SILVER LAKE COMMISSION
Meeting Notice and Draft Agenda

April 29, 2015
5:30 PM at Dover City Hall
Large Conference Room

DRAFT AGENDA

I. Welcome/Call to order

II. Approval of February 2015 meeting minutes

III. Project Updates
   a. Mirror Lake
   b. Central Middle Regenerative Step Pool update

IV. Old Business
   a. Punch List, Letters to City Manager and City Council
   b. Buffer Herbicide Treatment, Central Middle School & Mirror Lake
   c. Spring Clean Up
   d. Punch List, Letters to City Manager and City Council

V. New Business
   a. 2015 Lake draw down schedule and procedure
   b. Mirror Lake: Citizen comments received

Silver Lake Commission
February 4, 2015
5:30PM, Conference Room
Dover City Hall

**** DRAFT ****

Members Present	Others In Attendance
Dean Holden, Chairman	Carolyn Courtney, City Staff
Zach Carter	Lara Allison, DNREC
David Edgell	
Lyle Jones	
Ann Marie Townshend	

WELCOME & CALL TO ORDER: 5:35 PM

APPROVAL OF NOVEMBER MEETING MINUTES

Mr. Jones noted a typo in the spelling of DNREC on the page with that change Mr. Carter motioned to accept the minutes with a second from Mrs. Townshend the motion passed without objection.

PROJECT UPDATES

Punch List, Letters to City Manager & City Council

Mr. Holden presented two draft letters. (Attached) Discussion took place on how to word specific bullet points and who should be copied. We understand the staffing issues and cuts that have been made have hindered the parks maintenance and appearance. Some of the punch list items are one time repairs that can be completed. The ongoing weekly tasks are just not being done. We need regular maintenance. Mr. Edgell noted it sounds like we are talking about three different things: 1) We need regular maintenance activities to bring the appearance up, 2) A short list of one time fixes and 3) Visionary things that are great ideas but might throw off our message by putting them in the same letter. Mention the parks could become so much more but we are not even at the point due to maintenance items not being addressed. Mrs. Townshend noted we are doing a full master plan for Dover Park from our Recreation Needs Assessment, once we have the Dover Park plan completed I would say that we then focus on a master plan for Silver Lake park. Mr. Carter suggested the letter to the City Manager should go to the Parks Recreation and Community Enhancement Committee. Some discussion took place. After review Mr. Holden will finalize letters with Ms. Courtney and send out accordingly including a final the SLC members and the Parks & Recreation Committee. Mr. Carter made the motion to send the letters with amendments which was seconded by Mr. Jones, the motion passed without objection.

Buffer Herbicide Treatment, Central Middle School & Mirror Lake

Mrs. Townshend noted she met with the public works director. The short answer is yes, we can work with Matt Grabowksi, however, the director has requested a cost estimate for materials for budgeting purposes as she does not have a whole lot of money to use for the project. While we are in the middle of the fiscal year, there is concern on budgetary line items although it was believe we could still cover this project between the Public Works and Parks & Recreation budget. Mr. Holden will contact Mr. Grabowksi to see what he'll need and costs estimates. Also, the city needs to address the areas along Park Drive up to the dam, the whole border needs to be trimmed out and the invasives removed. Be sure to leave something to spray and not trimmed all the way down.

Lake Draw Down Procedure

Mr. Holden reported on draw down in December. We were unable to get the water level down very far due to the weather patterns. Mr. Holden said he had discussed the issue with Ms. Duca about doing this on an annual basis. It was agreed to schedule the draw down annually for late October – November. We would recraft the notices for residents and offer a point of contact at DNREC for permitting questions. The first notice will go out mid-summer with reminder post cards as the date nears.

The feedback indicated that we did not allow enough time for the residents to prepare and the message was unclear as to whether or not permits would be needed for various work. Again, the initial notice will be sent out mid-summer with verbiage directing permitting questions to a DNREC contact that can field their question. We will revisit the language used in the letters.

What is required letter and the contact for the City and State for permitting purposes. Mrs. Townshend noted with the flood plain regulations we may need to look at what does or does not need a permit. Some activities will require permits. So again, we will give a name and contact number to field the initial calls. We will be more prepared in 2015 for this activity. This was always intended to be an annual event. By scheduling annually we will always have it on our calendars and then we will not miss the opportunity or send out late notices for the project.

Mr. Holden will have a draft letter and schedule for the April meeting to review and have path for the city to move forward with notifications.

Mirror Lake Update

Mr. Holden shared a few slides (attached). Mr. Greene has indicated preliminary results are showing improvements. At this point the project is deemed successful and more studies are being done to monitor the various PCB levels in the lake and fish.

DNREC is going after an award with the American Academy of Environmental Engineers & Scientists. Mr. Greene asked if we could write a letter of support on their behalf. Mr. Holden's letter of support was included in the packet.

Mr. Carter noted we should invite Mr. Greene to City Council to share the results of the project. It was noted probably April would be a good time to get before City Council and PRCE with this update. It was noted that is a really good project that is cleaning up the water. Mr. Edgell asked if this was early to see these results. Mr. Holden responded with yes. Some discussion took place on the effectiveness long term and carbon absorption and the long term effect. We are also addressing the some of the problems that caused the issue, this will also help with the long term outlook of the project. Mr. Holden will reach out to Mr. Greene for presenting the findings. Then Mr. Holden will schedule with Traci McDowell our City Clerk for getting on the agenda.

A brief discussion took place on the check dam and that at this time it was noted to leave in place. To do anything with the dam it will require permits. Who is responsible for the structure? With discussion it was noted it's a who owns the water/who owns the structure issue. Even if the city wanted to do something with it we would have to thru DNREC to do anything with it. Mr. Holden will ask Mr. Greene if there is anything new discussion on this topic.

Central Middle Regenerative Step Pool

Ms. Allison does have a partial plan and can email everyone if they want to see it. (Attached.) The cost estimate is $255,958 with 2 scenarios attached for the step pool. Not a good point of contact or feedback from Central Middle School to get the project done. We would need them to be a partner in this project. As time has passed various groups were contact such as the PTO but nobody seems to want to own this project. There are grant funding sources available such as the 21st Century Fund and Community Water Fall grant (it does not require a match). It has sort of fallen to the wayside due to staffing changes. Mr. Holden noted he would discuss with Elliott Hardin of the state and see about an appropriate contact for the getting done. There are a few options for grant funding for the project. We will try to get Capital to buy into the project, then maybe the city as part of their storm water plan. Mr. Jones noted at one time we did have grant funding to pay for this, however DNREC could not get anyone to back the project.

Spring Clean Up

Mr. Jones noted he had not heard back from his contacts about a May date and reported he was not available the second weekend of May. Mr. Holden noted we reach back out to Glenn to see if we can get support from the HOBY youth. Dates for a spring clean-up were briefly discussed for April or May. May seemed fairly tight on the schedule. Again, talk with HOBY to see when they are available and also reach out to the DHS Jr ROTC group as they were a big help in the past. Will address again at our April meeting to see what we can have in place and make work with available members and volunteers.

NEW BUSINESS

2015 Lake Draw Down

Discussed earlier in meeting

Bike and Pedestrian Future Improvements

Mrs. Townshend reported what we have now is what we have for a while. We do have a Bicycle and Pedestrian Plan that will promote a Senator Bikeway, the bicycle boulevard. The trail would go from the east side of town to

the west side. Some of this is off road, along route and some side streets. Our input is still on the table and will be considered as the trails are developed. Mr. Jones asked if the trees along Park Drive that were removed will be replanted. Mrs. Townshend could not answer that but noted due to the time of year, it may just be that we couldn't replant during winter. Mr. Jones doesn't care about the cherry trees but he wants the native trees planted to be replaced. Mrs. Townshend agreed to follow up on this project.

Mr. Holden noted we will keep this on the agenda as progress is made so that we do not miss an opportunity as the east/west trail gets traction we can be involved and offer support and recommendations to connect the trails to existing. Brief discussion on the projected Senator Bike way and the Capital School District's input and support. This is a long term project, especially since we have to get over the rail road tracks and meet with the district to share the idea.

DNREC – Colonial Investment Wetland Project

Ms. Allison noted that Colonial Investments representatives are not in favor of developing this area as a wetland. They do not want this on their property as feel it would prevent future development and other issues. Regardless of the flood plain issues and DRNEC's concerns they are against any wetland development on their property.

We have decided to back up and look at options on the DNREC property alone. Grant money had to be returned due to the timing. Some options include a wetland sloped, a stone wetlands a newer approach and also a rain garden and in addition we would like to use the concrete structure made for the catch basin, we'd like to be able to use that if we can. We are looking to develop something on DRNEC property only. Mr. Jones noted he talked with Mr. Sean Lynn (their attorney) at length. Mr. Lynn agreed look into liability issues that are potentially there bases on Mr. Jones recommendation. Ms. Allison noted we are moving forward without them at this time. If they want to come back on board that would be great but we are moving forward.

Dover Pools Project

We are continuing to follow up on this project and already have a survey done. There is a potential to reapply for grant funding to complete this project. Mr. Jones feels they have a lot of water running off their property and we have a problem with the Silver Mills complex. Ms. Allison noted the manager here are on board and want to work with us, it the property owners in Germany who made the decisions.

ADJOURNMENT

With no further business, the meeting adjourned at 6:51PM.

Silver Lake Commission

Dean Holden
Chairman

Members

James Burcham
Zachery C. Carter
David Edgell
Lyle Jones
Ann Marie Townshend

February 5, 2015

Mayor & City Council
City of Dover
15 Loockerman Plaza
Dover, DE 19903

RE: **SILVER LAKE PARK – MAINTANENCE**
Dover, Delaware

Dear Mayor and Council:

We are writing to you to convey our concerns over ongoing maintenance needs and our strong recommendation to support annual maintenance activities within Silver Lake Park and connected downstream City open spaces.

We have just recently relayed a list of outstanding maintenance items to the City Manager, asking for his assistance in resolving them. We also want to highlight the support the City Manager, Planning and Public works Directors and Chris Kohout in maintenance have provided to Silver Lake Commission initiated volunteer cleanup events and identified maintenance concerns. Our concerns are not borne of staff inattention or mismanagement but of their staffing levels and associated ability to maintain these park areas at past levels of service.

Stepping back, we obviously are involved in the Silver Lake Commission due to an appreciation for our parks and what they offer. Our City residents make use of these areas for healthy recreation and outdoor enjoyment. Many utilize the pavilions in the park for birthday parties and family reunions. The park is utilized for locally sponsored running events as well. The growing greenway (Capital City Trail) network now connects the Park to the Isaac's Branch Trail, a wonderful accomplishment for a City developed long before these assets were valued. These greenways are becoming more heavily used for bicycle travel and exercise pursuits. Maintaining existing park facilities is critical to maintaining viable use of the parks for these activities. The presence of park and greenway facilities is also a huge attraction to families and businesses considering a move!

We'd like to be petitioning you now for improvements to increase the value these areas have, think of the Mispillion River Walk and the value it has added to downtown Milford, but recognize City staff no longer appears to have the manpower or resources to maintain the parks at past basic service levels. Necessary maintenance items aren't being addressed and our park areas are showing this reduced attention.

In short, we ask that you consider providing City Staff with increased resources and a renewed mandate to maintain these areas for all of the above reasons.

We look forward to an opportunity to discuss these matters with you.

Sincerely,

Dean Evans Holden, P.E.
City of Dover, Silver Lake Commission Chairman

Cc:
Sharon Duca, Public Works Director
Parks, Recreation & Community Enhancement Committee

Silver Lake Commission

Dean Holden
Chairman

Members

James Burcham
Zachery C. Carter
David Edgell
Lyle Jones
Ann Marie Townshend

February 5, 2015

Scott Koenig
City of Dover; City Manager
15 Loockerman Plaza
Dover, DE 19903

RE: **SILVER LAKE COMMISSION – PARK MAINTENANCE ITEMS**
Silver Lake Park; Dover, Delaware

Dear Scott:

We are writing to you to convey a list of maintenance items within Silver Lake Park that have been outstanding for some months. We are eager for the City to address these items to maintain Park and associated facilities and would enjoy any discussion with you or your staff on this matter. We are also eager to discuss with you and Council our vision for improvements within the Park and use of the Park in City sponsored, and other, community events.

Silver Lake Park and downstream park areas are a vital component of the City's outdoor recreation opportunities. These areas support economic development, offer space for healthy activities, support a healthy environment and provide greenway connections for those who travel by foot and pedal. These park areas need consistent maintenance and capital input to maintain existing service levels and require additional attention to become more productive areas for the City. We often reference the improvements made in downtown Milford along the Mispillion River and the Bug & Bud Festival held there as a model for what Dover's under-utilized park assets could become.

Specific maintenance items, numbered on the attached exhibit, are:

1. Re-sand the beach area or convert to turf park area with landscaping to mitigate waterfowl usage.
2. Clean grass, sediment and trash from curb line.
3. Weed and mulch playground.
4. Repair flashing on pavilion II.
5. Grade and seed topsoil placed around pavilion.
6. Restripe boat ramp area.
7. Clear weeds and reseed river edge. Remove or trim to grade stumps.
8. Replace rotting timber bollards.
9. Fertilize, lime or otherwise appropriately amend turf areas for healthy grass.
10. Install french drains or similar to keep water and debris from flowing across concrete pathway.
11. Clear path north of Division St. of debris and broken glass.

Thank you for your assistance and efforts in maintaining these valuable park areas!

Sincerely,

Dean Evans Holden, P.E.
City of Dover, Silver Lake Commission Chairman

Enclosures
Exhibit 1

Cc:
Parks, Recreation & Community Enhancement Committee



LAYER STATE : Layout3

SILVER LAKE PARK - MAINTENANCE AND REPAIR ITEMS

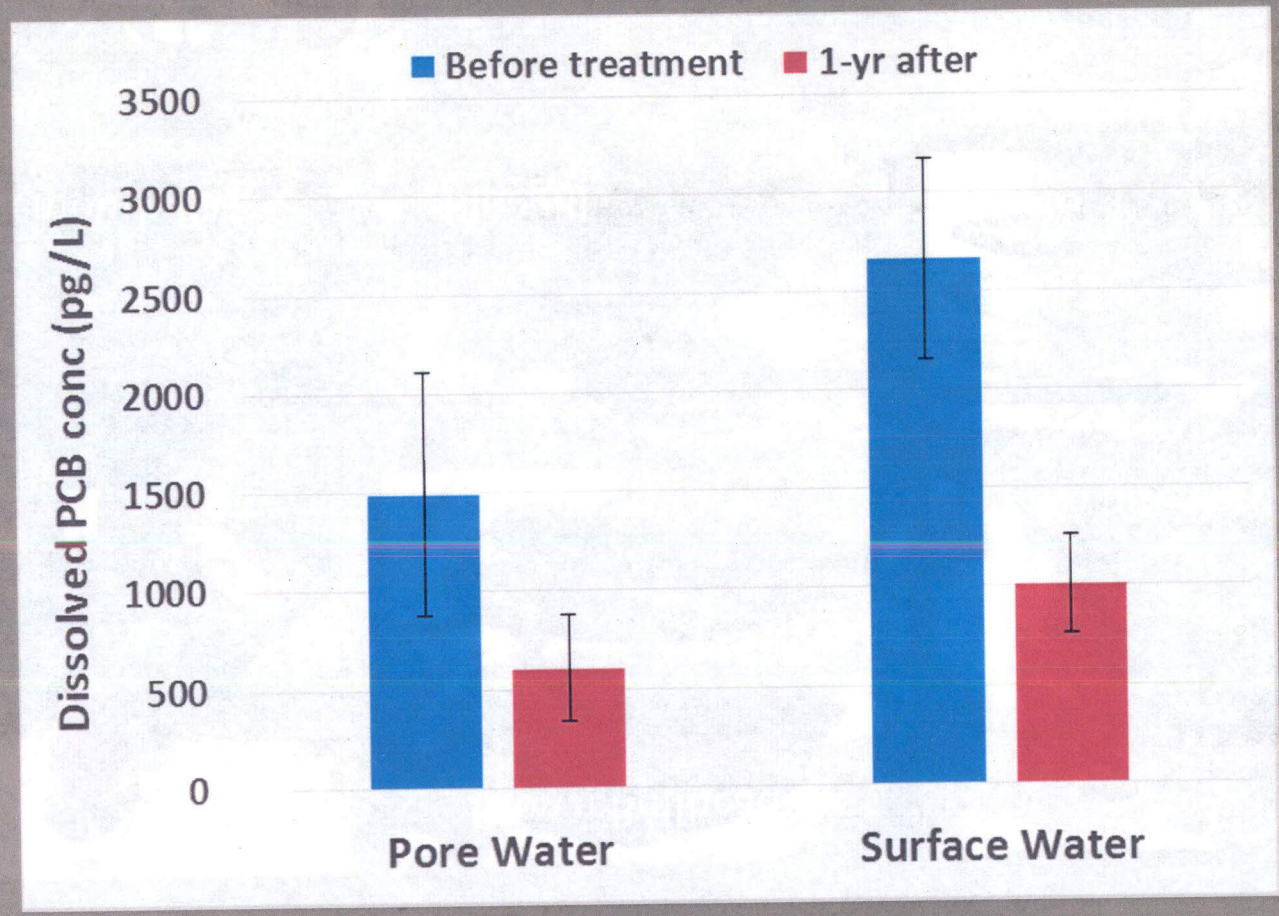
SILVER LAKE COMMISSION

SCALE : 1" = 150'
DATE : 01/01/2015
DRAWN BY : DEH

1

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Mirror Lake PCB – Passive Samplers



60% reduction in porewater and 62% in water column.
NOT corrected for non-equilibrium thru PRC loss.

Fish Tissue Sampling


Largemouth Bass


Brown Bullhead


White Perch

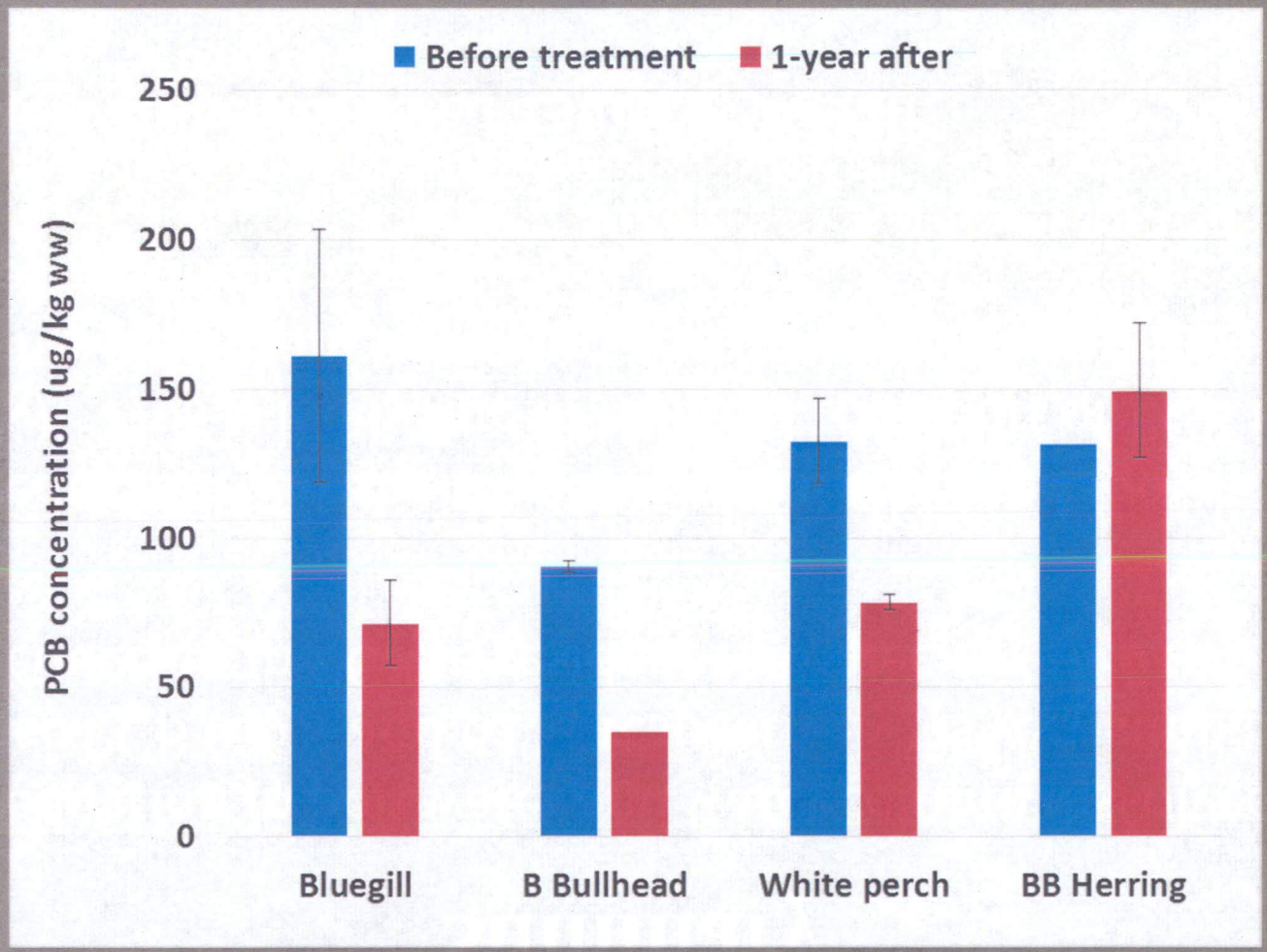

Bluegill


Golden Shiner




Blueback Herring

PCB in Fish Tissue



56 - 61% reduction in resident fish; 0 -41% reduction in migratory fish

Summary

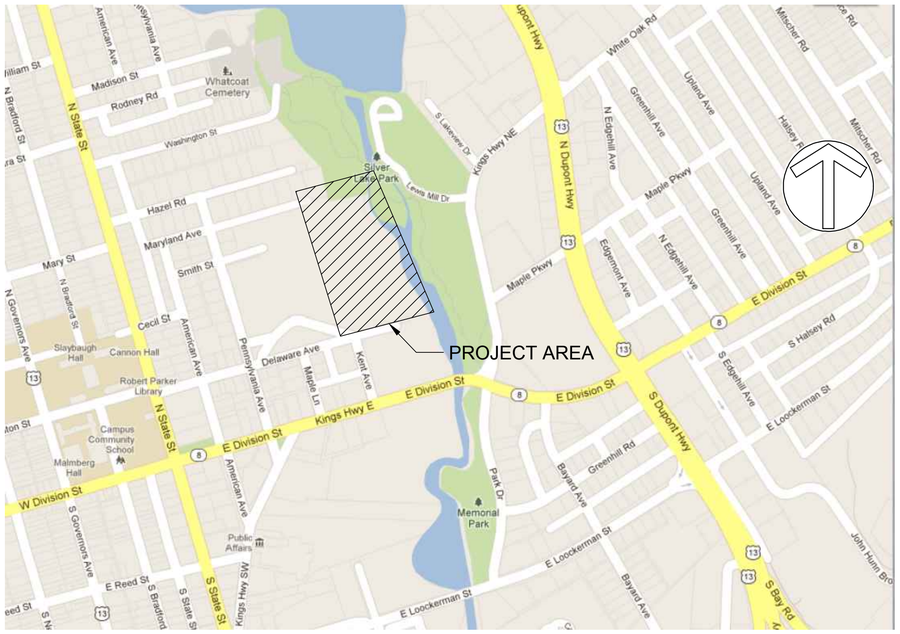
- % reduction in porewater and water column dissolved phase PCB (60% and 62%, respectively) is very similar to % reduction in PCB in resident fish species (56% to 61%).
- % reduction was slightly less than anticipated (70% - 90%). This is likely due to residual transport of PCB into Mirror Lake from upstream and downstream (under investigation).
- Project still considered a success overall.
- Monitoring will continue for several additional years.

CENTRAL MIDDLE SCHOOL

REGENERATIVE STORMWATER CONVEYANCE

LEGEND

EXISTING		PROPOSED	
— 15 —	MAJOR CONTOUR LINE	425	MAJOR CONTOUR LINE
— 14 —	MINOR CONTOUR LINE	425	MINOR CONTOUR LINE
	100 YR FLOODPLAIN		THALWEG
OHW	MEAN LOW WATER	LOD — LOD	LIMIT OF DISTURBANCE
MHT	MEAN HIGH TIDE	SF — SF	SILT FENCE
	PROPERTY LINE	TC-3 — TC-3	TURBIDITY CURTAIN
X X X	FENCE LINE	SCE	STABILIZED CONSTRUCTION ENTRANCE
	SOIL BOUNDARY		STAGING AND STOCKPILE AREA
>>	CULVERT PIPE		MULCH ACCESS ROAD
	TREE		RIFFLE 1' DROP
	INLET		RIFFLE 2' DROP
D	STORM DRAIN MANHOLE		CASCADE
	POWER POLE		BOULDER BANK PROTECTION
△	TRAVERSE POINT		BOULDER GRADE CONTROL



SCALE: 1" = 500'

VICINITY MAP

INDEX OF SHEETS

SHEET NUMBER	SHEET NAME
1	TITLE SHEET
2	SHEET INDEX
3	EXISTING CONDITIONS
4	EXISTING CONDITIONS
5	PROPOSED CONDITIONS
6	PROPOSED CONDITIONS
7	PROFILES
8	CROSS SECTIONS
9	DETAILS
10	DETAILS
11	DETAILS
12	EROSION & SEDIMENT CONTROL DETAILS
13	EROSION & SEDIMENT CONTROL DETAILS
14	EROSION & SEDIMENT CONTROL DETAILS
15	EROSION & SEDIMENT CONTROL NOTES
16	EROSION & SEDIMENT CONTROL NOTES
17	EROSION & SEDIMENT CONTROL NOTES
18	PLANTING DETAILS & SCHEDULES
19	PLANTING PLAN
20	PLANTING PLAN

GENERAL DATA:

SOURCE OF TOPOGRAPHY: TOPOGRAPHY SHOWN ON THIS PLAN IS BASED UPON DNREC SURVEYS DATED FEBRUARY 20, 2013. UTILITY LOCATION IS BASED UPON FIELD LOCATION OF VISIBLE EVIDENCE ONLY AS WELL AS CONSULTATION WITH THE CITY OF DOVER DEPARTMENT OF PUBLIC WORKS.

HORIZONTAL DATUM: SCALED NORTH AZIMUTH, ASSUMED COORDINATE SYSTEM
VERTICAL DATUM: NAVD 88 FEET
BENCHMARK: N/A

TAX PARCEL #: 2-05-06817-03-6600, 2-05-06817-03-2600, 2-05-06817-03-2700

SITE GROSS ACREAGE = 1.10 AC.
TOTAL DISTURBED AREA = 1.10 AC.
VOLUME OF CUT: 85.8 CY
VOLUME OF FILL: 341.6 CY
TOTAL CONTRIBUTING DRAINAGE AREA = XX,XXX AC.

GENERAL NOTES:

DRAINAGE, EROSION AND SEDIMENT CONTROL AND STORMWATER MANAGEMENT SHALL BE IN ACCORDANCE WITH THE DELAWARE SEDIMENT AND STORMWATER REGULATIONS, AS AMENDED.

REVIEW AND APPROVAL OF THE GENERAL PLAN SUBMISSION SHALL NOT RELIEVE THE CONTRACTOR FROM HIS OR HER RESPONSIBILITIES FOR COMPLIANCE WITH THE SEDIMENT AND STORMWATER REGULATIONS, AS AMENDED, NOR SHALL IT RELIEVE THE CONTRACTOR FROM ERRORS OR OMISSIONS ON THE APPROVED PLAN.

ACREAGE OF DISTURBED AREA =
1.00 AC LANDWARD
0.10 AC SUBAQUEOUS
1.10 AC TOTAL

LIMITS OF DISTURBANCE MUST BE DELINEATED IN THE FIELD.

THE APPLICANT SHALL NOTIFY THE DELEGATED INSPECTION AGENCY AT LEAST 48 HOURS PRIOR TO BEGINNING CONSTRUCTION.

INITIAL EARTH DISTURBANCE SHALL BE LIMITED TO THOSE AREAS NECESSARY TO INSTALL SEDIMENT AND EROSION CONTROL MEASURES.

OWNER/DEVELOPER IS NOT THE SAME OWNER/DEVELOPER OF TWO OR MORE CONTIGUOUS LOTS BEING DEVELOPED.

GENERAL NOTES (CON'T):

GRADING SHALL NOT IMPAIR SURFACE DRAINAGE, CREATE AN EROSION HAZARD OR CREATE A SOURCE OF SEDIMENT TO ANY ADJACENT WATERCOURSE OR PROPERTY OWNER.

ANY SEDIMENT TRANSPORTED OFF-SITE TO ROADS OR RIGHTS OF WAY INCLUDING DITCHES, SHALL BE REMOVED IMMEDIATELY. ANY DAMAGE TO DITCHES SHALL BE REPAIRED AND STABILIZED TO ORIGINAL CONDITION.

ALL DISTURBED SOIL SURFACES, INCLUDING STOCKPILES AND PERIMETER SEDIMENT CONTROLS ARE SUBJECT TO EROSION AND SHALL BE STABILIZED EITHER TEMPORARILY OR PERMANENTLY WITHIN FOURTEEN (14) DAYS.

EROSION AND SEDIMENT CONTROL MEASURES SHALL BE INSPECTED PERIODICALLY AND AFTER EACH RAINFALL. MAINTENANCE MUST BE PERFORMED AFTER EACH INSPECTION AS NECESSARY BY THE CONTRACTOR.

ALL EROSION AND SEDIMENT CONTROL PRACTICES SHALL COMPLY WITH THE CURRENT DELAWARE EROSION AND SEDIMENT CONTROL HANDBOOK AND SHALL BE MAINTAINED BY THE CONTRACTOR THROUGH THE LIFE OF THE CONTRACT UNTIL THEIR REMOVAL HAS BEEN AUTHORIZED.

IF THE APPROVED PLAN NEEDS TO BE MODIFIED, ADDITIONAL SEDIMENT AND STORMWATER MANAGEMENT PRACTICES MAY BE REQUIRED AS DEEMED NECESSARY BY THE DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL.

NOTES:

UTILITIES ARE SHOWN IN ACCORDANCE WITH THE BEST AVAILABLE INFORMATION. COMPLETENESS OR CORRECTNESS THEREOF IS NOT GUARANTEED. IT SHALL BE THE CONTRACTORS' RESPONSIBILITY TO CONTACT THE UTILITY COMPANIES INVOLVED IN ORDER TO SECURE THE MOST ACCURATE INFORMATION AVAILABLE AS TO UTILITY LOCATION AND ELEVATION. NO CONSTRUCTION AROUND OR ADJACENT TO UTILITIES SHALL BEGIN WITHOUT NOTIFYING THEIR OWNERS AT LEAST TWO WORKING DAYS IN ADVANCE. THE CONTRACTOR SHALL TAKE THE NECESSARY PRECAUTIONS TO PROTECT THE EXISTING UTLITIES AND MAINTAIN UNITERRUPTED SERVICE AND ANY DAMAGE DONE TO THEM DUE TO THE CONTRACTORS' NEGLIGENCE SHALL BE IMMEDIATELY AND COMPLETELY REPAIRED AT CONTRACTORS' EXPENSE. TO LOCATE EXITING UTILITIES IN THE FIELD PRIOR TO CONTRUCTION, THE CONTRACTOR SHALL CONTACT MISS UTILITY OF DELMARVA (TELEPHONE 800-282-8555).

THE CONTRACTOR SHALL NOT REMOVE ANY TREE LARGER THAN 5 INCHES DBH WITHOUT PRIOR APPROVAL FROM DNREC. ANY TREES THAT ARE REMOVED OR DAMAGED DUE TO THE CONTRACTORS' NEGLIGENCE WITHOUT PRIOR APPROVAL SHALL BE REPLACED AT THE CONTRACTORS' EXPENSE.

DUE TO THE LIMITS OF AVAILABLE SURVEY, PROPOSED GRADING TIE IN'S AND TIE OUT'S MAY NOT PRECISELY MATCH WITH THE CONTOURS THAT ARE SHOWN ONT HE PLANS.

CLIENT

BRITTANY STURGIS
DNREC
WATERSHED ASESSMENT DIVISION
820 SILVER LAKE BLVD
SUITE 220
DOVER, DE 19904-2464

DATE:	ISSUES / REVISIONS
2/4/2014	60% DESIGN - NOT FOR CONSTRUCTION

City of Dover
City Hall
15 Loockerman Plaza
Dover, DE 19901
Scott Koenig: 302-736-7005

DNREC
Watershed Assessment Division
820 Silver Lake Blvd.
Dover, DE 19904
Brittany Sturgis: 302-739-9939

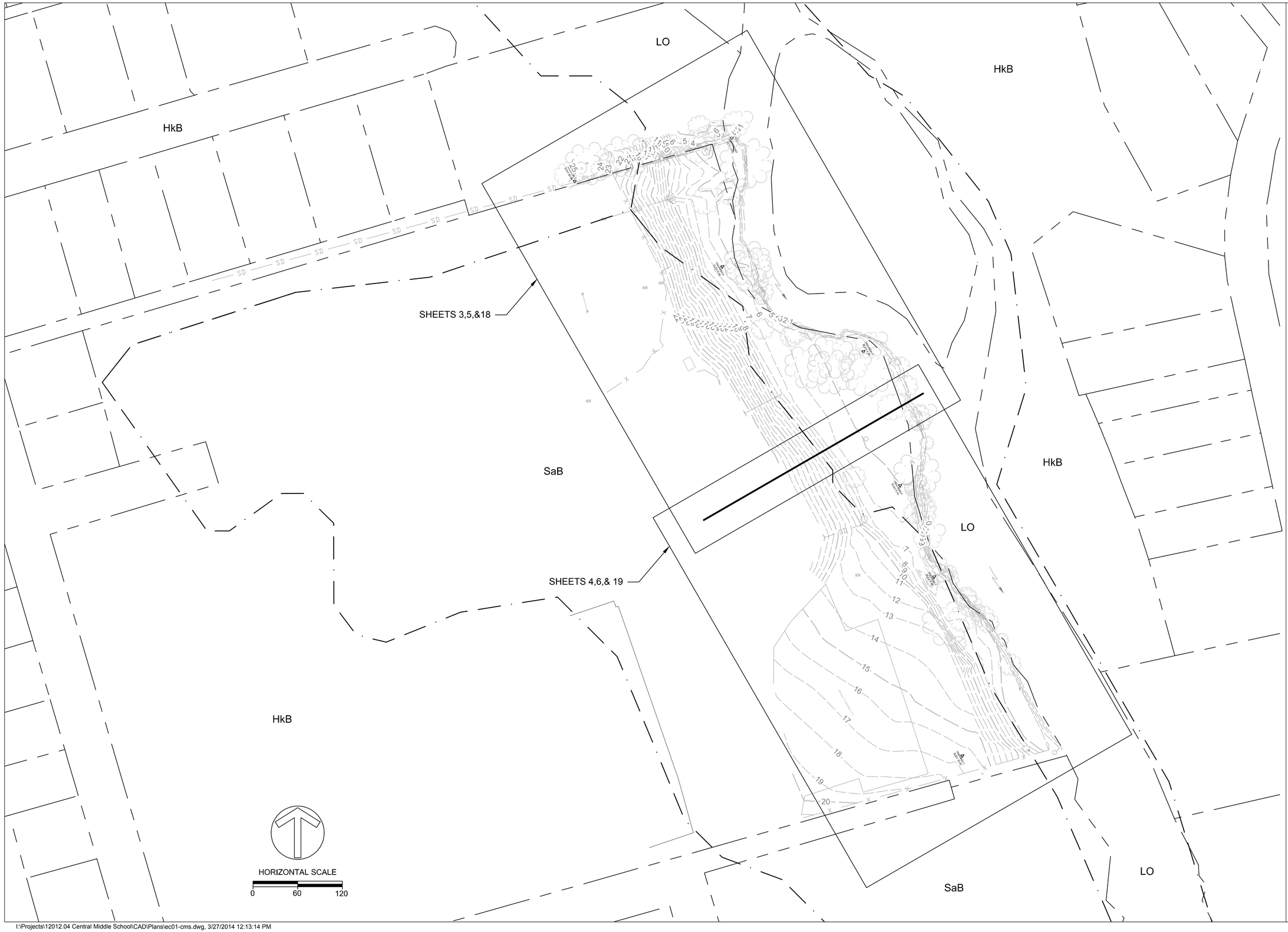
Biohabitats
The Stables Building 2081 Clipper Park Road
Baltimore, MD 21211 / ph: 410.554.0156
fx: 410.554.0168 / www.biohabitats.com
Restore the Earth & Inspire Ecological Stewardship

CENTRAL MIDDLE SCHOOL RSC

TITLE:

TITLE SHEET

PROJECT NO.: 12012.04	SCALE: AS SHOWN
SEAL:	BY: TB CHECK: MT,DS
	DWG. NO.: 1 OF 20



CLIENT

BRITTANY STURGIS
DNREC
WATERSHED ASESSMENT DIVISION
820 SILVER LAKE BLVD
SUITE 220
DOVER, DE 19904-2464

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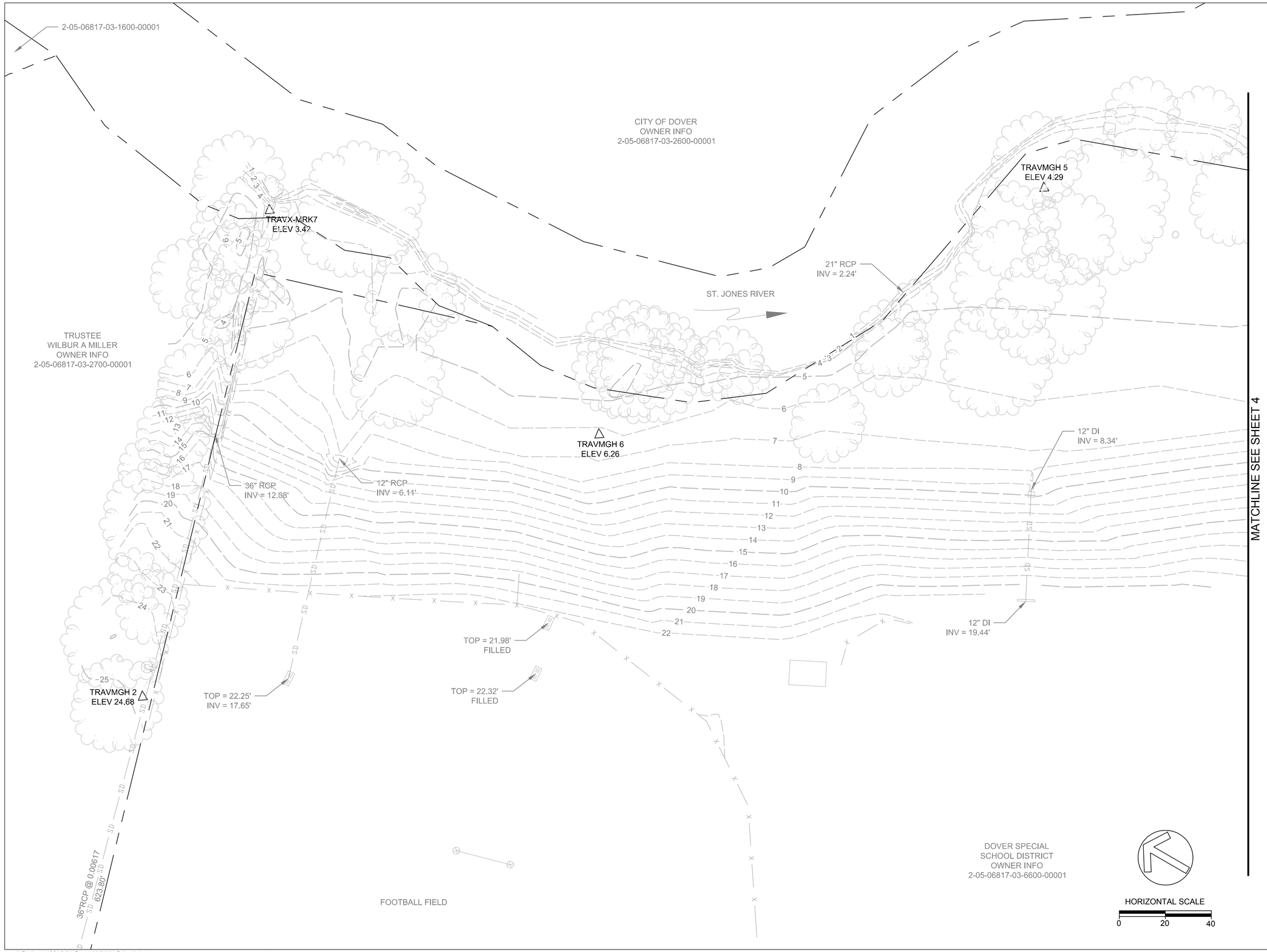
CENTRAL MIDDLE SCHOOL RSC

TITLE:

SHEET INDEX

PROJECT NO.: 12012.04
SCALE: 1" = 20'
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BY: TB
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DWG. NO.:

2 OF 20



CLIENT

BRITTANY STURGIS
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TITLE:

EXISTING CONDITIONS

PROJECT NO.: 12012.04	SCALE: 1" = 20'
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	DWG. NO.: 3 OF 20



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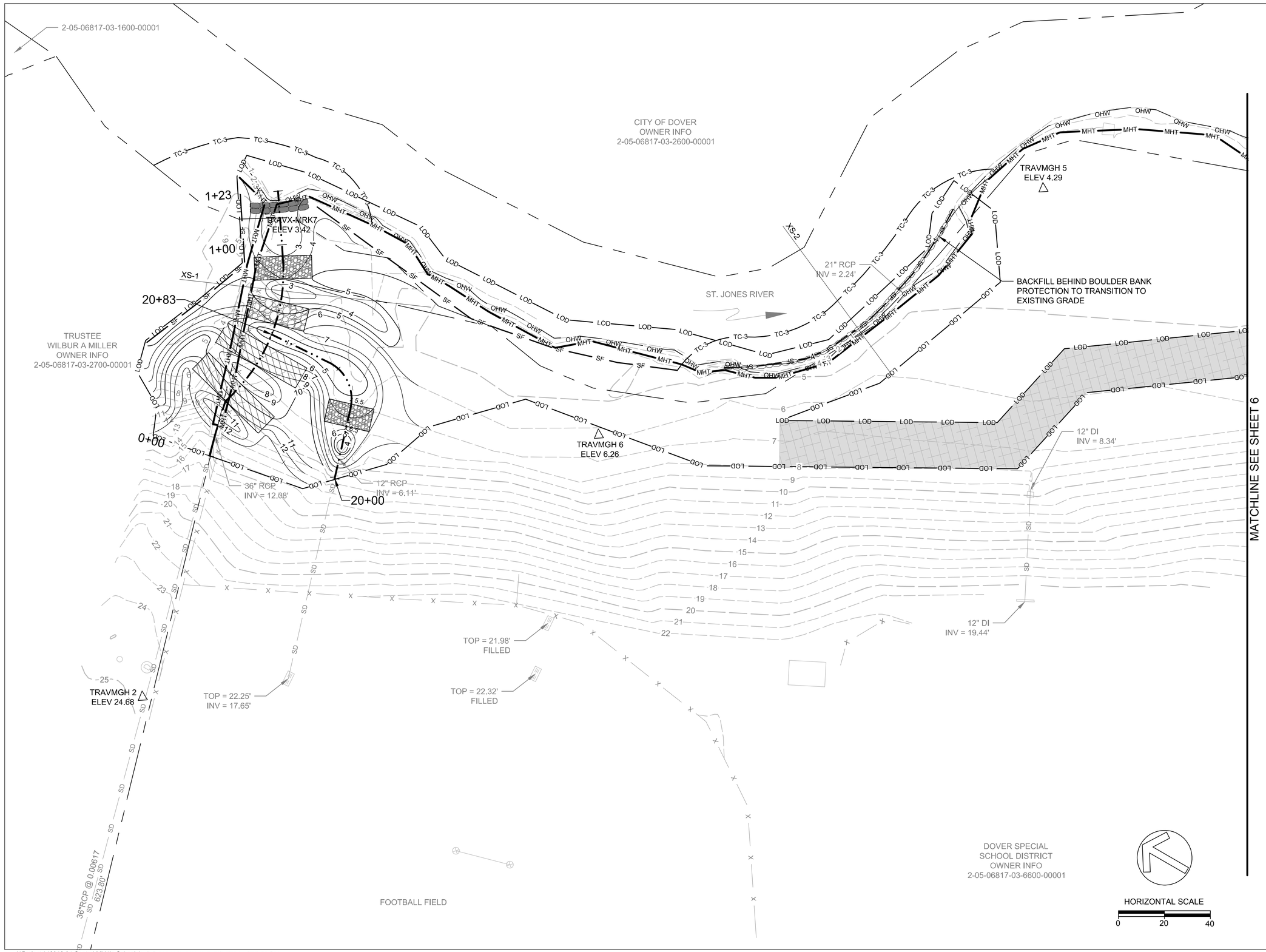
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TITLE:

EXISTING CONDITIONS

PROJECT NO.:	SCALE:
12012.04	1" = 20'
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CENTRAL MIDDLE SCHOOL RSC

TITLE:

PROPOSED CONDITIONS

PROJECT NO.:	SCALE:
12012.04	1" = 20'
SEAL:	BY: TB / CHECK: MT,DS
	DWG. NO.: 5 OF 20

I:\Projects\12012.04 Central Middle School\CAD\Plans\pc01-cms.dwg, 3/27/2014 12:13:34 PM

2-05-06817-03-2500-00001

ST. JONES RIVER

8" TC
INV = 2.63'

?
INV = 1.25'

TRAVMGH 4
ELEV 5.10

TRAVMGH 3
ELEV 6.40

12" DI
INV = 8.31'

TOP = 12.40'
FILLED/DEBRIS

12" DIA
INV = 16.08'

TRAVMCH 1
ELEV 16.50

ASPHALT PARKING LOT

2-05-07705-02-4900-00001

MATCHLINE SEE SHEET 5

HORIZONTAL SCALE
0 20 40

I:\Projects\12012.04 Central Middle School\CAD\Plans\pc01-cms.dwg, 3/27/2014 12:13:39 PM

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DATE:	ISSUES / REVISIONS
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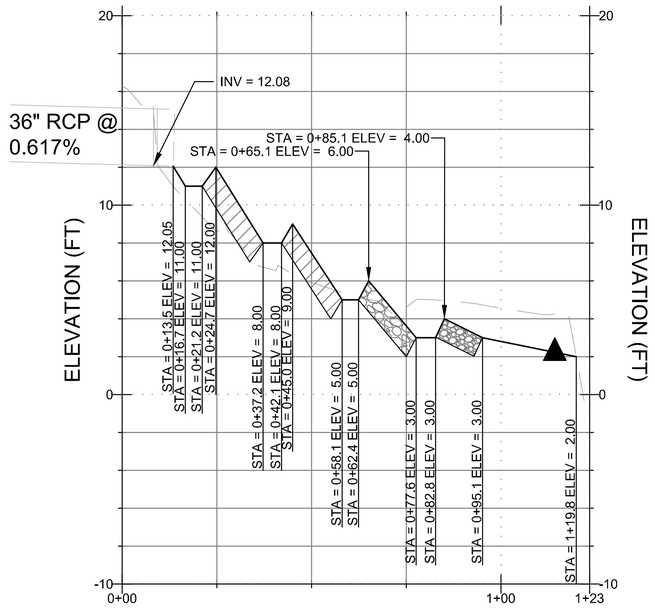
CENTRAL MIDDLE SCHOOL RSC

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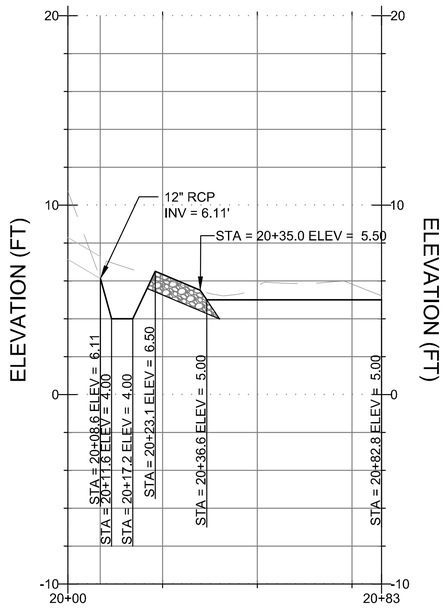
PROPOSED CONDITIONS

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SEAL:	BY: TB CHECK: MT,DS
	DWG. NO.: 6 OF 20

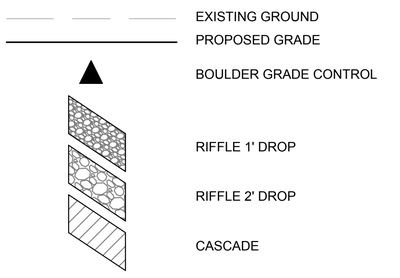
PROFILE VIEW OF 36" OUTFALL



PROFILE VIEW OF 12" OUTFALL



PROFILE LEGEND



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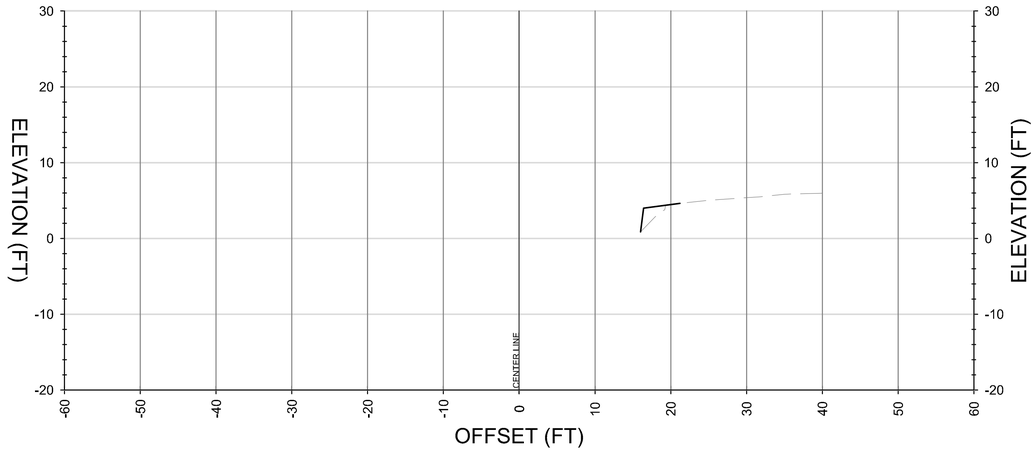
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PROFILES

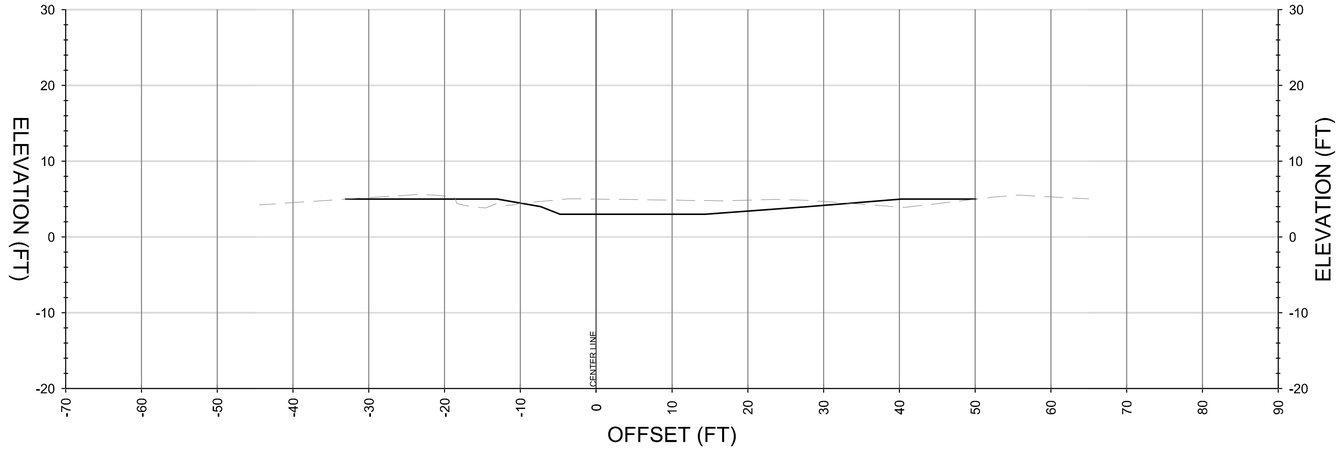
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SCALE: AS SHOWN
SEAL:
BY: TB
CHECK: MT,DS
DWG. NO.:

7 OF 20

XS-2 @ STATION - 0+00.00



XS-1 @ STATION - 0+80.00



CROSS SECTION LEGEND

EXISTING GROUND

PROPOSED GRADE

VERTICAL SCALE 0 10 20

HORIZONTAL SCALE 0 10 20

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CENTRAL MIDDLE SCHOOL RSC

TITLE:

CROSS SECTIONS

PROJECT NO. : 12012.04

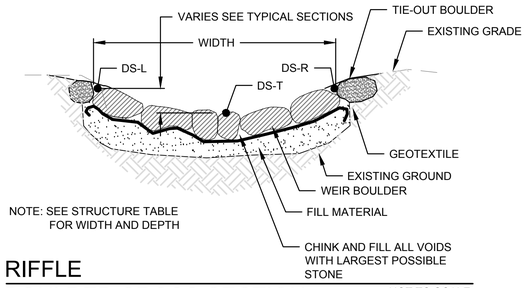
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BY: TB CHECK: MT,DS

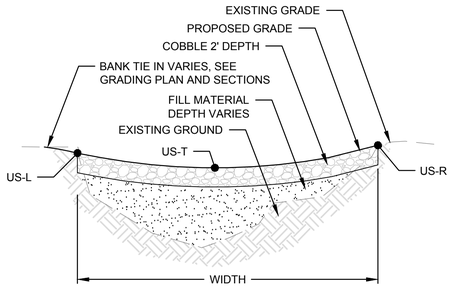
DWG. NO. :

8 OF 20



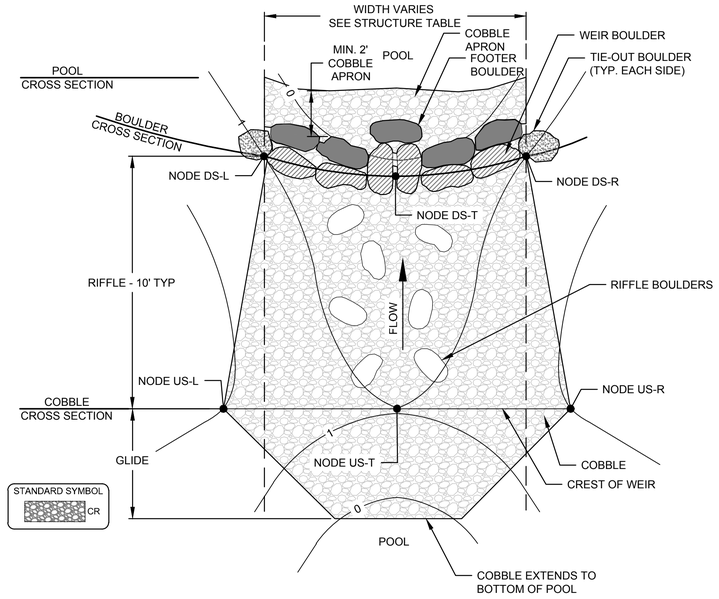
RIFFLE
BOULDER CROSS SECTION

NOT TO SCALE



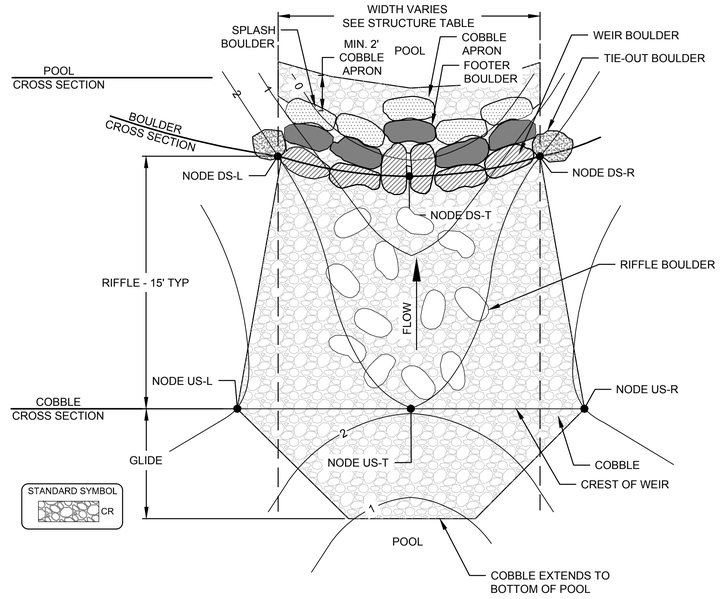
RIFFLE
COBBLE CROSS SECTION

NOT TO SCALE



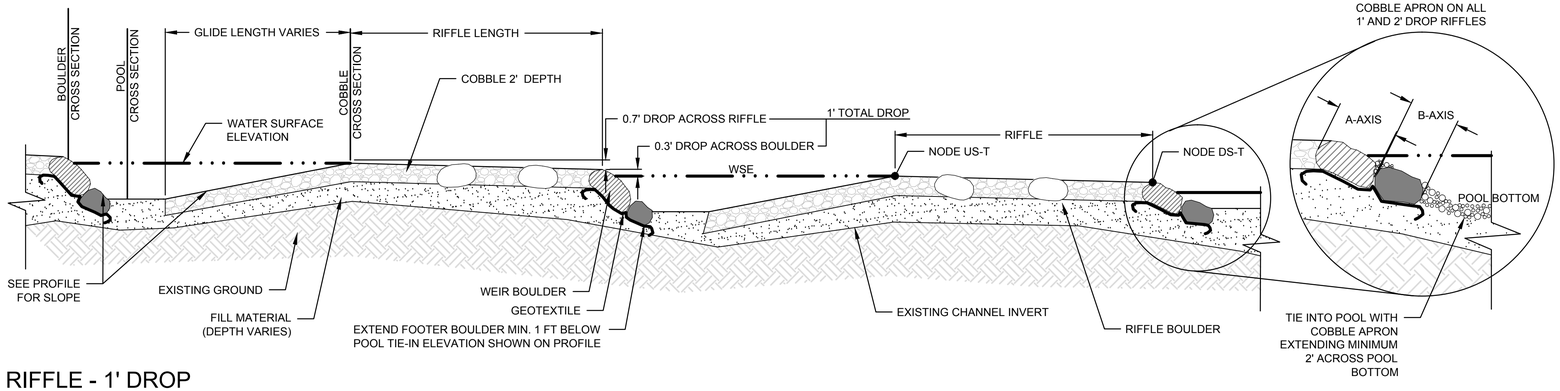
RIFFLE - 1' DROP
PLAN VIEW

NOT TO SCALE



RIFFLE - 2' DROP
PLAN VIEW

NOT TO SCALE

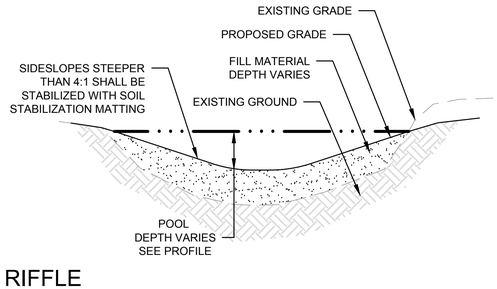


RIFFLE - 1' DROP
PROFILE INDEX

NOT TO SCALE

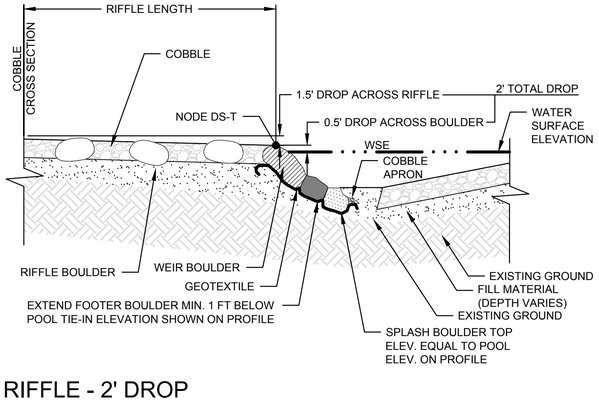
GRADATION TABLE	COBBLE		GRAVEL
	RIFFLE 1' DROP	RIFFLE 2' DROP	ALL REACHES
CUMULATIVE % FINER	SIZE (IN)	SIZE (IN)	SIZE (IN)
0	1.0	1.0	1/4
16	3.0	4.0	X
35	4.5	6.0	1/2
50	6.0	8.0	1
84	7.5	9.5	2
100	9.0	11.0	3

RIFFLE NOTES:
1. TIE-OUT BOULDER SHALL EXTEND PAST THE CORNER NODES DS-R & DS-L A MIN. OF ONE BOULDER LENGTH INTO EXISTING BANK. WHERE THIS CONFLICTS WITH EXISTING TREE ROOTS OR BEDROCK, TIE-OUT BOULDER MAY BE ELIMINATED OR ADJUSTED AT DIRECTION OF ENGINEER.
2. SEE SHEET 13 FOR NODE LOCATIONS.
3. RIFFLE BOULDERS SHALL BE INCORPORATED IN A RANDOM PLACEMENT WITHIN MIDDLE THIRD OF SECTIONS TO COVER APPROXIMATELY 25% OF THE RIFFLE SURFACE AREA FOR 1' DROP RIFFLES, AND 40% OF THE RIFFLE SURFACE AREA FOR 2' DROP RIFFLES. TOP OF RIFFLE BOULDERS SHALL EXTEND A MAXIMUM OF 2" ABOVE COBBLE SURFACE.
4. BOTH OUTER THIRDS OF SECTION TO BE COVERED WITH 3" OF BLOWN COMPOST, INCORPORATED INTO VOIDS. SEE DETAIL, SHEET 24 FOR LIMITS.



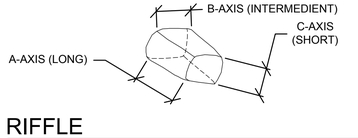
RIFFLE
POOL CROSS SECTION

NOT TO SCALE



RIFFLE - 2' DROP
PROFILE INDEX

NOT TO SCALE



RIFFLE
BOULDER AXIS

NOT TO SCALE

BOULDER DIMENSIONS (FT)			
BOULDER TYPE	A-AXIS	B-AXIS	C-AXIS
WEIR	3-4	2.5-3.5	1-2
FOOTER	3-4	2.5-3.5	1-2
TIE-OUT	2.5-3.5	2-3	1-2
SPLASH	3-4	2.5-3.5	1-2
RIFFLE	2-3	1-2	1-2

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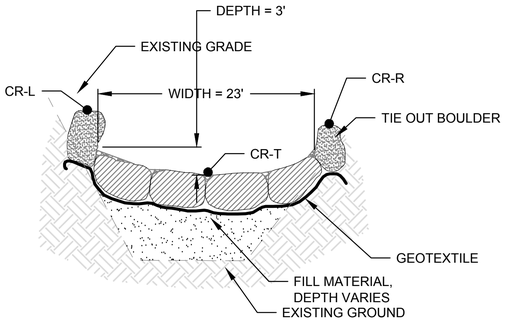
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CENTRAL MIDDLE SCHOOL RSC

TITLE:

DETAILS

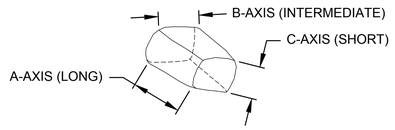
PROJECT NO. : 12012.04
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DWG. NO. :



CASCADE
CASCADE CREST SECTION A-A'

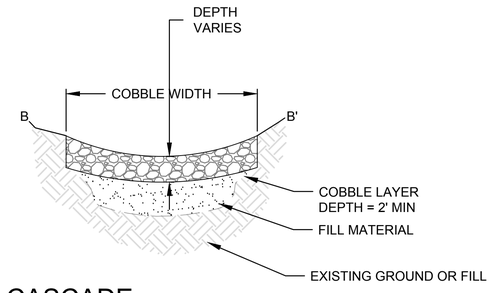
NOT TO SCALE

BOULDER DIMENSIONS (FT)			
BOULDER TYPE	A-AXIS	B-AXIS	C-AXIS
CASCADE	3-4	2.5-3.5	1.5-2
FOOTER	3-4	2.5-3.5	1.5-2
TIE-OUT	2.5-3.5	2-3	1.5-2



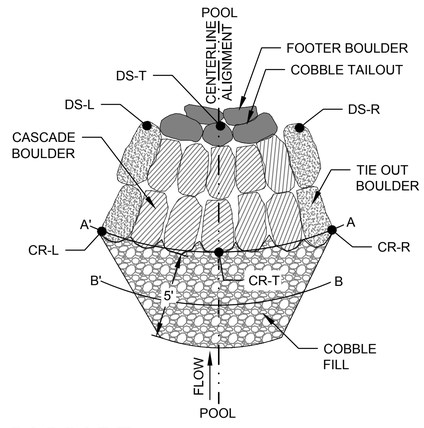
CASCADE
BOULDER AXIS

NOT TO SCALE



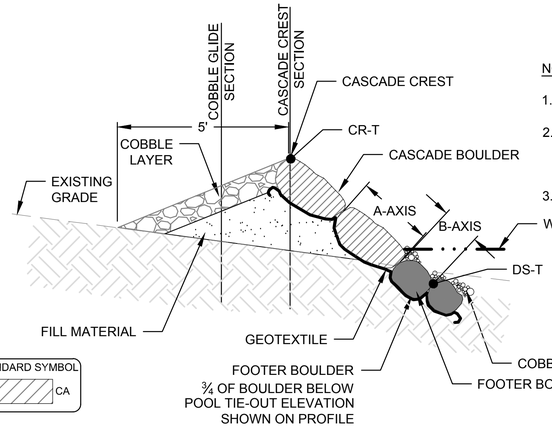
CASCADE
COBBLE GLIDE SECTION B-B'

NOT TO SCALE



CASCADE
PLAN VIEW

NOT TO SCALE

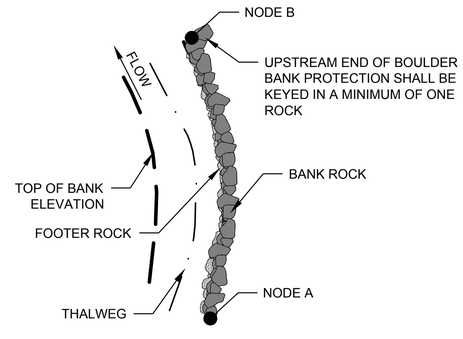


NOTES

1. GAPS BETWEEN BOULDERS SHALL BE CHINKED WITH COBBLE
2. TYPICALLY, CASCADE BOULDER A-AXIS WILL BE ORIENTED IN DIRECTION OF FLOW. FOOTER BOULDERS A-AXIS WILL BE ORIENTED PERPENDICULAR TO FLOW.
3. SEE SPECIFICATIONS FOR COBBLE SIZE AND DEPTH

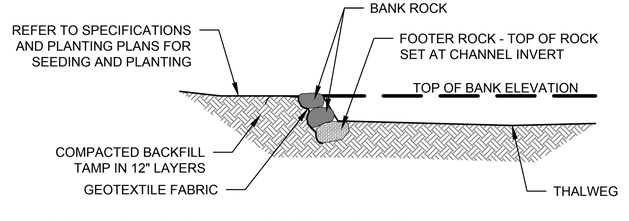
CASCADE
CENTERLINE PROFILE

NOT TO SCALE



BOULDER BANK PROTECTION
PLAN VIEW

NOT TO SCALE



BOULDER BANK PROTECTION
CROSS SECTION

NOT TO SCALE

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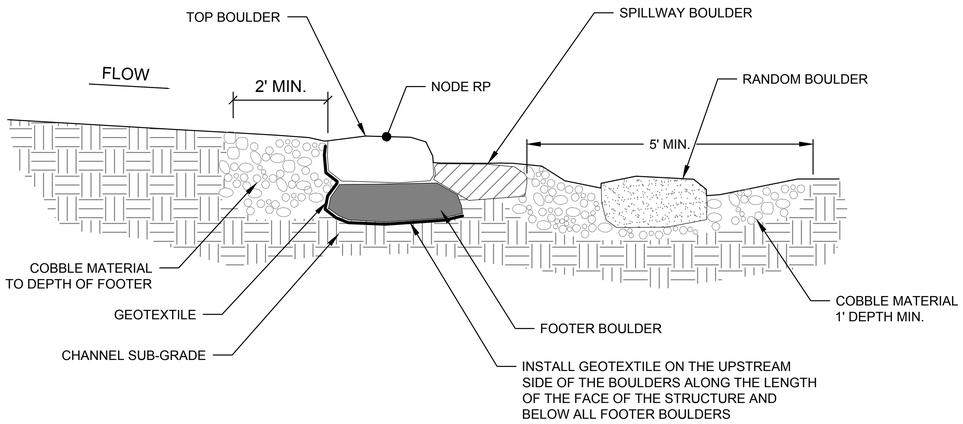
CENTRAL MIDDLE SCHOOL RSC

TITLE:

DETAILS

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SCALE: NOT TO SCALE
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CHECK: MT,DS
DWG. NO.:

10 OF 20



PROFILE

BOULDER GRADE CONTROL
SECTION B-B'

NOT TO SCALE

NOTES:
1. BOULDERS SHALL BE INTERLOCKED AND SHALL NOT ROCK OR ROTATE IN POSITION ONCE INSTALLED.

2. PLACEMENT OF TOP BOULDERS MUST BRIDGE SEAMS BY 1/3 BOULDER WIDTH BETWEEN FOOTER BOULDERS.

3. BOULDER PLACEMENT SHALL BE RANDOM IN NATURE SO NO TWO STRUCTURES ARE IDENTICAL.

4. SEE "BOULDER" AND "COBBLE" SPECIFICATIONS FOR MATERIAL PROPERTIES.

5. PLACE GEOTEXTILE ON THE UPSTREAM FACE OF THE BOULDERS ALONG THE STRUCTURES ENTIRE LENGTH AND BELOW THE FOOTERS.

6. SEE STRUCTURE TABLE FOR NODE LOCATIONS AND ELEVATIONS.

7. COBBLE MATERIAL SHALL BE PLACED WITHIN FULL LENGTH OF TRENCH UPSTREAM OF FOOTER AND TOP BOULDERS.

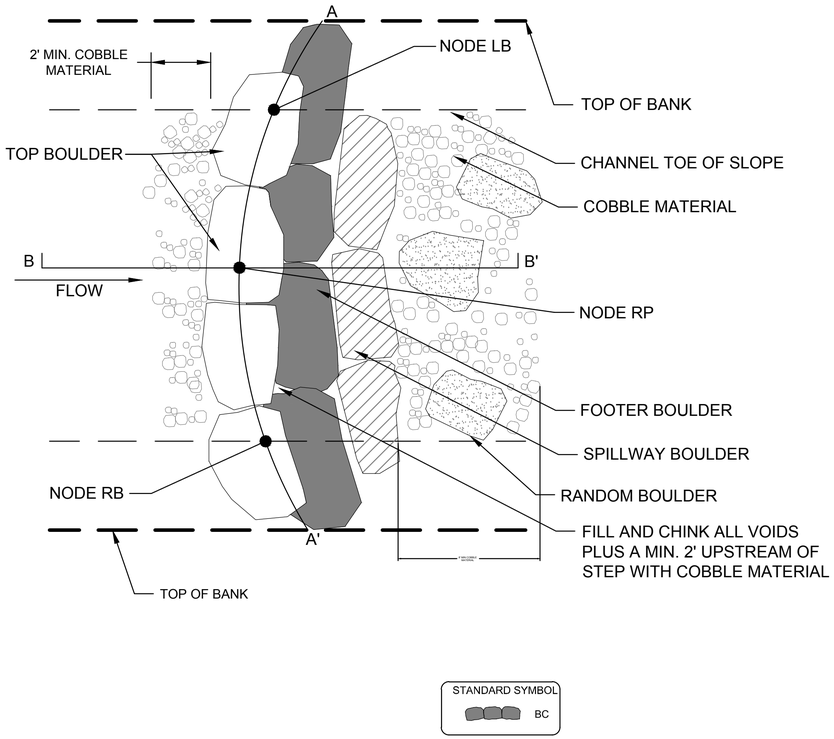
8. SET TOP BOULDER(S) AT THALWEG 0.2' LOWER THAN OTHER BOULDERS TO FORM A LOW FLOW CHANNEL.

9. BOULDER CUT-OFF SILL SHALL EXTEND A MIN. 2 FEET INTO EXISTING STREAM BANK.

10. RANDOM BOULDERS SHALL BE EMBEDDED INTO STREAMBED TO A DEPTH OF ⅔ THE MINOR AXIS LENGTH.

11. TREE ROOTS THAT INTERFERE WITH THE PLACEMENT OF BOULDER SHALL BE ROOT PRUNED.

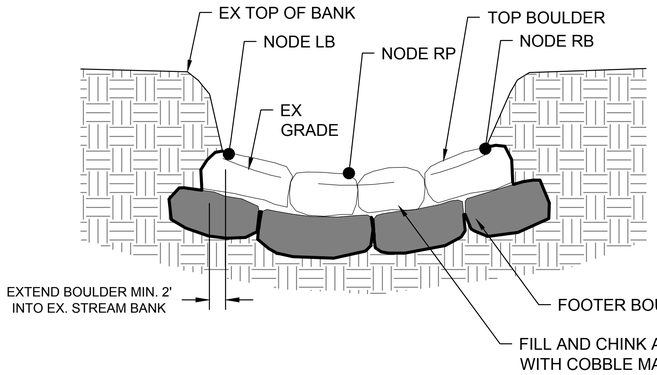
12. TOP BOULDER ELEVATIONS BETWEEN NODE RP AND NODE LB/RB SHALL FOLLOW PARABOLIC SHAPE TO THE EXTENT POSSIBLE.



STANDARD SYMBOL
BC

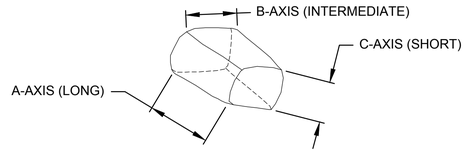
BOULDER GRADE CONTROL
PLAN

N.T.S.



BOULDER GRADE CONTROL
SECTION A-A'

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BOULDER GRADE CONTROL
BOULDER AXIS

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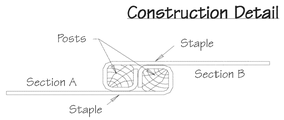
TITLE:

DETAILS

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Standard Detail & Specifications

Silt Fence



Construction Notes:

1. Geosynthetic fabric to be fastened securely to fence posts with wire ties or staples.
2. When two sections of filter cloth adjoin each other they shall be overlapped by six inches and folded.
3. Maintenance shall be performed as needed and material removed when "bulges" develop in the silt fence.

Materials:

1. Stakes: Steel (either T or U) or 2" x 2" hardwood
2. Geosynthetic Fabric: Type GD-I
3. Reinforcing strip: Wooden lath, plastic strip or other approved equivalent
4. Prefabricated Unit: Geofab, Envirofence, or approved equivalent

Source:	Symbol:	Detail No.
Adapted from MD Stds. & Specs. for ESC	SF	DE-ESC-3.1.2.1 Sheet 2 of 2 Date: 6/05

Standard Detail & Specifications

Geotextile Dewatering Bag

Construction Notes:

1. The dewatering bag should be placed so the incoming water flows into and through the bag, and then flow off the site without creating more erosion. The neck should be tied off tightly to stop the water from flowing out of the bag without going through the walls. The dewatering bag should be placed on a gravel bed to allow water to flow in all directions.
2. The dewatering bag is considered full and should be disposed when it is impractical for the bag to filter the sediment out at a reasonable flow rate. At this point, it should be replaced with a new bag.
3. Disposal may be accomplished as directed by the construction reviewer. If the site allows, the bag may be buried on site and seeded, visible fabric removed and seeded or removed from site to a proper disposal area.

Materials:

1. The geotextile fabric shall be a Type GD-IV.
2. The dewatering bag shall be sewn with a double needle machine using high strength thread. All structural seams will be sewn with high strength, double stitched "J" type. Seam strength test will have the following minimum average roll values:

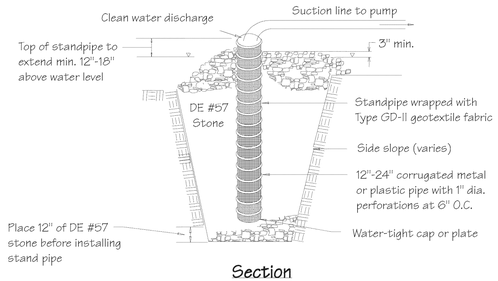
Type	TEST METHOD	TEST RESULT
Heavy duty	ASTM D-4884	100 lb / in

3. The dewatering bag shall have an opening large enough to accommodate a four (4) inch discharge hose with attached strap to tie off the hose to prevent the pumped water from escaping from the bag without being filtered.

Source:	Symbol:	Detail No.
Adapted from ACF Products, Inc.	GB	DE-ESC-3.2.1.2 Sheet 2 of 2 Date: 12/03

Standard Detail & Specifications

Pumping Pit - Type 1



Construction Notes:

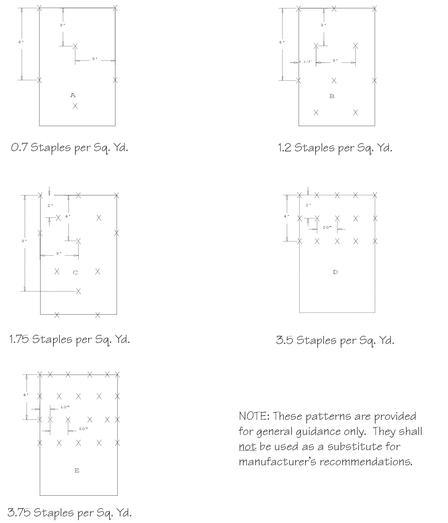
1. Pit dimensions are variable.
2. The standpipe should be constructed by perforating a 12" to 24" diameter corrugated or PVC pipe. The perforations shall be 1/2" X 6" slits or 1" diameter holes 6" on center.
3. A base of DE #57 aggregate should be placed in the pit to a depth of 12". After installing the standpipe, the pit surrounding the standpipe should then be backfilled with DE #57 aggregate.
4. The standpipe should extend 12" to 18" above the lip of the pit or riser crest elevation (basin dewatering).

NOTE: If discharge will be pumped directly to a storm drainage system, the standpipe must be wrapped with Type GD-II geotextile fabric before installation. If desired, 1/2" hardware cloth may be placed around the standpipe, prior to attaching the geotextile fabric. This will increase the rate of water seepage into the pipe.

Source:	Symbol:	Detail No.
Adapted from MD Stds. & Specs. for ESC	PP-1	DE-ESC-3.2.2.1 Sheet 1 of 1 Date: 12/03

Standard Detail & Specifications

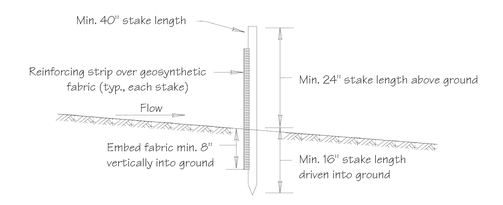
Stabilization Matting - Slope

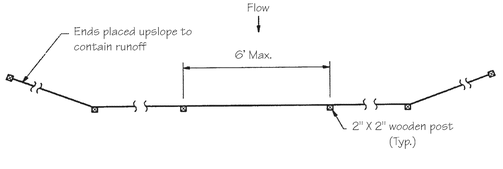


Source:	Symbol:	Detail No.
Adapted from North American Green, Inc.	SM-S	DE-ESC-3.4.6.1 Sheet 2 of 2 Date: 6/05

Standard Detail & Specifications

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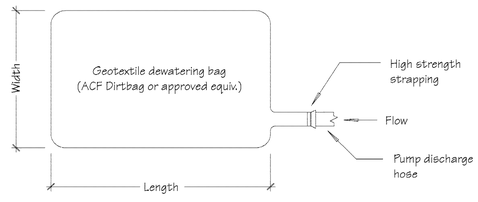


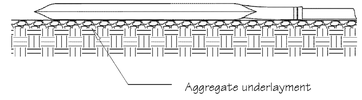


Source:	Symbol:	Detail No.
Adapted form MD Stds. & Specs. for ESC	SF	DE-ESC-3.1.2.1 Sheet 1 of 2 Date: 6/05

Standard Detail & Specifications

Geotextile Dewatering Bag

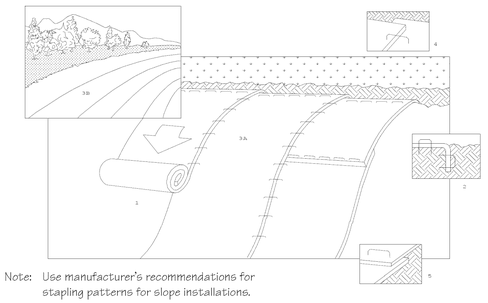




Source:	Symbol:	Detail No.
Adapted from ACF Products, Inc.	GB	DE-ESC-3.2.1.2 Sheet 1 of 2 Date: 12/03

Standard Detail & Specifications

Stabilization Matting - Slope



Construction Notes:

1. Prepare soil before installing matting, including application of lime, fertilizer, and seed.
2. Begin at the top of the slope by anchoring the mat in a 6" deep X 6" wide trench. Backfill and compact trench after stapling.
3. Roll the mats (A) down or (B) horizontally across the slope.
4. The edges of parrallel mats must be stapled with approx. 2" overlap.
5. When mats must be spliced down the slope, place mats end over end (shingle style) with approx. 4" overlap. Staple through overlapped area, approx. 12" apart.

Source:	Symbol:	Detail No.
Adapted from North American Green, Inc.	SM-S	DE-ESC-3.4.6.1 Sheet 1 of 2 Date: 6/05

CLIENT

BRITTANY STURGIS
DNREC
WATERSHED ASESSMENT DIVISION
820 SILVER LAKE BLVD
SUITE 220
DOVER, DE 19904-2464

DATE:	ISSUES / REVISIONS
2/4/2014	60% DESIGN - NOT FOR CONSTRUCTION

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Dover, DE 19901
Scott Koenig: 302-736-7005

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fx: 410.554.0168 / www.biohabitats.com
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CENTRAL MIDDLE SCHOOL RSC

TITLE:
EROSION & SEDIMENT CONTROL DETAILS

PROJECT NO.: 12012.04	SCALE: NOT TO SCALE
SEAL:	BY: TB CHECK: MT,DS
	DWG. NO.: 12 OF 20

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Standard Detail & Specifications

Site Pollution Prevention

Notes:

The Construction Site Pollution Prevention Plan should include the following elements:

1. Material Inventory

Document the storage and use of the following materials:

a. Concrete
b. Detergents
c. Paints (enamel and latex)
d. Cleaning solvents
e. Pesticides
f. Wood scraps
g. Fertilizers
h. Petroleum based products

2. Good housekeeping practices

a. Store only enough product required to do the job.
b. All materials shall be stored in a neat, orderly manner in their original labeled containers and covered.
c. Substances shall not be mixed.
d. When possible, all of a product shall be used up prior to disposal of the container.
e. Manufacturers' instructions for disposal shall be strictly adhered to.
f. The site foreman shall designate someone to inspect all BMPs daily.

3. Waste management practices

a. All waste materials shall be collected and stored in securely lidded dumpsters in a location that does not drain to a waterbody.
b. Waste materials shall be salvaged and/or recycled whenever possible.
c. The dumpsters shall be emptied a minimum of twice per week, or more if necessary. The licensed trash hauler is responsible for cleaning out dumpsters.

Source:	Symbol:	Detail No.
Adapted from USEPA Pub. 840-B-92-002		**DE-ESC-3.6.1** Sheet 1 of 3 Date: 6/05

Standard Detail & Specifications

Site Pollution Prevention

Notes (cont.)

d. Trash shall be disposed of in accordance with all applicable Delaware laws.
e. Trash cans shall be placed at all lunch spots and littering is strictly prohibited. Recycle bins shall be placed near the construction trailer.
f. If fertilizer bags can not be stored in a weather-proof location, they shall be kept on a pallet and covered with plastic sheeting which is overlapped and anchored.

4. Equipment maintenance practices

a. If possible, equipment should be taken to off-site commercial facilities for washing and maintenance.
b. If performed on-site, vehicles shall be washed with high-pressure water spray without detergents in an area contained by an impervious berm.
c. Drip pans shall be used for all equipment maintenance.
d. Equipment shall be inspected for leaks on a daily basis.
e. Washout from concrete trucks shall be disposed of in a temporary pit for hardening and proper disposal.
f. Fuel nozzles shall be equipped with automatic shut-off valves.
g. All used products such as oil, antifreeze, solvents and tires shall be disposed of in accordance with manufacturers' recommendations and local, state and federal laws and regulations.

5. Spill prevention practices

a. Potential spill areas shall be identified and contained in covered areas with no connection to the storm drain system.
b. Warning signs shall be posted in hazardous material storage areas.
c. Preventive maintenance shall be performed on all tanks, valves, pumps, pipes and other equipment as necessary.
d. Low or non-toxic substances shall be prioritized for use.

Source:	Symbol:	Detail No.
Adapted from USEPA Pub. 840-B-92-002		**DE-ESC-3.6.1** Sheet 2 of 3 Date: 6/05

Standard Detail & Specifications

Site Pollution Prevention

Notes (cont.)

e. Contact information for reporting spills through the DNREC 24-Hour Toll Free Number shall be prominently posted.

6. Education

a. Best management practices for construction site pollution control shall be a part of regular progress meetings.
b. Information regarding waste management, equipment maintenance and spill prevention shall be prominently posted in the construction trailer.

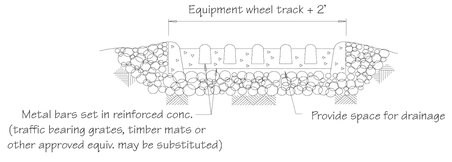
CONTACT INFORMATION

DNREC 24-Hour Toll Free Number	**800-662-8802**
DNREC Solid & Hazardous Waste Branch	**302-739-9403**

Source:	Symbol:	Detail No.
Adapted from USEPA Pub. 840-B-92-002		**DE-ESC-3.6.1** Sheet 3 of 3 Date: 6/05

Standard Detail & Specifications

Stabilized Construct. Entrance



Section A-A (Opt.)

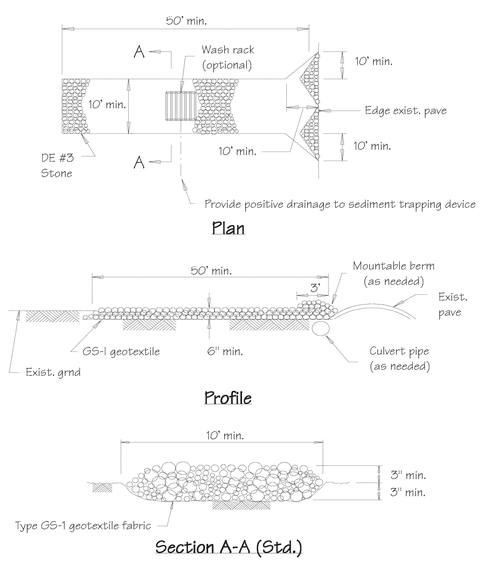
Construction Notes:

1. Stone size - Use DE #3 stone.
2. Length - As required, but not less than 50 feet (except on a single residence lot where a 30 foot minimum length would apply).
3. Thickness - Not less than size (6) inches.
4. Width - Ten (10) foot minimum, but not less than the full width at points where ingress or egress occurs.
5. Geotextile - Type GS-I; placed over the entire area prior to placing of stone.
6. Surface Water - All surface water flowing or diverted toward construction entrances shall be piped across the entrance. If piping is impractical, a mountable berm with 5:1 slopes will be permitted.
7. Maintenance - The entrance shall be maintained in a condition which will prevent tracking or flowing of sediment onto public rights-of-way. This may require periodic top dressing with additional stone as conditions demand and repair and/or cleanout of any measures used to trap sediment. All sediment spilled, dropped, washed or tracked onto public rights-of-way must be removed immediately.
8. Washing - Vehicle wheels shall be cleaned to remove sediment prior to entrance onto public rights-of-way. When washing is required, it shall be done on an area stabilized with stone and which drains into an approved sediment trapping device.
9. Inspection - Periodic inspection and needed maintenance shall be provided after each rain.

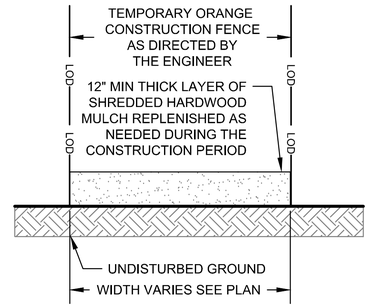
Source:	Symbol:	Detail No.
Adapted from VA ESC Handbook	SCE	**DE-ESC-3.4.7** Sheet 2 of 2 Date: 12/03

Standard Detail & Specifications

Stabilized Construct. Entrance



Source:	Symbol:	Detail No.
Adapted from VA ESC Handbook	SCE	**DE-ESC-3.4.7** Sheet 1 of 2 Date: 12/03



NOTES:
1. ACCESS ROUTES TO BE VERIFIED BY ENGINEER AT EROSION AND SEDIMENT CONTROL MEETING. REVISIONS TO THE ALIGNMENT THAT MINIMIZE TREE DISTURBANCE ARE ENCOURAGED AND REQUIRE REVIEW AND APPROVAL BY THE ENGINEER.
2. CONTRACTOR SHALL MAINTAIN MULCH ACCESS THROUGHOUT THE CONSTRUCTION PERIOD. UPON COMPLETION OF PROJECT, MULCH AND COIR MATTING SHALL BE FULLY REMOVED FROM ZONE 2 AND 2" OF MULCH SHALL REMAIN IN ZONE 1.

MULCH ACCESS ROAD

NOT TO SCALE

Standard Detail & Specifications

Mulching

Source:
Symbol:
Detail No. DE-ESC-3.4.5 Sheet 3 of 3 Date: 6/05

MULCHING MATERIAL SELECTION GUIDE

Percent Slope	Type of Mulch / App. Rate*	Dec. 1 to Feb. 28(29)	March 1 to May 31	June 1 to Aug. 31	Sept. 1 to Nov. 30
Less than 2%	Bonded Fiber @ 2000 lbs/ac. minimum	xxxxxxxxxxxxxxx	OK (≤ 1 in.)	xxxxxxxxxxxxxxx	OK (≤ 1 in.)
	Wood Fiber @ 2000 lbs/ac. min.	xxxxxxxxxxxxxxx	OK	xxxxxxxxxxxxxxx	OK
	BFM @ 3000 lbs/ac. min.	OK	OK	OK	OK
	Straw @ 2 Tons/ac. Min.	OK	OK	OK	OK
	Stabilization Matting**	OK	OK	OK	OK
2% to 6.9%	Wood Fiber @ 2000 lbs/ac. min.	xxxxxxxxxxxxxxx	OK	xxxxxxxxxxxxxxx	OK
	BFM @ 3000-3500 lbs/ac. min	OK	OK	OK	OK
	Straw @ 2 Tons/ac. min.	OK	OK	OK	OK
	Stabilization Matting**	OK	OK	OK	OK
7% to 10.9%	Wood Fiber @ 2000-2500 lbs/ac. min.	xxxxxxxxxxxxxxx	OK	xxxxxxxxxxxxxxx	OK
	BFM @ 3500-4000 lbs/ac. min.	OK	OK	OK	OK
	Straw @ 2 Tons/ac. min.	OK	OK	OK	OK
	Stabilization Matting**	OK	OK	OK	OK
11% to 24.9%	Wood Fiber @ 2500-3000 lbs/ac. min.	xxxxxxxxxxxxxxx	OK	xxxxxxxxxxxxxxx	OK
	BFM @ 3500-4000 lbs/ac. min.	OK	OK	OK	OK
	Straw @ 2 Tons/ac. min.	OK	OK	OK	OK
	Stabilization Matting**	OK	OK	OK	OK
25% to 33%	Wood Fiber @ 2500-3000 lbs/ac. min.	xxxxxxxxxxxxxxx	OK	xxxxxxxxxxxxxxx	OK
	BFM @ 4000 lbs/ac. min.	xxxxxxxxxxxxxxx	OK	OK	OK
	Straw @ 2 Tons/ac. min.	OK	OK	OK	OK
	Stabilization Matting**	OK	OK	OK	OK
33% and up	BFM @ 4000-4500 lbs/ac. min.	xxxxxxxxxxxxxxx	OK	xxxxxxxxxxxxxxx	OK
	Straw @ 2 Tons/ac. min.***	OK	OK	OK	OK
	Stabilization Matting**	OK	OK	OK	OK

* Note: Manufacturers Recommended Rates for informational purposes only. Performance standard requires 100% soil coverage.
** Note: Stabilization Matting must be applied in accordance with Section 3.4.6 of the Delaware ESC Handbook.
***Note: Straw applied on slopes greater than 33% must be netted (this does not apply to topsoil stockpiles).
OK = Acceptable to use during this time period.
xxx = Not acceptable to use during this time period.
All application rates are minimums

CLIENT

BRITTANY STURGIS
DNREC
WATERSHED ASESSMENT DIVISION
820 SILVER LAKE BLVD
SUITE 220
DOVER, DE 19904-2464

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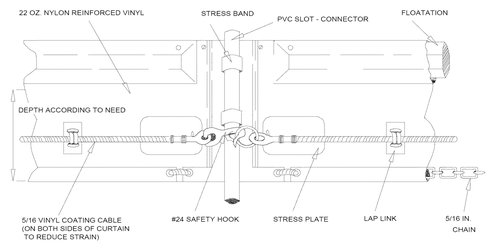
CENTRAL MIDDLE SCHOOL RSC

TITLE:

EROSION & SEDIMENT CONTROL DETAILS

PROJECT NO. : 12012.04	SCALE: NOT TO SCALE
SEAL:	BY: TB CHECK: MT,DS
	DWG. NO. : 13 OF 20

Standard Detail & Specifications
Turbidity Curtain



Typical Section - Type 3

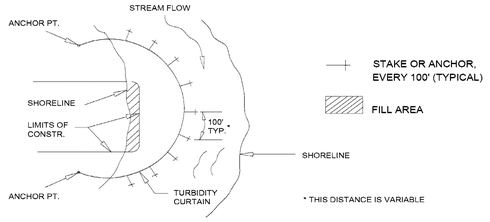
DATA

Curtain type (1, 2, or 3)
Layout (Std. or Alt.)

Source:	Symbol:	Detail No.
Adapt. from Amer. Boom and Barrier Corp.	___ TC-(1/2/3) ___ (Std/Alt)	DE-ESC-3.5.3 Sheet 3 of 8 Date: 12/03

Standard Detail & Specifications
Turbidity Curtain

NOTE: The standard layout shown is intended for use in streams, ponds and other non-tidal waters



Plan - Std. Layout

Source:	Symbol:	Detail No.
Adapt. from Amer. Boom and Barrier Corp.	___ TC-(1/2/3) ___ (Std/Alt)	DE-ESC-3.5.3 Sheet 4 of 8 Date: 12/03

Standard Detail & Specifications
Turbidity Curtain

Construction Notes:

1. **Materials**
   a. Barriers should be a bright color (yellow or "international" orange are recommended) that will attract the attention of nearby boaters.
   b. The curtain fabric shall meet manufacturer's recommendations for the application.
   c. Seams in the fabric shall be either vulcanized welded or sewn and shall develop the full strength of the fabric.
   d. Floatation devices shall be flexible, buoyant units contained in an individual floatation sleeve or collar attached to the curtain. Buoyancy provided by the floatation units shall be sufficient to support the weight of the curtain and maintain a freeboard of at least 3 inches above the water surface level.
   e. Load lines must be fabricated into the bottom of all floating turbidity curtains. Type II and Type III must have load lines also fabricated into the top of the fabric. The top load line shall consist of woven webbing or vinyl-sheathed steel cable and shall have a break strength in excess of 10,000 pounds. The supplemental (bottom) load line shall consist of a chain incorporated into the bottom hem of the curtain of sufficient weight to serve as ballast to hold the curtain in a vertical position. Additional anchorage shall be provided as necessary. The load lines shall have suitable connecting devices which develop the full breaking strength for connection to load lines in adjacent sections as shown in the detail.
   f. External anchors may consist of wooden or metal stakes (2- x 4-inch or 2-1/2-inch minimum diameter wood or 1.33 lbs/linear foot steel) when Type I installation is used; when Type II or Type III installations are used, bottom anchors should be used.
   g. Bottom anchors must be sufficient to hold the curtain in the same position relative to the bottom of the watercourse without interfering withthe action of the curtain. The anchor may dig into the bottom (grappling hook, plow or fluke-type) or may be weighted (mushroom type) and should be attached to a floating anchor buoy via an anchor line. The anchor line should then run from the buoy to the to load line of the curtain. When used with Type III installations, these lines must contain enough slack to allow the buoy and curtain to float freely with tidal changes without pulling the buoy or curtain down and must be checked regularly to make sure they do not become entangled with debris. As previously noted, anchor spacing will vary with current velocity and potential wind and wave action; manufacturer's recommendations should be followed. See detail for orientation of external anchors and anchor buoys for tidal installations.

Source:	Symbol:	Detail No.
Adapt. from Amer. Boom and Barrier Corp.	___ TC-(1/2/3) ___ (Std/Alt)	DE-ESC-3.5.3 Sheet 6 of 8 Date: 12/03

Standard Detail & Specifications
Turbidity Curtain

Construction Notes (cont.)

2. **Installation**
   a. In the calm water of lakes or ponds (Type I installation) it is usually sufficient to set the curtain end stakes or anchor points (using anchor buoys if bottom anchors are employed), then tow the curtain in the furled condition out and attach it to the stakes or anchor points. Following this, any additional stakes or buoyed anchors required to maintain the desired location of the curtain may be set and these anchor points made fast to the curtain. Only then shall the furling lines be cut to allow the curtain skirt to drop.
   b. In rivers or in other moving waters (Type II and Type III installations) it is important to set all curtain anchor points. Care must be taken to ensure that anchor points are of sufficient holding power to retain the curtain under the existing current conditions, prior to putting the furled curtain into the water. Anchor buoys should be employed on all anchors to prevent the current from submerging the flotation at the anchor points. If the curtain is being installed into tidal areas which would be subject to currents in both directions, anchors should be provided on both sides of the curtain. This will minimize curtain movement and prevent the curtain from overrunning the anchors during tide reversals. After the anchors have been secured, the furled curtain should be secured to the upstream anchor point and then sequentially attached to each next downstream anchor point until the entire curtain is in position. Before unfurling, the "lay" of the curtain should be assessed and any necessary adjustments made to the anchors. Once the location has been deemed adequate, the furling lines may be cut to allow the skirt to drop.
   c. Anchor lines should be attached to the flotation device, not to the bottom of the curtain. The anchoring line attached to the flotation device on the downstream side will provide support for the curtain. Attaching the anchors to the bottom of the curtain could cause premature failure of the curtain due to the stresses imparted on the middle section of the curtain.
   d. Turbidity curtain shall not be installed across channel flows unless there is a danger of causing sediment deposition to occur in the middle of a watercourse, thereby blocking access or creating a sand bar. In such situations, the curtain may be installed so as to form a long-sided, sharp "V" to deflect clean water around a work site, confining most of the silt-laden water to the work area inside the "V" and directing it to the shoreline. In no case shall the curtain be installed perpendicular to the channel flow.

Source:	Symbol:	Detail No.
Adapt. from Amer. Boom and Barrier Corp.	___ TC-(1/2/3) ___ (Std/Alt)	DE-ESC-3.5.3 Sheet 7 of 8 Date: 12/03

Standard Detail & Specifications
Turbidity Curtain

Construction Notes (cont.)

3. **Maintenance**
   a. The individual(s) identified on the plan as responsible for maintenance of the curtain shall do so for the duration of the project in order to ensure the continuous protection of the watercourse.
   b. Should repairs to the geotextile fabric become necessary, repair kits are generally available from the manufacturer. The manufacturer's instructions must be followed to ensure the adequacy of the repair.
   c. When the curtain is no longer required as determined by the inspector, the curtain and related components shall be removed in such a manner as to minimize turbidity. Remaining sediment shall be sufficiently settled before removing the curtain. Sediment may be removed and the original depth (or plan elevation) restored. Any spoils must be taken to an approved upland disposal area and stabilized in accordance with the approved plan.

4. **Removal**
   a. Care shall be taken to protect the skirt from damage as the turbidity curtain is dragged from the watercourse.
   b. The site selected to bring the curtain ashore should be free of sharp rocks, broken cement, debris, etc. so as to minimize damage when hauling the curtain over the area.
   c. If the curtain has a deep skirt, it can be further protected by running a small boat along its length with a crew installing furling lines before attempting to remove the curtain from the water.

Source:	Symbol:	Detail No.
Adapt. from Amer. Boom and Barrier Corp.	___ TC-(1/2/3) ___ (Std/Alt)	DE-ESC-3.5.3 Sheet 8 of 8 Date: 12/03

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CENTRAL MIDDLE SCHOOL RSC

TITLE:
EROSION & SEDIMENT CONTROL DETAILS

PROJECT NO.: 12012.04	SCALE: AS SHOWN
SEAL:	BY: TB CHECK: MT,DS
	DWG. NO.: 14 OF 20

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DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL
GENERAL NOTES FOR EROSION, SEDIMENT CONTROL, AND WATER POLLUTION

1. DEFINITIONS. CLEARING: THE CLEARING OF TREES, BRUSH, SHRUBS, DOWNED TIMBER, ROTTEN WOOD, RUBBISH, AND ANY OTHER VEGETATION, EXCEPT WHERE EXCLUDED BY THE DEFINITION FOR GRUBBING, AS WELL AS THE REMOVAL OF FENCES AND STRUCTURES. SEE SUBSECTION 201.01. DISTURBED AREA: AN AREA WHERE ANY ACTIVITY HAS BEEN INITIATED WHICH MAY RESULT IN SOIL EROSION FROM WATER OR WIND OR MOVEMENT OF SEDIMENTS OR POLLUTANTS INTO STATE WATERS OR ONTO LANDS IN THE STATE, OR WHICH MAY RESULT IN ACCELERATED STORMWATER RUNOFF, INCLUDING, BUT NOT LIMITED TO, CLEARING, GRUBBING, GRADING, EXCAVATING, TRANSPORTING, FILLING, AND BACKFILLING OF LAND. GRUBBING: SHALL MEAN THE REMOVAL FROM THE GROUND OF TREES, STUMPS, ROOTS, BRUSH, ROOT MAT, AND DEBRIS. PHASING: STAGED CONSTRUCTION SEQUENCING AS SHOWN ON THE EROSION AND SEDIMENT CONTROL PLANS AND THE MAINTENANCE OF TRAFFIC PLANS. PROJECT SITE: THE AREA OF LAND BOUNDED BY THE LIMITS OF CONSTRUCTION SHOWN ON THE PLANS.

2. LEGAL AUTHORITY. THE DEPARTMENT IS A DELEGATED AGENCY OF THE DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL (DNREC) AS DEFINED IN CHAPTER 40, TITLE 7, OF THE DELAWARE CODE. THE DEPARTMENT MAY ENFORCE COMPLIANCE WITH THE AFOREMENTIONED LAW AND THE DELAWARE SEDIMENT AND STORMWATER REGULATIONS THROUGH THE CONTRACT DOCUMENTS OR MAY REFER THE PROJECT TO THE DNREC FOR ENFORCEMENT ACTION. IF THE CONTRACT DOCUMENTS SHOULD BE FOUND TO CONFLICT WITH ANY OTHER APPLICABLE FEDERAL, STATE, OR MUNICIPAL WATER POLLUTION CONTROL LAW, RULE, OR REGULATION, THE MORE STRINGENT WATER POLLUTION CONTROL REQUIREMENTS SHALL APPLY.

3. SEDIMENT AND STORMWATER PERMIT APPROVAL. A SIGNATURE, DATE, AND SEAL IN THE STORMWATER ENGINEER'S BLOCK ON THE TITLE SHEET OF THE PLANS INDICATES THAT THE PLANS WERE DESIGNED IN CONFORMANCE WITH THE APPLICABLE STATE AND FEDERAL STORMWATER REGULATIONS AND THAT THE SEDIMENT AND STORMWATER PERMIT IS APPROVED. ALL WORK SHALL BE COMPLETED PURSUANT TO THE PLANS. REVIEW AND APPROVAL OF THE EROSION, SEDIMENT CONTROL, AND WATER POLLUTION CONTROL PLAN OR ERRORS AND OMISSIONS IN THE PLANS SHALL NOT RELIEVE THE CONTRACTOR FROM ITS RESPONSIBILITIES FOR COMPLIANCE WITH THE DELAWARE SEDIMENT AND STORMWATER REGULATIONS OR OTHER APPLICABLE LAWS OR REGULATIONS.

4. DESCRIPTION OF WORK. EROSION AND SEDIMENT CONTROL MEASURES SHALL BE APPLIED TO ERODIBLE EARTH MATERIAL EXPOSED BY ANY OF THE CONTRACTOR'S LAND DISTURBING ACTIVITIES ON THE PROJECT. THE WORK SHALL CONSIST OF THE APPLICATION OF TEMPORARY AND PERMANENT EROSION AND SEDIMENT CONTROL ITEMS AS PROVIDED IN THE CONTRACT OR ORDERED BY THE ENGINEER. THE TEMPORARY EROSION CONTROL ITEMS SHALL BE COORDINATED WITH THE PERMANENT EROSION CONTROL ITEMS SPECIFIED. THE ITEMS SHALL INCLUDE, BUT ARE NOT LIMITED TO, THE USE OF BERMS, DIKES, DAMS, SEDIMENT BASINS, TRAPS, GEOTEXTILES, STONE CHECK DAMS, SILT FENCES, PHASED CONSTRUCTION, SPECIAL LAND GRADING METHODS, MATS AND NETS, AGGREGATES, MULCHES, GRASSES, SLOPE DRAINS, CHEMICAL BINDERS, TACKIFIERS, AND OTHER EROSION AND SEDIMENT CONTROL ITEMS OR APPROVED METHODS AS DESIGNATED ON THE CONTRACT DOCUMENTS OR AS DIRECTED BY THE ENGINEER.

5. COMPLETION OF THE WORK. THIS SUBSECTION SETS FORTH THE METHODS OF CONSTRUCTION OPERATIONS, PROGRESS SCHEDULES, CONSTRUCTION PHASING, STAGING, AND SEQUENCING FOR THE COMPLETION OF TEMPORARY OR PERMANENT EROSION AND SEDIMENT CONTROL WORK. THE CONTRACTOR SHALL IMPLEMENT THE TEMPORARY AND PERMANENT EROSION CONTROL ITEMS FOR EACH PHASE OF CONSTRUCTION AS DETAILED IN THE CONTRACT DOCUMENTS. ADDITIONAL EROSION AND SEDIMENT CONTROL ITEMS MAY BE REQUIRED FROM TIME TO TIME DURING THE LIFE OF THE PROJECT AS DEEMED NECESSARY BY THE ENGINEER IN ORDER TO PROVIDE CONTINUOUS EROSION AND SEDIMENT CONTROL PROTECTION. BEFORE STARTING EACH PHASE OF ANY LAND-DISTURBING ACTIVITY, THE CONTRACTOR SHALL AND THE STATE INSPECTOR OF THE PROJECT WILL MAKE CERTAIN THAT ALL EROSION AND SEDIMENT CONTROL ITEMS REQUIRED IN THAT PHASE ARE INSTALLED AND FUNCTIONAL.
   A. PROGRESS SCHEDULE. THE WORK SHALL NOT BE STARTED UNTIL THE PROGRESS SCHEDULE AND METHODS OF CONSTRUCTION OPERATIONS FOR EACH PHASE OF CONSTRUCTION ARE ACCEPTABLE TO THE ENGINEER AND ARE IN CONFORMANCE WITH ALL APPLICABLE EROSION AND SEDIMENT CONTROL REQUIREMENTS. THE PROJECT SHALL BE SCHEDULED IN SUCH MANNER AND SEQUENCED AS TO MINIMIZE THE TIME AND SURFACE AREA OF ERODIBLE EARTH MATERIAL. IF THE CONTRACTOR PROPOSES TO FOLLOW A DIFFERENT SEQUENCE THAN THE ONE PROVIDED IN THE PLANS, A PROPOSED CHANGE MUST BE SUBMITTED TO THE ENGINEER IN ACCORDANCE WITH NOTE 6 BELOW.
   B. CONSTRUCTION PHASING FOR PROJECT SITES IN EXCESS OF 8 HA (20 AC), THE CONSTRUCTION MUST BE PHASED IN 8 HA INCREMENTS. ONCE GRADING IS INITIATED IN ONE 8 HA (20 AC) INCREMENT, A SECOND 8 HA (20 AC) INCREMENT MAY BE CLEARED AND GRUBBED PROVIDED THE CONTRACTOR MAINTAINS EFFECTIVE EROSION AND SEDIMENT CONTROL MEASURES ON BOTH SECTIONS TO THE SATISFACTION OF THE ENGINEER. WHEN BALANCING EARTHWORK, SUCH AS WHEN BORROW FROM A CUT IS USED AS FILL AT A NONCONTIGUOUS LOCATION DISTANT FROM THE CUT, MORE THAN A TOTAL OF 8 HA (20 AC) MAY BE ALLOWED TO BE GRUBBED AND GRADED WITHIN THE OVERALL LIMITS OF THE PROJECT AT ANY ONE TIME WITH PRIOR WRITTEN APPROVAL FROM THE ENGINEER. IN SUCH CASES, ONE 8 HA (20 AC) INCREMENT IN CUT AND ONE 8 HA (20 AC) INCREMENT IN FILL MAY BE GRUBBED AND GRADED AT EACH SEPARATE LOCATION CONCURRENTLY. EXAMPLES OF WHEN THIS WOULD LIKELY OCCUR WOULD BE ON INTERCHANGE CONSTRUCTION OR ON A NEW ALIGNMENT. THE ENGINEER MAY FURTHER LIMIT THE AREA OF CLEARING, GRUBBING, STRIPPING, AND GRADING OPERATIONS TO THE CONTRACTOR'S CAPABILITY AND ACTUAL PROGRESS OF KEEPING THE FINISH GRADING, MULCHING, SEEDING, AND OTHER TEMPORARY OR PERMANENT EROSION CONTROL MEASURES CURRENT ACCORDING TO THE APPROVED PROGRESS SCHEDULE AND CONSTRUCTION SEQUENCE. CONSTRUCTION TO COMPLY WITH THE FOLLOWING CONSTRAINTS UNLESS INDICATED OTHERWISE ON THE PLANS:
      (1) IMPLEMENT TEMPORARY EROSION AND SEDIMENT CONTROL ITEMS PRIOR TO ANY OPERATION WHICH EXPOSES SOIL TO EROSION, SUCH AS DURING THE CLEARING PORTION AND PRIOR TO THE GRUBBING PORTION OF EACH PHASE OF CONSTRUCTION.
      (2) SCHEDULE AND PERFORM THE CLEARING AND GRUBBING OPERATIONS SO THAT GRADING OPERATIONS AND PERMANENT STABILIZATION CAN FOLLOW IMMEDIATELY THEREAFTER. ONCE EARTHWORK HAS BEGUN, THE OPERATION SHALL BE CONTINUOUS FROM CLEARING AND GRUBBING THROUGH TO COMPLETION OF GRADING AND FINAL STABILIZATION IN ACCORDANCE WITH NOTE 9, A(2) BELOW. ANY INTERRUPTION IN THESE OPERATIONS IN EXCESS OF 14 CALENDAR DAYS MUST BE APPROVED BY THE ENGINEER AND SHALL REQUIRE INTERIM STABILIZATION IN ACCORDANCE WITH NOTE 9, A(1) BELOW.
      (3) VEGETATIVELY STABILIZE BARE SOIL AREAS IN EACH PHASE OF CONSTRUCTION IN ACCORDANCE WITH NOTE 9, A(1) BELOW PRIOR TO ADVANCING THE WORK INTO THE NEXT PHASE OF CONSTRUCTION.
      (4) VEGETATIVELY STABILIZE ALL CUT AND FILL SLOPES OF THE HIGHWAY EXCAVATION AND EMBANKMENT AS THE WORK PROGRESSES IN HEIGHT INCREMENTS NOT TO EXCEED 3 M (10 FT) MEASURED ALONG THE SLOPE SURFACE.
      (5) EXCAVATE ROADSIDE DITCHES AS EARLY IN THE PROJECT AS POSSIBLE TO ESTABLISH GOOD DRAINAGE.
      (6) VEGETATIVELY STABILIZE ALL GRASS DITCHES, SWALES, AND MEDIANS WITHIN SEVEN (7) CALENDAR DAYS AFTER THEIR INITIAL EXCAVATION.
      (7) REMOVE TEMPORARY EROSION AND SEDIMENT CONTROLS AFTER FINAL STABILIZATION IS COMPLETE IN ACCORDANCE WITH NOTE 9, A(2) BELOW. RETURN LAND CONTOURS TO ORIGINAL GRADE OR AS INDICATED ON THE PLANS, AND VEGETATIVELY STABILIZE ANY REMAINING BARE SOIL AREAS.

6. PLAN CHANGES. THE CONTRACTOR SHALL NOT DEVIATE FROM THE PLANS WITHOUT PRIOR REVIEW AND APPROVAL BY THE ENGINEER AND APPROPRIATE REGULATORY AUTHORITIES. THOSE PORTIONS OF THE PLANS WHICH ARE NORMALLY COVERED BY ENVIRONMENTAL PERMITS INCLUDE, BUT ARE NOT LIMITED TO, EROSION AND SEDIMENT CONTROL, STORMWATER MANAGEMENT, CONSTRUCTION SEQUENCING, STREAM DIVERSIONS, AND SITE DEWATERING. FOR PLAN CHANGES INITIATED BY THE CONTRACTOR, REVISED CONSTRUCTION PLANS SHALL BE SUBMITTED FOR REVIEW AND APPROVAL BY THE ENGINEER. THE REVISED PLANS SHALL BE PREPARED IN ACCORDANCE WITH CURRENT DEPARTMENT STANDARDS FOR ROADWAY DESIGN, TRAFFIC CONTROL, EROSION AND SEDIMENT CONTROL, AND STORMWATER MANAGEMENT. ALL SUPPORTING DESIGN CALCULATIONS AND COST ANALYSES REQUIRED BY THE ENGINEER SHALL ACCOMPANY THE SUBMISSION. THE NUMBER OF COPIES REQUIRED TO BE SUBMITTED FOR REVIEW SHALL BE DETERMINED BY THE ENGINEER DEPENDING ON THE NATURE OF THE PROPOSED REVISION. CONTRACTOR PROPOSED REVISIONS TO THE CONSTRUCTION PLANS, AS WELL AS REVIEW TIME BY THE DEPARTMENT, WILL NOT JUSTIFY A DELAY IN THE PROGRESS SCHEDULE. ALL COSTS INVOLVED IN PREPARING PLAN REVISION DOCUMENTS FOR CHANGES PROPOSED BY THE CONTRACTOR SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.

7. LIMITS OF CONSTRUCTION. THE CONTRACTOR SHALL NOT PERFORM ANY WORK INCLUDING, BUT NOT LIMITED TO, CLEARING, GRUBBING, CONSTRUCTION PHASING, EQUIPMENT STORAGE , AND MATERIAL STOCKPILING OUTSIDE THE LIMITS OF CONSTRUCTION SHOWN ON THE PLANS WITHOUT PRIOR APPROVAL OF THE ENGINEER. IF THE CONTRACTOR SHOULD REQUIRE ADDITIONAL LANDS WHICH ARE NOT WITHIN DEPARTMENT RIGHTS - OF - WAY OR EASEMENTS, IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO MAKE ALL ARRANGEMENTS WITH THE PROPERTY OWNERS AND TO ACQUIRE ALL PERMITS FROM THE APPROPRIATE REGULATORY AUTHORITIES FOR THE USE OF THESE LANDS. THE CONTRACTOR SHALL ACQUIRE A STATEMENT SIGNED BY THE PROPERTY OWNERS WHICH RELEASES THE DEPARTMENT FROM ALL CLAIMS ARISING FROM THE USE OF THE PROPERTY BEING CONSIDERED. THE SIGNED STATEMENT FROM THE PROPERTY OWNER AND COPIES OF ALL PERMITS ACQUIRED BY THE CONTRACTOR SHALL BE TRANSMITTED BY THE CONTRACTOR TO THE ENGINEER FOR THE ENGINEER'S RECORDS PRIOR TO INITIATING ANY OPERATION ON THE PROPERTY BEING CONSIDERED FOR USE.

8. SITE REVIEWER. AN EROSION CONTROL SITE REVIEWER SHALL BE A PERSON FROM THE CONTRACTOR'S STAFF ASSIGNED TO EROSION AND SEDIMENT CONTROL IMPLEMENTATION AND MAINTENANCE AND SHALL BE REQUIRED ON SPECIFIC PROJECTS. THE NAME AND DNREC CERTIFICATION NUMBER OF EACH SITE REVIEWER SO REQUIRED SHALL BE SUBMITTED TO THE DEPARTMENT AT THE TIME OF BID. THE SITE REVIEWER REQUIREMENTS IN EFFECT ON THIS PROJECT SHALL BE AS MARKED WITH AN (X) BELOW:

EROSION POTENTIAL FOR THIS PROJECT	SITE REVIEWER REQUIREMENTS
( ) INSIGNIFICANT	NONE
( ) MINOR	1 CONTRACTOR CERTIFICATION COURSE TRAINING ONLY
(X) MEDIUM	2 CERTIFIED SUPERINTENDENT SHALL BE A (CCR) OR SEPARATE CONSTRUCTION REVIEWER INDIVIDUAL FROM CONTRACTOR'S STAFF SHALL BE A (CCR)
( ) MAJOR	3 SUPERINTENDENT AND A SEPARATE INDIVIDUAL FROM CONTRACTOR'S STAFF SHALL BE A CCR.

1. AS DEFINED IN SECTION 13 OF THE DELAWARE SEDIMENT AND STORMWATER REGULATIONS
2. AS DEFINED IN SECTION 12 OF THE DELAWARE SEDIMENT AND STORMWATER REGULATIONS
3. SUPERINTENDENT MUST OBTAIN CCR WITHIN ONE YEAR OF AWARD OF CONTRACT.

9. VEGETATIVE STABILIZATION.
   A. INTERIM AND FINAL STABILIZATION. AN AREA OF THE WORK SHALL BE CONSIDERED VEGETATIVELY STABILIZED FOR EROSION CONTROL IF IT MEETS THE CRITERIA IN ONE OF THE FOLLOWING TWO CASES:
      (1) INTERIM STABILIZATION. THE SEEDING AND MULCHING ITEMS, SOD, OR EROSION AND SEDIMENT CONTROL ITEMS AS NOTED ON THE PLANS ARE IN PLACE AND ACCEPTED BY THE ENGINEER.
      (2) FINAL STABILIZATION. MEETS THE REQUIREMENT FOR THE REMOVAL OF THE TEMPORARY EROSION CONTROLS PLACED DURING INTERIM STABILIZATION AND COMPLETE GROWTH OF VEGETATION HAS OCCURRED TO THE SATISFACTION OF THE ENGINEER. COMPLETE GROWTH OF VEGETATION INCLUDES PERMANENT GRASS REACHING A HEIGHT OF 75 MM (3 IN) OVER ALL AREAS SEEDED.
   B. INCREMENTAL STABILIZATION. SIDE SLOPES, AND OTHER SLOPES 1:3 (VERTICAL TO HORIZONTAL) OR STEEPER REQUIRE PLACEMENT OF EITHER TEMPORARY OR PERMANENT SEEDING AND MULCHING AS THE WORK PROGRESSES IN HEIGHT INCREMENTS NOT TO EXCEED 3 M (10 FT) MEASURED ALONG THE SLOPE SURFACE.
   C. TRACKING OF SLOPES. DURING GRADING OPERATIONS THE CONTRACTOR SHALL TRACK ALL SLOPES 1:3 (VERTICAL TO HORIZONTAL) OR STEEPER AT HEIGHT INCREMENTS OF 3 M (10 FT) MEASURED ALONG THE SLOPE SURFACE. THE TRACKING SHALL BE ACCOMPLISHED BY DRIVING CLEATED EQUIPMENT SUCH AS A BULLDOZER UP AND DOWN THE SLOPES SO THE CLEATS MAKE HORIZONTALLY ORIENTED INDENTATIONS IN THE SOIL. ALL COSTS ASSOCIATED WITH TRACKING OF SLOPES AT REGULAR INCREMENTS SHALL BE INCIDENTAL TO SECTION 202. PRIOR TO APPLYING SEEDING ITEMS ON SLOPES 1:3 (VERTICAL TO HORIZONTAL) OR STEEPER, THE CONTRACTOR SHALL TRACK THE SLOPES AS DESCRIBED ABOVE IN ORDER TO PREPARE A STABLE SEEDBED. ALL COSTS ASSOCIATED WITH TRACKING OF SLOPES TO PREPARE A SEEDBED SHALL BE INCIDENTAL TO THE SEEDING ITEM BEING APPLIED TO THE SLOPE SURFACE.
   D. MAXIMUM SOIL EXPOSURE TIMES. ALL ERODIBLE EARTH MATERIAL EXPOSED BY THE CONTRACTOR'S ACTIVITIES SHALL BE VEGETATIVELY STABILIZED WITHIN THE TIME FRAMES SPECIFIED BELOW:

STABILIZED WITHIN THE TIME FRAMES SPECIFIED BELOW:

LOCATION	MAXIMUM TIME TO VEGETATIVELY STABILIZE
SEDIMENT CONTROLS (BERMS, DITCHES, TRAPS, BASIN, ETC.)	SEVEN (7) CALENDAR DAYS FROM INITIAL CONSTRUCTION
AREAS MEETING FINAL GRADES	SEVEN (7) CALENDAR DAYS FROM COMPLETION OF GRADING
AREAS NOT MEETING FINAL GRADES	FOURTEEN (14) CALENDAR DAYS FROM CEASING WORK IN THAT LOCATION

10. TEMPORARILY STOCKPILED MATERIAL. ERODIBLE EARTH MATERIAL DESIGNATED ON THE PLANS OR REQUIRED BY THE ENGINEER TO BE EXCAVATED AND TEMPORARILY STOCKPILED FOR LATER USE IN THE PROJECT SHALL BE LOCATED AWAY FROM LIVE STREAMS AND WETLANDS, KEPT WITHIN DEPARTMENT RIGHTS-OF-WAY AND EASEMENTS, AND PLACED ONLY IN AREAS DEEMED APPROPRIATE BY THE ENGINEER. THE CONTRACTOR SHALL INSTALL THE EROSION AND SEDIMENT CONTROL ITEMS DESIGNATED ON THE PLANS OR AS DIRECTED BY THE ENGINEER ABOUT THE BASE OF THE PILE IN ADVANCE OF THE ACTUAL STOCKPILING OPERATION. ERODIBLE EARTH MATERIAL SHALL BE PLACED IN PILES OF NEAT CONFORMATIONS. SIDE SLOPES SHALL BE SEEDED AND MULCHED AS THE PILE IS PLACED IN HEIGHT INCREMENTS OF 3 M (10 FT) MEASURED ALONG THE SLOPE SURFACE. ALL REMAINING UNSTABILIZED SURFACES SHALL BE SEEDED AND MULCHED IMMEDIATELY FOLLOWING COMPLETION OF THE STOCKPILING OPERATION. IF THE CONTRACTOR PROPOSES TO STOCKPILE ERODIBLE EARTH MATERIAL IN AREAS NOT DESIGNATED ON THE PLANS FOR SUCH USE, IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO PREPARE AND SUBMIT FOR APPROVAL BY THE ENGINEER EROSION AND SEDIMENT CONTROL PLANS FOR THOSE PROPOSED AREAS WHICH ARE LOCATED WITHIN DEPARTMENT RIGHTS- OF-WAY AND EASEMENTS. MATERIALS FOR THE PROPOSED STOCKPILE HAS BEEN APPROVED. IF THE CONTRACTOR PROPOSES TO STOCKPILE ERODIBLE EARTH MATERIAL IN AREAS OUTSIDE OF DEPARTMENT RIGHTS-OF-WAY AND EASEMENTS, A PLAN FOR THE USE OF THE PROPOSED SITE SHALL BE SUBMITTED FOR REVIEW AND APPROVAL TO THE APPROPRIATE AGENCIES HAVING JURISDICTION. NO STOCKPILING OPERATION SHALL COMMENCE IN AREAS OUTSIDE THE DEPARTMENT RIGHTS-OF-WAY AND EASEMENTS UNTIL THE ENGINEER HAS RECEIVED COPIES OF ALL APPROVALS AND RELEASE OF CLAIMS FORMS REQUIRED UNDER NOTE 7 ABOVE.

11. CHANNEL AND DITCH SCOUR PROTECTION. RIP RAP OR OTHER PROPOSED CHANNEL LINING ITEMS DESIGNATED ON THE PLANS AT PIPE, CULVERT, AND BRIDGE INLETS AND OUTLETS AND ALONG CHANNEL LENGTHS SHALL BE PLACED BEFORE THE PIPES, CULVERTS, BRIDGES, AND CHANNELS BECOME OPERATIONAL.

12. SEDIMENT-LADEN RUNOFF. STORMWATER RUNOFF FROM DISTURBED AREAS SHALL BE DIRECTED TO AN APPROVED SEDIMENT CONTROL MEASURE, SUCH AS A TRAP OR BASIN, PRIOR TO RELEASE TO DITCHES, STORM DRAIN SYSTEMS, STREAMS, OR SURFACE WATER BODIES OF ANY TYPE. ALL STORM DRAIN PIPES WHICH CONVEY SEDIMENT-LADEN RUNOFF SHALL DISCHARGE TO A SEDIMENT TRAP OR SEDIMENT BASIN PRIOR TO RELEASE FROM THE PROJECT LIMITS OF CONSTRUCTION AS SHOWN ON THE PLANS, OR AS DIRECTED BY THE ENGINEER.

13. DEWATERING OPERATIONS. THE CONTRACTOR SHALL NOT PUMP OR OTHERWISE WITHDRAW WATER FROM BELOW THE WATER TABLE AT A RATE EXCEEDING 189,270 LITERS PER DAY (50,000 GPD) WITHOUT HAVING FIRST OBTAINED THE NECESSARY WATER ALLOCATION AND WELL PERMITS. THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING ALL PERMITS REQUIRED FROM THE APPROPRIATE ISSUING AUTHORITY FOR THE WITHDRAWAL OF GROUNDWATER FROM THE PROJECT SITE. COSTS ASSOCIATED WITH WATER ALLOCATION AND WATER WELL PERMIT ACQUISITION SHALL BE PAID BY THE CONTRACTOR. THE CONTRACTOR SHALL SUBMIT COPIES OF ALL PERMIT APPROVALS TO THE ENGINEER FOR THE ENGINEER'S RECORDS. SEDIMENT-LADEN DEWATERING DISCHARGE SHALL BE DIRECTED TO AN APPROVED SEDIMENT TRAPPING DEVICE SUCH AS A DEWATERING BASIN, PORTABLE SEDIMENT TANK, SEDIMENT TRAP, OR SEDIMENT BASIN, PRIOR TO RELEASE TO DITCHES, STORM DRAIN SYSTEMS, STREAMS, OR SURFACE WATER BODIES OF ANY TYPE. PRIOR TO INITIATING A PUMPING OPERATION TO REMOVE WATER FROM OPEN EXCAVATIONS OR TEMPORARY COFFERDAMS, THE AREA TO BE DEWATERED SHALL BE ALLOWED TO REST UNDISTURBED UNDER QUIESCENT CONDITIONS FOR A PERIOD OF 12 HOURS IN ORDER TO INDUCE PHYSICAL SETTLING OF SUSPENDED PARTICLES. THE CONTRACTOR SHALL ATTACH THE SUCTION LINE OF THE PUMPING EQUIPMENT TO A FLOTATION DEVICE, IMMERSING THE INTAKE END NO MORE THAN SIX INCHES BELOW THE WATER SURFACE. IN THIS MANNER, WATER SHALL BE "SKIMMED" OFF THE SURFACE. ONCE THE WATER LEVEL HAS BEEN PUMPED DOWN, FURTHER DEWATERING SHALL BE ACCOMPLISHED IN CONJUNCTION WITH A SUMP PIT CONSTRUCTED IN CONFORMANCE WITH DEPARTMENT STANDARDS OR AS DIRECTED BY THE ENGINEER.

14. CLEAN WATER DIVERSIONS. STORMWATER RUNOFF FROM NON-DISTURBED AREAS SHALL BE DIRECTED AWAY FROM WORK AREAS USING ANY COMBINATION OF DIKES, SWALES, AND SLOPE DRAINS OR AS SHOWN ON THE PLANS, OR AS DIRECTED BY THE ENGINEER.

15. STREAM DIVERSIONS. THE CONTRACTOR SHALL NOT CONDUCT WORK IN A STREAM WITHOUT HAVING FIRST OBTAINED THE APPROPRIATE WETLAND AND SUBAQUEOUS LANDS PERMIT(S). WHEN WORK IS TO BE CONDUCTED IN THE FLOW LINE OF A STREAM, WHETHER THE STREAM IS PERENNIAL OR INTERMITTENT, THE CONTRACTOR SHALL USE ANY COMBINATION OF DIKES, SWALES, DITCHES, COFFERDAMS, PIPES, PUMPS, AND OTHER DEVICES SHOWN ON THE PLANS, OR AS DIRECTED BY THE ENGINEER TO DIRECT THE STREAM FLOW AROUND THE WORK AREA.

16. TEMPORARY STREAM CROSSINGS. EQUIPMENT SHALL NOT BE OPERATED IN LIVE STREAMS WITHOUT A STREAM DIVERSION BEING INSTALLED TO THE SATISFACTION OF THE ENGINEER. TEMPORARY BRIDGES SHALL BE INSTALLED IF THE WORK REQUIRES THE CROSSING OF A STREAM BY CONSTRUCTION EQUIPMENT.

17. WASH WATER. WATER CONTAINING SEDIMENT FROM ANY CONSTRUCTION ACTIVITY ON THE PROJECT SUCH AS SAW CUTTING, MILLING, AGGREGATE WASHING, AND EQUIPMENT WASHING AND WHICH IS NOT REGULATED AS A WASTE WATER UNDER STATE OR FEDERAL STATUTES SHALL BE DISCHARGED TO A SEDIMENT TRAPPING DEVICE, TREATED BY FILTRATION, OR SETTLING. SEDIMENT - LADEN WASH WATER SHALL NOT BE DISCHARGED DIRECTLY TO ANY STREAM OR WATERBODY OF ANY TYPE.

18. WASTE WATER. WATER CONTAINING POLLUTANTS, SUCH AS RAW SEWERAGE, BITUMENS, FUELS, LUBRICANTS, PAINT, OR OTHER HARMFUL MATERIALS, IS STRICTLY REGULATED UNDER STATE AND FEDERAL STATUTES AND AS SUCH SHALL NOT BE DISCHARGED INTO WATERS OF THE STATE AS DEFINED IN CHAPTER 60, TITLE 7, OF THE DELAWARE CODE OR INTO NATURAL OR MANMADE CHANNELS OR STORM DRAIN SYSTEMS LEADING TO WATERS OF THE STATE. THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING ALL PERMITS REQUIRED FROM THE APPROPRIATE ISSUING AUTHORITY FOR THE DISCHARGE OF WASTE WATERS FROM THE PROJECT SITE. COSTS ASSOCIATED WITH WASTE WATER PERMIT ACQUISITION SHALL BE PAID BY THE CONTRACTOR. THE CONTRACTOR SHALL SUBMIT COPIES OF ALL PERMIT APPROVALS TO THE ENGINEER FOR THE ENGINEER'S RECORDS.

19. WATER POLLUTION VIOLATIONS ENFORCED. IF A WATER POLLUTION CONTROL VIOLATION EXISTS ON THE PROJECT WHICH IN THE ENGINEER'S JUDGMENT POSES A PUBLIC HEALTH OR SAFETY RISK, SUCH AS A FUEL OR CHEMICAL SPILL OR RELEASE OF RAW SEWERAGE, THE ENGINEER MAY REFER THE VIOLATION TO THE DNREC FOR IMMEDIATE ENFORCEMENT ACTION. THE COST OF CLEAN UP SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR IF THE DNREC INVESTIGATION REVEALS THE CONTRACTOR'S ACTIONS CAUSED THE VIOLATION.

20. MAINTENANCE. EROSION AND SEDIMENT CONTROL ITEMS SHALL BE MAINTAINED DURING THE CONSTRUCTION SEASON AS WELL AS THE WINTER MONTHS AND OTHER TIMES WHEN THE PROJECT IS CLOSED DOWN. THE CONTRACTOR SHALL INSPECT THE PROJECT SITE IMMEDIATELY AFTER EACH RAIN AND REPAIR, REPLACE, OR MAINTAIN ANY EROSION AND SEDIMENT CONTROL ITEM PROMPTLY AS NEEDED OR AS DIRECTED BY THE ENGINEER. ANY ERODED SURFACE SHALL BE STABILIZED, AND ANY ACCUMULATED SEDIMENT NOT TRAPPED BY A CONTROL MEASURE SHALL BE REMOVED AND DISPOSED OF IN AN APPROVED STOCKPILE AREA OR HAULED OFF-SITE. ACCESS SHALL BE MAINTAINED TO ALL SEDIMENT CONTROL DEVICES UNTIL CONSTRUCTION PHASING AND STABILIZATION ALLOW THE REMOVAL OF THOSE CONTROLS THAT ARE NO LONGER REQUIRED. COSTS ASSOCIATED WITH REPAIRING, REPLACING, AND MAINTAINING THE EROSION AND SEDIMENT CONTROL ITEMS ARE INCIDENTAL TO THE INITIAL CONSTRUCTION OF EACH ITEM. SEDIMENT REMOVAL WILL BE PAID FOR SEPARATELY UNDER ITEM 740001, TEMPORARY EROSION CONTROL EXCAVATION AND EMBANKMENT.

CLIENT

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Restore the Earth & Inspire Ecological Stewardship

CENTRAL MIDDLE SCHOOL RSC

TITLE: EROSION & SEDIMENT CONTROL NOTES

PROJECT NO. :	SCALE:
12012.04	N/A
SEAL:	BY: TB / CHECK: MT,DS
	DWG. NO. : 15 OF 20

DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL
GENERAL NOTES FOR EROSION, SEDIMENT CONTROL, AND WATER POLLUTION (CONT.)

21. EROSION AND SEDIMENT CONTROL REPORTS. THE DEPARTMENT WILL PROVIDE THE CONTRACTOR WITH EROSION AND SEDIMENT CONTROL REPORTS ON A REGULAR BASIS. THE REPORTS WILL ITEMIZE WORK REQUIRED TO MAINTAIN COMPLIANCE WITH THE CONTRACT. THE CONTRACTOR SHALL COMPLETE THE ITEMS OF WORK LISTED BY THE COMPLETION DATES INDICATED ON THE REPORTS.

A. STOP WORK ORDER. IF THE CONTRACTOR CONTINUES TO FAIL TO IMPLEMENT AND MAINTAIN THE EROSION AND SEDIMENT CONTROLS AFTER ORAL OR WRITTEN DIRECTION TO DO SO BY THE ENGINEER, OR CONTINUES NOT TO FOLLOW THE APPROVED CONSTRUCTION PHASING, SEQUENCING, AND PROGRESS SCHEDULE, THE ENGINEER MAY ORDER A 'SHUT-DOWN' OF ALL LAND-DISTURBING ACTIVITIES EXCEPT THOSE NECESSARY TO BRING THE SITE INTO COMPLIANCE WITH THE CONTRACT. THE ENGINEER WILL ESTABLISH A TIME FRAME FOR COMPLETION OF THE EROSION AND SEDIMENT CONTROL WORK. IF THE UNSATISFACTORY CONSTRUCTION PROCEDURES AND OPERATIONS ARE NOT CORRECTED PROMPTLY AFTER THE INITIAL 'SHUT-DOWN', THE ENGINEER MAY SUSPEND THE PERFORMANCE OF OTHER CONSTRUCTION UNTIL ALL ITEMS OF WORK ON THE EROSION AND SEDIMENT CONTROL REPORTS ARE COMPLETE AND ACCEPTED. NO CLAIMS FOR ADDITIONAL TIME OR MONEY SHALL BE CONSIDERED DUE TO 'SHUT-DOWNS' RESULTING FROM THE CONTRACTOR'S FAILURE TO IMPLEMENT AND MAINTAIN THE REQUIRED EROSION AND SEDIMENT CONTROL ITEMS OR FAILURE TO FOLLOW THE APPROVED CONSTRUCTION PHASING, STAGING, SEQUENCING, AND PROGRESS SCHEDULE REQUIRED BY THE CONTRACT DOCUMENTS.

B. WITHHOLD PROGRESS PAYMENT. IF THE CONTRACTOR FAILS TO BRING THE EROSION AND SEDIMENT CONTROLS INTO COMPLIANCE WITH THE CONTRACT DOCUMENTS OR FAILS TO PROCEED IN ACCORDANCE WITH THE APPROVED CONSTRUCTION PHASING, STAGING, AND SEQUENCING AFTER ORAL OR WRITTEN DIRECTION FROM THE ENGINEER TO DO SO AND AFTER A SHUT-DOWN OF ALL LAND-DISTURBING ACTIVITIES, THEN NO MONTHLY ESTIMATE OR PAYMENT WILL BE MADE. NO PAYMENT WILL BE MADE UNTIL ALL ITEMS OF WORK ON THE EROSION AND SEDIMENT CONTROL REPORTS ARE COMPLETE AND ACCEPTED.

C. DEDUCT COST OF WORK COMPLETED BY OTHERS. IF THE CONTRACTOR FAILS TO REMEDY UNSATISFACTORY CONDITIONS WITHIN THE TIME FRAME ESTABLISHED AFTER ALL LAND-DISTURBING ACTIVITIES HAVE BEEN SHUT DOWN AND PAYMENT HAS BEEN WITHHELD, THEN THE ENGINEER MAY PROCEED WITH ADEQUATE FORCES AND EQUIPMENT TO IMPLEMENT OR MAINTAIN THE EROSION AND SEDIMENT CONTROL ITEMS NECESSARY TO BRING THE PROJECT INTO COMPLIANCE WITH THE CONTRACT DOCUMENTS. THE ENTIRE COST OF THIS WORK PLUS A 50% PREMIUM FOR ENGAGING AN ON-CALL CONTRACTOR AND ADMINISTERING THE ON-CALL CONTRACTOR WILL BE DEDUCTED FROM MONIES DUE THE CONTRACTOR ON THE CONTRACT.

D. DEFAULT OF CONTRACT. MORE THAN ONE 'SHUT DOWN' FOR EROSION AND SEDIMENT CONTROL NONCOMPLIANCE MAY BE CONSIDERED AS A FAILURE TO PERFORM THE TERMS OF THE CONTRACT AND WILL BE GROUNDS FOR FINDING THE CONTRACTOR IN DEFAULT OF THE CONTRACT IN ACCORDANCE WITH SUBSECTION 108.10 OF THE STANDARD SPECIFICATIONS. IF THE CONTRACTOR DEFAULTS ON THE EROSION AND SEDIMENT CONTROL PROVISIONS OF THE CONTRACT, THE PROJECT WILL BE REFERRED TO THE DNREC FOR ENFORCEMENT ACTION.

22. FAILURE TO IMPLEMENT AND MAINTAIN EROSION AND SEDIMENT CONTROL MEASURES. CONTROLLING EROSION AND SEDIMENTATION IS THE CONTRACTOR'S RESPONSIBILITY UNDER THE CONTRACT. IF THE CONTRACTOR FAILS AT ANY TIME TO IMPLEMENT AND MAINTAIN THE REQUIRED EROSION AND SEDIMENT CONTROL PROVISIONS OF THE CONTRACT, THE ENGINEER MAY NOTIFY THE CONTRACTOR, ORALLY OR IN WRITING, TO COMPLY WITH THE REQUIRED EROSION AND SEDIMENT CONTROL PROVISIONS. IF THE CONTRACTOR FAILS TO PERFORM THE WORK AS DIRECTED BY THE ENGINEER, THE ENGINEER MAY TAKE THE FOLLOWING ACTIONS IN THE ORDER LISTED BELOW TO GAIN COMPLIANCE WITH THE CONTRACT.

23. CONTRACTOR PAYMENT. PAYMENT WILL BE MADE AT THE UNIT PRICES BID FOR THE QUANTITIES OF THE VARIOUS EROSION AND SEDIMENT CONTROL ITEMS PROVIDED IN THE CONTRACT WHICH ARE INSTALLED BY THE CONTRACTOR AND ACCEPTED BY THE ENGINEER. ANY ADDITIONAL WORK OR CORRECTIONS BROUGHT ABOUT BY ERRORS BY THE CONTRACTOR SUCH AS NONCONFORMANCE WITH THE CONTRACT DOCUMENTS AND THE CONSTRUCTION PHASING, STAGING, OR SEQUENCING WILL BE MADE AT THE CONTRACTOR'S EXPENSE. WHEN ADDITIONAL QUANTITIES OF EROSION AND SEDIMENT CONTROL ITEMS ARE REQUIRED BY THE ENGINEER IN ORDER TO MAINTAIN COMPLIANCE WITH THE APPLICABLE WATER POLLUTION CONTROL REQUIREMENTS, THE ITEMS OF WORK SO ORDERED BY THE ENGINEER WILL BE PAID FOR IN ACCORDANCE WITH SUBSECTION 104.04 OF THE STANDARD SPECIFICATIONS. SHOULD ITEMS OF WORK BE REQUIRED WHICH ARE NOT COVERED BY APPLICABLE CONTRACT ITEMS, THE CONTRACTOR SHALL BE ORDERED TO PERFORM THESE ITEMS OF WORK ON A FORCE ACCOUNT BASIS IN ACCORDANCE WITH SUBSECTION 104.04 OF THE STANDARD SPECIFICATIONS. INCREASES OR DECREASES TO THE QUANTITIES OF THE VARIOUS EROSION AND SEDIMENT CONTROL ITEMS PROVIDED IN THE CONTRACT WILL NOT BE CONSIDERED BY THE DEPARTMENT AS MATERIALLY CHANGING THE CHARACTER OF THE WORK TO BE PERFORMED, THE COST THEREOF, OR THE TIME REQUIRED FOR PERFORMANCE OF THE WORK.

DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL
PROJECT NOTES FOR SEDIMENT AND STORMWATER MANAGEMENT

1. AS -BUILT DRAWINGS OF STORMWATER MANAGEMENT FACILITIES. THE CONTRACTOR SHALL PROVIDE 'AS-BUILT' DRAWINGS OF ALL STORMWATER MANAGEMENT FACILITIES, SUCH AS PONDS, BIOFILTRATION SWALES, BIORETENTION AREAS, ETC. THE 'AS-BUILT' DRAWINGS SHALL SHOW THE ACTUAL FINISHED GROUND CONTOURS, OUTLET STRUCTURE DIMENSIONS AND ELEVATIONS, ETC., AS THEY EXIST AT THE COMPLETION OF THE PROJECT. THESE DRAWINGS SHALL BE SIGNED AND SEALED BY A PROFESSIONAL ENGINEER OR LAND SURVEYOR REGISTERED IN THE STATE OF DELAWARE. ALL COSTS SHALL BE INCLUDED UNDER ITEM 763501 CONSTRUCTION ENGINEERING.

2. DUST CONTROL. DUST IS TO BE CONTROLLED EXCLUSIVELY THROUGH THE USE OF WATER. COSTS ASSOCIATED WITH THE FURNISHING AND APPLICATION OF WATER FOR DUST CONTROL SHALL BE INCIDENTAL TO ALL THE CONTRACT BID ITEMS.

3. MOWING. THE CONTRACTOR SHALL MAINTAIN ALL GRASS ESTABLISHED BY TEMPORARY AND PERMANENT SEEDING TO A MAXIMUM HEIGHT OF 150 mm UNLESS OTHERWISE DIRECTED BY THE ENGINEER. ALL COSTS ASSOCIATED WITH MAINTAINING A 150 mm MAXIMUM HEIGHT SHALL BE INCIDENTAL TO THE VARIOUS TEMPORARY AND PERMANENT SEEDING ITEMS. GRASS ESTABLISHED BY CROWN VETCH SEEDING SHALL BE EXCLUDED FROM THIS REQUIREMENT.

4. CONSTRUCTION ENTRANCES. IT IS INTENDED THAT MUD TRACKING BE ELIMINATED ON ALL STATE MAINTAINED ROADWAYS ADJOINING THE PROJECT. EACH POINT OF INGRESS AND EGRESS FROM THE PROJECT SHALL HAVE INSTALLED A STABILIZED CONSTRUCTION ENTRANCE IN CONFORMANCE WITH DEPARTMENT STANDARDS. ALL PAVED SURFACES ADJOINING THE PROJECT LIMITS SHALL BE LEFT IN A BROOM CLEAN CONDITION AT THE END OF EACH WORK DAY. STABILIZED CONSTRUCTION ENTRANCES SHALL BE TOP DRESSED WITH 50 mm OF CLEAN DE NO. 3 STONE WHEN THE VOIDS BECOME CLOGGED OR AS DIRECTED BY THE ENGINEER. ADDITIONAL STONE REQUIRED TO MAINTAIN THE ENTRANCES WILL BE PAID UNDER ITEM 302500, DELAWARE NUMBER 3 STONE.

5. TEMPORARY EROSION CONTROL EXCAVATION AND EMBANKMENT. ITEM 740001, TEMPORARY EROSION CONTROL EXCAVATION AND EMBANKMENT, HAS BEEN ESTABLISHED TO INCLUDE THE INITIAL CONSTRUCTION AND MAINTENANCE CLEANING OF TEMPORARY SEDIMENT CONTROL MEASURES SUCH AS SEDIMENT TRAPS, DEWATERING BASINS, SEDIMENT CONTROL DIKES, TEMPORARY SWALES, AND DIVERSIONS. IT SHALL ALSO INCLUDE THE REMOVAL OF SILT IN AND AROUND SILT FENCE AND REINFORCED SILT FENCE. REMOVAL AND BACKFILLING OF TEMPORARY SEDIMENT CONTROLS WHEN THEY ARE NO LONGER NEEDED SHALL BE INCIDENTAL TO THEIR INITIAL CONSTRUCTION.

6. SEDIMENT TRAPS. WHEN SHOWN ON THE PLANS OR AS DIRECTED BY THE ENGINEER, SEDIMENT TRAPS MUST BE PLACED BEFORE ANY STORMWATER PIPE DISCHARGES INTO WATER COURSES. THE COST FOR INSTALLING SEDIMENT TRAPS SHALL BE PAID UNDER ITEM 740001, TEMPORARY EROSION CONTROL EXCAVATION AND EMBANKMENT. SEDIMENT TRAP OUTLET DEVICES SHALL BE PAID FOR SEPARATELY UNDER THE APPROPRIATE ITEM(S) REQUIRED. SEDIMENT TRAPS SHALL NOT BE EXCAVATED IN EXCESS OF 1.219 m DEEP. SEDIMENT TRAPS HAVING PROPOSED BOTTOM ELEVATIONS GREATER THAN 1.219 m LOWER THAN THE ORIGINAL GRADE SHALL BE EXCAVATED IN STAGES CONCURRENT WITH THE ROADWAY EXCAVATION. THE CONTRACTOR SHALL DRIVE A STAKE IN THE CENTER OF EACH SEDIMENT TRAP AND CLEARLY MARK THE CLEAN OUT ELEVATION ON THE STAKE. COST FOR THIS WORK SHALL BE INCIDENTAL TO ITEM 740001, TEMPORARY EROSION CONTROL EXCAVATION AND EMBANKMENT.

7. MINIMUM RIP RAP APRON THICKNESS. RIP RAP OF THE VARIOUS TYPES SHALL BE PLACED TO THE FOLLOWING THICKNESS: 350 mm FOR R-4 RIP RAP; 500 mm FOR R-5 RIP RAP; 675 mm FOR R-6 RIP RAP.

8. SOIL STOCKPILES. STOCKPILES OF SOIL SHALL BE STABILIZED WITH ITEM 734017, TEMPORARY SEEDING, DRY GROUND AND MULCHED WITH ITEM 735521, MULCHING, BONDED FIBER MATRIX.

9. MAINTENANCE. SEDIMENT TRAPS, TEMPORARY SWALES, DEWATERING BASINS, AND DIVERSIONS SHALL BE CLEANED OF ACCUMULATED SEDIMENT WHEN THEY ARE 50 % FILLED. SILT FENCE, REINFORCED SILT FENCE, AND SEDIMENT CONTROL DIKES SHALL HAVE SEDIMENTATION REMOVED WHEN IT REACHES 50 % OF THE HEIGHT OF THE DIKE OR FENCE. STORMWATER MANAGEMENT PONDS SERVING AS TEMPORARY SEDIMENT BASINS DURING CONSTRUCTION SHALL HAVE SEDIMENTATION REMOVED AS REQUIRED AT TIMES DETERMINED APPROPRIATE BY THE ENGINEER AND AT THE CONCLUSION O THE PROJECT AFTER ALL AREAS DRAINING TO THE POND HAVE BEEN VEGETATIVELY STABILIZED. COST FOR SEDIMENT REMOVAL SHALL BE PAID FOR UNDER ITEM 740001, TEMPORARY EROSION CONTROL EXCAVATION AND EMBANKMENT. ACCESS SHALL BE MAINTAINED TO ALL SEDIMENT CONTROL DEVICES REQUIRING MAINTENANCE UNTIL CONSTRUCTION PHASING AND VEGETATIVE STABILIZATION ALLOW THE REMOVAL OF THOSE CONTROLS WHICH ARE NO LONGER REQUIRED.

CENTRAL MIDDLE SCHOOL SEQUENCE OF CONSTRUCTION

NOTE: CONSTRUCTION ACTIVITIES INCLUDING THE INSTALLATION OF EROSION AND SEDIMENT CONTROL MEASURES SHALL NOT BEGIN UNTIL ALL REQUIRED EASEMENTS AND RIGHT-OF-WAYS HAVE BEEN OBTAINED. CONSTRUCTION SHALL NOT BEGIN UNTIL ALL SEDIMENT AND EROSION CONTROL MEASURES HAVE BEEN INSTALLED AND APPROVED BY THE ENGINEER AND THE SEDIMENT CONTROL INSPECTOR. THE CONTRACTOR SHALL STAY WITHIN THE LIMIT OF DISTURBANCE AS SHOWN ON THE PLANS AND MINIMIZE DISTURBANCE WITHIN THE WORKING AREA WHEREVER POSSIBLE. THE CONSTRUCTION SEQUENCE MUST BE FOLLOWED UNLESS THE CONTRACTOR GETS WRITTEN APPROVAL FROM THE DELAWARE NATURAL RESOURCES AND ENVIRONMENTAL CONTROL AND THE SEDIMENT CONTROL INSPECTOR. THE CONTRACTOR SHALL NOTIFY THE DNREC AT 302-739-4691 AT LEAST 5 DAYS PRIOR TO BEGINNING CONSTRUCTION.

1. THE CONTRACTOR SHALL CONDUCT A PRE-CONSTRUCTION MEETING WITH THE DELAWARE DEPT. OF NATURAL RESOURCE AND ENVIRONMENTAL CONTROL PROJECT MANAGER, AND THE ENGINEER TO REVIEW THE LIMITS OF DISTURBANCE, EROSION AND SEDIMENT CONTROL REQUIREMENTS, AND THE SEQUENCE OF CONSTRUCTION.
2. THE CONTRACTOR SHALL CALL MISS UTILITY OF DELMARVA AT 1-800-282-8555 A MINIMUM OF FORTY-EIGHT (48) HOURS BEFORE BEGINNING CONSTRUCTION. ALL EXISTING UTILITIES MUST BE MARKED IN THE FIELD PRIOR TO CONSTRUCTION
3. THE CONTRACTOR SHALL STAKE OUT THE LIMITS OF DISTURBANCE
4. THE CONTRACTOR SHALL INSTALL THE STABILIZED CONSTRUCTION ENTRANCE AND FLAG ALL TREES THAT ARE TO BE SAVED .
5. DO NOT CLEAR AND GRUB THE ENTIRE PROJECT AREA AT ONCE. CLEAR AND GRUB ONLY THE AREA WHERE RSC CONSTRUCTION IS TAKING PLACE ALONG THE OUTFALL CHANNELS. ONCE THE RSC WORK IS COMPLETE, THEN CLEAR AND GRUB THE BOULDER BANK PROTECTION AREA.
6. THE CONTRACTOR SHALL ESTABLISH STAGING AND STOCKPILE AREAS AND INSTALL BLAZE ORANGE FENCE AND SILT FENCE AROUND THE PERIMETER OF THE LOD AS SHOWN IN THE DRAWINGS OUTSIDE OF WATER COURSE
7. NO TREES GREATER THAN 5" DBH SHALL BE REMOVED WITHOUT PRIOR APPROVAL FROM THE ENGINEER
8. IF DUST BECOMES A PROBLEM, MULCH IN ACCORDANCE WITH DNREC MULCHING SPECIFICATIONS
9. INSTALL TURBIDITY CURTAIN ALONG THE LOCATIONS SPECIFIED ON THE PLANS. BEGIN PLACEMENT OF TURBIDITY CURTAIN IN AND UPSTREAM TO DOWNSTREAM DIRECTION
10. THE SEDIMENT CONTROL INSPECTOR SHALL BE NOTIFIED UPON COMPLETION OF THE SEDIMENT CONTROL INSTALLATION. THEN, WITH APPROVAL OF THE SEDIMENT AND EROSION CONTROL INSPECTOR, THE CONTRACTOR MAY BEGIN GRADING OPERATIONS. THE CONTRACTOR SHALL ONLY DISTURB AN AREA THAT CAN BE COMPLETED AND STABILIZED BY THE END OF EACH DAY.
11. BEGIN CONSTRUCTION OF THE RSC SYSTEM AT THE PIPE OUTFALLS AND WORK IN A DOWNSTREAM DIRECTION TOWARDS THE ST. JONES RIVER.
12. UPON COMPLETION OF THE RSC, AND WITH THE PERMISSION FROM THE PROJECT ENGINEER AND SEDIMENT CONTROL INSPECTOR, BEGIN STABILIZATION OF THE RSC WORK.
13. UPON COMPLETION OF THE RSC WORK, ALL DISTURBED AREAS SHALL BE COVERED WITH A MINIMUM OF FOUR INCHES OF TOPSOIL TO BE PLACED AT THE FINAL GRADES AS SHOWN ON THE PLANS
14. BEGIN THE INSTALLATION OF THE BOULDER BANK PROTECTION ALONG THE ST. JONES RIVER WITHIN THE LOCATIONS SPECIFIED ON THE PLANS.
15. UPON COMPLETION OF THE BOULDER BANK PROTECTION, ALL DISTURBED AREAS SHALL BE COVERED WITH A MINIMUM OF FOUR INCHES OF TOPSOIL TO BE PLACED AT THE FINAL GRADES AS SHOWN ON THE PLAN.
16. PERMANENTLY STABILIZE (SEED AND MULCH) ALL REMAINING FINISHED GRADES; OTHERWISE TEMPORARILY STABILIZE ALL DISTURBED AREAS AT THE END OF EACH WORKING DAY.
17. FOLLOWING SOIL DISTURBANCE OR REDISTURBANCE, PERMANENT OR TEMPORARY STABILIZATION SHALL BE COMPLETED WITHIN 14 CALENDAR DAYS AS TO THE SURFACE OF ALL PERIMETER SEDIMENT CONTROLS, TOPSOIL STOCKPILES, AND ALL OTHER DISTURBED OR GRADED AREAS ON THE PROJECT SITE
18. UPON STABILIZATION OF THE SITE WITH ESTABLISHED PERMANENT VEGETATION AND WITH THE PERMISSION OF THE SEDIMENT CONTROL INSPECTOR, REMOVE THE SEDIMENT CONTROL MEASURES AND STABILIZE THOSE AREAS DISTURBED BY THIS PROCESS.

CERTIFICATIONS:

OWNER'S CERTIFICATION (signed and dated)

I, SCOTT KOENIG, TOWN MANAGER, CITY OF DOVER, HEREBY CERTIFY THAT THE CITY OF DOVER IS THE OWNER OF THE PROPERTY, WHICH IS THE SUBJECT OF THIS PLAN AND THAT THE LAND USE ACTION PROPOSED BY THIS PLAN IS MADE AT MY DIRECTION.

_____ DATE

OWNER'S CERTIFICATION (signed and dated)

I, STEPHEN WILLIAMS, HEREBY CERTIFY THAT THE DELAWARE DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL IS THE DEVELOPER OF THE PROPERTY WHICH IS THE SUBJECT OF THIS PLAN AND THAT THE LAND USE ACTION PROPOSED BY THIS PLAN IS MADE AT MY DIRECTION.

_____ DATE

I, DOUGLAS STREAKER, CERTIFY THAT I AM A REGISTERED PROFESSIONAL ENGINEER IN THE STATE OF DELAWARE WITH A BACKGROUND IN CIVIL ENGINEERING. TO THE BEST OF MY KNOWLEDGE AND BELIEF, I CERTIFY THAT THE PROPOSED CONSTRUCTION AS SHOWN ON THIS PLAN COMPLIES WITH APPLICABLE LAWS, REGULATIONS AND THE LATEST REVISION OF THE GENERAL PLAN SUBMISSION CRITERIA.

DOUGLAS STREAKER _____ DATE

SEAL

OWNER'S CERTIFICATION (signed and dated)

I, WILBUR A MILLER, TRUSTEE, HEREBY CERTIFY THAT I AM THE OWNER OF THE PROPERTY, WHICH IS THE SUBJECT OF THIS PLAN AND THAT THE LAND USE ACTION PROPOSED BY THIS PLAN IS MADE AT MY DIRECTION.

_____ DATE

OWNER'S CERTIFICATION (signed and dated)

I, THE UNDERSIGNED, CERTIFY THAT ALL LAND CLEARING, CONSTRUCTION AND DEVELOPMENT SHALL BE COMPLETED PURSUANT TO THE APPROVED PLAN AND THAT RESPONSIBLE PERSONNEL CERTIFIED BY DNREC WILL BE IN CHARGE OF ON SITE CLEARING AND LAND DISTURBING ACTIVITIES. DNREC, NCC AND NCCD PERSONNEL SHALL HAVE THE RIGHT TO CONDUCT ON-SITE INSPECTIONS.

SCOTT KOENIG, TOWN MANAGER, CITY OF DOVER _____ DATE

CLIENT

BRITTANY STURGIS
DNREC
WATERSHED ASESSMENT DIVISION
820 SILVER LAKE BLVD
SUITE 220
DOVER, DE 19904-2464

DATE:	ISSUES / REVISIONS
2/4/2014	60% DESIGN - NOT FOR CONSTRUCTION

City of Dover
City Hall
15 Loockerman Plaza
Dover, DE 19901
Scott Koenig: 302-736-7005

DNREC
Watershed Assessment Division
820 Silver Lake Blvd.
Dover, DE 19904
Brittany Sturgis: 302-739-9939

Biohabitats
The Stables Building 2081 Clipper Park Road
Baltimore, MD 21211 / ph: 410.554.0156
fx: 410.554.0168 / www.biohabitats.com
Restore the Earth & Inspire Ecological Stewardship

CENTRAL MIDDLE SCHOOL RSC

TITLE: EROSION & SEDIMENT CONTROL NOTES

PROJECT NO. :	SCALE:
12012.04	N/A
SEAL:	BY: TB / CHECK: MT,DS
	DWG. NO. : 16 OF 20

LONGMARSH SERIES (LO)

THE LONGMARSH SERIES CONSISTS OF VERY DEEP, VERY POORLY DRAINED SOILS THAT FORMED IN LOAMY ALLUVIUM OVER SANDY AND GRAVELLY SEDIMENTS. THE LONGMARSH SOILS ARE ON FLOODPLAINS ON THE MID-ATLANTIC COASTAL PLAIN. PERMEABILITY IS MODERATE. SLOPES RANGE FROM 0 TO 2 PERCENT. THE MEAN ANNUAL TEMPERATURE IN 55 DEGREES F, AND THE MEAN ANNUAL PRECIPITATION IS ABOUT 43 INCHES

TAXONOMIC CLASS: COARSE-LOAMY, SILICEOUS, ACTIVE, ACID, MESIC FLUVAQUENTIC HUMAQUEPTS

TYPICAL PEDON: LONGMARSH MUCKY LOAM, ON A ZERO PERCENT SLOPE, ON A WOODED FLOODPLAIN. (COLORS ARE FOR MOIST SOIL.)

OI--0 TO 0.5 INCHES; SLIGHTLY DECOMPOSED LEAVES AND TWIGS.

OE--0.5 TO 1 INCHES; MODERATELY DECOMPOSED ORGANIC MATERIALS. (COMBINED THICKNESS OF O HORIZONS IS 0 TO 3 INCHES)

A1--1 TO 7 INCHES; BLACK (10YR 2/1) MUCKY LOAM; WEAK MEDIUM SUBANGULAR BLOCKY STRUCTURE PARTING TO WEAK MEDIUM GRANULAR; VERY FRIABLE, NONSTICKY AND SLIGHTLY PLASTIC; MANY VERY FINE THROUGH COARSE ROOTS THROUGHOUT; FEW FINE DISCONTINUOUS TUBULAR PORES; VERY STRONGLY ACID; GRADUAL SMOOTH BOUNDARY.

A2--7 TO 19 INCHES; VERY DARK GRAY (7.5YR 3/1) MUCKY SANDY LOAM; WEAK COARSE SUBANGULAR BLOCKY STRUCTURE; VERY FRIABLE, NONSTICKY, AND SLIGHTLY PLASTIC; MANY VERY FINE THROUGH COARSE ROOTS THROUGHOUT; FEW FINE DISCONTINUOUS TUBULAR PORES; MODERATELY ACID; CLEAR SMOOTH BOUNDARY. (COMBINED THICKNESS OF A HORIZONS IS 10 TO 30 INCHES)

CG1--19 TO 34 INCHES; GRAYISH BROWN (2.5Y 5/2) FINE SANDY LOAM; MASSIVE; FIRM, NONSTICKY, SLIGHTLY PLASTIC; COMMON COARSE DISTINCT DARK GRAYISH BROWN (10YR 4/2) ORGANIC STAINS AROUND OLD ROOTS; COMMON VERY FINE AND FINE ROOTS THROUGHOUT; A LAYER OF DARK GRAY (10YR 4/1) LOAMY SAND IS BETWEEN 22 AND 24 INCHES; MODERATELY ACID; GRADUAL SMOOTH BOUNDARY.

CG2--34 TO 54 INCHES; LIGHT GRAY (2.5Y 7/2) LOAMY SAND; MASSIVE; LOOSE; 2 PERCENT FINE MIXED GRAVEL; MODERATELY ACID; GRADUAL SMOOTH BOUNDARY.

CG3--54 TO 66 INCHES; STRATIFIED: 60 PERCENT LIGHT BROWNISH GRAY (2.5Y 6/2) AND 40 PERCENT GRAYISH BROWN (2.5Y 5/2) LOAMY SAND; MASSIVE; LOOSE; MODERATELY ACID.

TYPE LOCATION: QUEEN ANNE'S COUNTY, MARYLAND; APPROXIMATELY ONE MILE SOUTHEAST OF THE TOWN OF HOPE, APPROXIMATELY 600 FEET SOUTHWEST OF THE DEVERS BRANCH RD. BRIDGE OVER THE GERMAN BRANCH. USGS PRICE TOPOGRAPHIC QUADRANGLE; 39 DEGREES 0 MINUTE 51 SECONDS N LATITUDE, AND 75 DEGREES 56 MINUTES 50 SECONDS W LONGITUDE.

RANGE IN CHARACTERISTICS: THE UMBRIC EPIPEDON RANGES FROM 10 TO 22 INCHES IN THICKNESS. ORGANIC MATTER CONTENT IN THE A HORIZON RANGES FROM 5 TO 18 PERCENT. IN THE SUBSTRATUM ORGANIC MATTER IS VARIABLE AND RANGES FROM 1 TO 10 PERCENT. COARSE FRAGMENTS OF MIXED ROUNDED GRAVEL RANGE FROM 0 TO 15 PERCENT IN THE A HORIZON AND 0 TO 35 PERCENT IN THE SUBSTRATUM.

THE A HORIZON HAS HUE OF 7.5YR THROUGH 5Y, VALUE OF 2 TO 4, AND CHROMA OF 0 TO 2. IT IS MUCKY SANDY LOAM, MUCKY LOAM, SANDY LOAM OR LOAM, AND MAY RANGE TO INCLUDE SAND, LOAMY SAND, SILT LOAM, AND FINE SANDY LOAM.

THE CG HORIZON HAS HUE OF 10YR THROUGH 5Y, VALUE OF 3 TO 8, AND CHROMA OF 1 TO 2. IT IS COMMONLY LOAMY SAND, FINE SANDY LOAM, OR COARSE SAND, BUT MAY INCLUDE SAND, LOAMY COARSE SAND, OR SANDY LOAM, AND THEIR GRAVELLY ANALOGUES. IRON ACCUMULATIONS AND DEPLETIONS, WHEN PRESENT, HAVE HUE OF 7.5YR TO 2.5Y, VALUE OF 4 TO 6, AND CHROMA OF 2 TO 6.

THE C HORIZON, WHERE PRESENT, HAS HUE OF 7.5YR THROUGH 5Y, VALUE OF 4 TO 6, AND CHROMA OF 3 TO 6. THESE HORIZONS ARE PRESENT IN A REDUCED ENVIRONMENT DESPITE THE HIGH CHROMA. IT IS CLAY LOAM, LOAMY SAND, OR SAND. ZONES OF IRON DEPLETION AND CONCENTRATION MAY BE PRESENT.

DRAINAGE AND PERMEABILITY: VERY POORLY DRAINED. RUNOFF IS VERY SLOW, AND PERMEABILITY IS MODERATELY RAPID IN THE SURFACE, AND MODERATE TO MODERATELY RAPID IN THE SUBSTRATUM. A SEASONAL HIGH WATER TABLE RANGING FROM 6 INCHES ABOVE THE SOIL SURFACE TO 10 INCHES BELOW THE SOIL SURFACE IS PRESENT FROM JANUARY TO DECEMBER. THESE SOILS ARE FLOODED BRIEFLY DURING STORM EVENTS.

USE AND VEGETATION: LONGMARSH SOILS ARE MAINLY WETLAND WILDLIFE HABITAT. MOST AREAS ARE ALONG ACTIVE STREAMS. NATIVE VEGETATION INCLUDES RED MAPLE (ACER RUBRUM), WATER OAK (QUERCUS NIGRA), GREEN ASH (FRAXINUS PENNSYLVANICA VAR. SUBINTEGERRIMA), SLIPPERY ELM (ULMUS RUBRA), RIVER BIRCH (BETULA NIGRA), BLACK GUM (NYSSA SYLVATICA), AND AMERICAN HOLLY (ILEX OPACA) IN THE CANOPY AND SUB-CANOPY; AND SPICE BUSH (LINDERA BENZOIN), AMERICAN ELDER (SAMBUCUS CANADENSIS), WINTERBERRY (ILEX VERTICILLATA), NORTHERN ARROWWOOD (VIBURNUM RECOGNITUM), VIRGINIA BUGLEWEED (LYCOPUS VIRGINICUS), STOUT WOOD REEDGRASS (CINNA ARUNDINACEA), SPOTTED TOUCH-ME-NOT (IMPATIENS CANADENSIS), WATER PARSNIP (SIUM SUAVE), CLEARWEED (PILEA PUMILLA), TEAR-THUMB (POLYGONUM SAGITTATUM), GREENBRIAR (SMILAX ROTUNDIFOLIA), AND RIVERBANK GRAPE (VITIS RIPAREA) IN THE UNDERSTORY.

DISTRIBUTION AND EXTENT: FLOOD PLAINS OF THE MID-ATLANTIC COASTAL PLAIN OF MARYLAND, DELAWARE, AND NEW JERSEY. THIS SERIES IS OF SMALL EXTENT.

DIAGNOSTIC FEATURES RECOGNIZED IN THIS PEDON ARE AN UMBRIC EPIPEDON; AN IRREGULAR DECREASE OF ORGANIC CARBON WITH DEPTH; AND AQUIC CONDITIONS BETWEEN 16 AND 20 INCHES DEPTH, AND DOMINANT MATRIX COLOR, DIRECTLY BELOW THE UMBRIC EPIPEDON, WITH A CHROMA OF 1 OR LESS, OR IF IRON CONCENTRATIONS ARE PRESENT, A CHROMA OF 2 OR LESS.

SASSAFRAS SERIES (SaB)

MLRA(S): 133A, 148, 149A, 153A, 153B, 153C, 153D
MLRA SOIL SURVEY REGIONAL OFFICE (MO) RESPONSIBLE: MORGANTOWN, WEST VIRGINIA
DEPTH CLASS: VERY DEEP
DRAINAGE CLASS: WELL DRAINED
PERMEABILITY: MODERATE OR MODERATELY SLOW
SURFACE RUNOFF: SLOW OR MEDIUM
PARENT MATERIAL: SANDY MARINE AND OLD ALLUVIAL SEDIMENTS
SLOPE: 0 TO 60 PERCENT
MEAN ANNUAL AIR TEMPERATURE (TYPE LOCATION): 52 DEGREES F.
MEAN ANNUAL PRECIPITATION (TYPE LOCATION): 45 INCHES

TAXONOMIC CLASS: FINE-LOAMY, SILICEOUS, SEMIACTIVE, MESIC TYPIC HAPLUDULTS

TYPICAL PEDON: SASSAFRAS SANDY LOAM, CULTIVATED. (COLORS ARE FOR MOIST SOIL).

AP--0 TO 9 INCHES; BROWN (10YR 5/3) SANDY LOAM; WEAK VERY FINE SUBANGULAR BLOCKY STRUCTURE; VERY FRIABLE; SLIGHTLY STICKY, SLIGHTLY PLASTIC; FEW ROOTS; STRONGLY ACID, ABRUPT SMOOTH BOUNDARY. (0 TO 12 INCHES THICK)

BA--9 TO 21 INCHES; YELLOWISH BROWN (10YR 5/4) LOAM; MODERATE VERY FINE TO MEDIUM SUBANGULAR BLOCKY STRUCTURE; FRIABLE; SLIGHTLY STICKY, SLIGHTLY PLASTIC; FEW ROOTS; STRONGLY ACID; CLEAR SMOOTH BOUNDARY. (0 TO 12 INCHES THICK)

BT1--21 TO 32 INCHES; BROWN (7.5YR 5/4) SANDY CLAY LOAM; WEAK MEDIUM SUBANGULAR BLOCKY STRUCTURE; FRIABLE, SLIGHTLY STICKY, SLIGHTLY PLASTIC; FEW CLAY FILMS ON FACES OF PEDS; VERY FEW ROOTS; VERY STRONGLY ACID; CLEAR SMOOTH BOUNDARY.

BT2--32 TO 40 INCHES; STRONG BROWN (7.5YR 5/6) SANDY LOAM; WEAK THICK PLATY STRUCTURE PARTING TO WEAK FINE SUBANGULAR BLOCKY STRUCTURE; FRIABLE; SLIGHTLY STICKY, SLIGHTLY PLASTIC; FEW CLAY FILMS ON FACES OF PEDS; VERY FEW ROOTS; VERY STRONGLY ACID; ABRUPT SMOOTH BOUNDARY. (COMBINED THICKNESS OF THE BT HORIZON IS 10 TO 20 INCHES.)

C1--40 TO 52 INCHES; STRONG BROWN (7.5YR 5/6) GRAVELLY SANDY LOAM; MASSIVE; FRIABLE; SLIGHTLY STICKY, NONPLASTIC; VERY STRONGLY ACID; 3 PERCENT SMALL LIGHT YELLOWISH BROWN (10YR 6/4) POCKETS OF CLAY; CLEAR SMOOTH BOUNDARY.

C2--52 TO 70 INCHES; BROWNISH YELLOW (10YR 6/8) LOAMY SAND; SINGLE GRAIN; LOOSE;, NONSTICKY, NONPLASTIC; 5 PERCENT, BY VOLUME FINE YELLOWISH BROWN (7.5YR 5/8) GRAVEL; EXTREMELY ACID.

TYPE LOCATION: ST. MARY'S COUNTY, MARYLAND; ABOUT 50 FEET EAST OF QUEEN TREE LANDING ROAD, 0.75 MILE NORTHEAST OF THE COMMUNITY OF LAUREL GROVE.

RANGE IN CHARACTERISTICS:
SOLUM THICKNESS: 25 TO 50 INCHES
DEPTH TO BEDROCK: GREATER THAN 60 INCHES
DEPTH TO SEASONAL HIGH WATER TABLE: GREATER THAN 72 INCHES
ROCK FRAGMENTS: 0 TO 20 PERCENT, BY VOLUME IN THE A AND B HORIZON AND 0 TO 30 PERCENT IN THE C HORIZON, MOSTLY QUARTZ PEBBLES
SOIL REACTION: EXTREMELY ACID TO STRONGLY ACID, THROUGHOUT THE PROFILE, UNLESS LIMED

RANGE OF INDIVIDUAL HORIZONS:
AP HORIZON:
COLOR--HUE OF 7.5YR TO 2.5Y, VALUE OF 4 OR 5, CHROMA OF 2 TO 4
TEXTURE (FINE-EARTH TEXTURES)--LOAM, FINE SANDY LOAM, SANDY LOAM, LOAMY FINE SAND, OR LOAMY SAND

A HORIZON (IF IT OCCURS IS 1 TO 4 INCHES THICK):
COLOR--HUE OF 7.5YR TO 2.5Y, VALUE OF 2 TO 4, CHROMA OF 1 TO 4
TEXTURE (FINE-EARTH TEXTURES)--LOAM, FINE SANDY LOAM, SANDY LOAM, LOAMY FINE SAND, OR LOAMY SAND

E HORIZON (IF IT OCCURS):
COLOR--HUE OF 7.5YR TO 2.5Y, VALUE OF 4 TO 6, CHROMA OF 2 TO 4
TEXTURE (FINE-EARTH FRACTION)--FINE SANDY LOAM, SANDY LOAM, LOAMY FINE SAND, OR LOAMY SAND

BA OR BE HORIZONS (IF THEY OCCUR):
COLOR--HUE OF 7.5YR TO 2.5Y, VALUE OF 4 TO 6, CHROMA OF 4 TO 8
TEXTURE (FINE-EARTH FRACTION)--LOAM, FINE SANDY LOAM, SANDY LOAM, OR SANDY CLAY LOAM

BT HORIZON:
COLOR--5YR TO 2.5Y, VALUE OF 4 TO 6, CHROMA OF 4 TO 8
TEXTURE (FINE-EARTH FRACTION)--LOAM, SANDY LOAM, OR SANDY CLAY LOAM WITH A WEIGHTED AVERAGE SILT CONTENT OF 20 TO 35 PERCENT

BC HORIZON (IF IT OCCURS):
COLOR--7.5YR TO 2.5Y, VALUE OF 5 OR 6, CHROMA OF 4 TO 8
TEXTURE (FINE-EARTH FRACTION)--LOAMY SAND, LOAMY FINE SAND, FINE SANDY LOAM, SANDY LOAM

C HORIZON:
COLOR--HUE OF 7.5YR TO 2.5Y, VALUE OF 4 TO 8, CHROMA OF 3 TO 8 OR IS VARIEGATED IN SHADES OF THESE COLORS
TEXTURE (FINE-EARTH FRACTION)--SANDY LOAM, LOAMY SAND, OR SAND AND THE TRANSITION TO SAND IS GREATER THAN 5 INCHES
REDOXIMORPHIC FEATURES--IRON DEPLETIONS IN SHADES OF OLIVE OR AND IRON ACCUMULATIONS IN SHADES OF RED, BROWN, YELLOW, OR OLIVE BELOW A DEPTH OF 72 INCHES

GEOGRAPHIC SETTING:
LANDSCAPE: COASTAL PLAIN
LANDFORM: SUMMITS AND SIDE SLOPES
ELEVATION: 35 TO 330 FEET
PARENT MATERIAL: SANDY MARINE AND OLD ALLUVIAL SEDIMENTS
MEAN ANNUAL AIR TEMPERATURE: 45 TO 58 DEGREES F.
MEAN ANNUAL PRECIPITATION: 35 TO 50 INCHES
FROST FREE PERIOD: 160 TO 250 DAYS

USE: MAINLY FOR GENERAL CROPS, TRUCK CROPS, PASTURES, FRUITS, WOODLAND, AND WIDE VARIETY OF NONFARM USES.

VEGETATION: NATIVE VEGETATION IS MIXED UPLAND HARDWOODS, WITH SOME SHORTLEAF AND VIRGINIA PINE.

DISTRIBUTION: DELAWARE, MARYLAND, NEW JERSEY, PENNSYLVANIA, AND VIRGINIA

REMARKS: DIAGNOSTIC HORIZONS AND OTHER DIAGNOSTIC SOIL CHARACTERISTICS RECOGNIZED IN THIS PEDON ARE:
OCHRIC EPIPEDON--THE ZONE FROM THE SURFACE OF THE SOIL TO A DEPTH OF 21 INCHES (A AND BA HORIZONS)
ARGILLIC HORIZON--THE ZONE FROM 21 INCHES TO 40 INCHES (BT1 AND BT2 HORIZONS)

HAMBROOK SERIES (HkB)

MLRA(S): 149A, 153B, 153C, 153D
MLRA SOIL SURVEY REGIONAL OFFICE (MO) RESPONSIBLE: MORGANTOWN, WEST VIRGINIA
DEPTH CLASS: VERY DEEP
DRAINAGE CLASS: WELL DRAINED
PERMEABILITY: MODERATE IN THE SOLUM, MODERATELY RAPID TO RAPID IN THE C HORIZON AND MODERATELY SLOW TO SLOW IN THE 2CG HORIZON
SURFACE RUNOFF: SLOW
PARENT MATERIAL: STRATIFIED ALLUVIAL AND MARINE SEDIMENTS
SLOPE: 0 TO 5 PERCENT
MEAN ANNUAL AIR TEMPERATURE (TYPE LOCATION): 55 DEGREES F.
MEAN ANNUAL PRECIPITATION (TYPE LOCATION): 45 INCHES

TAXONOMIC CLASS: FINE-LOAMY, SILICEOUS, SEMIACTIVE, MESIC TYPIC HAPLUDULTS

TYPICAL PEDON: HAMBROOK LOAM, ON A SMOOTH 0 PERCENT SLOPE, IN A CULTIVATED FIELD THAT HAS BEEN HEAVILY LIMED. (COLORS ARE FOR A MOIST SOIL).

AP--0 TO 10 INCHES; DARK GRAYISH BROWN (10YR 4/2) LOAM; WEAK FINE GRANULAR STRUCTURE; FRIABLE; SLIGHTLY STICKY, SLIGHTLY PLASTIC; MANY VERY FINE AND FINE ROOTS; MANY VERY FINE, COMMON FINE, AND FEW MEDIUM TUBULAR PORES; NEUTRAL; ABRUPT SMOOTH BOUNDARY. (7 TO 11 INCHES THICK)

BE--10 TO 14 INCHES; YELLOWISH BROWN (10YR 5/6) LOAM; WEAK MEDIUM SUBANGULAR BLOCKY STRUCTURE; FRIABLE; SLIGHTLY STICKY, SLIGHTLY PLASTIC; COMMON VERY FINE AND FEW FINE ROOTS; MANY VERY FINE, COMMON FINE, AND FEW MEDIUM TUBULAR PORES; NEUTRAL; CLEAR WAVY BOUNDARY. (0 TO 5 INCHES THICK)

BT1--14 TO 21 INCHES; YELLOWISH BROWN (10YR 5/8) SANDY CLAY LOAM; MODERATE MEDIUM SUBANGULAR BLOCKY STRUCTURE; FRIABLE; MODERATELY STICKY, MODERATELY PLASTIC; COMMON VERY FINE AND FEW FINE ROOTS; MANY VERY FINE AND FINE, COMMON MEDIUM, AND FEW COARSE TUBULAR PORES; MANY DISTINCT CLAY FILMS ON FACES OF PEDS AND LINING SOIL PORES; MODERATELY ACID; GRADUAL WAVY BOUNDARY.

BT2--21 TO 28 INCHES; YELLOWISH BROWN (10YR 5/8) SANDY LOAM; MODERATE MEDIUM SUBANGULAR BLOCKY STRUCTURE; FRIABLE; SLIGHTLY STICKY, SLIGHTLY PLASTIC; COMMON VERY FINE AND FEW FINE ROOTS; MANY VERY FINE AND FINE, COMMON MEDIUM, AND FEW COARSE TUBULAR PORES; MANY DISTINCT CLAY FILMS ON FACES OF PEDS AND LINING SOIL PORES; MODERATELY ACID; CLEAR WAVY BOUNDARY. (COMBINED THICKNESS OF THE BT HORIZONS IS 12 TO 25 INCHES.)

BC--28 TO 40 INCHES; STRONG BROWN (7.5YR 5/8) LOAMY SAND; WEAK MEDIUM SUBANGULAR BLOCKY STRUCTURE; VERY FRIABLE; FEW VERY FINE ROOTS; MANY VERY FINE, AND COMMON FINE IRREGULAR PORES; COMMON CLAY COATINGS ON SAND GRAINS; COMMON MEDIUM DISTINCT LIGHT YELLOWISH BROWN (10YR 6/4) IRON DEPLETIONS IN THE LOWER PART OF THE HORIZON; SLIGHTLY ACID; CLEAR SMOOTH BOUNDARY. (8 TO 14 INCHES THICK)

C--40 TO 60 INCHES; BROWNISH YELLOW (10YR 6/6) SAND; MASSIVE; VERY FRIABLE; FEW VERY FINE ROOTS; COMMON MEDIUM DISTINCT PALE BROWN (10YR 6/3) IRON DEPLETIONS AND FEW MEDIUM PROMINENT STRONG BROWN (7.5YR 5/8) IRON ACCUMULATIONS; SLIGHTLY ACID; ABRUPT SMOOTH BOUNDARY.

CG1--60 TO 65 INCHES; LIGHT GRAY (5Y 7/2) SAND; MASSIVE; VERY FRIABLE; FEW VERY FINE ROOTS; COMMON MEDIUM PROMINENT STRONG BROWN (7.5YR 5/8) IRON ACCUMULATIONS; SLIGHTLY ACID; ABRUPT SMOOTH BOUNDARY.

2CG2--65 TO 72 INCHES; LIGHT GRAY (5Y 7/2) SILT LOAM; MASSIVE; FRIABLE, STICKY, SLIGHTLY PLASTIC; SLIGHTLY ACID.

TYPE LOCATION: DORCHESTER COUNTY, MARYLAND; APPROXIMATELY 2.75 MILES SOUTHWEST OF SECRETARY; 5,000 FEET NORTH OF ROUTE 16 ON CEDAR GROVE ROAD, 100 FEET EAST INTO FIELD; LAT. 38 DEGREES 34 MINUTES 41 SECONDS N. AND LONG. 75 DEGREES 59 MINUTES 34 SECONDS W.

RANGE IN CHARACTERISTICS:
SOLUM THICKNESS: 20 TO 40 INCHES
DEPTH TO BEDROCK: GREATER THAN 60 INCHES
DEPTH TO THE LITHOLOGIC DISCONTINUITY: 48 TO 72 INCHES OR MORE
DEPTH TO SEASONAL HIGH WATER TABLE: 48 TO 72 INCHES, JANUARY TO MAY
ROCK FRAGMENTS: 0 TO 10 PERCENT, BY VOLUME IN THE SOLUM AND 0 TO 20 PERCENT IN THE SUBSTRATUM, MOSTLY ROUNDED QUART GRAVEL
SOIL REACTION: EXTREMELY ACID TO STRONGLY ACID, THROUGHOUT THE PROFILE, UNLESS LIMED

RANGE OF INDIVIDUAL HORIZONS:
AP OR A HORIZON:
COLOR--HUE OF 10YR, VALUE OF 3 TO 5, CHROMA OF 2 TO 4
TEXTURE--LOAMY SAND, SANDY LOAM OR LOAM

E HORIZON (IF IT OCCURS):
COLOR--HUE OF 10YR OR 2.5Y, VALUE OF 4 TO 6, CHROMA OF 4 TO 6
TEXTURE--LOAMY SAND, SANDY LOAM OR LOAM

BE HORIZON:
COLOR--HUE OF 10YR OR 2.5Y, VALUE OF 4 TO 6, CHROMA OF 4 TO 6
TEXTURE--LOAMY SAND, SANDY LOAM OR LOAM

BT HORIZON:
COLOR--HUE OF 7.5YR OR 10YR, VALUE OF 4 TO 6, CHROMA OF 4 TO 8
TEXTURE--SANDY CLAY LOAM, LOAM, OR SANDY LOAM

BC HORIZON:
COLOR--HUE OF 7.5YR OR 10YR, VALUE OF 4 TO 6, CHROMA OF 4 TO 8
TEXTURE--LOAMY SAND, SANDY LOAM, OR FINE SANDY LOAM

C HORIZON:
COLOR--HUE OF 10YR TO 5Y, VALUE OF 4 TO 7, CHROMA OF 3 TO 6
TEXTURE (FINE-EARTH FRACTION)--COMMONLY STRATIFIED SAND, LOAMY SAND, OR SANDY LOAM
REDOXIMORPHIC FEATURES--IRON DEPLETIONS IN SHADES OF OLIVE OR GRAY AND IRON ACCUMULATIONS IN SHADES OF RED, BROWN, YELLOW, OR OLIVE

CG HORIZON (IF IT OCCURS):
COLOR--HUE OF 10YR TO 5Y, VALUE OF 4 TO 7, CHROMA OF 1 OR 2 , OR IS NEUTRAL WITH VALUE OF 4 TO 7
TEXTURE (FINE-EARTH FRACTION)--COMMONLY STRATIFIED SAND, LOAMY SAND, OR SANDY LOAM
REDOXIMORPHIC FEATURES--IRON DEPLETIONS IN SHADES OF OLIVE OR GRAY AND IRON ACCUMULATIONS IN SHADES OF RED, BROWN, YELLOW, OR OLIVE

2CG HORIZON:
COLOR--HUE OF 10YR TO 5Y, VALUE OF 4 TO 7, CHROMA OF 1 OR 2, OR IS NEUTRAL WITH VALUE OF 4 TO 7
TEXTURE (FINE-EARTH FRACTION)--VERY FINE SANDY LOAM, FINE SANDY LOAM, LOAM, CLAY LOAM, OR SILT LOAM
REDOXIMORPHIC FEATURES--IRON DEPLETIONS IN SHADES OF OLIVE OR GRAY AND IRON ACCUMULATIONS IN SHADES OF RED, BROWN, YELLOW, OR OLIVE

GEOGRAPHIC SETTING:
LANDSCAPE: COASTAL PLAIN
LANDFORM: SLIGHTLY DEPRESSIONAL UPLANDS
ELEVATION: 5 TO 40 FEET
PARENT MATERIAL: STRATIFIED ALLUVIAL AND MARINE SEDIMENTS
MEAN ANNUAL AIR TEMPERATURE: 52 TO 58 DEGREES F.
MEAN ANNUAL PRECIPITATION: 42 TO 48 INCHES
FROST FREE PERIOD: 190 TO 210 DAYS

USE: MOST AREAS ARE CLEARED AND USED FOR GROWING CORN, BARLEY, WHEAT AND SOYBEANS.

VEGETATION: WOODED AREAS HAVE AN OVERSTORY OF WHITE OAK, BLACK OAK, AND SCARLET OAK. SOME AREAS HAVE VIRGINIA PINE AND LOBLOLLY PINE MIXED WITH THE OAKS. COMMON UNDERSTORY SPECIES ARE SASSAFRAS, DOGWOOD, GREENBRIAR, AMERICAN HOLLY AND LOWBUSH BLUEBERRY.

DISTRIBUTION: COASTAL PLAINS OF MARYLAND AND DELAWARE

REMARKS: THIS SOIL WAS FORMERLY INCLUDED IN THE SASSAFRAS SERIES. LABORATORY DATA INDICATES A BASE SATURATION (BY SUM OF CATIONS) GREATER THAN 35 PERCENT ON CROPLAND AREAS, AND A BASE SATURATION OF LESS THAN 35 PERCENT IN WOODLAND AREAS. SCIENTISTS BELIEVE THE HIGH BASE SATURATION IN THIS SOIL HAS BEEN CAUSED BY LONG-TIME CROPPING PRACTICES (LIMING), AND THE SOIL WOULD REVERT TO A LOWER BASE SATURATION IF THE CROPLAND AREAS WERE CONVERTED BACK TO WOODLAND.

DIAGNOSTIC HORIZONS AND OTHER DIAGNOSTIC SOIL CHARACTERISTICS RECOGNIZED IN THIS PEDON ARE:
OCHRIC EPIPEDON--THE ZONE FROM THE SURFACE OF THE SOIL TO A DEPTH OF 10 INCHES (AP HORIZON)
ARGILLIC HORIZON--THE ZONE FROM 14 TO 28 INCHES (BT HORIZON)

SERIES INTERPRETATION RECORD(S): MD0147

CLIENT

BRITTANY STURGIS
DNREC
WATERSHED ASESSMENT DIVISION
820 SILVER LAKE BLVD
SUITE 220
DOVER, DE 19904-2464

DATE:	ISSUES / REVISIONS
2/4/2014	60% DESIGN - NOT FOR CONSTRUCTION

City of Dover
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15 Loockerman Plaza
Dover, DE 19901
Scott Koenig: 302-736-7005

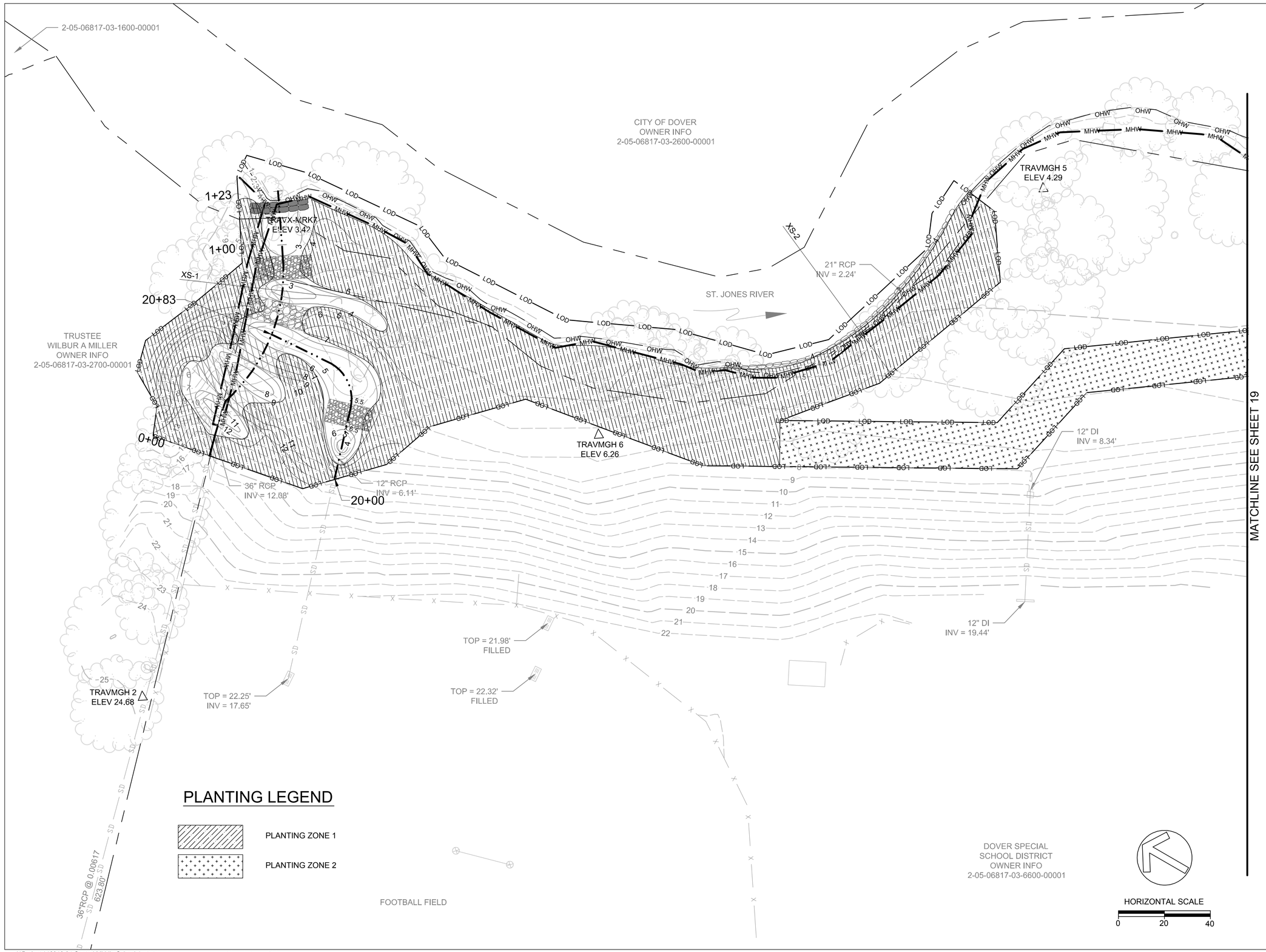
DNREC
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Restore the Earth & Inspire Ecological Stewardship

CENTRAL MIDDLE SCHOOL RSC

TITLE:
EROSION & SEDIMENT CONTROL NOTES

PROJECT NO. : 12012.04	SCALE: N/A
SEAL:	BY: TB / CHECK: MT,DS
	DWG. NO. : 17 OF 20



CLIENT

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CENTRAL MIDDLE SCHOOL RSC

TITLE:

PLANTING PLAN

PROJECT NO.: 12012.04	SCALE: 1" = 20'
SEAL:	BY: TB / CHECK: MT,DS
	DWG. NO.: 18 OF 20

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2-05-06817-03-2500-00001

ST. JONES RIVER

8" TC
INV = 2.63'

?
INV = 1.25'

TRAVMGH 4
ELEV 5.10

TRAVMGH 3
ELEV 5.40

12" DI
INV = 8.31'

TOP = 12.40'
FILLED/DEBRIS

12" DIA
INV = 16.08'

TRAVMGH 1
ELEV 16.50

ASPHALT PARKING LOT

2-05-07705-02-4900-00001

MATCHLINE SEE SHEET 18

PLANTING LEGEND

PLANTING ZONE 1

PLANTING ZONE 2

HORIZONTAL SCALE
0 20 40

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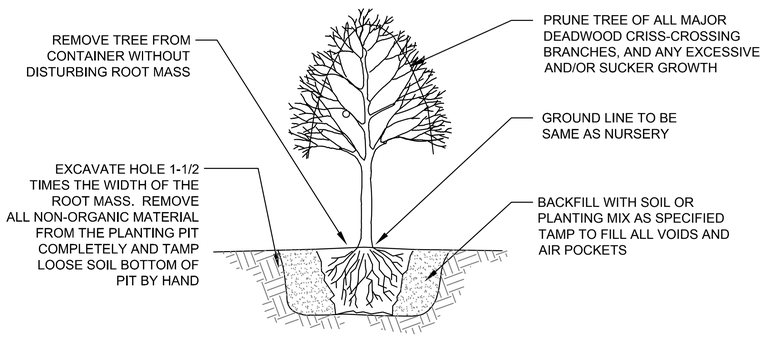
CENTRAL MIDDLE SCHOOL RSC

TITLE:

PLANTING PLAN

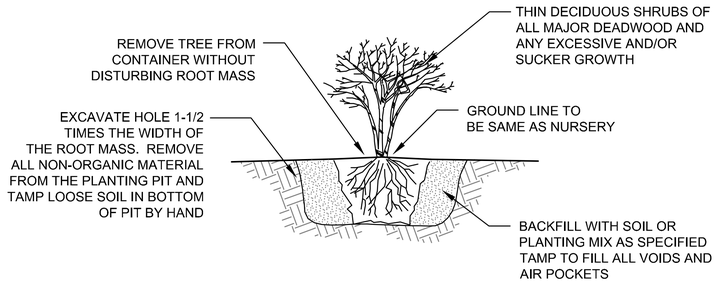
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SEAL:	BY: TB	CHECK: MT,DS
	DWG. NO.: 19 OF 20	

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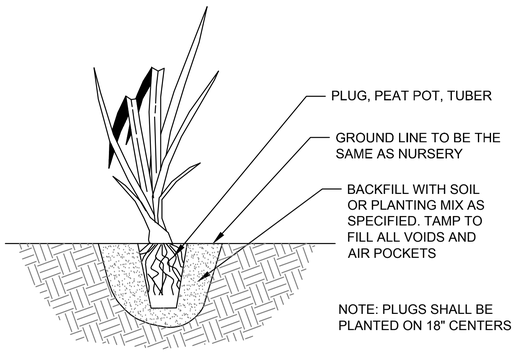
TREE PLANTING - CONTAINER GROWN

NOT TO SCALE



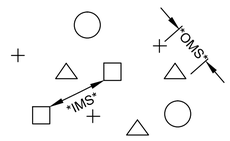
SHRUB PLANTING - CONTAINER GROWN

NOT TO SCALE



HERBACEOUS PLANTING - PLUGS

NOT TO SCALE



NOTE: EACH SYMBOL INDICATES A DIFFERENT SPECIES

OMS- AN OVERALL MINIMUM SPACING DISTANCE *OMS* IS ASSIGNED TO THE PLANTING CONFIGURATION *SEE PLANT SCHEDULE*

IMS- AN INDIVIDUAL MINIMUM SPACING DISTANCES *IMS* IS ASSIGNED TO EACH INDIVIDUAL SPECIES *SEE PLANT SCHEDULE*

PLANT SPACING - RANDOM

NOT TO SCALE

PLAN VIEW

PLANT COMPOSITION SCHEDULE

ZONE 1 - RIPARIAN FOREST — Size (acres): 0.38

Overall Minimum Spacing (ft.)	Quantity per acre	Frequency (%)	Species Quantity	Vegetation Strata/ Species Name	Common Name	Unit	Spacing Type	Size	Individual Minimum Spacing (ft.)
13	258			**TREES**					
		20	20	Quercus phellos	Willow oak	CON	Random	5 - 6 ft.	29
		20	20	Quercus falcata	Southern red oak	CON	Random	5 - 6 ft.	29
		10	10	Fraxinus pennsylvanica	Green ash	CON	Random	5 - 6 ft.	41
		30	30	Platanus occidentalis	American sycamore	CON	Random	5 - 6 ft.	24
		20	20	Acer rubrum	Red maple	CON	Random	5 - 6 ft.	29
		100	**100**	**= total**					
17	151			**MIDSTORY TREES**					
		20	12	Ilex opaca	American holly	CON	Random	3 - 4 ft.	37
		30	17	Sassafras albidum	Sassafras	CON	Random	3 - 4 ft.	31
		20	12	Magnolia virginiana	Sweetbay magnolia	CON	Random	3 - 4 ft.	37
		30	17	Nyssa sylvatica	Black gum	CON	Random	3 - 4 ft.	31
		100	**58**	**= total**					
14	222			**SHRUBS & VINES**					
		10	9	Cornus amomum	Silky dogwood	CON	Random	3 - 4 ft.	43
		15	13	Viburnum acerifolium	Maple leaved viburnum	CON	Random	3 - 4 ft.	36
		15	13	Amelanchier canadensis	Serviceberry	CON	Random	3 - 4 ft.	36
		10	9	Cornus florida	Flowering dogwood	CON	Random	3 - 4 ft.	43
		15	13	Ilex glabra	Inkberry	CON	Random	3 - 4 ft.	36
		15	13	Sambucus canadensis	American elder	CON	Random	3 - 4 ft.	36
		20	17	Viburnum dentatum	Southern arrowwood	CON	Random	3 - 4 ft.	31
		100	**87**	**= total**					
N/A	60			**NATIVE SEED**					
		5	1.2	Schizachyrium scoparium	Little bluestem	LB of P.L.S. 76 %	SEED	N/A	N/A
		20	4.6	Dichanthelium clandestinum	Deertongue grass	LB of P.L.S. 76 %	SEED	N/A	N/A
		10	2.3	Panicum virgatum	Switchgrass	LB of P.L.S. 76 %	SEED	N/A	N/A
		10	2.3	Chasmanthium latifolium	Northern Sea Oats	LB of P.L.S. 76 %	SEED	N/A	N/A
		20	4.6	Lolium multiforum	Annual Rye	LB of P.L.S. 76 %	SEED	N/A	N/A
		5	1.2	Osmunda cinnamonea	Cinnamon Fern	LB of P.L.S. 76 %	SEED	N/A	N/A
		5	1.2	Osmunda regalis	Royal Fern	LB of P.L.S. 76 %	SEED	N/A	N/A
		5	1.2	Eurybia divaricata	White wood aster	LB of P.L.S. 76 %	SEED	N/A	N/A
		5	1.2	Solidago caesia	Bluestem golden rod	LB of P.L.S. 76 %	SEED	N/A	N/A
		5	1.2	Carex stricta	Carex stricta	LB of P.L.S. 76 %	SEED	N/A	N/A
		10	2.3	Carex digitalis	Slender wood sedge	LB of P.L.S. 76 %	SEED	N/A	N/A
		100	**23.3**	**= total**					

CON=container

PLANT COMPOSITION SCHEDULE

ZONE 2 - Grass — Size (acres): 0.58

Overall Minimum Spacing (ft.)	Quantity per acre	Frequency (%)	Species Quantity	Vegetation Strata/ Species Name	Common Name	Unit	Spacing Type	Size	Individual Minimum Spacing (ft.)
N/A	60			**NATIVE SEED**					
		40	13.8	Panicum virgatum	Switchgrass	LB of P.L.S. 76 %	SEED	N/A	N/A
		30	10.4	Agrostis stolinifera	Red top	LB of P.L.S. 76 %	SEED	N/A	N/A
		30	10.4	Festuca rubra	Creeping red fescue	LB of P.L.S. 76 %	SEED	N/A	N/A
		100	**34.6**	**= total**					

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CENTRAL MIDDLE SCHOOL RSC

TITLE:

PLANTING DETAILS & SCHEDULES

PROJECT NO.: 12012.04	SCALE: NOT TO SCALE	
SEAL:	BY: TB	CHECK: MT,DS
	DWG. NO.: 20 OF 20	

OPINION OF PROBABLE CONSTRUCTION COST

CENTRAL MIDDLE SCHOOL REGENERATIVE STORMWATER CONVEYANCE

75% SUBMITTAL

		Scenario A				Scenario B (Over-Excavating)			
Item No.	**ITEM DESCRIPTION**	**QUANTITY**	**UNIT**	**UNIT COST**	**TOTAL COST**	**QUANTITY**	**UNIT**	**UNIT COST**	**TOTAL COST**
	Mobilization	1	LS	$18,000.00	$18,000.00	1	LS	$18,000.00	$18,000.00
	Construction Stakeout	1	LS	$4,000.00	$4,000.00	1	LS	$4,000.00	$4,000.00
	Stabilized Construction Entrance	1	EA	$2,500.00	$2,500.00	1	EA	$2,500.00	$2,500.00
	Silt Fence	460	LF	$5.00	$2,300.00	460	LF	$5.00	$2,300.00
	Turbidity Curtain	160	LF	$10.00	$1,600.00	160	LF	$10.00	$1,600.00
	Blaze Orange Fence	1170	LF	$5.00	$5,850.00	1170	LF	$5.00	$5,850.00
	Shredded Hardwood Mulch for Mulch Access Road	930	CY	$30.00	$27,900.00	930	CY	$30.00	$27,900.00
	Coir Fiber Matting for Mulch Access Road	2800	SY	$7.00	$19,600.00	2800	SY	$7.00	$19,600.00
	Pump Around - Maintenance of Stream Flow	1	LS	$10,000.00	$10,000.00	1	LS	$10,000.00	$10,000.00
	Clearing & Grubbing (incl. Tree removal)	1.10	AC	$3,500.00	$3,850.00	1.10	AC	$3,500.00	$3,850.00
	Earthwork								
	Salvaging and Stockpile Topsoil	185	CY	$10.00	$1,850.00	185	CY	$10.00	$1,850.00
	Topsoiling	1110	SY	$2.00	$2,220.00	1110	SY	$2.00	$2,220.00
	Coir Fiber Matting	444	SY	$7.00	$3,108.00	444	SY	$7.00	$3,108.00
	Shredded Hardwood Mulch for Fill Material	31	CY	$30.00	$930.00	85	CY	$30.00	$2,550.00
	Sand for Fill Material	125	CY	$60.00	$7,500.00	340	CY	$60.00	$20,400.00
	Cobble	99	CY	$85.00	$8,415.00	99	CY	$85.00	$8,415.00
	Rock	100	CY	$275.00	$27,500.00	100	CY	$275.00	$27,500.00
	Boulder Grade Control	1	EA	$1,600.00	$1,600.00	1	EA	$1,600.00	$1,600.00
	Boulder Bank Protection	129	LF	$100.00	$12,900.00	129	LF	$100.00	$12,900.00
	Plunge Pool	1	EA	$14,000.00	$14,000.00	1	EA	$14,000.00	$14,000.00
	Debris Removal (concrete along drainageway)	1	LS	$3,000.00	$3,000.00	1	LS	$3,000.00	$3,000.00
	Planting Trees and Shrubs - Zone 1								
	St Jones River Buffer Forest - Zone 1								
	Planting Zone 1 - Trees	96	EA	$100.00	$9,600.00	96	EA	$100.00	$9,600.00
	Planting Zone 1 - Midstory Trees	56	EA	$65.00	$3,640.00	56	EA	$65.00	$3,640.00
	Planting Zone 1 - Shrubs & Vines	85	EA	$42.00	$3,570.00	85	EA	$42.00	$3,570.00
	Herbaceous Permanent Seeding - Zones 1 & 2								
	St Jones River Buffer Forest-Zone 1								
	Planting Zone 1 - Native Seed	16,560	SF	$0.08	$1,324.80	16,560	SF	$0.08	$1,324.80
	Grass-Zone 2								
	Planting Zone 2 - Native Seed	25,265	SF	$0.08	$2,021.20	25,265	SF	$0.08	$2,021.20
	SUBTOTAL				**$198,779.00**				**$213,299.00**
	20% Contingency				$39,755.80				$42,659.80
	TOTAL				**$238,534.80**				**$255,958.80**
	Difference in Cost between Scenario A and B				$17,424.00				
	% Increase in Cost between Scenario A and B				7%				