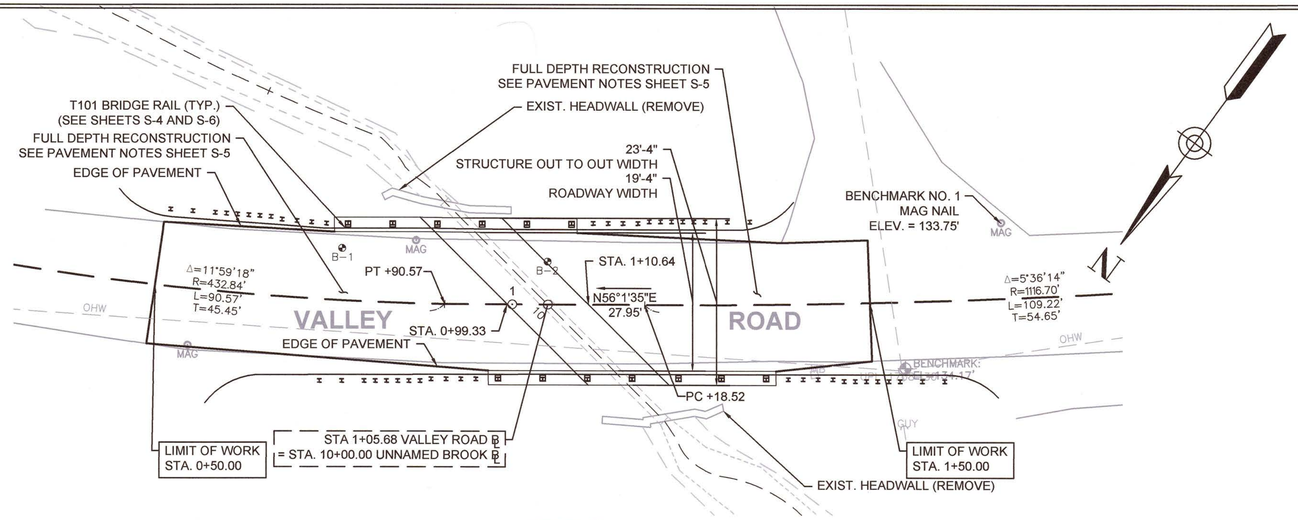
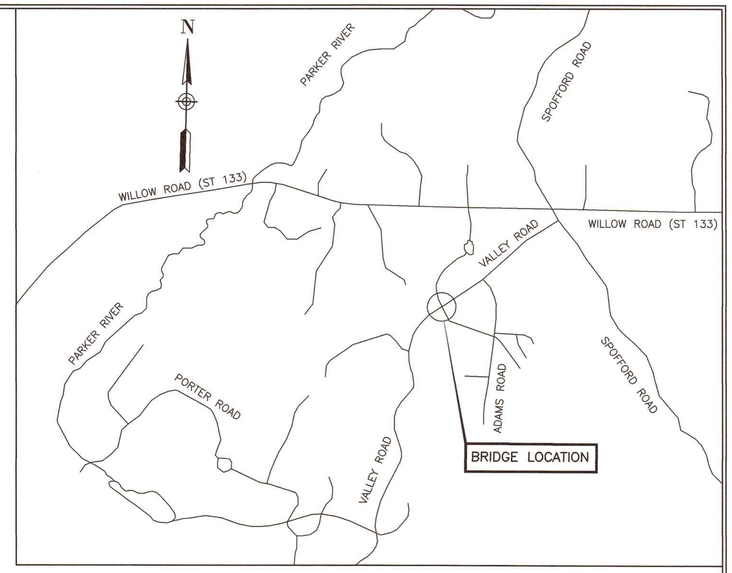


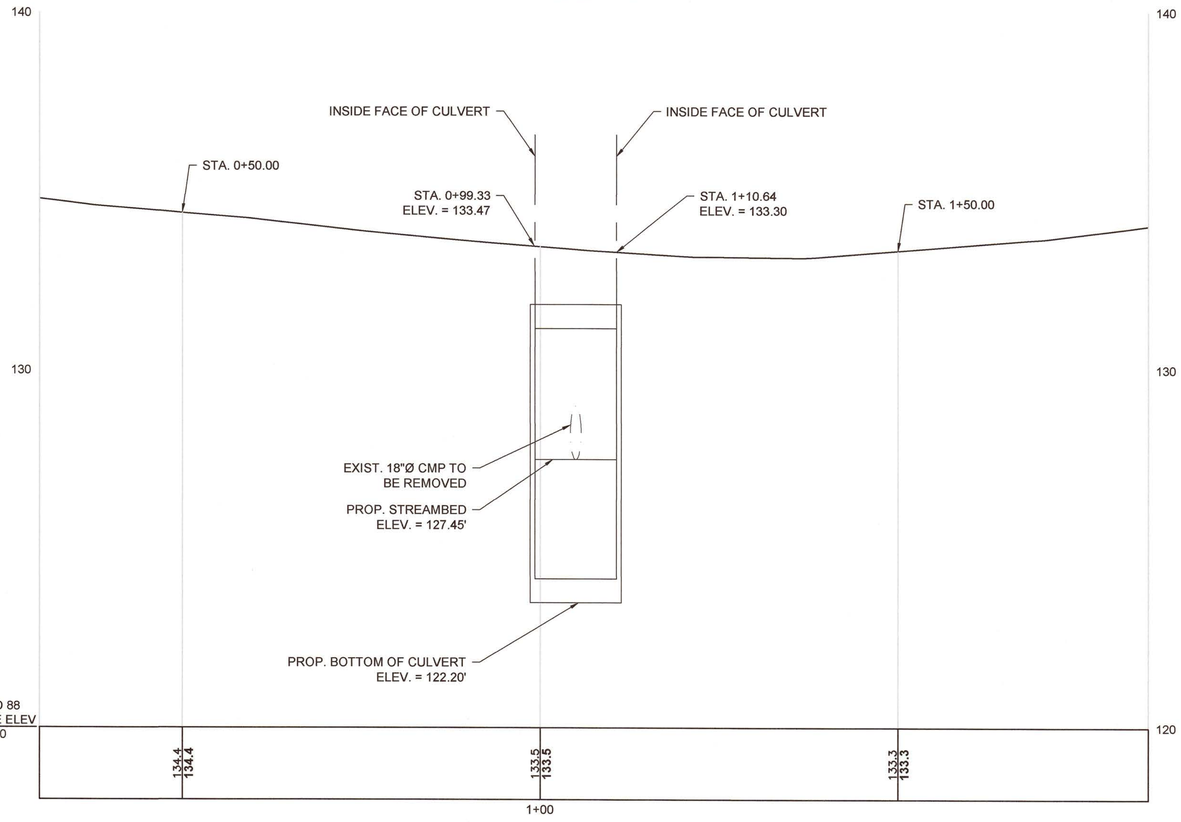
KEY PLAN

SCALE 1" = 10'



LOCUS PLAN

SCALE 1" = 1000'



PROFILE ALONG ℄ CONSTRUCTION VALLEY ROAD

SCALE: 1" = 10' HORIZONTAL
1" = 2' VERTICAL

DRAWING INDEX

COMMONWEALTH OF MASSACHUSETTS
BREE D. SULLIVAN
CIVIL
NO. 48441
REGISTERED PROFESSIONAL ENGINEER
6-27-18

REV.	COMMENTS	DATE

PROJECT #	2172302
SCALE	AS NOTED
DATE	JUNE 25, 2018
DRAFTED BY	AJM

CULVERT REPLACEMENT
VALLEY ROAD OVER UNNAMED BROOK
BOXFORD, MASSACHUSETTS

PREPARED FOR:
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Bridge & Structural Engineering
Civil/Site Engineering
Land Surveying
Transportation Engineering
Architectural Design & Building Renovations

BAYSIDE ENGINEERING
600 Unicorn Park Drive ▲ Woburn MA 01801
Phone: 781.932.3201▲ Fax: 781.932.3413

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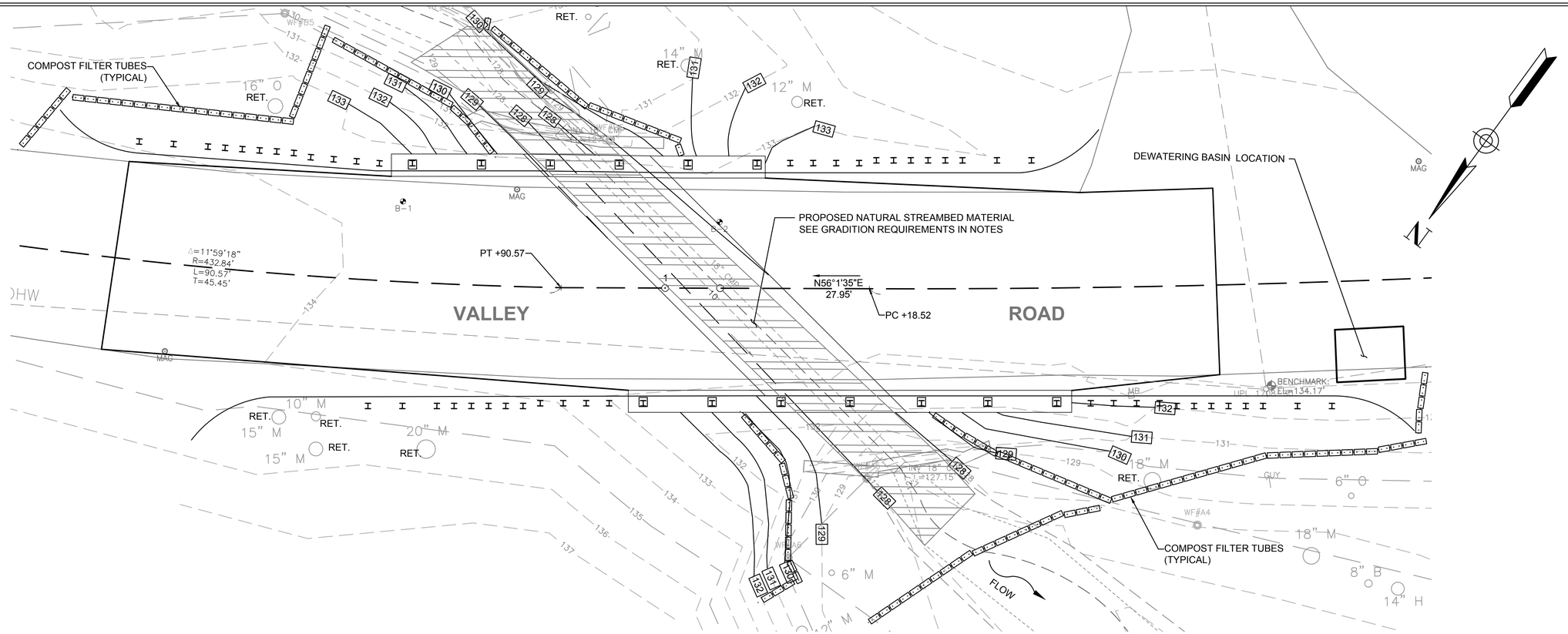

GRADING PLAN

SCALE 1" = 5'

GENERAL NOTES:

DESIGN:
IN ACCORDANCE WITH THE 2014 AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS LRFD BRIDGE DESIGN SPECIFICATIONS WITH CURRENT INTERIM SPECIFICATIONS THROUGH 2015 FOR HL-93 LOADING.

BENCH MARK:
MAG NAIL WITH AN ASSUMED ELEVATION OF 133.75' IS LOCATED AT STATION 1+68.79, OFFSET 10.53' RT

SCALES:
SCALES NOTED ON THE PLANS ARE NOT APPLICABLE TO REDUCED SIZE PRINTS. DIVIDE SCALES BY 2 FOR HALF-SIZED PRINTS (A3).

REINFORCEMENT:
REINFORCING STEEL SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M 31 GRADE 60. UNLESS OTHERWISE NOTED ON THE CONSTRUCTION DRAWINGS, ALL BARS SHALL BE LAPPED AS FOLLOWS:

MODIFICATION CONDITION	#4 BARS	#5 BARS
1. NONE	21"	26"
2. 12" OF CONCRETE BELOW BAR	29"	36"
3. COATED BARS, COVER <3d, OR CLEAR SPACING <6d	31"	39"
4. COATED BARS, ALL OTHER CASES	25"	31"
5. CONDITION 2. AND 3.	35"	44"
6. CONDITION 2. AND 4.	34"	43"

IF THE ABOVE BARS ARE SPACED 6" OR MORE ON CENTER, THE LAP LENGTH SHALL BE 80% OF THE LAP LENGTH GIVEN ABOVE. ALL OTHER BARS SHALL BE LAPPED AS SHOWN ON THE CONSTRUCTION DRAWINGS. ALL BARS WILL BE EPOXY COATED.

CAST-IN-PLACE CONCRETE:
4000 PSI, 1½ IN, 565 HP: WINGWALLS.

PRECAST CONCRETE:
4000 PSI, ¾ IN, 685 HP: CULVERT, HEADWALLS, AND CUTOFF WALLS.

UTILITIES:
ALL EXISTING UTILITIES SHALL BE LOCATED AND PROTECTED BY THE CONTRACTOR. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING WITH UTILITY OWNERS TO RELOCATE ANY OVERHEAD WIRES AND/OR UTILITY POLES AS REQUIRED TO COMPLETE THE CONSTRUCTION. THE CONTRACTOR SHALL LOCATE AND PROTECT ALL EXISTING UTILITIES FROM DAMAGE.

TRAFFIC:
THE BRIDGE WILL BE CLOSED TO TRAFFIC DURING ALL PHASES OF DEMOLITION AND CONSTRUCTION.

DEMOLITION NOTES

1. EXISTING 18"Ø CMP TO BE REMOVED
2. EXISTING GRANITE BLOCK HEADWALLS TO BE REMOVED

VEGETATED AREAS/SLOPES:
3:1 SLOPES: 4" LOAM AND SEED
2:1 SLOPES: 4" LOAM AND HAY MULCH

HYDRAULIC DESIGN DATA

DRAINAGE AREA:	0.13 SQUARE MILES
DESIGN FLOOD DISCHARGE:	35 CUBIC FEET PER SECOND
DESIGN FLOOD FREQUENCY:	10 YEARS
DESIGN FLOOD VELOCITY:	5.4 FEET PER SECOND
DESIGN FLOOD ELEVATION:	127.94 FEET
LOWER CHORD ELEVATION:	131.2 FEET

STREAM BED MATERIAL

1. MATERIAL SHALL BE CRUSHED, PARTIAL CRUSHED OR NATURALY OCCURING GRANULAR MATERIAL.
2. MATERIAL SHALL MEET THE FOLLOWING REQUIREMENTS FOR GRADING AND QUALITY WHEN PLACED IN HAULING VEHICLES FOR DELIVERY TO JOBSITE. (PERCENTAGES BY MASS)

SEDIMENT

SIEVE	% PASSING
2-1/2" SQUARE	100
2" SQUARE	65-100
1" SQUARE	50-85
#4	25-45
#40	16 MAX.
#200	5-10

GRAVEL/COBBLES

PERCENT FINER	SIZE (MM)
D16	23
D35	35
D50	44
D65	58
D84	92
D95	130

REV.	COMMENTS	DATE

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VALLEY ROAD OVER UNNAMED BROOK
BOXFORD, MASSACHUSETTS

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600 Unicorn Park Drive ▲ Woburn MA 01801
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TEST BORING LOG

MILLER ENGINEERING & TESTING, INC.
100 Sheffield Road - Manchester, NH 03103
Ph. (603) 668-6016 - Fax: (603) 668-8641

Project: Valley Rd. Bridge Culvert; Boxford, MA
Project No: 17.128.NH
Date Start: 06-22-17
Date End: 06-22-17
Sheet 1 **of** 1
Boring No: B-1
Location: See Sketch
Approx. Surface Elev:

	CASING	SAMPLER	GROUNDWATER OBSERVATIONS Date	Depth	Casing At	Stabilization Period
Type	HSA	SS	06-22-17	6'	14'	Upon Completion
Size	2-1/4" ID	1-3/8" ID				
Hammer		140 lbs.				
Fall		30"				

Depth/ Elev.	Cas bl/ft	Sample No.	Depth Range	Pen.	Rec.	BLOWS 0-6"	6-12"	12-18"	18-24"	Strata Change	Sample Description	Notes
0		-	0.0-0.4	5							-: 5" Asphalt	
		S-1	0.5-2.0	18	10		8	7	6		S-1: Loose, brown, fine to coarse sand, little gravel, little silt	
		S-2	2.0-3.5	18	12	3	3	4			S-2: Loose, dark brown, topsoil, roots	
4		S-2A	3.5-4.0	6	5				13		S-2A: Medium dense, brownish orange, fine to coarse sand and gravel, some silt	
		S-3	4.0-6.0	24	10	8	9	39	26		S-3: Dense, brown, fine to coarse sand and gravel, little silt	
											GWT	
											EL. 127.88 (6/22/2017)	
8		S-4	9.0-11.0	24	14	16	25	31	32		S-4: Very dense, gray, highly weathered rock	
											BOTTOM OF FOOTING	
12											EL. 122.20	
		S-5	14.0-15.0	12	12	46	6	5			S-5: Very dense, gray, weathered rock	
16											BORING TERMINATED AT 15.5 ft	
20												
24												

Driller: R. Marcoux
Helper: K. Schwotzer
Inspector:

COHESIVE CONSISTENCY (Blows/Foot)
0-2 VERY SOFT
2-4 SOFT
4-8 MEDIUM STIFF
8-15 STIFF
15-30 HARD

COHESIONLESS (Blows/Foot)
0-4 VERY LOOSE
4-10 LOOSE
10-30 MEDIUM DENSE
30-50 DENSE
50+ VERY DENSE

PROPORTIONS USED
TRACE: 0-10%
LITTLE: 10-20%
SOME: 20-35%
AND: 35-50%

NOTES:

REMARKS: THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES. TRANSITION MAY BE GRADUAL.
WATER LEVEL READINGS HAVE BEEN MADE IN THE DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THE BORING LOGS.
FLUCTUATIONS IN THE LEVEL OF THE GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS WERE MADE.

TEST BORING LOG

MILLER ENGINEERING & TESTING, INC.
100 Sheffield Road - Manchester, NH 03103
Ph. (603) 668-6016 - Fax: (603) 668-8641

Project: Valley Rd. Bridge Culvert; Boxford, MA
Project No: 17.128.NH
Date Start: 06-22-17
Date End: 06-22-17
Sheet 1 **of** 1
Boring No: B-2
Location: See Sketch
Approx. Surface Elev:

	CASING	SAMPLER	GROUNDWATER OBSERVATIONS Date	Depth	Casing At	Stabilization Period
Type	HSA	SS	06-22-17	8'	14'	Upon Completion
Size	2-1/4" ID	1-3/8" ID				
Hammer		140 lbs.				
Fall		30"				

Depth/ Elev.	Cas bl/ft	Sample No.	Depth Range	Pen.	Rec.	BLOWS 0-6"	6-12"	12-18"	18-24"	Strata Change	Sample Description	Notes
0		-	0.0-0.4	5							-: 5" Asphalt	
		S-1	0.5-2.0	18	6	10	13	7			S-1: Medium dense, brown, fine to coarse sand, gravel, trace silt	
		S-2	2.0-4.0	24	12	6	6	10	17		S-2: Medium dense, brown, fine to coarse sand, little silt, little gravel	
4		S-3	4.0-6.0	24	12	60	11	9	13		S-3: Medium dense, brown, fine sand, some gravel, trace silt	
											GWT	
8											EL. 125.88 (6/22/2017)	
		S-4	9.0-10.5	18	16	15	23	57			S-4: Very dense, brown, fine sand, weathered rock	
											BOTTOM OF FOOTING	
12											EL. 122.20	
		S-5	14.0-16.0	24	18	15	23	25	29		S-5: Dense, gray, fine sand, some silt, trace to little gravel	
16												
20		S-6	19.0-19.1	1	0	50/1"					S-6: No recovery	
											Auger Refusal at 19.1'	
											BORING TERMINATED AT 19.1 ft	
24												

Driller: R. Marcoux
Helper: K. Schwotzer
Inspector:

COHESIVE CONSISTENCY (Blows/Foot)
0-2 VERY SOFT
2-4 SOFT
4-8 MEDIUM STIFF
8-15 STIFF
15-30 HARD

COHESIONLESS (Blows/Foot)
0-4 VERY LOOSE
4-10 LOOSE
10-30 MEDIUM DENSE
30-50 DENSE
50+ VERY DENSE

PROPORTIONS USED
TRACE: 0-10%
LITTLE: 10-20%
SOME: 20-35%
AND: 35-50%

NOTES:

REMARKS: THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES. TRANSITION MAY BE GRADUAL.
WATER LEVEL READINGS HAVE BEEN MADE IN THE DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THE BORING LOGS.
FLUCTUATIONS IN THE LEVEL OF THE GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS WERE MADE.

REV.	COMMENTS	DATE

PROJECT # 2172302
SCALE AS NOTED
DATE JUNE 25, 2018
DRAFTED BY AJM

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Architectural Design & Building Renovations

BAYSIDE ENGINEERING
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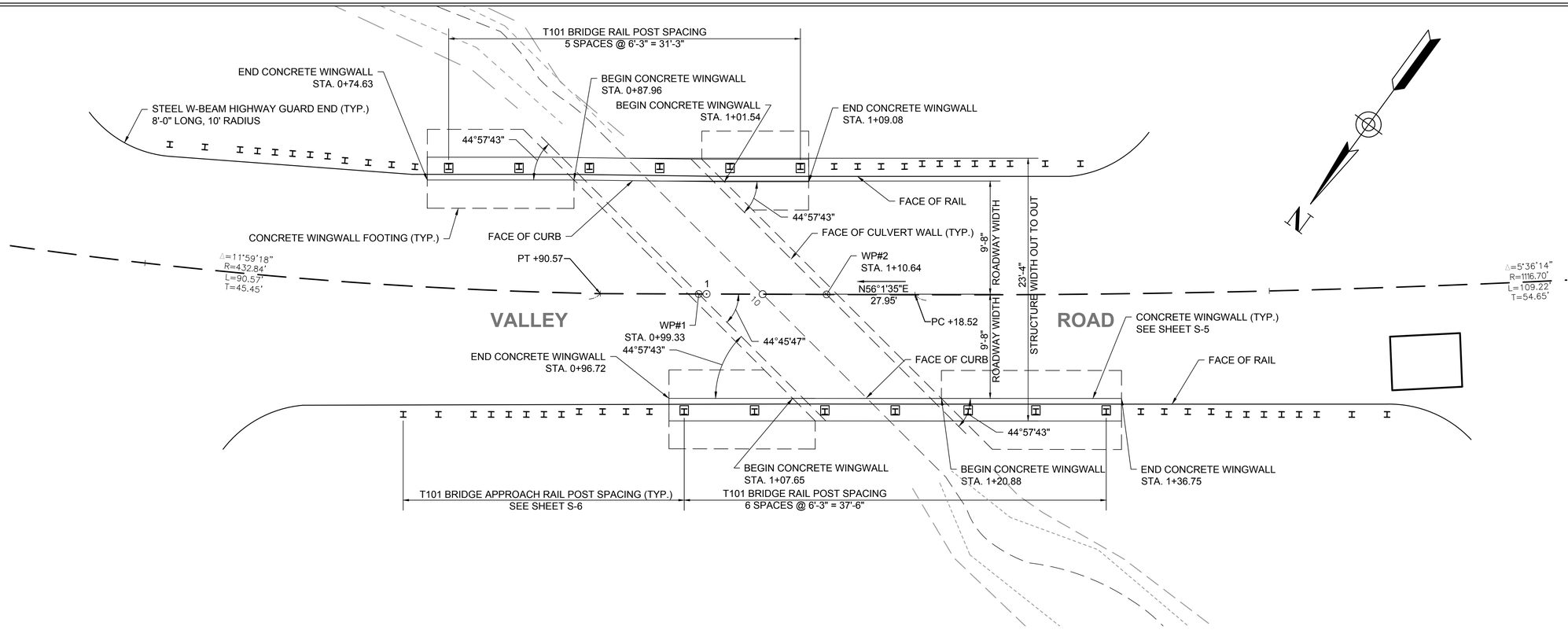
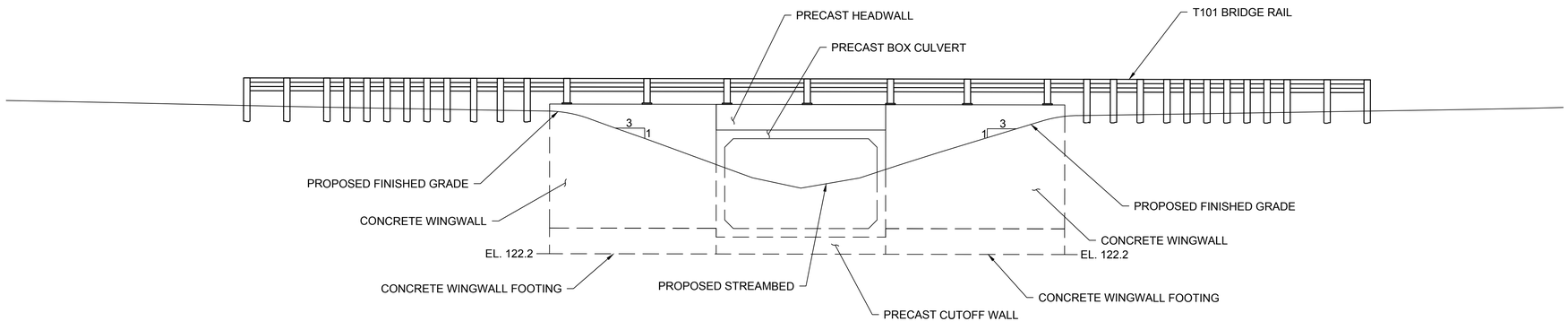


CULVERT PLAN

SCALE 1" = 5'



EAST ELEVATION

SCALE 1" = 5'

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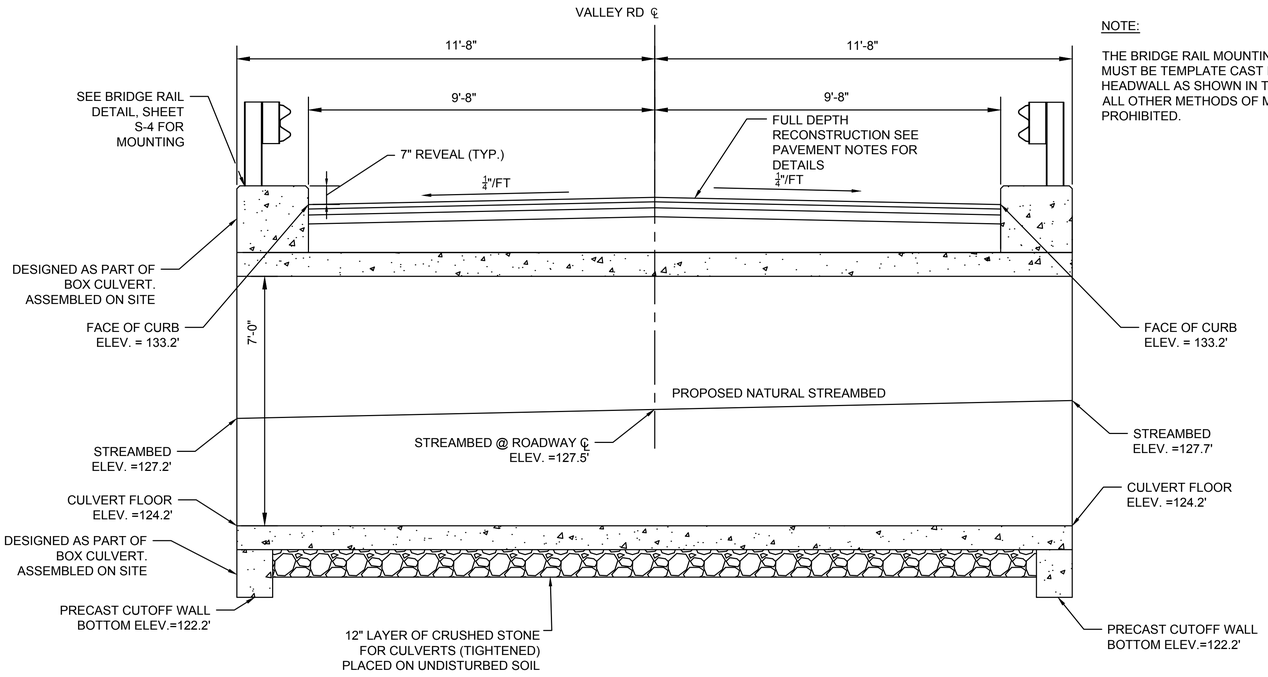
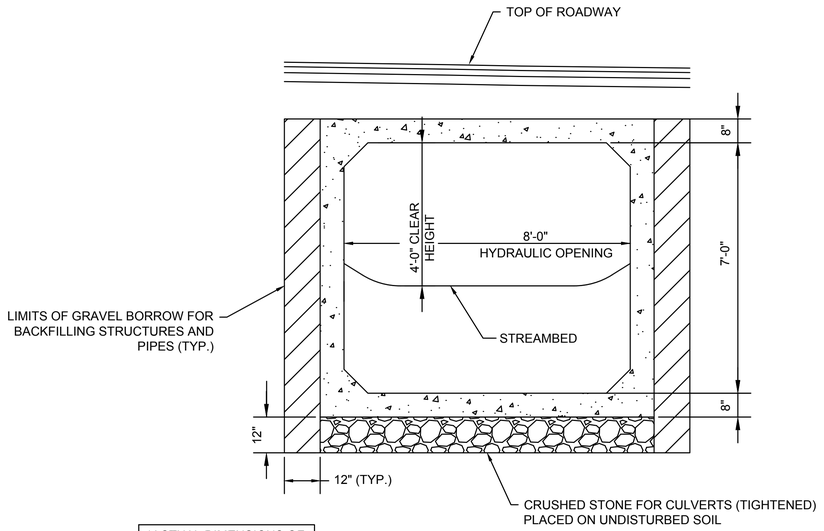


LONGITUDINAL CULVERT SECTION

SCALE ½" = 1'-0"

NOTE:

THE BRIDGE RAIL MOUNTING STUDS MUST BE TEMPLATE CAST IN THE HEADWALL AS SHOWN IN THE DETAILS. ALL OTHER METHODS OF MOUNTING ARE PROHIBITED.



*ACTUAL DIMENSIONS OF PRECAST CULVERT AND FOOTINGS TO BE DESIGNED BY PRECAST SUPPLIER

PAVEMENT NOTES:

ROADWAY PAVEMENT: (FULL DEPTH RECONSTRUCTION)

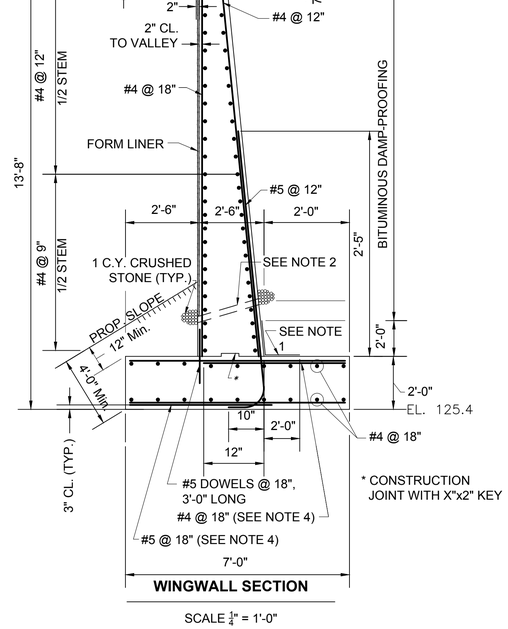
1-1/2" TOP COURSE MATERIAL OVER
2" BINDER COURSE MATERIAL OVER
3" HOT MIX ASPHALT BASE COURSE MATERIAL OVER
12" GRAVEL BORROW

PRECAST CONCRETE CULVERT NOTES:

1. CONTRACTOR SHALL SUBMIT PRECAST CONCRETE CULVERT DESIGN CALCULATIONS AND SHOP DRAWINGS SEALED BY A PROFESSIONAL ENGINEER REGISTERED IN THE COMMONWEALTH OF MASSACHUSETTS FOR APPROVAL PRIOR TO FABRICATION. PRESCRIBED HYDRAULIC OPENING SHALL BE MAINTAINED.
2. THE CONTRACTOR SHALL APPROVE ALL ELEVATIONS AND DIMENSIONS OF THE SHOP DRAWINGS PRIOR TO FABRICATION.
3. ALL CONCRETE SHALL HAVE A MINIMUM 28-DAY COMPRESSIVE STRENGTH OF 4000 PSI. CEMENT TO BE TYPE III CONFORMING TO ASTM C-150.
4. REINFORCEMENT SHALL BE PLACED WITH A MINIMUM OF 1½" COVER FROM THE FACE OF CONCRETE.
5. DESIGN SHALL BE IN ACCORDANCE WITH THE 2014 AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS WITH CURRENT INTERIM SPECIFICATIONS THROUGH 2015 FOR HL-93 LOADING WITH 12" OF SOIL COVER AND 6½" HOT MIX ASPHALT PAVEMENT.
6. AN ALLOWABLE BEARING CAPACITY OF 6500 PSF SHALL BE USED IN THE DESIGN OF THE CULVERT. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE SUBGRADE PREPARATION SUCH THAT THE DESIGN BEARING CAPACITY SHALL BE ACHIEVED. THE CONTRACTOR SHALL NOTIFY THE ENGINEER IF THIS BEARING CAPACITY CANNOT BE MET.
7. CONTRACTOR SHALL SUBMIT AN ERECTION PROCEDURE/SHOP DRAWING FOR APPROVAL PRIOR TO STARTING ANY CONSTRUCTION.

TYPICAL CULVERT SECTION

SCALE ½" = 1'-0"



WINGWALL SECTION

SCALE ¼" = 1'-0"

WINGWALL SECTION NOTES:

1. MEMBRANE WATERPROOFING AND 8"x16"x2", 4000 PSI, ¾ IN, 610 CEMENT CONCRETE BLOCKS LAID IN MORTAR OR OTHER WATERPROOFING PROTECTIVE COURSE, MIN. 2" THICK AS SPECIFIED IN MHD STANDARD SPECIFICATIONS.
2. 4" Ø WEEP HOLES 10'-0" O.C. (JUST ABOVE PROTECTIVE COURSE). PROVIDE 1 CUBIC YARD OF CRUSHED STONE AT EACH END OF WEEP HOLE.
3. ALL CONCRETE SHALL BE 4000 PSI, 1½ IN, 565 CEMENT CONCRETE.
4. EXTEND EVERY THIRD BAR FULL LENGTH AS SHOWN.

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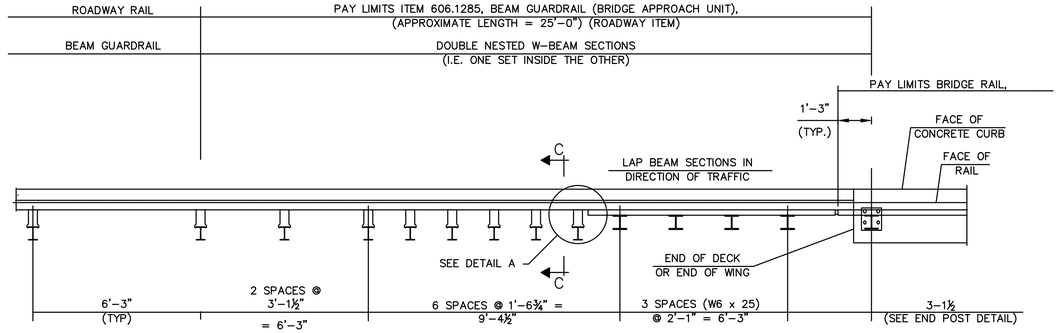
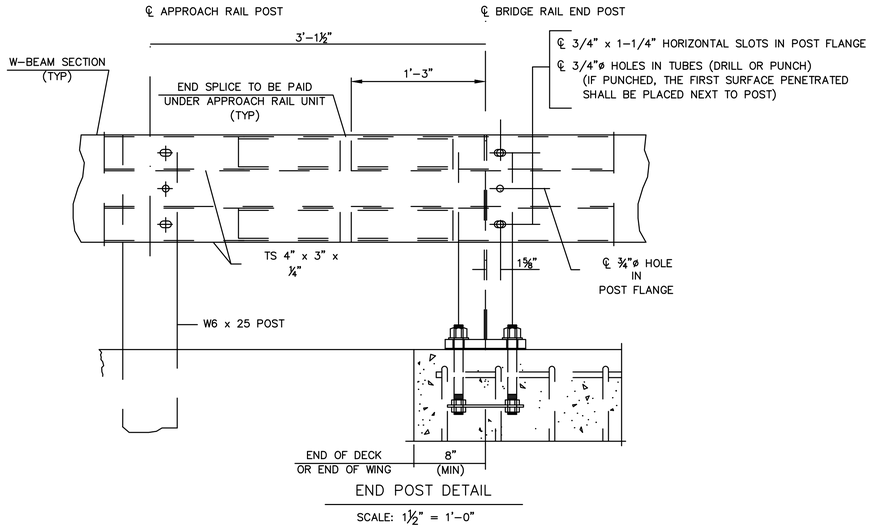


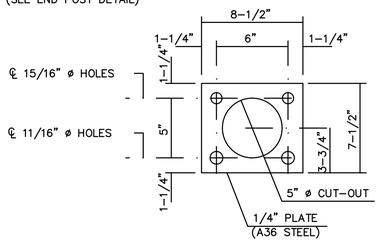
APPROACH RAIL LAYOUT

SCALE: 3/8" = 1'-0"



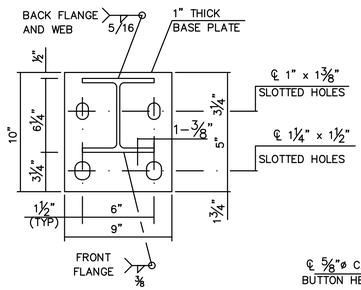
END POST DETAIL

SCALE: 1½" = 1'-0"



ANCHOR PLATE DETAIL

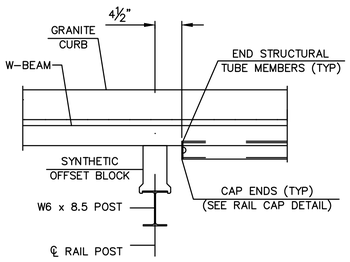
SCALE: 2" = 1'-0"



BASE PLATE DETAIL

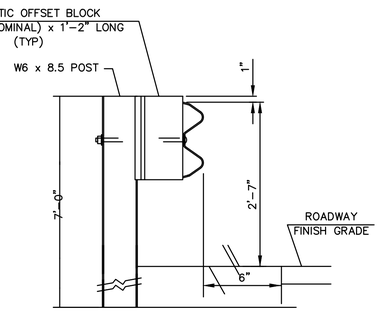
(SECTION B-B)

SCALE: 2" = 1'-0"



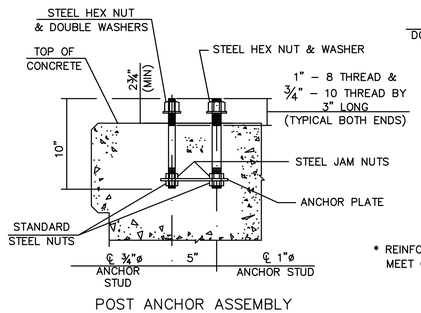
DETAIL A

SCALE: 1" = 1'-0"



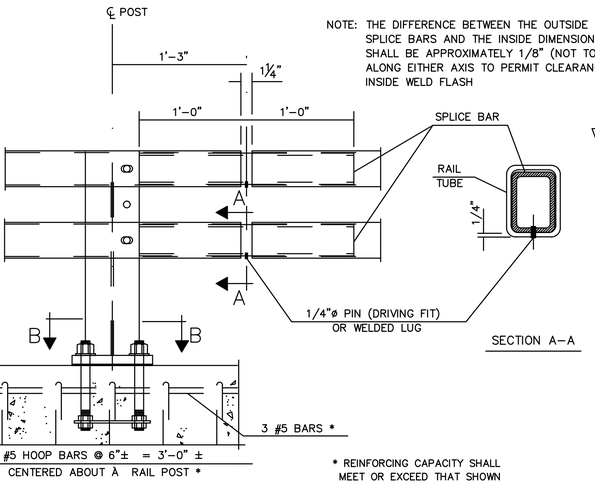
SECTION C-C

SCALE: 1" = 1'-0"



POST ANCHOR ASSEMBLY

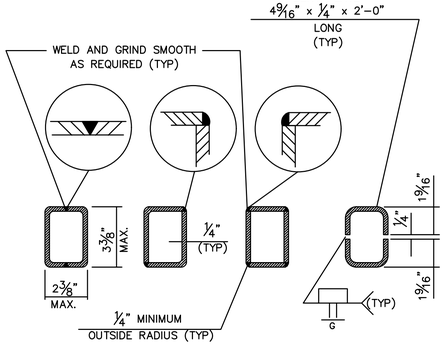
SCALE: 1½" = 1'-0"



TYPICAL SPLICE

* REINFORCING CAPACITY SHALL MEET OR EXCEED THAT SHOWN

NOTE: THE DIFFERENCE BETWEEN THE OUTSIDE DIMENSIONS OF SPLICE BARS AND THE INSIDE DIMENSIONS OF THE RAIL SHALL BE APPROXIMATELY 1/8" (NOT TO EXCEED 3/16") ALONG EITHER AXIS TO PERMIT CLEARANCE FOR INSIDE WELD FLASH

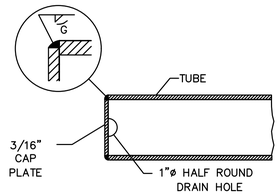


NOTE: OTHER SECTIONS OF EQUAL OR GREATER STRENGTH ARE ACCEPTABLE FOR SPLICE BARS

SPLICE BAR FABRICATION OPTIONS

SPLICE BAR DETAILS

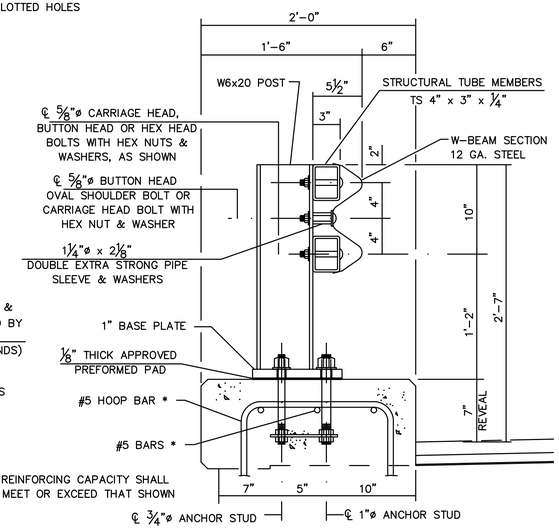
NOT TO SCALE



RAIL CAP DETAIL

(BOTTOM VIEW)

SCALE: 3" = 1'-0"



BRIDGE RAIL DETAIL

SCALE: 1½" = 1'-0"

GENERAL NOTES

1. BRIDGE RAIL T101 WAS SUCCESSFULLY CRASHED TESTED FOR NCHRP 350 (@ HEIGHT OF 2'-3"), TL-3 PER FHWA MAY 30, 1997 MEMORANDUM. USE OF THIS SYSTEM SHALL BE FOR POSTED SPEEDS 45 mph AND BELOW.

2. BRIDGE RAIL T101, SHALL INCLUDE POSTS, BASE PLATES, ANCHOR PLATES, ANCHOR STUDS, PREFORMED PADS, RAIL ASSEMBLY BOLTS, NUTS, WASHERS, STRUCTURAL TUBING, SPLICE BARS, PIPE SLEEVES AND W-BEAM SECTIONS.

   - ASTM A588 : POSTS AND BASE PLATES
   - ASTM A500: GRADE B (PAINTED) OR ASTM A588 (UNPAINTED) OR ASTM A847 (UNPAINTED) : STRUCTURAL TUBING
   - ASTM A36 : PIPE SLEEVES AND RAIL SPLICE BARS (PAINTED) AND ANCHOR PLATES (GALVANIZED)
   - ASTM A449 (GALV) : ANCHOR STUDS WITH STANDARD NUTS AND STEEL COMMERCIAL TYPE A PLAIN WIDE WASHERS HARDENED
   - A325 TYPE 3 : RAIL BOLTS, NUTS AND WASHERS
   - AASHTO M180 TYPE IV : W-BEAM SECTIONS

3. MEMBERS TO BE PAINTED SHALL FIRST BE GALVANIZED AFTER FABRICATION IN CONFORMANCE WITH AASHTO M111 (ASTM A123) AND THEN OUTSIDE SURFACES SHALL BE SHOP PAINTED WITH ONE COAT OF HIGH BUILD EPOXY POLYAMIDE (4-6 MILS DFT) AND ONE COAT OF ALIPHATIC POLYURETHANE (1.5 TO 2.5 MILS DFT), DARK BROWN (REFER TO SPECIAL PROVISIONS FOR PAINT SPECIFICATIONS). EXPOSED ANCHOR BOLTS, NUTS, WASHERS & RAIL BOLTS SHALL BE PAINTED DARK BROWN IN THE FIELD IN CONFORMANCE WITH THE STANDARDS IN THE SPECIAL PROVISIONS.

4. STRUCTURAL TUBING SHALL BE SUPPLIED AS ONE PIECE FOR BRIDGE RAIL 40 FEET OR LESS IN LENGTH. IN OTHER CASES, TUBING SHALL BE SPLICED WITH A SPLICE BAR (SEE SPLICE BAR DETAILS). NO TRANSVERSE BUTT WELDS ARE PERMITTED ON RAIL TUBING WITHIN A CONTINUOUS LENGTH.

5. EACH PIECE OF RAIL TUBING SHALL BE ATTACHED TO A MINIMUM OF THREE POSTS.

6. FOR BRIDGE RAIL POST SPACING, SEE BRIDGE RAIL LAYOUT. THE MAXIMUM BRIDGE RAIL POST SPACING SHALL BE 8'-4". POST SPACING OF 8'-4" OR 6'-3" IS RECOMMENDED WHENEVER POSSIBLE FOR USE WITH 25' SECTIONS OF STANDARD W-BEAM RAIL.

7. PREFORMED BEARING PADS SHALL CONFORM TO AASHTO M251.

8. NUTS FOR THREADED ANCHOR STUDS CONNECTING THE BASE PLATE TO THE CONCRETE SHALL BE TIGHTENED TO A SNUG FIT AND GIVEN AN ADDITIONAL 1/8 TURN.

REV.	COMMENTS	DATE

PROJECT #	2172302
SCALE	AS NOTED
DATE	JUNE 25, 2018
DRAFTED BY	AJM

CULVERT REPLACEMENT
VALLEY ROAD OVER UNNAMED BROOK
BOXFORD, MASSACHUSETTS

PREPARED FOR:
TOWN OF BOXFORD DEPARTMENT OF PUBLIC WORKS

Bridge & Structural Engineering
Civil/Site Engineering
Land Surveying
Transportation Engineering
Architectural Design & Building Renovations

BAYSIDE ENGINEERING
600 Unicorn Park Drive ▲ Woburn MA 01801
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CONSTRUCTION NOTES/CONSTRUCTION SEQUENCING

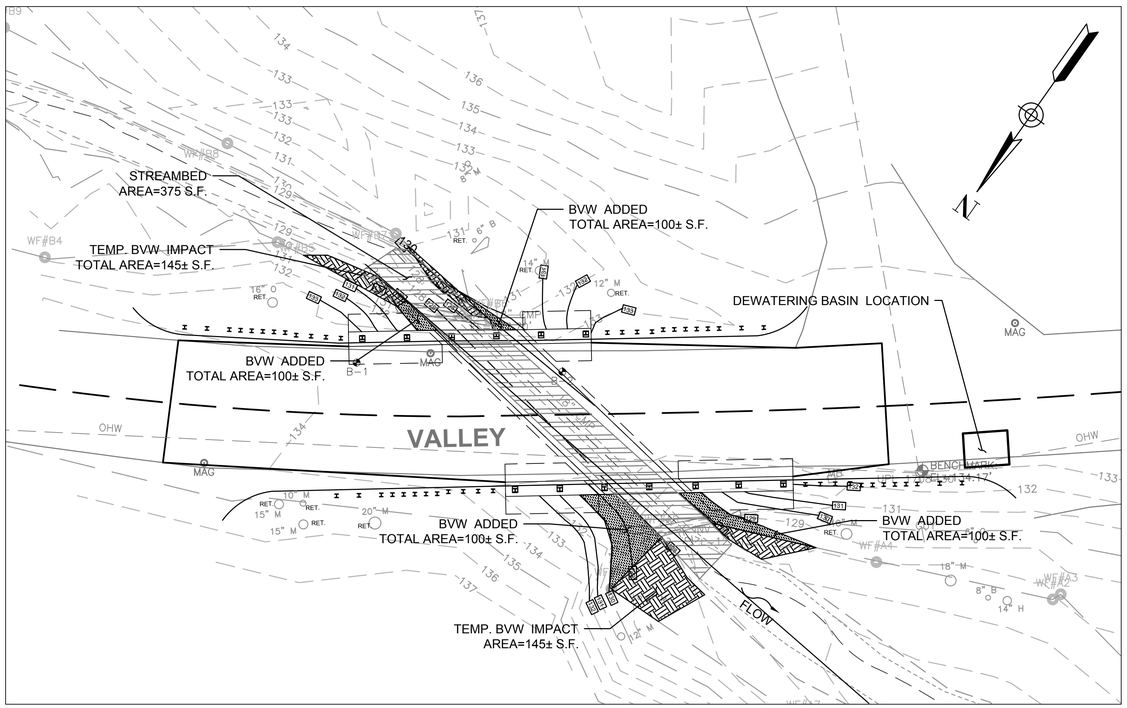
1. INSTALL SEDIMENTATION AND EROSION CONTROLS PRIOR TO BEGINNING WORK.
2. ALL WORK SHALL BE CLOSELY COORDINATED WITH THE BOXFORD CONSERVATION COMMISSION OR THEIR DESIGNEE.
3. ALL IN-STREAM WORK SHALL BE COORDINATED SO THAT CULVERT REMOVAL AND NEW CULVERT INSTALLATION BEGINS AND IS COMPLETED DURING A PERIOD OF "LOW FLOW" CONDITIONS AND IS PERFORMED IN ACCORDANCE WITH THE ORDER OF CONDITIONS. CONTRACTOR'S PROPOSED WORK SCHEDULE AND VERIFICATION OF WEATHER CONDITIONS SHALL BE SUBMITTED TO THE BOXFORD DEPARTMENT OF PUBLIC WORKS FOR REVIEW AND APPROVAL PRIOR TO COMMENCING WORK.
4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE CONTROL OF WATER AND STORM WATER AT ALL TIMES INCLUDING BUT NOT LIMITED TO MAINTAINING, REPLACING AND RE-FASTENING EROSION AND SEDIMENTATION CONTROL DEVICES AS NEEDED TO PREVENT SEDIMENT FROM LEAVING THE SITE AND ENTERING WETLAND RESOURCE AREAS.
5. EXISTING STREAMBED MATERIAL SHALL BE STOCKPILED SEPARATELY FOR REUSE. ADDITIONAL STREAMBED MATERIAL SHALL CONSIST OF CLEAN GRANULAR MATERIAL WITH THE SAME GRADATION AS THE EXISTING STREAM CHANNEL. STREAMBED MATERIAL SHALL BE DURABLE WASHED ROUNDED AGGREGATE FREE OF FINES, ORGANIC AND DELETERIOUS MATERIAL. CONCRETE, BRICK AND OTHER CONSTRUCTION DEBRIS IS PROHIBITED. THE ENGINEER SHALL APPROVE MATERIAL PRIOR TO PLACEMENT.
6. THE REFUELING OF VEHICLES AND/OR THE STOCKPILING OF NEW OR EXCAVATED FILL MATERIALS WITHIN 100 FEET OF THE STREAM SHALL NOT BE PERMITTED.
7. WORK IN WETLAND RESOURCE AREAS SHALL BE CONDUCTED MANUALLY. WITH EXCEPTION OF HAND HELD TOOLS, NO MECHANICAL EQUIPMENT SHALL BE OPERATED WITHIN THE RESOURCE AREA.
8. DISTURBED AREAS AND SLOPES SHALL BE STABILIZED WITH APPROVED SEED MIX, PLANTINGS AND/OR EROSION CONTROL BLANKET, AS NECESSARY, AS SHOWN ON THE PLANS. SEED MIX AND EROSION CONTROL BLANKET SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S REQUIREMENTS.
9. DEBRIS FROM CONSTRUCTION THAT FALLS INTO THE RESOURCE AREA WILL BE REMOVED PRIOR TO THE COMPLETION OF EACH WORKDAY.
10. ALL DISTURBED LAND UNDER WATER AREAS SHALL BE STABILIZED AS INDICATED ON THE PLANS, DETAILS AND SECTIONS, OR AS DIRECTED BY THE ENGINEER OR THE TOWN PRIOR TO REMOVING WATER CONTROL MEASURES.
11. EROSION AND SEDIMENTATION CONTROLS SHALL BE REMOVED AFTER COMPLETION AND ACCEPTANCE OF ALL WORK AND WHEN AUTHORIZED BY THE BOXFORD CONSERVATION COMMISSION OR DESIGNEE.

RESOURCE IMPACTS

BORDERING VEGETATED WETLAND (BVW)

BVW ADDED.....	100 S.F.
BVW TEMP. IMPACT.....	145 S.F.
NET BVW IMPACT.....	+100 S.F.

TOTAL TEMPORARY AND PERMANENT BVW IMPACT..... 145 S.F.

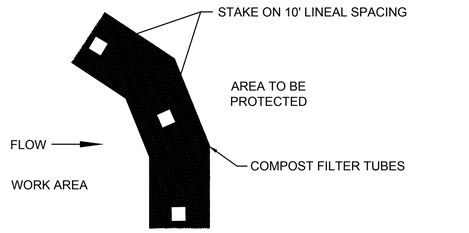


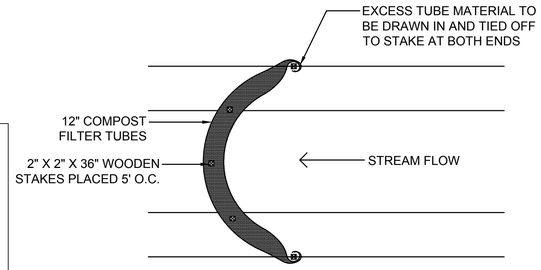
RESOURCE AREA IMPACTS

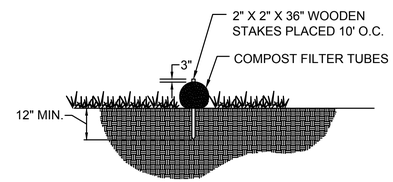
SCALE: 1"=10'

CONSTRUCTION ITEM NOTE

ITEM 984.6 - STONE FOR EROSION CONTROL AND ITEM 698.4 GEOTEXTILE FABRIC FOR EROSION CONTROL ARE PROVIDED AS CONTINGENCY ITEMS FOR STABILIZING ANY EXISTING ERODED AREAS AS FOLLOWS: 12" THICK LAYER OF STONE FOR EROSION CONTROL OVER 6" THICK CRUSHED STONE OVER GEOTEXTILE FABRIC FOR EROSION CONTROL

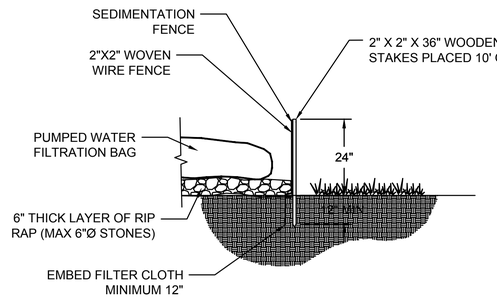






COMPOST FILTER TUBES

NOT TO SCALE



DEWATERING BAG/BASIN

NOT TO SCALE

WORK IN VEGETATED WETLAND AREAS

1. WETLAND SOIL SHALL BE EXCAVATED TO A DEPTH OF 12 INCHES, STOCKPILED AND COVERED WITH BURLAP OR STRAW MULCH TO RETAIN MOISTURE. PERIODIC LIGHT APPLICATION OF WATER MAY BE REQUIRED TO MAINTAIN MOISTURE.
2. WETLAND SOIL SHALL BE RESPREAD 12 INCHES DEEP AND LIGHTLY COMPACTED BY HAND
3. WETLAND SEED MIX SHALL BE APPLIED AT A RATE OF ½ LB./1000 SQUARE FEET AND LIGHTLY RAKED TO ENSURE SOIL/SEED CONTACT.
4. WETLAND SEED MIX SHALL BE PURE LIVE SEED AND CONTAIN NATIVE NON-HYBRIDIZED SPECIES. SEED MIX SPECIES LIST SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL PRIOR TO APPLICATION.

EROSION CONTROL NOTES:

1. PRIOR TO BEGINNING CONSTRUCTION OPERATIONS A SINGLE ROW OF COMPOST FILTER TUBES FILTER TUBES OR EQUAL FOR EROSION CONTROL SHALL BE INSTALLED AS SHOWN ON THIS PLAN. THIS SHALL SERVE AS THE LIMIT OF WORK LINE.
2. COMPOST FILTER TUBES SHOULD BE INSTALLED PARALLEL TO THE BASE OF THE SLOPE OR OTHER DISTURBED AREA.
3. STAKES SHALL BE INSTALLED THROUGH THE MIDDLE OF THE FILTER TUBES AT 10 FT. ON CENTER INTERVALS, USING 2" X2" X36" WOODEN STAKES.
4. STAKING DEPTH SHALL BE 12" MINIMUM.
5. THE CONTRACTOR SHALL MAINTAIN THE COMPOST FILTER TUBES IN A FUNCTIONAL CONDITION AT ALL TIMES, INCLUDING INSPECTIONS AFTER EACH RAINFALL AND AT LEAST DAILY DURING PROLONGED RAINFALL. THE CONTRACTOR SHALL IMMEDIATELY CORRECT ANY DEFICIENCIES.CONTRACTOR SHALL REMOVE SEDIMENT DEPOSITS AS NECESSARY TO MAINTAIN THE FILTERS IN WORKING CONDITION.
6. FILTER TUBES SHALL BE MAINTAINED UNTIL DISTURBED AREAS HAVE BEEN PERMANENTLY STABILIZED, OR AS DETERMINED BY THE ENGINEER.
7. NO WORK MAY PASS THE LINE OF STAKED FILTER TUBES DURING CONSTRUCTION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE REMOVAL AND LAWFUL DISPOSAL OF ALL EXCAVATED MATERIALS AND DEBRIS NOT OTHERWISE REUSED ON THE SITE FOR GRADING PURPOSES

DEWATERING NOTES

1. DEWATERING SHALL BE USED IF NECESSARY TO ENSURE THAT SOIL COMPACTION, CONCRETE PLACEMENT AND CULVERT INSTALLATION IS PERFORMED "IN THE DRY".
2. DIRECT DEWATERING DISCHARGE TO THE BROOK IS PROHIBITED.
3. DEWATERING EFFLUENT SHALL BE DISCHARGED INTO A WATER FILTRATION BAG SUITABLE FOR THE REQUIRED FLOW AND LOCATED WITHIN A DEWATERING SETTLING BASIN SURROUNDED BY SILT FENCE, LOCATED AS SHOWN ON THE PLANS.
4. THE DEWATERING BASIN SHOULD BE PLACED ON A REASONABLY LEVEL, STABLE SURFACE.
5. PUMPS AND HOSES SHALL BE IN GOOD WORKING CONDITION AND OF ADEQUATE CAPACITY FOR THE REQUIRED FLOW.
6. ALL EROSION CONTROL MEASURES SHALL BE INSTALLED PRIOR TO COMMENCING DEWATERING OPERATIONS.

REV.	COMMENTS	DATE

PROJECT #	2172302
SCALE	AS NOTED
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