



LINCOLN COUNTY PLANNING & INSPECTIONS DEPARTMENT
302 NORTH ACADEMY STREET, SUITE A, LINCOLNTON, NORTH CAROLINA 28092
704-736-8440 OFFICE 704-736-8434 INSPECTION REQUEST LINE 704-732-9010 FAX

To: Board of Commissioners
Planning Board

From: Randy Hawkins, Zoning Administrator

Date: May 20, 2016

Re: Watershed Conditional Use Permit #22
Ronnie Dedmon, applicant
Parcel ID# 77435 and 77436

The following information is for use by the Lincoln County Board of Commissioners and Planning Board at their joint meeting/public hearing on June 6, 2016.

REQUEST

The applicant is requesting a conditional use permit to allow the use of the high-density option in the WS-IV Protected Area of the Catawba River/Lake Norman Watershed. The applicant is proposing to develop a 2.0-acre site for a self-storage facility. The high-density option would allow the development to have a built-upon surface area covering up to 70 percent of the site, with the use of engineered stormwater controls. Otherwise, in this watershed district, non-residential developments that require an erosion control plan are limited to a built-upon area of 36 percent. In this case, a built-upon area of approximately 68 percent is proposed.

SITE AREA AND DESCRIPTION

The proposed 2.0-acre site is located on the north side of Campground Road and the east side of Dusty Ridge Court. The property is adjoined by property zoned B-G and R-T (Transitional Residential). Land uses in this area include business, residential, and institutional (church and church campground). This property is part of an area along Campground Road that is designated by the Lincoln County Land Use Plan as neighborhood business, suitable for small-sized, low-intensity, low-traffic business clusters.

HIGH-DENSITY OPTION REQUIREMENTS

Under the water-supply watershed regulations of the Lincoln County Unified Development Ordinance, the Catawba River/Lake Norman watershed is designated for the use of the high-density option. The option requires the use of stormwater control structures to control and treat the runoff from the first one-inch of rain. The structures must be designed to meet the Best Management Practices (BMP) standards of the N.C. Department of Environment and Natural Resources. In this case, the plans call for a sand filter.

The regulations require the developer to post a bond or other financial security in an amount not less than 1.25 times the cost of constructing the necessary stormwater control structure. In addition, a binding agreement must be signed, requiring the owner to maintain, repair and, if necessary, reconstruct the structure in accordance with an approved operations and maintenance plan. Once the stormwater control structure have been constructed and inspected, and prior to the release of the financial security, the applicant is required to deposit with the county either cash or a similar approved instrument in an amount equal to 15 percent of the total construction cost or 100 percent of the cost of maintaining the structure over a 20-year period, whichever is greater.



County Of Lincoln, North Carolina

Planning Board

Applicant **Ronnie Dedmon**

Application No. **WSCUP #22**

Parcel ID# **77435 and 77436**

Watershed District **Lake Norman WS-IV Protected Area**

Proposed Conditional Use **high-density option for development of self-storage facility**

FINDINGS OF FACT

1. The use will not materially endanger the public health or safety if located where proposed and developed according to plan. YES _____ NO _____

FACTUAL REASONS CITED: _____

2. The use meets all required conditions and specifications. YES _____ NO _____

FACTUAL REASONS CITED: _____

3. The use will not substantially injure the value of adjoining or abutting property unless the use is a public necessity. YES _____ NO _____

FACTUAL REASONS CITED: _____

4. The location and character of use, if developed according to the plan as submitted and approved, will be in harmony with the area in which it is to be located and will be in general conformity with the Land Use Plan for the area in question. YES _____ NO _____

FACTUAL REASONS CITED: _____

After having held a Public Hearing on _____ and in light of the Findings of Facts listed herein, the following action was taken by the Lincoln County Planning Board:

In recommending such Conditional Use, the following conditions were recommended by the Lincoln County Planning Board:



Watershed Conditional Use Permit

Application

Lincoln County Planning and Inspections Department
Zoning Administrator
302 N. Academy St., Suite A, Lincolnton, NC 28092

PART I

Applicant Name Ronnie J. Dedmon

Applicant Address P.O. Box 76 Terrell, NC 28682

Applicant Phone Number 704-483-1603

Property Owner Name Safeco Realty LLC

Property Owner Address 3147 KANNAPOLIS Parkway

Property Owner Phone Number 704-794-3439

PART II

Property Location Campground Road Denver N.C.

Property ID (10 digits) 3695970647 Property size 1.74 ACRES
77436

Parcel # (5 digits) 77435 Deed Book(s) 1822 Page(s) 902

PART III

3695972614
Watershed District WS4-PA

Briefly describe how the property is being used and any existing structures.

VACANT

Briefly describe the proposed project and the why it would require a Watershed Conditional Use Permit.

Mini Storage

\$1,000.00 APPLICATION FEE MUST BE RECEIVED BEFORE PROCESSING.

I hereby certify that all knowledge of the information provided for this application and attachments is true and correct to the best of my knowledge.

Applicant's Signature Ron J. Dedmon

Date 4/22/16

APPLICANT'S PROPOSED FINDINGS OF FACT
FOR A CONDITIONAL USE PERMIT

Application No. **WSCUP #22**

Applicant **Ronnie Dedmon**

Property Location **Campground Road**

Parcel ID No. **77435, 77436**

Proposed Conditional Use **high-density option**

PROPOSED FINDINGS

1. The use will not materially endanger the public health or safety if located where proposed and developed according to plan.

The self-storage facility will be accessed from Dusty Ridge Court and not from Campground Road. A driveway permit will be obtained from NCDOT. The self-storage buildings will be built to code. Stormwater controls will be provided.

2. The use meets all required conditions and specifications.

The plans have been reviewed by county staff and found to comply with all requirements.

3. The use will not substantially injure the value of adjoining or abutting property unless the use is a public necessity.

This property is adjoined by property zoned business. Landscape buffers will be provided along the roads and along the rear of the property. The outdoor storage area will be screened.

4. The location and character of use, if developed according to the plan as submitted and approved, will be in harmony with the area in which it is to be located and will be in general conformity with the Land Use Plan for the area in question.

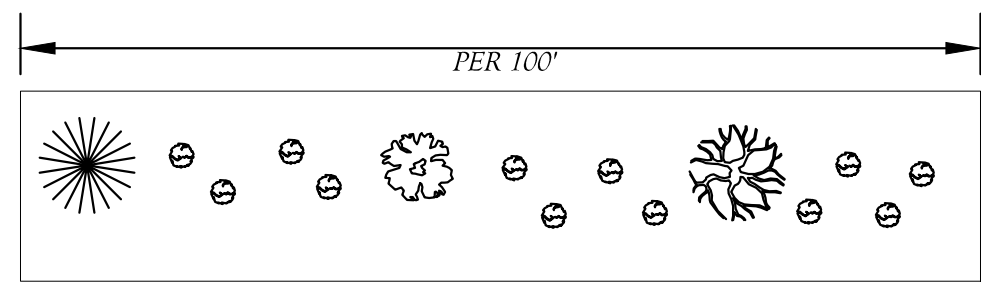
This is an existing business area. This property is part of an area designated by the Land Use Plan as business.



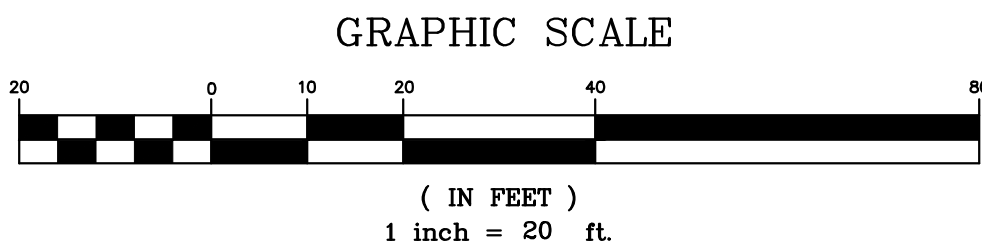
Know what's below.
Call before you dig.

- 1). CONTRACTOR IS FULLY RESPONSIBLE FOR CONTACTING APPROPRIATE PARTIES AND ASSURING THAT EXISTING UTILITIES ARE LOCATED PRIOR TO BEGINNING CONSTRUCTION.
- 2). CONTRACTOR IS RESPONSIBLE FOR PLACING BARRICADES USING FLAGMEN, ETC., AS NECESSARY TO INSURE SAFETY TO THE PUBLIC.
- 3). ALL PAVEMENT CUTS, CONCRETE OR ASPHALT, ARE TO BE REPLACED ACCORDING TO STANDARDS OF THE NORTH CAROLINA DEPARTMENT OF TRANSPORTATION.
- 4). SHORING WILL BE ACCORDING TO OSHA TRENCHING STANDARDS PART 1926 SUBPART P, OR AS AMENDED.

| Curve | Radius | Length | Chord | Chord Bear. |
|-------|----------|---------|---------|---------------|
| C1 | 1911.48' | 50.81' | 50.81' | N 79°36'42" W |
| C2 | 1911.48' | 170.68' | 170.62' | N 82°55'52" W |



20' CLASS C BUFFER



GRAPHIC SCALE

(IN FEET)
1 inch = 20 ft.

PROJECT NO.: 2016.12
SCALE: 1"=20'
DRAWN BY: MSL
CHECKED BY: JLW

SHEET NO:

C2.0

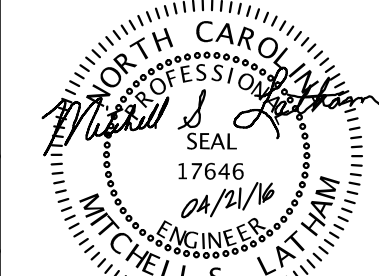
REVISIONS

CAMPGROUND ROAD STORAGE
CAMPGROUND ROAD, DENVER, NC 28037
GRADING & DRAINAGE
PLAN

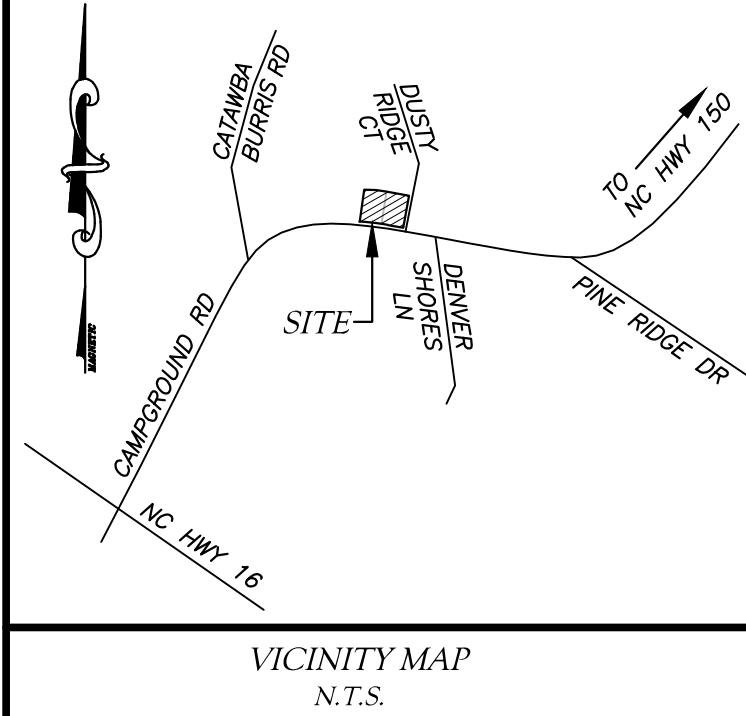
RONNIE & PATTI
DEDMON

P.O. BOX 76
TERRELL, NC 28682
PHONE: (704) 400-3398
EMAIL ADDRESS
RDEDMON844@AOL.COM

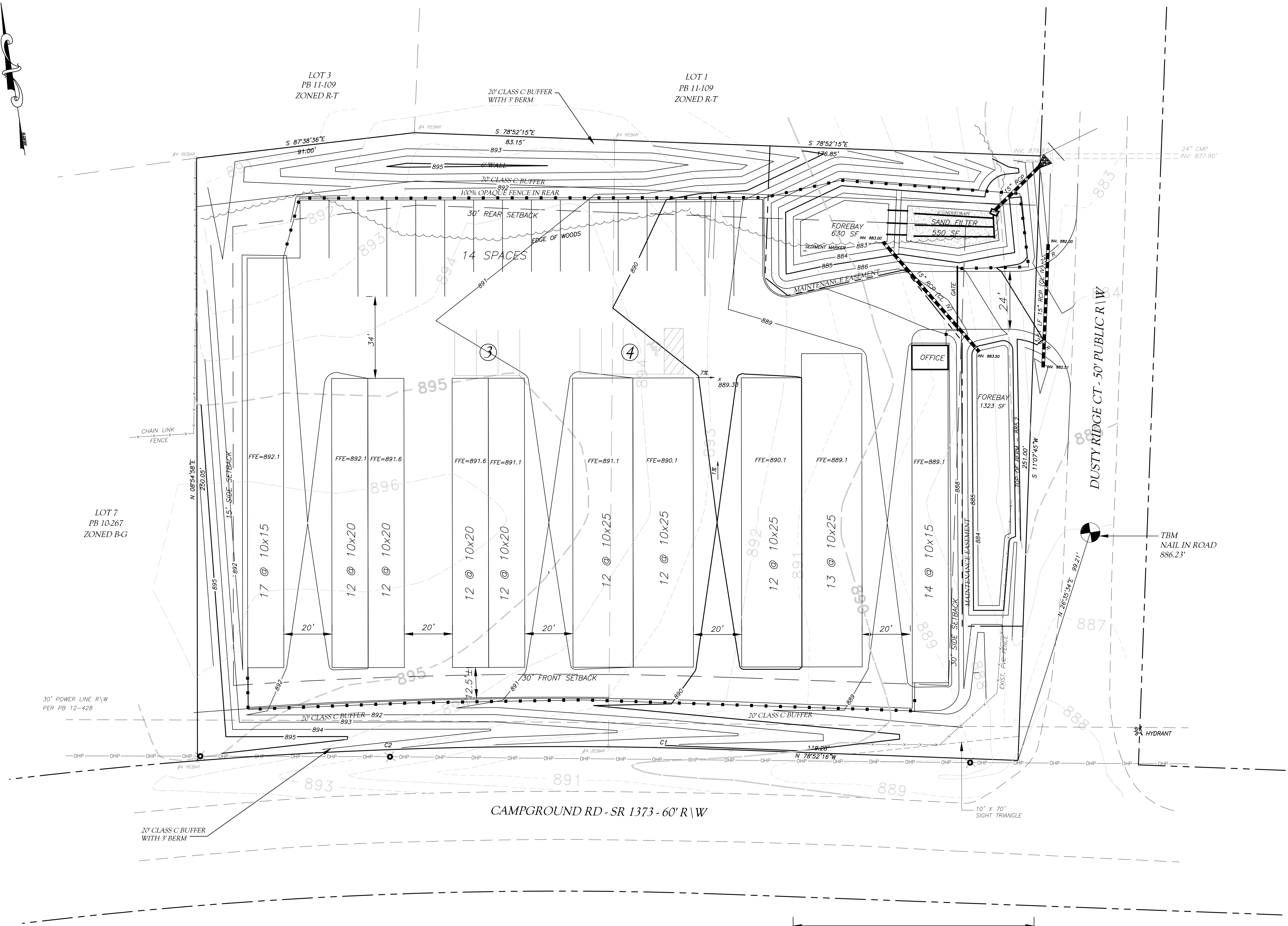
APRIL 21, 2016
DATE



LWE
LATHAM-WALTERS
ENGINEERING, INC.
N.C. CORP. LIC. C-1815
16507-A NORTH CROSS DRIVE
HUNTERSVILLE, N.C. 28078
PHONE: (704) 895-8484
FAX: (704) 237-4362



VICINITY MAP
N.T.S.



Sand Filter Operation and Maintenance Agreement

I will keep a maintenance record on this BMP. This maintenance record will be kept in a log in a known set location. Any deficient BMP elements noted in the inspection will be corrected, repaired or replaced immediately. These deficiencies can affect the integrity of structures, safety of the public, and the removal efficiency of the BMP.

- Important maintenance procedures:
- The drainage area will be carefully managed to reduce the sediment load to the sand filter.
 - The sedimentation chamber or forebay will be cleaned out whenever sediment depth exceeds six inches.
 - Once a year, sand media will be skimmed.
 - The sand filter media will be replaced whenever it fails to function properly after maintenance.

The sand filter will be inspected **quarterly and within 24 hours after every storm event greater than 1.0 inches (or 1.5 inches if in a Coastal County)**. Records of operation and maintenance will be kept in a known set location and will be available upon request.

Inspection activities shall be performed as follows. Any problems that are found shall be repaired immediately.

| BMP element: | Potential problem: | How I will remediate the problem: |
|-----------------------------------|---|---|
| Entire BMP | Trash/debris is present. | Remove the trash/debris. |
| Adjacent pavement (if applicable) | Sediment is present on the pavement surface. | Sweep or vacuum the sediment as soon as possible. |
| Perimeter of sand filter | Areas of bare soil and/or erosive gullies have formed. | Regrade the soil if necessary to remove the gully, and then plant a ground cover and water until it is established. Provide lime and a one-time fertilizer application. |
| | Vegetation is too short or too long. | Maintain vegetation at an appropriate height. |
| Flow diversion structure | The structure is clogged. | Unclog the conveyance and dispose of any sediment offsite. |
| | The structure is damaged. | Make any necessary repairs or replace if damage is too large for repair. |
| Forebay or pretreatment area | Sediment has accumulated to a depth of greater than six inches. | Search for the source of the sediment and remedy the problem if possible. Remove the sediment and stabilize or dispose of it in a location where it will not cause impacts to streams or the BMP. |
| | Erosion has occurred. | Provide additional erosion protection such as reinforced turf matting or riprap if needed to prevent future erosion problems. |
| | Weeds are present. | Remove the weeds, preferably by hand. If a pesticide is used, wipe it on the plants rather than spraying. |

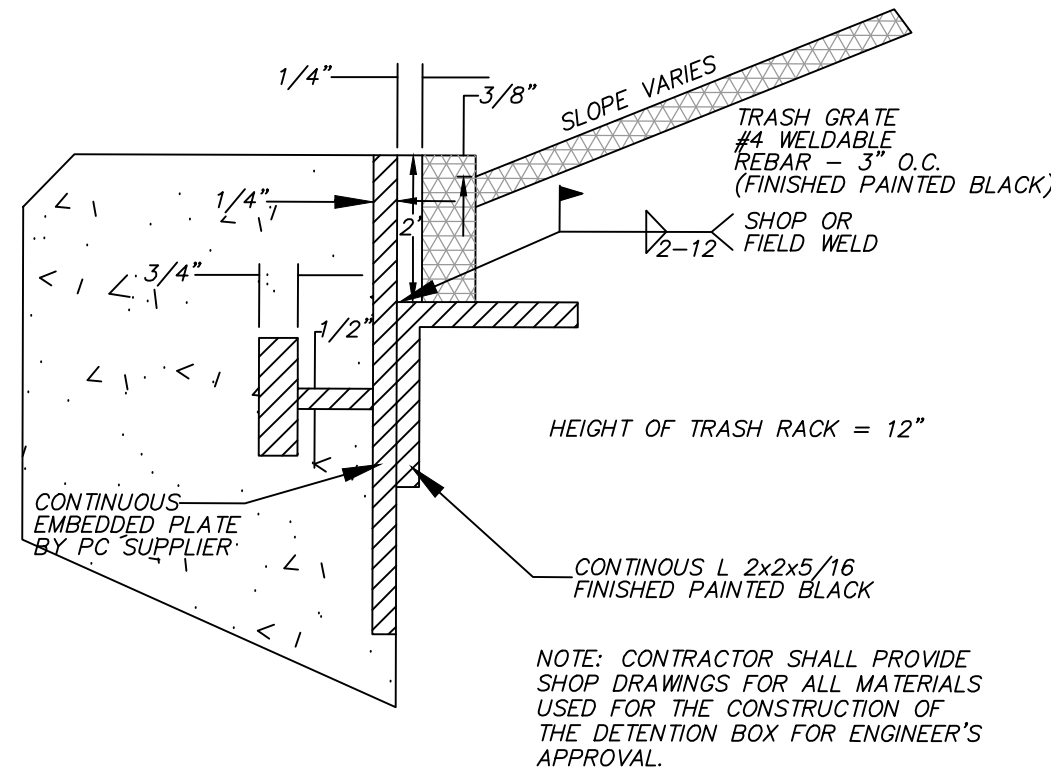
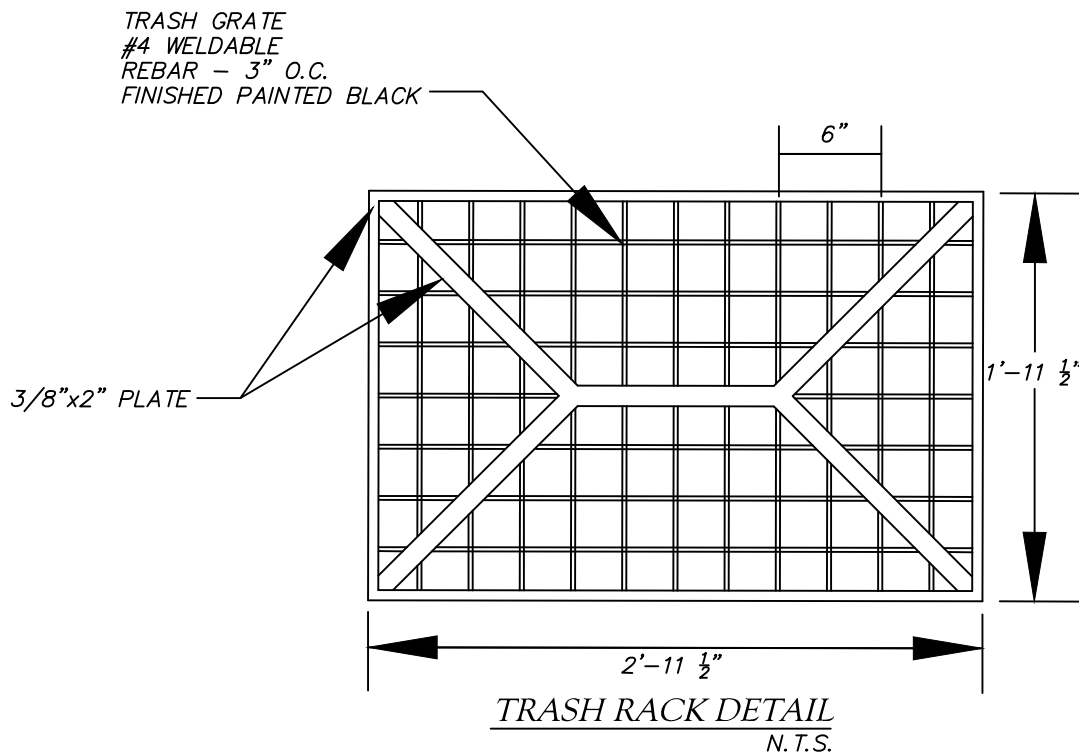
Form SW401-Sand Filter O&M-Rev.4 2009Sept17

Page 1 of 3

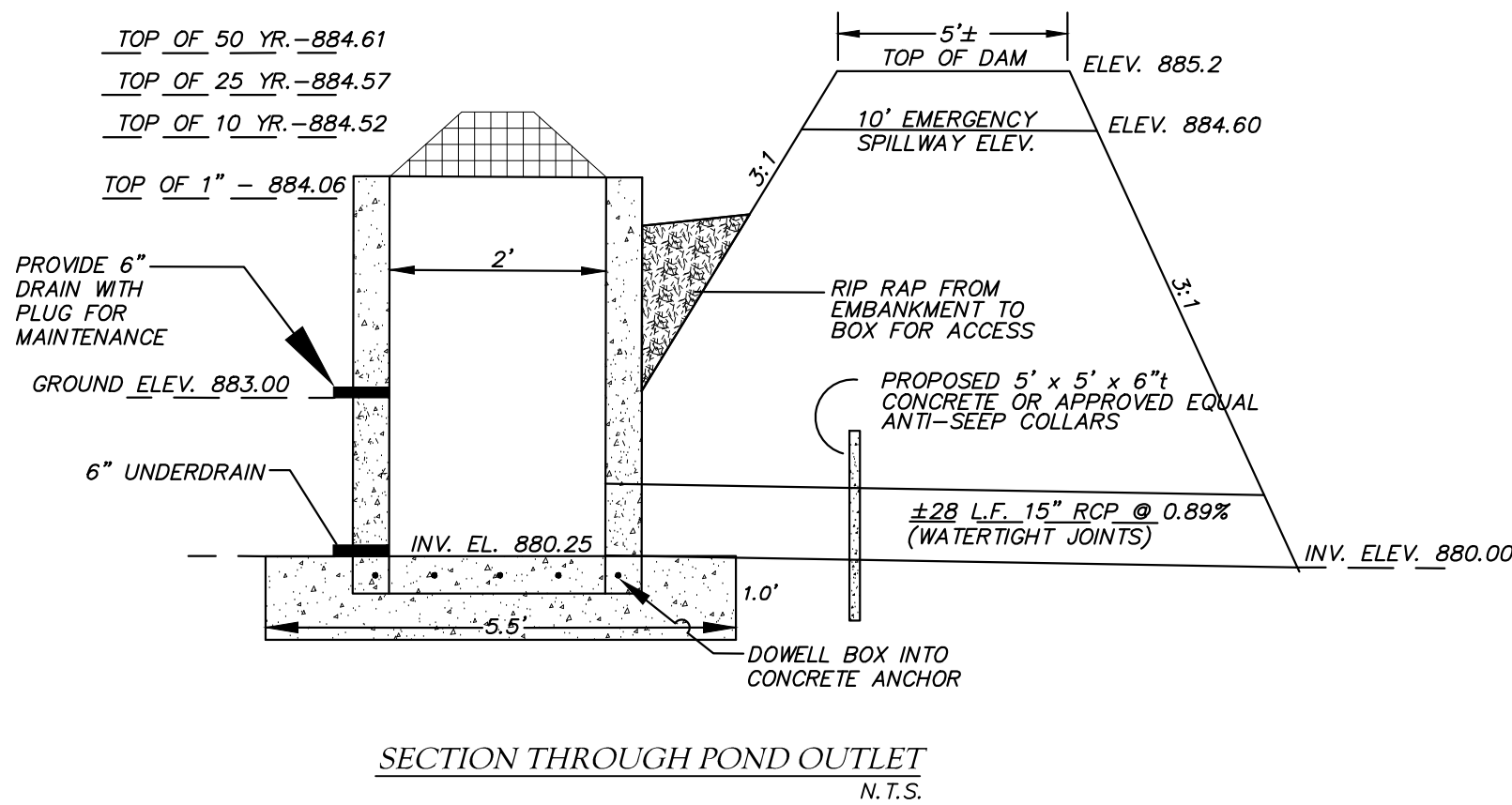
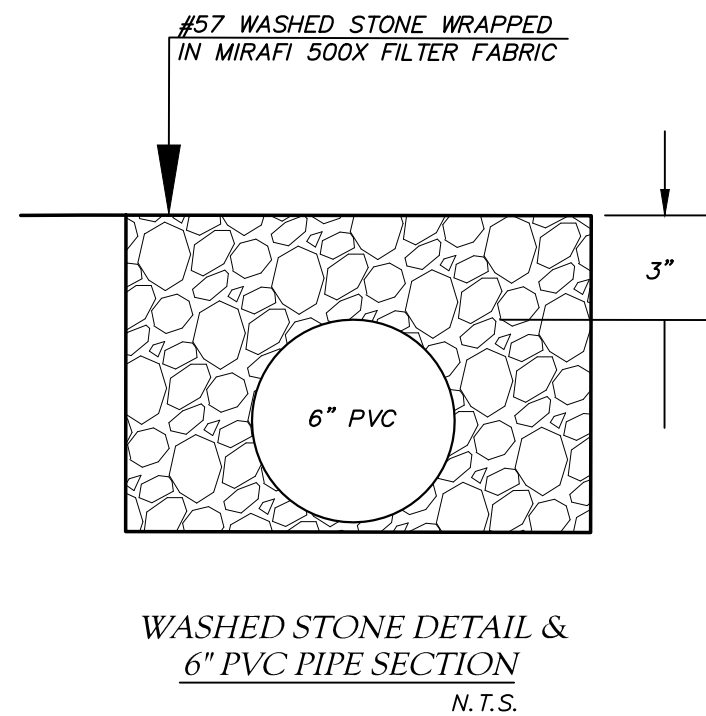
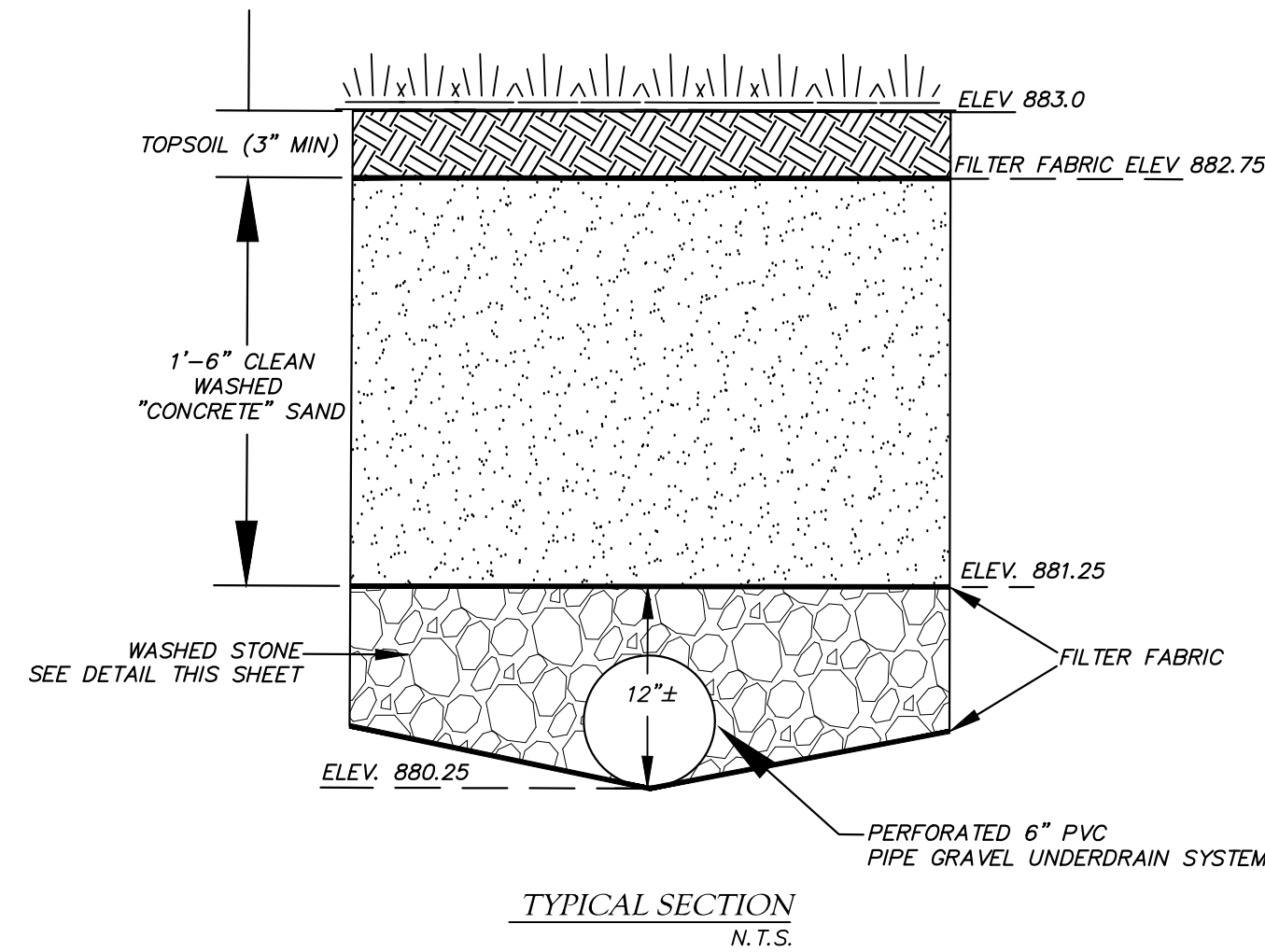
| BMP element: | Potential problem: | How I will remediate the problem: |
|---|---|--|
| Filter bed and underdrain collection system | Water is ponding on the surface for more than 24 hours after a storm. | Check to see if the collector system is clogged and flush if necessary. If water still ponds, remove the top few inches of filter bed media and replace. If water still ponds, then consult an expert. |
| Outlet device | Clogging has occurred. | Clean out the outlet device. Dispose of the sediment offsite. |
| | The outlet device is damaged | Repair or replace the outlet device. |
| Receiving water | Erosion or other signs of damage have occurred at the outlet. | Contact the NC Division of Water Quality 401 Oversight Unit at 919-733-1786. |

Form SW401-Sand Filter O&M-Rev.4 2009Sept17

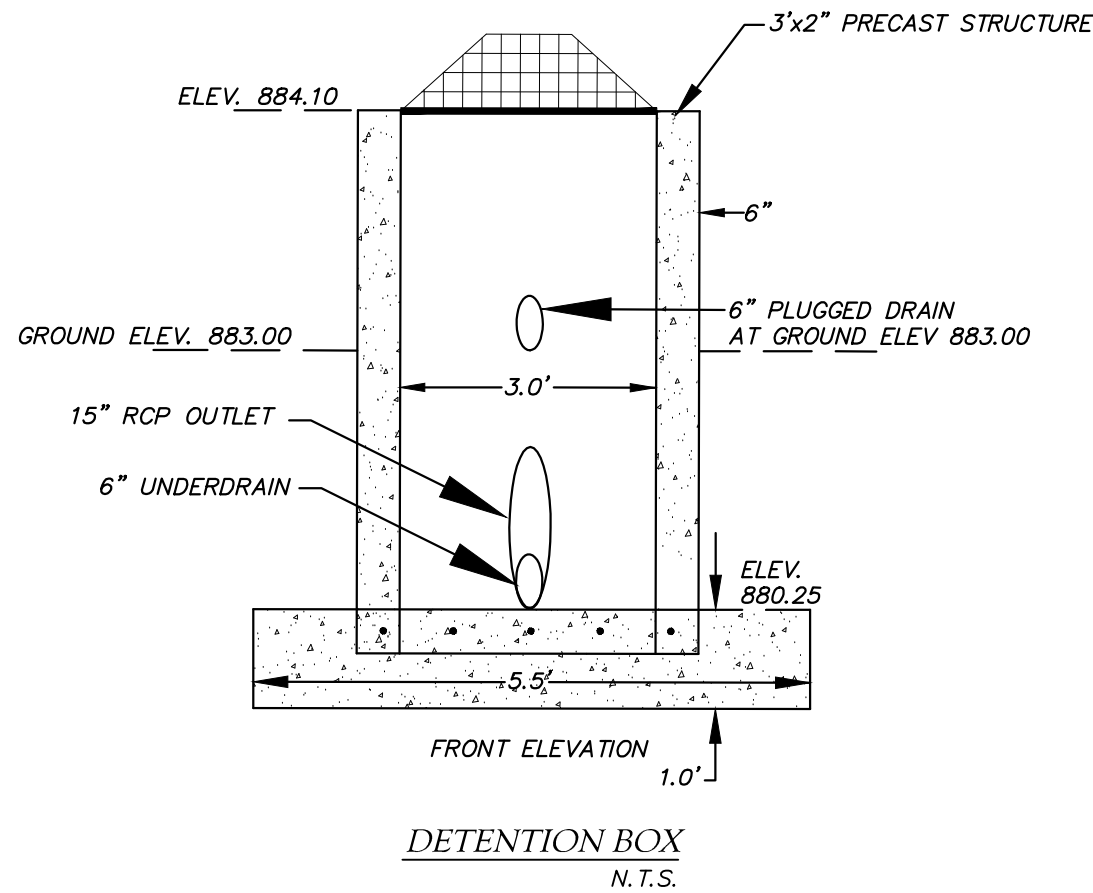
Page 2 of 3



- NOTES:
1. "CONCRETE" SAND REFERS TO SAND THAT IS COMMONLY USED IN CONCRETE MIXES.
 2. ALL DRAINAGE AREAS TO A SAND FILTER FACILITY ARE TO BE STABILIZED PRIOR TO INSTALLATION OF SAND.
 3. UNDERDRAIN PIPES SHOULD BE MIN. 6" PERFORATED SCHEDULE 40 PVC (PER AASHTO M278) OR DOUBLE WALL HDPE (PER AASHTO M252). PERFORATIONS SHOULD BE 3/4" SPACED 3" ON CENTER ALONG 4 LONGITUDINAL ROWS SPACED 30" APART.



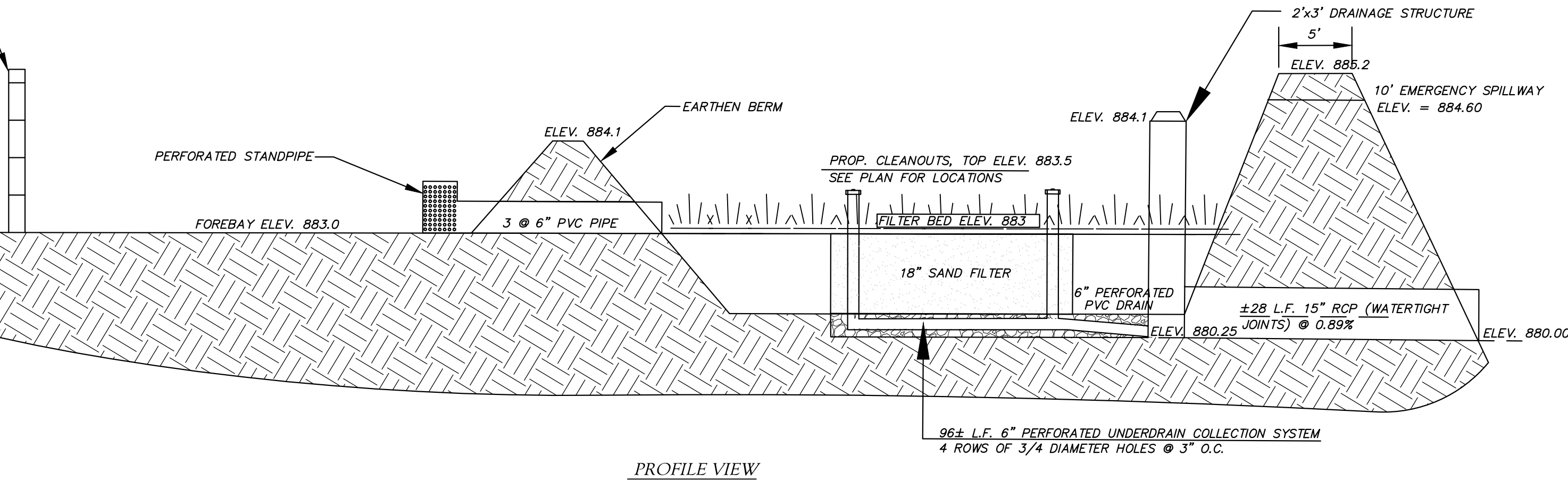
SECTION THROUGH POND OUTLET
N.T.S.



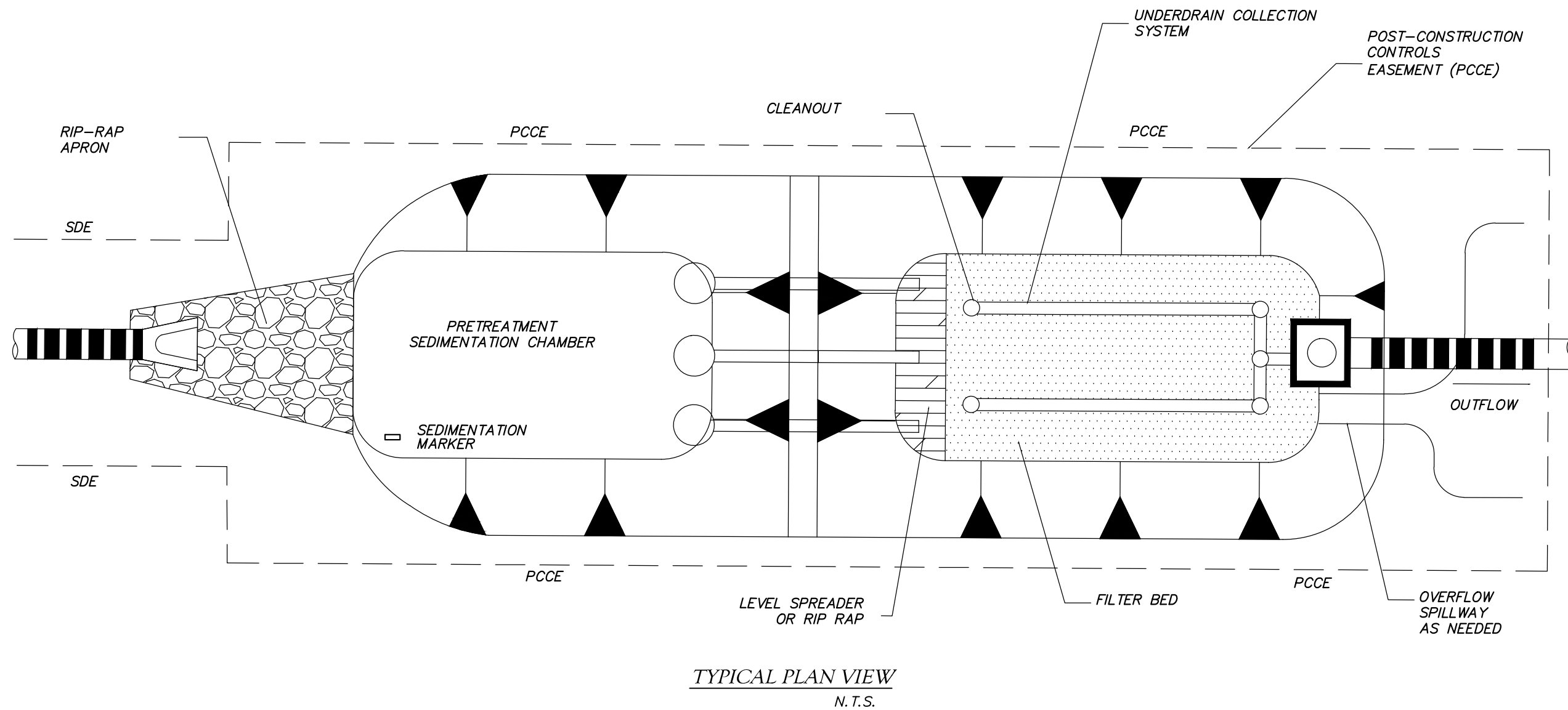
DETENTION BOX
N.T.S.

NOTES:

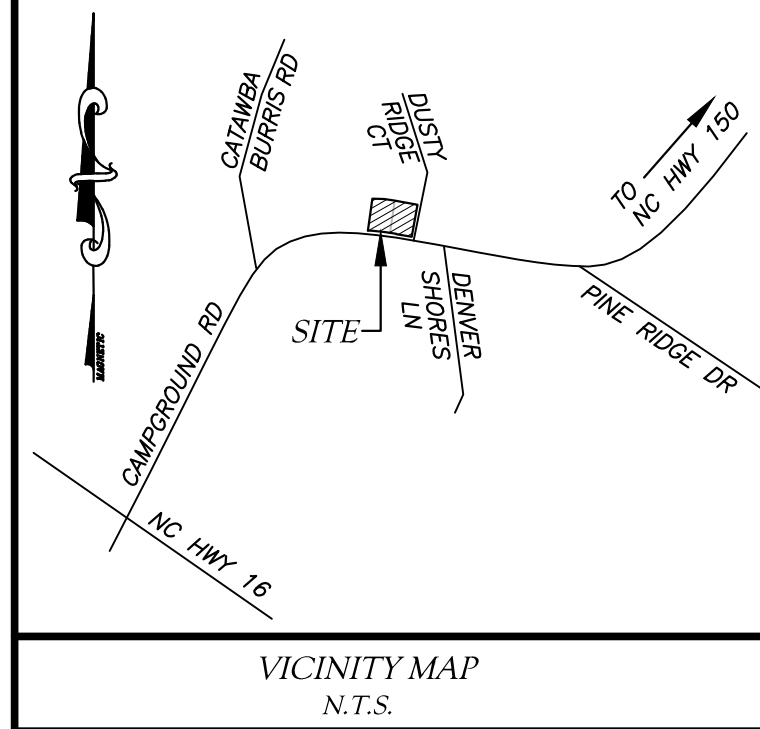
1. ALL SAND FILTERS SHALL HAVE A MINIMUM 20 FOOT ACCESS EASEMENT CONNECTING TO A DEDICATED PUBLIC RIGHT OF WAY. ACCESS ROAD SHALL HAVE MIN. 12' STABILIZED WIDTH, MAX. LONG. GRADE OF 15%, MAX. CROSS-SLOPE 5% IN ADDITION, A 10-FOOT WIDE PERMANENT MAINTENANCE ACCESS EASEMENT MUST BE PROVIDED AROUND THE PERIMETER OF ALL BMPs TO ALLOW FOR ADEQUATE MAINTENANCE AND REPAIR.
2. ALL DRAINAGE AREAS TO A SAND FILTER FACILITY ARE TO BE STABILIZED PRIOR TO INSTALLATION OF SAND.
3. CLEAN OUTS IN THE UNDERDRAIN SYSTEM ARE TO BE PROVIDED EVERY 50' MINIMUM. CLEAN OUTS SHALL HAVE WATER TIGHT, VANDAL PROOF CAPS AND EXTEND 6" ABOVE THE SURFACE.
4. GROUNDWATER ELEVATION SHALL BE DETERMINED PRIOR TO CONSTRUCTION. IF LESS THAN 1' OF CLEARANCE BETWEEN GWT AND SAND FILTER, LINER SHALL BE REQUIRED.



PROFILE VIEW



TYPICAL PLAN VIEW
N.T.S.



LWE
LATHAM-WALTERS
ENGINEERING, INC.
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PHONE: (704) 895-8484
FAX: (704) 237-4362



APRIL 21, 2016
DATE:

RONNIE & PATTI
DEDMON

P.O. BOX 76
TERRELL, NC 28682
PHONE: (704) 400-3398
EMAIL ADDRESS
RDEDMON844@AOL.COM

CAMPGROUND ROAD STORAGE
CAMPGROUND ROAD, DENVER, NC 28037

SITE DETAILS

REVISIONS

PROJECT NO.: 2016.12
SCALE: N.T.S.
DRAWN BY: MSL
CHECKED BY: JLW

SHEET NO:

C3.0



Know what's below.
Call before you dig.

16:12-det.dwg

**Stormwater Maintenance Plan
Best Management Practices**

FOR

Campground Road Storage

Denver, North Carolina

PREPARED FOR:

Ronnie & Patti Dedmon

P.O. Box 76
Terrell, North Carolina 28682

PREPARED BY:

LATHAM-WALTERS ENGINEERING, INC

Corporate License C-1815
16507-A Northcross Drive
Huntersville, NC 28078
704-895-8484 FAX 704-237-4362



Mitchell S. Latham

May 18, 2016

**STORMWATER MAINTENANCE PLAN
FOR
CAMPGROUND ROAD STORAGE

BEST MANAGEMENT PRACTICES
LINCOLN COUNTY -
DENVER, NORTH CAROLINA**

The purpose of this plan is to assist in keeping a maintenance record and in the making of repairs of the referenced Best Management Practice (BMP). The maintenance record shall be written in the attached log and kept in a known set location. Any deficient BMP elements noted in the inspection shall be corrected, repaired, or replaced immediately. These deficiencies can affect the integrity of structures, safety of the public, and the removal efficiency of the BMP.

Introduction

The Campground Road Storage development of a sand filter and this stormwater maintenance plan have been designed and prepared in accordance with N.C. Department of Environment and Natural Resources regulations and with the Lincoln County Unified Development Ordinance, §7 .3 .9, High Density Option.

The Campground Road Storage development is located within a designated WS-IV Protected Area of the Catawba/Lake Norman Watershed. With the high-density option, engineered stormwater controls are required to control and treat runoff from the first one inch of rainfall for development containing a maximum built-upon area of 70 percent. The use of a sand filter in accordance with NCDENR Chapter 11 has been designed to achieve a minimum of 85 percent of total suspended solids.

Financial Guarantees

All new stormwater control structures approved employing the high density option shall be conditioned on the posting of adequate financial assurance for the purpose of constructing, maintaining, repairing or reconstructing said devices.

1. If the Board of Commissioners approves the use of the high density option for a particular project, it may do so only after the applicant has posted a surety bond, cash, or equivalent security, in an amount not less than 1.25 times the cost of constructing the necessary stormwater control structure(s). Such financial security shall be made payable to Lincoln County and shall be in a form prescribed by the Board of Commissioners. All construction costs shall be verified by the County and the County may assess the applicant for actual costs associated with such verification. The total cost of the stormwater control structure shall include the value of all materials such as piping and other structures, seeding and soil stabilization, design and engineering, grading, excavation, fill, and etc. The costs shall not be prorated as part of a larger project, but rather shall be priced as an individual project.

2. Once the stormwater control structure(s) has been constructed and inspected in the manner provided in §7.3.9.G, and approved by the Board of Commissioners, the Board of Commissioners may authorize the release of up to 75 percent of the surety bond or other equivalent device outlined in §7.3.9.E. 1. The remaining portion of the surety bond or equivalent device may be released to the owning entity in accordance with §-7.3.9.G.

3. Prior to said release, however, the applicant shall be required to deposit with the County either cash or similar instrument approved by the Board of Commissioners in an amount equal to 15 percent of the total construction cost (See §7.3.9.E.1) or 100 percent of the cost of maintaining, repairing or reconstructing said structure over a 20 year period, whichever is greater. The estimated cost of maintaining the stormwater control structure shall be consistent with the approved operation and maintenance plan provided by the applicant as outlined in §7.3.9.D.

Default

1. Upon default of the applicant to complete the stormwater control structure as spelled out in the performance bond or other equivalent security, the Board of Commissioners may obtain and use all or any portion of the funds necessary to complete the improvements based on actual construction costs. The Board of Commissioners shall return any funds not spent in completing the improvements to the owning entity.

2. Upon default of the owning entity to maintain, repair and, if necessary, reconstruct the stormwater control structure in accordance with the approved operations and maintenance plan, the Board of Commissioners shall obtain and use any portion of the security outlined in §7.3.9.F to make necessary improvements based on the actual costs borne by the County to make such improvements.

Inspections of Newly Constructed Structures

All new stormwater control structures shall be inspected by the County after the owning entity notifies the Director that all construction has been completed. At this inspection the owning entity shall provide:

1. A signed deed, related easements, and survey plat for the structure in a manner suitable for filing with the Lincoln County Register of Deeds Office, if ownership of the stormwater control structure(s) is to be transferred to another person, firm, or entity. (This requirement will be waived for any repair work when such deed has previously been filed.)

2. A certification by an engineer or landscape architect (to the extent allowable by the General Statutes) stating that the stormwater control structure is complete and consistent with the approved Plan and all specifications previously stipulated by the County.

3. The Director shall forthwith present the materials submitted by the owning entity along with the County's inspection report to the Board of Commissioners for their review and approval. If the Board of Commissioners approves the inspection report and accepts the certification, deed and easements, the Director shall forthwith file said deed with the Lincoln County Register of Deeds Office. Release of up to 75 percent of the surety bond or equivalent security as called for in §7.3.9.E.1 shall be made in a manner as prescribed in §7.3_9.E.2 and §7.3.9.E.3.

4. If deficiencies are found as a result of the inspection, the Board of Commissioners shall direct the owning entity to make necessary improvements. Reinspections will be made thereafter. No release of any funds shall be made by the County until all deficiencies are properly addressed to the County's satisfaction.

5. No sooner than one year after approval of the stormwater control structure(s) by the County, the owning entity may petition the Board of Commissioners to release the remaining value of the posted bond or security called for in §7.3.9.E.1. Upon receipt of said petition, the County shall forthwith inspect the stormwater control structure to determine whether the structure is performing as designed and intended. Once the inspection is made, the Director shall forthwith present the inspection report and recommendations to the Board of Commissioners.

6. An occupancy permit shall not be issued for any structure within the permitted development until the Board of Commissioners approves the stormwater control structure in the manner as herein prescribed.

Annual Inspection of Stormwater Structures

1. All stormwater control structures shall be inspected by the County on an annual basis to determine whether the structures are performing as designed and intended. Records of inspection shall be maintained on forms approved or supplied by the North Carolina Department of Environment and Natural Resources (NCDENR). Annual inspections shall begin within one year of approval of the Board of Commissioners approval of the filing date of the deed for the stormwater control structure. A fee, in accordance with a fee schedule adopted by the Board of Commissioners, shall be charged to the owning entity for annual inspections (and re-inspections) made. A copy of each inspection report shall be filed with the Director.

2. In the event the County's report indicates the need for corrective action or improvements, the Director shall notify the owning entity of the needed improvements and the date by which such improvements are to be completed. All improvements shall be consistent with the adopted operations plan and specifications. Once such improvements are made, the owning entity shall forthwith contact the Director and ask that an inspection be made.

Permit Number: _____
(to be provided by DWQ)

Drainage Area Number: _____

Sand Filter Operation and Maintenance Agreement

I will keep a maintenance record on this BMP. This maintenance record will be kept in a log in a known set location. Any deficient BMP elements noted in the inspection will be corrected, repaired or replaced immediately. These deficiencies can affect the integrity of structures, safety of the public, and the removal efficiency of the BMP.

Important maintenance procedures:

- The drainage area will be carefully managed to reduce the sediment load to the sand filter.
- The sedimentation chamber or forebay will be cleaned out whenever sediment depth exceeds six inches.
- Once a year, sand media will be skimmed.
- The sand filter media will be replaced whenever it fails to function properly after maintenance.

The sand filter will be inspected **quarterly and within 24 hours after every storm event greater than 1.0 inches (or 1.5 inches if in a Coastal County)**. Records of operation and maintenance will be kept in a known set location and will be available upon request.

Inspection activities shall be performed as follows. Any problems that are found shall be repaired immediately.

| BMP element: | Potential problem: | How I will remediate the problem: |
|-----------------------------------|---|---|
| Entire BMP | Trash/debris is present. | Remove the trash/debris. |
| Adjacent pavement (if applicable) | Sediment is present on the pavement surface. | Sweep or vacuum the sediment as soon as possible. |
| Perimeter of sand filter | Areas of bare soil and/or erosive gullies have formed. | Regrade the soil if necessary to remove the gully, and then plant a ground cover and water until it is established. Provide lime and a one-time fertilizer application. |
| | Vegetation is too short or too long. | Maintain vegetation at an appropriate height. |
| Flow diversion structure | The structure is clogged. | Unclog the conveyance and dispose of any sediment offsite. |
| | The structure is damaged. | Make any necessary repairs or replace if damage is too large for repair. |
| Forebay or pretreatment area | Sediment has accumulated to a depth of greater than six inches. | Search for the source of the sediment and remedy the problem if possible. Remove the sediment and stabilize or dispose of it in a location where it will not cause impacts to streams or the BMP. |
| | Erosion has occurred. | Provide additional erosion protection such as reinforced turf matting or riprap if needed to prevent future erosion problems. |
| | Weeds are present. | Remove the weeds, preferably by hand. If a pesticide is used, wipe it on the plants rather than spraying. |

| BMP element: | Potential problem: | How I will remediate the problem: |
|--|---|--|
| Filter bed and underdrain collection system | Water is ponding on the surface for more than 24 hours after a storm. | Check to see if the collector system is clogged and flush if necessary. If water still ponds, remove the top few inches of filter bed media and replace. If water still ponds, then consult an expert. |
| Outlet device | Clogging has occurred. | Clean out the outlet device. Dispose of the sediment offsite. |
| | The outlet device is damaged | Repair or replace the outlet device. |
| Receiving water | Erosion or other signs of damage have occurred at the outlet. | Contact the NC Division of Water Quality 401 Oversight Unit at 919-733-1786. |

Permit Number: _____
(to be provided by DWQ)

I acknowledge and agree by my signature below that I am responsible for the performance of the maintenance procedures listed above. I agree to notify DWQ of any problems with the system or prior to any changes to the system or responsible party.

Project name: _____

BMP drainage area number: _____

Print name: _____

Title: _____

Address: _____

Phone: _____

Signature: _____

Date: _____

Note: The legally responsible party should not be a homeowners association unless more than 50% of the lots have been sold and a resident of the subdivision has been named the president.

I, _____, a Notary Public for the State of
_____, County of _____, do hereby certify that
_____ personally appeared before me this ____ day of
_____, _____, and acknowledge the due execution of the forgoing sand filter
maintenance requirements. Witness my hand and official seal,



SEAL

My commission expires _____

BMP INSPECTION LOG

PROJECT: Campground Road Storage

| Date: | Rainfall total | Observation of Device Operation/Problem | Corrective/Repair Measures Taken |
|-------|----------------|---|----------------------------------|
|-------|----------------|---|----------------------------------|

| Date: | Rainfall total | Observation of Device Operation/Problem | Corrective/Repair Measures Taken |
|-------|----------------|---|----------------------------------|
|-------|----------------|---|----------------------------------|

| Date: | Rainfall total | Observation of Device Operation/Problem | Corrective/Repair Measures Taken |
|-------|----------------|---|----------------------------------|
|-------|----------------|---|----------------------------------|

| Date: | Rainfall total | Observation of Device Operation/Problem | Corrective/Repair Measures Taken |
|-------|----------------|---|----------------------------------|
|-------|----------------|---|----------------------------------|

[illegible]

APPENDIX

WATER QUALITY PLAN
(BMP LOCATION)

SAND FILTER DETAILS (2 PAGES)

SAND FILTER COMMON MAINTENANCE ISSUES

OPINION OF PROBABLE COSTS FOR SAND FILTER

Sand Filter Operation and Maintenance Agreement

I will keep a maintenance record on this BMP. This maintenance record will be kept in a log in a known set location. Any deficient BMP elements noted in the inspection will be corrected, repaired or replaced immediately. These deficiencies can affect the integrity of structures, safety of the public, and the removal efficiency of the BMP.

Important maintenance procedures:

- The drainage area will be carefully managed to reduce the sediment load to the sand filter.
- The sedimentation chamber or forebay will be cleaned out whenever sediment depth exceeds six inches.
- Once a year, sand media will be skimmed.
- The sand filter media will be replaced whenever it fails to function properly after maintenance.

The sand filter will be inspected quarterly and within 24 hours after every storm event greater than 1.0 inches (or 1.5 inches if in a Coastal County). Records of operation and maintenance will be kept in a known set location and will be available upon request.

Inspection activities shall be performed as follows. Any problems that are found shall be repaired immediately.

| BMP element: | Potential problem: | How I will remediate the problem: |
|-----------------------------------|---|---|
| Entire BMP | Trash/debris is present. | Remove the trash/debris. |
| Adjacent pavement (if applicable) | Sediment is present on the pavement surface. | Sweep or vacuum the sediment as soon as possible. |
| Perimeter of sand filter | Areas of bare soil and/or erosive gullies have formed. | Regrade the soil if necessary to remove the gully, and then plant a ground cover and water until it is established. Provide lime and a one-time fertilizer application. |
| | Vegetation is too short or too long. | Maintain vegetation at an appropriate height. |
| Flow diversion structure | The structure is clogged. | Unclog the conveyance and dispose of any sediment offsite. |
| | The structure is damaged. | Make any necessary repairs or replace if damage is too large for repair. |
| Forebay or pretreatment area | Sediment has accumulated to a depth of greater than six inches. | Search for the source of the sediment and remedy the problem if possible. Remove the sediment and stabilize or dispose of it in a location where it will not cause impacts to streams or the BMP. |
| | Erosion has occurred. | Provide additional erosion protection such as reinforced turf matting or riprap if needed to prevent future erosion problems. |
| | Weeds are present. | Remove the weeds, preferably by hand. If a pesticide is used, wipe it on the plants rather than spraying. |

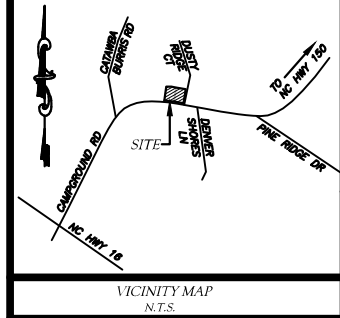
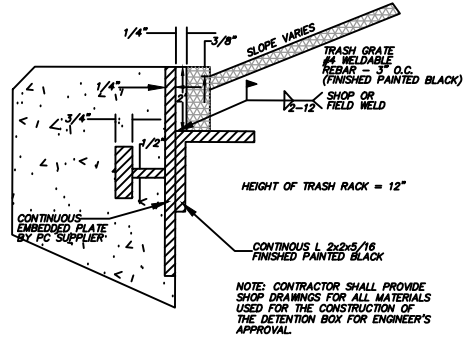
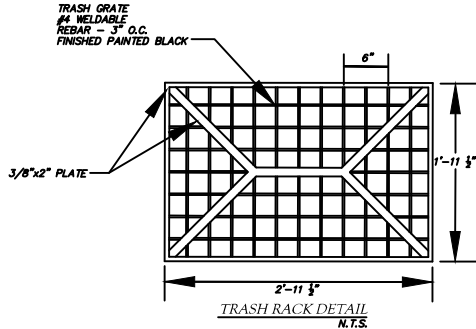
Form SW401-Sand Filter O&M-Rev.4 2009Sept17

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| BMP element: | Potential problem: | How I will remediate the problem: |
|---|---|--|
| Filter bed and underdrain collection system | Water is ponding on the surface for more than 24 hours after a storm. | Check to see if the collector system is clogged and flush if necessary. If water still ponds, remove the top few inches of filter bed media and replace. If water still ponds, then consult an expert. |
| Outlet device | Clogging has occurred. | Clean out the outlet device. Dispose of the sediment offsite. |
| | The outlet device is damaged. | Repair or replace the outlet device. |
| Receiving water | Erosion or other signs of damage have occurred at the outlet. | Contact the NC Division of Water Quality 401 Oversight Unit at 919-733-1786. |

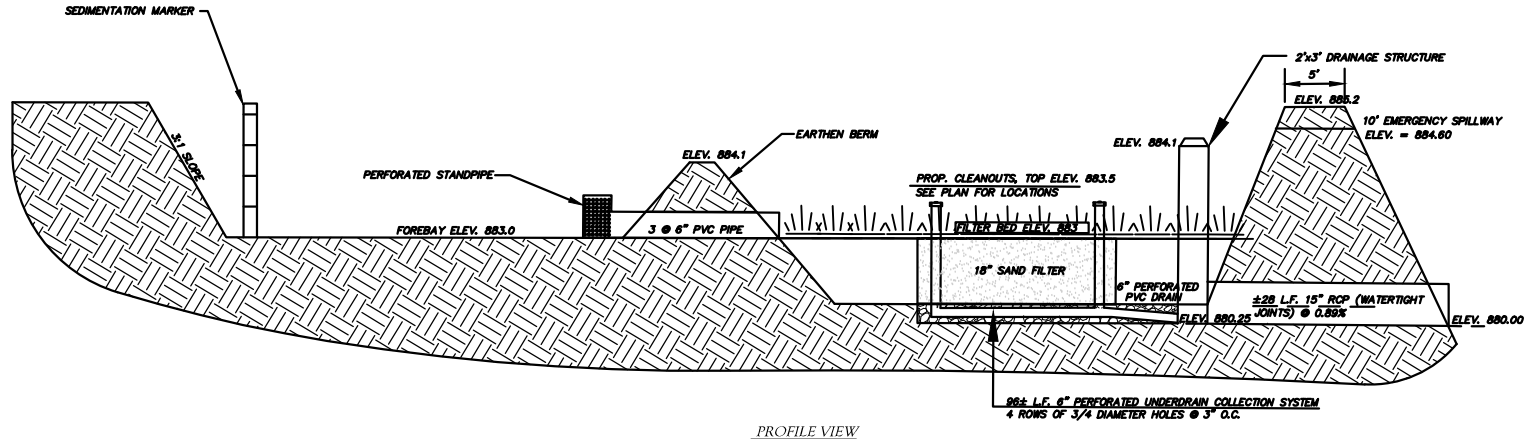
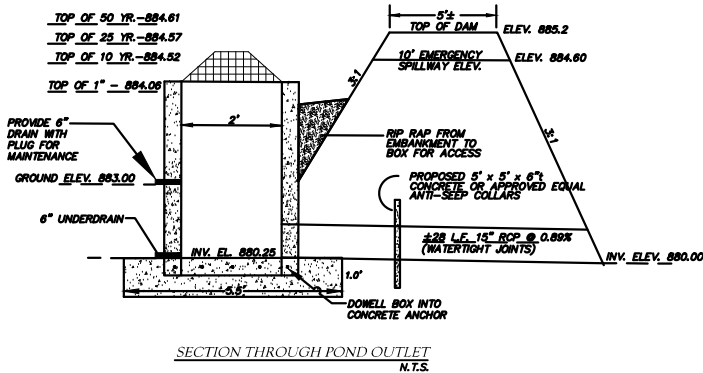
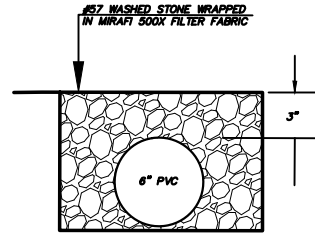
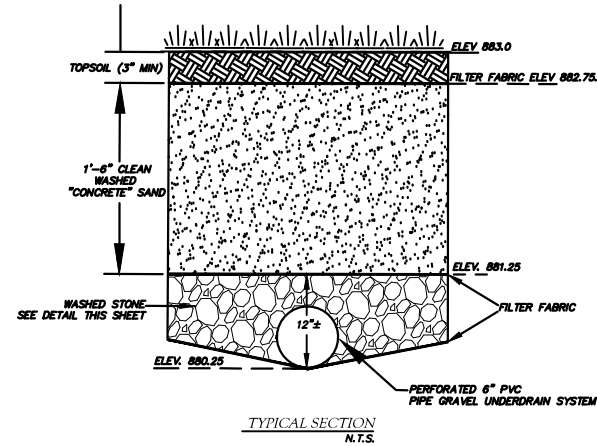
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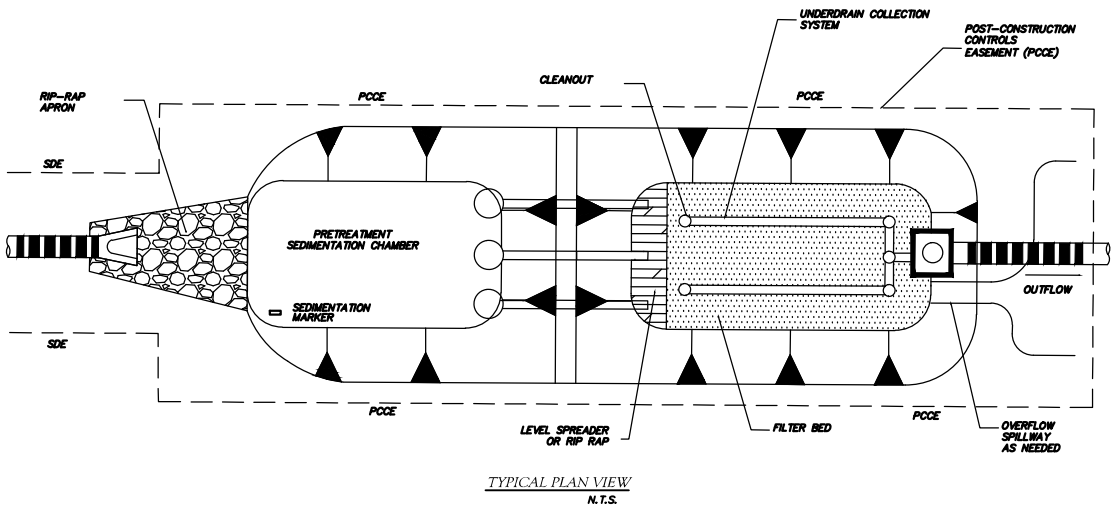
NOTES:

1. "CONCRETE" SAND REFERS TO SAND THAT IS COMMONLY USED IN CONCRETE MIXES.
2. ALL DRAINAGE AREAS TO A SAND FILTER FACILITY ARE TO BE STABILIZED PRIOR TO INSTALLATION OF SAND.
3. UNDERDRAIN PIPES SHOULD BE MIN. 6" PERFORATED SCHEDULE 40 PVC (PER AASHTO M278) OR DOUBLE WALL HDPE (PER AASHTO M252). PERFORATIONS SHOULD BE 3/4" SPACED 3" ON CENTER ALONG A LONGITUDINAL ROWS SPACED 30" APART.



NOTES:

1. ALL SAND FILTERS SHALL HAVE A MINIMUM 20 FOOT ACCESS EASEMENT CONNECTING TO A DEDICATED PUBLIC RIGHT OF WAY. ACCESS ROAD SHALL HAVE MIN. 12' STABILIZED WIDTH, MAX. LONG. GRADE OF 15% MAX. CROSS-SLOPE 5% IN ADDITION, A 10-FOOT WIDE PERMANENT MAINTENANCE ACCESS EASEMENT MUST BE PROVIDED AROUND THE PERIMETER OF ALL BMPs TO ALLOW FOR ADEQUATE MAINTENANCE AND REPAIR.
2. ALL DRAINAGE AREAS TO A SAND FILTER FACILITY ARE TO BE STABILIZED PRIOR TO INSTALLATION OF SAND.
3. CLEAN OUTS IN THE UNDERDRAIN SYSTEM ARE TO BE PROVIDED EVERY 50' MINIMUM. CLEAN OUTS SHALL HAVE WATER TIGHT, VANDAL PROOF CAPS AND EXTEND 6" ABOVE THE SURFACE.
4. GROUNDWATER ELEVATION SHALL BE DETERMINED PRIOR TO CONSTRUCTION. IF LESS THAN 1" OF CLEARANCE BETWEEN GWT AND SAND FILTER, LINER SHALL BE REQUIRED.



LWE
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ENGINEERING, INC.
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16507-A NORTH CROSS DRIVE
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APRIL 21, 2016
DATE

RONNIE & PATTI
DEDMON

P.O. BOX 76
TERRELL, NC 28682
PHONE: (704) 400-3398
EMAIL ADDRESS
RDEDMON844@AOL.COM

CAMPGROUND ROAD STORAGE
CAMPGROUND ROAD, DENVER, NC 28037
SITE DETAILS

REVISIONS

PROJECT NO.: 2016.12
SCALE: N=80'
DRAWN BY: MSL
CHECKED BY: J.LW

SHEET NO.:
C3.0



Know what's below.
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1612-det.dwg

COMMON MAINTENANCE ISSUES FOR SAND FILTERS

Sand filters should be inspected at least once per month, and after any large storm events to check for damage. They must be maintained as needed to remove visible surface sediment accumulation, trash, debris, and leaf litter to prevent the filter from clogging prematurely. Sediment should be cleaned out of the forebay/sedimentation chamber when it accumulates to a depth of more than 6 inches. Any structures (outlets, flow diversions, embankments, etc.) should be checked at least annually for damage or degradation. When filtering capacity diminishes substantially (e.g., when water ponds on the surface for more than 40 hours), remedial actions must be taken. One possible cause of this problem is that collection pipe systems have become clogged. Annual flushing of pipe cleanouts is recommended to facilitate unclogging of the pipes without disturbing the filter area. If the water still ponds above the sand filter bed for more than 40 hours, the top few inches of media should be removed and replaced with fresh media. The removed sediments should be disposed of in an acceptable manner (e.g., landfill). If the problem still persists, more extensive rebuilding is required.

Latham-Walters Engineering, Inc.

PROJECT: Campground Road Storage

Date: 5/17/16

By: Mitch Latham, P.E.

Engineer's Opinion of Probable Costs for New Sand Filter BMP

| Item # | Description | Quantity | Unit | Unit Cost | Total Cost |
|--------|--|----------|----------------------------------|------------|-------------------|
| 1 | Excavation & grading | 328 | CY | \$4.50 | \$1,476.00 |
| 2 | Masonry Sand | 31 | CY | \$42.00 | \$1,302.00 |
| 3 | 6" PVC Underdrain w/ filter fabric & stone | 130 | L.F. | \$10.00 | \$1,300.00 |
| 4 | Precast Drop Inlet Structure | 1 | Ea. | \$2,500.00 | \$2,500.00 |
| 5 | 15" RCP | 26 | L.F. | \$25.00 | \$650.00 |
| 6 | Rip-Rap | 1 | L.S. | \$500.00 | \$500.00 |
| | | | Cost | | \$7,728.00 |
| | | | 10% Contingency | | \$772.80 |
| | | | Total Cost | | \$8,500.80 |
| | | | 15% of Construction Costs | | \$1,275.12 |

Estimated Cost for 20 Year Maintenance

| Item # | Description | Times/yr | Unit Cost/time | Total Cost |
|--------|-------------------------------|----------|----------------------------------|-------------------|
| 1 | Remove sediment from Forebays | 2 | \$50.00 | \$100.00 |
| 2 | Clean Sand surface | 4 | \$50.00 | \$200.00 |
| 3 | Flush Underdrain | 1 | \$50.00 | \$50.00 |
| 4 | Freshen Sand | 0.25 | \$200.00 | \$50.00 |
| | | | Cost | \$400.00 |
| | | | 20 Year Maintenance Total | \$8,000.00 |