

EAST SIDE - WEST BOUND LANE
(LOOKING EAST)

Bridge 610 (N.E.P. 447.76)
Dunkirk-Fredonia Int. ramp over I-490
(Bridge repairs accepted)

West Side (Westbound)

- 1) Girders straightened with heat patterns & jacks.
- 2) Removed and replaced rivets with A325 fasteners at third intermediate connection plate.
- 3) Removed and replaced second intermediate connection plate.
- 4) Ground out scrapes on bottom flange at point of impact.

West Interior (Westbound)

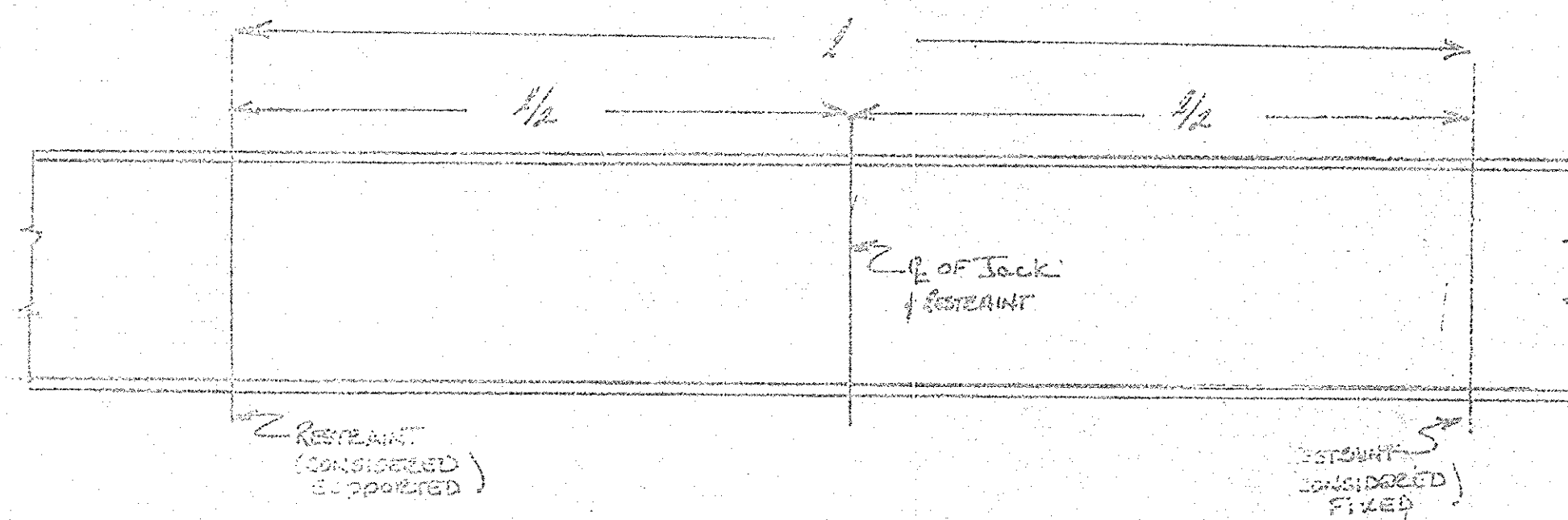
- 1) No heat patterns required.
- 2) Removed and replaced rivets with A325 fasteners at second and third intermediate connection plates.

New York State Thruway Authority FINAL SHOP DRAWING REVIEW	
<input checked="" type="checkbox"/> Approved <input type="checkbox"/> Approved As Noted <input type="checkbox"/> Approved For Revision No. _____	By: <i>[Signature]</i> Date: 7-1-78

AS-BUILT REVISIONS

Kim Alwe 10/14/96

1A 97-286 D-10-328 BRIDGE LOCATION & NO. MAP 100-741	
DIVISION - RECORDING THE ROAD, PAGE 1-20	
SCALE: M.T.S. DATE: 1-8-78	APPROVED BY: <i>[Signature]</i> DATE: 1-8-78
FROM 85-90 54110 REMOVE 10" STANDARD STEEL	
VICTOR CONSTRUCTION CORPORATION	



Bridge: 10 MP. 467.74
East Fascia (West bound)

ELONGE SHEET:

Pump Jack System Required
Pump at one end and supported at other (Dimensions shown)

Max Allowable moment M in M/F/S
where $l = 23$ feet

$S = 144 \times 203$
Girders W36 x 132

Flange thickness = 1.19
Flange width = 12.076
Cover plate thickness = 0.376
Cover plate width = 14

$S_{xx} = S$ (cover plate) + S (flange)
 $S_{xx} = 40.63$ cubic inches
therefore max allowable moment

M (with cover plate) = 813502

$S_{xx} = S$ (flange)
 $S_{xx} = 28.63$ cubic inches
therefore max allowable moment

M (without cover plate) = 573502

25 ton Jack effective area = 6.16

M (max) at fixed end = SEI
16

M (point of load) = SEI
32

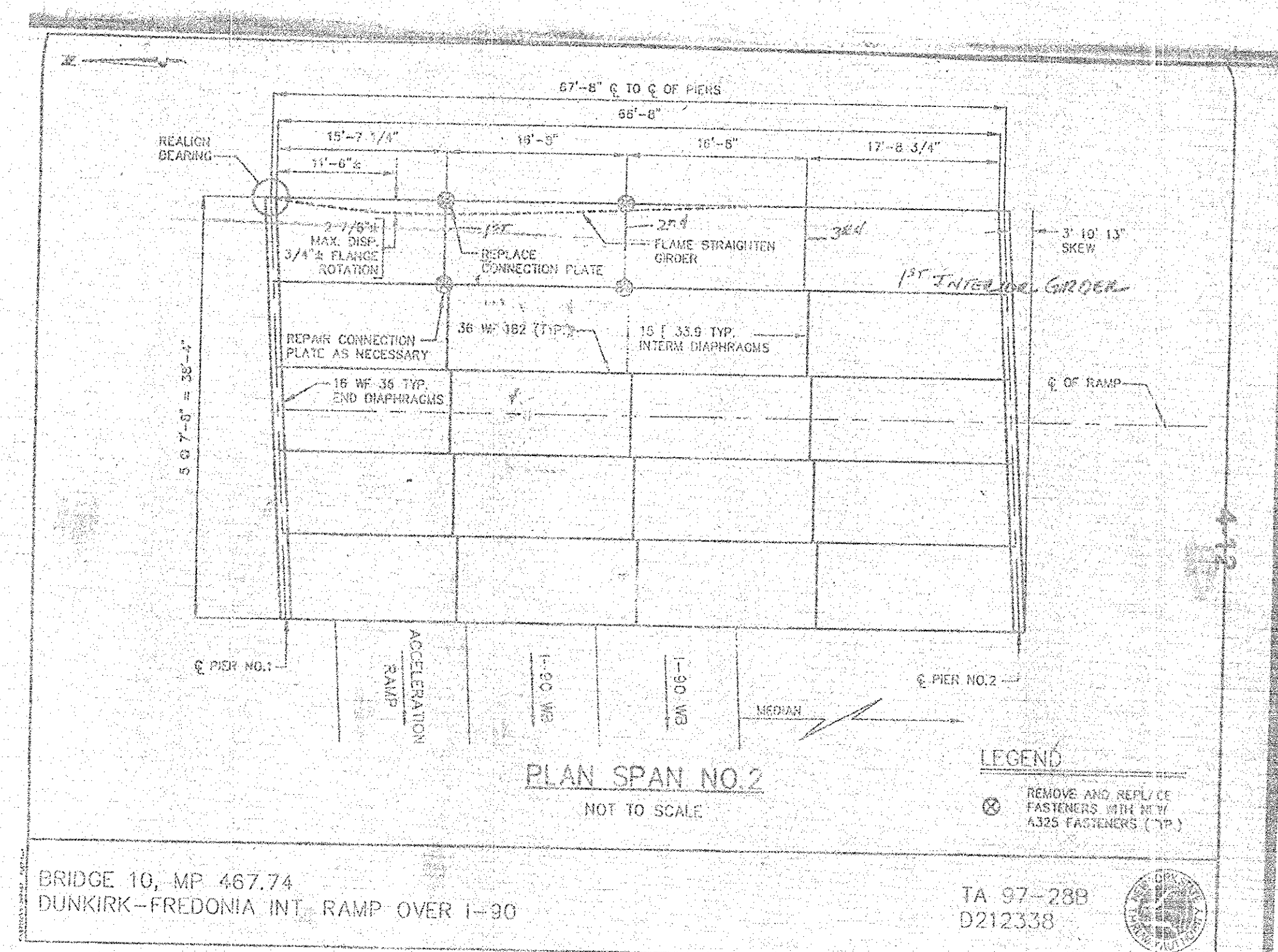
M (x) = SEI
16

East Fascia (West bound)

With Jack located @ 32 Feet From Pier #1 Bearing

		Point of Load	Point of Load	MAX P at fixed	Fixed End	Allowable
		Load	Hydraulic Pressure	and	Hydraulic Pressure	Hydraulic Pressure
1	3	72753	14127	60530	11773	11773
3	4	64687	10895	48472	8890	8890
10	5	43653	8476	33379	7024	7024
12	6	30976	7094	23216	5636	5636
14	7	21151	6055	16983	4048	4048
16	8	14238	5285	12733	3416	3416
18	9	10252	4709	9210	2924	2924
20	10	7487	4239	6819	2532	2532
22	11	5494	3853	5036	2211	2211
24	12	4010	3532	3667	2043	2043
26	13	2970	3280	2691	1877	1877
28	14	2159	3027	1982	1723	1723
30	15	1485	2826	1416	1586	1586
32	16	1042	2643	1008	1467	1467

NOTE: JACK LOCATION CAN BE MOVED ANYWHERE ALONG GIRDER AND STILL
MAINTAIN THE SAME PRESSURES CORRESPONDING TO RESTRAINT
SPACING



1st INTERIOR GIRDER

REMOVE PAINT & REPAINT 12" EACH SIDE
OF 1st & 2nd INTERMEDIATE CONNECTION
PLATES AS PER NOTES SHEET #11
REMOVE & REPLACE EXISTING FASTENERS
W/ A325 BOLTS AS PER BOLT REMOVAL
NOTES SHEET #13

New York State
Thruway Authority
FINAL SHOP DRAWING REVIEW

☒ Approved
☐ Approved As Noted
☐ Approved For Revision No. _____

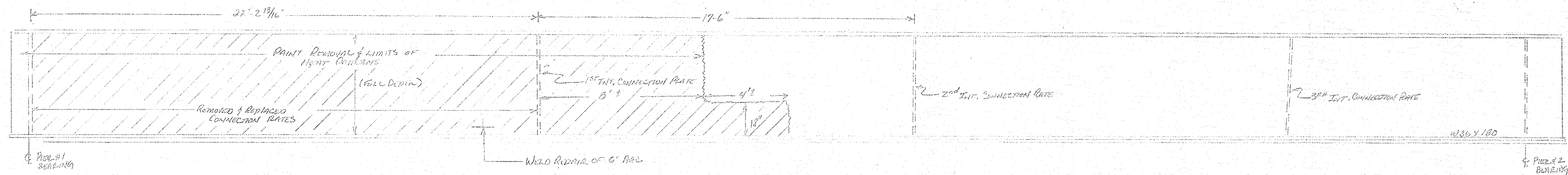
By: *MGP* Date: 9-1-98

[Signature]
SEAL OF THE STATE OF NEW YORK

TA 97-288 D212338
BRIDGE LOCATION #10, MP 467.74
DUNKIRK-FREDONIA INT. RAMP OVER I-90

SCALE: 1/4" = 1'-0"
DATE: 9-1-98
APPROVED BY: *[Signature]*
DRAWN BY: *[Signature]*

ITEM: 25690, 540110 REPAIR OF STRUCTURAL STEEL
VEEDER CONSTRUCTION CORP.
DRAWING NUMBER: BR10A2



SOUTH FASCIA - WEST BOUND LANE
(LOOKING NORTH)

Bridge #9 (M.T. 443.69)
Sturgeon Point Rd. over I-90
(Bridge repairs accepted)

South Fascia (West bound):

- 1.) Girder straightened with heat patterns & jacks.
- 2.) Removed and replaced Pier #1 and first intermediate connection plates.
- 3.) Repair crack at first intermediate connection plate (Passed Ultrasonic inspection test).
- 4.) Ground out scrapes on bottom flange at point of impact.

Pier Interior (West bound):

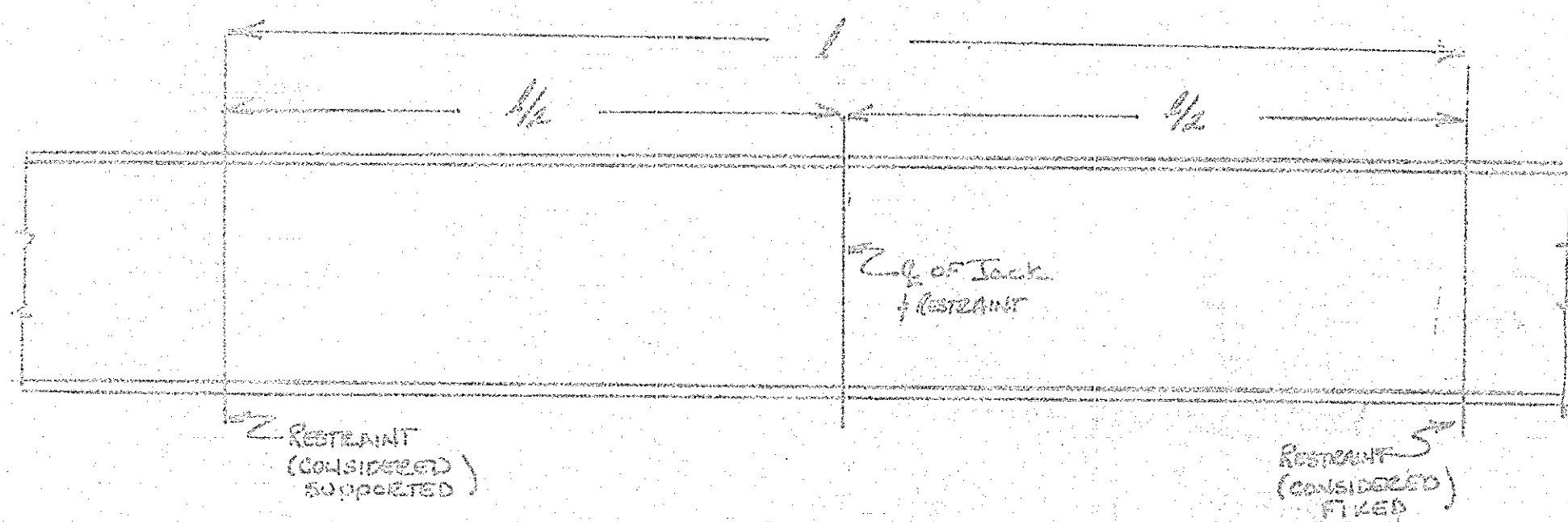
- 1.) No heat patterns required.
- 2.) Removed and replaced rivets with A325 fasteners at first and second intermediate connection plates.

New York State Thruway Authority	
FINAL SHCP DRAWING REVIEW	
<input checked="" type="checkbox"/> Approved <i>CT</i> <input type="checkbox"/> Approved As Noted <input type="checkbox"/> Approved For Revision No. _____	
By: <i>WAT</i>	Date: <i>9-1-98</i>

AS-BUILT REVISIONS

Kevin Howe 10/14/98

7/1 9/1/98 Date 338		BRIDGE LOCATION #9, MD 443.69		STURGEON POINT ROAD OVER I-90		SHE CO.	
SCALE: M.T.S.	APPROVED BY	DRAWN BY		DATE: 1-6-98		T. HANCOCK	
ITEM 236.90, 540109 REPAIR OF STRUCTURAL STEEL				As built			
LOCAL CONSTRUCTION CORPORATION				DRAWING NUMBER: B2901			



Bridge # 9 M.P. 443.89
South Fascia (West bound)

FLANGE WELDS:

Full Jack System Required

Fixed at one end and supported at other (Dimensions shown)

Max Allowable moment $M = \frac{1}{8} l^2$

where $R = 28 \text{ ksi}$

$S = b d^2 / 6$

Glucose 195×102

Range thickness: 1.10

Range width: 12.075

cover plate thickness: 1

cover plate width: 10.0

$S_{xx} = 3$ (cover plate) $\times 3$ (flange)

$S_{xx} = 67.85$ cubic inches

therefore max allowable moment

$M = \frac{1}{8} l^2$

M (with cover plate) = 841602

$S_{xx} = 3$ (flange)

$S_{xx} = 28.68$ cubic inches

therefore max allowable moment

M (without cover plate) = 673602

10 ton jack effective area =

2.32

M (max) at fixed end = 821
15

M (point of load) = 621
32

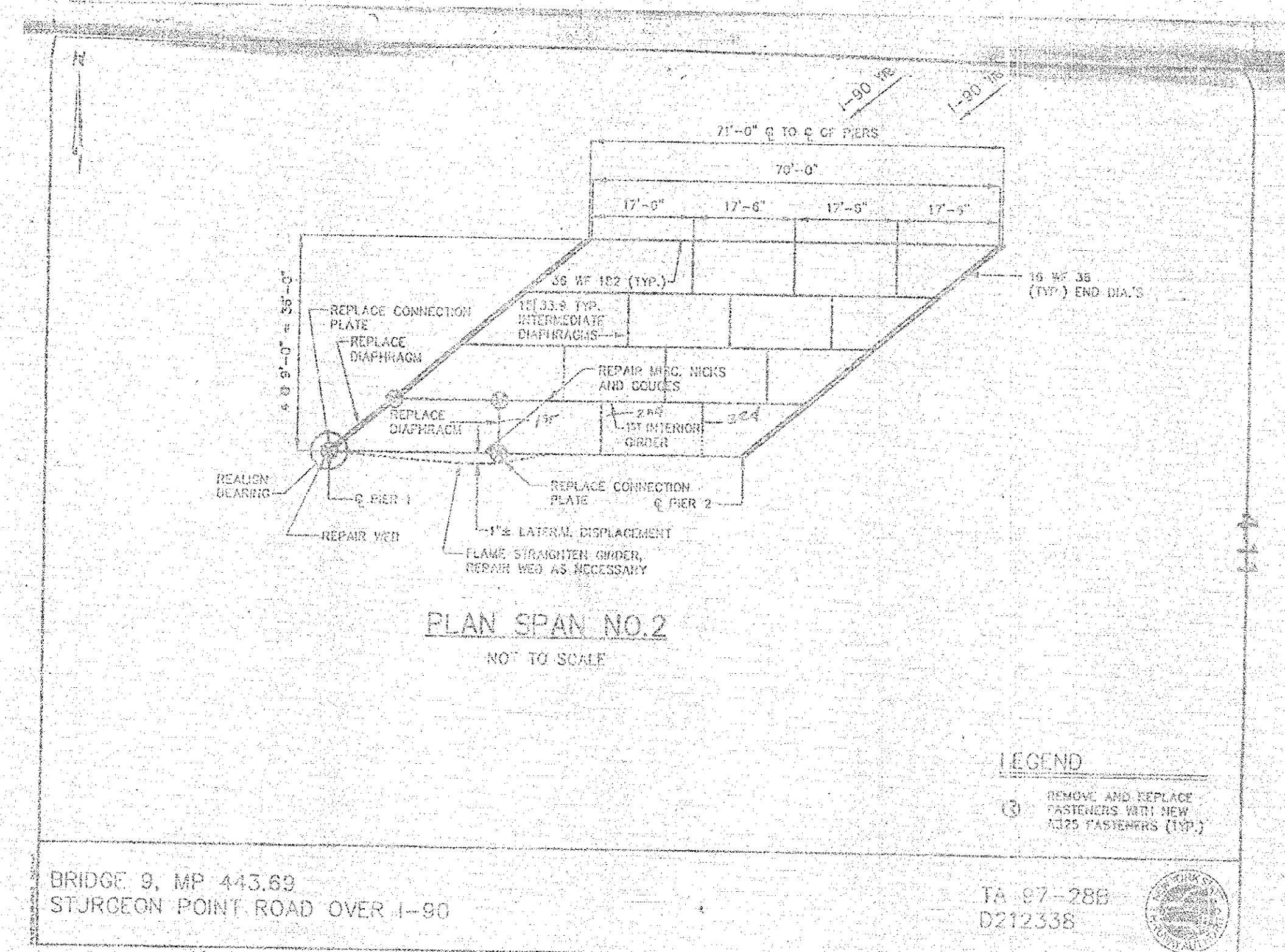
M (at) = 621
16

South Fascia (West bound)

With Jack located at 24' from Pier #1 Reading

		Point of Load Allowable	MAX P at fixed end	Fixed End Allowable	Allowable Hydraulic Pressure
1	24	89646	89794	89646	89646
5	20	22730	22834	22730	22730
10	16	29187	29287	29187	29187
12	14	41922	42022	41922	41922
13	13	36340	36440	36340	36340
16	10	31367	31467	31367	31367
18	9	27892	27992	27892	27892
20	8	25039	25139	25039	25039
22	7	22912	23012	22912	22912
24	6	20911	21011	20911	20911
26	5	19308	19408	19308	19308
28	4	17326	17426	17326	17326
30	3	15723	15823	15723	15723
32	2	14399	14499	14399	14399
34	1	14791	14891	14791	14791

NOTE: JACK LOCATION CAN BE MOVED ANYWHERE ALONG GIRDER AND STILL
MAINTAIN THE SAME PRESSURES CORRESPONDING TO RESTRAINT SPACING.

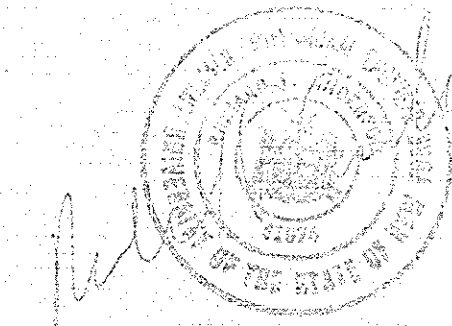


1. REMOVE PAINT & REPAINT 18" EACH SIDE OF PIER #1 & 1" INTERMEDIATE CONNECTION RATES (SEE SHEET M1)
2. REMOVE & REPAIR EXISTING FENDER'S W/ A-35 BOLTS - AS PER BOLT REMOVAL NOTES SHEET M3.
3. REPAIR MISC. NICKS & GROUDES IN GIRDER AT POINT OF IMPACT AND E (SEE NOTES SHEET M3)

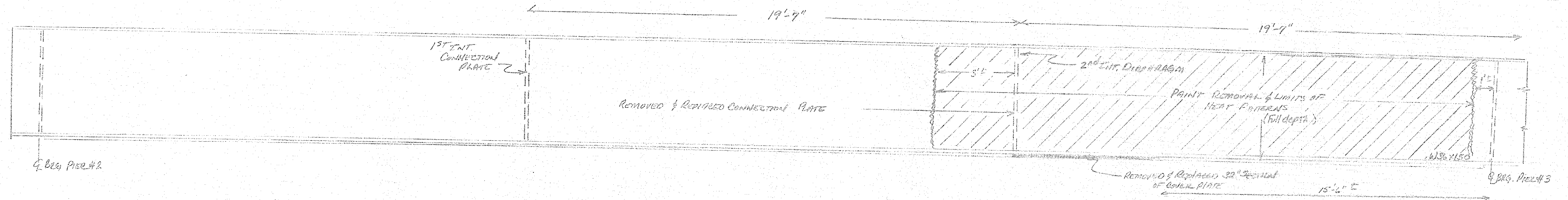
New York State
Thruway Authority
FINAL SHOP DRAWING REVIEW

☒ Approved *CT*
☐ Approved As Noted
☐ Approved For Revision No. _____

By: *W. G. G.* Date: 9-1-78



TA 97-288 D212338
BRIDGE LOCATION 4.9 MP 443.89
SUBMITTED BY: *W. G. G.* DATE: 7-80
SCALE: N.T.S. APPROVED BY: *T. Anderson*
DRAWING NUMBER: *60982*



West FASCH - East Bound Lane
(Looking East)

Bridge #8 (M.P. 417.27)
Depew Int. Ramp over I-190
(Bridge repairs accepted)

West FASCH (East bound):

- 1.) Girder straightened with heat patterns & jacks.
- 2.) Removed and replaced second intermediate connection plate.
- 3.) Removed and replaced a 32" section of cover plate at point of impact (Passed Ultrasonic inspection test).

First Interior (East bound):

- 1.) No heat patterns required.
- 2.) Removed and replaced rivets with A325 fasteners at first and second intermediate connection plates.

New York State
Thruway Authority
FINAL SHOP DRAWING REVIEW

☒ Approved
☐ Approved & Noted
☐ Approved For Revision No. _____

By: _____ Date: 9-1-78

AS-BUILT REVISIONS

John Bruce 10/14/98

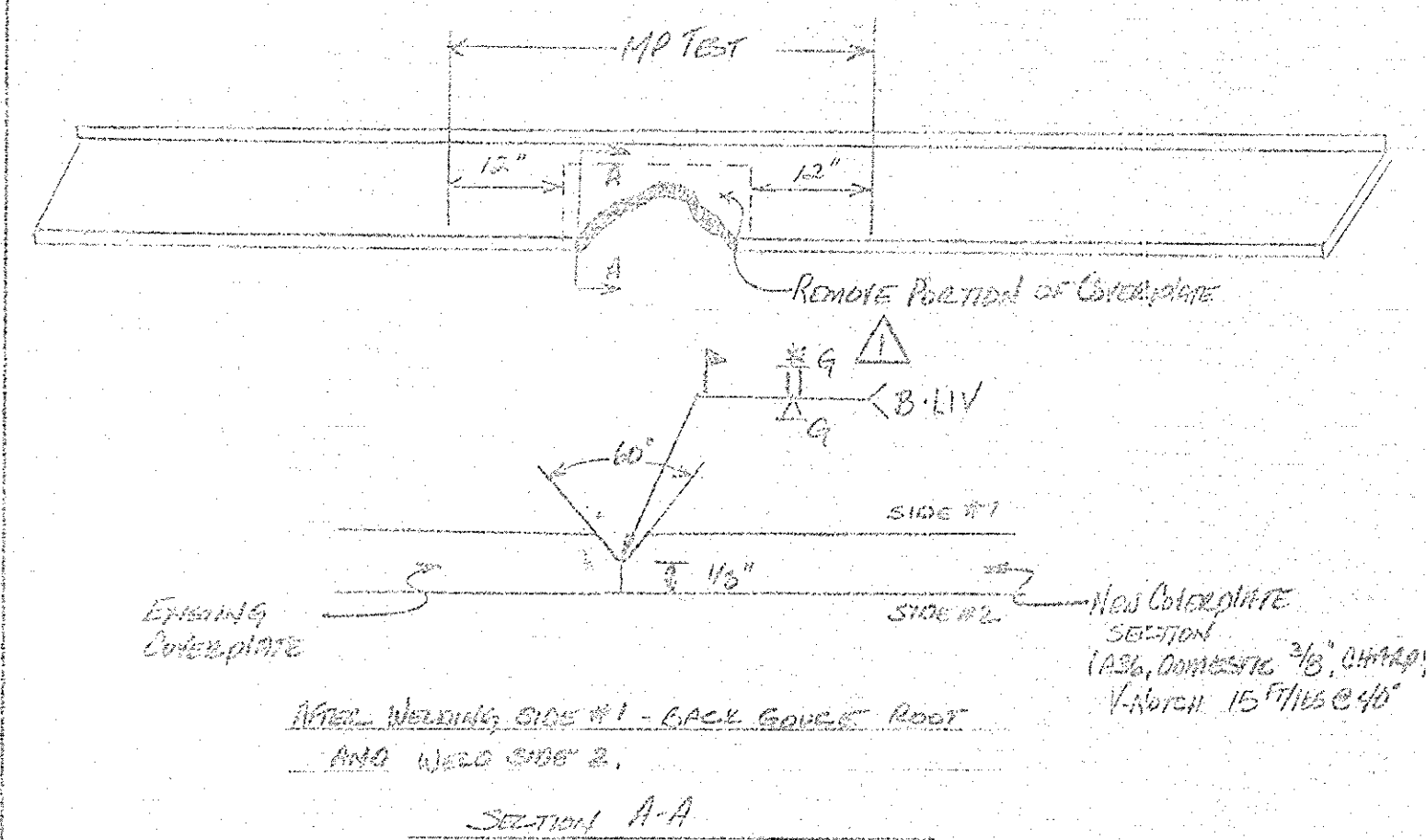
70 94-386 DOW 330			
BRIDGE LOCATION # 8, MD 417.27			
DEPEW INT. RAMP OVER I-190			
			ERIE CO.
SCALE:	N.T.S.	APPROVED BY:	DRAWN BY:
DATE:	1/16/78		J. Anderson
ITEM: 45670.040108 Repair of Structural Steel			
"Brigs"			
Victor Construction Corporation			DRAWING NUMBER
			BR 681

FASCON COVERPLATE REPAIR

OPTION #1 - WELD REPAIR

IF PORTION OF COVERPLATE THAT IS DAMAGED DOES NOT CONTACT GIRDER FLANGE

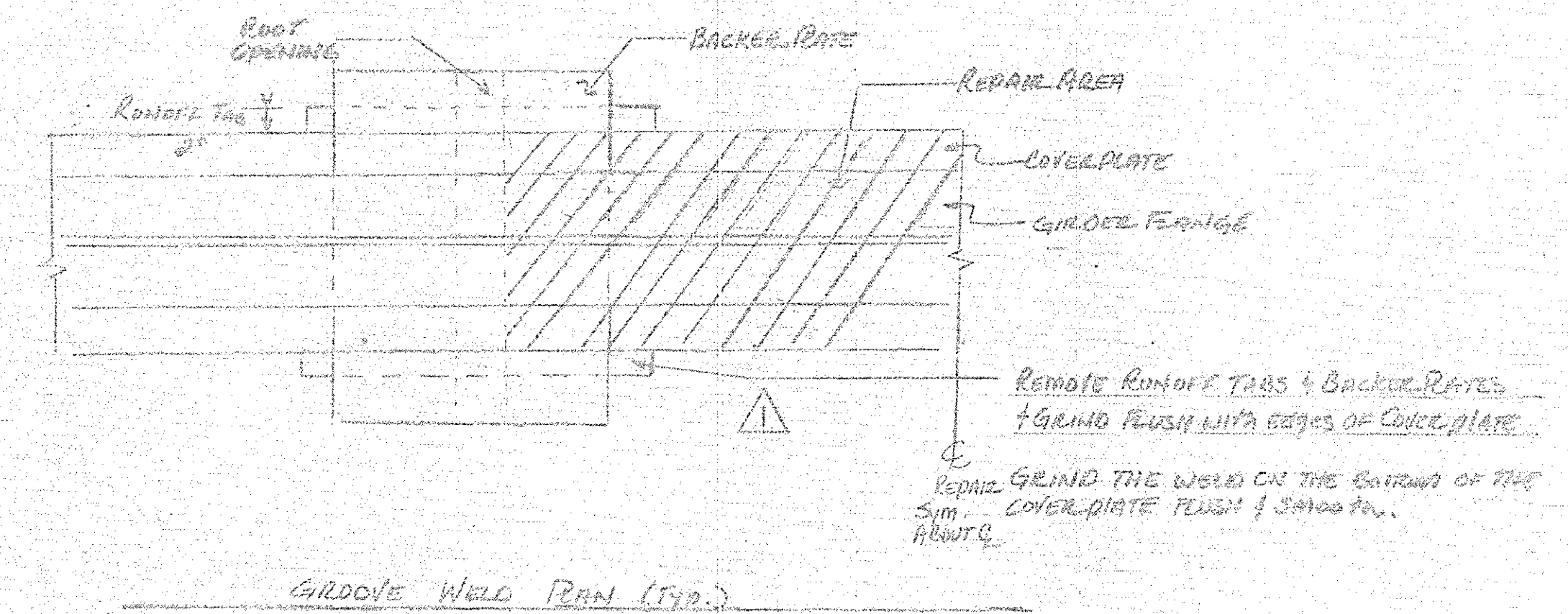
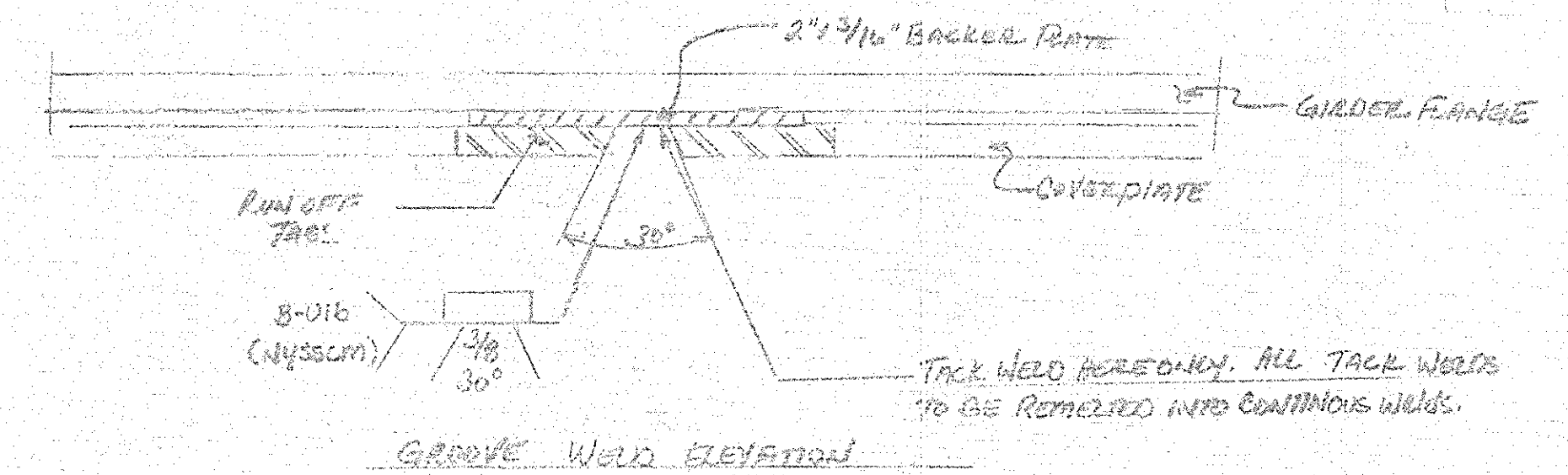
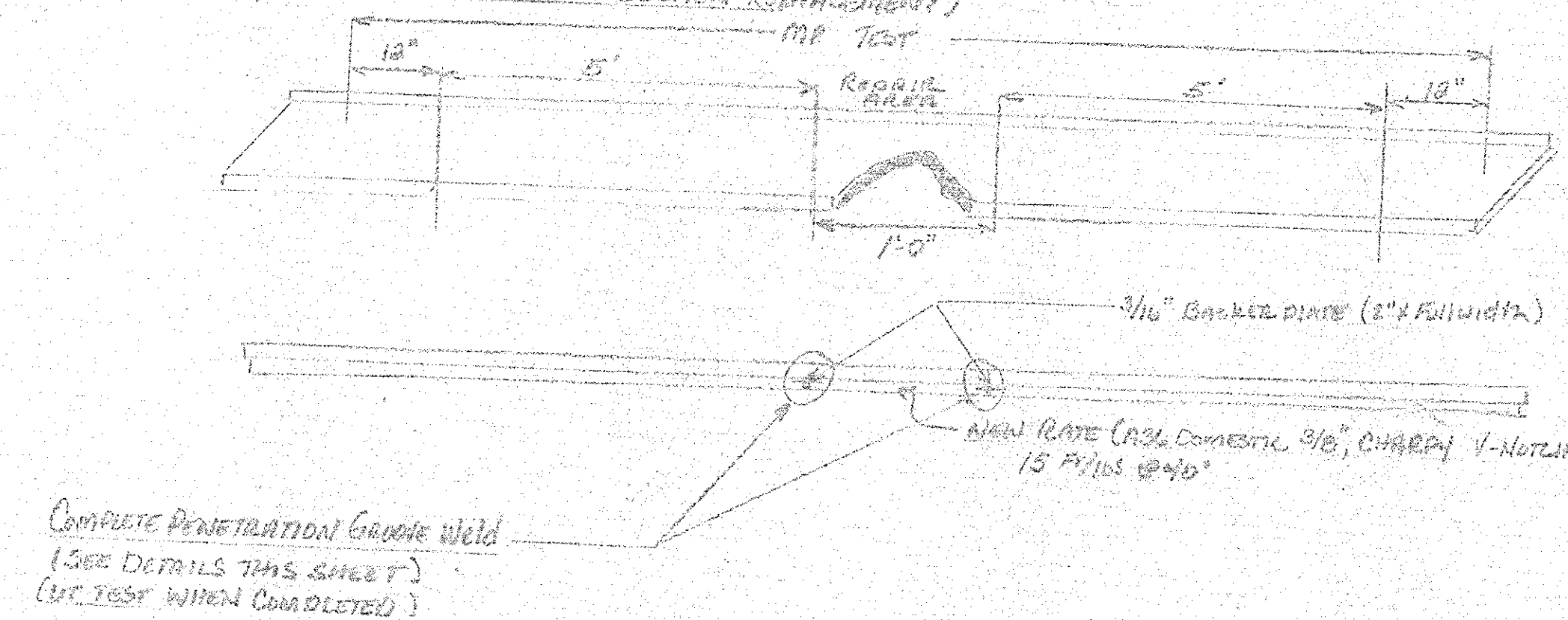
1. REMOVE PAINT 18" EITHER SIDE OF REPAIR AREA AND PERFORM INITIAL MAGNETIC PARTICLE TEST.
2. REMOVE PORTION OF COVERPLATE AND PREPARE JOINT FOR WELDING.
3. PREHEAT TO 400°F
4. WELD REPAIR AREA USING PROPERLY DRIED E7018 ELECTRODES AS DESCRIBED IN APPROVED WELDING SPECIFICATIONS WPDH.
5. ULTRASONIC TEST REPAIR.
6. PAINT AS PER NOTES SHEET #1.



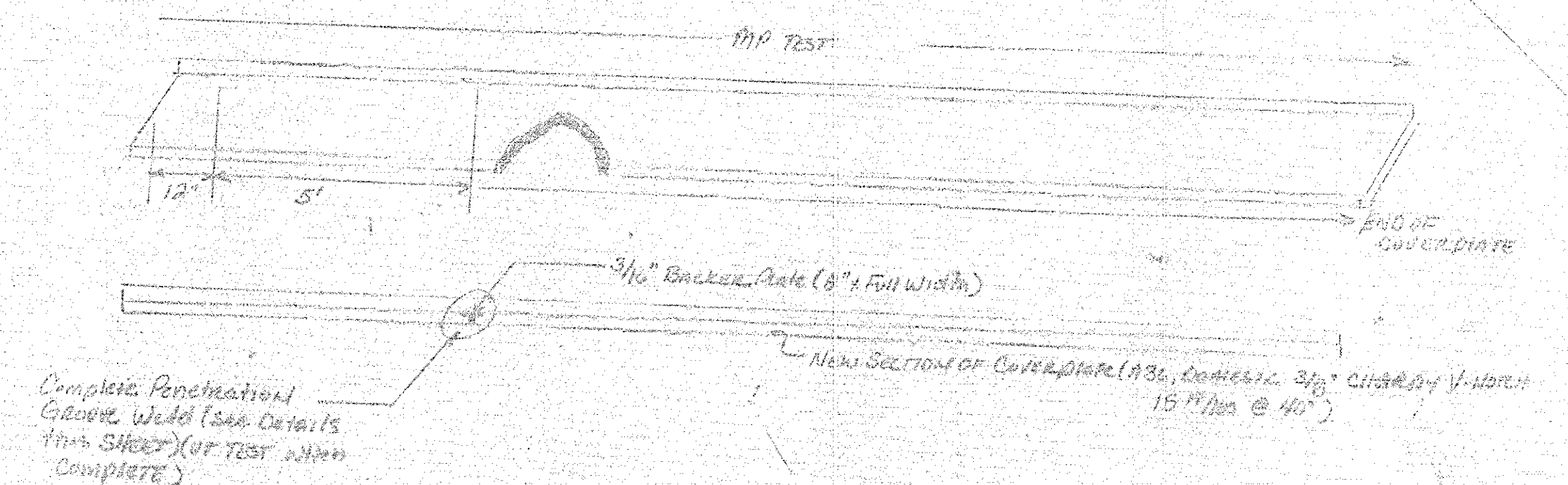
OPTIONS #1 & #2 REPLACE SECTION OF COVERPLATE (NOTES)

1. REMOVE PAINT 18" EITHER SIDE OF REPAIR AREA AND PERFORM INITIAL MAGNETIC PARTICLE TEST.
2. REMOVE FILLET WELD FIVE FEET EITHER SIDE OF REPAIR SECTION BY GRINDING OR AIR CARBON ARC GOUTING (IF AIR CARBON ARC GOUTING, LEAVE 1/8" OF WELD TO BASE METAL AND GRIND OFF 1/16" INTO BASE METAL).
3. PAY DOWN SECTION OF COVERPLATE w/ FILLET WELD REMOVED.
4. REMOVE SECTION OF COVERPLATE ONE FOOT LONG BY FULL WIDTH (FOR OPTION #2 REMOVE SECTION OF COVERPLATE FULL WIDTH & LENGTH REQUIRED).
5. MAKE NECESSARY REPAIRS TO GIRDER FLANGE USING APPROVED PROCEDURES.
6. IF WELDED REPAIRS ARE NECESSARY TO GIRDER FLANGE ULTRASONIC TEST REPAIRS.
7. INSERT TWO 3/16" BACKER PLATE (one plate for option #2) AT LOCATIONS OF COMPLETE PENETRATION GROOVE WELD. TACK WELDING TO GIRDER FLANGE WILL NOT BE ALLOWED.
8. INSTALL NEW SECTION OF COVERPLATE, DIRECTION OF ROLLING MUST BE PARALLEL TO THE LENGTH OF GIRDER.
9. PREPARE JOINT FOR WELDING, INCLUDING INSTALLATION OF RUN OFF TABS.
10. PREHEAT TO 400°F
11. WELD USING PROPERLY DRIED E7018 ELECTRODES AS DESCRIBED IN APPROVED WELDING PROCEDURES SPECIFICATIONS WPDH, WPD-06.
12. REMOVE RUNOFF TABS AND GRIND WELDS.
13. REMOVE FILLET WELDS TO RIND
14. ULTRASONIC TEST REPAIRS AND MP TEST FILLET WELD.

OPTION #2 (ONE FOOT SECTION REPLACEMENT)



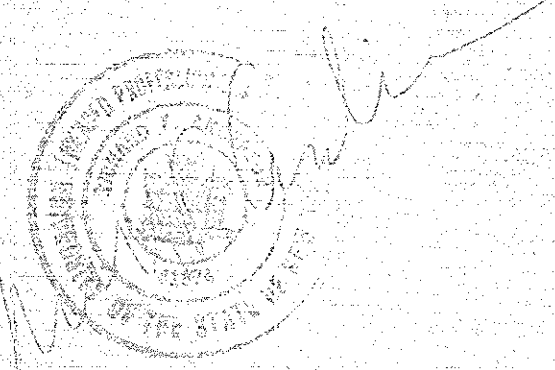
OPTION #3 (LARGE SECTION COVERPLATE REPAIR)



New York State
Thruway Authority
FINAL SHOP DRAWING REVIEW

Approved ☒ Approved As Noted ☐ Approved For Revision No.

By: WCH DATE: 9-1-78



REV 1 DEC 2, 1977

TR 87-288 D410338

BRIDGE NO. 100004 W 8, MP 9.127

DEPART. N.Y. STATE T-70

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

DATE: 11/78

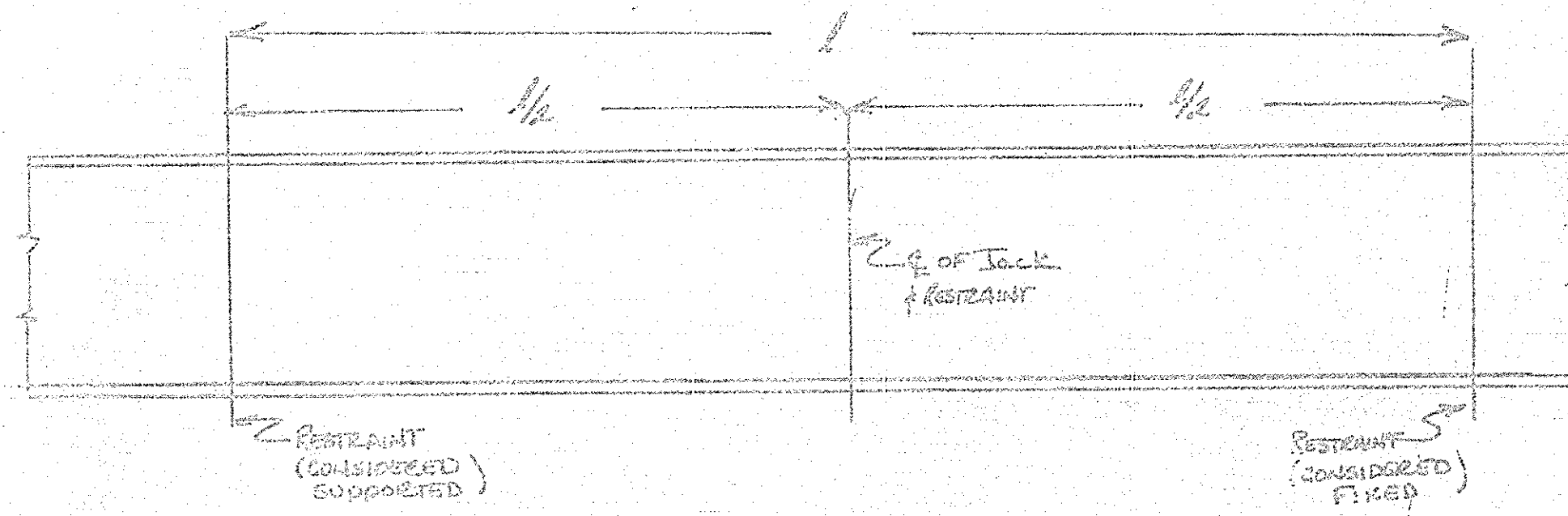
APPROVED BY: T. ALLEN

DRAWN BY: T. ALLEN

FROM: 20070.00000 - REPAIR OF STRUCTURE WELD

VECTOR CONSULTING CORP.

DRAWING NUMBER: 20070-001



Bridge No. 8 M.P. 417.27
West Facia (East bound)

FLANGE STIFFENING

Push Out System Required

Fixed at one end and supported at other (Dimensions shown)

Max Allowable moment $P_n \leq M / 3$

where $M = 20 \text{ ft}$

$S = 10.75 \text{ in}^3$

Grade $W8 \times 16$

Flange thickness $t_f = 0.44$

Flange width $b_f = 11.575$

cover plate thickness $t_{cp} = 0.375$

cover plate width $b_{cp} = 14$

Stiff S (cover plate) $+ S$ (flange)

Stiff $S = 24.72 \text{ cubic inches}$

therefore max allowable moment

$M = P_n \times S$

with cover plate $= 684822$

Stiff S (flange)

$S = 23.47 \text{ cubic inches}$

therefore max allowable moment

M (without cover plate) $=$

419322

25 ton jack effective area $=$

8.18

W (max) at fixed ends

201

10

M (point of load) $=$

521

52

W (max) $=$

112

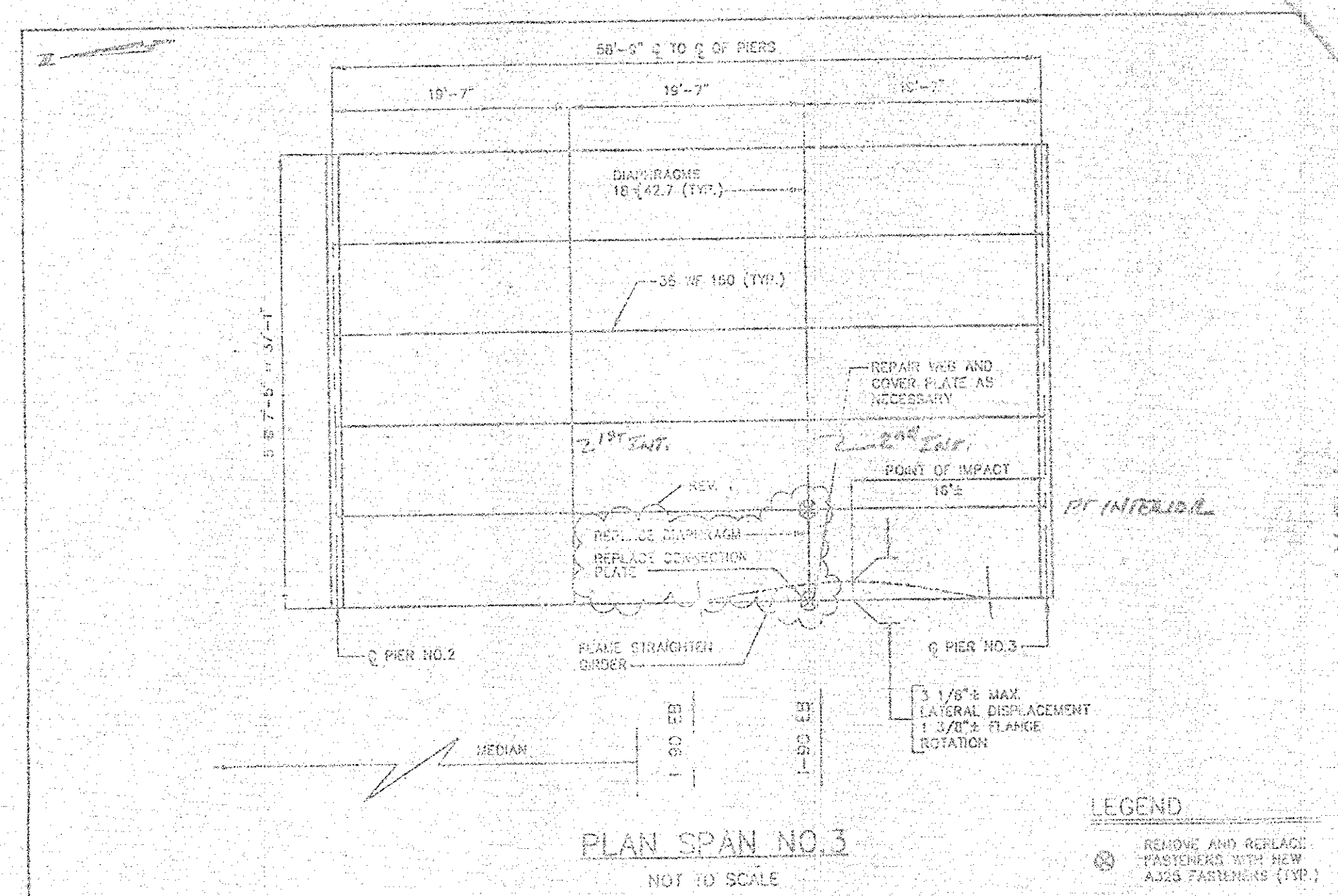
19

West Facia (East bound)

With Jack located @ 20' From Pier No. 2 Section

		Point of Load	Point of Load	MAX Permitted	Allowable	Allowable
		Dist	Hydraulic Pressure	Dist	Hydraulic Pressure	Hydraulic Pressure
1	112	1678	375	375	375	375
3	3	6710	1194	8144	5907	5907
5	5	4323	838	38573	7490	7490
10	5	37091	7190	38599	4882	4882
12	5	30328	5992	25716	4583	4583
14	7	26090	5136	23042	4280	4280
16	9	23744	4494	19237	3746	3746
18	9	20573	3995	17144	3223	3223
20	10	18515	3536	15423	2858	2858
22	14	16892	2938	14027	2724	2724
24	16	16423	2598	13053	2497	2497
26	19	16543	2798	11869	2356	2356
28	14	13223	2598	11021	2140	2140

NOTE: JACK LOCATION CAN BE MOVED ANYWHERE ALONG THE GIRDER AND STILL MAINTAIN THE SAME PRESSURES CORRESPONDING TO RESTRAINT SPACING.



PLAN SPAN NO. 3
NOT TO SCALE

LEGEND

REMOVE AND REPLACE FASTENERS WITH NEW A325 FASTENERS (TYP.)

BRIDGE 8, MP 417.27
DEWEY INT. RAMP OVER I-90

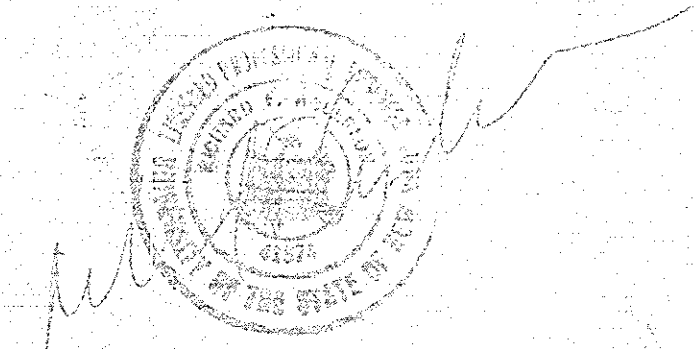
TA 97-28B
D212338

REV. 1 8-23-97

New York State
Thruway Authority
FINAL SHOP DRAWING REVIEW

☒ Approved *GT*
☐ Approved As Noted
☐ Approved For Revision No. _____

By: *McG* Date: 9-1-98



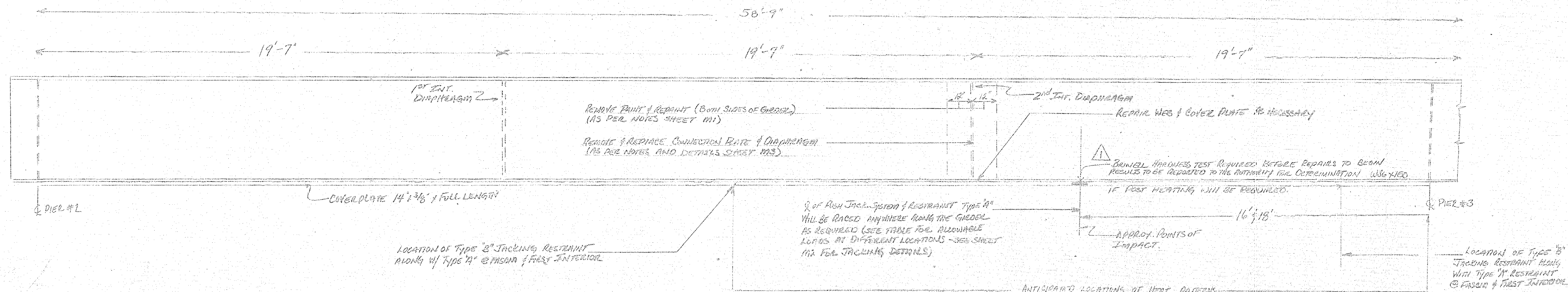
TA 97-28B D212338
BRIDGE LOCATED AT 8.18 MP 417.27
DEWEY INT. RAMP OVER I-90

SCALE: N.T.S. APPROVED BY: *T. Anderson* DRAWN BY: *EX-100*

DATE: _____

ITEM 25680.040108 REPAIR OF STRUCTURAL STEEL

VICOR CONSTRUCTION CORP. DRAWING NUMBER: *BR 812*



Bridge #8 M.P. 417.27
West Facade (East Bound)
Push Jack system

**FLANGE SWEEP-
SECTION**

Supported 5 Feet North of Pier #3 Basing and Fixed at 25 Feet North of Pier #3
Max Allowable moment: $M = 10 \times S$ where $S = 20 \text{ ksi}$
Girder = W36 x 150
Flange thickness = 0.54
Flange width = 11.975
Coverplate thickness = 0.375
Cover plate width = 14
Stiff = 5 (cover plate) + 5 (flange)
Stiff = 10
Therefore max allowable moment: $M = 10 \times S = 10 \times 20 = 200 \text{ k-ft}$
 $R1 = R1 \times S = 2007$
 $R1 = ((2 \times 14 \times 0.375) \times (1 + 21)) = 21943$
(M1) Allowable Hydraulic Pressure = $P / \text{Cylinder area of Jack} = 4566$
 $P = 13405$
(M2) Allowable Hydraulic Pressure = $P / \text{Cylinder area of Jack} = 2357$

A	B	M1 Allowable Hyd. Pressure	M2 Allowable Hyd. Pressure	Allowable Pressure
7	10	2578	2530	2522
8	10	2543	2495	2487
9	14	2249	2243	2212
11	12	2028	2049	2039
12	11	2026	2078	2072
13	10	2024	2040	2040
14	9	2019	2029	2029
15	8	2009	2007	2007
16	7	2004	2001	2001
17	6	2001	2002	2002
18	5	2000	2001	2001
19	4	2000	2001	2001
20	3	2000	2001	2001
21	2	2000	2001	2001

NOTE: IF JACKING RESTRAINTS OR INTERMEDIATE BLOCKING IS RELOCATED FROM THE POSITIONS SHOWN ON THIS SHEET, PRESSURES WILL BE MODIFIED AND APPROVED BY CHIEF ENGINEER.
* Additional Calculations on 04240.

Bridge #8 M.P. 417.27

West Facade (East Bound)

Maximum Preload for Flange Rotation:

$M = P \times L$
 $S = 20 \text{ ksi}$
GIRDER SIZE: W36 x 150

$t_w = 0.325$
 $t_f = 11.975$
 $t_c = 0.54$

Top cover plate: 14
Bottom cover plate width: 14
Length of cover plate: 14
Assume $b = 10 \times t_w$

$P = 2003 \text{ lbs}$

Allowable Hydraulic Pressure
Allowable Pressure = $P / \text{Cylinder Area of Jack}$
Eraspar 25 ton
Cylinder Area of Jack: 5.15 square inches
Allowable Pressure = 456 P.S.I.

Flange Girder:
Web Jacking Calculations:
Web Shear:

Girder Size: W36 x 150
Web thickness = 0.325
25 Ton Jack Effective Area = 5.15
A7 Allowable Shear = 11,000

Web Shear: Circumference of Indent x Web Thickness x Allowable Shear

Circumference = d
 $d = \text{diameter of indentation}$

Diameter of Indentation:
Inches: 6, 5, 4, 3, 2, 1

Load: 125,784, 103,137, 82,530, 64,822, 43,255, 21,627
Allowable: 25,197, 23,897, 18,799, 12,538, 8,160, 4,189
Use: 10,909, 10,909, 10,909, 10,909, 10,909, 10,909

* Governed by Jack Capacity

West Facade - East Bound Lane
(LOOKING EAST)

(A) LATERAL DISPLACEMENT = $3 \frac{1}{8}"$
(B) FLANGE ROTATION = $1 \frac{1}{8}"$



Bridge #8 West Facade (East Bound)

W36 x 150
Repair Tolerances: (Section 12, Dimensional Tolerances, New York State Steel Construction Manual)
Straightness: $2/4"$ or shall not exceed $1/8"$ in a ten foot test length
Yield of Flange: Combined warpage and tilt of flange must not exceed a $1/4"$ when measured from a point at the center of the web to toe of flange

Deviation From Girder Vertical Alignment: $7/16"$
Deviation From Flatness of Girder Web: $3/8"$

Any other tolerances should be in accordance with Section 12 of NYSSCM

Note: At specific areas such as points of impact, web punctures, etc. These tolerances may be considered subject to approval of Chief Engineer. All steel to be A36 unless specified.

Tolerances for Grinding Repair Scarves & Gouges:

Flange Thickness: 0.34
Flange Width: 11.98
Web Thickness: 0.33
Web Depth: 23.37
Coverplate Thickness: 0.38
Coverplate Width: 14.00

20% of Flange Thickness: 0.07 2/16"

20% of Web Thickness: 0.07 1/16"

20% of Coverplate Thickness: 0.08 1/8"

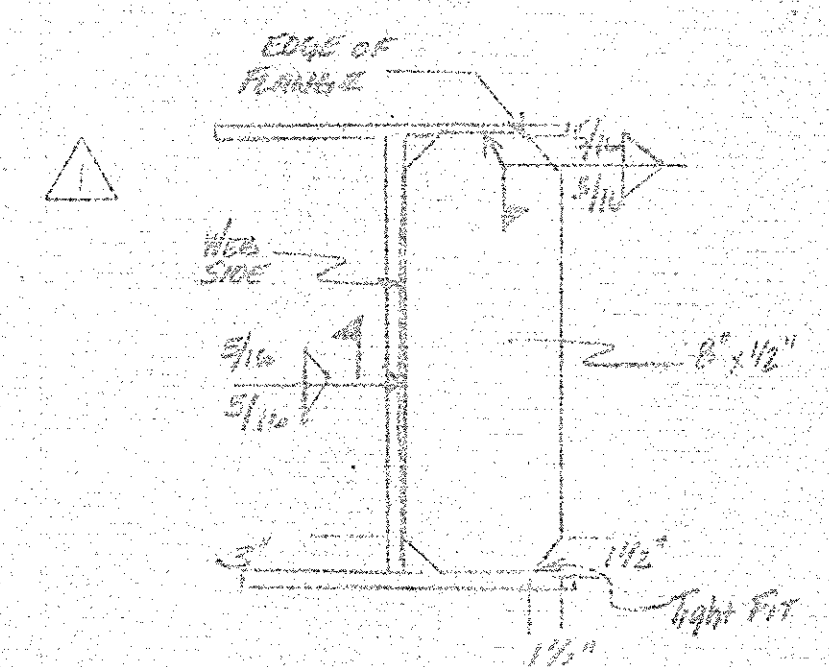
5% of Flange Width: 0.60 5/16"

5% of Coverplate Width: 0.70 11/16"

5% of Flange Cross Sectional Area: 0.58 in ²

5% of Web Cross Sectional Area: 1.08 in ²

5% of Coverplate Cross Sectional Area: 0.25 in ²



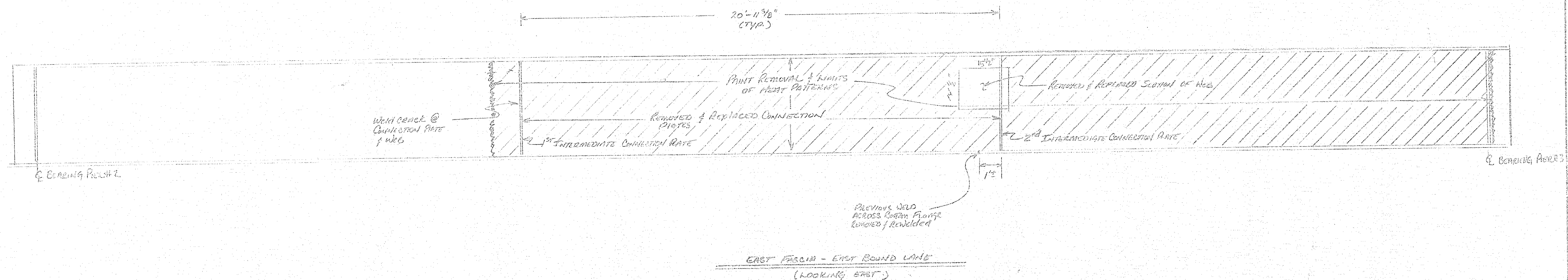
NEW CONNECTION PLATE (A36 DOMESTIC)
(OR MATCH EXISTING)

Notes:
HOLES IN CONNECTION PLATES & DIAPHRAGM ARE TO BE FIELD DRILLED BY MECHANICAL DRILL AND 1/4" HOLE OR JAW-BIT USING EXISTING COMPONENT AS TEMPLATE.
NO DRILLING OF ANY SIZED HOLES WILL BE ALLOWED.
ALL MATERIAL TO BE A36 UNLESS SPECIFIED, OTHER.
* EXISTING STEEL IS A9, ALL WELDING SHALL REQUIRE A 400° F PREHEAT.

1. Clean all steel surfaces within 12 inches of any repair area as determined by Engineer. For purposes of this work, a repair area is defined as any location that has been distorted as a result of the impact, welds joining member components within the distorted area, including connection plates at locations where fasteners are to be replaced, and any base metal that is to be heated, flame cut, welded, ground or tested. When cleaning areas to be heated or welded, it is intended that both sides of the member be cleaned, i.e., both sides of the web, flange, connection plate, etc.
2. Perform initial magnetic particle tests within 12 inches of the above repair areas, including welds and base metal, to determine presence of cracks. If cracks are found and confirmed, flame straightening operations will not be allowed to begin until the crack has been repaired to the satisfaction of the Engineer. The cost of repairs to cracks that have not been included in the specific work required for a given area will be paid for under the provisions of Item 25070.999799.
3. After all required repairs are complete, perform magnetic particle tests within 12 inches of all areas that were a) heated, b) straightened, c) ground to remove scrapes, or d) welded.
4. Ultrasonic test all new complete penetration groove welds made to repair cracks, install new sections of member components, etc., and all gouges repaired by welding.
5. As-built drawings will be completed by Vector Construction Corporation showing heating locations, cracks, major discontinuities, and repair welds.

New York State
Thruway Authority
FINAL SHOP DRAWING REVIEW
Approved By: [Signature]
Approved As Noted:
Approved For Revision No. [Blank]
By: [Signature] Date: 9-1-98

REV 1 DEC 2, 1997
7A 47-288 2412338
REPAIR LOCATIONS #8, MP 417.27
DETAILED INT. DRAWING OVER E-70
SCALE: 1/4" = 1'-0"
DATE: 9/2/97
DRAWN BY: T. ANDERSON
CHECKED BY: [Signature]
DESIGN: 2000-040108 REPAIR OF STRUCTURAL STEEL
VENDOR: CONSTRUCTION CORPORATION
DRAWING NUMBER: 2000-040108



Bridge #7 (M.P. 356.70)
Slusser Road over I-90
(Bridge repairs accepted)

East Fascia (East bound):

- 1.) Girder straightened with heat patterns & jacks.
- 2.) Removed and replaced first and second intermediate connection plates.
- 3.) Removed and replaced a 14.5" x 15.5" section of girder web approx. 1' north of the second intermediate connection plate (Passed Ultrasonic inspection test).
- 4.) Weld repair to previous weld across bottom of flange approximately 3' north of second intermediate connection plate (Passed Ultrasonic inspection test).
- 5.) Ground out scrapes on bottom flange at the point of impact.
- 6.) Weld crack at first int. connection plate to web.

First Interior (East bound):

- 1.) No heat patterns required.
- 2.) Removed and replaced rivets with A325 fasteners at first and second intermediate connection plates.
- 3.) Ground out scrapes on the bottom flange at the point of impact.

Second Interior (East bound):

- 1.) No heat patterns required.
- 2.) Removed and replaced rivets with A325 fasteners at first and second intermediate connection plates.

New York State Thruway Authority FINAL SHOP DRAWING REVIEW	
<input checked="" type="checkbox"/> Approved <i>CT</i> <input type="checkbox"/> Approved as Noted <input type="checkbox"/> Approved for Revision No. _____	By: <i>W. J. J.</i> Date: <i>7-1-98</i>

AS-BUILT REVISIONS

John H. H. 10/14/98

TR 97-238 D-212-338 BRIDGE LOCATION #7 M.P. 356.70 SLUSSER ROAD OVER I-90 EASTBOUND	
SCALE: <i>N.E.S.</i> DATE: <i>1-8-98</i>	APPROVED BY: _____ DRAWN BY: <i>T. H. H. H.</i>
Item: <i>25070-542107 REPAIR OF STRUCTURAL STEEL</i> <i>AS BUILT</i>	
PROJECT CONSTRUCTION CORPORATION	DRAWING NUMBER: <i>BR 981</i>

СДПОВ № 1

-

Full Jack System Required

flange thickness
flange width
cover plate thickness
cover plate width

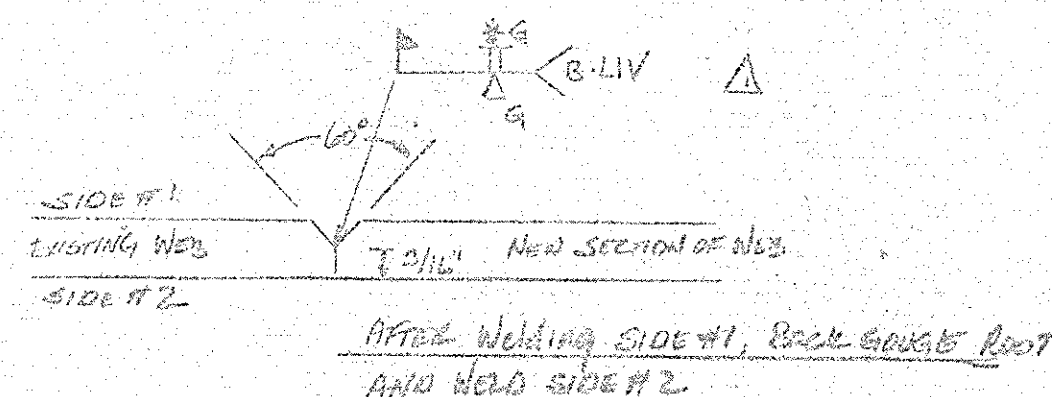
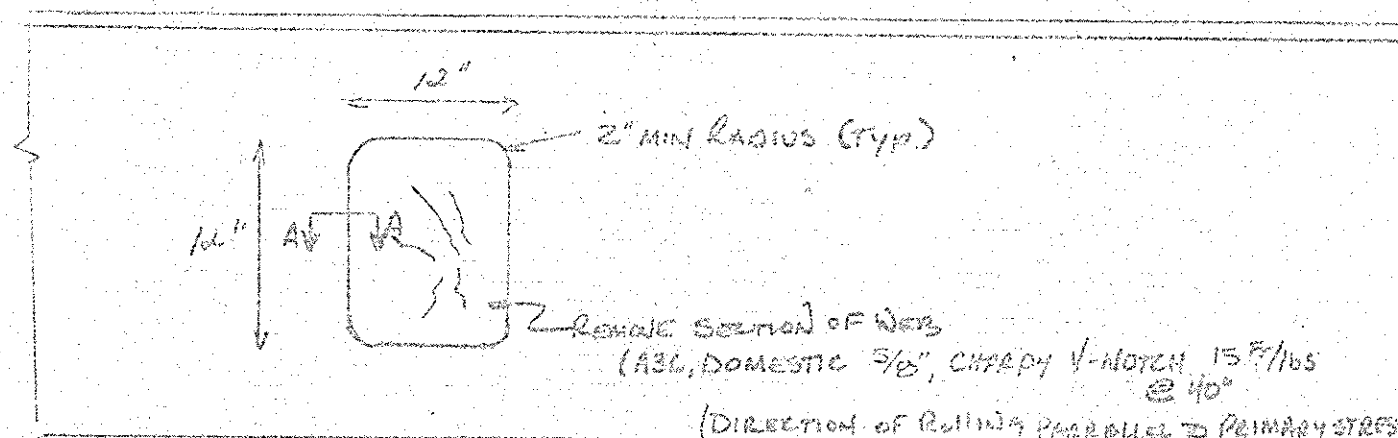
SysS (Range) 24.48 cubic inches
 therefore max allowable moment:
 M(without coverplate)= 480000

M (max) at fixed end:	$\frac{991}{16}$	M (point of load):	$\frac{551}{32}$
M(x):	$\frac{55x}{16}$	Facets glider does not have overplate	

		CATHARTIC		EMULSIFIC		HYPOLIPIDEMIC		HYPERLIPIDEMIC	
	EE	LDL	Hydrolytic Pressure	LDL	Hydrolytic Pressure	LDL	Hydrolytic Pressure	LDL	Hydrolytic Pressure
1	0	43355	16785	39337	16332	46335	16332	46335	16332
5	0	32240	14038	27220	11724	34220	11724	34220	11724
10	0	28112	11235	24740	9373	31740	9373	31740	9373
12	0	24740	9373	18333	7815	25333	7815	25333	7815
14	7	18351	6533	15343	6700	21343	6700	21343	6700
16	0	16320	7034	13333	5823	20333	5823	20333	5823
18	0	14367	2330	12025	6211	19025	6211	19025	6211
20	10	15356	3523	13360	4630	18360	4630	18360	4630
22	11	11233	6112	10231	4233	15231	4233	15231	4233
24	12	10230	4230	10237	3618	15237	3618	15237	3618
26	13	10233	4235	10233	3617	15233	3617	15233	3617
28	14	2326	4530	1771	2320	2320	3350	2320	3350
30	16	3732	1263	1263	3128	3128	3128	3128	3128

OPTION #2

- (With the use of lane closure no supports will be required to perform repair.)



SECTION A-A

W38 x 160

Straightness: 3/4" or shall not exceed 1/8" in a ten foot test length

Deviation From Flatness of Girder Web:

Note: At specific areas such as points of impact, web punctures, etc. These tolerances may be exceeded subject to approval of Chief Engineer. All SMCs to be 4% unless specified otherwise.

Flange Thickness	1.02
Flange Width	12.00
Web Thickness	0.65
Web Depth	34.00
Coverplate Thickness	0.00
Coverplate Width	0.00

20% of Flange Thickness=	0.20 in
20% of Web Thickness=	0.12 in
20% of Coverplate Thickness=	0.00
5% of Flange Width=	0.00 in
5% of Coverplate Width=	0.00
of Flange Gross Sectional Area=	0.04 in ²
% of Web Gross Sectional Area=	1.11 in ²
Coverplate Gross Sectional Area=	0.00

501. OXYGEN CUTTING - GENERAL

Steel and mild metal may be oxygen cut provided a smooth and regular surface, free from cracks and notches is obtained. All oxygen cut surfaces shall be produced using a mechanically guided torch unless otherwise approved by the DCS. Oxygen cut surfaces produced by a manually guided torch, when allowed, shall be smoothed by machining or grinding.

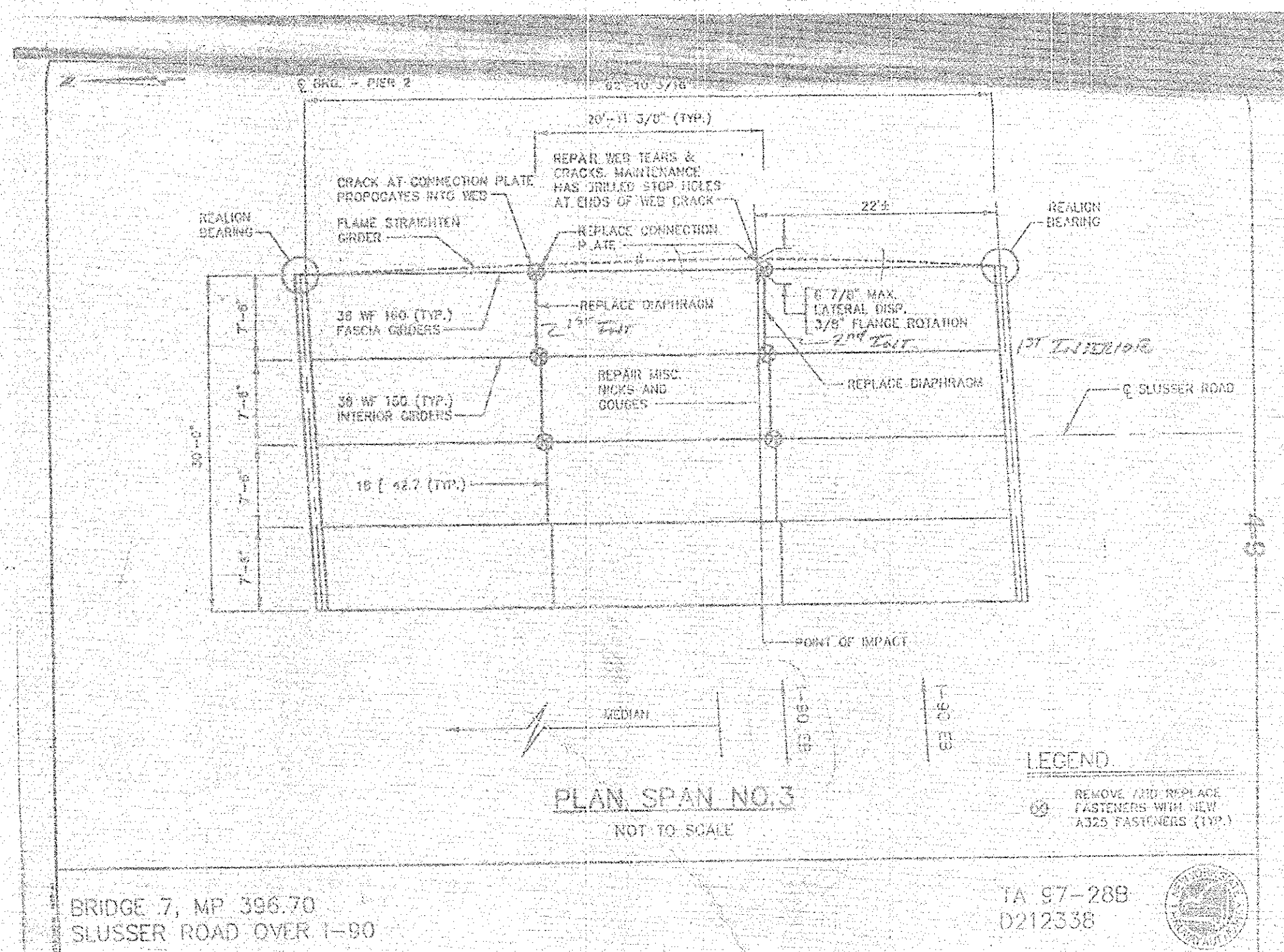
In all oxygen cutting, the cutting flame shall be adjusted and manipulated to avoid cutting beyond (inside) the prescribed limits. The roughness of oxygen cut surfaces shall not exceed the American National Standards Institute surface roughness value of 1000 microinches for materials up to 4 inches thick and 2000 microinches for material 4 inches to 8 inches thick, except, at the end of the cut, where there is no residual stress, the roughness shall not exceed 2000 microinches. Roughness exceeding this value and occasional notches or gouges no more than 1/4 inch deep on otherwise relatively smooth surface shall be removed by machining or grinding. Cut surfaces and edges shall be free of slag. Detection of discontinuities shall be referred to the oxygen cut surfaces with a slope not exceeding 1 in 10.

Occasional notches or gouges that exceed 1/4 inch shall be repaired by welding. The repair of notches or gouges over 7/16 inch deep shall be referred to the DCES officer to repair. Welding repairs shall be made by suitably preparing the discontinuity, welding with an approved process after preheating in accordance with Table 708 and grinding the completed weld smooth and flush with the adjacent surface to produce a workmanlike finish. All welded repairs to main material subject to tensile stress shall be tested by ultrasonic or radiographic inspection as determined by the DCES.

Reentrant corners shall be filleted to a radius of not less than 1/4 inch. On inside material a 2 inch minimum radius shall be provided wherever possible. The radius and its contiguous ends shall meet without offset or cutting past the point of tangency.

The Contractor (Fabricator) shall take steps to insure that the flame cut edges of main material are not hardened by the cutting process. This may be achieved by preheating, post heating or control of the burn-
ing process. Flame cut edges shall be free of cracks, hardening, and other defects.

The process of heat treatment is required to have a Rockwell Hardness Value of C 30 or greater will be considered unacceptable. A portable Rockwell Hardness Tester will be employed by the inspector to determine conformance with these requirements. Unacceptably hard surfaces shall be removed by grinding, machining, or approved heat treating procedures.

[illegible]

BRIDGE 7, MP 396.70
SLUSSER ROAD OVER I-90

LA 97-28E
D212338

TR 97-288 DAW 288
BRIDGE LOGGERS #7, M2396, 76
SLUSSER ROAD OVER 2-70

SCALE *N.T.S.* APPROVED BY _____
DATE _____

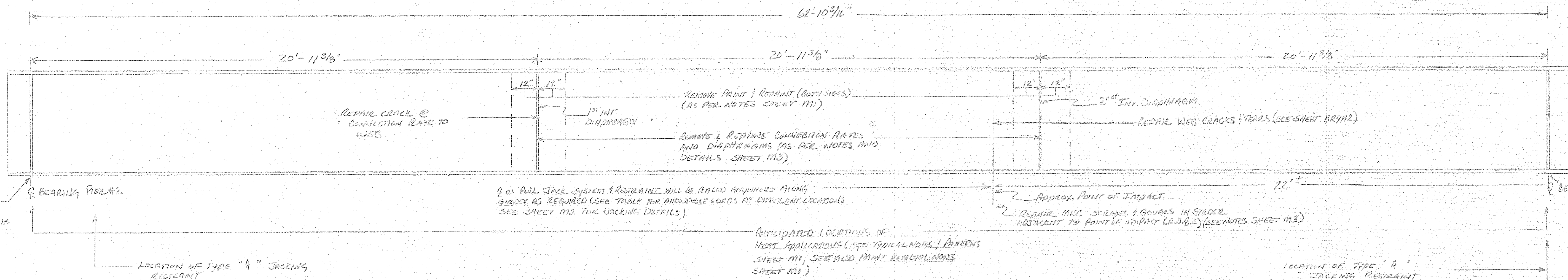
ITEM 30640 5/11/07 COAST OF QUEBECAL STREET

1997, 1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024, 2025, 2026, 2027, 2028, 2029, 2030, 2031, 2032, 2033, 2034, 2035, 2036, 2037, 2038, 2039, 2040, 2041, 2042, 2043, 2044, 2045, 2046, 2047, 2048, 2049, 2050, 2051, 2052, 2053, 2054, 2055, 2056, 2057, 2058, 2059, 2060, 2061, 2062, 2063, 2064, 2065, 2066, 2067, 2068, 2069, 2070, 2071, 2072, 2073, 2074, 2075, 2076, 2077, 2078, 2079, 2080, 2081, 2082, 2083, 2084, 2085, 2086, 2087, 2088, 2089, 2090, 2091, 2092, 2093, 2094, 2095, 2096, 2097, 2098, 2099, 2100, 2101, 2102, 2103, 2104, 2105, 2106, 2107, 2108, 2109, 2110, 2111, 2112, 2113, 2114, 2115, 2116, 2117, 2118, 2119, 2120, 2121, 2122, 2123, 2124, 2125, 2126, 2127, 2128, 2129, 2130, 2131, 2132, 2133, 2134, 2135, 2136, 2137, 2138, 2139, 2140, 2141, 2142, 2143, 2144, 2145, 2146, 2147, 2148, 2149, 2150, 2151, 2152, 2153, 2154, 2155, 2156, 2157, 2158, 2159, 2160, 2161, 2162, 2163, 2164, 2165, 2166, 2167, 2168, 2169, 2170, 2171, 2172, 2173, 2174, 2175, 2176, 2177, 2178, 2179, 2180, 2181, 2182, 2183, 2184, 2185, 2186, 2187, 2188, 2189, 2190, 2191, 2192, 2193, 2194, 2195, 2196, 2197, 2198, 2199, 2200, 2201, 2202, 2203, 2204, 2205, 2206, 2207, 2208, 2209, 2210, 2211, 2212, 2213, 2214, 2215, 2216, 2217, 2218, 2219, 2220, 2221, 2222, 2223, 2224, 2225, 2226, 2227, 2228, 2229, 2230, 2231, 2232, 2233, 2234, 2235, 2236, 2237, 2238, 2239, 2240, 2241, 2242, 2243, 2244, 2245, 2246, 2247, 2248, 2249, 2250, 2251, 2252, 2253, 2254, 2255, 2256, 2257, 2258, 2259, 2260, 2261, 2262, 2263, 2264, 2265, 2266, 2267, 2268, 2269, 2270, 2271, 2272, 2273, 2274, 2275, 2276, 2277, 2278, 2279, 2280, 2281, 2282, 2283, 2284, 2285, 2286, 2287, 2288, 2289, 2290, 2291, 2292, 2293, 2294, 2295, 2296, 2297, 2298, 2299, 2300, 2301, 2302, 2303, 2304, 2305, 2306, 2307, 2308, 2309, 2310, 2311, 2312, 2313, 2314, 2315, 2316, 2317, 2318, 2319, 2320, 2321, 2322, 2323, 2324, 2325, 2326, 2327, 2328, 2329, 2330, 2331, 2332, 2333, 2334, 2335, 2336, 2337, 2338, 2339, 2340, 2341, 2342, 2343, 2344, 2345, 2346, 2347, 2348, 2349, 2350, 2351, 2352, 2353, 2354, 2355, 2356, 2357, 2358, 2359, 2360, 2361, 2362, 2363, 2364, 2365, 2366, 2367, 2368, 2369, 2370, 2371, 2372, 2373, 2374, 2375, 2376, 2377, 2378, 2379, 2380, 2381, 2382, 2383, 2384, 2385, 2386, 2387, 2388, 2389, 2390, 2391, 2392, 2393, 2394, 2395, 2396, 2397, 2398, 2399, 2400, 2401, 2402, 2403, 2404, 2405, 2406, 2407, 2408, 2409, 2410, 2411, 2412, 2413, 2414, 2415, 2416, 2417, 2418, 2419, 2420, 2421, 2422, 2423, 2424, 2425, 2426, 2427, 2428, 2429, 2430, 2431, 2432, 2433, 2434, 2435, 2436, 2437, 2438, 2439, 2440, 2441, 2442, 2443, 2444, 2445, 2446, 2447, 2448, 2449, 2450, 2451, 2452, 2453, 2454, 2455, 2456, 2457, 2458, 2459, 2460, 2461, 2462, 2463, 2464, 2465, 2466, 2467, 2468, 2469, 2470, 2471, 2472, 2473, 2474, 2475, 2476, 2477, 2478, 2479, 2480, 2481, 2482, 2483, 2484, 2485, 2486, 2487, 2488, 2489, 2490, 2491, 2492, 2493, 2494, 2495, 2496, 2497, 2498, 2499, 2500, 2501, 2502, 2503, 2504, 2505, 2506, 2507, 2508, 2509, 2510, 2511, 2512, 2513, 2514, 2515, 2516, 2517, 2518, 2519, 2520, 2521, 2522, 2523, 2524, 2525, 2526, 2527, 2528, 2529, 2530, 2531, 2532, 2533, 2534, 2535, 2536, 2537, 2538, 2539, 2540, 2541, 2542, 2543, 2544, 2545, 2546, 2547, 2548, 2549, 2550, 2551, 2552, 2553, 2554, 2555, 2556, 2557, 2558, 2559, 2560, 2561, 2562, 2563, 2564, 2565, 2566, 2567, 2568, 2569, 2570, 2571, 2572, 2573, 2574, 2575, 2576, 2577, 2578, 2579, 2580, 2581, 2582, 2583, 2584, 2585, 2586, 2587, 2588, 2589, 2590, 2591, 2592, 2593, 2594, 2595, 2596, 2597, 2598, 2599, 2600, 2601, 2602, 2603, 2604, 2605, 2606, 2607, 2608, 2609, 2610, 2611, 2612, 2613, 2614, 2615, 2616, 2617, 2618, 2619, 2620, 2621, 2622, 2623, 2624, 2625, 2626, 2627, 2628, 2629, 2630, 2631, 2632, 2633, 2634, 2635, 2636, 2637, 2638, 2639, 2640, 2641, 2642, 2643, 2644, 2645, 2646, 2647, 2648, 2649, 2650, 2651, 2652, 2653, 2654, 2655, 2656, 2657, 2658, 2659, 2660, 2661, 2662, 2663, 2664, 2665, 2666, 2667, 2668, 2669, 2670, 2671, 2672, 2673, 2674, 2675, 2676, 2677, 2678, 26

[illegible]

VECTOR CONSTRUCTION CORP. B#1

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EAST FACIA (EAST BOUND)

Bridge #7 M.P. 396.7
East Facia (East Bound)
Full Jack system

Support at Pier #3 Bending and Fixed at 60 Feet North of Pier #3
Max Allowable moment = $M = 12 \times S$ where $S = 23$ ton

$S = b \times d^2$
Girder = W38 x 130
Flange thickness = 1.02
Flange width = 12
Coverplate thickness = 0
Cover plate width = 0

$S_{yy} = S \{ \text{cover plate} \} + S \{ \text{flange} \}$

$S_{yy} = 24.48$ entire section

therefore max allowable moment: $M = 12 \times S$
 $M = 489550$

$R_1 = R_1 \times a$

$R_1 = 2700$

$R_1 = \{ (P \times a^2) / (2 \times (1 + 3)) \} \times (a + 1)$

$P = 4299$

(1st) Allowable Hydraulic Pressure = $P / \text{Cylinder area of Jack}$

$P = 1053$

$R_2 = \{ (P \times a \times b) / (2 \times (1 + 3)) \} \times (a + 1)$

$P = 5303$

(2nd) Allowable Hydraulic Pressure = $P / \text{Cylinder area of Jack}$

$P = 2501$

a	b	M1 Allowable	M2 Allowable	Allowable
1	03	2042	5084	3042
2	02	2704	4076	2704
3	01	2846	3888	2846
4	00	2106	3308	2106
5	00	2082	3030	2082
6	00	2060	2938	2060
7	00	2040	2857	2040
8	00	2020	2784	2020
9	00	2000	2718	2000
10	00	1980	2658	1980
11	00	1960	2604	1960
12	00	1940	2556	1940
13	00	1920	2514	1920
14	00	1900	2476	1900
15	00	1880	2444	1880
16	00	1860	2416	1860
17	00	1840	2392	1840
18	00	1820	2372	1820
19	00	1800	2356	1800
20	00	1780	2344	1780
21	00	1760	2336	1760
22	00	1740	2332	1740
23	00	1720	2332	1720

NOTE: IF JACKING RESTRAINTS OR INTERMEDIATE BLOCKING IS RELOCATED FROM THE POSITIONS SHOWN ON THIS SHEET, PRESSURES WILL BE MODIFIED AND APPROVED BY CHIEF ENGINEER.

Additional calculations on sheet 12.7.7a2.

(A) LATERAL DISPLACEMENT = 6%
(B) FLANGE ROTATION = $3/8$

Bridge #7 M.P. 396.70

East Facia (East Bound)

Maximum Pressure for Flange Rotation

Maximum Pressure for Flange Rotation

Maximum Pressure for Flange Rotation

Maximum Pressure for Flange Rotation

Maximum Pressure for Flange Rotation

Maximum Pressure for Flange Rotation

Maximum Pressure for Flange Rotation

Maximum Pressure for Flange Rotation

Maximum Pressure for Flange Rotation

Maximum Pressure for Flange Rotation

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Maximum Pressure for Flange Rotation

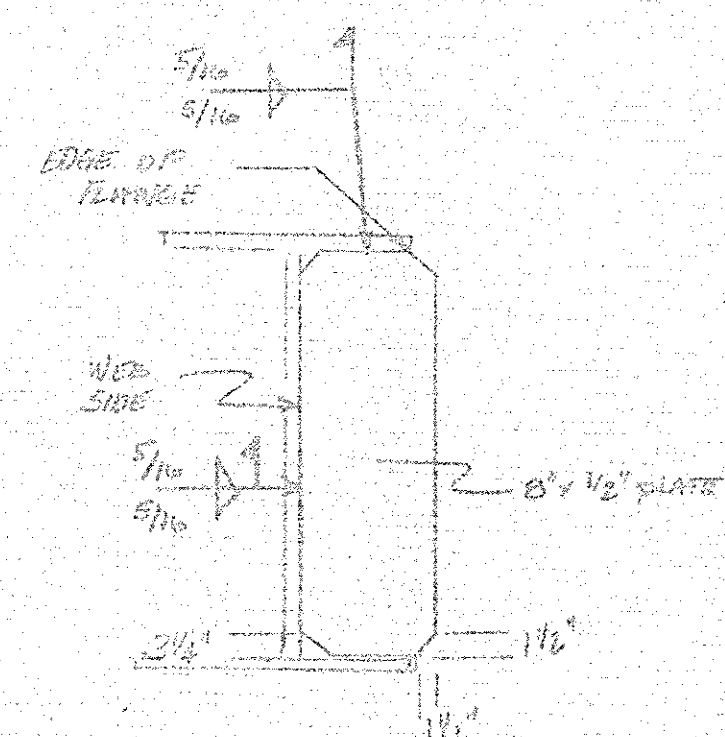
Maximum Pressure for Flange Rotation

Maximum Pressure for Flange Rotation

Maximum Pressure for Flange Rotation

Maximum Pressure for Flange Rotation

Maximum Pressure for Flange Rotation



A NEW CONNECTION (A36 DOMESTIC)
(OR MATCH EXISTING)

Flange Girder:
Web Shear:

Girder Size: W38 x 130

Web thickness = 0.63

25 Ton Jack Effective Area = 5.15

A7 Allowable Shear = 11,000

Web Shear = Circumference of Jack x Web thickness x Allowable Shear

Circumference = d

d = diameter of indentation

Diameter of Indentation:

Indenter:

Load

Allowable

Use

9

104,958

22,205

25,000

5

112,422

24,837

25,000

4

98,970

17,475

25,000

3

67,477

13,122

25,000

2

44,335

8,735

1

22,422

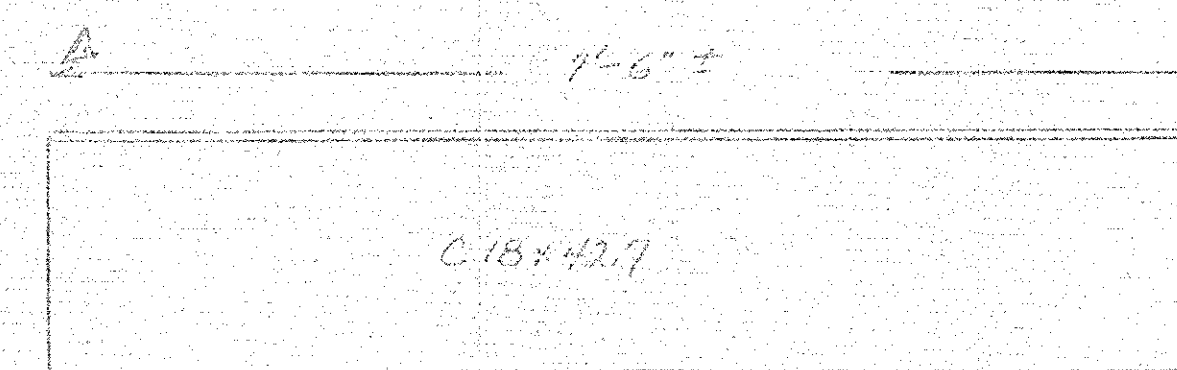
4,367

4,367

Governed by Jack Capacity

REPAIR BEARING:

IF DURING THE HEAT STRAIGHTENING PROCESS A BEARING DOES NOT REALIGN ITSELF, A JACKING SYSTEM APPROVED BY THE CHIEF ENGINEER WILL BE USED TO LIFT AND ALIGN THE BEARING. (SEE NOTES & DETAILS SHEET M3)



NEW DIAPHRAGM (A36 DOMESTIC)

Holes in Connection Plate & Diaphragm are to be field drilled using a magnetic drill and 1/2" HSS drill bit. AND USING EXISTING COMPONENTS AS TEMPLATES NO BEARING OF FULL SIZED HOLES WILL BE ALLOWED. ALL MATERIAL TO BE A36 UNLESS SPECIFIED, OTHERWISE.

Notes:

- Clean all steel surfaces within 12 inches of any repair area as determined by Engineer. For purposes of this work, a repair area is defined as any location that has been distorted as a result of the impact, welds joining member components within the distorted area, including connection plates at locations where fasteners are to be replaced, and any base metal that is to be heated, flame cut, welded, ground or treated. When cleaning areas to be heated or welded, it is intended that both sides of the member be cleaned, i.e., both sides of the web, flange, connection plate, etc.
- Perform initial magnetic particle tests within 12 inches of the above repair areas, including welds and base metal, to determine presence of cracks. If cracks are found and confirmed, flame straightening operations will not be allowed to begin until the crack has been repaired to the satisfaction of the Engineer. The cost of repairs to cracks that have not been included in the specific work required for a given structure will be paid for under the provisions of Item 25600.999799.
- After all required repairs are complete, perform magnetic particle tests within 12 inches of all areas that were a) heated, b) straightened, c) ground to remove warpage, or d) welded.
- Ultasonic test all new complete penetration groove welds made to repair cracks, install new sections of member components, etc., and all gouges repaired by welding.
- As-built drawings will be completed by Vector Construction Corporation showing heating locations, cracks, major discontinuities, and repair welds.

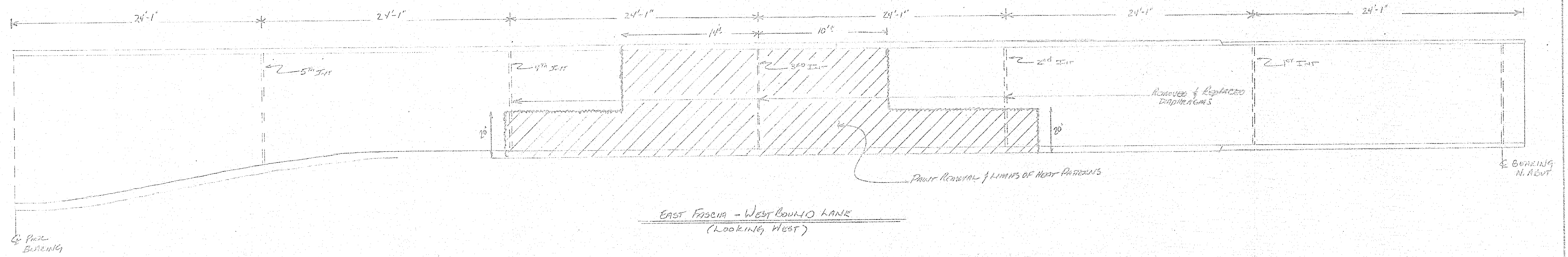
Revision A - 11/9/97

New York State
Thruway Authority
FINAL SHOP DRAWING REVIEW

By: *M. G. L.* Date: 7-1-98



TA 99-286 D212 358
BRIDGE LOCATION #7, MP 396.70
STRUCTURE: BRIDGE OVER R.F. 170 EASTBOUND
SCALE: 1/4" = 1'-0"
DATE: 7-1-98
APPROVED BY: *[Signature]*
DRAWN BY: *[Signature]*
FROM: 25600.999799 - REPAIR OF STRUCTURAL SYSTEM
DRAWING NUMBER: 22741 Rev 1
VECTOR CONSTRUCTION CORPORATION



Bridge #6 (M.P. 360.78)
Rusk-Henrietta Road (Rte. 15A) over I-90
(Bridge repairs accepted)

East Fascia (West bound):

- 1.) Girder straightened with heat patterns & jacks.
- 2.) Removed and replaced first second, third and fourth intermediate connection plates.
- 3.) Ground out scrapes on the bottom flange at the point of impact.

First Interior (West bound):

- 1.) No heat patterns required.
- 2.) Removed and replaced rivets with A325 fasteners at second, third and fourth intermediate connection plates.
- 3.) Ground out scrapes on the bottom flange at the point of impact.

Second Interior (West bound):

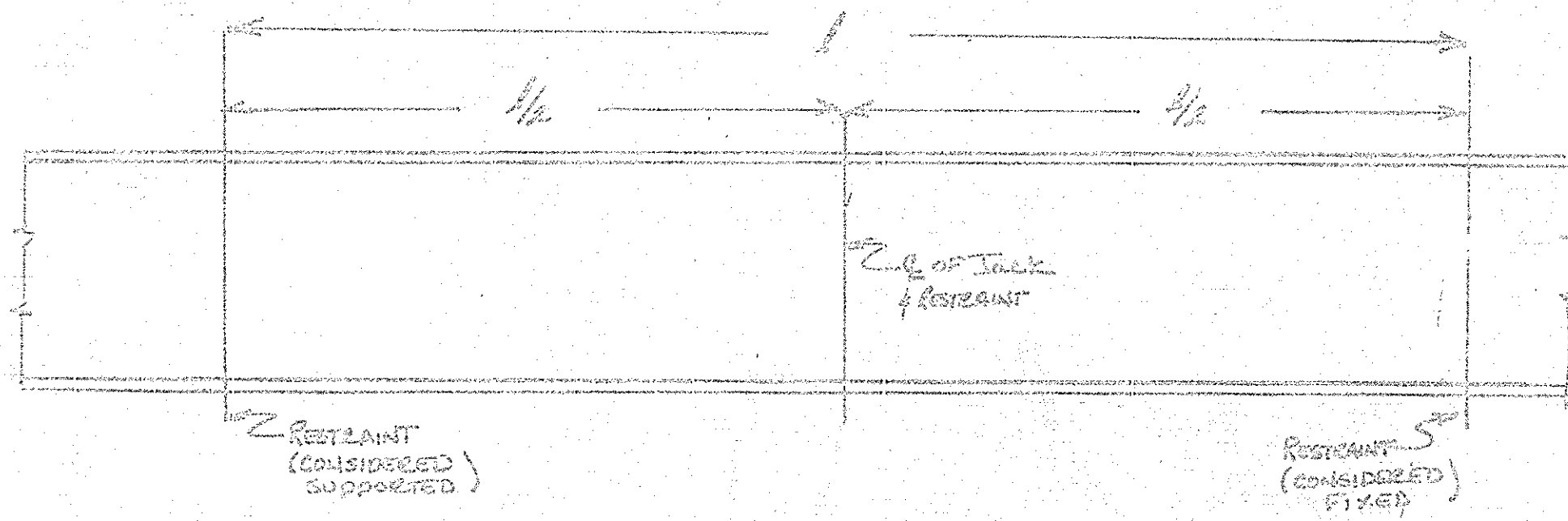
- 1.) No heat patterns required.
- 2.) Removed and replaced rivets with A325 fasteners at second, third and fourth intermediate connection plates.
- 3.) Ground out scrapes on the bottom flange at the point of impact.

New York State Thruway Authority	
FINAL SHOP DRAWING REVIEW	
<input checked="" type="checkbox"/> Approved <i>CT</i>	
<input type="checkbox"/> Approved As Noted	
<input type="checkbox"/> Approved For Revision No. _____	
By: <i>W. J. [Signature]</i>	Date: 7-1-88

AS-BUILT REVISIONS

Jim Abene 10/14/98

1A 99-288 201233B	
Bridge #6, MP 360.78	
RUSK-HENRIETTA ROAD (RTE 15A) OVER I-90	
SCALE: 1/4" = 1'-0"	APPROVED BY: <i>J. [Signature]</i>
DATE: 7-6-88	DRAWING NUMBER: 025670.540106
REPAIR OF STRUCTURAL STEEL (AS BUILT)	
VECTRA CONSTRUCTION CORP.	



SECTION 6 PREPARATION OF BASE METALS

601. OXYGEN CUTTING - GENERAL

Steel and weld metal may be oxygen cut provided a smooth and regular surface, free from cracks and notches is obtained. All oxygen cut surfaces shall be produced using a mechanically guided torch unless otherwise approved by the DCS. Oxygen cut surfaces produced by a manually guided torch, when allowed, shall be smoothed by machining or grinding.

In all oxygen cutting, the cutting flame shall be adjusted and manipulated to avoid cutting beyond (inside) the prescribed lines. The roughness of oxygen cut surfaces shall not exceed the American National Standards Institute surface roughness value of 1000 microinches for material up to 4 inches thick and 2000 microinches for material 4 inches to 8 inches thick, except, at the dead ends of members where there is no calculated stress, the roughness shall not exceed 2000 microinches. Roughness exceeding these values and occasional notches or gouges no more than 1/4 inch deep on otherwise satisfactory surfaces shall be removed by machining or grinding. Cut surfaces and edges shall be free of slag. Correction of discontinuities shall be filed to the oxygen cut surfaces with a slope not exceeding 1 in 10.

Occasional notches or gouges that exceed 1/4 inch shall be repaired by welding. The repair of notches or gouges over 7/16 inch deep shall be referred to the DCS prior to repair. Welding repairs shall be made by suitably preparing the discontinuity, welding with an approved process after preheating in accordance with Table 708 and grinding the completed weld smooth and flush with the adjacent surface to produce a workmanlike finish. All welded repairs to main material subject to tensile stress shall be tested by ultrasonic or radiographic inspection as determined by the DCS.

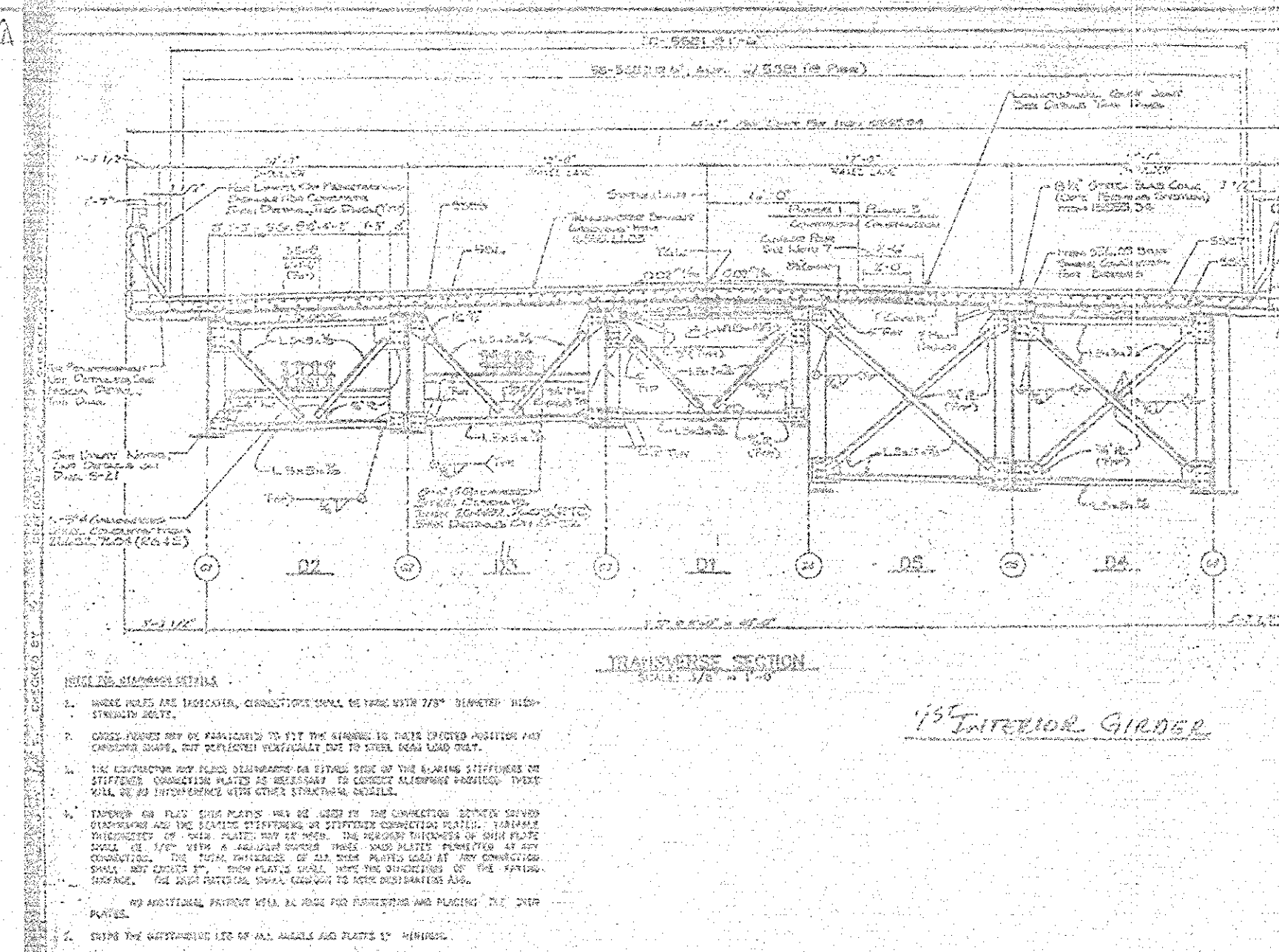
Reentrant corners shall be filleted to a radius of not less than 3/4 inch. On main material a 2 inch minimum radius shall be provided wherever possible. The radius and its contiguous cuts shall meet without offset or cutting past the point of tangency.

602. OXYGEN CUTTING OF HIGH STRENGTH STEEL (50,000 psi minimum yield strength)

The Contractor (Fabricator) shall take steps to insure that the flame cut edges of main material are not hardened by the cutting process. This may be achieved by preheating, post heating or control of the burning process. Flame cut edges found to have a Rockwell Hardness Value of C 30 or greater will be considered unacceptable. A portable Rockwell Hardness Tester will be employed by the Inspector to determine conformance with these requirements. Unacceptably hard surfaces shall be removed by grinding, machining, or approved heat treating procedures.

603. SURFACES AND EDGES TO BE WELDED

Surfaces and edges to be welded shall be smooth, uniform, and free from dirt, tears, cracks and other discontinuities which would adversely affect the quality or strength of the weld. Surfaces to be welded and surfaces adjacent to a weld shall also be free of loose or thick scale, slag, rust, moisture, grease and other foreign material that will prevent proper welding or produce objectionable fumes. Mill scale that withstands vigorous wire brushing, a thin non-inhibitive coating, or anti-spatter compound may remain except that all mill scale shall be removed from the surfaces on which flange-to-web welds are to be made by any of the approved welding processes. This provision shall apply to all girders, columns, beams, bridge columns, beam-to-column joints, truss frames, arches, truss chords and truss web members. The provision for removal of all mill scale prior to making web-to-flange welds shall not apply to secondary members, including columns or to members subjected to lateral blast cleaning prior to welding, where essentially all mill scale has been removed and no harmful rusting has occurred subsequent to blast cleaning, as determined by the Inspector. No mill scale shall be permitted to remain in the boundary of a groove weld subject to tensile stresses resulting from the design loads.



Bridge # 6 M.P. 360.78
East Faisle (West bound)

FLANGE SWEEP:

Push Jack System Required

Fixed at one end and supported at other (Dimensions shown)

Max Allowable moment = $M = \frac{1}{8} S$

where $S = 27 \text{ ksi}$

$S = b d^2 / 6$

Girder Built up Channel
Flange thickness = 1.375
Flange width = 17
Cover plate thickness = 0
Cover plate width = 0

$S_{yy} = S (\text{cover plate}) + S (\text{flange})$

$S_{yy} = 65.23 \text{ cubic inches}$

therefore max allowable moment:

$M = \frac{1}{8} S$

$M (\text{with coverplate}) = 1783163$

$S_{xx} = S (\text{flange})$

$S_{xx} = 42.15 \text{ cubic inches}$

therefore max allowable moment:

$M (\text{without coverplate}) = 1137638$

25 ton Jack effective area =

5.15

$M (\text{max})$ at fixed ends = 321
16

$M (\text{point of load}) =$ 321
32

$M (\text{max}) =$ 321
16

East Faisle (West bound)

With Jack located @ 72' South of North Abut.

		Rest Point of	Point of Load	MAX E at fixed	Head End Allowable	Allowable
		1.683	Hydraulic Pressure	Hydraulic Pressure	Hydraulic Pressure	Hydraulic Pressure
1	3	180950	30604	132058	26770	25720
2	4	140213	23148	96344	19280	19280
3	5	95370	18510	75476	15432	15432
4	6	79476	15432	66226	12830	12830
5	7	68121	13227	56768	11023	11023
6	8	59898	11374	48572	9545	9545
7	9	53303	9928	42153	8273	8273
8	10	47655	8769	37230	7218	7218
9	11	42860	7716	32928	6345	6345
10	12	38739	6742	29115	5620	5620
11	13	35291	5814	25734	5011	5011
12	14	32401	4914	22752	4501	4501
13	15	29950	4047	20114	4081	4081
14	16	27820	3204	17777	3727	3727
15	17	25900	2386	15695	3415	3415
16	18	24180	1594	13828	3128	3128
17	19	22640	826	12162	2865	2865
18	20	21260	0	10682	2620	2620
19	21	20020	0	9372	2390	2390
20	22	18910	0	8218	2182	2182
21	23	17920	0	7208	1992	1992
22	24	17040	0	6330	1818	1818
23	25	16260	0	5582	1660	1660
24	26	15580	0	4944	1518	1518
25	27	14990	0	4414	1388	1388
26	28	14480	0	3982	1268	1268
27	29	14040	0	3638	1158	1158
28	30	13660	0	3372	1058	1058
29	31	13340	0	3182	968	968
30	32	13070	0	3058	888	888
31	33	12850	0	2992	818	818
32	34	12670	0	2982	758	758
33	35	12520	0	2938	708	708
34	36	12400	0	2958	668	668
35	37	12300	0	2948	638	638
36	38	12220	0	2958	618	618
37	39	12150	0	2968	608	608
38	40	12090	0	2978	608	608
39	41	12040	0	2988	608	608
40	42	12000	0	2998	608	608
41	43	11960	0	3008	608	608
42	44	11920	0	3018	608	608
43	45	11880	0	3028	608	608
44	46	11840	0	3038	608	608
45	47	11800	0	3048	608	608
46	48	11760	0	3058	608	608
47	49	11720	0	3068	608	608
48	50	11680	0	3078	608	608
49	51	11640	0	3088	608	608
50	52	11600	0	3098	608	608
51	53	11560	0	3108	608	608
52	54	11520	0	3118	608	608
53	55	11480	0	3128	608	608
54	56	11440	0	3138	608	608
55	57	11400	0	3148	608	608
56	58	11360	0	3158	608	608
57	59	11320	0	3168	608	608
58	60	11280	0	3178	608	608
59	61	11240	0	3188	608	608
60	62	11200	0	3198	608	608
61	63	11160	0	3208	608	608
62	64	11120	0	3218	608	608
63	65	11080	0	3228	608	608
64	66	11040	0	3238	608	608
65	67	11000	0	3248	608	608
66	68	10960	0	3258	608	608
67	69	10920	0	3268	608	608
68	70	10880	0	3278	608	608
69	71	10840	0	3288	608	608
70	72	10800	0	3298	608	608
71	73	10760	0	3308	608	608
72	74	10720	0	3318	608	608
73	75	10680	0	3328	608	608
74	76	10640	0	3338	608	608
75	77	10600	0	3348	608	608
76	78	10560	0	3358	608	608
77	79	10520	0	3368	608	608
78	80	10480	0	3378	608	608
79	81	10440	0	3388	608	608
80	82	10400	0	3398	608	608
81	83	10360	0	3408	608	608
82	84	10320	0	3418	608	608
83	85	10280	0	3428	608	608
84	86	10240	0	3438	608	608
85	87	10200	0	3448	608	608
86	88	10160	0	3458	608	608
87	89	10120	0	3468	608	608
88	90	10080	0	3478	608	608
89	91	10040	0	3488	608	608
90	92	10000	0	3498	608	608
91	93	9960	0	3508	608	608
92	94	9920	0	3518	608	608
93	95	9880	0	3528	608	608
94	96	9840	0	3538	608	608
95	97	9800	0	3548	608	608
96	98	9760	0	3558	608	608
97	99	9720	0	3568	608	608
98	100	9680	0	3578	608	608
99	101	9640	0	3588	608	608
100	102	9600	0	3598	608	608

NOTE: JACK MAY BE MOVED ALONG GIRDER AND STILL MAINTAIN THE PRESSURES ASSOCIATED WITH CORRESPONDING RESTRAINT SPACING, ONLY IF THE RESTRAINTS ARE POSITIONED ON THE PORTION OF THE GIRDER WITH 1/8" FLANGE.

Bridge #6 East Faisle (West bound)

BUILT UP GIRDER

Repair Tolerances (Section 12, Dimensional Tolerances, New York State Steel Construction Manual)

Straightness: 1/4" or shall not exceed 1/8" in a ten foot length

Wt of Flange: Combined weight and lift of flange shall not exceed a 1/4" when measured from a point at the center of the web to toe of flange

Deviation From Girder Vertical Alignment: 5/8"

Deviation From Flatness of Girder Web: 5/16"

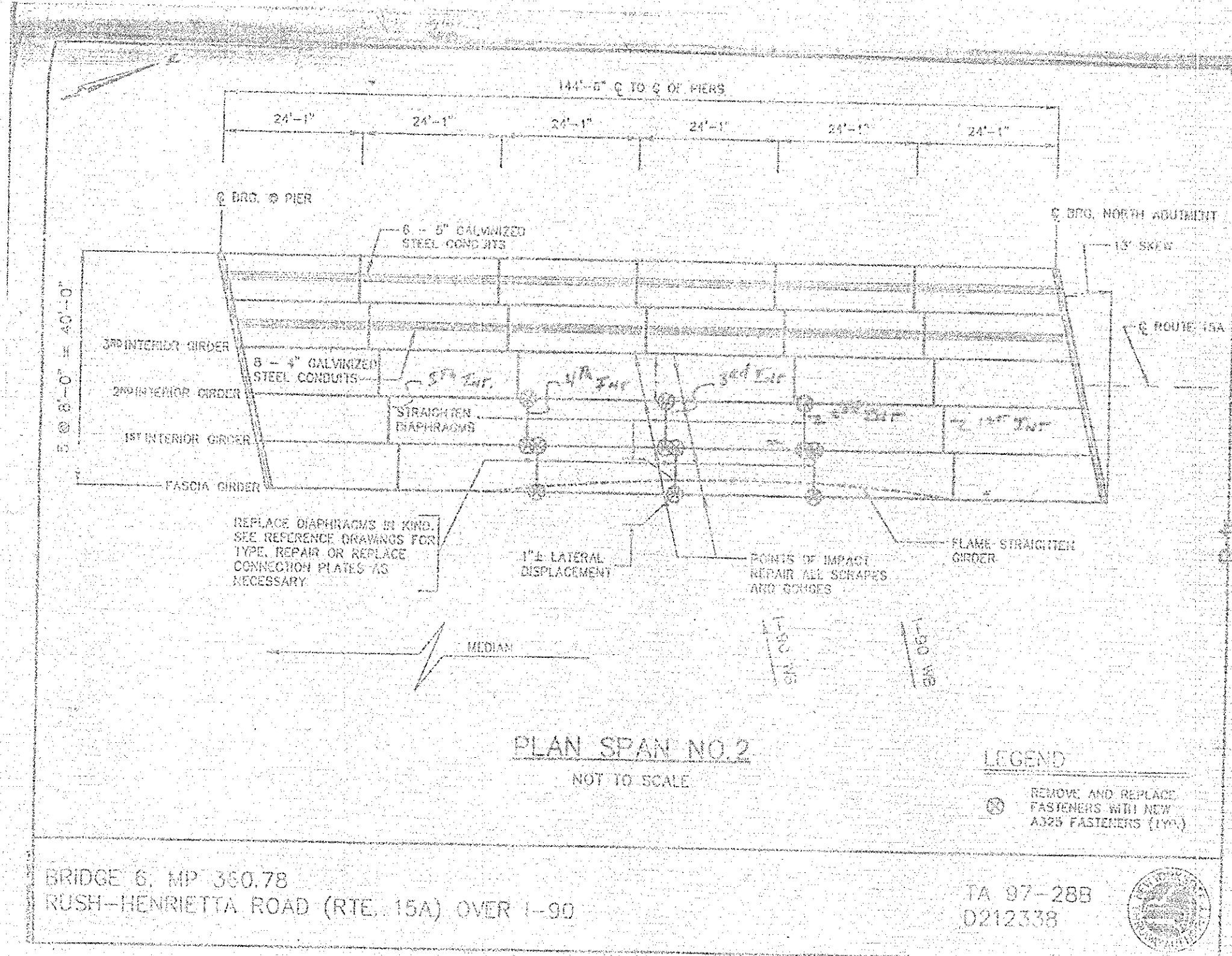
Any other tolerance should be in accordance with Section 12 of NYSSCM

Note: At specific areas such as points of impact, web punctures, etc. These tolerances may be extended subject to approval of Chief Engineer. All steel to be repaired shall be repaired in accordance with NYSSCM and shall be repaired in accordance with NYSSCM.

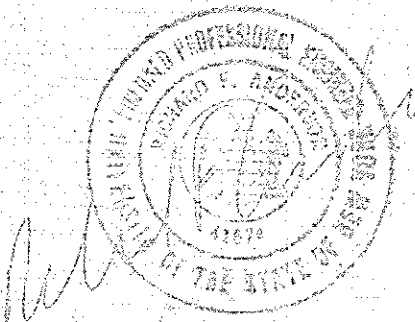
Tolerances for Grinding Repair Scours & Gouges

Flange Thickness	1.38
Flange Width	17.00
Web Thickness	0.68
Web Depth	56.00
Coverplate Thickness	0.60
Coverplate Width	0.90

20% of Flange Thickness	0.28 1/8"
20% of Web Thickness	0.13 3/16"
20% of Coverplate Thickness	0.09
5% of Flange Width	0.85 7/8"
5% of Coverplate Width	0.09
5% of Flange Cross Sectional Area	1.47 in ²
5% of Web Cross Sectional Area	1.76 in ²
5% of Coverplate Cross Sectional Area	0.09

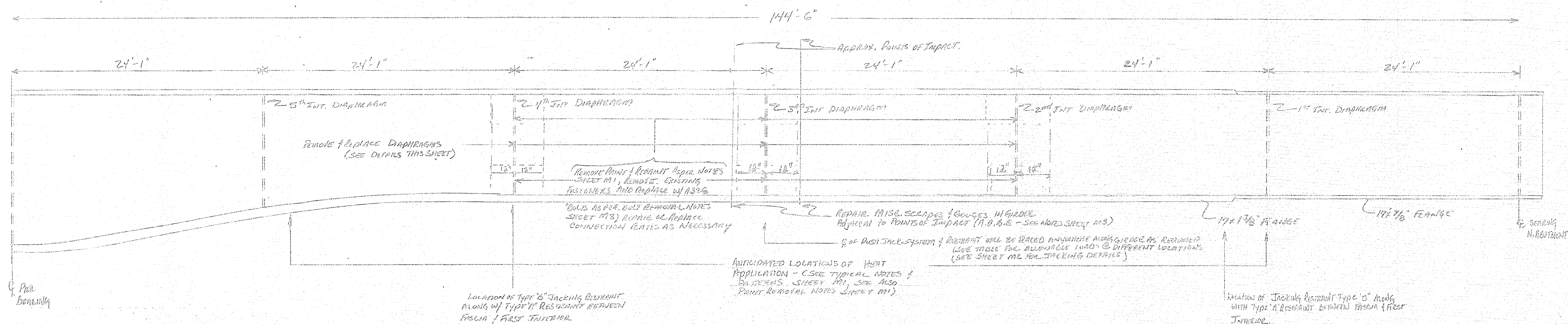


New York State
Thruway Authority
FINAL SHOP DRAWING REVIEW
Approved by: [Signature]
Approved As Noted
Approved For Revision No. [Blank]
By: [Signature] Date: 9-1-99



Rev. A - Dec 2, 1997
Revision #1 - Jan 16, 1999

TA 97-288 DRAWING
BRIDGE LOCATION #6, M.P. 360.78
RUSH-HENRIETTA ROAD (RTE. 15A) OVER I-90
SCALE: N.T.S.
DATE: [Blank]
ITEM: 25690.54006 REPAIR OF SUBMERGED STEEL
DRAWING NUMBER: 25690.54006



Bridge # 6 M.P. 360.78
East Fascia (West Bound)
Push Jack system

FLANGE SWEEP:
CONDITION

Supported at 28 Feet South of North Abut. and Fixed at North Intermediate Diaphragm South of North Abutment.
Max Allowable moment = $M = S \times S$ where $S = 27 \text{ ksi}$

$S = 24 \times 216$			
Girder - Built up Girder	$I =$	71.25	
Flange thickness = 1.375	$a =$	42	
Flange width = 17	$b =$	29.25	
cover plate thickness = 0	Piston area of Jack =	5.15	
cover plate width = 0	25 Ton Jack		

$Sys = S \times (cover plate) \times S \times (flange)$

$Sys = 66.25 \text{ cubic inches}$

therefore max allowable moment = $M = S \times S$

$$M = R1 \times a$$

$$R1 = \frac{P}{(P + 2) \times (L \times 3)} \times (a + 2L)$$

$P = 16250$

(M1) Allowable Hydraulic Pressure = $P / \text{Cylinder area of Jack}$

$$M2 = ((P \times a \times b) / (L \times 3)) \times (a + L)$$

$P = 16075$

(M2) Allowable Hydraulic Pressure = $P / \text{Cylinder area of Jack}$

a	b	M1 Allowable Hyd. Pressure	M2 Allowable Hyd. Pressure	Allowable Pressure
7	54.75	4945	5340	4945
8	59.25	4545	4945	4545
9	62.25	4245	4545	4245
10	64.25	4045	4245	4045
11	65.25	3845	3945	3845
12	66.25	3645	3645	3645
13	67.25	3445	3345	3445
14	68.25	3245	3045	3245
15	69.25	3045	2745	3045
16	70.25	2845	2445	2845
17	71.25	2645	2145	2645
18	72.25	2445	1845	2445
19	73.25	2245	1545	2245
20	74.25	2045	1245	2045
21	75.25	1845	945	1845
22	76.25	1645	645	1645
23	77.25	1445	345	1445
24	78.25	1245	45	1245

E: IF JACKING RESTRAINTS OR INTERMEDIATE BLOCKING IS RELOCATED FROM THE POSITIONS SHOWN ON THIS SHEET, PRESSURES WILL BE MODIFIED AND APPROVED BY CHIEF ENGINEER.

Actual calculations on sheet B-14

EAST FASCIA (West Bound)
LOOKING WEST

Bridge # 6 M.P. 360.78

East Fascia (East Bound)

Maximum Preload for Flange Rotation:

In Maximum Preload Stress = 27 ksi

$M = P \times L$

$S = 24 \times 216$

GIRDER SIZE: Built up Girder

$tw = 0.625$

$bf = 17$

$tf = 1.375$

Top cover plate = 17

Bottom cover plate width = 17

$L = \text{width of cover plate}$

$M = P \times L$

$P = 16250$

$L = 17$

$M = 276250$

$P = 16250$

$L = 17$

$M = 276250$

$P = 16250$

$L = 17$

$M = 276250$

$P = 16250$

$L = 17$

$M = 276250$

$P = 16250$

$L = 17$

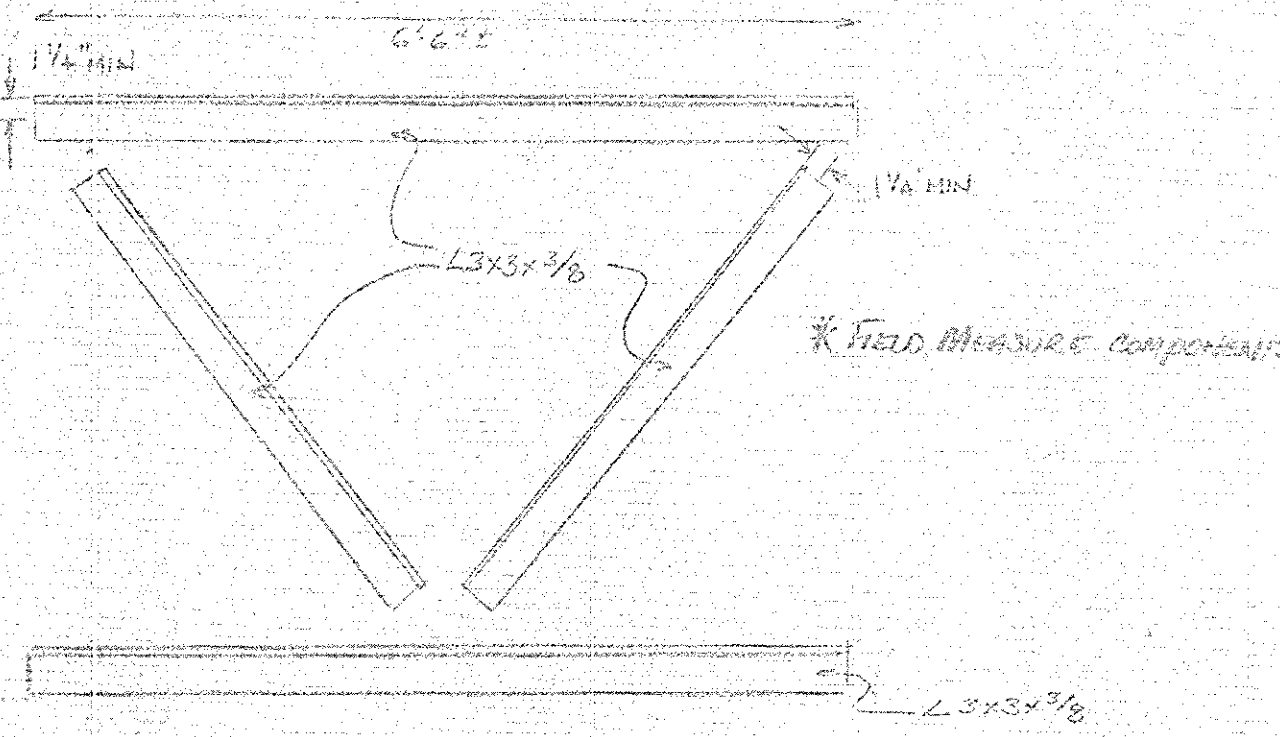
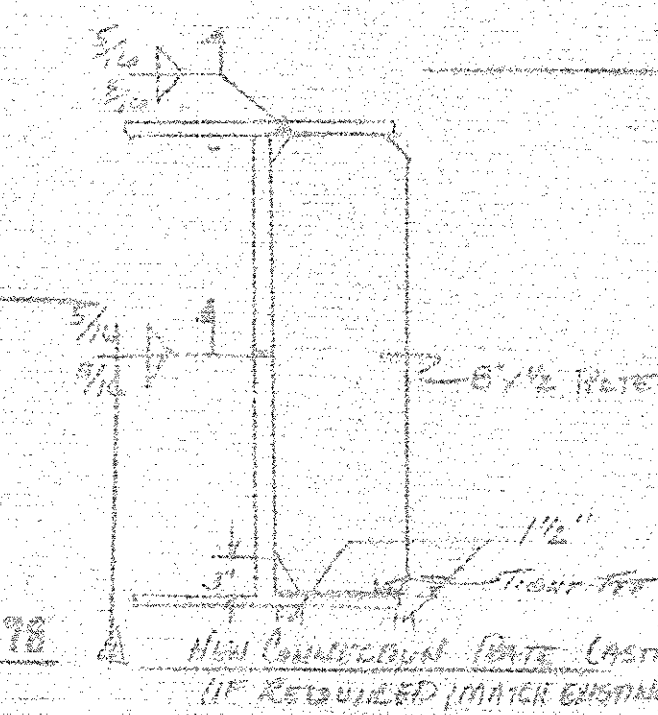
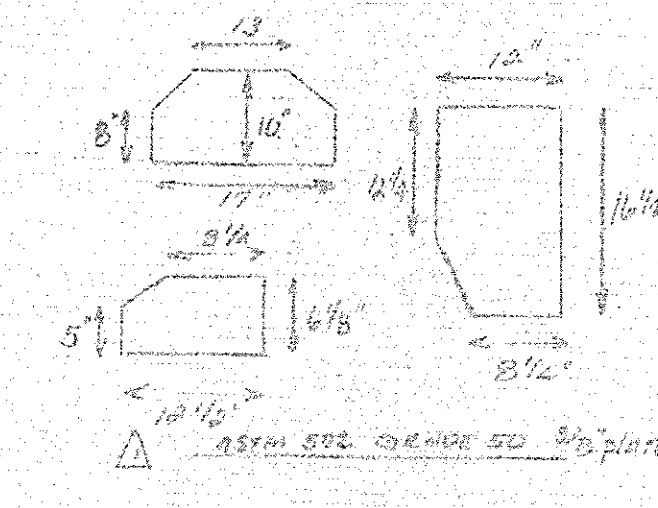
$M = 276250$

$P = 16250$

(C) Lateral Displacement = 1"

New York State
Thruway Authority
FINAL SHOP DRAWING REVIEW

Approved By: *[Signature]*
Approved As Noted
Approved For Revision No. *[Signature]*
Date: 7-1-78



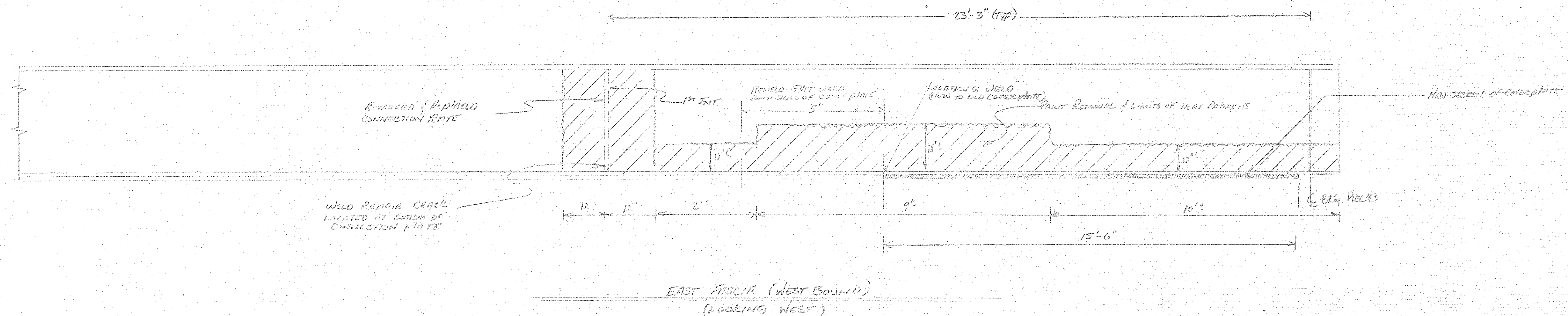
Notes:

- Holes in connection plate & diaphragm are to be filled with epoxy using magnetic drill and 1/2" hole.
- Remove all existing connection plates shall be done by the contractor and existing connection plate shall be removed by the contractor.
- Remove all existing connection plates shall be done by the contractor and existing connection plate shall be removed by the contractor.
- Remove all existing connection plates shall be done by the contractor and existing connection plate shall be removed by the contractor.

1. Clean all steel surfaces within 12 inches of any repair area as determined by Engineer. For purposes of this work, a repair area is defined as any location that has been distorted as a result of the impact, welds joining member components within the distorted area, including connection plates at locations where fasteners are to be replaced; and any base metal that is to be heated, flame cut, welded, ground or tested. Where cleaning areas to be heated or welded, it is intended that both sides of the member be cleaned, i.e., both sides of the web, flange, connection plate, etc.
2. Perform initial magnetic particle tests within 12 inches of the above repair areas, including welds and base metal, to determine presence of cracks. If cracks are found and confirmed, flame straightening operations will not be allowed to begin until the crack has been repaired to the satisfaction of the Engineer. The cost of repair to cracks that have not been included in the specific work required for a given structure will be paid for under the provisions of Item 25090.999799.
3. After all required repairs are complete, perform magnetic particle tests within 12 inches of all areas that were a) heated, b) straightened, c) ground to remove scrapes, or d) welded.
4. Ultrasonic test all new complete penetration groove welds made to repair cracks, install new sections of member components, etc., and all gouges repaired by welding.
5. As-built drawings will be completed by Vector Construction Corporation showing bearing locations, cracks, major discontinuities, and repair welds.

Revisions #1A - 11/9/77

7-1-78	1010338	Bridge # 6, M.P. 360.78	Drawn by: T. H. HARRIS
DATE	APPROVED BY	DRIVEN BY	
Item 25090.999799 Repair or Strengthen Steel			
Vector Construction Corporation			



Bridge #5 (M.P. 304.15)
Weedsport Int. Ramp over I-90 (West bound)
(Bridge repairs accepted)

East Fascia (West bound):

- 1.) Girder straightened with bent patterns and jacks.
- 2.) New section of cover plate installed from end of existing plate at Pier #3 to point of impact, approximately 15.5' (Passed Ultrasonic inspection test).
- 3.) Weld repair of crack found at bottom of first intermediate connection plate (Passed Ultrasonic inspection test).

First Interior (West bound):

- 1.) No heat patterns required.
- 2.) Removed and replaced rivets with A325 fasteners at first intermediate connection plate.

New York State Thruway Authority	
FINAL SHOP DRAWING REVIEW	
<input checked="" type="checkbox"/> Approved <i>OT</i> <input type="checkbox"/> Approved As Noted <input type="checkbox"/> Approved For Revision No. _____	
By: <i>WLL</i>	Date: 9-1-98

AS-BUILT REVISIONS

Steve Howe 10/14/98

77 84 888 D210338	
BRIDGE LOCATION: M.P. 304.19	
WEEDSPORT INT. RAMP OVER I-90	
SCALE: N.T.S.	APPROVED BY: <i>T. ANDERSON</i>
DATE: 1-6-98	DRAWN BY: <i>T. ANDERSON</i>
ITEM: 86670.540105 STRUCTURAL STEEL REPAIRS (AS BUILT)	
FOR: CUNEIFORM CORPORATION	DRAWING NUMBER: BR561

Bridge No. 6 M.P. 304.18
East Faisla (West bound)

FLANGE COVER:

Full Jack System Required
Fixed at one end and supported at other (Dimensions shown)
Max Allowable moment: $M = 621/8$
where $M = 28 \text{ k-ft}$

$S = 14.7 \text{ in}^3$
Flange thickness = 0.04
Flange width = 11.575
Cover plate thickness = 0.0625
Cover plate width = 16

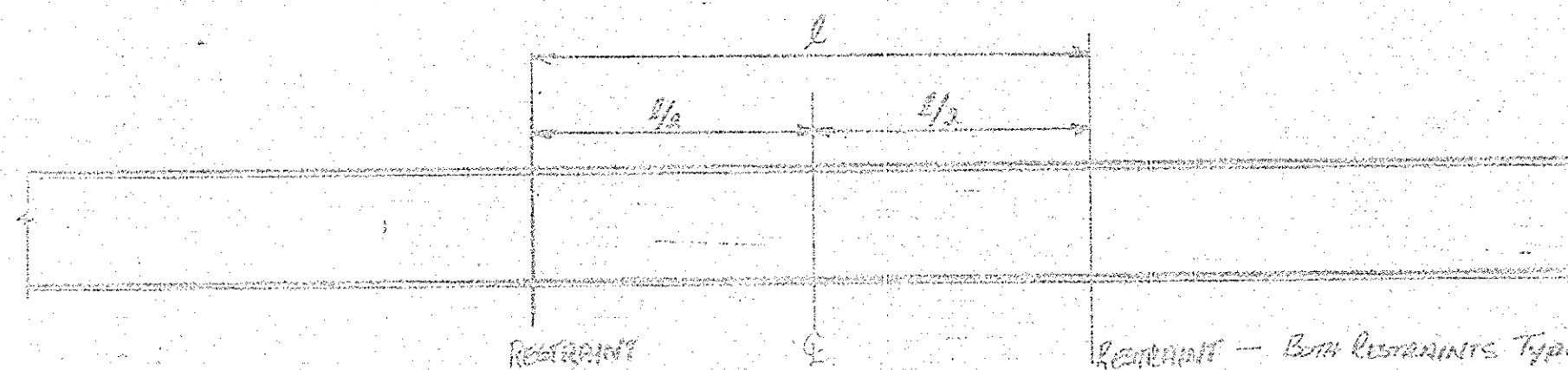
$S_{yy} = S + (S \text{ flange})$
 $S_{yy} = 49.47 \text{ cubic inches}$
therefore max allowable moment:
 $M = (S) \times S$
 $M (\text{with coverplate}) = 925322$

$S_y = S (\text{flange})$
 $S_y = 22.47 \text{ cubic inches}$
therefore max allowable moment:
 $M (\text{without coverplate}) = 440322$

28 ton jack effective area = 5.16

$M (\text{max}) \text{ at fixed end} = \frac{3PL}{16}$
 $M(a) = \frac{5PL}{16}$

$M (\text{point of load}) = \frac{5PL}{32}$



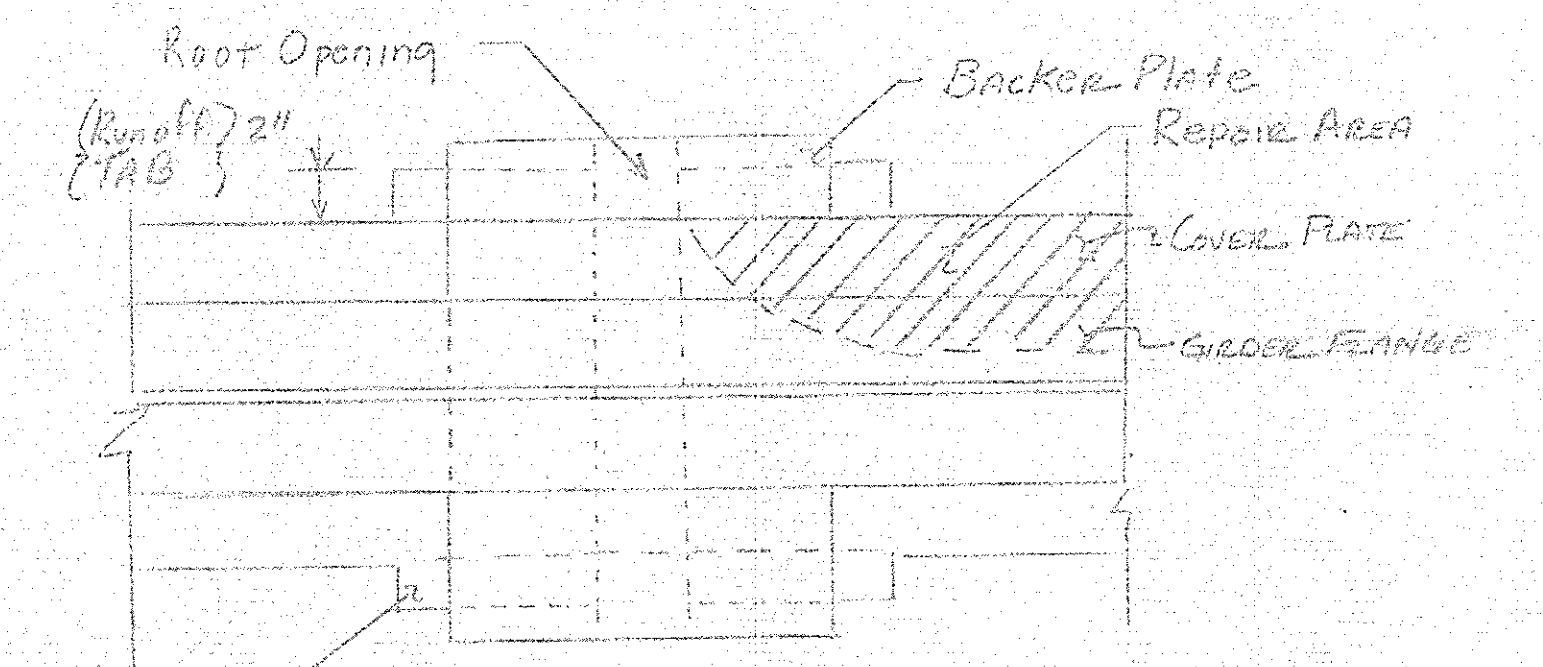
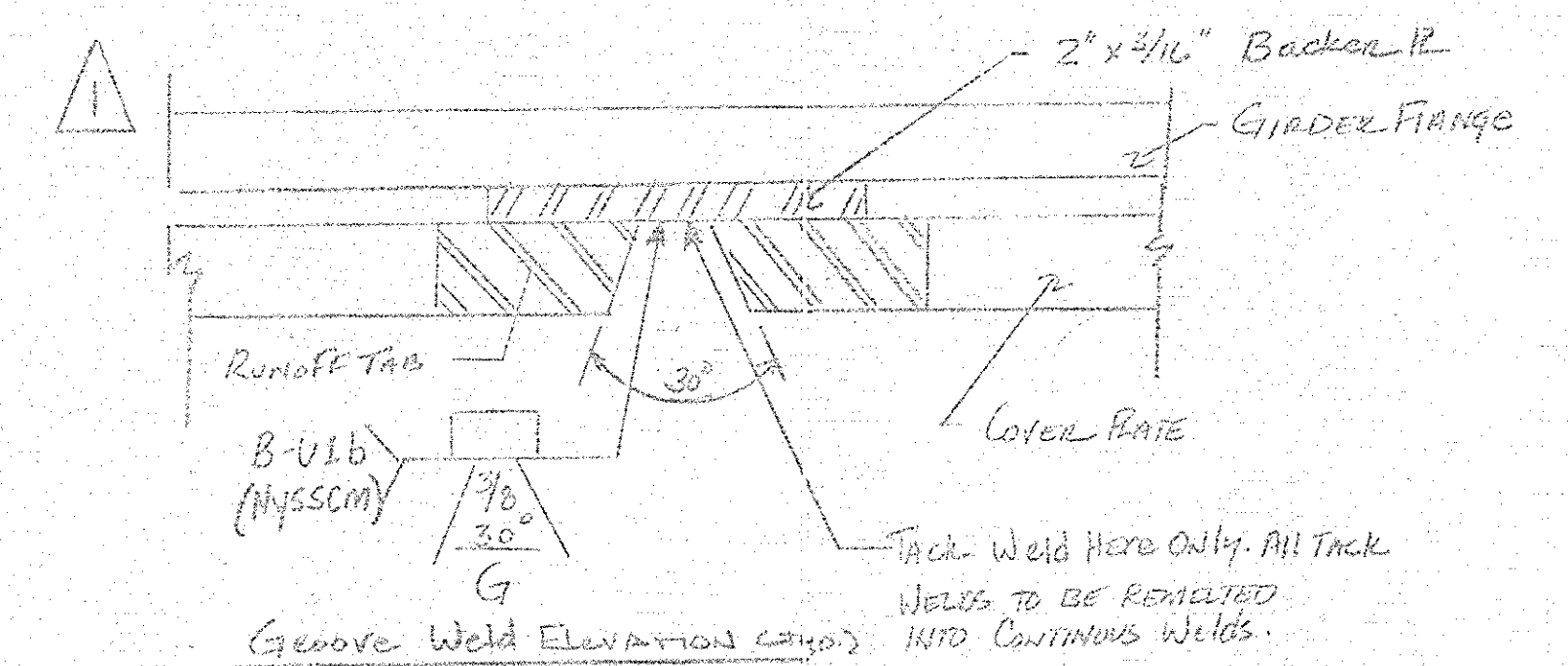
RESTRAINT — Both Restraints Type "B" Along W/Type "A" Between Faisla & First Int.

JACK CAN BE MOVED ANYWHERE ALONG THE GIRDER WITHOUT CHANGING THE ALLOWABLE HYDRAULIC PRESSURE IN TABLE BELOW AS LONG AS RESTRAINTS ARE MAINTAINED AT THE DIMENSIONS SHOWN IN THE TABLE BELOW

East Faisla (West bound)
With Jack located @ 24.57' From Pier #1 Reading

	Point of Load	Point of Load	MAX. P. at fixed	Fixed End	Allowable
	Load	Hydraulic Pressure	End	Hydraulic Pressure	Hydraulic Pressure
1	2	82894	16040	88339	13367
6	3	21956	12030	81626	10025
8	4	49664	5825	41309	6820
19	5	41303	3028	34418	6883
12	6	35403	3374	29332	5728
14	7	30877	3015	25814	5043
16	8	27835	2347	22348	4456
18	9	24782	2012	20882	4010
20	10	22523	1874	18734	3646
22	11	20362	17210	17210	3342
24	12	18203	15838	15838	3055
26	13	16044	14731	14731	2884
28	14	13885	13788	13788	2673
30	15	11726	12807	12807	2506
32	16	9567	12148	12148	2355
34	17	7408	2083	2083	2333
36.57	17.105	14421	2083	12917	2333

NOTE: IF JACKING RESTRAINTS OR INTERMEDIATE BULGING IS DETECTED FROM THE ABOVE LOCATIONS, THE ALLOWABLE HYDRAULIC PRESSURE WILL BE RECALCULATED AND APPROVED BY CHIEF ENGINEER.



Remove runoff tabs + Backer-Plates + Grind Finish with edges of Cover Plate

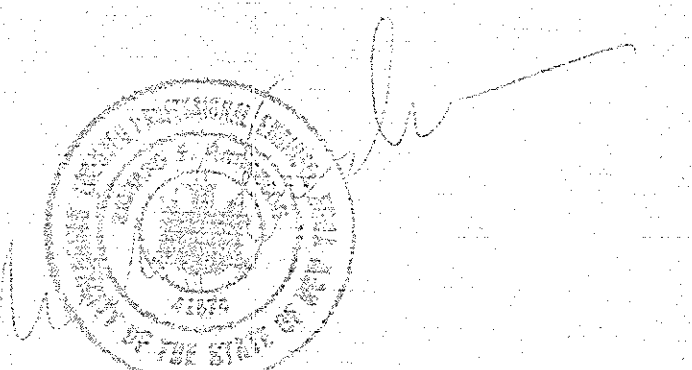
Grind the weld on the bottom of the cover plate flush + smooth

Groove Weld Run (GWD)

New York State
Thruway Authority
FINAL SHOP DRAWING REVIEW

☒ Approved ☐ Approved As Noted
☐ Approved For Revision No. _____

By: M. L. L. Date: 7-1-99



Rev A Dec 2, 1999

78-97-208 DAN 338
BRIDGE LOCATION #45 M.P. 304.19

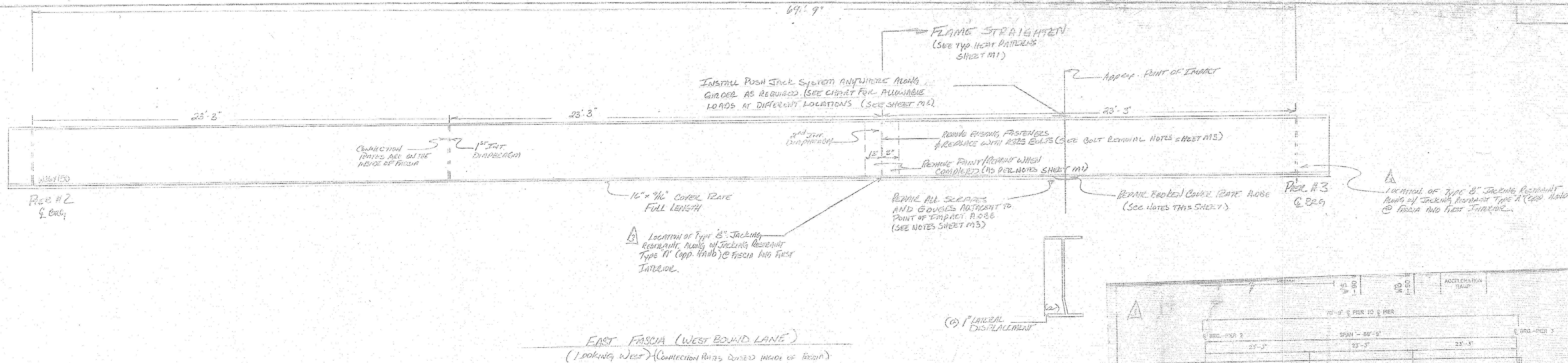
WEEDPORT INTERCHANGE CAYUGA COUNTY

SCALE: _____ APPROVED BY: _____ DRAWN BY: G. HARRISON

DATE: _____

MECHANICAL JACKING ALLOWABLE LOADS

VEEDER CONSTRUCTION CORP. DRAWING NUMBER: 025A2 1001



Bridge #0, R.P. 304.19
East Fascia (West Bound)
Push Jack system

FLANGE WELDER
CONNECTION

Fixed at Diaphragm and supported @ Bearing
Max Allowable moment = $M = 10 \times S$ where $10 = 20 \text{ ksi}$

$S = b d^2 / 6$
Girder = $W30 \times 150$ $b = 23.25$
Flange thickness = 0.84 $a = 11.525$
Flange width = 11.576 $b = 11.525$
Cover plate thickness = 0.625 Cylinder area of Jack = 5.15
Cover plate width = 16
Cyl = $(\text{cover plate} \times S) / (\text{flange})$
Cyl = 46.47 cubic inches

therefore max allowable moment = $M = 10 \times S$
 $M = 928982$

$M = 928982$
 $R = (P \times L) / (2 \times L) \times (a + 2L)$
 $R = 4138$

$P = 21318$
(101) Allowable Hydraulic Pressure = $P / \text{Cylinder area of Jack}$
 $P = 4138$
 $M = (P \times L) / (2 \times L) \times (a + 2L)$
 $M = 928982$
(102) Allowable Hydraulic Pressure = $P / \text{Cylinder area of Jack}$
 $P = 4138$

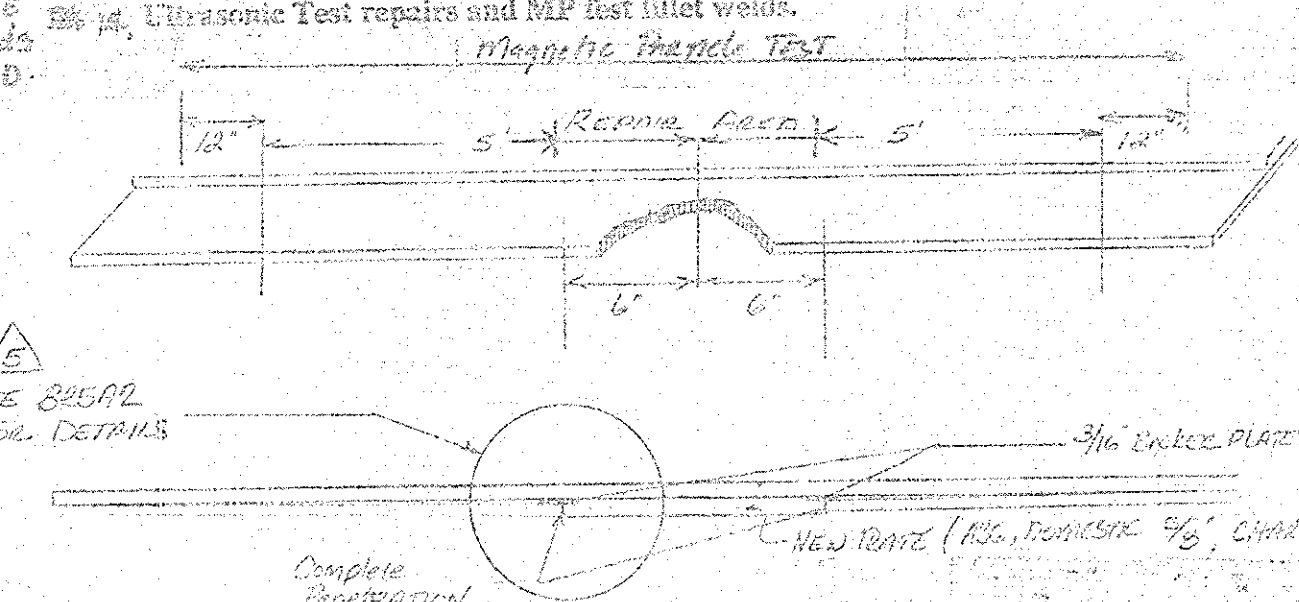
S	S	1st Allowable Hyd. Pressure	2nd Allowable Hyd. Pressure	Allowable Pressure
4	18.25	4497	6397	4497
5	17.25	4038	5370	4038
7	15.25	3422	4725	3422
8	15.25	3728	4254	3728
9	14.25	3727	3931	3727
10	13.25	3844	3635	3844
11	12.25	3592	3375	3592
12	11.25	4204	3419	4204
13	10.25	4804	3368	4804
14	9.25	5419	3370	5419
15	8.25	6030	3435	6030
16	7.25	7181	3571	7181
17	6.25	8364	3692	8364
18	5.25	11042	4174	11042
19	4.25	15816	4768	15816
20	3.25	23097	5793	23097

FIRST INTERIOR GIRDER
REMOVE PAINT WITHIN ONE FOOT EITHER SIDE OF CONNECTION (BOTH SIDES) (AS PER NOTES M1)
REMOVE EXISTING FASTENERS AND REPLACE WITH A325 BOLTS (SEE BOLT REMOVAL NOTES SHEET M3)
REPAINT WHEN REPAIR IS COMPLETED (AS PER NOTES SHEET M1)

Cover plate Repair Notes:

* The type of fracture at this location suggests that the cover plate is extremely brittle. Therefore, use the supplied Rockwell hardness device at test bottom cover plate. If the test exceeds Rc27 then post heating of the repair will be required.

- Remove Paint 12 inches either side of repair area and perform initial Magnetic Particle Test.
- Remove fillet weld five feet either side of repair section by grinding or air carbon arc gouging (if air carbon arc gouging, leave 1/8" of weld to base metal and grind weld off 1/16" into base metal).
- Pry down section of cover plate w/ fillet weld removed.
- Remove section of cover plate one foot long by full width.
- Make necessary repairs to girder flange using approved procedures.
- If welded repairs are necessary to girder flange ultrasonic test repairs.
- Insert two 3/16" backer plate at locations of complete penetration groove welds. **THICK WELDING TO GIRDER FLANGE WILL NOT BE ALLOWED.**
- Install new section of cover plate. Direction of rolling must be parallel to the length of girder.
- Prepare joint for welding, include installation of run off tabs.
- Preheat to 400 F.
- Weld using properly dried E7018 electrodes as described in approved welding procedure specifications WP-05, WP-06.
- Remove runoff tabs and weld.
- Ultrasonic Test repairs and MP test fillet welds.



Complete Penetration Groove Weld (UT TEST WHEN COMPLETED)

Notes:

- Clear all steel surfaces within 12 inches of any repair area as determined by Engineer. For purposes of this work, a repair area is defined as any location that has been disturbed as a result of the impact; welds joining member components within the disturbed area, including connection plates at locations where fasteners are to be replaced; and any base metal that is to be heated, flame cut, welded, ground or tested. When cleaning areas to be heated or welded, it is intended that both sides of the member be cleaned, i.e., both sides of the web, flange, connection plate, etc.
- Perform initial magnetic particle tests within 12 inches of the above repair areas, including welds and base metal, to determine presence of cracks. If cracks are found and confirmed, flame straightening operations will not be allowed to begin until the crack has been repaired to the satisfaction of the Engineer. The cost of repairs to cracks that have not been included in the specific work required for a given structure will be paid for under the provisions of Item 25590.999799.
- After all required repairs are complete, perform magnetic particle tests within 12 inches of all areas that were a) heated, b) straightened, c) ground to remove scrapes, or d) welded.
- Ultrasonic test all new complete penetration groove welds made as repairs needed, install new sections of member components, etc., and all gouges repaired by welding.
- As-built drawings will be completed by Vector Construction Corporation showing heating locations, cracks, major discontinuities, repairs and repair welds.

Bridge #0, R.P. 304.19
East Fascia (West Bound)

Maximum Allowed for Flange Rotation:

$\theta = \text{Maximum Preload Stress} = 20 \text{ ksi}$
 $M = P \times L$
GIRDER SIZE: $W 48 \times 150$

$b = 0.825$
 $b_f = 11.978$
 $t_f = 0.94$

Top cover plate = 16
Bottom cover plate width = 16
 $L = \text{width of cover plate} / 2$
 $f = 0.85$ $M = P \times L$ $(P \times L) = f \times (b d^2 / 6)$
 $P = f \times (b d^2 / 6) \times L$
Assume $b = 18 \times t_w$

$P = 1037 \text{ lbs.}$

Allowable Hydraulic Pressure

Allowable Pressure = $P / \text{Cylinder Area of Jack}$

Cylinder Area of Jack = 5.15 square inches

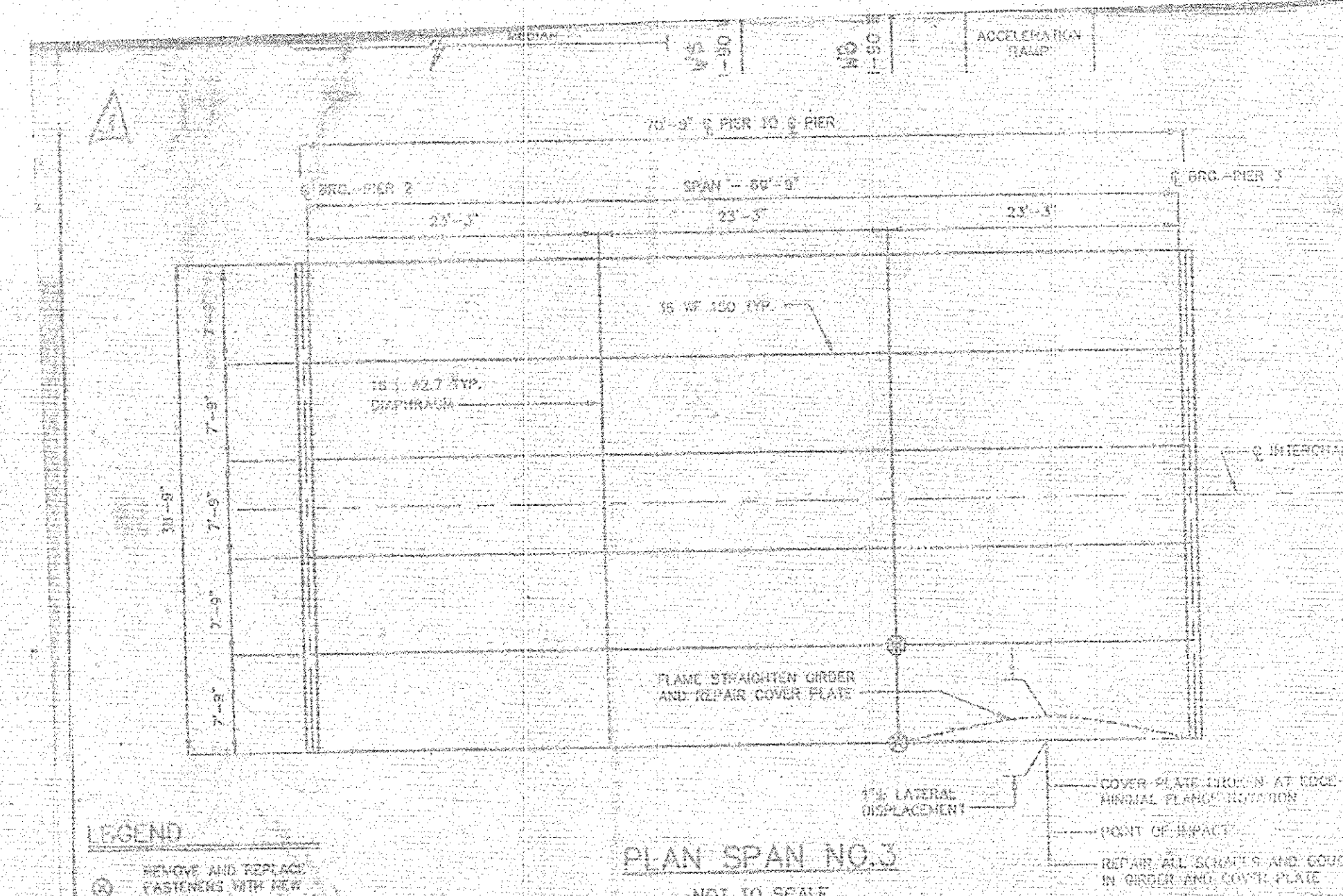
Allowable Pressure = 398 P.S.I.

Tolerances for Grinding Repair Scrapes & Gouges

Bridge #0 East Fascia (West Bound)

$W30 \times 150$

Flange Thickness	0.94
Flange Width	12.115
Web Thickness	0.625
Web Depth	33.87
Coverplate Thickness	0.625
Coverplate Width	16
20% of Flange Thickness	0.189
20% of Web Thickness	0.125
20% of Coverplate Thickness	0.125
0% of Flange Width	0.00072
5% of Coverplate Width	0.8
5% of Flange Gross Sectional Area	0.559405 sq. inch
5% of Web Gross Sectional Area	1.084523 sq. inch
5% of Coverplate Gross Sectional Area	0.65 sq. inch



REPAIR TOLERANCES:

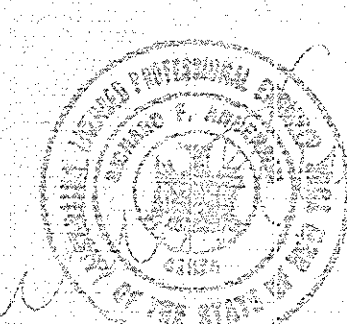
(SECTION 12, DIMENSIONAL TOLERANCES, NEW YORK STATE STEEL CONSTRUCTION MANUAL)

- STRAIGHTNESS: $7/8"$ OR SHALL NOT EXCEED $1/8"$ IN TEN FOOT TEST LENGTH
- TILT OF FLANGE: COMBINED WARPAGE AND TILT OF FLANGE MUST NOT EXCEED $1/4"$ WHEN MEASURED FROM A POINT AT THE CENTRAL OF WEB TO TIE OF FLANGE.
- DEVIATION FROM GIRDER VERTICAL ALIGNMENT: $7/16"$
- DEVIATION FROM FLATNESS OF GIRDER WEB: $3/16"$

NOTE: AT SPECIFIC AREAS SUCH AS POINTS OF IMPACT, WEB ANCHORS, ETC. THESE TOLERANCES MAY BE EXCEEDED SUBJECT TO APPROVAL OF CHIEF ENGINEER.
ANY OTHER TOLERANCES SHOULD BE IN ACCORDANCE WITH SECTION 12, NEW YORK STATE STEEL CONSTRUCTION MANUAL.
ALL STEEL TO STAY AS IS UNLESS SPECIFIED, OTHERWISE

New York State
Thruway Authority
BRIDGE SHOP DRAWING REVIEW

Approved by: *[Signature]*
Reviewed by: *[Signature]*
Date: 7-1-99



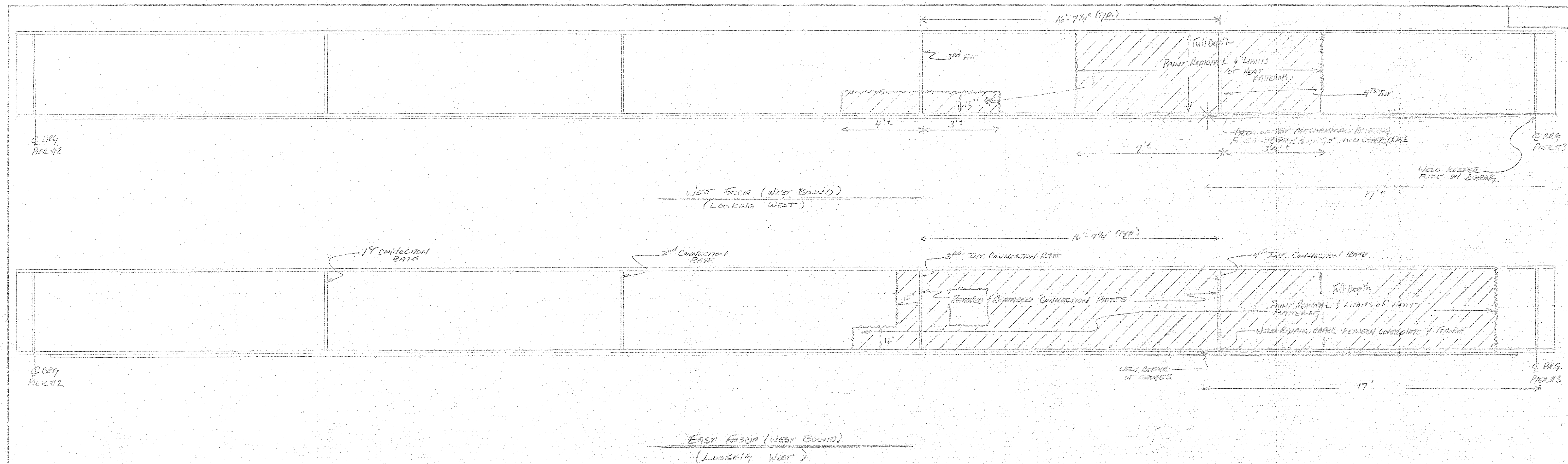
REV 4, Sept 18, 1997
REV 3, August 11, 1997
REV 2, July 31, 1997

BRIDGE LOCATION #0 R.P. 304.19
WINDYBLOT INTERCHANGE
CANNON COUNTY

SCALE: *[Blank]* APPROVED BY: *[Blank]* QUANTITY: *[Blank]*

DATE: *[Blank]* DRAWING NUMBER: *[Blank]*

VECTOR CONSTRUCTION CORPORATION



Bridge #4 (M.P. 294.52)
Memphis Road (Route 64) over I-90
(Bridge repairs accepted)

West Fascia (West bound):

- 1.) Girder straightened with heat patterns and jacks.
- 2.) Removed and replaced third and fourth intermediate connection plates.
- 3.) Weld repair gouges in flange at point of impact (Passed Ultrasonic inspection test).
- 4.) Weld repair cover plate to flange crack at point of impact (Pass Inspection test).

First Interior (West bound):

- 1.) No heat patterns required.
- 2.) Removed and replaced rivets with A325 fasteners at fourth intermediate connection plate.

Third Interior (West bound):

- 1.) No heat patterns required.
- 2.) Removed and replaced rivets with A325 fasteners at fourth intermediate connection plate.

West Fascia (East bound):

- 1.) Girder straightened with heat patterns and jacks.
- 2.) Removed and replaced rivets with A325 fasteners Pier #3 connection plate.
- 3.) Removed and replaced fourth intermediate connection plate.
- 4.) Used hot mechanical bending on flange at point of impact to flatten section.
- 5.) Ground out scrapes on bottom flange at point of impact.
- 6.) Weld keeper plate on bearing at Pier #3.

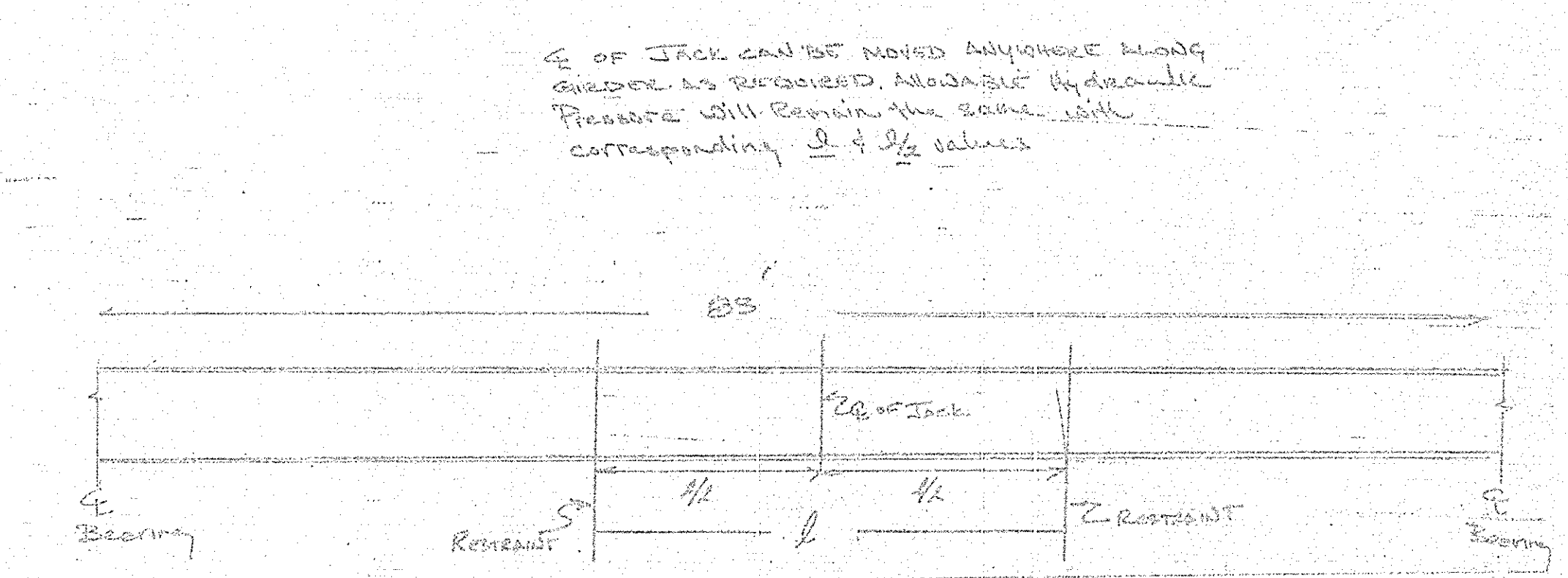
West Fascia (East bound):

- 1.) No heat patterns required.
- 2.) Weld repair of gouge in bottom flange at the point of impact (Passed Ultrasonic inspection test).
- 3.) Ground out scrapes on bottom flange at point of impact.

New York State Thruway Authority FINAL SHOP DRAWING REVIEW	
<input checked="" type="checkbox"/> Approved <input type="checkbox"/> Approved As Noted <input type="checkbox"/> Approved For Revision No. _____	
By: <i>W. J. [Signature]</i>	Date: 9-1-78

AS-BUILT REVISIONS

TA 99-55 D44333 BRIDGE LOCATION: # 4, M.P. 294.52 MEMPHIS ROAD (Route 64) OVER I-90	
SCALE: 1"=3'-0"	APPROVED BY: <i>[Signature]</i>
DATE: 1-3-78	DRAWN BY: <i>[Signature]</i>
ITEM: 05470.00004 REPAIR OF STRUCTURAL STEEL (AS BUILT)	
VECTOR CONSTRUCTION CORPORATION	DRAWING NUMBER: 04481



Note: One Resistant will be considered fixed & one will be considered supported.

Bridge: 4 M.P. 294.52
West Fascia (West bound)

FLANGE SWEEP:

Push Jack System Required.
Fixed at one end and supported at other (Dimensions shown).
Max allowable moment: $M = M/S$
where for 20 ksi
 $S = bd^2/2$
Circles W30 x 154
Flange thickness = 1.23
Flange width = 12.115
Cover plate thickness = 1
Cover plate width = 16

Sys S (cover plate) = S (flange)
Sys = 73.49 cubic inches
therefore max allowable moment:
 $M = M/S$
 $M(\text{with coverplate}) = 1405791$

Sys S (flange) = 30.83 cubic inches
therefore max allowable moment:
 $M(\text{without coverplate}) = 616445$

20 ton Jack effective area = 2.32

M (max) at fixed ends: 321
M (point of load): 321
M(x): 321

East Fascia (West bound)
With Jack located @ 41.6' From Pier #1 Bearing

1	2	Point of Load		MAX P at fixed	Fixed End Allowable	
		Load	Hydraulic Pressure		Hydraulic Pressure	Allowable
0	3	130947	55913	108873	46226	46226
6	4	97985	42236	61654	38156	38156
10	5	73595	37885	45324	29167	29167
12	6	63204	29167	38456	23464	23464
14	7	55902	24134	33553	20112	20112
16	8	49595	21112	29327	17856	17856
18	9	44548	18771	26291	15843	15843
20	10	40194	16884	23962	14078	14078
22	11	36551	15352	22083	12723	12723
24	12	33562	14076	20518	11732	11732
26	13	31143	12995	19124	10935	10935
28	14	29288	12067	17985	10286	10286
30	15	27923	11283	17179	9785	9785
32	16	26956	10629	16444	9399	9399
34	17	26258	10086	15813	9081	9081
36	18	25778	9655	15246	8821	8821
38	19	25482	9326	14740	8619	8619
40	20	25327	9077	14354	8459	8459
41.6	20.76	16489	8144	13741	8134	8134

Bridge: 4 M.P. 294.52
East Fascia (West bound)

FLANGE SWEEP:

Push Jack System Required.
Fixed at one end and supported at other (Dimensions shown).
Max allowable moment: $M = M/S$
where for 20 ksi
 $S = bd^2/2$
Circles W30 x 154
Flange thickness = 1.23
Flange width = 12.115
Cover plate thickness = 1
Cover plate width = 16

Sys S (cover plate) = S (flange)
Sys = 73.49 cubic inches
therefore max allowable moment:
 $M = M/S$
 $M(\text{with coverplate}) = 1405791$

Sys S (flange) = 30.83 cubic inches
therefore max allowable moment:
 $M(\text{without coverplate}) = 616445$

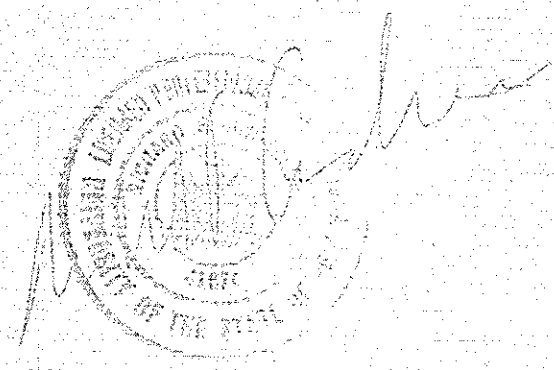
20 ton Jack effective area = 2.32

M (max) at fixed ends: 321
M (point of load): 321
M(x): 321

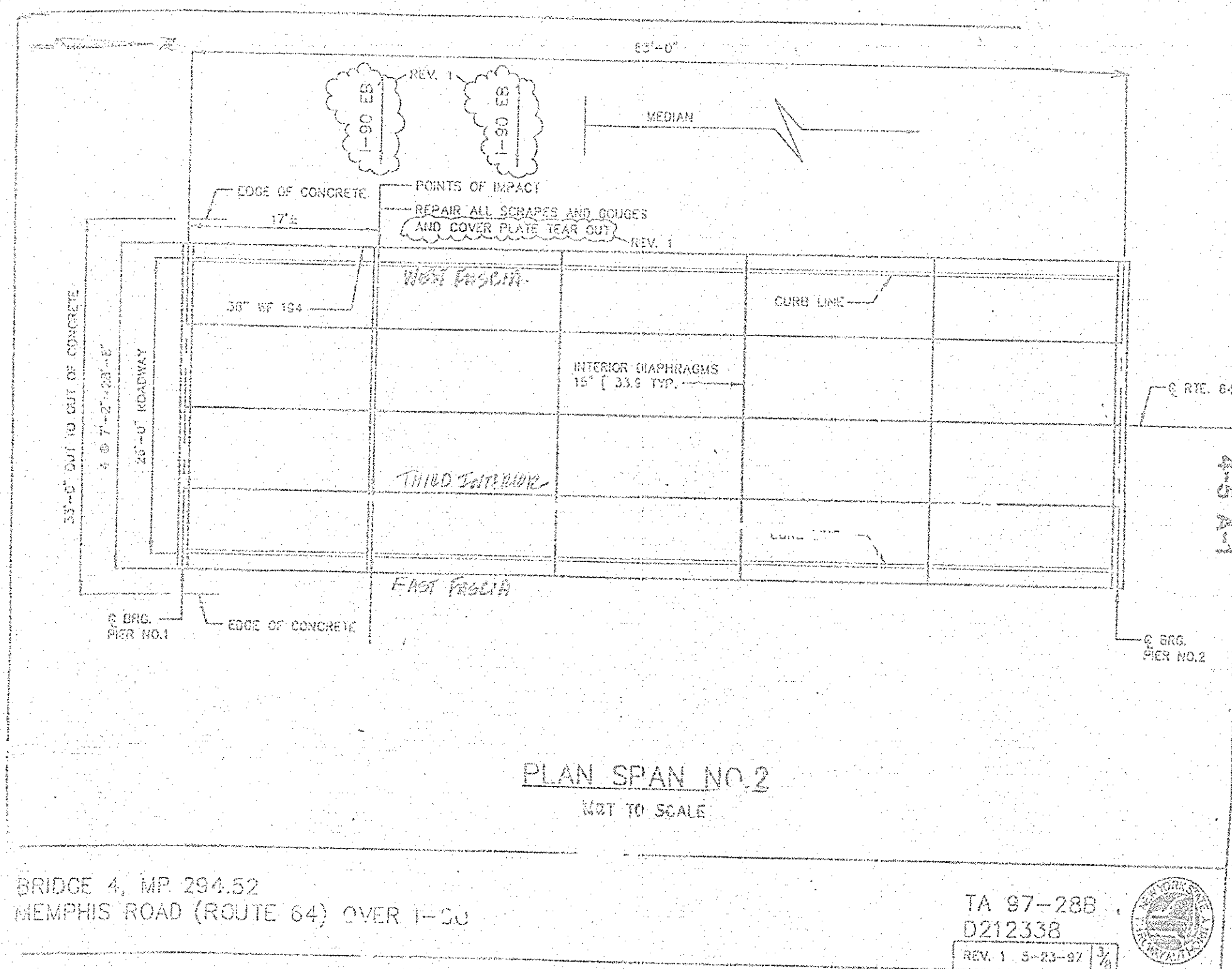
East Fascia (West bound)
With Jack located @ 41.6' From Pier #1 Bearing

1	2	Point of Load		MAX P at fixed	Fixed End Allowable	
		Load	Hydraulic Pressure		Hydraulic Pressure	Allowable
0	3	130947	55913	108873	46226	46226
6	4	97985	42236	61654	38156	38156
10	5	73595	37885	45324	29167	29167
12	6	63204	29167	38456	23464	23464
14	7	55902	24134	33553	20112	20112
16	8	49595	21112	29327	17856	17856
18	9	44548	18771	26291	15843	15843
20	10	40194	16884	23962	14078	14078
22	11	36551	15352	22083	12723	12723
24	12	33562	14076	20518	11732	11732
26	13	31143	12995	19124	10935	10935
28	14	29288	12067	17985	10286	10286
30	15	27923	11283	17179	9785	9785
32	16	26956	10629	16444	9399	9399
34	17	26258	10086	15813	9081	9081
36	18	25778	9655	15246	8821	8821
38	19	25482	9326	14740	8619	8619
40	20	25327	9077	14354	8459	8459
41.6	20.76	16489	8144	13741	8134	8134

New York State
Thruway Authority
FINAL SHOP DRAWING REVIEW
Approved By: [Signature]
Approved As Noted
Approved For Revision No. [Blank]
By: [Signature] Date: 7-1-78

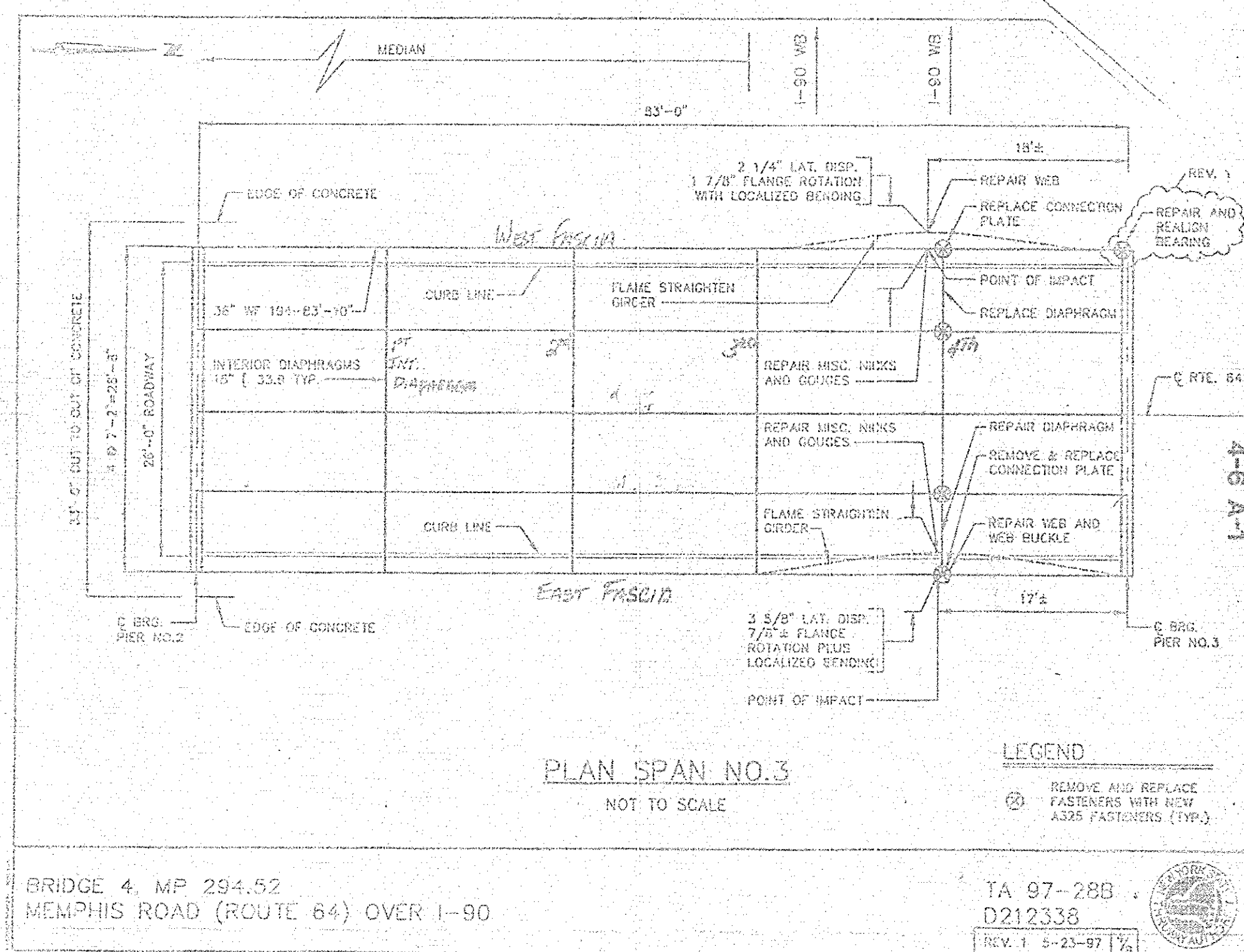


1A 74-18 D242338
Bridge Location: NY, MP 294.52
Rte 64, Mile 7.852 (Newburgh)
SCALE: [Blank] APPROVED BY: [Blank] DRAWN BY: [Blank]
DATE: [Blank]
EVEN: [Blank] STRUCTURAL STEEL WORK
APPROVAL: [Blank] REVIEW: [Blank]
VOLUME: [Blank] SHEET: [Blank]



BERLING KRIEGER PLATE WELD PROCEDURE

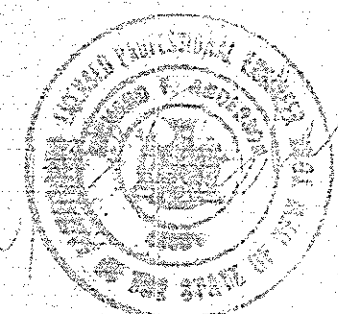
1. REMOVE ANY REMAINING PART OF EXISTING FILLET WELD BY GRINDING GRIND $\frac{1}{16}$ " AND BARE METAL TO REMOVE THE CRACK.
2. PREHEAT TO 400°F .
3. WELD USING PROPERLY DRIED E 7018
4. MAG PARTICLE TEST WELD.



New York State
Thruway Authority
FINAL SHOP DRAWING REVIEW

☒ Approved CT
☐ Approved As Noted
☐ Approved For Revision No. _____

By: M. G. L. Date: 7-1-78



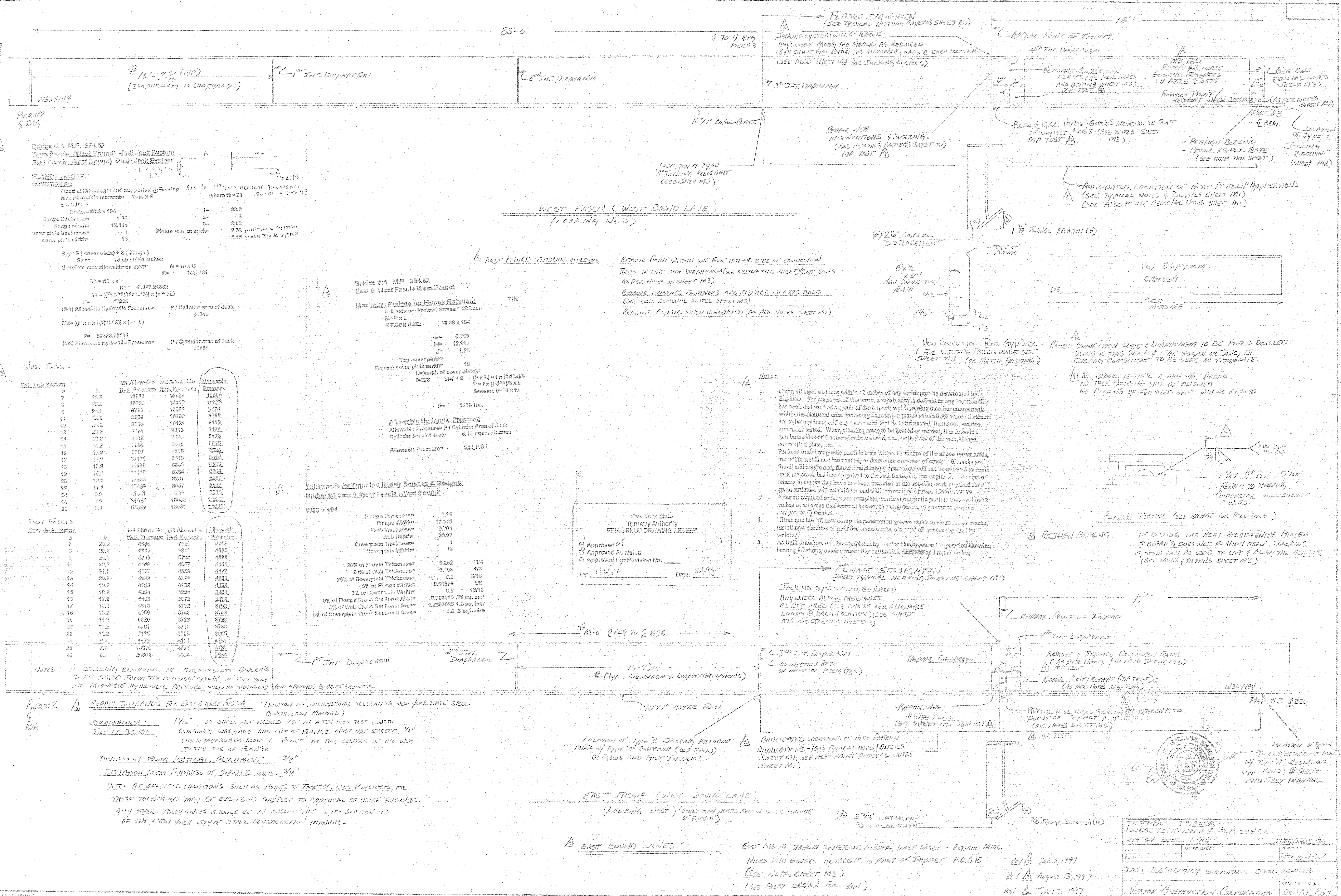
TA 97-288 D212338
BRIDGE LOCATION #4 MP 294.52
RTE 64 OVER I-90

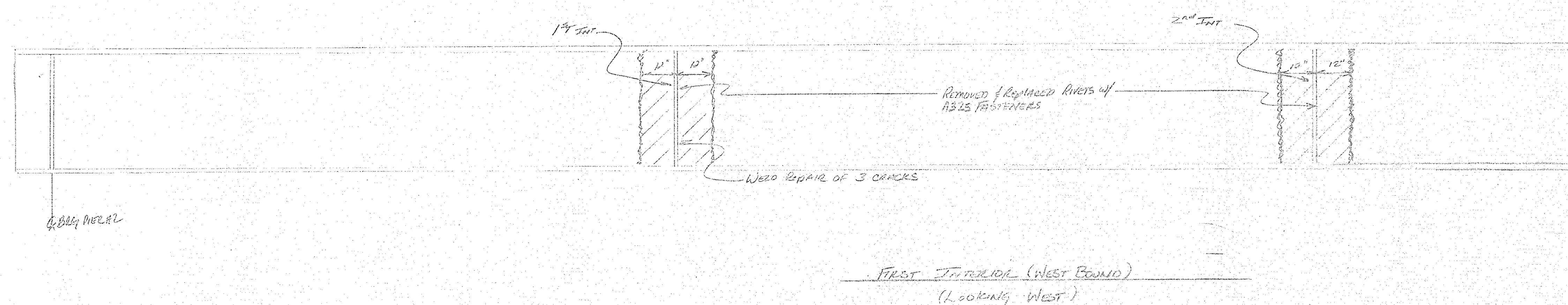
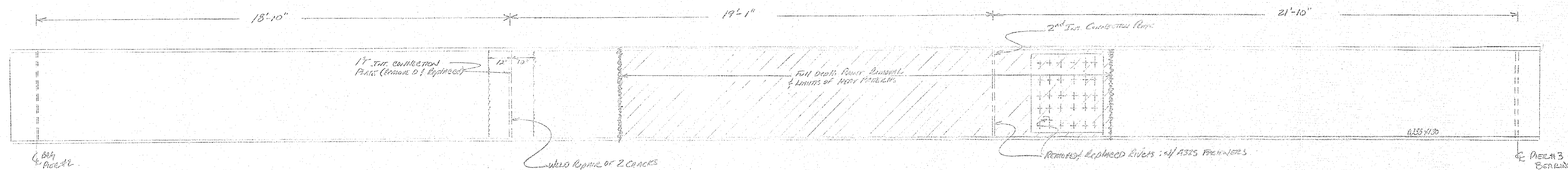
SCALE: _____ APPROVED BY: _____ DRAWN BY: _____
DATE: _____

ITEM #5690: BRIDGE STRUCTURAL STEEL REPAIRS

Ward Construction Corporation

DRAWING NUMBER: BR4A2 Rev. 1





- Bridge #3
William St. (Rte. 46) over I-90 West bound.
(Bridge repairs accepted)
- East Fascia (West bound):**
- 1.) Girder straightened with heat patterns and jacks.
 - 2.) Removed and replaced rivets with A325 fasteners at web splice plate as well as ~~first~~ ^{second} intermediate connection plates.
 - 3.) Removed and replaced first intermediate connection plate.
 - 4.) Repaired (2) cracks by welding located at first intermediate connection plate (Passed inspection test).
- First Interior (West bound):**
- 1.) No heat patterns required.
 - 2.) Removed and replaced rivets with A325 fasteners in first intermediate connection plate both sides.
 - 3.) Repair (3) cracks at first intermediate connection plate (Passed inspection test).

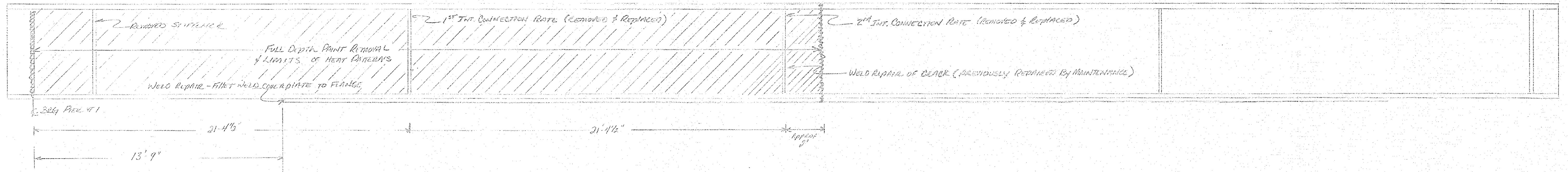
New York State
Thruway Authority
FINAL SHOP DRAWING REVIEW

☒ Approved *GT*
☐ Approved As Noted
☐ Approved For Revision No. _____

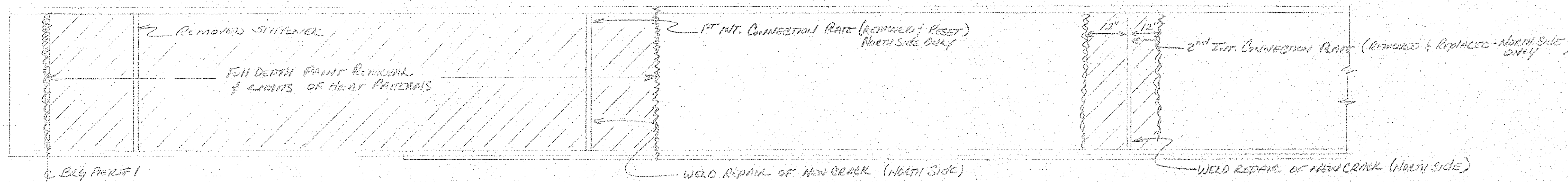
By: *MLH* Date: *7-1-98*

AS-BUILT REVISIONS
Kim Howe 10/14/98

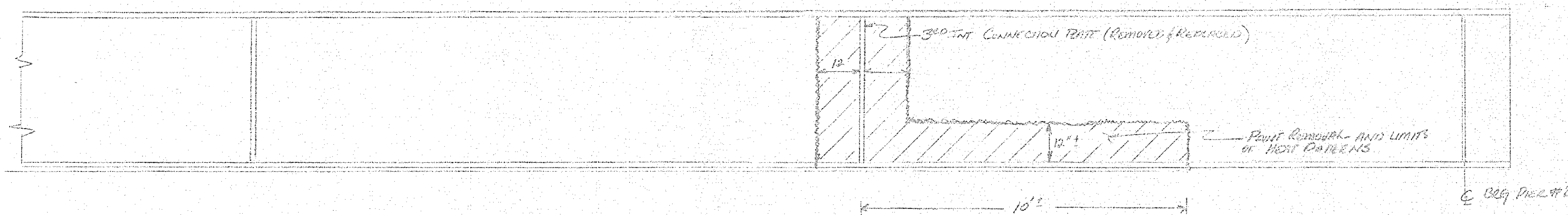
TA 44-208 DR1235B	
BRIDGE LOCATION #3, M.P. 257.03	
William St. (Rte 46) over I-90	
SCALE: N.T.S.	APPROVED BY: <i>T. Anderson</i>
DATE: 7-1-98	DRAWN BY: <i>T. Anderson</i>
ITEM: 25670, 240103 Repair of Structural Steel (As-Built)	
VICTOR CONSTRUCTION CORPORATION	DRAWING NUMBER: <i>BR304</i>



NORTH FASCIA GIRDER (WEST BOUND)
(LOOKING NORTH)



FIRST INTERIOR (WEST BOUND)
(LOOKING NORTH)



NORTH FASCIA (LAST BOUND)
(LOOKING NORTH)

Bridge #2 (M.P. 238.22)
I-90 over Oriskany Boulevard
(Bridge repairs accepted)

North Fascia (West bound):

- 1.) Girder straightened with heat patterns & jacks.
- 2.) Crack located at second intermediate connection plate to web (previously repaired by maintenance). Welded repair required (Passed Ultrasonic inspection test).
- 3.) Repair crack at end of coverplate. Welded repair (Passed inspection test).
- 4.) Removed and replaced first and second intermediate connection plates.
- 5.) Ground out scrapes on bottom flange at point of impact.
- 6.) Remove stiffener plate approx 3' east of pier #1.

First Interior (West bound):

- 1.) Girder straightened with heat patterns and jacks.
- 2.) Cracks located at first and second intermediate connection plates (north side). Welded repair required (Passed Ultrasonic inspection test).
- 3.) Removed and replaced first and second intermediate connection plates (North side). Replaced rivets with A325 fasteners at first and second intermediate connection plates (South bound).
- 4.) Ground out scrapes on bottom flange at point of impact.
- 5.) Remove stiffener plate approx 3' east of pier #1.

Second Interior (West bound):

- 1.) No heat patterns required.
- 2.) Removed rivets and replaced with A325 fasteners at first and second intermediate connection plates (North & South sides).

Third Interior (West bound):

- 1.) No heat patterns required.
- 2.) Removed rivets and replaced with A325 fasteners at first and second intermediate connection plates (North & South sides).
- 3.) Ground out scrapes on bottom flange at point of impact.

Fourth Interior (West bound):

- 1.) No heat patterns required.
- 2.) Removed rivets and replaced with A325 fasteners at first and second intermediate connection plates (North & South sides).
- 3.) Ground out scrapes on bottom flange at point of impact.

Fifth Interior (West bound):

- 1.) No heat patterns required.
- 2.) Removed rivets and replaced with A325 fasteners at first and second intermediate connection plates (North side).

North Fascia (East bound):

- 1.) Girder straightened with heat patterns and jacks.
- 2.) Removed and replaced third intermediate connection plate.
- 3.) Ground out scrapes on bottom flange at point of impact.

First Interior (East bound):

- 1.) No heat patterns required.
- 2.) Removed rivets and replaced with A325 fasteners at third intermediate connection plates (North & South sides).

New York State
Thruway Authority
FINAL SHOP DRAWING REVIEW

Approved ☒ Approved As Noted ☐ Approved For Revision No. _____

By: *MJD* Date: 9-1-98

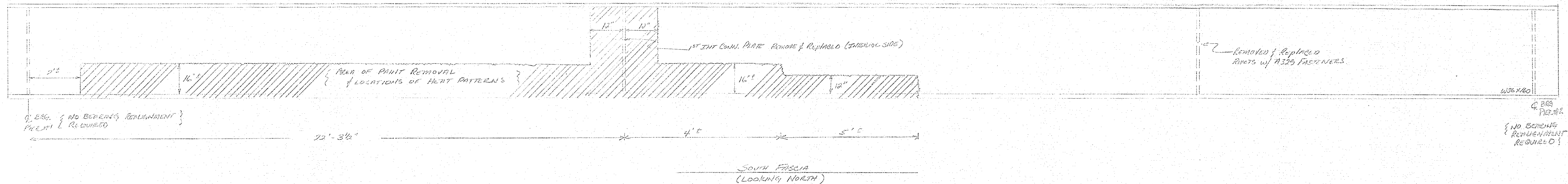
AS-BUILT REVISIONS

Kim Hume 10/14/98

TA 91-486 D012338
BRIDGE #2, M.P. 238.22
I-90 OVER ORISKANY BLVD.

SCALE: 1/8" = 1'-0"
DATE: 1-5-98

DESIGNED BY: *T. HENDERSON*
CHECKED BY: *T. HENDERSON*
DRAWING NUMBER: *BR2B1*



Bridge #1 (M.P. 213.97)
 I-90 Over Route 167
 (Bridge repairs Accepted)

South Fascia:

- 1.) Girder Straightened with heat patterns and jacks.
- 2.) First Intermediate connection plate removed & replaced.
- 3.) Rivets at second intermediate connection plate removed and replaced with A325 fasteners.
- 4.) Bearings at Pier #1 and Pier #2 required no jacking to realign.
- 5.) Ground out scrapes on bottom flange at impact location.

First Interior:

- 1.) No heat patterns required on girder.
- 2.) Replaced rivets at first & second intermediate connection plate with A325 fasteners.
- 3.) Removed embedded bolt and ground out flange.
- 4.) Ground out scrapes on bottom flange at impact location.

Second Interior:

- 1.) No heat patterns required on girder.
- 2.) Replaced rivets at first intermediate connection plate with A325 fasteners.
- 3.) Ground out scrapes on bottom flange at impact locations.

Third Interior:

- 1.) No heat patterns required on girder.
- 2.) Replaced rivets at first intermediate connection plate with A325 fasteners.
- 3.) Ground out scrapes on bottom flange at point of impact.

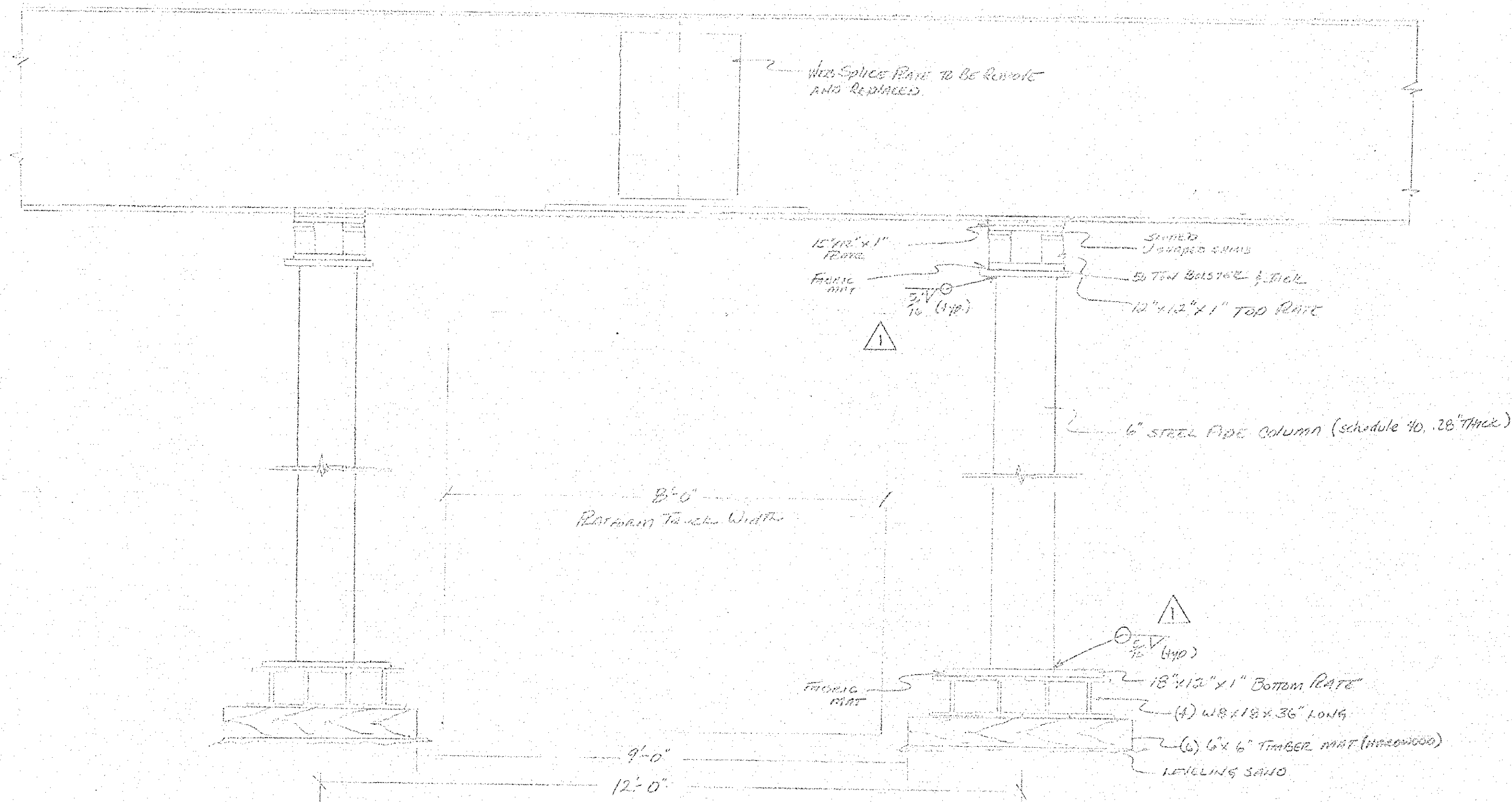
New York State Thruway Authority FINAL SHOP DRAWING REVIEW	
<input checked="" type="checkbox"/> Approved	<input type="checkbox"/> Approved As Noted
<input type="checkbox"/> Approved For Revision No. _____	
By: <i>MLP</i>	Date: 7-1-78

AS-BUILT REVISIONS

Karl Howe 10/14/98

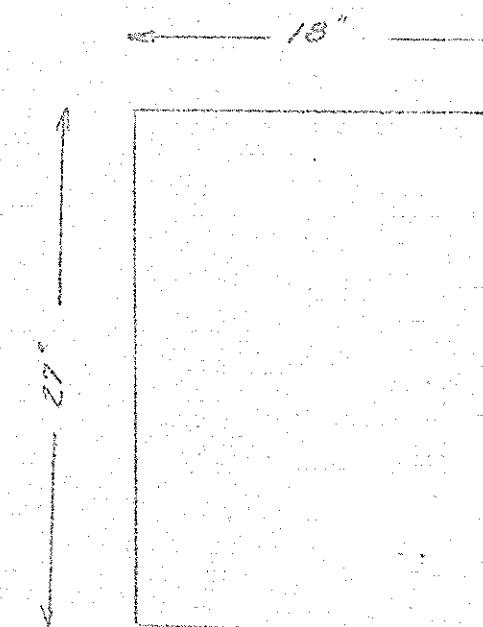
7A 77-28B DR18.33B BRIDGE LOCATION #1 MP 213.97 I-90 EAST BOUND OVER Rte 167		HAZARD CO
SCALE: 1" = 3'-98	APPROVED BY: <i>T. ADAMS</i>	DRAWN BY: <i>T. ADAMS</i>
ITEM: 05690.000101 REPAIR OF STEELWORK STEEL AS-BUILT		
LECTOR: Construction Corporation		DRAWING NUMBER: 13R 115

FIFTH FLOOR GIRDER SUPPORTS



Jacking Support Procedure:

- 1.) Locate Platform track directly under the center of splice plates.
- 2.) Locate center of Jacking Columns six feet from center of splice plates (both sides of track).
- 3.) Place leveling sand under area of which the 6" x 6" Timber matting will bear.
- 4.) Set Timber matting & W8 x 18's in location shown on this sheet.
- 5.) Set column, bolster, and jacking plates into place.
- 6.) Initiate jack and relieve loads at splice location, shim with U shaped plates as necessary.
- 7.) Remove web splice plates and replace with new plates. (All material shall be A36, Domestic, with Charpy test of 15 ft lbs at 40 degrees F, direction of rolling must be parallel to the direction of primary stress).
- 8.) Initiate jacking pressure again and remove shim plates.
- 9.) Relieve jacking pressure and remove bolster, column, and remainder of jacking system.

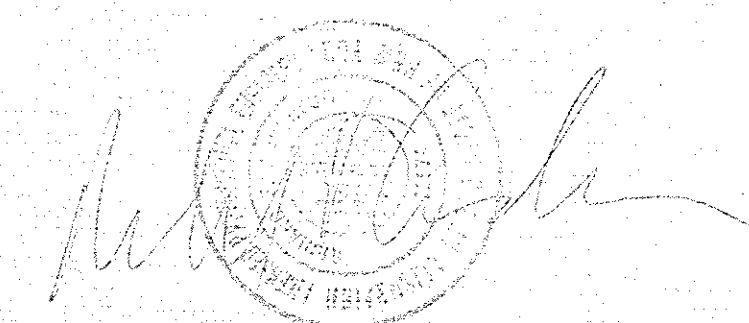


WEB SPLICE PLATES

(A36, DOMESTIC, with Charpy I-Natal
TEST OF 15 ft/lbs @ 40° F, direction of
Rolling must be parallel to the direction
of primary stress.

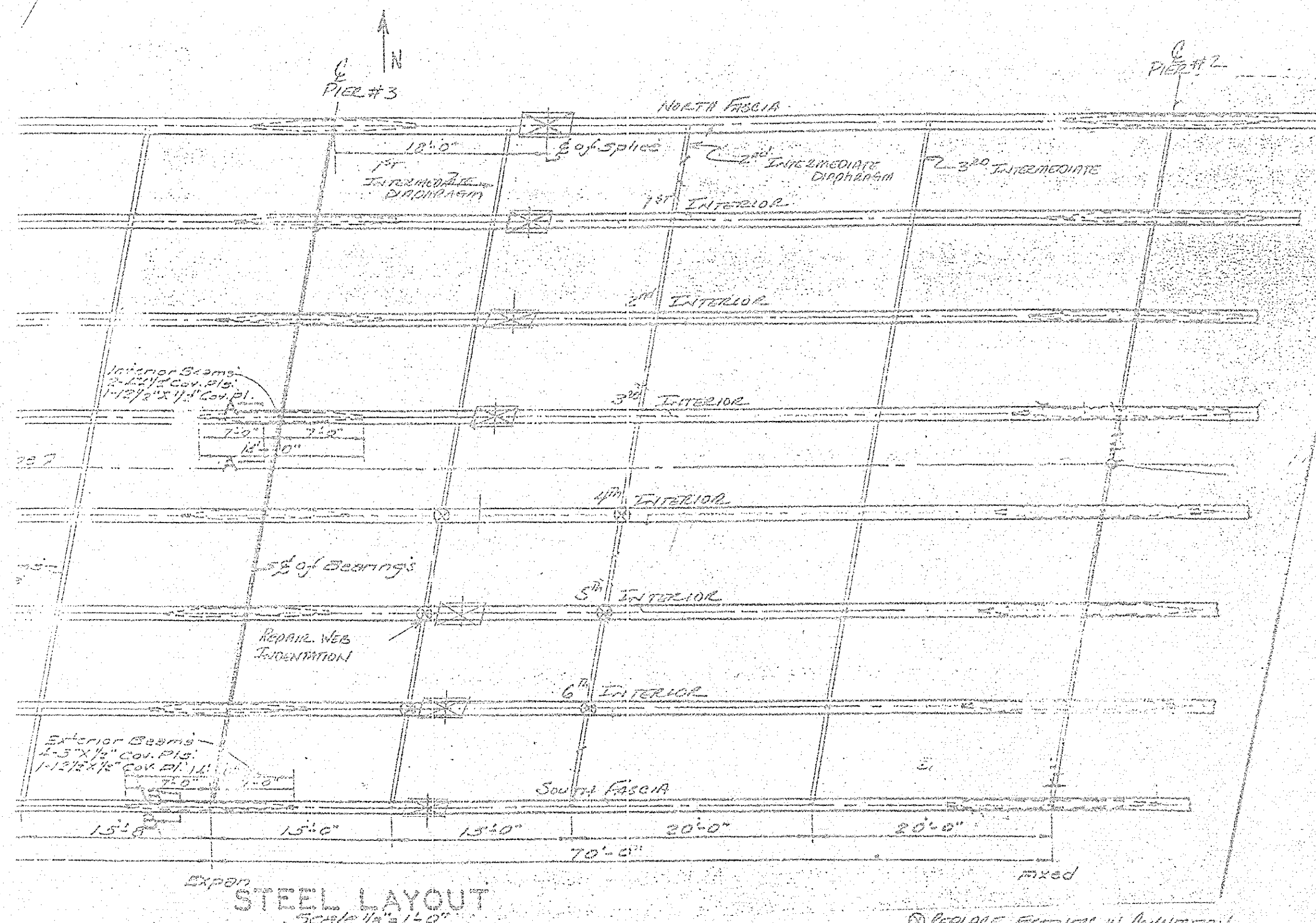
NOTE: 1. FIELD DRILL HOLES USING HOLES OF TANCY MAGNETIC DRILL
END 1/16" BUT, USE EXISTING COMPONENTS AS TEMPLATE

New York State Thruway Authority FINAL SHOP DRAWING REVIEW	
<input checked="" type="checkbox"/> Approved	<input type="checkbox"/> Approved As Noted
<input type="checkbox"/> Approved For Revision No. _____	
By: <i>MLC</i>	Date: 7-1-72



7th 77-206 0312.830 20,050 #12, M.P. 420.70 "Oakland Drive"	
SCALE	APPROVED BY
DATE	DRAWN BY
Item #10, 77-206 STRUCTURAL STEEL REPAIR	
Volume Construction Corp.	DRAWING NUMBER 15454 Rev 1

CLEVELAND DRIVE: M.P. 420.70



SECTION 4 PREPARATION OF BASE METALS

001. OXYGEN CUTTING - GENERAL

Steel and weld metal may be oxygen cut provided a smooth and regular surface, free from cracks and notches is obtained. All oxygen cut surfaces shall be produced using a mechanically guided torch unless otherwise approved by the DCS. Oxygen cut surfaces produced by a manually guided torch, when allowed, shall be smoothed by machining or grinding.

In all oxygen cutting, the cutting flame shall be adjusted and manipulated to avoid cutting beyond (inside) the prescribed lines. The roughness of oxygen cut surfaces shall not exceed the American National Standards Institute surface roughness value of 1000 microinches for material up to 1/4 inch thick and 2000 microinches for material 1/4 inch to 3/8 inch thick, except, at the dead end of members where there is no calculated stress, the roughness shall not exceed 2000 microinches. Roughness exceeding these values and occasional notches or gouges no more than 1/4 inch deep on otherwise satisfactory surfaces shall be removed by machining or grinding. Cut surfaces and edges shall be free of slag. Correction of discontinuities shall be faced to the oxygen cut surfaces with a slope not exceeding 1 in 10.

Occasional notches or gouges that exceed 1/4 inch shall be repaired by welding. The repair of notches or gouges over 1/16 inch deep shall be referred to the DCS prior to repair. Welding repairs shall be made by suitably preparing the discontinuity, welding with an approved procedure and grinding in accordance with Table 708 and grinding the completed weld smooth and flush with the adjacent surface to produce a workmanlike finish. All welded repairs to main material subject to tensile stress shall be tested by ultrasonic or radiographic inspection as determined by the DCS.

Reentrant corners shall be filleted to a radius of not less than 3/4 inch. On main material a 2 inch minimum radius shall be provided wherever possible. The radius and its contiguous cuts shall meet without offset or cutting past the point of tangency.

002. OXYGEN CUTTING OF HIGH STRENGTH STEEL (50,000 psi minimum yield strength)

The Contractor (Fabricator) shall take steps to insure that the flame cut edges of main material are not hardened by the cutting process. This may be achieved by preheating, post heating or control of the burning process. Flame cut edges found to have a Rockwell Hardness Value of C 30 or greater will be considered unacceptable. A portable Rockwell Hardness Tester will be employed by the Inspector to determine conformance with these requirements. Unacceptable hard surfaces shall be removed by grinding, machining, or approved heat treating processes.

003. SURFACES AND EDGES TO BE WELDED

Surfaces and edges to be welded shall be smooth, uniform, and free from dirt, oxides, cracks and other discontinuities which would adversely affect the quality or strength of the weld. Surfaces to be welded and surfaces adjacent to a weld shall also be free of loose or thick scale, slag, rust, moisture, grease and other foreign material that will prevent proper welding or produce objectionable fumes. Mill scale that withstands without wire brushing, a thin rust inhibitive coating, or ultrasonic compound may remain even; this mill scale shall be removed from the surfaces on which flange-to-web welds are to be made by any of the approved welding processes. This provision shall apply to all girders, stringers, beams, bridge columns, bracing, towers, rigid frames, arches, truss chords and truss web members. The provision for removal of all mill scale prior to making web-to-flange welds shall not apply to secondary members, building columns or to members subjected to general blast cleaning prior to welding, where essentially all mill scale has been removed and no harmful rusting has occurred subsequent to blast cleaning, as determined by the Inspector. No mill scale shall be permitted to remain in the boundary of a groove weld subject to tensile stresses resulting from the design loads.

Cleveland Drive- Work to be Done:

8. Location A1: Bridge A1, from 25690.5299xx, MP 420.70, Cleveland Drive over I-90 WB

1. Description of Damage - Bridge A1: The structure consists of four span continuous rolled beam girders, with partial length cover plates over the pier, both interior and exterior. The northern fascia, plus the first, second, third, fifth and sixth interior girders and the south fascia girder in Span 3, have been damaged by impact at approximately 20 feet east of Pier 3. Based on our evaluation of this structure, we know of the following damage:

- North Fascia Girder and First, Second, and Third Interior Girders, Span 3
 - The bottom flange of the girders have been laterally displaced approximately 1" in a southerly direction and have been rotated approximately 3/4".
 - The bottom of the bottom flanges have been scraped, notched and gouged adjacent to the point of impact.
 - The bottom flange splice plates adjacent to the point of impact have been damaged and must be replaced.
 - The rivets connecting the bottom flange splice plates to the girder have been damaged and must be replaced with new fasteners.
 - No apparent damage has occurred to adjacent bearings.
 - Rivets in the easterly and center intermediate diaphragm connections will not require replacement unless ordered by the Engineer.

- Fourth Interior Girder, Span 3
 - Replace the fasteners in the connection plates of the easterly and center intermediate diaphragms between interior girder four and five.

- Fifth Interior Girder, Span 3
 - The bottom flange has been displaced laterally approximately 5" in a southerly direction at the point of impact approximately 20'-0" east of Pier 3. The bottom flange of the girder has been rotated approximately 10" over the width of the flange, for a length of about five feet.

- Sixth Interior Girder and South Fascia, Span 3
 - The bottom flange splice plates adjacent to the point of impact have been severely damaged and must be replaced.
 - The bottom of the bottom flange has been scraped, notched and gouged adjacent to the point of impact.
 - The rivets connecting the bottom flange splice and web splice plates to the girder have been damaged and must be replaced with new fasteners.

- Seventh Interior Girder, Span 3
 - The westerly connection plate has been damaged and is torn and must be replaced.
 - Rivets in the easterly and center intermediate diaphragm connections must be replaced with new fasteners.
 - There is a 1/2" deep web indentation adjacent to the point of impact that must be repaired.
 - No apparent damage has occurred to adjacent bearings.

- Eighth Interior Girder and South Fascia, Span 3
 - The bottom flange has been displaced laterally approximately 2" in a southerly direction at the point of impact approximately 20'-0" east of Pier 3. The bottom flanges of the girders have been rotated approximately 2".
 - The bottom flange splice plates adjacent to the point of impact have been damaged and must be replaced. The bottom of the bottom flange has been scraped, notched and gouged at the point of impact.
 - The rivets connecting the bottom flange splice plates to the girder have been damaged and must be replaced with new fasteners.
 - Replace the fasteners in the connection plates of the easterly and center intermediate diaphragms between interior girder five and six.
 - No apparent damage has occurred to adjacent bearings.

- Perform initial Magnetic Particle testing of the entire area of the girder web within 12" of the easterly and center intermediate diaphragm connection plates, plus the connection plates and adjacent welds.

Notes:

- Clean all steel surfaces within 12 inches of any repair area as determined by Engineer. For purposes of this work, a repair area is defined as any location that has been distorted as a result of the impact; welds joining member components within the distorted area, including connection plates at location where fasteners are to be replaced; and any base metal that is to be heated, flame cut, welded, ground or tested. When cleaning areas to be heated or welded, it is intended that both sides of the member be cleaned, i.e., both sides of the web, flange, connection plate, etc.

- Perform initial magnetic particle tests within 12 inches of the above repair areas, including welds and base metals, to determine presence of cracks. If cracks are found and confirmed, flame straightening operations will not be allowed to begin until the crack has been repaired to the satisfaction of the Engineer. The cost of repairs to cracks that have not been included in the specific work required for a given structure will be paid for under the provisions of Item 25690.999739.

- After all required repairs are complete, perform magnetic particle tests within 12 inches of all areas that were a) heated, b) straightened, c) ground to remove scrapes, or d) welded.

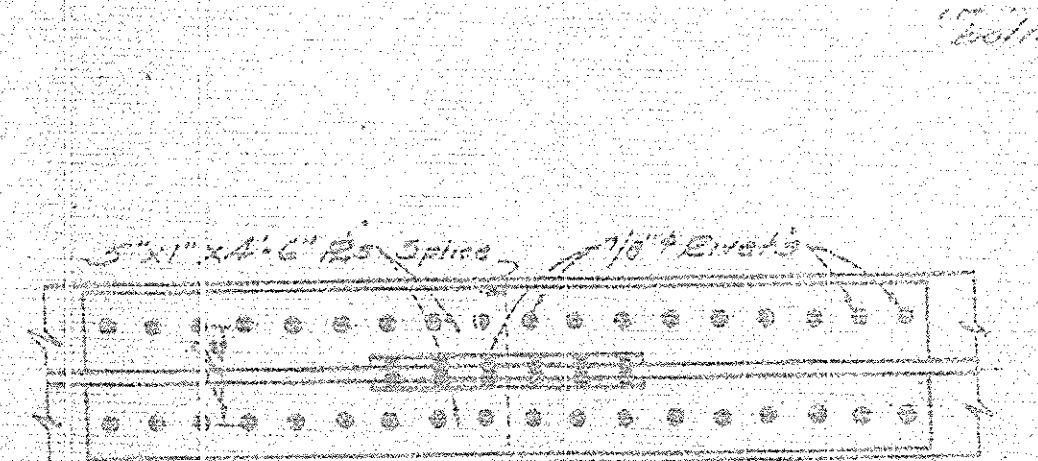
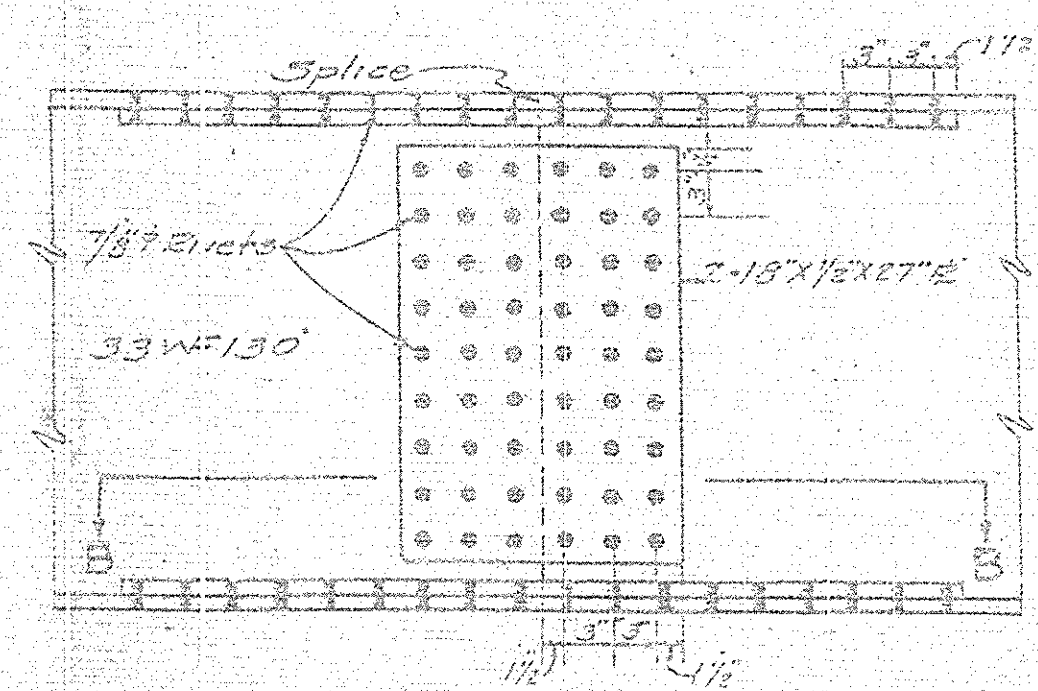
- Ultrasonic test all new complete penetration groove welds made to repair cracks, installed new sections of member components, etc., and all gouges repaired by welding.

- As-built drawings will be completed by Vector Construction Corporation showing heating locations, cracks, major discontinuities, and repair welds.

New York State
Thruway Authority
FINAL SHOP DRAWING REVIEW

Approved ☒ Approved As Noted ☐ Approved For Revision No. ☐

By: *WLC* Date: 7-1-99



Flange Splice Plate Replacement:

- Remove Paint (as per procedure sheet M1) and perform initial magnetic particle test.
- Setup lane closure above girder to minimize live load.
- Remove rivets and flange plates.
- Clean area underneath flange plates.
- Replace flange plates and fasteners (A325 Heavy Hex bolts, nuts, & washers). All material to be A36 (domestic) with a Charpy V-notch impact strength of 15 ft. lbs. at 49 degrees F. The direction of rolling must be parallel to the direction of the primary stress.
- Drills in splice plates are to be field drilled using a magnetic drill and 15/16" Hognin or Jancy bit. Existing component is to be used as a template.
- Perform final magnetic particle test.
- Paint repair area as per notes sheet M1.
- SUPPORTS WILL BE REQUIRED DURING WEB SPICE REPLACEMENT AND CRACKS
- No web repairs will be allowed until calculations for supporting the girder, while replacing the splice plates, have been submitted and approved.

Rev 1, Dec 14, 1997

78 99-235 D212333

BRIDGE #15, MP 420.70

CLEVELAND DRIVE OVER I-90 WB

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

DATE: 7-1-99

APPROVED BY: *T. ANDRESON*

DATE: 7-1-99

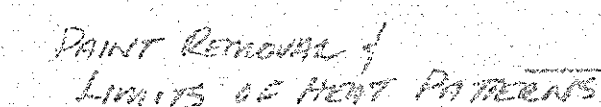
Drawn: 900.9918 - STRUCTURAL STEEL REPAIRS

DRAWING NUMBER: 18.15 011 Rev 1

Vector Construction Corporation

North Fascia (North bound):

- 1.) Girder straightened with heat patterns & jacks.
- 2.) Ground out scrapes on bottom flange at point of impact.



John Hume 10/14/98

New York State
Thruway Authority
FINAL SHOP DRAWING REVIEW

☒ Approved CT
☐ Approved As Noted
☐ Approved For Revision No. _____

By: MEH Date: 7-1-97

7A-97-082 DRAWING
BRIDGE LOCATIONS AND APPROX
WEST RIVER, BROOKLYN, OVER T-199 ALCAVIA, FIVE CO.
SCALE: N.T.S. APPROVED BY
DATE: 7/1/97
T. J. ANDERSON, INC.
THRUWAY AUTHORITY, 25602 99TH AVENUE OF STRUCTURAL
UNDERPINNING (10 BUILDINGS) SISTER
VERTICAL CONSTRUCTION CORPORATION
DRAWING NUMBER
521431

Bridge # 13 M.P. N13.67
North Fascia Southbound & South Fascia Northbound

FLANGE SWEEP:

Pull Jack System Required

Fixed at one end and supported at other (Dimensions shown)

Max Allowable moment: $R = M / S$

where $R = 20 \text{ ksi}$

$S = bd^2/6$

Girder = W30 x 100

Flange thickness = 0.76

Flange width = 10.475

cover plate thickness = 0

cover plate width = 0

$S_y = S (\text{cover plate}) + S (\text{flange})$

$S_y = 13.50 \text{ cubic inches}$

therefore max allowable moment:

$M = R \times S$

$M (\text{with coverplate}) = 277972$

$S_y = S (\text{flange})$

therefore max allowable moment:

$M (\text{without coverplate}) = 277972$

20 ton Jack effective area = 5.15

$M (\text{max})$ at fixed end =

SP1

$M (\text{point of load}) =$

SP1

$M (\text{point of load}) =$

SPX

Fascia girder does not have coverplate except at bearings

Bridge # 13 M.P. N13.67
South Fascia Southbound & North Fascia Northbound

FLANGE SWEEP:

Pull Jack System Required

Fixed at one end and supported at other (Dimensions shown)

Max Allowable moment: $R = M / S$

where $R = 20 \text{ ksi}$

$S = bd^2/6$

Girder = W30 x 100

Flange thickness = 0.76

Flange width = 10.475

cover plate thickness = 0

cover plate width = 0

$S_y = S (\text{cover plate}) + S (\text{flange})$

$S_y = 13.50 \text{ cubic inches}$

therefore max allowable moment:

$M (\text{with coverplate}) = 277972$

$S_y = S (\text{flange})$

therefore max allowable moment:

$M (\text{without coverplate}) = 277972$

10 ton Jack effective area = 2.32

$M (\text{max})$ at fixed end =

SP1

$M (\text{point of load}) =$

SP1

$M (\text{point of load}) =$

SPX

Fascia girder does not have coverplate except at bearings

North & South Fascia (Southbound)

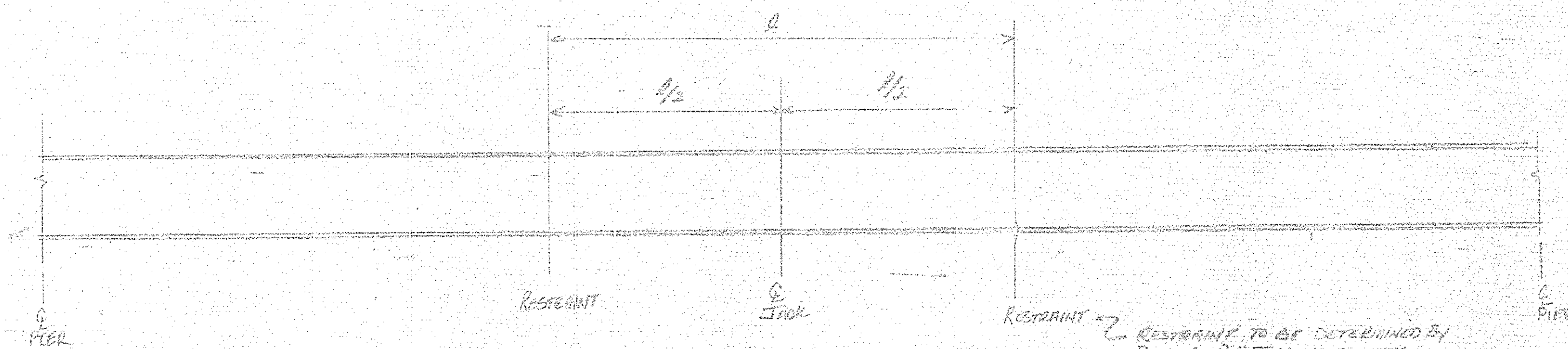
With Jack located @ 33.5' From Pier Bearing

		Point of Load	MAX P at fixed	Fixed End	Allowable
		Load	End	Hydraulic Pressure	Hydraulic Press
1	0.2	24700	20590	8338	3460
5	0.4	18531	15443	2300	2000
9	0.6	14525	12354	2300	2000
13	0.8	12354	10295	1889	1599
17	1.0	10939	8824	1713	1438
21	1.2	9268	7721	1409	1199
25	1.4	8238	6863	1333	1090
29	1.6	7413	6177	1189	1000
33	1.8	6739	5616	1090	920
37	2.0	6177	5146	1000	857
41	2.2	5702	4762	920	800
45	2.4	5285	4412	857	750
49	2.6	4942	4116	800	716
53	2.8	4632	3861	750	
57	3.0	4345	3638	716	

North & South Fascia (Southbound)

With Jack located @ 33.5' From Pier Bearing

		Point of Load	MAX P at fixed	Fixed End	Allowable
		Load	End	Hydraulic Pressure	Hydraulic Press
1	0.2	24700	20590	8338	3460
5	0.4	18531	15443	2300	2000
9	0.6	14525	12354	2300	2000
13	0.8	12354	10295	1889	1599
17	1.0	10939	8824	1713	1438
21	1.2	9268	7721	1409	1199
25	1.4	8238	6863	1333	1090
29	1.6	7413	6177	1189	1000
33	1.8	6739	5616	1090	920
37	2.0	6177	5146	1000	857
41	2.2	5702	4762	920	800
45	2.4	5285	4412	857	750
49	2.6	4942	4116	800	716
53	2.8	4632	3861	750	
57	3.0	4345	3638	716	

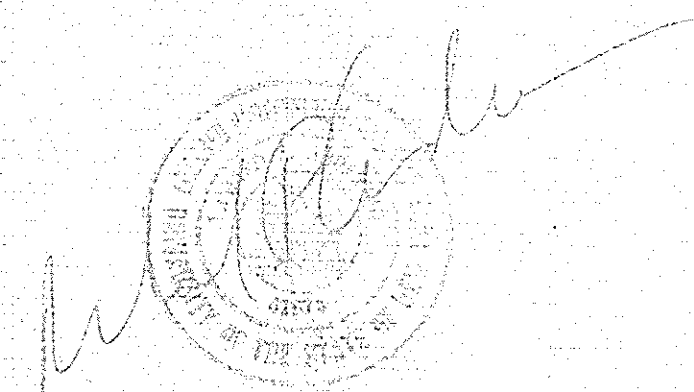


Note: JACK MAY BE MOVED ANYWHERE ALONG THE GIRDER
ALLOWABLE PRESSURES WILL REMAIN THE SAME AT ANY JACK LOCATION
PROVIDED THAT THE RESTRAINTS ARE MOVED TO THE CORRESPONDING
PRESSURE

New York State
Thruway Authority
FINAL SHOP DRAWING REVIEW

☒ Approved
☐ Approved As Noted
☐ Approved For Revision No. _____

By: *[Signature]* Date: 9-1-98



77 97186 DRAWING
BRIDGE LOCATION #13, MP N13.67
WSP: RICE, PERKINS, OVER, Z-110

SCALE: _____ APPROVED BY: _____ DRAWN BY: *[Signature]*

DATE: _____

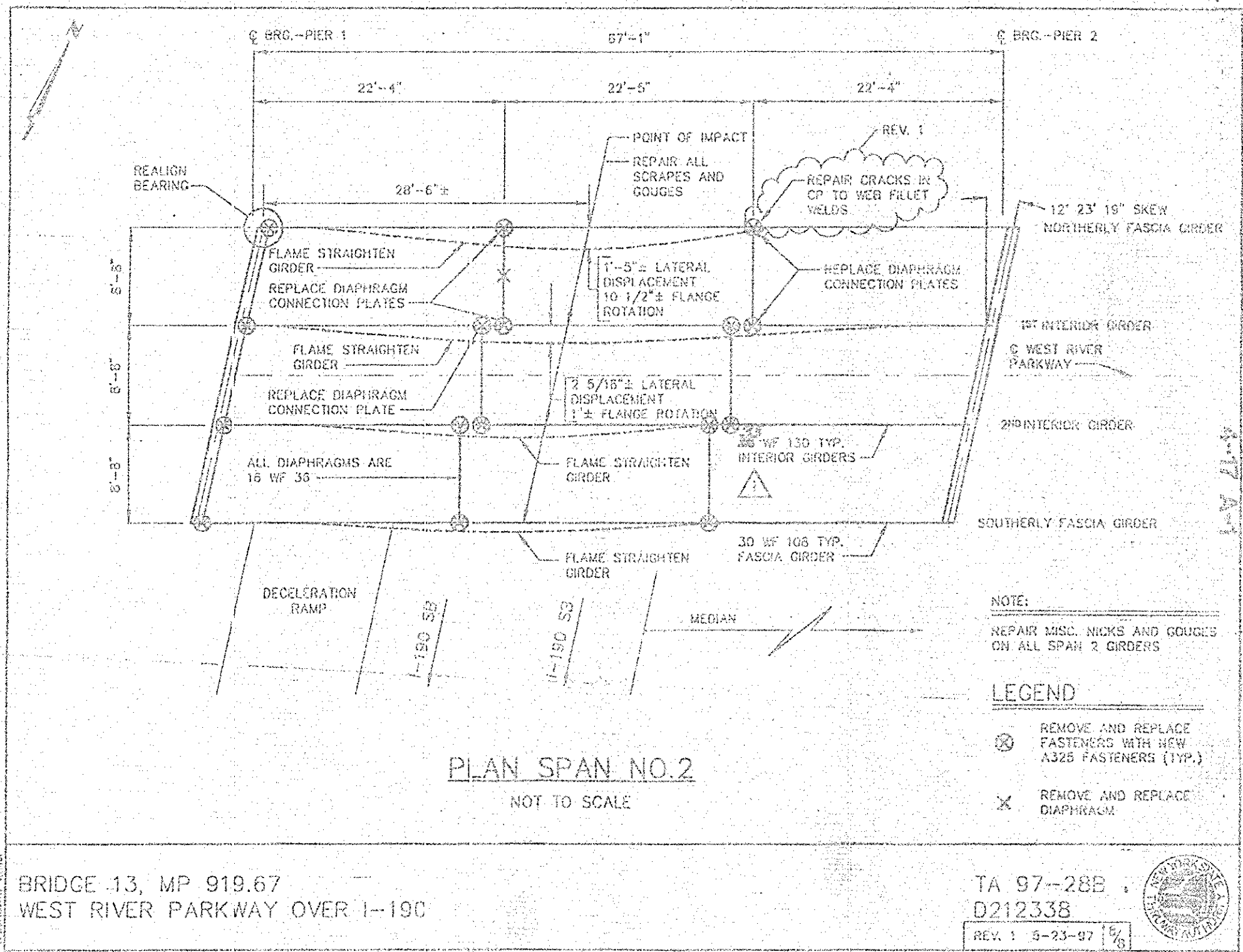
ADDITIONAL TAGGING, PRESSURES FOR PIERM GIRDERS

VECTRA CONSTRUCTION CORPORATION

DRAWING NUMBER: BR13/15

Interior Girders With Jack Located 49.33' From East of Bearings													
			P.1 Point of	Allowable	P.2 Point of	Allowable	x=42	5/16"	New P	Allowable	x=42	5/16"	REMP
			Load	Hydraulic Pressure	Load	Hydraulic Pressure	Mid	Allowable	Effect of max. reaction	Mid	Allowable	Effect of max. reaction	Mid
1	12	0	23920	8918	24082	8918	0	37588	ERR	ERR	0	37588	ERR
10	6	0	21622	8178	21622	8178	0	37588	ERR	ERR	0	37588	ERR
15	0	0	18447	6952	18447	6952	0	37588	ERR	ERR	0	37588	ERR
16	0	0	16154	6155	16154	6155	0	37588	ERR	ERR	0	37588	ERR
18	0	0	14040	5300	14040	5300	0	37588	ERR	ERR	0	37588	ERR
19	0	0	12813	4807	12813	4807	0	37588	ERR	ERR	0	37588	ERR
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24	0	0	8000	3012	8000	3012	0	37588	ERR	ERR	0	37588	ERR
25	0	0	7071	2737	7071	2737	0	37588	ERR	ERR	0	37588	ERR
26	0	0	6136	2485	6136	2485	0	37588	ERR	ERR	0	37588	ERR
27	0	0	5195	2255	5195	2255	0	37588	ERR	ERR	0	37588	ERR
28	0	0	4248	2046	4248	2046	0	37588	ERR	ERR	0	37588	ERR
29	0	0	3295	1857	3295	1857	0	37588	ERR	ERR	0	37588	ERR
30	0	0	2336	1688	2336	1688	0	37588	ERR	ERR	0	37588	ERR
31	0	0	1371	1538	1371	1538	0	37588	ERR	ERR	0	37588	ERR
32	0	0	409	1405	409	1405	0	37588	ERR	ERR	0	37588	ERR
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35	0	0	0	1093	0	1093	0	37588	ERR	ERR	0	37588	ERR
36	0	0	0	1016	0	1016	0	37588	ERR	ERR	0	37588	ERR
37	0	0	0	951	0	951	0	37588	ERR	ERR	0	37588	ERR
38	0	0	0	897	0	897	0	37588	ERR	ERR	0	37588	ERR
39	0	0	0	854	0	854	0	37588	ERR	ERR	0	37588	ERR
40	0	0	0	821	0	821	0	37588	ERR	ERR	0	37588	ERR
41	0	0	0	797	0	797	0	37588	ERR	ERR	0	37588	ERR
42	0	0	0	782	0	782	0	37588	ERR	ERR	0	37588	ERR
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44	0	0	0	750	0	750	0	37588	ERR	ERR	0	37588	ERR
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46	0	0	0	716	0	716	0	37588	ERR	ERR	0	37588	ERR
47	0	0	0	698	0	698	0	37588	ERR	ERR	0	37588	ERR
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63	0	0	0	375	0	375	0	37588	ERR	ERR	0	37588	ERR
64	0	0	0	354	0	354	0	37588	ERR	ERR	0	37588	ERR
65	0	0	0	333	0	333	0	37588	ERR	ERR	0	37588	ERR
66	0	0	0	312	0	312	0	37588	ERR	ERR	0	37588	ERR
67	0	0	0	291	0	291	0	37588	ERR	ERR	0	37588	ERR
68	0	0	0	270	0	270	0	37588	ERR	ERR	0	37588	ERR
69	0	0	0	249	0	249	0	37588	ERR	ERR	0	37588	ERR
70	0	0	0	228	0	228	0	37588	ERR	ERR	0	37588	ERR
71	0	0	0	207	0	207	0	37588	ERR	ERR	0	37588	ERR
72	0	0	0	186	0	186	0	37588	ERR	ERR	0	37588	ERR
73	0	0	0	165	0	165	0	37588	ERR	ERR	0	37588	ERR
74	0	0	0	144	0	144	0	37588	ERR	ERR	0	37588	ERR
75	0	0	0	123	0	123	0	37588	ERR	ERR	0	37588	ERR
76	0	0	0	102	0	102	0	37588	ERR	ERR	0	37588	ERR
77	0	0	0	81	0	81	0	37588	ERR	ERR	0	37588	ERR
78	0	0	0	60	0	60	0	37588	ERR	ERR	0	37588	ERR
79	0	0	0	39	0	39	0	37588	ERR	ERR	0	37588	ERR
80	0	0	0	18	0	18	0	37588	ERR	ERR	0	37588	ERR
81	0	0	0	0	0	0	0	37588	ERR	ERR	0	37588	ERR

Note: Bridge # 13 Interior girders, both South bound & North bound are similar girders with respect to size and coverplates. Therefore these pressures can be used on all interior girders.



New York State
Thruway Authority
FINAL SHOP DRAWING REVIEW

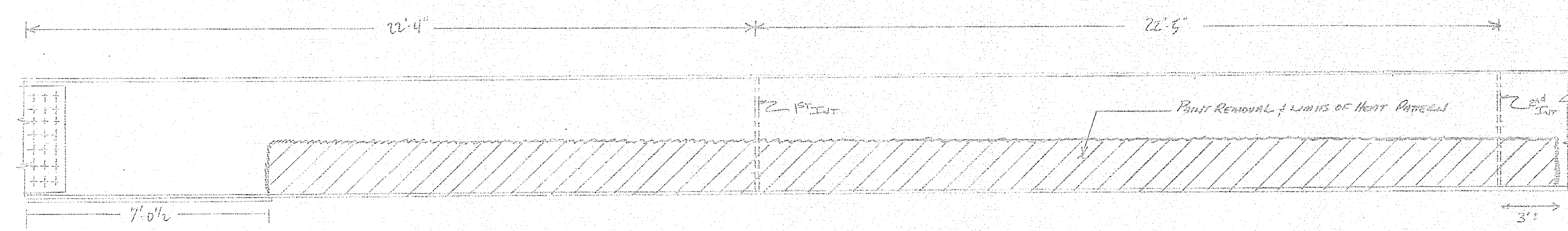
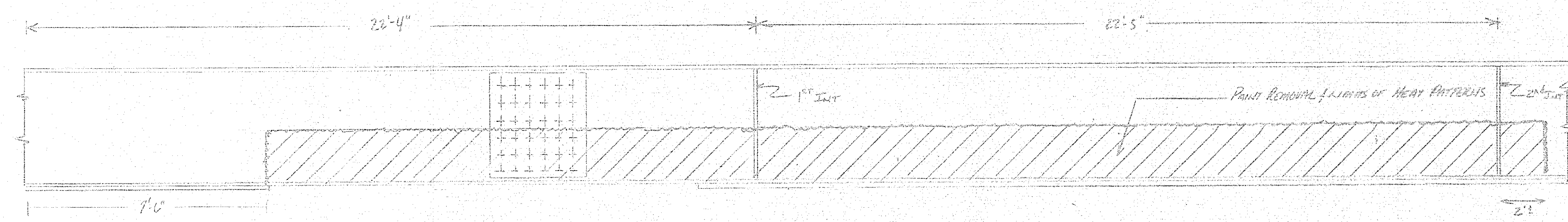
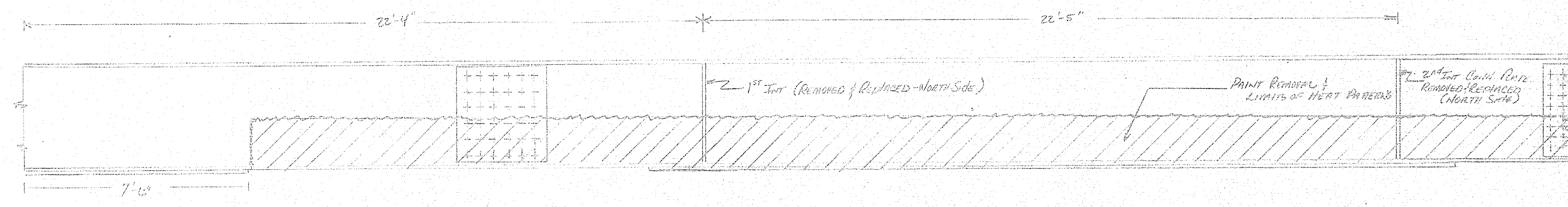
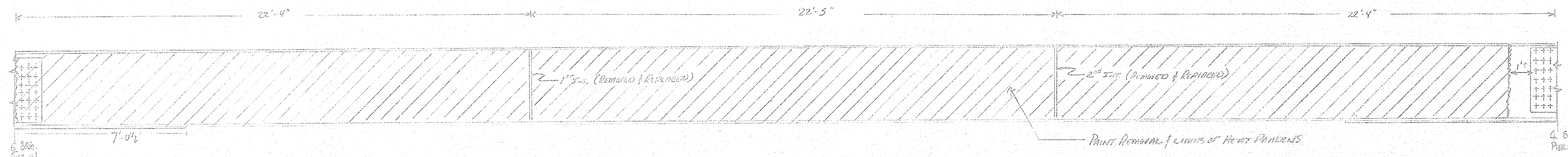
Approved By: *[Signature]*
Approved As Noted
Approved For Revision No. *[Signature]*
Date: 9-1-98

Rev'd, Dec. 2, 1993
TA 97-288 D212338
BRIDGE LOCATION #3 MAR 7.67
WEST RIVER PARKWAY OVER I-190 (SOUTH BOUND & NORTH BOUND)

SCALE: *[Blank]* APPROVED BY: *[Signature]* DRAWN BY: *[Signature]*
DATE: *[Blank]* T. ANDERSON
INTERIOR GIRDERS - JACKING PRESSURES
DRAWING NUMBER: *[Blank]*
VECTOR CONSTRUCTION CORP. BRIS 114 Rev 1

[illegible][illegible]

TA 44-255 DE 233B			
BUREAU LOCATION #13. MR N19.09			
WATER BULK, PARKLAND, OILER T-100		SOUTHERN A. HENDERSON	
SCALE:	APPROVED BY	DRAWN BY	
DATE		T. HENDERSON	
T-100		CHECKS - JACKING PRESSURES	
VOLUME INSTRUMENT COORDINATION		DRAWING NUMBER	
		BR 15 m3	



Bridge #13 (M.P. 919.67 South bound)
West River Parkway over I-190
(Bridge repairs accepted)

North Fascia (South bound):

- 1.) Girder straightened with heat patterns & jacks.
- 2.) Removed & replaced first and second intermediate connection plates.
- 3.) Removed & replaced rivets with A325 fasteners at Pier #1 bearing connection plate.
- 4.) Ground out scrapes on bottom flange at point of impact.
- 5.) Bearing aligned during heat straightening process.

First Interior (South bound):

- 1.) Girder straightened with heat patterns & jacks.
- 2.) Removed & replaced first and second intermediate connection plates (North side), removed and replaced rivets with A325 fasteners at first and second intermediate connection plates (south side) as well as Pier #1 connection plates (both sides).
- 3.) Ground out scrapes on bottom flange at point of impact.

Second Interior (South bound):

- 1.) Girder straightened with heat patterns & jacks.
- 2.) Removed and replaced rivets with A325 fasteners at first and second intermediate connection plates as well as Pier #1 connection plates (North & South sides).
- 3.) Ground out scrapes on bottom flange at point of impact.

South Fascia (South bound):

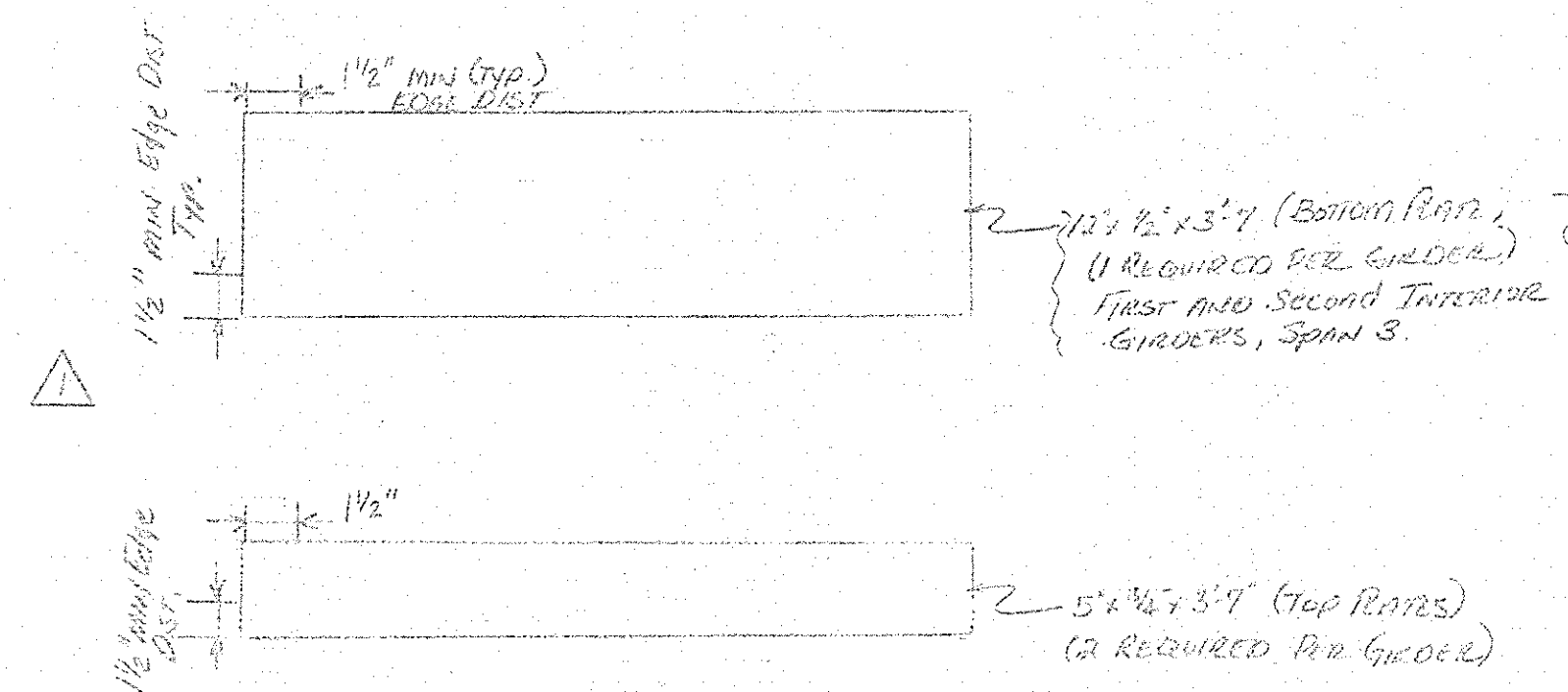
- 1.) Girder straightened with heat patterns & jacks.
- 2.) Removed and replaced rivets with A325 fasteners at first and second intermediate connection plates as well as Pier #1 connection plate (North side).
- 3.) Ground out scrapes on bottom flange at point of impact.

New York State
Thruway Authority
FINAL SHOP DRAWING REVIEW

By: *[Signature]* Date: 9-1-78

AS-BUILT REVISIONS

TH 87-288 0212338
BRIDGE LOCATION #13 M.P. N 1957
BRIDGE TYPE: THROUGH ARCH (SOUTH BOUND) PIER #1
SCALE: N.T.S. APPROVED BY: *[Signature]* DRAWN BY: *[Signature]*
DATE: 1-10-78
TOWN: # 45670 54015 - REPAIR OF STRUCTURAL STEEL
AS BUILT
VEHICLE CONSTRUCTION COOPERATION
DRAWING NUMBER: 1861381



FLANGE SPlice PLATE REPLACEMENTS (A36, DOMESTIC - CARPENTER NORTH 15" x 1/4" @ 40"

DIRECTION OF ROLLING SHALL BE
PARALLEL TO THE DIRECTION OF MAIN STRESS

PROCEDURE

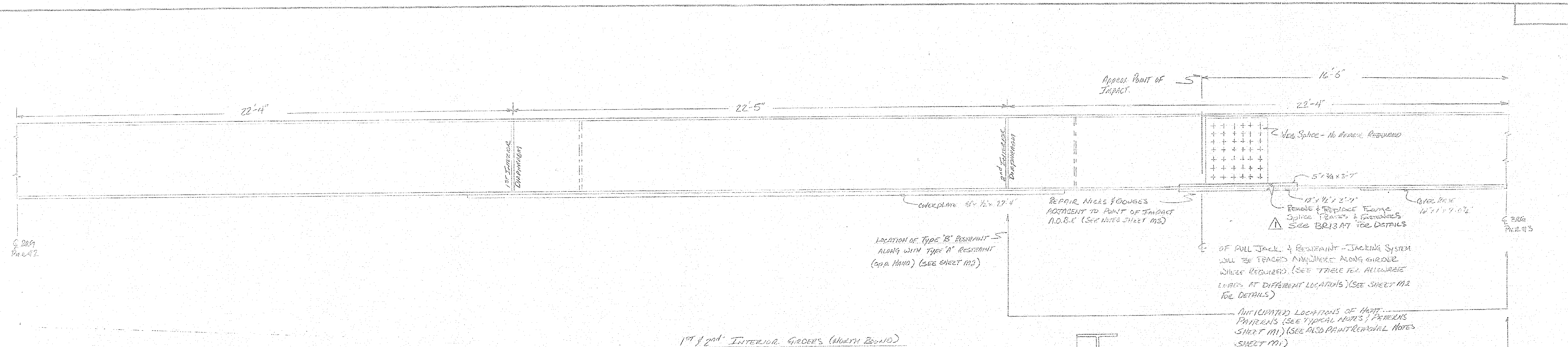


1. REMOVE EXISTING FASTENERS & PLATES. ANY SCRAPS AND GORES SHALL BE REPAIRED USING APPROVED REPAIR PROCEDURES
2. CLEAN SURFACE OF FLANGE TO OBTAIN TIGHT FIT
3. DRILL NEW SIDES OF TOP FLANGE PLATE TO MATCH EXISTING PLATE
4. FIELD DRILL HOLES 4" DIA. USING MAGNETIC DRILL AND MAGNET OR JAWKEY 30.
EXISTING COMPARTMENT TO BE USED AS TEMPLATE. NO BEAMING OR KILL SIZED HOLES WILL BE ALLOWED.
5. CLEAN, PRIME EXISTING AND NEW CONTACT SURFACES PRIOR TO FINAL ASSEMBLY.
PRIMER MUST BE FULLY CURED BEFORE FINAL ASSEMBLY.
6. INSTALL A36 FASTENERS AND TIGHTEN AS PER SECTION 10 OF THE NYSSM.
7. PAINT REPAIRS AS PER PAINTING NOTES SHEET M1

New York State Thruway Authority	
FINAL SHOP DRAWING REVIEW	
<input checked="" type="checkbox"/> Approved <i>CT</i>	
<input type="checkbox"/> Approved As Noted	
<input type="checkbox"/> Approved For Revision No. _____	
By: <i>WLY</i>	Date: 7-1-98



Rev 11, Dec 2, 1997	
TA 99-288 DRAW 333	
BRIDGE LOCATION #13, MP 19.6	
WEST RAMP, PHASE 1B	
SCALE:	APPROVED BY <i>T. Anderson</i>
FLANGE SPlice PLATE REPLACEMENTS	
VOIDER CONSTRUCTION CO.	DRAWING NUMBER B01307 Rev 1



Bridge #13 M.P. N19.87
First & Second Interior Girders (North Bound)
Push Jack System

FLANGE SWEED CONDITION
Supported at Pier #3 and Fixed at First Diaphragm west of Pier 5
Max Allowable moment $M = S \times S$ where $S = 20 \text{ ksi}$

$S = bd^2/2$		
Girders W33 x 130	$b =$	22.43
Flange thickness = 0.553	$d =$	15
Flange width = 11.51	$b =$	7.33
coverplate thickness = 0.5	Piston area of Jack =	5.15
cover plate width = 3	10 Ton Jack	

$S_y = S \{ \text{cover plate} \} + S \{ \text{flange} \}$ $S_y \{ \text{flange only} \} = 16.68$

$S_y = 24.21 \text{ cubic inches}$

therefore max allowable moment $M = F_b \times S$
 $M = 492,326$

$M_1 = R_1 \times L$
 $R_1 = 2690.19$

$R_1 = \{ (P \times b^2) / (2 \times L^3) \} \times (a \times L)$

$P = 18869$
(M1) Allowable Hydraulic Pressure P / Cylinder area of Jack
 $M = 3629$

$M_2 = \{ (P \times a \times b) / (2 \times L^2) \} \times (a \times L)$

$P = 9895$
(M2) Allowable Hydraulic Pressure P / Cylinder area of Jack
 $M = 1904$

Bridge #13 M.P. N19.87

Interior Girders (North Bound & South Bound)
Maximum Preload for Flange Rotation: TIR

*** AT LOCATIONS IN THE MIDDLE OF GIRDER WHERE COVERPLATE IS PRESENT.

$f =$ Maximum Preload Stress = 20 ksi	
$M = P \times L$	
$S = bd^2/2$	
GIRDER SIZE: W 33 x 130	
$b =$	0.55
$d =$	11.51
$f =$	0.553
Top cover plate =	
Bottom cover plate width =	0
Left width of cover plate/2	
$L = M / S$	$M = 4 \times S$
$P = f \times (bd^2/2) / L$	$P = f \times (bd^2/2) \times L$
Assume $b = 18 \times L$	
$P =$	2027 lbs.

Allowable Hydraulic Pressure
Allowable Pressure = P / Cylinder Area of Jack
Energac 25 ton
Cylinder Area of Jack = 5.15 square inches
Allowable Pressure = 385 P.S.I.

*** AT LOCATIONS WHERE THERE IS NO COVERPLATE

$f =$ Maximum Preload Stress = 20 ksi	
$M = P \times L$	
$S = bd^2/2$	
GIRDER SIZE: W 33 x 130	
$b =$	0.55
$d =$	11.51
$f =$	0.553
Top cover plate =	
Bottom cover plate width =	11.51
Left width of cover plate/2	
$L = M / S$	$M = 4 \times S$
$P = f \times (bd^2/2) / L$	$P = f \times (bd^2/2) \times L$
Assume $b = 18 \times L$	
$P =$	2054 lbs.

Allowable Hydraulic Pressure
Allowable Pressure = P / Cylinder Area of Jack
Energac 25 ton
Cylinder Area of Jack = 5.15 square inches
Allowable Pressure = 385 P.S.I.

Bridge #13 Interior Girders (North & South Bound)

W33 x 130
Repair Tolerances: (Section 12, Dimensional Tolerances, New York State Steel Construction Manual)

Straightness: $7/8"$ or shall not exceed $1/8"$ in a ten foot test length
Tilt of Flange: Combined warpage and tilt of flange must not exceed $1/8"$ when measured from a point at the center of the web to toe of flange

Deviation From Girder Vertical Alignment: $3/8"$

Deviation From Flatness of Girder Web: $3/16"$

Any other tolerances should be in accordance with Section 12 of NYSSCM

Note: At specific areas such as points of impact, web punctures, etc. These tolerances may be exceeded subject to approval of Chief Engineer

Tolerances for Grinding Repair Scrapers & Gouges:

Flange Thickness	0.06
Flange Width	11.51
Web Thickness	0.55
Web Depth	38.09
Coverplate Thickness	0.50
Coverplate Width	6.00
20% of Flange Thickness	0.17 3/16"
20% of Web Thickness	0.12 1/8"
20% of Coverplate Thickness	0.10 1/8"
5% of Flange Width	0.58 9/16"
5% of Coverplate Width	0.40
5% of Flange Cross Sectional Area	0.49 in ²
5% of Web Cross Sectional Area	0.98 in ²
5% of Coverplate Cross Sectional Area	0.20

(a) LATERAL DISPLACEMENT = Approx 1"
(b) FLANGE ROTATION = $3/4"$ to 1"

LOCATION OF TYPE 'B' RESTRAINT ALONG W/ TYPE 'A' RESTRAINT (OPP. HAND) (SEE SHEET M2 FOR DETAILS)

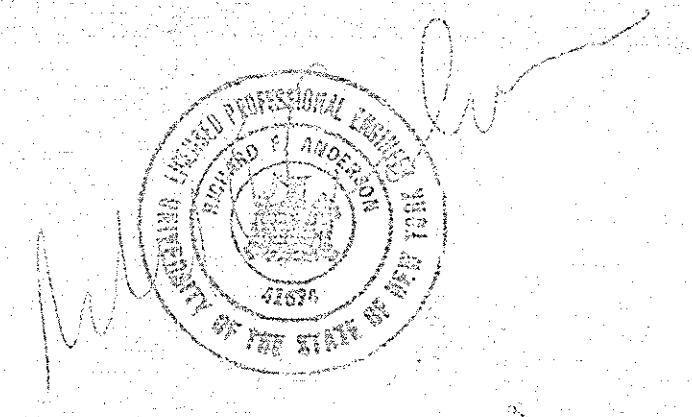
Notes:

1. Clean all steel surfaces within 12 inches of any repair area as determined by Engineer. For purposes of this work, a repair area is defined as any location that has been distorted by a result of the impact, welds joining member components within the distorted area, including connection plates at locations where fasteners are to be replaced, and any base metal that is to be heated, flame cut, welded, ground or tested. When cleaning areas to be heated or welded, it is intended that both sides of the member be cleaned, i.e., both sides of the web, flange, connection plate, etc.
2. Perform initial magnetic particle tests within 12 inches of the above repair areas, including welds and base metal, to determine presence of cracks. If cracks are found and confirmed, flame straightening operations will not be allowed to begin until the crack has been repaired to the satisfaction of the Engineer. The cost of repairs to cracks that have not been included in the specific work required for a given structure will be paid for under the provisions of item 25600.999799.
3. After all required repairs are complete, perform magnetic particle tests within 12 inches of all areas that were a) heated, b) straightened, c) ground to remove scrapes, or d) welded.
4. Ultrasonic test all new complete penetration groove welds made to repair cracks, install new sections of member components, etc., and all gouges repaired by welding.
5. As-built drawings will be completed by Vector Construction Corporation showing heating locations, cracks, major discontinuities, and repair welds.

New York State
Thruway Authority
FINAL SHOP DRAWING REVIEW

☒ Approved CT
☐ Approved As Noted
☐ Approved For Revision No. _____

By: MLG Date: 7-1-95



a	b	x1	Z1111	F1121	M1111	M1111	M1111	M1111	Allowable
7	10.33	19.75	2046	12703	1801	2483	198163	377688	Q.K.
8	14.38	19.75	3055	11574	1573	2247	206879	377688	Q.K.
9	13.23	19.75	8165	10707	1686	2079	224734	377688	Q.K.
11	11.33	19.75	2915	6888	1731	1891	266164	377688	Q.K.
12	10.33	19.75	9857	9486	1975	1836	276707	377688	Q.K.
13	8.53	19.75	10736	9381	2085	1824	258175	377688	Q.K.
14	6.33	19.75	12286	9488	2587	1844	318767	377688	Q.K.
15	7.33	19.75	14572	9265	2630	1804	333493	377688	Q.K.
16	6.33	19.75	10017	10365	3489	2013	344701	377688	Q.K.
17	6.33	19.75	23629	11292	4650	2155	337812	377688	Q.K.
18	4.33	19.75	33134	12572	6434	2509	160071	377688	Q.K.
19	3.33	19.75	52250	15369	10144	2308	153913	377688	Q.K.
20	2.33	19.75	127855	20401	28553	3261	73213	377688	Q.K.
21	1.33	19.75	330424	33282	71539	6457	41104	377688	Q.K.

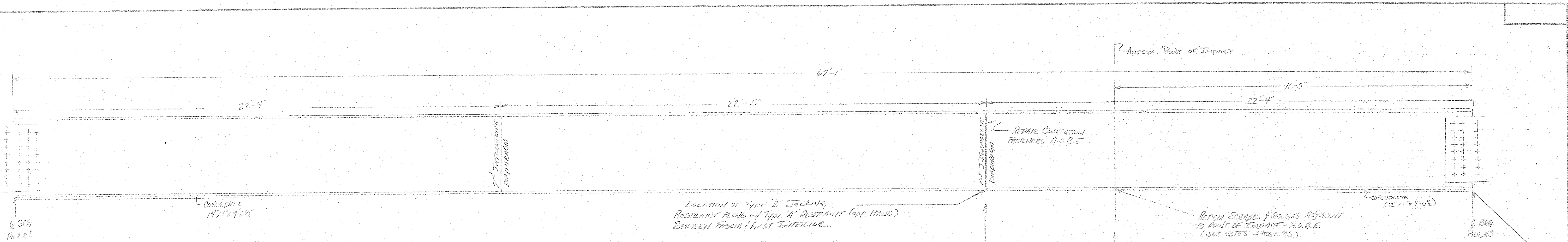
* Direction procedures altered because of lack of coverplate

Note: If Jacking Restraint or Extra Restraint Blocking is Relocated From Position Shown on These Sheets, the Allowable Load will be Recalculated and Approved by Chief Eng.
Re Additional Loads See SHEET BR13B10A BARS

Rev. 11, Dec 2, 1997
75-91-225 D20335
BRIDGE REPAIR #13 N19.87
New River Parkway (North Bound)

SCALE: _____ APPROVED BY: _____
DATE: _____
Drawn by: T. Adair
Checked by: J. S. G. 5277
Reviewed by: J. S. G. 5277
Vector Construction Corporation

DRAWING NUMBER: BR13A6 Rev. 1



Bridge #13 M.P. #19.67
Fascia's (North Bound)

FLANGE SHEET:
 Push Jack System Required
 Fixed at diaphragm (1st intermediate) and restrained @ Pier 2 bearing
 Max Allowable moment = M/S
 where $S = 20 \text{ ksi}$
 $S = b \cdot d^2 / 6$
 Girders = $W30 \times 108$
 Flange thickness = 0.76
 Flange width = 10.475
 Cover plate thickness = 0
 Cover plate width = 0

$S_y = S$ (cover plate) + S (flange)
 $S_y = 18.89$ cubic inches
 therefore max allowable moment = M/S
 $M = 277972$
 $S_y = 22.33$
 $S_y = 16$
 $S_y = 7.33$
 $S_y = 3.15$

25 ton Jack effective area =
 Moment @ point of Load = $2 \times P \times (a^2 \times b^2 \times L^3)$
 $P = 10855$
 Allowable Hydraulic Pressure = $P / \text{Cylinder area of Jack}$
 $P = 2071$

When a/c:
 $M = P \times a \times b^2 / 2$
 $P(M) = 511 \times 10^2$
 $P(M) = 14332$
 Allowable Hydraulic Pressure = $P / \text{Cylinder area of Jack}$
 $M(1) \text{ (Allowable Hyd. Pressure)} = 2703$

When b/c:
 $M = P \times a^2 \times b / 2$
 $P(M) = 112 \times 10^2$
 $P(M) = 7003$
 Allowable Hydraulic Pressure = $P / \text{Cylinder area of Jack}$
 $M(2) \text{ (Allowable Hyd. Pressure)} = 1359$

			At Pt. of Load	M1	M2	Allowable	Allowable
			Hyd. Pressure	Hyd. Pressure	Hyd. Pressure	Hyd. Pressure	Hyd. Pressure
2	b	P					
2	20.33	57799	11210	2743	27980	592	
2	19.33	49042	9116	2001	12932	536	
4	19.33	30445	7853	1809	7947	736	
6	17.33	24045	6911	1484	5177	749	
6	16.33	30043	6934	1402	3815	722	
7	15.33	27018	3246	1383	2366	734	
8	14.33	24603	4795	1305	2445	892	
9	13.33	6060	4947	1402	2077	883	
10	12.33	3455	6185	1476	1019	892	
11	11.33	5555	5939	1550	1638	807	
12	10.33	8555	5939	1745	1500	894	
13	9.33	9785	4702	1582	1422	785	
14	8.33	9482	1844	2509	1374	792	
15	7.33	10088	2071	2753	1350	794	
16	6.33	12572	2441	2420	1284	771	
17	5.33	15707	3058	4544	1456	852	
18	4.33	21223	4123	8548	1689	782	
19	3.33	32215	6255	18348	1858	738	
20	2.33	53346	11881	28566	2405	731	
21	1.33	155215	32108	60378	3824	713	
22	0.33	2448705	478559	935135	14042	828	

Note: If Jacking Restraints or Intermediate Blocking is required from position shown on this sheet, the allowable hydraulic pressure will be modified and approved by Chief Engineer.

For Additional Allowable Pressure at Different Locations - see sheet BR13M5

Bridge #13 Fascia's (North & South Bound)
 W30 x 108
 Repair Tolerances: (Section 12, Dimensional Tolerances, New York State Steel Construction Manual)

Straightness: $7/8"$ or shall not exceed $1/8"$ in a ten foot test length
 Tilt of Flange: Combined warpage and tilt of flange must not exceed $1/4"$ when measured from a point at the center of the web to toe of flange

Deviation From Girder Vertical Alignment: $5/16"$
 Deviation From Flatness of Girder Web: $3/16"$

Any other tolerances should be in accordance with Section 12 of NYSSCM

Note: At specific areas such as points of impact, web punctures, etc. These tolerances may be exceeded subject to approval of Chief Engineer.

Tolerances for Grinding Repair Screens & Gouges.

Flange Thickness	0.76
Flange Width	10.48
Web Thickness	0.65
Web Depth	23.65
Coverplate Thickness	0.00
Coverplate Width	0.00
20% of Flange Thickness	0.15 3/16"
25% of Web Thickness	0.11 1/8"
20% of Coverplate Thickness	0.00
5% of Flange Width	0.52 1/2"
5% of Coverplate Width	0.00
5% of Flange Cross Sectional Area	0.49 in 2
5% of Web Cross Sectional Area	0.81 in 2
5% of Coverplate Cross Sectional Area	0.00

Bridge #13 M.P. #19.67
Fascia's (North Bound & South Bound)
 Maximum Preload for Flange Rotation:
 $P = \text{Maximum Preload Stress} = 20 \text{ ksi}$
 $M = P \times L$
 $S = b \cdot d^2 / 6$
 GIRDER SIZE: $W30 \times 108$
 $t_w = 0.545$
 $d_f = 10.475$
 $t_f = 0.76$
 Top cover plate = 16.475
 Bottom cover plate width = 16.475
 $L = \text{width of cover plate} / 2$
 $P = M / S$
 $P = 1854 \text{ lbs.}$

Allowable Hydraulic Pressure
 Allowable Pressure = $P / \text{Cylinder Area of Jack}$
 Energy 25 ton
 Cylinder Area of Jack = 5.15 square inches
 Allowable Pressure = 350 P.S.I.

Fascia Girders:
 Web Jacking Calculations.
 Web Shear:
 Girder Size: $W30 \times 108$
 Web thickness = 0.545
 25 Ton Jack Effective Area = 5.15
 AT Allowable Shear = 11,000
 Web Shear = Circumference of Indent x Web thickness x Allowable Shear
 Circumference = d
 $d = \text{diameter of indentation}$

Diameter Of Indentation:	Load	Allowable	Use
1/8"	11,154	21,972	10,000 *
3/8"	24,135	18,310	10,500 *
1/2"	78,433	14,848	10,500 *
3/4"	58,577	10,988	10,000 *
1"	37,712	7,324	7,324
1 1/8"	18,859	3,552	3,552

* Governed by Jack Capacity

New York State
 Thruway Authority
FINAL SHOP DRAWING REVIEW
☒ Approved as Noted
☐ Approved for Revision No. _____
 By: *MLG* Date: 9-1-78

- Notes:**
1. Clean all steel surfaces within 12 inches of any repair area as determined by Engineer. For purposes of this work, a repair area is defined as any location that has been distorted as a result of the impact; welds joining member components within the distorted area, including connection plates at locations where fasteners are to be replaced; and any base metal that is to be heated, flame cut, welded, ground or tested. When cleaning areas to be heated or welded, it is intended that both sides of the member be cleaned, i.e., both sides of the web, flange, connection plate, etc.
 2. Perform initial magnetic particle tests within 12 inches of the above repair areas, including welds and base metal, to determine presence of cracks. If cracks are found and confirmed, flame straightening operations will not be allowed to begin until the crack has been repaired to the satisfaction of the Engineer. The cost of repairs to cracks that have not been included in the specific work required for a given structure will be paid for under the provisions of Item 23690.939799.
 3. After all required repairs are complete, perform magnetic particle tests within 12 inches of all areas that were a) heated, b) straightened, c) ground to remove scrapes, or d) welded.
 4. Ultrasonic test all new complete penetration groove welds made to repair cracks, install new sections of member components, etc., and all gouges repaired by welding.
 5. As-built drawings will be completed by Vector Construction Corporation showing heating locations, cracks, major discontinuities, and repair welds.

TOLERANCES - SECTION 12, NYSSCM DIMENSIONAL TOLERANCES
 STRAIGHTNESS - $7/8"$ or shall not exceed $1/8"$ in ten foot test length
 TILT OF FLANGE - COMBINED WARPAGE AND TILT OF FLANGE must not exceed $1/4"$ when measured from a point at the center of the web to toe of flange
 DEVIATION FROM VERTICAL ALIGNMENT: $5/16"$
 DEVIATION FROM FLATNESS OF GIRDOR WEB: $3/16"$

Notes: At specific locations such as points of impact, web punctures, etc. These tolerances may be exceeded subject to approval of Chief Engineer. Any other tolerances should be in accordance with Section 12, NYSSCM.

REV 1 DEC 2, 1977

BRIDGE LOCATION #13 AND #14 M.P. #19.67

WEST RIVER, DREYER (H. BOUND)

SCALE: _____

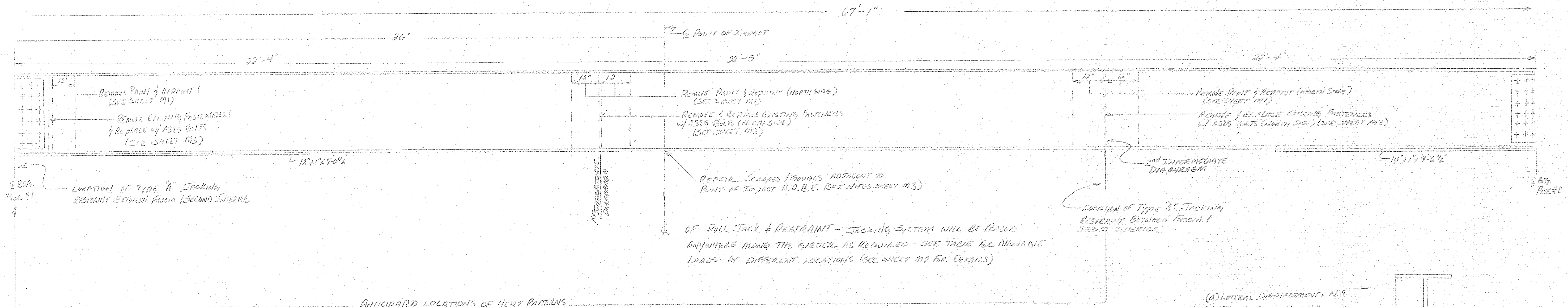
DATE: _____

DESIGN: 2545, 2279 REPAIR OF SEVERELY DAMAGED BRIDGE - SPAN 13

WATER PUMP, (H. BOUND)

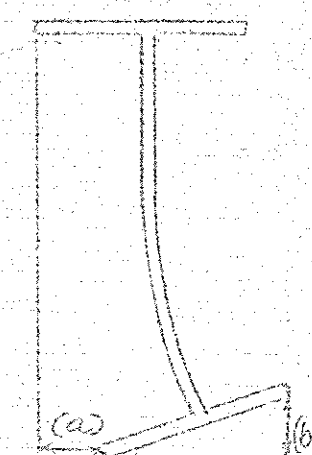
VECTRA CONSTRUCTION CORPORATION

DRAWING NUMBER: BR13A5 Rev 1



ANTICIPATED LOCATIONS OF HEAT PATTERNS
(SEE TYPICAL NOTES & PATTERNS SHEET M1)
(SEE ALSO PAINT REMOVAL NOTES SHEET M1)

(A) LATERAL DISPLACEMENT - N/A
(B) FLANGE RESTRAINT - N/A



Bridge #13 M.P. N 19.07
South Fascia (South Bound)
Full Jack system

FLANGE SHEAR CONDITION

Supported at Pier #1 Bearing and Fixed at Second Intermediate Diaphragm
Max. Allowable moment = $W \times L \times S$ where $W = 20 \text{ K/S}$

$S = 54 \text{ ft}^2/\text{S}$		
Girder = W30 x 108	$W =$	44.75
Flange thickness = 0.75	$a =$	22
Flange width = 10.475	$b =$	22.75
cover plate thickness =	Platen area of Jack =	2.32
cover plate width =	10 Ton Jack	

$$S_{ym} = S \times (\text{cover plate}) \times S \times (\text{flange})$$

$$S_{ym} = 10.90 \text{ cubic inches}$$

$$\text{therefore max allowable moment} = W \times L \times S$$

$$M = 277972$$

$$R1 = R1 \times a$$

$$R1 = (F \times b \times 2) / (2 \times L \times S) \times (a \times 21)$$

$$P = 3270$$

$$(M) \text{ Allowable Hydraulic Pressure} = P / \text{Cylinder area of Jack}$$

$$M2 = (P \times a \times b) / (2 \times L \times S) \times (a \times 21)$$

$$P = 2777$$

$$(M2) \text{ Allowable Hydraulic Pressure} = P / \text{Cylinder area of Jack}$$

a	b	M1 Allowable Hyd. Pressure	M2 Allowable Hyd. Pressure	Allowable Pressure
7	37.75	1853	2004	1853
8	36.75	1808	2079	1808
9	35.75	1873	2152	1873
11	33.75	1824	2332	1824
12	32.75	1779	2453	1779
13	31.75	1832	2578	1832
14	30.75	1886	2704	1886
15	29.75	1940	2830	1940
16	28.75	1994	2956	1994
17	27.75	2048	3082	2048
18	26.75	2102	3208	2102
19	25.75	2156	3334	2156
20	24.75	2210	3460	2210
21	23.75	2264	3586	2264
22	22.75	2318	3712	2318
23	21.75	2372	3838	2372
24	20.75	2426	3964	2426
25	19.75	2480	4090	2480
26	18.75	2534	4216	2534
27	17.75	2588	4342	2588
28	16.75	2642	4468	2642
29	15.75	2696	4594	2696
30	14.75	2750	4720	2750
31	13.75	2804	4846	2804
32	12.75	2858	4972	2858
33	11.75	2912	5098	2912
34	10.75	2966	5224	2966
35	9.75	3020	5350	3020
36	8.75	3074	5476	3074
37	7.75	3128	5602	3128
38	6.75	3182	5728	3182
39	5.75	3236	5854	3236
40	4.75	3290	5980	3290
41	3.75	3344	6106	3344

Bridge #13 Fascia (North & South Bound)

W30 x 108
Repair Tolerances: (Section 12, Dimensional Tolerances, New York State Steel Construction Manual)

Straightness: $1/8"$ or shall not exceed $1/8"$ in a ten foot test length

Tilt of Flange: Combined warpage and tilt of flange must not exceed a $1/4"$ when measured from a point at the center of the web to toe of flange

Deviation From Girder Vertical Alignment: $5/16"$

Deviation From Flatness of Girder Web: $5/16"$

Any other tolerances should be in accordance with Section 12 of NYSSCM

Note: At specific areas such as points of impact, web punctures, etc. These tolerances may be expanded subject to approval of Chief Engineer

Tolerances for Grinding Repair Scrapes & Gauges

Flange Thickness =	0.75
Flange Width =	10.475
Web Thickness =	0.55
Web Depth =	22.00
Coverplate Thickness =	0.90
Coverplate Width =	0.50
20% of Flange Thickness =	0.15 $1/16"$
20% of Web Thickness =	0.11 $1/8"$
20% of Coverplate Thickness =	0.00
5% of Flange Width =	0.52 $1/2"$
5% of Coverplate Width =	0.00
5% of Flange Gross Sectional Area =	0.49 in 2
5% of Web Gross Sectional Area =	0.31 in 2
5% of Coverplate Gross Sectional Area =	0.00

Note: For Additional Jack Pressures See Sheet BR13A16.

If Jacking Restraints or Intermediate Blocking is
Allocated For Restraints shown on these sheets, Allowable
Loads will be Re-evaluated and Approved By Chief Engineer

Bridge #13 M.P. N19.07

Fascia's (North Bound & South Bound)
Maximum Endload for Flange Rotation

For Maximum Preload Stress = 20 K.S.I.

$M = P \times L$

GIRDER SIZE: W30 x 108

$W = 0.845$

$L = 10.475$

$d = 0.75$

Top cover plate: $L = 10.475$

Bottom cover plate: $L = 10.475$

$P = 1854 \text{ lbs.}$

Allowable Hydraulic Pressure

Allowable Pressure = $P / \text{Cylinder Area of Jack}$

Encompass 25 ton

Cylinder Area of Jack = 5.15 square inches

Allowable Pressure = 360 P.S.I.

Notes

- Clean all steel surfaces within 12 inches of any repair area as determined by Engineer. For purposes of this work, a repair area is defined as any location that has been distorted as a result of the impact; welds joining member components within the distorted area, including connection plates at locations where fasteners are to be replaced; and any base metal that is to be heated, flame cut, welded, ground or sanded. When cleaning areas to be heated or welded, it is intended that both sides of the member be cleaned, i.e., both sides of the web, flange, connection plate, etc.
- Perform initial magnetic particle tests within 12 inches of the above repair areas, including welds and base metal, to determine presence of cracks. If cracks are found and confirmed, flame straightening operations will not be allowed to begin until the crack has been repaired to the satisfaction of the Engineer. The cost of repairs to cracks that have not been included in the specific work required for a given structure will be paid for under the provisions of Item 25650.999799.
- After all required repairs are complete, perform magnetic particle tests within 12 inches of all areas that were a) heated, b) straightened, c) ground to remove scrapes, or d) welded.
- Ultrasonic test all new complete penetration groove welds made to repair cracks, install new sections of member components, etc., and all gonges repaired by welding.
- As-built drawings will be completed by Vector Construction Corporation showing heating locations, cracks, major discontinuities, and repair welds.

Fascia Girders: Web Jacking Calculations: Web Shear:

Girder Size: W30 x 108

Web thickness = 0.55

25 Ton Jack Effective Area = 5.15

AT Allowable Shear = 11,000

Web Shear = Circumference of Indent x Web thickness x Allowable Shear

Circumference = d

$d =$ diameter of indentation

Diameter Of Indentation:

Inches:

Load

Allowable

Max. Force

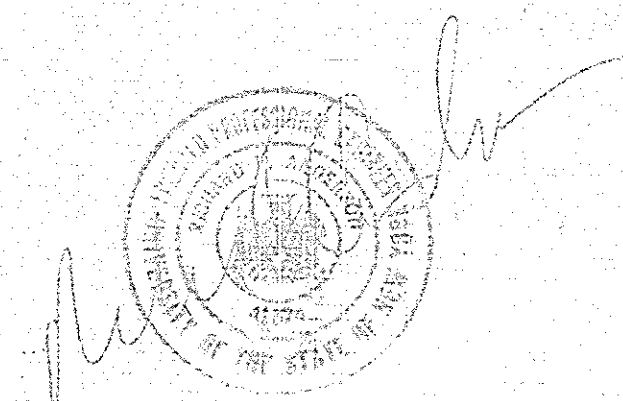
Web

1

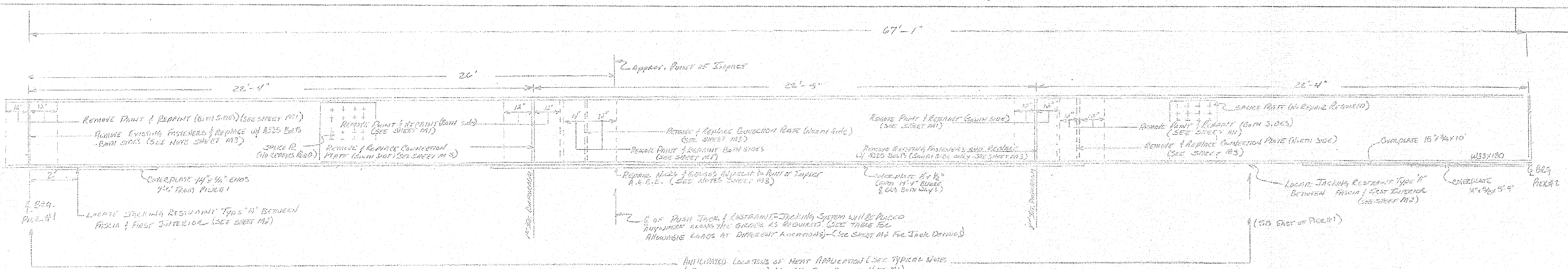
Governed by Jack Capacity

New York State
Thruway Authority
FINAL SHOP DRAWING REVIEW

By: *[Signature]* Date: 2/1/98



Rev. 11/28/97 DNR 338
BRIDGE LOCATION #13, M.P. N19.07
BRIDGE LOCATION #13, M.P. N19.07 (South Bound) - BRIDGE LOCATION
SCALE: 1/4" = 1'-0" APPROVED BY: *[Signature]* DRAWN BY: *[Signature]*
DATE: 05/05/98 STRUCTURAL STEEL REVIEW
(South Fascia - South Bound Lane)
Vector Construction Corporation
DRAWING NUMBER: BR13A16 REV1



Bridge #13 M.P. M19.87
 Steel Girder (South Bound)
 Push Jack System

FLANGE WEB
 CRACKING

Supported at 2 feet apart of Pier 81 and fixed at 60 feet of Pier 82

Max Allowable moment = 14 x 10⁶ ft-lb

where $P = 20$ ton

$S = 14.2$ in²

Flange thickness = 0.55 in

Flange width = 11.51 in

Flange web thickness = 0.5 in

Flange web width = 10.75 in

Flange web depth = 10.75 in

Flange web area = 115.5 in²

Flange web moment of inertia = 1000 in⁴

Flange web section modulus = 100 in³

Flange web yield strength = 36 ksi

Flange web ultimate strength = 58 ksi

Flange web allowable stress = 24 ksi

Flange web allowable moment = 14 x 10⁶ ft-lb

Flange web allowable load = 20 tons

Flange web allowable deflection = 1/16 in

Flange web allowable vibration = 1/16 in

Flange web allowable noise = 1/16 in

Flange web allowable temperature = 1/16 in

Flange web allowable humidity = 1/16 in

Flange web allowable air quality = 1/16 in

Flange web allowable seismic = 1/16 in

Flange web allowable wind = 1/16 in

Flange web allowable snow = 1/16 in

Flange web allowable ice = 1/16 in

Flange web allowable rain = 1/16 in

Flange web allowable sun = 1/16 in

Flange web allowable moon = 1/16 in

Flange web allowable stars = 1/16 in

Flange web allowable planets = 1/16 in

Flange web allowable galaxies = 1/16 in

Flange web allowable universe = 1/16 in

Flange web allowable everything = 1/16 in

Flange web allowable nothing = 1/16 in

Flange web allowable anything = 1/16 in

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Flange web allowable anything = 1/16 in

Flange web allowable nothing = 1/16 in

Flange web allowable anything = 1/16 in

FIRST INTERIOR (South Bound)
 LOOKING NORTH

Bridge #13 M.P. M19.87

Interior Girders (North Bound & South Bound)

Maximum Load for Flange Rotation

AT LOCATIONS IN THE MIDDLE OF GIRDER WHERE COVERPLATE IS PRESENT

1. Maximum Flange Stress = 20 ksi

2. Flange Width = 11.51 in

3. Flange Thickness = 0.55 in

4. Flange Web Thickness = 0.5 in

5. Flange Web Width = 10.75 in

6. Flange Web Depth = 10.75 in

7. Flange Web Area = 115.5 in²

8. Flange Web Moment of Inertia = 1000 in⁴

9. Flange Web Section Modulus = 100 in³

10. Flange Web Yield Strength = 36 ksi

11. Flange Web Ultimate Strength = 58 ksi

12. Flange Web Allowable Stress = 24 ksi

13. Flange Web Allowable Moment = 14 x 10⁶ ft-lb

14. Flange Web Allowable Load = 20 tons

15. Flange Web Allowable Deflection = 1/16 in

16. Flange Web Allowable Vibration = 1/16 in

17. Flange Web Allowable Noise = 1/16 in

18. Flange Web Allowable Temperature = 1/16 in

19. Flange Web Allowable Humidity = 1/16 in

20. Flange Web Allowable Air Quality = 1/16 in

21. Flange Web Allowable Seismic = 1/16 in

22. Flange Web Allowable Wind = 1/16 in

23. Flange Web Allowable Snow = 1/16 in

24. Flange Web Allowable Ice = 1/16 in

25. Flange Web Allowable Rain = 1/16 in

26. Flange Web Allowable Sun = 1/16 in

27. Flange Web Allowable Moon = 1/16 in

28. Flange Web Allowable Stars = 1/16 in

29. Flange Web Allowable Planets = 1/16 in

30. Flange Web Allowable Galaxies = 1/16 in

31. Flange Web Allowable Universe = 1/16 in

32. Flange Web Allowable everything = 1/16 in

33. Flange Web Allowable nothing = 1/16 in

34. Flange Web Allowable anything = 1/16 in

35. Flange Web Allowable nothing = 1/16 in

36. Flange Web Allowable anything = 1/16 in

37. Flange Web Allowable nothing = 1/16 in

38. Flange Web Allowable anything = 1/16 in

39. Flange Web Allowable nothing = 1/16 in

40. Flange Web Allowable anything = 1/16 in

41. Flange Web Allowable nothing = 1/16 in

42. Flange Web Allowable anything = 1/16 in

43. Flange Web Allowable nothing = 1/16 in

44. Flange Web Allowable anything = 1/16 in

45. Flange Web Allowable nothing = 1/16 in

46. Flange Web Allowable anything = 1/16 in

47. Flange Web Allowable nothing = 1/16 in

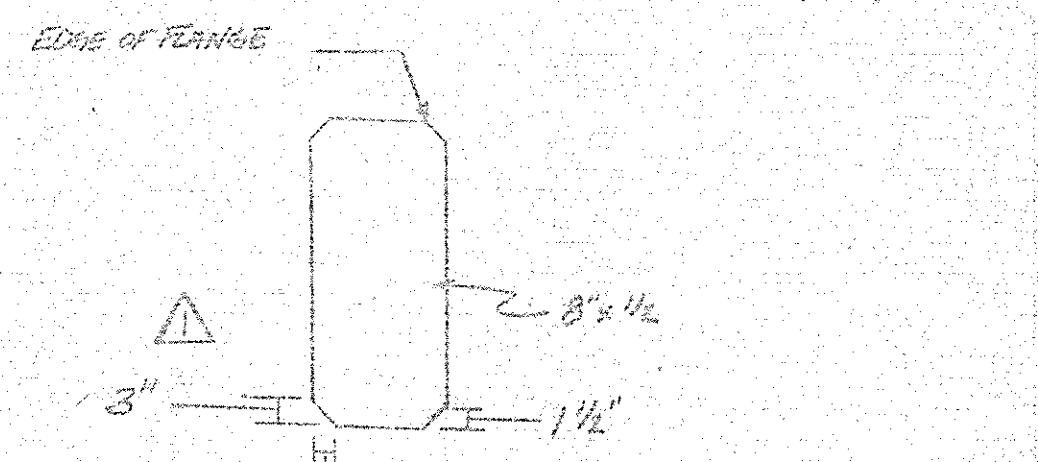
48. Flange Web Allowable anything = 1/16 in

49. Flange Web Allowable nothing = 1/16 in

50. Flange Web Allowable anything = 1/16 in

51. Flange Web Allowable nothing = 1/16 in

52. Flange Web Allowable anything = 1/16 in



NEW CONNECTION PLATE (A36 DOMESTIC)

FOR WELDING DETAILS SEE SHEET M13 OF MATCH EXISTING

W33 x 130

Flange Thickness = 0.55 in

Flange Width = 11.51 in

Web Thickness = 0.5 in

Web Depth = 10.75 in

Coverplate Thickness = 0.5 in

Coverplate Width = 10.75 in

20% of Flange Thickness = 0.11 in

20% of Web Thickness = 0.1 in

20% of Coverplate Thickness = 0.1 in

20% of Flange Width = 2.3 in

20% of Web Width = 2.15 in

20% of Coverplate Width = 2.15 in

20% of Flange Depth = 2.15 in

20% of Web Depth = 2.15 in

20% of Coverplate Depth = 2.15 in

20% of Flange Area = 4.6 in²

20% of Web Area = 4.3 in²

20% of Coverplate Area = 4.3 in²

20% of Flange Moment of Inertia = 200 in⁴

20% of Web Moment of Inertia = 190 in⁴

20% of Coverplate Moment of Inertia = 190 in⁴

20% of Flange Section Modulus = 20 in³

20% of Web Section Modulus = 19 in³

20% of Coverplate Section Modulus = 19 in³

20% of Flange Yield Strength = 7.2 ksi

20% of Web Yield Strength = 7.2 ksi

20% of Coverplate Yield Strength = 7.2 ksi

20% of Flange Ultimate Strength = 11.6 ksi

20% of Web Ultimate Strength = 11.6 ksi

20% of Coverplate Ultimate Strength = 11.6 ksi

20% of Flange Allowable Stress = 4.8 ksi

20% of Web Allowable Stress = 4.8 ksi

20% of Coverplate Allowable Stress = 4.8 ksi

20% of Flange Allowable Moment = 2.8 x 10⁶ ft-lb

20% of Web Allowable Moment = 2.8 x 10⁶ ft-lb

20% of Coverplate Allowable Moment = 2.8 x 10⁶ ft-lb

20% of Flange Allowable Load = 4 tons

20% of Web Allowable Load = 4 tons

20% of Coverplate Allowable Load = 4 tons

20% of Flange Allowable Deflection = 1/32 in

20% of Web Allowable Deflection = 1/32 in

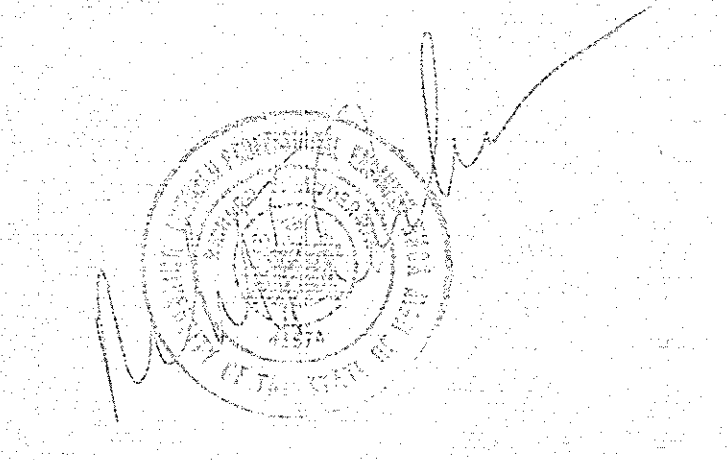
(a) Lateral Displacement = 3/16 in
 (b) Flange Rotation = 1/16 in

1. Clean all steel surfaces within 12 inches of any repair area as determined by Registrar. For purposes of this work, a repair area is defined as any location that has been distorted as a result of the impact; welds joining member components within the distorted area, including connection plates at locations where fasteners are to be replaced; and any base metal that is to be heated, flame cut, welded, ground or tested. When cleaning areas to be heated or welded, it is intended that both sides of the member be cleaned, i.e., both sides of the web, flange, connection plate, etc.
2. Perform initial magnetic particle tests within 12 inches of the above repair areas, including welds and base metal, to determine presence of cracks. If cracks are found and confirmed, flame straightening operations will not be allowed to begin until the crack has been repaired to the satisfaction of the Engineer. The cost of repairs to cracks that have not been included in the specific work required for a given structure will be paid for under the provisions of Item 25690.999799.
3. After all required repairs are complete, perform magnetic particle tests within 12 inches of all areas that were a) heated, b) straightened, c) ground to remove scrap, or d) welded.
4. Ultrasonic test all new complete penetration groove welds made to repair cracks, install new sections of member components, etc., and all gages repaired by welding.
5. As-built drawings will be completed by Vector Construction Corporation showing heating locations, cracks, major discontinuities, and repair welds.

New York State
 Thruway Authority
 FINAL SHOP DRAWING REVIEW

Approved by _____
 Approved by _____
 Approved for Revision No. _____

By: *[Signature]* Date: 9-1-98



Revised: 02/23/97

TA 77-085 02/23/97

Location: M13 M.P. M19.87

WISSAVER PARKWAY OVER I-190 SOUTHERN

SCALE: 1" = 10'-0"

DATE: 02/23/97

DESIGNED BY: T. HENDERSON

CHECKED BY: E. GENTRY

INCHES: 25690.54013 STRUCTURAL STEEL REPAIRS

(First Interior, South Bound)

VECTOR CONSTRUCTION CORPORATION

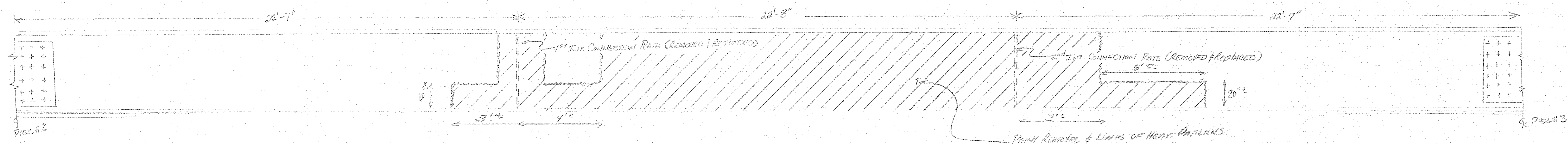
DRAWING NUMBER: 02/23/97

Flange pressure allowed because of lack of coverplate

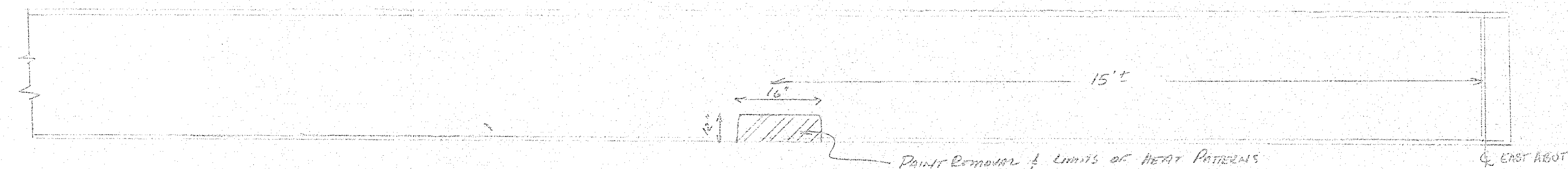
Note: SEE SHEETS M13.01 THRU M14 FOR ADDITIONAL PRESSURES

Note: IF JACKING RESTRAINTS OR INTERMEDIATE JACKING IS ENCLOSED FROM POSITION SHOWN ON THESE SHEETS, FLANGE PRESSURES WILL BE RECALCULATED AND APPROVED BY STRUCTURAL ENGINEER.

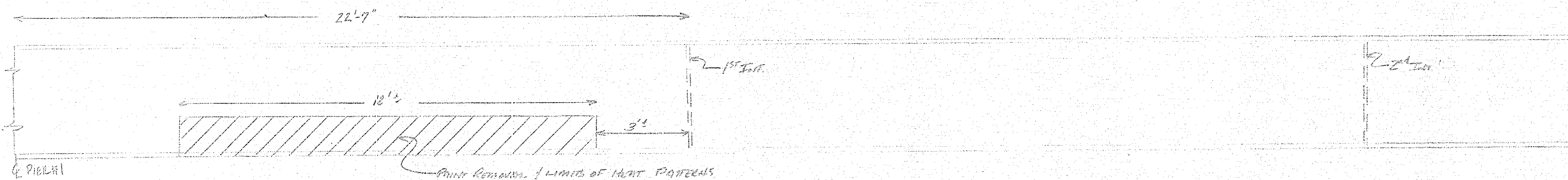
* Governed by capacity of Jack



SOUTH FASCIA - NORTH BOUND LONG
(LOOKING NORTH)



SOUTH FASCIA - NORTH BOUND
(LOOKING ABREAST)



SOUTH FASCIA - SOUTH BOUND LONG
(LOOKING NORTH)

Bridge #12 (M.P. 916.46)
Base Line Rd. over I-190
(Bridge repair accepted)

South Fascia (North bound):

- 1.) Girder straightened with heat patterns & jacks.
- 2.) Removed and replaced first and second intermediate connection plates.
- 3.) Ground out scrapes on bottom flange at point of impact.

First Interior (North bound):

- 1.) No heat patterns required.
- 2.) Removed and replaced rivets with A325 fasteners at first and second intermediate connection plates.

South Fascia (South bound):

- 1.) Girder straightened with heat patterns & jacks.
- 2.) Removed and replaced rivets with A325 fasteners at first intermediate connection plate.
- 3.) Ground out scrapes on bottom flange at point of impact.

First Interior (South bound):

- 1.) No heat patterns required.
- 2.) Removed and replaced rivets with A325 fasteners at first intermediate connection plate.
- 3.) Ground out scrapes on bottom flange at point of impact.

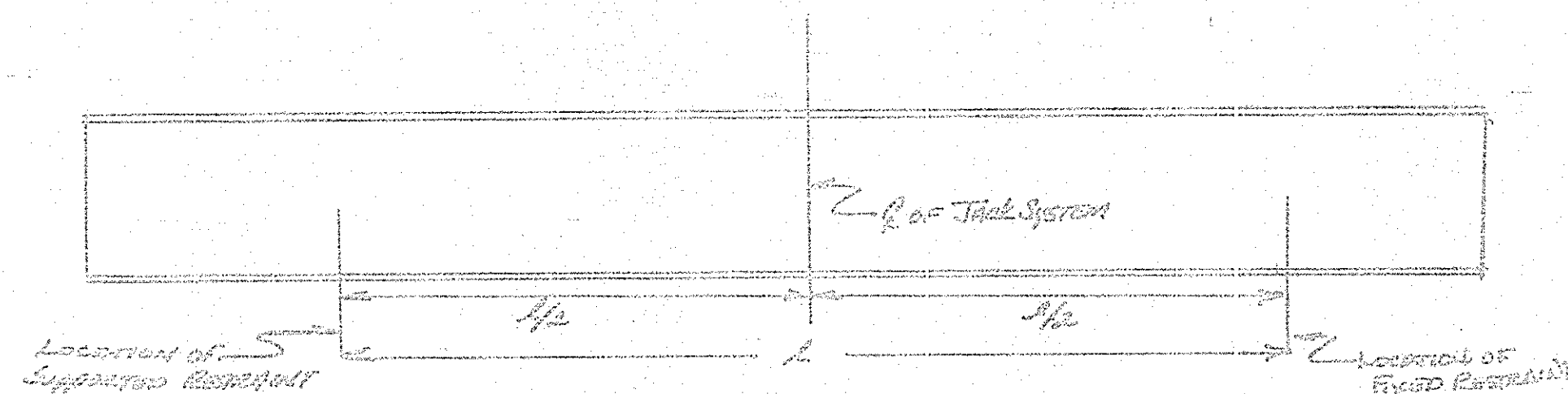
Second Interior (South bound):

- 1.) No heat patterns required.
- 2.) Ground out scrapes on bottom flange at point of impact.

New York State Thruway Authority FINAL SHOP DRAWING REVIEW	
<input checked="" type="checkbox"/> Approved	<input type="checkbox"/> Approved As Noted
<input type="checkbox"/> Approved For Revision No. _____	
By: _____	Date: 7-7-98

AS-BUILT REVISIONS

7A 99-288 0218335 BRIDGE LOCATION MAP MAP 715.45 BASELINE ROAD OVER I-190		ERIE COUNTY
SCALE:	APPROVED BY:	DRAWN BY:
DATE:		T. ANDERSON
ITEM 2540, 3401A - REPAIR OF STRUCTURAL STEEL "AS BUILT"		
VICTOR CONSTRUCTION CORPORATION		DRAWING NUMBER 0218335



SEE TABLE BELOW FOR ALLOWABLE PRESSURES PER
REPAIRS PLACED AT VARIOUS DISTANCES.

South Fascia (North bound)

PLATE SHEET:
Full Jack System Required
Fixed at one end and supported at other (Dimensions shown)
Max Allowable moment: $M = 1/3$
where $M = 20 \text{ ksi}$
 $G = 10 \text{ ksi}$
Girders W80 x 100
Flange thickness: 0.75
Flange width: 10.475
Cover plate thickness: 0
Cover plate width: 0

Sys 8 (cover plate) + 3 (flange)
Sys 8: 13.50 cubic inches
therefore max allowable moment:
 $M = 1/3$
M (without cover plate): 277872

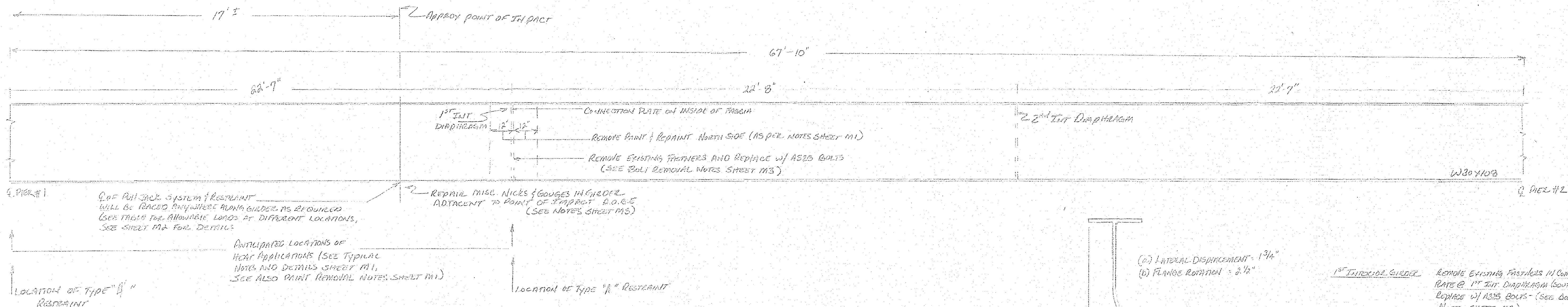
Sys 3 (flange)
13.50 cubic inches
therefore max allowable moment:
M (without cover plate): 277872

26 ton Jack effective area = 5.15

M (max) at fixed end: 321
M (point of load): 321
M (x): 321
Fascia girder does not have coverplate except at bearings

East Fascia (West bound)

		Point of Load		MAX F.A. Speed		Head End	
		At Point of	Allowable			At Point of	Allowable
		Load	Hydraulic Pressure	Load		Hydraulic Pressure	Hydraulic Pressure
1	52						
5	3	24703	4793	28590		3003	3883
9	4	18531	3889	18443		2393	2883
10	5	14323	2973	12854		2593	2393
12	8	12554	2555	10295		1993	1983
14	7	10523	2093	8524		1713	1713
15	8	9293	1723	772		1403	1493
16	9	8393	1693	6593		1333	1333
20	10	7413	1433	5177		1193	1193
22	11	6733	1303	5043		1053	1053
24	12	6177	1183	5163		1009	1003
25	12	5762	1167	4752		923	923
26	14	5355	1023	4412		867	877
30	15	4842	893	4113		805	805
32	16	4933	893	3951		793	793
33.92	16.96	4371	849	3642		707	707



Bridge #12, M.P. 118.46
South Fascia (South Bound)

FLANGE SHEET:

Pull Jack System Required
Restrained at Pier #1 and Fixed at 1st Int. Diaphragm
Max Allowable pressure: $f_b = M / S$
where $f_b = 20 \text{ ksi}$

$S = I_d / y$
Girder: W30 x 108
Flange thickness: 0.76
Flange width: 10.475
Cover plate thickness: 0
Cover plate width: 0

$S_{yy} = S \{ \text{cover plate} \} + S \{ \text{flange} \}$
 $S_{yy} = 18.50 \text{ cubic inches}$
therefore max allowable moment:

48 ton Jack effective area
Moment @ point of Load = $2 \times P \times (a/2 + b/2) \times 1.43$
 $P = 7244$

Allowable Hydraulic Pressure = $P / \text{Cylinder area of Jack}$
 $= 3422$

When $a \leq b$:
 $M = P \times a \times b/2$
 $I_d = 142$

When $a > b$:
 $M = P \times a \times b/2$
 $I_d = 142$

When $a \leq b$:
 $M = P \times a \times b/2$
 $I_d = 142$

When $a > b$:
 $M = P \times a \times b/2$
 $I_d = 142$

When $a \leq b$:
 $M = P \times a \times b/2$
 $I_d = 142$

When $a > b$:
 $M = P \times a \times b/2$
 $I_d = 142$

	a	b	I	Allowable Hyd. Pressure	Max. Pressure	Allowable Hyd. Pressure	Max. Pressure	Allowable Hyd. Pressure	Max. Pressure
6	23.65	142.04	142.04	2657	15883	2657	15883	2657	15883
8	22.45	142.04	142.04	2657	15883	2657	15883	2657	15883
7	21.85	141.73	141.73	2657	15883	2657	15883	2657	15883
6	20.85	141.35	141.35	2657	15883	2657	15883	2657	15883
9	19.85	140.98	140.98	2657	15883	2657	15883	2657	15883
10	18.65	140.60	140.60	2657	15883	2657	15883	2657	15883
11	17.82	140.27	140.27	2657	15883	2657	15883	2657	15883
12	16.95	139.94	139.94	2657	15883	2657	15883	2657	15883
13	16.05	139.60	139.60	2657	15883	2657	15883	2657	15883
14	14.85	139.27	139.27	2657	15883	2657	15883	2657	15883
15	13.85	138.94	138.94	2657	15883	2657	15883	2657	15883
16	12.85	138.60	138.60	2657	15883	2657	15883	2657	15883
17	11.85	138.27	138.27	2657	15883	2657	15883	2657	15883
18	10.85	137.94	137.94	2657	15883	2657	15883	2657	15883
19	9.85	137.60	137.60	2657	15883	2657	15883	2657	15883
20	8.85	137.27	137.27	2657	15883	2657	15883	2657	15883
21	7.85	136.94	136.94	2657	15883	2657	15883	2657	15883
22	6.85	136.60	136.60	2657	15883	2657	15883	2657	15883
23	5.85	136.27	136.27	2657	15883	2657	15883	2657	15883
24	4.85	135.94	135.94	2657	15883	2657	15883	2657	15883
25	3.85	135.60	135.60	2657	15883	2657	15883	2657	15883
26	2.85	135.27	135.27	2657	15883	2657	15883	2657	15883

Bridge #12, M.P. 118.46

Fascia's (North Bound & South Bound)
Maximum Preload for Flange Rotation:

$M = \text{Maximum Preload Stress} \times 20 \text{ ksi}$

$M = P \times L$

$S = I_d / y$

GIRDER SIZE: W30 x 108

$b_w = 0.345$

$b_f = 10.475$

$a = 0.76$

Top cover plate: 10.475

Bottom cover plate: 10.475

$L = \text{width of cover plate} / 2$

$M = P \times L$

$P = f_b \times (b_w \times L) \times 1$

Assume $b_w = 10 \times L$

$P = 1854 \text{ lbs.}$

Allowable Hydraulic Pressure

Allowable Pressure $P / \text{Cylinder Area of Jack}$

Exceeds 25 ton

Cylinder Area of Jack: 5.15 square inches

Allowable Pressure: 360 P.S.I.

Bridge #12 Fascia's (North & South Bound)

W30 x 108

Repair Tolerances: (Section 12, Dimensional Tolerances, New York State Steel Construction Manual)

Straightness: $7/8"$ or shall not exceed $1/8"$ in a ten foot test length

W of Flange: Combined warpage and tilt of flange must not exceed $1/16"$ when measured from a point at the center of the web to toe of flange

Deviation From Girder Vertical Alignment: $5/16"$

Deviation From Flatness of Girder Web: $9/16"$

Any other tolerances should be in accordance with Section 12 of NYSCSA

Note: At specific areas such as points of impact, web punctures, etc. These tolerances may be exceeded subject to approval of Chief Engineer

Tolerances for Grinding Repair Scrapes & Gouges:

Flange Thickness	0.76
Flange Width	10.43
Web Thickness	0.55
Web Depth	23.36
Coverplate Thickness	0.60
Coverplate Width	0.60
20% of Flange Thickness	0.15 3/16"
20% of Web Thickness	0.11 1/8"
20% of Coverplate Thickness	0.09
5% of Flange Width	0.52 1/2"
5% of Coverplate Width	0.00
5% of Flange Cross Sectional Area	0.40 in \times 2
5% of Web Cross Sectional Area	0.77 in \times 2
5% of Coverplate Cross Sectional Area	0.60

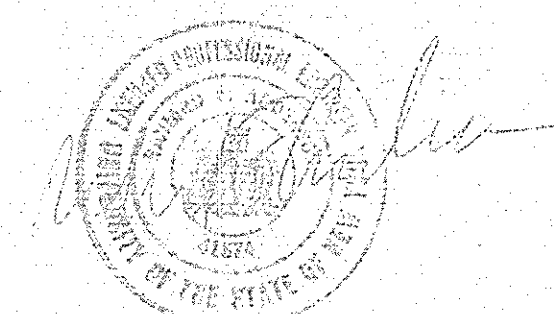
Notes:

- Clean all steel surfaces within 12 inches of any repair area as determined by Engineer. For purposes of this work, a repair area is defined as any location that has been distorted as a result of the impact; welds joining member components within the distorted area, including connection plates at locations where fasteners are to be replaced; and any base metal that is to be heated, flame cut, welded, ground or tested. When cleaning areas to be heated or welded, it is intended that both sides of the member be cleaned, i.e., both sides of the web, flange, connection plate, etc.
- Perform initial magnetic particle tests within 12 inches of the above repair areas, including welds and base metal, to determine presence of cracks. If cracks are found and confirmed, flame straightening operations will not be allowed to begin until the crack has been repaired to the satisfaction of the Engineer. The cost of repairs to cracks that have not been included in the specific work required for a given structure will be paid for under the provisions of Item 25590.999799. After all required repairs are complete, perform magnetic particle tests within 12 inches of all areas that were a) heated, b) straightened, c) ground to remove scrapes, or d) welded.
- Ultrasonic test all new complete penetration groove welds made to repair cracks, install new sections of member components, etc., and all gouges repaired by welding.
- As-built drawings will be completed by Vector Construction Corporation showing heating locations, cracks, major discontinuities, and repair welds.

New York State
Thruway Authority
FINAL SHOP DRAWING REVIEW

Approved By: _____
Approved As Noted: _____
Approved For Revision No. _____

By: _____ Date: 9-1-95



REV. 12345 DEC 2, 1994

BRIDGE LOCATION #12, M.P. 118.46

BASE CIRCULAR OVER I-190

EXHIBIT COUNTY

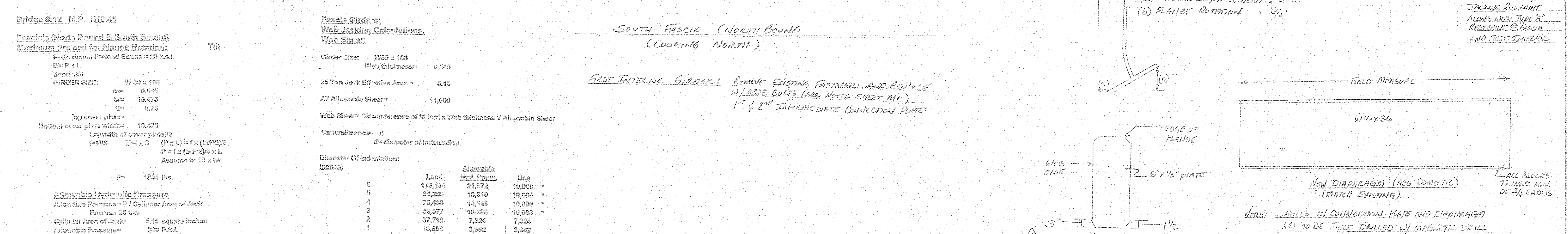
DATE: 9-1-95

APPROVED BY: T. BUCKLEY

ITEM: 25590.51012 - STRUCTURAL STEEL REPAIRS

VECTOR CONSTRUCTION CORPORATION

DRAWING NUMBER: 12345

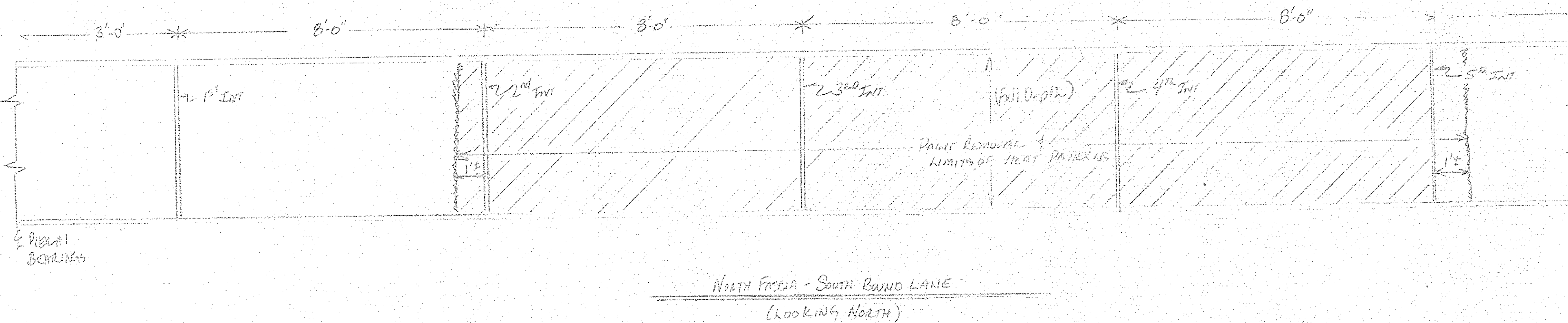
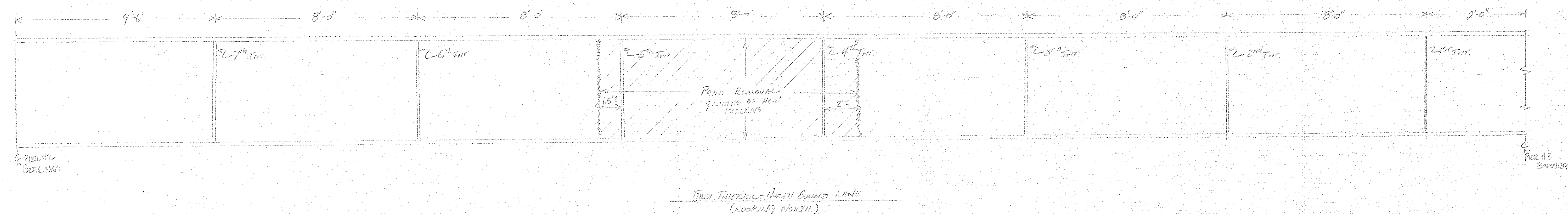
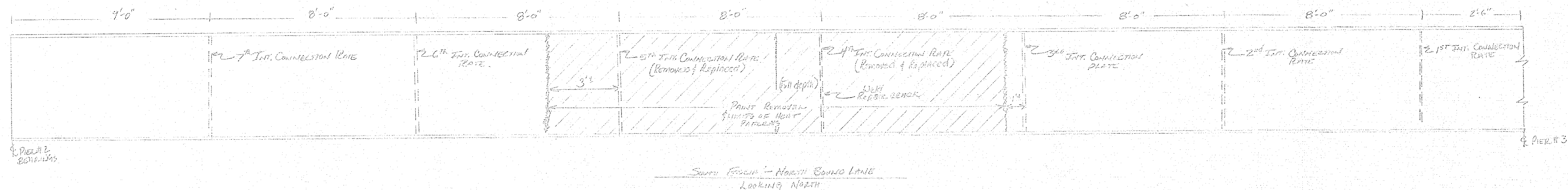


IF JACKING, RESTRAINTS OR INTERMEDIATE BRACING IS RELEASED FROM POSITIONS SHOWN ON THIS SHEET, THE ALLOWABLE LOAD WILL BE RECALCULATED AND APPROVED BY CHIEF ENGINEER - FOR ADDITIONAL LOADS SEE SHEET BR-11.3

5% of Composite Slab Width	0.00
5% of Flange Cross Sectional Area	0.46 in ²
5% of Web Cross Sectional Area	0.77 in ²
5% of Composite Cross Sectional Area	0.00

DATE: 08/04/00	APPROVED BY: T. HODGES
FROM: 85490.540112 - STRUCTURAL STEEL REPAIRS	
DRAWING NUMBER: BR-11.1 (REV.)	

VOORDE CONSTRUCTION CORPORATION



- Bridge #11 (M.P. 913.54)
Railroad (Cortell) over I-190
(Bridge repairs accepted)
- South Fasia (North bound):**
- 1.) Girder straightened with heat patterns & jacks.
 - 2.) Removed and replaced rivets with A325 fasteners at fourth, fifth, and sixth intermediate connection plates.
 - 3.) Removed and replaced fourth & fifth intermediate connection plates.
 - 4.) Repaired crack at fourth intermediate connection plate (Passed Ultrasonic inspection test).
 - 5.) Ground out scrapes on bottom flange at point of impact.
- First Interior (North bound):**
- 1.) Girder straightened with heat patterns & jacks.
 - 2.) Removed and replaced rivets with A325 fasteners at fourth, fifth, and sixth intermediate connection plates.
 - 3.) Ground out scrapes on bottom flange at point of impact.
- North Fasia (South bound):**
- 1.) Girder straightened with heat patterns & jacks.
 - 2.) Removed and replaced rivets with A325 fasteners at second and third intermediate connection plates.
 - 3.) Ground out scrapes on bottom flange at point of impact.
- First Interior (South bound):**
- 1.) No heat patterns required.
 - 2.) Removed and replaced rivets with A325 fasteners at second and third intermediate connection plates.

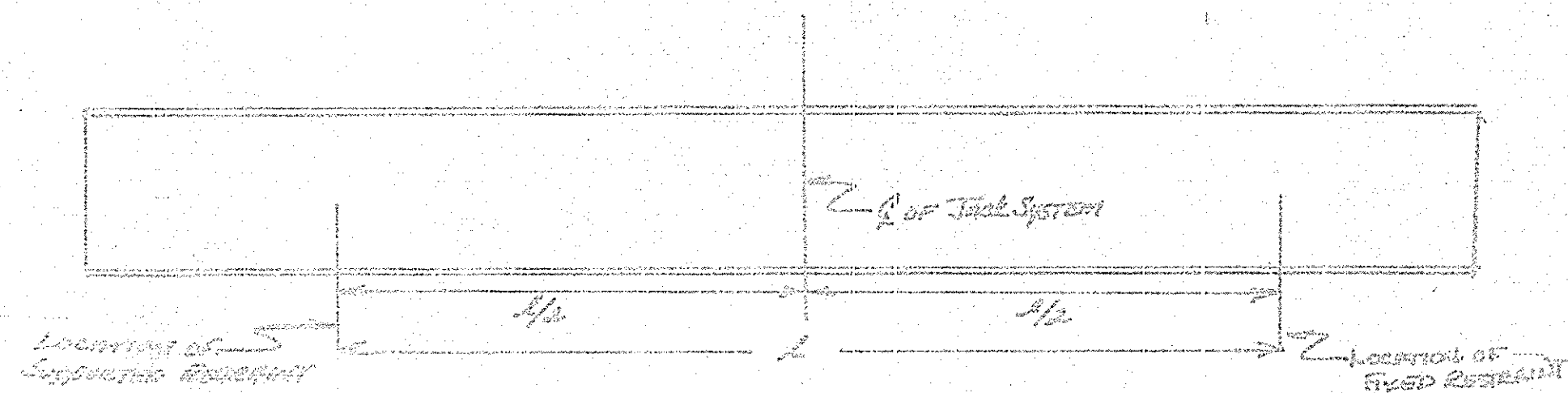
New York State
Thruway Authority
FINAL SHOP DRAWING REVIEW

Approved ☒ Approved As Noted ☐ Approved For Revision No. _____

By: *[Signature]* Date: 9-1-98

AS-BUILT REVISIONS
As-Built 10/14/98

10-97-088 DE18378		DRAWN BY	
BRIDGE LOCATION #14, M.P. 913.54		J. J. J. J.	
CONTRACT #482-1-190		DATE	
ITEM # 25690.5001 REPAIR OF BRIDGE STRUCTURE		APPROVED BY	
As-Built		J. J. J. J.	
VECTOR CONSULTING CORPORATION		DRAWING NUMBER	
		DE18378	



See Tables Below for Allowable Passenger Train
Remains Placed at Various Distances.

Bridge No. 11 M.P. 913.54
Fascia & Interior Girder (North & South Bound)

FLANGE SPACER

Put Jack Spacing Method
Flange at one end and supported at other (Dimensions shown)
Max. Allowable moment is 10 ft 10
where for 20 ksi
S = 10 ft 20
Girder W8 x 20
Range thickness 1.20
Range width 10.47
cover plate thickness 0
cover plate width 0

Spac 8 (cover plate) = 8 (Range)
Spac 8 66.38 cubic inches
therefore max allowable moment

M (with cover plate) = 1135236

Spac 8 (Range) = 86.89 cubic inches
therefore max allowable moment
M (without cover plate) = 1135236

20 ton Jack effective area = 2.45

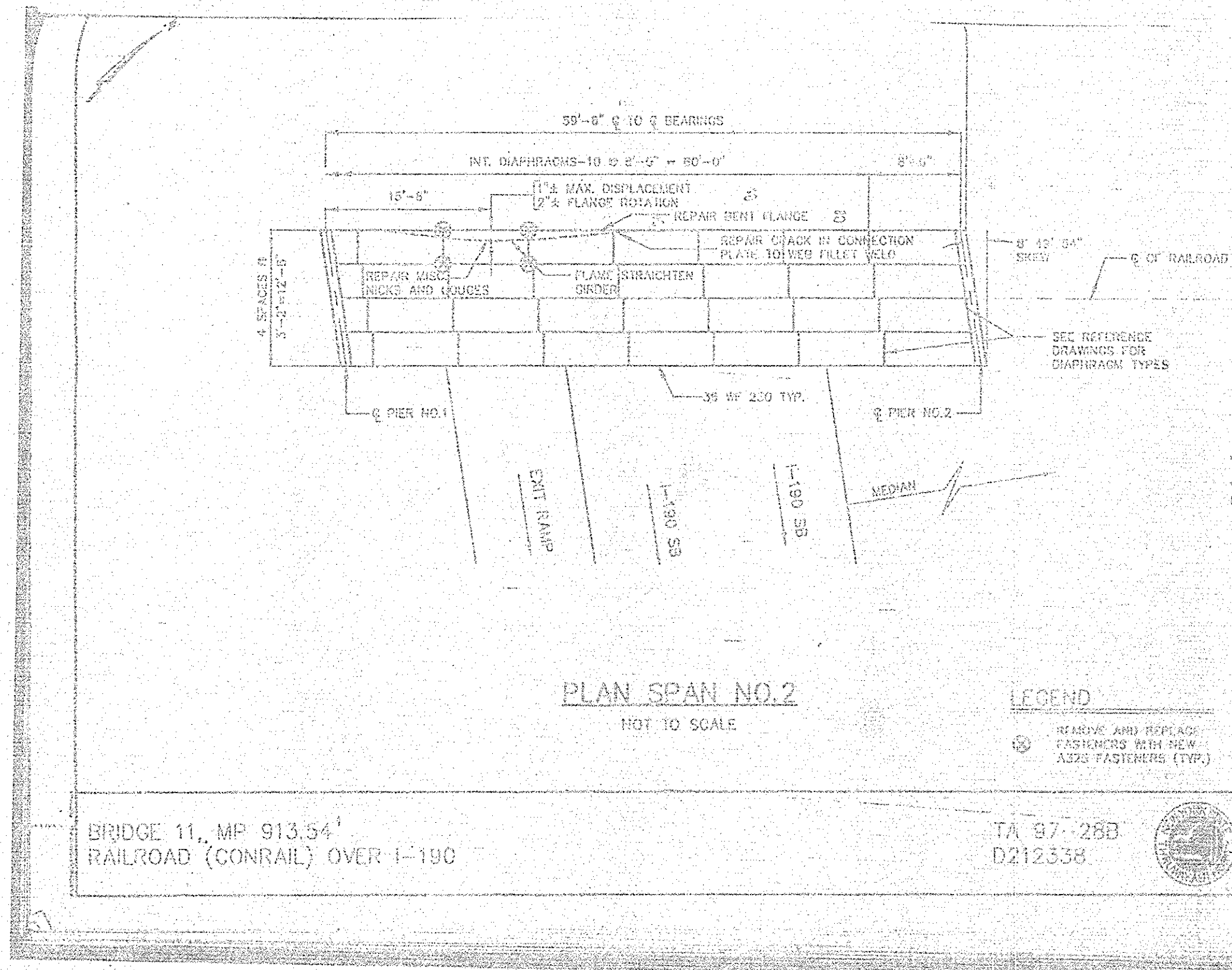
66 (max) at fixed end = 15
66 (max) at fixed end = 15
66 (max) at fixed end = 15

East Fascia (West bound)

With Jack located @ 90.17 ft From Pier No. 1

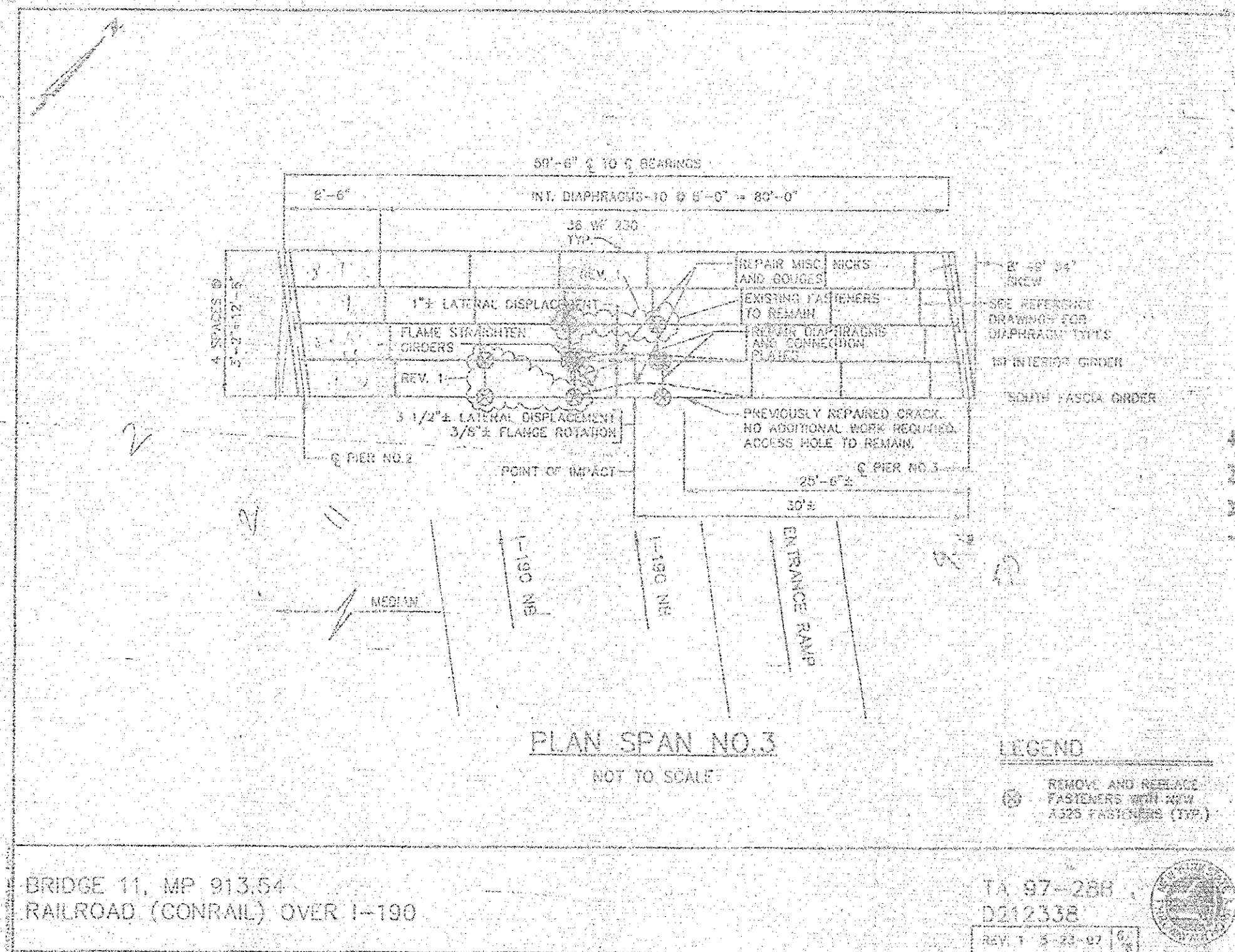
Dist	Point of Load	Max. Fatigue	Allowable
1	1000	1000	1000
2	101271	1000	1000
3	102542	1000	1000
4	103813	1000	1000
5	105084	1000	1000
6	106355	1000	1000
7	107626	1000	1000
8	108897	1000	1000
9	110168	1000	1000
10	111439	1000	1000
11	112710	1000	1000
12	113981	1000	1000
13	115252	1000	1000
14	116523	1000	1000
15	117794	1000	1000
16	119065	1000	1000
17	120336	1000	1000
18	121607	1000	1000
19	122878	1000	1000
20	124149	1000	1000
21	125420	1000	1000
22	126691	1000	1000
23	127962	1000	1000
24	129233	1000	1000
25	130504	1000	1000
26	131775	1000	1000
27	133046	1000	1000
28	134317	1000	1000
29	135588	1000	1000
30	136859	1000	1000
31	138130	1000	1000
32	139401	1000	1000
33	140672	1000	1000
34	141943	1000	1000
35	143214	1000	1000
36	144485	1000	1000
37	145756	1000	1000
38	147027	1000	1000
39	148298	1000	1000
40	149569	1000	1000
41	150840	1000	1000
42	152111	1000	1000
43	153382	1000	1000
44	154653	1000	1000
45	155924	1000	1000
46	157195	1000	1000
47	158466	1000	1000
48	159737	1000	1000
49	161008	1000	1000
50	162279	1000	1000
51	163550	1000	1000
52	164821	1000	1000
53	166092	1000	1000
54	167363	1000	1000
55	168634	1000	1000
56	169905	1000	1000
57	171176	1000	1000
58	172447	1000	1000
59	173718	1000	1000
60	174989	1000	1000
61	176260	1000	1000
62	177531	1000	1000
63	178802	1000	1000
64	180073	1000	1000
65	181344	1000	1000
66	182615	1000	1000
67	183886	1000	1000
68	185157	1000	1000
69	186428	1000	1000
70	187699	1000	1000
71	188970	1000	1000
72	190241	1000	1000
73	191512	1000	1000
74	192783	1000	1000
75	194054	1000	1000
76	195325	1000	1000
77	196596	1000	1000
78	197867	1000	1000
79	199138	1000	1000
80	200409	1000	1000
81	201680	1000	1000
82	202951	1000	1000
83	204222	1000	1000
84	205493	1000	1000
85	206764	1000	1000
86	208035	1000	1000
87	209306	1000	1000
88	210577	1000	1000
89	211848	1000	1000
90	213119	1000	1000
91	214390	1000	1000
92	215661	1000	1000
93	216932	1000	1000
94	218203	1000	1000
95	219474	1000	1000
96	220745	1000	1000
97	222016	1000	1000
98	223287	1000	1000
99	224558	1000	1000
100	225829	1000	1000

See and Remarks can be moved anywhere along the bridge and within the allowable loads and spacing
to Re-Build Distance.



BRIDGE 11, MP 913.54
RAILROAD (CONRAIL) OVER I-190

TA 97-28B
D212338



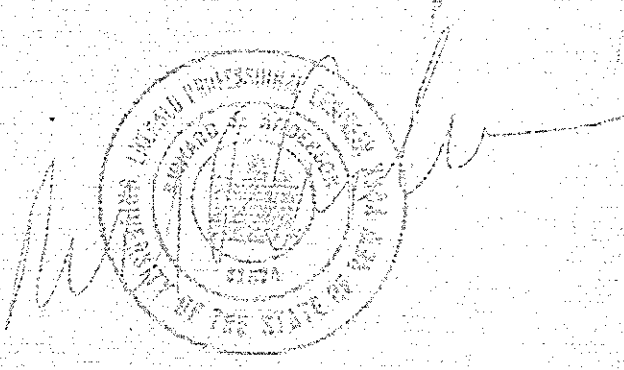
BRIDGE 11, MP 913.54
RAILROAD (CONRAIL) OVER I-190

TA 97-28B
D212338

New York State
Thruway Authority
FINAL SHOP DRAWING REVIEW

Approved by: *[Signature]*
Approved by: *[Signature]*
Approved by: *[Signature]*

By: *[Signature]* Date: 9-1-16



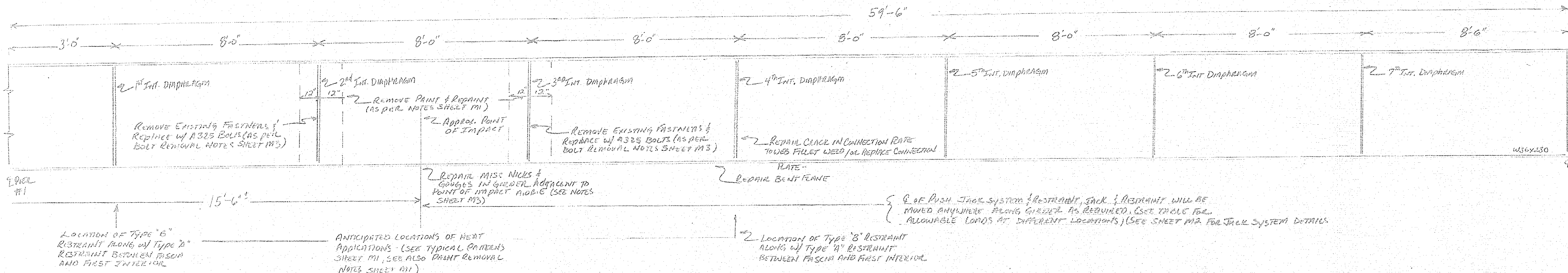
TR 97-28B D212338
BRIDGE 11, MP 913.54
RAILROAD (CONRAIL) OVER I-190

SCALE: *[Blank]* APPROVED BY: *[Signature]*

DATE: *[Blank]* DRAWING NUMBER: *[Blank]*

Rev 1 05070 04/01/11 STRUCTURAL STEEL REPAIRS

Revised Construction Corporation



Bridge #11 N.P. N13.04
North Fascia (South Bound)

FLANGE SHEAR

Push Jack System Required

Restrainted at 1st Int. Diaphragm and Fixed at 4th Int. Diaphragm.
Max. Allowable moment: $M = 18 / S$
where $M = 20 \text{ ksi}$

$S = b d^2 / 6$
Girder = W36 x 230
Flange thickness = 1.26
Flange width = 16.47
Cover plate thickness = 0
Cover plate width = 0

$S_y = S (\text{cover plate}) + S (\text{flange})$
 $S_y = 58.85 \text{ cubic inches}$
therefore max allowable moment:

$M = 18 / S$
 $M = 18 / 58.85$
 $M = 0.306 \text{ k-ft}$
25 ton Jack effective area = 5.15

Moment @ point of Load = $2 \times P \times (a^2/2 + b^2/2) / L^3$
 $M = 48344$

Allowable Hydraulic Pressure = $P / \text{Cylinder area of Jack}$
 $M = 8898$

When $a < b$:
 $M1 = \frac{P \times a \times b^2}{L^2}$

$P(M1) = \frac{M1 \times L^2}{a \times b^2}$

$P(M1) = 8388$
Allowable Hydraulic Pressure = $P / \text{Cylinder area of Jack}$
 $M1(\text{Allowable Hyd. Pressure}) = 12748$

When $a > b$:
 $M2 = \frac{P \times a^2 \times b}{L^2}$

$P(M2) = \frac{M2 \times L^2}{a^2 \times b}$

$P(M2) = 27632$
Allowable Hydraulic Pressure = $P / \text{Cylinder area of Jack}$
 $M2(\text{Allowable Hyd. Pressure}) = 8248$

			AS PL. OF LOAD	M1	M2	Allowable
			that Pressure	Allowable	Allowable	Hyd. Pressure
2	19	72742	14719	8555	22383	8893
3	18	83905	16935	8462	18387	8462
7	17	43041	8385	8249	12748	8249
9	16	46833	7777	8485	10370	8485
9	15	55097	6992	8344	8740	8344
10	14	63404	6201	8448	7885	8448
11	13	72742	5491	8712	6740	8712
12	12	83905	4777	9085	5418	9085
13	11	96833	4055	9562	4248	9562
14	10	111404	3333	10148	3240	10148
15	9	128597	2611	10849	2385	10849
16	8	148404	1889	11685	1687	11685
17	7	170933	1167	12662	1148	12662
18	6	206404	445	13895	788	13895
19	5	255933	173	15405	541	15405
20	4	320404	91	17248	385	17248
21	3	400933	45	19462	261	19462
22	2	500404	22	22148	137	22148

FOR ADDITIONAL LOADS SEE SHEET 22.11.94

Bridge #11 N.P. N13.04

Fascia & Interior Girders (North Bound & South Bound)

Maximum Preload for Flange Rotation:

$M = \text{Maximum Preload Stress} \times 20 \text{ k.s.i.}$

$M = P \times L$

$S = b d^2 / 6$

GIRDER SIZE: W 36 x 105

$t_w = 0.78$

$b_f = 16.47$

$t_f = 1.26$

Top cover plate: 16.47

Bottom cover plate width: 16.47

$L = \text{width of cover plate} / 2$

$P = f \times (b_f^2/2) / L$

$P = f \times (b_f^2/2) / L$

Assume $b_f = t_w$

$P = 3168 \text{ lbs.}$

Allowable Hydraulic Pressure

Allowable Pressure = $P / \text{Cylinder Area of Jack}$

Snag 25 ton

Cylinder Area of Jack: 5.15 square inches

Allowable Pressure: 621 P.S.I.

Fascia & Interior Girders:

Web Jacking Calculations:

Web Shear:

Girder Size: W36 x 230

Web thickness: 0.78

25 Ton Jack Effective Area = 5.15

A7 Allowable Shear: 11,000

Web Shear: Circumference of Indent x Web thickness x Allowable Shear

Circumference = d

$d = \text{diameter of indentation}$

Diameter Of Indentation:

Inches:

6

5

4

3

2

1

Load

Hyd. Press.

Use

147,793

131,494

105,195

78,897

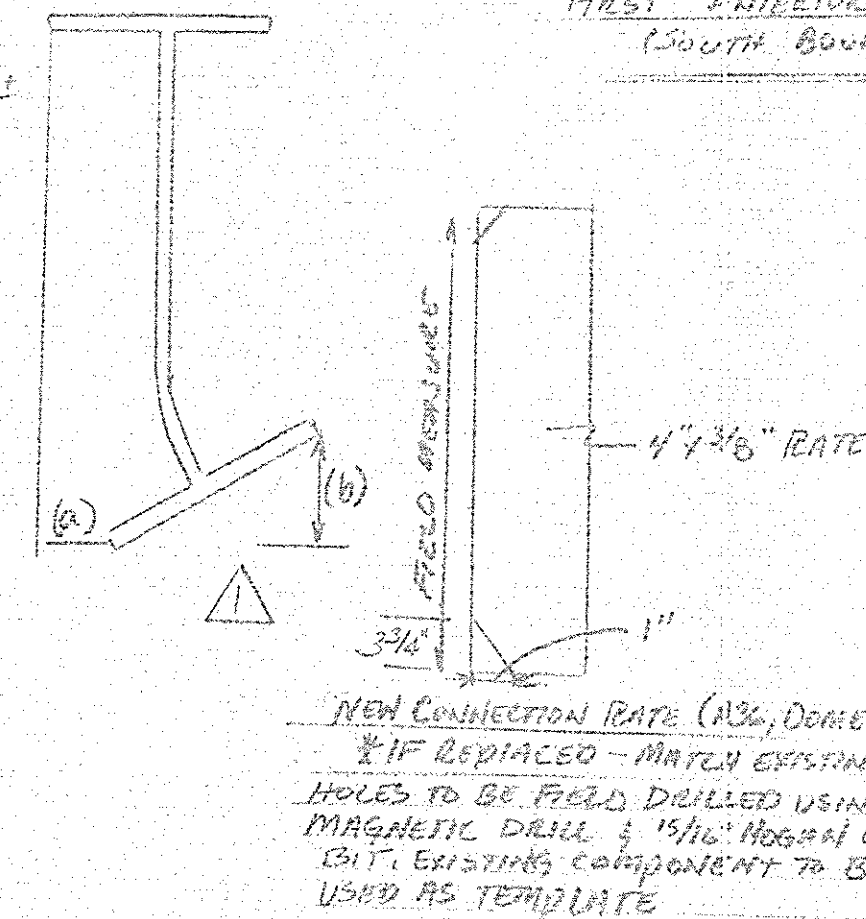
52,598

26,299

Governed by Jack Capacity

NORTH FASCIA (SOUTH BOUND)
LOOKING NORTH

(a) LATERAL DISPLACEMENT = 1"
(b) FLANGE ROTATION = 2"



Notes:

- Clean all steel surfaces within 12 inches of any repair area as determined by Engineer. For purposes of this work, a repair area is defined as any location that has been disturbed as a result of the impact, welds joining member components within the disturbed area, including connection plates at locations where fasteners are to be replaced; and any base metal that is to be heated, flame cut, welded, ground or tested. When cleaning areas to be heated or welded, it is included that both sides of the member be cleaned, i.e., both sides of the web, flange, connection plate, etc.
- Perform initial magnetic particle tests within 12 inches of the above repair areas, including welds and base metal, to determine presence of cracks. If cracks are found and confirmed, flame straightening operations will not be allowed to begin until the cracks have been repaired to the satisfaction of the Engineer. The cost of repairs to cracks that have not been included in the specific work required for a given structure will be paid for under the provisions of Item 25650.992799. After all required repairs are complete, perform magnetic particle tests within 12 inches of all areas that were heated, straightened, or ground to remove scrapes, or d) welded.
- Ultrasonic test all new complete penetration groove welds made to repair cracks, install new sections of member components, etc., and all gouges repaired by welding.
- As-built drawings will be completed by Vector Construction Corporation showing boring locations, cracks, major discontinuities, and repair welds.

Bridge #11 Fascia & Interior Girders (North & South Bound)

W36 x 230

Repair Tolerances: (Section 12, Dimensional Tolerances, New York State Steel Construction Manual)

Straightness: 3/4" or shall not exceed 1/8" in a ten foot test

length

Flange: Combined warpage and tilt of flange must not exceed 3/4" when measured from a point at the center of the web to toe of flange

Deviation From Girder Vertical Alignment: 7/16"

Deviation From Flatness of Girder Web: 3/8"

Any other tolerances should be in accordance with Section 12 of NYSSCM

Note: At specific areas such as points of impact, web punctures, etc. These tolerances may be exceeded subject to approval of Chief Engineer

Tolerances for Grinding Repair Scrapes & Gouges:

Flange Thickness: 4.26

Flange Width: 16.47

Web Thickness: 0.78

Web Depth: 36.39

Coverplate Thickness: 0.00

Coverplate Width: 0.00

20% of Flange Thickness: 0.25 1/8"

20% of Web Thickness: 3/16 1/8"

20% of Coverplate Thickness: 0.00

5% of Flange Width: 13/16 1/2"

5% of Coverplate Width: 0.00

5% of Flange Gross Sectional Area: 1.04 in^2

5% of Web Gross Sectional Area: 1.57 in^2

5% of Coverplate Gross Sectional Area: 0.00

New York State
Thruway Authority
FINAL SHOP DRAWING REVIEW

Approved By: *[Signature]*
Approved As Noted
Approved For Revision No. *[Blank]*

By: *[Signature]* Date: 9.1.99

TA 97-286 Data 338
BRIDGE LOCATION W 11, N 13.04
CONTRACT OVER I-190

DATE: *[Blank]* APPROVED BY: *[Blank]* DRAWN BY: *[Blank]*

ITEM: 45670.54011 STRUCTURAL STEEL REPAIRS

Vector Construction Corporation

DRAWING NUMBER: 22.11.94

Rev. 1 Dec 2, 1997

Shop Drawings
TA 97-28B
DRW 555

Bridge #11 M.P. N13.34
South Fascia (North Bound)

FLANGE SWEEP:
Push Jack System Required
Restrained at 3rd Int. Diaphragm and Fixed at 5th Int. Diaphragm.
Max Allowable moment $M = \frac{P \cdot L}{8}$
where $P = 20$ ksi
 $L = 54' - 6"$
Girder $W36 \times 230$
Flange thickness = 1.28
Flange width = 16.47
Cover plate thickness = 0
Cover plate width = 0

$S_{xx} = S(\text{cover plate}) + S(\text{flange})$
 $S_{xx} = 86.55$ cubic inches
therefore max allowable moment:
 $M = 1139295$
 $I = 16$
 $S = 8$
 $b = 5.15$

25 ton Jack effective area = 5.15
Moment @ point of Load = $2 \times P \times (a^2 \times b^2) / L^3$
 $P = 47471$
Allowable Hydraulic Pressure = $P / \text{Cylinder area of Jack}$
= 9218

When $a < b$:
 $M1 = \frac{P \times a \times b^2}{L^2}$
 $P(M1) = \frac{M1 \times L^2}{a \times b^2}$
47471
Allowable Hydraulic Pressure = $P / \text{Cylinder area of Jack}$
= 9218

When $a > b$:
 $M2 = \frac{P \times a^2 \times b}{L^2}$
 $P(M2) = \frac{M2 \times L^2}{a^2 \times b}$
47471
Allowable Hydraulic Pressure = $P / \text{Cylinder area of Jack}$
= 9218

At Pt. of Load	M1 Allowable Hyd. Pressure	M2 Allowable Hyd. Pressure	Allowable Hyd. Pressure
1	49167	12035	12035
2	249810	9505	9505
3	127537	8195	8195
4	64592	7601	7601
5	54079	7855	7855
6	50811	8323	8323
7	49559	8513	8513
8	47471	9218	9218
9	48509	10702	10702
10	52511	13199	13199
11	64275	17462	17462
12	84552	24530	24530
13	127637	40357	40357
14	249810	84275	84275
15	49477	167801	167801

If jacking restraint or intermediate blocking is released from position shown on this sheet, the allowable loads will be recalculated and applied by Chief Engineer.

For Additional Loads See Sheet DRW 555

Bridge #11 M.P. N13.34
Fascia & Interior Girders (North Bound & South Bound)
Maximum Preload for Flange Rotation:
f = Maximum Preload Stress = 20 k.s.i.
 $M = P \times L$
 $S = bd^2/6$
GIRDER SIZE: W36 x 230
 $I_{xx} = 16$
 $b = 16.47$
 $t_f = 1.28$

Top cover plate = 16.47
Bottom cover plate width = 16.47
 $L = \text{width of cover plate} / 2$
 $f = f \times 5$
 $P = f \times (bd^2/6) \times L$
Assume $b = 16 \times w$
 $P = 3193$ lbs.

Allowable Hydraulic Pressure
Allowable Pressure = $P / \text{Cylinder Area of Jack}$
Empac 25 ton
Cylinder Area of Jack = 5.15 square inches
Allowable Pressure = 621 P.S.I.

Bridge #11 Fascia & Interior Girders (North & South Bound)
W36 x 230
Repair Tolerances: (Section 12, Dimensional Tolerances, New York State Steel Construction Manual)

Straightness: 3/4" or shall not exceed 1/8" in a ten foot test length
Tilt of Flange: Combined warpage and tilt of flange must not exceed a 1/4" when measured from a point at the center of the web to toe of flange

Deviation From Girder Vertical Alignment: 7/16"
Deviation From Flatness of Girder Web: 3/16"

Any other tolerances should be in accordance with Section 12 of NYSSCM

Note: At specific areas such as points of impact, web punctures, etc. These tolerances may be exceeded subject to approval of Chief Engineer

Tolerances for Grinding Repair Scrapes & Gouges.

Flange Thickness	Flange Width	Web Thickness	Web Depth	Coverplate Thickness	Coverplate Width
1.28	16.47	0.76	33.38	0.00	0.00
20% of Flange Thickness	20% of Web Thickness	20% of Coverplate Thickness	5% of Flange Width	5% of Flange Width	5% of Coverplate Width
0.25 1/8"	3/16" 1/8"	0.00	12/16" 1/2"	0.00	1.04 in *2
					1.27 in *2
					0.00

New York State
Thruway Authority
FINAL SHOP DRAWING REVIEW
Approved: [Signature]
Date: 7-1-78

Flange Thickness = 1.28
Flange Width = 16.47
Web Thickness = 0.76
Web Depth = 33.38
Coverplate Thickness = 0.00
Coverplate Width = 0.00

20% of Flange Thickness = 0.25 1/8"
20% of Web Thickness = 3/16" 1/8"
20% of Coverplate Thickness = 0.00
5% of Flange Width = 12/16" 1/2"
5% of Flange Width = 0.00
5% of Flange Width = 1.04 in *2
5% of Web Cross Sectional Area = 1.27 in *2
5% of Coverplate Cross Sectional Area = 0.00

**SECTION 6
PREPARATION OF BASE METALS**

6.1. OXYGEN CUTTING - GENERAL

Steel and weld metal may be oxygen cut provided a smooth and regular surface, free from cracks and notches is obtained. All oxygen cut surfaces shall be produced using a mechanically guided torch unless otherwise approved by the DCEB. Oxygen cut surfaces produced by a manually guided torch, when allowed, shall be smoothed by machining or grinding.

In all oxygen cutting, the cutting flame shall be adjusted and manipulated to avoid cutting beyond (leakage) the prescribed line. The roughness of oxygen cut surfaces shall not exceed the American National Standards Institute surface roughness value of 1000 microinches for material up to 4 inches thick and 2000 microinches for material 4 inches to 8 inches thick, except, at the dead ends of members where there is no calculated stress, the roughness shall not exceed 2000 microinches. Roughness exceeding these values and occasional notches or gouges no more than 1/4 inch deep on otherwise satisfactory surfaces shall be repaired by machining or grinding. Cut surfaces and edges shall be free of slag. Correction of discontinuities shall be made to the oxygen cut surfaces with a slope not exceeding 1 in 10.

Occasional notches or gouges that exceed 1/4 inch shall be repaired by welding. The repair of notches or gouges over 7/16 inch deep shall be referred to the DCEB prior to repair. Welding repairs shall be made by suitably preparing the discontinuity, welding with an approved process after preheating in accordance with Table 708 and grinding the completed weld smooth and flush with the adjacent surface to produce a workmanlike finish. All welded repairs to main material subject to tensile stress shall be tested by ultrasonic or radiographic inspection as determined by the DCEB.

Repair of Diaphragm Indentations
Plate Jacking Calculations.
Plate Shear:
 $\text{Web thickness} = 0.375$
25 Ton Jack Effective Area = 5.15
A7 Allowable Shear = 11,000
Web Shear = Circumference of Indent x Web thickness x Allowable Shear
Circumference = d
 $d = \text{diameter of indentation}$
Diameter Of Indentation:
Inches:
Load
Allowable Hyd. Press.
Use

Inches	Load	Allowable Hyd. Press.	Use
6	77,882	15,115	10,000 *
8	94,882	12,508	10,000 *
4	61,996	10,079	10,000 *
3	38,928	7,539	7,500 *
2	25,963	5,039	5,000 *
1	12,976	2,520	2,520 *

* Governed by Jack Capacity

Notes:
1. Clean all steel surfaces within 12 inches of any repair area as determined by Engineer. For purposes of this work, a repair area is defined as any location that has been distorted as a result of the impact; welds joining member components within the distorted area, including connection plates at locations where fasteners are to be replaced; and any base metal that is to be heated, flame cut, welded, ground or tested. When cleaning areas to be heated or welded, it is intended that both sides of the member be cleaned, i.e., both sides of the web, flange, connection plate, etc.
2. Perform initial magnetic particle tests within 12 inches of the above repair areas, including welds and base metal, to determine presence of cracks. If cracks are found and confirmed, flame straightening operations will not be allowed to begin until the crack has been repaired to the satisfaction of the Engineer. The cost of repairs to cracks that have not been included in the specific work required for a given structure will be paid for under the provisions of item 25690.999799.
3. After all required repairs are complete, perform magnetic particle tests within 12 inches of all areas that were a) heated, b) straightened, c) ground to remove scrapes, or d) welded.
4. Ultrasonic test all new complete penetration groove welds made to repair cracks, install new sections of member components, etc., and all gouges repaired by welding.
5. As-built drawings will be completed by Vector Construction Corporation showing heating locations, cracks, major discontinuities, and repair welds.

Rev 11-288 Date 2/3/78
BRIDGE LOCATION N.H. MAP N13.34
SHEET 1 OF 1
SCALE: APPROVED BY: T. ANDERSON
ITEM: 26690.540111 STRUCTURAL STEEL REPAIRS
DRAWING NUMBER: 26690.540111