

Vermont Department of Environmental Conservation
Watershed Management Division
St. Johnsbury Regional Office
1229 Portland Street, Suite 201
St. Johnsbury, VT 05819
www.watershedmanagement.vt.gov

Agency of Natural Resources

[fax] 802-748-6687
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AUTHORIZATION TO CONDUCT NEXT FLOOD MEASURES

Pursuant to Section F of the Vermont Stream Alteration General Permit

Project Number: **NFM - 09 - 1022- 2016**

Applicant Name: Town of Brattleboro Phone: (802) 254-4255

Mailing Address: 211 Fairground Rd, Brattleboro, VT 05301

Project Location: Bonnyvale Road/Tributary to Whetstone Brook, Brattleboro, VT

Email: hoconnell@brattleboro.org

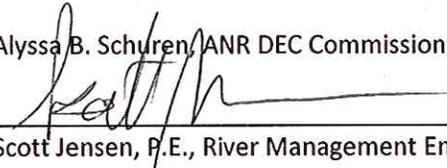
The Secretary of the Vermont Agency of Natural Resources (VT ANR) has determined that:

1. This project authorizes the repair of failed slope along Bonnyvale Road. This is a public safety issue – road has begun to fail.
2. The proposed activity is eligible for coverage under the VT ANR Stream Alteration General Permit – Next Flood Measures.
3. The proposed activity will meet the terms and conditions of Section F of the General Permit provided:
 - The project will be completed and approved as shown on the plans by Ron Bell, dated 1/28/2016; and to be discussed in the field with the River Management Engineer, and approved by the Vermont Agency of Natural Resources.
 - The project is proportional to the threat and conditioned to cease when the threat to life or to improved property has ended.
 - The project will not result in a threat to life, public health or safety.
 - The project will meet the standards detailed in subsection E.2.1 and E.2.2 of the General Permit.
 - The project will meet Stream Alteration Standards to the greatest extent possible.
 - A pre-construction meeting is held between the contractor, owner/applicant, and the ANR River Management Engineer.
 - The River Management Engineer is notified by phone or email when construction begins and when the project is complete.
 - A final construction inspection is required for any culvert and bridge related work.
 - Additional conditions: _____

If there are any changes in the project plan or deviation in construction from the plan, the Permittee must notify the River Management Engineer immediately.

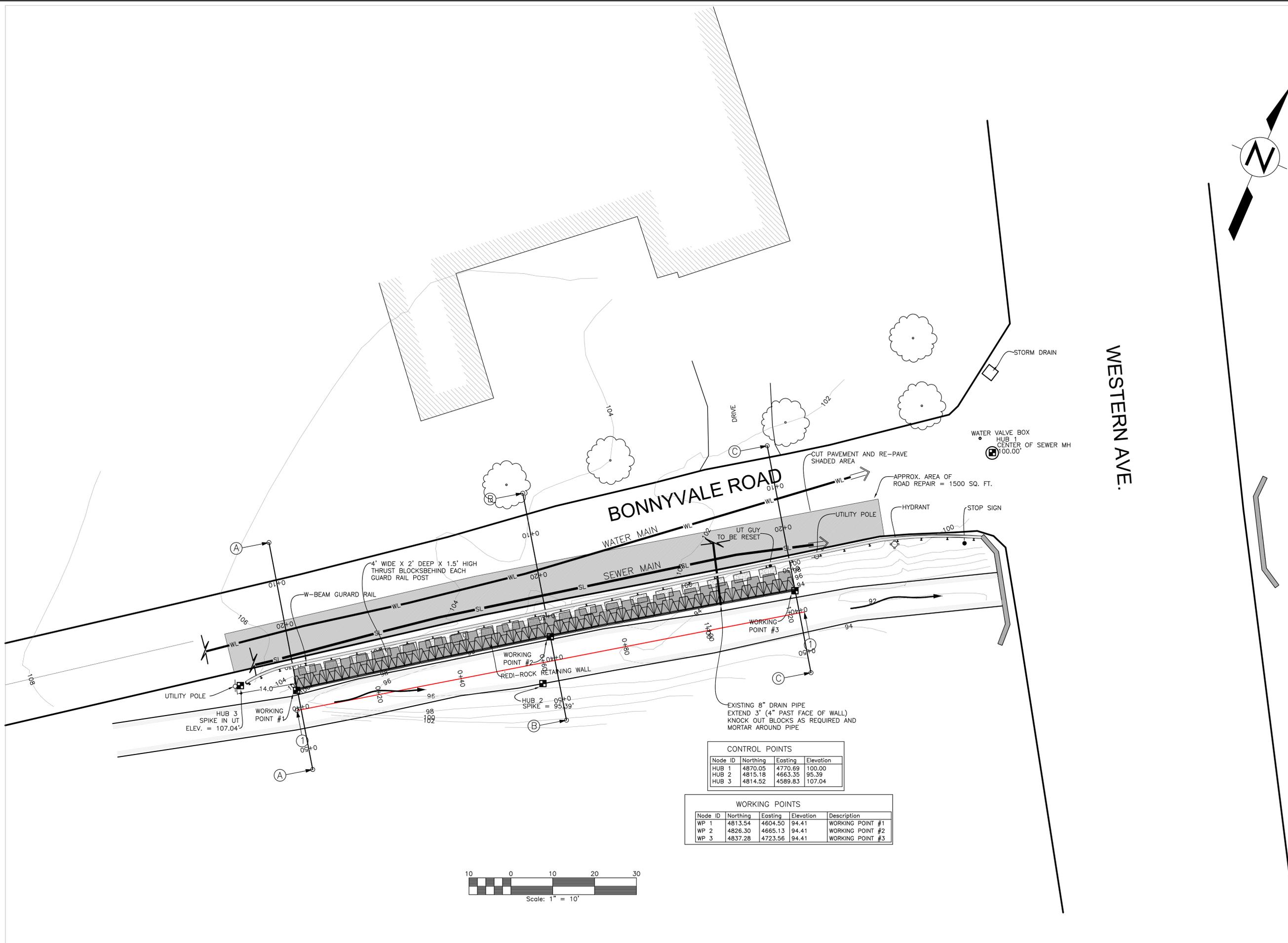
If the project is constructed as you have described, as shown on the above referenced approved plans and according to the above conditions, there is no reason to expect any violation of Vermont Water Quality Standards.

Alyssa B. Schuren, ANR DEC Commissioner



Scott Jensen, P.E., River Management Engineer

Dated: August 3 2016



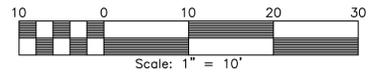
WESTERN AVE.

CONTROL POINTS

Node ID	Northing	Easting	Elevation
HUB 1	4870.05	4770.69	100.00
HUB 2	4815.18	4663.35	95.39
HUB 3	4814.52	4589.83	107.04

WORKING POINTS

Node ID	Northing	Easting	Elevation	Description
WP 1	4813.54	4604.50	94.41	WORKING POINT #1
WP 2	4826.30	4665.13	94.41	WORKING POINT #2
WP 3	4837.28	4723.56	94.41	WORKING POINT #3



REVISIONS:

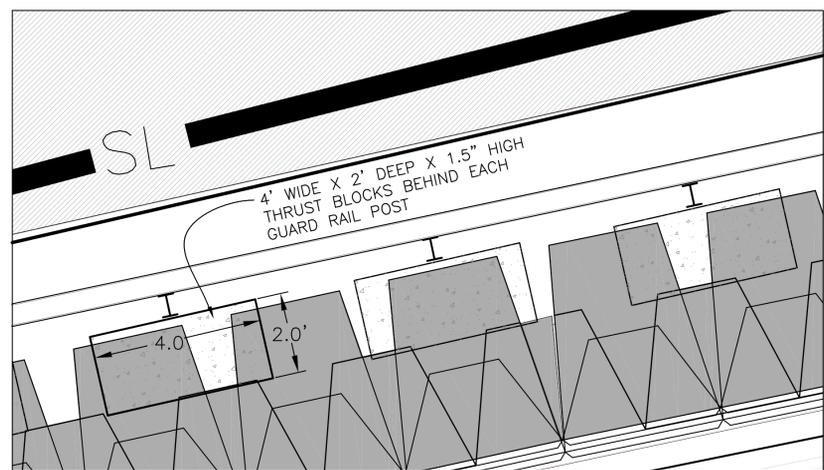
PROJECT:
**BONNYVALE ROAD
 RETAINING WALL**
 TOWN OF BRATTLEBORO
 PUBLIC WORKS DEPARTMENT

SHEET TITLE:
**PLAN VIEW
 OF RETAINING WALL
 &
 ROAD REPAIR**

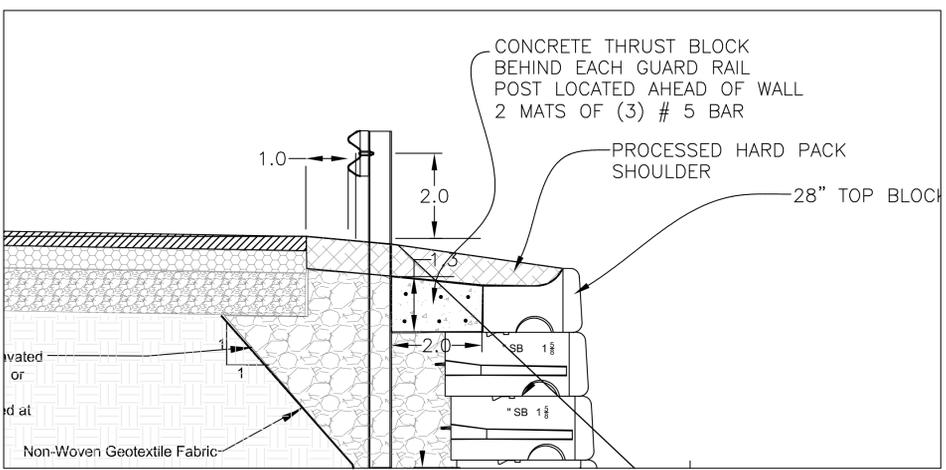
SCALE:
 AS NOTED

DATE:
 JANUARY 28, 2015

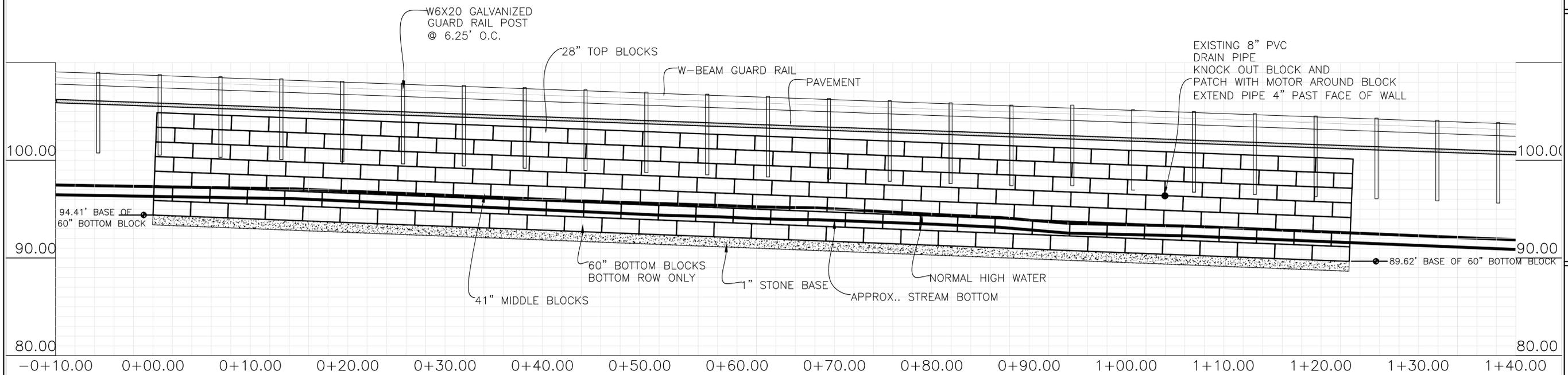
SHEET
1



PLAN OF GUARD RAIL THRUST BLOCKS
 1" = 2'

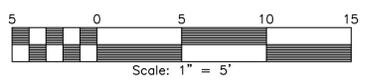


SECTION OF GUARD RAIL THRUST BLOCKS
 1" = 2'



PROFILE 1-1
 1" = 5'

NOTE: TYPE III RIP RAP AT BASE OF WALL NOT SHOWN FOR CLARITY



REVISIONS:

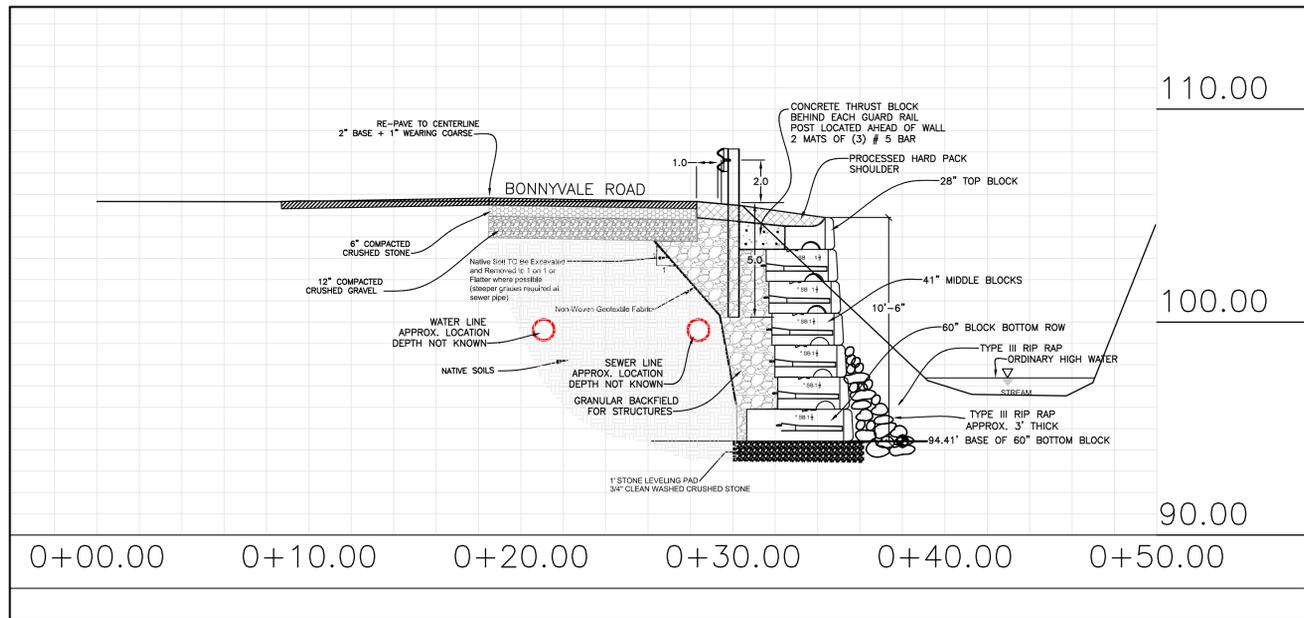
PROJECT:
**BONNYVALE ROAD
 RETAINING WALL**
 TOWN OF BRATTLEBORO
 PUBLIC WORKS DEPARTMENT

SHEET TITLE:
**PLAN VIEW
 RETAINING WALL
 &
 THRUST BLOCK DETAILS**

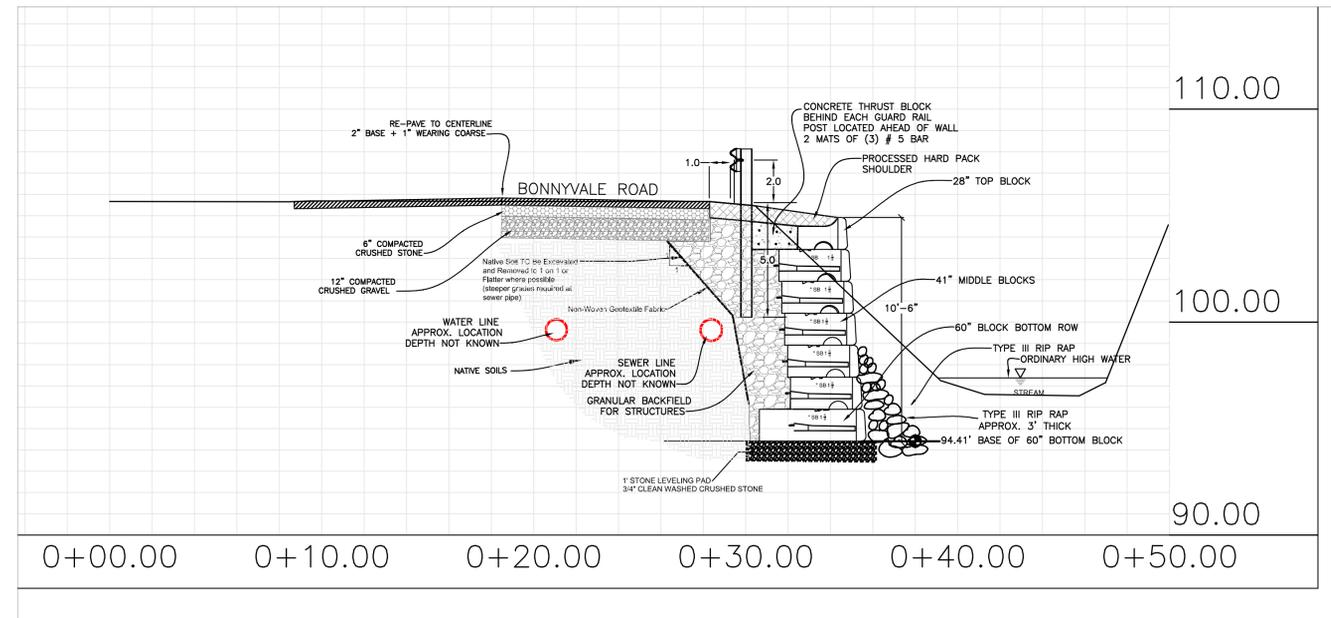
SCALE:
 AS NOTED

DATE:
 JANUARY 28, 2015

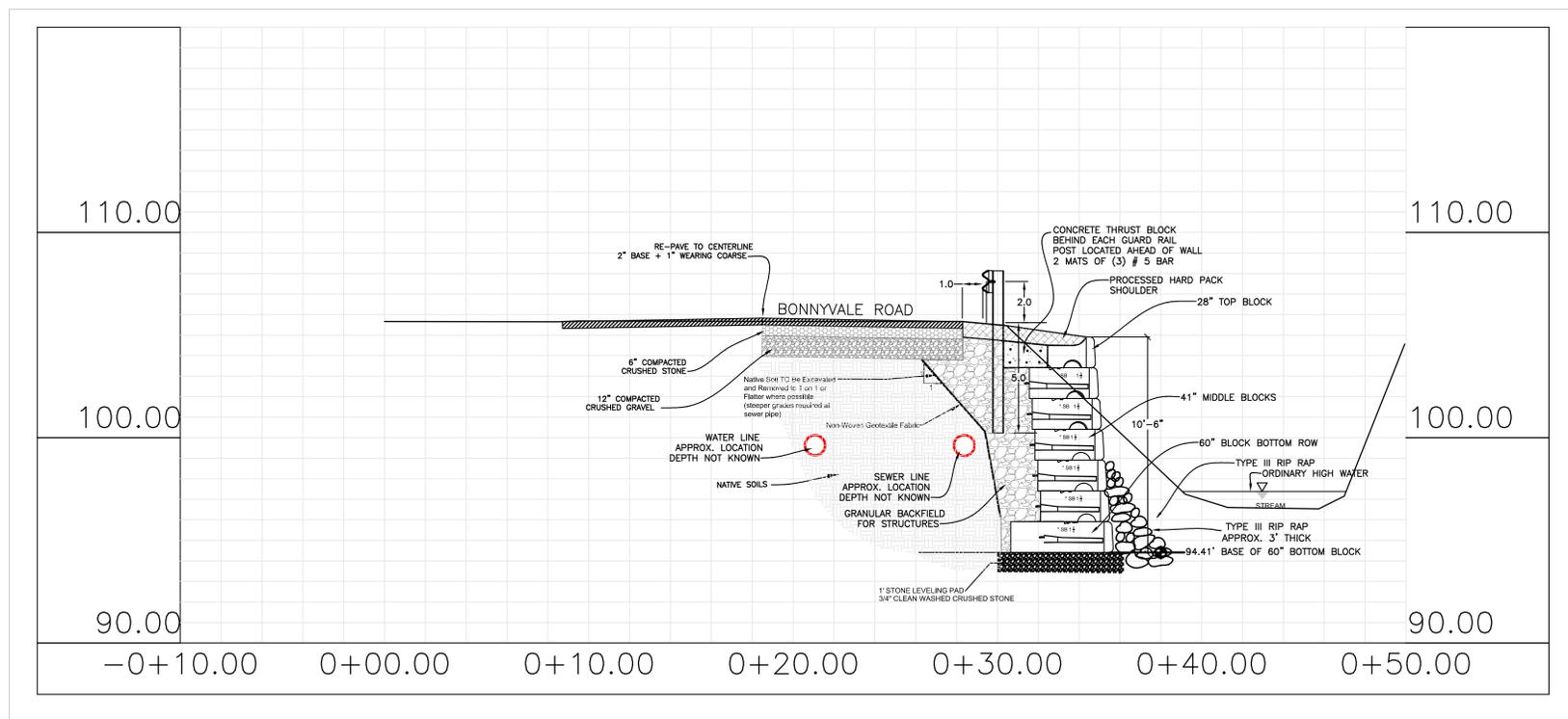
SHEET
2



SECTION A-A
 1" = 4'



SECTION B-B
 1" = 4'



SECTION C-C
 1" = 4'

REVISIONS:

PROJECT: **BONNYVALE ROAD
 RETAINING WALL**
 TOWN OF BRATTLEBORO
 PUBLIC WORKS DEPARTMENT

SHEET TITLE: **CROSS SECTIONS
 RETAINING WALL, GUARD
 RAIL & ROAD REPAIR**

SCALE: **AS NOTED**

DATE: **JANUARY 28, 2015**

SHEET

1. GENERAL

1.1 ALL MATERIALS, WORKMANSHIP, AND DETAILS SHALL COMPLY WITH THE 2012 INTERNATIONAL BUILDING CODE, 2012 AASHTO LRFD DESIGN SPECIFICATIONS FOR RETAINING WALLS AND THE TOWN OF BRATTLEBORO ROAD CONSTRUCTION SPECIFICATIONS.

1.2 THE CONTRACTOR SHALL FAMILIARIZE HIMSELF WITH THE CONTRACT DRAWINGS. ANY DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER BEFORE PROCEEDING WITH THE AFFECTED WORK. ANY VARIATIONS OR SUBSTITUTIONS OF MATERIALS OR DETAILS FROM THOSE INDICATED ON THE DRAWINGS MAY ONLY BE MADE WITH THE PRIOR APPROVAL OF THE TOWN OF BRATTLEBORO PUBLIC WORKS DEPARTMENT.

1.3 THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY SHORING REQUIRED TO COMPLETE THE WORK OF THIS PROJECT.

1.4 THE CONTRACTOR SHALL BE RESPONSIBLE FOR TRAFFIC CONTROL, TRAFFIC BARRIERS, AND DETOUR SIGNAGE.

2.0 CONTROL OF WATER, BYPASS OF WATER AND CONTROL OF SEDIMENT

2.1 THE CONTRACTOR IS RESPONSIBLE FOR THE CONTROL OF WATER IN THE EXCAVATION AND MAY INVOLVE THE USE OF CONDUITS TO CONTAIN THE STREAM, COFFERDAMS AND OR SHEET PILING. WATER SHALL BE CONTROLLED SO THAT PROPER INSTALLATION AND PREPARATION OF THE STONE BASE LAYER CAN BE ACHIEVED. IF PUMPING OF WATER OUT OF THE EXCAVATION IS REQUIRED THE PUMPED WATER SHALL BE FILTERED BEFORE DISCHARGING BACK TO THE STREAM. THE CONTRACTOR SHALL PROVIDE THE PUBLIC WORKS DEPARTMENT WITH A GENERAL DESCRIPTION OF HOW WATER IS TO BE CONTROLLED AND HOW PUMPED WATER WILL BE FILTERED. THE CONTRACTOR SHALL TAKE NECESSARY ACTIONS TO CONTROL SEDIMENTS. BEST MANAGEMENT PRACTICES FOR CONTROL OF EROSION AND SEDIMENT CONTROL ARE OUTLINED IN THE "Low Risk Site Handbook for Erosion Prevention and Sediment Control".

3.0 SEGMENTAL BLOCK RETAINING WALL

3.1 THE SEGMENTAL BLOCK RETAINING WALL SHALL BE THE REDI-ROCK INTERNATIONAL, LLC MONUMENT RETAINING SERIES. THE WALL SHALL BE CONSTRUCTED USING 60" BOTTOM BLOCKS, 41" MIDDLE BLOCKS AND 28" TOP BLOCKS. THE EXPOSED FACE SHALL BE THE COBBLESTONE FINISH PATTERN.

3.2 THE SEGMENTAL WALL SHALL BE CONSTRUCTED ON A 1'-0" THICKNESS OF 3/4" CRUSHED, WASHED STONE LEVELING PAD. THE PAD SHALL EXTEND 1'-0" BEYOND THE REAR FACE AND 6" MINIMUM BEYOND THE FRONT FACE.

3.3 THE BLOCKS SHALL BE LAID IN RUNNING BOND WITH KNOBS AND GROOVES FULLY ENGAGED. HALF BLOCKS SHALL BE USED WHERE NECESSARY TO MAINTAIN A RUNNING BOND.

3.4 THE SEGMENTAL WALL SHALL BE CONSTRUCTED WITH A 4% BATTER.

Pavement Repair:

Pavement shall be in accordance with the Marshall Mix Design method for bituminous

concrete pavement systems. This type of pavement shall be composed of mineral

aggregate, mineral filler if required, and bituminous material, plant mixed and laid hot.

This pavement shall be constructed in two courses on the prepared or existing base in

accordance with these Specifications and in conformity with the lines, grades, thickness

and typical cross-sections shown on the accepted drawings. All bituminous pavement

shall be in accordance with VTrans specification sections 406 and 702.

a. The coarse aggregate shall consist of clean, hard crushed rock or screened crushed

gravel free from dirt or foreign matter. It shall be reasonably free from soft and

elongated pieces.

b. The fine mineral aggregate shall consist of sand or a mixture of sand and stone

screenings. The sand shall consist of clean, hard, durable grains, free from dirt,

unsuitable material, and pieces which are structurally weak.

c. The asphalt binder shall conform to all the requirements as set forth by the State

of Vermont Standard Specifications for Highway Construction (Section 702).

THE DEPTHS OF ROADWAY BASE AND BITUMINOUS PAVEMENT SHALL BE A MIN. OF:

a. 18-inches of roadway subbase consisting of bankrun gravel installed in 6-inch

lifts and compacted to 95% of maximum dry density.

b. 6-inches of roadway upper base of crushed gravel fully compacted.

c. 2-inches of bituminous concrete base course (minimum).

d. 1-inch of bituminous concrete wearing course (minimum).

CONSTRUCTION NOTES

1. ALL SITE WORK SHALL BE IN CONFORMANCE WITH VERMONT AGENCY OF TRANSPORTATION "STANDARD SPECIFICATIONS FOR CONSTRUCTION", 2011 EDITION, EXCEPT AS MODIFIED IN THE DRAWINGS, SPECIFICATIONS AND NOTES.

2. SUBBASE FOR THE ROADWAY REPAIR SHALL CONSIST OF 12" MIN. OF COARSE GRAVEL FOR THE SUBBASE (ITEM 703.04) WITH MAX. SIZE OF STONE OF 6 INCHES. SUBBASE MATERIALS TO BE COMPACTED TO ATTAIN AT LEAST 95% OF THE MAXIMUM DRY DENSITY (AASHTO T-99, METHOD C). SURFACE COURSE AND SHOULDERS SHALL CONSIST OF 6 INCHES OF AGGREGATE FOR SURFACE COURSE AND SHOULDERS (ITEM 704.12).

3. SITE PREPARATION AND EARTHWORK SHALL BE AS FOLLOWS:

A. TOPSOIL AND ANY UNDERLYING SUBSOIL WHICH CONTAINS ORGANIC MATERIAL SHALL BE STRIPPED TO UNDISTURBED, FIRM, INORGANIC SUBGRADE. UNSUITABLE MATERIALS SHALL BE REMOVED FROM THE ROADWAY AND CULVERT AREAS, REGARDLESS OF ITS THICKNESS.

B. GROUNDWATER CONTROL MEASURES SHALL BE PERFORMED SO THAT THE EXCAVATION ACTIVITIES CAN BE CONSTRUCTED IN-THE-DRY, THUS LIMITING THE POTENTIAL FOR THE DISTURBANCE OF SUBGRADE SOILS.

C. EXCAVATION SIDESLOPES SHOULD BE NO STEEPER THAN THOSE ALLOWED BY OSHA, UNLESS BRACING OR TRENCH BOXES ARE USED.

D. PROOFROLLING OF SUBGRADE SOILS SHALL BE CONDUCTED PRIOR TO PLACEMENT OF FILL. PROOFROLLING SHOULD NOT BE CONDUCTED WHEN DISTURBANCE OF THE SUBGRADE SOILS MAY OCCUR AS A RESULT OF PROOFROLLING, SUCH AS WHEN SUBGRADE SOILS ARE WET. LOOSE OR SOFT ZONES IDENTIFIED DURING PROOFROLLING SHOULD BE EXCAVATED AND REPLACED WITH COMPACTED COARSE GRAVEL FOR SUBBASE (ITEM 704.04).

FILL PLACED BEHIND THE RETAINING WALL SHALL CONSIST OF GRANULAR BACKFILL FOR STRUCTURES (ITEM 704.08) OR APPROVED EQUAL.

E. SOIL MATERIALS SHALL BE PLACED IN LOOSE LIFTS NOT TO EXCEED 12 INCHES THICKNESS AND SHOULD BE COMPACTED TO THE FOLLOWING REQUIREMENTS (REFERENCE TO ASTM D-1557, METHOD D OR C):

AREA MINIMUM DEGREE OF COMPACTION

1. BELOW FOOTINGS	95
2. BASE COURSES	95
3. BELOW PAVEMENT SUBBASE AND BASE COURSES	95
4. BACKFILL OF FOOTINGS, WALLS AND CULVERT	95
5. ORDINARY FILL WITHIN THE TOP 3 FEET OF GRADE IN GRASS AREAS	90

4. CONCRETE SHALL BE IN CONFORMANCE WITH SECTION 501, STRUCTURAL CONCRETE, AND SECTION 507, REINFORCING STEEL. CONCRETE SHALL BE CLASS B (3500 PSI) AND BAR REINFORCEMENT SHALL BE GRADE 60 UNLESS OTHERWISE NOTED.

5. RIP-RAP SHOWN ON PLAN SHALL BE PLACED IN CONFORMANCE WITH STONE FILL, RIP-RAP AND STONE PAVING, VTRANS SECTIN 613 AND STONE FILL TYPE III (SECTION 706.04) TO BE AS INDICATED ON PLANS.

BACKFILL SPECIFICATIONS

THE BACKFILL SHALL MEET THE REQUIREMENTS OF VTRANS 2011 STANDARD SPECIFICATION FOR CONSTRUCTION 404.08 GRANULAR BACKFILL FOR STRUCTURES. GRANULAR BACKFILL FOR STRUCTURES SHALL BE OBTAINED FROM APPROVED SOURCES. IT SHALL CONSIST OF SATISFACTORILY GRADED, FREE DRAINING GRANULAR MATERIAL REASONABLY FREE FROM LOAM, SILT, CLAY AND ORGANIC MATERIAL.

THE MATERIAL SHALL BE PLACED IN 12-INCH LOOSE LIFTS AND COMPACTED TO 90% OF AASHTO T99 STANDARD PROCTOR DENSITY.

GRANULAR BACKFILL FOR STRUCTURES SHALL MEET THE GRADATION REQUIREMENTS OF THE FOLLOWING TABLE AS DETERMINED IN ACCORDANCE WITH AASHTO T 27 & 11.

SIEVE DESIGNATION	PERCENTAGE BY MASS PASSING SQUARE MESH SIEVES
75 MM (3 INCH)	100
4.75 MM (NO. 4)	45 TO 75
150 UM (NO. 100)	0 TO 12
75 UM (NO. 200)	0 TO 6

TESTING AND INSPECTION

A. Contractor to employ and pay for a qualified independent geotechnical testing laboratory to perform soil testing and inspection service during earthwork operations.

B. Test and analysis of fill material will be performed in accordance with ANSI/ASTM D 698 "Standard" Proctor Density.

C. Frequency of test: One in-place nuclear density compaction test should be performed for each 1,000 square feet of fill placed, per lift, with a minimum of three tests per lift.

D. Sub-grade shall be approved by testing lab before backfilling begins.

REVISIONS:



PROJECT:
**BONNYVALE ROAD
 RETAINING WALL**
 TOWN OF BRATTLEBORO
 PUBLIC WORKS DEPARTMENT

SHEET TITLE:
**NOTES
 &
 SPECIFICATIONS**

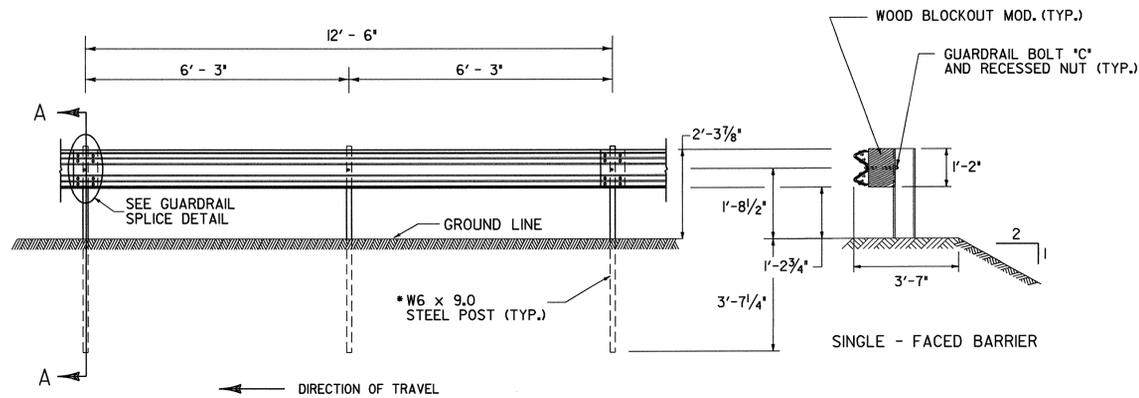
SCALE:
 NONE

DATE:
 JANUARY 28, 2015

SHEET

4

"W" BEAM GUARDRAIL WITH STEEL POSTS

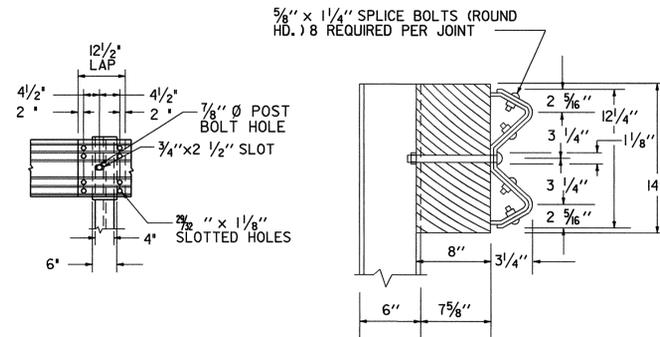


ELEVATION FROM CL OF ROAD

SECTION A - A

SINGLE - FACED BARRIER

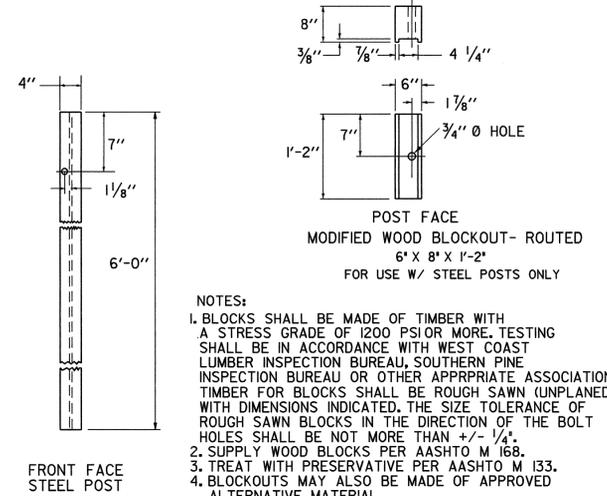
DOUBLE - FACED BARRIER



ELEVATION

SECTION

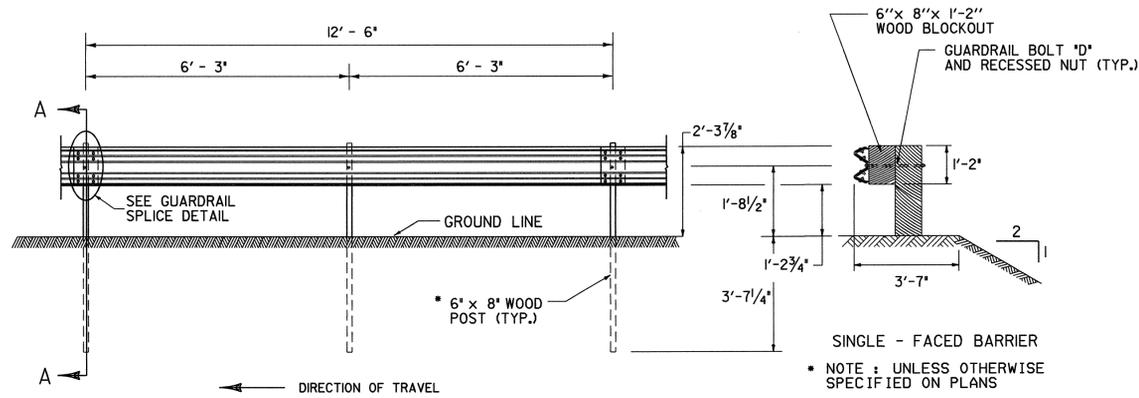
GUARDRAIL SPLICE DETAIL



FRONT FACE STEEL POST

- NOTES:
1. BLOCKS SHALL BE MADE OF TIMBER WITH A STRESS GRADE OF 1200 PSIOR MORE. TESTING SHALL BE IN ACCORDANCE WITH WEST COAST LUMBER INSPECTION BUREAU, SOUTHERN PINE INSPECTION BUREAU OR OTHER APPROPRIATE ASSOCIATION. TIMBER FOR BLOCKS SHALL BE ROUGH SAWN (UNPLANED) WITH DIMENSIONS INDICATED. THE SIZE TOLERANCE OF ROUGH SAWN BLOCKS IN THE DIRECTION OF THE BOLT HOLES SHALL BE NOT MORE THAN +/- 1/4".
 2. SUPPLY WOOD BLOCKS PER AASHTO M 168.
 3. TREAT WITH PRESERVATIVE PER AASHTO M 133.
 4. BLOCKOUTS MAY ALSO BE MADE OF APPROVED ALTERNATIVE MATERIAL.

"W" BEAM GUARDRAIL WITH WOOD POSTS

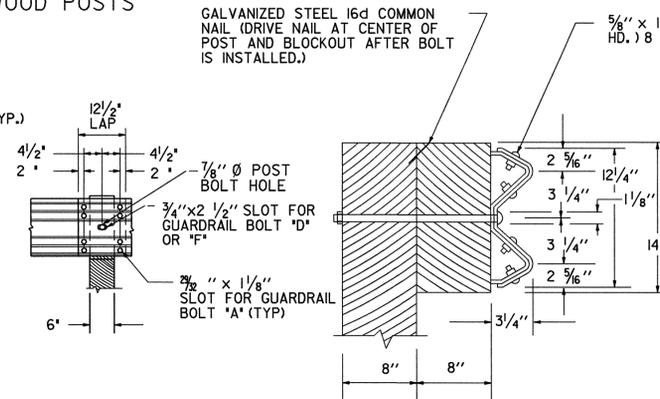


ELEVATION FROM CL OF ROAD

SECTION A - A

SINGLE - FACED BARRIER

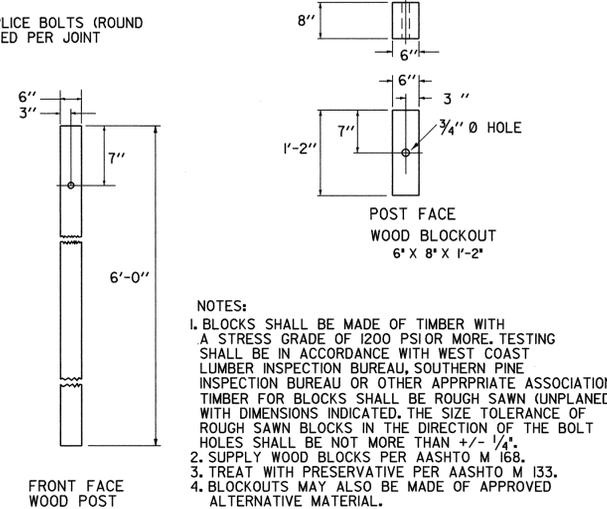
DOUBLE - FACED BARRIER



ELEVATION

SECTION

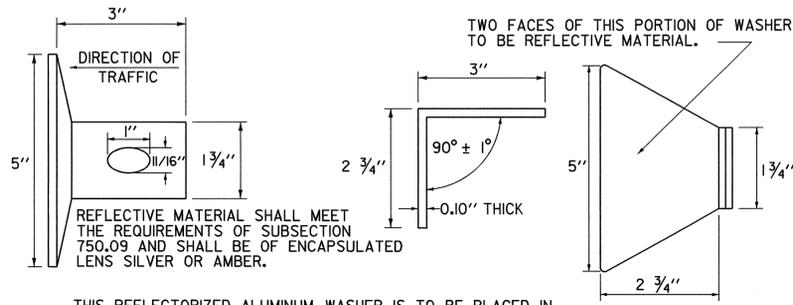
GUARDRAIL SPLICE DETAIL



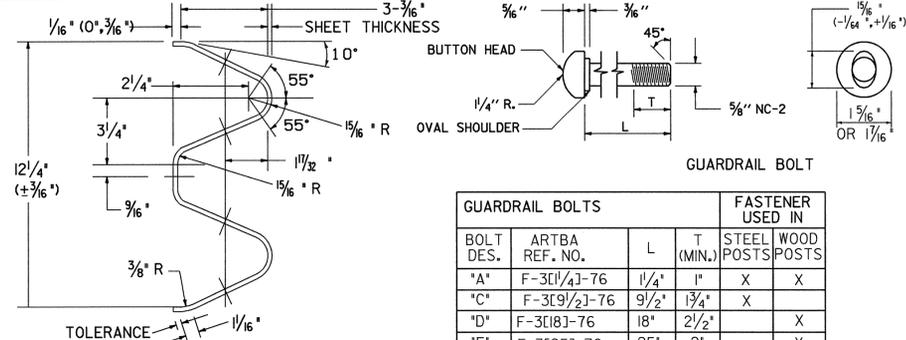
FRONT FACE WOOD POST

- NOTES:
1. BLOCKS SHALL BE MADE OF TIMBER WITH A STRESS GRADE OF 1200 PSIOR MORE. TESTING SHALL BE IN ACCORDANCE WITH WEST COAST LUMBER INSPECTION BUREAU, SOUTHERN PINE INSPECTION BUREAU OR OTHER APPROPRIATE ASSOCIATION. TIMBER FOR BLOCKS SHALL BE ROUGH SAWN (UNPLANED) WITH DIMENSIONS INDICATED. THE SIZE TOLERANCE OF ROUGH SAWN BLOCKS IN THE DIRECTION OF THE BOLT HOLES SHALL BE NOT MORE THAN +/- 1/4".
 2. SUPPLY WOOD BLOCKS PER AASHTO M 168.
 3. TREAT WITH PRESERVATIVE PER AASHTO M 133.
 4. BLOCKOUTS MAY ALSO BE MADE OF APPROVED ALTERNATIVE MATERIAL.

GUARDRAIL DELINEATOR

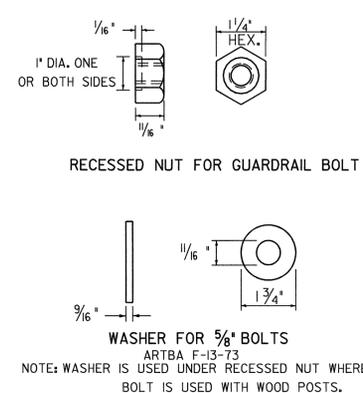


THIS REFLECTORIZED ALUMINUM WASHER IS TO BE PLACED IN VALLEY OF BEAM WHEN MOUNTING BEAM ONTO EACH FIFTH POST. WASHER SHALL MEET SPECIFICATION REQUIREMENTS FOR A.S.T.M. B-209 ALLOY 5052-H32



ARTBA RE-3[206]-3[12]-6" CLASS A, TYPE IJ-73 TYPICAL GUARDRAIL SECTION

GUARDRAIL BOLTS	BOLT DES.	ARTBA REF. NO.	L	T (MIN.)	FASTENER USED IN	
					STEEL POSTS	WOOD POSTS
A	F-3[1/4]-76	1 1/4"	1"	X	X	
C	F-3[9/2]-76	9/2"	1 3/4"	X		
D	F-3[18]-76	18"	2 1/2"		X	
F	F-3[25]-76	25"	2"		X	



NOTE: WASHER IS USED UNDER RECESSED NUT WHERE GUARDRAIL BOLT IS USED WITH WOOD POSTS.

- GENERAL NOTES:
1. GUARDRAIL SHALL MEET THE REQUIREMENTS OF AASHTO M 180, CLASS A, TYPE I, UNLESS OTHERWISE DESIGNATED
 2. GUARDRAIL SHALL BE SINGLE FACED UNLESS OTHERWISE DESIGNATED
 3. GUARDRAIL SECTIONS SHALL BE LAPPED IN THE DIRECTION OF TRAFFIC FLOW FOR THE LANE NEAREST THE GUARDRAIL.
 4. FOR DESCRIPTION AND SPECIFICATION OF PARTS IDENTIFIED BY (ARTBA ...) AND OTHER DETAILS OF POSTS, POST ACCESSORIES, FASTENERS & RAIL ELEMENTS, SEE AASHTO-AGC-ARTBA JOINT TASK FORCE NO. 13, TITLED "A GUIDE TO STANDARDIZED HIGHWAY BARRIER HARDWARE", LATEST EDITION.
 5. STANDARD STEEL BEAM TO BE 1/8" AND THE HEAVY DUTY TO BE 3/4" THICK.

OTHER STANDARD REQUIRED G-1d

REVISIONS AND CORRECTIONS
 JUNE 1, 1994 - REISSUED, WITHOUT CHANGE, UNDER NEW SIGNATURES.
 JAN. 3, 2000 - UPDATED TO REFLECT METRIC STD. CHANGES

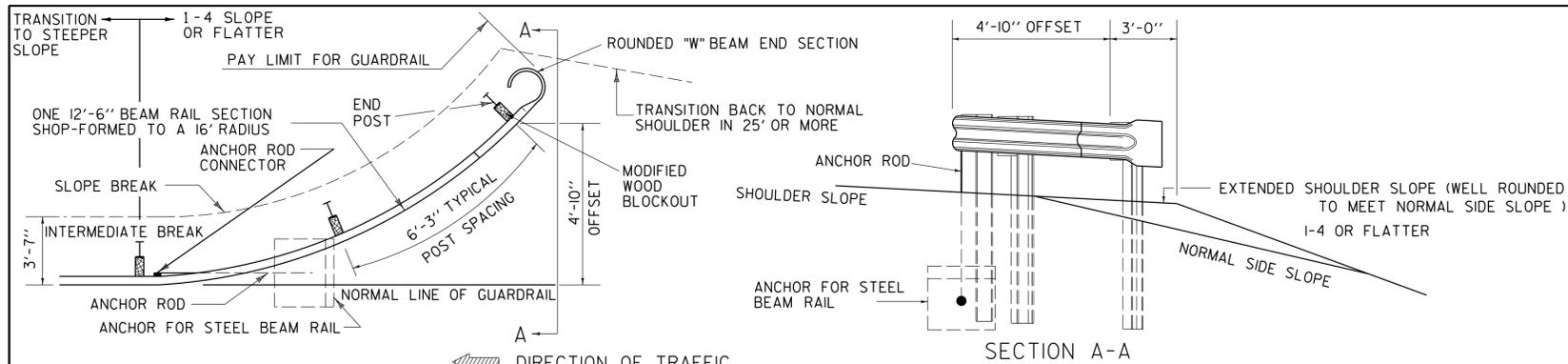
APPROVED

[Signature]
 DIRECTOR OF PROJECT DEVELOPMENT
[Signature]
 ROADWAY AND TRAFFIC DESIGN ENGINEER

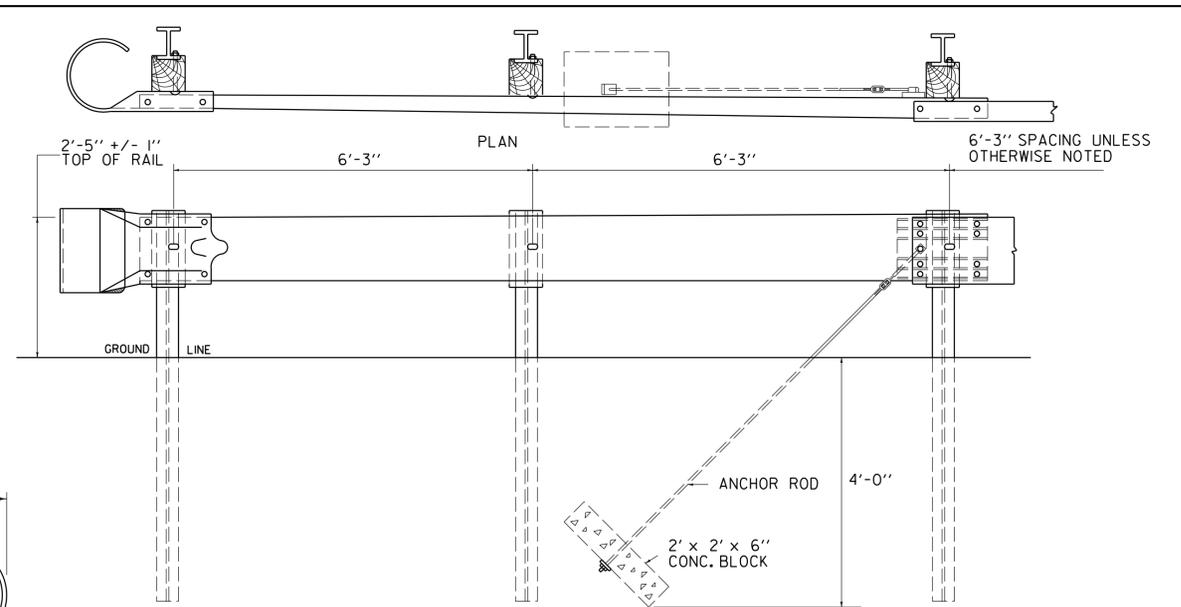
STEEL BEAM GUARDRAIL WITH STEEL POSTS
 STEEL BEAM GUARDRAIL WITH WOOD POSTS



STANDARD
 G-1



APPROACH END DETAIL
NHS APPROVED FOR USE WHERE DESIGN SPEED IS 40 OR LESS MPH
NON-NHS APPROVED FOR USE WHERE DESIGN SPEED IS 50 OR LESS MPH



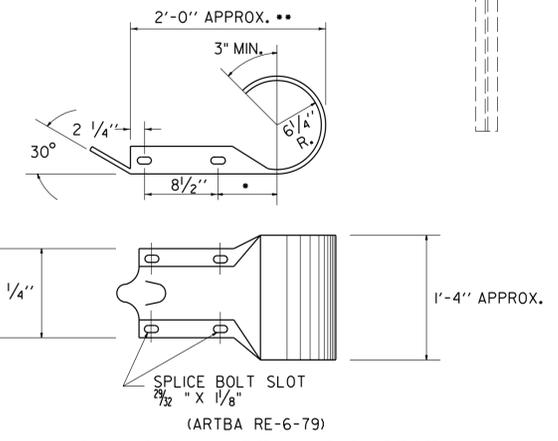
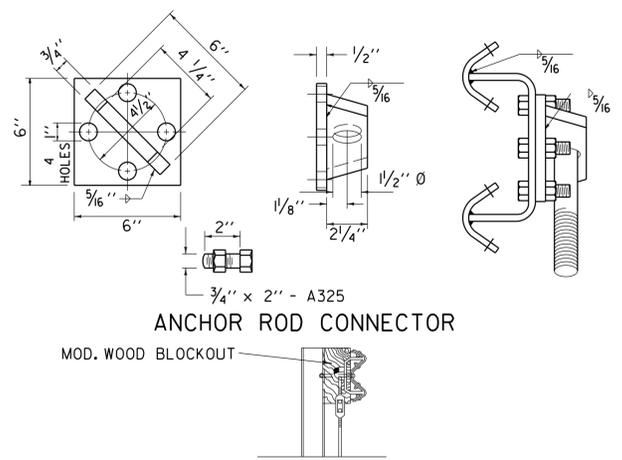
ASSEMBLY ELEVATION

TRAILING END TERMINAL FOR USE ON ONE-WAY HIGHWAYS

GENERAL NOTES:

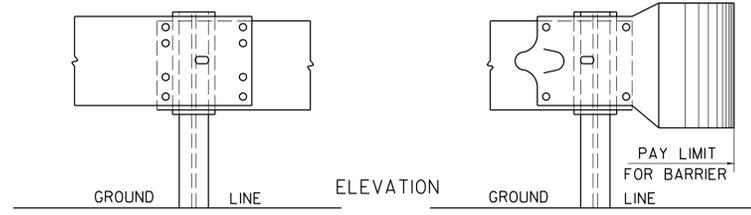
1. ALL METAL PARTS SHALL BE GALVANIZED
2. ALL WOOD POSTS SHALL BE GIVEN A PRESERVATIVE TREATMENT
3. DETAILS PERTINENT TO THE STANDARD INSTALLATION OF "W" BEAM SECTIONS WILL BE FOUND ON STANDARD DRAWING G-1.
4. FOR DESCRIPTION AND SPECIFICATIONS OF PARTS IDENTIFIED BY "ARTBA..." AND OTHER DETAILS OF POSTS, POST ACCESSORIES, FASTENERS AND RAIL ELEMENTS, SEE AASHTO-AGC-ARTBA JOINT TASK FORCE NO. 13, TITLED "A GUIDE TO STANDARDIZED HIGHWAY BARRIER HARDWARE", LATEST EDITION.
5. THE TRANSITION FROM THE APPROACH END TO THE STANDARD STEEL BEAM GUARDRAIL SHALL BE 25'-0" UNLESS OTHERWISE SPECIFIED.
6. WHEN STANDARD STEEL BEAM CONNECTS TO BRIDGE APPROACH RAIL OF A DIFFERENT HEIGHT THE LENGTH NEEDED TO TRANSITION THE HEIGHT OF STANDARD STEEL BEAM TO MATCH THE BRIDGE APPROACH RAIL SHALL BE 25'-0" UNLESS OTHERWISE SPECIFIED.
7. WHEN STANDARD STEEL BEAM CONNECTS TO A MANUFACTURED TERMINAL SECTION OF A DIFFERENT HEIGHT THE LENGTH NEEDED TO TRANSITION THE HEIGHT OF STANDARD STEEL BEAM TO MATCH THE MANUFACTURED TERMINAL SECTION SHALL BE 25'-0" UNLESS OTHERWISE SPECIFIED.

NOTE: THE GUARD RAIL ON THE NORTH END OF THE PROJECT TO TERMINATE IN THE CONCRETE BRIDGE APRON.

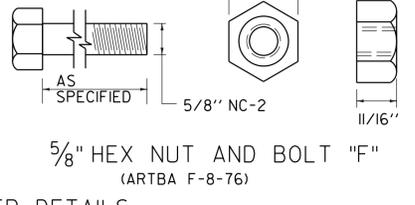
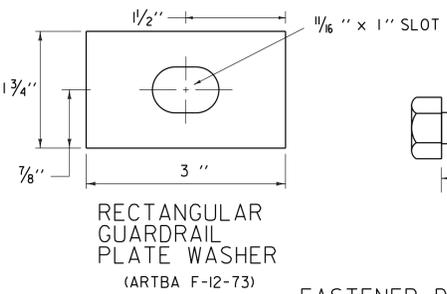
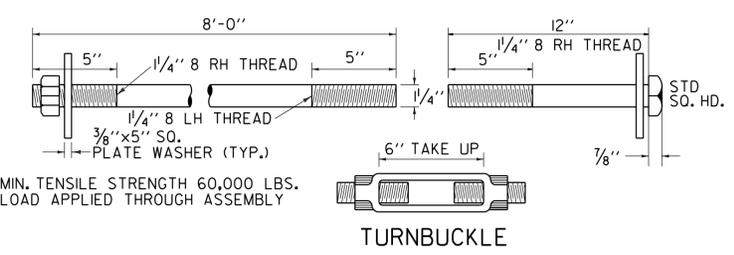


ROUNDED "W" BEAM END SECTION

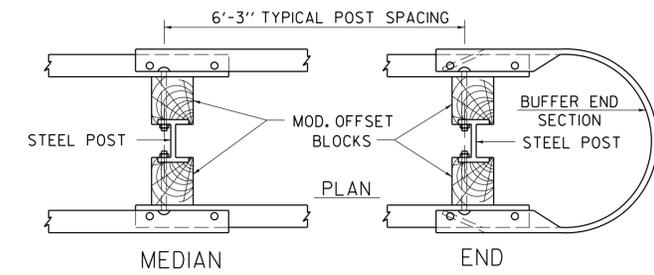
* THIS DIMENSION IS 7 1/2" IN RE-7-79. IF THE DIMENSION IS USED IN THIS PART, IT WILL GIVE AN ACCEPTABLE OVERALL LENGTH (**) OF APPROXIMATELY 2'-11/2".



ELEVATION



FASTENER DETAILS



STEEL BEAM MEDIAN BARRIER
NOTE: TO BE USED OUTSIDE CLEAR ZONE ONLY.

OTHER STANDARD REQUIRED: G-1

REVISIONS AND CORRECTIONS
JUNE 1, 1994 - REISSUED, WITHOUT CHANGE, UNDER NEW SIGNATURES.
JAN. 3, 2000 - UPDATED TO REFLECT METRIC STD. CHANGES
FEB. 10, 2014 - UPDATED TO REFLECT GUARDRAIL HEIGHT OF 29"; AS NOTED IN FHWA LETTER DATED MAY 17, 2010

APPROVED
Mark B. Richter
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STEEL BEAM GUARDRAIL APPROACH END TERMINAL
STEEL BEAM GUARDRAIL TRAILING END TERMINAL
ANCHOR FOR STEEL BEAM GUARDRAIL
STEEL BEAM MEDIAN BARRIER



STANDARD
G-1d