

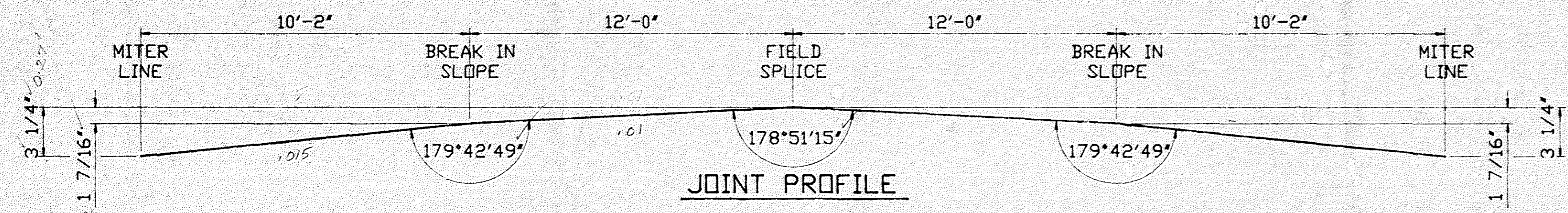
**ONE - EXPANSION JOINT - MOD24350AA**  
JOINT NEAR PIER 4

45	7.75"	7 3/4"
55	7.35"	7 9/16"
65	6.95"	6 15/16"
75	6.55"	6 9/16"
85	6.14"	6 1/8"
95	5.74"	5 3/4"

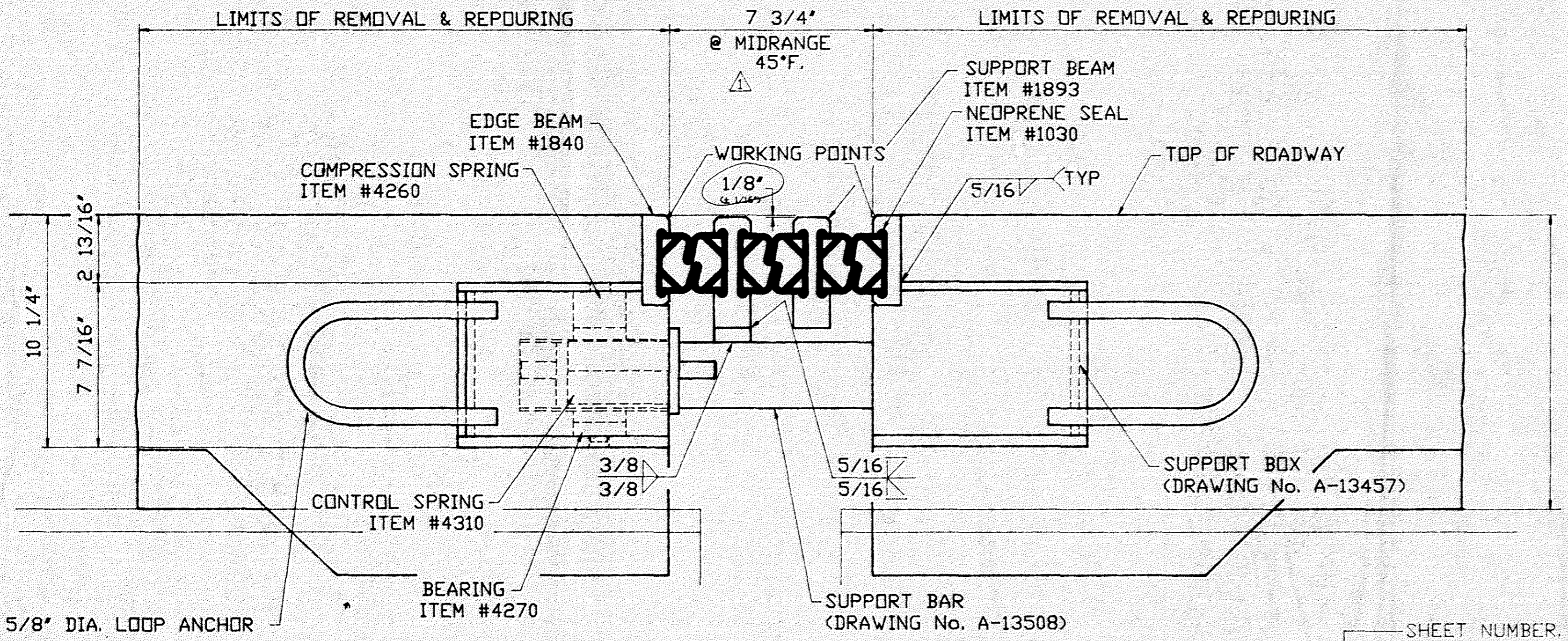
**TEMPERATURE ADJUSTMENT**

THE CHANGE PER 10°F. IS MEASURED PERPENDICULAR TO THE JOINT FOR BOTH NORMAL & SKEWED JOINTS  
DIMENSIONS SPANNING THE OPEN JOINT WILL DECREASE OR INCREASE FOR EVERY 10°F. RISE OR FALL RESPECTIVELY

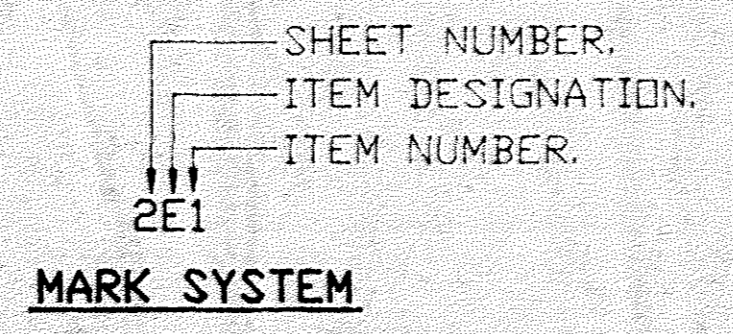
.40 INCHES AT HINGE NEAR PIER 4



**JOINT PROFILE**



**SECTION A-A**



**GENERAL NOTES**

1. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS TO ENSURE THE ACCURACY OF THE EXPANSION JOINT PRIOR TO FABRICATION.
2. FABRICATION AND MATERIALS SHALL COMPLY WITH THE 1988 MINNESOTA D.O.T. STANDARD SPECIFICATIONS FOR CONSTRUCTION AND ANY CONTRACT SPECIAL PROVISIONS.
3. WELDING SHALL BE IN ACCORDANCE WITH THE CURRENT AWS STRUCTURAL WELDING CODE D1.1 AS MODIFIED BY THE CURRENT A.A.S.H.T.O. STANDARD SPECIFICATIONS FOR WELDING OF STRUCTURAL STEEL HIGHWAY BRIDGES AND STANDARD SPECIFICATION SECTION 2471.3(K). ALL WELDING SHALL BE BY CERTIFIED WELDERS.
4. ALL STEEL SURFACES (EXCEPT STAINLESS STEEL) SHALL BE HOT-DP GALVANIZED IN ACCORDANCE WITH MN DOT/3394 (A123); GALVANIZE FASTENERS PER MN DDT/3392 (A153).
5. ALL FIELD WELDED ENDS OF THE EXTRUSIONS SHALL BE SHOP PREPARED FOR FIELD WELDING.
6. THE EXPANSION JOINT SHALL BE FACTORY PRESET TO 7 3/4" BETWEEN THE EDGE BEAMS.
7. THE EXPANSION JOINTS SHALL BE INSPECTED UPON ARRIVAL AT THE JOB SITE BY MN DOT.
8. ALL DAMAGED GALVANIZED SURFACES SHALL BE TOUCHED-UP WITH DEVCON Z PAINT.
9. ALL STEEL USED WITHIN THE EXPANSION JOINT SHALL BE AMERICAN MADE.
10. ALL STEEL SHALL BE STRAIGHT AFTER GALVANIZING.

**TABLE OF CONTENTS**

- SHT 1 EXPANSION JOINT PLAN SECTION & GENERAL NOTES
- SHT 2 MISC DETAILS
- SHT 3 MISC DETAILS & B.O.M.
- SHT 1 SUPPORT BAR DETAIL (DRAWING No. A-13508)
- SHT 1 SUPPORT BOX DETAIL (DRAWING No. A-13457)
- SHT 1 SLIDER PLATE DETAIL (DRAWING No. A-13497)

**PROJ. FILE**  
MAY 15 1991

BRIDGE NO.: 02523  
PROJECT NO.: 02-602-09  
F.A.PROJECT NO.: N/A  
FABRICATOR'S NAME: WATSON BOWMAN ACME  
PRODUCT NO.: MOD24350AA

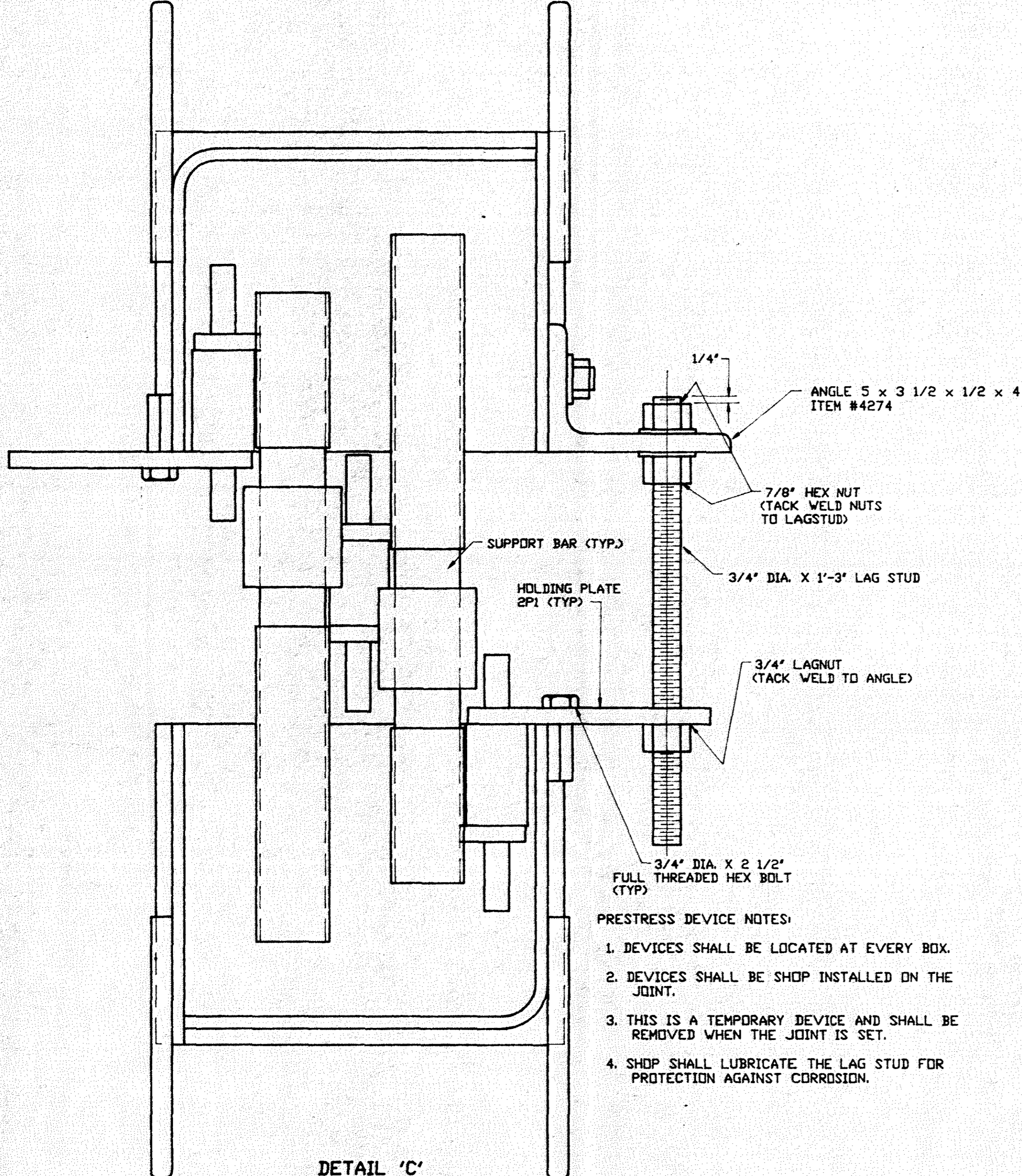
4		
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1	REVISE NOTES 4,7 & 10	JB 5/10
NO.	DESCRIPTION	NAME DATE
REVISIONS		
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<b>Watson Bowman Acme</b>		95 Shawnee Drive Ardenwood, N.Y. 14228	TEL: (716) 691-7566	FAX: (716) 691-9029
PROJECT: MINNESOTA D.O.T. - ANOKA COUNTY CSAH2 / YARD TRACKS IN NORTHTOWN				
TITLE: D-900 MODULAR EXPANSION JOINT				

DATE: 3-25-91	DRAWING NO: 24350
CHECKED BY: J. Bender	VBA JOB NO: 24350
DATE: 3-27-91	SHEET NO: 1 OF 3
SCALE: NONE	DRAWING NO: A-13435

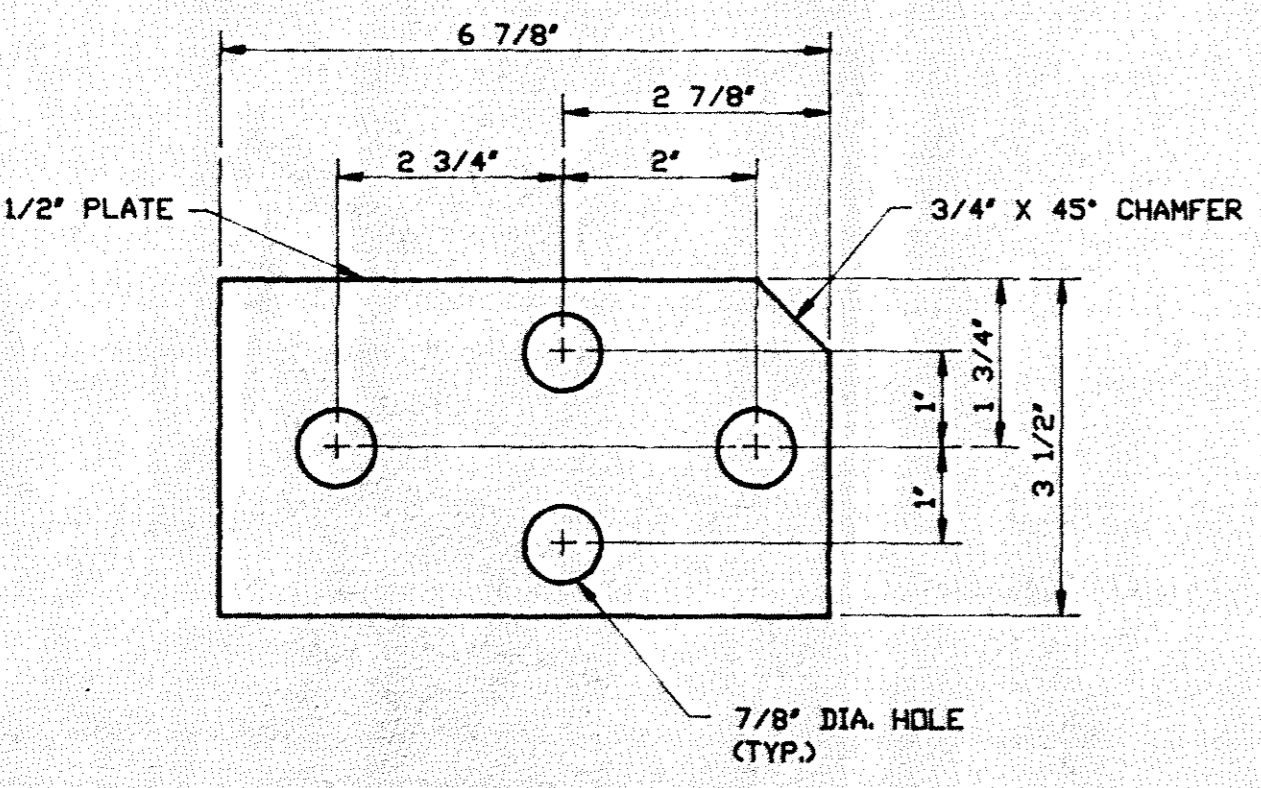
STATE OF MINNESOTA  
Department of Transportation  
NO OBJECTION TAKEN  
MAY 22 1991  
REVIEW IS FOR GENERAL COMPLIANCE WITH PLANS AND SPECIFICATIONS  
JOHN R. ALLEN  
STRUCTURAL METALS ENGINEER



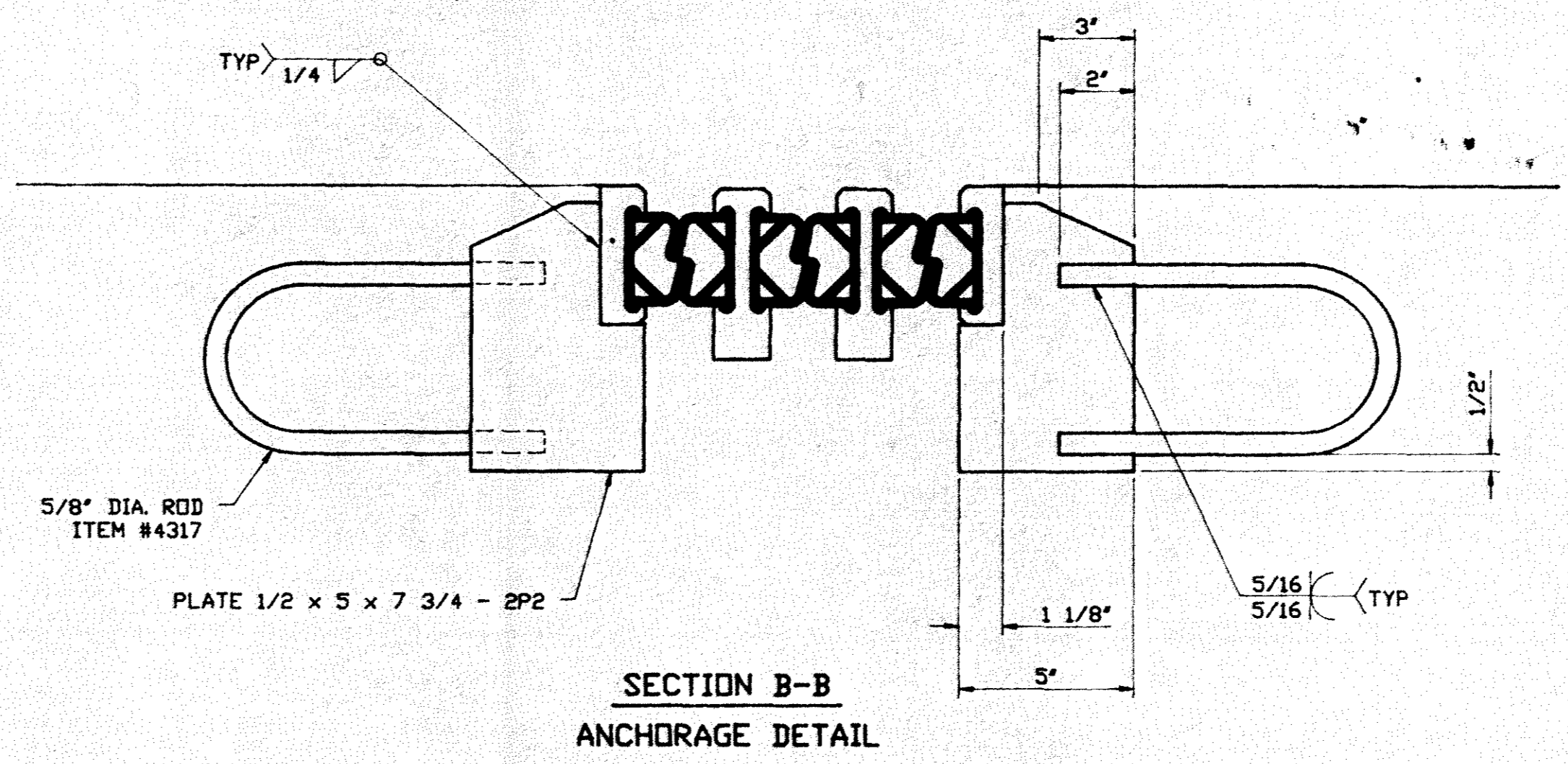


DETAIL 'C' SUPPORT BOX PLAN VIEW

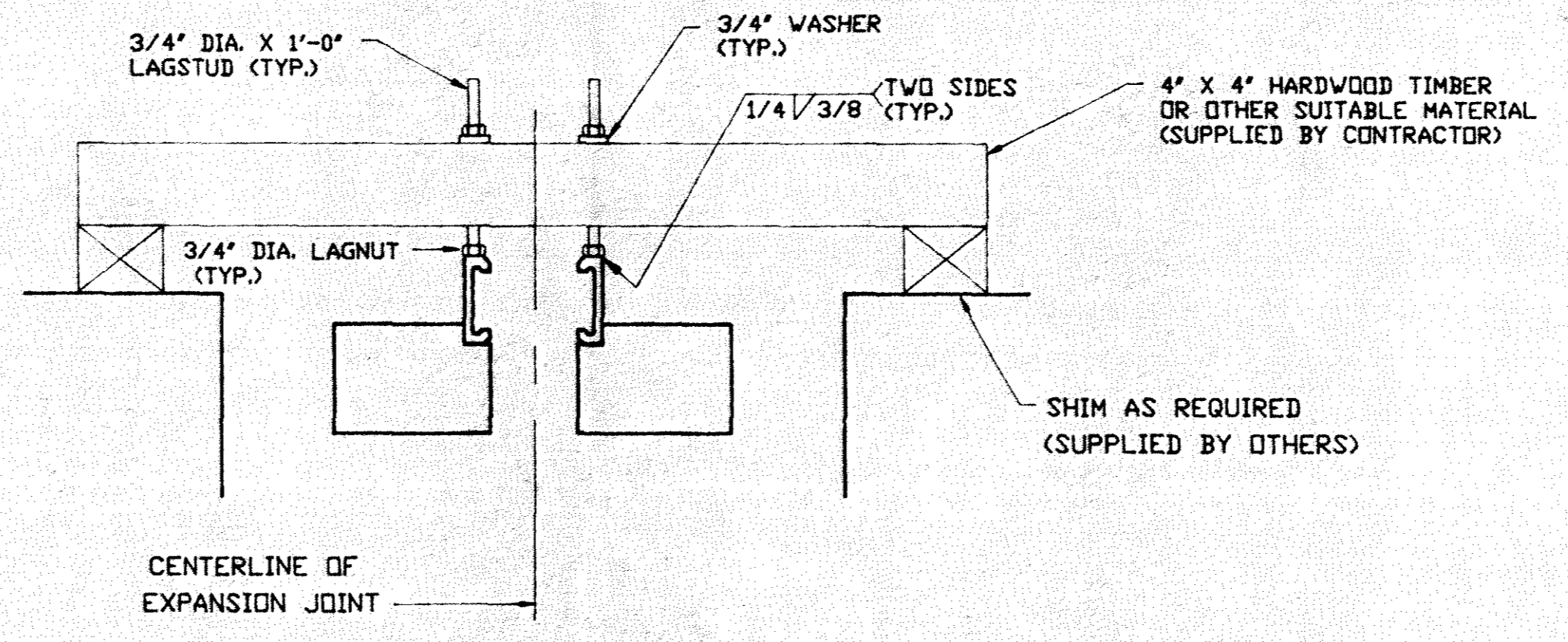
- PRESTRESS DEVICE NOTES:
1. DEVICES SHALL BE LOCATED AT EVERY BOX.
  2. DEVICES SHALL BE SHOP INSTALLED ON THE JOINT.
  3. THIS IS A TEMPORARY DEVICE AND SHALL BE REMOVED WHEN THE JOINT IS SET.
  4. SHOP SHALL LUBRICATE THE LAG STUD FOR PROTECTION AGAINST CORROSION.



2P1 - HOLDING PLATE DETAIL



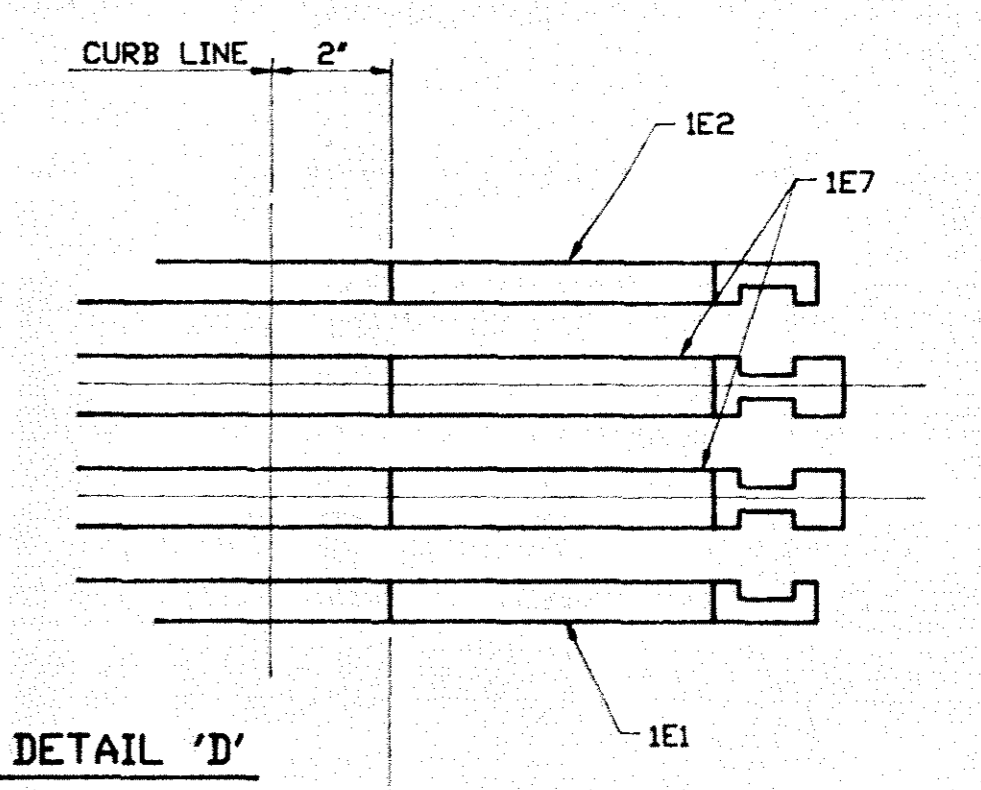
SECTION B-B ANCHORAGE DETAIL



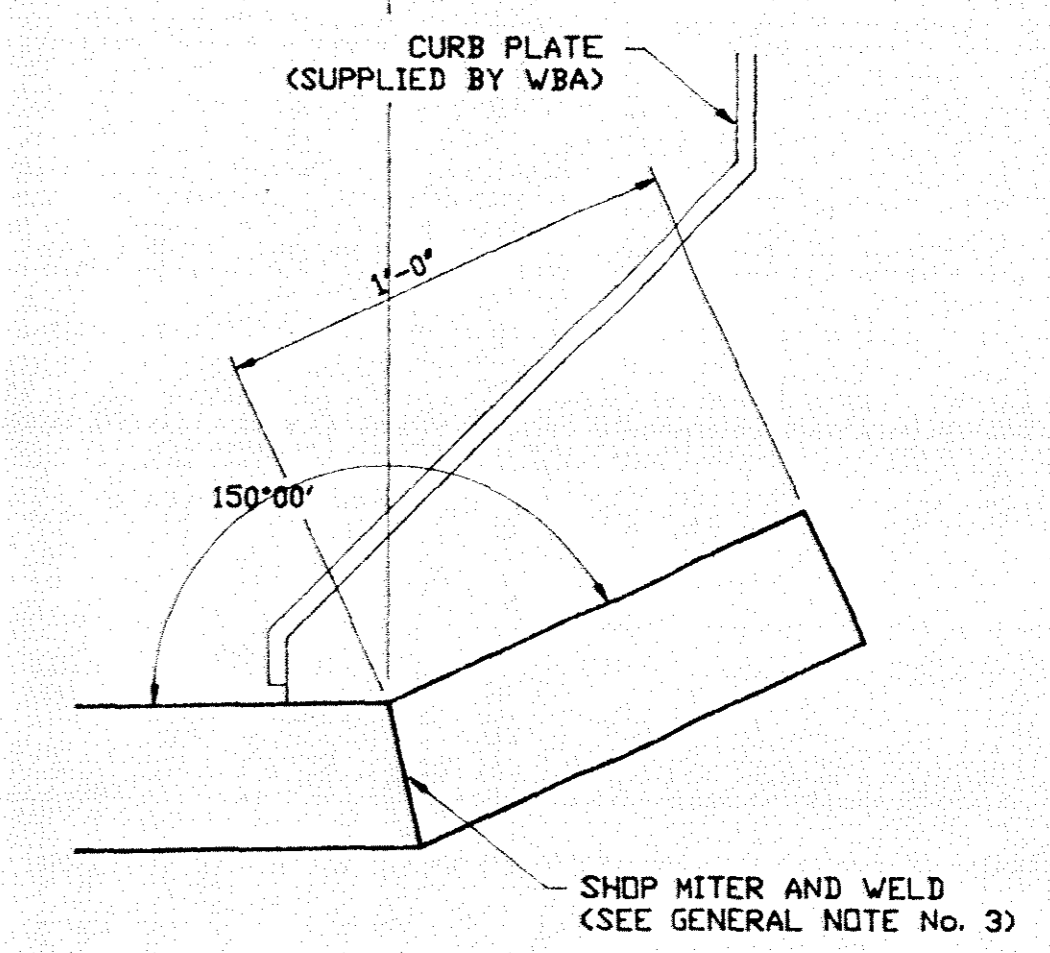
ELEVATION

LEVELING ASSEMBLY

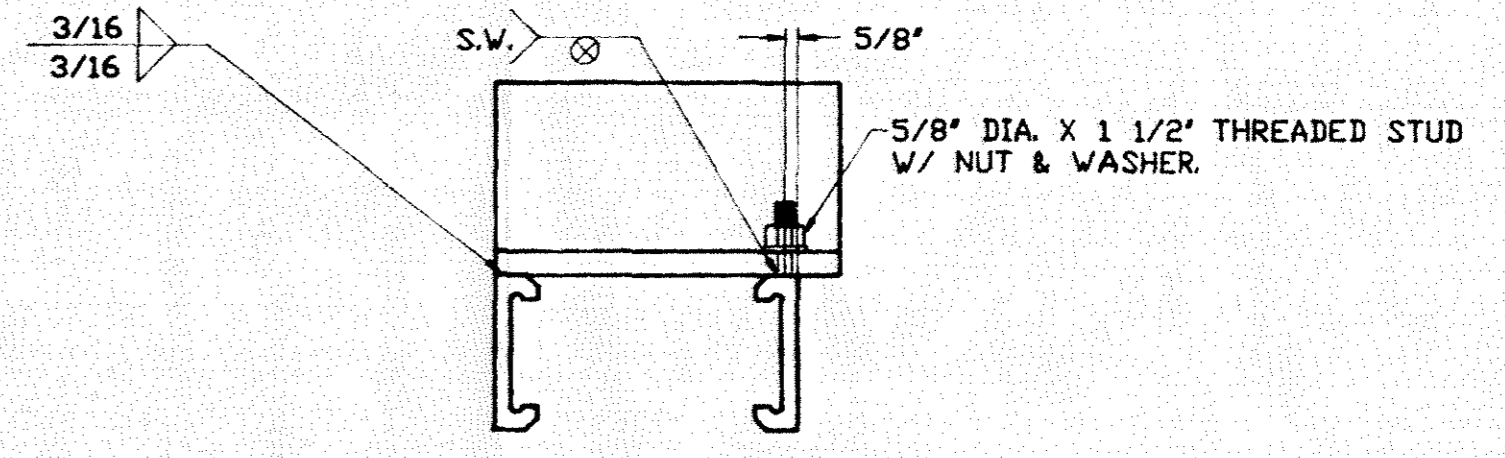
- NOTE:
1. LEVELING NUTS SHALL BE LOCATED AT EVERY OTHER SUPPORT BOX.
  2. LEVELING NUTS SHALL BE SHOP INSTALLED PARALLEL TO THE EXPANSION JOINT SUPPORT BARS.
  3. CONTRACTOR SHALL REMOVE LEVELING NUTS WHEN JOINT IS SET AND GRIND WELDS SMOOTH.
  4. CONTRACTOR SHALL MATCH DRILL THE TIMBER WITH THE 3/4" LAG NUTS PRIOR TO SETTING THE EXPANSION DAM IN ITS FINAL POSITION.



DETAIL 'D'

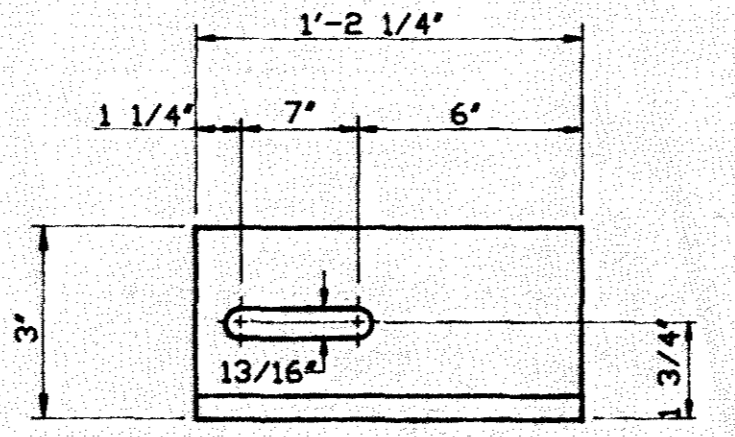


ELEVATION TYPICAL CURB UPTURN



SHIPPING CLAMP ASSEMBLY

- NOTE:
1. SHIPPING CLAMPS SHALL BE SPACED DIRECTLY BETWEEN SUPPORT BOXES, PARALLEL TO THE CENTERLINE OF THE SUPPORT BOX, AND BETWEEN THE MITERLINE AND FIRST BOX.
  2. EACH SHIPPING CLAMP ASSEMBLY SHALL INCLUDE:
    - (1) 5" X 3" X 3/8" X 1'-2 1/4" (2A1)
    - (1) 5/8" DIA. X 1 1/2" THREADED STUD
    - (1) 5/8" STD. HEX NUT
    - (1) 5/8" STD. WASHER
  3. CONTRACTOR TO REMOVE SHIPPING CLAMPS WHEN JOINT IS SET AND GRIND WELDS SMOOTH.



2A1 - SHIPPING CLAMP DETAIL ANGLE 5" x 3" x 3/8"

SHOP DRAWING NO. 111-111-1  
 State of Minnesota  
 Department of Transportation  
 NO OBJECTION TAKEN  
 MAY 22 1991  
 REVIEW IS FOR GENERAL COMPLIANCE WITH PLANS AND SPECIFICATIONS  
 JOHN R. ALLEN  
 STRUCTURAL METALS ENGINEER

PROJ. FILE

NO.	DESCRIPTION	NAME	DATE
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3			
2			
1			
REVISIONS			
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<b>Watson Bourman &amp; Company</b>		95 Pioneer Drive Amherst, N.Y. 14228	TEL. (716) 691-7566	FAX (716) 691-9299
PROJECT:	MINNESOTA D.O.T. - ANOKA COUNTY CSAH2 / YARD TRACKS IN NORTHTOWN			
TITLE:	D-900 MODULAR EXPANSION JOINT			

DETAILED BY:	J. Bender	DATE:	3-25-91
CHECKED BY:	J. Bender	DATE:	3-27-91
SCALE:	NONE	VBA JOB NO.:	24350
SHEET NO.:	2 OF 3	DRAWING NO.:	A-13435



**Bill of Materials for MOD24350AA**

**STEEL EDGE & SUPPORT BEAMS** - All beams are made of ASTM A-588 grade steel and have grooves which grip the neoprene locking seal.

**NEOPRENE LOCKING SEAL** - The neoprene locking seal is bonded to the steel beams with Prima-Lub Adhesive. The neoprene seal is designed to absorb all joint movements. The physical properties of the locking seal are as follows:

PHYSICAL PROPERTIES	PROCEDURE	REQUIREMENT
Tensile Strength	(D-412)	2000 PSI
Elongation at Break	(D-412)	250%
Hardness, Type A Durometer	(D-2240)	60 +/- 7
Compression Set	(D-395)	40%
70 hour at 212°F (D)	Method B Mod.	

Oven Aging, 70 hour at 212°F	(D-573)	20%
Tensile Strength, loss, max.		20%
Elongation, loss, max.		0 to +10
Hardness, Type A Durometer (points change)		

Dil Swell, Astm #3, 70 hour at 212, weight change max.		45%
Ozone Resistance, 20% strain 300 PPHM, in air at 104°F (wiped with toluene to remove surface contamination)	(D-1149)	No Cracks

**COMPRESSION SPRING C-306** - This compression spring is composed of urethane, epoxy and 3/64" thick teflon sheet. The compression spring sits on top of the support bar. The physical properties of the urethane are:

Shore Durometer	(ASTM D-2240)	90A
Elongation at Break	(ASTM D-412)	425%
Tensile Strength	(ASTM D-412)	6500 PSI
100% Modulus	(ASTM D-412)	1200 PSI
300% Modulus	(ASTM D-412)	2400 PSI
Tear Strength	(ASTM D-470)	110 PLI
Rebound Resilience	(ASTM D-2632)	40%

**CONTROL SPRING** - The control spring which is located between the support bars act to equalize the expansion of each seal. The control spring is made of EPDM.

**STAINLESS STEEL SHEETING** - Stainless steel is used on the sliding surfaces of the support bar. The stainless steel contact the teflon surfaces of the bearing and compression spring. The mechanical properties of the stainless steel are as follows:

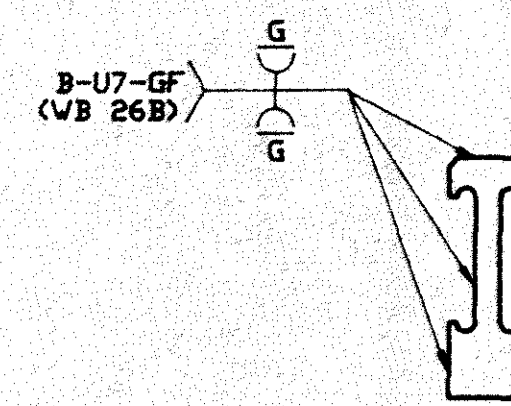
Tensile Strength	92,700 PSI
Yield	51,700 PSI
Hardness	Rb 68
Bend Test	180 TXT
Elongation	56%

**PRIMA-LUB ADHESIVE** - Prima-lub Adhesive is used to bond the neoprene locking seal to the steel extrusions. This adhesive shall be a one-part moisture curing polyurethane and hydrocarbon solvent mixture with the following physical properties:

Average Weight per Gallon	8.5 lbs +/- 10%
Solids Content	72% (min.)
Adhesive to remain workable	From 5-120°F
Film Strength	2000 PSI (min.)
Elongation at room temperature	350% (min.)
Flash Point (seta closed cup)	over 100°F

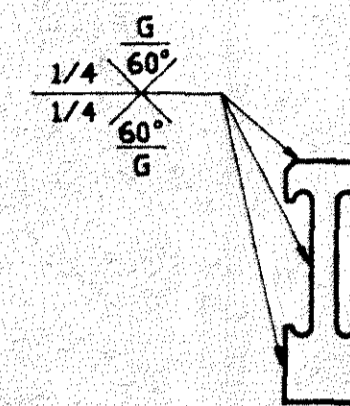
**BEARING C-307** - The bearing is composed of urethane, epoxy and 3/64" thick teflon sheet on which the support bar slides on. The physical properties of the urethane are:

Shore Durometer	(ASTM D-2240)	90A
Elongation at Break	(ASTM D-412)	425%
Tensile Strength	(ASTM D-412)	6500 PSI
100% Modulus	(ASTM D-412)	1200 PSI
300% Modulus	(ASTM D-412)	2400 PSI
Tear Strength	(ASTM D-470)	110 PLI
Rebound Resilience	(ASTM D-2632)	40%



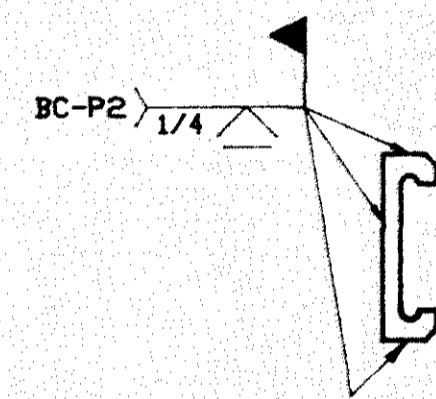
**SHOP WELD**

CENTER BEAM #1893



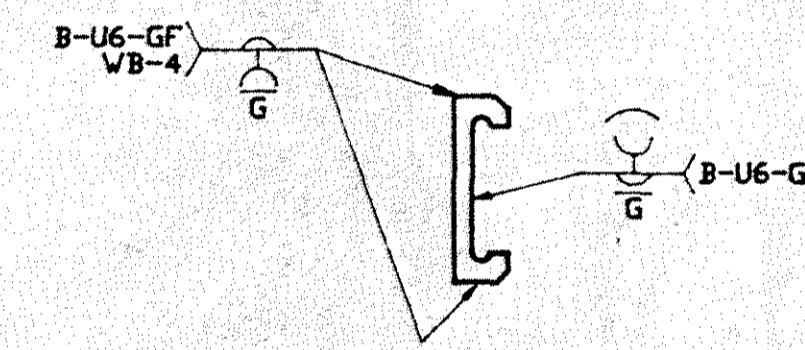
**SHOP WELD**

CENTER BEAM # 1893  
CURB SPLICE ONLY



**FIELD WELD**

EDGE BEAM #1840

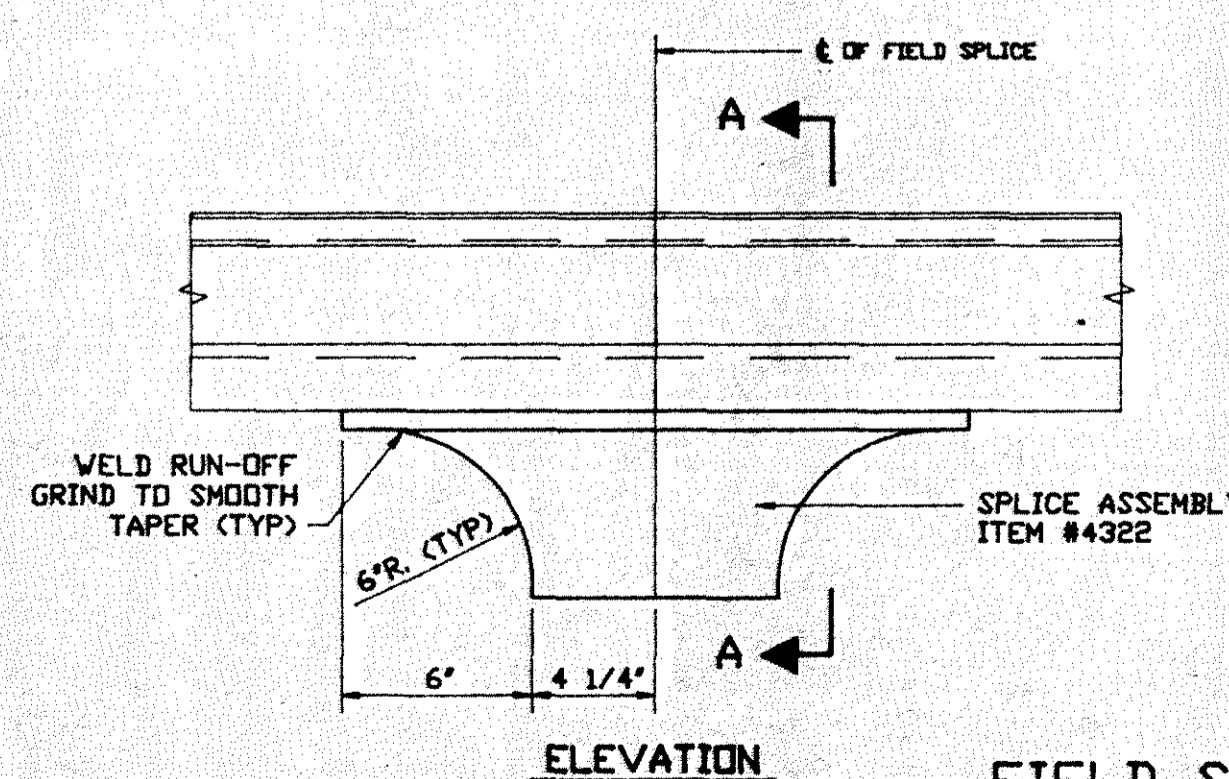


**SHOP WELD**

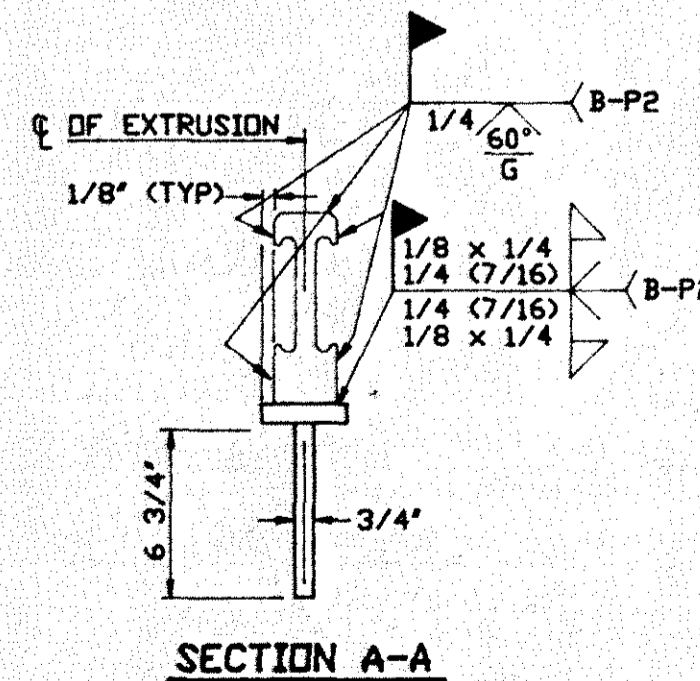
EDGE BEAM #1840

**INSTALLATION PROCEDURE**

- Compare the dimensions of the blockout with SECTION A-A on sheet #1.
- Move the center beam over and install the neoprene seal. Move the center beam in the other direction and install the other neoprene seal. The neoprene seals shall be installed with the seal installation tools and the Prima-Lub adhesive. The Prima-Lub adhesive shall be applied to the full surface, on the steel cavities. The neoprene seal shall be installed in one continuous piece.
- Preset the expansion joint opening using the ambient temperature and the temperature adjustment chart from the shop drawings. Discuss the final preset opening with the Engineer in charge. Retighten nuts at shipping clamps.
- Lift and then place expansion joint into blockout. While joint is suspended, install leveling devices and/or support brackets and adjust to proper grade and elevation.
- Check joint for alignment with crown and curbs.
- Complete all connections to the superstructure.
- Prior to placement of concrete, all prestress devices shall be removed. Devices on top of the joint may remain if their location will not interfere with concrete placement or expansion joint performance.
- Temperature and joint opening should be checked for any discrepancies from initial adjustment.
- Contractor shall at this time have all required formwork in place.
- All concrete placement shall be in accordance with the specifications.
- Upon completing concrete placement operations, the Engineer shall determine when removal of the leveling devices will be permitted. (if applicable) Contractor shall touch up damaged painted areas.
- Fill all bolt holes with styrofoam or other suitable material and install slider plates. (if applicable)

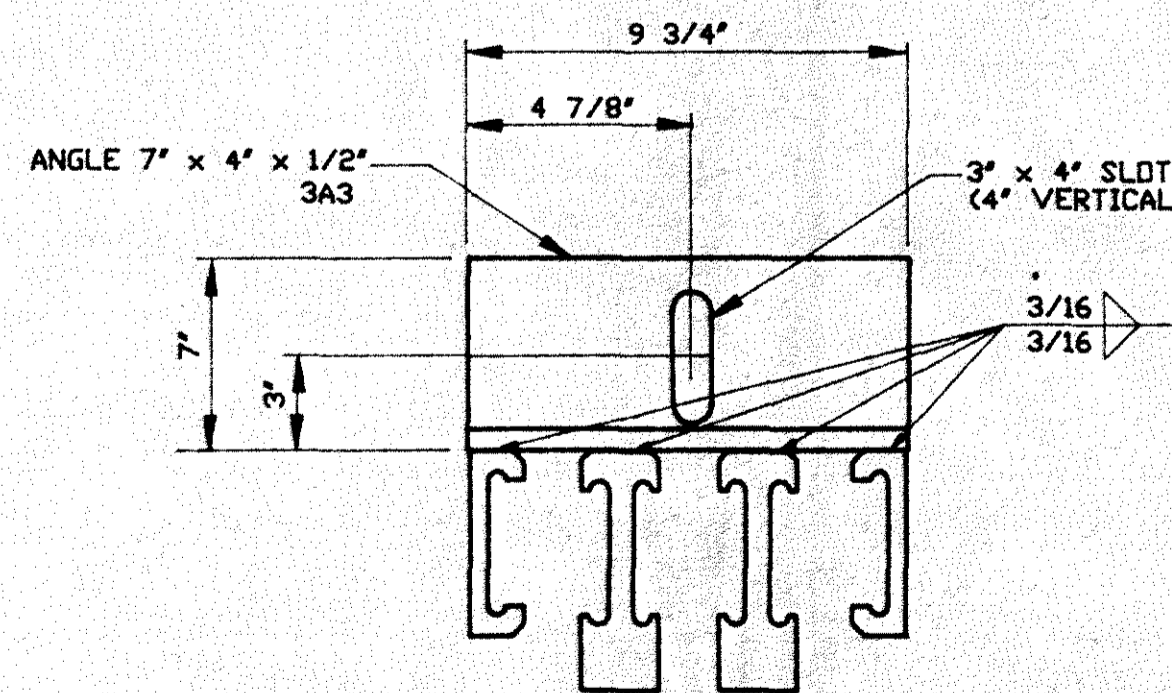


**ELEVATION**



**FIELD SPLICE DETAIL**

NOTE:  
THE SPLICE PLATE ASSEMBLY SHALL BE SHOP WELDED TO STAGE ONE CENTER BEAM EXTRUSION AND FIELD WELDED TO THE STAGE TWO CENTER BEAM EXTRUSION.



**LIFTING DEVICE ASSEMBLY**

- NOTE:
- LIFTING ANGLES SHALL BE PLACED BY THE FABRICATOR TO ACHIEVE A LEVEL LIFT FOR PLACEMENT.
  - THE CONTRACTOR SHALL REMOVE AFTER THE JOINT IS SET IN BLOCKOUT, PRIOR TO PRESETTING OF JOINT.
  - THE CONTRACTOR SHALL REMOVE BY GRINDING WELDS SMOOTH.

LEV	PART NO.	QTY REQD	U/M	DESCRIPTION	MATERIAL
0	MOD24350AA	1.000	EA	MOD900AM, PIER 4	46.33FT (X) SHIPPING LENGTH 23.00 FT
1	MOD24350AA01	1.000	PK	EXTRUSION ASSEMBLIES	(W)
2	MOD24350AA02	1.000	PK	PROFILES	(W)
3	1840	93.500	FT	MODSHP EC AM C3491-2 A588 WABO	EDGE BEAM (DOMESTIC) A588
3	1893	93.500	FT	MOD SHP 5" CB AM C11459 A588	SUPPORT BEAM (DOMESTIC) A588
3	4322	2.000	EA	SPLICE ASSEMBLY C13394 A588	PLATE 3/4"
2	MOD24350AA03	20.000	EA	D900 SUPPORT BOX A13457	(X)
3	3540	53.000	LB	PLATE 3/8 A36	ONE PLATE IS BENT
3	4317	2.000	EA	MOD COMP BDX LOOP ANC C11469	A36 - BENT
3	MOD24350AA03AA	1.000	PK	PARTS FOR BDX ASSEMBLY	(U)
4	8085	2.000	EA	NUT 3/4 X 2 1/4 H COUPLER ZP	A307
4	7010	2.000	EA	THD STUD 5/8 X 1 1/2	A108
2	MOD24350AA10	20.000	EA	D900 SUPPORT BAR ASSEMBLY	(X)
3	3730	36.000	LB	PLATE 2" A588	
3	6198	2.000	EA	SS 12GA x 2 1/4 x 6	
3	6197	2.000	EA	SS 12GA x 2 1/4 x 9	
3	4319	2.000	EA	MOD SUPPORT STOP BAR C13159	
2	MOD24350AA04	20.000	EA	HOLDING PLATE 2P1 DN A13435(X)	
3	3560	3.000	LB	PLATE 1/2 A36	
2	MOD24350AA05	60.000	EA	LDDP ANCHOR	(W)
3	3560	5.500	LB	PLATE 1/2" A36	
3	4317	2.000	EA	MOD COMP BDX LOOP ANC C11469	A36-BENT
2	4274	10.000	EA	PRETRESS ANGLE	(W)
					TEMP ANGLE 5 x 3 1/2 x 3/8 A36
2	MOD24350AA06	12.000	EA	SHIPPING CLAMP ANGLE 2A1	(W)
3	3990	1.200	LF	ANGLE 5"x 3"x 3/8" A36	ITEM IS TEMPORARY
2	MOD24350AA07	4.000	EA	LIFTING ANGLE 3A3	(W)
3	4130	0.850	FT	ANGLE 7 x 4 x 1/2 A36	ITEM IS TEMPORARY
2	MOD24350AA08	1.000	PK	PARTS FOR ASSEMBLY	(U)
3	4260	40.000	EA	MODULAR BEARING (UPPER) C306	URETHANE
3	4270	40.000	EA	MODULAR BEARING (LOWER) C307	URETHANE
3	4310	30.000	EA	MODULAR CONTROL SPRING C5590	
3	7959	32.000	EA	NUT 5/8 H A563 B695-83 C50 T1	ITEM IS TEMPORARY
3	7549	32.000	EA	WASHER 5/8 F436 B695-83 C50 T1	ITEM IS TEMPORARY
3	8084	12.000	EA	NUT 3/4 H NL LAG ZP	
3	5262	40.000	EA	BOLT 3/4 X 2 1/2 A325 ZP	FULLY THREAD
2	MOD24350AA09	10.000	EA	PRESTRESS ROD 1'-6"	(U)
3	7152	1.250	FT	THD ROD 3/4 LAG STUD RICHMOND	ITEM IS TEMPORARY
0	MOD24350PS	1.000	PK	PARTS FOR SHIPPING	(W)
1	8084	12.000	EA	NUT 3/4 H NL LAG ZP	
1	7602	12.000	EA	WASHER 3/4 F436 ZP AM	
1	4221	6.000	FT	MODULAR END PLUG C12728	
1	3010	1.000	EA	INSTALLATION TOOL POGG STICK	
1	3020	1.000	EA	INSTALLATION TOOL STRIP SEAL	
1	2720	1.000	GA	ADHESIVE PRIMA LUB	
1	2730	0.000	EA	ADH ARON ALPHA	
1	MOD24350PS01	12.000	EA	LEVELING ROD 1'-0"	(U)
2	7152	1.000	FT	THD ROD 3/4 LAG STUD RICHMOND	
0	MOD24350S01	3.000	EA	SEAL FOR SHIPPING	(W)
1	1040	49.000	FT	MOD SEAL C5603	

State of Minnesota  
Department of Transportation  
NO OBJECTION TAKEN

MAY 22 1991

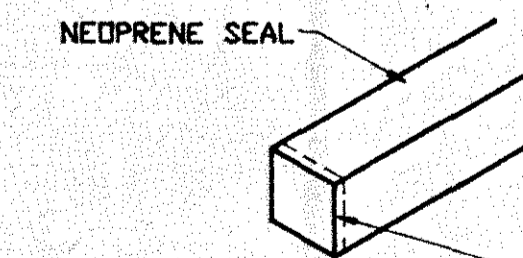
REVIEW IS FOR GENERAL COMPLIANCE WITH PLANS AND SPECIFICATIONS  
JOHN R. ALLEN  
STRUCTURAL METALS ENGINEER

**PROJ. FILE**

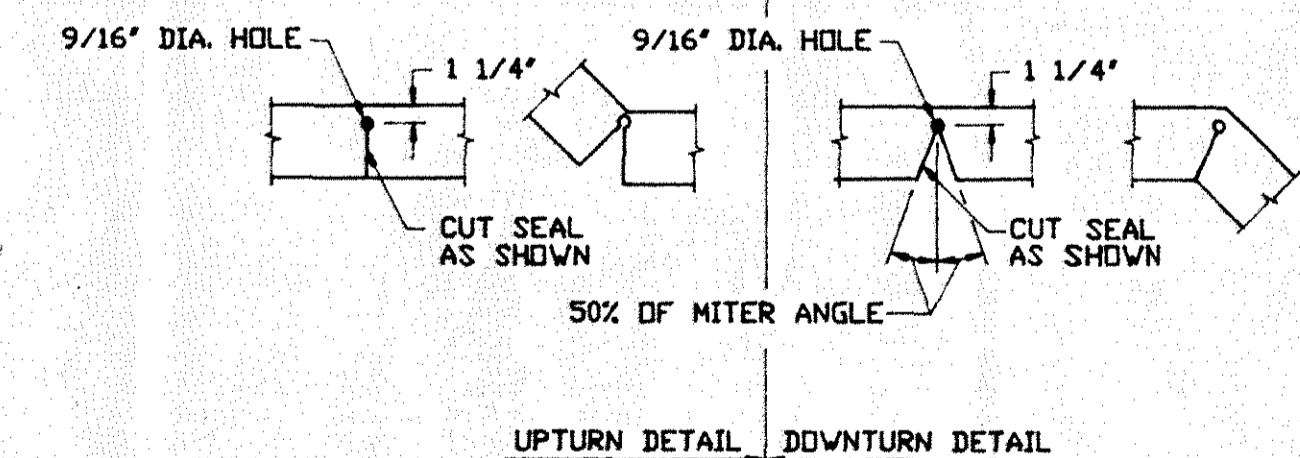
**ENDPLUG DETAIL**

(FIELD INSTALLED)

- CLEAN SEAL ENDS WITH A SUITABLE SOLVENT CLEANER SUCH AS TOLUENE.
- TRIM SPONGE AND/ OR COPE SEAL TO SECURE END CAP.
- APPLY PRIMA-LUB ADHESIVE TO ADHERE END CAP IN PLACE.



**UPTURN & DOWNTURN DETAIL**



**SEAL TREATMENTS**

4					
3					
2					
1					
NO.	DESCRIPTION	NAME	DATE		
<b>REVISIONS</b>					
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Watson Bowman Acme 95 Phoenix Drive Amherst, NY 14228 TEL: (716) 691-7566 FAX (716) 691-9229		DETAILED BY J. Bender	DATE 3-25-91		
		CHECKED BY J. Bender	DATE 3-27-91		
PROJECT: MINNESOTA D.O.T. - ANOKA COUNTY CSA#2 / YARD TRACKS IN NORTH TOWN		SCALE: NONE	VBA JOB NO. 24350		
TITLE: D-900 MODULAR EXPANSION JOINT		SHEET NO. 3 OF 3	DRAWING NO. A-13435		