



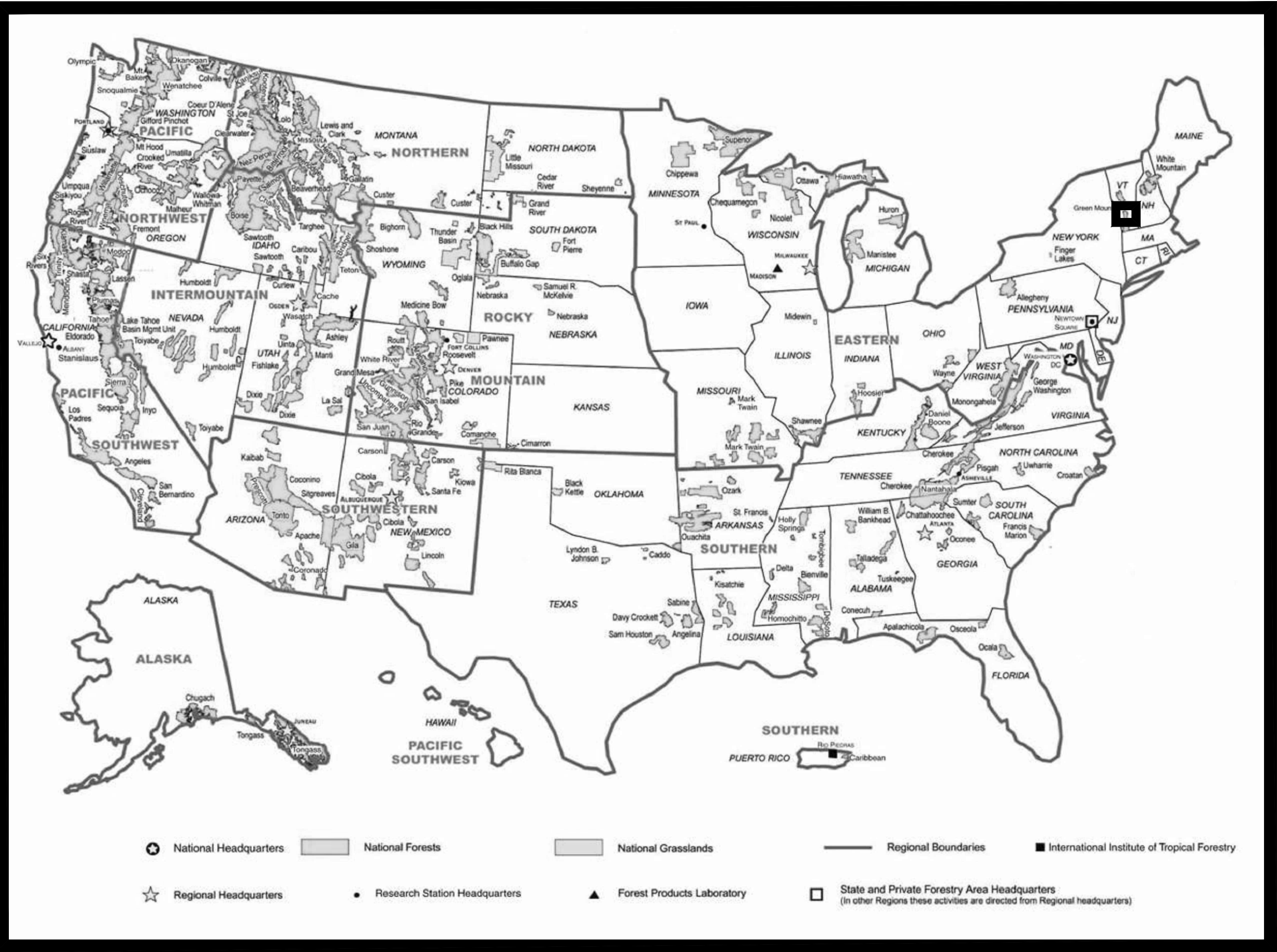
United States Department of Agriculture
Forest Service

(R09) EASTERN REGION
GREEN MOUNTAIN NATIONAL FOREST
BENNINGTON COUNTY
VERMONT

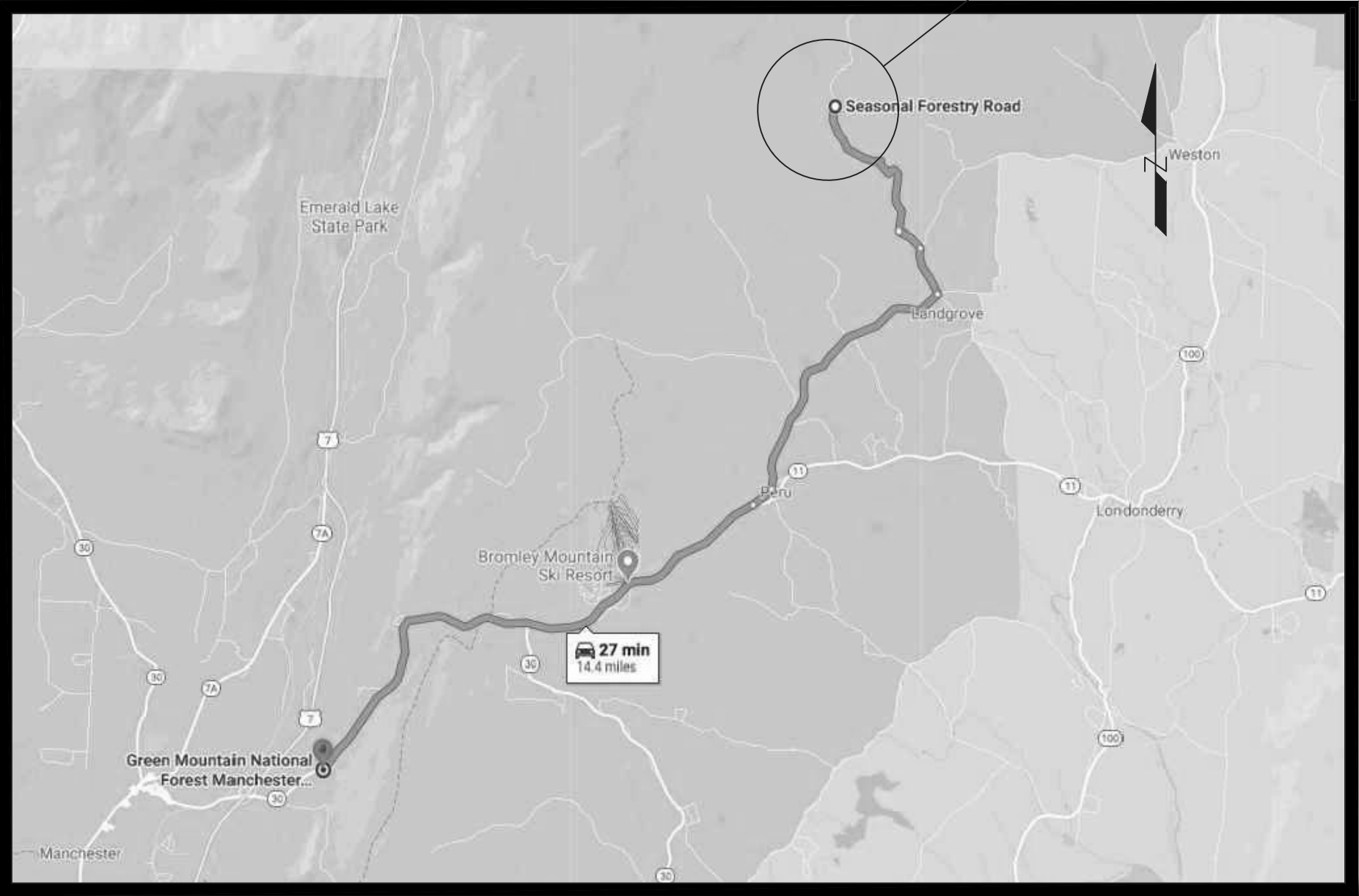


FOR CONSTRUCTION

FR 10-11.53 CULVERT REPLACEMENT
OVER TRIBUTARY TO UTLEY BROOK
STRUCTURE NUMBER: 092002000035731



FOREST LOCATION



VICINITY MAP

TRAVEL DIRECTIONS:

FROM THE INTERSECTION OF US-7 AND VT-11 E, TRAVEL EAST ALONG VT-11 E FOR 8.4 MILES. TAKE A SLIGHT LEFT ONTO MAIN ST. FOR .3 MILES. TAKE A SLIGHT LEFT ONTO HAPGOOD POND RD. FOR 3.7 MILES. TURN LEFT ONTO LANDGROVE RD. FOR .6 MILES. TURN LEFT ONTO LITTLE MICHIGAN RD. FOR .4 MILES. TURN RIGHT ONTO FOREST ROAD 10 FOR 2.2 MILES TO REACH THE CULVERT LOCATED AT MILE POST 11.53. 43°17'53" N, 72°53'02" W.

FROM THE INTERSECTION OF VT-155 S AND VT-100 S, TRAVEL SOUTH ALONG VT-100 S FOR 3.4 MILES. TURN RIGHT ONTO LAWRENCE HILL ROAD FOR .3 MILES. TURN LEFT ONTO LANDGROVE ROAD FOR 4 MILES. TURN RIGHT ONTO LITTLE MICHIGAN RD. FOR .4 MILES. TURN RIGHT ONTO FOREST ROAD 10 FOR 2.2 MILES TO REACH THE CULVERT LOCATED AT MILE POST 11.53. 43°17'53" N, 72°53'02" W.



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S-366	LONGSPAN STEEL BEAM GUARDRAIL, GALVANIZED	
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RECOMMENDED BY:

BRIAN AUSTIN

FOREST ENGINEER
MARTINA BARNES
DISTRICT RANGER

Digitally signed by BRIAN AUSTIN
Date: 2022.08.22 17:00:33 -04'00'

Digitally signed by MARTINA BARNES
Date: 2022.08.29 08:27:08 -04'00'

DATE

DATE

APPROVED:

JOHN SINCLAIR

FOREST SUPERVISOR

Digitally signed by JOHN SINCLAIR
Date: 2022.08.17 12:35:26 -04'00'

DATE

DESIGN LOADS, MATERIALS AND SPECIFICATIONS:

(1)	DESIGN LOADING:	HL-93
(2)	DESIGN METHOD:	LOAD AND RESISTANCE FACTOR DESIGN (LRFD)
(3)	SPECIFICATIONS:	AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, 8TH ED., 2017 U.S. DEPARTMENT OF TRANSPORTATION, FEDERAL HIGHWAY ADMINISTRATION STANDARD SPECIFICATIONS FOR CONSTRUCTION OF ROADS AND BRIDGES ON FEDERAL HIGHWAY PROJECTS, FP-14.
(4)	REINFORCING STEEL:	AASHTO M31 GRADE 60 DEFORMED REINFORCING STEEL.
(5)	CONCRETE:	PRECAST CONCRETE BOX CULVERT, CUTOFF WALLS, WINGWALLS AND FOOTINGS SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 4,000 psi.

HYDRAULIC DATA:

1. DRAINAGE AREA: .66 SQUARE MILES.
2. DESIGN FLOOD: 100 YEAR (1% ANNUAL EXCEEDANCE PROBABILITY). Q100 EL. = 1520.84'
3. ORDINARY HIGH WATER: 1518.46
4. BANKFULL WIDTH: 14'-0"
5. MINIMUM VERTICAL OPENING: 5'-6"
6. U.S. CHANNEL INVERT EL. = 1517.66'
7. D.S. CHANNEL INVERT EL. = 1517.29'
8. CHANNEL ROUGHNESS COEFFICIENT: n= .049
9. OVERBANK ROUGHNESS COEFFICIENT: n= .15

GENERAL NOTES:

1. ALL MATERIALS AND CONSTRUCTION SHALL CONFORM TO THE U.S. DEPARTMENT OF TRANSPORTATION, FEDERAL HIGHWAY ADMINISTRATION, STANDARD SPECIFICATIONS FOR CONSTRUCTION OF ROADS AND BRIDGES ON FEDERAL HIGHWAY PROJECTS, FP-14 AND THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, 8TH EDITION, DATED 2017.
2. ALL DIMENSIONS ARE HORIZONTAL AND VERTICAL, AND ARE GIVEN AT 68 DEGREES FAHRENHEIT.
3. ELEVATIONS ARE BASED ON NAVD88. HORIZONTAL NORTHINGS AND EASTINGS ARE BASED ON AN ASSUMED DATUM WITH HVCTRL #2 REPRESENTING NORTHING 10,000' AND EASTING 10,000'.
4. ALL DIMENSIONS AND FIELD CONDITIONS SHALL BE VERIFIED BY THE CONTRACTOR PRIOR TO COMMENCEMENT OF THE WORK.
5. ALL WORK PERFORMED BY THE CONTRACTOR SHALL COMPLY WITH ALL FEDERAL REGULATIONS AND REQUIREMENTS.
6. THE CONTRACTOR SHALL REVIEW AND UNDERSTAND ALL APPLICABLE ENVIRONMENTAL PERMITS AND ENSURE THAT ALL CONSTRUCTION CONDITIONS ARE MET.
7. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CONSTRUCTION SAFETY, AND MEANS AND METHODS TO PERFORM AND COMPLETE THE WORK.
8. THE CONTRACTOR SHALL BE RESPONSIBLE FOR REPAIRING ANY DAMAGE TO PRIVATE OR PUBLIC PROPERTY OUTSIDE THE LIMITS OF CONSTRUCTION SHOWN ON THE PLANS CAUSED BY THE CONTRACTOR, AT THE SOLE COST TO THE CONTRACTOR.
9. THE CONTRACTOR SHALL SUBMIT LITERATURE (MANUFACTURERS LITERATURE, CUT SHEETS, APPLICATION PROCEDURES, ETC.) FOR ALL PRODUCTS PROPOSED FOR USE ON THE PROJECT, FOR APPROVAL BY THE CONTRACTING OFFICERS REPRESENTATIVE (COR).
10. THE CONTRACTOR SHALL COMPACT THE ROADWAY SUBGRADE AFTER EXISTING MATERIAL IS REMOVED AND PRIOR TO THE PLACEMENT OF ANY ADDITIONAL OR NEW MATERIAL. SUBGRADE SHALL MEET 95% COMPACTION.
11. THE CONTRACTOR SHALL TAKE ALL NECESSARY MEASURES TO ENSURE THAT DEBRIS DOES NOT FALL ON ANY WATERWAY BELOW THE EXISTING STRUCTURE. ALL COSTS, INCLUDING ERECTION, MAINTENANCE AND REMOVAL OF TEMPORARY STRUCTURES OR OTHER SUCH APPROVED METHODS, SHALL BE SUBSIDIARY TO THE APPROPRIATE ITEMS OF WORK BEING PERFORMED.
12. ALL WASTE MATERIAL INCLUDING UNUSED EXCAVATED MATERIAL SHALL BECOME THE PROPERTY OF THE CONTRACTOR AND SHALL BE DISPOSED OF OFF U.S. GOVERNMENT (NATIONAL FOREST) LAND IN AN APPROVED LANDFILL. THERE ARE NO GOVERNMENT DISPOSAL SITES OR PITS AVAILABLE FOR THIS PROJECT.
13. ALL SOIL MOVING EQUIPMENT SHALL BE THOROUGHLY CLEANED TO MAKE IT FREE OF SOIL, NON-NATIVE INVASIVE SPECIES OR OTHER DEBRIS THAT COULD CONTAIN OR HOLD SEEDS PRIOR TO BEING DELIVERED TO THE PROJECT SITE. EQUIPMENT SHALL BE CONSIDERED FREE OF NON-NATIVE OR INVASIVE SPECIES AND OTHER SUCH DEBRIS WHEN A VISUAL INSPECTION BY THE C.O.R., COMPLETED PRIOR TO THE EQUIPMENT BEING MOVED TO THE SITE, DOES NOT DISCLOSE SUCH MATERIAL PRESENT.
14. PRIOR TO REMOVAL OF EQUIPMENT FROM THE PROJECT SITE, ALL SOIL MOVING EQUIPMENT SHALL BE THOROUGHLY CLEANED TO MAKE IT FREE OF SOIL, VEGETATION OR OTHER DEBRIS.
15. FR-10 SHALL BE CLOSED WITHIN THE PROJECT LIMITS AS SHOWN ON SHEET C-05 FOR THE DURATION OF CONSTRUCTION. THE CONTRACTOR SHALL PROVIDE TRAFFIC BARRICADES AS APPROVED BY THE C.O.R.. ALL ASSOCIATED COST SHALL BE INCIDENTAL TO THE CONTRACT. THE FOREST SERVICE SHALL PROVIDE AND INSTALL SIGNAGE FOR THE ROAD CLOSURE.
16. ALL EXPOSED RIPRAP AND AGGREGATE SURFACE COURSE SHALL BE BROWN, DARK GREY OR EATH TONE IN COLOR. THE C.O.R. SHALL APPROVE COLOR PRIOR TO PURCHASE OR PLACEMENT BY THE CONTRACTOR.
17. SUITABLE EXCAVATED MATERIALS AS APPROVED BY THE C.O.R. SHALL BE STOCKPILED FOR USE OUTSIDE THE LIMITS OF THE ITEM 20801-0000. ITEM 20403-0000, UNCLASSIFIED BURROW MAY BE USED WHERE ADDITIONAL FILL MATERIALS ARE REQUIRED WITH APPROVAL FROM THE C.O.R..

18. GUARDRAIL TERMINAL UNITS SHALL BE DELINEATED WITH OM3-L AND OM3-R OBJECT MARKERS AS SHOWN ON THE MODIFIED NHDOT TERMINAL UNIT DELINEATION SHEET AS SHOW ON SHEET C-15. ALL PAYMENT WILL SUBSIDIARY TO THE ITEM 61701-1950.
19. THE CONTRACTOR IS RESPONSIBLE FOR DEWATERING THE CONSTRUCTION SITE. THE CONTRACTOR SHALL DETERMINE THE DEWATERING METHOD, PROVIDE CALCULATIONS, AND LAYOUT SKETCH WITH ALL PERTINENT INFORMATION, INCLUDING ANY PLANNED STREAM RELOCATION, FOR REVIEW AND APPROVAL OF THE C.O.R. 15 DAYS PRIOR TO IMPLEMENTATION. THIS WORK SHALL BE CONSIDERED INCIDENTAL TO ALL CONTRACT ITEMS.
20. BACKFILL MATERIAL SHALL BE APPROVED BY THE C.O.R. AND SHALL CONSIST OF INERT MATERIAL THAT IS HARD, DURABLE STONE AND COURSE SAND, FREE FROM LOAM AND CLAY, SURFACE COATINGS, AND DELETERIOUS MATERIALS. BACKFILL PLACEMENT AND COMPACTION SHALL BE IN ACCORDANCE WITH FP-14 SPECIFICATIONS. ALL COSTS SHALL BE INCLUDED UNDER ITEM 25510-0000, SELECT GRANULAR BACKFILL.

CULVERT REMOVAL NOTES:

1. THE CONTRACTOR SHALL SUBMIT, FOR DOCUMENTATION, A DETAILED OUTLINE OR PLAN OF THE PROPOSED METHOD OF REMOVAL OF THE EXISTING CULVERT COMPONENTS PRIOR TO THE COMMENCEMENT OF ANY WORK.
2. THE EXISTING CULVERT SHALL BE REMOVED IN ITS ENTIRETY AND SHALL BE PAID FOR UNDER ITEM 20301-1900, REMOVAL OF PIPE CULVERT.

PRECAST CONCRETE ELEMENT NOTES:

GENERAL PRECAST CONCRETE NOTES:

1. THE CONTRACTOR SHALL SUBMIT AN ERECTION PLAN AND A COMPLETE PACKAGE OF SHOP DRAWINGS, CALCULATIONS, LOAD RATING, AND PRODUCT SPECIFICATIONS FOR THE PROPOSED PRECAST COMPONENTS, SEALED AND SIGNED BY A PROFESSIONAL ENGINEER LICENSED IN THE STATE OF VERMONT, FOR REVIEW AND ACCEPTANCE PRIOR TO FABRICATION IN ACCORDANCE WITH 106.01. SHOP DRAWINGS SHALL SHOW THE JOINT DETAILS, REINFORCEMENT SIZE AND LOCATION.
2. DIMENSIONS SHOWN FOR THE PRECAST CONCRETE BOX CULVERT AND WINGWALLS ARE ASSUMED. NO ADJUSTMENTS TO QUANTITIES OR PAYMENTS WILL BE MADE FOR ANY OF THE PRECAST ITEMS OR ANY OTHER ITEM AS A RESULT OF FABRICATING AND INSTALLING PRECAST UNITS SIZED DIFFERENTLY THAN SHOWN ON THE PLANS.
3. THE CONTRACTOR SHALL FURNISH ALL LABOR, MATERIALS AND EQUIPMENT REQUIRED TO PERFORM ALL OPERATIONS IN CONNECTION WITH THE INSTALLATION OF PRECAST CONCRETE ELEMENTS IN ACCORDANCE WITH THE SPECIFIED INFORMATION SHOWN ON THE PLANS.
4. TWO (2) SETS OF APPROVED SHOP DRAWINGS SHALL BE SUBMITTED ON 22"x34" PAPER.
5. REINFORCEMENT OF ALL PRECAST ELEMENTS SHALL HAVE A 2" MINIMUM CLEAR COVER ON ALL FACES.
6. ALL EXPOSED EDGES OF CONCRETE SHALL BE CHAMFERED 3/4" EXCEPT AS NOTED.
7. MEMBRANED SURFACES TO BE BACKFILLED AGAINST SHALL BE PROTECTED BY A PROTECTION BOARD. THE PROTECTION BOARD SHALL BE SUBSIDIARY TO THE APPROPRIATE PAY ITEM.
8. JOINTS BETWEEN ABUTTING PRECAST UNITS SHALL BE MECHANICALLY CONNECTED AND GROUTED.
9. JOINTS BETWEEN ABUTTING PRECAST BOX CULVERT, WINGWALLS AND HEADWALL ELEMENTS SHALL BE MECHANICALLY CONNECTED AND WATER TIGHT.
10. THE QUALITY OF MATERIALS, THE PROCESS OF MANUFACTURE, AND THE FINISHED PRECAST UNITS SHALL BE SUBJECT TO INSPECTION AND APPROVAL BY THE COR.
11. SILANE WATERPROOFING SHALL BE APPLIED TO ALL EXPOSED CONCRETE SURFACES IN ACCORDANCE WITH MANUFACTURERS RECOMMENDATIONS. SILANE PRODUCTS SHALL BE APPROVED BY THE C.O.R. ALL COSTS ASSOCIATED WITH SILANE, INCLUDING COSTS FOR FURNISHING, LABOR, TOOLS, EQUIPMENT, AND INCIDENTALS NECESSARY TO COMPLETE THE WORK SHALL BE PAID FOR UNDER ITEM 56224-0000, SEAL CONCRETE SURFACE.

PRECAST BOX CULVERT NOTES:

1. ITEM 60220-0000 PRECAST REINFORCED CONCRETE BOX CULVERT, SHALL INCLUDE THE BOX CULVERT AND PRECAST CONCRETE CUTOFF WALLS. THE BOX CULVERT SHALL HAVE THE CLEAR SPAN AND RISE AS INDICATED IN THE PLANS.
2. THE PRECAST BOX CULVERT SECTIONS SHALL BE DESIGNED TO ACCOUNT FOR ALL EARTH PRESSURE AND LIVE LOAD SURCHARGES AS SPECIFIED IN THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, 8TH ED. 2017.
3. WEEP HOLES SHALL BE PLACED 1'-0" (TYP.) ABOVE THE RIPRAP BANK ON BOTH SIDES AT 10'-0" (MAX.) SPACING.

PRECAST WINGWALL NOTES:

1. ITEM 60220-0000 PRECAST CONCRETE BOX CULVERT, SHALL INCLUDE ALL PRECAST CONCRETE WINGWALLS, FOOTINGS, CUTOFF WALLS, AND JOINT MATERIALS, COMPLETE AND IN PLACE. THE WINGWALLS SHALL HAVE THE DIMENSIONS AS INDICATED ON THE PLANS AT A MINIMUM, OTHERWISE AS SPECIFIED BY THE FABRICATOR.
2. WEEP HOLES SHALL BE PLACED 2'-0" (TYP.) ABOVE THE TOP OF EACH WINGWALL FOOTING AND SPACED AT ONE (1) LOCATION PER PRECAST UNIT OR 10'-0" (MAX.) SPACING.
3. THE DESIGN OF THE WINGWALLS, INCLUDING THE GEOMETRIC DIMENSIONS AND REINFORCING SIZES AND SPACINGS SHALL BE COMPLETED BY THE FABRICATOR AND STAMPED BY A LICENSED PROFESSIONAL ENGINEER IN THE STATE OF VERMONT. ALL DESIGNS SHALL BE IN ACCORDANCE WITH AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS.

STREAM RECONSTRUCTION NOTES:

1. FILL PLACED TO ESTABLISH FINISHED STREAMBED GRADES SHALL BE PAID FOR UNDER ITEM 64704-1000, MITIGATION, STREAMBED MATERIAL.
2. ALL RIPRAP ROCK VANES SHALL BE APPROXIMATELY 2'-0" IN DIAMETER AND SHALL BE BROWN, DARK GREY OR EARTH TONE IN COLOR. THE C.O.R. SHALL APPROVE COLOR PRIOR TO PURCHASE OR PLACEMENT BY THE CONTRACTOR.
3. THE EXISTING STREAM BANKS AS SHOWN IN THESE PLANS HAVE BEEN MODIFIED BASED ON AVAILABLE LIDAR, AERIAL IMAGES AND CONTOURS TO BEST REPRESENT EXISTING CONDITIONS. THE CONTRACTOR SHALL WORK WITH THE C.O.R. PRIOR TO CONSTRUCTION TO DETERMINE THE MOST APPROPRIATE STREAM BED ALIGNMENT.
4. THE CONTRACTOR SHALL PLACE IMMOBILE FEATURES SUCH AS IRREGULAR BANKLINES, ROCK CLUSTERS AND ROCK VANES WITHIN AND AROUND THE CULVERT TO MATCH THE NATURAL CHANNEL ROUGHNESS. THESE IMMOBILE FEATURES SHALL MATCH THE GRADATION AND BE PAID FOR UNDER ITEM 25101-0300, PLACED RIPRAP, METHOD A, CLASS 3.
2. GRADATION FOR THE PLACED STREAMBED MATERIAL HAS BEEN DETERMINED FROM A GRADATION OF THE EXISTING MATERIAL AS WELL AS THE USE OF THE FULLER-THOMPSON EQUATION. THE STREAMBED MATERIAL SHALL BE A MIXTURE OF SAND, GRAVEL AND FINES CONFORMING TO THE FOLLOWING GRADATION:


PERCENT FINER:	PARTICLE SIZE:
96%	1½"
88%	1"
55%	¾"
42%	NO. 4
13%	NO. 20
2%	NO. 60



United States Department of Agriculture
Forest Service

(R09)
EASTERN REGION

STAMPS, LOGOS, AND SEALS



FOR CONSTRUCTION

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NO.	REVISION / ISSUE	DATE

PROJECT NAME

FR 10-11.53
CULVERT
REPLACEMENT
OVER TRIBUTARY
TO UTLEY BROOK

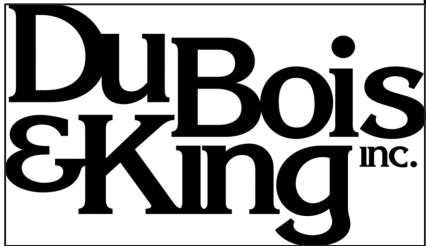
GREEN MOUNTAIN
NATIONAL FOREST

MANCHESTER RANGER DISTRICT

DRAWING TITLE

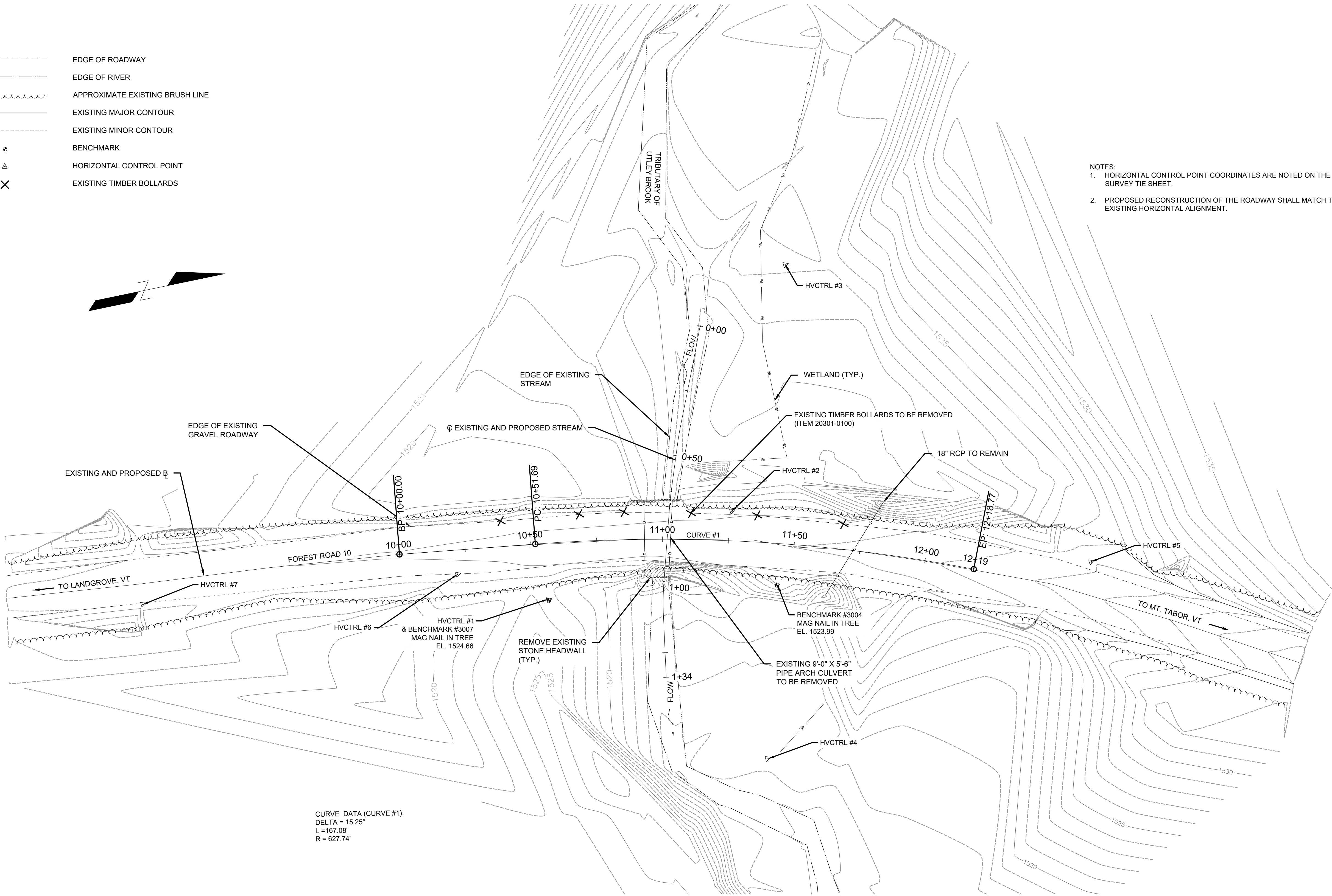
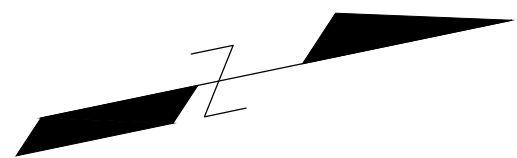
GENERAL NOTES

DATE 07/18/22	ARCHIVE NO.
DESIGNER K. KITTREDGE	DRAWING SHEET NO.
DRAWN K. KITTREDGE	C-02
CHECKED R. GAUDREAU	
PROJECT NO. 626426	SHEET 02 OF 18



LEGEND:

- EDGE OF ROADWAY
- EDGE OF RIVER
- APPROXIMATE EXISTING BRUSH LINE
- EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- BENCHMARK
- HORIZONTAL CONTROL POINT
- EXISTING TIMBER BOLLARDS



- NOTES:
- HORIZONTAL CONTROL POINT COORDINATES ARE NOTED ON THE SURVEY TIE SHEET.
 - PROPOSED RECONSTRUCTION OF THE ROADWAY SHALL MATCH THE EXISTING HORIZONTAL ALIGNMENT.



United States Department of Agriculture
Forest Service

(R09)
EASTERN REGION

STAMPS, LOGOS, AND SEALS

STATE OF VERMONT
MEGAN COMPTON
8/11/22
NO. 199532
Structural I
Megan Compton
LICENSED PROFESSIONAL ENGINEER

FOR CONSTRUCTION

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NO.	REVISION / ISSUE	DATE

PROJECT NAME

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CULVERT
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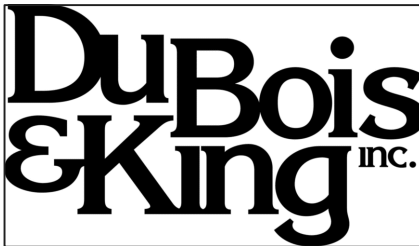
GREEN MOUNTAIN
NATIONAL FOREST

MANCHESTER RANGER DISTRICT

DRAWING TITLE

EXISTING CONDITIONS
PLAN

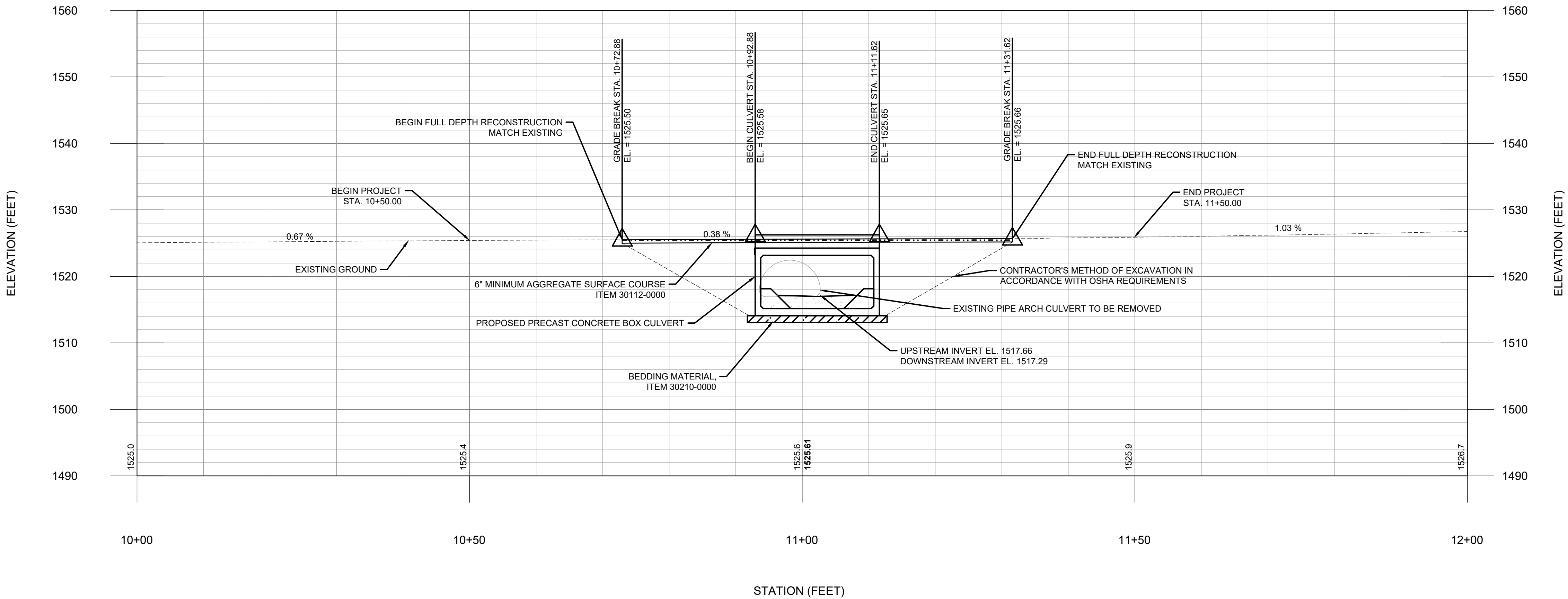
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DESIGNER K. KITTREDGE	DRAWING SHEET NO. C-03
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CHECKED R. GAUDREAU	
PROJECT NO. 626426	SHEET 03 OF 18



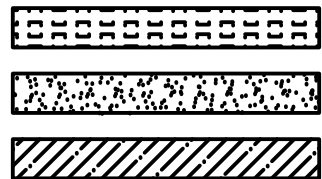
EXISTING CONDITIONS PLAN
SCALE: 1" = 20'-0"

CURVE DATA (CURVE #1):
DELTA = 15.25°
L = 167.08'
R = 627.74'

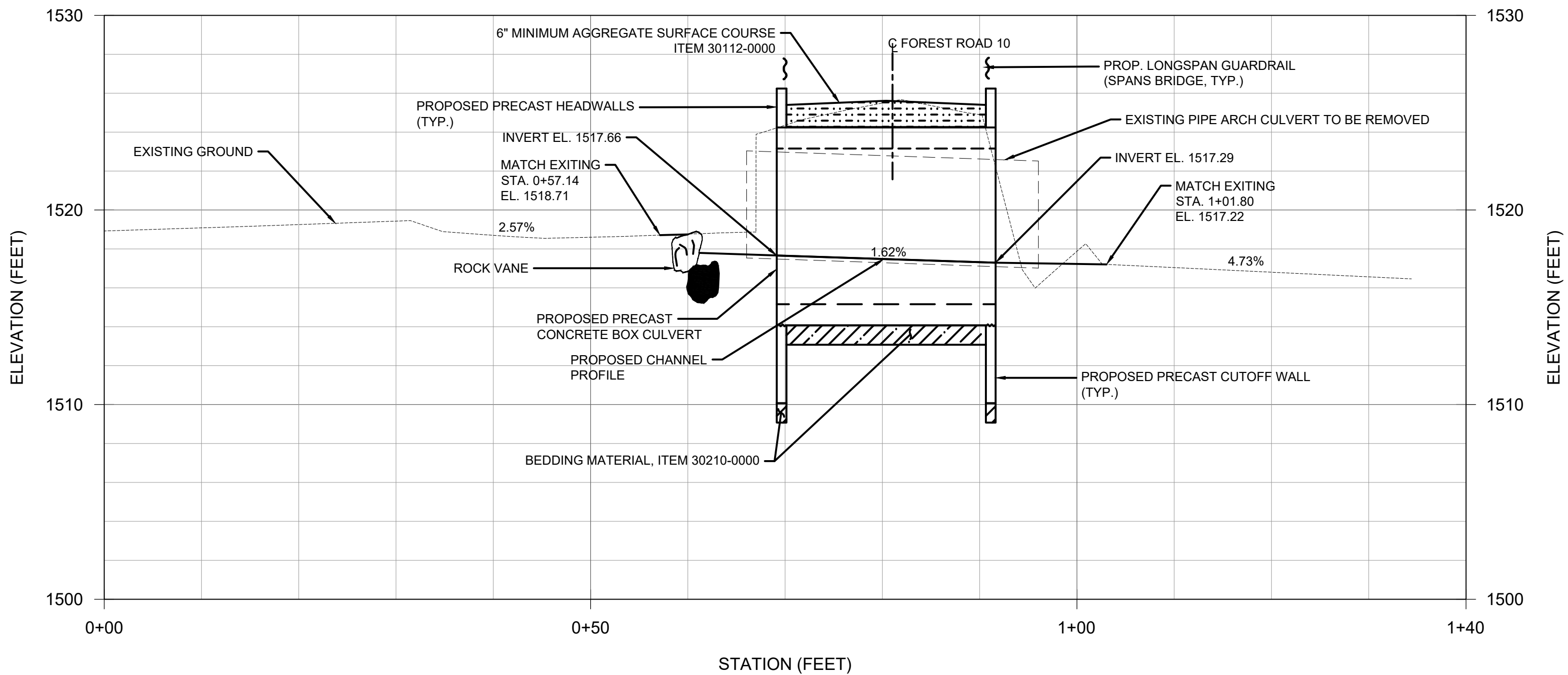
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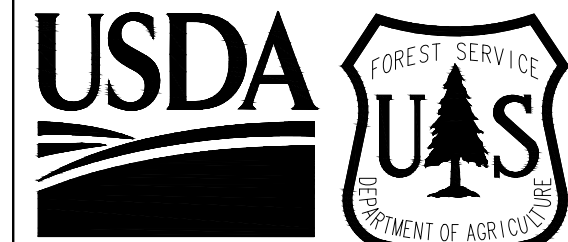
LEGEND:



AGGREGATE SURFACE COURSE
STREAMBED MATERIAL
BEDDING MATERIAL



STREAM BED PROFILE
HORIZONTAL SCALE: 1" = 10'-0"
VERTICAL SCALE: 1" = 20'-0"



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**GREEN MOUNTAIN
NATIONAL FOREST**

MANCHESTER RANGER DISTRICT

DRAWING TITLE

PROFILE

DATE 07/18/22	ARCHIVE NO.
DESIGNER K. KITTREDGE	DRAWING SHEET NO. C-04
DRAWN K. KITTREDGE	
CHECKED R. GAUDREAU	
PROJECT NO. 626426	SHEET 04 OF 18

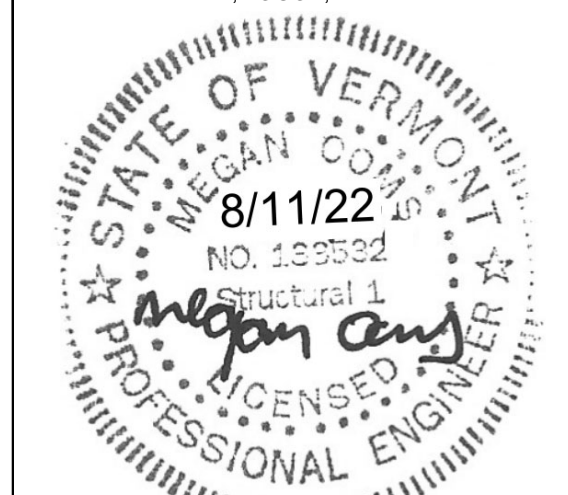




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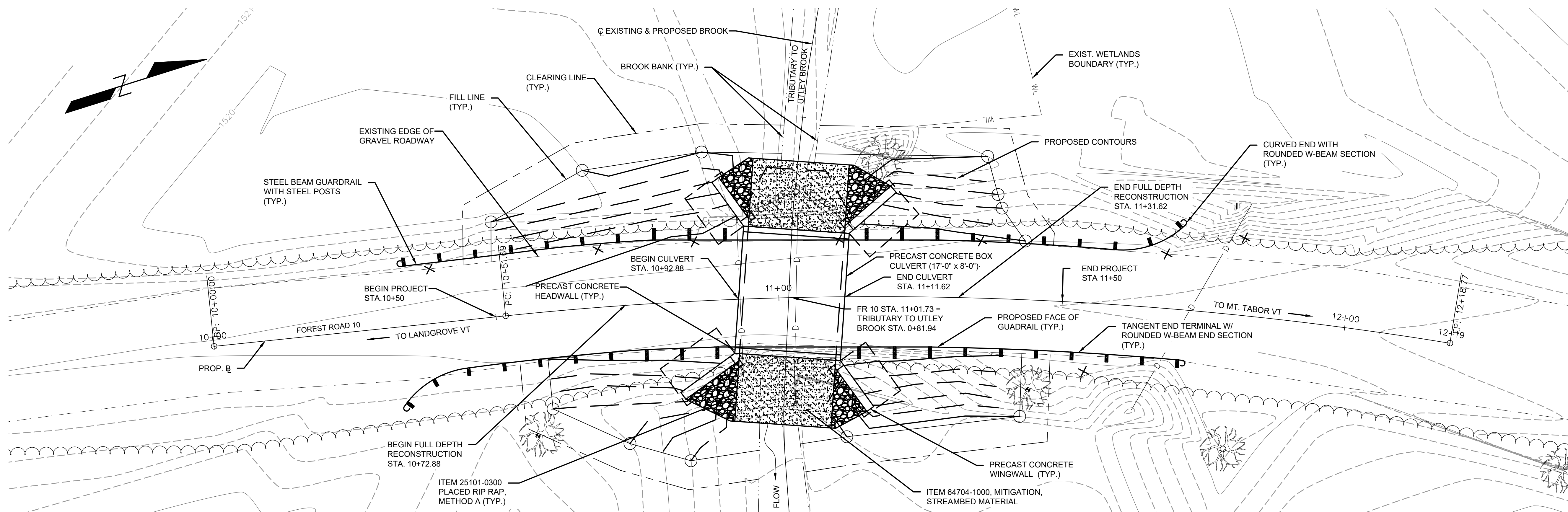
MANCHESTER RANGER DISTRICT

DRAWING TITLE

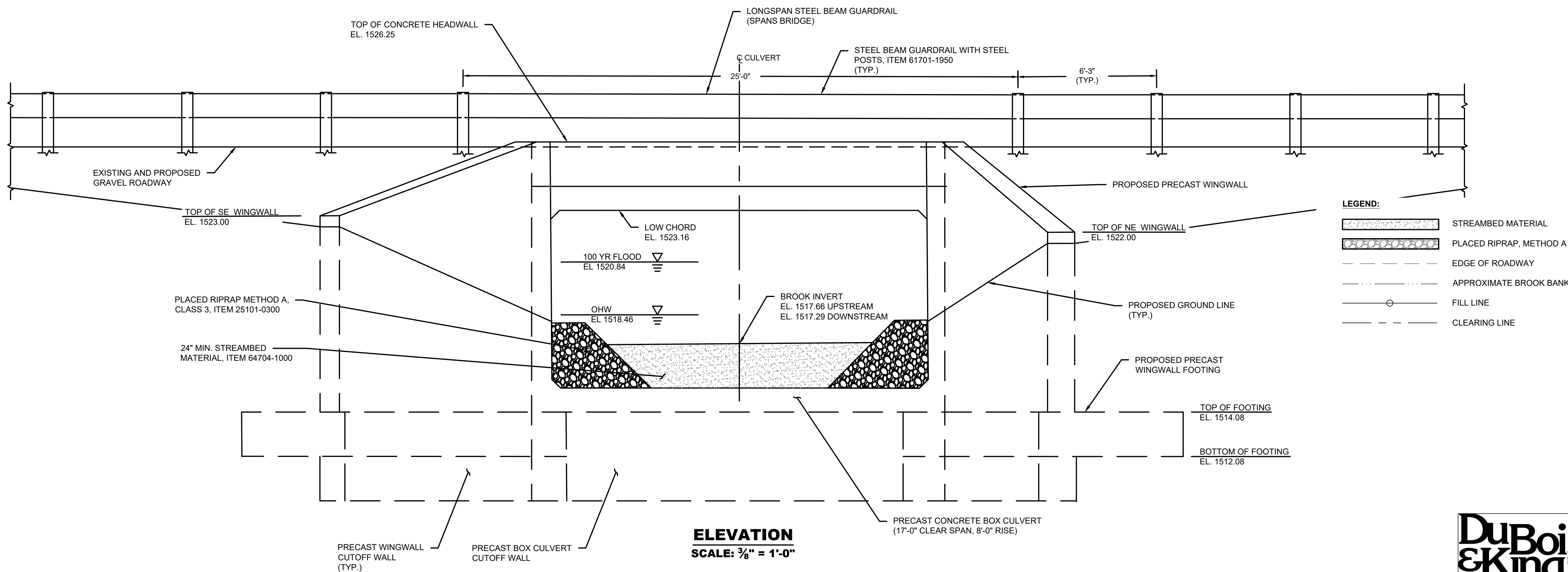
GENERAL PLAN AND
ELEVATION

DATE 07/18/22	ARCHIVE NO.
DESIGNER K. KITTREDGE	DRAWING SHEET NO. C-05
DRAWN K. KITTREDGE	
CHECKED R. GAUDREAU	
PROJECT NO. 626426	SHEET 05 OF 18

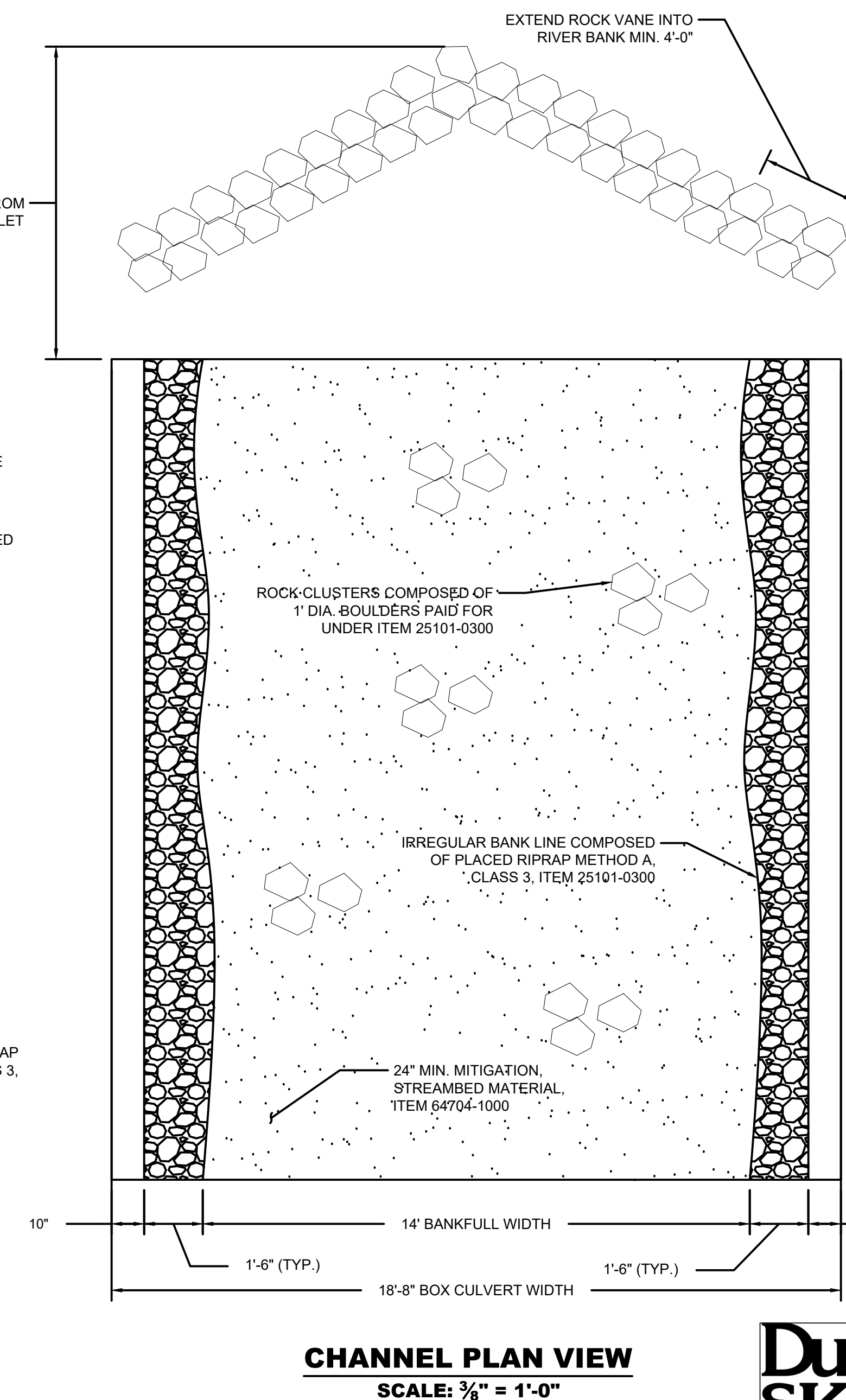
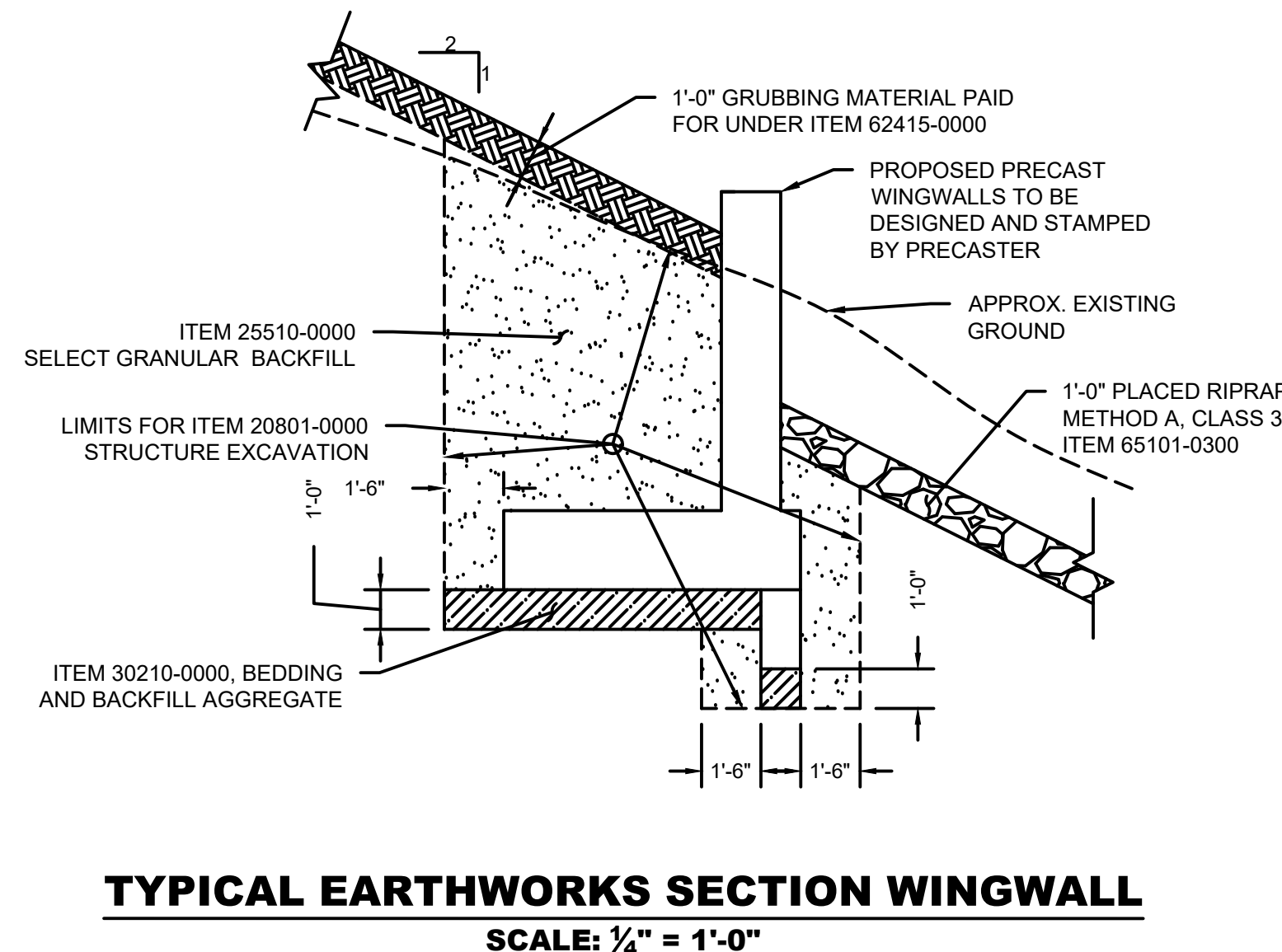
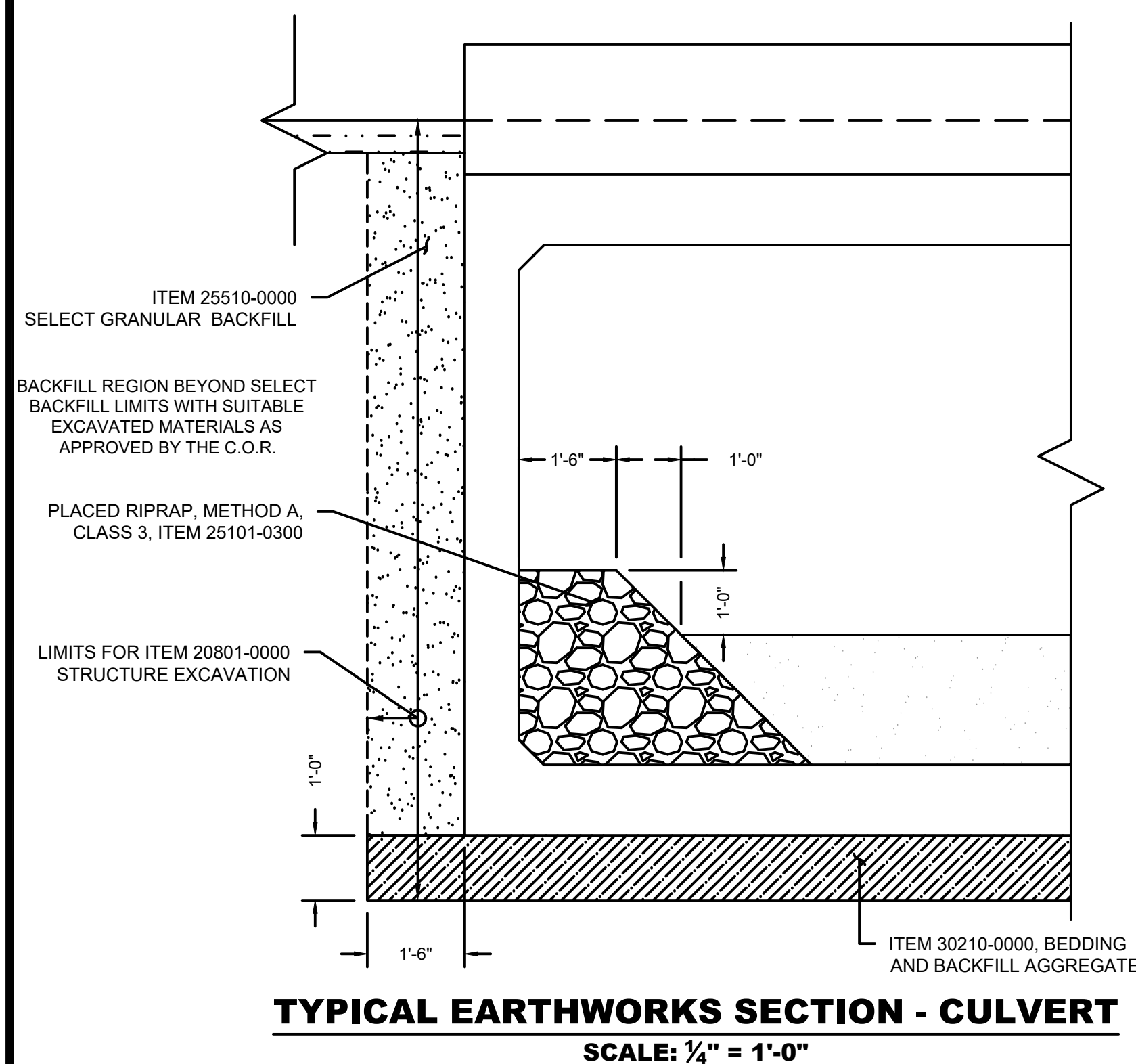
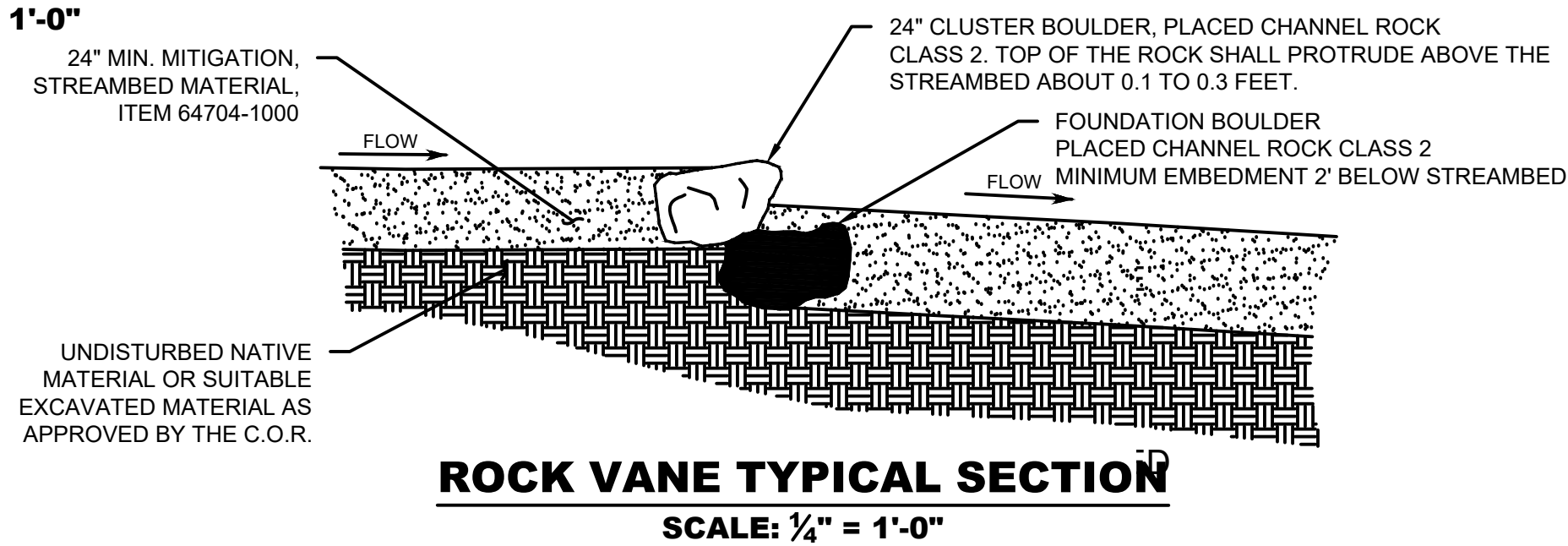
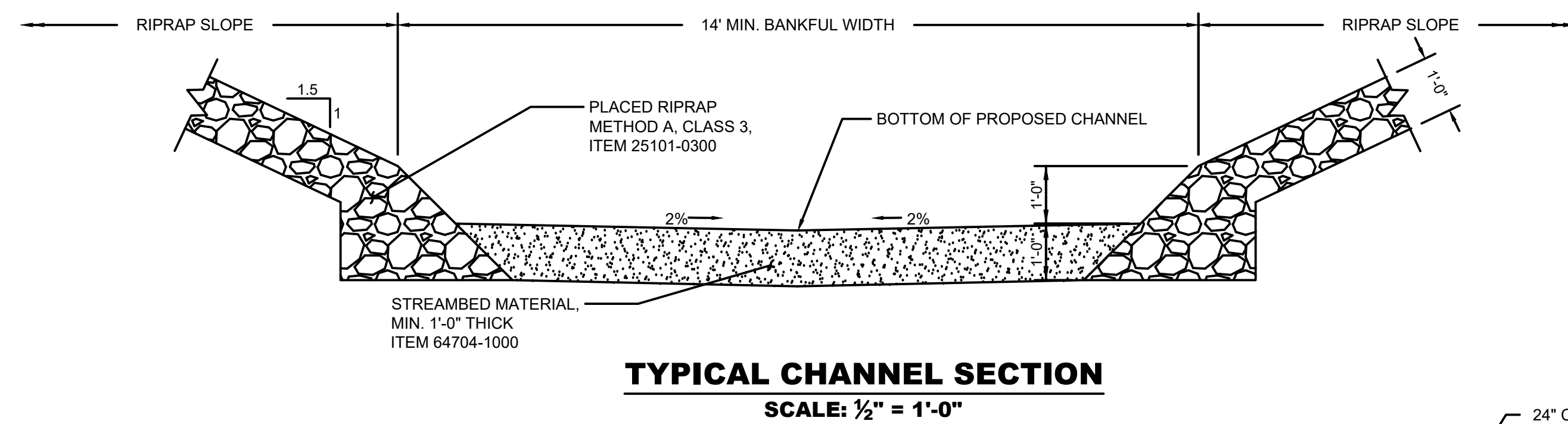
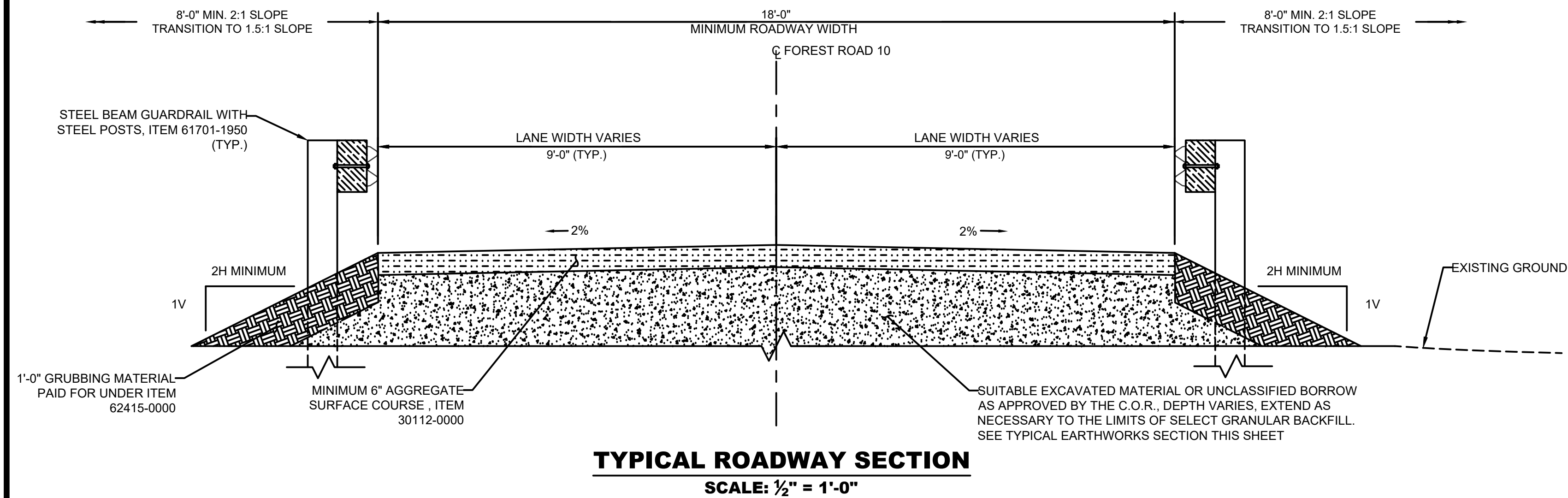
DuBois
& King
inc.










GENERAL PLAN
SCALE: 1" = 10'-0"



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



- LEGEND:

- | | |
|---|--|
|  | AGGREGATE SURFACE COURSE |
|  | RIPRAP CLASS 3 |
|  | SELECT GRANULAR BACKFILL |
|  | SUITABLE EXCAVATED MATERIAL OR UNCLASSIFIED BORROW |
|  | STREAMBED MATERIAL |
|  | BEDDING MATERIAL |
|  | GRUBBING MATERIAL |

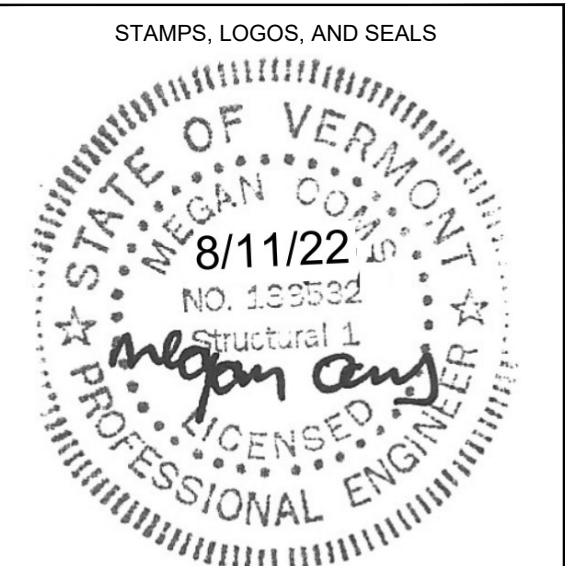
- NOTES:

1. EXISTING BOULDERS LOCATED NEAR OR WITHIN THE STREAM THAT MUST BE REMOVED FOR FOOTING CONSTRUCTION SHALL BE STOCKPILED AND REUSED TO CONSTRUCT IMMOBILE BROOK FEATURES.
2. EXISTING BOULDERS LOCATED WITHIN THE STREAM THAT DO NOT NEED TO BE DISTURBED FOR CONSTRUCTION ACTIVITIES MAY BE LEFT IN PLACE.
3. THE CONTRACTOR SHALL COORDINATE WITH THE C.O.R. TO CONFIRM BOULDERS LEFT IN PLACE THAT MAY MEET THE REQUIREMENTS OF THE ROCK CLUSTERS AS NOTED ON THIS SHEET.
4. THE 17'-0" CLEAR WIDTH INSIDE THE CULVERT SHOWN IS THE MINIMUM REQUIRED CLEAR WIDTH. WALL THICKNESS AND OUT TO OUT CULVERT DIMENSIONS SHOWN ARE CONCEPTUAL AND SHALL BE COORDINATED WITH THE REQUIRED WALL SIZES AS DESIGNED BY THE FABRICATOR.



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FOR CONSTRUCTION		
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2		
1		
NO.	REVISION / ISSUE	DATE

PROJECT NAME

**FR 10-11.53
CULVERT
REPLACEMENT
OVER TRIBUTARY
TO UTLEY BROOK

GREEN MOUNTAIN
NATIONAL FOREST**

DRAWING TITLE

TYPICAL SECTIONS

DATE 07/18/22	ARCHIVE NO.	
DESIGNER K. KITTREDGE	DRAWING SHEET NO. C-06	
DRAWN K. KITTREDGE		
CHECKED R. GAUDREAU	SHEET 06 OF 18	
PROJECT NO. 626426		

**DuBois
& King inc.**

2. MEMBRANE WATERPROOFING SHALL BE PLACED WITHIN THE LIMITS OF THE PRECAST HEADWALL. ADDITIONALLY ANY HORIZONTAL OR VERTICAL STRIP OF MEMBRANE WATERPROOFING, CENTRAL MEMBRANE WATERPROOFING SHALL BE MADE

22'-6"

12'-0" APRON

1'-0"

10'-3" (VARIES)

1'-0"

10'-3" (VARIES)

1'-0"

EXIST. & PROP. GRAVEL ROADWAY
EL 1525.61 ±

1'-4" MAX

PRECAST CONCRETE HEADWALL (TYP.)

PROP. LONGSPAN GUARDRAIL,
ITEM 61701-1950
(SPANS BRIDGE, TYP.)

TOP OF CONCRETE HEADWALL
EL. 1526.25

2'-0"

1'-1"

2%

2%

LOW CHORD
EL. 1523.16

1'-2" (MIN.)

ITEM 30112-0000,
AGGREGATE SURFACE
COURSE

MEMBRANE WATERPROOFING,
ITEM 55901-0000

9" (REVEAL)

12'-0" APRON (TYP.)

2'-0" MIN.

1.62% SLOPE

MATCH EXISTING

UPSTREAM CHANNEL INVERT
EL. 1517.66

CHANNEL EL. 1517.47
@ C FR-10

24" MIN. STREAMBED MATERIAL, ITEM 64704-1000

DOWNSTREAM CHANNEL INVERT
EL. 1517.29

CULVERT INVERT
EL. 1515.16

8'-0" RISE

5'-6" (MIN.)

1'-1"

4'-0"

1'-0" MIN.

1'-6" (TYP.)

12" BEDDING MATERIAL
ITEM 30210-0000

ITEM 25510-0000, SELECT GRANULAR BACKFILL

ITEM 25510-0000, SELECT GRANULAR BACKFILL

PRECAST CONCRETE CUTOFF WALL (TYP.), EXTEND TO 4' BELOW BOTTOM OF CULVERT

ITEM 25510-0000, SELECT GRANULAR BACKFILL

ITEM 25510-0000, SELECT GRANULAR BACKFILL

CONSTRUCTION JOINT

1'-0" (TYP.)

BOTTOM OF CUTOFF WALL
EL. 1510.08

BOTTOM OF CULVERT
EL. 1514.08

24" MIN. STREAMBED MATERIAL (TYP.)

ROCK VANE PLACED 8'-0" LONGITUDINALLY FROM THE CULVERT INLET PAID FOR UNDER ITEM 25101-0300 PLACED RIPRAP, METHOD A, CLASS 3

FLOW

TRIBUTARY TO UTLEY BROOK

8'-0" RISE

5'-6" (MIN.)

1'-1"

4'-0"

1'-0" MIN.

1'-6" (TYP.)

12" BEDDING MATERIAL
ITEM 30210-0000

ITEM 25510-0000, SELECT GRANULAR BACKFILL

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1'-1"

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1'-6" (TYP.)

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4'-0"

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ITEM 30210-0000

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1'-6" (TYP.)

12" BEDDING MATERIAL
ITEM 30210-0000

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PRECAST CONCRETE CUTOFF WALL (TYP.), EXTEND TO 4' BELOW BOTTOM OF CULVERT

ITEM 25510-0000, SELECT GRANULAR BACKFILL

CONSTRUCTION JOINT

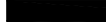
1'-0" (TYP.)

BOTTOM OF CUTOFF WALL
EL. 1510.08

BOTTOM OF CULVERT
EL. 1514.08

24" MIN. STREAMBED MATERIAL (TYP.)

ROCK VANE PLACED



USDA
FOREST SERVICE
U.S. DEPARTMENT OF AGRICULTURE

(R09)
EASTERN REGION

STATE OF VERMONT
MEGAN COATS
8/11/22
NO. 139532
Structural I
Megan Coats
LICENSED PROFESSIONAL ENGINEER

4		
3		
2		
1		
NO.	REVISION / ISSUE	DATE

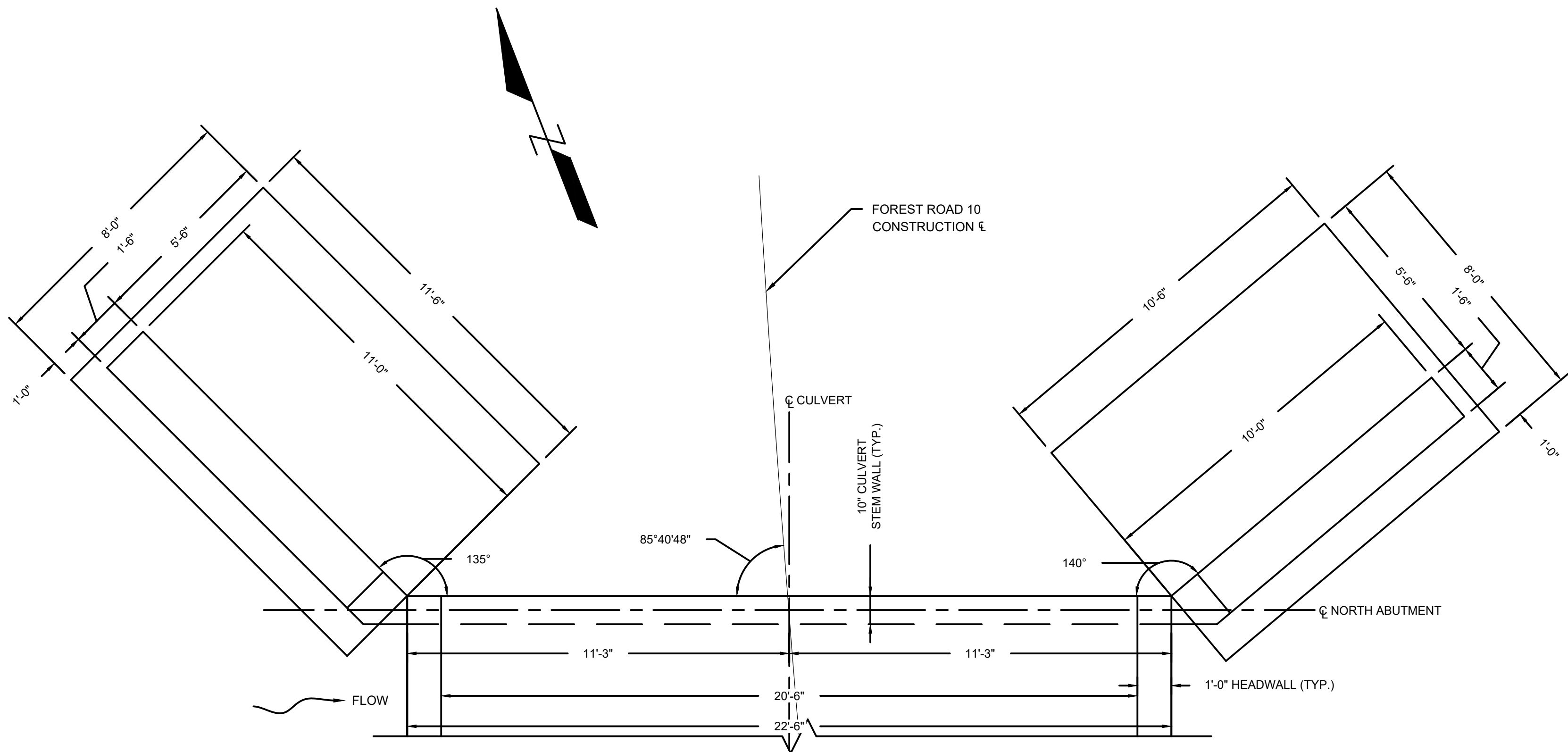
MANCHESTER RANGER DISTRICT

BOX CULVERT ELEVATION AND TYPICAL SECTION

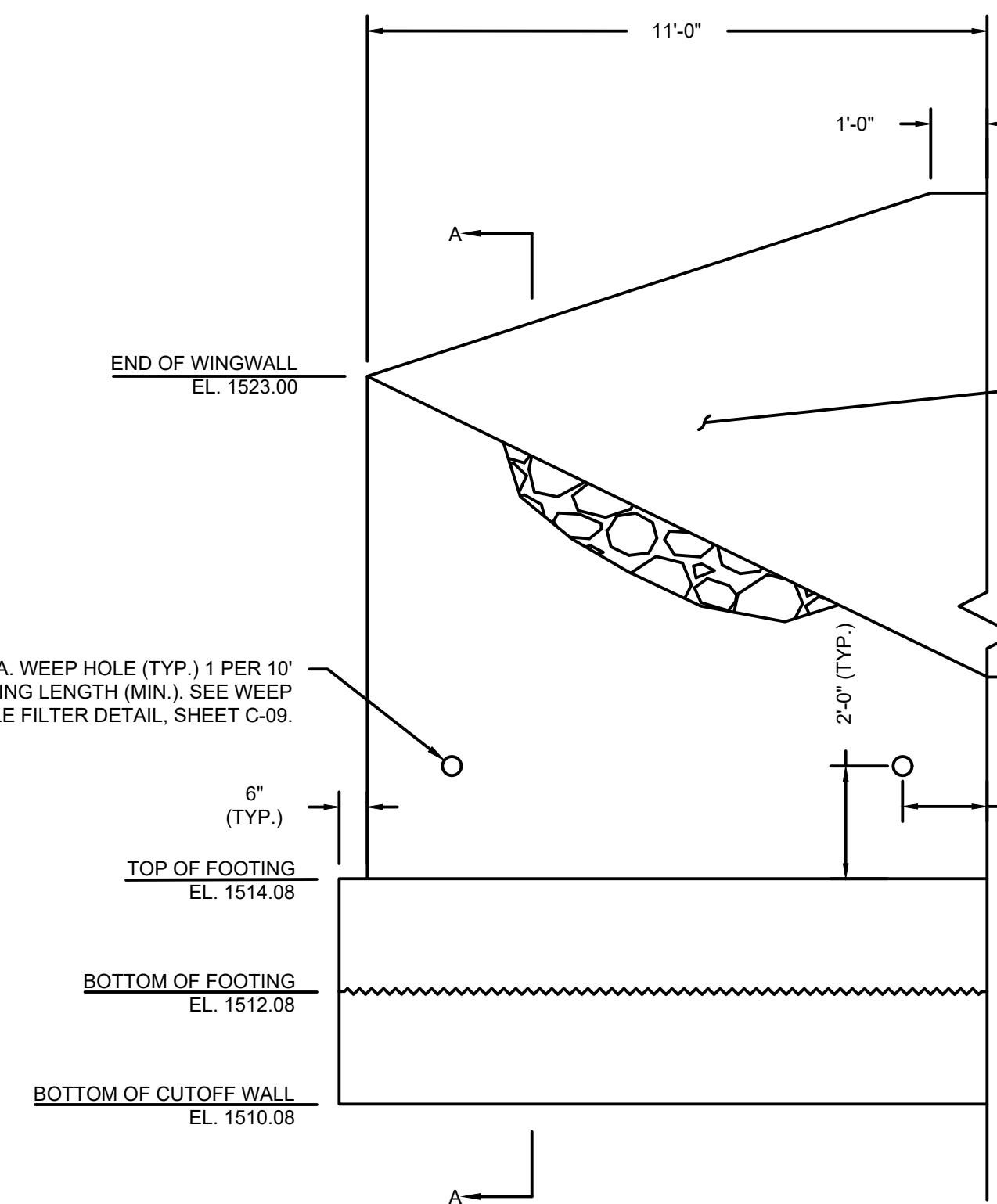
DuBois & King inc.

3/8/22 08:18 KKITREDGE 1:61626426 GMFL FOREST RAOD BRIDGE DESIGN PERUIDRAWINGSCADD1626426_07 - BOX ELEV & TYP SECTION.DWG;

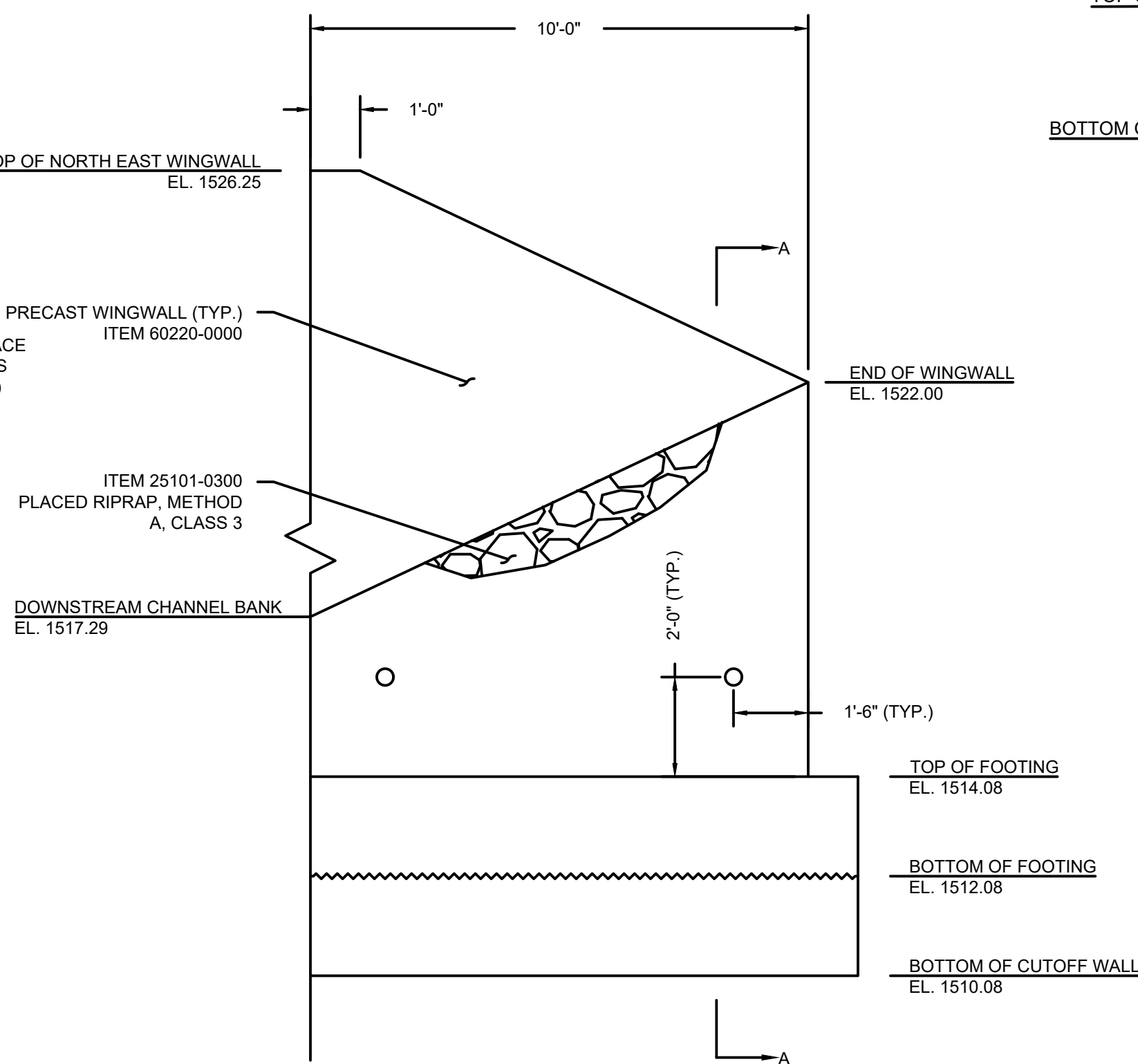
8/4/22 08:32 KITTREDGE 13626426 GMI FOREST ROAD BRIDGE DESIGN PERUDRAWINGS CADD 626426_08 & 09 - WINGWALL ELEVATIONS.DWG.



NORTH WINGWALL PLAN
SCALE: 3/8" = 1'-0"



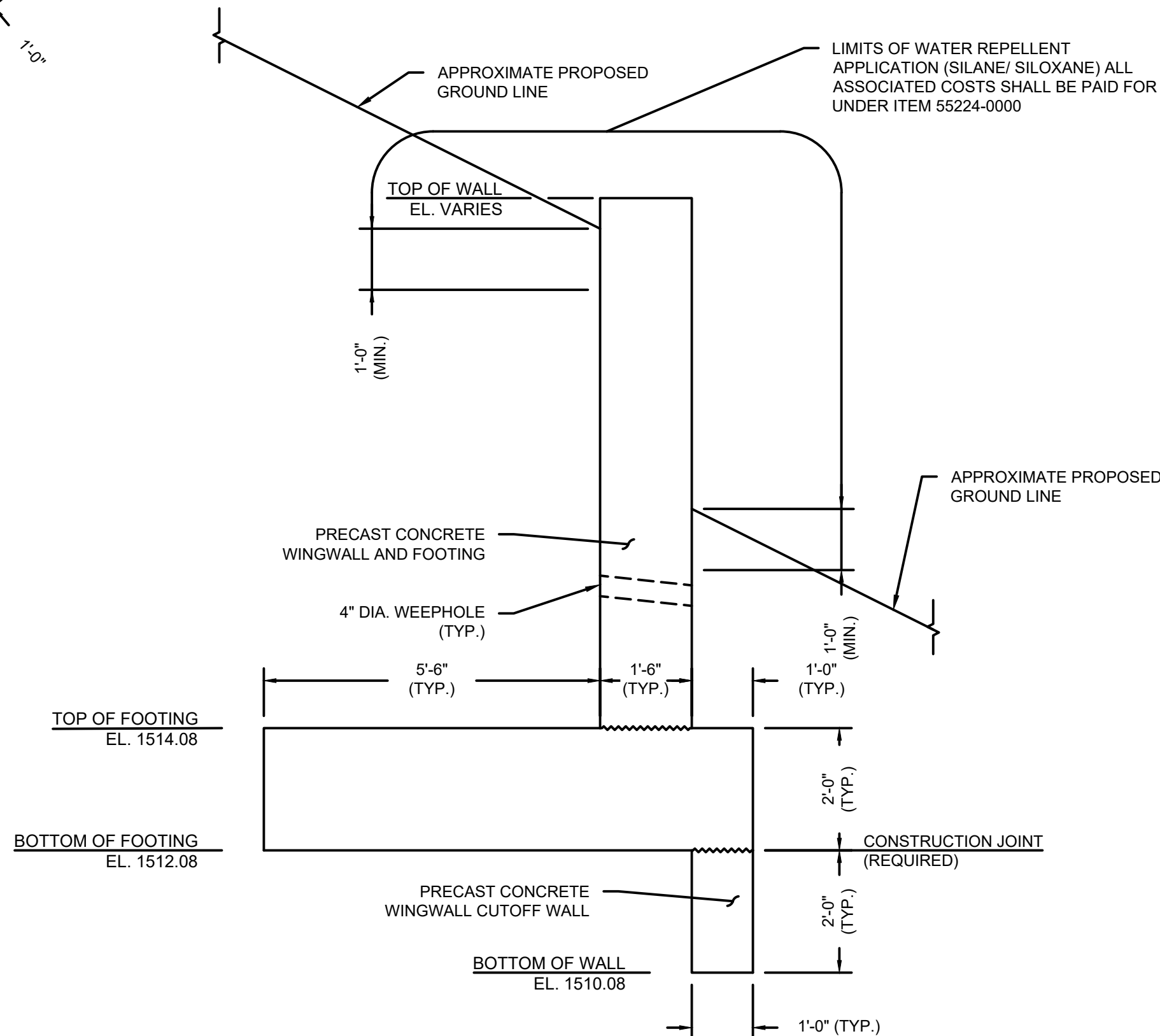
NORTHWEST WINGWALL ELEVATION
SCALE: 3/8" = 1'-0"



NORTHEAST WINGWALL ELEVATION
SCALE: 3/8" = 1'-0"

NOTES:

- LAYOUT SHOWN IS BASED ON A CONCEPTUAL WINGWALL STEM THICKNESS OF 1'-6" WITH CONCEPTUAL ESTIMATED FOOTINGS. ALL SIZES TO BE DETERMINED BY FABRICATOR.
- ALL PRECAST WINGWALLS, FOOTINGS AND CUTOFF WALLS SHALL BE DESIGNED AND STAMPED BY A VERMONT LICENSED PE.



SECTION A-A
TYPICAL WINGWALL SECTION
SCALE: 1/2" = 1'-0"



United States Department of Agriculture
Forest Service

(R09)
EASTERN REGION

STAMPS, LOGOS, AND SEALS



FOR CONSTRUCTION

NO.	REVISION / ISSUE	DATE
4		
3		
2		
1		

PROJECT NAME

FR 10-11.53
CULVERT
REPLACEMENT
OVER TRIBUTARY
TO UTLEY BROOK
GREEN MOUNTAIN
NATIONAL FOREST

MANCHESTER RANGER DISTRICT

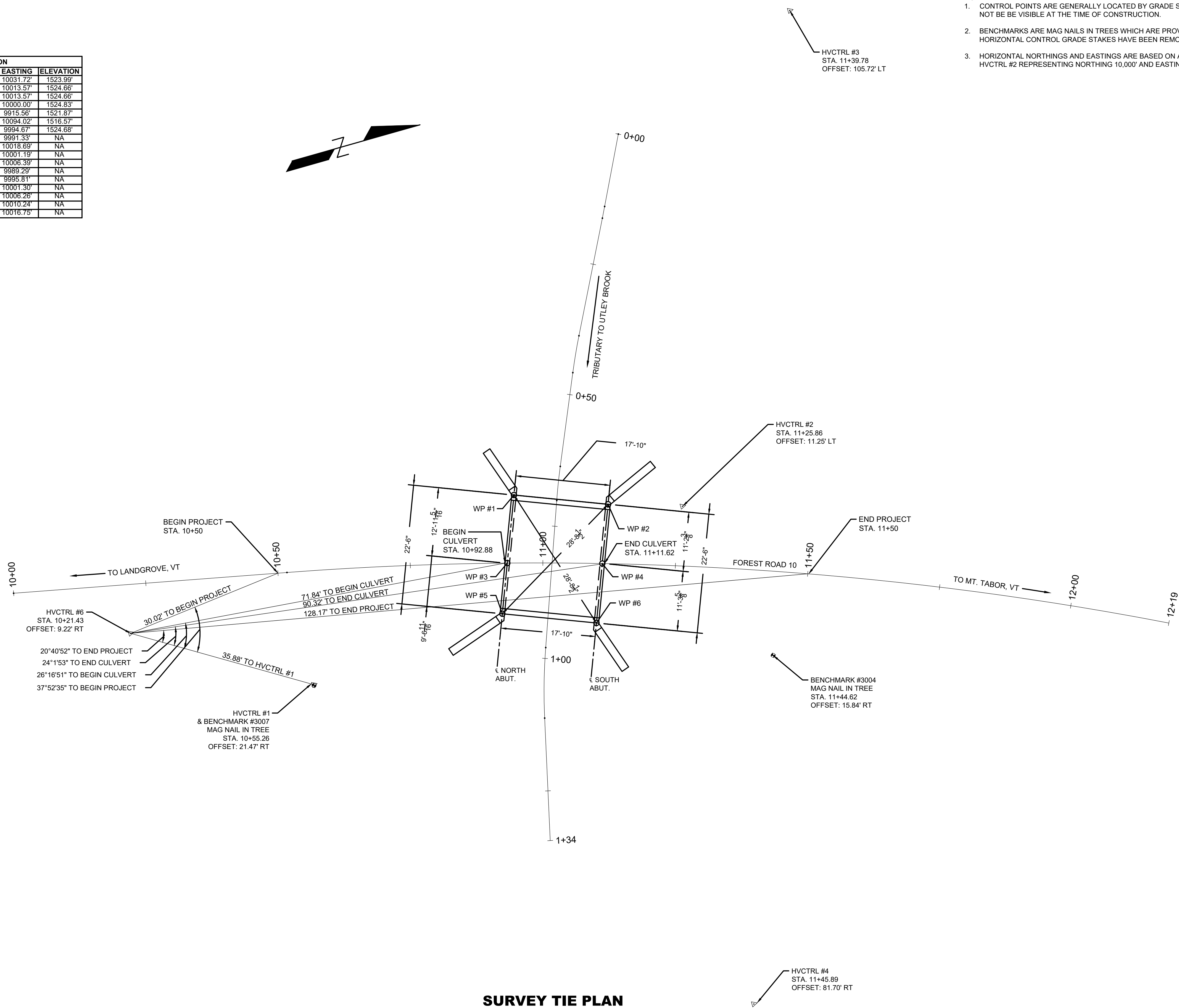
DRAWING TITLE

NORTH ABUTMENT
WINGWALL DETAILS

DATE 07/18/22	ARCHIVE NO.
DESIGNER K. KITTREDGE	DRAWING SHEET NO. C-08
DRAWN K. KITTREDGE	
CHECKED R. GAUDREAU	
PROJECT NO. 626426	SHEET 08 OF 18

DuBois
& King inc.

TIE INFORMATION			
LOCATION	NORTHING	EASTING	ELEVATION
BENCHMARK #3004	10008.79'	10031.72'	1523.99'
BENCHMARK #3007	9923.95'	10013.57'	1524.66'
CONTROL POINT #1	9923.95'	10013.57'	1524.66'
CONTROL POINT #2	10000.00'	10000.00'	1524.83'
CONTROL POINT #3	10044.98'	9915.56'	1521.87'
CONTROL POINT #4	9987.32'	10094.02'	1516.57'
CONTROL POINT #6	9893.39'	9994.67'	1524.68'
BEGIN PROJECT	9923.18'	9991.33'	NA
END PROJECT	10019.25'	10013.69'	NA
ξ BEGIN CULVERT	9984.90'	10001.19'	NA
ξ END CULVERT	9982.91'	10006.39'	NA
WP #1	9970.01'	9989.29'	NA
WP #2	9986.62'	9995.81'	NA
WP #3	9985.30'	10001.30'	NA
WP #4	9982.51'	10006.26'	NA
WP #5	9961.80'	10010.24'	NA
WP #6	9978.40'	10016.75'	NA



- NOTES:
- CONTROL POINTS ARE GENERALLY LOCATED BY GRADE STAKES, WHICH MAY OR MAY NOT BE BE VISIBLE AT THE TIME OF CONSTRUCTION.
 - BENCHMARKS ARE MAG NAILS IN TREES WHICH ARE PROVIDED IN THE EVENT THAT HORIZONTAL CONTROL GRADE STAKES HAVE BEEN REMOVED.
 - HORIZONTAL NORTHINGS AND EASTINGS ARE BASED ON AN ASSUMED DATUM WITH HVCRTL #2 REPRESENTING NORTHING 10,000' AND EASTING 10,000'.

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FOREST SERVICE

United States Department of Agriculture
Forest Service

(R09)
EASTERN REGION

STAMPS, LOGOS, AND SEALS

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PROJECT NAME

FR 10-11.53
CULVERT
REPLACEMENT
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TO UTLEY BROOK

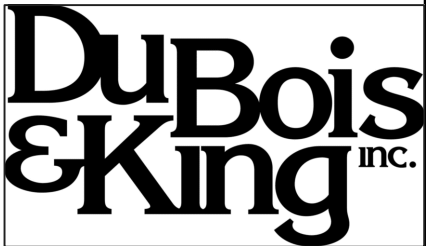
GREEN MOUNTAIN
NATIONAL FOREST

MANCHESTER RANGER DISTRICT

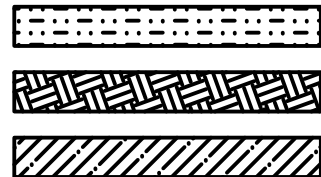
DRAWING TITLE

SURVEY TIE PLAN

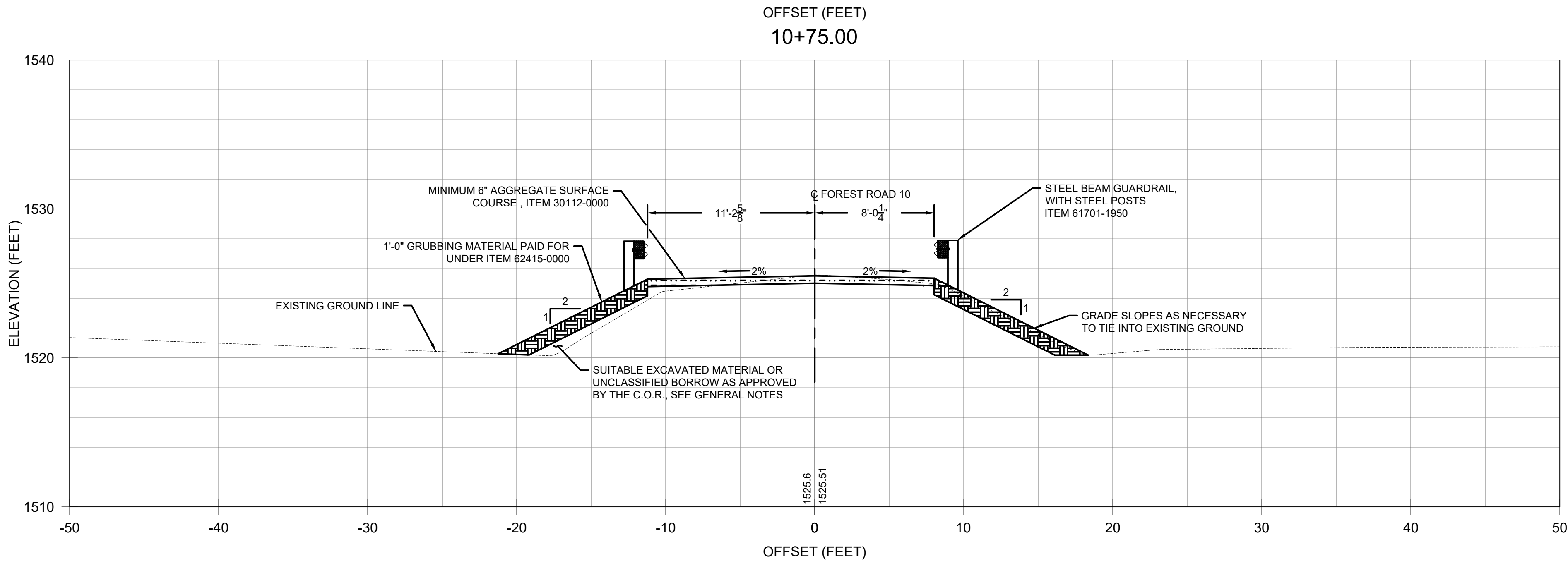
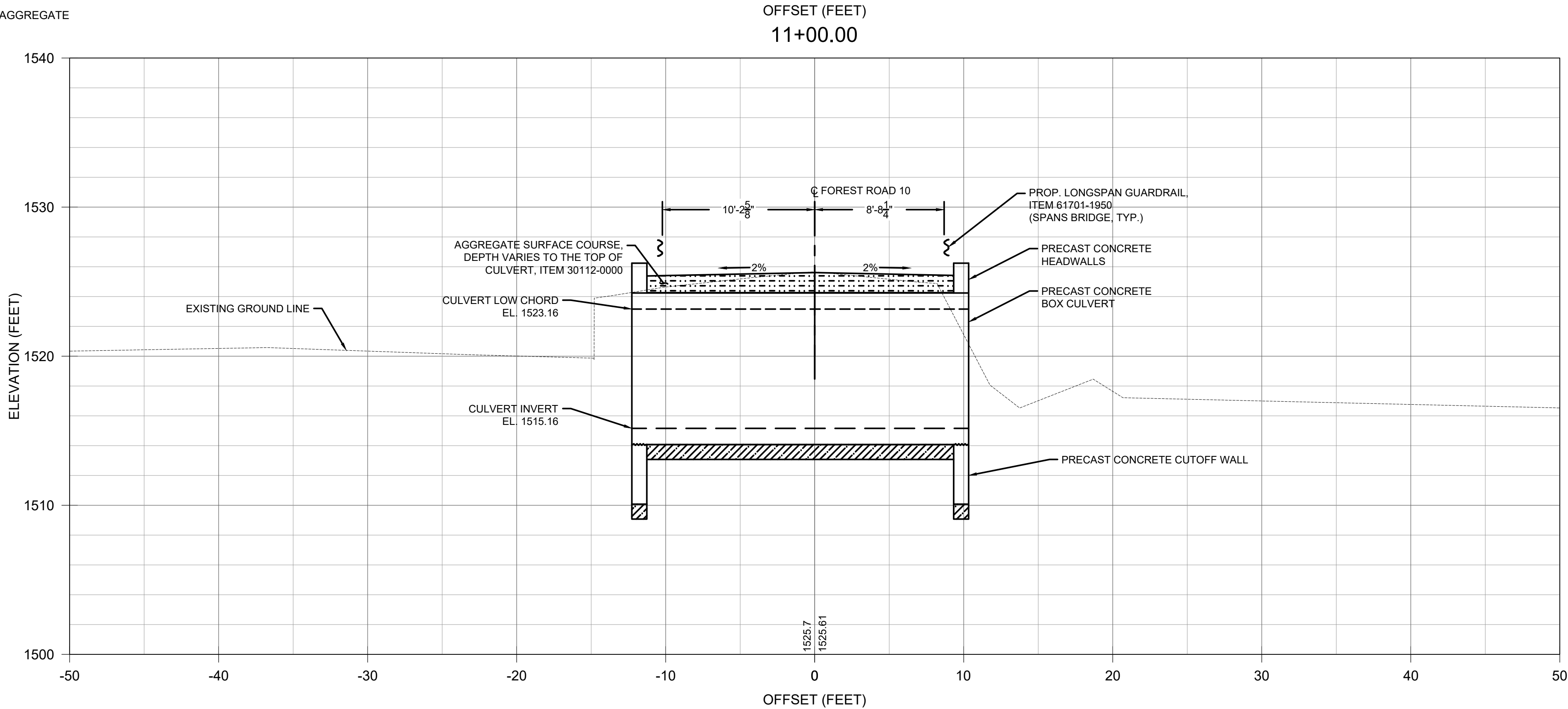
DATE 07/18/22	ARCHIVE NO.
DESIGNER K. KITTREDGE	DRAWING SHEET NO.
DRAWN K. KITTREDGE	C-10
CHECKED R. GAUDREAU	
PROJECT NO. 626426	SHEET 10 OF 18



LEGEND:



AGGREGATE SURFACE COURSE
GRUBBING MATERIAL
BEDDING AND BACKFILL AGGREGATE



United States Department of Agriculture
Forest Service

(R09)
EASTERN REGION

STAMPS, LOGOS, AND SEALS



FOR CONSTRUCTION

4		
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FR 10-11.53
CULVERT
REPLACEMENT
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TO UTLEY BROOK
GREEN MOUNTAIN
NATIONAL FOREST

MANCHESTER RANGER DISTRICT

DRAWING TITLE

ROADWAY CROSS
SECTIONS (1 OF 2)

DATE 07/18/22	ARCHIVE NO.
DESIGNER K. KITTREDGE	DRAWING SHEET NO. C-11
DRAWN K. KITTREDGE	
CHECKED R. GAUDREAU	
PROJECT NO. 626426	SHEET 11 OF 18

DuBois
& King
inc.

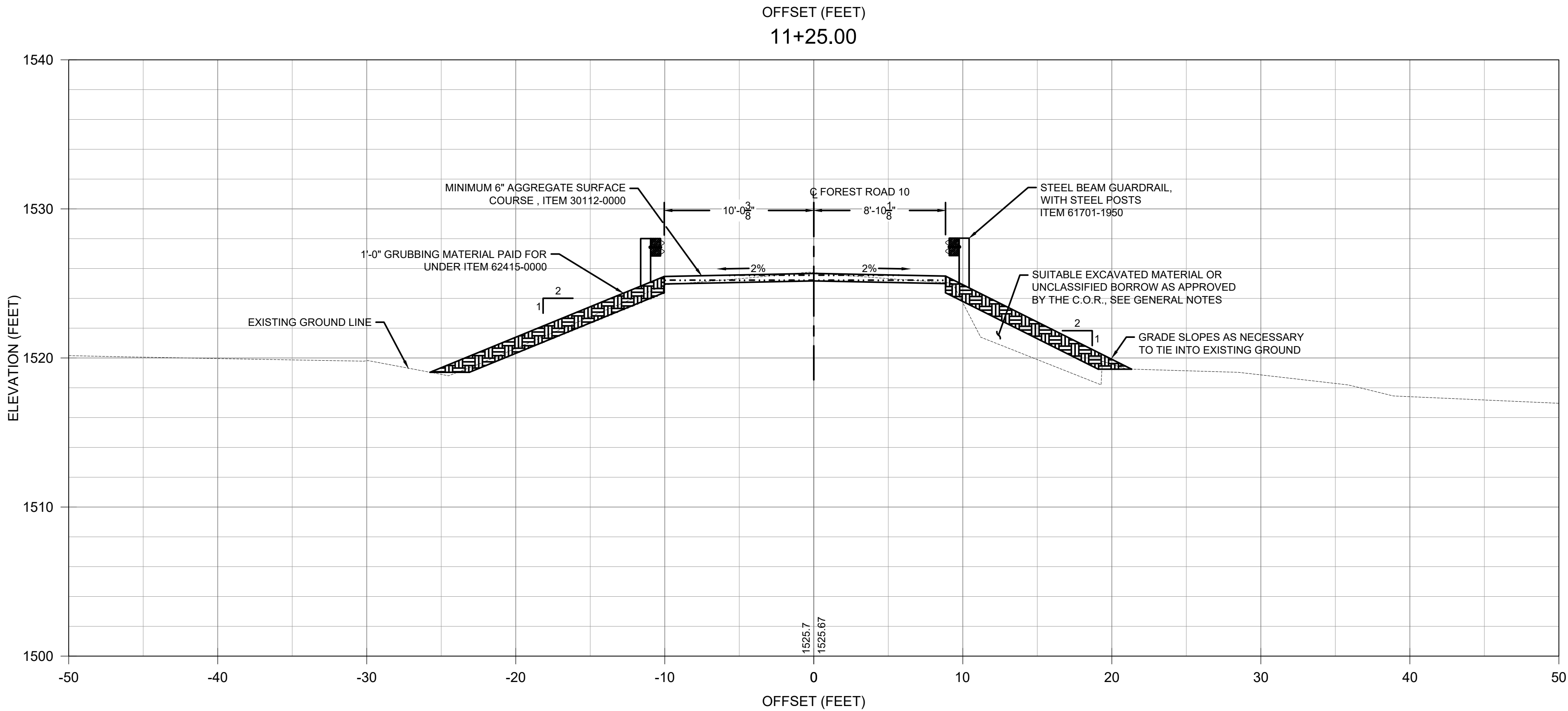
LEGEND:



AGGREGATE SURFACE COURSE



GRUBBING MATERIAL



United States Department of Agriculture
Forest Service

(R09)
EASTERN REGION

STAMPS, LOGOS, AND SEALS



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FR 10-11.53
CULVERT
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GREEN MOUNTAIN
NATIONAL FOREST

MANCHESTER RANGER DISTRICT

DRAWING TITLE

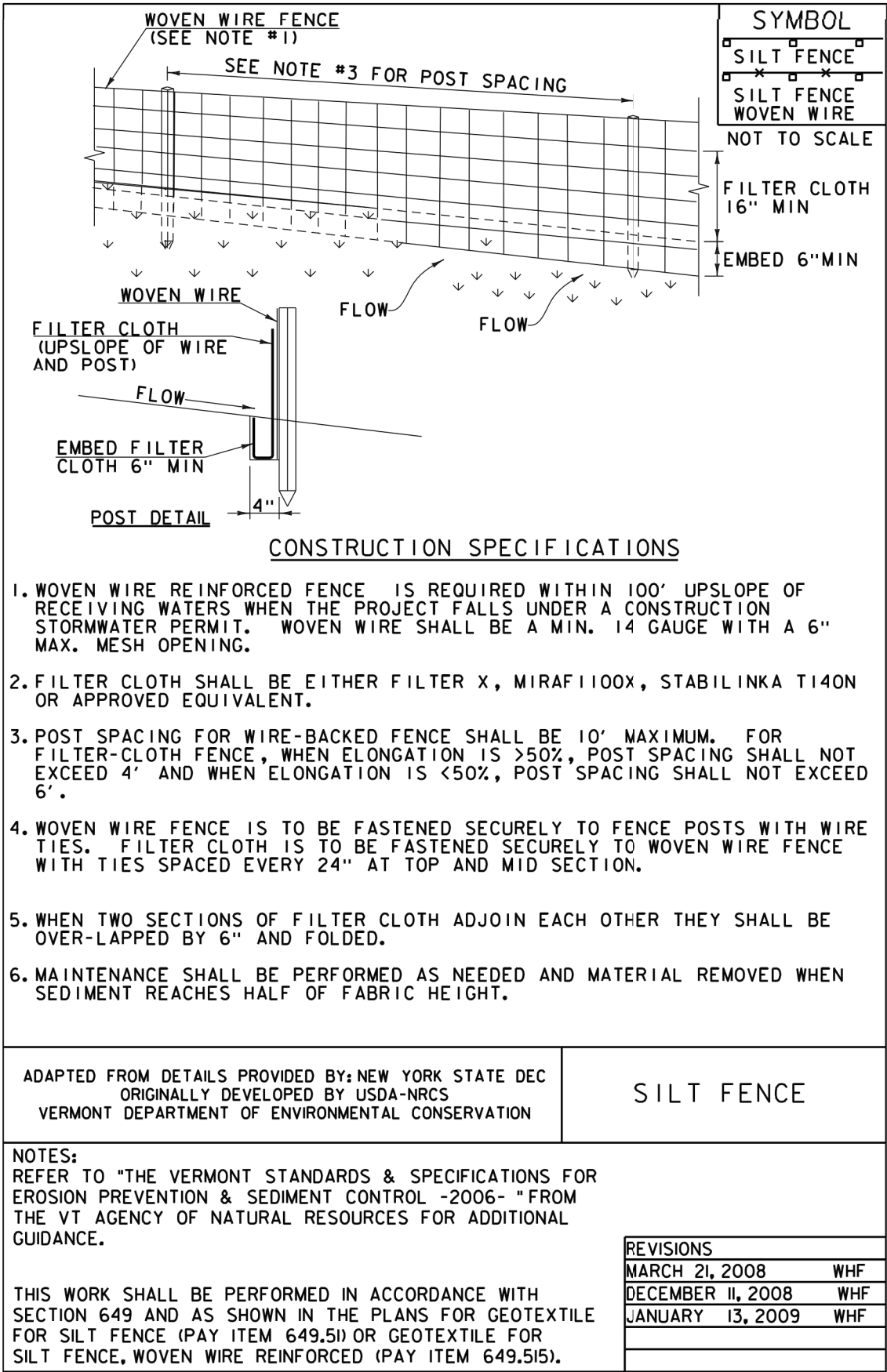
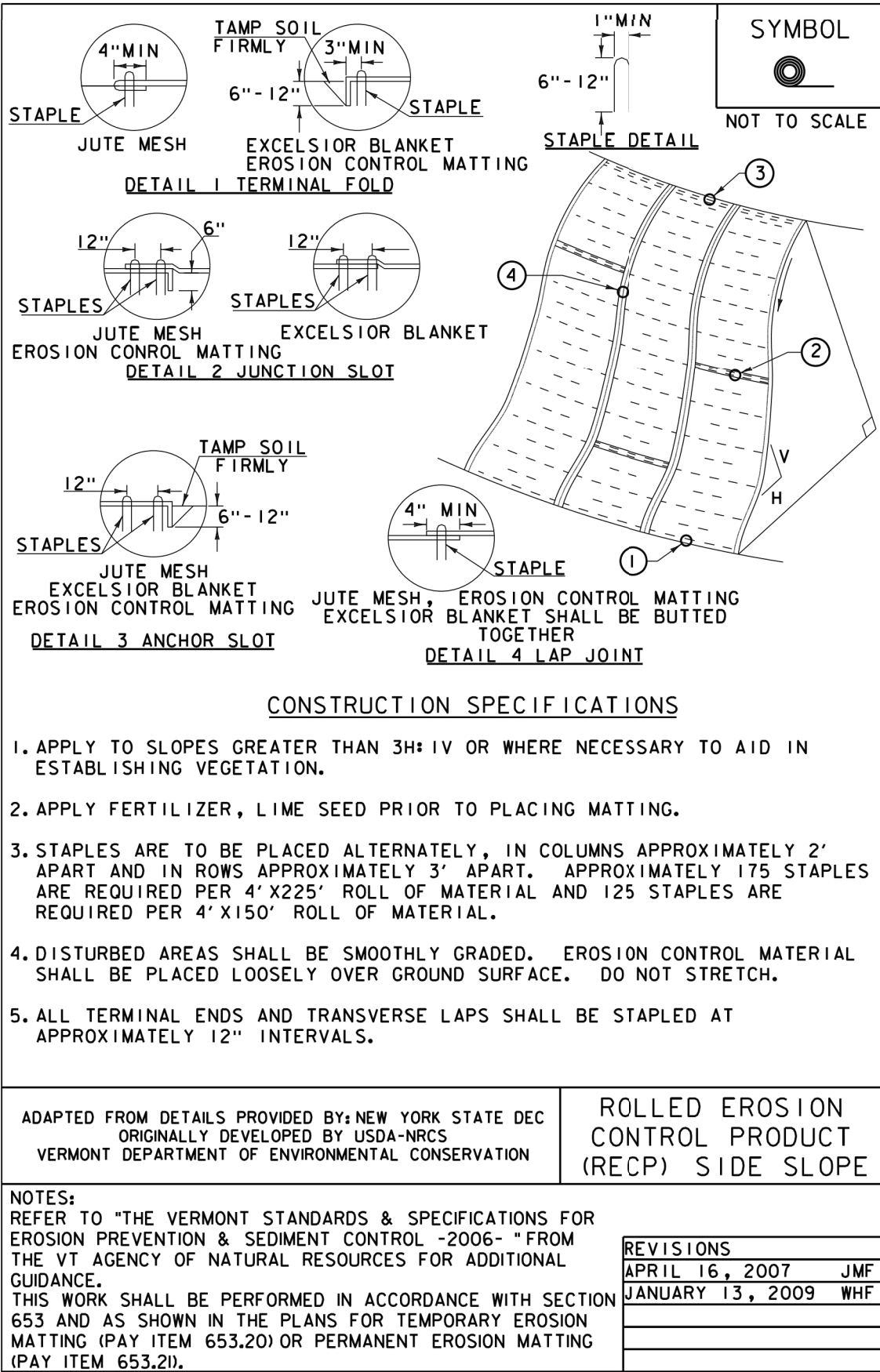
ROADWAY CROSS
SECTIONS (2 OF 2)

DATE 07/18/22	ARCHIVE NO.
DESIGNER K. KITTREDGE	DRAWING SHEET NO. C-12
DRAWN K. KITTREDGE	
CHECKED R. GAUDREAU	
PROJECT NO. 626426	SHEET 12 OF 18



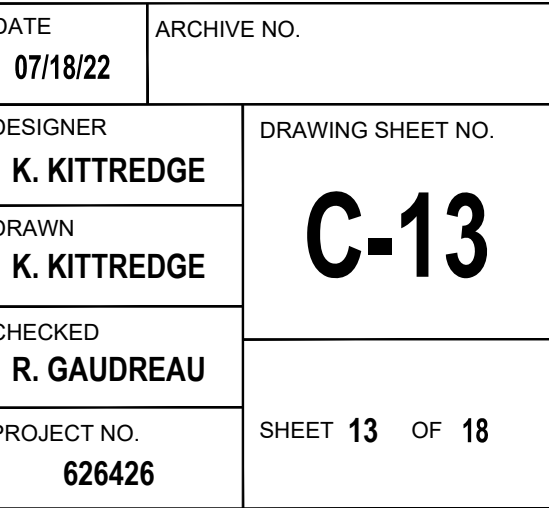
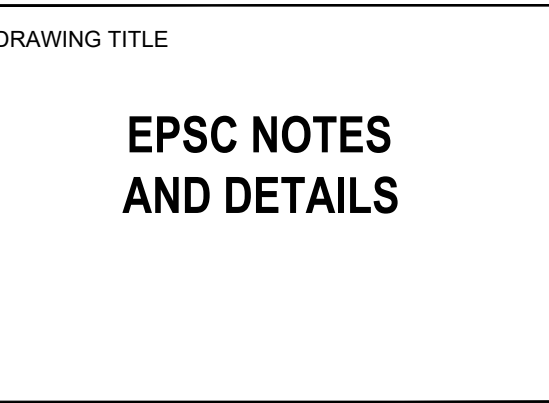
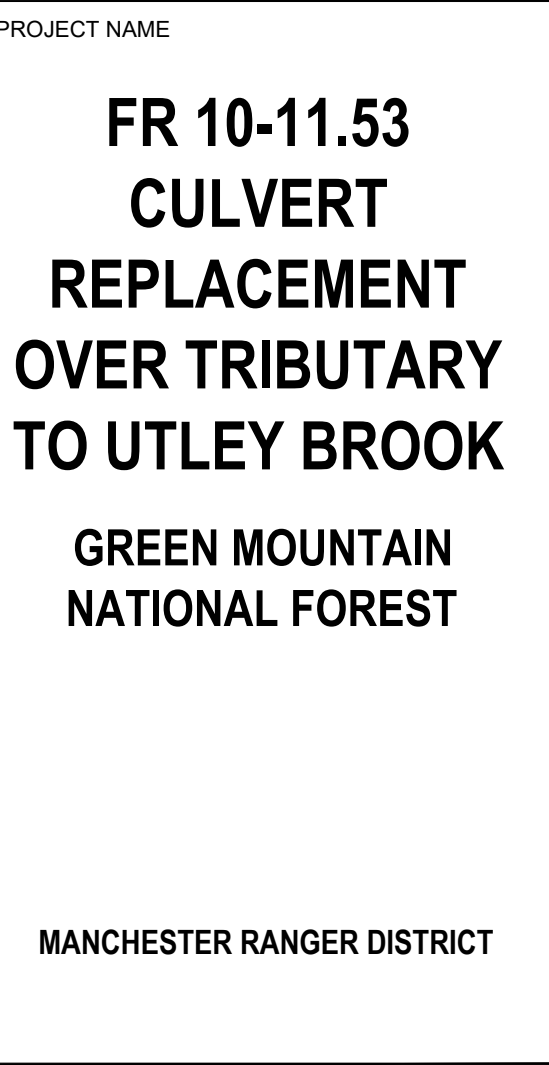
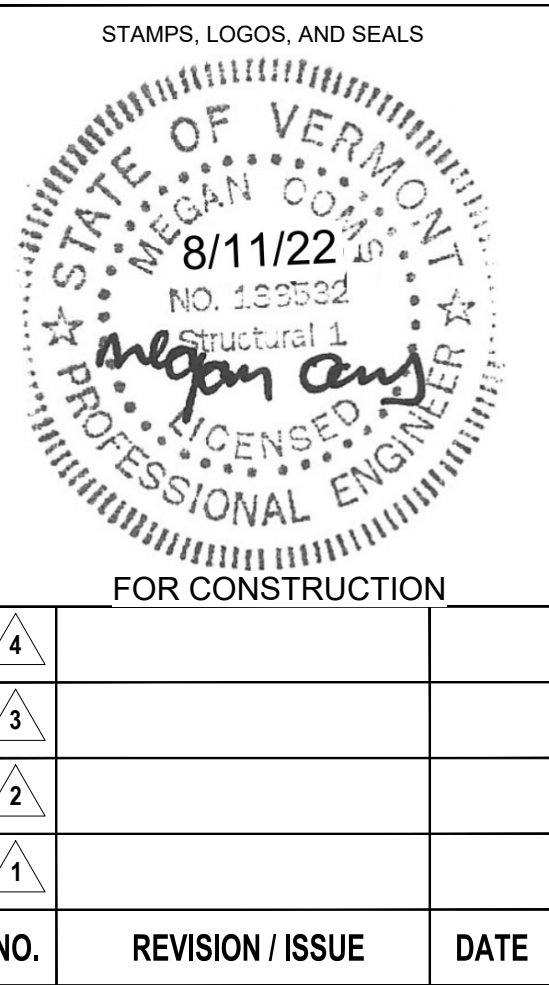
EROSION CONTROL NOTES:

1. PRIOR TO STARTING CONSTRUCTION THE CONTRACTOR SHALL SUBMIT AN EROSION AND SEDIMENT CONTROL PLAN WITH A SCHEDULE OF CONSTRUCTION ACTIVITIES. THE PLAN SHALL BE SITE SPECIFIC AND SHALL BE PAID FOR UNDER ITEM 15701-0000, SOIL EROSION CONTROL.
2. THE CONTRACTOR SHALL MINIMIZE THE AMOUNT OF DISTURBED SOIL EXPOSED TO EROSION FROM STORM WATER AND WIND AT ANY TIME BY USING VEGETATIVE AND STRUCTURAL CONTROLS AND PROPER TIMING AND SEQUENCING OF CONSTRUCTION ACTIVITIES.
3. ONLY DISTURB, CLEAR, OR GRADE AREAS NECESSARY FOR IMMEDIATE CONSTRUCTION ACTIVITY. FLAG OR OTHERWISE DELINEATE AREAS NOT TO BE DISTURBED. EXCLUDE VEHICLES AND CONSTRUCTION EQUIPMENT FROM THESE AREAS TO PRESERVE NATURAL VEGETATION.
4. IF PROJECT IS GREATER THAN 5-ACRES, THE AREA OF UNSTABILIZED SOIL SHALL NOT EXCEED 5 ACRES AT ANY TIME UNLESS PROJECT PERMITS SPECIFICALLY PROVIDE FOR A GREATER AREA OF DISTURBANCE.
5. ALL EROSION AND SEDIMENT CONTROL PRACTICES AND MEASURES TO BE CONSTRUCTED, APPLIED AND MAINTAINED IN ACCORDANCE WITH THESE DRAWINGS, PER THESE NOTES AND DETAILS, AND ACCORDING TO MANUFACTURER'S RECOMMENDATIONS.
6. THE CONTRACTOR SHALL USE PROPER EROSION AND SEDIMENT CONTROL MEASURES TO ENSURE NO SEDIMENT IS TRACKED OFF-SITE (E.G. STABILIZED CONSTRUCTION ENTRANCE).
7. DISTURBED AREAS WITH POTENTIAL TO DISCHARGE SEDIMENT-LADEN WATER INTO SURFACE WATERS OR OFF THE SITE MUST BE PROTECTED WITH TEMPORARY EROSION CONTROL MEASURES (E.G., SILT FENCE).
8. THE CONTRACTOR SHALL DIVERT OFFSITE STORMWATER RUNOFF FROM HIGHLY ERODIBLE AREAS AND STEEP SLOPES AND CONVEY OFFSITE STORMWATER RUNOFF TO STABLE AREAS. INSTALL PERIMETER SILT FENCE PRIOR TO CLEARING AND GRUBBING AND INSTALL NECESSARY EROSION AND SEDIMENT CONTROL PRACTICES AS WORK TAKES PLACE.
9. AREAS TO BE FILLED SHALL BE CLEARED, GRUBBED, AND STRIPPED OF TOPSOIL TO REMOVE TREES, VEGETATION, ROOTS OR OTHER OBJECTIONABLE MATERIALS.
10. EXCAVATED TOPSOIL GRADE MATERIAL REQUIRED FOR THE ESTABLISHMENT OF VEGETATION SHALL BE STOCKPILED TEMPORARILY IN THE AMOUNT NECESSARY TO COMPLETE FINISHED GRADING (WITHIN PROPOSED CONSTRUCTION LIMITS) AND USED IN CONJUNCTION WITH SEEDING AND PLANTING THE PROJECT AREA.
11. ALL STOCKPILES, BORROW AREAS, AND SPOILS SHALL BE PROTECTED FROM EROSION AND SURROUNDED BY SILT FENCE AND COVERED WITH A BLANKET OF STRAW MULCH.
12. FROZEN MATERIAL OR SOFT, MUCKY OR HIGHLY COMPRESSIBLE MATERIALS ARE SUSCEPTIBLE TO ACCELERATED SETTLEMENT AND POTENTIAL ACCELERATED EROSION. WORK IN THESE MATERIALS TO BE PERFORMED UNDER THE DIRECTION OF A PROFESSIONAL ENGINEER.
13. REPAIR OR REPLACEMENT OF EROSION CONTROL MEASURES SHALL BE MADE PROMPTLY AS NEEDED, AND AS DESCRIBED IN THE INSPECTION, MONITORING AND MAINTENANCE NOTES ON THESE DRAWINGS.
14. THE OUTER FACE OF THE FILL SLOPE SHALL BE ALLOWED TO STAY LOOSE, NOT ROLLED, COMPACTED, OR BLADED SMOOTH. ROUGHEN THE SURFACE OF ALL SLOPES DURING THE CONSTRUCTION OPERATION TO RETAIN WATER, INCREASE INFILTRATION, AND FACILITATE VEGETATION ESTABLISHMENT.
15. USE SLOPE BREAKS, SUCH AS DIVERSIONS, BENCHES, OR CONTOUR FURROWS AS APPROPRIATE, TO REDUCE THE LENGTH OF CUT-AND-FILL SLOPES TO LIMIT SHEET AND RILL EROSION AND PREVENT GULLY EROSION. ALL BENCHES TO BE KEPT FREE OF SEDIMENT DURING ALL PHASES OF DEVELOPMENT.
16. AREAS SHALL BE SCARIFIED TO A MINIMUM DEPTH OF 3 INCHES PRIOR TO PLACEMENT OF TOPSOIL. TOPSOIL TO BE PLACED WITHOUT SIGNIFICANT COMPACTION TO PROVIDE A LOOSE BEDDING FOR PLACEMENT OF SEED.
17. STABILIZE ALL GRADED AREAS WITH VEGETATION, CRUSHED STONE, COMPOST BLANKET, OR OTHER GROUND COVER AS SOON AS GRADING IS COMPLETED OR IF WORK IS INTERRUPTED FOR 21 WORKING DAYS OR MORE. USE MULCH OR OTHER APPROVED METHODS TO STABILIZE AREAS TEMPORARILY WHERE FINAL GRADING MUST BE DELAYED.
18. ALL GRADED AREAS TO BE PERMANENTLY STABILIZED IMMEDIATELY FOLLOWING FINISHED GRADING.
19. SEED MIXTURE FOR THE PURPOSES OF TURF ESTABLISHMENT SHALL BE THE NEW ENGLAND EROSION CONTROL RESTORATION MIX (FOR DETENTION BASINS AND MOIST SITES) BY NEW ENGLAND WETLANDS, INC. OR AN APPROVED EQUAL. THE MIX SHALL BE APPLIED PER THE SEEDING FORMULA AND MANUFACTURERS RECOMMENDATIONS. ALL SEEDED AREAS SHALL RECEIVE EROSION CONTROL MATTING IMMEDIATELY FOLLOWING SEEDING. NATURAL FIBER MATTING ONLY SHALL BE ALLOWED. THIS WORK SHALL BE PAID FOR UNDER ITEM 62542-1000.
20. PERMANENT OR TEMPORARY COVER MUST BE IN PLACE BEFORE THE GROWING SEASON ENDS. WHEN SEEDED AREAS ARE MULCHED, PLANTINGS MAY BE MADE FROM EARLY SPRING TO EARLY OCTOBER. WHEN SEEDED AREAS ARE NOT MULCHED, SEED SHOULD BE PLACED FROM EARLY SPRING TO MAY 20 OR FROM AUGUST 15 TO SEPTEMBER 15. NO DISTURBED AREA SHALL BE LEFT EXPOSED DURING WINTER MONTHS (NOVEMBER THROUGH MARCH).
21. ONCE DISTURBED AREAS HAVE BEEN STABILIZED AND VEGETATION IS ESTABLISHED, ALL TEMPORARY EROSION CONTROL MEASURES SUCH AS SILT FENCE SHALL BE REMOVED. AREAS DISTURBED BY REMOVAL OF THESE MEASURES SHALL BE IMMEDIATELY SEEDED ACCORDING TO SEEDING SPECIFICATIONS ON THESE DRAWINGS.
22. AN AREA IS CONSIDERED "STABLE" IF ONE OF THE FOLLOWING HAS OCCURRED: A MINIMUM OF 85% VEGETATED GROWTH HAS BEEN ESTABLISHED; A MINIMUM OF 3" OF NON-EROSIVE MATERIAL (SUCH AS STONE RIP RAP OR A CERTIFIED COMPOST BLANKET) HAS BEEN INSTALLED. EROSION CONTROL BLANKETS HAVE BEEN PROPERLY INSTALLED.
23. ALL AREAS OF EXPOSED OR DISTURBED SOIL TO BE TEMPORARILY STABILIZED AS SOON AS PRACTICABLE BUT NO LATER THAN 45 DAYS FROM THE TIME OF INITIAL DISTURBANCE, UNLESS A SHORTER TIME IS SPECIFIED BY LOCAL AUTHORITIES, THE CONSTRUCTION SEQUENCE APPROVED AS PART OF THE ISSUED PERMIT, OR AN INDEPENDENT MONITOR.
24. ALL AREAS OF EXPOSED OR DISTURBED SOIL TO BE PERMANENTLY STABILIZED AS SOON AS PRACTICABLE BUT NO LATER THAN 3 DAYS FOLLOWING FINAL GRADING.
25. ALL ITEMS SPECIFIED IN THE EROSION CONTROL PLAN BUT NOT INCLUDED AS A SEPARATE PAY ITEM SHALL BE PAID FOR UNDER ITEM 15701-0000, SOIL EROSION CONTROL.



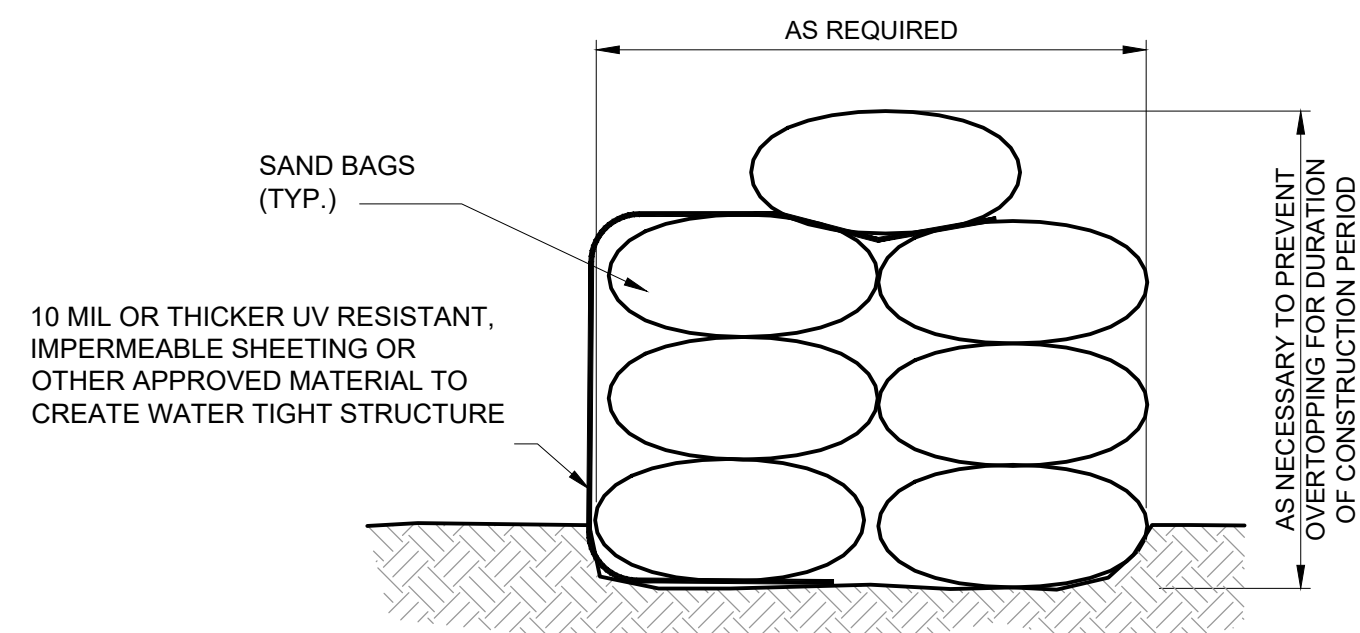
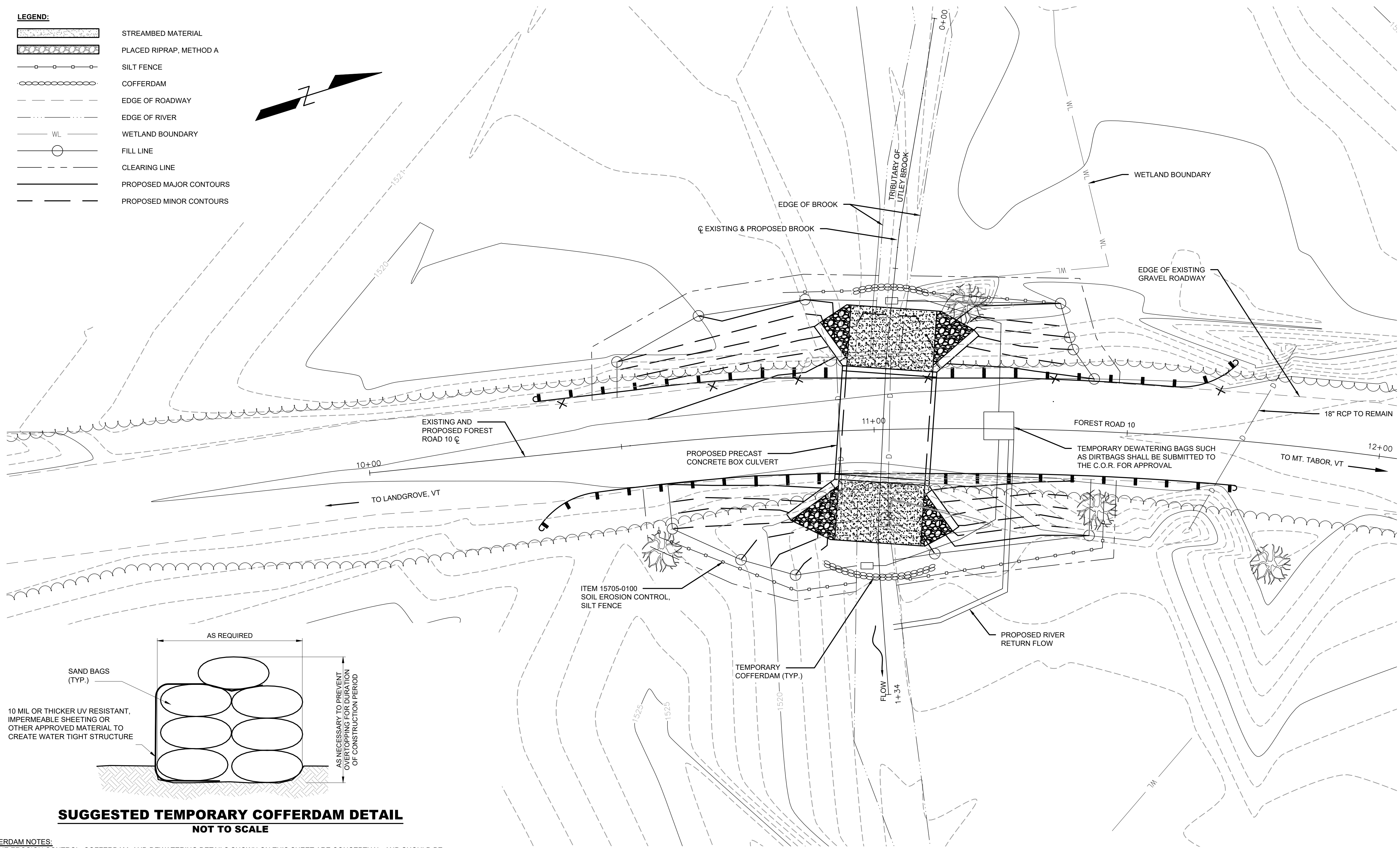
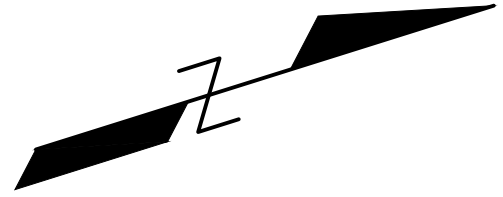
NOTES:

1. VTRANS ROLLED EROSION CONTROL PRODUCT (RECP) SIDE SLOPE AND SILT FENCE DETAILS ARE ADDED ONLY FOR REFERENCE OF ACCEPTED PRODUCTS AND PROCEDURES. NO PAYMENT SHALL BE MADE TO THE VTRANS ITEMS REFERENCED ABOVE. ALL PAYMENT SHALL BE MADE UNDER ITEM 15701-0000 SOIL EROSION CONTROL OR ITEM 15705-0100 SOIL EROSION CONTROL, SILT FENCE.



8/4/22 08:32 KITTREDGE 136628428 GML FOREST ROAD BRIDGE DESIGN PERUDRAWINGS CADD 628428 14 - EPSC CNSTR.DWG

- LEGEND:
- STREAMBED MATERIAL
 - PLACED RIPRAP, METHOD A
 - SILT FENCE
 - COFFERDAM
 - EDGE OF ROADWAY
 - EDGE OF RIVER
 - WL WETLAND BOUNDARY
 - FILL LINE
 - CLEARING LINE
 - PROPOSED MAJOR CONTOURS
 - PROPOSED MINOR CONTOURS



SUGGESTED TEMPORARY COFFERDAM DETAIL
NOT TO SCALE

COFFERDAM NOTES:

1. THE EROSION CONTROL, COFFERDAM, AND DEWATERING DETAILS SHOWN ON THIS SHEET ARE CONCEPTUAL, AND SHOULD BE FINALIZED AND SUBMITTED BY THE CONTRACTOR FOR APPROVAL.
2. COFFERDAMS OR WATER DIVERSION STRUCTURES ARE REQUIRED AT EACH HEADWALL LOCATION TO CONTROL THE INFLOW AND ADEQUATELY DEWATER TO CONSTRUCT. ALL COSTS FOR DESIGN, CONSTRUCTION, MAINTENANCE, AND REMOVAL SHALL BE INCLUDED IN ITEM 20815-0000, COFFERDAMS. ALL WORK REQUIRED TO MAINTAIN A DEWATERED CONDITION SHALL BE INCLUDED IN ITEM 20820-0000.
3. THE CONTRACTOR SHALL SUBMIT DETAILS, INDICATING THEIR METHOD OF DEWATERING AND THEIR METHOD OF HANDLING THE WATER FROM THE WORK AREA FOR APPROVAL BY THE C.O.R.
4. ALL COSTS ASSOCIATED WITH THE RE-DESIGN AND RE-INSTALLATION OF COFFERDAMS DUE TO SUBSURFACE CONDITIONS ENCOUNTERED DURING THE COFFERDAM INSTALLATION THAT ARE DIFFERENT FROM WHAT THE COFFERDAM DESIGN ASSUMED AND/OR INTERPRETED FROM THE AVAILABLE SUBSURFACE INFORMATION, SHALL BE SUBSIDIARY TO THE ASSOCIATED COFFERDAM ITEM.

EPSC CONSTRUCTION CONDITIONS PLAN
SCALE: 1" = 10'-0"

United States Department of Agriculture
Forest Service

(R09)
EASTERN REGION

STAMPS, LOGOS, AND SEALS

FOR CONSTRUCTION

4		
3		
2		
1		
NO.	REVISION / ISSUE	DATE

PROJECT NAME

**FR 10-11.53
CULVERT
REPLACEMENT
OVER TRIBUTARY
TO UTLEY BROOK**

**GREEN MOUNTAIN
NATIONAL FOREST**

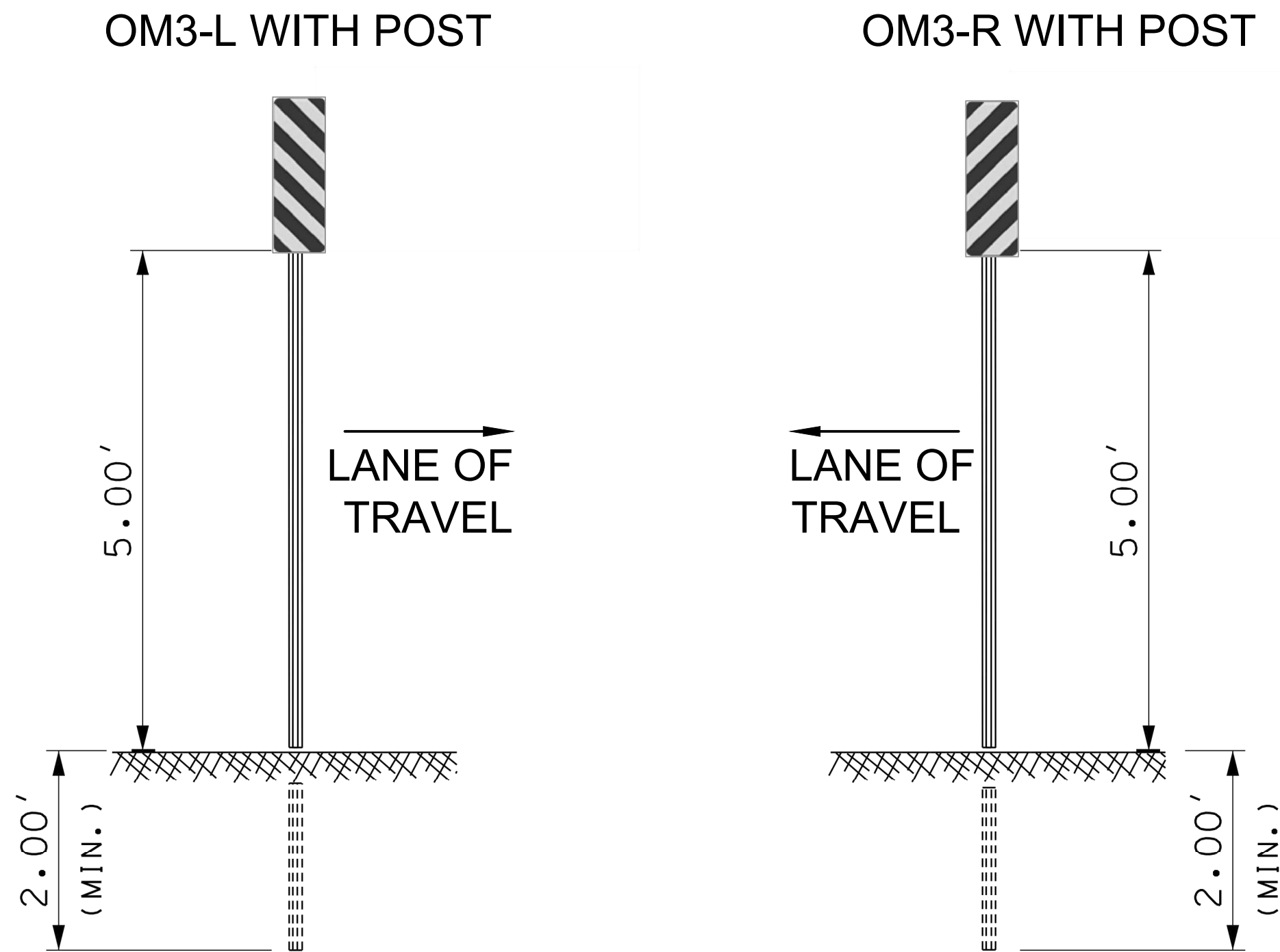
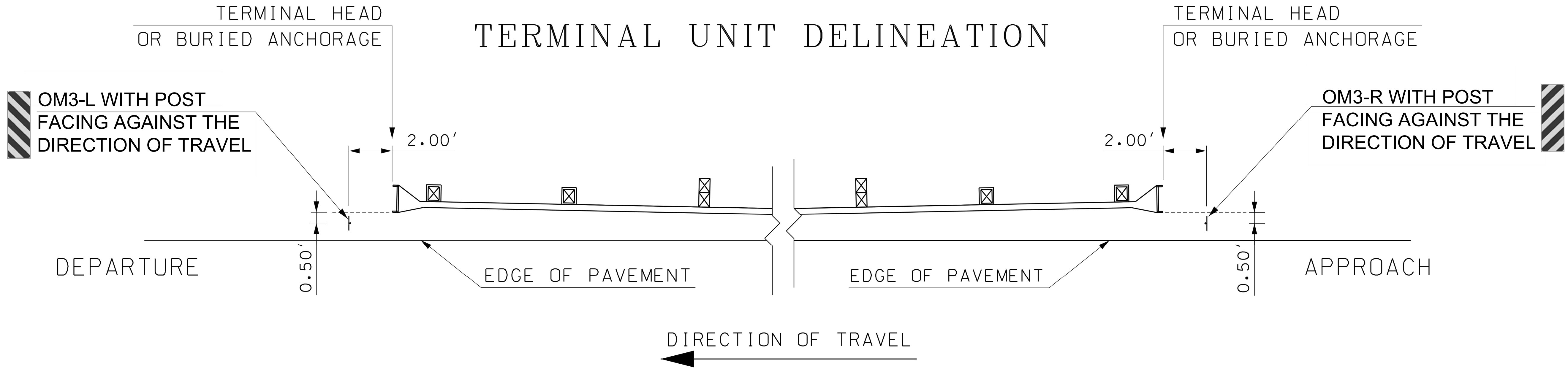
MANCHESTER RANGER DISTRICT

DRAWING TITLE

**EPSC CONSTRUCTION
PLAN SHEET**

DATE 07/18/22	ARCHIVE NO.
DESIGNER K. KITTREDGE	DRAWING SHEET NO. C-14
DRAWN K. KITTREDGE	
CHECKED R. GAUDREAU	
PROJECT NO. 626426	SHEET 14 OF 18

7/20/22 13:20 KKITTREDGE I:\0658426 0MFL FOREST ROAD BRIDGE DESIGN PER\DRAWINGS\CADD\0658426_15 & 16 & 17 & 18- RAIL SHEETS.DWG



TYPICAL INSTALLATION

NOTE:
1. THIS SHEET HAS BEEN ADAPTED FROM THE NHDOT "TERMINAL UNIT DELINEATION" STANDARD DETAIL TO INCLUDE OM3 OBJECT MARKERS.



United States Department of Agriculture
Forest Service

(R09)
EASTERN REGION

STAMPS, LOGOS, AND SEALS



FOR CONSTRUCTION		
4		
3		
2		
1		
NO.	REVISION / ISSUE	DATE

PROJECT NAME

**FR 10-11.53
CULVERT
REPLACEMENT
OVER TRIBUTARY
TO UTLEY BROOK**

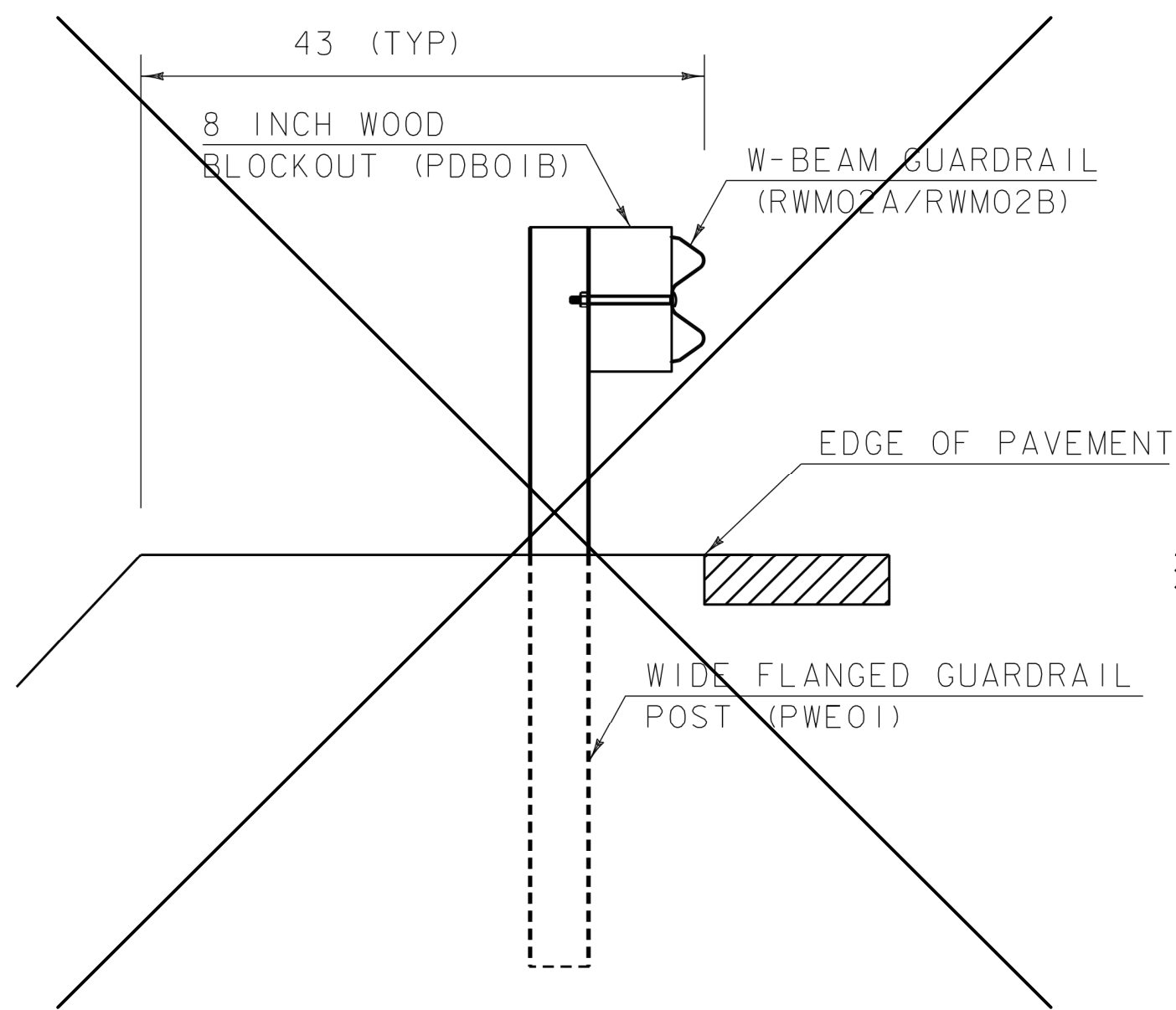
**GREEN MOUNTAIN
NATIONAL FOREST**

MANCHESTER RANGERS DISTRICT

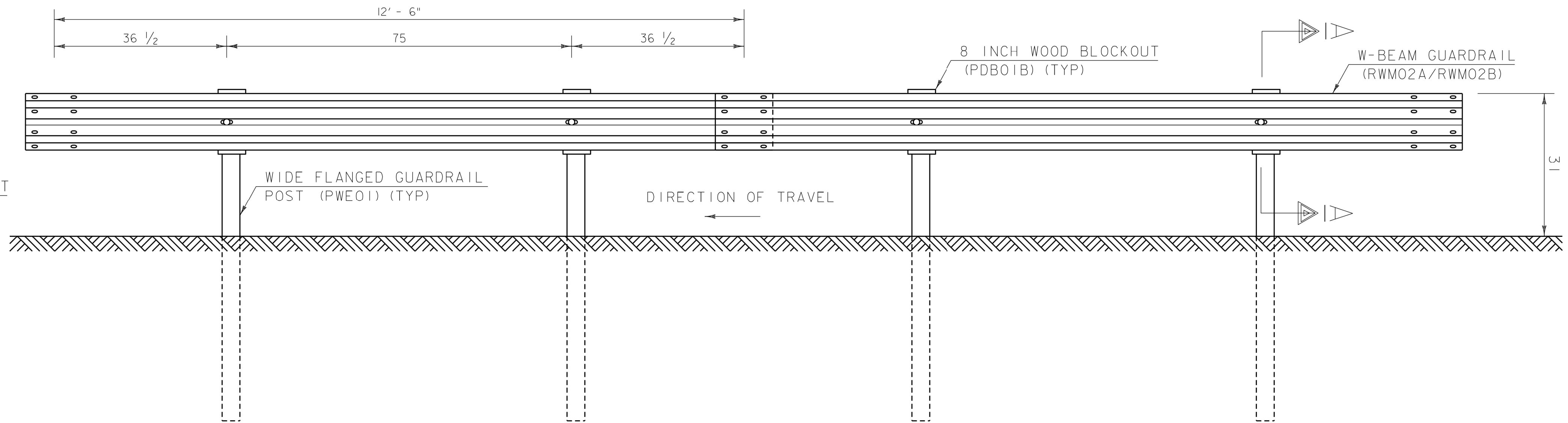
DRAWING TITLE

**TERMINAL UNIT
DELINEATION**

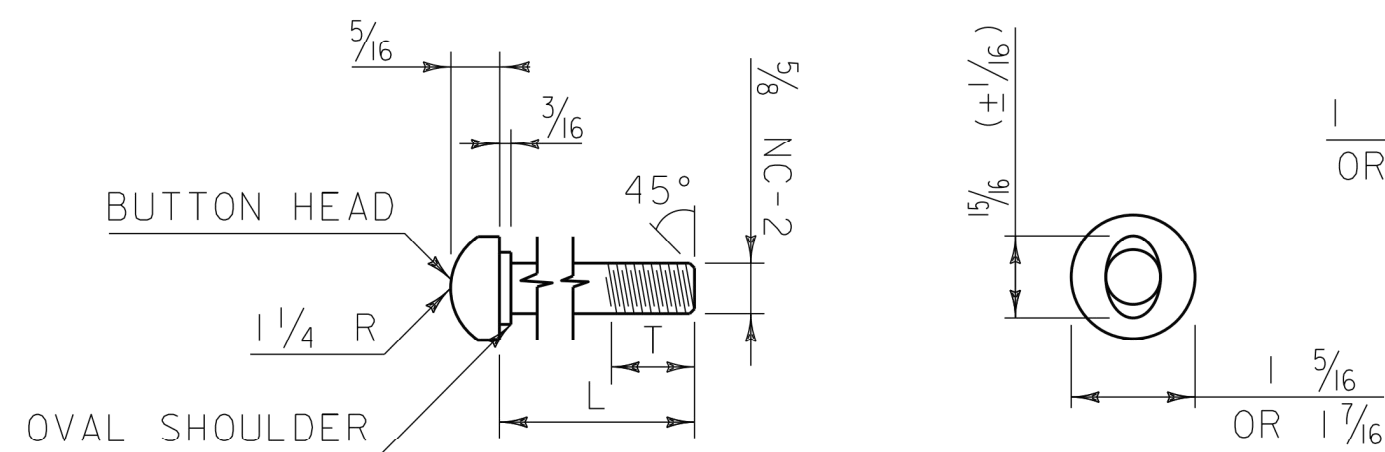
DATE 07/18/22	ARCHIVE NO.
DESIGNER K. KITTREDGE	DRAWING SHEET NO. C-15
DRAWN K. KITTREDGE	
CHECKED R. GAUDREAU	
PROJECT NO. 626426	SHEET 15 OF 18



TYPICAL GUARDRAIL DETAIL
SECTION A-A

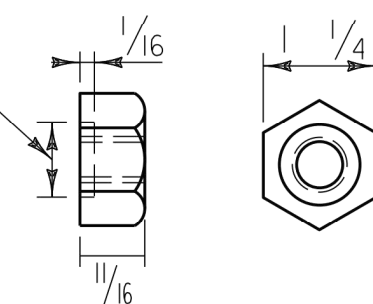


GUARDRAIL ELEVATION



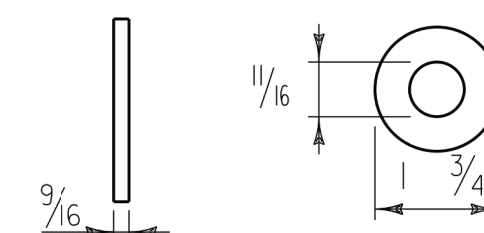
GUARDRAIL BOLT

1 IN. DIA. ONE
OR BOTH SIDES



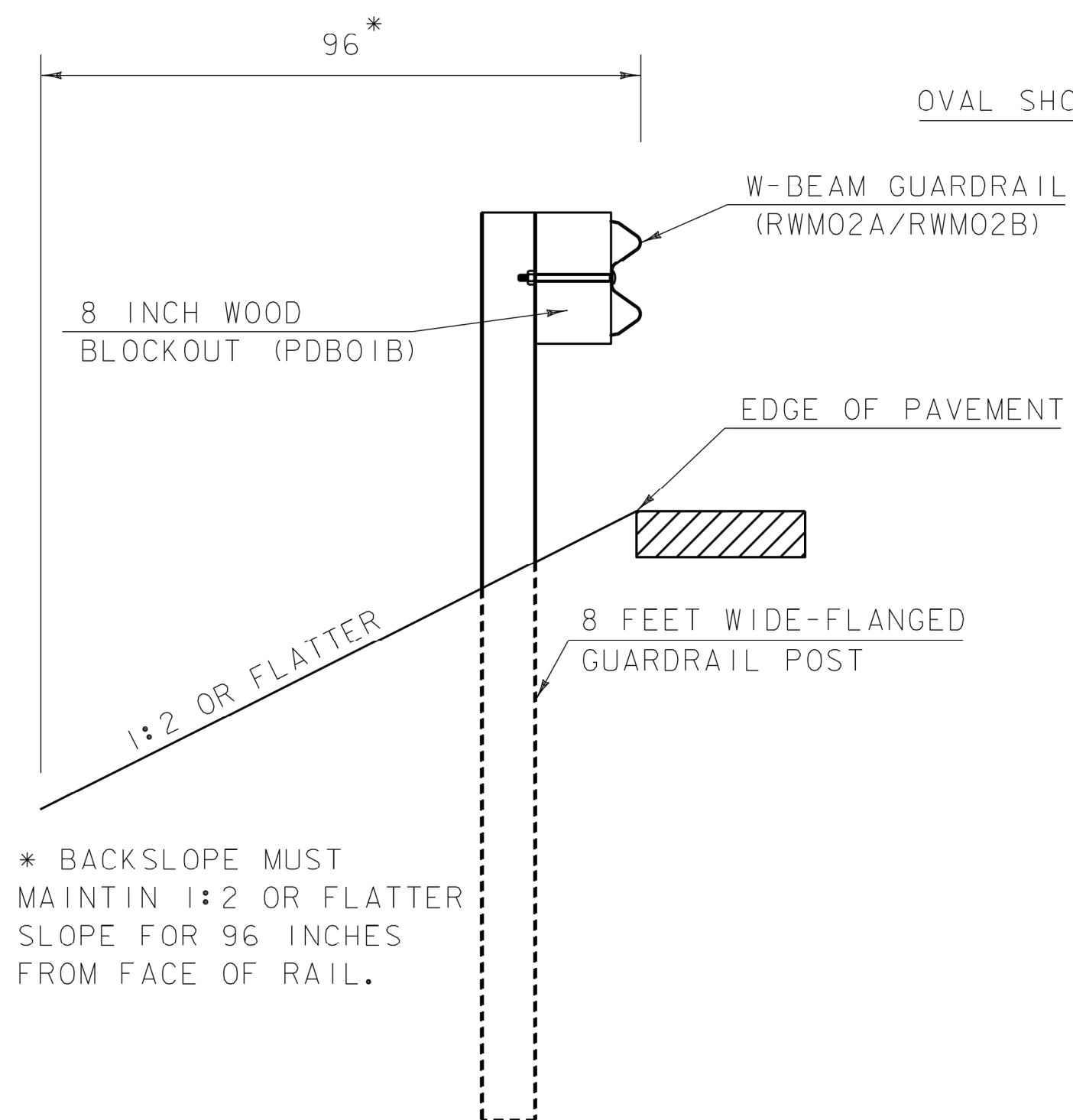
RECESSED NUT FOR GUARDRAIL BOLT

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

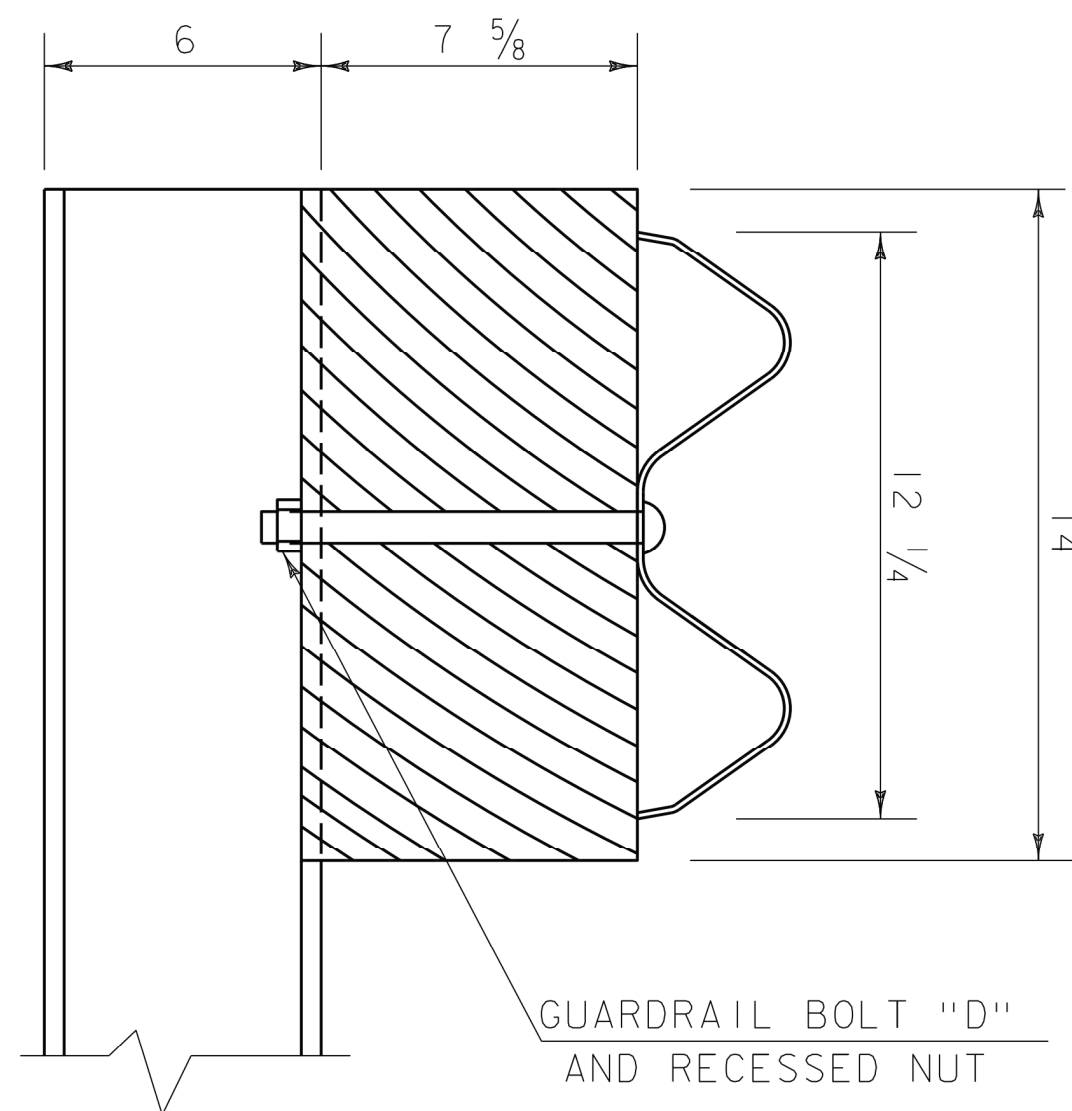


WASHER FOR 5/8" BOLTS
ARTBA F-13-73

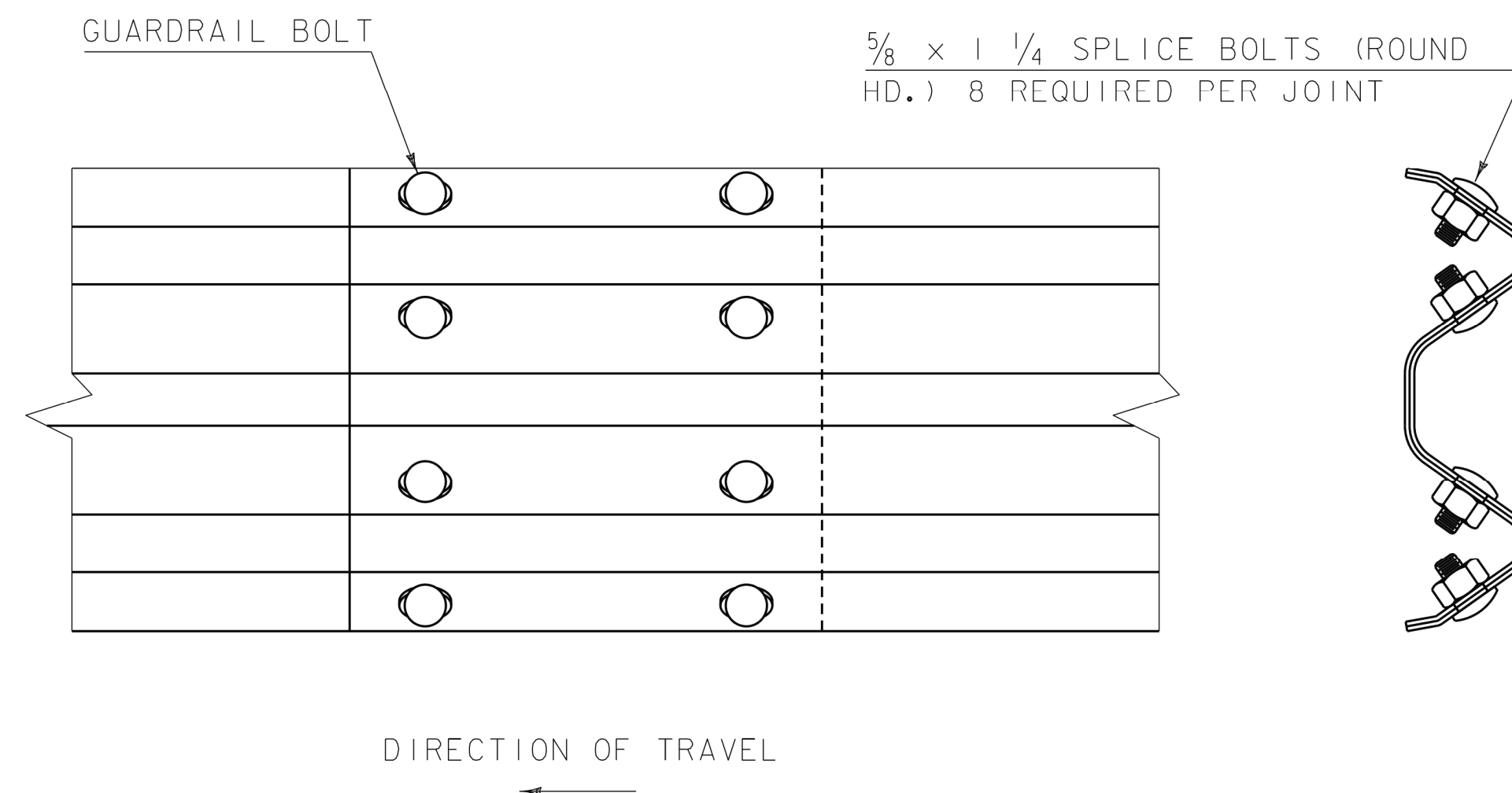
GUARDRAIL BOLTS				FASTENER USED IN	
BOLT DES.	ARTBA REF. NO.	L	T (MIN.)	STEEL POSTS	WOOD POSTS
"A"	F-3[1 1/4]-76	1 1/4"	1"	X	X
"C"	F-3[9 1/2]-76	9 1/2"	1 3/4"	X	
"D"	F-3[18]-76	18"	2 1/2"		X
"F"	F-3[25]-76	25"	2"		X



8 FEET POSTS GUARDRAIL DETAIL
SECTION A-A



POST ATTACHMENT DETAIL



SPLICE DETAIL

GENERAL NOTES

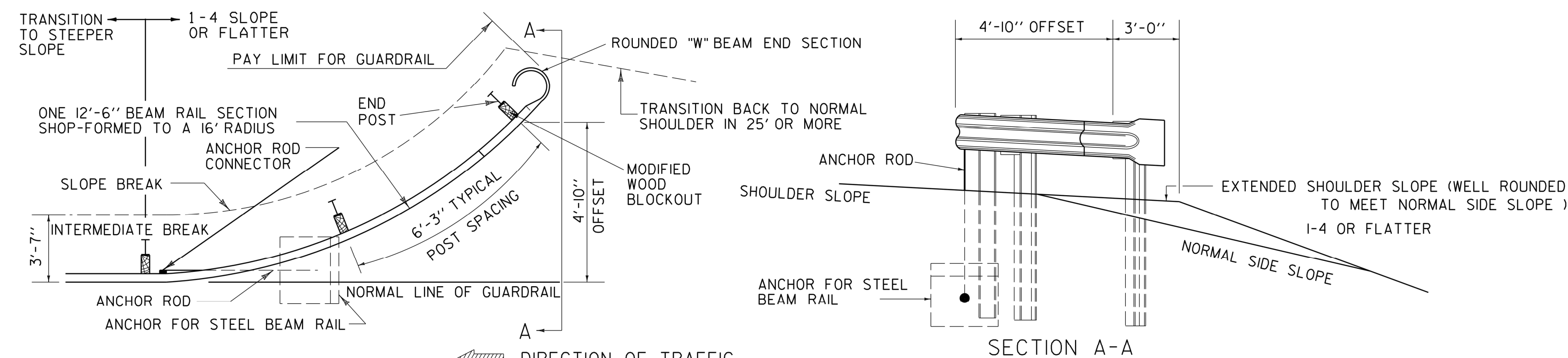
- DESIGNATIONS ARE AS IDENTIFIED IN "A GUIDE TO STANDARDIZED HIGHWAY BARRIER HARDWARE" AS PUBLISHED BY THE "AMERICAN ASSOCIATION OF STATE AND HIGHWAY TRANSPORTATION OFFICIALS" (AASHTO), "ASSOCIATED GENERAL CONTRACTORS OF AMERICA" (AGC) AND THE "AMERICAN ROAD AND TRANSPORTATION BUILDERS ASSOCIATION" (ARTBA).
- MATERIALS SHALL BE IN ACCORDANCE WITH SECTION 728 OF THE CURRENT STANDARD SPECIFICATIONS FOR CONSTRUCTION, AND ITS LATEST REVISIONS, AS APPLICABLE.
- WHEN W-BEAM GUARDRAIL, 8 FEET POSTS IS SPECIFIED ON THE PLANS, WIDE FLANGED GUARDRAIL POST (PWE01) SHALL BE INCREASED FROM 72 INCHES TO 96 INCHES, SEE DETAIL HSD-621.07B.
- THE DYNAMIC DEFLECTION DISTANCE OF 57 INCHES FOR W BEAM GUARDRAIL SHALL BE MAINTAINED CLEAR OF OBSTACLES, TO BE MEASURED FROM THE BACK OF POST.
- FOR TEST LEVEL 3 APPLICATIONS, AS APPROVED IN THE FEDERAL HIGHWAY ADMINISTRATION'S ELIGIBILITY LETTER, HSST/B-240, DATED NOVEMBER 8, 2012.
- ALL DIMENSION IN INCHES, UNLESS OTHERWISE NOTED.

REV.	DATE	DESCRIPTION
--	APR. 17, 2019	ORIGINAL APPROVAL
1	JAN. 4, 2021	CORRECTED REFERENCE IN NOTE 3
OTHER DETAILS REQUIRED: 621.07B		
DETAILS APPROVED FOR USE BY HIGHWAY SAFETY & DESIGN		

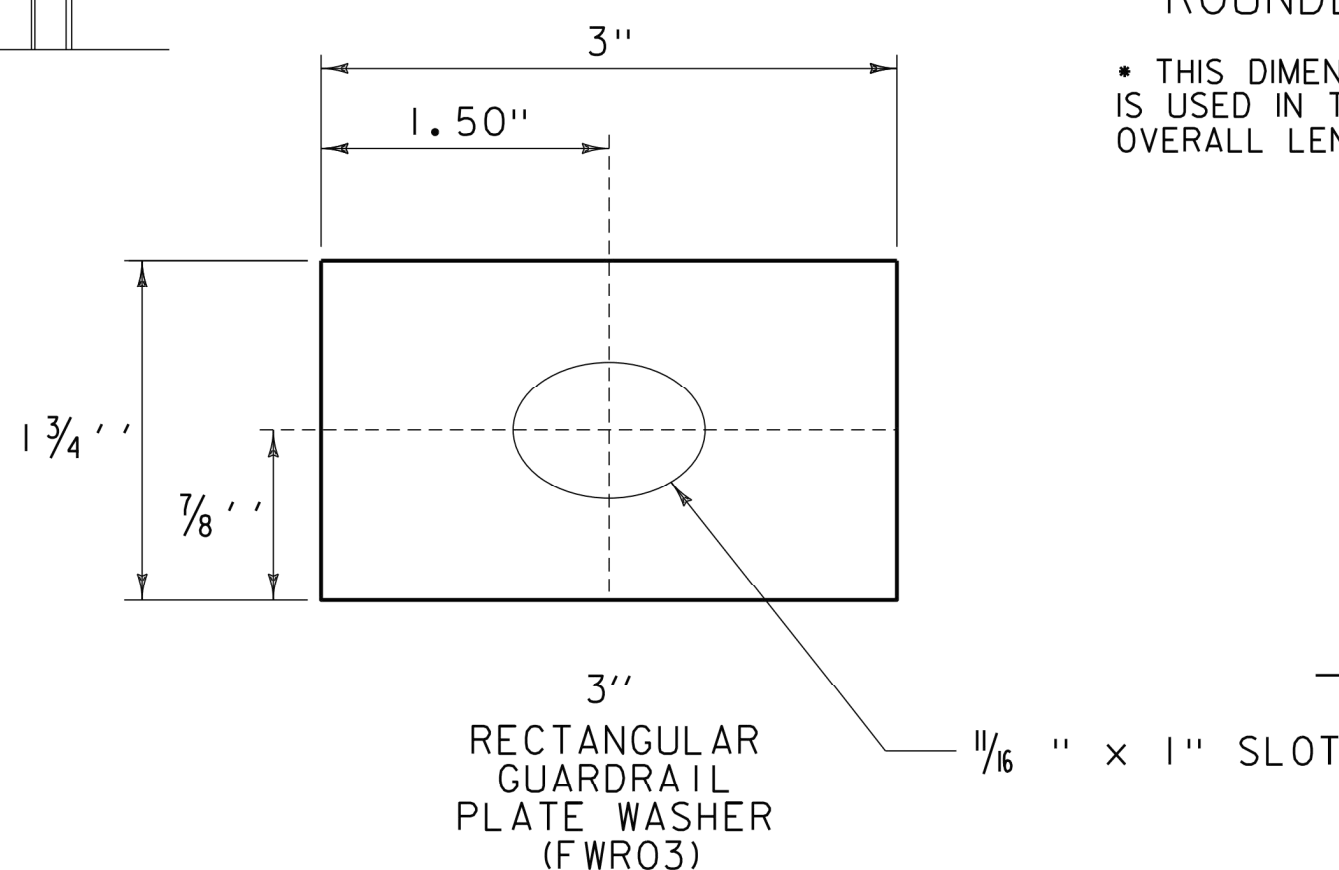
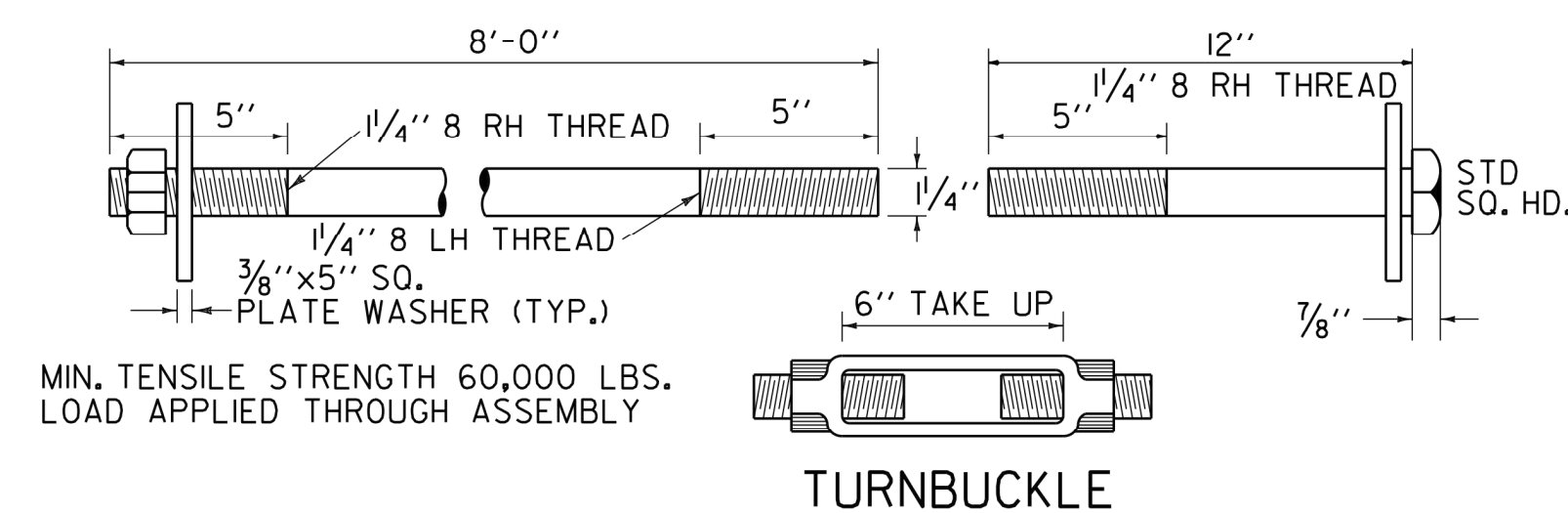
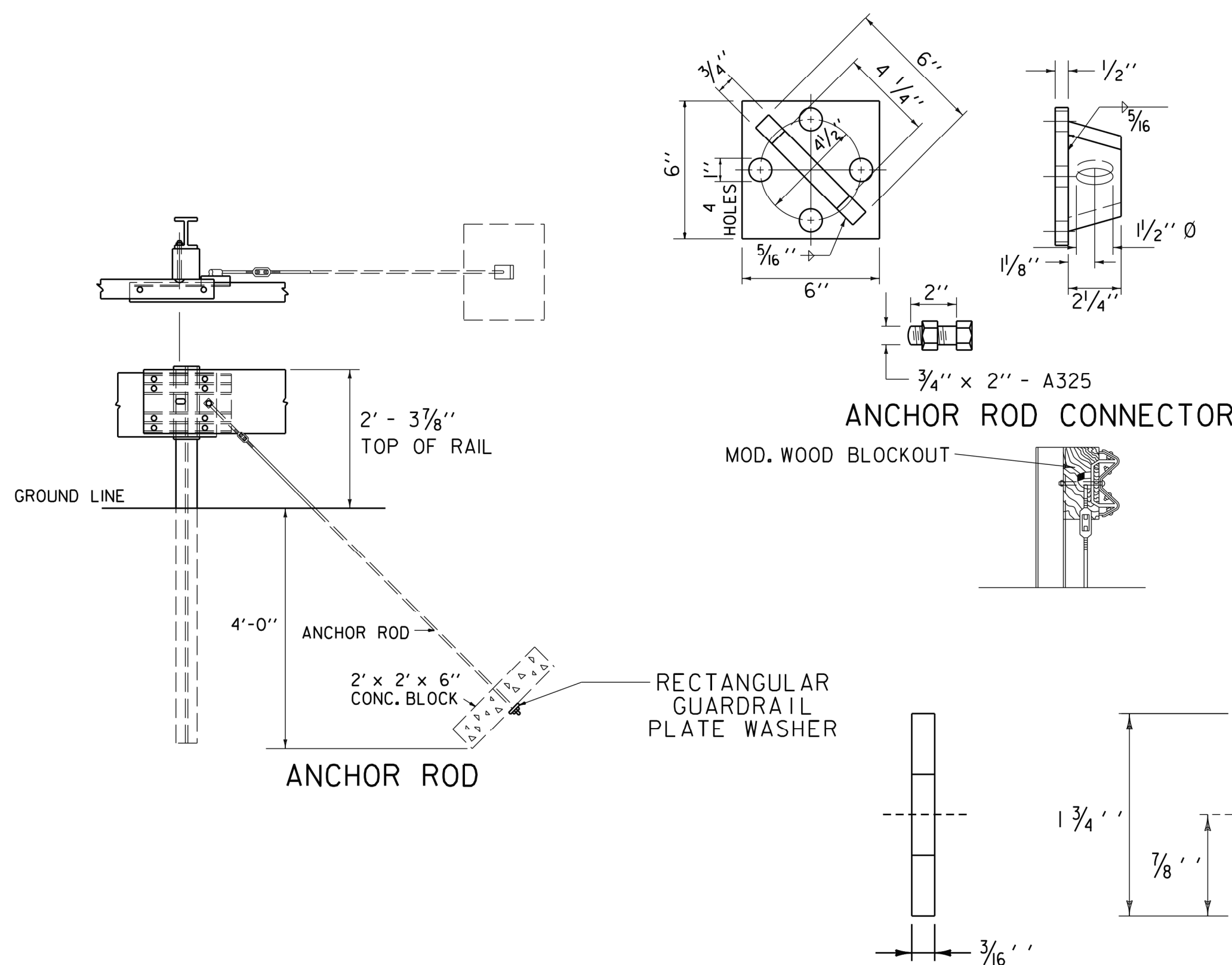
MIDWEST GUARDRAIL SYSTEM (MGS)



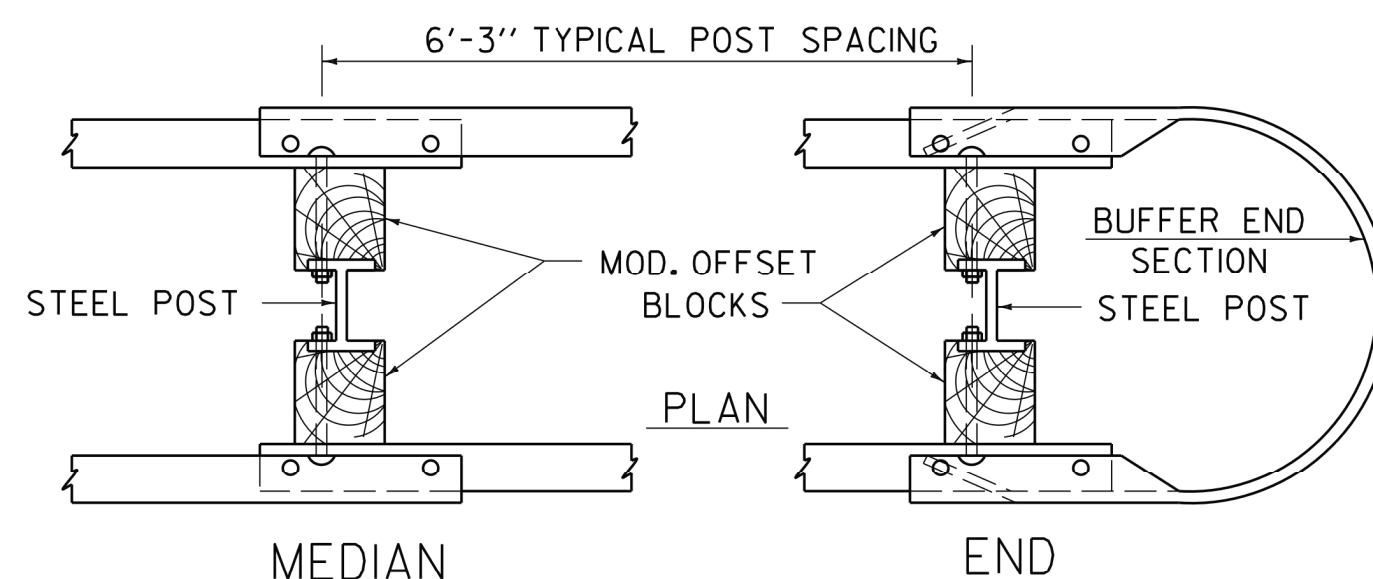
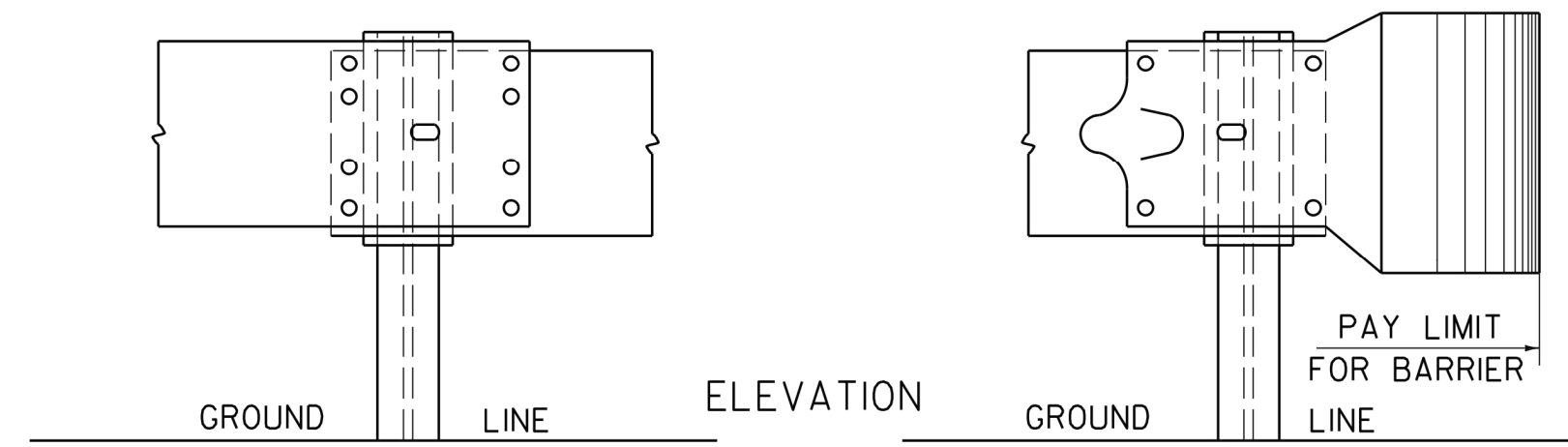
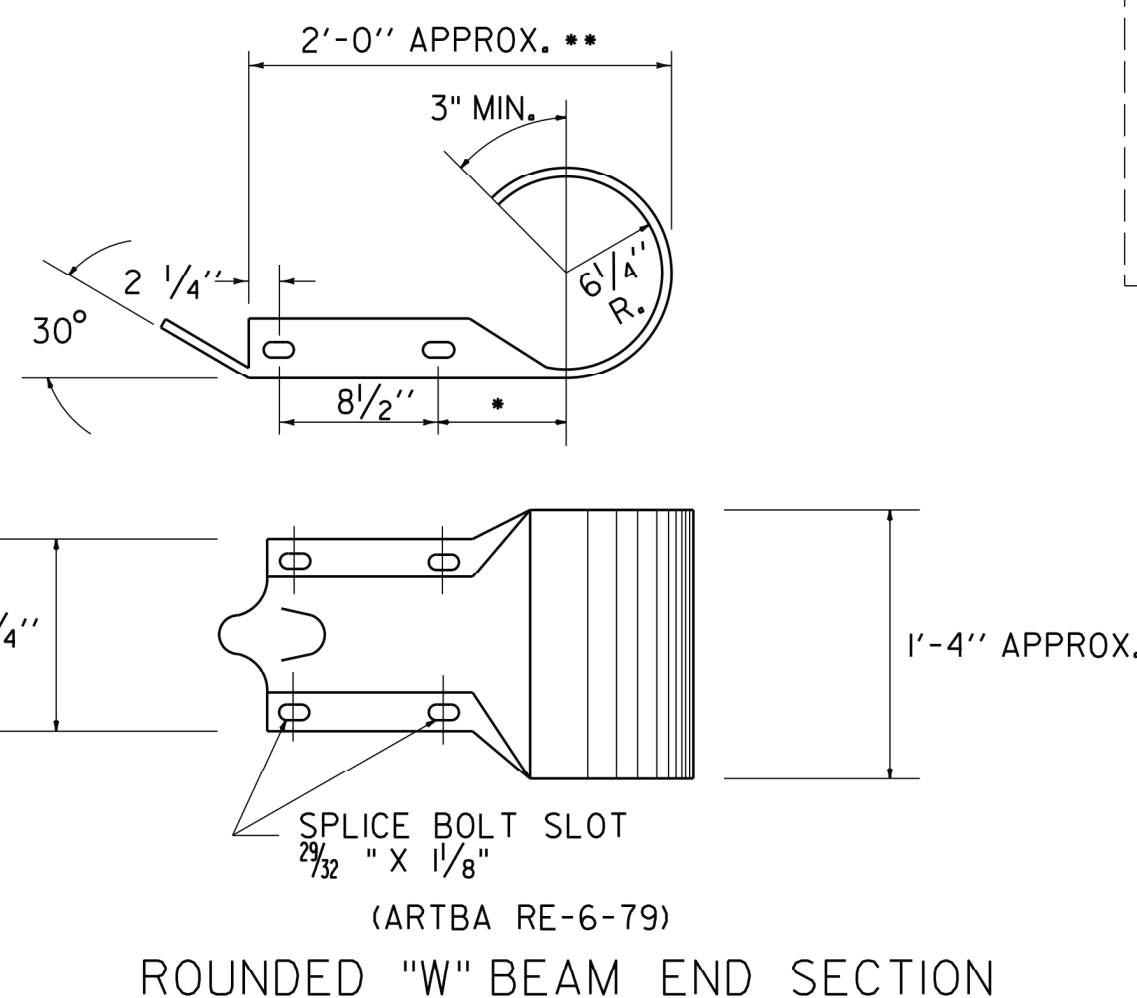
HIGHWAY SAFETY
& DESIGN DETAIL
HSD-621.07A



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



FASTENER DETAILS
 5/8" HEX NUT AND BOLT "F"
 (ARTBA F-8-76)



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

ASSEMBLY ELEVATION

TRAILING END TERMINAL FOR
 USE ON ONE-WAY HIGHWAYS

GENERAL NOTES:

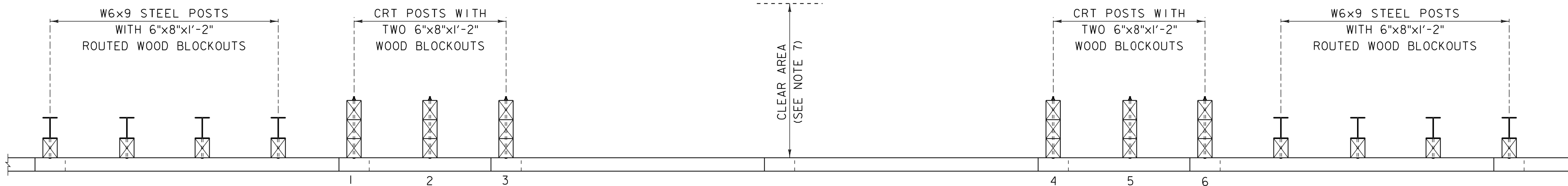
1. ALL METAL PARTS SHALL BE GALVANIZED
2. ALL WOOD POSTS SHALL BE GIVEN A PRESERVATIVE TREATMENT
3. DETAILS PERTINENT TO THE STANDARD INSTALLATION OF "W" BEAM SECTIONS WILL BE FOUND ON STANDARD DRAWING G-1.
4. FOR DESCRIPTION AND SPECIFICATIONS OF PARTS IDENTIFIED BY "ARTBA..." AND OTHER DETAILS OF POSTS, 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.

REV.	DATE	DESCRIPTION
2	JAN. 3, 2000	UPDATED TO REFLECT METRIC STD. CHANGES
3	FEB. 10, 2014	UPDATED TO REFLECT GUARDRAILS HEIGHT OF 29" AS NOTED IN FHWA LETTER DATED MAY 17, 2000
4	MAR. 10, 2017	UPDATED WASHER DETAILS
OTHER STANDARDS REQUIRED: G-1		
VTRANS AND FHWA APPROVAL ON FILE WITH CONTRACT ADMINISTRATION		

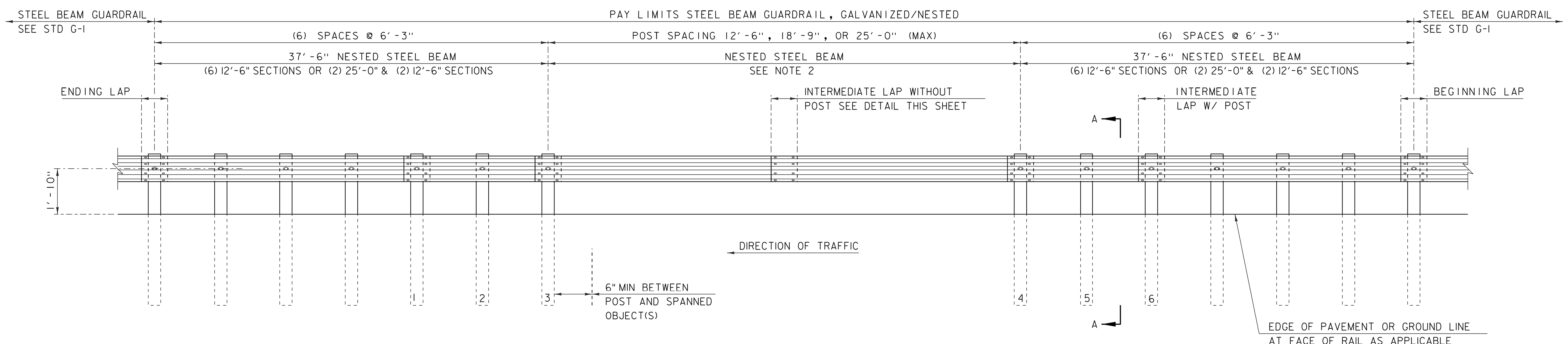
STEEL BEAM GUARDRAIL END TERMINALS ANCHOR FOR STEEL BEAM GUARDRAIL STEEL BEAM MEDIAN BARRIER



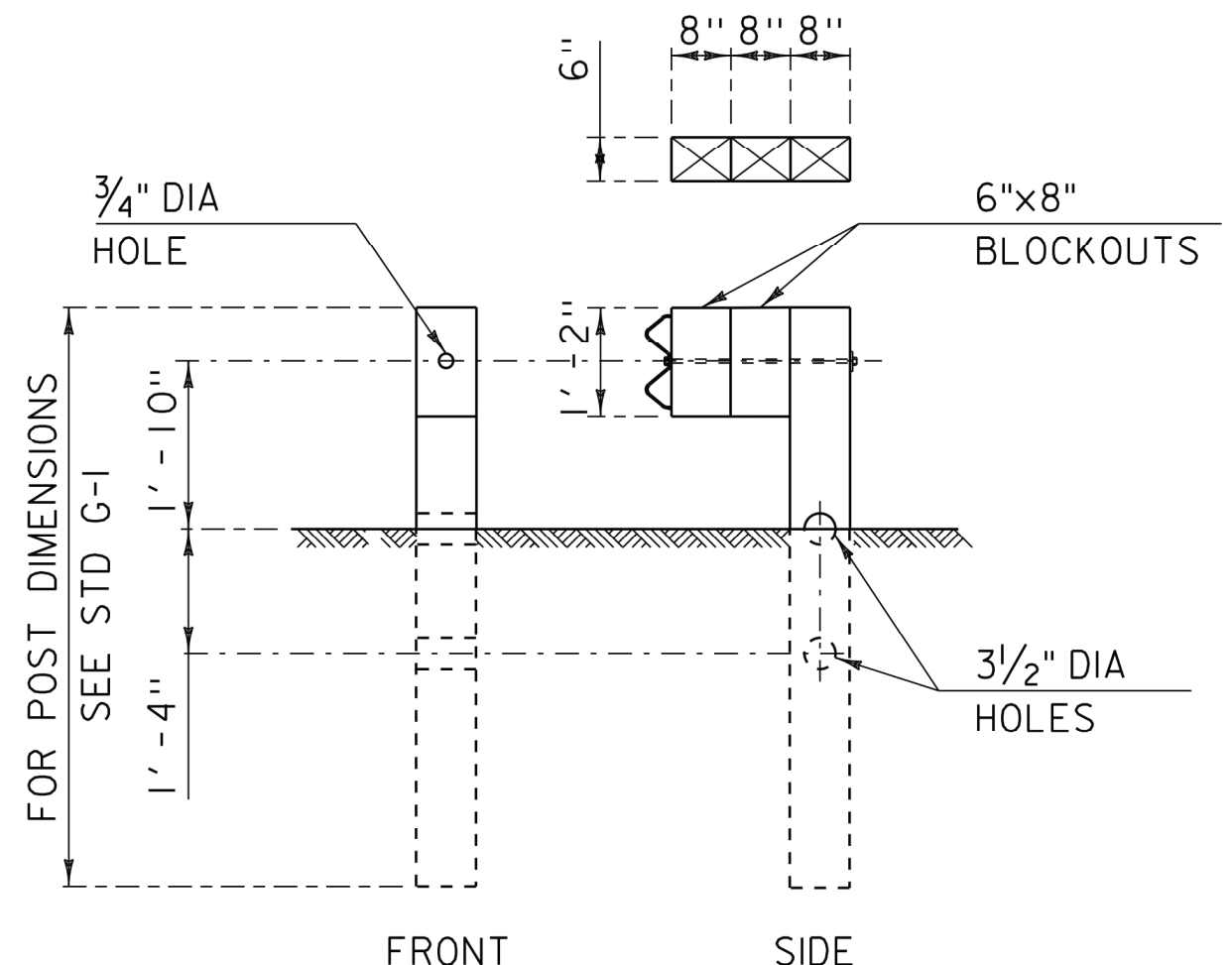
STANDARD
 G-1D



LONGSPAN STEEL BEAM GUARDRAIL PLAN

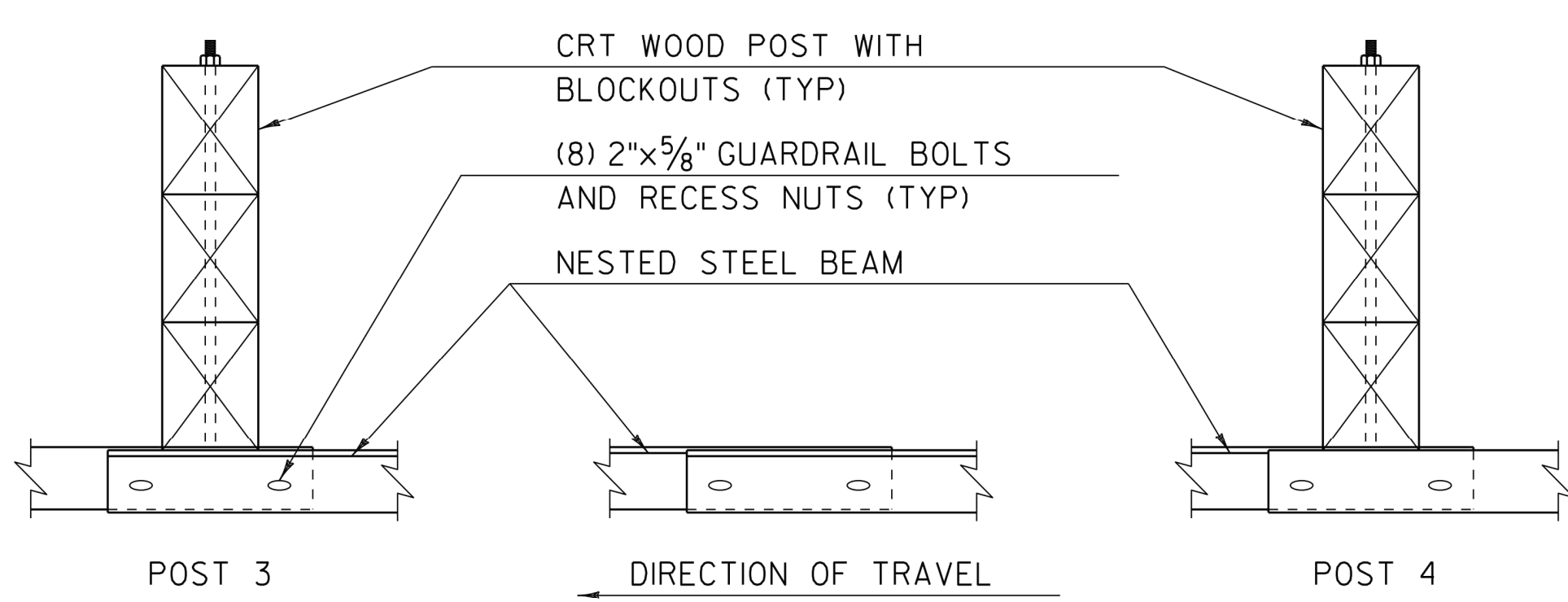


LONGSPAN STEEL BEAM GUARDRAIL ELEVATION



SECTION A-A

SECTION A-A TYPICAL FOR POST 1-6.
SEE NOTES 3 AND 4



INTERMEDIATE LAP WITHOUT POST

NOTES:

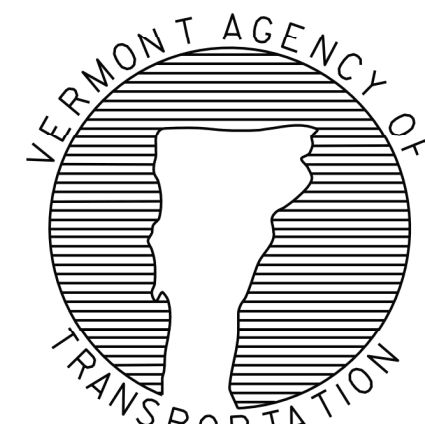
1. RAIL MEETS REQUIREMENTS OF NCHRP REPORT 350, TEST LEVEL 3; AS APPROVED IN FHWA ACCEPTANCE DOCUMENT HMHS-B58 (DATED: OCTOBER 8, 1999)
2. THERE SHALL BE NO MORE THAN ONE SPLICE IN THE LONGSPAN LOCATION.
3. POSTS 1 THRU 6 ARE BREAKAWAY CONTROLLED RELEASING TERMINAL (CRT) POSTS.
4. POSTS 1 THRU 6 HAVE TWO 6"x8" BLOCKOUTS.
5. ON POSTS 1 THRU 6, GUARDRAIL BOLT "D" AS SHOWN ON STD G1, SHALL BE 26" LONG.
6. ON ALL POSTS WHERE THE RAIL IS NESTED, GUARDRAIL BOLT "A" AS SHOWN ON STD G1, SHALL BE 2" LONG.
7. CLEAR AREA BEHIND BACK OF RAIL SHALL BE:
5'-0" MINIMUM FOR OBSTRUCTIONS LESS THAN OR EQUAL TO THE HEIGHT OF RAIL.
6'-0" FOR OBSTRUCTIONS TALLER THAN THE TOP OF RAIL.
8. W6x9 STEEL POST MAY BE REPLACED WITH CRT WOOD POST WITH THE APPROVAL OF THE ENGINEER.
9. ALL MATERIALS NECESSARY FOR THE ASSEMBLY OF THE RAIL MUST MEET THE REQUIREMENTS OF STD G-1 UNLESS OTHERWISE NOTED.
10. GUARDRAIL SECTIONS SHALL BE LAPPED IN THE DIRECTION OF TRAFFIC FLOW FOR THE LANE NEAREST THE GUARDRAIL.

OTHER STDS. REQUIRED: G-1, G-1D

REVISIONS AND CORRECTIONS
FEBRUARY 10, 2014 - ORIGINAL APPROVAL

APPROVED
W. P. S.
STRUCTURES ENGINEER
Richard F. Huant
DIRECTOR OF PROGRAM DEVELOPMENT
Mark D. Richter
FEDERAL HIGHWAY ADMINISTRATION

LONGSPAN STEEL BEAM GUARDRAIL, GALVANIZED



STANDARD
S - 366