

CUMMINGS BEACH WATER QUALITY IMPROVEMENT PROJECT

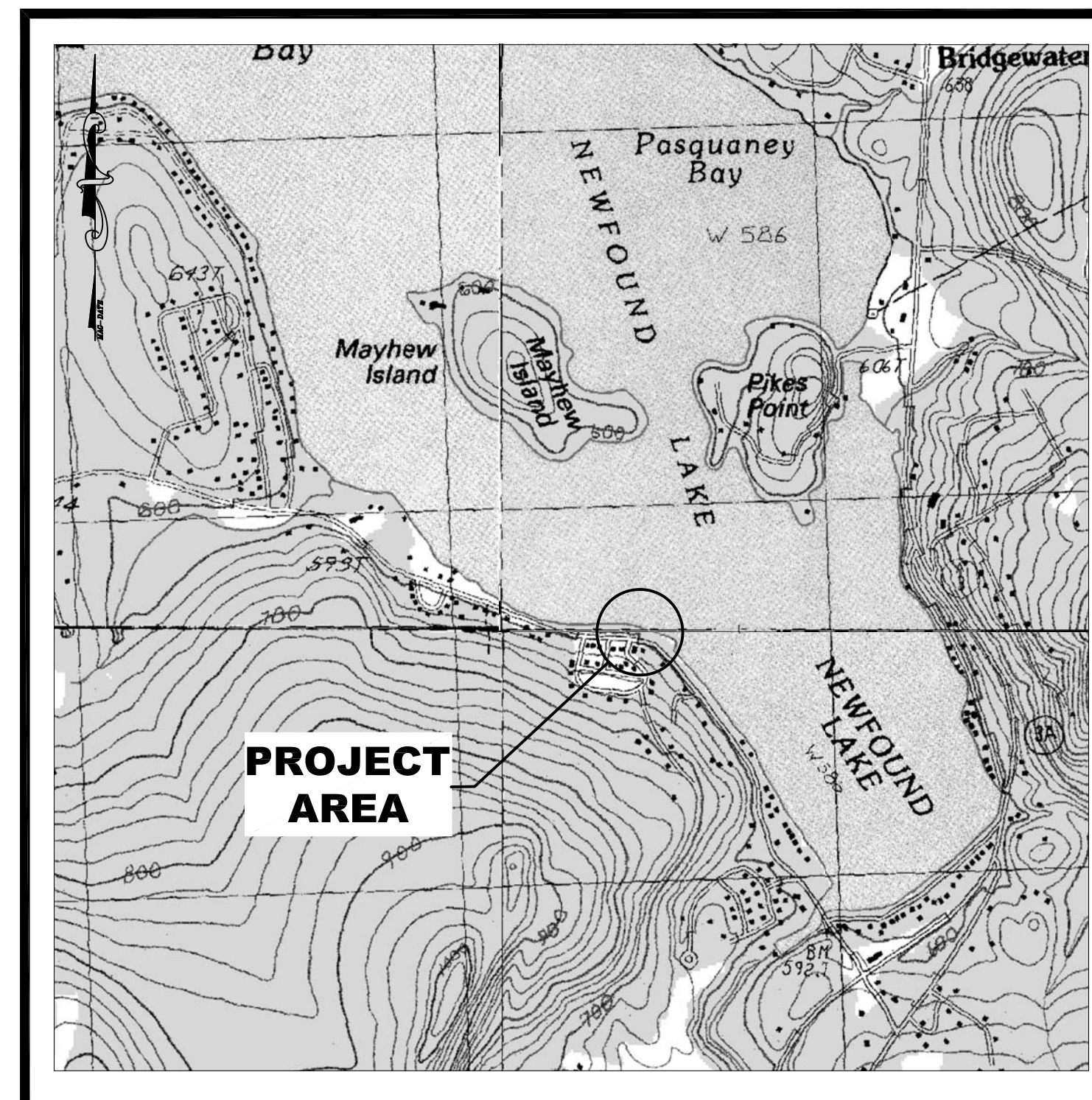
TOWN OF BRISTOL, NEW HAMPSHIRE

PREPARED FOR THE

NEWFOUND LAKE REGION ASSOCIATION

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Locus Map

Not to Scale

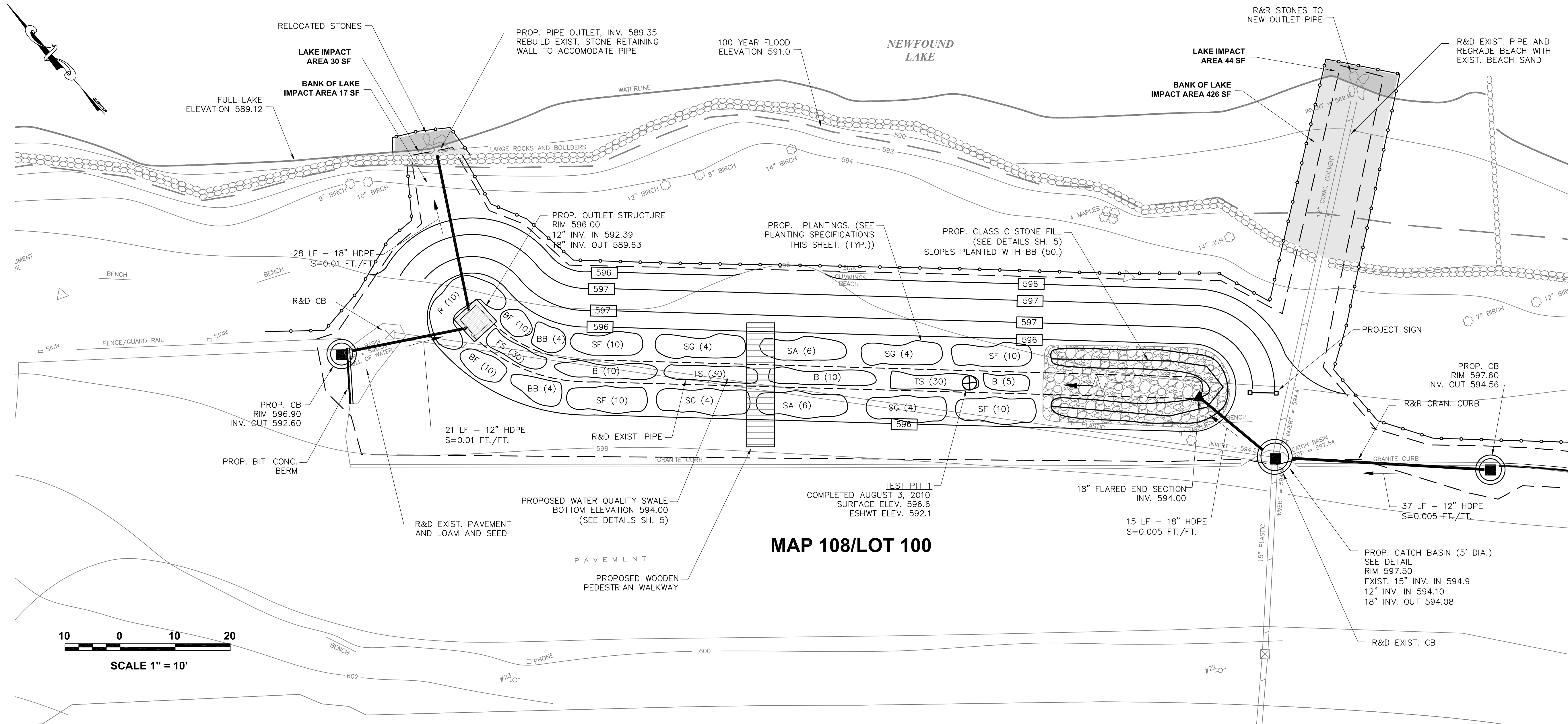
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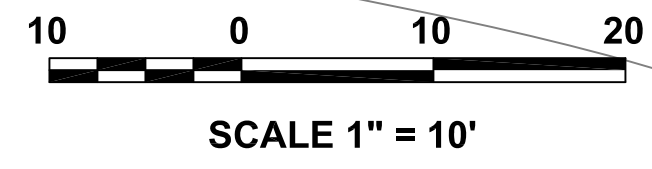
8-9-10

***KVP*Partners LLC**

P.O. Box 898
Manchester, NH 03105



SEE SHEET 4 FOR CONTINUATION

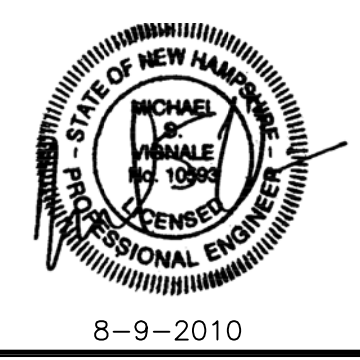


MAP 108/LOT 100

WEST SHORE ROAD

PLANT SPECIFICATIONS			
NAME	SIZE	QTY.	LABEL
Plants			
Blue Flags <i>Iris versicolor</i>	#2	20	BF
Rudbeckia	#2	10	R
Fox Sedge <i>Carax vulpinoidea</i>	2" plugs	30	FS
Bearberry <i>Arctostaphylos-uva-ursi</i>	#1	62	BB
Sweet Fern <i>Comptonia perigrina</i>	#1	40	SF
Boneset <i>Eupatorium perfoliatum</i>	2" plugs	25	B
Tussock sage <i>Carex stricta</i>	2" plugs	60	TS
Sweet Gale <i>Myrica gale</i>	#2	12	SG
Swamp azalea <i>Rhododendron viscosum</i>	2'-3'	12	SA
New England wild Flower Mix	23 lb/acre	12	VFM

REVISIONS			
NUMBER	DATE	BY	DESCRIPTION



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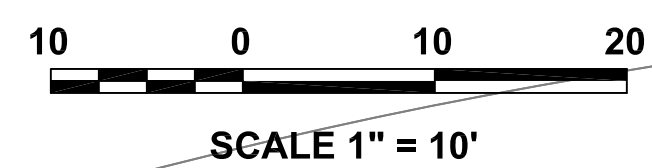
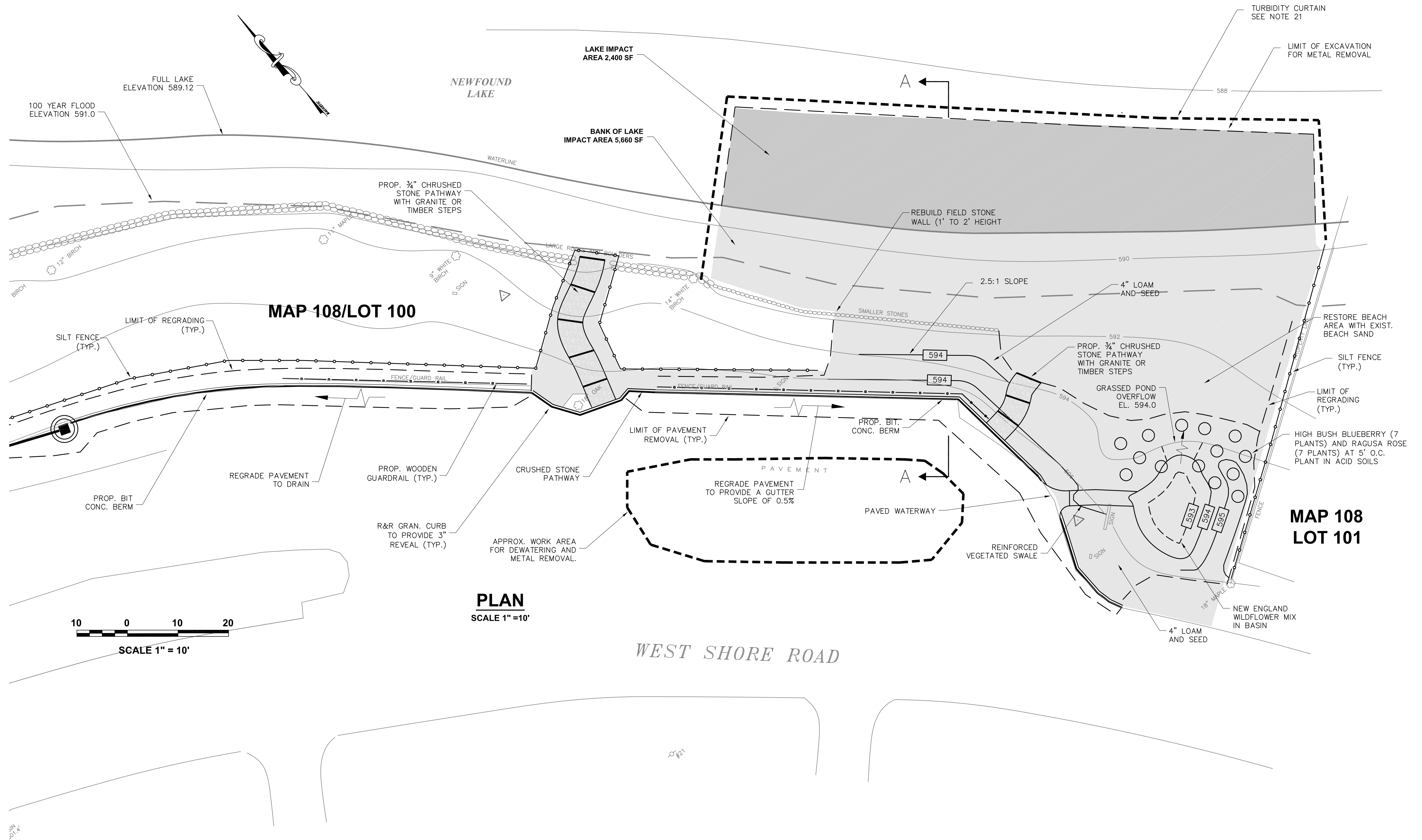
SCALE AS NOTED

DESIGNED BY:	MSV
DRAWN BY:	MSV
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CUMMINGS BEACH WATER QUALITY IMPROVEMENT PROJECT
 BRISTOL, NEW HAMPSHIRE
CONSTRUCTION PLAN 1

SHEET NO.
3
 AUGUST 2010

SEE SHEET 3 FOR CONTINUATION



PLAN
SCALE 1" = 10'

WEST SHORE ROAD

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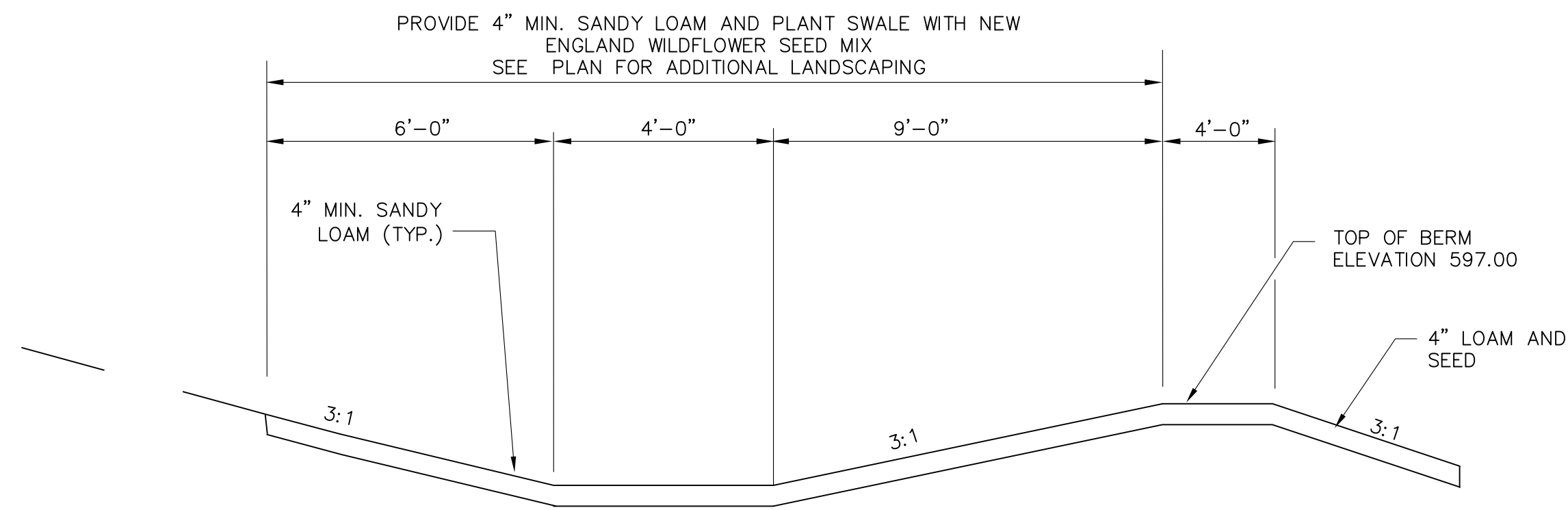
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**CUMMINGS BEACH WATER
QUALITY IMPROVEMENT PROJECT**
BRISTOL, NEW HAMPSHIRE
CONSTRUCTION PLAN 2

SHEET NO.
4
AUGUST 2010



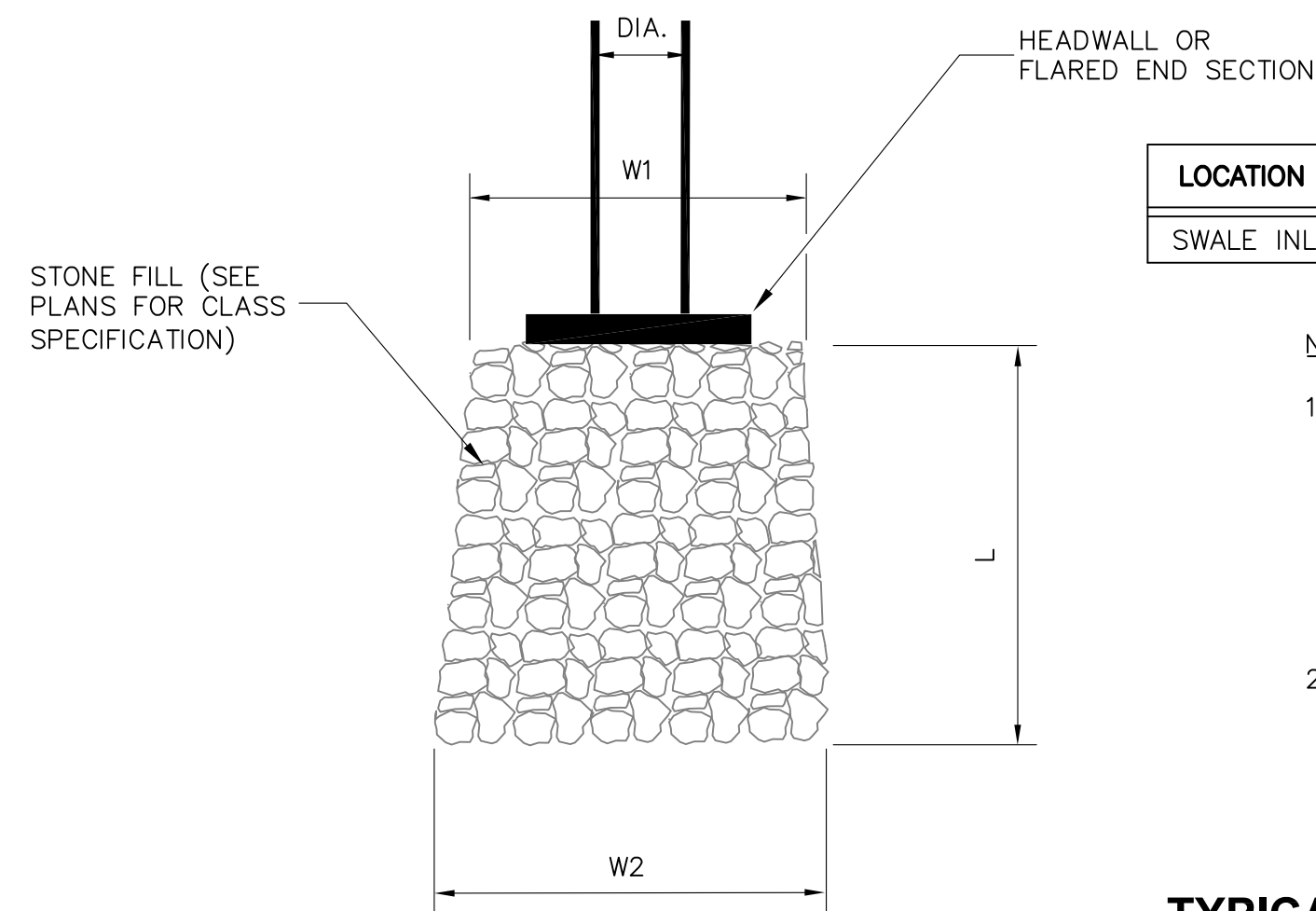
WATER QUALITY SWALE DETAIL
NOT TO SCALE

WATER QUALITY SWALE NOTES

1. THE BASE AREA SHALL BE CLEANED OF ALL TREES, LOGS, ROOTS, BRUSH, BOULDERS, LOAM AND ORGANIC MATERIALS. BASE AREAS SHALL BE FREE OF STANDING WATER WHEN CONSTRUCTION OPERATIONS ARE ONGOING.
2. EMBANKMENT FILL SHALL BE FREE OF SIGNIFICANT AMOUNT OF SOD, ROOTS, LARGE STONES IN EXCESS OF 6", AND ANY OTHER MATERIAL THAT MIGHT COMPROMISE THE INTEGRITY OF THE EMBANKMENT FILL AREA. FILL MATERIALS SHALL BE PLACED IN 12" THICK LAYERS AND COMPACTED WITH A VIBRATORY COMPACTOR SUITABLE OF ACCOMPLISHING 92% COMPACTION.
3. THE DISTRIBUTION AND GRADATION OF FILL MATERIALS SHALL BE SUCH THAT MATERIALS DO NOT BECOME SEGREGATED INTO SIMILAR SIZED MATERIALS WHICH MAY CAUSE PIPING THROUGH THE EMBANKMENT OR LIMIT THE SUCCESS OF COMPACTION OPERATIONS.
4. LOAMING, SEEDING AND FERTILIZING SHALL BE IN ACCORDANCE WITH THE SEEDING SPECIFICATIONS CONTAINED HEREIN AND WITH THE OVERALL PROJECT SPECIFICATIONS.
5. PRIOR TO CONSTRUCTION, CONTRACTOR SHALL VERIFY EXISTING GROUND AND INVERT ELEVATIONS. COORDINATE FINAL ELEVATIONS WITH THE ENGINEER.

MAINTENANCE REQUIREMENTS

1. THE WATER QUALITY SWALE EMBANKMENT SHALL BE INSPECTED ANNUALLY TO DETERMINE IF RODENT BURROWS, ROOTS, EROSION OR WET AREAS HAVE COMPROMISED THE INTEGRITY OF THE EMBANKMENT.
2. VEGETATION SHOULD BE PROTECTED FROM FIRE, GRAZING, TRAFFIC AND EXCESSIVE WEED GROWTH. FERTILIZER AND LIME SHALL BE APPLIED, AS REQUIRED, BASED ON SOIL TESTING.
3. THE OUTLET STRUCTURE SHALL BE CHECKED REGULARLY FOR CLOGGING AND SHALL BE CLEANED AND REPAIRED AS NECESSARY. INSPECTIONS SHOULD BE COMPLETED ANNUALLY OR AFTER A LARGE RAINFALL EVENT.
4. POND VEGETATION NEEDS TO BE TRIMMED OR HARVESTED, AS APPROPRIATE, GRASSY AREAS MUST BE FREQUENTLY MOWED. GRASS SHOULD BE MOWED SO THAT IT DOES NOT GROW OVER 6 INCHES HIGH.
5. REMOVE SEDIMENT WHEN ACCUMULATION REACHES 6 INCHES, OR IF RE-SUSPENSION IS OBSERVED OR PROBABLE.
6. STORMWATER INLETS (CATCH BASINS, HEADWALLS, ETC.) SHALL BE INSPECTED ANNUALLY AND AFTER EACH LARGE RAINFALL EVENT. ACCUMULATED SEDIMENTS SHALL BE REMOVED, AS NECESSARY, AND ANY REPAIRS REQUIRED SHALL BE COMPLETED IMMEDIATELY.

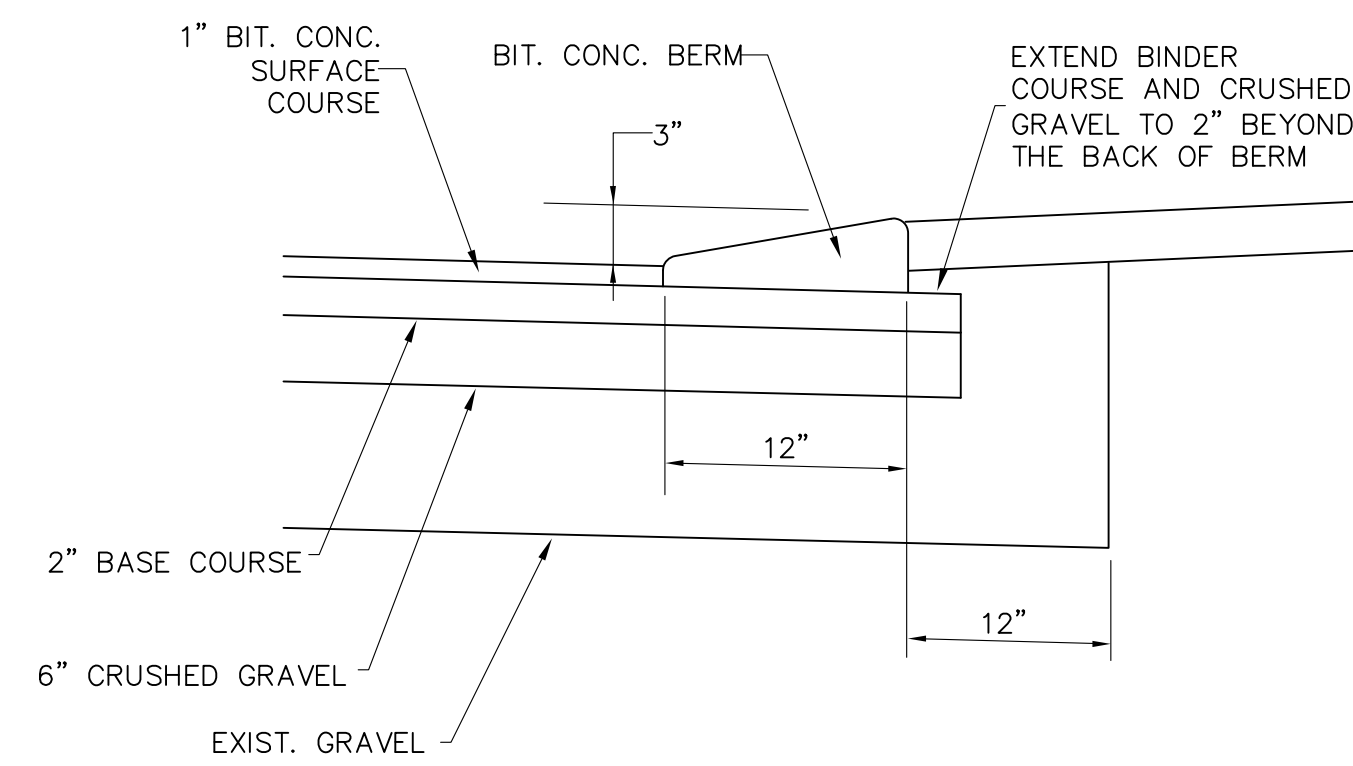


LOCATION	DIA	L	W1	W2	STONE SIZE
SWALE INLET	18"	32'	5'	14'	CLASS C

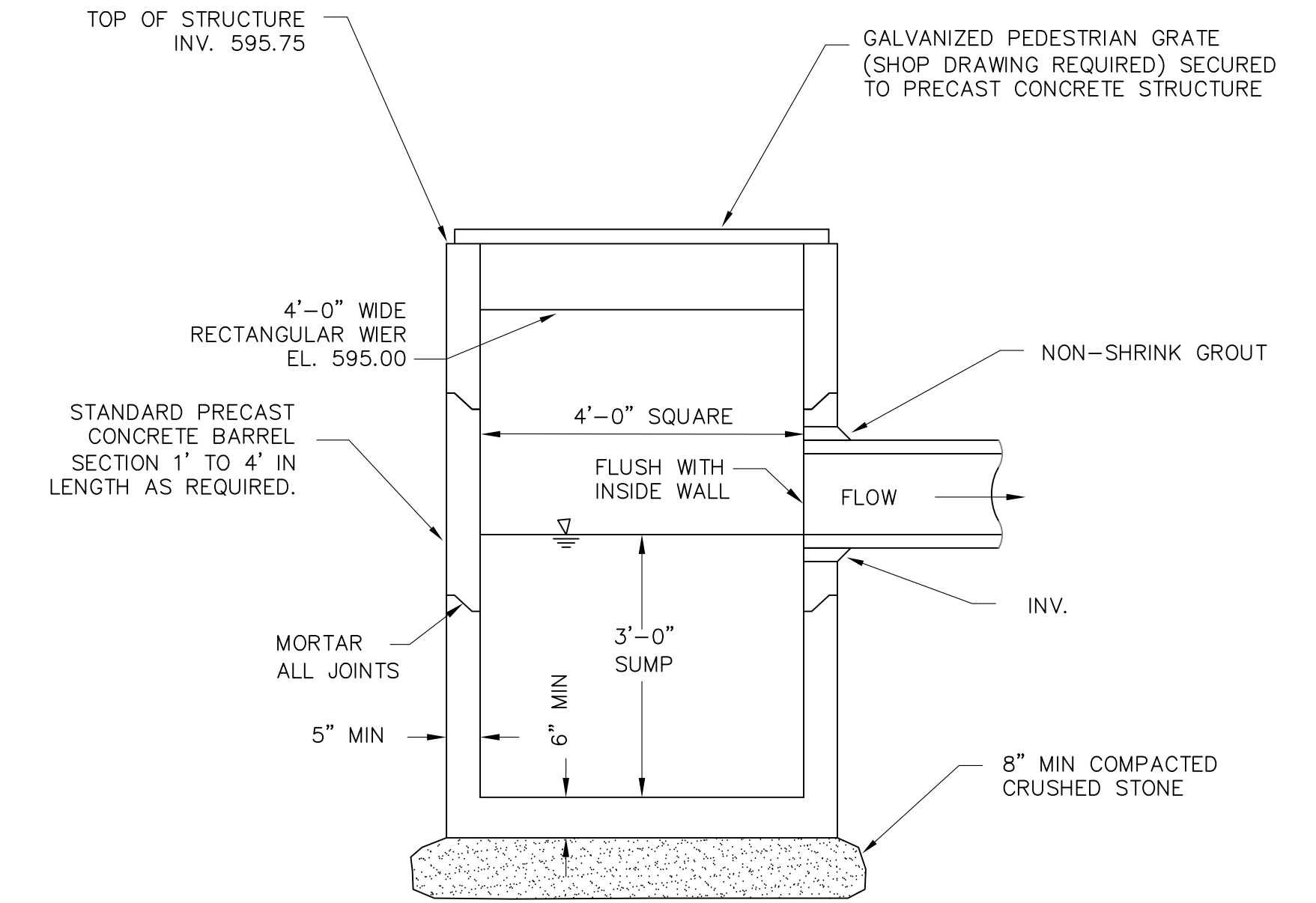
NOTES:

1. NON WOVEN FILTER FABRIC (MIRAFI 140N OR EQUAL FOR CLASS C AND MIRAFI 180N FOR CLASS B) SHALL BE PLACED ON BOTTOM OF CHANNEL ONLY ON A PREPARED SUBBASE AND ROLLS SHALL BE OVERLAPPED A MINIMUM OF 12 INCHES. CARE SHALL BE TAKEN NOT TO PUNCTURE THE FABRIC DURING INSTALLATION AND ANY DAMAGED AREAS SHALL BE REPAIRED TO THE SATISFACTION OF THE ENGINEER.
2. STONE FILL SHALL CONFORM TO NHDOT STONE SIZE CLASSIFICATIONS AND SHALL BE PLACED WITH A MINIMUM THICKNESS AS FOLLOWS:
A. CLASS C STONE FILL - MINIMUM THICKNESS 12 INCHES
B. CLASS B STONE FILL - MINIMUM THICKNESS 18 INCHES

TYPICAL STONE APRON DETAIL
NOT TO SCALE



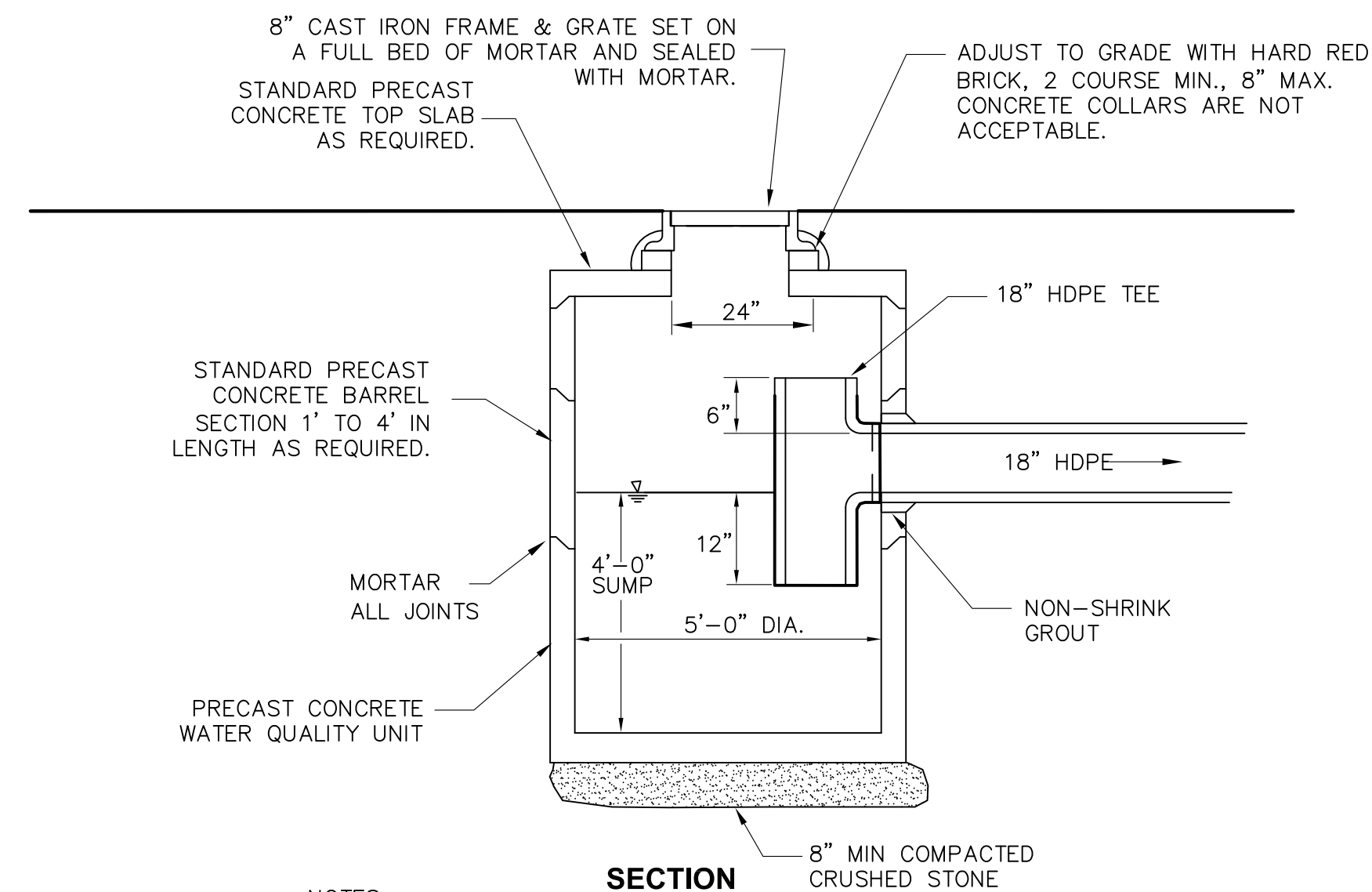
BITUMINOUS BERM DETAIL
NOT TO SCALE



NOTES:

1. PRECAST CONCRETE SECTION ASSEMBLIES SHALL WITHSTAND H-20 LOADING AND SHALL CONFORM TO ASTM C478.

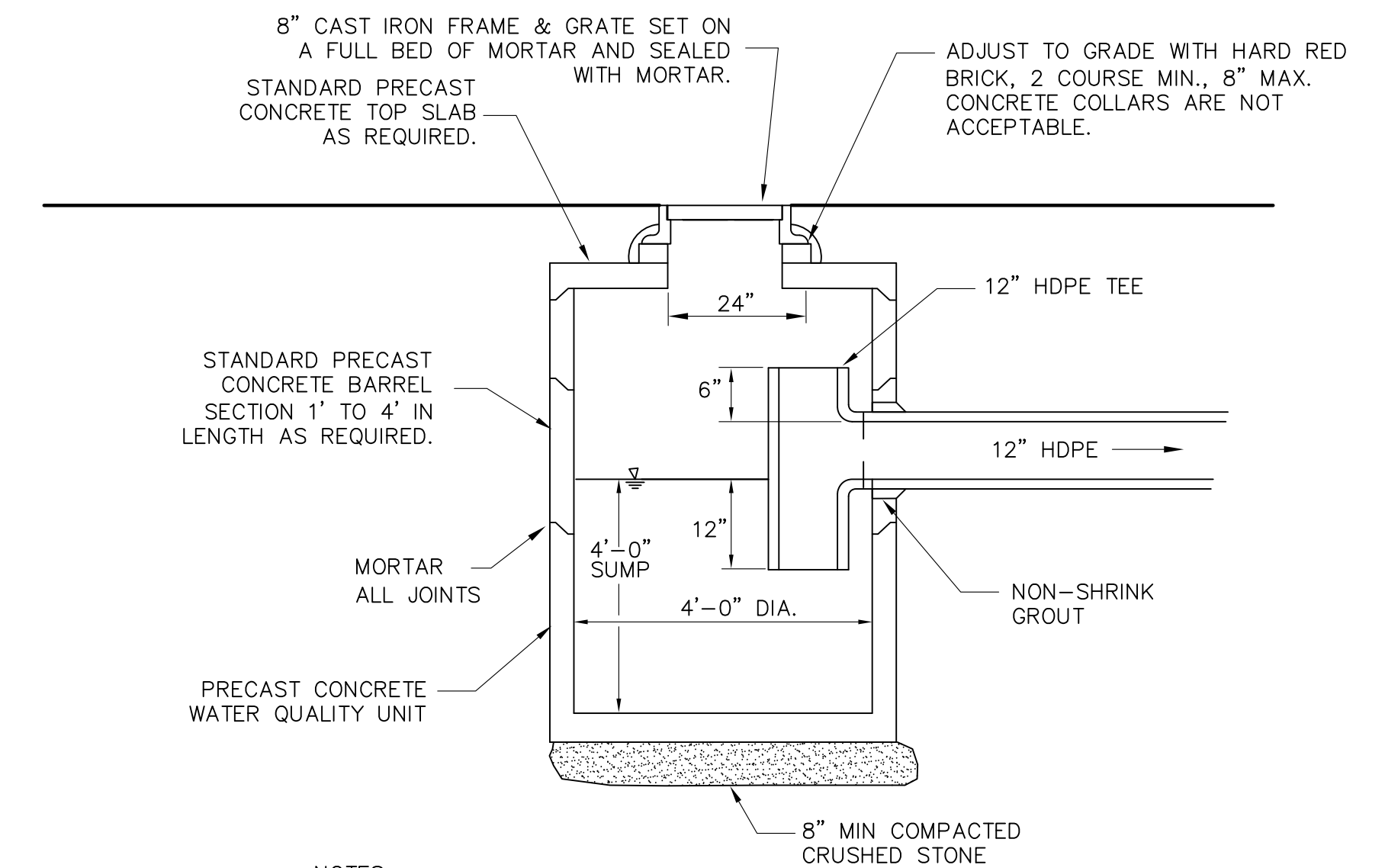
TYPICAL WATER QUALITY SWALE OUTLET STRUCTURE DETAIL
NOT TO SCALE



NOTES:

1. PRECAST CONCRETE SECTION ASSEMBLIES SHALL WITHSTAND H-20 LOADING AND SHALL CONFORM TO ASTM C478.

CATCH BASIN (5' DIA.) DETAIL
NOT TO SCALE



NOTES:

1. PRECAST CONCRETE SECTION ASSEMBLIES SHALL WITHSTAND H-20 LOADING AND SHALL CONFORM TO ASTM C478.

TYPICAL CATCH BASIN DETAIL
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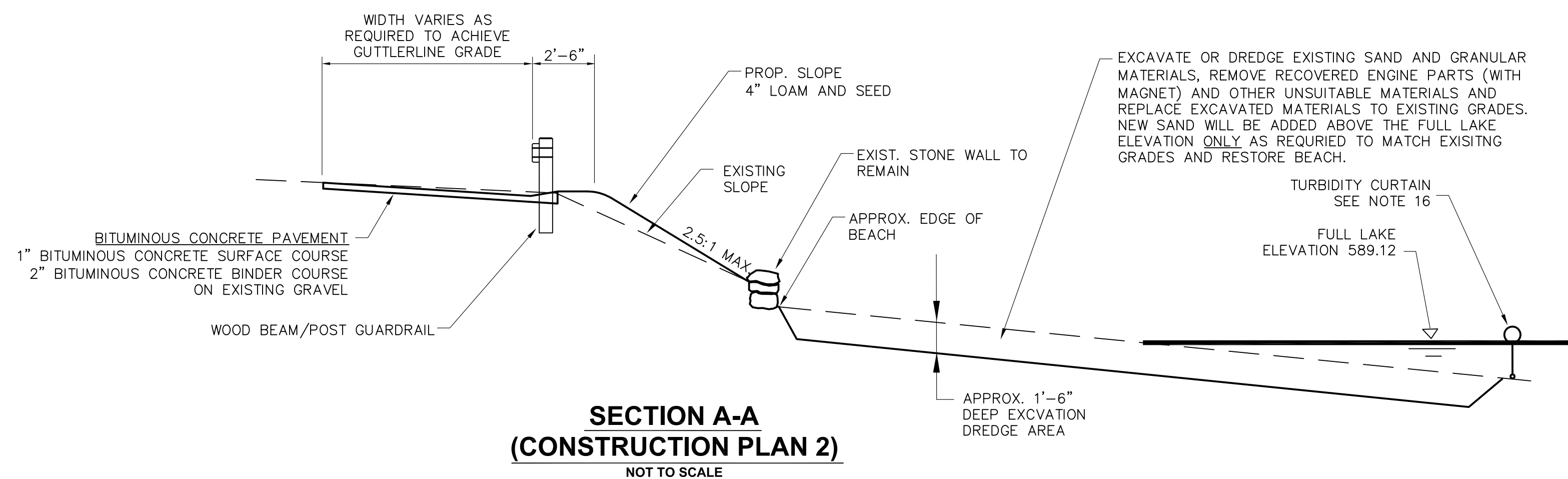
CUMMINGS BEACH WATER QUALITY IMPROVEMENT PROJECT
BRISTOL, NEW HAMPSHIRE

CONSTRUCTION DETAILS - 1

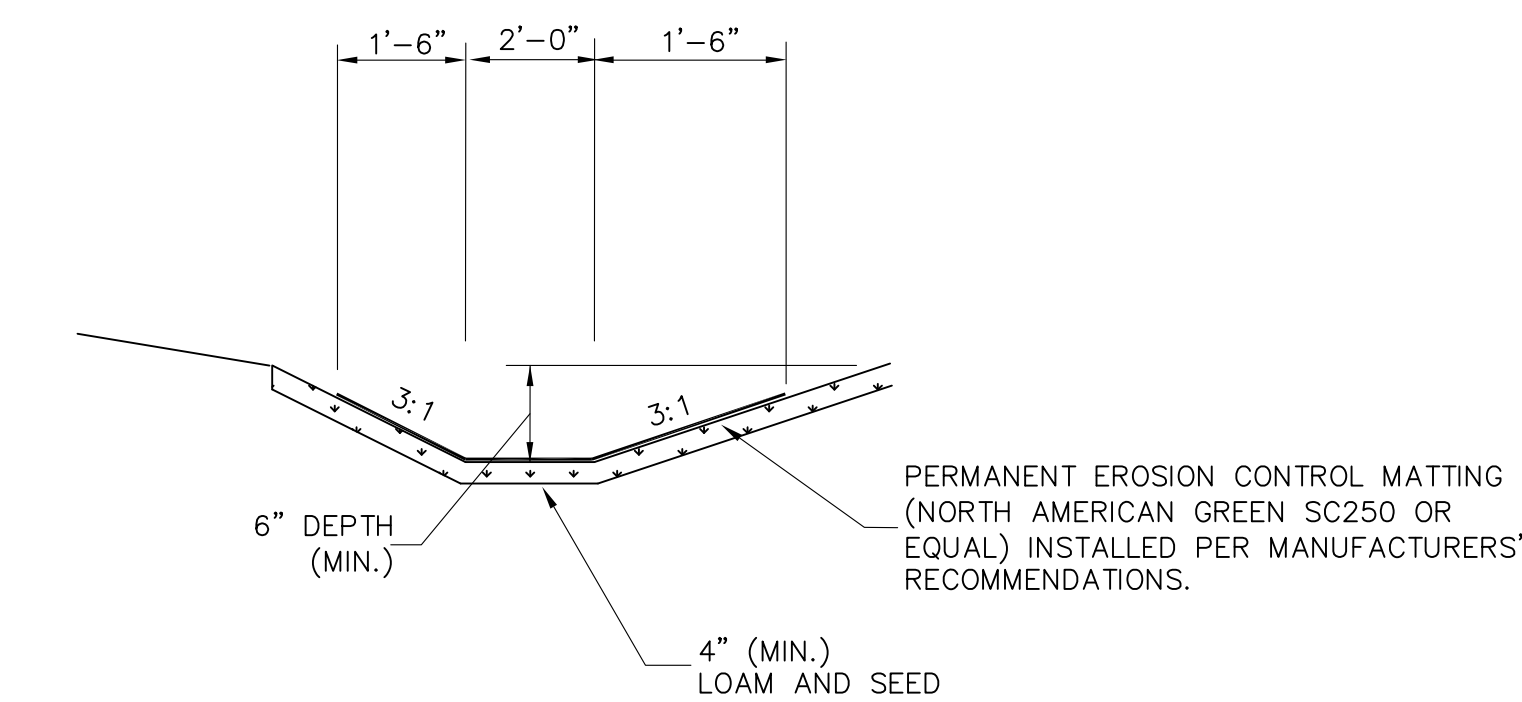
SHEET NO.

5

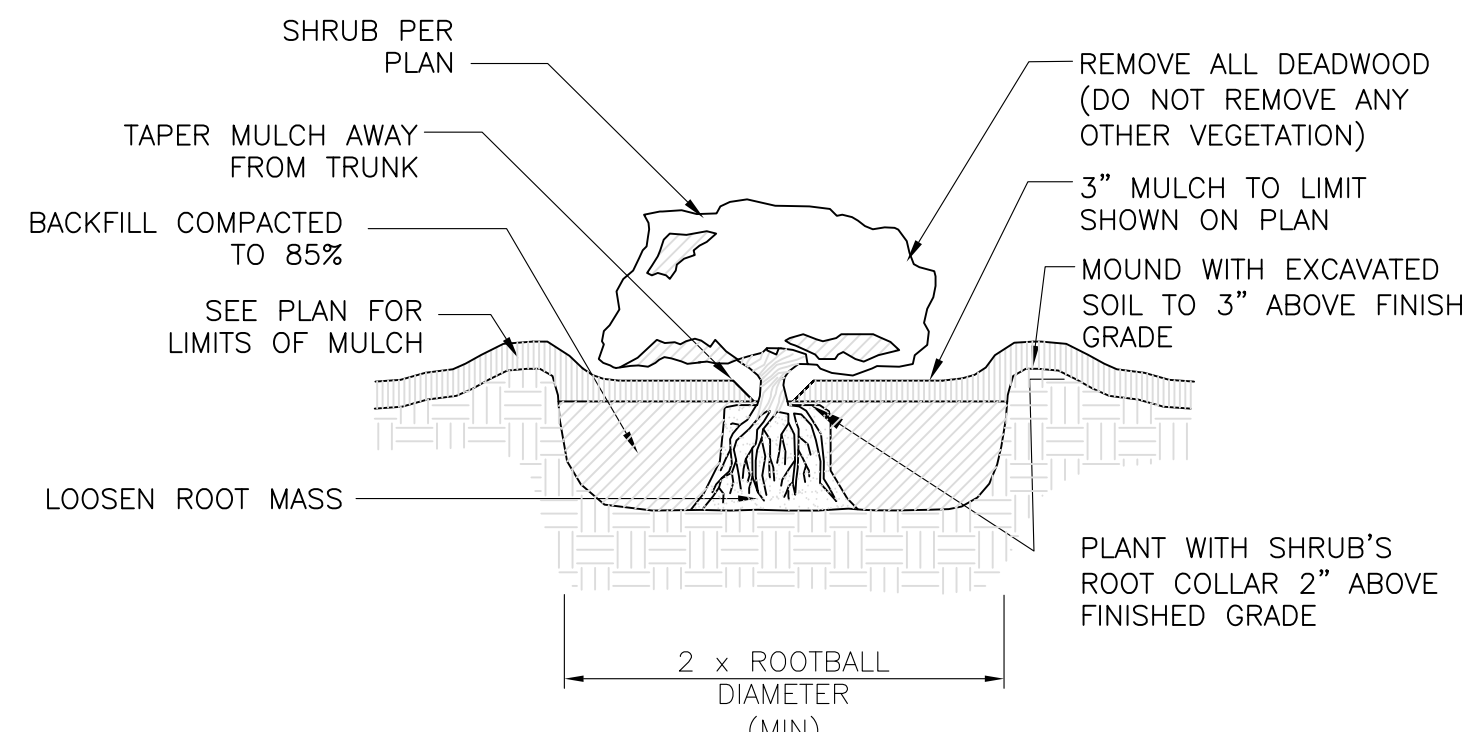
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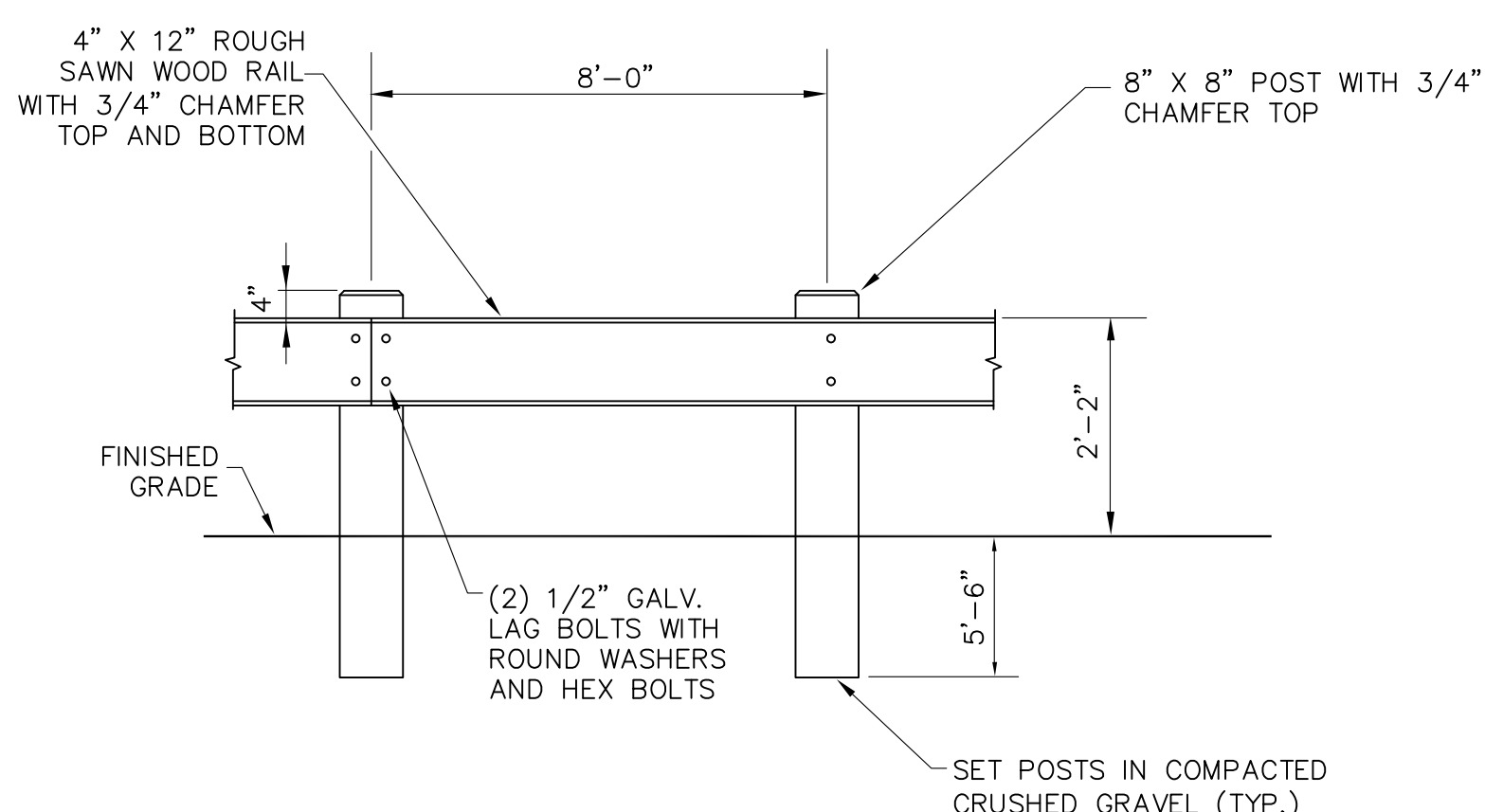
**SECTION A-A
(CONSTRUCTION PLAN 2)**
NOT TO SCALE



**TYPICAL REINFORCED
VEGETATED SWALE DETAIL**
NOT TO SCALE



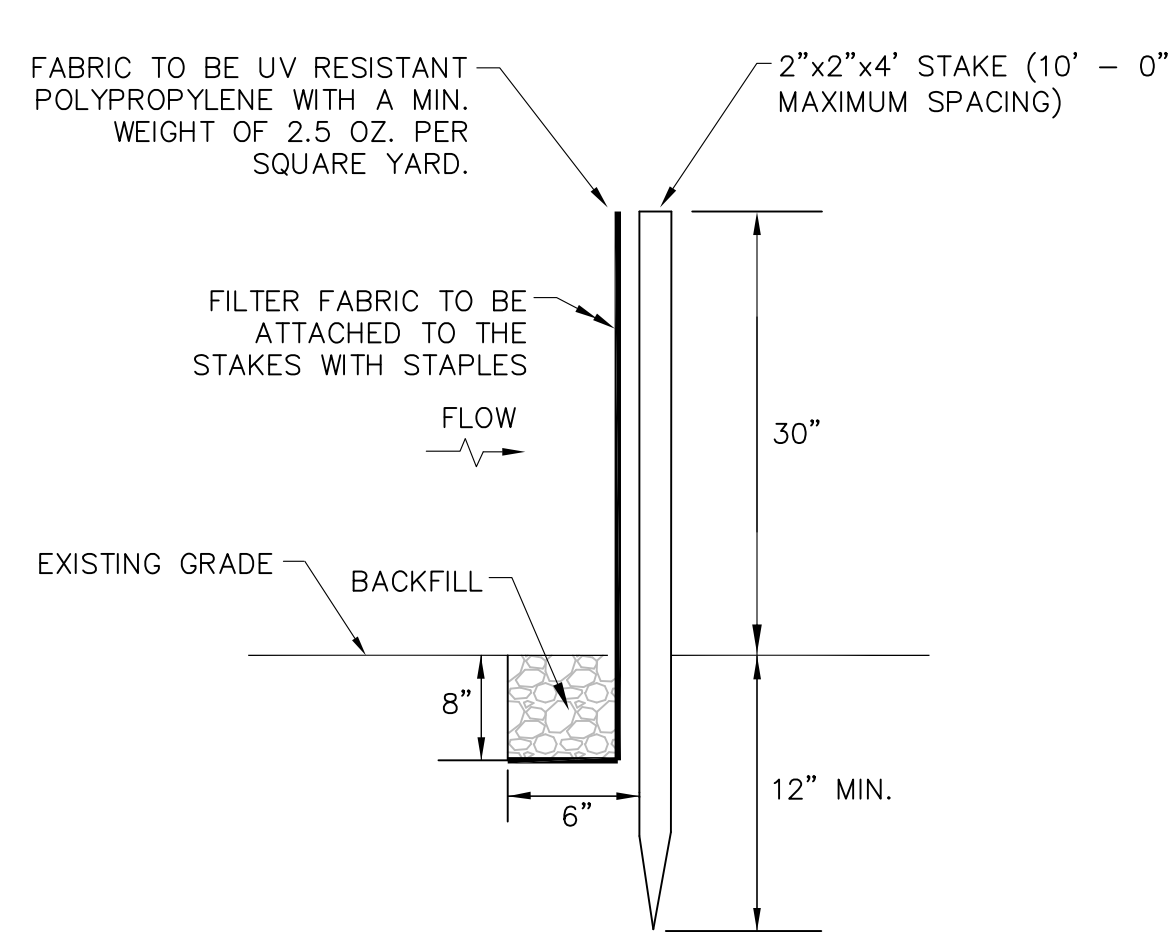
**CONTAINER GROWN TREE AND SHRUB
PLANTING DETAIL**
NOT TO SCALE



TYPICAL TIMBER GUARDRAIL DETAIL
NOT TO SCALE

NOTES:

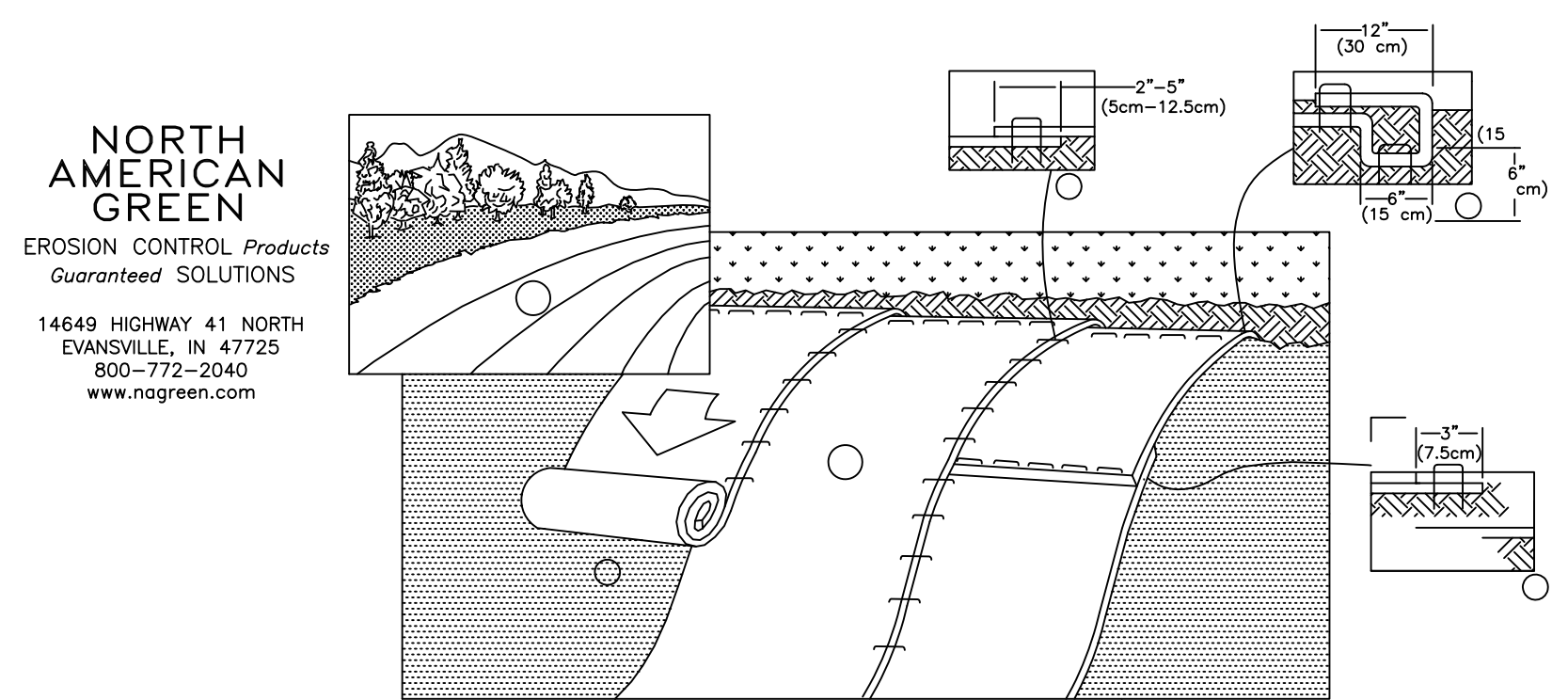
1. ALL TIMBERS SHALL BE PRESSURE TREATED.
2. INSTALLATION SHALL BE IN ACCORDANCE WITH NHDOT STANDARDS AND SPECIFICATIONS, AS APPLICABLE.
3. TWO BOLTS ARE REQUIRED FOR EACH RAIL AT EACH POST. BOLTS AND NUTS SHALL BE FULLY COUNTERSUNK.



SEDIMENTATION BARRIER DETAIL
NOT TO SCALE

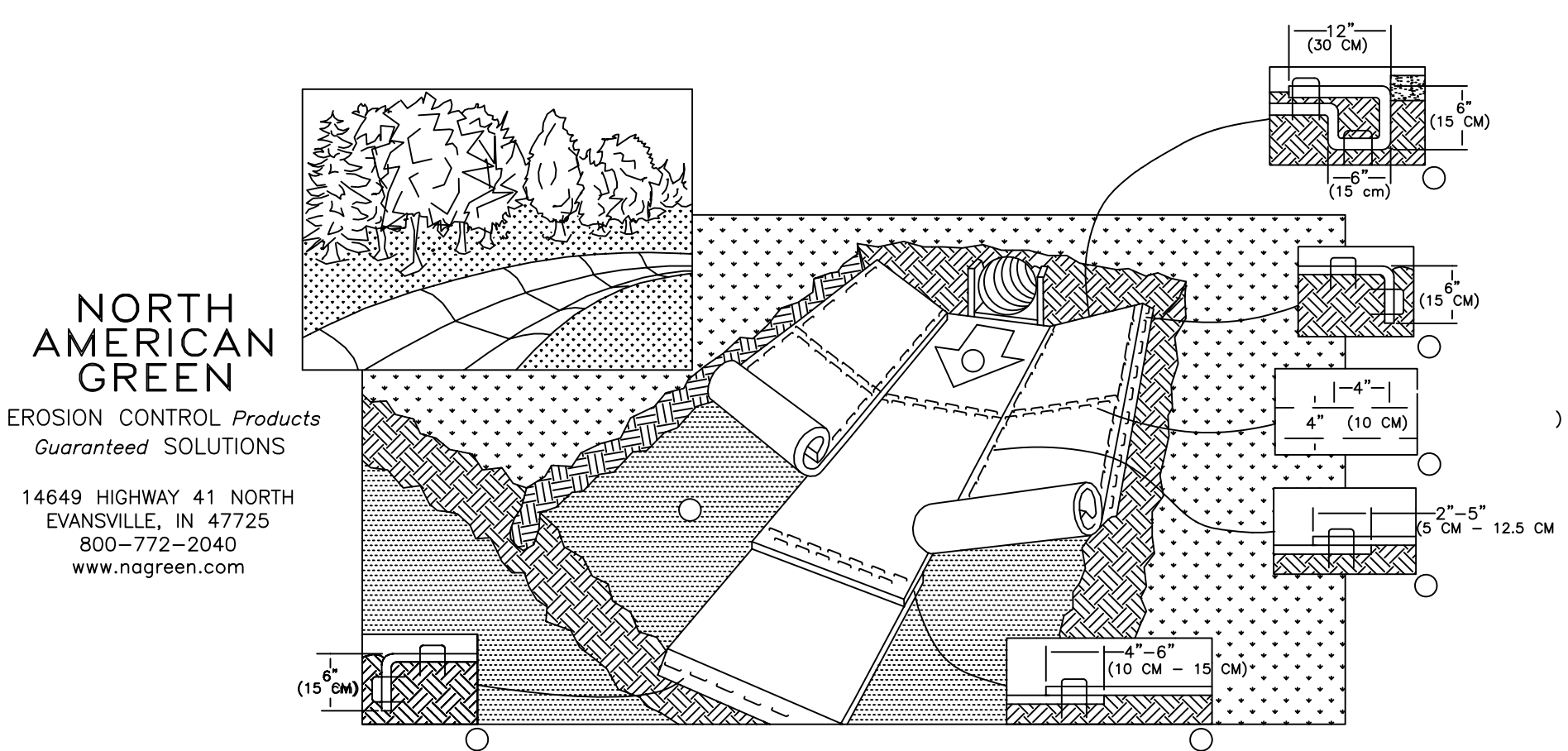
NOTES:

1. INSTALL SILT FENCE AS SHOWN ON THE PLANS OR AS DIRECTED BY THE ENGINEER.

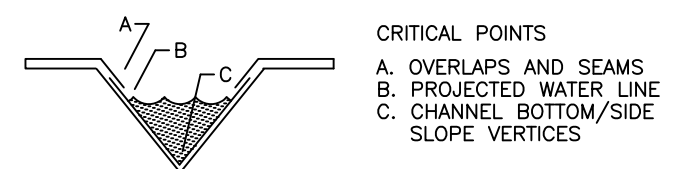


1. PREPARE SOIL BEFORE INSTALLING ROLLED EROSION CONTROL PRODUCTS (RECP's), INCLUDING ANY NECESSARY APPLICATION OF LIME, FERTILIZER, AND SEED.
NOTE: WHEN USING CELL-0-SEED DO NOT SEED PREPARED AREA. CELL-0-SEED MUST BE INSTALLED WITH PAPER SIDE DOWN
2. BEGIN AT THE TOP OF THE SLOPE BY ANCHORING THE RECP'S IN A 6" (15 CM) DEEP X 6" (15 CM) WIDE TRENCH WITH APPROXIMATELY 12" (30CM) OF RECP'S EXTENDED BEYOND THE UP-SLOPE PORTION OF THE TRENCH. ANCHOR THE RECP'S 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 RECP'S BACK OVER SEED AND COMPACTED SOIL. SECURE RECP'S OVER COMPACTED SOIL WITH A ROW OF STAPLES/STAKES SPACED APPROXIMATELY 12" (30 CM) APART ACROSS THE WIDTH OF THE RECP'S.
3. ROLL THE RECP'S (A) DOWN OR (B) HORIZONTALLY ACROSS THE SLOPE. RECP'S WILL UNROLL WITH APPROPRIATE SIDE AGAINST THE SOIL SURFACE. ALL RECP'S MUST BE SECURELY FASTENED TO SOIL SURFACE BY PLACING STAPLES/STAKES IN APPROPRIATE LOCATIONS AS 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.
4. THE EDGES OF PARALLEL RECP'S MUST BE STAPLED WITH APPROXIMATELY 2" - 5" (5 CM - 12.5 CM) OVERLAP DEPENDING ON RECP'S TYPE.
5. CONSECUTIVE RECP'S SPICED DOWN THE SLOPE MUST BE PLACED END OVER END (SHINGLE STYLE) WITH AN APPROXIMATE 3" (7.5 CM) OVERLAP. STAPLE THROUGH OVERLAPPED AREA, APPROXIMATELY 12" (30 CM) APART ACROSS ENTIRE RECP'S WIDTH.
NOTE:
* IN LOOSE SOIL CONDITIONS, THE USE OF STAPLE OR STAKE LENGTHS GREATER THAN 6" (15 CM) MAY BE NECESSARY TO PROPERLY SECURE THE RECP'S.

SLOPE INSTALLATION



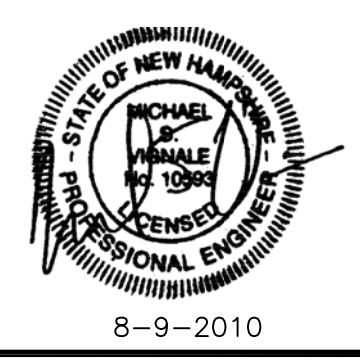
1. PREPARE SOIL BEFORE INSTALLING ROLLED EROSION CONTROL PRODUCTS (RECP's), INCLUDING ANY NECESSARY APPLICATION OF LIME, FERTILIZER, AND SEED.
2. BEGIN AT THE TOP OF THE CHANNEL BY ANCHORING THE RECP'S IN A 6" (15 CM) DEEP X 6" (15 CM) WIDE TRENCH WITH APPROXIMATELY 12" (30 CM) OF RECP'S EXTENDED BEYOND THE UP-SLOPE PORTION OF THE TRENCH. ANCHOR THE RECP'S 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 RECP'S BACK OVER SEED AND COMPACTED SOIL. SECURE RECP'S OVER COMPACTED SOIL WITH A ROW OF STAPLES/STAKES SPACED APPROXIMATELY 12" (30 CM) ACROSS THE WIDTH OF THE RECP'S.
3. ROLL CENTER RECP'S IN DIRECTION OF WATER FLOW IN BOTTOM OF CHANNEL. RECP'S WILL UNROLL WITH APPROPRIATE SIDE AGAINST THE SOIL SURFACE. ALL RECP'S MUST BE SECURELY FASTENED TO SOIL SURFACE IN APPROPRIATE LOCATIONS AS 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.
4. PLACE CONSECUTIVE RECP'S 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 RECP'S.
5. FULL LENGTH EDGE OF RECP'S 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.
6. ADJACENT RECP'S MUST BE OVERLAPPED APPROXIMATELY 2" - 5" (5 CM - 12.5 CM) (DEPENDING ON RECP'S TYPE) AND STAPLED.
7. 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.
8. THE TERMINAL END OF THE RECP'S 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 RECP'S.



- CRITICAL POINTS**
- A. OVERLAPS AND SEAMS
 - B. PROJECTED WATER LINE
 - C. CHANNEL BOTTOM/SIDE SLOPE VERTICES
- NOTE:**
- * HORIZONTAL STAPLE SPACING SHOULD BE ALTERED IF NECESSARY TO ALLOW STAPLES TO SECURE THE CRITICAL POINTS ALONG THE CHANNEL SURFACE.
 - ** IN LOOSE SOIL CONDITIONS, THE USE OF STAPLE OR STAKE LENGTHS GREATER THAN 6" (15 CM) MAY BE NECESSARY TO PROPERLY ANCHOR THE RECP'S.

SWALE INSTALLATION

REVISIONS				
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QUALITY IMPROVEMENT PROJECT**
BRISTOL, NEW HAMPSHIRE

CONSTRUCTION DETAILS - 2

SHEET NO.
6
AUGUST 2010