

# STATE OF VERMONT AGENCY OF TRANSPORTATION



## PROPOSED IMPROVEMENT BRIDGE PROJECT

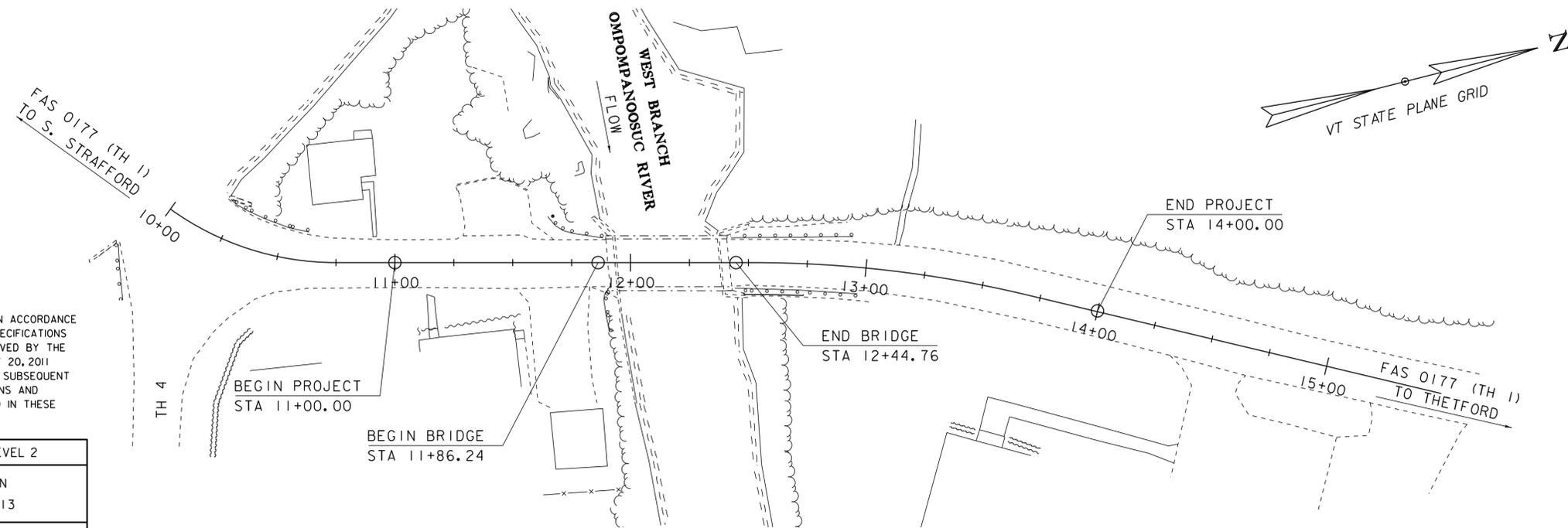
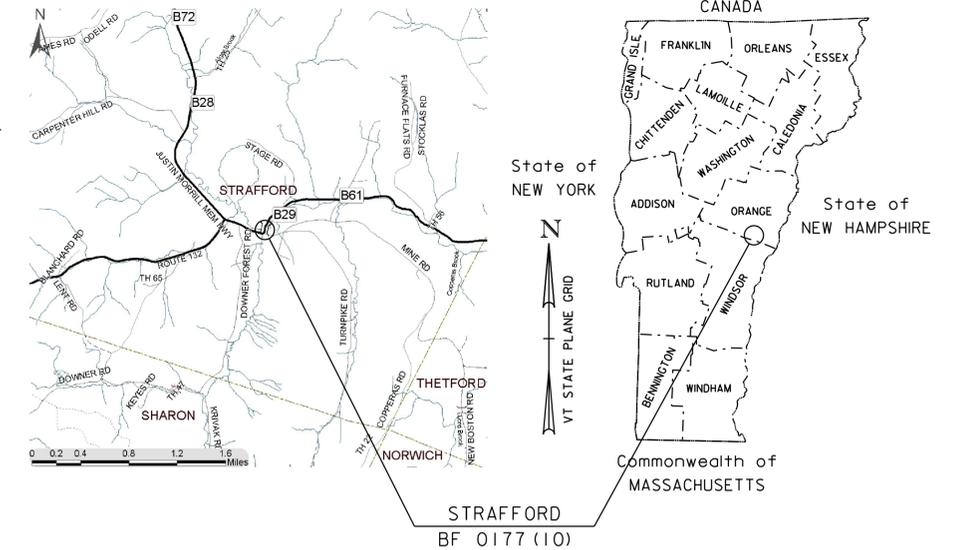
TOWN OF STRAFFORD  
COUNTY OF ORANGE

ROUTE NO : FAS 0177 (TH 1), RURAL MAJOR COLLECTOR, CLASS 2 TOWN HIGHWAY BRIDGE NO : 29

PROJECT LOCATION: APPROXIMATELY 0.04 MILES NORTH OF THE INTERSECTION OF TOWN HIGHWAY 1 (FAS 0177) AND TOWN HIGHWAY 4.

PROJECT DESCRIPTION: REMOVAL OF THE EXISTING STRUCTURE AND REPLACEMENT WITH A NEW STRUCTURE.

LENGTH OF STRUCTURE: 58.52 FEET  
LENGTH OF ROADWAY: 241.48 FEET  
LENGTH OF PROJECT: 300.00 FEET



CONSTRUCTION IS TO BE CARRIED ON IN ACCORDANCE WITH THESE PLANS AND THE STANDARD SPECIFICATIONS FOR CONSTRUCTION DATED 2011, AS APPROVED BY THE FEDERAL HIGHWAY ADMINISTRATION ON JULY 20, 2011 FOR USE ON THIS PROJECT, INCLUDING ALL SUBSEQUENT REVISIONS AND SUCH REVISED SPECIFICATIONS AND SPECIAL PROVISIONS AS ARE INCORPORATED IN THESE PLANS.

QUALITY ASSURANCE PROGRAM : LEVEL 2	
SURVEYED BY :	R. GILMAN
SURVEYED DATE :	04/18/2013
DATUM	
VERTICAL	NAVD88
HORIZONTAL	NAD 83 (2011)

SCALE 1" = 30' - 0"  
30 0 30

**FINAL PLANS**  
**09-MAY-2016**

DIRECTOR OF PROJECT DELIVERY	
APPROVED _____	DATE _____
PROJECT MANAGER : KRISTIN HIGGINS, P.E.	
PROJECT NAME :	STRAFFORD
PROJECT NUMBER :	BF 0177 (10)
SHEET 1 OF 50 SHEETS	

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STRUCTURES DETAIL SHEETS

SD-501.00	CONCRETE DETAILS AND NOTES	5/7/2010
SD-502.00	CONCRETE DETAILS AND NOTES	5/7/2010
SD-516.10	BRIDGE JOINT ASPHALTIC PLUG	5/7/2010
SD-601.00	STRUCTURAL STEEL DETAILS AND NOTES	5/7/2010
SD-602.00	STRUCTURAL STEEL PLATE GIRDER DETAILS AND NOTES	5/7/2010

STANDARDS LIST

C-10	CURBING	02-11-2008
D-1	PRECAST REINFORCED CONCRETE DROP INLET DETAILS	06-01-1994
D-15	PRECAST REINF CONC. MH-GRATES, CAST IRON GRATE WITH FRAME, TYPE D & E	06-01-1994
E-193	PAVEMENT MARKING DETAILS	08-18-1995
G-1	STEEL BEAM GUARDRAIL DETAILS (POST, DELINEATOR, TYPICALS)	11-10-2015
G-1D	STEEL BEAM GUARDRAIL DETAILS (END TERMINAL, ANCHOR, MEDIAN)	02-10-2014
G-4	PLANK RAIL, GUIDE POSTS, MARKER POSTS	06-01-1994
G-19	GENERIC GRADING PLANS FOR GUARDRAIL END TERMINALS	11-15-2002
T-1	TRAFFIC CONTROL GENERAL NOTES	04-25-2016
T-10	CONVENTIONAL ROADS CONSTRUCTION APPROACH SIGNING	08-06-2012
T-17	TRAFFIC CONTROL MISCELLANEOUS DETAILS	08-06-2012
T-24	TRAFFIC CONTROL FOR MAINTENANCE PAVEMENT MARKING OPERATION	08-06-2012
T-28	CONSTRUCTION SIGN DETAILS	08-06-2012
T-29	CONSTRUCTION SIGN DETAILS	08-06-2012
T-30	CONSTRUCTION SIGN DETAILS	08-06-2012
T-31	CONSTRUCTION SIGN DETAILS	08-06-2012
T-40	DELINEATORS AND MILEPOSTS	01-02-2013
T-42	BRIDGE NUMBER PLAQUE	04-09-2014
T-45	SQUARE TUBE SIGN POST AND ANCHOR	01-02-2013

FINAL HYDRAULIC REPORT

HYDROLOGIC DATA Date: April 2015

DRAINAGE AREA : 34.7 sq. mi.  
 CHARACTER OF TERRAIN : Mostly forested, small ponds, rural  
 STREAM CHARACTERISTICS : Sinuous and alluvial  
 NATURE OF STREAMBED : Cobbles, gravel, and sand

PEAK FLOW DATA  
 Q 2.33 = 1125 cfs Q 50 = 3900 cfs  
 Q 10 = 2350 cfs Q 100 = 4700 cfs  
 Q 25 = 3150 cfs Q 500 = 6500 cfs

DATE OF FLOOD OF RECORD : Unknown  
 ESTIMATED DISCHARGE : Unknown  
 WATER SURFACE ELEV. : Unknown  
 NATURAL STREAM VELOCITY : @ Q50 = 8.4 fps  
 ICE CONDITIONS : Moderate  
 DEBRIS : Light to moderate  
 DOES THE STREAM REACH MAXIMUM HIGHWATER ELEV. RAPIDLY? No  
 IS ORDINARY RISE RAPID? No  
 IS STAGE AFFECTED BY UPSTREAM OR DOWNSTREAM CONDITIONS? No  
 IF YES, DESCRIBE:

WATERSHED STORAGE: <1% HEADWATERS:  
 UNIFORM: X  
 IMMEDIATELY ABOVE SITE:

EXISTING STRUCTURE INFORMATION

STRUCTURE TYPE: Single span concrete t-beam  
 YEAR BUILT: 1923  
 CLEAR SPAN(NORMAL TO STREAM): 43'  
 VERTICAL CLEARANCE ABOVE STREAMBED: ~10'  
 WATERWAY OF FULL OPENING: 425 sq. ft.  
 DISPOSITION OF STRUCTURE: Remove and replace  
 TYPE OF MATERIAL UNDER SUBSTRUCTURE: See borings

WATER SURFACE ELEVATIONS AT:  
 Q2.33 = 879.8' VELOCITY = 5.2 fps  
 Q10 = 882.3' " 7.5 fps  
 Q25 = 883.3' " 9.5 fps  
 Q50 = 885.9' " 9.5 fps  
 Q100 = 886.5' " 11.2 fps

LONG TERM STREAMBED CHANGES: None noted

IS THE ROADWAY OVERTOPPED BELOW Q100: Yes  
 FREQUENCY: Below Q50  
 RELIEF ELEVATION: 884.7'  
 DISCHARGE OVER ROAD @Q100: 645 cfs

UPSTREAM STRUCTURE

TOWN: Stratford DISTANCE: 8600'  
 HIGHWAY #: TH 2 STRUCTURE #: 28  
 CLEAR SPAN: 26' CLEAR HEIGHT:  
 YEAR BUILT: 1919 FULL WATERWAY:  
 STRUCTURE TYPE: Concrete t-beam

DOWNSTREAM STRUCTURE

TOWN: Stratford DISTANCE: 4040'  
 HIGHWAY #: TH 39 STRUCTURE #: 61  
 CLEAR SPAN: 62' CLEAR HEIGHT:  
 YEAR BUILT: 1919, Reconstructed in 1971 FULL WATERWAY:  
 STRUCTURE TYPE: Rolled beam

LRFR LOAD RATING FACTORS

LOADING LEVELS	TRUCK						
	H-20	HL-93	3S2	6 AXLE	3A. STR.	4A. STR.	5A. SEM
TONNAGE	20	36	36	66	30	34.5	38
INVENTORY	2.1	1.15					
POSTING							
OPERATING	2.73	1.49	2.46	1.51	1.96	1.76	2.03
COMMENTS:							

AS BUILT "REBAR" DETAIL		
LEVEL I	LEVEL II	LEVEL III
TYPE:	TYPE:	TYPE:
GRADE:	GRADE:	GRADE:

TRAFFIC DATA

YEAR	ADT	DHV	% D	% T	ADTT	
						20 year ESAL for flexible pavement from 2016 to 2036 : 228000
2016	1400	180	55	3.7	65	40 year ESAL for flexible pavement from 2016 to 2056 : 542000
2036	1500	190	55	6	110	Design Speed : 25 mph

PROPOSED STRUCTURE

STRUCTURE TYPE: Single span steel beam  
 CLEAR SPAN(NORMAL TO STREAM): 53'  
 VERTICAL CLEARANCE ABOVE STREAMBED: ~11.5'  
 WATERWAY OF FULL OPENING: 565 sq. ft.

WATER SURFACE ELEVATIONS AT:  
 Q2.33 = 879.4' VELOCITY= 5.2 fps  
 Q10 = 882.0' " 7.0 fps  
 Q25 = 883.1' " 8.3 fps  
 Q50 = 884.0' " 9.6 fps  
 Q100 = 884.8' " 11.4 fps

IS THE ROADWAY OVERTOPPED BELOW Q100: No  
 FREQUENCY: N/A  
 RELIEF ELEVATION: 884.7'  
 DISCHARGE OVER ROAD @Q100: N/A

AVERAGE LOW ELEVATION OF SUPERSTRUCTURE: 885.0'  
 VERTICAL CLEARANCE: @ Q50 = 1.0'

SCOUR: 4' of contraction scour up to Q200  
 Piles should be freestanding up to 6' below streambed elevation.  
 REQUIRED CHANNEL PROTECTION: Stone Fill Type III

PERMIT INFORMATION

AVERAGE DAILY FLOW: DEPTH OR ELEVATION:  
 ORDINARY LOW WATER:  
 ORDINARY HIGH WATER:

TEMPORARY BRIDGE REQUIREMENTS

STRUCTURE TYPE: None required  
 CLEAR SPAN (NORMAL TO STREAM):  
 VERTICAL CLEARANCE ABOVE STREAMBED:  
 WATERWAY AREA OF FULL OPENING:

ADDITIONAL INFORMATION

TRAFFIC MAINTENANCE NOTES

1. MAINTAIN TRAFFIC ON AN OFF SITE DETOUR.
2. TRAFFIC SIGNALS ARE NOT NECESSARY.
3. SIDEWALKS ARE NOT NECESSARY

DESIGN VALUES

1. DESIGN LIVE LOAD HL-93
2. FUTURE PAVEMENT  $d_p$ : 0.0 INCH
3. DESIGN SPAN L: 57.00 FT
4. MIN. MID-SPAN POS. CAMBER @ RELEASE (PRESTRESSED UNITS)  $\Delta$ : ---
5. PRESTRESSING STRAND  $f_y$ : ---
6. PRESTRESSED CONCRETE STRENGTH  $f'c$ : ---
7. PRESTRESSED CONCRETE RELEASE STRENGTH  $f'cr$ : ---
8. CONCRETE, HIGH PERFORMANCE CLASS AA  $f'c$ : 4.0 KSI
9. CONCRETE, HIGH PERFORMANCE CLASS A  $f'c$ : 4.0 KSI
10. CONCRETE, HIGH PERFORMANCE CLASS B  $f'c$ : 3.5 KSI
11. CONCRETE, CLASS C  $f'c$ : 3.0 KSI
12. REINFORCING STEEL  $f_y$ : 60 KSI
13. STRUCTURAL STEEL AASHTO M270(GALVANIZED OR METALLIZED)  $f_y$ : 50 KSI
14. NOMINAL BEARING RESISTANCE OF SOIL  $q_n$ : 4.0 KSF
15. SOIL BEARING RESISTANCE FACTOR (REFER TO AASHTO LRFD)  $\phi$ : ---
16. NOMINAL BEARING RESISTANCE OF ROCK  $q_n$ : 10.0 KSF
17. ROCK BEARING RESISTANCE FACTOR (REFER TO AASHTO LRFD)  $\phi$ : ---
18. PILE RESISTANCE FACTOR  $\phi$ : 0.65
19. LATERAL PILE DEFLECTION  $\Delta$ : ---
20. BASIC WIND SPEED  $V_{3s}$ : ---
21. MINIMUM GROUND SNOW LOAD  $p_g$ : ---
22. SEISMIC DATA PGA: 0.65  $S_s$ : ---  $S_1$ : ---
23. ---
24. ---
25. ---
26. ---

PROJECT NAME: STRAFFORD  
 PROJECT NUMBER: BF 0177(10)  
 FILE NAME: s13j088excel.dgn PLOT DATE: 4/28/2016  
 PROJECT LEADER: K. HIGGINS DRAWN BY: T. MATTHEWS  
 DESIGNED BY: J. GRIGAS CHECKED BY: J. GRIGAS  
 PRELIMINARY INFORMATION SHEET SHEET 2 OF 50

**GENERAL**

1. ALL MATERIALS AND CONSTRUCTION SHALL CONFORM TO THE VERMONT AGENCY OF TRANSPORTATION 2011 STANDARD SPECIFICATIONS FOR CONSTRUCTION, THE 2012 AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, AND THEIR LATEST REVISIONS.
2. ALL PRECAST CONCRETE ELEMENTS SHALL BE FABRICATED TO THE SPECIFIED DIMENSIONS WITHIN THE TOLERANCES DICTATED IN THE PRECAST/PRESTRESSED CONCRETE INSTITUTE TOLERANCE MANUAL FOR PRECAST AND PRESTRESSED CONCRETE CONSTRUCTION, MNL 135-00, AND ITS LATEST REVISIONS OR AS DIRECTED IN THE CONTRACT DOCUMENTS.
3. CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING CONSISTENCY BETWEEN THE FABRICATOR'S SHOP DRAWINGS AND ENSURING THAT ALL PRECAST AND RAIL COMPONENTS FIT TOGETHER.
4. ALL DIMENSIONS ARE HORIZONTAL OR VERTICAL, AND ARE GIVEN AT 68 DEGREES FAHRENHEIT, UNLESS NOTED OTHERWISE.
5. NO ADJUSTMENTS TO THE BITUMINOUS WEARING SURFACE ON THE BRIDGE SHALL BE MADE TO ACCOUNT FOR THE DIFFERENCE BETWEEN BEAM CAMBER AND THE THEORETICAL ROADWAY PROFILE. THE WEARING SURFACE SHALL BE SHIMMED TRANSVERSELY AS NECESSARY TO ACCOUNT FOR POTENTIAL DIFFERENTIAL CAMBER OF THE ADJACENT BEAMS.
6. NO CAST IN PLACE CONCRETE SUBSTITUTIONS WILL BE PERMITTED FOR PRECAST CONCRETE.
7. THE REMOVAL OF EXISTING STRUCTURE WILL BE PAID FOR UNDER ITEM 529.15, "REMOVAL OF STRUCTURE". THIS WORK SHALL INCLUDE REMOVAL OF THE ENTIRE SUPERSTRUCTURE AND ANY PORTIONS OF THE EXISTING ABUTMENTS THAT FALL OUTSIDE THE LIMITS OF STRUCTURE EXCAVATION OR UNCLASSIFIED CHANNEL EXCAVATION.

**TRAFFIC CONTROL**

8. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE DESIGN AND IMPLEMENTATION OF A SITE SPECIFIC TRAFFIC CONTROL PLAN FOR ALL STAGES OF CONSTRUCTION. THE PLAN SHALL CLEARLY DETAIL HOW TRAFFIC WILL BE MAINTAINED. THE PLAN SHALL SPECIFY ALL CONSTRUCTION ACTIVITIES REQUIRING ALTERNATING ONE WAY TRAFFIC, RELATE THOSE ACTIVITIES TO THE CONSTRUCTION SCHEDULE, AND SHOW APPROPRIATE TEMPORARY TRAFFIC CONTROL. THE CONTRACTOR SHALL SUBMIT DETAILED TRAFFIC CONTROL PLANS TO THE ENGINEER FOR APPROVAL PER SUBSECTION 105.03. ALL COSTS WILL BE INCLUDED IN ITEM 900.645 "SPECIAL PROVISION (TRAFFIC CONTROL, ALL-INCLUSIVE)".

9. ALL ITEMS REQUIRED TO IMPLEMENT THE CONTRACTOR'S TRAFFIC CONTROL PLAN WILL NOT BE PAID FOR DIRECTLY BUT WILL BE CONSIDERED INCIDENTAL TO THE BID PRICE FOR ITEM 900.645, "SPECIAL PROVISION (TRAFFIC CONTROL, ALL-INCLUSIVE)".
10. INSTALLATION OF TEMPORARY TRAFFIC CONTROL SIGNS SHALL NOT BLOCK ANY EXISTING TRAFFIC CONTROL SIGN ASSEMBLIES. THE CONTRATOR SHALL TRY TO MAINTAIN AT LEAST 200 FEET BETWEEN SIGN ASSEMBLIES.
11. TH1, IN PROXIMITY OF THE PROJECT, WILL BE CLOSED DURING THE BRIDGE CLOSURE PERIOD. IF THE TOWN ELECTS TO SIGN A LOCAL DETOUR, THEN NO SIGNS WILL BE PERMITTED IN A STATE HIGHWAY RIGHT OF WAY. ANY DETOUR SIGNED IS THE SOLE RESPONSIBILITY OF THE TOWN OF STRAFFORD.
12. ITEM 641.15 "PORTABLE CHANGEABLE MESSAGE SIGN" SHALL BE PLACED ON THE OFF RAMPS OF BOTH I-89 NORTHBOUND AND I-89 SOUTHBOUND AT EXIT 2 IN SHARON, VERMONT.

V	T		1	3	2		
C	L	O	S	E	D		
T	O		T	R	U	C	K

PORTABLE CHANGEABLE SIGN - PHASE 1

E	A	S	T		O	F	
S	O	U	T	H			
S	T	R	A	F	F	R	D

PORTABLE CHANGEABLE SIGN - PHASE 2

M	M	M	M		D	D	-
M	M	M	M		D	D	

PORTABLE CHANGEABLE SIGN - PHASE 2\*

\*M = MONTH/ D = DAY

13. ITEM 641.15 "PORTABLE CHANGEABLE MESSAGE SIGN" SHALL ALSO BE PLACED ON THE OFF RAMPS OF BOTH I-91 NORTHBOUND AND I-91 SOUTHBOUND AT EXIT 14 IN THETTFORD, VERMONT.

V	T		1	3	2		
C	L	O	S	E	D		
T	O		T	R	U	C	K

PORTABLE CHANGEABLE SIGN - PHASE 1

W	E	S	T		O	F	
T	H	E	T	F	O	R	D

PORTABLE CHANGEABLE SIGN - PHASE 2

M	M	M	M		D	D	-
M	M	M	M		D	D	

PORTABLE CHANGEABLE SIGN - PHASE 3\*

\*M = MONTH/ D = DAY

14. THE PORTABLE CHANGEABLE MESSAGE SIGNS SHALL BE OPERATIONAL A MINIMUM OF TWO WEEKS PRIOR TO THE BRIDGE CLOSURE PERIOD. DURING THE BRIDGE CLOSURE PERIOD, ELIMINATE PHASE 3 ONLY.

**CONCRETE**

15. ALL LIFTING POINTS IN THE SUPERSTRUCTURE SHALL BE REMOVABLE TO THE MINIMUM CLEAR COVER FOR REINFORCING STEEL SPECIFIED IN THE PLANS. THE LIFTING POINTS SHALL BE DETAILED IN THE APPROPRIATE FABRICATION DRAWING. PAYMENT FOR THIS WORK WILL BE CONSIDERED INCIDENTAL TO ITEM \*900.640 SPECIAL PROVISION (PREFABRICATED BRIDGE UNIT SUPERSTRUCTURE) (GALVANIZED OR METALLIZED) (FPQ)".
16. ALL RECESSED LIFTING POINTS AND BLOCKOUTS SHALL BE FILLED WITH A TYPE IV MORTAR PER SUBSECTION 707.03. PAYMENT WILL BE CONSIDERED INCIDENTAL TO THE APPROPRIATE PRECAST ITEM.

	<b>CONCRETE</b>		<b>REINFORCING STEEL</b>	
<b>STRUCTURAL ELEMENT</b>	TO MEET THE REQUIREMENTS FOR:	PAYMENT TO BE INCLUDED IN:	TO MEET THE REQUIREMENTS FOR:	PAYMENT TO BE INCLUDED IN:
PREFABRICATED BRIDGE UNITS (INCLUDES REINFORCING STEEL LABELED SR1, ER2, ER3 AND ER4 IN PBU AND BEARING DETAILS)	900.640 "SPECIAL PROVISION (PREFABRICATED BRIDGE UNIT SUPERSTRUCTURE)"	ITEM 900.640 "SPECIAL PROVISION (PREFABRICATED BRIDGE UNIT SUPERSTRUCTURE) (GALVANIZED OR METALLIZED) (FPQ)"	507.11 "REINFORCING STEEL, LEVEL I (EPOXY COATED)"	ITEM 900.640 "SPECIAL PROVISION (PREFABRICATED BRIDGE UNIT SUPERSTRUCTURE) (GALVANIZED OR METALLIZED) (FPQ)"
SUPERSTRUCTURE LONGITUDINAL CLOSURE POURS	ITEM 900.608 "SPECIAL PROVISION (HIGH PERFORMANCE CONCRETE, RAPID SET)"	ITEM 900.608 "SPECIAL PROVISION (HIGH PERFORMANCE CONCRETE, RAPID SET) (FPQ)"	507.11 "REINFORCING STEEL, LEVEL I (EPOXY COATED)"	507.11 "REINFORCING STEEL, LEVEL I (EPOXY COATED)"
ABUTMENT 1	540.10 "PRECAST CONCRETE STRUCTURE (ABUTMENT #1)" OR 900.645 "SPECIAL PROVISION (CONTRACTOR FABRICATED PRECAST CONCRETE STRUCTURE) (ABUTMENT #1)"	ITEM 540.10 "PRECAST CONCRETE STRUCTURE (ABUTMENT #1)" OR ITEM 900.645 "SPECIAL PROVISION (CONTRACTOR FABRICATED PRECAST CONCRETE STRUCTURE) (ABUTMENT #1)"	507.11 "REINFORCING STEEL, LEVEL I" FOR REINFORCING COMPLETELY BELOW BRIDGE SEAT. 507.11 "REINFORCING STEEL, LEVEL I (EPOXY COATED)" FOR REINFORCING STEEL EXTENDING ABOVE BRIDGE SEAT.	ITEM 540.10 "PRECAST CONCRETE STRUCTURE (ABUTMENT #1)" OR ITEM 900.645 "SPECIAL PROVISION (CONTRACTOR FABRICATED PRECAST CONCRETE STRUCTURE) (ABUTMENT #1)"
ABUTMENT 2	540.10 "PRECAST CONCRETE STRUCTURE (ABUTMENT #2)" OR 900.645 "SPECIAL PROVISION (CONTRACTOR FABRICATED PRECAST CONCRETE STRUCTURE) (ABUTMENT #2)"	ITEM 540.10 "PRECAST CONCRETE STRUCTURE (ABUTMENT #2)" OR ITEM 900.645 "SPECIAL PROVISION (CONTRACTOR FABRICATED PRECAST CONCRETE STRUCTURE) (ABUTMENT #2)"	507.11 "REINFORCING STEEL, LEVEL I" FOR REINFORCING COMPLETELY BELOW BRIDGE SEAT. 507.11 "REINFORCING STEEL, LEVEL I (EPOXY COATED)" FOR REINFORCING STEEL EXTENDING ABOVE BRIDGE SEAT.	ITEM 540.10 "PRECAST CONCRETE STRUCTURE (ABUTMENT #2)" OR ITEM 900.645 "SPECIAL PROVISION (CONTRACTOR FABRICATED PRECAST CONCRETE STRUCTURE) (ABUTMENT #2)"
ABUTMENT PILE CAVITIES	900.608 "SPECIAL PROVISION (HIGH PERFORMANCE CONCRETE, RAPID SET)"	ITEM 900.608 "SPECIAL PROVISION (HIGH PERFORMANCE CONCRETE, RAPID SET) (FPQ)"	N/A	N/A
ABUTMENT CLOSURE/END DIAPHRAGM CLOSURE POUR	900.608 "SPECIAL PROVISION (HIGH PERFORMANCE CONCRETE, RAPID SET)"	ITEM 900.608 "SPECIAL PROVISION (HIGH PERFORMANCE CONCRETE, RAPID SET) (FPQ)"	507.11 "REINFORCING STEEL, LEVEL I (EPOXY COATED)"	507.11 "REINFORCING STEEL, LEVEL I (EPOXY COATED)"
WING WALL 1	540.10 "PRECAST CONCRETE STRUCTURE (ABUTMENT #1)" OR 900.645 "SPECIAL PROVISION (CONTRACTOR FABRICATED PRECAST CONCRETE STRUCTURE) (ABUTMENT #1)"	ITEM 540.10 "PRECAST CONCRETE STRUCTURE (ABUTMENT #1)" OR ITEM 900.645 "SPECIAL PROVISION (CONTRACTOR FABRICATED PRECAST CONCRETE STRUCTURE) (ABUTMENT #1)"	507.11 "REINFORCING STEEL, LEVEL I" FOR REINFORCING COMPLETELY BELOW BRIDGE SEAT. 507.11 "REINFORCING STEEL, LEVEL I (EPOXY COATED)" FOR REINFORCING STEEL EXTENDING ABOVE BRIDGE SEAT.	ITEM 540.10 "PRECAST CONCRETE STRUCTURE (ABUTMENT #1)" OR ITEM 900.645 "SPECIAL PROVISION (CONTRACTOR FABRICATED PRECAST CONCRETE STRUCTURE) (ABUTMENT #1)"
WING WALLS 2-3	540.10 "PRECAST CONCRETE STRUCTURE (ABUTMENT #2)" OR 900.645 "SPECIAL PROVISION (CONTRACTOR FABRICATED PRECAST CONCRETE STRUCTURE) (ABUTMENT #2)"	ITEM 540.10 "PRECAST CONCRETE STRUCTURE (ABUTMENT #2)" OR ITEM 900.645 "SPECIAL PROVISION (CONTRACTOR FABRICATED PRECAST CONCRETE STRUCTURE) (ABUTMENT #2)"	507.11 "REINFORCING STEEL, LEVEL I" FOR REINFORCING COMPLETELY BELOW BRIDGE SEAT. 507.11 "REINFORCING STEEL, LEVEL I (EPOXY COATED)" FOR REINFORCING STEEL EXTENDING ABOVE BRIDGE SEAT.	ITEM 540.10 "PRECAST CONCRETE STRUCTURE (ABUTMENT #2)" OR ITEM 900.645 "SPECIAL PROVISION (CONTRACTOR FABRICATED PRECAST CONCRETE STRUCTURE) (ABUTMENT #2)"
CAST-IN-PLACE APPROACH SLABS	501.34 "CONCRETE, HIGH PERFORMANCE CLASS B"	ITEM *501.34 CONCRETE, HIGH PERFORMANCE CLASS B (FPQ)"	507.11 "REINFORCING STEEL, LEVEL I (EPOXY COATED)"	507.11 "REINFORCING STEEL, LEVEL I (EPOXY COATED) (FPQ)"
TEXAS STYLE BRIDGE RAIL	501.34 "CONCRETE, HIGH PERFORMANCE CLASS A"	ITEM 900.640 "SPECIAL PROVISION (BRIDGE RAILING, TEXAS)"	507.11 "REINFORCING STEEL, LEVEL I (EPOXY COATED)"	ITEM 900.640 "SPECIAL PROVISION (BRIDGE RAILING, TEXAS)"

PROJECT NAME: STRAFFORD

PROJECT NUMBER: BF 0177(10)

FILE NAME: s13j088gen.dgn

PROJECT LEADER: K. HIGGINS

DESIGNED BY: J. GRIGAS

PROJECT NOTES I

PLOT DATE: 09-MAY-2016

DRAWN BY: J. GRIGAS

CHECKED BY: G. LAROCHE

SHEET 3 OF 50

17. THE METHOD OF FORMING FOR SUBSEQUENT POURS AFTER PLACING PRECAST SUPERSTRUCTURE UNITS SHALL BE DETERMINED BY THE CONTRACTOR. THE CONTRACTOR IS ENCOURAGED TO WORK WITH THE FABRICATOR IF ADDITIONAL SUPPORTS ARE REQUIRED. IN NO CASE SHALL THE CONTRACTOR ATTACH ADDITIONAL FORM OR SCREED SUPPORTS BY DRILLING OR SIMILAR MEANS INTO ANY PRECAST SUPERSTRUCTURE UNIT.
18. THE EFFECTIVE CURE TIME OF THE BRIDGE RAIL MAY BE REDUCED TO A MINIMUM OF (7) SEVEN DAYS PROVIDED THAT THE CONCRETE HAS REACHED 85% OF THE COMPRESSIVE STRENGTH. THE BRIDGE RAIL CONCRETE SHALL MEET ALL OTHER SPECIFICATIONS OF SECTION 501 OF THE STANDARD SPECIFICATIONS.
19. THE BRIDGE RAIL CONCRETE OR CAST-IN-PLACE APPROACH SLAB CONCRETE SHALL NOT BE SUBSTITUTED FOR HIGH PERFORMANCE CONCRETE, RAPID SET.
20. WATER REPELLENT, SILANE SHALL BE APPLIED TO ALL EXPOSED CONCRETE SURFACES, EXCEPT THE UNDERSIDE OF THE DECK BETWEEN DRIP NOTCHES.
21. ALL EXPOSED EDGES SHALL HAVE A 1"x1" CHAMFER UNLESS OTHERWISE NOTED.

**REINFORCING STEEL**

22. ALL REINFORCING STEEL SHALL BE DETAILED AND FABRICATED USING PROCEDURES AND TOLERANCES IN ACCORDANCE WITH APPLICABLE PUBLICATIONS OF THE "CONCRETE REINFORCING STEEL INSTITUTE".
23. TEST BARS SHALL BE PROVIDED IN ACCORDANCE WITH THE "VERMONT AGENCY OF TRANSPORTATION MATERIAL SAMPLING MANUAL" AVAILABLE ON THE AGENCY WEBSITE. A MINIMUM OF TWO TEST SECTIONS ARE REQUIRED FOR EACH SIZE, BRAND, AND GRADE OR TYPE OF REINFORCING. SEE THE MANUAL FOR ACCEPTABLE DIMENSIONS OF TEST SECTIONS. ALL COSTS ASSOCIATED WITH PROVIDING BARS FOR TESTING WILL BE INCLUDED IN THE UNIT PRICE BID FOR THE APPROPRIATE PRECAST ITEM.
24. MINIMUM CLEAR COVER FOR REINFORCING STEEL SHALL BE AS FOLLOWS:

ALONG BACK FACES OF WALLS AGAINST EARTH	2 INCH
ALONG TOP SURFACE OF DECK SLAB:	2 ½ INCH
ALONG BOTTOM SURFACE OF NEXT BEAM:	1¾ INCH
ALONG BOTTOM SURFACE OF PBU:	1 ½ INCH
ELSEWHERE UNLESS OTHERWISE INDICATED:	3 INCH

**PRECAST ABUTMENTS AND POST-TENSIONING**

25. IF A VERTICAL CONSTRUCTION JOINT IS REQUIRED BY THE CONTRACTOR FOR SHIPMENT OF THE ABUTMENTS, THE SECTIONS SHALL BE KEYED AND MATCH CAST. A JOINT DETAIL SHALL BE SHOWN ON THE FABRICATION DRAWINGS. EACH JOINT SHALL NOT BE LOCATED CLOSER THAN 1'-0" AWAY FROM THE EDGE OF PILE CAVITY. NO LESS THAN TWO PILES SHALL SUPPORT EACH PRECAST ABUTMENT SECTION.
26. EPOXY BONDING COMPOUND SHALL BE APPLIED TO ALL VERTICAL MATCH CAST CONSTRUCTION JOINTS. SEE AGENCY WEBSITE FOR A LIST OF APPROVED EPOXY BONDING COMPOUNDS. PAYMENT FOR EPOXY WILL BE INCLUDED IN THE UNIT PRICE BID FOR THE APPROPRIATE PRECAST ITEM.
27. POST-TENSIONING AND ASSOCIATED ITEMS ARE ONLY REQUIRED IF THE PILE CAP IS CONSTRUCTED OF MORE THAN ONE UNIT. POST-TENSIONING STRANDS SHALL BE COVERED WITH SEAMLESS POLYPROPYLENE SHEATH (WITH CORROSION INHIBITOR GREASE BETWEEN SHEATH AND STRAND) FOR THE LENGTH OF THE STRAND, EXCEPT AT ANCHORAGE LOCATIONS. ANY POST-TENSIONING STRANDS AND CONDUITS SHALL ADHERE TO THE REQUIREMENTS OF SECTION 510 – PRESTRESSED CONCRETE. GALVANIZED ANCHOR ASSEMBLIES, CONDUIT, POLYPROPYLENE SHEATH, AND POST-TENSIONING STRANDS WILL BE INCLUDED IN THE UNIT PRICE BID FOR THE APPROPRIATE PRECAST ITEM.
28. POST-TENSIONING SHALL BE COMPLETED PRIOR TO POURING THE PILE CAVITY CLOSURE POUR.
29. GALVANIZE ANCHOR ASSEMBLIES AFTER FABRICATION ACCORDING TO AASHTO M232M/M 232.
30. DESIGN VALUES
  - a. CONCRETE COMPRESSIVE STRENGTH:  $f_c = 5,000$  PSI.
  - b. POST-TENSIONING STRANDS: 0.5 INCH DIAMETER, 270 KSI, LOW RELAXATION 7-WIRE STRANDS.
  - c. ASSUMED MODULUS OF ELASTICITY IS 28,500 KSI.
  - d. THERE SHALL BE 2 STRANDS PER CONDUIT.
  - e. THE JACKING FORCE PER STRAND = 32 KIPS
31. THE CORRUGATED STEEL PIPE SHALL MEET THE REQUIREMENTS OF SUBSECTION 711.01 AND SHALL BE GALVANIZED PER SUBSECTION 726.08 OF THE STANDARD SPECIFICATIONS. ALL COSTS ASSOCIATED WITH PLACING THE CORRUGATED STEEL PIPE, WILL BE INCLUDED IN THE UNIT PRICE BID FOR THE APPROPRIATE PRECAST ABUTMENT ITEM.

32. THE BACKFILL BEHIND THE ABUTMENTS SHALL BE LIMITED TO A HEIGHT OF 3'-0" BELOW THE BRIDGE SEAT AND NO CRANES SHALL BE CLOSER THAN 1'-0" TO THE ABUTMENT DURING THE ERECTION OF THE SUPERSTRUCTURE.
33. WING WALLS SHALL NOT BE BACKFILLED UNTIL THE GROUT FOR THE MECHANICAL SPLICE CONNECTORS HAS REACHED 85% OF THE MANUFACTURER SPECIFIED DESIGN STRENGTH.

**PREFABRICATED BRIDGE UNITS (PBU)**

34. PREFABRICATED BRIDGE UNITS ARE A NON-PROPRIETARY PRODUCT.
35. STRUCTURAL STEEL MEMBERS DESIGNATED "CVN" IN THE PLANS SHALL BE CHARPY V-NOTCH TESTED IN ACCORDANCE WITH SUBSECTION 714.01.
36. ALL PERMANENT STRUCTURAL STEEL SHALL BE GALVANIZED OR METALLIZED AND MEET THE MATERIAL REQUIREMENTS OF SECTION 506 OF THE STANDARD SPECIFICATIONS.
37. TEMPORARY DIAPHRAGMS SHALL ONLY BE REQUIRED DURING THE CASTING AND CURING OF THE PBU DECK. THE TEMPORARY DIAPHRAGMS SHALL CONFORM TO AASHTO M270M/M 270 GRADE 345 (GRADE 50). PAYMENT FOR TEMPORARY DIAPHRAGMS WILL BE INCLUDED IN ITEM 900.640 "SPECIAL PROVISION (PREFABRICATED BRIDGE UNIT SUPERSTRUCTURE)".
38. THE DECK FOR THE PREFABRICATED BRIDGE UNITS SHALL BE CAST SIMULTANEOUSLY.
39. ANY HOLES IN THE WEBS OF THE FASCIA BEAMS NOT OTHERWISE FILLED OR IN THE DIAPHRAGM STIFFENER PLATES AFTER REMOVAL OF THE TEMPORARY DIAPHRAGMS SHALL BE FILLED WITH BUTTON HEAD BOLTS. THESE BOLTS SHALL BE TIGHTENED IN ACCORDANCE WITH SUBSECTION 506.19.
40. ANY CONNECTIONS NOT DETAILED ON THE PLANS SHALL BE DETAILED BY THE FABRICATOR AND SUBMITTED TO THE PROJECT MANAGER FOR APPROVAL.
41. ALL FIELD CONNECTIONS SHALL BE MADE WITH 7/8" DIAMETER HIGH STRENGTH BOLTS IN 15/16" DIAMETER HOLES, PER SECTION 506 UNLESS OTHERWISE NOTED.
42. FLEMING BRACKETS OR SIMILAR FALSE WORK SHALL BE PLACED AT A MAXIMUM SPACING OF 4 FEET. THE BRACKETS SHALL BEAR NEAR THE BOTTOM FLANGE AND IN NO CASE SHALL THEY BEAR ABOVE THE BOTTOM QUARTER WEB.
43. AFTER THE SUPERSTRUCTURE STEEL HAS BEEN ERECTED AT THE DECK CASTING SITE, AND BEFORE ANY FORMWORK OR OTHER LOADS ARE ADDED TO THE GIRDERS, BEAM PROFILES SHALL BE TAKEN AS DIRECTED BY THE RESIDENT ENGINEER FOR USE IN DETERMINING DECK FORMWORK ELEVATIONS.
44. BEAM WEBS AND CROSS FRAMES SHALL BE PLUMB IN FINAL POSITION.
45. ALL WELDING TO THE STRUCTURAL STEEL SHALL BE COMPLETED PRIOR TO GALVANIZING OR METALLIZING.
46. DUE TO STABILITY CONCERNS AT THE ABUTMENTS DURING THE ERECTION OF THE SUPERSTRUCTURE, THE CONTRACTOR SHALL SUBMIT THE ERECTION PLAN A MINIMUM OF 30 CALENDAR DAYS PRIOR TO THE BRIDGE CLOSURE PERIOD. UNDER NO CIRCUMSTANCES SHALL A BRIDGE CLOSURE PERIOD BEGIN PRIOR TO HAVING AN ACCPETED ERECTION PLAN.
47. THE FABRICATOR MAY ALTER THE DESIGN AS DETAILED IN THESE PLANS TO ACCOMMODATE THEIR SPECIFIC OPERATION. THIS ALTERATION SHALL BE DESIGNED BY A PROFESSIONAL ENGINEER LICENSED IN STATE OF VERMONT TO MEET SPECIFIED CRITERIA AND SHALL BE APPROVED BY THE PROJECT MANAGER.

**SUPERSTRUCTURE LONGITUDINAL CLOSURE POURS**

48. THE CONCRETE EDGES ALONG THE LONGITUDINAL CLOSURE POURS SHALL BE TREATED TO PROVIDE A ROUGHENED/ EXPOSED AGGREGATE SURFACE. THAT AMPLITUDE OF THE EXPOSED AGGREGATE SHALL BE A MINIMUM OF 1/8" AND BE COMPLETED PRIOR TO ERECTION OF THE BEAMS. THE FABRICATOR SHALL INDICATE THE METHOD USED TO ACHIEVE THIS PROFILE ON THE FABRICATION DRAWINGS AND METHOD USED TO PROTECT THE REINFORCING STEEL.

**ABUTMENT CLOSURE/END DIAPHRAGM**

49. AFTER THE CONCRETE HAS BEEN PLACED AND THE FINISHING OPERATIONS CONCLUDED IT SHALL NOT BE WALKED ON OR DISTURBED IN ANY MANNER, INCLUDING THE REMOVAL OF FORMS FOR 12 HOURS.

**H-PILES**

50. THE PILES SHALL BE HP 12X63.
51. TO PREVENT DAMAGE TO THE PILES, PILE SHOES ARE REQUIRED AND SHALL CONFORM TO SUBSECTION 505.04 (f).
52. THE CONTRACTOR MAY DRIVE THE PILES IN THE 14 DAY PERIOD PRIOR TO THE BRIDGE CLOSURE PERIOD. THIS WORK SHALL BE DONE DURING DAILY LANE CLOSURES.
53. PILES SHALL BE DRIVEN TO A NOMINAL PILE DRIVING RESISTANCE ( $R_{NDP}$ ) OF 255 KIPS, PROVIDED A MINIMUM PENETRATION OF 18 FEET BELOW THE BOTTOM OF PILE CAP HAS BEEN REACHED.
54. A MINIMUM OF ONE DYNAMIC PILE TESTS SHALL BE CONDUCTED AT EACH ABUTMENT. PAYMENT WILL BE MADE UNDER ITEM 505.45, "DYNAMIC PILE LOADING TEST".
55. FOR ESTIMATING PURPOSES, THE PILE TIP ELEVATIONS WERE ASSUMED AS SHOWN ON THE BORING LOGS. THE ACTUAL IN PLACE LENGTHS MAY VARY.
56. THE TOPS OF THE PILES SHALL NOT VARY FROM THE POSITION SHOWN ON THE PLANS BY MORE THAN 3 INCHES. THE PILE ORIENTATION SHALL NOT VARY BY MORE THAN 5 DEGREES. THE CONTRACTOR SHALL DEMONSTRATE TO THE SATISFACTION OF THE ENGINEER HOW THE TOLERANCES WILL BE MET. THESE MEASURES SHALL BE DEMONSTRATED IN A SUBMITTAL TO BE ACCEPTED BEFORE PILE PLACEMENT COMMENCES.

**MISCELLANEOUS**

57. THE "STONE FILL, TYPE III" UNDER THE BRIDGE AS SHOWN IN THE PLANS SHALL BE PLACED BEFORE THE NEW BEAMS ARE SET.
58. EPSC EXISTING CONDITIONS SHEET AND EPSC PLAN SHEET HAVE BEEN INCLUDED AS A REFERENCE FOR SUBMITTALS.
59. ITEM 404.65 "EMULSIFIED ASPHALT" IS TO BE APPLIED AT A RATE OF 0.080 GAL/SY BETWEEN SUCCESSIVE COURSES OF PAVEMENT AND ON ALL COLD PLANED SURFACES OR AS DIRECTED BY THE ENGINEER.
60. ITEM 520.10, "MEMBRANE WATERPROOFING, SPRAY APPLIED" SHALL BE APPLIED TO THE BRIDGE DECK AS PER THE MANUFACTURER'S INSTRUCTIONS AND EXTEND ONTO THE APPROACH SLABS 2 FEET BEYOND THE BEGIN BRIDGE/END OF BRIDGE ALONG WITH 2 INCHES VERTICALLY ONTO THE SURFACE OF THE BRIDGE RAIL.

PROJECT NAME: STRAFFORD  
PROJECT NUMBER: BF 0177(10)

FILE NAME: s13j088gen.dgn	PLOT DATE: 09-MAY-2016
PROJECT LEADER: K. HIGGINS	DRAWN BY: J. GRIGAS
DESIGNED BY: J. GRIGAS	CHECKED BY: G. LAROCHE
PROJECT NOTES 2	SHEET 4 OF 50

# QUANTITY SHEET 1

SUMMARY OF ESTIMATED QUANTITIES										TOTALS		DESCRIPTIONS				DETAILED SUMMARY OF QUANTITIES			
						ROADWAY	EROSION CONTROL	BRIDGE	FULL C.E. ITEMS	ROADWAY (NO FEDERAL/STATE)	GRAND TOTAL	FINAL	UNIT	ITEMS	ITEM NUMBER	ROUND	QUANTITIES	UNIT	ITEMS
						1					1		LS	CLEARING AND GRUBBING, INCLUDING INDIVIDUAL TREES AND STUMPS	201.10				EARTHWORK SUMMARY
						950					950		CY	COMMON EXCAVATION	203.15				FILL AVAILABLE
						10					10		CY	SOLID ROCK EXCAVATION	203.16		950 CY		COMMON EXCAVATION(950 x 1.0)
								250			250		CY	UNCLASSIFIED CHANNEL EXCAVATION	203.27		75 CY		CHANNEL EXCAVATION(250 x 0.3)
						40					40		CY	GRANULAR BORROW	203.32		83 CY		STRUCTURE EXCAVATION(275 x 0.3)
						40				50	90		CY	TRENCH EXCAVATION OF EARTH	204.20		81 CY		TRENCH EXCAVATION(90x 0.9)
						1					1		CY	TRENCH EXCAVATION OF EARTH, EXPLORATORY (N.A.B.I.)	204.22		1 CY		ROUNDING
								275			275		CY	STRUCTURE EXCAVATION	204.25		1190 CY		TOTAL FILL AVAILABLE
						10		175		10	195		CY	GRANULAR BACKFILL FOR STRUCTURES	204.30				FILL REQUIRED
						325					325		SY	COLD PLANING, BITUMINOUS PAVEMENT	210.10		0 CY		FILL (0 CY EARTH)
						1050					1050		CY	SUBBASE OF CRUSHED GRAVEL, COARSE GRADED	301.25		0 CY		FACTORED FILL (x1.15)
						5					5		CY	AGGREGATE SURFACE COURSE	401.10		0 CY		ROUNDING
						25					25		CY	AGGREGATE SHOULDERS, IN PLACE	402.10		0 CY		TOTAL FILL REQUIRED
						20					20		CWT	EMULSIFIED ASPHALT	404.65		1115 CY		TOTAL WASTE
						1					1		LU	PRICE ADJUSTMENT, ASPHALT CEMENT (N.A.B.I.)	406.50				
						290					290		TON	SUPERPAVE BITUMINOUS CONCRETE PAVEMENT	490.30				SUPERPAVE BITUMINOUS CONCRETE PAVEMENT
						1					1		LU	AIR VOIDS PAY ADJUSTMENT (N.A.B.I.)	490.31				
						1					1		LU	MAT DENSITY PAY ADJUSTMENT (N.A.B.I.)	490.32				
								50			50		CY	CONCRETE, HIGH PERFORMANCE CLASS B (FPQ)	501.34				
								1			1		LS	FURNISHING EQUIPMENT FOR DRIVING PILING	504.10				
								450			450		LF	STEEL PILING, HP 12 X 63	505.155				
								2			2		EACH	DYNAMIC PILE LOADING TEST	505.45				
								8600			8600		LB	REINFORCING STEEL, LEVEL I (EPOXY COATED) (FPQ)	507.11				
								17			17		GAL	WATER REPELLENT, SILANE	514.10				
								53			53		LF	BRIDGE EXPANSION JOINT, ASPHALTIC PLUG	516.10				
								185			185		SY	MEMBRANE WATERPROOFING, SPRAY APPLIED	520.10				
								75			75		LF	JOINT SEALER, HOT POURED	524.11				
								1			1		EACH	REMOVAL OF STRUCTURE (1210 SF - EST.)	529.15				
								15			15		CY	REMOVAL OF CONCRETE OR MASONRY	529.25				
														BEGIN OPTION AA					
								1			1		LS	PRECAST CONCRETE STRUCTURE (ABUTMENT #1)	540.10				
								1			1		LS	SPECIAL PROVISION (CONTRACTOR-FABRICATED PRECAST CONCRETE STRUCTURES)(ABUTMENT #1)	900.645				
														END OPTION AA					
														BEGIN OPTION BB					
								1			1		LS	PRECAST CONCRETE STRUCTURE (ABUTMENT #2)	540.10				
								1			1		LS	SPECIAL PROVISION (CONTRACTOR-FABRICATED PRECAST CONCRETE STRUCTURES)(ABUTMENT #2)	900.645				
														END OPTION BB					

PROJECT NAME:	STRAFFORD	PLOT DATE:	09-MAY-2016
PROJECT NUMBER:	BF 0177(10)	DRAWN BY:	T. MATTHEWS
FILE NAME:	sl3j088qs.dgn	CHECKED BY:	J. GRIGAS
PROJECT LEADER:	K. HIGGINS	QUANTITY SHEET	1
DESIGNED BY:	J. GRIGAS	SHEET	5 OF 50

# QUANTITY SHEET 2

SUMMARY OF ESTIMATED QUANTITIES										TOTALS		DESCRIPTIONS				DETAILED SUMMARY OF QUANTITIES			
						ROADWAY	EROSION CONTROL	BRIDGE	FULL C.E. ITEMS	ROADWAY (NO FEDERAL/STATE)	GRAND TOTAL	FINAL	UNIT	ITEMS	ITEM NUMBER	ROUND	QUANTITIES	UNIT	ITEMS
														BEGIN OPTION CC					
						56					56		LF	18" CSP .064 (2-2/3 X 1/2)	601.0015				
						56					56		LF	18" CAAP .060 (2-2/3 X 1/2)	601.0215				
						56					56		LF	18" PCCSP .079 (2-2/3 X 1/2)	601.0416				
						56					56		LF	18" RCP CLASS III	601.0815				
						56					56		LF	18" CPEP	601.0915				
						56					56		LF	18" CPPP (SL)	601.2815				
														END OPTION CC					
														BEGIN OPTION DD					
										90	90		LF	18" CSP .064 (2-2/3 X 1/2)	601.0015				
										90	90		LF	18" CAAP .060 (2-2/3 X 1/2)	601.0215				
										90	90		LF	18" PCCSP .079 (2-2/3 X 1/2)	601.0416				
										90	90		LF	18" RCP CLASS III	601.0815				
										90	90		LF	18" CPEP	601.0915				
										90	90		LF	18" CPPP (SL)	601.2815				
														END OPTION DD					
						2				1	3		EACH	PRECAST REINFORCED CONCRETE DROP INLET WITH CAST IRON GRATE	604.18				
							1				1		MGAL	DUST CONTROL WITH WATER	609.10				
						85					85		CY	STONE FILL, TYPE I	613.10				
								170			170		CY	STONE FILL, TYPE III	613.12				
						40					40		LF	CAST-IN-PLACE CONCRETE CURB, TYPE B	616.28				
						1					1		EACH	REMOVING AND RESETTING PROPERTY MARKERS	619.20				
						104					104		LF	HD STEEL BEAM GUARDRAIL, GALVANIZED	621.21				
						1					1		EACH	ANCHOR FOR STEEL BEAM RAIL	621.60				
						125					125		LF	REMOVAL AND DISPOSAL OF GUARDRAIL	621.80				
						2					2		EACH	GUIDE POSTS	621.85				
						20					20		HR	UNIFORMED TRAFFIC OFFICERS	630.10				
						500					500		HR	FLAGGERS	630.15				
									1		1		LS	FIELD OFFICE, ENGINEERS	631.10				
									1		1		LS	TESTING EQUIPMENT, CONCRETE	631.16				
									1		1		LS	TESTING EQUIPMENT, BITUMINOUS	631.17				
									3000		3000		DL	FIELD OFFICE TELEPHONE (N.A.B.I.)	631.26				
						1					1		LS	MOBILIZATION/DEMOBILIZATION	635.11				
						4					4		EACH	PORTABLE CHANGEABLE MESSAGE SIGN	641.15				
						900					900		LF	4 INCH WHITE LINE	646.20				
						900					900		LF	4 INCH YELLOW LINE	646.21				
						1175					1175		SY	GEOTEXTILE FOR ROADBED SEPARATOR	649.11				
						350		240			590		SY	GEOTEXTILE UNDER STONE FILL	649.31				
							220				220		SY	GEOTEXTILE FOR SILT FENCE	649.51				
							70				70		SY	GEOTEXTILE FOR FILTER CURTAIN	649.61				

PROJECT NAME: STRAFFORD

PROJECT NUMBER: BF 0177(10)

FILE NAME: s13j088qs.dgn

PROJECT LEADER: K. HIGGINS

DESIGNED BY: J. GRIGAS

QUANTITY SHEET 2

PLOT DATE: 09-MAY-2016

DRAWN BY: T. MATTHEWS

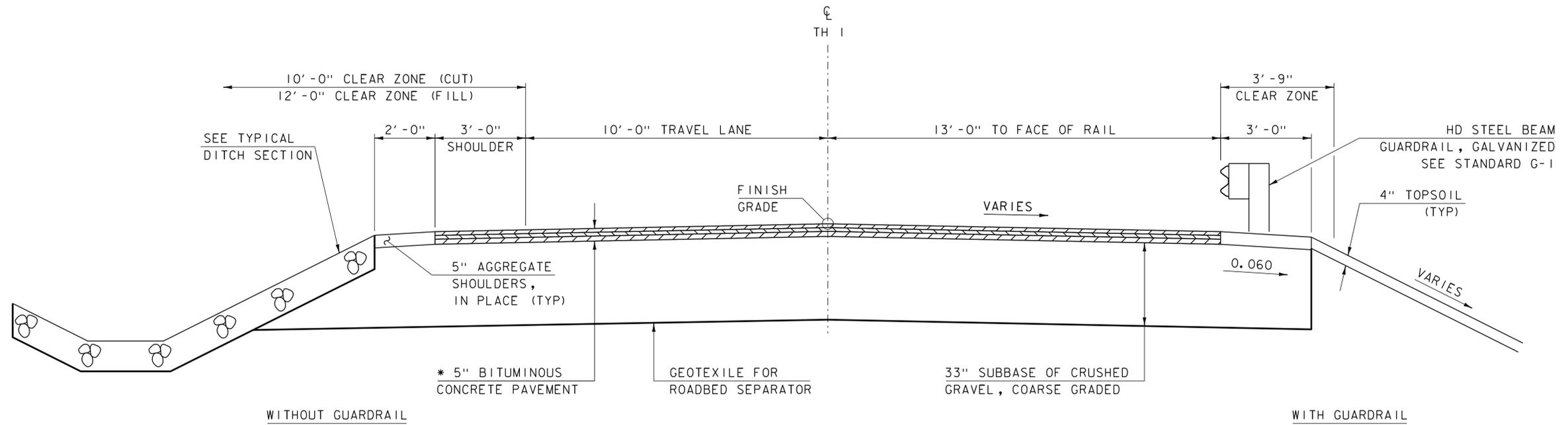
CHECKED BY: J. GRIGAS

SHEET 6 OF 50

# QUANTITY SHEET 3

SUMMARY OF ESTIMATED QUANTITIES										TOTALS		DESCRIPTIONS				DETAILED SUMMARY OF QUANTITIES			
						ROADWAY	EROSION CONTROL	BRIDGE	FULL C.E. ITEMS	ROADWAY (NO FEDERAL/STATE)	GRAND TOTAL	FINAL	UNIT	ITEMS	ITEM NUMBER	ROUND	QUANTITIES	UNIT	ITEMS
							10				10		LB	SEED	651.15				
							20				20		LB	FERTILIZER	651.18				
							1				1		TON	AGRICULTURAL LIMESTONE	651.20				
							1				1		TON	HAY MULCH	651.25				
							20				20		CY	TOPSOIL	651.35				
						150		120			270		SY	GRUBBING MATERIAL	651.40				
							1				1		LS	EPSC PLAN	652.10				
							40				40		HR	MONITORING EPSC PLAN	652.20				
							1				1		LU	MAINTENANCE OF EPSC PLAN (N.A.B.I.)	652.30				
							80				80		SY	TEMPORARY EROSION MATTING	653.20				
							36				36		CY	VEHICLE TRACKING PAD	653.35				
							700				700		LF	BARRIER FENCE	653.50				
							700				700		LF	PROJECT DEMARCATION FENCE	653.55				
						0.66					0.66		SF	TRAFFIC SIGNS, TYPE A	675.20				
						31					31		LF	SQUARE TUBE SIGN POST AND ANCHOR	675.341				
						1					1		EACH	REMOVING SIGNS	675.50				
						1					1		EACH	ERECTING SALVAGED SIGNS	675.60				
						2					2		EACH	DELINEATOR WITH STEEL POST	676.10				
										1	1		EACH	LUMINAIRE	679.50				
								52			52		CY	SPECIAL PROVISION (HIGH PERFORMANCE CONCRETE, RAPID SET) (FPQ)	900.608				
						1					1		DL	SPECIAL PROVISION (INCENTIVE/DISINCENTIVE) (N.A.B.I.)	900.615				
						5					5		EACH	SPECIAL PROVISION (CPM SCHEDULE)	900.620				
						4					4		EACH	SPECIAL PROVISION (GUARDRAIL APPROACH SECTION TO CONCRETE BRIDGE RAILING)	900.620				
								118			118		LF	SPECIAL PROVISION (BRIDGE RAILING, TEXAS)	900.640				
								177			177		LF	SPECIAL PROVISION (PREFABRICATED BRIDGE UNIT SUPERSTRUCTURE)	900.640				
						1					1		LS	SPECIAL PROVISION (TRAFFIC CONTROL, ALL-INCLUSIVE)	900.645				

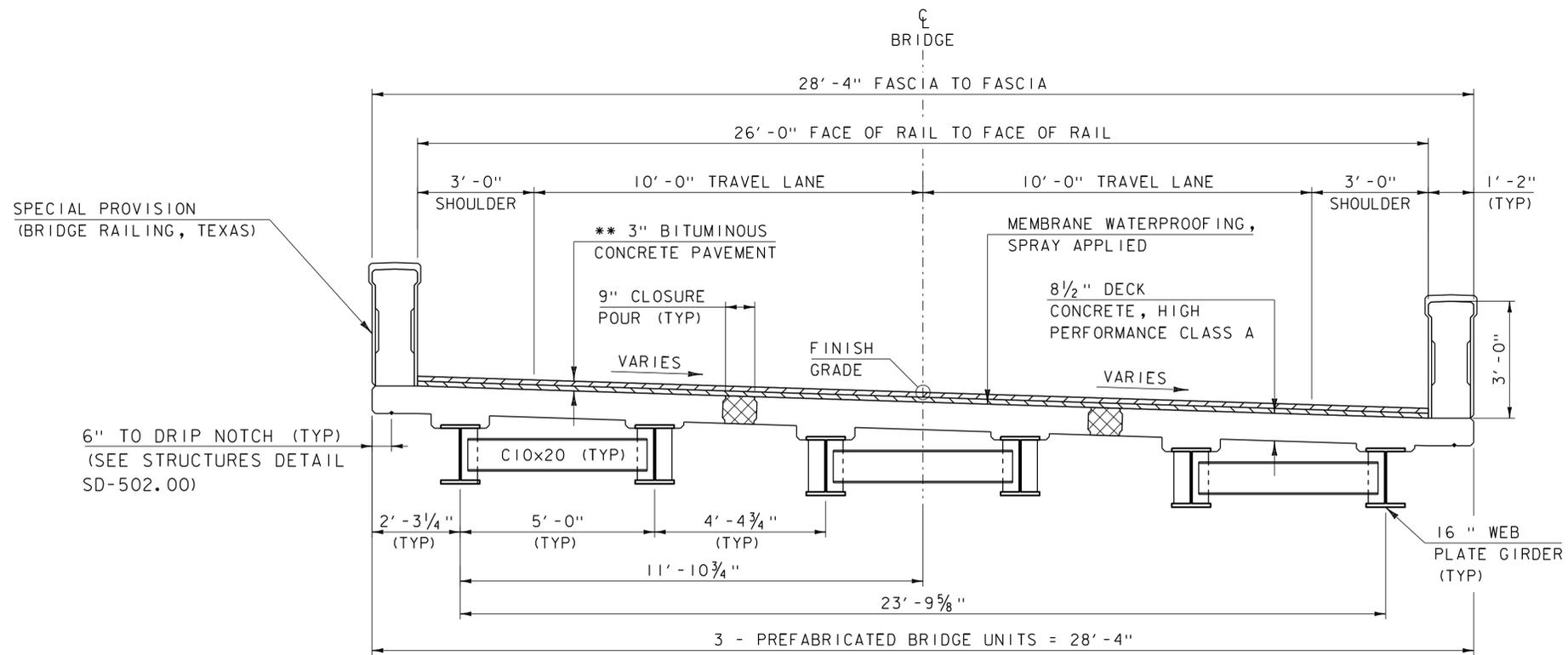
PROJECT NAME:	STRAFFORD
PROJECT NUMBER:	BF 0177(10)
FILE NAME:	sl3j088qs.dgn
PROJECT LEADER:	K. HIGGINS
DESIGNED BY:	J. GRIGAS
QUANTITY SHEET	3
PLOT DATE:	09-MAY-2016
DRAWN BY:	T. MATTHEWS
CHECKED BY:	J. GRIGAS
SHEET	7 OF 50



**ROADWAY TYPICAL SECTION**

SCALE 1/2" = 1'-0"

- \* 1 1/2" SUPERPAVE BITUMINOUS CONCRETE PAVEMENT TYPE IVB, OVER
- 1 1/2" SUPERPAVE BITUMINOUS CONCRETE PAVEMENT TYPE IVB, OVER
- 2" SUPERPAVE BITUMINOUS CONCRETE PAVEMENT TYPE IIIS



**BRIDGE TYPICAL SECTION**

SCALE 1/2" = 1'-0"

- \*\* 1 1/2" SUPERPAVE BITUMINOUS CONCRETE PAVEMENT TYPE IVB, OVER
- 1 1/2" SUPERPAVE BITUMINOUS CONCRETE PAVEMENT TYPE IVB

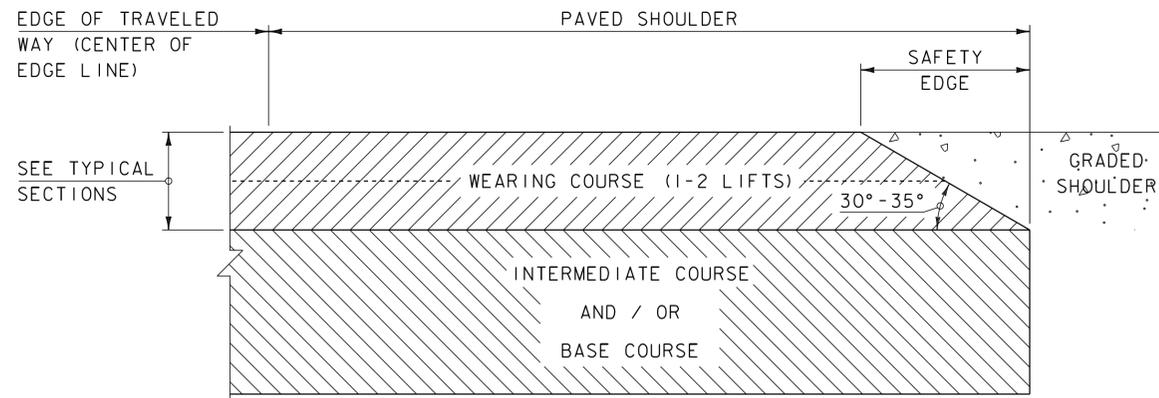
**MATERIAL TOLERANCES**  
(IF USED ON PROJECT)

SURFACE	
- PAVEMENT (TOTAL THICKNESS)	+/- "
- AGGREGATE SURFACE COURSE	+/- "
SUBBASE	
- SUBBASE	+/- 1"
SAND BORROW	
- SAND BORROW	+/- 1"

PROJECT NAME: STRAFFORD  
PROJECT NUMBER: BF 0177(10)

FILE NAME: s13j088typ.dgn  
PROJECT LEADER: K. HIGGINS  
DESIGNED BY: J. GRIGAS  
TYPICAL SECTIONS I

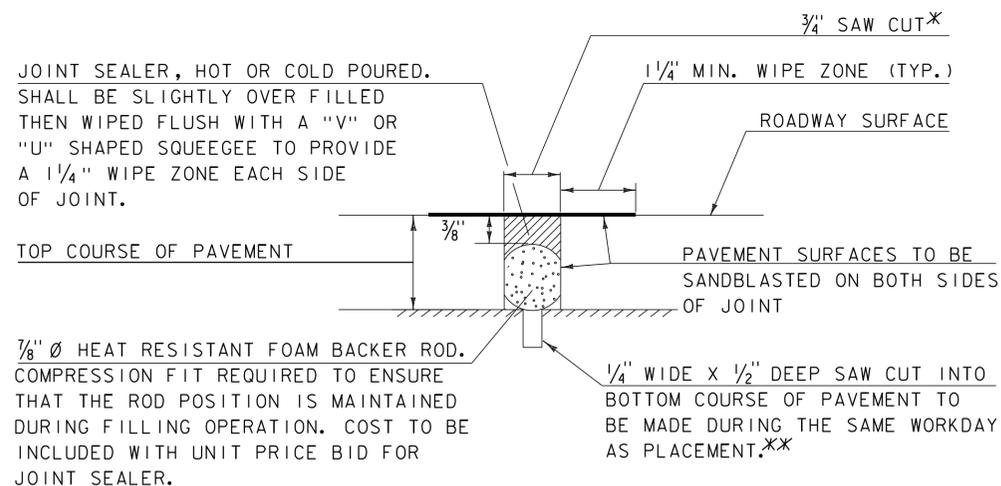
PLOT DATE: 09-MAY-2016  
DRAWN BY: J. GRIGAS  
CHECKED BY: G. LAROCHE  
SHEET 8 OF 50



**SAFETY EDGE DETAIL**

NOT TO SCALE

1. LEVELING COURSE MAY INCLUDE THE "SAFETY EDGE" AT THE CONTRACTOR'S CHOICE.
2. THE EDGE OF PAVEMENT SHALL BE FORMED IN SUCH A WAY THAT THE BITUMINOUS CONCRETE PAVEMENT IS EXTRUDED OR COMPRESSED TO FORM THE 30 TO 35 DEGREE ANGLE. DEVICES THAT SIMPLY STRIKE-OFF THE MIX WITHOUT PROVIDING ANY COMPACTIVE EFFORT WILL NOT BE ALLOWED.
3. THE PAVED SHOULDER EXTENDS FROM THE EDGE OF TRAVELED WAY TO THE EDGE OF THE WEARING COURSE, INCLUDING THE "SAFETY EDGE".

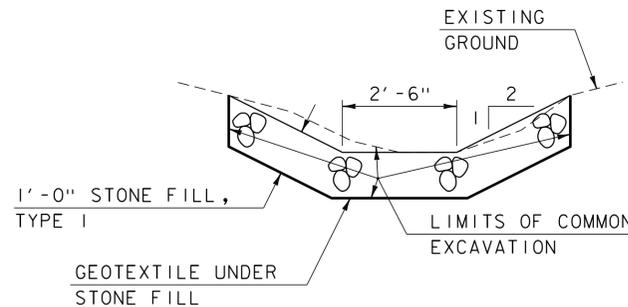


**SAWED PAVEMENT JOINT DETAIL**

NOT TO SCALE

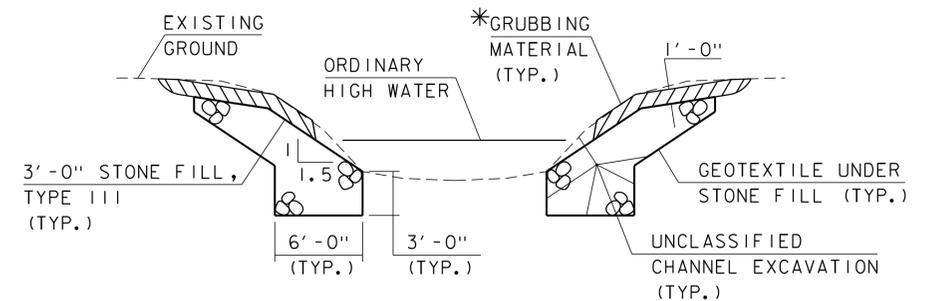
\*JOINT IS TO BE LOCATED ACCURATELY BY STRING LINING, OR OTHER MEANS, PRIOR TO PAVING, SO THAT THE SAW CUTS WILL BE MADE DIRECTLY OVER THE END OF CONCRETE DECK. JOINT SHALL BE CUT DRY IN A SINGLE PASS AND BE SEALED WITHIN 24 HOURS OR PRIOR TO EXPOSURE TO TRAFFIC. JOINT SHALL BE CLEANED PRIOR TO APPLYING THE JOINT SEALER.

\*\*SAWED PAVEMENT JOINT AT APRON IS TO BE CUT TO FULL PAVEMENT DEPTH.



**TYPICAL DITCH SECTION**

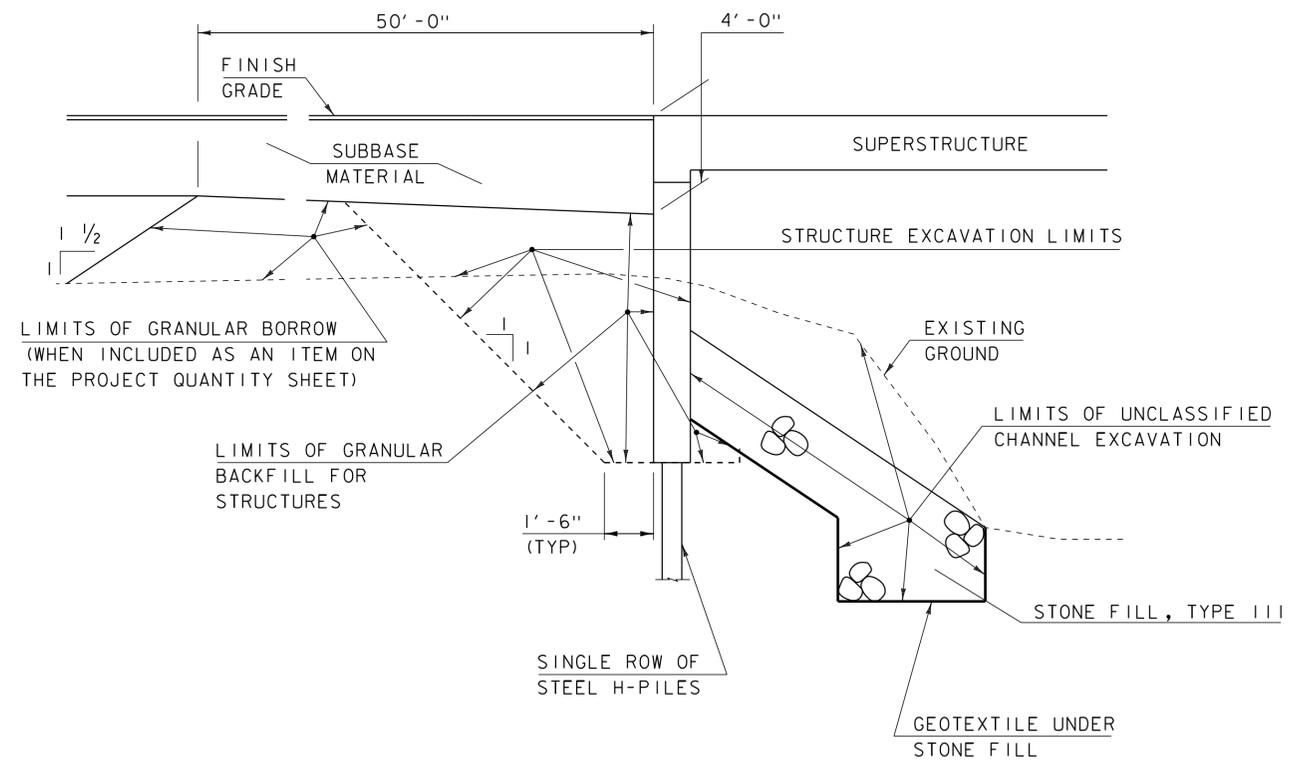
NOT TO SCALE



**TYPICAL CHANNEL SECTION**

NOT TO SCALE

\*GRUBBING MATERIAL SHALL NOT BE PLACED ON THE STONE FILL IN THE AREA UNDER THE BRIDGE. WHENEVER CHANNEL SLOPE INTERSECTS ROADWAY SUBBASE, GRUBBING MATERIAL SHALL BEGIN AT THE BOTTOM OF SUBBASE.



**TYPICAL INTEGRAL ABUTMENT SECTION**

NOT TO SCALE

ACTUAL LIMITS OF STRUCTURE EXCAVATION SHALL BE DETERMINED BY THE CONTRACTOR. HOWEVER, ONLY EXCAVATION BETWEEN THE LIMITS SHOWN WILL BE PAID FOR UNDER ITEM 204.25 "STRUCTURE EXCAVATION". EXCAVATION BY THE CONTRACTOR OUTSIDE OF THESE LIMITS WILL BE AT THE EXPENSE OF THE CONTRACTOR.

PROJECT NAME:	STRAFFORD
PROJECT NUMBER:	BF 0177(10)
FILE NAME:	sl3j088typical.dgn
PROJECT LEADER:	K. HIGGINS
DESIGNED BY:	J. GRIGAS
TYPICAL SECTIONS	2
PLOT DATE:	09-MAY-2016
DRAWN BY:	J. GRIGAS
CHECKED BY:	G. LAROCHE
SHEET	9 OF 50

**GENERAL INFORMATION**

**SYMBOLGY LEGEND NOTE**

THE SYMBOLGY ON THIS SHEET IS INTENDED TO COVER STANDARD CONVENTIONAL SYMBOLGY. THE SYMBOLGY IS USED FOR EXISTING & PROPOSED FEATURES WITH HEAVIER LINEWEIGHT, IN COMBINATION WITH PROJECT ANNOTATION, AS NOTED ON PROJECT PLAN SHEETS. THIS LEGEND SHEET COVERS THE BASICS. SYMBOLGY ON PLANS MAY VARY, PLAN ANNOTATIONS AND NOTES SHOULD BE USED TO CLARIFY AS NEEDED.

**R. O. W. ABBREVIATIONS (CODES) & SYMBOLS**

POINT CODE	DESCRIPTION
CH	CHANNEL EASEMENT
CONST	CONSTRUCTION EASEMENT
CUL	CULVERT EASEMENT
D&C	DISCONNECT & CONNECT
DIT	DITCH EASEMENT
DR	DRAINAGE EASEMENT
DRIVE	DRIVEWAY EASEMENT
EC	EROSION CONTROL
HWY	HIGHWAY EASEMENT
I&M	INSTALL & MAINTAIN EASEMENT
LAND	LANDSCAPE EASEMENT
R&RES	REMOVE & RESET
R&REP	REMOVE & REPLACE
SR	SLOPE RIGHT
UE	UTILITY EASEMENT
(P)	PERMANENT EASEMENT
(T)	TEMPORARY EASEMENT
■	BNDNS BOUND SET
▣	BNDNS BOUND TO BE SET
●	IPNS IRON PIN SET
⊙	IPNS IRON PIN TO BE SET
⊠	CALC EXISTING ROW POINT
○	PROW PROPOSED ROW POINT
[LENGTH]	LENGTH CARRIED ON NEXT SHEET

**COMMON TOPOGRAPHIC POINT SYMBOLS**

POINT CODE	DESCRIPTION
⊕	APL BOUND APPARENT LOCATION
◻	BM BENCHMARK
◻	BND BOUND
⊞	CB CATCH BASIN
⊞	COMB COMBINATION POLE
⊞	DITHR DROP INLET THROATED DNC
⊞	EL ELECTRIC POWER POLE
◊	FPOLE FLAGPOLE
○	GASFIL GAS FILLER
○	GP GUIDE POST
×	GSO GAS SHUT OFF
◊	GUY GUY POLE
◊	GUYW GUY WIRE
×	GV GATE VALUE
⊞	H TREE HARDWOOD
△	HCTRL CONTROL HORIZONTAL
△	HVCTRL CONTROL HORIZ. & VERTICAL
◇	HYD HYDRANT
◊	IP IRON PIN
◊	IPIPE IRON PIPE
⊞	LI LIGHT - STREET OR YARD
⊞	MB MAILBOX
○	MH MANHOLE (MH)
◻	MM MILE MARKER
◻	PM PARKING METER
◻	PMK PROJECT MARKER
◊	POST POST STONE/WOOD
⊞	RRSIG RAILROAD SIGNAL
⊞	RRSL RAILROAD SWITCH LEVER
⊞	S TREE SOFTWOOD
⊞	SAT SATELLITE DISH
⊞	SHRUB SHRUB
⊞	SIGN SIGN
⊞	STUMP STUMP
⊞	TEL TELEPHONE POLE
◊	TIE TIE
⊞	TSIGN SIGN W/DOUBLE POST
⊞	VCTRL CONTROL VERTICAL
◊	WELL WELL
×	WSO WATER SHUT OFF

THESE ARE COMMON VAOT SURVEY POINT SYMBOLS FOR EXISTING FEATURES, ALSO USED FOR PROPOSED FEATURES WITH HEAVIER LINEWEIGHT, IN COMBINATION WITH PROPOSED ANNOTATION.

**PROPOSED GEOMETRY CODES**

CODE	DESCRIPTION
PC	POINT OF CURVATURE
PI	POINT OF INTERSECTION
CC	CENTER OF CURVE
PT	POINT OF TANGENCY
PCC	POINT OF COMPOUND CURVE
PRC	POINT OF REVERSE CURVE
POB	POINT OF BEGINNING
POE	POINT OF ENDING
STA	STATION PREFIX
AH	AHEAD STATION SUFFIX
BK	BACK STATION SUFFIX
D	CURVE DEGREE OF (100FT)
R	CURVE RADUIS OF
T	CURVE TANGENT LENGTH
L	CURVE LENGTH OF
E	CURVE EXTERNAL DISTANCE

**UTILITY SYMBOLGY**

**UNDERGROUND UTILITIES**

— UT —	UTILITY (GENERIC-UNKNOWN)
— UE —	TELEPHONE
— UE —	ELECTRIC
— UTV —	CABLE (TV)
—	ELECTRIC+CABLE
—	ELECTRIC+TELEPHONE
—	CABLE+TELEPHONE
—	ELECTRIC+CABLE+TELEP.
— G —	GAS LINE
— W —	WATER LINE
— S —	SANITARY SEWER (SEPTIC)

**ABOVE GROUND UTILITIES (AERIAL)**

— T —	UTILITY (GENERIC-UNKNOWN)
— E —	TELEPHONE
—	ELECTRIC
—	CABLE (TV)
—	ELECTRIC+CABLE
—	ELECTRIC+TELEPHONE
— AER E&T —	ELECTRIC+TELEPHONE
—	CABLE+TELEPHONE
—	ELECTRIC+CABLE+TELEP.
—	UTILITY POLE GUY WIRE

**PROJECT CONSTRUCTION SYMBOLGY**

**PROJECT DESIGN & LAYOUT SYMBOLGY**

— CZ —	CLEAR ZONE
—	PLAN LAYOUT MATCHLINE

**PROJECT CONSTRUCTION FEATURES**

—	TOP OF CUT SLOPE
—	TOE OF FILL SLOPE
—	STONE FILL
—	BOTTOM OF DITCH
—	CULVERT PROPOSED
—	STRUCTURE SUBSURFACE
PDF — PDF —	PROJECT DEMARCATION FENCE
—	BARRIER FENCE
—	TREE PROTECTION ZONE (TPZ)
—	STRIPING LINE REMOVAL
—	SHEET PILES

**CONVENTIONAL BOUNDARY SYMBOLGY**

**BOUNDARY LINES**

—	TOWN BOUNDARY LINE
—	COUNTY BOUNDARY LINE
—	STATE BOUNDARY LINE
—	PROPOSED STATE R.O.W. (LIMITED ACCESS)
—	PROPOSED STATE R.O.W.
—	STATE ROW (LIMITED ACCESS)
—	STATE ROW
—	TOWN ROW
—	PERMANENT EASEMENT LINE (P)
—	TEMPORARY EASEMENT LINE (T)
—	SURVEY LINE
P — P —	PROPERTY LINE (P/L)
SR — SR —	SLOPE RIGHTS
6f — 6f —	6F PROPERTY BOUNDARY
4f — 4f —	4F PROPERTY BOUNDARY
HAZ — HAZ —	HAZARDOUS WASTE

**EPSC LAYOUT PLAN SYMBOLGY**

**EPSC MEASURES**

—	FILTER CURTAIN
—	SILT FENCE
—	SILT FENCE WOVEN WIRE
—	CHECK DAM
—	DISTURBED AREAS REQUIRING RE-VEGETATION
—	EROSION MATTING

SEE EPSC DETAIL SHEETS FOR ADDITIONAL SYMBOLGY

**ENVIRONMENTAL RESOURCES**

—	WETLAND BOUNDARY
—	RIPARIAN BUFFER ZONE
—	WETLAND BUFFER ZONE
—	SOIL TYPE BOUNDARY
T&E —	THREATENED & ENDANGERED SPECIES
HAZ — HAZ —	HAZARDOUS WASTE AREA
AG —	AGRICULTURAL LAND
HABITAT —	FISH & WILDLIFE HABITAT
FLOOD PLAIN —	FLOOD PLAIN
OHW —	ORDINARY HIGH WATER (OHW)
—	STORM WATER
—	USDA FOREST SERVICE LANDS
—	WILDLIFE HABITAT SUIT/CONN

**ARCHEOLOGICAL & HISTORIC**

— ARCH —	ARCHEOLOGICAL BOUNDARY
— HISTORIC DIST —	HISTORIC DISTRICT BOUNDARY
— HISTORIC —	HISTORIC AREA
(H)	HISTORIC STRUCTURE

**CONVENTIONAL TOPOGRAPHIC SYMBOLGY**

**EXISTING FEATURES**

—	ROAD EDGE PAVEMENT
—	ROAD EDGE GRAVEL
—	DRIVEWAY EDGE
—	DITCH
—	FOUNDATION
x — x — x — x —	FENCE (EXISTING)
—	FENCE WOOD POST
—	FENCE STEEL POST
—	GARDEN
—	ROAD GUARDRAIL
—	RAILROAD TRACKS
—	CULVERT (EXISTING)
—	STONE WALL
—	WALL
—	WOOD LINE
—	BRUSH LINE
—	HEDGE
—	BODY OF WATER EDGE
—	LEDGE EXPOSED

PROJECT NAME: STRAFFORD

PROJECT NUMBER: BF 0177(10)

FILE NAME: s13j088exce1.dgn

PROJECT LEADER: K. HIGGINS

DESIGNED BY: J. GRIGAS

LEGEND SHEET

PLOT DATE: 09-MAY-2016

DRAWN BY: M.LONGSTREET

CHECKED BY: J. GRIGAS

SHEET 10 OF 50

GPS CONTROL POINTS

--- HVCTRL #1 ---

S STRAFFORD BR 25

NORTH = 486206.940  
EAST = 1677367.840  
ELEV. = 894.930

GENERAL LOCATION SOUTH STRAFFORD, VT.  
THE MARK IS SET IN THE TOP OF THE ABUTMENT AT THE SOUTHWEST CORNER OF A BRIDGE OVER A STREAM FEEDING THE WEST BRANCH OF THE OMPOMPANOSUC RIVER. IT IS ABOUT 100 M SOUTHWEST OF THE BARRETT MEMORIAL BRIDGE OVER THE WEST BRANCH.  
IT IS 15 CM EAST OF THE WEST EDGE OF THE ABUTMENT, 15 CM WEST OF THE EAST EDGE OF THE ABUTMENT, 0.3 M SOUTH-SOUTHWEST OF THE SOUTH TIP OF THE BRIDGE RAIL, 0.8 M NORTH OF THE ABUTMENT VERTICAL ANGLE POINT AND 5.3 M NORTHWEST OF POLE NO 3.

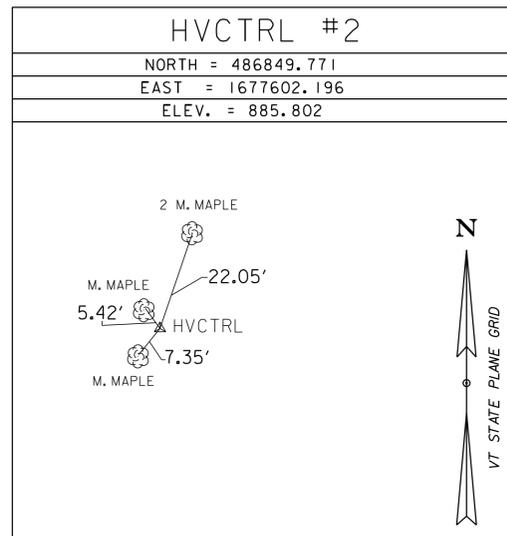
--- HVCTRL #10 ---

JB 1

NORTH = 486660.580  
EAST = 1684339.340  
ELEV. = 829.260

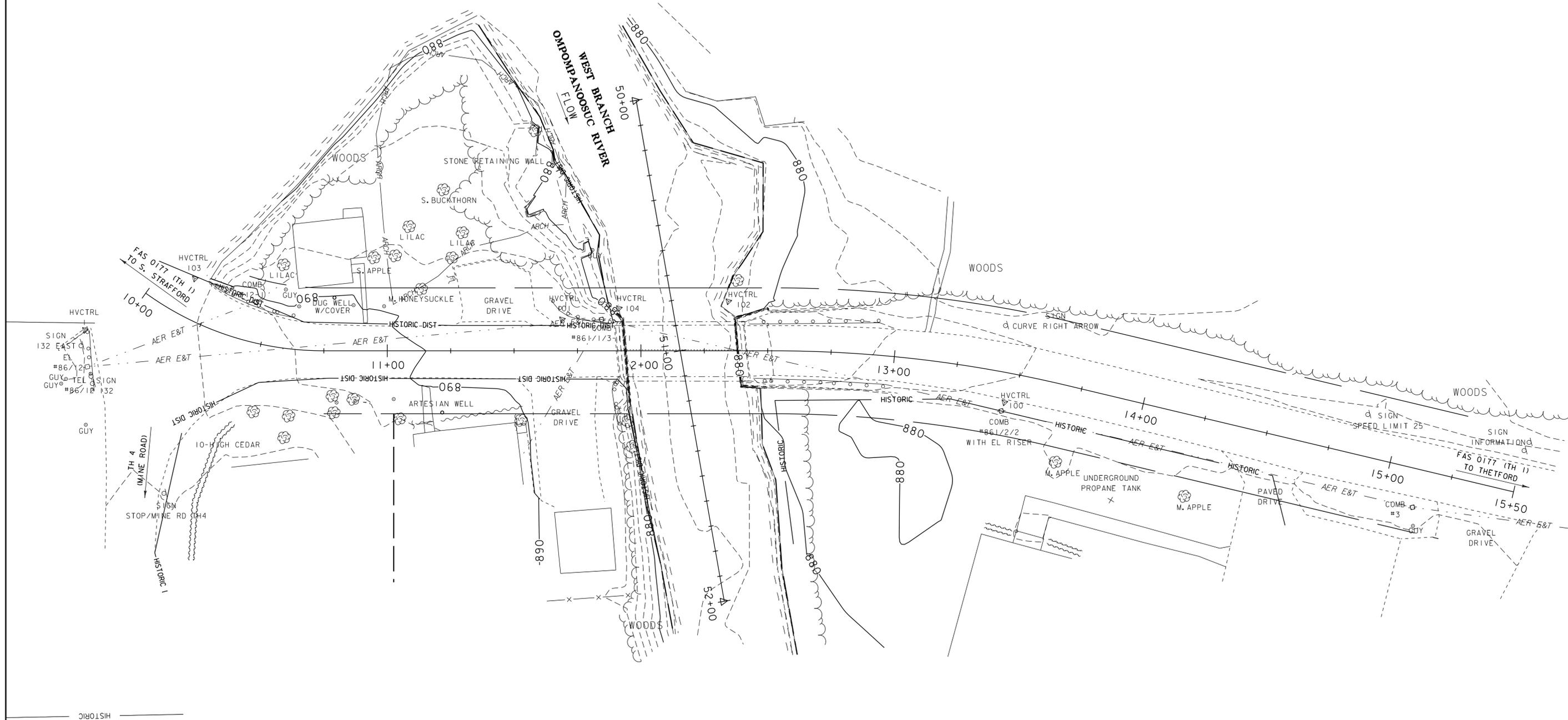
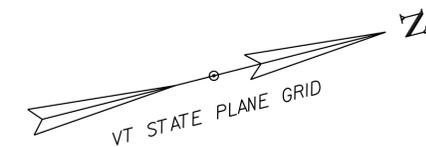
GENERAL LOCATION, SOUTH STRAFFORD, VT.  
1.6 MI (2.6 KM) EAST OF, AT DESERTED VILLAGE OF COPPER FLAT, 25 FT (7.6 M) SOUTHWEST OF CENTER OF ROAD, 250 FT (76.2 M) NORTHWEST JUNCTION OF DISCONTINUED ROAD SOUTHWEST, IN EMBEDDED BOULDER.

TRAVERSE TIES

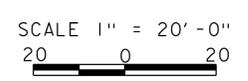


DATUM	
VERTICAL	NAVD 88
HORIZONTAL	NAD 83(2011)
ADJUSTMENT	COMPASS

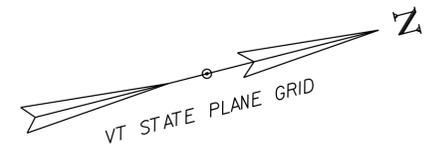
PROJECT NAME: STRAFFORD	
PROJECT NUMBER: BF 0177(10)	
FILE NAME: s13j088+1.dgn	PLOT DATE: 09-MAY-2016
PROJECT LEADER: K. HIGGINS	DRAWN BY: S. DONOVAN
DESIGNED BY: J. GRIGAS	CHECKED BY: J. GRIGAS
TIE SHEET	SHEET 11 OF 50



EXISTING CONDITIONS



PROJECT NAME:	STRAFFORD
PROJECT NUMBER:	BF 0177(10)
FILE NAME:	sl3j088bdr_ex.dgn
PROJECT LEADER:	K. HIGGINS
DESIGNED BY:	R. KLINEFELTER
EXISTING CONDITIONS	
PLOT DATE:	09-MAY-2016
DRAWN BY:	R. KLINEFELTER
CHECKED BY:	J. SALVATORI
SHEET	12 OF 50



**MAINLINE CURVE #1:**  
 DELTA = 35°47'00"  
 D = 47°44'47"  
 R = 120.00'  
 T = 38.74'  
 L = 74.94'  
 E = 6.10'

**MAINLINE CURVE #2:**  
 DELTA = 13°22'00"  
 D = 11°27'33"  
 R = 500.00'  
 T = 58.59'  
 L = 116.65'  
 E = 3.42'

**CONSTRUCT DRIVE W/5'-0" PAVED APRON AND 3" AGGREGATE SURFACE COURSE BEYOND APRON**  
 STA 11+24.65 - 11+62.99 LT  
 STA 11+51.96 - 11+87.03 RT

**CONSTRUCT 5'-0" PAVED APRON**  
 STA 14+36.73 - 14+69.72 RT

**4" YELLOW LINE (DOUBLE)**  
 STA 10+25 - 14+75 CL

**STONE FILL, TYPE I DITCH**  
 STA 13+25 - 14+20 LT

**REMOVAL OF CONCRETE OR MASONRY**  
 STA 12+50 - 13+03 RT  
 STA 12+51 - 12+91 LT

**REMOVAL AND DISPOSAL OF GUARDRAIL**  
 STA 11+65 - 11+88 LT  
 STA 11+89 - 11+91 RT  
 STA 12+43 - 12+93 LT  
 STA 12+44 - 12+97 RT

**CONCRETE CURB, TYPE B**  
 STA 12+48 - 12+74 RT

**REMOVING AND RESETTING PROPERTY MARKERS (GRANITE BOLLARD)**  
 STA 11+65 LT  
 RELOCATE TO STA 11+67 LT  
 N=1677402.4105  
 E=486390.2366

**MAINLINE PT #1**  
 STA 10+74.94  
 N = 486296.1699  
 E = 1677398.8689

**MAINLINE POB/PC #1**  
 STA 10+00.00  
 N = 486233.7153  
 E = 1677359.6785

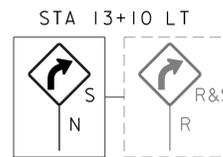
**BEGIN APPROACH**  
 STA 10+25.00  
 MATCH EXISTING

**CHANNEL POB**  
 STA 50+00.00  
 N = 486439.7737  
 E = 1677333.6585

**MAINLINE PC #2**  
 STA 12+52.02  
 N = 486467.8201  
 E = 1677442.3562

**MAINLINE PI #2**  
 STA 13+10.61 BK=  
 STA 13+10.07 AHD  
 N = 486524.6148  
 E = 1677456.7451

**MAINLINE PT #2**  
 STA 13+68.66  
 N = 486576.5446  
 E = 1677483.8740



**END PROJECT**  
 STA 14+00.00  
 FG = 883.17

**END APPROACH**  
 STA 14+75.00  
 MATCH EXISTING

**MAINLINE POE**  
 STA 15+50.00  
 N = 486737.2697  
 E = 1677567.8396

**BEGIN PROJECT**  
 STA 11+00.00  
 FG = 890.48

**BEGIN BRIDGE**  
 STA 11+85.22  
 FG = 888.74

**CL BEARING**  
 STA 11+87.00  
 FG = 888.72

**END BRIDGE**  
 STA 12+45.78  
 FG = 887.68

**CL BEARING**  
 STA 12+44.00  
 FG = 887.73

**ML STA 12+15.50 =**  
**CH STA 51+00.00**  
**Δ = 80°00'00" RT**

**CHANNEL POE**  
 STA 52+00.00  
 N = 486425.0680  
 E = 1677533.1172

**BENCHMARK**  
 CH. SO. BOT STEP  
 ELEV. 732.78

**SIGN LEGEND**

N = NEW
R = REMOVE
S = SALVAGE

MILEMARKER, STATION, OR SIGN NUMBER	SIGN LEGEND	SIGN DIMENSIONS		NEW & SALVAGED SIGN		EXIST POST RETAIN	NEW SIGN POSTS						REMARKS	SIGN DETAIL			
		WIDTH (in)	HEIGHT (in)	"A"	SALV SIGN		NO. OF POSTS	SQUARE STEEL (in)			ANCHOR	SLEEVE		DETAIL ON SHEET NUMBER	STD. SHEET NUMBER		
								1.75	2.0	2.5							
11+87 RT	[Sign Legend]	6	8	0.33		I	8				X				VD-701	T-42	
12+54 LT	[Sign Legend]	6	8	0.33		I	8				X				VD-701	T-42	
13+10 LT	[Sign Legend]				X	I	15				X				WI-2		
FINAL POST LENGTHS ARE TO BE DETERMINED IN THE FIELD. POST SIZES ARE COMPUTED BASED ON INFORMATION FURNISHED ON THE STANDARD SHEETS AND THE VTRANS "SIGN POST DESIGN GUIDELINE."							FT	FT	FT	EA							
							16	15									
							SF	EACH			FT						
							0.66	1			31						

SHS = STANDARD HIGHWAY SIGNS (MUTCD)

**LAYOUT SHEET**

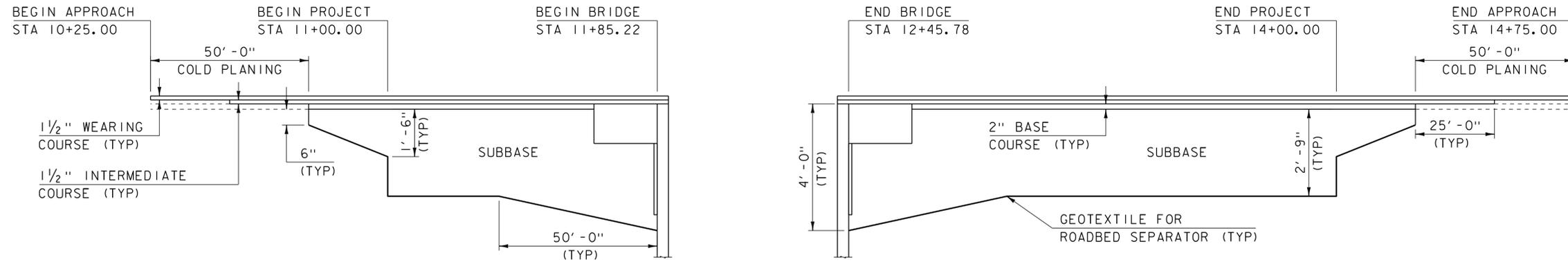
SCALE 1" = 20' - 0"  
 20 0 20

**NOTE:**  
 ADJUST NEW CENTERLINE AND EDGE LINES TO MATCH EXISTING LINES AT BEGIN/END APPROACH

**PROJECT NAME:** STRAFFORD  
**PROJECT NUMBER:** BF 0177(10)

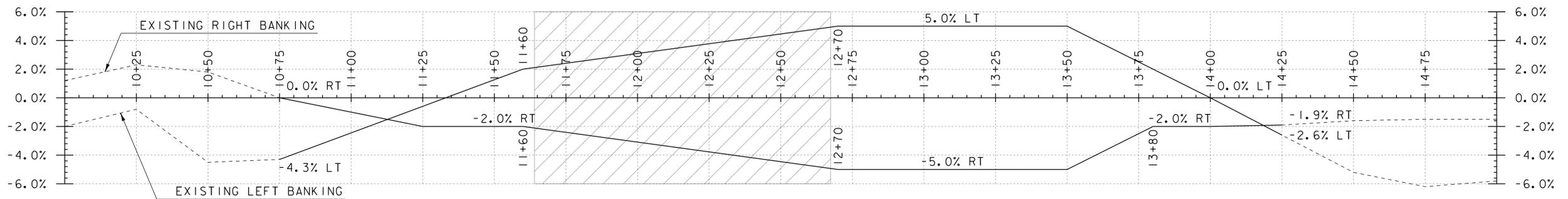
**FILE NAME:** s13j088bdr.dgn  
**PROJECT LEADER:** K. HIGGINS  
**DESIGNED BY:** J. GRIGAS  
**LAYOUT SHEET**

**PLOT DATE:** 09-MAY-2016  
**DRAWN BY:** J. GRIGAS  
**CHECKED BY:** G. LAROCHE  
**SHEET 13 OF 50**



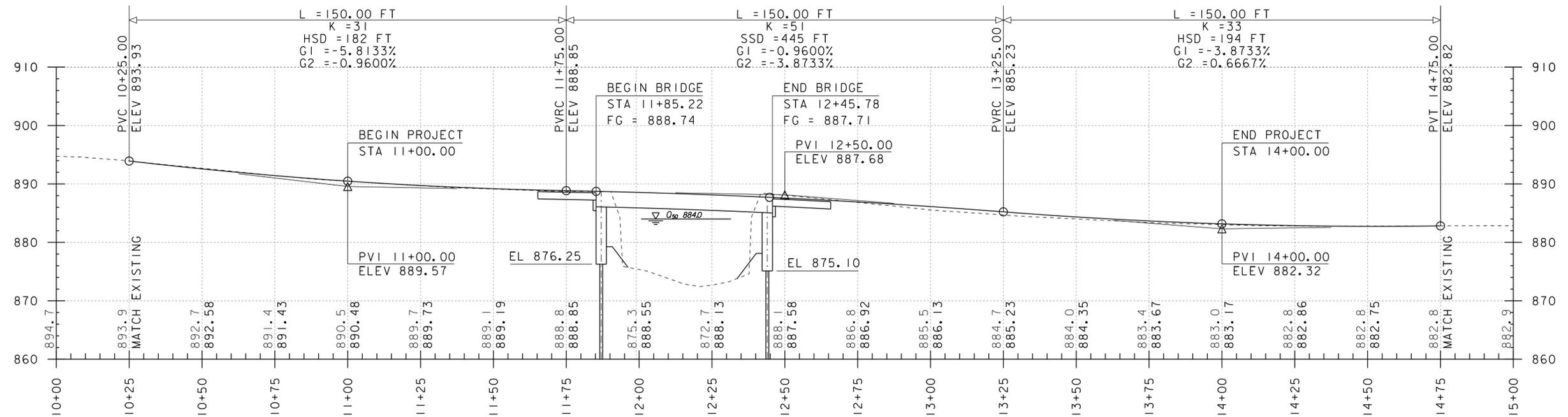
**MATERIAL TRANSITION**

SCALE: HORIZONTAL: 1"=20'-0"  
NO VERTICAL SCALE



**BANKING DIAGRAM**

SCALE: HORIZONTAL: 1"=20'-0"  
VERTICAL: 1"=1.0%



**MAINLINE PROFILE**

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

THE GRADES SHOWN TO THE TENTH ARE THE EXISTING GROUND ELEVATIONS ALONG THE PROPOSED ALIGNMENT.  
THE GRADES SHOWN TO THE NEAREST HUNDREDTH ARE THE FINISH GRADES ALONG THE PROPOSED ALIGNMENT.

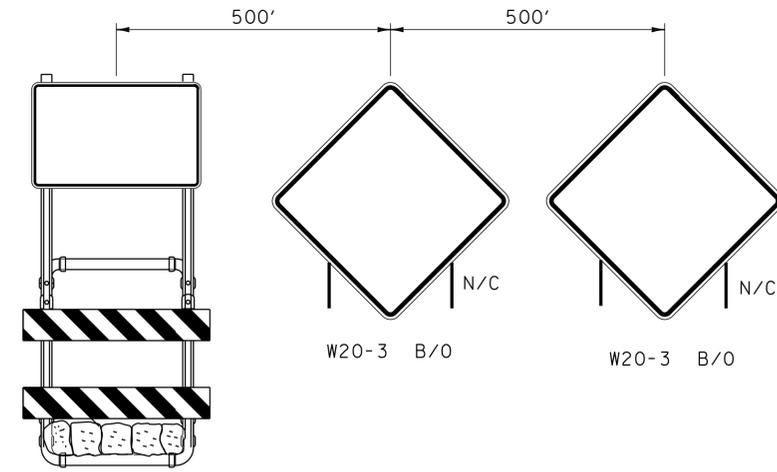
PROJECT NAME: STRAFFORD  
PROJECT NUMBER: BF 0177(10)

FILE NAME: s13j088pro.dgn  
PROJECT LEADER: K. HIGGINS  
DESIGNED BY: J. GRIGAS  
MAINLINE PROFILE & BANKING DIAGRAM

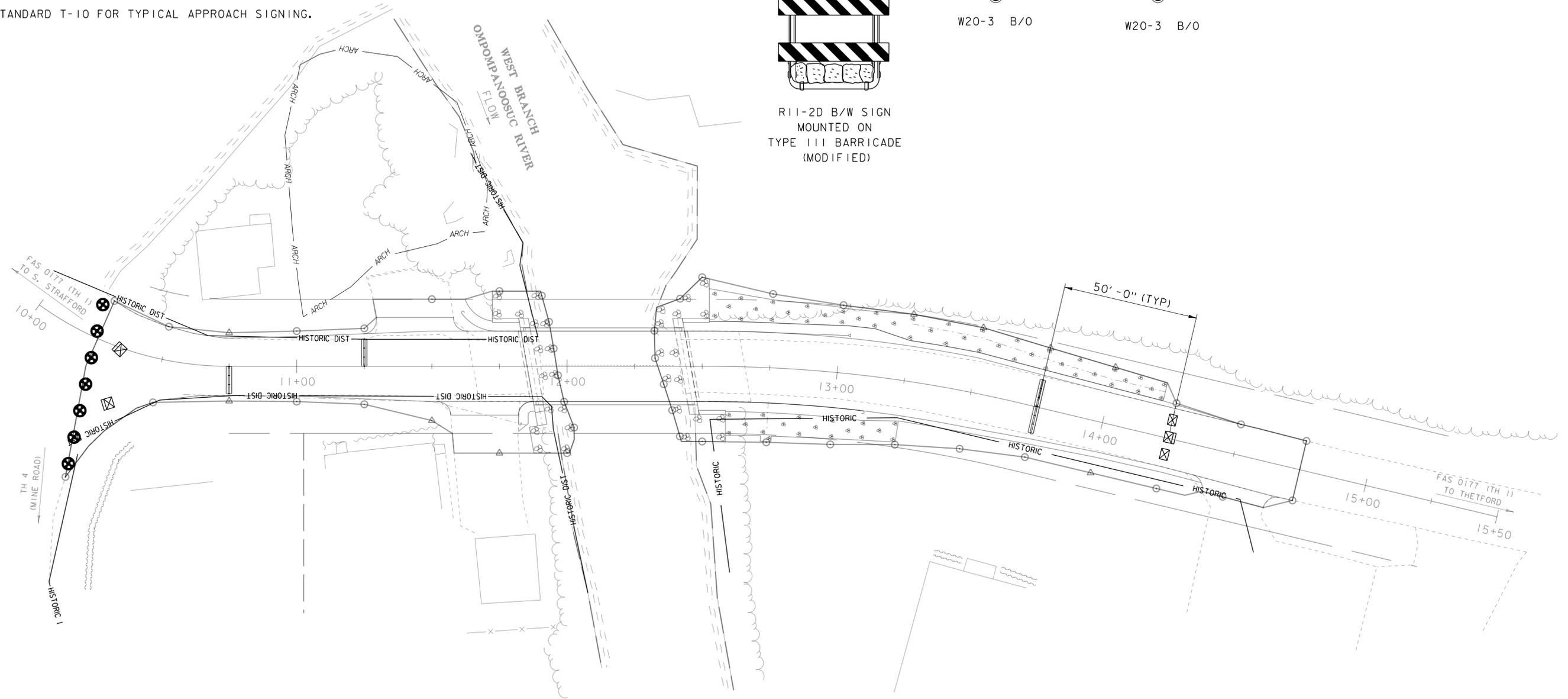
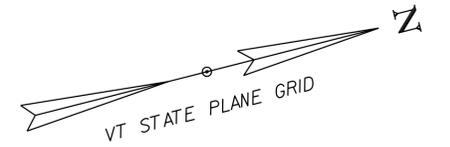
PLOT DATE: 09-MAY-2016  
DRAWN BY: J. GRIGAS  
CHECKED BY: G. LAROCHE  
SHEET 14 OF 50

**NOTES:**

1. THE CONTRACTOR IS RESPONSIBLE FOR SIGNS AND BARRICADES SHOWN ON THIS SHEET. THEY SHALL BE PAID FOR UNDER ITEM 900.645, "SPECIAL PROVISION (TRAFFIC CONTROL, ALL-INCLUSIVE)".
2. TEMPORARY TRAFFIC BARRIER AT EACH END OF THE PROJECT SHALL BE FURNISHED IN ACCORDANCE WITH SECTION 621 AND PAYMENT SHALL BE CONSIDERED INCIDENTAL TO PAY ITEM 900.645, "SPECIAL PROVISION (TRAFFIC CONTROL, ALL-INCLUSIVE)".
3. SEE STANDARD T-10 FOR TYPICAL APPROACH SIGNING.

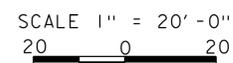


R11-2D B/W SIGN  
MOUNTED ON  
TYPE III BARRICADE  
(MODIFIED)



LEGEND	
N/C	- NEW/CONSTRUCTION ONLY
B/O	- BLACK/ORANGE
B/W	- BLACK/WHITE
⊗	- REFLECTORIZED BARREL
⊠	- TYPE III BARRICADE
⊠	- TYPE III BARRICADE (MOD.)
▬	- TEMPORARY TRAFFIC BARRIER

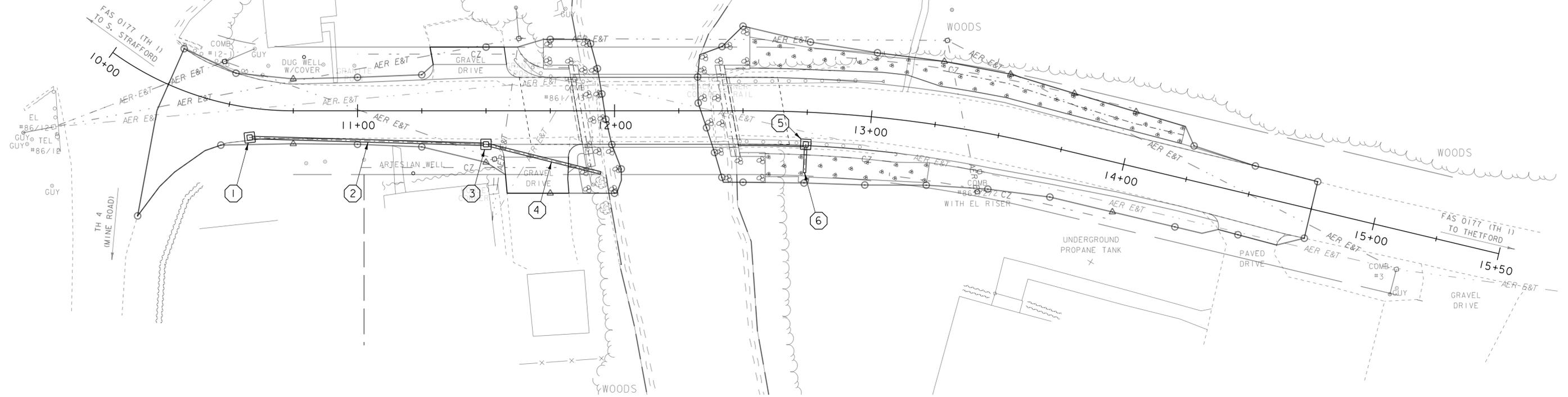
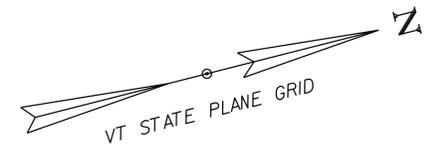
**TRAFFIC LAYOUT SHEET**



PROJECT NAME: STRAFFORD  
PROJECT NUMBER: BF 0177(10)

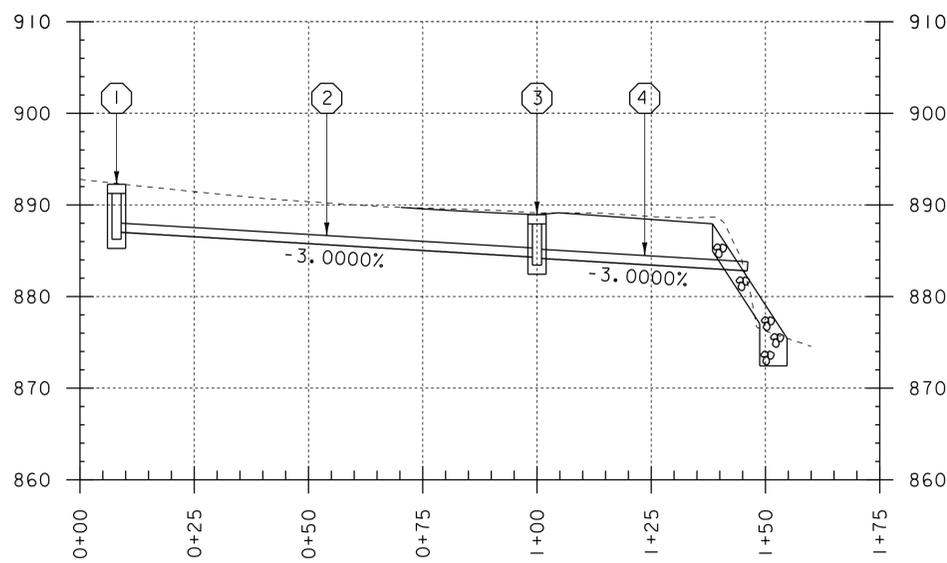
FILE NAME: s13j088traff.dgn  
PROJECT LEADER: K. HIGGINS  
DESIGNED BY: J. GRIGAS  
TRAFFIC LAYOUT SHEET

PLOT DATE: 09-MAY-2016  
DRAWN BY: T. MATTHEWS  
CHECKED BY: J. GRIGAS  
SHEET 15 OF 50



**DRAINAGE LAYOUT**

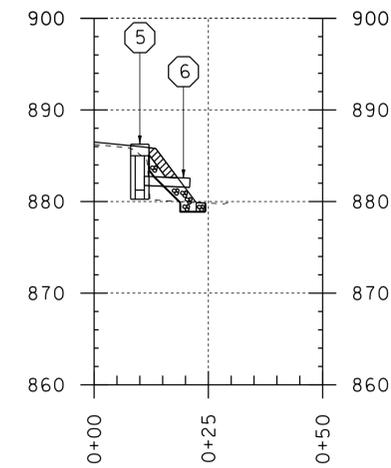
SCALE 1" = 20'-0"  
 20 0 20



**DRAINAGE PROFILE #1**

HOR. SCALE 1" = 20'-0"  
 VER. SCALE 1" = 10'-0"

- ① NEW PRECAST REINFORCED CONCRETE DROP INLET WITH CAST IRON GRATE  
 PTOG EL 892.25  
 SUMP EL 886.25
- ② NEW 18" x 90' OPTION PIPE  
 INLET EL 887.00  
 OUTLET EL 884.30
- ③ NEW PRECAST REINFORCED CONCRETE DROP INLET WITH CAST IRON GRATE  
 PTOG EL 888.90  
 SUMP EL 883.40
- ④ NEW 18" x 45' OPTION PIPE  
 INLET EL 884.15  
 OUTLET EL 882.80



**DRAINAGE PROFILE #2**

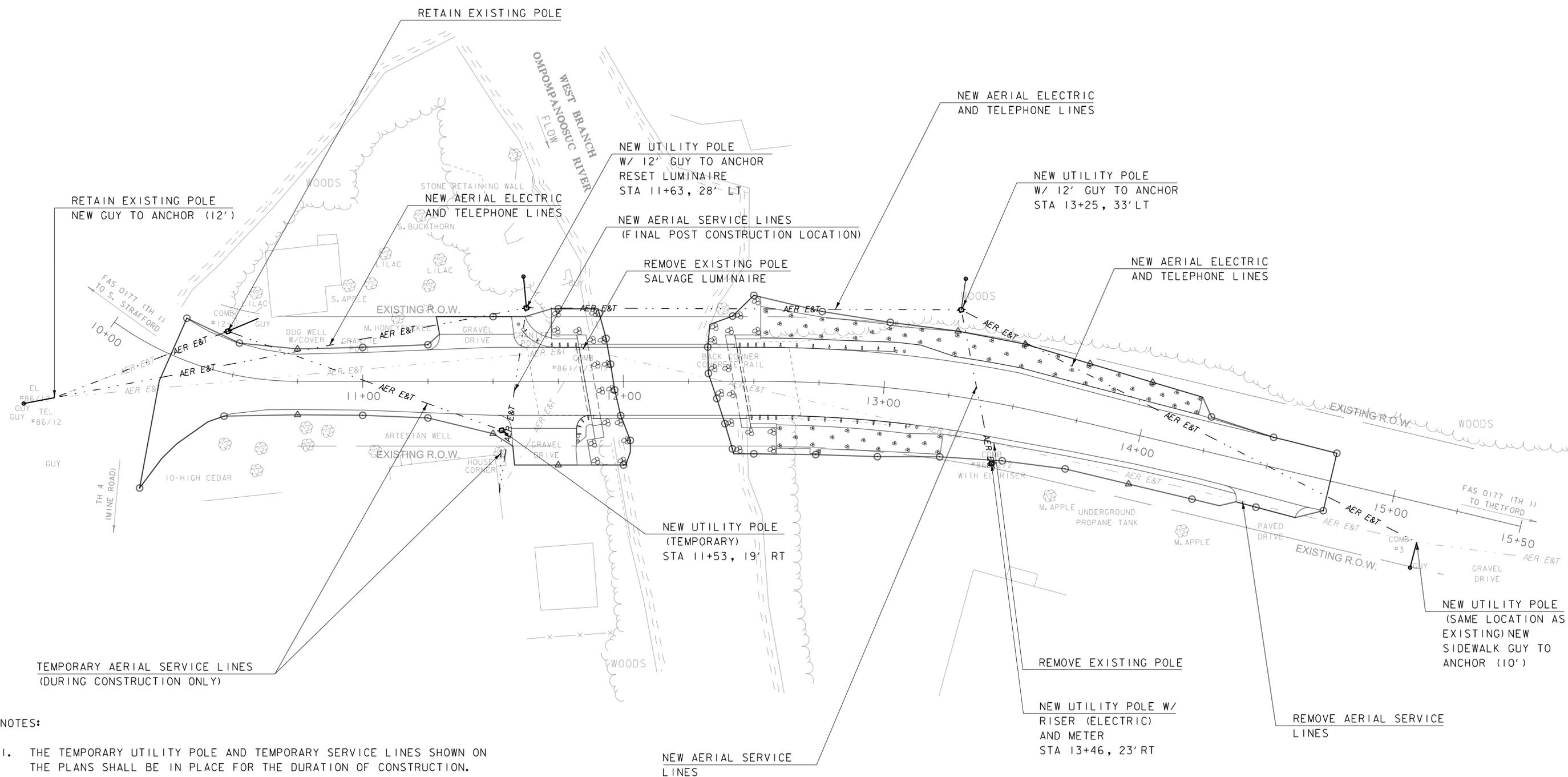
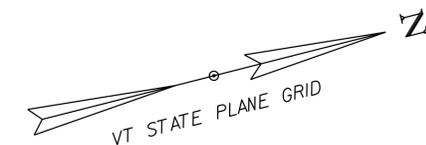
HOR. SCALE 1" = 20'-0"  
 VER. SCALE 1" = 10'-0"

- ⑤ NEW PRECAST REINFORCED CONCRETE DROP INLET WITH CAST IRON GRATE, TYPE E  
 PTOG EL 886.25  
 SUMP EL 881.25
- ⑥ NEW 18" x 10' OPTION PIPE WITH 4' WIDE x 2' LONG' STONE FILL, TYPE 1 PAD  
 INLET EL 881.75  
 OUTLET EL 881.50

PROJECT NAME: STRAFFORD  
 PROJECT NUMBER: BF 0177(10)

FILE NAME: s13j088bdr\_drain.dgn  
 PROJECT LEADER: K. HIGGINS  
 DESIGNED BY: J. GRIGAS  
 DRAINAGE LAYOUT

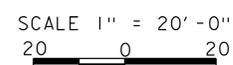
PLOT DATE: 09-MAY-2016  
 DRAWN BY: T. MATTHEWS  
 CHECKED BY: J. GRIGAS  
 SHEET 16 OF 50



NOTES:

1. THE TEMPORARY UTILITY POLE AND TEMPORARY SERVICE LINES SHOWN ON THE PLANS SHALL BE IN PLACE FOR THE DURATION OF CONSTRUCTION.
2. ALL TEMPORARY UTILITY WORKS SHALL BE REMOVED NO LATER THAN 90 DAYS AFTER FINAL INSPECTION OF THE PROJECT.

UTILITY LAYOUT SHEET



PROJECT NAME:	STRAFFORD	PLOT DATE:	09-MAY-2016
PROJECT NUMBER:	BF 0177(10)	DRAWN BY:	J. GRIGAS
FILE NAME:	s13j08but11.dgn	CHECKED BY:	T. MATTHEWS
PROJECT LEADER:	K. HIGGINS	UTILITY LAYOUT SHEET	SHEET 17 OF 50
DESIGNED BY:	J. GRIGAS		

**SOIL CLASSIFICATION**

**AASHTO**

A1	Gravel and Sand
A3	Fine Sand
A2	Silty or Clayey Gravel and Sand
A4	Silty Soil - Low Compressibility
A5	Silty Soil - Highly Compressible
A6	Clayey Soil - Low Compressibility
A7	Clayey Soil - Highly Compressible

**ROCK QUALITY DESIGNATION**

R.Q.D. (%)	ROCK DESCRIPTION
<25	Very Poor
25 to 50	Poor
51 to 75	Fair
76 to 90	Good
>90	Excellent

**SHEAR STRENGTH**

UNDRAINED SHEAR STRENGTH IN P.S.F.	CONSISTENCY
<250	Very Soft
250-500	Soft
500-1000	Med. Stiff
1000-2000	Stiff
2000-4000	Very Stiff
>4000	Hard

**CORRELATION GUIDE OF "N" TO DENSITY/CONSISTENCY**

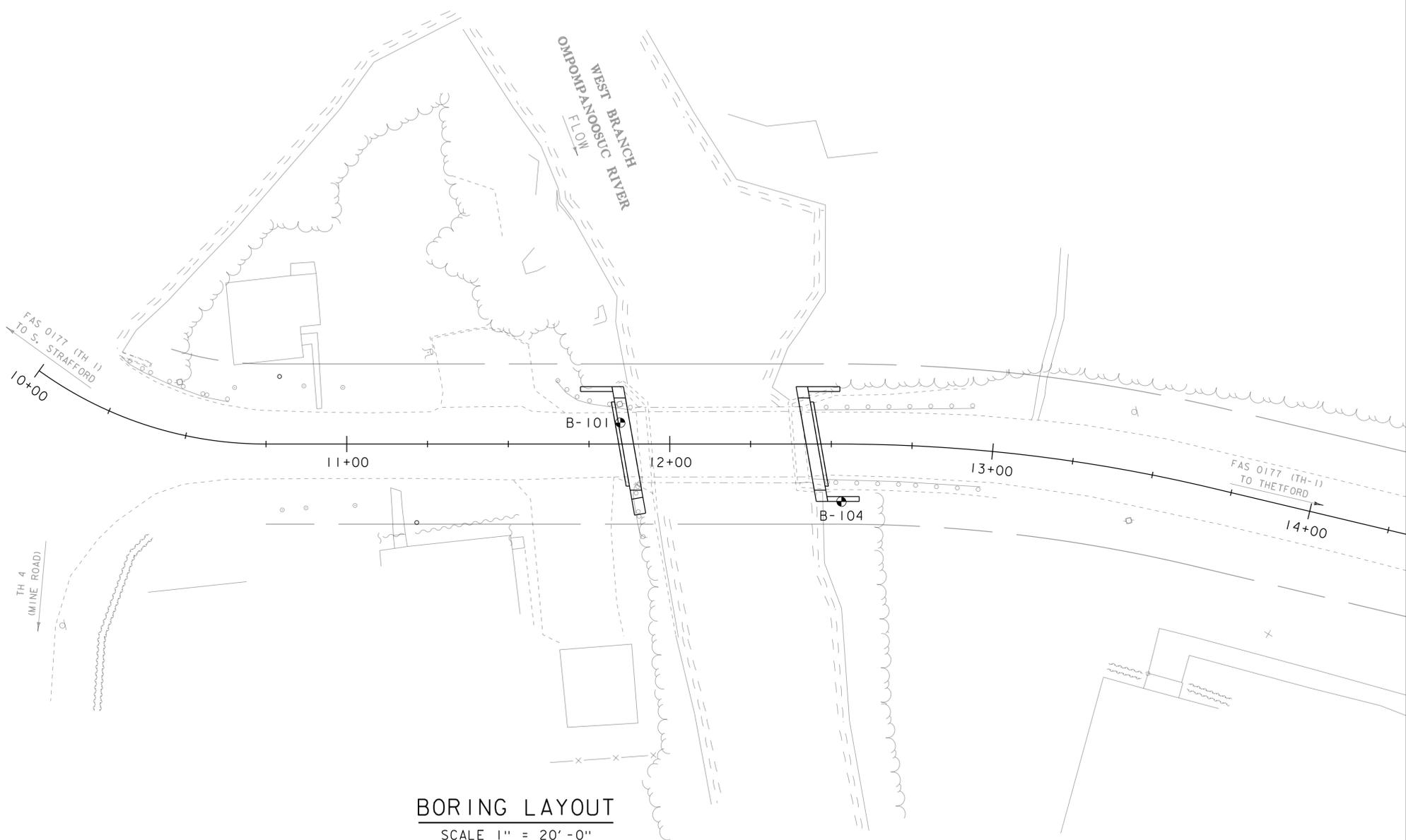
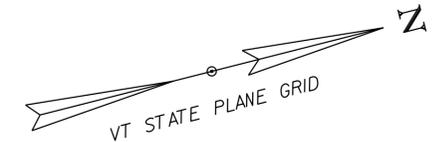
DENSITY (GRANULAR SOILS)		CONSISTENCY (COHESIVE SOILS)	
N	DESCRIPTIVE TERM	N	DESCRIPTIVE TERM
<5	Very Loose	<2	Very Soft
5-10	Loose	2-4	Soft
11-24	Med. Dense	5-8	Med. Stiff
25-50	Dense	9-15	Stiff
>50	Very Dense	16-30	Very Stiff
		31-60	Hard
		>60	Very Hard

**COMMONLY USED SYMBOLS**

- ▼ Water Elevation
- ⊕ Standard Penetration Boring
- ⊕ Auger Boring
- ⊕ Rod Sounding
- ⊕ Sample
- N Standard Penetration Test Blow Count Per Foot For: 2" O.D. Sampler 1 "I.D. Sampler Hammer Weight Of 140 Lbs. Hammer Fall Of 30"
- VS Field Vane Shear Test
- US Undisturbed Soil Sample
- B Blast
- DC Diamond Core
- MD Mud Drill
- WA Wash Ahead
- HSA Hollow Stem Auger
- AX Core Size 1 "
- BX Core Size 1 "
- NX Core Size 2 "
- M Double Tube Core Barrel Used
- LL Liquid Limit
- PL Plastic Limit
- PI Plasticity Index
- NP Non Plastic
- w Moisture Content (Dry Wgt. Basis)
- D Dry
- M Moist
- MTW Moist To Wet
- W Wet
- Sat Saturated
- Bo Boulder
- Gr Gravel
- Sa Sand
- Si Silt
- Cl Clay
- HP Hardpan
- Le Ledge
- NLTD No Ledge To Depth
- CNPF Can Not Penetrate Further
- TLOB Top of Ledge Or Boulder
- NR No Recovery
- Rec. Recovery
- 1/2 Rec. Percent Recovery
- ROD Rock Quality Designation
- CBR California Bearing Ratio
- < Less Than
- > Greater Than
- R Refusal (N > 100)
- VTSPG NAD83 - See Note 7

**COLOR**

blk	Black	pnk	Pink
bl	Blue	pu	Purple
brn	Brown	rd	Red
dk	Dark	tn	Tan
gr'y	Gray	wh	White
gn	Green	yel	Yellow
lt	Light	mltc	Multicolored
or	Orange		



**BORING LAYOUT**

SCALE 1" = 20'-0"  
20 0 20

**DEFINITIONS (AASHTO)**

- BEDROCK (LEDGE) - Rock in its native location of indefinite thickness.
- BOULDER - A rock fragment with an average dimension > 12 inches.
- COBBLE - Rock fragments with an average dimension between 3 and 12 inches.
- GRAVEL - Rounded particles of rock < 3" and > 0.0787" (#10 sieve).
- SAND - Particles of rock < 0.0787" (#10 sieve) and > 0.0029" (#200 sieve).
- SLT - Soil < 0.0029" (#200 sieve), non or slightly plastic and exhibits no strength when air-dried.
- CLAY - Fine grained soil, exhibits plasticity when moist and considerable strength when air-dried.
- VARVED - Alternate layers of silt and clay.
- HARDPAN - Extremely dense soil, cemented layer, not softened when wet.
- MUCK - Soft organic soil (containing > 10% organic material).
- MOISTURE CONTENT - Weight of water divided by dry weight of soil.
- FLOWING SAND - Granular soil so saturated (loose) that it flows into drill casing during extraction of wash rod.
- STRIKE - Angle from magnetic north to line of intersection of bed with a horizontal plane.
- DIP - Inclination of bed with a horizontal plane.

**GENERAL NOTES**

1. The subsurface explorations shown herein were made between 12/12/2013 and 01/16/2014 by the Agency.
2. Soil and rock classifications, properties and descriptions are based on engineering interpretation from available subsurface information by the Agency and may not necessarily reflect actual variations in subsurface conditions that may be encountered between individual boring or sample locations.
3. Observed water levels and/or conditions indicated are as recorded at the time of exploration and may vary according to the prevailing rainfall, methods of exploration and other factors.
4. Engineering judgment was exercised in preparing the subsurface information presented herein. Analysis and interpretation of subsurface data was performed and interpreted for Agency design and estimating purposes. Presentation of the information in the Contract is intended to provide the Contractor access to the same data available to the Agency. The subsurface information is presented in good faith and is not intended as a substitute for personal investigation, independent interpretation, independent analysis or judgment by the Contractor.
5. Pictorial structure details shown on the boring plan layout or soils profile are for illustrative purposes only and may not accurately portray final contract details.
6. Terminology used on boring logs to describe the hardness, degree of weathering, and spacing of fractures, joints and other discontinuities in the bedrock is defined in the AASHTO Manual on Subsurface Investigations, 1988.
7. Northing and Easting coordinates are shown in Vermont State Plane Grid North American Datum 1983 in meters and survey feet.

**BORING CHART**

HOLE NO.	SURV. STATION	OFFSET	GROUND ELEV.	ELEV. TLOB
B-101	11+85	6.6 LT	888.0	830.9
B-104	12+53	17.8 RT	881.0	851.0

PROJECT NAME: STRAFFORD  
 PROJECT NUMBER: BF 0177(10)  
 FILE NAME: s13j088boring.dgn PLOT DATE: 09-MAY-2016  
 PROJECT LEADER: K. HIGGINS DRAWN BY: J. GRIGAS  
 DESIGNED BY: J. GRIGAS CHECKED BY: T. MATTHEWS  
 BORING LAYOUT SHEET SHEET 18 OF 50

VTTrans Working to Get You There STATE OF VERMONT AGENCY OF TRANSPORTATION MATERIALS & RESEARCH SECTION SUBSURFACE INFORMATION		BORING LOG		Boring No.: <b>B-101</b>					
		<b>STRAFFORD BF 0177(10) VT-132 BR-29</b>		Page No.: 1 of 2					
				Pin No.: 13J088					
				Checked By: CEE					
Boring Crew: GARROW, HOOK, DAIGNEAULT		Casing Sampler		Groundwater Observations					
Date Started: 12/12/13 Date Finished: 1/10/14		Type: WB SPLIT BARREL		Date Depth (ft) Notes					
VTSPG NAD83: N 486404.17 ft E 1677419.41 ft		I.D.: 4 in 1.5 in		12/23/13 12.9 After 10 days.					
Station: 11+85 Offset: -7.00		Hammer Wt: N.A. 140 lb.		01/09/14 9.6 AM					
Ground Elevation: 888.0 ft		Hammer Fall: N.A. 30 in.		01/14/14 12.6 AM					
		Hammer/Rod Type: Auto/AWJ							
		Rig: CME 45C SKID C <sub>e</sub> = 1.33							
Depth (ft)	Strata (1)	Run (Dip deg.)	Core Rec. % (RQD %)	Drill Rate (min/ft)	Blows/ft (N Value)	Moisture Content %	Gravel %	Sand %	Fines %
	Asphalt Pavement, 0.0 ft - 1.15 ft								
	A-2-4, GrSa, Lt/brn, Moist, Rec. = 1.2 ft, Cleaned out with roller cone.				10-6-4-6 (10)	13.5	24.7	56.7	18.6
5	A-2-4, Sa, brn, Moist, Rec. = 0.8 ft				5-3-4-6 (7)	17.6	18.7	61.5	19.8
	Field Note: No Recovery Field Note: NXDC, Cleaned out casing.				R@5.0"				
	A-1-b, SaGr, brn, Moist, Rec. = 0.3 ft, Lab Note: Lots of Broken Rock was within sample.				44-R@1.0"	9.3	56.0	30.7	13.3
10	Field Note: NXDC, Cleaned out casing. Field Note: No Recovery Field Note: NXDC, Cleaned out casing.				R@1.0"				
	A-2-4, SiSa, gry-brn, MTW, Rec. = 0.5 ft, NXDC, Cleaned out casing.				10-2-1-3 (3)	39.8	8.4	67.9	23.7
15	A-1-a, SaGr, gry-brn, MTW, Rec. = 0.3 ft, Lab Note: Sample was mostly Broken Rock.				12-10-8-12 (18)	10.7	60.3	29.1	10.6
	A-1-b, GrSa, brn, Moist, Rec. = 1.2 ft				14-22-20-22 (42)	12.0	32.2	49.7	18.1
	A-1-b, GrSa, brn, Moist, Rec. = 1.0 ft				17-15-13-13 (28)	13.1	25.5	60.6	13.9
20	A-1-b, GrSa, brn, Moist, Rec. = 0.9 ft Field Note: NXDC, Cleaned out casing.				24-15-13-R@5.0" (28)	12.5	36.9	50.5	12.6
25	A-1-b, GrSa, brn, Moist, Rec. = 0.8 ft, Lab Note: Broken Rock was within sample.				4-12-17-31 (29)	13.5	20.1	66.5	13.4
30	Visual Description: Broken Rock, gry, Moist, Rec. = 0.3 ft Field Note: Pulled casing and changed bit Field Note: NXDC, Cleaned out casing.				3-R@3.5"	11.4			
35	A-2-4, GrSa, brn, Moist, Rec. = 1.0 ft, Lab Note: Broken Rock was within sample.				29-44-R@2.5" (R)	13.9	32.6	49.4	18.0
<b>Notes:</b> 1. Stratification lines represent approximate boundary between material types. Transition may be gradual. 2. N Values have not been corrected for hammer energy. C <sub>e</sub> is the hammer energy correction factor. 3. Water level readings have been made at times and under conditions stated. Fluctuations may occur due to other factors than those present at the time measurements were made.									

ABUT I BTM.  
EL 876.25

BORING LOG 2 STRAFFORD BF 0177(10).GPJ VERMONT AOT.GDT 1/21/14

EST. PILE TIP  
EL 830.9

BORING LOG 2 STRAFFORD BF 0177(10).GPJ VERMONT AOT.GDT 1/21/14

VTTrans Working to Get You There STATE OF VERMONT AGENCY OF TRANSPORTATION MATERIALS & RESEARCH SECTION SUBSURFACE INFORMATION		BORING LOG		Boring No.: <b>B-101</b>					
		<b>STRAFFORD BF 0177(10) VT-132 BR-29</b>		Page No.: 2 of 2					
				Pin No.: 13J088					
				Checked By: CEE					
Boring Crew: GARROW, HOOK, DAIGNEAULT		Casing Sampler		Groundwater Observations					
Date Started: 12/12/13 Date Finished: 1/10/14		Type: WB SPLIT BARREL		Date Depth (ft) Notes					
VTSPG NAD83: N 486404.17 ft E 1677419.41 ft		I.D.: 4 in 1.5 in		12/23/13 12.9 After 10 days.					
Station: 11+85 Offset: -7.00		Hammer Wt: N.A. 140 lb.		01/09/14 9.6 AM					
Ground Elevation: 888.0 ft		Hammer Fall: N.A. 30 in.		01/14/14 12.6 AM					
		Hammer/Rod Type: Auto/AWJ							
		Rig: CME 45C SKID C <sub>e</sub> = 1.33							
Depth (ft)	Strata (1)	Run (Dip deg.)	Core Rec. % (RQD %)	Drill Rate (min/ft)	Blows/ft (N Value)	Moisture Content %	Gravel %	Sand %	Fines %
	Field Note: NXDC, Cleaned out casing.								
40	A-2-4, Sa, brn, Moist, Rec. = 1.1 ft				26-34-R@2.5" (R)	17.8	7.4	74.6	18.0
45	A-1-b, GrSa, Dk/brn, Moist, Rec. = 1.1 ft				16-8-22-R@2.5" (30)	18.2	27.8	52.8	19.4
50	Field Note: NXDC, Cleaned out casing. A-1-b, GrSa, Dk/brn, Moist, Rec. = 1.0 ft				39-43-R@2.5" (R)	14.9	30.3	53.9	15.8
55	Field Note: NXDC, Cleaned out casing. Field Note: No Recovery				R@6.0"				
	57.1 ft - 59.1 ft, Gray, Micaceous quartz-rich Limestone, Hard, Unweathered, Fair rock, NXDC, RMR = 57	1 (60)	65 (0)	5	Top of Bedrock @ 57.1 ft				
60	59.1 ft - 63.1 ft, Gray, Micaceous quartz-rich Limestone, Hard, Unweathered, Good rock, NXDC, RMR = 65	2 (60)	90 (50)	11					
				7					
				6					
65	63.1 ft - 67.1 ft, Gray, Micaceous quartz-rich Limestone, Hard, Unweathered, Good rock, NXDC, RMR = 74	3 (60)	100 (93)	10					
				7					
				8					
				7					
	Hole stopped @ 67.1 ft								
70	<b>Remarks:</b> 1. Inclement weathered hindered the days able to drill within the start and finish date. 2. Hole collapsed at 16.3 ft. (01/14/14)								
75									
<b>Notes:</b> 1. Stratification lines represent approximate boundary between material types. Transition may be gradual. 2. N Values have not been corrected for hammer energy. C <sub>e</sub> is the hammer energy correction factor. 3. Water level readings have been made at times and under conditions stated. Fluctuations may occur due to other factors than those present at the time measurements were made.									

PROJECT NAME:	STRAFFORD
PROJECT NUMBER:	BF 0177(10)
FILE NAME:	s13j088boring.dgn
PROJECT LEADER:	K. HIGGINS
DESIGNED BY:	J. GRIGAS
BORING LOGS	
PLOT DATE:	09-MAY-2016
DRAWN BY:	J. GRIGAS
CHECKED BY:	T. MATTHEWS
SHEET	19 OF 50



STATE OF VERMONT  
AGENCY OF TRANSPORTATION  
MATERIALS & RESEARCH SECTION  
SUBSURFACE INFORMATION

**BORING LOG**

Boring No.: **B-104**  
Page No.: 1 of 1  
Pin No.: 13J088  
Checked By: CEE

**STRAFFORD  
BF 0177(10)  
VT-132 BR-29**

Boring Crew: <u>HOOK, DAIGNEAULT</u>	Type: <u>WB</u>	Casing: <u>SS</u>	Groundwater Observations		
Date Started: <u>1/15/14</u> Date Finished: <u>1/16/14</u>	I.D.: <u>4 in</u>	Sampler: <u>1.5 in</u>	Date	Depth (ft)	Notes
VTSPG NAD83: <u>N 486464.52 ft E 1677459.89 ft</u>	Hammer Wt: <u>N.A.</u>	Hammer Fall: <u>140 lb.</u>	01/16/14	7.5	AM
Station: <u>12+52</u> Offset: <u>17.50</u>	Hammer/Rod Type: <u>Auto/AWJ</u>	Rig: <u>CME 45C TRACK</u>	01/16/14	5.3	Casing removed.
Ground Elevation: <u>881.0 ft</u>	$C_e = 1.34$				

Depth (ft)	Strata (1)	CLASSIFICATION OF MATERIALS (Description)	Run (Dip deg.)	Core Rec. % (RQD %)	Drill Rate minutes/ft	Blows/ft (N Value)	Moisture Content %	Gravel %	Sand %	Fines %
		A-3, Sa, brn, Moist, Rec. = 0.2 ft				2-1-WH-1 (1)	38.4	5.5	86.9	7.6
		A-2-4, Sa, brn, Moist, Rec. = 1.1 ft, Lab Note: Wood chunks were within sample.				1-2-2-3 (4)	19.9	11.7	76.6	11.7
5		A-1-b, SaGr, Lt/brn, Moist, Rec. = 0.5 ft, Lab Note: Broken Rock was within sample.				2-5-10-7 (15)	9.0	50.0	43.3	6.7
		A-1-b, GrSa, gry-brn, MTW, Rec. = 1.5 ft, Lab Note: Broken Rock was within sample.				5-8-9-7 (17)	16.5	34.0	56.7	9.3
		A-1-b, GrSa, brn, Wet, Rec. = 2.0 ft, Cleaned out with roller cone.				6-6-8-9 (14)	18.7	25.5	65.3	9.2
10		A-2-4, GrSa, brn, Moist, Rec. = 0.9 ft, Cleaned out with roller cone.				5-7-7-11 (14)	15.8	25.4	56.6	18.0
		A-1-b, GrSa, brn, Moist, Rec. = 1.1 ft, Cleaned out with roller cone.				12-15-27-23 (42)	12.2	30.5	54.8	14.7
15		A-1-b, GrSa, brn, Moist, Rec. = 1.1 ft, Lab Note: Broken Rock was within sample.				9-21-31-R@1.0" (52)	10.9	38.6	46.1	15.3
		Field Note: NXDC, Cleaned out casing.				15-14-22-20 (36)	13.5	32.6	51.5	15.9
		A-2-4, GrSa, brn, Moist, Rec. = 1.2 ft, NXDC, Cleaned out casing.				12-11-16-28 (27)	12.7	34.5	52.3	13.2
20		A-1-b, GrSa, brn, Moist, Rec. = 1.1 ft, Lab Note: Broken Rock was within sample.								
		Field Note: NXDC, Cleaned out casing.								
25		A-2-4, SiGrSa, brn, Moist, Rec. = 0.9 ft				45-R@6.0" (R)	15.5	28.1	51.4	20.5
		Field Note: Cobble/Hardpan, NXDC, Cleaned out casing.								
30		30.0 ft - 32.0 ft, Gray, Micaceous quartz-rich Limestone, Hard, Unweathered, Fair rock, NXDC, RMR = 57	1 (60)	100 (0)	6 5					Top of Bedrock @ 30.0 ft
		32.0 ft - 35.0 ft, Gray, Micaceous quartz-rich Limestone, Hard, Unweathered, Good rock, NXDC, RMR = 71	2 (60)	100 (87)	7 8 7					
35		35.0 ft - 40.0 ft, Gray, Micaceous quartz-rich Limestone, Hard, Unweathered, Good rock, NXDC, RMR = 71	3 (60)	86 (80)	6 7 5 6 5					
40		Hole stopped @ 40.0 ft								

Notes:  
1. Stratification lines represent approximate boundary between material types. Transition may be gradual.  
2. N Values have not been corrected for hammer energy.  $C_e$  is the hammer energy correction factor.  
3. Water level readings have been made at times and under conditions stated. Fluctuations may occur due to other factors than those present at the time measurements were made.

ABUT 2 BTM.  
EL 875.10

EST. PILE TIP  
EL 851.0

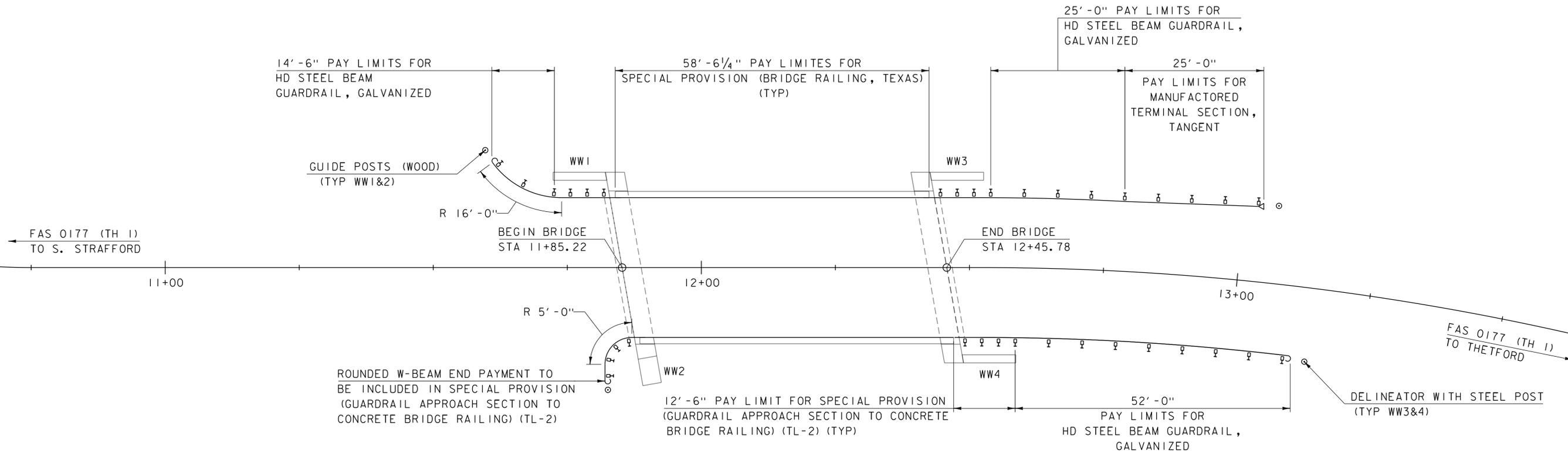
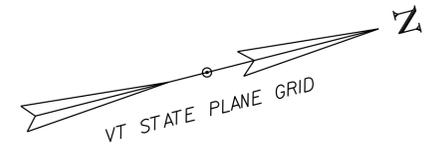
BORING LOG: 2 STRAFFORD BF 0177(10).GP.J. VERMONT AOT.GDT. 1/21/14

PROJECT NAME: STRAFFORD	PLOT DATE: 09-MAY-2016
PROJECT NUMBER: BF 0177(10)	DRAWN BY: J. GRIGAS
FILE NAME: s13j088boring.dgn	CHECKED BY: T. MATTHEWS
PROJECT LEADER: K. HIGGINS	SHEET 20 OF 50
DESIGNED BY: J. GRIGAS	
BORING LOGS	

GUIDE POSTS (WOOD)  
 STA 11+59 LT  
 STA 11+82 RT

DELINEATOR WITH STEEL POST  
 STA 13+20 LT (BLUE)  
 STA 13+35 RT (GREEN)

ANCHOR FOR STEEL BEAM GUARDRAIL  
 STA 12+97 RT



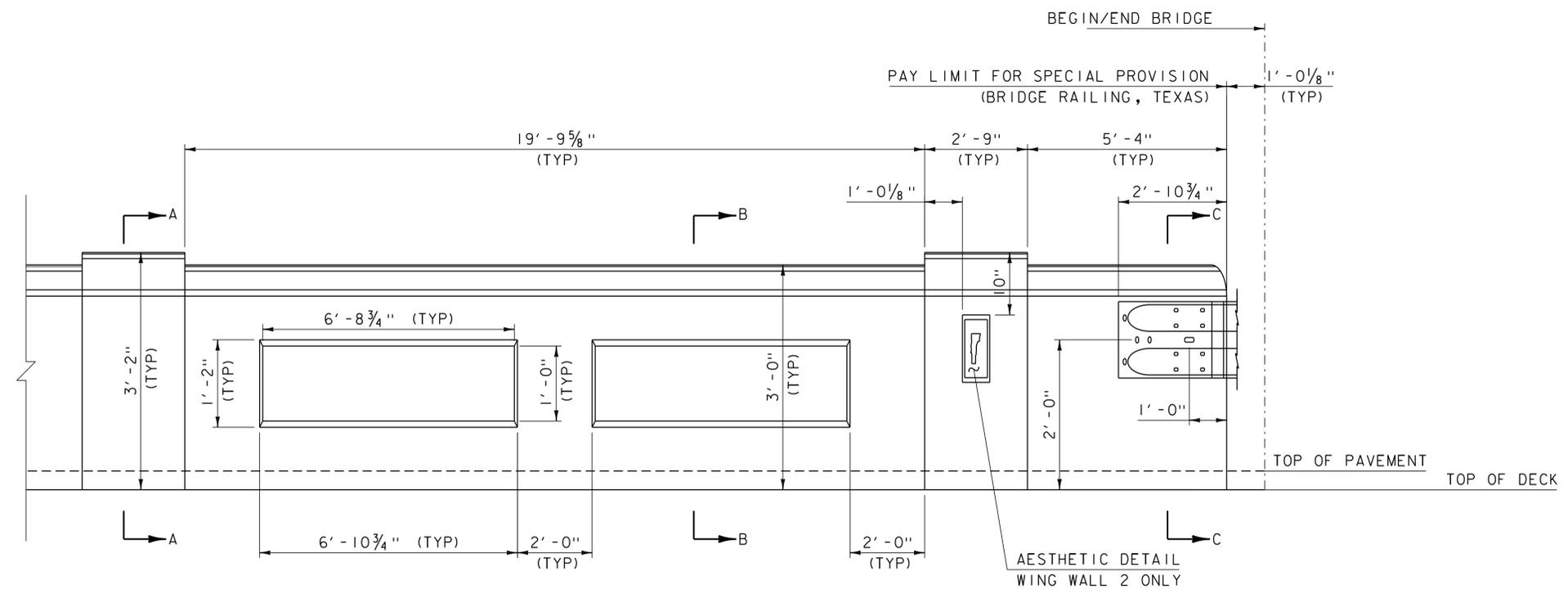
NOTES:

- 1) SEE STANDARDS G-1, G-1D, G-4, G-19, T-40, AND T-45 FOR ADDITIONAL DETAILS.

RAIL LAYOUT SHEET

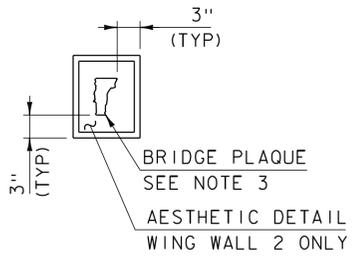
SCALE 1" = 10'-0"  
 10 0 10

PROJECT NAME:	STRAFFORD
PROJECT NUMBER:	BF 0177(10)
FILE NAME:	s13j088rail.dgn
PROJECT LEADER:	K. HIGGINS
DESIGNED BY:	J. GRIGAS
RAIL LAYOUT SHEET	
PLOT DATE:	09-MAY-2016
DRAWN BY:	S. COLEY
CHECKED BY:	J. GRIGAS
SHEET	21 OF 50



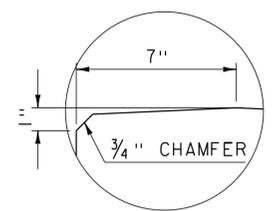
**ROADWAY ELEVATION OF RAIL**

SCALE: VERTICAL: 1" = 1'-0"  
 HORIZONTAL: 1/2" = 1'-0"



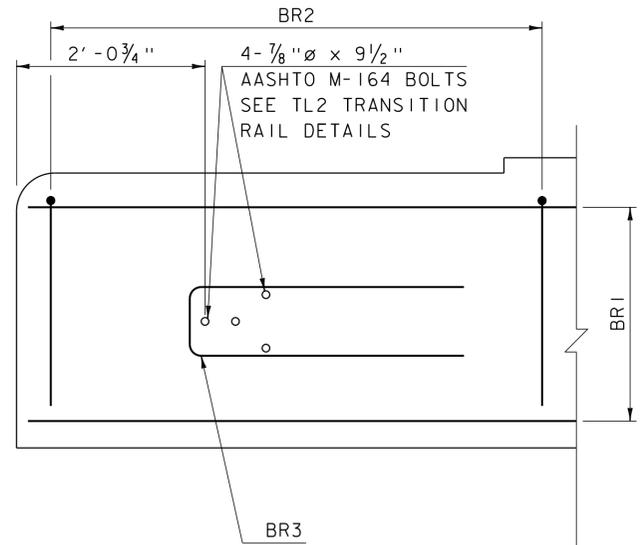
**BRIDGE PLAQUE**

SCALE 1" = 1'-0"



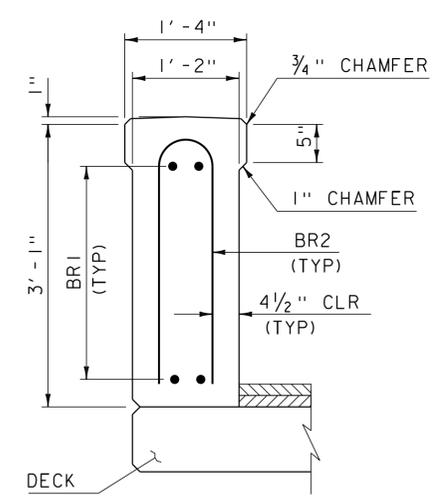
**DETAIL "A"**

SCALE 3" = 1'-0"



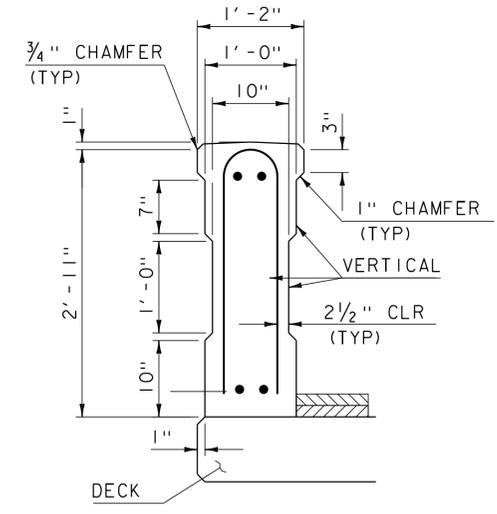
**TYPICAL REINFORCING PLACEMENT**

SCALE 1" = 1'-0"



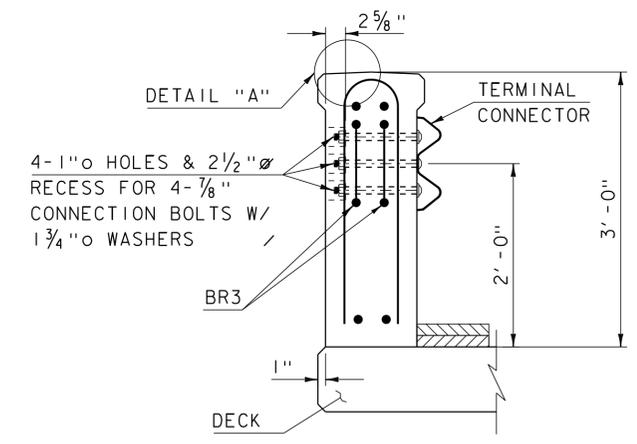
**SECTION A-A**

SCALE 1" = 1'-0"



**SECTION B-B**

SCALE 1" = 1'-0"



**SECTION C-C**

SCALE 1" = 1'-0"

HOLES AND RECESSES ARE TO BE FORMED OR CORED, PERCUSSION DRILLING IS NOT PERMITTED.

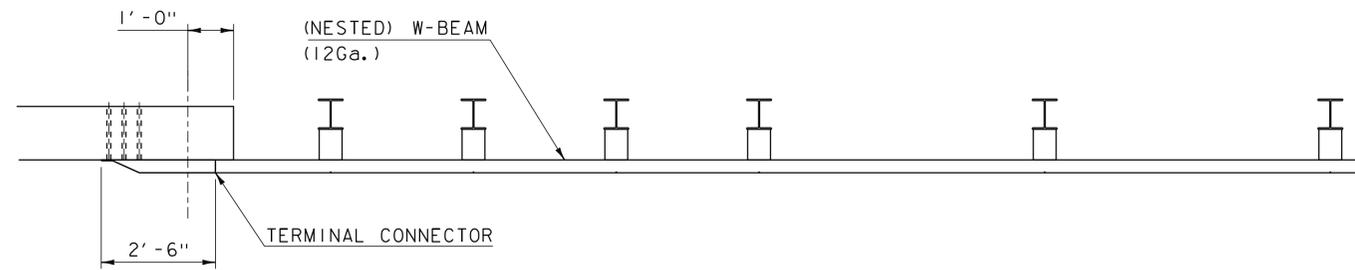
**BRIDGE RAIL REINFORCING CHART**

BAR	SIZE	SPACING	TYPE
BR1	4	9"	2
BR2	4	8"	2
BR3	4	AS SHOWN	2

**NOTES:**

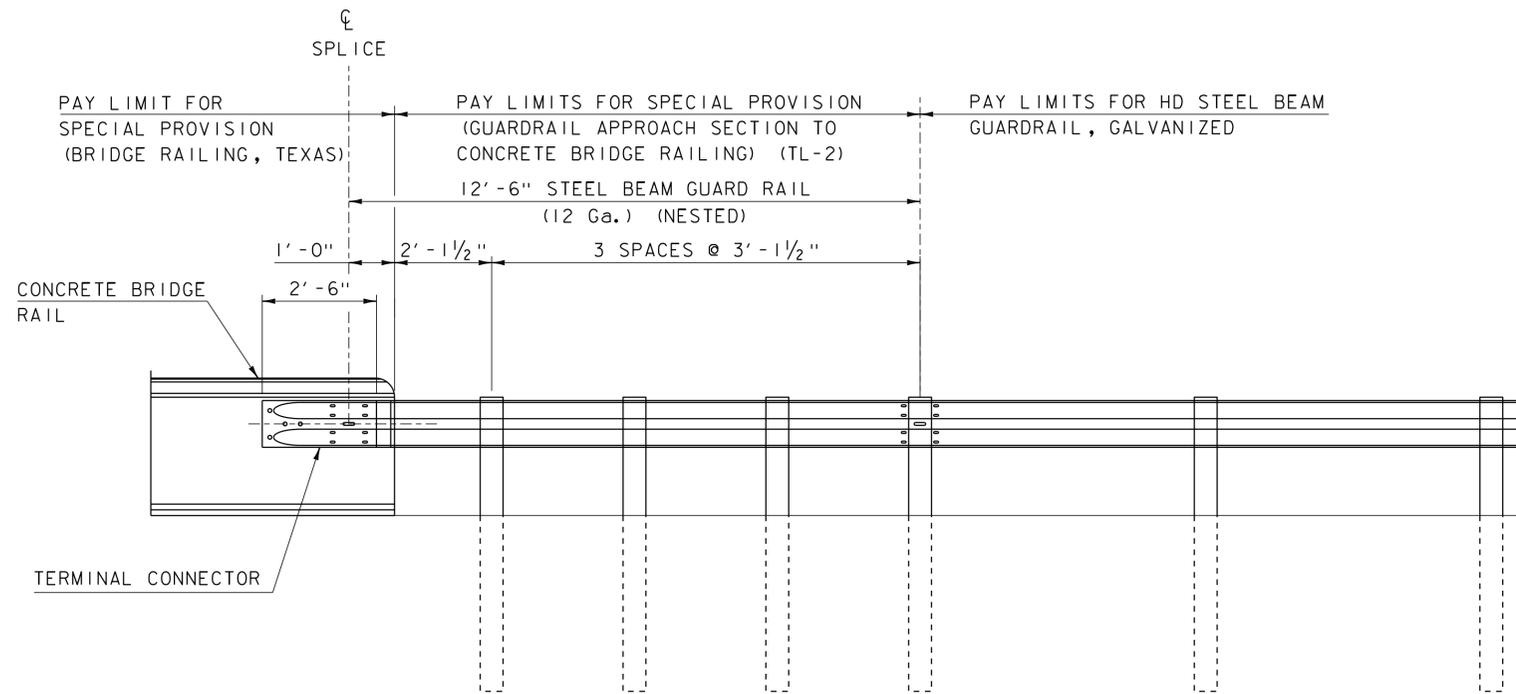
- 2'-1" NUMBER 4 BAR LAP LENGTH
- SUPERSTRUCTURE REINFORCING OMITTED FOR CLARITY
- BRIDGE PLAQUE IS TO BE PLACED ON THE PARAPET OFF OF WINGWALL 2. A BRIDGE PLAQUE AS SHOWN IN SD 502.00 WILL NOT BE REQUIRED. THE BRIDGE PLAQUE WILL BE SUPPLIED BY THE AGENCY OF TRANSPORTATION AND WILL BE CONSIDERED INCIDENTAL TO SPECIAL PROVISION BRIDGE RAIL.
- BRIDGE PLAQUE TO HAVE A 3" BORDER FOR THE AESTHETIC DETAIL.

PROJECT NAME: STRAFFORD	PLOT DATE: 09-MAY-2016
PROJECT NUMBER: BF 0177(10)	DRAWN BY: S. COLEY
FILE NAME: s13j088raildet	CHECKED BY: J. GRIGAS
PROJECT LEADER: K.HIGGINS	SHEET 22 OF 50
DESIGNED BY: S. COLEY	
BRIDGE RAIL DETAIL	



**TYPICAL PLAN VIEW**

SCALE 1/2" = 1'-0"

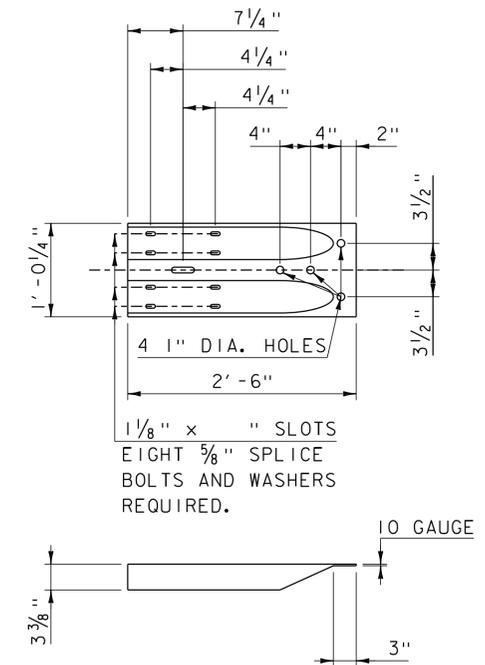


**TYPICAL ELEVATION VIEW**

SCALE 1/2" = 1'-0"

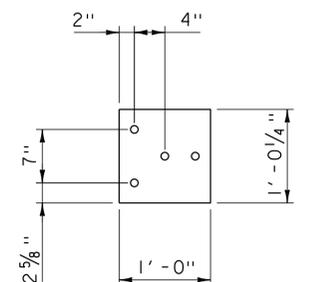
**GENERAL NOTES**

1. A COMPOSITE MATERIAL POST AND/ OR BLOCKOUT FROM THE APPROVED PRODUCTS LIST MAY BE SUBSTITUTED FOR A POST AND/ OR BLOCKOUT OF SIMILAR DIMENSIONS
2. REFER TO STANDARD DRAWINGS G-1 AND G-ID FOR ADDITIONAL DETAILS
3. THE TERMINAL CONNECTOR SHALL BE INCLUDED IN THE BID PRICE FOR ITEM 900.620 "SPECIAL PROVISION (GUARDRAIL APPROACH SECTION TO CONCRETE BRIDGE RAILING) (TL-2)". THE CONNECTION PLATE SHALL BE INCLUDED IN THE BID PRICE FOR ITEM 900.640 "SPECIAL PROVISION (BRIDGE RAILING, TEXAS)".



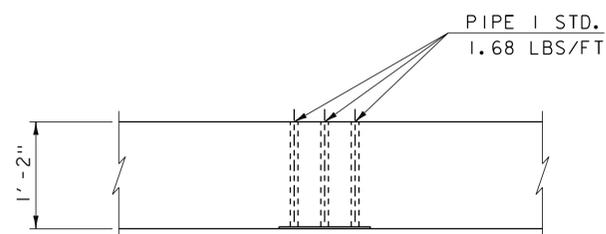
**TERMINAL CONNECTOR**

SCALE 1" = 1'-0"



**CONNECTION PLATE  
DETAIL - ELEVATION**

SCALE 1" = 1'-0"



**CONNECTION PLATE  
DETAIL - PLAN**

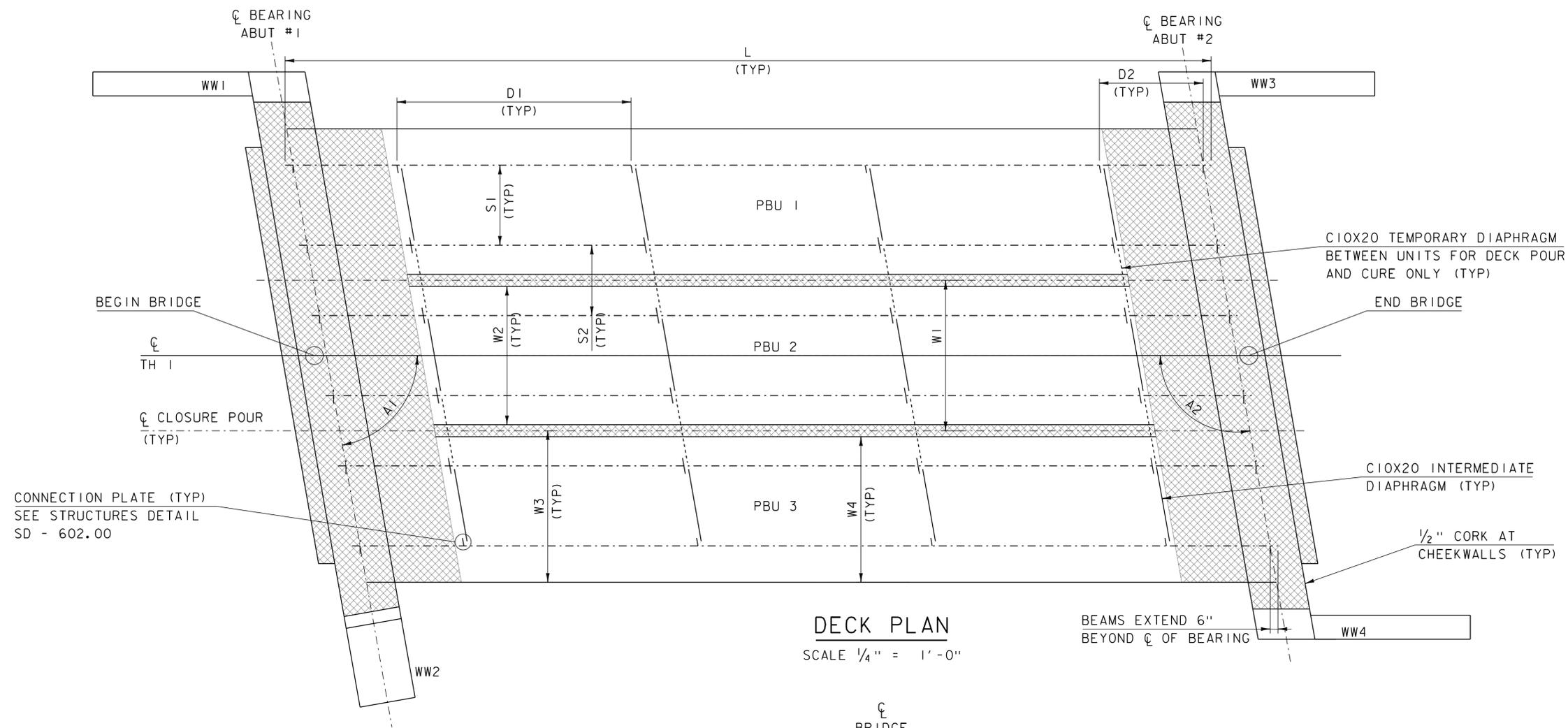
SCALE 1" = 1'-0"

PROJECT NAME: STRAFFORD

PROJECT NUMBER: BF 0177(10)

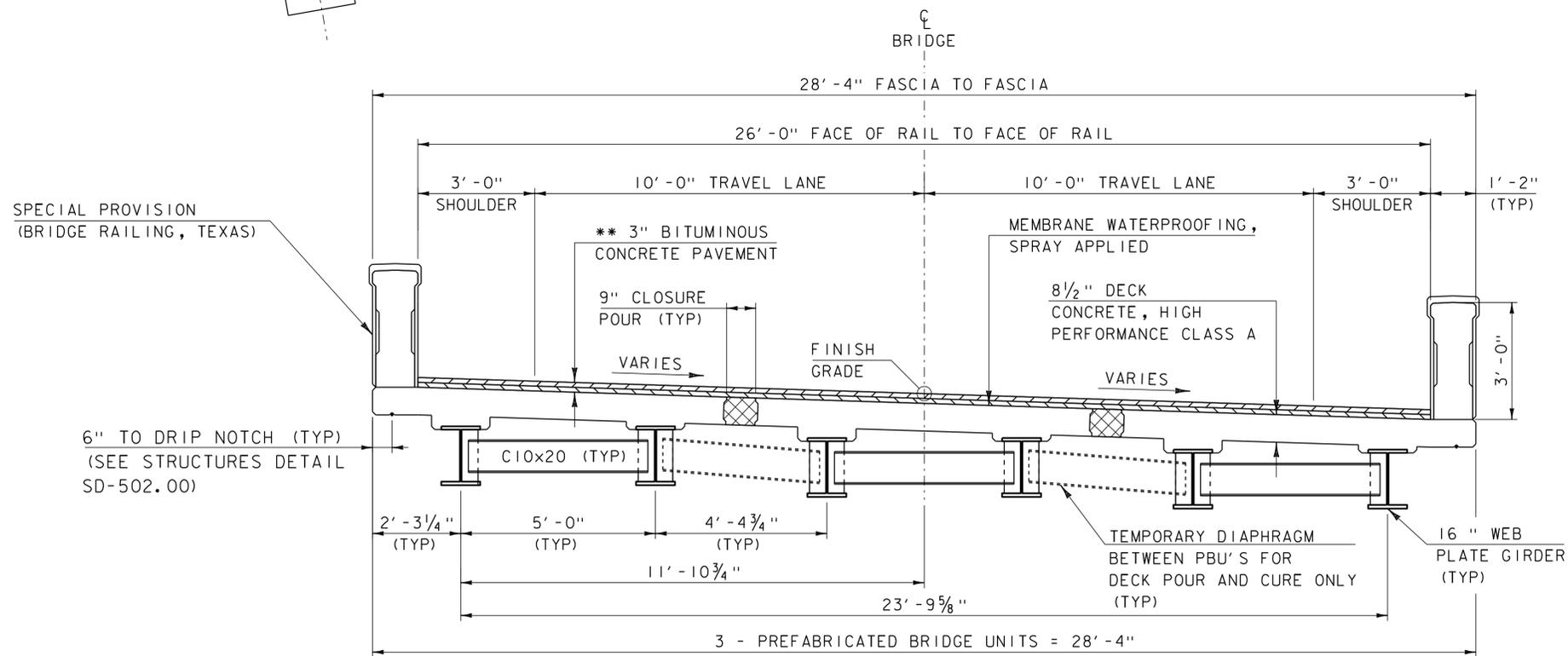
FILE NAME: s13j088railde+  
PROJECT LEADER: K. HIGGINS  
DESIGNED BY: J. GRIGAS  
TRANSITION RAIL DETAILS

PLOT DATE: 09-MAY-2016  
DRAWN BY: S. COLEY  
CHECKED BY: J. GRIGAS  
SHEET 23 OF 50



L	58' - 0"
W1	9' - 4 3/4"
W2	8' - 7 3/4"
W3	9' - 5 3/4"
W4	9' - 1 1/8"
S1	5' - 0"
S2	4' - 4 3/4"
D1	14' - 8"
D2	6' - 6"

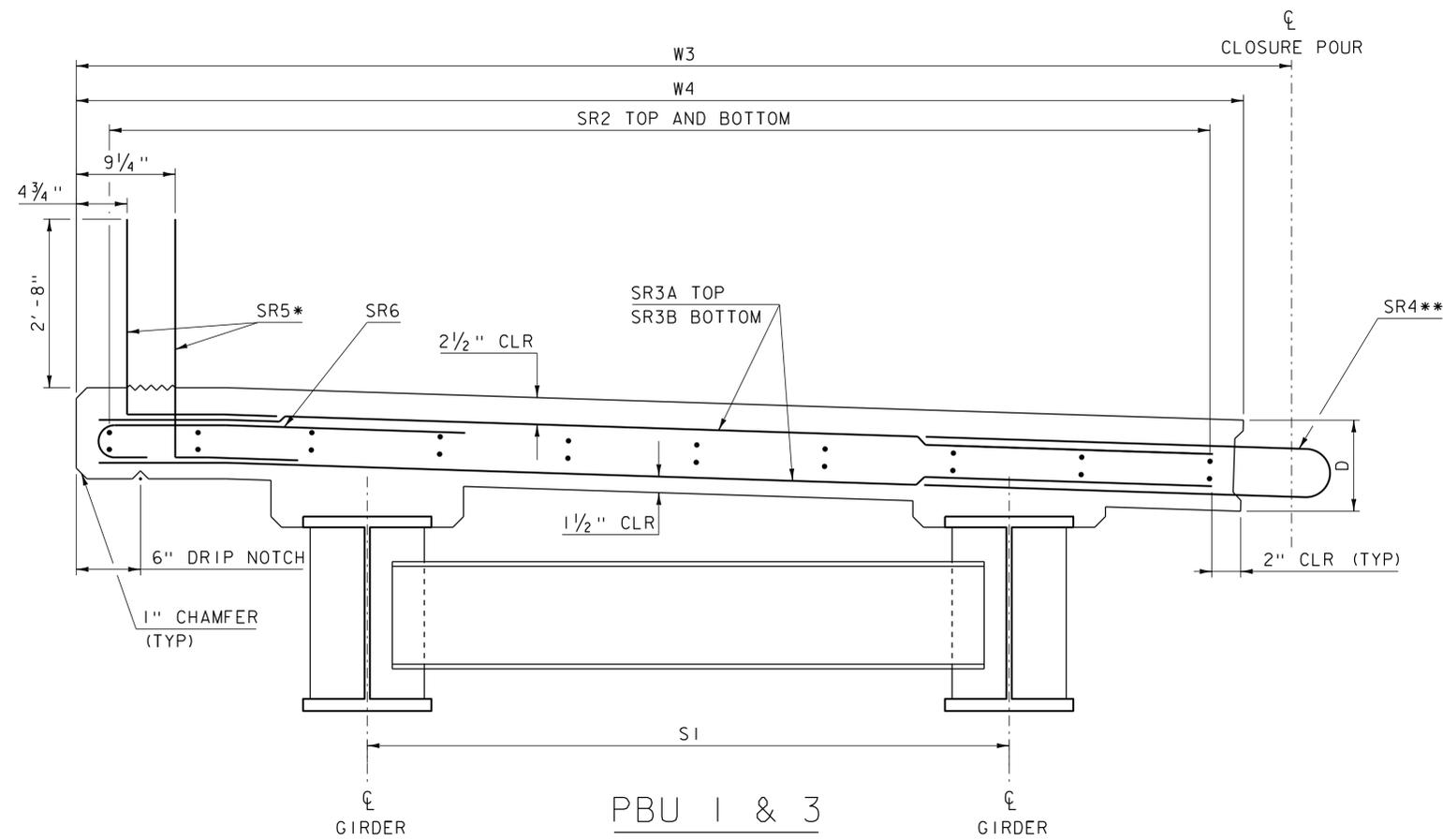
SKEW	A1	80°
	A2	100°



- SPECIAL PROVISION (HIGH PERFORMANCE CONCRETE, RAPID SET)
- SPECIAL PROVISION (BITUMINOUS CONCRETE PAVEMENT, SMALL QUANTITY)\*

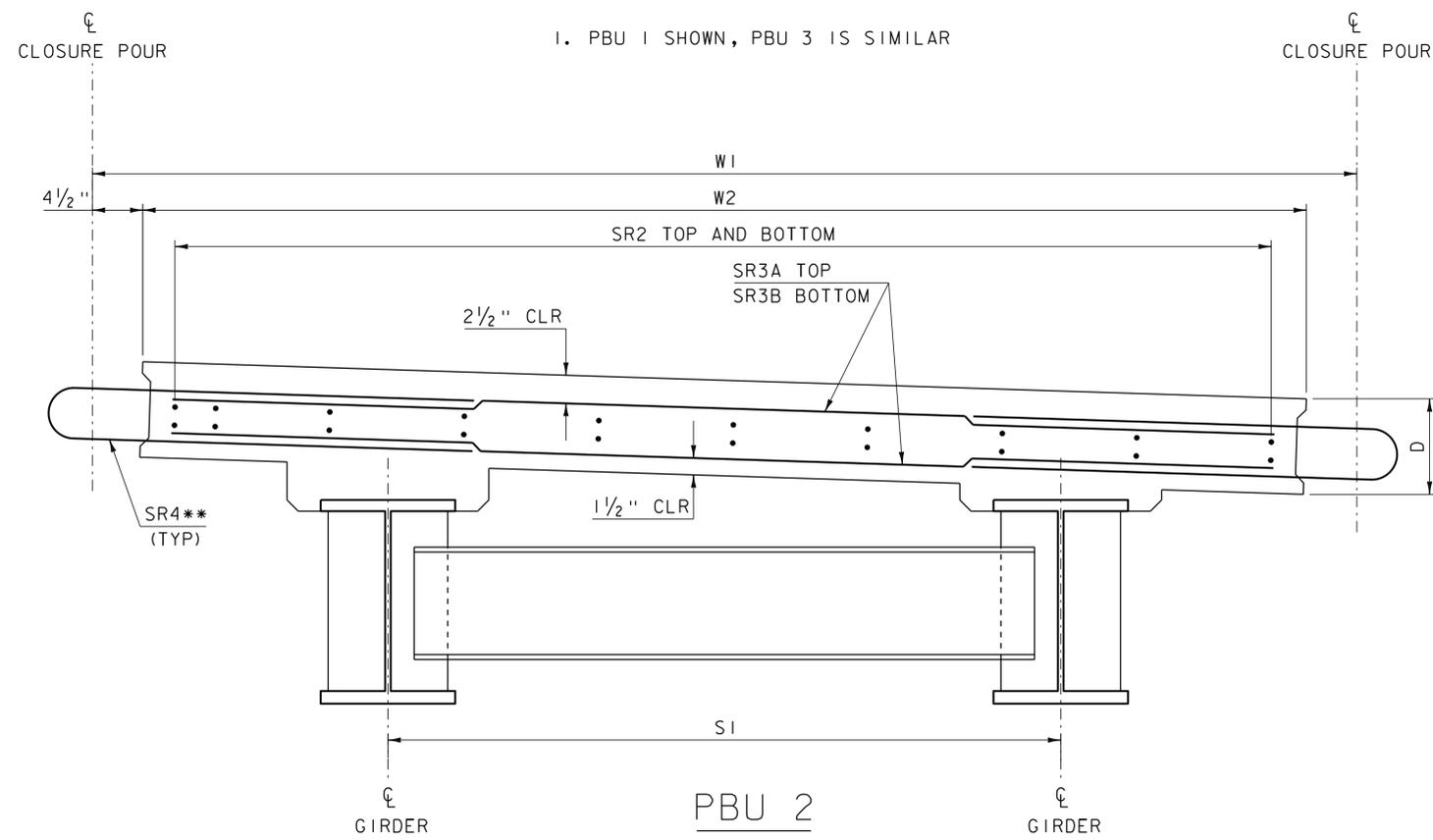
\*\* 1 1/2" SUPERPAVE BITUMINOUS CONCRETE PAVEMENT TYPE IVB, OVER  
1 1/2" SUPERPAVE BITUMINOUS CONCRETE PAVEMENT TYPE IVB

PROJECT NAME:	STRAFFORD	PLOT DATE:	09-MAY-2016
PROJECT NUMBER:	BF 0177(10)	DRAWN BY:	T. MATTHEWS
FILE NAME:	sl3j08sup.dgn	CHECKED BY:	J. GRIGAS
PROJECT LEADER:	K. HIGGINS	FRAMING PLAN	SHEET 24 OF 50
DESIGNED BY:	T. MATTHEWS		



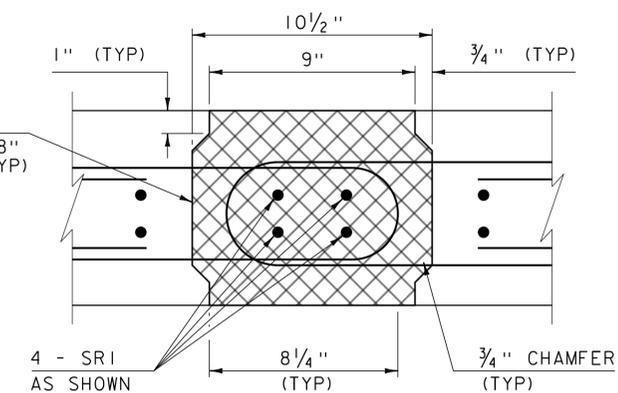
**PBU 1 & 3**  
SCALE = 1/2" = 1'-0"

NOTE:  
1. PBU 1 SHOWN, PBU 3 IS SIMILAR



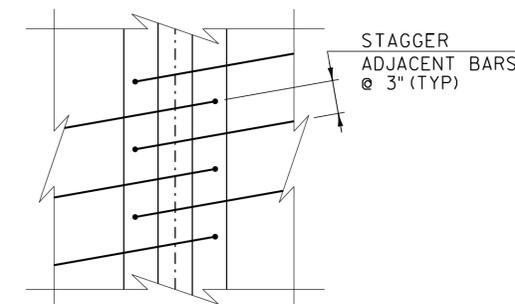
**PBU 2**  
SCALE = 1/2" = 1'-0"

CLOSURE POUR  
EXPOSED AGGREGATE 1/8"  
MINIMUM AMPLITUDE (TYP)



**CONNECTION DETAIL SECTION**

NOT TO SCALE



**CONNECTION DETAIL PLAN**

NOT TO SCALE

**PBU BEAM REINFORCING CHART**

BAR	SIZE	SPACING	TYPE
SR1	4	AS SHOWN	STR
SR2	5	9"	STR
SR3A	4	6"	STR
SR3B	4	6"	STR
SR4	4	6"	SII
SR5	4	8"	2
SR6	4	12"	1

**PBU BEAM DIMENSIONS**

D	8 1/2"
W1	9' - 4 3/4"
W2	8' - 7 3/4"
W3	9' - 5 3/4"
W4	9' - 1 1/8"
S1	5' - 0"

**NOTE:**

- \* VERTICAL LEGS TO BE SET PLUM IN FINAL CONDITION
- \*\* TO BE STAGGERED WITH ADJACENT BEAM
- 3" CLEAR, UNLESS OTHERWISE SPECIFIED ON THE PLANS
- 2' - 7" #5 BAR LAP LENGTH
- 2' - 1" #4 BAR LAP LENGTH

PROJECT NAME: STRAFFORD

PROJECT NUMBER: BF 0177(10)

FILE NAME: s13j088sup.dgn

PROJECT LEADER: K. HIGGINS

DESIGNED BY: T. MATTHEWS

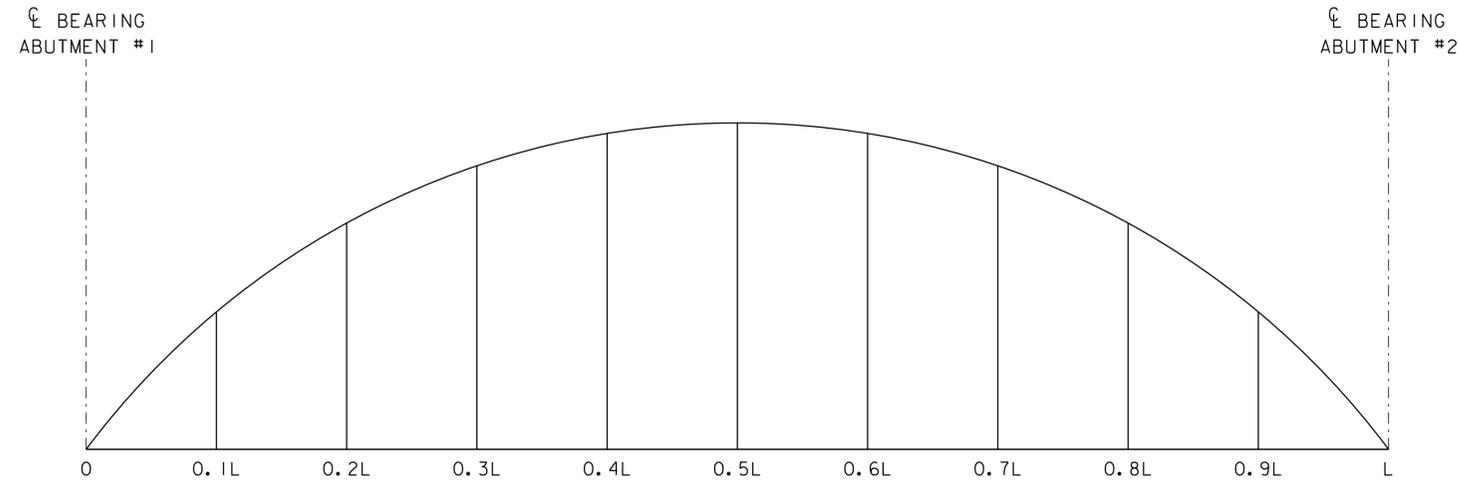
PBU DETAILS 1

PLOT DATE: 09-MAY-2016

DRAWN BY: T. MATTHEWS

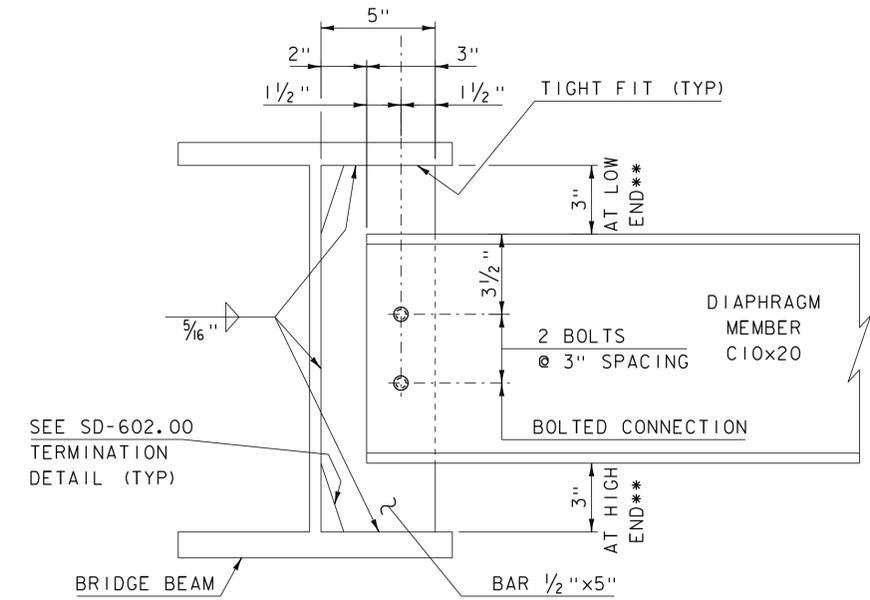
CHECKED BY: J. GRIGAS

SHEET 25 OF 50



CAMBER DIAGRAM

NOT TO SCALE  
SEE TABLES BELOW



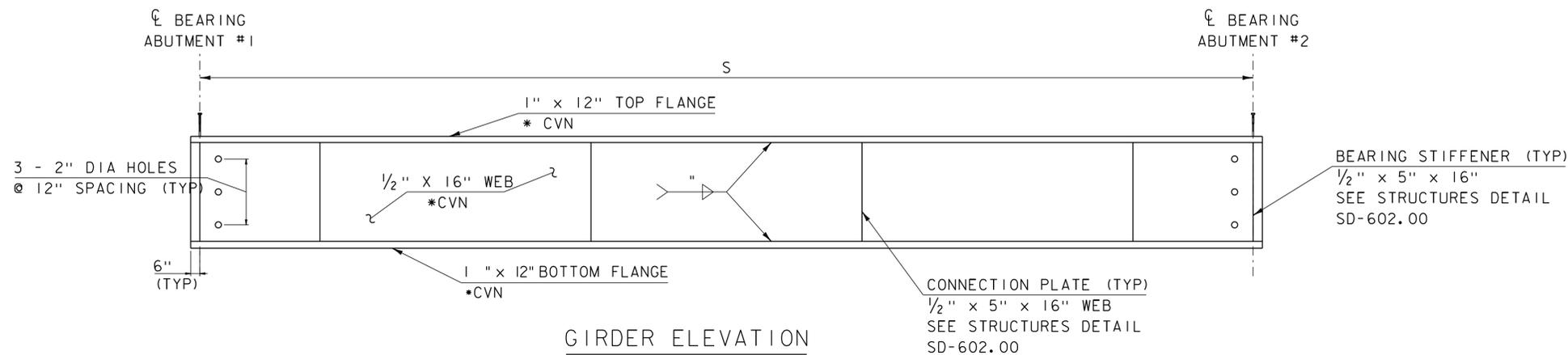
DIAPHRAGM DETAIL

SCALE 3" = 1'-0"

	0	0.1L	0.2L	0.3L	0.4L	0.5L	0.6L	0.7L	0.8L	0.9L	L
Steel Deflection	0	3/16	5/16	7/16	1/2	1/2	1/2	7/16	5/16	3/16	0
Slab & Super Deflection	0	13/16	1 1/2	2 1/16	2 3/8	2 1/2	2 3/8	2 1/16	1 1/2	13/16	0
Total Deflection	0	15/16	1 13/16	2 1/2	2 7/8	3 1/16	2 7/8	2 1/2	1 13/16	15/16	0
Residual Camber	0	3/8	5/8	13/16	15/16	1	15/16	13/16	5/8	3/8	0
Total Camber	0	1 5/16	2 7/16	3 5/16	3 7/8	4 1/16	3 7/8	3 5/16	2 7/16	1 5/16	0

WELDED SHEAR STUD CONNECTOR TABLE (S)

GIRDER	SIZE	SPACING
G1	7/8" X 8"	10"
G2	7/8" X 7"	10"
G3	7/8" X 8"	10"
G4	7/8" X 7"	10"
G5	7/8" X 8"	10"
G6	7/8" X 7"	10"

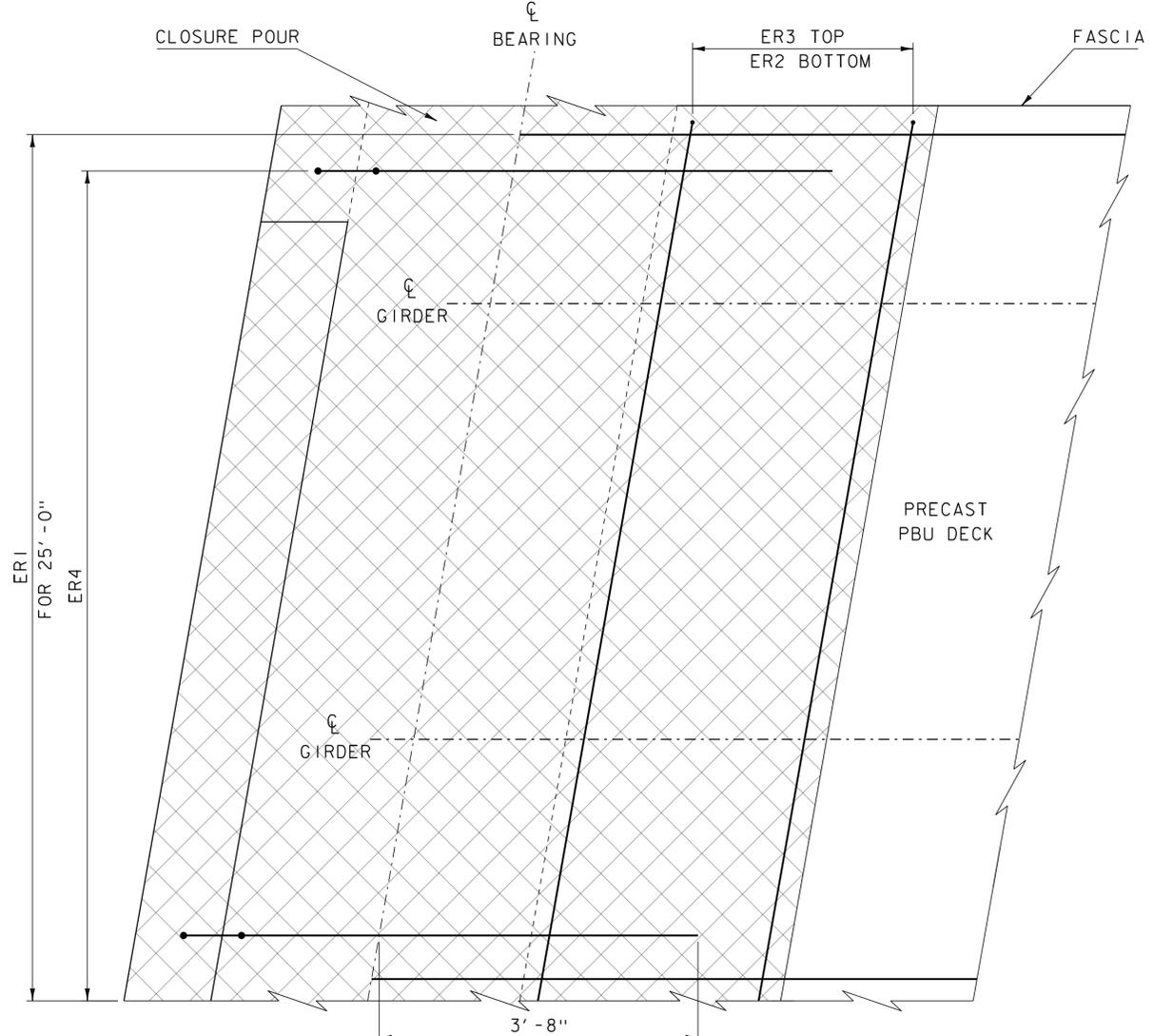


GIRDER ELEVATION

SCALE: HORIZ: 1/4" = 1'-0"  
VERT: 1" = 1'-0"

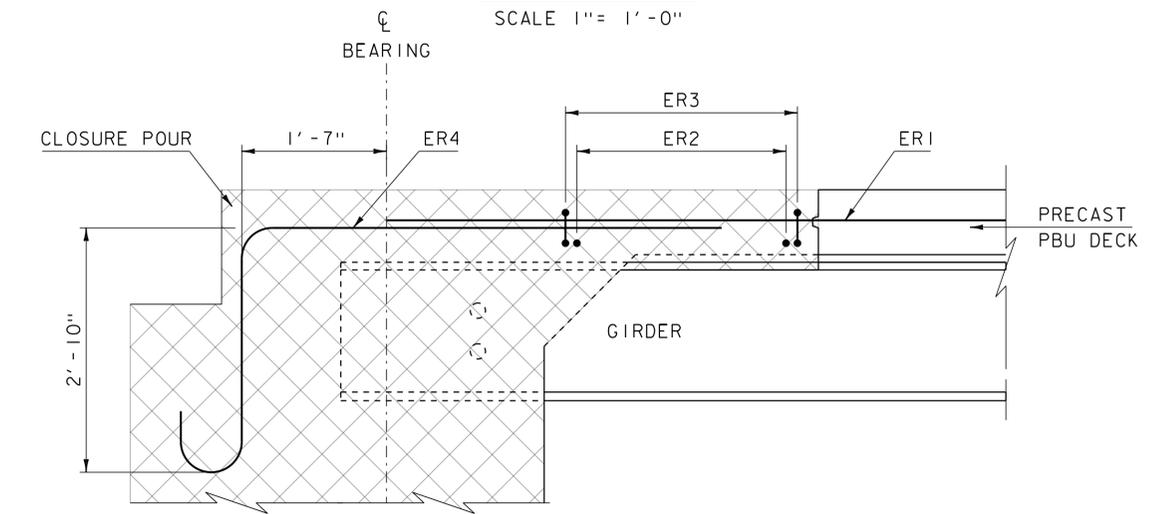
- \* CVN DENOTES THAT CHARPY V-NOTCH TEST IS REQUIRED
- \*\* TEMPORARY DIAPHRAGMS TO BE SLOPED IN ORDER TO MAINTAIN CLEARANCE

PROJECT NAME: STRAFFORD	PLOT DATE: 09-MAY-2016
PROJECT NUMBER: BF 0177(10)	DRAWN BY: T. MATTHEWS
FILE NAME: s13j088sup.dgn	CHECKED BY: J. GRIGAS
PROJECT LEADER: K. HIGGINS	SHEET 26 OF 50
DESIGNED BY: T. MATTHEWS	
PBU DETAILS 2	



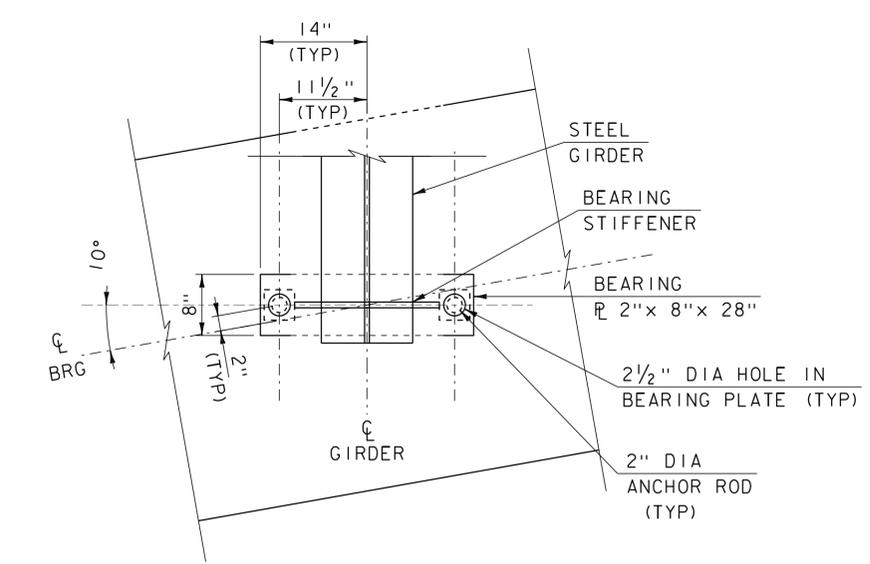
ADDITIONAL END REINFORCING  
PLAN VIEW

SCALE 1" = 1'-0"



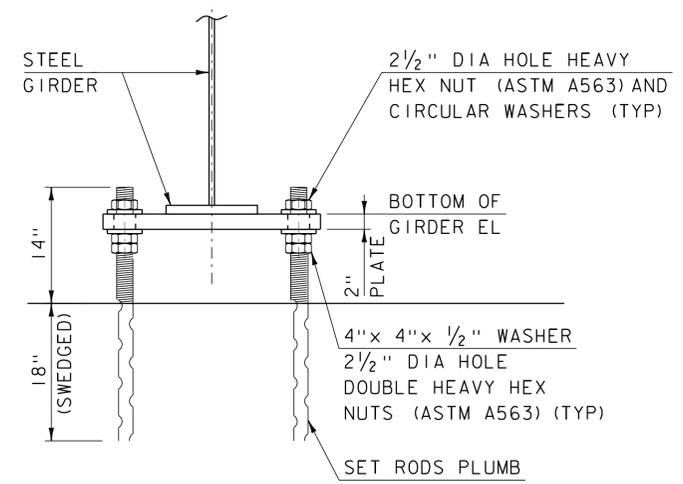
ADDITIONAL END REINFORCING  
ELEVATION VIEW

SCALE 1" = 1'-0"



TEMPORARY BEARING ASSEMBLY PLAN

SCALE 1" = 1'-0"



TEMPORARY BEARING ASSEMBLY ELEVATION

SCALE 1" = 1'-0"

TEMPORARY BEARING NOTES

1. PAYMENT FOR TEMPORARY BEARING ASSEMBLIES WILL BE CONSIDERED INCIDENTAL TO THE APPROPRIATE PRECAST CONCRETE ABUTMENT ITEMS.
2. BEARING PLATES SHALL BE LEVEL PRIOR TO SETTING PREFABRICATED BRIDGE UNITS. ELEVATIONS SHALL BE ADJUSTED TO WITHIN 0.01FT OF ELEVATIONS NOTED DURING OFF-SITE FABRICATION OF THE UNITS.
3. BEARING PLATE STEEL SHALL CONFORM TO SUBSECTION 714.03. ANCHOR RODS SHALL MEET THE REQUIREMENTS OF SUBSECTION 714.08, AND SHALL BE GRADE 55.

BOTTOM OF GIRDER ELEVATIONS		
GIRDER	ABUTMENT #1	ABUTMENT #2
G1	886.28	885.39
G2	886.28	885.39
G3	886.00	884.95
G4	886.00	884.95
G5	885.72	884.50
G6	885.72	884.50

ADDITIONAL END REINFORCING CHART

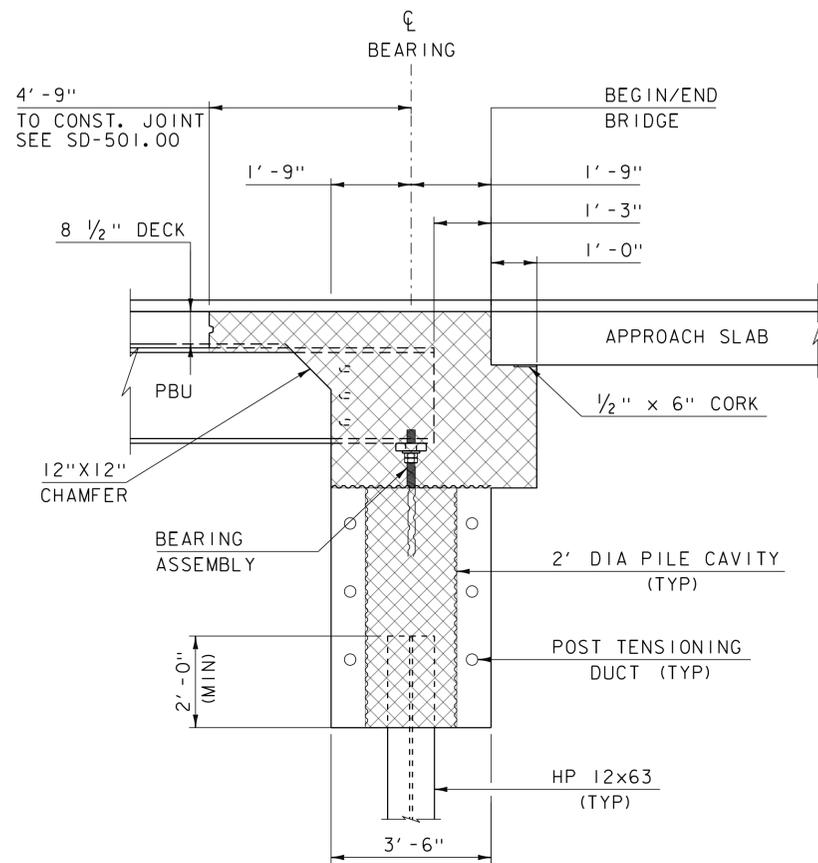
BAR	SIZE	SPACING	TYPE
ER1	5	9"	STR
ER2	4	6"	STR
ER3	4	6"	I
ER4	8	6"	I8

\* BAR LABELED SR2 IS OMITTED FOR CLARITY ALONG WITH BARS DETAILED IN PBU ABUTMENT REINFORCING SHEET AND PBU CLOSURE POUR REINFORCING SHEET.

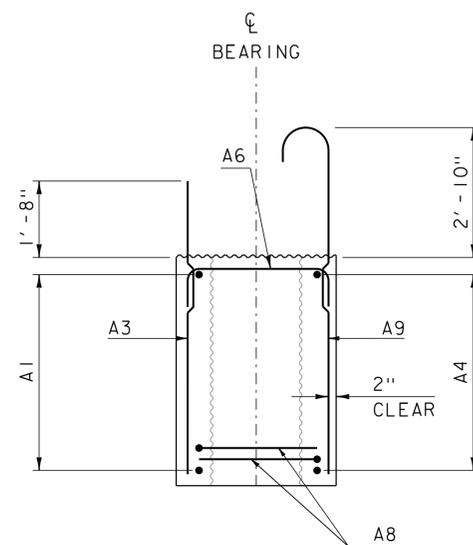
SPECIAL PROVISION (HIGH PERFORMANCE CONCRETE, RAPID SET)

NOTE:  
 NF = NEAR FACE  
 FF = FAR FACE  
 EF = EACH FACE  
 3" CLEAR, UNLESS OTHERWISE SPECIFIED ON THE PLANS.  
 2'-7" BAR LAP UNLESS OTHERWISE SPECIFIED ON THE PLANS.

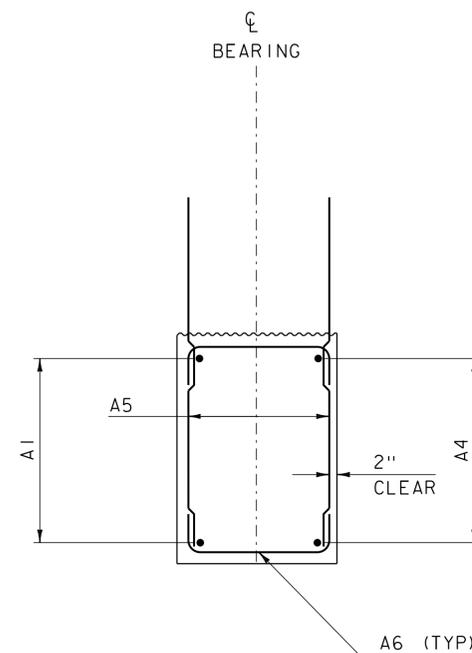
PROJECT NAME: STRAFFORD	PLOT DATE: 09-MAY-2016
PROJECT NUMBER: 0177(10)	DRAWN BY: T MATTHEWS
FILE NAME: s13j088sup.dgn	CHECKED BY: J. GRIGAS
PROJECT LEADER: K HIGGINS	SHEET 27 OF 50
DESIGNED BY: T MATTHEWS	
PBU AND BEARING DETAILS 3	



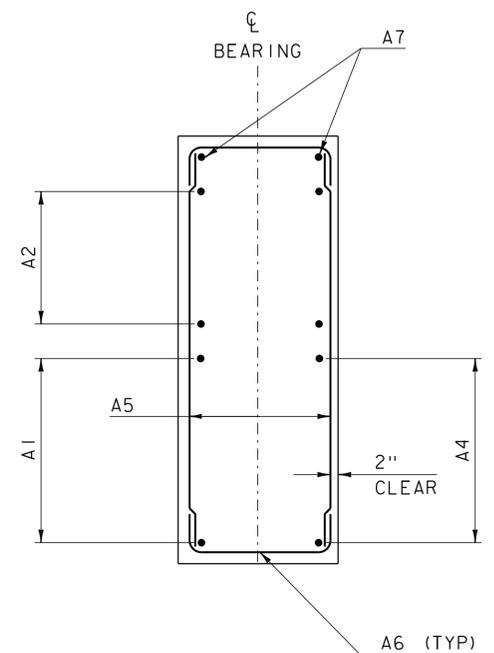
ABUTMENT TYPICAL  
NOT TO SCALE



ABUTMENT REINFORCING AT BRIDGE SEAT  
NOT TO SCALE



ABUTMENT REINFORCING AT CAST IN PLACE CHEEK WALL  
NOT TO SCALE



ABUTMENT REINFORCING AT PRECAST CHEEK WALL  
NOT TO SCALE

**NOTE:**

- SEE ABUTMENT REINFORCING SHEET FOR REINFORCING TABLE.

**NOTE:**

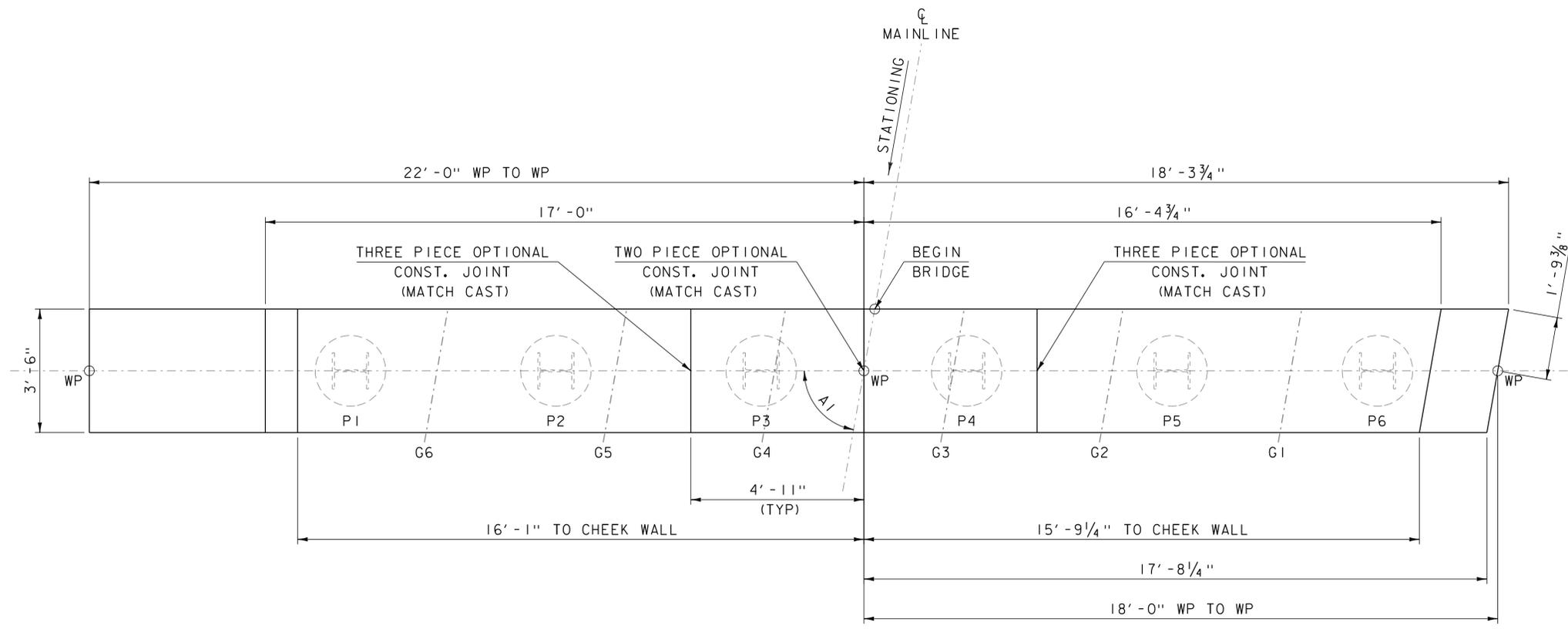
- NF = NEAR FACE
- FF = FAR FACE
- EF = EACH FACE
- 3" CLEAR, UNLESS OTHERWISE SPECIFIED ON THE PLANS.
- 6" LEG LENGTH FOR BAR LABELED A6 SPECIFIED ON THE PLANS.

SPECIAL PROVISION (HIGH PERFORMANCE CONCRETE, RAPID SET)

PROJECT NAME: STRAFFORD  
PROJECT NUMBER: BF 0177(10)

FILE NAME: s13j088subl.dgn  
PROJECT LEADER: K. HIGGINS  
DESIGNED BY: J. GRIGAS  
ABUTMENT TYPICALS

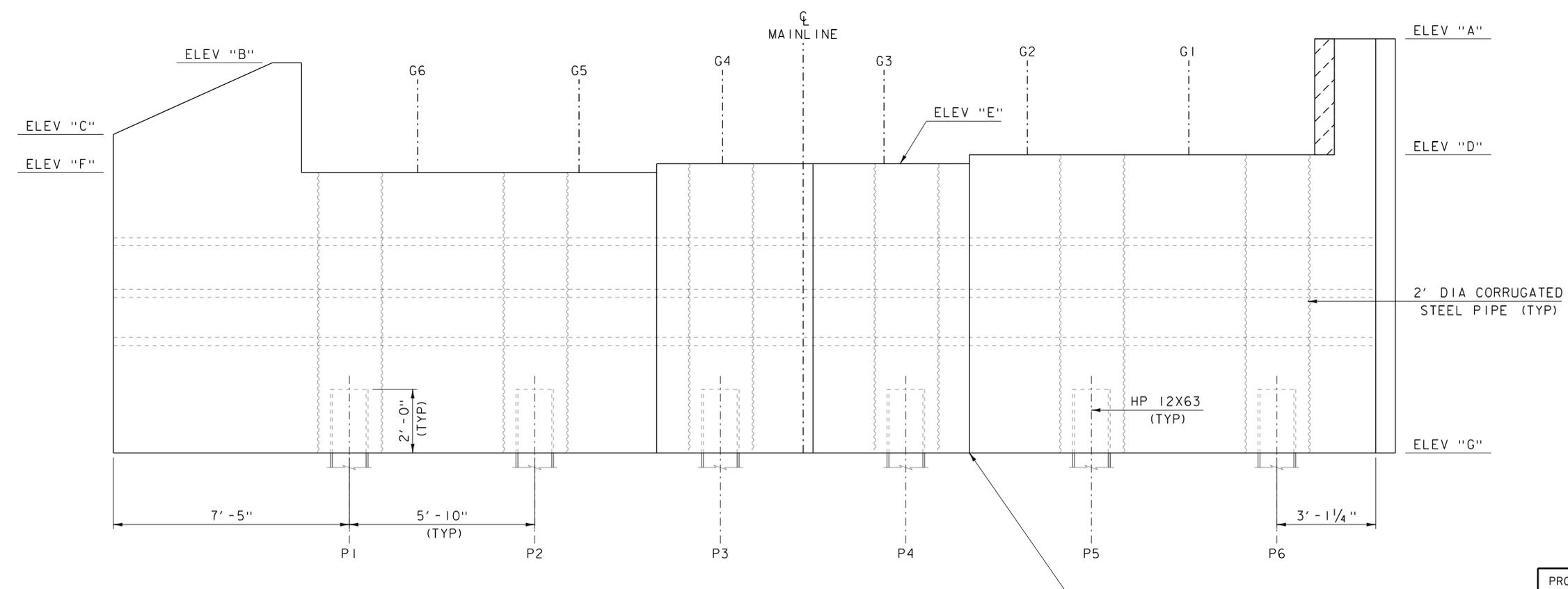
PLOT DATE: 09-MAY-2016  
DRAWN BY: J. GRIGAS  
CHECKED BY: G. LAROCHE  
SHEET 28 OF 50



ABUTMENT ELEVATIONS

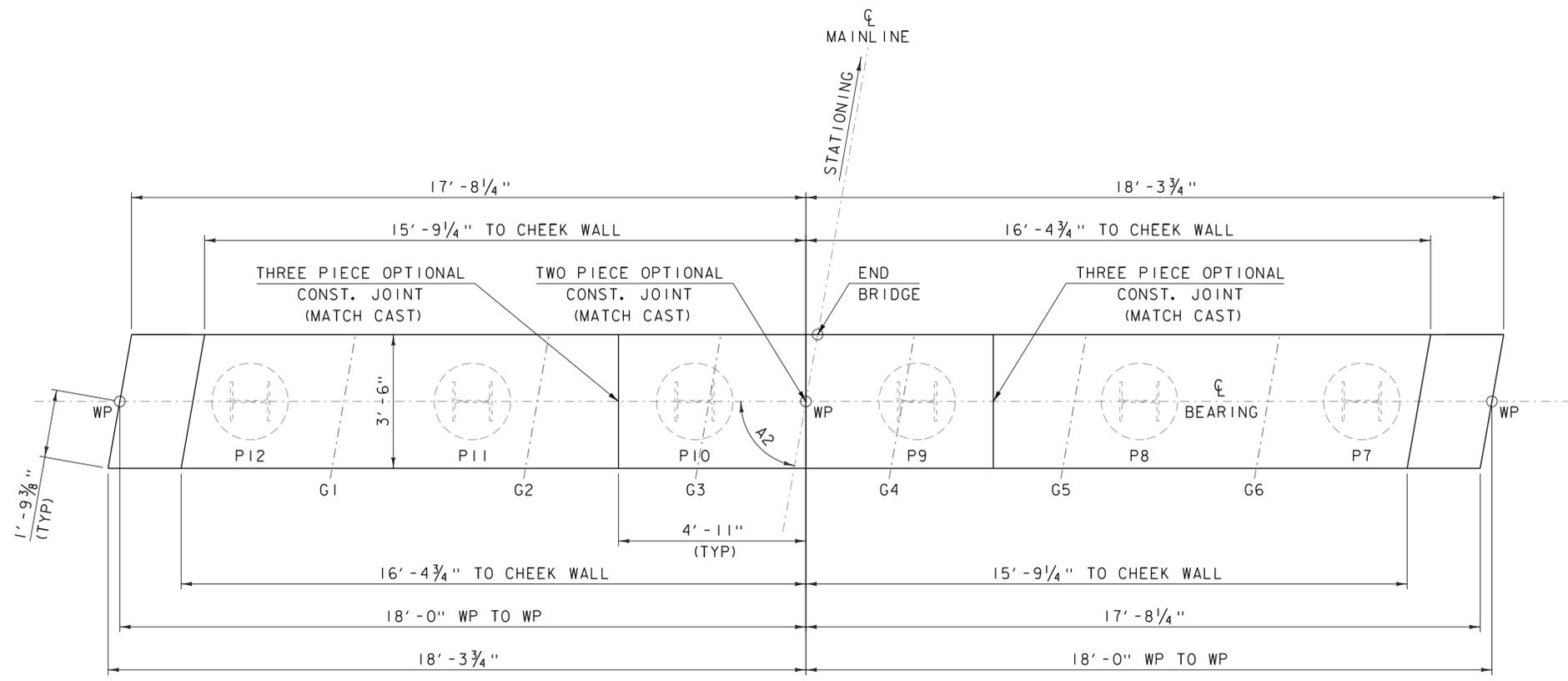
	AB 2
ANGLE "A1"	80°
ELEV "A"	889.25
ELEV "B"	888.50
ELEV "C"	886.25
ELEV "D"	885.61
ELEV "E"	885.33
ELEV "F"	885.05
ELEV "G"	876.25

ABUTMENT I PLAN (PCU I)  
SCALE 1/2" = 1'-0"



ABUTMENT I PLAN (PCU I)  
SCALE 1/2" = 1'-0"

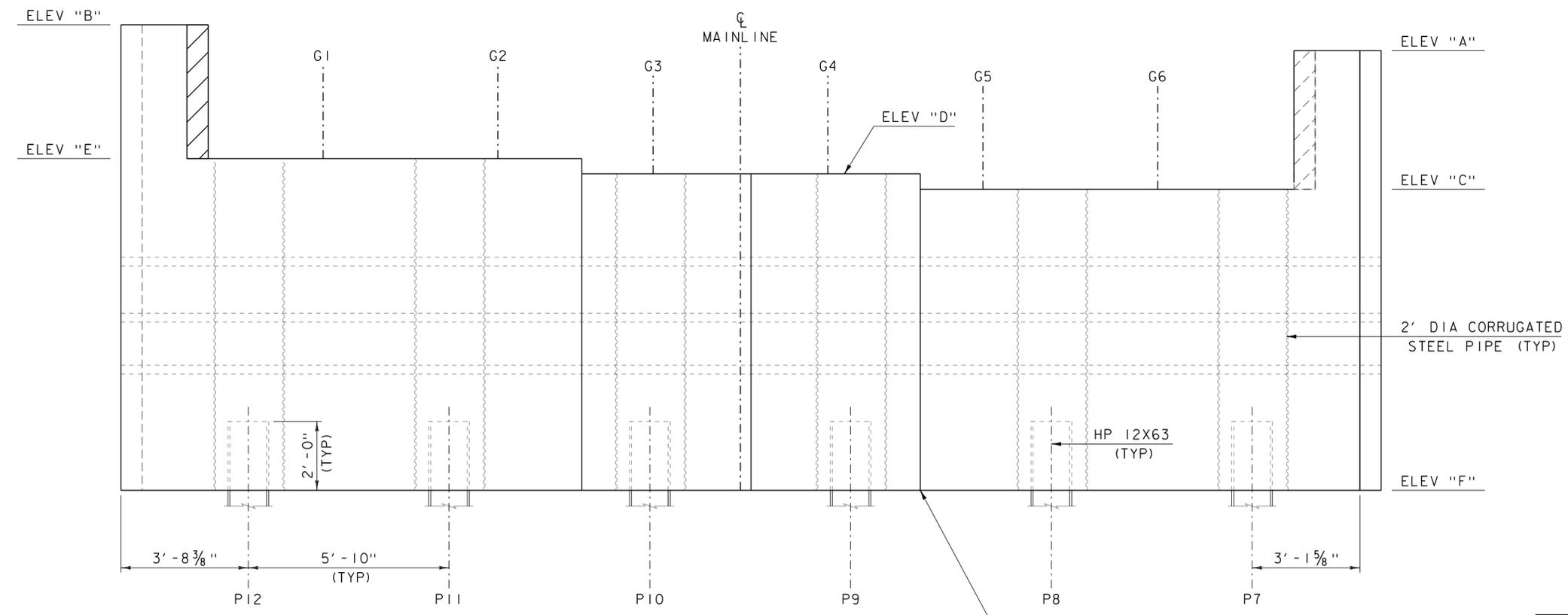
PROJECT NAME:	STRAFFORD	PLOT DATE:	09-MAY-2016
PROJECT NUMBER:	BF 0177(10)	DRAWN BY:	J. GRIGAS
FILE NAME:	sl3j088subl.dgn	CHECKED BY:	G. LAROCHE
PROJECT LEADER:	K. HIGGINS	SHEET	29 OF 50
DESIGNED BY:	J. GRIGAS		
ABUTMENT I PLAN			



ABUTMENT ELEVATIONS

	AB 2
ANGLE "A2"	80°
ELEV "A"	887.85
ELEV "B"	888.60
ELEV "C"	883.83
ELEV "D"	884.28
ELEV "E"	884.72
ELEV "F"	875.10

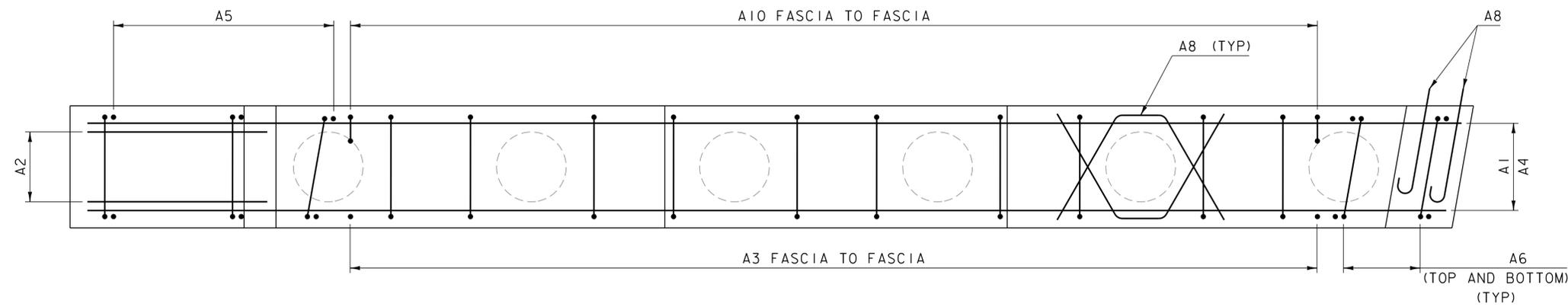
ABUTMENT 2 PLAN (PCU 2)  
SCALE 1/2" = 1'-0"



ABUTMENT 2 PLAN (PCU 2)  
SCALE 1/2" = 1'-0"

APPLY JOINT SEALER, POLYURETHANE TO MATCH CAST JOINT (FAR FACE) (TYP)

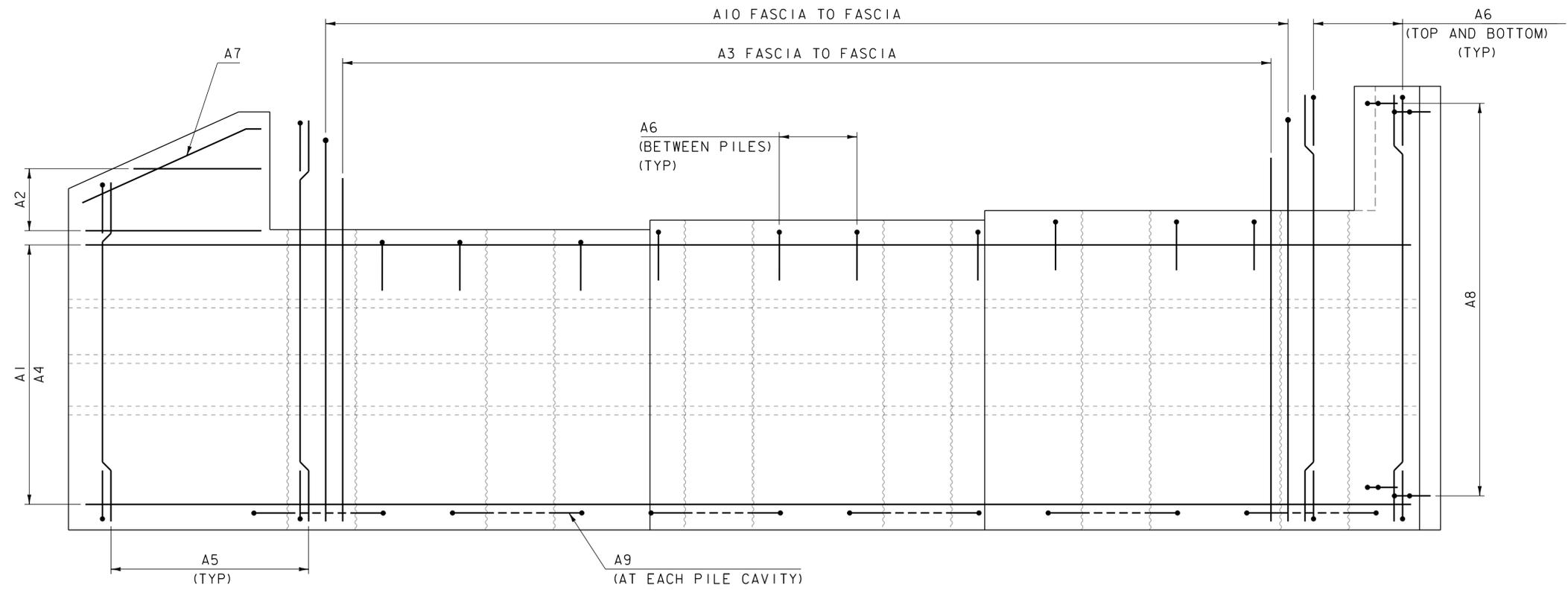
PROJECT NAME:	STRAFFORD	PLOT DATE:	09-MAY-2016
PROJECT NUMBER:	BF 0177(10)	DRAWN BY:	J. GRIGAS
FILE NAME:	sl3j088sub2.dgn	CHECKED BY:	G. LAROCHE
PROJECT LEADER:	K. HIGGINS	SHEET	30 OF 50
DESIGNED BY:	J. GRIGAS		
ABUTMENT 2 PLAN			



ABUTMENT I REINFORCING PLAN (PCU I)  
SCALE 1/2" = 1'-0"

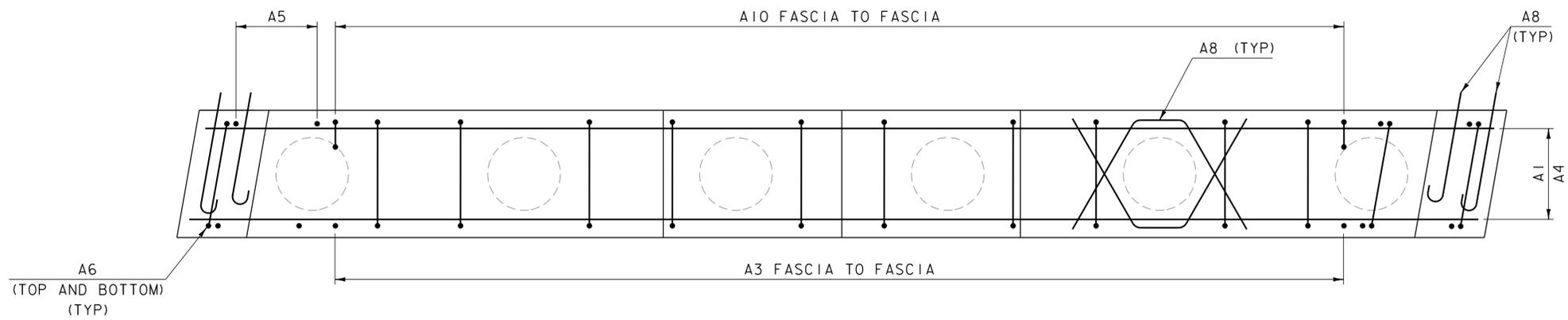
ABUTMENT REINFORCING

BAR	SIZE	SPACING	FACE	TYPE
A1	5	9"	NF	STR
A2	5	9"	EF	STR
A3	5	12"	NF	STR
A4	5	9"	FF	STR
A5	5	9"	EF	STR
A6	5	9"	---	S10
A7	5	AS SHOWN	EF	19
A8	5	9"	EF	1
A9	6	AS SHOWN	EF	14
A10	8	6	FF	1

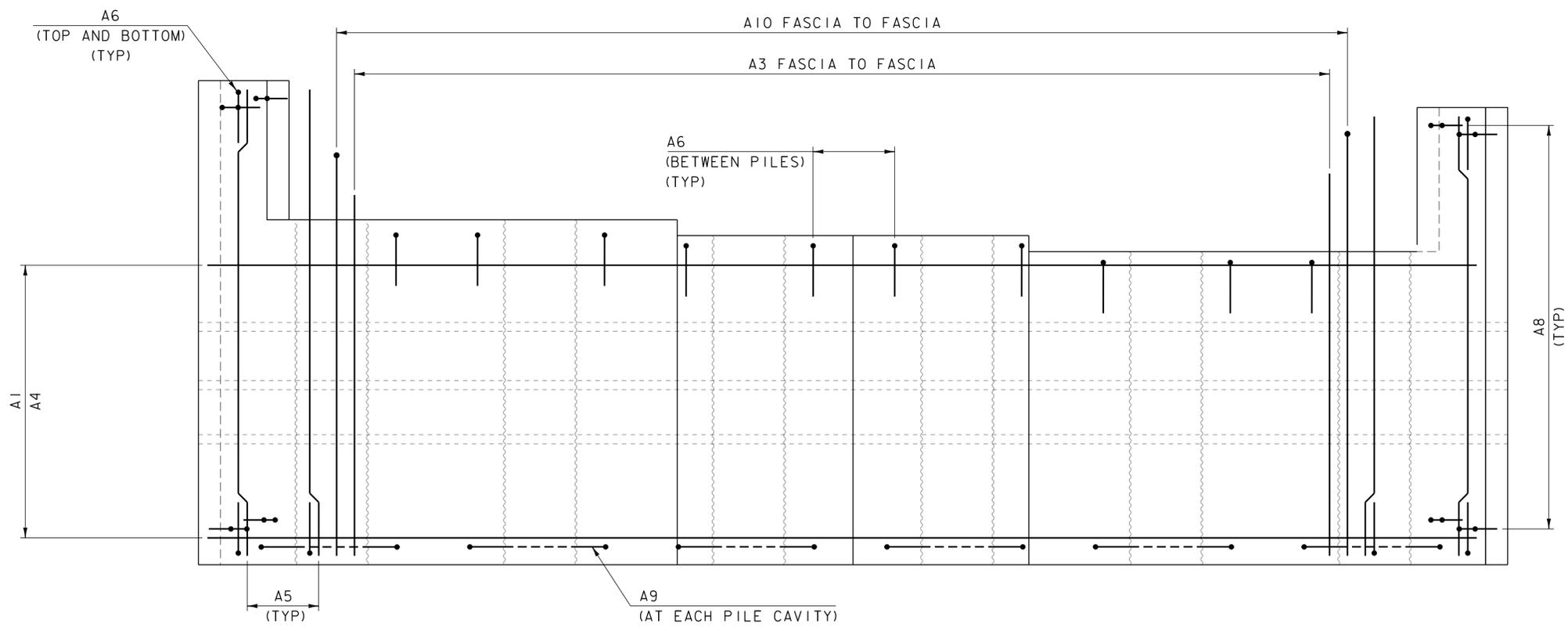


ABUTMENT I REINFORCING ELEVATION (PCU I)  
SCALE 1/2" = 1'-0"

PROJECT NAME:	STRAFFORD	PLOT DATE:	09-MAY-2016
PROJECT NUMBER:	BF 0177(10)	DRAWN BY:	J. GRIGAS
FILE NAME:	sl3j088subl.dgn	CHECKED BY:	G. LAROCHE
PROJECT LEADER:	K. HIGGINS	SHEET	31 OF 50
DESIGNED BY:	J. GRIGAS		
ABUTMENT I REINFORCING			



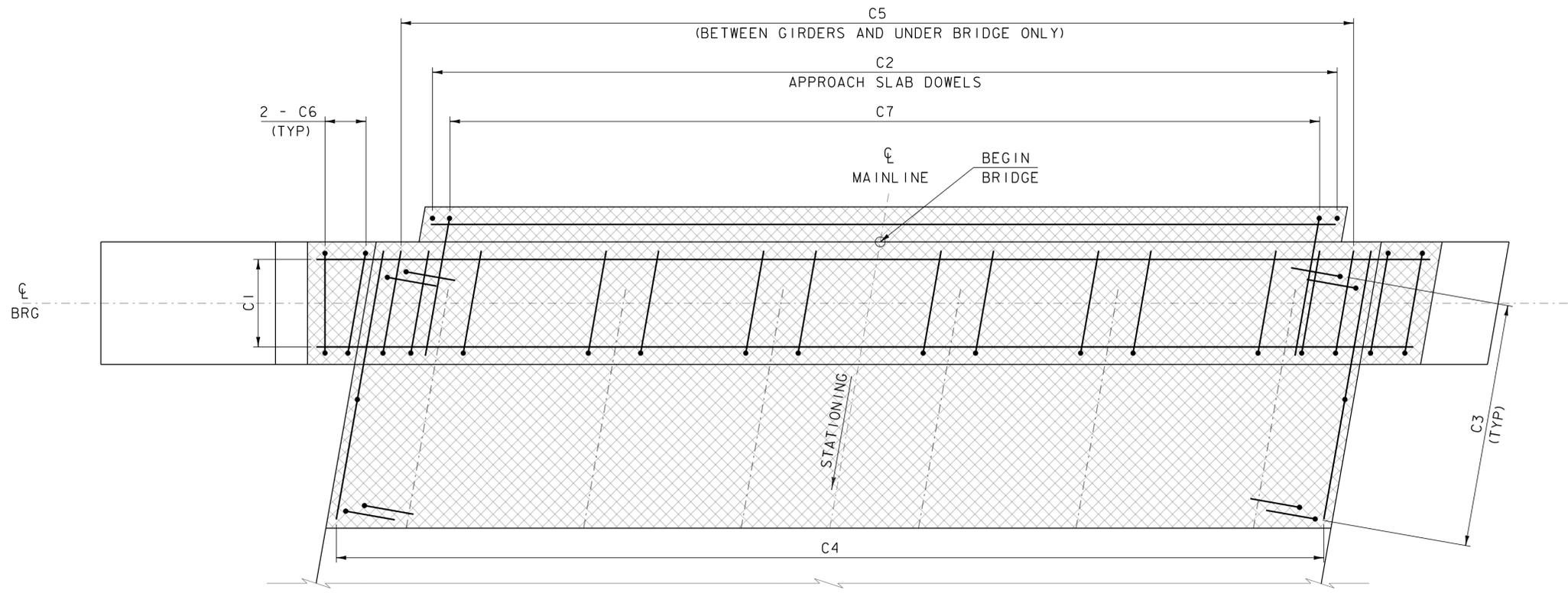
ABUTMENT 2 REINFORCING PLAN (PCU 1)  
SCALE 1/2" = 1'-0



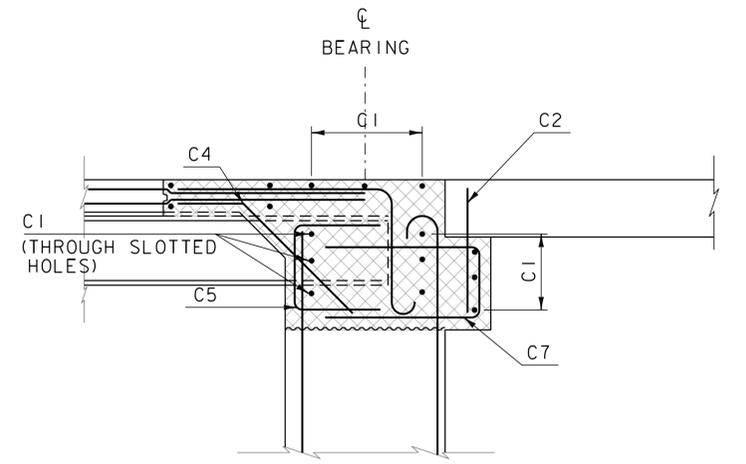
ABUTMENT 2 REINFORCING ELEVATION (PCU 1)  
SCALE 1/2" = 1'-0

NOTE:  
1. SEE ABUTMENT 1 REINFORCING SHEET FOR REINFORCING TABLE.

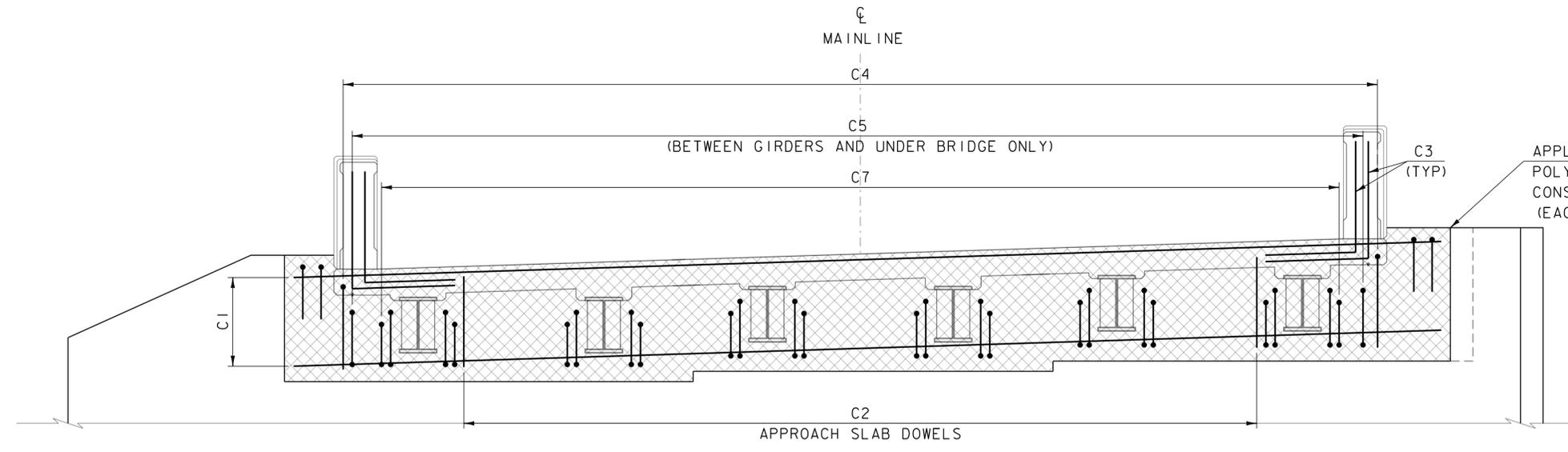
PROJECT NAME:	STRAFFORD	PLOT DATE:	09-MAY-2016
PROJECT NUMBER:	BF 0177(10)	DRAWN BY:	J. GRIGAS
FILE NAME:	sl3j088sub2.dgn	CHECKED BY:	G. LAROCHE
PROJECT LEADER:	K. HIGGINS	SHEET	32 OF 50
DESIGNED BY:	J. GRIGAS		
ABUTMENT 2 REINFORCING			



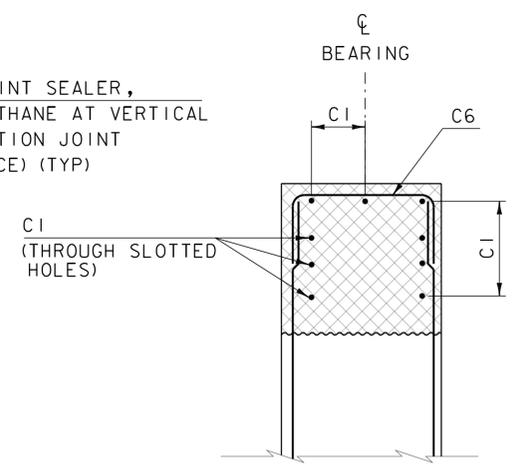
DECK CLOSURE POUR REINFORCING PLAN  
SCALE 1/2" = 1'-0"



ABUTMENT ELEVATION  
AT BRIDGE  
SCALE 1/2" = 1'-0"



DECK CLOSURE POUR  
REINFORCING ELEVATION  
SCALE 1/2" = 1'-0"

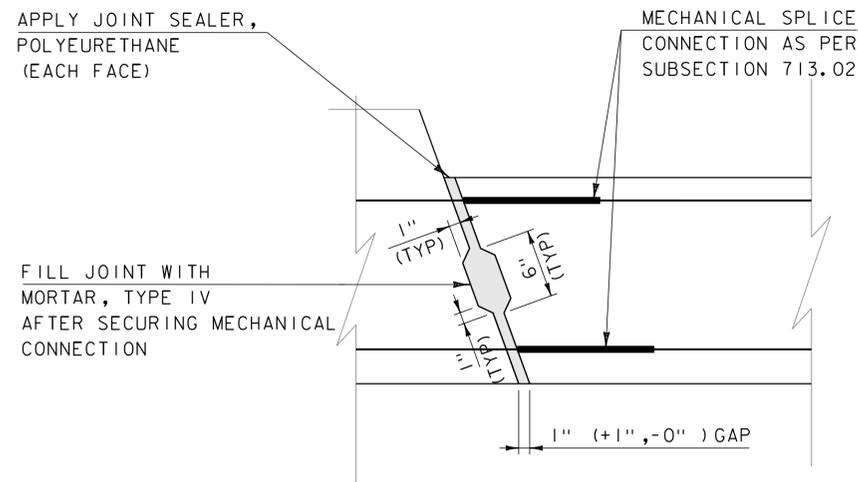
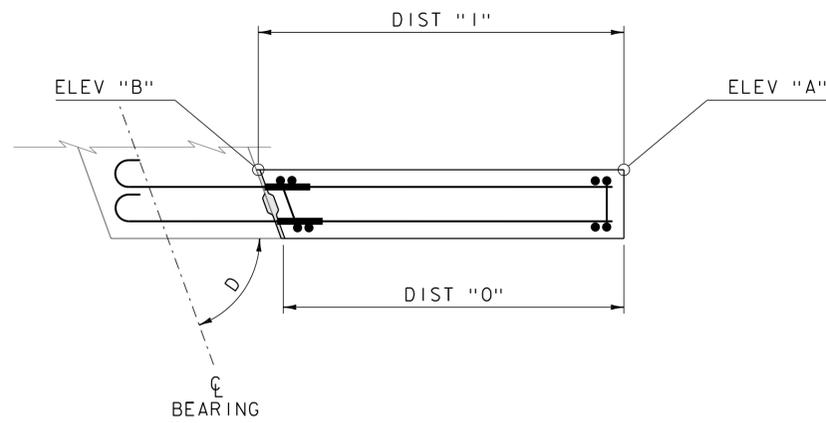


ABUTMENT ELEVATION  
AT CHEEKWALL  
SCALE 1/2" = 1'-0"

CLOSURE POUR REINFORCING

BAR	SIZE	SPACING	FACE	TYPE
C1	5	12"	AS SHOWN	STR
C2	5	12"	FF	STR
C3	4	8"	---	20
C4	5	10"	---	19
C5	5	12"	---	S10
C6	5	12"	---	S10
C7	6	9"	---	S10

PROJECT NAME:	STRAFFORD	PLOT DATE:	09-MAY-2016
PROJECT NUMBER:	BF 0177(10)	DRAWN BY:	J. GRIGAS
FILE NAME:	sl3j088closurepour.dgn	CHECKED BY:	G. LAROCHE
PROJECT LEADER:	K. HIGGINS	SHEET	33 OF 50
DESIGNED BY:	J. GRIGAS		
CLOSURE POUR			

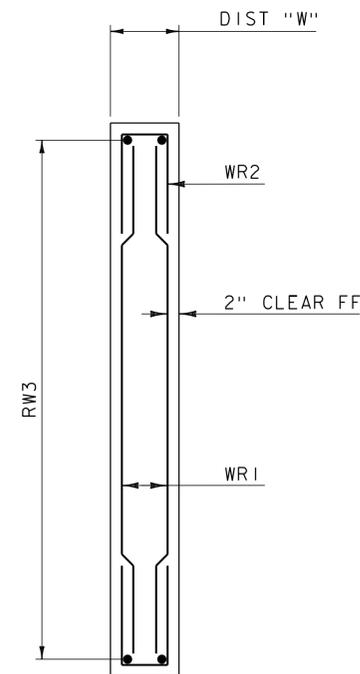
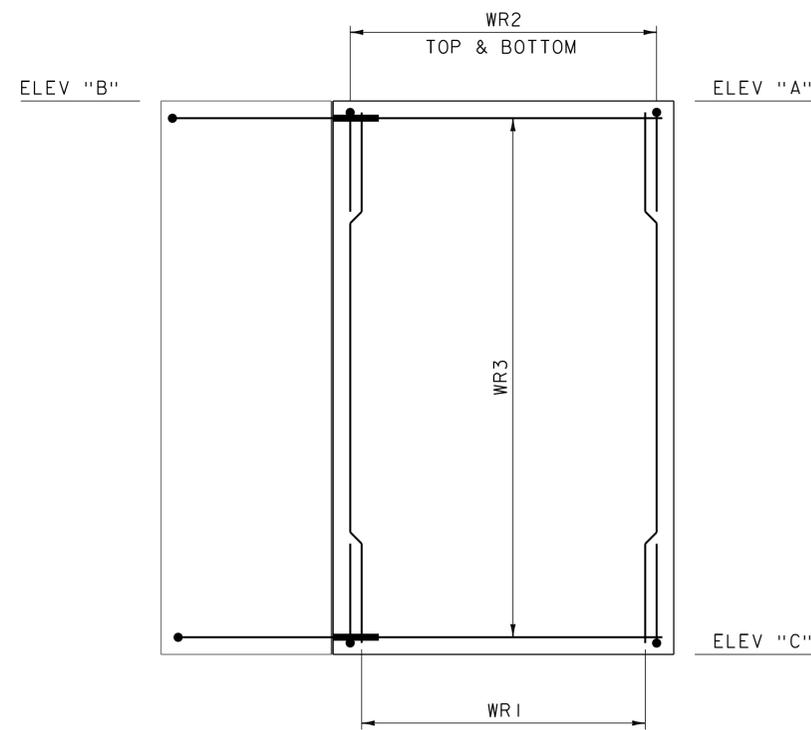


PCU 3-5 ELEVATIONS

	WW1 (PCU 3)	WW3 (PCU 4)	WW4 (PCU 5)
ELEV "A"	889.25	888.10	887.35
ELEV "B"	889.25	888.60	887.85
ELEV "C"	876.25	875.10	875.10
DIST "W"	1'-6"	1'-6"	1'-6"
DIST "1"	10'-0"	9'-8 7/8"	10'-0"
DIST "0"	9'-8 7/8"	10'-0"	9'-8 7/8"
ANGLE "D"	80°	100°	80°

WING WALL REINFORCING

BAR	SIZE	SPACING	FACE	TYPE
WR1	5	9"	NF	STR
WR2	5	9"	EF	STR
WR3	5	9"	NF	STR



MORTAR, TYPE IV

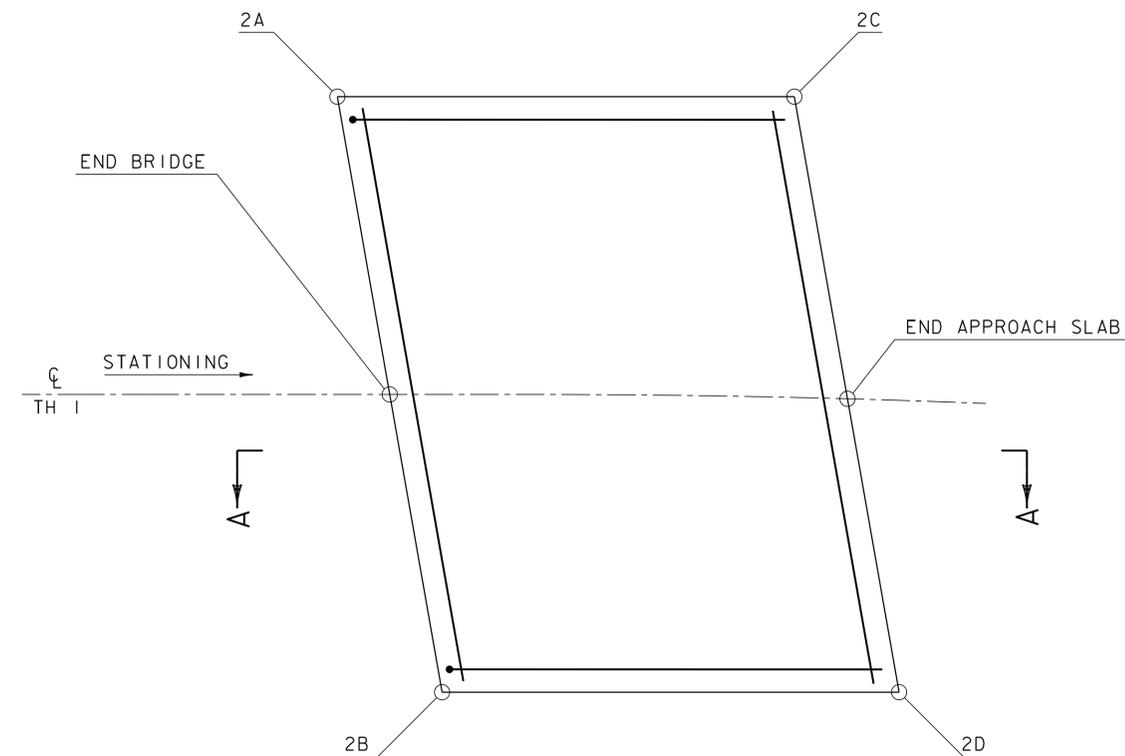
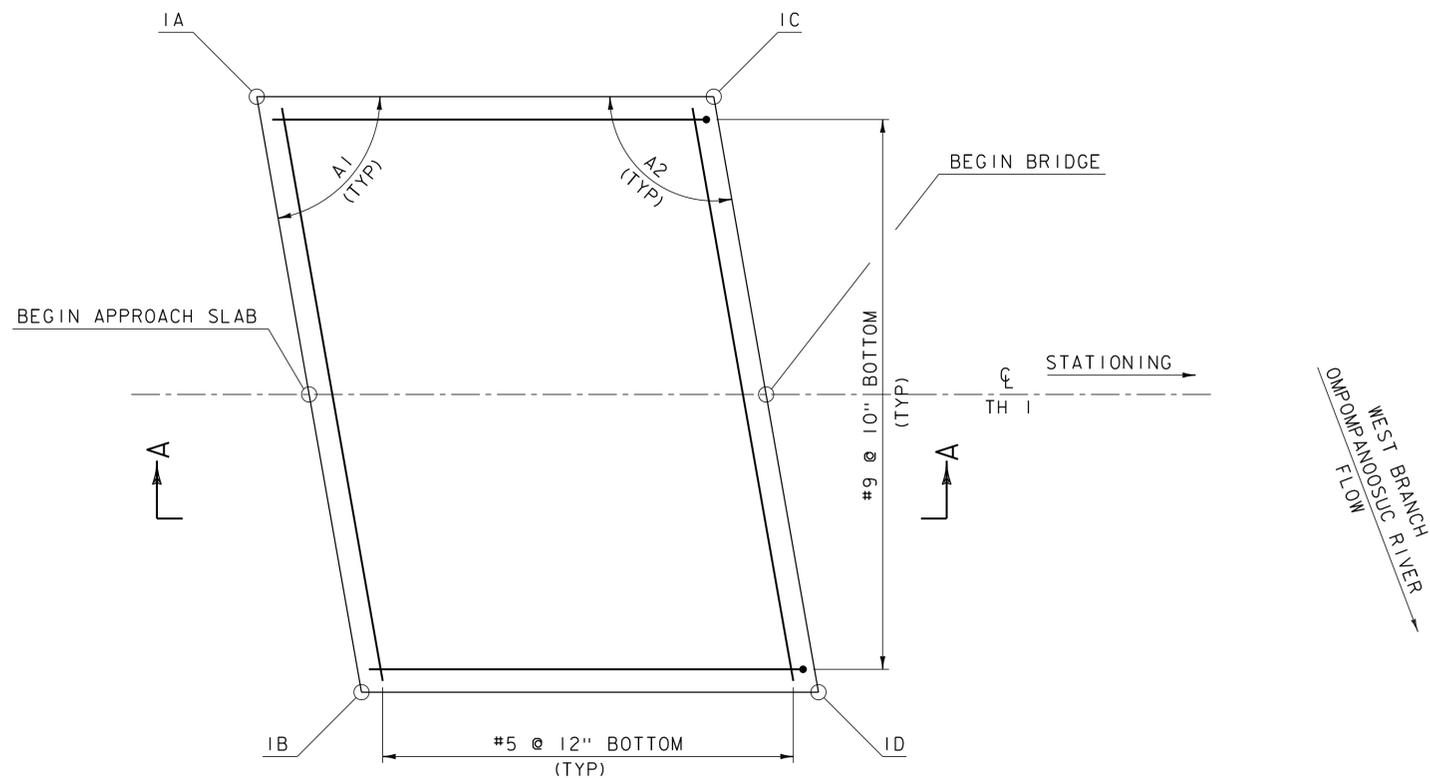
NOTE:

NF = NEAR FACE  
 FF = FAR FACE  
 EF = EACH FACE  
 ▲ = CUT TO FIT IN FIELD  
 3" CLEAR, UNLESS OTHERWISE SPECIFIED ON THE PLANS.  
 2'-7" BAR LAP UNLESS OTHERWISE SPECIFIED ON THE PLANS.

PROJECT NAME: STRAFFORD  
 PROJECT NUMBER: BF 0177(10)

FILE NAME: s13j088ww.dgn  
 PROJECT LEADER: K. HIGGINS  
 DESIGNED BY: J. GRIGAS  
 WING WALL DETAILS

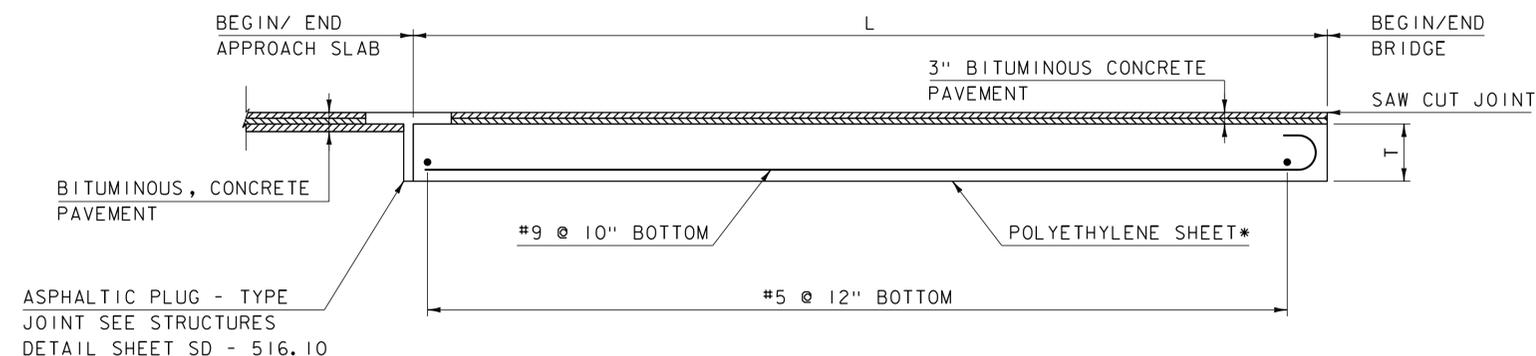
PLOT DATE: 09-MAY-2016  
 DRAWN BY: J. GRIGAS  
 CHECKED BY: G. LAROCHE  
 SHEET 34 OF 50



APPROACH SLAB #1			
	STATION	OFFSET	ELEVATION
IA	11+62.93	13'-0" LT	889.01
BEGIN AS #1	11+65.22	CL	888.71
IB	11+67.52	13'-0" RT	888.39
IC	11+82.93	13'-0" LT	888.86
END AS #1	11+85.22	CL	888.49
ID	11+87.51	13'-0" RT	888.10
APPROACH SLAB #2			
	STATION	OFFSET	ELEVATION
2A	12+43.48	13'-0" LT	888.05
BEGIN AS #2	12+45.78	CL	887.43
2B	12+48.07	13'-0" RT	886.81
2C	12+63.19	13'-1 1/2" LT	887.63
END AS #2	12+65.81	CL	886.93
2D	12+68.49	12'-8 7/8" RT	886.22

A1	80°
A2	100°
L	20'-0"
T	1'-3"

### APPROACH SLAB DIMENSIONS



### CAST-IN-PLACE APPROACH SLAB ELEVATION VIEW

SCALE 1/2" = 1'-0"

- \* POLYETHYLENE SHEET SHALL BE INCIDENTAL TO PAY ITEM 501.34 "HIGH PERFORMANCE CONCRETE, CLASS B"
- ABUTMENT CLOSURE POUR REINFORCING "C2" NOT SHOWN FOR CLARITY

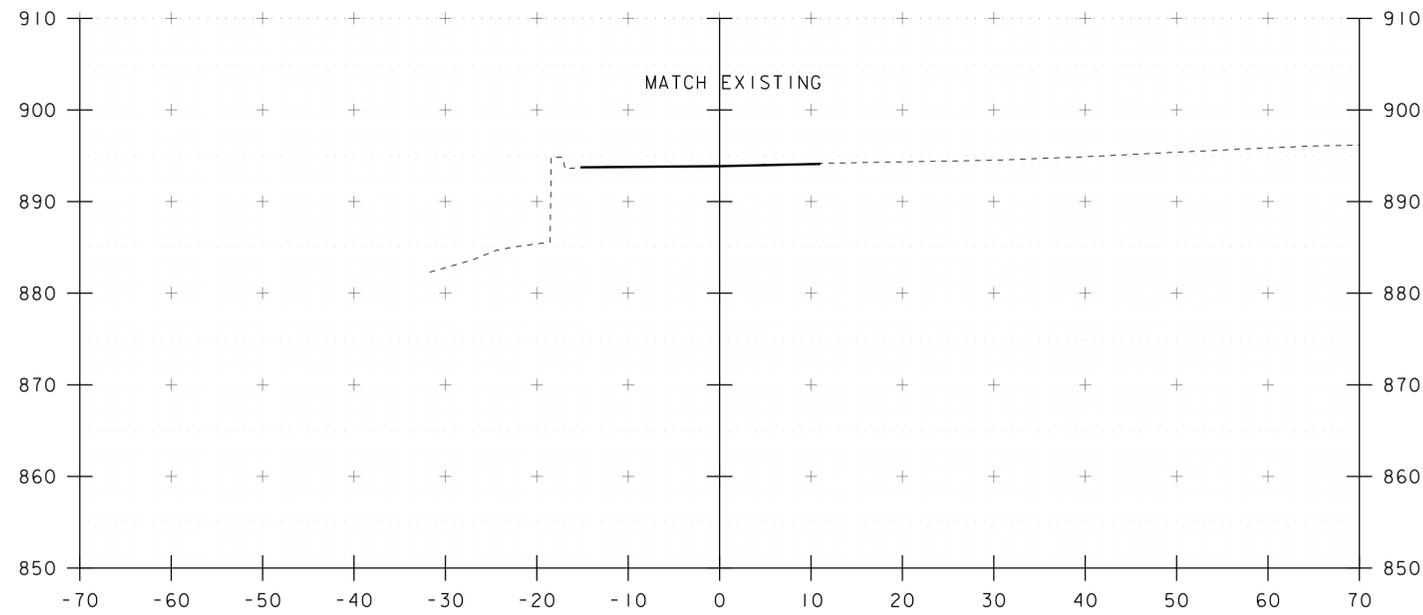
### TOP OF SLAB ELEVATIONS

- NOTES:
- NF = NEAR FACE
  - FF = FAR FACE
  - EF = EACH FACE
  - 3" CLEAR, UNLESS OTHERWISE SPECIFIED ON PLANS.

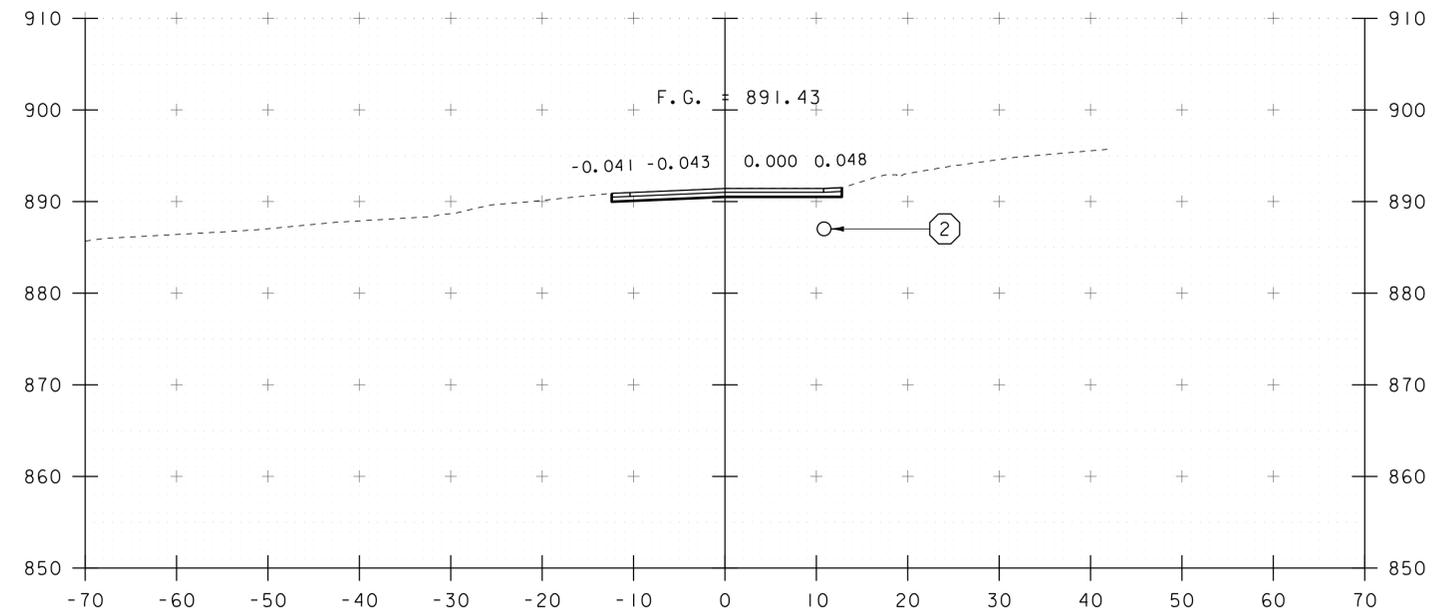
PROJECT NAME: STRAFFORD  
PROJECT NUMBER: BF 017710

FILE NAME: s13j08bapps1ab  
PROJECT LEADER: K. HIGGINS  
DESIGNED BY: S. COLEY  
APPROACH SLAB DETAILS

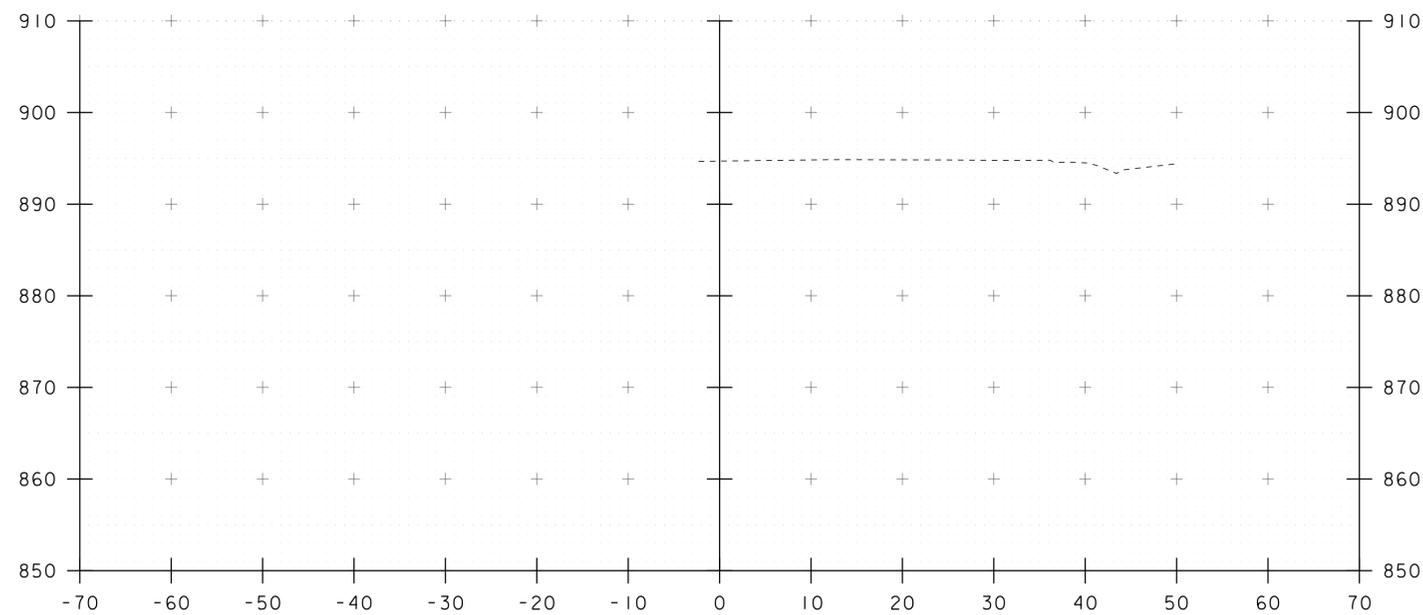
PLOT DATE: 09-MAY-2016  
DRAWN BY: J. GRIGAS  
CHECKED BY: G. LAROCHE  
SHEET 35 OF 50



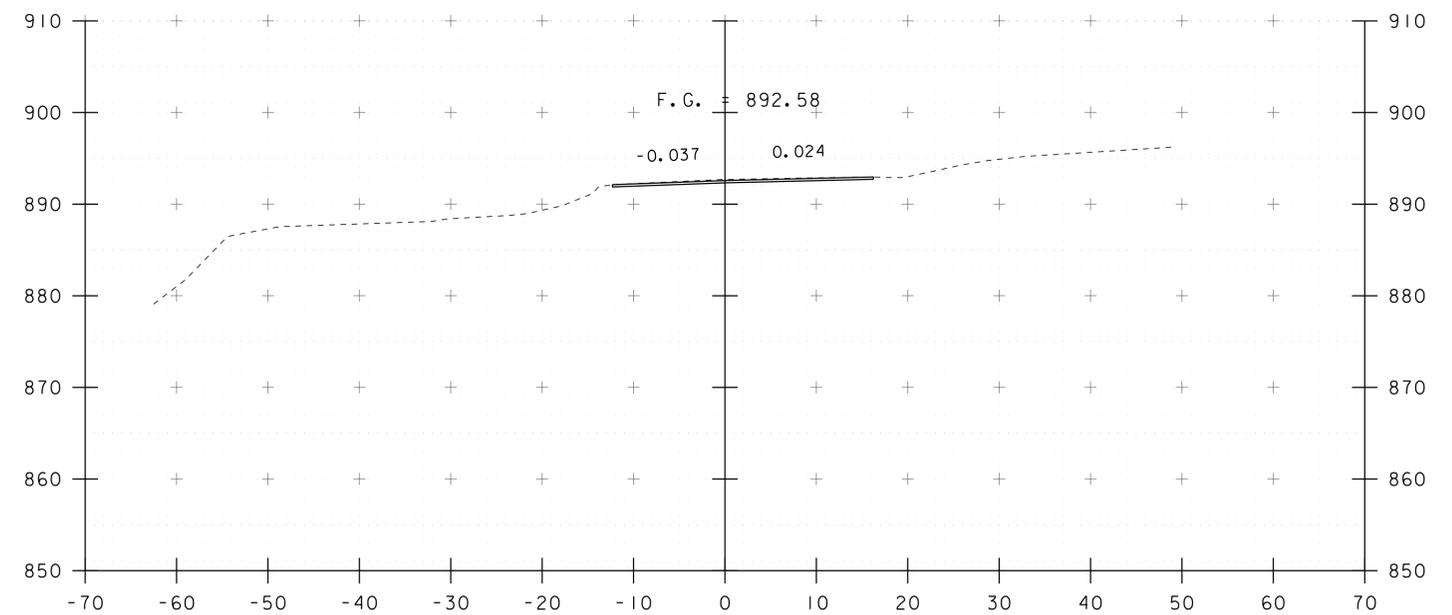
10+25  
BEGIN APPROACH



10+75



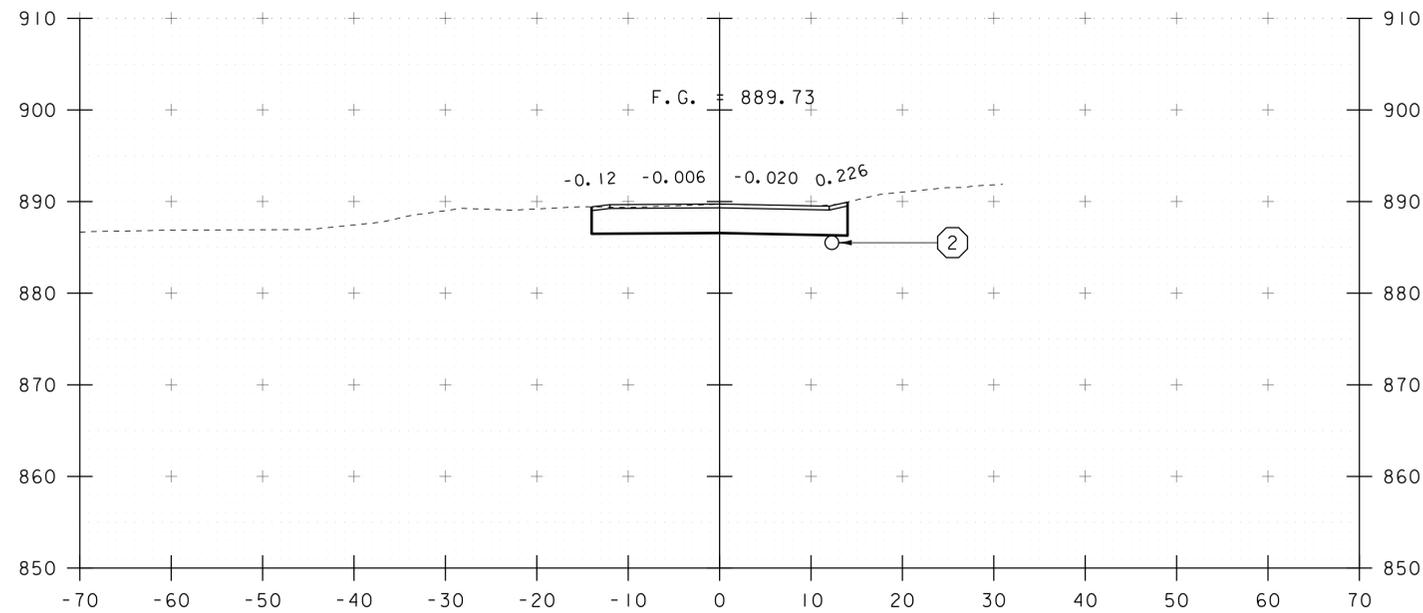
10+00



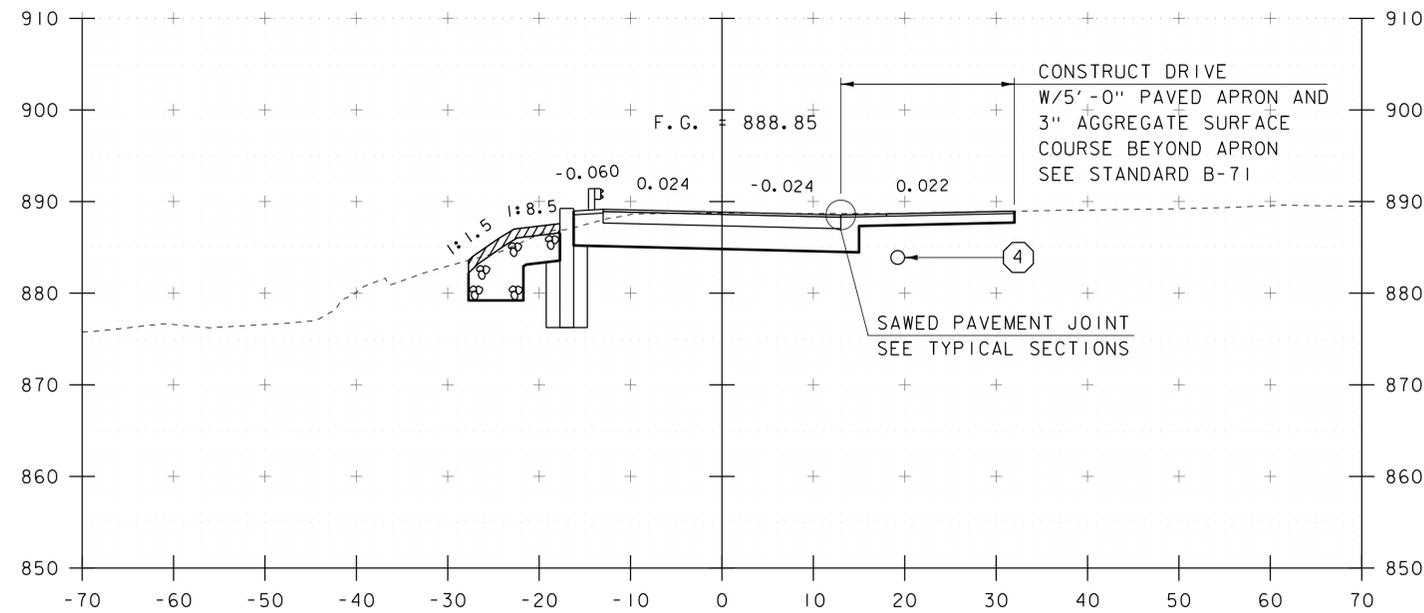
10+50

STA. 10+00 TO STA. 10+75

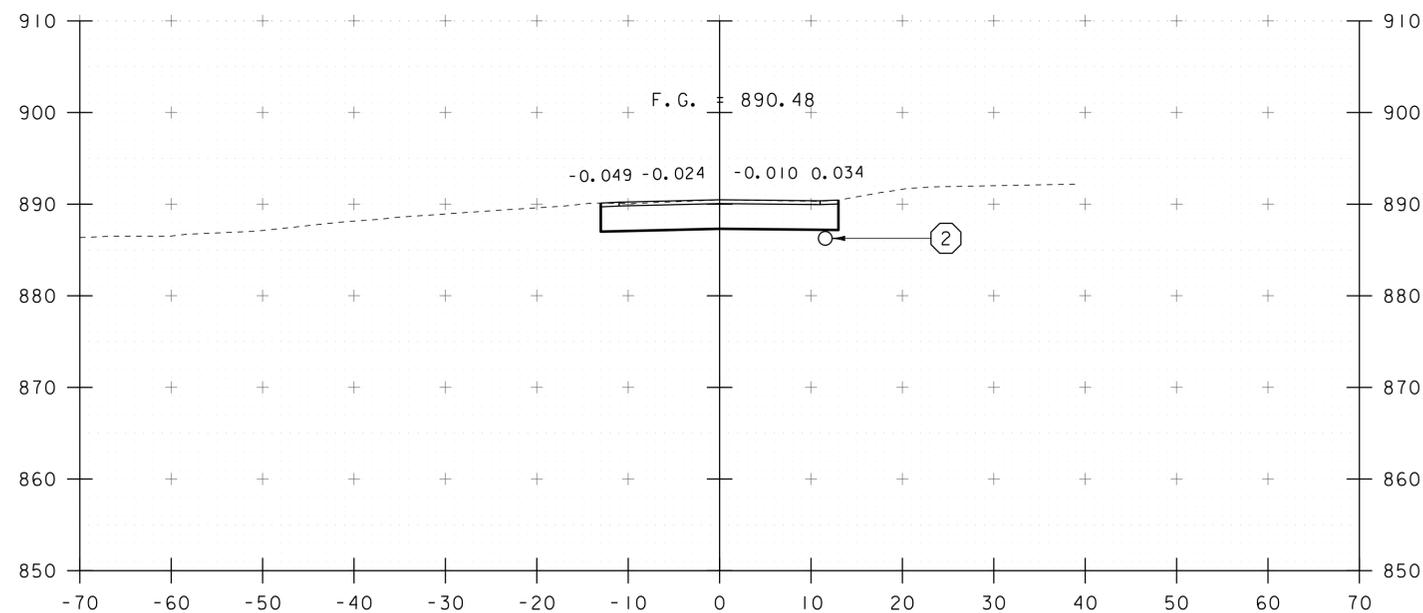
PROJECT NAME: STRAFFORD	
PROJECT NUMBER: BF 0177(10)	
FILE NAME: s13j088xsl.dgn	PLOT DATE: 09-MAY-2016
PROJECT LEADER: K. HIGGINS	DRAWN BY: J.GRIGAS
DESIGNED BY: J.GRIGAS	CHECKED BY: T. MATTHEWS
MAINLINE SECTIONS	SHEET 36 OF 50



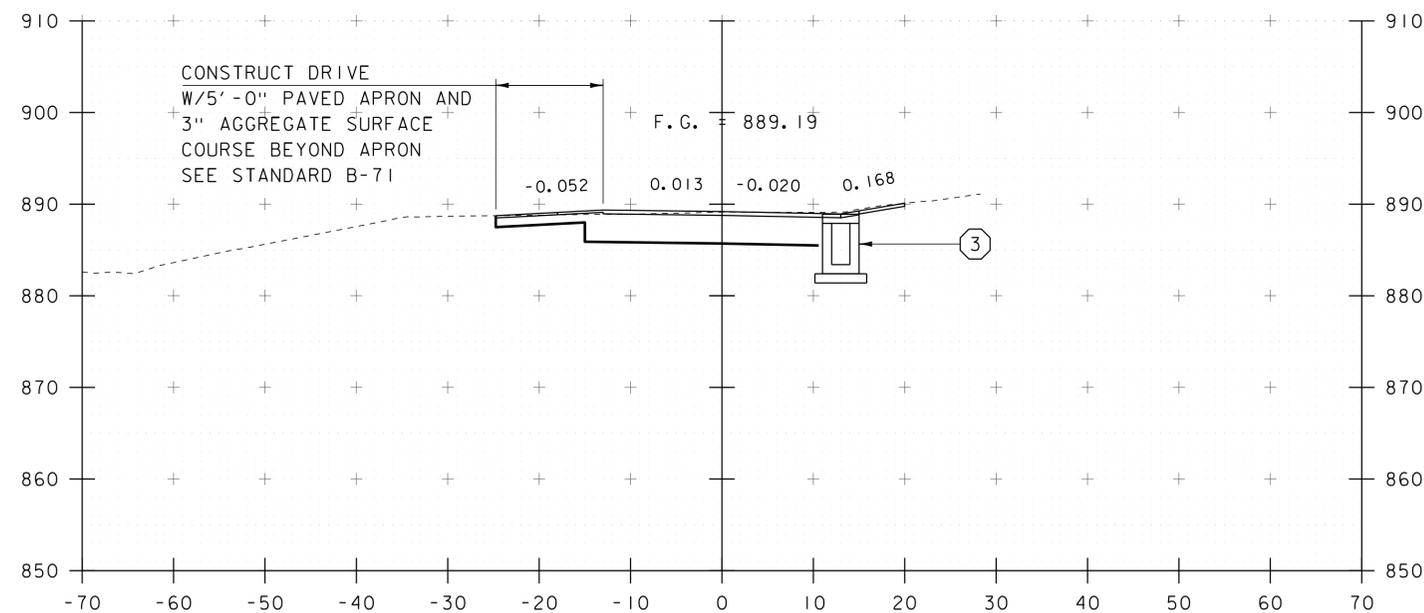
11+25



11+75  
BEGIN BRIDGE STA 11+85.22



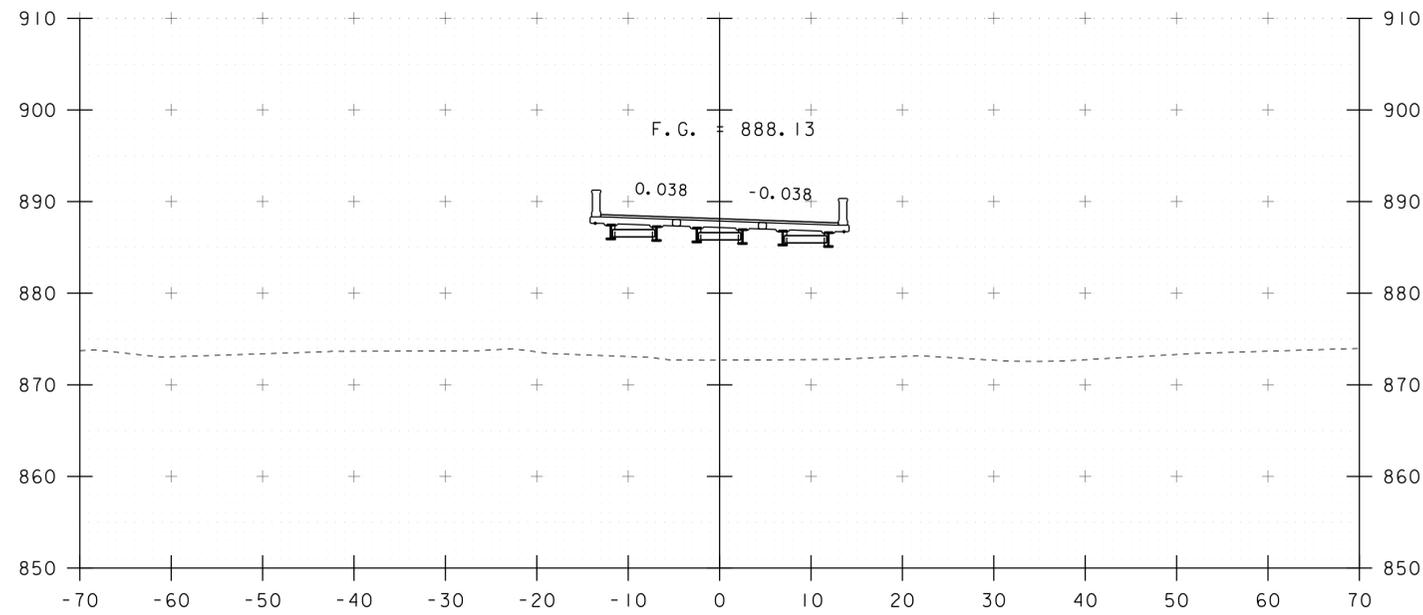
11+00  
BEGIN PROJECT



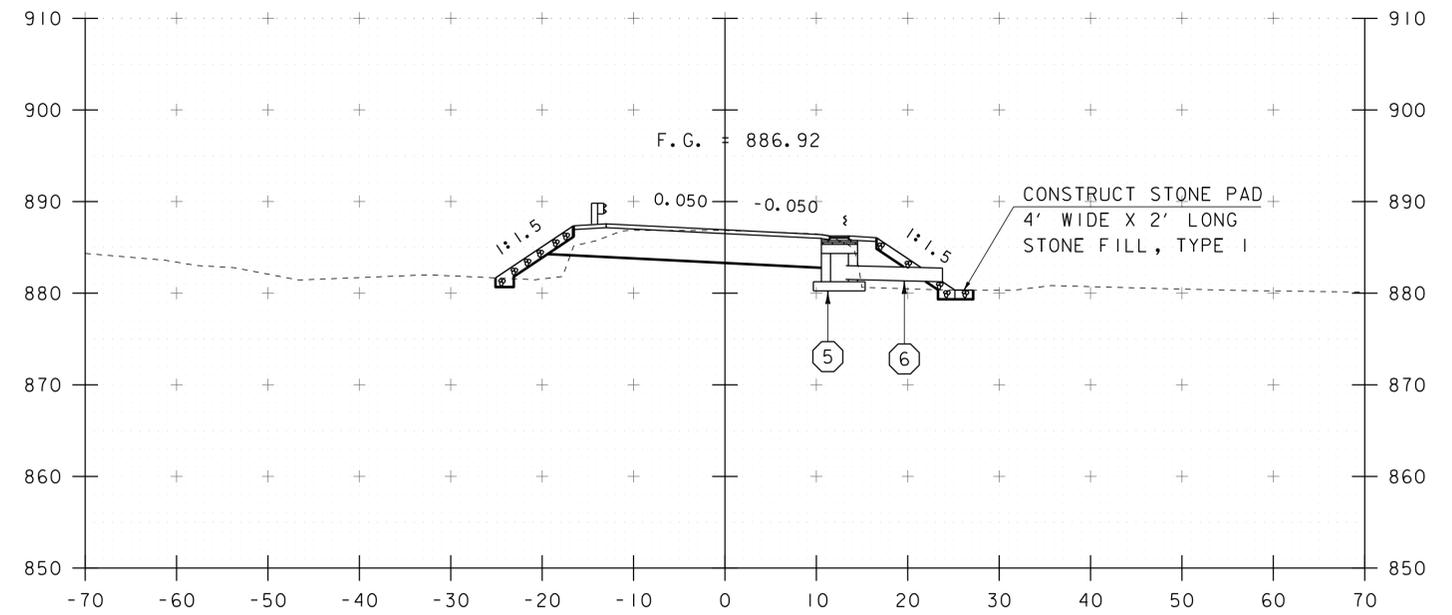
11+50

STA. 11+00 TO STA. 11+75

PROJECT NAME: STRAFFORD	
PROJECT NUMBER: BF 0177(10)	
FILE NAME: s13j088xsl.dgn	PLOT DATE: 09-MAY-2016
PROJECT LEADER: K. HIGGINS	DRAWN BY: J.GRIGAS
DESIGNED BY: J.GRIGAS	CHECKED BY: T. MATTHEWS
MAINLINE SECTIONS	SHEET 37 OF 50



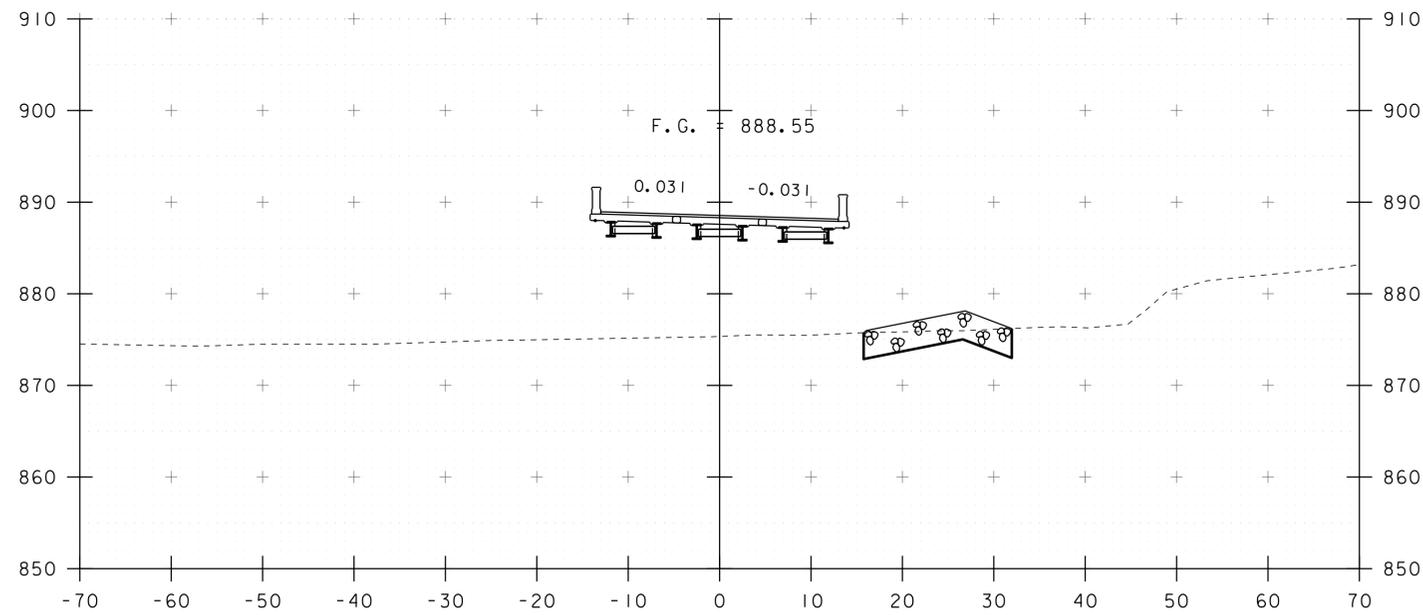
12+25  
END BRIDGE STA 12+45.78



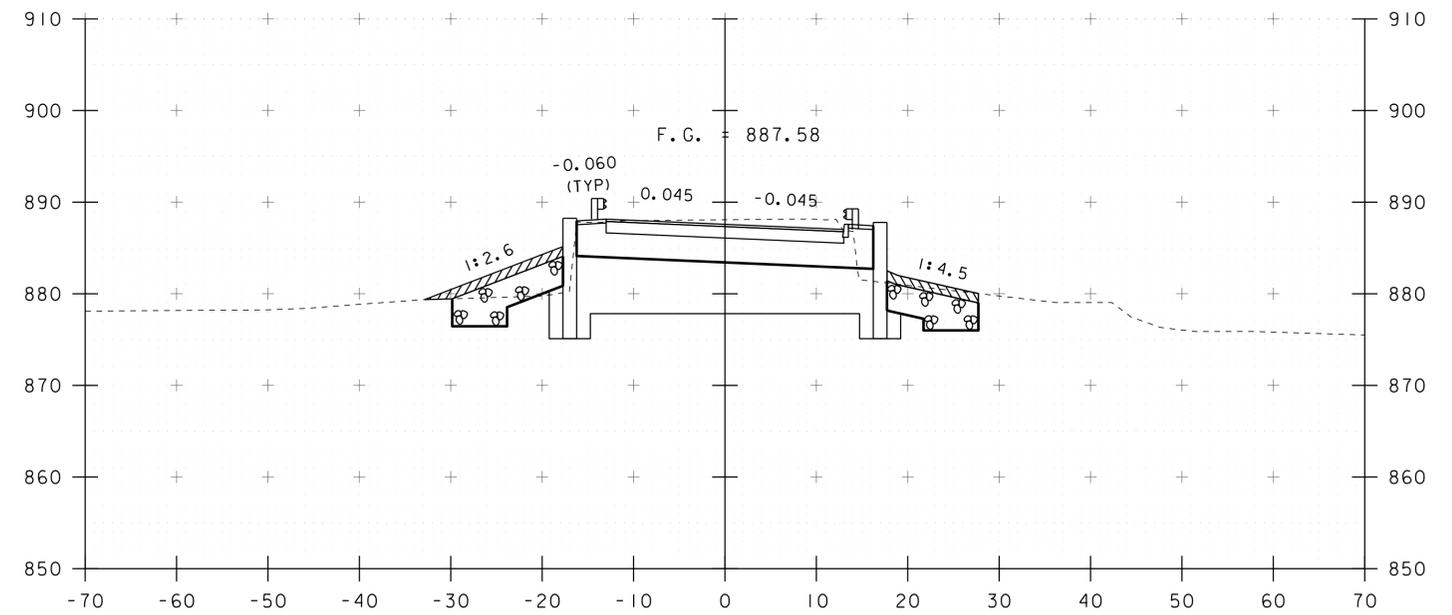
STA 12+53 LT  
BEGIN STONE FILL, TYPE I  
GEOTEXTILE UNDER STONE FILL  
GRUBBING MATERIAL

12+75

STA 12+59 RT  
BEGIN STONE FILL, TYPE I  
GEOTEXTILE UNDER STONE FILL  
GRUBBING MATERIAL



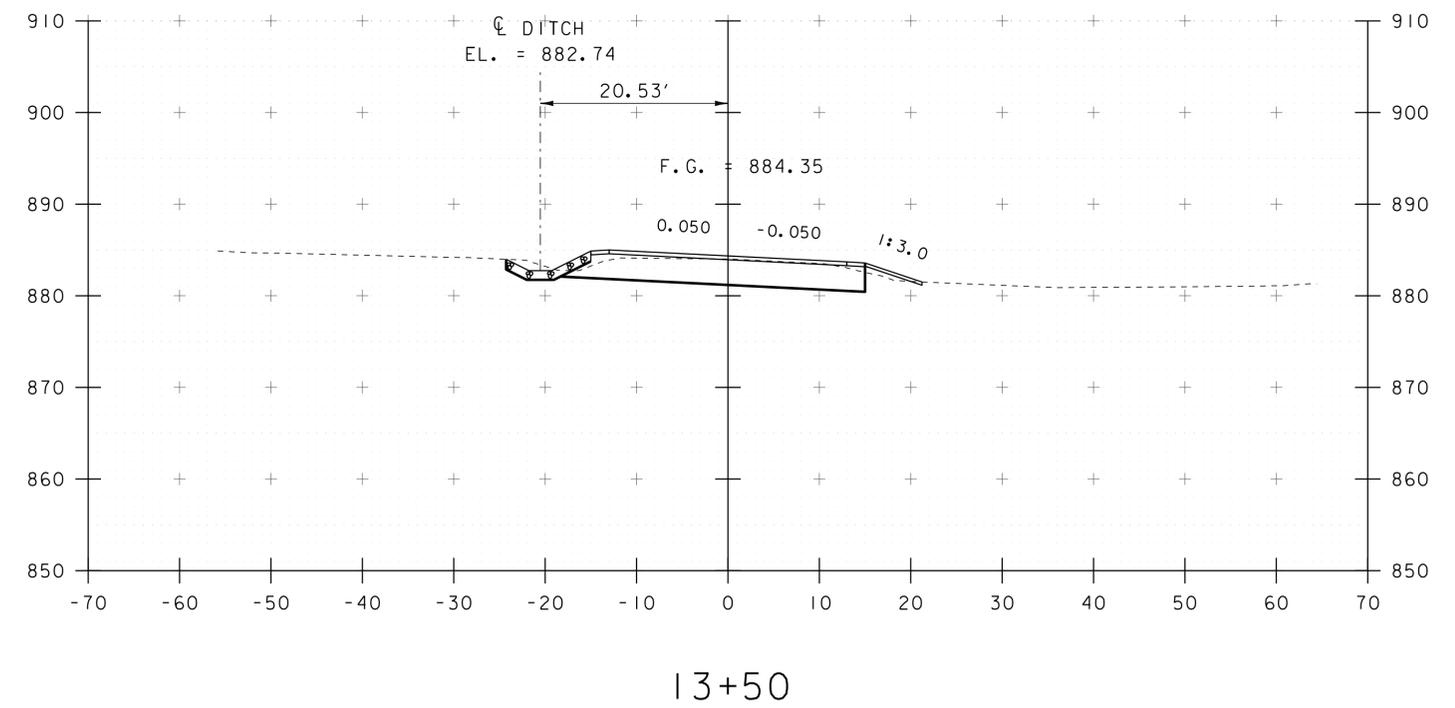
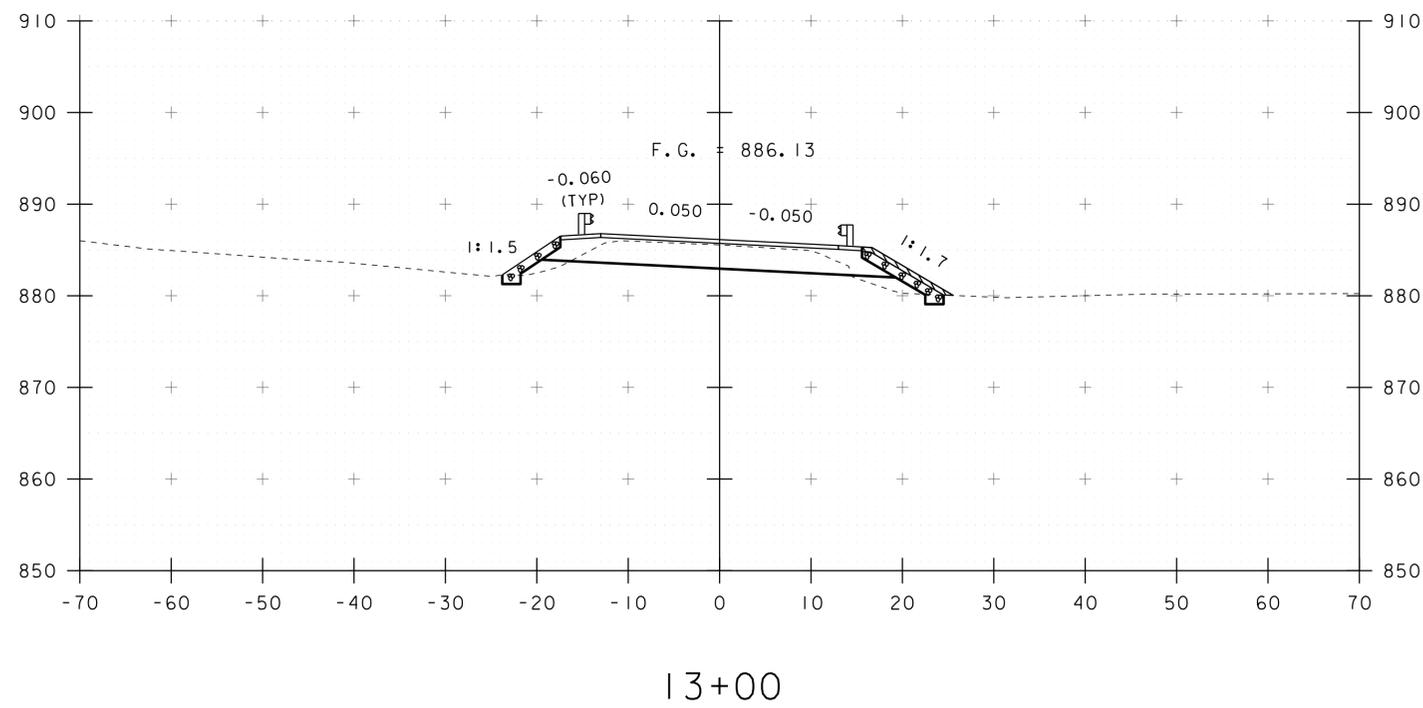
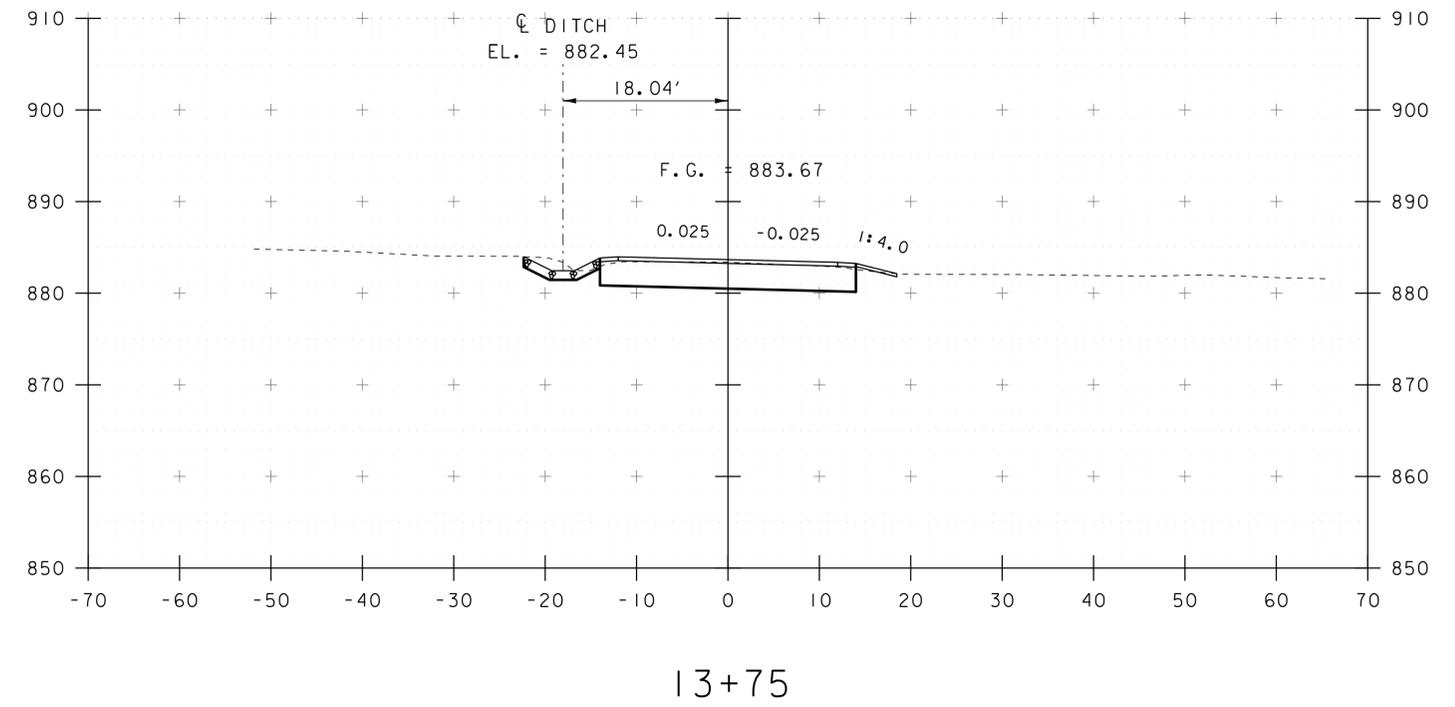
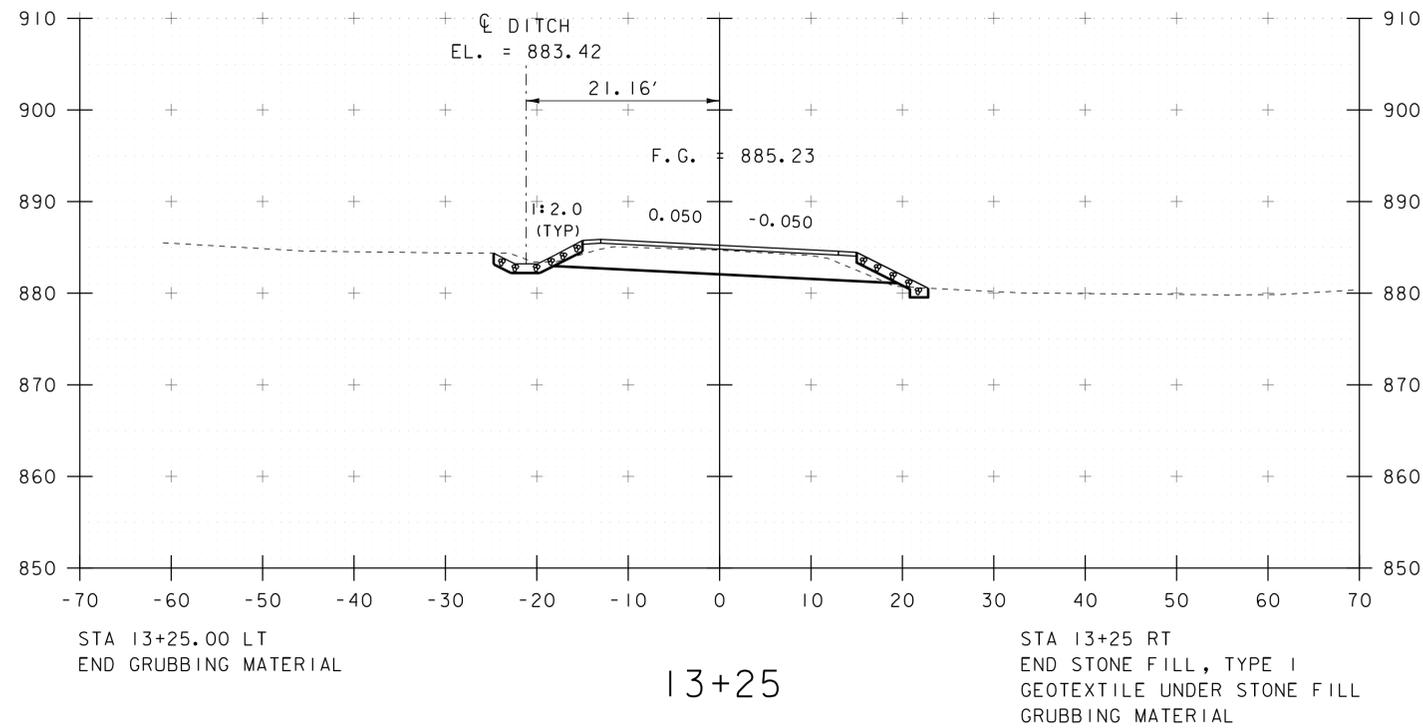
12+00



12+50

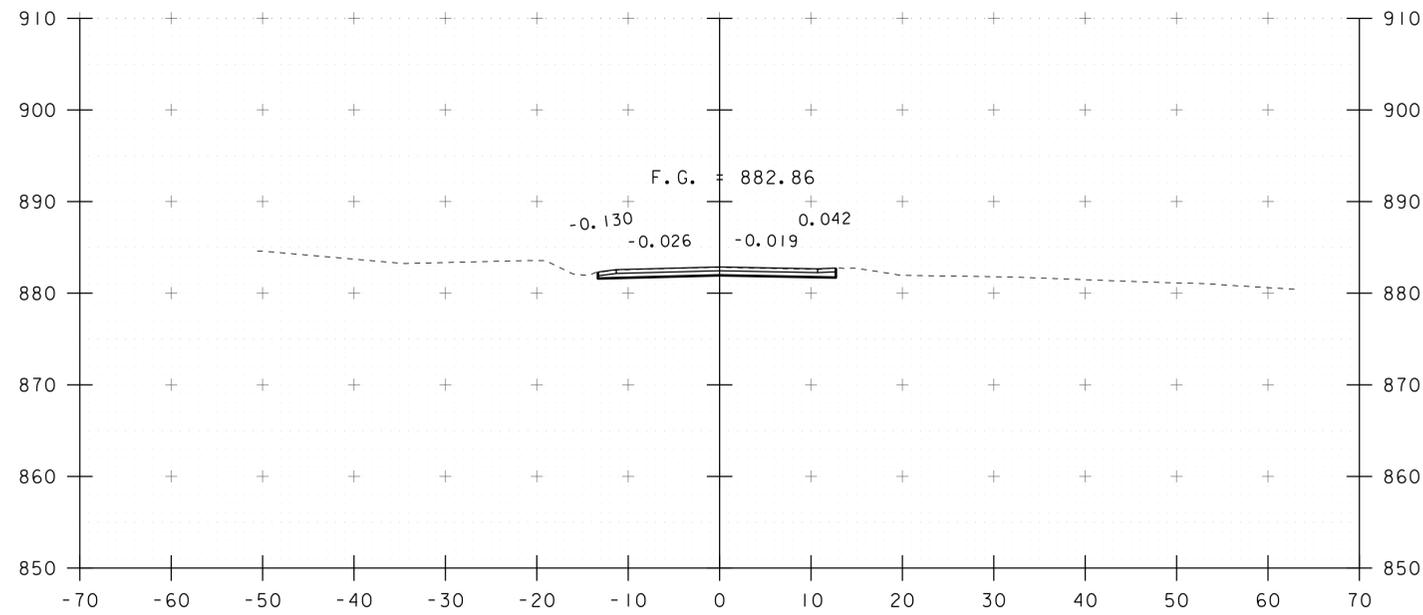
STA. 12+00 TO STA. 12+75

PROJECT NAME:	STRAFFORD	PLOT DATE:	09-MAY-2016
PROJECT NUMBER:	BF 0177(10)	DRAWN BY:	J.GRIGAS
FILE NAME:	sl3j088xsl.dgn	CHECKED BY:	T. MATTHEWS
PROJECT LEADER:	K. HIGGINS	SHEET	38 OF 50
DESIGNED BY:	J.GRIGAS	MAINLINE SECTIONS	

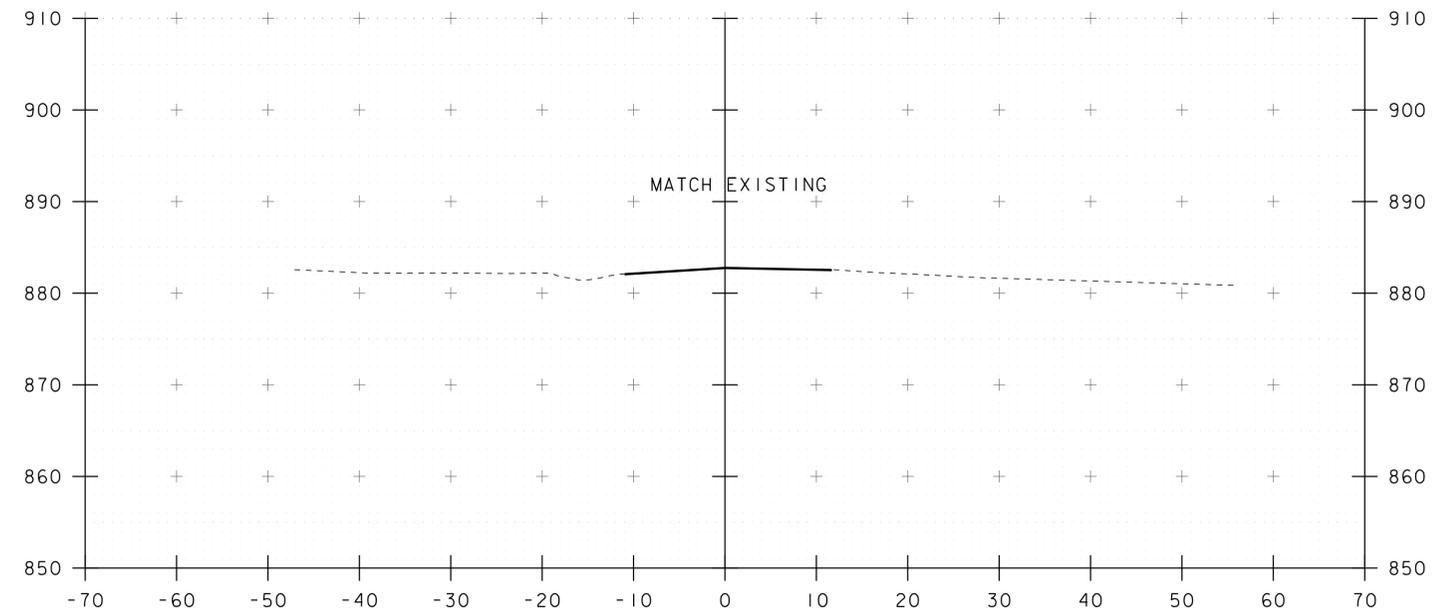


STA. 13+00 TO STA. 13+75

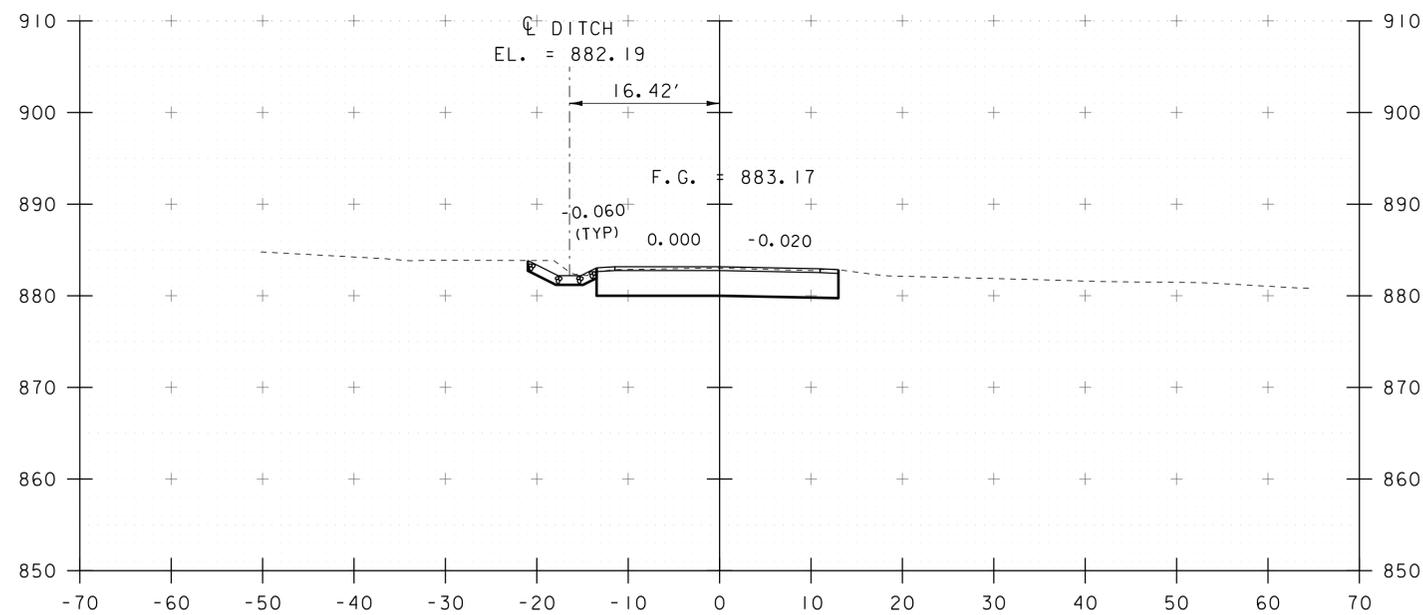
PROJECT NAME: STRAFFORD	
PROJECT NUMBER: BF 0177(10)	
FILE NAME: s13j088xsl.dgn	PLOT DATE: 09-MAY-2016
PROJECT LEADER: K. HIGGINS	DRAWN BY: J.GRIGAS
DESIGNED BY: J.GRIGAS	CHECKED BY: T. MATTHEWS
MAINLINE SECTIONS	SHEET 39 OF 50



14+25

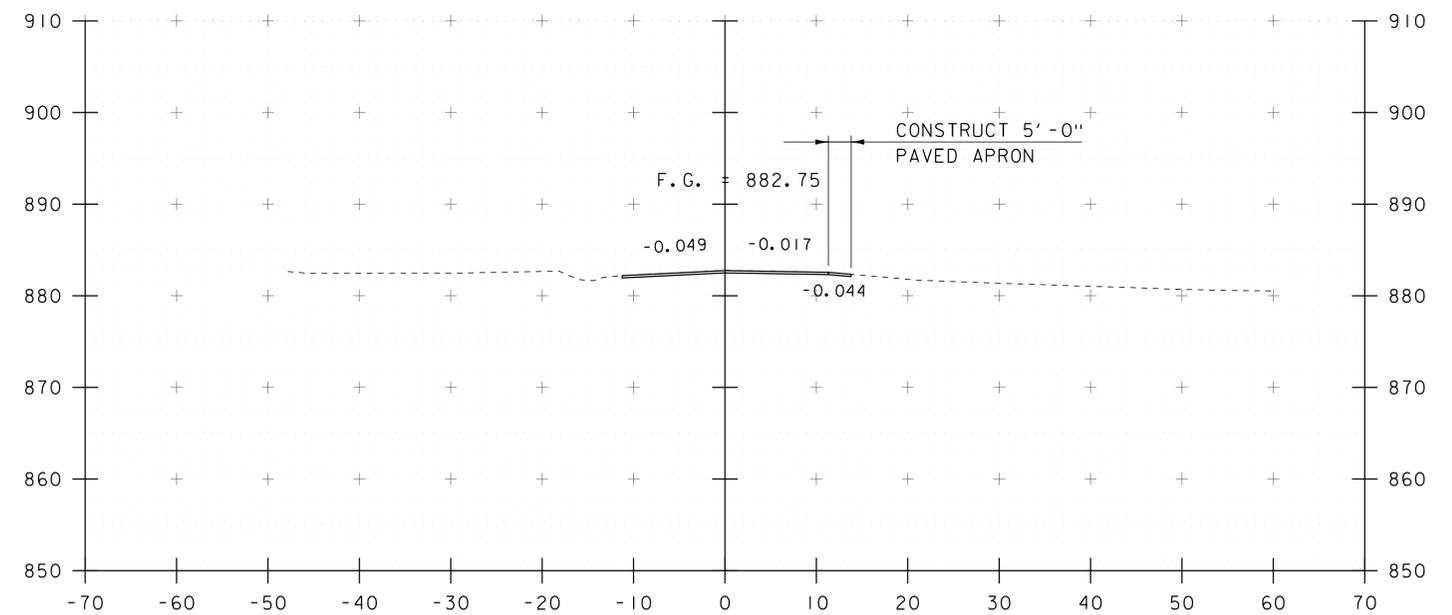


14+75  
END APPROACH



14+00  
END PROJECT

STA 14+20.00 LT  
END STONE FILL, TYPE I  
GEOTEXTILE UNDER STONE FILL



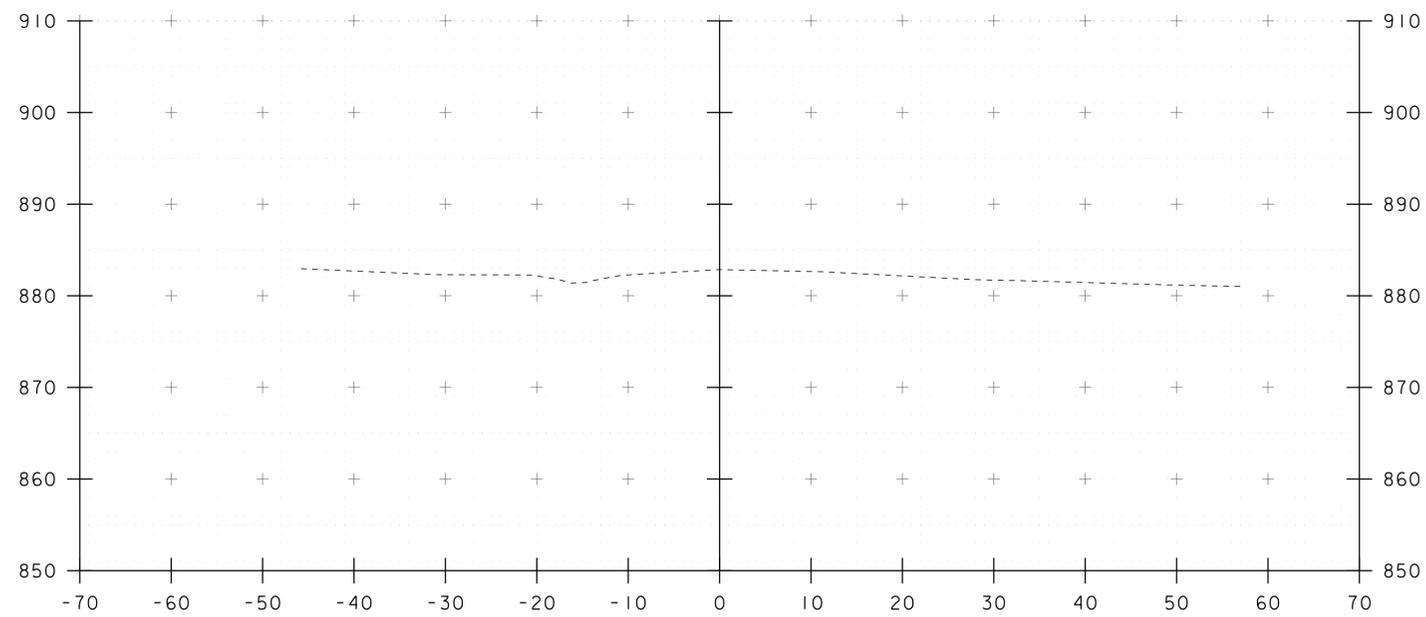
14+50

PROJECT NAME: STRAFFORD  
PROJECT NUMBER: BF 0177(10)

FILE NAME: s13j088xsl.dgn  
PROJECT LEADER: K. HIGGINS  
DESIGNED BY: J.GRIGAS  
MAINLINE SECTIONS

PLOT DATE: 09-MAY-2016  
DRAWN BY: J.GRIGAS  
CHECKED BY: T. MATTHEWS  
SHEET 40 OF 50

STA. 14+00 TO STA. 14+75

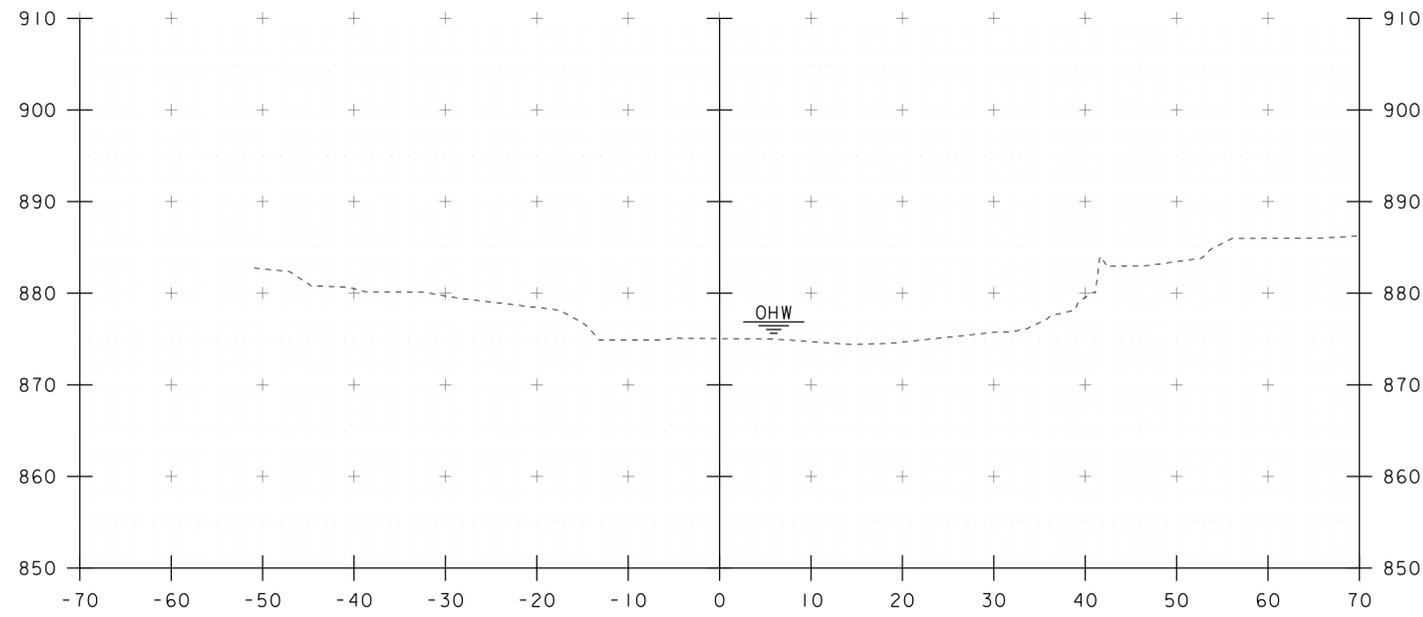


15+00

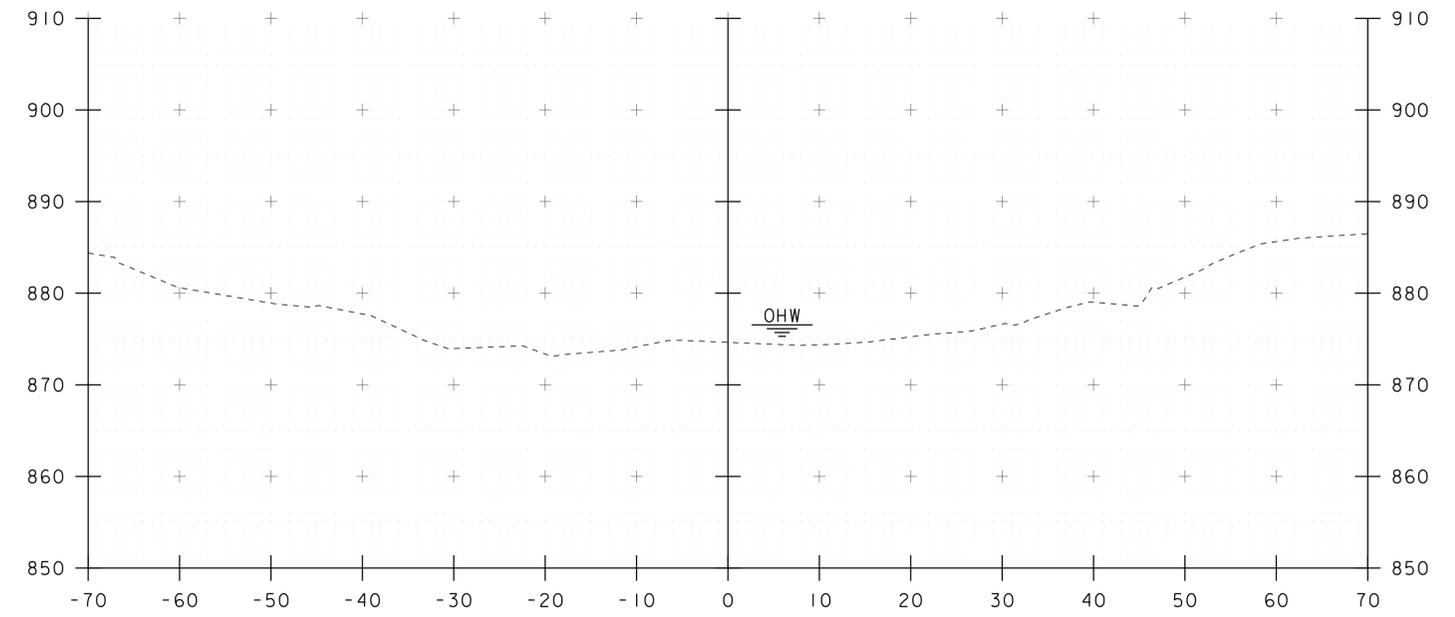
STA. 15+00 TO STA. 15+00

PROJECT NAME: STRAFFORD  
 PROJECT NUMBER: BF 0177(10)  
 FILE NAME: s13j088xsl.dgn  
 PROJECT LEADER: K. HIGGINS  
 DESIGNED BY: J.GRIGAS  
 MAINLINE SECTIONS

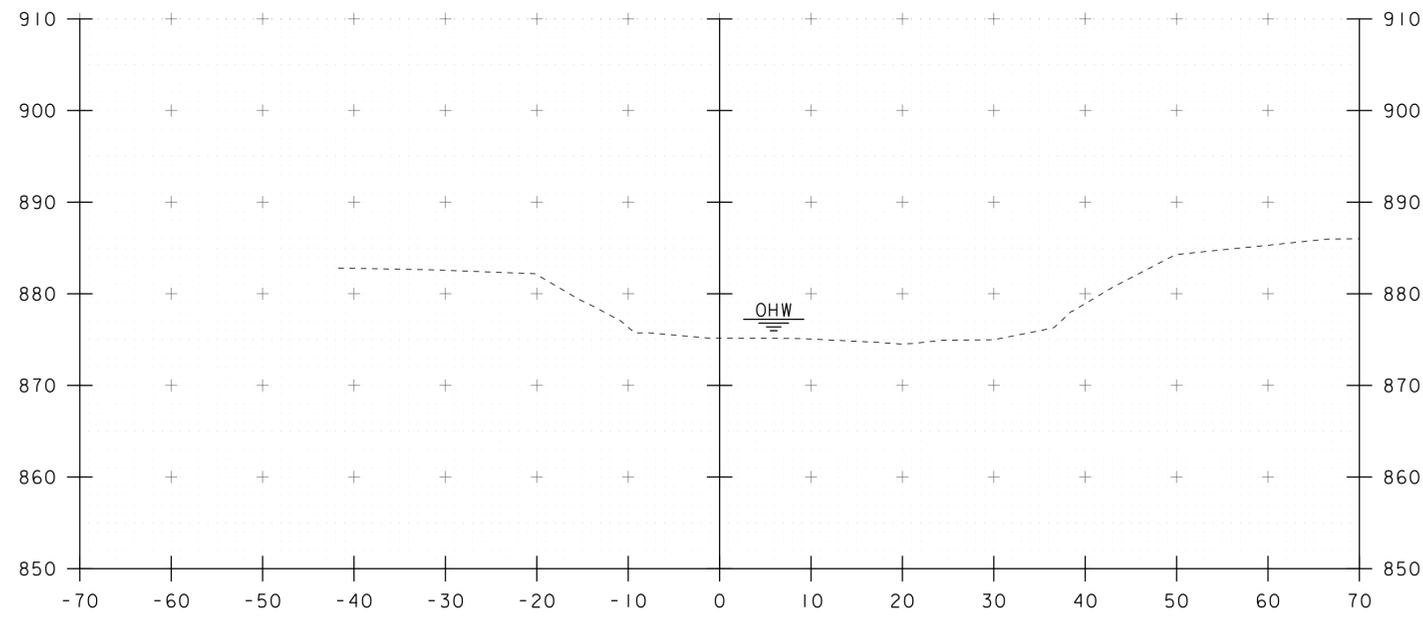
PLOT DATE: 09-MAY-2016  
 DRAWN BY: J.GRIGAS  
 CHECKED BY: T. MATTHEWS  
 SHEET 41 OF 50



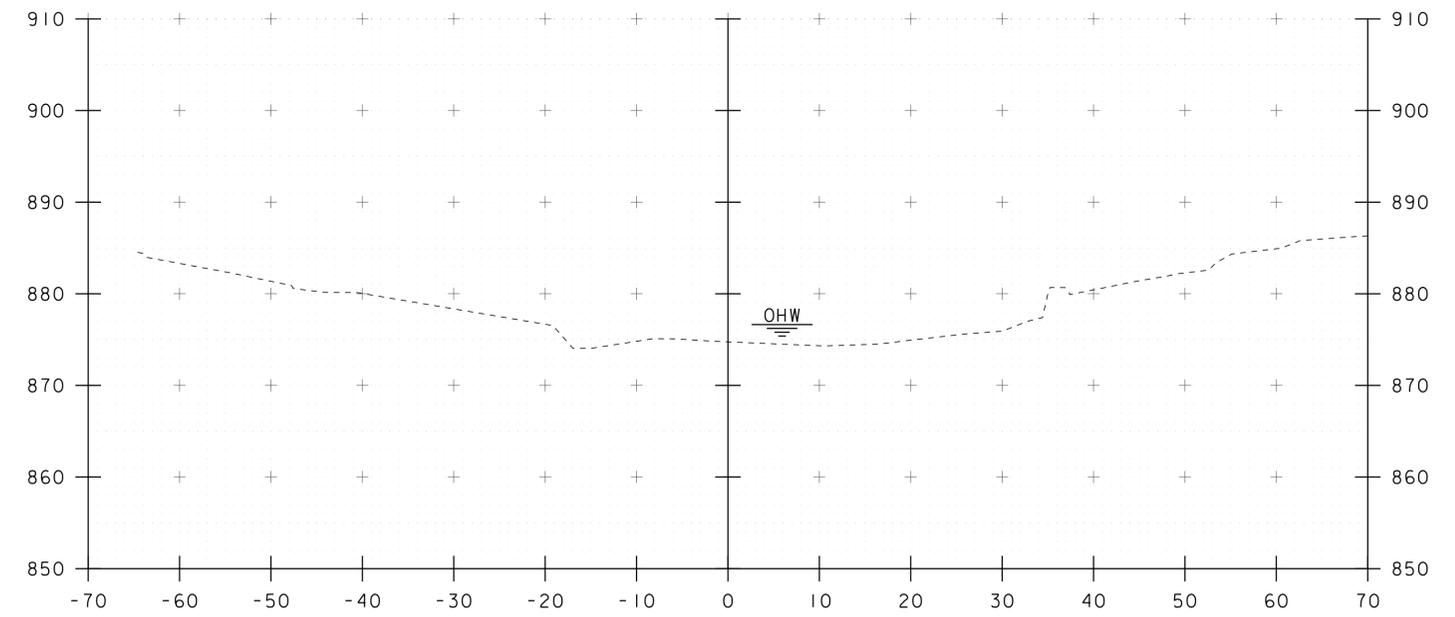
50+10



50+30



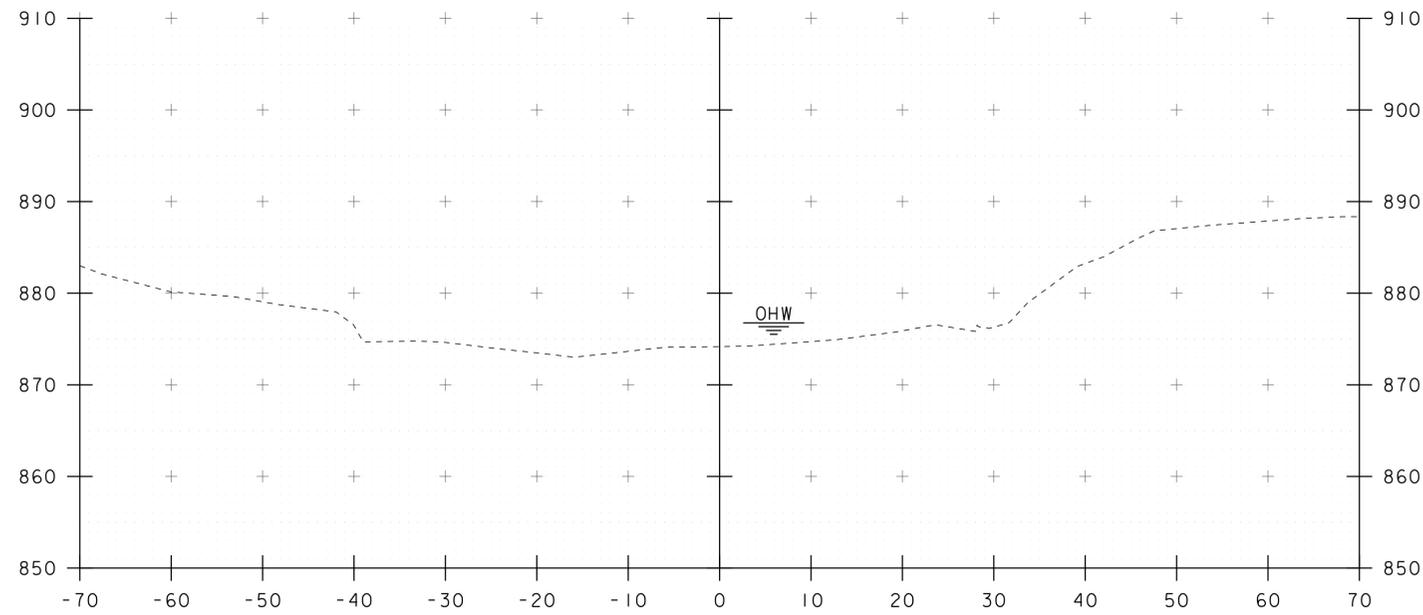
50+00



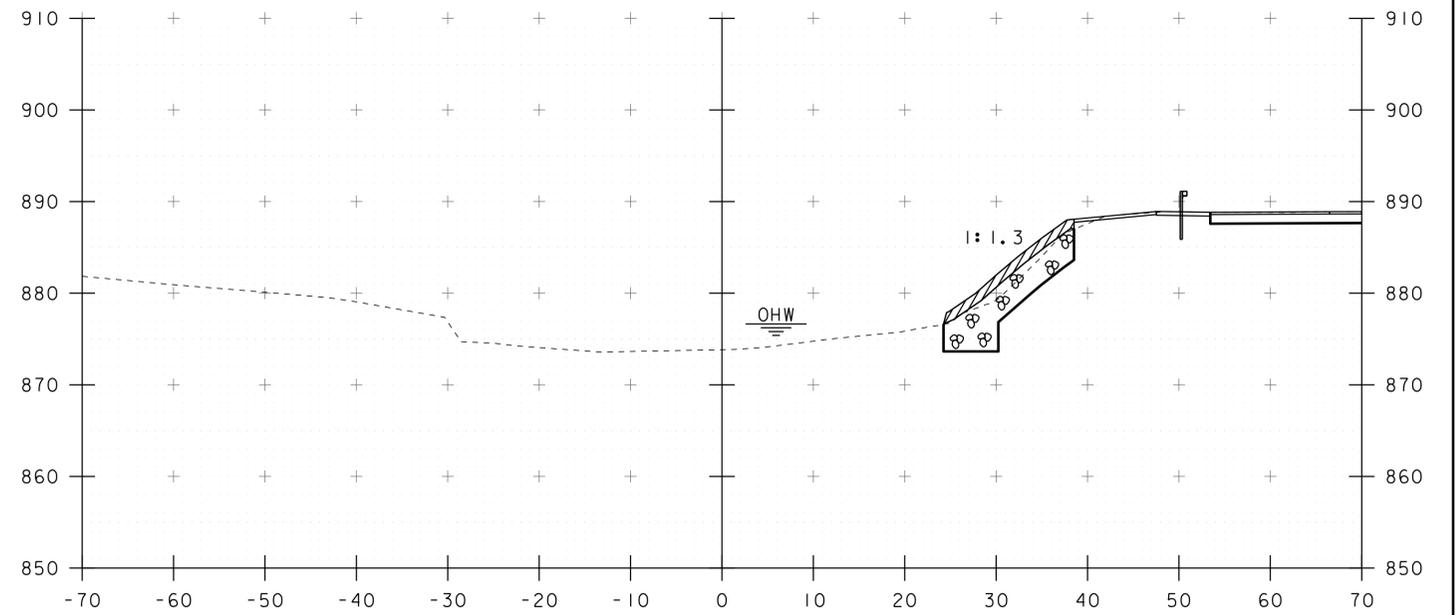
50+20

STA. 50+00 TO STA. 50+30

PROJECT NAME: STRAFFORD	
PROJECT NUMBER: BF 0177(10)	
FILE NAME: s13j088xsl.dgn	PLOT DATE: 09-MAY-2016
PROJECT LEADER: K. HIGGINS	DRAWN BY: J.GRIGAS
DESIGNED BY: J.GRIGAS	CHECKED BY: T. MATTHEWS
CHANNEL SECTIONS	SHEET 42 OF 50

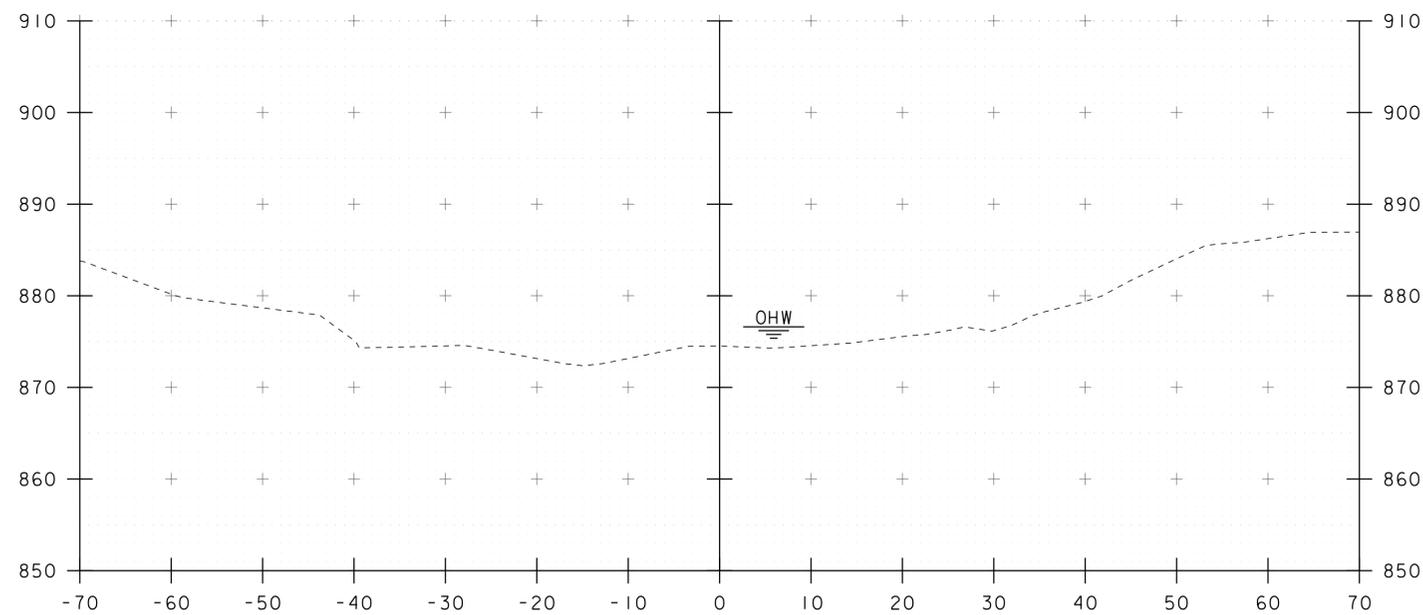


50+50

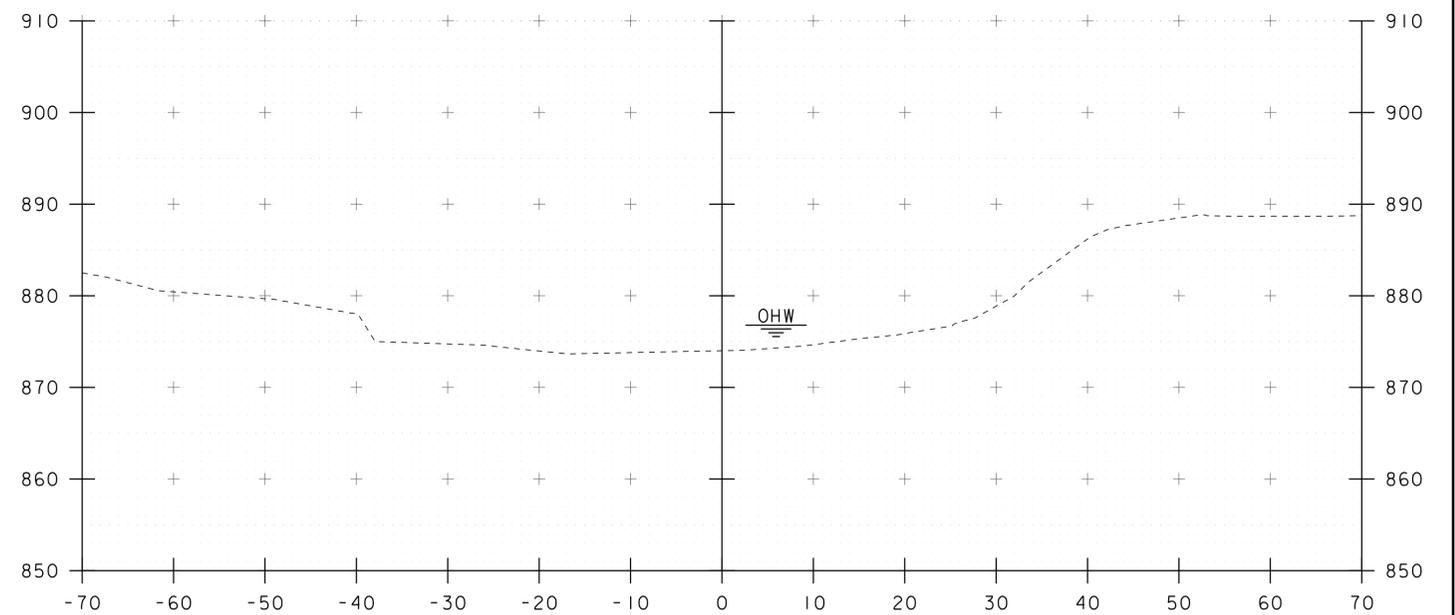


STA 50+76.00 LT  
 BEGIN STONE FILL, TYPE III  
 GEOTEXTILE UNDER STONE FILL  
 GRUBBING MATERIAL  
 UNCLASSIFIED CHANNEL EXCAVATION

50+70



50+40

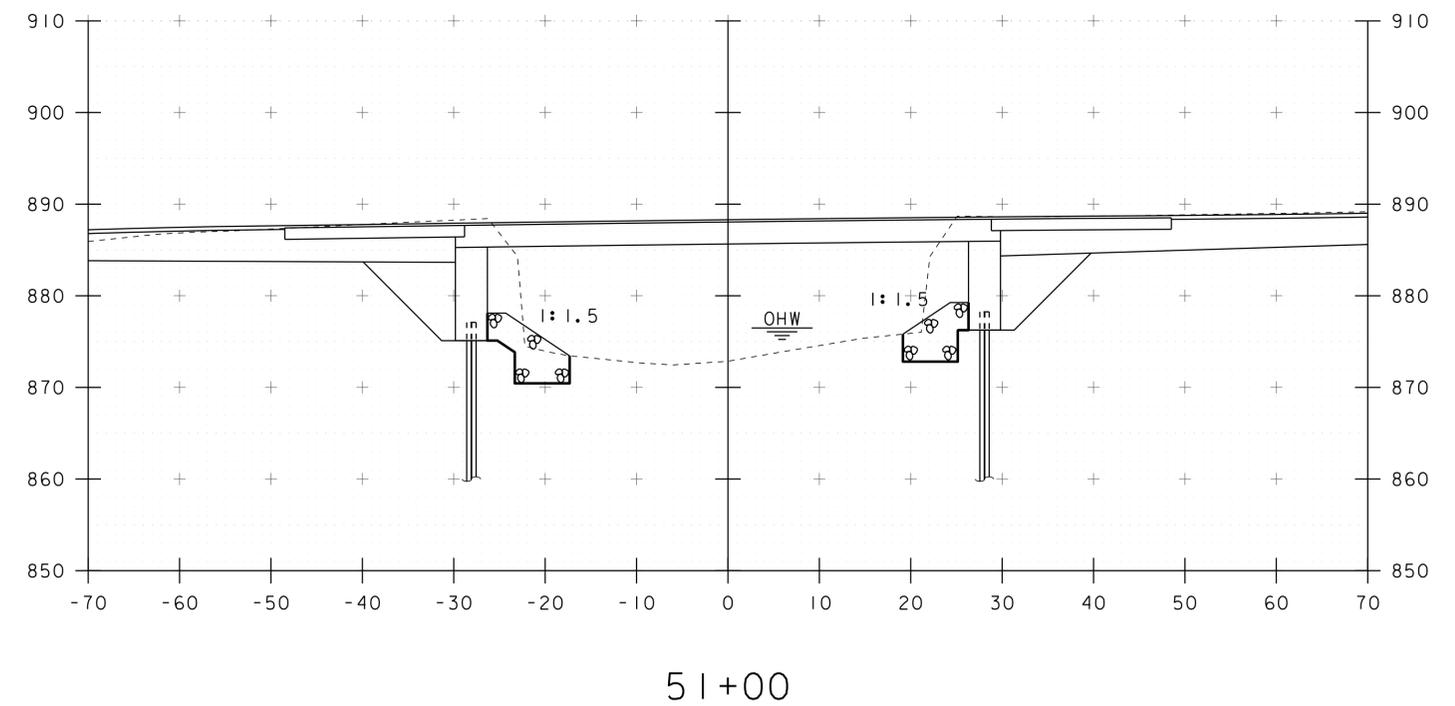
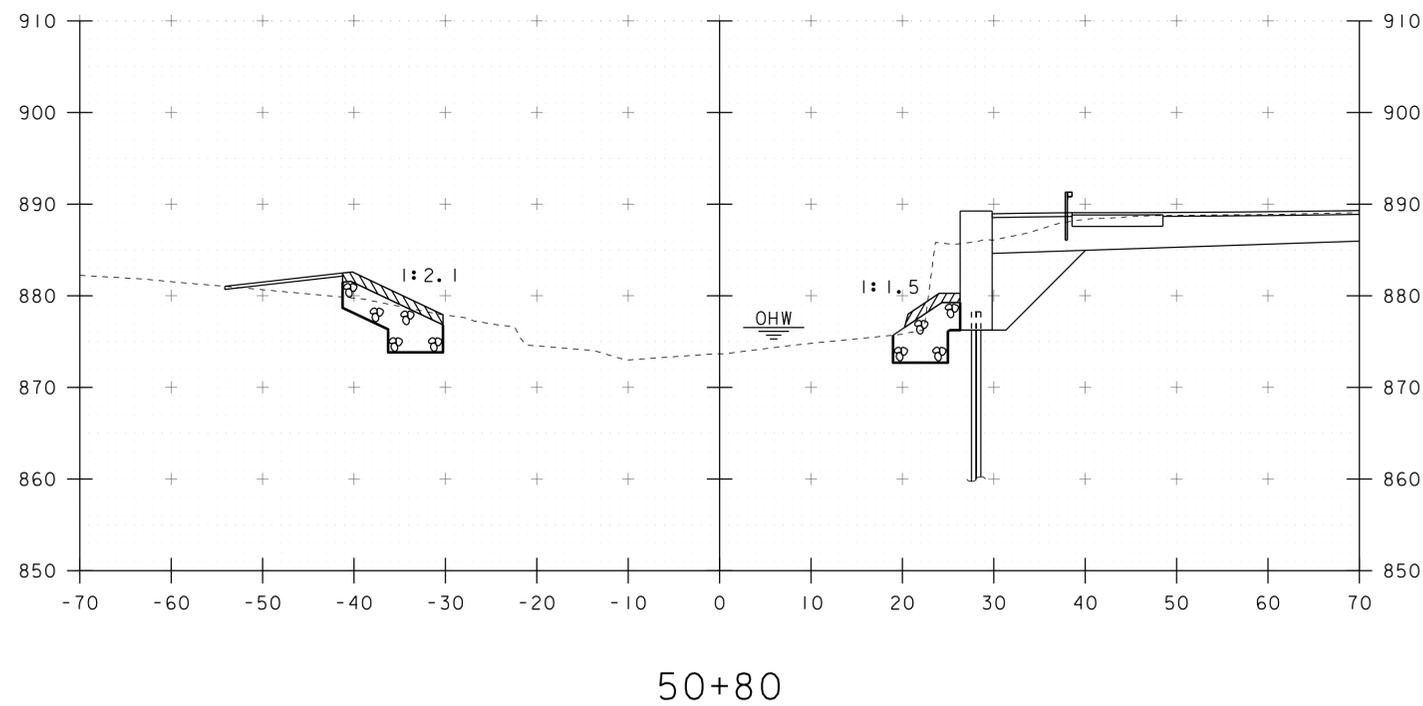
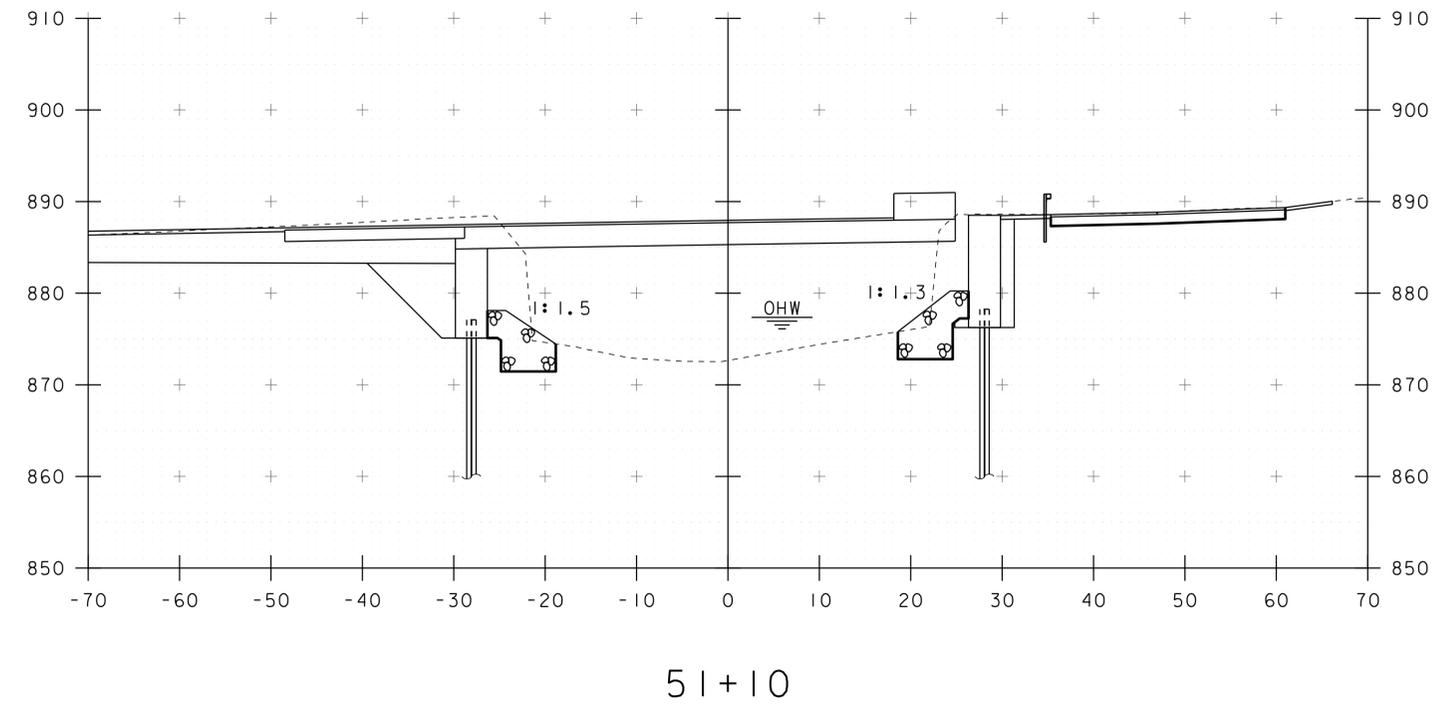
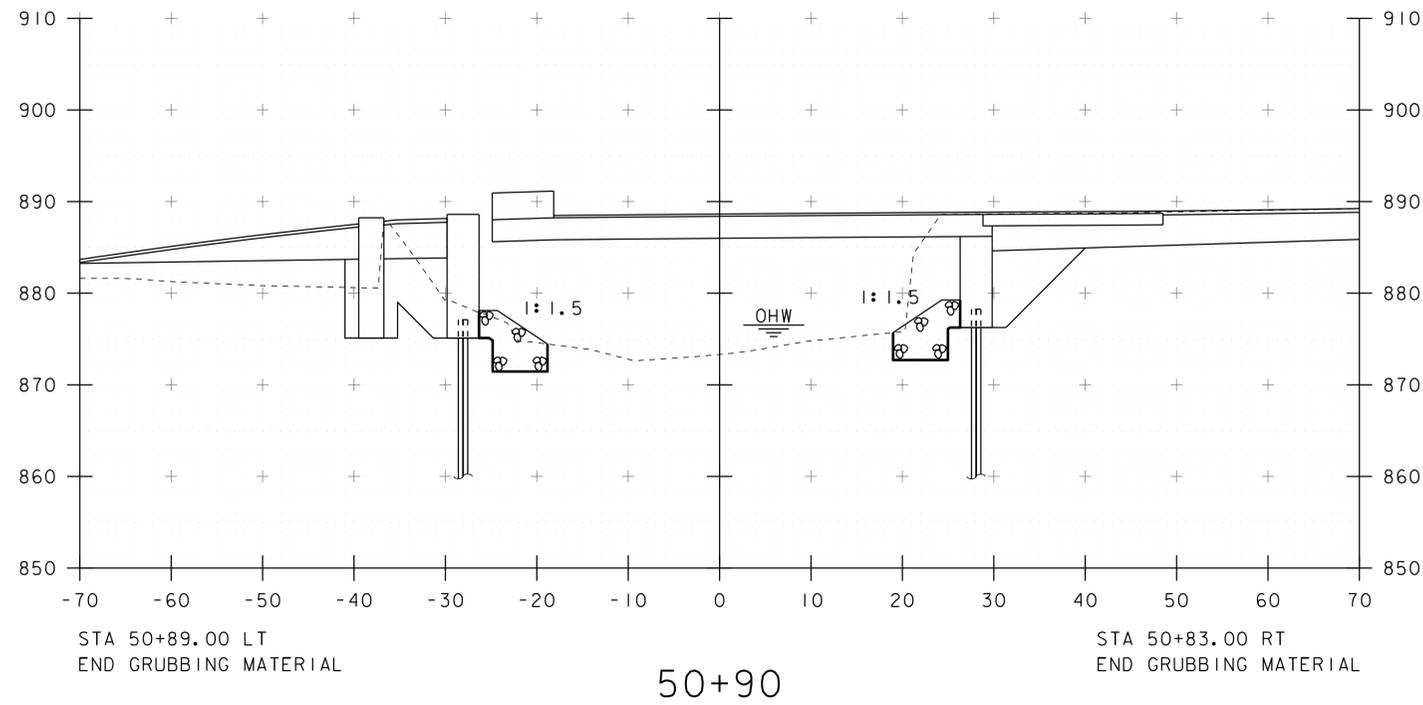


STA 50+65.00 RT  
 BEGIN STONE FILL, TYPE III  
 GEOTEXTILE UNDER STONE FILL  
 GRUBBING MATERIAL  
 UNCLASSIFIED CHANNEL EXCAVATION

50+60

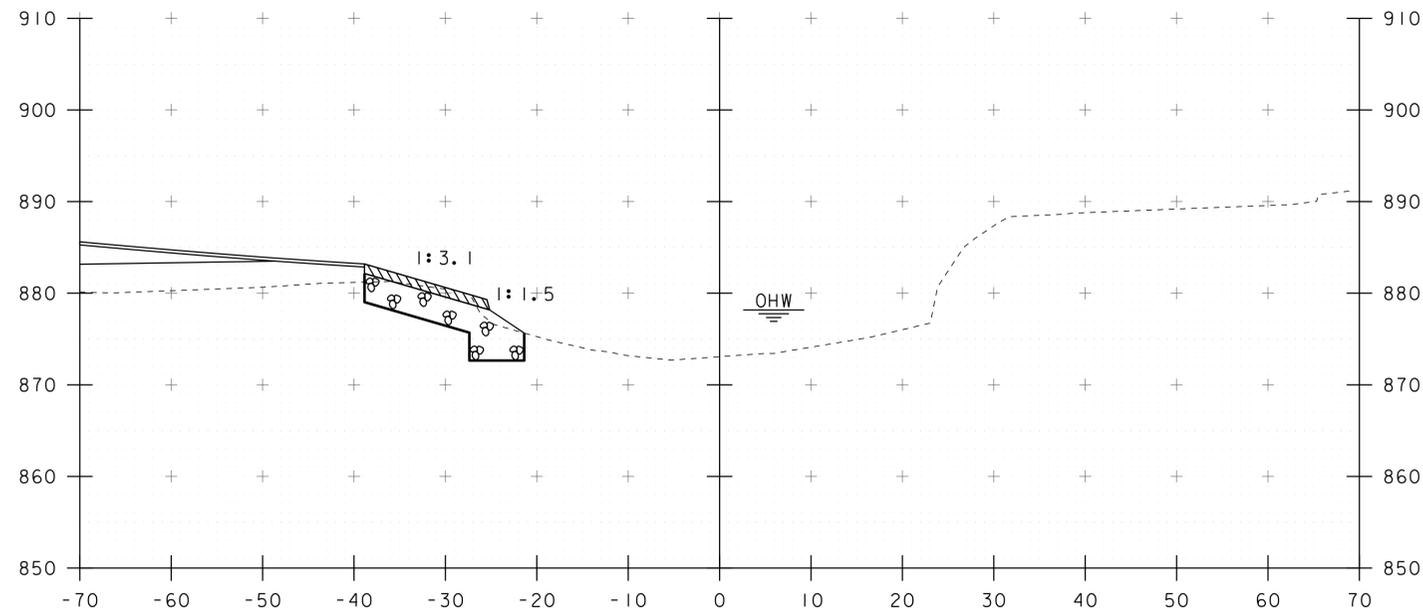
STA. 50+40 TO STA. 50+70

PROJECT NAME:	STRAFFORD	PLOT DATE:	09-MAY-2016
PROJECT NUMBER:	BF 0177(10)	DRAWN BY:	J.GRIGAS
FILE NAME:	sl3j088xsl.dgn	DESIGNED BY:	J.GRIGAS
PROJECT LEADER:	K. HIGGINS	CHECKED BY:	T. MATTHEWS
CHANNEL SECTIONS		SHEET	43 OF 50



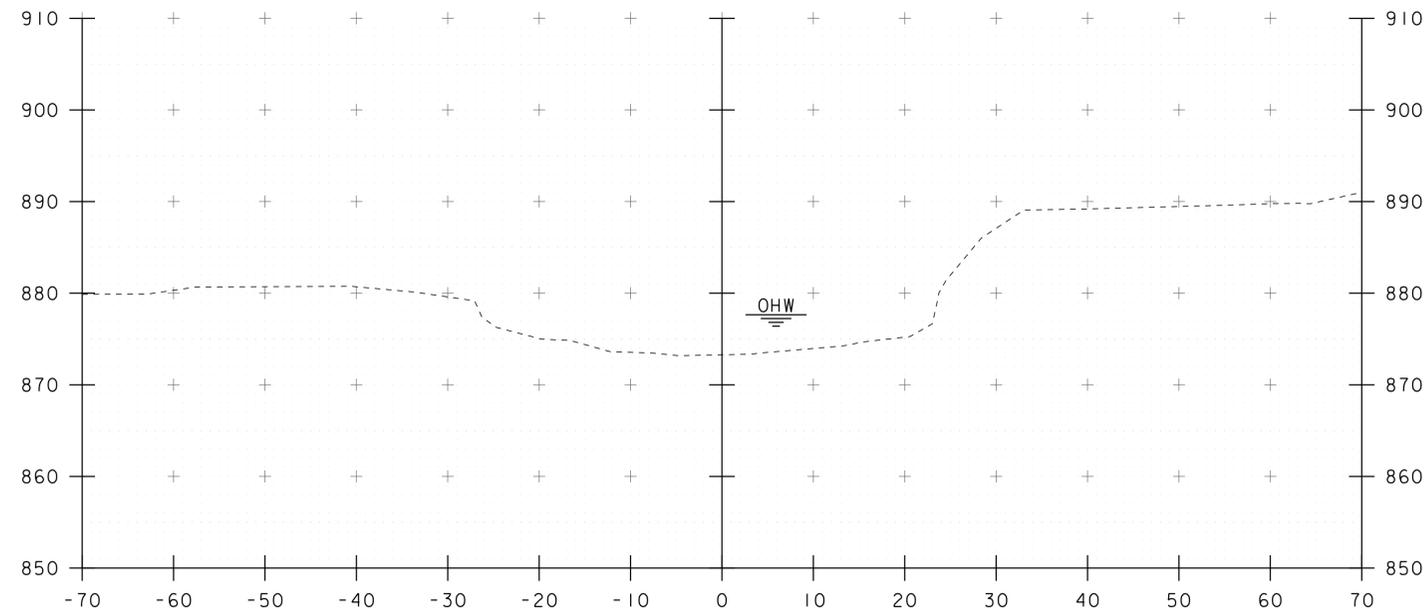
STA. 50+80 TO STA. 51+10

PROJECT NAME:	STRAFFORD	PLOT DATE:	09-MAY-2016
PROJECT NUMBER:	BF 0177(10)	DRAWN BY:	J.GRIGAS
FILE NAME:	s13j088xsl.dgn	DESIGNED BY:	J.GRIGAS
PROJECT LEADER:	K. HIGGINS	CHECKED BY:	T. MATTHEWS
CHANNEL SECTIONS		SHEET	44 OF 50

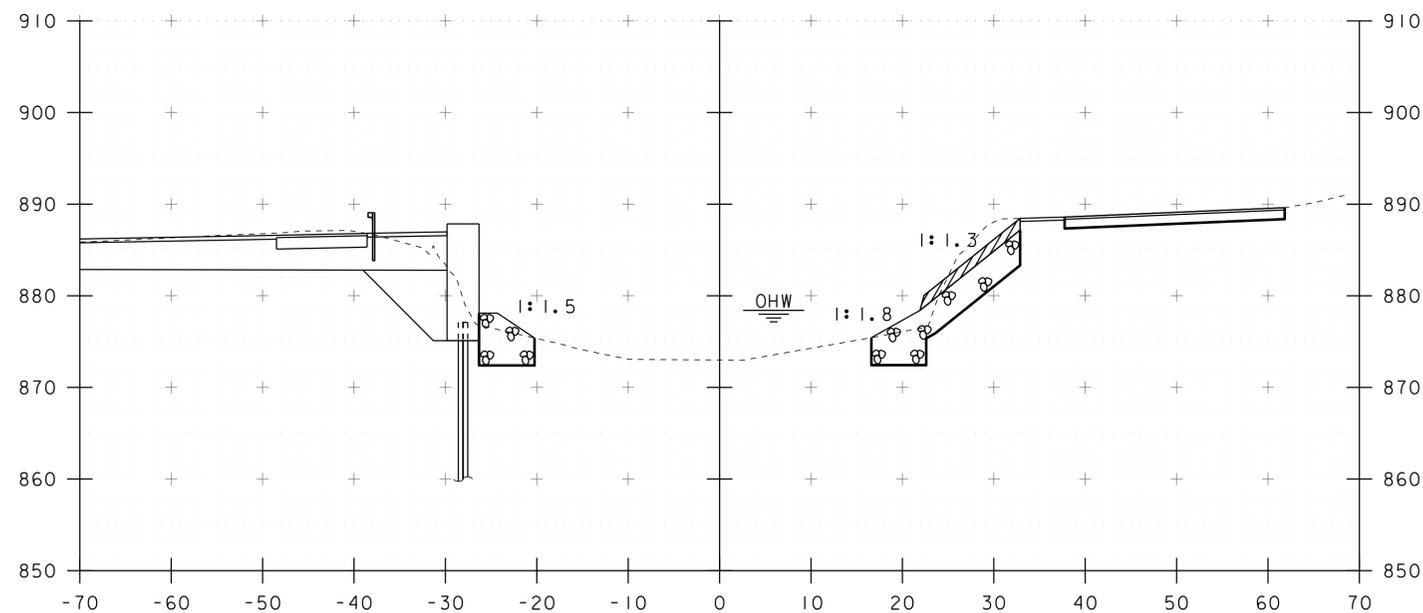


STA 51+35.00 LT  
END STONE FILL, TYPE III  
GEOTEXTILE UNDER STONE FILL  
GRUBBING MATERIAL  
UNCLASSIFIED CHANNEL EXCAVATION

51+30



51+50

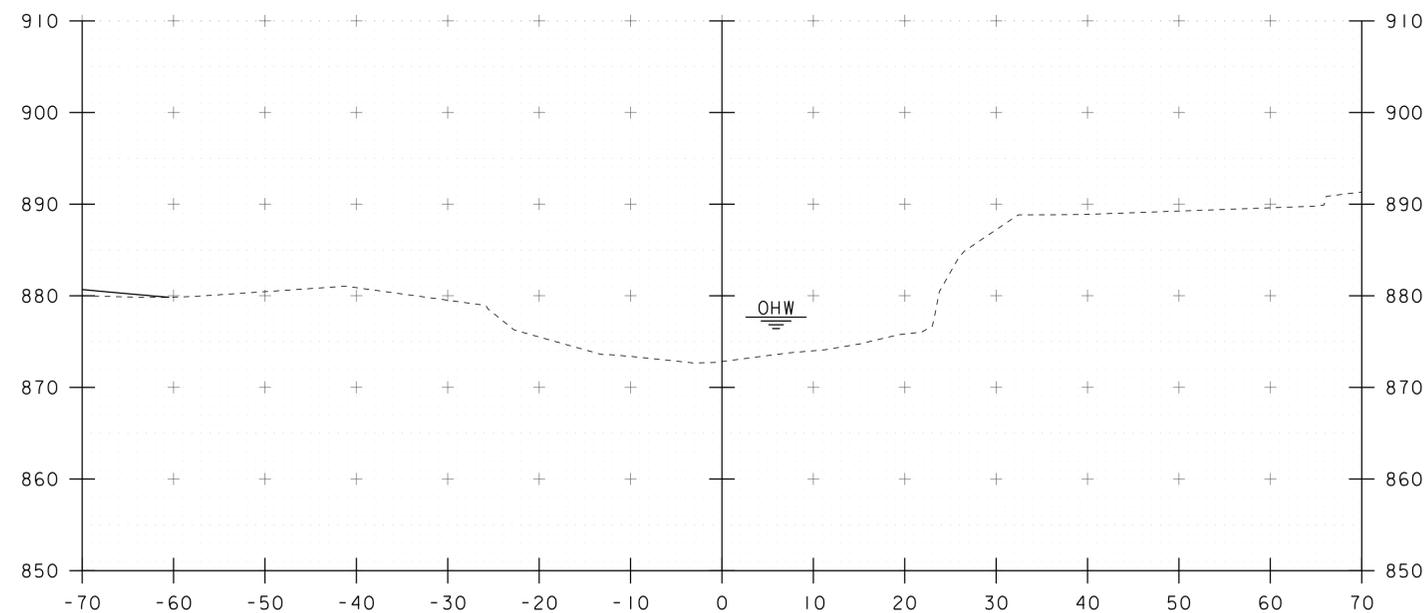


STA 51+18.00 LT  
BEGIN GRUBBING MATERIAL

51+20

STA 51+11.00 RT  
BEGIN GRUBBING MATERIAL

STA 51+29.00 RT  
END STONE FILL, TYPE III  
GEOTEXTILE UNDER STONE FILL  
GRUBBING MATERIAL  
UNCLASSIFIED CHANNEL EXCAVATION



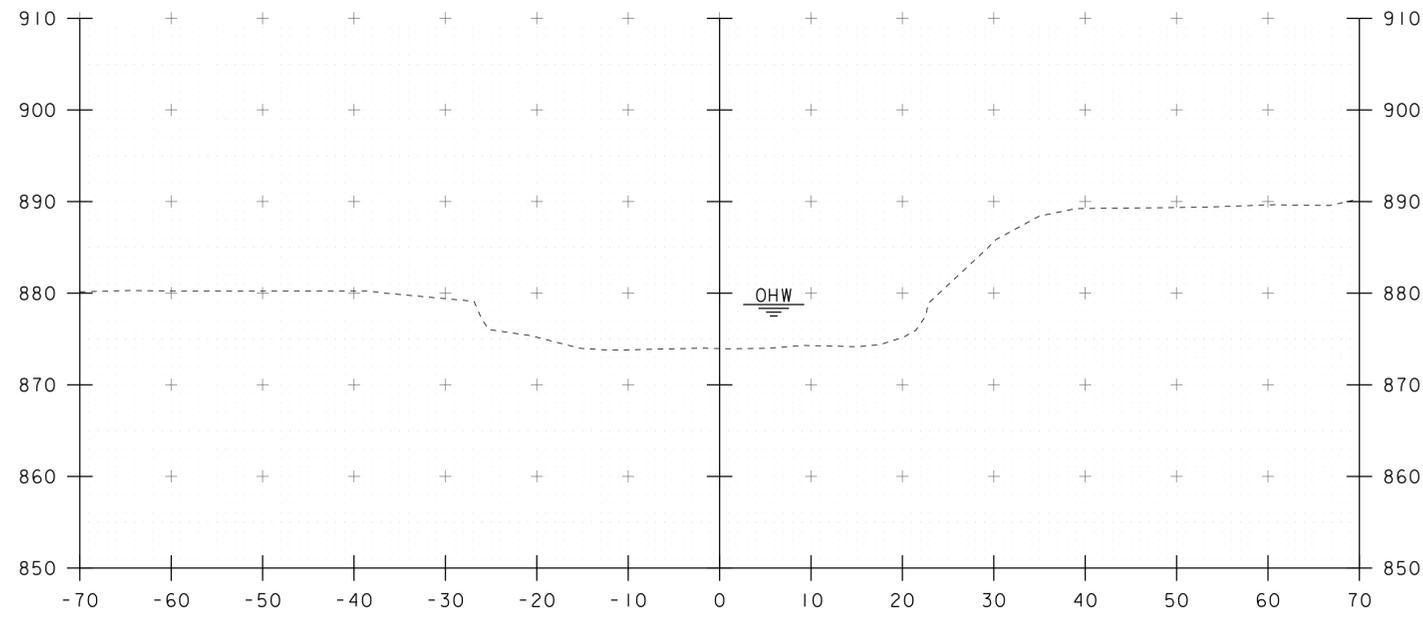
51+40

STA. 51+20 TO STA. 51+50

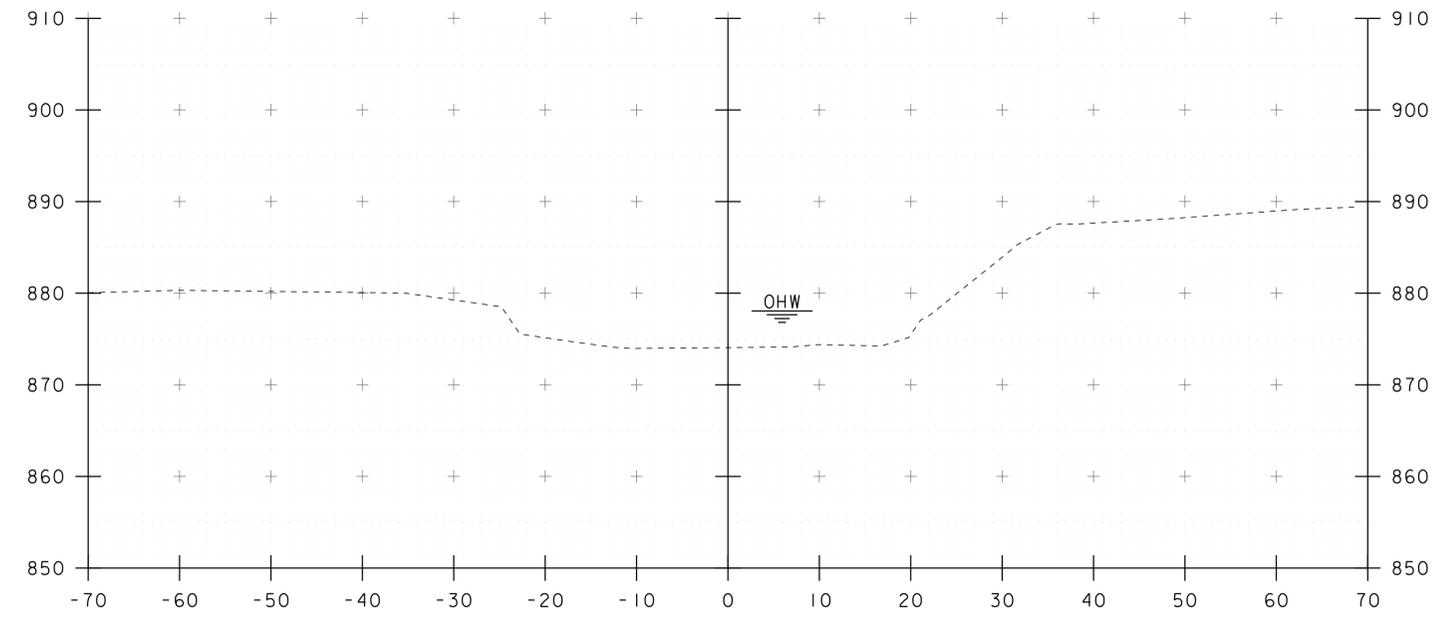
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PROJECT NUMBER: BF 0177(10)

FILE NAME: s13j088xsl.dgn  
PROJECT LEADER: K. HIGGINS  
DESIGNED BY: J. GRIGAS  
CHANNEL SECTIONS

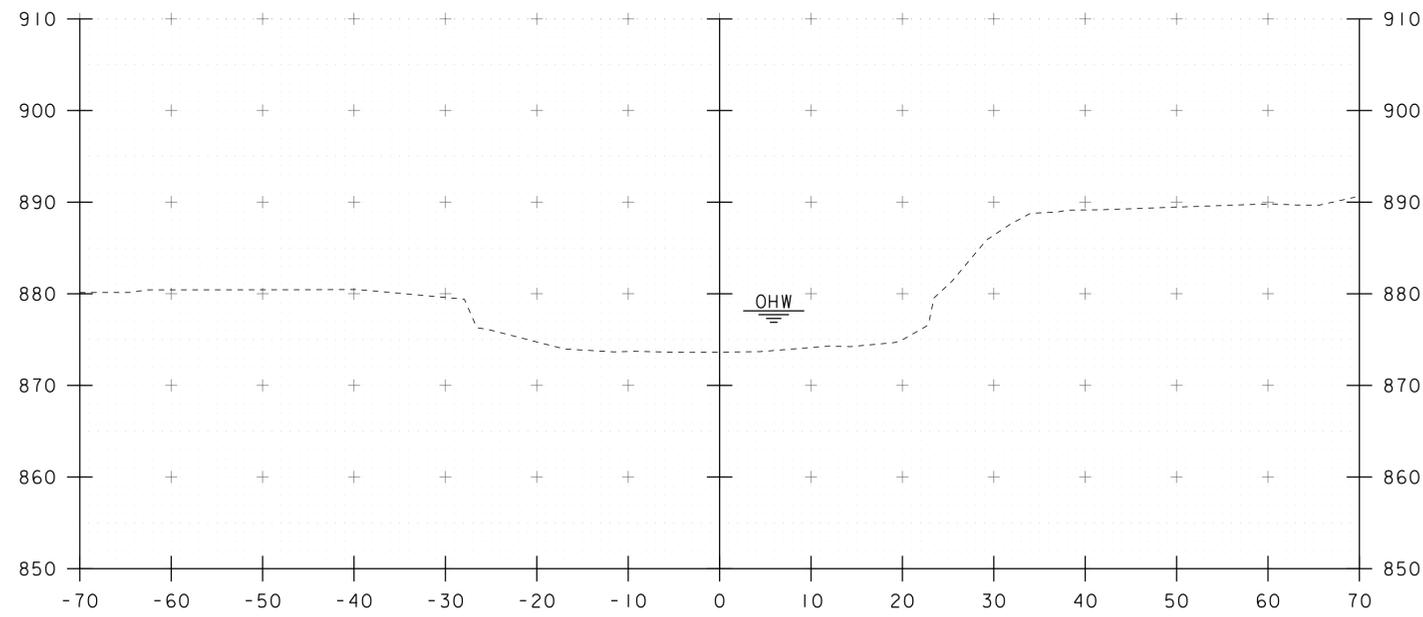
PLOT DATE: 09-MAY-2016  
DRAWN BY: J. GRIGAS  
CHECKED BY: T. MATTHEWS  
SHEET 45 OF 50



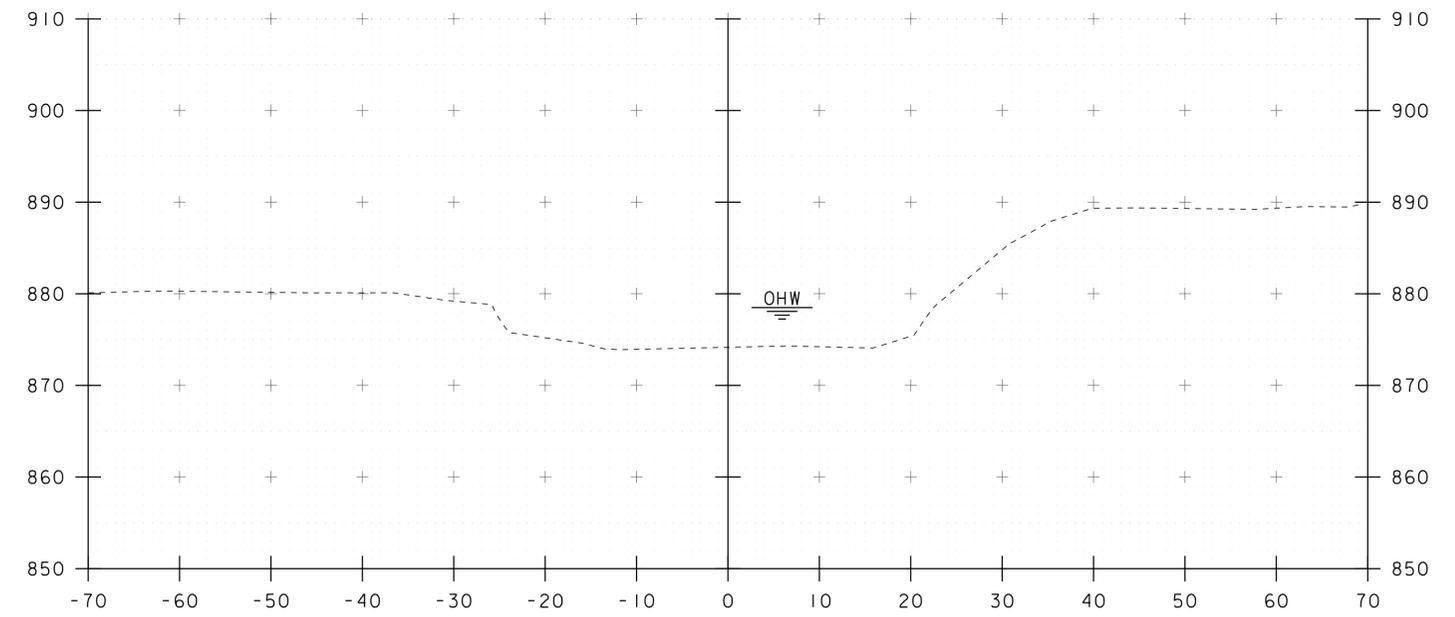
51+70



51+90



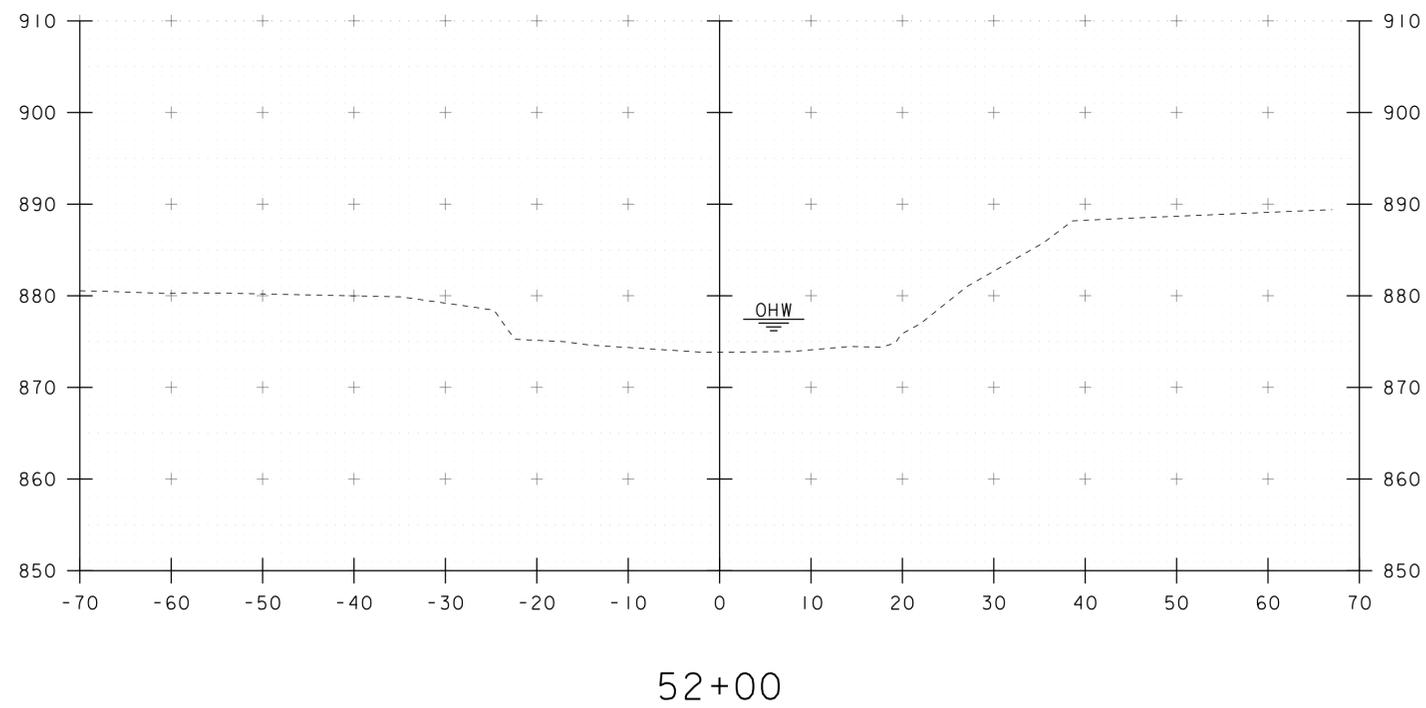
51+60



51+80

STA. 51+60 TO STA. 51+90

PROJECT NAME:	STRAFFORD	PLOT DATE:	09-MAY-2016
PROJECT NUMBER:	BF 0177(10)	DRAWN BY:	J.GRIGAS
FILE NAME:	sl3j088xsl.dgn	CHECKED BY:	T. MATTHEWS
PROJECT LEADER:	K. HIGGINS	SHEET	46 OF 50
DESIGNED BY:	J.GRIGAS	CHANNEL SECTIONS	



STA. 52+00 TO STA. 52+00

PROJECT NAME: STRAFFORD	PLOT DATE: 09-MAY-2016
PROJECT NUMBER: BF 0177(10)	DRAWN BY: J.GRIGAS
FILE NAME: s13j088xsl.dgn	CHECKED BY: T. MATTHEWS
PROJECT LEADER: K. HIGGINS	SHEET 47 OF 50
DESIGNED BY: J.GRIGAS	
CHANNEL SECTIONS	

# EPSC PLAN NARRATIVE

## 1.1 PROJECT DESCRIPTION

THIS PROJECT INVOLVES THE REMOVAL OF BRIDGE 29 IN ITS ENTIRETY. BRIDGE 29 WILL BE REPLACED WITH A NEW STRUCTURE, SPANNING 53 FEET OVER THE WEST BRANCH OMPOMPANOOSUC RIVER, ON NEW ABUTMENTS ALONG THE EXISTING ALIGNMENT. BRIDGE 29 IS LOCATED IN THE TOWN OF STRAFFORD, ON TOWN HIGHWAY 1 (FAS 0177), APPROXIMATELY 0.04 MILES NORTH OF THE INTERSECTION OF TOWN HIGHWAY 1 AND TOWN HIGHWAY 4.

NOTE: AREA OF DISTURBANCE INCLUDES LIMITS OF EARTH DISTURBANCE WITHIN THE PROJECT AREA, AS WELL AS WASTE, BORROW AND STAGING AREAS, AND OTHER EARTH DISTURBING ACTIVITIES WITHIN OR DIRECTLY ADJACENT TO THE PROJECT LIMITS AS SHOWN ON THE ATTACHED EPSC PLAN.

TOTAL AREA OF DISTURBANCE AS SHOWN ON THE ATTACHED EPSC PLAN IS APPROXIMATELY 0.45 ACRES.

IT IS ANTICIPATED THAT THIS PROJECT WILL LAST ONE CONSTRUCTION SEASON.

## 1.2 SITE INVENTORY

### 1.2.1 TOPOGRAPHY

THE TOPOGRAPHY OF THE AREA INCLUDES FORESTED ROLLING HILLS WITH OCCASIONAL OPEN AREAS FOR RESIDENTIAL AND AGRICULTURAL USE. TOWN HIGHWAY 1 (FAS 0177), MINE ROAD (TH4), AND THREE DRIVEWAYS ARE WITHIN THE PROJECT SITE. THERE ARE TWO RESIDENCES ON THE SOUTH SIDE OF THE PROJECT AND A CHURCH ON THE NORTH SIDE OF THE PROJECT.

### 1.2.2 DRAINAGE, WATERWAYS, BODIES OF WATER, AND PROXIMITY TO NATURAL OR MAN-MADE WATER FEATURES

THE WEST BRANCH OMPOMPANOOSUC RIVER AND AN UNNAMED TRIBUTARY THAT CROSSES BENEATH TOWN HIGHWAY 1 TO THE SOUTH OF THE PROJECT ARE THE ONLY WATER SOURCES ON THE PROJECT SITE. THE WEST BRANCH OMPOMPANOOSUC RIVER IS CLASSIFIED AS SINUOUS AND ALLUVIAL. THE STREAM BED CONSISTS OF COBBLES, GRAVEL, AND SAND. THE TRIBUTARY AREA AT THE BRIDGE CROSSING IS 34.7 MILES<sup>2</sup>.

### 1.2.3 VEGETATION

THE VEGETATION IN THE PROJECT AREA CONSISTS OF HARDWOOD AND SOFTWOOD TREES AND UNDERGROWTH. THE IMPACT TO VEGETATION WILL BE LIMITED TO THAT WHICH IS DIRECTLY AFFECTED BY REPLACEMENT OF THE EXISTING BRIDGE. UPON PROJECT COMPLETION, THE CHANNEL WILL BE ARMORED WITH STONE FILL TYPE III AS SPECIFIED ON THE PLANS. DISTURBED VEGETATION WILL BE REESTABLISHED WITH STANDARD SEED AND MULCH PRACTICES.

### 1.2.4 SOILS

ALL SOIL DATA CAME FROM THE U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE FOR THE COUNTY OF ORANGE, VERMONT. SOILS ON THE PROJECT SITE ARE BUCKLAND LOAM, 3% TO 8% SLOPES, "K FACTOR" = 0.32 AND WINOOSKI VERY FINE SANDY LOAM, "K FACTOR" = 0.37. BOTH OF THESE SOILS ARE CONSIDERED TO HAVE MODERATE TO HIGH EROSION POTENTIAL.

NOTE: K-VALUES GENERALLY INDICATE THE FOLLOWING:  
0.0-0.23 = LOW EROSION POTENTIAL  
0.24-0.36 = MODERATE EROSION POTENTIAL  
0.37 AND HIGHER = HIGH EROSION POTENTIAL

### 1.2.5 SENSITIVE RESOURCE AREAS

CRITICAL HABITATS: NO  
HISTORICAL OR ARCHEOLOGICAL AREAS: YES, HISTORICAL AREA ON SOUTH SIDE OF PROJECT AND ARCHEOLOGICAL AREA IN SOUTHWEST QUADRANT.  
PRIME AGRICULTURAL LAND: NO  
THREATENED AND ENDANGERED SPECIES: NO  
WATER RESOURCE: WEST BRANCH OMPOMPANOOSUC RIVER  
WETLANDS: NO

## 1.3 RISK EVALUATION

THIS PROJECT DOES NOT FALL UNDER THE JURISDICTION OF GENERAL PERMIT 3-9020 FOR STORMWATER RUNOFF FROM CONSTRUCTION SITES. SHOULD CHANGES PRIOR TO OR DURING CONSTRUCTION RESULT IN ONE OR MORE ACRES OF EARTH DISTURBANCE OR SHOULD THE PROJECT BECOME PART OF A LARGER PLAN OF DEVELOPMENT, THE CONTRACTOR WILL BE RESPONSIBLE FOR ANY ADDITIONAL PERMITTING.

## 1.4 EROSION PREVENTION AND SEDIMENT CONTROL

THE EROSION CONTROL PLANS ARE MEANT AS A GUIDELINE FOR PREVENTING EROSION AND CONTROLLING SEDIMENT TRANSPORT. THE PRINCIPLES OUTLINED IN THIS NARRATIVE CONSIST OF APPLYING MEASURES THROUGHOUT CONSTRUCTION OF THE PROJECT IN ORDER TO MINIMIZE SEDIMENT TRANSPORT TO THE RECEIVING WATERS. THE MEASURES INCLUDE STABILIZATION AND STRUCTURAL PRACTICES, STORM WATER CONTROLS AND OTHER POLLUTION PREVENTION PRACTICES. THEY HAVE BEEN PROPOSED BY THE DESIGNER AS A BASIS FOR PROTECTING RESOURCES AND WILL NEED TO BE BUILT UPON BASED ON THE SPECIFIC MEANS AND METHODS OF THE CONTRACTOR. REFER TO THE LOW RISK SITE HANDBOOK AND APPROPRIATE DETAIL SHEETS FOR SPECIFIC GUIDANCE AND CONSTRUCTION DETAILING.

ALL MEASURES SHALL BE REGULARLY MAINTAINED AND SHALL BE CHECKED FOR SEDIMENT BUILD-UP. SEDIMENT SHALL BE DISPOSED OF AT AN APPROVED SITE WHERE IT WILL NOT BE SUBJECT TO EROSION.

### 1.4.1 MARK SITE BOUNDARIES

SITE BOUNDARIES AND AREAS CONSTRUCTION EQUIPMENT CAN ACCESS SHALL BE DELINEATED.

BARRIER FENCE (BF) SHALL BE USED TO PHYSICALLY MARK SITE BOUNDARIES AS PROPOSED ON THE EPSC PLAN.

### 1.4.2 LIMIT DISTURBANCE AREA

PREVENTING INITIAL SOIL EROSION BY MINIMIZING THE EXPOSED AREA IS MUCH MORE EFFECTIVE THAN TREATING ERODED SEDIMENT. EARTH DISTURBANCE CAN BE MINIMIZED THROUGH CONSTRUCTION PHASING BY ONLY OPENING UP EARTH AS NECESSARY. THIS CAN LIMIT THE AREA THAT WILL BE DISTURBED AND EXPOSED TO EROSION. EMPLOY TEMPORARY CONSTRUCTION STABILIZATION PRACTICES IN INCREMENTAL STAGES AS PHASES CHANGE. FOR PROJECTS WHICH FALL UNDER THE CONSTRUCTION GENERAL PERMIT, ONLY THE ACREAGE LISTED ON THE PERMIT AUTHORIZATION MAY BE EXPOSED AT ANY GIVEN TIME.

MAINTAINING VEGETATED BUFFERS ALONG STREAM BANKS, WETLANDS OR OTHER SENSITIVE AREAS IS A CRUCIAL EROSION AND SEDIMENT CONTROL MEASURE THAT SHOULD BE ESTABLISHED WHEREVER POSSIBLE.

### 1.4.3 SITE ENTRANCE/EXIT STABILIZATION

TRACKING OF SEDIMENT ONTO PUBLIC HIGHWAYS SHALL BE MINIMIZED TO REDUCE THE POTENTIAL FOR RUNOFF ENTERING RECEIVING WATERS. INSTALLATION SHALL COINCIDE WITH THE CONTRACTORS PROGRESS SCHEDULE.

STABILIZED CONSTRUCTION ENTRANCES SHALL BE INSTALLED AS PROPOSED ON THE EPSC PLAN AND ANYWHERE EQUIPMENT WILL BE GOING FROM AREAS OF EXPOSED SOILS TO PAVED SURFACES.

### 1.4.4 INSTALL SEDIMENT BARRIERS

SEDIMENT BARRIERS SHALL BE UTILIZED TO INTERCEPT RUNOFF AND ALLOW SUSPENDED SEDIMENT TO SETTLE OUT. THEY SHALL BE INSTALLED PRIOR TO ANY UP SLOPE WORK.

WOVEN WIRE SILT FENCE SHALL BE INSTALLED AS PROPOSED ON THE EPSC PLAN.

FILTER CURTAINS SHALL BE INSTALLED AS PROPOSED ON THE EPSC PLAN.

FILTER FABRIC DROP INLET PROTECTION SHALL BE INSTALLED AS PROPOSED ON THE EPSC PLAN.

### 1.4.5 DIVERT UPLAND RUNOFF

DIVERSIONARY MEASURES SHALL BE USED TO INTERCEPT RUNOFF FROM ABOVE THE CONSTRUCTION AND DIRECT IT AROUND THE DISTURBED AREA SO THAT CLEAN WATER DOES NOT BECOME MUDDIED WHILE TRAVELING OVER EXPOSED SOILS ON THE CONSTRUCTION SITE.

NO DIVERSIONARY MEASURES ARE ANTICIPATED ON THIS PROJECT.

### 1.4.6 SLOW DOWN CHANNELIZED RUNOFF

CHECK STRUCTURES SHALL BE UTILIZED TO REDUCE THE VELOCITY, AND THUS THE EROSION POTENTIAL, OF CONCENTRATED FLOW IN CHANNELS.

NO CHECK STRUCTURES ARE ANTICIPATED ON THIS PROJECT.

### 1.4.7 CONSTRUCT PERMANENT CONTROLS

DROP INLETS, OPTION PIPES AND STONE LINED DITCHES SHALL BE INSTALLED AS SHOWN ON THE PLANS AND IN ACCORDANCE WITH PERMIT CONDITIONS.

### 1.4.8 STABILIZE EXPOSED SOILS DURING CONSTRUCTION

ALL AREAS OF DISTURBANCE MUST HAVE TEMPORARY STABILIZATION IN PLACE WITHIN 48 HOURS OF DISTURBANCE OR IN ACCORDANCE WITH THE CONSTRUCTION GENERAL PERMIT 3-9020 AUTHORIZATION.

SURFACE ROUGHENING OF ALL EXPOSED SLOPES, COMBINED WITH TEMPORARY MULCHING, SHALL BE UTILIZED ON A REGULAR BASIS. BIODEGRADABLE EROSION CONTROL MATTING OR AN EQUIVALENT SHALL BE USED TO STABILIZE ALL SLOPES STEEPER THAN 1:3.

THE FORECAST OF RAINFALL EVENTS SHALL TRIGGER IMMEDIATE PROTECTION OF EXPOSED SOILS.

### 1.4.9 WINTER STABILIZATION

VARIOUS MEASURES SPECIFIC TO WINTER MAY BE NECESSARY SHOULD THE PROJECT EXTEND INTO WINTER (OCTOBER 15 THROUGH APRIL 15). REFER TO THE LOW RISK SITE HANDBOOK FOR GUIDANCE.

### 1.4.10 STABILIZE SOIL AT FINAL GRADE

EXPOSED SOIL MUST BE STABILIZED WITHIN 48 HOURS OF REACHING FINAL GRADE.

SEED, MULCH, FERTILIZER AND LIME SHALL BE USED TO ESTABLISH PERMANENT VEGETATION. FOR SLOPES STEEPER THAN 1:3, BIODEGRADABLE EROSION CONTROL MATTING OR AN EQUIVALENT SHALL BE USED INSTEAD OF MULCH.

BIODEGRADABLE EROSION CONTROL SHALL BE INSTALLED AS PROPOSED ON THE EPSC PLAN.

### 1.4.11 DE-WATERING ACTIVITIES

DISCHARGE FROM DEWATERING ACTIVITIES THAT FLOWS OFF OF THE CONSTRUCTION SITE MUST NOT CAUSE OR CONTRIBUTE TO A VIOLATION OF THE VERMONT WATER QUALITY STANDARDS.

TREATMENT OF DEWATERING COFFERDAM IS NOT ANTICIPATED.

### 1.4.12 INSPECT YOUR SITE

INSPECT THE PROJECT SITE BASED ON SPECIAL PROVISION REQUIREMENTS OR CONSTRUCTION GENERAL PERMIT AUTHORIZATION STIPULATIONS.

## 1.5 SEQUENCE AND STAGING

THIS SECTION WILL BE DEVELOPED BY THE CONTRACTOR USING THE GUIDANCE OUTLINED IN THE VTRANS EPSC PLAN CONTRACTOR CHECKLIST.

### 1.5.1 CONSTRUCTION SEQUENCE

### 1.5.2 OFF-SITE ACTIVITIES

IN ADDITION TO THE CONTRACTOR CHECKLIST ANY ACTIVITIES OUTSIDE THE CONSTRUCTION LIMITS SHALL FOLLOW SPECIFICATION 105.25- 105.29 OF THE STANDARD SPECIFICATIONS FOR CONSTRUCTION.

### 1.5.3 UPDATES

PROJECT NAME: STRAFFORD

PROJECT NUMBER: BF 0177(10)

FILE NAME: s13j088ero\_narrative.dgn

PROJECT LEADER: K. HIGGINS

DESIGNED BY: J. GRIGAS

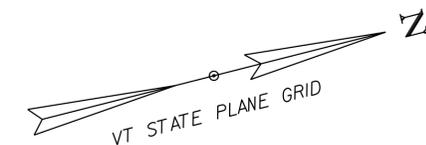
EPSC NARRATIVE

PLOT DATE: 09-MAY-2016

DRAWN BY: J. GRIGAS

CHECKED BY: T. MATTHEWS

SHEET 48 OF 50



WINOOSKI VERY FINE SANDY LOAM  
 0-3% SLOPE  
 TYPE C SOIL  
 K VALUE = 0.37  
 HIGH EROSION POTENTIAL

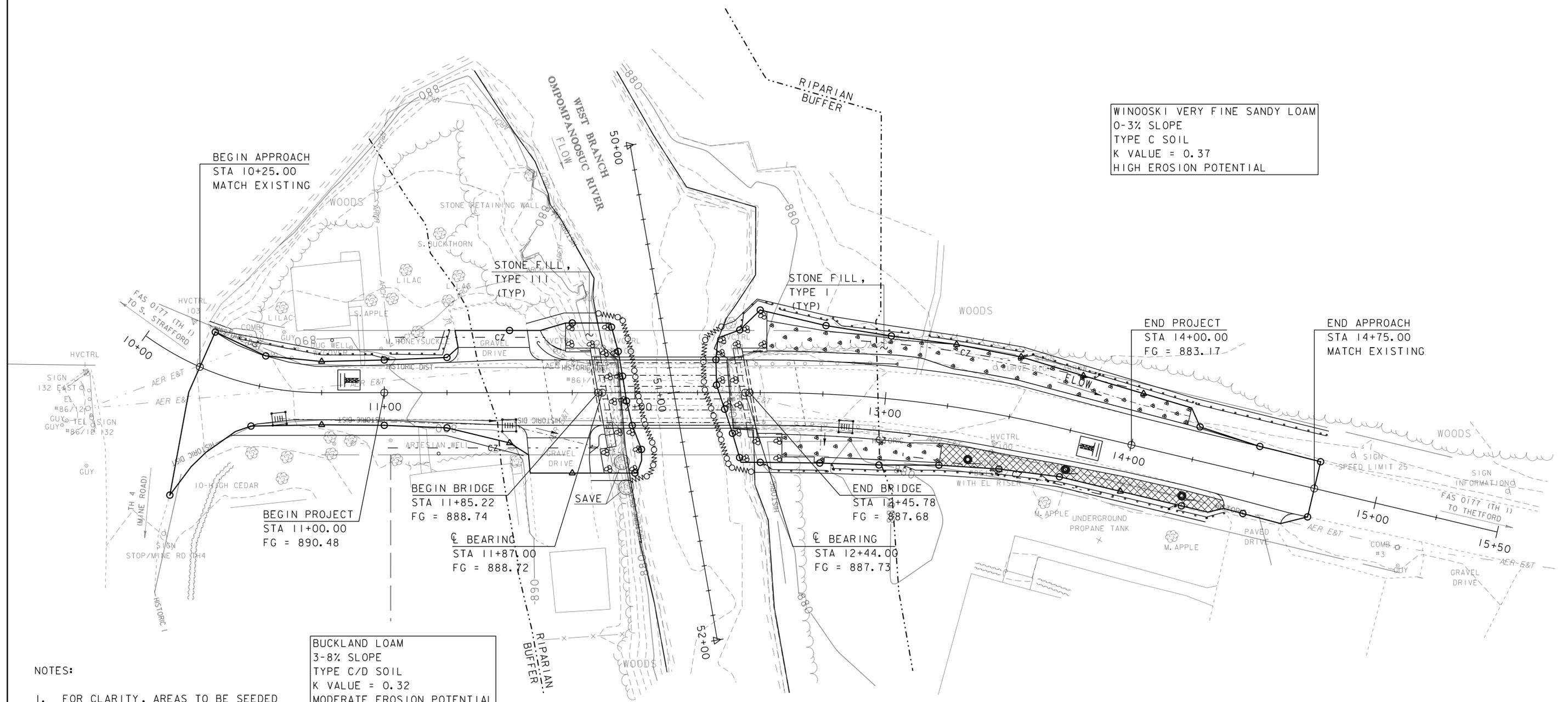
BUCKLAND LOAM  
 3-8% SLOPE  
 TYPE C/D SOIL  
 K VALUE = 0.32  
 MODERATE EROSION POTENTIAL

- NOTES:
- FOR CLARITY, AREAS TO BE SEEDED AND MULCHED ARE NOT SHOWN; HOWEVER, ALL DISTURBED AREAS SHALL BE SEEDED AND MULCHED AS APPLICABLE.
  - EXISTING CONTOURS ARE SHOWN. SEE CROSS SECTIONS FOR FINAL CONTOURS.
  - THESE PLANS SHOW A CONCEPTUAL EROSION CONTROL PLAN, THE CONTRACTOR MUST SUBMIT A TEMPORARY EROSION CONTROL PLAN FOR APPROVAL.
  - THE CONTRACTOR SHALL USE OTHER EROSION CONTROL MEASURES AS NECESSITATED BY THE SEQUENCE OF CONSTRUCTION OR AS DIRECTED BY THE RESIDENT ENGINEER AND ON-SITE COORDINATOR.

EPSC PLAN

SCALE 1" = 20' - 0"  
 20 0 20

PROJECT NAME: STRAFFORD	
PROJECT NUMBER: BF 0177(10)	
FILE NAME: s13j088bdr_ero.dgn	PLOT DATE: 09-MAY-2016
PROJECT LEADER: K. HIGGINS	DRAWN BY: J. GRIGAS
DESIGNED BY: J. GRIGAS	CHECKED BY: T. MATTHEWS
EPSC PLAN	SHEET 49 OF 50



**SYMBOL**  
NOT TO SCALE

**CONSTRUCTION SPECIFICATIONS**

1. FILTER CURTAIN SHALL NOT BE PLACED ACROSS A FLOWING WATERWAY, OR IN A WATERWAY WITH STREAM VELOCITIES GREATER THAN 1.5 FEET/SECOND.
2. MAXIMUM 100' LENGTH BETWEEN ANCHORS.
3. LAST SECTION SHALL TERMINATE A MINIMUM OF 10' BEYOND LIMIT OF DISTURBANCE.
4. THE WEIGHTED ANCHOR SYSTEM SHALL BE A TYPE WHICH ALLOWS THE CURTAIN TO CONFORM TO THE BOTTOM OF THE WATERWAY.
5. THE CURTAIN SHALL BE REMOVED BY SLOWLY PULLING TOWARD THE SHORE MINIMIZING THE ESCAPE OF SEDIMENTS INTO WATERWAY.

**FILTER CURTAIN**

REVISIONS		
APRIL 1, 2008	WHF	
JANUARY 13, 2009	WHF	
SEPTEMBER 4, 2009	WHF	

THIS WORK SHALL BE PERFORMED IN ACCORDANCE WITH SECTION 649 FOR GEOTEXTILE FOR FILTER CURTAIN (PAY ITEM 649.61).

**SYMBOL**  
NOT TO SCALE

**CONSTRUCTION SPECIFICATIONS**

NOTE: GROOVE SLOPE BY CUTTING FURROWS ALONG THE CONTOUR. IRREGULARITIES IN THE SOIL SURFACE CATCH RAINWATER AND RETAIN LIME, FERTILIZER AND SEED.

**SURFACE ROUGHENING**

ADAPTED FROM DETAILS PROVIDED BY: NEW YORK STATE DEC ORIGINALLY DEVELOPED BY USDA-NRCS VERMONT DEPARTMENT OF ENVIRONMENTAL CONSERVATION

REVISIONS		
APRIL 1, 2008	WHF	
JANUARY 13, 2009	WHF	

THIS WORK SHALL BE CONSIDERED INCIDENTAL TO THE CONTRACT

VAOT LOW GROW/FINE FESCUE MIX						
WEIGHT	BROADCAST	HYDROSEED	NAME	LATIN NAME	GERM	PURITY
38%	57	95	CREeping RED FESCUE	FESTUCA RUBRA VAR. RUBRA	90%	98%
29%	43.5	72.5	HARD FESCUE	FESTUCA LONGIFOLIA	85%	95%
15%	22.5	37.5	CHEWINGS FESCUE	FESTUCA RUBRA VAR. COMMUTATA	87%	95%
15%	22.5	37.5	ANNUAL RYEGRASS	LOLIUM MULTIFLORUM	90%	95%
3%	4.5	7.5	INERTS			
100%	150	250				

VAOT RURAL AREA MIX						
WEIGHT	BROADCAST	HYDROSEED	NAME	LATIN NAME	GERM	PURITY
37.5%	22.5	45	CREeping RED FESCUE	FESTUCA RUBRA VAR. RUBRA	85%	98%
37.5%	22.5	45	TALL FESCUE	FESTUCA ARUNDINACEA	90%	95%
5.0%	3	6	RED TOP	AGROSTIS GIGANTEA	90%	95%
15.0%	9	18	WHITE FIELD CLOVER	TRIFOLIUM REPENS	85%	98%
5.0%	3	6	ANNUAL RYE GRASS	LOLIUM MULTIFLORUM	85%	95%
100%	60	120				

GENERAL AMENDMENT GUIDANCE		
FERTILIZER	LIME	
10/20/10	AG LIME	PELLITIZED
500 LBS/AC	2 TONS/AC	1 TONS/AC

**CONSTRUCTION GUIDANCE**

1. SEED MIX: THE CONTRACTOR SHALL COORDINATE WITH THE RESIDENT ENGINEER ON WHICH SEED MIX TO USE.
2. SEED MIX: USE AS INDICATED IN THE PLANS AND/OR FOR ALL ESTABLISHED UPLAND (NON WETLAND) AREAS DISTURBED BY THE CONTRACTOR.
3. ALL SEED MIXTURES SHALL NOT HAVE A WEED CONTENT EXCEEDING 0.40% BY WEIGHT AND SHALL BE FREE OF ALL NOXIOUS SEED.
4. FERTILIZER AND LIMESTONE: SHALL FOLLOW RATES SHOWN ON PLAN OR AS DIRECTED BY THE ENGINEER.
5. HAY MULCH: TO BE PLACED ON EARTH SLOPES AT THE RATE OF 2 TONS/ACRE, ACHIEVE 90% GROUND COVER OR AS DIRECTED BY THE ENGINEER.
6. HYDROSEEDING: ALTHOUGH GUIDANCE IS GIVEN ABOVE THE SITE CONDITIONS AND THE TYPE OF HYDROSEED PROPOSED FOR USE WILL ULTIMATELY DICTATE THE AMOUNTS AND TYPES OF SOIL AMENDMENTS TO BE APPLIED.
7. TURF ESTABLISHMENT: PLACING SEED, FERTILIZER, LIME AND MULCH PRIOR TO SEPTEMBER 15 AND AFTER APRIL 15 CAN BETTER ENSURE A VIGOROUS GROWTH OF GRASS.

**TURF ESTABLISHMENT**

ADAPTED FROM VTRANS TECHNICAL LANDSCAPE MANUAL FOR ROADWAYS AND TRANSPORTATION FACILITIES

REVISIONS		
JANUARY 12, 2015	WHF	

THIS WORK SHALL BE PERFORMED IN ACCORDANCE WITH SECTION 651 FOR SEED (PAY ITEM 651.5)

**SYMBOL**  
NOT TO SCALE

**CONSTRUCTION SPECIFICATIONS**

1. FILTER FABRIC SHALL HAVE AN EOS OF 40-85. BURLAP MAY BE USED FOR SHORT TERM APPLICATIONS.
2. CUT FABRIC FROM A CONTINUOUS ROLL TO ELIMINATE JOINTS. IF JOINTS ARE NEEDED THEY WILL BE OVERLAPPED TO THE NEXT STAKE.
3. STAKE MATERIALS WILL BE STANDARD 2" x 4" WOOD OR EQUIVALENT METAL WITH A MINIMUM LENGTH OF 3 FEET.
4. SPACE STAKES EVENLY AROUND INLET 3 FEET APART AND DRIVE A MINIMUM 18 INCHES DEEP. SPANS GREATER THAN 3 FEET MAY BE BRIDGED WITH THE USE OF WIRE MESH BEHIND THE FILTER FABRIC FOR SUPPORT.
5. FABRIC SHALL BE EMBEDDED 1 FOOT MINIMUM BELOW GROUND AND BACKFILLED. IT SHALL BE SECURELY FASTENED TO THE STAKES AND FRAME.
6. A 2" x 4" WOOD FRAME SHALL BE COMPLETED AROUND THE CREST OF THE FABRIC FOR OVER FLOW STABILITY.

MAXIMUM DRAINAGE AREA 1 ACRE

**FILTER FABRIC DROP INLET PROTECTION**

ADAPTED FROM DETAILS PROVIDED BY: NEW YORK STATE DEC ORIGINALLY DEVELOPED BY USDA-NRCS VERMONT DEPARTMENT OF ENVIRONMENTAL CONSERVATION

REVISIONS		
MARCH 8, 2007	JMF	

THIS ITEM SHALL BE PAID FOR UNDER ITEM 653.40 INLET PROTECTION DEVICE, TYPE 1

**SYMBOL**  
NOT TO SCALE

**CONSTRUCTION SPECIFICATIONS**

1. APPLY TO SLOPES GREATER THAN 3H:1V OR WHERE NECESSARY TO AID IN ESTABLISHING VEGETATION.
2. APPLY FERTILIZER, LIME SEED PRIOR TO PLACING MATTING.
3. STAPLES ARE TO BE PLACED ALTERNATELY, IN COLUMNS APPROXIMATELY 2' APART AND IN ROWS APPROXIMATELY 3' APART. APPROXIMATELY 175 STAPLES ARE REQUIRED PER 4' X 225' ROLL OF MATERIAL AND 125 STAPLES ARE REQUIRED PER 4' X 150' ROLL OF MATERIAL.
4. DISTURBED AREAS SHALL BE SMOOTHLY GRADED. EROSION CONTROL MATERIAL SHALL BE PLACED LOOSELY OVER GROUND SURFACE. DO NOT STRETCH.
5. ALL TERMINAL ENDS AND TRANSVERSE LAPS SHALL BE STAPLED AT APPROXIMATELY 12" INTERVALS.

**ROLLED EROSION CONTROL PRODUCT (RECP) SIDE SLOPE**

ADAPTED FROM DETAILS PROVIDED BY: NEW YORK STATE DEC ORIGINALLY DEVELOPED BY USDA-NRCS VERMONT DEPARTMENT OF ENVIRONMENTAL CONSERVATION

REVISIONS		
APRIL 16, 2007	JMF	
JANUARY 13, 2009	WHF	

THIS WORK SHALL BE PERFORMED IN ACCORDANCE WITH SECTION 653 AND AS SHOWN IN THE PLANS FOR TEMPORARY EROSION MATTING (PAY ITEM 653.20) OR PERMANENT EROSION MATTING (PAY ITEM 653.20).

**SYMBOL**  
NOT TO SCALE

**CONSTRUCTION SPECIFICATIONS**

1. STONE SIZE- USE 1-4" STONE, RECLAIMED OR RECYCLED CONCRETE EQUIVALENT.
2. LENGTH- NOT LESS THAN 50' (EXCEPT ON A SINGLE RESIDENCE LOT WHERE A 30' MINIMUM LENGTH APPLIES).
3. THICKNESS- NOT LESS THAN 8".
4. WIDTH- 12' MINIMUM, BUT NOT LESS THAN THE FULL WIDTH AT POINTS WHERE INGRESS OR EGRESS OCCURS. 24' IF SINGLE ENTRANCE TO SITE.
5. GEOTEXTILE MUST BE PLACED OVER THE ENTIRE AREA PRIOR TO PLACING STONE.
6. SURFACE WATER- ALL SURFACE WATER FLOWING OR DIVERTED TOWARD CONSTRUCTION ENTRANCES SHALL BE PIPED BENEATH THE ENTRANCE. IF PIPING IS IMPRACTICAL, A MOUNTABLE BERM WITH 5:1 SLOPES WILL BE PERMITTED.
7. MAINTENANCE- THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS-OF-WAY. ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACKED ONTO PUBLIC RIGHTS-OF-WAY MUST BE REMOVED IMMEDIATELY.
8. WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON AN AREA STABILIZED WITH STONE AND WHICH DRAINS INTO AN APPROVED SEDIMENT TRAPPING DEVICE.
9. PERIODIC INSPECTION AND NEEDED MAINTENANCE SHALL BE PROVIDED ACCORDING TO PERMIT REQUIREMENTS.

**STABILIZED CONSTRUCTION ENTRANCE**

ADAPTED FROM DETAILS PROVIDED BY: NEW YORK STATE DEC ORIGINALLY DEVELOPED BY USDA-NRCS VERMONT DEPARTMENT OF ENVIRONMENTAL CONSERVATION

REVISIONS		
MARCH 24, 2008	WHF	
JANUARY 13, 2009	WHF	

THIS WORK SHALL BE PERFORMED IN ACCORDANCE WITH SECTION 653 FOR VEHICLE TRACKING PAD (PAY ITEM 653.35) OR AS SPECIFIED IN THE CONTRACT.

**SYMBOL**  
NOT TO SCALE

**CONSTRUCTION SPECIFICATIONS**

1. WOVEN WIRE REINFORCED FENCE IS REQUIRED WITHIN 100' UPSLOPE OF RECEIVING WATERS WHEN THE PROJECT FALLS UNDER A CONSTRUCTION STORMWATER PERMIT. WOVEN WIRE SHALL BE A MIN. 14 GAUGE WITH A 6" MAX. MESH OPENING.
2. FILTER CLOTH SHALL BE EITHER FILTER X, MIRAF1100X, STABILINKA T140N OR APPROVED EQUIVALENT.
3. POST SPACING FOR WIRE-BACKED FENCE SHALL BE 10' MAXIMUM. FOR FILTER-CLOTH FENCE, WHEN ELONGATION IS >50%, POST SPACING SHALL NOT EXCEED 4' AND WHEN ELONGATION IS <50%, POST SPACING SHALL NOT EXCEED 6'.
4. WOVEN WIRE FENCE IS TO BE FASTENED SECURELY TO FENCE POSTS WITH WIRE TIES. FILTER CLOTH IS TO BE FASTENED SECURELY TO WOVEN WIRE FENCE WITH TIES SPACED EVERY 24" AT TOP AND MID SECTION.
5. WHEN TWO SECTIONS OF FILTER CLOTH ADJOIN EACH OTHER THEY SHALL BE OVER-LAPPED BY 6" AND FOLDED.
6. MAINTENANCE SHALL BE PERFORMED AS NEEDED AND MATERIAL REMOVED WHEN SEDIMENT REACHES HALF OF FABRIC HEIGHT.

**SILT FENCE**

ADAPTED FROM DETAILS PROVIDED BY: NEW YORK STATE DEC ORIGINALLY DEVELOPED BY USDA-NRCS VERMONT DEPARTMENT OF ENVIRONMENTAL CONSERVATION

REVISIONS		
MARCH 21, 2008	WHF	
DECEMBER 11, 2008	WHF	
JANUARY 13, 2009	WHF	

THIS WORK SHALL BE PERFORMED IN ACCORDANCE WITH SECTION 649 AND AS SHOWN IN THE PLANS FOR GEOTEXTILE FOR SILT FENCE (PAY ITEM 649.51) OR GEOTEXTILE FOR SILT FENCE, WOVEN WIRE REINFORCED (PAY ITEM 649.515).

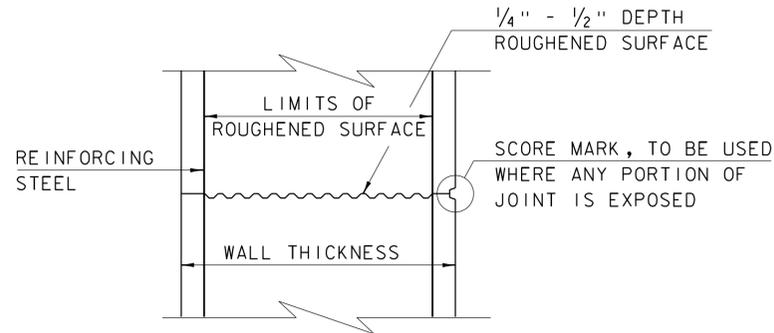
PROJECT NAME: STRAFFORD  
PROJECT NUMBER: BF 0177(10)

FILE NAME: s13j08bero\_details.dgn  
PROJECT LEADER: K. HIGGINS  
DESIGNED BY: J. GRIGAS  
EPSC DETAILS

PLOT DATE: 09-MAY-2016  
DRAWN BY: T. MATTHEWS  
CHECKED BY: J. GRIGAS  
SHEET 50 OF 50

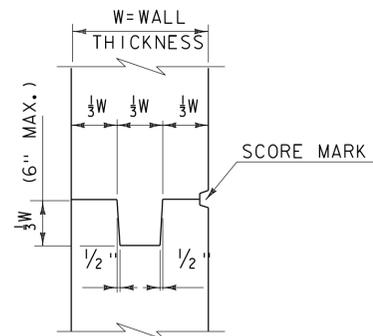
**CONCRETE GENERAL NOTES**

1. ALL EXPOSED EDGES OF CONCRETE SHALL BE CHAMFERED 1" x 1"
2. REINFORCING STEEL SIZE AND SPACING SHOWN IN THE PLANS IS BASED ON 60 KSI STEEL, UNLESS NOTED OTHERWISE. WITH THE ENGINEER'S PERMISSION, BAR SIZE AND SPACING MAY BE MODIFIED ACCORDING TO THE LATEST AASHTO LRFD BRIDGE DESIGN SPECIFICATION AND STRUCTURES DESIGN MANUAL WHEN USING HIGHER STRENGTH STEEL.

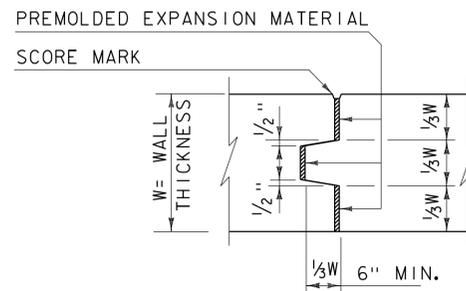
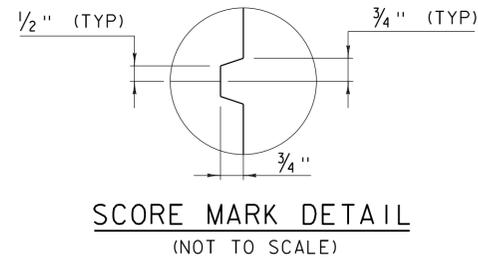


**TYPICAL HORIZONTAL CONSTRUCTION JOINT**  
(NOT TO SCALE)

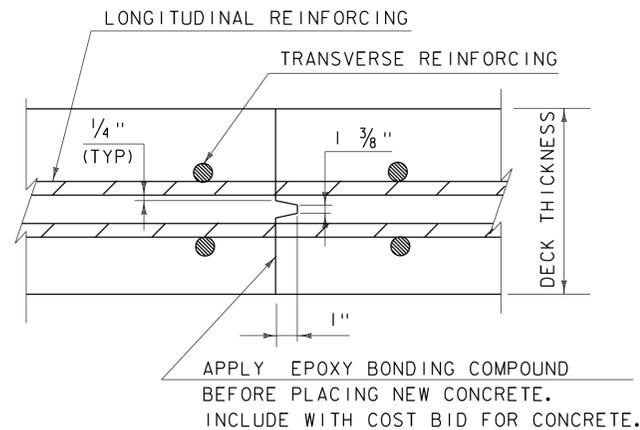
1. THE SURFACE OF THE CONCRETE CONSTRUCTION JOINTS SHALL BE CLEANED AND FREE OF LAITANCE.
2. IMMEDIATELY BEFORE NEW CONCRETE IS PLACED, ALL CONSTRUCTION JOINTS SHALL BE WETTED AND STANDING WATER REMOVED.



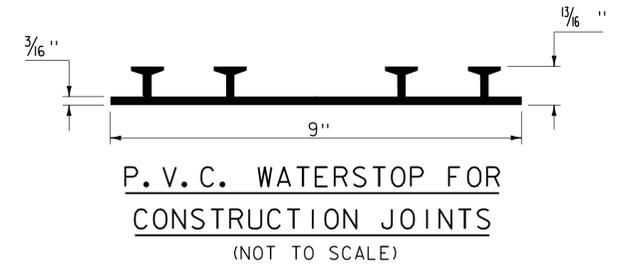
**TYPICAL CONCRETE CONSTRUCTION JOINT**  
(NOT TO SCALE)



**TYPICAL CONCRETE EXPANSION JOINT**  
(NOT TO SCALE)

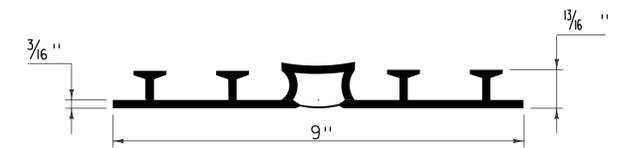


**TRANSVERSE BRIDGE SLAB CONSTRUCTION JOINT DETAILS**  
(NOT TO SCALE)



PAYMENT FOR THE P.V.C. WATERSTOP SHALL BE INCIDENTAL TO THE UNIT BID PRICE FOR THE ADJACENT CONCRETE.

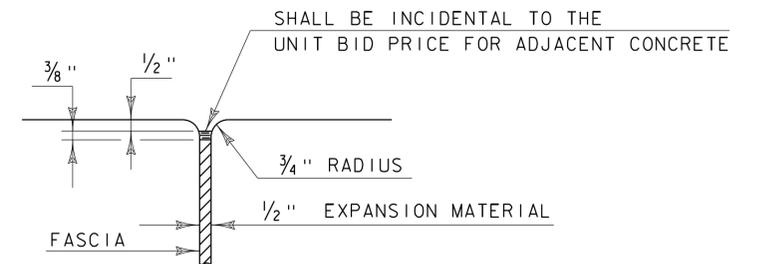
OTHER CONFIGURATIONS OF WATERSTOP MAY BE USED UPON APPROVAL OF THE ENGINEER.



**P.V.C. WATERSTOP FOR EXPANSION JOINTS**  
(NOT TO SCALE)

PAYMENT FOR THE P.V.C. WATERSTOP SHALL BE INCIDENTAL TO THE UNIT BID PRICE FOR THE ADJACENT CONCRETE.

OTHER CONFIGURATIONS OF WATERSTOP MAY BE USED UPON APPROVAL OF THE ENGINEER.



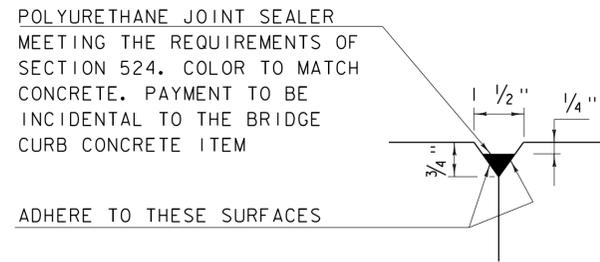
**JOINT BETWEEN FASCIA AND WINGWALL**  
(NOT TO SCALE)

REVISIONS	
MAY 7, 2010	APPROVED FOR USE BY VAOT STRUCTURES SECTION
FEBRUARY 9, 2012	REBAR SUBSTITUTION ALLOWANCE ADDED TO CONCRETE GENERAL NOTES.

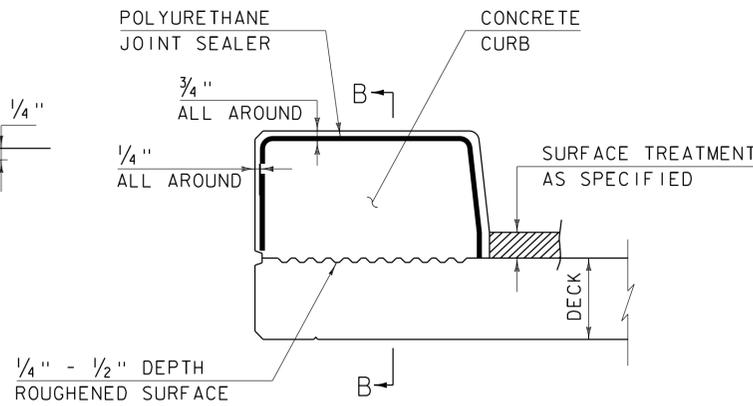
**CONCRETE  
DETAILS AND NOTES**



**STRUCTURES  
DETAIL  
SD-501.00**

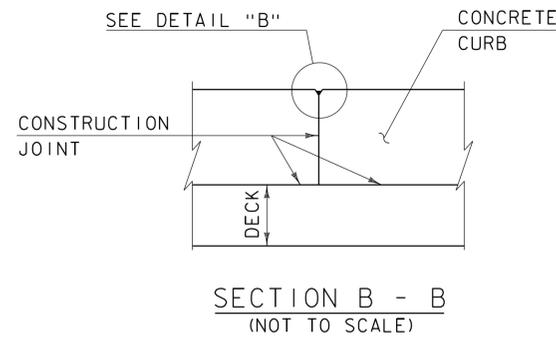


DETAIL "B"  
(NOT TO SCALE)

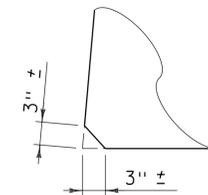


CONCRETE CURB JOINT SECTION  
(NOT TO SCALE)

1. SEE TYPICAL HORIZONTAL CONSTRUCTION JOINT DETAIL FOR ADDITIONAL INFORMATION



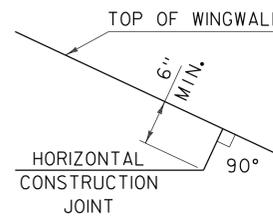
SECTION B - B  
(NOT TO SCALE)



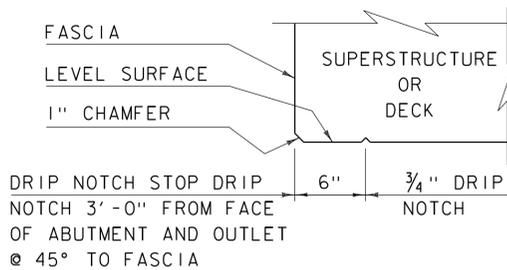
ACUTE ANGLE  
CLIP DETAIL  
(NOT TO SCALE)

CONCRETE CURB JOINT NOTES

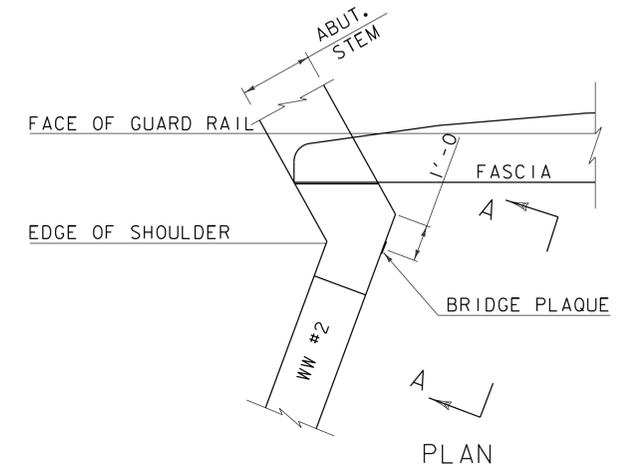
1. CONCRETE CURBS MAY BE PLACED IN ONE CONTINUOUS OPERATION IF AN APPROVED SHRINKAGE REDUCING ADMIXTURE LISTED IN THE SPECIAL PROVISIONS IS USED WITH THE CONCRETE MIX DESIGN. PAYMENT FOR THE SHRINKAGE REDUCING ADMIXTURE WILL BE INCIDENTAL TO THE BRIDGE CURB CONCRETE ITEM.
2. IF THE CONTRACTOR CHOOSES NOT TO USE AN APPROVED SHRINKAGE REDUCING ADMIXTURE, THE CURBS SHALL BE CONSTRUCTED WITH CONSTRUCTION JOINTS SPACED AT A MAXIMUM OF 15'-0" CENTER TO CENTER AND 2'-0" MINIMUM FROM THE CENTER OF NEAREST BRIDGE RAILING POST.
3. ON MULTI-SPAN CONTINUOUS SUPERSTRUCTURES, REGARDLESS OF WHETHER APPROVED SHRINKAGE REDUCING ADMIXTURE IS USED, CURB JOINTS SHALL BE LOCATED OVER THE CENTERLINE OF PIERS AND 7'-0" EACH SIDE OF THE CENTERLINE OF EACH PIER.
4. WHEN CURB JOINTS ARE USED THE CURBS SHALL BE PLACED IN ALTERNATE SECTIONS WITH A MINIMUM OF 48 HOUR DELAY BETWEEN ADJACENT PLACEMENTS.
5. LONGITUDINAL REINFORCING SHALL BE CONTINUOUS THROUGH CURB CONSTRUCTION JOINTS. CURB STIRRUP BARS SHALL BE TURNED AS NECESSARY TO MAINTAIN COVER IN THE FLARED CURB ENDS.
6. THE JOINT SPACING AND DETAILS SHOWN SHALL APPLY TO SIDEWALKS WHEN SHOWN IN THE PLANS.



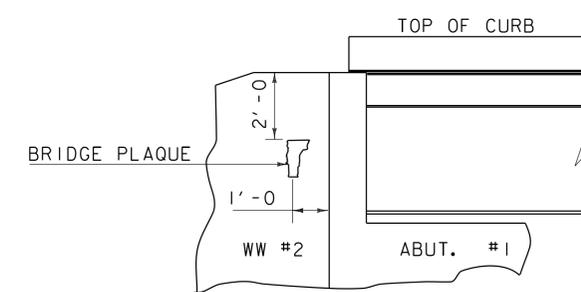
HORIZONTAL WINGWALL  
CONSTRUCTION JOINT  
(NOT TO SCALE)



DRIP NOTCH DETAIL  
(NOT TO SCALE)



PLAN



VIEW "A - A"

BRIDGE PLAQUE  
(NOT TO SCALE)

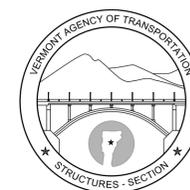
THE BRIDGE PLAQUE WILL BE SUPPLIED BY THE AGENCY OF TRANSPORTATION AND SHALL BE INSTALLED BY THE CONTRACTOR AT ABUTMENT #1 ON THE RIGHT SIDE AS SHOWN OR AS DIRECTED BY THE ENGINEER.

PAYMENT FOR INSTALLATION OF THE BRIDGE PLAQUE SHALL BE INCIDENTAL TO THE ADJACENT CONCRETE.

REVISIONS

MAY 7, 2010	APPROVED FOR USE BY VAOT STRUCTURES SECTION
JUNE 4, 2010	MODIFIED AND ADDED TWO DETAILS
OCTOBER 10, 2012	MODIFIED HORZ. JOINT WINGWALL ADD 6" MIN. DIMENSION

CONCRETE  
DETAILS AND NOTES



STRUCTURES  
DETAIL  
SD-502.00

ASPHALTIC PLUG JOINT NOTES

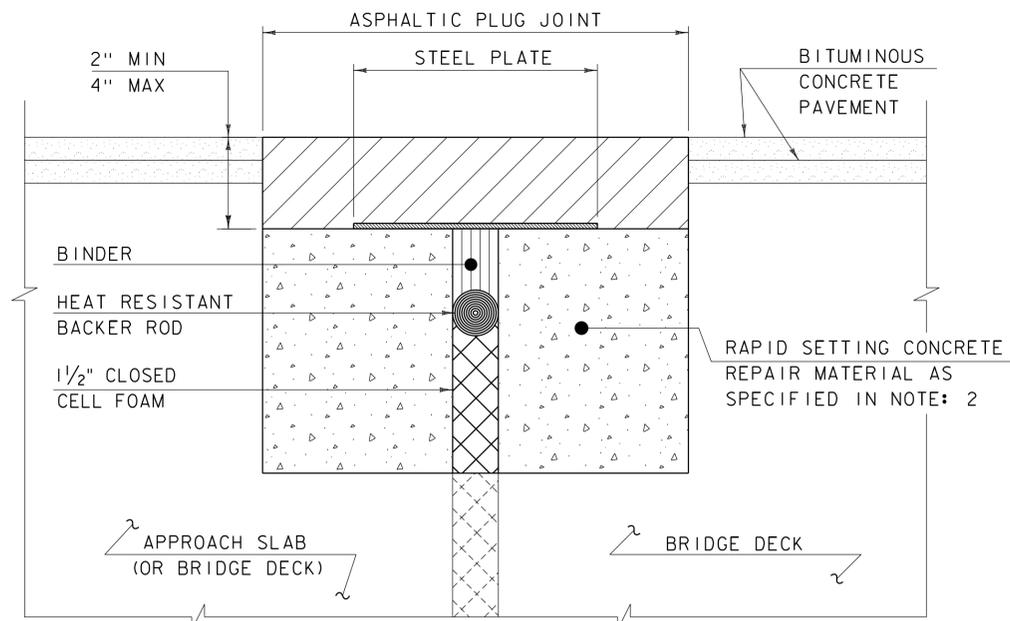
INSTALLATION:

1. LOCATE THE JOINT CENTRALLY OVER THE DECK OVERLAY EXPANSION GAP OR FIXED JOINT, MARKED OUT TO THE MANUFACTURER'S RECOMMENDED WIDTH.
2. REMOVE THE BITUMINOUS CONCRETE PAVEMENT FULL DEPTH AS SHOWN ON THE PLANS. THE PAVEMENT SHALL BE DRY AND SAW CUT TO THE LIMITS REQUIRED TO PLACE THE JOINT. A PNEUMATIC HAMMER AND CHISEL MAY BE USED ADJACENT TO THE CURB ONLY WHEN SAW CUTTING IS NOT POSSIBLE.
3. BLAST CLEAN THE JOINT AREA OF DEBRIS, ASPHALT AND SHEET MEMBRANE. THOROUGHLY DRY THE JOINT AREA WITH COMPRESSED AIR PRIOR TO APPLYING BINDER MATERIAL.
4. PLACE PROPERLY SIZED HEAT RESISTANT BACKER ROD IN THE MOVEMENT GAP ALLOWING FOR 1" +/- OF BINDER ABOVE THE ROD.
5. HEAT AND PLACE THE BINDER MATERIAL AS RECOMMENDED BY THE MANUFACTURER.
6. IMMEDIATELY AFTER TOP COATING, CAST AN ANTI-SKID MATERIAL OVER THE JOINT TO REDUCE THE RISK OF TRACKING.

WEATHER LIMITATIONS

APPLY BINDER MATERIAL ONLY WHEN THE FOLLOWING CONDITIONS PREVAIL OR AS RECOMMENDED BY THE MANUFACTURER:

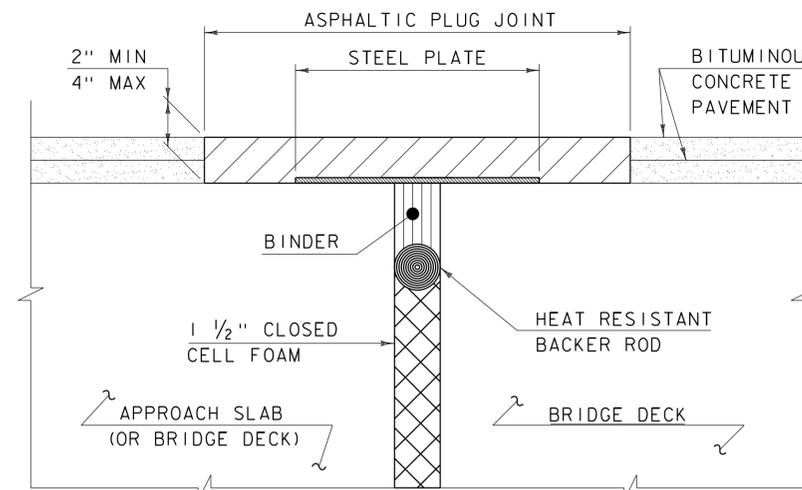
1. THE AMBIENT AIR TEMPERATURE IS AT LEAST 10 DEG C (50 DEG F) AND RISING.
2. THE ROAD SURFACE IS DRY.
3. WEATHER CONDITIONS OR OTHER CONDITIONS ARE FAVORABLE AND ARE EXPECTED TO REMAIN SO FOR THE PERFORMANCE OF SATISFACTORY WORK.



ASPHALTIC PLUG JOINT DETAIL - REHAB

NOTES:

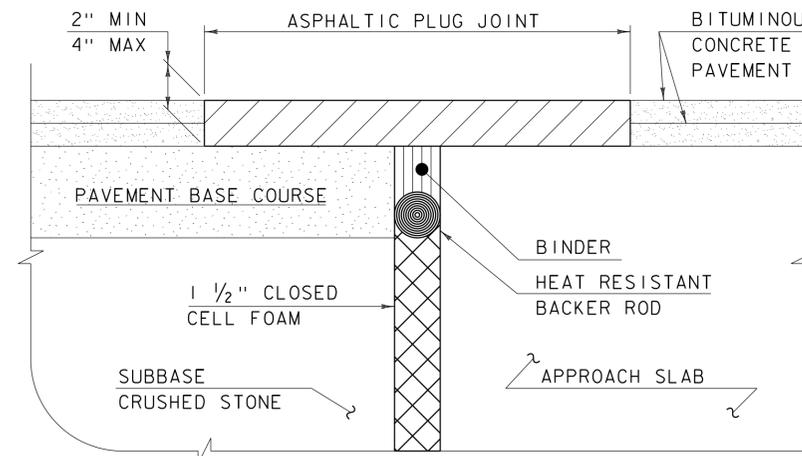
1. THE CONTRACTOR SHALL REMOVE ALL ASPHALTIC PLUG JOINT MATERIAL AND DETERIORATED CONCRETE AS DIRECTED BY THE ENGINEER. REMOVAL OF THE FIRST 4 INCHES OF MATERIAL SHALL BE INCLUDED IN THE BID PRICE FOR ITEM 516.10 BRIDGE EXPANSION JOINT, ASPHALTIC PLUG. ANY REMOVAL OF MATERIAL GREATER THAN 4 INCHES SHALL BE INCLUDED IN THE BID PRICE OF ITEM 580.20 RAPID SETTING CONCRETE REPAIR MATERIAL WITH COARSE AGGREGATE.
2. THE CONTRACTOR SHALL REPLACE REMOVED MATERIAL THAT IS LESS THAN 4" FROM FINISHED GRADE WITH ASPHALTIC PLUG JOINT MATERIAL MEETING THE REQUIREMENTS OF SUBSECTION 707.15. ALL REMOVED MATERIAL THAT IS GREATER THAN 4 INCHES FROM FINISHED GRADE SHALL BE REPLACED WITH RAPID SETTING CONCRETE REPAIR MATERIAL WITH COARSE AGGREGATE MEETING THE REQUIREMENTS OF SUBSECTION 780.04.
3. REINFORCING STEEL NOT SHOWN FOR CLARITY.
4. PLACE 1/4" THICK BY 8" WIDE SECTIONS OF STEEL PLATE OVER THE CENTER OF THE MOVEMENT GAP. SECURE THE PLATES FROM MOVING BY INSERTING LOCATING PINS THROUGH THE PRE-STAMPED HOLES INTO BACKER ROD AND COVER WITH HOT BINDER. THE STEEL PLATES MAY BE OMITTED WHERE THE ENGINEER DETERMINES THAT THE APPROACH SLAB OR BRIDGE DECK WILL PROVIDE INADEQUATE SUPPORT AND WHERE VERTICAL MOVEMENT OF THE PLATES MIGHT OCCUR.



ASPHALTIC PLUG JOINT DETAIL "A" - NEW

NOTE:

PLACE 1/4" THICK BY 8" WIDE SECTIONS OF STEEL PLATE OVER THE CENTER OF THE MOVEMENT GAP. SECURE THE PLATES FROM MOVING BY INSERTING LOCATING PINS THROUGH THE PRE-STAMPED HOLES INTO BACKER ROD AND COVER WITH HOT BINDER.



ASPHALTIC PLUG JOINT DETAIL "B" - NEW

DETAILS ON THIS SHEET ARE NOT TO SCALE.

REVISIONS	
MAY 7, 2010	APPROVED FOR USE BY VAOT STRUCTURES SECTION
AUGUST 29, 2011	ADD DETAIL "B" AND REV. NOTES

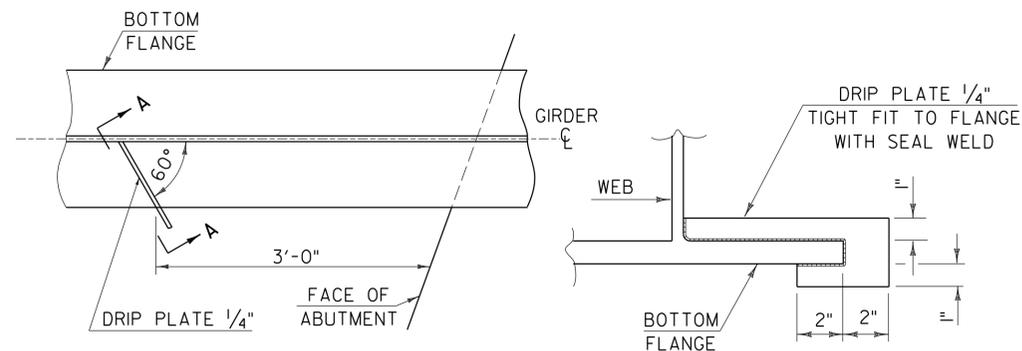
BRIDGE JOINT  
ASPHALTIC PLUG



STRUCTURES  
DETAIL  
SD-516.10

STRUCTURAL STEEL GENERAL NOTES:

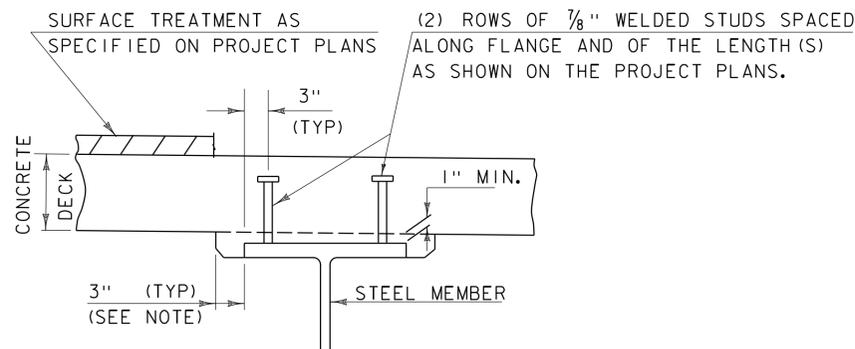
1. ALL FIELD CONNECTIONS SHALL BE MADE WITH 7/8" DIAMETER HIGH-STRENGTH BOLTS IN 15/16" DIAMETER HOLES, PER SUBSECTION 506.I9, UNLESS OTHERWISE SPECIFIED.
2. ALL HOLES IN THE WEBS OF THE FASCIA GIRDERS THAT ARE NOT OTHERWISE FILLED, SHALL BE FILLED WITH EITHER BUTTON HEAD OR HEX HEAD BOLTS. THESE BOLTS SHALL BE TIGHTENED IN ACCORDANCE WITH SUBSECTION 506.I9.
3. ALL WELDING SHALL CONFORM TO THE PROVISIONS OF SUBSECTION 506.I0.
4. ANY CONNECTIONS THAT ARE NOT DETAILED ON THE PLANS SHALL BE DETAILED BY THE FABRICATOR AND SUBMITTED TO THE STRUCTURES ENGINEER FOR APPROVAL.
5. STRUCTURAL STEEL MEMBERS DESIGNATED "CVN" IN THE PLANS SHALL BE CHARPY V-NOTCH TESTED IN ACCORDANCE WITH SUBSECTION 714.01 OF THE STANDARD SPECIFICATIONS.
6. ENDS OF GIRDERS ARE TO BE VERTICAL IN THEIR FINAL POSITION.
7. AFTER SUPERSTRUCTURE STEEL HAS BEEN ERECTED, ELEVATIONS ALONG THE TOP OF THE GIRDERS SHALL BE TAKEN AS DIRECTED BY THE RESIDENT ENGINEER FOR USE IN DETERMINING FINISHED GRADES.



PLAN DRIP PLATE

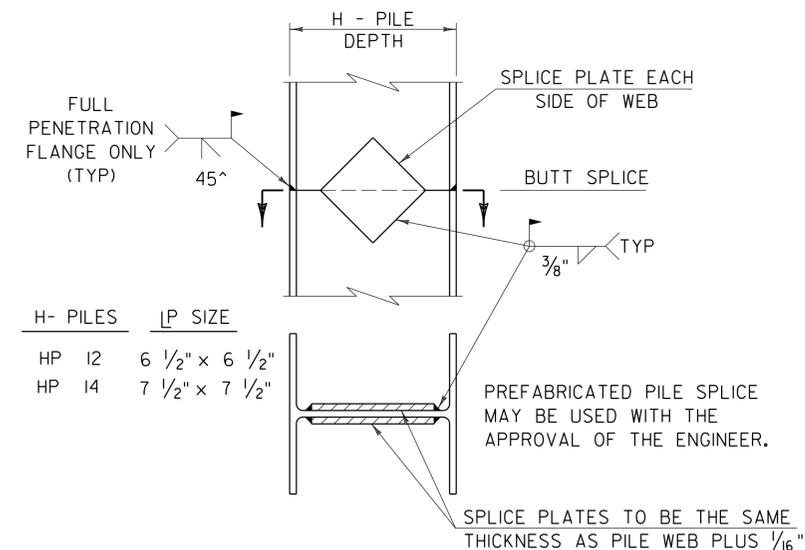
SECTION A - A

NOTE: DRIP PLATES SHALL BE PLACED ON OUTSIDE EDGE OF FASCIA GIRDERS ON THE HIGH SIDE OF ALL PIERS AND ABUTMENTS OR AS INDICATED ON PROJECT PLANS.



NOTE:  
THE 3" HORIZONTAL SECTION MAY BE ELIMINATED FOR FORMING SYSTEMS DESIGNED FOR THE CONSTRUCTION OF VERTICAL HAUNCHES. ANY VOIDS RESULTING FROM FORMING SYSTEM ELEMENTS SHALL BE FILLED WITH JOINT SEALER, POLYURETHANE MEETING THE REQUIREMENTS OF SECTION 524. THE COST OF THE JOINT SEALER, POLYURETHANE SHALL BE INCIDENTAL TO THE ADJACENT CONCRETE.

HAUNCH AND SHEAR CONNECTOR DETAIL

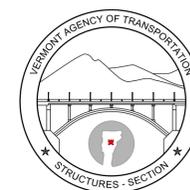


DETAIL OF PILE SPLICE

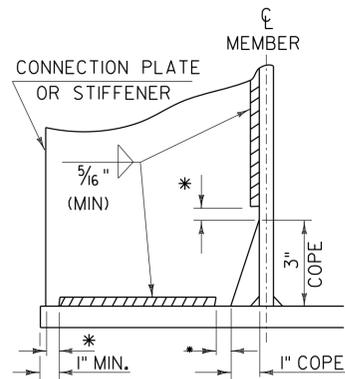
DETAILS ON THIS SHEET ARE "NOT TO SCALE" UNLESS NOTED OTHERWISE.

REVISIONS	
MAY 7, 2010	APPROVED FOR USE BY VAOT STRUCTURES SECTION
JUNE 4, 2010	MODIFIED NOTES

# STRUCTURAL STEEL DETAILS & NOTES

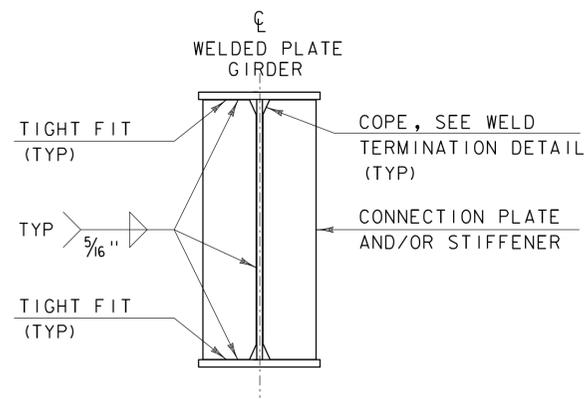


# STRUCTURES DETAIL SD-601.00



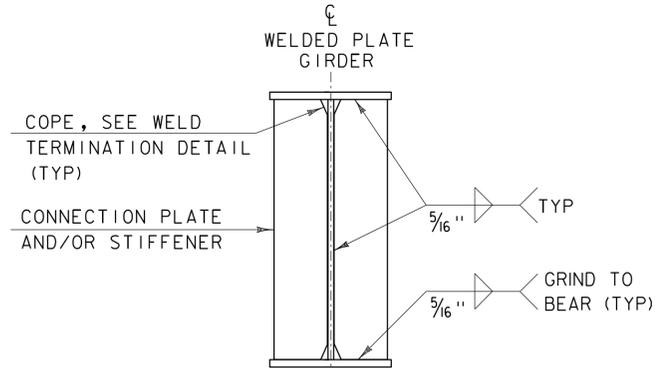
WELD TERMINATION AND COPING DETAILS FOR STEEL MEMBERS

\*NO WELD FOR 3/8" MIN. 7/8" MAX. (EXCEPT MUST MAINTAIN 1" MINIMUM FROM EDGE OF FLANGE)

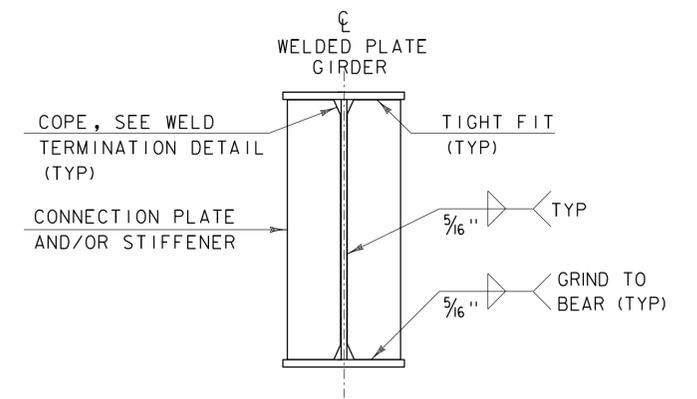


INTERMEDIATE CONNECTION PLATES AND/OR STIFFENERS FOR WELDED PLATE GIRDERS

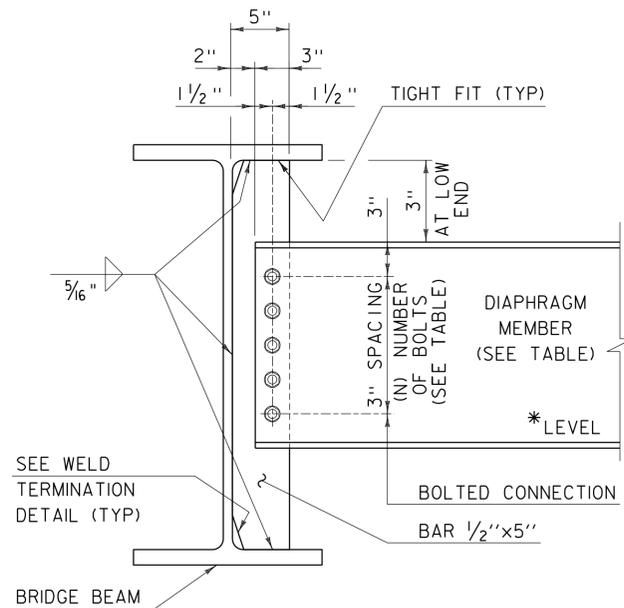
INTERMEDIATE DETAIL IS ONLY USED WHEN PLATE DOES NOT OCCUR AT AN ABUTMENT OR PIER.



ABUTMENT BEARING STIFFENERS AND/OR CONNECTION PLATES FOR WELDED PLATE GIRDERS



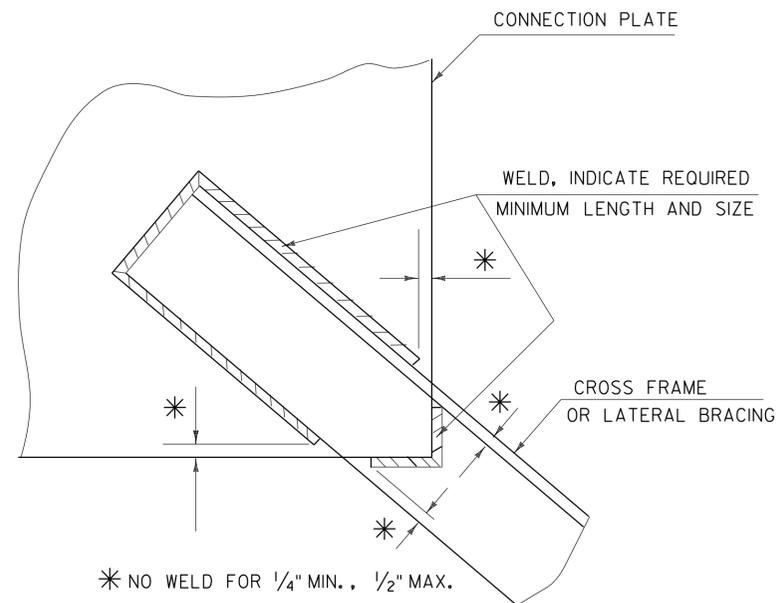
PIER BEARING STIFFENERS AND/OR CONNECTION PLATES FOR WELDED PLATE GIRDERS



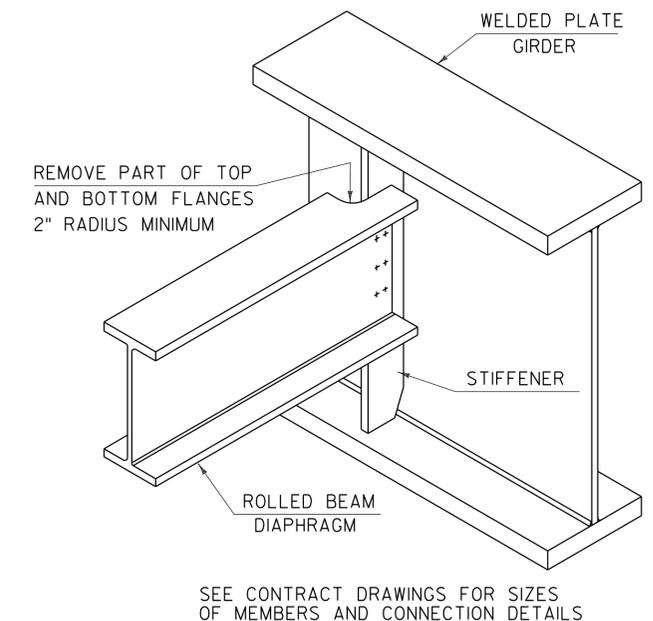
INTERMEDIATE DIAPHRAGMS FOR 24" TO 48" BRIDGE BEAMS

\* IF CLEARANCE CANNOT BE MET, DIAPHRAGM MAY BE SLOPED.

	DEPTH	DIAPHRAGM MEMBER	(N) BOLTS
ROLLED BEAM	24"	C15x33.9	4
	30"		
	31"	MC18x42.7	5
	36"		
PLATE GIRDER WEB	37"	W21x44	6
	42"		
	31"	W27x84	7
	36"		
37"	W33x118	9	
42"			
	43"	W36x135	10
	48"		



WELD LOCATION DETAIL AT CROSS FRAMES AND LATERAL BRACING



ROLLED BEAM USED AS DIAPHRAGM

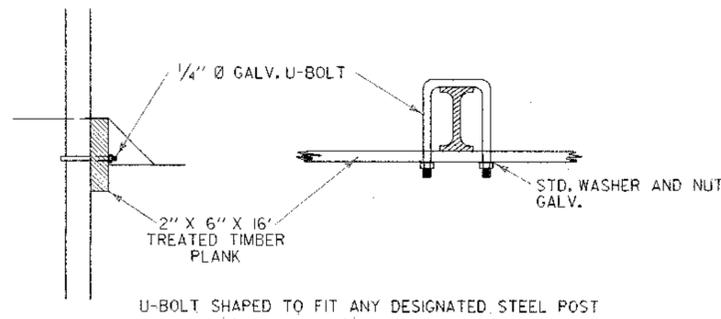
DETAILS ON THIS SHEET ARE "NOT TO SCALE" UNLESS NOTED OTHERWISE.

REVISIONS	
MAY 7, 2010	APPROVED FOR USE BY VAOT STRUCTURES SECTION
MAY 2, 2011	ADD INTERMEDIATE DIAPHRAGMS DETAIL & ADD NOT TO SCALE NOTE

# STRUCTURAL STEEL PLATE GIRDER DETAILS AND NOTES

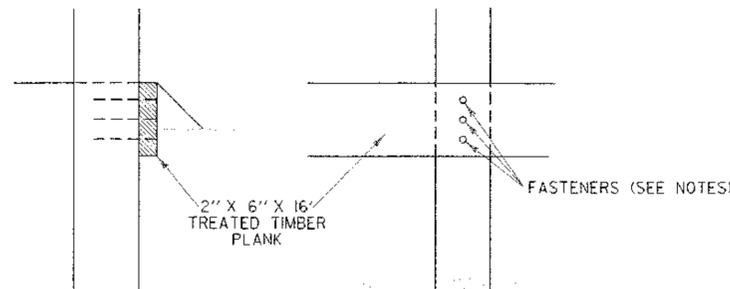


STRUCTURES  
DETAIL  
SD-602.00

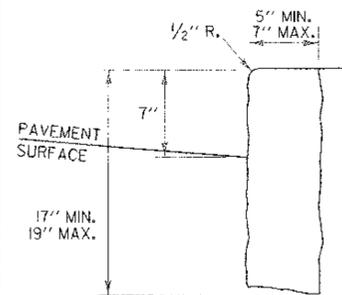


U-BOLT SHAPED TO FIT ANY DESIGNATED STEEL POST

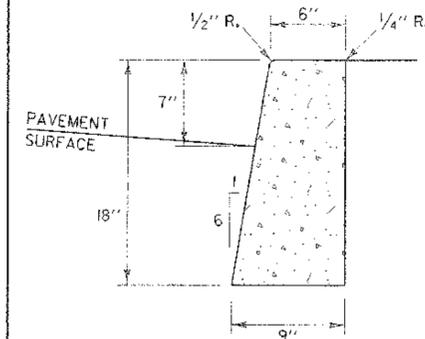
WITH STEEL POSTS



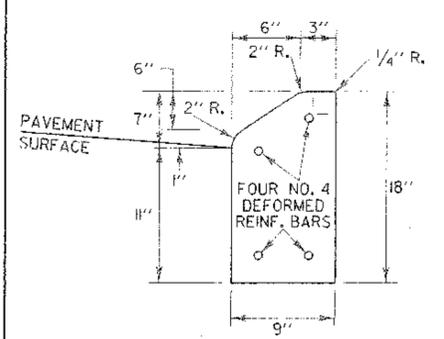
WITH WOOD POSTS (EXISTING CONDITION)



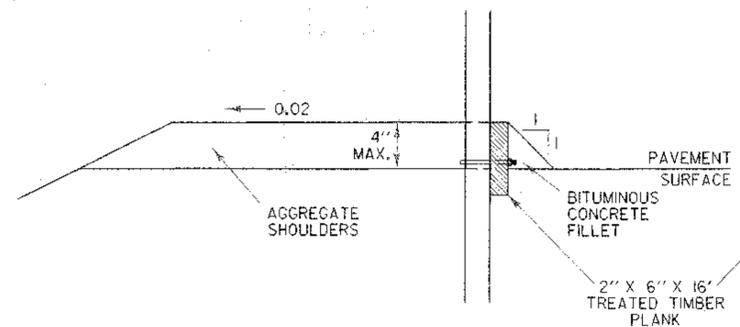
VERTICAL GRANITE CURB



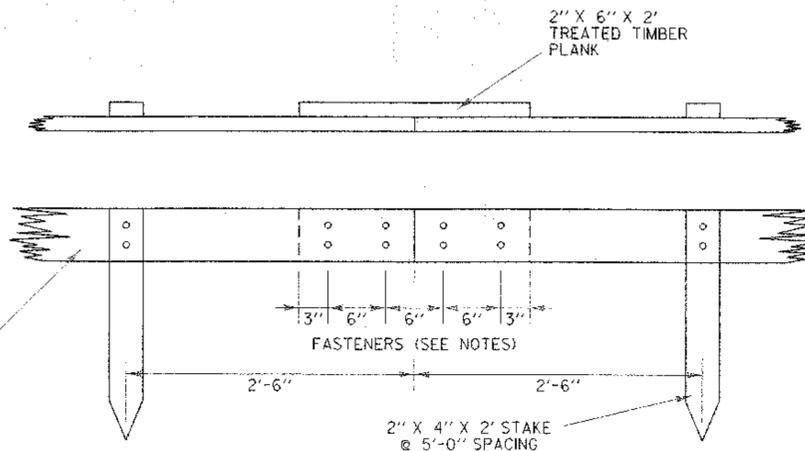
CAST IN PLACE CONCRETE CURB, TYPE B



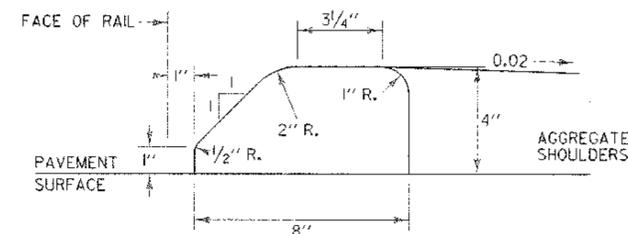
PRECAST REINFORCED CONCRETE CURB, TYPE A



BITUMINOUS CONCRETE FILLET DETAIL

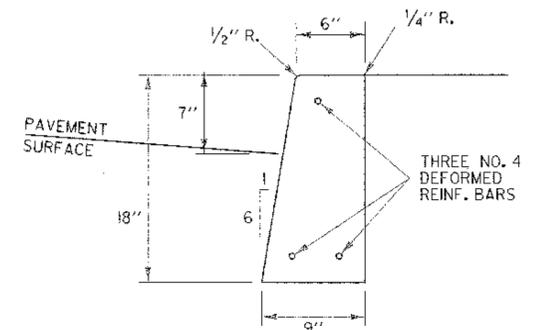


SPLICE DETAIL

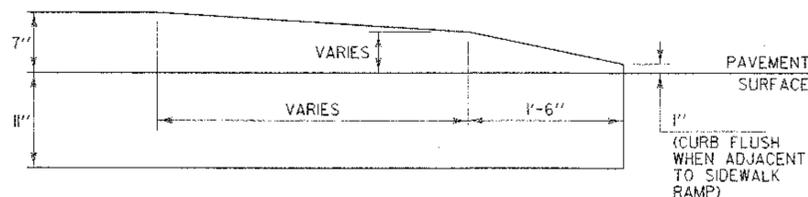


USE ONLY WITH STEEL BEAM GUARDRAIL

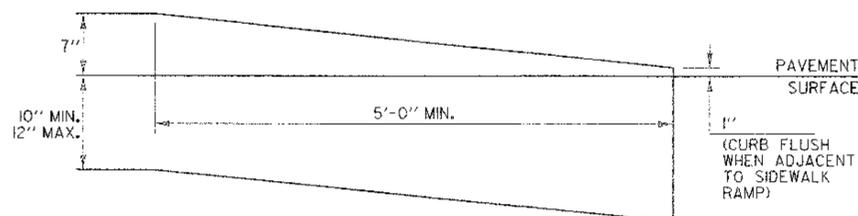
BITUMINOUS CONCRETE CURB, TYPE A



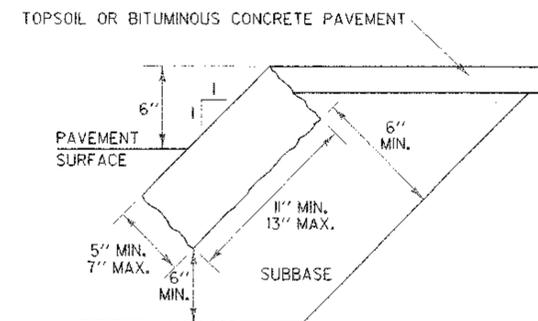
PRECAST REINFORCED CONCRETE CURB, TYPE B



CONCRETE CURB END



VERTICAL GRANITE CURB END



GRANITE SLOPE EDGING

**GENERAL NOTES:**

1. HEIGHT OF REVEAL OF CURB SHALL NOT EXCEED FOUR INCHES WHERE DESIGN OR POSTED SPEED IS EQUAL TO OR GREATER THAN 40 MPH AND WHEN INSTALLED WITH GUARDRAIL (STANDARD SHAPE TO BE BURIED TO THIS DEPTH).
2. WHEN CONCRETE SIDEWALK IS CONSTRUCTED ADJACENT TO CONCRETE OR VERTICAL GRANITE CURB, ASPHALT TREATED FELT SHALL BE PLACED BETWEEN THE SIDEWALK AND CURB FOR THE TOTAL DEPTH OF THE SIDEWALK.
3. FASTENERS (20d NAILS OR SCREWS) SHALL BE CORROSION RESISTANT TO THE TREATED LUMBER.
4. FOR SPECIFICATIONS FOR EXPANSION/CONTRACTION JOINTS AND LENGTHS OF SECTIONS, SEE SECTION 616.
5. JOINTS BETWEEN CURB SECTIONS SHALL BE MORTARED IN CONFORMANCE WITH SECTION 616.
6. BITUMINOUS CONCRETE AND TREATED TIMBER CURB SHALL BE IN CONFORMANCE WITH SECTION 616.
7. TWO INCH MINIMUM CLEARANCE FROM FACE OF CONCRETE TO EDGE OF REINFORCING STEEL.

**OTHER STDS. REQUIRED: NONE**

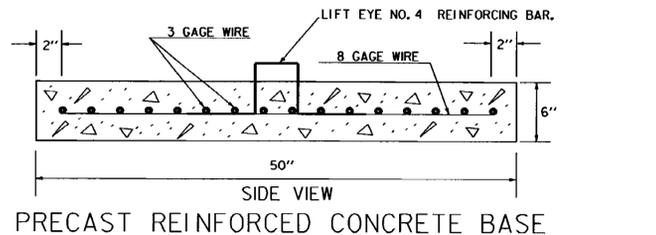
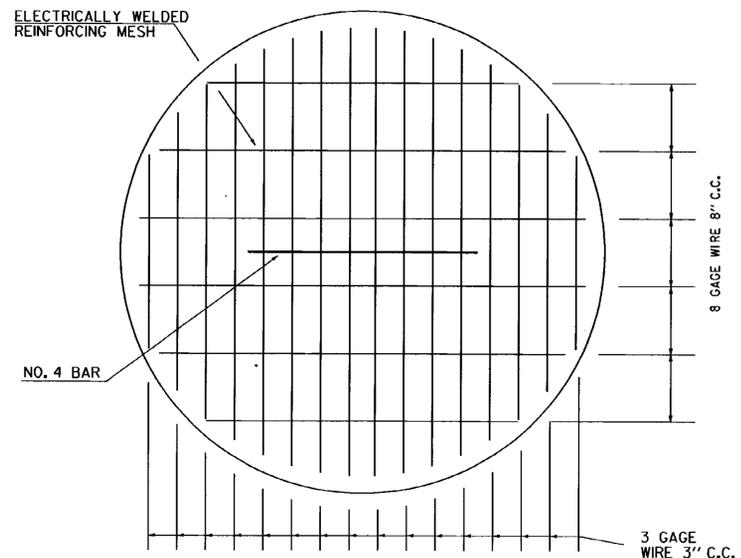
REVISIONS AND CORRECTIONS  
FEB. 11, 2008 - ORIGINAL APPROVAL DATE

APPROVED  
*Kevin S. Marzke*  
ROADWAY, TRAFFIC & SAFETY ENGINEER  
*Robert Johnson*  
DIRECTOR OF PROGRAM DEVELOPMENT  
*Mark B. Kuttler*  
FEDERAL HIGHWAY ADMINISTRATION

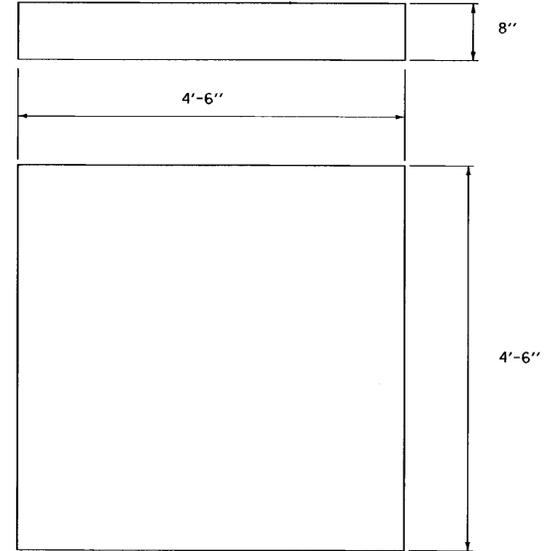
**CURBING**



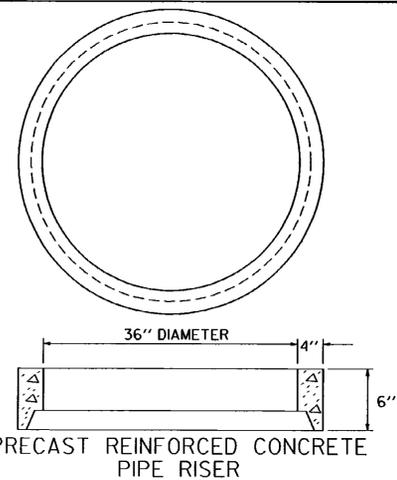
**STANDARD  
C-10**



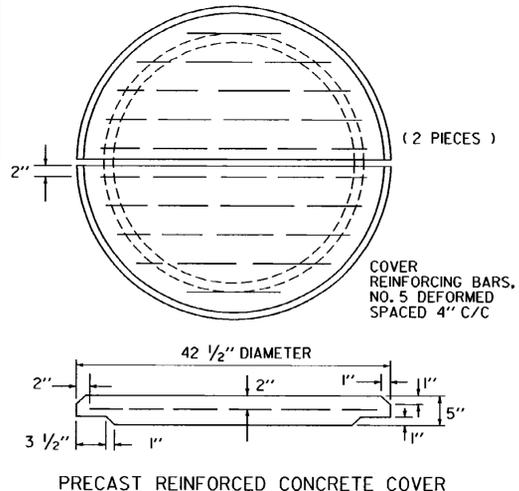
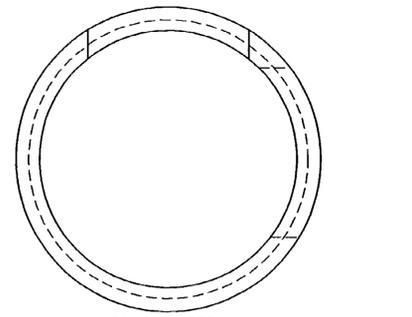
PRECAST REINFORCED CONCRETE BASE



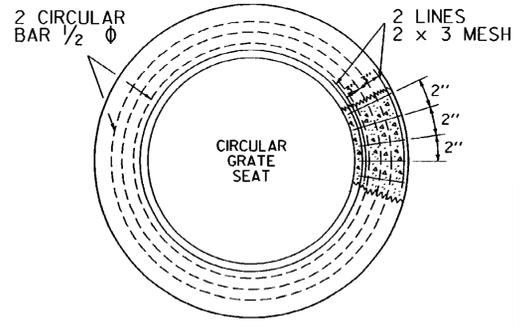
DROP INLET PIPE BASE CAST IN PLACE  
(CONCRETE CONFORMING TO STRUCTURAL CONCRETE CLASS B)



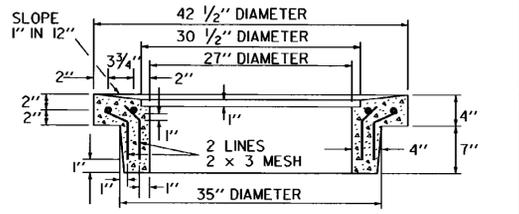
PRECAST REINFORCED CONCRETE PIPE RISER



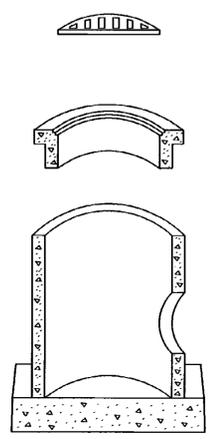
SECTION A-A  
CAST IRON GRATE



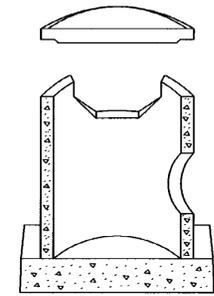
PRECAST REINFORCED CONCRETE COVER



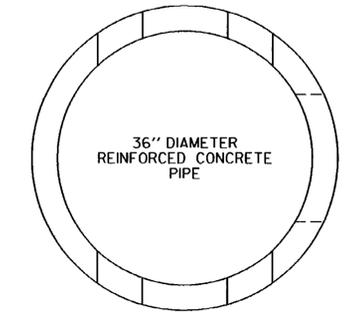
PRECAST REINFORCED CONCRETE RING FOR GRATE



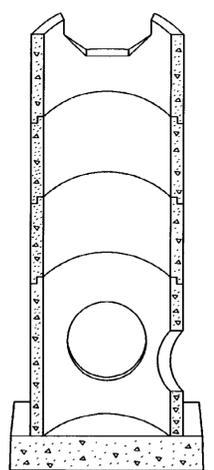
PRECAST REINFORCED CONCRETE PIPE DROP INLET WITH CAST IRON GRATE



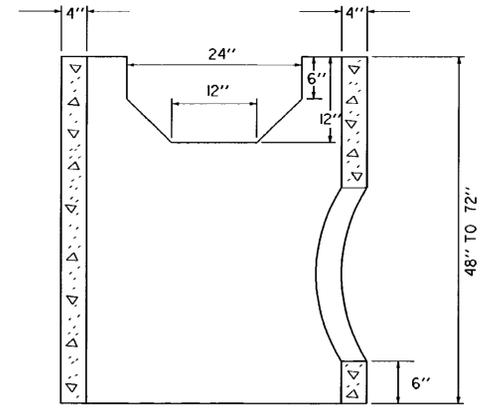
PRECAST REINFORCED CONCRETE PIPE DROP INLET WITH CONCRETE COVER



36" DIAMETER REINFORCED CONCRETE PIPE



PRECAST REINFORCED CONCRETE PIPE DROP INLET WITH THROATED RISER



PRECAST REINFORCED CONCRETE PIPE DROP INLET WITH THROAT

NOTE :  
THESE DROP INLETS SHOULD NOT BE USED IN AREAS OF VEHICULAR TRAFFIC OR IN BENCHES ON CUT SLOPES

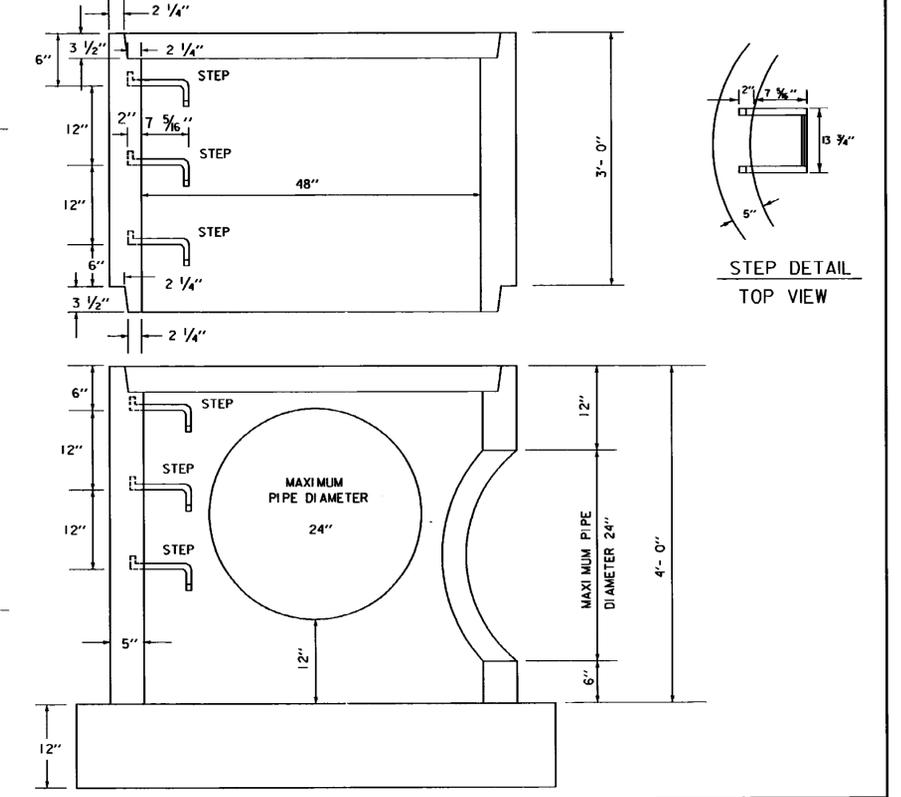
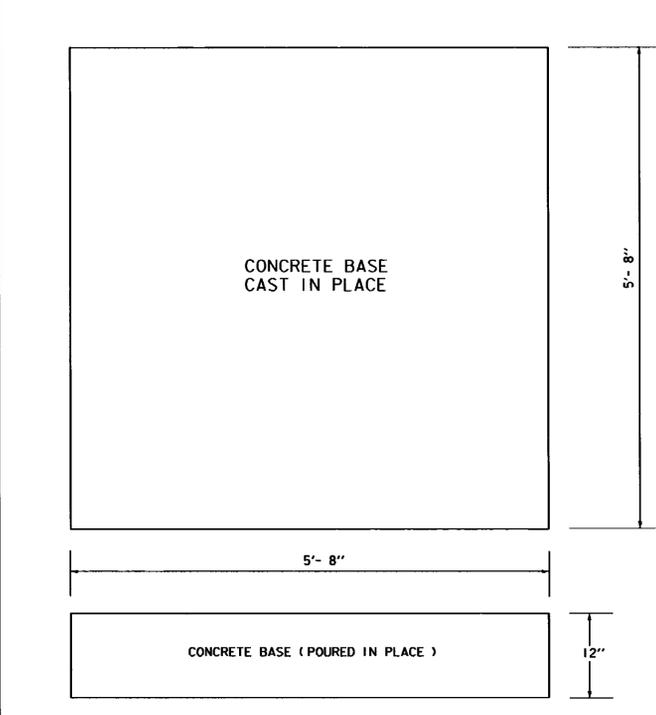
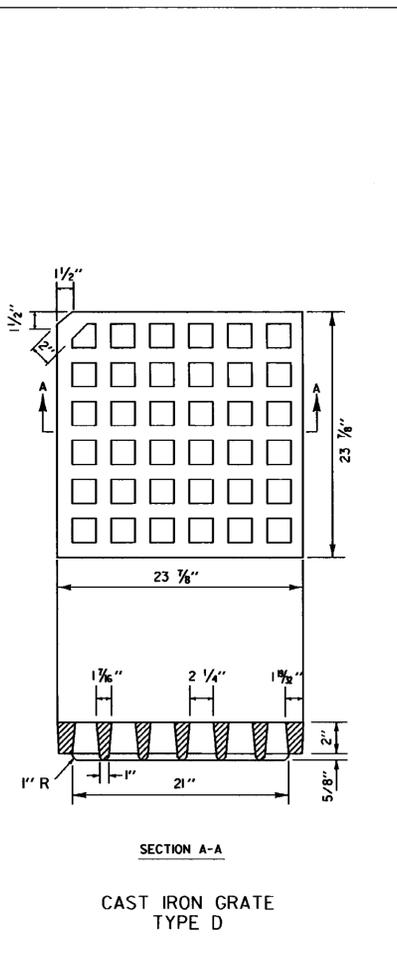
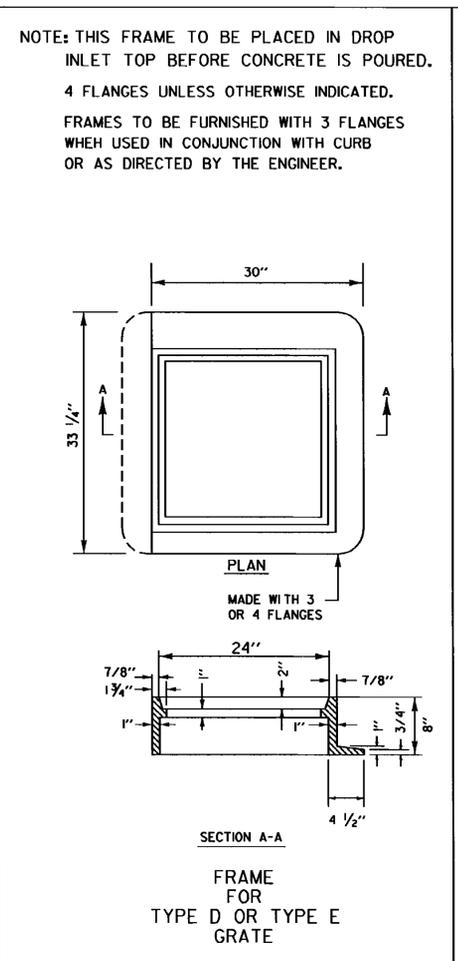
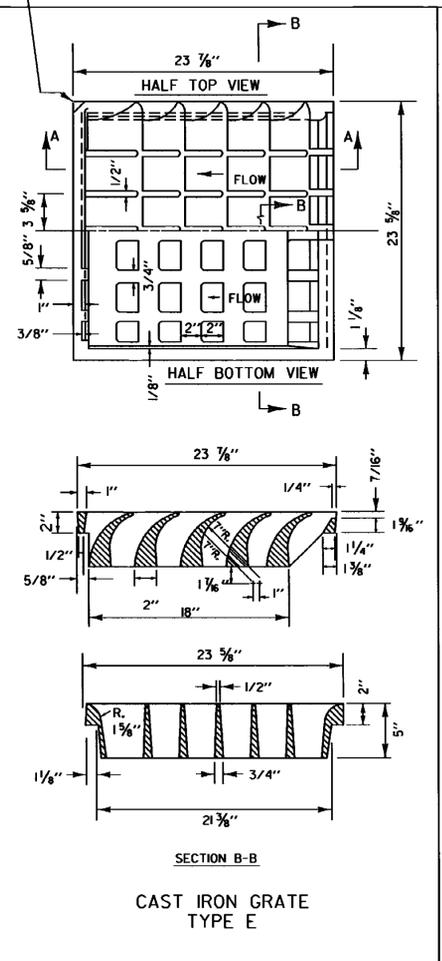
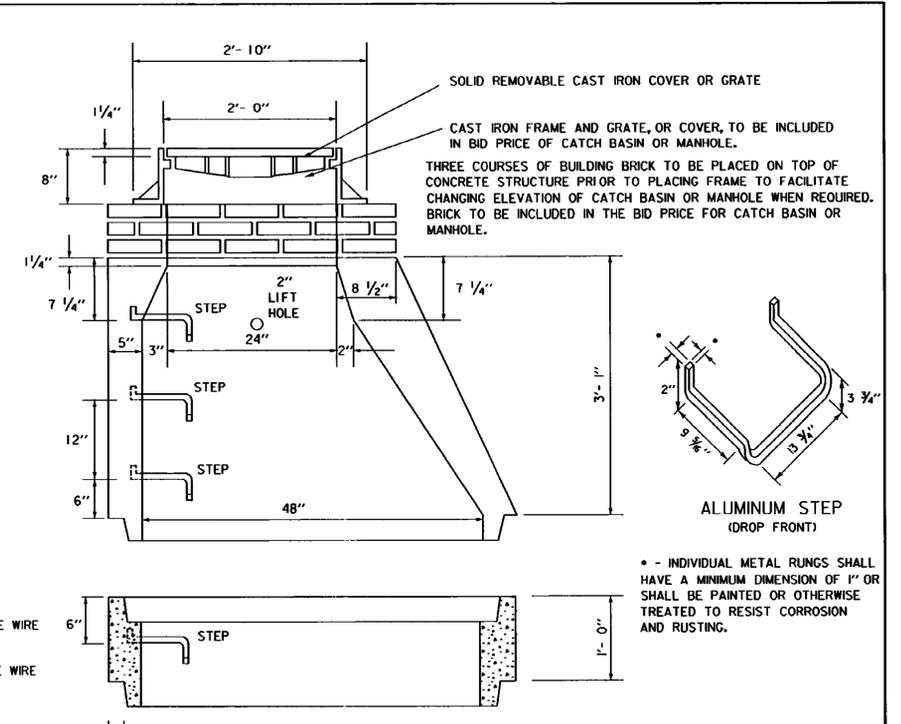
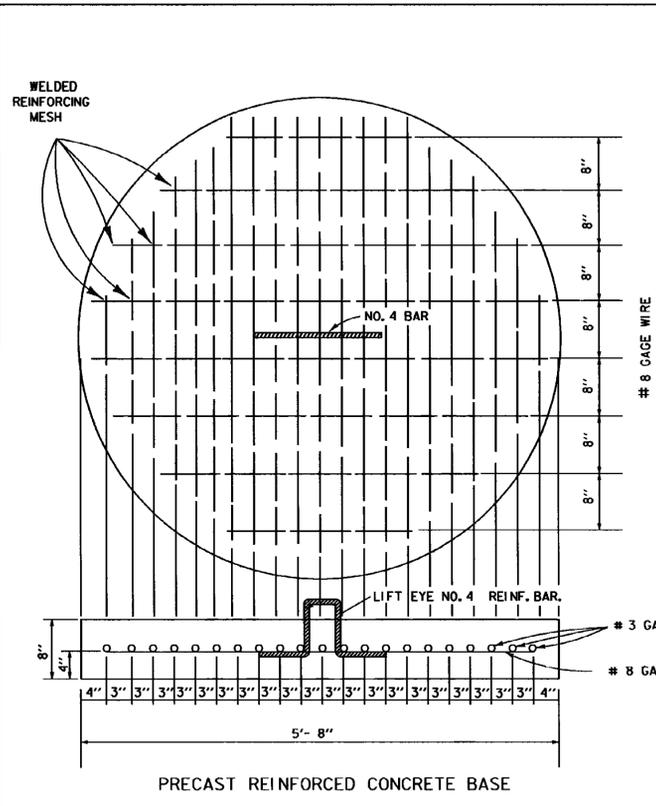
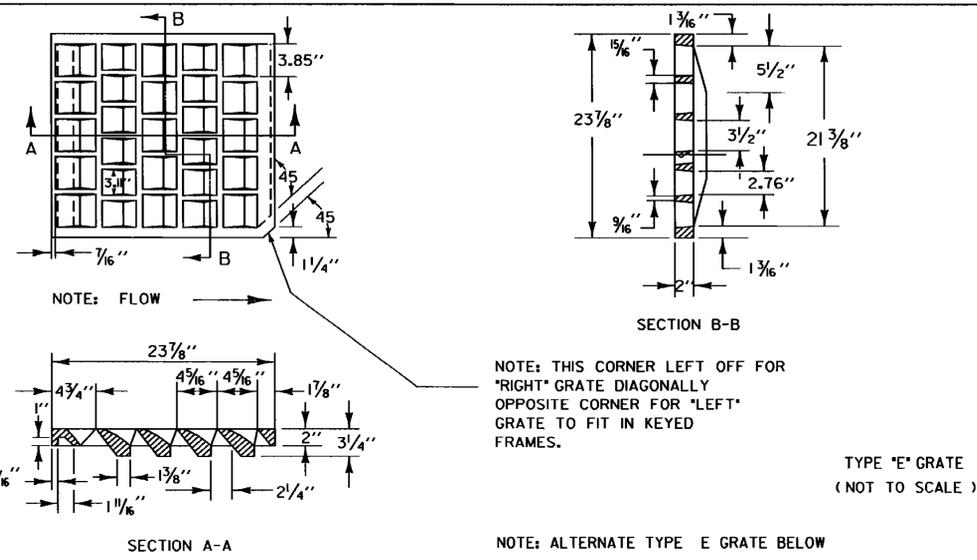
REVISIONS AND CORRECTIONS  
DEC. 6, 1971 - ORIGINAL APPROVAL DATE  
JUNE 1, 1994 - REISSUED, WITHOUT CHANGE, UNDER NEW SIGNATURES.

APPROVED  
APPROVED FOR THIS PROJECT AND/OR DESIGN IMPLEMENTATION. FHWA FINAL APPROVAL PENDING.  
*Stephen D. MacArthur, P.E.*  
DIRECTOR OF ENGINEERING  
*John M. Murphy, P.E.*  
DESIGN ENGINEER

**PRECAST REINFORCED CONCRETE PIPE DROP INLET WITH CAST IRON GRATE**  
**PRECAST REINFORCED CONCRETE PIPE DROP INLET WITH CONCRETE COVER**



**STANDARD**  
**D-1**



REVISIONS AND CORRECTIONS

DEC. 6, 1971 - ORIGINAL APPROVAL

OCT. 22, 1976 - CAST IRON GRATE WITH FRAME, TYPE E ADDED

OCT. 6, 1978 - TYPE D GRATE ADDED

OCT. 30, 1985 - IMPERFECT TRENCH DETAILS DELETED

FEB. 17, 1993 - SECOND CAST IRON GRATE TYPE E ADDED.

MAR. 23, 1994 - ADDED NOTE FOR STEP DETAILS

JUNE 1, 1994 - REISSUED, WITHOUT CHANGE, UNDER NEW SIGNATURES.

APPROVED

APPROVED FOR THIS PROJECT AND/OR DESIGN IMPLEMENTATION. FHWA FINAL APPROVAL PENDING.

*Gordon S. MacArthur*   
DIRECTOR OF ENGINEERING

*Robert M. Mungler*   
DESIGN ENGINEER

**PRECAST REINFORCED CONCRETE CATCH BASIN W/ CAST IRON GRATE**

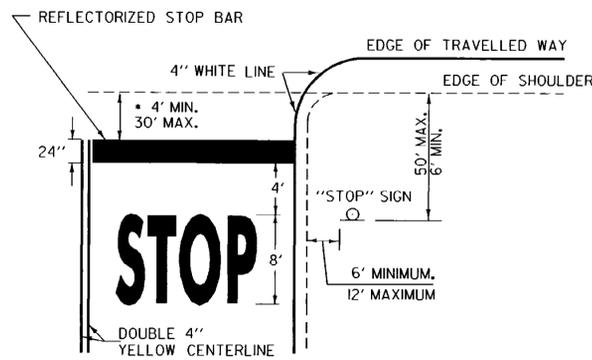
**PRECAST REINFORCED CONCRETE MANHOLE W/ CAST IRON COVER**

**CAST IRON GRATE WITH FRAME, TYPE D**

**CAST IRON GRATE WITH FRAME, TYPE E**

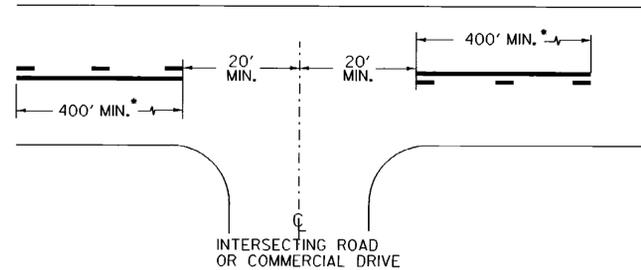
VERMONT AGENCY OF TRANSPORTATION

**STANDARD D-15**



\* THE "DESIRED STOPPING POINT" IS THE LOCATION BASED ON SITE CONDITIONS THAT BEST ALLOWS THE STOPPED VEHICLE TO VIEW THE APPROACHING TRAFFIC.

**STOP BAR LAYOUT**

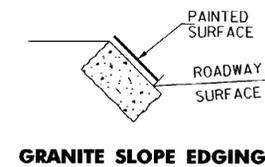


\* THE SOLID LINE SHALL BE PAIRED WITH EITHER A SOLID OR DASHED LINE DEPENDING ON SIGHT DISTANCE AVAILABILITY IN THE OPPOSING DIRECTION. ADJUSTMENTS TO THE 40 FOOT CENTERLINE OPENING MAY BE MADE TO ACCOMMODATE SKEWED INTERSECTIONS.

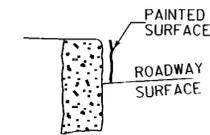
CENTERLINE BREAKS:

- A. AT ALL STATE HIGHWAYS AND TOWN HIGHWAYS, INCLUDING CLASS 4 TH'S, THAT HAVE STOP AND LEGAL LOAD LIMIT SIGNS INSTALLED
- B. COMMERCIAL DRIVES:
  1. WHERE A SEPERATE TURN LANE EXISTS ON THE MAIN LINE (LT. OR RT.)
  2. SIGNIFICANT TRAFFIC VOLUMES EXISTS.
  3. IF MOTORISTS NEED ASSISTANCE TO DEFINE ENTRANCE POINTS.

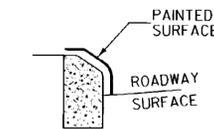
**CENTERLINE LAYOUT**



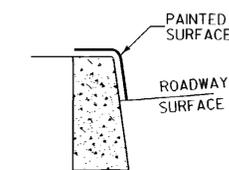
**GRANITE SLOPE EDGING**



**VERTICAL GRANITE CURB**

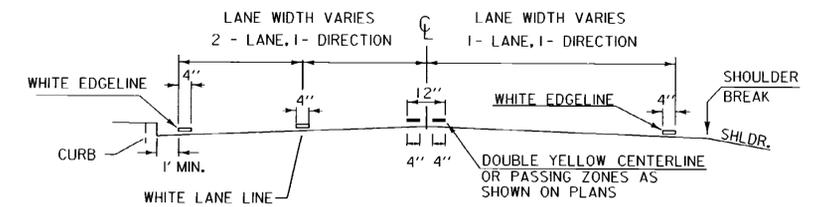


**TYPE A (CONCRETE)**

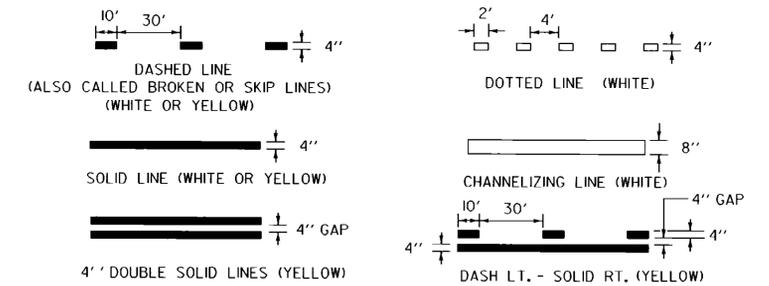


**TYPE B (CONCRETE)**

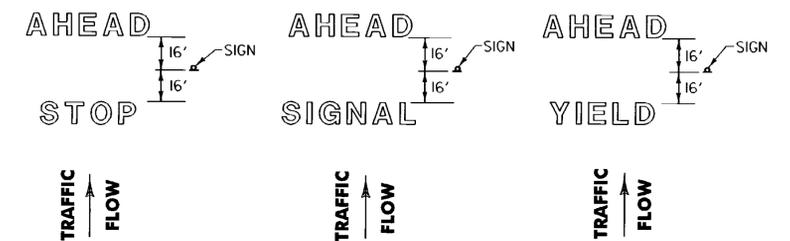
**PAINTED CURB**



**PAVEMENT MARKING PLACEMENT DETAIL**

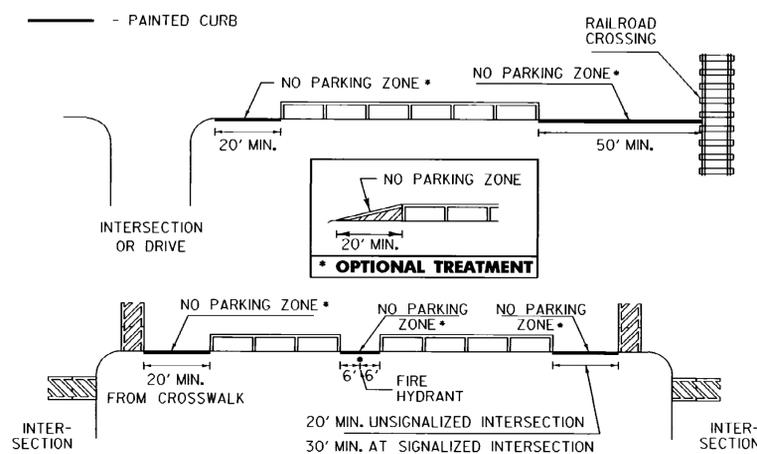


**PAVEMENT MARKING LINE DETAILS**

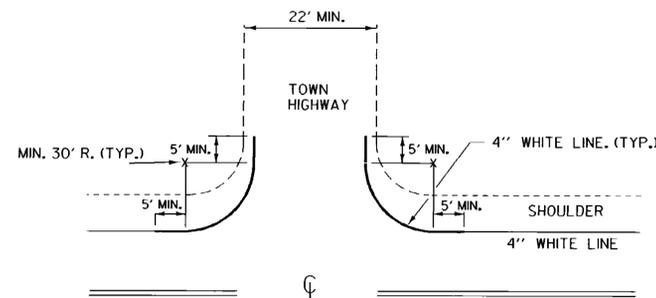


**LETTER IN WORD MARKING SPACING DETAIL**

NOTE: SINGLE WORDS CENTERED ON SIGN ie: SCHOOL OR YIELD



**NO PARKING LAYOUT DETAILS**

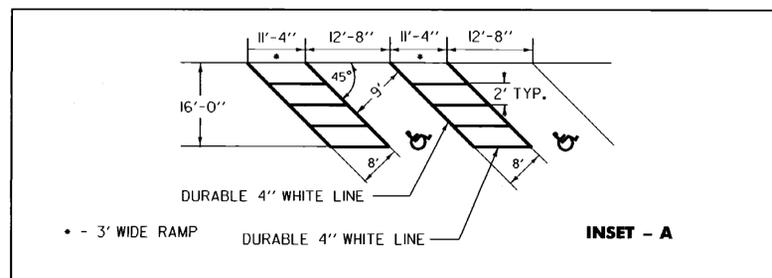


**EDGE LINE LAYOUTS**

EDGE LINES SHALL BE APPLIED TO ALL STATE HIGHWAYS AND SHOULD BE MAINTAINED AT A CONSTANT DISTANCE FROM THE CENTERLINE UNLESS PAVEMENT WIDTH INCREASES TO ALLOW WIDER LANES.

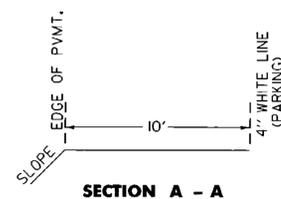
APPLY EDGE LINE AS DETAILED ON ALL PAVED CLASS 1 & CLASS 2 TOWN HIGHWAYS AND ANY CLASS 3 TOWN HIGHWAY 22 FEET OR MORE IN WIDTH.

IF MIN. 30 FOOT RADIUS CANNOT BE OBTAINED, OR THE TOWN HIGHWAY IS NOT PAVED, BREAK THE EDGE LINE USING AN 80 FOOT GAP AT INTERSECTION.

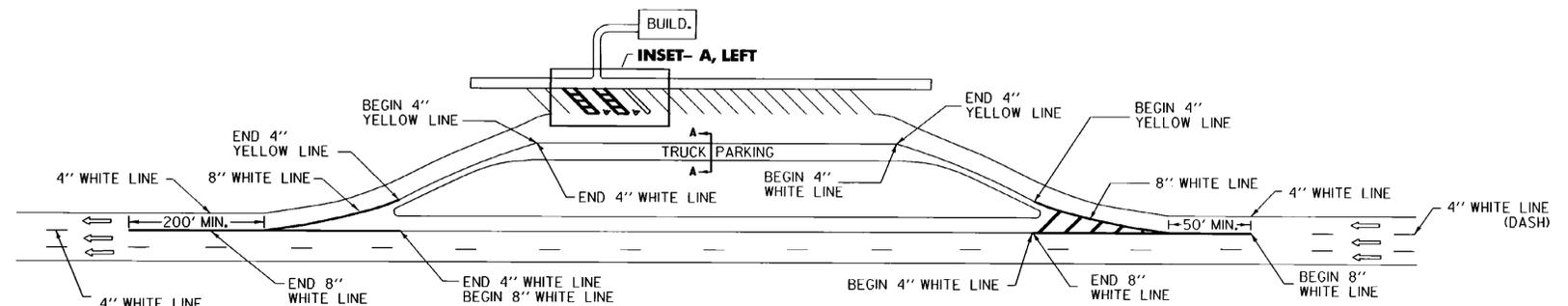


NOTE:

SEE STANDARD SHEET E-191 FOR HANDICAP SYMBOL POSITIONING AND DETAIL.



**TRUCK PARKING DETAIL**



**REST AREA PARKING DETAILS**

THIS SHEET IS NOT TO SCALE

OTHER STDS. E - 191, E - 192 REQUIRED

**REVISIONS AND CORRECTIONS**

AUG. 18, 1995 - DATE OF ORIGINAL ISSUE

**APPROVED**

*Stephen D. McArthur*  
DIRECTOR OF ENGINEERING

*David A. Ross*  
TRAFFIC AND SAFETY ENGINEER

APPROVED FOR THIS PROJECT AND/OR DESIGN IMPLEMENTATION. FHWA FINAL APPROVAL PENDING.

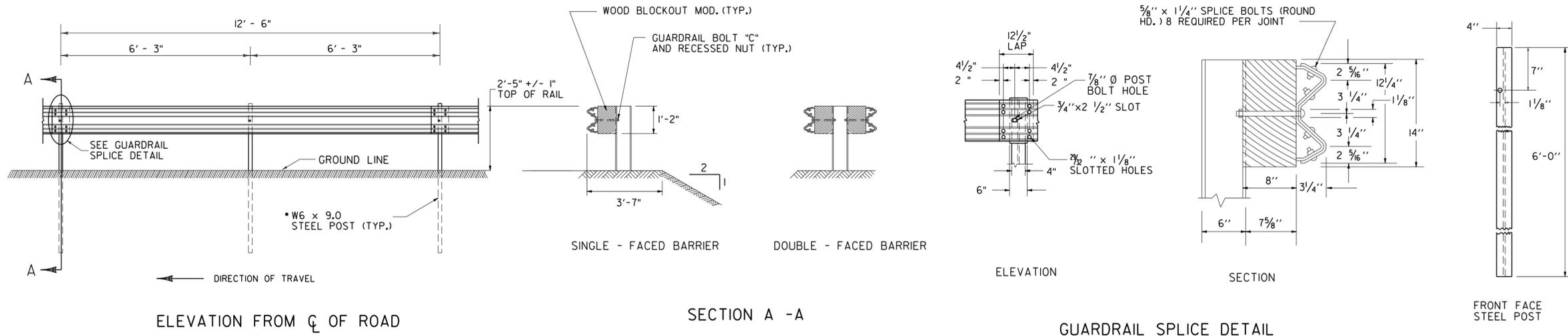
**PAVEMENT MARKING DETAILS**

/traf/std/stdel93.dgn/stdel93.i



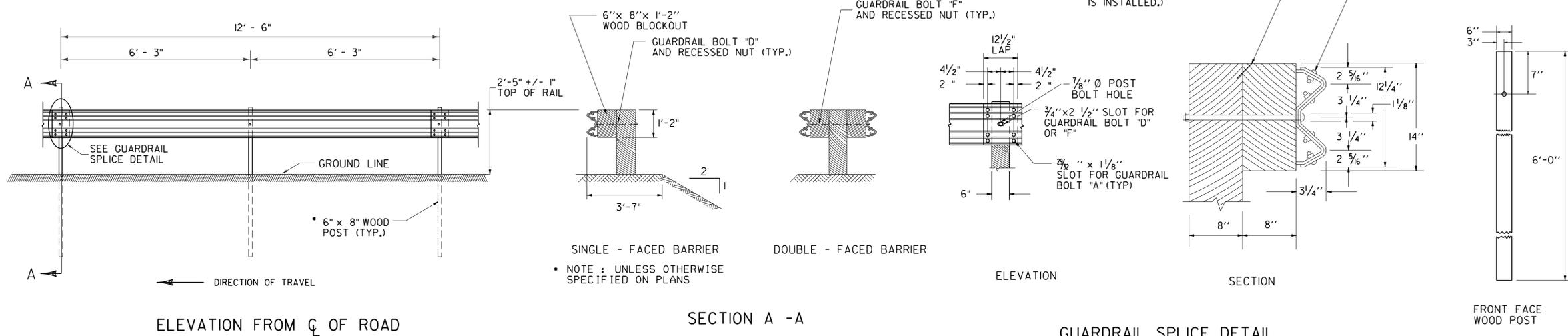
**STANDARD E-193**

"W" BEAM GUARDRAIL WITH STEEL POSTS



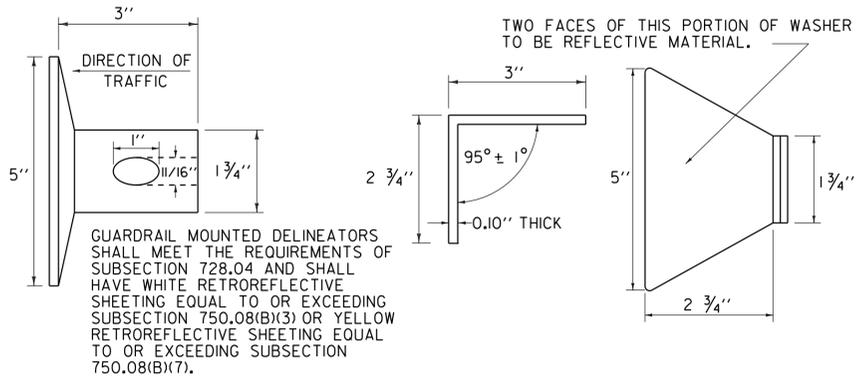
- NOTES:
- BLOCKS SHALL BE MADE OF TIMBER WITH A STRESS GRADE OF 1200 PSI OR MORE. TESTING SHALL BE IN ACCORDANCE WITH WEST COAST LUMBER INSPECTION BUREAU, SOUTHERN PINE INSPECTION BUREAU OR OTHER APPROPRIATE ASSOCIATION. TIMBER FOR BLOCKS SHALL BE ROUGH SAWN (UNPLANED) WITH DIMENSIONS INDICATED. THE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

"W" BEAM GUARDRAIL WITH WOOD POSTS



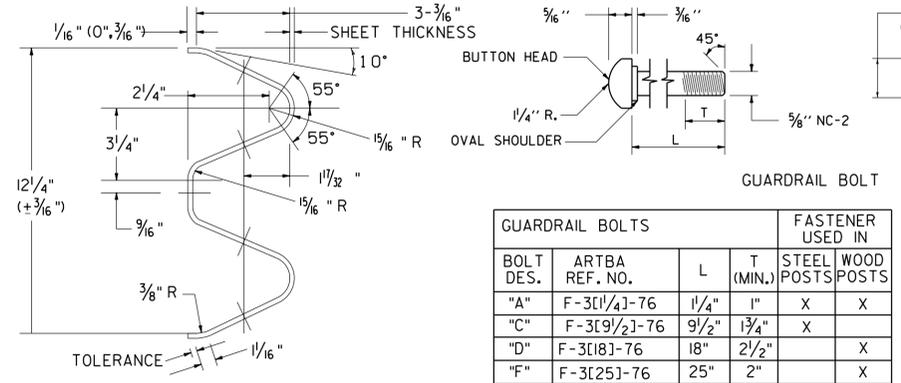
- NOTES:
- BLOCKS SHALL BE MADE OF TIMBER WITH A STRESS GRADE OF 1200 PSI OR MORE. TESTING SHALL BE IN ACCORDANCE WITH WEST COAST LUMBER INSPECTION BUREAU, SOUTHERN PINE INSPECTION BUREAU OR OTHER APPROPRIATE ASSOCIATION. TIMBER FOR BLOCKS SHALL BE ROUGH SAWN (UNPLANED) WITH DIMENSIONS INDICATED. THE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

GUARDRAIL DELINEATOR



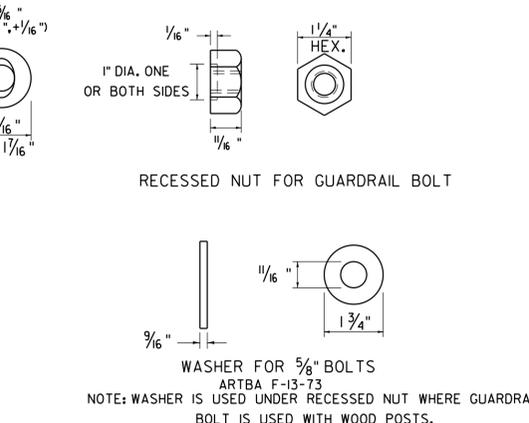
GUARDRAIL MOUNTED DELINEATORS SHALL MEET THE REQUIREMENTS OF SUBSECTION 728.04 AND SHALL HAVE WHITE RETROREFLECTIVE SHEETING EQUAL TO OR EXCEEDING SUBSECTION 750.08(B)(3) OR YELLOW RETROREFLECTIVE SHEETING EQUAL TO OR EXCEEDING SUBSECTION 750.08(B)(7).

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 1]-73 TYPICAL GUARDRAIL SECTION

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



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

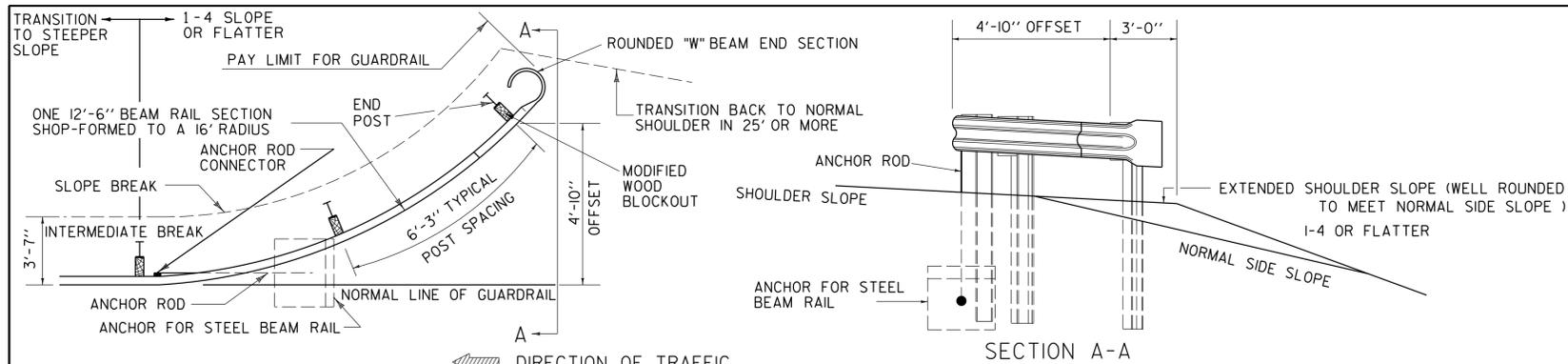
- GENERAL NOTES:
- GUARDRAIL SHALL MEET THE REQUIREMENTS OF AASHTO M 180, CLASS A, TYPE 1, UNLESS OTHERWISE DESIGNATED.
  - GUARDRAIL SHALL BE SINGLE FACED UNLESS OTHERWISE DESIGNATED.
  - GUARDRAIL SECTIONS SHALL BE LAPPED IN THE DIRECTION OF TRAFFIC FLOW FOR THE LANE NEAREST THE GUARDRAIL.
  - FOR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

REV.	DATE	DESCRIPTION
--	JAN. 3, 2000	UPDATED TO REFLECT METRIC STD. CHANGES
--	FEB. 10, 2014	UPDATED TO REFLECT GUARDRAIL HEIGHT OF 29"; FHWA LETTER (MAY 17, 2010)
--	NOV. 10, 2015	UPDATED DELINEATOR RETROREFLECTIVE SHEETING NOTES

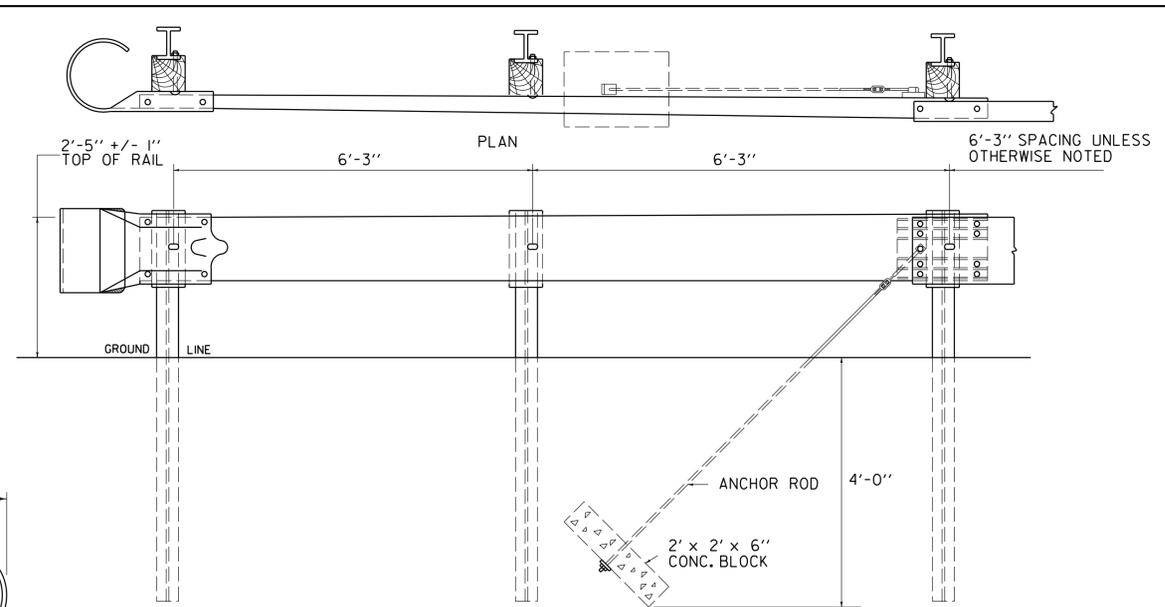
OTHER STANDARDS REQUIRED: G-ID  
VTRANS AND FHWA APPROVAL ON FILE WITH CONTRACT ADMINISTRATION

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





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

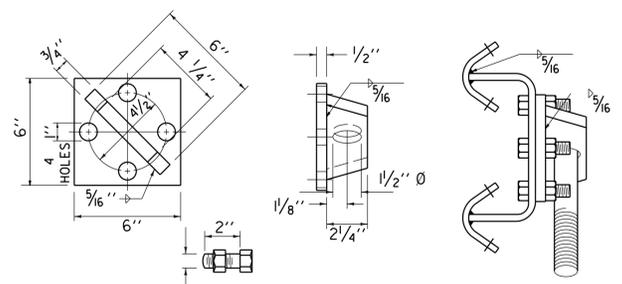


ASSEMBLY ELEVATION

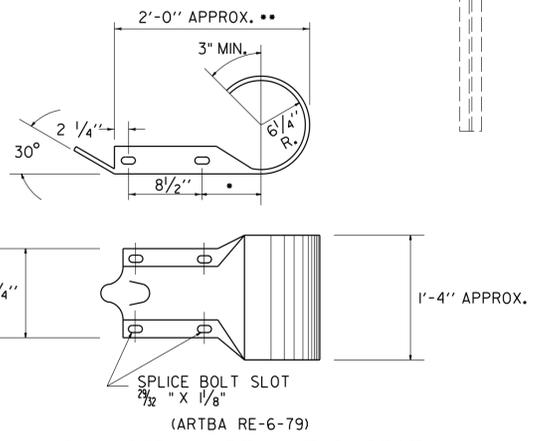
TRAILING END TERMINAL FOR USE ON ONE-WAY HIGHWAYS

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.

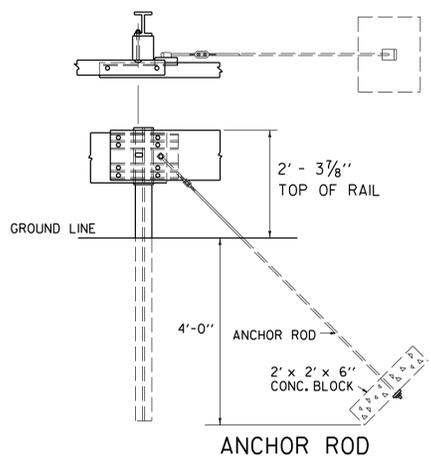


ANCHOR ROD CONNECTOR

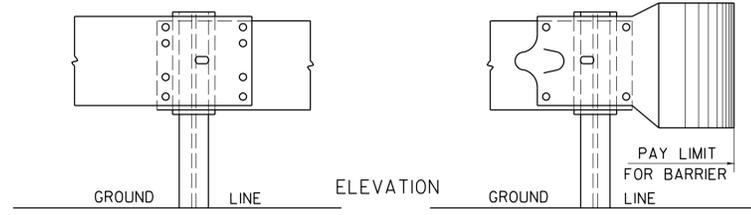


ROUNDED "W" BEAM END SECTION

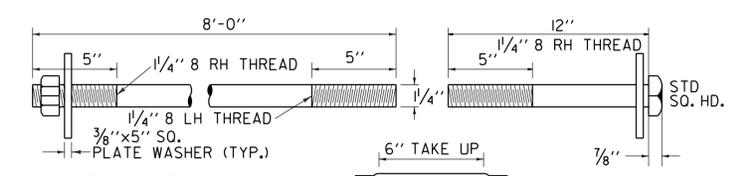
\* THIS DIMENSION IS 7 1/2" IN RE-7-79. IF THE DIMENSION IS USED IN THIS PART, IT WILL GIVE AN ACCEPTABLE OVERALL LENGTH (\*\*) OF APPROXIMATELY 2'- 11/2."



ANCHOR ROD

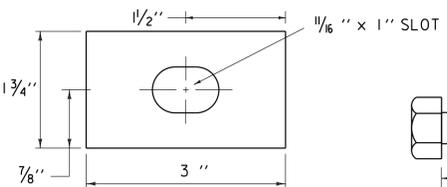


ELEVATION

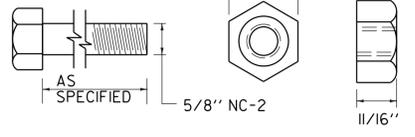


TURNBUCKLE

MIN. TENSILE STRENGTH 60,000 LBS. LOAD APPLIED THROUGH ASSEMBLY

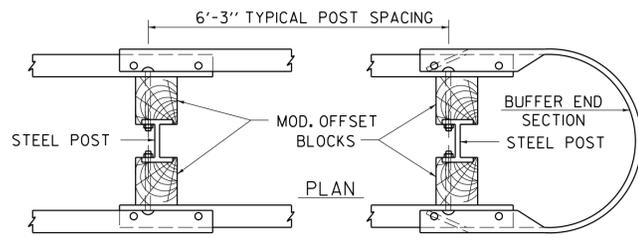


RECTANGULAR GUARDRAIL PLATE WASHER (ARTBA F-12-73)



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

FASTENER DETAILS



MEDIAN

END

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

OTHER STANDARD REQUIRED: G-1

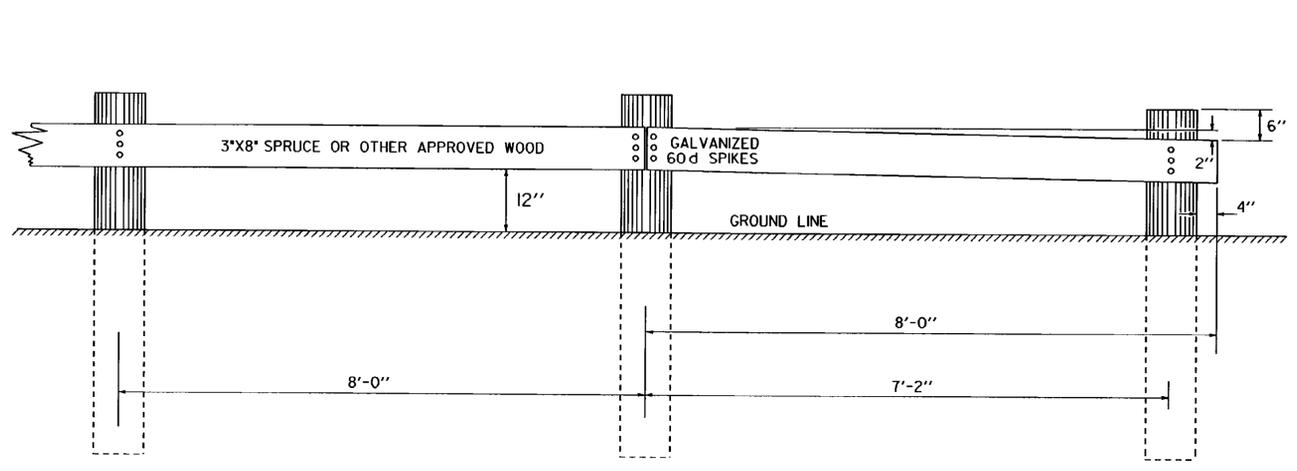
REVISIONS AND CORRECTIONS  
 JUNE 1, 1994 - REISSUED, WITHOUT CHANGE, UNDER NEW SIGNATURES.  
 JAN. 3, 2000 - UPDATED TO REFLECT METRIC STD. CHANGES  
 FEB. 10, 2014 - UPDATED TO REFLECT GUARDRAIL HEIGHT OF 29"; AS NOTED IN FHWA LETTER DATED MAY 17, 2010

APPROVED  
*[Signature]*  
 HIGHWAY SAFETY & DESIGN ENGINEER  
*[Signature]*  
 DIRECTOR OF PROGRAM DEVELOPMENT  
*[Signature]*  
 FEDERAL HIGHWAY ADMINISTRATION

STEEL BEAM GUARDRAIL APPROACH END TERMINAL  
 STEEL BEAM GUARDRAIL TRAILING END TERMINAL  
 ANCHOR FOR STEEL BEAM GUARDRAIL  
 STEEL BEAM MEDIAN BARRIER

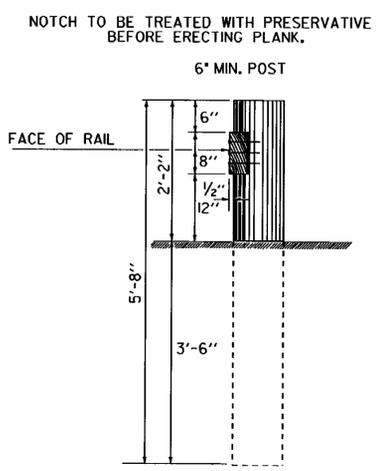


STANDARD  
 G-1d

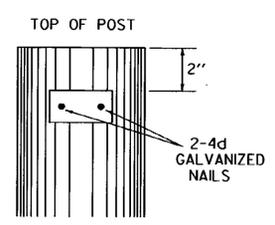


PLANK SIXTEEN FEET IN LENGTH TO BE USED WHEREVER POSSIBLE. POSTS SIX (6) INCHES SQUARE MAY BE USED IN PLACE OF ROUND POSTS. FIRST AND LAST POSTS OF EACH SECTION TO BE SET BACK TWELVE INCHES FROM THE GENERAL LINE OF POSTS, WHEN FOUR OR MORE POSTS ARE REQUIRED. REFLECTIVE MATERIAL TO BE PLACED AS DIRECTED BY THE ENGINEER. ALL WOOD MEMBERS SHALL BE GIVEN A PRESERVATIVE TREATMENT.

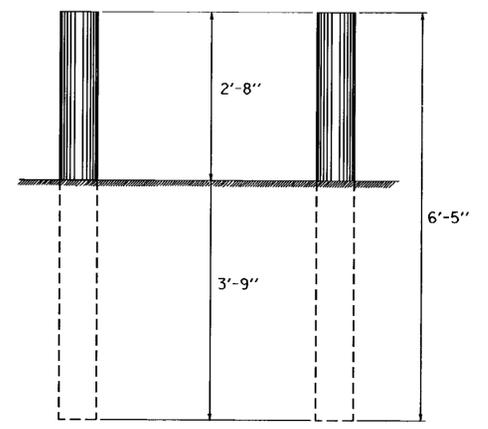
PLANK RAIL  
TO BE USED AS A BARRICADE OFF THE HIGHWAY



3" x 1/2" REFLECTIVE ALUMINUM STRIP TO BE PLACED ON EVERY OTHER WOOD POST IN A LINE OF POSTS AND CLEARLY VISIBLE TO APPROACHING TRAFFIC. STRIPS TO BE ATTACHED TO THE DESIGNATED RAIL POSTS ON BOTH SIDES OF THE ROAD AND VISIBLE TO TRAFFIC IN BOTH DIRECTIONS. REFLECTIVE MATERIAL SHALL MEET THE REQUIREMENTS OF SUBSECTION 750.09 AND SHALL BE OF ENCAPSULATED LENS SILVER OR AMBER.

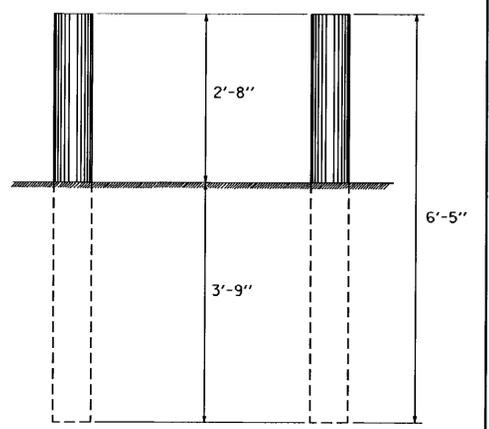


DELINEATION OF WOOD RAIL AND GUIDE POSTS



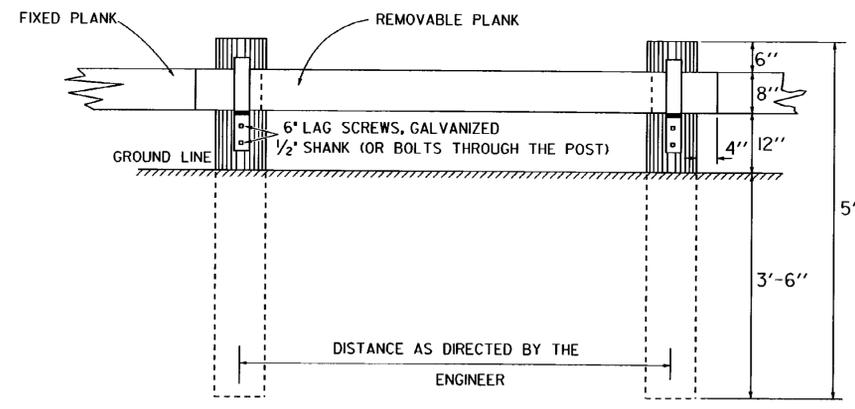
MARKER POSTS ARE TO BE 4" TO 5 1/2" IN DIAMETER AND ARE TO BE PLACED AS DIRECTED BY THE ENGINEER. POSTS SHALL BE GIVEN A PRESERVATIVE TREATMENT.

WOOD MARKER POSTS

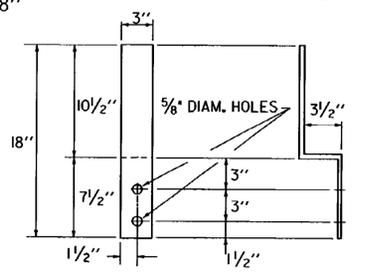


REFLECTIVE MATERIAL TO BE PLACED AS DIRECTED BY THE ENGINEER. POSTS ARE TO BE 4" TO 5 1/2" IN DIAMETER AND ARE TO BE PLACED AS DIRECTED BY THE ENGINEER. POSTS SHALL BE GIVEN A PRESERVATIVE TREATMENT.

WOOD GUIDE POSTS

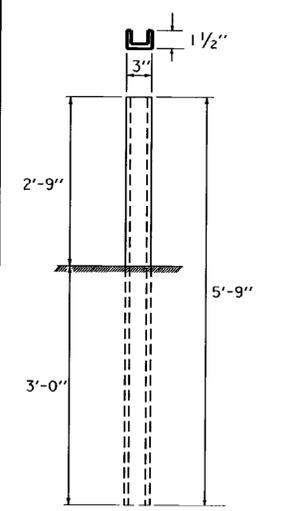
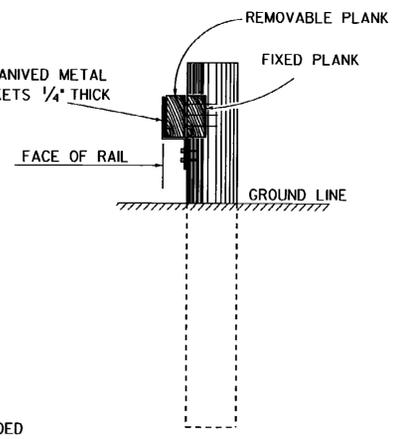


ENTRANCE THROUGH PLANK RAIL



BRACKET DETAIL

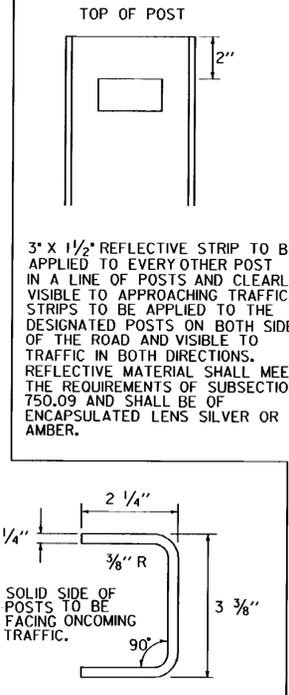
GALVANIZED METAL BRACKETS ARE TO BE INCLUDED IN THE UNIT BID PRICE FOR PLANK RAIL.



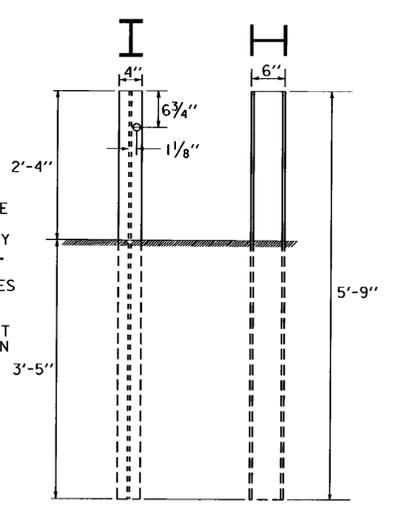
ALL STEEL MARKER POSTS TO BE GALVANIZED. STEEL MARKER POSTS TO BE PLACED AS DIRECTED BY THE ENGINEER.

POSTS ARE TO BE AMERICAN STANDARD CHANNEL 5'-9" X 3", (4.1 LBS. PER FT.)

STEEL MARKER POSTS



ALTERNATE POST



ALL STEEL GUIDE POSTS TO BE GALVANIZED. REFLECTIVE MATERIAL TO BE PLACED AS DIRECTED BY THE ENGINEER. POSTS ARE TO BE 5'-9" X 6" X 4" (8.5 LBS. PER FT.).

ALL POSTS IN A GIVEN RUN OF BARRIER TO BE UNIFORM.

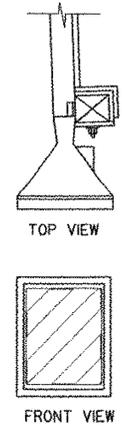
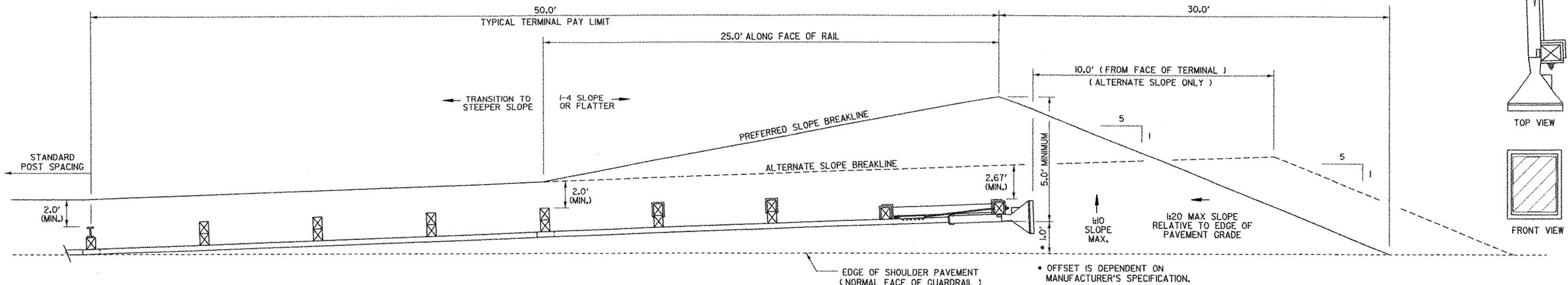
STEEL GUIDE POSTS

REVISIONS AND CORRECTIONS  
 DEC. 8, 1971 - ORIGINAL APPROVAL DATE  
 MAY 23, 1974 - ALTERNATE POST ADDED  
 MAY 29, 1979 - NOTE ON REFLECTIVE MATERIAL CHANGED  
 JULY 23, 1980 - CHANGED DIAMETER OF WOOD MARKER POST & WOOD GUIDE POST  
 MAY 25, 1982 - REMOVED ALTERNATE POST DETAIL  
 OCT. 31, 1985 - REVISED TO CONFORM TO 1986 SPECIFICATIONS  
 JUNE 1, 1994 - REISSUED, WITHOUT CHANGE, UNDER NEW SIGNATURES.

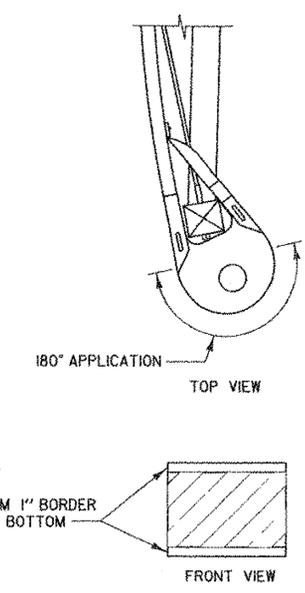
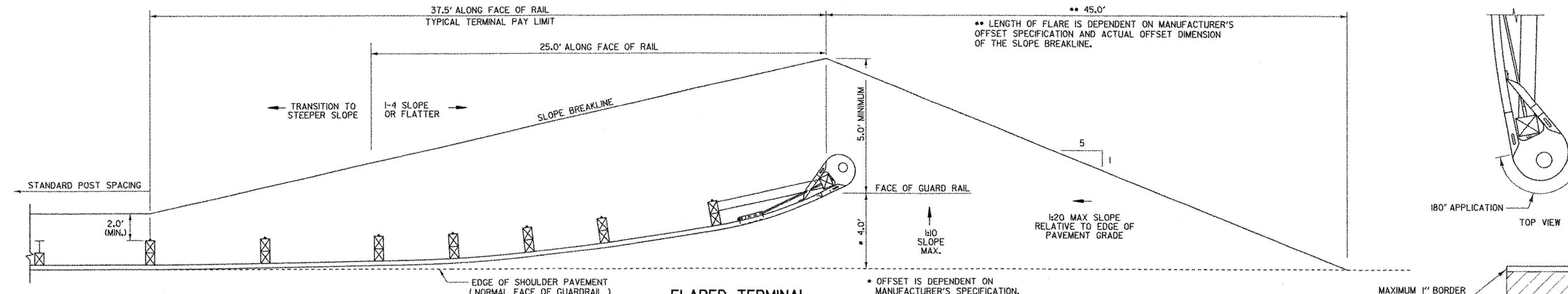
APPROVED  
  
 DIRECTOR OF ENGINEERING  
  
 DESIGN ENGINEER

**PLANK RAIL  
 GUIDE POSTS  
 WOOD MARKER POSTS  
 STEEL MARKER POSTS**

**STANDARD  
 G-4**



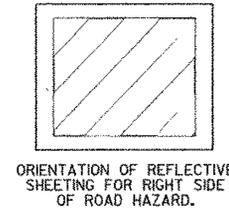
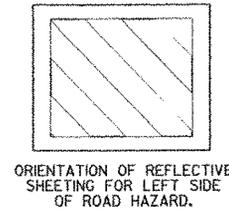
**TANGENTIAL TERMINAL**



**FLARED TERMINAL**

**GENERAL NOTES**

- ① THE AREA IMMEDIATELY BEHIND AND BEYOND THE TERMINAL SHOULD BE REASONABLY TRAVERSABLE AND FREE FROM FIXED-OBJECT HAZARDS TO THE EXTENT PRACTICABLE. IF A CLEAR RUNOUT PATH IS NOT ATTAINABLE, THIS AREA SHOULD AT LEAST BE SIMILAR IN CHARACTER TO UPSTREAM/UNSHIELDED ROADSIDE AREAS.
- ② REFLECTIVE SHEETING SHALL BE PLACED ON THE TERMINAL END OF ALL TANGENT END TERMINALS. THIS SHALL BE OBJECT MARKER MATERIAL (TYPE 3 - STRIPED MARKER OM-3L AND OM-3R) CONSISTING OF A SQUARE OR RECTANGULAR SHAPE WITH ALTERNATING BLACK AND RETROREFLECTIVE YELLOW STRIPES SLOPING DOWNWARD AT AN ANGLE OF 45 DEGREES TOWARDS TRAFFIC. THE MINIMUM WIDTH OF THE YELLOW STRIPE SHALL BE 3 INCHES. THE DIMENSIONS OF THE MARKER SHALL EXTEND FOR THE FULL WIDTH OF THE FACE PLATE ON THE TERMINAL HEAD AND BE SUFFICIENT IN HEIGHT (DEPENDENT ON THE TYPE OF END TERMINAL AND HEAD SIZE). REFLECTIVE MATERIAL SHALL MEET THE REQUIREMENTS OF SUBSECTION 750.08 (B)(3) TYPE 111 OR HIGHER (AASHTO M 268 (ASTM 4956)). THE COST SHALL BE INCLUDED IN THE COST OF THE END TERMINAL.
- ③ REFLECTIVE SHEETING SHALL BE PLACED ON THE END OF FLARED TERMINALS WHICH ARE LOCATED 6 FEET OR LESS FROM THE EDGE OF SHOULDER (NORMAL FACE OF GUARDRAIL). THIS SHALL BE THE SAME OBJECT MARKER MATERIAL SPECIFIED IN NOTE 2. THE COST OF THE REFLECTIVE SHEETING SHALL BE INCLUDED IN THE COST OF THE END TERMINAL.
- ④ FOR THE FLARED TERMINAL, WITH AN OFFSET BETWEEN 4 FEET AND 6 FEET FROM THE NORMAL FACE OF GUARDRAIL, THE FOLLOWING SHALL PERTAIN: A REFLECTIVE BUTTON, MOUNTED ON A STANDARD DELINEATOR POST, SHALL BE INSTALLED AT THE NORMAL FACE OF GUARDRAIL, DIRECTLY OPPOSITE THE LEAD END OF THE TERMINAL. THE BUTTON SHALL BE WHITE FOR THE RIGHT SIDE OF THE ROAD AND YELLOW FOR THE LEFT SIDE. ANY DELINEATORS INSTALLED SHALL BE PAID FOR BY THE APPROPRIATE PAY ITEMS.



NOT TO SCALE

REVISIONS AND CORRECTIONS  
 OCT. 21, 1998 ORIGINAL APPROVAL  
 NOV. 15, 2002 MODIFIED SLOPE BREAKLINE,  
 REFLECTIVE SHEETING ADDED

APPROVED  
  
 DIRECTOR OF PROJECT DEVELOPMENT  
  
 ROADWAY DESIGN ENGINEER  
  
 FEDERAL HIGHWAY ADMINISTRATION

**GENERIC PLANS FOR  
 GUARDRAIL END TERMINALS**



STANDARD  
 G-19

1. TRAFFIC CONTROL DEVICES NOT DETAILED IN THE VERMONT AGENCY OF TRANSPORTATION (VAOT) "STANDARD DRAWINGS" OR THE PROJECT PLANS SHALL BE IN ACCORDANCE WITH THE CURRENT "MANUAL ON TRAFFIC CONTROL DEVICES" (MUTCD) AND THE "STANDARD HIGHWAY SIGNS AND MARKINGS" BOOK, AND THEIR LATEST REVISIONS, (SHSM) PUBLISHED BY THE FEDERAL HIGHWAY ADMINISTRATION (FHWA).
2. CONSTRUCTION SIGNS SHALL BE ERECTED BEFORE THE START OF ANY WORK AND SHALL BE COVERED UNTIL WORK COMMENCES, DURING PERIODS OF INACTIVITY OR UPON COMPLETION OF THE WORK. EACH SIGN SHALL BE ERECTED IN A NEAT AND WORKMANLIKE MANNER.
3. DIAMOND SHAPED CONSTRUCTION SIGNS SHALL BE 48 INCH BY 48 INCH.
4. CONSTRUCTION SIGN COVERS SHALL CONSIST OF A PANEL, PAINTED FLAT BLACK, THE SAME SIZE AS THE SIGN IT COVERS. THE PANEL SHALL BE OF WOOD, PLYWOOD, HARDBOARD OR ANY MATERIAL SATISFACTORY TO THE ENGINEER. NO MATERIAL WILL BE APPROVED THAT WILL DETERIORATE BY EXPOSURE TO THE WEATHER DURING THE PROJECT. MOUNTING OF THE PANEL SHALL BE DONE IN SUCH A WAY AS NOT TO DAMAGE THE SIGN FACE MATERIAL.
5. SIGNS SHALL BE MAINTAINED IN A CLEAN AND LEGIBLE CONDITION SATISFACTORY TO THE ENGINEER. THEY SHALL BE KEPT PLUMB AND LEVEL, AND ALWAYS PRESENT A NEAT APPEARANCE. DAMAGED, DEFACED OR DIRTY SIGNS SHALL BE REPAIRED, CLEANED OR REPLACED AS ORDERED BY THE ENGINEER.
6. NO CROSS-BRACING OR BACK-BRACING TO KEEP POSTS PLUMB WILL BE ALLOWED. CONCRETE FOUNDATIONS, COLLARS OR SOIL BEARING PLATES ARE NOT PERMITTED.
7. CONSTRUCTION SIGNS INSTALLED ON POSTS SHALL BE SET SECURELY IN THE GROUND ON TWO POSTS. THE BOTTOM OF A SIGN SHALL BE AT LEAST FIVE FEET ABOVE THE EDGE OF PAVEMENT AND THE NEAREST EDGE OF A SIGN SHALL BE AT LEAST SIX FEET OUTSIDE THE SHOULDER POINT, FOUR FEET OUTSIDE GUARDRAIL, OR TWO FEET OUTSIDE CURBING OR SIDEWALK. THE INSTALLATION OF SIGNS SHALL BE SUBJECT TO APPROVAL OF THE ENGINEER. IN URBAN AREAS, THE BOTTOM OF THE SIGN SHALL BE AT LEAST SEVEN FEET ABOVE THE SIDEWALK OR EDGE OF PAVEMENT, WHICHEVER IS HIGHER.
8. PORTABLE SIGNS SHALL BE PLACED ON THE EDGE OF ROADWAY AND A MINIMUM OF ONE FOOT ABOVE THE TRAVELED WAY. ALL VEGETATION THAT INTERFERES WITH VISIBILITY OF THE SIGNS SHALL BE REMOVED. WHEN PLACED BEHIND GUARDRAIL, THE BOTTOM OF THE SIGN FACE SHALL BE ABOVE THE TOP OF THE GUARDRAIL.
9. SIGNS SHALL BE REMOVED UPON COMPLETION OF THE WORK AT THE DISCRETION OF THE ENGINEER.
10. ROLL UP CONSTRUCTION SIGNS SHALL HAVE RETROREFLECTIVE SHEETING EQUAL TO OR EXCEEDING THE "AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS" (AASHTO) M 268 ["AMERICAN SOCIETY FOR TESTING AND MATERIALS" (ASTM) D 4956] TYPE VI AND TYPE VII UNLESS OTHERWISE NOTED.
11. SOLID SUBSTRATE CONSTRUCTION SIGNS SHALL HAVE RETROREFLECTIVE SHEETING EQUAL TO OR EXCEEDING THE "AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS" (AASHTO) M 268 ["AMERICAN SOCIETY FOR TESTING AND MATERIALS" (ASTM) D 4956] TYPE VIII OR IX REQUIREMENTS UNLESS OTHERWISE NOTED.
12. WHERE CONSTRUCTION SIGN INSTALLATIONS ARE NOT PROTECTED BY GUARDRAIL OR OTHER APPROVED TRAFFIC BARRIERS, ALL SIGN STANDS AND POST INSTALLATIONS SHALL MEET "NATIONAL COOPERATIVE HIGHWAY RESEARCH PROGRAM" (NCHRP) REPORT 350 OR THE AASHTO "MANUAL FOR ASSESSING SAFETY HARDWARE" (MASH). THE APPROPRIATE RESOURCE SHALL BE DETERMINED AS DESCRIBED IN THE MASH PUBLICATION. NO SIGN POSTS SHALL EXTEND OVER THE TOP OF THE SIGN INSTALLED ON SAID POSTS. WHEN ANCHORS ARE INSTALLED, STUBS SHALL NOT BE GREATER THAN FOUR INCHES ABOVE EXISTING GROUND.
13. ROADWAY AND SHOULDER WIDTHS DEPICTED ON THE STANDARD DRAWINGS MAY VARY.
14. THESE STANDARD DRAWINGS ARE INTENDED TO SERVE AS VTRANS STANDARD OPERATING PROCEDURE. IT IS NOTED THAT COMPONENT PARTS OF A TEMPORARY TRAFFIC CONTROL WORK ZONE MAY BE MODIFIED DUE TO FIELD CONDITIONS AT THE DISCRETION OF THE ENGINEER.

REV.	DATE	DESCRIPTION
0	AUG. 6, 2012	ORIGINAL APPROVAL
1	APR. 25, 2016	INSERTED NOTE 3, UPDATED STANDARD NAME
OTHER STANDARDS REQUIRED: NONE		
VTRANS AND FHWA APPROVAL ON FILE WITH CONTRACT ADMINISTRATION		

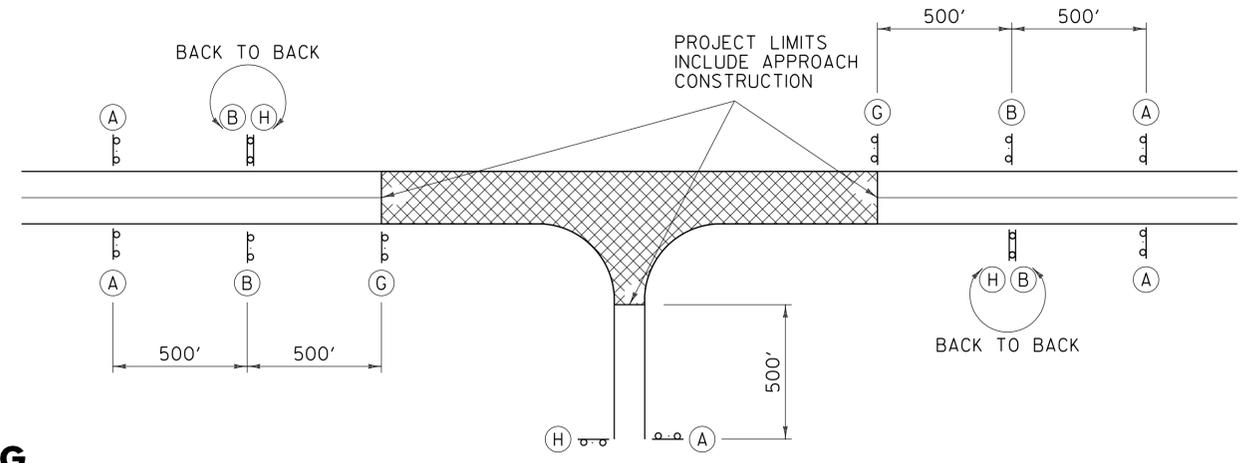
## TEMPORARY TRAFFIC CONTROL GENERAL NOTES



STANDARD  
T-1

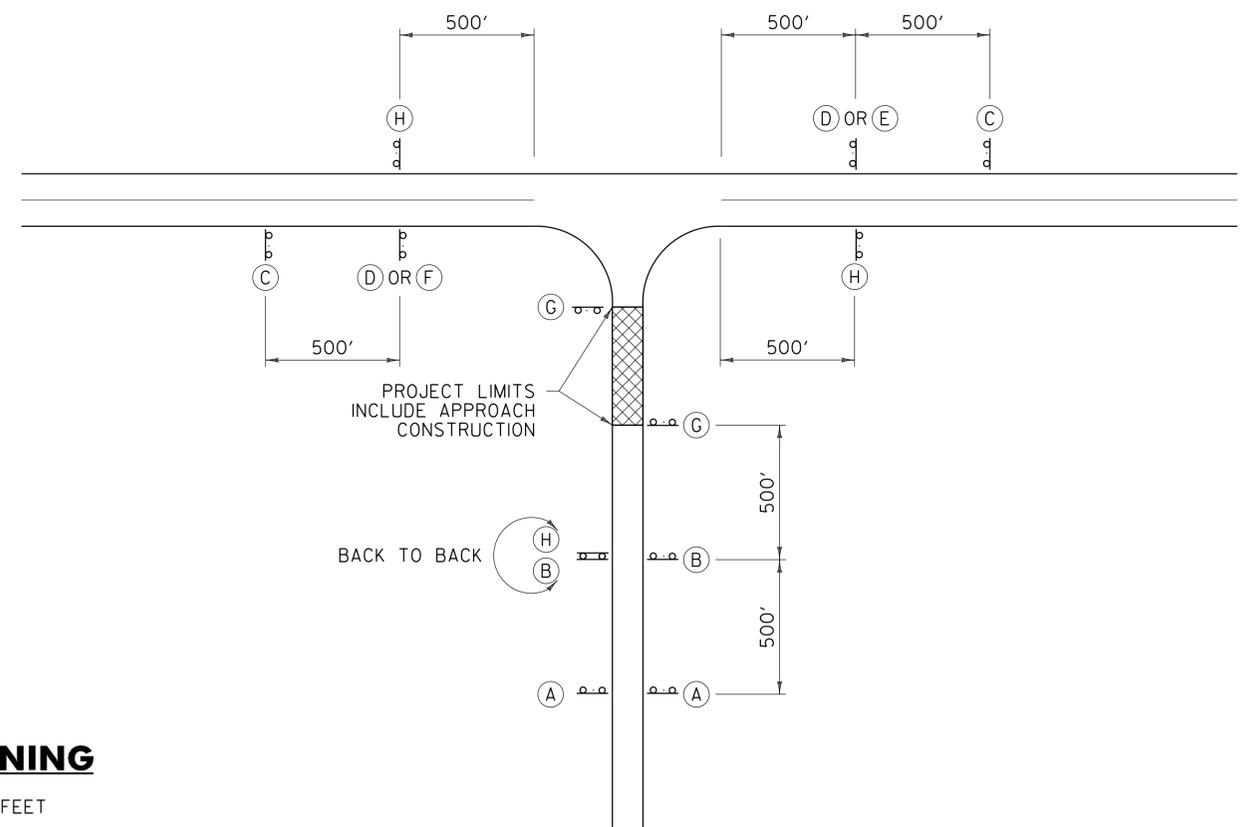
**LEGEND**

- (A)  ROAD WORK AHEAD  
W20-1
- (B)  ROAD WORK 500 FT  
W20-1
- (C)  SIDE ROAD WORK AHEAD  
VC-869
- (D)  SIDE ROAD WORK 500 FT  
VC-869
- (E)  SIDE ROAD WORK LEFT  
VC-869
- (F)  SIDE ROAD WORK RIGHT  
VC-869
- (G)  ROAD WORK NEXT XX MILES  
G20-1
- (H)  END ROAD WORK  
G20-2



**TYPICAL APPROACH SIGNING**

FIELD CONDITIONS MAY DICTATE THE ACTUAL PLACEMENT.



**SIDE ROAD APPROACH SIGNING**

TO BE USED WHEN CONSTRUCTION IS UP TO 1000 FEET FROM THE INTERSECTION. FIELD CONDITIONS MAY DICTATE THE ACTUAL PLACEMENT.

**GENERAL NOTES:**

1. SIGNS SHOWN ON THIS SHEET ARE INTENDED FOR USE IN PROVIDING ADVANCE WARNING AND INFORMATION ON CONSTRUCTION PROJECTS OVER WHICH TRAFFIC WILL BE MAINTAINED. WHEN ADDITIONAL APPROACH SIGNS OR OTHER TYPES OF ADVANCE SIGNING OR CONTROL ARE NECESSARY, THE PLANS AND/OR THE SPECIFICATIONS FOR THAT PROJECT WILL GIVE THE DETAILS OF THE SIGNS AND DEVICES REQUIRED. FOR ON-PROJECT CONSTRUCTION SIGNS, REFER TO APPROPRIATE STANDARD SHEETS.
2. THE "ROAD WORK NEXT XX MILES" SIGN (G20-1) SHALL BE INSTALLED IN ADVANCE OF TEMPORARY TRAFFIC CONTROL ZONES THAT ARE MORE THAN TWO MILES IN LENGTH OR AS DIRECTED BY THE ENGINEER. DISTANCES SHALL BE STATED TO THE NEAREST WHOLE MILE.
3. SIGNS SHALL BE LOCATED AS DETAILED ON THIS SHEET OR AS OTHERWISE SHOWN ON THE PLANS. THEY SHALL APPEAR AT EACH END OF THE HIGHWAY UNDER CONSTRUCTION AND ON ALL INTERSECTING PUBLIC HIGHWAYS. THE ENGINEER SHALL DETERMINE THE EXACT LOCATIONS.

**OTHER STDS. REQUIRED: T-1, T-28**

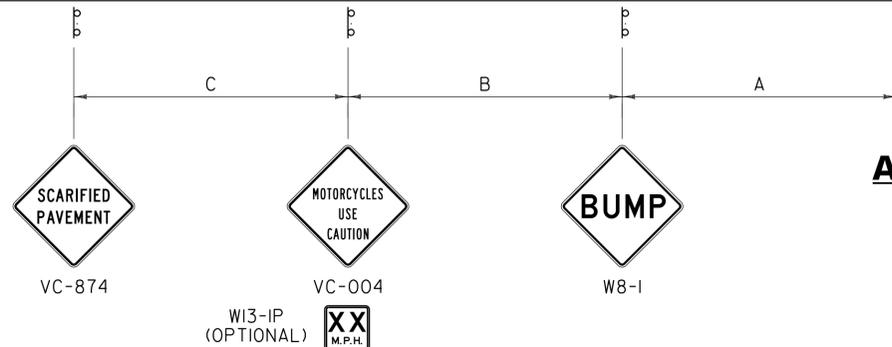
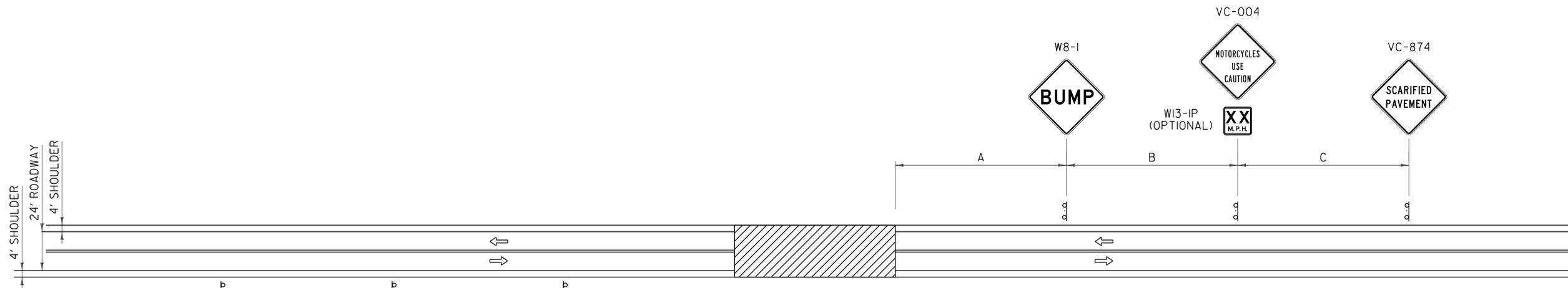
REVISIONS AND CORRECTIONS  
AUG. 6, 2012 - ORIGINAL APPROVAL DATE

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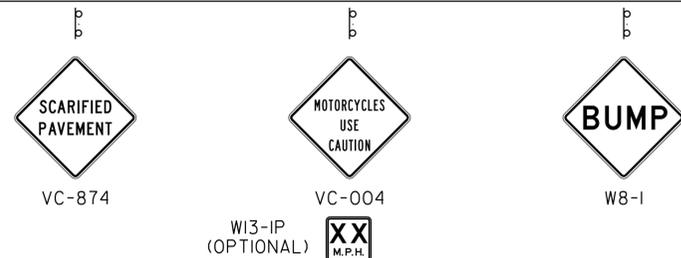
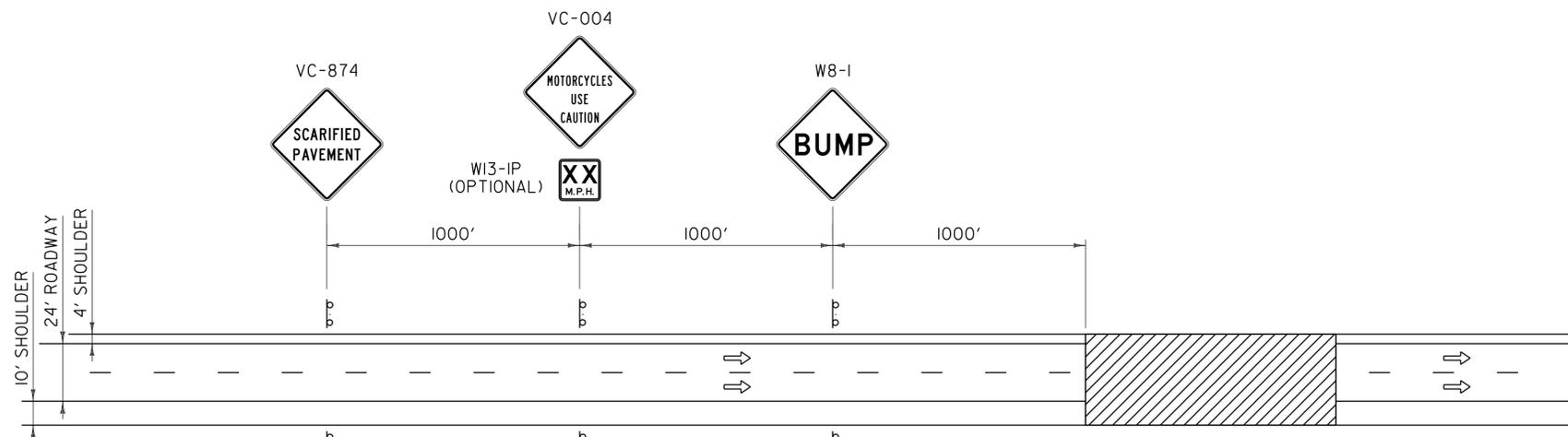
**CONVENTIONAL ROADS  
CONSTRUCTION APPROACH  
SIGNING**



STANDARD  
T-10



**ADVANCE WARNING SIGN PACKAGE FOR  
COLD PLANED (SCARIFIED) SURFACES  
TWO LANE ROADWAY**



**ADVANCE WARNING SIGN PACKAGE FOR  
COLD PLANED (SCARIFIED) SURFACES  
DIVIDED HIGHWAY**

**LEGEND**

- FLOW OF TRAFFIC
- ▨ WORK AREA

**GENERAL NOTES:**

1. THE BUMP SIGN MAY BE ELIMINATED WHEN THERE IS NO BUMP. WHEN THE CONTRACTOR IS WORKING IN THE CONSTRUCTION AREA, THE APPROPRIATE ADVANCED WARNING SIGN PACKAGE SHALL BE USED. SEE THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES" (MUTCD) FOR ADDITIONAL INFORMATION.
2. GATE POSTING OF SIGNS IS AN OPTION AS DETERMINED BY THE ENGINEER FOR TWO LANE ROADWAY WHEN PASSING, TURNING OR CLIMBING LANES LIMIT VISIBILITY.
3. FOR DIMENSIONS A, B AND C, REFER TO THE MUTCD, USE TABLE 6C-1 (RECOMMENDED ADVANCE WARNING SIGN MINIMUM SPACING), FOR SIGN SPACING.

**OTHER STDS. REQUIRED: T-1, T-28**

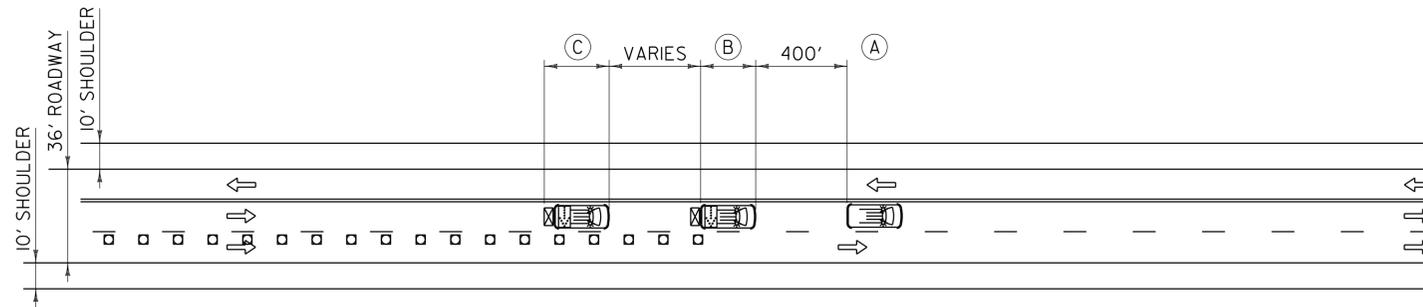
REVISIONS AND CORRECTIONS  
AUG. 6, 2012 - ORIGINAL APPROVAL DATE

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TRAFFIC CONTROL  
MISCELLANEOUS DETAILS



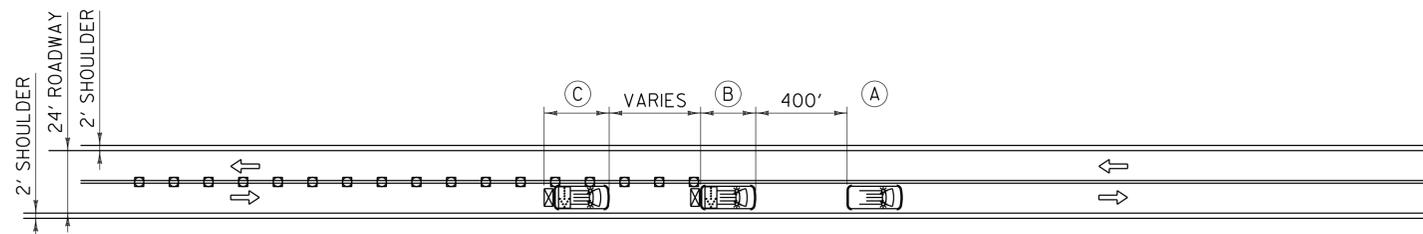
STANDARD  
T-17



**PAVEMENT MARKING OPERATION  
ON MULTI-LANE ROAD**

**NOTES:**

1. PAVEMENT MARKING OPERATION VEHICLE (C) SHOULD TRAVEL AT A VARYING DISTANCE FROM THE PAVEMENT MARKING OPERATION SO AS TO PROVIDE ADEQUATE SIGHT DISTANCE FOR TRAFFIC APPROACHING FROM THE REAR.
2. ON HIGH SPEED ROADWAYS, A THIRD PROTECTION VEHICLE SHOULD BE USED - THE FIRST PROTECTION VEHICLE ON THE SHOULDER (IF POSSIBLE), THE SECOND PROTECTION VEHICLE IN THE CLOSED LANE, AND THE THIRD PROTECTION VEHICLE IN THE CLOSED LANE.
3. ARROW PANELS SHALL BE AS A MINIMUM TYPE B, 60 INCHES BY 30 INCHES (MUTCD FIGURE 6F-6, SECTION 6F.6I).
4. WORK SHOULD BE PERFORMED DURING OFF-PEAK TRAFFIC HOURS WHEN PRACTICAL.



**PAVEMENT MARKING OPERATION  
ON TWO LANE ROAD**

**NOTES:**

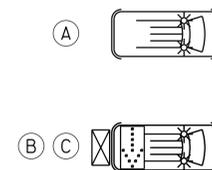
1. ALL PAVEMENT MARKING VEHICLES SHOULD PULL OVER PERIODICALLY TO ALLOW TRAFFIC TO PASS.
2. THE DISTANCE BETWEEN THE WORK AND PROTECTION VEHICLES MAY VARY ACCORDING TO TERRAIN AND OTHER FACTORS. PROTECTION VEHICLES ARE USED TO WARN TRAFFIC OF THE OPERATION AHEAD.
3. UNIFORMED TRAFFIC OFFICERS MAY BE USED TO CONTROL TRAFFIC AT INTERSECTIONS.
4. VEHICLE MOUNTED SIGNS SHALL BE MOUNTED WITH BOTTOM OF THE SIGN AT A MINIMUM HEIGHT OF ONE FOOT ABOVE THE PAVEMENT. SIGNS SHALL BE COVERED OR TURNED FROM VIEW WHEN WORK IS NOT IN PROGRESS.
5. ARROW PANELS ARE OPTIONAL; WHEN USED ARROW PANELS SHALL BE DISPLAYED IN CAUTION MODE.

- FLOW OF TRAFFIC
- ⚡ FLASHING ARROW PANEL
- ☒ TRUCK MOUNTED ATTENUATOR (TMA)
- CONE
- 🚚 PAVEMENT MARKING OPERATION VEHICLE
- Ⓐ PAVEMENT MARKING VEHICLE WITH FLASHING ARROW PANEL, "WET PAINT WITH LEFT ARROW" VC-886L, "WET PAINT WITH RIGHT ARROW" VC-886R SIGNS.
- Ⓑ PROTECTION VEHICLE WITH CONE CAPABILITIES AND TMA.
- Ⓒ PROTECTION VEHICLE WITH FLASHING ARROW PANEL, TMA, "WET PAINT" VC-885, "WET PAINT WITH LEFT ARROW" VC-886L, "WET PAINT WITH RIGHT ARROW" VC-886R SIGNS.

**GENERAL NOTES:**

1. ALL VEHICLES SHALL DISPLAY HIGH-INTENSITY ROTATING, FLASHING, OSCILLATING, OR STROBE LIGHTS IN ADDITION TO VEHICLE HAZARD LIGHTS.
2. PROTECTION VEHICLE SHOULD SLOW DOWN IN ADVANCE OF VERTICAL OR HORIZONTAL CURVES THAT RESTRICT SIGHT DISTANCE.
3. SIGNS LOCATED ON PAVEMENT MARKING OPERATION VEHICLES SHALL BE PLACED SO AS NOT TO OBSCURE OTHER SIGNS OR FLASHING ARROW PANELS.
4. REPEAT "WET PAINT" (VC-885) SIGN AS NEEDED AT SIDE ROADS
5. ALL DISTANCES ARE DESIRABLE MINIMUMS. FIELD CONDITIONS SHALL CONTROL THE ACTUAL SPACING OF THE VEHICLES.
6. CONE SPACING SHALL BE ADEQUATE SO THAT DRIVERS CAN ALWAYS SEE ONE CONE.

**OTHER STDS. REQUIRED: T-1, T-29**



**OPERATION VEHICLE  
SYMBOLGY**

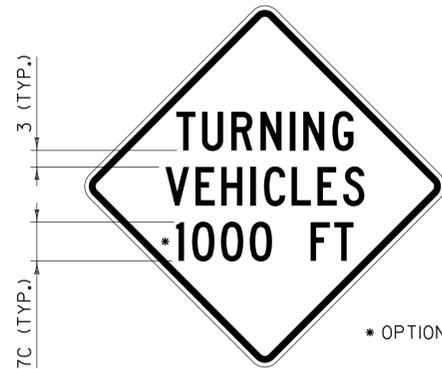
REVISIONS AND CORRECTIONS  
AUG. 6, 2012 - ORIGINAL APPROVAL DATE

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TRAFFIC CONTROL FOR  
MAINTENANCE PAVEMENT  
MARKING OPERATION

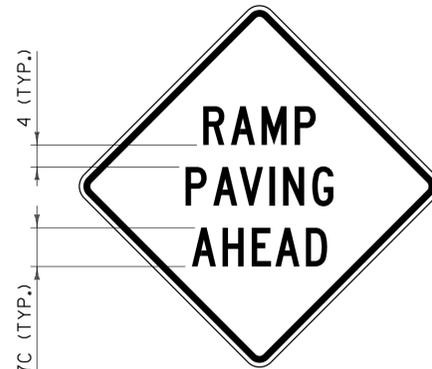


STANDARD  
T-24

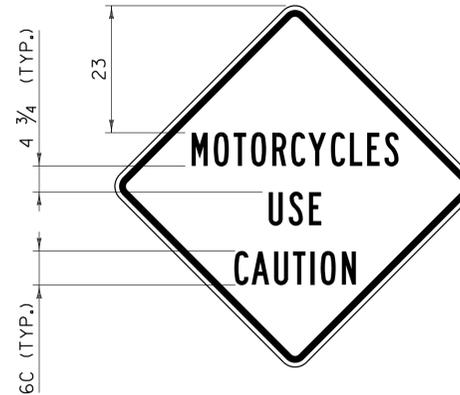


**VC-001**

\* OPTIONS { 500  
1500



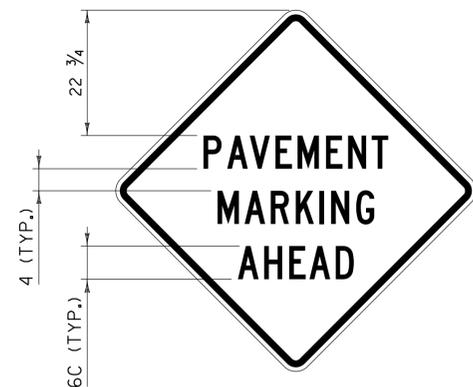
**VC-003**



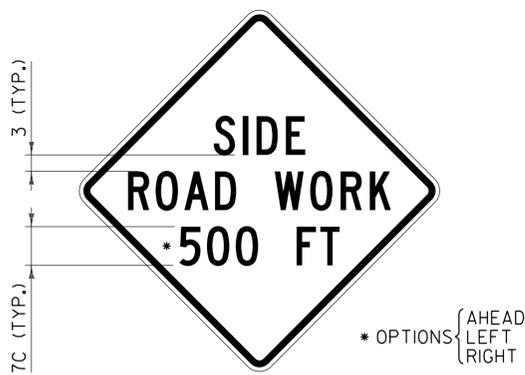
**VC-004**



**VC-008**



**VC-813**



**VC-869**



**VC-874**

**GENERAL NOTES:**

1. COLORS FOR SIGNS SHALL BE BLACK LEGEND AND BORDER ON FLUORESCENT ORANGE BACKGROUND.
2. CONSTRUCTION SIGNS SHALL BE 48 INCH BY 48 INCH. IF SOLID SUBSTRATE SIGNS ARE USED, SIGNS SHALL HAVE CORNERS ROUNDED TO A THREE INCH RADIUS.
3. SIGNS SHALL HAVE 1 1/4 INCH WIDE BORDERS THAT ARE INDENTED 3/4 INCH FROM THE EDGE OF THE SIGN.
4. SIGNS SHALL HAVE THE LEGEND CENTERED HORIZONTALLY AND VERTICALLY ON THE SIGN UNLESS OTHERWISE INDICATED.
5. ALL DIMENSIONS SHOWN IN INCHES.

**OTHER STDS. REQUIRED: T-1**

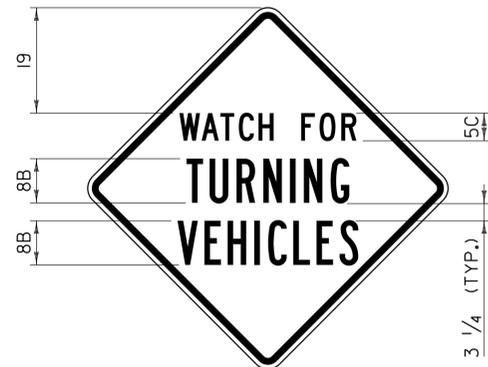
REVISIONS AND CORRECTIONS  
AUG. 6, 2012 - ORIGINAL APPROVAL DATE

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CONSTRUCTION SIGN  
DETAILS



STANDARD  
T-28



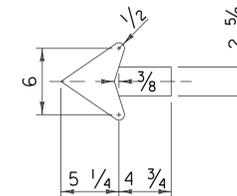
**VC-883**



**VC-885**



**VC-886L**



**VC-886R**

**NOTES:**

1. SIGNS SHALL BE 24 INCH BY 24 INCH. IF SOLID SUBSTRATE SIGNS ARE USED, SIGNS SHALL HAVE CORNERS ROUNDED TO A 1 1/2 INCH RADIUS.
2. SIGNS SHALL HAVE 5/8 INCH WIDE BORDERS THAT ARE INDENTED 3/8 INCH FROM THE EDGE OF THE SIGN.



**VC-887**

**GENERAL NOTES:**

1. COLORS FOR SIGNS SHALL BE BLACK LEGEND AND BORDER ON FLUORESCENT ORANGE BACKGROUND.
2. CONSTRUCTION SIGNS SHALL BE 48 INCH BY 48 INCH UNLESS OTHERWISE NOTED. IF SOLID SUBSTRATE SIGNS ARE USED, SIGNS SHALL HAVE CORNERS ROUNDED TO A THREE INCH RADIUS UNLESS OTHERWISE NOTED.
3. SIGNS SHALL HAVE 1 1/4 INCH WIDE BORDERS THAT ARE INDENTED 3/4 INCH FROM THE EDGE OF THE SIGN UNLESS OTHERWISE NOTED.
4. SIGNS SHALL HAVE THE LEGEND CENTERED HORIZONTALLY AND VERTICALLY ON THE SIGN UNLESS OTHERWISE INDICATED.
5. ALL DIMENSIONS SHOWN IN INCHES.

**OTHER STDS. REQUIRED: T-1**

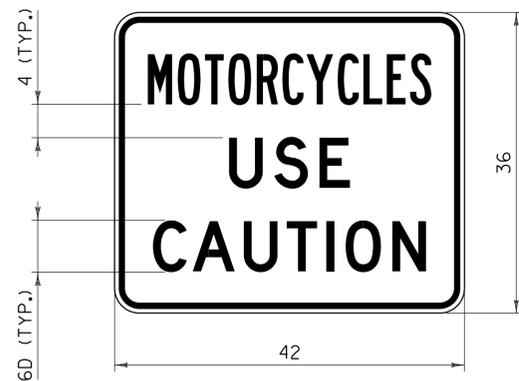
REVISIONS AND CORRECTIONS  
AUG. 6, 2012 - ORIGINAL APPROVAL DATE

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MARK D. RICHTER  
FEDERAL HIGHWAY ADMINISTRATION

CONSTRUCTION SIGN  
DETAILS



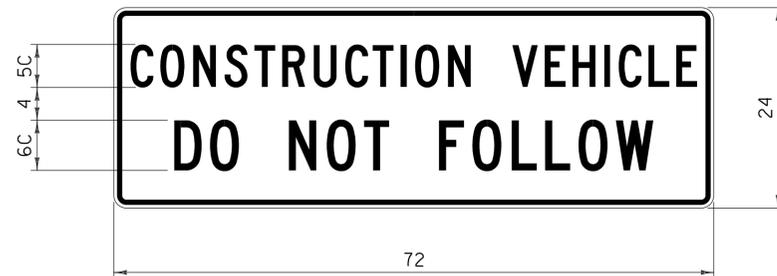
STANDARD  
T-29



**VC-004P**

**NOTES:**

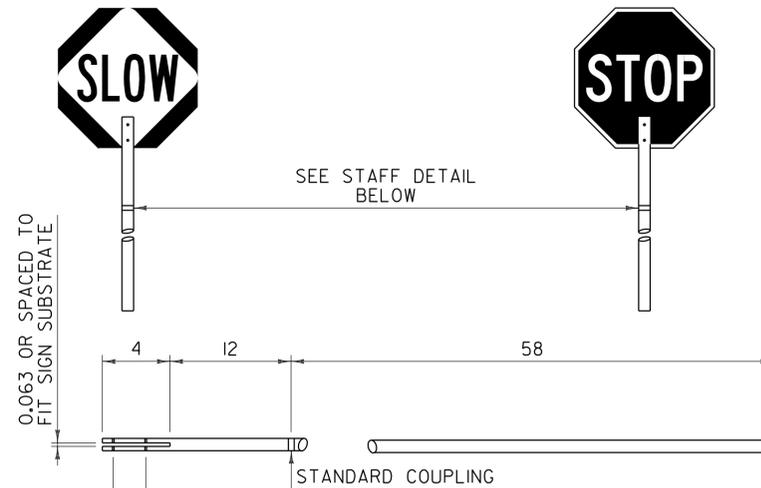
1. CORNERS SHALL BE ROUNDED TO A THREE INCH RADIUS.
2. THE BORDER SHALL BE 3/4 INCH WIDE WITH A 1/2 INCH INDENT FROM THE EDGE OF THE SIGN.
3. "MOTORCYCLES" SHALL HAVE A SPECIFIED WIDTH OF 34 INCHES.
4. "USE" SHALL HAVE A SPECIFIED WIDTH OF 14 1/2 INCHES.
5. "CAUTION" SHALL HAVE A SPECIFIED WIDTH OF 32 3/4 INCHES.
6. SIGN SHALL ONLY BE INSTALLED AS A SUPPLEMENTAL TO A PARENT WARNING SIGN AND SHALL NOT BE INSTALLED BY ITSELF.



**VC-007**

**NOTES:**

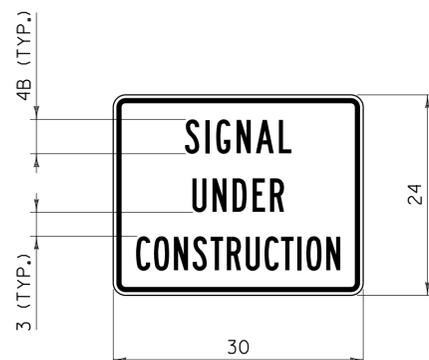
1. CORNERS SHALL BE ROUNDED TO A 1 1/2 INCH RADIUS.
2. THE BORDER SHALL BE 5/8 INCH WIDE WITH A 3/8 INCH INDENT FROM THE EDGE OF THE SIGN.
3. "CONSTRUCTION VEHICLE" SHALL HAVE A SPECIFIED WIDTH OF 68 INCHES.
4. "DO NOT FOLLOW" SHALL HAVE A SPECIFIED WIDTH OF 57 1/2 INCHES.
5. SIGN SHALL BE MOUNTED IN A CONSPICUOUS LOCATION ON THE REAR OF THE CONSTRUCTION VEHICLE.
6. THE SIGN SHALL BE MOUNTED AS NOT TO INTERFERE WITH THE VISIBILITY OF DIRECTIONAL SIGNALS OR TAIL LIGHTS AS REQUIRED BY LAW.
7. SIGN SHALL BE COVERED OR REMOVED WHEN NOT IN USE.



**STOP-SLOW PADDLE & STAFF DETAIL**

**NOTES:**

1. REFER TO THE "STANDARD HIGHWAY SIGNS AND MARKINGS" BOOK (SHSM) "TEMPORARY TRAFFIC CONTROL - WARNING SIGNS" FOR THE STOP-SLOW PADDLE DESIGN.
2. COLORS FOR THE SLOW SIDE OF THE PADDLE SHALL BE BLACK LEGEND AND BORDER ON A FLUORESCENT ORANGE DIAMOND WITH RETROREFLECTIVE SHEETING EQUAL TO OR EXCEEDING AASHTO M 268 [ASTM D 4956] TYPE VII, VIII OR IX REQUIREMENTS.
3. COLORS FOR THE STOP SIDE OF THE PADDLE SHALL BE WHITE RETROREFLECTIVE LEGEND AND BORDER ON A RED RETROREFLECTIVE OCTAGON. BOTH COLORS SHALL HAVE RETROREFLECTIVE SHEETING EQUAL TO OR EXCEEDING AASHTO M 268 [ASTM D 4956] TYPE III.
4. SIGN SUBSTRATE MATERIALS SHALL BE ALUMINUM, ACRYLONITRILE BUTADIENE STYRENE (ABS) PLASTIC OR EQUIVALENT.
5. THE STAFF MAY BE RIGID ABS PLASTIC OR WOOD WITH A ONE TO 1 1/2 INCH DIAMETER.
6. SIGNS SHALL BE MAINTAINED IN A CLEAN AND LEGIBLE CONDITION SATISFACTORY TO THE ENGINEER. THEY SHALL BE COMPLETELY VISIBLE TO APPROACHING TRAFFIC AT ALL TIMES. THEY SHALL BE KEPT PLUMB AND LEVEL, AND ALWAYS PRESENT A NEAT APPEARANCE. DAMAGED, DEFACTED OR DIRTY SIGNS SHALL BE REPAIRED, CLEANED OR REPLACED AS ORDERED BY THE ENGINEER.



**VC-820**

**NOTES:**

1. CORNERS SHALL BE ROUNDED TO A 1 1/2 INCH RADIUS.
2. THE BORDER SHALL BE 5/8 INCH WIDE WITH A 3/8 INCH INDENT FROM THE EDGE OF THE SIGN.
3. "SIGNAL" SHALL HAVE A SPECIFIED WIDTH OF 12 3/4 INCHES.
4. "UNDER" SHALL HAVE A SPECIFIED WIDTH OF 11 INCHES.
5. "CONSTRUCTION" SHALL HAVE A SPECIFIED WIDTH OF 24 1/2 INCHES.
6. SIGN SHALL ONLY BE INSTALLED AS A SUPPLEMENTAL TO A PARENT WARNING SIGN AND SHALL NOT BE INSTALLED BY ITSELF.

**GENERAL NOTES:**

1. ALL LEGEND SHALL BE CENTERED VERTICALLY AND HORIZONTALLY UNLESS OTHERWISE NOTED.
2. COLORS FOR SIGNS SHALL BE BLACK LEGEND AND BORDER ON FLUORESCENT ORANGE BACKGROUND UNLESS OTHERWISE NOTED.
3. ALL DIMENSIONS IN INCHES.

**OTHER STDS. REQUIRED: T-1**

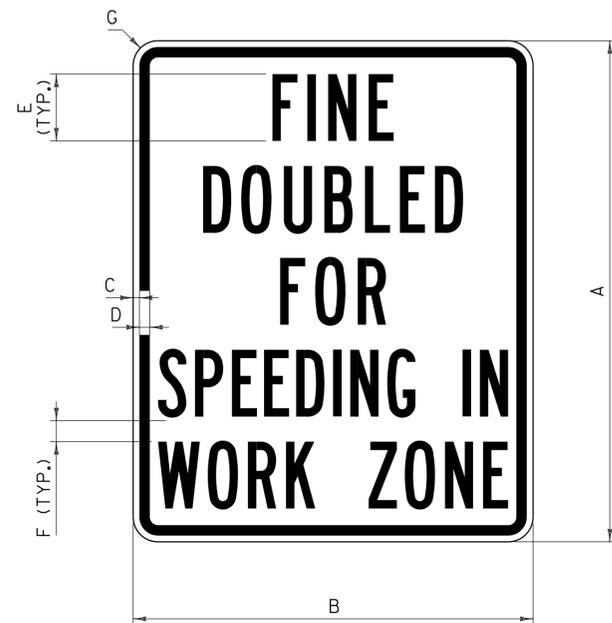
REVISIONS AND CORRECTIONS  
AUG. 6, 2012 - ORIGINAL APPROVAL DATE

APPROVED  
*[Signature]*  
HIGHWAY SAFETY & DESIGN ENGINEER  
*[Signature]*  
DIRECTOR OF PROGRAM DEVELOPMENT  
*[Signature]*  
MARK D. RICHTER  
FEDERAL HIGHWAY ADMINISTRATION

CONSTRUCTION SIGN  
DETAILS



STANDARD  
T-30

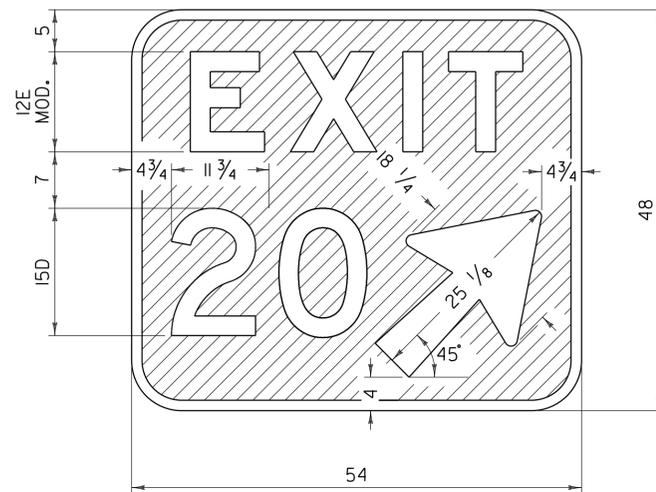


**VR-355**

SIGN	DIMENSIONS						
	A	B	C	D	E	F	G
STANDARD	36	30	1/2	3/4	4C	2 1/4	1 7/8
EXPRESSWAY/ FREEWAY	60	48	3/4	1 1/4	8B	3	3

**NOTES:**

- "SPEEDING IN" AND "WORK ZONE" SHALL EACH HAVE A SPECIFIED WIDTH OF 26 INCHES FOR STANDARD AND 42 INCHES FOR EXPRESSWAY/FREEWAY.
- THE SIGN SHALL HAVE BLACK LEGEND AND BORDER ON A WHITE BACKGROUND WITH RETROREFLECTIVE SHEETING EQUAL TO OR EXCEEDING "AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS" (AASHTO) M 268 ["AMERICAN SOCIETY FOR TESTING AND MATERIALS" (ASTM) D 4956] TYPE III.
- LEGEND SHALL BE CENTERED HORIZONTALLY AND VERTICALLY.



**VC5-1A**

**NOTES:**

- THE SIGN SHALL BE WHITE RETROREFLECTIVE LEGEND ON A GREEN RETROREFLECTIVE BACKGROUND. BOTH SHALL HAVE RETROREFLECTIVE SHEETING EQUAL TO OR EXCEEDING "AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS" (AASHTO) M 268 ["AMERICAN SOCIETY FOR TESTING AND MATERIALS" (ASTM) D 4956] TYPE III.
- CORNERS SHALL BE ROUNDED TO A SIX INCH RADIUS.
- THE SIGN SHALL HAVE A 1/4 INCH WIDE BORDER ALONG THE EDGE OF THE SIGN.
- EXIT NUMBER SHALL BE AS PER PLANS, OPTICALLY SPACED.
- "EXIT" SHALL BE CENTERED HORIZONTALLY.

**GENERAL NOTES:**

- ALL DIMENSIONS IN INCHES.

**OTHER STDS. REQUIRED: T-1**

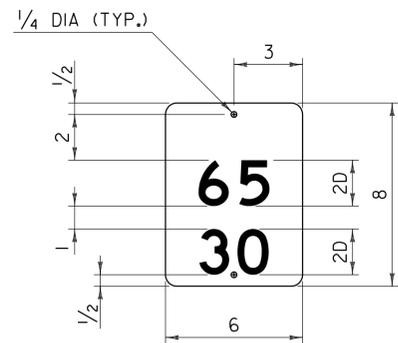
REVISIONS AND CORRECTIONS  
AUG. 6, 2012 - ORIGINAL APPROVAL DATE

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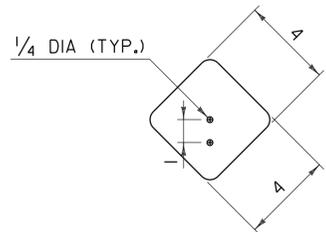
CONSTRUCTION SIGN  
DETAILS



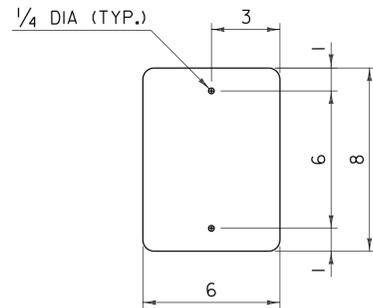
STANDARD  
T-31



**INTERSTATE MILEPOST PLAQUE**



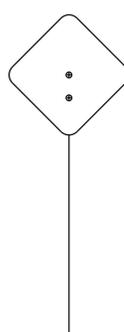
**TYPE I DELINEATOR**



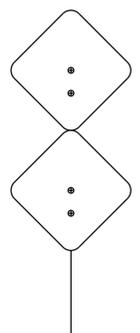
**TYPE II DELINEATOR**

**GENERAL NOTES:**

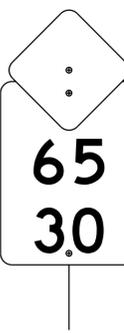
1. THE FIRST LINE OF TEXT ON INTERSTATE MILEPOST PLAQUES INDICATES THE WHOLE NUMBER MILEAGE FROM THE BEGINNING OF A ROUTE. MILEAGE IS ALWAYS MEASURED TRAVELING FROM THE SOUTH TO NORTH OR FROM THE WEST TO EAST. THE ROUTE DIRECTION IS ESTABLISHED USING THE VERMONT AGENCY OF TRANSPORTATION (VAOT) ROUTE LOGS.
2. THE SECOND LINE OF TEXT ON INTERSTATE MILEPOST PLAQUES INDICATES THE ADDITIONAL MILEAGE, IN HUNDREDTHS, FROM THE BEGINNING OF A ROUTE. MILEAGE IS ALWAYS MEASURED TRAVELING FROM THE SOUTH TO NORTH OR FROM THE WEST TO EAST. THE ROUTE DIRECTION IS ESTABLISHED USING THE VAOT ROUTE LOGS.
3. THE INTERSTATE MILEPOST PLAQUE SHALL BE GREEN RETROREFLECTIVE LEGEND ON A WHITE RETROREFLECTIVE BACKGROUND AND SHALL HAVE RETROREFLECTIVE SHEETING EQUAL TO OR EXCEEDING "AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS" (AASHTO) M 268 ["AMERICAN SOCIETY FOR TESTING AND MATERIALS" (ASTM) D 4956] TYPE III.
4. ALL LINES OF TEXT SHALL BE CENTERED HORIZONTALLY AND SHALL BE AS IDENTIFIED IN THE PLANS.
5. THE INTERSTATE MILEPOST PLAQUE AND DELINEATOR BASE MATERIAL SHALL BE 0.063 INCH FLAT SHEET ALUMINUM.
6. CORNERS SHALL BE ROUNDED TO A 1/2 INCH RADIUS.
7. A TYPE III DELINEATOR CONSISTS OF A TYPE I DELINEATOR FACING THE NORMAL DIRECTION OF TRAVEL AND A SINGLE RED TYPE I DELINEATOR FACING THE OPPOSITE DIRECTION. THE WHITE DELINEATOR AND RED DELINEATOR COMBINATION IS PLACED ON THE DRIVER'S RIGHT AND THE AMBER DELINEATOR AND RED DELINEATOR COMBINATION ON THE DRIVER'S LEFT.
8. DELINEATORS SHALL HAVE WHITE, GREEN, OR BLUE RETROREFLECTIVE SHEETING EQUAL TO OR EXCEEDING AASHTO M 268 ASTM D 4956 TYPE III, OR RED OR YELLOW RETROREFLECTIVE SHEETING EQUAL TO OR EXCEEDING AASHTO M 268 ASTM D 4956 TYPE VII, VIII, OR IX.
9. A SINGLE 14 GAGE, 1.75 INCH SQUARE STEEL POST AND 12 GAGE, TWO INCH SQUARE ANCHOR SHALL BE USED FOR INSTALLATION. THE ANCHOR SHALL BE A MINIMUM OF 30 INCHES IN LENGTH.
10. THE TOP OF POST SHALL BE ONE INCH ABOVE THE UPPER HOLE FOR ALL TYPE I DELINEATORS.
11. THE TOP OF POST SHALL BE FLUSH WITH THE TOP OF ALL TYPE II DELINEATORS.
12. ALL DIMENSIONS SHOWN IN INCHES.



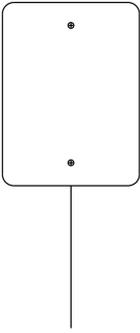
**TYPE I**



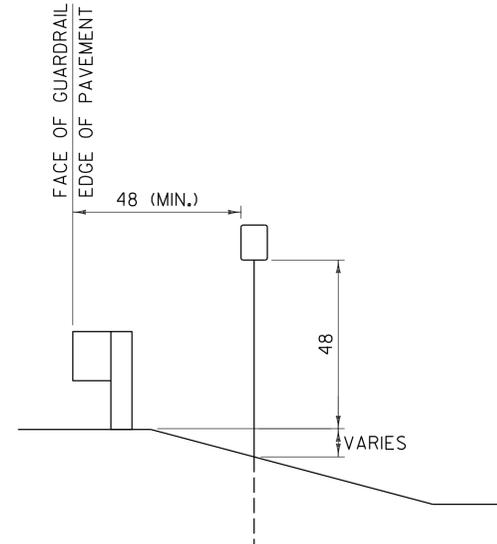
**TYPE I - U-TURNS**



**WHITE TYPE I WITH MILEPOST PLAQUE**



**TYPE II**



**INSTALLATION DETAIL\***

\* INSTALLATION DETAIL APPLICABLE TO ALL DELINEATOR ASSEMBLIES

**OTHER STDS. REQUIRED: T-45**

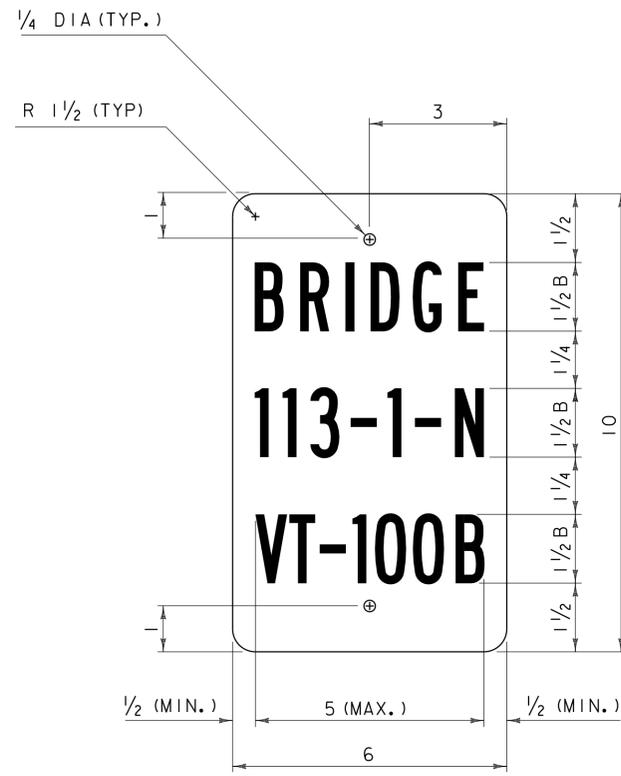
REVISIONS AND CORRECTIONS  
JAN. 2, 2013 - ORIGINAL APPROVAL DATE

APPROVED  
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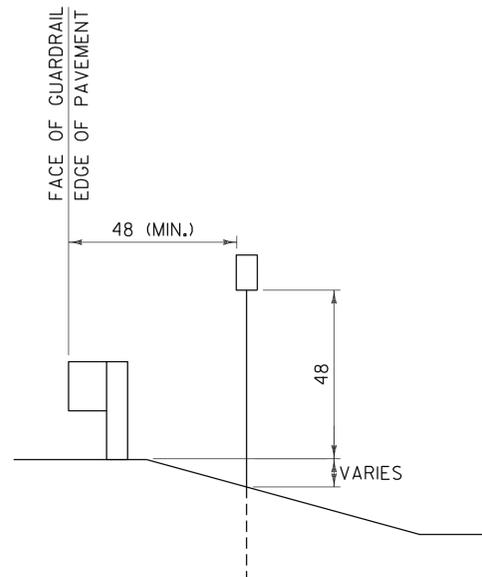
**DELINEATORS AND MILEPOSTS**



**STANDARD  
T-40**



**VD-701**



**VD-701 INSTALLATION DETAIL**

**GENERAL NOTES:**

- BRIDGE NUMBER PLAQUES ARE TO BE INSTALLED ALONG THE FEDERAL AID HIGHWAY SYSTEM INCLUDING ALL STATE HIGHWAYS AND TOWN HIGHWAYS ON THE FEDERAL AID HIGHWAY SYSTEM.
- BRIDGE NUMBER PLAQUES SHALL BE LOCATED ON BOTH BRIDGE APPROACHES AT THE NEAREST VISIBLE LOCATION.
- THE SIGN BASE MATERIAL SHALL BE 0.063 INCH FLAT SHEET ALUMINUM.
- THE SIGN SHALL BE WHITE RETROREFLECTIVE LEGEND ON A GREEN RETROREFLECTIVE BACKGROUND, BOTH SHALL HAVE RETROREFLECTIVE SHEETING EQUAL TO OR EXCEEDING "AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS" (AASHTO) M 268 ["AMERICAN SOCIETY FOR TESTING AND MATERIALS" (ASTM) D 4956] TYPE III.
- THE SECOND LINE OF TEXT INDICATES THE BRIDGE NUMBER. THE BRIDGE NUMBER CAN BE OBTAINED USING THE VERMONT AGENCY OF TRANSPORTATION (VAOT) ROUTE LOGS OR BY CONSULTING WITH THE VAOT STRUCTURES SECTION.
- THE THIRD LINE OF TEXT INDICATES THE STATE ROUTE NUMBER. IN ALL CASES THIS WILL BE DEPICTED USING THE LETTER ABBREVIATION, FOLLOWED BY A HYPHEN, FOLLOWED BY THE ROUTE NUMBER. FOR EXAMPLE US ROUTE 2 WOULD BE IDENTIFIED USING US-2.
- THE SECOND AND THIRD LINES OF TEXT SHALL BE CENTERED HORIZONTALLY AND SHALL BE AS DEFINED IN THE PLANS.
- A SINGLE 14 GAGE, 1.75 INCH SQUARE STEEL POST AND 12 GAGE, TWO INCH SQUARE ANCHOR SHALL BE USED FOR INSTALLATION. THE ANCHOR SHALL BE A MINIMUM OF 30 INCHES IN LENGTH.
- ALL DIMENSIONS SHOWN IN INCHES.

**OTHER STDS. REQUIRED: T-45**

REVISIONS AND CORRECTIONS  
APRIL 9, 2014 - ORIGINAL APPROVAL DATE

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**BRIDGE NUMBER PLAQUE**



STANDARD  
T-42

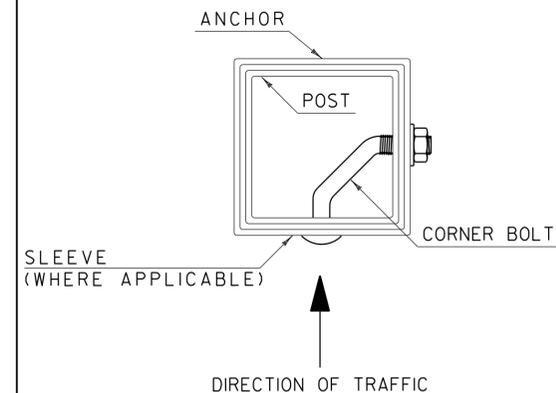
## POST AND ANCHOR SELECTION CHART

POST SIZE (IN.)	POST THICKNESS (IN.)	POST WEIGHT (LBS./FT.)	POST GAGE	SECTION MODULUS (IN. <sup>3</sup> )	ONE POST SV	TWO POST SV	THREE POST SV	POSTS PERMITTED IN 8' PATH	ANCHOR SIZE (IN.)	ANCHOR GAGE	MINIMUM ANCHOR LENGTH
1.75	.083	1.88	14	0.222	45	90	135	TWO	2.00	12	30
2.00	.109	2.42	12	0.393	80	160	240	TWO	2.25	12	48
2.50	.109	3.35	12	0.673	137	274	411	ONE	3.00	7	48

### NOTES:

- ALL SIGN POSTS SHALL HAVE  $\frac{7}{16}$  INCH HOLES EVERY ONE INCH ON CENTER (ALL FOUR SIDES).
- THE NUMBER OF SIGN POSTS PERMITTED WITHIN AN EIGHT FOOT PATH ASSUMES THAT THE SIGN ASSEMBLY IS NOT PROTECTED BY GUARDRAIL OR IS LOCATED WITHIN A GUARDRAIL'S DEFLECTION DISTANCE DETERMINED PER THE CURRENT "AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS" (AASHTO) ROADSIDE DESIGN GUIDE. ADDITIONAL POSTS MAY BE INSTALLED USING SLIP BASES THAT MEET "NATIONAL COOPERATIVE HIGHWAY RESEARCH PROGRAM" (NCHRP) REPORT 350 OR THE AASHTO "MANUAL FOR ASSESSING SAFETY HARDWARE" (MASH). THE APPROPRIATE RESOURCE SHALL BE DETERMINED AS DESCRIBED IN THE MASH PUBLICATION.
- TO USE THE SELECTION VALUE (SV) COLUMNS IN THE TABLE ABOVE, MULTIPLY A SIGN'S SURFACE AREA IN SQUARE FEET ( $H \times L$ ) BY THE SIGN'S HEIGHT IN FEET MEASURED FROM THE GROUND TO THE CENTROID OF THE SIGN ASSEMBLY ( $h$ ). THIS RESULT MUST BE LESS THAN OR EQUAL TO THE CORRESPONDING SELECTION VALUE. NOTE THAT FOR SIGNS WITH MULTIPLE POSTS, THE LARGEST HEIGHT DIMENSION SHALL BE USED TO CALCULATE THE POST SELECTION VALUE.
- THE DESIGN CRITERIA UTILIZED IN SIGN POST AND ANCHOR SELECTION IS AS FOLLOWS: WIND SPEED OF 70 MPH (10 YEAR MEAN RECURRENCE INTERVAL), WIND PRESSURE OF 19 PSF, STEEL MINIMUM YIELD OF 55,000 PSI, AND AN ALLOWABLE STRESS OF 1.4 (0.60 F<sub>y</sub>).

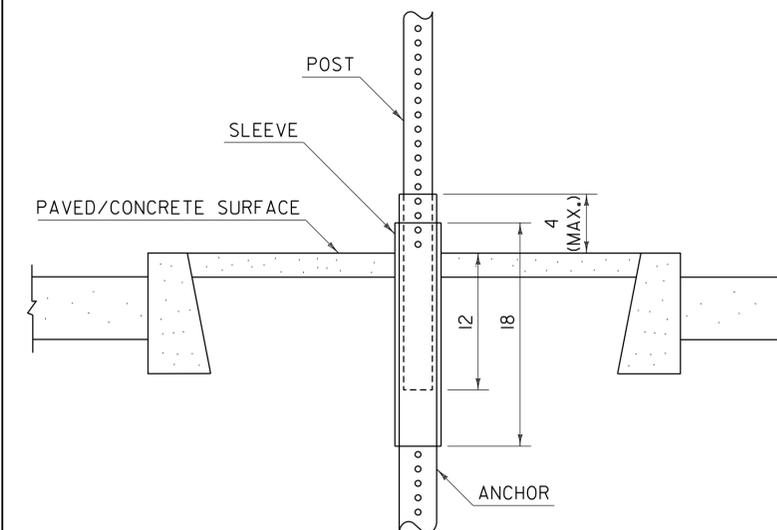
## CORNER BOLT INSTALLATION DETAIL



### NOTES:

- CORNER BOLTS SHALL BE  $\frac{5}{16}$  INCH DIAMETER WITH 18 THREADS PER INCH AND DIMENSIONS SHALL BE DETERMINED BASED ON THE OUTERMOST DIMENSION OF THE SLEEVE, ANCHOR OR POST. THREAD EXPOSURE MUST EXCEED THE CORRESPONDING NUT WIDTH. THE CORNER BOLT AND CORRESPONDING HARDWARE SHALL BE ZINC PLATED, MEETING OR EXCEEDING THE REQUIREMENTS OF THE "AMERICAN SOCIETY FOR TESTING AND MATERIALS" (ASTM) A307.

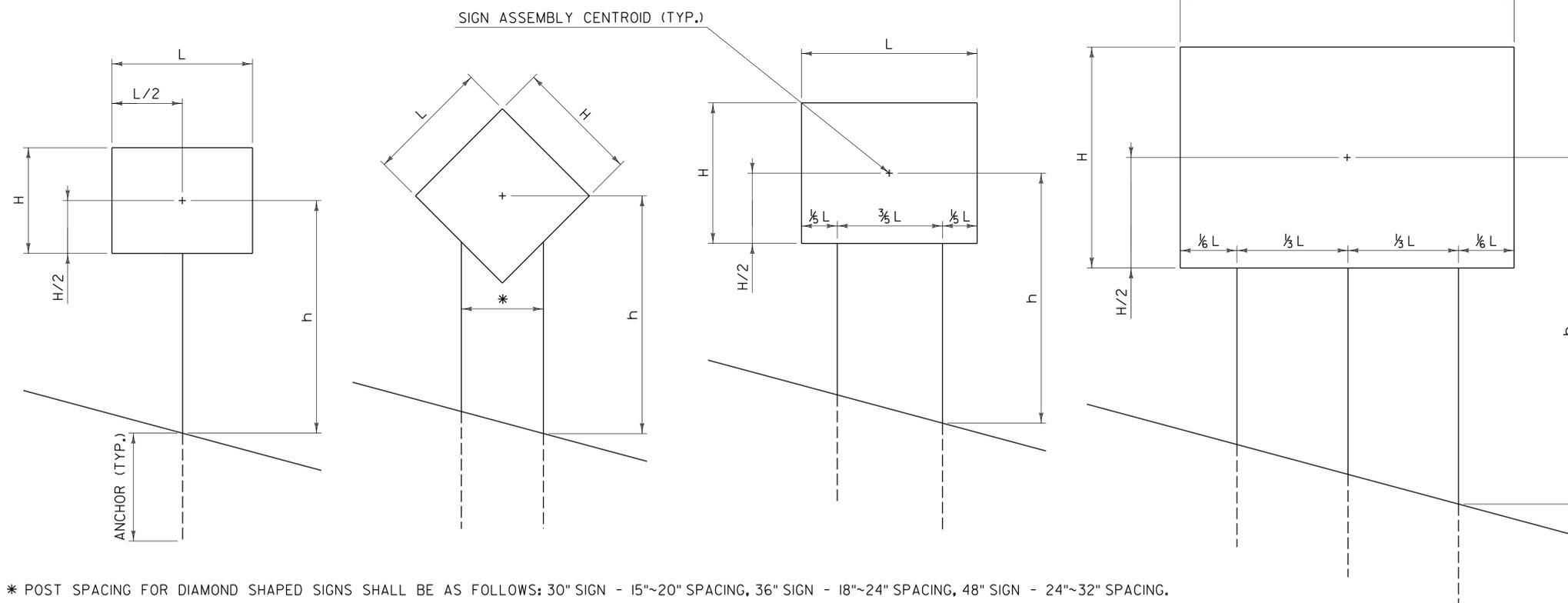
## SLEEVE /ANCHOR INSTALLATION DETAIL



### NOTES:

- A SLEEVE SHALL BE INSTALLED FOR SIGN INSTALLATIONS IN CONCRETE OR PAVEMENT.
- THE SLEEVE SHALL BE 18 INCHES MINIMUM IN LENGTH.
- THREE INCH SLEEVES THAT DO NOT HAVE HOLES WILL REQUIRE THAT  $\frac{7}{16}$  INCH HOLES ARE DRILLED TO FACILITATE CONNECTIONS.
- REFER TO CURRENT EDITION OF THE "VERMONT AGENCY OF TRANSPORTATION STANDARD SPECIFICATIONS FOR CONSTRUCTION" FOR MATERIAL REQUIREMENTS.

## POST SPACING DETAILS



### GENERAL NOTES:

- ALL SQUARE TUBE STEEL POSTS AND ANCHORS SHALL BE FORMED INTO A SIZE AND SHAPE IN SUCH A MANNER THAT NEITHER FLASH NOR WELD SHALL INTERFERE WITH THE TELESCOPING PROPERTIES, NOR DAMAGE THE GALVANIZING.
- ANCHORS MAY BE DRIVEN OR SET INTO A DUG HOLE AND BACKFILLED. IF DRIVEN, A DRIVING CAP SHALL BE USED. THE DUG HOLE INSTALLATION METHOD SHALL BE UTILIZED IN AREAS WITH POOR SOIL CONDITIONS OR AS DIRECTED BY THE ENGINEER. BACKFILL SHALL BE COMPACTED AS DIRECTED BY THE ENGINEER.
- THE TOPS OF SIGN POSTS SHALL BE AT OR NEAR THE TOP OF SIGN. THE POST SHALL NOT EXTEND ABOVE THE TOP OF SIGN.
- SIGN POSTS SHALL BE INSTALLED A MINIMUM OF ONE FOOT BELOW GROUND, INSIDE THE ANCHOR. THE LENGTH OF ANCHOR EXPOSED ABOVE GROUND SHALL NOT EXCEED FOUR INCHES.
- ALL DIMENSIONS SHOWN IN INCHES.

**OTHER STDS. REQUIRED: NONE**

REVISIONS AND CORRECTIONS  
JAN. 2, 2013 - ORIGINAL APPROVAL DATE

APPROVED  
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# SQUARE TUBE SIGN POST AND ANCHOR



# STANDARD T-45