,538 person. The growth rate from 1990 to 1998 was 30.9%

12. PRESENT AND FUTURE YIELD FROM THE SOURCES OF SUPPLY

The City of Hendersonville Water Plant currently draws water from the Mills River. The present and future yield of the source of supply is expected to be adequate for the City of Hendersonville's needs.

13. PROPOSED WATER TREATMENT PROCESSES

Not Applicable

14. DESIGN BASIS

The design basis for this project is to provide adequate flow and 30 psi minimum throughout the system.

15. PRIORITIZED LIST OF INFRASTRUCTURE IMPROVEMENTS

Not Applicable

TECHNICAL SPECIFICATIONS

for

WATER DISTRIBUTION SYSTEM

to serve

THE SANCTUARY AT MILLS RIVER

City of Hendersonville
Henderson County, North Carolina

WILLIAM G. LAPSLEY & ASSOCIATES, P.A.
CONSULTING ENGINEERS
Two Town Square Blvd., Suite 320
Asheville, NC 28803

February, 2008

06200.1 APPLICABLE AWWA STANDARDS

C600: Installation of Ductile-Iron Water Mains and Their Appurtenances
C605: Underground Installation of Polyvinyl Chloride (PVC) Pressure Pipe and Fittings for Water
C651: Disinfecting Water Mains (Preventive and Corrective Measures During Construction)

06200.2 TRENCH DEPTH AND COVER

The minimum allowable soil cover over a water main must be 30". The minimum trench depth must be 4'.

06200.3 HANDLING AND STORING MATERIALS

The Contractor shall use care unloading pipe to avoid damage. Pipe shall not be placed within pipe of a large size and shall not be rolled or dragged over gravel or rock during handling. The Contractor shall store the pipe on sills above storm drainage level and deliver for laying after the trench is excavated. When any joint or section of pipe is damaged during transporting, unloading, handling, or storing, the undamaged portions of the joint or section may be used where partial lengths are needed, or if damaged sufficiently, the Engineer will reject the joint or section as being unfit for installation.

If any defective pipe is discovered after installation, it shall be removed and replaced with sound pipe or shall be repaired by the Contractor in an approved manner and at his own expense.

06200.4 SAW CUTTING ASPHALT

Refer to Section 250-2 of the NCDOT Standard Specification for Roads and Structures.

06200.5 PREPARATION OF PIPE FOUNDATION

The preparation of the pipe bedding shall be in accordance with the typical trench cross-sections as shown on the plans for the type of pipe being installed.

The pipe foundation shall be prepared to be uniformly firm and shall be true to the lines and grades as shown on the plans. Any deviation or field adjustment will require the approval of the Engineer. When an Inspector is present on the site and is so requested by the Contractor, he shall check the position of grades and lines but the Contractor shall be responsible for the finished work conforming to exact and proper line and grade.

Whenever the nature of the ground will permit, the excavations at the bottom of the trench shall have the shape and dimensions of the outside the pipe, care being taken to secure a firm bearing support uniformly throughout the length of the pipe. A space shall be excavated under and around each bell to sufficient depth to relieve it of any load and to allow ample space for filling and finishing the joint. The pipe, when thus bedded firmly, shall be on the exact grade.

In case the bed shaped in the bottom of the trench is too low, the pipe shall be completely removed from position, and earth of suitable quality shall be placed and thoroughly tamped to prepare a new foundation for the pipe. In no case shall the pipe be brought to grade by blocking up under the barrel or bell of same, but a new and uniform support must be provided for the full length of the pipe. Where rock or boulders are encountered in the bottom of the trench, the same shall be removed to such depth that no part of the pipe,

when laid to grade, will be closer to the rock or boulders than six (6) inches. A suitably tamped and shaped foundation of approved material shall be placed to bring the bottom of the trench to proper subgrade over rock or boulders.

Where the foundation material is found to be of poor supporting value, the Engineer may make minor adjustments in the location of the pipe to provide a more suitable foundation. Where this is not practical, the foundation shall be conditioned by removing the existing foundation material by undercutting to the depth as directed by the Engineer, within limits established on the plans, and backfilling with either an approved material secured from unclassified excavation or borrow excavation at the nearest accessible location along the project, or foundation conditioning material consisting of crushed stone or gravel approved by the Engineer as being suitable for the purpose intended. The selection of the type of backfill material to be used for foundation conditioning will be made by the Engineer.

The Contractor shall remove all water which may be encountered or which may accumulate in the trenches by pumping or bailing and no pipes shall be laid until the water has been removed from the trench. Water so removed from the trench must be disposed of in such a manner as not to cause injury to work completed or in progress.

Whenever the bottom of the trench shall be of such nature as to provide unsatisfactory foundation for the pipe, the Engineer will require the pipe to be laid on the timber or concrete cradle foundations. Such foundations whether of single plank, plank cradle supported by piles, or poured concrete cradle, shall be placed by the Contractor and compensation will be allowed the Contractor for the work.

6200.6 LAYING PIPE

All pipe is to be installed in strict accordance with the manufacturer's recommendations and the contract material specifications. Installation manuals from various material suppliers are required to be furnished to the Engineer for his review and approval prior to installation of any materials. No pipe shall be laid except in the presence of the Engineer or his inspector or with special permission from the Engineer. Water lines shall have thrust blocks constructed at all tees, "Y's", bends, and valves as shown on the plans.

Proper tools, implements and facilities satisfactory to the Engineer shall be provided and used for the safe and convenient prosecution of pipe laying. All pipe, fittings, valves, and other materials used in the laying of pipe will be lowered into the trench piece by piece by means of suitable equipment in such a manner to prevent damage to the pipe, materials, to the protective coating on the pipe materials, and to provide a safe working condition to all personnel in the trench. Each piece of pipe being lowered into the trench shall be clean and free of defects. It shall be laid on the prepared foundations, as specified elsewhere to produce a straight line on a uniform grade, each pipe being laid so as to form a smooth and straight inside flow line. Pipe shall be removed at any time if broken, injured or displaced in the process of laying same, or of backfilling the trench.

When cutting short lengths of pipe, a pipe cutter as approved by the Engineer will be used and care will be taken to make the cut at right angles to the center line of the pipe or on the exact skew as shown on the plans. In the case of push-on pipe, the cut ends shall be tapered with a portable grinder, or coarse file to match the manufactured taper.

All pipe joints shall be constructed in strict accordance with the pipe manufacturer's specifications and materials and any deviation must have prior approval of the Engineer.

The maximum deflection per joint of flexible joint pipe shall be that deflection recommended by the manufacturer. No deflection shall be allowed in galvanized steel pipe joints or concrete pressure pipe joints.

06200.7 BACKFILLING

Methods of backfilling shall be in strict accordance with these specifications and the pipe manufacturer's recommendations. Where there is a conflict between the two, the manufacturer's recommendations shall govern.

All backfill shall be from the excavation and shall be free from organic matter and rocks larger than three inches in the largest dimension and shall contain more than 50 percent of minus ¾ inch material. Backfill shall be moisture conditioned to achieve a moisture content at or near the laboratory optimum moisture content. Material too dry for compaction shall have water added and mixed to obtain uniform moisture distribution. Material too wet for compaction shall be mixed and dried to obtain uniform moisture distribution. Backfill shall be placed in loose approximately horizontal layers not to exceed 6 inches, and compacted by mechanical means to ninety (95) percent of the Standard Proctor Test. Jetting will not be allowed. Backfill placed around pipes shall be placed in such a manner that the pipes will not be displaced or damaged. Backfill placed adjacent to pipes or appurtenances shall be compacted by hand operated power tampers. All backfill material shall be approved by the Engineer.

06200.8 SELECT BACKFILL

When the Engineer determines that material from the excavation is not suitable for backfill, select backfill shall be utilized and compensation will be negotiated under a change order.

06200.9 PAYMENT

With the exception of Select Backfill, the contract prices shall include full compensation for all costs incurred under this section.

SECTION 06900 WATER APPURTENANCE INSTALLATION, TESTING AND DISINFECTION

06900.1 SCOPE

This section covers the installation of all necessary fittings, valves and appurtenances for the water distribution system as shown on the plans and specified herein, testing and chlorination.

06900.2 HANDLING AND STORING MATERIALS

The Contractor shall use care unloading materials to avoid damage. Material shall not be rolled or dragged over gravel or rock during handling. The Contractor shall store the fittings, valves and appurtenances on sills above storm drainage level and deliver for installation after the trench is excavated. All valves shall be drained and so stored as to protect them from freezing. When any material is damaged during transporting, unloading, handling or storing, the undamaged portions may be used or, if damaged sufficiently, the Engineer will reject the material as being unfit for installation.

If any defective material is discovered after installation, it shall be removed and replaced with sound material or shall be repaired by the Contractor in an approved manner at his own expense.

06900.3 THRUST BLOCKS

All plugs, caps, tees, bends, and other fittings shall be provided with adequate thrust blocks. Thrust blocks shall be constructed to the minimum dimensions shown on the drawings or as directed. Thrust blocks shall be made of concrete having a compressive strength of twenty-eight (28) days of 3000 psi when tested in accordance with ASTM Specification C39 or C42 and shall bear directly against the undisturbed trench wall. Where possible, the backing shall be so placed that the fitting joints will be accessible for repair. All bolts and pipe joints shall be protected against contact with thrust block concrete by the installation of a polyethylene film placed between the fittings and the poured concrete. Where any section of a main is provided with concrete thrust blocks, the hydrostatic pressure test shall not be made until three (3) days after installation of the concrete thrust blocks unless otherwise approved by the Engineer. Where trench conditions are, in the opinion of the Engineer, unsuitable for thrust blocks, the Contractor shall provide steel tie rods and socket clamps to adequately anchor the piping. All tie rods and clamps shall be given a bituminous protective coating or shall be galvanized. Sakrete or any similar material will not be permitted under any circumstances.

06900.4 GATE VALVE INSTALLATION

Before setting each valve the Contractor shall make sure the interior is clean and test opening and closing. Valves shall be set with stems plumb, unless horizontal installation is called for on the plans, and at the exact locations shown. Trench backfill shall be tamped thoroughly for a distance of three (3) feet on each side of valve boxes.

06900.5 GATE VALVE BOX INSTALLATION

A valve box shall be installed over each underground valve. All boxes shall be set plumb with their top flush with finished grade.

06900.6 FIRE HYDRANT INSTALLATION

Fire hydrants shall be located as shown. Each hydrant shall be connected to the main with a six (6) inch branch line having at least as much cover as the distribution main. Hydrants shall be set plumb with the pumper nozzle facing the roadway and with the center of the lowest outlet not less than eighteen (I8) inches above the finished grade. Hydrants shall be thoroughly blocked with concrete or shall be rodded to the six (6) inch branch tee. Unless otherwise specified, the backfill around hydrants shall be thoroughly compacted to the final grade immediately after installation in order to put the hydrant into service as soon as practicable. Not less than seven (7) cubic feet of clean crushed stone shall be placed around the base of the hydrant to insure drainage of the hydrant barrel. A cap block shall be set under the fire hydrant foot for a solid bottom.

06900.7 AIR RELIEF VALVE INSTALLATION

Each air relief valve shall be installed at the exact location shown per the detail. Meter boxes shall be set plumb and on a firm foundation. When mere boxes are precast concrete, each joint between sections and all wall openings shall be sealed inside and out with a 2:1 sand-cement mortar and made watertight. When so directed, the Contractor shall install a flat slab top, precast with a standard frame and cover. Flat slab tops shall be traffic bearing as appropriate.

06900.8 BLOWOFF VALVES

Blowoff valves shall be installed as shown on the contract drawings.

06900.9 LINE FLUSHING

Reference is made to AWWA C651. Prior to testing of any sections of water main, the Contractor, using an approved water source, shall completely flush out all lines at a minimum velocity of 2.5 feet per second to clean out any sediment or debris.

06900.10 TESTING

After the pipeline has been satisfactorily constructed complete with the required fire hydrants, services, and all other appurtenances, and the trench backfilled satisfactorily, and after line flushing and approval by the Engineer, the newly constructed pipeline and valved sections shall be subjected to a hydrostatic pressure leakage test. The Contractor shall notify the Engineer when the work is ready for testing with all testing done in the presence of the Engineer. All labor, equipment, water and materials, including meters and gauges shall be furnished by the Contractor at his own expense.

Ductile iron pipe will be tested in accordance with AWWA C600. PVC pipe will be tested in accordance with AWWA standard C-605 and Manual M-23.

Each completed section of the pipeline shall be plugged at both ends and slowly filled with water. As the main is being filled with water in preparation of the tests, all air shall be expelled from the pipe. The main shall be subjected to hydrostatic pressure of 200 pounds per square inch for a period of two (2) hours unless otherwise specified. Pressure shall be applied to the main by means of a hand pump for small lines or by use of a gasoline pump or fire engine for larger lines.

The rate of leakage shall be determined at fifteen (15) minute intervals by means of volumetric measurement of the water added during the test until the rate has stabilized at the constant value for three (3) consecutive fifteen (15) minute periods.

Leakage is defined as the quantity of water to be supplied into the newly laid pipe, or any valved section, necessary to maintain the specified leakage test pressure after the pipe has been filled with water and the air expelled. No piping installation will be accepted until the leakage is less than ten (10) gallons per inch of pipe diameter per mile of pipe per twenty-four (24) hours.

No leakage will be allowed under the above tests for piping in buildings and structures.

Cracked or defective pipe, joints, fittings, valves, or hydrants discovered in consequence of this test shall be removed and replaced with sound materials, and the test shall be repeated until the test results are satisfactory. Precautions shall be taken to remove or otherwise protect equipment in, or attached to, pipe to prevent damage or injury.

Tests of insulated and concealed piping shall be made before the piping is covered or concealed. No leakage will be allowed under the above tests for piping in buildings.

06900.11 DISINFECTION

After the pressure-leakage test is completed and prior to being put into service, new waterline shall be disinfected in strict accordance with AWWA Standard C651. The contractor shall submit a plan at least two weeks prior to the planned start of disinfection that describes in detail the following:

Proposed form of chlorine to be used
Proposed method of chlorination
Final Flushing, including disposal of chlorinated water
Bacteriological testing, including the name and address of the State approved lab to be used
Redisinfection as necessary

Disinfection will not be permitted to begin until the plan is approved by the Engineer.

North Carolina Department of Environment
And Natural Resources
Division of Environmental Health
Public Water Supply Section

Application for Approval of Engineering Plans and Specifications For Water Supply Systems

Instructions & Checklist: To apply for approval for plans and specifications, submit the following materials & information:

Project Name: _____
(This is the name to appear on Public Water Supply records and tracking system)

Attached are three copies of each of the following items:

- ☐ This completed "Application for Approval…;"
- ☐ The plan drawings;
- ☐ The Engineering Report (ER) addressing each of the items listed in 15A NCAC 18C .0307(b), including the design basis of the project.[15A NCAC 18C .0307(b)(12)]

One of the following:

- ☐ The project will use the following system's previously approved standard specifications:

  Name of System: _____

  PWS Approval Number & Date: _____

OR

- ☒ Attached are three copies of the specifications.

One of the following:

- ☒ The applicant is the Public Water System;

OR

- ☐ Attached is a letter from the Owner of the Public Water System agreeing to serve the project and stating that the system has adequate supply.

Note the following:

- ☐ Beginning January 1, 2007, attached is a check for the proper plan review fee amount, in accordance with NCGS 130A-328. See note 4 on page 4.

Date _____ Serial No._____
(for DENR use only) (for DENR use only)

To: Division of Environmental Health,
Department of Environment and Natural Resources

The Utilities Director, Lee Smith
(name of board, or council, authorized official and title, or owner)

of City of Hendersonville
(name of city, town, corporation, sanitary district, water company or other)

in the County of Henderson, State of North Carolina authorized by law to act for the said

City of Hendersonville
(name of city, town, corporation, sanitary district, water company or other)

and to expend its funds for the water project described below, herewith submit for the counsel and advice of the Division of Environmental Health plans and specifications prepared by _____
(engineer or firm)

_____ _____
(Phone Number of Engineer – optional for faster contact) (Email Address of Engineer – optional for faster contact)

of _____ for the installation or construction of
(address of engineer)

_____ ,
(description of project)

_____
(location of project)

in _____ County, and make application to the Division of Environmental Health for the approval of said plans and specifications as related to public health and protection of public water supplies and public water systems.

These plans have been approved and accepted by the applicant.

This application is made under and in full accord with the provision of NCGS 130A-317, and such other statutes as related to public water systems. The applicant agrees that no change or deviation from the engineering plans and specifications approved by the Division of Environmental Health will be made except as allowed by 15A NCAC 18C .0306 or with the written consent and approval of the Division of Environmental Health or its authorized representative. The applicant agrees that a professional engineer licensed to practice in the State of North Carolina shall submit a statement reflecting that adequate observations during and upon completion of construction, by the engineer or by a representative of the engineer's office who is under the engineer's supervision, indicates that construction was completed in accordance with approved plans and specifications.

Remarks: _____

_____ 305 Williams Street, Suite 119
(Signature of Owner, Manager, Mayor or Chairman) (Street or Box Number)

Lee Smith, Utilities Director Hendersonville, NC 28792
(Type Name Signed Above) (City, State, Zip Code)

828-233-3211 lsmith@cityofhendersonville.org
(Phone Number – optional for faster contact) (Email Address – optional for faster contact)

Status of Water System Management Plan (WSMP)
Check one of the following, and if applicable, provide the required information:

☐ The WSMP for the project, as defined in the attached engineering plans and specifications, is submitted with this application.

☒ The WSMP that includes this project, as defined in the attached engineering plans and specifications, was previously submitted.

Provide the following:

Water System Name: City of Hendersonville

Owner Name: City of Hendersonville

PWS I.D. No.: 01-45-010

WSMP No.: 00-02080

WSMP Submittal Date: _____

County: Henderson

By my signature below, I certify that the previously submitted WSMP contains the information required by 15A NCAC 18C .0307(c) for the project defined in the attached engineering plans and specifications.

NAME: Lee Smith, Utilities Director
(Type or Print Name)

SIGNATURE: _____ DATE: _____
(Owner, Manager, Mayor or Chairman)

☐ The WSMP for the project, as defined in the attached engineering plans and specifications, has not been submitted.

Note: When the WSMP is submitted, the applicant must clearly identify the previously submitted project engineering plans and specifications for which the WSMP was prepared.

Status of Engineer's Report
Check one of the following, and if applicable, provide the required information.

☒ The Engineer's Report for the project, as defined in the attached engineering plans and specifications, is submitted with this application.

☐ The Engineer's Report that includes this project, as defined in the attached engineering plans and specifications, was previously submitted.

Provide the following:

Water System Name: _____

Owner Name: _____

PWS I.D. No.: _____

Engineer's Report No.: _____

Engineer's Report Title: _____

Engineer's Report Submittal Date: _____

County: _____

Note: If the previously submitted Engineer's Report covered multiple projects, then attach to this Application, a letter from the engineer stating that the previously submitted Engineer's Report contains the information required by 15A NCAC 18C .0307(b) for the project defined in the attached engineering plans and specifications.

****

In accordance with NCGS 130A-328, there will be a fee charged for plan review by the NC DENR Public Water Supply Section. **Any documents submitted for review on or after January 1, 2007 must be accompanied by a check payable to *DENR-Public Water Supply Section* before the review will begin.**

** There is a $25 fee for returned checks **

The charges for review of plans are shown below. Check one of the following.

Distribution System fees		
☐	Construction of water lines, less than 5000 linear feet	**$150**
☐	Construction of water lines, 5000 linear feet or more	**$200**
☐	Other construction or alteration to a distribution system	**$ 75**
Ground Water System fees		
☐	Construction of a new ground water system or adding a new well	**$200**
☐	Alteration to an existing ground water system	**$100**
Surface water system fees		
☐	Construction of a new surface water treatment facility	**$250**
☐	Alteration to existing surface water treatment facility	**$150**
Other fees		
☐	Water System Management Plan review	**$ 75**
☐	Miscellaneous changes or maintenance not covered above	**$ 50**

Notes:

1. The fee is not refundable if the plans are not approved
2. Revisions to plans to address PWS or other state agency's comments do not incur an additional fee.
3. If one set of plans has multiple related sheets, such as a new well with construction of water lines, only one fee must be submitted for highest price item (the amounts are not cumulative, except fees for Water System Management Plans).
4. Water System Management Plan review fees stand alone and must be included in addition to those for the review of the plans themselves.
5. **Ten days after the receipt of plans and specifications for approval, if the appropriate plan review fee is not received, then all plan documents will be recycled. A new set of documents must then be submitted with the appropriate fee for approval.**

****

These plans and specifications cited in the foregoing application, including any provisos in the approval letter, are approved insofar as the protection of public health is concerned as provided in the rules, standards and criteria adopted under the authority of NCGS 130A-315 and 130A-317. This approval does not address all applicable laws, rules, standards and criteria, and other approvals and licenses that may be required by the local, state or federal government.

This approval is given with the understanding that upon installation of such works, its operation shall be placed under the care of a competent person, and the operation shall be carried out according to best accepted practice and in accordance with the recommendations of the Division of Environmental Health.

The official copies of plans and specifications accompanying this application have been sealed and stamped with the serial number of this application _____. Any erasures, additions or alterations of the proposed improvements except those permitted in 15A NCAC 18C .0306 will make this approval null and void.

This approval does not constitute a warranty of the design, construction or future operation of the water system.

Signed: _____

Public Water Supply Section
Division of Environmental Health

North Carolina Department of Environment
And Natural Resources
Division of Environmental Health
Public Water Supply Section

Application for Approval of Engineering Plans and Specifications For Water Supply Systems

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One of the following:

- ☐ The project will use the following system's previously approved standard specifications:

  Name of System: _____

  PWS Approval Number & Date: _____

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One of the following:

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OR

- ☐ Attached is a letter from the Owner of the Public Water System agreeing to serve the project and stating that the system has adequate supply.

Note the following:

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Date _____ Serial No._____
(for DENR use only) (for DENR use only)

To: Division of Environmental Health,
Department of Environment and Natural Resources

The _____
(name of board, or council, authorized official and title, or owner)

of _____
(name of city, town, corporation, sanitary district, water company or other)

in the County of _____, State of North Carolina authorized by law to act for the said

_____
(name of city, town, corporation, sanitary district, water company or other)

and to expend its funds for the water project described below, herewith submit for the counsel and advice of the Division of Environmental Health plans and specifications prepared by _____
(engineer or firm)

_____ _____
(Phone Number of Engineer – optional for faster contact) (Email Address of Engineer – optional for faster contact)

of _____ for the installation or construction of
(address of engineer)

_____,
(description of project)

_____
(location of project)

in _____ County, and make application to the Division of Environmental Health for the approval of said plans and specifications as related to public health and protection of public water supplies and public water systems.

These plans have been approved and accepted by the applicant.

This application is made under and in full accord with the provision of NCGS 130A-317, and such other statutes as related to public water systems. The applicant agrees that no change or deviation from the engineering plans and specifications approved by the Division of Environmental Health will be made except as allowed by 15A NCAC 18C .0306 or with the written consent and approval of the Division of Environmental Health or its authorized representative. The applicant agrees that a professional engineer licensed to practice in the State of North Carolina shall submit a statement reflecting that adequate observations during and upon completion of construction, by the engineer or by a representative of the engineer's office who is under the engineer's supervision, indicates that construction was completed in accordance with approved plans and specifications.

Remarks: _____

_____ _____
(Signature of Owner, Manager, Mayor or Chairman) (Street or Box Number)

_____ _____
(Type Name Signed Above) (City, State, Zip Code)

_____ _____
(Phone Number – optional for faster contact) (Email Address – optional for faster contact)

Status of Water System Management Plan (WSMP)
Check one of the following, and if applicable, provide the required information:

☐ The WSMP for the project, as defined in the attached engineering plans and specifications, is submitted with this application.

☐ The WSMP that includes this project, as defined in the attached engineering plans and specifications, was previously submitted.

Provide the following:

Water System Name: _____

Owner Name: _____

PWS I.D. No.: _____

WSMP No.: _____

WSMP Submittal Date: _____

County: _____

By my signature below, I certify that the previously submitted WSMP contains the information required by 15A NCAC 18C .0307(c) for the project defined in the attached engineering plans and specifications.

NAME: _____
(Type or Print Name)

SIGNATURE: _____ DATE: _____
(Owner, Manager, Mayor or Chairman)

☐ The WSMP for the project, as defined in the attached engineering plans and specifications, has not been submitted.

Note: When the WSMP is submitted, the applicant must clearly identify the previously submitted project engineering plans and specifications for which the WSMP was prepared.

Status of Engineer's Report
Check one of the following, and if applicable, provide the required information.

☐ The Engineer's Report for the project, as defined in the attached engineering plans and specifications, is submitted with this application.

☐ The Engineer's Report that includes this project, as defined in the attached engineering plans and specifications, was previously submitted.

Provide the following:

Water System Name: _____

Owner Name: _____

PWS I.D. No.: _____

Engineer's Report No.: _____

Engineer's Report Title: _____

Engineer's Report Submittal Date: _____

County: _____

Note: If the previously submitted Engineer's Report covered multiple projects, then attach to this Application, a letter from the engineer stating that the previously submitted Engineer's Report contains the information required by 15A NCAC 18C .0307(b) for the project defined in the attached engineering plans and specifications.

****

In accordance with NCGS 130A-328, there will be a fee charged for plan review by the NC DENR Public Water Supply Section. **Any documents submitted for review on or after January 1, 2007 must be accompanied by a check payable to *DENR-Public Water Supply Section* before the review will begin.**

** There is a $25 fee for returned checks **

The charges for review of plans are shown below. Check one of the following.

Distribution System fees		
☐	Construction of water lines, less than 5000 linear feet	**$150**
☐	Construction of water lines, 5000 linear feet or more	**$200**
☐	Other construction or alteration to a distribution system	**$ 75**
Ground Water System fees		
☐	Construction of a new ground water system or adding a new well	**$200**
☐	Alteration to an existing ground water system	**$100**
Surface water system fees		
☐	Construction of a new surface water treatment facility	**$250**
☐	Alteration to existing surface water treatment facility	**$150**
Other fees		
☐	Water System Management Plan review	**$ 75**
☐	Miscellaneous changes or maintenance not covered above	**$ 50**

Notes:

1. The fee is not refundable if the plans are not approved
2. Revisions to plans to address PWS or other state agency's comments do not incur an additional fee.
3. If one set of plans has multiple related sheets, such as a new well with construction of water lines, only one fee must be submitted for highest price item (the amounts are not cumulative, except fees for Water System Management Plans).
4. Water System Management Plan review fees stand alone and must be included in addition to those for the review of the plans themselves.
5. **Ten days after the receipt of plans and specifications for approval, if the appropriate plan review fee is not received, then all plan documents will be recycled. A new set of documents must then be submitted with the appropriate fee for approval.**

****

These plans and specifications cited in the foregoing application, including any provisos in the approval letter, are approved insofar as the protection of public health is concerned as provided in the rules, standards and criteria adopted under the authority of NCGS 130A-315 and 130A-317. This approval does not address all applicable laws, rules, standards and criteria, and other approvals and licenses that may be required by the local, state or federal government.

This approval is given with the understanding that upon installation of such works, its operation shall be placed under the care of a competent person, and the operation shall be carried out according to best accepted practice and in accordance with the recommendations of the Division of Environmental Health.

The official copies of plans and specifications accompanying this application have been sealed and stamped with the serial number of this application _____. Any erasures, additions or alterations of the proposed improvements except those permitted in 15A NCAC 18C .0306 will make this approval null and void.

This approval does not constitute a warranty of the design, construction or future operation of the water system.

Signed: _____

Public Water Supply Section
Division of Environmental Health

PROJECT SUMMARY
WATER UTILITY EXTENSION
Sanctuary at Mills River

February 22, 2008

To: Honorable Mayor and Members of City of Council

From: Water & Sewer Department Staff

RE: STAFF RECOMMENDATION FOR ACCEPTANCE OF WATER UTILITY EXTENSION AGREEMENT (WUEA)

This is a project to extend lines to provide water service to a **proposed single-family residential development consisting of 10 units on 11 acres.** This project is located **on North Rugby Road.** This project is under the reviewing jurisdiction of **Henderson County** and is located within the **USA – Urban Services Area.** This project **will not** involve an IBT (Interbasin Transfer) from the French Broad River Basin. The entire cost of the proposed water line extension is to be paid for by **M &M Land Developer's of WNC, LLC., of Hendersonville, NC.**

This project requires approximately **1,700** linear feet of water line sized as following:

Approximate Length:	Description:
180 lf	**8" DIP CL 350**
1,000 lf	**6" DIP CL 350**
500 lf	**2" SDR 13.5 PVC**

Fire Protection will be provided by the installation of **2**-fire hydrant(s).

The Reviewing Jurisdiction, listed below, has completed their review of this utility extension request in regard to their adopted land use plan or in terms of its future impact on existing land uses for that local government.

Reviewing Jurisdiction: **Henderson County**
☐Approved ☐Disapproved (See attached letter provided to the City by the Reviewing Jurisdiction)
Narrative Comments Provided: ☐ Yes ☐ No

Signing of Official: _____ Date: _____
Printed Name: _____

Based on the above information, the Water & Sewer Department has the capacity to support this additional infrastructure and associated connections and hereby recommends approval of said project contingent upon final approval of construction plans and specifications by the Water & Sewer Department.

A motion is needed to approve and accept this project. Suggested wording for motion is as follows:

"I move to accept this Water Utility Extension Project and to authorize the City Manager to execute the associated Water Utility Extension Agreement on behalf of the City."

Water and Sewer Department:	☒ Approved	☐ Disapproved	Date: 2-28-08
Henderson Co. Commissioners:	☐ Approved	☐ Disapproved	Date: _____
Hendersonville City Council:	☐ Approved	☐ Disapproved	Date: _____

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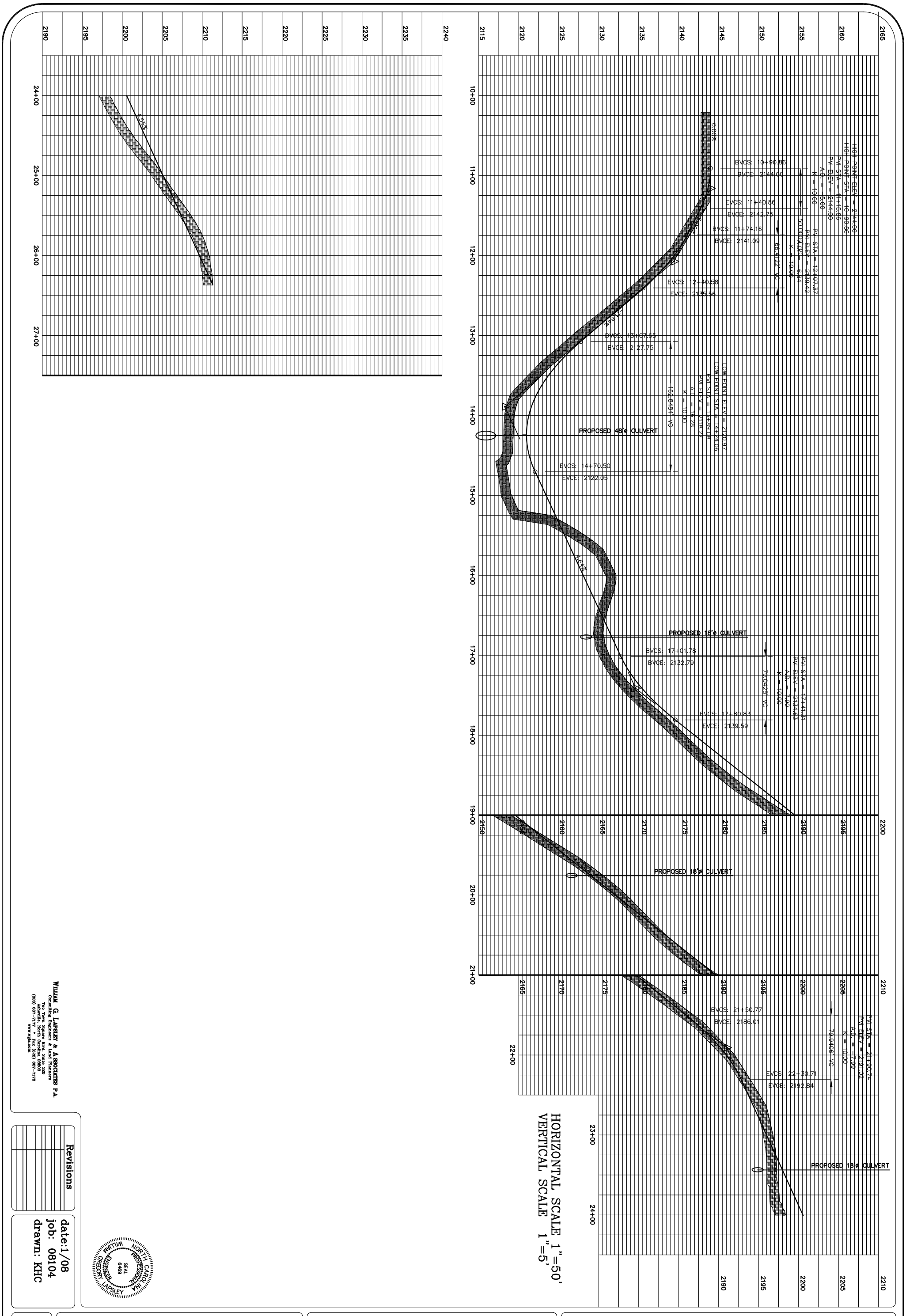

HORIZONTAL SCALE 1"=50'
VERTICAL SCALE 1"=5'

WILLIAM G. LAPSLEY & ASSOCIATES P.A.
Consulting Engineers & Land Planners
Two Town Square Blvd. Suite 300
Asheville, North Carolina 28803
(828) 687-7177 • Fax (828) 687-7178
www.wgla.com

Revisions

date:1/08
job: 08104
drawn: KHC

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 6469 WILLIAM GREGORY LAPSLEY

PROPOSED
PROMISED RIDGE
ROAD PROFILE

THE SANCTUARY AT MILLS RIVER
HENDERSON COUNTY,
NORTH CAROLINA

WILLIAM G. LAPSLEY & ASSOCIATES P.A.
CONSULTING ENGINEERS & LAND PLANNERS
ASHEVILLE, NORTH CAROLINA

sheet 2 of 3

NORTH RUGBY ROAD
S.R. 1365
WITH 60' R.O.W.

PLAT NORTH
PLAT SLIDE 550

EXISTING 8"ø WATER LINE (DIP)
PROPOSED 8"X8" T.S. & VALVE
PROPOSED 8"ø WATER LINE (DIP/CL 350)
PROPOSED 18"ø BORE & ENCASEMENT (30 LF)
PROPOSED 6"X6"X6" TEE 6" G.V. & BOX FIRE HYDRANT 8X6 REDUCER
PROPOSED STABILIZED ENTRY/EXIT
PROPOSED 50 FT. ROAD R/W
PROPOSED DITHLINE "D"
PROPOSED DITCHLINE "H"
PROPOSED CHECK DAM
PROPOSED 6"ø WATER LINE (DIP/CL 350)
PROPOSED 48"ø CULVERT #1 (HDPE) (50 LF)
BYBASS PUMPING IS REQUIRED TO PROPERLY INSTALL CULVERT BELOW EXISTING STREAMBED ELEVATION
RELOCATE EXISTING WATER METER FOR DEUSCHLE RESIDENCE
PROPOSED SILT FENCE
PROPOSED PROJECT SIGN
PROPOSED TEMPORARY SEDIMENT TRAP
PROPOSED 18"ø CULVERT #2 (HDPE)
PROPOSED DITCH LINE "C"
PROPOSED 18"ø CULVERT #3 (HDPE)
PROPOSED 18"ø CULVERT #4 (HDPE)
PROPOSED DITCH LINE "B"
PROPOSED DITCHLINE "F"
PROPOSED AIR RELEASE VALVE
PROPOSED 2"ø FLUSH HYDRANT
PROPOSED RIDGE DRIVE (PUBLIC)
PROPOSED DITCHLINE "G"
PROPOSED DITCHLINE "E"
PROPOSED DISTURBED AREA (1.89 AC.)
PROPOSED 6"X6"X6" TEE 6" G.V. & BOX 6X2 PLUG 2" G.V. & BOX FIRE HYDRANT
PROPOSED DITCHLINE "A"
PROPOSED 2"ø WATER LINE (PVC/DR 13.5)
PROPOSED 48" CMP CULVERT (LENGTH T.B.D.)
PROPOSED CHECK DAM

1 — 1.26 ACRES±
2 — 1.01 ACRES±
3 — 1.00 ACRE±
4 — 1.00 ACRE±
5 — 1.00 ACRE±
6 — 1.00 ACRE±
7 — 1.00 ACRE±
8 — 1.00 ACRE±
9 — 1.00 ACRE±
10 — 1.04 ACRES±

JOHN L. CHRISTY
D.B. 447 PG. 605
9651-00-5463

CHRISTY M. MACK
D.B. 1087 PG. 389
SLIDE 550
9651-00-2574

CHRISTY M. MACK
D.B. 1087 PG. 389
9651-00-0119

ANNEKE S. DEUSCHLE
D.B. 1246 PG. 406
SLIDE 5690
9650-09-2985

JOHN L. CHRISTY
D.B. 736 PG. 379
SLIDE 550
9651-00-9270

CHARLES B. ASHE
D.B. 971 PG. 705
P.C. A SLIDE 312A

DOROTHY S. MAZUROWSKI
D.B. 777 PG. 783
P.C. A SLIDE 312A
9650-19-7929

JOSEPH DALE ZIMMER
D.B. 884 PG. 118
P.C. A SLIDE 312A
9650-19-8841

MARTHA CHRISTY JOHNSON
D.B. 865 PG. 807

LEWIS R. EMORY
D.B. 751 PG. 243
P.C. A SLIDE 389
9650-09-2657

GEORGE ELTON VEEN
D.B. 1098 PG. 006
P.C. A SLIDE 387A
9650-09-4618

GARY R. BOWERS
D.B. 1062 PG. 006
P.C. A SLIDE 387A
9650-09-5781

JAMES F. ENGEL, JR.
D.B. 722 PG. 241
P.C. A SLIDE 387A
9650-09-7678

HANS F. IWEN
D.B. 722 PG. 377
P.C. A SLIDE 387A
9650-09-8599

SCOTT C. MILLER
D.B. 978 PG. 289
P.C. A SLIDE 388
9650-19-0547

MARILYN M. DANIELS
D.B. 986 PG. 654
P.C. A SLIDE 388
9650-19-1670

MICHAEL W. TALLANT
D.B. 1064 PG. 557
P.C. A SLIDE 388
9650-19-3622

GARY C. PRECHTER
D.B. 905 PG. 587
SLIDE 867
9650-19-4651

GARY C. PRECHTER
D.B. 905 PG. 587
SLIDE 867
9650-19-6600

ANN D. LAZARUS
D.B. 1134 PG. 433
SLIDE 867
9650-19-7559

APPARENT GAP

SWEETWATER HILLS SUBDIVISION

ROAD SECTION
N.T.S.

50' R.O.W. · 6' SHOULDER · 18' · 6' SHOULDER · 6' DITCH · 1 1/2:1 SLOPE · 1" PER FT. · 1/4" PER FT. · 3:1 · 2", "S" 9.5-B SURFACE COURSE · 6" CABC

END VIEW
STANDARD EXCAVATION

END VIEW
OVERCUT EXCAVATION

TYPICAL TRENCH DETAIL
N.T.S.

SELECT MATERIAL COMPACTED IN 6" LIFTS · SHEETED TRENCH · OPEN TRENCH · SELECT MATERIAL COMPACTED IN 3" LIFTS · UNDISTURBED EARTH · NOTE: BELL HOLES NOT SHOWN

CUL-DE-SAC DETAIL
N.T.S.

50'R · 35'R · 13.5' · 18' · 25'R · 45' R/W

LOCATION MAP
N.T.S.

PROJECT SITE

LEGEND
- ROCK DOUGHNUT INLET PROTECTION
- GRAVEL INLET PROTECTION
- PROPOSED DROP INLET
- PROPOSED EROSION CONTROL MATTING
- PROPOSED SILT FENCE
- PROPOSED TEMPORARY SEDIMENT TRAP
- PROPOSED TEMPORARY DIVERSION DITCH
- PROPOSED RIPRAP OUTLET
- EXISTING CONTOUR
- PROPOSED DRAINAGE DITCH

GRAPHIC SCALE
60 0 30 60 120 240
(IN FEET)
1 inch = 60 ft.

NOTES:
1. WATER LINE TO BE 3 FEET FROM EDGE OF PAVEMENT.

DEVELOPMENT DATA

ZONING – R-2	HENDERSON COUNTY
SETBACKS– FRONT–	15 FT
SIDE–	10 FT
REAR–	10 FT
WATER–	SUPPLY WATERSHED WS IV

SURVEYOR:
STACY K. RHODES, PLS
WAGGONER & RHODES
LAND SURVEYORS, INC.
545 OLD SPARTANBURG RD
HENDERSONVILLE, NC 28792
828-693-1022

OWNER/DEVELOPER
M&M LAND DEVELOPERS OF WNC, LLC
3702 SPARTANBURG HWY
FLAT ROCK, NC 28731
PIN: 9650-19-5722
PIN: 9650-19-0825
D.B. 1341, PG 396

WILLIAM G. LAPSLEY & ASSOCIATES P.A.
Consulting Engineers & Land Planners
Two Town Square Blvd. Suite 320
Asheville, North Carolina 28803
(828) 687-7177 * Fax (828) 687-7178
www.wgla.com

NORTH CAROLINA PROFESSIONAL SEAL 6469 ENGINEER WILLIAM GREGORY LAPSLEY

Revisions

date:1/30
job: 08104
drawn: KHC

sheet 1 of 3

WILLIAM G. LAPSLEY & ASSOCIATES P.A.
CONSULTING ENGINEERS & LAND PLANNERS
ASHEVILLE, NORTH CAROLINA

THE SANCTUARY AT MILLS RIVER
HENDERSON COUNTY,
NORTH CAROLINA

PROPOSED
SITE IMPROVEMENTS

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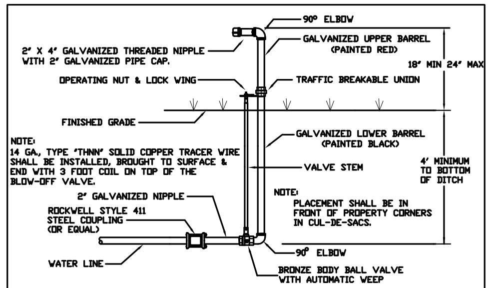
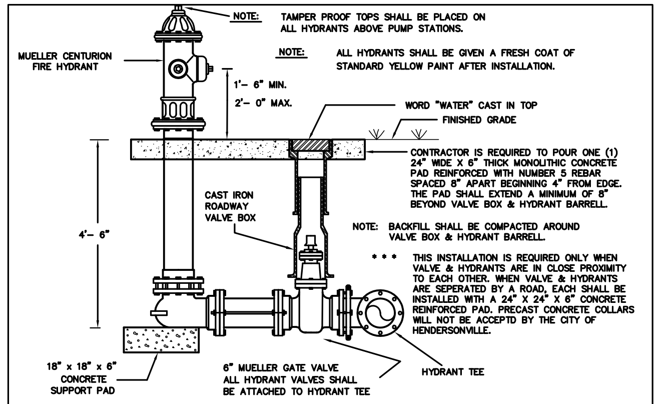


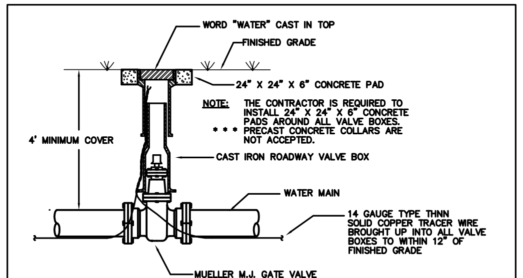
TYPICAL 2" POST BLOW-OFF DETAIL

N.T.S.



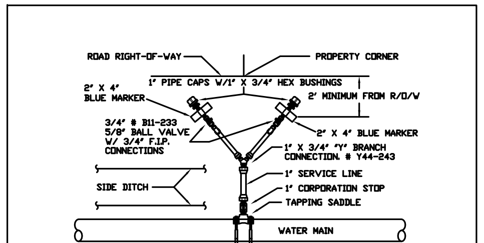
TYPICAL RODED FIRE HYDRANT INSTALLATION DETAIL

N.T.S.



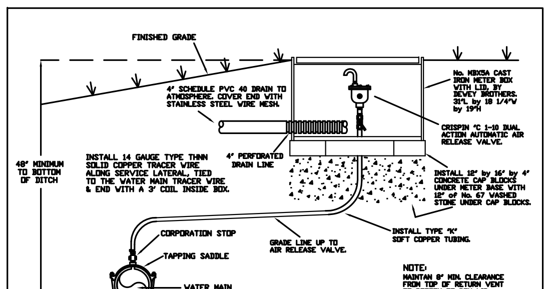
TYPICAL IN-GROUND INSTALLATION OF ALL 2" AND LARGER GATE VALVES

N.T.S.



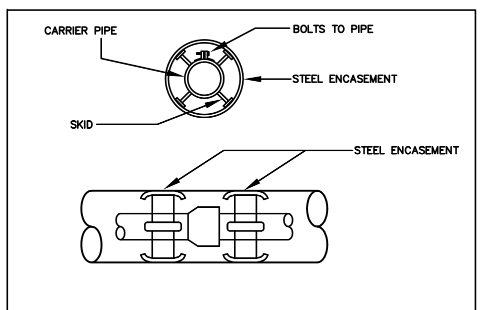
TYPICAL "Y" BRANCH CONNECTION

N.T.S.



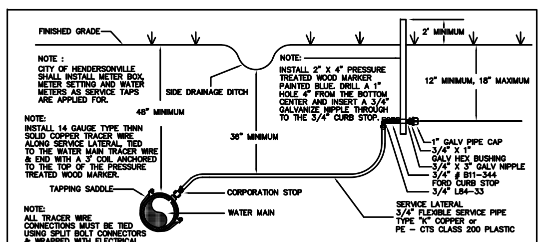
TYPICAL PRESSURE AIR RELEASE VALVE DETAIL

N.T.S.



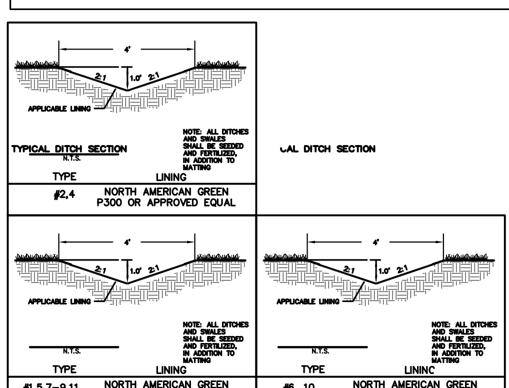
TYPICAL ENCASEMENT OF WATER AND SEWER LINES

N.T.S.



TYPICAL SERVICE LATERAL INSTALLATION

N.T.S.



TYPICAL DITCH SECTION

N.T.S.

TYPE	LINING
#2,4	NORTH AMERICAN GREEN P300 OR APPROVED EQUAL

…AL DITCH SECTION

TYPE	LINING
#1,5,7-9,11	NORTH AMERICAN GREEN C125 OR APPROVED EQUAL
#6, 10	NORTH AMERICAN GREEN S150 OR APPROVED EQUAL

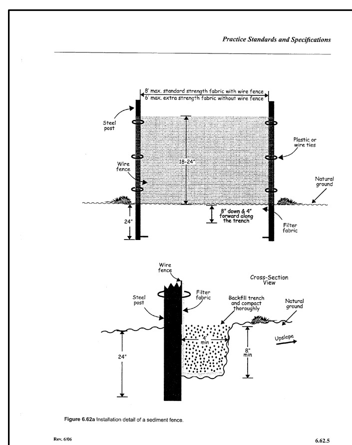


Figure 6.62a Installation detail of a sediment fence.

Rev. 6/06 6.62.5

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.

Rev. 6/06 6.62.3

6

Installation Specifications

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).

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.

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.

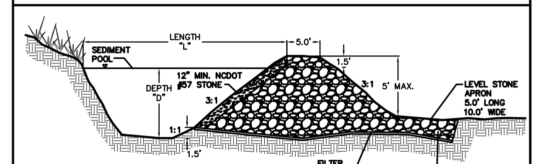
B. Solid wastes to be removed such as sidewalks, curbs, pavement, etc. may be placed in specified disposal areas if permitted by the appropriate agencies and approved by the Owner. This material shall be spread and mixed with dirt eliminating all voids. This material shall have a minimum cover of 2'. 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.

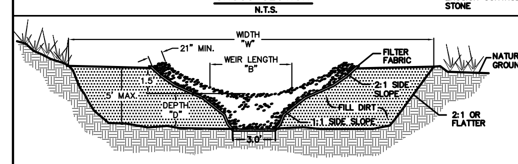
6. Unless otherwise specified, all base, paving, curbing and other concrete work shall conform to the local municipality or NCDOT specifications for construction. All water and sewer construction shall conform to the local utility requirements and/or the NCDENR minimum standards.
7. In the event excessive 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.

TEMPORARY SEDIMENT TRAP



CROSS SECTION

N.T.S.



STONE SECTION

N.T.S.

NOTE: ALL VALUES FOR "L", "W", "D" & "B" ARE IN FEET.

TRAP #	"L"	"W"	"D"	"B"

CONSTRUCTION SPECIFICATIONS

1. CLEAR GRUB & STRIP THE AREA UNDER THE EMBANKMENT OF ALL VEGETATION AND ROOT MAT.
2. CLEAR POND AREA. BASIN SHOULD BE EXCAVATED TO 1.5 FEET BELOW GRADE.
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 DAM 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 DAM AT ALL POINTS.
6. STONE USED FOR SPILLWAY SECTION- 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
11. INSTALL BAFFLES

NOTE: SEDIMENT REMOVED FROM TRAP SHALL BE PLACED IN AN AREA WITH EROSION CONTROL DEVICES AND SHALL BE STABILIZED IMMEDIATELY.

REMOVE SEDIMENT FROM THE TRAP AND RESTORE THE CAPACITY TO ORIGINAL TRAP DIMENSIONS WHEN SEDIMENT HAS ACCUMULATED TO ONE HALF THE DESIGN DEPTH.

NOTE: AFTER THE CONTRIBUTING DRAINAGE AREA HAS BEEN PROPERLY STABILIZED, REMOVE ALL BAFFLE MATERIALS AND UNSTABLE SEDIMENT DEPOSITS, BRING THE AREA TO GRADE, AND STABILIZE IT.

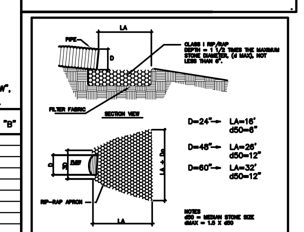
NPDES REQUIREMENTS

The contractor should be aware that any project with a disturbed area of greater than one acre must now comply with NPDES requirements for new construction projects. The contractor should obtain a copy of the plan approval and should follow all requirements including but not limited to:

Placement and upkeep of rain gauge on site that must be monitored throughout the course of the project.

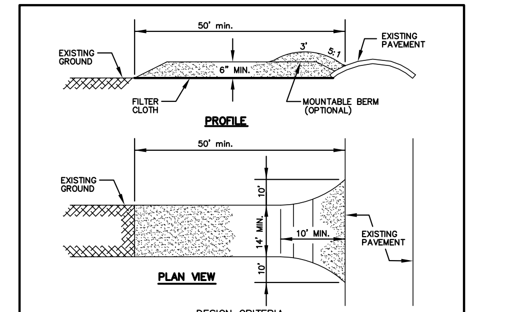
The contractor shall keep a log of all rainfall events, erosion control activities, and inspections throughout the course of the project. This log must be kept on ~

1t) obtain copy of the permit for this project for details.



TYPICAL PIPE OUTLET

N.T.S.



DESIGN CRITERIA

1. STONE SIZE – Use 2" stone, or reclaimed or recycled concrete equivalent.
2. LENGTH – As required, but not less than 50 feet (except on a single residence lot where a 30 foot minimum length would apply).
3. THICKNESS – Not less than six (6) inches of "ABC" or "Base Course".
4. WIDTH – Fourteen (14) foot minimum for one way traffic, Twenty (20) foot minimum for two way traffic, but not less than the full width at points where ingress or egress occurs.
5. ROAD GRADE – A maximum grade of 10% to 12% is recommended, although grades up to 15% are possible for short distance.
6. SIDE SLOPE OF ROAD EMBANKMENT – 2:1 or flatter.

CONSTRUCTION SPECIFICATIONS

1. Clear roadbed and parking areas of all vegetation, roots, and other objectionable material.
2. Ensure that road construction follows the natural contours of the terrain if it is possible.
3. Locates parking areas on naturally flat areas if they are available. Keep grades sufficient for drainage but generally not more than 2% to 3%.
4. Provide surface drainage, and divert excess runoff to stable areas by using water bars or turnouts.
5. Keep cuts and fills at 2:1 or flatter for safety and stability and to facilitate establishment of vegetation and maintance.
6. Spread a 6-inch course of "ABC" crushed stone evenly over the full width of the raod and smooth to avoid depressions.
7. Where seepage areas or seasonally wet areas must be crossed, install subsurface drains or geotextile fabric cloth before placing the crushed stone.
8. Vegetate all roadside ditches, cuts, fills, and other disturbed areas or otherwise appropriately stabilize as soon as grading is complete.
9. Provide appropriate sediment control measures to prevent off-site sedimentation.

STABILIZED CONSTRUCTION ENTRY/EXIT

N.T.S.

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 50 LB/AC.
OR GERMAN MILLET 40 LB/AC.

SEPT. THROUGH APRIL

RYEGRAIN 120 LBS/AC.

ALL SEEDS SHALL HAVE BEEN TESTED NOT NORE 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)

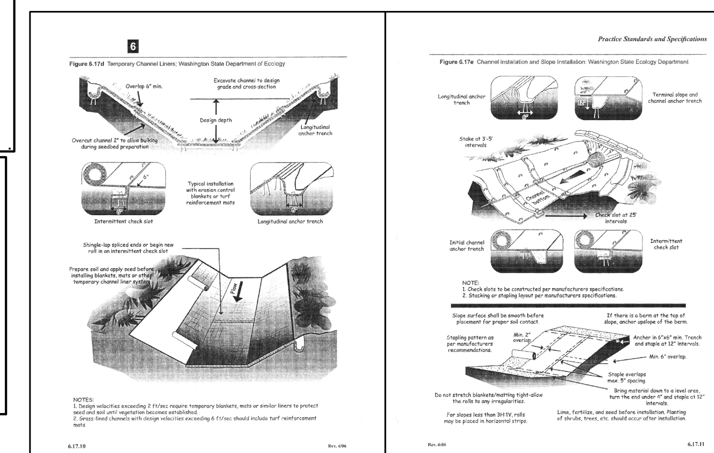
B. SEEDING DATES: KY.31 TALL FESCUE

AUG. 20 – SEPT. 15 / MARCH 1 – MAY1 (BELOW 2500' ELEVATION)

JULY 15 – AUG. 30 / MARCH 5 – MAY 15 (ABOVE 2500' ELEVATION)

C. MULCHING

APPLY 4,000 LB PER ACRE OF GRAIN STRAW SUITABLY TACKED DOWN.
ADD NETTING TO STEEP SLOPES AND STAPLE PER MANUFACTURERS RECOMMENDATIONS.



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EROSION CONTROL CONSTRUCTION SEQUENCE

1. OBTAIN PLAN APPROVAL AND APPLICABLE PERMITS
2. HOLD PRE CONSTRUCTION CONFERENCE. (PLEASE SEE NPDES REQUIREMENTS ON THIS SHEET)
3. INSTALL STABILIZED CONSTRUCTION ENTRY/EXIT.
4. INSTALL SILT FENCE AS SHOWN ON PLANS.
5. INSTALL SEDIMENT TRAPS.
6. INSTALL TEMPORARY DIVERSIONS & SILT FENCING, CLEAR ONLY THE AREAS NECESSARY FOR THE INSTALLATION OF EROSION CONTROL MEASURES.
7. CLEAR AND GRUB SITE.
8. ROUGH GRADE SITE AND STOCKPILE TOPSOIL.
9. ANY DENUDED AREA THAT WILL NOT BE BROUGHT TO FINAL GRADE FOR A PERIOD OF MORE THAN 21 CALENDAR DAYS 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.
10. CONSTRUCT STORM DRAINAGE SYSTEM.
11. INSTALL INLET PROTECTION AROUND EACH CATCH BASIN AND PIPE INLET.
12. FINAL GRADE SITE.
13. ALL EROSION AND SEDIMENT CONTROL PRACTICES SHALL BE INSPECTED IN ACCORDANCE WTH NPDES REGULATIONS, AND HENDERSON COUNTY EROSION CONTROL DIVISION NEEDED REPAIRS SHALL BE MADE IMMEDIATELY.
14. AFTER SITE IS FINE GRADED, PERMANENT VEGETATION SHALL BE INSTALLED WITHIN 15 WORKING DAYS OR 90 CALENDAR (WHICHEVER IS SHORTER)DAYS ON ALL DISTURBED AREAS AND REMOVE TEMPORARY EROSION CONTROL DEVICES ONCE SITE HAS STABILIZED.

Culvert Calculations

Culvert	Length	Slope	Pipe	Size	Q_{25}	Q_{pipe}
1	50 lf	2.0%	HDPE	48"Ø	96.42 cfs	311.26 cfs
2	50 lf	4.0%	HDPE	18"Ø	5.36 cfs	22.75 cfs
3	50 lf	4.0%	HDPE	18"Ø	0.95 cfs	22.75 cfs
4	50 lf	4.0%	HDPE	14"Ø	1.03 cfs	22.75 cfs

Drainage Calculations

Culvert	Drainage Area	Runoff Coefficient	Rainfall Intensity	Q_{25}
1	32.14 ac	0.40	7.5 in/hr	96.42 cfs
2	0.21 ac.	0.60	7.5 in/hr	0.94 cfs
3	0.23 ac.	0.60	7.5 in/hr	1.03 cfs

Ditchline	Drainage Area	Runoff Coefficient	Rainfall Intensity	Q_{25}
A	0.23 ac	0.60	7.0	1.00 cfs
B	0.41 ac	0.60	7.0	1.90 cfs
C	0.12 ac	0.60	7.0	0.50 cfs
D	0.16 ac	0.60	7.0	0.72 cfs
E	0.12 ac	0.60	7.0	0.54 cfs
F	0.22 ac	0.60	7.0	0.99 cfs
G	0.21 ac	0.60	7.0	0.95 cfs
H	0.17 ac	0.60	7.0	0.76 cfs

Ditchline Calculations

Ditch	Runoff	Slope	Velocity	Lining
A	1.03 cfs	4.6%	2.70 fps	Grass
B	3.87 cfs	12.5%	5.30 fps	Syn. Matt
C	5.36 cfs	12.5%	3.80 fps	Grass
D	0.72 cfs	12.5%	4.10 fps	Syn. Matt
E	0.54 cfs	12.5%	3.80 fps	Grass
F	0.99 cfs	4.6%	3.10 fps	Grass
G	0.95 cfs	12.5%	4.50 fps	Syn. Matt
H	0.76 cfs	12.5%	4.20 fps	Syn. Matt

Trap	Drainage Area (acres)	C	I	Q_{10} (cfs)	x .01 (acres)	Required Surface Area (sq. ft.)	Provided Surface Area (sq. ft.)	Dimensions Length (feet)	Width (feet)	Depth (feet)	Disturbed Area (acres)	Required Sediment Capacity (cu. ft.)	Provided Sediment Capacity (cu.ft.)	Weir Length (ft.)
1	1.31 AC	0.6	7.0	5.50	0.05	2,397 sf	2,450 sf	70'	35'	3'	1.31	4,716	7,350	4 FT

SEDIMENT FENCE MATERIALS:

1. USE A SYNTHETIC FIBER OF AT LEAST 95% BY WEIGHT OF POLYOLEFINS OR POLYESTER, WHICH IS CERTIFIED BY THE MANUFACTURER OR SUPPLIER AS CONFORMING TO THE REQUIREMENTS IN ASTM D 6461, WHICH IS SHOWN IN PART IN TABLE 6.62b.

SYNTHETIC FIBER SHOULD CONTAIN ULTRAVIOLET RAY INHIBITORS AND STABILIZERS TO PROVIDE A MINIMUM OF 6 MONTHS OF EXPECTED USABLE CONSTRUCTION LIFE AT A TEMPERATURE RANGE ON 0 TO 120°F.

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.

WILLIAM G. LAPSLEY & ASSOCIATES P.A.
Consulting Engineers & Land Planners
Two Town Square Blvd. Suite 320
Asheville, North Carolina 28803
(828) 687-7177 • Fax (828) 687-7178
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NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 6469 WILLIAM GREGORY LAPSLEY

Revisions

date:1/08
job: 08104
drawn: KHC

sheet 3 of 3

PROPOSED PROMISED RIDGE DRIVE DETAIL SHEET

THE SANCTUARY AT MILLS RIVER
HENDERSON COUNTY,
NORTH CAROLINA

WILLIAM G. LAPSLEY & ASSOCIATES P.A.
CONSULTING ENGINEERS & LAND PLANNERS
ASHEVILLE, NORTH CAROLINA

HENDERSON COUNTY
REVIEW OF CITY WATER LINE EXTENSIONS

Project Name: Sanctuary at Mills River

Size of Water Line (Main & Distribution Pipe Size): 1,700 lf (180 lf 8" DIP CL 350; 1,000 lf 6" DIP CL 350; 500 lf 2" SDR 13.5 PVC)

County Staff Reviewing Extension: Rocky Hyder, Fire Marshal; Alexis Baker, Planner; Autumn Radcliff, Senior Planner

Has the project been reviewed under the **County Subdivision Regulations of the Land Development Code**? ☒ Yes ☐ No ☐ N/A

Date reviewed: 2/26/2008

Action: Conditional Letter of Approval for Minor Subdivision Development Plan

Conditions: Shoulder stabilization, road name approval, and additional final plat requirements

Comments:

Has the project been reviewed under the **County Manufactured Park Regulations of the Land Development Code**? ☐ Yes ☒ No ☐ N/A

Date reviewed:

Action:

Conditions:

Comments:

Has the project been reviewed under the **County Zoning Regulations (i.e. Special-Use or Conditional-Use Permit) of the Land Development Code**? ☐ Yes ☒ No ☐ N/A

Date reviewed:

Action:

Conditions:

Comments:

Is the project subject to **any other County Land Use Regulations**? ☐ Yes ☒ No ☐ N/A

If yes, explain:

Does the project conform with the 2020 **Henderson County Comprehensive Plan (CCP)**? ☒ Yes ☐ No ☐ N/A

The project lies in the Urban Services Area.

Does the project have **adequate hydrant location and spacing**? ☒ Yes ☐ No ☐ N/A

Description of **hydrant type and thread**: Mueller Centurion – National Standard Thread

Does the estimated flow rate (gpm) meet **fire protection standards**?The estimated flow rate of 500 gpm requires structure spacing of more than 100 feet. ☐ Yes ☒ No ☐ N/A

BOARD OF COMMISSIONERS APPROVAL

☐ Approved
☐ Not Approved
☐ Conditional Approval (See Comments)

Date of Board Review:

Comments: