Transmittal

Stantec Consulting Services Inc.
55 Green Mountain Drive
South Burlington VT 05403
Tel: (802) 864-0223
Fax: (802) 864-0165

To:	Douglas E. Bonneau, P.E.	From:	Thomas Knight
Company:	VTrans	☐	For Your Information
Address:	Douglas.Bonneau@state.vt.us	☐	For Your Approval
Phone:	(802) 828-3874	☐	For Your Review
Date:	February 27, 2015	☑	As Requested
File:	Waterbury IM 089-2(43) - 195310438		
Delivery:	Electronic		

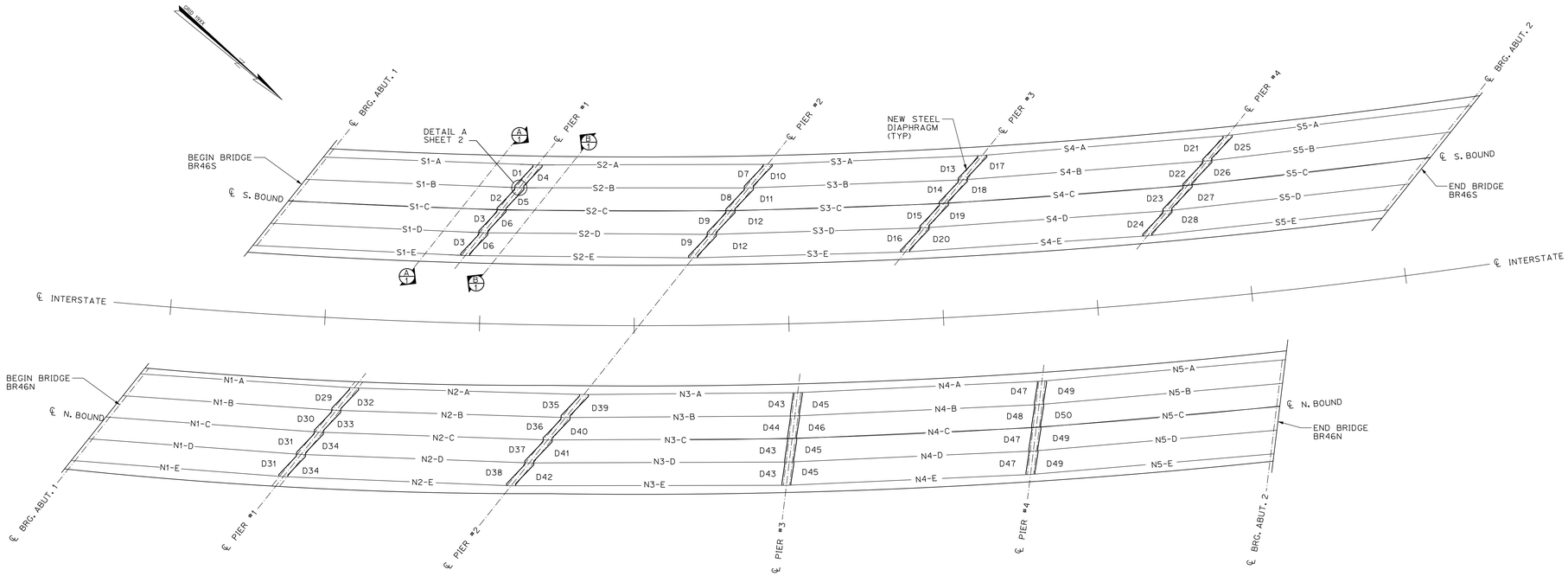
Reference: BR46NS Steel Diaphragm Fabrication

Attachment:

Copies	Doc Date	Pages	Description
1	02/25/2015	1,2,3 & M1	DWG:1,2,3 AND M1 -- Approved

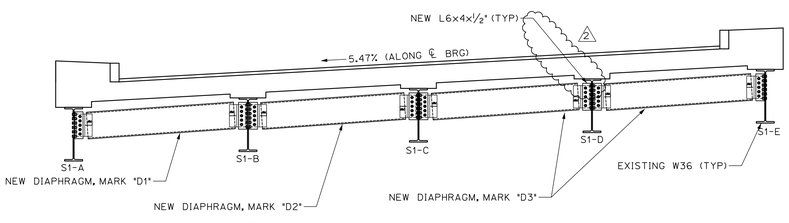
STANTEC CONSULTING SERVICES INC.

Tom Knight
Sr. Structural Engineer
Phone: (802) 497-6409
Fax: 802-864-0165
tom.knight@stantec.com



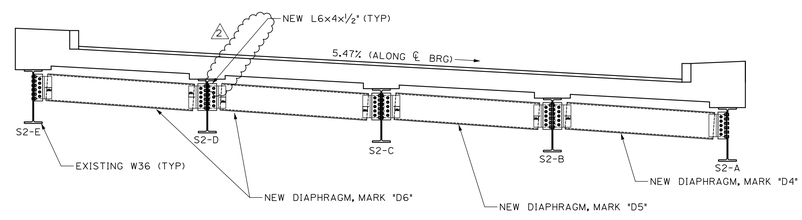
LAYOUT PLAN

SCALE: 1" = 20'



A/1 SOUTHBOUND SECTION AT PIER #1
1/4" = 1'-0" (LOOKING UPSTATION)

(SECTION AT SOUTHBOUND PIERS 2-4 AND NORTHBOUND PIERS 1-4 SIMILAR, SEE LAYOUT PLAN FOR DIAPHRAGM LOCATIONS)



B/1 SOUTHBOUND SECTION AT PIER #1
1/4" = 1'-0" (LOOKING BACKSTATION)

(SECTION AT SOUTHBOUND PIERS 2-4 AND NORTHBOUND PIERS 1-4 SIMILAR, SEE LAYOUT PLAN FOR DIAPHRAGM LOCATIONS)

GENERAL FABRICATION NOTES

MATERIAL SPECIFICATIONS

1.) ALL MATERIAL SHALL BE ASTM AASHTO M 270M/M 270 GRADE 50 (ASTM A709 GRADE 50) (UNO)

2.) ALL A709 GRADE 50 MATERIAL DENOTED "CVN" SHALL MEET THE CHARPY V-NOTCH TESTING REQUIREMENTS OF ZONE 2, H FREQUENCY: 15 FT-LB AT 40° (UP TO 2" WELDED)

ITEMS SHALL CALL OUT "CVN" FOR EACH APPLICABLE ITEM IN THE BILL OF MATERIALS

3.) BOLTS SHALL BE HIGH STRENGTH BOLTS ASTM A325, TYPE 1 GALVANIZED NUTS SHALL BE A563 GRADE C3 OR DH3 WASHERS SHALL BE ASTM F436, TYPE 3

BOLTS AND NUTS SHALL BE ROTATIONAL CAPACITY TESTED. DO NOT MIX NUTS AND BOLTS FROM DIFFERENT CONTAINERS UNLESS ALL NUTS AND BOLTS HAVE THE SAME LOT NUMBER.

FABRICATION

1.) DIE STAMPING IS ALLOWED IN SPECIFIC LOCATIONS WITH THE APPROVAL OF THE ENGINEER.

2.) ALL EDGES OF FLAME CUT MATERIAL SUBJECTED TO CALCULATED STRESSES SHALL BE ROUNDED TO A MINIMUM RADIUS OF 1/16", OR AN EQUIVALENT FLAT SURFACE AT A SUITABLE ANGLE.

3.) ALL PLATES, FLAME CUT FROM LARGER PLATES, SHALL BE CUT SO THAT THE PRIMARY DIRECTION OF ROLLING IS PARALLEL TO THE MAIN TENSILE OR COMPRESSIVE STRESS. STANDARD SPEC. 504.18, DECEMBER, 2002.

WELDING

1.) ALL WELDING PROCEDURES SHALL BE IN ACCORDANCE WITH THE PROVISIONS OF SUBSECTION 506.10.

2.) NON DESTRUCTIVE TESTING OF WELDS SHALL BE IN ACCORDANCE WITH ANSI/AASHTO/AWS D1.5 – SECTION 6.

FIELD CONNECTIONS

1.) FIELD BOLTS SHALL HAVE A HEAVY HEX NUT, HEX HEAD, AND ONE HARD WASHER EACH.

2.) PIECE MARKS WILL BE LOCATED AS SHOWN ON ERECTION DRAWINGS. ALL ERECTION MARKS, MATCH MARKS, AND WEIGHT MARKS MUST NOT BE EXPOSED IN THE FINISHED STRUCTURE.

3.) HARDENED WASHERS ARE REQUIRED OVER OVERSIZED HOLES.

CLEANING AND PAINTING

1.) THE NEW DIAPHRAGMS SHALL BE PAINTED WITH THREE (3) COATS, ZINC RICH SYSTEM DESCRIBED BELOW PRIOR TO DELIVERY TO THE SITE. FIELD PAINTING IS ONLY REQUIRED WHERE NEW DIAPHRAGMS CONNECT TO THE EXITING BEAMS.

2.) COATING SYSTEMS SHALL BE NORTHEAST PROTECTIVE COATING COMMITEE (NEPCOAT) SSC(03)-01 AS FOLLOWS:
- PRIMER: CARBOZINC 859
- INTERMEDIATE COAT: CARBOGUARD 888
- TOP COAT: CARBOTHANE 133LH

3.) PAINTED SURFACES WITHIN 3" OF AN OPE HOLE SHALL BE PRIMED ONLY AND DEVELOP A CLASS B SLIP COEFFICIENT.

CONTRACTOR VERIFY:

DIMENSIONS FOR EXISTING DETAILS ARE TAKEN FROM THE REFERENCE PLANS AND MUST BE VERIFIED PRIOR TO FABRICATION OF NEW DIAPHRAGMS.

APPROVED: Approval of drawings and/or procedures indicates concurrence with the information presented and does not relieve the Contractor or Fabricator of compliance with all specifications and code requirements — X
APPROVED AS NOTED
REVISE AND RESUBMIT
NOT REVIEWED

Stantec

Date: 2/27/2015

By: [signature]

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 which 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 the fabrication processes or to techniques of construction and installation and for coordination of the work of all subtrades.

Vermont Agency of Transportation
RECEIVED
Waterbury_BR46N3_S5_Dwgs_Fab_Vent_Approved.pdf

CK'D BY Stantec OK'D BY D Bonneau

February 27, 2015

RESUBMIT No Approved

BY D Bonneau DATE 02/28/15

PROJECT No. IM 089-2(43)
ITEM No. 506.50

FINISH N/A				
MATERIAL SEE DETAIL SHEETS				
HOLES				
ELECTRODES PER WELD PROCEDURE	3	2/16/15	BILL OF MTL'S	DLM
WELDS PER WELD PROCEDURE	2	2/10/15	Arrows and title block	DLM
SURFACE PREP	1	1/19/15	dim. reference chart (sh-3)	DLM
	NO	DATE	DESCRIPTION	BY

REVISIONS

ARC ENTERPRISES, INC.

ADVANCED RESOURCES & CONST. ENTERPRISES, INCORPORATED
P.O. BOX 120 KINGFIELD, ME. 04947
PHONE: (207) 265-2646 – FAX: (207) 265-4054

DRAFTER DLM
DATE JAN. 2015
CHECKED GNM
DATE JAN. 2015

BR46S STEEL DIAPHRAGMS 2
WATERBURY, VT. BRIDGE 46 North and South
I-89 EXIT RAMP over STOWE ST. & THATCHER BROOK
SC: BECK & BELLUCCI

PROJECT NO. 14-148
DWG. NO. 1

BILL OF MATERIALS (PIER#1 SOUTHBOUND)

SHIP	SHIP MARK	NO. PCS.	PIECE MARK	DESCRIPTION	LENGTH	WEIGHT	MATERIAL
1	D1			DIAPHRAGM	9'-2 9/16"	357# EACH	
		2	B1	BENT PLATE 1/2" x 10 5/16"	1'-3"		
		1	M1	MC18x42.7	8'-3 7/8"	3	
1	D2			DIAPHRAGM	8'-11 15/16"	357# EACH	
		2	B1	BENT PLATE 1/2" x 10 5/16"	1'-3"		
		1	M2	MC18x42.7	8'-0 3/4"		
2	D3			DIAPHRAGM	9'-2"	357# EACH	
		2	B1	BENT PLATE 1/2" x 10 5/16"	1'-3"		
		1	M3	MC18x42.7	8'-2 5/8"	3	
1	D4			DIAPHRAGM	9'-2 9/16"	362# EACH	
		2	B2	BENT PLATE 1/2" x 10 5/16"	1'-3"		
		1	M4	MC18x42.7	8'-4 13/16"	3	
1	D5			DIAPHRAGM	9'-0 1/16"	352# EACH	
		2	B2	BENT PLATE 1/2" x 10 5/16"	1'-3"		
		1	M5	MC18x42.7	8'-1 1/8"	3	
2	D6			DIAPHRAGM	9'-2 1/16"	357# EACH	
		2	B2	BENT PLATE 1/2" x 10 5/16"	1'-3"		
		1	M6	MC18x42.7	8'-3 1/8"	3	

BILL OF MATERIALS (PIER#1 NORTHBOUND)

SHIP	SHIP MARK	NO. PCS.	PIECE MARK	DESCRIPTION	LENGTH	WEIGHT	MATERIAL
1	D29			DIAPHRAGM	9'-0 5/16"	347# EACH	
		2	B6	BENT PLATE 1/2" x 10 5/16"	1'-3"		
		1	M28	MC18x42.7	8'-0 5/8"	3	
1	D30			DIAPHRAGM	8'-9 9/16"	337# EACH	
		2	B6	BENT PLATE 1/2" x 10 5/16"	1'-3"		
		1	M29	MC18x42.7	7'-9 7/8"	3	
2	D31			DIAPHRAGM	8'-11 3/4"	347# EACH	
		2	B6	BENT PLATE 1/2" x 10 5/16"	1'-3"		
		1	M30	MC18x42.7	8'-0 1/16"	3	
1	D32			DIAPHRAGM	9'-0 7/16"	357# EACH	
		2	B7	BENT PLATE 1/2" x 10 5/16"	1'-3"		
		1	M2	MC18x42.7	8'-0 3/4"	3	
1	D33			DIAPHRAGM	8'-9 11/16"	347# EACH	
		2	B7	BENT PLATE 1/2" x 10 5/16"	1'-3"		
		1	M31	MC18x42.7	7'-10 5/16"	3	
2	D34			DIAPHRAGM	8'-11 3/4"	387# EACH	
		2	B7	BENT PLATE 1/2" x 10 5/16"	1'-3"		
		1	M30	MC18x42.7	8'-0 1/16"	3	
			3				

BILL OF MATERIALS (PIER#2 SOUTHBOUND)

SHIP	SHIP MARK	NO. PCS.	PIECE MARK	DESCRIPTION	LENGTH	WEIGHT	MATERIAL
1	D7			DIAPHRAGM	9'-6 5/8"	372# EACH	
		2	B2	BENT PLATE 1/2" x 10 5/16"	1'-3"		
		1	M7	MC18x42.7	8'-7 1/2"	3	
1	D8			DIAPHRAGM	9'-3 3/4"	362# EACH	
		2	B2	BENT PLATE 1/2" x 10 5/16"	1'-3"		
		1	M8	MC18x42.7	8'-4 9/16"	3	
2	D9			DIAPHRAGM	9'-6 1/16"	372# EACH	
		2	B2	BENT PLATE 1/2" x 10 5/16"	1'-3"		
		1	M9	MC18x42.7	8'-6 13/16"	3	
1	D10			DIAPHRAGM	9'-7"	372# EACH	
		2	B3	BENT PLATE 1/2" x 10 1/4"	1'-3"		
		1	M10	MC18x42.7	8'-8 1/8"	3	
1	D11			DIAPHRAGM	9'-3 15/16"	362# EACH	
		2	B3	BENT PLATE 1/2" x 10 1/4"	1'-3"		
		1	M11	MC18x42.7	8'-5"	3	
2	D12			DIAPHRAGM	9'-6 1/4"	372# EACH	
		2	B3	BENT PLATE 1/2" x 10 1/4"	1'-3"		
		1	M12	MC18x42.7	8'-7 5/16"	3	

BILL OF MATERIALS (PIER#2 NORTHBOUND)

SHIP	SHIP MARK	NO. PCS.	PIECE MARK	DESCRIPTION	LENGTH	WEIGHT	MATERIAL
1	D35			DIAPHRAGM	9'-3 9/16"	357# EACH	
		2	B7	BENT PLATE 1/2" x 10 5/16"	1'-3"		
		1	M32	MC18x42.7	8'-4 1/8"	3	
1	D36			DIAPHRAGM	9'-0 13/16"	347# EACH	
		2	B7	BENT PLATE 1/2" x 10 5/16"	1'-3"		
		1	M33	MC18x42.7	8'-1 7/8"	3	
1	D37			DIAPHRAGM	9'-3"	347# EACH	
		2	B7	BENT PLATE 1/2" x 10 5/16"	1'-3"		
		1	M34	MC18x42.7	8'-3 9/16"	3	
1	D38			DIAPHRAGM	9'-2 3/4"	357# EACH	
		2	B7	BENT PLATE 1/2" x 10 5/16"	1'-3"		
		1	M6	MC18x42.7	8'-3 1/8"	3	
1	D39	3		DIAPHRAGM	9'-3 3/4"	362# EACH	
		2	B8	BENT PLATE 1/2" x 10 5/16"	1'-3"		
		1	M8	MC18x42.7	8'-4 9/16"	3	
1	D40			DIAPHRAGM	9'-1"	357# EACH	
		2	B8	BENT PLATE 1/2" x 10 5/16"	1'-3"		
		1	M35	MC18x42.7	8'-1 13/16"	3	
1	D41			DIAPHRAGM	9'-3 1/4"	357# EACH	
		2	B8	BENT PLATE 1/2" x 10 5/16"	1'-3"		
		1	M32	MC18x42.7	8'-4 1/8"	3	
1	D42			DIAPHRAGM	9'-2 15/16"	347# EACH	
		2	B8	BENT PLATE 1/2" x 10 5/16"	1'-3"		
		1	M34	MC18x42.7	8'-3 9/16"	3	

BILL OF MATERIALS (PIER#3 SOUTHBOUND)

SHIP	SHIP MARK	NO. PCS.	PIECE MARK	DESCRIPTION	LENGTH	WEIGHT	MATERIAL
1	D13			DIAPHRAGM	9'-10 11/16"	387# EACH	
		2	B3	BENT PLATE 1/2" x 10 1/4"	1'-3"		
		1	M13	MC18x42.7	8'-11 3/4"	3	
1	D14			DIAPHRAGM	9'-7 5/8"	377# EACH	
		2	B3	BENT PLATE 1/2" x 10 1/4"	1'-3"		
		1	M14	MC18x42.7	8'-8 1/16"	3	
1	D15			DIAPHRAGM	9'-9 13/16"	387# EACH	
		2	B3	BENT PLATE 1/2" x 10 1/4"	1'-3"		
		1	M15	MC18x42.7	8'-10 7/8"	3	
1	D16			DIAPHRAGM	9'-9 1/2"	387# EACH	
		2	B3	BENT PLATE 1/2" x 10 1/4"	1'-3"		
		1	M16	MC18x42.7	8'-10 1/2"	3	
1	D17			DIAPHRAGM	9'-10 7/8"	387# EACH	
		2	B4	BENT PLATE 1/2" x 10 1/4"	1'-3"		
		1	M17	MC18x42.7	9'-0 1/4"	3	
1	D18			DIAPHRAGM	9'-7 13/16"	377# EACH	
		2	B4	BENT PLATE 1/2" x 10 1/4"	1'-3"		
		1	M18	MC18x42.7	8'-9 9/16"	3	
1	D19			DIAPHRAGM	9'-10"	387# EACH	
		2	B4	BENT PLATE 1/2" x 10 1/4"	1'-3"		
		1	M19	MC18x42.7	8'-11 3/8"	3	
1	D20			DIAPHRAGM	9'-9 5/8"	387# EACH	
		2	B4	BENT PLATE 1/2" x 10 1/4"	1'-3"		
		1	M15	MC18x42.7	8'-10 7/8"	3	

BILL OF MATERIALS (PIER#3 NORTHBOUND)

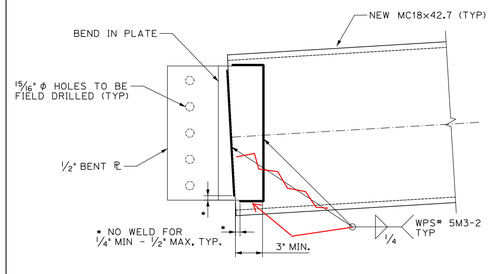
SHIP	SHIP MARK	NO. PCS.	PIECE MARK	DESCRIPTION	LENGTH	WEIGHT	MATERIAL
3	D43			DIAPHRAGM	7'-3 5/8"	262# EACH	
		2	B9	BENT PLATE 1/2" x 10 5/8"	1'-3"		
		1	M36	MC18x42.7	6'-1 1/4"	3	
1	D44			DIAPHRAGM	7'-1 7/16"	257# EACH	
		2	B9	BENT PLATE 1/2" x 10 5/8"	1'-3"		
		1	M37	MC18x42.7	5'-11 1/4"	3	
3	D45			DIAPHRAGM	7'-3 11/16"	262# EACH	
		2	B10	BENT PLATE 1/2" x 10 5/8"	1'-3"		
		1	M36	MC18x42.7	6'-1 1/4"	3	
1	D46			DIAPHRAGM	7'-1 5/8"	257# EACH	
		2	B10	BENT PLATE 1/2" x 10 5/8"	1'-3"		
		1	M37	MC18x42.7	5'-11 1/4"	3	

BILL OF MATERIALS (PIER#4 SOUTHBOUND)

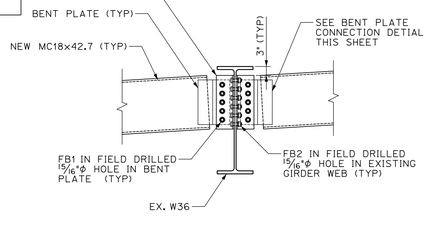
SHIP	SHIP MARK	NO. PCS.	PIECE MARK	DESCRIPTION	LENGTH	WEIGHT	MATERIAL
1	D21			DIAPHRAGM	10'-3 5/8"	402# EACH	
		2	B4	BENT PLATE 1/2" x 10 1/4"	1'-3"		
		1	M20	MC18x42.7	9'-5 3/16"	3	
1	D22			DIAPHRAGM	10'-0 5/16"	392# EACH	
		2	B4	BENT PLATE 1/2" x 10 1/4"	1'-3"		
3		1	M21	MC18x42.7	9'-1 13/16"	3	
1	D23			DIAPHRAGM	10'-2 7/16"	402# EACH	
		2	B4	BENT PLATE 1/2" x 10 1/4"	1'-3"		
		1	M22	MC18x42.7	9'-3 7/8"	3	
1	D24			DIAPHRAGM	10'-2 1/8"	402# EACH	
		2	B4	BENT PLATE 1/2" x 10 1/4"	1'-3"		
		1	M23	MC18x42.7	9'-3 9/16"	3	
1	D25			DIAPHRAGM	10'-3 13/16"	407# EACH	
		2	B5	BENT PLATE 1/2" x 10 1/4"	1'-3"		
3		1	M24	MC18x42.7	9'-5 11/16"	3	
1	D26			DIAPHRAGM	10'-0 7/16"	392# EACH	
		2	B5	BENT PLATE 1/2" x 10 1/4"	1'-3"		
3		1	M25	MC18x42.7	9'-2 5/8"	3	
1	D27			DIAPHRAGM	10'-2 5/8"	402# EACH	
		2	B5	BENT PLATE 1/2" x 10 1/4"	1'-3"		
3		1	M26	MC18x42.7	9'-4 7/16"	3	
1	D28			DIAPHRAGM	10'-2 9/16"	402# EACH	
		2	B5	BENT PLATE 1/2" x 10 1/4"	1'-3"		
		1	M27	MC18x42.7	9'-4 1/16"	3	

BILL OF MATERIALS (PIER#4 NORTHBOUND)

SHIP	SHIP MARK	NO. PCS.	PIECE MARK	DESCRIPTION	LENGTH	WEIGHT	MATERIAL
3	D47			DIAPHRAGM	7'-4 9/16"	267# EACH	
		2	B10	BENT PLATE 1/2" x 10 5/8"	1'-3"		
		1	M38	MC18x42.7	6'-2"	3	
1	D48			DIAPHRAGM	7'-2 5/16"	257# EACH	
		2	B10	BENT PLATE 1/2" x 10 5/8"	1'-3"		
		1	M39	MC18x42.7	6'-0 1/16"	3	
3	D49			DIAPHRAGM	7'-4 3/8"	267# EACH	
		2	B11	BENT PLATE 1/2" x 10 5/8"	1'-3"		
		1	M38	MC18x42.7	6'-2"	3	
1	D50			DIAPHRAGM	7'-2 7/16"	257# EACH	
		2	B11	BENT PLATE 1/2" x 10 5/8"	1'-3"		
		1	M39	MC18x42.7	6'-0 1/16"	3	

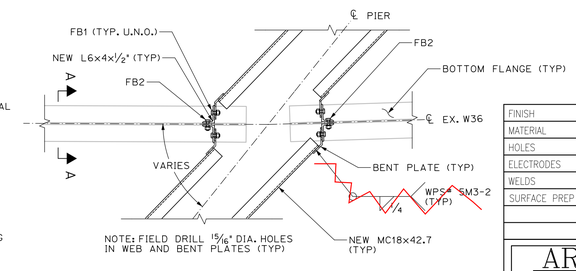


BENT PLATE CONNECTION DETAIL
SCALE: 1 1/2" = 1'-0"
(TYPICAL AT ALL DIAPHRAGMS)



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

NOTE: FIELD DRILL 15/16" DIA. HOLES IN WEB AND BENT PLATES (TYP)



NOTE: FIELD DRILL 15/16" DIA. HOLES IN WEB AND BENT PLATES (TYP)

DETAIL A
SCALE: 1/2" = 1'-0"

Vermont Agency of Transportation
RECEIVED
CK'D BY Stantec OK'D BY D Bonneau
February 27, 2015
RESUBMIT No Approved AsNoted
BY D Bonneau DATE 02/28/15

APPROVED: Approval of drawings and/or procedures indicates concurrence with the information presented and does not relieve the Contractor or Fabricator of compliance with all specifications and code requirements — X
APPROVED AS NOTED
REVISE AND RESUBMIT
NOT REVIEWED
Stantec
Date: 2/27/2015
By:
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 which 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 the fabrication processes or to techniques of construction and installation and for coordination of the work of all subtrades.

PROJECT No. IM 089-2(43)
ITEM No. 506.50

FINISH	N/A				
MATERIAL	SEE DETAIL SHEETS				
HOLES					
ELECTRODES	PER WELD PROCEDURE	3	2/16/15	BILL OF MTL'S	DLM
WELDS	PER WELD PROCEDURE	2	2/10/15	Title Block	DLM
SURFACE PREP		1	1/19/15	dim. reference chart (sh-3)	DLM
		NO	DATE	DESCRIPTION	BY

REVISIONS

ARC ENTERPRISES, INC.
ADVANCED RESOURCES & CONST. ENTERPRISES, INCORPORATED
P.O. BOX 120 KINGFIELD, ME. 04947
PHONE: (207) 265-2646 – FAX: (207) 265-4054

DRAFTER	DLM	BR46 STEEL DIAPHRAGMS 2	PROJECT NO. 14-148
DATE	JAN. 2015	WATERBURY, VT. BRIDGE 46 North and South I-89 EXIT RAMP over STOWE ST. & THATCHER BROOK	
CHECKED	GNM		DWG. NO. 2
DATE	JAN. 2015	SC: BECK & BELLUCCI	

DIMENSIONAL REFERENCE CHART (SEE SECTION A-A) 1

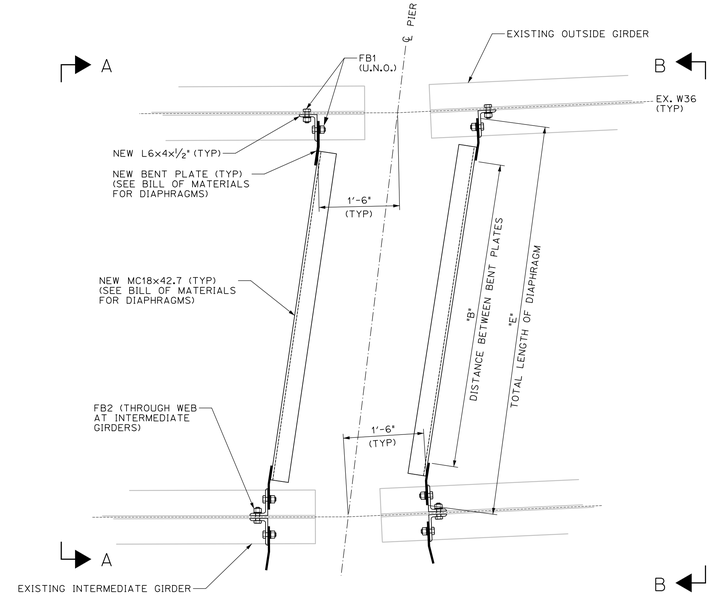
DIAPHRAGM	"A"	"B"	"C"	"D"	"E"
D1	6 3/8"	7'-8 1/16"	8'-3 7/8" 3	1 3/16"	9'-2 9/16"
D2	6 3/8"	7'-5 7/16"	8'-0 3/4"	1 3/16"	8'-11 15/16"
D3	6 3/8"	7'-7 3/8"	8'-2 5/8"	1 3/16"	9'-2"
D7	6 3/8"	8'-7 15/16"	8'-7 1/2"	1 3/16"	9'-6 5/8"
D8	6 3/8"	8'-5 1/16"	8'-4 9/16"	1 3/16"	9'-3 3/4"
D9	6 3/8"	8'-7 3/8"	8'-6 13/16"	1 3/16"	9'-6 1/16"
D13	6 3/8"	8'-4 1/2"	8'-11 3/4"	1 3/16"	9'-10 11/16"
D14	6 3/8"	8'-1 7/16"	8'-8 11/16"	1 3/16"	9'-7 5/8"
D15	6 3/8"	8'-3 5/8"	8'-10 7/8"	1 3/16"	9'-9 13/16"
D16	6 3/8"	8'-3 1/4"	8'-10 1/2"	1 3/16"	9'-9 1/2"
D21	6 1/4"	8'-9 3/4"	9'-5 3/16"	1 1/16"	10'-3 5/8"
D22	6 1/4"	8'-6 3/8"	9'-1 13/16"	1 1/16"	10'-0 5/16"
D23	6 1/4"	8'-8 1/2"	9'-3 7/8"	1 1/16"	10'-2 7/16"
D24	6 1/4"	8'-8 7/16"	9'-3 9/16"	1 1/16"	10'-2 1/8"
D29	6 3/8"	7'-5 5/16"	8'-0 5/8"	7/8"	9'-0 5/16"
D30	6 1/2"	7'-2 9/16"	7'-9 7/8"	7/8"	8'-9 9/16"
D31	6 1/2"	7'-4 5/8"	8'-0 1/16"	7/8"	8'-11 3/4"
D35	6 3/8"	7'-8 7/8"	8'-4 1/8"	1 3/16"	9'-3 9/16"
D36	6 1/2"	7'-6 1/16"	8'-1 7/8"	7/8"	9'-0 13/16"
D37	6 3/8"	7'-8 5/16"	8'-3 9/16"	1 3/16"	9'-3"
D38	6 3/8"	7'-8"	3 8'-3 1/8"	1 3/16"	9'-2 3/4"
D43	6 3/4"	5'-6 5/16"	6'-1 1/4"	1 3/16"	7'-3 5/8"
D44	6 3/4"	5'-4 1/4"	5' 11 1/4"	1 3/16"	7'-1 7/16"
D47	6 13/16"	5'-7 1/16"	6'-2"	1 3/16"	7'-4 5/16"
D48	6 15/16"	5'-5 1/8"	6'-0 1/16"	1 1/4"	7'-2 5/16"

NOTE:
"A" = CHANGE IN ELEVATION
"B" = DISTANCE BETWEEN BENT PLATES
"C" = LENGTH OF CHANNEL
"D" = RISE PER LINEAR FOOT
"E" = OVERALL LENGTH OF DIAPHRAGM

DIMENSIONAL REFERENCE CHART (SEE SECTION B-B) 1

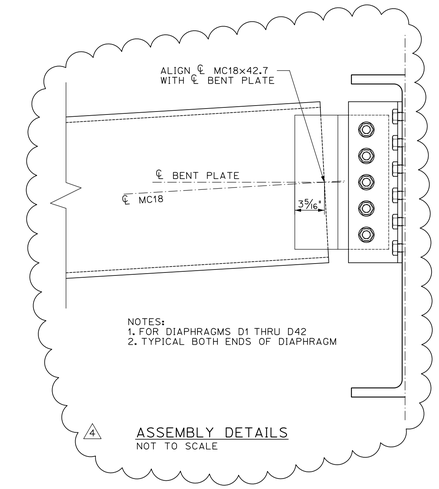
DIAPHRAGM	"A"	"B"	"C"	"D"	"E"
D4	6 3/8"	7'-8 1/2"	8'-4 13/16"	1 3/16"	9'-2 9/16"
D5	6 3/8"	7'-5 13/16"	3 8'-1 1/8"	1 3/16"	9'-0 1/16"
D6	6 3/8"	7'-7 13/16"	8'-3 1/8"	1 3/16"	9'-2 1/16"
D10	6 3/8"	8'-9 13/16"	8'-8 1/8"	1 3/16"	9'-7"
D11	6 3/8"	8'-5 9/16"	8'-5"	1 3/16"	9'-3 15/16"
D12	6 3/8"	8'-7 13/16"	8'-7 5/16"	1 3/16"	9'-6 1/4"
D17	6 3/8"	8'-5"	9'-0 1/4"	1 3/16"	9'-10 7/8"
D18	6 3/8"	8'-1 15/16"	8'-9 3/16"	1 3/16"	9'-7 13/16"
D19	6 3/8"	8'-4 1/4"	8'-11 3/8"	1 3/16"	9'-10"
D20	6 3/8"	8'-3 3/4"	8'-10 7/8"	1 3/16"	9'-9 5/8"
D25	6 1/4"	8'-10 1/4"	9'-5 11/16"	1 1/16"	10'-3 13/16"
D26	6 1/4"	8'-6 15/16"	3 9'-2 5/8"	1 1/16"	10'-0 7/16"
D27	6 1/4"	8'-9 1/16"	9'-4 7/16"	1 1/16"	10'-2 5/8"
D28	6 1/4"	8'-8 11/16"	9'-4 1/16"	1 1/16"	10'-2 5/16"
D32	6 3/8"	7'-5 3/4"	8'-0 3/4"	7/8"	9'-0 7/16"
D33	6 1/2"	7'-3"	7'-10 5/16"	7/8"	8'-9 11/16"
D34	6 1/2"	7'-5 1/16"	3 8'-0 1/16"	7/8"	8'-11 3/4"
D39	6 1/2"	7'-9 5/16"	8'-4 9/16"	1 3/16"	9'-3 3/4"
D40	6 1/4"	7'-6 9/16"	8'-1 13/16"	1 3/16"	9'-1"
D41	6 3/8"	7'-8 13/16"	8'-4 1/8"	1 3/16"	9'-3 1/4"
D42	6 1/4"	7'-8 1/2"	8'-3 9/16"	1 3/16"	9'-2 15/16"
D45	6 13/16"	5'-6 7/16"	3 6'-1 1/4"	1 3/16"	7'-3 11/16"
D46	6 15/16"	5'-4 3/8"	5'-11 1/4"	1 1/4"	7'-1 5/8"
D49	6 13/16"	5'-7 3/16"	6'-2"	1 3/16"	7'-4 3/8"
D50	6 15/16"	5'-5 1/4"	6'-0 1/16"	1 1/4"	7'-2 7/16"

NOTE:
"A" = CHANGE IN ELEVATION
"B" = DISTANCE BETWEEN BENT PLATES
"C" = LENGTH OF CHANNEL
"D" = RISE PER LINEAR FOOT
"E" = OVERALL LENGTH OF DIAPHRAGM

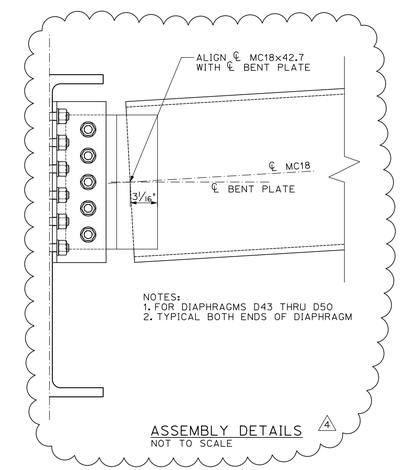


SEE DIMENSIONAL REFERENCE CHART

DIMENSIONAL PLAN DETAIL
SCALE: 3/4" = 1'-0"

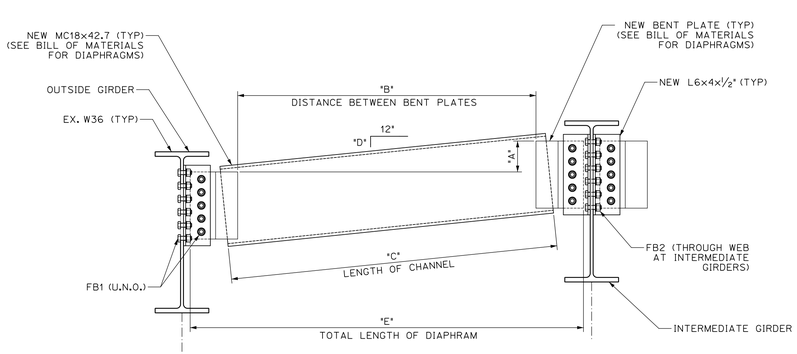


4 ASSEMBLY DETAILS
NOT TO SCALE



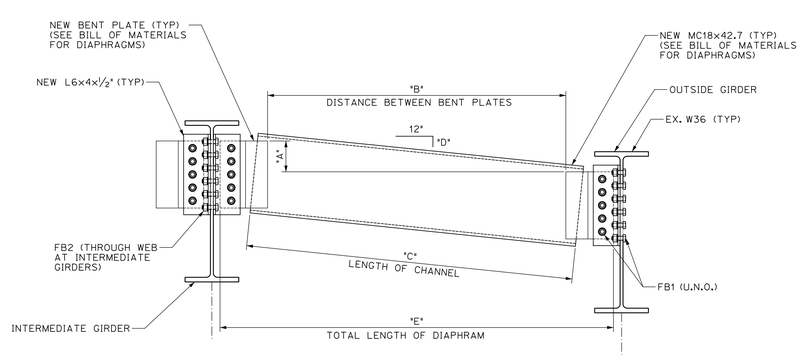
ASSEMBLY DETAILS 4
NOT TO SCALE

APPROVED: Approval of drawings and/or procedures indicates concurrence with the information presented and does not relieve the Contractor or Fabricator of compliance with all specifications and code requirements — X
APPROVED AS NOTED
REVISE AND RESUBMIT
NOT REVIEWED
Stantec
Date: 2/27/2015
By:
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 which 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 the fabrication processes or to techniques of construction and installation and for coordination of the work of all subtrades.



SEE DIMENSIONAL REFERENCE CHART

DIMENSIONAL SECTION A-A
SCALE: 3/4" = 1'-0"
(LOOKING UPSTATION)



SEE DIMENSIONAL REFERENCE CHART

DIMENSIONAL SECTION B-B
SCALE: 3/4" = 1'-0"
(LOOKING BACKSTATION)

Vermont Agency of Transportation
RECEIVED
Waterbury_BR46NO_58_Dwgs_Flat_Iss4_Approved.pdf
CK'D BY Stantec OK'D BY D Bonneau
February 27, 2015
RESUBMIT No Approved
BY D Bonneau DATE 02/28/15

PROJECT No. IM 089-2(43)
ITEM No. 506.50

FINISH	N/A			
MATERIAL	SEE DETAIL SHEETS			
HOLES	4	2/25/15	ADDED ASSEMBLY DETAILS	DLM
ELECTRODES	PER WELD PROCEDURE	3	2/16/15	BILL OF MTL'S	DLM
WELDS	PER WELD PROCEDURE	2	2/10/15	Title Block	DLM
SURFACE PREP		1	1/19/15	dim. reference chart (sh-3)	DLM
		NO	DATE	DESCRIPTION	BY

REVISIONS

ARC ENTERPRISES, INC.
ADVANCED RESOURCES & CONST. ENTERPRISES, INCORPORATED
P.O. BOX 120 KINGFIELD, ME. 04947
PHONE: (207) 265-2646 – FAX: (207) 265-4054

DRAFTER	DLM	BR46 STEEL DIAPHRAGMS 2	PROJECT NO. 14-148
DATE	JAN. 2015	WATERBURY, VT. (BRIDGE 46 North and South) I-89 EXIT RAMP over STOWE ST. & THATCHER BROOK	
CHECKED	GNM	SC: BECK & BELLUCCI	DWG. NO. 3
DATE	JAN. 2015		

BILL OF MATERIALS

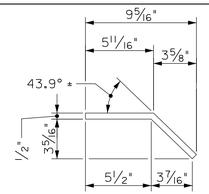
SHIP	SHIP MARK	NO. PCS.	PIECE MARK	DESCRIPTION	LENGTH	WEIGHT	MATERIAL
128	L1			L6x4x1/2"	1'-6"	25# EACH	
1	M1			MC18x42.7	8'-3 7/8"	355# EACH	
2	M2			MC18x42.7	8'-0 3/4"	355# EACH	
2	M3			MC18x42.7	8'-2 5/8"	355# EACH	
1	M4			MC18x42.7	8'-4 13/16"	360# EACH	
1	M5			MC18x42.7	8'-1 1/8"	350# EACH	
3	M6			MC18x42.7	8'-3 1/8"	355# EACH	
1	M7			MC18x42.7	8'-7 1/2"	370# EACH	
2	M8			MC18x42.7	8'-4 9/16"	360# EACH	
2	M9			MC18x42.7	8'-6 13/16"	370# EACH	
1	M10			MC18x42.7	8'-8 1/8"	370# EACH	
1	M11			MC18x42.7	8'-5"	360# EACH	
2	M12			MC18x42.7	8'-7 5/16"	370# EACH	
1	M13			MC18x42.7	8'-11 3/4"	385# EACH	
1	M14			MC18x42.7	8'-8 11/16"	375# EACH	
2	M15			MC18x42.7	8'-10 7/8"	385# EACH	
1	M16			MC18x42.7	8'-10 1/2"	385# EACH	
1	M17			MC18x42.7	9'-0 1/4"	385# EACH	
1	M18			MC18x42.7	8'-9 3/16"	375# EACH	
1	M19			MC18x42.7	8'-11 3/8"	385# EACH	
1	M20			MC18x42.7	9'-5 3/16"	400# EACH	
1	M21			MC18x42.7	9'-1 13/16"	390# EACH	
1	M22			MC18x42.7	9'-3 7/8"	400# EACH	
1	M23			MC18x42.7	9'-3 9/16"	400# EACH	
1	M24			MC18x42.7	9'-5 11/16"	405# EACH	
1	M25			MC18x42.7	9'-2 5/8"	390# EACH	
1	M26			MC18x42.7	9'-4 7/16"	400# EACH	
1	M27			MC18x42.7	9'-4 1/16"	400# EACH	
1	M28			MC18x42.7	8'-0 5/8"	345# EACH	
1	M29			MC18x42.7	7'-9 7/8"	335# EACH	
4	M30			MC18x42.7	8'-0 1/16"	345# EACH	
1	M31			MC18x42.7	7'-10 5/16"	345# EACH	
2	M32			MC18x42.7	8'-4 1/8"	355# EACH	
1	M33			MC18x42.7	8'-1 7/8"	345# EACH	
2	M34			MC18x42.7	8'-3 9/16"	345# EACH	
1	M35			MC18x42.7	8'-1 13/16"	355# EACH	
6	M36			MC18x42.7	6'-1 1/4"	260# EACH	
2	M37			MC18x42.7	5'-11 1/4"	255# EACH	
6	M38			MC18x42.7	6'-2"	265# EACH	
2	M39			MC18x42.7	6'-0 1/16"	255# EACH	
8	B1			BENT PLATE 1/2" x 10 5/16"	1'-3"	1# EACH	
16	B2			BENT PLATE 1/2" x 10 5/16"	1'-3"	1# EACH	
16	B3			BENT PLATE 1/2" x 10 1/4"	1'-3"	1# EACH	
16	B4			BENT PLATE 1/2" x 10 1/4"	1'-3"	1# EACH	
8	B5			BENT PLATE 1/2" x 10 1/4"	1'-3"	1# EACH	
8	B6			BENT PLATE 1/2" x 10 5/16"	1'-3"	1# EACH	
16	B7			BENT PLATE 1/2" x 10 5/16"	1'-3"	1# EACH	
8	B8			BENT PLATE 1/2" x 10 5/16"	1'-3"	1# EACH	
8	B9			BENT PLATE 1/2" x 10 5/8"	1'-3"	1# EACH	
16	B10			BENT PLATE 1/2" x 10 5/8"	1'-3"	1# EACH	
8	B11			BENT PLATE 1/2" x 10 5/8"	1'-3"	1# EACH	

*THE DIAPHRAGMS (MC18x42.7) ARE SQUARE CUTS AND THEREFORE NOT DETIALED

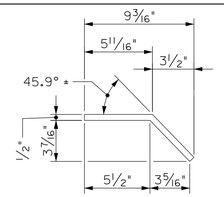
COMPLETE BOLT SCHEDULE

NO. BOLTS	PIECE MARK	LENGTH	DESCRIPTION	LOCATION
832	FB1	2 1/2"	7/8"ϕ BOLT w/ N&W ASTM A325, TYPE 1 GALVANIZED	-NEW BENT PLATE AT NEW "L" CONNECTION PLATES -NEW "L" CONNECTION PLATES TO WEB OF EXISTING OUTSIDE GIRDERS
288	FB2	3"	7/8"ϕ BOLT w/N&W ASTM A325, TYPE 1 GALVANIZED	NEW "L" CONNECTION PLATES TO WEB OF EXISTING INTERMEDIATE GIRDERS

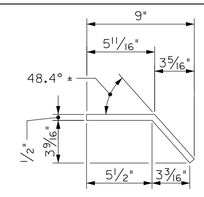
NOTE: REQUIRED BOLT LENGTH SHALL BE FIELD VERIFIED BY THE CONTRACTOR. (SEE NOTE 9 ON SHEET 169 OF 252 IN CONTRACT PLANS)



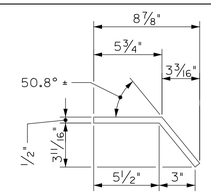
1/2" BENT PL, MARK "B2"
SCALE: 1 1/2" = 1'-0"
(8 TOTAL)



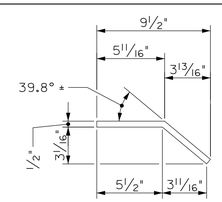
1/2" BENT PL, MARK "B3"
SCALE: 1 1/2" = 1'-0"
(8 TOTAL)



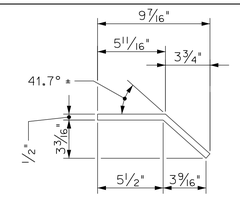
1/2" BENT PL, MARK "B4"
SCALE: 1 1/2" = 1'-0"
(8 TOTAL)



1/2" BENT PL, MARK "B5"
SCALE: 1 1/2" = 1'-0"
(8 TOTAL)



1/2" BENT PL, MARK "B6"
SCALE: 1 1/2" = 1'-0"
(8 TOTAL)



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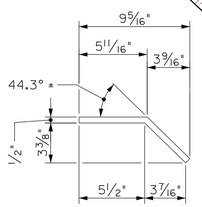
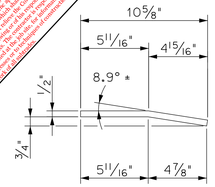
SCALE: 1 1/2" = 1'-0"
(8 TOTAL)



1/2" BENT PL, MARK "B8"
SCALE: 1 1/2" = 1'-0"
(8 TOTAL)



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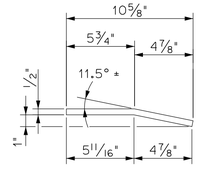
SCALE: 1 1/2" = 1'-0"
(8 TOTAL)



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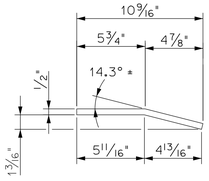
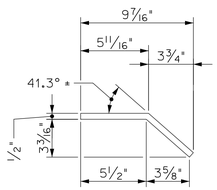
SCALE: 1 1/2" = 1'-0"
(8 TOTAL)



1/2" BENT PL, MARK "B11"
SCALE: 1 1/2" = 1'-0"
(8 TOTAL)



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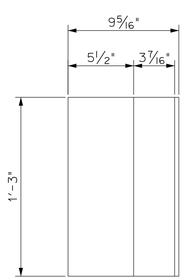
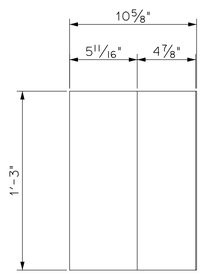
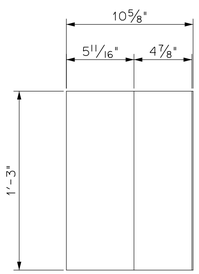
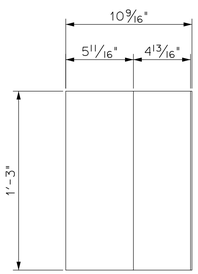
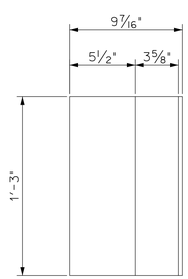
SCALE: 1 1/2" = 1'-0"
(8 TOTAL)

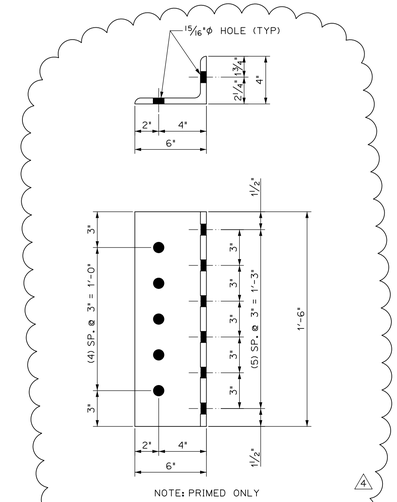












L6x4x1/2", MARK "L1"
SCALE: 2" = 1'-0"
(128 TOTAL)

Vermont Agency of Transportation
RECEIVED
Waterbury_BR46SS_Stl_Diaph_Fab_Ver1_Approved.pdf
CK'D BY Stantec OK'D BY D Bonneau
February 27, 2015
RESUBMIT No Approved
BY D Bonneau DATE 02/28/15

Stantec
APPROVED, NOTWITHSTANDING THE FOLLOWING, THAT THE CONTRACTOR IS SOLELY RESPONSIBLE FOR THE ACCURACY AND CONFORMITY TO THE CONTRACT DOCUMENTS OF THIS SHOP DRAWING. THE REVIEW OF THIS SHOP DRAWING DOES NOT RELIEVE THE CONTRACTOR FROM RESPONSIBILITY FOR ERRORS OR OMISSIONS IN THE SHOP DRAWING OR FOR DEVIATIONS FROM THE CONTRACT DOCUMENTS NOT BROUGHT TO THE ATTENTION OF THE ENGINEER IN WRITING. THE ENGINEER'S REVIEW OF THIS SHOP DRAWING DOES NOT RELIEVE THE CONTRACTOR OF THE RESPONSIBILITY FOR ERRORS OR OMISSIONS IN THE SHOP DRAWING OR FOR DEVIATIONS FROM THE CONTRACT DOCUMENTS NOT BROUGHT TO THE ATTENTION OF THE ENGINEER IN WRITING. THE ENGINEER'S REVIEW OF THIS SHOP DRAWING DOES NOT RELIEVE THE CONTRACTOR OF THE RESPONSIBILITY FOR ERRORS OR OMISSIONS IN THE SHOP DRAWING OR FOR DEVIATIONS FROM THE CONTRACT DOCUMENTS UNLESS THE CONTRACTOR HAS BROUGHT THE DEVIATIONS TO THE ATTENTION OF THE ENGINEER IN WRITING. THE ENGINEER'S REVIEW OF THIS SHOP DRAWING DOES NOT RELIEVE THE CONTRACTOR OF RESPONSIBILITY FOR ERRORS OR OMISSIONS IN THE SHOP DRAWING OR FOR DEVIATIONS FROM THE CONTRACT DOCUMENTS UNLESS THE CONTRACTOR HAS BROUGHT THE DEVIATIONS TO THE ATTENTION OF THE ENGINEER IN WRITING.
APPROVED AS NOTED
REVISE AND RESUBMIT
NOT APPROVED
Date 2/27/2015
Sig.

PROJECT No. IM 089-2(43)
ITEM No. 506.50

FINISH N/A				
MATERIAL SEE DETAIL SHEETS				
HOLES	4	2/25/15	ADDED L1 DETAIL	DLM
ELECTRODES PER WELD PROCEDURE	3	2/16/15	BILL OF MTL'S	DLM
WELDS PER WELD PROCEDURE	2	2/10/15	Title Block	DLM
SURFACE PREP	1	1/19/15	dim. reference chart (sh-3)	DLM
	NO	DATE	DESCRIPTION	BY

REVISIONS

ARC ENTERPRISES, INC.
ADVANCED RESOURCES & CONST. ENTERPRISES, INCORPORATED
P.O. BOX 120 KINGFIELD, ME. 04947
PHONE: (207) 265-2646 – FAX: (207) 265-4054

DRAFTER DLM
DATE JAN. 2015
CHECKED GNM
DATE JAN. 2015

BR46 STEEL DIAPHRAGMS 2
WATERBURY, VT. (BRIDGE 46 North and South)
I-89 EXIT RAMP over STOWE ST. & THATCHER BROOK
BC: BECK & BELLUCCI

PROJECT NO. 14-148
DWG. NO. M1