

Baboosic Lake Watershed Restoration

Stormwater BMP Implementation Project Operations & Maintenance Plan

Town of Merrimack, NH

Department of Public Works

Baboosic Lake Association

December 2012



Prepared by

Comprehensive Environmental, Inc.

Baboosic Lake is a 222 acre water body located in the towns of Amherst and Merrimack in southern New Hampshire. The lake has a 1,909 acre watershed with many different land use types with several gravel/paved municipal and private camp roads. Baboosic Lake has experienced declines in water quality in recent years, and has been included on the Draft 2008 List of Threatened or Impaired Waters That Require a TMDL for nuisance blooms of Cyanobacteria (hepatoxic blue-green algae), elevated Chlorophyll-a concentrations and elevated levels of the bacteria Escherichia coli. The watershed management plan focuses on installing stormwater controls and treatment throughout the watershed to minimize impacts from stormwater inputs and reduce elevated concentrations in the lake.

The goal of the Baboosic Lake Watershed Restoration Project is to improve water quality through the implementation of stormwater Best Management Practices (BMPs). The BMPs are designed to treat runoff and restore some of the watershed's pre-development hydrology. This project is part of a NH DES s.319 Nonpoint Source Pollution Grant to retrofit and repair several municipal and residential drainage systems around Baboosic Lake.

BMPs to be utilized include:

- Riprap plunge pools,
- sediment forebays
- rain gardens
- riprap and vegetated swales

BMP Owner:

Town of Merrimack (all locations)

O&M Responsible Party:

Town of Merrimack Department of Public Works (all locations)

Schedule for Inspection & Maintenance:

See attached O&M procedures for each specific BMP.

List of O&M Tasks:

See attached O&M procedures for each specific BMP.

Source of Long-Term O&M Funding:

Department of Public Works annual budget.

BMP Locations:

See attached map.

Plan Elements:

1. O&M Plan procedures for each BMP.
2. BMP maintenance log.
3. Site Map
4. BMP Detailed Plans

Baboosic Lake

Sediment Forebays / Plunge Pools		
Procedure	Objective	Frequency
Sediment Removal	Remove sediment and debris from the plunge pool to prevent it from entering down gradient BMPs (raingardens, swales, etc.).	Performed twice per year on the same routine maintenance schedule as contributing catch basins.
Structural Inspection	Visually inspect slope of bank and check for soil erosion. Visually inspect plunge pool stones to make sure they are not being undermined or displaced.	Performed quarterly for the first year and after heavy storms. After first year, performed inspection on the same routine maintenance schedule as contributing catch basins.frequency). Do not let sediment build up to 6 inches at any spot or completely cover vegetation.
Pipe Inspection	Remove accumulated sediment to maintain flow capacity through outlet pipe.	Performed inspection on the same routine maintenance schedule as contributing catch basins.

Locations: **Plunge Pools** - Site 5 - Greenwood Road, Site 7 - Jebb Road, Site 14A - Miriam Road, Site 16B - Longa Road
Forebays - Site 6 - Lakeside Drive, Site 8 - Lakeside Drive, Site 10 - N. Jebb Road, Site 10A -N. Jebb Road, Site 14A - Arnold Road, Site 14C - Carter Road, Site 16 - Shore Road, Site 16A - Shore Road

Notes:

Forebays should be maintained at a minimum on a yearly basis. However, if maintenance is only conducted once per year, it is optimally performed before the winter to ensure pipe inlet is not clogged with sand and debris.

The accumulated sediment, leaves, and debris from the BMPs are to be removed and disposed of in an approved manner and in such a way as to not cause harm to the environment.

Baboosic Lake

Raingardens / Infiltration Trenches		
Procedure	Objective	Frequency
Debris and Litter Removal	Remove for aesthetics and contribution of downstream floatables problem.	As needed by inspection. Not less than twice per year.
Sediment removal	Maintain flow capacity. Inspect and remove sediment if present. Replace damaged vegetation as needed.	Perform quarterly or following the first 2 significant storm events (>.25") for the first year. Establish a specific schedule based on first year accumulations (min. 1 year frequency). Do not let sediment build up to 6 inches at any spot or completely cover vegetation.
Plantings & Mulch Care	Maintain healthy vegetation. Prune plants and remove weeds as required. Replace mulch and regrade as necessary. Replace unhealthy plants with new healthy plantings.	Spring and Fall or as necessary.

Locations: Site 6 - Lakeside Drive, Site 8 - Lakeside Drive, Site 10 - N. Jebb Road, Site 10A -N. Jebb Road, Site 14A - Arnold Road, Site 14C - Carter Road, Site 16 - Shore Road, Site 16A - Shore Road

Notes:

The accumulated sediment, leaves, and debris from the BMPs are to be removed and disposed of in an approved manner and in such a way as to not cause harm to the environment.

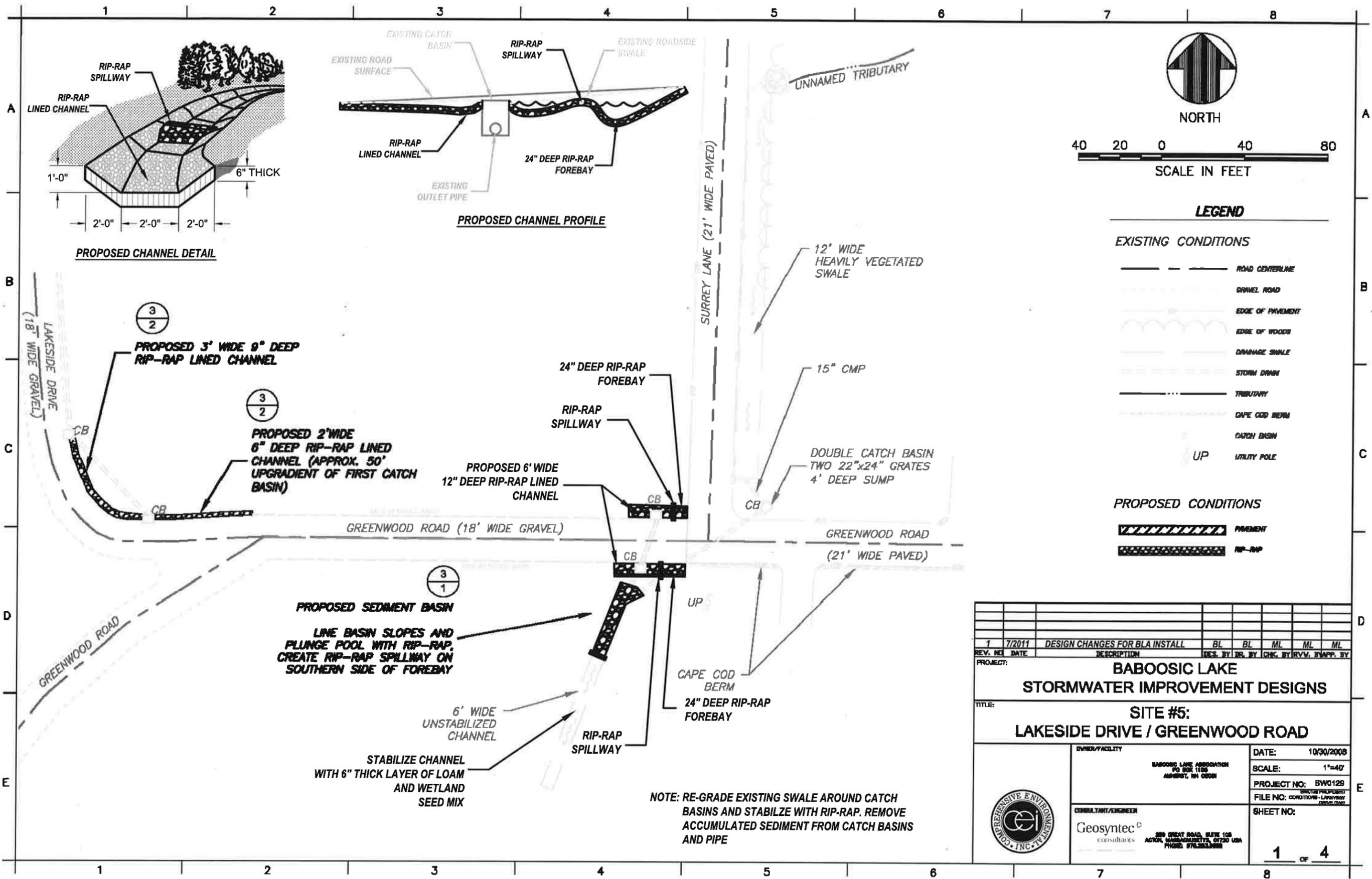
Baboosic Lake

Vegetated / Riprap Swales		
Task	Objective & Procedure	Frequency
Mowing and Vegetation Care	Minimize woody vegetation establishment/takeover to increase grass density and pollutant removal.	Mow yearly; Remove mowed material/clippings every other year. Do not cut grass below flow line.
Debris and Litter Removal	Remove for aesthetics and contribution of downstream floatables problem.	As needed by inspection. Not less than twice per year.
Sediment removal	Maintain flow capacity. Inspect and remove sediment. Inspect condition of check dams and remove accumulated sediment behind check dams taking care not to undermine and damage riprap stone. Replace damaged vegetation as needed.	Perform quarterly or following the first 2 significant storm events (>.25") for the first year. Establish a specific schedule based on first year accumulations (min. 1 year frequency). Do not let sediment build up to 6 inches at any spot or completely cover vegetation.
Structural Integrity	Minimize erosion and channelization of stormwater. Inspect swale for signs of scouring particularly near high velocity areas (e.g. pipe discharge). Re-grade as needed. Replace riprap and vegetation in areas where scour is observed.	After large storms, but not less than once per year.

Locations: Site 5 - Greenwood Road, Site 12 - Lakeside Drive, Site 14A Miriam Road, Site 16B Longa Road

Notes:

The accumulated sediment, leaves, and debris from the BMPs are to be removed and disposed of in an approved manner and in such a way as to not cause harm to the environment.



LEGEND

EXISTING CONDITIONS

- ROAD CENTERLINE
- - - - GRVEL ROAD
- - - - EDGE OF PAVEMENT
- - - - EDGE OF WOODS
- - - - DRAINAGE SWALE
- - - - STORM DRAIN
- - - - TRIBUTARY
- - - - CAPE COD BERM
- - - - CATCH BASIN
- - - - UTILITY POLE

PROPOSED CONDITIONS

- ▨ PAVEMENT
- ▨ RIP-RAP

1	7/2011	DESIGN CHANGES FOR BLA INSTALL	BL	BL	ML	ML	ML
REV. NO.	DATE	DESCRIPTION	DES. BY	DR. BY	CHK. BY	RVW. BY	APP. BY
PROJECT:			BABOOSIC LAKE				
TITLE:			STORMWATER IMPROVEMENT DESIGNS				
PROJECT:			SITE #5:				
TITLE:			LAKESIDE DRIVE / GREENWOOD ROAD				
<p>Geosyntec[®] consultants</p> <p>200 GREAT ROAD, SUITE 100 ACTON, MASSACHUSETTS, 01720 USA PHONE: 978.250.1000</p>	OWNER/FACILITY	DATE:		10/30/2008			
	<p>BABOOSIC LAKE ASSOCIATION PO BOX 1108 ACTON, MA 01720</p>	SCALE:	1"=40'				
CONSULTANT/ENGINEER	PROJECT NO:	BWO129					
	FILE NO:	CONDITIONS - LAKESIDE DRIVE / GREENWOOD ROAD					
	SHEET NO:	1 OF 4					

1 INCH AT FULL SCALE PLOT

NOTE: RE-GRADE EXISTING SWALE AROUND CATCH BASINS AND STABILZE WITH RIP-RAP. REMOVE ACCUMULATED SEDIMENT FROM CATCH BASINS AND PIPE

GENERAL LAYOUT PLAN NOTES:

1. BASE PLAN INFORMATION WAS TAKEN FROM FIELD MEASUREMENTS AND IS USED FOR PICTORIAL PURPOSES ONLY.
2. THE LOCATION OF ALL UNDERGROUND INFRASTRUCTURE AND UTILITIES SHOULD BE VERIFIED AND DIG-SAFE SHOULD BE CONTACTED AT LEAST 72 HOURS PRIOR TO EARTH-DISTURBING ACTIVITIES. THE CONTRACTOR IS RESPONSIBLE FOR VERIFICATION OF EXISTING CONDITIONS SHOWN AND THE COORDINATION AND MARKING OF EXISTING UTILITIES PRIOR TO STARTING CONSTRUCTION.
3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR INSTALLING AND MAINTAINING TEMPORARY EROSION AND SEDIMENT CONTROLS (E.G., SILT FENCE) THROUGHOUT CONSTRUCTION. TEMPORARY CONTROLS SHALL BE MAINTAINED THROUGH THE PROJECT AND SHALL BE REMOVED AFTER PERMANENT CONTROLS HAVE BEEN INSTALLED AND THE DISTURBED AREA HAS BEEN STABILIZED.
4. CONTRACTOR IS RESPONSIBLE FOR SECURITY AND SAFETY OF THE SITE THROUGHOUT CONSTRUCTION.
5. THE PROPOSED CONDITIONS DEPICTS A CONCEPTUAL LAYOUT TO IMPROVE TREATMENT OF STORM WATER THROUGH BEST MANAGEMENT PRACTICE IMPROVEMENTS. ADJUSTMENTS SHALL BE MADE AS NECESSARY DURING CONSTRUCTION TO ACCOMMODATE EXISTING CONDITIONS AND TO MINIMIZE DISTURBANCE OF ESTABLISHED VEGETATION.
6. A MATERIAL STORAGE AREA SHALL BE USED TEMPORARILY BY THE CONTRACTOR TO STORE AND PREPARE CONSTRUCTION MATERIALS SPECIFIC TO THE PROJECT. APPROVAL OF THE STORAGE LOCATION SHALL BE OBTAINED FROM THE TOWN OF MERRIMACK PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR RESTORING THE MATERIAL STORAGE AREA TO THE ORIGINAL PRE-CONSTRUCTION CONDITION.
7. THE CONTRACTOR MAY STOCKPILE MATERIAL IN A STOCKPILE MANAGEMENT AREA DESIGNATED BY THE CONTRACTOR AND APPROVED BY THE TOWN. STOCKPILES SHALL BE OF NEAT CONFIGURATION AND HAVING SIDE SLOPES NO STEEPER THAN 1(H):1(V). TEMPORARY EROSION AND SEDIMENT CONTROLS (E.G., SILT FENCE) SHALL BE INSTALLED AND MAINTAINED DOWN GRADIENT OF THE STOCKPILE.
8. THE TOWN OF MERRIMACK SHALL BE RESPONSIBLE FOR OBTAINING PERMISSION TO CONSTRUCT BMPs FROM THE PROPERTY OWNER ON WHICH A BMP WILL BE PLACED.



NORTH

30 15 0 30 60

SCALE IN FEET

LEGEND

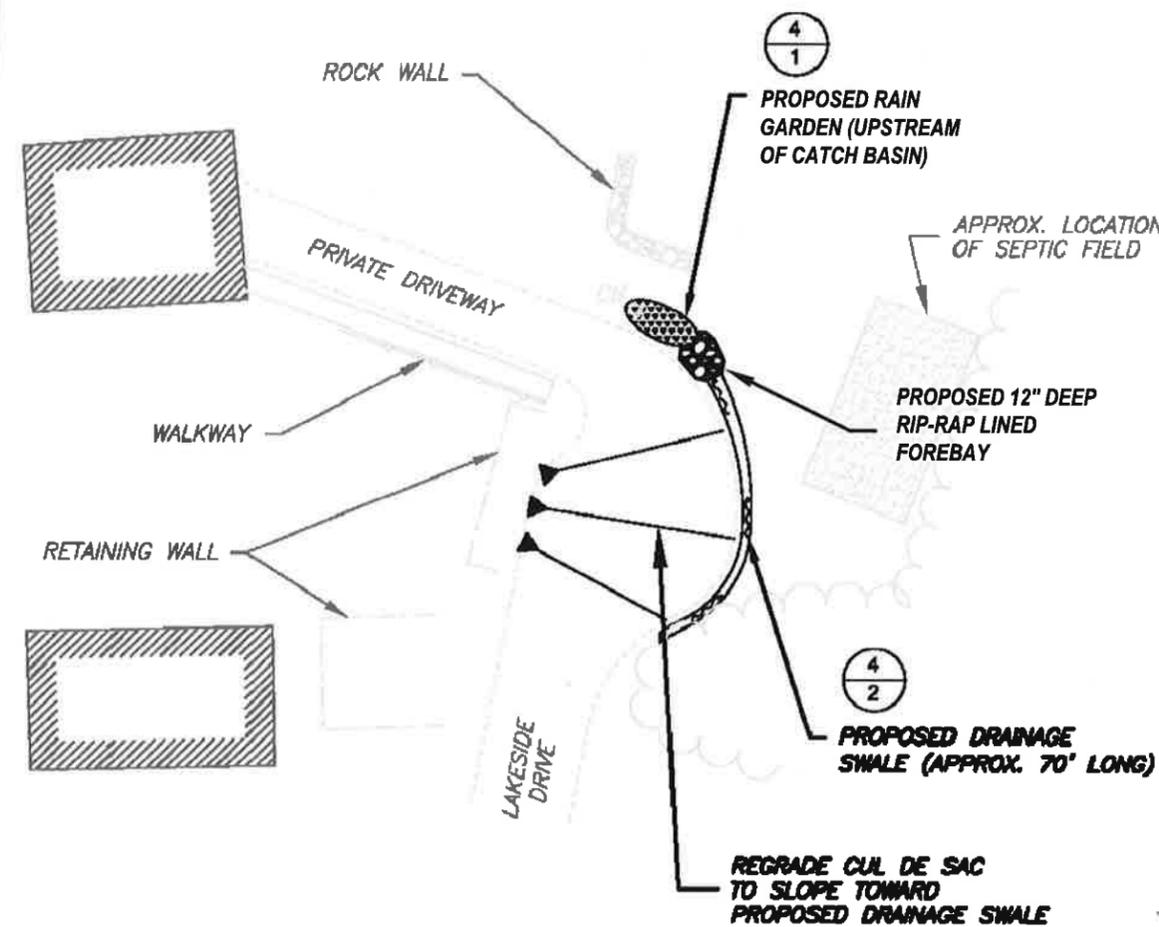
EXISTING CONDITIONS

- GRAVEL ROAD
- RETAINING WALL
- EDGE OF WOODS
- HANDRAIL
- CULVERT
- DWELLING
- SEPTIC FIELD
- CATCH BASIN

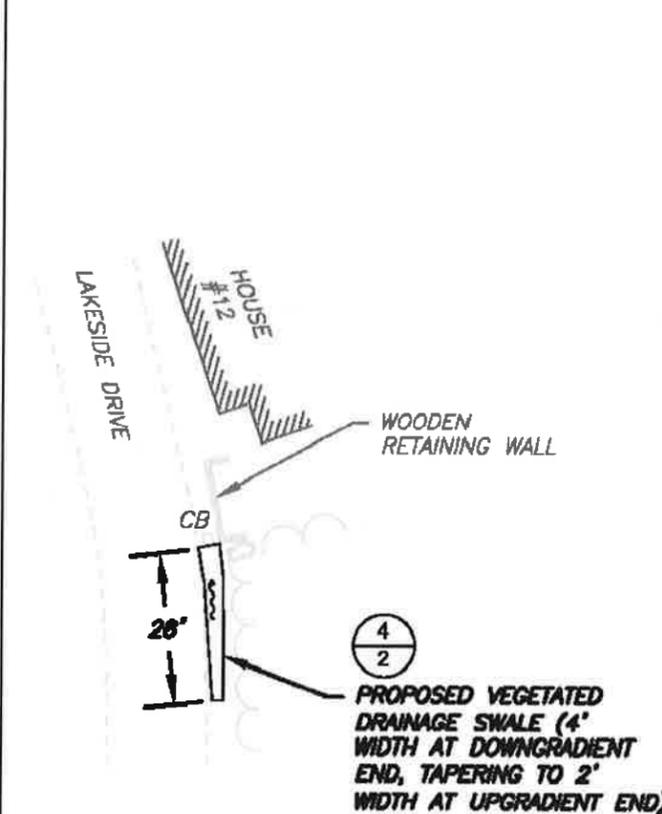
PROPOSED CONDITIONS

- BIORETENTION CELL
- DRAINAGE SWALE
- DOWNGRADIENT DIRECTION OF SLOPE

SITE #8



SITE #12



REV. NO.	DATE	DESCRIPTION	DES. BY	DR. BY	CHK. BY	RVV. BY	APP. BY
1	7/2011	DESIGN CHANGES FOR BLA INSTALL	BL	BL	ML	ML	ML

PROJECT: **BABOOSIC LAKE STORMWATER IMPROVEMENT DESIGNS**

TITLE: **SITE #8 & #12 LAKESIDE DRIVE**

<p>Geosyntec[®] consultants</p> <p>200 GREAT ROAD, SUITE 100 ACQUA, MASSACHUSETTS, 01720 USA PHONE: 978.282.8888</p>	OWNER/FACILITY BABOOSIC LAKE ASSOCIATION PO BOX 1128 ANDOVER, MA 03001	DATE: 10/30/2008 SCALE: 1"=30' PROJECT NO: BWD129 FILE NO: CONDITIONS - LAKESIDE DRIVE SWALE SHEET NO:
	2 OF 4	

1 INCH AT FULL SCALE PLOT

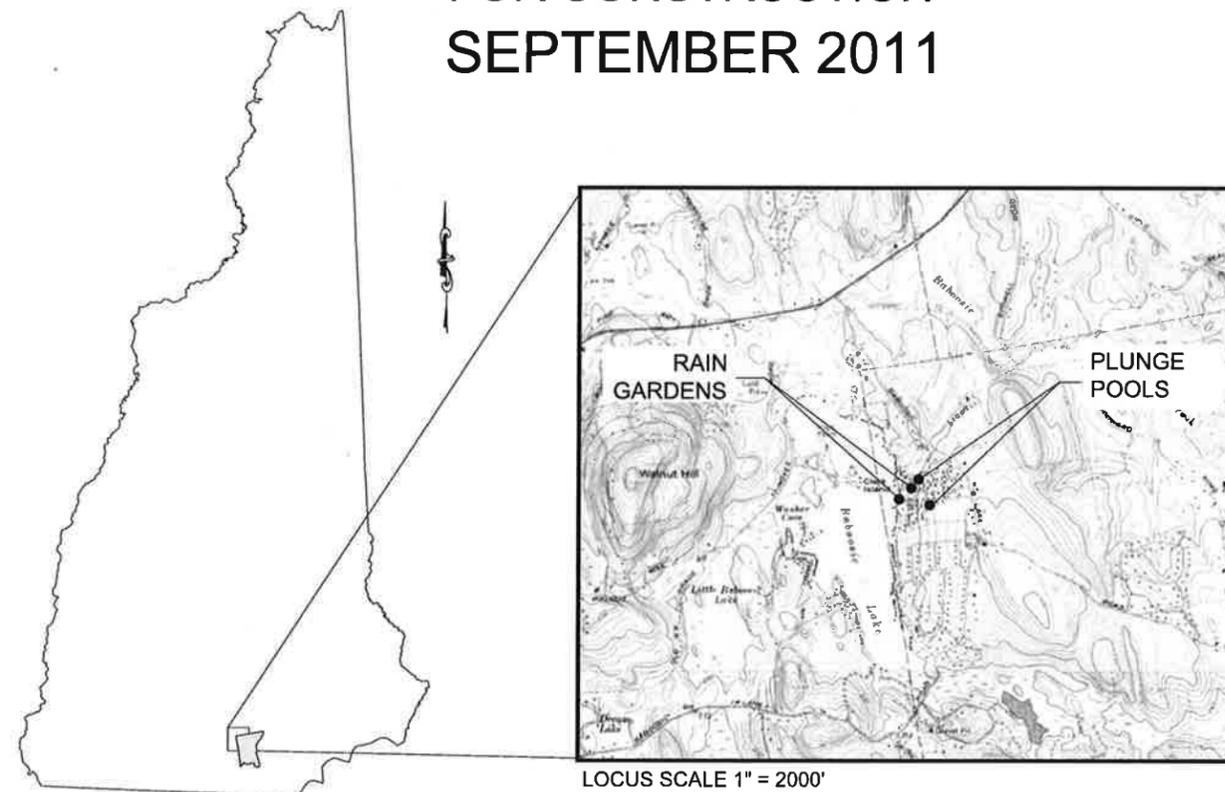
THE BABOOSIC LAKE ASSOCIATION

BABOOSIC LAKE WATERSHED GRANT STORMWATER IMPROVEMENTS

FOR CONSTRUCTION
SEPTEMBER 2011

PROJECT FUNDED THROUGH THE
U.S. EPA / NH DES s.319 WATERSHED
ASSISTANCE GRANT PROGRAM.

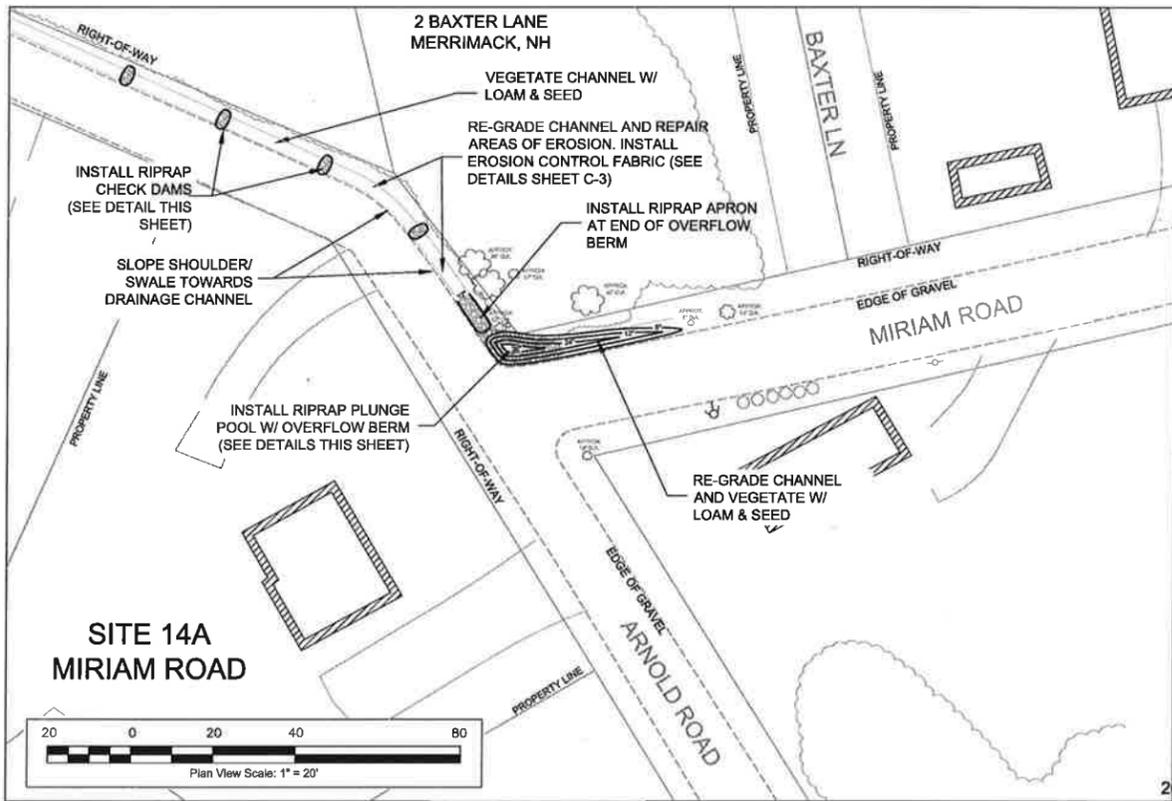
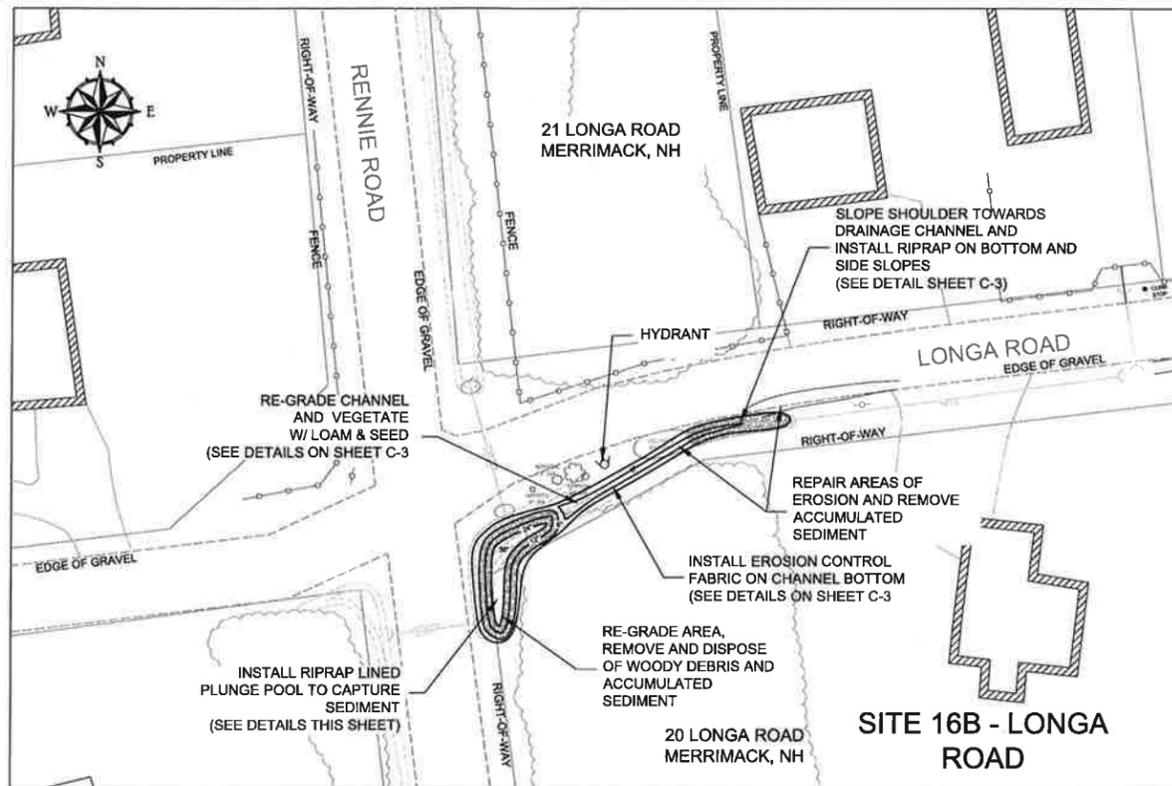
IN COORDINATION WITH:
THE BABOOSIC LAKE ASSOCIATION



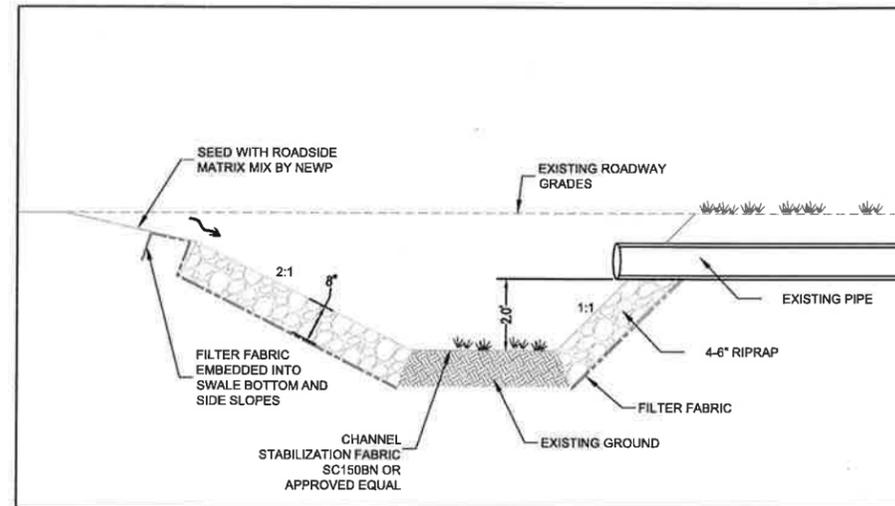
SHEET	TITLE
C-1	LONGA RD & MIRIAM RD STORMWATER BMPS
C-2	CARTER RD & SHORE RD RAIN GARDENS
C-3	PROJECT DETAILS
C-4	MATERIAL NOTES



COMPREHENSIVE ENVIRONMENTAL INCORPORATED • MERRIMACK, NEW HAMPSHIRE

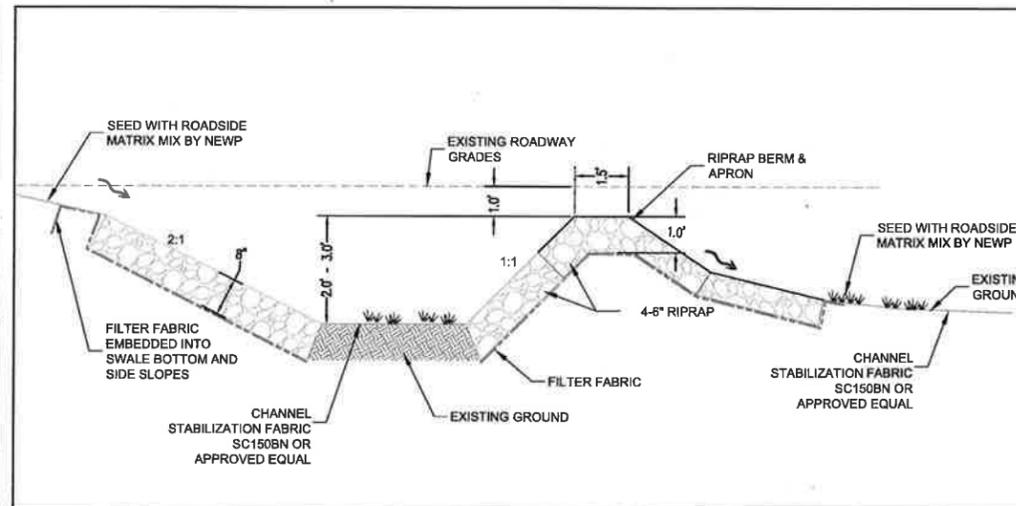


PLUNGE POOL PROJECT OVERVIEWS



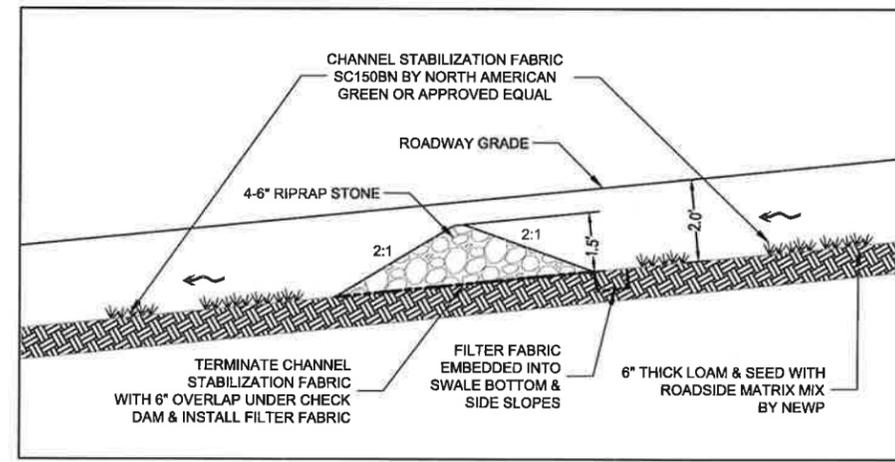
PLUNGE POOL TYP. DETAIL

NOT TO SCALE



PLUNGE POOL & OVERFLOW BERM TYP. DETAIL

NOT TO SCALE



SWALE CHECK DAM TYP. DETAIL

NOT TO SCALE

General Notes

1. DRAWINGS BASED ON STATE OF NEW HAMPSHIRE GRANIT GIS LAYER INFORMATION FOR THE TOWN OF MERRIMACK, GIS LAYERS PROVIDED BY THE TOWN OF MERRIMACK AND CEI FIELD INVESTIGATIONS CONDUCTED IN SEPTEMBER 2011.
2. THE LOCATION OF UNDERGROUND UTILITIES HAVE NOT BEEN VERIFIED OR INSPECTED. THE BLA, PRIOR TO COMMENCEMENT OF CONSTRUCTION, SHALL VERIFY THE LOCATION OF ALL UTILITIES AND CONTACT "DIG-SAFE" AT 1-888-344-7233.
3. ANY CHANGE IN FIELD CONDITIONS SHALL BE REPORTED TO THE ENGINEER TO INSURE THAT ANY MODIFICATIONS TO THE ORIGINAL DESIGN ARE PROPER AND ADEQUATE TO SERVE THE PROJECT'S NEEDS AND COMPLY WITH THE APPLICABLE STANDARDS AND REGULATIONS.
4. EROSION CONTROL SUCH AS SILT FENCE AND/OR HAY BALES SHALL BE INSTALLED TO PREVENT SEDIMENT FROM ENTERING BABOOSIC LAKE OR ANY ADJACENT RESOURCE AREAS.

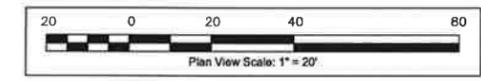
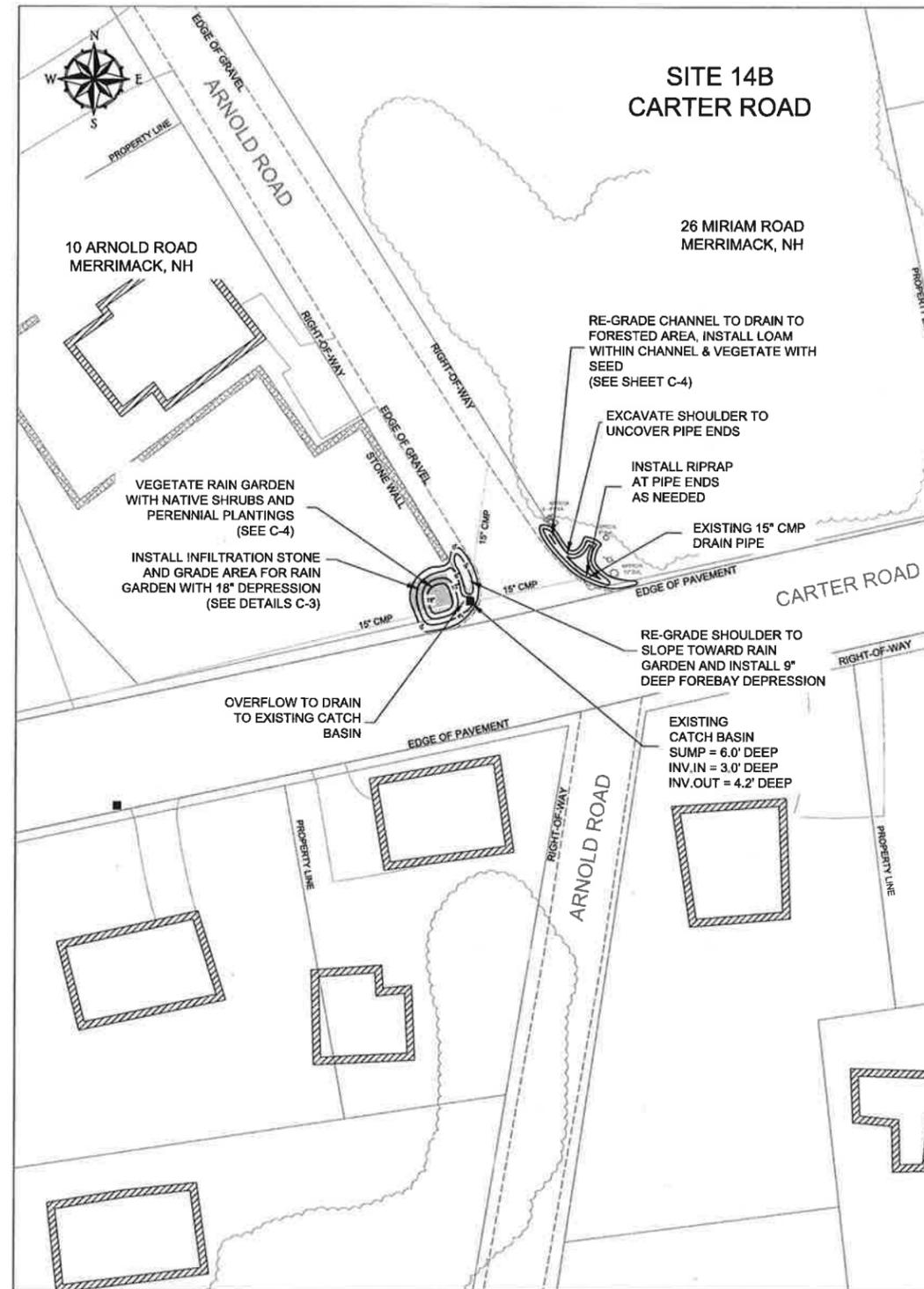
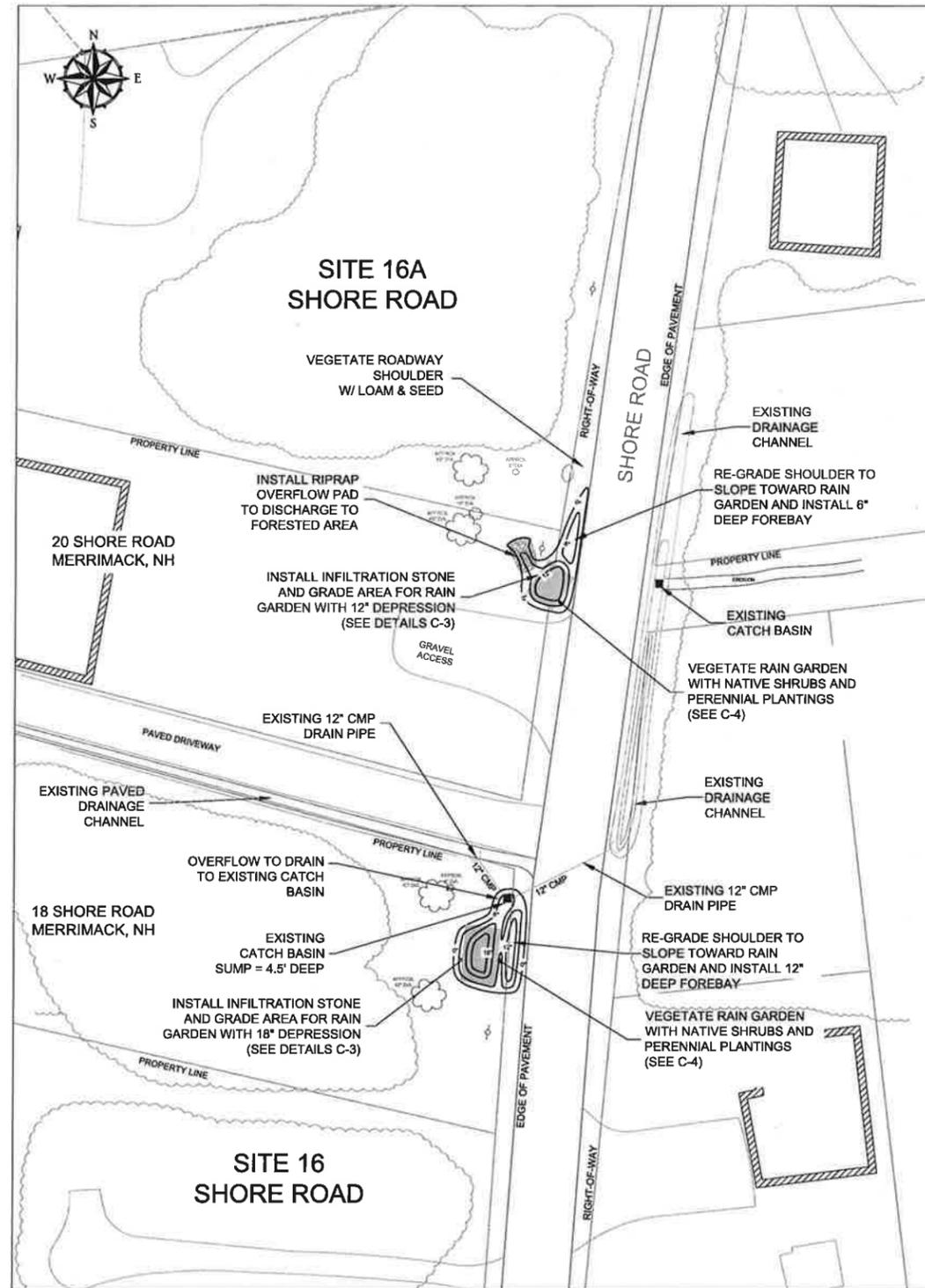


FOR CONSTRUCTION

No.	Revision/Issue	Date
1	DES/BLA COMMENTS	9/23/11

**LONGA RD & MIRIAM RD
STORMWATER BMPs**
THE BABOOSIC LAKE ASSOCIATION
MR. GREG GENDRON
13 CLARK ISLAND ROAD
AMHERST, NH 03031

Project: NO. 281-1	Sheet:
Date: SEPT 2011	C-1
Designed by: SS	
Checked by: ML	
Scale: As Shown	



- General Notes
1. DRAWINGS BASED ON STATE OF NEW HAMPSHIRE GRANIT GIS LAYER INFORMATION FOR THE TOWN OF MERRIMACK, GIS LAYERS PROVIDED BY THE TOWN OF MERRIMACK AND CEI FIELD INVESTIGATIONS CONDUCTED IN SEPTEMBER 2011.
 2. THE LOCATION OF UNDERGROUND UTILITIES HAVE NOT BEEN VERIFIED OR INSPECTED. THE B.L.A. PRIOR TO COMMENCEMENT OF CONSTRUCTION, SHALL VERIFY THE LOCATION OF ALL UTILITIES AND CONTACT "DIG-SAFE" AT 1-888-344-7233.
 3. ANY CHANGE IN FIELD CONDITIONS SHALL BE REPORTED TO THE ENGINEER TO INSURE THAT ANY MODIFICATIONS TO THE ORIGINAL DESIGN ARE PROPER AND ADEQUATE TO SERVE THE PROJECT'S NEEDS AND COMPLY WITH THE APPLICABLE STANDARDS AND REGULATIONS.
 4. EROSION CONTROL SUCH AS SILT FENCE AND/OR HAY BALES SHALL BE INSTALLED TO PREVENT SEDIMENT FROM ENTERING BABOOSIC LAKE OR ANY ADJACENT RESOURCE AREAS.



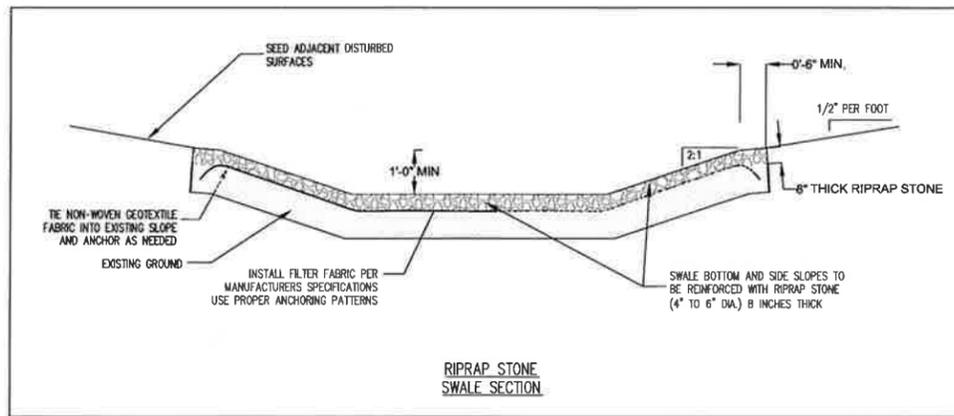
FOR CONSTRUCTION

No.	Revision/Issue	Date
1	DES/BLA COMMENTS	9/23/11

COMPREHENSIVE ENVIRONMENTAL INCORPORATED
21 DEPOT STREET
MERRIMACK, NH 03054

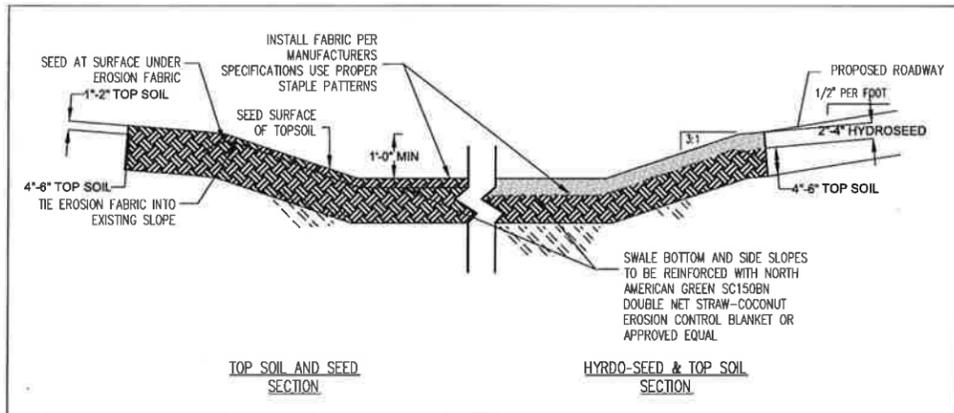
CARTER RD & SHORE RD RAIN GARDENS
THE BABOOSIC LAKE ASSOCIATION
MR. GREG GENDRON
13 CLARK ISLAND ROAD
AMHERST, NH 03031

Project: NO. 281-1	Sheet:
Date: SEPT 2011	C-2
Designed by: SS	
Checked by: ML	
Scale: As Shown	



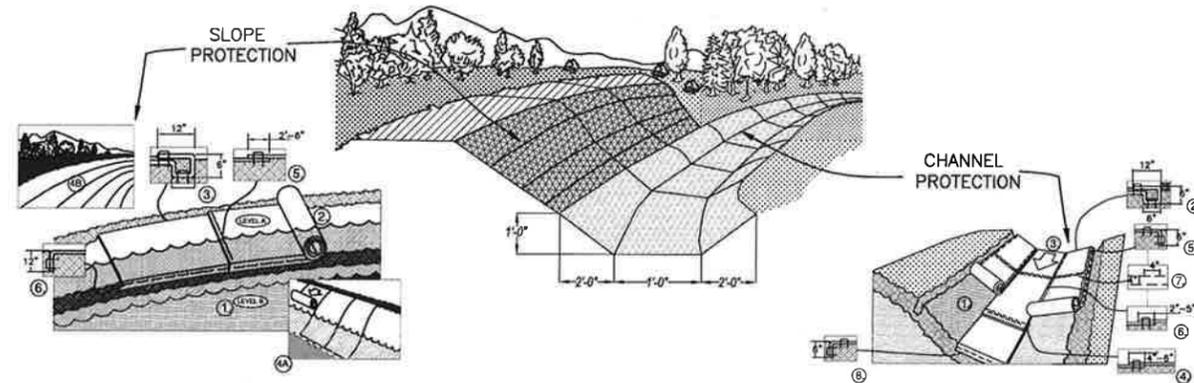
SWALE STABILIZATION WITH STONE TYP. DETAIL

NOT TO SCALE



SWALE STABILIZATION WITH VEGETATION TYP. DETAIL

NOT TO SCALE

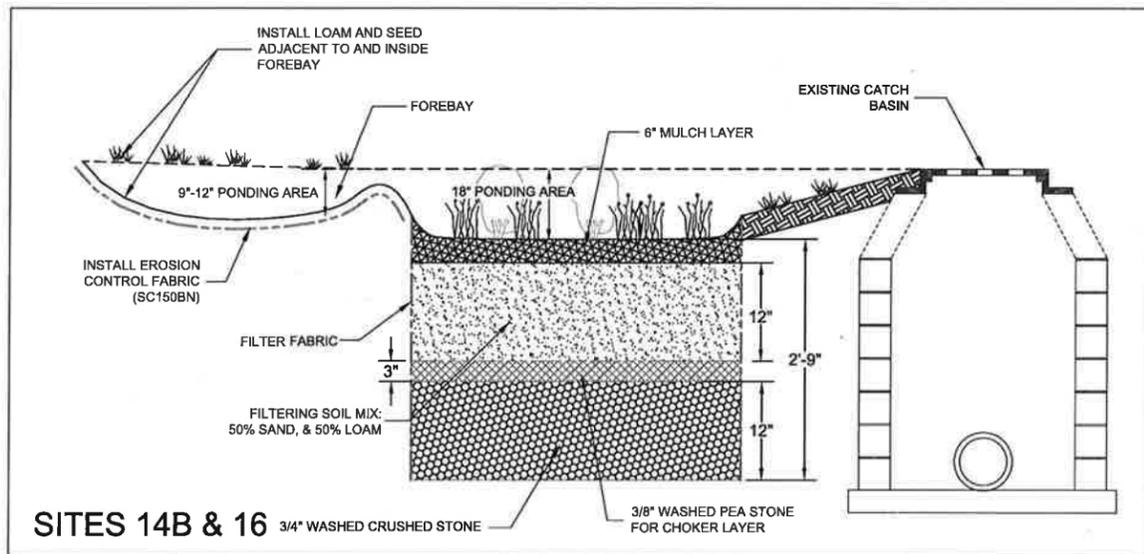


- FOR EASIER INSTALLATION, LOWER WATER FROM LEVEL A TO LEVEL B BEFORE INSTALLATION.
 - PREPARE SOIL BEFORE INSTALLING BLANKETS, INCLUDING ANY NECESSARY APPLICATION OF LIME, FERTILIZER, AND SEED. NOTE: WHEN USING CELL-O-SEED, DO NOT SEED PREPARED AREA. CELL-O-SEED MUST BE INSTALLED WITH PAPER SIDE DOWN.
 - BEGIN AT THE TOP OF THE SHOULDER BY ANCHORING THE BLANKET IN A 6" (15cm) DEEP X 6" (15cm) WIDE TRENCH WITH APPROXIMATELY 12" (30cm) OF BLANKET EXTENDING BEYOND THE UP-SLOPE PORTION OF THE TRENCH. ANCHOR THE BLANKET WITH A ROW OF STAPLES/STAKES APPROXIMATELY 12" (30cm) APART IN THE BOTTOM OF THE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING. APPLY SEED TO COMPACTED SOIL AND FOLD REMAINING 12" (30cm) PORTION OF BLANKET BACK OVER SEED AND COMPACTED SOIL. SECURE BLANKET OVER COMPACTED SOIL WITH A ROW OF STAPLES/STAKES SPACED APPROXIMATELY 12" (30cm) APART ACROSS THE WIDTH OF THE BLANKET.
 - ROLL BLANKETS EITHER (A) DOWN THE SHOULDER FOR LONG BANKS, (TOP TO BOTTOM) OR (B) HORIZONTALLY ACROSS THE SHOULDER SLOPE. BLANKETS WILL UNROLL WITH APPROPRIATE SIDE AGAINST THE SOIL SURFACE. ALL BLANKETS MUST BE SECURELY FASTENED TO SOIL SURFACE BY PLACING STAPLES/STAKES IN APPROPRIATE LOCATIONS AS SHOWN IN THE STAPLE PATTERN GUIDE. WHEN USING OPTIONAL DOT SYSTEM, STAPLES/STAKES SHOULD BE PLACED THROUGH EACH OF THE COLORED DOTS CORRESPONDING TO THE APPROPRIATE STAPLE PATTERN.
 - THE EDGES OF ALL HORIZONTAL AND VERTICAL BLANKET SEAMS MUST BE STAPLED WITH APPROXIMATELY 2"-5" (5cm-12.5cm) OVERLAP. TO ENSURE PROPER SEAM ALIGNMENT BETWEEN ADJACENT BLANKETS, PLACE THE EDGE OF THE OVERLAPPING BLANKET (BLANKET BEING INSTALLED ON TOP) EVEN WITH THE COLORED SEAM STITCH ON THE PREVIOUSLY INSTALLED BLANKET. SECURE ALL OVERLAPS WITH STAPLES SPACED 12" (30cm) APART.
- NOTE: * SEAM OVERLAP SHOULD BE STAPLED ACCORDING TO PREDOMINANT DRAINAGE ACTUAL.
- THE EDGE OF THE BLANKET AT OR BELOW NORMAL WATER LEVEL MUST BE ANCHORED BY PLACING THE BLANKET IN A 12" (30cm) DEEP X 6" (15cm) WIDE ANCHOR TRENCH. ANCHOR THE BLANKET WITH A ROW OF STAPLES/STAKES SPACED APPROXIMATELY 12" (30cm) APART IN THE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING (STONE OR SOIL MAY BE USED AS BACKFILL).
- NOTE: * IN LOOSE SOIL CONDITIONS, THE USE OF STAPLE OR STAKE LENGTHS GREATER THAN 6" (15 CM) MAY BE NECESSARY TO PROPERLY ANCHOR THE BLANKETS.

- PREPARE SOIL BEFORE INSTALLING BLANKETS, INCLUDING ANY NECESSARY APPLICATION OF LIME, FERTILIZER, AND SEED. WHEN USING CELL-O-SEED DO NOT SEED PREPARED AREA. CELL-O-SEED MUST BE INSTALLED WITH PAPER SIDE DOWN.
 - BEGIN AT THE TOP OF THE CHANNEL BY ANCHORING THE BLANKET IN A 6" (15 CM) DEEP X 6" (15 CM) WIDE TRENCH WITH APPROXIMATELY 12" (30 CM) OF BLANKET EXTENDING BEYOND THE UP-SLOPE PORTION OF THE TRENCH. ANCHOR THE BLANKET WITH A ROW OF STAPLES/STAKES APPROXIMATELY 12" (30 CM) APART IN THE BOTTOM OF THE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING. APPLY SEED TO COMPACTED SOIL AND FOLD REMAINING 12" (30 CM) PORTION OF BLANKET BACK OVER SEED AND COMPACTED SOIL. SECURE BLANKET OVER COMPACTED SOIL WITH A ROW OF STAPLES/STAKES SPACED APPROXIMATELY 12" (30 CM) ACROSS THE WIDTH OF THE BLANKET.
 - ROLL CENTER BLANKET IN DIRECTION OF WATER FLOW IN BOTTOM OF CHANNEL. BLANKETS WILL UNROLL WITH APPROPRIATE SIDE AGAINST THE SOIL SURFACE. ALL BLANKETS MUST BE SECURELY FASTENED TO SOIL SURFACE BY PLACING STAPLES/STAKES IN APPROPRIATE LOCATIONS SHOWN IN THE STAPLE PATTERN GUIDE. WHEN USING THE DOT SYSTEM, STAPLES/STAKES SHOULD BE PLACED THROUGH EACH OF THE COLORED DOTS CORRESPONDING TO THE APPROPRIATE STAPLE PATTERN.
 - PLACE CONSECUTIVE BLANKETS END OVER END (SHINGLE STYLE) WITH A 4" - 6" (10 CM - 15 CM) OVERLAP. USE A DOUBLE ROW OF STAPLES STAGGERED 4" (10 CM) APART AND 4" (10 CM) ON CENTER TO SECURE BLANKETS.
 - FULL LENGTH EDGE OF BLANKETS AT TOP OF SIDE SLOPES MUST BE ANCHORED WITH A ROW OF STAPLES/STAKES APPROXIMATELY 12" (30 CM) APART IN A 6" (15 CM) DEEP X 6" (15 CM) WIDE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING.
 - ADJACENT BLANKETS MUST BE OVERLAPPED APPROXIMATELY 2" - 5" (5 CM - 12.5 CM) (DEPENDING ON BLANKET TYPE) AND STAPLED.
 - IN HIGH FLOW CHANNEL APPLICATIONS, A STAPLE CHECK SLOT IS RECOMMENDED AT 30 TO 40 FOOT (9 M - 12 M) INTERVALS. USE A DOUBLE ROW OF STAPLES STAGGERED 4" (10 CM) APART AND 4" (10 CM) ON CENTER OVER ENTIRE WIDTH OF THE CHANNEL.
 - THE TERMINAL END OF THE BLANKETS MUST BE ANCHORED WITH A ROW OF STAPLES/STAKES APPROXIMATELY 12" (30 CM) APART IN A 6" (15 CM) DEEP X 6" (15 CM) WIDE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING.
- NOTE: * IN LOOSE SOIL CONDITIONS, THE USE OF STAPLE OR STAKE LENGTHS GREATER THAN 6" (15 CM) MAY BE NECESSARY TO PROPERLY ANCHOR THE BLANKETS.

EROSION CONTROL FABRIC TYP. DETAILS

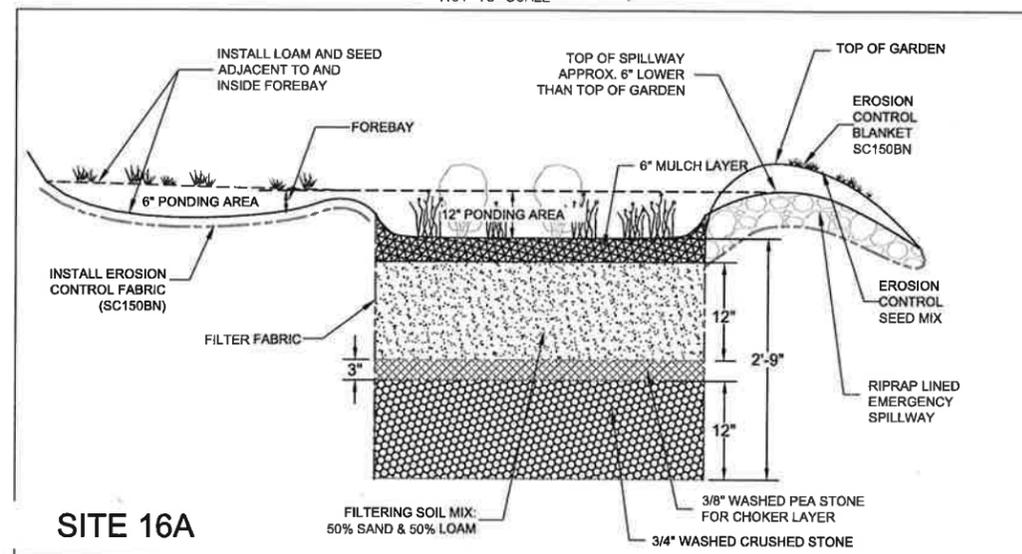
NOT TO SCALE



SITES 14B & 16

RAIN GARDEN WITH CATCH BASIN OVERFLOW TYP. DETAIL

NOT TO SCALE



SITE 16A

RAIN GARDEN WITH RIPRAP OVERFLOW TYP. DETAIL

NOT TO SCALE

General Notes

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- EROSION CONTROL SUCH AS SILT FENCE AND/OR HAY BALES SHALL BE INSTALLED TO PREVENT SEDIMENT FROM ENTERING BABOOSIC LAKE OR ANY ADJACENT RESOURCE AREAS.



FOR CONSTRUCTION

No.	Revision/Issue	Date
1	DES/BLA COMMENTS	9/23/11

COMPREHENSIVE ENVIRONMENTAL INCORPORATED
 21 DEPOT STREET
 MERRIMACK, NH 03054

PROJECT DETAILS

THE BABOOSIC LAKE ASSOCIATION
 MR. GREG GENDRON
 13 CLARK ISLAND ROAD
 AMHERST, NH 03031

Project NO. 281-1
 Date: SEPT 2011
 Designed by: SS
 Checked by: ML
 Scale: As Shown

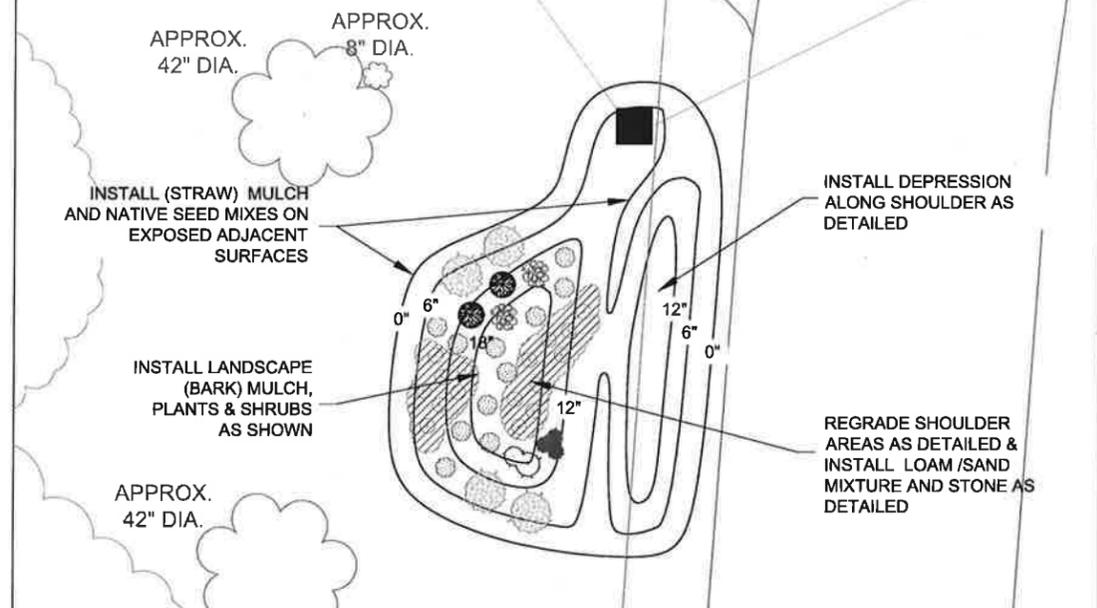
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C-3

NOTE:
USE THE FOLLOWING PLANTS/SHRUBS
FOR LANDSCAPED RAIN GARDEN & SWALE AREAS

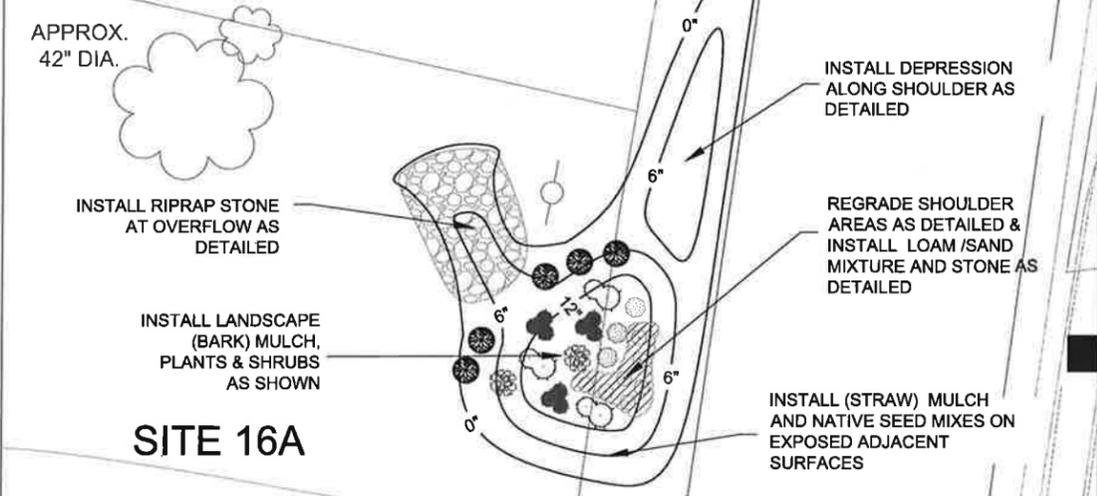
PLANT NAME	SIZE	SYMBOL
WINTERBERRY HOLLY	2'-3'	
BLUEFLAG IRIS	6"-1'	
HIGHBUSH CRANBERRY	2'-3'	
HIGHBUSH BLUEBERRY	2'-3'	
SPICEBUSH	2'-3'	
GOLDEN ALEXANDER	6"-1'	
FOTHERGILLA	6"-1'	

RAINGARDEN PLANT LISTING

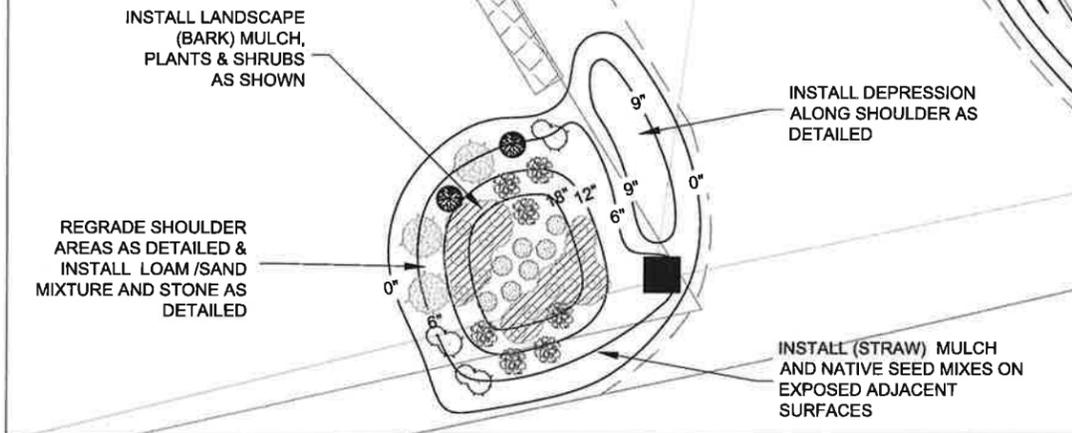
SITE 16



SITE 16A



SITE 14B



VEGETATIVE SUPPORT MATERIAL
1. VEGETATIVE SUPPORT MATERIAL FOR RAIN GARDENS AND BUFFER AREAS SHALL BE REASONABLY FREE OF STUMPS, ROOTS, AND HEAVY OR STIFF CLAY, STONES LARGER THAN 2-INCHES IN DIAMETER, LUMPS, COARSE SAND, NOXIOUS WEEDS, STICKS, BRUSH OR OTHER LITTER. IT SHALL BE COMPOSED OF THE FOLLOWING PERCENTAGES OF MATERIALS:

LOAM	50%
SAND	50%

LOAM
2. LOAM SHALL CONSIST OF LOOSE FRIABLE TOPSOIL WITH NO ADMIXTURE OF REFUSE OR MATERIAL TOXIC TO PLANT GROWTH. LOAM SHALL BE GENERALLY FREE FROM STONES, LUMPS, STUMPS, OR SIMILAR OBJECTS LARGER THAN 50 MM (2 IN) IN GREATEST DIAMETER, SUBSOIL, ROOTS, AND WEEDS. THE TERM AS USED HEREIN SHALL MEAN THAT PORTION OF THE SOIL PROFILE DEFINED TECHNICALLY AS THE "A" HORIZON BY THE SOIL SCIENCE SOCIETY OF AMERICA. THE MINIMUM AND MAXIMUM PH VALUE SHALL BE FROM 5.5 TO 7.6. LOAM SHALL CONTAIN A MINIMUM OF 3 PERCENT AND A MAXIMUM OF 10 PERCENT OF ORGANIC MATTER AS DETERMINED BY LOSS BY IGNITION. NOT MORE THAN 65 PERCENT SHALL PASS A 0.075 MM (NO. 200) SIEVE AS DETERMINED BY THE WASH TEST IN ACCORDANCE WITH ASTM D 1140. IN NO INSTANCE SHALL MORE THAN 20% OF THAT MATERIAL PASSING THE 4.75 MM (NO. 4) SIEVE CONSIST OF CLAY SIZE PARTICLES.

SAND
3. SAND SHALL CONSIST OF BANK RUN SAND CONFORMING TO THE FOLLOWING REQUIREMENTS DETERMINED BY ASTM D422:

SIEVE OPENING	PERCENT PASSING WEIGHT
1-INCH	100
1/2-INCH	50-100
NO. 20	20-95
NO. 50	10-60
NO. 200	0-8

INSTALLATION

- THE VEGETATIVE SUPPORT MATERIAL SHALL BE MIXED, HAULED, DEPOSITED, SPREAD, COMPACTED AND RAKED TO A TOTAL DEPTH AND TO THE LINES AND GRADES SHOWN ON THE PLANS OR AS DIRECTED BY THE ENGINEER. THE VEGETATIVE SUPPORT MATERIAL SHALL BE PLACED IN 6" LIFTS.
- ALL DEPRESSIONS CAUSED BY SETTLEMENT SHALL BE FILLED WITH ADDITIONAL MATERIALS AND THE SURFACES SHALL BE REGRADED UNTIL IT PRESENTS A REASONABLY SMOOTH AND EVEN FINISH AND IS UP TO THE REQUIRED GRADE.
- DURING HAULING OPERATIONS, ALL PUBLIC AND PRIVATE ROADWAY SURFACES SHALL BE KEPT CLEAN AND ANY TOPSOIL OR OTHER DIRT, WHICH MAY BE BROUGHT UPON THE SURFACE, SHALL BE REMOVED PROMPTLY AND THOROUGHLY BEFORE IT BECOMES COMPACTED BY TRAFFIC. IF NECESSARY, THE WHEELS OF ALL VEHICLES USED FOR HAULING SHALL BE CLEANED FREQUENTLY AND KEPT CLEAN TO AVOID BRINING ANY DIRT UPON THE SURFACE.

VEGETATION NOTES:

1. ALL PLANTS AND SHRUBS USED FOR RAIN GARDENS SHALL BE INSTALLED AT LOCATIONS AS SHOWN ON THESE PLANS. TYPICAL SPACING FOR LARGE SHRUBS SHALL BE 4-5 FEET AND SPACING FOR SMALLER PLANTS SHALL BE 1-2 FEET. APPROVED EQUALS FOR PLANT TYPES SHALL BE USED IN ACCORDANCE WITH ENGINEER'S RECOMMENDATIONS.

2. WINTERBERRY HOLLY SHALL BE INSTALLED WITH A MIX OF BOTH FEMALE AND MALE SPECIES AT ALL SITES TO ENSURE BERRY PRODUCTION.

3. ROADSIDE SWALES AND DRAINAGE CHANNELS SHALL BE COVERED WITH LOAM AND SEEDED WITH NEW ENGLAND ROADSIDE MATRIX UPLAND SEED MIX BY NEW ENGLAND WETLAND PLANTS OR APPROVED EQUAL.

4. ALL ADJACENT DISTURBED AREAS SHALL BE REPAIRED TO PRE-CONSTRUCTION CONDITIONS AND SEEDED WITH A FAST GROWING NATIVE TEMPORARY COVER CROP SEED MIX.

MATERIAL NOTES:

1. EROSION CONTROL FABRIC FOR CHANNEL LINING AND STREAM BANK RESTORATION SHALL BE SC150BN EROSION FABRIC BY NORTH AMERICAN GREEN OR APPROVED EQUAL.

2. NON-WOVEN GEO-TEXTILE FABRIC SHALL BE PLACED ON THE SIDES OF ALL INFILTRATION DEVICES AND UNDER RIPRAP LINED AREAS AS SHOWN ON THESE PLANS. FILTER FABRIC SHALL BE MIRAFI 140N OR APPROVED EQUAL.

3. CRUSHED STONE USED FOR INFILTRATION AREAS SHALL BE WASHED ANGULAR CRUSHED STONE FREE OF ORGANIC MATERIAL AND DEBRIS. RESERVOIR STONE FOR INFILTRATION AREAS SHALL HAVE A MAXIMUM STONE SIZE OF 1-1/2 INCH DIAMETER AND CHOKER COURSE STONE FOR INFILTRATION AREAS SHALL HAVE A MAXIMUM STONE SIZE OF 3/4 INCH DIAMETER.

4. RIPRAP STONE FOR FOREBAYS, ROADSIDE SWALES, PLUNGE POOLS AND CHECK DAMS SHALL BE HARD, DURABLE, IRREGULAR IN SHAPE, RESISTANT TO WEATHERING AND SHALL MEET THE GRADATION REQUIREMENTS THAT MEET THE APPROVAL OF THE ENGINEER. STONE SHALL BE FREE FROM OVERBURDEN, SPOIL, SHALE, AND ORGANIC MATERIAL.

5. MULCH USED IN RAIN GARDENS SHALL BE A WOOD FIBER BARK MULCH PRODUCED FROM HARD WOOD THAT HAS BEEN RUN THROUGH MECHANICAL CHIPPER OR HAMMERMILL. BARK MULCH SHALL BE FREE OF MOLD, DIRT, SAWDUST AND FOREIGN MATERIALS.

8. LANDSCAPE MULCH USED IN ROADSIDE CHANNELS, SHOULDERS AND ADJACENT EXPOSED AREAS SHALL BE STRAW MULCH MADE FROM WHEAT, OATS OR OTHER SMALL GRAIN SPECIES. STRAW MULCH SHALL BE FREE OF MOLD, DIRT AND OTHER FOREIGN MATERIALS.

General Notes

- DRAWINGS BASED ON STATE OF NEW HAMPSHIRE GRANIT GIS LAYER INFORMATION FOR THE TOWN OF MERRIMACK, GIS LAYERS PROVIDED BY THE TOWN OF MERRIMACK AND CEI FIELD INVESTIGATIONS CONDUCTED IN SEPTEMBER 2011.
- THE LOCATION OF UNDERGROUND UTILITIES HAVE NOT BEEN VERIFIED OR INSPECTED. THE B.L.A. PRIOR TO COMMENCEMENT OF CONSTRUCTION, SHALL VERIFY THE LOCATION OF ALL UTILITIES AND CONTACT "DIG-SAFE" AT 1-888-344-7233.
- ANY CHANGE IN FIELD CONDITIONS SHALL BE REPORTED TO THE ENGINEER TO INSURE THAT ANY MODIFICATIONS TO THE ORIGINAL DESIGN ARE PROPER AND ADEQUATE TO SERVE THE PROJECT'S NEEDS AND COMPLY WITH THE APPLICABLE STANDARDS AND REGULATIONS.
- EROSION CONTROL SUCH AS SILT FENCE AND/OR HAY BALES SHALL BE INSTALLED TO PREVENT SEDIMENT FROM ENTERING BABOOSIC LAKE OR ANY ADJACENT RESOURCE AREAS.



FOR CONSTRUCTION

1	DES/BLA COMMENTS	9/23/11
No.	Revision/Issue	Date



DETAILS & MATERIAL NOTES

THE BABOOSIC LAKE ASSOCIATION
MR. GREG GENDRON
13 CLARK ISLAND ROAD
AMHERST, NH 03031

Project NO. 281-1
Date: SEPT 2011
Designed by: SS
Checked by: ML
Scale: As Shown

Sheet:
C-4

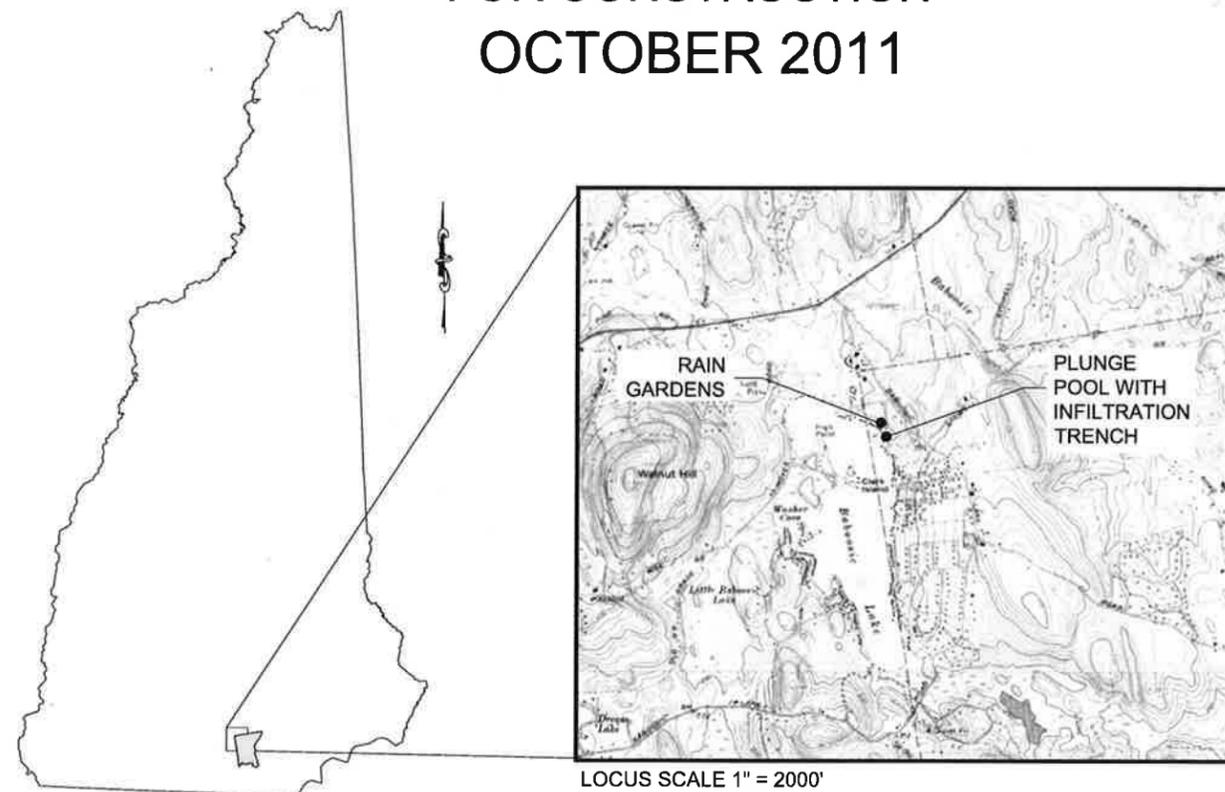
THE BABOOSIC LAKE ASSOCIATION

BABOOSIC LAKE WATERSHED GRANT STORMWATER IMPROVEMENTS

FOR CONSTRUCTION
OCTOBER 2011

PROJECT FUNDED THROUGH THE
U.S. EPA / NH DES s.319 WATERSHED
ASSISTANCE GRANT PROGRAM.

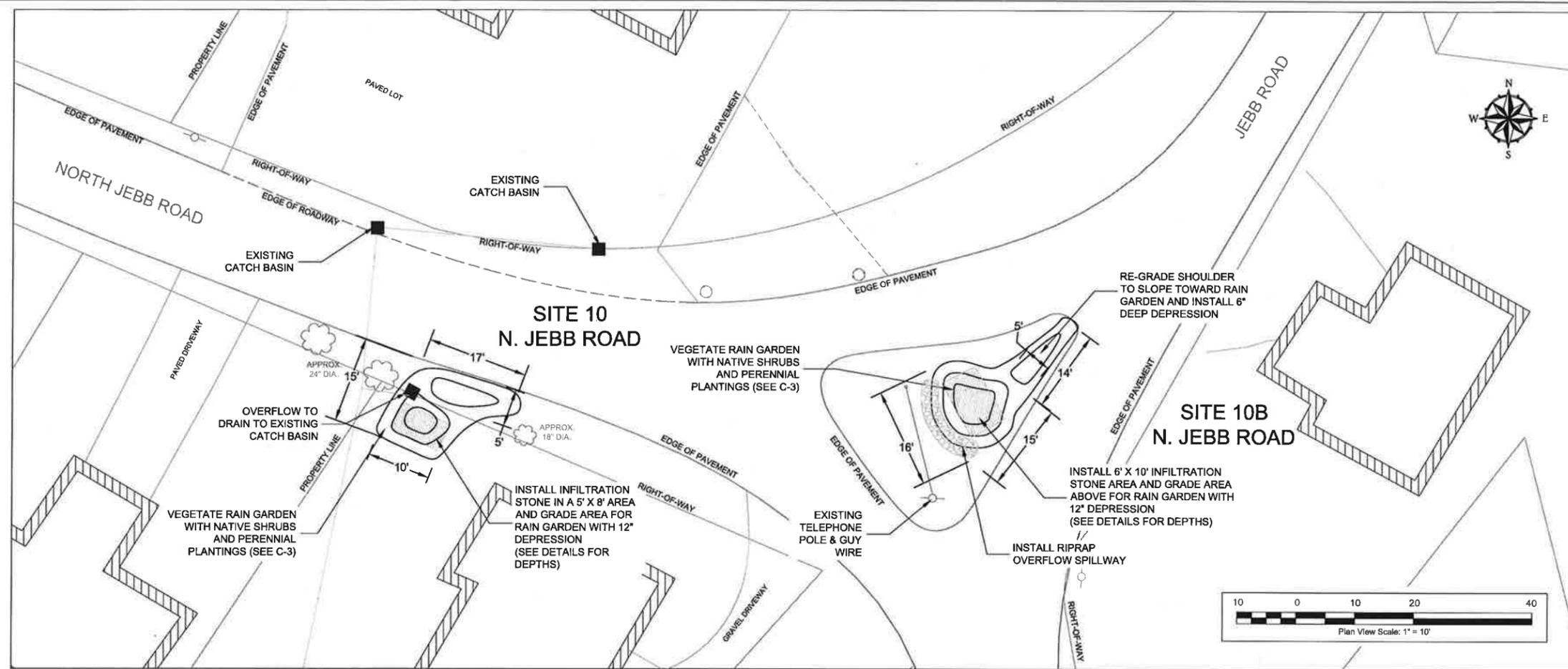
IN COORDINATION WITH:
THE BABOOSIC LAKE ASSOCIATION



<u>SHEET</u>	<u>TITLE</u>
C-1	N. JEBB RD RAIN GARDENS
C-2	JEBB RD. & LAKESIDE DR. STORMWATER BMPS
C-3	PLANTING PLAN & MATERIAL NOTES
C-4	AUTUMN LANE PLUNGE POOL
C-5	CARTER RD RAIN GARDEN



COMPREHENSIVE ENVIRONMENTAL INCORPORATED • MERRIMACK, NEW HAMPSHIRE



- General Notes
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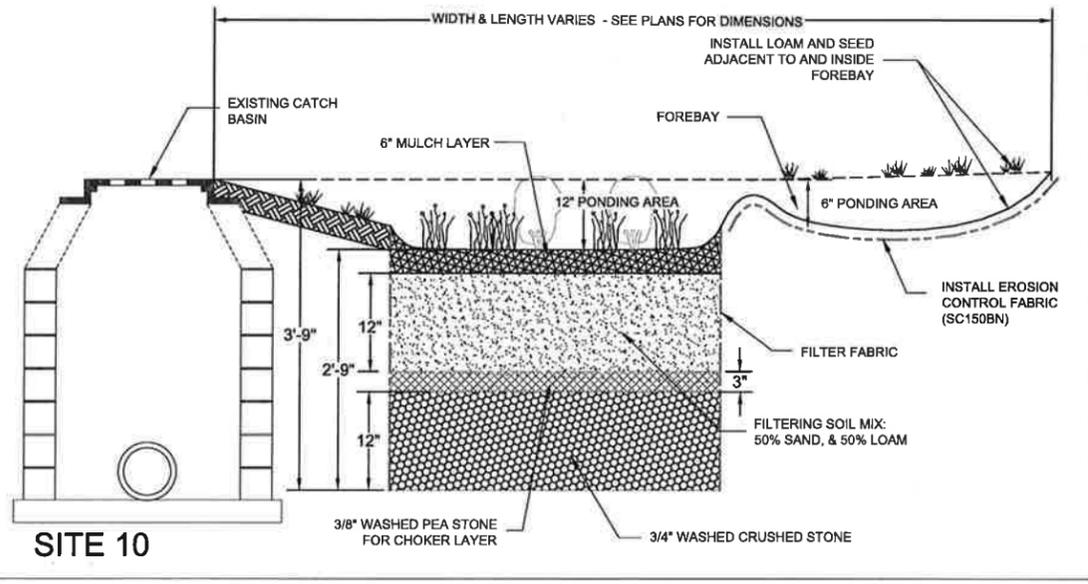
FOR CONSTRUCTION

No.	Revision/Issue	Date
1	BLA COMMENTS	10/11/11

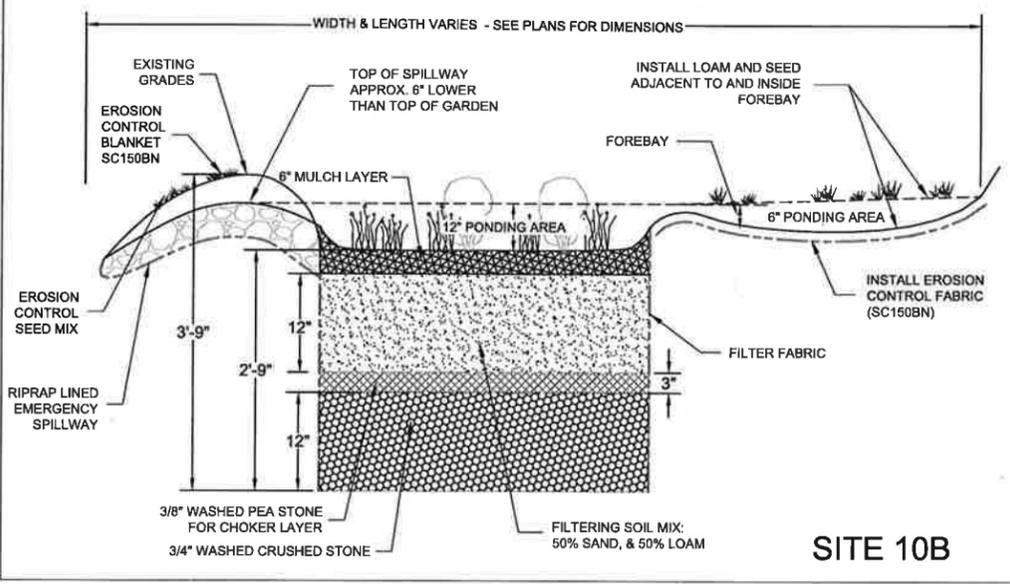
COMPREHENSIVE ENVIRONMENTAL INCORPORATED
 21 DEPOT STREET
 MERRIMACK, NH 03054

N. JEBB ROAD RAIN GARDENS
 THE BABOOSIC LAKE ASSOCIATION
 MR. GREG GENDRON
 13 CLARK ISLAND ROAD
 AMHERST, NH 03031

Project: NO. 281-1	Sheet:
Date: OCT 2011	C-1
Designed by: SS	
Checked by: ML	
Scale: As Shown	

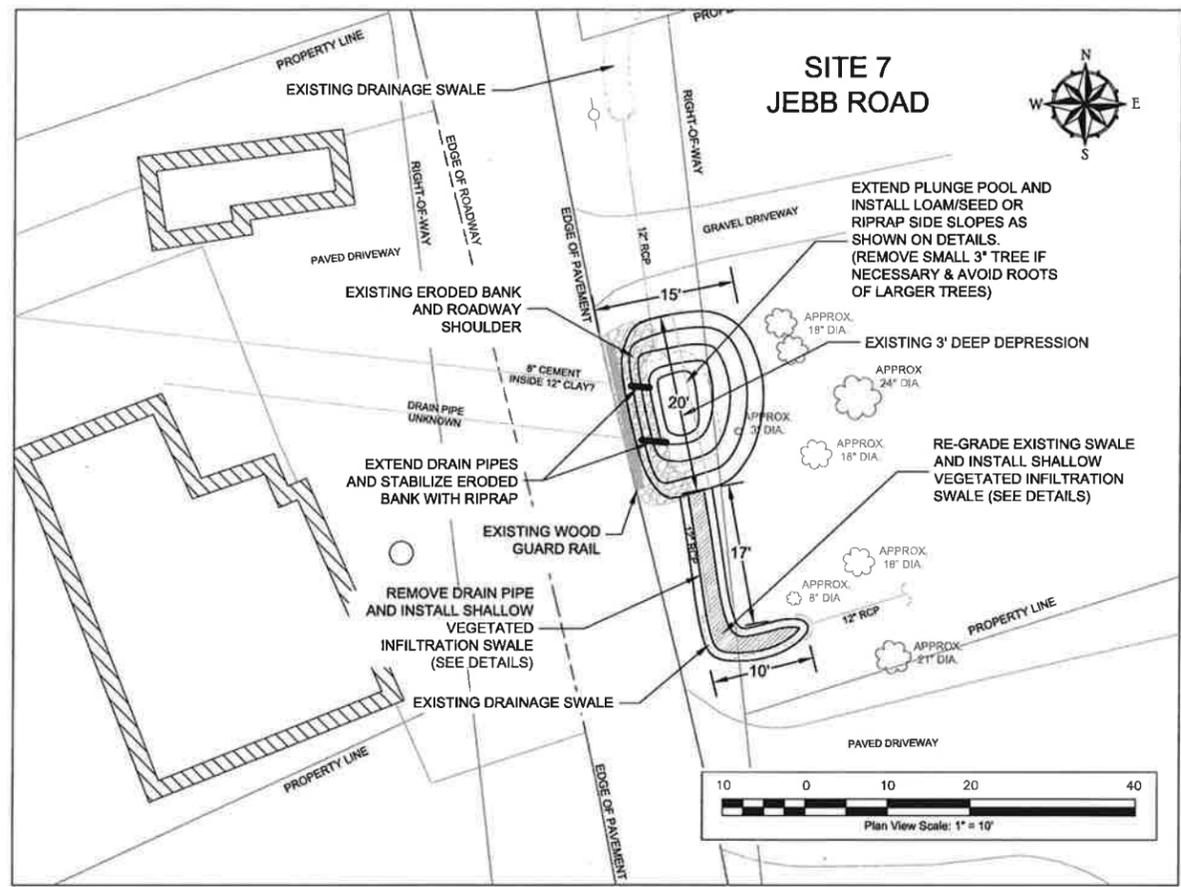


RAIN GARDEN WITH CATCH BASIN OVERFLOW TYP. DETAIL
 NOT TO SCALE

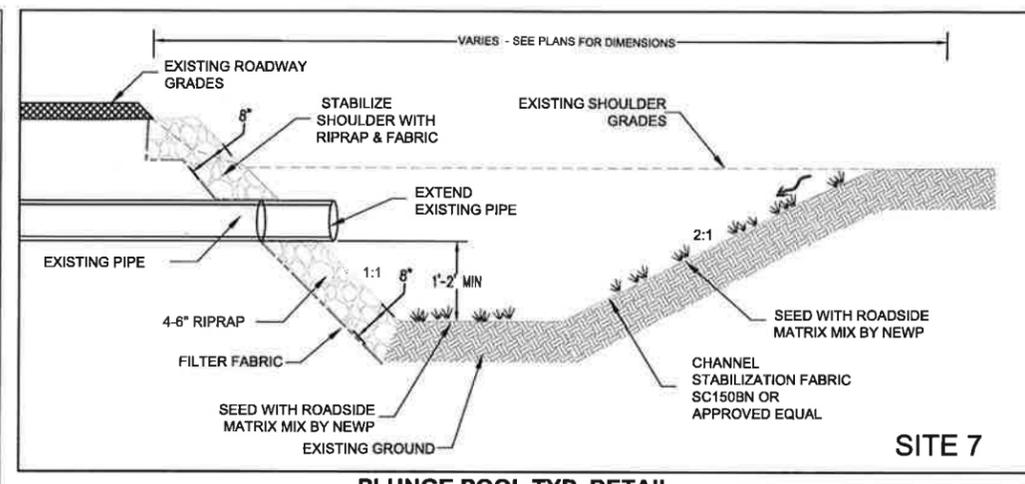


RAIN GARDEN WITH RIPRAP OVERFLOW TYP. DETAIL
 NOT TO SCALE

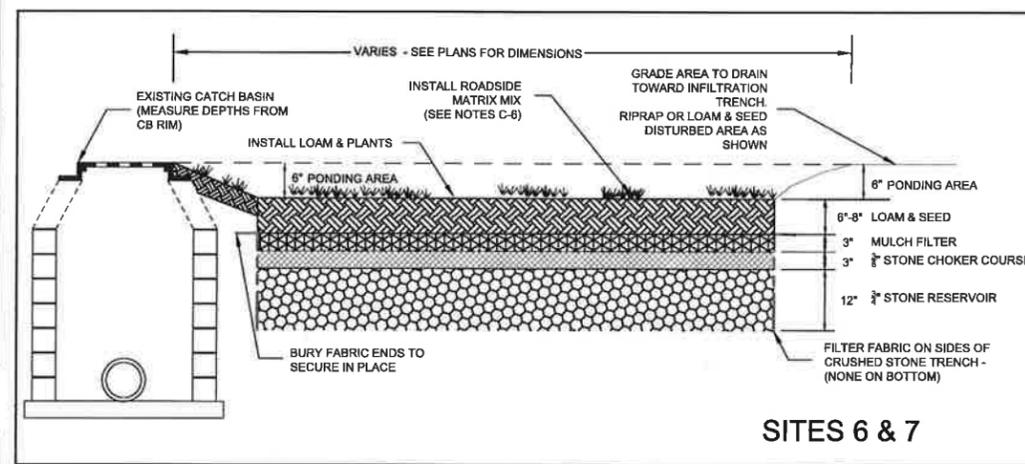
SITES 10 & 10B RAIN GARDEN PROJECT OVERVIEWS



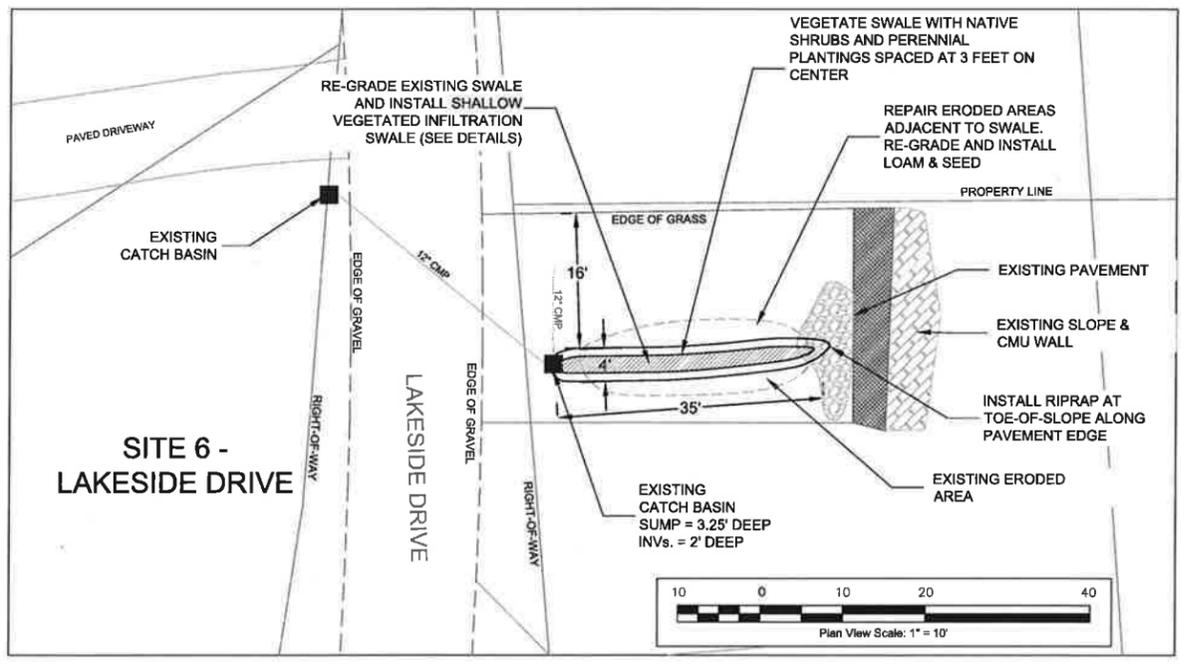
SITE 7 - PLUNGE POOL & INFILTRATION SWALE



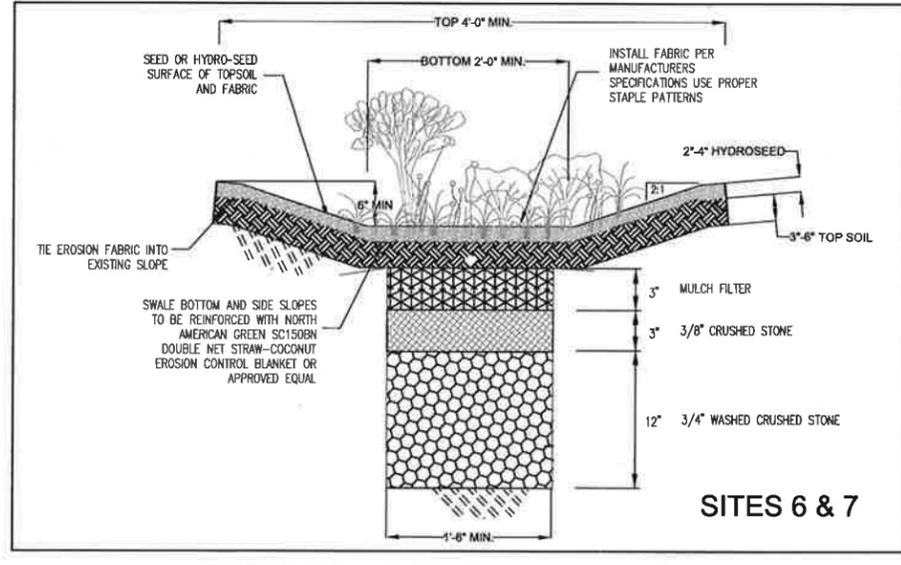
PLUNGE POOL TYP. DETAIL



VEGETATED INFILTRATION SWALE - SIDE VIEW



SITE 6 - VEGETATED INFILTRATION SWALE



VEGETATED INFILTRATION SWALE - SECTION

- General Notes
1. DRAWINGS BASED ON STATE OF NEW HAMPSHIRE GRANIT GIS LAYER INFORMATION FOR THE TOWN OF MERRIMACK. GIS LAYERS PROVIDED BY THE TOWN OF MERRIMACK AND CEI FIELD INVESTIGATIONS CONDUCTED IN SEPTEMBER 2011.
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 4. EROSION CONTROL SUCH AS SILT FENCE AND/OR HAY BALES SHALL BE INSTALLED TO PREVENT SEDIMENT FROM ENTERING BABOOSIC LAKE OR ANY ADJACENT RESOURCE AREAS.



FOR CONSTRUCTION

No.	Revision/Issue	Date
1	BLA COMMENTS	10/11/11

COMPREHENSIVE ENVIRONMENTAL INCORPORATED
 21 DEPOT STREET
 MERRIMACK, NH 03054

JEBB RD. & LAKESIDE DR. STORMWATER BMPs
 THE BABOOSIC LAKE ASSOCIATION
 MR. GREG GENDRON
 13 CLARK ISLAND ROAD
 AMHERST, NH 03091

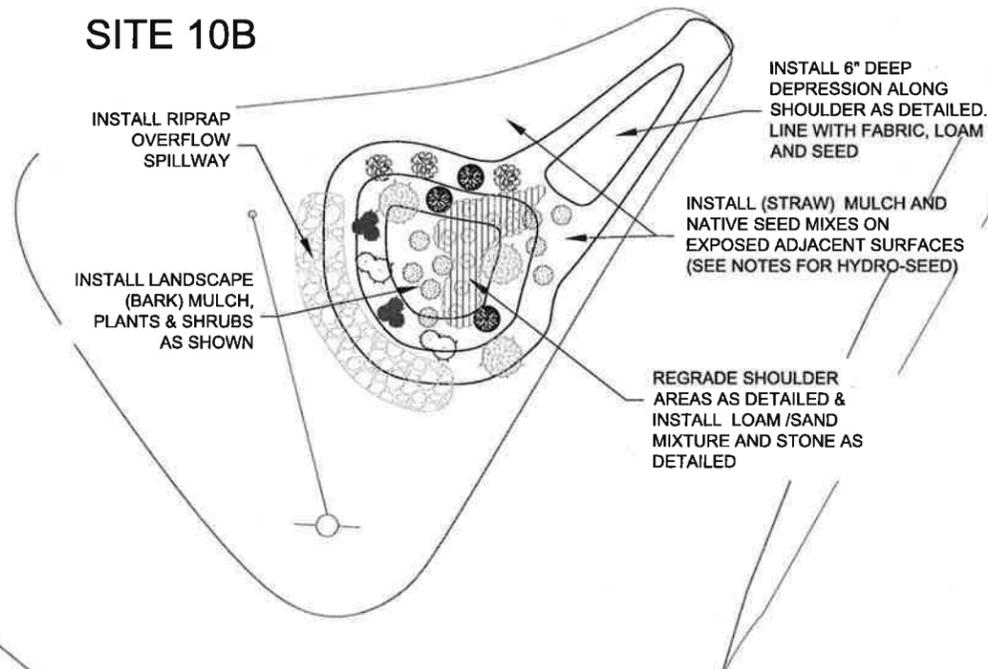
Project: NO. 281-1 Date: OCT 2011	Sheet: C-2
Designed by: SS Checked by: ML	
Scale: As Shown	

NOTE:
USE THE FOLLOWING PLANTS/SHRUBS
FOR LANDSCAPED RAIN GARDEN & SWALE AREAS

PLANT NAME	SIZE	SYMBOL
WINTERBERRY HOLLY	2'-3'	
BLUEFLAG IRIS	6"-1'	
HIGHBUSH CRANBERRY	2'-3'	
HIGHBUSH BLUEBERRY	2'-3'	
SPICEBUSH	2'-3'	
GOLDEN ALEXANDER	6"-1'	
FOTHERGILLA	6"-1'	

RAINGARDEN PLANT LISTING

SITE 10B



APPROX. 24" DIA.

INSTALL (STRAW) MULCH AND NATIVE SEED MIXES ON EXPOSED ADJACENT SURFACES (SEE NOTES FOR HYDRO-SEED)

INSTALL LANDSCAPE (BARK) MULCH, PLANTS & SHRUBS AS SHOWN

SITE 10

INSTALL 6" DEEP DEPRESSION ALONG SHOULDER AS DETAILED. LINE WITH FABRIC, LOAM AND SEED

APPROX. 18" DIA.

REGRADE SHOULDER AREAS AS DETAILED & INSTALL LOAM/SAND MIXTURE AND STONE AS DETAILED

VEGETATIVE SUPPORT MATERIAL

1. VEGETATIVE SUPPORT MATERIAL FOR RAIN GARDENS AND BUFFER AREAS SHALL BE REASONABLY FREE OF STUMPS, ROOTS, AND HEAVY OR STIFF CLAY, STONES LARGER THAN 2-INCHES IN DIAMETER, LUMPS, COARSE SAND, NOXIOUS WEEDS, STICKS, BRUSH OR OTHER LITTER. IT SHALL BE COMPOSED OF THE FOLLOWING PERCENTAGES OF MATERIALS:

LOAM	50%
SAND	50%

LOAM

2. LOAM SHALL CONSIST OF LOOSE FRIABLE TOPSOIL WITH NO ADMIXTURE OF REFUSE OR MATERIAL TOXIC TO PLANT GROWTH. LOAM SHALL BE GENERALLY FREE FROM STONES, LUMPS, STUMPS, OR SIMILAR OBJECTS LARGER THAN 50 MM (2 IN) IN GREATEST DIAMETER, SUBSOIL, ROOTS, AND WEEDS. THE TERM AS USED HEREIN SHALL MEAN THAT PORTION OF THE SOIL PROFILE DEFINED TECHNICALLY AS THE "A" HORIZON BY THE SOIL SCIENCE SOCIETY OF AMERICA. THE MINIMUM AND MAXIMUM PH VALUE SHALL BE FROM 5.5 TO 7.6. LOAM SHALL CONTAIN A MINIMUM OF 3 PERCENT AND A MAXIMUM OF 10 PERCENT OF ORGANIC MATTER AS DETERMINED BY LOSS BY IGNITION. NOT MORE THAN 65 PERCENT SHALL PASS A 0.075 MM (NO. 200) SIEVE AS DETERMINED BY THE WASH TEST IN ACCORDANCE WITH ASTM D 1140. IN NO INSTANCE SHALL MORE THAN 20% OF THAT MATERIAL PASSING THE 4.75 MM (NO. 4) SIEVE CONSIST OF CLAY SIZE PARTICLES.

SAND

3. SAND SHALL CONSIST OF BANK RUN SAND CONFORMING TO THE FOLLOWING REQUIREMENTS DETERMINED BY ASTM D422:

SIEVE OPENING	PERCENT PASSING WEIGHT
1-INCH	100
1/2-INCH	50-100
NO.20	20-95
NO.50	10-60
NO.200	0-8

INSTALLATION

- THE VEGETATIVE SUPPORT MATERIAL SHALL BE MIXED, HAULED, DEPOSITED, SPREAD, COMPACTED AND RAKED TO A TOTAL DEPTH AND TO THE LINES AND GRADES SHOWN ON THE PLANS OR AS DIRECTED BY THE ENGINEER. THE VEGETATIVE SUPPORT MATERIAL SHALL BE PLACED IN 6" LIFTS.
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- DURING HAULING OPERATIONS, ALL PUBLIC AND PRIVATE ROADWAY SURFACES SHALL BE KEPT CLEAN AND ANY TOPSOIL OR OTHER DIRT, WHICH MAY BE BROUGHT UPON THE SURFACE, SHALL BE REMOVED PROMPTLY AND THOROUGHLY BEFORE IT BECOMES COMPACTED BY TRAFFIC. IF NECESSARY, THE WHEELS OF ALL VEHICLES USED FOR HAULING SHALL BE CLEANED FREQUENTLY AND KEPT CLEAN TO AVOID BRINGING ANY DIRT UPON THE SURFACE.

VEGETATION NOTES:

1. ALL PLANTS AND SHRUBS USED FOR RAIN GARDENS SHALL BE INSTALLED AT LOCATIONS AS SHOWN ON THESE PLANS. TYPICAL SPACING FOR LARGE SHRUBS SHALL BE 4-5 FEET AND SPACING FOR SMALLER PLANTS SHALL BE 1-2 FEET. APPROVED EQUALS FOR PLANT TYPES SHALL BE USED IN ACCORDANCE WITH ENGINEER'S RECOMMENDATIONS.

2. WINTERBERRY HOLLY SHALL BE INSTALLED WITH A MIX OF BOTH FEMALE AND MALE SPECIES AT ALL SITES TO ENSURE BERRY PRODUCTION.

3. ROADSIDE SWALES AND DRAINAGE CHANNELS SHALL BE COVERED WITH LOAM AND SEEDED WITH NEW ENGLAND ROADSIDE MATRIX UPLAND SEED MIX BY NEW ENGLAND WETLAND PLANTS OR APPROVED EQUAL.

4. ALL ADJACENT DISTURBED AREAS SHALL BE REPAIRED TO PRE-CONSTRUCTION CONDITIONS AND SEEDED WITH A FAST GROWING NATIVE TEMPORARY COVER CROP SEED MIX.

5. IF HYDRO-SEED IS TO BE USED, IT SHALL CONTAIN NO PHOSPHORUS OR BE A SLOW RELEASE PHOSPHORUS BRAND.

MATERIAL NOTES:

1. EROSION CONTROL FABRIC FOR CHANNEL LINING AND STREAM BANK RESTORATION SHALL BE SC150BN EROSION FABRIC BY NORTH AMERICAN GREEN OR APPROVED EQUAL.

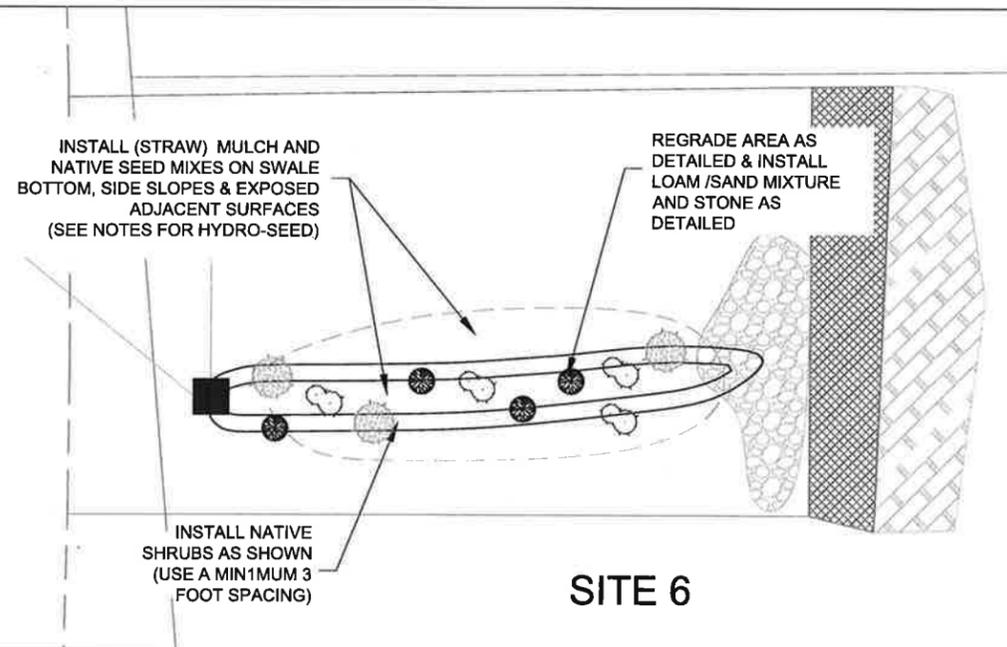
2. NON-WOVEN GEO-TEXTILE FABRIC SHALL BE PLACED ON THE SIDES OF ALL INFILTRATION DEVICES AND UNDER RIPRAP LINED AREAS AS SHOWN ON THESE PLANS. FILTER FABRIC SHALL BE MIRAFI 140N OR APPROVED EQUAL.

3. CRUSHED STONE USED FOR INFILTRATION AREAS SHALL BE WASHED ANGULAR CRUSHED STONE FREE OF ORGANIC MATERIAL AND DEBRIS. RESERVOIR STONE FOR INFILTRATION AREAS SHALL HAVE A MAXIMUM STONE SIZE OF 3/4 INCH DIAMETER AND CHOKER COURSE STONE FOR INFILTRATION AREAS SHALL HAVE A MAXIMUM STONE SIZE OF 3/8 INCH DIAMETER.

4. RIPRAP STONE FOR FOREBAYS, ROADSIDE SWALES, PLUNGE POOLS AND CHECK DAMS SHALL BE HARD, DURABLE, IRREGULAR IN SHAPE, RESISTANT TO WEATHERING AND SHALL MEET THE GRADATION REQUIREMENTS THAT MEET THE APPROVAL OF THE ENGINEER. STONE SHALL BE FREE FROM OVERBURDEN, SPOIL, SHALE, AND ORGANIC MATERIAL.

5. MULCH USED IN RAIN GARDENS SHALL BE A WOOD FIBER BARK MULCH PRODUCED FROM HARD WOOD THAT HAS BEEN RUN THROUGH MECHANICAL CHIPPER OR HAMMERMILL. BARK MULCH SHALL BE FREE OF MOLD, DIRT, SAWDUST AND FOREIGN MATERIALS.

6. LANDSCAPE MULCH USED IN ROADSIDE CHANNELS, SHOULDERS AND ADJACENT EXPOSED AREAS SHALL BE STRAW MULCH MADE FROM WHEAT, OATS OR OTHER SMALL GRAIN SPECIES. STRAW MULCH SHALL BE FREE OF MOLD, DIRT AND OTHER FOREIGN MATERIALS.



General Notes

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2. THE LOCATION OF UNDERGROUND UTILITIES HAVE NOT BEEN VERIFIED OR INSPECTED. THE BLA, PRIOR TO COMMENCEMENT OF CONSTRUCTION, SHALL VERIFY THE LOCATION OF ALL UTILITIES AND CONTACT "DIG-SAFE" AT 1-888-344-7233.

3. ANY CHANGE IN FIELD CONDITIONS SHALL BE REPORTED TO THE ENGINEER TO INSURE THAT ANY MODIFICATIONS TO THE ORIGINAL DESIGN ARE PROPER AND ADEQUATE TO SERVE THE PROJECT'S NEEDS AND COMPLY WITH THE APPLICABLE STANDARDS AND REGULATIONS.

4. EROSION CONTROL SUCH AS SILT FENCE AND/OR HAY BALES SHALL BE INSTALLED TO PREVENT SEDIMENT FROM ENTERING BARBOOSIC LAKE OR ANY ADJACENT RESOURCE AREAS.



FOR CONSTRUCTION

2	DES COMMENTS	10/13/11
1	BLA COMMENTS	10/11/11
No.	Revision/Issue	Date



PLANTING PLAN & MATERIAL NOTES

THE BARBOOSIC LAKE ASSOCIATION
MR. GREG GENDRON
13 CLARK ISLAND ROAD
AMHERST, NH 03031

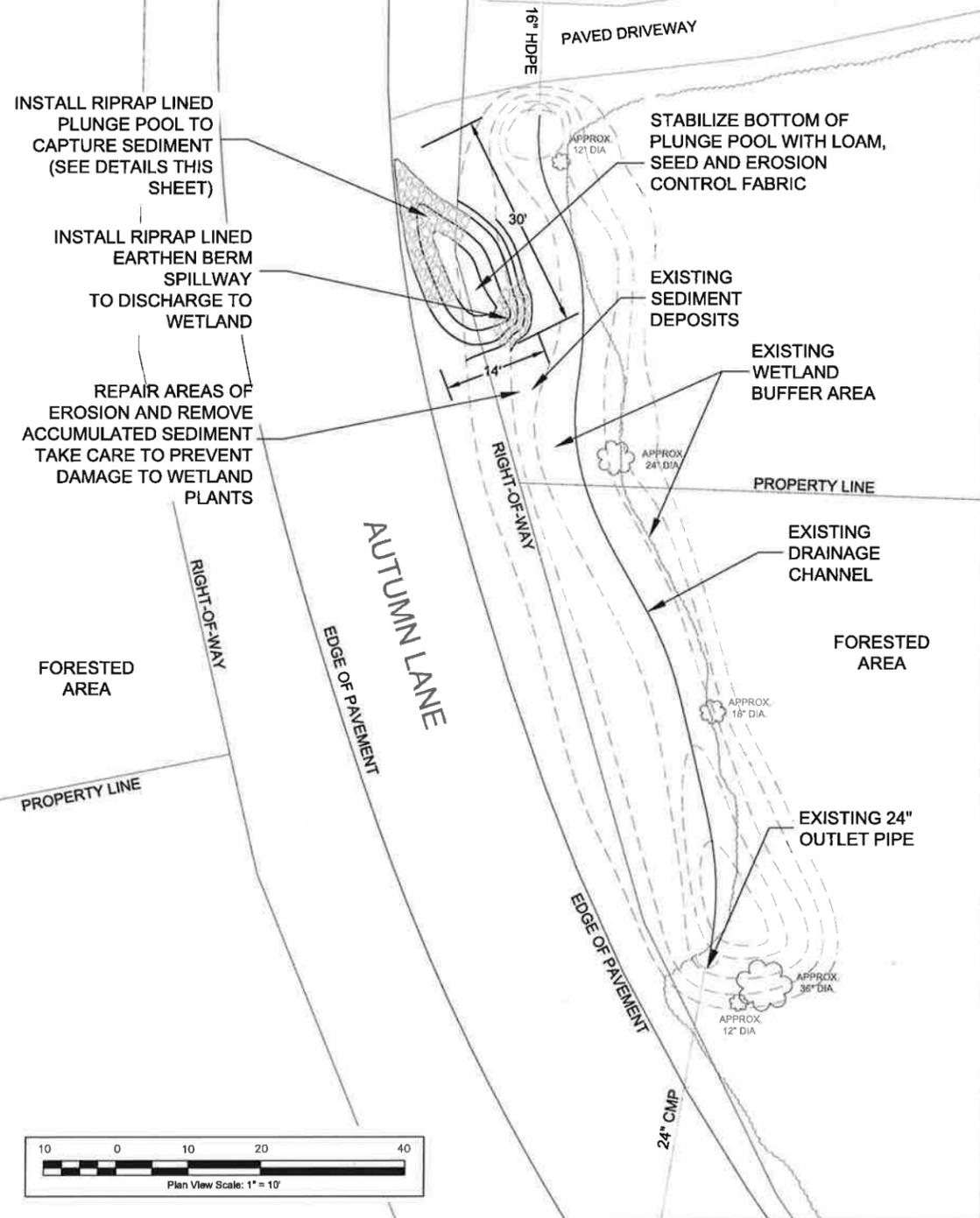
Project: NO. 281-1
Date: OCT 2011
Designed by: SS
Checked by: ML
Scale: As Shown

Sheet:

C-3



**SITE 13A -
AUTUMN LANE**



INSTALL RIPRAP LINED
PLUNGE POOL TO
CAPTURE SEDIMENT
(SEE DETAILS THIS
SHEET)

INSTALL RIPRAP LINED
EARTHEN BERM
SPILLWAY
TO DISCHARGE TO
WETLAND

REPAIR AREAS OF
EROSION AND REMOVE
ACCUMULATED SEDIMENT
TAKE CARE TO PREVENT
DAMAGE TO WETLAND
PLANTS

STABILIZE BOTTOM OF
PLUNGE POOL WITH LOAM,
SEED AND EROSION
CONTROL FABRIC

EXISTING
SEDIMENT
DEPOSITS

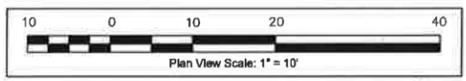
EXISTING
WETLAND
BUFFER AREA

PROPERTY LINE

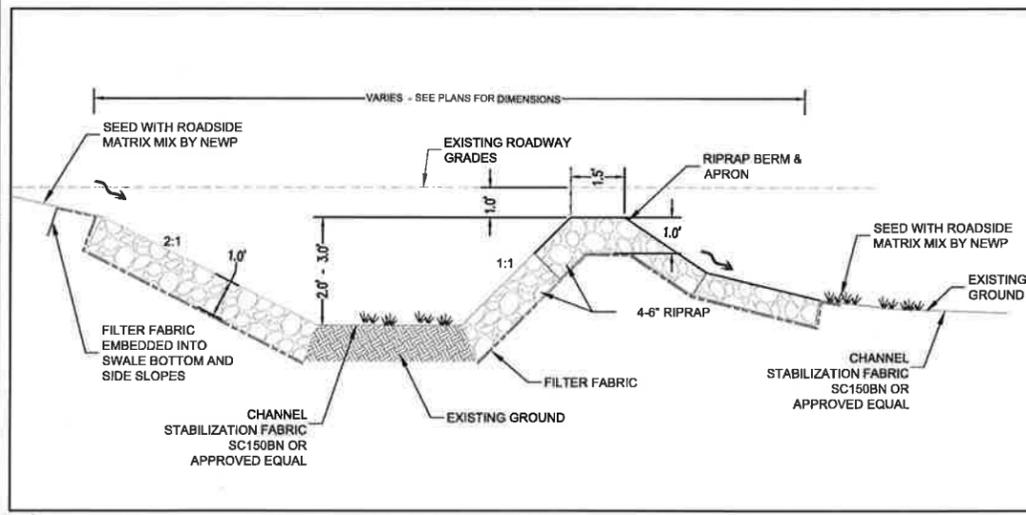
EXISTING
DRAINAGE
CHANNEL

FORESTED
AREA

EXISTING 24"
OUTLET PIPE



SITE 13A - PLUNGE POOL OVERVIEW



PLUNGE POOL & OVERFLOW BERM TYP. DETAIL
NOT TO SCALE

General Notes

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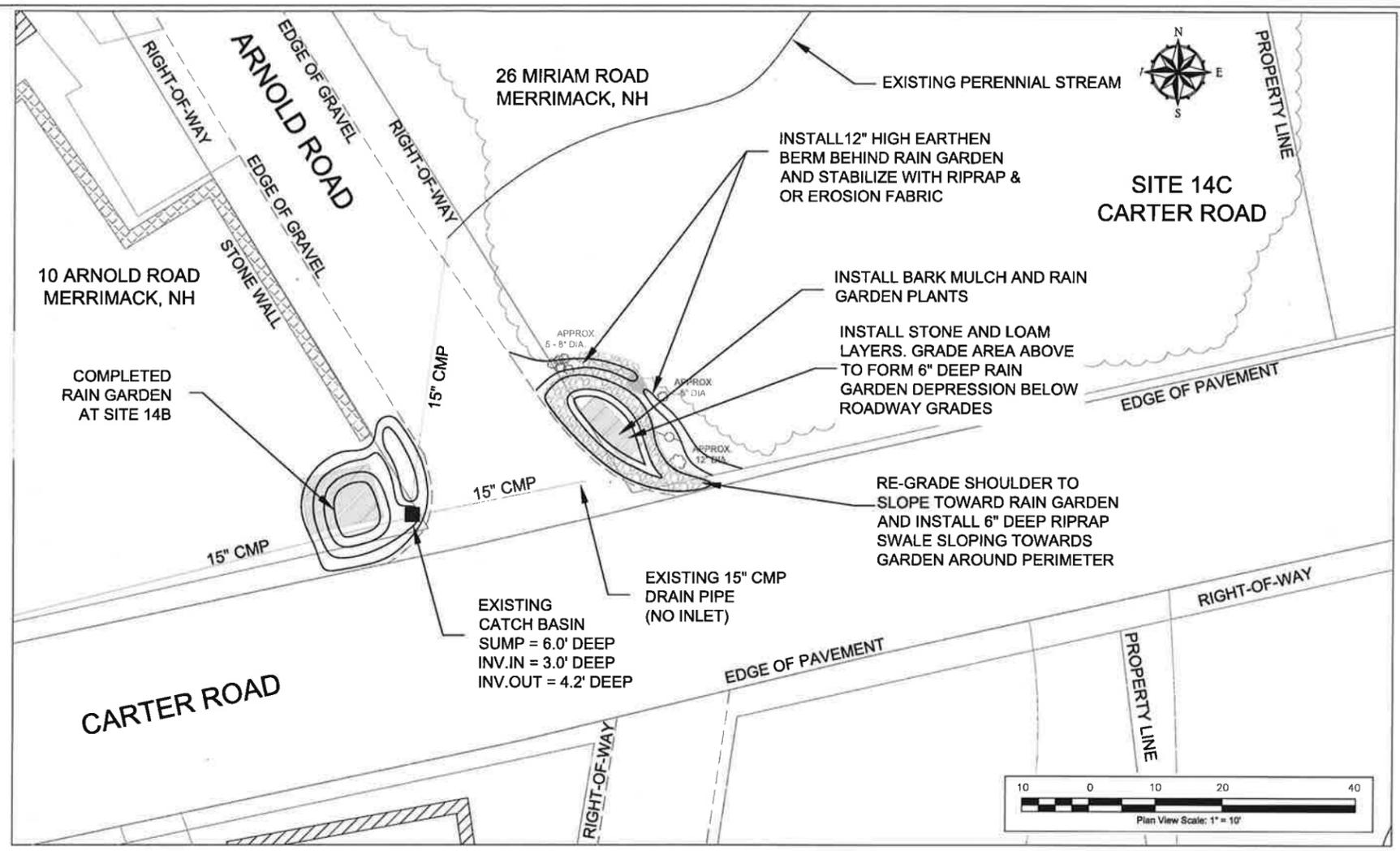
FOR CONSTRUCTION

No.	Revision/Issue	Date
1	BLA COMMENTS	10/11/11

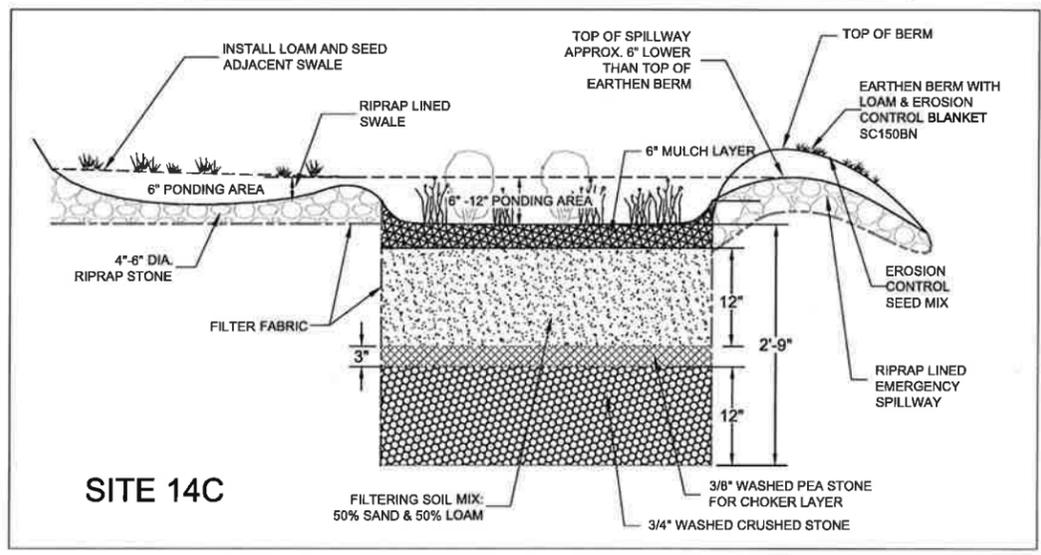
COMPREHENSIVE ENVIRONMENTAL INCORPORATED
21 DEPOT STREET
MERRIMACK, NH 03054

**AUTUMN LANE
PLUNGE POOL**
THE BABOOSIC LAKE ASSOCIATION
MR. GREG GENDRON
13 CLARK ISLAND ROAD
AMHERST, NH 03031

Project: NO. 281-1	Sheet:
Date: OCT 2011	C-4
Designed by: SS	
Checked by: ML	
Scale: As Shown	



SITE 14C - RAIN GARDEN OVERVIEW



RAIN GARDEN WITH RIPRAP OVERFLOW TYP. DETAIL

NOT TO SCALE

General Notes

1. DRAWINGS BASED ON STATE OF NEW HAMPSHIRE GRANIT GIS LAYER INFORMATION FOR THE TOWN OF MERRIMACK. GIS LAYERS PROVIDED BY THE TOWN OF MERRIMACK AND CEI FIELD INVESTIGATIONS CONDUCTED IN SEPTEMBER 2011.
2. THE LOCATION OF UNDERGROUND UTILITIES HAVE NOT BEEN VERIFIED OR INSPECTED. THE BLA, PRIOR TO COMMENCEMENT OF CONSTRUCTION, SHALL VERIFY THE LOCATION OF ALL UTILITIES AND CONTACT "DIG-SAFE" AT 1-888-344-7233.
3. ANY CHANGE IN FIELD CONDITIONS SHALL BE REPORTED TO THE ENGINEER TO INSURE THAT ANY MODIFICATIONS TO THE ORIGINAL DESIGN ARE PROPER AND ADEQUATE TO SERVE THE PROJECT'S NEEDS AND COMPLY WITH THE APPLICABLE STANDARDS AND REGULATIONS.
4. EROSION CONTROL SUCH AS SILT FENCE AND/OR HAY BALES SHALL BE INSTALLED TO PREVENT SEDIMENT FROM ENTERING BABOOSIC LAKE OR ANY ADJACENT RESOURCE AREAS.



FOR CONSTRUCTION

No.	Revision/Issue	Date
1	BLA COMMENTS	10/11/11

COMPREHENSIVE ENVIRONMENTAL INCORPORATED
 21 DEPOT STREET
 MERRIMACK, NH 03054

CARTER RD RAIN GARDEN
 THE BABOOSIC LAKE ASSOCIATION
 MR. GREG GENDRON
 13 CLARK ISLAND ROAD
 AMHERST, NH 03031

Project: NO. 281-1	Sheet:
Date: SEPT 2011	C-5
Designed by: SS Checked by: ML	
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