SEE SHEET 2 FOR THE INDEX OF SHEETS

RECORD PLANS

CONTRACTOR: T. BUCK CONSTRUCTION, INC. – AUBURN, ME

RESIDENT ENGINEER: GREG WILCOX

CONSTRUCTION BEGAN: MARCH 9, 2009

CONSTRUCTION COMPLETE: AUGUST 28, 2009

RECORD PLANS BY: GREG WILCOX & NICK GARBACIK

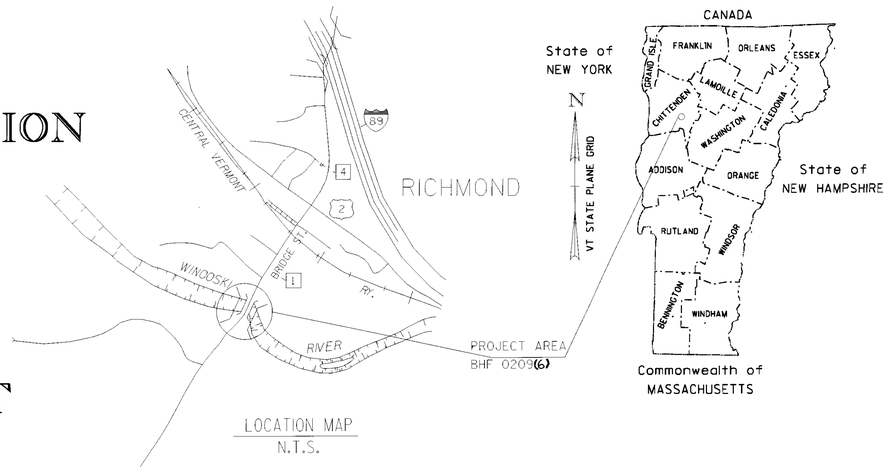
I HEREBY CERTIFY THAT ALL THE CONSTUCTION REQUIRED BY THIS SET OF DRAWINGS HAS BEEN ACCOMPLISHED AS INDICATED HEREIN.

BY Greg Wilcox RESIDENT ENGINEER

DATE 2/8/10

NOTE: Any further information concerning final quantities, amounts or other details relative to this project may be found at Central Files in the electronic archives.

STATE OF VERMONT
AGENCY OF TRANSPORTATION

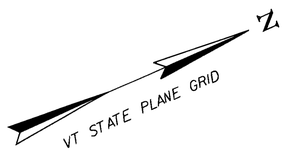


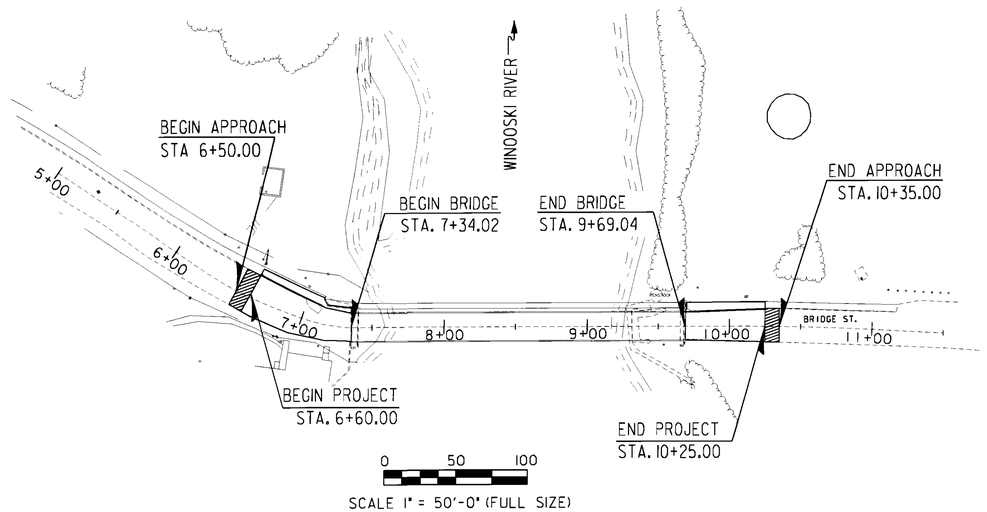
LOCATION MAP
N.T.S.

PROPOSED IMPROVEMENT
BRIDGE PROJECT
TOWN OF RICHMOND
COUNTY OF CHITTENDEN
BRIDGE NO. 31 ON TOWN HIGHWAY NO. 1 (FAS 0209)
RURAL MAJOR COLLECTOR

PROJECT LOCATION: BRIDGE STREET, APPROXIMATELY 0.25 MILES SOUTH OF THE INTERSECTION OF US ROUTE 2 AND BRIDGE STREET (T.H. 1) IN THE TOWN OF RICHMOND.

PROJECT DESCRIPTION: THIS PROJECT INVOLVES THE REHABILITATION OF EXISTING STEEL TRUSS BRIDGE, MINOR REPAIR OF EXISTING ABUTMENTS AND MINOR APPROACH RECONSTRUCTION.
LENGTH OF STRUCTURE: 235.02 FEET (0.045 MILES)
LENGTH OF ROADWAY: 129.98 FEET (0.028 MILES)
LENGTH OF PROJECT: 365 FEET (0.073 MILES)





SCALE 1" = 50'-0" (FULL SIZE)

CONVENTIONAL SYMBOLS

COUNTY LINE
TOWN LINE
LIMITS OF ACCESS
POINT OF ACCESS
FENCE LINE
STONE WALL
TRAVELED WAY
GUARD RAIL
RAILROAD
SURVEY LINE
CULVERT
POWER POLE
TELEPHONE POLE
TREES
CONTROL OF ACCESS
PROPERTY LINE
R.O.W. TAKING LINE
SLOPE RIGHTS (SR)
TOP OF CUT
TOE OF SLOPE

SURVEYED BY : VERMONT SURVEY
SURVEYED DATE : 06/26/07

DATUM
VERTICAL NAVD88 (Geoid03)
HORIZONTAL NAD 83 (CORS96) SPC (4400 VT)

STATE OF VERMONT THOMAS E. KNIGHT No. 8277 Structural LICENSED PROFESSIONAL ENGINEER 1/11/09

THESE PLANS ARE SUBJECT TO SUCH ENGINEERING CHANGES AS MAY BE REQUIRED BY THE FEDERAL HIGHWAY ADMINISTRATION OR THE DIRECTOR OF PROGRAM DEVELOPMENT.

CONSTRUCTION IS TO BE CARRIED ON IN ACCORDANCE WITH THESE PLANS AND THE STANDARD SPECIFICATIONS FOR CONSTRUCTION DATED 2006, AS APPROVED BY THE FEDERAL HIGHWAY ADMINISTRATION ON JUNE 15, 2006 FOR USE ON THIS PROJECT, INCLUDING ALL SUBSEQUENT REVISIONS AND SUCH REVISED SPECIFICATIONS AND SPECIAL PROVISIONS AS ARE INCORPORATED IN THESE PLANS.

Stantec
Stantec Consulting Services Inc.
55 Green Mountain Drive
South Burlington VT U.S.A.
05403
Tel. 802.864.0223
Fax. 802.864.0165
www.stantec.com

DIRECTOR OF PROGRAM DEVELOPMENT
APPROVED Ruth D. Stevens DATE 1-6-09

PROJECT MANAGER : CHRIS WILLIAMS, P.E.

PROJECT NAME : RICHMOND
PROJECT NUMBER : BHF 0209 (6)

SHEET 1 OF 50 SHEETS

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7-8	TIE SHEETS
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13	PROJECT NOTES
14	FRAMING PLAN
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23	PEDESTRIAN RAILING DETAILS
24-26	BRIDGE DECK DETAILS
27	SCUPPER DETAILS
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32	APPROACH RAIL DETAILS
33	EXPANSION JOINT PLAN
34	EXPANSION JOINT DETAILS
35	DOWNSPOUT DETAILS
36	ABUTMENT NO.1BEARING DETAILS
37	ABUTMENT NO.1 PLAN & ELEVATION
38	ABUTMENT NO.2 PLAN & ELEVATION
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40	REINFORCING STEEL SCHEDULE
41-42	ROADWAY CROSS SECTIONS
43-45	CHANNEL CROSS SECTIONS
46-50	REFERENCE PLANS

VAOT STANDARDS

C-10	02/11/08
C-24	10/14/05
E-100	01/02/04
E-100A	01/02/04
E-101	05/30/03
E-102	06/30/03
E-102A	05/01/04
E-106	03/01/04
E-107	06/30/03
E-107A	08/08/95
E-108	12/08/08
E-121	08/08/95
E-154	05/01/04
E-155	05/01/04
E-164	05/20/99
E-191	02/01/99
E-193	08/8/95
G-1b	06/01/94
SB-R6-82	01/06/95

REHABILITATED BRIDGE TYPICAL SECTION

NOT TO SCALE

*NEW UTILITY SUPPORT ASSEMBLIES TO MATCH LOCATION AND TYPE OF EXISTING HANGERS, IN ACCORDANCE WITH ITEM 900.620 SPECIAL PROVISION (UTILITY SUPPORT ASSEMBLY, SEWER) AND ITEM 900.620 SPECIAL PROVISION (UTILITY SUPPORT ASSEMBLY, WATER).

ASSEMBLY TO BE COOPER B-LINE ADJUSTABLE STEEL YOKE AND PIPE ROLL (PART NO. B3801, COOPER B-LINE W/ 7/8" DIA. ASTM A 307 THREADED ROD AND STEEL BEAM CLAMP (PART NO. B3055-R OR EQUIVALENT ASSEMBLY.

CONTACTOR SHALL TAKE NECESSARY MEASUREMENTS TO ORDER APPROPRIATE HARDWARE.

**REFER TO SPECIAL PROVISIONS.

FINAL HYDRAULICS REPORT

HYDROLOGIC DATA

DRAINAGE AREA= 946.0 square miles
CHARACTER OF TERRAIN= Hilly to mountainous drainage basin
CHARACTER & TYPE OF STREAM= Sinuous with sharp bends upstream

NATURE OF STREAMBED= Silt, sand, gravel, cobbles, and some ledge

Q2.33= 17,600 cfs — Q50= 46,900 cfs
Q10= 32,100 cfs — Q100= 54,300 cfs
Q25= 40,000 cfs — Q500= 75,000 cfs

DATE OF FLOOD OF RECORD= November 1927
WATER SURFACE ELEV.= 311.5' ESTIMATED DISCHARGE= Unknown
NATURAL STREAM VELOCITY @ Q25 = 6.0 fps
ICE CONDITIONS= Moderate to heavy DEBRIS= Moderate
DOES THE STREAM REACH MAXIMUM HIGHWATER ELEVATION RAPIDLY? No
IS ORDINARY RISE RAPID? No
IS STAGE AFFECTED BY UPSTREAM OR DOWNSTREAM CONDITIONS? No
IF YES, DESCRIBE:

WATERSHED STORAGE (.03 HEADWATERS) UNIFORM THROUGHOUT WATERSHED X IMMEDIATELY ABOVE SITE

EXISTING STRUCTURE

STRUCTURE TYPE= Single span steel truss bridge
YEAR BUILT= 1928, rehabilitated in 1977
CLEAR SPAN (NORMAL TO STREAM)= 225' (185' effective from old abutment)
VERTICAL CLEARANCE ABOVE STREAMBED= 37' maximum
WATERWAY OF FULL OPENING= 5,200 sq. ft
DISPOSITION OF STRUCTURE= Rehabilitate
TYPE OF MATERIAL UNDER SUBSTRUCTURE= Ledge South, unknown North

WATER SURFACE ELEV. @ Q2.33= 298.0 ft VELOCITY= 7.9 fps
Q10= 306.0 ft " 7.0 fps
Q25= 307.3 ft " 7.8 fps
Q50= 308.6 ft " 8.3 fps
Q100= 309.9 ft " 8.8 fps

LONG TERM STREAM BED CHANGES= None noted

IS THE ROADWAY OVERTOPPED BELOW THE Q100? Yes FREQUENCY= Below Q10
RELIEF ELEVATION= 303.9 ft DISCHARGE OVER ROAD @ Q100= 2115 cfs

UPSTREAM STRUCTURE= TOWN= Richmond DISTANCE= 18,300 ft
HIGHWAY NO.= T.H.3 STRUCTURE NO.= 10
STRUCTURE TYPE= 2 span steel girder bridge
CLEAR SPAN= 236 ft CLEAR HEIGHT= 27.5 ft
YEAR BUILT= 2003 FULL WATERWAY= 5,670 sq. ft

DOWNSTREAM STRUCTURE= TOWN= Richmond DISTANCE= 13,400 ft
HIGHWAY NO.= 189 STRUCTURE NO.= 58 S
STRUCTURE TYPE= 3 span steel girder bridge
CLEAR SPAN= 541 ft CLEAR HEIGHT= 65 ft
YEAR BUILT= 1962 FULL WATERWAY= 20,700 sq. ft

PROPOSED STRUCTURE

STRUCTURE TYPE= Rehabilitate existing truss bridge

CLEAR SPAN (NORMAL TO STREAM)= 225 ft (185 ft effective from old abut.)
VERTICAL CLEARANCE ABOVE STREAMBED= 37' maximum
WATERWAY OF FULL OPENING= 5,200 sq. ft

WATER SURFACE ELEV. @ Q2.33= 298.0 ft VELOCITY= 7.9 fps
Q10= 306.0 ft " 7.0 fps
Q25= 307.3 ft " 7.8 fps
Q50= 308.6 ft " 8.3 fps
Q100= 309.9 ft " 8.8 fps

IS THE ROADWAY OVERTOPPED BELOW THE Q100? Yes FREQUENCY= Below Q10
RELIEF ELEVATION= 303.9' DISCHARGE OVER ROAD @ Q100= 2115 cfs

AVERAGE LOW ELEVATION OF SUPERSTRUCTURE= 312.0 ft
VERTICAL CLEARANCE= @ Q25 = 6.7 ft average (3.7 ft minimum)

SCOUR= Bridge is stable for scour. South abutment is on ledge. North abutment is behind and protected by an older abutment.

REQUIRED CHANNEL PROTECTION= Stone fill, Type IV as needed

PERMIT INFORMATION

AVERAGE DAILY FLOW= 2,000 cfs
ORDINARY LOW WATER= 800 cfs DEPTH= EL. 287'
ORDINARY HIGH WATER= 7,600 cfs DEPTH= EL. 293'

ADDITIONAL INFORMATION

All elevations are based on NAVD88 vertical datum.
Velocities listed are the average velocities for the entire section, channel and floodplain.
Velocities within the channel are higher.
Hydraulics is based on limited project survey and FIS water surface elevations.

DESIGN CRITERIA:
1. DESIGN LIVE LOAD AASHTO= MS-18
2. DESIGN SPAN= 229' - 10.5"
3. ALLOWABLE LOAD FOR SPREAD FOOTINGS ON SOIL: N/A ON LEDGE= N/A
4. ALLOWABLE LOAD FOR PILING: TYPE= ESTIMATED LENGTH=
5. STRUCTURAL STEEL AASHTO GRADE= SEE PROJECT GENERAL NOTES
6. REINFORCING STEEL GRADE 60
CONCRETE, HIGH PERFORMANCE CLASS AA f'_c = 4000 PSI f_{ci}=1600 psi
CONCRETE, HIGH PERFORMANCE CLASS B f'_c = 3500 PSI f_{ci}=1400 psi

TRAFFIC MAINTENANCE:
1. IS TRAFFIC TO BE MAINTAINED? NO IF YES, ON EXISTING STRUCTURE= N/A OR ON TEMPORARY BRIDGE= N/A
2. TEMPORARY BRIDGE REQUIREMENTS: ONE OR TWO WAY= N/A TRAFFIC CONTROL SIGNALS REQUIRED= NO
MINIMUM CLEAR SPAN (NORMAL TO STREAM) MINIMUM CLEAR HEIGHT= N/A
MINIMUM WATERWAY AREA=
ARE SIDEWALKS REQUIRED? N/A IF SO, ON WHAT SIDE? N/A
STRUCTURE TYPE

WORKING STRESS LOAD RATING (TONS)

LOADING LEVELS (WORKING STRESS)	TRUCK: H	HS	3S2	6 AXLE	3A.STR.	4A.STR.	5A.SEMI
INVENTORY 0.55 Fy	17	30					
POSTING 0.72 Fy	26	47	42		28	35	26
OPERATING 0.75 Fy		60	54	84	36	45	34

MEMBER W8 AND W25 ARE THE CONTROLLING MEMBERS, REFER TO TRUSS ELEVATION FOR MEMBER LOCATIONS.

WORKING STRESS RF= $\frac{F_{ALLOW} - F_{DL}}{F_{LL+I}}$

TRAFFIC DATA

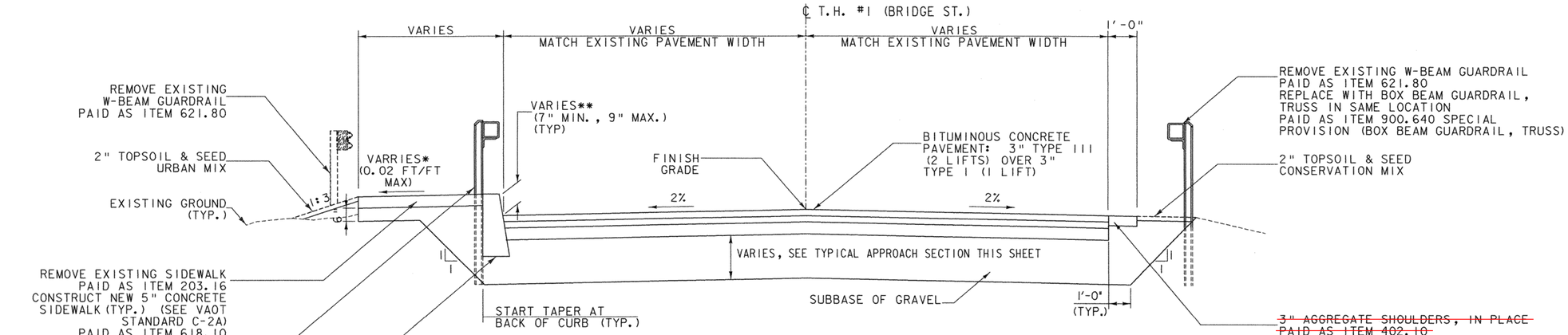
YEAR	AADT	DHV	% D	% T	ADTT
2009	5800	650	66	4.2	270
2029	7100	800	66	7.0	550

20 year ESAL for flexible pavement 2009 to 2029 = 1,752,000
40 year ESAL for flexible pavement 2009 to 2049 = 4,626,000
Design speed= 45 mph

Stantec

PROJECT NAME= RICHMOND
PROJECT NUMBER= BHF 0209(5)

FILE NAME= ...\drawing\z08j32_pl.dgn PLOT DATE= 1/9/2009
PROJECT LEADER= C. WILLIAMS DRAWN BY= J. SOTER
DESIGNED BY= T. KNIGHT CHECKED BY= G. BOGUE
PRELIMINARY INFORMATION SHEET SHEET 2 OF 50

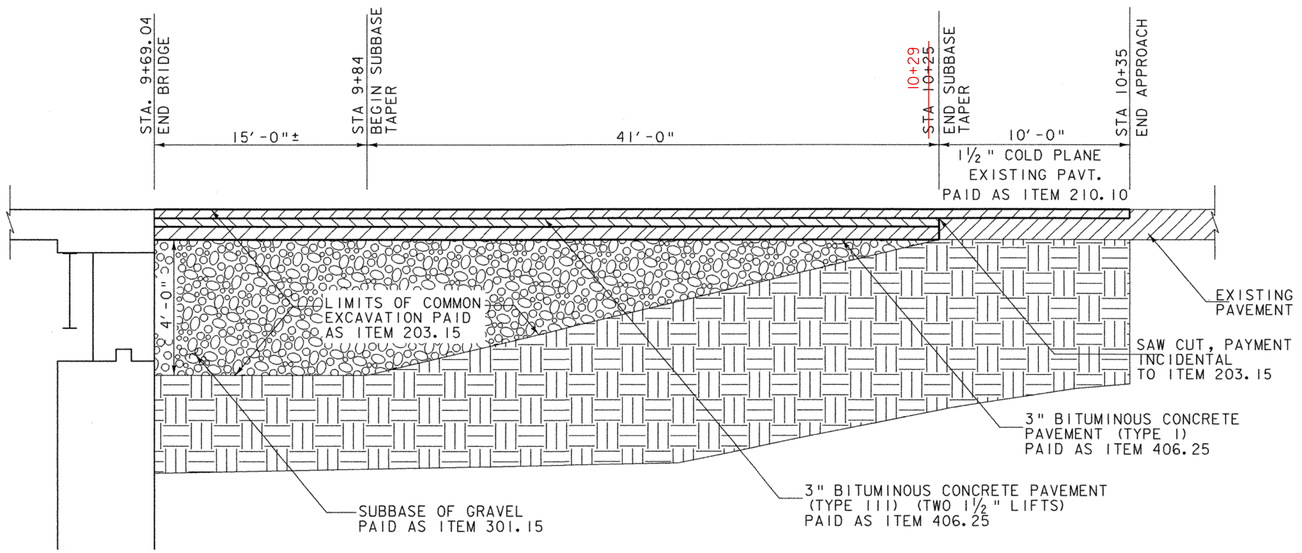


ROADWAY TYPICAL SECTION NORTH APPROACH

NOT TO SCALE

* TRANSITION SIDEWALK SLOPE FROM 0.02 FT/FT AT STA. 9+75 TO MATCH EXISTING BACK OF SIDEWALK GRADE AT STA. 10+25

** TRANSITION CONCRETE CURB REVEAL FROM 9" AT STA. 9+69.04 TO 7" AT STATION 9+78



TYPICAL APPROACH SECTION NORTH APPROACH

NOT TO SCALE

SEEDING NOTES

URBAN MIX SEEDING FORMULA

% WT	LBS/A	NAME
37.5	45	CREEPING RED FESCUE
31.25	37.5	KENTUCKY BLUE GRASS
31.25	37.5	WINTER HARDY, PERENNIAL RYE
100	120	

CONSERVATION MIX SEEDING FORMULA

% WT	LBS/A	NAME
35	35	CREEPING RED FESCUE
23	23	KENTUCKY BLUE GRASS
15	15	ANNUAL RYE
11	11	WINTER HARDY, PERENNIAL RYE (VARIETY PENNFINE, MANHATTAN OR SIMILAR VARIETY)
6	6	WHITE CLOVER
10	10	HIGHLAND BENTGRASS
100	100	

1. SEED MIXTURE IN LAWN AREAS AROUND DWELLINGS AND WITHIN STREET LIMITS SHALL BE URBAN MIX CONFORMING TO THE ABOVE TABLE. FOR SEEDING BETWEEN SEPTEMBER 1 AND OCTOBER 1, WINTER RYE SHALL BE USED IN ADDITION TO THE URBAN MIX AT AN APPLICATION RATE OF 100 POUNDS PER ACRE.

2. SEED MIXTURE IN ALL OTHER DISTURBED AREAS SHALL BE CONSERVATION MIX CONFORMING TO THE ABOVE TABLE. FOR SEEDING BETWEEN SEPTEMBER 1 AND OCTOBER 1, WINTER RYE SHALL BE USED IN ADDITION TO THE URBAN MIX AT AN APPLICATION RATE OF 100 POUNDS PER ACRE.

3. THE SEED MIXTURE SHALL NOT HAVE A WEED CONTENT EXCEEDING 0.40% BY WEIGHT AND SHALL BE FREE FROM ALL NOXIOUS WEED SEED.

4. SEED - TO BE APPLIED PER SEEDING FORMULAS OR AS DIRECTED BY THE ENGINEER.

5. FERTILIZER - FORMULA 19-19-19 TO BE USED WITH SEED, APPLIED AT THE RATE Of 500 LBS/ACRE.

6. AGRICULTURAL LIMESTONE - TO BE APPLIED AT A RATE OF 2 TONS/ACRE OR AS DIRECTED BY THE ENGINEER.

7. EROSION MATTING - TO BE PLACED ON EARTH SLOPES WITH 1:3 SLOPE OR GREATER AND IN ALL DRAINAGE DITCHES.

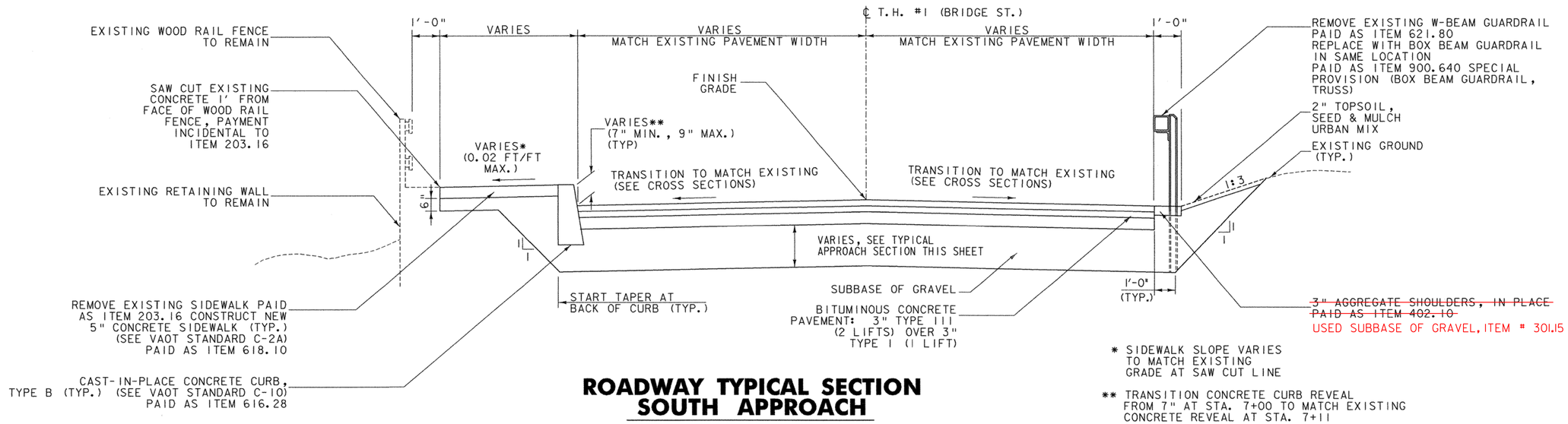
8. HAY MULCH - TO BE PLACED ON ALL DISTURBED AREAS NOT REQUIRING EROSION MATTING AT THE RATE OF 2 TONS/ACRE OR AS DIRECTED BY THE ENGINEER.

9. TOPSOIL - TO BE USED WITH SEED, AS INDICATED ON THE PLANS, OR AS DIRECTED BY THE ENGINEER.

Stantec

PROJECT NAME: RICHMOND
PROJECT NUMBER: BHF 0209(5)

FILE NAME: ...\03-04 Typical Roadway Sections.p PLOT DATE: 1/8/2009
PROJECT LEADER: C. WILLIAMS DRAWN BY: E. ALLING
DESIGNED BY: G. GOYETTE CHECKED BY: T. KNIGHT
TYPICAL ROADWAY SECTIONS 1 SHEET 3 OF 50



* SIDEWALK SLOPE VARIES TO MATCH EXISTING GRADE AT SAW CUT LINE

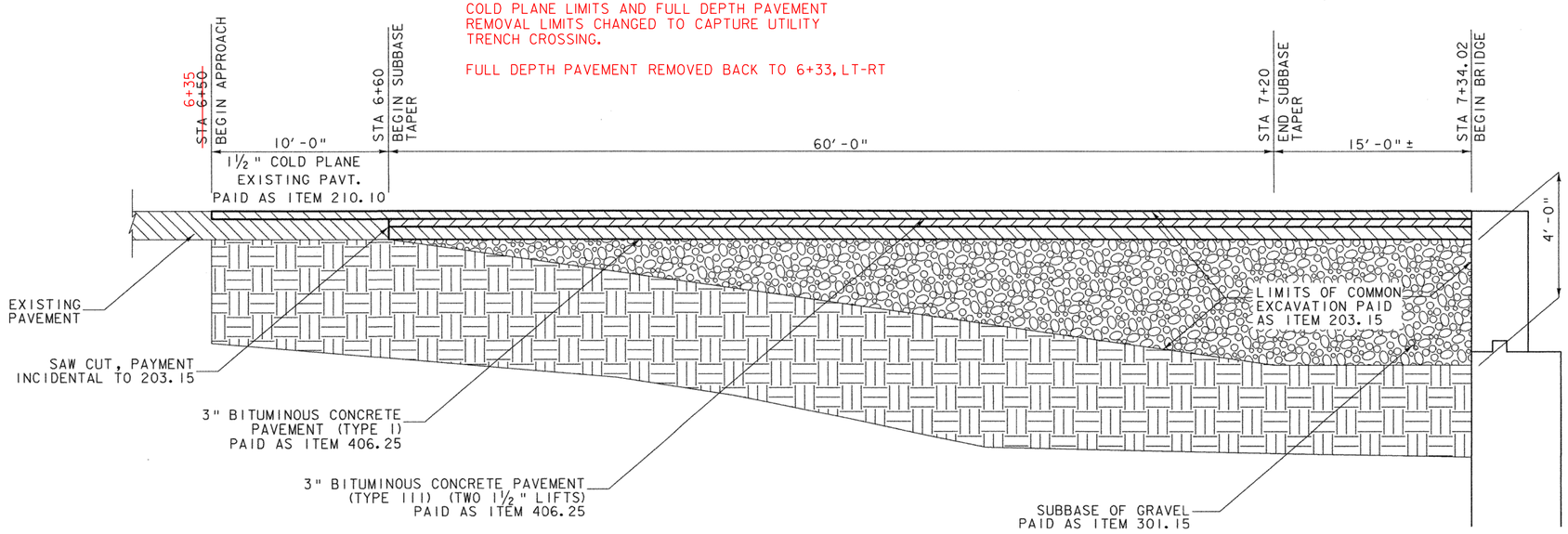
** TRANSITION CONCRETE CURB REVEAL FROM 7" AT STA. 7+00 TO MATCH EXISTING CONCRETE REVEAL AT STA. 7+11

ROADWAY TYPICAL SECTION SOUTH APPROACH

NOT TO SCALE

COLD PLANE LIMITS AND FULL DEPTH PAVEMENT REMOVAL LIMITS CHANGED TO CAPTURE UTILITY TRENCH CROSSING.

FULL DEPTH PAVEMENT REMOVED BACK TO 6+33, LT-RT



TYPICAL APPROACH SECTION SOUTH APPROACH

NOT TO SCALE

Stantec

PROJECT NAME:	RICHMOND
PROJECT NUMBER:	BHF 0209(5)
FILE NAME: ...\03-04 Typical Roadway Sections.p	PLOT DATE: 1/8/2009
PROJECT LEADER: C. WILLIAMS	DRAWN BY: E. ALLING
DESIGNED BY: G. GOYETTE	CHECKED BY: T. KNIGHT
TYPICAL ROADWAY SECTIONS 2	SHEET 4 OF 50

STATE OF VERMONT
AGENCY OF TRANSPORTATION

QUANTITY SHEET 1

SUMMARY OF ESTIMATED QUANTITIES			TOTALS		DESCRIPTIONS				DETAILED SUMMARY OF QUANTITIES		
ROADWAY	BRIDGE	FULL C.E.	GRAND TOTAL	FINAL	UNIT	ITEMS	ITEM NUMBER	ROUND	QUANTITIES	UNIT	ITEMS
1			1		LS	CLEARING AND GRUBBING, INCLUDING INDIVIDUAL TREES AND STUMPS	201.10				
385			385		CY	COMMON EXCAVATION	203.15				
9			9		CY	SOLID ROCK EXCAVATION	203.16				
1			1		CY	TRENCH EXCAVATION OF EARTH, EXPLORATORY (N.A. B.I.)	204.22				
	13		13		CY	STRUCTURE EXCAVATION	204.25				
	12		12		CY	GRANULAR BACKFILL FOR STRUCTURES	204.30				
56			56		SY	COLD PLANING, BITUMINOUS PAVEMENT	210.10				
300			300		CY	SUBBASE OF GRAVEL	301.15				
1			1		CY	AGGREGATE SHOULDERS, IN PLACE	402.10				
2			2		CWT	EMULSIFIED ASPHALT	404.65				
121			121		TON	BITUMINOUS CONCRETE PAVEMENT (PG 58-28)	406.25				
1			1		LU	PRICE ADJUSTMENT, ASPHALT CEMENT (N.A. B.I.)	406.50				
	110		110		CY	CONCRETE, HIGH PERFORMANCE CLASS AA	501.32				
	25		25		CY	CONCRETE, HIGH PERFORMANCE CLASS B	501.34				
	1		1		LS	SHORING SUPERSTRUCTURE	502.10				
	163254		163254		LB	STRUCTURAL STEEL, ROLLED BEAM	506.50				
	3200		3200		LB	STRUCTURAL STEEL	506.60				
	3200		3200		LB	REINFORCING STEEL	507.15				
	290		290		LF	DRILLING AND GROUTING DOWELS	507.16				
	19000		19000		LB	EPOXY COATED REINFORCING STEEL	507.17				
	1		1		LS	SHEAR CONNECTORS (260-1/2" x 2")	508.15				
	1		1		LS	SHEAR CONNECTORS (3388-7/8" x 6")	508.15				
	1		1		LS	STRUCTURAL PAINTING, FIELD APPLIED	513.30				
	1		1		LS	CONTAINMENT & ENVIRONMENTAL PROTECTION, FIELD	513.36				
	1		1		LS	SURFACE PREPARATION, FIELD	513.41				
	110		110		GAL	WATER REPELLENT, SILANE	514.10				
	22		22		LF	BRIDGE EXPANSION JOINT, VERMONT	518.11				
	1		1		EACH	PARTIAL REMOVAL OF STRUCTURE	529.20				
	30		30		CY	REMOVAL OF CONCRETE OR MASONRY	529.25				
24			24		HR	ALL PURPOSE EXCAVATOR RENTAL, TYPE I	606.25				
1			1		MGAL	DUST CONTROL WITH WATER	609.10				
	6		6		CY	STONE FILL, TYPE I	613.10				
110			110		LF	CAST-IN-PLACE CONCRETE CURB, TYPE B	616.28				
56			56		LF	REMOVAL OF EXISTING CURB	618.41				
65			65		SY	PORTLAND CEMENT CONCRETE SIDEWALK, 5 INCH	618.10				
2			2		EACH	REMOVING AND RESETTING PROPERTY MARKERS	619.20				
200			200		LF	REMOVAL AND DISPOSAL OF GUARDRAIL	621.80				
300			300		HR	FLAGGERS	630.15				
		1	1		LS	FIELD OFFICE, ENGINEERS	631.10				
		1	1		LS	TESTING EQUIPMENT, CONCRETE	631.16				

Stantec

PROJECT NAME: RICHMOND
PROJECT NUMBER: BHF 0209(5)

FILE NAME: ...\plot files\Quantity sheet.ptf PLOT DATE: 1/9/2009
PROJECT LEADER: C. WILLIAMS DRAWN BY: E. ALLING
DESIGNED BY: G. GOYETTE CHECKED BY: T. KNIGHT
QUANTITY SHEET 1 SHEET 5 OF 50

STATE OF VERMONT
AGENCY OF TRANSPORTATION

QUANTITY SHEET 2

SUMMARY OF ESTIMATED QUANTITIES			TOTALS		DESCRIPTIONS				DETAILED SUMMARY OF QUANTITIES		
ROADWAY	BRIDGE	FULL C.E.	GRAND TOTAL	FINAL	UNIT	ITEMS	ITEM NUMBER	ROUND	QUANTITIES	UNIT	ITEMS
		1	1		LS	TESTING EQUIPMENT, BITUMINOUS	631.17				
		1	1		LU	FIELD OFFICE TELEPHONE (N.A.B.I.)	631.25				
1			1		LS	MOBILIZATION/DEMOBILIZATION	635.11				
1			1		LS	TRAFFIC CONTROL	641.10				
1			1		LS	PUBLIC RELATIONS OFFICER	641.12				
780			780		LF	4 INCH YELLOW LINE	646.21				
200			200		LF	BARRIER FENCE	653.50				
17			17		SF	TRAFFIC SIGNS, TYPE A	675.20				
30			30		LF	SQUARE TUBE SIGN POST AND ANCHOR	675.341				
3			3		EACH	REMOVING SIGNS	675.50				
	2		2		EACH	SPECIAL PROVISION (INSTALL BEARING DEVICE ASSEMBLY)	900.620				
	19		19		EACH	SPECIAL PROVISION (UTILITY SUPPORT ASSEMBLY, SEWER)	900.620				
	25		25		EACH	SPECIAL PROVISION (UTILITY SUPPORT ASSEMBLY, WATER)	900.620				
212			212		LF	SPECIAL PROVISION (BOX BEAM GUARDRAIL, TRUSS)	900.640				
	463		463		LF	SPECIAL PROVISION (BRIDGE RAILING, TRUSS)	900.640				
	490		490		LF	SPECIAL PROVISION (PEDESTRIAN RAILING, STEEL)	900.640				
	1		1		LS	SPECIAL PROVISION (INSTALL STEEL GRID FLOORING, BRIDGE)	900.645				
	1		1		LS	SPECIAL PROVISION (INSTALL STEEL GRID FLOORING, SIDEWALK)	900.645				
	1		1		LS	SPECIAL PROVISION (TEMPORARY SUPPORT, SEWER)	900.645				
	1		1		LS	SPECIAL PROVISION (TEMPORARY SUPPORT, WATER)	900.645				
1			1		LU	SPECIAL PROVISION (INCENTIVE/DISINCENTIVE)(N.A.B.I.)	900.650				

Stantec

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FILE NAME: ...\plot files\Quantity sheet.ptf PLOT DATE: 1/9/2009
PROJECT LEADER: C. WILLIAMS DRAWN BY: E. ALLING
DESIGNED BY: G. GOYETTE CHECKED BY: T. KNIGHT
QUANTITY SHEET 2 SHEET 6 OF 50

GPS CONTROL POINTS

DESIGNATION - UVM COOLIDGE CORS ARP
CORS ID - VTUV
PID - DG9783
STATE/COUNTY - VT/CHITTENDEN
USGS QUAD - BURLINGTON (1987)
NAD 83 (CORS) - 44° 28' 09.21307"(N) 073° 11' 52.37630"(W) ADJ.
ELLIP HEIGHT - 368.818 (FEET)
SPC VT - 718,549.76 (NORTH) 1,458,233.62 (EAST)
U.S. NATIONAL GRID SPATIAL ADDRESS: 18TXQ4334025570 (NAD 83)
MARKER: STATION IS THE ANTENNA REFERENCE POINT OF THE GPS ANTENNA

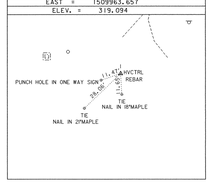
DESCRIBED BY NATIONAL GEODETIC SURVEY 2005
STATION IS A GPS CORS. LATEST INFORMATION INCLUDING
POSITIONS AND VELOCITIES ARE AVAILABLE IN THE
COORDINATE AND LOG FILES ACCESSIBLE BY ANONYMOUS
FTP OR THE WORLDWIDE WEB.
FTP CORS.NGS.NOAA.GOV: CORS/COORD AND CORS/STATION.LOG
HTTP://WWW.NOS.NOAA.GOV UNDER PRODUCTS AND SERVICES.

DESIGNATION - UVM COOLIDGE CORS L1 PHASE CENTER
CORS ID - VTUV
PID - DG9784
STATE/COUNTY - VT/CHITTENDEN
USGS QUAD - BURLINGTON (1987)
NAD 83 (CORS) - 44° 28' 09.21308"(N) 073° 11' 52.37627"(W) ADJ.
ELLIP HEIGHT - 369.054 (FEET)
SPC VT - 718,549.76 (NORTH) 1,458,233.62 (EAST)
U.S. NATIONAL GRID SPATIAL ADDRESS: 18TXQ4334025570 (NAD 83)
MARKER: STATION IS THE L1 PHASE CENTER OF THE GPS ANTENNA

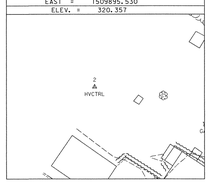
DESCRIBED BY NATIONAL GEODETIC SURVEY 2005
STATION IS A GPS CORS. LATEST INFORMATION INCLUDING
POSITIONS AND VELOCITIES ARE AVAILABLE IN THE
COORDINATE AND LOG FILES ACCESSIBLE BY ANONYMOUS
FTP OR THE WORLDWIDE WEB.
FTP CORS.NGS.NOAA.GOV: CORS/COORD AND CORS/STATION.LOG
HTTP://WWW.NGS.NOAA.GOV UNDER PRODUCTS AND SERVICES.

TRAVERSE TIES

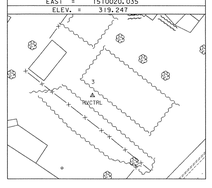
HVCTRL #1
NORTH = 692709.436
EAST = 1509963.657
ELEV. = 319.094



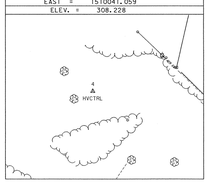
HVCTRL #2
NORTH = 692950.576
EAST = 1509895.530
ELEV. = 320.357



HVCTRL #3
NORTH = 692923.193
EAST = 1510020.035
ELEV. = 319.247



HVCTRL #4
NORTH = 693081.368
EAST = 1510041.059
ELEV. = 308.228



HVCTRL #5
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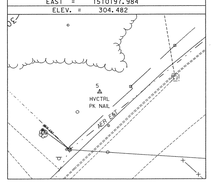
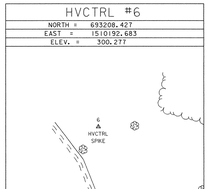
EAST = 1510197.984
ELEV. = 304.482

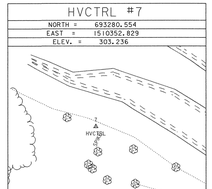


TRAVERSE TIES

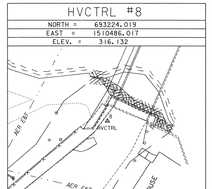
HVCTRL #6
NORTH = 693208.427
EAST = 1510192.683
ELEV. = 300.277



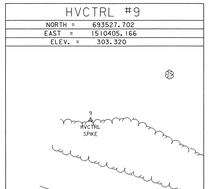
HVCTRL #7
NORTH = 693280.554
EAST = 1510352.829
ELEV. = 303.236



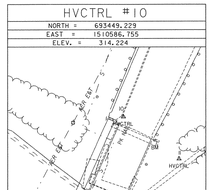
HVCTRL #8
NORTH = 693224.019
EAST = 1510486.017
ELEV. = 316.132



HVCTRL #9
NORTH = 693527.702
EAST = 1510405.166
ELEV. = 303.320



HVCTRL #10
NORTH = 693449.229
EAST = 1510586.755
ELEV. = 314.224



DATUM
VERTICAL NAVD 88
HORIZONTAL NAD 83
ADJUSTMENT

Stantec

PROJECT NAME: RICHMOND
PROJECT NUMBER: BHF 0209(5)

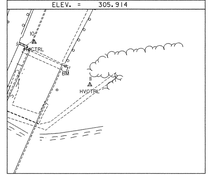
FILE NAME: ...\plot files\Tie Sheets.ptf
PROJECT LEADER: C. WILLIAMS
DESIGNED BY: G. GOYETTE
TIE SHEET 1

PLOT DATE: 1/8/2009
DRAWN BY: E. ALLING
CHECKED BY: T. KNIGHT
SHEET 7 OF 50

TRAVERSE TIES

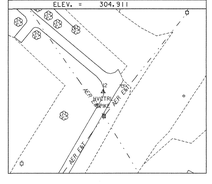
HVCTRL #11

NORTH = 693425.439
EAST = 1510617.858
ELEV. = 305.914



HVCTRL #12

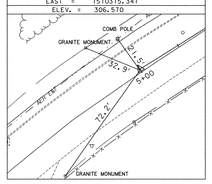
NORTH = 693765.847
EAST = 1510731.415
ELEV. = 304.911



ALIGNMENT TIES

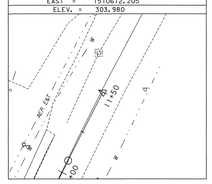
ALIGNMENT 1 POB

NORTH = 693086.609
EAST = 1510315.347
ELEV. = 306.570



ALIGNMENT 1 POE

NORTH = 693604.329
EAST = 1510672.205
ELEV. = 303.980



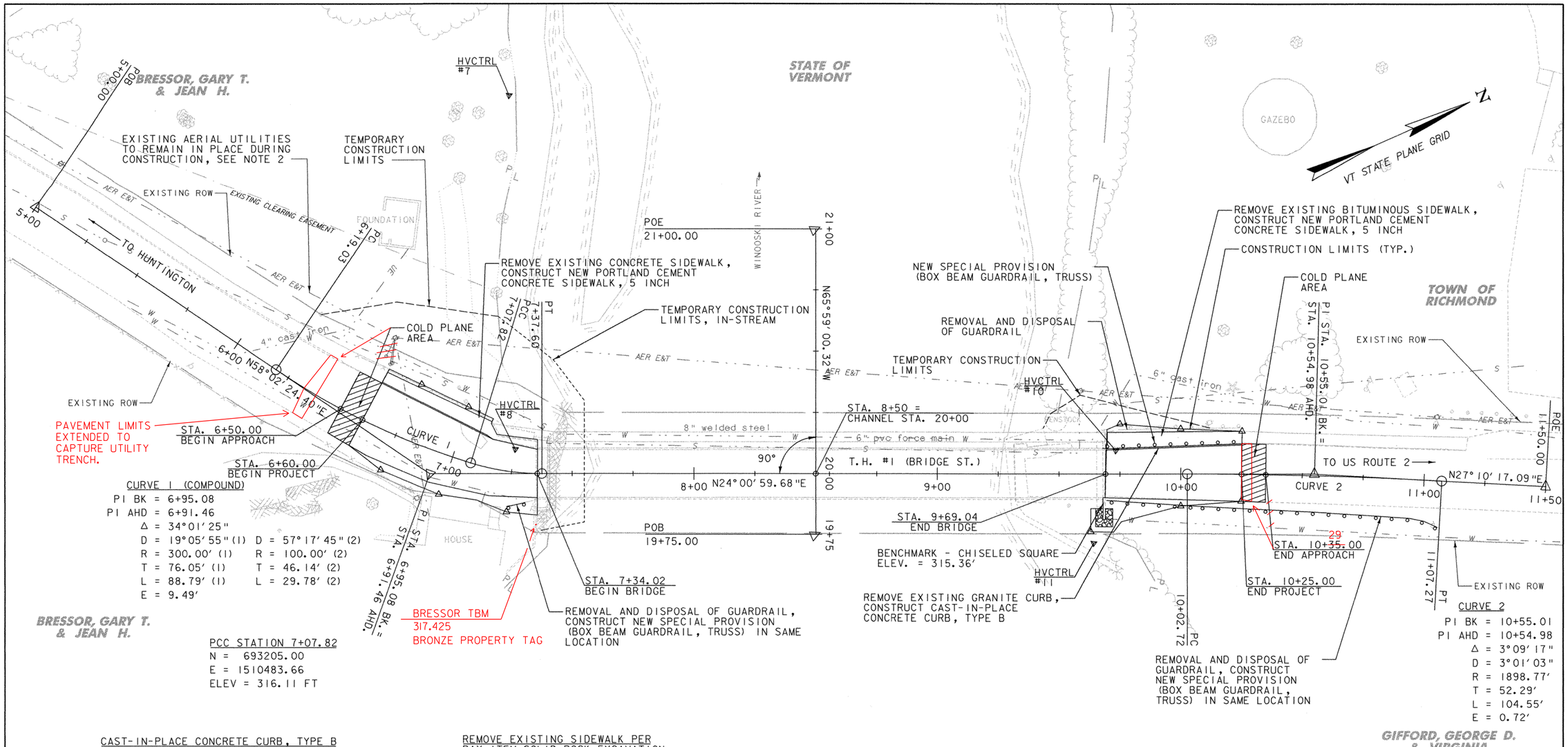
DATUM
VERTICAL NAVD 88
HORIZONTAL NAD 83
ADJUSTMENT

Stantec

PROJECT NAME: RICHMOND
PROJECT NUMBER: BHF 0209(5)

FILE NAME: ...\plot files\Tie Sheets.pltf
PROJECT LEADER: C. WILLIAMS
DESIGNED BY: G. GOYETTE
TIE SHEET 2

PLOT DATE: 1/8/2009
DRAWN BY: E. ALLING
CHECKED BY: T. KNIGHT
SHEET 8 OF 50



CURVE 1 (COMPOUND)

PI BK = 6+95.08			
PI AHD = 6+91.46			
Δ = 34° 01' 25"			
D = 19° 05' 55" (1)	D = 57° 17' 45" (2)		
R = 300.00' (1)	R = 100.00' (2)		
T = 76.05' (1)	T = 46.14' (2)		
L = 88.79' (1)	L = 29.78' (2)		
E = 9.49'			

PCC STATION 7+07.82
N = 693205.00
E = 1510483.66
ELEV = 316.11 FT

CURVE 2

PI BK = 10+55.01	
PI AHD = 10+54.98	
Δ = 3° 09' 17"	
D = 3° 01' 03"	
R = 1898.77'	
T = 52.29'	
L = 104.55'	
E = 0.72'	

CAST-IN-PLACE CONCRETE CURB, TYPE B

STA. 6+60, 17.5' LT - STA. 7+11, 12.8' LT
STA. 9+70, 10.6' LT - STA. 10+25, 12.6' LT

SPECIAL PROVISION (BOX BEAM GUARDRAIL, TRUSS)

STA. 7+24, 14.5' RT - STA. 7+36, 11.1' RT
STA. 9+68, 10.8' RT - STA. 11+08, 19.1' RT
STA. 9+68, 11.1' LT - STA. 10+28, 12.8' LT

SPECIAL PROVISION (BRIDGE RAILING, TRUSS)

STA. 7+36, 10.6' RT - STA. 9+68, 10.6' RT
STA. 7+36, 10.6' LT - STA. 9+68, 10.6' LT

PORTLAND CEMENT CONCRETE SIDEWALK, 5 INCH

STA. 6+60, 17.5' LT - STA. 7+11, 12.8' LT
STA. 9+70, 10.6' LT - STA. 10+25, 12.6' LT

REMOVE EXISTING SIDEWALK PER PAY ITEM SOLID ROCK EXCAVATION

STA. 6+60, 17.5' LT - STA. 7+11, 12.8' LT
STA. 9+70, 10.6' LT - STA. 10+25, 12.6' LT

REMOVAL OF EXISTING CURB

STA. 9+70, 10.6' LT - STA. 10+26, 12.6' LT

REMOVAL AND DISPOSAL OF GUARDRAIL

STA. 7+25, 14.5' RT - STA. 7+34, 11.1' RT
STA. 9+70, 10.8' RT - STA. 11+06, 19.1' RT
STA. 9+74, 18.0' LT - STA. 10+24, 19.0' LT

REMOVING AND RESETTING PROPERTY MARKERS

STA. 6+23, 29.0' LT
STA. 7+09, 35.3' LT

STATE OF VERMONT

LEGEND

- CONSTRUCTION LIMITS
- TEMPORARY CONSTRUCTION LIMITS
- TEMPROARY CONSTRUCTION LIMITS, IN-STREAM

1'-0" STONE FILL, TYPE I

STA. 9+69, 23.0' RT

0 20 40
SCALE

Stantec

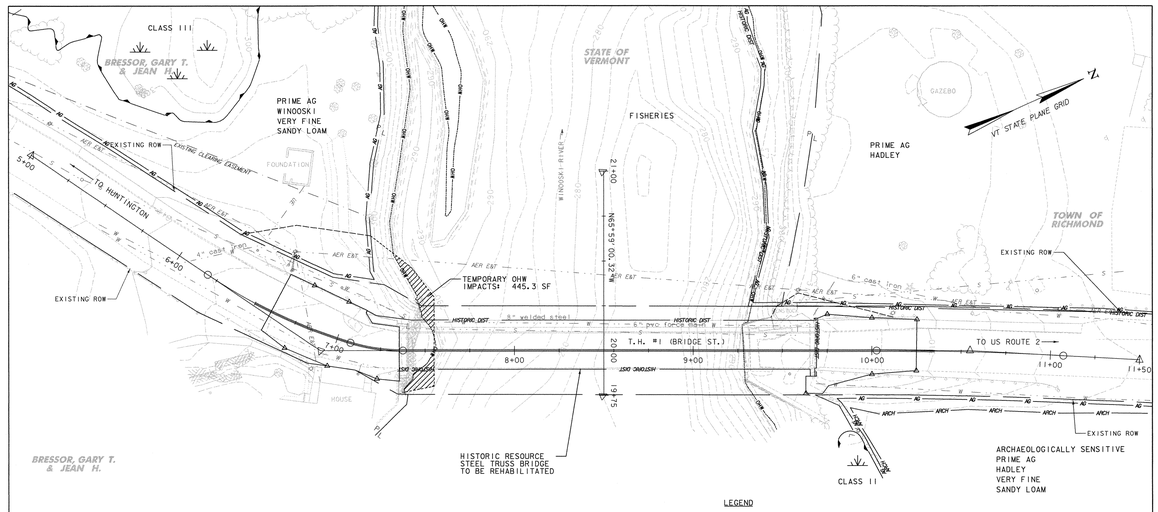
NOTES:

1. SEE TYPICAL ROADWAY SECTIONS SHEETS FOR BRIDGE APPROACH CONSTRUCTION DETAILS.
2. CONTRACTOR SHALL SHIELD EXISTING UTILITY POLES DURING CONSTRUCTION IN ACCORDANCE WITH THE SPECIAL PROVISIONS.
3. LOCATION OF WATER AND SEWER LINES OBTAINED FROM THE TOWN OF RICHMOND WATER RESOURCES DEPARTMENT AND ARE CONSIDERED APPROXIMATE. CONTRACTOR SHALL FIELD VERIFY LOCATION OF WATER AND SEWER LINE LOCATIONS PRIOR TO EARTH DISTURBANCE.
4. PROVIDE GEOTEXTILE UNDER STONE FILL IN ACCORDANCE WITH SECTION 649 OF THE STANDARD SPECIFICATIONS, COST INCIDENTAL TO ITEM 613.10.

PROJECT NAME: RICHMOND
PROJECT NUMBER: BHF 0209(5)

FILE NAME:...\plot files\Layout Plan.ptf
PROJECT LEADER: C. WILLLIAMS
DESIGNED BY: G. GOYETTE
LAYOUT PLAN

PLOT DATE: 1/8/2009
DRAWN BY: E. ALLING
CHECKED BY: T. KNIGHT
SHEET 9 OF 50



LEGEND

- CONSTRUCTION LIMITS
- TEMPORARY CONSTRUCTION LIMITS
- TEMPROARY CONSTRUCTION LIMITS, IN-STREAM
- AG — AGRICULTURAL LAND
- ARCH — ARCHEAOLOGICAL SITE
- OHW — ORDINARY HIGH WATER
- WETLANDS
- RIGHT-OF-WAY
- P / L — PROPERTY LINE
- HISTORIC DIST — HISTORIC/HISTORIC DISTRICT
- TEMPORARY OHW IMPACTS

ENVIRONMENTAL RESOURCE	LEVEL	LINESTYLE NAME	CHECKED BY	DATE
Wetlands	EMB_P	wetland-it, wetland-rt	G. Gingras	10-07-08
Historic/Historic District	WHBC	historic dist.	J. Ramsey	10-07-08
Archeaological Site	LAAS	arch. area	University of Vermont	10-15-08
4f Property	WPL	4f property	G. Gingras	10-07-08
6f Property	WPL	6f property	G. Gingras	10-07-08
Agricultural Land	LAPB	agricult. land	G. Gingras	10-07-08
Fish & Wildlife Habitat	EHA	critical hab.	G. Gingras	10-07-08
Flood Plains	EMB_P	fld. plains	J. Ramsey	10-07-08
Endangered Species	EHA	thr. & end. spec.	G. Gingras	10-07-08
Hazardous Waste	EDEFAULT	haz. waste	J. Ramsey	10-07-08
Stormwater	DDEFAULT	Diamond		
USDA-Forest Service Lands	MJPB	Phantom	G. Gingras	10-07-08
Wildlife Habitat Suit/Conn	EHA	Divide	G. Gingras	10-07-08

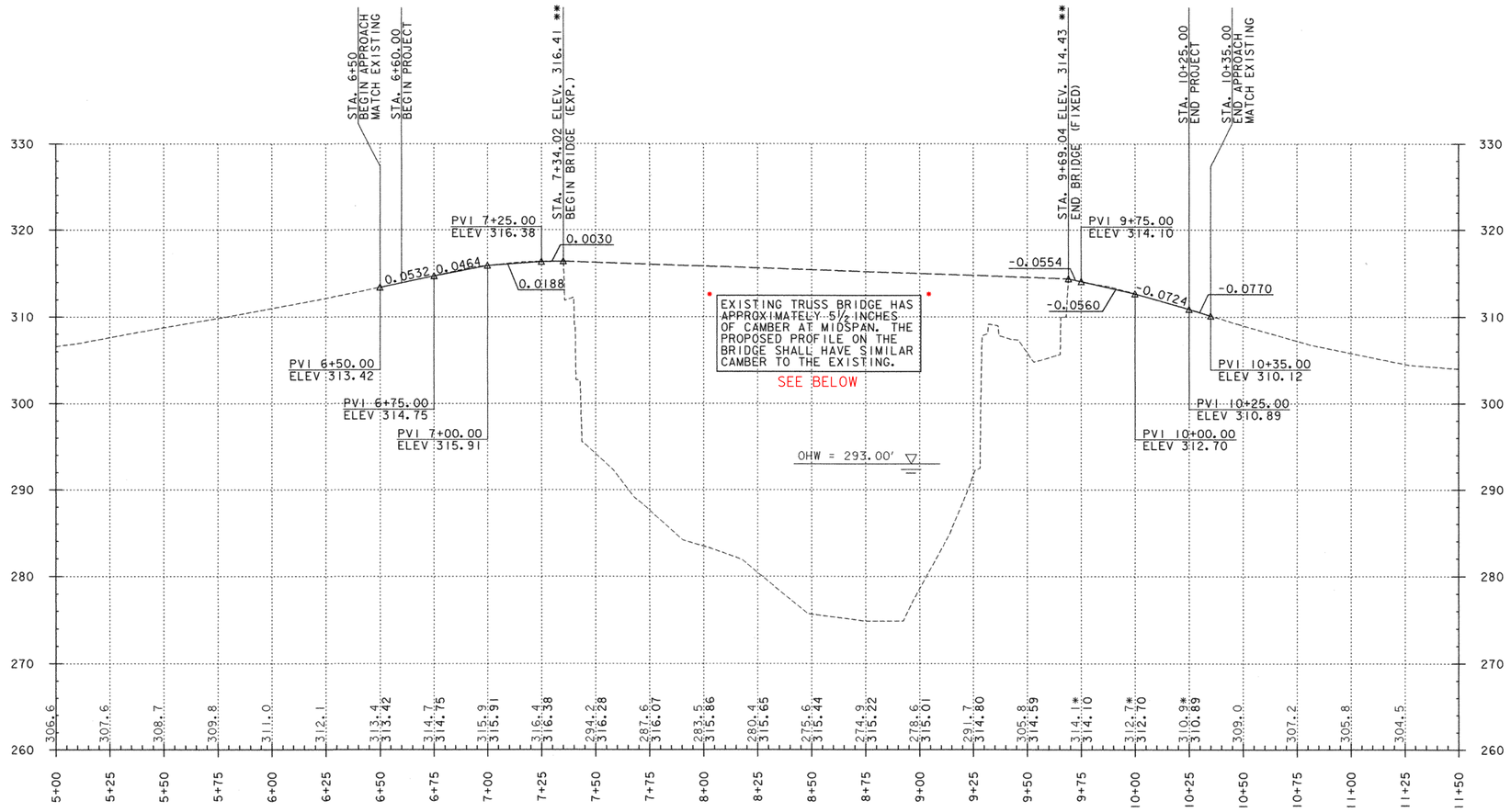
0 20 40
SCALE

Stantec

PROJECT NAME: RICHMOND
PROJECT NUMBER: BHF 0209(5)

FILE NAME: ...\09 Resources Plan.pdf
PROJECT LEADER: C. WILLIAMS
DESIGNED BY: G. GOYETTE
RESOURCES PLAN

PLOT DATE: 1/8/2009
DRAWN BY: E. ALLING
CHECKED BY: T. KNIGHT
SHEET 10 OF 50



NOTES:
1. ELEVATIONS SHOWN TO THE NEAREST TENTH ARE EXISTING GROUND ALONG CENTERLINE
2. ELEVATIONS SHOWN TO THE NEAREST HUNDREDTH ARE FINISH GRADE ALONG CENTERLINE
3. * INDICATES EXISTING ELEVATIONS UPDATED BASED ON SUPPLEMENTAL SURVEY COMPLETED BY T. KNIGHT & J. SOTER ON OCTOBER 8, 2008.
4. ** ELEVATION BASED ON ASSUMED DECK THICKNESS OF 8". ELEVATION MAY VARY BASED ON ACTUAL DECK THICKNESS PROVIDED.

CAMBER NOTES

EXISTING CAMBER VERIFIED ON 3-14-09 @ 0.4625
CAMBER @ CONCLUSION OF PROJECT = 0.43

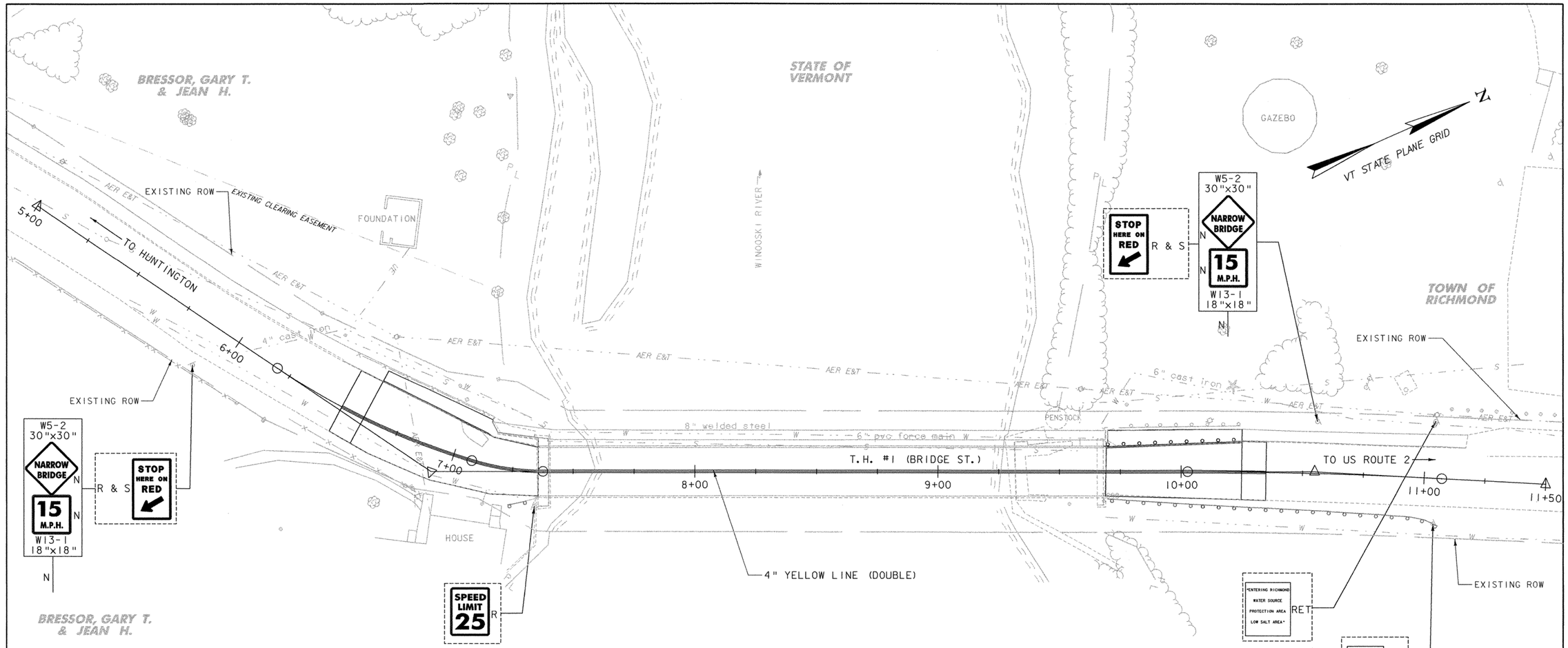
SEE SHEET # 15

BRIDGE & APPROACH PROFILE

VERTICAL 0 5 10 15
HORIZONTAL 0 20 40 60
SCALE IN FEET
SHEET SCALE

Stantec

PROJECT NAME:	RICHMOND
PROJECT NUMBER:	BHF 0209(5)
FILE NAME: ...\plot files\10 Profile.ptf	PLOT DATE: 1/8/2009
PROJECT LEADER: C. WILLIAMS	DRAWN BY: E. ALLING
DESIGNED BY: G. GOYETTE	CHECKED BY: T. KNIGHT
PROFILE	SHEET 11 OF 50



NOTES:

1. ALL EXISTING SIGNS NOT SHOWN SHALL BE RETAINED AS DIRECTED BY THE ENGINEER.
2. FOR PAVEMENT MARKING DETAILS SEE VTRANS STANDARD SHEETS E-191 AND E-193.
3. FOR SIGN DETAILS SEE VTRANS STANDARD SHEETS E-154 AND E-155.
4. NEW SIGN POSTS SHALL BE SQUARE STEEL POSTS. SEE VTRANS STANDARD SHEETS E-121 AND E-164.
5. ALL REMOVED SIGNS SHALL BE RETURNED TO THE TOWN OF RICHMOND HIGHWAY DEPARTMENT.
6. SIGN DIMENSIONS SHALL BE STANDARD SIGN SIZES PER VTRANS STANDARDS

SIGN LEGEND

N = NEW
R = REMOVE
R&S = REMOVE AND SALVAGE
S = SALVAGE SIGN
RET = RETAIN
---- = EXISTING
—— = PROPOSED

4" YELLOW LINE (DOUBLE)

STA. ~~6+50 TO STA. 10+35~~, SOLID LT. & RT.
7+34 TO 9+69

REMOVING SIGNS

3 - AS SHOWN

OBJECT MARKER ADDED ON EACH END OF BRIDGE
SIGNS ALL 36" x 12"
7+34 LT
7+34 RT
9+69 LT
9+69 RT

0 20 40
SCALE

Stantec

PROJECT NAME:	RICHMOND
PROJECT NUMBER:	BHF 0209(5)
FILE NAME: ...\Signs and Pvmt Mrkgs.ptf	PLOT DATE: 1/9/2009
PROJECT LEADER: C. WILLIAMS	DRAWN BY: E. ALLING
DESIGNED BY: G. GOYETTE	CHECKED BY: T. KNIGHT
SIGN & PAVEMENT MARKING PLAN	SHEET 12 OF 50

GENERAL NOTES

1. ALL MATERIALS AND CONSTRUCTION SHALL CONFORM TO STATE OF VERMONT, AGENCY OF TRANSPORTATION, 2006 `STANDARD SPECIFICATIONS FOR CONSTRUCTION, AND ITS LATEST REVISIONS, AND THE AASHTO STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES, DATED 2002, AND ITS LATEST REVISIONS.

2. DIMENSIONS SHOWN ON EXISTING DETAILS ARE TAKEN FROM THE 1928 FABRICATION PLANS AND ARE NOT GUARANTEED. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND EXISTING DETAILS NECESSARY FOR THE COMPLETION OF ALL WORK BY FIELD MEASUREMENT AND SURVEY. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE ADEQUACY AND ACCURACY THEREOF, AND SHALL NOT ORDER ANY MATERIAL OR COMMENCE ANY FABRICATION UNTIL THEY HAVE MADE THE REQUIRED MEASUREMENTS ON THE EXISTING STRUCTURE. FOR EMPHASIS, SOME PROPOSED DIMENSIONS ARE NOTED AS "VERIFY IN FIELD" OR "VIF". THIS IS DONE FOR EMPHASIS ONLY AND DOES NOT RELIEVE THE CONTRACTOR OF THE RESPONSIBILITY TO VERIFY ALL DIMENSIONS AND DETAILS AS NOTED PREVIOUSLY.

3. ALL DIMENSIONS SHOWN IN THE PLANS ARE HORIZONTAL OR VERTICAL AT 68 DEGREES FAHRENHEIT, UNLESS NOTED OTHERWISE.

4. EXISTING OVERHEAD UTILITIES SHALL REMAIN IN PLACE DURING CONSTRUCTION AND SHALL BE PROTECTED IN ACCORDANCE WITH THE SPECIAL PROVISIONS.

5. EXISTING WATERLINE SHALL BE SUPPORTED AND PROTECTED IN PLACE DURING CONSTRUCTION IN ACCORDANCE WITH ITEM 900.645 SPECIAL PROVISION ITEMPORARY SUPPORT, WATER.

6. EXISTING FORCE MAIN SHALL BE SUPPORTED AND PROTECTED IN PLACE DURING CONSTRUCTION IN ACCORDANCE WITH ITEM 900.645 SPECIAL PROVISION ITEMPORARY SUPPORT, SEWER.

7. EXISTING SIGNAL HEADS AND FEEDER WIRES MOUNTED ON THE BRIDGE SHALL BE SALVAGED AND DELIVERED TO THE RICHMOND TOWN HIGHWAY DEPARTMENT (CONTACT PETER GOSSELIN - TOWN HIGHWAY FOREMAN FOR DETAILS AT (802)434-2630. COST TO BE INCIDENTAL TO ITEM 529.20.

8. EXISTING LIGHT FIXTURE AND FEEDER WIRES MOUNTED TO THE TRUSS ON THE SOUTHERN END OF THE STRUCTURE MAY BE REMOVED AND STORED DURING CONSTRUCTION AS NECESSARY TO FACILITATE WORK. PRIOR TO COMPLETION OF WORK, THE LIGHT SHALL BE REMOUNTED. THE CONTRACTOR SHALL SUBMIT DETAILS FOR REMOUNTING THE FIXTURE TO THE ENGINEER FOR APPROVAL. PAYMENT SHALL BE INCIDENTAL TO ALL OTHER CONTRACT ITEMS. THE TOWN WILL BE RESPONSIBLE FOR TAKING THE NECESSARY STEPS TO RUN A NEW FEEDER WIRE AND TO RE-ENERGIZE THE FIXTURE.

9. ITEM 529.20 SHALL INCLUDE ALL REMOVAL AND DISASSEMBLY OF THE EXISTING STRUCTURE AS NECESSARY TO COMPLETE THE PROPOSED WORK, UNLESS NOTED OTHERWISE.

10. ALL LOOSE OR FLAKING PAINT ON MEMBERS THAT ARE TO BE REMOVED SHALL BE CONTAINED AND PROPERLY DISPOSED OF IN ACCORDANCE WITH SUBSECTION 105.24 OF THE STANDARD SPECIFICATIONS.

11. STEEL GRID FLOORING FOR THE BRIDGE AND SIDEWALK WAS PRE-PURCHASED BY VTRANS AND WILL BE MADE AVAILABLE TO THE CONTRACTOR. REFER TO THE SPECIAL PROVISIONS FOR DETAILS.

12. CONTRACTOR SHALL RETAIN THE FABRICATOR OF THE STEEL GRID FLOORING TO ASSIST AND ADVISE THE INSTALLER IN TRANSPORTING AND ERECTING THE STEEL GRID FLOORING. ALL INSTRUCTIONS ON ERECTION AND FIELD CONNECTIONS PROVIDED BY THE MANUFACTURER SHALL BE ADHERED TO BY THE INSTALLER, TO THE SATISFACTION OF THE RESIDENT ENGINEER. COST INCLUDED IN ITEM 900.645 SPECIAL PROVISION INSTALL STEEL GRID FLOORING, BRIDGE) AND ITEM 900.645 SPECIAL PROVISION INSTALL STEEL GRID FLOORING, SIDEWALK)

13. BEARING DEVICE ASSEMBLIES WERE PRE-PURCHASED BY VTRANS AND WILL BE MADE AVAILABLE TO THE CONTRACTOR. REFER TO THE SPECIAL PROVISIONS FOR DETAILS.

14. ITEM 900.650 SPECIAL PROVISION (INCENTIVE/DISINCENTIVE) WILL BE USED FOR PAYMENT OF MONIES UNDER THE CONTRACT INCENTIVE/DISINCENTIVE CLAUSE.

15. THE EXISTING STRUCTURAL STEEL ON THIS PROJECT WAS PAINTED WITH A MATERIAL WHICH MAY CONTAIN LEAD. THE REMOVED STRUCTURAL STEEL IS THE PROPERTY OF THE CONTRACTOR. THE CONTRACTOR SHALL INDEMNIFY AND HOLD THE STATE, ITS OFFICERS AND EMPLOYEES HARMLESS CONCERNING THE CONTRACTOR'S USE OR DISPOSITION OF THE STRUCTURAL STEEL. TEN DAYS PRIOR TO COMMENCING WORK WHICH INVOLVES THE HANDLING OR DISTURBANCE OF PAINTED COMPONENTS, THE CONTRACTOR SHALL PROVIDE DOCUMENTS TO THE ENGINEER, AS REFERENCED IN SECTION 513 OF THE SPECIFICATIONS.

16. THE ABANDONED UTILITY CONDUIT MAY CONTAIN ASBESTOS, SEE SPECIAL PROVISIONS.

DETOUR NOTE

17. THE TOWN OF RICHMOND WILL BE RESPONSIBLE FOR SELECTING, SIGNING, AND MAINTAINING A DETOUR ROUTE AT NO COST TO THE STATE. THE TOWN WILL SIGN THE DETOUR ROUTE IN CONFORMANCE WITH 23 VSA SECTION 1025 AND THE LATEST EDITION OF THE `MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES.

18. CONSTRUCTION SIGNING NOT RELATED TO THE DETOUR SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR AND WILL BE INCIDENTAL TO ITEM 641.10 TRAFFIC CONTROL.

CONCRETE AND REINFORCING STEEL

19. CONCRETE FOR THE DECK, SIDEWALK DECK, EXPANSION JOINT BLOCKOUT AND CURBS SHALL BE HIGH PERFORMANCE CLASS AA AND WILL BE PAID FOR UNDER ITEM 501.32, "CONCRETE, HIGH PERFORMANCE CLASS AA". ALL OTHER CONCRETE SHALL BE CONCRETE HIGH PERFORMANCE CLASS B AND WILL BE PAID FOR UNDER ITEM 501.34, UNLESS NOTED OTHERWISE.

20. ALL SUBSTRUCTURE REINFORCING STEEL SHALL BE PAID FOR UNDER ITEM 507.15, "REINFORCING STEEL" OR ITEM 507.17 "EPOXY COATED REINFORCING STEEL".

21. ALL SUPERSTRUCTURE REINFORCING STEEL SHALL BE EPOXY COATED AND PAID FOR UNDER ITEM 507.17, "EPOXY COATED REINFORCING STEEL" UNLESS NOTED OTHERWISE.

22. VTRANS WILL PROVIDE DETAILED PLACEMENT DRAWINGS AND A SCHEDULE FOR THE REINFORCING STEEL REQUIRED FOR THE FLOORING AS DETAILED BY THE STEEL GRID FLOORING FABRICATOR. THE CONTRACTOR SHALL REVISE OR APPEND THESE DRAWINGS AND SCHEDULES AS NECESSARY TO ENCOMPASS ALL REINFORCEMENT TO BE INCLUDED IN THE FINAL CONFIGURATION OF THE DECK AND SHALL SUBMIT THEM FOR APPROVAL. APPENDED DRAWINGS SHALL INCLUDE ADDITIONAL STEEL REQUIRED FOR BRIDGE CURBS AND THE ENDS OF THE BRIDGE DECK. ALL DRAWINGS AND SCHEDULES OF REINFORCING BARS TO BE INCLUDED IN THE FINAL DECK CONFIGURATION SHALL BE IN ACCORDANCE WITH THE CURRENT CRSI `MANUAL OF STANDARD PRACTICE' AND SHALL BE TO A LEVEL OF DETAIL SUCH THAT THE REINFORCEMENT MAY BE PROPERLY FABRICATED, PLACED AND ITS MASS READILY COMPUTED. COST OF DETAILING TO BE INCIDENTAL TO ITEM 900.645 SPECIAL PROVISION (INSTALL STEEL GRID FLOORING, BRIDGE).

23. SURFACES OF BRIDGE SEATS UNDER BEARING DEVICES SHALL BE LEVEL.

24. ALL EXPOSED EDGES OF CONCRETE SHALL BE CHAMFERED 1"x1".

25. WATER REPELLENT, SILANE SHALL BE APPLIED TO ALL EXPOSED CONCRETE SURFACES.

STRUCTURAL STEEL

26. ALL SCUPPERS AND DOWNSPOUTS SHALL BE PAID FOR UNDER ITEM 506.60, "STRUCTURAL STEEL" AND SHALL CONFORM TO AASHTO M 270M/M 270 GRADE 36 UNLESS NOTED OTHERWISE.

27. ALL OTHER NEW STEEL SHALL BE PAID FOR UNDER ITEM 506.50, "STRUCTURAL STEEL, ROLLED BEAM" UNLESS NOTED OTHERWISE AND SHALL CONFORM TO AASHTO M 270M/M 270 GRADE 50 AND SHALL BE CHARPY "V" NOTCH TESTED, UNLESS NOTED OTHERWISE ON THE PLANS.

28. ALL NEW STEEL ELEMENTS SHALL BE GALVANIZED IN ACCORDANCE WITH SUBSECTION 506.15(A). COST INCLUDED IN THE UNIT BID PRICE FOR THE INDIVIDUAL ITEM. GALVANIZED MEMBERS SHALL BE AIR COOLED.

29. FIELD FABRICATION OF STRUCTURAL STEEL MEMBERS WILL NOT BE ALLOWED EXCEPT FOR FIELD DRILLING OF NEW MEMBERS WHERE HOLES MUST MATCH FASTENER LAYOUT IN EXISTING MEMBERS OR AS APPROVED IN WRITING BY THE RESIDENT ENGINEER.

30. ALL BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED IN ACCORDANCE WITH SUBSECTION 714.05. BOLTS SHALL NOT BE PAID FOR DIRECTLY, BUT SHALL BE INCIDENTAL TO THE ASSOCIATED STRUCTURAL STEEL ITEM.

31. ALL STRUCTURAL COMPONENTS OF THE BRIDGE SHALL BE INSPECTED BY THE CONTRACTOR AND THE ENGINEER FOR ADDITIONAL AREAS IN NEED OF REPAIR NOT SHOWN ON THE CONTRACT DOCUMENTS. ANY ADDITIONAL REPAIRS SHALL BE MADE AT THE DISCRETION OF THE ENGINEER AND SHALL BE APPROVED BY THE ENGINEER. ADDITIONAL REPAIRS SHALL BE PAID FOR UNDER CONTRACT ITEM 506.60. CLEANING AND PAINTING FOR THESE REPAIRS SHALL BE IN ACCORDANCE WITH SECTION 513 OF THE STANDARD SPECIFICATIONS. COST INCIDENTAL TO ITEM 506.60. 2,000 POUNDS OF STEEL WAS INCLUDED IN THE ESTIMATED QUANTITY FOR ITEM 506.60 IN ANTICIPATION OF THE NEED FOR ADDITIONAL REPAIRS.

32. ANY EXISTING RIVETS THAT ARE MISSING OR REMOVED FOR REPAIRS AS DETAILED ON THE PLANS OR AS ORDERED BY THE ENGINEER SHALL BE REPLACED WITH ¾" DIAMETER HIGH STRENGTH BOLTS. THE CONTRACTOR SHALL VERIFY THAT THE EXISTING HOLE DIAMETER IS ⅞" AND BRING ANY DISCREPANCIES TO THE ATTENTION OF THE ENGINEER. CONTRACTOR MAY BE REQUIRED TO REAM HOLES AS DIRECTED BY ENGINEER, COST INCIDENTAL TO ASSOCIATED STRUCTURAL STEEL ITEM.

STRUCTURAL STEEL (CONTINUED)

33. ALL NEW CONNECTIONS SHALL BE MADE WITH ¾" DIAMETER HIGH STRENGTH BOLTS, MEETING AASHTO M 164 TYPE 1 GALVANIZED. REQUIRED BOLT LENGTH SHALL BE FIELD VERIFIED BY THE CONTRACTOR.

34. CONNECTIONS NOT DETAILED SHALL BE DETAILED BY THE FABRICATOR AND SUBMITTED TO THE ENGINEER FOR APPROVAL.

35. UNLESS OTHERWISE NOTED BOLTS SHALL BE INSTALLED WITH THE BOLT HEADS ON THE TOP OR EXPOSED ELEMENT OF THE CONNECTION.

36. ALL FAYING SURFACES OF THE EXISTING STEEL TO BE CONNECTED TO NEW STEEL SHALL BE BLAST CLEANED AND PRIMED WITH AN ORGANIC ZINC RICH PRIMER MEETING THE CLASS B SLIP COEFFICIENT VALUE OF NOT LESS THAN 0.50 AS SPECIFIED BY AASHTO. CONTAINMENT, SURFACE PREPARATION AND PAINTING SHALL BE IN ACCORDANCE WITH ITEMS 513.36, 513.41 AND 513.50 RESPECTIVELY. ALL EDGES OR SHARP DISCONTINUITIES SHALL BE STRIPE COATED WITH A BRUSH OR ROLLER.

37. WHERE RIVET HEADS ARE IN DIRECT CONTACT WITH MEMBERS TO BE RETAINED, THE CONTRACTOR SHALL USE EXTREME CARE NOT TO DAMAGE EXISTING MEMBERS WHILE REMOVING RIVETS. BEFORE PROCEEDING WITH REMOVAL OF RIVETS, THE CONTRACTOR SHALL DEMONSTRATE THE PROPOSED METHOD OF REMOVAL TO THE ENGINEER, SHOULD AT ANY TIME, IN THE JUDGMENT OF THE ENGINEER, THE REMOVAL METHOD CAUSE DAMAGE TO MEMBERS THAT ARE TO BE RETAINED, THE CONTRACTOR SHALL CEASE WORK UNTIL THEY CAN DEMONSTRATE A METHOD THAT DOES NOT RESULT IN DAMAGE.

38. THE BOTTOM CHORD OF THE TRUSS IS A FRACTURE CRITICAL MEMBER.

39. PRIOR TO ASSEMBLY, CONTACT SURFACES OF GALVANIZED STRESS-CARRYING MEMBERS SHALL BE LIGHTLY BRUSHED OR BLASTED TO A DULL GRAY APPEARANCE.

EROSION CONTROL AND PROJECT DEMARCATION

40. PAYMENT FOR EROSION PREVENTION AND SEDIMENT CONTROL MEASURES REQUIRED TO TEMPORARILY OR PERMANENTLY STABILIZE DISTURBED SOILS INCLUDING BUT NOT LIMITED TO TOPSOIL, SEED, FERTILIZER, LIMESTONE, EROSION MATTING, MULCH AND SILT FENCE SHALL BE INCIDENTAL TO ALL OTHER CONTRACT ITEMS. ALL WORK SHALL BE COMPLETED IN CONFORMANCE WITH SECTION 105 OF THE VTRANS STANDARD SPECIFICATIONS.

41. ITEM 653.50 BARRIER FENCE SHALL BE INCLUDED IN THE CONTRACT TO PROTECT ARCHEOLOGICAL SENSITIVE AREAS OR AS DIRECTED BY THE ENGINEER.

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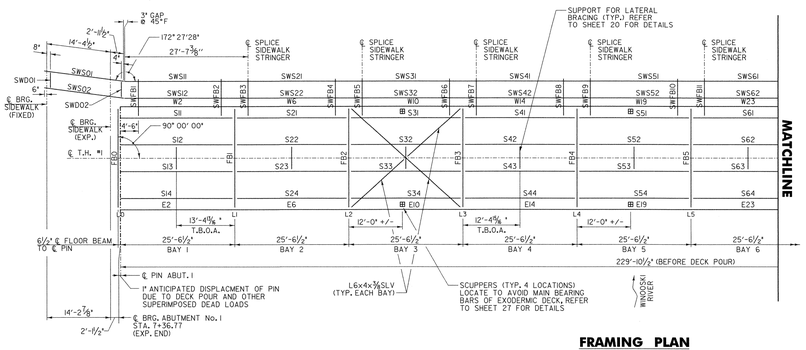
STATE OF VERMONT
AGENCY OF TRANSPORTATION

Town Of	RICHMOND	Bridge No.	31
Highway No.	T.H. #1	Log Sta.	
		Sufix Sta.	

TOWN HIGHWAY #1 OVER WINOOSKI RIVER

PROJECT NOTES

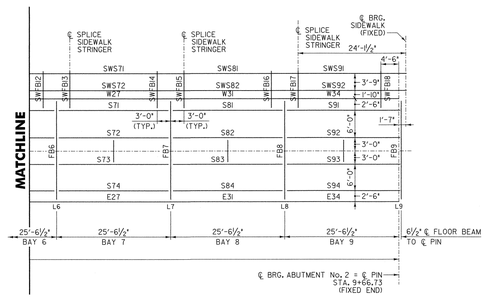
Designed By G. BOGUE		Drawn By T. KNIGHT	
Checked By T. KNIGHT	Date 01/09	Bridge Design Supervisor G. BOGUE	Date 01/09
PROJECT	RICHMOND	PROJECT NO.	BHF 0209(5)
CAD Dwgs ...\drawings\20332_NOTES.dgn		Plot Date 1/9/2009	
Bridge Sheet No.		Sheet 13 of 50	



FRAMING PLAN

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

1 0 2 4 6 8



LEGEND

L = LOWER TRUSS JOINT
U = UPPER TRUSS JOINT
S = FLOOR STRINGER (NEW W24x55)
FB = FLOOR BEAM (NEW W30x116)
E = EAST TRUSS MEMBER
W = WEST TRUSS MEMBER
SWS = SIDEWALK STRINGER (NEW W12x35)
SWFB = SIDEWALK FLOOR BEAM (NEW W12x35)
SWD = SIDEWALK DIAPHRAM (NEW C9x13.4)
T.B.O.A. = TO BACK OF ANGLE (L3½x3½)

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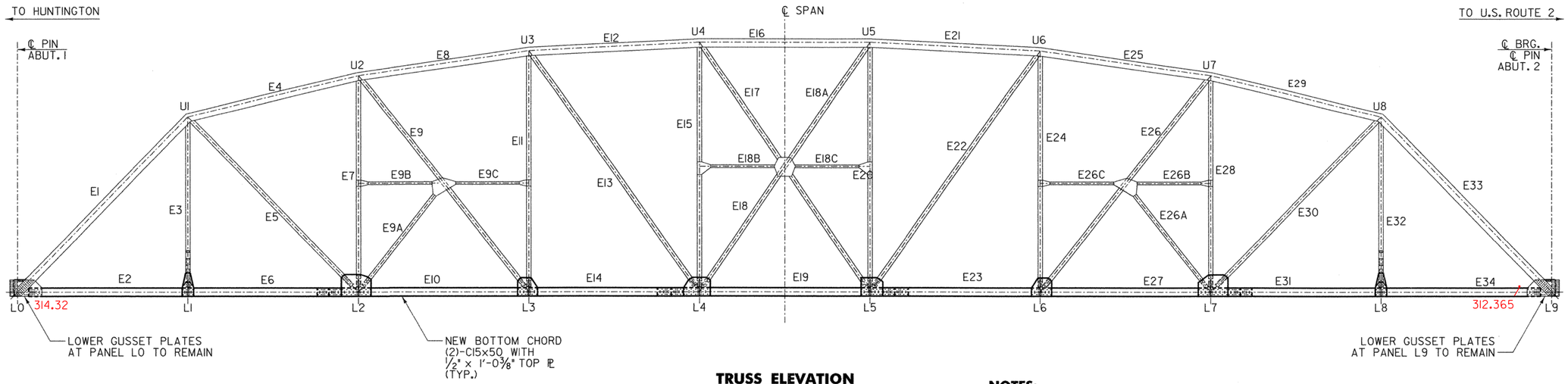
STATE OF VERMONT
AGENCY OF TRANSPORTATION

Town Of RICHMOND	Bridge No. 31
Highway No. T.H. #1	Log Sta. Serv. Sta.

TOWN HIGHWAY #1 OVER WINOOSKI RIVER

FRAMING PLAN

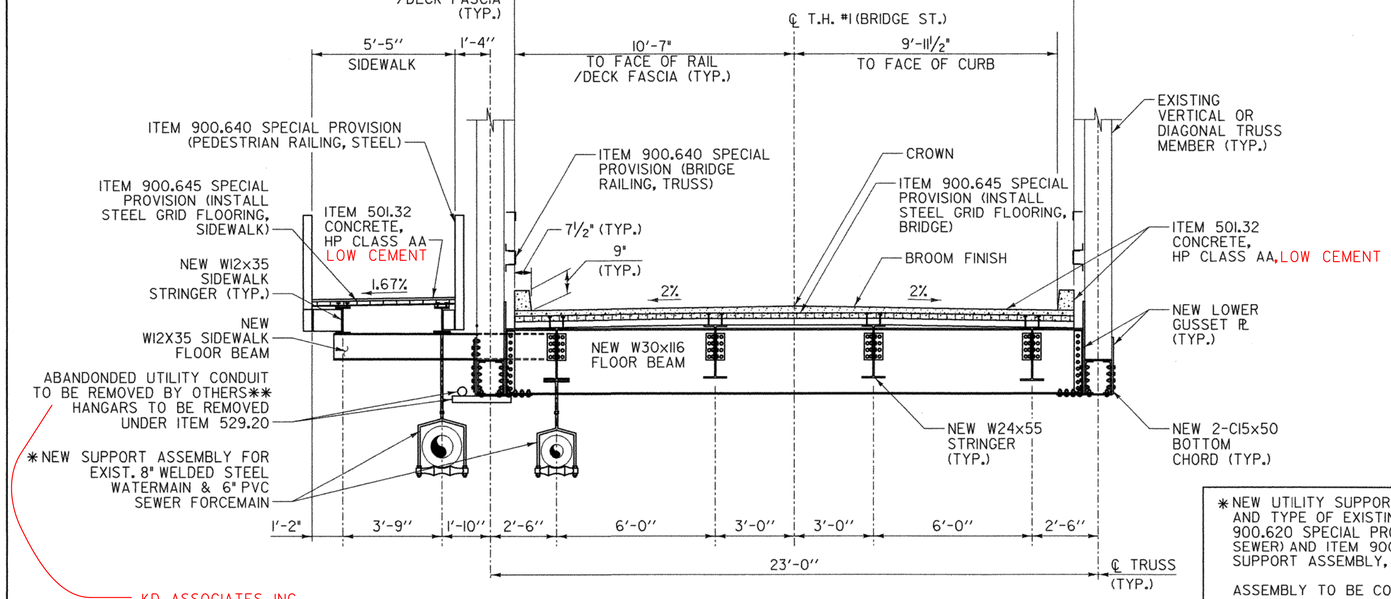
Designed By T.KNIGHT	Drawn By J.SOTER
Checked By T.KNIGHT Date 01/09	Bridge Design Supervisor G.BOGUE Date 01/09
PROJECT RICHMOND	PROJECT NO. BHF 020915()
CAD Dwgs ...\drawings\208332_FRA.dgn	Plot Date: 1/8/2009
Bridge Sheet No.	Sheet 14 of 50



TRUSS ELEVATION

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

0 2 4 6 8



REHABILITATED BRIDGE TYPICAL SECTION

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

1 0 1 2 3 4

KD ASSOCIATES, INC REMOVED THE PIPE

DEMO/RENO NOTIFICATION

ARTICLE # 7002-24100001-4442-6371

NOTES:

1. EAST TRUSS ELEVATION SHOWN. WEST TRUSS ELEVATION SIMILAR, EXCEPT PREFIX.
2. THE ENTIRE FLOOR SYSTEM, BOTTOM CHORD, LOWER LATERAL BRACING AND LOWER GUSSET PLATES WILL BE REMOVED AND REPLACED WITH NEW GALVANIZED STEEL UNLESS NOTED OTHERWISE.
3. VERTICAL AND DIAGONAL TRUSS MEMBERS WILL BE RETAINED.

CAMBER ELEVATIONS

TOP OF BOTTEM CHORD

L0 = 314.32
L9 = 312.365

MIDSPAN = 313.775

313.775 - [((314.32 - 312.365)/2) + 312.365]

= 0.433

OR 5 1/8"

*NEW UTILITY SUPPORT ASSEMBLIES TO MATCH LOCATION AND TYPE OF EXISTING HANGERS. IN ACCORDANCE WITH ITEM 900.620 SPECIAL PROVISION (UTILITY SUPPORT ASSEMBLY, SEWER) AND ITEM 900.620 SPECIAL PROVISION (UTILITY SUPPORT ASSEMBLY, WATER).

ASSEMBLY TO BE COOPER B-LINE ADJUSTABLE STEEL YOKE AND PIPE ROLL (PART NO. B3110), COOPER B-LINE W/ 1" DIA. ASTM A 307 THREADED ROD AND STEEL BEAM CLAMP (PART NO. B3055-1) OR EQUIVALENT ASSEMBLY.

CONTACTOR SHALL TAKE NECESSARY MEASUREMENTS TO ORDER APPROPRIATE HARDWARE.

**REFER TO SPECIAL PROVISIONS.

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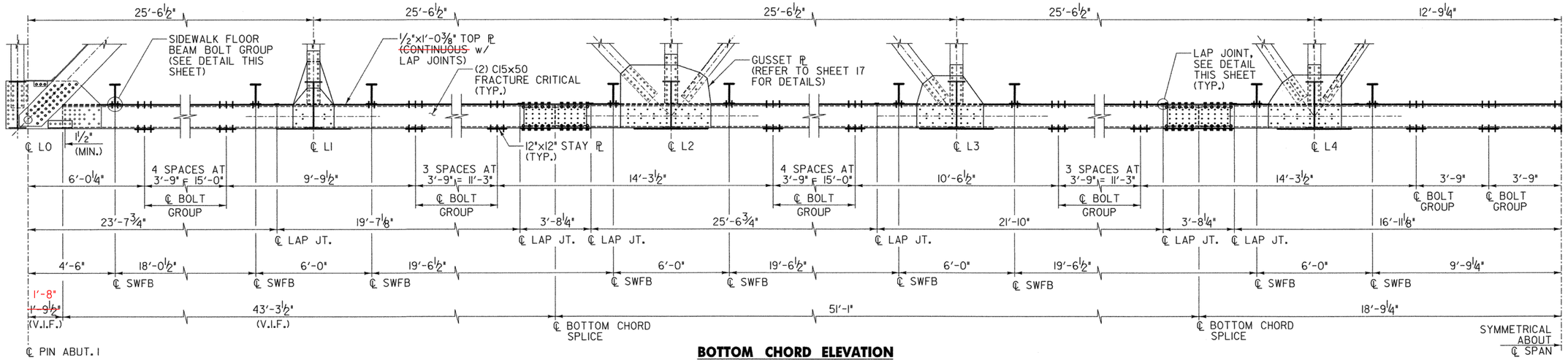
STATE OF VERMONT
AGENCY OF TRANSPORTATION

Town Of RICHMOND	Bridge No. 31
Highway No. T.H. #1	Log Sta. / Surv. Sta.
TOWN HIGHWAY #1 OVER WINOOSKI RIVER	

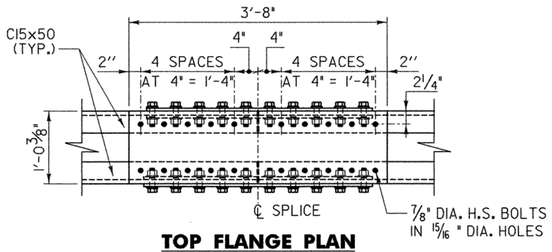
TYPICAL BRIDGE SECTION AND ELEVATION

Designed By T. KNIGHT	Drawn By J. SOTER
Checked By T. KNIGHT Date 01/09	Bridge Design Supervisor G. BOGUE Date 01/09
PROJECT RICHMOND	PROJECT NO. BHF 0209(5)
CAD Dwg: ...\drawing\z08jl32_TYPSEC.dgn	Plot Date: 1/8/2009
Bridge Sheet No.	Sheet 15 of 50

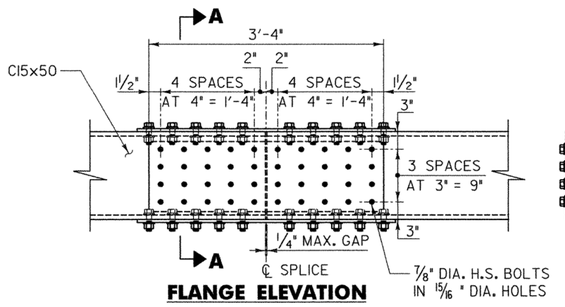


BOTTOM CHORD ELEVATION

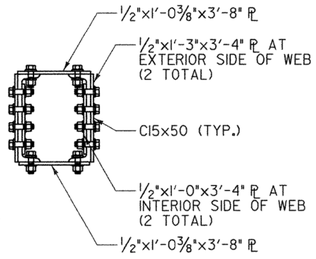
SCALE: ⅜" = 1'-0"



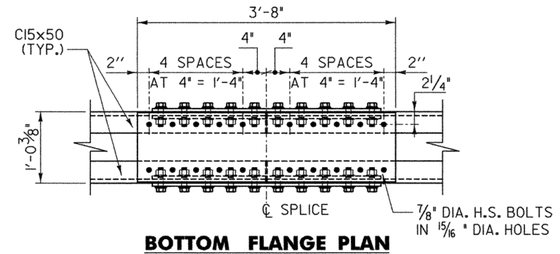
TOP FLANGE PLAN



FLANGE ELEVATION



SECTION A-A



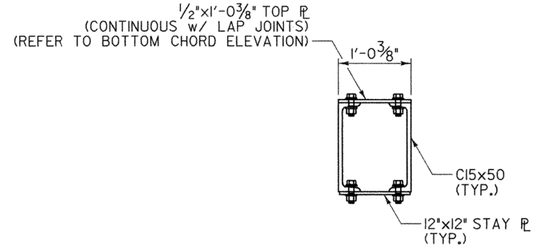
BOTTOM FLANGE PLAN

BOTTOM CHORD SPLICE

SCALE 1" = 1'-0"

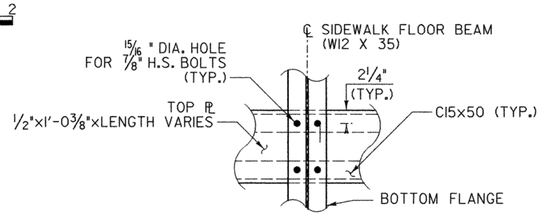
NOTES:

1. ALL SPLICE PLATES ARE FRACTURE CRITICAL MEMBERS.
2. TOP PLATE LAP JOINT NOT SHOWN FOR CLARITY.



TYPICAL BOTTOM CHORD SECTION

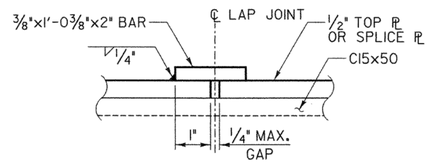
SCALE 1" = 1'-0"



NOTE: SIDEWALK FLOOR BEAMS REQUIRED WEST TRUSS ONLY, BOLT GROUP REQUIRED BOTH EAST AND WEST TRUSS.

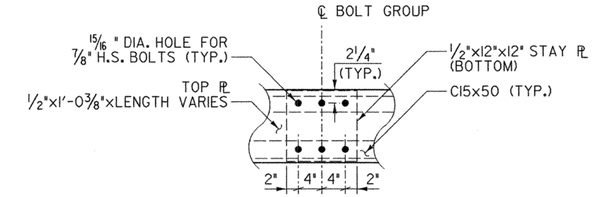
BOLT GROUP AT SIDEWALK FLOOR BEAM

SCALE: 1" = 1'-0"



TOP PLATE LAP JOINT DETAIL

(OPPOSITE HAND SOME LOCATIONS)
NOT TO SCALE



PLAN

TOP PLATE/STAY PLATE BOLT GROUP DETAIL

SCALE: 1" = 1'-0"

LEGEND

- ● = NEW 15/16" DIA. HOLE FOR ⅞" DIA. BOLT UNLESS NOTED OTHERWISE
- ○ = EXISTING RIVETS TO BE REPLACED w/ ⅞" DIA. BOLTS. LAYOUT TO BE DETERMINED FROM FIELD MEASUREMENTS
- ◎ = EXISTING RIVETS TO REMAIN
- NS = NEAR SIDE (ROADWAY SIDE OF TRUSS)
- FS = FAR SIDE (OUTSIDE OF TRUSS)

STATE OF VERMONT
AGENCY OF TRANSPORTATION

Town Of RICHMOND	Bridge No. 31
Highway No. T.H. #1	Log Sta. / Surv. Sta.
TOWN HIGHWAY #1 OVER WINOOSKI RIVER	
STEEL DETAILS 1	
Designed By T. KNIGHT	Drawn By J. SOTER
Checked By T. KNIGHT Date 01/09	Bridge Design Supervisor G. BOGUE Date 01/09
PROJECT RICHMOND	PROJECT NO. BHF 0209(5)
CAD Dwg: ...\drawing\z08J132_STEEL DETS.dgn Plot Date: 1/8/2009	
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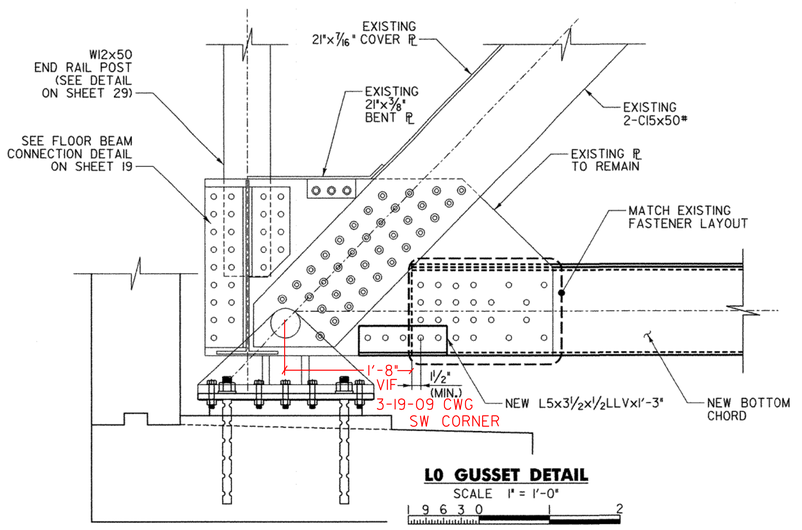
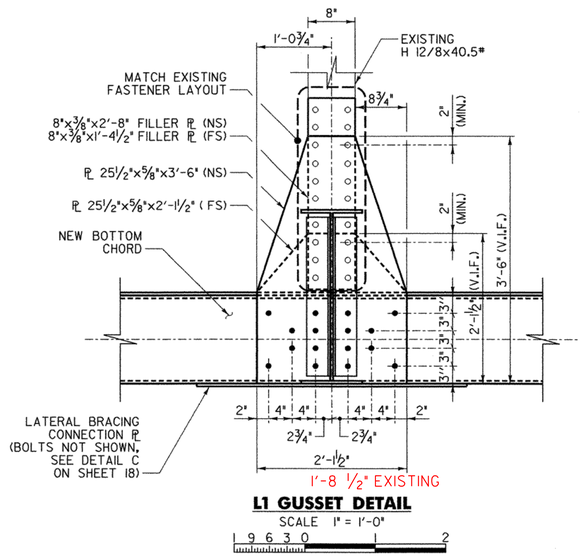


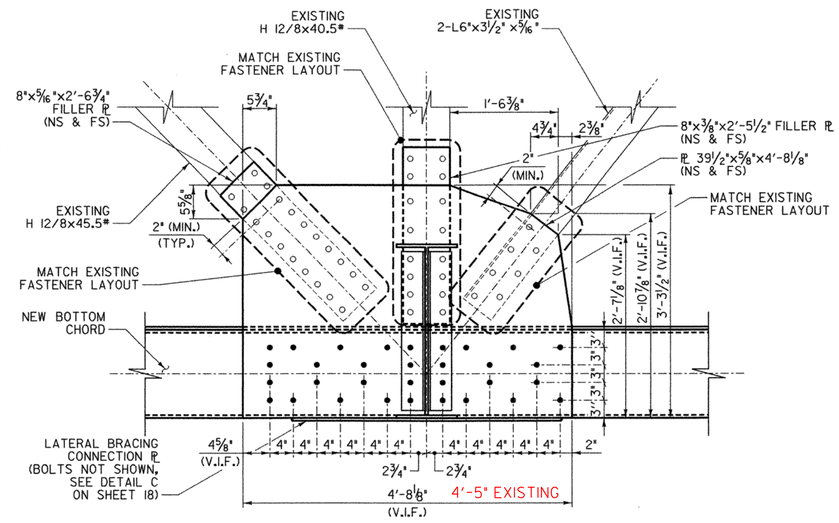
L0 GUSSET DETAIL

SCALE 1" = 1'-0"



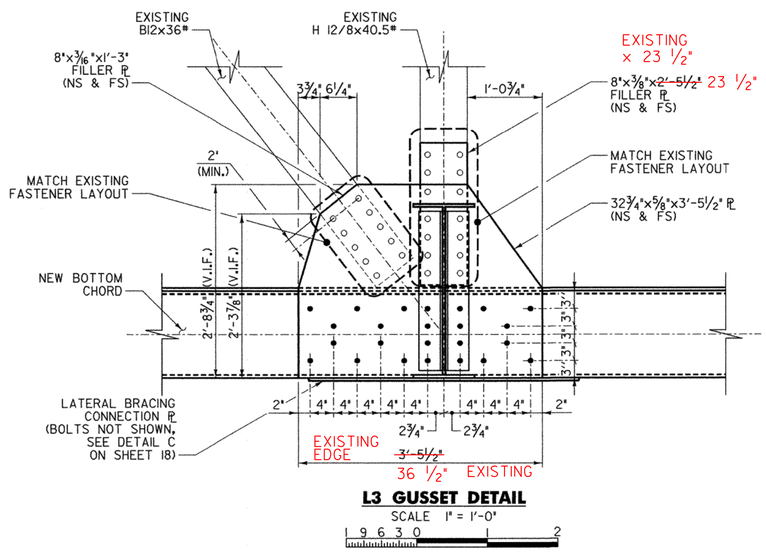
L1 GUSSET DETAIL

SCALE 1" = 1'-0"



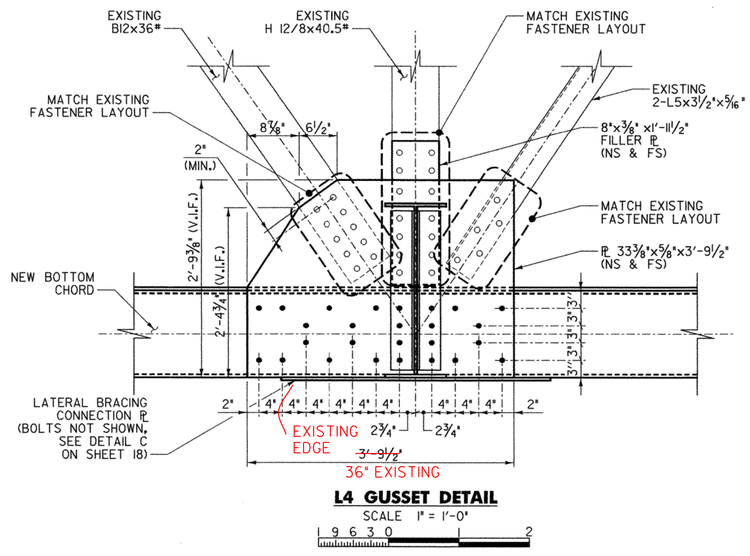
L2 GUSSET DETAIL

SCALE 1" = 1'-0"



L3 GUSSET DETAIL

SCALE 1" = 1'-0"



L4 GUSSET DETAIL

SCALE 1" = 1'-0"

NOTES:

1. GUSSET PLATE DIMENSIONS ARE BASED ON THE RIVET LAYOUTS SHOWN ON THE 1928 FABRICATION PLANS (ATTACHED). CONTRACTOR SHALL VERIFY ALL DIMENSIONS SHOWN PRIOR TO FABRICATION. PROVIDE 2" MINIMUM CLEARANCE FROM THE CENTERLINE OF HOLES TO EDGE OF GUSSET PLATE (UNLESS NOTED OTHERWISE). V.I.F. INDICATED SOME LOCATIONS FOR EMPHASIS ONLY.
2. DETAILS FOR L0 THRU L4 SHOWN. L5 THRU L9 SIMILAR.
3. FOR FLOOR BEAM CONNECTION DETAILS SEE SHEETS 18 AND 19.
4. GUSSET DETAILS ARE SYMMETRICAL ABOUT ℄ SPAN.
5. REFER TO SHEET 16 FOR LEGEND.

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STATE OF VERMONT
AGENCY OF TRANSPORTATION

Town Of RICHMOND	Bridge No. 31
Highway No. T.H. #1	Log Sta. / Surv. Sta.
TOWN HIGHWAY #1 OVER WINOOSKI RIVER	
STEEL DETAILS 2	
Designed By T. KNIGHT	Drawn By J. SOTER
Checked By G. BOGUE Date 01/09	Bridge Design Supervisor G. BOGUE Date 01/09
PROJECT RICHMOND	PROJECT NO. BHF 0209(5)
CAD Dwg: ...\drawing\z08J132_STEEL DETS.dgn Plot Date: 1/8/2009	
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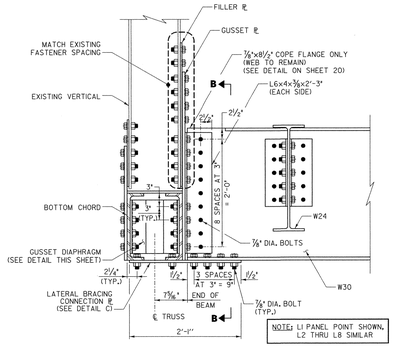
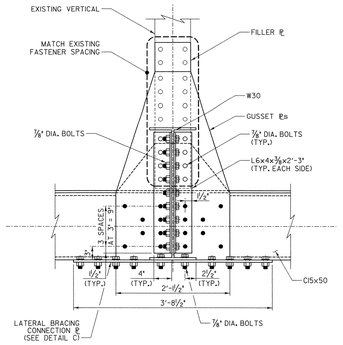


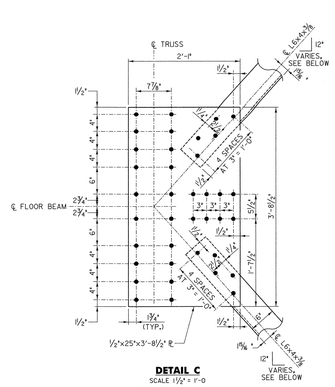
FLOOR BEAM TO TRUSS CONNECTION DETAIL (PB1 THRU FB8)

SCALE 1½" = 1'-0



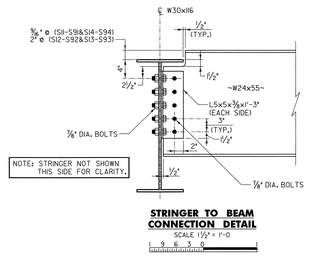
SECTION B–B

SCALE 1½" = 1'-0



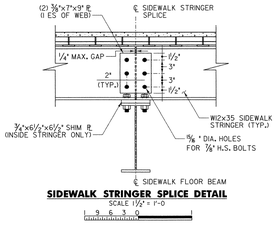
DETAIL C

SCALE 1½" = 1'-0



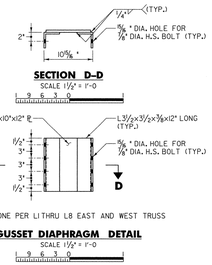
STRINGER TO BEAM CONNECTION DETAIL

SCALE 1½" = 1'-0



SIDEWALK STRINGER SPLICE DETAIL

SCALE 1½" = 1'-0



SECTION D–D

SCALE 1½" = 1'-0

NOTE: ONE PER LITHRU L8 EAST AND WEST TRUSS

GUSSET DIAPHRAGM DETAIL

SCALE 1½" = 1'-0

12"
10⅜" AT LO TO LIAND L8 TO L9
10⅝" AT LITO L8

NOTE:

L REFER TO SHEET 16 FOR LEGEND.

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STATE OF VERMONT
AGENCY OF TRANSPORTATION

Town Of	RICHMOND	Bridge No.	31
Highway No.	T.H. #1	Log Sta.	
		Sta. Sta.	

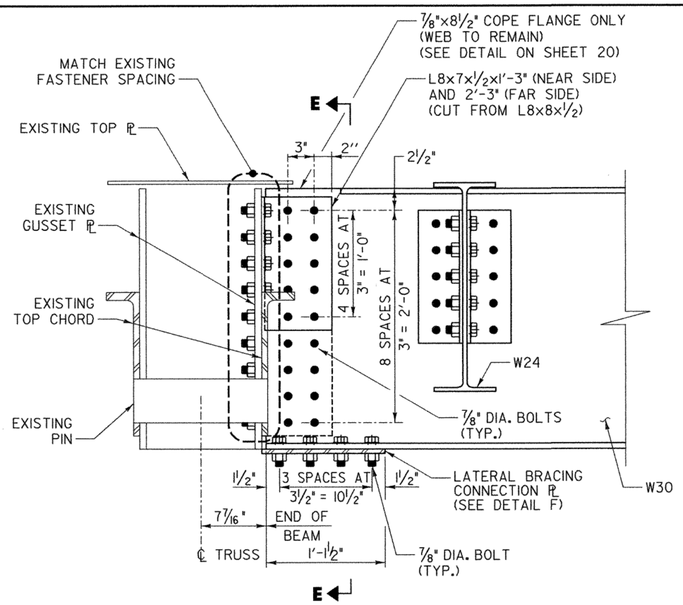
TOWN HIGHWAY #1 OVER WINOOSKI RIVER

STEEL DETAILS 3

Designed By	S. BURBANK	Drawn By	J. SOTER
Checked By	S. BURBANK	Bridge Design Supervisor	C. BOGUE
Date	01/09	Date	01/09
PROJECT	RICHMOND	PROJECT NO.	BHF 0209(15)

CAD Dwgs ...\drawings\38332_STEEL DETS.dgn Plot Date: 1/8/2009

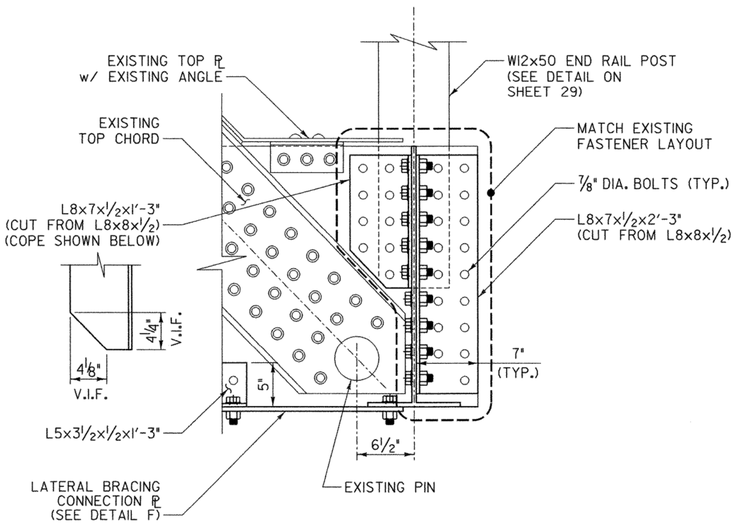
Bridge Sheet No. Sheet 18 of 50



BEAM TO TRUSS CONNECTION DETAIL (FB0 & FB9)

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

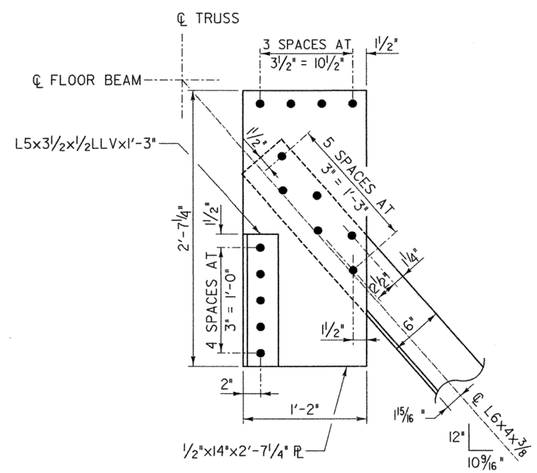
9 6 3 0



SECTION E-E

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

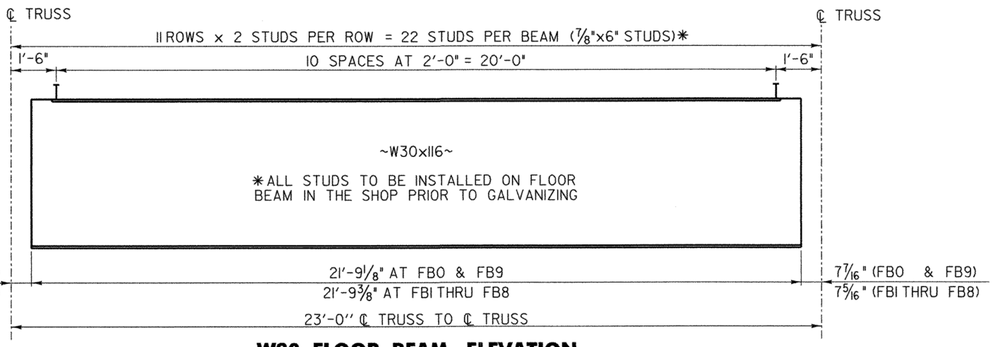
9 6 3 0



DETAIL F

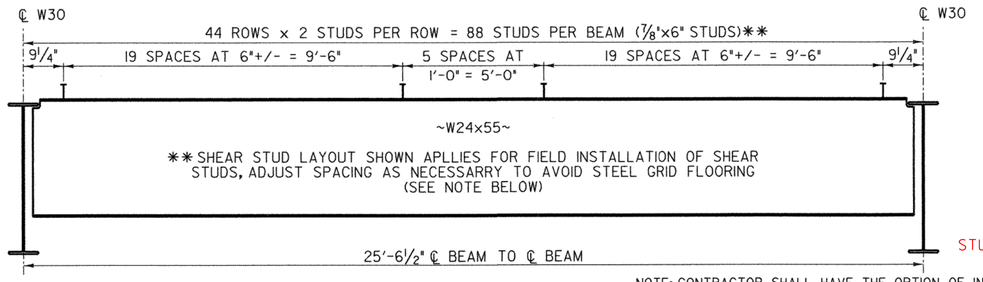
SCALE 1 1/2" = 1'-0"

9 6 3 0



W30 FLOOR BEAM ELEVATION

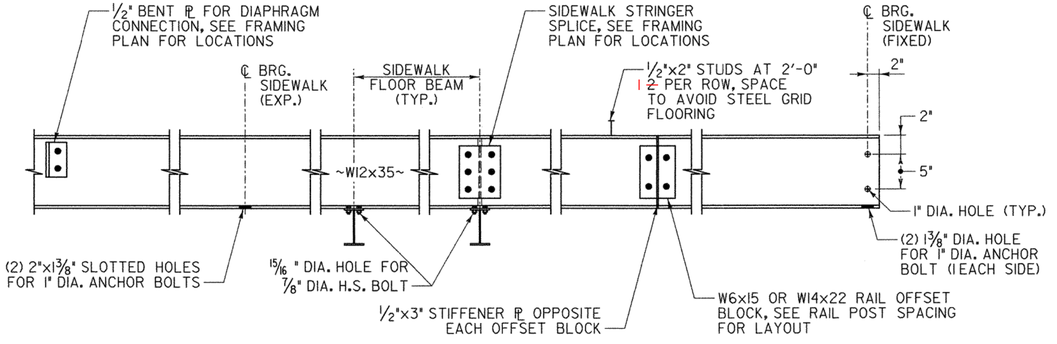
NOT TO SCALE



W24 STRINGER ELEVATION

NOT TO SCALE

NOTE: CONTRACTOR SHALL HAVE THE OPTION OF INSTALLING THE STUDS OF STRINGER IN THE SHOP PRIOR TO GALVANIZING. IF THE CONTRACTOR ELECTS TO SHOP INSTALL THE STUDS, THEY SHALL SUBMIT A REVISED STUD LAYOUT TO AVOID INTERFERENCE WITH THE STEEL GRID FLOORING.

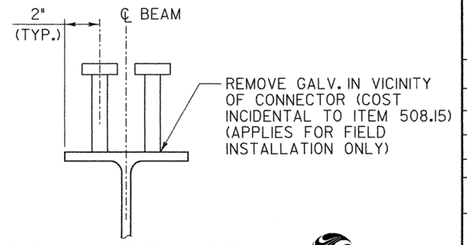


PARTIAL SIDEWALK STRINGER ELEVATION

NOT TO SCALE

NOTE:

1. REFER TO SHEET 16 FOR LEGEND.



SHEAR CONNECTOR DETAIL

NOT TO SCALE

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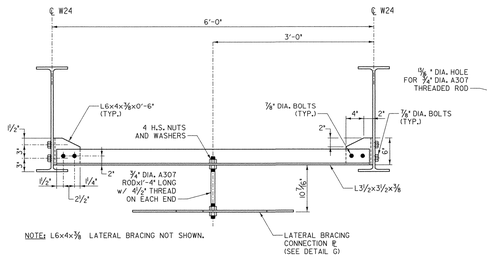
STATE OF VERMONT
AGENCY OF TRANSPORTATION

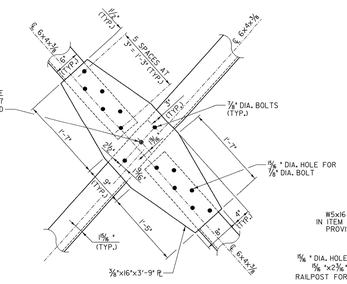
Town Of RICHMOND	Bridge No. 31
Highway No. T.H. #1	Log Sta. / Surv. Sta.
TOWN HIGHWAY #1 OVER WINOOSKI RIVER	
STEEL DETAILS 4	
Designed By S. BURBANK	Drawn By J. SOTER
Checked By S. BURBANK Date 01/09	Bridge Design Supervisor G. BOGUE Date 01/09
PROJECT RICHMOND	PROJECT NO. BHF 0209(5)
CAD Dwg: ...\drawing\z08J132_STEEL DETS.dgn	Plot Date: 1/8/2009
Bridge Sheet No.	Sheet 19 of 50

© BRG



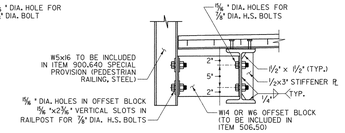
LATERAL BRACE SUPPORT DETAIL

SCALE 1½" = 1'-0



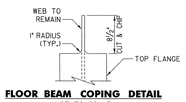
DETAIL G

SCALE 1½" = 1'-0



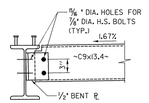
RAIL POST CONNECTION DETAIL

SCALE 1½" = 1'-0



FLOOR BEAM COPING DETAIL

NOT TO SCALE



SIDEWALK DIAPHRAGM CONNECTION DETAIL

SCALE 1½" = 1'-0

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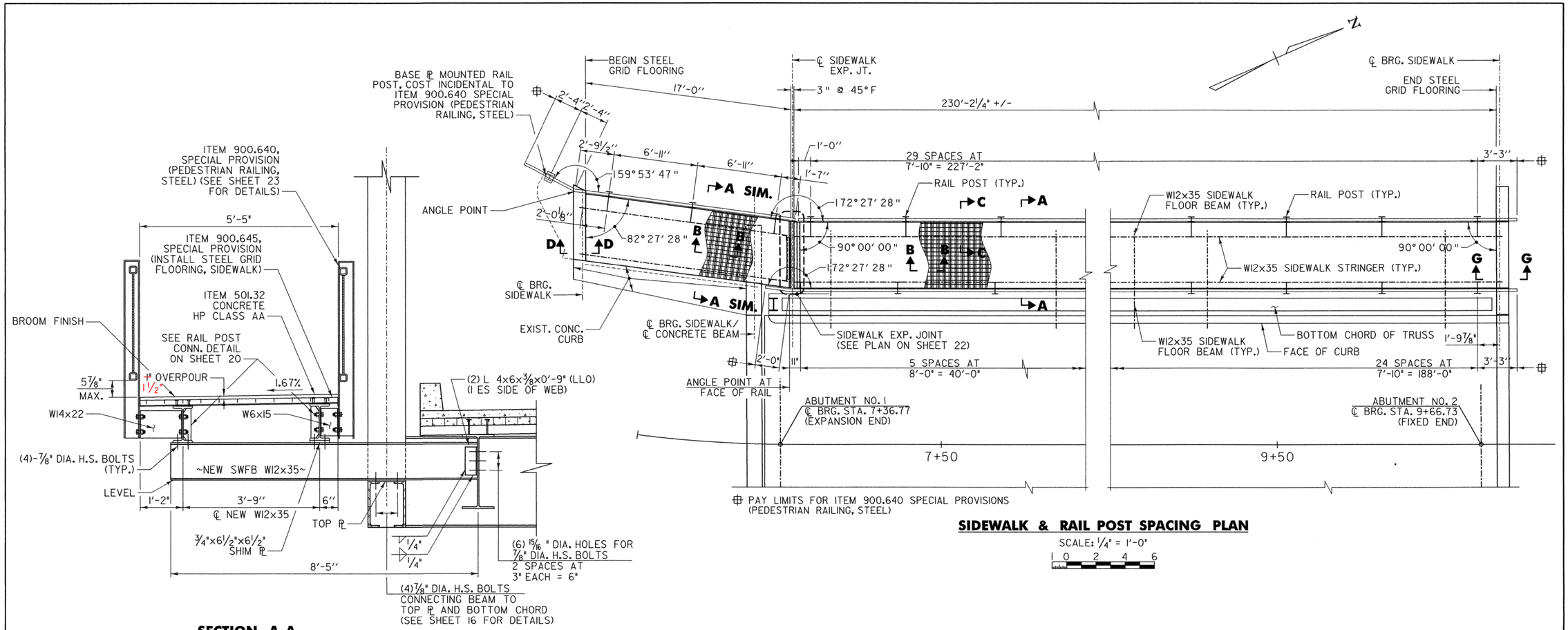
STATE OF VERMONT
AGENCY OF TRANSPORTATION

Town Of RICHMOND	Bridge No. 31
Highway No. T.H. #1	Log Sta. Back Sta.
TOWN HIGHWAY #1 OVER WINOOSKI RIVER	
STEEL DETAILS 5	
Designed By S. BURBANK	Drawn By J. SOTER
Checked By Date S. BURBANK 01/09	Bridge Design Supervisor G. BOGUE Date 01/09
PROJECT RICHMOND	PROJECT NO. BHF 0209(5)
CAD Dwgs ...\drawings\08832-STEEL DETS.dgn Plot Date: 1/8/2009	
Bridge Sheet No.	Sheet 20 of 50



SIDEWALK & RAIL POST SPACING PLAN

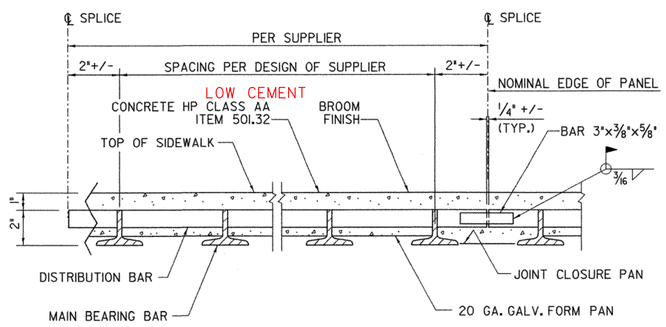
SCALE: ¼" = 1'-0"

0 2 4 6

SECTION A–A

SCALE ¾" = 1'-0"

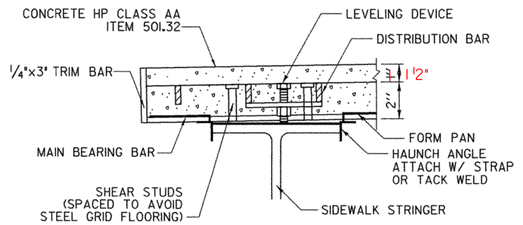
0 1 2



SECTION B–B

SCALE 3" = 1'-0"

9 6 3 0



SECTION C–C

NOT TO SCALE

NOTES:

1. REFER TO SHEET 22 FOR SECTION D-D AND G-G.
2. SIDEWALK DECK POUR SEQUENCE:
   CONCRETE SHALL BE PLACED IN ONE CONTINUOUS POUR WITH A MAXIMUM DURATION OF 8 HOURS. CONCRETE SHALL REMAIN PLASTIC DURING POUR.

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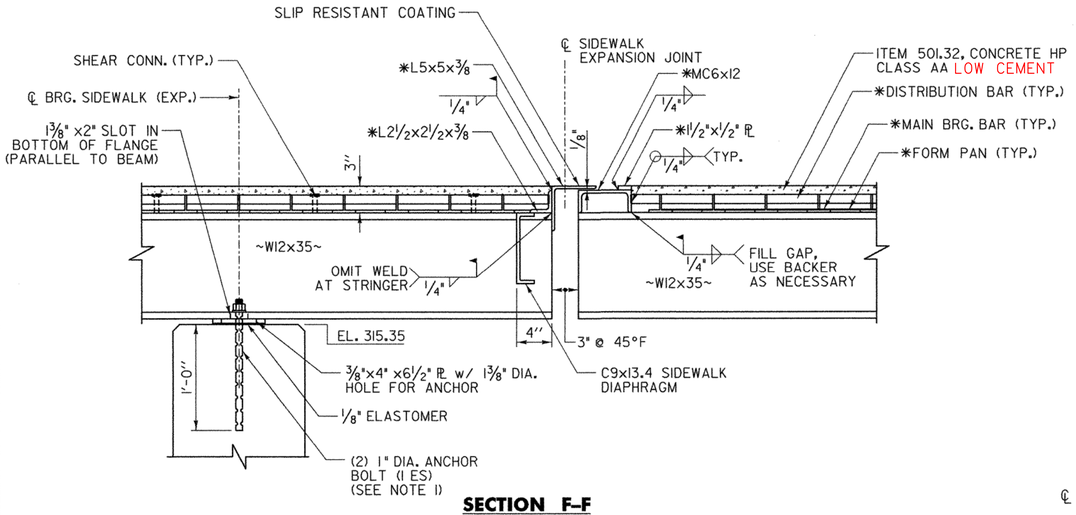
STATE OF VERMONT
AGENCY OF TRANSPORTATION

Town Of RICHMOND	Bridge No. 31
Highway No. T.H. #1	Log Sta. / Surv. Sta.

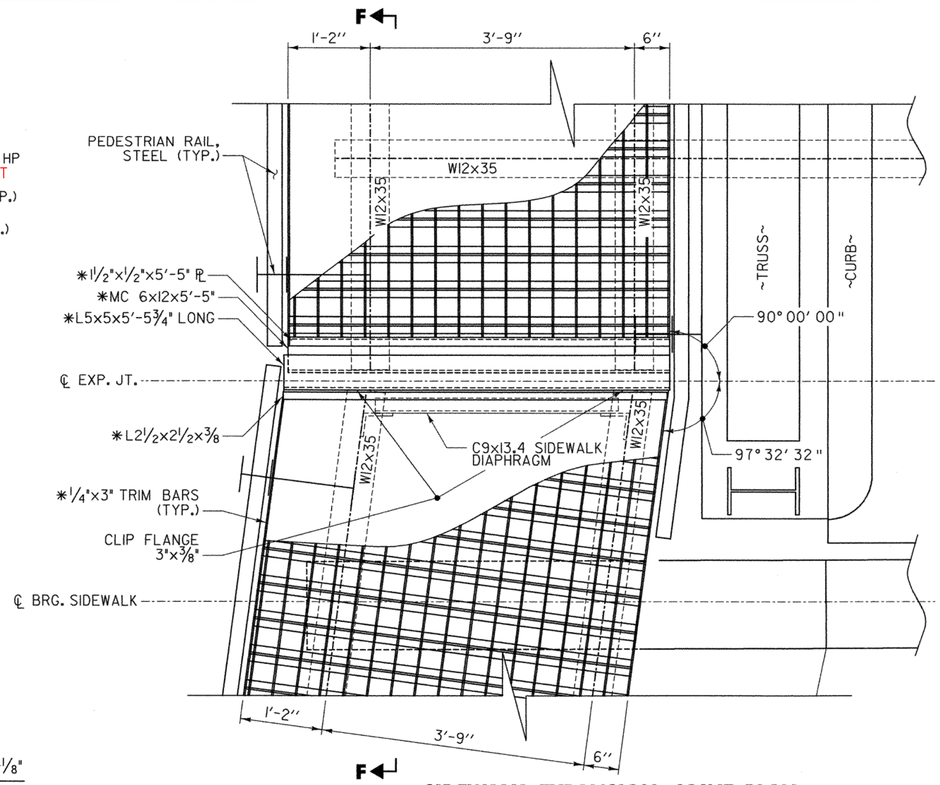
TOWN HIGHWAY #1 OVER WINOOSKI RIVER

SIDEWALK DETAILS 1

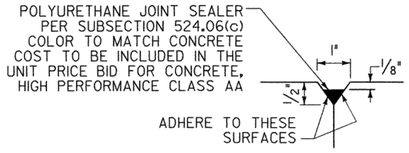
Designed By T. KNIGHT	Drawn By J. SOTER
Checked By T. KNIGHT Date 01/09	Bridge Design Supervisor G. BOGUE Date 01/09
PROJECT RICHMOND	PROJECT NO. BHF 0209(5)
CAD Dwg: ...\z08j132_SIDEWALK_DETS.dgn	Plot Date: 1/8/2009
Bridge Sheet No.	Sheet 21 of 50



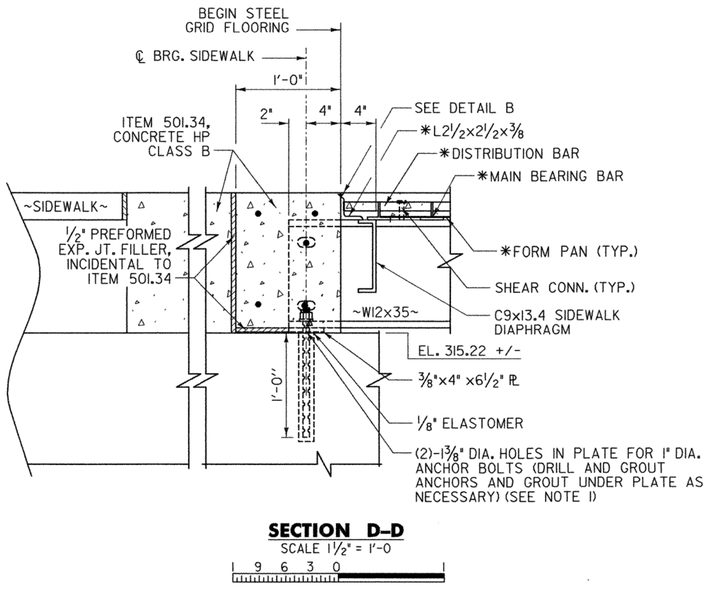
SECTION F-F
SCALE 1½" = 1'-0
9 6 3 0



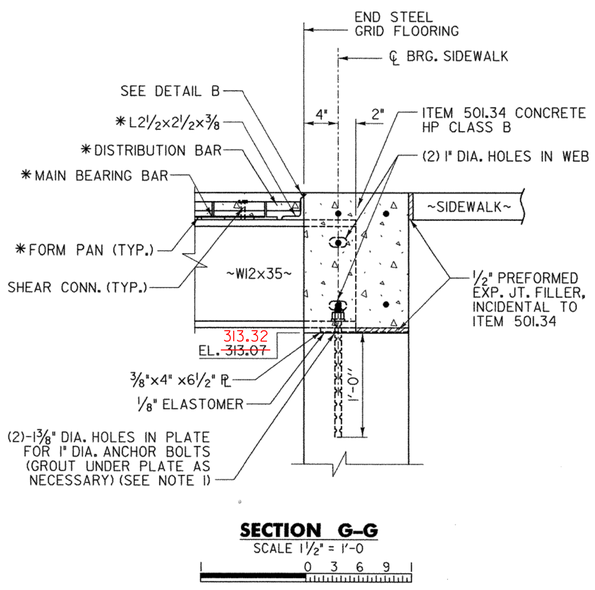
SIDEWALK EXPANSION JOINT PLAN
SCALE 1" = 1'-0"
9 6 3 0 2



DETAIL B
NOT TO SCALE



SECTION D-D
SCALE 1½" = 1'-0
9 6 3 0



SECTION G-G
SCALE 1½" = 1'-0
0 3 6 9

NOTES:

1. ANCHOR BOLTS AND BEARING PLATES SHALL BE IN ACCORDANCE WITH SECTION 531, COST INCIDENTAL TO ITEM 506.50.
2. * = FURNISHED WITH STEEL GRID FLOORING

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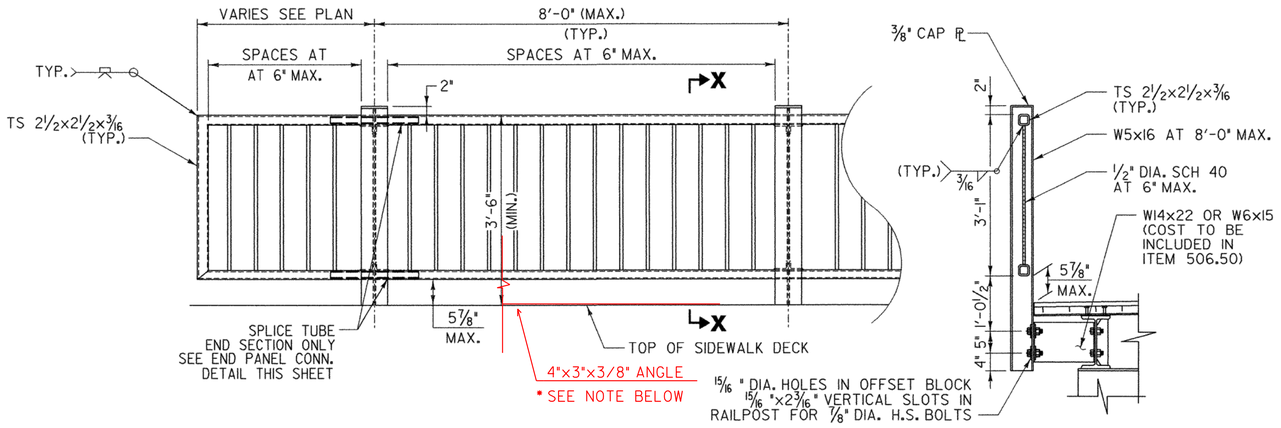
STATE OF VERMONT
AGENCY OF TRANSPORTATION

Town Of RICHMOND	Bridge No. 31
Highway No. T.H. #1	Log Sta. / Surv. Sta.

TOWN HIGHWAY #1 OVER WINOOSKI RIVER

SIDEWALK DETAILS 2

Designed By T. KNIGHT	Drawn By J. SOTER
Checked By T. KNIGHT Date 01/09	Bridge Design Supervisor G. BOGUE Date 01/09
PROJECT RICHMOND	PROJECT NO. BHF 0209(5)
CAD Dwg: ...\z08J132_SIDEWALK_DETS.dgn	Plot Date: 1/8/2009
Bridge Sheet No.	Sheet 22 of 50



PEDESTRIAN RAILING ELEVATION

SCALE: ¾" = 1'-0"

0 1 2

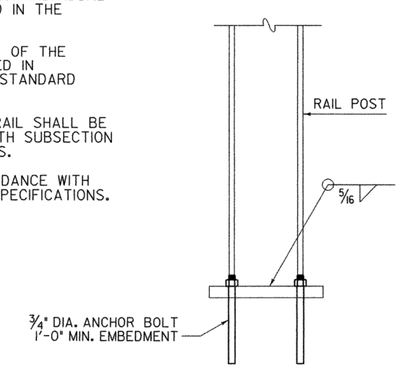
SIDEWALK X-X

SCALE ¾" = 1'-0"

0 1 2

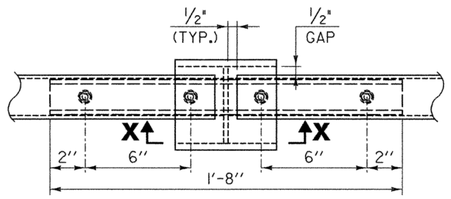
NOTES:

1. ALL STEEL EXCEPT TUBE SECTIONS SHALL CONFORM TO AASHTO M 270M/M 270, GRADE 36.
2. ALL STEEL TUBING SHALL CONFORM TO SUBSECTION 714.11.
3. RAIL SHALL BE FABRICATED SUCH THAT POSTS ARE NORMAL TO GRADE.
4. PANELS SHALL BE FABRICATED SUCH THAT INDIVIDUAL PANELS CAN BE REMOVED AND REPAIRED IN THE FUTURE.
5. FABRICATION DRAWINGS SHOWING DETAILS OF THE PEDESTRIAN RAILING SHALL BE SUBMITTED IN ACCORDANCE WITH SECTION 105 OF THE STANDARD SPECIFICATIONS.
6. ALL COMPONENTS OF THE PEDESTRIAN RAIL SHALL BE HOT DIP GALVANIZED IN ACCORDANCE WITH SUBSECTION 506.15 OF THE STANDARD SPECIFICATIONS.
7. ALL ANCHOR BOLTS SHALL BE IN ACCORDANCE WITH SUBSECTION 714.07 OF THE STANDARD SPECIFICATIONS.



BASE WELD DETAIL

NOT TO SCALE

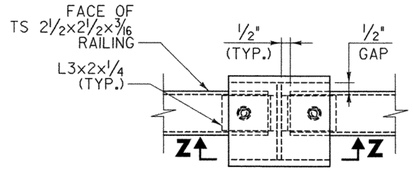


PLAN

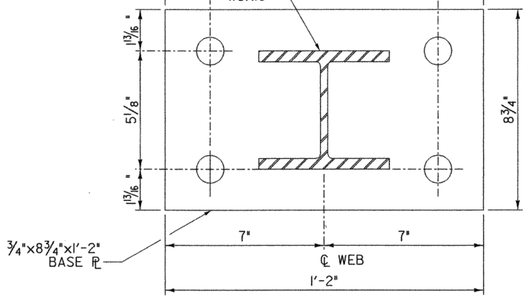
- A 4"x3"x3/8" GALVANIZED ANGLE WAS ADDED TO THE UNDERSIDE OF EACH BOTTOM RAIL FOR SAFETY REASONS

  SEE CHANGE ORDER #6

  ADDITIONAL DEAD LOAD = 4,095.61 lbs

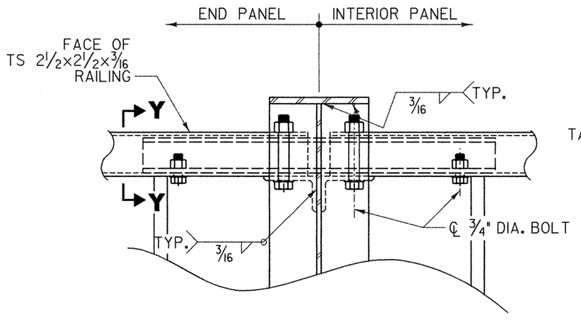


PLAN

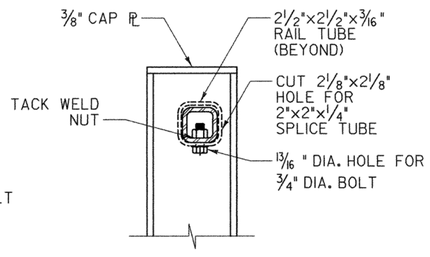


POST & BASE PLATE

NOT TO SCALE



SECTION X-X

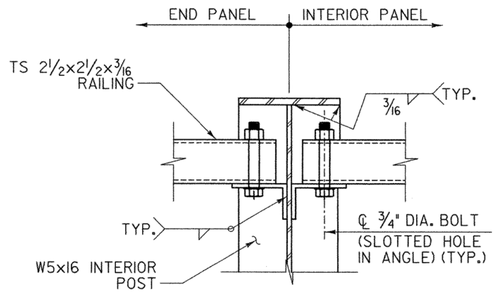


SECTION Y-Y

END PANEL CONNECTION DETAILS

SCALE 3" = 1'-0"

9 6 3 0



SECTION Z-Z

INTERIOR PANEL RAIL CONNECTION DETAILS

SCALE 3" = 1'-0"

9 6 3 0

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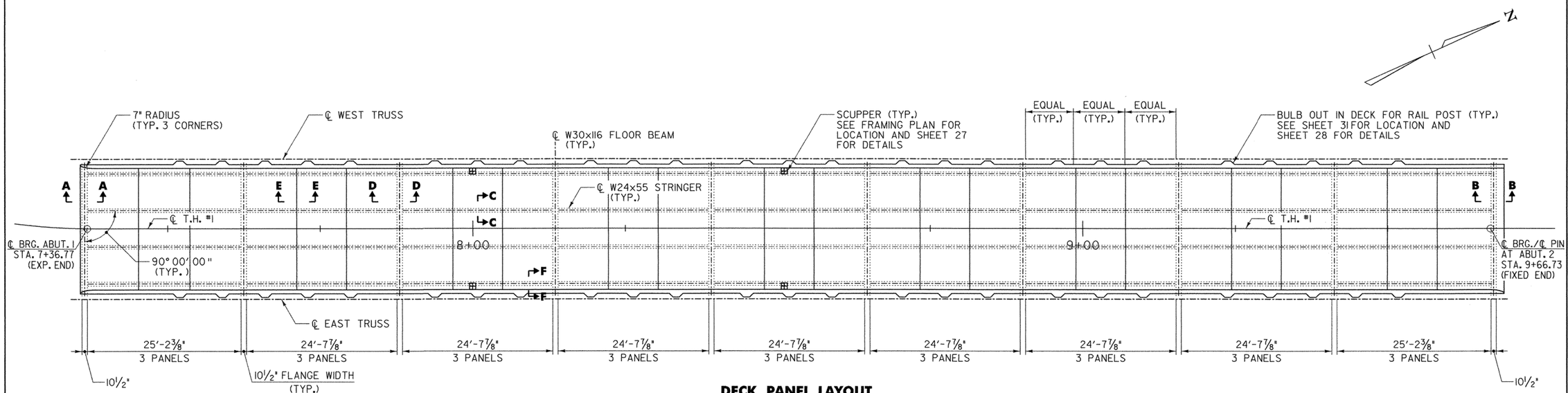
STATE OF VERMONT
AGENCY OF TRANSPORTATION

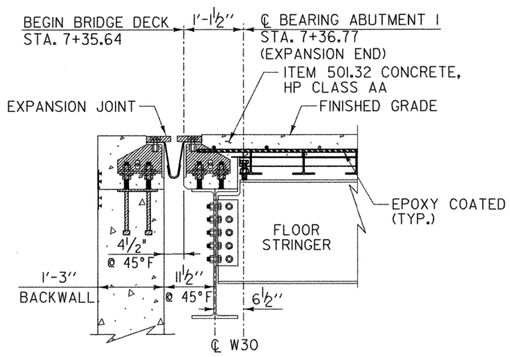
Town Of RICHMOND	Bridge No. 31
Highway No. T.H. #1	Log Sta. / Surv. Sta.
TOWN HIGHWAY #1 OVER WINOOSKI RIVER	
PEDESTRIAN RAILING DETAILS	
Designed By T. KNIGHT	Drawn By J. SOTER
Checked By T. KNIGHT Date 01/09	Bridge Design Supervisor G. BOGUE Date 01/09
PROJECT RICHMOND	PROJECT NO. BHF 0209(5)
CAD Dwg: ...\z08j132_PED RAIL DETS.dgn	Plot Date: 1/8/2009
Bridge Sheet No.	Sheet 23 of 50



DECK PANEL LAYOUT (STEEL GRID FLOORING, BRIDGE)

SCALE: ⅛" = 1'-0"

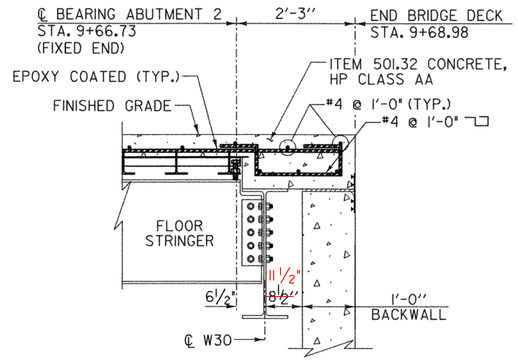
0 2 4 6 8



SECTION A–A

SCALE: ¾" = 1'-0"

0 1 2



SECTION B–B

SCALE: ¾" = 1'-0"

0 1 2

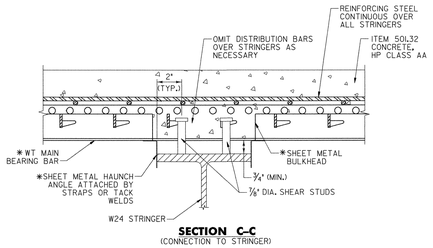
NOTES:

1. FOR SECTIONS C-C, D-D AND E-E REFER TO SHEET 25.
2. FOR SECTIONS F-F REFER TO SHEET 26.
3. REFER TO SHEET 40 FOR ABUTMENT REINFORCEMENT.
4. BRIDGE DECK POUR SEQUENCE: CONCRETE SHALL BE PLACED IN ONE CONTINUOUS POUR WITH A MAXIMUM DURATION OF 8 HOURS. CONCRETE SHALL REMAIN PLASTIC DURING POUR.

Stantec

STATE OF VERMONT
AGENCY OF TRANSPORTATION

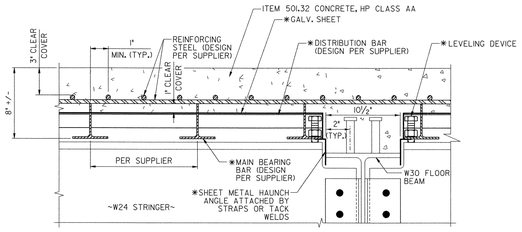
Town Of RICHMOND	Bridge No. 31
Highway No. T.H. #1	Log Sta. / Surv. Sta.
TOWN HIGHWAY #1 OVER WINOOSKI RIVER	
BRIDGE DECK DETAILS 1	
Designed By T. KNIGHT	Drawn By J. SOTER
Checked By T. KNIGHT Date 01/09	Bridge Design Supervisor G. BOGUE Date 01/09
PROJECT RICHMOND	PROJECT NO. BHF 0209(5)
CAD Dwg: ...\z08j132_BRIDGE DECK DETS.dgn	Plot Date: 1/8/2009
Bridge Sheet No.	Sheet 24 of 50



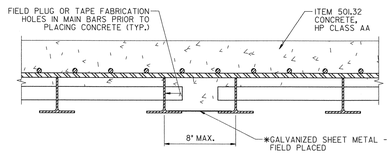
SECTION C–C
(CONNECTION TO STRINGER)

LEVELING BOLTS NOT SHOWN

OMIT DISTRIBUTION BARS OVER STRINGERS AS NECESSARY TO PROVIDE CLEARANCE FOR SHEAR STUDS AND LEVELING BOLTS



SECTION D–D
(TYPICAL SECTION THROUGH DECK)



SECTION E–E
(TYPICAL CONNECTION BETWEEN PANELS)

NOTES:

1. DETAILS NOT TO SCALE.
2. * FURNISHED WITH STEEL GRID DECK.

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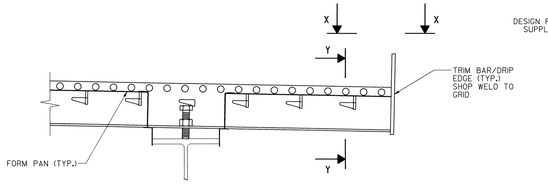
STATE OF VERMONT
AGENCY OF TRANSPORTATION

Town Of	RICHMOND	Bridge No.	31
Highway No.	T.H. #1	Log Sta.	
		Conn.Sta.	

TOWN HIGHWAY #1 OVER WINOOSKI RIVER

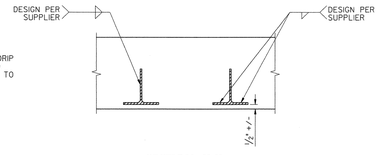
BRIDGE DECK DETAILS 2

Designed By T. KNIGHT		Drawn By J. SOTER	
Checked By T. KNIGHT	Date 01/09	Bridge Design Supervisor C. BOGLE	Date 01/09
PROJECT	RICHMOND	PROJECT NO.	BHF 020915)
CAD Dwgs ...\208332.BRIDGE DECK DETS.dgn		Plot Date: 1/8/2009	
Bridge Sheet No.		Sheet 25 of 50	



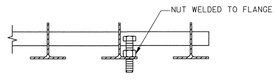
SECTION F–F

(CONCRETE AND REINFORCEMENT NOT SHOWN FOR CLARITY)



SECTION Y–Y

TYPICAL CONNECTION OF TRIM PLATE TO GRID

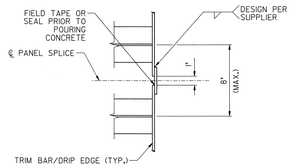


BOLTS AND NUTS SHALL BE ¾" DIA. ASTM A307 AND A563, RESPECTIVELY.

USE THREE PER SUPPORTING BEAM PER PANEL FOR TYPICAL PANELS UP TO 9' WIDE. DEVICES TO BE LOCATED ON FIRST INTERIOR MAIN BAR AND ON A BAR AT OR CLOSE TO THE PANEL CENTERLINE.

BOLTS CAN BE LOCATED ON EITHER SIDE OF THE WEB OF A MAIN BAR. WHEN POSITIONING THE GRID PANEL HORIZONTALLY, USE A CRANE TO KEEP THE FULL DEAD LOAD OFF OF THE LEVELING BOLTS.

LEVELING DEVICE DETAIL



SECTION X–X

TYPICAL PLAN VIEW AT PANEL SPLICE

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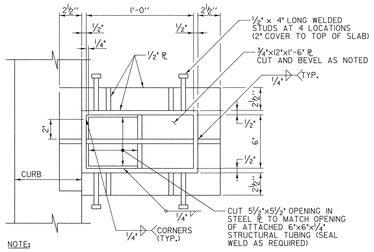
STATE OF VERMONT
AGENCY OF TRANSPORTATION

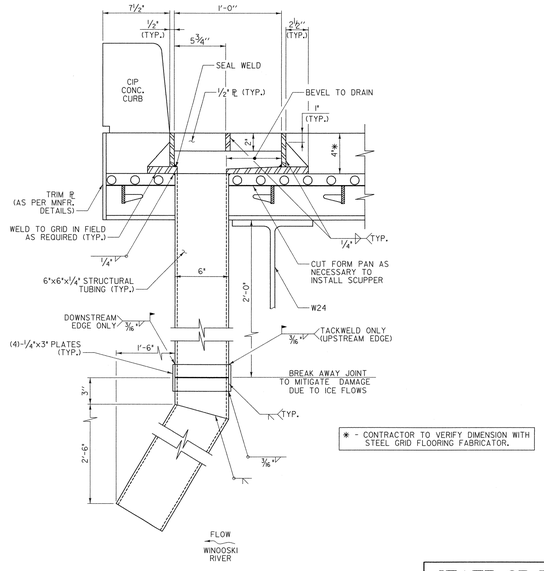
Town Of RICHMOND	Bridge No. 31
Highway No. T.H. #1	Log Sta. / Curv.Sta.
TOWN HIGHWAY #1 OVER WINOOSKI RIVER	
BRIDGE DECK DETAILS 3	
Designed By T. KNIGHT	Drawn By J. SOTER
Checked By T. KNIGHT Date 01/09	Bridge Design Supervisor G. BOGUE Date 01/09
PROJECT RICHMOND	PROJECT NO. BHF 020915)
CAD Dwgs ...\x08332_BRIDGE DECK DETS.dgn	Plot Date: 1/8/2009
Bridge Sheet No.	Sheet 26 of 50



NOTE:

THE TOP SURFACE OF THE SCUPPER SHALL BE SLOPED TO MATCH THE ROADWAY FINISHED GRADE.

SCUPPER PLAN
NOT TO SCALE



* - CONTRACTOR TO VERIFY DIMENSION WITH STEEL GRID FLOORING FABRICATOR.

SCUPPER SECTION
NOT TO SCALE

STATE OF VERMONT
AGENCY OF TRANSPORTATION

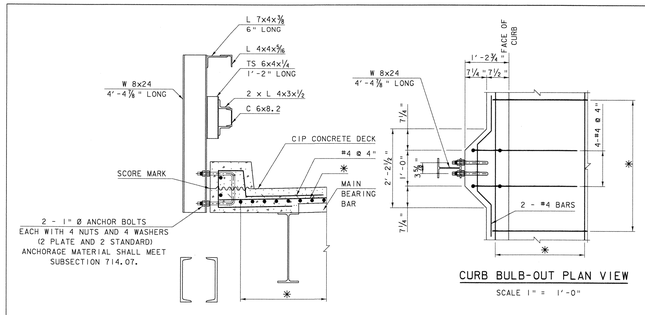
Town Of RICHMOND	Bridge No. 31
Highway No. TH# M	Log Sta. Orig. Sta.

TOWN HIGHWAY #1 OVER WINOOSKI RIVER

SCUPPER DETAILS

Designed By T. KNIGHT	Drawn By J. SOTER
Checked By T. KNIGHT — Date 01/09	Bridge Design Supervisor G. BOGGIE — Date 01/09
PROJECT RICHMOND	PROJECT NO. BHF 0209(5)
CAD Dwgs ...\drawings\208332_SCUPPER.dgn	Plot Date: 1/8/2009
Bridge Sheet No.	Sheet 27 of 50

Stantec



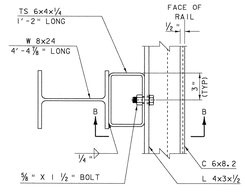
CURB & RAILING DETAIL AT BULB-OUT

SCALE 1" = 1'-0"

CURB BULB-OUT PLAN VIEW

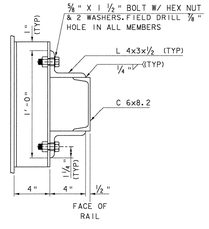
SCALE 1" = 1'-0"

✱REINFORCING STEEL IN THE DECK WILL BE DETERMINED BY THE GRID MANUFACTURER



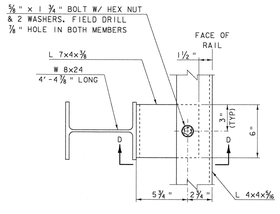
SECTION "A-A"

SCALE 3" = 1'-0"



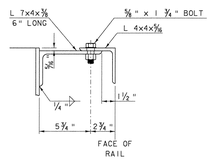
SECTION "B-B"

SCALE 3" = 1'-0"



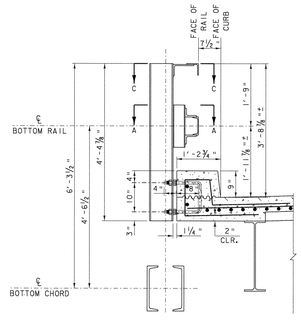
SECTION "C-C"

SCALE 3" = 1'-0"



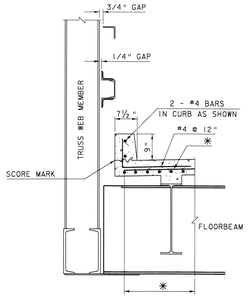
SECTION "D-D"

SCALE 3" = 1'-0"



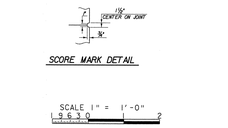
CURB & RAILING DIMENSIONS AT BULB-OUT

SCALE 1" = 1'-0"



TYPICAL CURB DETAIL

SCALE 1" = 1'-0"



SCORE MARK DETAIL

SCALE 1" = 1'-0"

9 6 3 0 2

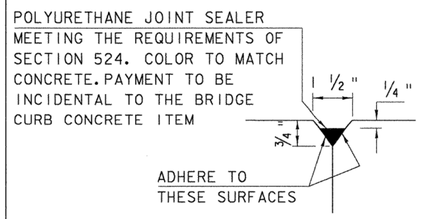
SCALE 3" = 1'-0"

9 6 3 0

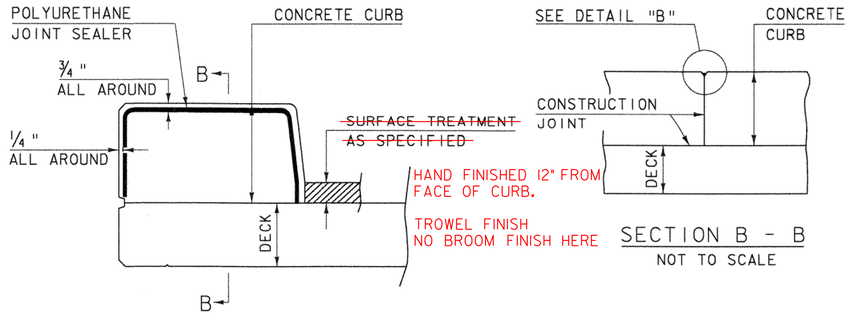
SEE CURB JOINT SECTION ON SHEET 29
SEE BRIDGE RAILING NOTES ON PAGE 31

STATE OF VERMONT
AGENCY OF TRANSPORTATION

Town Of RICHMOND	Bridge No. 31
Highway No. T.H. #1	Log Sta. / Surv. Sta.
TOWN HIGHWAY #1 OVER WINOOSKI RIVER	
CURB AND RAILING DETAILS	
Designed By C.P. WILLIAMS	Drawn By D.D. BEARD
Checked By C.P. WILLIAMS Date 12/10/08	Bridge Design Supervisor G. BOGUE Date
PROJECT RICHMOND	PROJECT NO. BHF 0209(5)
CAD Dwg\Structures\s08332_Railing.dgn	Plot Date 07-JAN-2009
Bridge Sheet No.	Sheet 28 of 50



DETAIL "B"
NOT TO SCALE



SECTION B - B
NOT TO SCALE

CONCRETE CURB JOINT SECTION
NOT TO SCALE

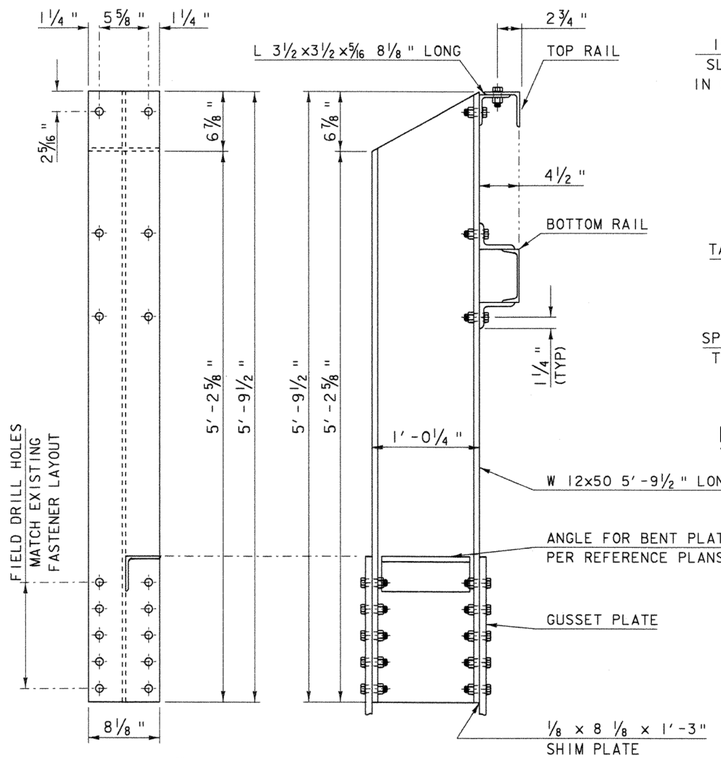
CONCRETE CURB JOINT NOTES

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.

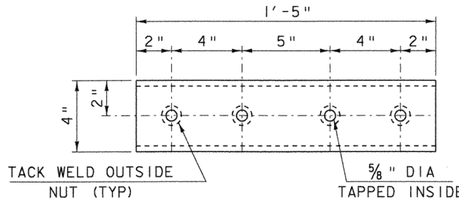
2. IF THE CONTRACTOR CHOOSES NOT TO USE AN APPROVED SHRINKAGE REDUCING ADMIXTURE, THE CURBS SHALL BE CONSTRUCTED WITH CONSTRUCTION JOINTS SPACED AT A MAXIMUM OF 15'-0" CENTER TO CENTER AND 2'-0" MINIMUM FROM THE CENTER OF NEAREST BRIDGE RAILING POST.

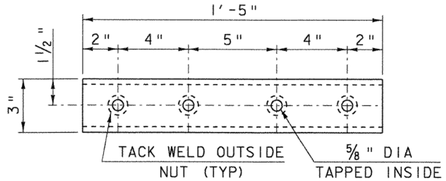
3. WHEN CURB JOINTS ARE USED THE CURBS SHALL BE PLACED IN ALTERNATE SECTIONS WITH A MINIMUM OF 48 HOUR DELAY BETWEEN ADJACENT PLACEMENTS.

4. LONGITUDINAL REINFORCING SHALL BE CONTINUOUS THROUGH CURB CONSTRUCTION JOINTS.



END RAIL POST
SCALE 1 1/2 " = 1'-0"
ALL HOLES SHALL BE FIELD DRILLED UNLESS OTHERWISE NOTED.

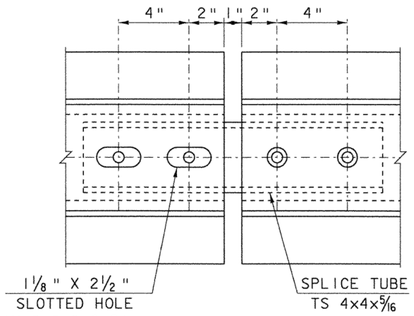




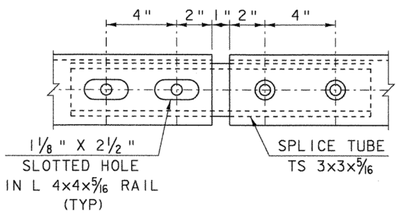
BOTTOM RAIL SPLICE TUBE DETAIL

TOP RAIL SPLICE TUBE DETAIL

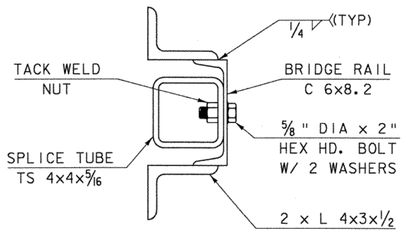
TS 4x4x5/16
SCALE 3" = 1'-0"



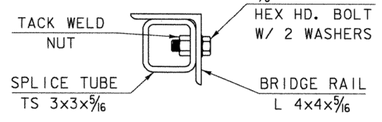
TS 3x3x5/16
SCALE 3" = 1'-0"



BOTTOM RAIL SPLICE DETAIL
SCALE 3" = 1'-0"



TOP RAIL SPLICE DETAIL
SCALE 3" = 1'-0"



BOTTOM RAIL SPLICE SECTION
SCALE 3" = 1'-0"

TOP RAIL SPLICE SECTION
SCALE 3" = 1'-0"

NOTE: BOLTS IN SLOTTED HOLES SHALL BE SNUG TIGHT AND COATED TO PREVENT LOOSENING

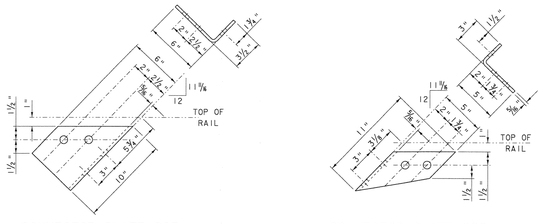
SCALE 1 1/2 " = 1'-0"
1 9 6 3 0 1

SCALE 3" = 1'-0"
1 9 6 3 0 1

SEE BRIDGE RAILING NOTES ON SHEET 31

STATE OF VERMONT
AGENCY OF TRANSPORTATION

Town Of RICHMOND	Bridge No. 31
Highway No. T.H. #1	Log Sta. / Surv. Sta.
TOWN HIGHWAY #1 OVER WINOOSKI RIVER	
RAIL SPLICE & END RAIL DETAILS	
Designed By C.P. WILLIAMS	Drawn By D.D. BEARD
Checked By C.P. WILLIAMS Date 12/19/08	Bridge Design Supervisor G. BOGUE Date
PROJECT RICHMOND	PROJECT NO. BHF 0209 (5)
CAD Dwg:\Structures\s08J132_Railing.dgn	Plot Date:07-JAN-2009
Bridge Sheet No.	Sheet 29 of 50

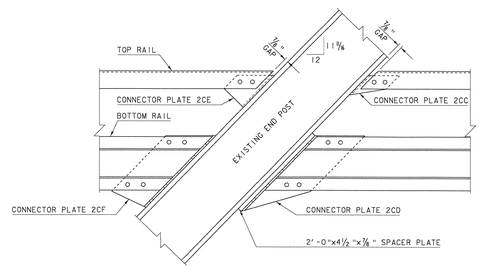


CONNECTOR PLATE 2CE

L 6x3½x⅝ - 0'-10" LONG
SCALE 3" = 1'-0"

CONNECTOR PLATE 2CC

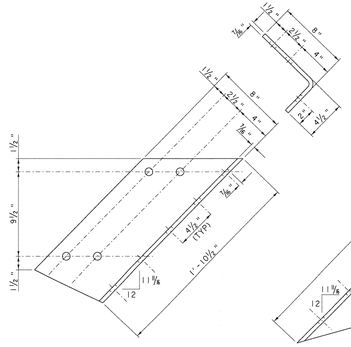
L 5x3x⅝ - 0'-11" LONG
SCALE 3" = 1'-0"



RAIL CONNECTOR DETAIL

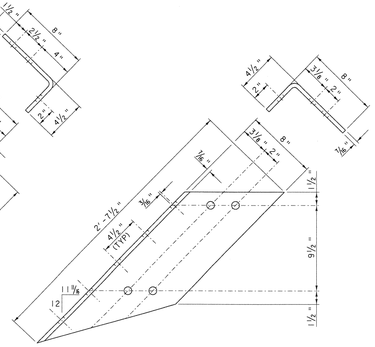
N.T.S.

THE DETAILS ON THIS SHEET ARE INTENDED TO CLARIFY THE INFORMATION FROM THE REFERENCE SHEETS. THE INTENT IS TO USE NEW MATERIAL TO DUPLICATE THE EXISTING CONNECTION. ANY CONFLICTS BETWEEN THIS INFORMATION AND THE REFERENCE PLANS SHALL BE BROUGHT TO THE ATTENTION OF THE RESIDENT ENGINEER IMMEDIATELY.



CONNECTOR PLATE 2CF

L 8x4½x⅞ - 1'-10½" LONG
SCALE 3" = 1'-0"



CONNECTOR PLATE 2CD

L 8x4½x⅞ - 2'-7½" LONG
SCALE 3" = 1'-0"

NOTE:

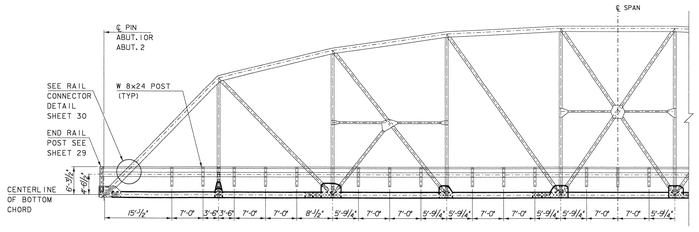
ALL HOLES SHALL BE FIELD DRILLED UNLESS OTHERWISE NOTED.

SCALE 3" = 1'-0"
9 6 3 0

SEE BRIDGE RAILING NOTES ON SHEET 31

STATE OF VERMONT
AGENCY OF TRANSPORTATION

Town Of RICHMOND	Bridge No. 31
Highway No. T.H. #1	Log Sta. Surv. Sta.
TOWN HIGHWAY #1 OVER WINOOSKI RIVER	
RAIL CONNECTOR DETAILS	
Designed By C.P. WILLIAMS	Drawn By D.D. BEARD
Checked By C.P. WILLIAMS Date 12/19/08	Bridge Design Supervisor G. BOGUE Date
PROJECT RICHMOND	PROJECT NO. BHF 0209 (5)
CAD Dwg=\Structures\s08332_Railing.dgn	Plot Date=07-JAN-2009
Bridge Sheet No.	Sheet 30 of 50



RAILING ELEVATION

(TRUSS IS SYMMETRICAL
ABOUT CENTER OF SPAN)
SCALE: 1/8" = 1'-0"

0 2 4 6 8

BRIDGE RAILING NOTES

1. THE TRUSS RAILING SHALL BE PAID FOR UNDER ITEM 900.640 "SPECIAL PROVISION (BRIDGE RAILING, TRUSS)" TO THE LIMITS SHOWN ON THE PLANS.

2. ALL STEEL TRUSS RAILING COMPONENTS SHALL BE GALVANIZED IN ACCORDANCE WITH 506.15(A). QUENCHING OF THE GALVANIZED STEEL SHALL NOT BE ALLOWED.

3. THE COST TO MODIFY THE STEEL GRID PANELS TO CONSTRUCT THE RAILING BULB-OUT SHALL BE INCIDENTAL TO THE GRID ITEM. THIS WILL INCLUDE CUTTING, TRIMMING, OR REMOVING ALL PLATES AND GALVANIZED PANS, REPAIRING CUT ENDS AS NECESSARY, AND FOR ALL NECESSARY CONCRETE FORMING.

4. FOR ADDITIONAL INFORMATION ON THE RAIL POST ANCHORAGE, SEE STANDARD DRAWING SB-R6-82.

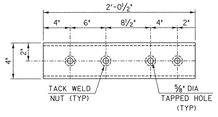
5. ALL BRIDGE RAILING MATERIAL, WITHIN THE LIMITS SHOWN ON THE PLANS, SHALL BE GRADE 36 STEEL, IN ACCORDANCE WITH SUBSECTION 732.03.

6. SECTIONS OF RAIL SHALL BE ATTACHED TO A MINIMUM OF THREE POSTS.

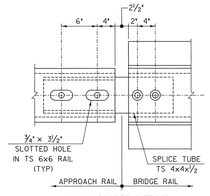
7. SPLICE LOCATIONS SHALL BE DETERMINED BY THE FABRICATOR. SPLICES SHALL NOT OCCUR IN RAILING SPANS GREATER THAN 7 FEET.

STATE OF VERMONT
AGENCY OF TRANSPORTATION

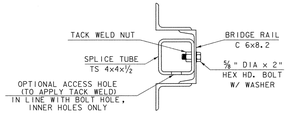
Town OF RICHMOND	Bridge No. 31
Highway No. T.H. #1	Log Sta.
	Surv. Sta.
TOWN HIGHWAY #1 OVER WINOOSKI RIVER	
RAILING POSTS LAYOUT	
Designed By C.P. WILLIAMS	Drawn By D.D. BEARD
Checked By C.P.W. Date 12/19/08	Bridge Design Supervisor G. BOGUE Date
PROJECT RICHMOND	PROJECT NO. BHF 0209(5)
CAD Dwg:\Structures\s083132_Railing.dgn	Plot Date:07-JAN-2009
Bridge Sheet No.	Sheet 31 of 50



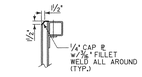
SPLICE TUBE DETAIL
TS 4x4x⅜
NOT TO SCALE



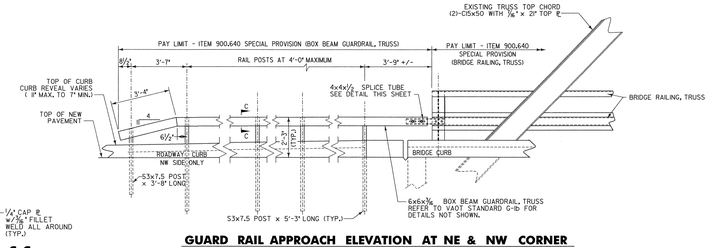
RAIL SPLICE DETAIL
NOT TO SCALE



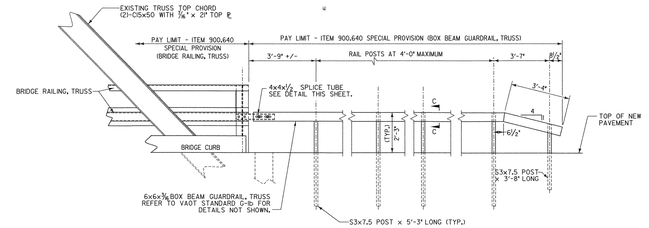
RAIL SPLICE SECTION
NOT TO SCALE



SECTION C–C
SCALE ¾"= 1'-0"



GUARD RAIL APPROACH ELEVATION AT NE & NW CORNER
SCALE ½"= 1'-0"



GUARD RAIL APPROACH ELEVATION AT SE CORNER
SCALE ½"= 1'-0"

APPROACH RAIL NOTES

1. ALL WORK AND MATERIALS SHALL CONFORM TO SECTIONS 525 AND 621 OF THE STANDARD SPECIFICATIONS.
2. TUBING SHALL MEET THE REQUIREMENTS OF SUBSECTION 732.03. ALL OTHER SHAPES AND PLATES SHALL BE AASHTO M 270M/M 270 GRADE 36.
3. ALL EXPOSED CUT OR SHEARED EDGES SHALL BE ROUNDED TO A ⅛" RADIUS AND BE FREE OF BURRS.
4. SECTIONS OF RAIL SHALL BE ATTACHED TO A MINIMUM OF THREE (3) POSTS.
5. ALL PARTS SHALL BE GALVANIZED.

Stantec

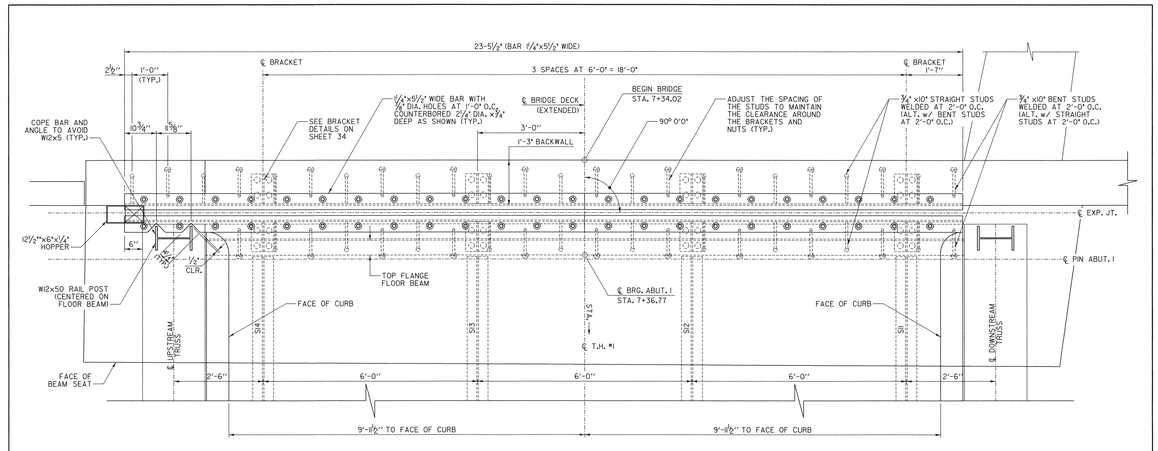
STATE OF VERMONT
AGENCY OF TRANSPORTATION

Town Of RICHMOND	Bridge No. 31
Highway No. T.H. #1	Log Sta.
	Sorv. Sta.

TOWN HIGHWAY #1 OVER WINOOSKI RIVER

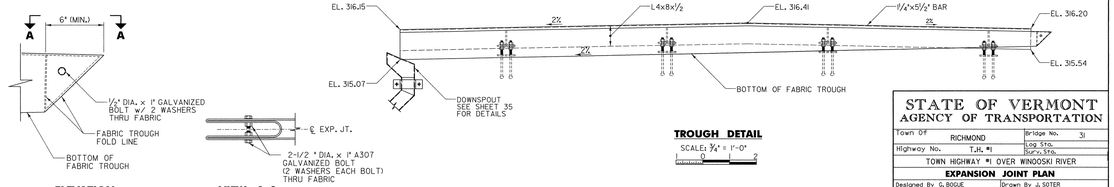
APPROACH RAIL DETAILS

Designed By T. KNIGHT	Drawn By J. SOTER
Checked By Date T. KNIGHT 01/09	Bridge Design Supervisor G. BOGUE Date 01/09
PROJECT RICHMOND	PROJECT NO. BHF 0209(5)
CAD Dwgs ...\drawings\c08332_AppRailDgn	Plot Date: 1/8/2009
Bridge Sheet No.	Sheet 32 of 50



EXPANSION JOINT PLAN

SCALE 1" = 1'-0"



ELEVATION **VIEW A-A**

FOLDED TROUGH END DETAILS

NOT TO SCALE

TROUGH DETAIL

SCALE: ¾" = 1'-0"

Stantec

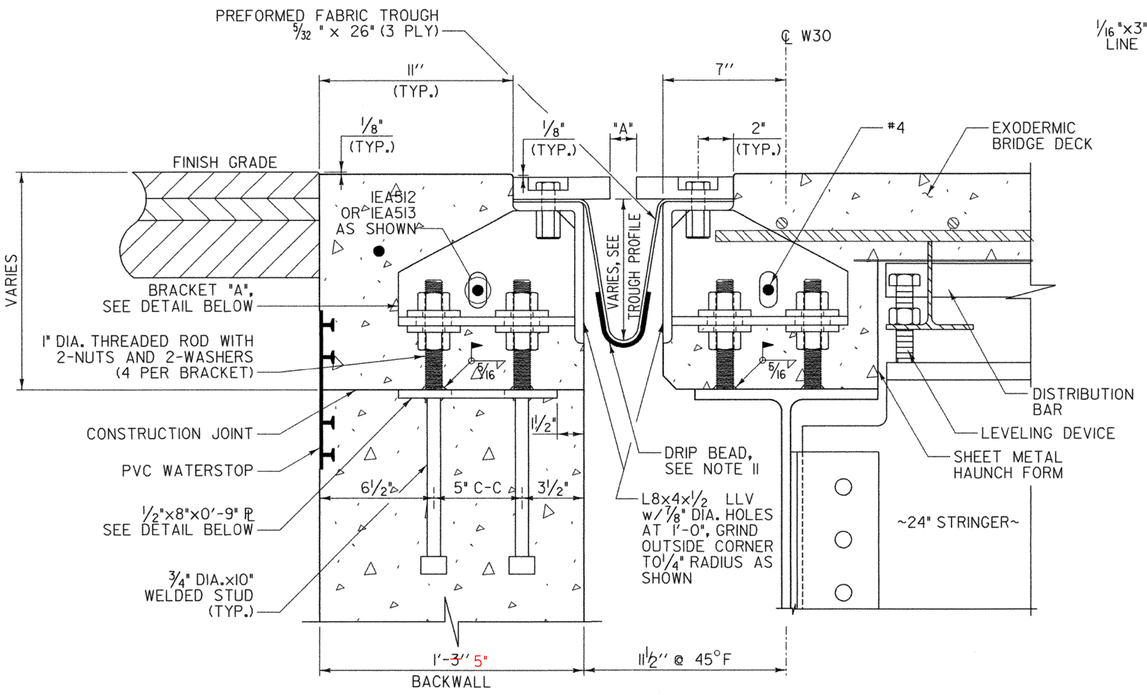
STATE OF VERMONT
AGENCY OF TRANSPORTATION

Town Of	RICHMOND	Bridge No.	31
Highway No.	T.H. #1	Log Sta. Back Sta.	

TOWN HIGHWAY #1 OVER WINOOSKI RIVER

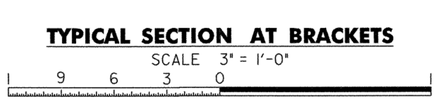
EXPANSION JOINT PLAN

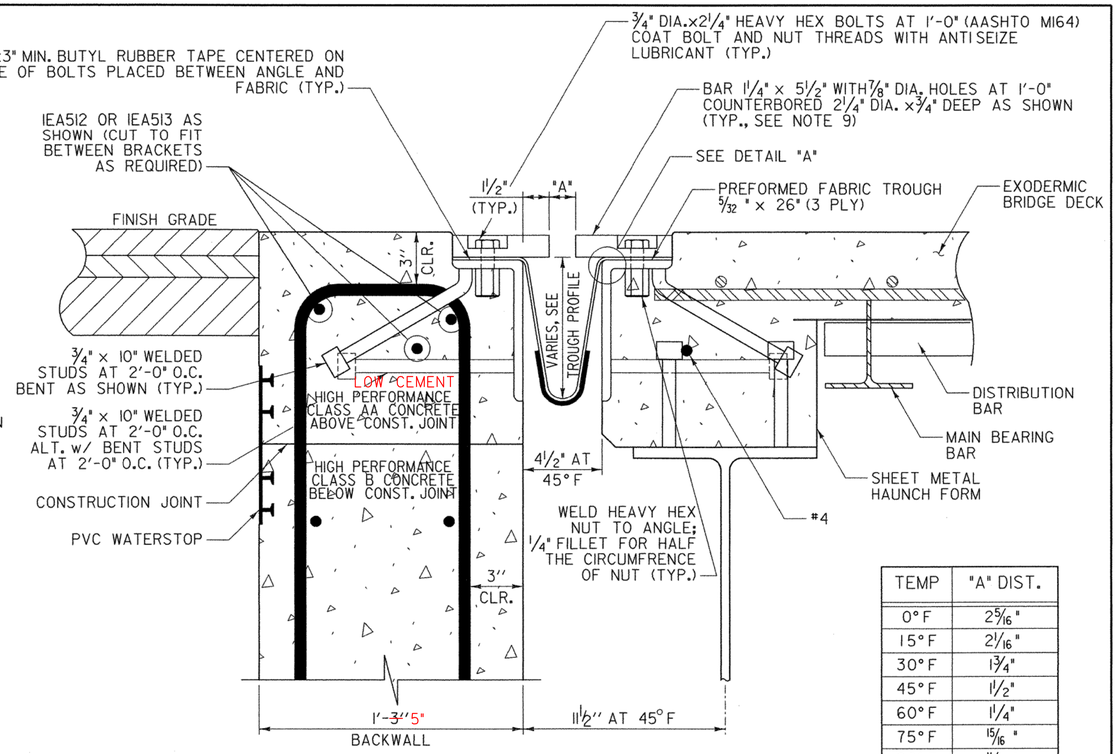
Designed By G. BOGUE		Drawn By J. SOTER	
Checked By G. BOGUE	Date 04/09	Bridge Design Supervisor G. BOGUE	Date 04/09
PROJECT RICHMOND		PROJECT NO. BHF 0209(5)	
CAD Dwgs ...\drawings\c08332_EXPJT_PLN.dgn Plot Date: 08/2009			
Bridge Sheet No.		Sheet 33 of 50	



TYPICAL SECTION AT BRACKETS

SCALE 3" = 1'-0"

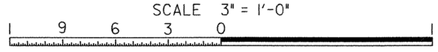




TEMP	"A" DIST.
0°F	2 5/16"
15°F	2 1/16"
30°F	1 3/4"
45°F	1 1/2"
60°F	1 1/4"
75°F	15/16"
90°F	11/16"
105°F	7/16"

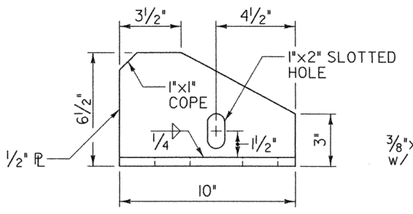
TYPICAL SECTION BETWEEN BRACKETS

SCALE 3" = 1'-0"

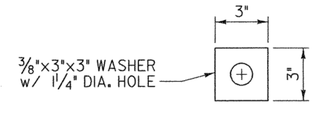


NOTES:

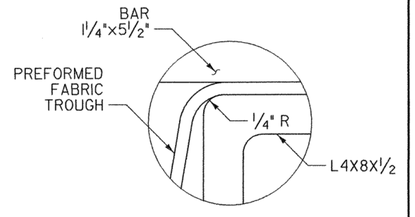
1. DETAILS ON SHEETS 33 AND 34 ARE FOR ITEM 516.11, "BRIDGE EXPANSION JOINT, VERMONT".
2. THE PREFORMED FABRIC MATERIAL SHALL BE CONTINUOUS AND SHALL CONFORM TO SUBSECTION 707.07.
3. BUTYL RUBBER TAPE SHALL CONFORM TO SUBSECTION 707.12.
4. THE FINAL FINISH OF THE EXPANSION DEVICE SHALL BE COVERED DURING THE PLACING OF BRIDGE DECK CONCRETE.
5. ALL STEEL COMPONENTS SHALL BE AASHTO M 270 GRADE 36 GALVANIZED OR METALIZED AS PER SUBSECTION 506.15, UNLESS OTHERWISE SPECIFIED. THREADED RODS SHALL CONFORM TO ASTM A307, GRADE C. THE NUTS FOR THE THREADED RODS SHALL BE ASTM A563.
6. THE ITEM 516.11, "BRIDGE EXPANSION JOINT, VERMONT" SHALL INCLUDE THE FABRICATION AND ERECTION OF THE COMPLETE JOINT ASSEMBLY INCLUDING ALL STEEL PLATES, BRACKETS, ANGLES, WELDED STUDS OR RODS, PREFORMED FABRIC DRAIN TROUGH MATERIAL, BUTYL RUBBER TAPE AND ANY OTHER MISCELLANEOUS MATERIAL NECESSARY TO INSTALL JOINT.
7. THE 8"x4"x1/2" ANGLES SHALL BE FURNISHED AS ONE CONTINUOUS PIECE. THE 1 1/4" X 5 1/2" BARS EACH SIDE OF THE JOINT SHALL BE PROVIDED IN FOUR EQUAL LENGTHS.
8. COAT CONCRETE CONTACT SURFACES WITH EPOXY BONDING COMPOUND. PAYMENT SHALL BE INCLUDED IN THE UNIT PRICE BID FOR ITEM 516.11 "BRIDGE EXPANSION JOINT, VERMONT".
9. FILL COUNTER BORED HOLES WITH HOT POURED JOINT SEALER AFTER BOLT INSTALLATION. PAYMENT FOR THE WORK SHALL BE INCIDENTAL TO ITEM 516.11.
10. PAYMENT FOR WATERSTOP SHALL BE INCIDENTAL TO CONTRACT ITEM 501.34.
11. A DRIP BEAD OF 1/4" X 7" STRIP OF PREFORMED MATERIAL SHALL BE CEMENTED TO THE BOTTOM OF THE FABRIC TROUGH USING AN ADHESIVE APPROVED BY THE MANUFACTURER. THE DRIP BEAD SHALL BE APPLIED 1" FROM THE DOWNSPOUT END OF THE TROUGH.
12. FABRIC TROUGH SHALL BE THOROUGHLY CLEANED AND FLUSHED AFTER PAVING OPERATION
13. THE EXPANSION JOINT SHALL BE SHOP ASSEMBLED AND SHIPPED AS ONE UNIT.
14. PROJECTING THREADS OF THE 3/4" BOLTS IN THE JOINT SHALL BE GREASED BY CONTRACTOR PRIOR TO PLACING ADJACENT CONCRETE. THIS WILL FACILITATE BOLT REMOVAL IF REQUIRED IN THE FUTURE.
15. ALL EXPOSED CUT OR SHEARED EDGES SHALL BE ROUNDED TO A 1/16" RADIUS AND BE FREE OF BURRS PRIOR TO GALVANIZING.



BRACKET ELEVATION

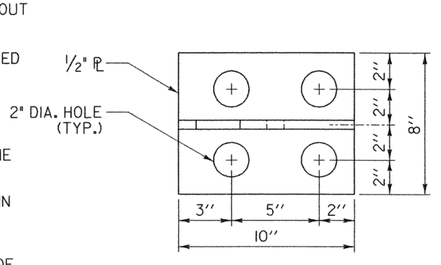


WASHER FOR BRACKET

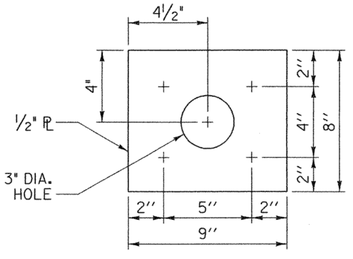


DETAIL A

NOT TO SCALE



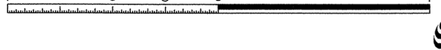
BRACKET PLAN



WASHER FOR BRACKET

BRACKET DETAILS

SCALE 3" = 1'-0"



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STATE OF VERMONT
AGENCY OF TRANSPORTATION

Town Of RICHMOND	Bridge No. 31
Highway No. T.H. #1	Log Sta. / Surv. Sta.

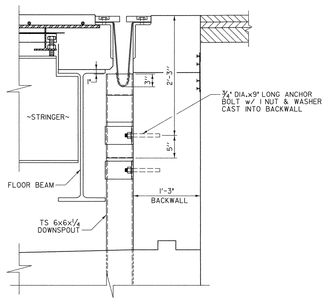
TOWN HIGHWAY #1 OVER WINOOSKI RIVER

EXPANSION JOINT DETAILS

Designed By G. BOGUE	Drawn By J. SOTER
Checked By G. BOGUE — Date 01/09	Bridge Design Supervisor G. BOGUE — Date 01/09
PROJECT RICHMOND	PROJECT NO. BHF 0209(5)

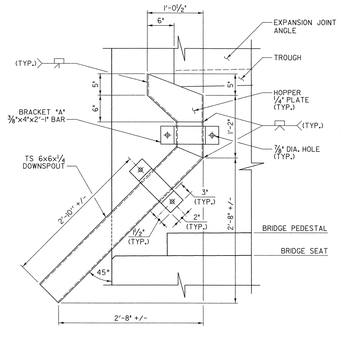
CAD Dwg: ...\z08J132_EXPJT_DETS_EXODERM.dgn Plot Date: 1/9/2009

Bridge Sheet No. — Sheet 34 of 50



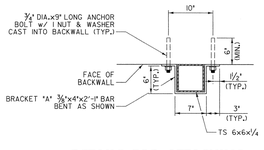
DOWNSPOUT SECTION

SCALE 1½" = 1'-0



DOWNSPOUT ELEVATION

SCALE 1½" = 1'-0



DETAILS FOR ATTACHING DOWNSPOUT TO ABUTMENT

SCALE 1½" = 1'-0

NOTES:

1. STRUCTURAL STEEL TUBING SHALL CONFORM TO ASTM A-500 GRADE B.
2. ALL PLATES, BARS, AND ANGLES SHALL CONFORM TO AASHTO M270 GRADE 36.
3. DOWNSPOUTS SHALL BE GALVANIZED IN ACCORDANCE WITH VAOT STANDARD SPECIFICATIONS FOR CONSTRUCTION SECTION 506J5 (b).
4. ALL BOLTS AND RELATED HARDWARE SHALL BE ASTM A-307 AND SHALL BE GALVANIZED IN ACCORDANCE WITH AASHTO M 232M/M 232.
5. ANY PLACE WHERE THE GALVANIZING HAS BEEN REMOVED FROM THE DOWNSPOUT EITHER BY CUTTING, BURNING, WELDING, PLACING, OR ANY OTHER MEANS, IT SHALL BE REPAIRED BY THOROUGHLY CLEANING THE DAMAGED AREAS WITH A WIRE BRUSH AND PAINTING THE DAMAGED AREAS WITH AN APPROVED SEALANT.
6. HOPPER, DOWNSPOUT, AND BRACKETS SHALL BE PAID FOR UNDER THE ITEM 506.60 "STRUCTURAL STEEL".

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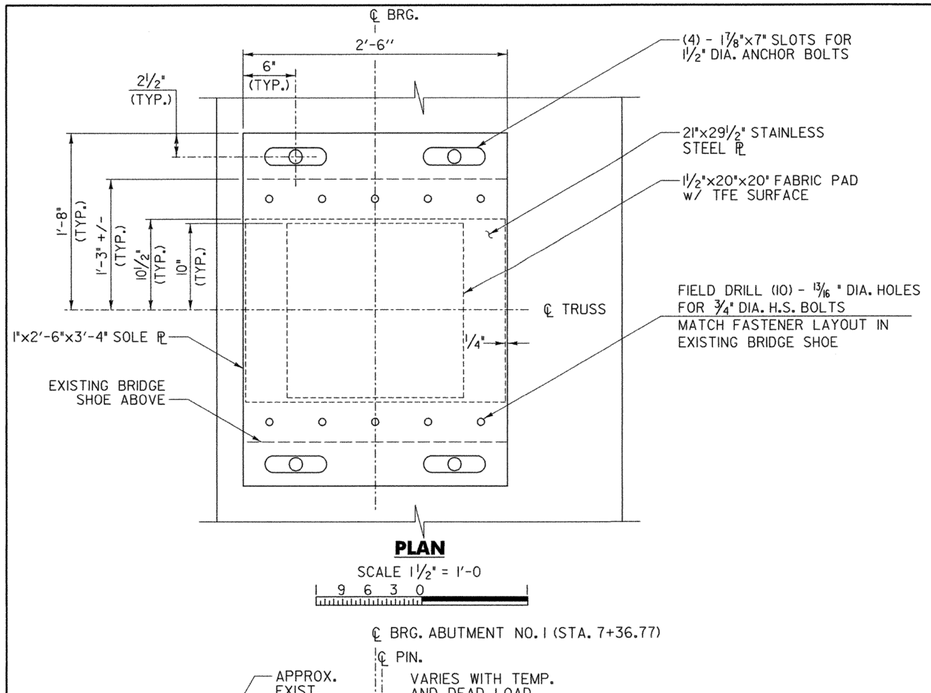
STATE OF VERMONT
AGENCY OF TRANSPORTATION

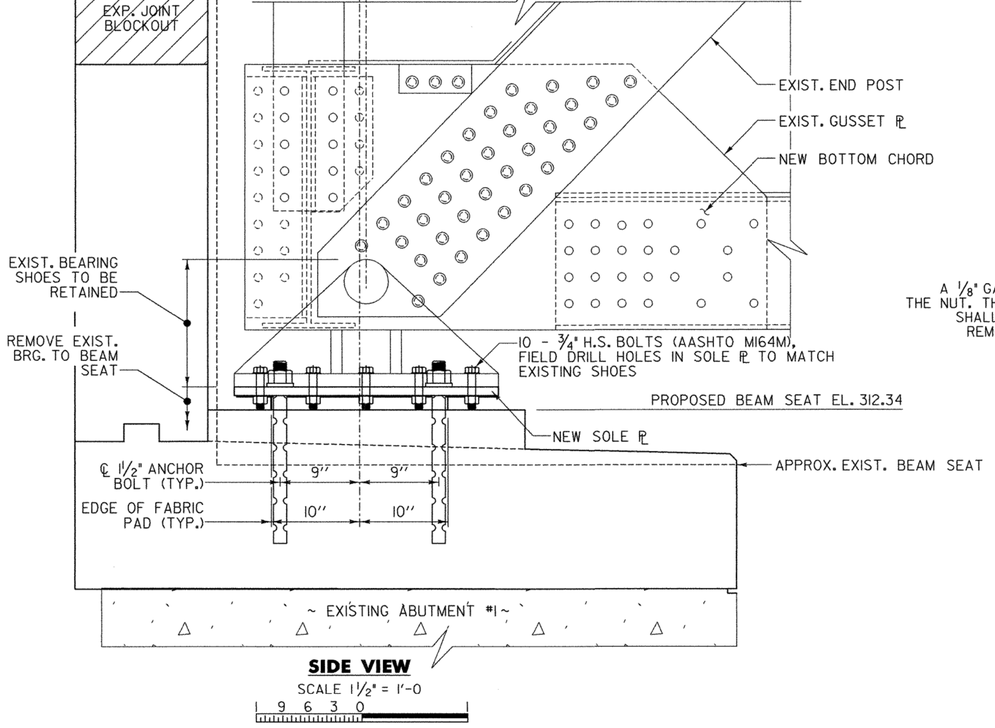
Town Of RICHMOND	Bridge No. 31
Highway No. T.H. #1	Log Sta. Exp. Sta.
TOWN HIGHWAY #1 OVER WINOOSKI RIVER	
DOWNSPOUT DETAILS	
Designed By T. KNIGHT	Drawn By J. SOTER
Checked By Date	Bridge Design Supervisor
T.T. KNIGHT 01/09	C. BOGUE Date 01/09
PROJECT RICHMOND	PROJECT NO. BHF 0209(5)
CAD Dwgs ...\drawing\c08332_da.dgn	Plot Date: 1/8/2009
Bridge Sheet No.	Sheet 35 of 50



PLAN

SCALE 1½" = 1'-0

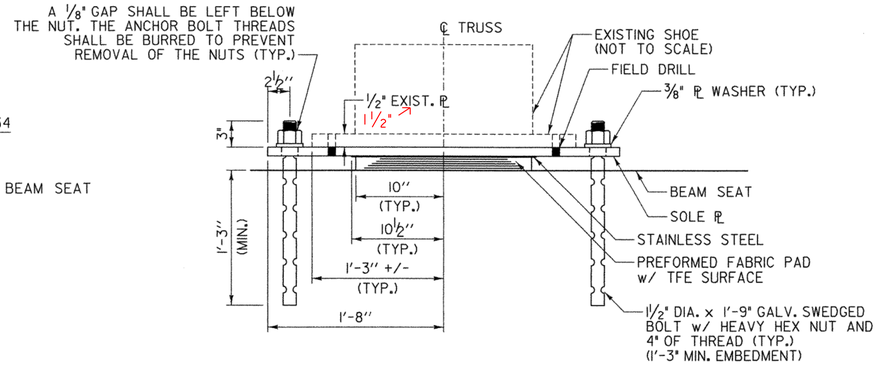
9 6 3 0



SIDE VIEW

SCALE 1½" = 1'-0

9 6 3 0



FRONT VIEW

SCALE 1½" = 1'-0

9 6 3 0

BEARING NOTES:

1. INSTALL BEARINGS IN ACCORDANCE WITH SECTION 531 AND 731 OF VAOT STANDARD SPECIFICATIONS AS MODIFIED BY SPECIAL PROVISION 900.620, "SPECIAL PROVISION (INSTALL BEARING DEVICE ASSEMBLY)"
2. THE CONCRETE SURFACE UNDER THE BEARING DEVICE SHALL BE LEVEL.
3. ANCHOR BOLTS SHALL HAVE A MINIMUM OF 1'-3" EMBEDMENT INTO THE CONCRETE.
4. AREAS OF DAMAGED GALVANIZING SHALL BE REPAIRED IN ACCORDANCE WITH SECTION 513. AREAS OF DAMAGED METALIZING SHALL BE REPAIRED WITH THE SAME SEALANT USED BY THE BEARING SUPPLIER.
5. EXISTING BEARING PIN SHALL BE MADE FREE AND GREASED AND SHOE TO BE SET PLUMB PRIOR TO PLACING NEW BEARINGS, COST INCLUDED IN ITEM 900.620, "SPECIAL PROVISION (INSTALL BEARING DEVICE ASSEMBLY)".
6. PORTIONS OF EXISTING BEARING TO REMAIN SHALL BE CLEANED AND PRIMED. FOLLOWING INSTALLATION OF THE BEARING COMPONENTS, ALL STEEL COMPONENTS EXCEPT STAINLESS SHALL BE GREASED. ALL IN ACCORDANCE WITH SECTION 513 OF THE STANDARD SPECIFICATIONS, COST INCIDENTAL TO ITEM 900.620, "SPECIAL PROVISION (INSTALL BEARING DEVICE ASSEMBLY)".
7. PAYMENT FOR ANCHOR BOLTS, NUTS, WASHERS AND THEIR INSTALLATIONS SHALL BE INCIDENTAL TO ITEM 900.620, "SPECIAL PROVISION (INSTALL BEARING DEVICE ASSEMBLY)".

Stantec

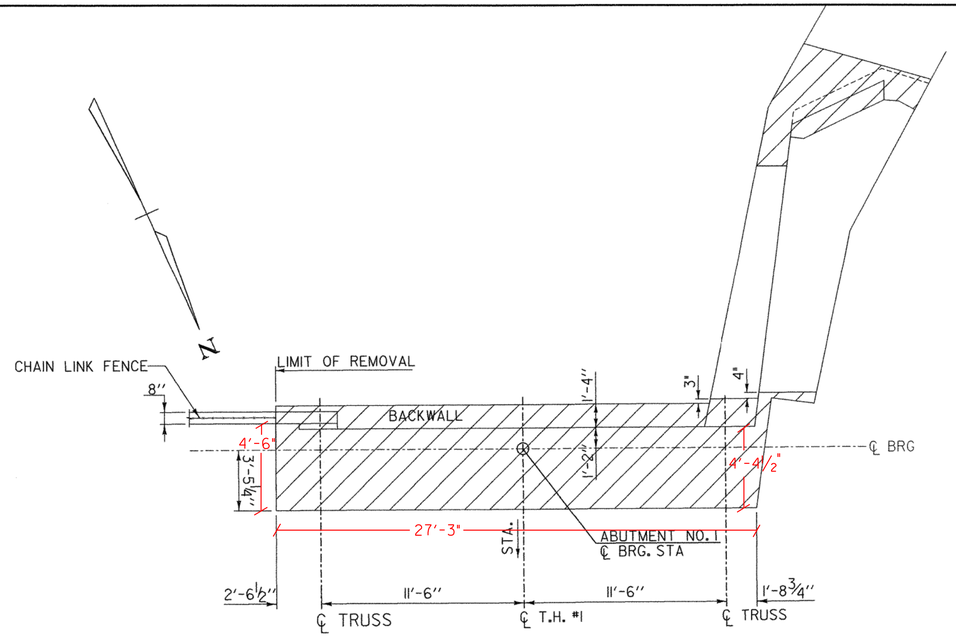
STATE OF VERMONT
AGENCY OF TRANSPORTATION

Town Of RICHMOND	Bridge No. 31
Highway No. T.H. #1	Log Sta. / Surv. Sta.

TOWN HIGHWAY #1 OVER WINOOSKI RIVER

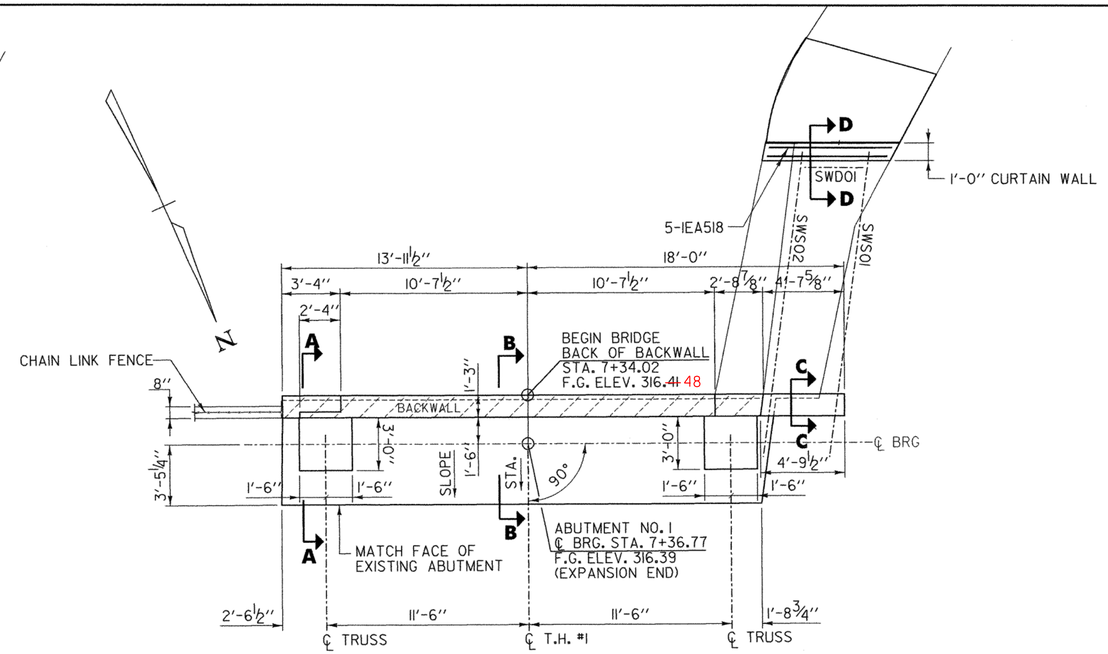
ABUTMENT No. 1 BEARING DETAILS

Designed By T. KNIGHT	Drawn By J. SOTER
Checked By T. KNIGHT — Date 01/09	Bridge Design Supervisor G. BOGUE — Date 01/09
PROJECT RICHMOND	PROJECT NO. BHF 0209(5)
CAD Dwg: ...\drawing\z0831132_brgs.dgn	Plot Date: 1/8/2009
Bridge Sheet No.	Sheet 36 of 50



EXISTING PLAN

SCALE 1/4 " = 1'-0"

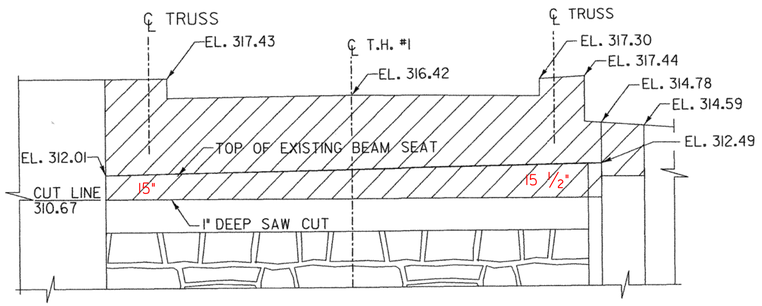


PROPOSED PLAN

SCALE 1/4 " = 1'-0"

NOTES:

1. FOR SECTIONS A-A, B-B, AND C-C SEE SHEET 39.
2. FOR SECTION D-D SEE SHEET 22.



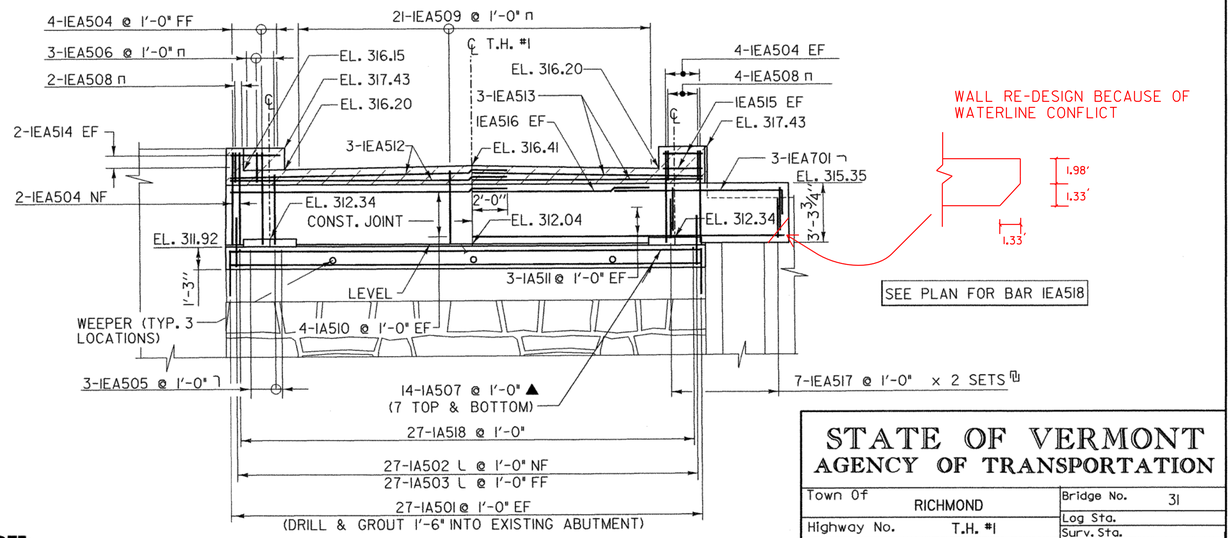
EXISTING ELEVATION

SCALE 1/4 " = 1'-0"

EXISTING CONCRETE REMOVAL NOTES:

▨ EXISTING CONCRETE TO BE REMOVED

ALL CONCRETE REMOVAL AS DETAILED SHALL BE PAID FOR UNDER ITEM 529.25, "REMOVAL OF CONCRETE OR MASONRY"



NOTE:

NF = NEAR FACE
FF = FAR FACE
EF = EACH FACE
▲ = CUT TO FIT IN FIELD
2" CLEAR UNLESS SHOWN OTHERWISE
▨ EXPANSION JOINT BLOCKOUT

PROPOSED ELEVATION

SCALE 1/4 " = 1'-0"

Stantec

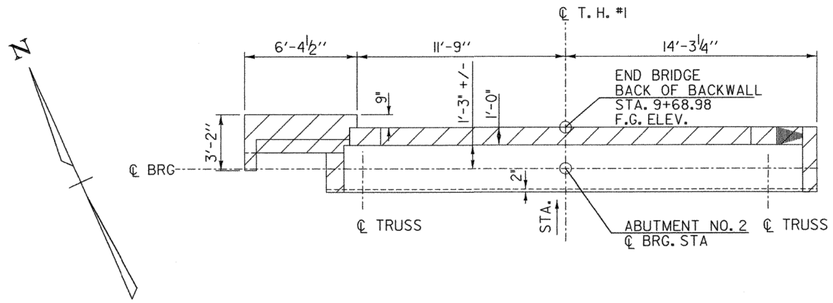
STATE OF VERMONT
AGENCY OF TRANSPORTATION

Town Of RICHMOND	Bridge No. 31
Highway No. T.H. #1	Log Sta. / Surv. Sta.

TOWN HIGHWAY #1 OVER WINOOSKI RIVER

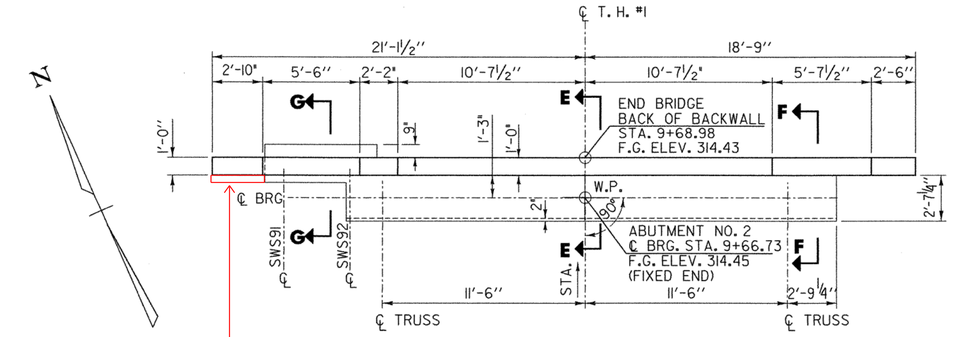
ABUTMENT NO. 1 PLAN & ELEVATION

Designed By T. KNIGHT	Drawn By R. WALKER
Checked By M. CHENETTE Date 01/09	Bridge Design Supervisor G. BOGUE Date 01/09
PROJECT RICHMOND	PROJECT NO. BHF 0209(5)
CAD Dwg: ...\drawing\z08j132_ABUT 1.dgn	Plot Date: 1/8/2009
Bridge Sheet No.	Sheet 37 of 50



EXISTING PLAN

SCALE 1/4 " = 1'-0"



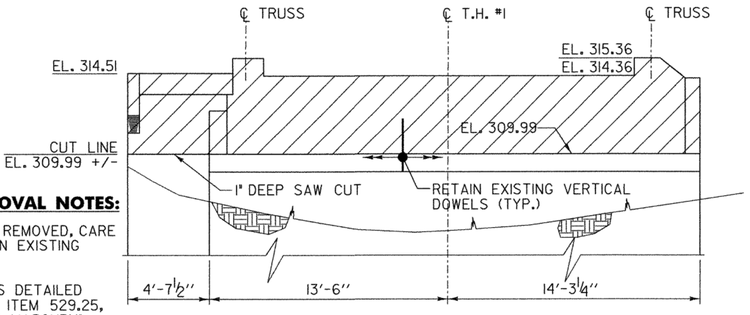
ADDITIONAL 6" WIDTH ON LOWER PORTION FOR DOWEL CONFLICT.

PROPOSED PLAN

SCALE 1/4 " = 1'-0"

NOTE:

1. FOR SECTION E-E, F-F SEE SHEET 39
2. FOR SECTION G-G SEE SHEET 22



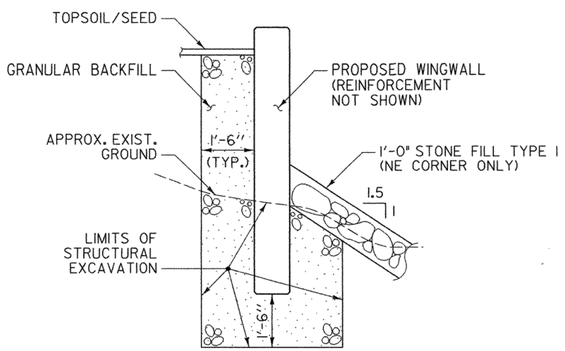
EXISTING CONCRETE REMOVAL NOTES:

EXISTING CONCRETE TO BE REMOVED, CARE SHALL BE TAKEN TO RETAIN EXISTING VERTICAL DOWELS

ALL CONCRETE REMOVAL AS DETAILED SHALL BE PAID FOR UNDER ITEM 529.25, "REMOVAL OF CONCRETE OR MASONRY"

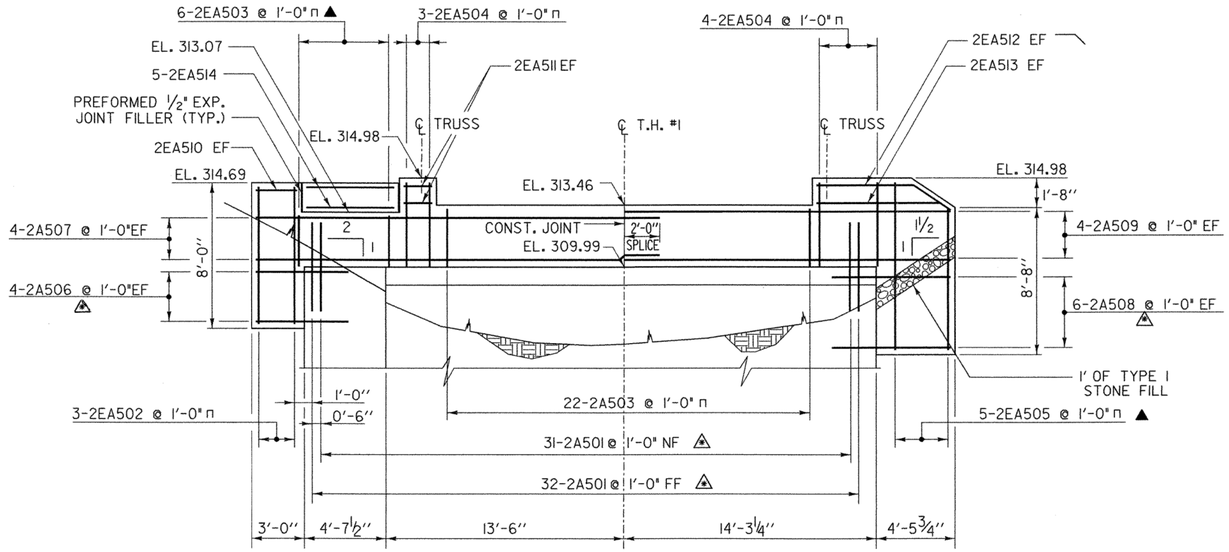
EXISTING ELEVATION

SCALE 1/4 " = 1'-0"



TYPICAL WINGWALL EARTHWORKS SECTION

NOT TO SCALE



NOTE:

▲ = DRILL @ GROUT 2'-6" INTO EXISTING ABUTMENT
NF = NEAR FACE
FF = FAR FACE
EF = EACH FACE
▲ = CUT TO FIT IN FIELD

PROPOSED ELEVATION

SCALE 1/4 " = 1'-0"

Stantec

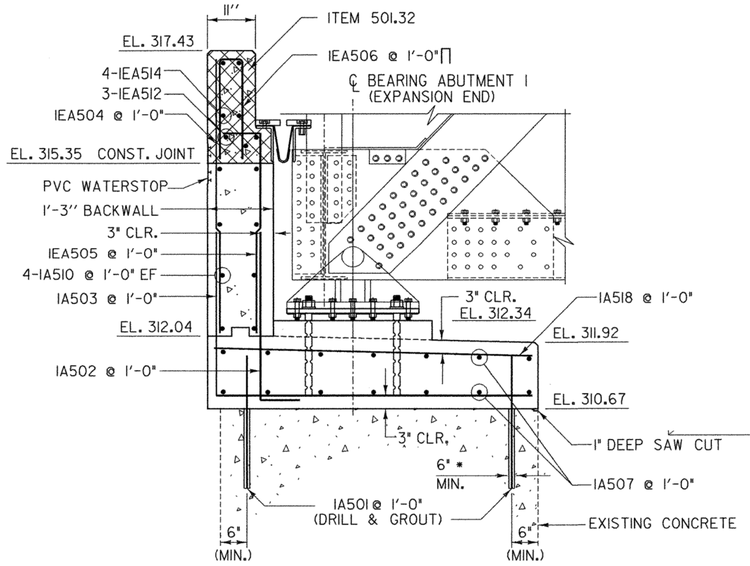
STATE OF VERMONT
AGENCY OF TRANSPORTATION

Town Of RICHMOND	Bridge No. 31
Highway No. T.H. #1	Log Sta. / Surv. Sta.

TOWN HIGHWAY #1 OVER WINOOSKI RIVER

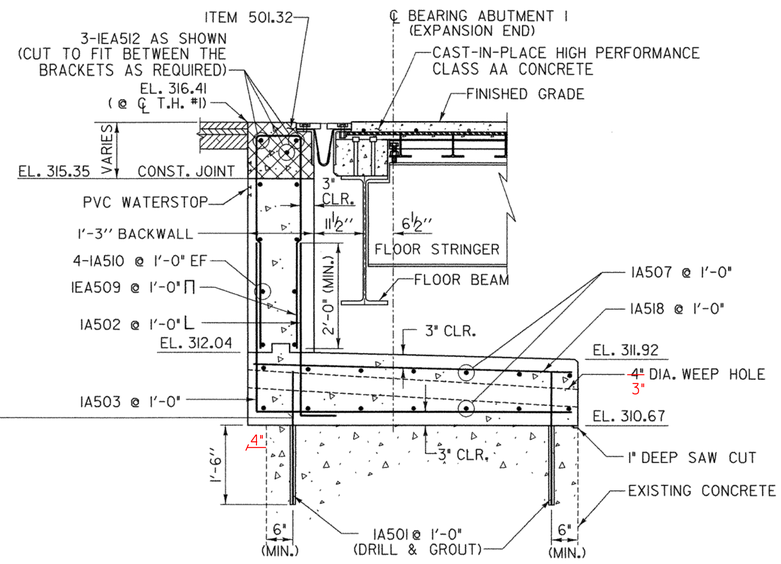
ABUTMENT NO. 2 PLAN & ELEVATION

Designed By T. KNIGHT	Drawn By R. WALKER
Checked By M. CHENETTE Date 01/09	Bridge Design Supervisor G. BOGUE Date 01/09
PROJECT RICHMOND	PROJECT NO. BHF 0209(5)
CAD Dwg: ...\drawing\z08j132_ABUT 2.dgn	Plot Date: 1/9/2009
Bridge Sheet No.	Sheet 38 of 50



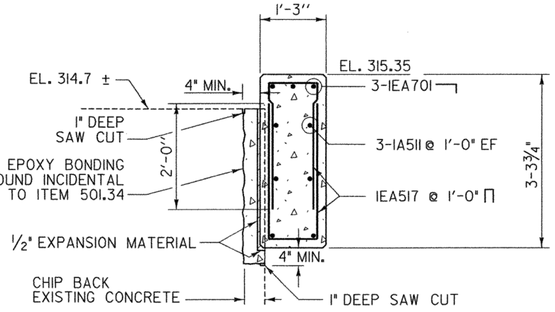
ABUTMENT 1 SECTION A–A

SCALE 3/4" = 1'-0



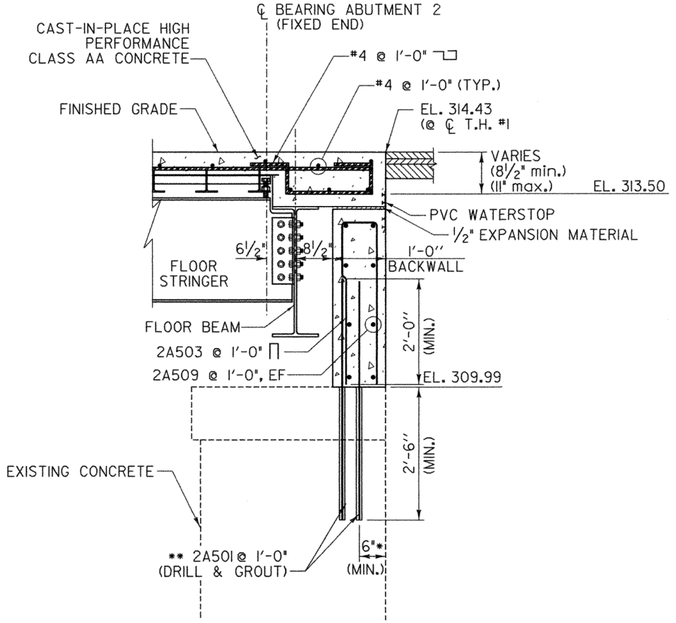
ABUTMENT 1 SECTION B–B

SCALE 3/4" = 1'-0



ABUTMENT 1 SECTION C–C

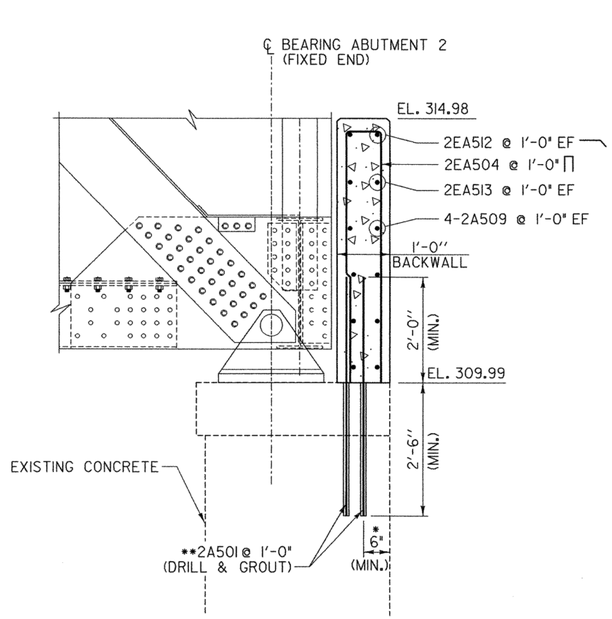
SCALE 3/4" = 1'-0



NOTE: NOTIFY ENGINEER IF WIDTH OF EXISTING ABUTMENT IS LESS THAN SHOWN.

ABUTMENT 2 SECTION E–E

SCALE 3/4" = 1'-0



NOTE: NOTIFY ENGINEER IF WIDTH OF EXISTING ABUTMENT IS LESS THAN SHOWN.

ABUTMENT 2 SECTION F–F

SCALE 3/4" = 1'-0

* CONTRACTOR TO VERIFY THAT A MINIMUM EDGE DISTANCE OF 6" IS PROVIDED

** BAR TO BE INCLUDED IF EXISTING VERTICAL REINFORCEMENT IS NOT ADEQUATE, AS DIRECTED BY THE ENGINEER

NOTE:

NF = NEAR FACE
FF = FAR FACE
EF = EACH FACE
▲ = CUT TO FIT IN FIELD
2" CLEAR UNLESS OTHERWISE SPECIFICED ON PLAN

Stantec

STATE OF VERMONT
AGENCY OF TRANSPORTATION

Town Of RICHMOND	Bridge No. 31
Highway No. T.H. #1	Log Sta. / Surv. Sta.
TOWN HIGHWAY #1 OVER WINOOSKI RIVER	
ABUTMENT SECTIONS	
Designed By T.KNIGHT	Drawn By D. HARRINGTON
Checked By M. CHENETTE Date 01/09	Bridge Design Supervisor G. BOGUE Date 01/09
PROJECT RICHMOND	PROJECT NO. BHF 0209(5)
CAD Dwg: ...\drawing\z08j132_abutsects.dgn Plot Date: 1/8/2009	
Bridge Sheet No.	Sheet 39 of 50

STATE OF VERMONT
AGENCY OF TRANSPORTATION

REINFORCING STEEL SCHEDULE

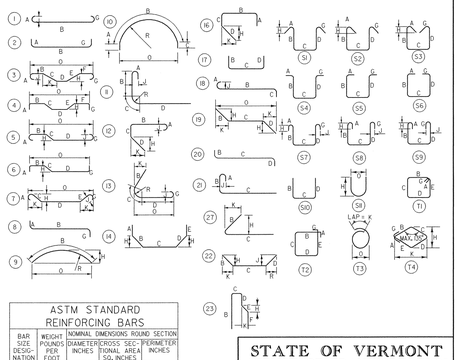
ITEM	NO. PIECES	SIZE	LENGTH	MARK	TYPE	A	B	C	D	E	F	G	H	J	K	R	O
			ABUTMENT NO. 1														
1	54	5	2'-6"	EA501	STR.												
2	27	5	4'-3"	EA502	17		0'-10"	3'-5"									
3	27	5	9'-1"	EA503	17		3'-5"	5'-8"									
4 •	15	5	5'-1"	EA504	STR.												
5	3	5	4'-7"	EA505	17		0'-10"	3'-9"									
6	3	5	4'-1"	EA506	17		1'-10"	0'-5"	1'-10"								
7 ▲	14	5	27'-6"	EA507	STR.												
8	6	5	4'-5"	EA508	17		1'-10"	0'-9"	1'-10"								
9	21	5	8'-5"	EA509	17		3'-10"	0'-9"	3'-10"								
10 •	3	5	16'-5"	EA510	STR.												
11 •	7	5	17'-9"	EA511	STR.												
12	5	5	16'-0"	EA512	STR.												
13	3	5	13'-0"	EA513	STR.												
14	4	5	12'-10"	EA514	STR.												
15	4	5	2'-0"	EA515	STR.												
16	2	5	10'-3"	EA516	STR.												
17 •	15	5	6'-9"	EA517	17		2'-6"	1'-9"	2'-6"								
18	5	5	6'-9"	EA518	STR.												
19																	
20 <	4	7	10'-8"	EA701	17			9'-6"	1'-2"								
21																	
22																	
23																	
24			**ABUTMENT NO. 2**														
25																	
26	63	5	4'-6"	2A501	STR.												
27	3	5	15'-8"	2A502	17		7'-6"	1'-0"	6'-1"	1'-6"							
28 ▲	28	5	16'-10"	2A503	17		5'-2"	10'-6"	4'3"-2"								
29	7	5	8'-6"	2A504	17		4'-0"	0'-5"	4'-0"								
30 ▲	5	5	20'-2"	2A505	17		9'-10"	0'-5"	9'-10"								
31 •	13	5	5'-3"	2A506	STR.												
32	8	5	22'-11"	2A507	STR.												
33 •	13	5	52'-9"	2A508	STR.												
34	9	5	18'-6"	2A509	STR.												
35	2	5	2'-5"	2A510	STR.												
36	6	5	7'-8"	2A511	STR.												
37 <	3	5	8'-1"	2A512	92		5'-3"	2'-10"					1'-7"		2'-4"		
38 •	5	5	6'-9"	2A513	STR.												
39	5	5	4'-11"	2A514	STR.												

DECK

ESTIMATED QUANTITY OF 19,000 POUND OF EPOXY COATED REINFORCING STEEL TO BE INCLUDED IN DECK; ACTUAL QUANTITY AND SCHEDULE OF BARS TO BE DETERMINED BY CONTRACTOR (REFER TO GENERAL NOTES ON SHEET 13)

~ NOTES ~

1. UNLESS OTHERWISE DESIGNATED, ALL BAR REINFORCEMENT FOR CONCRETE IN SIZES UP TO AND INCLUDING NO. 18 SHALL CONFORM TO THE REQUIREMENTS OF THE "SPECIFICATION FOR DEFORMED BILLET-STEEL BARS FOR CONCRETE REINFORCEMENT", AASHTO M 31(ASTM A 615-91). ALL BARS SHALL BE GRADE 60, UNLESS OTHERWISE DESIGNATED.
2. FOR TYPICAL BENDING DETAILS, RECOMMENDED PIN DIAMETER "D" OF BENDS AND HOOKS, AND OTHER STANDARD PRACTICE, SEE CURRENT CONCRETE REINFORCING STEEL INSTITUTE "MANUAL OF STANDARD PRACTICE."
3. BARS WHICH REQUIRE MORE ACCURATE BENDING THAN STANDARD PRACTICES SHOULD HAVE LIMITS INDICATED.
4. ALL DIMENSIONS ARE OUT TO OUT OF BAR EXCEPT "A" AND "C" ON STANDARD 180 DEGREE AND 135 DEGREE HOOKS.
5. "J" DIMENSION ON 180 DEGREE HOOKS TO BE SHOWN ONLY WHERE NECESSARY TO RESTRICT HOOK SIZE, OTHERWISE, STANDARD HOOKS ARE TO BE USED.
6. "H" DIMENSION ON STIRRUPS TO BE SHOWN ONLY WHEN NECESSARY TO MAINTAIN CLEARANCES.
7. WHERE SLOPE DIFFERS FROM 45 DEGREES, DIMENSIONS "H" AND "K" MUST BE SHOWN.
8. ▲ DENOTES BARS TO BE CUT IN FIELD
9. • DENOTES ONE EXTRA BAR ADDED FOR TESTING PURPOSES.
10. ^ DENOTES TWO EXTRA BARS ADDED FOR TESTING PURPOSES.
11. "E" IN PREFIX DENOTES EPOXY COATED REINFORCING STEEL.



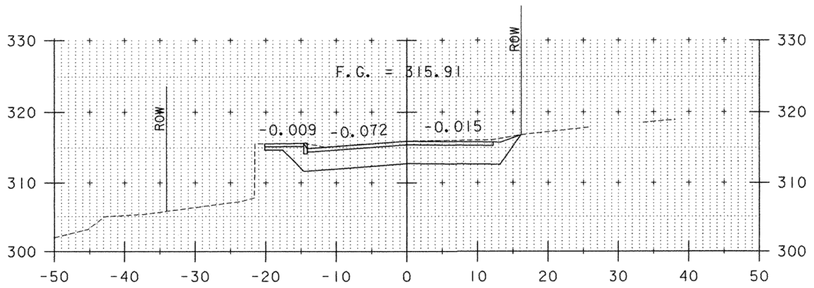
ASTM STANDARD REINFORCING BARS

BAR SIZE DESIGNATION	WEIGHT POUNDS PER FOOT	NOMINAL DIMENSIONS ROUND SECTION DIAMETER INCHES	CROSS SECTIONAL AREA SQ. INCHES	PERIMETER INCHES
#3	.376	.375	.11	1.178
#4	.668	.500	.20	1.571
#5	1.043	.625	.31	1.963
#6	1.502	.750	.44	2.356
#7	2.044	.875	.60	2.749
#8	2.670	1.000	.79	3.142
#9	3.400	1.128	1.00	3.544
#10	4.303	1.270	1.27	3.990
#11	5.313	1.410	1.56	4.430
#14	7.65	1.693	2.25	5.32
#18	13.60	2.257	4.00	7.09

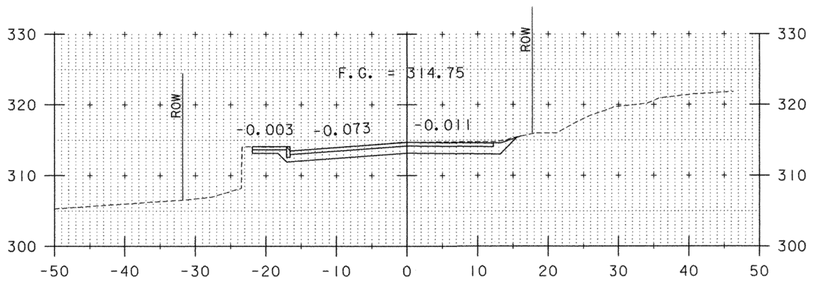
Stantec

STATE OF VERMONT
AGENCY OF TRANSPORTATION

Town Of RICHMOND	Bridge No. 31
Highway No. T.H. #1	Log Sta. Serv. Sta.
TOWN HIGHWAY #1 OVER WINOOSKI RIVER	
REINFORCING STEEL SCHEDULE	
Designed By T. KNIGHT	Drawn By R. WALKER
Checked By M. DENETTE Date 12/08	Bridge Design Supervisor C. BOGUE Date 01/09
PROJECT RICHMOND	PROJECT NO. BHF 0209(5)
CAD Dwgs ...\drawings\208332_REBAR.dgn	Plot Date: 1/8/2009
Bridge Sheet No.	Sheet 40 of 50



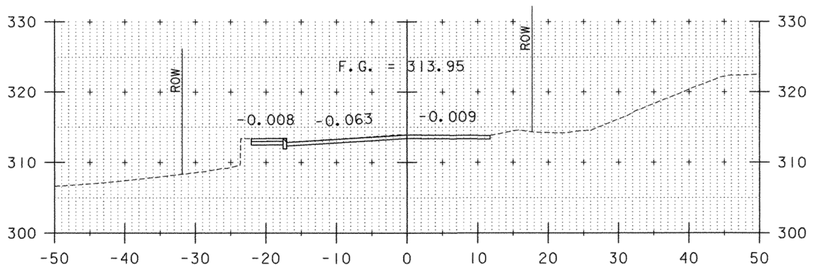
7+00



6+75

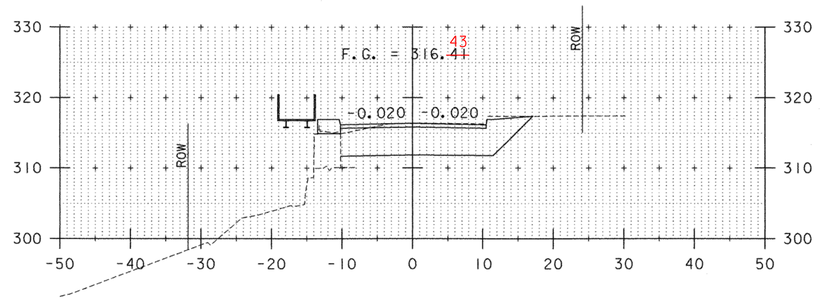
STA. 6+50
BEGIN APPROACH

STA. 6+60
BEGIN PROJECT

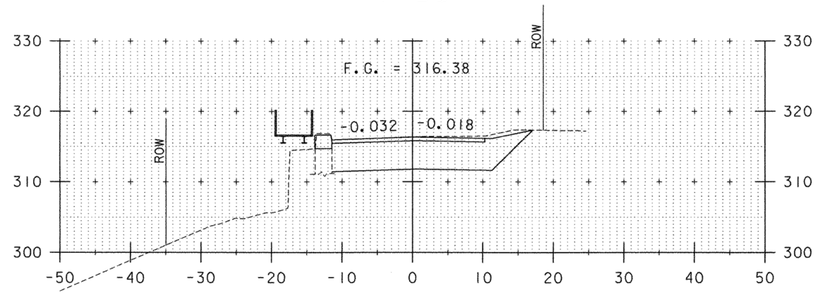


6+60

STA. 7+34.02
BEGIN BRIDGE



7+35



7+25

0 10 20
SCALE

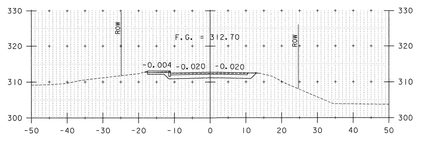
STA. 6+60 TO STA. 9+69

Stantec

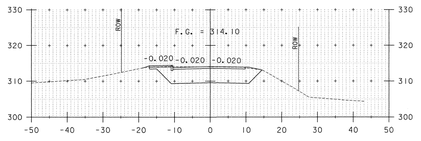
PROJECT NAME: RICHMOND
PROJECT NUMBER: BHF 0209(5)

FILE NAME: ...\drawing\z08J132_xsl.dgn
PROJECT LEADER: C. WILLIAMS
DESIGNED BY: G. GOYETTE
ROADWAY CROSS SECTIONS 1

PLOT DATE: 1/9/2009
DRAWN BY: E. ALLING
CHECKED BY: T. KNIGHT
SHEET 41 OF 50

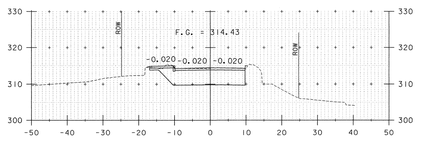


10+00



9+75

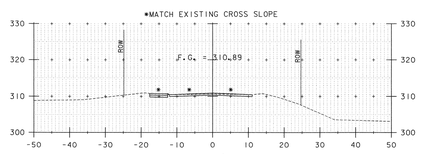
STA. 9+69.04
END BRIDGE



9+69

STA. 10+25
END PROJECT

STA. 10+35
END APPROACH



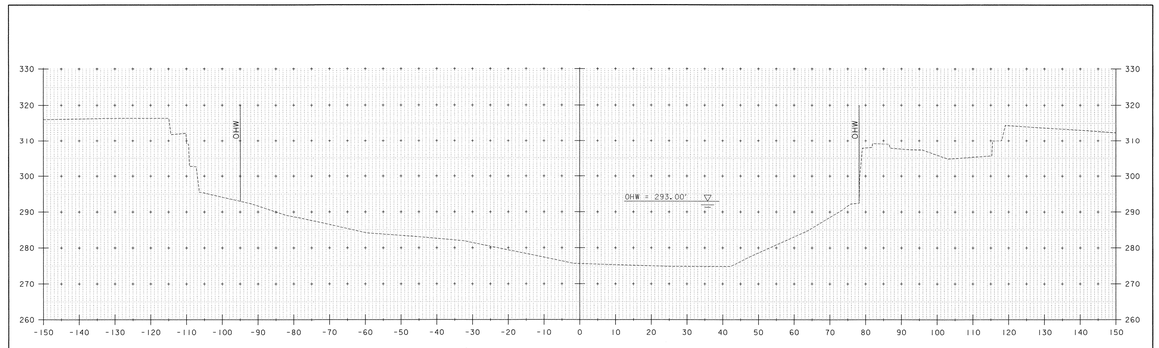
10+25

0 10 20
SCALE

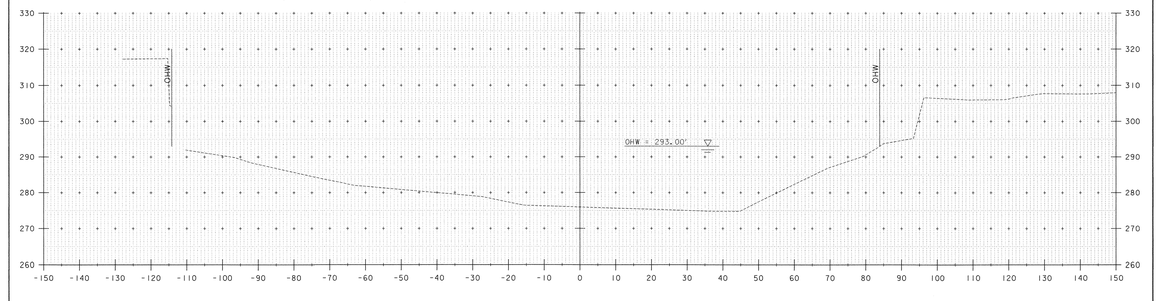
STA. 9+75 TO STA. 10+25

Stantec

PROJECT NAME: RICHMOND	
PROJECT NUMBER: BHF 0209(5)	
FILE NAME: ...\drawing\z08j32.xsl.dgn	PLOT DATE: 1/9/2009
PROJECT LEADER: C. WILLIAMS	DRAWN BY: E. ALLING
DESIGNED BY: G. GOYETTE	CHECKED BY: T. KNIGHT
ROADWAY CROSS SECTIONS 2	SHEET 42 OF 50



20+00



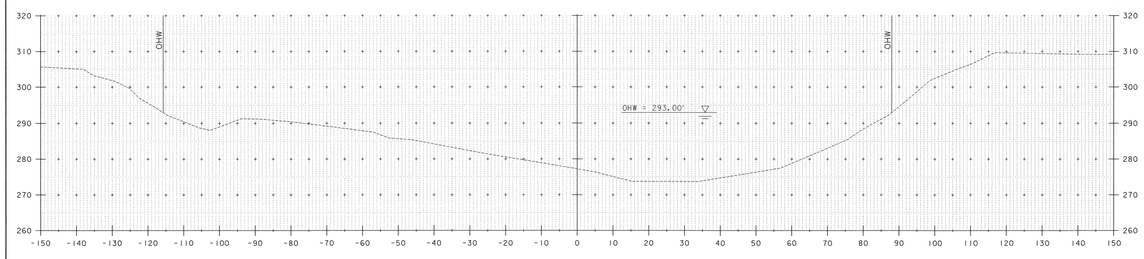
19+75

0 10 20
SCALE

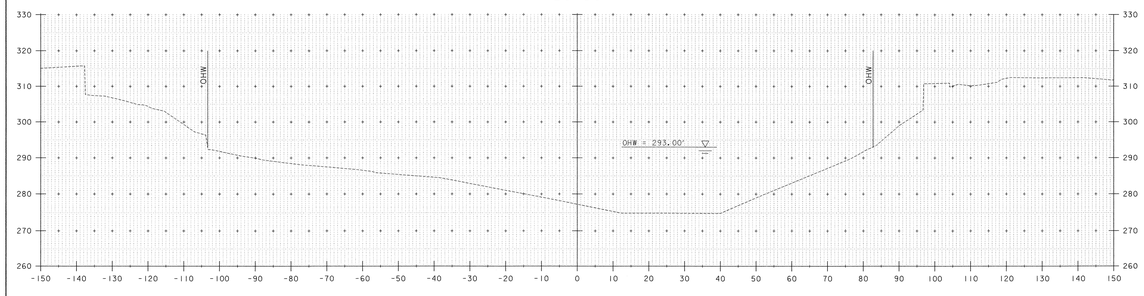
STA. 19+75 TO STA. 20+00

Stantec

PROJECT NAME: RICHMOND	
PROJECT NUMBER: BHF 0209(5)	
FILE NAME: ...\drawing\z08J32.xsl.dgn	PLOT DATE: 1/9/2009
PROJECT LEADER: C. WILLIAMS	DRAWN BY: E. ALLING
DESIGNED BY: G. GOYETTE	CHECKED BY: T. KNIGHT
CHANNEL CROSS SECTIONS 1	SHEET 43 OF 50



20+50



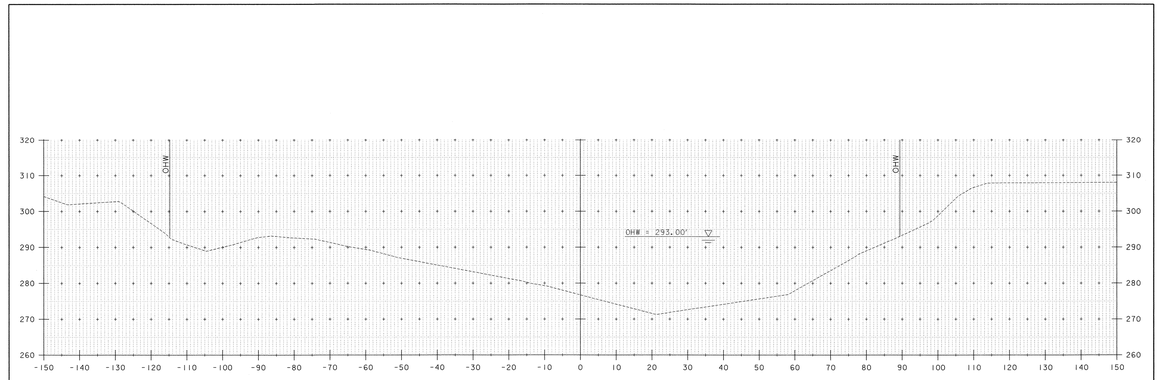
20+25

0 10 20
SCALE

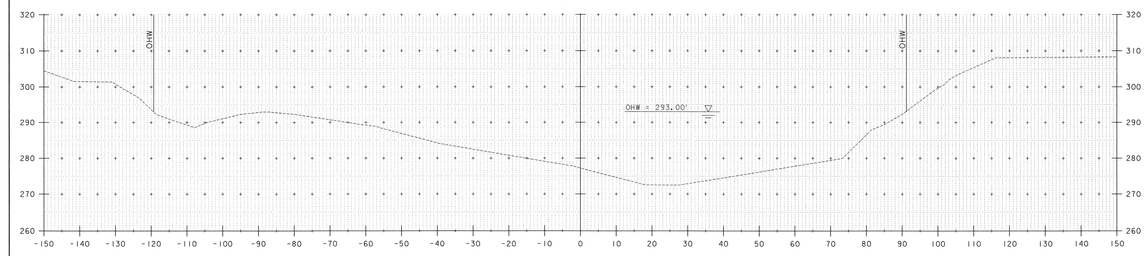
STA. 20+25 TO STA. 20+50

Stantec

PROJECT NAME: RICHMOND	
PROJECT NUMBER: BHF 0209(5)	
FILE NAME: ...\drawing\z08J32.xsl.dgn	PLOT DATE: 1/9/2009
PROJECT LEADER: C. WILLIAMS	DRAWN BY: E. ALLING
DESIGNED BY: G. GOYETTE	CHECKED BY: T. KNIGHT
CHANNEL CROSS SECTIONS 2	SHEET 44 OF 50



21+00



20+75

0 10 20
SCALE

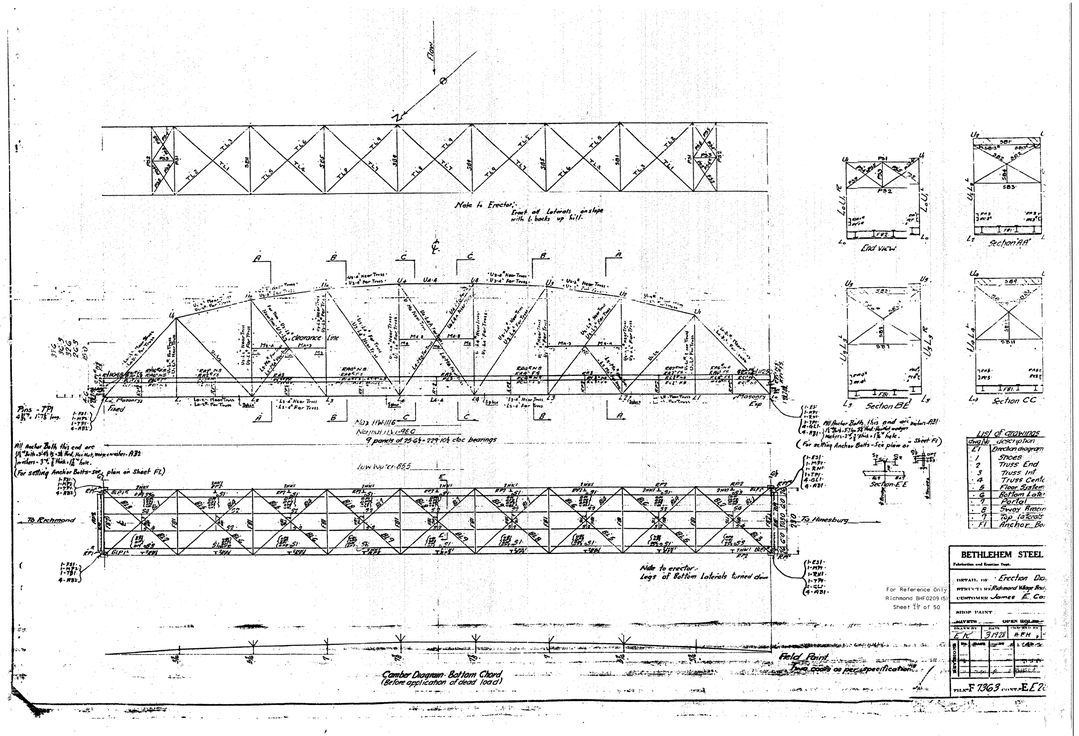
STA. 20+75 TO STA. 21+00

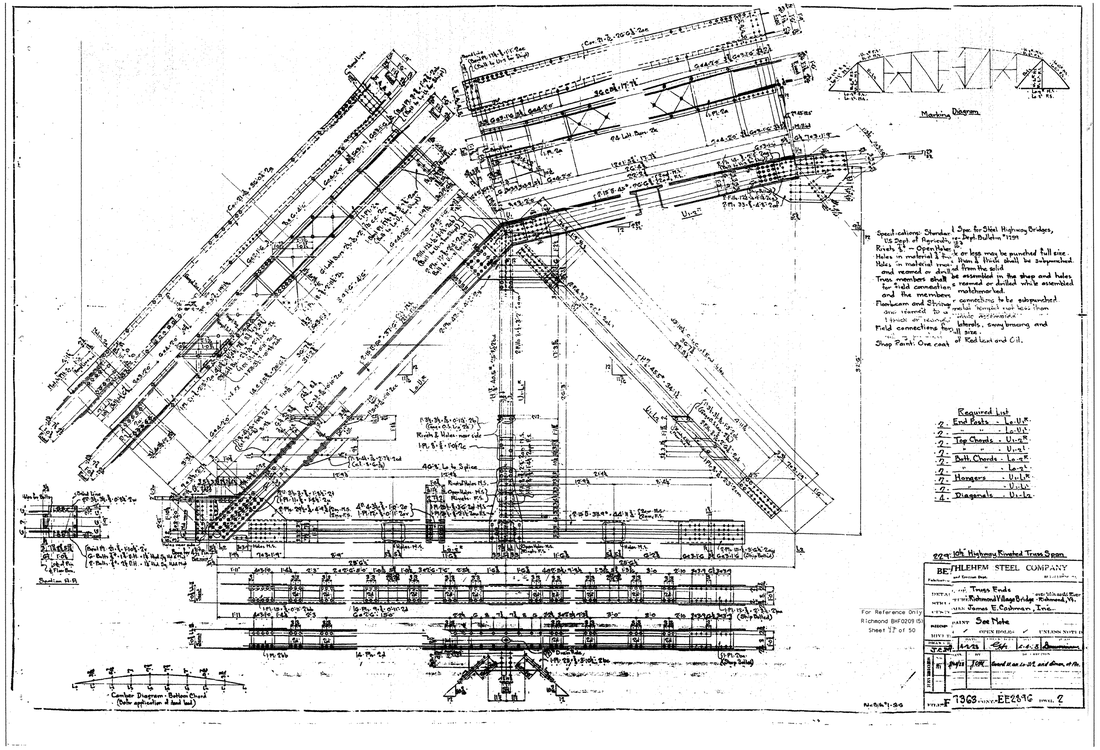
Stantec

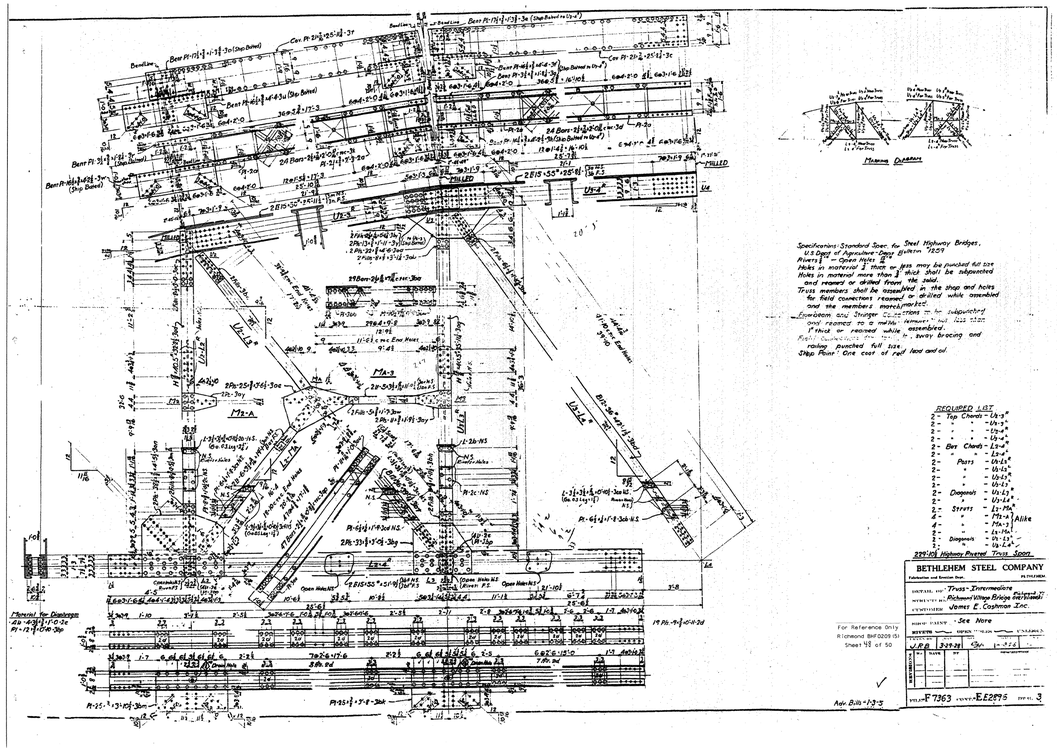
PROJECT NAME: RICHMOND
PROJECT NUMBER: BHF 0209(5)

FILE NAME: ...\drawing\z08J32.xsl.dgn
PROJECT LEADER: C. WILLIAMS
DESIGNED BY: G. GOYETTE
CHANNEL CROSS SECTIONS 3

PLOT DATE: 1/9/2009
DRAWN BY: E. ALLING
CHECKED BY: T. KNIGHT
SHEET 45 OF 50


Note to Erector:
Camber Diagram-Bottom Chord
(before application of dead load)
Field Paint
Note to erector -
Legs of Bottom Laterals turned down
To Richmond
To Hinesburg
Low Water 855
Clearance Line
Section AA
Section BB'
Section CC
Section E-E
End View
List of Drawings
BETHLEHEM STEEL
Fabrication and Erection Units
For Reference Only
Richmond BHF0209 (5)
Sheet TF of 50


Marking Diagram.
Required List
End Posts - L6-U1
" - " - L6-U1
Top Chords - U1-U3
" " - U3-U5
Bott. Chords - L0-L2
" " - L2-L4
" " - L4-L6
Hangers - U1-L1
" - U3-L3
" - U5-L5
Diagonals - U1-L2
Center Diagram - Bottom Chord
(Note application of dust tool)
Shop Paint: One coat of Red Lead and Oil.
Field connections for
1 Span 10th Highway Riveted Truss Span.
BETHLEHEM STEEL COMPANY
Through Truss
Richmond Village Bridge - Richmond, Va.
James E. Cashman, Inc.
See Note
7363 EE2516
For Reference Only
Richmond Bri 0201 (5)
Sheet 17 of 50



Portal for Drawings
L2-4-2½"x½"-17'-0"
R1-12"x½"-17'-3½"

Portal Drawings

Specifications: Standard Spec. for Steel Highway Bridges, U.S. Dept. of Agriculture-Bureau of Public Roads 1929
Rivets ⅞" — Open Holes ⅞"
Holes in material 1" thick or less may be punched full size
Holes in material more than ⅞" thick shall be subpunched and reamed or drilled from the solid.
Truss members shall be assembled in the shop and holes for field connections reamed or drilled while assembled and the members match marked.
Floorbeam and Stringer Connections to be subpunched and reamed to a matching template, full size for ⅞" thick or reamed while assembled.
Right Connections Pin Holes to be bored after riveting punched full size.
Shop Paint: One coat of red lead and oil.

REQUIRED LIST

2 -	Top Chords	-	U9-9"
2 -	"	"	U10-3"
2 -	"	"	U10-4"
2 -	"	"	U10-4"
2 -	Bot. Chords	-	L9-8"
2 -	"	"	L9-8"
2 -	Posts	-	U0-L0"
2 -	"	"	U0-L0"
2 -	"	"	U0-L0"
2 -	Diagonals	-	U0-L1"
2 -	"	"	U0-L1"
2 -	Struts	-	L1-U1"
4 -	"	"	L1-U1"
4 -	"	"	P10-1 Alike
4 -	"	"	P10-1
4 -	"	"	L1-U1"
2 -	Diagonals	-	U1-L2"
2 -	"	"	U1-L2"

229'-0" Highway Pratt Truss Span.

BETHLEHEM STEEL COMPANY
Fabricators and Erection Steel — Bethlehem, Pa.

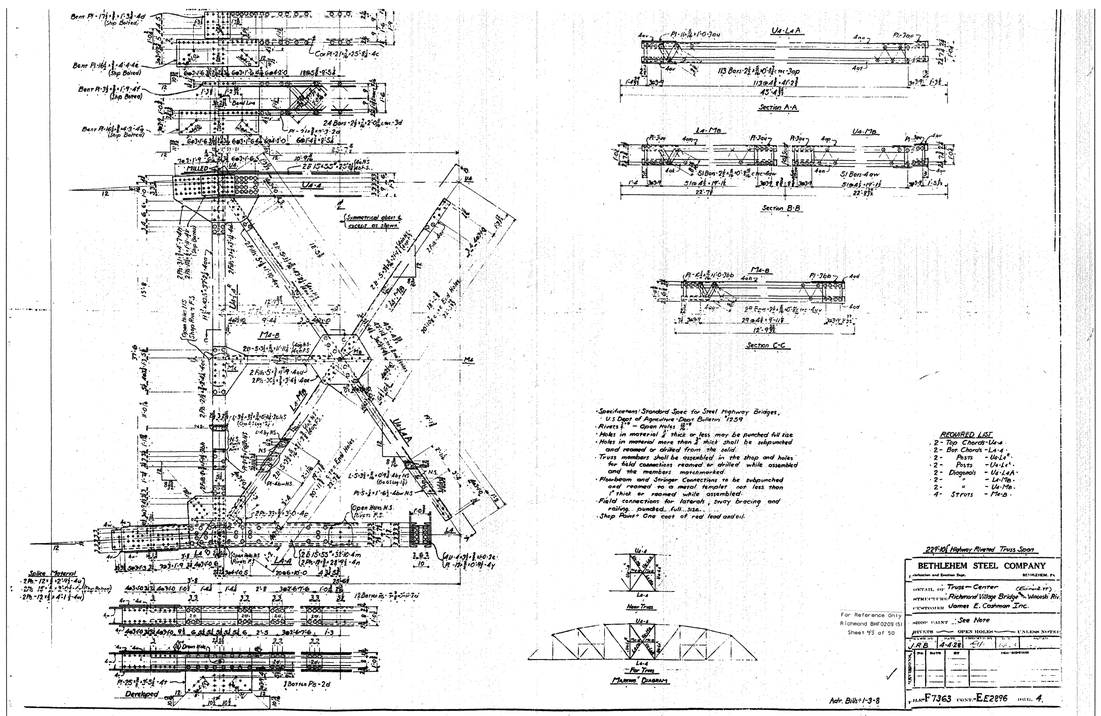
DETAIL OF: Truss - Intermediate — Richmond Village Bridge over Island
ERECTED BY: James E. Cashman Inc.
SHOP NAME: See Note — ERECTION NAME: — STRAINS:
JOB 329-29 — Spc. 1-316

NO.	MARK	DATE	REVISIONS

DRAWING F7363 — CONTRACT E62895 — SHT. NO. 3

For Reference Only
Richmond BRF0209(9)
Sheet 98 of 50

Adv. Bills 1-13-3



- Specifications: Standard Spec for Steel Highway Bridges, U.S. Dept of Agriculture-Dept Bulletin "1209"
- Rivets 7/8" - Open Holes 15/16"
- Holes in material 3/4" thick or less may be punched fot size
- Holes in material more than 3/4" thick shall be subpunched and reamed or drilled from the solid
- Truss members shall be assembled in the shop and holes for field connections reamed or drilled while assembled and the members match-marked
- Floorbeam and Stringer Connections to be subpunched and reamed to a metal template not less than 1 thick or reamed while assembled.
- Field connections for laterals, portal bracing and railing, punched, full size.
- Shop Paint: One coat of red lead and oil.

RECAPPED LIST
- 2 - Top Chords - U6-A
- 2 - Bot Chords - L6-A -
- 2 - Posts - U6-L6 -
- 2 - Posts - U6-L6 -
- 2 - Diagonals - U6-L6A -
- 2 - " - L6-M6 -
- 2 - " - U6-M6 -
- 4 - Struts - M6-B -

22'-10" Highway Riveted Truss Span

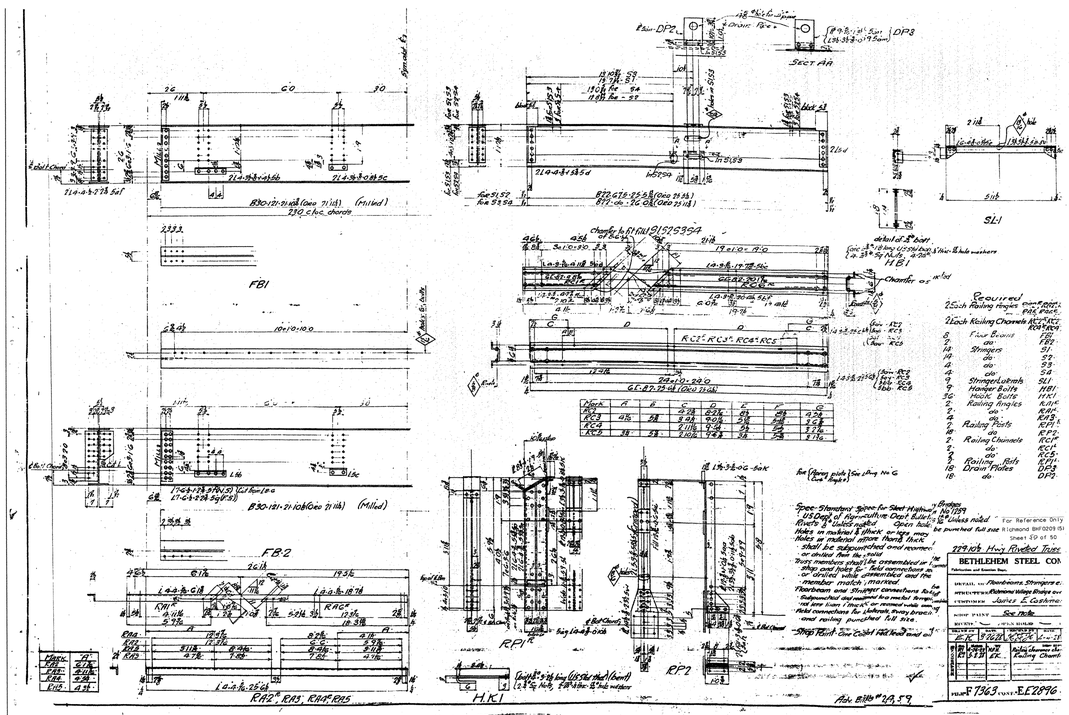
BETHLEHEM STEEL COMPANY
Fabricators and Erectors Only — BETHLEHEM, PA.

CONTRACT NO. Truss-Center (Colorado)
STRUCTURE Richmond Village Bridge, Wreck Rt.
OWNERSHIP James E. Coleman Inc.
SHOP PAINT See Note
DETAIL — DRAWN — TRACED — CHECKED — CHECKED — UNLESS NOTED

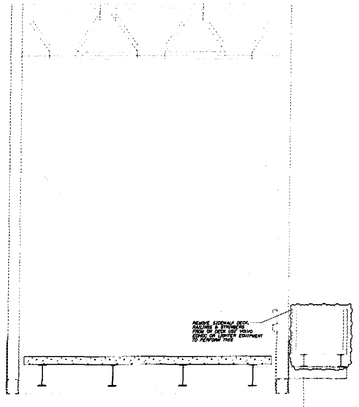
DATE	4-4-28				
CHANGES	DATE	BY			

DRAWING F7363 TRACE E-E2896 SHEET 4.

For Reference Only
Richmond Bill 0209 (5)
Sheet 93 of 50


DP2
DP3
SECT AA
SL1
FB1
FB2
HB1
HK1
RP1
RP2
RA2, RA3, RA4, RA5
B30-121-21 108 (Geo 71 ilb) (rolled)
B30-121-21 118 (Geo 71 ilb) (rolled)
Required
25 ch Railing ringers
12 each Railing Channels
Floor Beams
Stringers
Stringer Laterals
Hanger Bolts
Pedestal Bolts
Railing Angles
Railing Posts
Railing Channels
Railing Plates
Drawn Plates
Spec. Standard Spikes for Steel Highway Bridges
US Dept. of Agriculture Dept. Bulletin No 1789
Rivets & Bolts shall be 7/8" unless noted
Holes in material 3/4 thick or less may be punched full size
Holes in material above 3/4 thick shall be subpunched and reamed or drilled from the solid
Truss members shall be assembled in the shop and holes for field connections shall be reamed or drilled while assembled and the members match marked
Fairbanks and Stringer connections & lateral bracing shall be subpunched and reamed to match templates
All bolts shall be 7/8" unless noted
Open holes shall be punched full size
For Reference Only
Richmond BHF(20)R-151
Sheet 29 of 50
279'-10" Howe Riveted Truss
BETHLEHEM STEEL CO
Fabricators and Erectors of Steel
DETAIL OF Floorbeams, Stringers e
STRUCTURE Richmond Village Bridge ov
CONTRACT James E. Cathrin
SHOP PLAN See Note
REVISED ____ 19__ SCALE 3/8" = 1'-0"
DRAWN BY EK
TRACED BY EK
CHECKED BY Railing Channels
DATE 6/13
Plan F 7343 Shop E.E 2896

I:\Projects\...\D1_25_BR_05_Richmond\Engineering\Structures\Drawings Username: Eric.Calderwood Date: 3/4/2009



STAGE 1 - REMOVE SIDEWALK DECK, STRINGERS & RAILING

KEEP EQUIPMENT USED TO REMOVE SIDEWALK & RAILING UNSUPPORTED SPANS OF THE TRUSS DURING REMOVAL OPERATIONS.
DO NOT STORE EQUIPMENT OR MATERIALS ON THE BRIDGE.

GENERAL NOTES

1. THESE PLANS ARE NOT INTENDED TO BE WORKED ALONE, BUT ARE INTENDED TO BE USED IN CONJUNCTION WITH THE VERMONT AOT CONTRACT DETAILS FOR THE BRIDGE IN QUESTION (BRIDGE NO. 31 IN RICHMOND VT.)

2. ANY CONFLICT BETWEEN THESE PLANS AND THE CONTRACT PLANS MUST BE REPORTED TO THE DEMO. PLAN & PHASING DESIGN ENGINEER OF RECORD IMMEDIATELY. DO NOT PROCEED WITH DEMOLISH WORK UNTIL ANY SUCH REPORTED DISCREPANCY IS CORRECTED TO THE SATISFACTION OF THE DEMO PLAN & PHASING DESIGN ENGINEER.

3. ALL WELDING IS TO BE DONE BY A CERTIFIED/QUALIFIED WELDER. ALL ELECTRODES ARE TO BE E70XX SERIES.

4. ALL NEW STEEL USED FOR TEMPORARY STRUCTURES IS TO BE GRADE 50 (ASTM A 992, OR ASTM A572 OR 50) U.N.O.

5. ALL USED STEEL SHALL BE IN GOOD CONDITION & SHALL BE GRADE 50 OR BETTER

6. CLOSE THE BRIDGE TO TRAFFIC & HANG STAGING FROM TRUSS AND CONTAIN AND BLAST TO REMOVE LEAD PAINT FROM ALL LOCATIONS WHERE REMOVAL IS GOING TO TAKE PLACE. ALL LEAD & CONTAMINATED BLAST MEDIUM SHALL BE HANDLED IN ACCORDANCE WITH ALL APPLICABLE STATE & FEDERAL REGULATIONS.

7. ONCE STAGING & BLASTING ARE COMPLETE BEGIN THIS PROCEDURE AT STAGE 1.

BHF 0209(6)

JOB # 19331.0243

Stantec

REVIEWED
REVIEWED AS MODIFIED
REVISE AND RE-SUBMIT
NOT REVIEWED

This review by Stantec Consulting Services, Inc. is for the sole purposes of ascertaining conformance with the general design concept. This review shall not mean that Stantec Consulting Services, Inc approves the detail design inherent in the shop drawings responsibility for with shall remain with the Contractor submitting same, and such review shall not relieve the Contractor of his responsibility for errors or omissions in the shop drawing or of his responsibility for meeting all requirements of the Contract documents. The Contractor is responsible for dimensions to be confirmed and correlated at the job site, for information that pertains solely to fabrication processes or to techniques of construction and installation and for coordination of the work of all subtrades.

Stantec Consulting Services Inc

By TEK Date:

CALDERWOOD ENGINEERING, LLC
STRUCTURAL ENGINEERING • BRIDGE DESIGN
PREPARED FOR: Shaw Construction
PREPARED UNDER THE DIRECTION OF: Eric Calderwood
WITH RESPONSIBLE CHARGE OF: Eric Calderwood
DATE: 3/4/2009

NO.	DATE	BY	REVISIONS
1	3/4/09	EC	ADDED STAGE 1

P.E. NUMBER

RICHMOND, BRIDGE ST. OVER THE WINOOSKI RIVER

PARTIAL TRUSS DEMO & STAGE PLAN

SHEET NUMBER

D1

BHF 032916

JOB # 153 x 10249

Stantec

REVIEWED ☑
REVIEWED AS MODIFIED ☐
REVISE AND RE-SUBMIT ☐
NOT REVIEWED ☐

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Stantec Consulting Services Inc.

Date 3/13/9

BY JEE

TYP
¾
7" MIN
1'-0" MAX
L 3x3x5/16 x 3' MIN GRADE 50 TEMP SUPPORT ANGLE TYP @ 9'-6" CENTERS
FIELD VERIFY IF TOP TRAFFIC RAIL ∠ 30° + 7/16" (2) PIECES BACK TO BACK 4"-9"(DIA) MAY BE USED IN LIEU OF NEW ANGLES AT THIS LOCATION THREADROD SHIELD PROJECT BETWEEN THE VERTICAL LEGS
(2) C7x10.25 MIN GRADE 50 (ASTM A992) CONTINUOUS SPLICE AS SHOWN IN DETAIL A OF THIS SHEET
LARGER SIZED CHANNELS MAY BE SUBSTITUTED AT THE CONTRACTORS OPTION △
¾ A36 THREADROD HANGER TYPICAL AS SHOWN
7" MIN
TYP
1'-0" MAX
1'-0" MAX
5'-0" ANGLE PIECE FIELD VERIFY TOP TRAFFIC RAIL ANGLE IS ∠ 13x3x5/16 IF SO IT MAY BE USED AS THIS LOWER HANGER ASSEMBLY ANGLE ITHIS MAY BE DONE DURING STAGE 3)

STAGE 2 - INSTALL TEMP UTILITY SUPPORT ANGLES & CHANNELS

INSTALL POLY OVER HANGING STAGING BELOW

SAW CUT DECK INTO MANAGEABLE SECTIONS. VACUUM ALL WATER IMMEDIATELY BEHIND CONCRETE CUTTING OPERATION

INSTALL TEMPORARY WATER & SEWER LINE SUPPORT SYSTEM (UPPER COMPONENTS ONLY)

BEGINNING AT ABUTMENT 12 REMOVE DECKING IN PIECES NOT TO EXCEED 1000+/- LBS USING 100 TON CRANE EXCAVATOR (LIGHTER EQUIPMENT MAY BE SUBSTITUTED AT THE CONTRACTORS OPTION) RECORD & REPORT DECK THICKNESSES REMOVED TO THE ENGINEER OF RECORD OF THE DEMO & PHASING PLAN AS SOON AS PRACTICABLE UPON REMOVAL OF THE DECKING

WITH DECK REMOVED COMPLETE WATER & SEWER LINE TEMP SUPPORT INSTALLATION

(-2" TYP CONTRACTORS OPTION THIS STAGE MAY BE COMPLETED PRIOR TO SIDEWALK UPPER MEMBER REMOVAL (STAGE 1) HOLES WILL NEED TO BE CUT IN THE DECK TO ACCOMODATE HANGERS AS REQ'D. △

INSTALL THREADED ROD HANGERS AT EACH VERTICAL TIE-ROD SPACING (2 PER GIRDER) SET IN GIRDER WEB. TORQUE TO 2000 LBS TO FLOW FACE MEMBER

4" [MIN]
TYP
¾
4" MIN
1 x 4 WOOD PIECE TO PROTECT TOP OF TRAFFIC RAIL TO BE REMOVED
5'-0" ANGLE PIECE — REMOVE FROM TOP OF TRAFFIC RAIL TO BE DETAILED VERIFY CHANNELS ∠

TEMPORARY WATER & SEWER SUPPORT SYSTEM ELEVATION

½ (TYP.)
¼
¼
7/16 x 6 LONG SPLICE PLATE
6"x½ x 12" LONG SPLICE PLATE

DETAIL A - CHANNEL SPLICE

SPLICE MAY BE LOCATED AT ANY CONVENIENT LOCATION IN THE UTILITY SUPPORT CHANNEL ASSEMBLIES

ALL WELDS ARE TO BE MADE WITH E70XX SERIES ELECTRODES BY QUALIFIED CERTIFIED WELDERS

ALL MATERIAL IS TO BE GOOD USED OR NEW GRADE 50 MATERIAL. LARGER CHANNELS SECTIONS MAY BE SUBSTITUTED AT THE CONTRACTORS SOLE DISCRETION

CALDERWOOD ENGINEERING, ETC.
CIVIL/STRUCTURAL ENGINEERING CONSULTANTS
CONSTRUCTION MANAGEMENT
339 RIVER HILL ROAD, DANVILLE, NEW HAMPSHIRE 03819-6300 (603) 382-5538

T-Buck Construction
Phone: (978) 465-0555 Fax: (978) 465-0554
Newburyport, MA 01950

THE WINOOSKI BRIDGE AUTHORITY

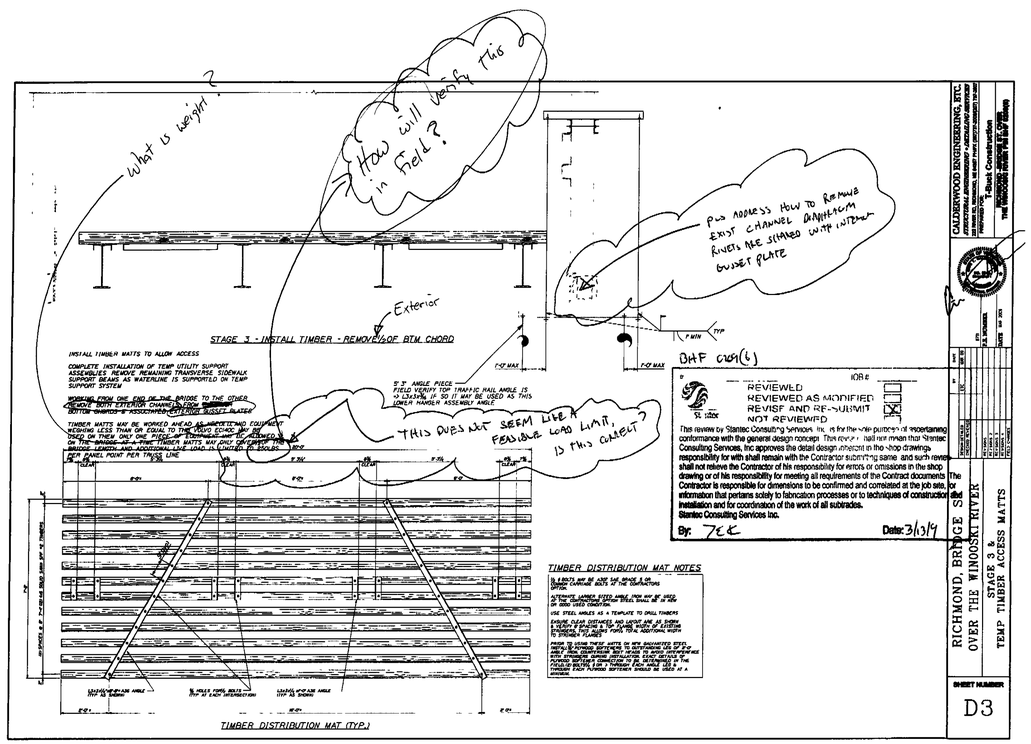
#	DATE	BY	DESCRIPTION
1	3/13/16	J.E.	AS NOTED
2	3/29/16	J.E.	AS NOTED
3	4/5/16	J.E.	AS NOTED
4	4/6/16	J.E.	AS NOTED

J.E. CHARLES
No. 9
REGISTERED PROFESSIONAL ENGINEER
STATE OF VERMONT

RICHMOND, BRIDGE ST
OVER THE WINOOSKI RIVER
STAGE 2 &
TEMP UTILITY SUPPORT

SHEET NUMBER
D2

Tremont Street | Newburyport, Structures Division | Username: Robert | Date Saved:



I:\Revit\ 123.25.BR.20_Richmond\Bridge 3 Mod.rvt Username: Eric Calderwood Date: 3/4/2009

Stantec

REVIEWED
REVIEWED AS MODIFIED
REVISE AND RE-SUBMIT
NOT REVIEWED

JOB# 1731 10292

This review by Stantec Consulting Services, Inc. is for the sole purpose of ascertaining conformance with the general design concept. This review shall not mean that Stantec Consulting Services, Inc approves the detail design inherent in the shop drawings responsibility for with shall remain with the Contractor submitting same and such review shall not relieve the Contractor of his responsibility for errors or omissions in the shop drawing or of his responsibility for meeting all requirements of the Contract documents. The Contractor is responsible for dimensions to be confirmed and correlated at the job site, for information that pertains solely to fabrication processes or to techniques of construction and installation and for coordination of the work of all subtrades

Stantec Consulting Services Inc.

By ZL Date. 3/13/9

CALDERWOOD ENGINEERING, ETC
PROFESSIONAL ENGINEERS
DRAWINGS AS NOTED ARE NOT TO BE USED FOR CONSTRUCTION UNLESS SIGNED AND SEALED BY THE ENGINEER
PROJECT: T-Block Construction
THE MUNICIPAL BRIDGE AT RICHMOND

#	BY	DESCRIPTION	DATE
1	ERC	ISSUED FOR TENDER	MAY 2009

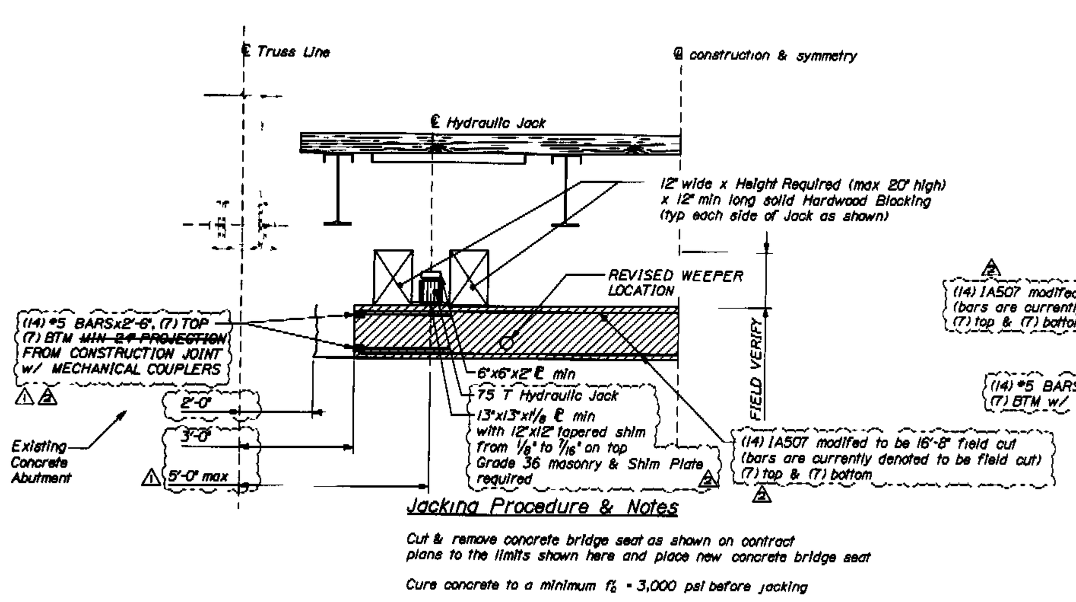
ERC
P.A. STEWARD
DATE: MAY 2009

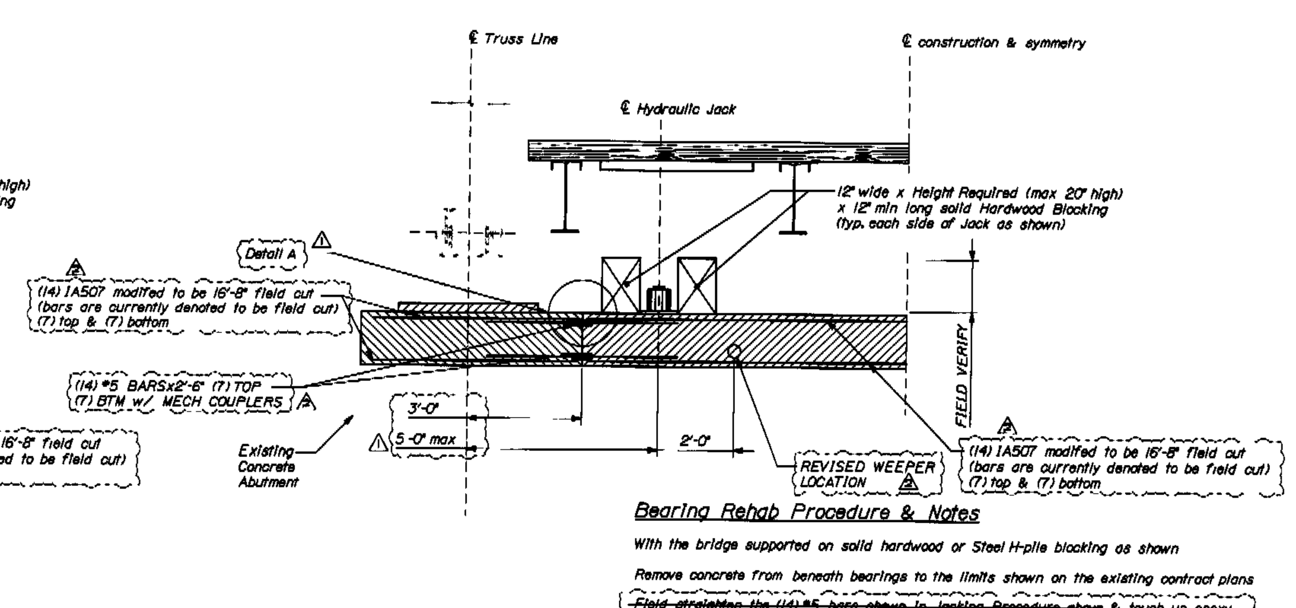
RICHMOND BRIDGE ST
OVER THE WINOOSKI RIVER
STAGE 4

SHEET NUMBER
D4

File name: V:\1_25_08_06_Richmond\Engineering\ Structures Division Username: Eric Calderwood Date: 3/4/2009

Filename \J1_25_BR_09_Richmond\Bgtgroup Structures Division Username Eric Calderwood Date 5/7/2009





Jacking Procedure & Notes

Cut & remove concrete bridge seat as shown on contract plans to the limits shown here and place new concrete bridge seat

Cure concrete to a minimum f'_c = 3,000 psi before jacking

Verify Outside diameter of Bottle Jack >6"ϕ

If Saddle dimension >= 6" then 2"x6"x6" Jack ℄ may be omitted

Center Jack beneath new end Floorbeam Stringers must be connected to the floorbeams throughout the bearing replacement operation

Record the effective ram area of the Jack Find the Hydraulic pressure that corresponds with 150 kips Hyd Pressure x Effective Ram Area = Jacking Force Post this pressure adjacent to the Jack

Jack the bearing up monitor the hydraulic pressure during Jacking operations record and report the Jacking pressure & effective ram area to the Jacking plan engineer of record Do Not Exceed the Hydraulic Pressure posted adjacent to the Jack in the previous step, if this hydraulic pressure is insufficient to move the structure report this discrepancy to the Jacking plan Engineer prior to proceeding with any Jacking

Jack bridge until there is visible clearance beneath the entire existing bearing Masonry Plate and the new bridge pedestal may be cast and finished beneath the existing bearing sole plate (4"± min higher than the ~~new finished grade elevation) Floorbeam may need to be temporarily blocked to allow for shimming beneath the~~ Jack, depending on the throw of the Jack available Monitor Utilities during the jacking process and limit distress to said utilities by lowering the hangers as required Limit Jacking height to that required for replacement of sole plate estimated at 4-6 inches above proposed bridge seat elevation

Both bearings shall be Jacked simultaneously Maintain both bearings at approximately the same elevation during Jacking

Do not rely upon hydraulic pressure within the Jack to support the load for an extended period of time either use a locking collar or Solidly Block the bottom flange of the floorbeam with Hardwood blocking

Protect Jacks from getting contamination from concrete removal operations between the ram and damaging the O-rings within the Jack (of most importance if locking collars are used)

Jacking Loads assume all Steel Framing installed all sidewalk framing, and all sidewalk & bridge deck panels installed hanging staging beneath the bridge without live load on it no concrete in deck panels has been assumed, 31,000 lbs live load has been assumed at the center of the bridge span (halfway between L4 & L5) Timber decking may be substituted at any point for steel deck panels

Factor of safety used for Jack size including locking collar if used is 1.5

Bearing Rehab Procedure & Notes

With the bridge supported on solid hardwood or Steel H-pile blocking as shown

Remove concrete from beneath bearings to the limits shown on the existing contract plans

~~Field straighten the (14) #5 bars shown in Jacking Procedure above & touch up epoxy coating as required. Lap with rebar for new bridge seat & pedestal~~

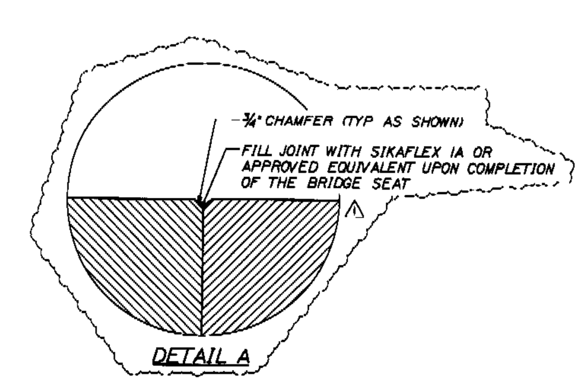
Field drill new sole plate & bolt to the existing Masonry Plate

Prep formwork & Rebar as required Coat previously placed bridge seat cap joint with an epoxy bonding agent (sika dur 32 Lo mod or equal) immediately prior to placing concrete for remaining bridge seat & pedestal

Cast new bridge seat & Pedestal finish to exact pedestal elevation as shown on contract plan sheet 36, embed anchor rods in casting using a template protect threads with grease & tape it should be noted that interior anchor rods will not be accessible to drill and anchor after casting the breastwall cap without altering the structural steel (floorbeam flange & lateral bracing) Contractor may elect to drill and anchor the exterior anchor rods using an approved anchoring product

Once concrete has cured to f'_c > 3,000 psi install new preformed bearing pad with teflon sliding surface & remove nuts from the anchor rods if they've been installed, and Jack from Jacking location to relieve pressure from the solid hardwood blocking, remove blocking and slowly release the hydraulic jack to transfer pressure gradually to the new bearings

Once pressure is entirely off the hydraulic Jack and onto the new bearings install nuts on anchor rods, remove jacks & blocking



DETAIL A

CALDERWOOD ENGINEERING, ETC.
STRUCTURAL ENGINEERING • DETAILING SERVICES
222 RIVER RD, RICHMOND, ME 04357 PH/FX (207) 737-2008 (207) 737-2037
PREPARED FOR: T-Buck Construction
RICHMOND-BRIDGE ST. OVER THE WINOOSKI RIVER PIN BHF 0236(9)

P.E. NUMBER 8711
DATE APR 2009

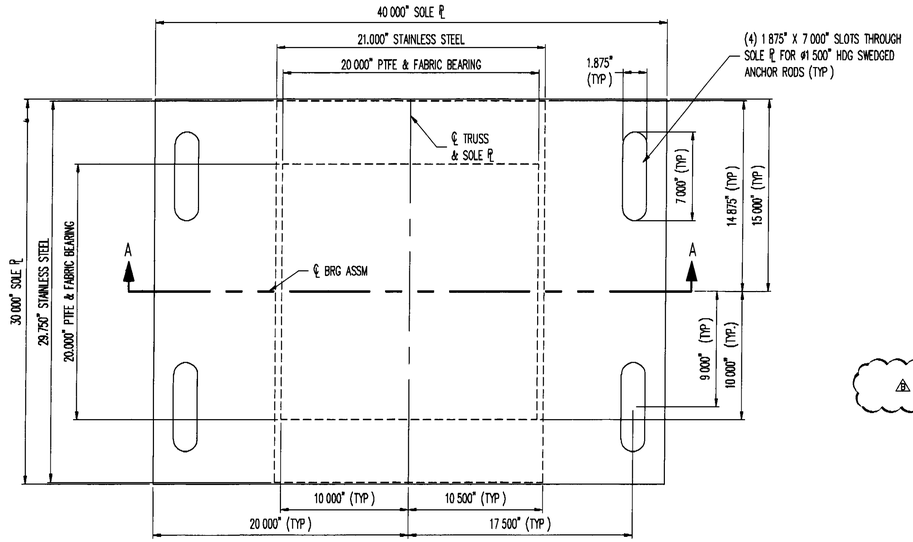
	BY	DATE
DESIGN-DETAILED	ETC	APR 09
CHECKED-REVIEWED		
REVISIONS 1 BAR SPLICE & JT DETAIL		APR 09
REVISIONS 2 ADDRESS COMMENTS		MAY 09
REVISIONS 3		
REVISIONS 4		
FIELD CHANGES		

RICHMOND, BRIDGE ST
OVER THE WINOOSKI RIVER

JACKING & BRG REPL PROCEDURE

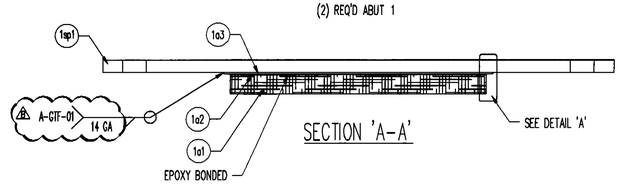
SHEET NUMBER

J1

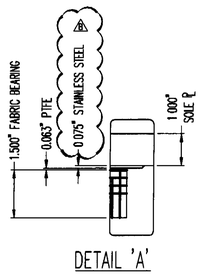


PLAN VIEW
EXP BEARING
(2) REQ'D ABUT 1

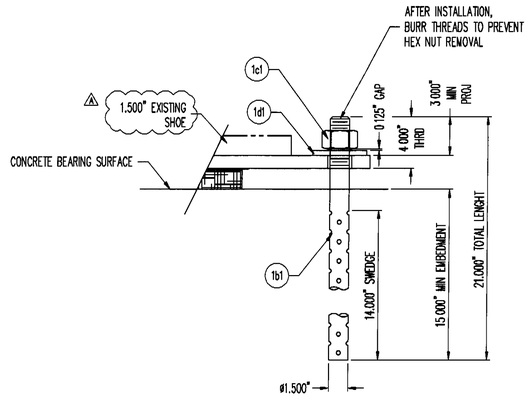
NOTE: SOLE ℄ AND EXISTING SHOE ℄ SHALL BE FIELD DRILLED, BY OTHERS



SECTION 'A-A'



DETAIL 'A'



ANCHOR ROD ASSEMBLY

GENERAL NOTES

1 MATERIAL AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE VERMONT AGENCY OF TRANSPORTATION "STANDARD SPECIFICATIONS FOR CONSTRUCTION, 2006 EDITION", SPECIAL PROVISIONS, SUPPLEMENTAL SPECIFICATIONS AND THE CONTRACT PLANS GENERAL SHOP PRACTICES, STRUCTURAL FABRICATION, WELDING AND ASSEMBLY SHALL BE GOVERNED BY ANSI/AASHTO/AWS D1.5 BRIDGE WELDING CODE.

2 THIS SHOP DRAWING WAS PREPARED IN ACCORDANCE WITH THE CONTRACT PLANS AND SPECIFICATIONS. THE D.S. BROWN COMPANY DOES NOT ACCEPT LIABILITY FOR THE DESIGN OF THE PRODUCTS DETAILED IN THIS SHOP DRAWING

3 THE D.S. BROWN COMPANY TO SUPPLY ONLY THE PARTS SHOWN ON THIS DRAWING

4 ALL STEEL SHALL BE PRODUCED IN THE UNITED STATES OF AMERICA.

5. PTFE (TEFLON) SHALL BE VIRGIN, UNFILLED POLYTETRAFLUOROETHYLENE SATISFYING THE REQUIREMENTS OF ASTM D4894

6 PTFE IS TO BE PURCHASED ETCHED ON ONE SIDE FOR BONDING THE BONDING PROCESS FOR LAMINATING PTFE TO THE FABRIC PAD IS AS FOLLOWS THE FABRIC PAD SURFACE TO BE BONDED IS PREPARED FOR LAMINATION A TWO-PART STRUCTURAL GRADE EPOXY IS THEN APPLIED PER THE MANUFACTURE'S INSTRUCTIONS THE PTFE IS CUT SLIGHTLY OVERSIZE TO ACCOUNT FOR POSSIBLE DRIFT. THE PTFE IS THEN APPLIED TO THE FABRIC PAD AND PUT INTO A VACUUM PRESS AT THE APPROPRIATE PRESSURE FOR THE NECESSARY TIME PERIOD ONCE THE FABRIC PAD AND PTFE IS REMOVED FROM THE PRESS, THE PTFE IS TRIMMED TO PLAN SIZE AND THE PADS ARE SUBMITTED FOR QUALITY CONTROL REVIEW

⚠ 7 STAINLESS STEEL SHALL CONFORM TO ASTM A240 – TYPE 304 AND SHALL BE 14GA (0.075"). STAINLESS STEEL SLIDING SURFACES IN CONTACT WITH PTFE SHALL HAVE A NO. 8 MIRROR FINISH AND ALL OTHERS SHALL HAVE A 2B FINFISH

8 DS BROWN MAY SUBSTITUTE A709 GR. 50 FOR A709 GR. 36 DUE TO AVAILABILITY AT NO ADDITIONAL COST TO THE OWNER OR CONTRACTOR.

9 ALL CORNERS AND EDGES OF STEEL PLATES SHALL BE GROUND TO A 0.063" RADIUS FOR GALVANIZING.

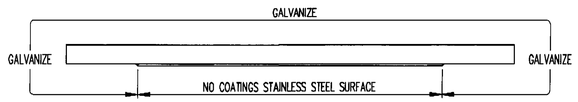
10 THE TEMPERATURE OF THE STEEL ADJACENT TO THE FABRIC PAD SHALL NOT EXCEED 300°F (149°C)AND 250°F (121°C) FOR SURFACES IN CONTACT WITH THE PTFE, WHERE APPLICABLE TEMPERATURE SHALL BE CONTROLLED BY THE USE OF TEMPERATURE INDICATING CRAYON OR OTHER DEVICES APPROVED BY THE ENGINEERS

PROTECTIVE COATING NOTES:

1 ALL STRUCTURAL STEEL SURFACES TO BE GALVANIZED SHALL BE CLEANED IN ACCORDANCE WITH SSPC-SP10

2 ALL EXTERNAL STEEL SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A123 GALVANIZATION LIFTING DEVICES MAY BE WELDED TO PARTS IF NECESSARY. WHEN THEIR USE IS COMPLETE, REMOVE AND GRIND FLUSH ALL CONNECTION LOCATIONS. REPAIR ALL GALVANIZATION IN ACCORDANCE WITH ASTM A780 GALVANIZING REPAIR PAINTS CONTAINING ALUMINUM SHALL NOT BE USED ON SURFACES TO BE IN CONTACT WITH FRESH CONCRETE

3. SEE GALVANIZING LIMIT DETAILS.



COATING LIMITS

LOAD DATA	25596-1106-1
DESIGN LOAD (kips)	360.0

MK	QTY	DESCRIPTION	MATERIAL	LENGTH	REMARKS	REV
1A	2	FABRIC BEARING				-
1a1	2	1.500" X 20.000"	VT 731.01	20.000"	AASHTO 18.4.9.1	-
1a2	2	0.063" X 20.000"	PTFE	20.000"	PURE VIRGIN UNFILLED	-
1a3	2	14 GA. X 21.000"	A240 T304, #8 & 2B	29.750"	PLAIN	B
1sp1	2	1.000" X 40.000"	A709 GR.36 OR 50	30.000"	A123-HDG	-
1B	8	SWEDGED ANCHOR ROD				-
1b1	8	ø1.500" X 21.000" SWEDGED ROD	A449		14" SWEDGE, 4" THRD; A153-HDG	-
1C	8	HEAVY HEX NUT				-
1c1	8	ø1.500" HEX NUT	A563-DH OR A194-2H		DRY LUBE & DYE, A153-HDG	-
1D	8	WASHER PLATE				-
1d1	8	0.375" X 2.375"	A36	7.500"	1.563"ø HOLE CENTERED, A123-HDG	-
1F	23	CONN BOLT			20 + 3 TESTING	-
1f1	23	ø0.750" X 3.750" HEX HEAD STRUCTURAL BOLT	A325		A153-HDG	A
1G	23	HEX NUT			20 + 3 TESTING	-
1g1	23	ø0.750" HEX NUT	A563-DH OR A194-2H		DRY LUBE & DYE, A123-HDG	-
1H	43	FLAT WASHER			40 + 3 TESTING	-
1h1	43	ø0.750" FLAT WASHER	F436		A153-HDG	-
					2/17/2009 7:28:23 AM	

TOLERANCE TABLE	
SOLE PL. PLAN DIMENSIONS	±1/16"
SOLE PL. SURFACE FLATNESS	±0.01
SOLE PL. THICKNESS	±1/16"
HOLE LOCATION	±1/16"
PTFE THICKNESS	±1/16"
PTFE PLAN DIMENSION	±1/16"
STAINLESS STEEL SURFACE FLATNESS	±0.01
STAINLESS STEEL FINISH	≤20μ" RMS #8 MIRROR

FLATNESS TOLERANCE	
CLASS	X NOM. DIM.
A	0.001
B	0.002
C	0.005

WINGS ARE REVIEWED UNLESS NOTED OTHERWISE
EXCEPTION TAKEN
AS NOTED
RESUBMISSION NOT REQUIRED
REVISE AS NOTED
RESUBMISSION REQUIRED
REJECTED
Stantec
DATE 2/18/09
SIGNATURE
REVIEW BY STANTEC is FOR THE SOLE PURPOSE OF ASCERTAINING GENERAL CONFORMITY WITH DESIGN. CONTRACTOR IS RESPONSIBLE FOR DIMENSIONS, FABRICATION AND CONSTRUCTION METHODS, COORDINATION OF SUB-TRADES, DETAIL DESIGN OF COMPONENTS, AND ERRORS OR OMISSIONS ON SHOP DRAWINGS.

REV	DESCRIPTION	DATE	DET	CKD
⚠ 6	REVISE STAINLESS STEEL, BOM	2/17/09	SP	NRA
⚠ 1	REVISED SHOE PLATE THICKNESS AND CONN BOLT LENGTH	02/12/09	SP	NRA

D.S. BROWN
THE D.S. BROWN COMPANY
300 E. CHERRY STREET
NORTH BALTIMORE, OHIO 45872
419 257 3561
FAX 419 257 0332
WWW.DSBROWN.COM

LOCATION — TOWN HIGHWAY #1 OVER WINOOSKI RIVER
BRIDGE — 31
PROJECT — BHF 0209(5)
—
P.O. NO — 081260000002012
DESIGNER — STANTEC
CUSTOMER — STATE OF VERMONT

ITEM	QUANTITY
25598-1106-1	2 OF 2
-	-
-	-
-	-
-	-
-	-
-	-
-	-
-	-

DESCRIPTION: VERSIFLEX PREFORMED FABRIC BEARING
CHITTENDEN CO., VT

SCALE	DRAWN BY	CHECKED BY	DATE	
N.T.S.	SP	NRA	2/09	-
PROJECT NUMBER	PRODUCT CODE	RELEASE	SHEET	
25598	1106	1	1	

DSBROWN

Production Joint Welding Procedure Specification (D1.5-02)

Procedure No: A-GTF-01 Date Issued: 1-9-04 Revision No: 0 Rev. Date: _____

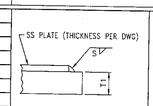
Contractor (Fabricator) D.S. Brown Company Prepared by: James R. Connor, Quality Assurance Manager

1. Non-Fracture Critical [X] Fracture Critical [ ] WPS Expiration Date: _____
2. Qualified in accordance with: AWS D1.5- 2002 , AWS D1.6-99
   Referenced PQR No(s). PQR-GTAW-01-(03) __ , __ , __
   Referenced FWST No(s). PQR-GTAW-01(03) , _____ , __ , __
3. Material specification(s) ASTM A709 Gr. 36, 50, 50W, 304SS, 316SS
4. Material Thickness (es) Unlimited
5. Welding process GTAW
6. Manual [X] , machine [ ] , or semiautomatic [ ]
7. Position(s) of welding 1F, 2F
8. Filler metal specification AWS A5.9
9. Filler metal class and brand name ER309L (Murrex)
10. Flux class & brand N/A , Type N/A
11. Shielding gas 100% Argon Flow rate 20 CFH
12. Single pass [X] Or multiple pass [ ]
13. Single arc [X] Or multiple arc [ ]
14. Welding Current DCEN
15. Polarity Straight
16. Welding progression stringers
17. Root treatment Clean to bright sound metal or per AWS D1.5 (3.2.1 & 3.11)
18. Postheat treatment N/A
19. Calculated Heat Input (KJ/In) Min 10.9 KJ Max 20.4 KJ
20. Electrode extension (electrical stickout) N/A

For DOT Approval

VTRANS
RECEIVED
OK'D BY _____ OK'D BY JLK
FEB 04 2009
R ___ APPROVED
BY DATE 02/11/09

Weld size (in)	Pass No(s)	Electrode Size (in)	Welding Process Variables AMPS/WFS*	VOLTS	Travel Speed (IPM)	Joint Detail (Flare Bevel) Show all dimensions, weld sizes, passes, and AWS symbols
20 ga.	1	1/8"	170-200	15-17	10-14	
16 ga.	1	1/8"	170-200	15-17	10-14	
14 ga.	1	1/8"	170-200	15-17	10-14	
12 ga.	1	1/8"	170-200	15-17	10-14	
11 ga.	1	1/8"	170-200	15-17	10-14	
10 ga.	1	1/8"	170-200	15-17	10-14	
8 ga.	1	1/8"	170-200	15-17	10-14	
3/16"	1	1/8"	170-200	15-17	10-14	



T_1 = Varies
S = Fillet Weld Size (Fillet weld must not exceed thickness of stainless steel)

* Wire feed speed may be used along with amperage (include chart)

Prepared By: James R. Connor DSB QA Manager

Project: _____

DSB Job: 25598-1106-VT

Preheat and Interpass Temperature Chart		
Base Metal Thickness range	Minimum Preheat (°F)	Max Preheat & Interpass (°F)
= 3/4"	50°F	450 °F
>3/4" to =1.5"	70°F	450 °F
>1.5" to =2.5"	150°F	450 °F
>2.5"	225°F	450 °F

Note: When this procedure is used for A709Gr50W materials, it shall be limited to 5/16" single pass or material be coated.

D.S. BROWN
The D.S. Brown Company • 300 East Cherry Street • North Baltimore, Ohio 45872-0158
Phone: (419) 257-3561 • General Fax: (419) 257-2200 • Engineering Fax: (419) 257-0332

The D.S. Brown Company
300 E. Cherry Street
North Baltimore, Ohio 45872
419.257.3561
Fax: 419.257.2200
e-mail: dsb@dsbrown.com
www.dsbrown.com

Lewis Engineering Company
4201 Norex Drive
Chaska, Minnesota 55318
952.368.3000
Fax: 952.448.7000

International Division
57 Pioneer Road
Singapore 628508
65.862.6266
Fax: +65.862.6255
e-mail:
dsbrown@mbox2.singnet.com.sg

Bonding Procedure

The bonding process for laminating PTFE to the fabric pad is as follows:

The fabric pad surface to be bonded is prepared for lamination. A two-part structural grade epoxy is then applied per the manufacture's instructions. The PTFE is cut slightly oversize to account for the possible drift. The PTFE is then applied to the fabric pad and put into a vacuum press at the appropriate pressure for the necessary time period.

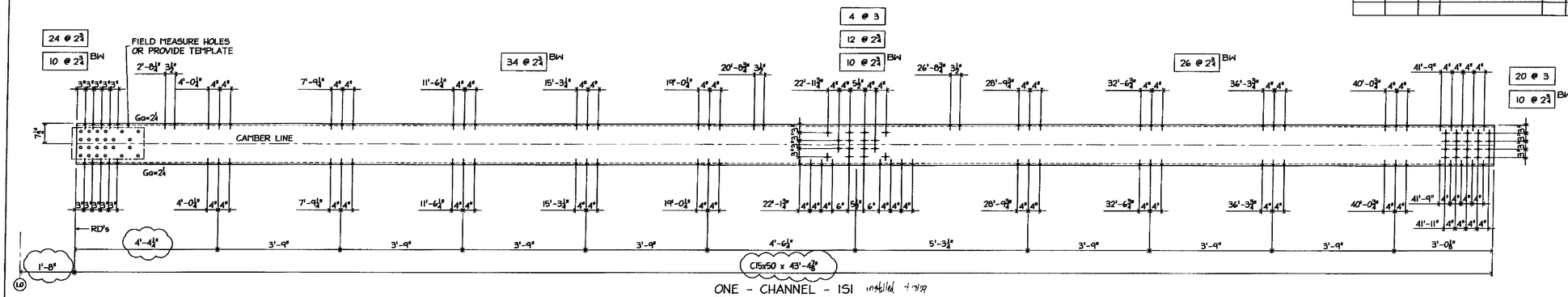
Once the fabric pad PTFE is removed from the press, the PTFE is trimmed to plan size and the pads are submitted for quality control review.

VTRANS
RECEIVED
CK'D BY_____OK'D BY JWC
FEB 04 2009
R ... APPROVED ✓
BY DATE 02/11/09

Equal Opportunity Employer

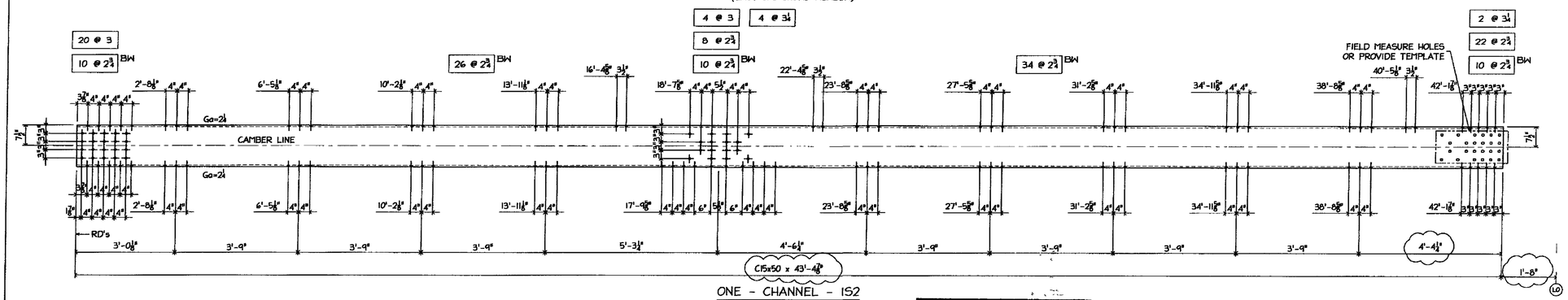
BILL OF MATERIAL

MARKS SHIP	MARKS TEMP	QTY	MATERIAL	FT	IN	GR	REMARK S
151		ONE	C15x50	43	4 7/16		CVN, FCM
152		ONE	C15x50	43	4 7/16		CVN, FCM



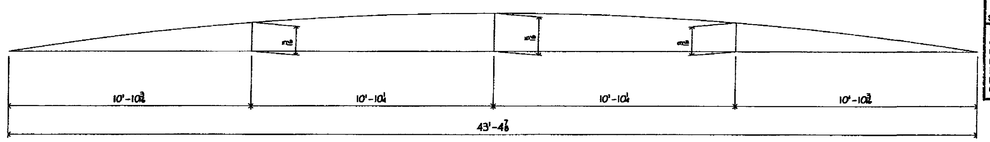
ONE - CHANNEL - IS1 installed first

(EAST O/S CHORD MEMBER)



ONE - CHANNEL - IS2

(EAST I/S CHORD MEMBER)



CAMBER DIAGRAM

SHOP DRAWINGS ARE REVIEWED UNLESS NOTED OTHERWISE	
NO EXCEPTION TAKEN	X
REVISE AS NOTED - RESUBMISSION NOT REQUIRED	
REVISE AS NOTED - RESUBMISSION REQUIRED	
REJECTED	

Stantec

DATE 3/24/09

SIGNATURE TEK

REVIEW BY STANTEC IS FOR THE SOLE PURPOSE OF ASCERTAINING GENERAL CONFORMITY WITH DESIGN. CONTRACTOR IS RESPONSIBLE FOR DIMENSIONS, FABRICATION AND CONSTRUCTION METHODS, COORDINATION OF SUB-TRADES DETAIL DESIGN OF COMPONENTS, AND ERRORS OR OMISSIONS ON SHOP DRAWINGS.

NOTE
FIELD VERIFY/PROVIDE ALL DIM's INDICATED THUS '( )'

GALVANIZING NOTES:
1. ALL WELDS SHALL BE SEALED
2 VENT AS REQUIRED
3 COMPLETE FINAL ASSEMBLY OF BOLTED ITEMS AFTER GALVANIZING WIRE-BRUSH ALL CONTACTING SURFACES TO A DULL-GRAY APPEARANCE PRIOR TO ASSEMBLY

FB THIS DWG
180- 7/8ø x 2 3/4 (A325 GALV) BOLT w/N&BW
66- 7/8ø x 2 3/4 (A325 GALV) BOLT w/N&W
48- 7/8ø x 3 (A325 GALV) BOLT w/N&W
6- 7/8ø x 3 1/4 (A325 GALV) BOLT w/N&W

MATL
1 ALL MAT'L SHALL CONFORM TO AASHTO M 270M/M 270 GRADE 50 (UNLESS NOTED)
2 'CVN' INDICATES CHARPY "V" NOTCH TESTED
3 'FCM' INDICATES "FRACTURE CRITICAL MEMBER"

WELD: E70xx

HOLES 13/16"ø UNO

PREP SSPC-SP6

PAINT: GALVANIZED AND AIR COOLED (NOT QUENCHED) (SEE GALVANIZING NOTES)

A 3/11/09 PER ARP'L COMMENTS DATED 3/06/09

ARC ENTERPRISES, INC.
KINGFIELD, MAINE

PROJECT: STATE OF VERMONT – AGENCY OF TRANSPORTATION
BRIDGE No 31 – RICHMOND, VERMONT

SCALE. NTS	APPROVED BY	DRAWN BY KAJ
DATE 2/18/09		CHKD BY: DMDS – 082

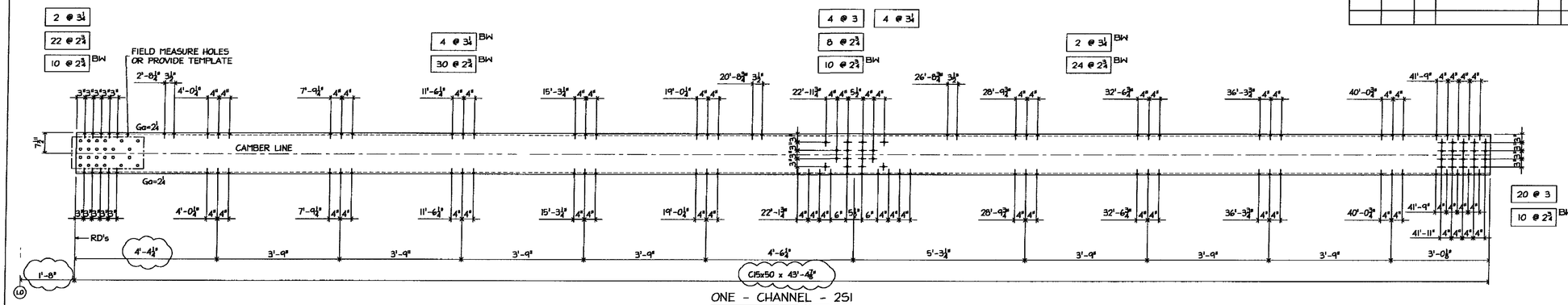
BRIDGE @ HIGHWAY #1 OVER WINOOSKI RIVER
CHORD MEMBER DETAILS

T BUCK CONSTRUCTION

DWG NO. 09-113 – 01 A

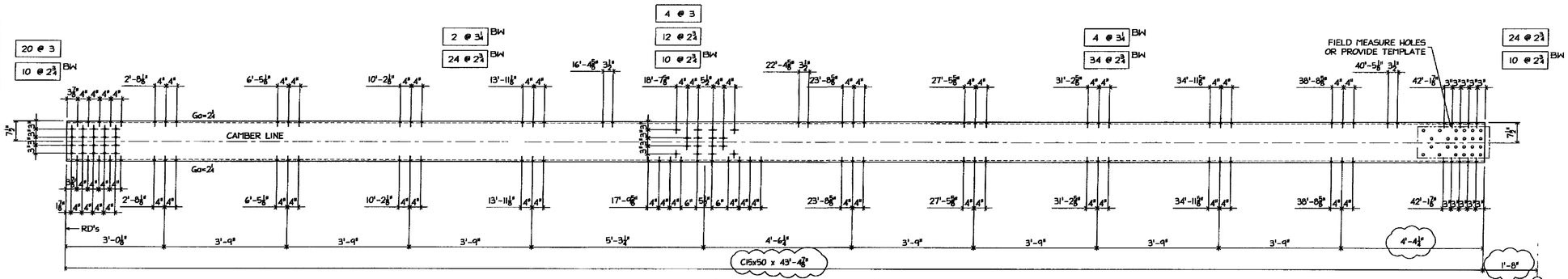
BILL OF MATERIAL

MARKS SHIP	MARKS TEMP	QTY	MATERIAL	FT	IN	GR	REMARK'S
251		ONE	C15x50	43	4 7/8		CVN, FCM
252		ONE	C15x50	43	4 7/8		CVN, FCM



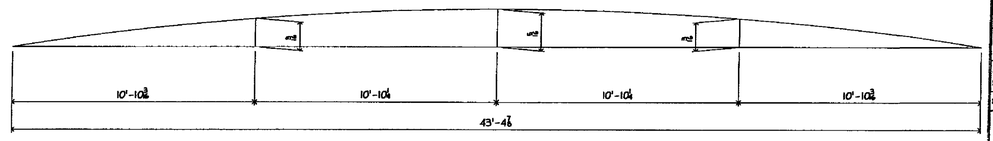
ONE - CHANNEL - 251

(WEST I/S CHORD MEMBER)



ONE - CHANNEL - 252 in stock 4/15/09

(WEST O/S CHORD MEMBER)



CAMBER DIAGRAM

NOTE
FIELD VERIFY/PROVIDE ALL DIM's INDICATED THUS '

MATL
1 ALL MAT'L SHALL CONFORM TO AASHTO M 270M/M 270 GRADE 50 (UNLESS NOTED)
2 'CVN' INDICATES CHARPY "V" NOTCH TESTED.
3 'FCM' INDICATES "FRACTURE CRITICAL MEMBER"

WELD: E70xx

HOLES: 13/16"ϕ UNO

PREP SSPC-SP6

PAINT GALVANIZED AND AIR COOLED (NOT QUENCHED) (SEE GALVANIZING NOTES)

GALVANIZING NOTES
1 ALL WELDS SHALL BE SEALED
2 VENT AS REQUIRED.
3 COMPLETE FINAL ASSEMBLY OF BOLTED ITEMS AFTER GALVANIZING WIRE-BRUSH ALL CONTACTING SURFACES TO A DULL-GRAY APPEARANCE PRIOR TO ASSEMBLY

FB THIS DWG
168- 7/8ϕ x 2¾ (A325 GALV) BOLT w/N&BW
66- 7/8ϕ x 2¾ (A325 GALV) BOLT w/N&W
48- 7/8ϕ x 3 (A325 GALV) BOLT w/N&W
12- 7/8ϕ x 3½ (A325 GALV) BOLT w/N&BW
6- 7/8ϕ x 3½ (A325 GALV) BOLT w/N&W

SHOP DRAWINGS ARE REVIEWED UNLESS NOTED OTHERWISE

NO EXCEPTION TAKEN	X
REVISE AS NOTED RESUBMISSION NOT REQUIRED	
REVISE AS NOTED RESUBMISSION REQUIRED	
REJECTED	

Stantec

DATE 3/29/09

SIGNATURE TLC

REVIEW BY STANTEC IS FOR THE SOLE PURPOSE OF ASCERTAINING GENERAL CONFORMITY WITH DESIGN. CONTRACTOR IS RESPONSIBLE FOR DIMENSIONS, FABRICATION AND CONSTRUCTION METHODS, COORDINATION OF SUB-TRADES DETAIL DESIGN OF COMPONENTS AND ERRORS OR OMISSIONS ON SHOP DRAWINGS

A 3/11/09 PER APP'L COMMENTS DATED 3/06/09

ARC ENTERPRISES, INC.
KINGFIELD, MAINE

PROJECT STATE OF VERMONT – AGENCY OF TRANSPORTATION
BRIDGE No 31 – RICHMOND, VERMONT

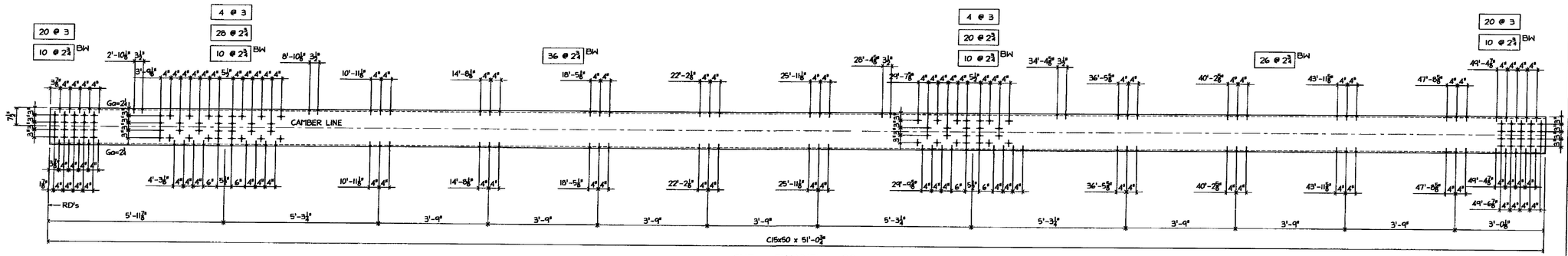
SCALE	NTS	APPROVED BY:	DRAWN BY: KAJ
DATE:	2/18/09		CHKD. BY: CMDS-DB2

BRIDGE @ HIGHWAY #1 OVER WINOOSKI RIVER
CHORD MEMBER DETAILS

T BUCK CONSTRUCTION — DWG NO 09-113 – 02 A

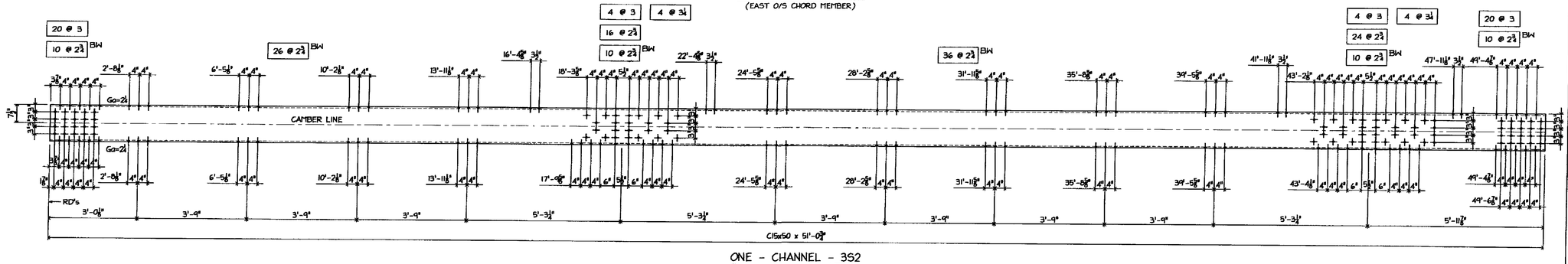
BILL OF MATERIAL

MARKS SHIP	MARKS TEMP	QTY	MATERIAL	FT	IN	GR	REMARK S
351		ONE	C15x50	51	0¾		CVN, FCM
352		ONE	C15x50	51	0¾		CVN, FCM



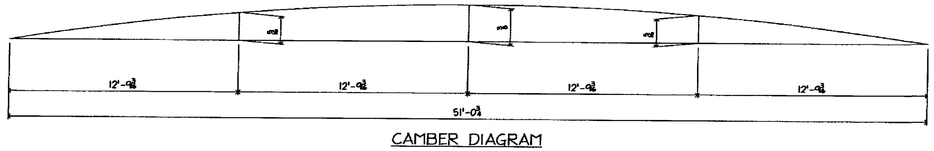
ONE - CHANNEL - 351

(EAST O/S CHORD MEMBER)



ONE - CHANNEL - 352

(EAST I/S CHORD MEMBER)



CAMBER DIAGRAM

SHOP DRAWINGS ARE REVIEWED UNLESS NOTED OTHERWISE
NO EXCEPTION TAKEN X
REVISE AS NOTED
RESUBMISSION NOT REQUIRED
REVISE AS NOTED
RESUBMISSION REQUIRED
REJECTED
Stantec
DATE 3/24/09
SIGNATURE TCK
REVIEW BY STANTEC IS FOR THE SOLE PURPOSE OF ASCERTAINING GENERAL CONFORMITY WITH DESIGN. CONTRACTOR IS RESPONSIBLE FOR DIMENSIONS, FABRICATION AND CONSTRUCTION METHODS, COORDINATION OF SUB-TRADES, DETAIL DESIGN OF COMPONENTS, AND ERRORS OR OMISSIONS ON SHOP DRAWINGS.

GALVANIZING NOTES:
1 ALL WELDS SHALL BE SEALED
2 VENT AS REQUIRED.
3 COMPLETE FINAL ASSEMBLY OF BOLTED ITEMS AFTER GALVANIZING. WIRE-BRUSH ALL CONTACTING SURFACES TO A DULL-GRAY APPEARANCE PRIOR TO ASSEMBLY

FB THIS DWG
204- ⅞ø x 2¾ (A325 GALV) BOLT w/N&BW
88- ⅞ø x 2¾ (A325 GALV) BOLT w/N&W
96- ⅞ø x 3 (A325 GALV) BOLT w/N&W
8- ⅞ø x 3¼ (A325 GALV) BOLT w/N&W

MATL:
1 ALL MAT'L SHALL CONFORM TO AASHTO M 270M/M 270 GRADE 50 (UNLESS NOTED)
2 'CVN' INDICATES CHARPY "V" NOTCH TESTED.
3 'FCM' INDICATES "FRACTURE CRITICAL MEMBER"

WELD E70xx

HOLES: ⅞"ø UNO

PREP: SSPC-SP8

PAINT: GALVANIZED AND AIR COOLED (NOT QUENCHED) (SEE GALVANIZING NOTES)

A 3/11/09 PER APP'L COMMENTS DATED 3/06/09

ARC ENTERPRISES, INC.
KINGFIELD, MAINE

PROJECT: STATE OF VERMONT – AGENCY OF TRANSPORTATION
BRIDGE No 31 – RICHMOND, VERMONT

SCALE: NTS	APPROVED BY:	DRAWN BY: KAJ	
DATE: 2/18/09		CHKD BY CMDS-082	

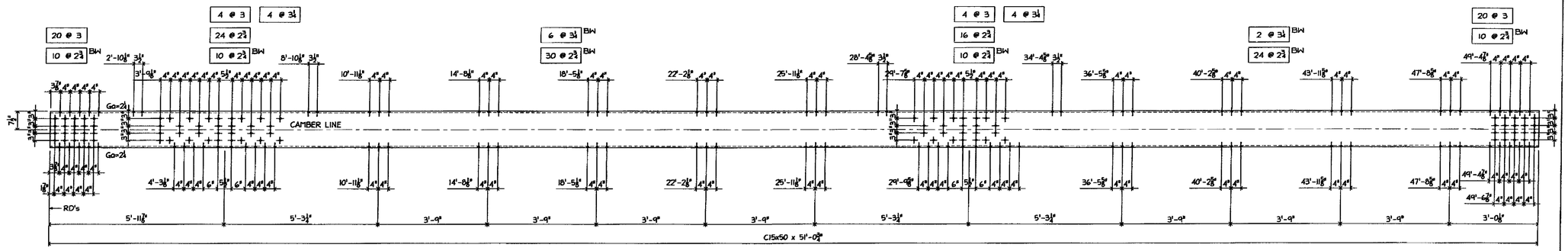
BRIDGE ❹ HIGHWAY #1 OVER WINOOSKI RIVER
CHORD MEMBER DETAILS

T BUCK CONSTRUCTION

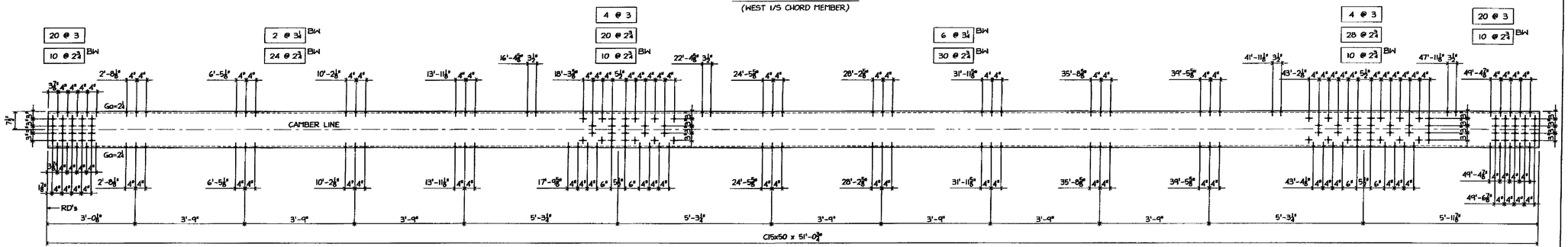
DWG NO 09-113 – 03 A

BILL OF MATERIAL

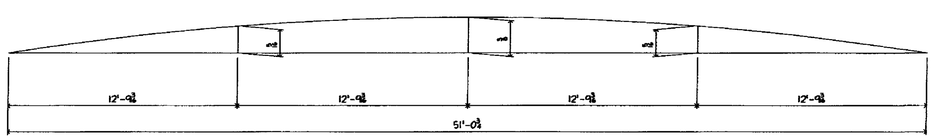
MARKS SHIP	MARKS TEMP	QTY	MATERIAL	FT	IN	GR.	REMARK'S
451		ONE	C15x50	51	0 3/4		CVN, FCM
452		ONE	C15x50	51	0 3/4		CVN, FCM



ONE - CHANNEL - 451
(WEST I/S CHORD MEMBER)



ONE - CHANNEL - 452
(WEST O/S CHORD MEMBER)



CAMBER DIAGRAM

SHOP DRAWINGS ARE REVIEWED UNLESS NOTED OTHERWISE	
NO EXCEPTION TAKEN	
REVISE AS NOTED RESUBMISSION NOT REQUIRED	
REVISE AS NOTED RESUBMISSION REQUIRED	
REJECTED	

Stantec

DATE 3/24/09

SIGNATURE TCK

REVIEW BY STANTEC IS FOR THE SOLE PURPOSE OF ASCERTAINING GENERAL CONFORMITY WITH DESIGN. CONTRACTOR IS RESPONSIBLE FOR DIMENSIONS FABRICATION AND CONSTRUCTION METHODS, COORDINATION OF SUB-TRADES DETAIL DESIGN OF COMPONENTS, AND ERRORS OR OMISSIONS ON SHOP DRAWINGS.

GALVANIZING NOTES.
1. ALL WELDS SHALL BE SEALED
2 VENT AS REQUIRED
3 COMPLETE FINAL ASSEMBLY OF BOLTED ITEMS AFTER GALVANIZING WIRE-BRUSH ALL CONTACTING SURFACES TO A DULL-GRAY APPEARANCE PRIOR TO ASSEMBLY

FB THIS DWG

188- 7/8ϕ x 2 3/4 (A325 GALV) BOLT w/N&BW
88- 7/8ϕ x 2 3/4 (A325 GALV) BOLT w/N&W
96- 7/8ϕ x 3 (A325 GALV) BOLT w/N&W
16- 7/8ϕ x 3 1/2 (A325 GALV) BOLT w/N&BW
8- 7/8ϕ x 3 1/2 (A325 GALV) BOLT w/N&W

MATL:
1 ALL MAT'L SHALL CONFORM TO AASHTO M 270M/M 270 GRADE 50 (UNLESS NOTED)
2 'CVN' INDICATES CHARPY "V" NOTCH TESTED.
3 'FCM' INDICATES "FRACTURE CRITICAL MEMBER"

WELD E70xx

HOLES: 15/16"ϕ UNO

PREP: SSPC-SP6

PAINT: GALVANIZED AND AIR COOLED (NOT QUENCHED) (SEE GALVANIZING NOTES)

A 3/11/09 PER APP'L COMMENTS DATED 3/06/09

ARC ENTERPRISES, INC.
KINGFIELD, MAINE

PROJECT: STATE OF VERMONT – AGENCY OF TRANSPORTATION
BRIDGE No 31 – RICHMOND, VERMONT

SCALE: NTS	APPROVED BY:	DRAWN BY KAJ	
DATE 2/18/09		CHKD. BY: CMDS-DB2	

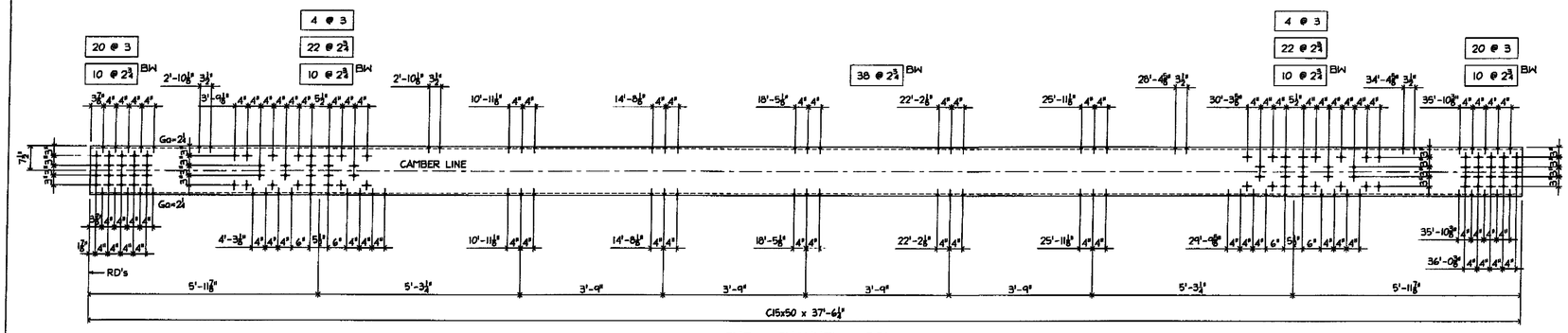
BRIDGE @ HIGHWAY #1 OVER WINOOSKI RIVER
CHORD MEMBER DETAILS

T BUCK CONSTRUCTION

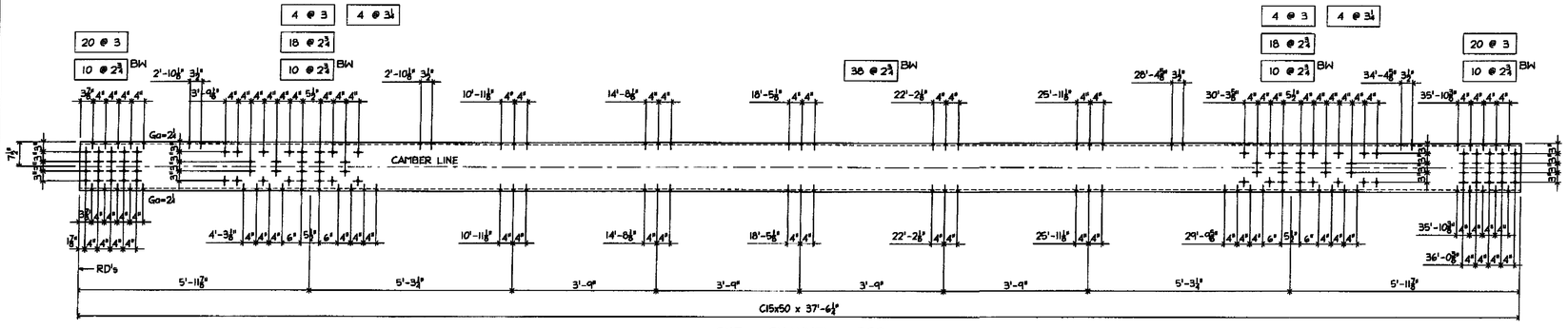
DWG NO 09-113 – 04 A

BILL OF MATERIAL

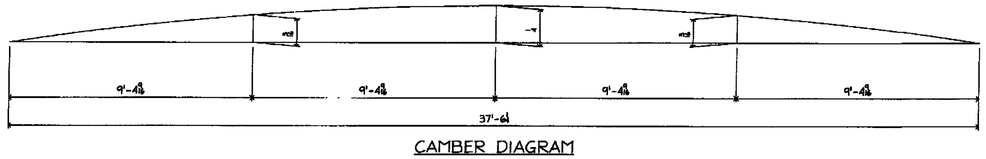
MARKS SHIP	MARKS TEMP	QTY	MATERIAL	FT	IN	GR	REMARK'S
551		ONE	C15x50	37	6½		CVN, FCM
552		ONE	C15x50	37	6½		CVN, FCM



ONE - CHANNEL - 551
(EAST O/S CHORD MEMBER)



ONE - CHANNEL - 552
(EAST I/S CHORD MEMBER)



CAMBER DIAGRAM

SHOP DRAWINGS ARE REVIEWED UNLESS NOTED OTHERWISE

NO EXCEPTION TAKEN	
REVISE AS NOTED RESUBMISSION NOT REQUIRED	
REVISE AS NOTED RESUBMISSION REQUIRED	
REJECTED	

Stantec

DATE 3/24/09

SIGNATURE

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MATL
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2 'CVN' INDICATES CHARPY "V" NOTCH TESTED.
3 'FCM' INDICATES "FRACTURE CRITICAL MEMBER"

WELD E70xx

HOLES: ⅞"ϕ UNO

PREP: SSPC-SP8

PAINT: GALVANIZED AND AIR COOLED (NOT QUENCHED) (SEE GALVANIZING NOTES)

GALVANIZING NOTES
1 ALL WELDS SHALL BE SEALED
2 VENT AS REQUIRED
3 COMPLETE FINAL ASSEMBLY OF BOLTED ITEMS AFTER GALVANIZING. WIRE-BRUSH ALL CONTACTING SURFACES TO A DULL-GRAY APPEARANCE PRIOR TO ASSEMBLY

FB THIS DWG
156- ⅞ϕ x 2¾ (A325 GALV) BOLT w/N&BW
80- ⅞ϕ x 2¾ (A325 GALV) BOLT w/N&W
96- ⅞ϕ x 3 (A325 GALV) BOLT w/N&W
8- ⅞ϕ x 3¼ (A325 GALV) BOLT w/N&W

△A 3/11/09 PER APP'L COMMENTS DATED 3/06/09

ARC ENTERPRISES, INC.
KINGFIELD, MAINE

PROJECT: STATE OF VERMONT – AGENCY OF TRANSPORTATION
BRIDGE No 31 – RICHMOND, VERMONT

SCALE: NTS	APPROVED BY	DRAWN BY	KAJ
DATE 2/18/09		CHKD BY:	CMDS-082

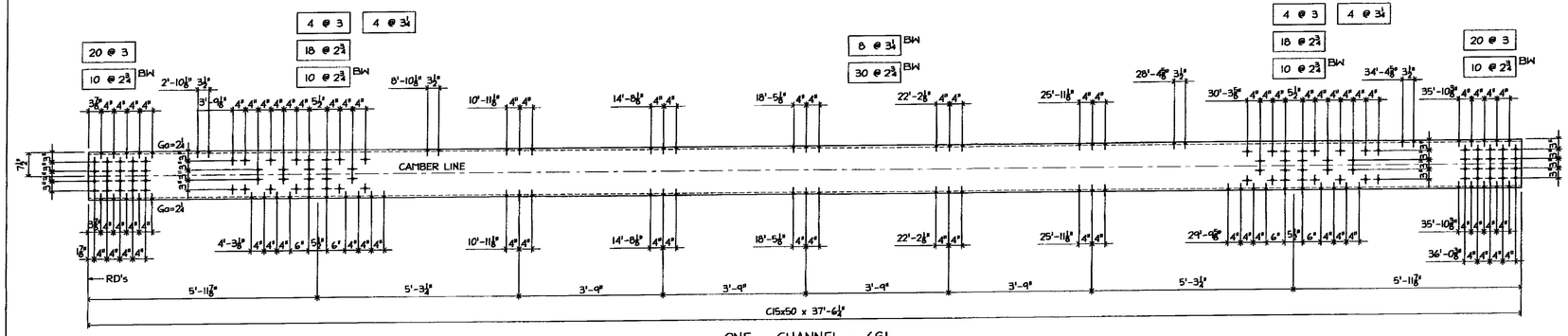
BRIDGE @ HIGHWAY #1 OVER WINOOSKI RIVER
CHORD MEMBER DETAILS

T BUCK CONSTRUCTION

DWG NO. 09-113 – 05 △A

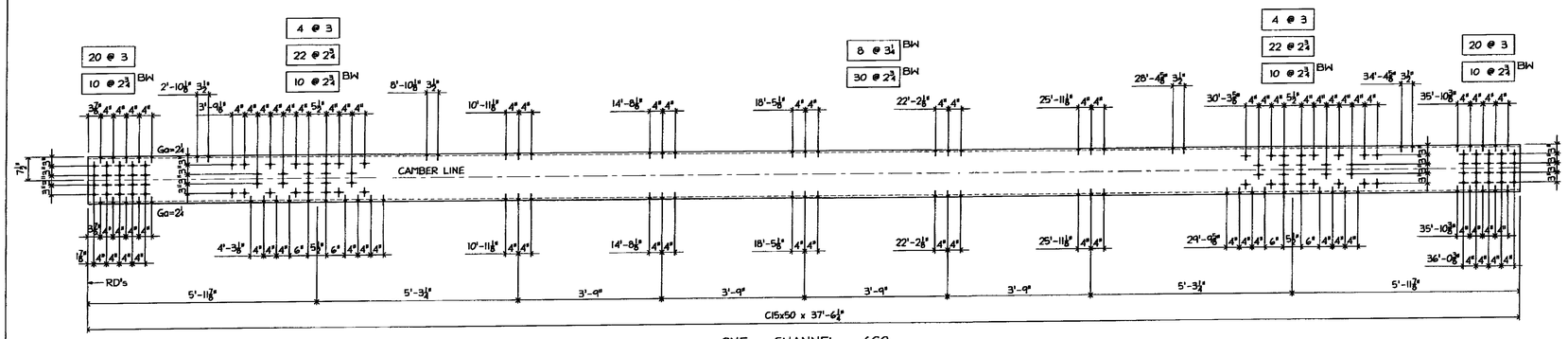
BILL OF MATERIAL

MARKS SHIP	MARKS TEMP	QTY	MATERIAL	FT	IN	GR	REMARK'S
651		ONE	C15x50	37	6½		CVN, FCM
652		ONE	C15x50	37	6½		CVN, FCM



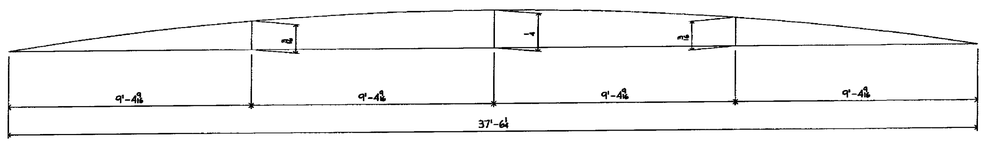
ONE - CHANNEL - 651

(WEST I/S CHORD MEMBER)



ONE - CHANNEL - 652

(WEST O/S CHORD MEMBER)



CAMBER DIAGRAM

GALVANIZING NOTES:
1. ALL WELDS SHALL BE SEALED
2 VENT AS REQUIRED
3 COMPLETE FINAL ASSEMBLY OF BOLTED ITEMS AFTER GALVANIZING WIRE-BRUSH ALL CONTACTING SURFACES TO A DULL-GRAY APPEARANCE PRIOR TO ASSEMBLY

FB THIS DWG

140- ⅞ø x 2¾ (A325 GALV) BOLT w/N⊗BW
80- ⅞ø x 2¾ (A325 GALV) BOLT w/N⊗W
96- ⅞ø x 3 (A325 GALV) BOLT w/N⊗W
16- ⅞ø x 3¼ (A325 GALV) BOLT w/N⊗BW
8- ⅞ø x 3¼ (A325 GALV) BOLT w/N⊗W

MATL:
1 ALL MAT'L SHALL CONFORM TO AASHTO M 270M/M 270 GRADE 50 (UNLESS NOTED)
2 'CVN' INDICATES CHARPY "V" NOTCH TESTED
3 'FCM' INDICATES "FRACTURE CRITICAL MEMBER"

WELD: E70xx

HOLES: ⅞"ø UNO

PREP: SSPC-SP8

PAINT: GALVANIZED AND AIR COOLED (NOT QUENCHED) (SEE GALVANIZING NOTES)

SHOP DRAWINGS ARE REVIEWED UNLESS NOTED OTHERWISE	
NO EXCEPTION TAKEN	✓
REVISE AS NOTED RESUBMISSION NOT REQUIRED	
REVISE AS NOTED RESUBMISSION REQUIRED	
REJECTED	

Stantec

DATE 3/24/09

SIGNATURE TEK

REVIEW BY STANTEC IS FOR THE SOLE PURPOSE OF ASCERTAINING GENERAL CONFORMITY WITH DESIGN. CONTRACTOR IS RESPONSIBLE FOR DIMENSIONS, FABRICATION AND CONSTRUCTION METHODS, COORDINATION OF SUB-TRADES, DETAIL DESIGN OF COMPONENTS, AND ERRORS OR OMISSIONS ON SHOP DRAWINGS.

△A 3/11/09 PER APP'L COMMENTS DATED 3/06/09

ARC ENTERPRISES, INC.
KINGFIELD, MAINE

PROJECT: STATE OF VERMONT – AGENCY OF TRANSPORTATION
BRIDGE No 31 – RICHMOND, VERMONT

SCALE: NTS	APPROVED BY	DRAWN BY: KJJ
DATE 2/18/09		CHKD. BY: CMDS-DB2

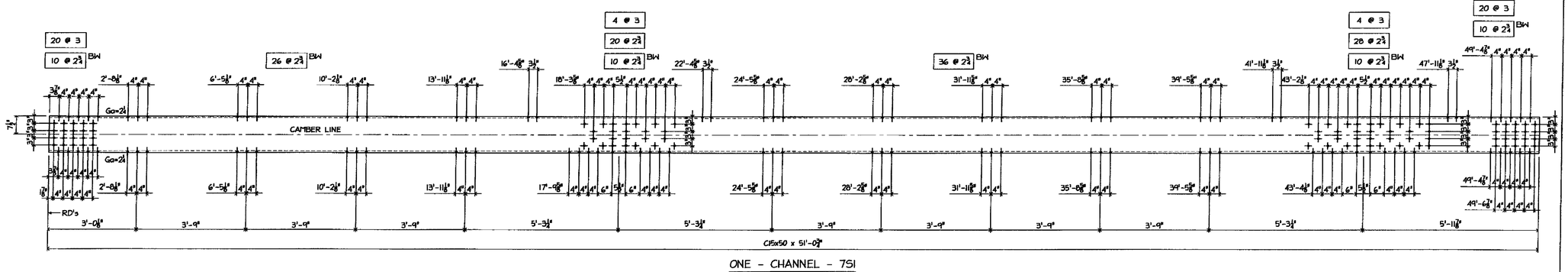
BRIDGE @ HIGHWAY #1 OVER WINOOSKI RIVER
CHORD MEMBER DETAILS

T BUCK CONSTRUCTION

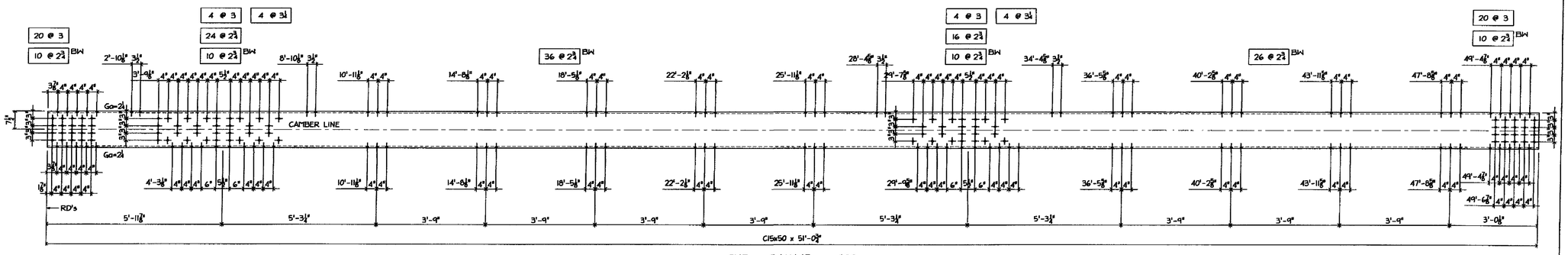
DWG NO 09-113 – 06 △A

BILL OF MATERIAL

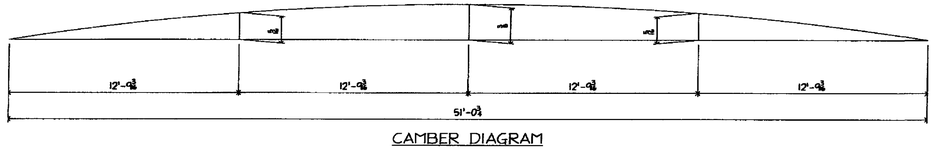
MARKS SHIP	MARKS TEMP	QTY	MATERIAL	FT	IN	GR	REMARK'S
751		ONE	C15x50	51	0 3/4		CVN, FCM
752		ONE	C15x50	51	0 3/4		CVN, FCM



ONE - CHANNEL - 751
(EAST O/S CHORD MEMBER)



ONE - CHANNEL - 752
(EAST I/S CHORD MEMBER)



CAMBER DIAGRAM

SHOP DRAWINGS ARE REVIEWED UNLESS NOTED OTHERWISE	
NO EXCEPTION TAKEN	
REVISE AS NOTED RESUBMISSION NOT REQUIRED	
REVISE AS NOTED RESUBMISSION REQUIRED	
REJECTED	
DATE	3/24/09
SIGNATURE	

Stantec

REVIEW BY STANTEC IS FOR THE SOLE PURPOSE OF ASCERTAINING GENERAL CONFORMITY WITH DESIGN. CONTRACTOR IS RESPONSIBLE FOR DIMENSIONS, FABRICATION AND CONSTRUCTION METHODS, COORDINATION OF SUB-TRADES DETAIL DESIGN OF COMPONENTS, AND ERRORS OR OMISSIONS ON SHOP DRAWINGS.

GALVANIZING NOTES
1 ALL WELDS SHALL BE SEALED
2 VENT AS REQUIRED.
3 COMPLETE FINAL ASSEMBLY OF BOLTED ITEMS AFTER GALVANIZING. WIRE-BRUSH ALL CONTACTING SURFACES TO A DULL-GRAY APPEARANCE PRIOR TO ASSEMBLY

FB THIS DWG
204- 7/8ϕ x 2 3/4 (A325 GALV) BOLT w/N&BW
88- 7/8ϕ x 2 3/4 (A325 GALV) BOLT w/N&W
96- 7/8ϕ x 3 (A325 GALV) BOLT w/N&W
8- 7/8ϕ x 3 1/4 (A325 GALV) BOLT w/N&W

MATL
1 ALL MAT'L SHALL CONFORM TO AASHTO M 270M/M 270 GRADE 50 (UNLESS NOTED)
2 'CVN' INDICATES CHARPY "V" NOTCH TESTED
3 'FCM' INDICATES "FRACTURE CRITICAL MEMBER"

WELD E70xx

HOLES: 15/16ϕ UNO

PREP: SSPC-SP8

PAINT: GALVANIZED AND AIR COOLED (NOT QUENCHED) (SEE GALVANIZING NOTES)

A 3/11/09 PER APP'L COMMENTS DATED 3/06/09

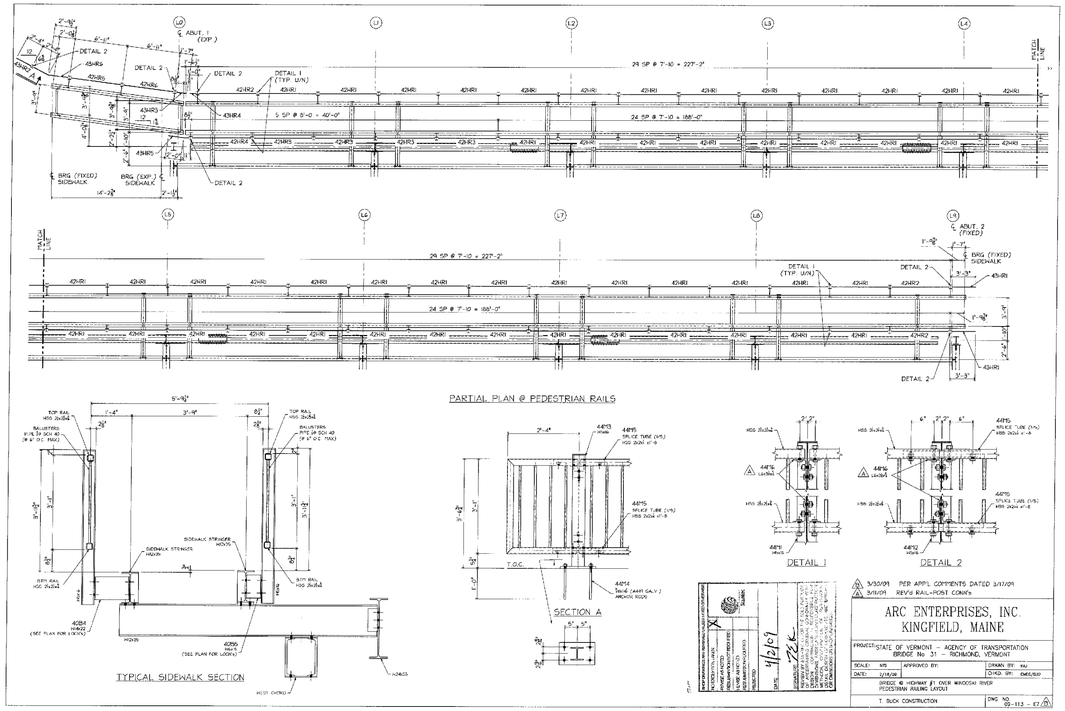
ARC ENTERPRISES, INC.
KINGFIELD, MAINE

PROJECT STATE OF VERMONT - AGENCY OF TRANSPORTATION
BRIDGE No 31 - RICHMOND, VERMONT

SCALE: NTS	APPROVED BY:	DRAWN BY: KAJ
DATE 2/18/09		CHKD. BY: CMDS-DB2

BRIDGE @ HIGHWAY #1 OVER WINOOSKI RIVER
CHORD MEMBER DETAILS

T BUCK CONSTRUCTION — DWG NO 09-113 - 07 A



TYPICAL SIDEWALK SECTION

PARTIAL PLAN @ PEDESTRIAN RAILS

△ 3/30/09 PER APPL COMMENTS DATED 3/17/09
△ 3/13/09 REVS RAIL-POST CONN'S

ARC ENTERPRISES, INC.
KINGFIELD, MAINE

PROJECT: STATE OF VERMONT — AGENCY OF TRANSPORTATION
BRIDGE No. 31 — RICHMOND, VERMONT

SCALE:	NTS	APPROVED BY:	DRAWN BY: KAJ
DATE:	1/14/09		CHKD. BY: DMS/BJD

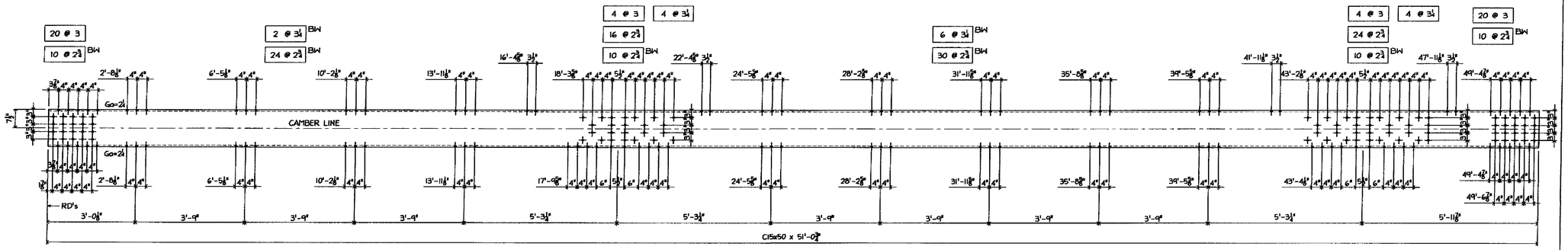
BRIDGE 40 HIGHWAY #1 OVER WINOOSKI RIVER
PEDESTRIAN RAILING LAYOUT

T. BUCK CONSTRUCTION

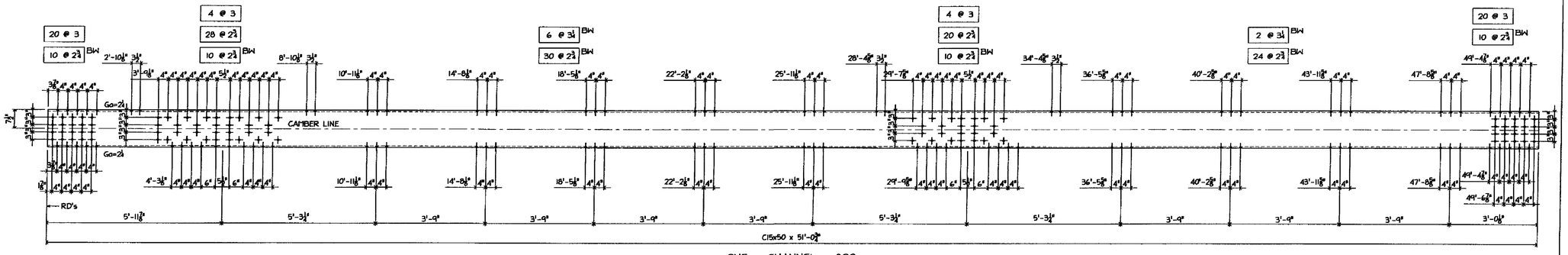
DWG NO. 99-113 - 67 △

BILL OF MATERIAL

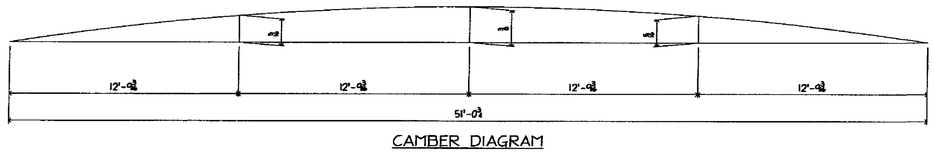
MARKS SHIP	MARKS TEMP	QTY	MATERIAL	FT	IN	GR	REMARK'S
851		ONE	C15x50	51	0 3/4		CVN, FCM
852		ONE	C15x50	51	0 3/4		CVN, FCM



ONE - CHANNEL - 851
(WEST I/S CHORD MEMBER)



ONE - CHANNEL - 852
(WEST O/S CHORD MEMBER)



CAMBER DIAGRAM

SHOP DRAWINGS ARE REVIEWED UNLESS NOTED OTHERWISE

NO EXCEPTION TAKEN	X
REVISE AS NOTED RESUBMISSION NOT REQUIRED	
REVISE AS NOTED RESUBMISSION REQUIRED	
REJECTED	

Stantec

DATE 3/24/09

SIGNATURE TEK

REVIEW BY STANTEC IS FOR THE SOLE PURPOSE OF ASCERTAINING GENERAL CONFORMITY WITH DESIGN. CONTRACTOR IS RESPONSIBLE FOR DIMENSIONS FABRICATION AND CONSTRUCTION METHODS COORDINATION OF SUB-TRADES DETAIL DESIGN OF COMPONENTS AND ERRORS OR OMISSIONS ON SHOP DRAWINGS

GALVANIZING NOTES
1 ALL WELDS SHALL BE SEALED
2 VENT AS REQUIRED
3 COMPLETE FINAL ASSEMBLY OF BOLTED ITEMS AFTER GALVANIZING. WIRE-BRUSH ALL CONTACTING SURFACES TO A DULL-GRAY APPEARANCE PRIOR TO ASSEMBLY

FB THIS DWG
188- 7/8ϕ x 2 3/4 (A325 GALV) BOLT w/N&BW
88- 7/8ϕ x 2 3/4 (A325 GALV) BOLT w/N&W
96- 7/8ϕ x 3 (A325 GALV) BOLT w/N&W
16- 7/8ϕ x 3 1/4 (A325 GALV) BOLT w/N&W
8- 7/8ϕ x 3 1/4 (A325 GALV) BOLT w/N&W

MATL
1 ALL MAT'L SHALL CONFORM TO AASHTO M 270M/M 270 GRADE 50 (UNLESS NOTED)
2 'CVN' INDICATES CHARPY "V" NOTCH TESTED.
3 'FCM' INDICATES "FRACTURE CRITICAL MEMBER"

WELD: E70xx

HOLES: 13/16"ϕ UNO

PREP: SSPC-SP8

PAINT GALVANIZED AND AIR COOLED (NOT QUENCHED) (SEE GALVANIZING NOTES)

A 3/11/09 PER APP'L COMMENTS DATED 3/06/09

ARC ENTERPRISES, INC.
KINGFIELD, MAINE

PROJECT STATE OF VERMONT – AGENCY OF TRANSPORTATION
BRIDGE No 31 – RICHMOND, VERMONT

SCALE: NTS	APPROVED BY:	DRAWN BY KAJ	
DATE 2/18/09		CHKD. BY: CWOS-DB2	

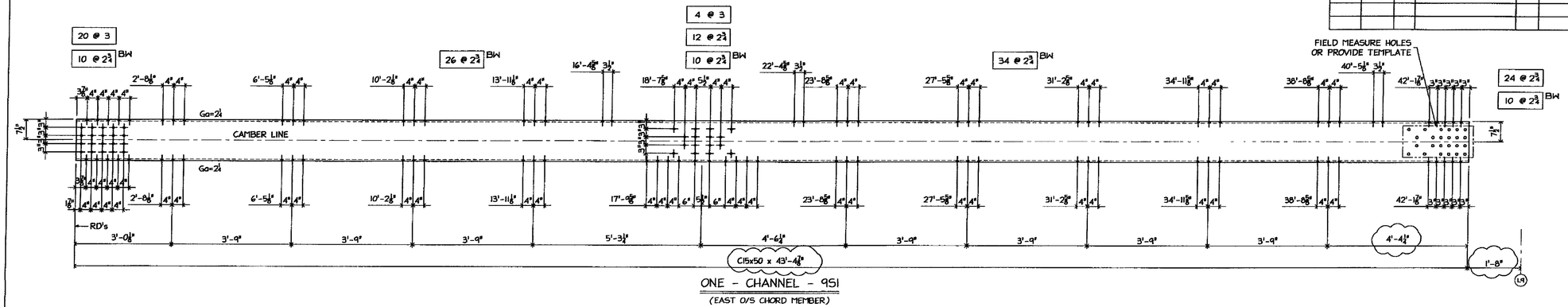
BRIDGE @ HIGHWAY #1 OVER WINOOSKI RIVER
CHORD MEMBER DETAILS

T BUCK CONSTRUCTION

DWG NO 09-113 - 08 A

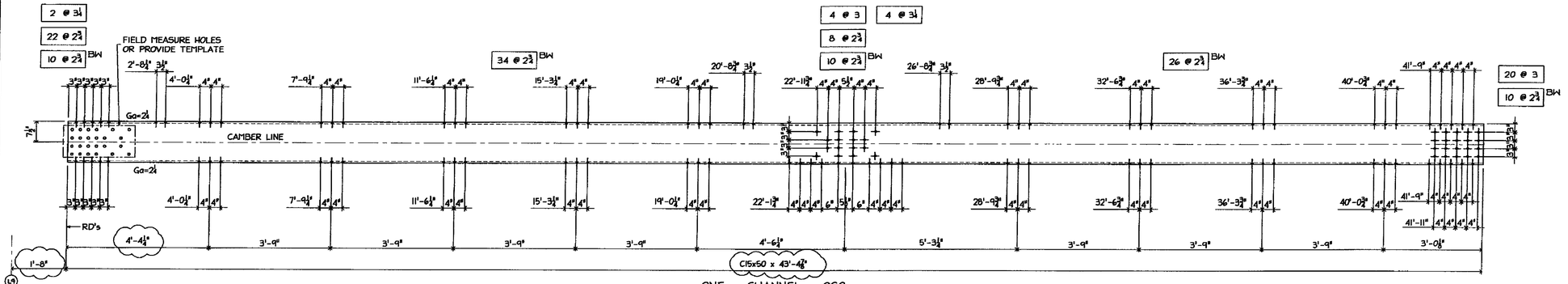
BILL OF MATERIAL

MATL MARKS SHIP	MATL MARKS TEMP	QTY	MATERIAL	FT	IN	GR	REMARK'S
951		ONE	C15x50	43	4 7/8		CVN, FCM
952		ONE	C15x50	43	4 7/8		CVN, FCM



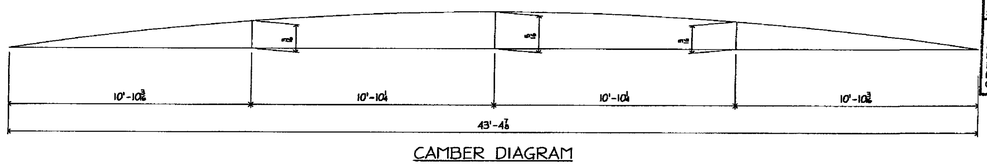
ONE - CHANNEL - 951

(EAST O/S CHORD MEMBER)



ONE - CHANNEL - 952

(EAST I/S CHORD MEMBER)



CAMBER DIAGRAM

SHOP DRAWINGS ARE REVIEWED UNLESS NOTED OTHERWISE

NO EXCEPTION TAKEN	
REVISE AS NOTED RESUBMISSION NOT REQUIRED	
REVISE AS NOTED RESUBMISSION REQUIRED	
REJECTED	

Stantec

DATE 3/24/9

SIGNATURE TEK

REVIEW BY STANTEC IS FOR THE SOLE PURPOSE OF ASCERTAINING GENERAL CONFORMITY WITH DESIGN. CONTRACTOR IS RESPONSIBLE FOR DIMENSIONS, FABRICATION AND CONSTRUCTION METHODS, COORDINATION OF SUB-TRADES DETAIL DESIGN OF COMPONENTS, AND ERRORS OR OMISSIONS ON SHOP DRAWINGS.

NOTE:
FIELD VERIFY/PROVIDE ALL DIM's INDICATED THUS ' '

GALVANIZING NOTES

1. ALL WELDS SHALL BE SEALED
2. VENT AS REQUIRED.
3. COMPLETE FINAL ASSEMBLY OF BOLTED ITEMS AFTER GALVANIZING. WIRE-BRUSH ALL CONTACTING SURFACES TO A DULL-GRAY APPEARANCE PRIOR TO ASSEMBLY

FB THIS DWG

180- 7/8ϕ x 2 3/4 (A325 GALV) BOLT w/N&BW
66- 7/8ϕ x 2 3/4 (A325 GALV) BOLT w/N&W
48- 7/8ϕ x 3 (A325 GALV) BOLT w/N&W
6- 7/8ϕ x 3 1/2 (A325 GALV) BOLT w/N&W

MATL

1 ALL MAT'L SHALL CONFORM TO AASHTO M 270M/M 270 GRADE 50 (UNLESS NOTED)
2 'CVN' INDICATES CHARPY "V" NOTCH TESTED.
3 'FCM' INDICATES "FRACTURE CRITICAL MEMBER"

WELD: E70xx

HOLES: 13/16"ϕ UNO

PREP SSPC-SP8

PAINT: GALVANIZED AND AIR COOLED (NOT QUENCHED) (SEE GALVANIZING NOTES)

A 3/11/09 PER APP'L COMMENTS DATED 3/06/09

ARC ENTERPRISES, INC.
KINGFIELD, MAINE

PROJECT STATE OF VERMONT - AGENCY OF TRANSPORTATION
BRIDGE No 31 - RICHMOND, VERMONT

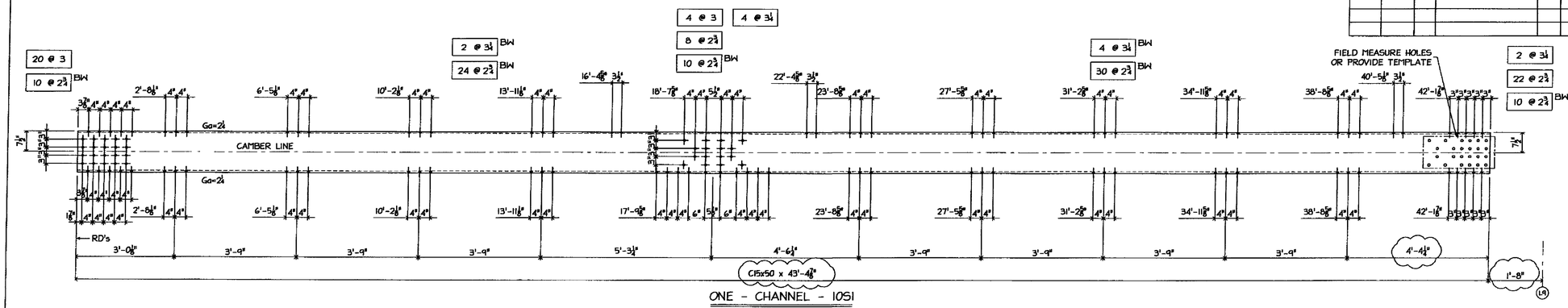
SCALE: NTS	APPROVED BY	DRAWN BY KAJ
DATE: 2/18/09		CHKD. BY: CMDS-DB2

BRIDGE @ HIGHWAY #1 OVER WINOOSKI RIVER
CHORD MEMBER DETAILS

T BUCK CONSTRUCTION

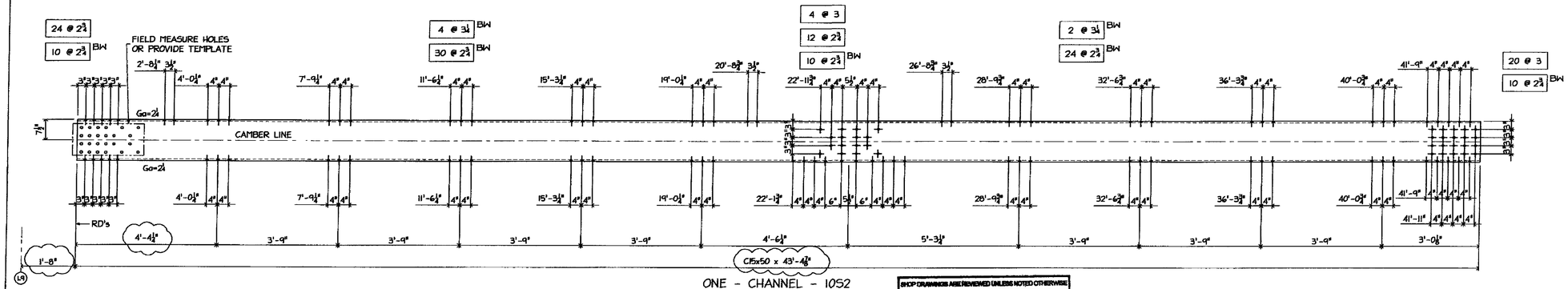
DWG NO 09-113 - 09 A

BILL OF MATERIAL							
MARKS SHIP	MARKS TEMP	QTY	MATERIAL	FT	IN	GR	REMARK'S
1051		ONE	C15x50	43	4 7/8		CVN, FCM
1052		ONE	C15x50	43	4 7/8		CVN, FCM



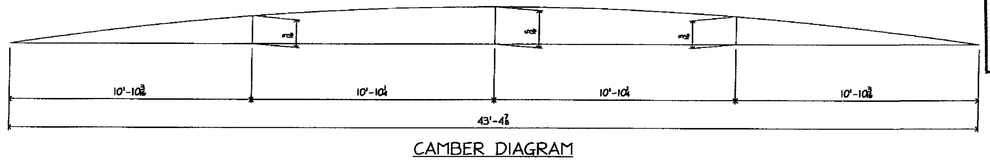
ONE - CHANNEL - 1051

(WEST 1/5 CHORD MEMBER)



ONE - CHANNEL - 1052

(WEST 0/S CHORD MEMBER)



CAMBER DIAGRAM

SHOP DRAWINGS ARE REVIEWED UNLESS NOTED OTHERWISE	
NO EXCEPTION TAKEN	X
REVISE AS NOTED RESUBMISSION NOT REQUIRED	
REVISE AS NOTED RESUBMISSION REQUIRED	
REJECTED	
DATE	3/24/09
SIGNATURE	

Stantec

REVIEW BY STANTEC IS FOR THE SOLE PURPOSE OF ASCERTAINING GENERAL CONFORMITY WITH DESIGN. CONTRACTOR IS RESPONSIBLE FOR DIMENSIONS, FABRICATION AND CONSTRUCTION METHODS, COORDINATION OF SUB-TRADES DETAIL DESIGN OF COMPONENTS, AND ERRORS OR OMISSIONS ON SHOP DRAWINGS.

NOTE
FIELD VERIFY/PROVIDE ALL DIM's INDICATED THUS ' '

GALVANIZING NOTES:
1 ALL WELDS SHALL BE SEALED
2 VENT AS REQUIRED
3 COMPLETE FINAL ASSEMBLY OF BOLTED ITEMS AFTER GALVANIZING WIRE-BRUSH ALL CONTACTING SURFACES TO A DULL-GRAY APPEARANCE PRIOR TO ASSEMBLY

FB THIS DWG
168- 7/8ø x 2 3/4 (A325 GALV) BOLT w/N&BW
66- 7/8ø x 2 3/4 (A325 GALV) BOLT w/N&W
48- 7/8ø x 3 (A325 GALV) BOLT w/N&W
12- 7/8ø x 3 1/4 (A325 GALV) BOLT w/N&BW
6- 7/8ø x 3 1/4 (A325 GALV) BOLT w/N&W

MATL:
1 ALL MAT'L SHALL CONFORM TO AASHTO M 270M/M 270 GRADE 50 (UNLESS NOTED)
2 'CVN' INDICATES CHARPY "V" NOTCH TESTED.
3 'FCM' INDICATES "FRACTURE CRITICAL MEMBER"

WELD: E70xx

HOLES: 13/16"ø UNO

PREP: SSPC-SP8

PAINT GALVANIZED AND AIR COOLED (NOT QUENCHED) (SEE GALVANIZING NOTES)

A 3/11/09 PER APP'L COMMENTS DATED 3/06/09

ARC ENTERPRISES, INC.
KINGFIELD, MAINE

PROJECT STATE OF VERMONT - AGENCY OF TRANSPORTATION
BRIDGE No 31 - RICHMOND, VERMONT

SCALE	NTS	APPROVED BY	DRAWN BY	KAJ
DATE	2/18/09		CHKD. BY	CWDS-082

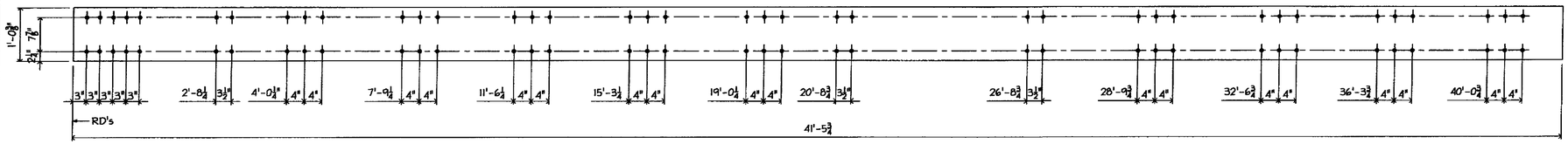
BRIDGE @ HIGHWAY #1 OVER WINOOSKI RIVER
CHORD MEMBER DETAILS

T BUCK CONSTRUCTION

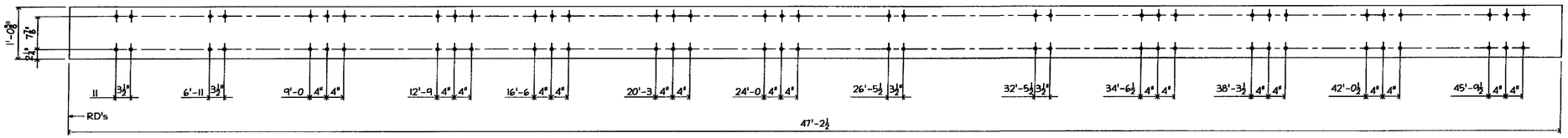
DWG NO. 09-113 - 10 A

BILL OF MATERIAL

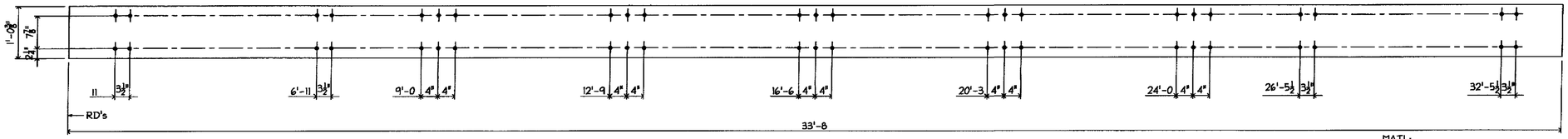
MARKS SHIP	MARKS TEMP	QTY	MATERIAL	FT	IN	GR	REMARK'S
11M1		4	PL½ x 12⅜	41	5¾		CVN
11M2		4	PL½ x 12⅜	47	2½		CVN
11M3		2	PL½ x 12⅜	33	8		CVN



4 - COVER PL's - 11M1
(PL½)



4 - COVER PL's - 11M2
(PL½)



2 - COVER PL's - 11M3
(PL½)

SHOP DRAWINGS ARE REVIEWED UNLESS NOTED OTHERWISE

NO EXCEPTION TAKEN	X
REVISE AS NOTED RESUBMISSION NOT REQUIRED	
REVISE AS NOTED RESUBMISSION REQUIRED	
REJECTED	

Stantec

DATE 3/24/09

SIGNATURE TCK

REVIEW BY STANTEC IS FOR THE SOLE PURPOSE OF ASCERTAINING GENERAL CONFORMITY WITH DESIGN. CONTRACTOR IS RESPONSIBLE FOR DIMENSIONS, FABRICATION AND CONSTRUCTION METHODS, COORDINATION OF SUB-TRADES, DETAIL DESIGN OF COMPONENTS, AND ERRORS OR OMISSIONS ON SHOP DRAWINGS.

GALVANIZING NOTES.
1 ALL WELDS SHALL BE SEALED
2 VENT AS REQUIRED
3 COMPLETE FINAL ASSEMBLY OF BOLTED ITEMS AFTER GALVANIZING. WIRE-BRUSH ALL CONTACTING SURFACES TO A DULL-GRAY APPEARANCE PRIOR TO ASSEMBLY

MATL:
1 ALL MAT'L SHALL CONFORM TO AASHTO M 270M/M 270 GRADE 50 (UNLESS NOTED)
2 'CVN' INDICATES CHARPY "V" NOTCH TESTED
3 'FCM' INDICATES "FRACTURE CRITICAL MEMBER"

WELD E70xx

HOLES: ⅞"ϕ UNO

PREP SSPC-SP6

PAINT: GALVANIZED AND AIR COOLED (NOT QUENCHED) (SEE GALVANIZING NOTES)

B 3/18/09 BOM UPDATED
A 3/11/09 PER APP'L COMMENTS DATED 3/06/09

ARC ENTERPRISES, INC.
KINGFIELD, MAINE

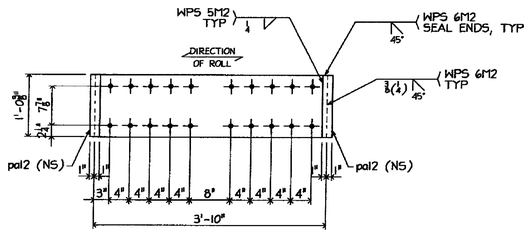
PROJECT: STATE OF VERMONT – AGENCY OF TRANSPORTATION
BRIDGE No 31 – RICHMOND, VERMONT

SCALE: NTS	APPROVED BY:	DRAWN BY: KAJ	
DATE: 2/18/09		CHKD. BY CWDS	

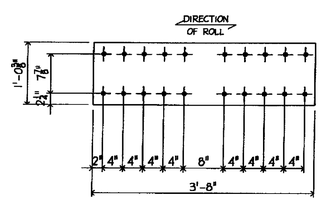
BRIDGE @ HIGHWAY #1 OVER WINOOSKI RIVER
CHORD COVER PLATES

T BUCK CONSTRUCTION

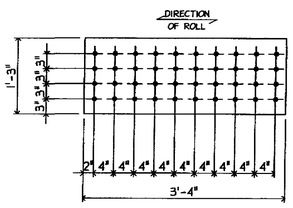
DWG NO. 09-113 – 11 B



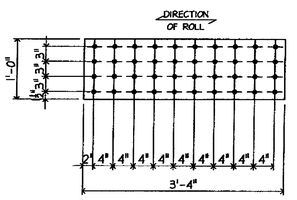
8 - SPLICE PL's - 12M1
(PL¾)



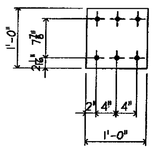
8 - SPLICE PL's - 12M2
(PL¾)



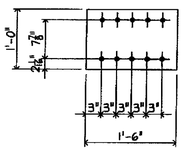
16 - SPLICE PL's - 12M3
(PL¾)



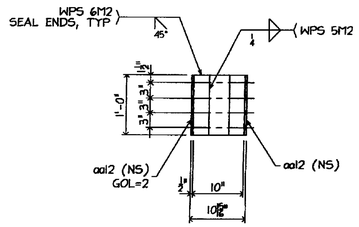
16 - SPLICE PL's - 12M4
(PL¾)



82 - STAY PL's - 12M5
(PL¾)



4 - STAY PL's - 12M6
(PL¾)



16 - DIAPHRAGMS - 12M7
(PL¾)

SHOP DRAWINGS ARE REVIEWED UNLESS NOTED OTHERWISE	
NO EXCEPTION TAKEN	X
REVISE AS NOTED RESUBMISSION NOT REQUIRED	
REVISE AS NOTED RESUBMISSION REQUIRED	
REJECTED	
DATE	3/24/14

Stantec

GALVANIZING NOTES:
1. ALL WELDS SHALL BE SEALED
2 VENT AS REQUIRED.
3 COMPLETE FINAL ASSEMBLY OF BOLTED ITEMS AFTER GALVANIZING WIRE-BRUSH ALL CONTACTING SURFACES TO A DULL-GRAY APPEARANCE PRIOR TO ASSEMBLY

BILL OF MATERIAL

MARKS SHIP	MARKS TEMP	QTY	MATERIAL	FT	IN	GR	REMARK'S
12M1		8	PL¾ x 12⅛	3	10		CVN, FCM
	pal2	16	PL⅜ x 2	1	0⅛		CVN, FCM
12M2		8	PL¾ x 12⅛	3	8		CVN, FCM
12M3		16	PL¾ x 15	3	4		CVN, FCM
12M4		16	PL¾ x 12	3	4		CVN, FCM
12M5		82	PL¾ x 12	1	0		CVN
12M6		4	PL¾ x 12	1	6		CVN
12M7		16	PL¾ x 10	1	0		CVN
	aal2	32	L3½x3½x⅜	1	0		CVN

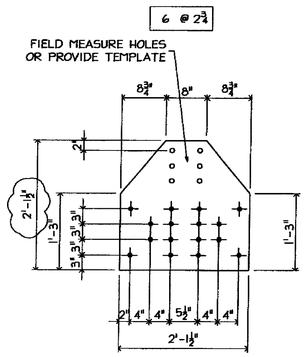
MATL:
1 ALL MAT'L SHALL CONFORM TO AASHTO M 270M/M 270 GRADE 50 (UNLESS NOTED)
2 'CVN' INDICATES CHARPY "V" NOTCH TESTED.
3 'FCM' INDICATES "FRACTURE CRITICAL MEMBER"

WELD: E70xx

HOLES: ⅞"ϕ UNO

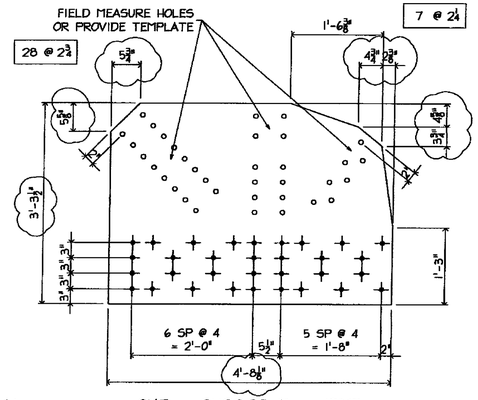
PREP: SSPC-SP6

PAINT: GALVANIZED AND AIR COOLED (NOT QUENCHED) (SEE GALVANIZING NOTES)



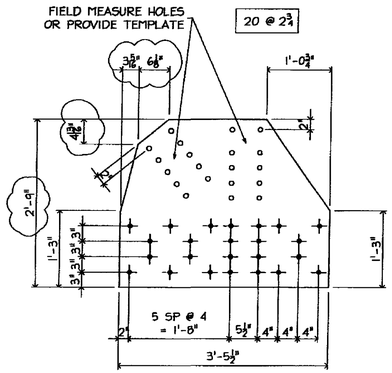
ONE - GUSSET PL - 13M1 rev'd/dtd 4/13/09

(PL⅝) GRID 'L1' EAST - O/S



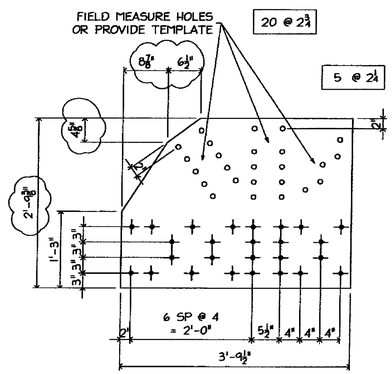
ONE - GUSSET PL - 13M3

(PL⅝) GRID 'L2' EAST - O/S



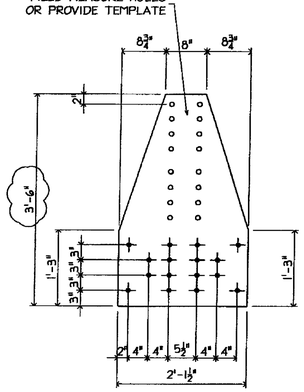
ONE - GUSSET PL - 13M5

(PL⅝) GRID 'L3' EAST - O/S



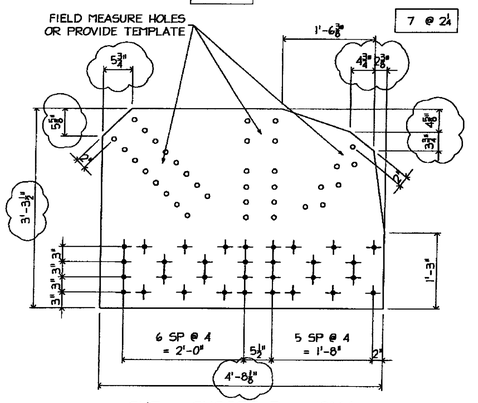
ONE - GUSSET PL - 13M7

(PL⅝) GRID 'L4' EAST - O/S



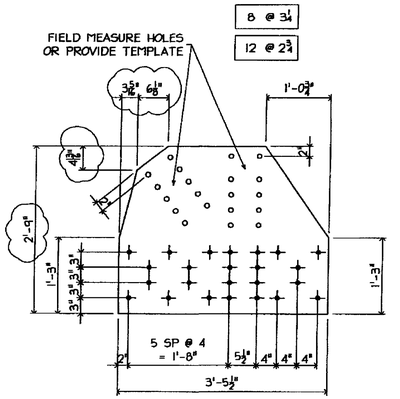
ONE - GUSSET PL - 13M2

(PL⅝) GRID 'L1' EAST - 1/S



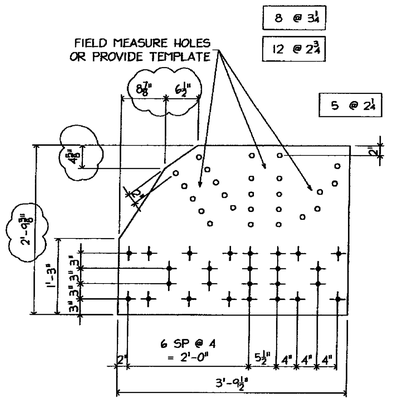
ONE - GUSSET PL - 13M4

(PL⅝) GRID 'L2' EAST - 1/S



ONE - GUSSET PL - 13M6

(PL⅝) GRID 'L3' EAST - 1/S



ONE - GUSSET PL - 13M8

(PL⅝) GRID 'L4' EAST - 1/S

BILL OF MATERIAL

MARKS SHIP	MARKS TEMP	QTY	MATERIAL	FT	IN	GR	REMARK'S
13M1		ONE	PL⅝ x 25½	2	½		CVN SHAPED
13M2		ONE	PL⅝ x 25½	3	6		CVN SHAPED
13M3		ONE	PL⅝ x 30½	4	8⅛		CVN SHAPED
13M4		ONE	PL⅝ x 30½	4	8½		CVN SHAPED
13M5		ONE	PL⅝ x 33	3	5½		CVN SHAPED
13M6		ONE	PL⅝ x 33	3	5½		CVN SHAPED
13M7		ONE	PL⅝ x 33⅜	3	9½		CVN SHAPED
13M8		ONE	PL⅝ x 33⅜	3	9½		CVN SHAPED

MATL

1 ALL MAT'L SHALL CONFORM TO AASHTO M 270M/M 270 GRADE 50 (UNLESS NOTED)
2 'CVN' INDICATES CHARPY "V" NOTCH TESTED.
3 'FCM' INDICATES "FRACTURE CRITICAL MEMBER"

WELD E70xx

HOLES: 15/16"ø UNO

PREP SSPC-SP8

PAINT GALVANIZED AND AIR COOLED (NOT QUENCHED) (SEE GALVANIZING NOTES)

A 3/11/09 PER APP'L COMMENTS DATED 3/06/09

NOTE:
FIELD VERIFY/PROVIDE ALL DIM's INDICATED THUS ' ☁ '

'SHOP DRAWINGS ARE REVIEWED UNLESS NOTED OTHERWISE

NO EXCEPTION TAKEN	X
REVISE AS NOTED RESUBMISSION NOT REQUIRED	
REVISE AS NOTED RESUBMISSION REQUIRED	
REJECTED	

Stantec

DATE 3/24/09

SIGNATURE TLK

REVIEW BY STANTEC IS FOR THE SOLE PURPOSE OF ASCERTAINING GENERAL CONFORMITY WITH DESIGN. CONTRACTOR IS RESPONSIBLE FOR DIMENSIONS, FABRICATION AND CONSTRUCTION METHODS, COORDINATION OF SUB-TRADES DETAIL DESIGN OF COMPONENTS, AND ERRORS OR OMISSIONS ON SHOP DRAWINGS

GALVANIZING NOTES:
1 ALL WELDS SHALL BE SEALED
2 VENT AS REQUIRED.
3 COMPLETE FINAL ASSEMBLY OF BOLTED ITEMS AFTER GALVANIZING. WIRE-BRUSH ALL CONTACTING SURFACES TO A DULL-GRAY APPEARANCE PRIOR TO ASSEMBLY

FB THIS DWG

24- ⅞ø x 2¼ (A325 GALV.) BOLT w/N&W
126- ⅞ø x 2¾ (A325 GALV.) BOLT w/N&W
32- ⅞ø x 3¼ (A325 GALV.) BOLT w/N&W

ARC ENTERPRISES, INC.
KINGFIELD, MAINE

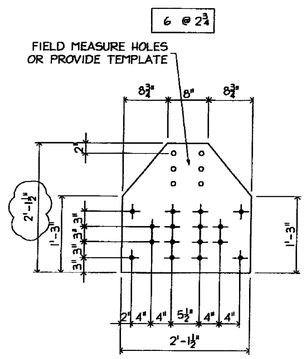
PROJECT: STATE OF VERMONT – AGENCY OF TRANSPORTATION
BRIDGE No 31 – RICHMOND, VERMONT

SCALE	NTS	APPROVED BY:	DRAWN BY KAJ
DATE	2/18/09		CHKD BY CMOS-DB2

BRIDGE @ HIGHWAY #1 OVER WINOOSKI RIVER
GUSSET PLATE DETAILS

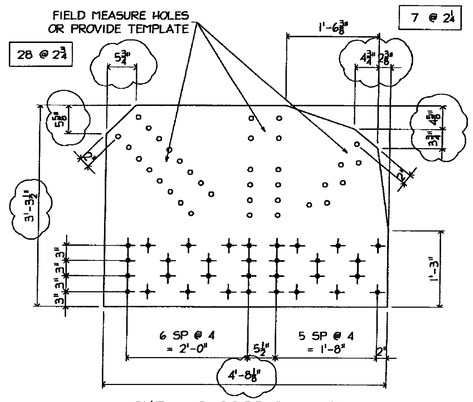
T BUCK CONSTRUCTION

DWG NO. 09-113 – 13 A



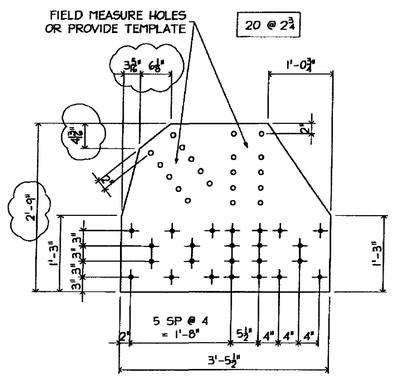
ONE - GUSSET PL - 14M11

(PL⅝) GRID 'L8' EAST - O/S



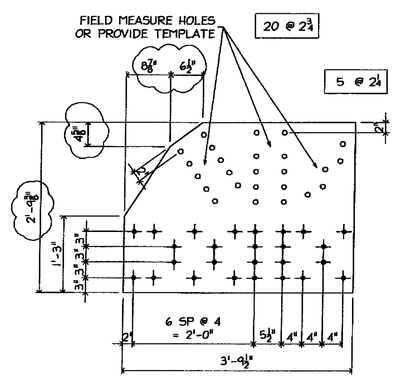
ONE - GUSSET PL - 14M13

(PL⅝) GRID 'L7' EAST - O/S



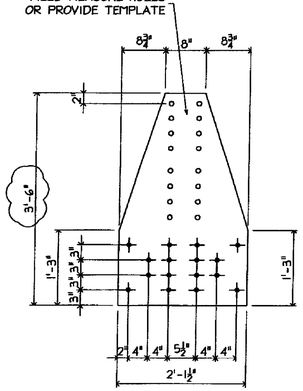
ONE - GUSSET PL - 14M15

(PL⅝) GRID 'L6' EAST - O/S



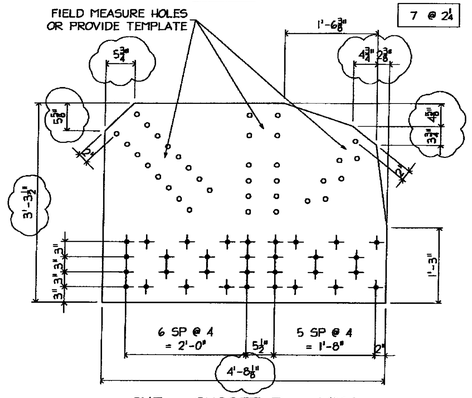
ONE - GUSSET PL - 14M17

(PL⅝) GRID 'L5' EAST - O/S



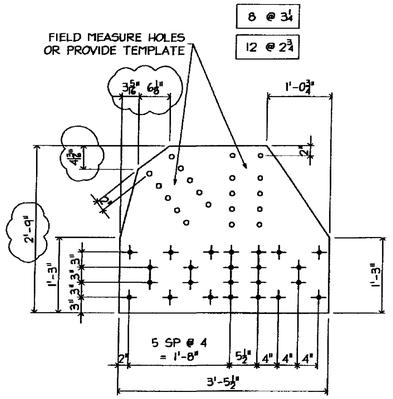
ONE - GUSSET PL - 14M12

(PL⅝) GRID 'L8' EAST - I/S



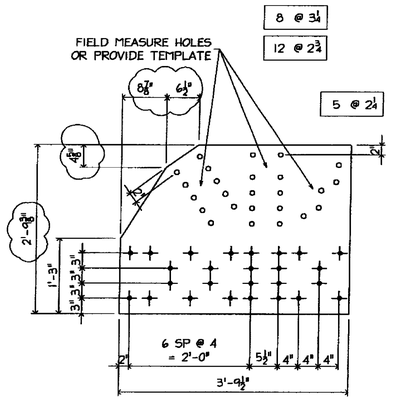
ONE - GUSSET PL - 14M14

(PL⅝) GRID 'L7' EAST - I/S



ONE - GUSSET PL - 14M16

(PL⅝) GRID 'L6' EAST - I/S



ONE - GUSSET PL - 14M18

(PL⅝) GRID 'L5' EAST - I/S

NOTE:
FIELD VERIFY/PROVIDE ALL DIM's
INDICATED THUS '⬭'

SHOP DRAWINGS ARE REVIEWED UNLESS NOTED OTHERWISE		
NO EXCEPTION TAKEN	X	Stantec
REVISE AS NOTED RESUBMISSION NOT REQUIRED		
REVISE AS NOTED RESUBMISSION REQUIRED		
REJECTED		
DATE	3/24/09	
SIGNATURE	ZEK	

REVIEW BY STANTEC IS FOR THE SOLE PURPOSE OF ASCERTAINING GENERAL CONFORMITY WITH DESIGN. CONTRACTOR IS RESPONSIBLE FOR: DIMENSIONS, FABRICATION AND CONSTRUCTION METHODS, COORDINATION OF SUB-TRADES, DETAIL DESIGN OF COMPONENTS AND ERRORS OR OMISSIONS ON SHOP DRAWINGS

GALVANIZING NOTES:
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3 COMPLETE FINAL ASSEMBLY OF BOLTED ITEMS AFTER GALVANIZING. WIRE-BRUSH ALL CONTACTING SURFACES TO A DULL-GRAY APPEARANCE PRIOR TO ASSEMBLY

FB THIS DWG
24- ⅞ϕ x 2¼ (A325 GALV) BOLT w/N&W
126- ⅞ϕ x 2¾ (A325 GALV) BOLT w/N&W
32- ⅞ϕ x 3¼ (A325 GALV) BOLT w/N&W

BILL OF MATERIAL

MARKS SHIP	MARKS TEMP	QTY	MATERIAL	FT	IN	GR	REMARK'S
14M11		ONE	PL⅝ x 25½	2	½		CVN SHAPED
14M12		ONE	PL⅝ x 25½	3	6		CVN SHAPED
14M13		ONE	PL⅝ x 30½	4	8½		CVN SHAPED
14M14		ONE	PL⅝ x 30½	4	8½		CVN SHAPED
14M15		ONE	PL⅝ x 33	3	5½		CVN SHAPED
14M16		ONE	PL⅝ x 33	3	5½		CVN SHAPED
14M17		ONE	PL⅝ x 33⅝	3	9½		CVN SHAPED
14M18		ONE	PL⅝ x 33⅝	3	9½		CVN SHAPED

MATL
1 ALL MAT'L SHALL CONFORM TO AASHTO M 270M/M 270 GRADE 50 (UNLESS NOTED)
2 'CVN' INDICATES CHARPY "V" NOTCH TESTED
3 'FCM' INDICATES "FRACTURE CRITICAL MEMBER"

WELD: E70xx

HOLES: 15/16"ϕ UNO

PREP SSPC-SP8

PAINT GALVANIZED AND AIR COOLED (NOT QUENCHED) (SEE GALVANIZING NOTES)

A 3/11/09 PER APP'L COMMENTS DATED 3/06/09

ARC ENTERPRISES, INC.
KINGFIELD, MAINE

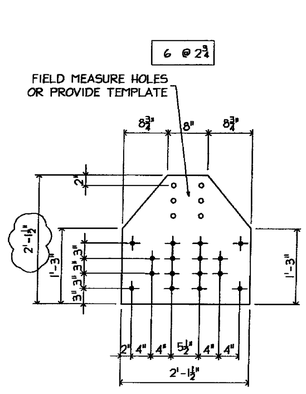
PROJECT: STATE OF VERMONT – AGENCY OF TRANSPORTATION
BRIDGE No 31 – RICHMOND, VERMONT

SCALE: NTS	APPROVED BY:	DRAWN BY: KAJ
DATE 2/18/09		CHKD. BY CMDS-082

BRIDGE @ HIGHWAY #1 OVER WINOOSKI RIVER
GUSSET PLATE DETAILS

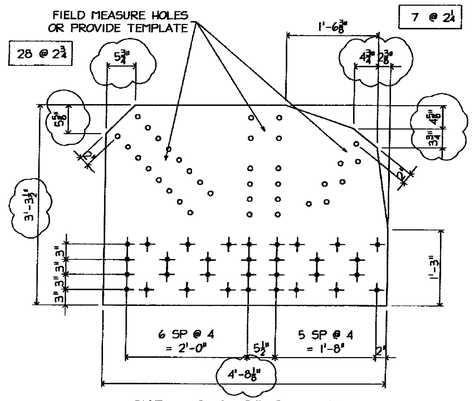
T BUCK CONSTRUCTION

DWG NO 09-113 - 14 A



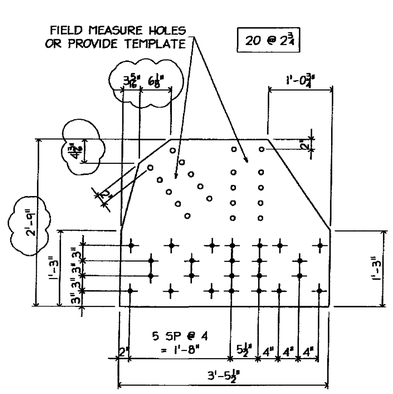
ONE - GUSSET PL - 15M11

(PL⅝) GRID 'L8' WEST - O/S



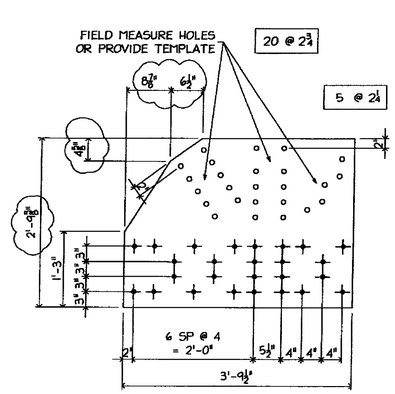
ONE - GUSSET PL - 15M13

(PL⅝) GRID 'L7' WEST - O/S



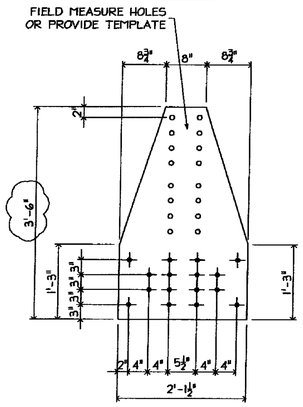
ONE - GUSSET PL - 15M15

(PL⅝) GRID 'L6' WEST - O/S



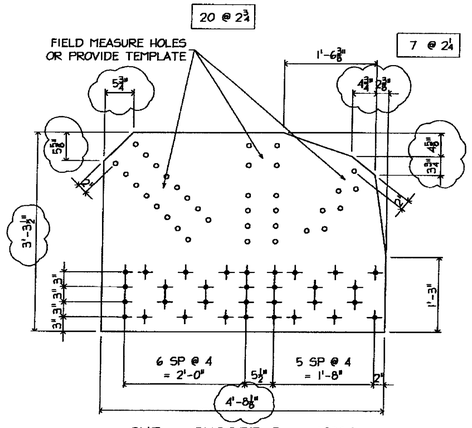
ONE - GUSSET PL - 15M17

(PL⅝) GRID 'L5' WEST - O/S



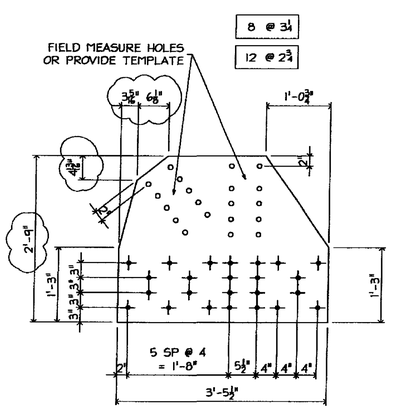
ONE - GUSSET PL - 15M12

(PL⅝) GRID 'L8' WEST - I/S



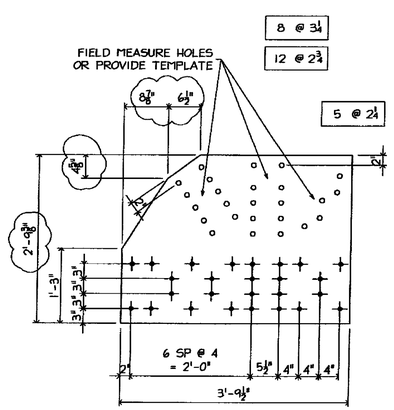
ONE - GUSSET PL - 15M14

(PL⅝) GRID 'L7' WEST - I/S



ONE - GUSSET PL - 15M16

(PL⅝) GRID 'L6' WEST - I/S



ONE - GUSSET PL - 15M18

(PL⅝) GRID 'L5' WEST - I/S

NOTE:
FIELD VERIFY/PROVIDE ALL DIM's
INDICATED THUS ' ☁ '

SHOP DRAWINGS ARE REVIEWED UNLESS NOTED OTHERWISE	
NO EXCEPTION TAKEN	X
REVISE AS NOTED RESUBMISSION NOT REQUIRED	
REVISE AS NOTED RESUBMISSION REQUIRED	
REJECTED	
DATE 3/24/09	
SIGNATURE TEK	

Stantec

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GALVANIZING NOTES
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2 VENT AS REQUIRED
3 COMPLETE FINAL ASSEMBLY OF BOLTED ITEMS AFTER GALVANIZING. WIRE-BRUSH ALL CONTACTING SURFACES TO A DULL-GRAY APPEARANCE PRIOR TO ASSEMBLY

FB THIS DWG
24- ⅞ø x 2¼ (A325 GALV) BOLT w/N&W
126- ⅞ø x 2¾ (A325 GALV) BOLT w/N&W
32- ⅞ø x 3¼ (A325 GALV) BOLT w/N&W

BILL OF MATERIAL

MARKS SHIP	MARKS TEMP	QTY	MATERIAL	FT	IN	GR	REMARK'S
15M11		ONE	PL⅝ x 25½	2	½		CVN SHAPED
15M12		ONE	PL⅝ x 25½	3	6		CVN SHAPED
15M13		ONE	PL⅝ x 34½	4	6½		CVN SHAPED
15M14		ONE	PL⅝ x 34½	4	6⅝		CVN SHAPED
15M15		ONE	PL⅝ x 33	3	5½		CVN SHAPED
15M16		ONE	PL⅝ x 33	3	5½		CVN SHAPED
15M17		ONE	PL⅝ x 33⅜	3	9½		CVN SHAPED
15M18		ONE	PL⅝ x 33⅜	3	9⅝		CVN SHAPED

MATL
1 ALL MAT'L SHALL CONFORM TO AASHTO M 270M/M 270 GRADE 50 (UNLESS NOTED)
2 'CVN' INDICATES CHARPY "V" NOTCH TESTED
3 'FCM' INDICATES "FRACTURE CRITICAL MEMBER"

WELD: E70xx

HOLES 15/16"ø UNO

PREP SSPC-SP6

PAINT: GALVANIZED AND AIR COOLED (NOT QUENCHED) (SEE GALVANIZING NOTES)

A 3/11/09 PER APP'L COMMENTS DATED 3/06/09

ARC ENTERPRISES, INC.
KINGFIELD, MAINE

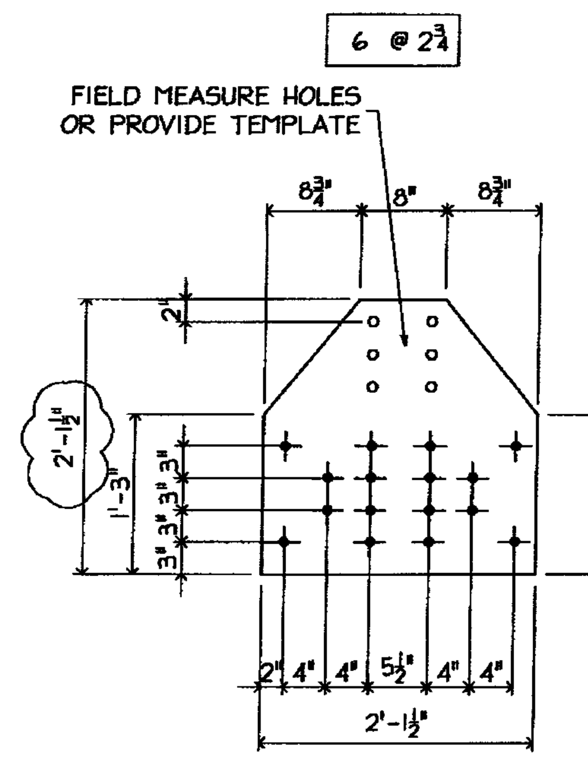
PROJECT STATE OF VERMONT - AGENCY OF TRANSPORTATION
BRIDGE No 31 - RICHMOND, VERMONT

SCALE: NTS	APPROVED BY:	DRAWN BY KAJ
DATE. 2/18/09		CHKD BY: CMDS-082

BRIDGE @ HIGHWAY #1 OVER WINOOSKI RIVER
GUSSET PLATE DETAILS

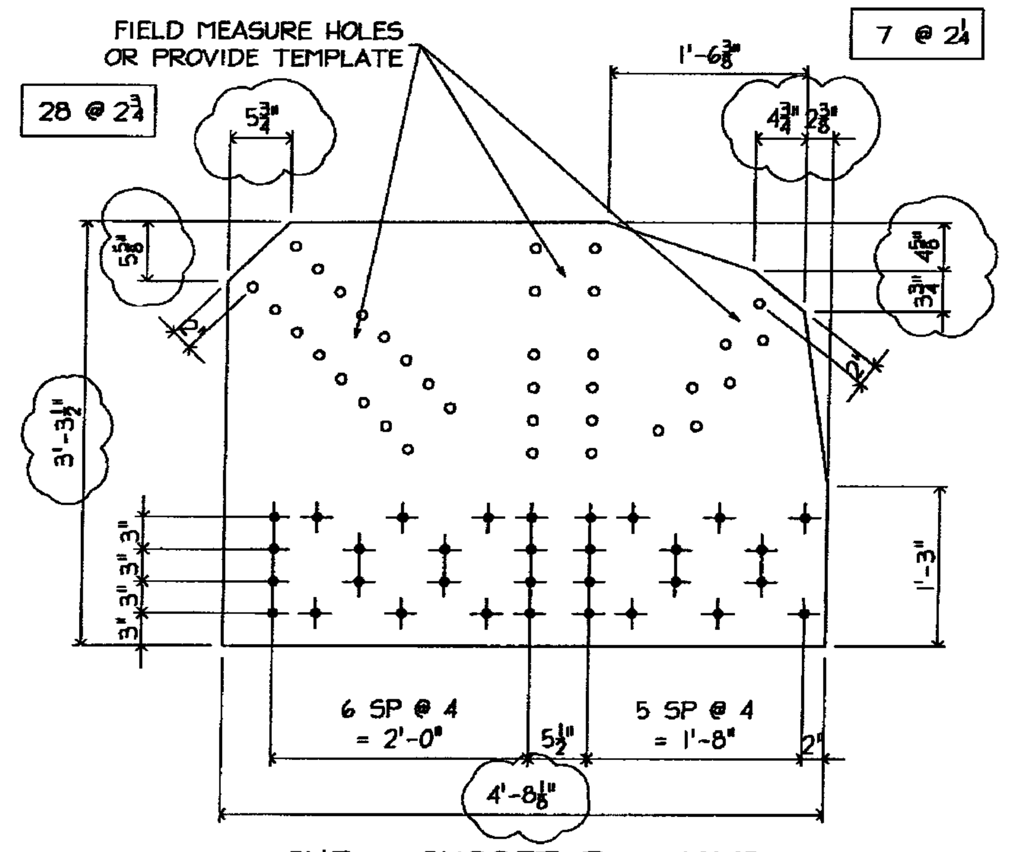
T BUCK CONSTRUCTION

DWG NO 09-113 - 15 A



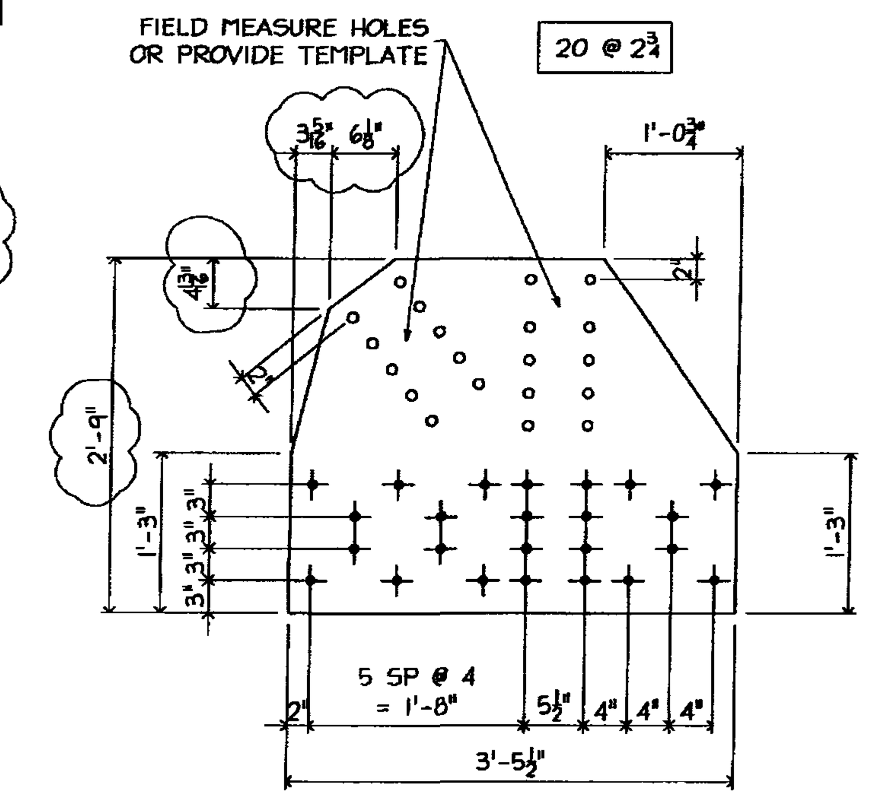
ONE - GUSSET PL - 16M1 installed 4/13/09

(PL⅝) GRID 'L1' WEST - O/S



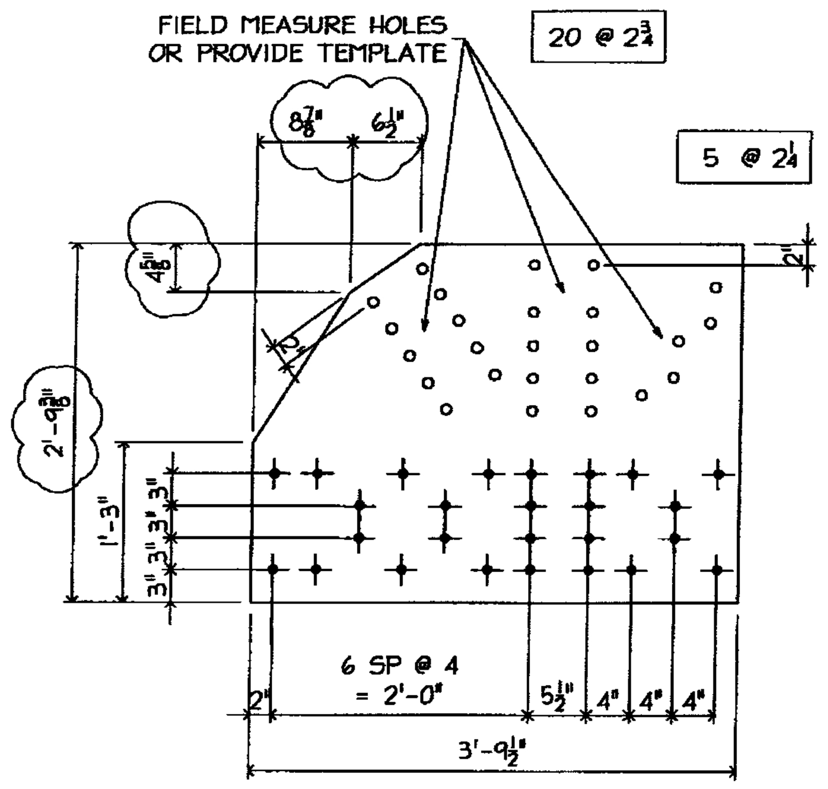
ONE - GUSSET PL - 16M3

(PL⅝) GRID 'L2' WEST - O/S



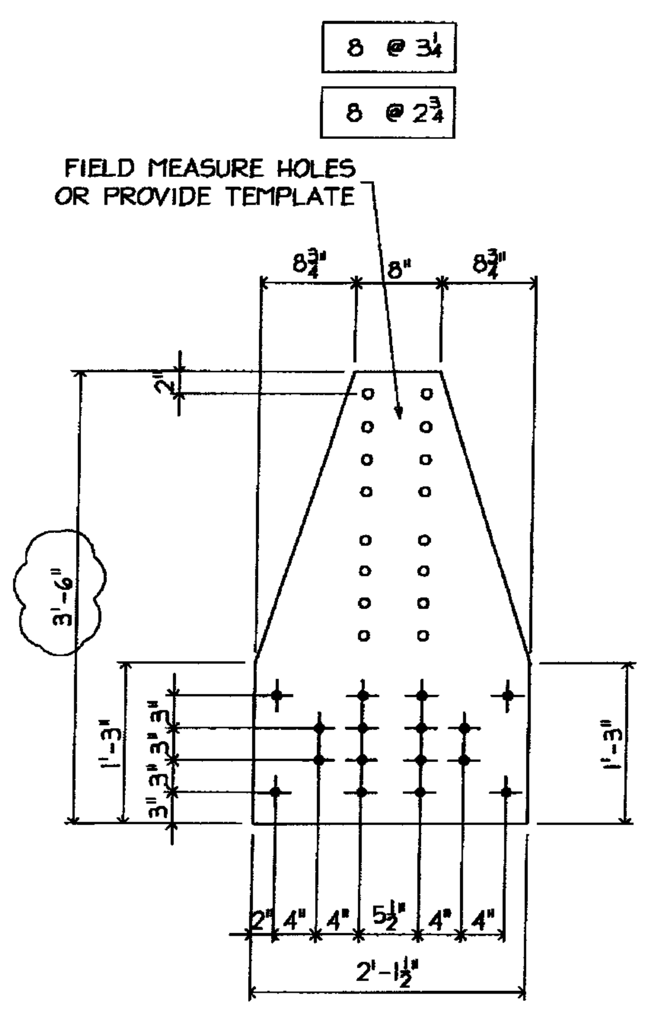
ONE - GUSSET PL - 16M5

(PL⅝) GRID 'L3' WEST - O/S



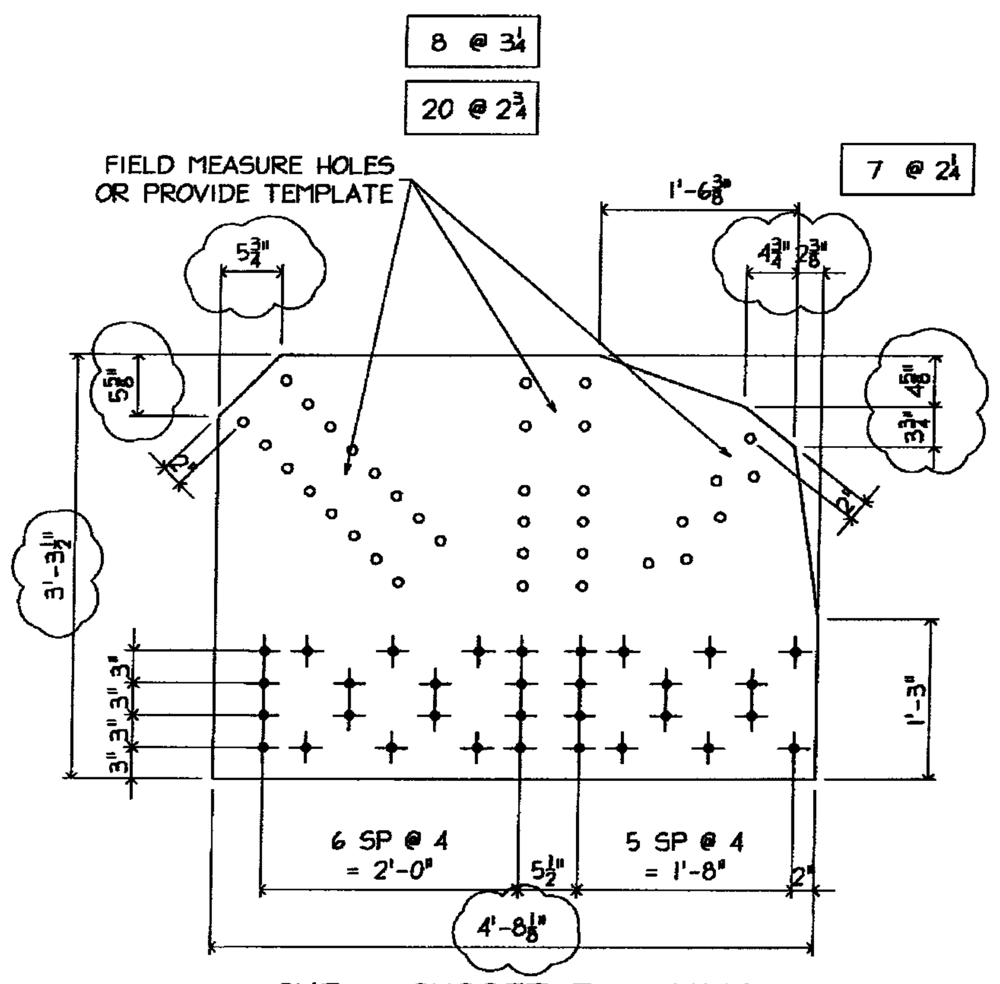
ONE - GUSSET PL - 16M7

(PL⅝) GRID 'L4' WEST - O/S



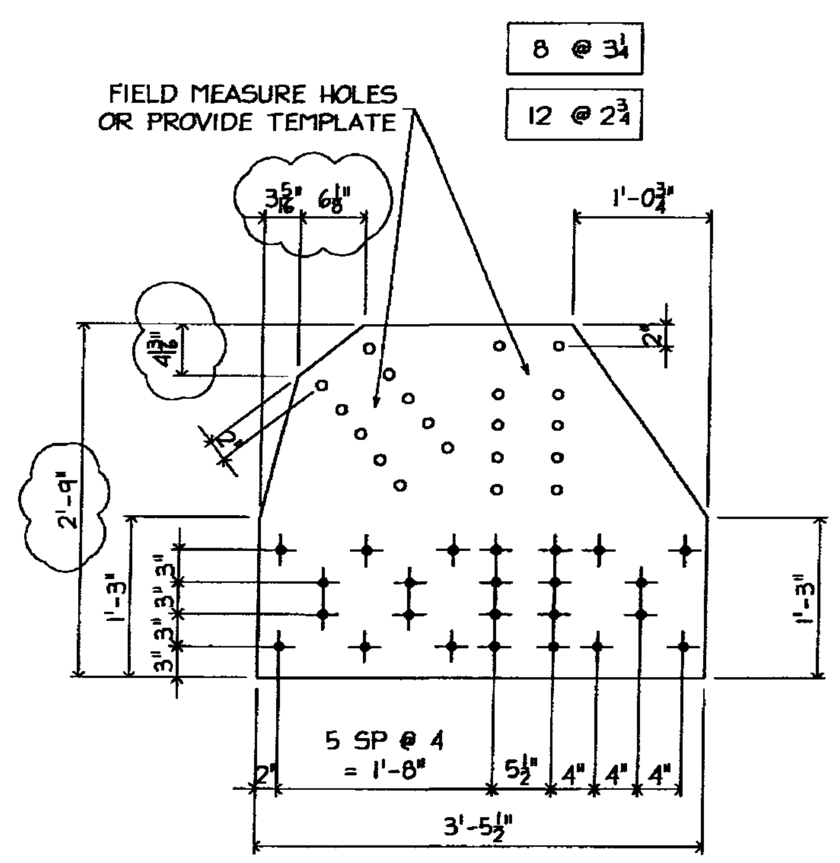
ONE - GUSSET PL - 16M2

(PL⅝) GRID 'L1' WEST - I/S



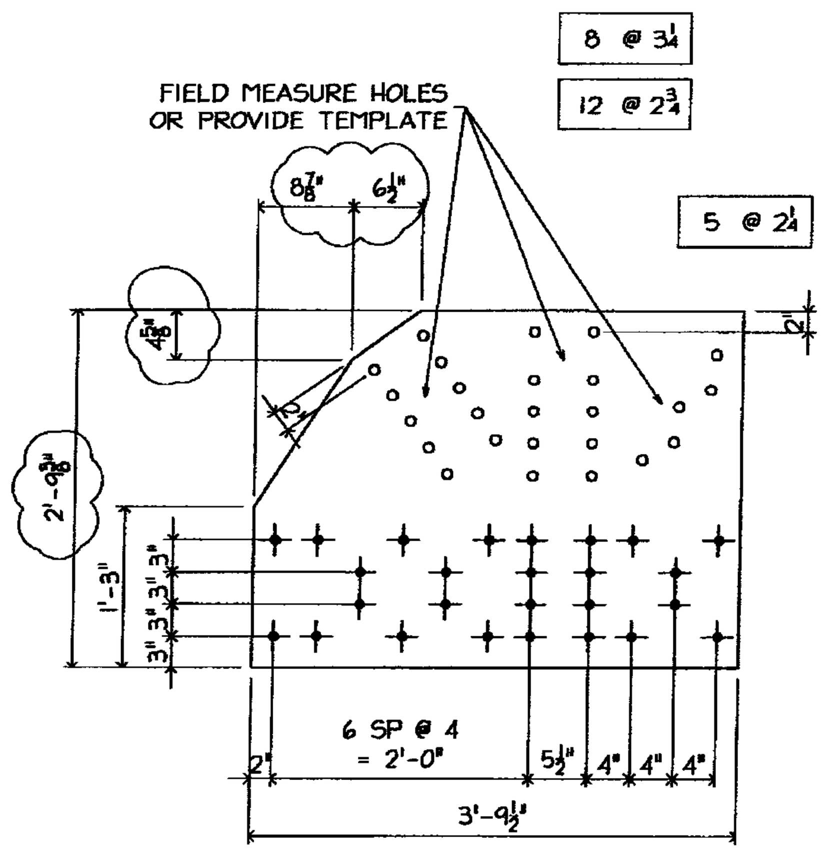
ONE - GUSSET PL - 16M4

(PL⅝) GRID 'L2' WEST - I/S



ONE - GUSSET PL - 16M6

(PL⅝) GRID 'L3' WEST - I/S



ONE - GUSSET PL - 16M8

(PL⅝) GRID 'L4' WEST - I/S

NOTE:
FIELD VERIFY/PROVIDE ALL DIM's INDICATED THUS '( )'

SHOP DRAWINGS ARE REVIEWED UNLESS NOTED OTHERWISE

NO EXCEPTION TAKEN	X
REVISE AS NOTED RESUBMISSION NOT REQUIRED	
REVISE AS NOTED RESUBMISSION REQUIRED	
REJECTED	

Stantec

DATE 3/24/09

SIGNATURE TCK

REVIEW BY STANTEC IS FOR THE SOLE PURPOSE OF ASCERTAINING GENERAL CONFORMITY WITH DESIGN. CONTRACTOR IS RESPONSIBLE FOR DIMENSIONS, FABRICATION AND CONSTRUCTION METHODS, COORDINATION OF SUB-TRADES, DETAIL DESIGN OF COMPONENTS, AND ERRORS OR OMISSIONS ON SHOP DRAWINGS.

GALVANIZING NOTES:
1 ALL WELDS SHALL BE SEALED
2 VENT AS REQUIRED
3 COMPLETE FINAL ASSEMBLY OF BOLTED ITEMS AFTER GALVANIZING. WIRE-BRUSH ALL CONTACTING SURFACES TO A DULL-GRAY APPEARANCE PRIOR TO ASSEMBLY

FB THIS DWG

24- ⅞φ x 2¼ (A325 GALV) BOLT w/N&W
126- ⅞φ x 2¾ (A325 GALV) BOLT w/N&W
32- ⅞φ x 3¼ (A325 GALV) BOLT w/N&W

BILL OF MATERIAL

MARKS SHIP	MARKS TEMP	QTY	MATERIAL	FT	IN	GR	REMARK'S
16M1		ONE	PL⅝ x 25½	2	1½		CVN SHAPED
16M2		ONE	PL⅝ x 25½	3	6		CVN SHAPED
16M3		ONE	PL⅝ x 39½	4	8⅛		CVN SHAPED
16M4		ONE	PL⅝ x 39½	4	8⅛		CVN SHAPED
16M5		ONE	PL⅝ x 33	3	5½		CVN SHAPED
16M6		ONE	PL⅝ x 33	3	5½		CVN SHAPED
16M7		ONE	PL⅝ x 33⅜	3	9½		CVN SHAPED
16M8		ONE	PL⅝ x 33⅜	3	9½		CVN SHAPED

MATL
1 ALL MAT'L SHALL CONFORM TO AASHTO M 270M/M 270 GRADE 50 (UNLESS NOTED)
2 'CVN' INDICATES CHARPY "V" NOTCH TESTED.
3 'FCM' INDICATES "FRACTURE CRITICAL MEMBER"

WELD: E70xx

HOLES: 15/16"φ UNO

PREP SSPC-SP8

PAINT: GALVANIZED AND AIR COOLED (NOT QUENCHED) (SEE GALVANIZING NOTES)

(A) 3/11/09 PER APP'L COMMENTS DATED 3/06/09

ARC ENTERPRISES, INC.
KINGFIELD, MAINE

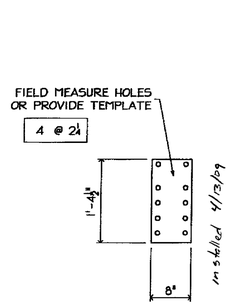
PROJECT: STATE OF VERMONT – AGENCY OF TRANSPORTATION
BRIDGE No 31 – RICHMOND, VERMONT

SCALE: NTS	APPROVED BY.	DRAWN BY: KAJ	
DATE 2/18/09		CHKD. BY: CMDS-DB2	

BRIDGE @ HIGHWAY #1 OVER WINOOSKI RIVER
GUSSET PLATE DETAILS

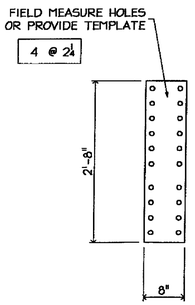
T BUCK CONSTRUCTION

DWG NO. 09-113 – 16 (A)



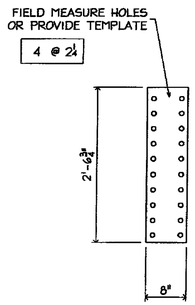
ONE - SHIM PL - 17M1

(PL⅜) GRID 'L1' EAST - O/S



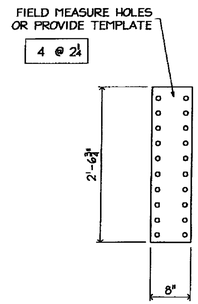
ONE - SHIM PL - 17M2

(PL⅜) GRID 'L1' EAST - I/S



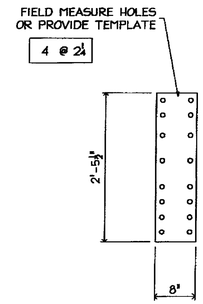
ONE - SHIM PL - 17M3

(PL⅜) GRID 'L2' EAST - O/S



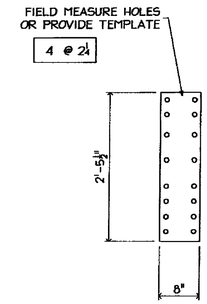
ONE - SHIM PL - 17M4

(PL⅜) GRID 'L2' EAST - I/S



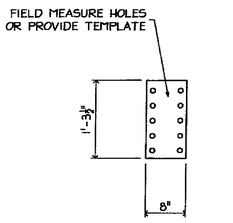
ONE - SHIM PL - 17M5

(PL⅜) GRID 'L2' EAST - O/S



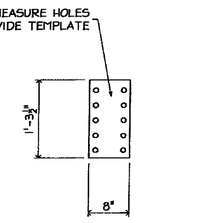
ONE - SHIM PL - 17M6

(PL⅜) GRID 'L2' EAST - I/S



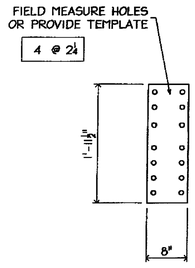
ONE - SHIM PL - 17M7

(PL¾) GRID 'L3' EAST - O/S



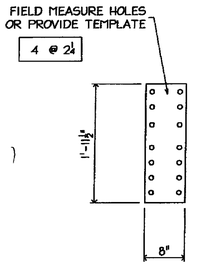
ONE - SHIM PL - 17M8

(PL¾) GRID 'L3' EAST - I/S



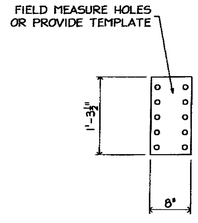
ONE - SHIM PL - 17M9

(PL⅜) GRID 'L3' EAST - O/S



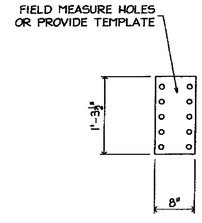
ONE - SHIM PL - 17M10

(PL⅜) GRID 'L3' EAST - I/S



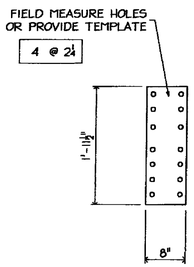
ONE - SHIM PL - 17M11

(PL¾) GRID 'L4' EAST - O/S



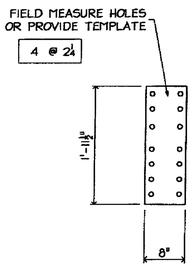
ONE - SHIM PL - 17M12

(PL¾) GRID 'L4' EAST - I/S



ONE - SHIM PL - 17M13

(PL⅜) GRID 'L4' EAST - O/S



ONE - SHIM PL - 17M14

(PL⅜) GRID 'L4' EAST - I/S

NOTE:
FIELD VERIFY THE THICKNESS OF ALL SHIMS

SHOP DRAWINGS ARE REVIEWED UNLESS NOTED OTHERWISE

NO EXCEPTION TAKEN	X
REVISE AS NOTED RESUBMISSION NOT REQUIRED	
REVISE AS NOTED RESUBMISSION REQUIRED	
REJECTED	

Stantec

DATE 3/24/09

SIGNATURE

REVIEW BY STANTEC IS FOR THE SOLE PURPOSE OF ASCERTAINING GENERAL CONFORMITY WITH DESIGN. CONTRACTOR IS RESPONSIBLE FOR DIMENSIONS, FABRICATION AND CONSTRUCTION METHODS, COORDINATION OF SUB-TRADES DETAIL DESIGN OF COMPONENTS, AND ERRORS OR OMISSIONS ON SHOP DRAWINGS.

GALVANIZING NOTES:
1 ALL WELDS SHALL BE SEALED
2 VENT AS REQUIRED
3 COMPLETE FINAL ASSEMBLY OF BOLTED ITEMS AFTER GALVANIZING. WIRE-BRUSH ALL CONTACTING SURFACES TO A DULL-GRAY APPEARANCE PRIOR TO ASSEMBLY

FB THIS DWG
40- ⅞ø x 2½ (A325 GALV) BOLT w/N&W

BILL OF MATERIAL

MARKS SHIP	MARKS TEMP	QTY	MATERIAL	FT	IN	GR	REMARK'S
17M11		ONE	PL⅜ x 8	1	4½	Gr 36	
17M12		ONE	PL⅜ x 8	2	8	Gr 36	
17M13		ONE	PL⅜ x 8	2	6¾	Gr 36	
17M14		ONE	PL⅜ x 8	2	6¾	Gr 36	
17M15		ONE	PL⅜ x 8	2	5½	Gr 36	
17M16		ONE	PL⅜ x 8	2	5½	Gr 36	
17M17		ONE	PL⅜ x 8	1	3½	Gr 36	
17M18		ONE	PL⅜ x 8	1	3½	Gr 36	
17M19		ONE	PL⅜ x 8	1	11½	Gr 36	
17M110		ONE	PL⅜ x 8	1	11½	Gr 36	
17M111		ONE	PL⅜ x 8	1	3½	Gr 36	
17M112		ONE	PL⅜ x 8	1	3½	Gr 36	
17M113		ONE	PL⅜ x 8	1	11½	Gr 36	
17M114		ONE	PL⅜ x 8	1	11½	Gr 36	

MATL.
1 ALL MAT'L SHALL CONFORM TO AASHTO M 270M/M 270 GRADE 50 (UNLESS NOTED)
2 'CVN' INDICATES CHARPY "V" NOTCH TESTED
3 'FCM' INDICATES "FRACTURE CRITICAL MEMBER"

WELD: E70xx

HOLES ⅞"ø UNO

PREP: SSPC-SP8

PAINT: GALVANIZED AND AIR COOLED (NOT QUENCHED) (SEE GALVANIZING NOTES)

A 3/11/09 PER APP'L COMMENTS DATED 3/06/09

ARC ENTERPRISES, INC.
KINGFIELD, MAINE

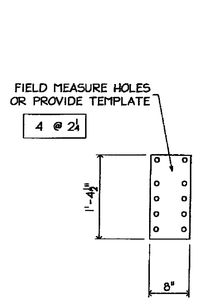
PROJECT STATE OF VERMONT – AGENCY OF TRANSPORTATION
BRIDGE No 31 – RICHMOND, VERMONT

SCALE. NTS	APPROVED BY:	DRAWN BY KAJ
DATE: 2/18/09		CHKD BY CMDS-DB2

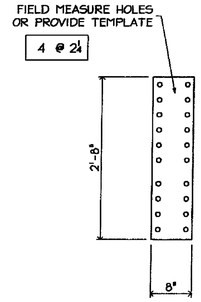
BRIDGE @ HIGHWAY #1 OVER WINOOSKI RIVER
SHIM PLATE DETAILS

T BUCK CONSTRUCTION

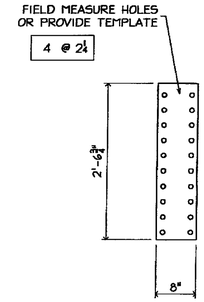
DWG NO 09-113 - 17 A



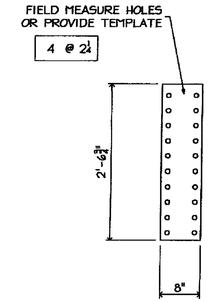
ONE - SHIM PL - 18M11
(PL⅜) GRID 'L8' EAST - O/S



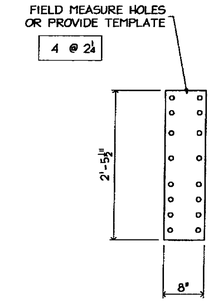
ONE - SHIM PL - 18M12
(PL⅜) GRID 'L8' EAST - I/S



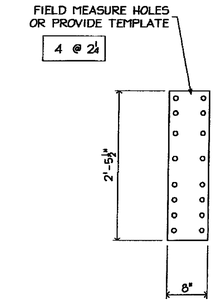
ONE - SHIM PL - 18M13
(PL½) GRID 'L7' EAST - O/S



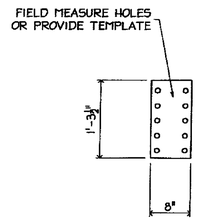
ONE - SHIM PL - 18M14
(PL⅜) GRID 'L7' EAST - I/S



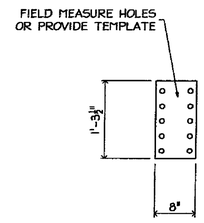
ONE - SHIM PL - 18M15
(PL⅜) GRID 'L7' EAST - O/S



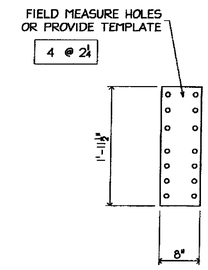
ONE - SHIM PL - 18M16
(PL⅜) GRID 'L7' EAST - I/S



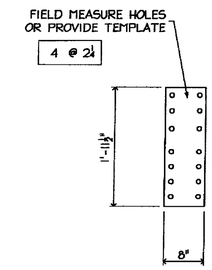
ONE - SHIM PL - 18M7
(PL⅜) GRID 'L6' EAST - O/S



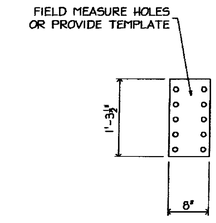
ONE - SHIM PL - 18M8
(PL⅜) GRID 'L6' EAST - I/S



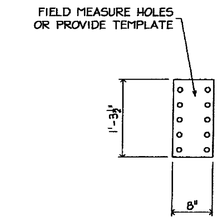
ONE - SHIM PL - 18M9
(PL⅜) GRID 'L6' EAST - O/S



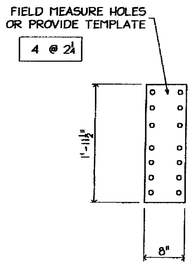
ONE - SHIM PL - 18M10
(PL⅜) GRID 'L6' EAST - I/S



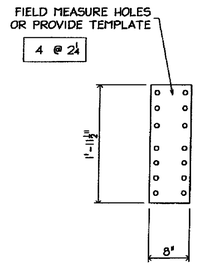
ONE - SHIM PL - 18M11
(PL½) GRID 'L5' EAST - O/S



ONE - SHIM PL - 18M12
(PL½) GRID 'L5' EAST - I/S



ONE - SHIM PL - 18M13
(PL⅜) GRID 'L5' EAST - O/S



ONE - SHIM PL - 18M14
(PL⅜) GRID 'L5' EAST - I/S

NOTE:
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SHOP DRAWINGS ARE REVIEWED UNLESS NOTED OTHERWISE

NO EXCEPTION TAKEN	X
REVISE AS NOTED RESUBMISSION NOT REQUIRED	
REVISE AS NOTED RESUBMISSION REQUIRED	
REJECTED	

Stantec

DATE 3/24/9

SIGNATURE ZCK

REVIEW BY STANTEC IS FOR THE SOLE PURPOSE OF ASCERTAINING GENERAL CONFORMITY WITH DESIGN. CONTRACTOR IS RESPONSIBLE FOR DIMENSIONS, FABRICATION AND CONSTRUCTION METHODS, COORDINATION OF SUB-TRADES DETAIL DESIGN OF COMPONENTS, AND ERRORS OR OMISSIONS ON SHOP DRAWINGS.

GALVANIZING NOTES
1. ALL WELDS SHALL BE SEALED
2 VENT AS REQUIRED.
3 COMPLETE FINAL ASSEMBLY OF BOLTED ITEMS AFTER GALVANIZING. WIRE-BRUSH ALL CONTACTING SURFACES TO A DULL-GRAY APPEARANCE PRIOR TO ASSEMBLY

FB THIS DWG
40- ¾ø x 2½ (A325 GALV) BOLT w/N&W

BILL OF MATERIAL

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18M13		ONE	PL⅜ x 8	2	6¾	Gr 36	
18M14		ONE	PL⅜ x 8	2	6¾	Gr 36	
18M15		ONE	PL⅜ x 8	2	5½	Gr 36	
18M16		ONE	PL⅜ x 8	2	5½	Gr 36	
18M17		ONE	PL⅜ x 8	1	3½	Gr 36	
18M18		ONE	PL⅜ x 8	1	3½	Gr 36	
18M19		ONE	PL⅜ x 8	1	11½	Gr 36	
18M110		ONE	PL⅜ x 8	1	11½	Gr 36	
18M111		ONE	PL⅜ x 8	1	3½	Gr 36	
18M112		ONE	PL⅜ x 8	1	3½	Gr 36	
18M113		ONE	PL⅜ x 8	1	11½	Gr 36	
18M114		ONE	PL⅜ x 8	1	11½	Gr 36	

MATL:
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3 'FCM' INDICATES "FRACTURE CRITICAL MEMBER"

WELD E70xx

HOLES ⅞"ø UNO

PREP SSPC-SP8

PAINT: GALVANIZED AND AIR COOLED (NOT QUENCHED) (SEE GALVANIZING NOTES)

A 3/11/09 PER APP'L COMMENTS DATED 3/06/09

ARC ENTERPRISES, INC.
KINGFIELD, MAINE

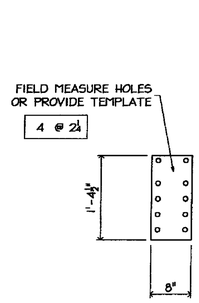
PROJECT: STATE OF VERMONT - AGENCY OF TRANSPORTATION
BRIDGE No 31 - RICHMOND, VERMONT

SCALE: NTS	APPROVED BY	DRAWN BY: KAJ	
DATE 2/18/09		CHKD BY CMDS-DB2	

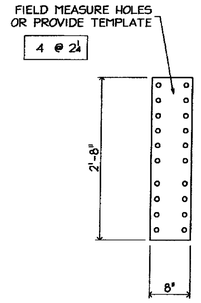
BRIDGE @ HIGHWAY #1 OVER WINOOSKI RIVER
SHIM PLATE DETAILS

T BUCK CONSTRUCTION

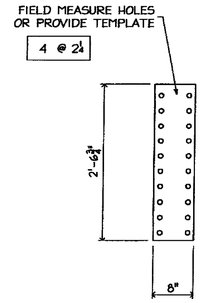
DWG NO. 09-113 - 18 A



ONE - SHIM PL - 20M11
(PL⅜) GRID 'L1' WEST - O/S



ONE - SHIM PL - 20M12
(PL⅜) GRID 'L1' WEST - I/S



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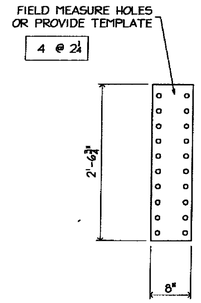
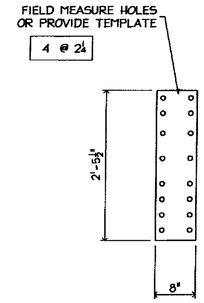
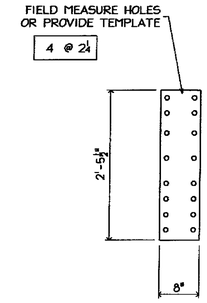
(PL⅜) GRID 'L2' WEST - O/S



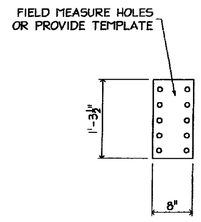
ONE - SHIM PL - 20M14
(PL⅜) GRID 'L2' WEST - I/S



ONE - SHIM PL - 20M15
(PL⅜) GRID 'L2' WEST - O/S



ONE - SHIM PL - 20M16
(PL⅜) GRID 'L2' WEST - I/S



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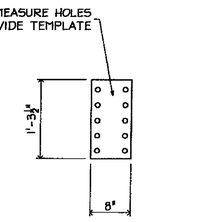
(PL⅜) GRID 'L3' WEST - O/S



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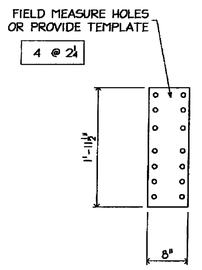
(PL⅜) GRID 'L3' WEST - I/S



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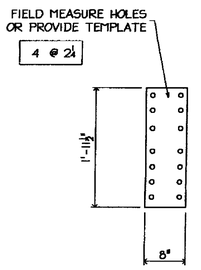
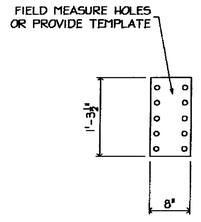
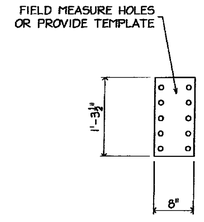
(PL⅜) GRID 'L3' WEST - O/S



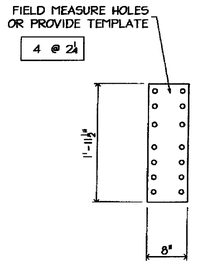
ONE - SHIM PL - 20M110
(PL⅜) GRID 'L3' WEST - I/S



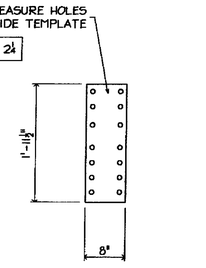
ONE - SHIM PL - 20M111
(PL⅜) GRID 'L4' WEST - O/S



ONE - SHIM PL - 20M112
(PL⅜) GRID 'L4' WEST - I/S



ONE - SHIM PL - 20M113
(PL⅜) GRID 'L4' WEST - O/S



ONE - SHIM PL - 20M114
(PL⅜) GRID 'L4' WEST - I/S

NOTE:
FIELD VERIFY THE THICKNESS
OF ALL SHIMS

SHOP DRAWINGS ARE REVIEWED UNLESS NOTED OTHERWISE

NO EXCEPTION TAKEN	X
REVISE AS NOTED RESUBMISSION NOT REQUIRED	
REVISE AS NOTED RESUBMISSION REQUIRED	
REJECTED	

Stantec

DATE 3/24/09

SIGNATURE TEK

REVIEW BY STANTEC IS FOR THE SOLE PURPOSE OF ASCERTAINING GENERAL CONFORMITY WITH DESIGN. CONTRACTOR IS RESPONSIBLE FOR DIMENSIONS FABRICATION AND CONSTRUCTION METHODS COORDINATION OF SUB-TRADES DETAIL DESIGN OF COMPONENTS AND ERRORS OR OMISSIONS ON SHOP DRAWINGS

GALVANIZING NOTES:
1 ALL WELDS SHALL BE SEALED
2 VENT AS REQUIRED
3 COMPLETE FINAL ASSEMBLY OF BOLTED ITEMS AFTER GALVANIZING. WIRE-BRUSH ALL CONTACTING SURFACES TO A DULL-GRAY APPEARANCE PRIOR TO ASSEMBLY

FB THIS DWG
40- ⅞ø x 2½ (A325 GALV) BOLT w/NUT

BILL OF MATERIAL

MARKS SHIP	MARKS TEMP	QTY	MATERIAL	FT	IN	GR	REMARK'S
20M11		ONE	PL⅜ x 8	1	4½	Gr 36	
20M12		ONE	PL⅜ x 8	2	8	Gr 36	
20M13		ONE	PL⅜ x 8	2	6¾	Gr 36	
20M14		ONE	PL⅜ x 8	2	6¾	Gr 36	
20M15		ONE	PL⅜ x 8	2	5½	Gr 36	
20M16		ONE	PL⅜ x 8	2	5½	Gr 36	
20M17		ONE	PL⅜ x 8	1	3½	Gr 36	
20M18		ONE	PL⅜ x 8	1	3½	Gr 36	
20M19		ONE	PL⅜ x 8	1	11½	Gr 36	
20M110		ONE	PL⅜ x 8	1	11½	Gr 36	
20M111		ONE	PL⅜ x 8	1	3½	Gr 36	
20M112		ONE	PL⅜ x 8	1	3½	Gr 36	
20M113		ONE	PL⅜ x 8	1	11½	Gr 36	
20M114		ONE	PL⅜ x 8	1	11½	Gr 36	

MATL:
1 ALL MAT'L SHALL CONFORM TO AASHTO M 270M/M 270 GRADE 50 (UNLESS NOTED)
2 'CVN' INDICATES CHARPY "V" NOTCH TESTED.
3 'FCM' INDICATES "FRACTURE CRITICAL MEMBER"

WELD: E70xx

HOLES: 13/16"ø UNO

PREP: SSPC-SP6

PAINT: GALVANIZED AND AIR COOLED (NOT QUENCHED) (SEE GALVANIZING NOTES)

A 3/11/09 PER APP'L COMMENTS DATED 3/06/09

ARC ENTERPRISES, INC.
KINGFIELD, MAINE

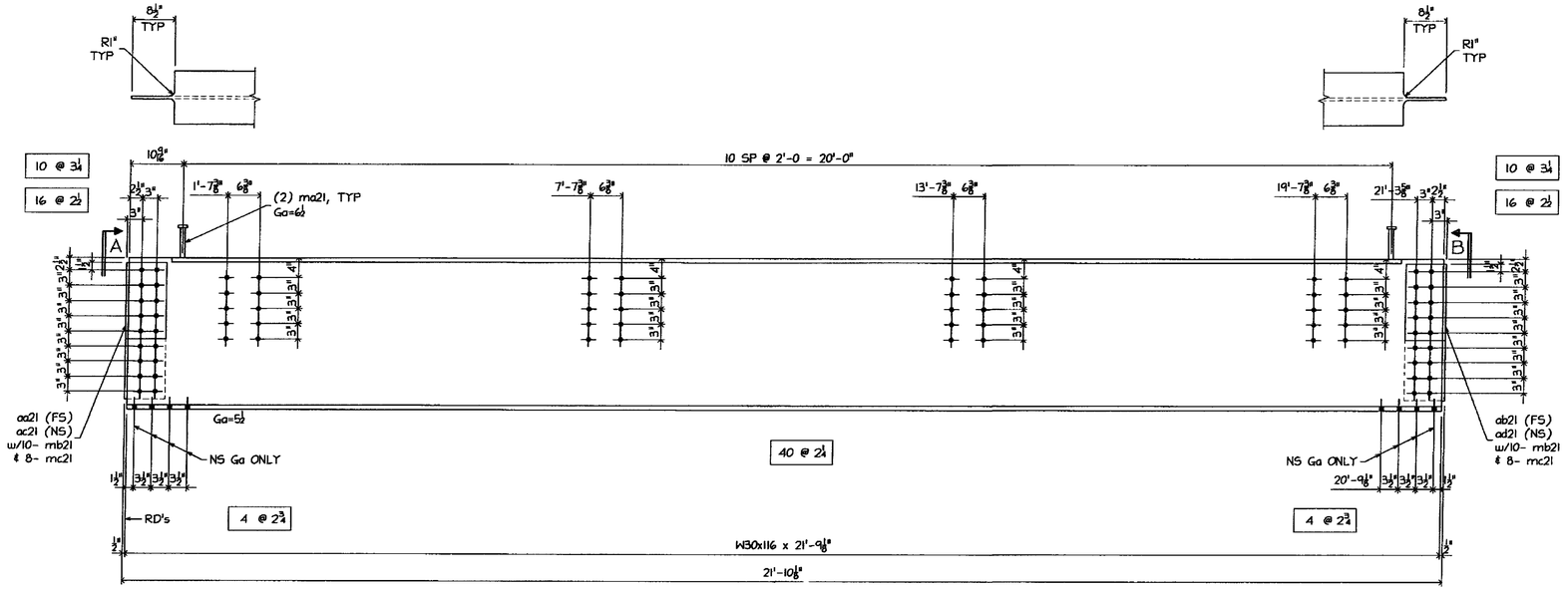
PROJECT STATE OF VERMONT – AGENCY OF TRANSPORTATION
BRIDGE No 31 – RICHMOND, VERMONT

SCALE: NTS	APPROVED BY:	DRAWN BY KAJ	
DATE: 2/18/09		CHKD BY: CMDS-DB2	

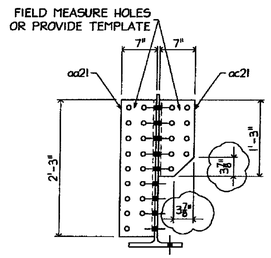
BRIDGE @ HIGHWAY #1 OVER WINOOSKI RIVER
SHIM PLATE DETAILS

T BUCK CONSTRUCTION

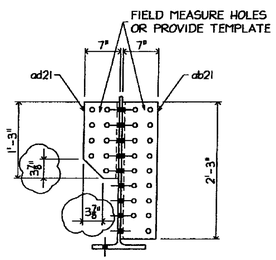
DWG NO 09-113 - 20 A



ONE - BEAM - 21B1



SECTION A



SECTION B

SHOP DRAWINGS ARE REVIEWED UNLESS NOTED OTHERWISE	
NO EXCEPTION TAKEN	
REVISE AS NOTED RESUBMISSION NOT REQUIRED	
REVISE AS NOTED RESUBMISSION REQUIRED	
REJECTED	
DATE	3/24/09
SIGNATURE	TEK

Stantec

REVIEW BY STANTEC IS FOR THE SOLE PURPOSE OF ASCERTAINING GENERAL CONFORMITY WITH DESIGN. CONTRACTOR IS RESPONSIBLE FOR DIMENSIONS, FABRICATION AND CONSTRUCTION METHODS, COORDINATION OF SUB-TRADES DETAIL DESIGN OF COMPONENTS AND ERRORS OR OMISSIONS ON SHOP DRAWINGS

NOTE:
FIELD VERIFY/PROVIDE ALL DIM's INDICATED THUS ' '

GALVANIZING NOTES
1 ALL WELDS SHALL BE SEALED
2 VENT AS REQUIRED.
3 COMPLETE FINAL ASSEMBLY OF BOLTED ITEMS AFTER GALVANIZING. WIRE-BRUSH ALL CONTACTING SURFACES TO A DULL-GRAY APPEARANCE PRIOR TO ASSEMBLY

FB THIS DWG
40- ⅞ø x 2½ (A325 GALV) BOLT w/N&W
32- ⅞ø x 2½ (A325 GALV) BOLT w/N&W
8- ⅞ø x 2¾ (A325 GALV) BOLT w/N&W
20- ⅞ø x 3¼ (A325 GALV) BOLT w/N&W

BILL OF MATERIAL

MARKS SHIP	MARKS TEMP	QTY	MATERIAL	FT	IN	GR	REMARK'S
21B1		ONE	W30x116	21	9⅛		CVN
	aa21	1	L8x7x½	2	3		FROM L8x8
	ab21	1	L8x7x½	2	3		FROM L8x8
	ac21	1	L8x7x½	1	3		FROM L8x8
	ad21	1	L8x7x½	1	3		FROM L8x8
	ma21	22	SHEAR STUD ¾ø	0	6		
	mb21	20	BOLT ⅞ø	0	3	A325 GALV	w/N&W
	mc21	16	BOLT ¾ø	0	2½	A325 GALV	w/N&W

MATL
1 ALL MAT'L SHALL CONFORM TO AASHTO M 270M/M 270 GRADE 50 (UNLESS NOTED)
2 'CVN' INDICATES CHARPY "V" NOTCH TESTED
3 'FCM' INDICATES "FRACTURE CRITICAL MEMBER"

WELD: E70xx

HOLES: 15/16"ø UNO

PREP: SSPC-SP8

PAINT: GALVANIZED AND AIR COOLED (NOT QUENCHED) (SEE GALVANIZING NOTES)

A 3/11/09 PER APP'L COMMENTS DATED 3/06/09

ARC ENTERPRISES, INC.
KINGFIELD, MAINE

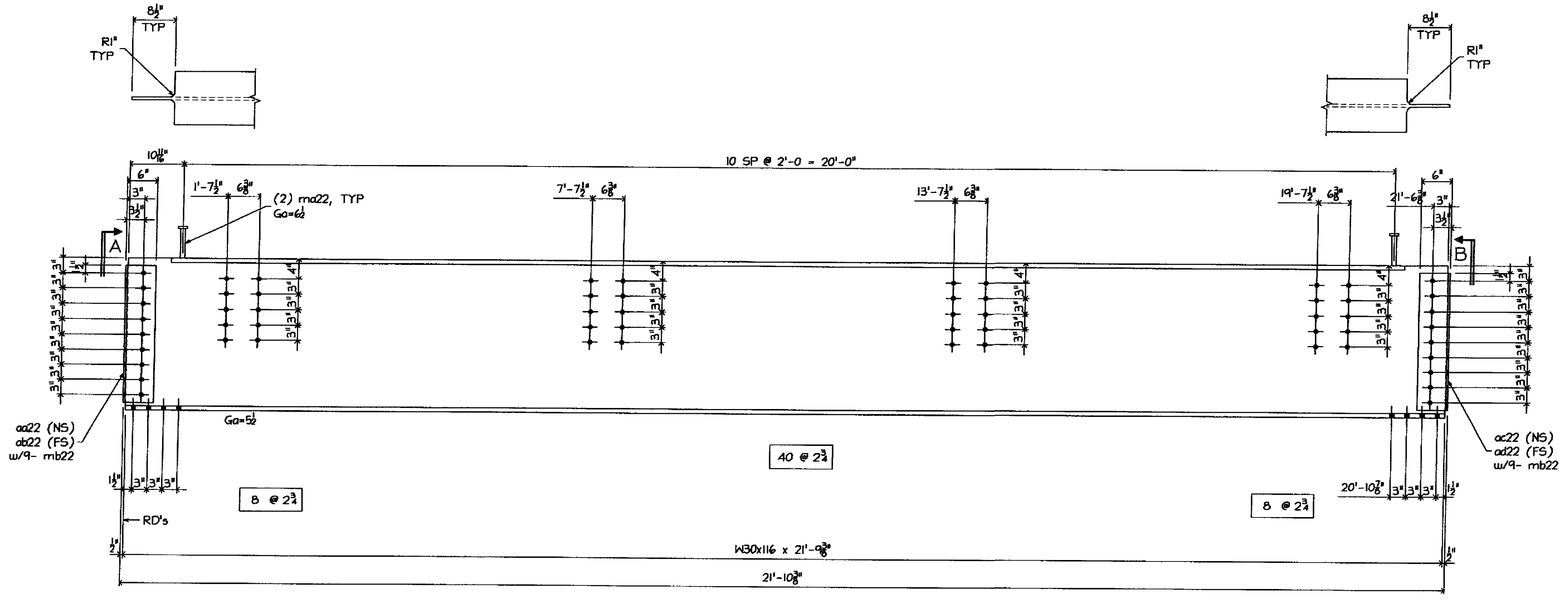
PROJECT: STATE OF VERMONT - AGENCY OF TRANSPORTATION
BRIDGE No 31 - RICHMOND, VERMONT

SCALE: NTS	APPROVED BY:	DRAWN BY KAJ
DATE 2/18/09		CHKD. BY: CMDS-DB2

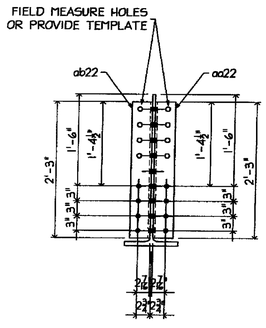
BRIDGE @ HIGHWAY #1 OVER WINOOSKI RIVER
FLOOR BEAM DETAILS

T BUCK CONSTRUCTION

DWG NO. 09-113 - 21 A



ONE - BEAM - 22B1 5/5/09



SECTION A

SHOP DRAWINGS ARE REVIEWED UNLESS NOTED OTHERWISE

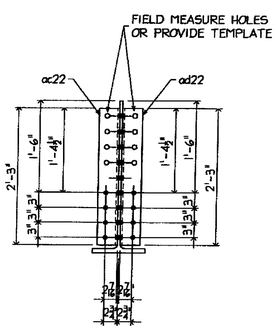
NO EXCEPTION TAKEN	X
REVISE AS NOTED RESUBMISSION NOT REQUIRED	
REVISE AS NOTED RESUBMISSION REQUIRED	
REJECTED	

Stantec

DATE 3/24/09

SIGNATURE

REVIEW BY STANTEC IS FOR THE SOLE PURPOSE OF ASCERTAINING GENERAL CONFORMITY WITH DESIGN. CONTRACTOR IS RESPONSIBLE FOR DIMENSIONS, FABRICATION AND CONSTRUCTION METHODS, COORDINATION OF SUB-TRADES DETAIL DESIGN OF COMPONENTS, AND ERRORS OR OMISSIONS ON SHOP DRAWINGS.



SECTION B

GALVANIZING NOTES
1. ALL WELDS SHALL BE SEALED
2 VENT AS REQUIRED
3 COMPLETE FINAL ASSEMBLY OF BOLTED ITEMS AFTER GALVANIZING. WIRE-BRUSH ALL CONTACTING SURFACES TO A DULL-GRAY APPEARANCE PRIOR TO ASSEMBLY

FB THIS DWG
56- ⅞ϕ x 2¾ (A325 GALV) BOLT w/NEW

BILL OF MATERIAL

MARKS SHIP	MARKS TEMP	QTY	MATERIAL	FT	IN	GR	REMARK'S
22B1		ONE	W30x116	21	9⅜		CVN
	aa22	1	L6x4x⅜	2	3		
	ab22	1	L6x4x⅜	2	3		
	ac22	1	L6x4x⅜	2	3		
	ad22	1	L6x4x⅜	2	3		
	ma22	22	SHEAR STUD ¾ϕ	0	6		
	mb22	18	BOLT ⅞ϕ	0	2¾	A325 GALV	w/NUT

MATL.
1 ALL MAT'L SHALL CONFORM TO AASHTO M 270M/M 270 GRADE 50 (UNLESS NOTED)
2 'CVN' INDICATES CHARPY "V" NOTCH TESTED
3 'FCM' INDICATES "FRACTURE CRITICAL MEMBER"

WELD: E70xx

HOLES: 15/16"ϕ UNO

PREP SSPC-SP8

PAINT: GALVANIZED AND AIR COOLED (NOT QUENCHED) (SEE GALVANIZING NOTES)

A 3/11/09 PER APP'L COMMENTS DATED 3/06/09

ARC ENTERPRISES, INC.
KINGFIELD, MAINE

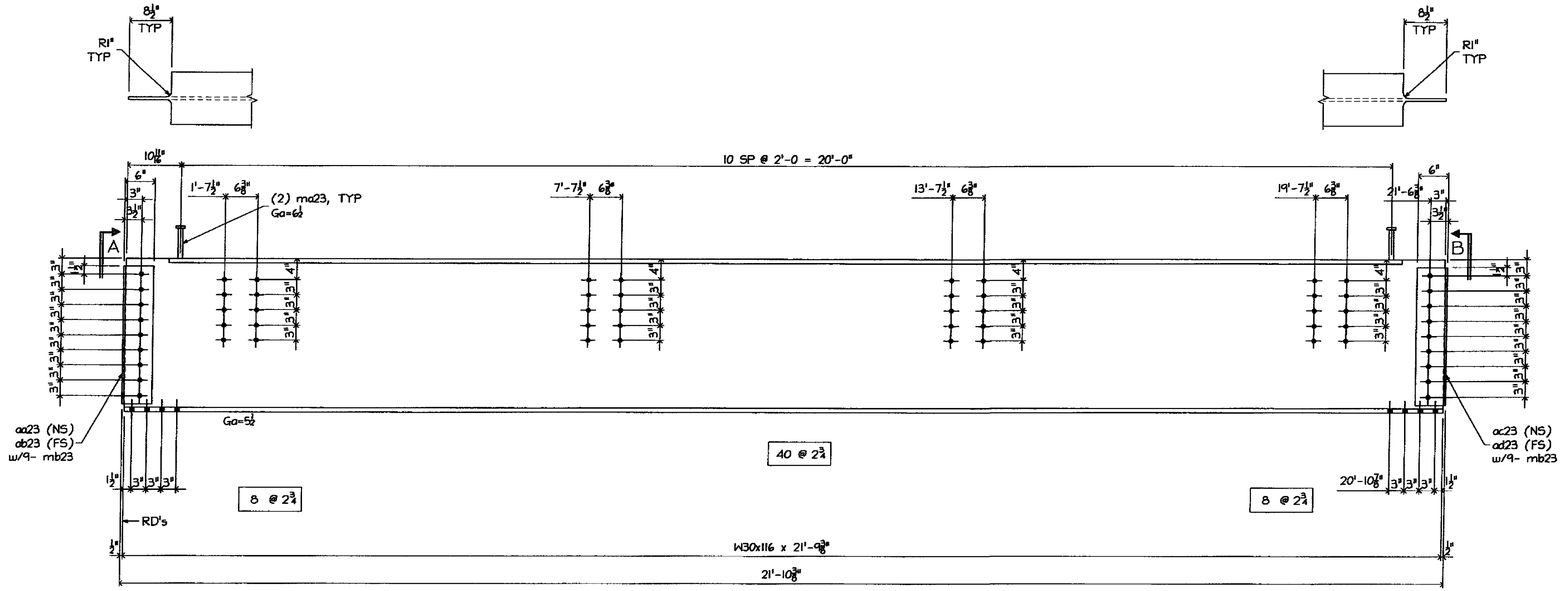
PROJECT STATE OF VERMONT - AGENCY OF TRANSPORTATION
BRIDGE No 31 - RICHMOND, VERMONT

SCALE: NTS	APPROVED BY:	DRAWN BY KAJ	
DATE: 2/18/09		CHKD BY: CMDS-DB2	

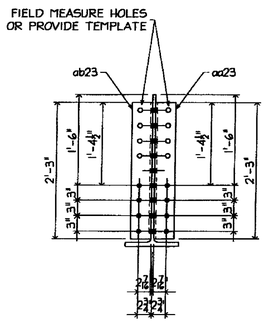
BRIDGE ✪ HIGHWAY #1 OVER WINOOSKI RIVER
FLOOR BEAM DETAILS

T BUCK CONSTRUCTION

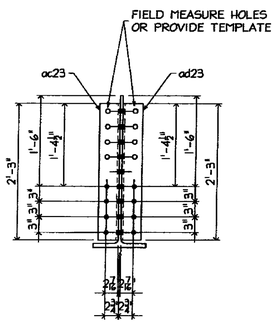
DWG NO 09-113 - 22 A



ONE - BEAM - 23B1



SECTION A



SECTION B

BILL OF MATERIAL							
MARKS SHIP	MARKS TEMP	QTY	MATERIAL	FT	IN	GR	REMARK'S
23B1		ONE	W30x116	21	9⅜		CVN
	aa23	1	L6x4x⅜	2	3		
	ab23	1	L6x4x⅜	2	3		
	ac23	1	L6x4x⅜	2	3		
	ad23	1	L6x4x⅜	2	3		
	ma23	22	SHEAR STUD ¾ϕ	0	6		
	mb23	18	BOLT ¾ϕ	0	2¾	A325 GALV	w/NHN

MATL:
1 ALL MAT'L SHALL CONFORM TO AASHTO M 270M/M 270 GRADE 50 (UNLESS NOTED)
2 'CVN' INDICATES CHARPY "V" NOTCH TESTED
3 'FCM' INDICATES "FRACTURE CRITICAL MEMBER"

WELD: E70xx

HOLES: ⅞"ϕ UNO

PREP: SSPC-SP6

PAINT: GALVANIZED AND AIR COOLED (NOT QUENCHED) (SEE GALVANIZING NOTES)

GALVANIZING NOTES
1 ALL WELDS SHALL BE SEALED
2 VENT AS REQUIRED.
3 COMPLETE FINAL ASSEMBLY OF BOLTED ITEMS AFTER GALVANIZING WIRE-BRUSH ALL CONTACTING SURFACES TO A DULL-GRAY APPEARANCE PRIOR TO ASSEMBLY

FB THIS DWG
56- ¾ϕ x 2¾ (A325 GALV) BOLT w/NHN

SHOP DRAWINGS ARE REVIEWED UNLESS NOTED OTHERWISE
NO EXCEPTION TAKEN
REMISE AS NOTED RESUBMISSION NOT REQUIRED
REMISE AS NOTED RESUBMISSION REQUIRED
REJECTED
DATE 3/24/09
REVIEW BY STANTEC IS FOR THE SOLE PURPOSE OF ASCERTAINING GENERAL CONFORMITY WITH DESIGN. CONTRACTOR IS RESPONSIBLE FOR DIMENSIONS, FABRICATION AND CONSTRUCTION METHODS, COORDINATION OF SUB-TRADES, DETAIL DESIGN OF COMPONENTS, AND ERRORS OR OMISSIONS ON SHOP DRAWINGS.

A 3/11/09 PER APP'L COMMENTS DATED 3/06/09

ARC ENTERPRISES, INC.
KINGFIELD, MAINE

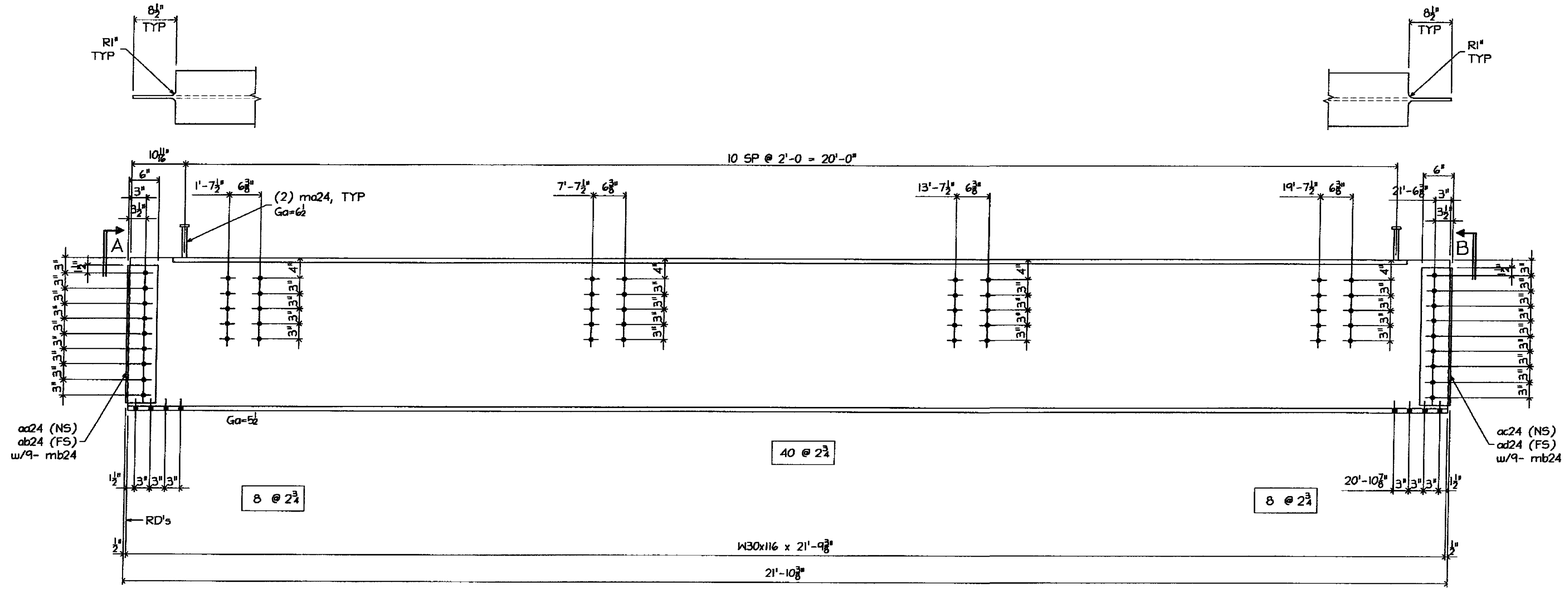
PROJECT STATE OF VERMONT – AGENCY OF TRANSPORTATION
BRIDGE No 31 – RICHMOND, VERMONT

SCALE	NTS	APPROVED BY:	DRAWN BY	KAJ
DATE:	2/18/09		CHK'D. BY:	CMDS-DB2

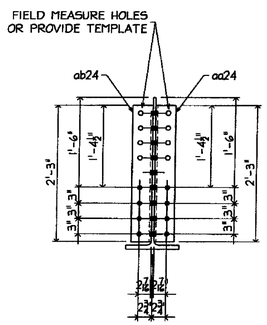
BRIDGE @ HIGHWAY #1 OVER WINOOSKI RIVER
FLOOR BEAM DETAILS

T BUCK CONSTRUCTION

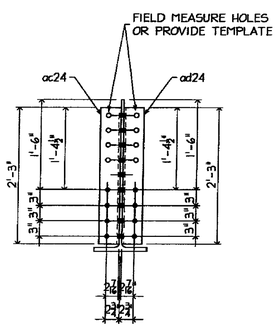
DWG NO. 09-113 – 23 A



ONE - BEAM - 24BI



SECTION A



SECTION B

SHOP DRAWINGS ARE REVIEWED UNLESS NOTED OTHERWISE

NO EXCEPTION TAKEN	X
REMISE AS NOTED RESUBMISSION NOT REQUIRED	
REMISE AS NOTED RESUBMISSION REQUIRED	
REJECTED	

Stantec

DATE 3/24/09

BY TEL

REVIEW BY STANTEC IS FOR THE SOLE PURPOSE OF ASCERTAINING GENERAL CONFORMITY WITH DESIGN. CONTRACTOR IS RESPONSIBLE FOR DIMENSIONS, FABRICATION AND CONSTRUCTION METHODS, COORDINATION OF SUB-TRADES DETAIL DESIGN OF COMPONENTS, AND ERRORS OR OMISSIONS ON SHOP DRAWINGS.

GALVANIZING NOTES:
1 ALL WELDS SHALL BE SEALED
2 VENT AS REQUIRED.
3 COMPLETE FINAL ASSEMBLY OF BOLTED ITEMS AFTER GALVANIZING. WIRE-BRUSH ALL CONTACTING SURFACES TO A DULL-GRAY APPEARANCE PRIOR TO ASSEMBLY

FB THIS DWG
56- ⅞ϕ x 2¾ (A325 GALV) BOLT w/N&W

BILL OF MATERIAL

MARKS SHIP	MARKS TEMP	QTY	MATERIAL	FT	IN	GR	REMARK'S
24BI		ONE	W30x116	21	9⅜		CVN
	aa24	1	L6x4x⅜	2	3		
	ab24	1	L6x4x⅜	2	3		
	ac24	1	L6x4x⅜	2	3		
	ad24	1	L6x4x⅜	2	3		
	ma24	22	SHEAR STUD ⅞ϕ	0	6		
	mb24	18	BOLT ⅞ϕ	0	2¾	A325 GALV	w/N&W

MATL:
1 ALL MAT'L SHALL CONFORM TO AASHTO M 270M/M 270 GRADE 50 (UNLESS NOTED)
2 'CVN' INDICATES CHARPY "V" NOTCH TESTED
3 'FCM' INDICATES "FRACTURE CRITICAL MEMBER"

WELD: E70xx

HOLES: 15/16"ϕ UNO

PREP: SSPC-SP6

PAINT: GALVANIZED AND AIR COOLED (NOT QUENCHED) (SEE GALVANIZING NOTES)

A 3/11/09 PER APP'L COMMENTS DATED 3/06/09

ARC ENTERPRISES, INC.
KINGFIELD, MAINE

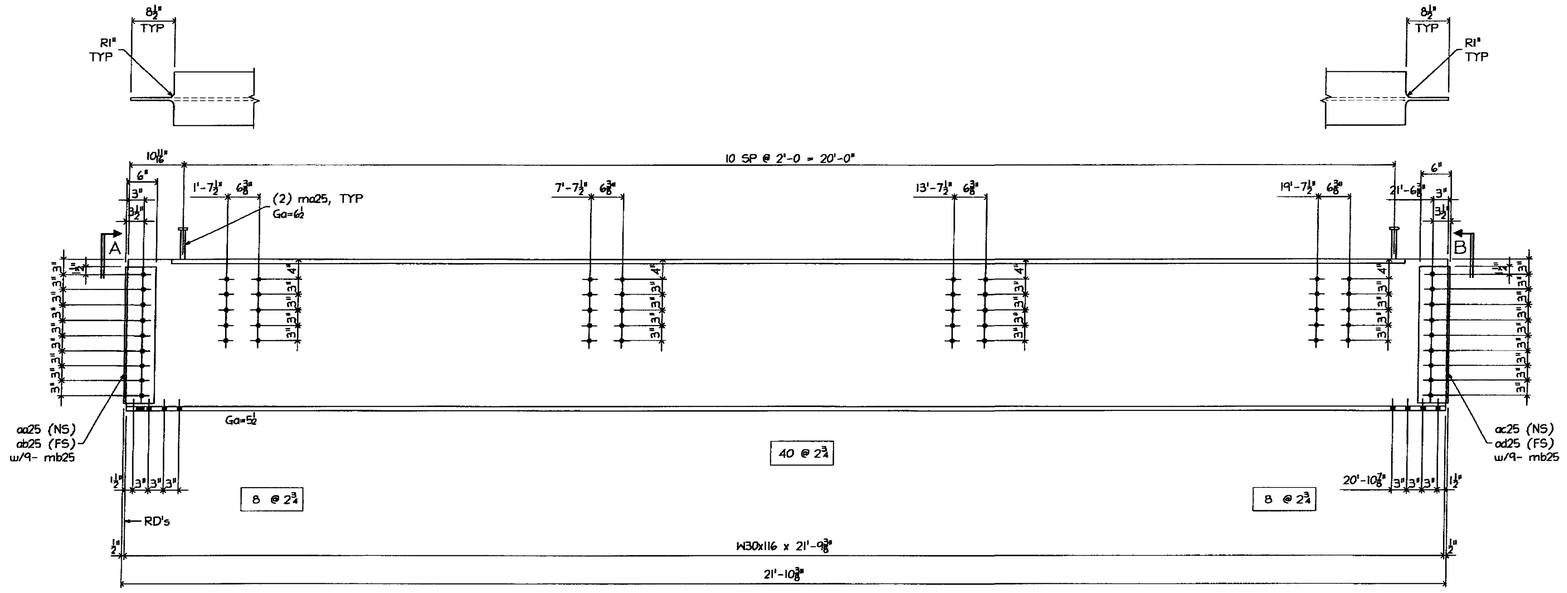
PROJECT STATE OF VERMONT – AGENCY OF TRANSPORTATION
BRIDGE No 31 – RICHMOND, VERMONT

SCALE: NTS	APPROVED BY	DRAWN BY: KAJ	
DATE 2/18/09		CHKD BY: CMDS-DB2	

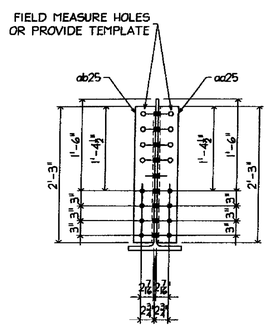
BRIDGE @ HIGHWAY #1 OVER WINOOSKI RIVER
FLOOR BEAM DETAILS

T BUCK CONSTRUCTION

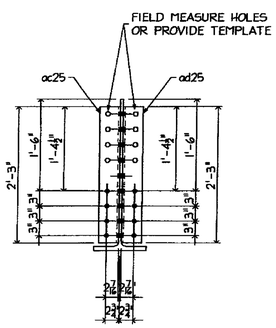
DWG NO. 09-113 – 24 A



ONE - BEAM - 25B1



SECTION A



SECTION B

SHOP DRAWINGS ARE REVIEWED UNLESS NOTED OTHERWISE

NO EXCEPTION TAKEN

REMARKS AS NOTED

RESUBMISSION NOT REQUIRED

REMARKS NOTED

RESUBMISSION REQUIRED

REJECTED

DATE 2/24/09

SIGNATURE TEK

REVIEW BY STANTEC IS FOR THE SOLE PURPOSE OF ASCERTAINING GENERAL CONFORMITY WITH DESIGN. CONTRACTOR IS RESPONSIBLE FOR DIMENSIONS, FABRICATION AND CONSTRUCTION METHODS, COORDINATION OF SUB-TRADES DETAIL DESIGN OF COMPONENTS, AND ERRORS OR OMISSIONS ON SHOP DRAWINGS.

GALVANIZING NOTES:
1 ALL WELDS SHALL BE SEALED
2 VENT AS REQUIRED.
3 COMPLETE FINAL ASSEMBLY OF BOLTED ITEMS AFTER GALVANIZING. WIRE-BRUSH ALL CONTACTING SURFACES TO A DULL-GRAY APPEARANCE PRIOR TO ASSEMBLY

FB THIS DWG
56- ¾ø x 2¾ (A325 GALV) BOLT w/N⊕W

BILL OF MATERIAL

MARKS SHIP	MARKS TEMP	QTY	MATERIAL	FT	IN	GR	REMARK'S
25B1		ONE	W30x116	21	9⅜		CVN
	aa25	1	L6x4x⅜	2	3		
	ab25	1	L6x4x⅜	2	3		
	ac25	1	L6x4x⅜	2	3		
	ad25	1	L6x4x⅜	2	3		
	ma25	22	SHEAR STUD ¾ø	0	6		
	mb25	18	BOLT ¾ø	0	2¾	A325 GALV	w/N⊕W

MATL
1 ALL MAT'L SHALL CONFORM TO AASHTO M 270M/M 270 GRADE 50 (UNLESS NOTED)
2 'CVN' INDICATES CHARPY 'V' NOTCH TESTED
3 'FCM' INDICATES 'FRACTURE CRITICAL MEMBER'

WELD: E70xx

HOLES: 13/16"ø UNO

PREP SSPC-SP6

PAINT: GALVANIZED AND AIR COOLED (NOT QUENCHED) (SEE GALVANIZING NOTES)

A 3/11/09 PER APP'L COMMENTS DATED 3/06/09

ARC ENTERPRISES, INC.
KINGFIELD, MAINE

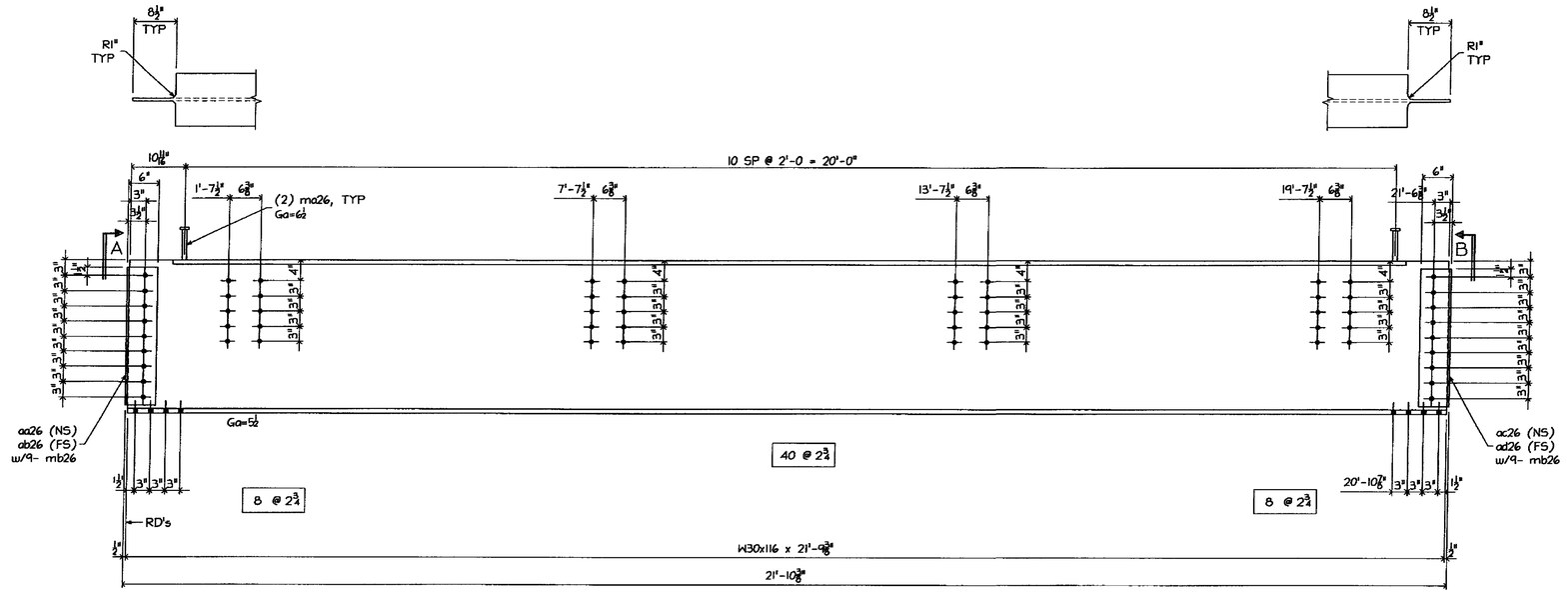
PROJECT STATE OF VERMONT – AGENCY OF TRANSPORTATION
BRIDGE No 31 – RICHMOND, VERMONT

SCALE: NTS	APPROVED BY.	DRAWN BY: KAJ
DATE: 2/18/09		CHKD BY CMDS-DB2

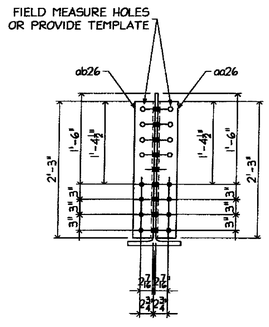
BRIDGE @ HIGHWAY #1 OVER WINOOSKI RIVER
FLOOR BEAM DETAILS

T BUCK CONSTRUCTION

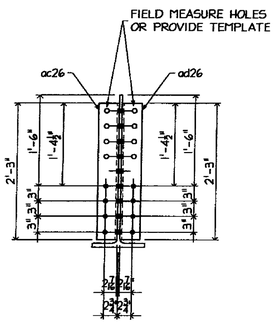
DWG NO 09-113 – 25 A



ONE - BEAM - 26BI



SECTION A



SECTION B

SHOP DRAWINGS ARE REVIEWED UNLESS NOTED OTHERWISE

NO EXCEPTION TAKEN

REVISE AS NOTED
RESUBMISSION NOT REQUIRED

REVISE AS NOTED
RESUBMISSION REQUIRED

REJECTED

DATE 3/24/09

BY TEK

REVIEW BY STANTEC IS FOR THE SOLE PURPOSE OF ASCERTAINING GENERAL CONFORMITY WITH DESIGN. CONTRACTOR IS RESPONSIBLE FOR DIMENSIONS, FABRICATION AND CONSTRUCTION METHODS, COORDINATION OF SUB-TRADES DETAIL DESIGN OF COMPONENTS, AND ERRORS OR OMISSIONS ON SHOP DRAWINGS.

GALVANIZING NOTES
1. ALL WELDS SHALL BE SEALED
2 VENT AS REQUIRED
3 COMPLETE FINAL ASSEMBLY OF BOLTED ITEMS AFTER GALVANIZING. WIRE-BRUSH ALL CONTACTING SURFACES TO A DULL-GRAY APPEARANCE PRIOR TO ASSEMBLY

FB THIS DWG
56- ¾ϕ x 2¾ (A325 GALV) BOLT w/NHW

BILL OF MATERIAL

MARKS SHIP	MARKS TEMP	QTY	MATERIAL	FT	IN	GR	REMARK'S
26BI		ONE	W30x116	21	0⅜		CVN
	oa26	1	L6x4x⅜	2	3		
	ob26	1	L6x4x⅜	2	3		
	oc26	1	L6x4x⅜	2	3		
	od26	1	L6x4x⅜	2	3		
	ma26	22	SHEAR STUD ¾ϕ	0	6		
	mb26	18	BOLT ¾ϕ	0	2¾	A325 GALV	w/NHW

MATL:
1 ALL MAT'L SHALL CONFORM TO AASHTO M 270M/M 270 GRADE 50 (UNLESS NOTED)
2 'CVN' INDICATES CHARPY "V" NOTCH TESTED
3 'FCM' INDICATES "FRACTURE CRITICAL MEMBER"

WELD: E70xx

HOLES: 1⅛"ϕ UNO

PREP: SSPC-SP8

PAINT: GALVANIZED AND AIR COOLED (NOT QUENCHED) (SEE GALVANIZING NOTES)

A 3/11/09 PER APP'L COMMENTS DATED 3/06/09

ARC ENTERPRISES, INC.
KINGFIELD, MAINE

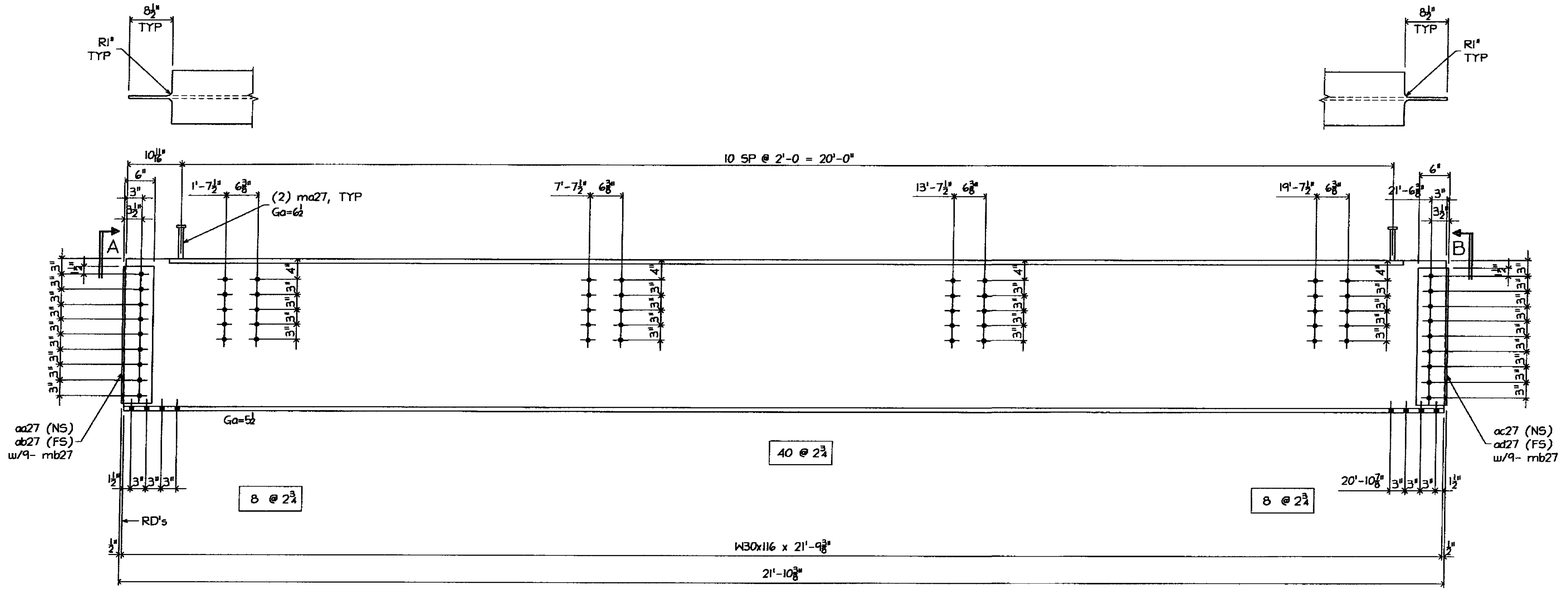
PROJECT: STATE OF VERMONT – AGENCY OF TRANSPORTATION
BRIDGE No 31 – RICHMOND, VERMONT

SCALE: NTS	APPROVED BY:	DRAWN BY: KAJ
DATE. 2/18/09		CHKD. BY CWDS-082

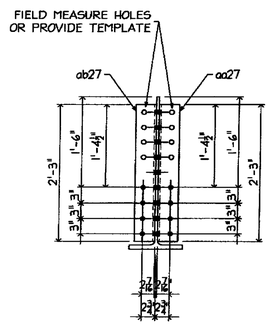
BRIDGE @ HIGHWAY #1 OVER WINOOSKI RIVER
FLOOR BEAM DETAILS

T BUCK CONSTRUCTION

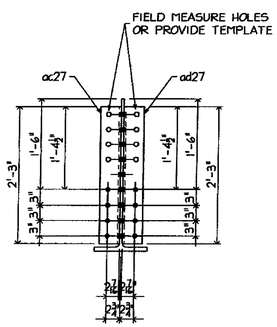
DWG NO 09-113 - 26 A



ONE - BEAM - 27B1



SECTION A



SECTION B

SHOP DRAWINGS ARE REVIEWED UNLESS NOTED OTHERWISE

NO EXCEPTION TAKEN	X
REVISE AS NOTED RESUBMISSION NOT REQUIRED	
REVISE AS NOTED RESUBMISSION REQUIRED	
REJECTED	

Stantec

DATE 3/24/09

SIGNATURE TEK

REVIEW BY STANTEC IS FOR THE SOLE PURPOSE OF ASCERTAINING GENERAL CONFORMITY WITH DESIGN. CONTRACTOR IS RESPONSIBLE FOR DIMENSIONS, FABRICATION AND CONSTRUCTION METHODS, COORDINATION OF SUB-TRADES DETAIL DESIGN OF COMPONENTS, AND ERRORS OR OMISSIONS ON SHOP DRAWINGS.

GALVANIZING NOTES
1. ALL WELDS SHALL BE SEALED
2 VENT AS REQUIRED
3 COMPLETE FINAL ASSEMBLY OF BOLTED ITEMS AFTER GALVANIZING WIRE-BRUSH ALL CONTACTING SURFACES TO A DULL-GRAY APPEARANCE PRIOR TO ASSEMBLY

FB THIS DWG
56- ⅞ø x 2¾ (A325 GALV) BOLT w/N&W

BILL OF MATERIAL

MARKS SHIP	MARKS TEMP	QTY	MATERIAL	FT	IN	GR	REMARK'S
27B1		ONE	W30x116	21	9⅜		CVN
	aa27	1	L6x4x⅜	2	3		
	ab27	1	L6x4x⅜	2	3		
	ac27	1	L6x4x⅜	2	3		
	ad27	1	L6x4x⅜	2	3		
	ma27	22	SHEAR STUD ¾ø	0	6		
	mb27	18	BOLT ¾ø	0	2¾	A325 GALV	w/N&W

MATL
1 ALL MAT'L SHALL CONFORM TO AASHTO M 270M/M 270 GRADE 50 (UNLESS NOTED)
2 'CVN' INDICATES CHARPY "V" NOTCH TESTED
3 'FCM' INDICATES "FRACTURE CRITICAL MEMBER"

WELD: E70xx

HOLES: 1⅛"ø UNO

PREP: SSPC-SP6

PAINT: GALVANIZED AND AIR COOLED (NOT QUENCHED) (SEE GALVANIZING NOTES)

A 3/11/09 PER APP'L COMMENTS DATED 3/06/09

ARC ENTERPRISES, INC.
KINGFIELD, MAINE

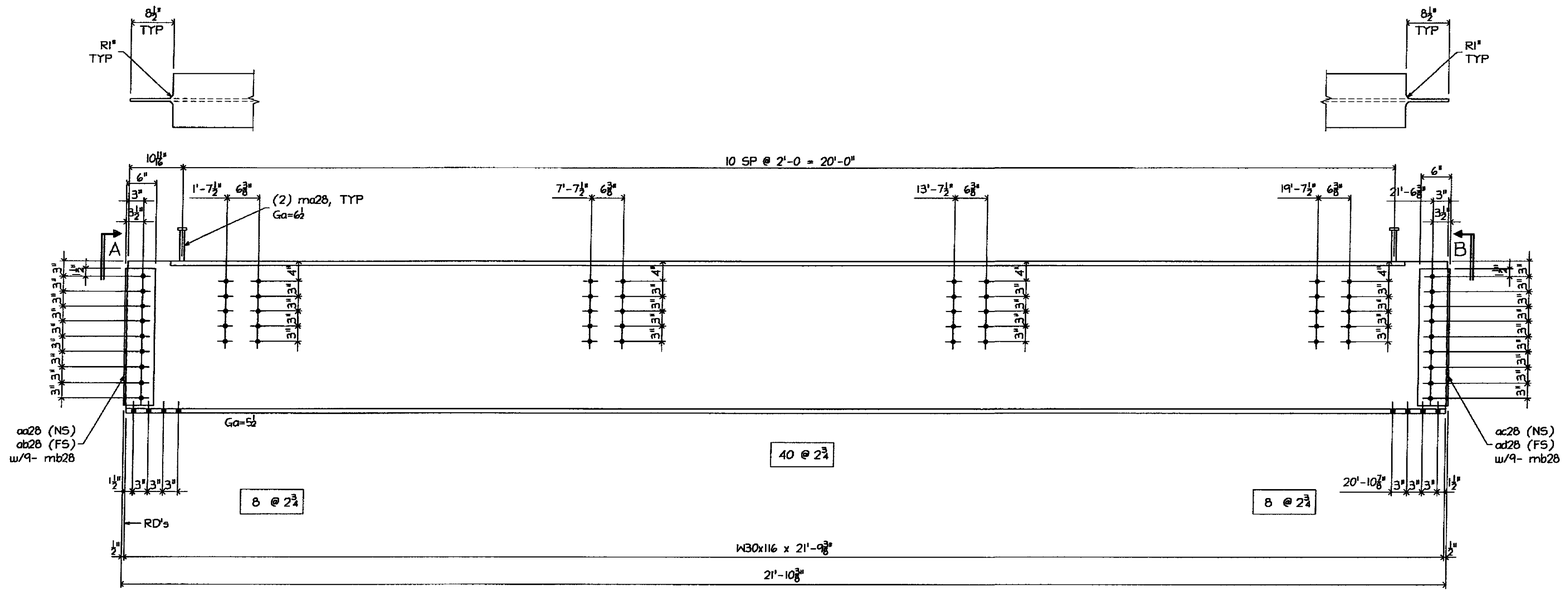
PROJECT STATE OF VERMONT – AGENCY OF TRANSPORTATION
BRIDGE No 31 – RICHMOND, VERMONT

SCALE: NTS	APPROVED BY.	DRAWN BY: KAJ	
DATE: 2/18/09		CHKD BY CWDS-DBZ	

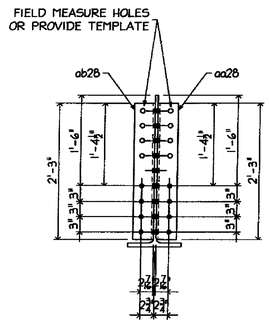
BRIDGE @ HIGHWAY #1 OVER WINOOSKI RIVER
FLOOR BEAM DETAILS

T BUCK CONSTRUCTION

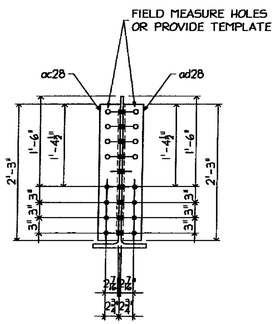
DWG NO. 09-113 - 27 A



ONE - BEAM - 28B1



SECTION A



SECTION B

SHOP DRAWINGS ARE REVIEWED UNLESS NOTED OTHERWISE
NO EXCEPTION TAKEN
REMISE AS NOTED
RESUBMISSION NOT REQUIRED
REMISE AS NOTED
RESUBMISSION REQUIRED
REJECTED
DATE 3/24/09
REVIEWED BY TEK
REVIEW BY STANTEC IS FOR THE SOLE PURPOSE OF ASCERTAINING GENERAL CONFORMITY WITH DESIGN. CONTRACTOR IS RESPONSIBLE FOR DIMENSIONS, FABRICATION AND CONSTRUCTION METHODS, COORDINATION OF SUB-TRADES DETAIL DESIGN OF COMPONENTS, AND ERRORS OR OMISSIONS ON SHOP DRAWINGS.

GALVANIZING NOTES:
1. ALL WELDS SHALL BE SEALED
2 VENT AS REQUIRED.
3 COMPLETE FINAL ASSEMBLY OF BOLTED ITEMS AFTER GALVANIZING WIRE-BRUSH ALL CONTACTING SURFACES TO A DULL-GRAY APPEARANCE PRIOR TO ASSEMBLY

FB THIS DWG
56- ⅞ø x 2¾ (A325 GALV) BOLT w/NHW

BILL OF MATERIAL

MARKS SHIP	MARKS TEMP	QTY	MATERIAL	FT	IN	GR	REMARK'S
28B1		ONE	W30x116	21	9⅜		CVN
	aa28	1	L6x4x⅜	2	3		
	ab28	1	L6x4x⅜	2	3		
	ac28	1	L6x4x⅜	2	3		
	ad28	1	L6x4x⅜	2	3		
	ma28	22	SHEAR STUD ⅞ø	0	6		
	mb28	18	BOLT ⅞ø	0	2¾	A325 GALV	w/NHW

MATL
1 ALL MAT'L SHALL CONFORM TO AASHTO M 270M/M 270 GRADE 50 (UNLESS NOTED)
2 'CVN' INDICATES CHARPY "V" NOTCH TESTED.
3 'FCM' INDICATES "FRACTURE CRITICAL MEMBER"

WELD: E70xx

HOLES: 13/16"ø UNO

PREP SSPC-SP8

PAINT. GALVANIZED AND AIR COOLED (NOT QUENCHED) (SEE GALVANIZING NOTES)

A 3/11/09 PER APP'L COMMENTS DATED 3/06/09

ARC ENTERPRISES, INC.
KINGFIELD, MAINE

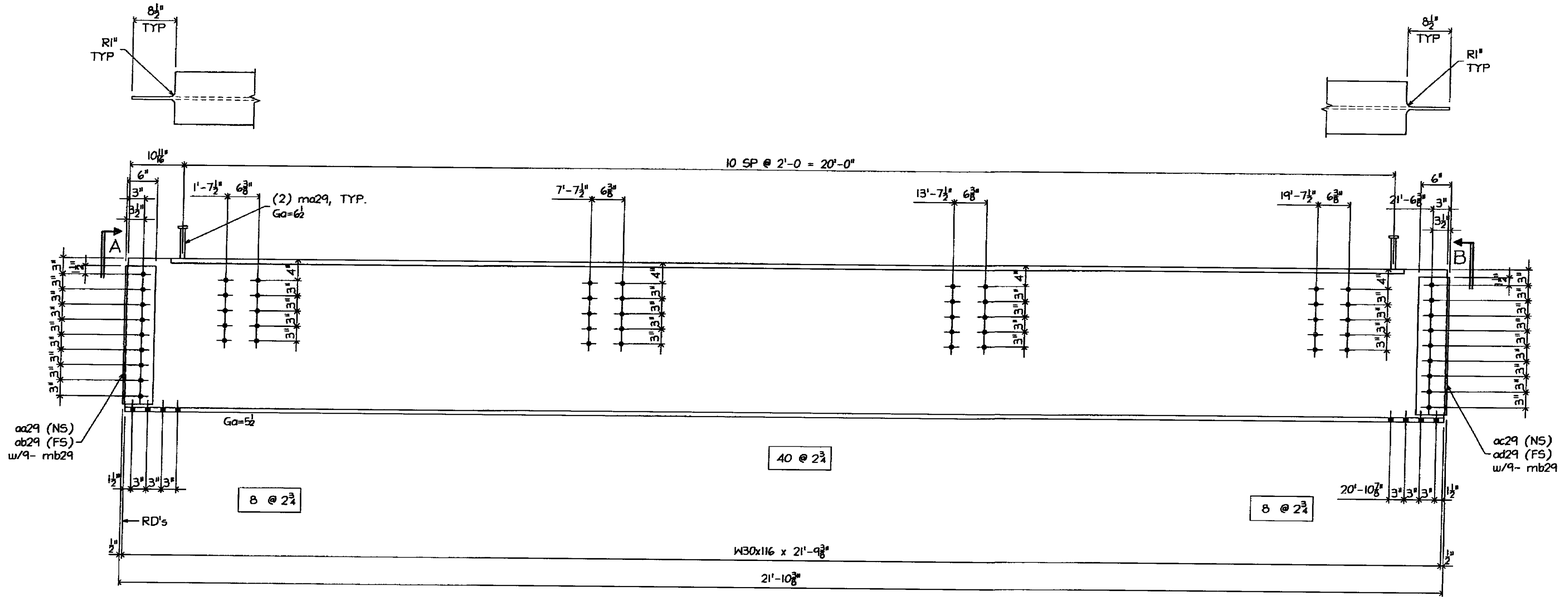
PROJECT: STATE OF VERMONT – AGENCY OF TRANSPORTATION
BRIDGE No 31 – RICHMOND, VERMONT

SCALE: NTS	APPROVED BY:	DRAWN BY KAJ
DATE: 2/18/09		CHKD. BY: CMDS-DBZ

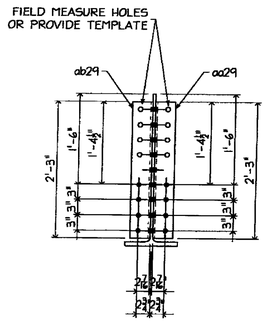
BRIDGE @ HIGHWAY #1 OVER WINOOSKI RIVER
FLOOR BEAM DETAILS

T BUCK CONSTRUCTION

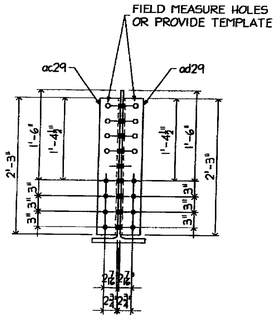
DWG NO. 09-113 - 28 A



ONE - BEAM - 29BI



SECTION A



SECTION B

SHOP DRAWINGS ARE REVIEWED UNLESS NOTED OTHERWISE

NO EXCEPTION TAKEN

REMISE AS NOTED
RESUBMISSION NOT REQUIRED

REMISE AS NOTED
RESUBMISSION REQUIRED

REJECTED

DATE 3/24/09

SIGNATURE TCL

REVIEW BY STANTEC IS FOR THE SOLE PURPOSE OF ASCERTAINING GENERAL CONFORMITY WITH THE DESIGN. CONTRACTOR IS RESPONSIBLE FOR DIMENSIONS, FABRICATION AND CONSTRUCTION METHODS, COORDINATION OF SUB-TRADES DETAIL DESIGN OF COMPONENTS, AND ERRORS OR OMISSIONS ON SHOP DRAWINGS.

GALVANIZING NOTES.
1 ALL WELDS SHALL BE SEALED
2 VENT AS REQUIRED
3 COMPLETE FINAL ASSEMBLY OF BOLTED ITEMS AFTER GALVANIZING. WIRE-BRUSH ALL CONTACTING SURFACES TO A DULL-GRAY APPEARANCE PRIOR TO ASSEMBLY

FB THIS DWG
56- ⅞ø x 2¾ (A325 GALV) BOLT w/N&W

BILL OF MATERIAL

MARKS SHIP	MARKS TEMP	QTY	MATERIAL	FT	IN	GR	REMARK'S
29BI		ONE	W30x116	21	9⅜		CVN
	aa29	1	L6x4x⅜	2	3		
	ab29	1	L6x4x⅜	2	3		
	ac29	1	L6x4x⅜	2	3		
	ad29	1	L6x4x⅜	2	3		
	ma29	22	SHEAR STUD ⅞ø	0	6		
	mb29	18	BOLT ⅞ø	0	2¾	A325 GALV	w/N&W

MATL
1 ALL MAT'L SHALL CONFORM TO AASHTO M 270M/M 270 GRADE 50 (UNLESS NOTED)
2 'CVN' INDICATES CHARPY "V" NOTCH TESTED.
3 'FCM' INDICATES "FRACTURE CRITICAL MEMBER"

WELD E70xx

HOLES 1⅛ø UNO

PREP SSPC-SP8

PAINT: GALVANIZED AND AIR COOLED (NOT QUENCHED) (SEE GALVANIZING NOTES)

A 3/11/09 PER APP'L COMMENTS DATED 3/06/09

ARC ENTERPRISES, INC.
KINGFIELD, MAINE

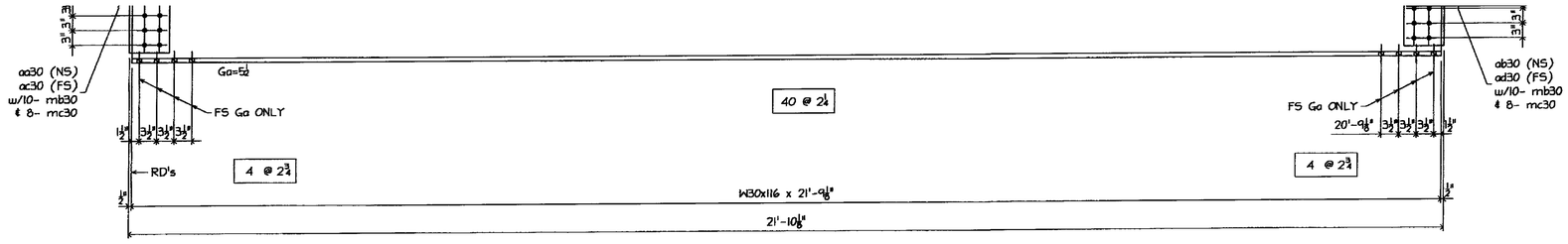
PROJECT STATE OF VERMONT - AGENCY OF TRANSPORTATION
BRIDGE No 31 - RICHMOND, VERMONT

SCALE	NTS	APPROVED BY:	DRAWN BY. KAJ
DATE	2/18/09		CHKD BY: CMDS-DBZ

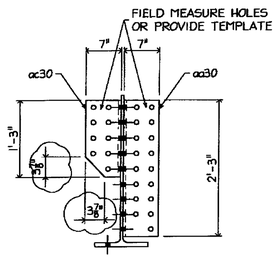
BRIDGE @ HIGHWAY #1 OVER WINOOSKI RIVER
FLOOR BEAM DETAILS

T BUCK CONSTRUCTION

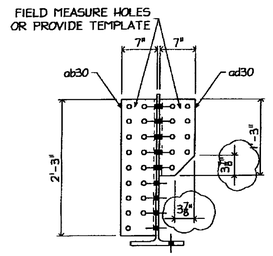
DWG NO 09-113 - 29 A



ONE - BEAM - 30BI



SECTION A



SECTION B

SHOP DRAWINGS ARE REVIEWED UNLESS NOTED OTHERWISE	
NO EXCEPTION TAKEN	✓
REMISE AS NOTED RESUBMISSION NOT REQUIRED	
REMISE AS NOTED RESUBMISSION REQUIRED	
REJECTED	

Stantec

DATE 3/24/09

SIGNATURE TEK

REVIEW BY STANTEC IS FOR THE SOLE PURPOSE OF ASCERTAINING GENERAL CONFORMITY WITH DESIGN. CONTRACTOR IS RESPONSIBLE FOR DIMENSIONS, FABRICATION AND CONSTRUCTION METHODS, COORDINATION OF SUB-TRADES DETAIL DESIGN OF COMPONENTS, AND ERRORS OR OMISSIONS ON SHOP DRAWINGS

NOTE:
FIELD VERIFY/PROVIDE ALL DIM's INDICATED THUS '⌒'

GALVANIZING NOTES
1. ALL WELDS SHALL BE SEALED
2 VENT AS REQUIRED.
3 COMPLETE FINAL ASSEMBLY OF BOLTED ITEMS AFTER GALVANIZING. WIRE-BRUSH ALL CONTACTING SURFACES TO A DULL-GRAY APPEARANCE PRIOR TO ASSEMBLY

FB THIS DWG
40- ¾ø x 2½ (A325 GALV) BOLT w/N&W
32- ¾ø x 2½ (A325 GALV) BOLT w/N&W
8- ¾ø x 2¾ (A325 GALV) BOLT w/N&W
20- ¾ø x 3¼ (A325 GALV) BOLT w/N&W

MATL
1 ALL MAT'L SHALL CONFORM TO AASHTO M 270M/M 270 GRADE 50 (UNLESS NOTED)
2 'CVN' INDICATES CHARPY "V" NOTCH TESTED
3 'FCM' INDICATES "FRACTURE CRITICAL MEMBER"

WELD: E70xx

HOLES: ⅞"ø UNO

PREP: SSPC-SP8

PAINT GALVANIZED AND AIR COOLED (NOT QUENCHED) (SEE GALVANIZING NOTES)

A 3/11/09 PER APP'L COMMENTS DATED 3/06/09

ARC ENTERPRISES, INC
KINGFIELD, MAINE

PROJECT STATE OF VERMONT – AGENCY OF TRANSPORTATION
BRIDGE No 31 – RICHMOND, VERMONT

SCALE: NTS	APPROVED BY	DRAWN BY KAJ	
DATE 2/18/09		CHKD BY: CMDS-DB2	

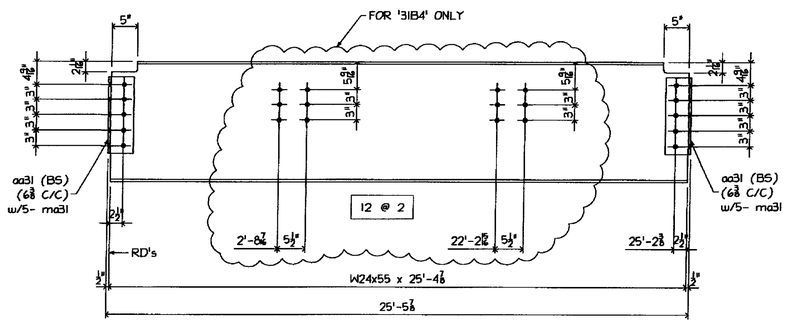
BRIDGE @ HIGHWAY #1 OVER WINOOSKI RIVER
FLOOR BEAM DETAILS

T BUCK CONSTRUCTION

DWG NO. 09-113 - 30 A

2 - BEAMS - 31B1

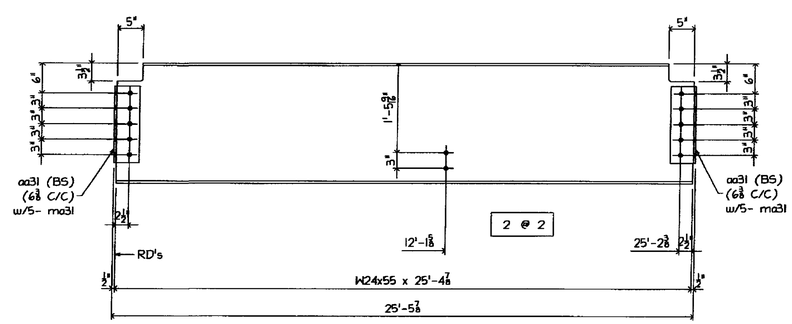
2 - BEAMS - 31B2 (AS NOTED)



7 - BEAMS - 31B3

7 - BEAMS - 31B4 (AS NOTED)

4 - BEAMS - 31B5



14 - BEAMS - 31B6

31B5		4	W24x55	25	11⅜		CVN
	aa31	16	L5x5x⅜	1	3		
	ma31	40	BOLT ⅞ϕ	0	2½	A325 GALV	w/NtW
31B6		14	W24x55	25	4⅜		CVN
	aa31	56	L5x5x⅜	1	3		
	ma31	140	BOLT ⅞ϕ	0	2½	A325 GALV	w/NtW

MATL

1 ALL MAT'L SHALL CONFORM TO AASHTO M 270M/M 270 GRADE 50 (UNLESS NOTED)
2 'CVN' INDICATES CHARPY "V" NOTCH TESTED.
3 'FCM' INDICATES "FRACTURE CRITICAL MEMBER"

WELD: E70xx

HOLES: 15/16"ϕ UNO

PREP: SSPC-SP8

PAINT: GALVANIZED AND AIR COOLED (NOT QUENCHED) (SEE GALVANIZING NOTES)

A 3/11/09 PER APP'L COMMENTS DATED 3/06/09

GALVANIZING NOTES:
1. ALL WELDS SHALL BE SEALED
2 VENT AS REQUIRED
3 COMPLETE FINAL ASSEMBLY OF BOLTED ITEMS AFTER GALVANIZING. WIRE-BRUSH ALL CONTACTING SURFACES TO A DULL-GRAY APPEARANCE PRIOR TO ASSEMBLY

FB THIS DWG

144- ⅞ϕ x 2 (A325 GALV) BOLT w/NtW

SHOP DRAWINGS ARE REVIEWED UNLESS NOTED OTHERWISE

NO EXCEPTION TAKEN	X
REVISE AS NOTED RESUBMISSION NOT REQUIRED	
REVISE AS NOTED RESUBMISSION REQUIRED	
REJECTED	

Stantec

DATE 3/24/09

SIGNATURE TEK

REVIEW BY STANTEC IS FOR THE SOLE PURPOSE OF ASCERTAINING GENERAL CONFORMITY WITH DESIGN. CONTRACTOR IS RESPONSIBLE FOR DIMENSIONS, FABRICATION AND CONSTRUCTION METHODS, COORDINATION OF SUB-TRADES DETAIL DESIGN OF COMPONENTS, AND ERRORS OR OMISSIONS ON SHOP DRAWINGS.

ARC ENTERPRISES, INC.
KINGFIELD, MAINE

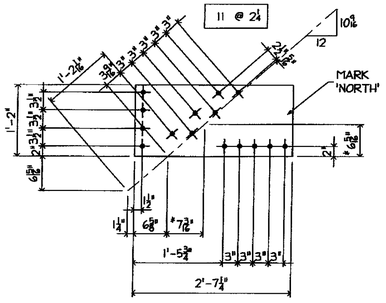
PROJECT: STATE OF VERMONT – AGENCY OF TRANSPORTATION
BRIDGE No 31 – RICHMOND, VERMONT

SCALE: NTS	APPROVED BY:	DRAWN BY XAJ
DATE: 2/18/09		CHKD BY CMDS-DB2

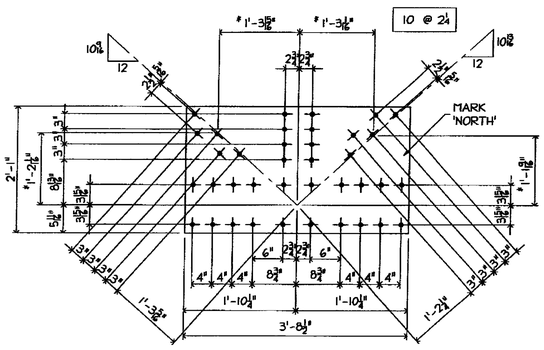
BRIDGE @ HIGHWAY #1 OVER WINOOSKI RIVER
FLOOR STRINGER DETAILS

T BUCK CONSTRUCTION

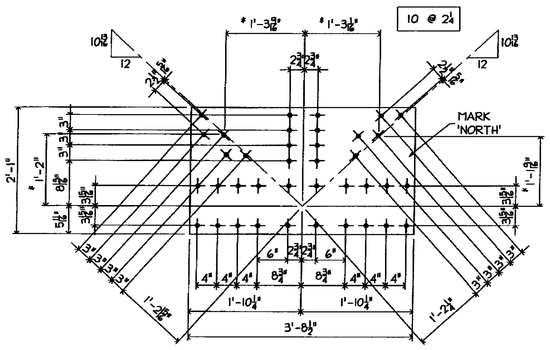
DWG NO 09-113 – 31 A



2 - BRACE PL's - 32M11
(PL½)

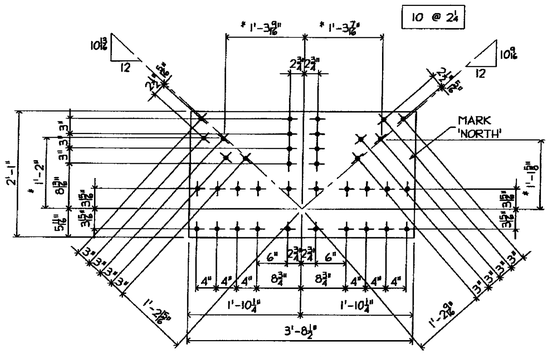


2 - BRACE PL's - 32M12
(PL½)

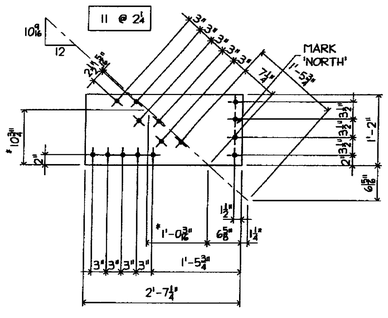


12 - BRACE PL's - 32M13
(PL½)

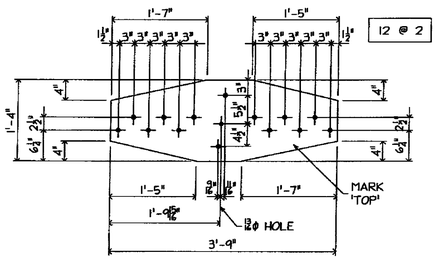
SHOP NOTE:
* = DIMENSIONS ARE GIVEN TO WORK LINE, NOT HOLES



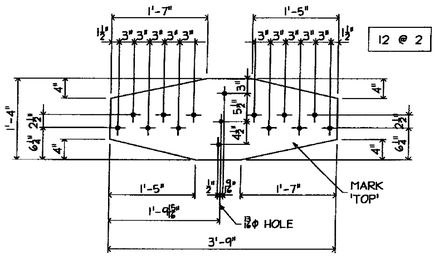
2 - BRACE PL's - 32M14
(PL½)



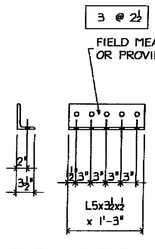
2 - BRACE PL's - 32M15
(PL½)



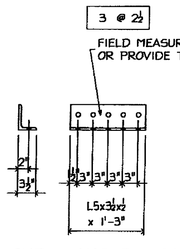
2 - BRACE PL's - 32M10
(PL⅜)



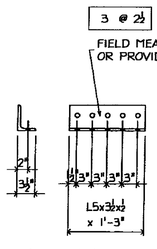
7 - BRACE PL's - 32M11
(PL⅜)



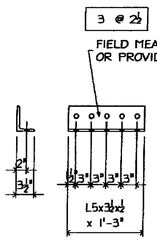
ONE - ANGLE - 32A6



ONE - ANGLE - 32A7



ONE - ANGLE - 32A8



ONE - ANGLE - 32A9

SHOP DRAWINGS ARE REVIEWED UNLESS NOTED OTHERWISE

NO EXCEPTION TAKEN	X
REVISE AS NOTED RESUBMISSION NOT REQUIRED	
REVISE AS NOTED RESUBMISSION REQUIRED	
REJECTED	

DATE 3/24/09

SIGNATURE TEK

REVIEW BY STANTEC IS FOR THE SOLE PURPOSE OF ASCERTAINING GENERAL CONFORMITY WITH DESIGN. CONTRACTOR IS RESPONSIBLE FOR DIMENSIONS, FABRICATION AND CONSTRUCTION METHODS, COORDINATION OF SUB-TRADES DETAIL DESIGN OF COMPONENTS, AND ERRORS OR OMISSIONS ON SHOP DRAWINGS.

GALVANIZING NOTES
1. ALL WELDS SHALL BE SEALED
2 VENT AS REQUIRED
3 COMPLETE FINAL ASSEMBLY OF BOLTED ITEMS AFTER GALVANIZING. WIRE-BRUSH ALL CONTACTING SURFACES TO A DULL-GRAY APPEARANCE PRIOR TO ASSEMBLY

FB THIS DWG
108- ⅞Ø x 2 (A325 GALV) BOLT w/NHW
182- ⅞Ø x 2½ (A325 GALV) BOLT w/NHW
12- ⅞Ø x 2½ (A325 GALV) BOLT w/NHW

BILL OF MATERIAL

MARKS SHIP	MARKS TEMP	QTY	MATERIAL	FT	IN	GR	REMARK'S
32M11		2	PL½ x 14	2	7¼		
32M12		2	PL½ x 25	3	8½		
32M13		12	PL½ x 25	3	8½		
32M14		2	PL½ x 25	3	8½		
32M15		2	PL½ x 14	2	7¼		
32A6		ONE	L5x3½x½	1	3		
32A7		ONE	L5x3½x½	1	3		
32A8		ONE	L5x3½x½	1	3		
32A9		ONE	L5x3½x½	1	3		
32M10		2	PL⅜ x 16	3	9		SHAPED
32M11		7	PL⅜ x 16	3	9		SHAPED

MATL
1 ALL MAT'L SHALL CONFORM TO AASHTO M 270M/M 270 GRADE 50 (UNLESS NOTED)
2 'CVN' INDICATES CHARPT "V" NOTCH TESTED.
3 'FCM' INDICATES "FRACTURE CRITICAL MEMBER"

WELD E70xx

HOLES 1¼Ø UNO

PREP SSPC-SP8

PAINT GALVANIZED AND AIR COOLED (NOT QUENCHED) (SEE GALVANIZING NOTES)

A 3/11/09 PER APP'L COMMENTS DATED 3/06/09

ARC ENTERPRISES, INC.
KINGFIELD, MAINE

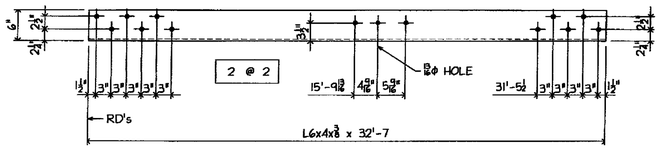
PROJECT: STATE OF VERMONT – AGENCY OF TRANSPORTATION
BRIDGE No 31 – RICHMOND, VERMONT

SCALE: NTS	APPROVED BY:	DRAWN BY. KAJ	
DATE: 2/18/09		CHKD. BY: CMDS-DB2	

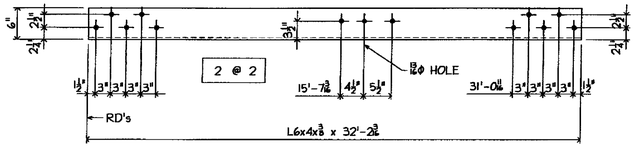
BRIDGE @ HIGHWAY #1 OVER WINOOSKI RIVER
BRACING PLATE DETAILS

T BUCK CONSTRUCTION

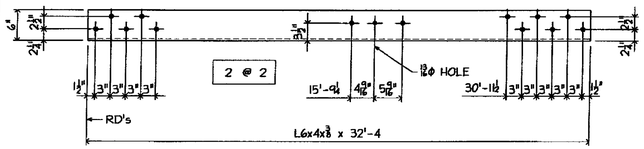
DWG NO 09-113 - 32 A



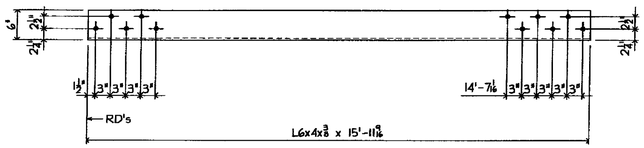
ONE - ANGLE - 33A1



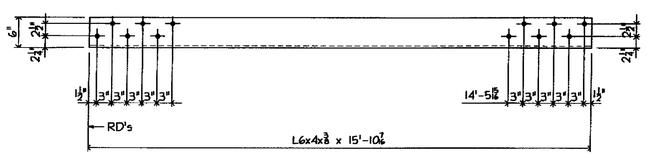
7 - ANGLES - 33A2



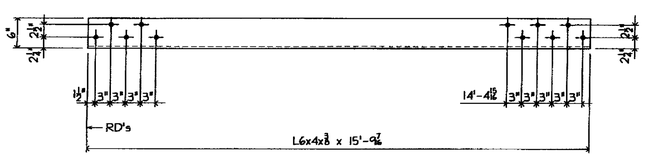
ONE - ANGLE - 33A3



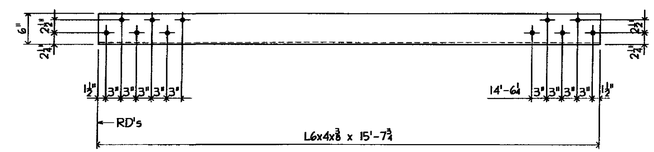
ONE - ANGLE - 33A4



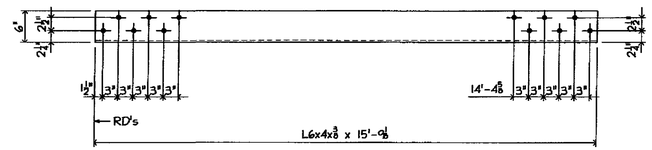
ONE - ANGLE - 33A5



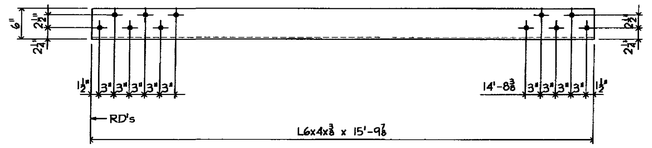
7 - ANGLES - 33A6



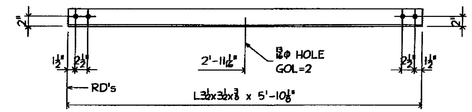
7 - ANGLES - 33A7



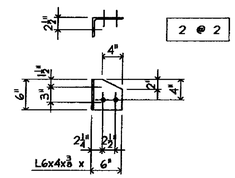
ONE - ANGLE - 33A8



ONE - ANGLE - 33A9

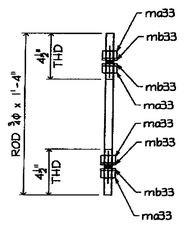


9 - ANGLES - 33A10



9 - ANGLES - 33A11 (AS SHOWN)

9 - ANGLES - 33A12 (OPP HAND)



9 - THD RODS - 33M13

SHOP DRAWINGS ARE REVIEWED UNLESS NOTED OTHERWISE
NO EXCEPTION TAKEN
REVISE AS NOTED
RESUBMISSION NOT REQUIRED
REVISE AS NOTED
RESUBMISSION REQUIRED
REJECTED
DATE 3/24/09
SIGNATURE TEK
REVIEW BY STANTEC IS FOR THE SOLE PURPOSE OF ASCERTAINING GENERAL CONFORMITY WITH DESIGN. CONTRACTOR IS RESPONSIBLE FOR DIMENSIONS, FABRICATION AND CONSTRUCTION METHODS, COORDINATION OF SUB-TRADES, DETAIL DESIGN OF COMPONENTS, AND ERRORS OR OMISSIONS ON SHOP DRAWINGS.

GALVANIZING NOTES:
1 ALL WELDS SHALL BE SEALED
2 VENT AS REQUIRED
3 COMPLETE FINAL ASSEMBLY OF BOLTED ITEMS AFTER GALVANIZING, WIRE-BRUSH ALL CONTACTING SURFACES TO A DULL-GRAY APPEARANCE PRIOR TO ASSEMBLY

FB THIS DWG
54- ⅞Ø x 2 (A325 GALV) BOLT w/N&W

BILL OF MATERIAL

MARKS SHIP	MARKS TEMP	QTY	MATERIAL	FT	IN	GR	REMARK'S
33A1		ONE	L6x4x⅜	32	7		
33A2		7	L6x4x⅜	32	2⅜		
33A3		ONE	L6x4x⅜	32	4		
33A4		ONE	L6x4x⅜	15	11⅛		
33A5		ONE	L6x4x⅜	15	10⅞		
33A6		7	L6x4x⅜	15	9⅞		
33A7		7	L6x4x⅜	15	7¾		
33A8		ONE	L6x4x⅜	15	9⅛		
33A9		ONE	L6x4x⅜	15	9⅛		
33A10		9	L3½x3½x⅜	5	10⅛		
33A11		9	L6x4x⅜	0	6		
33A12		9	L6x4x⅜	0	6		
33M13		9	ROD ¾Ø	1	4	A307 GALV	THD B/E
	m33	36	HVY HEX NUT ¾Ø			A307 GALV	
	mb33	36	FLAT WASHER ¾Ø			A307 GALV	

MATL
1 ALL MAT'L SHALL CONFORM TO AASHTO M 270M/M 270 GRADE 50 (UNLESS NOTED)
2 'CVN' INDICATES CHARPY "V" NOTCH TESTED
3 'FCM' INDICATES "FRACTURE CRITICAL MEMBER"

WELD: E70xx

HOLES: ⅞Ø UNO

PREP SSPC-SP8

PAINT GALVANIZED AND AIR COOLED (NOT QUENCHED) (SEE GALVANIZING NOTES)

A 3/11/09 PER APP'L COMMENTS DATED 3/06/09

ARC ENTERPRISES, INC.
KINGFIELD, MAINE

PROJECT: STATE OF VERMONT - AGENCY OF TRANSPORTATION
BRIDGE No. 31 - RICHMOND, VERMONT

SCALE: NTS	APPROVED BY.	DRAWN BY KAJ	
DATE: 2/18/09		CHKD BY: CMDS-DB2	

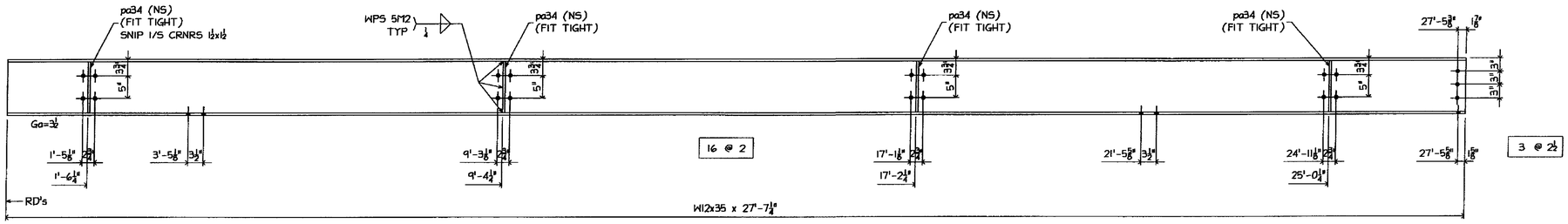
BRIDGE @ HIGHWAY #1 OVER WINOOSKI RIVER
BRACING ANGLES DETAILS

T BUCK CONSTRUCTION

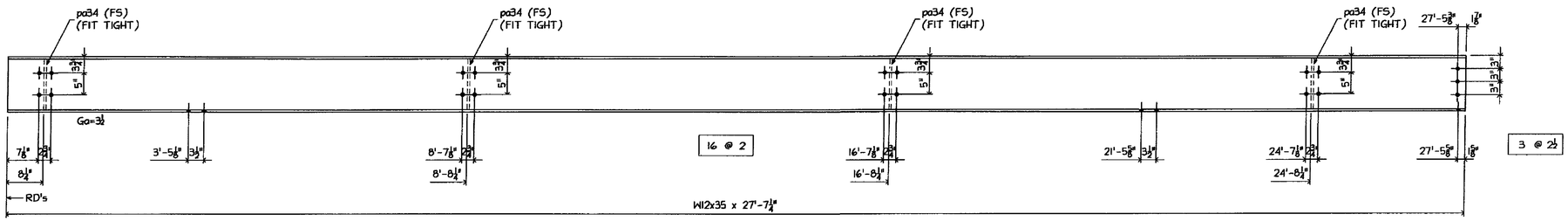
DWG NO. 09-113 - 33 A

BILL OF MATERIAL

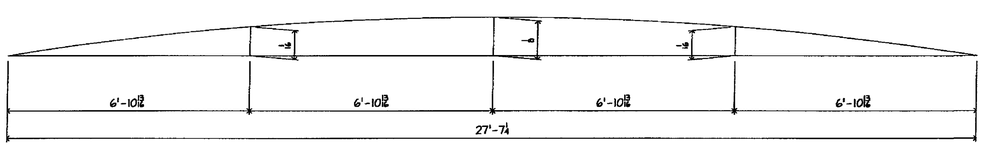
MARKS SHIP	MARKS TEMP	QTY	MATERIAL	FT	IN	GR	REMARK'S
34B1		ONE	W12x35	27	7¼		
	pa34	4	PL½ x 3	0	11⅝		SHAPED
34B2		ONE	W12x35	27	7¼		
	pa34	4	PL½ x 3	0	11⅝		SHAPED



ONE - BEAM - 34B1



ONE - BEAM - 34B2



CAMBER DIAGRAM

SHOP DRAWINGS ARE REVIEWED UNLESS NOTED OTHERWISE

- NO EXCEPTION TAKEN
- REVISE AS NOTED RESUBMISSION NOT REQUIRED
- REVISE AS NOTED RESUBMISSION REQUIRED
- REJECTED

Stantec

DATE: 3/24/09

SIGNATURE: TEK

REVIEW BY STANTEC IS FOR THE SOLE PURPOSE OF ASCERTAINING GENERAL CONFORMITY WITH DESIGN. CONTRACTOR IS RESPONSIBLE FOR DIMENSIONS, FABRICATION AND CONSTRUCTION METHODS COORDINATION OF SUB-TRADES DETAIL DESIGN OF COMPONENTS, AND ERRORS OR OMISSIONS ON SHOP DRAWINGS.

GALVANIZING NOTES:
1 ALL WELDS SHALL BE SEALED
2 VENT AS REQUIRED
3 COMPLETE FINAL ASSEMBLY OF BOLTED ITEMS AFTER GALVANIZING WIRE-BRUSH ALL CONTACTING SURFACES TO A DULL-GRAY APPEARANCE PRIOR TO ASSEMBLY

FB THIS DWG
32- ⅞ø x 2 (A325 GALV) BOLT w/NtW
6- ⅞ø x 2½ (A325 GALV) BOLT w/NtW

MATL.
1 ALL MAT'L SHALL CONFORM TO AASHTO M 270M/M 270 GRADE 50 (UNLESS NOTED)
2 'CVN' INDICATES CHARPY "V" NOTCH TESTED
3 'FCM' INDICATES "FRACTURE CRITICAL MEMBER"

WELD: E70xx

HOLES: ⅞"ø UNO

PREP SSPC-SP6

PAINT GALVANIZED AND AIR COOLED (NOT QUENCHED) (SEE GALVANIZING NOTES)

A 3/11/09 PER APP'L COMMENTS DATED 3/06/09

ARC ENTERPRISES, INC.
KINGFIELD, MAINE

PROJECT: STATE OF VERMONT – AGENCY OF TRANSPORTATION
BRIDGE No 31 – RICHMOND, VERMONT

SCALE: NTS	APPROVED BY:	DRAWN BY: KAJ
DATE: 2/18/09		CHKD. BY: CMDS-DB2

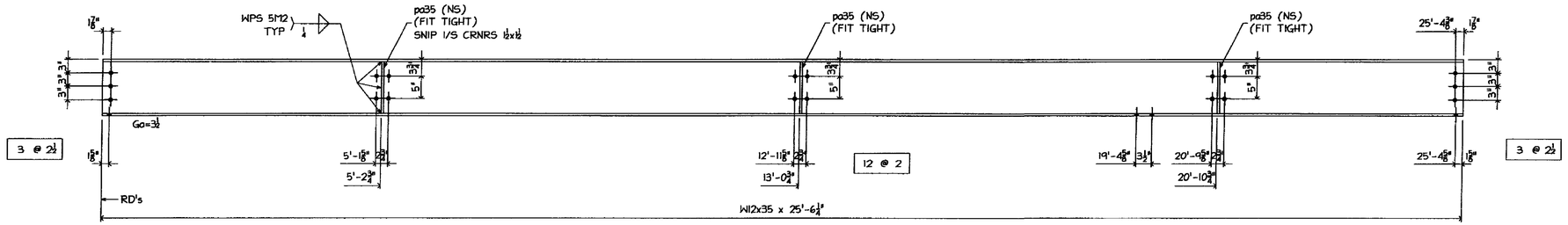
BRIDGE @ HIGHWAY #1 OVER WINOOSKI RIVER
SIDEWALK STRINGER DETAILS

T BUCK CONSTRUCTION

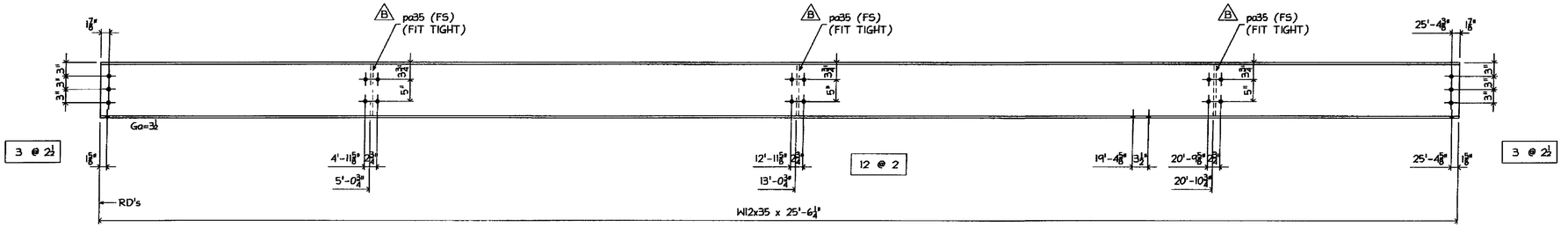
DWG NO 09-113 – 34 A

BILL OF MATERIAL

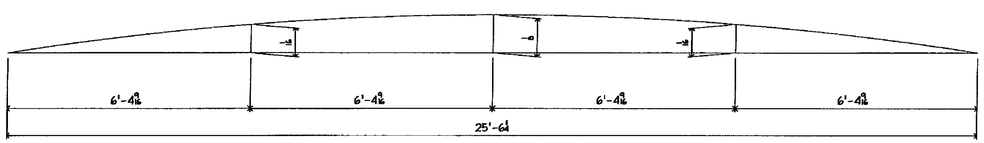
MARKS SHIP	MARKS TEMP	QTY	MATERIAL	FT	IN	GR	REMARKS
35B1		ONE	W12x35	25	6¼		
	pa35	3	PL½ x 3	0	11⅞		SHAPED
35B2		ONE	W12x35	25	6¼		
	pa35	3	PL½ x 3	0	11⅞		SHAPED



ONE - BEAM - 35B1



ONE - BEAM - 35B2



CAMBER DIAGRAM

SHOP DRAWINGS ARE REVIEWED UNLESS NOTED OTHERWISE
NO EXCEPTION TAKEN X
REMAKE AS NOTED RESUBMISSION NOT REQUIRED
REMAKE AS NOTED RESUBMISSION REQUIRED
REJECTED
DATE 3/24/09
SIGNATURE ZEK
Stantec
REVIEW BY STANTEC IS FOR THE SOLE PURPOSE OF ASCERTAINING GENERAL CONFORMITY WITH DESIGN. CONTRACTOR IS RESPONSIBLE FOR DIMENSIONS, FABRICATION AND CONSTRUCTION METHODS, COORDINATION OF SUB-TRADES DETAIL DESIGN OF COMPONENTS AND ERRORS OR OMISSIONS ON SHOP DRAWINGS.

GALVANIZING NOTES
1 ALL WELDS SHALL BE SEALED
2 VENT AS REQUIRED.
3 COMPLETE FINAL ASSEMBLY OF BOLTED ITEMS AFTER GALVANIZING WIRE-BRUSH ALL CONTACTING SURFACES TO A DULL-GRAY APPEARANCE PRIOR TO ASSEMBLY

FB THIS DWG
24- ⅞ϕ x 2 (A325 GALV) BOLT w/N&W
12- ⅞ϕ x 2½ (A325 GALV) BOLT w/N&W

MATL:
1 ALL MAT'L SHALL CONFORM TO AASHTO M 270M/M 270 GRADE 50 (UNLESS NOTED)
2 'CVN' INDICATES CHARPY "V" NOTCH TESTED.
3 'FCM' INDICATES "FRACTURE CRITICAL MEMBER"

WELD E70xx

HOLES: ¹³⁄₁₆"ϕ UNO

PREP: SSPC-SP8

PAINT: GALVANIZED AND AIR COOLED (NOT QUENCHED) (SEE GALVANIZING NOTES)

B 3/18/09 STIFFENERS MARKED TO FS
A 3/11/09 PER APP'L COMMENTS DATED 3/06/09

ARC ENTERPRISES, INC.
KINGFIELD, MAINE

PROJECT STATE OF VERMONT – AGENCY OF TRANSPORTATION
BRIDGE No 31 – RICHMOND, VERMONT

SCALE: NTS	APPROVED BY:	DRAWN BY: KAJ
DATE. 2/18/09		CHKD BY: CMDS

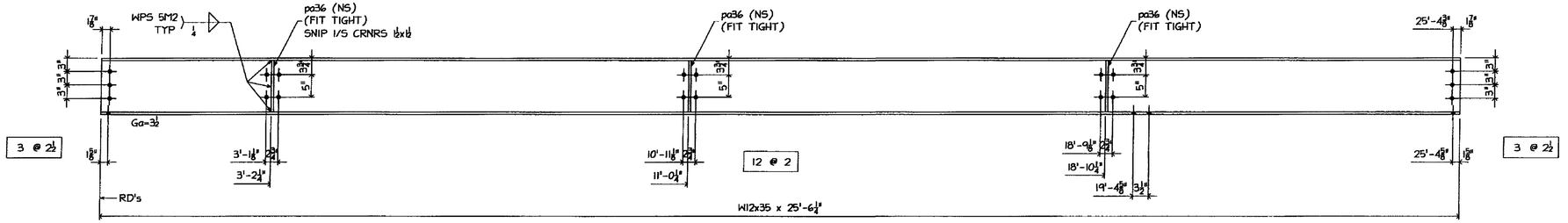
BRIDGE @ HIGHWAY #1 OVER WINOOSKI RIVER
SIDEWALK STRINGER DETAILS

T BUCK CONSTRUCTION

DWG. NO. 09-113 – 35 B

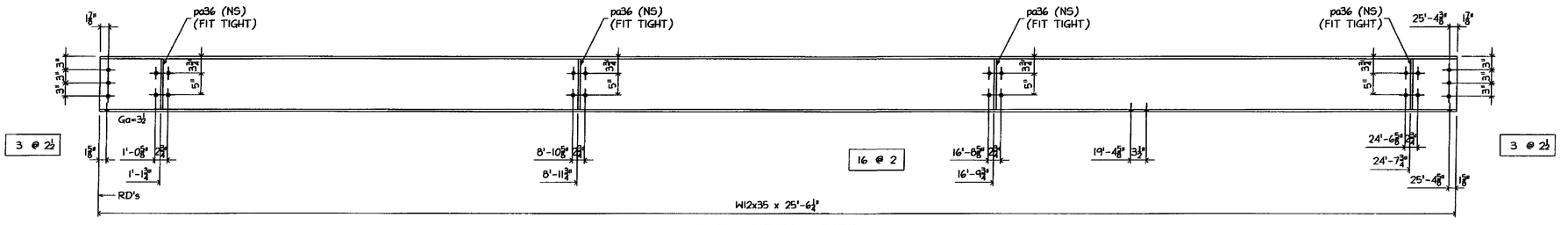
BILL OF MATERIAL

MARKS SHIP	MARKS TEMP	QTY	MATERIAL	FT	IN	GR	REMARK'S
36B1		ONE	W12x35	25	6¼		
	pa36	3	PL½ x 3	0	11⅞		SHAPED
36B2		ONE	W12x35	25	6¼		
	pa36	3	PL½ x 3	0	11⅞		SHAPED
36B3		ONE	W12x35	25	6¼		
	pa36	4	PL½ x 3	0	11⅞		SHAPED
36B4		ONE	W12x35	25	6¼		
	pa36	4	PL½ x 3	0	11⅞		SHAPED



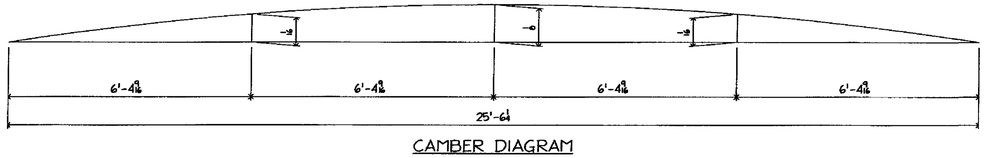
ONE - BEAM - 36B1 (AS SHOWN)

ONE - BEAM - 36B2 (OPP HAND)



ONE - BEAM - 36B3 (AS SHOWN)

ONE - BEAM - 36B4 (OPP HAND)



CAMBER DIAGRAM

SHOP DRAWINGS ARE REVIEWED UNLESS NOTED OTHERWISE

NO EXCEPTION TAKEN	X
REVISE AS NOTED RESUBMISSION NOT REQUIRED	
REVISE AS NOTED RESUBMISSION REQUIRED	
REJECTED	

Stantec

DATE 3/24/09

SIGNATURE ZK

REVIEW BY STANTEC IS FOR THE SOLE PURPOSE OF ASCERTAINING GENERAL CONFORMITY WITH DESIGN. CONTRACTOR IS RESPONSIBLE FOR DIMENSIONS FABRICATION AND CONSTRUCTION METHODS COORDINATION OF SUB-TRADES DETAIL DESIGN OF COMPONENTS, AND ERRORS OR OMISSIONS ON SHOP DRAWINGS.

GALVANIZING NOTES.
1 ALL WELDS SHALL BE SEALED
2 VENT AS REQUIRED
3 COMPLETE FINAL ASSEMBLY OF BOLTED ITEMS AFTER GALVANIZING WIRE-BRUSH ALL CONTACTING SURFACES TO A DULL-GRAY APPEARANCE PRIOR TO ASSEMBLY

FB THIS DWG

56- ⅞Φ x 2 (A325 GALV.) BOLT w/N&W

24- ⅞Φ x 2½ (A325 GALV.) BOLT w/N&W

MATL:
1 ALL MAT'L SHALL CONFORM TO AASHTO M 270M/M 270 GRADE 50 (UNLESS NOTED)
2 'CVN' INDICATES CHARPY "V" NOTCH TESTED.
3 'FCM' INDICATES "FRACTURE CRITICAL MEMBER"

WELD: E70xx

HOLES: 15/16"Φ UNO

PREP. SSPC-SP8

PAINT: GALVANIZED AND AIR COOLED (NOT QUENCHED) (SEE GALVANIZING NOTES)

A 3/11/09 PER APP'L COMMENTS DATED 3/06/09

ARC ENTERPRISES, INC.
KINGFIELD, MAINE

PROJECT: STATE OF VERMONT – AGENCY OF TRANSPORTATION
BRIDGE No 31 – RICHMOND, VERMONT

SCALE. NTS	APPROVED BY:	DRAWN BY KAJ	
DATE 2/18/09		CHKD. BY. CMOS-DB2	

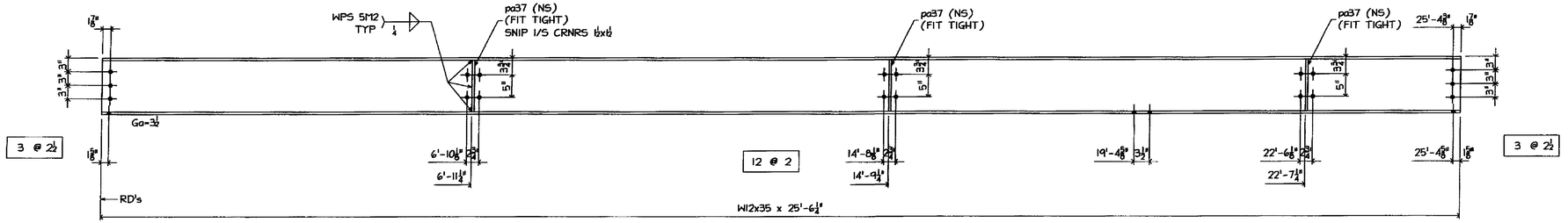
BRIDGE @ HIGHWAY #1 OVER WINOOSKI RIVER
SIDEWALK STRINGER DETAILS

T BUCK CONSTRUCTION

DWG NO 09-113 – 36 A

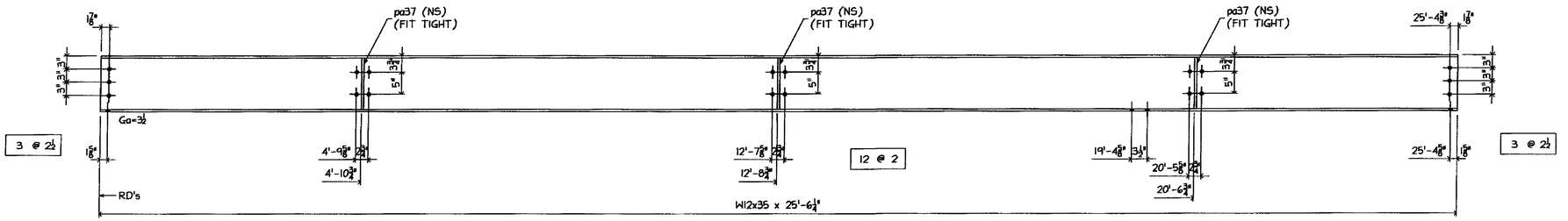
BILL OF MATERIAL

MARKS SHIP	MARKS TEMP	QTY	MATERIAL	FT	IN	GR	REMARK'S
37B1		ONE	W12x35	25	6½		
	pa37	3	PL½ x 3	0	11⅝		SHAPED
37B2		ONE	W12x35	25	6½		
	pa37	3	PL½ x 3	0	11⅝		SHAPED
37B3		ONE	W12x35	25	6½		
	pa37	3	PL½ x 3	0	11⅝		SHAPED
37B4		ONE	W12x35	25	6½		
	pa37	3	PL½ x 3	0	11⅝		SHAPED



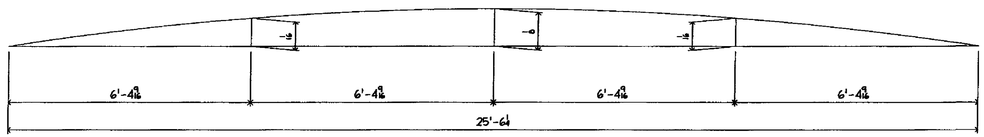
ONE - BEAM - 37B1 (AS SHOWN)

ONE - BEAM - 37B2 (OPP HAND)



ONE - BEAM - 37B3 (AS SHOWN)

ONE - BEAM - 37B4 (OPP HAND)



CAMBER DIAGRAM

SHOP DRAWINGS ARE REVIEWED UNLESS NOTED OTHERWISE

NO EXCEPTION TAKEN	X
REVISE AS NOTED RESUBMISSION NOT REQUIRED	
REVISE AS NOTED RESUBMISSION REQUIRED	
REJECTED	

Stantec

DATE 3/24/09

SIGNATURE TCK

REVIEW BY STANTEC IS FOR THE SOLE PURPOSE OF ASCERTAINING GENERAL CONFORMITY WITH DESIGN. CONTRACTOR IS RESPONSIBLE FOR DIMENSIONS, FABRICATION AND CONSTRUCTION METHODS, COORDINATION OF SUB-TRADES, DETAIL DESIGN OF COMPONENTS, AND ERRORS OR OMISSIONS ON SHOP DRAWINGS

GALVANIZING NOTES:
1 ALL WELDS SHALL BE SEALED
2 VENT AS REQUIRED
3 COMPLETE FINAL ASSEMBLY OF BOLTED ITEMS AFTER GALVANIZING. WIRE-BRUSH ALL CONTACTING SURFACES TO A DULL-GRAY APPEARANCE PRIOR TO ASSEMBLY

FB THIS DWG

48- ⅞ø x 2 (A325 GALV) BOLT w/N&W

24- ⅞ø x 2½ (A325 GALV) BOLT w/N&W

MATL.
1 ALL MAT'L SHALL CONFORM TO AASHTO M 270M/M 270 GRADE 50 (UNLESS NOTED)
2 'CVN' INDICATES CHARPY "V" NOTCH TESTED
3 'FCM' INDICATES "FRACTURE CRITICAL MEMBER"

WELD: E70xx

HOLES: 15/16"ø UNO

PREP: SSPC-SP6

PAINT: GALVANIZED AND AIR COOLED (NOT QUENCHED) (SEE GALVANIZING NOTES)

A 3/11/09 PER APP'L COMMENTS DATED 3/06/09

ARC ENTERPRISES, INC.
KINGFIELD, MAINE

PROJECT: STATE OF VERMONT – AGENCY OF TRANSPORTATION
BRIDGE No 31 – RICHMOND, VERMONT

SCALE	NTS	APPROVED BY:	DRAWN BY KAJ
DATE:	2/18/09		CHKD. BY: CMDS-082

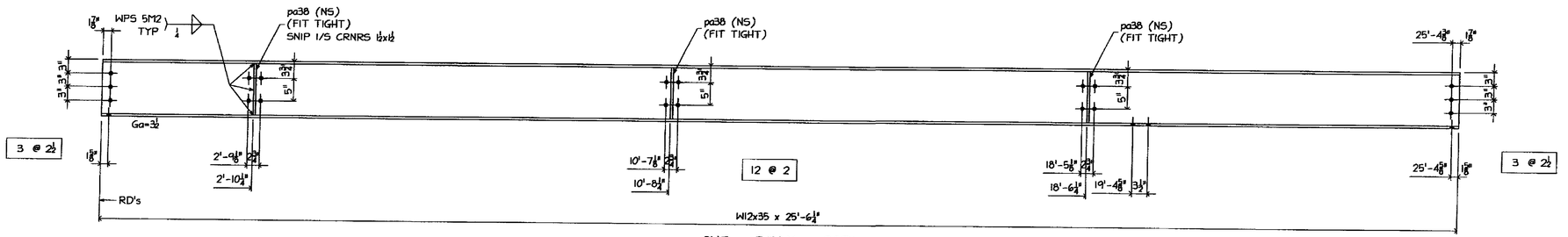
BRIDGE @ HIGHWAY #1 OVER WINOOSKI RIVER
SIDEWALK STRINGER DETAILS

T BUCK CONSTRUCTION

DWG NO 09-113 – 37 A

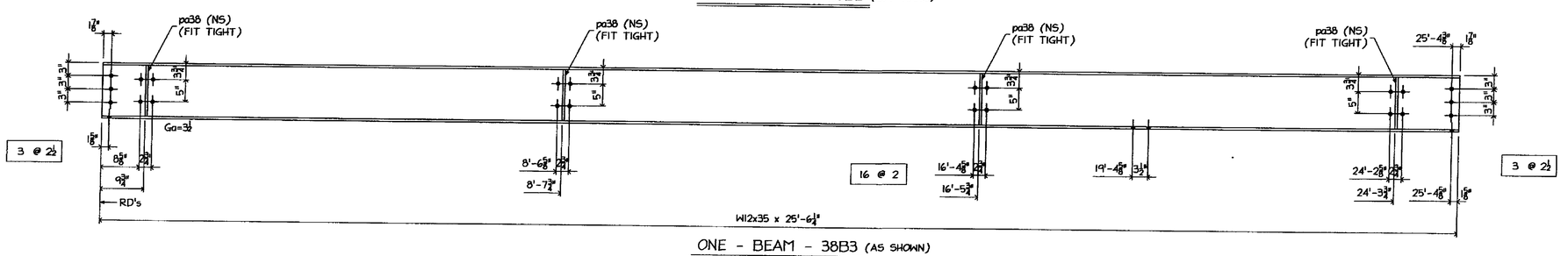
BILL OF MATERIAL

MARKS SHIP	MARKS TEMP	QTY	MATERIAL	FT	IN	GR	REMARK'S
38B1		ONE	W12x35	25	6¼		
	pa38	3	PL½ x 3	0	11⅝		SHAPED
38B2		ONE	W12x35	25	6¼		
	pa38	3	PL½ x 3	0	11⅝		SHAPED
38B3		ONE	W12x35	25	6¼		
	pa38	4	PL½ x 3	0	11⅝		SHAPED
38B4		ONE	W12x35	25	6¼		
	pa38	4	PL½ x 3	0	11⅝		SHAPED



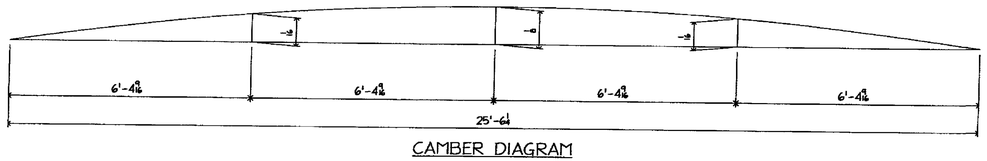
ONE - BEAM - 38B1 (AS SHOWN)

ONE - BEAM - 38B2 (OPP HAND)



ONE - BEAM - 38B3 (AS SHOWN)

ONE - BEAM - 38B4 (OPP HAND)



CAMBER DIAGRAM

SHOP DRAWINGS ARE REVIEWED UNLESS NOTED OTHERWISE
NO EXCEPTION TAKEN X
REVISE AS NOTED
RESUBMISSION NOT REQUIRED
REVISE AS NOTED
RESUBMISSION REQUIRED
REJECTED
DATE 3/24/09
SIGNATURE
REVIEW BY STANTEC IS FOR THE SOLE PURPOSE OF ASCERTAINING GENERAL CONFORMITY WITH DESIGN. CONTRACTOR IS RESPONSIBLE FOR DIMENSIONS FABRICATION AND CONSTRUCTION METHODS, COORDINATION OF SUB-TRADES DETAIL DESIGN OF COMPONENTS AND ERRORS OR OMISSIONS ON SHOP DRAWINGS
Stantec

GALVANIZING NOTES
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3 COMPLETE FINAL ASSEMBLY OF BOLTED ITEMS AFTER GALVANIZING. WIRE-BRUSH ALL CONTACTING SURFACES TO A DULL-GRAY APPEARANCE PRIOR TO ASSEMBLY

FB THIS DWG

56- ⅞ø x 2 (A325 GALV) BOLT w/N&W

24- ⅞ø x 2½ (A325 GALV) BOLT w/N&W

MATL.

1 ALL MAT'L SHALL CONFORM TO AASHTO M 270M/M 270 GRADE 50 (UNLESS NOTED)
2 'CVN' INDICATES CHARPY "V" NOTCH TESTED.
3 'FCM' INDICATES "FRACTURE CRITICAL MEMBER"

WELD: E70xx

HOLES: 1⅛ø UNO

PREP SSPC-SP8

PAINT: GALVANIZED AND AIR COOLED (NOT QUENCHED) (SEE GALVANIZING NOTES)

A 3/11/09 PER APP'L COMMENTS DATED 3/06/09

ARC ENTERPRISES, INC.
KINGFIELD, MAINE

PROJECT: STATE OF VERMONT - AGENCY OF TRANSPORTATION
BRIDGE No 31 - RICHMOND, VERMONT

SCALE: NTS	APPROVED BY:	DRAWN BY KAJ
DATE: 2/18/09		CHKD. BY: CMOS-082

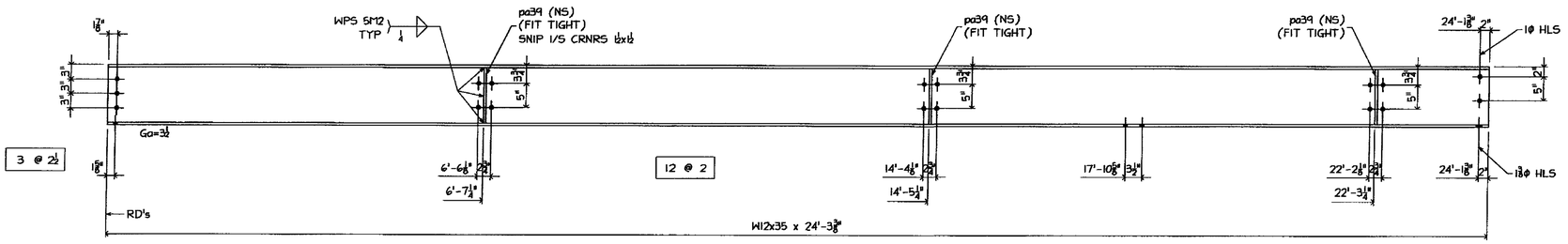
BRIDGE @ HIGHWAY #1 OVER WINOOSKI RIVER
SIDEWALK STRINGER DETAILS

T BUCK CONSTRUCTION

DWG NO 09-113 - 38 A

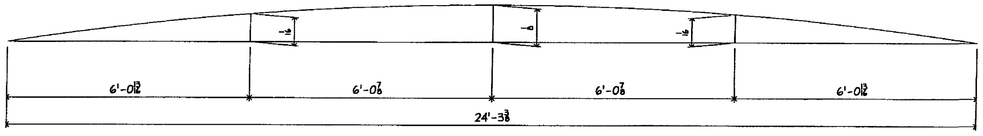
BILL OF MATERIAL

MARKS SHIP	MARKS TEMP	QTY	MATERIAL	FT	IN	GR	REMARK'S
39B1		ONE	W12x35	24	3 3/8		
	pa39	3	PL 1/2 x 3	0	11 5/8		SHAPED
39B2		ONE	W12x35	24	3 3/8		
	pa39	3	PL 1/2 x 3	0	11 5/8		SHAPED



ONE - BEAM - 39B1 (AS SHOWN)

ONE - BEAM - 39B2 (OPP HAND)



CAMBER DIAGRAM

SHOP DRAWINGS ARE REVIEWED UNLESS NOTED OTHERWISE

NO EXCEPTION TAKEN X

REVISE AS NOTED RESUBMISSION NOT REQUIRED

REVISE AS NOTED RESUBMISSION REQUIRED

REJECTED

Stantec

DATE 3/24/09

SIGNATURE TCK

REVIEW BY STANTEC IS FOR THE SOLE PURPOSE OF ASCERTAINING GENERAL CONFORMITY WITH DESIGN. CONTRACTOR IS RESPONSIBLE FOR DIMENSIONS, FABRICATION AND CONSTRUCTION METHODS, COORDINATION OF SUB-TRADES, DETAIL DESIGN OF COMPONENTS AND ERRORS OR OMISSIONS ON SHOP DRAWINGS

GALVANIZING NOTES:
1. ALL WELDS SHALL BE SEALED
2 VENT AS REQUIRED.
3 COMPLETE FINAL ASSEMBLY OF BOLTED ITEMS AFTER GALVANIZING. WIRE-BRUSH ALL CONTACTING SURFACES TO A DULL-GRAY APPEARANCE PRIOR TO ASSEMBLY

FB THIS DWG

24- 7/8Ø x 2 (A325 GALV) BOLT w/N&W

6- 7/8Ø x 2 1/2 (A325 GALV) BOLT w/N&W

MATL

1 ALL MAT'L SHALL CONFORM TO AASHTO M 270M/M 270 GRADE 50 (UNLESS NOTED)
2 'CVN' INDICATES CHARPY "V" NOTCH TESTED
3 'FCM' INDICATES "FRACTURE CRITICAL MEMBER"

WELD E70xx

HOLES 1 1/2"Ø U.N.O.

PREP: SSPC-SP8

PAINT: GALVANIZED AND AIR COOLED (NOT QUENCHED) (SEE GALVANIZING NOTES)

A 3/11/09 PER APP'L COMMENTS DATED 3/06/09

ARC ENTERPRISES, INC.
KINGFIELD, MAINE

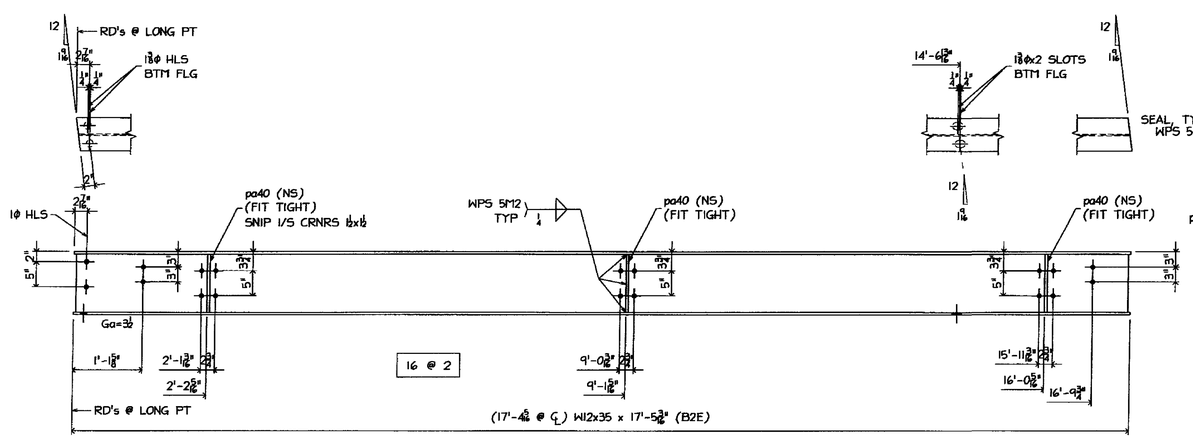
PROJECT STATE OF VERMONT – AGENCY OF TRANSPORTATION
BRIDGE No 31 – RICHMOND, VERMONT

SCALE: NTS	APPROVED BY:	DRAWN BY: KAJ
DATE: 2/18/09		CHKD BY: CWDS-DB2

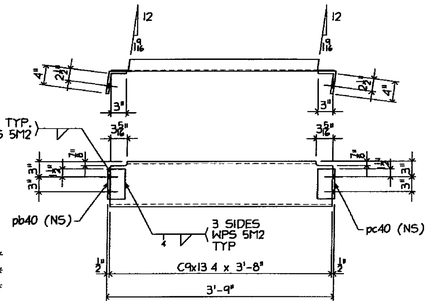
BRIDGE @ HIGHWAY #1 OVER WINOOSKI RIVER
SIDEWALK STRINGER DETAILS

T BUCK CONSTRUCTION

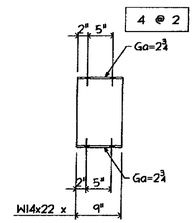
DWG NO. 09-113 – 39 A



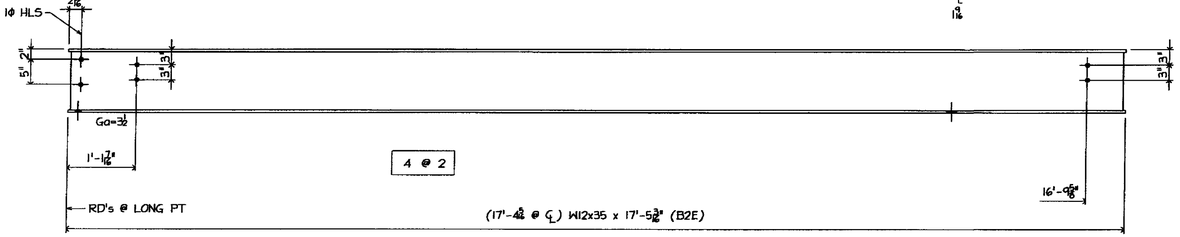
ONE - BEAM - 40B1



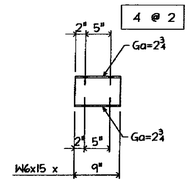
2 - CHANNELS - 40B3



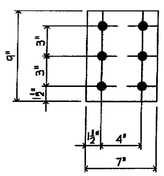
33 - BEAMS - 40B4



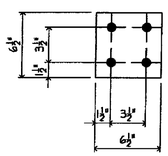
ONE - BEAM - 40B2



30 - BEAMS - 40B5



32 - SPLICE PL's - 40M16 (PL⅜)



18 - SPACER PL's - 40M17 (PL¾)

SHOP DRAWINGS ARE REVIEWED UNLESS NOTED OTHERWISE

NO EXCEPTION TAKEN

REVISE AS NOTED RESUBMISSION NOT REQUIRED

REVISE AS NOTED RESUBMISSION REQUIRED

REJECTED

Stantec

DATE 3/24/09

SIGNATURE TBK

REVIEW BY STANTEC IS FOR THE SOLE PURPOSE OF ASCERTAINING GENERAL CONFORMITY WITH DESIGN. CONTRACTOR IS RESPONSIBLE FOR DIMENSIONS FABRICATION AND CONSTRUCTION METHODS, COORDINATION OF SUB-TRADES DETAIL DESIGN OF COMPONENTS, AND ERRORS OR OMISSIONS ON SHOP DRAWINGS

GALVANIZING NOTES:
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2 VENT AS REQUIRED
3 COMPLETE FINAL ASSEMBLY OF BOLTED ITEMS AFTER GALVANIZING WIRE-BRUSH ALL CONTACTING SURFACES TO A DULL-GRAY APPEARANCE PRIOR TO ASSEMBLY

FB THIS DWG
274- ⅞ϕ x 2 (A325 GALV) BOLT w/N&W

BILL OF MATERIAL

MARKS SHIP	MARKS TEMP	QTY	MATERIAL	FT	IN	GR	REMARK'S
40B1		ONE	W12x35	17	5 3/16		B2E
	pa40	3	PL½ x 3	0	11⅛		SHAPED
40B2		ONE	W12x35	17	5 3/16		B2E
40B3		2	C9x13.4	3	8		
	pb40	2	PL½ x 6	0	7		BEND
	pc40	2	PL½ x 6	0	7		BEND
40B4		33	W14x22	0	9		
40B5		30	W6x15	0	9		
40M16		32	PL⅜ x 7	0	9		
40M17		18	PL¾ x 6½	0	6½		

MATL
1 ALL MAT'L SHALL CONFORM TO AASHTO M 270M/M 270 GRADE 50 (UNLESS NOTED)
2 'CVN' INDICATES CHARPY "V" NOTCH TESTED
3 'FCM' INDICATES "FRACTURE CRITICAL MEMBER"

WELD: E70xx

HOLES 1⅛ϕ UNO

PREP: SSPC-SP8

PAINT: GALVANIZED AND AIR COOLED (NOT QUENCHED) (SEE GALVANIZING NOTES)

A 3/11/09 PER APP'L COMMENTS DATED 3/06/09

ARC ENTERPRISES, INC.
KINGFIELD, MAINE

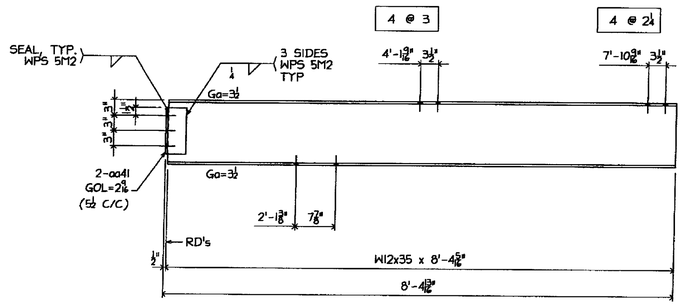
PROJECT: STATE OF VERMONT – AGENCY OF TRANSPORTATION
BRIDGE No 31 – RICHMOND, VERMONT

SCALE: NTS	APPROVED BY:	DRAWN BY KAJ	
DATE 2/18/09		CHKD BY: CMDS-DB2	

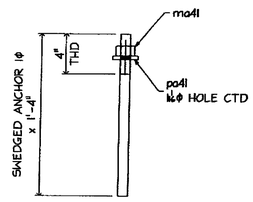
BRIDGE @ HIGHWAY #1 OVER WINOOSKI RIVER
SIDEWALK STRINGER DETAILS

T BUCK CONSTRUCTION

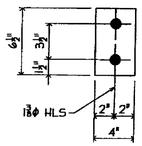
DWG NO 09-113 – 40 A



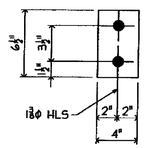
18 - BEAMS - 41B1



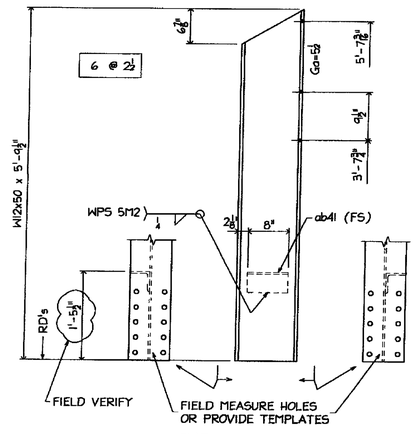
12 - ANCHORS - 41M2



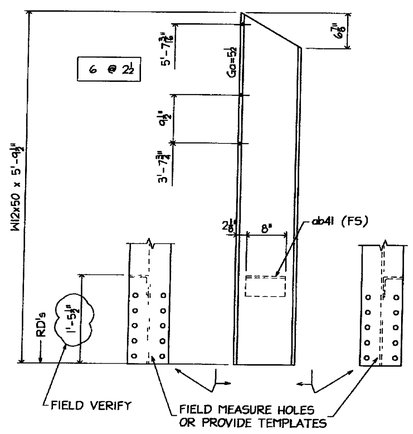
6 - BRG PL's - 41M3
(PL⅜)



6 - ELAST PADS - 41M4
(⅛ THK)



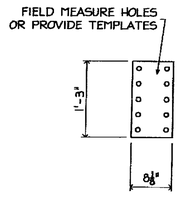
ONE - POST - 41B5



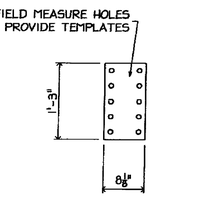
ONE - POST - 41B6

ONE - POST - 41B7

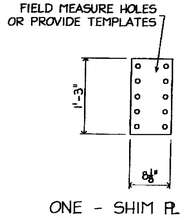
ONE - POST - 41B8



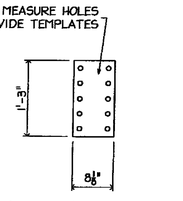
ONE - SHIM PL - 41M9
(PL⅛)



ONE - SHIM PL - 41M10
(PL⅛)



ONE - SHIM PL - 41M11
(PL⅛)



ONE - SHIM PL - 41M12
(PL⅛)

SHOP DRAWINGS ARE REVIEWED UNLESS NOTED OTHERWISE
NO EXCEPTION TAKEN
REVISE AS NOTED RESUBMISSION NOT REQUIRED
REVISE AS NOTED RESUBMISSION REQUIRED
REJECTED
Stantec
DATE 3/24/09
SIGNATURE
REVIEW BY STANTEC IS FOR THE SOLE PURPOSE OF ASCERTAINING GENERAL CONFORMITY WITH DESIGN. CONTRACTOR IS RESPONSIBLE FOR DIMENSIONS, FABRICATION AND CONSTRUCTION METHODS, COORDINATION OF SUB-TRADES DETAIL DESIGN OF COMPONENTS, AND ERRORS OR OMISSIONS ON SHOP DRAWINGS

GALVANIZING NOTES
1 ALL WELDS SHALL BE SEALED
2 VENT AS REQUIRED
3 COMPLETE FINAL ASSEMBLY OF BOLTED ITEMS AFTER GALVANIZING. WIRE-BRUSH ALL CONTACTING SURFACES TO A DULL-GRAY APPEARANCE PRIOR TO ASSEMBLY

FB THIS DWG
72- ⅞φ x 2½ (A325 GALV) BOLT w/N&W
24- ⅞φ x 2½ (A325 GALV) BOLT w/N&W
72- ⅞φ x 3 (A325 GALV) BOLT w/N&W

BILL OF MATERIAL

MARKS SHIP	MARKS TEMP	QTY	MATERIAL	FT	IN	GR	REMARK'S
41B1		18	W12x35	8	4⅝		
	αα41	36	L4x4x⅜	0	9		
41M2		12	SWEDGED ANCHOR 1φ	1	4	A307	THD
	pα41	12	PL⅜ x 2½	0	2½		
	mα41	12	HVY HEX NUT 1φ				
41M3		6	PL⅜ x 4	0	6½		
41M4		6	ELAST PAD ⅛ x 4	0	6½		
41B5		ONE	W12x50	5	9½		BIE
	αb41	1	L4x4x⅜	0	8		
41B6		ONE	W12x50	5	9½		BIE
	αb41	1	L4x4x⅜	0	8		
41B7		ONE	W12x50	5	9½		BIE
	αb41	1	L4x4x⅜	0	8		
41B8		ONE	W12x50	5	9½		BIE
	αb41	1	L4x4x⅜	0	8		
41M9		ONE	PL⅛ x 8⅛	1	3	Gr 36	
41M10		ONE	PL⅛ x 8⅛	1	3	Gr 36	
41M11		ONE	PL⅛ x 8⅛	1	3	Gr 36	
41M12		ONE	PL⅛ x 8⅛	1	3	Gr 36	

MATL
1 ALL MAT'L SHALL CONFORM TO AASHTO M 270M/M 270 GRADE 50 (UNLESS NOTED)
2 'CVN' INDICATES CHARPY "V" NOTCH TESTED
3 'FCM' INDICATES "FRACTURE CRITICAL MEMBER"

WELD: E70xx

HOLES: 1⅛"φ UNO

PREP: SSPC-SP8

PAINT: GALVANIZED AND AIR COOLED (NOT QUENCHED) (SEE GALVANIZING NOTES)

A 3/11/09 PER APP'L COMMENTS DATED 3/06/09

ARC ENTERPRISES, INC.
KINGFIELD, MAINE

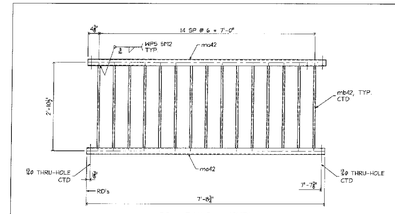
PROJECT: STATE OF VERMONT – AGENCY OF TRANSPORTATION
BRIDGE No 31 – RICHMOND, VERMONT

SCALE: NTS	APPROVED BY	DRAWN BY KAJ
DATE: 2/18/09		CHKD BY: CMDS-DB2

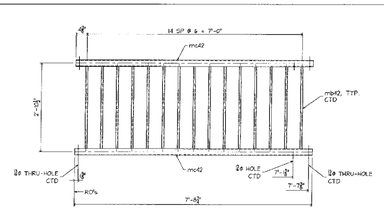
BRIDGE @ HIGHWAY #1 OVER WINOOSKI RIVER
MISC DETAILS

T BUCK CONSTRUCTION

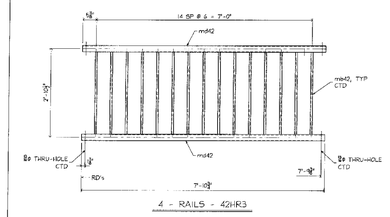
DWG NO 09-113 - 41 A



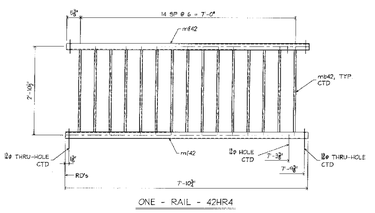
50 - RAILS - 42HR1



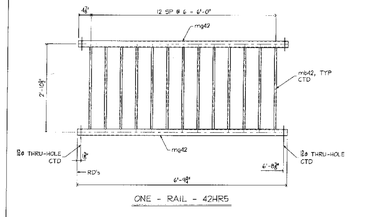
3 - RAILS - 42HR2



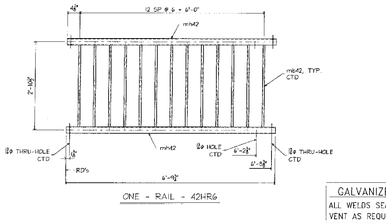
4 - RAILS - 42HR3



ONE - RAIL - 42HR4



ONE - RAIL - 42HR5



ONE - RAIL - 42HR6

GALVANIZED
ALL WELDS SEALED
VENT AS REQUIRED

BILL OF MATERIAL

MARK/ SHEET/REVIS	QTY	MATERIAL	FT	IN	QTY	REMARKS
42HR1	50	RAILS				
mk42	100	HSS 3x3x¼	7	3½	4208	
mk43	750	PIPE 3ø SCH 40	2	8	4208	
42HR2	3	RAILS				
mk42	6	HSS 3x3x¼	7	3½	252	
mk43	45	PIPE 3ø SCH 40	2	8	252	
42HR3	4	RAILS				
mk42	8	HSS 3x3x¼	7	3½	336	
mk43	60	PIPE 3ø SCH 40	2	8	336	
42HR4	ONE	RAIL				
mk42	2	HSS 3x3x¼	7	3½	84	
mk43	15	PIPE 3ø SCH 40	2	8	84	
42HR5	ONE	RAIL				
mk42	2	HSS 3x3x¼	6	4½	168	
mk43	13	PIPE 3ø SCH 40	2	8	168	
42HR6	ONE	RAIL				
mk42	2	HSS 3x3x¼	6	0½	168	
mk43	13	PIPE 3ø SCH 40	2	8	168	

PERFORMANCE SPECIFICATIONS CALCULATIONS SHOP DRAWINGS
NO EXCEPTION TAKEN ✓
MAKE CORRECTIONS NOTED
AMEND & RESUBMIT FOR APPROVAL
RESUBMIT CORRECTED COPIES
REJECTED
DATE 4/2/09
SIGNATURE
REVIEW BY ENGINEER IS FOR THE SOLE PURPOSE OF ASCERTAINING GENERAL CONFORMITY WITH DESIGN. CONTRACTOR IS RESPONSIBLE FOR: MEANS, METHODS, TECHNIQUES, SEQUENCES, PROCEDURES, COORDINATION OF SUB-TRADES, DETAIL DESIGN OF CONNECTIONS, AND ERRORS OR OMISSIONS ON SHOP DRAWINGS.

MATL:
1 ALL MATL SHALL CONFORM TO AASHTO M 270M/M 270 GRADE 36 (UNLESS NOTED)

WELD: E70xx
HOLES: ø UNO
PRIMER: SSPC-SP6
PAINT: GALVANIZED PER ASTM A-123

3 3/30/09 PER APPR'L COMMENTS DATED 3/17/09

ARC ENTERPRISES, INC.
KINGFIELD, MAINE

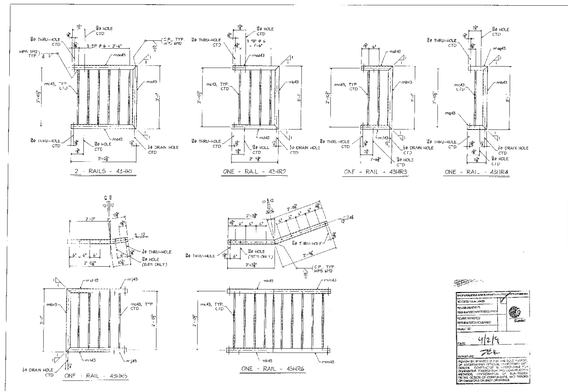
PROJECT: STATE OF VERMONT - AGENCY OF TRANSPORTATION
BRIDGE No. 31 - RICHMOND, VERMONT

SCALE:	NTS	APPROVED BY:	DRAWN BY: KAI
DATE:	2/16/09		CHKD. BY: DMS/BBB

BRIDGE 8 HIGHWAY 89 OVER WINOOSKI RIVER
FLOODWALL RAIL DETAILS

1 BUCK CONSTRUCTION

DWG NO. 09-113 - 42 3



BILL OF MATERIAL

MARK	QTY	MATERIAL	L'G	W	WT	REMARKS
ASSY-1	2	ASSY.				
M1	2	W12 - 26.0#/F	*	12	312	FP
M2	2	W12 - 26.0#/F	*	12	312	FP
M3	2	W12 - 26.0#/F	*	12	312	FP
M4	2	W12 - 26.0#/F	2	1	52	FP
M5	2	PIPE 3# SCH 40	2	3		
ASSY-2	1	ASSY.				
M10	1	W12 - 26.0#/F	2	14	728	FP
M11	1	W12 - 26.0#/F	2	12	624	FP
M12	1	PL 1/2" x 3" x 1'-0"	1	1	51	FP
M13	2	PIPE 3# SCH 40	2	3		
ASSY-3	1	ASSY.				
M10	1	W12 - 26.0#/F	2	14	728	FP
M11	1	W12 - 26.0#/F	2	12	624	FP
M12	1	PL 1/2" x 3" x 1'-0"	1	1	51	FP
M13	2	PIPE 3# SCH 40	2	3		
ASSY-4	1	ASSY.				
M10	1	W12 - 26.0#/F	2	14	728	FP
M11	1	W12 - 26.0#/F	2	12	624	FP
M12	1	PL 1/2" x 3" x 1'-0"	1	1	51	FP
M13	2	PIPE 3# SCH 40	2	3		
ASSY-5	1	ASSY.				
M10	1	W12 - 26.0#/F	2	14	728	FP
M11	1	W12 - 26.0#/F	2	12	624	FP
M12	1	PL 1/2" x 3" x 1'-0"	1	1	51	FP
M13	2	PIPE 3# SCH 40	2	3		
ASSY-6	1	ASSY.				
M10	1	W12 - 26.0#/F	2	14	728	FP
M11	1	W12 - 26.0#/F	2	12	624	FP
M12	1	PL 1/2" x 3" x 1'-0"	1	1	51	FP
M13	2	PIPE 3# SCH 40	2	3		

NOTES:

1. ALL PARTS SHALL CONFORM TO AASHTO M 270 GRADE 36 (UNLESS NOTED)

WELD: E70xx

HOLES: 13/16 ø UNO

PAINT: SURF. N/A

STEEL: GALVANIZED PER ASTM A-123

3/30/09 - PER MPPL COMMENTS DATED 3/27/09

ARC ENTERPRISES, INC.
KINGFIELD, MAINE

PREPARED OF VERMONT - AGENCY OF TRANSPORTATION
BRIDGE No. 21 - WILMINGTON, VERMONT

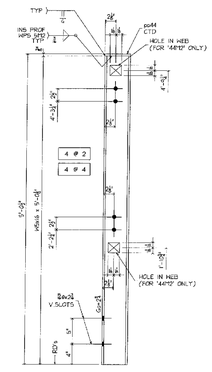
SCALE:	NTS	APPROVED BY:	DRAWN BY:	MM
DATE:	2/2009		CHKD BY:	MM/MB

PEDESTRIAN BRIDGE - 45' SUMMIT ST. (NORTH) RAMP
MISCELLANEOUS DETAILS

T. BUCK CORPORATION

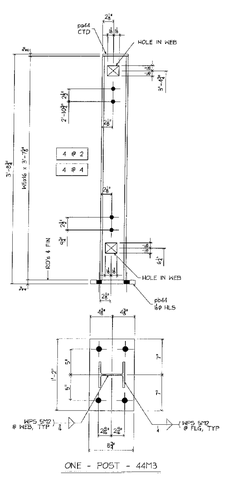
DWG. No. 08-0123 - 45-00

GALVANIZED
ALL WELDS SEALED
VENT AS REQUIRED

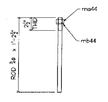


5B - POSTS - 44M11

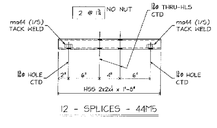
5 - POSTS - 44M12 (AS NOTED)



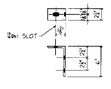
ONE - POST - 44M13



4 - ANCHORS - 44M14



12 - SPLICES - 44M15



256 - CLIPS - 44M16

SHOP DRAWINGS ARE REVIEWED FOR GENERAL DETAILS ONLY
NO EXCEPTIONS TAKEN
REVISE AS NOTED
RESUBMISSION NOT REQUIRED
REVISE AS NOTED
RESUBMISSION REQUIRED
REJECTED

4/20/09

DATE

SIGNATURE: T.E.

REVIEW IS GENERAL ONLY AND DOES NOT RELIEVE THE CONTRACTOR OF RESPONSIBILITY FOR ALL DIMENSIONS, QUANTITIES AND FABRICATION PROCESSES AND TECHNIQUES. THE CONTRACTOR IS RESPONSIBLE FOR CONFIRMING AND CORRELATING ALL DIMENSIONS, SELECTION OF FABRICATION PROCESSES AND TECHNIQUES OF CONSTRUCTION, COORDINATION OF HIS WORK WITH THAT OF ALL OTHER TRADES AND THE SATISFACTORY PERFORMANCE OF HIS WORK.

GALVANIZED
ALL WELDS SEALED
VENT AS REQUIRED

FB THIS DWG
24- ⅞ø x 11 (A325 GALV.) BOLT w/1 H.
256- ⅞ø x 2 (A325 GALV.) BOLT w/NM
256- ⅞ø x 4 (A325 GALV.) BOLT w/NM

BILL OF MATERIAL

MARK'S SHAPE	PATT	QTY	MATERIAL	FT	IN	DR	REMARKS
44M11		5B	W6x16	5	4½		
	pl44	5B	PL¾ x 5	0	5		
44M12		5	W6x16	5	3½		
	pl44	5	PL¾ x 5	0	5		
44M13		ONE	W6x16	3	7½		FT
	pl44	1	PL¾ x 5	0	5		
	pl44	1	PL¾ x 1½	1	2		
44M14		4	ROD 1¼	1	2½	HVY HEX NUT	"AT"
	ma44	4	HVY HEX NUT 1¼			FOR GALV. ZONE	
	mb44	4	FLAT WASHER 1¼			FOR GALV. ZONE	
44M15		12	HSS 2x2x¼	1	6	FOR GALV. ZONE	
	ma44	24	HVY HEX NUT 1¼			FOR GALV. ZONE	
44M16		256	L4x3½x¼	0	7½		

MATL
1 ALL MATL SHALL CONFORM TO AASHTO M 270M/M 270 GRADE 36 (UNLESS NOTED)

WELD: ETOxx (SHOP NOTE)
HOLES: ø" UNO
PREP: SSPC-SP6
PAINT: GALVANIZED PER ASTM A-123

3/20/09 PER APPD. COMMENTS DATED 3/17/09
3/11/09 REVD RAIL-POST CONN's

ARC ENTERPRISES, INC.
KINGFIELD, MAINE

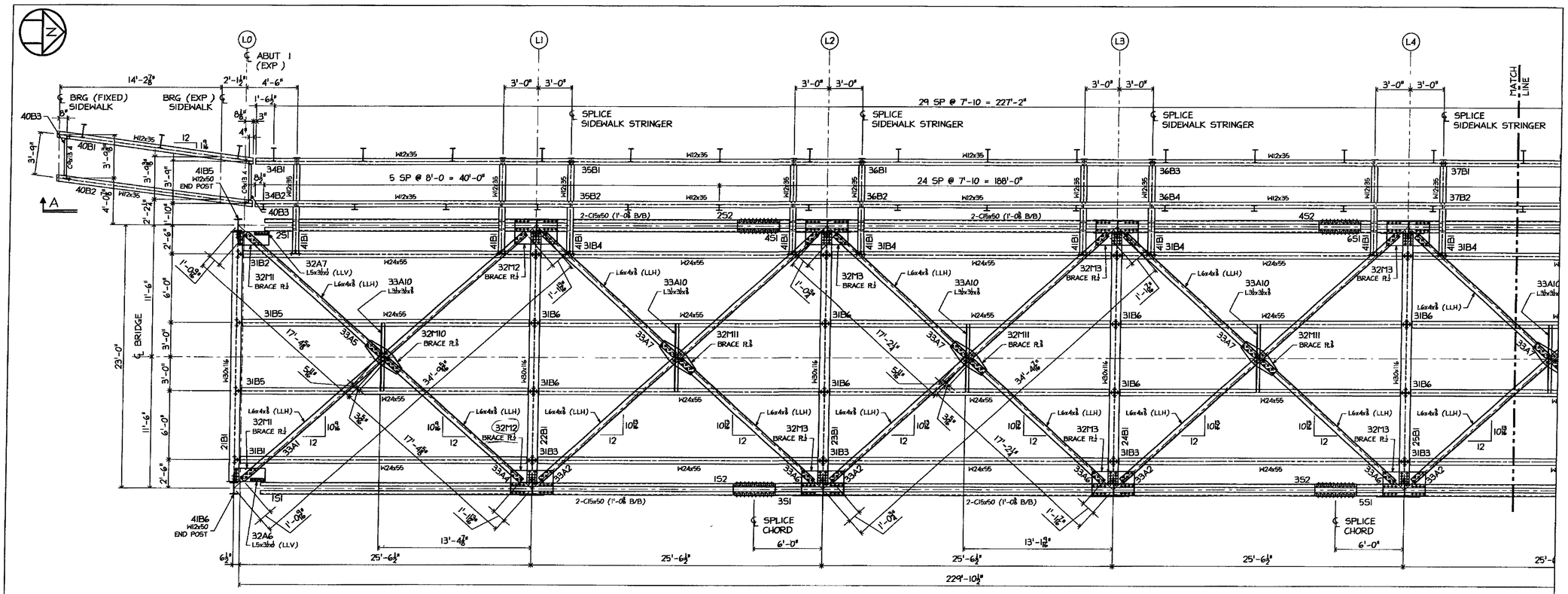
PROJECT: STATE OF VERMONT - AGENCY OF TRANSPORTATION
BRIDGE NO. 31 - RICHMOND, VERMONT

SCALE:	NTS	APPROVED BY:	DRAWN BY: KAC
DATE:	3/16/09		CHKD. BY: DMS/BRD

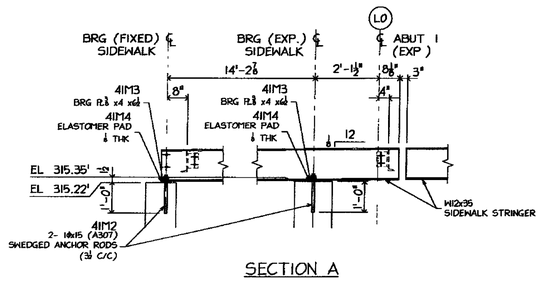
BRIDGE @ HIGHWAY #1 OVER WINOOSKI RIVER
PEDESTRIAN RAIL DETAILS

T. BUCK CONSTRUCTION

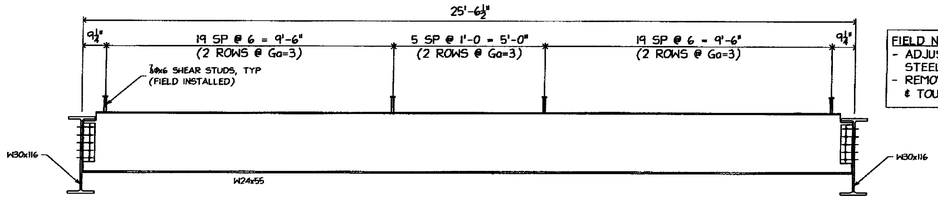
DWG NO. 09-113 - 44.0



FRAMING PLAN @ NEW DECK STEEL



SECTION A



STUD LAYOUT ON DECK STRINGER

FIELD NOTES:
- ADJUST STUD SPACINGS TO AVOID STEEL GRID FLOORING.
- REMOVE GALV IN VICINITY OF STUD ℄ TOUCH UP PER ENGINEER'S SPEC

NOTES RE. NEW STEEL:
1 ALL ROLLED SECTIONS SHALL CONFORM TO AASHTO M 270M/M 270 GRADE 50 ℄ SHALL BE CHARPY "V" NOTCH TESTED
2 ALL OTHER MATERIAL SHALL CONFORM TO AASHTO M 270M/M 270 GRADE 36 (UNLESS NOTED)
3 BOTTOM CHORD OF TRUSS SHALL BE "FRACTURE CRITICAL MEMBERS"
4 ALL MATERIAL SHALL BE HOT-DIPPED GALVANIZED PER ASTM A-123
5 WIRE-BRUSH ALL CONTACT SURFACES TO A DULL-GRAY APPEARANCE PRIOR TO ASSEMBLY
6 ALL BOLTS SHALL BE ⅞ø A325 (GALV) UNLESS NOTED (BOLT HEADS ON TOP OR EXPOSED SIDE IF POSSIBLE)

NOTES RE DRAWINGS:
1. WORK THIS DRAWING WITH DWG #E2
2 REFER TO DWG #E3 ℄ E4 FOR CHORD ELEVATIONS.
3 REFER TO DWG #E5 ℄ E6 FOR SECTIONS ℄ DETAILS

SHOP DRAWINGS ARE REVIEWED UNLESS NOTED OTHERWISE

NO EXCEPTION TAKEN	X
REMISE AS NOTED RESUBMISSION NOT REQUIRED	
REMISE AS NOTED RESUBMISSION REQUIRED	
REJECTED	

Stantec

DATE 3/27/09

SIGNATURE TEK

REVIEW BY STANTEC IS FOR THE SOLE PURPOSE OF ASCERTAINING GENERAL CONFORMITY WITH DESIGN CONTRACTOR IS RESPONSIBLE FOR: DIMENSIONS, FABRICATION AND CONSTRUCTION METHODS COORDINATION OF SUB-TRADES. DETAIL DESIGN OF COMPONENTS AND ERROR'S OR OMISSIONS ON SHOP DRAWINGS

A 3/11/09 PER APP'L COMMENTS DATED 3/06/09

ARC ENTERPRISES, INC
KINGFIELD, MAINE

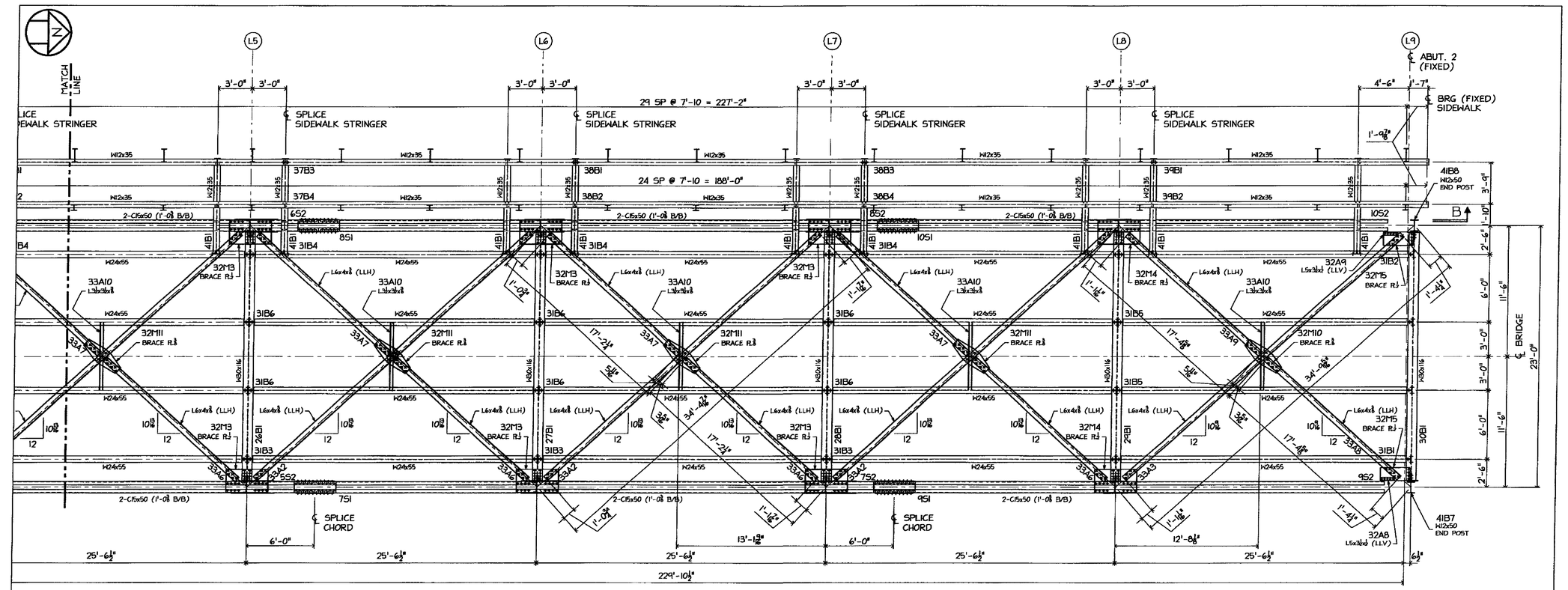
PROJECT STATE OF VERMONT – AGENCY OF TRANSPORTATION
BRIDGE No 31 – RICHMOND, VERMONT

SCALE	NTS	APPROVED BY	DRAWN BY: KAJ
DATE.	2/18/09		CHKD. BY: CMDS – DB2

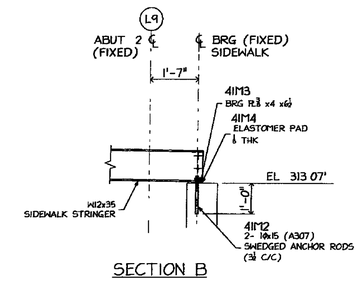
BRIDGE @ HIGHWAY #1 OVER WINOOSKI RIVER
STEEL FRAMING PLAN

T BUCK CONSTRUCTION

DWG NO. 09-113 – E1 A



FRAMING PLAN @ NEW DECK STEEL



SECTION B

SHOP DRAWINGS ARE REVIEWED UNLESS NOTED OTHERWISE

NO EXCEPTION TAKEN	X
REVISE AS NOTED RESUBMISSION NOT REQUIRED	
REVISE AS NOTED RESUBMISSION REQUIRED	
REJECTED	

Stantec

DATE 3/24/09

SIGNATURE TEK

REVIEW BY STANTEC IS FOR THE SOLE PURPOSE OF ASCERTAINING GENERAL CONFORMITY WITH DESIGN. CONTRACTOR IS RESPONSIBLE FOR DIMENSIONS, FABRICATION AND CONSTRUCTION METHODS, COORDINATION OF SUB-TRADES DETAIL DESIGN OF COMPONENTS, AND ERRORS OR OMISSIONS ON SHOP DRAWINGS.

NOTES RE. NEW STEEL

1 ALL ROLLED SECTIONS SHALL CONFORM TO AASHTO M 270M/M 270 GRADE 50 & SHALL BE CHARPY "V" NOTCH TESTED
2 ALL OTHER MATERIAL SHALL CONFORM TO AASHTO M 270M/M 270 GRADE 36 (UNLESS NOTED)
3 BOTTOM CHORD OF TRUSS SHALL BE "FRACTURE CRITICAL MEMBERS"
4 ALL MATERIAL SHALL BE HOT-DIPPED GALVANIZED PER ASTM A-123
5 WIRE-BRUSH ALL CONTACT SURFACES TO A DULL-GRAY APPEARANCE PRIOR TO ASSEMBLY
6 ALL BOLTS SHALL BE ⅞ø A325 (GALV.) UNLESS NOTED (BOLT HEADS ON TOP OR EXPOSED SIDE IF POSSIBLE)

NOTES RE. DRAWINGS:

1 WORK THIS DRAWING WITH DWG #E1
2 REFER TO DWG #E3 & E4 FOR CHORD ELEVATIONS
3 REFER TO DWG #E5 &E6 FOR SECTIONS & DETAILS

A 3/11/09 PER APP'L COMMENTS DATED 3/06/09

ARC ENTERPRISES, INC.
KINGFIELD, MAINE

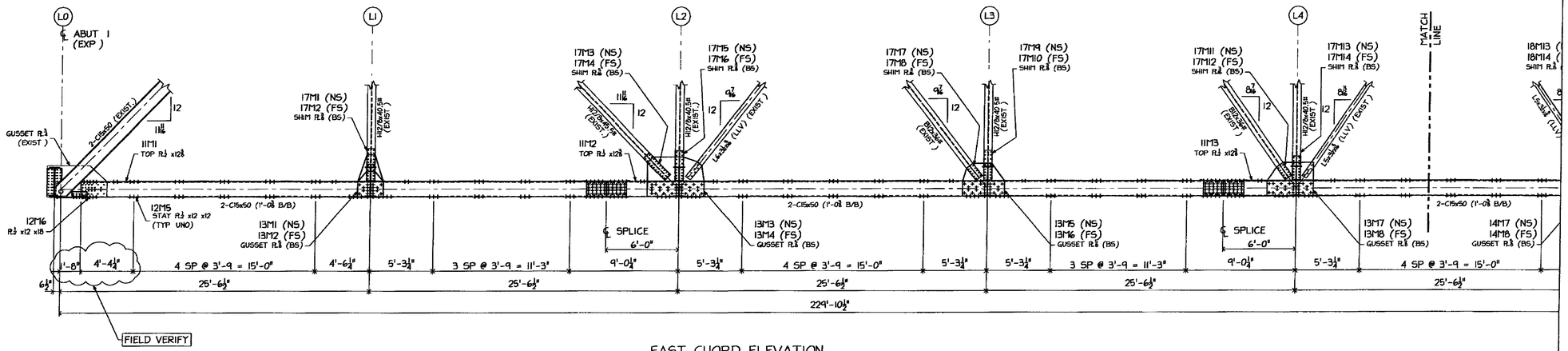
PROJECT STATE OF VERMONT – AGENCY OF TRANSPORTATION
BRIDGE No 31 – RICHMOND, VERMONT

SCALE NTS	APPROVED BY:	DRAWN BY: KAJ	
DATE: 2/18/09		CHKD. BY: CWDS – DB2	

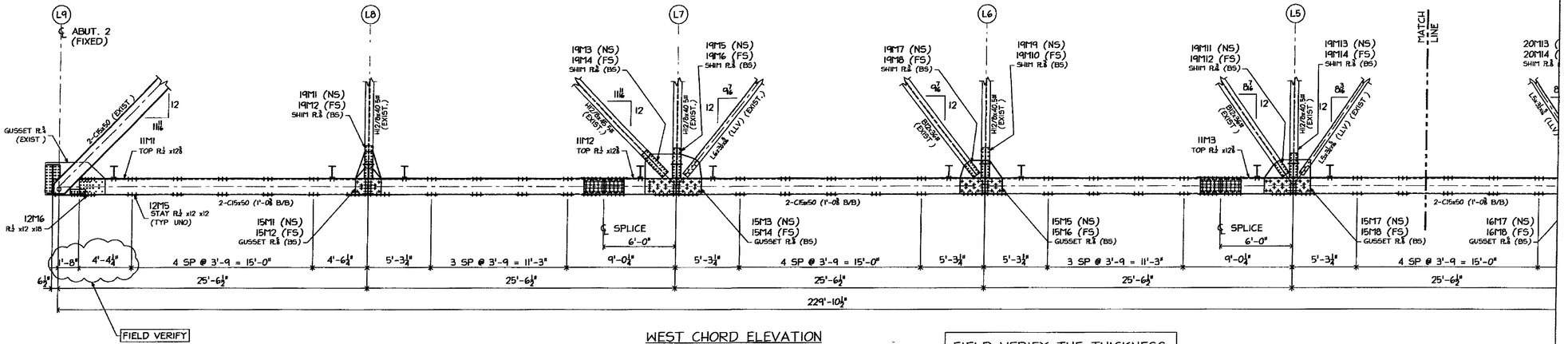
BRIDGE @ HIGHWAY #1 OVER WINOOSKI RIVER
STEEL FRAMING PLAN

T BUCK CONSTRUCTION

DWG NO. 09-113 – E2 A

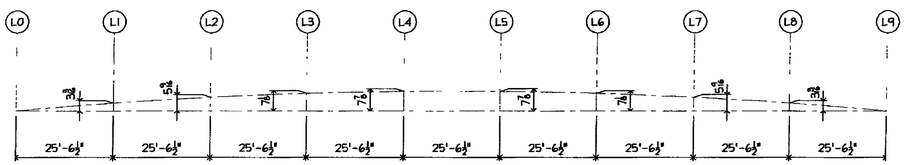


EAST CHORD ELEVATION
(LOOKING WEST)



WEST CHORD ELEVATION
(LOOKING EAST)

FIELD VERIFY THE THICKNESS OF ALL SHIMS



CAMBER DIAGRAM BOTTOM CHORD
(BEFORE APPLICATION OF DEAD LOAD)

SHOP DRAWINGS ARE REVIEWED UNLESS NOTED OTHERWISE

NO EXCEPTION TAKEN	X
REVISE AS NOTED RESUBMISSION NOT REQUIRED	
REVISE AS NOTED RESUBMISSION REQUIRED	
REJECTED	

Stantec

DATE 3/24/14

SIGNATURE TEK

REVIEW BY STANTEC IS FOR THE SOLE PURPOSE OF ASCERTAINING GENERAL CONFORMITY WITH THE DESIGN. CONTRACTOR IS RESPONSIBLE FOR DIMENSIONS, FABRICATION AND CONSTRUCTION METHODS, COORDINATION OF SUB-TRADES DETAIL DESIGN OF COMPONENTS AND ERRORS OR OMISSIONS ON SHOP DRAWINGS.

NOTES RE. NEW STEEL

1 ALL ROLLED SECTIONS SHALL CONFORM TO AASHTO M 270M/M 270 GRADE 50 & SHALL BE CHARPY "V" NOTCH TESTED
2 ALL OTHER MATERIAL SHALL CONFORM TO AASHTO M 270M/M 270 GRADE 36 (UNLESS NOTED)
3 BOTTOM CHORD OF TRUSS SHALL BE "FRACTURE CRITICAL MEMBERS".
4 ALL MATERIAL SHALL BE HOT-DIPPED GALVANIZED PER ASTM A-123
5 WIRE-BRUSH ALL CONTACT SURFACES TO A DULL-GRAY APPEARANCE PRIOR TO ASSEMBLY
6. ALL BOLTS SHALL BE ¾Ø A325 (GALV.) UNLESS NOTED (BOLT HEADS ON TOP OR EXPOSED SIDE IF POSSIBLE)

NOTES RE. DRAWINGS

1. WORK THIS DRAWING WITH DWG #E4
2 REFER TO DWG #E1 & E2 FOR FRAMING PLAN
3: REFER TO DWG #E5 & E6 FOR SECTIONS & DETAILS

A 3/11/09 PER APP'L COMMENTS DATED 3/06/09

ARC ENTERPRISES, INC.
KINGFIELD, MAINE

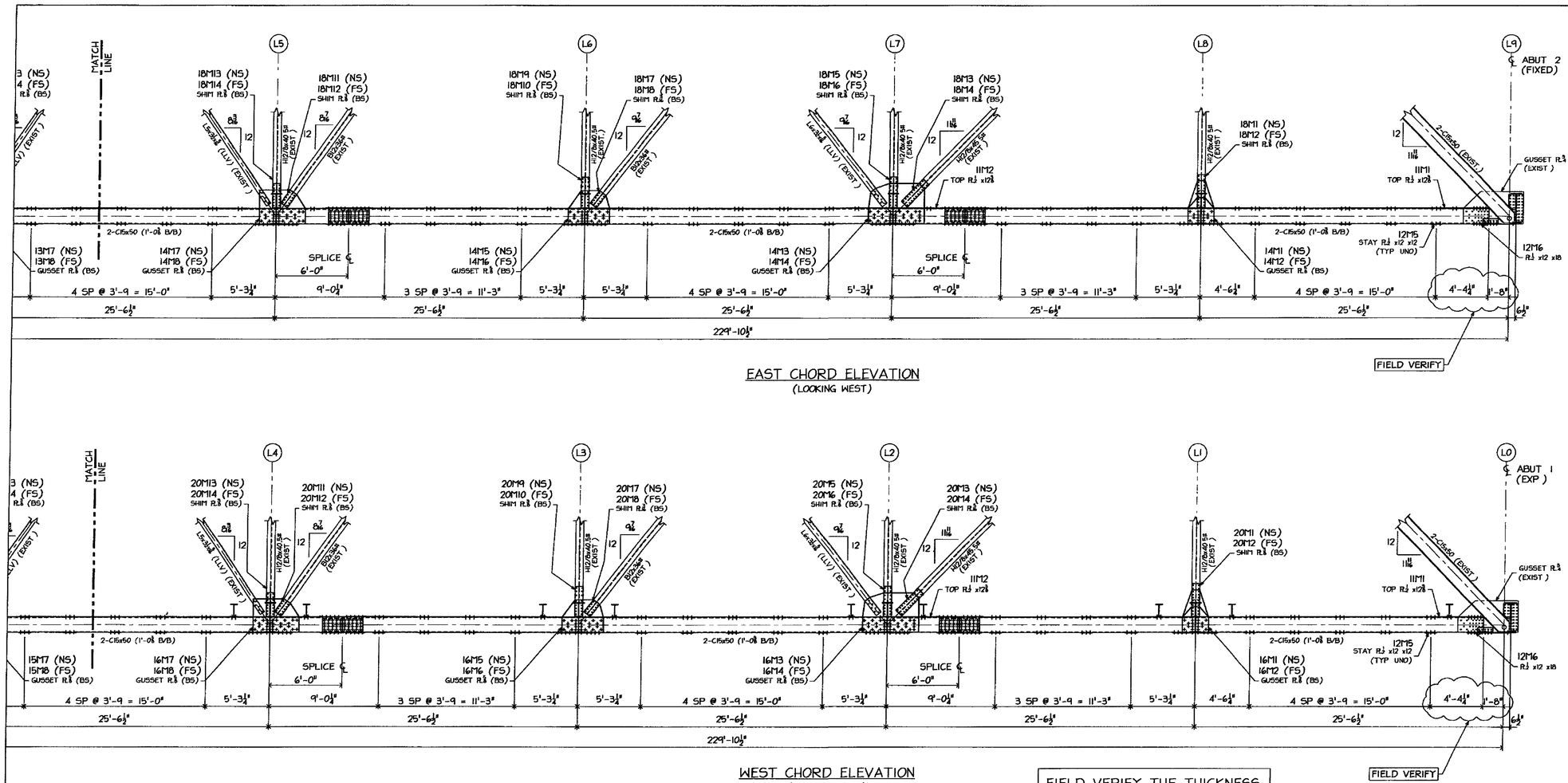
PROJECT: STATE OF VERMONT – AGENCY OF TRANSPORTATION
BRIDGE No 31 – RICHMOND, VERMONT

SCALE: NTS	APPROVED BY:	DRAWN BY: KAJ	
DATE: 2/18/09		CHKD BY: CMDS – DBZ	

BRIDGE @ HIGHWAY #1 OVER WINOOSKI RIVER
BOTTOM CHORD ELEVATIONS

T BUCK CONSTRUCTION

DWG NO. 09-113 – E3 A



EAST CHORD ELEVATION
(LOOKING WEST)

WEST CHORD ELEVATION
(LOOKING EAST)

FIELD VERIFY THE THICKNESS OF ALL SHIMS

SHOP DRAWINGS ARE REVIEWED UNLESS NOTED OTHERWISE

NO EXCEPTION TAKEN	X
REVISE AS NOTED RESUBMISSION NOT REQUIRED	
REVISE AS NOTED RESUBMISSION REQUIRED	
REJECTED	

Stantec

DATE 3/24/09

SIGNATURE TzK

REVIEW BY STANTEC IS FOR THE SOLE PURPOSE OF ASCERTAINING GENERAL CONFORMITY WITH DESIGN. CONTRACTOR IS RESPONSIBLE FOR DIMENSIONS, FABRICATION AND CONSTRUCTION METHODS, COORDINATION OF SUB-TRADES DETAIL DESIGN OF COMPONENTS, AND ERRORS OR OMISSIONS ON SHOP DRAWINGS

NOTES RE. NEW STEEL:
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2. ALL OTHER MATERIAL SHALL CONFORM TO AASHTO M 270M/M 270 GRADE 36 (UNLESS NOTED)
3. BOTTOM CHORD OF TRUSS SHALL BE "FRACTURE CRITICAL MEMBERS".
4. ALL MATERIAL SHALL BE HOT-DIPPED GALVANIZED PER ASTM A-123
5. WIRE-BRUSH ALL CONTACT SURFACES TO A DULL-GRAY APPEARANCE PRIOR TO ASSEMBLY
6. ALL BOLTS SHALL BE ¾ø A325 (GALV.) UNLESS NOTED (BOLT HEADS ON TOP OR EXPOSED SIDE IF POSSIBLE)

NOTES RE. DRAWINGS
1. WORK THIS DRAWING WITH DWG #E3
2. REFER TO DWG #E1 & E2 FOR FRAMING PLAN.
3. REFER TO DWG #E5 & E6 FOR SECTIONS & DETAILS

A 3/11/09 PER APP'L COMMENTS DATED 3/06/09

ARC ENTERPRISES, INC.
KINGFIELD, MAINE

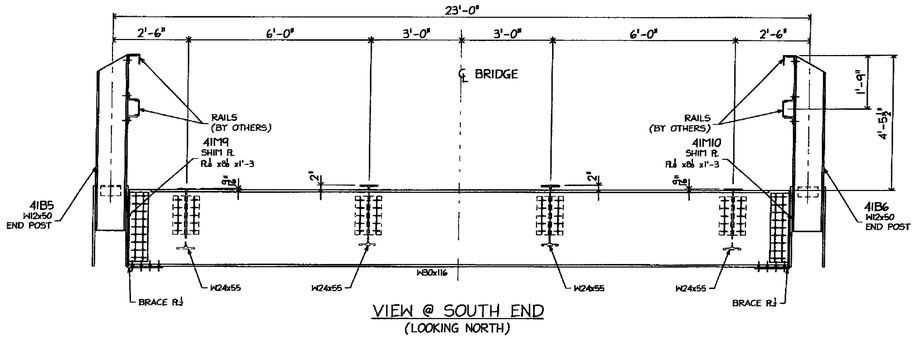
PROJECT: STATE OF VERMONT – AGENCY OF TRANSPORTATION
BRIDGE No 31 – RICHMOND, VERMONT

SCALE	NTS	APPROVED BY	DRAWN BY: KAJ
DATE	2/18/09		CHKD BY: CMDS – DB2

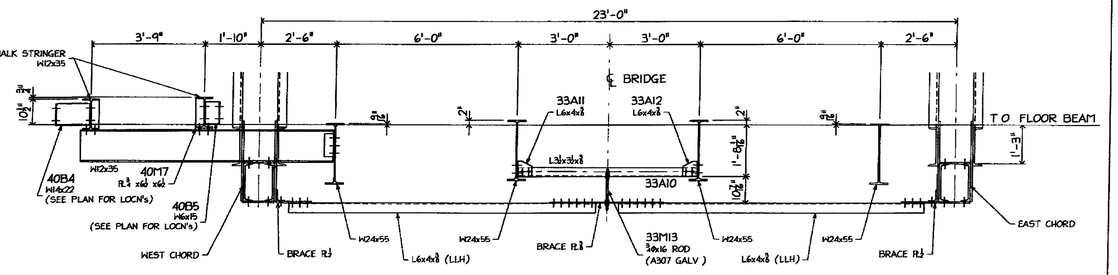
BRIDGE @ HIGHWAY #1 OVER WINOOSKI RIVER
BOTTOM CHORD ELEVATIONS

T BUCK CONSTRUCTION

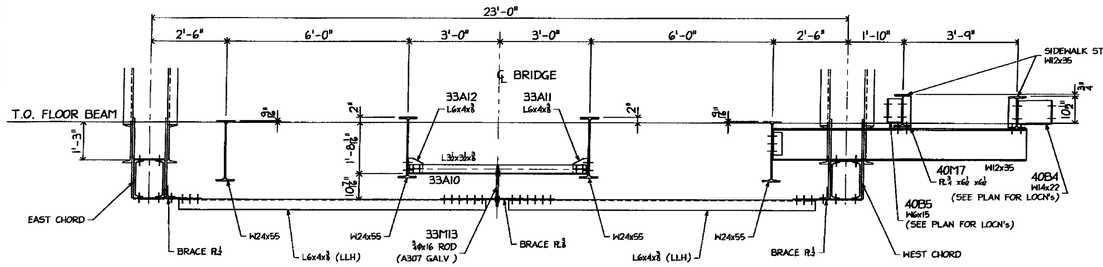
DWG NO. 09-113 – E4 A



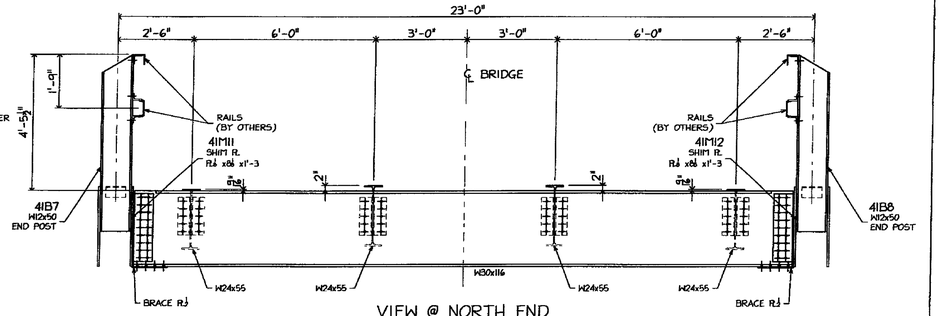
VIEW @ SOUTH END
(LOOKING NORTH)



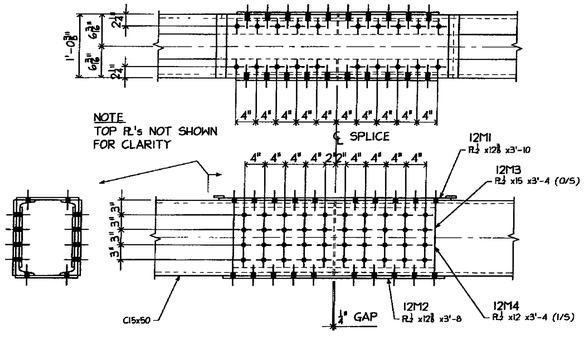
VIEW @ GRID 'L0'
(LOOKING NORTH)



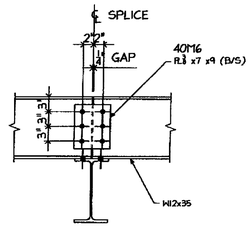
VIEW @ GRID 'L9'
(LOOKING SOUTH)



VIEW @ NORTH END
(LOOKING SOUTH)



DETAIL @ CHORD SPLICE



DETAIL @ STRINGER SPLICE

SHOP DRAWINGS ARE REVIEWED UNLESS NOTED OTHERWISE

NO EXCEPTION TAKEN	X
REVISE AS NOTED RESUBMISSION NOT REQUIRED	
REVISE AS NOTED RESUBMISSION REQUIRED	
REJECTED	

Stantec

DATE 3/24/09

SIGNATURE TJL

REVIEW BY STANTEC IS FOR THE SOLE PURPOSE OF ASCERTAINING GENERAL CONFORMITY WITH DESIGN. CONTRACTOR IS RESPONSIBLE FOR DIMENSIONS, FABRICATION AND CONSTRUCTION METHODS, COORDINATION OF SUB-TRADES DETAIL DESIGN OF COMPONENTS, AND ERRORS OR OMISSIONS ON SHOP DRAWINGS

△A 3/11/09 PER APP'L COMMENTS DATED 3/06/09

ARC ENTERPRISES, INC.
KINGFIELD, MAINE

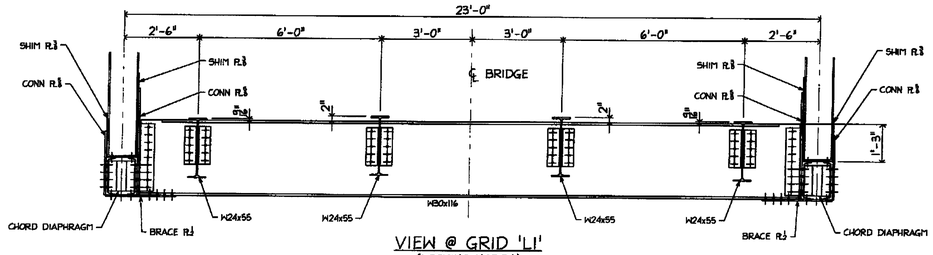
PROJECT: STATE OF VERMONT – AGENCY OF TRANSPORTATION
BRIDGE No 31 – RICHMOND, VERMONT

SCALE	NTS	APPROVED BY	DRAWN BY: KAJ
DATE	2/18/09		CHKD BY: DMDS – DBZ

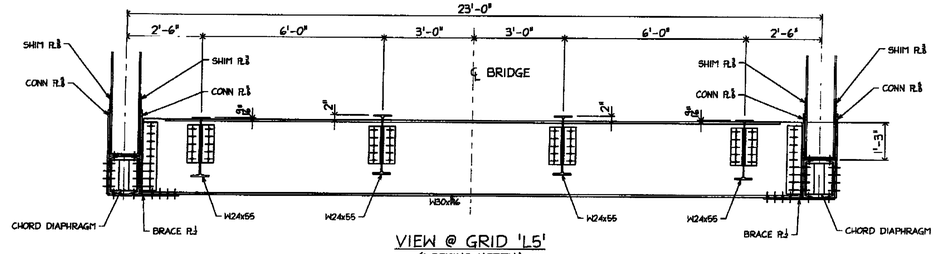
BRIDGE @ HIGHWAY #1 OVER WINOOSKI RIVER
SECTIONS & DETAILS

T BUCK CONSTRUCTION

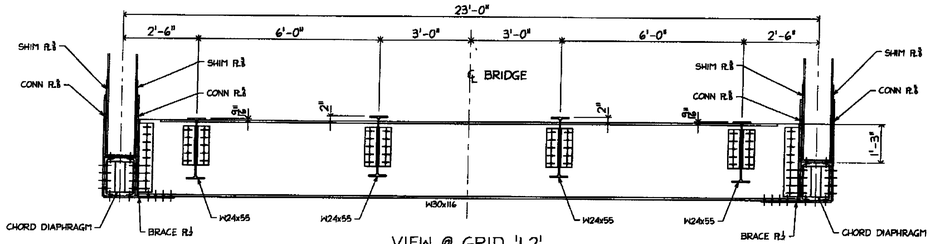
DWG NO 09-113 – E5 △A



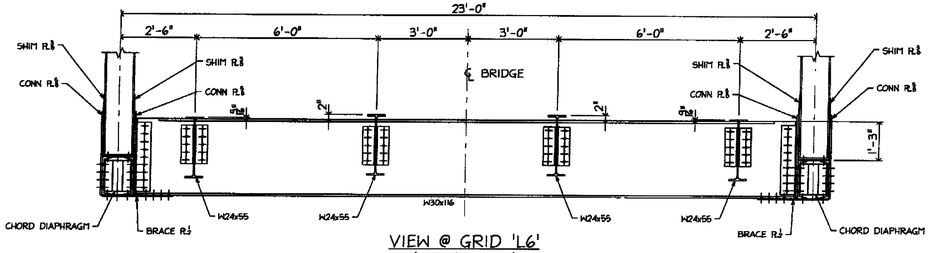
VIEW @ GRID 'L1'
(LOOKING NORTH)



VIEW @ GRID 'L5'
(LOOKING NORTH)



VIEW @ GRID 'L2'
(LOOKING NORTH)



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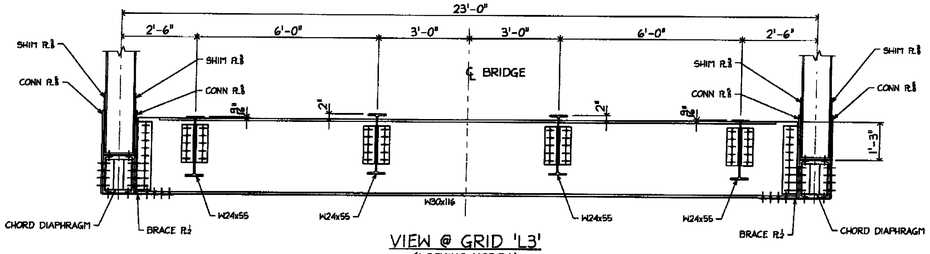
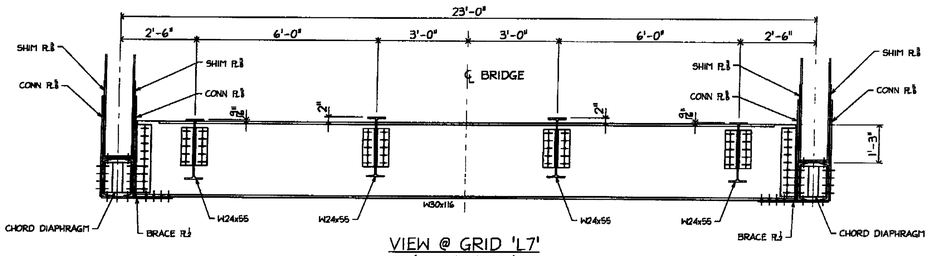
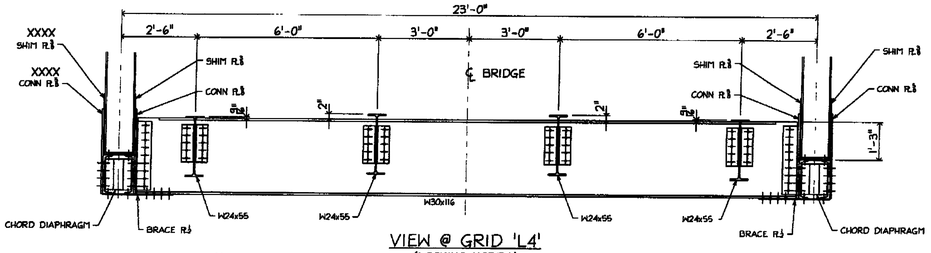
(LOOKING NORTH)



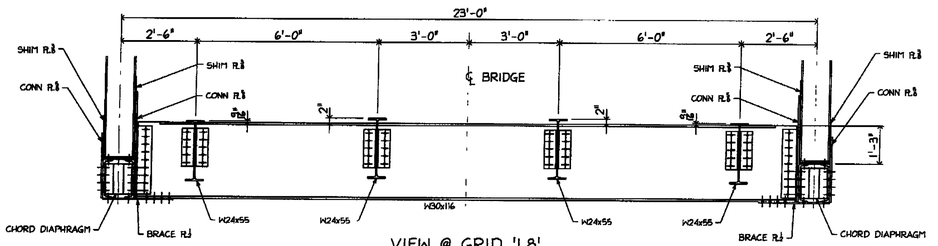
VIEW @ GRID 'L3'
(LOOKING NORTH)



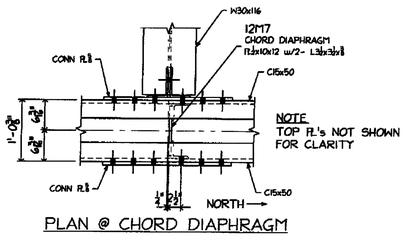
VIEW @ GRID 'L7'
(LOOKING NORTH)



VIEW @ GRID 'L4'
(LOOKING NORTH)



VIEW @ GRID 'L8'
(LOOKING NORTH)



PLAN @ CHORD DIAPHRAGM

SHOP DRAWINGS REQUIRED UNLESS NOTED OTHERWISE			
NO EXCEPTIONS TAKEN			
REVISE AS NOTED RESUBMISSION NOT REQUIRED			
REVISE AS NOTED RESUBMISSION REQUIRED			
REJECTED			
	Shimko	3/24/09	TBK
	SIGNATURE	DATE	

REVIEW BY STANTEC IS FOR THE SOLE PURPOSE OF ASCERTAINING GENERAL CONFORMANCE WITH THE DESIGN CONCEPT. CONTRACTOR IS RESPONSIBLE FOR CONFIRMING AND CORRELATING ALL QUANTITIES AND DIMENSIONS, FABRICATION AND CONSTRUCTION METHODS, COORDINATION OF THE WORK WITH ALL TRADES, AND THE SATISFACTORY CONSTRUCTION OF ALL DETAIL DESIGN OF COMPONENTS. STANTEC SHALL NOT BE RESPONSIBLE FOR ANY DEVIATIONS, OMISSIONS OR CLARIFICATIONS ON SHOP DRAWINGS

A 3/11/09	PER APP'L COMMENTS DATED 3/06/09

ARC ENTERPRISES, INC.
KINGFIELD, MAINE

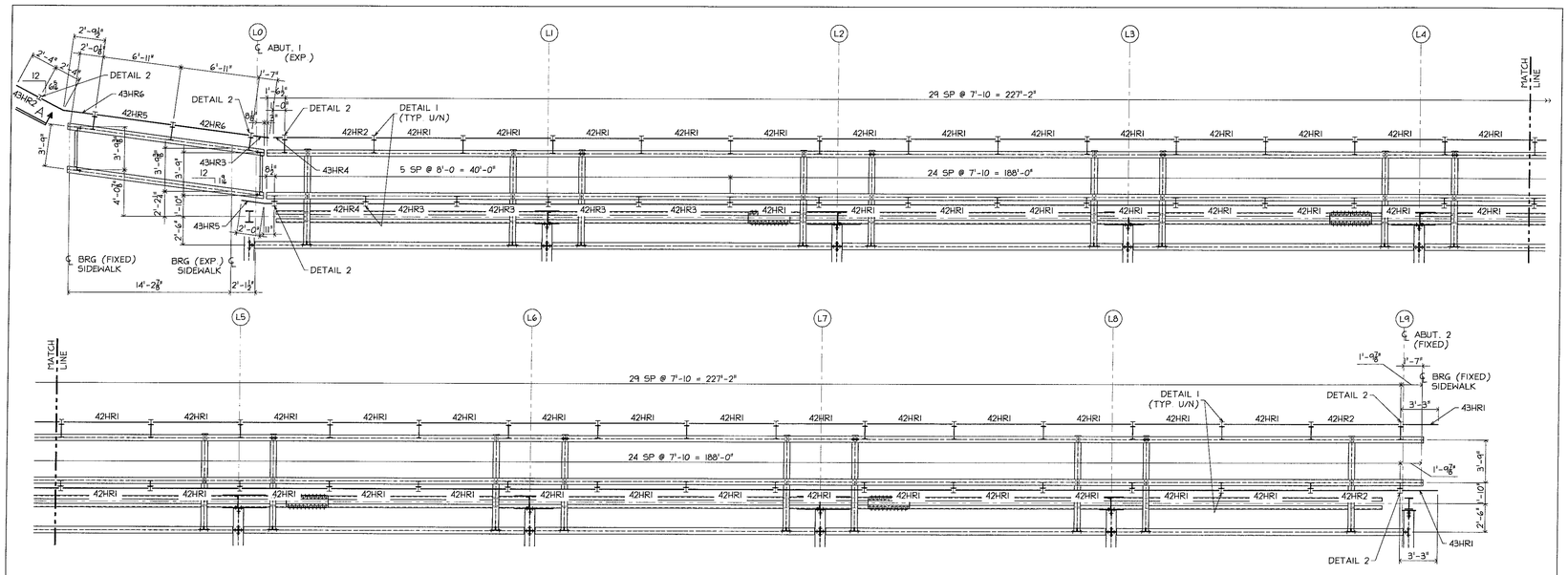
PROJECT STATE OF VERMONT – AGENCY OF TRANSPORTATION
BRIDGE No 31 – RICHMOND, VERMONT

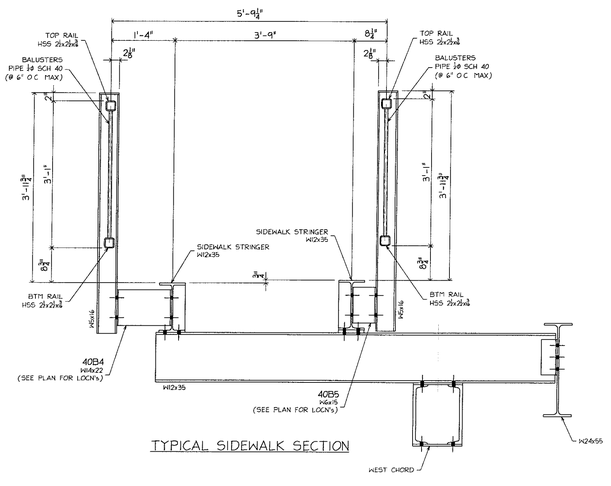
SCALE. NTS	APPROVED BY	DRAWN BY: KAJ	
DATE 2/18/09		CHKD. BY: CMDS – DB2	

BRIDGE @ HIGHWAY #1 OVER WINOOSKI RIVER
SECTIONS & DETAILS

T BUCK CONSTRUCTION

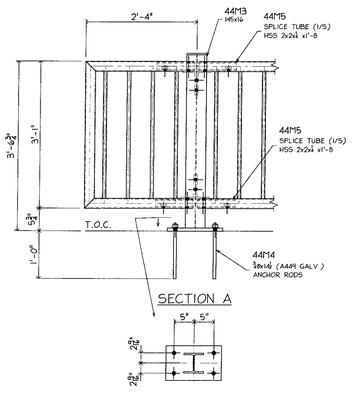
DWG NO. 09-113 – E6 A



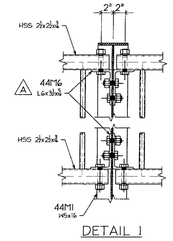


TYPICAL SIDEWALK SECTION

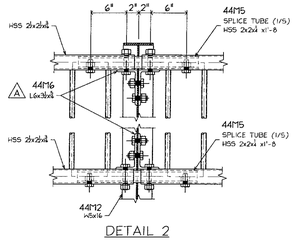
PARTIAL PLAN @ PEDESTRIAN RAILS



SECTION A



DETAIL 1



DETAIL 2

SHOP DRAWINGS ARE REVIEWED UNLESS NOTED OTHERWISE

- X — NO EXCEPTIONS TAKEN (AS-IS)
- MAKE CORRECTIONS NOTED
- REVISE & RESUBMIT FOR REVIEW (NOT RELEASED)
- REVISE & RESUBMIT FOR RELEASE (REQUIRED)
- REJECTED

DATE: 4/2/09

SIGNATURE

REVIEW BY STANTEC IS ONLY TO CHECK FOR GENERAL CONFORMANCE WITH THE DESIGN CONCEPT OF THE PROJECT AND GENERAL COMPLIANCE WITH THE INFORMATION GIVEN IN THE CONTRACT DOCUMENTS. CONTRACTOR IS RESPONSIBLE FOR CONFIRMING AND CORRELATING ALL QUANTITIES AND DIMENSIONS, FABRICATION PROCESSES AND TECHNIQUES OF CONSTRUCTION, COORDINATION OF HIS WORK WITH THAT OF ALL OTHER TRADES AND THE SATISFACTORY PERFORMANCE OF HIS WORK. REVIEW BY STANTEC SHALL NOT INDICATE APPROVAL OF ASSEMBLY DETAILS, SCHEDULES, NUMBERS OF ITEMS SHOWN, MATERIAL QUANTITIES, CONNECTIONS, CLEARANCES, FABRICATION PROCESSES OR TECHNIQUES OF CONSTRUCTION.

△2	3/30/09 PER APP'L COMMENTS DATED 3/17/09
△1	3/11/09 REV'd RAIL-POST CONN's

ARC ENTERPRISES, INC.
KINGFIELD, MAINE

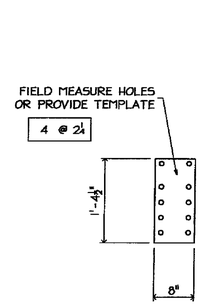
PROJECT: STATE OF VERMONT – AGENCY OF TRANSPORTATION
BRIDGE No. 31 – RICHMOND, VERMONT

SCALE: NTS	APPROVED BY:	DRAWN BY:	KAJ
DATE: 2/18/09		CHKD. BY:	CWD5/DB2

BRIDGE @ HIGHWAY #1 OVER WINOOSKI RIVER
PEDESTRIAN RAILING LAYOUT

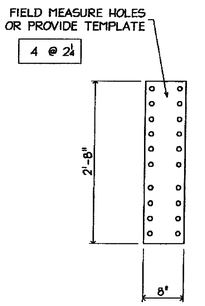
T. BUCK CONSTRUCTION

DWG. NO. 09-113 – E7 △2



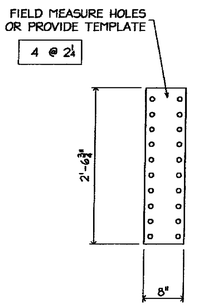
ONE - SHIM PL - 19M1

(PL⅜) GRID 'L8' WEST - O/S



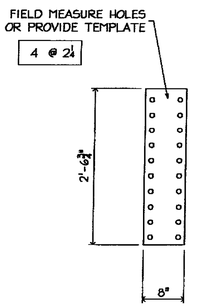
ONE - SHIM PL - 19M2

(PL⅜) GRID 'L8' WEST - I/S



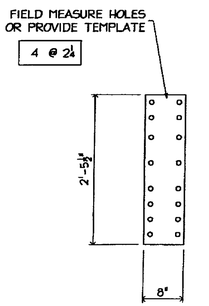
ONE - SHIM PL - 19M3

(PL½) GRID 'L7' WEST - O/S



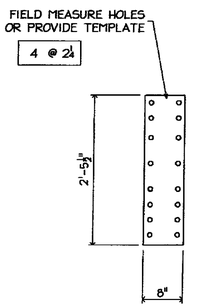
ONE - SHIM PL - 19M4

(PL½) GRID 'L7' WEST - I/S



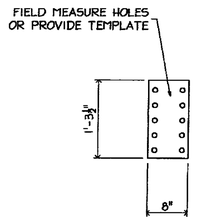
ONE - SHIM PL - 19M5

(PL⅜) GRID 'L7' WEST - O/S



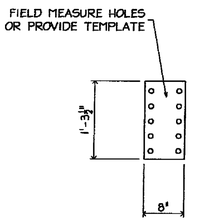
ONE - SHIM PL - 19M6

(PL⅜) GRID 'L7' WEST - I/S



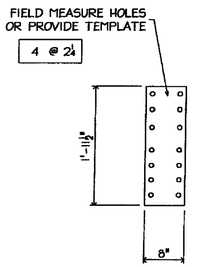
ONE - SHIM PL - 19M7

(PL½) GRID 'L6' WEST - O/S



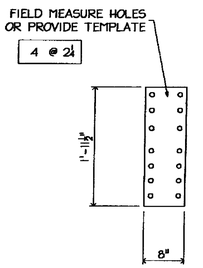
ONE - SHIM PL - 19M8

(PL½) GRID 'L6' WEST - I/S



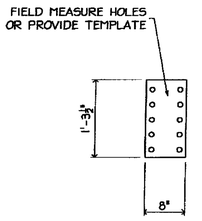
ONE - SHIM PL - 19M9

(PL⅜) GRID 'L6' WEST - O/S



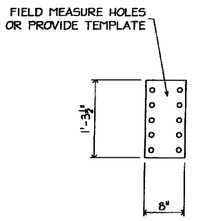
ONE - SHIM PL - 19M10

(PL⅜) GRID 'L6' WEST - I/S



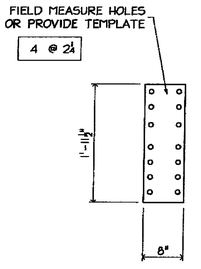
ONE - SHIM PL - 19M11

(PL½) GRID 'L5' WEST - O/S



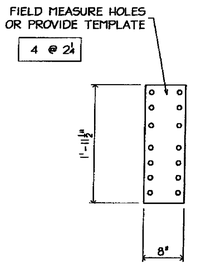
ONE - SHIM PL - 19M12

(PL½) GRID 'L5' WEST - I/S



ONE - SHIM PL - 19M13

(PL⅜) GRID 'L5' WEST - O/S



ONE - SHIM PL - 19M14

(PL⅜) GRID 'L5' WEST - I/S

NOTE:
FIELD VERIFY THE THICKNESS
OF ALL SHIMS

SHOP DRAWINGS ARE REVIEWED UNLESS NOTED OTHERWISE

NO EXCEPTION TAKEN

REVISE AS NOTED
RESUBMISSION NOT REQUIRED

REVISE AS NOTED
RESUBMISSION REQUIRED

REJECTED

Stantec

DATE 3/24/09

SIGNATURE TKL

REVIEW BY STANTEC IS FOR THE SOLE PURPOSE OF ASCERTAINING GENERAL CONFORMITY WITH DESIGN. CONTRACTOR IS RESPONSIBLE FOR DIMENSIONS, FABRICATION AND CONSTRUCTION METHODS, COORDINATION OF SUB-TRADES, DETAIL DESIGN OF COMPONENTS, AND ERRORS OR OMISSIONS ON SHOP DRAWINGS.

GALVANIZING NOTES
1. ALL WELDS SHALL BE SEALED
2 VENT AS REQUIRED
3 COMPLETE FINAL ASSEMBLY OF BOLTED ITEMS AFTER GALVANIZING. WIRE-BRUSH ALL CONTACTING SURFACES TO A DULL-GRAY APPEARANCE PRIOR TO ASSEMBLY

FB THIS DWG
40- ⅞ø x 2½ (A325 GALV) BOLT w/N&W

BILL OF MATERIAL

MARKS SHIP	MARKS TEMP	QTY	MATERIAL	FT	IN	GR	REMARK'S
19M1		ONE	PL⅜ x 8	1	4½	Gr 36	
19M2		ONE	PL⅜ x 8	2	8	Gr 36	
19M3		ONE	PL½ x 8	2	6¾	Gr 36	
19M4		ONE	PL½ x 8	2	6¾	Gr 36	
19M5		ONE	PL⅜ x 8	2	5½	Gr 36	
19M6		ONE	PL⅜ x 8	2	5½	Gr 36	
19M7		ONE	PL½ x 8	1	3½	Gr 36	
19M8		ONE	PL⅜ x 8	1	3½	Gr 36	
19M9		ONE	PL⅜ x 8	1	11½	Gr 36	
19M10		ONE	PL⅜ x 8	1	11½	Gr 36	
19M11		ONE	PL½ x 8	1	3½	Gr 36	
19M12		ONE	PL½ x 8	1	3½	Gr 36	
19M13		ONE	PL⅜ x 8	1	11½	Gr 36	
19M14		ONE	PL⅜ x 8	1	11½	Gr 36	

MATL
1 ALL MAT'L SHALL CONFORM TO AASHTO M 270M/M 270 GRADE 50 (UNLESS NOTED)
2 'CVN' INDICATES CHARPY "V" NOTCH TESTED
3 'FCM' INDICATES "FRACTURE CRITICAL MEMBER"

WELD: E70xx

HOLES: 1⅛"ø UNO

PREP SSPC-SP8

PAINT: GALVANIZED AND AIR COOLED (NOT QUENCHED) (SEE GALVANIZING NOTES)

A 3/11/09 PER APP'L COMMENTS DATED 3/06/09

ARC ENTERPRISES, INC.
KINGFIELD, MAINE

PROJECT: STATE OF VERMONT – AGENCY OF TRANSPORTATION
BRIDGE No 31 – RICHMOND, VERMONT

SCALE: NTS	APPROVED BY.	DRAWN BY KAJ
DATE: 2/18/09		CHKD BY: CMDS-DB2

BRIDGE @ HIGHWAY #1 OVER WINOOSKI RIVER
SHIM PLATE DETAILS

T BUCK CONSTRUCTION

DWG NO. 09-113 - 19 A

STANDARD EXODERMIC BRIDGE DECK – DATA INPUT SHEET

Variables are in drop down boxes or are shown in red

	(Additional Input Variables on Cantilever Sheet)				
Project Title	VT - Richmond Truss				
Grid Component	60" x 8				
Main Bearing Bar Spacing	12				
Concrete Component					
Concrete type	Normal weight	Cast-in-place			
Concrete thickness (in.)	8				
Top portion of concrete to ignore for future resurfacing	0.5	in.			
Weight of proposed or future wearing surface	25	lb/sf			
Weight of additional dead load (sidewalks, barriers, etc.)	0	lb/sf	(Distributed across deck)		
Concrete weight	145		MODULAR RATIO, 'n'	8	
Concrete strength (f'_c)	4000	psi	(See discussion on sheet "Section")		
Steel strength (f_s)	50,000	psi	Specify ASTM A992 for ASTM A709 for weathering steel)		
top rebar #	4 @	4 in. c-c			
bottom rebar #	4 @	6 in. c-c			
Rebar strength	60,000	psi			
Maximum Allowable Stress in Rebar	24,000	psi	20,000 per AASHTO 10.6B.2.1 (20,000 for Grade 40, 24,000 for Grade 60 - AASHTO 8.15.2.2)		
Shear Hole height	0.75	in. @	2 in. c-c	Weld length =	0.5 in.
		Location of top of welds relative to bottom of main bars =		2.945	
		(Assumes top of weld located at top of distribution bar)			
Height of Main Bar embedded in concrete		1 in.	Form Pan Thickness	20 gauge	
Deck Continuity	Continuous	Design Load	HS-25		
	Pedestrian Uniform Load		85	PSF	(Generally 85 PSF, AASHTO 3.14.1.2)
Main Bar Direction	Transverse to traffic	Impact	30%		(30% for Trucks, 0% for Pedestrian)
ALLOWABLE LIVELOAD STRESS RANGE FOR FATIGUE			10	ksi	AASHTO 10.3.1
ALLOWABLE LIVE LOAD DEFLECTION <= L /			800		800 for Trucks (1000 for Pedestrian) AASHTO 8.9.3 & 10.6.2
Panel Layout					
Length (direction Main Bars)		21.1667 ft.			
Width		8 ft.			
Number of composite supporting beams		4			
Superstructure					
Description of supporting beam – beam is perpendicular to main bearing bars, and can be I, stringer, floorbeam, or girder, depending on the application.					
Beam Size		Metric			W24 x 79
Beam Spacing		6 ft.			
Flange Width		8.99 in.			
Haunch Width		8.99 in.			
Haunch Height		4.445 in.		assumes a	1.5 inch actual haunch
(from the top of the girder to the bottom of the concrete slab)					
Beam Depth		23.90			
Beam Area		22.40			
Beam Centroid		11.95			
Beam Moment of Inertia		2,100.000			
Beam Length (L – ft.)		0.000 ft.			
Top Cover Plate Width		0.000			
Top Cover Plate Thickness		0.000			
Bottom cover plate width (in.)		0.000			
Bottom cover plate thickness (in.)		0.000			
FOR PRE-CAST DECKS:					
Field Placed Concrete weight	145	lb/cu.ft.			

PHILIP M. GASE 84459 REGISTERED PROFESSIONAL ENGINEER STATE OF OHIO

PMG 01 FEB 2009

STATE OF VERMONT JOHN BRENNAN 1,100 LICENSED PROFESSIONAL ENGINEER

02-26-09

VT - Richmond Truss

SUMMARY RESULTS

grid main bar type: WT 4 x 5 @ 12 in. c-c Spacing

concrete thickness			5 in.	
top rebar	# 4	@	4 in.	
bot. Rebar	# 4	@	8 in.	

Cast-in-place concrete; main bars transverse to traffic; deck is Continuous

Beam Spacing 6 ft.	STRESSES (lbs/sq.in.) POSITIVE Top of Concrete	POSITIVE Bottom of main bar	NEGATIVE rebar	Main Bar @ Top of Weld	Bottom of main bar	HS-25 DECK WEIGHT	INSTALLED WEIGHT	
Dead Load	0	1,399	0	5,287	1,399	71.1	80.9	lbs
Sup. Imp. DL	12	143	335	122	236			
Live Load	731	8,976	20,963	7,643	14,770			
Total	742	10,518	21,298	13,051	16,406	Grid Weight =	8.9 lbs	

Deflection with wet concrete (if CIP unshored) =		0.032	< or =	0.3 in. O.K.-Check for excess sag and extra weight
Deflection under live load (if CIP unshored) =	/	1436	simple span	O.K.
Deflection under live load (if CIP unshored) =	/	1994	continuous	O.K.
Deflection under live load (if pre-cast) =	/	1436	simple span	O.K.
Deflection under live load (if pre-cast) =	/	1994	continuous	O.K.

Maximum Spans for this Configuration (ft.) HS-25

Normal weight concrete	pre-trans	pre-para	clp-trans	clp-para
n= 8	6.5	5	6.9	5.1

Notes:
- "Maximum Spans for this Configuration" are based on maximum stresses, fatigue, and deflection.
- Maximum stresses are based on the design (input sheet selected) live load and dead load.
- For Vehicular live loads, fatigue and deflection are evaluated at HS-20 , REGARDLESS OF THE LIVE LOAD SELECTED ON THE INPUT SHEET!
- For Pedestrian load cases, fatigue and deflection are evaluated at the pedestrian load.
- Fatigue is checked at the top (assumed at top of distribution bar) or bottom of the weld, which ever produces the worst case.

Overall Height from bottom of main bar to top of selected concrete thickness=	7.945 in.
Clear concrete cover over main reinforcing steel @ selected concrete thickness=	3 in.

LRFD Moment and Deflection Check
(Cracked Section Properties)

LRFD 3RD EDITION, 2004

FOR MAIN BARS TRANSVERSE TO TRAFFIC

For L <= 120 IN

$$M_{transverse} = C\ 1.28\ D^{0.197}\ L^{0.459} \qquad \text{LRFD 4.6.2.1.8-1}$$

For L > 120 IN

$$M_{transverse} = C\frac{D^{0.188}(3.7\ L^{1.35} - 956.3)}{L} \qquad \text{LRFD 4.6.2.1.8-2}$$

FOR MAIN BARS PARALLEL TO TRAFFIC

For L <= 120 IN

$$M_{Parallel} = C\ 0.73\ D^{0.123}\ L^{0.64} \qquad \text{LRFD 4.6.2.1.8-3}$$

For L > 120 IN

$$M_{Parallel} = C\frac{D^{0.138}(3.1\ L^{1.429} - 1088.5)}{L} \qquad \text{LRFD 4.6.2.1.8-4}$$

where :

L = span length (IN) from center-to-center of supports

C = continuity factor; 1.0 for simply supported and 0.8 for continuous spans

D = DxDy

DX = flexural rigidity of deck in main bar direction (KIP-IN2/IN)

Dy = flexural rigidity of deck perpendicular to main bar direction (KIP-IN2/IN)

For grid decks, D_x and D_y should be calculated as EI_x and EI_y where E is the modulus of elasticity and I_x and I_y are the moment of inertia per unit width of deck, considering the section as cracked and using the transformed area method for the main bar direction and transverse to main bar direction respectively.

Moments for fatigue assessment may be estimated for all span lengths by reducing Eq. 4.6.2.1.8-1 for main bars transverse to traffic or Eq. 4.6.2.1.8-3 for main bars parallel to traffic by a factor of 3.

Live Load Moment

L	6 ft. =	72 in.			
C	0.8		LRFD Continuity Factor	0.8	
Ix	31.887 in^4/ft =	2.657 in^4/in			
Iy	9.069 in^4/ft =	0.756 in^4/in			
E	29000 $kips/in^2$				
Dx		77059.67 $kips\text{-}in^2/in$			
Dy		21915.59 $kips\text{-}in^2/in$			
D		3.518			

$M_{LL\text{-}transverse}$ **	9.34 in kips/in=	9.34 ft kips/ft
$M_{LL\text{-}parallel}$ **	10.53 in kips/in=	10.53 ft kips/ft

DC - Dead Load Moment

w		71.09 PSF
Dead Load Factor (DC)		1.25 AASHTO LRFD Table 3.4.1-2
M_{DC} =	0.32 ft kips/ft	$\frac{(DC)wL^2}{8}(C)$

DW - FWS Dead Load Moment

w		26 PSF
Wearing Surface Dead Load Factor (DW)		1.50 AASHTO LRFD Table 3.4.1-2
M_{DW} =	0.14 ft kips/ft	$\frac{(DW)wE^2}{8}(C)$

Total Moment

$M = M_{LL} + M_{DC} + M_{DW}$ Mtransverse = 9.80 ft kips/ft

Check for Nominal Moment Capacity
Use cracked section
first concrete in positive bending

$M_{n\text{-}Concrete}$* 27.13995 ft-kips/ft

then check steel in positive bending

$M_{n\text{-}Bot\ fiber}$* 27.51085 ft-kips/ft

then check rebar in negative bending

$M_{n\text{-}Rebar}$* 14.18782 ft-kips/ft

Use lowest

M_n = 14.18782

Check against design moment

MN => Mtransverse ? YES - O.K. ◄ CHECK

Check Fatigue and Deflection due to Live Load

$M_{LL(transverse)}$= 9.34 ft kips/ft (Use Eq. 1 or Eq. 3 for all span lengths respective of main bar direction.)

Fatigue in Negative Bending:

SM top of welds in negative bending = 7.78 in^3

$M_F = M_{strength}$ / 3 = 3.113658

Factor to reduce moment due to flexibility of supports (not yet in code) = 1

Negative M_F adjusted for flexibility of supports = 3.113658

Check liveload stress = 3.113658 x 12 / SM = 4.80105 ksi at top of welds in negative bending

check against f/2 cat C= 5 ksi: O.K. ◄ CHECK

Fatigue in Positive Bending:

SM bottom of punchout in positive bending = 9.47 in^3

$M_F = M_{strength}$ / 3 = 3.113658

Factor to reduce moment due to flexibility of supports (not yet yet in code) = 1

Positive M_F adjusted for flexibility of supports = 3.113658

Check liveload stress = 3.113658 x 12 / SM = 3.945262 ksi at bottom of welds in positive bending

check against f/2 cat C= 5 ksi: O.K. ◄ CHECK

Deflection:

$\Delta_{transverse} = \frac{0.0052\ P^{in}\ L^3}{D_x}$ * 0.0319836 in. = L / 2261

$\Delta_{parallel} = \frac{0.0072\ P^{in}\ L^3}{D_y}$ * 0.0400471 in. = L / 1798

Deflection = Δtransverse = 0.0319836 in. = L / 2251

But this is for a simple span. Reduce by continuity factor if continuous:

Deflection = 0.025587 in. = L / 2814 O.K. ◄ CHECK

Exodermic Bridge Deck
VT - Richmond Truss
Analysis for HS-25 Live Load
7.945 in. Overall Thickness

Main Bars: WT 4 x 6 @ 12" c-c — **5" Concrete (Cast-in-place)**
Distribution Bars: 1.5" x 0.25", 6" c-c — **Top rebar #4 @ 4" c-c**
Shear Holes: 0.75" high @ 2" c-c — **Bottom rebar #4 @ 6" c-c**
Main Bars transverse to traffic. — **Deck Continuous**
N= 5 **25 lbs/sf for Future Overlay** — **Normal weight Concrete**

	Composite Sectional Properties (in⁴/ft)					Exodermic Deck Weight (lbs/sf)	
	POSITIVE		NEGATIVE				
	Top of Concrete Slab	Bottom of Steel Grid Main Bar	Embedded Steel Reinforcing Bar	Main Bar @ Top of Welds	Bottom of Steel Grid Main Bar	Weight before grinding or overlay	Wt. wi. overlay (if any) and additional deck load with no grinding
Composite	12.42	-5.63	-2.54	-7.78	-14.03	71.1	96.1
Grid Only	1.93	-0.51	0.51	-0.51	-5.93		

(negative sign indicates tension)

Deadload Moment = $M_{DL} = WS^2/8$ (times 0.8 if continuous)
where W = weight/sf
S = Stringer spacing, o-c, minus 1/2 the flange width
DL_1 = Dead load carried by the Grid only
DL_2 = Superimposed dead load carried by the composite section

Liveload Moment = $M_{LL} = ((9+2)/32) \times P$ (AASHTO 3.24.3.1), or $WS^2/8$ (AASHTO 3.14.1.3) for pedestrian,
where P = 18 x (1+impact) for HS-20 loading (20 x (1+impact) for HS-25), and W=85 (typically) psf.
0.3 is the typical vehicular impact factor. 0.0 typical pedestrian impact.
multiply the moment by 0.8 if continuous

SAMPLE CALCULATION

Stringer spacing	8	feet
Stringer flange width	8.86	inches
Weight before grinding (DL_1)	71.1	lbs/sf
Superimposed Deadload (DL_2)	25.0	lbs/sf
Deadload (DL_1) Moment =	0.225	ft kips/ft
Deadload (DL2) Moment =	0.079	ft kips/ft
Liveload Moment =	4.667	ft kips/ft

STRESS AT BOTTOM OF STEEL GRID, POSITIVE BENDING

$DL\ Stress_{fact\ steel\ grid}$ = Deadload Moment (DL1) x 12/Section Modulus grid only
= 1,399 psi

$DL\ Stress_{fact\ steel\ grid}$ = Deadload Moment (DL2) x 12/Section Modulus composite deck
= 143

$LL\ Stress_{fact\ steel\ grid}$ = Liveload Moment x 12/Section Modulus composite deck
= 8,976 psi

Total HS-25 stress = 10,618 psi

Stringer Spacing = 6.00 ft.	STRESSES (lbs/sq.in.) @ HS-25 Load				
	POSITIVE		NEGATIVE		
	Top of Concrete Slab	Bottom of Steel Grid Main Bar	Embedded Steel Reinforcing Bar @	Main Bar @ Top of Welds	Bottom of Steel Grid Main Bar
Dead Load (DL1)	12	1,399	0	5,287	1,399
Sup. Imp. DL (DL2)	12	143	335	122	236
Live Load	731	8,976	20,961	7,643	14,770
Total	742	10,618	21,296	13,051	18,406

Exodermic Weight Calculation - Cast-in-place

VT - Richmond Truss

Panel length (direction main grid bars)	21.167	ft.
Panel width	8.000	ft.
No. of composite beams per panel	4	
Concrete type	Normal weight	
Concrete weight	145	lbs/cu.ft.
Concrete thickness	5	in.
Top rebar size	4	
Top rebar spacing	4	in.
Bottom rebar size	4	
Bottom rebar spacing	8	in.
"Haunch" height (see note)	4.445	in. (May vary.)
"Haunch" width	8.99	in.
Connection between panels - height	7.945	in.
Connection between panels - width	8	in.
Main bar weight	5	lbs/lin.ft.
Main bar spacing	12	in.
Distribution bar height	1.5	in.
Distribution bar thickness	0.25	in.
Distribution bar spacing	6	in.
Galv. horiz sheet metal (gauge)	20	gauge

WEIGHTS

Main bars	5.0	lbs./s.f
Distribution bars	2.6	lbs./s.f
Galv. horiz sheet metal	1.4	lbs./s.f
Weight of Steel Grid		8.9 lbs/sf
Concrete		60.4 lbs/sf
Rebar		3.3 lbs/sf
less concrete displaced by steel		-1.6 lbs/sf
WEIGHT OF EXODERMIC DECK		**71.1 lbs/sf**
Plus additional concrete for full depth "haunch"		7.6 lbs/sf
less haunch concrete displaced by steel in haunch		-0.3 lbs/sf
Plus additional concrete for connection between panels		2.5 lbs/sf
TOTAL INSTALLED WEIGHT before overlay		80.9 lbs/sf
TOTAL INSTALLED WEIGHT with overlay if specified		105.9 lbs/sf

Note: The term "haunch" is used here to describe the areas of the deck over beams where the grid is filled full depth.

The information provided herein was prepared with reference to generally accepted engineering practices. It is the responsibil of the user of this information to independently verify such information and determine its applicability to any particular project o application. DS Brown assumes no liability for use of any information contained herein.

Deflection Calculation: Cast-In-Place Exodermic Deck
VT - Richmond Truss

First, look at the bare grid with wet concrete on it.

w = uniform load per foot =	71.1	lbs/ft =	5.92 lbs/in
l = beam spacing =	6.0000	ft. =	72 in.
I = the moment of inertia =	1.18907	in^4	for steel grid only
E = modulus of elasticity of steel =	29.0E+6	lbs/in^2	

A. Maximum deflection for a simple span is given by: $\frac{5wl^4}{384EI}$

Deflection = 0.060 inches

B. Maximum deflection for a continuous span is given by: $0.0069\frac{wl^4}{EI}$

The constant c=0.0069 from AISC LRFD 2nd Edition, page 4-203 for a 3-span continuous uniformly loaded beam, which is the worst case. For 4 spans, c=0.0065 on page 4-203. By analysis, c=0.00642 for 2 spans, c=0.00657 for 5 spans, c=0.00654 for 6 spans, and c=0.00655 for more than 6 spans.

Deflection = 0.032 inches

FOR THE COMPLETED UNSHORED, CIP DECK:

LIVELOAD For the completed deck, deflection due to vehicular live load and impact is given by:

$\frac{Pl^3}{48EI}$ (Simple Span)

P = *HS-25 wheel load plus 0.5 impact factor* =	26	kips	
l = floorbeam spacing =	6.0000	ft. =	72 in.

I = the moment of inertia

For the completed deck (grid and reinforced concrete), the moment of inertia is 31.88676 in^4, but I = the moment of inertia of the width of deck that is effective.

We'll use AASHTO 3.24.3.2,

which gives effective width as (4+.06S), with a maximum of 7', where S is the span.

So, effective width= 4.36 feet, and the moment of inertia to use in the equation = effective width times I for a one foot width as given above.

= 4.36 times 31.887 = 139.026 in^4

If the Live Load is Pedestrian however, the load is generally 85 PSF and deflection is given by:

$\frac{5wl^4}{384EI}$

w = uniform load per foot =	85	lbs/ft	7.0833333 lbs/in
l = beam spacing =	72	in.	
I = the moment of inertia =	31.88676	in^4	
E = modulus of elasticity of steel =	29.0E+6	lbs/in^2	

$DEFLECT_{MAX}$ due to liveload (vehicle or pedestrian) & impact for vehicle loads = 0.05015 in. = l / 1436 O.K.

BUT THIS IS FOR A SIMPLE SPAN. For two continuous spans:

Vehicular $DEFLECT_{MAX} = 0.015Pl^3/EI$ = 0.0351 = l / 1994 O.K.

or Pedestrian $DEFLECT_{MAX} = 0.0069wl^4/EI$ =

Notes: An Exodermic deck is very stiff. The section is deep, with materials (steel grid, concrete, and rebar) located where they can do the most good. When the deck is continuous over supports, the stiffness in positive moment areas (i.e. between supports) is further enhanced.

Laboratory tests of Exodermic decks at Lehigh and West Virginia Universities included deflection measurements during the course of extensive fatigue testing. At West Virginia University, for example, the 6'6" wide deck panels tested were relatively light, with 3" structural T's as main bearing bars, located on 10" centers. 4" of reinforced concrete was used. At a 9'5" span between supports, measured deflection was 0.1 1/8", or L/853. Loading was HS-25 (20.8 kips including 30% impact). The calculated transformed moment of inertia for this module was 32.31 in^4. Following the calculations above yields a calculated deflection of 0.1422 inches, or L/802.

Computation of Section Properties – Exodermic Deck

VT - Richmond Truss

DESIGN PARAMETERS

MAIN BAR TYPE = WT 4 x 5

Element	Height (in.)	Width (in.)	Weight (lbs/lin.ft.)	Area ($in.^2$)	Spacing (in.)	Moment of Inertia	Distance to Centroid from Grid Bottom (in.)
Main Bar	3.945	0.17	5.00	1.480	12	2.15	0.963
Punchout for distr	0.75	0.17			12		1.820
Shear Hole Size	0.75	0.17	0.43	0.128	12		3.320

note: Bottom of shear holes always at bottom of concrete
Ht of main bar embedded in concrete 1 in.

Concrete Component

Concrete thickness (in.) 4.5 after deducting 0.5 in. for future wear or milling
Concrete type Normal weight
Concrete weight 145
Concrete strength (f'_c) 4000
top rebar # 4 @ 4 in. c-c
bottom rebar # 4 @ 6 in. c-c

Determine the Modular Ratio, $n = E_s/E_c$

CASE 1, for all calculations other than for deflection, (AASHTO 8.15.3.4)

look up n in table given in AASHTO 10.38.1.3:
for f'_c = 4,000 psi,
n = 8

CASE 2, only for calculations of deflection (AASHTO 8.15.3.4)
E_s = 29,000,000 AASHTO 8.7.2

$$E_c = w_c^{1.5}\, 33\sqrt{f'_c}$$ AASHTO 8.7.1

E_c = 3,644,147
n = 8

for these calculation, use
n = 8

The information provided herein was prepared with reference to generally accepted engineering practices. It is the responsibility of the user of this information to independently verify such information and determine its applicability to any particular project or application. DS Brown assumes no liability for use of any information contained herein.

Calculate Composite Centroid - Positive Bending

n= 8

Element	Actual Height of Element	Effective Height of Element (Concrete above N.A.) See Note.	Width of Element	Spacing of Elements c-c (in.)	Number of Elements (per ft)	Actual Area	Trans-formed Area (A/n)	Distance from Bottom of Grid to Horiz. Centroid of Element	
						A	A_t	d	A_t x d
Main Bars	3.945	3.945		12	1	1.480	1.480	0.953	1.410
less punchout hol	0.75	0.75	0.17	12	1	-0.128	-0.128	1.820	-0.232
less shear hole	0.75	0.75	0.17	12	1	-0.128	-0.128	3.320	-0.423
Concrete	4.5	2.6331	12	12	1	31.597	3.950	6.128	24.205
Rebar *				4	3	0.515	0.515	4.685	2.420
Σ							5.690		27.380

Centroid of composite section = y (measured from bottom of grid) = $\Sigma(A_t{}^*d)/\Sigma(A_t)$ = **4.812** In.

Notes: Effective Height of concrete found by iterating until no effective concrete is below the centroid.
* Rebar area reduced by (n-1)/n to account for concrete displaced by rebar.

Calculate Composite Moment of Inertia - Positive Bending

Element	Distance from Centroid of Element to Composite Centroid (y)		Moment of Inertia of Element Taken by Itself	Trans-formed Moment of Inertia	Times Number of Elements (per ft.)	Trans-formed Moment of Inertia (per ft.)
	d'	A_t x $(d')^2$	I	I/n		I_t
Main Bars	-3.859	22.039	2.150	2.150	1	2.150
less punchout hol	-2.992	-1.141	-0.006	-0.006	1	-0.006
less shear hole	-1.492	-0.284	-0.006	-0.006	1	-0.006
Concrete	1.317	6.846	18.255	2.282	1	2.282
Rebar	-0.117	0.007	0.000	0.000	3	0.000
Sums		27.467				4.420

I_g=Moment of Inertia for Composite Section= $\Sigma(At \times (d')^2) + \Sigma(I_t)$ = **31.887** In^4

Computation of Section Properties -- Exodermic Deck

SECTION MODULI - POSITIVE BENDING

Point of Interest	Location Relative to Bottom of Grid	Distance from Centroid to Point of Interest	Effective Section Modulus In^3
Top of Concrete	7.945	- 3.133	81.42
Top of Steel Grid	3.945	-0.867	-36.76
Top of Shear hole	3.595	-1.117	-28.55
Bottom of Shear hole	2.945	-1.867	-17.08
Top of distribution bar	2.945	-1.867	-17.08
Top of Weld	2.945	-1.867	-17.08
Bot of Weld	2.445	-2.367	-13.47
Top of Punchout	2.195	-2.617	-12.18
Bottom of distrib. Bar	1.445	-3.367	-9.47
Bottom of Steel Grid	0	-4.812	-6.63

Calculate Composite Centroid - Negative Bending

n= 8

Element	Actual Height of Element	Effective Height of Element (Concrete above N.A.) See Note.	Width of Element	Spacing of Elements c-c (in.)	Number of Elements (per ft)	Actual Area	Trans-formed Area (A/n)	Distance from bottom of grid to horiz. centroid of element	
						A	A_t	d	$A_t \times d$
Main Bars	3.945	3.945		12	1	1.480	1.480	0.953	1.410
less punchout hol	0.75	0.75	0.17	12	1	-0.128	-0.128	1.820	-0.232
less shear hole	0.75	0.75	0.17	12	1	-0.128	-0.128	3.320	-0.423
Concrete	0	0.0000	12	12	1	0.000	0.000	7.445	0.000
Rebar				4	3	0.589	0.589	4.695	2.766
Σ							1.814		3.521

Centroid of composite section = y (measured from bottom of grid) = $\Sigma(A_t{*}d)/\Sigma(A_t)$ **1.941** in.

Note: No concrete is included in the calculations for negative bending.

Calculate Composite Moment of Inertia - Negative Bending

Element	Distance from Centroid of Element to Composite Centroid (y)		Moment of Inertia of Element Taken by Itself	Trans-formed Moment of Inertia	Times Number of Elements (per ft.)	Trans-formed Moment of Inertia (per ft.)
	d'	$A_t \times (d')^2$	I	I/n		I_t
Main Bars	-0.988	1.444	2.150	2.150	1	2.150
less punchout hol	-0.121	-0.002	-0.006	-0.006	1	-0.006
less shear hole	1.379	-0.243	-0.006	-0.006	1	-0.006
Concrete	5.504	0.000	0.000	0.000	1	0.000
Rebar	2.754	4.468	0.003	0.003	3	0.009
Sums		5.668				2.147

I_g=Moment of Inertia for Composite Section= $\Sigma(A_t \times (d')^2) + \Sigma(I_t)$ = **7.815** in^4

Computation of Section Properties -- Exodermic Deck

SECTION MODULI - NEGATIVE BENDING

Point of Interest	Location Relative to Bottom of Grid	Distance from Centroid to Point of Interest	Effective Section Modulus in^3
Embedded Rebar	4.695	2.754	-2.84
Top of Main Bars	3.945	2.004	-3.90
Top of Shear Hole	3.695	1.754	-4.46
Bottom of Shear hole	2.945	1.004	-7.78
Top of Distribution Bars	2.945	1.004	-7.78
Top of Weld	2.945	1.004	-7.78
Bottom of welds	2.445	0.504	-15.50
Top of Punchout	2.195	0.254	-30.74
Bottom of distrib. Bar	1.445	-0.495	15.76
Bottom of Punchout	1.445	-0.495	15.76
Bottom of Steel Grid	0	-1.941	4.03

Computation of Section Properties -- GRID ONLY

MAIN BAR TYPE = WT 4 x 5

Element	Height (in.)	Width (in.)	Weight (lbs/lin.ft.)	Area ($in.^2$)	Spacing (in.)	Moment of Inertia	Distance to centroid from grid bottom
Main Bar	3.945	0.17	5.00	1.480	12	2.15	0.953
Punchout for distr	0.75	0.17			12		1.820
Shear Hole Size	0.75	0.17	0.43	0.128	12		3.320

note: Shear holes always start 0.25 in. down from top of T
Ht of main bar embedded in concrete 1 in.

Calculate Centroid

Element	Actual Height of Element	Effective Height of Element (Concrete above N.A.) See note.	Width of element	Spacing of Elements c-c (in.)	Number of Elements (per ft)	Actual Area	Trans-formed area (A/n)	Distance from bottom of grid to horiz. centroid of element	
						A	A_t	d	A x d
Main Bars	3.945	3.945		12	1	1.480	1.480	0.953	1.410
Punchout for distr	0.75	0.75	0.17	12	1	-0.128	-0.128	1.820	-0.232
Shear Hole Size	0.75	0.75	0.17	12	1	-0.128	-0.128	3.320	-0.423
Σ:							1.225		0.755

Centroid of composite section = y (measured from bottom of grid) = $\Sigma(A_t{*}d)/\Sigma(A_t)$ = **0.616**

Calculate Moment of Inertia

Element	Distance from centroid of element to composite centroid (y)		Moment of Inertia of element taken by itself	Trans-formed Moment of Inertia	Times Number of elements (per ft.)	Trans-formed Moment of Inertia (per ft.)
	d	$A_t \times (d)^2$	I	I/n		I_t
Main Bars	0.337	0.168	2.150	2.150	1	2.150
less punchout hol	1.204	-0.185	-0.005	-0.006	1	-0.006
less shear hole	2.704	-0.932	-0.006	-0.006	1	-0.006
Sums		-0.949				2.139

I_g=Moment of Inertia for Composite Section= $\Sigma(A_t \times (d)^2) + \Sigma(I_t)$ = **1.189**

Calculate Section Modull

Point of Interest	Location relative to bottom of grid	Distance from centroid to point of interest	Effective Section Modulus
Top of Main Bearing Bar	3.945	3.329	0.36
Bottom of Shear hole	2.945	2.329	0.51
Top of Distribution Bar	2.945	2.329	0.51
Top of Weld	2.945	2.329	0.51
Top of Punchout	2.195	1.579	0.75
Bottom of Steel Grid	0	-0.616	-1.93

L. B. Foster Company Fabricated Products Division
Weight of Grid Deck

Grid

		Depth	Width	Gross Weight / FT	Net Weight / FT		Inches	# / SF
Main Bar	2" Tee	2	N/A	3.85	3.79	Main Bars Spacing	10	4.54
Cross Bar 1	1 x 1/4 CD	1	1/4	0.85	0.85	Cross Bar 1 Spacing	4	2.55
Cross Bar 2	None	0	0	0.00	0.00	Cross Bar 2 Spacing	10	0.00
Bottom Round	None	0	0	0.00	0.00	Bottom Round Spacing	8	0.00
Supplemental Bar 1	None	0	0	0.00	0.00	Supplemental Bar 1 Spacing	4	0.00
Supplemental Bar 2	None	0	0	0.00	0.00	Supplemental Bar 2 Spacing	3.75	0.00
Form Pan	20 Gauge	20 Gauge	N/A	1.5	1.50	Form Pans	12	1.50
							Sub Total	8.60
							Add for Finish	5%
		Subject to Mill Tolerances		Approximate Total Steel Weight per Square Foot Excluding Attachements				9.1

Concrete

Weight of Concrete	145	# / ft³	Gross Weight / SF	Deduct for Concrete Displaced by Grid	Net Weight of Concrete per Foot
f'c	4000	psi	36.3	2.5	33.7
Depth of Concrete Infill	2	Inches			
Depth of Concrete Overfill	1	Inches			
Total Depth of Concrete	3	Inches			

E_c = 3,644,147 — Weight is approximate — Does not include Concrete Haunch

E_s = 29,000,000

n = 8 Only for Calculations of Deflection (AASHTO 8.15.3.4 & 8.7.1)

n = 8 For all Calculations other than Deflection (AASHTO 8.15.3.4 & 10.36.1.3)

Superimposed Dead Load (Parapets & Median Barrier) LB / SF	0
Approximate Total Weight of Base Product	42.8

For Strength Design Only Calculate Composite Centroid - Positive Bending

Element	Actual Height of Element	Effective Height of Element *,**	Width of Element	Spacing of Elements IN C/C	Number of Elements per Foot	Actual Area	Transformed Area	Distance from Bottom of Grid to Centroid of Element	
						A	A_t	d	$A_t \times d$
Main Bar	2.000	2.000	N/A	10	1.2	1.39691720	1.39691720	0.44111029	0.59637389
Supplemental Bar 1	0.000	0.000	0.000	4	3	0.00000000	0.00000000	2.00000000	0.00000000
Supplemental Bar 2	0.000	0.000	0.000	3.75	3.2	0.00000000	0.00000000	2.00000000	0.00000000
Concrete**	3.000	1.430	12.000	12	1	17.16000000	2.14500000	2.28500000	4.90132500
Top Punchout*	0.000	0.000	-0.193	10	1.2	0.00000000	0.00000000	1.00000000	0.00000000
Bottom Punchout*	0.000	0.000	-0.193	10	1.2	0.00000000	0.00000000	0.00000000	0.00000000
Σ							3.54192		5.49983889

Centroid of Composite Section = y (measured from bottom of grid) = $\Sigma(A_t * d)/\Sigma(A_t)$ = 1.57066623 Taken as 1.57

Note : Effective Height of Concrete is found by iterating until no effective concrete is below the centroid

Calculate Composite Moment of Inertia - Positive Bending

Element	Distance from Centroid of Element to Composite Centroid (Δy)		Moment of Inertia of Element taken by itself	Transformed Moment of Inertia	Times Number of Elements (per ft.)	Transformed Moment of Inertia (per ft.)
	Δ^2	$A_t * (d')^2$	i	I / n		I_t
Main Bars	-1.12665134	1.73076181	0.31752077	0.31752077	1.2	0.38102492
Supplemental Bar 1	0.42933838	0.00000000	0.00000000	0.00000000	3	0.00000000
Supplemental Bar 2	0.42933838	0.00000000	0	0.00000000	3.2	0.00000000
Concrete**	0.71433838	1.09454913	2.92420700	0.28552588	1	0.28552588
Top Punchout*	-0.57066162	0.00000000	0.00000000	0.00000000	1.2	0.00000000
Bottom Punchout*	-1.57066162	0.00000000	0.00000000	0.00000000	1.2	0.00000000
Σ		2.82510742				0.74655080

I_g = Moment of Inertia for Composite Section = $\Sigma(A_t * (d')^2) + \Sigma(I_t)$ = 3.571661541

Computation of Section Properties

Point of Interest	Location Relative to Bottom of Grid	Distance from Centroid to Point of Interest	Effective Section Modulus
Top of Concrete	3.000	1.42933838	19.99159182
Bottom of Grid	0	-1.57066162	-2.27411270
Top of Grid	2.000	0.42933838	8.31946566
Form Pan	0.000	-1.57066162	-2.27411270
OB Web	2	0.42933838	8.31946566

*Punchout is ignored in Compression Areas and Subtracted When in Tension

**Concrete is Transformed to Steel in Compression Areas and Ignored When in Tension

For Strength Design Only **Calculate Composite Centroid - Negative Bending**

Element	Actual Height of Element	Effective Height of Element * **	Width of Element	Spacing of Elements in C/C	Number of Elements per Foot	Actual Area	Transformed Area	Distance from Bottom of Grid to Centroid of Element	
						A	A_t	d	$A_t \times d$
Main Bar	2.000	2.000	N/A	10	1.2	1.36651720	1.36651720	0.44111029	0.59837369
Supplemental Bar 1	0.000	0.000	0.000	4	3	0.00000000	0.00000000	2.00000000	0.00000000
Supplemental Bar 2	0.000	0.000	0.000	3.75	3.2	0.00000000	0.00000000	2.00000000	0.00000000
Concrete**	3.000	0.360	12.000	12	1	4.32000000	0.64000000	0.18000000	0.09720000
Top Punchout*	0.000	0.000	-0.193	10	1.2	0.00000000	0.00000000	1.00000000	0.00000000
Bottom Punchout*	0.000	0.000	-0.193	10	1.2	0.00000000	0.00000000	0.00000000	0.00000000
Σ							1.89652		0.69557369

Centroid of Composite Section = y (measured from bottom of grid) = $\Sigma(A_t * d) / \Sigma(A_t)$ = 0.366763713 Taken as 0.36

Note : Effective Height of Concrete is found by iterating until no effective concrete is below the centroid.

Calculate Composite Moment of Inertia - Negative Bending

Element	Distance from Centroid of Element to Composite Centroid (y)		Moment of Inertia of Element taken by Itself	Transformed Moment of Inertia	Times Number of Elements (per ft.)	Transformed Moment of Inertia (per ft)
	d	$A_t * (d)^2$	I	I / n		I_t
Main Bars	0.07434667	0.00749803	0.31752077	0.31752077	1.2	0.38102492
Supplemental Bar 1	1.63323629	0.00000000	0.00000000	0.00000000	3	0.00000000
Supplemental Bar 2	1.63323629	0.00000000	0	0.00000000	3.2	0.00000000
Concrete**	-0.18676371	0.01883557	0.04666600	0.00583200	1	0.00583200
Top Punchout*	0.63323629	0.00000000	0.00000000	0.00000000	1.2	0.00000000
Bottom Punchout*	-0.36676371	0.00000000	0.00000000	0.00000000	1.2	0.00000000
Σ		0.0283336				0.38685692

I_e = Moment of Inertia for Composite Section = $\Sigma(A_t * (d)^2) + \Sigma(I_t)$ = 0.413160524

Computation of Section Properties

Point of Interest	Location Relative to Bottom of Grid	Distance from Centroid to Point of Interest	Effective Section Modulus
Bottom of Concrete	0.000	-0.36676371	0.01269059
Bottom of Grid	0	-0.36676371	1.12658507
Top of Grid	2.000	1.63323629	-0.25298682
Form Pan	0.000	-0.36676371	1.12658507
CB Weld	2	1.63323629	-0.25298682

*Punchout is Ignored in Compression Areas and Subtracted When in Tension

**Concrete is Transformed to Steel in Compression Areas and Ignored When in Tension

For Strength Design Only **Calculate Centroid - Grid Only - Positive Bending**

Element	Actual Height of Element	Effective Height of Element *,**	Width of Element	Spacing of Elements IN C/C	Number of Elements per Foot	Actual Area	Transformed Area	Distance from Bottom of Grid to Centroid of Element	
						A	A_t	d	$A_t \times d$
Main Bar	2.000	2.000	N/A	10	1.2	1.35651720	1.35651720	0.44111023	0.59837369
Supplemental Bar 1	0.000	0.000	0.000	4	3	0.00000000	0.00000000	2.00000000	0.00000000
Supplemental Bar 2	0.000	0.000	0.000	3.75	3.2	0.00000000	0.00000000	2.00000000	0.00000000
						0.00000000	0.00000000	3.00000000	0.00000000
Top Punchout*	0.000	0.000	-0.193	10	1.2	0.00000000	0.00000000	1.00000000	0.00000000
Bottom Punchout*	0.000	0.000	-0.193	10	1.2	0.00000000	0.00000000	0.00000000	0.00000000
Σ							1.35682		0.59837369

Centroid of Section = y (measured from bottom of grid) = $\Sigma(A_t * d) / \Sigma(A_t)$ = 0.441110286 Taken as 0.44

Calculate Moment of Inertia - Positive Bending

Element	Distance from Centroid of Element to Composite Centroid (y)		Moment of Inertia of Element taken by Itself	Transformed Moment of Inertia	Times Number of Elements (per ft.)	Transformed Moment of Inertia (per ft.)
	d	$A_t * (d)^2$	I	I / n		I_t
Main Bars	0.00000000	0.00000000	0.31782077	0.31782077	1.2	0.38102492
Supplemental Bar 1	1.55888971	0.00000000	0.00000000	0.00000000	3	0.00000000
Supplemental Bar 2	1.55888971	0.00000000	0	0.00000000	3.2	0.00000000
		0.00000000	0.00000000	0.00000000	0	0.00000000
Top Punchout*	0.55888971	0.00000000	0.00000000	0.00000000	1.2	0.00000000
Bottom Punchout*	-0.44111029	0.00000000	0.00000000	0.00000000	1.2	0.00000000
Σ		0				0.38102492

I_x = Moment of Inertia for Composite Section = $\Sigma(A_t * (d')^2) + \Sigma(I_t)$ = 0.381024924

Computation of Section Properties

Point of Interest	Location Relative to Bottom of Grid	Distance from Centroid to Point of Interest	Effective Section Modulus
Bottom of Grid	0	-0.44111029	-0.86378608
Top of Grid	2.000	1.55888971	0.24442071
Form Pan	0.000	-0.44111029	-0.86378608
CB Weld	2	1.55888971	0.24442071

*Punchout is Ignored in Compression Areas and Subtracted When in Tension

**Concrete is Transformed to Steel in Compression Areas and Ignored When in Tension

For Strength Design Only Calculate Centroid - Grid Only - Negative Bending

Element	Actual Height of Element	Effective Height of Element *,**	Width of Element	Spacing of Elements IN C/C	Number of Elements per Foot	Actual Area	Transformed Area	Distance from Bottom of Grid to Centroid of Element	
						A	A_t	d	$A_t \times d$
Main Bar	2.000	2.000	N/A	10	1.2	1.39631720	1.39651720	0.44111029	0.58537369
Supplemental Bar 1	0.000	0.000	0.000	4	3	0.00000000	0.00000000	2.00000000	0.00000000
Supplemental Bar 2	0.000	0.000	0.000	3.75	3.2	0.00000000	0.00000000	2.00000000	0.00000000
						0.00000000	0.00000000	0.00000000	0.00000000
Top Punchout*	0.000	0.000	-0.193	10	1.2	0.00000000	0.00000000	1.00000000	0.00000000
Bottom Punchout*	0.000	0.000	-0.193	10	1.2	0.00000000	0.00000000	0.00000000	0.00000000
Σ							1.39652		0.58537369

Centroid of Section = y (measured from bottom of grid) = $\Sigma(A_t * d) / \Sigma(A_t)$ = 0.441110286 Taken As 0.44

Calculate Moment of Inertia - Negative Bending

Element	Distance from Centroid of Element to Composite Centroid (y)		Moment of Inertia of Element taken by Itself	Transformed Moment of Inertia	Times Number of Elements (per ft.)	Transformed Moment of Inertia (per ft.)
	d	$A_t * (d^*)^2$	I	I/n		I_t
Main Bars	0.00000000	0.00000000	0.31752077	0.31752077	1.2	0.38102492
Supplemental Bar 1	1.55888971	0.00000000	0.00000000	0.00000000	3	0.00000000
Supplemental Bar 2	1.55888971	0.00000000	6	0.00000000	3.2	0.00000000
Top Punchout*	0.55888971	0.00000000	0.00000000	0.00000000	1.2	0.00000000
Bottom Punchout*	-0.44111029	0.00000000	0.00000000	0.00000000	1.2	0.00000000
Σ		0				0.38102492

I_g = Moment of Inertia for Composite Section = $\Sigma(A_t * (d^*)^2) + \Sigma(I_t)$ = 0.381024924

Computation of Section Properties

Point of Interest	Location Relative to Bottom of Grid	Distance from Centroid to Point of Interest	Effective Section Modulus
Bottom of Grid	0	-0.44111029	0.86378008
Top of Grid	2.000	1.55888971	-0.24442071
Form Pan	0.000	-0.44111029	0.86378008
CB Weld	2	1.55888971	-0.24442071

*Punchout is Ignored in Compression Areas and Subtracted When in Tension

**Concrete is Transformed to Steel in Compression Areas and Ignored When in Tension

Fatigue and Deflection only

Calculate Composite Centroid

Element	Actual Height of Element	Effective Height of Element **	Width of Element	Spacing of Elements IN C/C	Number of Elements per Foot	Actual Area	Transformed Area	Distance from Bottom of Grid to Centroid of Element	
						A	A_t	d	$A_t \times d$
Main Bar	2.000	2.000	N/A	16	1.2	1.36651729	1.36651729	0.44119029	0.59837569
Supplemental Bar 1	0.000	0.000	0.000	4	3	0.00000000	0.00000000	2.00000000	0.00000000
Supplemental Bar 2	0.000	0.000	0.000	3.75	3.2	0.00000000	0.00000000	2.00000000	0.00000000
Concrete**	3.000	3.000	12.000	12	1	36.00000000	4.50000000	1.50000000	6.75000000
Top Punchout*	0.000	0.000	-0.183	16	1.2	0.00000000	0.00000000	1.00000000	0.00000000
Bottom Punchout*	0.000	0.000	-0.183	16	1.2	0.00000000	0.00000000	1.87500000	0.00000000
Σ							5.86651729		7.34837569

Centroid of Composite Section = y (measured from bottom of grid) = $\Sigma(A_t * d) / \Sigma(A_t)$ = 1.254734416 ft

**Note : Effective Height of Concrete for fatigue and deflection per AASHTO 10.38.1.6

Calculate Composite Moment of Inertia

Element	Distance from Centroid of Element to Composite Centroid (y)		Moment of Inertia of Element taken by Itself	Transformed Moment of Inertia	Times Number of Elements (per ft.)	Transformed Moment of Inertia (per ft.)
	d'	$A_t * (d')^2$	I	I/n		I_t
Main Bars	-0.813532413	0.89788299	0.31702077	0.31702077	1.2	0.38102492
Supplemental Bar 1	0.74528558	0.00000000	0.00000000	0.00000000	3	0.00000000
Supplemental Bar 2	0.74528558	0.00000000	0	0.00000000	3.2	0.00000000
Concrete*	0.24528558	0.27000843	27.00000000	3.37500000	1	3.37500000
Top Punchout*	-0.25473442	0.00000000	0.00000000	0.00000000	1.2	0.00000000
Bottom Punchout*	0.62028558	0.00000000	0.00000000	0.00000000	1.2	0.00000000
Σ		1.18988711E				3.75602492

I_x = Moment of Inertia for Composite Section = $\Sigma(A_t * (d')^2) + \Sigma(I_t)$ = 4.924716342

Computation of Section Properties

Point of Interest	Location Relative to Bottom of Grid	Distance from Centroid to Point of Interest	Effective Section Modulus
Top of Concrete	3.000	1.74528558	22.57406042
Bottom of Grid	0	-1.25473442	-3.92490736
Top of Grid	2.000	0.74528558	6.60800183
Form Pan	0.000	-1.25473442	-3.92490736
Other Area of Interest	0.000	-1.25473442	-3.92490736
CB Weld / Main Bar Punchout	2	0.74528558	6.60800183

*Punchout is Ignored in Compression Areas and Subtracted When in Tension

Sidewalk Design

AASHTO 17th Edition

C/C Spacing of Supports =	3.75 FT	Uniform Pedestrian Load	85 LBS
Support Top Flange Width =	0 IN	Impact	0%
		Continuity Factor	1
Effective Span Length for Design =	3.75 FT		
Effective Span Length (S) shall be the distance between edges of top flange plus one-half of stringer top flange width. (AASHTO 3.24.1.2)		Allowable Steel Stress	20 ksi
		Allowable Concrete Stress	1.6 ksi

Dead Load Moment = 0.07527 Kip-Foot / Foot
$W * S^2 / 8 * 0.8$ (IF Continuous Span) Acting on steel grid only

Live Load Plus Impact Moment = 0.1494141 Kip-Foot / Foot
$W * S^2 / 8 * 0.8$ (IF Continuous Span) Acting on composite steel/concrete deck

Maximum Stress Negative Moment

@ Bottom of Concrete =	0.299152 Ksi	OK	Design Stress Okay AASHTO 8.15.2.1.1
@ Bottom of Grid =	2.637129 Ksi	OK	Design Stress Okay AASHTO 10.32.1
@Top of Grid =	-10.7624 Ksi	OK	Negative Number Indicates Tension
@ Form Pan =	-1.7022 Ksi	OK	*N/A means no concrete figured in design
@ Cross Bar Weld =	-10.7624 Ksi	OK	

$M_{DL} * 12$ / (Grid Only Section Modulus for Negative Moment) + $M_{LL+I} * 12$ / (Composite Section Modulus for Negative Moment)

Maximum Stress Positive Moment

Top of Concrete =	0.134864 Ksi	OK	Design Stress Okay AASHTO 8.15.2.1.1
Bottom of Grid =	-0.32863 Ksi	OK	Design Stress Okay AASHTO 10.32.1
Top of Grid =	0.650684 Ksi	OK	Negative Number Indicates Tension
Form Pan =	-0.32883 Ksi	OK	*N/A means no concrete figured in design
Cross Bar Weld =	0.650684 Ksi	OK	

$M_{DL} * 12$ / (Grid Only Section Modulus for Positive Moment) + $M_{LL+I} * 12$ / (Composite Section Modulus for Positive Moment)

Deflection

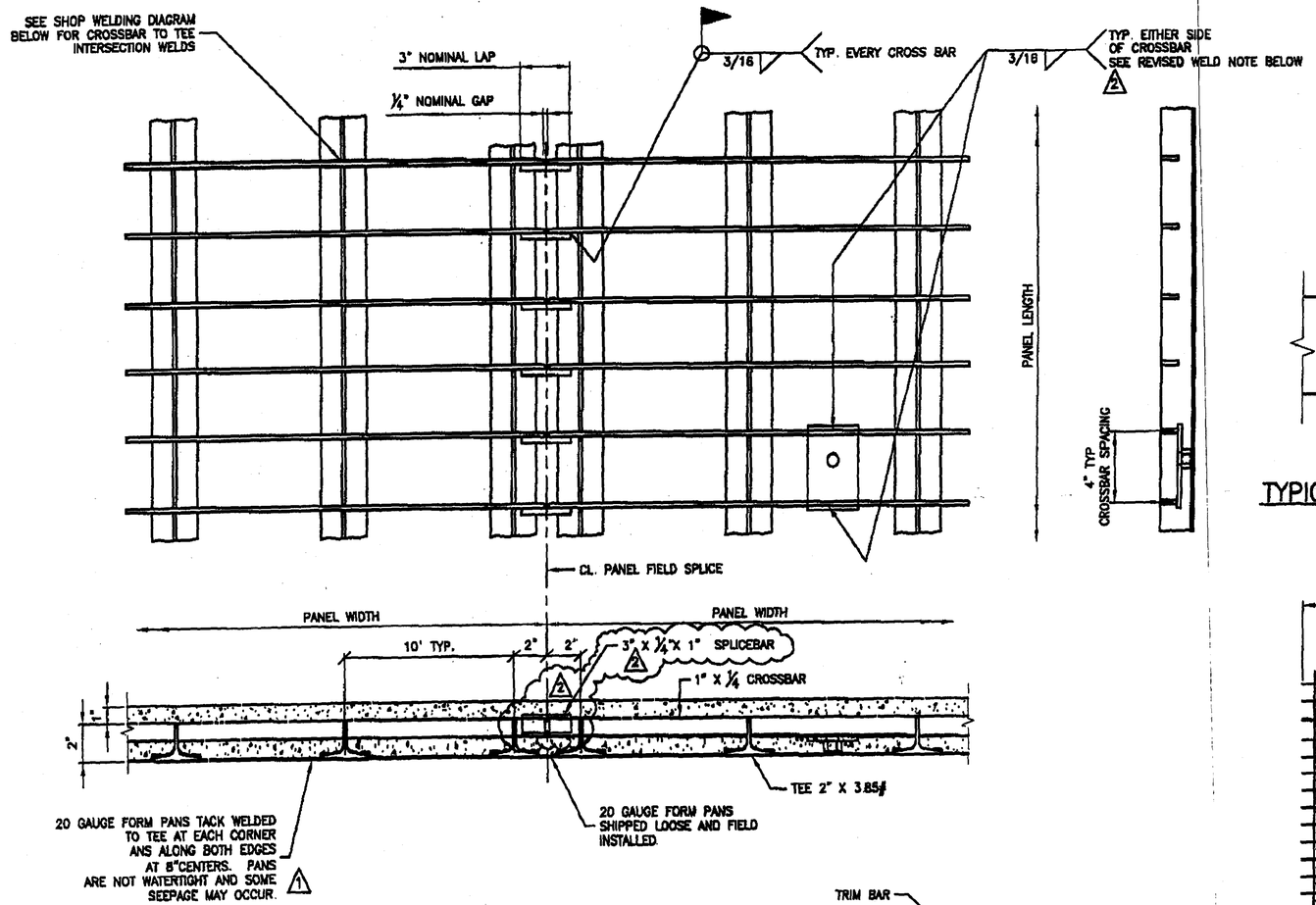
Effective Width of Deck - E = 4.225 Feet
E = (4 + 0.06S) but not over 7' (AASHTO 3.24.3.2)

Deflection of Grid under Load of Wet Concrete = 0.01724182 Inches = L / 2,610 Simple Span
(5 * W * S^4) / 384 * E_s * I

Deflection of Composite Grid Section under Live Load and Impact = 0.00264618 Inches = L / 16,993 Simple Span
(5 * W * S^4) / 384 * E_s * I

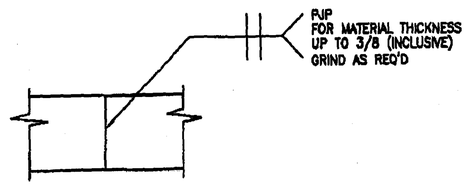
STATE OF VERMONT
DISTRICT 7 CONSTRUCTION
SHD
Shephard
LICENSED
PROFESSIONAL ENGINEER

2-26-09

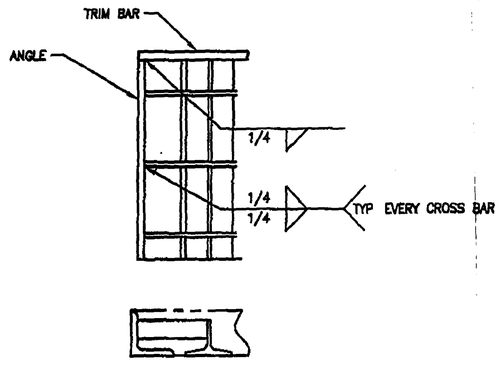


TYPICAL FLOORING DETAILS SECTION D–D

FROM LB2

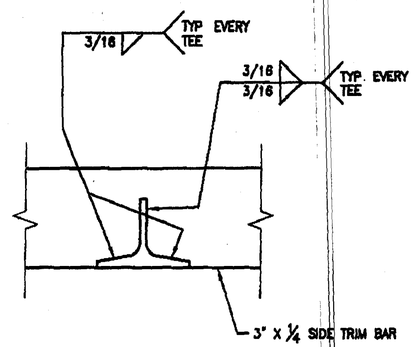


OPTIONAL SHOP SPLICE

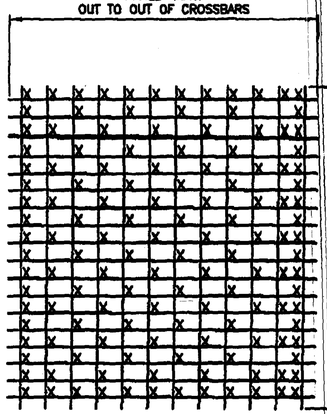


TYPICAL CORNER WELD DETAIL

STANDARD PANEL TOLERANCES	
PANEL WIDTH	+0 –1/8
PANEL LENGTH	±1/4
SQUARENESS	±1/2
TRANSVERSE CAMBER (WIDTH)	.005 x WIDTH
LONGITUDINAL CAMBER (LENGTH)	.003 x LENGTH
SIDE BOW (SWEEP)	±1/4 PER 10'–0"
MAIN BAR VERTICALITY	±1/8
CROSS BAR VERTICALITY	±1/16



TYPICAL TRIM ATTACHMENT



SHOP WELDING DIAGRAM

X = WELD 2" TEE AND CROSSBAR INTERSECTIONS WITH A 3/16 FILLET WELD X 3/8" LONG IN ONE QUADRANT. WELD MAY BE IN ANY QUADRANT.

2 WELD ALL ADJACENT INTERSECTIONS TO LEVELING PLATE.

MATERIAL SPECIFICATIONS

DESCRIPTION	ASTM	ALLOY / GR.	REMARKS
TEE & CROSSBAR	A 36		GALV'D A123
TRIM PLATES	A 36		GALV'D A123
LEVELING PLATES	A 36		GALV'D A123
20 GA. FORM PAN	A 366		BLACK (SHOP INSTALLED PANS)
20 GA. FORM PAN	A 653	GR. 80 OR BETTER	GALV'D (FIELD INSTALLED PANS)
ALL THREAD ROD	F 1554		GALV'D A153
HEX NUTS	A 563		GALV'D A153
TEK SCREWS			S-MD 8-18X1/2 HWH #4 ZINC PLATED

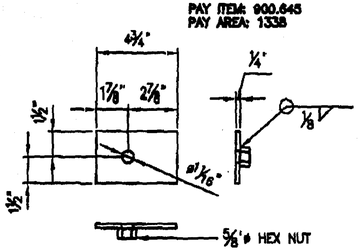
GENERAL NOTES:

MATERIAL AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH STATE OF VERMONT AGENCY OF TRANSPORTATION 2006 STANDARD SPECIFICATIONS FOR CONSTRUCTION, AND ITS LATEST REVISIONS, THE AASHTO STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES, DATED 2002 AND THE SPECIAL PROVISIONS.

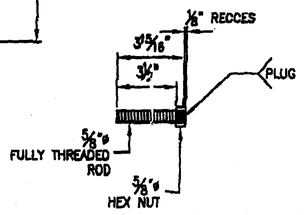
SHOP WELDING SHALL BE PERFORMED BY THE GAS METAL ARC PROCESS (MIG) USING ER70S-3 FILLER METAL PER AWS D1.5 OF THE BRIDGE WELDING CODE.

AFTER FABRICATION, GRID PANELS SHALL BE HOT DIPPED GALVANIZED PER ASTM A123. DUE TO THE GALVANIZING PROCESS, PANELS MAY HAVE SOME DISTORTION AND SIDE SWEEP WHICH WILL REQUIRE ADJUSTMENT BY THE CONTRACTOR PRIOR TO INSTALLATION.

PAY ITEM: 900.645
PAY AREA: 1338



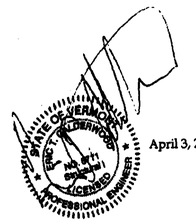
FAB'D. LEVELING PL.



FAB'D. LEVELING BOLT

SHOP DRAWINGS ARE REVIEWED UNLESS NOTED OTHERWISE	
NO EXCEPTION TAKEN	✓
REVISE AS NOTED RESUBMISSION NOT REQUIRED	
REVISE AS NOTED RESUBMISSION REQUIRED	
REJECTED	
DATE 4/15/09	
SIGNATURE	

REVIEW BY STANTEC IS FOR THE SOLE PURPOSE OF ASCERTAINING GENERAL CONFORMITY WITH DESIGN. CONTRACTOR IS RESPONSIBLE FOR DIMENSIONS, FABRICATION AND CONSTRUCTION METHODS, COORDINATION OF SUB-TRADES, DETAIL DESIGN OF COMPONENTS, AND ERRORS OR OMISSIONS ON SHOP DRAWINGS.



April 3, 2009

APPROVED: _____ DATE APP. _____

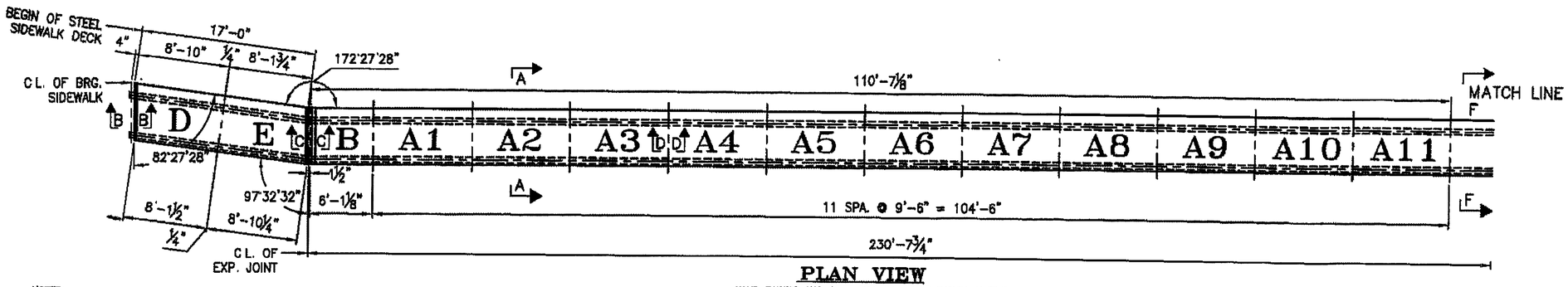
DIVISION _____

L. B. FOSTER CO.
GENERAL OFFICES
PITTSBURGH, PENNSYLVANIA 15220

FOR: STATE OF VERMONT
STATE OF VERMONT AGENCY OF TRANSPORTATION
TOWN OF RICHMOND HIGHWAY T.H.#1 BRIDGE #31
TOWN HIGHWAY #1 OVER WINOOSKI RIVER BHF 020(5)
2" TEE GRID GENERAL NOTES AND TYPICAL DETAILS

DWG BLJ DATE 01/19/09 JOB NO. SD0284 DWG. NO. _____
CHECK CMS DATE 02/04/09 DRAWING LB1 REV. NO. 2

REV	DESCRIPTION	BY	DATE	CHK'D
2	REVISED PER CHANGE TO SPLICE BAR ADDITIONAL WELD	BLJ	04 01 09	
1	REVISED PER INTERNAL CHECK	BLJ	03 23 09	



PLAN VIEW

HAND RAILING AND POST ASSEMBLY NOT SHOWN IN PLAN

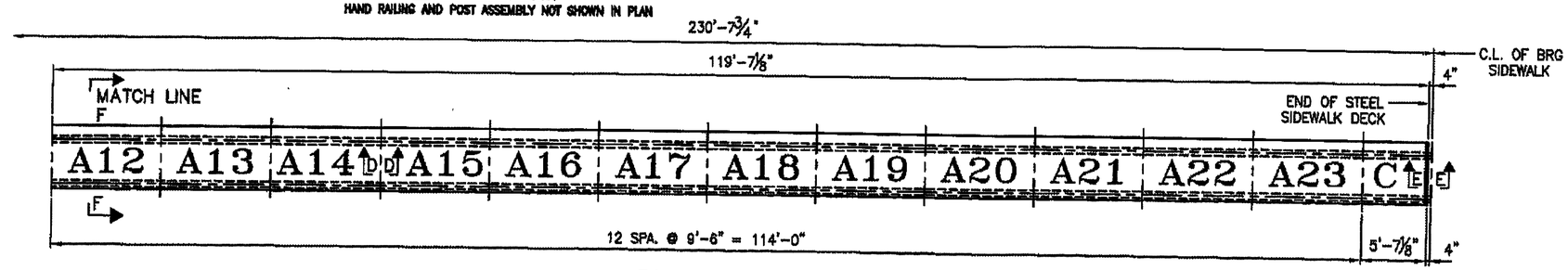
NOTES:

DURING ERECTION OF GRID FLOOR UNITS, CARE MUST BE EXERCISED, TO PLACE EACH UNIT IN ITS PROPER LOCATION, MEASURING IN ALL CASES FROM SOME FIXED POINT AS OTHERWISE A CUMULATIVE ERROR IN SPACING WILL APPEAR CAUSING THE SPACE FOR THE FINAL UNITS TO BE MORE OR LESS THAN THE ACTUAL WIDTH OF UNITS.

PANELS WITH LIKE MARKS SUCH AS A1. A2 ARE ALIKE AND INTERCHANGEABLE

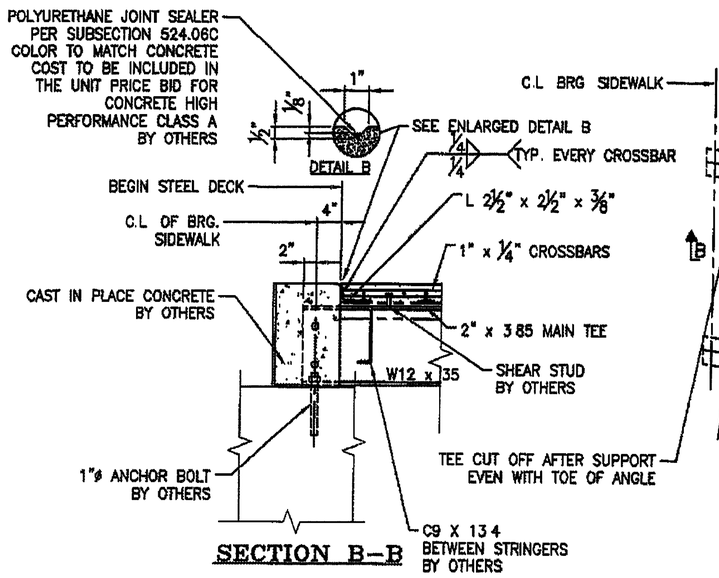
FOR SECTION A–A SEE DRAWING SHEET LB3
FOR SECTION B–B SEE DRAWING SHEET LB2
FOR SECTION C–C SEE DRAWING SHEET LB3
FOR SECTION D–D SEE DRAWING SHEET LB1
FOR SECTION E–E SEE DRAWING SHEET LB3

PANEL IDENTIFICATION LETTER / NUMBER WELDED TO OUTSIDE FACE OF MAIN TEE STEM LOWER RIGHT HAND CORNER OF PANEL IN PLAN.

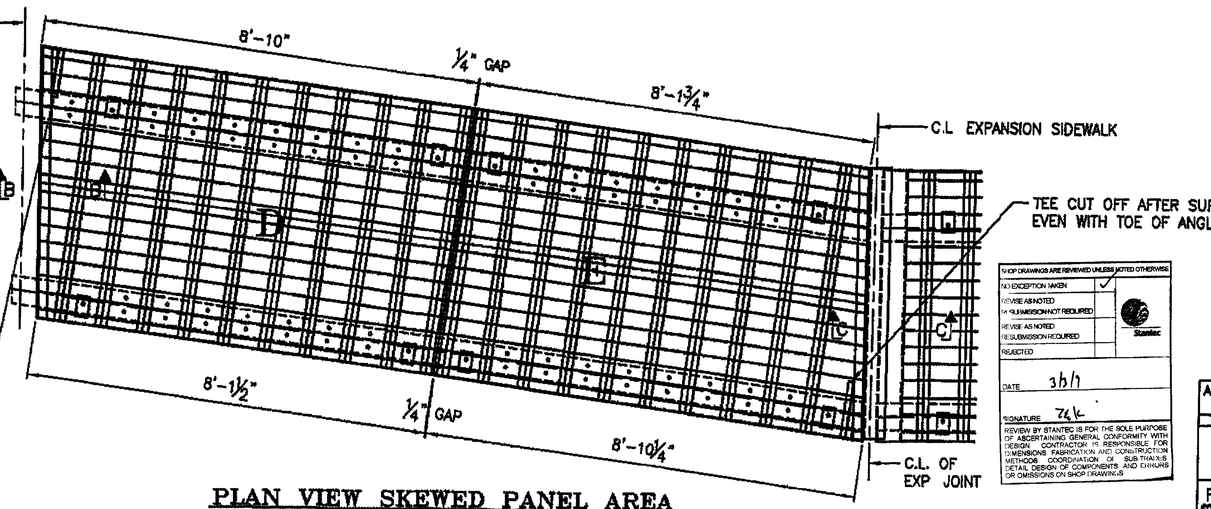


PLAN VIEW

HAND RAILING AND POST ASSEMBLY NOT SHOWN IN PLAN



SECTION B–B



PLAN VIEW SKEWED PANEL AREA

HAND RAILING AND POST ASSEMBLY NOT SHOWN IN PLAN

FORM PANS NOT SHOWN IN PLAN

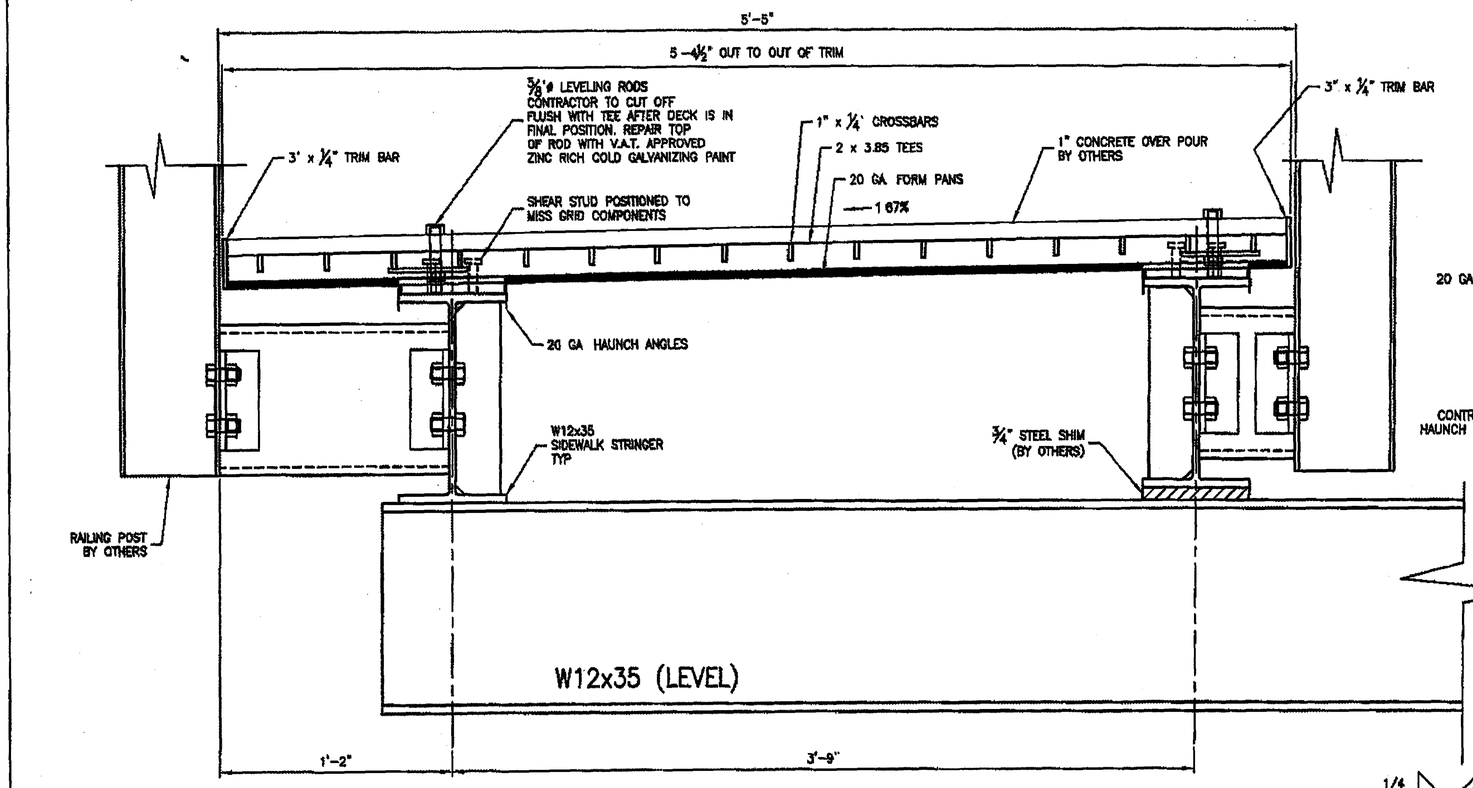
SHOP DRAWINGS ARE REVIEWED UNLESS NOTED OTHERWISE
NO EXCEPTION TAKEN
REVISE AS NOTED
RESUBMISSION REQUIRED
REVISE AS NOTED
RESUBMISSION REQUIRED
REJECTED
DATE 3/6/09
SIGNATURE
REVIEW BY STANTEC IS FOR THE SOLE PURPOSE OF ASCERTAINING GENERAL CONFORMITY WITH DESIGN. CONTRACTOR IS RESPONSIBLE FOR DIMENSIONS, FABRICATION AND CONSTRUCTION METHODS, COORDINATION OF SUB-TRADES, DETAIL DESIGN OF COMPONENTS AND ERRORS OR OMISSIONS ON SHOP DRAWINGS

2-26-09
ERIC T. BALDERWOOD
STATE OF VERMONT
No. 8711
Structural
LICENSED
PROFESSIONAL ENGINEER

APPROVED:

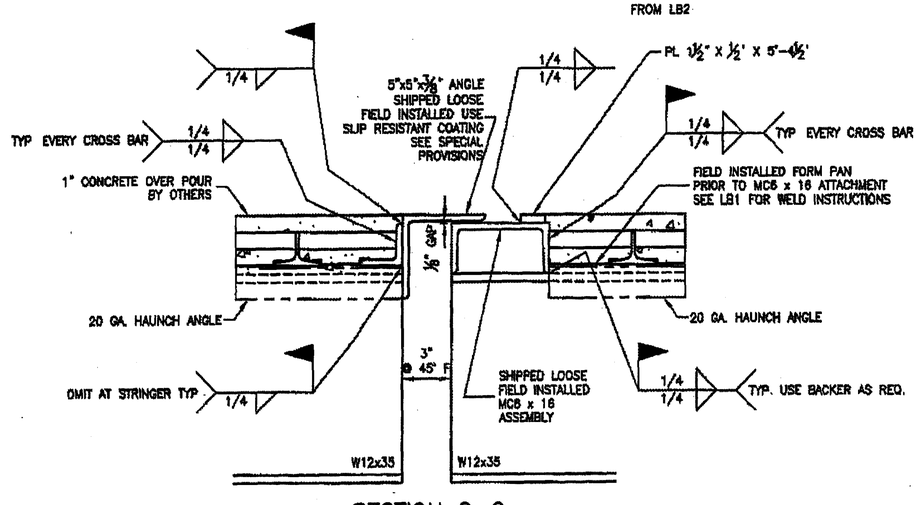
L. B. FOSTER CO.
GENERAL OFFICES
PITTSBURGH, PENNSYLVANIA 15220

FOR: STATE OF VERMONT
STATE OF VERMONT AGENCY OF TRANSPORTATION
TOWN OF RICHMOND HIGHWAY T.H.#1 BRIDGE #31
TOWN HIGHWAY #1 OVER WINOOSKI RIVER BHF 0209(5)
BRIDGE PLAN VIEW



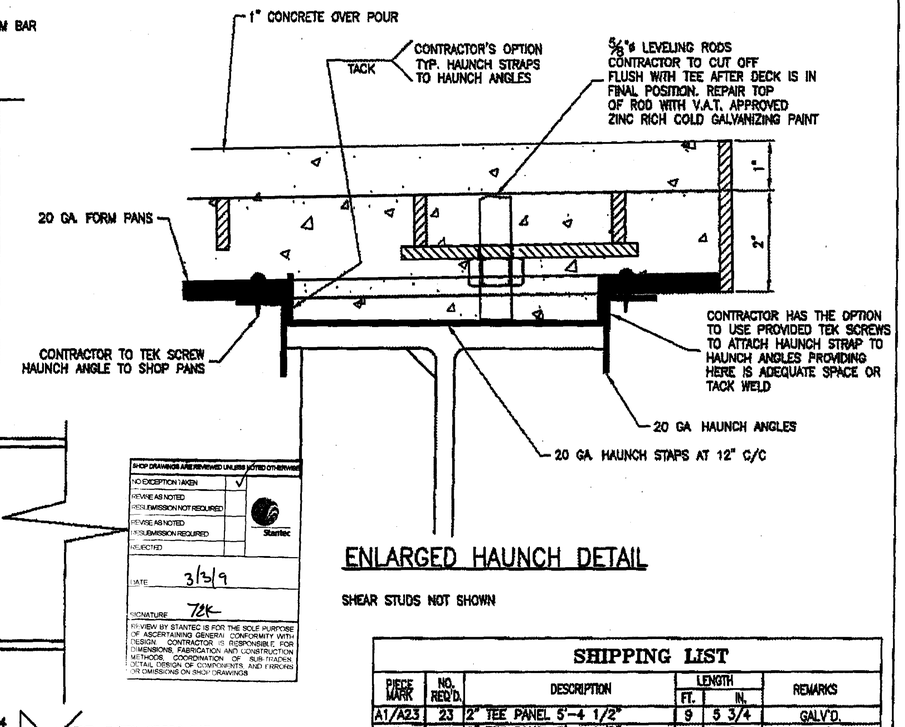
SECTION A-A

FROM LB2



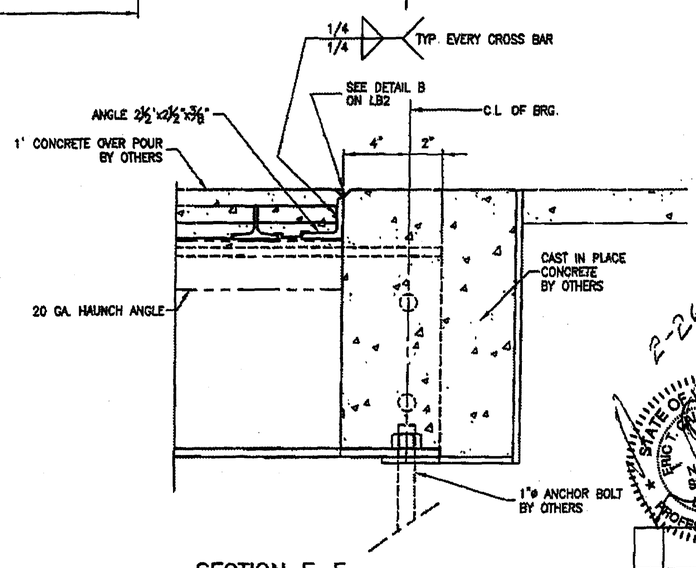
SECTION C-C

FROM LB2



ENLARGED HAUNCH DETAIL

SHEAR STUDS NOT SHOWN



SECTION E-E

FROM LB2

SHIPPING LIST

PIECE MARK	NO. REQ'D.	DESCRIPTION	LENGTH FT.	LENGTH IN.	REMARKS
A1/A23	23	2" TEE PANEL 5'-4 1/2"	9	5 3/4	GALV'D.
B	ONE	2" TEE PANEL 5'-4 1/2"	5	7	GALV'D.
C	ONE	2" TEE PANEL 5'-4 1/2"	5	7	GALV'D.
D	ONE	2" TEE PANEL 5'-4 1/2"	8	10	GALV'D.
E	ONE	2" TEE PANEL 5'-4 1/2"	8	10 1/4	GALV'D.
FP500	25	20 GA. FIELD PANS 2 1/2		2 1/4	GALV'D.
FP600	25	20 GA. FIELD PANS 2 1/2	3	2 1/2	GALV'D.
FP700	25	20 GA. FIELD PANS 2 1/2		10 1/4	GALV'D.
FP800	ONE	20 GA. FIELD PANS 4 3/8		2 1/4	GALV'D.
FP900	ONE	20 GA. FIELD PANS 4 3/8	3	2 1/2	GALV'D.
FP110	ONE	20 GA. FIELD PANS 4 3/8		10 1/4	GALV'D.
SP4	500	20 GA. GALV'D. HAUNCH STRAP		6 1/2	ALONG STRINGERS
HA4	117	20 GA. GALV'D. HAUNCH ANGLES	8	6	ALONG STRINGERS
LB1	108	5/8"ø LEVELING ROD w/NUT		3 15/16	GALV'D.
VTK1	2500	SMD 8-18 HWH #4 ZINC PLATED		1/2	SHIP TO JOB SITE
EX1	ONE	EXPANSION ANGLE 5x5x 3/8	5	4 1/2	GALV'D.
MC1	ONE	MC8 x 18 w/ STOP PL.	5	4 1/2	GALV'D.
SB1	400	3" x 3/8" x 5/8" BAR			CROSSBAR SPLICE

SHOP DRAWINGS ARE REVIEWED UNLESS NOTED OTHERWISE
NO EXCEPTION TAKEN ✓
MAKE AS NOTED
RESUBMISSION NOT REQUIRED
MAKE AS NOTED
RESUBMISSION REQUIRED
REJECTED
DATE 3/3/9
SIGNATURE TEK
Stantec
REVIEW BY STANTEC IS FOR THE SOLE PURPOSE OF ASCERTAINING GENERAL CONFORMITY WITH DESIGN. CONTRACTOR IS RESPONSIBLE FOR DIMENSIONS, FABRICATION AND CONSTRUCTION METHODS, COORDINATION OF SUB-TRADES, DETAIL DESIGN OF COMPONENTS, AND ERRORS OR OMISSIONS ON SHOP DRAWINGS

2-26-09
STATE OF VERMONT
PRINCETON CALDERWOOD
No. 8711
Structural
LICENSED
PROFESSIONAL ENGINEER

APPROVED: _____ DATE APPR. _____ DRAWING _____

L. B. FOSTER CO.
GENERAL OFFICES
PITTSBURGH, PENNSYLVANIA 15220

FOR: STATE OF VERMONT
STATE OF VERMONT AGENCY OF TRANSPORTATION
TOWN OF RICHMOND HIGHWAY T.H. #1 BRIDGE #31
TOWN HIGHWAY #1 OVER WINOOSKI RIVER BHF 0209(5)
2" TEE GRID GENERAL NOTES AND TYPICAL DETAILS

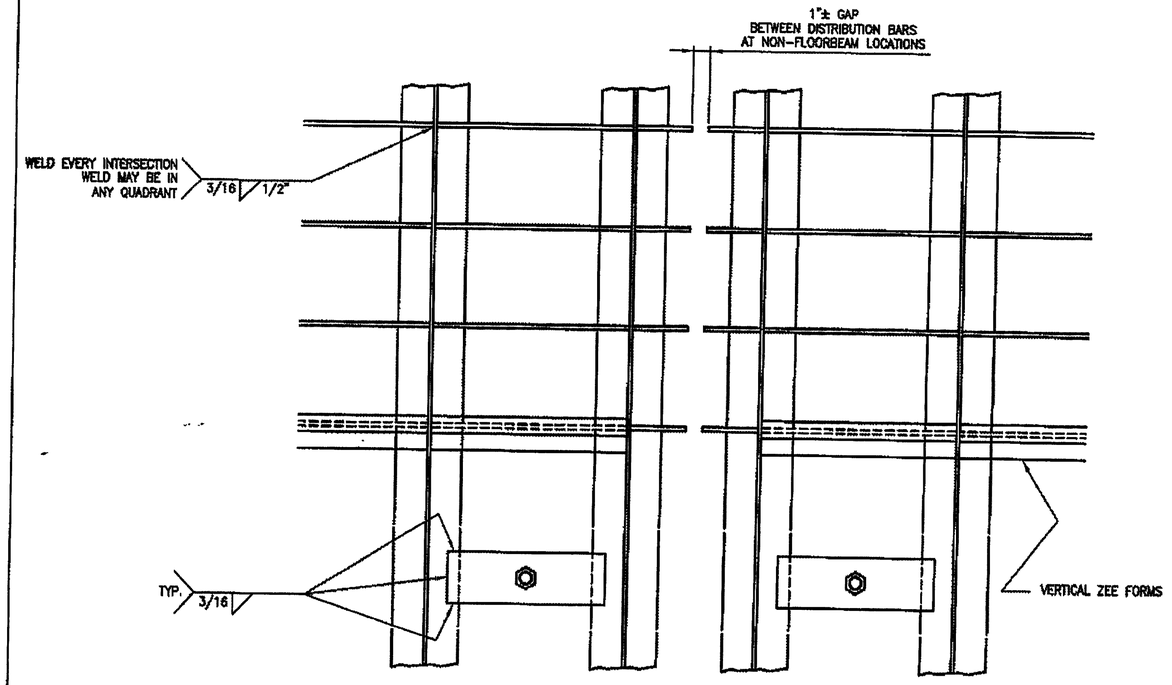
DRAWN BLJ DATE 01/23/09 JOB NO. SD0264 DWG. NO.
CHECK CMS DATE 02/04/09 DRAWING LB3 REV. NO.

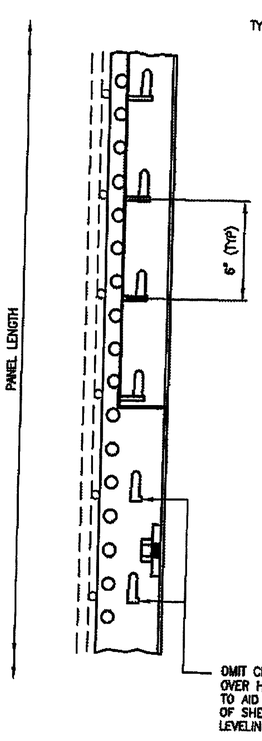
REV	DESCRIPTION	BY	DATE	CHK'D

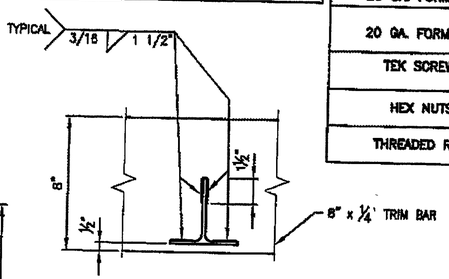
STANDARD PANEL TOLERANCES	
PANEL WIDTH	+0 −1/8
PANEL LENGTH	±1/4
SQUARENESS	±1/2
TRANSVERSE CAMBER (WIDTH)	.005 x WIDTH
LONGITUDINAL CAMBER (LENGTH)	.003 x LENGTH
SIDE BOW (SWEEP)	±1/4 PER 10'-0"
MAIN BAR VERTICALITY	±1/8
CROSS BAR VERTICALITY	±1/16

MATERIAL SPECIFICATIONS

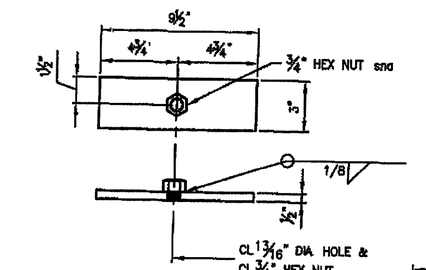
DESCRIPTION	ASTM	ALLOY / GR.	REMARKS
WT4 X 5 AND DISTRIBUTION BARS CROSS BARS	A 572	50	GALV'D W/ PANEL
LEVELING PLATES	A 572	50	GALV'D W/ PANEL
20 GA. FORM PAN	A 366		BLACK AS/S W/ PANEL (SHOP WELDED VERTICAL PANS)
20 GA. FORM PAN	A 653	GR 90 OR BETTER	GALV'D (FIELD INSTALLED PANS)
TEK SCREWS			SMD 8-18 X 1/2 HWH #4 ZINC PLATED
HEX NUTS	A 563	GR. DH	BLACK-TAPPED OVERSIZE SHOP WELD TO LW PLS & LEVELING BOLTS AS/S W/ PANEL
THREADED ROD	F 1554		GALV'D LEVELING BOLTS



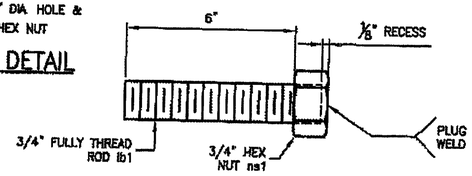




TYPICAL TRIM ATTACHMENT



FAB'D LEVELING PLATE DETAIL



FAB'D LEVELING BOLT DETAIL ~ LB1

GENERAL NOTES:

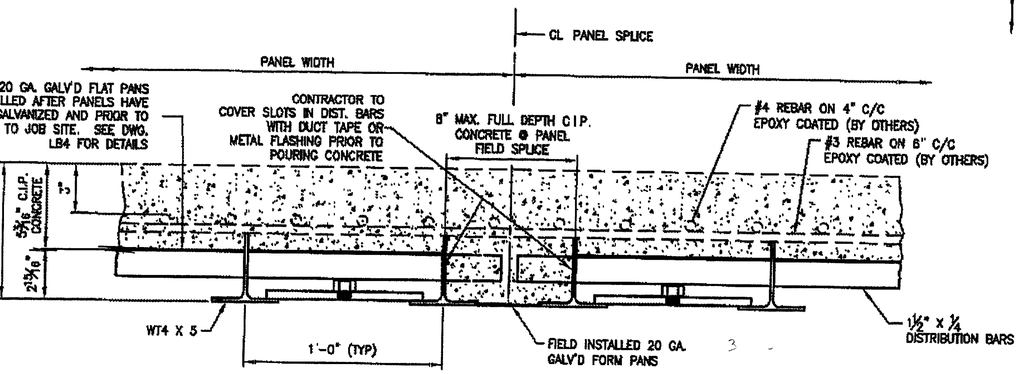
MATERIAL AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH STATE OF VERMONT AGENCY OF TRANSPORTATION 2006 STANDARD SPECIFICATIONS FOR CONSTRUCTION, AND ITS LATEST REVISIONS, THE AASHTO STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES, DATED 2002 AND THE SPECIAL PROVISIONS.

SHOP WELDING SHALL BE PERFORMED BY THE GAS METAL ARC PROCESS (MIG) USING ER70S-3 FILLER METAL PER AWS D1.5 OF THE BRIDGE WELDING CODE.

AFTER FABRICATION, GRID PANELS SHALL BE HOT DIPPED GALVANIZED PER ASTM A123. DUE TO THE GALVANIZING PROCESS, PANELS MAY HAVE SOME DISTORTION AND SIDE SWEEP WHICH WILL REQUIRE ADJUSTMENT BY THE CONTRACTOR PRIOR TO INSTALLATION.

CHASE THREADS ON LEVELING NUTS AFTER GALVANIZING.

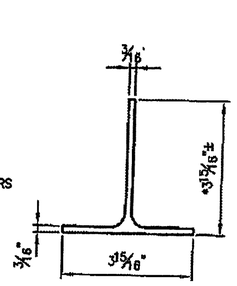
PAY ITEM:
PAY AREA:



4 4/16
4 7/8

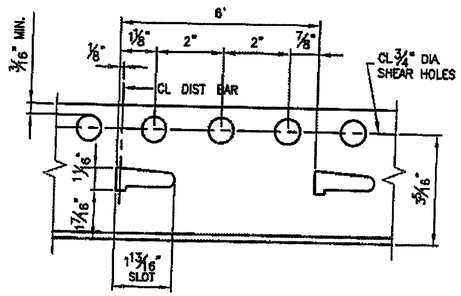
TYPICAL FLOORING DETAILS

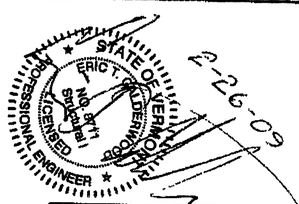
FORM PANS NOT SHOWN IN PLAN



WT 4 X 5 DETAIL

*DUE TO MILL TOLERANCES, THE WT4 X 5 MAY VARY IN HEIGHT





DATE	DESCRIPTION	BY	DATE	CHK'D

APPROVED: _____ DATE APPL. SIGNED

L. B. FOSTER CO.
GENERAL OFFICES
PITTSBURGH, PENNSYLVANIA 15220

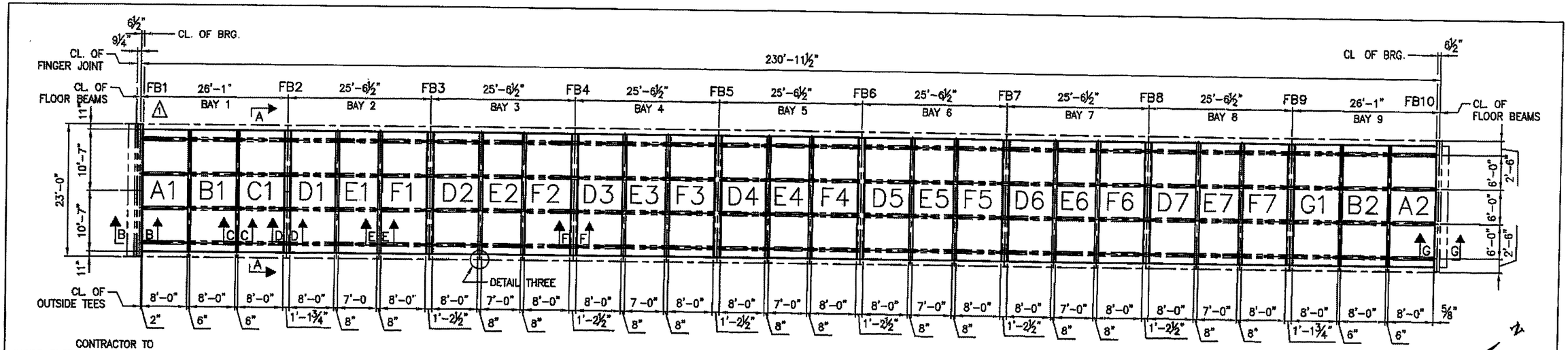
FOR: STATE OF VERMONT
STATE OF VERMONT AGENCY OF TRANSPORTATION
TOWN OF RICHMOND HIGHWAY T.H.#1 BRIDGE #31
TOWN HIGHWAY #1 OVER WINOOSKI RIVER BHF 0209(5)
GENERAL NOTES AND TYPICAL DETAILS

MADE BLJ DATE 01/28/09 JOB No. SD0265 CONT. NO.
CHECK CMS DATE 02/04/09 DRAWING LB1 REV. NO.

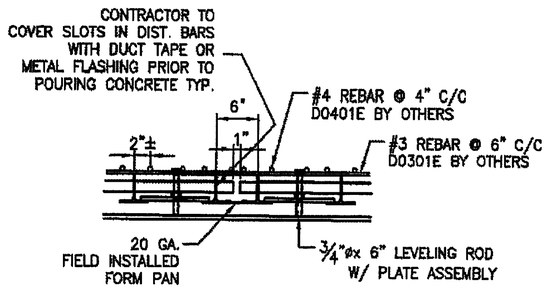
DRAWINGS ARE REVIEWED AS NOTED BELOW:	
EXCEPTION TAKEN	
DWG. RESUBMITTED	
SUBMISSION NOT REQUIRED	
DWG. RESUBMITTED	
SUBMISSION REQUIRED	
REJECTED	

DATE 5/2/07

SIGNATURE: THE REVIEW IS FOR THE SOLE PURPOSE OF ASCERTAINING CONFORMANCE WITH THE GENERAL DESIGN. THE CONTRACTOR IS RESPONSIBLE FOR DIMENSIONS, FABRICATION PROCESSES AND TECHNIQUES OF CONSTRUCTION, COORDINATION OF HIS WORK WITH THAT OF ALL OTHER TRADES, AND THE SATISFACTORY PERFORMANCE OF HIS WORK. REVIEW OF SHOP DRAWINGS DOES NOT RELIEVE THE CONTRACTOR OF RESPONSIBILITY FOR DIMENSIONS OR DIMENSIONS ON SHOP DRAWINGS.

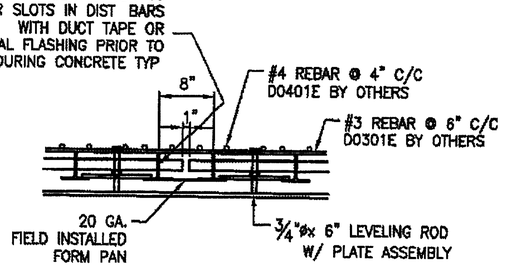


PLAN VIEW



SECTION C–C

STRINGER HAUNCH NOT SHOWN
VERTICAL ZEES NOT SHOWN



SECTION E–E

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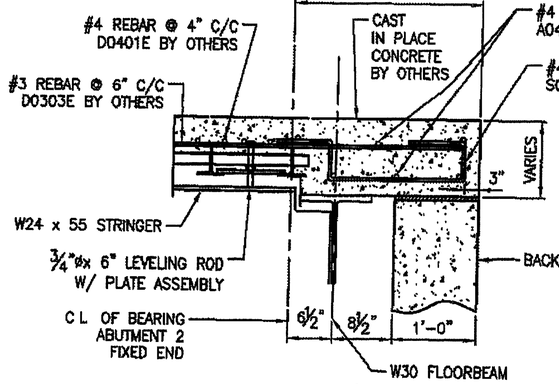
VERTICAL ZEES NOT SHOWN



SECTION G–G

STRINGER HAUNCH NOT SHOWN
VERTICAL ZEES NOT SHOWN

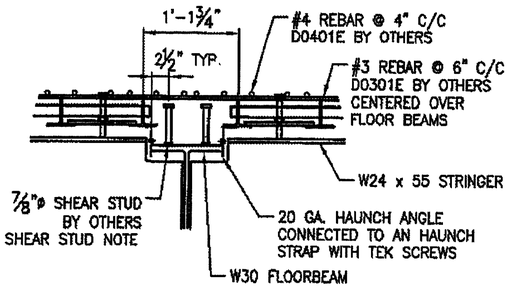
NOTES:

DURING ERECTION OF GRID FLOOR UNITS CARE MUST BE EXERCISED, TO PLACE EACH UNIT IN ITS PROPER LOCATION, MEASURING IN ALL CASES FROM SOME FIXED POINT AS OTHERWISE A CUMULATIVE ERROR IN SPACING WILL APPEAR CAUSING THE SPACE FOR THE FINAL UNITS TO BE MORE OR LESS THAN THE ACTUAL WIDTH OF UNITS.

PANELS WITH LIKE MARKS SUCH AS D1 D2, ARE ALIKE AND INTERCHANGEABLE

FOR SECTION A–A SEE DRAWING SHEET LB3
FOR SECTION B–B SEE DRAWING SHEET LB3
FOR SECTION C–C SEE DRAWING SHEET LB2.
FOR SECTION D–D SEE DRAWING SHEET LB2
FOR SECTION E–E SEE DRAWING SHEET LB2.
FOR SECTION F–F SEE DRAWING SHEET LB2
FOR SECTION G–G SEE DRAWING SHEET LB2
FOR DETAIL THREE SEE DRAWING SHEET LB2

PANEL IDENTIFICATION LETTER & NUMBER WELDED TO OUTSIDE FACE OF MAIN TEE STEM UPPER LEFT HAND CORNER OF PANEL IN PLAN



SECTION D–D

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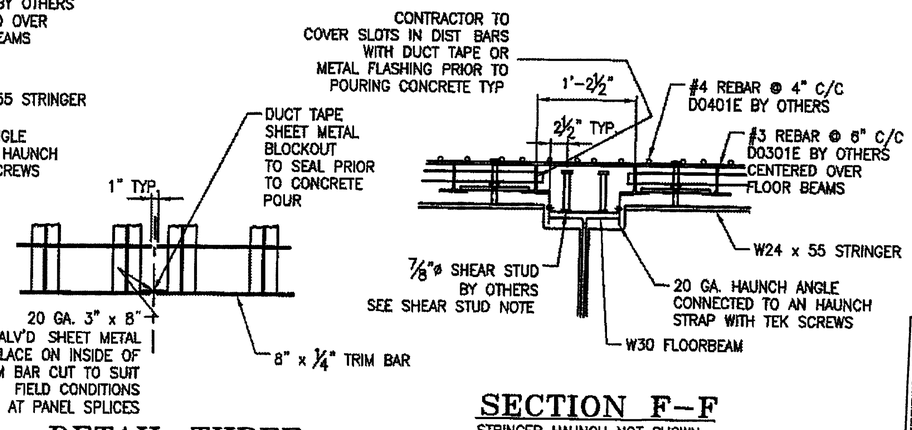
VERTICAL ZEES NOT SHOWN



SECTION F–F

STRINGER HAUNCH NOT SHOWN
VERTICAL ZEES NOT SHOWN

DETAIL THREE

⚠1 REMOVED NOTE:

LIFTING NOTES:

USE LIFTING POINT ADJACENT TO LEVELING DEVICE LOCATION. LIFT AT MIN. OF FOUR CORNERS. USES OF A RIDGED LIFTING BEAM THAT PICKS IN ONLY A VERTICAL DIRECTION IS RECOMMENDED

SHEAR STUDS SHOULD BE PLACED ONLY AFTER PANELS HAVE BEEN PLACED IN FINAL LOCATION.

#3 LONGITUDINAL REBARS ARE CENTERED OVER FLOOR BEAMS WITH A TYPICAL 2'-0" LAP OCCURRING OVER PANELS A1 AND A2 AND ALL E MARKED PANELS.

STATE OF VERMONT ERIC T. WILDERWOOD No. 8711 Structural LICENSED PROFESSIONAL ENGINEER

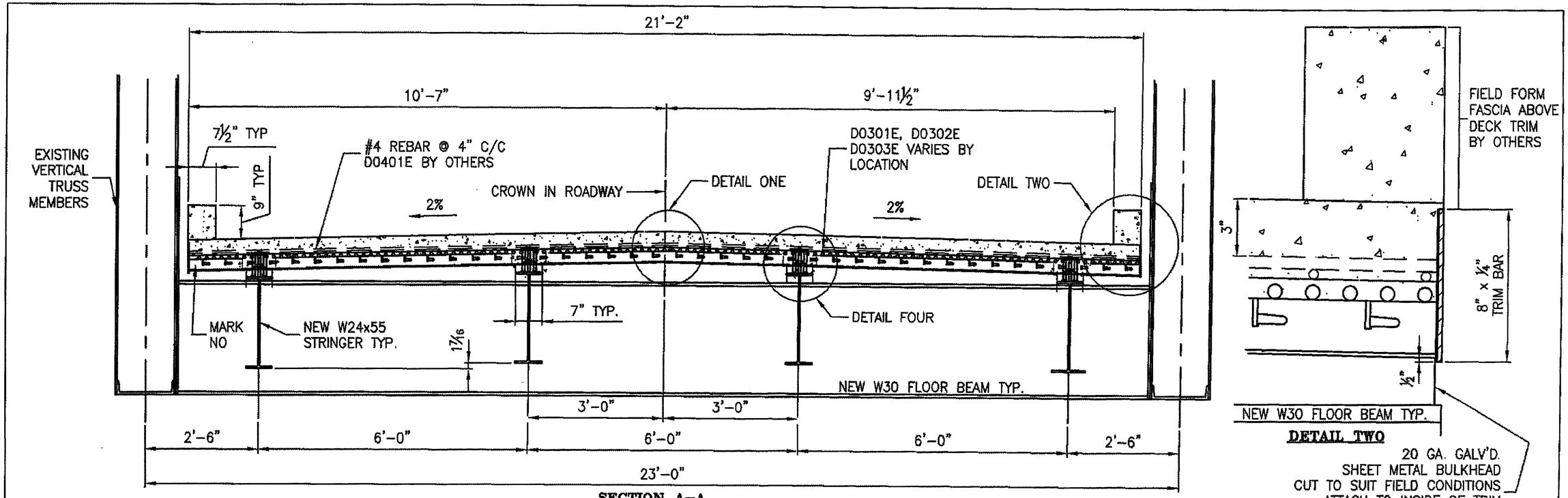
REV	DESCRIPTION	BY	DATE	CHECK
⚠1	REVISED PER INTERNAL CHECK & APPROVERS COMMENTS	B L J	02 05 09	

APPROVED: _____ DATE: _____

L. B. FOSTER CO.
GENERAL OFFICES
PITTSBURGH, PENNSYLVANIA 15220

FOR: STATE OF VERMONT
STATE OF VERMONT AGENCY OF TRANSPORTATION
TOWN OF RICHMOND HIGHWAY T.N.#1 BRIDGE #31
TOWN HIGHWAY #1 OVER WINOOSKI RIVER BHF 0209(5)
PLAN VIEW AND SECTION DETAILS

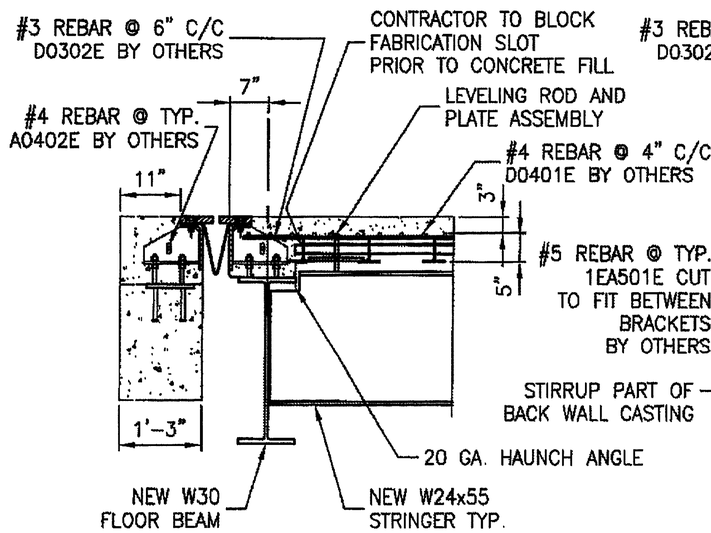
DRAWN BLJ DATE 01/27/09 JOB NO. SD0265 CUST. NO.
CHECKED CMS DATE 02/04/09 DRAWING LB2 REV. NO. 1



SECTION A-A

DETAIL TWO

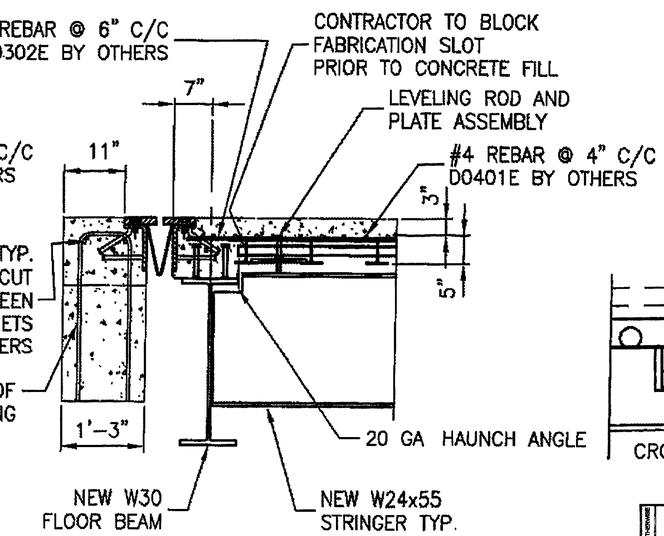
20 GA. GALV'D.
SHEET METAL BULKHEAD
CUT TO SUIT FIELD CONDITIONS
ATTACH TO INSIDE OF TRIM
AT FLOOR BEAM LOCATIONS
SEE DETAIL THREE ON LB2.



TYPICAL SECTION AT BRACKETS

STRINGER HAUNCH NOT SHOWN

SECTION B-B

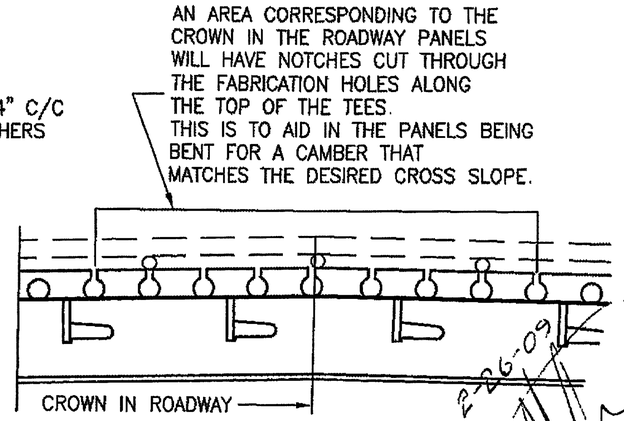


TYPICAL SECTION BETWEEN BRACKETS

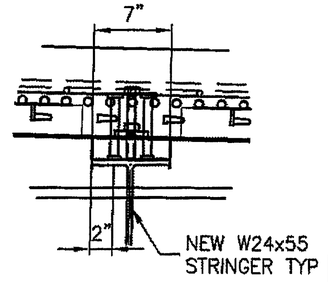
STRINGER HAUNCH NOT SHOWN

SECTION B-B

SEE CONTRACT SHEETS 5 OF 6 AND 6 OF 6 FOR IN DEPTH DETAILS OF EXPANSION JOINTS



DETAIL ONE



DETAIL FOUR

2-26-09

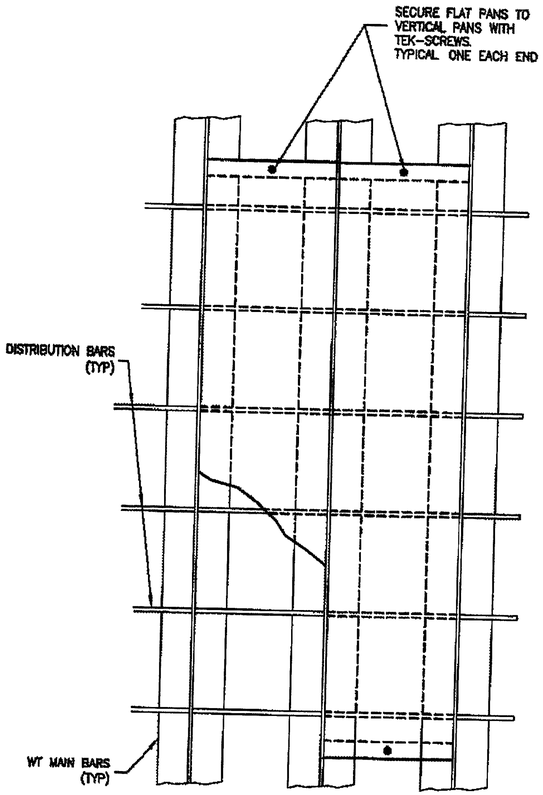
STATE OF VERMONT
ERIC T. WILDERWOOD
NO. 9711
LICENSED
PROFESSIONAL ENGINEER

APPROVED:

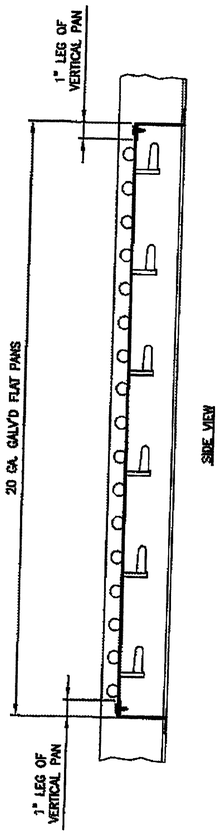
L. B. FOSTER CO.
GENERAL OFFICES
PITTSBURGH, PENNSYLVANIA 15220

FOR: STATE OF VERMONT
STATE OF VERMONT AGENCY OF TRANSPORTATION
TOWN OF RICHMOND HIGHWAY T.H.#1 BRIDGE #31
TOWN HIGHWAY #1 OVER WINOOSKI RIVER BHF 0209(5)
CROSS SECTION AND TYPICAL DETAILS

MADE BLJ DATE 01/27/09 JOB NO. SD0285 CONT. NO.
CHECK CMS DATE 02/04/09 DRAWING LB3 REV. NO.



PLAN VIEW



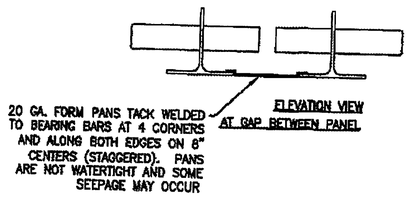
EPOXY COATED REINFORCING BAR SCHEDULE FOR ROADWAY DECKING

MARK NO.	REINFORCEMENT LOCATION	SIZE	TYPE	TOTAL NO. REQ'D.	LENGTH	COATING
D0301E	DECK LONGITUDINAL BAR CENTERED OVER FB2 THRU. FB9	#3	STR.	344	27'-6 1/2"	EPOXY
D0302E	DECK LONGITUDINAL BAR AT ABUTMENT NO. 1	#3	STR.	43	15'-0"	EPOXY
D0303E	DECK LONGITUDINAL BAR AT ABUTMENT NO. 2	#3	STR.	43	15'-10 1/2"	EPOXY
D0401E	DECK TRANSVERSE BAR CONTINUES ACROSS ALL BAYS	#4	STR.	709	~~21'-1"~~ 20'-10"	EPOXY
A0401E	DECK TRANSVERSE BAR AT ABUTMENT 2	#4	STR.	6	~~21'-1"~~ 20'-10"	EPOXY
A0402E	DECK TRANSVERSE BAR AT ABUTMENT 1	#4	STR.	2	~~21'-1"~~ 20'-10"	EPOXY
S0401E	STIRRUPS AT ABUTMENT 2 LENGTH NOT DISCOUNTING BENDS	#4	Ⓐ	22	3'-11"	EPOXY
1EA501E	DECK TRANSVERSE BAR AT ABUTMENT 1 CUT TO FIT	#5	STR.	8	~~21'-1"~~ 20'-10"	EPOXY

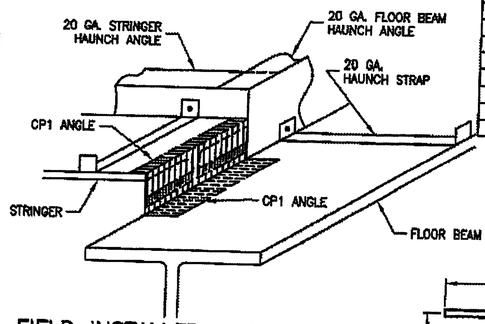
REINFORCING BAR TO BE A-615 GR, 60 EPOXY COATED (BY OTHERS)

SHIPPING LIST

PIECE MARK	NO. REQ'D.	DESCRIPTION	LENGTH FT.	LENGTH IN.	REMARKS
A1 / A2	2	EXODERMIC GRID PANEL 8'-5"	21	2	GALV'D.
B1 / B2	2	EXODERMIC GRID PANEL 8'-5"	21	2	GALV'D.
C1	ONE	EXODERMIC GRID PANEL 8'-8 1/2"	21	2	GALV'D.
D1 / D7	7	EXODERMIC GRID PANEL 8'-10 1/2"	21	2	GALV'D.
E1 / E7	7	EXODERMIC GRID PANEL 7'-7"	21	2	GALV'D.
F1 / F7	7	EXODERMIC GRID PANEL 8'-10 1/4"	21	2	GALV'D.
G1	ONE	EXODERMIC GRID PANEL 8'-8 1/2"	21	2	GALV'D.
FP100	8	20 GA. FIELD FORM PANS 2 7/8	1	2 1/4	GALV'D.
FP200	12	20 GA. FIELD FORM PANS 2 7/8	5	3	GALV'D.
FP300	28	20 GA. FIELD FORM PANS 4 7/8	1	2 1/4	GALV'D.
FP400	42	20 GA. FIELD FORM PANS 4 7/8	5	3	GALV'D.
					ALONG INTER FLOORBEAMS
SP1	898	20 GA. GALV'D.HAUNCH STRAP		9	ALONG ENDS STRINGERBEAMS
SP2	152	20 GA. GALV'D.HAUNCH STRAP		10 1/2	
SP3	38	20 GA. GALV'D.HAUNCH STRAP		10 1/2	
LB1	324	3/4"ø LEVELING BOLTS ASSEMBLY		7	GALV'D.
TK1	1700	SMD 8-18 HWH#4 ZINC PLATED		1/2	SHIP TO GALVANIZOR
TK1	4000	SMD 8-18 HWH#4 ZINC PLATED		1/2	SHIP TO JOB SITE
HA1	36	20 GA. GALV'D.HAUNCH ANGLES	1	2 1/4	AT FLOORBEAMS
HA2	54	20 GA. GALV'D.HAUNCH ANGLES	5	3	AT FLOORBEAMS
HA3	360	20 GA. GALV'D.HAUNCH ANGLES	5	0	AT STRINGERS
CP1	144	20 GA. GALV'D. COVER ANGLE PAN 1"x 2"		7	AT STRINGER COPE
BH1	56	20 GA. GALV'D. BULK HEAD PAN 3"		8	AT PANEL SPLICE
BH2	20	20 GA. GALV'D. BULK HEAD PAN 10 3/8"		10 5/8	AT FLOOR BEAM ENDS



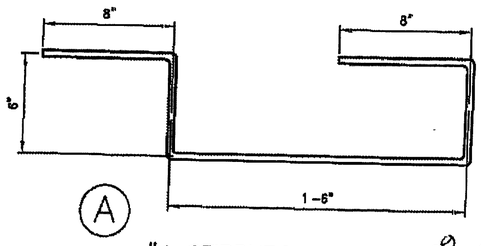
SHOP INSTALLED FULL DEPTH FORM PAN WELD DETAIL



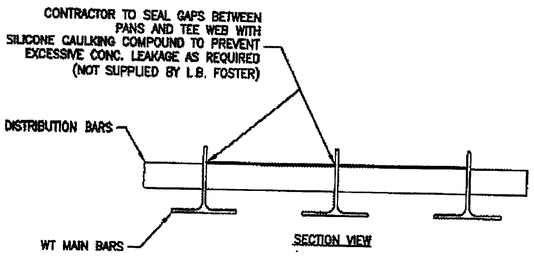
FIELD INSTALLED CP1 ANGLES

INVERT CP1'S TO FIT CONDITIONS

TEK SCREW TOGETHER ATTACH TO FLANGE

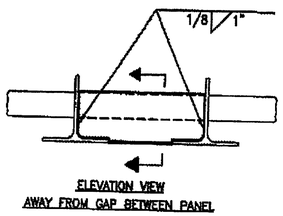


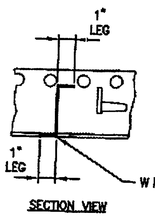
#4 STIRRUPS ~ S0401E



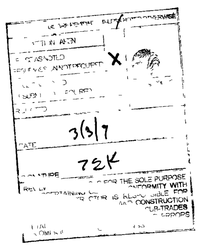
SECTION VIEW

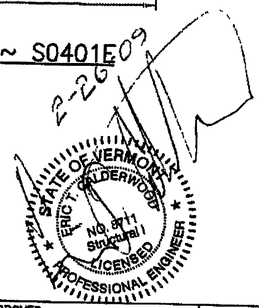
TYPICAL PAN INSTALLATION DETAILS





SHOP INSTALLED VERTICAL PAN WELD DETAIL





APPROVED: _____ DATE APP. _____ DRAWN _____

L. B. FOSTER CO.
GENERAL OFFICES
PITTSBURGH, PENNSYLVANIA 15220

FOR: STATE OF VERMONT
STATE OF VERMONT AGENCY OF TRANSPORTATION
TOWN OF RICHMOND HIGHWAY T.H. #1 BRIDGE #31
TOWN HIGHWAY #1 OVER WINOOSKI RIVER BHF 0209(5)
EXODERMIC FORM PAN INSTALLATION DETAILS

MADE BY BLJ DATE 01/27/09 JOB NO. S00265 SHT. NO. _____
CHK'D. _____ CHECK _____ DATE _____ DRAWING L84 REV. NO. _____

REV	DESCRIPTION	BY	DATE	CHK'D.

Transmittal

Stantec
55 Green Mountain Drive
South Burlington, VT 05403
P 802-864-0223
F 802-864-0165

To	Bradley Jones	From	Tom Knight
Company	LB Foster	☐	For Your Information
Address	1016 Greentree Rd	☐	For Your Approval
	Suite 300	☐	For Your Review
	Pittsburgh, PA 15220	☑	As Requested
Phone	412-928-3415		
Date	3/4/09		
File	195310243		
Delivery	Couner		

Reference: **Richmond BHF 0209(5) SDO264/SDO265**

Attachment:

Copies	Doc Date	Pages	Description
1	2/26/09	19	Exodermic Grid Deck and SW Grid Calculations
1	2/4/09	1-4	Steel Grid Flooring, Bridge – Fab Dwgs
1	2/4/09	1-3	Steel Grid Flooring, Sidewalk – Fab Dwgs
1	12/30/2004	4	LB Foster Weld Procedure – GMAW Flat & Horz

Bradley, please find the attached fabrication drawings, calcs and welding procedure for the bridge and sidewalk steel grid flooring, marked "No exception taken" except for sheet 4 of the Bridge Steel Grid Flooring dwgs, which was marked make revisions noted, resubmission not required because we are suggesting revisions to the reinforcing schedule

Stantec Consulting Ltd.

Tom Knight, PE
Project Engineer
Tel (802) 864-0223
Fax (802) 864-0165
tom.knight@stantec.com

cc

[x] Greg Wilcox - Resident Engineer (No Calcs)
[x] Brian Emmons – T Buck Construction (No Calcs)
[x] Jeff Clark – VTrans Shop Inspector (No Calcs)
[x] VTrans Materials & Research (C&IA Unit) - letter only
[x] Al Campo, VTrans Construction Division - letter only
[x] Chris Williams – VTrans Project Manager

L B. Foster Co

Welding Procedure Specification

1F (AWS)

Material Spec ASTM A709Gr 36, 50 & 50W, A588 A572 A992 Gr 36, A36

Welding Process(es) GMAW

Position of Welding Flat

Manual ☐ Machine ☐ Semi-Automatic ☒ Automatic ☐

Filler Metal Specification AWS A5 18

Filler Metal Classification ER70S-3 (Lincoln L-50 Superarc)

Flux N/A

Shielding Gas 80% Argon 20% CarbonDioxide Gas Flow Rate 30 CFH

Single or Multiple Pass Single

Single or Multiple Arc Single

Welding Current Direct Current

Polarity AC ☐ DCEP ☒ DCEN ☐ Pulsed ☐

Welding Progression Up ☐ Down ☐

Root Treatment Wire Brush

Preheat Temperature See Notes Interpass Temperature

Postheat Treatment N/A

Heat Input Min Max

TRANS
RECEIVED
FEB 04 2009

CK'D BY OK'D BY JWK

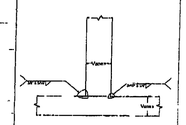
R APPROVED

BY DATE 2/11/09

WELDING PROCEDURE

Pass No	Electrode Size	Amperes	Volts	Travel Speed	Other
3/16"	0.045"	270	26	9 IPM	
1/4"	0.045"	270	26	9 IPM	
5/16"	0.045"	270	26	9IPM	
	Min	243	24	8 IPM	
	Max	297	28	10 IPM	

Joint Detail



This procedure may vary due to fabrication sequence fit-up pass size, etc , within the limitation of variables given in Section 5

Procedure No 1F (AWS) Contractor L B Foster Co

Revision No 1 Authorized By Julian M Pedrazzani Date 12/30/2004

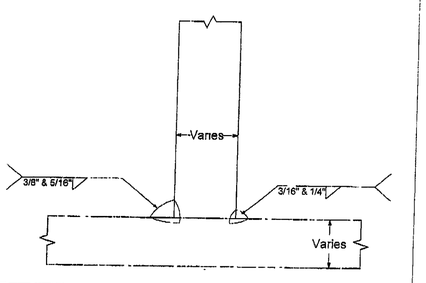
Per AWS D1 5

L.B. Foster Co.

Welding Procedure Specification

1F (AWS)

Joint Detail



MEMO

Preheat Treatment:
60 Deg F up to 3/4",
over 3/4" to 1 1/2" 70 Deg F,
over 1 1/2" to 2 1/2" 150 Deg F

Supporting PQR B-GM-06 Expire May 2011

For Bridge Flooring

Per AWS D1 5

L.B. Foster Co.

Welding Procedure Specification

2F (AWS)

Material Spec ASTM A709Gr 35, 50 & 50W, A588 A572, A992 Gr 36, A36

Welding Process(es) GMAW

Position of Welding Horizontal

Manual ☐ Machine ☐ Semi-Automatic ☒ Automatic ☐

Filler Metal Specification AWS A5 18

Filler Metal Classification ER70S-3 (Lincoln L-50 Superarc)

Flux N/A

Shielding Gas 80% Argon 20% CarbonDioxide Gas Flow Rate 30 CFH

Single or Multiple Pass Single

Single or Multiple Arc Single

Welding Current Direct Current

Polarity AC ☐ DCEP ☒ DCEN ☐ Pulsed ☐

Welding Progression Up ☐ Down ☐

Root Treatment Wire Brush

Preheat Temperature See Notes Interpass Temperature

Postheat Treatment N/A

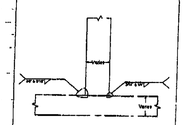
Heat Input Min Max

VT KANS
RECEIVED
FEB 04 2009
CK'D BY OK'D BY JWC
APPROVED
BY DATE 01/11/09

WELDING PROCEDURE

Pass No	Electrode Size	Amperes	Volts	Travel Speed	Other
3/16"	0.045"	270	28	9 IPM	
1/4"	0.045"	270	28	9 IPM	
	Min	243	24	8 IPM	
	Max	297	28	10 IPM	

Joist Detail



*Ina procedure may vary due to fabrication sequence fit-up, pass size, etc within the limitation of variables given in Section 5

Procedure No 2F (AWS) Contractor L. B. Foster Co

Revision No 1 Authorized By Julian M. Pedrazzani Date 12/30/2004

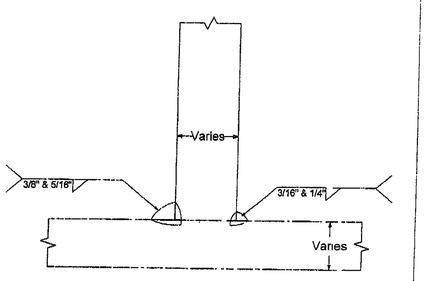
Per AWS D1.5

L.B. Foster Co.

Welding Procedure Specification

2F (AWS)

Joint Detail



MEMO

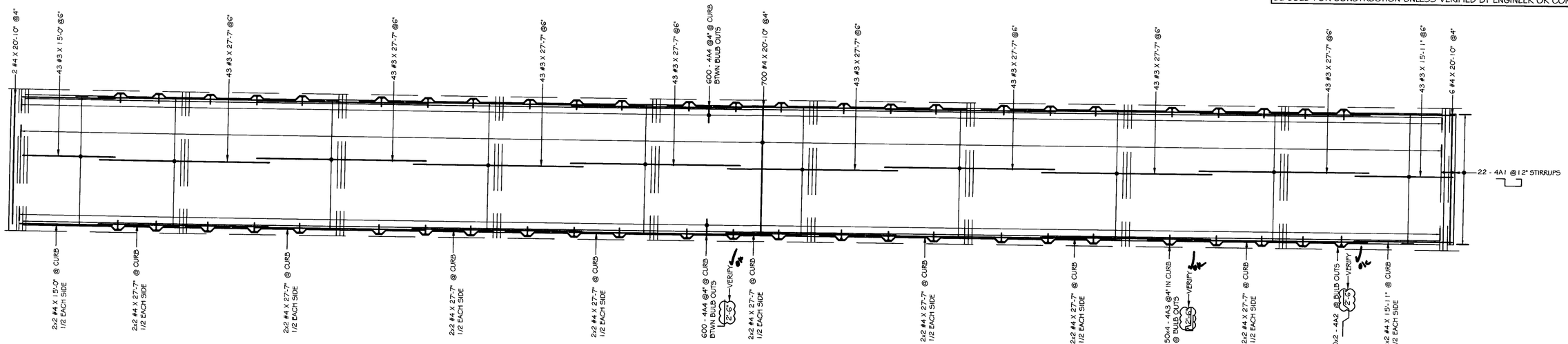
Preheat Treatment:
50 Deg F up to 3/4":
over 3/4 to 1 1/2" 70 Deg F,
over 1 1/2" to 2 1/2" 150 Deg F

Supporting PQR B QM 09 Expire May 2011

For Bridge Flooring

Per AWS D1 5

REINFORCING STEEL PLACING DRAWING ONLY USE IN CONJUCTION WITH CONTRACT DRAWINGS & SPECIFICATIONS ELEVATIONS & DIMENSIONS SHOWN ON DRAWING ARE FOR DETAILING PURPOSES ONLY AND SHOULD NOT BE USED FOR CONSTRUCTION UNLESS VERIFIED BY ENGINEER OR CONTRACTOR



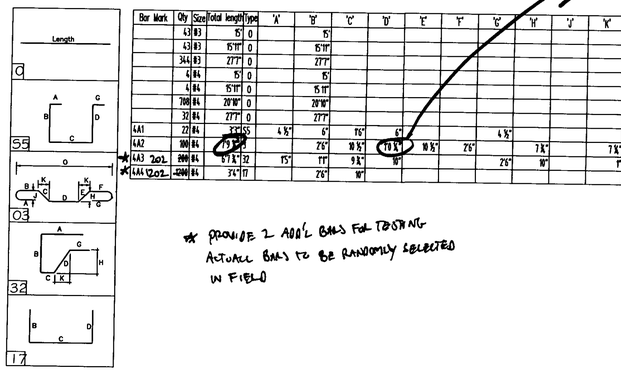
DECK REINFORING PLAN

1/8"= 1'-0"

NOTES

CONTRACTOR PLEASE VERIFY → 1. SUPPORT REBAR MAT WITH 5,000 L.F. OF 1" SBU PLACED 48" O.C.

2. BULB OUT LOCATIONS ARE SHOWN FOR REFERENCE ONLY
3. REFENCE L.B. FOSTER DRAWINGS LB1 THRU LB4 & B01 FOR DETAILS & SECTIONS
4. REVIEWER PLEASE VERIFY ALL CLOUDED ITEMS



Bar Mark	Qty	Size	Total length	Type	'A'	'B'	'C'	'D'	'E'	'F'	'G'	'H'	'J'	'K'	'O'	'W'
	43	B3	5'	0		5'										
	43	B3	15'11"	0		15'11"										
	344	B3	27'7"	0		27'7"										
	4	B4	5'	0		5'										
	4	B4	15'11"	0		15'11"										
	700	B4	20'10"	0		20'10"										
	37	B4	27'7"	0		27'7"										
4A1	22	B4	SEE SS		4 ½"	6"	16"	6"			4 ½"					
4A2	100	B4	79'8"			2'6"	10 ½"	79 ½"	10 ½"	2'6"		7 ¾"		7 ¾"	72 ½"	
★4A3 202	200	B4	9'2"	32	15"	1'1"	9 ½"	18"			2'6"	10"		1'		
★4A4 202	400	B4	3'4"	17		2'6"	10"									

9½"?

★ PROVIDE 2 ADD'L BARS FOR TESTING
ACTUAL BARS TO BE RANDOMLY SELECTED IN FIELD

...WGS ARE REVIEWED UNLESS NOTED OTHERWISE
...TION AVEN
...AS NOTED
...N ASSION NOT REQUIRED
...SE AS NOTED
...UBMISSION REQUIRED
...JECTED
Stantec
DATE 4/13/09
SIGNATURE
REVIEW BY STANTEC IS FOR THE SOLE PURPOSE OF ASCERTAINING GENERAL CONFORMITY WITH DESIGN. CONTRACTOR IS RESPONSIBLE FOR DIMENSIONS FABRICATION AND CONSTRUCTION METHODS COORDINATION OF SUB-TRADES DETAIL DESIGN OF COMPONENTS AND ERRORS OR OMISSIONS ON SHOP DRAWINGS.

SPLICES USED CLASS B UNO		ABBREVIATIONS		BAR MARK SIZE EQUIVALENT	
TOP BARS	OTHER BARS	ADD = Additional	BOW = Bottom of wall	Imperial	Soft Metric
#3 ____	#3 24"	CB = Corner Bars	DIAG = Diagonal	#3	#10
#4 ____	#4 30"	DO = Door Opening	DWLS = Dowels	#4	#13
#5 ____	#5 ____	EF = Each Face	ES = Each Side	#5	#16
#6 ____	#6 ____	EW = Each Way	FTG = Footing	#6	#19
#7 ____	#7 ____	FF = Far Face	HORIZ = Horizontal	#7	#22
#8 ____	#8 ____	IF = Inside Face	INTERS = Intersection	#8	#25
#9 ____	#9 ____	LW = long Way	NF = Near Face	#9	#29
#10 ____	#10 ____	OF = Outside Face	SW = Short Way	#10	#32
#11 ____	#11 ____	T&B = Top & Bottom	TOW = Top of Wall	#11	#36
#14 ____	#14 ____	Trans = Transverse	VERT = Vertical		

REBAR GRADE 60 EPOXY COATED

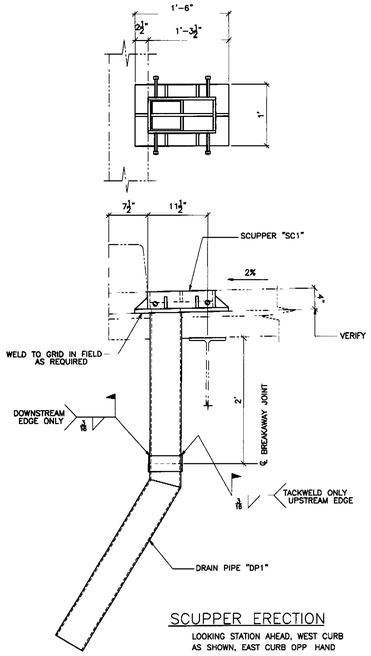
HARMAC REBAR AND STEEL CORPORATION
A Division of A.H. Harris & Sons, Inc.
Formerly MacFarlane Steel
P O Box 142
Cornshop Road
Fryeburg, ME 04037
Tel 800-294-4702
Fax 207-935-3058
301 Hartle Street
Sayreville, NJ 03301

RICHMOND BHF 0209 (6)

DECK REINFORCING

RICHMOND, VT.

DATE	04 01 09	CUSTOMER T BUCK	
REV 1		DESIGNER	
REV 2			
REV 3			
REV 4		DRAWN BY	JOB NO
APPV'D		R.M.K.	09-K-068 R-1



SCUPPER ERECTION

LOOKING STATION AHEAD, WEST CURB
AS SHOWN, EAST CURB OPP HAND

ARC JOB #08-113

WORK THIS DWG. WITH DWG 2

ERECTION BOLTS A325/A490				TERMINUS		FINISH
QUAN.	SIZE	LENGTH	TYPE	PLATE	BOX	ONLY AASHTO M232

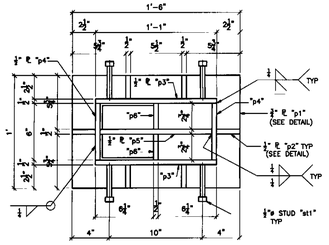
FINISH	HOT DIPPED GALVANIZED
MATERIAL	AASHTO M270 GR. 36
HOLES	AS NOTED
ELECTRODES	PER A.W.S.
WELDS	AS NOTED
SURFACE PREP	SSPC-SP6

NO	DATE	DESCRIPTION	BY
REVISIONS			

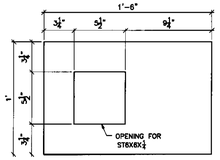
ARC
ENGINEERING CONSULTANTS, INC.

ADVANCED RESOURCES & CONST ENTERPRISES, INCORPORATED
P.O. BOX 150 SHAPLEIGH, ME 04076
PHONE (207) 324-3648 ~ FAX (207) 324-4204

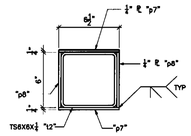
DRAWN BY	ARC	SCUPPER ERECTION	CONTRACT NO.
DATE	3/3/09	STATE AGENCY OF TRANSPORTATION, TOWN OF RICHMOND BRIDGE NO. 71 ON TOWN HIGHWAY NO. 1 (FAS 0282)	BRF 0328 (0)
CHECKED	MD	CLIENT	SHEET NO.
DATE	3/3/09	T BUCK CONSTRUCTION, INC	1

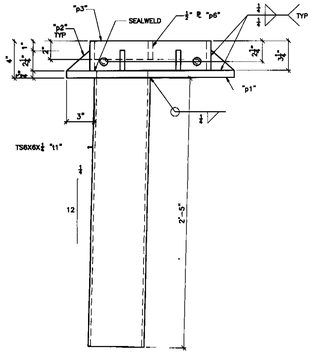


4 REQ'D. SCUPPER MARK "SC1"

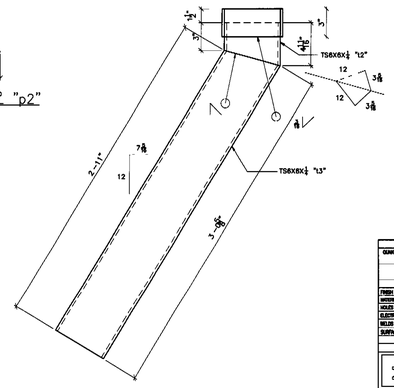


DETAIL ¾" ℄ "p1"





DETAIL ½" ℄ "p2"



4 REQ'D. DRAIN PIPE MARK "DP1"

ARC ASB 808-113

BILL OF MATERIAL

SHIP	SHIP MARK	NO. PCS	PIECE MARK	DESCRIPTION	LENGTH	REMARKS	MAT'L
4	SC1			SCUPPER			
		4	s1	TS 6X6X¼	2'-5	ASM A500 GR.B	
		4	p1	℄ 6X12	1'-6		
		24	p2	℄ 1X2	0'-2½		
		8	p3	℄ 1X3	1'-1		
		8	p4	℄ 1X3½	0'-6		
		4	p5	℄ 1X2	1'-0		
		8	p6	℄ 1X2	0'-2½		
		16	st1	½"ø DOMC STUD	0'-4		
4	DP1			DRAIN PIPE			
		4	t2	TS 6X6X¼	0'-4⅛	ASM A500 GR.B	
		4	t3	TS 6X6X¼	3'-0⅝	ASM A500 GR.B	
		8	p7	℄ 3X3	0'-6		
		8	p8	℄ 3X3	0'-6		

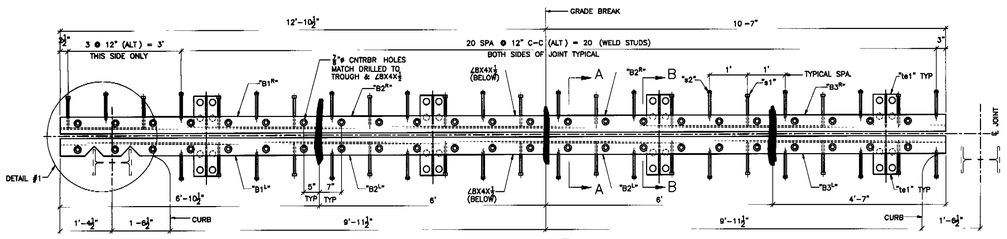
DIRECTION BOLTS W/NUTS				WASHERS		FINISH
CLIMB	SIZE	LENGTH	TYPE	PLATE	BEV	BLK. A325TC W/DR

FINISH	HOT DIPPED GALVANIZED		
MATERIAL	AASHTO M270 GR. 36		
HOLES	AS NOTED		
ELECTRODES	PER A.W.S.		
WELDS	AS NOTED		
SURFACE PREP	SSPC-SP6		

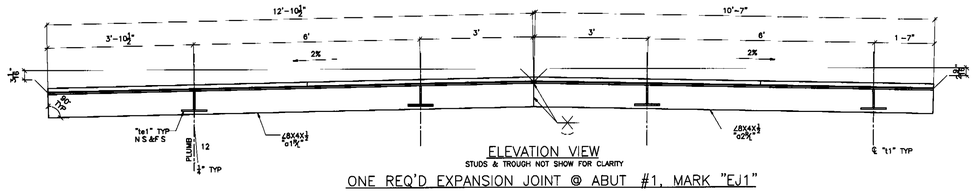
NO.	DATE	DESCRIPTION	BY
		REVISIONS	

ARC
ADVANCED RESOURCES & CONST
ENTERPRISES, INCORPORATED
P.O. BOX 130 GRANFILLS, NC. 28642
PHONE: (207) 350-3648 - FAX: (207) 350-4054

DRAWN	ARC	SCUPPER DETAILS	CONTRACT NO.
DATE	3/13/18	BRIDGE NO. 2 OVER W. PRONG BUFFALO CREEK ON SECONDARY ROAD NO. 91 (S. FORK HIGHWAY NO. 1) POLK COUNTY	SHT. ASSN (X)
CHECKED	MTD		DWG. NO.
DATE	3/13/18	T BUCK CONSTRUCTION, INC	2



PLAN VIEW

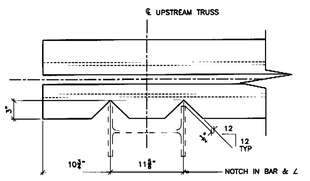


ELEVATION VIEW

STUDS & TROUGH NOT SHOW FOR CLARITY

ONE REQ'D EXPANSION JOINT @ ABUT #1, MARK "EJ1"

SEE DWG 4 FOR SECTIONS AND DETAILS NOT SHOWN
SEE DWG 5 FOR TROUGH & DOWNSPOUT



DETAIL #1

CNTRBR HOLES & WELD STUDS NOT SHOWN

NOTES

1. THE EXPANSION JOINT SHALL BE SHOP ASSEMBLED AND SHIPPED AS ONE UNIT. SHOP TO LOCATE AND ATTACH TEMPORARY SHIPPING DEVICES AS REQ'D.
2. ALL EXPOSED CUT OR SHEARED EDGES SHALL BE ROUNDED TO A ¼" RADIUS AND BE FREE OF BURRS PRIOR TO GALVANIZING

CONCRETE AREAS (S.F./U.N./A.)				ENDBEARS		FINISH
QUAN.	SIZE	LENGTH	TYPE	FLAT	BEV	WLY AASHTO M330

FINISH	HOT DIPPED GALVANIZED
MATERIAL	AASHTO M270 GR. 36
HOLES	AS NOTED
ELECTRODES	PER N.P.A.
WELDS	AS NOTED
SURFACE PREP	SSPC-SP6

NO	DATE	DESCRIPTION	BY

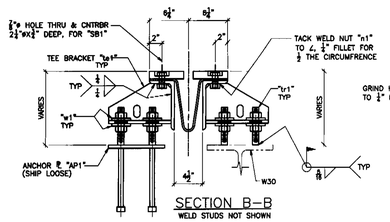
REVISIONS

ARC DESIGNERS, INC.

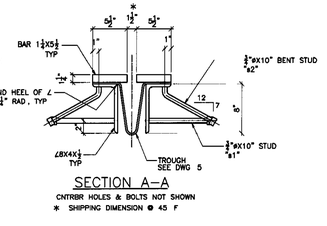
ADVANCED RESOURCES & CONST ENTERPRISES, INCORPORATED
P.O. BOX 130 HAMTRAMCK, MI. 48212
PHONE: (307) 365-3648 – FAX: (307) 365-4650

DRAWN	ARC	EXPANSION JOINT DETAILS	CONTRACT NO.
DATE	3/5/18	BRIDGE PLANS OF PROPOSED STATE OF MICHIGAN BRIDGE NO. 74 ON M-1 OVER RIVER RD. & CSX RAILROAD	SHF 0206 (0)
CHECKED	MTR		DWG. NO.
DATE	3/1/18	T. BUCK CONSTRUCTION, INC.	3

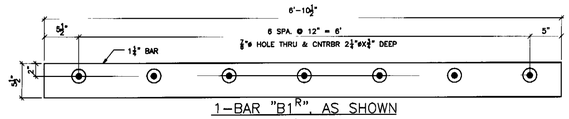
ARC JOB #08-113



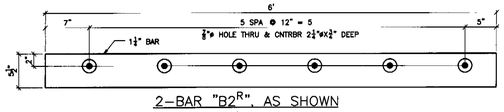
SECTION B–B
WELD STUDS NOT SHOWN



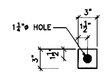
SECTION A–A
CNTRBR HOLES & BOLTS NOT SHOWN
* SHIPPING DIMENSION ⌀ 45 F



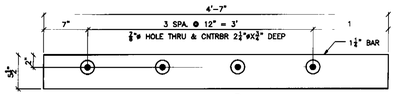
1–BAR "B1^{R}", AS SHOWN
1–BAR "B1^{L}", OPP HAND



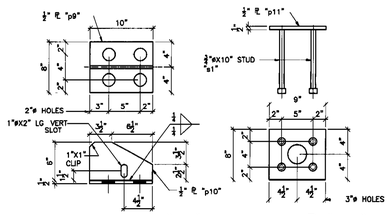
2–BAR "B2^{R}", AS SHOWN
2–BAR "B2^{L}", OPP HAND



64–$\frac{3}{8}$" WASHER "w1"



1–BAR "B3^{R}", AS SHOWN
1–BAR "B3^{L}", OPP HAND



8–TEE BRACKET "te1" 4–ANCHOR ℄ "AP1"

ARC 300 (06-11)

BILL OF MATERIAL

SHIP	SHIP MARK	NO PCS	PIECE MARK	DESCRIPTION	LENGTH	REMARKS	MAT'L
1	Ent			EXPANSION JOINT			
		2	e1	L8X4X$\frac{1}{2}$	12'-10$\frac{1}{2}$"	1RB1L	
		2	e2	L8X4X$\frac{1}{2}$	10'-7"	1RB1L	
		2	B1	℄ L1X$\frac{1}{2}$	6'-10$\frac{1}{2}$"	1RB1L	
		4	B2	℄ L1X$\frac{1}{2}$	6'-0"	2RB2L	
		2	B3	℄ L1X$\frac{1}{2}$	4'-7"	1RB1L	
		22	s1	$\frac{3}{4}$"ø CONC STUD	0'-10		
		23	s2	$\frac{3}{4}$"ø CONC STUD	0'-10		
		48	SB1	$\frac{3}{4}$"ø BOLT	0'-2$\frac{1}{2}$"	A325	
		48	n1	$\frac{3}{4}$"ø NUT		A563	
		8	p8	℄ L3X8	0'-10	A588"Y to1	
		8	p10	℄ L3X8	0'-10	A588"Y to1	
		64	w1	℄ PL X3	0'-3		
		32	w1	1"ø ALL THREAD W/(2) NUTS EA.	0'-7	A307 A563	
4	AP1	4	p11	ANCHOR PLATE ℄ PL X8	0'-9		
		16	s1	$\frac{3}{4}$"ø CONC STUD	0'-10		
1	NP1			1/2"thk" PREFORMED FABRIC	24'-2$\frac{1}{2}$"	3-PLY	
				3/8" thk" RUBBER SHT			
				1/4"thk" PREFORMED FABRIC	0'-7"	3-PLY	
1	DS1			DOWNSPOUT			
		1	b6	TS 6X6X$\frac{1}{4}$	0'-8		
		1	b5	TS 6X6X$\frac{1}{4}$	3'-5$\frac{1}{2}$"		
		2	p12	℄ 2X11	1'-0"		
		1	p13	℄ 2X5$\frac{1}{2}$	0'-4$\frac{1}{2}$"		
		1	p14	℄ 2X5$\frac{1}{2}$	0'-5"		
		1	p15	℄ 2X5$\frac{1}{2}$	0'-5		
2	SR1			℄ PL X4	1'-11$\frac{1}{2}$"	BEND	
4	AN1			$\frac{3}{4}$"ø ANCHOR BOLT	0'-9	W/NaW	
2	FB1			$\frac{3}{4}$"ø GALV BOLT	0'-1	W/NaC(2)W	

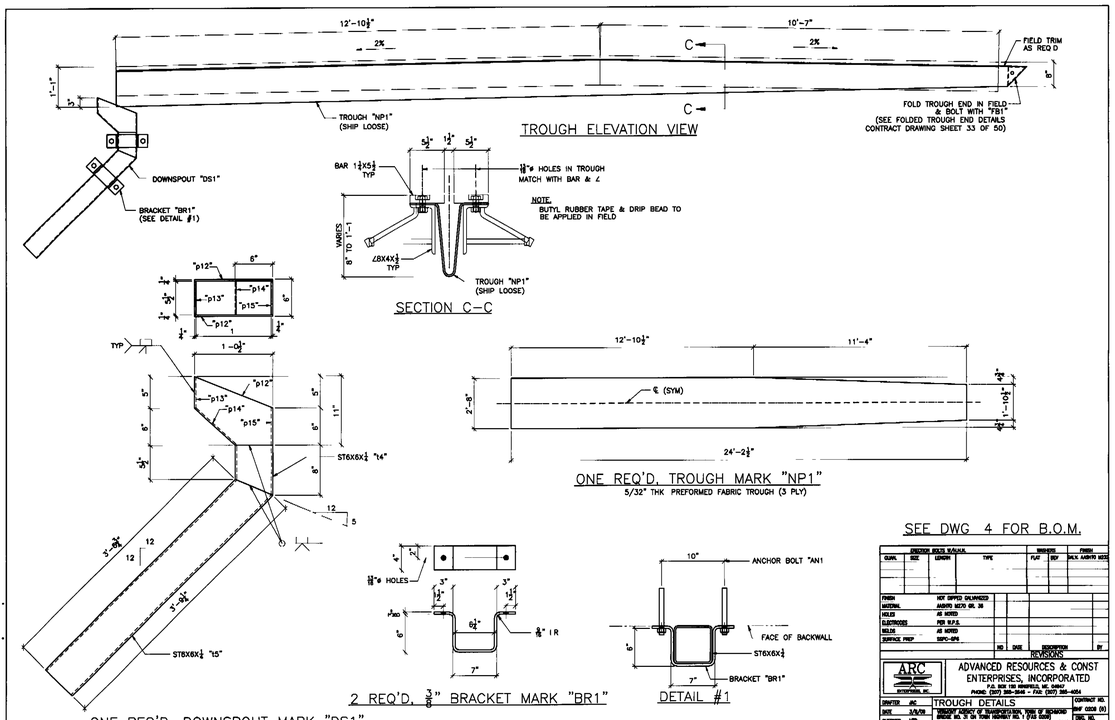
EXPANSION JOINT BOLTS & NUTS				WASHERS		PAINT
QUAN.	SIZE	LENGTH	TYPE	PLATE	REV	GALV A123/123 M332
FINISH	HOT DIPPED GALVANIZED					
MATERIAL	ASSTM A570 GR. 36					
HOLES	AS NOTED					
ELECTRODES	PER W.P.S.					
WELDS	AS NOTED					
SURFACE PREP	SSPC-SP6					

NO	DATE	DESCRIPTION	BY
		REVISIONS	

ARC
NORTHBORO, MA.

ADVANCED RESOURCES & CONST ENTERPRISES, INCORPORATED
P.O. BOX 120 ZEMENTIA, MS. 49967
PHONE (307) 385-3940 · FAX (307) 385-4054

DRAWN	JRC	EXPANSION JOINT DETAILS	CONTRACT NO.
DATE	3/6/08	REVISED TO CHANGE ALL DIMENSIONS, SIZE OF MEMBERS	BHF 0309 (5)
CHECKED	MTB	REVISED TO ADD NOTE	DWG. NO.
DATE	3/11/08	T. BUCK CONSTRUCTION, INC	4

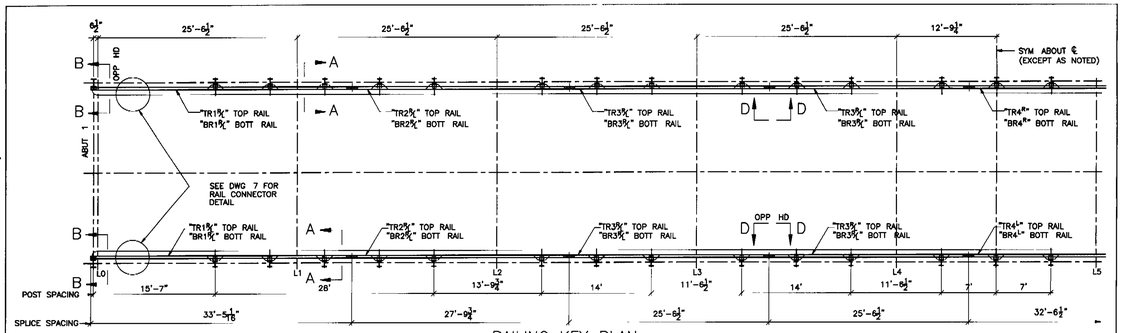


ANCHOR BOLTS W/NUTS				WASHERS		FINISH
QUAN.	SIZE	LENGTH	TYPE	FLAT	BEV	BOLT, NUT & WASHER
FINISH	HOT DIPPED GALVANIZED					
MATERIAL	ASSHTO M270 GR. 36					
HOLES	AS NOTED					
ELECTRODES	PER A.W.S.					
WELDS	AS NOTED					
SURFACE PREP	SSPC-SP6					

NO.	DATE	DESCRIPTION	BY
REVISIONS			

ARC
ADVANCED RESOURCES & CONST ENTERPRISES, INCORPORATED
P.O. BOX 150 BRADFIELD, ME. 04410
PHONE: (207) 935-2645 - FAX: (207) 935-4054

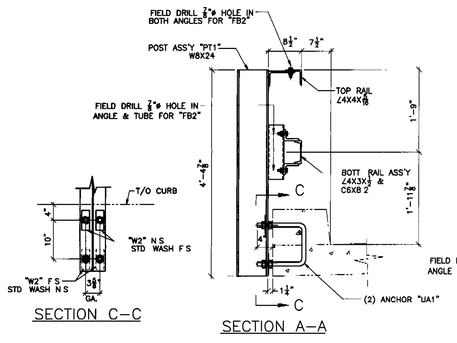
DRAWN BY	JAC	TROUGH DETAILS	CONTRACT NO.
DATE	3/8/05	DEPARTMENT OF TRANSPORTATION, TOWN OF BRIDGTON	SHT CODE (X)
CHECKED BY	KFD	BRIDGE NO. 72 ON TOWN HIGHWAY NO. 1 (FAI 0000)	TWP. NO.
DATE	3/11/05	T BUCK CONSTRUCTION, INC	5

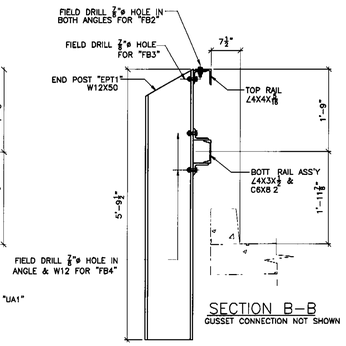


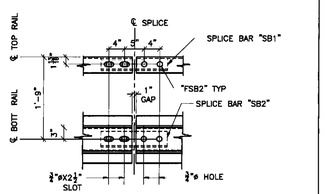
RAILING KEY PLAN

POST & SPLICE SPACING TYPICAL BOTH SIDES OF BRIDGE

WORK THIS DWG. WITH DWGS 7 THRU 9







SECTION D–D

ERECTION DATA SCHEDULE				MARKING		FINISH
QUAN.	SIZE	LENGTH	TYPE	PLATE	DEV	ONLY AASHTO M232

FINISH	HOT DIPPED GALVANIZED
MATERIAL	AASHTO M270 GR. 36
HOLES	AS NOTED
ELECTRODES	PER W.P.S.
WELDS	AS NOTED
SURFACE PREP	SSPC-SP6

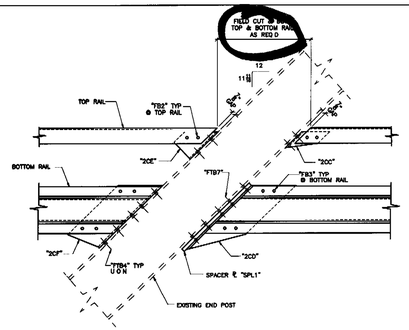
NO	DATE	DESCRIPTION	BY
REVISIONS			

ARC
ADVANCED RESOURCES & CONST ENTERPRISES, INCORPORATED
P.O. BOX 1 MAYFIELD, NY. 12117
PHONE: (518) 503-3948 - FAX: (518) 395-4604

DRAWN	ARC	BRIDGE RAILING ERECTION	CONTRACT NO.
DATE	3/1/08	SUBMIT COPIES TO: DEPARTMENT OF TRANSPORTATION, BUREAU OF BRIDGING	DWG. CODE (K)
CHECKED	MTD	BRIDGE NO. 3 ON TOWN HIGHWAY NO. 1 (CR 113) OVER	DWG. NO.
DATE	3/1/08	T. BUCK CONSTRUCTION, INC	6

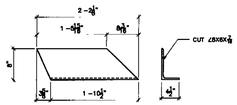
ARC JOB #08-113

G.C. PLEASE VERIFY ALL DETAILS AND DIMENSIONS

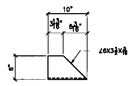


RAIL CONNECTOR DETAIL

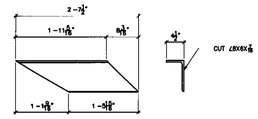
ALL HOLES ARE TO BE FIELD DRILLED



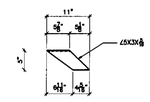
2 REQ'D "2CF^{R}", AS SHOWN
2 REQ'D "2CF^{L}", OPP HAND



2 REQ'D "2CE^{R}", AS SHOWN
2 REQ'D "2CE^{L}", OPP HAND



2 REQ'D "2CD^{R}", AS SHOWN
2 REQ'D "2CD^{L}", OPP HAND



2 REQ'D "2CC^{R}", AS SHOWN
2 REQ'D "2CC^{L}", OPP HAND

ARC ASB 209-113

BILL OF MATERIAL

SHAP	SHAP MARK	NO PCS	PIECE MARK	DESCRIPTION	LENGTH	REMARKS	MAT'L
4	2CC℄			∠8X3X⅜	0'-11	2 Req'd.	
4	2CD℄			∠8X8X⅝	2'-7½	2 Req'd.	
4	2CE℄			∠8X8X⅝	0'-10	2 Req'd.	
4	2CF℄			∠8X8X⅝	2'-3½	2 Req'd.	
4	SPL1			ℛ 2x4	2'-0		
16	FB2			¾" ø BOLT	0'-2	W/NAS2CW	
32	FB3			¾" ø BOLT	0'-3½	W/NAS2CW	
32	FTB4			¾" ø BOLT	0'-2½	W/NAS8SBSW W	
20	FTB7			¾" ø BOLT	0'-3½	W/NAS8SBSW W	

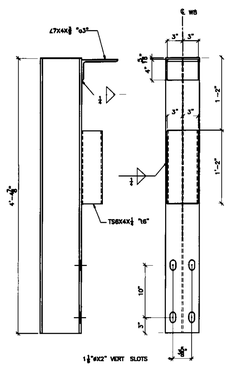
ERECTION BOLTS H.S.A.L.B.				SHEARING		FINISH
QUAN.	SIZE	LENGTH	TYPE	FLAT	DEV	ONLY AASHTO M232

FINISH	HOT DIPPED GALVANIZED
MATERIAL	AASHTO M270 GR. 36
HOLES	AS NOTED
ELECTRODES	PER W.P.S.
WELDS	AS NOTED
SURFACE PREP	SSPC-SP6

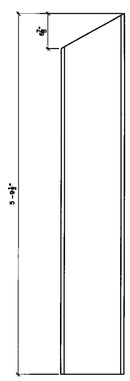
NO	DATE	DESCRIPTION	BY
REVISIONS			

ARC
ADVANCED RESOURCES & CONST ENTERPRISES, INCORPORATED
P.O. BOX 130 Smithfield, ME. 04978
PHONE: (207) 362-3648 - FAX: (207) 362-4224

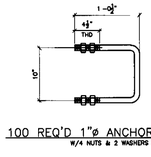
INSPECTOR	JAC	BRIDGE RAILING ERECTION	CONTRACT NO.
DATE	3/4/09	VERMONT AGENCY OF TRANSPORTATION, TOWN OF RICHMOND	BHF 0200 (6)
CHECKED	MTD	BRIDGE NO. 77 ON TOWN HIGHWAY NO. 1 (VAN RAMM)	ENG. NO.
DATE	3/4/09	T. BUCK CONSTRUCTION, INC	7



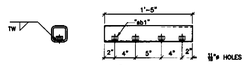
50 REQ'D W8X24 POSTS MARK "PT1"



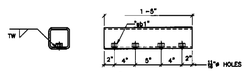
4 REQ'D W12X50 END POSTS MARK "EPT1"



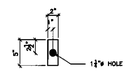
100 REQ'D 1"ø ANCHORS MARK "UA1"
W/4 NUTS & 2 WASHERS EA.



14 REQ'D. 3X3X¼ SPLICE, MARK "SB1"



14 REQ'D. 4X4X¼ SPLICE, MARK "SB2"



200 REQ'D. ½" THK. WASHER, MARK "W2"

BILL OF MATERIAL

SHEET	SHEET MARK	NO. PCS.	PIECE MARK	DESCRIPTION	LENGTH	REMARKS	MAT'L
50	PT1			W8X24	4'-4¢		
		50	a3	L7X4X¾	0'-6		
		50	b5	TS 6X4X¼	1'-2	ASTM A500 GR.B	
4	EPT1			W12X50	5'-9½		
200	W2			℄ ½"ø	0'-5		
100	UA1			1"ø BENT ROD	2'-9	W(4)M&(2)W	
14	SB1			TS 3X3X¼	1'-5	ASTM A500 GR.B	
		56	sb1	¾"ø NUT			
14	SB2			TS 4X4X¼	1'-5	ASTM A500 GR.B	
		56	sb1	¾"ø NUT			
104	FB2			¾"ø BOLT	0'-2	W/MACHW	
4	FB3			¾"ø BOLT	0'-2½	W/MACHW	
8	FB4			¾"ø BOLT	0'-2½	W/MACHW	
112	FSB2			¾"ø BOLT	0'-2	W/WASHER	

ERECTION BOLTS (U.N.U.N.)					BEARING		FINISH
QUAN.	SIZE	LENGTH	TYPE		FLAT	BEV	BOLT AASHTO M232

FINISH	HOT DIPPED GALVANIZED
MATERIAL	AASHTO M270 GR. 36
HOLES	AS NOTED
ELECTRODES	PER W.P.S.
WELDS	AS NOTED
SURFACE PREP	SSPC-SP6

NO	DATE	DESCRIPTION	BY
REVISIONS			

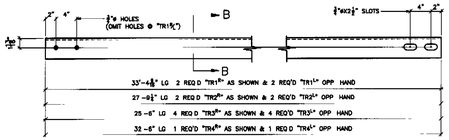
ARC
ADVANCED RESOURCES & CONST ENTERPRISES, INCORPORATED
P.O. BOX 130 DANVILLE, NC 24541
PHONE: (207) 385-3940 – FAX: (207) 385-4054

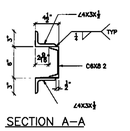
DRAFTER ARC	BRIDGE RAILING DETAILS
DATE 3/5/98	SUBJECT PROJECT OF TRANSPORTATION, STATE OF NORTH CAROLINA
CHECKED RTD	BRIDGE NO. 3 ON TOM HOWARD RD. OVER DEEP
DATE 3/5/98	W.C. T BUCK CONSTRUCTION, INC

CONTRACT NO.
TIP# C005 (A)
SHT. NO. 8

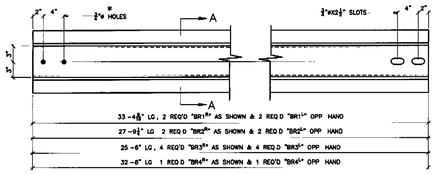
ARC JOB #98-113

SECTION B–B





SECTION A–A



* OMIT HOLES FOR (1) "BR1⅝" TO BE PLACED AT SW CORNER OF BRIDGE

BILL OF MATERIAL

SHAP	SHAP MARK	NO PCS.	PIECE MARK	DESCRIPTION	LENGTH	REMARKS	WAT'L
4	TR1⅝			TOP RAIL		2R & 2L	
		4		L4X3X⅜	33'-4⅛		
4	TR2⅝			TOP RAIL		2R & 2L	
		4		L4X4X⅜	27'-9½		
8	TR3⅝			TOP RAIL		4R & 4L	
		8		L4X4X⅜	25'-6		
2	TR4⅝			TOP RAIL		1R & 1L	
		2		L4X4X⅜	32'-6		
4	BR1⅝			BOTTOM RAIL		2R & 2L	
		8		L4X3X¼	33'-4⅛		
		4		C6X8.2	33'-4⅛		
4	BR2⅝			BOTTOM RAIL		2R & 2L	
		8		L4X3X¼	27'-9½		
		4		C6X8.2	27'-9½		
8	BR3⅝			BOTTOM RAIL		4R & 4L	
		16		L4X3X¼	25'-6		
		8		C6X8.2	25'-6		
2	BR4⅝			BOTTOM RAIL		1R & 1L	
		4		L4X3X¼	32'-6		
		2		C6X8.2	32'-6		

BOLTS, NUTS, WASHERS				WASHERS		FINISH
QUAN.	SIZE	LENGTH	TYPE	FLAT	BEV	BLK. AASHTO M270

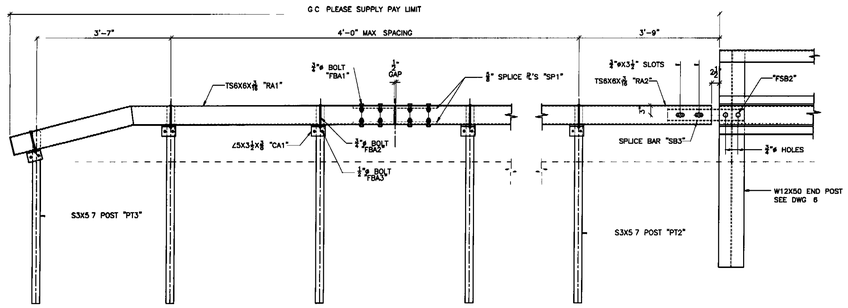
FINISH	HOT DIPPED GALVANIZED
MATERIAL	AASHTO M270 GR. 36
HOLES	AS NOTED
ELECTRODES	PER W.P.S.
WELDS	AS NOTED
SURFACE PREP	SSPC-SP6

NO	DATE	DESCRIPTION	BY
REVISIONS			

ADVANCED RESOURCES & CONST ENTERPRISES, INCORPORATED
P.O. BOX 130 GRAYFIELD, NE. 69941
PHONE (307) 995-3648 – FAX (307) 995-4004

DRAWN	JKC	BRIDGE RAILING DETAILS	CONTRACT NO.
DATE	3/5/08	PROJECT NUMBER OF TRANSPORTATION, TYPE OF ROADWAY, BRIDGE NO., ST. ZIP, TOTAL PROJECT NO. (F.A.S. NUMBER)	SHT. CODE (X)
CHECKED	KTD		DWG. NO.
DATE	3/5/08	T. BUCK CONSTRUCTION, INC.	9

ARC JOB 208-113



GUARD RAIL APPROACH ELEVATION @ NE CORNER, AS SHOWN

GUARD RAIL APPROACH ELEVATION @ SE & NW CORNER, OPP. HAND

WORK THIS DWG WITH DWGS 11 & 12

G.C. PLEASE SUPPLY RAILING LENGTH REQUIREMENTS FOR EACH CORNER

G.C. PLEASE SUPPLY ANY FLARE OR CURVE REQUIREMENTS

ERECTION BOLTS R/A/H/A				WASHERS		FINISH
QUAN.	SIZE	LENGTH	TYPE	PLAT	BEV	GALV. AASHTO M232

FINISH	HOT DIPPED GALVANIZED
MATERIAL	AASHTO M270 GR. 36
HOLES	AS NOTED
ELECTRODES	FED. W.P.S.
WELDS	AS NOTED
SURFACE PREP	SSPC-SP6

NO.	DATE	DESCRIPTION	BY

REVISIONS

ARC
ADVANCED RESOURCES CONSTRUCTION, INC.

ADVANCED RESOURCES & CONST ENTERPRISES, INCORPORATED
P.O. BOX 130 SMITHVILLE, WV. 26437
PHONE: (304) 269-3046 • FAX: (304) 269-4054

DRAFTER	JRC	BRIDGE APPROACH RAIL ERECTION	CONTRACT NO.
DATE	3/5/08	SUBJECT PROJECT OF REHABILITATION, WORK OF HIGHWAYS	SHF 0008 (6)
CHECKED	MTD	BRIDGE NO. 31 ON THIS HIGHWAY NO. 1 (FSB2 SHOWN)	DWG. NO.
DATE	3/5/08	T BUCK CONSTRUCTION, INC.	10

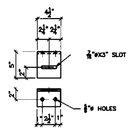
ARC JOB 804-113

? REQ'D S3X7.5 POSTS MARK "PT2"
O.C. PLEASE SUPPLY QTY

3 REQ'D S3X7.5 POSTS MARK "PT3"

3 REQ'D, 4X4X¼ SPLICE, MARK "SB3"

? REQ'D, ¾" SPLICE PL MARK "SP1"
O.C. PLEASE SUPPLY QTY



? REQ'D, L5X3½X⅜, MARK "CA1"
O.C. PLEASE SUPPLY QTY

BILL OF MATERIAL

SHIP	SHAP MARK	NO PCS.	PIECE MARK	DESCRIPTION	LENGTH	REMARKS	MAT'L
?	PT2			S3X7.5	5'-3		
		?	CP1	PL ¾X2½	0'-3½		
3	PT3			S3X7.5	3'-8		
		9	CP1	PL ¾X2½	0'-3½		
?	CA1			L5X3½X⅜	0'-4½		
?	SP1			PL ¾X6½	2'-3		
		?	BD2	¾"ø NUT			
3	SB3			T3 4X4X¼	2'-0½	ASTM A500 GR.B	
		12	BD1	¾"ø NUT			
?	FBA1			¾"ø BOLT	0'-2	W/WASHER	
?	FBA2			¾"ø BOLT	0'-2½	W/WASHER	
?	FBA3			¾"ø BOLT	0'-1½	W/WASHER	
12	FSB2			¾"ø BOLT	0'-2	W/WASHER	

ERECTION BOLTS R/VALVE				WASHERS		FINISH
GUAR.	SIZE	LENGTH	TYPE	FLAT	BEV	BLK. ASSTD MILL

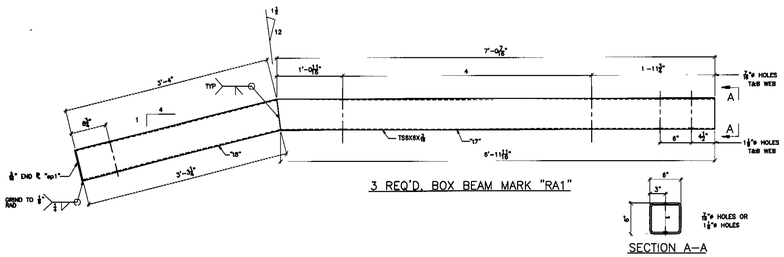
FINISH	HOT DIPPED GALVANIZED
MATERIAL	AASHTO M270 GR. 36
HOLES	AS NOTED
ELECTRODES	PER W.P.S.
WELDS	AS NOTED
SURFACE PREP	SSPC-SP6

NO	DATE	DESCRIPTION	BY
		REVISIONS	

ARC
ADVANCED RESOURCES & CONST ENTERPRISES, INCORPORATED
P.O. BOX 133 BRISTOL, ME. 04547
PHONE: (207) 563-3646 • FAX: (207) 563-4054

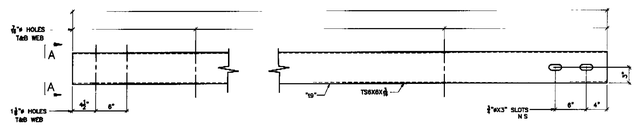
DRAWN BY	JAC	BRIDGE APPROACH RAIL DETAILS	CONTRACT NO.
DATE	3/2/09	HIGHWAY PROJECT OF TRANSPORTATION, TOWN OF RICHMOND BRIDGE NO. 39 ON TOWN HIGHWAY NO. 1 (FID 15559)	BHF 0009 (X)
CHECKED BY	MTD		DWG. NO.
DATE	3/4/09	T BUCK CONSTRUCTION, INC	11

ARC JOB #08-113



3 REQ'D. BOX BEAM MARK "RA1"

SECTION A-A



2 REQ'D. BOX BEAM MARK "RA2"

ARC JOB 200-113

BILL OF MATERIAL

SHIP	SHIP MARK	NO. PCS	PIECE MARK	DESCRIPTION	LENGTH	REMARKS	MAT'L
3	RA1			BOX BEAM RAIL			
		3	17	T5X6X5/8	7'-0 1/2"	ASM ABBD GR B	
		3	18	T5X6X5/8	3'-4"	ASM ABBD GR B	
		3	901	PL 3/4X12	0'-12"		
?	RA2	?		BOX BEAM RAIL			
		?	19	T5X6X5/8	?	ASM ABBD GR B	

ERECTION BOLTS W/NUTS				WELDING		FINISH
QUAN.	SIZE	LENGTH	TYPE	PLAT	REV	GALV. AASHTO M232

FINISH	HOT DIPPED GALVANIZED
MATERIAL	AASHTO M270 GR. 36
HOLES	AS NOTED
ELECTRODES	PER A.W.S.
WELDS	AS NOTED
SURFACE PREP	SSPC-SP6

NO	DATE	REVISIONS DESCRIPTION	BY

ARC
ADVANCED RESOURCES & CONST ENTERPRISES, INCORPORATED
P.O. BOX 130 HAMPDEN, ME 04444
PHONE (207) 862-3648 - FAX (207) 862-4084

DRAFTER	JRC	BRIDGE APPROACH RAIL DETAILS	CONTRACT NO.
DATE	3/8/08	WORKS PROJECT OF TRANSPORTATION, TOWN OF BOWDOIN	DWF CODE (S)
CHECKED	MTB	BRIDGE NO. 5 ON OLD TOWN HIGHWAY NO. 1 (T.R.D. 13.62)	DWG. NO.
DATE	3/8/08	T. BUCK CONSTRUCTION, INC	12