

STATE OF OHIO  
DEPARTMENT OF TRANSPORTATION

# ERI/LOR-2-22.24/0.23

## BERLIN & VERMILION TOWNSHIPS ERIE COUNTY

## CITY OF VERMILION BROWNHELM TOWNSHIP LORAIN COUNTY

MICROFILMED  
JUN 23 1997

PROJECT DESCRIPTION

UPGRADING 9.01 MILES OF STATE ROUTE 2 BY RESURFACING, INCLUDING NEW GUARDRAIL, SIGNING, PAVEMENT MARKINGS AND DRAINAGE, AND REHABILITATION OF BRIDGES OVER FRAILEY ROAD, N&W RAILROAD, CHAPPEL CREEK, SUGAR CREEK AND S.R. 60.

LIMITED ACCESS

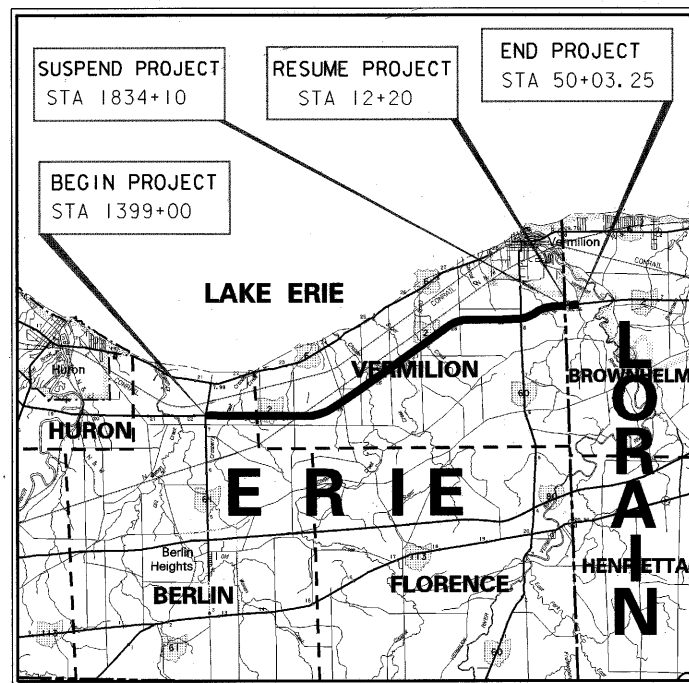
THIS IMPROVEMENT IS ESPECIALLY DESIGNED FOR THROUGH TRAFFIC AND HAS BEEN DECLARED A LIMITED ACCESS HIGHWAY OR FREEWAY BY ACTION OF THE DIRECTOR IN ACCORDANCE WITH THE PROVISIONS OF SECTION 5511.02 OF THE REVISED CODE OF OHIO.

1995 SPECIFICATIONS

THE STANDARD SPECIFICATIONS OF THE STATE OF OHIO, DEPARTMENT OF TRANSPORTATION, INCLUDING CHANGES AND SUPPLEMENTAL SPECIFICATIONS LISTED IN THE PROPOSAL SHALL GOVERN THIS IMPROVEMENT.

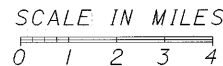
I HEREBY APPROVE THESE PLANS AND DECLARE THAT THE MAKING OF THIS IMPROVEMENT WILL NOT REQUIRE THE CLOSING TO TRAFFIC OF THE HIGHWAY AND THAT PROVISIONS FOR MAINTENANCE AND SAFETY OF TRAFFIC WILL BE SET FORTH ON THE PLANS AND ESTIMATES.

UNDER AUTHORITY OF SECTION 4511.21, DIVISION (1) OF THE REVISED CODE OF OHIO, THE REVISED PRIMA FACIE SPEED LIMITS AS INDICATED HEREIN ARE DETERMINED TO BE REASONABLE AND SAFE, AND ARE HEREBY ESTABLISHED FOR THE DURATION OF THIS PROJECT. THE PRIMA FACIE SPEED LIMIT OR LIMITS HEREBY ESTABLISHED SHALL BECOME EFFECTIVE WHEN APPROPRIATE SIGNS GIVING NOTICE THEREOF ARE ERECTED.



LOCATION MAP

LATITUDE: 41°23'50" N LONGITUDE: 82°23'10" W



PORTION TO BE IMPROVED \_\_\_\_\_  
STATE & FEDERAL ROUTES \_\_\_\_\_  
OTHER ROADS \_\_\_\_\_

DESIGN DESIGNATION

CURRENT ADT (1995)	16,900
DESIGN YEAR ADT (2015)	27,040
D.H.V.	3,240
D	60%
T	13%
DESIGN SPEED	70 MPH
LEGAL SPEED	65 MPH

FUNCTIONAL CLASSIFICATION - FREEWAY (RURAL)

DESIGN EXCEPTION:

DESIGN FEATURE	APPROVAL DATES
SHOULDER WIDTH	8-23-93
HORIZONTAL CLEARANCE	8-23-93

INDEX OF SHEETS:

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NOTE: ALL REFERENCES OF ERI/LOR-2-22.24/0.00 SHALL BE CONSIDERED TO READ ERI/LOR-2-22.24/0.23

STANDARD CONSTRUCTION DRAWINGS

STANDARD CONSTRUCTION DRAWINGS										SUPPLEMENTAL SPECIFICATIONS			
BP-1.1	2-21-92	GR-3.1	5-6-91	MT-95.31	10-10-88	MT-99.10	11-14-86	TC-41.20	6-21-94	AS-1-81	9-15-94	802	3-23-95
BP-2.1	10-28-94	GR-3.2	5-6-91	MT-95.32	8-25-89	MT-99.20	4-29-88	TC-41.50	6-21-94			815	7-17-95
BP-2.2	10-28-94	GR-4.2	5-6-91	MT-98.12	6-24-93	MT-105.10	7-1-92	TC-42.10	8-19-77	EXJ-4-87	1-20-94	820	6-14-95
BP-2.4	2-21-92	GR-7.1	10-30-92	MT-95.30	10-10-88	MT-105.11	7-1-92	TC-42.20	3-26-79			903	7-17-95
BP-2.5	2-21-92	GR-8.1	1-31-94	MT-95.40	10-1-92			TC-51.11	9-30-94	RB-1-55	2-2-59	910	7-17-95
BP-3.1	2-21-92	GR-5.3	10-30-92	MT-97.10	4-29-88			TC-51.12	1-3-94			921	6-14-95
BP-5.1	10-28-94	HW-4A	4-1-80							SD-1-69	6-12-69	924	6-14-95
BP-6.1	2-21-92	MH-1	12-18-84	MT-98.13	6-24-93	PCB-91	4-24-92	TC-52.10	4-3-79				
CB-3A	5-1-79	MC-4	7-26-76	MT-98.14	6-24-93			TC-52.20	4-3-79			931	7-17-95
CB-4	11-10-83	MC-9.4	10-30-92	MT-98.15	6-24-93			TC-61.10	4-5-82	HL-10.13	5-1-87	933	7-17-95
GR-1.1	5-6-91	MC-9.2	5-6-91	MT-98.16	6-24-93	TC-18.24	4-25-79	TC-65.10	2-1-90	HL-20.14	5-1-87	942	6-14-95
GR-1.2	10-30-92	MC-9.3	10-30-92	MT-98.17	4-25-94	TC-31.21	9-1-92	TC-65.11	2-1-90	HL-30.31	5-1-87	944	3-23-95
GR-1.3	2-21-92	MC-10	5-1-76	MT-98.18	4-25-94	TC-35.10	8-29-84	TC-65.12	2-1-90	HL-50.21	5-1-87		
GR-2.1	5-6-91	MH-3	12-18-84			TC-41.10	8-29-84					902	6-14-95
GR-4.1	5-6-91	MH-2	6-12-75					TC-72.20	2-26-82			923	6-14-95

**UNDERGROUND UTILITIES**  
TWO WORKING DAYS  
**BEFORE YOU DIG**  
CALL 1-800-362-2764 (TOLL FREE)  
OHIO UTILITIES PROTECTION SERVICE  
NON-MEMBERS  
MUST BE CALLED DIRECTLY

PLAN PREPARED BY:  
DISTRICT THREE  
LOCATION & DESIGN

APPROVED James D. Maudson  
DATE 8-18-95 DISTRICT DEPUTY DIRECTOR,  
DEPARTMENT OF TRANSPORTATION

APPROVED Richard L. Engel  
DATE 9-26-95 ENGINEER, BUREAU OF BRIDGES  
AND STRUCTURAL DESIGN

APPROVED Paradise Howard  
DATE 10-23-95 DEPUTY DIRECTOR, PROJECT MGMT.

APPROVED Doug Young  
DATE 10-23-95 DIRECTOR, DEPARTMENT OF  
TRANSPORTATION

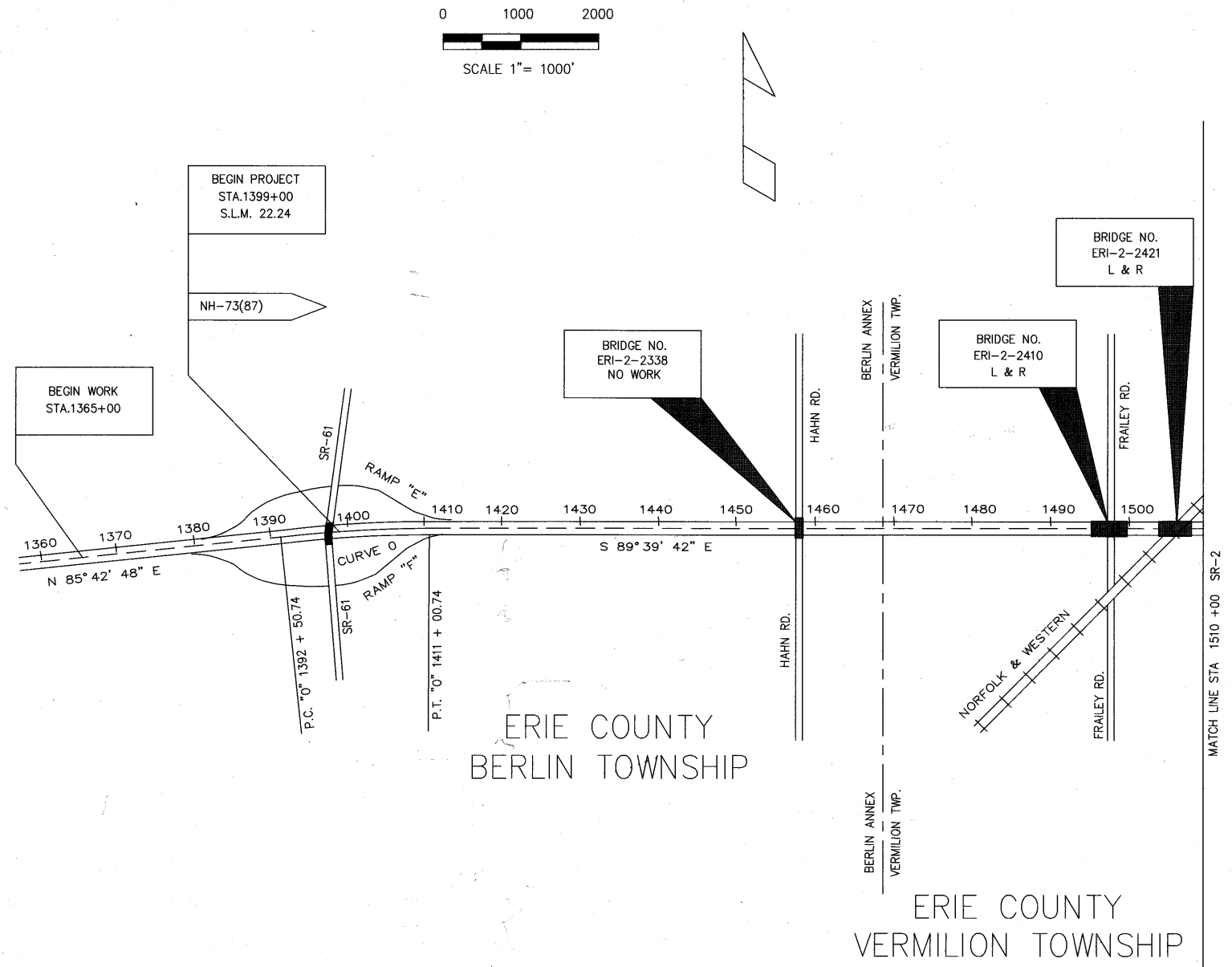
96090 ERI-2-22.22  
187PGS  
02-28-96

DESIGN FILE: c:\dwg\02\11\el1.dgn  
WORKSTATION: sjuzwk DATE: 16-AUG-1995

FEDERAL PROJECT NO. NH-73(87)  
 PID NO. 8442  
 CONSTRUCTION PROJECT NO.  
 RAILROAD INVOLVEMENT  
 NORFOLK & WESTERN  
 ERI/LOR-2-22.24/0.23  
 187

DATA FOR SR-2 VERTICAL CURVES MAINLINE

LOCATION: P.C. STA. TO P.T. STA.	P.V.I. STA.	L.V.C.	SSD/ DESIGN SPEED	PROPOSED P.V.I. EL.	SLOPE
1406+00 TO 1416+00	1411+00	1000'	70 MPH	618.31'	+0.52% -0.47%
1425+50 TO 1431+50	1428+50	600'	70 MPH	609.87'	-0.47% +0.24%
1479+50 TO 1484+50	1482+00	500'	70 MPH	622.96'	+0.24% +2.00%
1495+50 TO 1514+50	1505+00	1900'	70 MPH	668.96'	+2.00% -1.78%
1519+50 TO 1524+50	1522+00	500'	70 MPH	638.70'	-1.78% -0.24%
1571+00 TO 1575+00	1573+00	400'	70 MPH	626.46'	-0.24% -0.64%
1582+50 TO 1587+50	1585+00	500'	70 MPH	618.78'	-0.64% +0.28%
1601+00 TO 1605+00	1603+00	400'	70 MPH	623.82'	+0.28% -0.24%
1624+50 TO 1627+50	1626+00	300'	>70 MPH	618.30'	-0.24% -0.44%
1636+00 TO 1641+00	1638+50	500'	70 MPH	612.80'	-0.44% +0.32%
1653+50 TO 1658+50	1656+00	500'	70 MPH	618.40'	+0.32% -0.28%
1669+00 TO 1673+00	1671+00	400'	70 MPH	614.20'	-0.28% +0.24%
1708+00 TO 1712+00	1710+00	400'	70 MPH	623.56'	+0.24% -0.24%
1721+00 TO 1725+00	1723+00	400'	70 MPH	620.44'	-0.24% +0.24%
1749+50 TO 1754+50	1752+00	500'	70 MPH	627.40'	+0.24% +1.00%
1772+50 TO 1777+50	1775+00	500'	70 MPH	650.40'	-1.00% +2.00%
1778+00 TO 1795+00	1786+50	1700'	70 MPH	673.40'	+2.00% -1.72%
1795+00 TO 1799+00	1797+00	400'	70 MPH	655.34'	-1.72% +0.24%
1810+00 TO 1814+00	1812+00	400'	70 MPH	651.74'	-0.24% +0.24%



FILE NAME = E2\SCH11.DWG

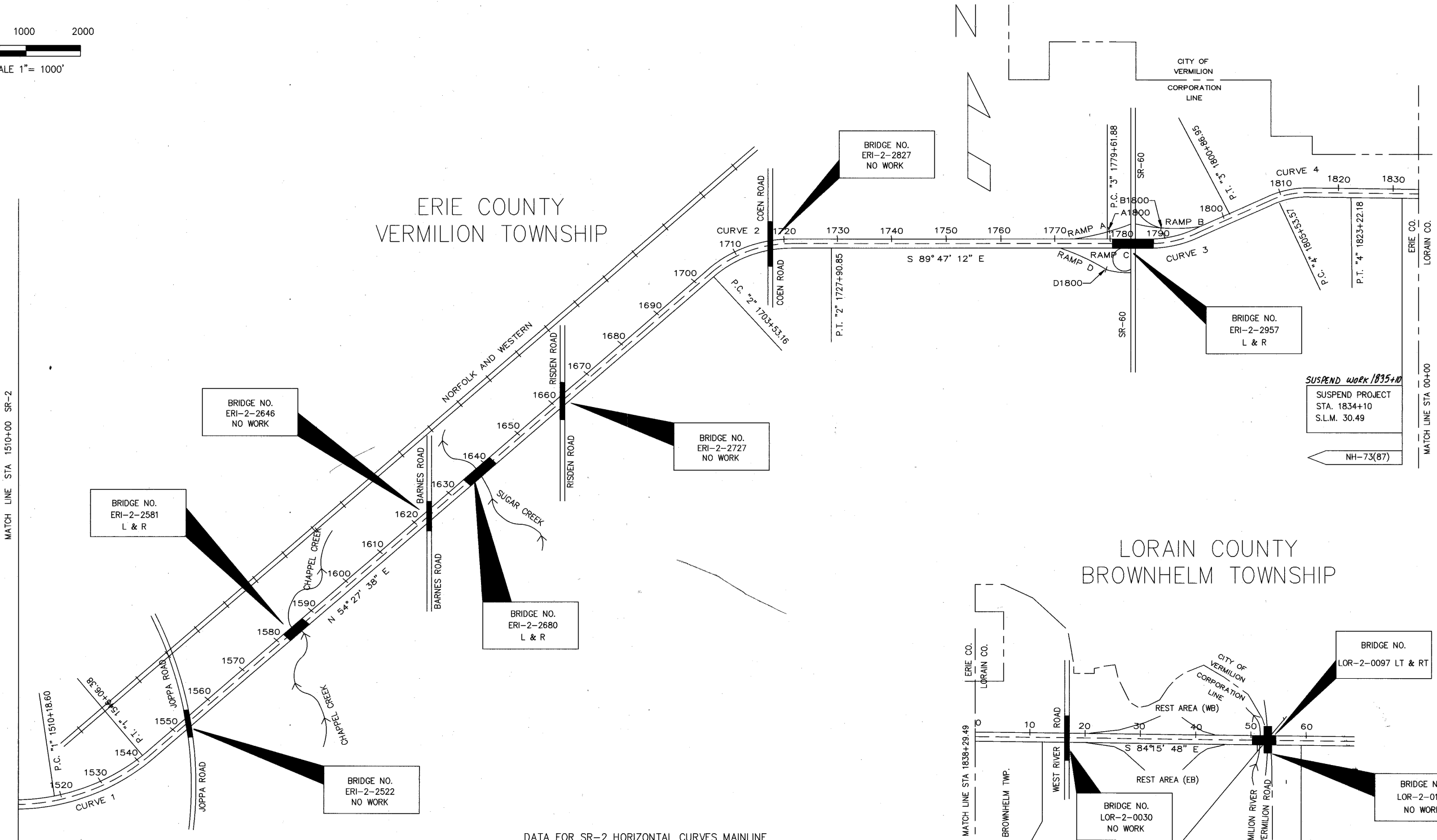
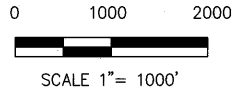
CALCULATED  
CHECKED

PLAN NO.

SCHMATIC PLAN

ERI/LOR-2-22.24/0.00

3  
187



SR-2 CURVE 0	SR-2 CURVE 1	SR-2 CURVE 2	SR-2 CURVE 3	SR-2 CURVE 4
P.I. = 1401+76.24	P.I. = 1528+73.50	P.I. = 1716+13.16	P.I. = 1792+05.69	P.I. = 1814+54.72
$\Delta = 4^{\circ}37'30''$ RT.	$\Delta = 35^{\circ}52'40''$ LT.	$\Delta = 35^{\circ}45'10''$ RT.	$\Delta = 35^{\circ}19'20''$ LT.	$\Delta = 29^{\circ}22'20''$ RT.
D = 0°15'	D = 1°00'	D = 1°28'	D = 1°28'	D = 2°00'
R = 22,918.31'	R = 5729.58'	R = 3906.53'	R = 3906.53'	R = 2864.79'
L = 1850.00'	L = 3587.78'	L = 2437.69'	L = 2408.33'	L = 1168.61'
T = 925.52'	T = 1854.90'	T = 1260.00'	T = 1243.81'	T = 901.16'
E = 18.68'	E = 292.77'	E = 198.17'	E = 193.23'	E = 98.10'
S = NORMAL CROWN	S = 0.0322 f/f	S = 0.0472 f/f	S = 0.0492 f/f	S = 0.0644 f/f
DSGN. SPD. = 70 MPH	DSGN. SPD. = 70 MPH	DSGN. SPD. = 70 MPH	DSGN. SPD. = 70 MPH	DSGN. SPD. = 70 MPH

FOR BRIDGE DETAIL WORK, SEE SHEETS 139-187

FILE NAME = E2\SCH2.DWG

SCHMATIC PLAN

# STRUCTURE GENERAL NOTES

## REFERENCE SHALL BE MADE TO STD. DWGS:

AS-1-81 9/15/94 (REV) EXJ-4-87 1/20/94 HL-30.31 5/01/87  
SD-1-69 6/12/69 RB-1-55 2/2/59 (REV.) HL-50.21 5/01/87  
HL-10.13 5/01/87 HL-20.14 5/01/87

## AND TO SUPPLEMENTAL SPECIFICATION:

910 DATED 7-17-95 815 DATED 7-17-95

## UTILITY LINES

ALL EXPENSES INVOLVED IN RELOCATING THE AFFECTED UTILITY LINES SHALL BE BORNE BY THE UTILITIES. THE CONTRACTOR AND UTILITIES ARE TO COOPERATE BY ARRANGING THEIR WORK IN SUCH A MANNER THAT INCONVENIENCE TO EITHER WILL BE HELD TO A MINIMUM.

## DESIGN SPECIFICATIONS:

THESE STRUCTURES CONFORM TO "STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES" ADOPTED BY THE AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS, 1992, INCLUDING THE 1993 AND 1994 INTERIM SPECIFICATIONS AND THE ODOT BRIDGE DESIGN MANUAL.

## DESIGN LOADING:

HS20-44 AND ALTERNATE MILITARY LOADING

## DESIGN DATA:

CONCRETE CLASS S- COMPRESSIVE STRENGTH 4500 P.S.I. (SUPERSTRUCTURE)

CONCRETE CLASS C- COMPRESSIVE STRENGTH 4000 P.S.I. (SUBSTRUCTURE)

REINFORCING STEEL- ASTM A615, A616 OR A617  
GRADE 60 MINIMUM YIELD STRENGTH 60,000 P.S.I.

STRUCTURAL STEEL- ASTM A36- YIELD STRENGTH 36,000 P.S.I.

## DECK PROTECTION METHOD:

MICRO-SILICA MODIFIED CONCRETE OVERLAY

## EXISTING STRUCTURE VERIFICATION

DETAILS AND DIMENSIONS SHOWN ON THESE PLANS PERTAINING TO THE EXISTING STRUCTURES HAVE BEEN OBTAINED FROM PLANS OF THE EXISTING STRUCTURES AND FROM FIELD OBSERVATIONS AND MEASUREMENTS. CONSEQUENTLY, THEY ARE INDICATIVE OF THE EXISTING STRUCTURES AND THE PROPOSED WORK BUT THEY SHALL BE CONSIDERED TENTATIVE AND APPROXIMATE. THE CONTRACTOR IS REFERRED TO CMS SECTIONS 102.05, 105.02, AND 513.02. CONTRACT BID PRICES SHALL BE BASED UPON A RECOGNITION OF THE UNCERTAINTIES DESCRIBED ABOVE AND UPON A PREBID EXAMINATION OF THE EXISTING STRUCTURES BY THE CONTRACTOR. HOWEVER, ALL PROJECT WORK SHALL BE BASED UPON ACTUAL DETAILS AND DIMENSIONS WHICH HAVE BEEN VERIFIED BY THE CONTRACTOR IN THE FIELD.

## ITEM 815 - FIELD PAINTING OF EXISTING STEEL

THIS ITEM OF WORK SHALL APPLY TO ALL EXISTING STRUCTURAL STEEL TO REMAIN AS PART OF THE PROPOSED STRUCTURES. EXISTING STEEL SHALL BE CLEANED AND PAINTED IN ACCORDANCE WITH THE PAINT NOTES IN **SS 815**.

NEW STRUCTURAL STEEL FOR END CROSS FRAMES AND ROCKER ASSEMBLIES SHALL BE SUPPLIED BARE FOR PREPARATION AND PAINTING IN THE FIELD. FOR PURPOSES OF FIELD PAINTING, NEW STRUCTURAL STEEL SHALL BE CONSIDERED EXISTING STEEL AND PREPARED AND PAINTED IN CONFORMANCE WITH THE PAINT NOTES IN **SUPPLEMENTAL SPECIFICATION 815**.

THE PLAN QUANTITY IS BASED ON THE MEASUREMENTS OF THE STEEL BEAMS, PLUS A 21.8% INCREASE FOR INCIDENTALS, SUCH AS CROSSFRAMES, BEARINGS, CONNECTIONS, AND OTHER MISCELLANEOUS STEEL.

## ITEM SPECIAL - SEALING OF CONCRETE SURFACES

### (NON-EPOXY)

EXPOSED CONCRETE SURFACES SHALL BE SEALED USING A NON-EPOXY SEALER. SEE DETAILS FOR EACH STRUCTURE FOR AREAS TO BE SEALED. SEE PROPOSAL NOTE FOR SURFACE PREPARATION REQUIREMENTS, APPLICATION RATES, MATERIAL REQUIREMENTS, AND APPLICATION PROCEDURES.

## ITEM 202- WEARING COURSE REMOVED, AS PER PLAN

INCLUDED IN THIS ITEM SHALL BE THE COST OF REMOVING ANY WATER-PROOFING MATERIAL FROM BETWEEN THE CONCRETE DECK AND ASPHALT WEARING COURSE. ASPHALT REMOVAL SHALL BE A SEPARATE OPERATION FROM REMOVING ANY WATERPROOFING MATERIAL, AND SEPARATE FROM THE SCARIFICATION OF THE DECK.

THE COST OF ALL LABOR, EQUIPMENT, INCIDENTALS AND MATERIALS SHALL BE INCLUDED IN THE UNIT PRICE BID FOR THE ITEM 202- SO.YD. WEARING COURSE REMOVED, AS PER PLAN.

## ITEM 511-CONCRETE, AS PER PLAN

THIS ITEM SHALL CONSIST OF FURNISHING AND PLACING PORTLAND CEMENT CONCRETE IN ACCORDANCE WITH 511 WITH THE FOLLOWING ADDITIONS:

ALL COARSE AGGREGATE SHALL BE #8 LIMESTONE.

## ITEM 202 PORTIONS OF STRUCTURES REMOVED, AS PER PLAN (ABUTMENTS)

THIS ITEM OF WORK SHALL BE USED TO REMOVE PORTIONS OF THE ABUTMENTS, AS PER DETAILS FOR EACH STRUCTURE. THE CONCRETE ABUTMENT PORTIONS SHALL BE REMOVED BY A HYDRAULIC SPLITTING METHOD. A LINE OF HOLES SHALL BE DRILLED ALONG THE REMOVAL LINE AND A HYDRAULIC SPLITTER USED AS PER THE MANUFACTURERS'S RECOMMENDATIONS. THIRTY-FIVE (35) AND FIFTEEN (15) POUND JACK HAMMERS SHALL BE USED FOR ANY REQUIRED FINISH WORK. HOE RAMS, CONCRETE CRUSHERS OR OTHER SIMILAR TYPE IMPACT DEVICES WILL NOT BE PERMITTED TO DO ANY OF THE REMOVAL WORK. CONCRETE SHALL BE REMOVED IN A MANNER THAT PREVENTS CUTTING, ELONGATING OR DAMAGING OF THE EXISTING REINFORCING STEEL DESIGNATED FOR SALVAGE. IF EXISTING REINFORCING STEEL DESIGNATED FOR SALVAGE IS DAMAGED DURING REMOVAL OPERATIONS, DOWELLED REINFORCING STEEL MUST BE ADDED AT THE CONTRACTOR'S EXPENSE. CARE SHOULD ALSO BE TAKEN NOT TO DAMAGE OTHER PORTIONS OF THE ABUTMENTS TO REMAIN. ANY DAMAGE TO PORTIONS TO REMAIN SHALL BE REPAIRED AT THE CONTRACTOR'S EXPENSE.

PAYMENT FOR ALL OF THE ABOVE WORK SHALL BE AT THE UNIT PRICE BID PER CUBIC YARD FOR ITEM 202- PORTIONS OF STRUCTURE REMOVED, AS PER PLAN (ABUTMENTS) WHICH SHALL INCLUDE ALL LABOR, EQUIPMENT, MATERIALS AND INCIDENTALS NECESSARY TO COMPLETE THE ABOVE WORK.

## ITEM 202 - PORTIONS OF STRUCTURE REMOVED, AS PER PLAN (SUPERSTRUCTURE)

THIS ITEM OF WORK SHALL BE USED TO REMOVE THE EXISTING CONCRETE DECK AT EACH END OF THE BRIDGE FOR STRUCTURES ERI-2-2421 L & R AND ERI-2-2957 L & R. JOINT MATERIAL TO BE REMOVED, AS DETAILED FOR EACH STRUCTURE, SHALL BE INCIDENTAL TO THIS ITEM. CARE SHALL BE TAKEN NOT TO DAMAGE THE STEEL BEAMS DURING THE DECK REMOVAL. THE USE OF EXPLOSIVES, CONCRETE CRUSHERS HEADACHE BALLS, HOE RAMS, AND OTHER SIMILAR TYPE IMPACTIVE DEVICES IS NOT PERMITTED.

THE CONCRETE DECK MAY BE REMOVED BY SAWING WITH THE FOLLOWING RESTRICTIONS.

1. BEFORE ANY SAWING IS PERMITTED; THE OUTLINES OF THE TOP FLANGES OF ALL STRINGERS ARE TO BE DRAWN ON THE BRIDGE DECK AND ONE (1) INCH +/- DIAMETER PILOT HOLES SHALL BE DRILLED OUTSIDE THESE LINES TO CONFIRM THE WIDTH OF THE FLANGES. PILOT HOLES SHALL NOT BE DRILLED OVER THE BEAM FLANGES.
2. ALL SAWING SHALL BE CONFINED TO THE AREAS BETWEEN THE FLANGE EDGES MINUS FOUR (4) INCHES. (2 INCHES +/- EACH SIDE)
3. THE DRILLING OF PILOT HOLES AND THE GENERAL SAWING PATTERN SHALL BE APPROVED BY THE ENGINEER.
4. HAND SAWS MAY BE USED IN THE FLANGE AREAS IF THE OPERATION IS OBSERVED AND APPROVED BY THE ENGINEER; AND THEN ONLY TO A DEPTH NOT PENETRATING THE LOWER REINFORCING STEEL MAT. THE ENGINEER MAY TERMINATE THE HAND SAWING OPERATION OVER THE FLANGES IF HE FEELS THE BRIDGE INTEGRITY IS IN JEOPARDY.
5. AS AN ALTERNATIVE TO USING HAND SAWS; THE LARGE CUTTING SAWS MAY BE USED FOR THE TRANSVERSE CUTS ACROSS THE FLANGES WITH THE CUT RESTRICTED TO A MAXIMUM DEPTH OF FOUR (4) INCHES OVER THE FLANGES. THIS SHALL BE ACCOMPLISHED BY MAKING AN INITIAL TRANSVERSE PRECUT TO A MAXIMUM DEPTH OF FOUR (4) INCHES CONTINUOUSLY ACROSS THE ENTIRE DECK. THE SECOND CUT SHALL BE RESTRICTED TO THE AREAS BETWEEN THE BEAMS IN ACCORDANCE WITH NUMBER 2 ABOVE.

CONCRETE MAY BE REMOVED BY MEANS OF APPROVED PNEUMATIC HAMMERS EMPLOYING POINTED AND BLUNT CHISEL EDGED TOOLS. THE WEIGHT OF THE HAMMERS SHALL NOT EXCEED 35 POUNDS WITHIN EIGHTEEN (18) INCHES OF THE STEEL BEAMS. OUTSIDE THE EIGHTEEN (18) INCH LIMIT THE WEIGHT OF THE HAMMERS SHALL NOT EXCEED NINETY (90) POUNDS. CARE SHALL BE TAKEN NOT TO NICK OR GOUGE THE STEEL BEAMS WITH THE PNEUMATIC HAMMERS. ALL IMPERFECTIONS AND EXISTING TACK WELDS ON THE BEAMS DISCOVERED AFTER THE DECK HAS BEEN REMOVED SHALL BE GROUND SMOOTH. ANY BOLTS OR PROJECTIONS WELDED TO THE STRUCTURAL STEEL SHALL BE CUT 1-1/2" ABOVE THE EXISTING WELDS.

ANY DAMAGE TO THE STEEL BEAMS, DONE BY THE CONTRACTOR, SHALL BE REPAIRED BY THE CONTRACTOR AT HIS EXPENSE. THE CONTRACTOR'S PROPOSED METHOD OF REPAIR SHALL BE SUBMITTED IN WRITING FOR APPROVAL BY THE DIRECTOR. THE CONTRACTOR SHALL RECEIVE APPROVAL FROM THE DIRECTOR BEFORE COMMENCEMENT OF SAID REPAIRS.

NO PART OF THE STRUCTURE SHALL BE SUBJECT TO UNIT STRESSES THAT EXCEED BY MORE THAN ONE-THIRD THE ALLOWABLE UNIT STRESSES AS GIVEN IN AASHTO "STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES" DUE TO ERECTION, REMOVAL AND CONSTRUCTION METHODS, OR TO THE USE OR MOVEMENT OF CONSTRUCTION EQUIPMENT ONTO OR ACROSS THE STRUCTURE. WHEN EQUIPMENT PLACED ON THE WEIGHT IN EXCESS OF 40,000 POUNDS IS TO BE PLACED ON THE STRUCTURE AND USED FOR REMOVAL AND CONSTRUCTION PURPOSES, STRUCTURAL ANALYSIS CALCULATIONS BY A REGISTERED STRUCTURAL ENGINEER SHOWING THE STRESSES PRODUCED BY THE EQUIPMENT AND ASSOCIATED LOADS SHALL BE SUBMITTED TO THE ENGINEER FOR REVIEW AND APPROVAL.

PAYMENT FOR ALL OF THE ABOVE SHALL BE AT THE LUMP SUM PRICE BID FOR ITEM 202 PORTIONS OF STRUCTURE REMOVED, AS PER PLAN (SUPERSTRUCTURE) WHICH SHALL INCLUDE ALL LABOR, EQUIPMENT, MATERIALS AND INCIDENTALS NECESSARY TO COMPLETE THE ABOVE WORK.

## ITEM 202- PORTIONS OF STRUCTURE REMOVED, AS PER PLAN (PARAPETS)

THIS ITEM OF WORK SHALL BE USED TO REMOVE THE EXISTING PARAPETS, AS PER DETAILS FOR EACH STRUCTURE. THE CONCRETE SHALL BE REMOVED BY SAW CUTTING. THE WATER FROM THE SAWING OPERATION SHALL BE IMMEDIATELY WASHED FROM THE STRUCTURE.

THE FINAL REMOVAL SHALL BE PERFORMED USING THIRTY-FIVE (35) AND FIFTEEN (15) POUND JACK HAMMERS. A HOE RAM, CONCRETE CRUSHER OR OTHER SIMILAR TYPE IMPACTIVE DEVICE WILL NOT BE PERMITTED FOR ANY OF THE REMOVAL WORK. EXISTING SMOOTH CONSTRUCTION JOINTS OR SAW CUTS SHALL BE MECHANICALLY SCARIFIED 1/4" DEEP TO INSURE BONDING OF THE NEW CONCRETE.

PAYMENT FOR ALL OF THE ABOVE SHALL BE AT THE UNIT PRICE BID PER CUBIC YARD FOR ITEM 202- PORTIONS OF STRUCTURE REMOVED, AS PER PLAN (PARAPETS) WHICH SHALL INCLUDE ALL LABOR, EQUIPMENT, MATERIALS AND INCIDENTALS NECESSARY TO COMPLETE THE ABOVE WORK.

## ITEM 202- PORTIONS OF STRUCTURE REMOVED, AS PER PLAN (DECK EDGES)

THIS ITEM OF WORK SHALL BE USED TO REMOVE THE EXISTING CONCRETE DECK EDGES ON STRUCTURES ERI-2-2581 L & R AND ERI-2-2680 L & R. ONE OF THE FOLLOWING METHODS SHALL BE USED TO REMOVE THE DECK EDGES:

### METHOD A: (PLAN DETAILED)

THE CONCRETE SHALL BE REMOVED BY A HYDRAULIC SPLITTING METHOD. A LINE OF HOLES SHALL BE DRILLED ALONG THE REMOVAL LINE AND A HYDRAULIC SPLITTER USED AS PER MANUFACTURER'S RECOMMENDATIONS.

CONCRETE SHALL BE REMOVED IN A MANNER THAT PREVENTS CUTTING, ELONGATION OR DAMAGING OF EXISTING REINFORCING STEEL TO BE PRESERVED. IF EXISTING REINFORCING STEEL DESIGNATED FOR PRESERVATION IS DAMAGED DURING THE REMOVAL OPERATION, DOWELLED REINFORCING STEEL SHALL BE ADDED AT THE CONTRACTOR'S EXPENSE. THE LENGTH INTO THE DECK SHALL BE .18 INCHES. ALL DOWEL HOLES SHALL BE GROUTED WITH A NON-SHRINK, NON-METALLIC, EPOXY MORTAR ACCORDING TO ITEM 510 CMS.

### METHOD B: (OPTIONAL)

THE CONCRETE SHALL BE REMOVED BY SAW CUTTING. THE WATER FROM THE SAWING OPERATION SHALL BE IMMEDIATELY WASHED FROM THE STRUCTURE.

FOR THE REINFORCING STEEL MARKED FOR PRESERVATION THAT IS CUT OFF, THE CONTRACTOR SHALL PROVIDE LONGER TRANSVERSE BARS, WHICH SHALL BE GROUTED WITH A NONSHRINK, NONMETALLIC, EPOXY MORTAR ACCORDING TO ITEM 510 CMS.

THE COST OF THE ADDITIONAL LENGTH BARS, DOWEL HOLES AND GROUTING SHALL BE BORNE BY THE CONTRACTOR.

### BOTH METHODS:

THE FINAL REMOVAL SHALL BE PERFORMED USING THIRTY-FIVE (35) AND FIFTEEN (15) POUND JACK HAMMERS. A HOE RAM, CONCRETE CRUSHER OR OTHER SIMILAR TYPE IMPACT DEVICE WILL NOT BE PERMITTED FOR ANY OF THE REMOVAL WORK.

PAYMENT FOR ALL OF THE ABOVE SHALL BE AT THE UNIT PRICE BID PER CUBIC YARD FOR ITEM 202- PORTIONS OF STRUCTURE REMOVED, AS PER PLAN (DECK EDGES) WHICH SHALL INCLUDE ALL LABOR, EQUIPMENT, MATERIALS AND INCIDENTALS NECESSARY TO COMPLETE THE ABOVE WORK.

## ITEM 510- DOWEL HOLE WITH NONSHRINK, NONMETALLIC GROUT

ALL DOWEL HOLES SHALL BE GROUTED WITH AN EPOXY MORTAR.

PAYMENT FOR ALL OF THE ABOVE SHALL BE AT THE UNIT PRICE BID PER EACH FOR ITEM 510- DOWEL HOLE WITH NONSHRINK, NONMETALLIC GROUT, WHICH SHALL INCLUDE ALL LABOR, EQUIPMENT, MATERIALS AND INCIDENTALS NECESSARY TO COMPLETE THE ABOVE WORK.

## ITEM SPECIAL- KEYWAY DRAIN

HOLES SHALL BE DRILLED IN THE ABUTMENT FOR KEYWAY DRAINS AS SHOWN IN THE PLAN DETAILS. THE HOLES SHALL BE SPACED AT APPROXIMATELY (5) FOOT CENTERS AS DIRECTED BY THE ENGINEER.

PAYMENT FOR ALL OF THE ABOVE SHALL BE AT THE UNIT PRICE BID PER EACH FOR ITEM SPECIAL- KEYWAY DRAIN, WHICH SHALL INCLUDE ALL LABOR, EQUIPMENT, MATERIALS, AND INCIDENTALS NECESSARY TO COMPLETE THE ABOVE WORK.

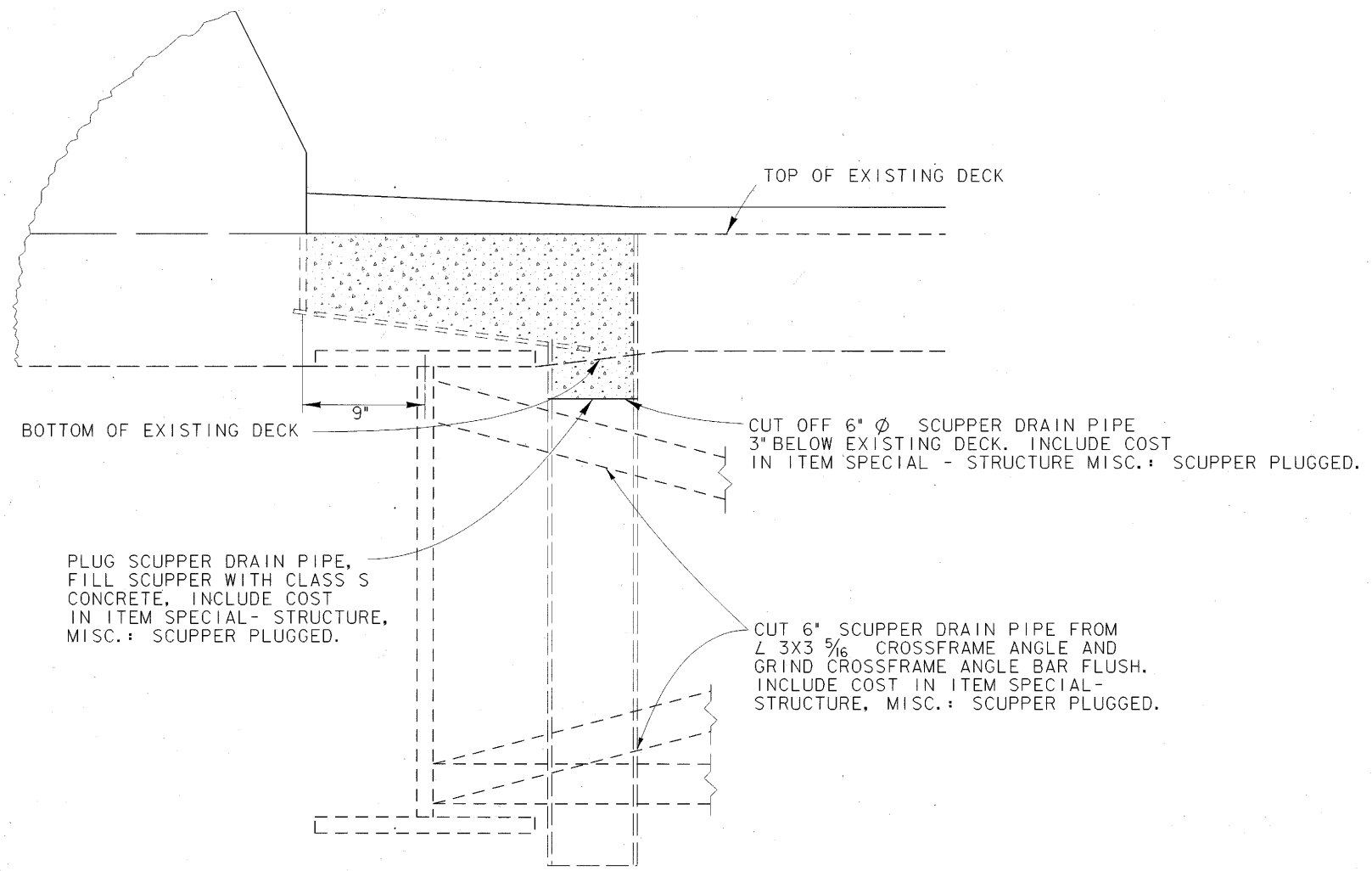
## CONCRETE PARAPETS

WITHIN 48 HOURS AFTER PLACEMENT OF PARAPET CONCRETE SAWCUT 1 INCH DEEP JOINTS INTO THE CONCRETE PARAPETS AT LOCATIONS DETAILED IN THE PLANS. THE SAW CUT SHALL BE MADE IN THE COMPLETE CIRCUMFERENCE OF THE PARAPET, STARTING AND ENDING AT THE ELEVATION OF THE CONCRETE DECK, AND THE COMPLETED SAWCUT SHALL BE FILLED WITH A CAULKING MATERIAL CONFORMING TO FEDERAL SPECIFICATION TT-S-00227E. THE BOTTOM HALF INCH OF THE ONE INCH DEEP SAWED JOINT IN BOTH THE INSIDE AND OUTSIDE FACES OF THE PARAPET SHOULD BE LEFT UNSEALED TO ALLOW ANY WATER WHICH MAY ENTER THE JOINT TO ESCAPE.

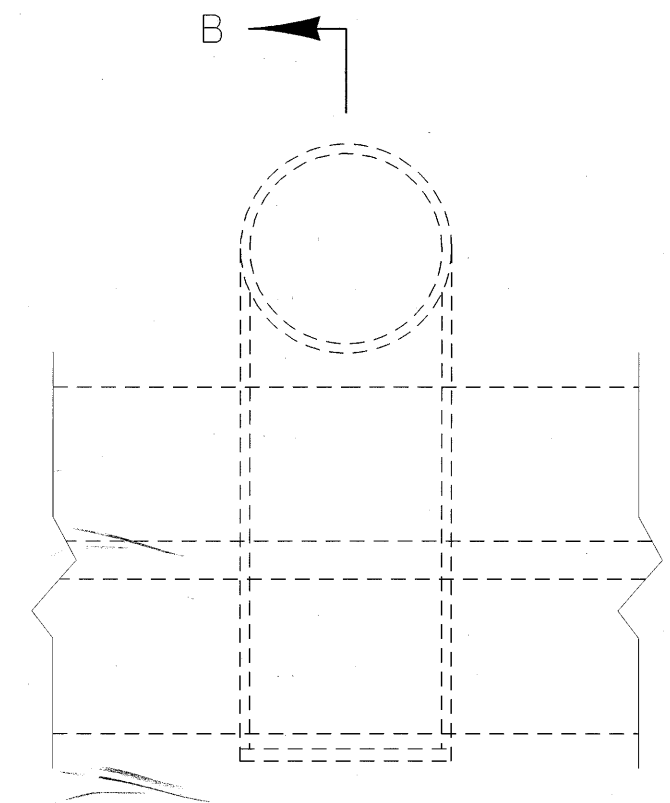
## REINFORCING STEEL

NEW REINFORCING STEEL MAY REQUIRE FIELD CUTTING OR BENDING TO BE PROPERLY FITTED. PAYMENT FOR THIS WORK SHALL BE INCLUDED IN THE UNIT PRICE BID FOR ITEM 509.

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SECTION B - B

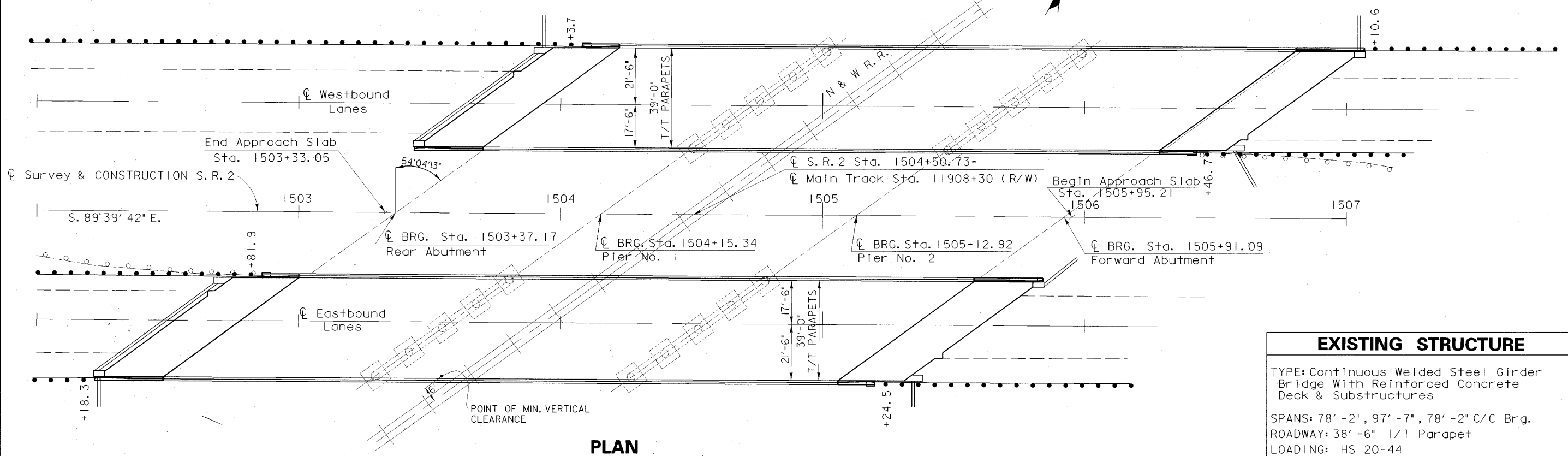


PLAN VIEW OF SCUPPER AND BULB ANGLE

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 WORKSTATION: darmsfro DATE: 18-AUG-1995

DESIGNED D, RA CHECKED RDN		DRAWN D, RA REVISED		REVIEWED FEC	DATE 4/95	DESIGN AGENCY OHIO DEPT. OF TRANSPORTATION DISTRICT THREE LOCATION AND DESIGN
ERI/LOR-2-22.24/0.00						140 187
SCUPPER PLUGGED DETAIL						2/2

PROPOSED WORK ON THESE STRUCTURES SHALL INCLUDE A MICRO-SILICA CONCRETE DECK OVERLAY; STRIP SEAL EXPANSION JOINTS; REPLACE EXISTING CONCRETE PARAPET WITH SAFETY SHAPE PARAPET; REPLACE TOP OF ABUTMENT BACKWALLS; RESET ABUTMENT BEARINGS; CONCRETE SEALING; PLUG SCUPPERS; PAINTING STRUCTURAL STEEL; NEW APPROACH SLABS; AND CATCH BASINS AT THE ENDS OF THE APPROACH SLABS.



**EXISTING STRUCTURE**

TYPE: Continuous Welded Steel Girder Bridge With Reinforced Concrete Deck & Substructures

SPANS: 78' -2", 97' -7", 78' -2" C/C Brg.

ROADWAY: 38' -6" T/T Parapet

LOADING: HS 20-44

WEARING SURFACE: ASPHALT CONCRETE

SKEW: 54°04' 13" L.F.

APPROACH SLAB: AS-1-67 (25' -0" Long)

ALIGNMENT: Tangent

SUPERELEVATION: None

YEAR BUILT: 1973

STRUCTURE FILE NUMBER: 2204754 & 2204762

**PROPOSED STRUCTURE**

PROPOSED WORK: NEW DECK OVERLAY & MINOR REPAIRS INCLUDING PAINTING

TYPE: Continuous Welded Steel Girder Bridge With Reinforced Concrete Deck & Substructures

SPANS: 78' -2", 97' -7", 78' -2" C/C Brg.

ROADWAY: 39' -0" T/T Parapet

LOADING: HS 20-44 (CASE I) & Alternate Military

WEARING SURFACE: 1 1/4" Micro-Silica Concrete

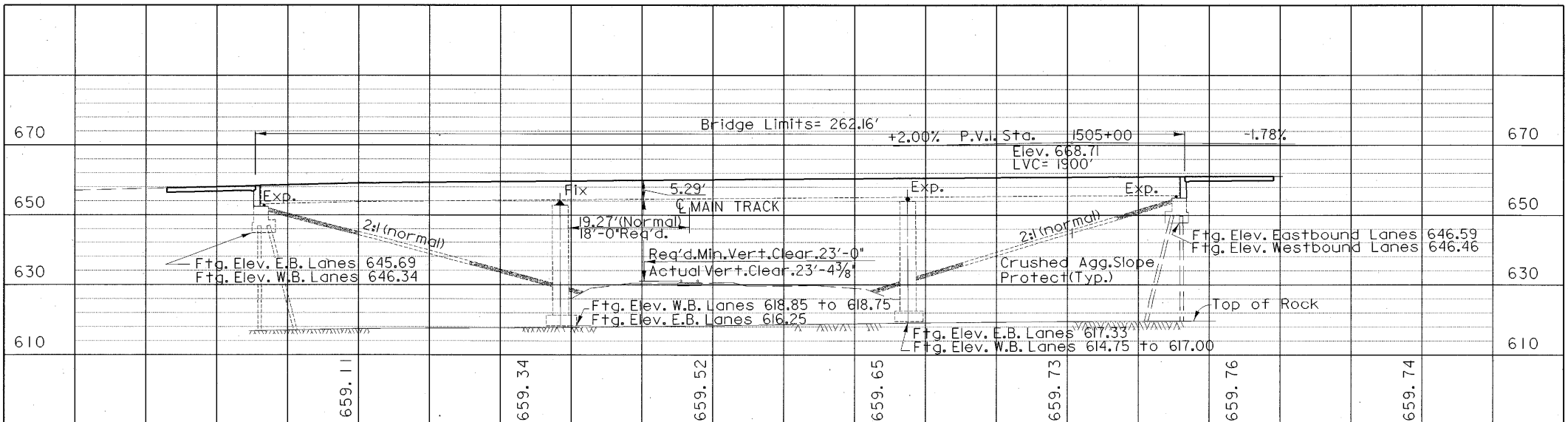
SKEW: 54°-04' -13" L.F.

APPROACH SLAB: AS-1-81 (25' -0" Long)

ALIGNMENT: Tangent

SUPERELEVATION: None

DESIGN AVERAGE DAILY TRAFFIC:  
ADT(2015)=21500  
ADTT(2015)=5375



**PROFILE ALONG EASTBOUND LANES**

OHIO DEPT. OF TRANSPORTATION  
DISTRICT THREE  
LOCATION AND DESIGN

DATE 4/95  
REVIEWED FEC  
STRUCTURE FILE NUMBER 2204754 & 2204762

ERIC COUNTY  
STA. 1503+37.17  
STA. 1505+95.21

**SITE PLAN**  
BRIDGE NO. ERI-2-2421 L&R  
OVER NORFOLK & WESTERN RAILROAD

ERI/LOR-2-22-24/0.00

1/12

147  
187

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WORKSTATION: dgrmsrfo DATE: 18-AUG-1995

# STRUCTURE NOTES

## CONSTRUCTION CLEARANCE:

CONSTRUCTION CLEARANCE 13'-0" HORIZONTALLY FROM THE CENTER OF TRACKS AND 22'-0" VERTICALLY FROM A POINT LEVEL WITH THE TOP OF THE HIGHER RAIL, AND 6 FEET FROM THE CENTER OF TRACKS, SHALL BE MAINTAINED AT ALL TIMES.

## RAILROAD AERIAL LINES

RAILROAD AERIAL LINES WILL BE RELOCATED BY THE RAILROAD. THE CONTRACTOR SHALL USE ALL PRECAUTIONS NECESSARY TO SEE THAT THE LINES ARE NOT DISTURBED DURING CONSTRUCTION STAGE AND SHALL COOPERATE WITH THE RAILROAD IN THE RELOCATION OF THESE LINES. THE COST OF THE RELOCATION SHALL BE INCLUDED IN THE RAILROAD FORCE ACCOUNT WORK.

## COOPERATION WITH RAILROADS

THE CONTRACTOR SHALL COOPERATE AT ALL TIMES WITH THE LOCAL OFFICIALS OF THE RAILROAD COMPANY. THE CONTRACTOR SHALL USE ALL REASONABLE CARE AND DILIGENCE IN THE WORK IN ORDER TO AVOID ACCIDENTS, DAMAGE, OR INTERFERENCE WITH TRAINS OR THE PROPERTY OF THE RAILROAD. NO MATERIAL SHALL BE ALLOWED TO DROP ONTO THE RAILROAD TRACKS AT ANY TIME. SEE SPECIAL CLAUSES IN THE PROPOSAL FOR SPECIFIC REQUIREMENTS FOR WORK ON RAILROAD PROPERTY.

## MAINTENANCE OF TRAFFIC

PHASED CONSTRUCTION CONTAINING TWO PHASES WILL BE USED TO REHABILITATE THIS STRUCTURE IN THE FOLLOWING MANNER:

DURING PHASE "A", THE RIGHT PORTION OF THE STRUCTURE SHALL BE REHABILITATED WHILE TRAFFIC IS MAINTAINED IN THE LEFT (PASSING) LANE.

DURING PHASE "B", THE LEFT PORTION OF THE STRUCTURE SHALL BE REHABILITATED WHILE TRAFFIC IS MAINTAINED IN THE RIGHT (DRIVING) LANE.

SEE SHEETS 12-34 FOR COMPLETE MAINTENANCE OF TRAFFIC NOTES AND DETAILS.

## REPLACEMENT OF EXISTING REINFORCING STEEL

ANY EXISTING REINFORCING BARS WHICH ARE TO BE INCORPORATED INTO THE NEW WORK AND WHICH ARE MADE UNUSABLE BY THE CONTRACTOR'S CONCRETE REMOVAL OPERATIONS SHALL BE REPLACED WITH NEW STEEL AT HIS COST. ANY EXISTING REINFORCING BARS DEEMED BY THE ENGINEER TO BE UNUSABLE BECAUSE OF CORROSION SHALL BE REPLACED WITH NEW STEEL. AN ALLOWANCE OF 200 POUNDS IS INCLUDED IN ITEM 509 FOR THIS PURPOSE.

## REINFORCING STEEL SPLICE LENGTHS

MINIMUM LAP LENGTHS FOR BARS SHALL BE:

- \*5 - 2'-6"
- \*6 - 3'-0"

## ITEM 513- STRUCTURAL STEEL, MISC. RETROFIT EXISTING CROSS FRAME CONNECTION STIFFENER

STEEL MEMBERS TO BE FABRICATED UNDER THIS ITEM WILL NOT REQUIRE SHOP DRAWINGS PRIOR TO FABRICATION. THE CONTRACTOR SHALL MAKE NECESSARY MEASUREMENTS AND PREPARE SKETCHES, DRAWINGS, TABLES, ETC. THE ENGINEER SHALL HAVE AUTHORITY AND RESPONSIBILITY FOR ENSURING THAT THE FABRICATED STEEL IS ACCEPTABLE. TECHNICAL ASSISTANCE WILL BE PROVIDED ON REQUEST BY THE BUREAU OF BRIDGES. MILL TEST REPORTS AND SHIPPING DOCUMENTS SHALL BE SUBMITTED TO THE ENGINEER FOR REVIEW AND APPROVAL PRIOR TO INCORPORATING STEEL ITEMS INTO THE WORK, AS REQUIRED BY 501.07. AFTER FABRICATION, THE CONTRACTOR SHALL SUBMIT SHOP DRAWINGS TO THE ENGINEER FOR REVIEW AND APPROVAL TO ENSURE THAT THE DRAWINGS DEPICT THE STEEL AS ACTUALLY INCORPORATED INTO THE WORK. THE ENGINEER WILL THEN SEND ONE APPROVED SET TO THE BUREAU OF BRIDGES FOR INFORMATION. THE FABRICATOR SHALL FURNISH A 35 MILLIMETER MICROFILM COPY OF EACH SHOP DRAWING, WHICH SHALL BE MOUNTED ON AN APERTURE CARD AS SPECIFIED IN 501.05.

STEEL MEMBERS INCLUDED IN THIS ITEM INCLUDE GIRDER TRANSVERSE STIFFENERS AND CROSS FRAMES.

## ITEM 516 - STRUCTURAL EXPANSION JOINT INCLUDING ELASTOMERIC STRIP SEAL, AS PER PLAN

THE EXPANSION JOINT SHALL BE AS PER STANDARD DRAWING EXJ-4-87 AND DETAILS IN THE PLAN.

PARAPET JOINT SEALS SHALL BE CONSTRUCTED AS DETAILED ON SHEET NO. 5712.

THE PARAPET JOINT SEAL SHALL BE EVAZOTE 380 AS MANUFACTURED BY E-POXY INDUSTRIES, INC., 14 WEST SHORE STREET, RAVENA, NEW YORK 12143 OR E.V.A. AS MANUFACTURED BY THERMAL CHEM INC., 1400 LEWIS AVENUE, ELK GROVE VILLAGE, ILL. 60007 OR AN APPROVED EQUAL.

THE SEAL SHALL BE CEMENTED INTO THE JOINT WITH AN ADHESIVE RECOMMENDED BY THE MANUFACTURER OF THE SEAL. MAXIMUM ADHESION SHALL BE INSURED BY THE REMOVAL OF LAITANCE AND/OR SURFACE CONTAMINANTS. ALL THE PROCEDURES FOR INSTALLATION OF THE JOINT SEAL SHALL BE IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.

PAYMENT FOR ALL OF THE ABOVE WORK SHALL BE INCLUDED WITH ITEM 516- STRUCTURAL EXPANSION JOINT INCLUDING ELASTOMERIC STRIP SEAL, AS PER PLAN, WHICH SHALL INCLUDE ALL LABOR, EQUIPMENT, MATERIALS AND INCIDENTALS NECESSARY TO COMPLETE THE PARAPET JOINT SEAL.

## ITEM 516 - JACKING AND TEMPORARY SUPPORT OF SUPERSTRUCTURE, AS PER PLAN

THIS ITEM SHALL CONSIST OF FURNISHING THE NECESSARY LABOR AND MATERIALS TO JACK THE EXISTING STRUCTURE TO RESET THE EXISTING ABUTMENT ROCKER ASSEMBLIES.

THE SUPERSTRUCTURE SHALL BE JACKED ABOVE THE EXISTING SUBSTRUCTURE SEAT A UNIFORM AMOUNT NOT TO EXCEED ONE (1) INCH. DETAILED PLANS AND PROCEDURES OF THE JACKING OF THE SUPERSTRUCTURE SHALL BE PREPARED BY A REGISTERED PROFESSIONAL ENGINEER AND SHALL BEAR HIS SIGNATURE AND NUMBER OR PROFESSIONAL ENGINEERING SEAL. APPROVAL OF THE ABOVE PLANS AND PROCEDURES SHALL NOT RELIEVE THE CONTRACTOR OF RESPONSIBILITY FOR THE BEHAVIOR OF THE PROPOSED JACKING PROCEDURES.

THE CONTRACTOR SHALL SUBMIT THREE (3) COPIES OF THE PLANS AND PROCEDURES AND TWO (2) COPIES OF THE CALCULATIONS TO THE DIRECTOR, THIRTY (30) DAYS PRIOR TO THE JACKING OPERATION AND RECEIVE APPROVAL BEFORE BEGINNING THE JACKING OPERATIONS.

THE FOLLOWING JACKING REQUIREMENTS AND PROCEDURES SHALL APPLY:

- 1) JACKING SHALL BE DONE PRIOR TO THE PLACEMENT OF THE NEW DECK OVERLAY.
- 2) ATTACHMENTS MADE BY WELDING TO ANY MAIN STRUCTURAL MEMBER SHALL BE APPROVED BY THE DIRECTOR BEFORE SUCH ATTACHMENTS ARE MADE. DETAILS OF THE ATTACHMENTS SHALL BE SUBMITTED FOR APPROVAL AS PART OF THE JACKING PLANS AND PROCEDURES OR INDEPENDENTLY BY A SIMILAR SUBMISSION. WELDING TO TENSION AREAS IS NOT PERMITTED.
- 3) PROPERLY ARRANGE ALL TEMPORARY SUPPORTS SO AS NOT TO DAMAGE OR INDUCE EXCESS STRESS IN ANY MEMBER, INCLUDING CROSS FRAMES.
- 4) JACK ALL BEAMS SIMULTANEOUSLY AT A UNIFORM RATE. VERTICAL DIFFERENTIAL MOVEMENT SHALL NOT BE PERMITTED BETWEEN ANY BEAMS. THE CONTRACTOR SHALL REPLACE AT HIS EXPENSE, ANY PART OF THE STRUCTURE MADE UNSATISFACTORY BY MOVEMENT, AS DETERMINED AND DIRECTED BY THE DIRECTOR.

PAYMENT FOR ALL OF THE ABOVE SHALL BE AT THE LUMP SUM PRICE BID FOR ITEM 516- JACKING AND TEMPORARY SUPPORT OF SUPERSTRUCTURE, AS PER PLAN WHICH SHALL INCLUDE ALL LABOR, EQUIPMENT, MATERIALS AND INCIDENTALS NECESSARY TO COMPLETE THE ABOVE WORK.

## ITEM 516 - RESET BEARING

THIS ITEM SHALL CONSIST OF FURNISHING THE NECESSARY MATERIALS AND LABOR TO RESET THE EXISTING R-125 ROCKER ASSEMBLIES ON THE FORWARD AND REAR ABUTMENT OF THE RIGHT AND LEFT BRIDGES, INCLUDING THE INSTALLATION OF NEW SHEET LEAD OR PREFORMED BEARING PADS AS PER STANDARD DRAWING RB-1-55.

THE CONTRACTOR SHALL FIELD MEASURE ALL NECESSARY DIMENSIONS PRIOR TO RESETTING THE ROCKER ASSEMBLY. THE ASSEMBLY SHALL BE CLEANED AND PAINTED IN ACCORDANCE WITH THE PAINT NOTES IN THE PROPOSAL FOR SYSTEM OZEU. ALL ITEM 519- PATCHING OF CONCRETE STRUCTURE WORK SHALL BE COMPLETED BEFORE THE ROCKER ASSEMBLY CAN BE RESET.

PAYMENT FOR ALL OF THE ABOVE SHALL BE AT THE UNIT PRICE BID PER EACH FOR ITEM 516- RESET BEARING WHICH SHALL INCLUDE ALL LABOR, EQUIPMENT, MATERIALS AND INCIDENTALS NECESSARY TO COMPLETE THE ABOVE WORK.

## ITEM 517 - RAILING (DEFLECTOR PARAPET TYPE), AS PER PLAN

THIS ITEM OF WORK SHALL CONSIST OF FURNISHING THE NECESSARY MATERIALS AND LABOR TO CONSTRUCT ITEM 517- RAILING (DEFLECTOR PARAPET TYPE), AS PER PLAN, AS DETAILED ON SHEET NO. 5712. THIS ITEM ALSO INCLUDES ALL REINFORCEMENT, DOWEL HOLES, CONCRETE, EXCAVATION, BACKFILL, SUBGRADE PREPARATION AND ALL INCIDENTALS NECESSARY TO COMPLETE THE ITEM.

REINFORCING STEEL SHALL BE GRADE 60, EPOXY COATED. CONCRETE SHALL BE CLASS S CONCRETE, SUPERSTRUCTURE. EXCAVATION SHALL BE PER CMS 503.

PAYMENT FOR ALL OF THE ABOVE WORK SHALL BE INCLUDED WITH ITEM 517- RAILING (DEFLECTOR PARAPET TYPE), AS PER PLAN, WHICH SHALL INCLUDE ALL LABOR, EQUIPMENT, MATERIALS AND INCIDENTALS NECESSARY TO COMPLETE THE ABOVE WORK.

## ITEM 518 - POROUS BACKFILL, AS PER PLAN

THE AGGREGATE SHALL BE NO. 57 CRUSHED GRAVEL AND SHALL EXTEND UP TO THE PLANE OF THE SUBGRADE, TO ONE FOOT BELOW THE EMBANKMENT SURFACE AND LATERALLY TO THE ENDS OF THE WINGWALLS. FOR ADDITIONAL DETAILS SEE SHEET 4712. PAYMENT FOR ALL OF THE ABOVE SHALL BE AT THE UNIT PRICE BID PER CUBIC YARD FOR ITEM 518 - POROUS BACKFILL, AS PER PLAN, WHICH SHALL INCLUDE ALL LABOR EQUIPMENT, MATERIAL AND INCIDENTALS NECESSARY TO COMPLETE THE ABOVE WORK.

## REMOVAL OF EXISTING PARAPETS

IN ADDITION TO THE REQUIREMENTS LISTED ON SHEET 139, THE CONTRACTOR SHALL MAKE SPECIAL PROVISIONS TO PROTECT THE RAILROAD DURING THE REMOVAL OPERATIONS. NO PART OR DEBRIS SHALL BE PERMITTED TO DROP ON THE GROUND OR RAILROAD BELOW.

PRIOR TO COMMENCING ANY WORK INVOLVING THE REMOVAL OF THE EXISTING STRUCTURE, THE CONTRACTOR SHALL SUBMIT TO THE ENGINEER AND RAILROADS FOR APPROVAL COMPLETE DETAILS OF THE PROPOSED METHOD FOR REMOVING THE EXISTING STRUCTURE. NO DEMOLITION SHALL BEGIN UNTIL WRITTEN APPROVAL IS RECEIVED FROM THE RAILROADS AND THE ENGINEER.

# ESTIMATED QUANTITIES

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WORKSTATION: darmsfro DATE: 18-AUG-1995

## BRIDGE ESTIMATED QUANTITIES

ITEM	ITEM EXTENSION	TOTAL	UNIT	DESCRIPTION
202	11301	41	CU. YD.	PORTIONS OF STRUCTURE REMOVED, AS PER PLAN (ABUTMENTS) (SEE SHT. 139)
202	11301	13	CU. YD.	PORTIONS OF STRUCTURE REMOVED, AS PER PLAN (SUPERSTRUCTURE) (SEE SHT. 139)
202	11301	146	CU. YD.	PORTIONS OF STRUCTURE REMOVED, AS PER PLAN (PARAPET) (SEE SHT. 139)
202	23501	2243	SQ. YD.	WEARING COURSE REMOVED, AS PER PLAN (SEE SHT. 139)
503	21300	LUMP		UNCLASSIFIED EXCAVATION
509	15824	26335	POUND	EPOXY COATED REINFORCING STEEL, GRADE 60
510	10000	1916	EACH	DOWEL HOLE WITH NONSHRINK, NONMETALLIC GROUT
511	34001	144	CU. YD.	CLASS S CONCRETE, SUPERSTRUCTURE, AS PER PLAN (PARAPET) (SEE SHT. 139)
511	34401	14	CU. YD.	CLASS S CONCRETE, SUPERSTRUCTURE, AS PER PLAN (SEE SHT. 139)
511	45701	41	CU. YD.	CLASS C CONCRETE, ABUTMENT, AS PER PLAN (SEE SHT. 139)
SPEC	51267504	1248	SQ. YD.	SEALING OF CONCRETE SURFACES (NON-EPOXY) *
513	16800	354	EACH	STRUCTURAL STEEL, MISC.: RETROFIT EXISTING CROSS FRAME CONNECTION STIFFENER (SEE SHT. 158)
513	16800	177	EACH	STRUCTURAL STEEL, MISC.: DRILLING STRUCTURAL STEEL (1/2" DIAMETER HOLE) (SEE SHT. 158)
513	16800	177	EACH	STRUCTURAL STEEL, MISC.: PENCIL ABRASIVE BLASTING, GRINDING AND NDT (SEE SHT. 158)
015	00050	42100	SQ. FT.	SURFACE PREPARATION OF EXISTING STEEL, SYSTEM OZEU
015	00056	42100	SQ. FT.	FIELD PAINTING OF EXISTING STEEL, PRIME COAT, SYSTEM OZEU
015	00060	42100	SQ. FT.	FIELD PAINTING OF EXISTING STEEL, INTERMEDIATE COAT, SYSTEM OZEU
015	00066	42100	SQ. FT.	FIELD PAINTING OF EXISTING STEEL, FINISH COAT, SYSTEM OZEU
015	00504	100	MAN HOUR	GRINDING FINIS, TEARS, SLIVERS
516	11211	270	LIN. FT.	STRUCTURAL EXPANSION JOINT INCLUDING ELASTOMERIC STRIP SEAL, AS PER PLAN * (SEE SHT. 148)
516	46700	20	EACH	RESET BEARING
516	47001	LUMP		JACKING AND TEMPORARY SUPPORT OF SUPERSTRUCTURE, AS PER PLAN (SHT. 148)
517	73201	160.36	LIN. FT.	RAILING (DEFLECTOR PARAPET TYPE), AS PER PLAN * (SEE SHT. 148)
518	21101	33	CU. YD.	POROUS BACKFILL, AS PER PLAN (SEE SHT. 148)
519	11100	526	SQ. FT.	PATCHING CONCRETE STRUCTURE
SPEC	51922000	2207	SQ. YD.	MICRO-SILICA MODIFIED CONCRETE OVERLAY (1.25" THICKNESS) (SEE PROPOSAL NOTE)
SPEC	51922100	83	CU. YD.	MICRO-SILICA MODIFIED CONCRETE OVERLAY (VARIABLE THICKNESS) (SEE PROPOSAL NOTE)
SPEC	51922300	LUMP		TEST SLAB (SEE PROPOSAL NOTE)
SPEC	53000400	17	EACH	STRUCTURE, MISC.: SCUPPER PLUGGED (SEE SHT. 140)

\* SEE PROPOSAL NOTE

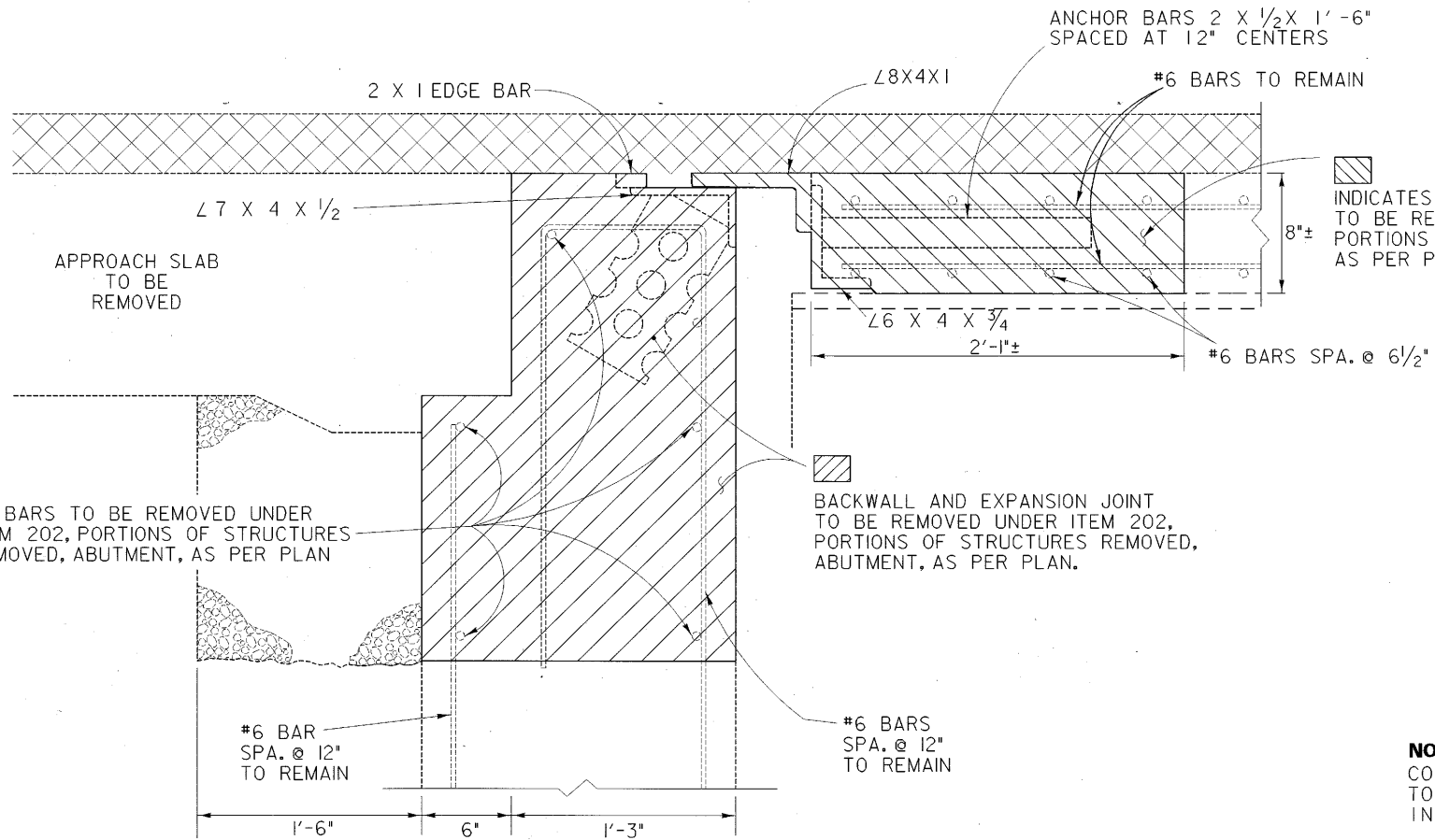
DESIGN AGENCY OHIO DEPT. OF TRANSPORTATION DISTRICT THREE LOCATION AND DESIGN	DATE 4/95	REVIEWED FEC STRUCTURE FILE NUMBER 2204754 & 2204762
DESIGNED PEA CHECKED RPN	DRAWN PEA REVISION	
ESTIMATED QUANTITIES BRIDGE NO. ERI-2-2421 L&R OVER NORFOLK & WESTERN RAILROAD		
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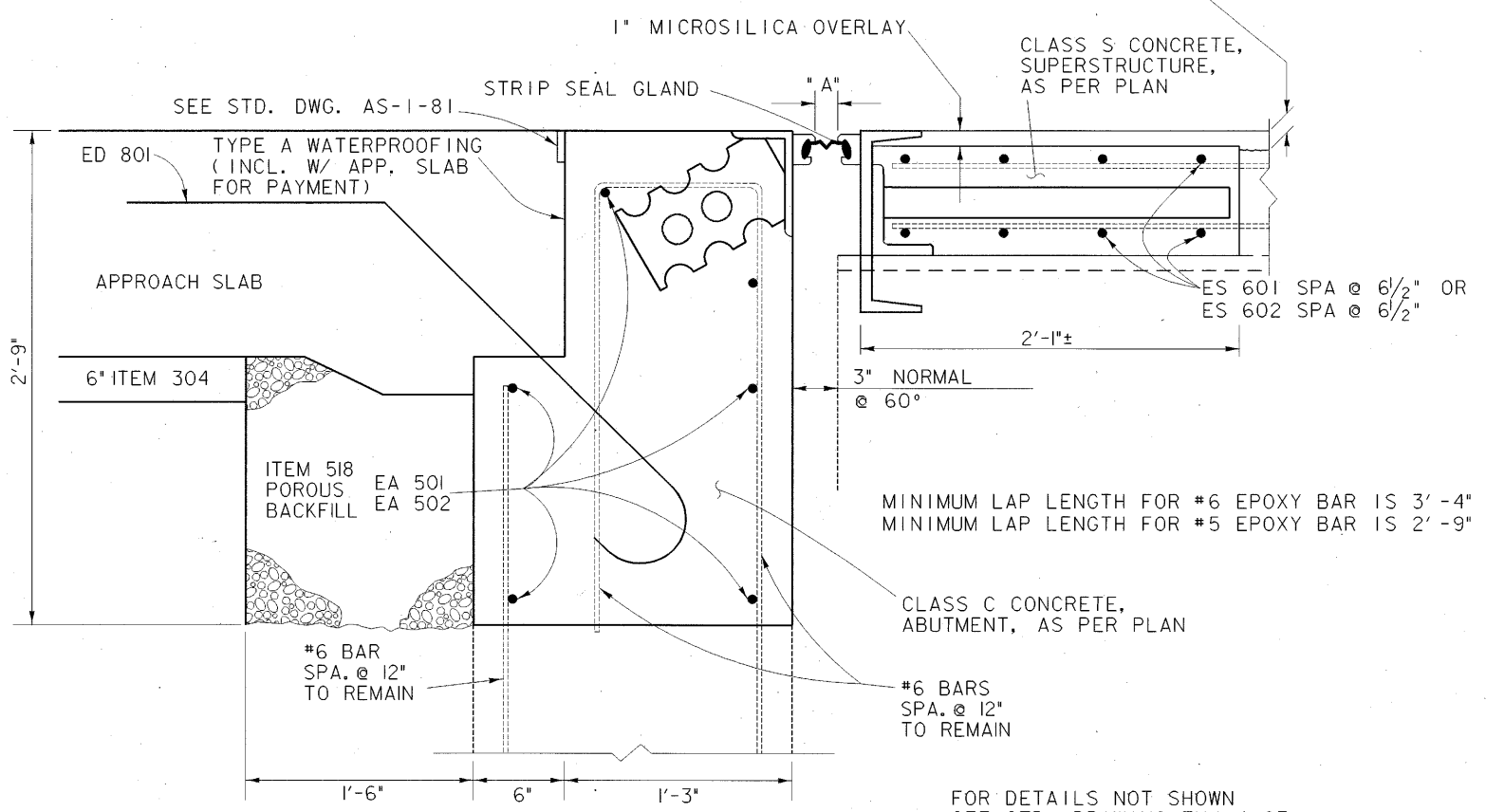
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 WORKSTATION: darastro DATE: 18-AUG-1995



**EXISTING EXPANSION JOINT**

1/4" MICROSILICA OVERLAY  
 (INCLUDING 1/4" DECK REMOVAL)

**NOTE:**  
 COST OF CONNECTING EXISTING CROSSFRAMES  
 TO NEW EXPANSION JOINTS SHALL BE INCLUDED  
 IN COST OF EXPANSION JOINTS.



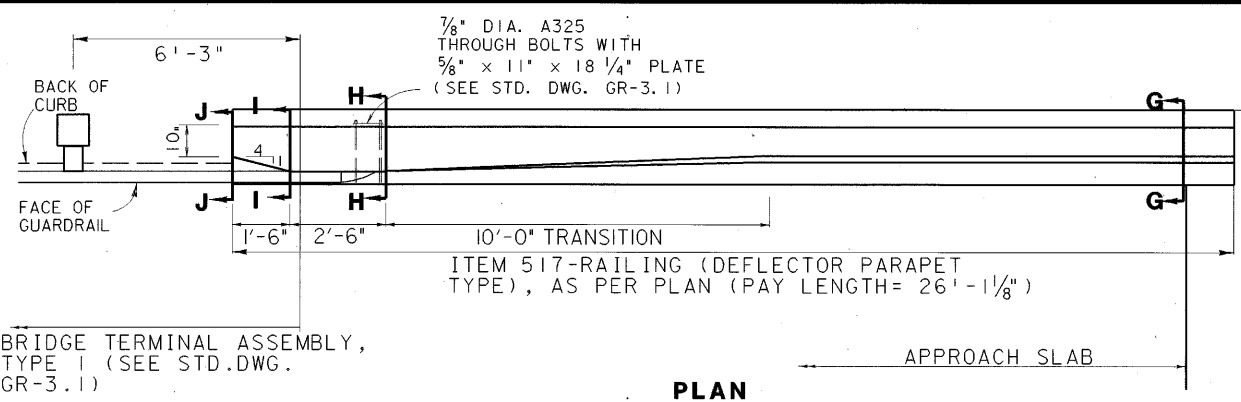
**PROPOSED EXPANSION JOINT**

FOR DETAILS NOT SHOWN  
 SEE STD. DRAWING EXJ-4-87

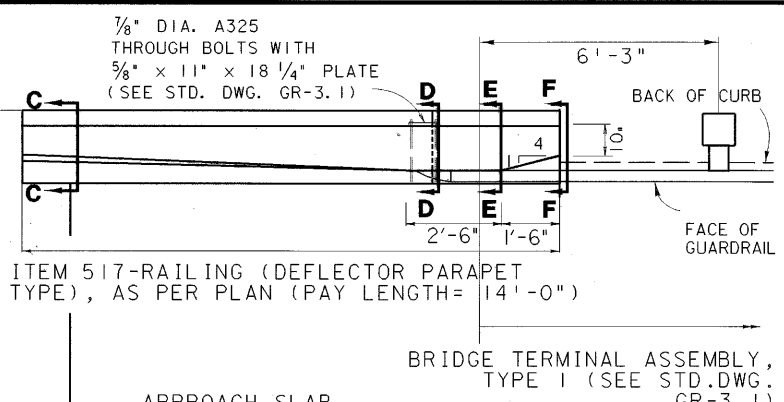
REAR ABUTMENT 3" STRIP SEAL GLAND		FORWARD ABUTMENT 4" STRIP SEAL GLAND	
TEMP. (°F)	'A' (INCHES)	TEMP. (°F)	'A' (INCHES)
90	1 1/2	90	1 3/4
80	1 9/16	80	1 7/8
70	1 5/8	70	2
60	1 11/16	60	2 1/8
50	1 3/4	50	2 1/4
40	1 13/16	40	2 3/8
30	1 7/8	30	2 1/2

FOR ABUTMENT DETAILS  
 SEE SHEET 3/12

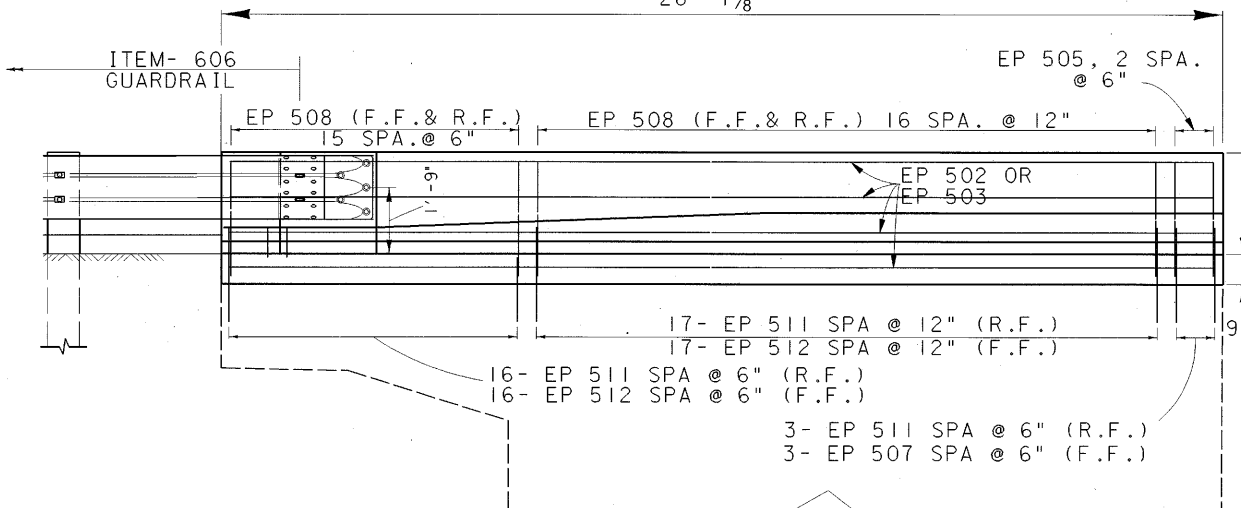
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 WORKSTATION: darmsfr DATE: 18-AUG-1995



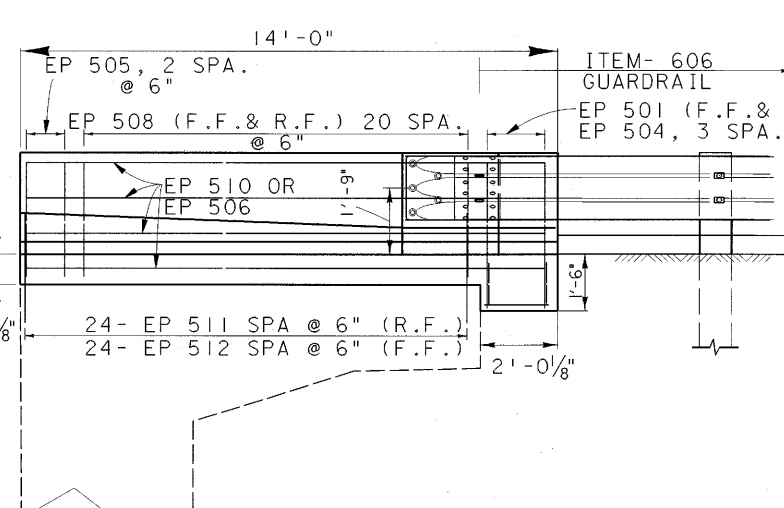
**PLAN**



**PLAN**



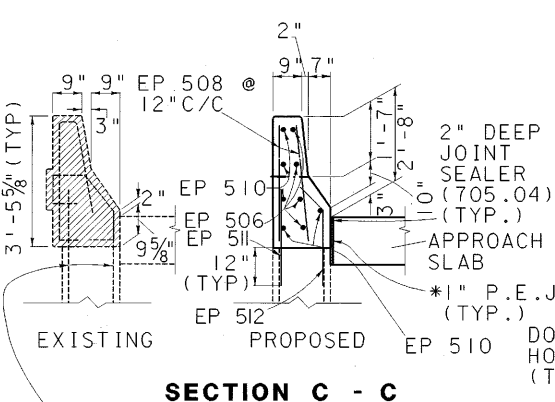
**ELEVATION WING WALL "A"**



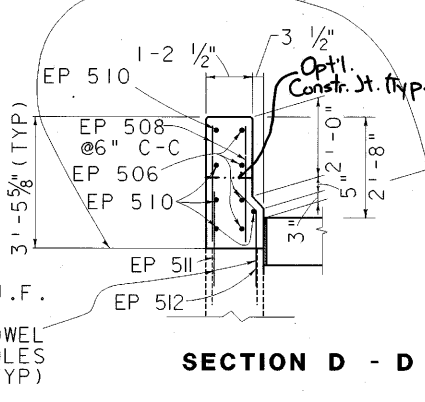
**ELEVATION WING WALL "B"**

INDICATES AREA TO BE REMOVED AS PART OF ITEM 202-PORTION OF STRUCTURE REMOVED, AS PER PLAN (PARAPETS)

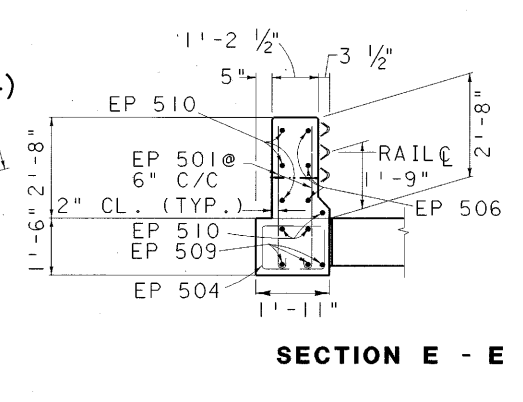
LIMITS OF SEALING OF CONCRETE SURFACES (NON-EPOXY) (TYP.)



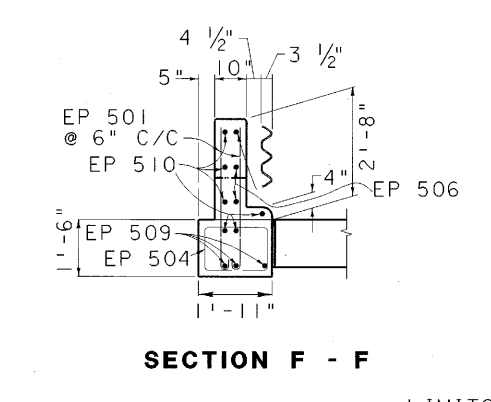
**SECTION C - C**



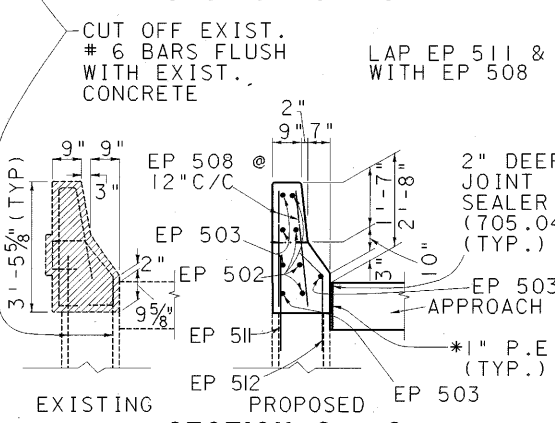
**SECTION D - D**



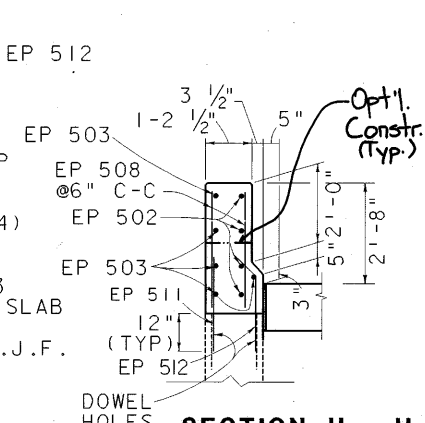
**SECTION E - E**



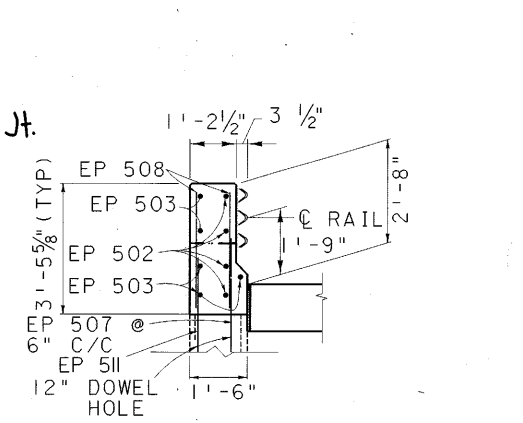
**SECTION F - F**



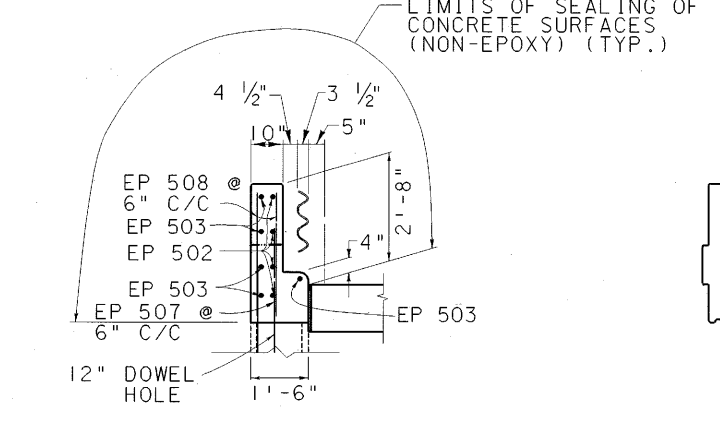
**SECTION G - G**



**SECTION H - H**



**SECTION I - I**



**SECTION J - J**

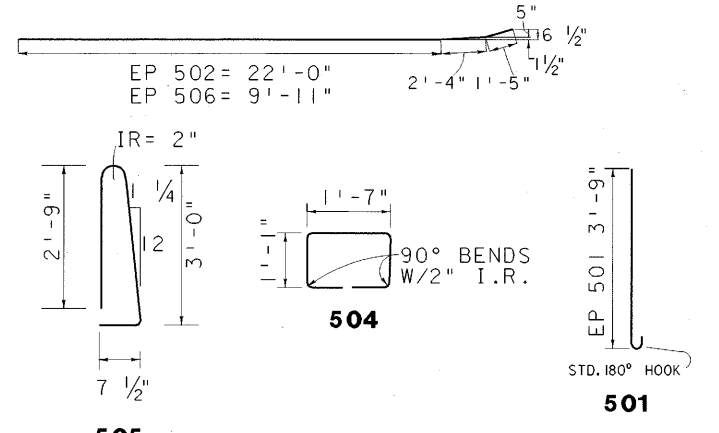
LIMITS OF SEALING OF CONCRETE SURFACES (NON-EPOXY) (TYP.)

**GENERAL NOTES**  
 DESIGN DATA: CONCRETE SHALL BE CLASS S CONCRETE SUPERSTRUCTURE. REINFORCING STEEL SHALL BE GRADE 60, EPOXY COATED.  
 PARAPET: SEE PLAN NOTE FOR ITEM 517- RAILING (DEFLECTOR PARAPET TYPE), AS PER PLAN ON SHEET NO. 2712.

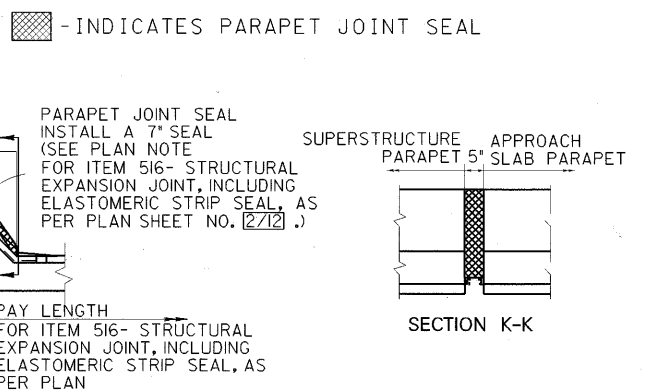
**BENDING DIAGRAMS REINFORCING BAR LIST**

MARK	NO.	LENGTH	TYPE
EP 501	16	4'-4"	BT.
EP 502	16	25'-9"	BT.
EP 503	20	25'-8"	STR.
EP 504	16	5'-0"	BT.
EP 505	24	5'-10"	BT.
EP 506	16	13'-8"	BT.
EP 507	12	3'-0"	STR.
EP 508	432	3'-1"	STR.
EP 509	12	1'-8"	STR.
EP 510	20	13'-5"	STR.
EP 511	240	2'-6"	STR.
EP 512	228	2'-10"	BT.

ALL REINFORCING BARS SHALL BE EPOXY COATED AND INCLUDED FOR PAYMENT WITH ITEM 517- RAILING (DEFLECTOR PARAPET TYPE), AS PER PLAN



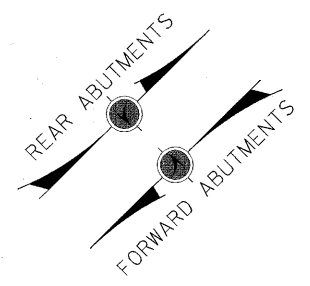
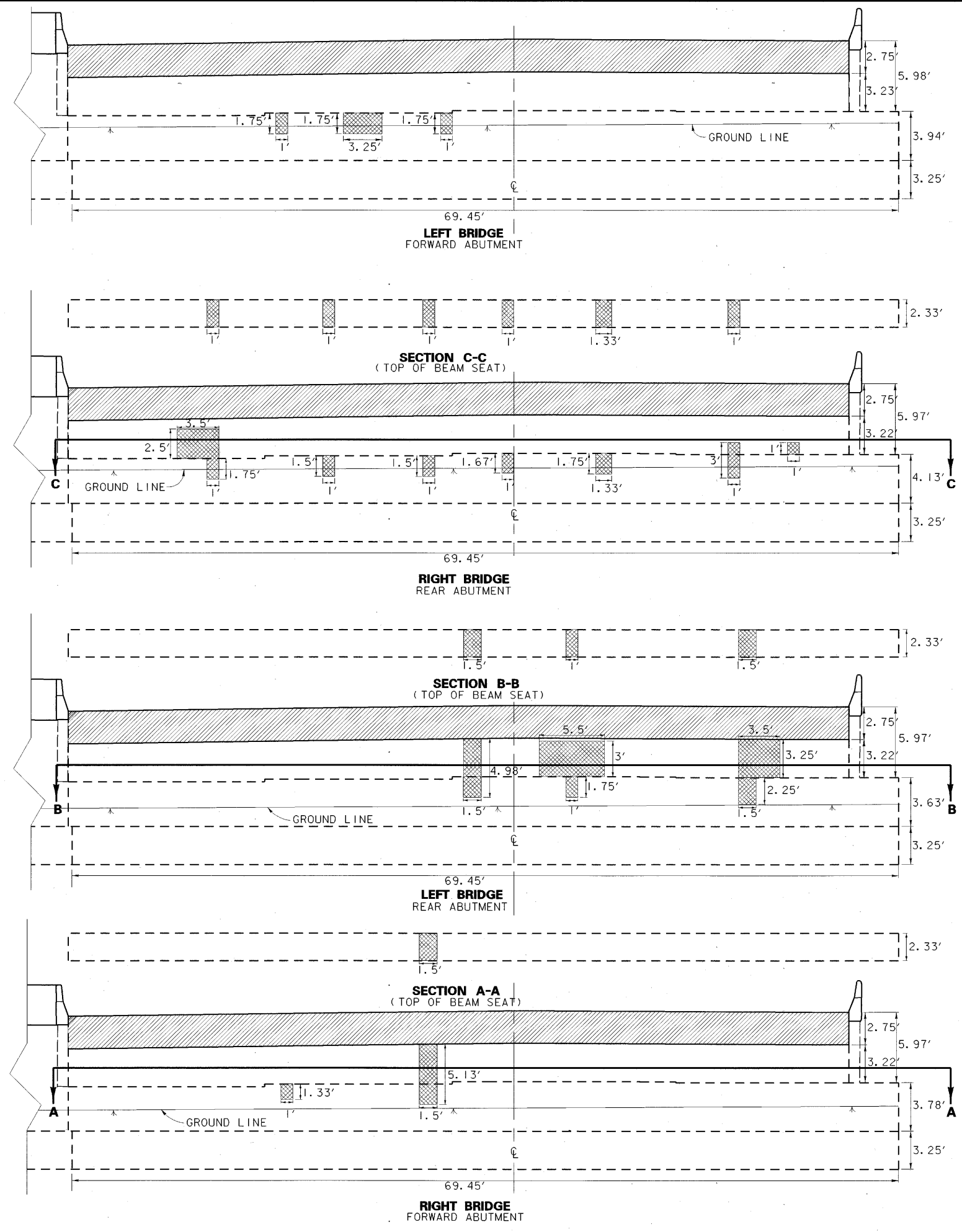
F.F. = FRONT FACE  
 R.F. = REAR FACE  
 \* 1" P.E.J.F. AND 2" DEEP JOINT SEALER (705.04) SHALL BE INCLUDED WITH ITEM 611-APPROACH SLAB FOR PAYMENT.




**DETAIL OF JOINT SEAL**


OHIO DEPT. OF TRANSPORTATION  
 DISTRICT THREE  
 LOCATION AND DESIGN  
 DATE: 4/95  
 REVIEWED: FEC  
 STRUCTURE FILE NUMBER: 2204754 & 2204762  
 DESIGNED: P. KA  
 CHECKED: R. ON  
 APPROACH SLAB PARAPET DETAILS  
 STRUCTURE NO. ERI-2-2421 L & R  
 OVER NORFOLK & WESTERN RAILROAD  
 ERI/LOR-2-22-24/0.00  
 5/12  
 152/187

DESIGN FILE: c:\dgn\er12\242\242ipatl.dgn  
 WORKSTATION: dar.mstro DATE: 18-AUG-1995



 - INDICATES AREA TO BE REMOVED AS PART OF ITEM 202- PORTIONS OF STRUCTURE REMOVED, AS PER PLAN AND NEW ITEM 511- CLASS C CONCRETE, ABUTMENT, AS PER PLAN

SEE SHEET 3/12 FOR ABUTMENT DETAILS.

 - INDICATES ITEM 519, PATCHING CONCRETE STRUCTURES

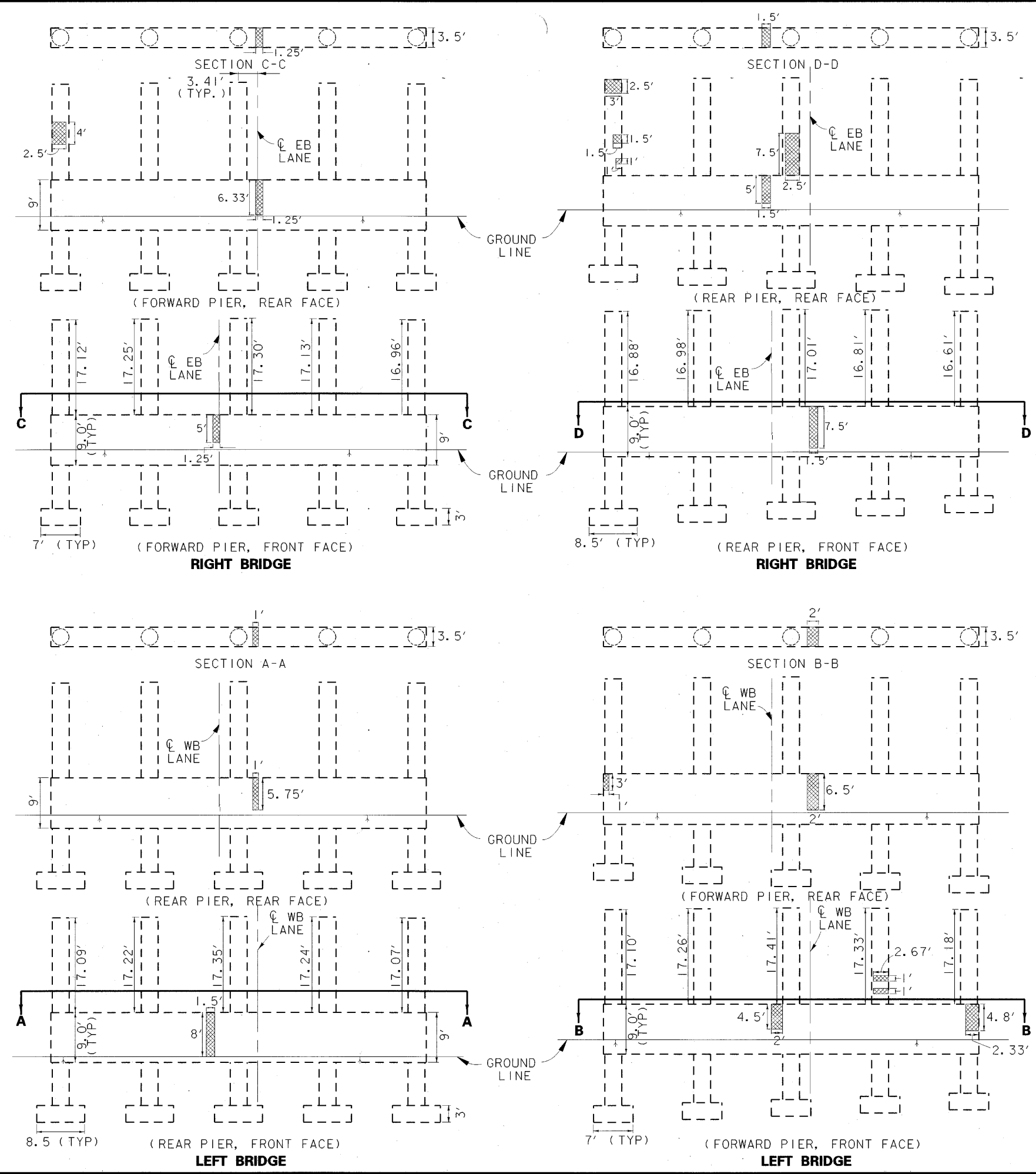
FOR SECTIONS THROUGH BACKWALL SEE SHEET 3/12.

CONCRETE PATCHING SUMMARY			
LOCATION	UNIT	MEASURED QUANTITY	ESTIMATED QUANTITY
RIGHT BRIDGE REAR ABUTMENT	SQ. FT.	36.2	75
LEFT BRIDGE FORWARD ABUTMENT	SQ. FT.	9.2	20
RIGHT BRIDGE FORWARD ABUTMENT	SQ. FT.	12.5	25
LEFT BRIDGE REAR ABUTMENT	SQ. FT.	49.8	100
<b>TOTAL</b>		<b>107.7</b>	<b>220</b>

TOTAL CARRIED TO BRIDGE ESTIMATED QUANTITIES

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DESIGN FILE: c:\dgn\er12\242\242ipat2.dgn  
 WORKSTATION: darastro DATE: 18-AUG-1995



INDICATES ITEM 519, PATCHING CONCRETE STRUCTURES

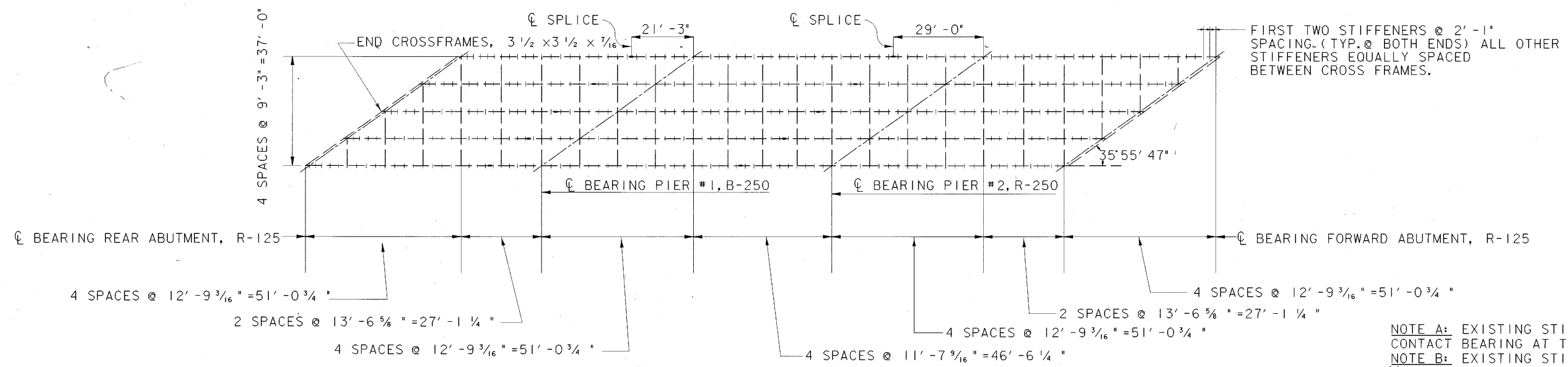
CONCRETE PATCHING SUMMARY			
LOCATION	UNIT	MEASURED QUANTITY	ESTIMATED QUANTITY
LEFT BRIDGE REAR PIER	SQ. FT.	21.3	45
LEFT BRIDGE FORWARD PIER	SQ. FT.	48.5	97
RIGHT BRIDGE REAR PIER	SQ. FT.	53.5	107
RIGHT BRIDGE FORWARD PIER	SQ. FT.	28.5	57
<b>TOTAL</b>		<b>151.8</b>	<b>306</b>

TOTAL CARRIED TO BRIDGE ESTIMATED QUANTITIES



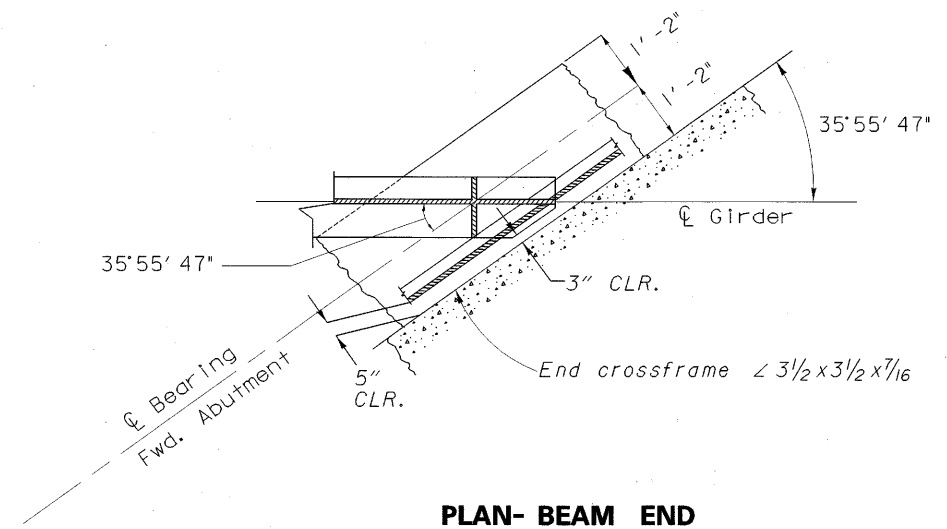
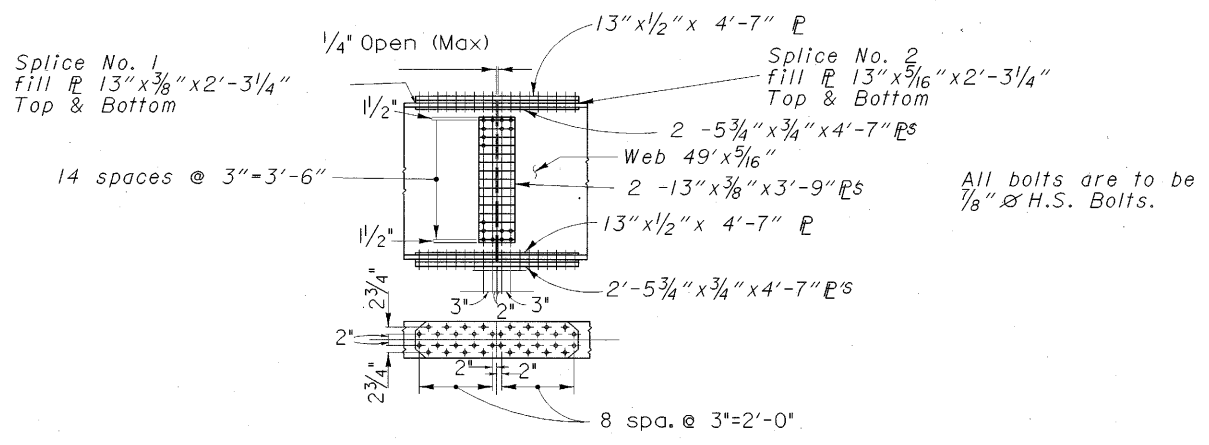
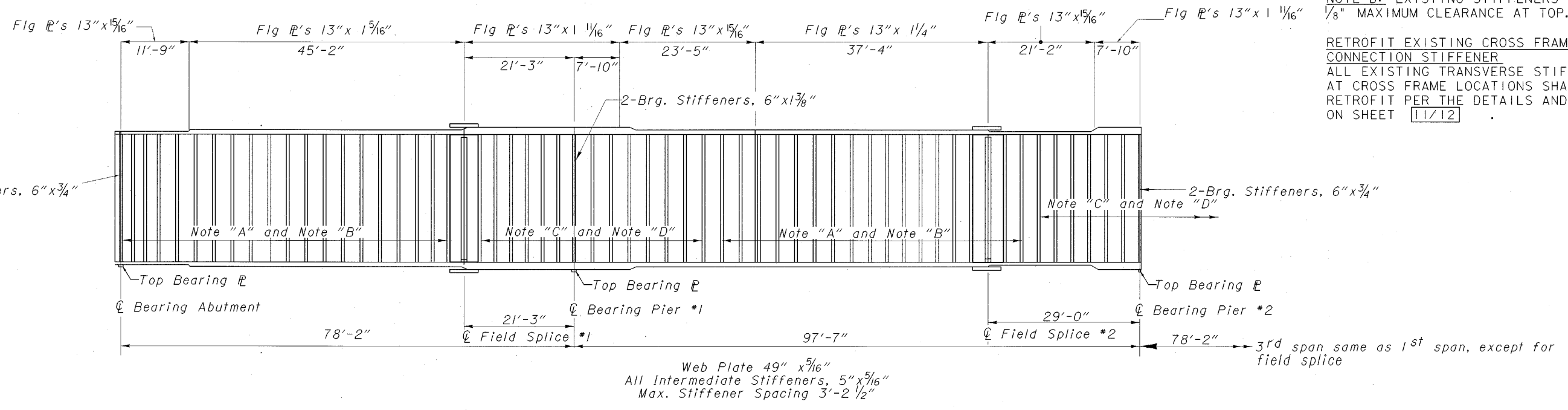


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NOTE A: EXISTING STIFFENERS HAVE CONTACT BEARING AT TOP.  
 NOTE B: EXISTING STIFFENERS HAVE 1/8" MAXIMUM CLEARANCE AT BOTTOM.  
 NOTE C: EXISTING STIFFENERS HAVE CONTACT BEARING AT BOTTOM.  
 NOTE D: EXISTING STIFFENERS HAVE 1/8" MAXIMUM CLEARANCE AT TOP.

RETROFIT EXISTING CROSS FRAME CONNECTION STIFFENER  
 ALL EXISTING TRANSVERSE STIFFENERS AT CROSS FRAME LOCATIONS SHALL BE RETROFIT PER THE DETAILS AND NOTES ON SHEET 11/12



DESIGN FILE: c:\dgn\er1\242\242issdd.dgn  
 WORKSTATION: darmsfro DATE: 18-AUG-1995



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DESIGN FILE: c:\dgn\er12\242\242stiff.dgn  
 WORKSTATION: darmstro DATE: 18-AUG-1995

**ITEM 513-STRUCTURAL STEEL, MISC.: RETROFIT EXISTING CROSS FRAME CONNECTION STIFFENER**

THIS WORK SHALL CONSIST OF CONNECTING EXISTING TRANSVERSE STIFFENERS AT CROSS FRAME LOCATIONS TO GIRDER TOP AND BOTTOM FLANGES AS DIRECTED IN THE PLANS. SEE SHEET 10712.

ALL STRUCTURAL STEEL FOR THE CONNECTION PLATES SHALL BE A-36. THE PLATES SHALL BE SHOP CLEANED AND DELIVERED TO THE SITE BARE. THEY SHALL BE FIELD CLEANED AND PAINTED WITH THE EXISTING STRUCTURAL STEEL USING SYSTEM OZEU.

THE COST OF ALL MATERIAL, LABOR, EQUIPMENT, TOOLS, AND INCIDENTALS NECESSARY TO COMPLETE THIS WORK SHALL BE INCLUDED IN THE UNIT PRICE BID PER EACH STIFFENER END RETROFITTED FOR:

ITEM	UNIT	DESCRIPTION
513	EACH	STRUCTURAL STEEL, MISC.: RETROFIT EXISTING CROSS FRAME CONNECTION STIFFENER

**PENCIL ABRASIVE BLASTING**

THE PENCIL BLASTING REFERRED TO BY THE VARIOUS REPAIR ITEMS IN THESE PLANS SHALL CONFORM TO THE FOLLOWING:

THE DESIGNATED NON-DESTRUCTIVE TESTING (NDT) AREAS SHALL BE CLEANED OF ALL PAINT, RUST, AND FOREIGN MATERIALS BY ABRASIVE BLASTING TO A SURFACE QUALITY OF PREPARATION GRADE Sa 2 1/2. SINCE THE INTENT OF THE PENCIL BLASTING IS TO ENHANCE THE VISUAL AND NDT CRACK DETECTION TECHNIQUES PERFORMED UPON THE STRUCTURAL STEEL, A GENTLE BLAST SHALL BE USED SUCH THAT THE SURFACE IS NOT PEENED OR OTHERWISE COLD WORKED. CARE SHALL BE TAKEN SO AS NOT TO DAMAGE THE PAINT IN THE SURROUNDING AREA. THE BLASTING SHALL BE PERFORMED USING A MAXIMUM COMPRESSED AIR PRESSURE OF 100 PSI, A HOSE NOZZLE DIAMETER OF 1/4 ± 1/16 INCH AND A GRADE 30/60 COAL SLAG ABRASIVE OR EQUIVALENT. SILICA SAND SHALL NOT BE USED. BLASTERS USED FOR SURFACE PREPARATION FOR STRUCTURAL STEEL COATING CANNOT BE USED FOR PENCIL BLASTING. AFTER ABRASIVE BLASTING IS COMPLETE THE CLEANED AREA SHALL BE AIR BLOWN CLEAN.

THE CONTRACTOR SHALL DEMONSTRATE TO THE ENGINEER PRIOR TO THE START OF THE WORK THAT HE CAN SATISFACTORILY PERFORM PENCIL ABRASIVE BLASTING ACCORDING TO THESE SPECIFICATIONS. COST OF PENCIL ABRASIVE BLASTING HAS BEEN INCLUDED FOR PAYMENT WITH THE APPROPRIATE PAY ITEMS.

**ITEM 513- STRUCTURAL STEEL, MISC.: PENCIL ABRASIVE BLASTING, GRINDING AND NDT**

THIS WORK SHALL CONSIST OF THE FOLLOWING SEQUENCE OF OPERATIONS PERFORMED AT ALL STIFFENERS AT THE CROSS FRAME LOCATIONS AS DIRECTED BY THE ENGINEER.

- CLEAN THE AREA BY PENCIL ABRASIVE BLASTING THE PAINT AND/OR RUST FROM THE SURFACE OF THE PLATES AND ADJACENT WELDS.
- THE ENGINEER, ACCOMPANIED BY THE CONTRACTOR, SHALL CAREFULLY VISUALLY INSPECT THE CLEANED AREA. GRINDING MAY BE DIRECTED BY THE ENGINEER TO ENHANCE INVESTIGATION FOR CRACK PRESENCE. ALL GRINDING MUST BE DONE CAUTIOUSLY, ESPECIALLY IN TENSION ZONES. THE GRINDING MOTION SHALL BE PARALLEL WITH THE FLANGE EDGE.
- THE CONTRACTOR SHALL NON-DESTRUCTIVELY TEST (NDT) THE AREA USING MAGNETIC PARTICLE EXAMINATION AND/OR DYE PENETRANT SO THAT THE ENGINEER MAY FURTHER INSPECT FOR CRACKS.
- ALL CRACKS AND/OR CRACK TIPS THAT ARE ACCESSIBLE SHALL BE REMOVED ACCORDING TO, AND PAID FOR UNDER, ITEM SPECIAL-DRILLING STRUCTURAL STEEL. ANY CRACKS INACCESSIBLE TO DRILLING SHALL BE REMOVED BY CAREFUL GRINDING OR BY CAREFULLY ENLARGING THE DRILLED HOLES BY GRINDING AND PAID FOR UNDER DRILLING STRUCTURAL STEEL.
- PERFORM THE STEP 1 THROUGH STEP 4 OPERATIONS ON THE OTHER SIDE OF THIS LOCATION.

THE ACCEPTED NUMBER OF NDT LOCATIONS AS DESCRIBED IN THIS NOTE WILL BE PAID FOR AT THE CONTRACT UNIT PRICE PER LOCATION, WHICH PRICE AND PAYMENT SHALL BE FULL COMPENSATION FOR FURNISHING ALL MATERIAL, LABOR AND EQUIPMENT NECESSARY TO CLEAN, GRIND AND PERFORM NDT OF BOTH SIDES OF THE WEB AT THE BRACKET LOCATION.

PAYMENT WILL BE MADE AT THE CONTRACT PRICE BID UNDER:

ITEM	UNIT	DESCRIPTION
513	EACH	STRUCTURAL STEEL, MISC.:PENCIL ABRASIVE BLASTING, GRINDING AND N.D.T.

**ITEM 513- STRUCTURAL STEEL, MISC.: DRILLING STRUCTURAL STEEL, (1/2" DIAMETER HOLE)**

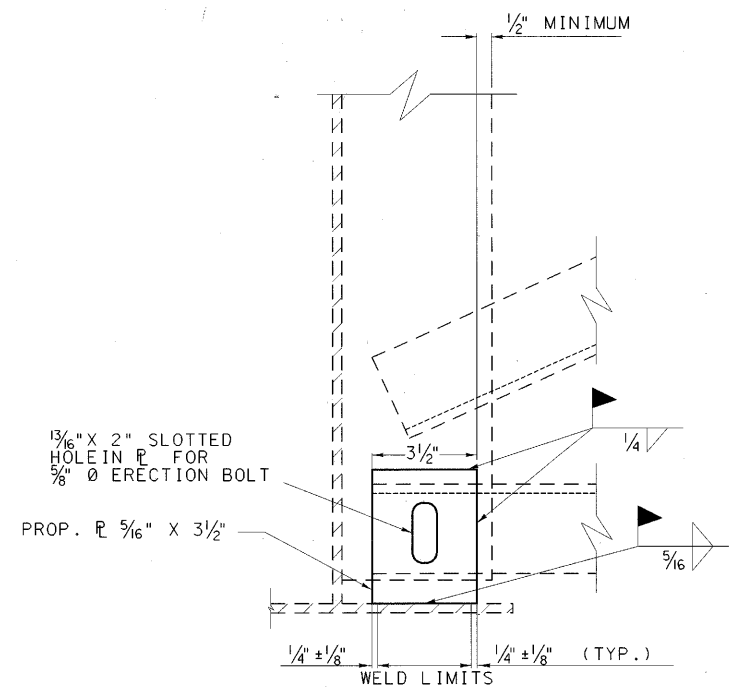
THIS WORK SHALL CONSIST OF THE FOLLOWING SEQUENCE OF OPERATIONS PERFORMED ON THE WEB.

- THE CONTRACTOR AND THE ENGINEER SHALL CAREFULLY VISUALLY INSPECT THE AREAS INDICATED IN THE DETAIL BELOW.
- THE CONTRACTOR SHALL THEN PENCIL ABRASIVE BLAST THE AREAS AND PERFORM NON-DESTRUCTIVE TESTING TO LOCATE THE END OF THE CRACKS.
- THE CONTRACTOR AND THE ENGINEER SHALL THEN REINSPECT THE AREA TO DETERMINE THE ENDS OF THE CRACKS.
- THE CONTRACTOR SHALL THEN DRILL THE 1/2" DIAMETER HOLES AT THE APPARENT ENDS OF THE CRACKS REVEALED BY THE TESTING.
- THE EXPOSED CIRCUMFERENCE OF THE HOLE SHALL THEN BE GROUND SMOOTH AND CAREFULLY INSPECTED FOR CRACKS USING MAGNETIC PARTICLE AND DYE PENETRANT. DRILLING, GRINDING AND TESTING SHALL CONTINUE UNTIL ALL CRACK ENDS ARE REMOVED.

THE ACCEPTED NUMBER OF HOLES DRILLED IN THE STRUCTURAL STEEL AS DETAILED ABOVE WILL BE PAID FOR THE CONTRACT UNIT PRICE PER EACH HOLE FOR ITEM SPECIAL- DRILLING STRUCTURAL STEEL (1/2" DIAMETER HOLE) WHICH PRICE AND PAYMENT SHALL BE FULL COMPENSATION FOR FURNISHING ALL MATERIAL, EQUIPMENT, LABOR AND INCIDENTALS NECESSARY TO CLEAN, DRILL, GRIND AND NON-DESTRUCTIVELY TEST THE WEB AREAS.

ITEM	UNIT	DESCRIPTION
513	EACH	STRUCTURAL STEEL, MISC.: DRILLING STRUCTURAL STEEL, (1/2" DIAMETER HOLE)

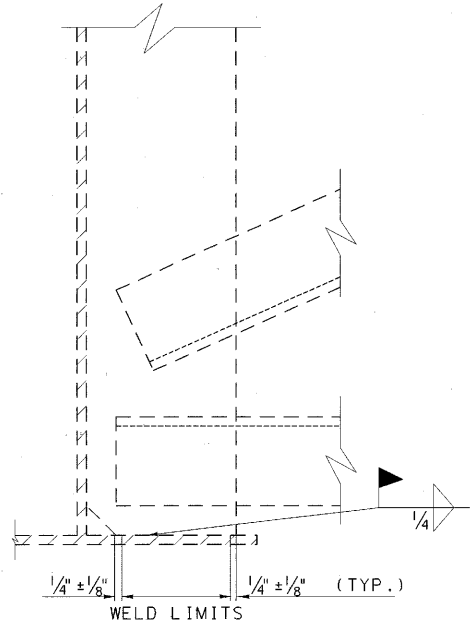
SEE SHEET 11A712 FOR ADDITIONAL LOCATIONS AND DETAILS



**AT STIFFENER END CUT CLEAR OF FLANGE**

NOTES:  
CONNECTION PLATE INSTALLATION PROCEDURE:

- USING FIELD MEASUREMENTS, DETERMINE REQUIRED PLATE LENGTH AND POSITION OF SLOTTED HOLE PRIOR TO FABRICATION RETROFIT PLATES.
- REMOVE EXISTING ERECTION BOLT COMMON TO CROSSFRAME ANGLE.
- ABRASIVELY CLEAN STIFFENER AT MATING SURFACE WITH RETROFIT PLATE.
- INSTALL RETROFIT PLATE USING 5/8" Ø ERECTION BOLT AND WELD AS SHOWN.

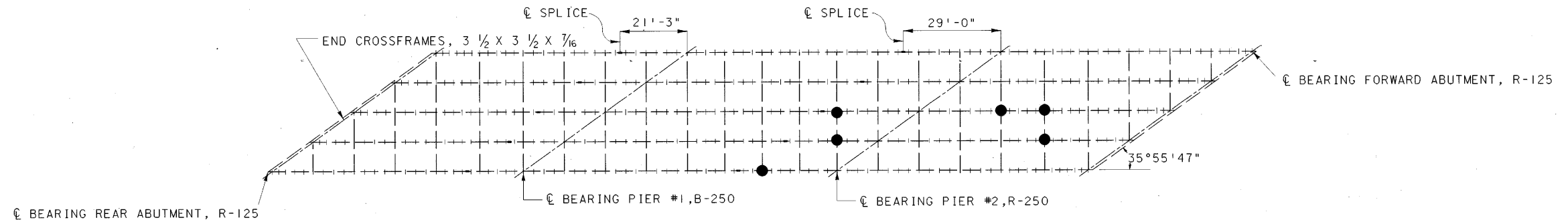


**AT CONTACT BEARING END OF STIFFENER**

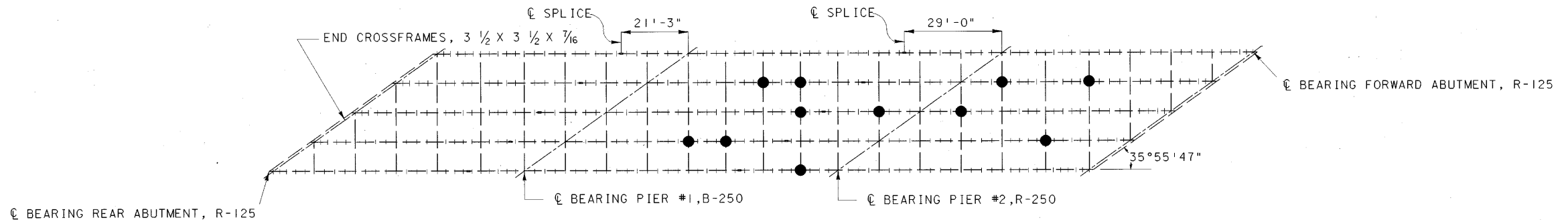
**RETROFIT OF EXISTING STIFFENERS AT CROSSFRAME LOCATIONS**  
(TYPICAL AT TOP AND BOTTOM FLANGE)

DESIGN AGENCY: OHIO DEPT. OF TRANSPORTATION  
 DISTRICT THREE  
 LOCATION AND DESIGN  
 DATE: 4/95  
 REVISION: 4/95  
 STRUCTURE FILE NUMBER: 2204754 & 2204762  
 DESIGNED: P. KA  
 CHECKED: RDN  
 RETROFIT OF EXISTING STIFFENERS DETAIL - 1  
 BRIDGE NO. ERI-2-2421 L & R  
 OVER NORFOLK & WESTERN RAILROAD  
 ERI/LOR-2-22.24/0.00  
 11/12  
 158  
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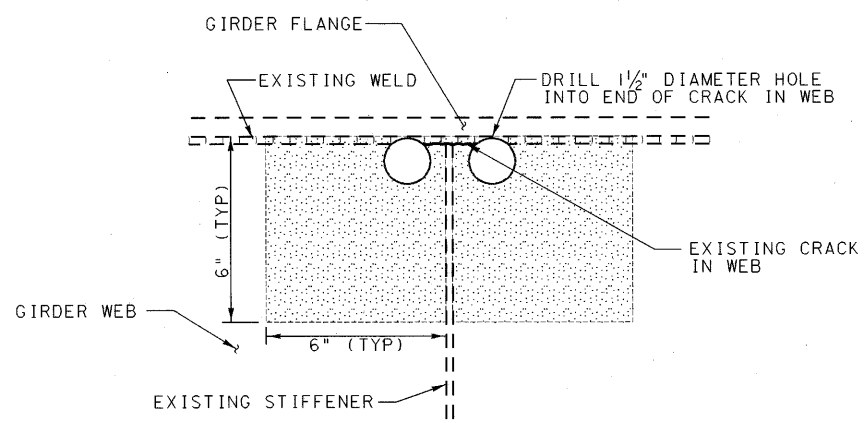
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LEFT BRIDGE

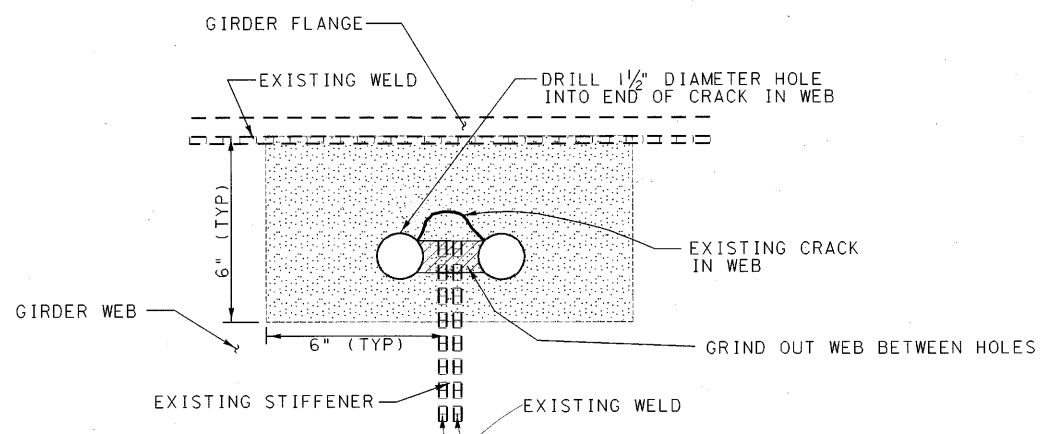


RIGHT BRIDGE



**DRILLING STRUCTURAL STEEL AT CROSSFRAME LOCATIONS**  
(HORIZONTAL CRACK ALONG WELD BETWEEN TOP FLANGE AND WEB OF GIRDER)

▨ -AREA TO BE PENCIL ABRASIVE BLASTED AND N.D.T.



**ADDITIONAL DRILLING OF STRUCTURAL STEEL AT CROSSFRAME LOCATIONS SHOWN ABOVE**

● -CRACK AT TOP OF WELD BETWEEN STIFFENER AND WEB OF GIRDER

▨ -AREA TO BE PENCIL ABRASIVE BLASTED AND N.D.T.

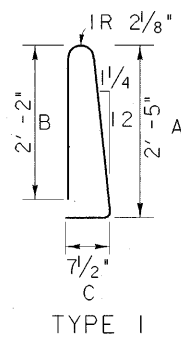
SEE SHEET 11/12 FOR ADDITIONAL DETAILS AND NOTES.

DESIGN FILE: c:\dgn\er12\242\242istffo.dgn  
WORKSTATION: darnstro DATE: 18-AUG-1995

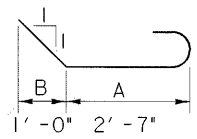
DESIGN AGENCY OHIO DEPT. OF TRANSPORTATION DISTRICT THREE LOCATION AND DESIGN	DATE 4/95	REVIEWED FEC	STRUCTURE FILE NUMBER 2204754 & 2204762
DESIGNER DRA	CHECKED RON	DRAWN DRA	REVISED
RETROFIT OF EXISTING STIFFENERS DETAIL - 2 BRIDGE NO. ER1-2-242 L & R OVER NORFOLK & WESTERN RAILROAD			
ERI/LOR-2-22-24/0.00			
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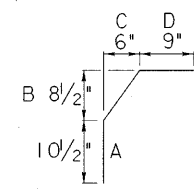
MARK	NUMBER			LENGTH	TYPE	A	B	C	D	E	WEIGHT
	LEFT	RIGHT	TOTAL								
EA 501	12	12	24	16'-5"	STR						411
EA 502	12	12	24	17'-7"	STR						440
ED 801	88	88	176	4'-11"	2	2'-7"	1'-0"				2312
ADDITIONAL FROM SHEET 2/12											200
<b>TOTAL</b>											<b>3363</b>



TYPE 1



TYPE 2



TYPE 3

MARK	NUMBER		TOTAL	LENGTH	TYPE	A	B	C	D	E	WEIGHT
	LT BRIDGE	RT BRIDGE									
ES 601	32	32	64	16'-5"	STR						1578
ES 602	32	32	64	17'-7"	STR						1690
<b>TOTAL</b>											<b>3268</b>

MARK	NUMBER		TOTAL	LENGTH	TYPE	A	B	C	D	E	WEIGHT
	LT BRIDGE	RT BRIDGE									
EX 501	350	350	700	3'-2"	STR						2314
EX 502	350	350	700	2'-6"	3	10 1/2"	8 1/2"	6"	9"		1825
EX 503	350	350	700	5'-3"	1	2'-5"	2'-2"	7 1/2"			3833
EX 504	72	72	144	30'-0"	STR						4506
EX 505	8	8	16	15'-0"	STR						250
EX 601	72	72	144	30'-0"	STR						6489
EX 602	8	8	16	20'-3"	STR						487
<b>TOTAL</b>											<b>19704</b>

DESIGN FILE: c:\dgn\er12\242\242ist1.dgn  
 WORKSTATION: darnstro DATE: 18-AUG-1995