April 6, 2015

Ashley Rodgers, PE
State Sedimentation Specialist
NCDENR - Division of Energy, Mineral, and Land Resources
1612 Mail Service Center
Raleigh, NC 27699

Dear Ms. Rodgers,

On behalf of Green Meadow, LLC and Charah, Inc., HDR provides the following response to NCDENR's March 26, 2015 Express Review Comments regarding the permit application entitled:

> *Erosion and Sedimentation Control Plan – Northwest Area, Colon Mine Site, Structural Fill, Charah, Inc., Sanford, North Carolina*. Prepared for Charah, Inc. Prepared by HDR Inc. March 20, 2015.

The Division's comments have been addressed and responses provided herein. Each comment is restated below; HDR's responses on behalf of the applicant follow in *italics*.

Upon completion of the permit application process the revisions will be combined into a final permit application document for the record.

Requirements for Approval

1. Provide proof that Norman Divers is the Registered Agent for Green Meadow, LLC and has the authority to sign on behalf of that company. The Secretary of State's office has Corporation Service Company listed as the Registered Agent for Green Meadow, LLC. (GS 113A-54.1(a))

   Green Meadow has provided a letter of authority acknowledging Norman Divers as a Registered Agent for Green Meadow, LLC. Appendix A has been revised to include the letter.

2. Sheet 01C-01: Revise Note no. 9 to refer only to the NPDES stabilization timeframes, as these are more restrictive than those in the SPCA. (NCG01, Section IIB, 2)

   Completed. See revised drawing sheet.

3. Sheet 01C-02: Revise plans to show silt fence (and any other measures) within the LOD for this project. (GS 113A-57(4))

Completed. See revised drawing sheet.

4. Sheet 01C-06: In the sequence, note 5, additional information needs to be added regarding the dewatering and decommissioning of basins (allow all water to drain via skimmer or pump water through silt bag – add detail for silt bag). (GS 113A-57(3))

   Completed. See revised Drawing Sheet 01C-06 and 01C-12.

5. Sheet 01C-07: Silt fence being shown outside LOD (refer to comment no. 3, above). (GS 113A-57(4))

   Completed. See revised drawing sheet.

6. Sheet 01C-11: Ditch lining should extend to top of bank (revise note on V-ditch detail). (GS 113A-57(3))

   Completed. See revised drawing sheet.

7. Sheet 01C-13

   a. Revise Note 7 in the Seeding specs to specify that if asphalt tack is used it should be applied at a rate of a minimum 400 gal/acre. (GS 113A-57(3)) Or, if hydroseeding will/may be used, please specify the following 2-step method (GS 113A-57(3)):

      Step 1 – 1/3 mulch, all seeding and all inoculant spread in one direction
      Step 2 – 2/3 mulch rate applied in opposing direction

      Completed. See revised drawing sheet.

   b. Revise silt fence outlet details to specify 5 ft posts (consistent with manual and existing silt fence detail). (GS 113A-57(3))

      Completed. See revised drawing sheet.

   c. Provide a note that concrete washouts will be located at least 50 feet from any storm drain inlets and surface waters as per NPDES requirements. (NCG01, Section IIB, 1(e))

      Completed. See revised drawing sheet.

8. Put a note on the plans (probably best in the construction sequence of Phase 1) that the boundary between the mine permit (53-05) and the E&SC site will clearly be marked in the field. (GS 113A-57(4))

   Completed. See revised drawing sheet 01C-01.

9. Provide calculations for any diversion swales onsite (you may wish to do a “worst-case”). Include shear stress calculation. No charts please. If any temporary liners are needed in the diversions, specify the liner type and note that the diversions will be lined immediately upon construction (GS 113A-57(3))

   See the attached calculation.

Other Suggestions

- You may wish to add the inspector’s name and phone number to item 2 of the Phase 1 construction sequence for reference. The inspector for this site will be Thad Valentine, and his number is (919) 791-4200.

  Completed. See revised drawing sheet 01C-01 note 3 under the Construction Sequence section.

- You may wish to add the generic dimensions and specified liner for diversion swales to either the plan sheets or on the corresponding detail (not just in the calculation document). This will help the inspector in the field.

  Completed. See revised drawing sheet 01C-11, Detail 6, Diversion Swale.

Conditions of Approval

- The E&SC plan approval will also be conditioned with respect to the Coal Ash Management Act, mine permit modification approval, and structural fill permit.

  Noted.

- A performance reservation will be added with respect to the functionality and performance of Basin #1 during Phase 1.

  Noted.

The following drawings have been revised to include these updates: 01C-01, 01C-02, 01C-06, 01C-07, 01C-11, 01C-12 and 01C-13. These revised drawings are enclosed. If you have any questions, comments, or require additional information, please contact me at 704. 338.6843.

Sincerely,
HDR Engineering, Inc. of the Carolinas

Michael D. Plummer, PE
Project Manager

Enclosures: Acknowledgement of Authority Letter
Diversion Swale Calculation
Drawings
- 01C-01
- 01C-02
- 01C-06
- 01C-07
- 01C-11
- 01C-12
- 01C-13

March 30, 2015

NC Department of Environment
and Natural Resources
Division of Energy, Mineral and Land Resources
Land Quality Section
1600 Mail Service Center
Raleigh, NC 27699-1601

Attention: Allison Davidson

RE: Erosion & Sediment Control Permit – Sanford Mine Site
Lee County, NC

Dear Ms. Davidson:

We are writing to acknowledge the recent erosion and sediment control submittal for permitting for areas that are outside of the current mine permitted boundary as prepared by our consultant, HDR Engineering of the Carolinas in Charlotte, NC. We acknowledge that Norman Divers is a registered agent for Green Meadow, LLC in North Carolina acting on our behalf in state and local permitting needs for our projects and as such is allowed to sign permit applications on or behalf.

Should you have any additional questions or need anything further, please do not hesitate to contact our office.

Regards,

Charles E. Price
Managing Partner

Green Meadow, LLC • 12601 Plantside Drive • Louisville, Kentucky 40299
O: 502-245-1353 • F: 502-245-7398

HDR Computation

I Job No. 453925-235691-018 I

Project:	Charah Colon Mine	Computed PAW	Date 04/02/15
Subject:	Permit Application	Checked MDP	Date 04/02/15
Task:	Drainage - Temporary Diversion Berms	Sheet 1	of 2

Objective Design temporary diversion berms to handle no more than 5 acres and for various channel slopes.

References

1. NC Erosion and Sediment Control Planning and Design Manual.
2. "Elements of Urban Stormwater Design" by H. Rooney Malcom, P.E.
3. NCDOT Standard Specifications for Roads and Structures
4. North American Green Product Brochure version 4.11
5. East Coast Erosion Blankets (ECS-1)
6. Maccaferri
7. Green Armor Systems
8. NOAA Atlas 14, Volume 2, Version 3 (Sanford, NC)

Equations

Normal Depth Procedure (Manning's Eqn) Ref 2

$Z_{av} = AR^{2/3}$ Area (A) = bd + z d^2

$Z_{req} = Q\,n / 1.49s^{0.5}$ R = Area / $(b+2d(z^2+1)^{0.5})$

$AR^{2/3} = Q\,n/\ 1.49s^{0.5}$ Avg Shear Stress (T) = d*s*unit weight of water

Q (cfs) = CIA

$Z_{av} = Z_{req}$

Channel Design

Min Channel Freeboard =	0.1	ft	
Inside Channel Side Slope =	2	(enter X for X:1)	
Outside Channel Side Slope =	2	(enter X for X:1)	
Bottom Width, b =	0	ft	
Runoff Coeff (initial)=	0.60	Ag land, smooth	Ref 1
Runoff Coeff (permanent)=	0.25	Pasture, Sandy	Ref 1
I (in/hr) =	6.76	25-yr, 10-min Design Storm (Sanford, NC)	Ref 8

Various Lining Types

Lining Type	Lining Description	Manning's n depths of 0-0.5 ft	Manning's n depths of 0.5-2.0	Vp (ft/sec)	Allowable Shear Stress (psf)
A	Jute Net (HEC-15)		0.015	2.0	0.45
B	Erosion Control Blanket Single Net (Curlex 1)		0.034	5.0	1.55
C	Erosion Control Blanket, Straw w/ Single Net (Ref 4)*		0.025	6.7	1.50
D	Erosion Control Blanket Double Net (Curlex HV)		0.026	10.0	1.65
E	Ordinary Firm Loam (Ref 2)	0.023	0.020	3.5	2.0
F	Grass Lined (Ref 1)*		0.030	5.0	2.0
G	6" Rip Rap (Ref 2, Ref 1)		0.069	9.0	2.0
H	GreenArmor 7010 (unvegetated)		0.034	12.0	3.3
I	Unvegetated Turf Reinforcement Mat (TRM) (NAG C350)		0.025	9.5	2.25
J	Class D Phase 2 (Partially vegetated) TRM (NAG C350)		0.048	14.0	3.34
K	12" Rip Rap (Ref 2, Ref 1)		0.078	12.5	4.0
L	Class B Phase 3 (Fully vegetated) TRM (NAG C350)		0.048	18.0	5.7
M	Reno Mattress (6-inch, unvegetated) Ref 6		0.0277	13.8	4.3
N	Reno Mattress (6-inch, vegetated) Ref 6		0.050	13.8	8.35
O	Smart Ditch (Pre-formed HDPE channel)		0.022	-	-
P	Concrete (HEC-15, EPA 832-F-99-002)		0.013	25.0	10.0

*Depth of Flow is not specified for Manning's' n

Select Lining System for each channel slope that will handle the design flow when vegetated and when initially placed.

Drainage Area (acres)	Channel Slope	Channel Side Slope Inside (X:1)	Channel Side Slope Outside (X:1)	Bottom Width, b (ft)
4	1.0%	2	2	0
4	0.5%	2	2	0
3	1.00%	2	2	0
3	0.5%	2	2	0
2	1.0%	2	2	0
2	0.50%	2	2	0

Flow Q (cfs)	Lining Type	Z_{req}	Flow Depth d (ft)	Cross Sectional Area (sf)	R	Z_{av}	Velocity (ft/sec)	Avg Shear Stress (lb/sf)	Comment
Initial Lining - Ag land, smooth									
16.2	E	2.18	1.26	3.19	0.56	2.18	5.1	0.8	Need Liner
16.2	E	3.08	1.44	4.14	0.64	3.08	3.9	0.4	Exceeds max depth
12.2	E	1.63	1.13	2.57	0.51	1.63	4.7	0.7	Need Liner
12.2	E	2.31	1.29	3.33	0.58	2.31	3.7	0.4	Need Liner
8.1	E	1.09	0.97	1.90	0.44	1.09	4.3	0.6	Need Liner
8.1	E	1.54	1.11	2.46	0.50	1.54	3.3	0.3	OK
Temp Lining - Ag land, smooth									
16.2	C	2.72	1.37	3.77	0.61	2.72	4.3	0.9	OK
16.2	C	3.85	1.56	4.89	0.70	3.85	3.3	0.5	Exceeds max depth
12.2	C	2.04	1.23	3.04	0.55	2.04	4.0	0.8	OK
12.2	C	2.89	1.40	3.94	0.63	2.89	3.1	0.4	OK
8.1	C	1.36	1.06	2.24	0.47	1.36	3.6	0.7	OK
8.1	C	1.92	1.20	2.90	0.54	1.92	2.8	0.4	OK

Flow Q (cfs)	Lining Type	Z_{req}	Flow Depth d (ft)	Cross Sectional Area (sf)	R	Z_{av}	Velocity (ft/sec)	Avg Shear Stress (lb/sf)	Comment
Permanent Lining - Pasture, Sandy									
6.8	F	1.36	1.06	2.24	0.47	1.36	3.0	0.7	OK
6.8	F	1.92	1.20	2.90	0.54	1.92	2.3	0.4	OK
5.1	F	1.02	0.95	1.80	0.42	1.02	2.8	0.6	OK
5.1	F	1.44	1.08	2.34	0.48	1.44	2.2	0.3	OK
3.4	F	0.68	0.82	1.33	0.36	0.68	2.5	0.5	OK
3.4	F	0.96	0.93	1.72	0.42	0.96	2.0	0.3	OK

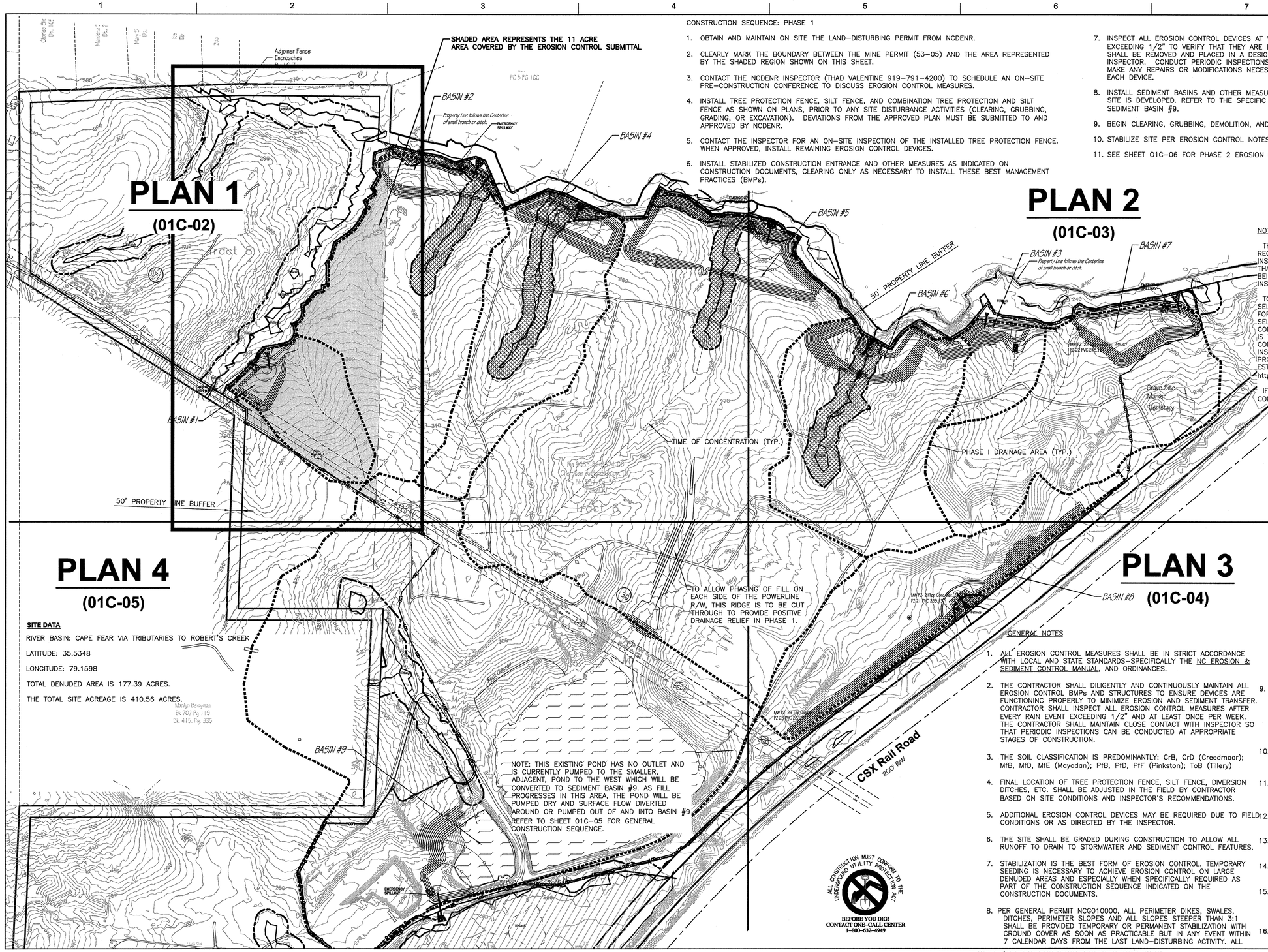
CONCLUSION

Locate the diversion berms with the following criteria

Diversion berms that have a drainage area of 4 acres must have a minimum 1% slope.

Diversion berms that have a drainage area of less than 4 acres may have 0.5% slope.

Diversion berms that have a 1% slope and have a drainage area of 2 acres or more, a temporary liner is needed and vegetated.



CONSTRUCTION SEQUENCE: PHASE 1

1. OBTAIN AND MAINTAIN ON SITE THE LAND–DISTURBING PERMIT FROM NCDENR.
2. CLEARLY MARK THE BOUNDARY BETWEEN THE MINE PERMIT (53–05) AND THE AREA REPRESENTED BY THE SHADED REGION SHOWN ON THIS SHEET.
3. CONTACT THE NCDENR INSPECTOR (THAD VALENTINE 919–791–4200) TO SCHEDULE AN ON–SITE PRE–CONSTRUCTION CONFERENCE TO DISCUSS EROSION CONTROL MEASURES.
4. INSTALL TREE PROTECTION FENCE, SILT FENCE, AND COMBINATION TREE PROTECTION AND SILT FENCE AS SHOWN ON PLANS, PRIOR TO ANY SITE DISTURBANCE ACTIVITIES (CLEARING, GRUBBING, GRADING, OR EXCAVATION). DEVIATIONS FROM THE APPROVED PLAN MUST BE SUBMITTED TO AND APPROVED BY NCDENR.
5. CONTACT THE INSPECTOR FOR AN ON–SITE INSPECTION OF THE INSTALLED TREE PROTECTION FENCE. WHEN APPROVED, INSTALL REMAINING EROSION CONTROL DEVICES.
6. INSTALL STABILIZED CONSTRUCTION ENTRANCE AND OTHER MEASURES AS INDICATED ON CONSTRUCTION DOCUMENTS, CLEARING ONLY AS NECESSARY TO INSTALL THESE BEST MANAGEMENT PRACTICES (BMPs).
7. INSPECT ALL EROSION CONTROL DEVICES AT WEEKLY INTERVALS AND AFTER EVERY RAINFALL EXCEEDING 1/2" TO VERIFY THAT THEY ARE FUNCTIONING PROPERLY. ANY ACCUMULATED SEDIMENT SHALL BE REMOVED AND PLACED IN A DESIGNATED SPOIL DISPOSAL AREA APPROVED BY THE INSPECTOR. CONDUCT PERIODIC INSPECTIONS OF ALL EROSION AND SEDIMENTATION CONTROLS AND MAKE ANY REPAIRS OR MODIFICATIONS NECESSARY TO ASSURE CONTINUED EFFECTIVE OPERATION OF EACH DEVICE.
8. INSTALL SEDIMENT BASINS AND OTHER MEASURES AS INDICATED ON CONSTRUCTION DOCUMENTS AS SITE IS DEVELOPED. REFER TO THE SPECIFIC CONSTRUCTION SEQUENCE ON SHEET 01C–05 FOR SEDIMENT BASIN #9.
9. BEGIN CLEARING, GRUBBING, DEMOLITION, AND GRADING OF SITE.
10. STABILIZE SITE PER EROSION CONTROL NOTES AS AREAS ARE BROUGHT TO ROUGH GRADES.
11. SEE SHEET 01C–06 FOR PHASE 2 EROSION CONTROL.

NOTIFICATION OF COMBINED SELF–MONITORING AND SELF INSPECTION FORM:

THE SEDIMENT POLLUTION CONTROL ACT WAS AMENDED IN 2006 TO REQUIRE THAT PERSONS RESPONSIBLE FOR LAND–DISTURBING ACTIVITIES INSPECT A PROJECT AFTER EACH PHASE OF THE PROJECT TO MAKE SURE THAT THE APPROVED EROSION AND SEDIMENTATION CONTROL PLAN IS BEING FOLLOWED. RULES DETAILING THE DOCUMENTATION OF THESE INSPECTIONS TOOK EFFECT OCTOBER 1, 2010.

TO SIMPLIFY DOCUMENTATION OF SELF–INSPECTION REPORTS AND NPDES SELF–MONITORING REPORTS, DWQ AND DEMLR DEVELOPED A COMBINED FORM. THE SELF–INSPECTION PROGRAM IS SEPARATE FROM THE WEEKLY SELF–MONITORING PROGRAM OF NPDES STORMWATER PERMIT FOR CONSTRUCTION ACTIVITIES. THE FOCUS OF THE SELF–INSPECTION REPORT IS THE INSTALLATION AND MAINTENANCE OF EROSION AND SEDIMENTATION CONTROL MEASURES ACCORDING TO THE APPROVED PLAN. THE INSPECTIONS SHOULD BE CONDUCTED AFTER EACH PHASE OF THE PROJECT, AND CONTINUED UNTIL PERMANENT GROUND COVER IS ESTABLISHED. THE FORM CAN BE ACCESSED AT:
http//portal.ncdenr.org/web/lr/erosion

IF YOU HAVE ANY QUESTIONS OR CANNOT ACCESS THE FORM, PLEASE CONTACT RALEIGH REGIONAL OFFICE AT (919) 791–4200.

1) GROUND STABILIZATION

SITE AREA DISPOSITION	STABILIZATION TIME FRAME	STABILIZATION TIME FRAME EXCEPTIONS
• PERIMETER DIKES, SWALES, DITCHES AND SLOPES	7 DAYS	NONE
• HIGH QUALITY WATER (HQW) ZONES	7 DAYS	NONE
• SLOPES STEEPER THAN 3:1	7 DAYS	IF SLOPES ARE 10' OR LESS IN LENGTH AND ARE NOT STEEPER THAN 2:1, 14 DAYS ARE ALLOWED
• SLOPES 3:1 OR FLATTER	14 DAYS	7–DAYS FOR SLOPES GREATER THAN 50 FEET IN LENGTH
• ALL OTHER AREAS WITH SLOPES FLATTER THAN 4:1	14 DAYS	NONE (EXCEPT FOR PERIMETERS AND HQW ZONES)

SITE DATA

RIVER BASIN: CAPE FEAR VIA TRIBUTARIES TO ROBERT'S CREEK

LATITUDE: 35.5348

LONGITUDE: 79.1598

TOTAL DENUDED AREA IS 177.39 ACRES.

THE TOTAL SITE ACREAGE IS 410.56 ACRES.

GENERAL NOTES

1. ALL EROSION CONTROL MEASURES SHALL BE IN STRICT ACCORDANCE WITH LOCAL AND STATE STANDARDS–SPECIFICALLY THE NC EROSION & SEDIMENT CONTROL MANUAL, AND ORDINANCES.
2. THE CONTRACTOR SHALL DILIGENTLY AND CONTINUOUSLY MAINTAIN ALL EROSION CONTROL BMPs AND STRUCTURES TO ENSURE DEVICES ARE FUNCTIONING PROPERLY TO MINIMIZE EROSION AND SEDIMENT TRANSFER. CONTRACTOR SHALL INSPECT ALL EROSION CONTROL MEASURES AFTER EVERY RAIN EVENT EXCEEDING 1/2" AND AT LEAST ONCE PER WEEK. THE CONTRACTOR SHALL MAINTAIN CLOSE CONTACT WITH INSPECTOR SO THAT PERIODIC INSPECTIONS CAN BE CONDUCTED AT APPROPRIATE STAGES OF CONSTRUCTION.
3. THE SOIL CLASSIFICATION IS PREDOMINANTLY: CrB, CrD (Creedmoor); MfB, MfD, MfE (Mayodan); PfB, PfD, PfF (Pinkston); ToB (Tillery)
4. FINAL LOCATION OF TREE PROTECTION FENCE, SILT FENCE, DIVERSION DITCHES, ETC. SHALL BE ADJUSTED IN THE FIELD BY CONTRACTOR BASED ON SITE CONDITIONS AND INSPECTOR'S RECOMMENDATIONS.
5. ADDITIONAL EROSION CONTROL DEVICES MAY BE REQUIRED DUE TO FIELD CONDITIONS OR AS DIRECTED BY THE INSPECTOR.
6. THE SITE SHALL BE GRADED DURING CONSTRUCTION TO ALLOW ALL RUNOFF TO DRAIN TO STORMWATER AND SEDIMENT CONTROL FEATURES.
7. STABILIZATION IS THE BEST FORM OF EROSION CONTROL. TEMPORARY SEEDING IS NECESSARY TO ACHIEVE EROSION CONTROL ON LARGE DENUDED AREAS AND ESPECIALLY WHEN SPECIFICALLY REQUIRED AS PART OF THE CONSTRUCTION SEQUENCE INDICATED ON THE CONSTRUCTION DOCUMENTS.
8. PER GENERAL PERMIT NCG010000, ALL PERIMETER DIKES, SWALES, DITCHES, PERIMETER SLOPES AND ALL SLOPES STEEPER THAN 3:1 SHALL BE PROVIDED TEMPORARY OR PERMANENT STABILIZATION WITH GROUND COVER AS SOON AS PRACTICABLE BUT IN ANY EVENT WITHIN 7 CALENDAR DAYS FROM THE LAST LAND–DISTURBING ACTIVITY. ALL OTHER DISTURBED AREAS SHALL BE PROVIDED TEMPORARY OR PERMANENT STABILIZATION WITH GROUND COVER AS SOON AS PRACTICABLE BUT IN ANY EVENT WITHIN 14 CALENDAR DAYS FROM THE LAST LAND–DISTURBING ACTIVITY.
9. THE ANGLE FOR GRADED SLOPES AND FILLS SHALL BE NO GREATER THAN THE ANGLE THAT CAN BE RETAINED BY VEGETATIVE COVER OR OTHER ADEQUATE EROSION–CONTROL DEVICES OR STRUCTURES. IN ANY EVENT, SLOPES LEFT EXPOSED WILL BE PLANTED OR OTHERWISE PROVIDED WITH TEMPORARY OR PERMANENT GROUND COVER, DEVICES, OR STRUCTURES SUFFICIENT TO RESTRAIN EROSION IN ACCORDANCE WITH NPDES STABILIZATION TIMEFRAMES.
10. ALL MATERIALS REQUIRED FOR CONSTRUCTION OF SEDIMENTATION AND EROSION CONTROL MEASURES SHALL BE AVAILABLE ON SITE BEFORE ANY LAND DISTURBING ACTIVITY IS BEGUN.
11. STAGING AREAS AND MATERIAL STOCKPILES FOR THIS PROJECT WILL BE ENCOMPASSED BY SILT FENCE EXCEPT FOR THE POINTS OF ACCESS TO THE STOCKPILE AREA WHICH SHALL BE ON THE HIGH SIDE.
12. SEE DETAIL 2/SHEET 01C–13 FOR SEEDING SPECIFICATIONS AND SEEDBED PREPARATION NOTES.
13. ALL BASINS ARE SEDIMENT BASINS WITH RISERS & SKIMMERS. SEE DETAIL 5/01C–12
14. LINEAR TREE PROTECTION FENCING SHALL BE ORANGE SAFETY FENCE MINIMUM 3' HEIGHT.
15. SILT FENCE SHOULD NOT BE INSTALLED ON DOWNHILL GRADES WHERE THERE IS CONCENTRATED FLOW. SILT FENCE SHOULD NOT BE USED TO DIVERT OR DIRECT FLOW. A DIVERSION SWALE SHOULD BE USED TO DIVERT OR DIRECT FLOW.
16. ROCK OUTLETS IN SILT FENCE MAY BE USED IN LOCATIONS OF MINOR CONCENTRATED FLOW AND IN ISOLATED LOW POINTS OF THE SILT FENCE.

ALL CONSTRUCTION MUST CONFORM TO THE UNDERGROUND UTILITY PROTECTION ACT
BEFORE YOU DIG!
CONTACT ONE-CALL CENTER
1–800–632–4949

HDR Engineering, Inc. of the Carolinas
440 S. Church St. Suite 1000
Charlotte, NC 28202-2075
704.338.6700
N.C.B.E.L.S. License Number F-0116

ISSUE	DATE	DESCRIPTION
E	04/02/15	REVISED PER NCDENR COMMENTS
D	03/19/15	EROSION CONTROL SUBMITTAL FOR NORTHWEST AREA
C	01/15/15	REVISED PER NCDENR COMMENTS
B	12/31/14	REVISED PER NCDENR COMMENTS
A	11/2014	ISSUED FOR APPROVAL

PROJECT MANAGER	M.D. PLUMMER, P.E.
DESIGNED BY	R. BAYSDEN, P.E.
DRAWN BY	R. BAYSDEN, P.E.
CHECKED BY	J. READLING, P.E.
PROJECT NUMBER	453925–235691–018

NORTH CAROLINA PROFESSIONAL SEAL 025495 ENGINEER MICHAEL D. PLUMMER 4/6/15

Charah®

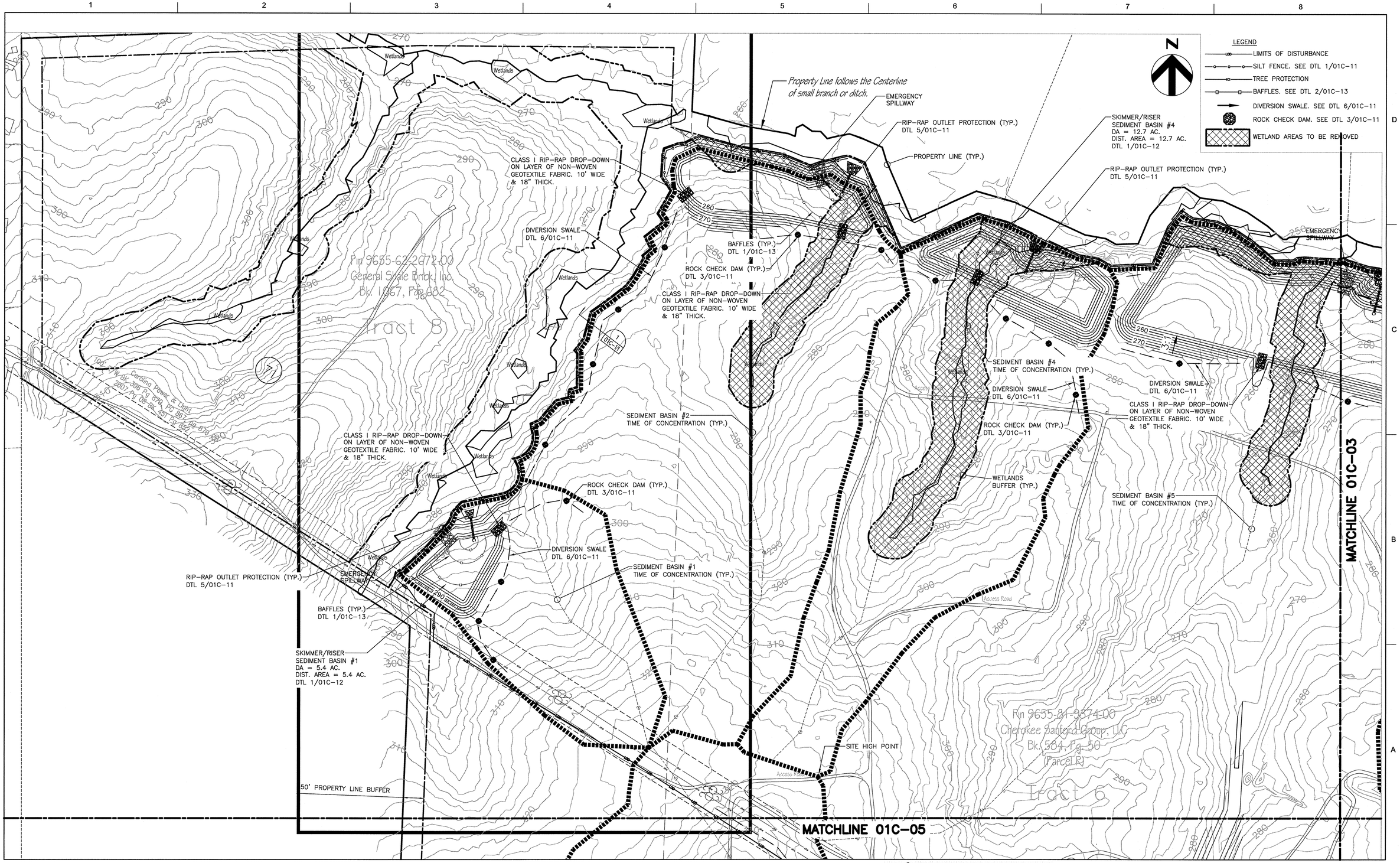
COLON MINE SITE STRUCTURAL FILL
SANFORD, NC

EROSION AND SEDIMENTATION CONTROL PLAN - PHASE 1 OVERALL

0 1" 2"

FILENAME 01C–01.dwg
SCALE 1"=200'
SHEET 01C-01

C:\pwworking\tpa\d0502\S8391\C-01.dwg, Plot, 3/31/2015 11:30:38 PM, pwestmor



HDR Engineering, Inc. of the Carolinas

440 S. Church St. Suite 1000
Charlotte, NC 28202-2075
704.338.6700
N.C.B.E.L.S. License Number F-0116

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PROJECT MANAGER	M.D. PLUMMER, P.E.
DESIGNED BY	R. BAYSDEN, P.E.
DRAWN BY	R. BAYSDEN, P.E.
CHECKED BY	J. READLING, P.E.
PROJECT NUMBER	453925-235691-018

NORTH CAROLINA PROFESSIONAL SEAL 025495 ENGINEER MICHAEL D. PLUMMER 4/6/15

Charah®

COLON MINE SITE STRUCTURAL FILL
SANFORD, NC

EROSION AND SEDIMENTATION CONTROL PLAN - PHASE 1 PLAN 1

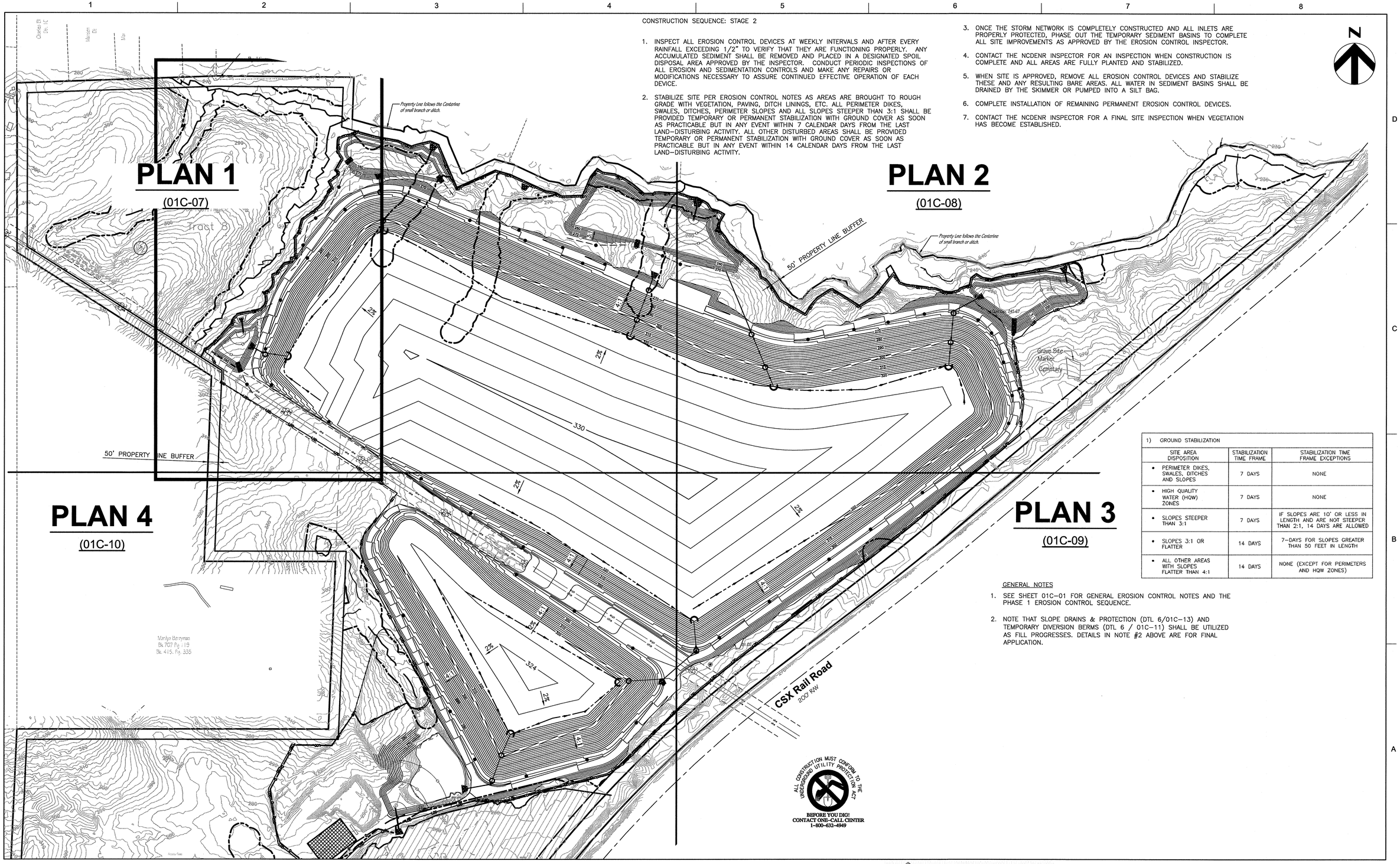
0 1" 2"

FILENAME 01C-02.dwg
SCALE 1"=100'

SHEET 01C-02

CONSTRUCTION SEQUENCE: STAGE 2

1. INSPECT ALL EROSION CONTROL DEVICES AT WEEKLY INTERVALS AND AFTER EVERY RAINFALL EXCEEDING 1/2" TO VERIFY THAT THEY ARE FUNCTIONING PROPERLY. ANY ACCUMULATED SEDIMENT SHALL BE REMOVED AND PLACED IN A DESIGNATED SPOIL DISPOSAL AREA APPROVED BY THE INSPECTOR. CONDUCT PERIODIC INSPECTIONS OF ALL EROSION AND SEDIMENTATION CONTROLS AND MAKE ANY REPAIRS OR MODIFICATIONS NECESSARY TO ASSURE CONTINUED EFFECTIVE OPERATION OF EACH DEVICE.
2. STABILIZE SITE PER EROSION CONTROL NOTES AS AREAS ARE BROUGHT TO ROUGH GRADE WITH VEGETATION, PAVING, DITCH LININGS, ETC. ALL PERIMETER DIKES, SWALES, DITCHES, PERIMETER SLOPES AND ALL SLOPES STEEPER THAN 3:1 SHALL BE PROVIDED TEMPORARY OR PERMANENT STABILIZATION WITH GROUND COVER AS SOON AS PRACTICABLE BUT IN ANY EVENT WITHIN 7 CALENDAR DAYS FROM THE LAST LAND-DISTURBING ACTIVITY. ALL OTHER DISTURBED AREAS SHALL BE PROVIDED TEMPORARY OR PERMANENT STABILIZATION WITH GROUND COVER AS SOON AS PRACTICABLE BUT IN ANY EVENT WITHIN 14 CALENDAR DAYS FROM THE LAST LAND-DISTURBING ACTIVITY.
3. ONCE THE STORM NETWORK IS COMPLETELY CONSTRUCTED AND ALL INLETS ARE PROPERLY PROTECTED, PHASE OUT THE TEMPORARY SEDIMENT BASINS TO COMPLETE ALL SITE IMPROVEMENTS AS APPROVED BY THE EROSION CONTROL INSPECTOR.
4. CONTACT THE NCDENR INSPECTOR FOR AN INSPECTION WHEN CONSTRUCTION IS COMPLETE AND ALL AREAS ARE FULLY PLANTED AND STABILIZED.
5. WHEN SITE IS APPROVED, REMOVE ALL EROSION CONTROL DEVICES AND STABILIZE THESE AND ANY RESULTING BARE AREAS. ALL WATER IN SEDIMENT BASINS SHALL BE DRAINED BY THE SKIMMER OR PUMPED INTO A SILT BAG.
6. COMPLETE INSTALLATION OF REMAINING PERMANENT EROSION CONTROL DEVICES.
7. CONTACT THE NCDENR INSPECTOR FOR A FINAL SITE INSPECTION WHEN VEGETATION HAS BECOME ESTABLISHED.



1) GROUND STABILIZATION		
SITE AREA DISPOSITION	STABILIZATION TIME FRAME	STABILIZATION TIME FRAME EXCEPTIONS
• PERIMETER DIKES, SWALES, DITCHES AND SLOPES	7 DAYS	NONE
• HIGH QUALITY WATER (HQW) ZONES	7 DAYS	NONE
• SLOPES STEEPER THAN 3:1	7 DAYS	IF SLOPES ARE 10' OR LESS IN LENGTH AND ARE NOT STEEPER THAN 2:1, 14 DAYS ARE ALLOWED
• SLOPES 3:1 OR FLATTER	14 DAYS	7-DAYS FOR SLOPES GREATER THAN 50 FEET IN LENGTH
• ALL OTHER AREAS WITH SLOPES FLATTER THAN 4:1	14 DAYS	NONE (EXCEPT FOR PERIMETERS AND HQW ZONES)

GENERAL NOTES

1. SEE SHEET 01C-01 FOR GENERAL EROSION CONTROL NOTES AND THE PHASE 1 EROSION CONTROL SEQUENCE.
2. NOTE THAT SLOPE DRAINS & PROTECTION (DTL 6/01C-13) AND TEMPORARY DIVERSION BERMS (DTL 6 / 01C-11) SHALL BE UTILIZED AS FILL PROGRESSES. DETAILS IN NOTE #2 ABOVE ARE FOR FINAL APPLICATION.

HDR Engineering, Inc. of the Carolinas

440 S. Church St. Suite 1000
Charlotte, NC 28202-2075
704.338.6700
N.C.B.E.L.S. License Number F-0116

ISSUE	DATE	DESCRIPTION
D	04/02/15	REVISED PER NCDENR COMMENTS
C	03/19/15	EROSION CONTROL SUBMITTAL FOR NORTHWEST AREA
B	12/31/14	REVISED PER NCDENR COMMENTS
A	11/2014	ISSUED FOR APPROVAL

PROJECT MANAGER	M. PLUMMER, P.E.
DESIGNED BY	R. BAYSDEN, P.E.
DRAWN BY	R. BAYSDEN, P.E.
CHECKED BY	J. READLING, P.E.
PROJECT NUMBER	453925-235691-018

NORTH CAROLINA PROFESSIONAL SEAL 025495 ENGINEER MICHAEL D. PLUMMER

Charah®

COLON MINE SITE STRUCTURAL FILL
SANFORD, NC

EROSION AND SEDIMENTATION CONTROL PLAN - PHASE 2 OVERALL

0 1" 2"

FILENAME 01C-06.dwg
SCALE 1"=200'

SHEET 01C-06

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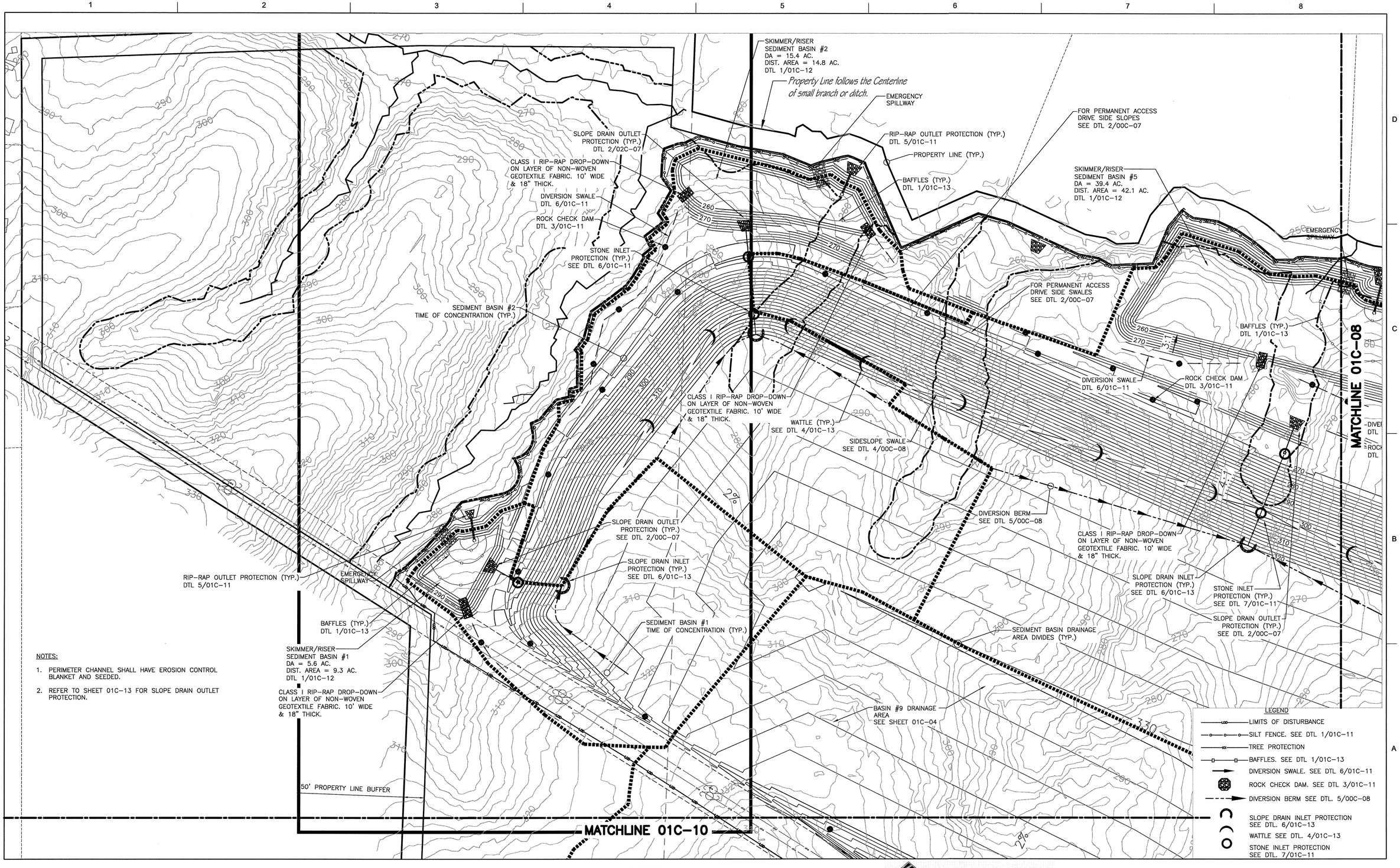

NOTES:

1. PERIMETER CHANNEL SHALL HAVE EROSION CONTROL BLANKET AND SEEDED.
2. REFER TO SHEET 01C-13 FOR SLOPE DRAIN OUTLET PROTECTION.

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PROJECT MANAGER	M. PLUMMER, P.E.
DESIGNED BY	R. BAYSDEN, P.E.
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NORTH CAROLINA PROFESSIONAL SEAL 025495 ENGINEER MICHAEL D. PLUMMER

Charah®

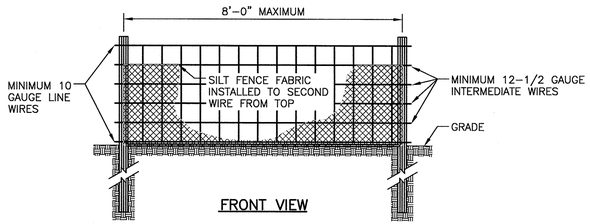
COLON MINE SITE STRUCTURAL FILL
SANFORD, NC

EROSION AND SEDIMENTATION CONTROL PLAN - PHASE 2 PLAN 1

0 1" 2"

FILENAME 01C-07.dwg
SCALE 1"=100'

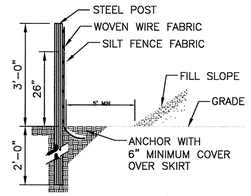
SHEET 01C-07



FRONT VIEW

NOTE:

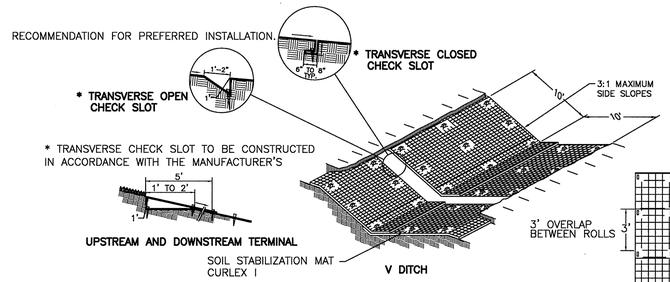
1. USE SILT FENCE ONLY WHEN DRAINAGE AREA DOES NOT EXCEED 1/4 ACRE AND NEVER IN AREAS OF CONCENTRATED FLOW.
2. SILT FENCE IS TO BE SECURELY FASTENED TO EACH STEEL SUPPORT POST OR TO WOVEN WIRE WHICH IS IN TURN ATTACHED TO THE STEEL FENCE POST.
3. INSPECT FREQUENTLY AND REPAIR OR REPLACE PROMPTLY AS NEEDED.
4. REMOVE SEDIMENT DEPOSITED AS NEEDED TO PROVIDE STORAGE VOLUME FOR THE NEXT RAIN AND TO REMOVE PRESSURE ON THE SILT FENCE. UNIFORMLY DISTRIBUTE ON THE SOURCE AREA PRIOR TO TOPSOILING.



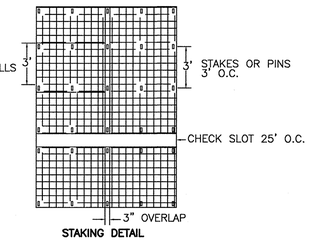
SIDE VIEW

TEMPORARY SILT FENCE DETAIL (1)

NO TO SCALE



LINING SHALL EXTEND TO THE TOP OF THE CHANNEL SIDESLOPES.
LINING SHALL BE CURLEX I OR EQUAL.
SIDE SLOPES SHALL BE A MAXIMUM SLOPE OF 3 TO 1.
LINING SHALL BE INSTALLED IN STRICT ACCORDANCE WITH MANUFACTURER'S INSTALLATION PROCEDURES.



STAKING DETAIL

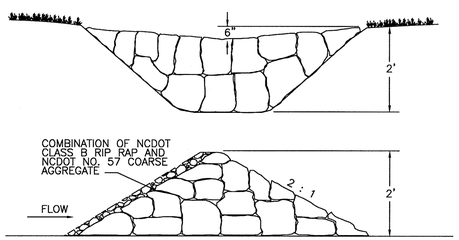
NOTE: STAKES SHALL BE WOOD OR METAL AS RECOMMENDED BY MANUFACTURER AND SHALL BE AT LEAST 12" IN LENGTH.

SLOPE INSTALLATION–EROSION CONTROL BLANKET NOTES:

1. PREPARE SOIL BEFORE INSTALLING BLANKETS, INCLUDING APPLICATION OF FERTILIZER AND SEED.
2. BEGIN AT THE TOP OF THE SLOPE BY ANCHORING THE BLANKET IN A 6" DEEP x 6" WIDE TRENCH WITH APPROXIMATELY 12" OF BLANKET EXTENDED BEYOND THE UP–SLOPE PORTION OF THE TRENCH. ANCHOR THE BLANKET WITH A ROW OF STAPLES/STAKES APPROXIMATELY 12" APART IN THE BOTTOM OF THE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING.
3. APPLY SEED TO COMPACTED SOIL AND FOLD REMAINING 12" PORTION OF BLANKET BACK OVER SEED AND COMPACTED SOIL. SECURE BLANKET OVER COMPACTED SOIL WITH A ROW OF STAPLES/STAKES SPACED APPROXIMATELY 12" APART ACROSS THE WIDTH OF THE BLANKET.
3. ROLL THE BLANKETS DOWN OR HORIZONTALLY ACROSS THE SLOPE. BLANKETS WILL UNROLL WITH APPROPRIATE SIDE AGAINST THE SOIL SURFACE. ALL BLANKETS MUST BE SECURELY FASTENED BY PLACING STAPLES/STAKES IN APPROXIMATE LOCATIONS, SEE MANUFACTURER'S INSTALLATION INSTRUCTIONS.
4. THE EDGES OF PARALLEL BLANKETS MUST BE STAPLED WITH APPROXIMATELY 2"–5" OVERLAP DEPENDING ON BLANKET TYPE. TO ENSURE PROPER SEAM ALIGNMENT, PLACE THE EDGE OF THE OVERLAPPING BLANKET EVEN WITH THE COLORED SEAM STITCH ON THE PREVIOUSLY INSTALLED BLANKET.
5. CONSECUTIVE BLANKETS SPLICED DOWN THE SLOPE MUST BE PLACED END OVER END (SHINGLE STYLE) WITH AN APPROXIMATE 3" OVERLAP. STAPLE THROUGH OVERLAPPED AREA, APPROXIMATELY 12" APART ACROSS ENTIRE BLANKET WIDTH.

TYPICAL SECTION FOR SOIL STABILIZATION MAT LINED AREAS (TYP.) (2)

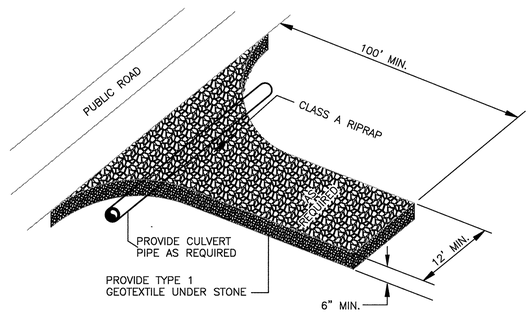
NTS



NOTE:
PLACE EVERY 100' ALONG FLOW PATH.

ROCK CHECK DAM (3)

NTS

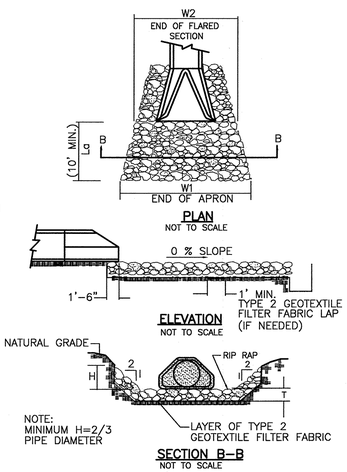


TEMPORARY GRAVEL CONSTRUCTION ENTRANCE DETAIL (4)

NOT TO SCALE NCDENR 6.06

NOTES:

1. CLASS OR MEDIAN SIZE OF RIP RAP AND LENGTH, WIDTH AND DEPTH OF APRON TO BE SHOWN ON PLANS.
2. RIP RAP SHOULD EXTEND UP BOTH SIDES OF THE APRON AND AROUNG THE END OF THE PIPE OR CULBVERT AT THE DISCHARGE OUTLET AT A MAXIMUM SLOPE OF 2:1 AND A HEIGHT NOT LESS THAN TWO THIRDS THE PIPE DIAMETER OR CULVERT HEIGHT.
3. THERE SHALL BE NO OVERFLOW FROM THE END OF THE APRON TO THE SURFACE OF THE RECEIVING CHANNEL. THE AREA TO BE PAVED OR RIP RAPPED SHALL BE UNDERCUT SO THAT THE INVERT OF THE APRON SHALL BE THE SAME GRADE (FLUSH) WITH THE SURFACE OF THE RECEIVING CHANNEL. THE APRON SHALL HAVE A CUTOFF OR TOE WALL AT THE DOWNSTREAM END.
4. THE WIDTH OF THE END OF THE APRON SHALL BE EQUAL TO THE BOTTOM WIDTH OF THE RECEIVING CHANNEL. MAXIMUM TAPER TO RECEIVING CHANNEL 5:1.
5. ALL SUBGRADE FOR STRUCTURE TO BE COMPACTED TO 95% OR GREATER.
6. THE PLACING OF FILL, EITHER LOOSE OR COMPACTED IN THE RECEVIGING CHANNEL SHALL NOT BE ALLOWED.
7. NO BENDS OR CURVES IN THE HORIZONTAL ALIGNMENT OF THE APRON UNLESS OTHERWISE SHOWN.
8. TYPE 2 GEOTEXTILE FILTER FABRIC SHALL BE INSTALLED ON COMPACTED SUBGRADE PRIOR TO PLACEMENT OF RIP RAP.
9. ANY DISTURBED AREA FROM END OF APRON TO RECEIVING CHANNEL MUST BE STABILIZED.

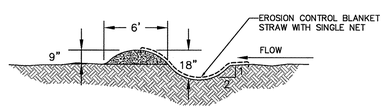


LOCATION	W1	W2	La	CLASS	T
SB1	12'	4.5'	10'	B	18"
SB2*	12'	6'	10'	B	18"
SB3	9'	3'	8'	B	18"
SB4	9'	3'	8'	B	18"
SB5*	12'	6'	10'	B	18"
SB6	9'	3'	8'	B	18"
SB7*	12'	6'	10'	B	18"
SB8	9'	3'	8'	B	18"
SB9*	26'	11'	22'	B	18"

1. SB = SEDIMENT BASIN
2. CLASS = NCDOT CLASS RIP RAP
3. * = FOR EACH BARREL. SEE SEDIMENT BASIN SCHEDULE ON 01C–12.
4. CLASS A RIP RAP MIDRANGE = 4"
5. CLASS B RIP RAP MIDRANGE = 8"
6. CLASS 1 RIP RAP MIDRANGE = 10"
7. CLASS 2 RIP RAP MIDRANGE = 14"

RIPRAP APRON AT PIPE OUTFALLS (5)

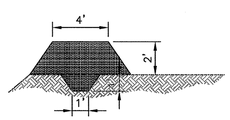
NTS



NOTE: SWALE SHOULD BE LINED IMMEDIATELY AFTER CONSTRUCTION.

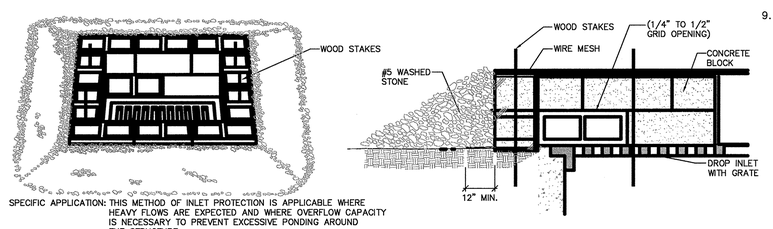
DIVERSION SWALE (6)

N.T.S.



DIVERSION DIKE (8)

N.T.S.



SPECIFIC APPLICATION: THIS METHOD OF INLET PROTECTION IS APPLICABLE WHERE HEAVY FLOWS ARE EXPECTED AND WHERE OVERFLOW CAPACITY IS NECESSARY TO PREVENT EXCESSIVE PONDING AROUND THE STRUCTURE

BLOCK AND GRAVEL STONE INLET SEDIMENT FILTER (7)

NOT TO SCALE

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PROJECT MANAGER	M.D. PLUMMER, P.E.
DESIGNED BY	R. BAYSDEN, P.E.
DRAWN BY	R. BAYSDEN, P.E.
CHECKED BY	J. READLING, P.E.
PROJECT NUMBER	453925–235691–018

NORTH CAROLINA PROFESSIONAL SEAL 025495 9/16/15 ENGINEER MICHAEL D. PLUMMER

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COLON MINE SITE STRUCTURAL FILL
SANFORD, NC

EROSION AND SEDIMENTATION CONTROL DETAILS (1 OF 3)

0 1" 2"

FILENAME 01C–11.dwg
SCALE AS SHOWN

SHEET 01C-11

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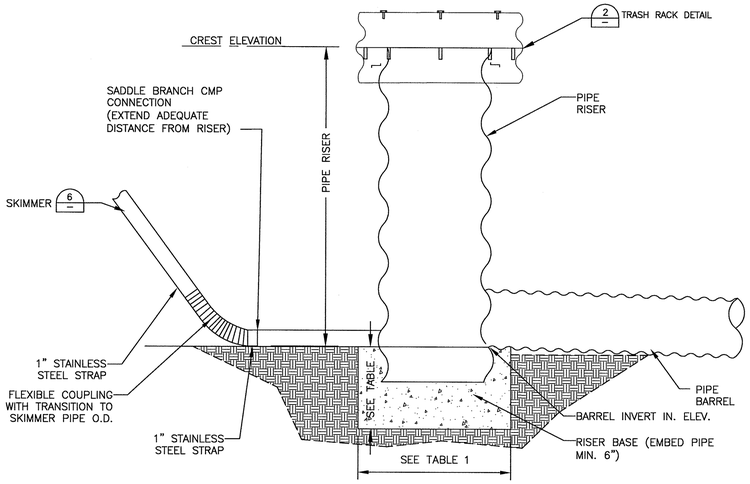
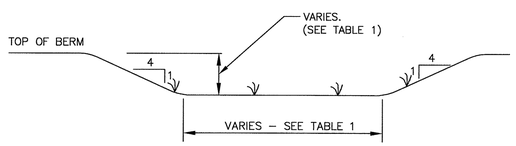


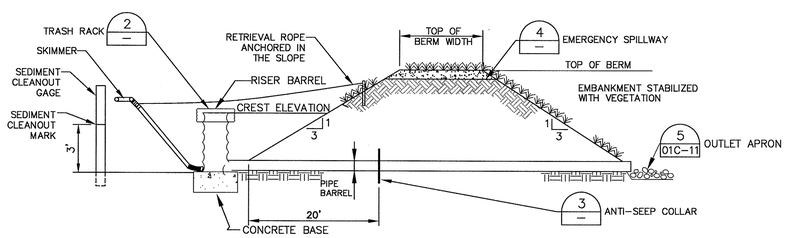
OUTLET STRUCTURE ENLARGEMENT
N.T.S.



NOTES:

1. EMERGENCY SPILLWAY IS GRASS LINED.

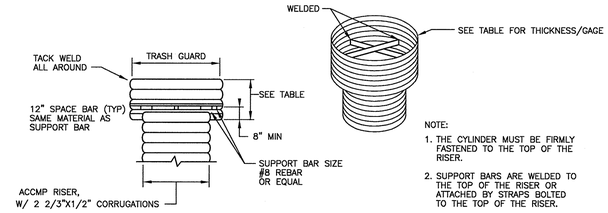
EMERGENCY SPILLWAY TYPICAL
N.T.S.



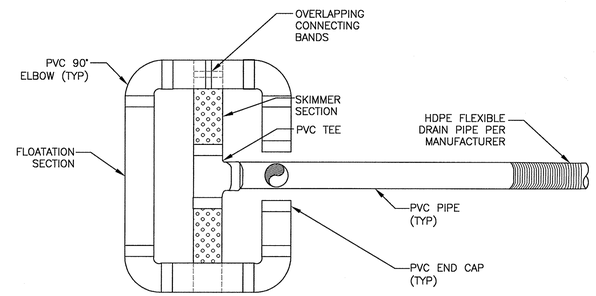
Sediment Basin #	Useful Life (Phase)	Bottom Elevation (MSL)	Top of Berm Elevation (MSL)	Top of Berm Width (FT)	Emergency Spillway Elevation (MSL)	Emergency Spillway Width (FT)	Number of Riser/Barrel /Skimmer Assemblies	Riser Diameter (IN)	Riser Crest Elevation (MSL)	Trash Guard Diameter (IN)	Trash Guard Thickness (Gage)	Trash Guard Height (IN)	Concrete Ballast Dimensions (FT)	Barrel Diameter (IN)	Barrel Invert In (MSL)	Barrel Invert Out (MSL)	Antiseep Collar Size (FT)	Skimmer Size (IN)	Skimmer Orifice (IN)	Dewatering Time (days)
1	1 & 2	283.0	290.5	3	290.0	20	1	54	289.4	78	16	25	6x6x2	18	283.0	282.5	3x3	4	2.7	5
2	1 & 2	259.0	266.0	6	265.0	15	2	60	264.2	90	14	29	6x6x2	24	259.0	258.5	4x4	4	3.1	5
3	1	244.0	250.0	12	249.0	10	1	24	248.4	36	16	13	3x3x1	12	244.0	243.5	2x2	2.5	2	5
4	1	261.0	267.6	12	267.0	20	1	24	266.3	36	16	13	3x3x2	12	261.0	260.5	2x2	4	3.7	5
5	1 & 2	255.0	262.0	12	261.0	20	2	48	260.3	72	16	21	5x5x2	24	255.0	253.8	4x4	6	5.1	5
6	1	249.0	256.0	12	255.1	10	1	18	254.0	27	16	8	2.5x2.5x1	12	249.0	248.5	2x2	5	4	5
7	1 & 2	238.0	245.5	12	244.9	20	2	60	244.4	90	14	29	6x6x2.5	24	238.0	237.5	4x4	4	3.5	5
8	1	273.0	279.0	12	278.3	10	1	18	277.5	27	16	8	2.5x2.5x1	12	273.0	272.0	2x2	4	3.2	5
9	1 & 2	262.0	270.5	3	269.5	50	2	72	268.7	102	14	36	7x7x3	42	262.0	260.8	7x7	5	4.6	5

NOTES:
1. MSL = MEAN SEA LEVEL
2. ALL PIPES ARE ASPHALT COATED 16GA OR HEAVIER EXCEPT FOR SKIMMER

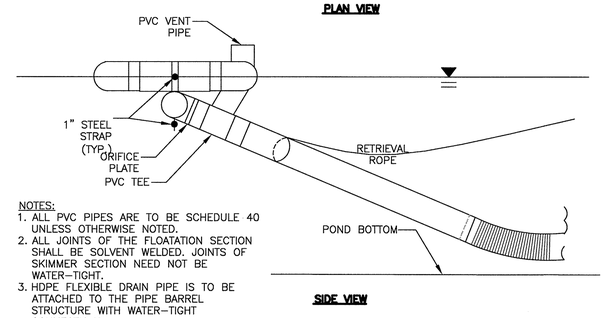
SEDIMENT BASIN SCHEDULE DETAIL
N.T.S.



TRASH RACK DETAIL
N.T.S.



PLAN VIEW



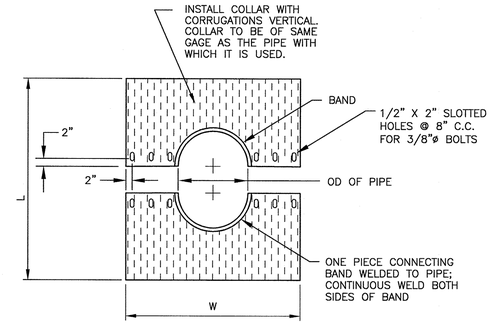
SIDE VIEW

NOTES:
1. ALL PVC PIPES ARE TO BE SCHEDULE 40 UNLESS OTHERWISE NOTED.
2. ALL JOINTS OF THE FLOATATION SECTION SHALL BE SOLVENT WELDED. JOINTS OF SKIMMER SECTION NEED NOT BE WATER–TIGHT.
3. HDPE FLEXIBLE DRAIN PIPE IS TO BE ATTACHED TO THE PIPE BARREL STRUCTURE WITH WATER–TIGHT CONNECTIONS.
4. SEE SCHEDULE FOR ORIFICE SIZE.
5. FAIRCLOTH TYPE OR EQUIVALENT SKIMMER TO BE USED.

FAIRCLOTH SKIMMER DETAIL
N.T.S.

MAINTENANCE AND INSPECTION

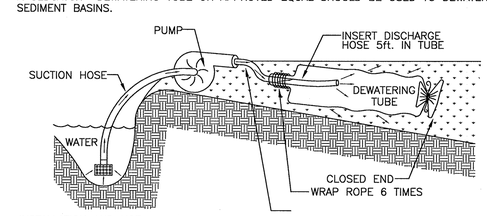
1. INSPECT SEDIMENT BASINS AT LEAST WEEKLY AND AFTER EACH SIGNIFICANT (1/2 INCH OR GREATER) RAINFALL EVENT AND REPAIR IMMEDIATELY.
2. REMOVE SEDIMENT AND RESTORE THE BASIN TO ITS ORIGINAL DIMENSIONS WHEN IT ACCUMULATES TO ONE–HALF THE DESIGN DEPTH. PLACED REMOVED SEDIMENT IN AN AREA WITH SEDIMENT CONTROLS
3. CHECK EMBANKMENT, SPILLWAYS, AND OUTLET FOR EROSION DAMAGE, AND INSPECT THE EMBANKMENT FOR PIPING AND SETTLEMENT. MAKE ALL NECESSARY REPAIRS IMMEDIATELY. REMOVE ALL TRASH AND OTHER DEBRIS FROM THE RISER AND POOL AREA.
4. ALL CMP SHALL BE FULLY ASPHALT COATED, 16 GA. OR HEAVIER
5. POND DIMENSIONS SHOWN ARE FOR THE CONTROLLING PHASE.



ANTI–SEEP COLLAR DETAIL
N.T.S.

THE PURPOSE OF A DEWATERING TUBE IS TO COLLECT SEDIMENT CONTAINED IN THE DISCHARGED WATER, TO PREVENT THE SCOUR AND EROSION FROM WATER EXITING A PIPE AT HIGH VELOCITY, TO DEFUSE THE WATER OVER A WIDER AREA TO MINIMIZE EROSION AS THE WATER DRAINS AWAY, AND TO RETAIN OIL CONTAINED WITHIN EFFLUENT.

A SEDCATCH DEWATERING TUBE OR APPROVED EQUAL SHOULD BE USED TO DEWATER THE SEDIMENT BASINS.



INSTALLATION AND USE:

1. PLACE SEDCATCH DEWATERING TUBE ON THE GROUND OR ON A TRAILER OVER A RELATIVELY LEVEL, STABILIZED AREA.
2. INSERT DISCHARGE PIPE A MINIMUM OF 5FT. INSIDE SEDCATCH DEWATERING TUBE AND SECURE WITH A ROPE (INCLUDED) WRAPPED 6 TIMES AROUND THE SNOUT OVER A 6 INCH WIDTH OF THE BAG. TO CLOSE AND OPEN END OF THE DEWATERING TUBE : OVERLAP THE TUBE 2 FT. FROM THE END. GATHER THE DISCHARGE HOSE DOUBLED–UP PORTION FORMING A BOW TIE. SECURE WITH A ROPE WRAPPED MULTIPLE TIMES.
3. EMPTY SEDCATCH DEWATERING TUBE WHEN HALF FULL OF SEDIMENT OR WHEN THE SEDIMENT HAS REDUCED THE FLOW RATE OF THE PUMP DISCHARGE TO AN IMPRACTICAL AMOUNT.

MAINTENANCE AND DISPOSAL:

1. REMOVE AND DISPOSE OF ACCUMULATED SEDIMENT AWAY FROM WATERWAYS OR ENVIRONMENTALLY SENSITIVE AREAS. OPEN BOTH ENDS OF THE SEDCATCH DEWATERING TUBE , PICK IT UP IN THE CENTER AND DUMP ACCUMULATED SEDIMENT OUT OF BOTH ENDS. ALLOW TO DRY AND STORE FOR RE–USE OR; AS DIRECTED BY ENGINEER OR INSPECTOR.

SILT BAG DETAIL
N.T.S.

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PROJECT MANAGER	M.D. PLUMMER, P.E.
DESIGNED BY	R. BAYSDEN, P.E.
DRAWN BY	R. BAYSDEN, P.E.
CHECKED BY	J. READLING, P.E.
PROJECT NUMBER	453925–235691–018

NORTH CAROLINA PROFESSIONAL SEAL 025495 ENGINEER MICHAEL D. PLUMMER

Charah®

COLON MINE SITE STRUCTURAL FILL
SANFORD, NC

EROSION AND SEDIMENTATION CONTROL DETAILS (2 OF 3)

0 1" 2"

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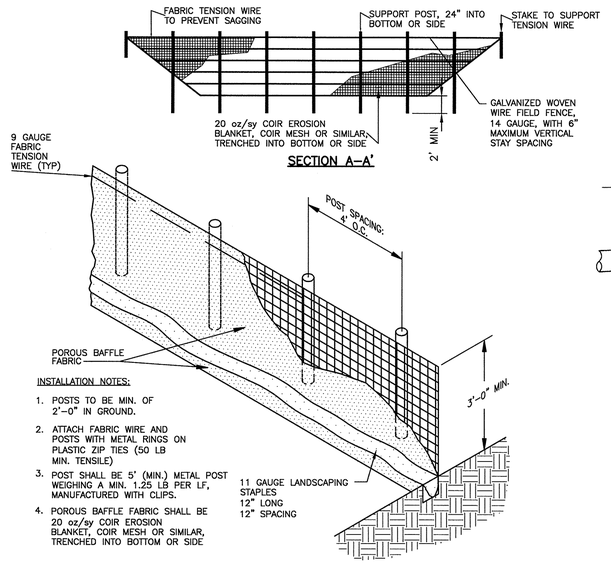


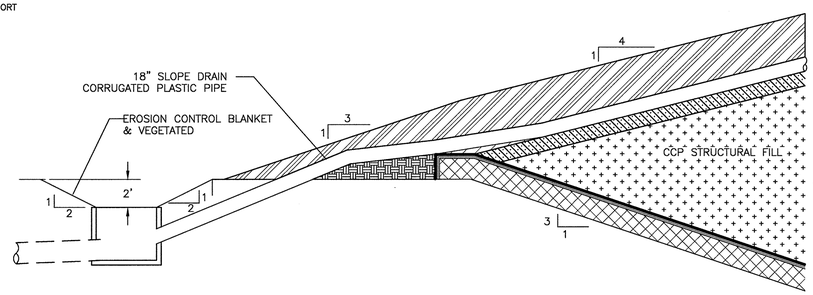
INSTALLATION NOTES:

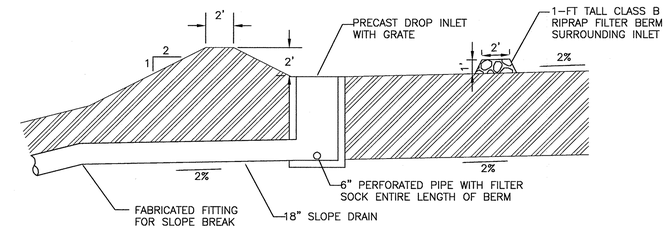
1. POSTS TO BE MIN. OF 2'–0" IN GROUND.
2. ATTACH FABRIC WIRE AND POSTS WITH METAL RINGS ON PLASTIC ZIP TIES (50 LB MIN. TENSILE)
3. POST SHALL BE 5' (MIN.) METAL POST WEIGHING A MIN. 1.25 LB PER LF, MANUFACTURED WITH CLIPS.
4. POROUS BAFFLE FABRIC SHALL BE 20 oz/sy COIR EROSION BLANKET, COIR MESH OR SIMILAR, TRENCHED INTO BOTTOM OR SIDE

SEDIMENT BAFFLE

NTS

1 / 01C–02





SLOPE DRAIN INLET / OUTLET PROTECTION

6 / –

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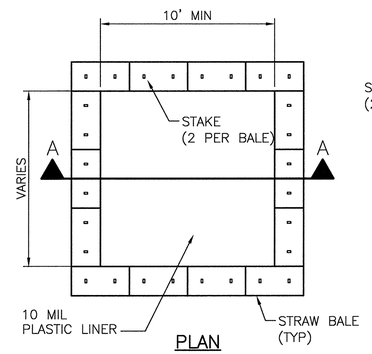
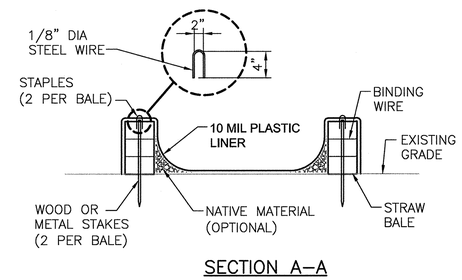


PLAN



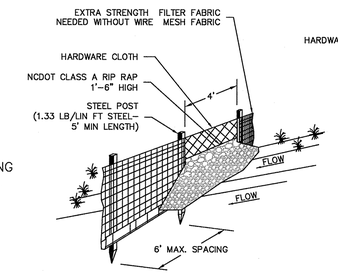
SECTION A–A

NOTE
CONCRETE WASHOUTS WILL BE LOCATED AT LEAST 50–FT FROM ANY STORM DRAIN INLETS AND SURFACE WATERS AS PER NPDES REQUIREMENTS

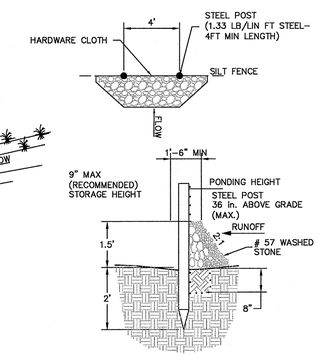
CONCRETE WASHOUT AREA DETAIL

3 / –

NOT TO SCALE



DESIGN TYPE	DRAINAGE AREA (APPROX.)	WEIR LENGTH (L) MIN.
1/4	1/2 ACRE	4.0 FT



ROCK SECTION DETAIL
TRENCH WITH GRAVEL

SILT FENCE W/ ROCK OUTLET

5 / –

N.T.S.

FOR SHOULDERS, SIDE DITCHES, SLOPES (MAX 3:1):

DATE	TYPE	PLANTING RATE
AUG 15 – NOV 1	TALL FESCUE	300 LBS/ACRE
NOV 1 – MAR 1	TALL FESCUE & ABRUZZI RYE	300 LBS/ACRE
MAR 1 – APR 15	HULLED COMMON BERMUDAGRASS	300 LBS/ACRE
APR 15 – JUN 30	TALL FESCUE AND BROWNTOP MILLET OR SORGHUM–SUDAN HYBRIDS***	300 LBS/ACRE
APR 15 – JUN 30	TALL FESCUE AND BROWNTOP MILLET OR SORGHUM–SUDAN HYBRIDS***	300 LBS/ACRE

*** TEMPORARY: RESEED ACCORDING TO OPTIMUM SEASON FOR DESIRED PERMANENT VEGETATION. DO NOT ALLOW TEMPORARY COVER TO GROW MORE THAN 12" IN HEIGHT BEFORE MOWING; OTHERWISE, FESCUE MAY BE SHADED OUT.

FOR SHOULDERS, SIDE DITCHES, SLOPES (MAX 3:1 TO 2:1):

DATE	TYPE	PLANTING RATE
MAR 1 – JUN 1	SERICEA LESPEDEZA (SCARIFIED) AND USE THE FOLLOWING COMBINATIONS:	50 LBS/ACRE (SERICEA LESPEDEZA);
MAR 1 – APR 15	ADD TALL FESCUE	120 LBS/ACRE
MAR 1 – JUN 30	OR ADD WEEPING LOVE GRASS	10 LBS/ACRE
MAR 1 – JUN 30	OR ADD HULLED COMMON BERMUDAGRASS	25 LBS/ACRE
SEPT 1 – MAR 1	SERICEA LESPEDEZA (UNHULLED UNSCARIFIED) AND TALL FESCUE	70 LBS/ACRE (SERICEA LESPEDEZA); 120 LBS/ACRE (TALL FESCUE)
NOV 1 – MAR 1	AND ABRUZZI RYE	25 LBS/ACRE

IF SOIL CONDITIONS ARE NOT KNOWN, APPLY LIME AT A RATE OF 1 TO 1.5 TONS/ACRE ON COARSE TEXTURED SOILS AND 2–3 TONS/ACRE ON FINE–TEXTURED SOILS. APPLY LIMESTONE UNIFORMLY AND INCORPORATE INTO THE TOP 4–6 INCHES OF SOIL. APPLY 10–10–10 FERTILIZER AT 700–1000 LBS/ACRE MIXED INTO THE TOP 4–6 INCHES OF SOIL.

SEEDBED PREPARATION NOTES

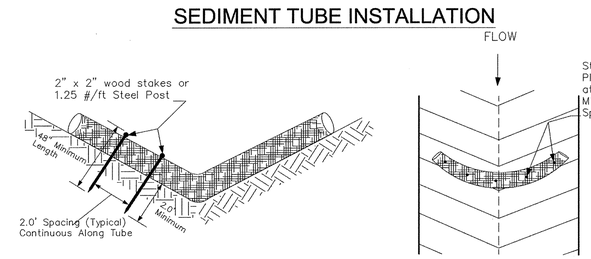
1. SURFACE WATER CONTROL MEASURES TO BE INSTALLED ACCORDING TO PLAN.
2. AREAS TO BE SEEDED SHALL BE RIPPED AND SPREAD WITH AVAILABLE TOPSOIL 3" DEEP. TOTAL SEEDBED PREPARED DEPTH SHALL BE 4" TO 6" DEEP.
3. LOOSE ROCKS, ROOTS AND OTHER OBSTRUCTIONS SHALL BE REMOVED FROM THE SURFACE SO THAT THEY WILL NOT INTERFERE WITH ESTABLISHMENT AND MAINTENANCE OF VEGETATION. SURFACE FOR FINAL SEEDBED PREPARATION AT FINISHED GRADES SHOWN SHALL BE REASONABLY SMOOTH AND UNIFORM.
4. IF NO SOIL TEST IS TAKEN, FERTILIZER AND LIME TO BE ACCORDING TO SEEDING SPECIFICATIONS BELOW. IN ADDITION, PROVIDE 15 LBS/1000 S.F. OF SUPERPHOSPHATE.
5. IF SOIL TEST IS TAKEN, PROVIDE LIME AND FERTILIZER ACCORDING TO SOIL TEST REPORT.
6. LIME AND FERTILIZER SHALL BE APPLIED UNIFORMLY AND MIXED WITH THE SOIL DURING SEEDBED PREPARATION. ADDITIONAL EROSION CONTROL MEASURES MAY BE REQUIRED DEPENDING ON FIELD CONDITION.
7. MULCHING
   A. STEP 1: $\frac{1}{3}$ MULCH, ALL SEEDING AND ALL INOCULATE SPREAD IN ONE DIRECTION.
   B. STEP 2: $\frac{2}{3}$ MULCH RATE APPLIED IN OPPOSING DIRECTION.
8. ALL SLOPES GREATER THAN 2.5:1 SHALL BE STABILIZED WITH JUTE MESH.

SEEDING

N.T.S.

2 / –

SEDIMENT TUBE INSTALLATION



SEDIMENT TUBE SPACING

SLOPE	MAX. SEDIMENT TUBE SPACING
LESS THAN 2%	150–FEET
2%	100–FEET
3%	75–FEET
4%	50–FEET
5%	40–FEET
6%	30–FEET
GREATER THAN 6%	25–FEET

SEDIMENT TUBES – GENERAL NOTES

1. Sediment tubes may be installed along contours, in drainage conveyance channels, and around inlets to help prevent off–site discharge of sediment–laden stormwater runoff.
2. Sediment tubes are elongated tubes of compacted geotextiles, curled excelsior wood, natural coconut fiber, or hardwood mulch. Straw, pine needle, and leaf mulch–filled sediment tubes are not permitted.
3. The outer netting of the sediment tube should consist of seamless, high–density polyethylene photodegradable materials treated with ultraviolet stabilizers or a seamless, high–density polyethylene non–degradable material.
4. Sediment tubes, when used as checks within channels, should range between 18–inches and 24–inches depending on channel dimensions. Diameters outside this range may be allowed where necessary when approved.
5. Curled excelsior wood, or natural coconut products that are rolled up to create a sediment tube are not allowed.
6. Sediment tubes should be staked using wooden stakes (2–inch X 2–inch) or steel posts (standard "U" or "T" sections with a minimum weight of 1.25 pounds per foot) at a minimum of 48–inches in length placed on 2–foot centers.
7. Install all sediment tubes to ensure that no gaps exist between the soil and the bottom of the tube. Manufacturer's recommendations should always be consulted before installation.
8. The ends of adjacent sediment tubes should be overlapped 6–inches to prevent flow and sediment from passing through the field joint.
9. Sediment tubes should not be stacked on top of one another, unless recommended by manufacturer.
10. Each sediment tube should be installed in a trench with a depth equal to 1/5 the diameter of the sediment tube.
11. Sediment tubes should continue up the side slopes a minimum of 1–foot above the design flow depth of the channel.
12. Install stakes at a diagonal facing incoming runoff.

SEDIMENT TUBES – INSPECTION & MAINTENANCE

1. The key to functional sediment tubes is weekly inspections, routine maintenance, and regular sediment removal.
2. Regular inspections of sediment tubes shall be conducted once every calendar week and, as recommended, within 24–hours after each rainfall even that produces 1/2–inch or more of precipitation.
3. Attention to sediment accumulations in front of the sediment tube is extremely important. Accumulated sediment should be continually monitored and removed when necessary.
4. Remove accumulated sediment when it reaches 1/3 the height of the sediment tube.
5. Removed sediment shall be placed in stockpile storage areas or spread thinly across disturbed area. Stabilize the removed sediment after it is relocated.
6. Large debris, trash, and leaves should be removed from in front of tubes when found.
7. If erosion causes the edges to fall to a height equal to or below the height of the sediment tube, repairs should be made immediately to prevent runoff from bypassing tube.
8. Sediment tubes should be removed after the contributing drainage area has been completely stabilized. Permanent vegetation should replace areas from which sediment tubes have been removed.

WATTLE INSTALLATION

4 / –

NOT TO SCALE

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ISSUE	DATE	DESCRIPTION
D	04/02/15	REVISED PER NCDENR COMMENTS
C	03/19/14	EROSION CONTROL SUBMITTED FOR NORTHWEST AREA
B	12/31/14	REVISED PER NCDENR COMMENTS
A	11/2014	ISSUED FOR APPROVAL

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NORTH CAROLINA PROFESSIONAL SEAL 025495 ENGINEER MICHAEL D. PLUMMER 4/6/15

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SANFORD, NC

EROSION AND SEDIMENTATION CONTROL DETAILS (3 OF 3)

0 1" 2"

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SCALE AS SHOWN

SHEET 01C-13

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