



526 South Church Street
Charlotte, NC 28202

Mailing Address
Mail Code EC13K
P.O. Box 1006
Charlotte, NC 28201-1006

August 7, 2012

Mr. Larry Frost
North Carolina Department of Environment
and Natural Resources (NCDENR)
Division of Waste Management - Solid Waste Section
Asheville Regional Office
2090 U.S. Highway 70
Swannanoa, North Carolina 28778

Re: Belews Creek Steam Station
Pine Hall Road Landfill Cover Repairs

Dear Mr. Frost:

As discussed by telephone, some erosion has occurred in the area of the downhill anchor trench at the Pine Hall Road Landfill located at the Duke Energy Belews Creek Steam Station. It is the opinion of the design engineer (S&ME) that this erosion is caused by insufficient capacity in the anchor trench drainage system. The engineer has completed design modifications, and Duke Energy has engaged a contractor to effect the necessary repairs. Work is expected to begin on the repairs as quickly as contracts can be finalized and the contractor can mobilize. It is anticipated that the work will be completed in late September.

If you have any questions concerning this site, please contact me at (980) 373-3719 or by e-mail at ed.sullivan@duke-energy.com.

Sincerely,

D. Edwin M. Sullivan, P.E.
Waste Management & Remediation

Permit No.	Scan Date	DIN
8503-INDUS-1984	August 9, 2012	17013

RECEIVED
August 7, 2012
Solid Waste Section
Asheville Regional Office

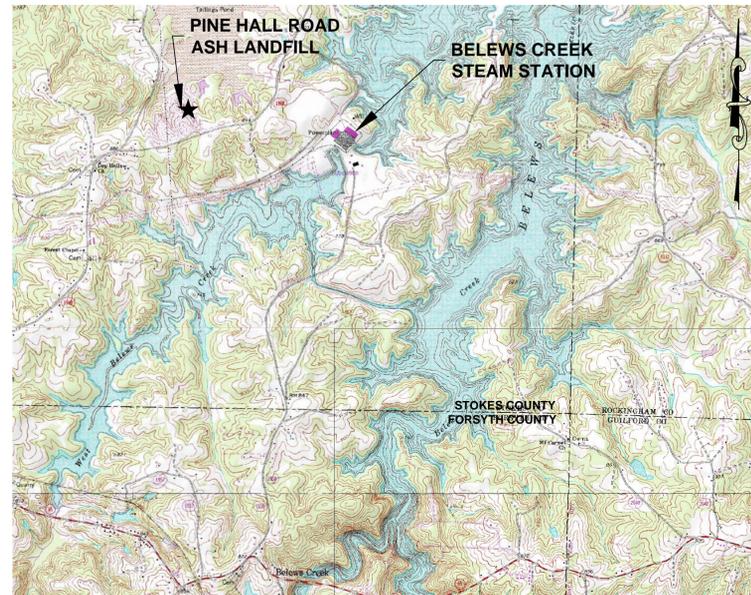
cc: Kim Hutchinson

PINE HALL ROAD ASH LANDFILL CLOSURE COVER SYSTEM RETROFIT JULY 2012 REVISION

DUKE ENERGY - BELEWS CREEK STEAM STATION BELEWS CREEK, NORTH CAROLINA



LOCATION / S&ME OFFICE MAP
NOT TO SCALE



SITE VICINITY MAP
NOT TO SCALE

INDEX OF DRAWINGS

DRAWING	TITLE
C0	TITLE SHEET
C1	2008 EXISTING SITE CONDITIONS
C2	PROPOSED RETROFIT AND MAINTENANCE PLAN COMPLETED 2011
C3	PROPOSED PERIMETER DRAIN PLAN
D1	PROPOSED PERIMETER DRAIN DETAILS
D2	E & S CONTROL DETAILS 1
D3	E & S CONTROL DETAILS 2
D4	DOWN DRAIN RETROFIT
D5	PERIMETER DRAIN & CHANNEL DETAILS 1
D6	PERIMETER DRAIN & CHANNEL DETAILS 2

REVISION 1 : PERIMETER OUTLET REVISIONS, JULY 2012

-ISSUED FOR CONSTRUCTION-

S&ME PROJECT NO.
1356-07-017 PHASE 5



9751 SOUTHERN PINE BLVD.
CHARLOTTE, N.C. 28273
(704)523-4726

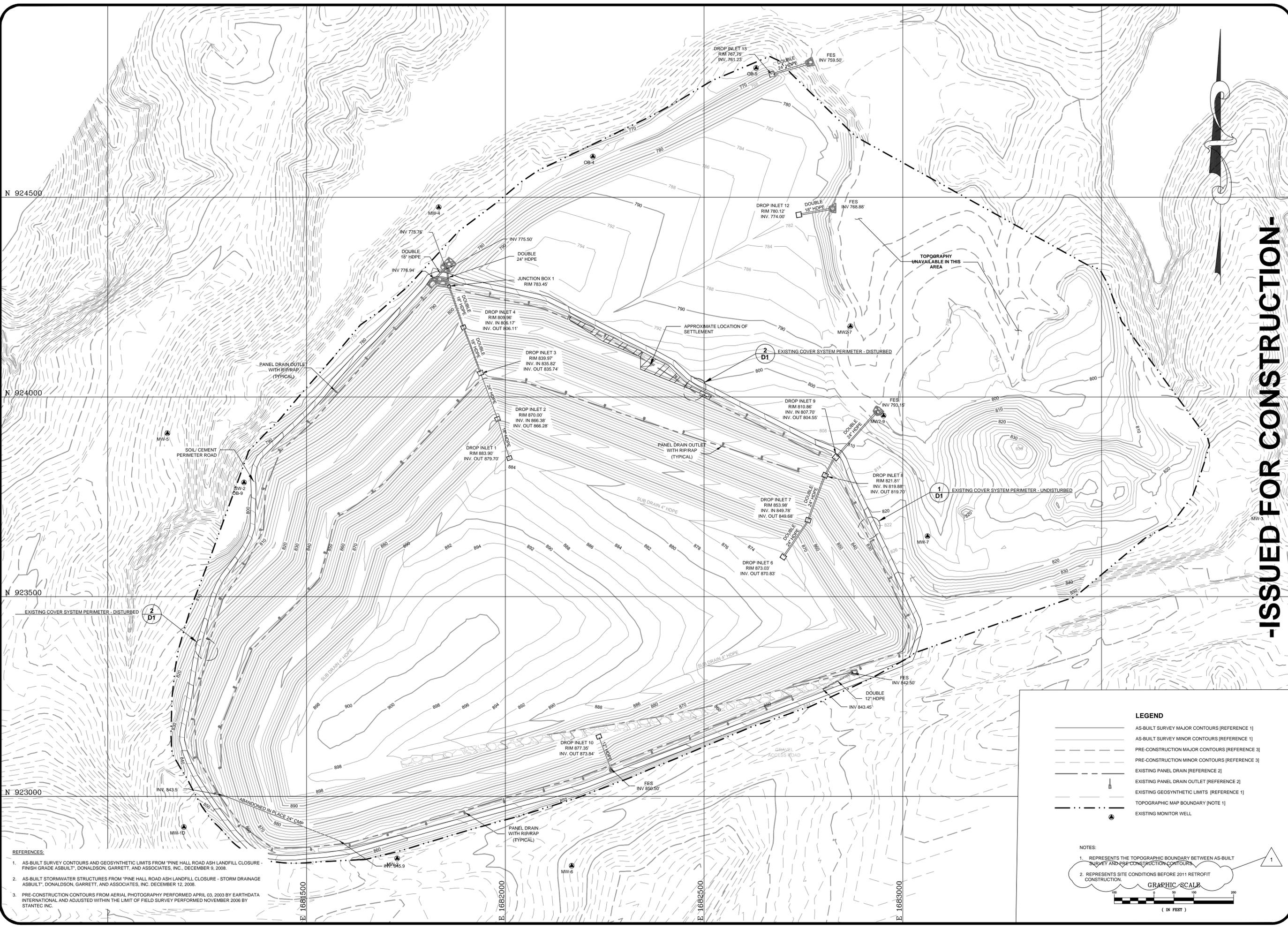


NO.	DATE	DESCRIPTION	BY
2	8-6-12	RE-ISSUED FOR CONSTRUCTION	JJA
1	7-26-12	PERIMETER OUTLET REVISIONS	JJA
0	6-6-11	ISSUED FOR CONSTRUCTION	KRD

TITLE SHEET	PINE HALL ROAD ASH LANDFILL RETROFIT
BELEWS CREEK STEAM STATION	BELEWS CREEK, NORTH CAROLINA

ENGINEERING LICENSE NO: F-0176	
DRAWN BY: CLD	CHECKED BY: KRD
DESIGNED BY: CHR	APPROVED BY:
PROJECT NUMBER 1356-07-017	
DUKE ENERGY DRAWING NUMBER BC-1039-05.00	
SCALE: AS SHOWN	DATE: 7-26-12
DRAWING: C0	OF: 9

DRAWING DATE



-ISSUED FOR CONSTRUCTION-

LEGEND

- AS-BUILT SURVEY MAJOR CONTOURS [REFERENCE 1]
- AS-BUILT SURVEY MINOR CONTOURS [REFERENCE 1]
- PRE-CONSTRUCTION MAJOR CONTOURS [REFERENCE 3]
- PRE-CONSTRUCTION MINOR CONTOURS [REFERENCE 3]
- EXISTING PANEL DRAIN [REFERENCE 2]
- EXISTING PANEL DRAIN OUTLET [REFERENCE 2]
- EXISTING GEOSYNTHETIC LIMITS [REFERENCE 1]
- TOPOGRAPHIC MAP BOUNDARY [NOTE 1]
- EXISTING MONITOR WELL

NOTES:

- REPRESENTS THE TOPOGRAPHIC BOUNDARY BETWEEN AS-BUILT SURVEY AND PRE-CONSTRUCTION CONTOURS.
- REPRESENTS SITE CONDITIONS BEFORE 2011 RETROFIT CONSTRUCTION.

GRAPHIC SCALE

(IN FEET)

REFERENCES:

- AS-BUILT SURVEY CONTOURS AND GEOSYNTHETIC LIMITS FROM "PINE HALL ROAD ASH LANDFILL CLOSURE - FINISH GRADE AS-BUILT", DONALDSON, GARRETT, AND ASSOCIATES, INC. DECEMBER 9, 2008.
- AS-BUILT STORMWATER STRUCTURES FROM "PINE HALL ROAD ASH LANDFILL CLOSURE - STORM DRAINAGE AS-BUILT", DONALDSON, GARRETT, AND ASSOCIATES, INC. DECEMBER 12, 2008.
- PRE-CONSTRUCTION CONTOURS FROM AERIAL PHOTOGRAPHY PERFORMED APRIL 03, 2003 BY EARTHDATA INTERNATIONAL AND ADJUSTED WITHIN THE LIMIT OF FIELD SURVEY PERFORMED NOVEMBER 2006 BY STANTEC INC.

9765 SOUTHERN PINE BLVD.
CHARLOTTE, N.C. 28273
(704)623-4726

WWW.SMEINC.COM

NO.	DATE	DESCRIPTION	BY
2	8-6-12	RE-ISSUED FOR CONSTRUCTION	JJA
1	7-26-12	PERIMETER OUTLET REVISIONS	JJA
0	6-6-11	ISSUED FOR CONSTRUCTION	KRD

2008 SITE CONDITIONS

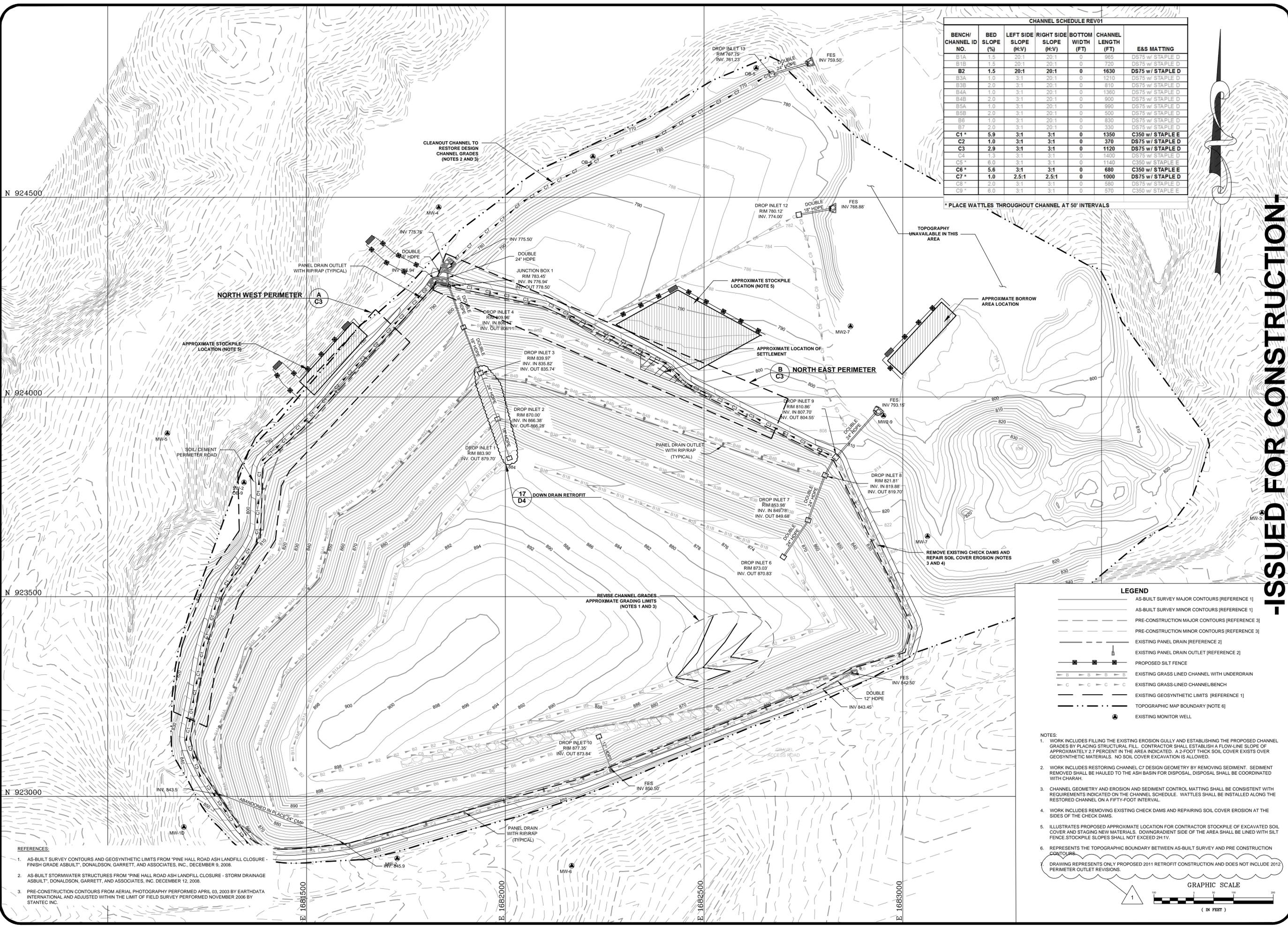
PINE HALL ROAD ASH LANDFILL RETROFIT

BELEWS CREEK STEAM STATION

BELEWS CREEK, NORTH CAROLINA

ENGINEERING LICENSE NO: F-0176	CHECKED BY: KRD
DRAWN BY: CLD	APPROVED BY:
DESIGNED BY: CHR	
PROJECT NUMBER 1356-07-017	
DUKE ENERGY DRAWING NUMBER BC-1039-06.00	
SCALE: AS SHOWN	DATE: 7-2-12
DRAWING: C1	OF: 9

DRAWING PATH: Q:\ISSUES\ENERGY\07-017\Pinhall\BC-1039-06.dwg

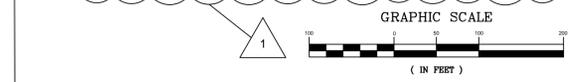


CHANNEL SCHEDULE REV01						
BENCH/CHANNEL NO.	BED SLOPE (%)	LEFT SIDE SLOPE (H:V)	RIGHT SIDE SLOPE (H:V)	BOTTOM WIDTH (FT)	CHANNEL LENGTH (FT)	E&S MATTING
B1A	1.5	20:1	20:1	0	985	DS75 w/ STAPLE D
B1B	1.5	20:1	20:1	0	720	DS75 w/ STAPLE D
B2	1.5	20:1	20:1	0	1630	DS75 w/ STAPLE D
B3A	1.0	3:1	20:1	0	1210	DS75 w/ STAPLE D
B3B	2.0	3:1	20:1	0	810	DS75 w/ STAPLE D
B4A	1.0	3:1	20:1	0	1360	DS75 w/ STAPLE D
B4B	2.0	3:1	20:1	0	960	DS75 w/ STAPLE D
B5A	1.0	3:1	20:1	0	990	DS75 w/ STAPLE D
B5B	2.0	3:1	20:1	0	590	DS75 w/ STAPLE D
B6	1.0	3:1	20:1	0	830	DS75 w/ STAPLE D
B7	2.0	3:1	20:1	0	330	DS75 w/ STAPLE D
C1 *	5.9	3:1	3:1	0	1350	C350 w/ STAPLE E
C2	1.0	3:1	3:1	0	370	DS75 w/ STAPLE D
C3	2.9	3:1	3:1	0	1120	DS75 w/ STAPLE D
C4	1.3	3:1	3:1	0	1400	DS75 w/ STAPLE D
C5 *	6.0	3:1	3:1	0	1140	C350 w/ STAPLE E
C6 *	5.6	3:1	3:1	0	680	C350 w/ STAPLE E
C7 *	1.0	2.5:1	2.5:1	0	1000	DS75 w/ STAPLE D
C8 *	2.0	3:1	3:1	0	580	DS75 w/ STAPLE D
C9 *	6.0	3:1	3:1	0	570	C350 w/ STAPLE E

* PLACE WATTLES THROUGHOUT CHANNEL AT 50' INTERVALS

LEGEND	
	AS-BUILT SURVEY MAJOR CONTOURS [REFERENCE 1]
	AS-BUILT SURVEY MINOR CONTOURS [REFERENCE 1]
	PRE-CONSTRUCTION MAJOR CONTOURS [REFERENCE 3]
	PRE-CONSTRUCTION MINOR CONTOURS [REFERENCE 3]
	EXISTING PANEL DRAIN [REFERENCE 2]
	EXISTING PANEL DRAIN OUTLET [REFERENCE 2]
	PROPOSED SILT FENCE
	EXISTING GRASS-LINED CHANNEL WITH UNDERDRAIN
	EXISTING GRASS-LINED CHANNEL/BENCH
	EXISTING GEOSYNTHETIC LIMITS [REFERENCE 1]
	TOPOGRAPHIC MAP BOUNDARY [NOTE 6]
	EXISTING MONITOR WELL

- NOTES:
- WORK INCLUDES FILLING THE EXISTING EROSION GULLY AND ESTABLISHING THE PROPOSED CHANNEL GRADES BY PLACING STRUCTURAL FILL. CONTRACTOR SHALL ESTABLISH A FLOW-LINE SLOPE OF APPROXIMATELY 2.7 PERCENT IN THE AREA INDICATED. A 2' THICK SOIL COVER EXISTS OVER GEOSYNTHETIC MATERIALS. NO SOIL COVER EXCAVATION IS ALLOWED.
 - WORK INCLUDES RESTORING CHANNEL C7 DESIGN GEOMETRY BY REMOVING SEDIMENT. SEDIMENT REMOVED SHALL BE HAULED TO THE ASH BASIN FOR DISPOSAL. DISPOSAL SHALL BE COORDINATED WITH CHARAH.
 - CHANNEL GEOMETRY AND EROSION AND SEDIMENT CONTROL MATTING SHALL BE CONSISTENT WITH REQUIREMENTS INDICATED ON THE CHANNEL SCHEDULE. WATTLES SHALL BE INSTALLED ALONG THE RESTORED CHANNEL ON A FIFTY-FOOT INTERVAL.
 - WORK INCLUDES REMOVING EXISTING CHECK DAMS AND REPAIRING SOIL COVER EROSION AT THE SIDES OF THE CHECK DAMS.
 - ILLUSTRATES PROPOSED APPROXIMATE LOCATION FOR CONTRACTOR STOCKPILE OF EXCAVATED SOIL COVER AND STAGING NEW MATERIALS. DOWN-SLOPE SIDE OF THE AREA SHALL BE LINED WITH SILT FENCE. STOCKPILE SLOPES SHALL NOT EXCEED 2H:1V.
 - REPRESENTS THE TOPOGRAPHIC BOUNDARY BETWEEN AS-BUILT SURVEY AND PRE CONSTRUCTION CONTOURS.
- DRAWING REPRESENTS ONLY PROPOSED 2011 RETROFIT CONSTRUCTION AND DOES NOT INCLUDE 2012 PERIMETER OUTLET REVISIONS.



-ISSUED FOR CONSTRUCTION-

N 924500
N 924000
N 923500
N 923000

E 1681500
E 1682000
E 1682500
E 1683000

- REFERENCES:
- AS-BUILT SURVEY CONTOURS AND GEOSYNTHETIC LIMITS FROM "PINE HALL ROAD ASH LANDFILL CLOSURE - FINISH GRADE ASBUILT", DONALDSON, GARRETT, AND ASSOCIATES, INC., DECEMBER 9, 2008.
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9751 SOUTHERN PIKE BLD.
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(704)523-4726

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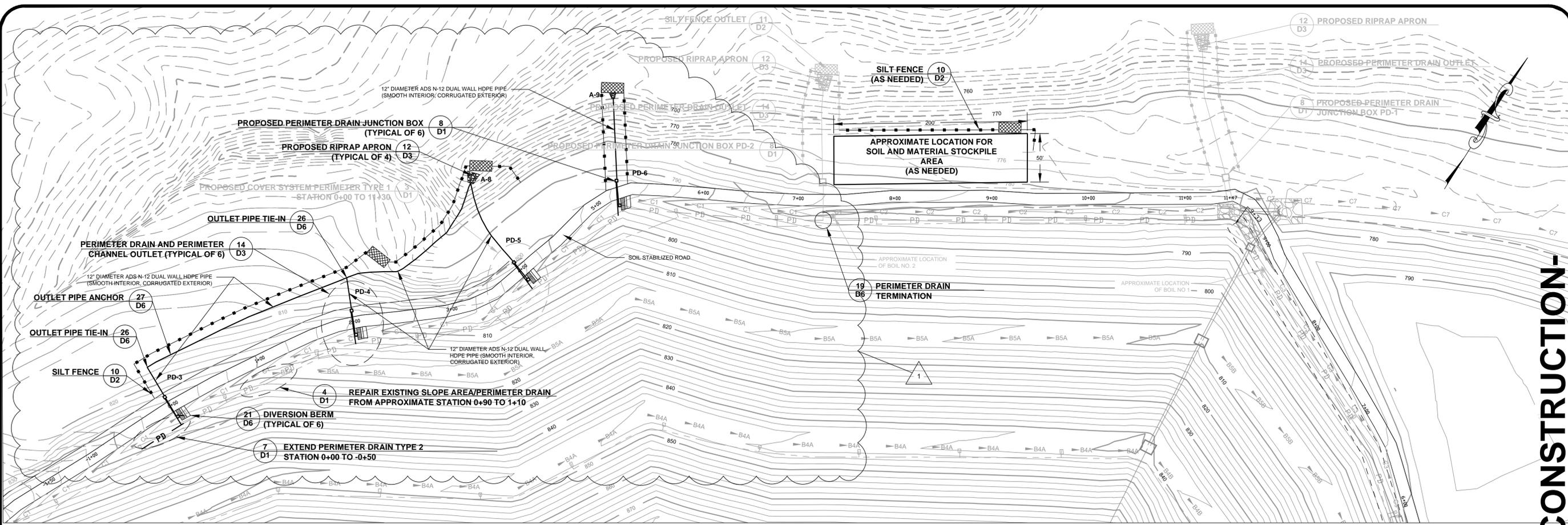
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1	7-26-12	PERIMETER OUTLET REVISIONS	JJA
0	6-6-11	ISSUED FOR CONSTRUCTION	KRD

RETROFIT AND MAINTENANCE PLAN
COMPLETED 2011
PINE HALL ROAD ASH LANDFILL RETROFIT

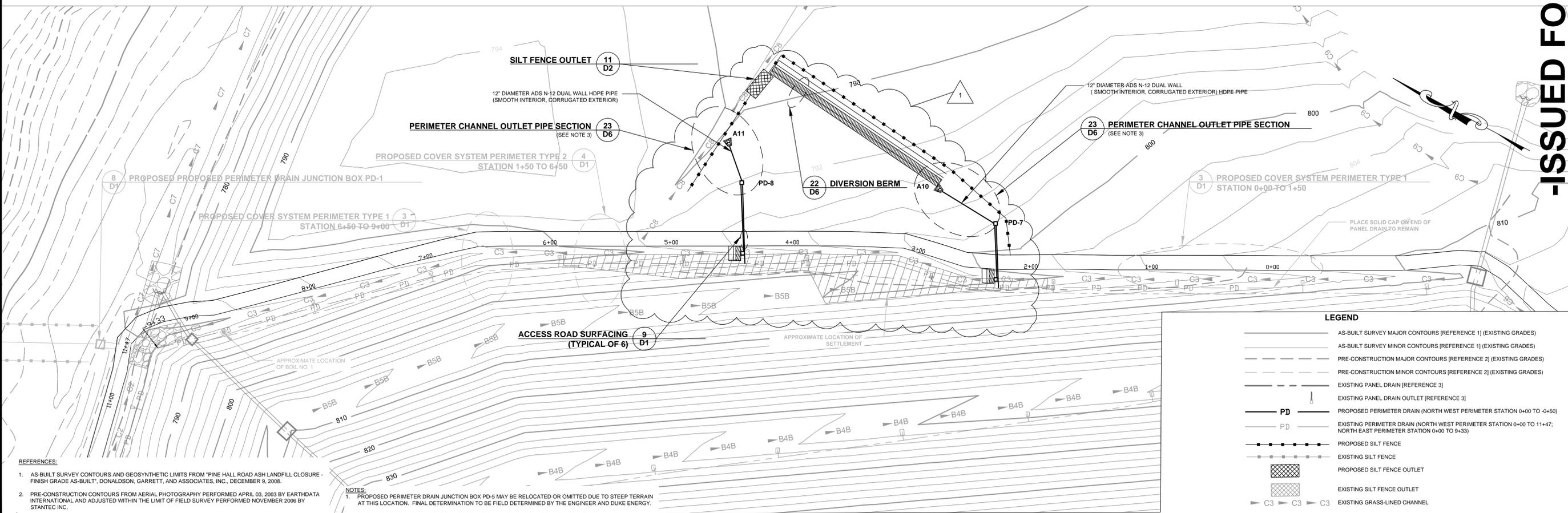
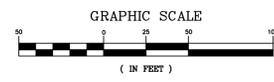
BELEWS CREEK STEAM STATION
BELEWS CREEK, NORTH CAROLINA

ENGINEERING LICENSE NO: F-0176	CHECKED BY: KRD
DRAWN BY: CLD	APPROVED BY: KRD
DESIGNED BY: CHR	PROJECT NUMBER: 1356-07-017
DUKE ENERGY DRAWING NUMBER: BC-1039-07.00	SCALE: AS SHOWN
DRAWING DATE: 7-2-12	DATE: 7-2-12
DRAWING NO: C2	OF: 9

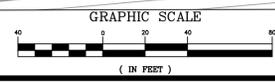
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A NORTH WEST PERIMETER
C3 SCALE: 1"=50'



B NORTH EAST PERIMETER
C3 SCALE: 1"=40'



LEGEND

	AS-BUILT SURVEY MAJOR CONTOURS (REFERENCE 1) (EXISTING GRADES)
	AS-BUILT SURVEY MINOR CONTOURS (REFERENCE 1) (EXISTING GRADES)
	PRE-CONSTRUCTION MAJOR CONTOURS (REFERENCE 2) (EXISTING GRADES)
	PRE-CONSTRUCTION MINOR CONTOURS (REFERENCE 2) (EXISTING GRADES)
	EXISTING PANEL DRAIN (REFERENCE 3)
	EXISTING PANEL DRAIN OUTLET (REFERENCE 3)
	PROPOSED PERIMETER DRAIN (NORTH WEST PERIMETER STATION 0+00 TO 0+50)
	EXISTING PERIMETER DRAIN (NORTH WEST PERIMETER STATION 0+00 TO 11+47; NORTH EAST PERIMETER STATION 0+00 TO 9+33)
	PROPOSED SILT FENCE
	EXISTING SILT FENCE
	PROPOSED SILT FENCE OUTLET
	EXISTING SILT FENCE OUTLET
	EXISTING GRASS-LINED CHANNEL
	DIVERSION BERM
	EROSION CONTROL MATTING

- REFERENCES:**
- AS-BUILT SURVEY CONTOURS AND GEOSYNTHETIC LIMITS FROM "PINE HALL ROAD ASH LANDFILL CLOSURE - FINISH GRADE AS-BUILT", DONALDSON, GARRETT, AND ASSOCIATES, INC., DECEMBER 9, 2008.
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 - AS-BUILT STORMWATER STRUCTURES FROM "PINE HALL ROAD ASH LANDFILL CLOSURE - STORM DRAINAGE AS-BUILT", DONALDSON, GARRETT, AND ASSOCIATES, INC. DECEMBER 12, 2008.

- NOTES:**
- PROPOSED PERIMETER DRAIN JUNCTION BOX PD-5 MAY BE RELOCATED OR OMITTED DUE TO STEEP TERRAIN AT THIS LOCATION. FINAL DETERMINATION TO BE FIELD DETERMINED BY THE ENGINEER AND DUKE ENERGY.
 - SILT FENCE TO BE INSTALLED DOWNGRADE OF JUNCTION BOX LOCATION (PD-3 THROUGH PD-8)
 - OVEREXCAVATION AND COMPACTED SOIL FILL LIMITS TO BE FIELD DETERMINED.

-ISSUED FOR CONSTRUCTION-



975 SOUTHERN PINE BLVD.
CHARLOTTE, NC 28273
(704)523-4726



NO.	DATE	DESCRIPTION	BY
2	8-6-12	RE-ISSUED FOR CONSTRUCTION	JJA
1	7-26-12	PERIMETER OUTLET REVISIONS	JJA
0	6-6-11	ISSUED FOR CONSTRUCTION	KRD

PROPOSED PERIMETER DRAIN PLAN
PINE HALL ROAD ASH LANDFILL RETROFIT
BELEWS CREEK STEAM STATION
BELEWS CREEK, NORTH CAROLINA

ENGINEERING LICENSE NO: F-0176	CHECKED BY: KRD
DRAWN BY: CLD	APPROVED BY: CHR
DESIGNED BY: CHR	DATE: 7-26-12
PROJECT NUMBER: 1356-07-017	DUKE ENERGY DRAWING NUMBER: BC-1039.08.00
SCALE: AS SHOWN	DATE: 7-26-12
DRAWING: C3	OF: 9

DRAWING PATH: Q:\TSM\DUKE ENERGY\07-017\Perimeter Ret-C3A_08092012.dwg (PDR FOR CONSTRUCTION) (REVISED) - PROPOSED DRAIN PLAN.dwg

DEFINITION

Controlling runoff and erosion on disturbed areas by establishing perennial vegetative cover with seed.

PURPOSE

To reduce erosion and decrease sediment yield from disturbed areas, and to permanently stabilize such areas in a manner that is economical, adapts to site conditions, and allows selection of the most appropriate plant materials.

SPECIFICATIONS

SEEDBED REQUIREMENTS

Establishment of vegetation should not be attempted on sites that are unsuitable due to excessive soil compaction, inappropriate soil texture, poor drainage, concentrated overland flow, or steepness of slope until measures have been taken to correct these problems.

To maintain a good stand of vegetation, the soil must meet certain minimum requirements as a growth medium. The existing soil should have these criteria:

- Enough fine-grained (silt and clay) material to maintain adequate moisture and nutrient supply (available water capacity of at least .05 inches water to 1 inch of soil).
- Sufficient pore space to permit root penetration.
- Sufficient depth of soil to provide an adequate root zone. The depth to rock or impermeable layers such as hardpans should be 12 inches or more, except on slopes steeper than 2:1 where the addition of soil is not feasible.
- A favorable pH range for plant growth, usually 6.0 - 6.5.
- Free from large roots, branches, stones, large clods of earth, or trash of any kind. Clods and stones may be left on slopes steeper than 3:1 if they are to be hydro seeded.

If any of the above criteria are not met - i.e., if existing soil is too coarse, dense, shallow or acidic to foster vegetation - special amendments are required. The soil conditions described below may be beneficial or, preferably, topsoil may be applied.

SEEDBED PREPARATION

Install necessary mechanical erosion and sedimentation control practices before seeding, and complete grading according to the approved plan.

Lime and fertilizer needs should be determined by soil tests. Directions, sample cartons, and information sheets are available through county Agricultural Extension offices. Testing is also done by commercial laboratories.

When soil tests results are not available, follow rates suggested in the seeding specifications shown at right. Application rates usually fall into the following ranges:

- Ground agricultural limestone: Light-textured, sandy soils: 1 to 1-1/2 tons/acre
- Heavy-textured, clayey soils: 2-3 tons/acre
- Fertilizer: Grasses: 800-1200 lb/acre of 10-10-10 (or the equivalent)
- Grass-legume mixtures: 800-1200 lb/acre of 5-10-10 (or the equivalent)

Apply lime and fertilizer evenly and incorporate into the top 4-6 inches of soil by disking or other suitable means. Operate machinery on the contour. When using a hydro seeder, apply lime and fertilizer to a rough, loose surface.

Roughen surfaces prior to seeding.

Complete seedbed preparation by breaking up large clods and raking into a smooth, uniform surface (slopes less than 3:1). Fill in or level depressions that can collect water. Broadcast seed into a freshly loosened seedbed that has not been sealed by rainfall.

SEEDING

Seeding dates given in the seeding mixture specifications are designated as "best" or "possible". Seedings properly carried out within the "best" dates have a high probability of success. It is also possible to have satisfactory establishment when seeding outside these dates. However, as you deviate from them, the probability of failure increases rapidly. Seeding on the last date shown under "possible" may reduce changes of success by 30-50%. Always take this into account in scheduling land-disturbing activities.

Use certified seed for permanent seeding whenever possible.

Labeling of non-certified seed is also required by law. Labels contain important information on seed purity, germination, and presence of weed seeds. Seeds must meet State standards for content of noxious weeds. Do not accept seed containing "prohibited" noxious weed seed.

Inoculate legume seed with the Rhizobium bacteria appropriate to the species of legume.

Apply seed uniformly with a cyclone seeder, drop-type spreader, drill, cultipacker seeder, or hydro seeder on a firm, friable seedbed.

When using a drill or cultipacker seeder, plant small grains no more than 1 inch deep, grasses and legumes no more than 1/2 inch. Equipment should be calibrated in the field for the desired seeding rate.

When using broadcast-seeding methods, subdivide the area into workable sections and determine the amount of seed needed for each section. Apply one-half the seed while moving back and forth across the area, making a uniform pattern; then apply the second half in the same way, but moving at right angles to the first pass.

Mulch all plantings immediately after seeding.

HYDRO SEEDING

Surface roughening is particularly important when hydro seeding, as a roughened slope will provide some natural coverage for lime, fertilizer, and seed. The surface should not be compacted or smooth. Fine seedbed preparation is not necessary for hydro seeding operations: large clods, stones, and irregularities provide cavities in which seeds can lodge.

Rate of wood fiber (cellulose) application should be at least 2,000 lb/acre.

Apply legume inoculants at four times the recommended rate when adding inoculant to a hydro seeder slurry.

If a machinery breakdown of 1/2 to 2 hours occurs, add 50% more seed to the tank, based on the proportion of the slurry remaining. This should compensate for damage to seed. Beyond 2 hours, a full rate of new seed may be necessary.

Lime is not normally applied with a hydraulic seeder because it is abrasive. It can be blown onto steep slopes in dry form.

MAINTENANCE

Generally, a stand of vegetation cannot be determined to be fully established until soil cover has been maintained for one full year from planting. Inspect seeded areas for failure and make necessary repairs and reseeding within the same season, if possible.

Reseeding--If a stand has inadequate cover, re-evaluate choice of plant materials and quantities of lime and fertilizer. Re-establish the stand after seedbed preparation or over-seed the stand. Consider seeding temporary, annual species if the time of year is not appropriate for permanent seeding.

If vegetation fails to grow, soil must be tested to determine if acidity or nutrient imbalance is responsible.

Fertilization--On the typical disturbed site, full establishment usually requires re-fertilization in the second growing season. Fine turf requires annual maintenance fertilization. Use soil tests if possible or follow the guidelines given for the specific seeding mixture.

TEMPORARY SEEDING SPECIFICATIONS

Ground stabilization shall be performed within 7 calendar days on perimeter areas and slopes greater than 3h:1v. Ground stabilization shall be performed within 14 calendar days in other areas.

Seeding mixture (fall)

Species*	Rate (lb/acre)
Rye Grain (<i>Secale cereale</i>)	120

Seeding Mixture (late winter early spring)

Species*	Rate (lb/acre)
Rye Grain (<i>Secale cereale</i>)	120
Annual (Korean) Lespedeza (<i>Kummerowia stipulacea</i>)	50

Seeding mixture (summer)

Species*	Rate (lb/acre)
German Millet (<i>Setaria italica</i>)	40

Seeding dates (Piedmont)

Fall:	Aug. 15 - Dec. 30
Late winter (early spring):	Jan. 1 - May 1 Late
Summer:	May 1 - Aug. 15

Soil amendments

Follow recommendations of soil tests or apply 2,000 lb/acre ground agricultural limestone and 750 lb/acre 10-10-10 fertilizer.

Mulch

Apply 4,000 lb/acre straw. Anchor mulch by tacking with asphalt, roving or a mulch anchoring tool. A disk with blades set nearly straight can be used as a mulch anchoring tool.

Maintenance

Re-fertilize if growth is not fully adequate. Reseed, re-fertilize and mulch immediately following erosion or other damage.

*REF: 6.10 A,B and C, NC Erosion and Sediment Control Planning and Design Manual, 2006

PERMANENT SEEDING SPECIFICATIONS

Ground stabilization shall be performed within 7 calendar days on perimeter areas and slopes greater than 3h:1v. Ground stabilization shall be performed within 14 calendar days in other areas.

Seeding mixture

Species*	Rate (lb/acre)
Tall fescue (<i>Festuca arundinacea</i>) (Grass lined Channels)	200
Tall fescue (<i>Festuca arundinacea</i>) (Other Areas)	100

Nurse plants

Between May 1 and Aug. 15, add 10 lb/acre German millet (*Setaria italica*) or 15 lb/acre Sudan grass. Prior to May 1 or after Aug. 15, add 40 lb/acre Rye Grain (*Festuca arundinacea*).

Seeding dates

	Best	Possible
Fall:	Aug. 25 - Sept. 15	Aug. 20 - Oct. 25
Late winter:	Feb. 15 - Mar. 21	Feb. 1 - Apr. 15

Fall is best for tall fescue (*Festuca arundinacea*) and late winter or summer for lespedeza. Over seeding of Kobe lespedeza (*Kummerowia striata*) over fall-seeded tall fescue is very effective.

Soil amendments

Apply lime and fertilizer according to soil tests, or apply 4,000 lb/acre ground agricultural limestone and 1,000 lb/acre 10-10-10 fertilizer.

Mulch

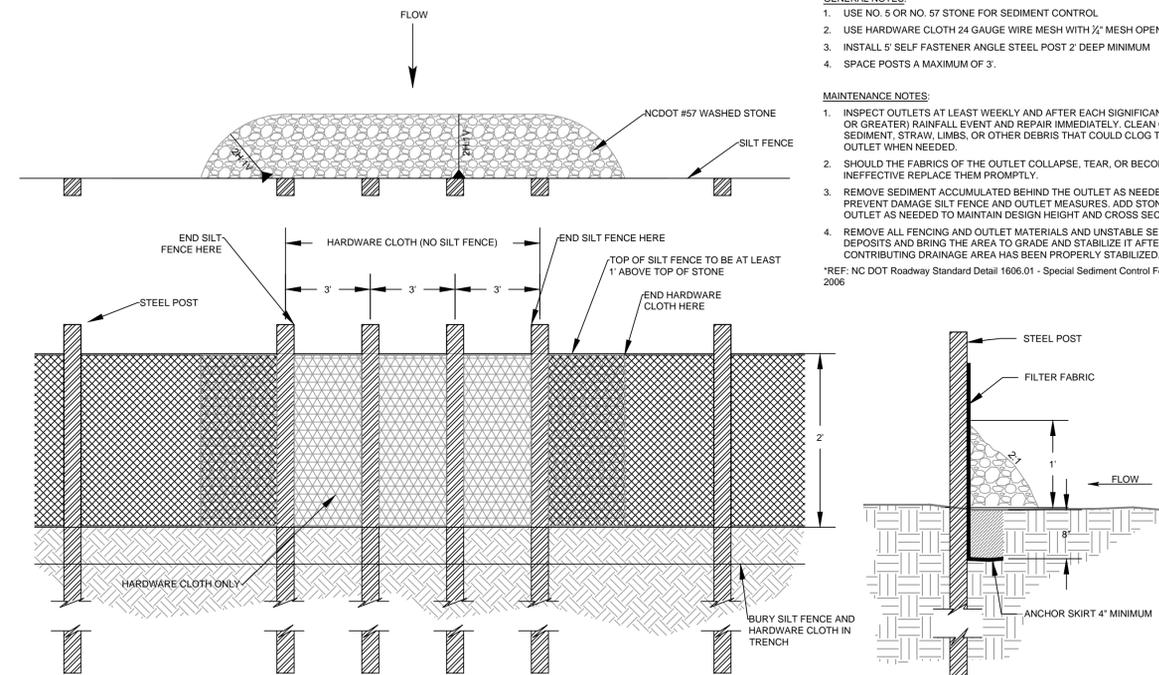
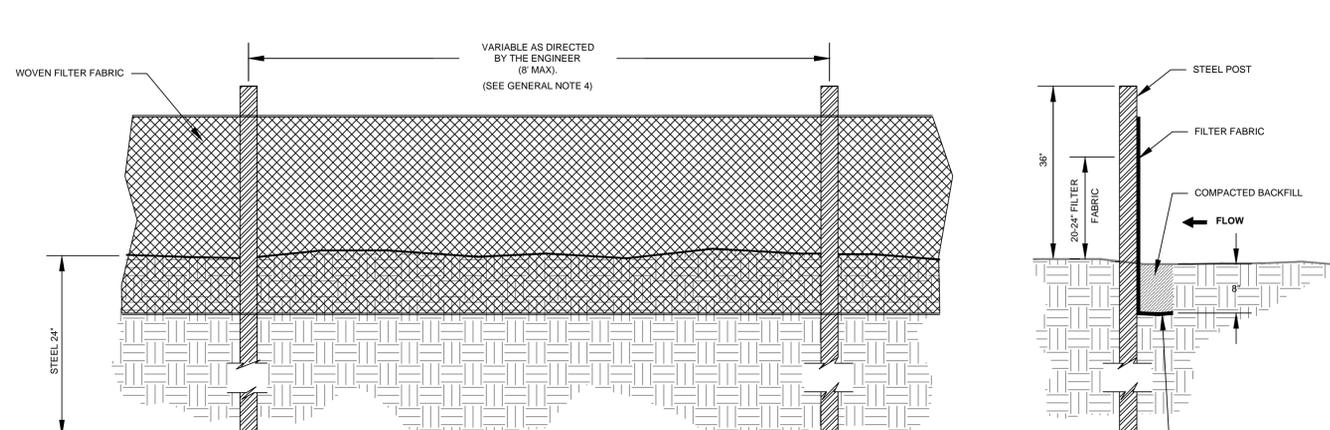
Apply 4,000-5,000 lb/acre grain straw or equivalent cover of another suitable mulching material. Anchor mulch by tacking with asphalt, roving, or netting. Netting is the preferred anchoring method on steep slopes.

Maintenance

Re-fertilize in the second year unless growth is fully adequate. May be mowed once or twice a year, but mowing is not necessary. Reseed, fertilize, and mulch damaged areas immediately.

*REF: 6.11 NC Erosion and Sediment Control Planning and Design Manual, 2006

GENERAL SEEDING SPECIFICATIONS



- GENERAL NOTES:**
1. PREFABRICATED SILT FENCE IS NOT ACCEPTABLE ON THIS PROJECT.
 2. STEEL POSTS SHALL BE USED ON THIS PROJECT INSTEAD OF WOOD POSTS. STEEL POSTS SHALL BE 5'-0" IN HEIGHT AND BE OF THE SELF-FASTENER ANGLE STEEL TYPE.
 3. WOVEN FILTER FABRIC SHALL BE USED WHERE SILT FENCE IS TO REMAIN FOR A PERIOD OF MORE THAN 30 DAYS. FILTER FABRIC FENCE SHALL BE A MINIMUM OF 32" IN WIDTH AND SHALL HAVE A MINIMUM OF 6 LINE WIRES WITH 12" STAY SPACING.
 4. SILT FENCE SHALL BE STANDARD STRENGTH FILTER FABRIC WITH WIRE MESH REINFORCEMENT OR EXTRA STRENGTH FILTER FABRIC. WHEN FABRIC IS USED WITH WIRE MESH, 8" CENTERED POSTS MAY BE USED. OMISSION OF THE REINFORCING WIRE IS A CONSTRUCTION CHANGE THAT NECESSITATES MORE POSTS FOR SUPPORT (IE. THE SPACING DISTANCE NEEDS TO BE REDUCED TO NO GREATER THAN SIX (6) FEET APART).
 5. TURN SILT FENCE UP SLOPE AT ENDS.
 6. THE USE OF SILT FENCE IN AREAS OF CONCENTRATED FLOW IS INAPPROPRIATE.

- MAINTENANCE NOTES:**
1. INSPECT SILT FENCES AT LEAST ONCE A WEEK AND AFTER EACH SIGNIFICANT (0.5" OR GREATER) RAINFALL. MAKE ANY REQUIRED REPAIRS IMMEDIATELY.
 2. SHOULD THE FABRIC OF A SILT FENCE COLLAPSE, TEAR, DECOMPOSE OR BECOME INEFFECTIVE, REPLACE IT IMMEDIATELY.
 3. REMOVE SEDIMENT DEPOSITS AS NECESSARY TO PROVIDE ADEQUATE STORAGE VOLUME FOR THE NEXT RAIN AND TO REDUCE PRESSURE ON THE FENCE. TAKE CARE TO AVOID UNDERMINING THE FENCE DURING CLEANOUT.
 4. REMOVE ALL FENCING MATERIALS AND UNSTABLE SEDIMENT DEPOSITS AND BRING THE AREA TO GRADE AND STABILIZE IT AFTER THE CONTRIBUTING DRAINAGE AREA HAS BEEN PROPERLY STABILIZED.
- *REF: 6.62.7 NC Erosion and Sediment Control Planning and Design Manual, 2006

- GENERAL NOTES:**
1. USE NO. 5 OR NO. 57 STONE FOR SEDIMENT CONTROL.
 2. USE HARDWARE CLOTH 24 GAUGE WIRE MESH WITH 1/2" MESH OPENINGS.
 3. INSTALL 5' SELF FASTENER ANGLE STEEL POST 2" DEEP MINIMUM
 4. SPACE POSTS A MAXIMUM OF 3'.
- MAINTENANCE NOTES:**
1. INSPECT OUTLETS AT LEAST WEEKLY AND AFTER EACH SIGNIFICANT (0.5" OR GREATER) RAINFALL EVENT AND REPAIR IMMEDIATELY. CLEAN OUT SEDIMENT, STRAW, LIMBS, OR OTHER DEBRIS THAT COULD CLOG THE OUTLET WHEN NEEDED.
 2. SHOULD THE FABRICS OF THE OUTLET COLLAPSE, TEAR, OR BECOME INEFFECTIVE REPLACE THEM PROMPTLY.
 3. REMOVE SEDIMENT ACCUMULATED BEHIND THE OUTLET AS NEEDED TO PREVENT DAMAGE SILT FENCE AND OUTLET MEASURES. ADD STONE TO OUTLET AS NEEDED TO MAINTAIN DESIGN HEIGHT AND CROSS SECTION.
 4. REMOVE ALL FENCING AND OUTLET MATERIALS AND UNSTABLE SEDIMENT DEPOSITS AND BRING THE AREA TO GRADE AND STABILIZE IT AFTER THE CONTRIBUTING DRAINAGE AREA HAS BEEN PROPERLY STABILIZED.
- *REF: NC DOT Roadway Standard Detail 1606.01 - Special Sediment Control Fence, 2006

10 D2 SILT FENCE SCALE: 1" = 1'

11 D2 SILT FENCE OUTLET SCALE: 1" = 1'

-ISSUED FOR CONSTRUCTION-



9751 SOUTHERN PINE BLVD.
CHARLOTTE, NC 28270
(704)923-4726



NO.	DATE	DESCRIPTION	BY
2	8-6-12	RE-ISSUED FOR CONSTRUCTION	JJA
1	7-26-12	PERIMETER OUTLET REVISIONS	JJA
0	6-6-11	ISSUED FOR CONSTRUCTION	KRD

E & S CONTROL DETAILS 1
PINE HALL ROAD ASH LANDFILL RETROFIT

BELEWS CREEK STEAM STATION
BELEWS CREEK, NORTH CAROLINA

ENGINEERING LICENSE NO: F-0176	CHECKED BY: KRD
DRAWN BY: CLD	DESIGNED BY: CHR
PROJECT NUMBER: 1356-07-017	DUKE ENERGY DRAWING NUMBER: BC-1039-10.00
SCALE: AS SHOWN	DATE: 7-26-12
DRAWING: D2	OF: 9

DRAWING PATH: Q:\1356DUKE ENERGY\07-017 PineHall Ret Coal_FOSCON\02_Retire_FPRR_ISSUED FOR CONSTRUCTION\02.DWG DETAILS.dwg

DEFINITION:

A STRUCTURE DESIGNED TO CONTROL EROSION AT THE OUTLET OF A CHANNEL OR CONDUIT.

PURPOSE:

TO PREVENT EROSION AT THE OUTLET OF A CHANNEL OR CONDUIT BY REDUCING THE VELOCITY OF FLOW AND DISSIPATING THE ENERGY.

CONSTRUCTION SPECIFICATIONS:

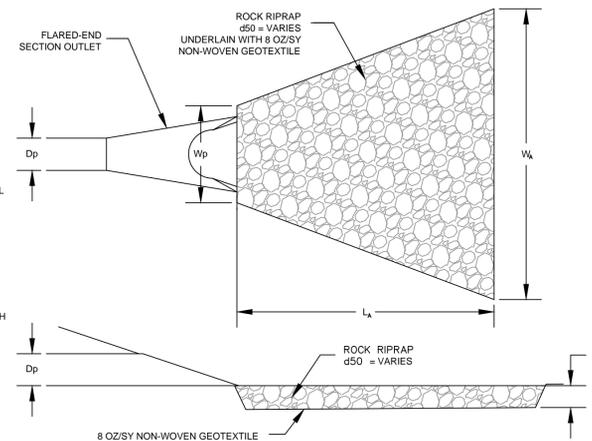
1. ENSURE THAT THE SUBGRADE FOR THE FILTER AND RIPRAP FOLLOWS THE REQUIRED LINES AND GRADES SHOWN IN THE PLAN. COMPACT ANY FILL REQUIRED IN THE SUBGRADE TO THE DENSITY OF THE SURROUNDING DISTURBED MATERIAL. LOW AREAS IN THE SUBGRADE ON UNDISTURBED SOIL MAY ALSO BE FILLED BY INCREASING THE RIPRAP THICKNESS.
2. THE RIPRAP AND GRAVEL FILTER MUST CONFORM TO THE SPECIFIED GRADING LIMITS SHOWN ON THE PLANS.
3. FILTER CLOTH, WHEN USED, MUST MEET DESIGN REQUIREMENTS AND BE PROPERLY PROTECTED FROM PUNCHING OR TEARING DURING INSTALLATION. REPAIR ANY DAMAGE BY REMOVING THE RIPRAP AND PLACING ANOTHER PIECE OF FILTER CLOTH OVER THE DAMAGED AREA. ALL CONNECTING JOINTS SHOULD OVERLAP SO THE TOP LAYER IS ABOVE THE DOWNSTREAM LAYER A MINIMUM OF 1 FT. IF THE DAMAGE IS EXTENSIVE, REPLACE THE ENTIRE FILTER CLOTH.
4. RIPRAP MAY BE PLACED BY EQUIPMENT, BUT TAKE CARE TO AVOID DAMAGING THE FILTER.
5. THE MINIMUM THICKNESS OF THE RIPRAP SHOULD BE 1.5 TIMES THE MAXIMUM STONE DIAMETER.
6. RIPRAP SHALL BE NCDOT RIPRAP CLASS AS SPECIFIED OR APPROVED EQUIVALENT. IT SHOULD BE HARD, ANGULAR, HIGHLY WEATHER-RESISTANT AND WELL GRADED.
7. CONSTRUCT THE APRON ON ZERO GRADE WITH NO OVERFILL AT THE END. MAKE THE TOP OF THE RIPRAP AT THE DOWNSTREAM END LEVEL WITH THE RECEIVING AREA OR SLIGHTLY BELOW IT.
8. ENSURE THAT THE APRON IS PROPERLY ALIGNED WITH THE RECEIVING STREAM AND PREFERABLY STRAIGHT THROUGHOUT ITS LENGTH. IF A CURVE IS NEEDED TO FIT SITE CONDITIONS, PLACE IN THE UPPER SECTION OF THE APRON.
9. IMMEDIATELY AFTER CONSTRUCTION, STABILIZE ALL DISTURBED AREAS WITH VEGETATION.

MAINTENANCE:

INSPECT RIPRAP OUTLET STRUCTURES WEEKLY AND AFTER SIGNIFICANT (0.5 INCH OR GREATER) RAINFALL EVENTS TO SEE IF ANY EROSION AROUND OR BELOW THE RIPRAP HAS TAKEN PLACE, OR IF STONES HAVE BEEN DISLODGED. IMMEDIATELY MAKE ALL NEEDED REPAIRS TO PREVENT FURTHER DAMAGE.

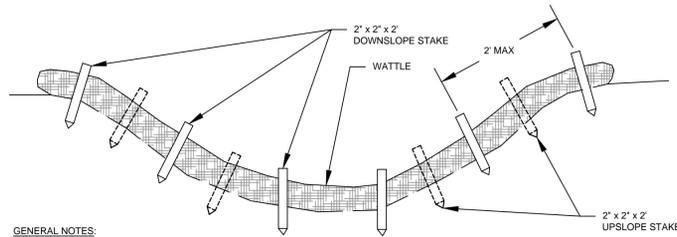
REFERENCE:

6.41.5 NC EROSION AND SEDIMENTATION CONTROL PLANNING AND DESIGN MANUAL, 2006



SUMMARY OF PROTECTION APRONS								
APRON ID	DISCHARGE PIPE LOCATION	Dp (FT)	LA (FT)	Wp (FT)	WA (FT)	T (IN)	D50 (IN)	Dmax (IN)
A8	PERIMETER DRAIN OUTLET (2)	11	6	13	18	8	12	
A9	PERIMETER DRAIN OUTLET	1	6	3	7	18	8	12
A10	PERIMETER DRAIN OUTLET	1	6	3	7	18	8	12
A11	PERIMETER DRAIN OUTLET	1	6	3	7	18	8	12

12 RIP RAP APRON DETAIL
SCALE: NTS



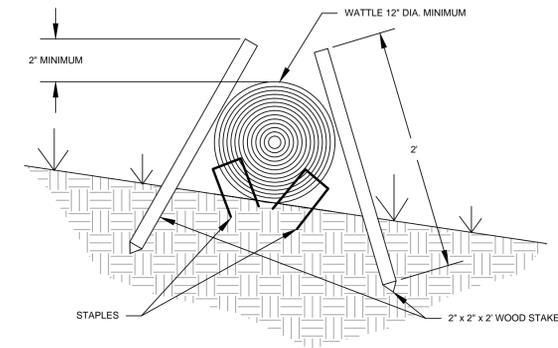
GENERAL NOTES:

1. PLACE WATTLES AT THE LOWER LIMITS OF EACH DAYS WORK.
2. PLACE WATTLES ACCORDING TO CHANNEL SCHEDULE
3. PLACE FIRST WATTLE 1/2 SPACING DISTANCE FROM CREST OF QUALIFYING SLOPE.
4. ONLY INSTALL WATTLE(S) TO A HEIGHT IN DITCH SO FLOW WILL NOT WASH AROUND WATTLE AND SCOUR DITCH SLOPES AND AS DIRECTED.
5. SPACE WOODEN STAKES 2 FEET O.C. ALONG DITCH SLOPE.
6. INSTALL A MINIMUM OF 2 UPSLOPE STAKES AND 4 DOWNSLOPE STAKES AT AN ANGLE TO WEDGE WATTLE TO BOTTOM OF DITCH.
7. PROVIDE STAPLES MADE 0.125 IN. DIAMETER STEEL WIRE FORMED INTO A U-SHAPE NOT LESS THAN 12" IN LENGTH.
8. INSTALL STAPLES APPROXIMATELY EVERY 1 LINEAR FOOT ON BOTH SIDES OF WATTLE AND EACH END TO SECURE IT TO SOIL.

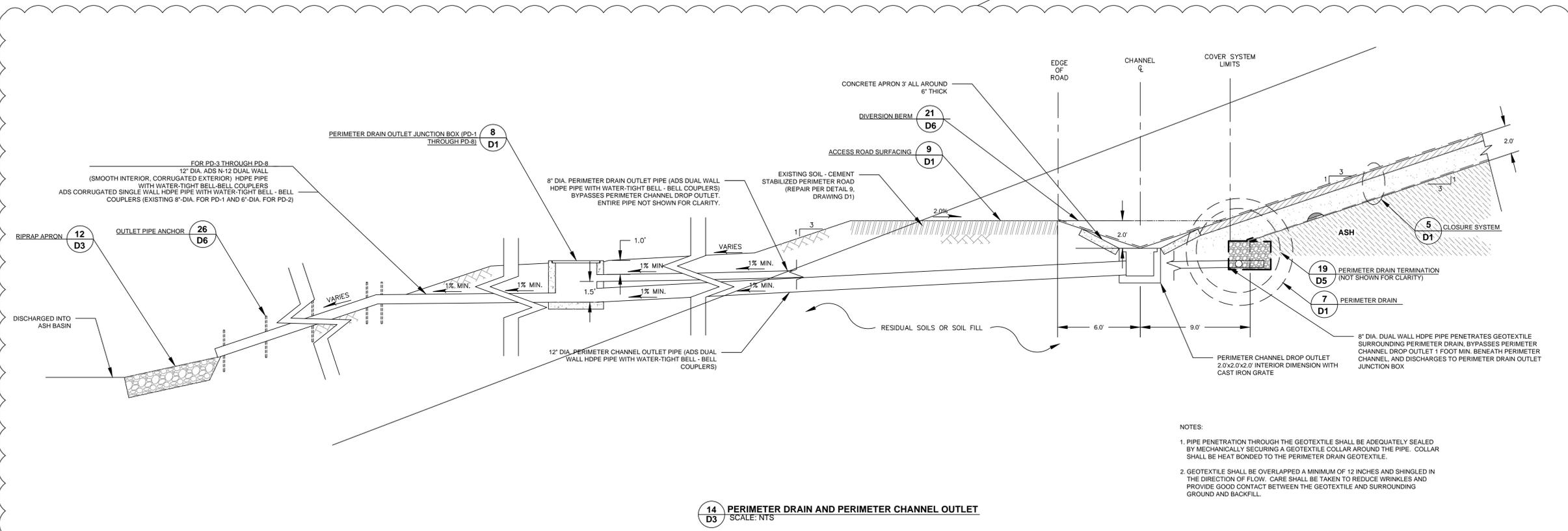
MAINTENANCE NOTES:

1. IT IS IMPERATIVE THAT WATTLES BE INSPECTED AFTER INSTALLATION AND SIGNIFICANT (0.5' OR GREATER) RAINFALL EVENTS.
2. THERE ARE TO BE NO GAPS BETWEEN ADJACENT WATTLES OR BETWEEN SOIL SURFACE AND WATTLE BOTTOM.
3. REPAIR ANY UPSLOPE OR UNDERCUTTING DEFICIENCIES FOR PROPER PERFORMANCE.
4. REMOVE ALL FILTRATION IMPEDIMENTS INCLUDING SEDIMENT DEPOSITS AND LOOSE DEBRIS WHEN SUCH CONDITIONS IMPACT WATTLE FUNCTIONALITY.
5. SEDIMENT BUILD UP SHOULD NOT BE ALLOWED TO EXCEED ONE THIRD OF WATTLE HEIGHT.
6. MONITOR CHANGING CONDITIONS TO ANTICIPATE WATTLE REMOVAL OR REPLACEMENT.

*REF: NCDOT ROADSIDE ENVIRONMENTAL UNIT: SOIL AND WATER SECTION



13 WATTLE DETAIL
SCALE: NTS



14 PERIMETER DRAIN AND PERIMETER CHANNEL OUTLET
SCALE: NTS

- NOTES:**
1. PIPE PENETRATION THROUGH THE GEOTEXTILE SHALL BE ADEQUATELY SEALED BY MECHANICALLY SECURING A GEOTEXTILE COLLAR AROUND THE PIPE. COLLAR SHALL BE HEAT BONDED TO THE PERIMETER DRAIN GEOTEXTILE.
 2. GEOTEXTILE SHALL BE OVERLAPPED A MINIMUM OF 12 INCHES AND SHINGLED IN THE DIRECTION OF FLOW. CARE SHALL BE TAKEN TO REDUCE WRINKLES AND PROVIDE GOOD CONTACT BETWEEN THE GEOTEXTILE AND SURROUNDING GROUND AND BACKFILL.

-ISSUED FOR CONSTRUCTION-



9751 SOUTHERN PINE BLVD.
CHARLOTTE, N.C. 28276
(704)924-4726

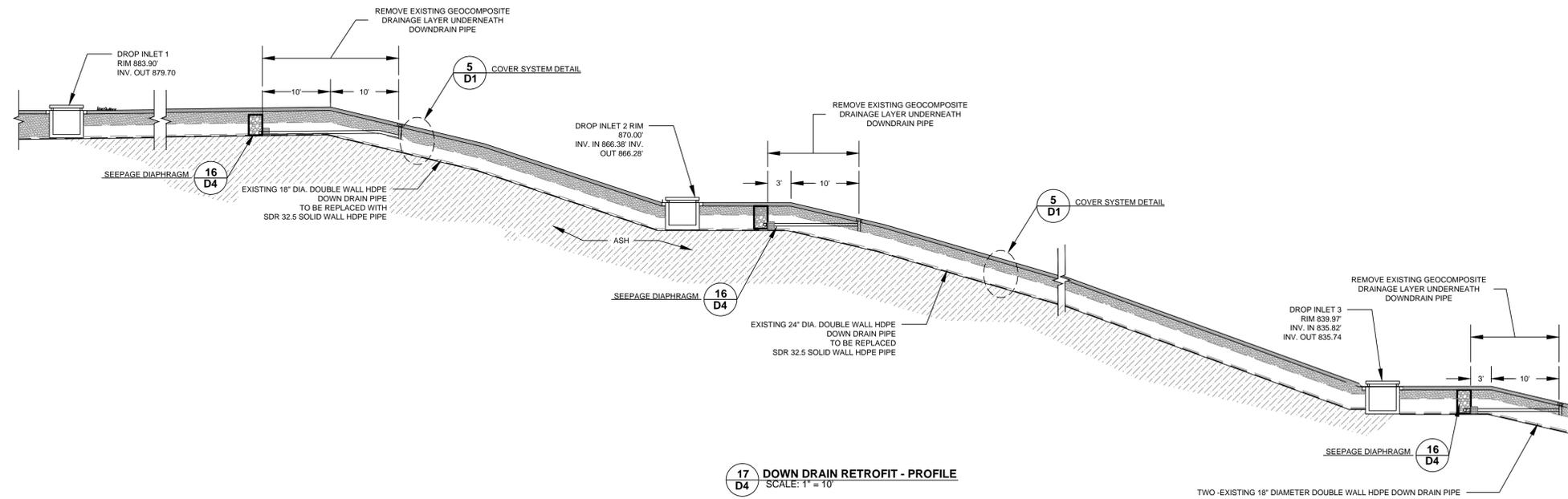
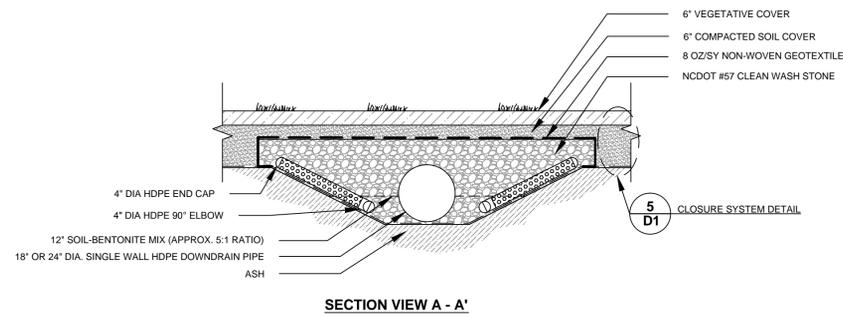
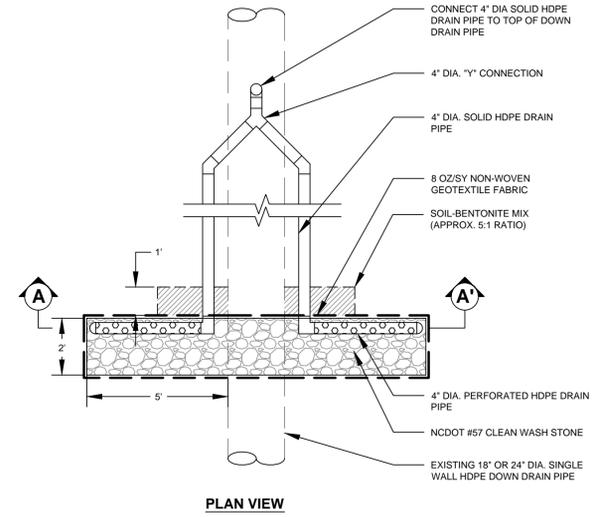
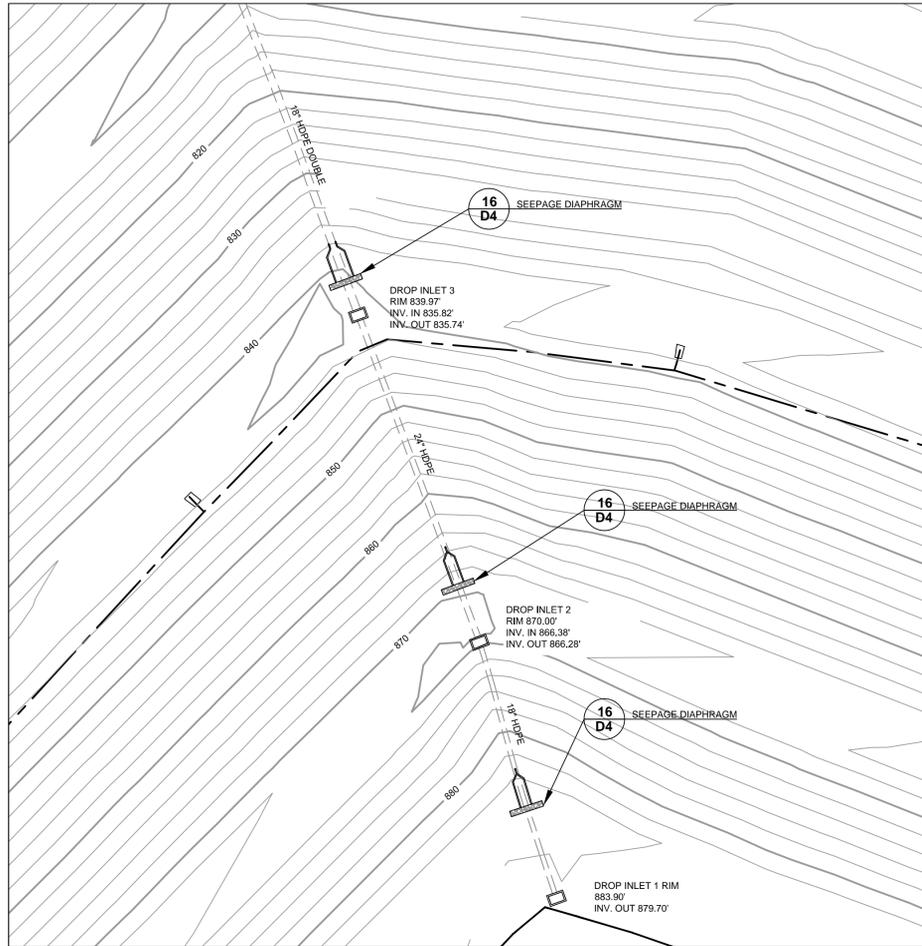


NO.	DATE	DESCRIPTION	BY
2	8-6-12	RE-ISSUED FOR CONSTRUCTION	JJA
1	7-26-12	PERIMETER OUTLET REVISIONS	JJA
0	6-6-11	ISSUED FOR CONSTRUCTION	KRD

E&S CONTROL DETAIL & PERIMETER DRAIN OUTLET
PINE HALL ROAD ASH LANDFILL RETROFIT
BELEWS CREEK STEAM STATION
BELEWS CREEK, NORTH CAROLINA

ENGINEERING LICENSE NO: F-0176	CHECKED BY: KRD
DRAWN BY: CLD	DESIGNED BY: CHR
PROJECT NUMBER: 1356-07-017	DUKE ENERGY DRAWING NUMBER: BC-1039-11.00
SCALE: AS SHOWN	DATE: 7-26-12
DRAWING: D3	OF: 9

DRAWING PATH: Q:\135607017\PROJECT\AS\CDIAL_PROJECT\0202_Retire_PDRP_ISSUED FOR CONSTRUCTION\0202_DET.DWG



-ISSUED FOR CONSTRUCTION-



9761 SOUTHERN PINE BLVD.
CHARLOTTE, N.C. 28273
(704)623-4726



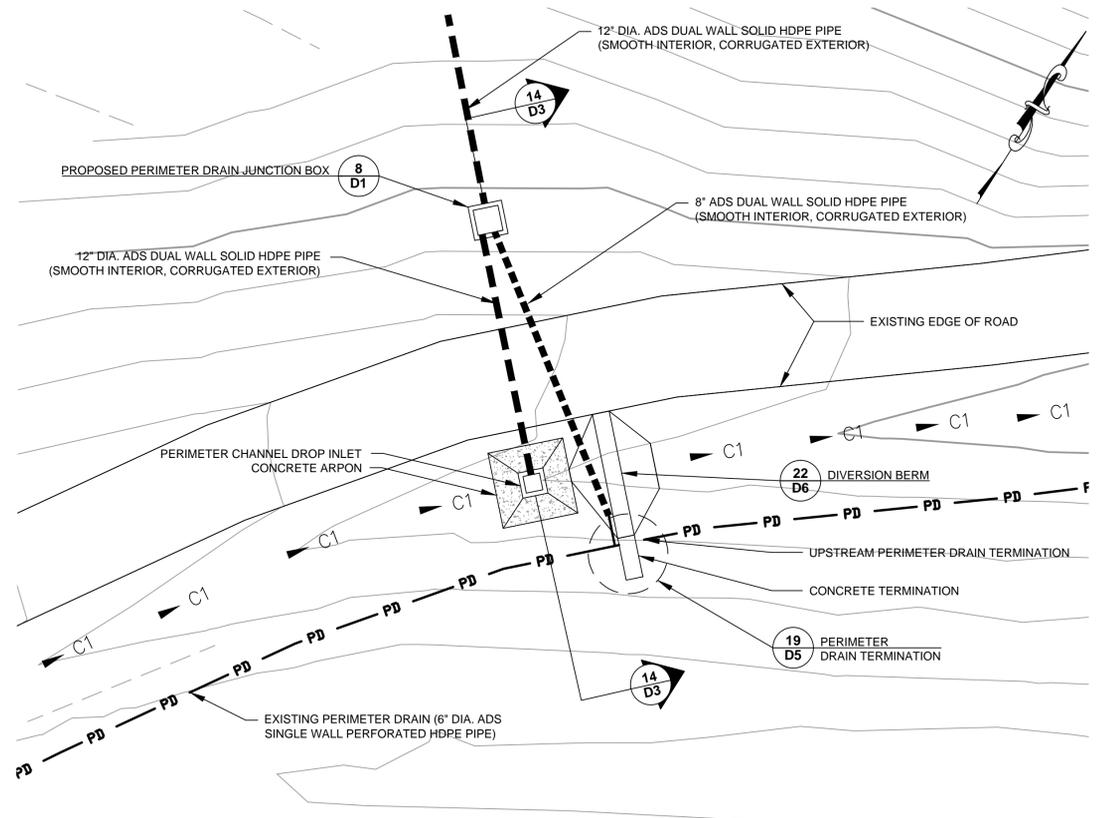
NO.	DATE	DESCRIPTION	BY
4	8-6-12	RE-ISSUED FOR CONSTRUCTION	JJA
3	7-26-12	PERIMETER OUTLET REVISIONS	JJA
2	6-23-11	NOC T. DOWN DRAIN RETROFIT	KRD
1	6-7-11	SEEPAGE DIAPHRAGM CHANGE	KRD
0	6-6-11	ISSUED FOR CONSTRUCTION	KRD

DOWN DRAIN RETROFIT
PINE HALL ROAD ASH LANDFILL RETROFIT
BELEWS CREEK STEAM STATION
BELEWS CREEK, NORTH CAROLINA

ENGINEERING LICENSE NO. F-0176
DRAWN BY: CLD CHECKED BY: KRD
DESIGNED BY: CHR APPROVED BY:
PROJECT NUMBER 1356-07-017
DUKE ENERGY DRAWING NUMBER BC-1039-12.00

SCALE: AS SHOWN DATE: 7-26-12
DRAWING: D4 OF: 9

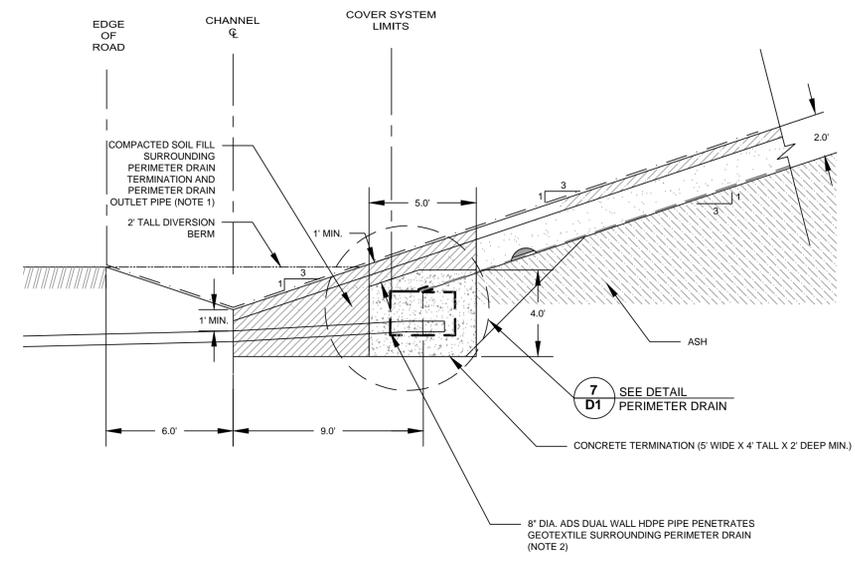
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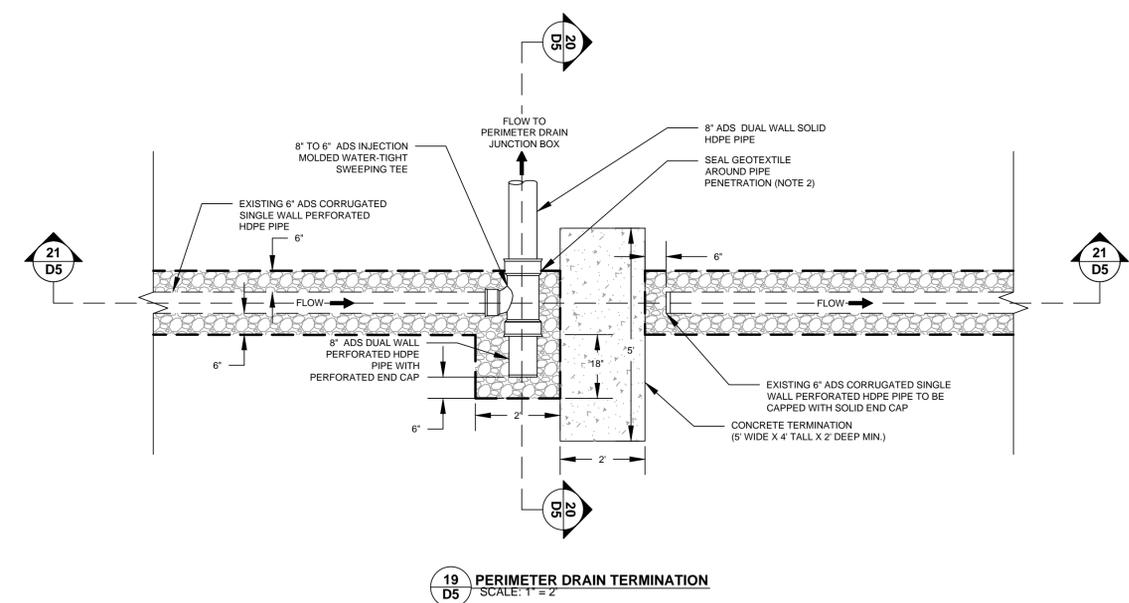
NOTES:

1. DETAIL IS ILLUSTRATED AT LOCATION OF PD-4, HOWEVER IS APPLICABLE TO THE INSTALLATION OF PD-3 THROUGH PD-8

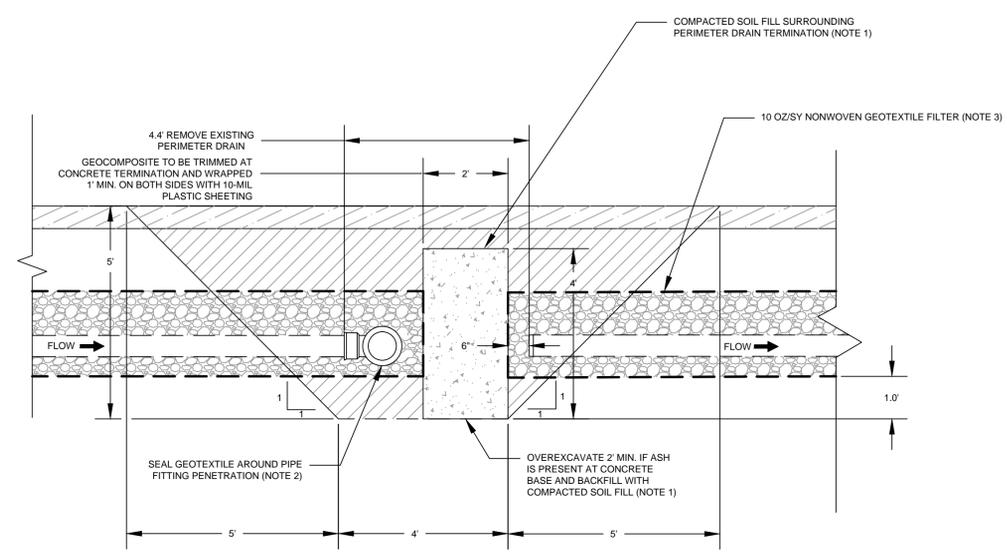
18 D5 PLAN- PERIMETER CHANNEL AND DRAIN OUTLET (TYPICAL PD3 - PD8)
SCALE: 1" = 10'



20 D5 PERIMETER DRAIN TERMINATION SECTION 1
SCALE: 1" = 4'



19 D5 PERIMETER DRAIN TERMINATION
SCALE: 1" = 2'



21 D5 PERIMETER DRAIN TERMINATION SECTION 2
SCALE: 1" = 2'

NOTES:

1. COMPACTED SOIL FILL SHALL BE COMPACTED PER SPECIFICATION SECTION 02320 FILL TYPE S1, COMPACTED SOIL FILL.
2. PIPE FITTING PENETRATION THROUGH THE GEOTEXTILE SHALL BE ADEQUATELY SEALED BY MECHANICALLY SECURING A GEOTEXTILE COLLAR AROUND THE PIPE FITTING. COLLAR SHALL BE HEAT BONDED TO THE PERIMETER DRAIN GEOTEXTILE.
3. GEOTEXTILE SHALL BE OVERLAPPED A MINIMUM OF 12 INCHES AND SHINGLED IN THE DIRECTION OF FLOW. CARE SHALL BE TAKEN TO REDUCE WRINKLES AND PROVIDE GOOD CONTACT BETWEEN THE GEOTEXTILE AND SURROUNDING GROUND AND BACKFILL.
4. PERIMETER DRAIN TERMINATION CONSTRUCTION TO BE PERFORMED IN THE PRESENCE OF THE ENGINEER'S REPRESENTATIVE.

-ISSUED FOR CONSTRUCTION-



9751 ROYAL PINE BLVD
CHARLOTTE, N.C. 28233
(704) 323-4728



NO.	DATE	DESCRIPTION	BY
1	8-6-12	RE-ISSUED FOR CONSTRUCTION	JJA
0	7-26-12	SHEET ADDED FOR PERIMETER OUTLET REVISIONS	JJA

PROPOSED PERIMETER DRAIN PLAN
PINE HALL ROAD ASH LANDFILL RETROFIT
BELEWS CREEK STEAM STATION
BELEWS CREEK, NORTH CAROLINA

ENGINEERING LICENSE NO:
F-0176
DRAWN BY: **JO** CHECKED BY: **JJA**
DESIGNED BY: **KR** APPROVED BY:
PROJECT NUMBER
1356-07-017
DUKE ENERGY DRAWING NUMBER
BC-1039-13.00

SCALE: **AS SHOWN** DATE: **7-26-12**
DRAWING: **D5** OF: **9**

DRAWING PATH: Q:\DISKCACHE\ENERGY\07-017\Final\BC-1039-13.00\DISKCACHE\ENERGY\07-017\Final\BC-1039-13.00\DRAWING.DWG

