LOR-611-3.57	OHIO
	FHWA REGION 5
BHM-9C28(2)	FEDERAL PROJECT

1/99

STATE OF OHIO
DEPARTMENT OF TRANSPORTATION

LOR-611-3.57
CITY OF LORAIN
LORAIN COUNTY

LOR-611-0358
SUPERSTRUCTURE WORK

DESIGN DESIGNATION

1988 ADT	=	16,600
2008 ADT	=	24,100
DHV	=	1,900
D	=	55%
T	=	4%
V	=	35 MPH*

LEGAL SPEED = 35 MPH
FUNCTIONAL CLASS. = URBAN ARTERIAL

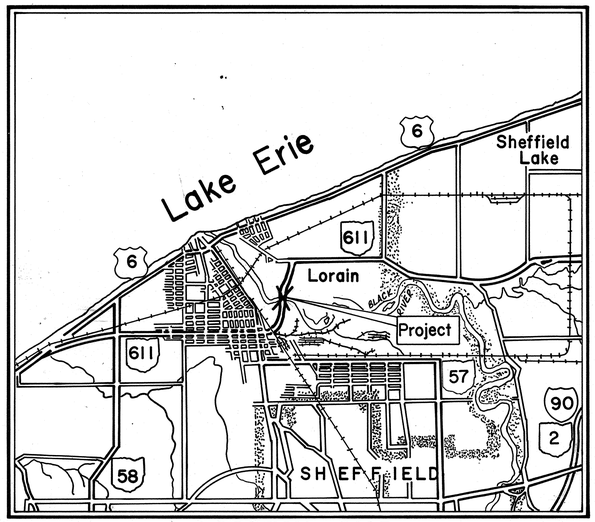
* Design Exceptions noted on sheet 2

CONVENTIONAL SIGNS

County Line
Township Line
Section Line
Corporation Line or
Fence Line (existing) (proposed) 352 353
Center Line
Trees, Stumps, (to be removed)
Utility Poles: Telephone, Power, Light

Limited Access (only) LA
Right of Way (only) RW
Limited Access & Right of Way LA & RW
Existing Right of Way
Property Line (in existing fence)
Railroad or
Guardrail (existing) (proposed)

INDEX OF SHEETS



LOCATION MAP

SCALE IN MILES
0 1 2 3 4

Portion to be improved
State & Federal Routes
Other Roads

SCALES

Plan 0 50 100
Profile: Horizontal 0 50 100, Vertical 0 10 20
Cross Section: Horizontal 0 5 10, Vertical 0 5 10

LINE DATA

BEGIN PROJECT	STA. 188+59.6	
END PROJECT	STA. 206+27.4	
NET LENGTH		1767.8 LIN. FT. OR 0.335 MILE
BEGIN WORK	STA. 182+55	
END WORK	STA. 217+20	
NET LENGTH		3465.0 LIN. FT. OR 0.656 MILE

UNDERGROUND UTILITIES
TWO WORKING DAYS
BEFORE YOU DIG
Call---800-362-2764 (Toll free)
OHIO UTILITIES PROTECTION SERVICE
NON-MEMBERS
MUST BE CALLED DIRECTLY

1987 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 require the closing to traffic of the highway, except as noted on sheet 5, and that detours will be provided as indicated on the plans.

SUPPLEMENTAL SPECIFICATIONS			
847	10-17-83	802	5-4-88
947	10-17-83		
824	10-8-82		
853	6-26-78		
956	6-26-78		

SUPPLEMENTAL PRINTS OF STANDARD CONSTRUCTION DRAWINGS									
BP-3	12-6-76	MT-99.10	11-14-86	AS-1-81	11-27-81	HL-30.11	5-1-87		
BP-5	10-1-87					HL-30.21	5-1-87		
BP-7	10-1-87	TC-42.20	3-26-79			HL-40.10	5-1-87		
BP-12	10-1-87					HL-50.21	5-1-87		
						HL-60.11	5-1-87		
						HL-60.31	5-1-87		
GR-1	1-11-85								
GR-2B	2-5-82								
GR-3	1-21-85	TC-35.10	8-29-84						
GR-4	2-5-82								
GR-4A	1-30-84								
GR-4B	2-5-82								

Approved Gary W. Ling
Date 9/7/88 District Deputy Director of Transportation

FFE Approved B. D. Venkiteswaran FFE
Date 7-27-88 Engineer, Bureau of Bridges and Structural Design

Approved George E. Downing
Date 10-17-88 Chief Engineer, Planning and Design

Approved Bernard B Hunt
Date 10-17-88 Director, Department of Transportation

DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

APPROVED:

DIVISION ADMINISTRATOR DATE

Plan Prepared By:
Richland Engineering Limited
(Structure Plans)
and
District 3 Design
(Roadway Plans)

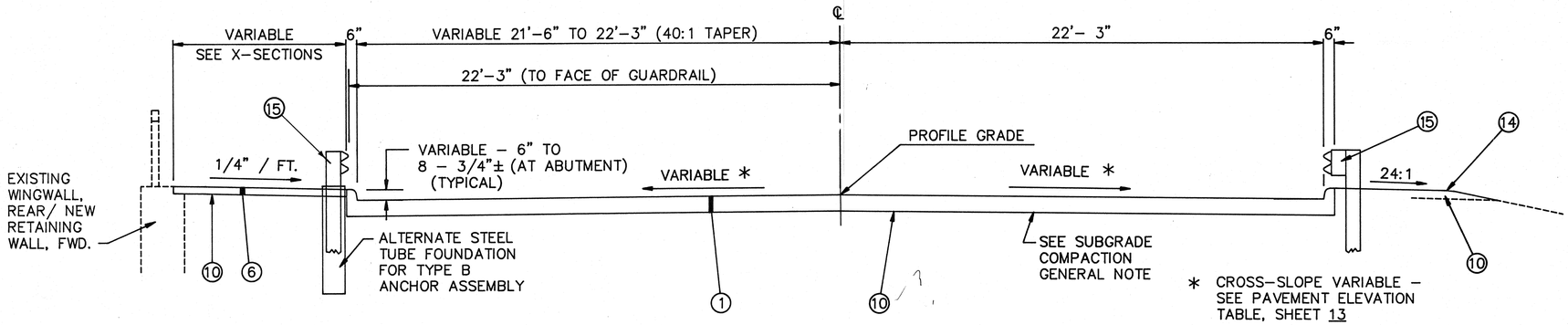
SEAL

Project: LOR-611-3.57 LORAIN COUNTY
Date of Letting 19 , Contract No.

LD 0300 Rev. 1-1-81

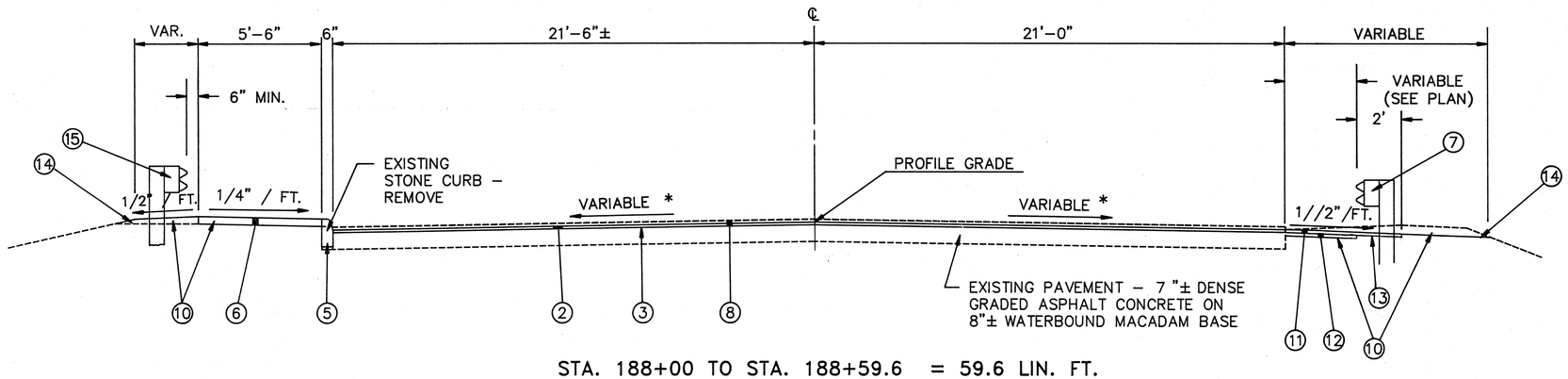
TYPICAL SECTIONS

TYPE 404



STA. 188+59.6 TO STA. 188+89.6 = 30 LIN. FT.
STA. 205+97.4 TO STA. 206+27.4 = 30 LIN. FT.
TOTAL = 60 LIN. FT.

NOTE: BRIDGE LIMITS STA. 188+89.6 TO STA. 205+97.4 = 1707.8 LIN. FT.



STA. 188+00 TO STA. 188+59.6 = 59.6 LIN. FT.

LEGEND

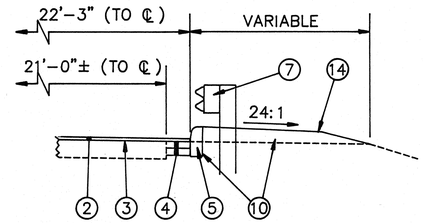
1. 611 REINFORCED CONCRETE APPROACH SLAB, T = 17"
2. 1–1/4" 404 ASPHALT CONCRETE, AC–20
3. 407 TACK COAT, AS PER PLAN (SEE GENERAL NOTE)
4. 10" 301 BITUMINOUS AGGREGATE BASE, AC–20
5. 609 STANDARD TYPE 6 CURB
6. 608 CONCRETE WALK, T = 4"
7. 606 GUARDRAIL, TYPE 5, AS PER PLAN (SEE GENERAL NOTE)
8. SPECIAL PAVEMENT PLANING, BITUMINOUS (SEE PROPOSAL NOTE)
9. VARIABLE 402 ASPHALT CONCRETE, AC–20 (0" TO 7–1/2"± MAX., PLACED IN 2" MAX. LIFTS)
10. 203 LINEAR GRADING *(SEE GENERAL NOTE)*
11. 2" 404 ASPHALT CONCRETE, AC–20
12. 4" 301 BITUMINOUS AGGREGATE BASE, (MAY USE 402 MATERIAL AS APPROVED BY ENGINEER)
13. 408 BITUMINOUS PRIME COAT, AS PER PLAN (SEE GENERAL NOTE)
14. 659 SEEDING AND MULCHING (SEE GENERAL NOTE)
15. 606 GUARDRAIL, TYPE 5

EXCEPTIONS TO MINIMUM DESIGN STANDARDS

EXCEPTION	REQUIRED WIDTH	ACTUAL WIDTH
LANE WIDTH	12'	10' & 11' (EACH DIRECTION)
GRADED SHOULDER WIDTH WITHOUT CURB	14'	8' MIN.
BRIDGE WIDTH	50'	44'–6"

EXCEPTIONS APPROVED MAY 11, 1988

NOTE: ALL ANGLES AT CHANGE OF SLOPE SHALL HAVE 4' ROUNDING UNLESS OTHERWISE SHOWN.

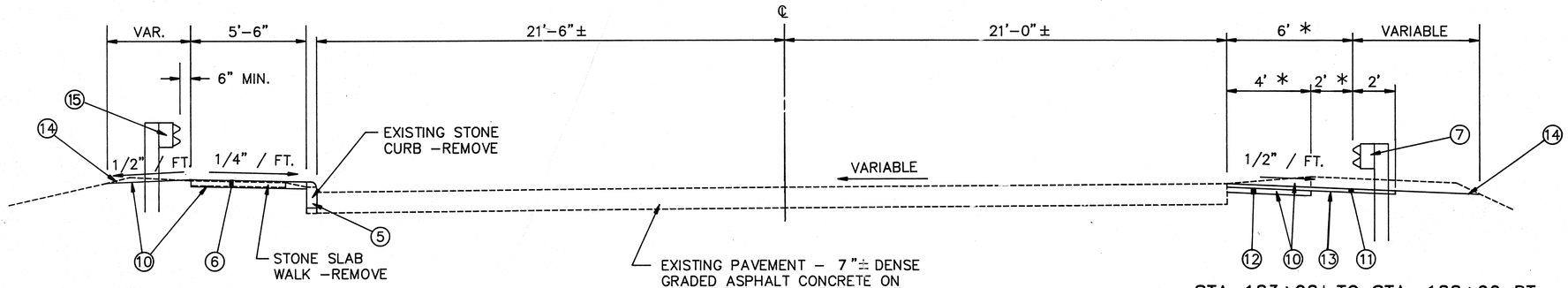


DETAIL FOR PAVEMENT WIDENING WITH CURB

STA. 188+41.6 TO STA. 188+59.6 RT.
STA. 206+27.4 TO STA. 206+45.4 RT.

PETE/LOR611

TYPICAL SECTIONS
TYPE 404



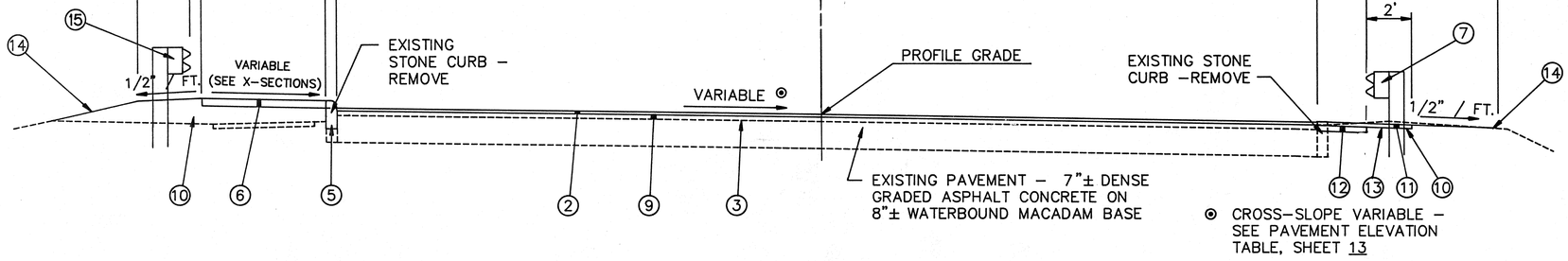
STA. 182+60± TO STA. 188+00 LT

STA. 183+08± TO STA. 188+00 RT.

FOR DESIGN EXCEPTIONS, SEE SHEET 2

SEE SHEET 2 FOR LEGEND

NOTE: ALL ANGLES AT CHANGE OF SLOPE SHALL HAVE 4' ROUNDING UNLESS OTHERWISE SHOWN.

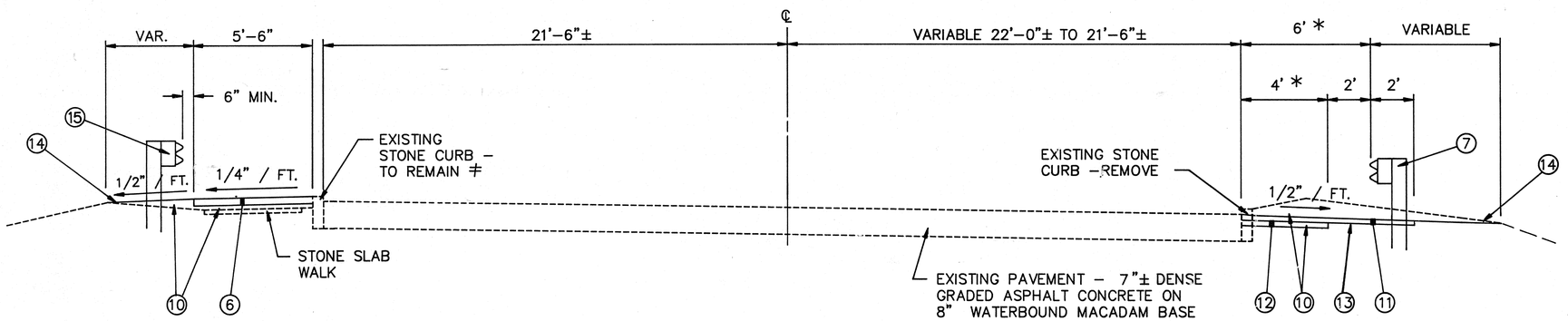


⊙ CROSS-SLOPE VARIABLE - SEE PAVEMENT ELEVATION TABLE, SHEET 13

* EXCEPT IN TAPERS TO MEET BRIDGE RAILING (SEE SHEET 13)

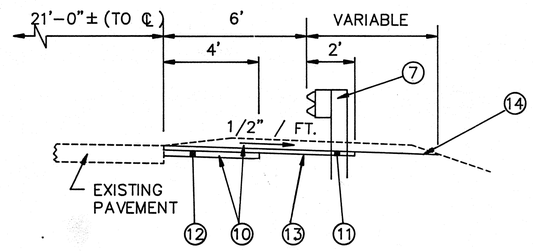
≠ EXCEPT WHERE CURB IS REPLACED AS DIRECTED BY ENGINEER - SEE GENERAL NOTE

STA. 206+27.4 TO STA. 207+50 = 122.6 LIN. FT.



STA. 207+50 TO STA. 217+17± LT.

STA. 207+50 TO STA. 213+40 RT.



STA. 213+40± TO STA. 217+00± RT.

PETE/LOR611A

GENERAL NOTES

LOR-611-3.57

FHWA REGION	STATE	PROJECT		4
5	OHIO			99

CALC. BY : RDS 7/82
CHK'D. BY : R.S. 8/82

FIELD OFFICE

THE CONTRACTOR SHALL PROVIDE A SUITABLE FIELD OFFICE HAVING A MINIMUM OF 800 SQ. FT. OF FLOOR SPACE. PAYMENT SHALL BE AT THE LUMP SUM PRICE BID FOR ITEM 619, FIELD OFFICE.

ROUNDING OF CORNERS SHOWN ON CROSS SECTIONS

THE ROUNDED CORNERS SHOWN ON THE TYPICAL SECTIONS, APPLY TO ALL CROSS SECTIONS EVEN THOUGH OTHERWISE SHOWN ON THESE PLANS.

UNDERGROUND UTILITIES

THE LOCATIONS OF UNDERGROUND UTILITIES SHOWN ON THE PLANS ARE AS OBTAINED FROM THE OWNERS OF THE UTILITY AS REQUIRED BY SECTION 153.64 ORC.

UTILITY OWNERSHIP

THE FOLLOWING UTILITIES AND OWNERS ARE LOCATED WITHIN THE WORK LIMITS OF THIS PROJECT:

ELECTRIC	OHIO EDISION COMPANY 76 SOUTH MAIN STREET AKRON, OHIO 44308 PHONE: (216) 384-5244
TELEPHONE	LORAIN TELEPHONE COMPANY 1730 WEST 19TH STREET LORAIN, OHIO 44052 PHONE: (216) 244-8271
CABLE TV	CONTINENTAL CABLEVISION OF OHIO 322 BROAD STREET ELYRIA, OHIO 44035 PHONE: (216) 323-9923

CONTINGENCY QUANTITIES

THE CONTRACTOR SHALL NOT ORDER MATERIALS OR PERFORM WORK LISTED IN THE GENERAL SUMMARY FOR ITEMS DESIGNATED BY PLAN NOTE TO BE USED "AS DIRECTED BY ENGINEER". THE ACTUAL WORK LOCATIONS AND QUANTITIES USED AT THE ENGINEER'S DISCRETION SHALL BE MADE A MATTER OF RECORD BY INCORPORATION INTO THE FINAL CHANGE ORDER GOVERNING COMPLETION OF THIS PROJECT.

SEEDING

QUANTITIES FOR SEEDING ARE CALCULATED FOR THE SOIL AREAS BETWEEN TEN (10) FEET OUTSIDE THE WORK LIMITS, AS SHOWN ON THE CROSS SECTIONS, OR TO THE RIGHT-OF-WAY LINE, IF SUCH LINE IS LESS THAN TEN (10) FEET FROM THE WORK LIMITS.

WATERING PERMANENT SEEDED AREAS

THE FOLLOWING ESTIMATED QUANTITY IS TO BE USED AS DIRECTED BY THE ENGINEER TO PROMOTE GROWTH OF THE PERMANENT SEEDED AREAS, AS PER 659.09.

659 WATER 4 M GAL.

REMOVAL OF TREES OR STUMPS

ALL TREES AND STUMPS SPECIFICALLY MARKED FOR REMOVAL WITHIN THE CONSTRUCTION LIMITS OF THIS PROJECT SHALL BE REMOVED UNDER THE LUMP SUM BID FOR ITEM 201, CLEARING AND GRUBBING, EXCEPT THAT THOSE TREES FOR WHICH PROTECTION AND PRESERVATION WORK IS INDICATED ELSEWHERE IN THESE PLANS SHALL NOT BE REMOVED.

THE FOLLOWING IS AN APPROXIMATE ESTIMATE OF THE NUMBER OF TREES AND STUMPS TO BE REMOVED:

SIZES	NO. TREES	NO. STUMPS	TOTAL
18"	2	0	2
30"	1	0	1
48"	0	0	0
60"	0	0	0

THE ABOVE ESTIMATE IS APPROXIMATE AND THE STATE OF OHIO RESERVES THE RIGHT TO ORDER THE REMOVAL OF ADDITIONAL TREES OR STUMPS OUTSIDE OF THE LIMITS OF CONSTRUCTION BUT WITHIN THE RIGHT-OF-WAY AND/OR EASEMENT LINES. PAYMENT FOR THE REMOVAL OF THESE ADDITIONAL TREES OR STUMPS SHALL BE INCLUDED IN THE LUMP SUM PRICE BID FOR ITEM 201, CLEARING AND GRUBBING.

LOCATION OF GUARDRAIL

THE LOCATIONS OF GUARDRAIL RUNS, AS SHOWN IN THESE PLANS, ARE SUBJECT TO ADJUSTMENT PRIOR TO FINAL ACCEPTANCE. THE ENGINEER SHALL BE SATISFIED THAT ALL INSTALLATIONS WILL AFFORD MAXIMUM PROTECTION FOR TRAFFIC.

606 GUARDRAIL TYPE 5, AS PER PLAN

THE PROPOSED GUARDRAIL WITH THE PAVED BERM (RIGHT SIDE) SHALL NOT BE PLACED UNTIL AFTER THE NEW 404 ASPHALT CONCRETE COURSE HAS BEEN PLACED. (SEE TYPICAL SECTIONS). THE GUARDRAIL POSTS SHALL BE SET IN HOLES BORED THROUGH THE NEW ASPHALT CONCRETE SURFACE. AFTER THE POSTS ARE IN FINAL POSITION, THE DISTURBED AREA AROUND EACH POST SHALL BE BACKFILLED WITH 404 AND COMPACTED, AS DIRECTED BY THE ENGINEER.* THE COST OF ALL THE ABOVE SHALL BE INCLUDED IN THE UNIT PRICE BID PER LINEAR FOOT FOR ITEM 606 GUARDRAIL TYPE 5, AS PER PLAN.

ALL THE NEW GUARDRAIL SHALL BE IN PLACE PRIOR TO REOPENING THE ROAD TO TRAFFIC.

* 404 MATERIAL SHALL BE PLACED FLUSH TO THE POST AND SLOPED TO PREVENT PONDING OF WATER.

SUBGRADE COMPACTION

IN LIEU OF THE REQUIREMENT OF 203.13(A) FOR COMPACTION OF THE SUBGRADE UNDER THE APPROACH SLABS, THE SUBGRADE SHALL BE COMPACTED TO A DEPTH OF 6" AND THE COST OF SAME INCLUDED IN THE UNIT PRICE BID FOR ITEM 203 LINEAR GRADING,

ITEM 407 TACK COAT, AS PER PLAN

THE RATE OF APPLICATION OF 407 TACK COAT SHALL BE SUBJECT TO ADJUSTMENT, AS DIRECTED BY THE ENGINEER. WHEN COVER AGGREGATE IS NEEDED, IT SHALL BE USED AS DIRECTED BY THE ENGINEER, AND IT SHALL BE CONSIDERED INCIDENTAL TO, AND BE INCLUDED FOR PAYMENT IN: ITEM 407 TACK COAT, AS PER PLAN. PLAN QUANTITIES INDICATE AN AVERAGE APPLICATION RATE OF 0.1 GALLONS PER SQUARE YARD OF TACK COAT FOR ESTIMATING PURPOSES ONLY.

TEMPORARY PAVEMENT MARKINGS

THE FOLLOWING ESTIMATED QUANTITIES HAVE BEEN CARRIED TO THE SUMMARY FOR USE AS DIRECTED BY THE ENGINEER:

614 TEMPORARY CENTERLINES, CLASS II 0.37 MI.
614 TEMPORARY LANE LINES, CLASS II 0.74 MI.

SEE STANDARD DRAWING MT-99.10 FOR REQUIREMENTS
THESE ITEMS MAY BE NON-PERFORMED IF THE 621 PAVEMENT MARKINGS ARE IN PLACE PRIOR TO OPENING THE ROAD TO TRAFFIC.

203 LINEAR GRADING

ALL EARTHWORK OPERATIONS REQUIRED TO GRADE THE EXISTING SHOULDERS AND UNDER THE APPROACH SLABS, AS SHOWN ON THE TYPICAL SECTIONS AND THE PLAN CROSS-SECTIONS, SHALL BE INCLUDED UNDER THIS ITEM.
ALL AREAS SHALL BE SCALPED FIRST. EXCESS MATERIALS EXCAVATED FROM ONE AREA MAY BE USED ELSEWHERE ON THE PROJECT FOR EMBANKMENT OR USED TO BUILD UP SHOULDERS AND SLOPES WITHIN THE RIGHT-OF-WAY, AS APPROVED BY THE ENGINEER. ANY ADDITIONAL EMBANKMENT MATERIAL REQUIRED SHALL BE PROVIDED BY THE CONTRACTOR.
THE SEEDING AND MULCHING OF ALL DISTURBED AREAS SHALL BE PAID FOR UNDER ITEM 659, SEEDING AND MULCHING.
ALL LABOR, EQUIPMENT AND MATERIALS REQUIRED TO PERFORM THE NECESSARY GRADING WORK, AS DETAILED ABOVE, SHALL BE INCLUDED IN THE UNIT PRICE BID PER STATION, ON EACH SIDE OF THE PAVEMENT, FOR ITEM 203 LINEAR GRADING.

SHOULDER TREATMENT AND 408 PRIME COAT, AS PER PLAN

THE AREA ADJACENT TO THE PROPOSED PAVED SHOULDER WHERE NEW GUARDRAIL IS PROVIDED SHALL BE PAVED WITH A TWO (2) INCH COMPACTED COURSE OF ITEM 404 ASPHALT CONCRETE AS SHOWN ON THE TYPICAL SECTIONS, ITEM 13.

PRIOR TO PLACING THIS 404 MATERIAL, A SOIL STERILIZER USING ONE OF THE FOLLOWING BRANDS SHALL BE APPLIED AT THE RATE RECOMMENDED BY THE MANUFACTURER:

1. 25B BY CIBA GEIGY
2. PRAMITEL
3. KROVAR BY DIAMOND SHAMROCK
4. AN APPROVED EQUAL

AND ITEM 408 BITUMINOUS PRIME COAT SHALL BE APPLIED AT THE RATE OF 0.4 GALLONS PER SQ. YD. PRIOR TO PLACING THE 404 ASPHALT CONCRETE.

AFTER THE 404 ASPHALT CONCRETE HAS BEEN PLACED AND COMPACTED, GUARDRAIL POSTS SHALL BE PLACED THROUGH THE 404 COURSE AS DESCRIBED UNDER 606 GUARDRAIL, TYPE 5, AS PER PLAN NOTE AT LEFT.

THE SOIL STERILANT AND PRIME COAT SHALL BE INCLUDED FOR PAYMENT IN THE UNIT PRICE BID FOR ITEM 408 – BITUMINOUS PRIME COAT, AS PER PLAN.

PETE/LOR611GN

GENERAL NOTES

LOR-611-3.57

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614 MAINTAINING TRAFFIC

A. DETOUR LIMITATION AND INTERIM COMPLETION DATE:
TWO-WAY TRAFFIC SHALL BE MAINTAINED AT ALL TIMES, EXCEPT FOR A PERIOD NOT TO EXCEED 240 CONSECUTIVE CALENDAR DAYS, THROUGH TRAFFIC SHALL BE DETOURED AS SHOWN ON SHEET 6. THE DETOUR SHALL BE REMOVED NO LATER THAN NOVEMBER 15, 1989.
THE 240 CONSECUTIVE CALENDAR DAYS SHALL BE CONSIDERED AS AN INTERIM COMPLETION DATE (SECTION 108) AND FOR EACH CALENDAR DAY BEYOND THE 240 CONSECUTIVE CALENDAR DAYS THAT THE ROADWAY REMAINS CLOSED TO TRAFFIC, THE CONTRACTOR SHALL BE ASSESSED LIQUIDATED DAMAGES IN THE AMOUNT OF 1200 DOLLARS PER CALENDAR DAY. THE 240 CONSECUTIVE CALENDAR DAYS SHALL INCLUDE ALL DAYS LOST TO WEATHER.

THE PROGRESS OF WORK, DURING THIS DETOUR PHASE WILL REQUIRE CLOSE COORDINATION OF WORK ACTIVITIES BY THE CONTRACTOR. THE CONTRACTOR SHALL, AS NECESSARY, PROSECUTE THE WORK WITH SUFFICIENT CREWS AND WORK SHIFTS EACH DAY (NO NIGHT LIMITATION) UNTIL THE BRIDGE IS REOPENED TO TRAFFIC. THE PROGRESS SCHEDULE SUBMITTED, AS PER 108.03 OF THE SPECIFICATIONS, MUST INDICATE THE NUMBER AND DURATION OF ALL CREWS AND SHIFTS TO WORK EACH CALENDAR DAY AND THE SPECIFIC PORTION OF THE PROJECT'S WORK AS-SIGNED TO EACH CREW.

B. DETOUR SIGNING:
THE CONTRACTOR SHALL NOTIFY IN WRITING THE LORAIN CITY ENGINEER, THE LORAIN COUNTY ENGINEER AND THE DISTRICT 3 TRAFFIC ENGINEER AT LEAST TEN (10) DAYS PRIOR TO PLACING THE DETOUR IN EFFECT.
THE DETOUR SHOWN IN THE PLAN SHALL BE THE RESPONSIBILITY OF THE CON-TRACTOR INCLUDING FURNISHING, PLACING, MAINTAINING AND SUBSEQUENTLY RE-MOVING THE DETOUR. PAYMENT FOR ALL SIGNS, SUPPORTS, HARDWARE, MATERIALS, LABOR, EQUIPMENT AND TOOLS SHALL BE INCLUDED IN THE LUMP SUM BID FOR ITEM 614 MAINTAINING TRAFFIC.
ANY TRAFFIC SIGNAL WORK REQUIRED TO BETTER ACCOMODATE TRAFFIC MOVE-MENTS ON THE DETOUR SHALL BE COORDINATED AND PERFORMED BY CITY FORCES.
PLACING AND REMOVING THE DETOUR SHALL AT ALL TIMES BE SUBJECT TO THE APPROVAL OF THE ENGINEER.

C. MAINTAINING THROUGH TRAFFIC:
EXCEPT FOR THE PERIOD WHEN TRAFFIC IS DETOURED, TWO-WAY TRAFFIC SHALL BE MAINTAINED AT ALL TIMES.
DURING PERIODS WHEN THE CONTRACTOR IS WORKING IN OR NEAR A TRAFFIC LANE, THE LANE SHALL BE CLOSED TO TRAFFIC. THE TRAFFIC CONTROL SHALL BE AS DETAILED ON SHEETS 8 & 9 FOR CLOSING ONE LANE OF A 4-LANE UNDIVIDED HIGHWAY. DURING NON-WORKING HOURS, TRAFFIC SHALL BE RETURNED TO ITS NORMAL PATTERN.

D. PEDESTRIANS:
DURING THE PERIOD WHEN THE TRAFFIC IS DETOURED AND DURING ANY OTHER WORK PERIOD WHEN THERE IS POTENTIAL DANGER TO PEDESTRIANS, THE BRIDGE AND APPROACHES SHALL BE CLOSED TO PEDESTRIAN TRAFFIC. THE CONTRACTOR SHALL BE RESPONSIBLE FOR FURNISHING, PLACING, MAINTAINING AND SUBSEQUENTLY REMOVING THE "SIDEWALK CLOSED" SIGNS AT LOCATIONS AS DETAILED ON SHEET 6. ALL THE SIDEWALK REPLACEMENT WORK ON THE BRIDGE APPROACHES SHALL BE COMPLETED DURING THE DETOUR PERIOD.

E. PAYMENT:
ALL ITEMS OF WORK SPECIFIED ABOVE AND DETAILED ON THE VARIOUS MAINTE-NANCE OF TRAFFIC PLAN SHEETS SHALL BE INCLUDED IN THE LUMP SUM PRICE BID FOR ITEM 614 MAINTAINING TRAFFIC.

PETE/LOR611MT

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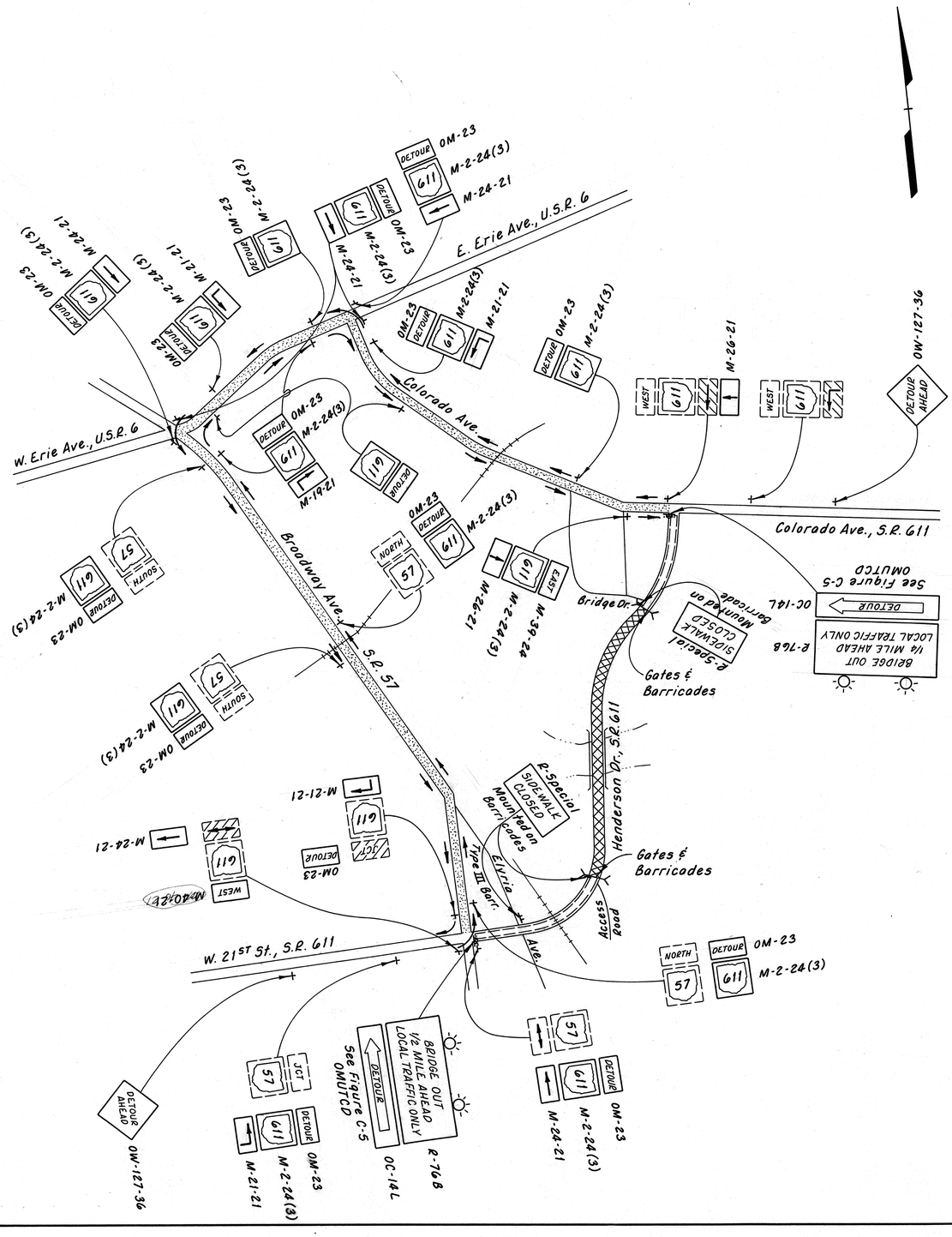
6
99

Scale in Feet
700 0 700 1400



LEGEND

- Sign on 1 Support
- Sign on 2 Supports
- Gates & Barricades - See Sheet 7
- Sign Support with Red Lights
- Existing Route Marker Sign
- Existing Sign to be Covered or Overlayed
- Proposed Detour Route Marker Sign
- Portion of Route to be Closed to All Traffic
- Local Traffic Only
- Detour Route

DETOUR MAP

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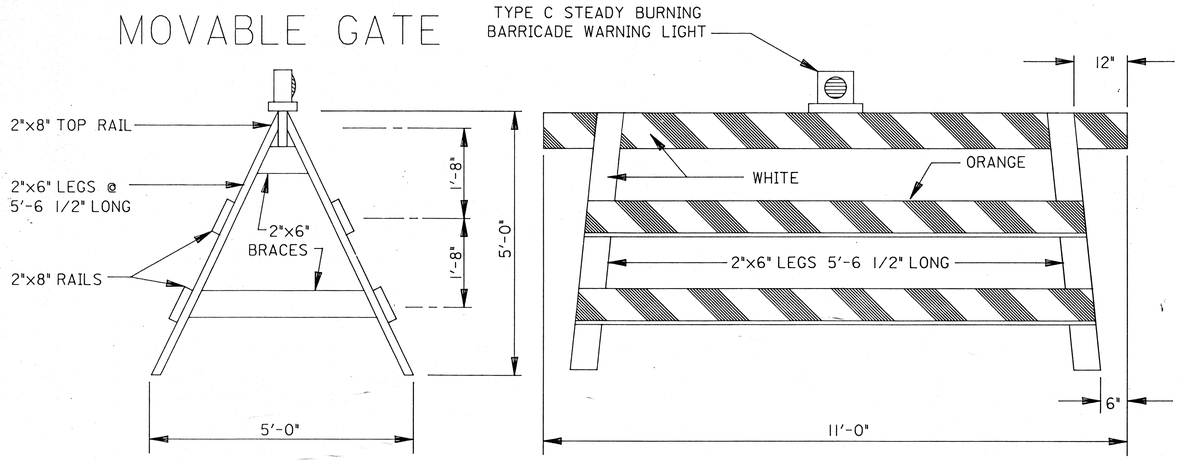
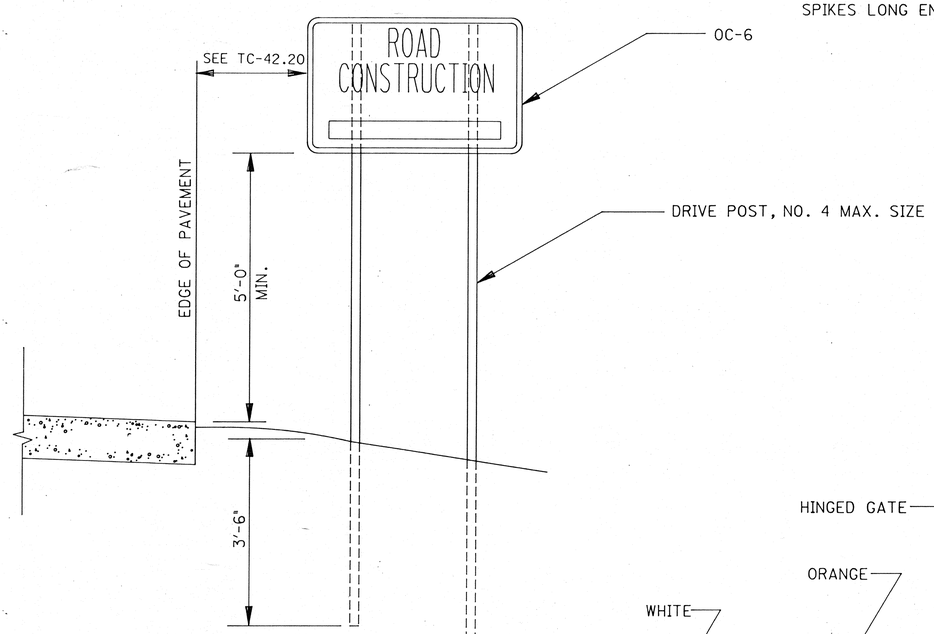
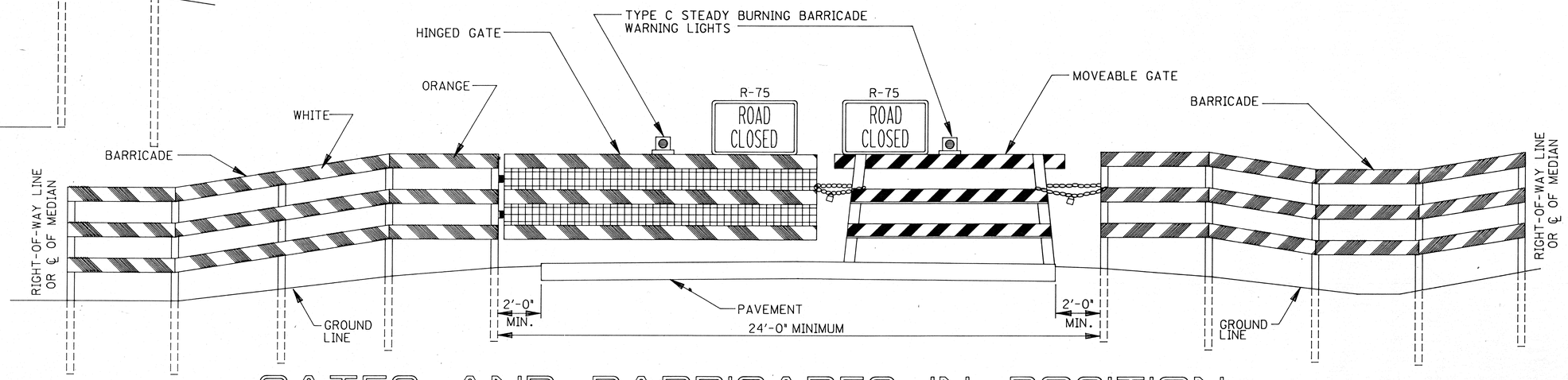
7/99

MOVABLE GATE



GATES SHALL BE WELL SPIKED USING SPIKES LONG ENOUGH TO CLINCH.





GATES AND BARRICADES IN POSITION

-NOTES-

① **BARRICADES:** BARRICADES SHALL BE CONSTRUCTED ACCORDING TO DETAILS SHOWN. WHEN THE ROAD IS CLOSED TO TRAFFIC, BARRICADES AND GATES SHALL BE USED TO EFFECTIVELY CLOSE THE ENTIRE ROADWAY INCLUDING THE MEDIAN OF DIVIDED HIGHWAYS. IN URBAN AREAS AND AT LOCATIONS WHERE IT IS IMPRACTICAL TO EXTEND THE BARRICADE TO THE RIGHT-OF-WAY LINE BECAUSE OF A SIDEWALK OR OTHER OBSTRUCTION, THE ENDS OF THE BARRICADE SHALL BE LOCATED AS DIRECTED BY THE ENGINEER TO EFFECT THE DESIRED CLOSING OF THE HIGHWAY.

② **PAINTING AND REFLECTORIZATION:** ALL RAILS OF THE BARRCADES AND GATES SHALL BE REFLECTORIZED WITH ORANGE AND WHITE REFLECTORIZED TYPE G SHEETING IN 6" WIDE ALTERNATE STRIPES WHICH SLOPE DOWNWARD TOWARD THE CENTER LINE OF THE ROAD AT AN ANGLE OF 45 . ALL THREE RAILS OFTHE ROAD CLOSED BARRICADE SHALL BE STRIPED ON THE SIDE FACING TRAFFIC. ALL GATE RAILS SHALL BE STRIPED ON BOTH SIDES. ALL POSTS, BRACES, GATE LEGS, AND ANY UNSTRIPED RAILS SHALL BE PAINTED WHITE.

③ **GATES:** ONE GATE SHALL BE ERECTED FOR EACH TRAFFIC LANE. GATES SHALL BE CHAINED AND PADLOCKED TO ONE ANOTHER AND TO ADJACENT POSTS OF THE BARRICADES. CHAINS SHALL BE 1/4" STOCK OR LARGER WITH WELDED LINKS.

A HINGED GATE MAY BE USED AND SHALL BE AN APPROVED 12'x4' STEEL FRAME FARM TYPE, OR A TYPE APPROVED BY THE ENGINEER THE GATE SHALL BE HUNG ON HINGE SCREW HOOKS, OR AS OTHERWISE APPROVED. STRIPING SIMILAR TO THATUSED ON THE MOVEABLE GATE SHALL BE ACCOMPLISHED WITH 1"x8" LUMBER OR WITH METAL STRIPS FASTENED TO THE GATE. THE GATE SHALL BE SUPPORTED AT THE CENTER IN AN APPROVED MANNER.

④ **TYPE C STEADY BURNING BARRICADE WARNING LIGHTS:** EACH GATE SHALL BE EQUIPPED WITH A TYPE C STEADY BURNING BARRICADE WARNING LIGHT, CONSPICUOUSLY VISABLE AT ALL DISTANCES UP TO 1000' UNDER NORMAL ATMOSPHERIC CONDITIONS. THE LIGHT SHALL BE IN OPERATION AT ALL TIMES BETWEEN SUNSET AND SUNRISE DURING THE PERIOD THE HIGHWAY IS CLOSED.

⑤ **SIGNS:** WHERE THE ROAD IS CLOSED TO TRAFFIC BY THE ERECTION OF GATES AND BARRICADES, ROAD CLOSED SIGNS (R-75) SHALL BE MOUNTED ON THE GATES AS SHOWN.

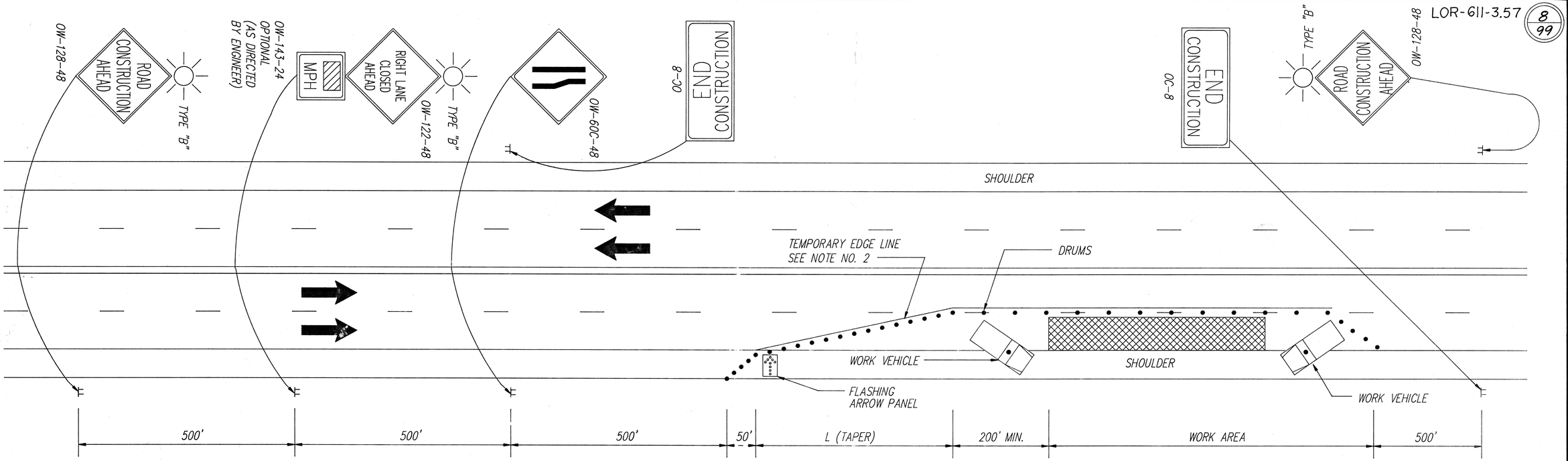
WHERE TRAFFIC IS MAINTAINED, A ROAD CONSTRUCTION AHEAD SIGN (OW-128) SHALL BE USED ON THE RIGHT SHOULDER ON THE APPROACHES APPROXIMATELY 500 FEET IN ADVANCE OF THE PROJECT. A ROAD CONSTRUCTION NEXT__MILES SIGN (OC-6) SHALL BE USED ONTHE RICHT SHOULDER ON THE APPROACHES TO ANY MAJOR CONSTRUCTION OR MAINTENANCE JOB OF TWO (2) MILES OR MORE IN LENGTH. AN END CONSTRUCTION SIGN (OC-8) SHALL BE ERECTED FACING TRAFFIC LEAVING THE CONSTRUCTION SECTION. THE SIGNS SHALL BE ERECTED AS DETAILED HEREON. DUAL MOUNTED SIGNS ARE REQUIRED FOR A FOUR LANE FACILITY.

⑥ **LUMBER:** LUMBER USED IN THE CONSTRUCTION OF THE GATES AND BARRICADES SHALL BE NO. 1 COMMON YELLOW PINE OR NO. 1 COMMON DOUGLAS FIR, SURFACED ON FOUR SIDES STANDARD, OR OTHER MATERIALS APPROVED BY THE ENGINEER. ALL SIZES ARE NOMINAL.

⑦ **POSTS:** POSTS SHALL BE SOUND 4"x4" SAWED OR 4-1/2" ROUND. RAILS OF THE BARRICADE SHALL BE BOLTED TO THE POSTS WITH 5/8" BOLTS.

STANDARD D3-01 06-05-87

DETAILS FOR POSITIONING GATES AND BARRICADES



(1) THE TAPER LENGTH (L) SHALL BE IN ACCORDANCE WITH SECTION 7F-17 OF THE OMUTCD. THE LOCATION OF THE TRANSITION TAPER AND LOCATION OF THE ADVANCE WARNING SIGNS SHOULD BE ADJUSTED TO PROVIDE FOR ADEQUATE SIGHT DISTANCE FOR THE EXISTING VERTCAL AND HORIZONTAL ROADWAY ALIGNMENT. IN ORDER TO DETERMINE THE MINIMUM NUMBER OF CHANNELIZING DEVICES FOR THE TRANSITION TAPER SEE TABLE 7-5 OMUTCD. FOR A 55 MPH PREVAILING SPEED AND A 12 FT. LANE, NOT LESS THAN THIRTEEN (13) DRUMS SHALL BE USED TO FORM THE LANE TRANSITION TAPER IN ADVANCE OF THE WORK AREA. NOT LESS THAN FIVE (5) DRUMS SHALL BE USED TO FORM THE TAPER ON THE SHOULDER. DRUMS SHALL BE SPACED AT 50' CENTER TO CENTER ALONG THE WORK AREA. DRUMS ON THE RETURN TAPER SHALL BE AT 10' CENTER TO CENTER. CONES HAVING A MINIMUM HEIGHT OF 28 INCHES MAY BE SUBSTITUTED FOR DRUMS FOR DAY TIME LANE CLOSURES. PROVISIONS SHALL BE MADE TO STABILIZE THE CONES TO PREVENT THEM FROM BLOWING OVER. IF THIS CANNOT BE ACHIEVED, DRUMS SHALL BE USED.

(2) IF THE CONSTRUCTION OPERATION REQUIRES THE LANE CLOSURE FOR MORE THAN ONE DAY, THEN THE EXISTING CONFLICTING PAVEMENT MARKINGS AND REFLECTORS FROM THE RAISED PAVEMENT MARKERS SHALL BE REMOVED AND THE APPROPRIATE COLOR TEMPORARY EDGE LINES SHALL BE APPLIED. PAVEMENT MARKING TAPE MAY BE USED. AFTER COMPLETION OF THE WORK, TEMPORARY MARKINGS SHALL BE REMOVED IN ACCORDANCE WITH 621.134 AND THE ORIGINAL MARKINGS AND RAISED PAVEMENT MARKER REFLECTORS SHALL BE RESTORED. THE TEMPORARY PAVEMENT MARKING SHALL EXTEND FOR THE TOTAL LENGTH OF THE CLOSURE.

(3) THE WORK VEHICLES SHOWN AT THE BEGINNING AND END OF THE WORK AREA SHALL BE IN PLACE AND UNOCCUPIED WHENEVER WORKERS ARE IN THE WORK AREA. THIS WORK VEHICLE SHALL BE REMOVED FROM THE PAVEMENT WHENEVER WORKERS ARE NOT IN THE WORK AREA. OTHER PROTECTIVE DEVICES MAY BE USED IN LIEU OF THE WORK VEHICLE SHOWN WHEN APPROVED BY THE ENGINEER. THE VEHICLE SHALL BE EQUIPPED WITH A 360° ROTATING OR FLASHING AMBER BEACON CLEARLY VISIBLE FOR A MINIMUM OF ONE-QUARTER (1/4) MILE. A TRUCK MOUNTED IMPACT ATTENUATOR MAY BE EMPLOYED.

(4) THE FLASHING ARROW PANEL SHALL MEET THE REQUIREMENTS OF STANDARD DRAWING TC-35.10.

(5) TYPE "C" STEADY BURNING WARNING LIGHTS SHALL BE ERECTED ON DRUMS FOR NIGHT LANE CLOSURES. THE MAXIMUM SPACING SHALL BE IDENTICAL TO THE CHANNELIZING DEVICE SPACING REQUIREMENTS DESCRIBED IN NOTE NO. 1.

(6) THE TYPE "B" FLASHING WARNING LIGHTS SHOWN ON THE "ROAD CONSTRUCTION AHEAD" AND THE "RIGHT LANE CLOSED AHEAD" SIGNS ARE REQUIRED WHENEVER A NIGHT LANE CLOSURE IS NECESSARY.

(7) THE OC-8 SIGNS ARE ONLY REQUIRED FOR LANE CLOSURES OF MORE THAN ONE DAY AND MAY BE OMITTED IF IT FALLS WITHIN THE LIMITS OF A CONSTRUCTION PROJECT.

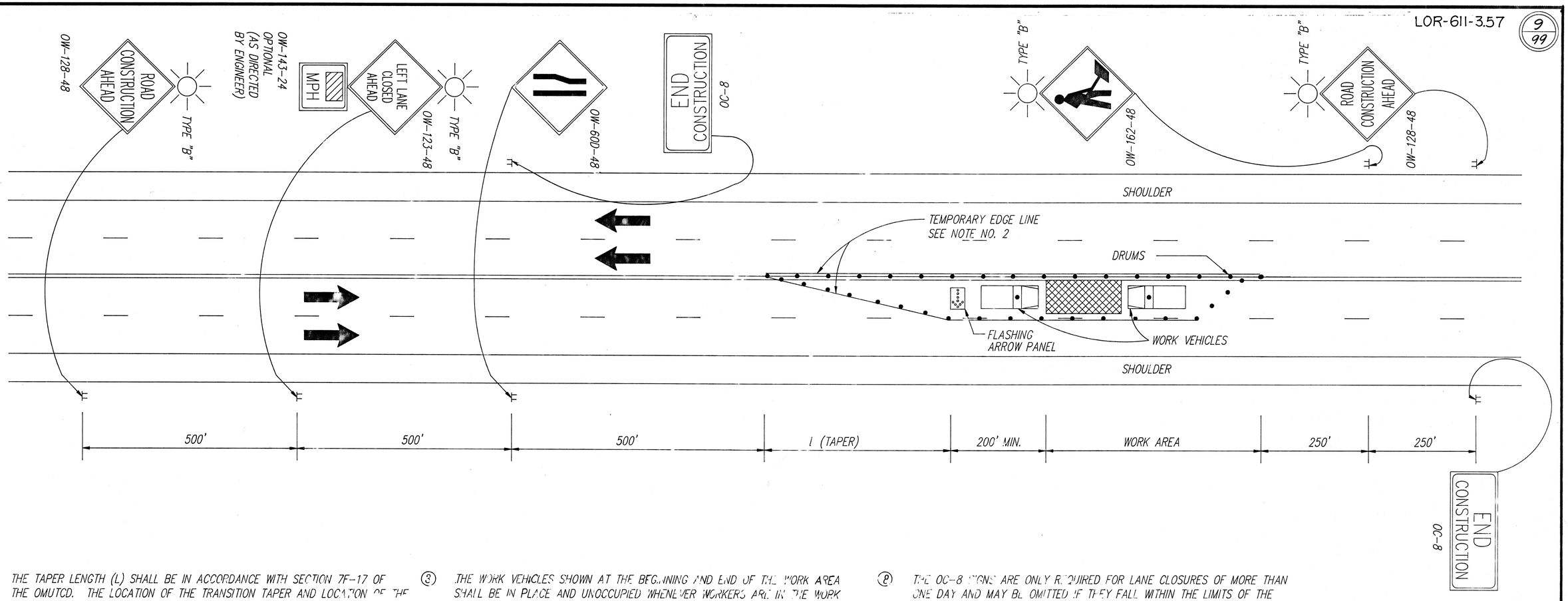
(8) SOME WORK AREA LOCATIONS MAY REQUIRE MORE THAN JUST STATIC OR CONVENTIONAL SIGNS TO ENHANCE COMMUNICATION WITH THE DRIVER. AT THESE LOCATIONS PORTABLE CHANGEABLE MESSAGE SIGNS (PCMS) UNITS ARE RECOMMENDED. THESE DEVICES SHOULD BE LOCATED APPROXIMATELY 2000 FEET IN ADVANCE OF A LANE CLOSURE OR OTHER POINT OF REQUIRED ACTION. SEE SECTION 7G-8.1, OMUTCD FOR FURTHER GUIDANCE ON USE OF PCMS UNITS. THESE UNITS, IF REQUIRED, WILL BE SPECIFICALLY CALLED FOR IN THE PLANS AND PAID FOR SEPARATELY.

(9) PAYMENT FOR ALL OF THE ABOVE, UNLESS ITEMIZED SEPARATELY, SHALL BE INCLUDED IN "ITEM 614 – MAINTAINING TRAFFIC".

STATE OF OHIO
DEPARTMENT OF TRANSPORTATION
DISTRICT THREE

CLOSING RIGHT LANE OF A MULTILANE UNDIVIDED HIGHWAY

REV.	DRAWN	
11/87		STANDARD DRAWING D3-5



(1) THE TAPER LENGTH (L) SHALL BE IN ACCORDANCE WITH SECTION 7F-17 OF THE OMUTCD. THE LOCATION OF THE TRANSITION TAPER AND LOCATION OF THE ADVANCE WARNING SIGNS SHOULD BE ADJUSTED TO PROVIDE FOR ADEQUATE SIGHT DISTANCE FOR THE EXISTING VERTCAL AND HORIZONTAL ROADWAY ALIGNMENT. IN ORDER TO DETERMINE THE MINIMUM NUMBER OF CHANNELIZING DEVICES FOR THE TRANSITION TAPER SEE TABLE 7-5 OMUTCD. FOR A 55 MPH PREVAILING SPEED AND A 12 FT. LANE, NOT LESS THAN THIRTEEN (13) DRUMS SHALL BE USED TO FORM THE LANE TRANSITION TAPER IN ADVANCE OF THE WORK AREA. DRUMS SHALL BE SPACED AT 50' CENTER TO CENTER ALONG THE WORK AREA. DRUMS ON THE RETURN TAPER SHALL BE SPACED AT 10' CENTER TO CENTER. DRUMS SHALL ALSO BE PLACED ON THE LEFT SIDE OF THE WORK AREA BETWEEN THE CLOSED LANE AND THE OPPOSING TRAFFIC. THESE DEVICES SHALL BE SPACED AT 50' CENTER TO CENTER. CONES HAVING A MINIMUM HEIGHT OF 28 INCHES MAY BE SUBSTITUTED FOR DRUMS FOR DAYTIME CLOSURES. PROVISIONS SHALL BE MADE TO STABILIZE THE CONES TO PREVENT THEM FROM BLOWING OVER. IF THIS CANNOT BE ACHIEVED, DRUMS SHALL BE USED.

(2) IF THE CONSTRUCTION OPERATION REQUIRES THE LANE CLOSURE FOR MORE THAN ONE DAY, THEN THE EXISTING CONFLICTING PAVEMENT MARKINGS AND REFLECTORS FROM THE RAISED PAVEMENT MARKERS SHALL BE REMOVED AND THE APPROPRIATE COLOR TEMPORARY EDGE LINES SHALL BE APPLIED. PAVEMENT MARKING TAPE MAY BE USED. AFTER COMPLETION OF THE WORK, TEMPORARY MARKINGS SHALL BE REMOVED IN ACCORDANCE WITH 621.134 AND THE ORIGINAL MARKINGS AND RAISED PAVEMENT MARKER REFLECTORS SHALL BE RESORED. THE TEMPORARY PAVEMENT MARKING SHALL EXTEND FOR THE TOTAL LENGTH OF THE CLOSURE.

(3) THE WORK VEHICLES SHOWN AT THE BEGINNING AND END OF THE WORK AREA SHALL BE IN PLACE AND UNOCCUPIED WHENEVER WORKERS ARE IN THE WORK AREA. THESE WORK VEHICLES SHALL BE REMOVED FROM THE PAVEMENT WHENEVER WORKERS ARE NOT IN THE WORK AREA. OTHER PROTECTIVE DEVICES MAY BE USED IN LIEU OF THE WORK VEHICLE SHOWN WHEN APPROVED BY THE ENGINEER. THE VEHICLE SHALL BE EQUIPPED WITH A 360° ROTATING OR FLASHING AMBER BEACON CLEARLY VISIBLE FOR A MINIMUM OF ONE QUARTER (1/4) MILE. A TRUCK MOUNTED IMPACT ATTENUATOR MAY BE EMPLOYED.

(4) THE FLASHING ARROW PANEL SHALL MEET THE REQUIREMENTS OF STANDARD DRAWING TC-35.10.

(5) TYPE "C" STEADY BURNING WARNING LIGHTS SHALL BE ERECTED ON DRUMS FOR NIGHT LANE CLOSURES. THE MAXIMUM SPACING SHALL BE IDENTICAL TO THE CHANNELIZING DEVICE SPACING REQUIREMENTS DESCRIBED IN NOTE 1.

(6) THE TYPE "B" FLASHING WARNING LIGHTS SHOWN ON THE "ROAD CONSTRUCTION AHEAD" AND "LEFT LANE CLOSED AHEAD" SIGNS ARE REQUIRED WHENEVER A NIGHT LANE CLOSURE IS NECESSARY.

(7) IF THE WORK AREA ENCROACHES UPON THE LEFT LANE OF THE OPPOSITE DIRECTION OF TRAFFIC THEN BOTH LEFT LANES SHALL BE CLOSED TO TRAFFIC. THE TRAFFIC CONTROL DEVICES (SIGNS, PAVEMENT MARKING, CHANNELIZING DEVICES, AND FLASHING ARROW PANEL) SHALL BE IDENTICAL IN TYPE, SIZE AND PLACEMENT AS THE PRIMARY APPROACH TRAFFIC CONTROL ON THE OPPOSITE DIRECTION APPROACH. WORK VEHICLES SHALL BE RE-POSITIONED ACCORDINGLY.

(8) THE OC-8 SIGNS ARE ONLY REQUIRED FOR LANE CLOSURES OF MORE THAN ONE DAY AND MAY BE OMITTED IF THEY FALL WITHIN THE LIMITS OF THE CONSTRUCTION PROJECT. THE OW-162-48 SIGN SHALL BE COVERED OR REMOVED WHEN THE CLOSURE IS IN EFFECT AND NO CONSTRUCTION WORKERS ARE IN THE WORK AREAS.

(9) SOME WORK AREA LOCATIONS MAY REQUIRE MORE THAN JUST STATIC OR CONVENTIONAL SIGNS TO ENHANCE COMMUNICATION WITH THE DRIVER. AT THESE LOCATIONS PORTABLE CHANGEABLE MESSAGE SIGNS (PCMS) UNITS ARE RECOMMENDED. THESE DEVICES SHOULD BE LOCATED APPROXIMATELY 2000 FEET IN ADVANCE OF A LANE CLOSURE OR OTHER POINT OF REQUIRED ACTION. SEE SECTION 7G-8.1, OMUTCD FOR FURTHER GUIDANCE ON USE OF PCMS UNITS. THESE UNITS, IF REQUIRED, WILL BE SPECIFICALLY CALLED FOR IN THE PLANS AND PAYED FOR SEPARATELY.

(10) PAYMENT FOR ALL OF THE ABOVE, UNLESS ITEMIZED SEPARATELY, SHALL BE INCLUDED IN "ITEM 614 – MAINTAINING TRAFFIC".

STATE OF OHIO
DEPARTMENT OF TRANSPORTATION
DISTRICT THREE

CLOSING LEFT LANE OF A MULTILANE UNDIVIDED HIGHWAY

REV.	DRAWN	
11/87		STANDARD DRAWING TC-6

659 FERTILIZER CALCULATION :

659 SEEDING = 2013 SQ. YD.

FERTILIZER = $\frac{2013 \times 9 \times 20}{1000 \times 2000}$ = 0.18 TON

GENERAL SUMMARY

CALC. BY RDM DATE 7/88
CHKD. BY R.S. DATE 8/88

LOR-611-3.57

OHIO | FHWA REGION 5 | FEDERAL PROJECT

10/99

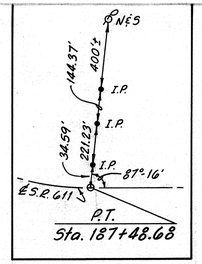
ITEM	SHEET NUMBER 4	5	10	11	12	13	14	15	17	ITEM	ITEM EXT.	QUANT.	UNIT	DESCRIPTION
														ROADWAY
201	LUMP									201		LUMP		CLEARING AND GRUBBING
202				84						202		84	SQ.YD.	PAVEMENT REMOVED
202				528	590	431				202		1549	LIN.FT.	CURB REMOVED
202				2813	5159					202		7972	SQ.FT.	WALK REMOVED
						415				SPEC.		415	SQ.YD.	PAVEMENT PLANING, BITUMINOUS, WITHOUT HEATING (SEE PROPOSAL NOTE)
202				1140	2195					202		3335	LIN.FT.	GUARDRAIL REMOVED
202					3					202		3	EACH	CATCH BASIN ABANDONED
203				10	22					203		32	STA.	LINEAR GRADING
606				587.5	1087.5					606		1675	LIN.FT.	GUARDRAIL, TYPE 5
606				512.5	1000					606		1512.5	LIN.FT.	GUARDRAIL, TYPE 5, AS PER PLAN (NOTE ON SHEET No. 4)
606				2	2					606		4	EACH	BRIDGE TERMINAL ASSEMBLY, TYPE A
606				2	2					606		4	EACH	ANCHOR ASSEMBLY, TYPE A
606				1	1					606		2	EACH	ANCHOR ASSEMBLY, TYPE B
606				1	1					606		2	EACH	ANCHOR ASSEMBLY, TYPE T
608				3441	6348					608		9789	SQ.FT.	4"" CONCRETE WALK
608				1						608		1	EACH	CURB RAMP, TYPE 2
802				25	45					802		70	EACH	BARRIER REFLECTOR, TYPE A
802									36	802		36	EACH	BARRIER REFLECTOR, TYPE B
														EROSION CONTROL
659							2013			659		2013	SQ.YD.	SEEDING AND MULCHING
659			0.18							659		0.18	TON	COMMERCIAL FERTILIZER
659	4									659		4	M.GAL.	WATER
														DRAINAGE
604				2						604		2	EACH	CATCH BASIN ADJUSTED TO GRADE
604				1						604		1	EACH	MANHOLE ADJUSTED TO GRADE
														PAVEMENT
301				26	50	1				301		77	CU.YD.	BITUMINOUS AGGREGATE BASE, AC-20
402						61				402		61	CU.YD.	ASPHALT CONCRETE, AC-20
404				25	49	31				404		105	CU.YD.	ASPHALT CONCRETE, AC-20
407						87				407		87	GAL.	TACK COAT, AS PER PLAN (NOTE SHEET No. 4)
408				90	175					408		265	GAL.	BITUMINOUS PRIME COAT, AS PER PLAN (NOTE SHEET No. 4)
609				528		219				609		747	LIN.FT.	CURB, TYPE 6
611						301				611		301	SQ.YD.	REINFORCED CONCRETE APPROACH SLAB (T= 17")
SPEC.														
														TRAFFIC CONTROL
621								0.98		621		0.98	MILE	EDGE LINES
621								0.74		621		0.74	MILE	LANE LINES
621								0.37		621		0.37	MILE	CENTER LINES
614	0.37									614		0.37	MILE	TEMPORARY CENTER LINES, CLASS II
614	0.74									614		0.74	MILE	TEMPORARY LANE LINES, CLASS II
														LIGHTING - SEE SHEET 17
														STRUCTURES 20 FT. SPAN AND OVER LOR-611-0358 SEE SHEET NO. 17
614		LUMP								614		LUMP		MAINTAINING TRAFFIC
619	LUMP									619		LUMP		FIELD OFFICE
623										623		LUMP		CONSTRUCTION LAYOUT STAKES
624										624		LUMP		MOBILIZATION

PETE/LOR611GS

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

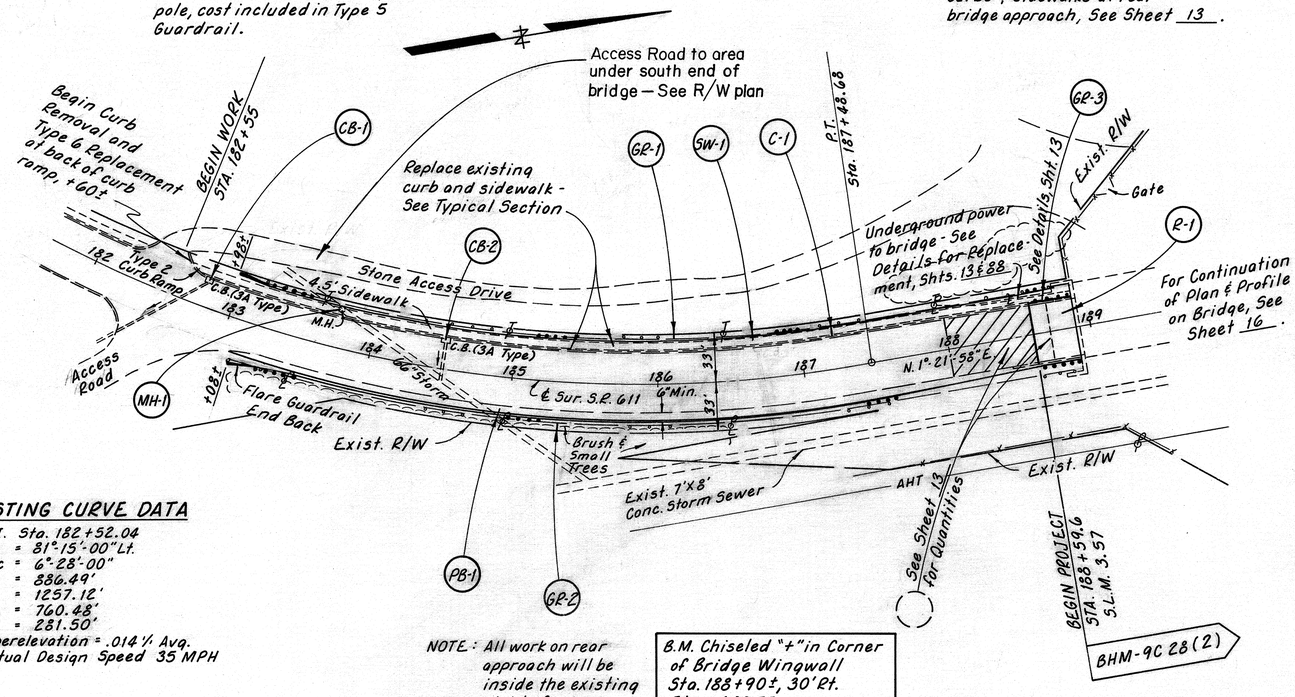
LOR-611-3.57

Calc. By : PDY 1/88
Chk'd. By : R.S. 8/88



NOTE : The Type 5 Guardrail shall have 3'-1½" post spacings for 12.5' on both sides of each utility pole, cost included in Type 5 Guardrail.

For additional detail of approach slab, guardrail, curbs & sidewalks at rear bridge approach, See Sheet 13 .

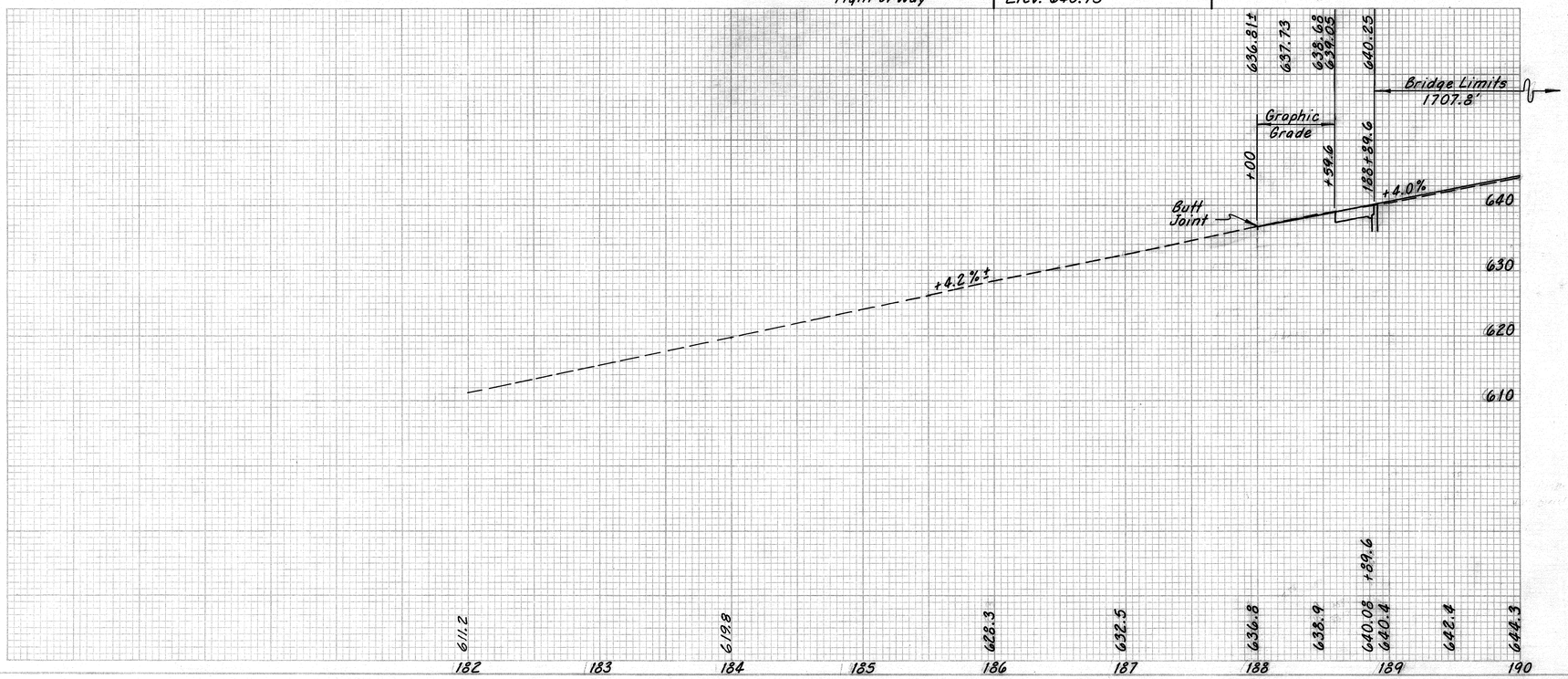


EXISTING CURVE DATA

P.I. Sta. 182+52.04
Δ = 81°-15'-00" Lt.
Dc = 6°-28'-00"
R = 886.49'
L = 1257.12'
T = 760.48'
E = 281.50'
Superelevation = .014'/' Avg.
Actual Design Speed 35 MPH

NOTE : All work on rear approach will be inside the existing right of way

B.M. Chiseled "+" in Corner of Bridge Wingwall
Sta. 188+90±, 30' Rt.
Elev. 640.75



802	Barrier Reflector, Type A (White)	Ea.	12	12	1											25
606	Guardrail, Type 5, As Per Plan	Lin.Ft.		512.5												512.5
404	Asphalt Concrete 2"	Cu. Yd.									25.4					25.4
301	Bituminous Aggregate Base 4"	Cu. Yd.									25.7					25.7
203	Linear Grading	Cu. Yd.		5.0										5.3		10.3
604	Manhole, Adjusted to Grade	Each								1						1
	Catch Basin, Adjusted to Grade							1	1							2
609	Curb, Type 6	Lin.Ft.					528									528
608	Curb Ramp, Type 2	Ea.												1		1
	Concrete Walk, T=4"	S.F.												3441		3441
606	Anchor Assembly Type T	Each	1													1
	Anchor Assembly Type B				1											1
	Anchor Assembly Type A		1	1												2
	Bridge Terminal Assembly, Type A			1	1											2
	Guardrail, Type 5	Lin.Ft.	525	50	12.5											587.5
408	Bituminous Prime Coat, As Per Plan	Gal.									90					90
202	Pavement Removed	Sq.Yd.										84				84
	Curb Removed	Lin.Ft.					528									528
	Walk Removed	Sq.Ft.												2813		2813
	Guardrail Removed	Lin.Ft.	560	580												1140
Side			Lt.	Rt.	Lt.		Lt.	Lt.	Lt.	Lt.	Rt.	Lt.&Rt.		Lt.		
Station Limits			182+98± to 188+74±	183+08± to 188+89.6	188+64.6 to 188+89.6		182+60± to 188+00	182+78±	184+50±	183+73±	183+08± to 188+41.6	188+71.6± to 188+89.6		182+60± to 188+89.6		Totals
Ref. No.			GR-1	GR-2	GR-3		C-1	CB-1	CB-2	MH-1	PB-1	R-1		SW-1		

PLAN & PROFILE - REAR APPROACH

For additional detail of approach slab, quardrail, curbs & sidewalks at forward bridge approach, See Sheet 13.

EXISTING CURVE DATA

P.I. Sta. 209+44.50
Δ = 36°-48'-00" Rt.
Dc = 6°-00'
R = 955.37'
L = 613.32'
T = 317.81'
E = 51.48'
Superelevation = .032'/' (Avg.)
Exceeds Design Speed

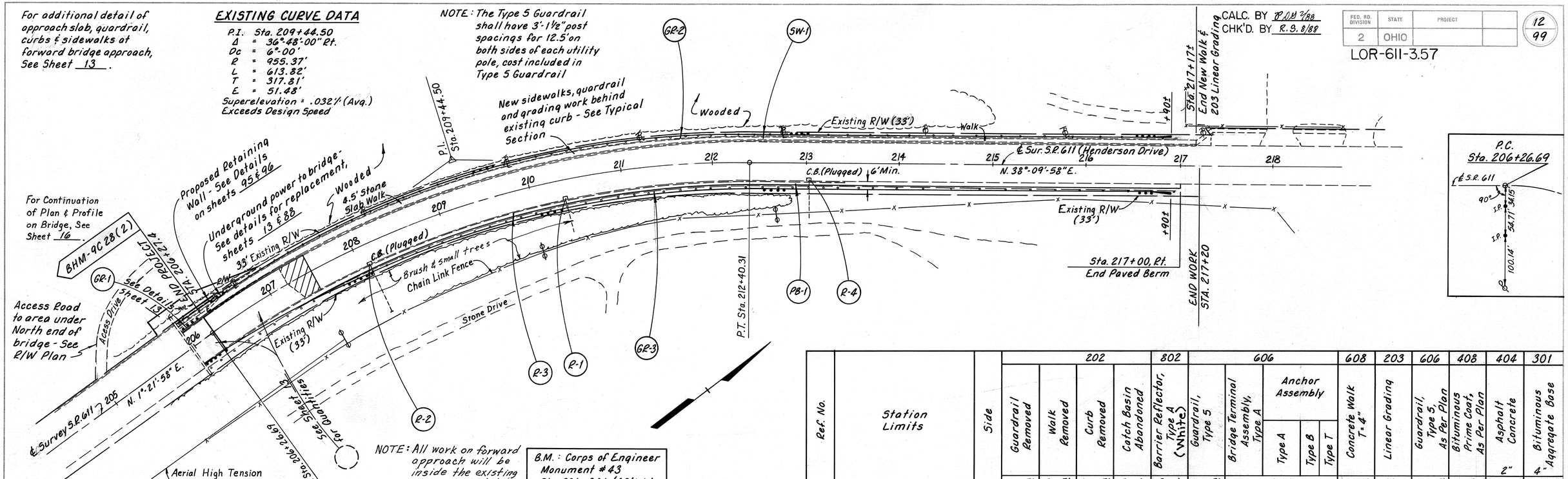
NOTE: The Type 5 Guardrail shall have 3'-1½" post spacings for 12.5'on both sides of each utility pole, cost included in Type 5 Guardrail

CALC. BY R.D.M. 7/88
CHK'D. BY R.S. 8/88

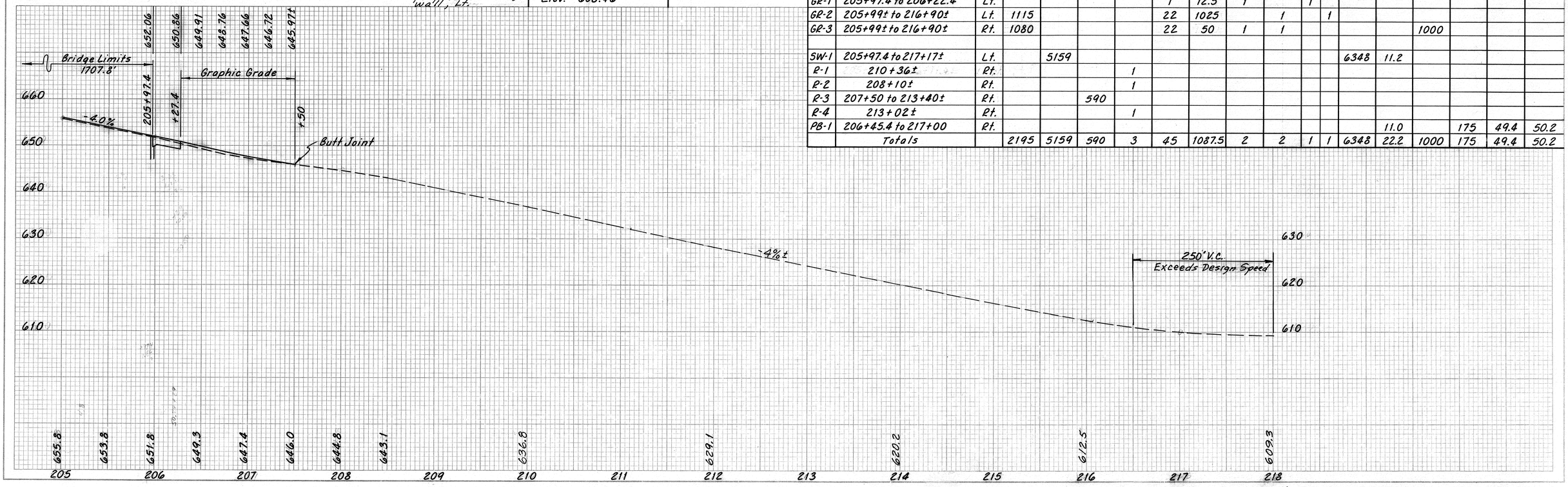
FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

LOR-611-3.57

12 / 99



Ref. No.	Station Limits	Side	202 Guardrail Removed	202 Walk Removed	202 Curb Removed	202 Catch Basin Abandoned	802 Barrier Reflector, Type A (White)	606 Guardrail, Type 5	606 Bridge Terminal Assembly, Type A	606 Anchor Assembly Type A	606 Anchor Assembly Type B	606 Anchor Assembly Type T	608 Concrete Walk T=4"	203 Linear Grading	606 Guardrail, Type 5, As Per Plan	408 Bituminous Prime Coat, As Per Plan	404 Asphalt Concrete 2"	301 Bituminous Aggregate Base 4"
			Lin.Ft.	Sq.Ft.	Lin.Ft.	Each	Each	Lin.Ft.	Each				Sq.Ft.	Sta.	Lin.Ft.	Gal.	Cu.Yd.	Cu.Yd.
GR-1	205+97.4 to 206+22.4	Lt.					1	12.5	1		1							
GR-2	205+99± to 216+90±	Lt.	1115				22	1025	1	1		1						
GR-3	205+99± to 216+90±	Rt.	1080				22	50	1	1					1000			
SW-1	205+97.4 to 217+17±	Lt.		5159									6348	11.2				
P-1	210+36±	Rt.				1												
P-2	208+10±	Rt.				1												
P-3	207+50 to 213+40±	Rt.			590													
P-4	213+02±	Rt.				1												
PB-1	206+45.4 to 217+00	Rt.												11.0		175	49.4	50.2
	Totals		2195	5159	590	3	45	1087.5	2	2	1	1	6348	22.2	1000	175	49.4	50.2



PLAN & PROFILE - FORWARD APPROACH

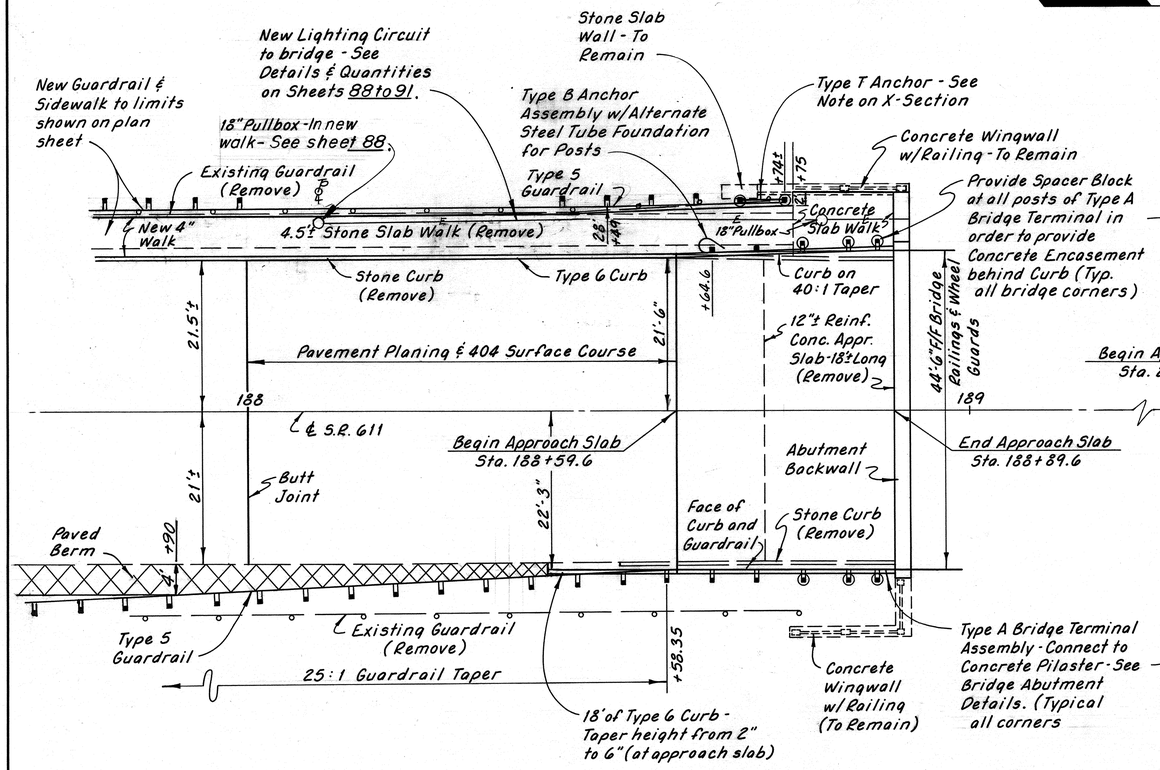
NOTE: Approach Slab on Forward Bridge End was previously Removed and Replaced with Bituminous Base Material.

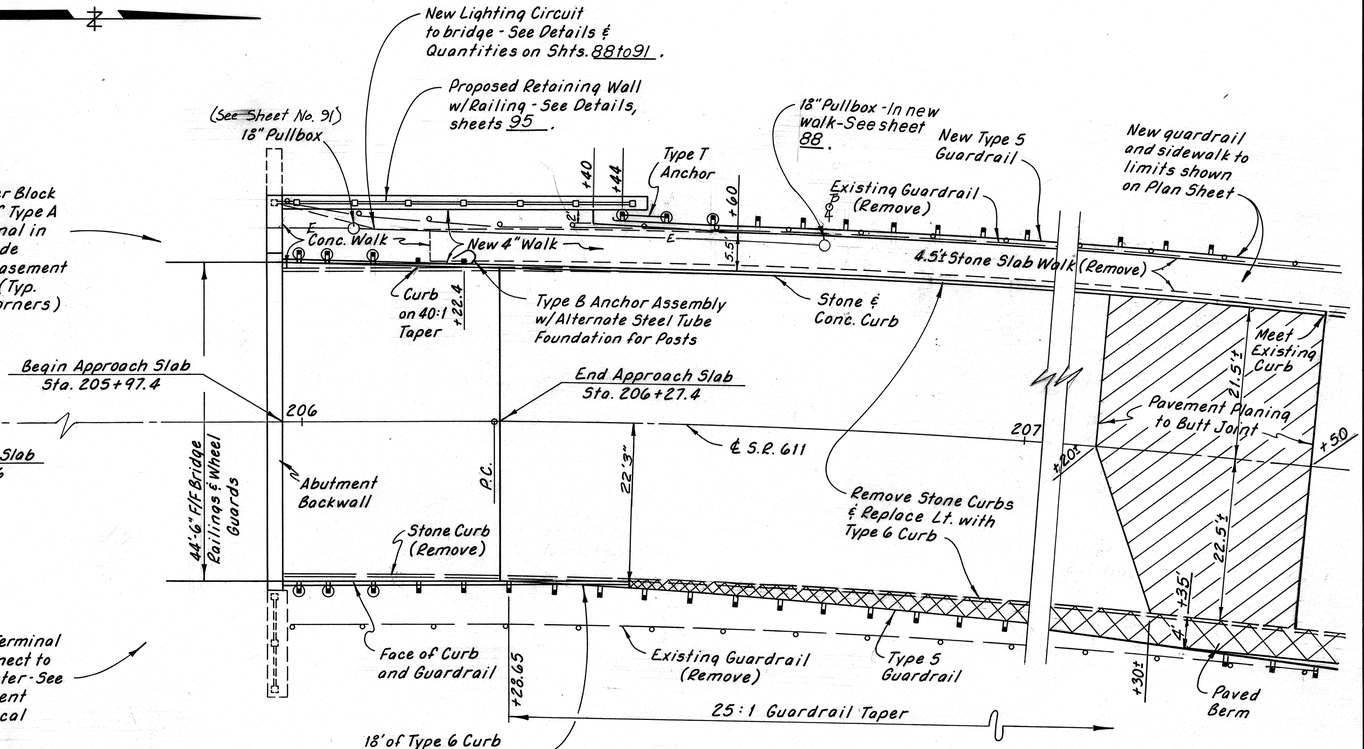
Calc. By: DDB 1/88
Chk'd. By: R.S. 8/88

FHWA REGION	STATE	PROJECT	
5	OHIO		

13
99

LOR-611-3.57





Scale in Feet
10 0 10 20

NOTE: Paved berm quantities carried on plan sheet

DETAILS OF REAR BRIDGE APPROACH

PAVEMENT QUANTITIES (STA. 188+00 AH.)

404	Asphalt Concrete (1¼" Course)	10.0 Cu. Yd.
407	Tack Coat, As Per Plan	28 Gal.
Special	Pavement Planing, Bituminous, Without Heating	281 Sq. Yd.
611	Reinforced Concrete Approach Slab, T=17"	150.4 Sq. Yd.
608	Standard Type 6 Curb	78 Lin. Ft.
202	Curb Removed	127 Lin. Ft.
301	Bituminous Aggregate Base	0.7 Cu. Yd.

DETAILS OF FORWARD BRIDGE APPROACH

PAVEMENT QUANTITIES (STA. 207+50 BK.)

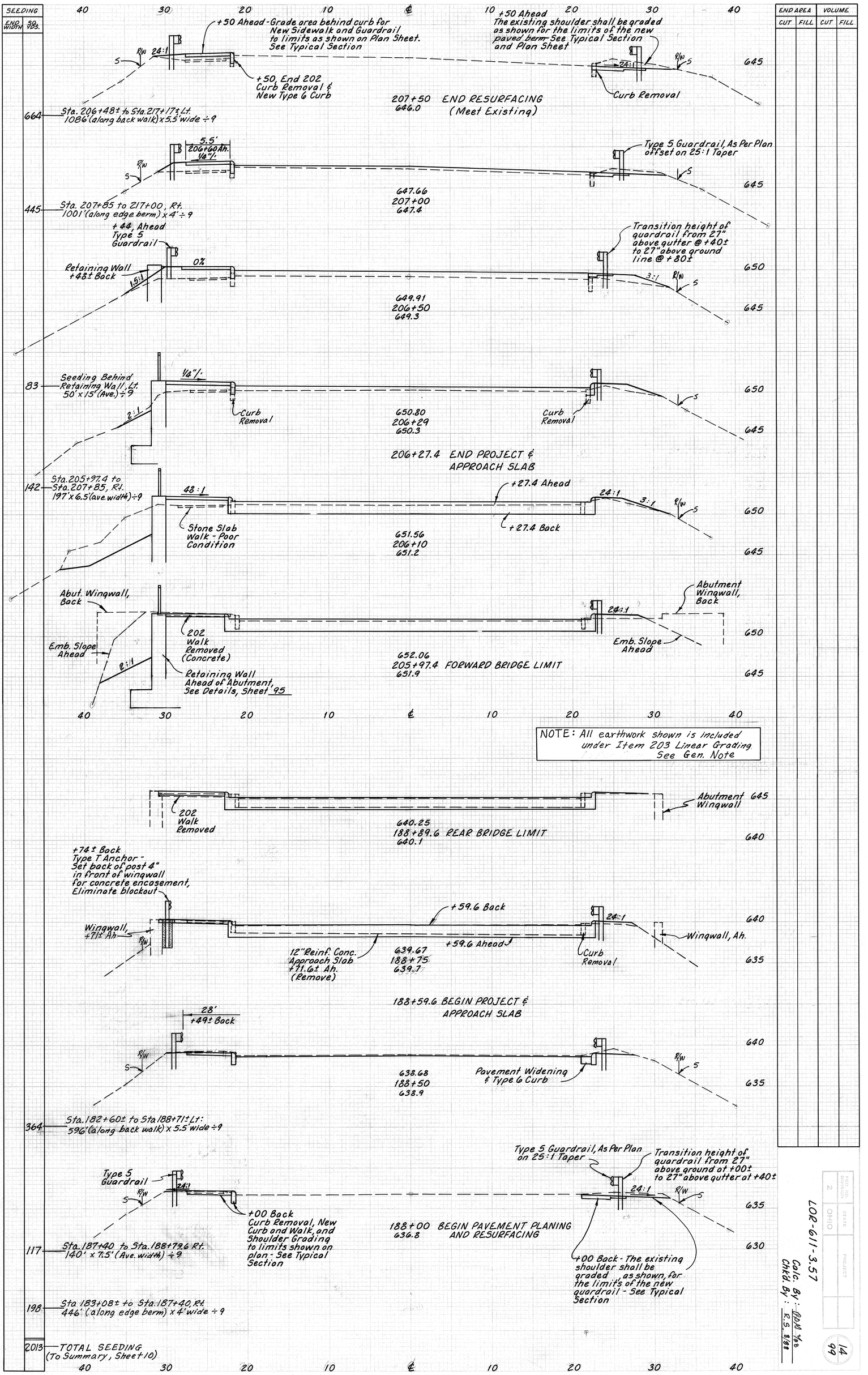
404	Asphalt Concrete (1¼" Course)	20.7 Cu. Yd.
402	Asphalt Concrete (Variable Thick.)	61.4 Cu. Yd.
407	Tack Coat, As Per Plan	59 Gal.
Special	Pavement Planing, Bituminous, Without Heating	134 Sq. Yd.
611	Reinforced Concrete Approach Slab, T=17"	150.4 Sq. Yd.
608	Standard Type 6 Curb	141 Lin. Ft.
202	Curb Removed	304 Lin. Ft.
301	Bituminous Aggregate Base	0.6 Cu. Yd.

PAVEMENT ELEVATIONS - REAR BRIDGE APPROACH

Station	Left Edge		℄ Profile	Right Edge		
	Elev.	Offset	Elev.	Offset	Elev.	
188+00	636.77±	21.5'±	636.81±	22'±	636.88±	Meet Existing
+25	637.63	21.5'	637.73	22.16'	637.73	
+50	638.60	21.5'	638.68	22.25'	638.63	
+59.6	638.99	21.5'	639.05	22.25'	638.99	Begin Approach Slab
+75	639.64	21.88'	639.67	22.25'	639.64	
188+89.6	640.25	22.25'	640.25	22.25'	640.25	Bridge Limit

PAVEMENT ELEVATIONS - FORWARD BRIDGE APPROACH

Station	Left Edge		℄ Profile	Right Edge		
			Elev.			
205+97.4	652.06	22.25'	652.06	22.25'	652.06	Bridge Limit
206+00	651.96	22.19'	651.96	22.25'	651.94	
+25	651.01	21.56'	650.96	22.25'	650.82	
+27.4	650.92	21.5'	650.86	22.25'	650.70	End Approach Slab
+50	650.01		649.91	22.0'±	649.61	
+75	648.91		648.76	22.1'±	648.28	
207+00	647.86		647.66	22.2'±	646.99	
+25	646.97		646.72	22.4'±	645.84	
207+50	646.27±	21.5'±	645.97±	22.5'±	644.91±	Meet Existing

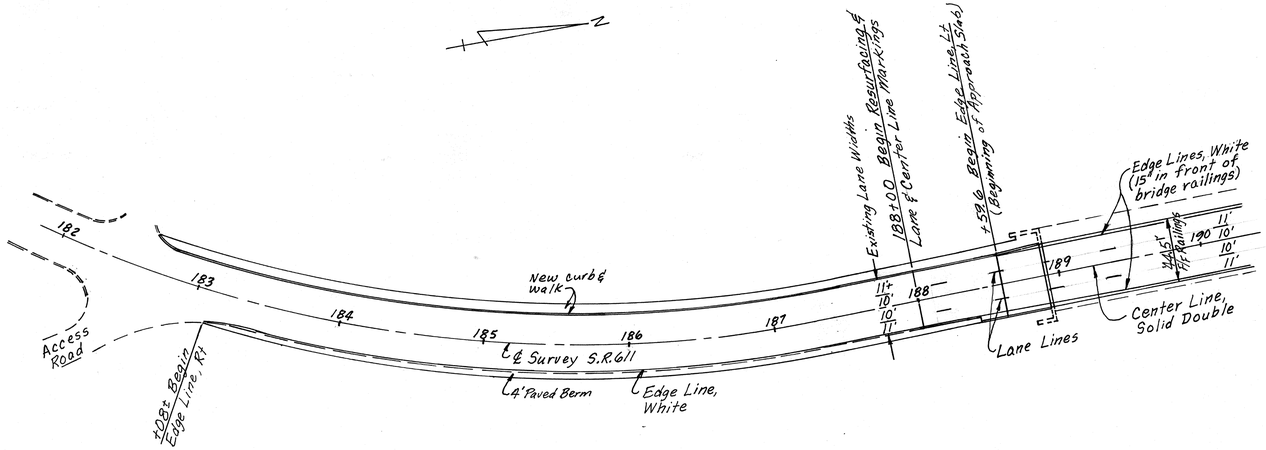

SEEDING
END WIDTH
SQ. YDS.
40 30 20 10 ℄ 10 20 30 40
+50 Ahead - Grade area behind curb for New Sidewalk and Guardrail to limits as shown on Plan Sheet. See Typical Section
+50 Ahead The existing shoulder shall be graded as shown for the limits of the new paved berm See Typical Section and Plan Sheet
+50, End 202 Curb Removal & New Type 6 Curb
Curb Removal
207+50 END RESURFACING
646.0 (Meet Existing)
664 Sta. 206+48± to Sta. 217+17± Lt. 1086' (along back walk) x 5.5' wide ÷ 9
5.5'
206+60 Ah.
1/2"/.
Type 5 Guardrail, As Per Plan offset on 25:1 Taper
647.66
207+00
647.4
445 Sta. 207+85 to 217+00, Rt. 1001' (along edge berm) x 4' ÷ 9
+44, Ahead Type 5 Guardrail
Transition height of guardrail from 27" above gutter @ +40± to 27" above ground line @ +80±
Retaining Wall +48± Back
0%
1.5:1
3:1
649.91
206+50
649.3
83 Seeding Behind Retaining Wall, Lt. 50' x 15' (Ave.) ÷ 9
1/2"/.
2:1
Curb Removal
650.80
206+29
650.3
206+27.4 END PROJECT & APPROACH SLAB
142 Sta. 205+97.4 to Sta. 207+85, Rt. 197' x 6.5' (ave. width) ÷ 9
48:1
+27.4 Ahead
+27.4 Back
Stone Slab Walk - Poor Condition
651.56
206+10
651.2
Abut. Wingwall, Back
202 Walk Removed (Concrete)
Abutment Wingwall, Back
Emb. Slope Ahead
Retaining Wall Ahead of Abutment, See Details, Sheet 95
632.06
205+97.4 FORWARD BRIDGE LIMIT
651.9
NOTE: All earthwork shown is included under Item 203 Linear Grading See Gen. Note
202 Walk Removed
640.25
188+89.6 REAR BRIDGE LIMIT
640.1
+74± Back Type T Anchor - Set back of post 4" in front of wingwall for concrete encasement, Eliminate blockout
+59.6 Back
Wingwall, +71± Ah.
Wingwall, Ah.
12" Reinf. Conc. Approach Slab +71.6± Ah. (Remove)
639.67
188+75
639.7
+59.6 Ahead
188+59.6 BEGIN PROJECT & APPROACH SLAB
28'
+49± Back
638.68
188+50
638.9
Pavement Widening & Type 6 Curb
364 Sta. 182+60± to Sta 188+71± Lt: 596' (along back walk) x 5.5 wide ÷ 9
Type 5 Guardrail
Type 5 Guardrail, As Per Plan on 25:1 Taper
Transition height of guardrail from 27" above ground at +00± to 27" above gutter at +40±
+00 Back Curb Removal, New Curb and Walk, and Shoulder Grading to limits shown on plan - See Typical Section
188+00 BEGIN PAVEMENT PLANING AND RESURFACING
636.8
117 Sta. 187+40 to Sta. 188+72.6 Rt. 140' x 7.5' (Ave. width) ÷ 9
+00 Back - The existing shoulder shall be graded as shown, for the limits of the new guardrail - See Typical Section
198 Sta 183+08± to Sta. 187+40 Rt. 446' (along edge berm) x 4' wide ÷ 9
2013 TOTAL SEEDING (To Summary, Sheet 10)
END AREA CUT FILL
VOLUME CUT FILL
LOR-611-3.57
Calc. By: DM 9/98
Ckkd. By: R.S. 9/98
14
99

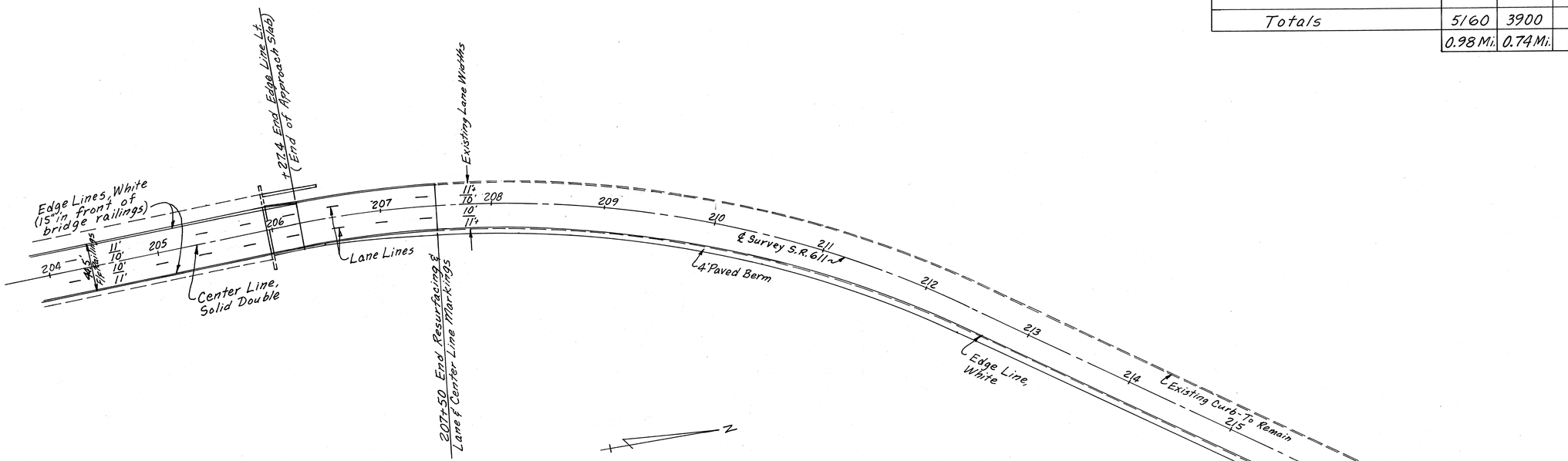
Calc. by PDY 3/88
Chkd. by R.S. 3/88

FHWA REGION	STATE	PROJECT	
5	OHIO		

15/99

LOR-611-3.57





PAVEMENT MARKING QUANTITIES

STATION LIMITS		621 Edge Lines, White	621 Lane Lines		621 Center Lines, Solid Double
		Lin. Ft. / Mile			
188+00 to 207+50	℄				1950
188+00 to 207+50	Lt. & Rt.		3900		
188+59.6 to 206+27.4	Lt.	1768			
183+08 to 217+00	Rt.	3392			
Totals		5160	3900		1950
		0.98 Mi.	0.74 Mi.		0.37 Mi.

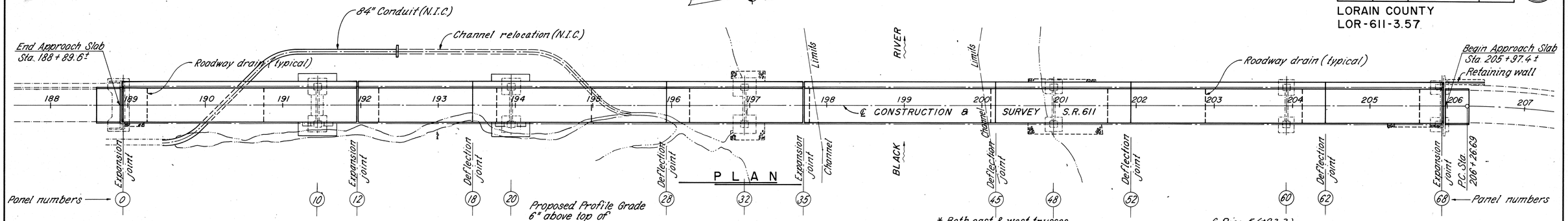
TRAFFIC CONTROL

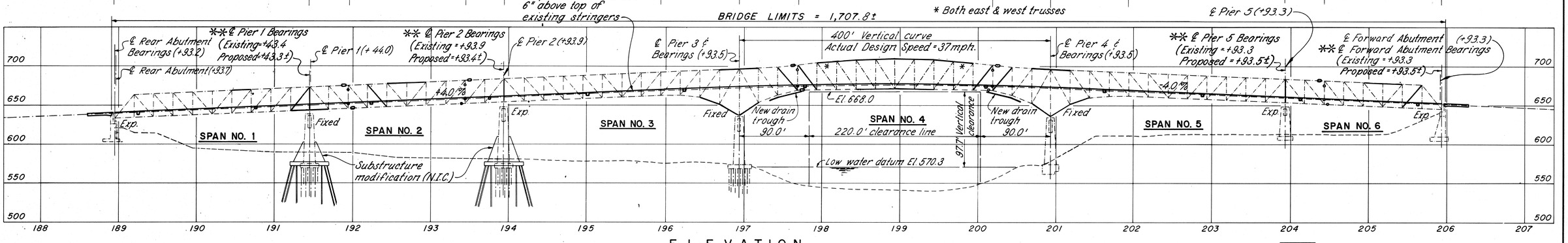
(N.I.C.)- Indicates Not In Contract for construction. Work performed under separate construction contract for substructure.

FHWA REGION	STATE	PROJECT	
5	OHIO		

16/99

LORAIN COUNTY
LOR-611-3.57



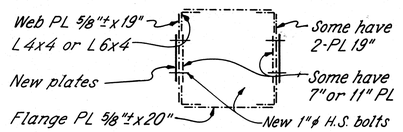


ELEVATION

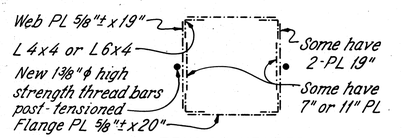
** See General Note "Relocating Spans and Bearings" Sheet 11/81.

TRUSS MEMBER STRENGTHENING

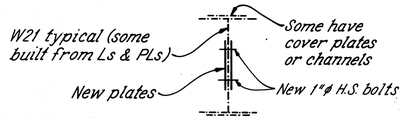
TYPICAL MEMBER CROSS SECTIONS



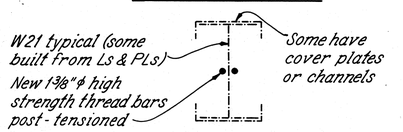
COMPRESSION MEMBER



TENSION MEMBER



COMPRESSION MEMBER



TENSION MEMBER

STRENGTHENED MEMBERS
(WEST TRUSS UNLESS NOTED)

U36 U37*, U43 U44*, L31 L32, L48 L49, U38 U39, U41 U42, L32 L33
L47 L48, L9 L10, L10 L11, U37 U38, U42 U43, U39 U40, U40 U41
L30 L31, L49 L50, U6 U7, U15 U16, U64 U65, U65 U66, U14 U15

L38 L39, L39 L40, L40 L41, L41 L42
U31 U32, U32 U33, U47 U48, U48 U49

L10 U10, L20 U20, L60 U60

L9 U10, U13 L14, U34 L35, U35 L36
U45 L44, U46 L45, U67 L66

* Both east & west trusses

EXISTING STRUCTURE

TYPE: Concrete filled steel grid roadway deck and sidewalk, carried by steel stringers and floor beams, on cantilevered steel through trusses, supported on reinforced concrete piers and abutments.

SPANS: 250.0', 250.0', 300.0', 400.0', 300.0', 200.0'

ROADWAY: 42'-0" b/b curbs W/6'-0" sidewalk

LOADING: Floor system: Equivalent HS-13 & 100% Ohio legal. Trusses: Equivalent HS-17 & 150% Ohio legal.

SKEW: 0°

ALIGNMENT: Tangent

CONDITION: Deck - poor; Superstructure - Fair; Substructure - to be rehabilitated under separate contract.

YEAR BUILT: 1940

STRUCTURE FILE NUMBER: 4707443

PROPOSED STRUCTURE

TYPE: Rehabilitation of existing superstructure on existing rehabilitated substructure including: new concrete filled steel grid roadway deck and sidewalk; new joints; new drainage; structure repairs; and painting.

SPANS: Same as existing.

ROADWAY: 44'-6" b/b guardrails W/6'-0" sidewalk

LOADING: HS 20-44 & Alternate Military Loading and 150% Ohio legal.

SKEW: Same as existing

ALIGNMENT: Same as existing.

WEARING SURFACE: Monolithic concrete

APPROACH SLABS: AS-1-81 (30'-0" long)

DESIGN AVERAGE DAILY TRAFFIC: 24,100 (2005)

DESIGN AVERAGE DAILY TRUCK TRAFFIC: 960 (2005)

1/81

RICHLAND ENGINEERING LIMITED
MANSFIELD, OHIO

GENERAL PLAN
SUPERSTRUCTURE
BRIDGE NO. LOR-611-0358
OVER BLACK RIVER

LORAIN COUNTY S.R. 611

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
DAP	DAP	TW	RDN	DHT	9/6/88	

Revised AS BUILT 6/91

ESTIMATED QUANTITIES

ITEM	TOTAL	UNIT	DESCRIPTION
			STRUCTURE
202	Lump		Portions of structure removed
202	9900	Each	Remove existing rivet or bolt.
503	Lump		Unclassified excavation, as per plan
509	2521	Lb.	Reinforcing steel, Grade 60
510	87	Each	Dowel holes, as per plan
511	24	Cu. Yd.	Class C concrete, footings
511	27	Cu. Yd.	Class C concrete, retaining wall above footings
511	34	Cu. Yd.	Class C concrete, abutment backwall
Special	75,230	Sq. Ft.	Class S concrete, 6" steel grid fill (Note sheet 20/99)
Special	13,610	Sq. Ft.	Class S concrete, 3" steel grid fill (Note sheet 20/99)
512	3	Sq. Yd.	Type B waterproofing
621,776	513 ~~644,000~~	Lb.	New A36 structural steel (AISC Category III)
106,364	513 ~~106,200~~	Lb.	New A36 galvanized structural steel (AISC Category III) - curbs
26,097	513 ~~30,000~~	Lb.	Structural steel for rehabilitation, including removals, as per plan.
858	513 ~~900~~	Lb.	Bronze sliding bearings, 711.16 & 711.17
1082	513 ~~650~~	Lb.	Stainless steel facing plates, as per plan.
3715	513 ~~3900~~	Lb.	Steel pins and nuts, as per plan
	513 3	Each	Dismantle, move and erect reused catwalk and ladder, as per plan.
	513 74,840	Sq. Ft.	4¼" Welded epoxy coated steel grid, as per plan.
	513 13,600	Sq. Ft.	2" Welded epoxy coated steel grid, as per plan.
	513 924	Each	Welded stud shear connectors
	513 8	Each	2¼" diameter x 4'-0" swedge anchor bolt, as per plan.
	513 16	Each	1¼" diameter x 3'-6" swedge anchor bolt, as per plan.
	513 8	Each	1" diameter x 3'-0" swedge anchor bolt, as per plan.
	513 36	Each	⅝" diameter x 1'-2" swedge anchor bolt, as per plan.
	516 54.1	Lin. Ft.	Structural steel expansion joint including elastomeric strip seal (4" size), as per plan.
	516 93.0	Lin. Ft.	Structural steel modular expansion joint including neoprene seals (6" size), as per plan.
	516 44.5	Lin. Ft.	Structural steel finger expansion joint, including new material and reused finger castings, as per plan.
	516 7.1	Lin. Ft.	Structural steel expansion joint, sidewalk at abutments.
	516 16.8	Lin. Ft.	Structural steel expansion joint, sidewalk at panels 12 & 35.
	516 230.0	Lin. Ft.	Structural steel roadway deflection joint including elastomeric compression seal (2½" size), as per plan.
	516 31.1	Lin. Ft.	Structural steel sidewalk deflection joint including elastomeric compression seal (1¾" size), as per plan.
	516 33	Sq. Ft.	1" Preformed expansion joint filler
	516 103	Sq. Ft.	⅛" Sheet lead or preformed bearing pad
	517 1707.8	Lin. Ft.	Railing (galvanized steel double tube), as per plan.
	517 1707.8	Lin. Ft.	Railing (galvanized steel triple tube), as per plan.
	517 50.0	Lin. Ft.	Railing (steel post and panel pedestrian), as per plan.
	517 1	Each	Railing repair, as per plan
	518 23	Cu. Yd.	Porous backfill, as per plan
	518 504	Lin. Ft.	Dismantle, move and erect reused roadway drains, as per plan.
	518 91	Lin. Ft.	Flashing, expansion joint, as per plan.
	518 230	Lin. Ft.	Flashing, deflection joint, as per plan.
	518 82	Lin. Ft.	Flashing, roadway drain, as per plan.
	518 172	Lin. Ft.	Drain trough including supports, fittings, new material and reused trough, as per plan.
	519 822	Sq. Ft.	Patching concrete structures, as per plan
	802 36	Each	Barrier reflector, type B (Carried to General Summary sheet 10)
	824 5626	Lb.	Epoxy coated reinforcing steel, Grade 60
	Special Lump		Corrosion monitoring system
20,334	Special ~~20,000~~	Lb.	Post-tensioning rods
	Special 32	Each	Substructure drain hole screening
	Special 430	Sq. Yd.	Sealing of concrete surfaces (epoxy), see Proposal Note

ITEM	TOTAL	UNIT	DESCRIPTION
Special	1420	Lin Ft.	Sidewalk joint sealing, poured polyurethane with foam backup
Special	Lump		Relocating Span No. 1 and Pier No. 1 fixed bearings.
Special	Lump		Relocating Span No. 3 and Pier No. 2 expansion bearings.
Special	Lump		Relocating Span No. 5 and Pier No. 5 fixed bearings.
Special	Lump		Relocating Span No. 6 and Forward Abutment expansion bearings
Special	10	Each	Access hatches
Special	Lump		Field painting of existing steel, surface preparation, system OZEU
Special	Lump		Field painting of existing steel, prime coat, system OZEU
Special	Lump		Field painting of new and existing steel, intermediate coat, system OZEU
Special	Lump		Field painting of new and existing steel, finish coat, system OZEU
Special	15,500	Lin. Ft.	Caulking
	1456	Each	Pigeon doors
Special	44	Each	Closing truss chords
			LIGHTING
202	Lump		Existing lighting system removed
625	186	Lin. Ft.	Trench, 24" deep
625	1	Each	Structure grounding system
625	4	Each	Ground rod, 713.16
625	4	Each	Pull box, concrete 713.08, 18"
625	33	Each	Junction box, 9"x12"x6" deep, as per plan
625	3448	Lin. Ft.	2"ϕ Conduit, 713.04
625	246	Lin. Ft.	1¼"ϕ Conduit, 713.04
625	10	Lin. Ft.	2"ϕ Liquid tight flexible conduit.
625	12,062	Lin. Ft.	No. 4 AWG 5000 volt distribution cable
625	570	Lin. Ft.	No. 10 AWG Pole and bracket cable
625	375	Lin. Ft.	3/C No. 10 AWG, 713.02
625	40	Each	Connector kit, Type II
625	22	Each	Connector kit, Type VII A
625	6	Each	Connector kit, Type VII B
625	2	Each	Channel centerline marker light
625	4	Each	Channel margin marker light
625	2	Each	Power service, as per plan
625	8	Each	Cable splicing kit

QUANTITIES		
CALCULATED	DAP	12/86
CHECKED	RDN	9/88

FHWA REGION	STATE	PROJECT	
5	OHIO		

17

LORAIN COUNTY
LOR-611-3.57

INDEX OF STRUCTURE SHEETS

RICHLAND ENGINEERING LIMITED
MANSFIELD, OHIO

2/81

ESTIMATED QUANTITIES & INDEX
SUPERSTRUCTURE
BRIDGE NO. LOR-611-0358
OVER BLACK RIVER

LORAIN COUNTY S.R. 611

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
DAP	TWH	TWH	RDN	DHT	9/6/88	10/3/88

AS BUILT 6/91

GENERAL NOTES

REFERENCE shall be made to Standard Drawing:

AS-1-81, Sheets 1, 2, and 3 of 3, Dated 11/27/81

And to Supplemental Specifications:

824 Dated 10/08/82
853 Dated 6/26/78
956 Dated 6/26/78

DESIGN SPECIFICATIONS: This structure conforms to "Standard Specifications for Highway Bridges" adopted by the American Association of State Highway and Transportation Officials, 1983, including the 1984 Interim Specifications, and the Ohio "Supplement" to these Specifications.

DESIGN DATA: New materials incorporated in the structure conform to the following:

Design Loading - HS20-44 Case II and the Alternate Military Loading.
Concrete Class S - Unit Stress 1500 P.S.I.
Concrete Class C - Unit Stress 1330 P.S.I.
Reinforcing Steel ASTM A615, A616, or A617 - Grade 60 - Unit Stress 24,000 P.S.I.
Structural Steel ASTM A36 - Unit Stress 20,000 P.S.I.
Post-Tensioning Rod ASTM A722-Ultimate Tensile Strength 150,000 P.S.I., Unit Stress 66,000 P.S.I, Initial Stress 24,000 P.S.I.
Deck Protection Method - Epoxy coated steel grid and calcium nitrite concrete additive.

SEQUENCE OF CONSTRUCTION: The following requirements shall be met to allow maximum relief of stresses in existing members and to provide the lowest stress condition for installing new materials:

1. The existing roadway concrete filled steel grid deck shall be removed for the full 42 foot width before any new longitudinally continuous materials, such as stringers or deck, are installed in an area. The existing sidewalk concrete filled steel grid deck shall be removed at the same time as the roadway deck.

   A temporary sidewalk shall be constructed to provide access along the bridge in areas where the deck and sidewalk have been removed. The temporary sidewalk shall remain in place until the new steel grid is installed.

2. Abutment backwall concrete shall be removed before adjacent bearings are relocated.

3. Bearings at Piér 1 and Pier 2 shall be relocated before roadway, sidewalk, or truss expansion joints at the rear abutment, panel no. 12 or panel no. 35 are reconstructed. Bearings at Pier 1 shall be relocated while the deck and sidewalk are off of the bridge from panel no. 0 to 18. Bearings at Pier 2 shall be relocated while the deck and sidewalk are off of the bridge from panel no. 12 to 35.

4. Bearings at Pier 5 and the forward abutment shall be relocated before roadway, sidewalk, or truss expansion joints at panel no. 35 or the forward abutment are reconstructed. Bearings at Pier 5 and the forward abutment shall be relocated while the deck and sidewalk are off of the bridge from panel no. 45 to 68.

5. All existing roadway and sidewalk concrete filled steel deck shall have been removed in adjacent spans before roadway, sidewalk, or truss expansion joints are reconstructed as follows:

	Deck and Sidewalk Removed	
Expansion Joint	Panel No. to	Panel No.
Rear Abutment	0	12
Panel No. 12	0	35
Panel No. 35	12	68
Forward Abutment	35	68

   New steel grid and portions of the new concrete fill may be in place before the expansion joints are reconstructed. However, concrete fill shall not be placed in steel grid panels adjacent to expansion joints until the expansion joints are complete.

6. Floorbeams shall be strengthened by post-tensioning or adding material only when all of the existing deck concrete and steel grid has been removed, and before any new materials are installed, within 25 feet either side of the floorbeam.

7. Truss members shall be strengthened by post-tensioning or adding material only when all of the existing deck and sidewalk concrete and steel grid has been removed, and before any new materials are installed, within the following limits:

Truss Member to be Strengthened Between		Deck Removed Between	
Panel No.	to Panel No.	Panel No.	to Panel No.
6	11	0	18
13	16	12	18
20	20	12	32
30	35	20	35
35	45	35	45
45	50	45	60
60	60	48	68
64	67	62	68

8. Painting work shall be performed in two stages. Stage 1 painting work shall be performed after the existing deck and sidewalk is removed and before new steel grid is installed. Stage 2 painting work shall be performed after all other structure and lighting work is complete.

   Stage 1 painting includes surface preparation, prime coat, intermediate coat, and finish coat on existing steel and intermediate and finish coats on new steel for roadway stringers, sidewalk stringers, diaphragms, sidewalk struts, access hatch framing, lower lateral bracing, top flange of floorbeams, top angles of sidewalk support brackets, portion of pedestrian railing to be hidden by sidewalk, and truss members from 2 feet above the deck to 2 feet below the deck. Members and connections are included. The top of the top flange of stringers is included. The top, sides and bottom of the top flange of floorbeams is included. The floorbeam web, stiffners and bottom flange that will be concealed by flashing shall be painted at Panel nos. 12, 18, 28, 35, 45, 52 and 62 as part of Stage 1 painting.

   Stage 2 painting includes all remaining unpainted surfaces and repairing damaged and inadequate Stage 1 work.

9. Flashing at joints shall be installed after Stage 1 painting and before Stage 2 painting.

10. Pigeon guards shall be installed within 10 days after the finish coat of paint on a member.

The Contractor shall submit a detailed sequence of work to the Engineer for approval prior to beginning any work. The sequence of work shall be specific for each span of the structure and show the relationship to work in other spans.

The cost of performing the described work in sequence shall be included as incidental to the pertinent work items.

BLACK RIVER TRAFFIC: The Black River under the structure is navigable and is used by large ships, work boats, and pleasure boats. The horizontal and vertical clearances for navigation shall be maintained at all times. River traffic shall not be interrupted.

The Contractor shall not drop materials or debris in the river. The Contractor shall notify the U.S. Coast Guard of any major work being performed over the river.

REPAIR OF SEEDED AREAS UNDER BRIDGE: The Contractor shall repair any area under the bridge that he may disturb during this contract at his expense and at the direction of the Engineer. The repair seeding and mulching shall be according to Item 659-Repair seeding and mulching using crown vetch.

EXISTING STRUCTURE PLANS including design plans and shop drawings may be examined by prospective bidders at the Lorain County Engineers Office, 247 Hadaway Street, Elyria, Ohio and ODOT District #3 Office, 906 North Clark Street, Ashland, Ohio.

EXISTING STRUCTURE VERIFICATION: Details and dimensions shown on these plans pertaining to the existing structure have been obtained from plans of the existing structure and/or from field observations and measurements. Consequently, they are indicative of the existing structure 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 pre-bid examination of the existing structure 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.

UTILITY LINES: All expenses involved in permanent relocation of the affected utility lines shall be borne by the owners. The Contractor and owners are requested to cooperate by arranging their work in such a manner that inconvenience to either will be held to a minimum.

SHOP DRAWINGS, SUBMITTALS AND RECORDS: Shop drawings are required to be submitted per CMS 501.05 and working drawings shall be submitted as noted in particular pay items. A meeting will be held with Project Engineer, District Construction Engineer, Central Office Construction Personnel, Central Office Structural Steel Engineer, Consultant and Contractor, to discuss the procedure for submitting and reviewing shop drawings and working drawings. This meeting will be separate from the pre-construction conference.

Shop drawings per 501.05 will be required for all Items 513; 516 (except preformed expansion joint filler); 517-Railing (galvanized steel tube); and 518 (except porous backfill).

Working drawings shall be submitted for Items Special-Corrosion monitoring system; Post-tensioning rods; and all Items 625.

The Project Engineer will maintain a file of shop drawings and working drawings and keep a set of plans marked to "as-built" conditions in the project field office.

GENERAL NOTES CONTINUED
Sheet 4 of 81 .

3/81

RICHLAND ENGINEERING LIMITED
MANSFIELD, OHIO

GENERAL NOTES
SUPERSTRUCTURE

BRIDGE NO. LOR-611-0358
OVER BLACK RIVER

LORAIN COUNTY S.R.611

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
DAP	KH	KH	RDN	DHT	9/6/88	

AS BUILT 6/91

GENERAL NOTES

WORKING DRAWINGS: The Contractor shall submit to the Director for review and approval eight sets of drawings, catalog cuts, specifications, brochures, data sheets, wiring drawings, etc., of apparatus and equipment he proposes to furnish. The material shall show clearly the design, quality, dimensions, and other such information as may be necessary for a proper evaluation of the items submitted. All submitted documents shall identify the specific project with the bid item reference number to which the apparatus or equipment applies. If more than one catalog number or type is listed on a sheet, the item intended to be furnished shall be indicated by an appropriate mark.

Information shall show conformance to all plan requirements. Electrical equipment shall indicate electrical voltage, phase, and amperage requirements.

The Contractor shall not install any material until written approval is received from the Director. After approval, working drawings shall be considered as supplemental to, but not a substitute for the original plans. Approval of working drawings shall not relieve the Contractor of responsibility for omissions and erroneous or inconsistent dimensions, notations or other errors.

PORTIONS OF STRUCTURE REMOVED shall include the elements indicated in the plans and general notes and are not separately listed for payment except for rivet or bolt removal. Items to be removed include all existing materials being replaced by new construction, and miscellaneous items that are not shown incorporated in the final construction and are directed to be removed by the Engineer. The following major items are included:

Item	Approximate Quantity for Information Only	
Abutment concrete	35	C.Y.
2" concrete filled steel grid sidewalk	15,560	S.F.
4 1/4" concrete filled steel grid deck with 1" asphalt wearing surface	70,430	S.F.
Structural steel	386	Tons
Transverse drain troughs & flashing & supports	410	L.F.
Longitudinal drain troughs & supports	484	L.F.
Downspouts & supports	54	L.F.
3 1/2" dia. double steel pipe rail & supports	1706	L.F.
3 1/2" dia. triple steel pipe rail & supports	1706	L.F.
Access hatches	9	Each
Catwalks and ladders *	4	Each
Drain casting *	546	L.F.
Finger expansion joint casting *	168	L.F.

* Some portion of these materials are specified for reuse in the final structure. See "Reused Materials" General Notes Sheet 6 of 81 .

Concrete shall be removed by means of approved pneumatic hammers employing pointed and blunt chisel tools. Hydraulic hoe-rams will not be permitted. The weight of hammer shall be approved by the Engineer. The weight of the hammer shall not be more than 35 pounds for removal within 18-in. of portions to be preserved. Outside the 18-in. limit, a hammer heavier than 35 pounds, but not to exceed 85 pounds, may be used at the approval of the Engineer. Pneumatic hammers shall not be placed in direct contact with reinforcing steel that is to be retained in the rebuilt structure.

Exposed reinforcing steel shall be cleaned by sandblasting to Grade SA-1 to remove all loose particles of concrete or rust. Existing reinforcing steel shall be cut and/or maintained as indicated in the plans, or as directed by the Engineer, to serve as dowels or principal reinforcement in the re-built structure. These bars shall be cleaned to remove concrete fragments and foreign matter. Care shall be taken to preserve the bond of such dowels or principal reinforcement to the existing concrete. Where bond between existing concrete and reinforcing steel that is to be retained has been destroyed, the unbonded concrete adjacent to the bar shall be removed to a depth which will permit new concrete to bond to the entire periphery of the bar so debonded. A minimum of 1 1/2 in. clearance around the perimeter of the steel shall be provided. Damaged areas of reinforcement that are to remain shall be cut and stress transfer shall be accomplished by either a lapped or mechanical splice as approved by the Engineer. Other existing reinforcement within the removal limits shall be removed and disposed of. All necessary labor, equipment and material required to cut and clean existing reinforcing steel shall be provided by the Contractor and included with Item 202-Portions of structure removed, for payment. Lapped or mechanical splices required for stress transfer where existing reinforcement is damaged by the Contractor shall be provided by the Contractor at his expense.

The existing concrete filled steel grid deck was designed to be welded to the existing stringers with a 5/16" x 2 1/4" fillet weld at alternate bars, i.e. at 1'-0" c/c along the stringer. The existing concrete filled steel grid sidewalk was designed to be welded to the existing stringers with a 1/4" x 2" fillet weld at alternate bars, i.e. at 8" c/c along the stringer. The actual size and frequency of welds is not known. The Contractor is responsible for all costs incurred in removal of the concrete filled steel grid regardless of the actual weld size and frequency. Care shall be taken to minimize damage to stringers and supports which are to be reused. Saw cuts shall not penetrate the entire thickness of the grid to avoid nicking the stringer flanges. Hydraulic hoe-rams will not be permitted. The Contractor shall submit his proposed method of deck and sidewalk removal to the Director for approval prior to beginning work. The proposed method shall identify equipment to be used. Any cranes or vehicles which exceed Ohio Legal Loads for gross vehicle weight or axles that are proposed for use will not be approved without an anaylsis of the existing structure for the proposed loads. The analysis shall be prepared by a Registered Professional Engineer and shall bear his signature and number of professional engineering seal. Three copies of the proposed methods, equipment and calculations shall be submitted.

Plywood templates of sidewalk holes around truss members shall be made before the sidewalk is removed. See detail note on sheet 57 of 81 .

Any weld metal or other protrusions left from the grid deck removal operations which will not interfere with the flush seating of the new deck on the stringers may remain. Any protrusions which will interfere with the flush seating of the new grid deck at any point shall be removed by grinding. Grinding shall be in the direction parallel to the length of the stringer.

If the removal operation is such that possible distortion of the top flange could occur, care shall be taken to ensure that the distortion does not exceed the dimensional variation permitted by ASTM A6, Section 5. Stringers distorted beyond tolerance shall be replaced entirely between their connections with high strength bolts being used in place of rivets.

Any surface depressions on the top surface of the stringer flange and located in a compression area may be repaired subject to the requirements of ASTM A6, Section 9.

Any surface depressions on the top surface of the stringer flange and located in a tension area shall be repaired by a welding procedure conforming to AWS and subject to the approval of the Director. Non-destructive testing may be required for tension area repairs depending on the nature and severity. For continuous stringers the tension area is defined as the distance from the support to a point 0.2 L from the support where L is the total distance between consecutive supports.

The total repair area by grinding or chipping prior to welding (exclusive of grinding required for protrusions) shall not exceed 2 percent of the surface area of the piece. The piece means the length of stringer between stringer splices or ends. Stringers with repair work in excess of this requirement shall be replaced entirely between their connections with high strength bolts being used in place of rivets.

There will be no separate pay for any repair work described above including replacement of stringers. Compensation for this work shall be included with the unit price bid for portions of structure removed.

A temporary sidewalk shall be constructed to provide access along the bridge in areas where the deck and sidewalk have been removed. The temporary sidewalk shall remain in place until the new steel grid is installed. The temporary sidewalk may be located in the existing sidewalk location, in the roadway, or outside of the east truss. The walkway shall have a minimum 4 foot clear width and a 3'6" high continuous railing on each side. The walkway shall have a solid continuous floor designed for 85 psf. Railings shall be designed for 50 plf horizontal and vertical loads. The cost of the temporary sidewalk shall be included as incidental to Item 202--Portions of structure removed.

EXISTING RIVET AND STRUCTURAL STEEL REMOVAL: Existing rivets that are in holes used to connect new material to existing material, existing rivets that must be removed to remove existing steel, and rivets directed to be removed by the Engineer shall be removed with care.

All existing rivets to be removed shall first have the heads cut off and then the remainder of the rivet removed by drilling. Some rivets to be removed have countersunk heads on one or both ends. Rivets that are countersunk both ends shall be removed by drilling. Punching may be used to remove loose fitting shanks. Rivet removal methods shall not damage base material that is to remain in place. Burning through the rivet shank is not an acceptable removal method. The Contractor shall submit details of the proposed rivet removal method for approval by the Engineer prior to beginning work. Any damage to existing material to remain in place due to the Contractor's removal operation shall be repaired to the satisfaction of the Engineer at the cost of the Contractor.

Existing structural steel which is indicated to be removed by cutting may be flame cut to straight lines. All flame cut edges shall be ground smooth. All other structural steel shall be removed by removal of existing rivets.

Payment for careful structural steel removal shall be included with Item 202-Portions of structure removed. Payment for special rivet removal procedures shall be included with Item 202 - Remove existing rivet or bolt.

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RICHLAND ENGINEERING LIMITED
MANSFIELD, OHIO

GENERAL NOTES
SUPERSTRUCTURE

BRIDGE NO. LOR-611-0358
OVER BLACK RIVER

LORAIN COUNTY S.R. 611

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
DAP	KH	KH	RDN	DHT	9/16/88	

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RETAINING WALL EXCAVATION: After excavating for the construction of the proposed retaining wall and prior to placing the concrete for the retaining wall footing, the material located at the retaining wall footing elevation shall be compacted with mechanical equipment. Soft materials shall be removed to a depth of 2 feet and replaced with well compacted 203 granular material. Payment for the work shall be included with Item 503-Unclassified excavation.

DOWEL HOLES: Drilling of holes into concrete and the furnishing and placing grout into the holes shall be in accordance with Supplemental Specification 853 and Supplemental Specification 956 except for the basis of payment. Drilling dowel holes, furnishing and placing nonshrinking epoxy mortar and setting structural element will be measured as a unit and paid for at the contract unit price bid for Item 510-Dowel holes, as per plan. This price shall be payment in full for all material, equipment, labor and incidentals necessary to complete the work.

CLASS S CONCRETE, STEEL GRID FILL: Class S concrete shall conform to 511 of the CMS except as modified hereafter. A corrosion-inhibiting admixture, calcium nitrite, shall be added to the batch. The dosage and concentration shall be such as to provide 4.0 gallons of an aqueous solution of calcium nitrite per cubic yard of concrete. The calcium nitrite shall conform to ASTM C-494, Type C accelerator and shall not increase the soluble alkali content of the concrete. Also it shall not contain sodium bonzoate or sodium nitrite and it shall be compatible with other admixtures used. A set retarding admixture per 705.12 and approved by the manufacturer shall be used whenever the ambient temperature is above 60 degrees F.

The calcium nitrite, W.R. Grace's Darex Corrosion Inhibitor (30% solids) or an approved alternate, shall be added as an aqueous solution. The water in such solution shall be counted as mixing water for the purpose of determining the water to cement ratio of the concrete. Set retarding admixture, equal to Daratard-17 and compatible with DCI, may be used to offset the acceleration caused by DCI. A compatible air entraining admixture shall be used to provide air content of 7 1/2 % ± 1 1/2%.

The batching sequence shall be recommended by the calcium nitrite manufacturer and approved by the Engineer.

The Contractor shall give notice of the intended date of deck concrete placement to the technical representative of the manufacturer of the corrosion inhibiting admixture who shall be present at that time. The manufacturer's representative shall have the authority to make recommendations regarding the use of the corrosion-inhibiting admixture.

Curing shall be in accordance with 511.14 type A water curing. Continuous sprinkling method shall be used and Supplemental Specification 836 shall not apply to these items.

The maximum coarse aggregate size shall be No. 8.

A pre-pour conference shall be held at least 7 days before the first portion of deck is placed. The conference shall include representatives of the Contractor, concrete supplier, admixture suppliers, test lab, Project Engineer, and the District Bridge Engineer.

The Contractor shall make one or more trial batches of the concrete of the size to be hauled at least four days before the deck is to be placed. He shall cast one or more test slabs, 8 ft. long by a width which is wide enough to accommodate his tining equipment by 4 in. thick, for texturizing according to 511.16 and shall prepare other samples and specimens as directed by the Project Engineer. The Contractor shall furnish the required materials and samples without charge to the State as per 106.03. The Project Engineer shall be notified seven (7) days in advance of the test batch preparation and he will conduct all the required tests.

No concrete shall be placed when it is raining, nor when the ambient air temperature is below 45°F or is predicted to fall below 45°F for the duration of the curing period.

Placement of the concrete shall be completed under favorable atmospheric conditions. Placement during the late evening, night, and early morning hours will be considered to meet this requirement. Concrete may be placed during the day if the concrete surface evaporation rate, as affected by ambient air temperature, concrete temperature, deck temperature, relative humidity and wind velocity, is 0.1 pound per square foot per hour or less. In this case, the Contractor shall determine and document the atmospheric conditions, subject to verification by the Engineer.

Figure 1 shall be used to determine graphically the loss of surface moisture for the overlay. In using this figure, the concrete temperature shall be taken as the average of the deck surface temperature and the plastic concrete temperature.

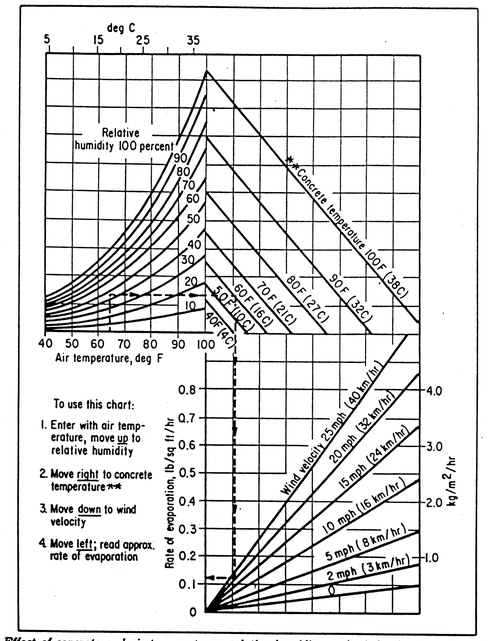

Fig. 1 — Effect of concrete and air temperatures, relative humidity, and wind velocity on the rate of evaporation of surface moisture from concrete. This chart provides a graphic method of estimating the loss of surface moisture for various weather conditions. To use the chart, follow the four steps outlined above.*

* ACI Committee 308, "Standard Practice for Curing Concrete (ACI 308-81)", American Concrete Institute, Detroit, 1981, 11 pp.

**See Note.

If placement of the class S concrete is to be made at night, the Contractor shall submit a plan which provides adequate lighting for the work area at least fifteen (15) calendar days in advance and receive written approval from the Engineer before placing the concrete.

All other provisions of Item 511 shall remain in effect.

Payment shall be made on gross square footage area out to out of edge plates and bars without deduction for truss member holes or access holes. Deduction shall be made for roadway drains and joints.

Payment for the completed and accepted quantities will be made at the contract bid price for:

Item	Unit	Description
511	Sq.Ft.	Class S concrete, 6" steel grid fill, as per plan.
511	Sq.Ft.	Class S concrete, 3" steel grid fill, as per plan.

CONNECTION BOLTS 5/8 inch diameter and larger shall be hex head, galvanized ASTM A325 high strength bolts, unless otherwise noted. Bolts 1/2 inch diameter and smaller, and countersunk bolts of any size, shall be galvanized SAE J429 Grade 5 or galvanized ASTM A449. Countersunk bolts shall have socket heads and conform to ANSI 18.5. Stainless steel bolts shall be Type 304. New connection bolts shall be included for payment with the pertinent new material pay item.

SHOP PAINTING NEW STRUCTURAL STEEL: All new steel that is not galvanized or stainless, including post tensioning rods, shall be shop painted according to General Note "Field Painting of New and Existing Steel, System OZEU" for surface preparation and prime coat, except that the prime coat shall be inorganic zinc. The inorganic zinc prime coat shall be part of the approved coating system for the project.

The prime coat shall be applied within the shop and the steel shall not be handled unnecessarily or removed from the shop until paint has dried sufficiently to allow thickness gaging and to resist being marred in handling and shipping.

Pins, pin holes and contact surfaces of all assemblies including bolted connections, shall be painted with one coat of prime paint. The tops of all stringers shall be painted.

Erection marks shall be applied after the prime coat is dry, using a thinned paint of a type and color which will be completely concealed by and compatible with the second coat. The Fabricator's name may be applied in a similar manner by use of a stencil or by use of removable tape.

Shop painting shall be included in the price bid for the applicable steel item.

NEW GALVANIZED STEEL: Shall be galvanized after fabrication per 711.02. The Contractor shall be very careful in handling the galvanized steel to minimize scratches and abrasions of the finish. Wire rope slings and metal hooks shall be padded with wood, or reinforced fabric webbing shall be used for material handling. Scratches and abrasions of the galvanized finish shall be touched up in the field by "cold applied galvanizing" as directed by the Engineer. Connection bolts for galvanized steel members shall be mechanically galvanized.

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RICHLAND ENGINEERING LIMITED
MANSFIELD, OHIO

GENERAL NOTES
SUPERSTRUCTURE

BRIDGE NO. LOR-611-0358
OVER BLACK RIVER

LORAIN COUNTY S.R. 611

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
DAP	KH	KH	RDN	DHT	9/6/88	

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BOLTED CONNECTION TO EXISTING STEEL: At locations indicated on the plans and as directed by the Engineer, new structural steel shall be connected to existing structural steel using existing rivet or bolt holes and new bolts. Rivet removal procedures are described in the General Note sheet 4 of 81. Payment for rivet or bolt removal is included with Item 202-Remove existing rivet or bolt. Holes in new material shall be made by any of the following methods (to be selected by the Contractor):

1. Careful field measurements and examination of existing shop drawings by the Contractor shall be used for locating holes in new material to be subpunched or drilled undersize in the shop. The hole shall be 3/16 inch less in diameter than the nominal diameter of the new bolt. The holes shall be reamed to proper size in the field after fit-up to the existing rivet or bolt holes.

2. Make templates in the field of hole patterns and locations after removal of rivets or bolts. Use the field templates in the shop to punch or drill standard size holes. The holes shall be reamed in the field after fit-up to the existing rivet or bolt holes.

3. Furnish new structural steel without shop holes for connection to existing rivet or bolt holes. Holes in new material to be field drilled and reamed to match existing rivet or bolt location.

Rivet holes not used for bolted connections shall be left open.

Existing material without holes for connection to new material shall be field drilled.

All holes through new and existing material shall be reamed after assembly. The final holes shall be standard size, 1/16 inch larger in diameter than the nominal bolt diameter.

Additional requirements for holes shall be per 513.14. Shop holes that do not match existing rivet holes shall be field drilled.

Existing material shall be cleaned and prime painted before connecting new material.

The cost of all material, equipment and labor for connecting new material to existing material including reaming new or existing holes, and drilling new holes, shall be included as incidental to the pertinent new material pay item.

WELDING TO EXISTING STEEL: The original design plans and shop drawings for LOR-611-0358 indicate that structural carbon steel was used for the structure. Welding to the existing structural steel shall not be permitted without the approval of the Director, except where detailed in the plans.

STRUCTURAL STEEL FOR REHABILITATION: Any existing structural steel members deemed by the Engineer to be unusable, after sandblasting, because of corrosion or damage, shall be removed and new material of the same size and dimension shall be installed in its place. New material shall be A36 steel.

Members shall be completely replaced from connection to connection with new high strength bolts used in place of existing rivets. No field welding will be permitted.

The following estimated quantities have been included to be used at the direction of the Engineer:

Item	Quantity
Miscellaneous structural steel damaged by corrosion: (Plates, angles, or channels)	2,200 lb.
Roadway stringers, diaphragms and connections:	22,000 lb.
Damaged stringer connections: (Repair similar to Panel Point 16, sheet 27 of 81.)	500 lb.
Sidewalk stringers and connections	4,000 lb.
Lower lateral bracing and connections	1,300 lb.
Total	30,000 lb.

The new steel shall be prime painted with inorganic zinc per the "Shop Painting New Structural Steel" Note Sheet 5 of 81.

Structural Steel 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 Consultant. 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. Pay weights shall be computed in compliance with 513 of the Construction and Material Specifications and submitted to the Engineer for his review and approval. 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.

The cost of all labor, materials and equipment necessary for replacing existing steel with new structural steel, including removal of existing steel and rivets according to 202, shall be included in the unit price bid, per pound of new structural steel installed, for Item 513-Structural steel for rehabilitation, including removals.

STEEL PINS AND NUTS: Steel pins shall be ASTM A668 Class D steel forgings. The pins shall meet the specified minimum notch toughness requirements for A36 steel as specified in 711.01. In order to meet the Charpy V-notch impact requirements, the steel may need to be heat treated. The longitudinal axis of the pins shall be oriented in the direction of forging of the bars. Pins shall be completely hard chrome plated to a minimum thickness of 3 mils. The surface roughness of the chromed pins shall be less than 20 micro inches on the bearing surface and less than 125 micro inches (ANSI 125) on the ends and threads.

The pin spacers and nuts shall be A36 steel prime painted with inorganic zinc per the "Shop Painting New Structural Steel" Note Sheet 5 of 81.

Pins, pin spacers, nuts and set screw shall be included for payment with Item 513 - Steel pins and nuts.

REUSED MATERIALS are to be dismantled, removed from the existing structure, stored, cleaned, refurbished, and installed in the finished structure. The Engineer and Contractor shall together view and record the condition of items to be reused prior to beginning removal work. Items to be reused shall be carefully removed so as not to cause damage to the material. The Contractor shall repair any damage caused by his removal or handling procedures to the satisfaction of the Engineer. Material which cannot be satisfactorily repaired shall be replaced by the Contractor at no additional cost.

Reused structural steel and steel castings shall be cleaned, prepared by sandblasting, and prime coated according to the "Field Painting of New and Existing Steel" General Note prior to installing in the finished structure.

Where more material is available for reuse than is required in the final structure, the Engineer shall designate which pieces are to be reused prior to removal from the structure.

The Contractor may, at his option, furnish all new material in lieu of reusing existing material. If the Contractor chooses to furnish new material, the existing material shall be removed per Item 202, and the new material of equivalent size and configuration furnished per Item 513, at no additional cost. Existing steel castings may be replaced with weldments.

The cost of dismantling, removing, storing, cleaning, refurbushing, repairing, installing, and new materials shall be included in the pertinent material pay item:

Item 513 - per each-Dismantle, move and erect reused catwalk, as per plan.

Item 516 - per lineal foot - Structural steel finger expansion joint, including reused finger castings, as per plan.

Item 518 - per lineal foot - Dismantle, move and erect reused roadway drains, as per plan.

Item 518 - per lineal foot - Drain trough including supports, fittings, new material and reused trough, as per plan.

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RICHLAND ENGINEERING LIMITED
MANSFIELD, OHIO

GENERAL NOTES
SUPERSTRUCTURE
BRIDGE NO. LOR-611-0358
OVER BLACK RIVER

LORAIN COUNTY S.R. 611

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
DAP	KH	KH	RDN	DHT	9/6/88	

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WELDED STEEL GRID shall be of the size and type detailed on sheet 56 of 81. The materials shall be manufactured products as follows:

4 1/4" welded A36 steel grid shall be Greulich 4 1/4" interlock concrete-filled, Foster 4 1/4" concrete-filled steel bridge flooring, Reliance 4 1/4" I-beam interlock type 4I-6, or equal.

2" welded A36 steel grid shall be Greulich standard ArmaDek sidewalk flooring, Reliance standard T-sidewalk, or equal.

Greulich, Inc., Bridge Flooring Systems and the L.B. Foster Company are located in Pittsburgh, Pa. Reliance Steel Products Company is located in McKeesport, Pa. Borden Metal Products Company is located in Elizabeth, N.J.

All edge plates, angles, shop fabrications and fasteners necessary for a complete installation shall be included as incidental to the pertinent pay items.

After the deck panels are fabricated, an epoxy coating shall be applied to the steel. The epoxy, application of the epoxy, shipping handling, storage placement, and field patching shall be consistent with ODOT Supplemental Specification 824, except the thickness of the epoxy coating shall be 10 mils ± 5 mils. Thickness readings shall be made on flat surfaces only. Corners and thin edges shall be covered but thickness may be less than 5 mils.

The epoxy coating shall be removed from the steel grid in areas that are to be field welded before welding. The epoxy coating shall be removed by grinding or scraping. Steel grid to stringer welds, splice welds, scratches and abrasions shall be patched in the field per Supplemental Specification 824.

Payment shall be made on the gross square footage area out to out of edge plates and bars without deduction for truss member holes or access holes. Deduction shall be made for roadway drains and joints.

STRUCTURAL STEEL JOINT INCLUDING ELASTOMERIC SEALS:

A. DESCRIPTION: This work shall include furnishing and installing continuous sealed expansion joints for the bridge deck in accordance with the plans and applicable parts of Item 516. The furnished joints shall be in conformity with lines and grades shown on the plans or established by the Engineer.

B. QUALIFICATION: Each lot of seals and adhesives furnished under these provisions shall be identified, shall be products which have been tested by the manufacturer or a commercial laboratory and shall comply with these provisions. Adhesives are required.

C. CERTIFICATION: Two certified copies of the qualification test results for the continuous seals, indicating the tested materials comply with these provisions, shall be submitted to the testing laboratory for approval. Sampling, if requested, will be submitted to the testing laboratory from each lot. Seal samples shall be one piece two feet long.

D. ACCEPTANCE: Material acceptance will be based upon evaluation of certified test results submitted, upon laboratory test of sampled material, or upon evaluation of both certificates and tested samples.

E. REQUIREMENTS, GENERAL: Continuous seals of the size, shape and tolerances shown on the plans shall be Watson Bowman & Acme, D.S. Brown, Onflex, or an approved alternate type composed of an extruded or molded vulcanized elastomeric virgin polychloroprene material conforming to ASTM D-2628 modified to omit the recovery test.

The seals shall also have the properties listed below:

Property	Requirements	ASTM Method
Tensile Strength min. psi.	2000	D412
Elongation at break minimum percent	250	D412
Hardness, Type A durometer	60 ± 7	D2240 (modified)
Oven aging, 70 hr. @ 212°F.		
Tensile Strength, loss, max.	20%	D573
Elongation, loss, max.	20%	
Hardness, Type A durometer (points change)	0 to + 10	
Ozone resistance 20 percent strain, 300 pphm, in air at 104°F. (wiped with toulene to remove surface contamination)	No Cracks	D1149

The seals shall be resilient and shall not soften excessively or become brittle, between the temperature of -30°F and 160°F. Permanent seals shall be furnished in one continuous piece.

All extrusions, armor and supports shall be steel conforming to ASTM A36. Portions of the metalwork not encased in concrete, not in contact with the continuous seal and not covered by adhesive shall be cleaned and painted in conformance with field coating new and existing steel except that the total painting cost shall be included with the pertinent Item 516 steel expansion joints including elastomeric seals, for payment.

Adhesives shall be stored at temperatures between 50° and 80° and shall be used within 270 days after the date of manufacture. Adhesives shall be Sikastix 360 manufactured by the Sika Chemical company of Lyndhurst, New Jersey. Fel-Poxy FP-101 manufactured by the Felt Products Manufacturing Company of Skokie, Illinois, or an approved equal.

F. REQUIREMENTS, COMPRESSION SEALS: Compression seals shall conform to the pertinent provisions of AASHTO M 220 except that specimens for the low temperature recovery test shall be lightly dusted with talc on the outside surfaces only.

Each design, shape, width, depth, web and shell thickness shall be approved by the Director prior to use. Drawings of the seals showing dimensions, dimensional tolerances and weight per foot shall be submitted with the request for design approval.

The seal fabricator shall furnish closure devices vulcanized to the ends of all deck joint seals. These devices shall be designed to prevent the entrance of precipitation, surface drainage and roadway debris into the seals. Such devices shall not be detrimental to the compressive behavior of the seals. The closure devices shall be designed to ventilate all seal compartments.

When requested, the adequacy of closure devices shall be established by a simulation test. A sample compression seal with a closure device attached to each end shall be capable of withstanding 500 cycles of compression at 70°F ± 10°F, within a 24-hour period, without visible distress to the seal, closure devices or the bond between them. In each cycle, the sample shall be compressed from 20 to 60 percent of the nominal seal width.

G. PREPARATIONS FOR INSTALLATION: To avoid the subsequent contamination of prepared surfaces. All surfaces of elastomeric seals shall be cleaned by Methyl Ethyl Keton (MEK), Toluene (T) or other approved solvent using clean disposable cloths.

The bonding surfaces of the steel extrusion (the interior of the anchor grooves) for strip seals shall be blast cleaned to white metal, grade SA 3, ASTM D2200. Preparation shall be accomplished not more than 24 hours prior to adhesive bonding.

H. INSTALLATION, STRIP SEALS: Immediately prior to adhesive application, bonding surfaces shall be clean, dry and warmer than 45°F, and they shall be maintained at or above this temperature until the adhesive has cured. Adhesive shall be applied liberally to both steel and elastomeric bonding surfaces using a stiff brush, as necessary to achieve a complete and relatively uniform coat. Then the bulbed edges of the elastomeric seal shall be inserted into the anchor grooves. After installation, excess adhesive shall be removed from the exposed seal surfaces.

The joint seal shall be installed with equipment designed specifically for the installation of elastomeric strip seals. This equipment shall not elongate the seal longitudinally, cause structural damage to the seal, nor twist, distort, or cause other malformations in the completed seal. Equipment that does not provide a properly installed seal shall not be used.

STRUCTURAL STEEL JOINT INCLUDING ELASTOMERIC SEALS CONTINUED
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RICHLAND ENGINEERING LIMITED
MANSFIELD, OHIO

GENERAL NOTES
SUPERSTRUCTURE

BRIDGE NO. LOR-611-0358
OVER BLACK RIVER

LORAIN COUNTY S.R. 611

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
DAP	KH	KH	RDN	DHT	9/6/88	

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GENERAL NOTES

STRUCTURAL STEEL JOINT INCLUDING ELASTOMERIC SEALS CONTINUED

I. INSTALLATION, COMPRESSION SEALS: Substrate surfaces shall be clean, dry and warmer than 45° during seal installation and adhesive curing. Supplemental heating will be permitted to attain and maintain the substrate temperature at the required temperature during installation and curing. Adhesive shall be applied liberally to both the steel and elastomeric bonding surfaces using a serrated spatula if necessary to achieve a complete and relatively uniform coating. Then the elastomeric seal shall be compressed sufficiently so that it can be inserted and allowed to expand within the joint.

Adhesive shall then be removed from the exposed joint and seal surfaces after which a small bead of adhesive, approximately 1/4 inch in diameter, shall be applied to fillet the corners formed by the top edges of the seal and the sides of the joint.

Seals shall be installed with equipment designed or specifically adapted for the installation of elastomeric joint seals. This equipment shall not elongate the seal or cause structural damage to the completed installation.

J. SHOP DRAWINGS: Shop drawings covering all details for structural expansion joints including elastomeric seals are required, per 501.05.

K. MEASUREMENT: Pay quantity for elastomeric seals complete and accepted shall be based on the sealed length of joints measured horizontally along joint centerlines, end to end of the elastomeric seal.

L. PAYMENT: Payment will be made at the contract unit price per lineal foot for:

Item 516 - Structural steel expansion joint including elastomeric, strip seal (4" size).

Item 516 - Structural steel roadway deflection joint including elastomeric compression seal (2 1/2" size).

Item 516 - Structural steel sidewalk deflection joint including elastomeric compression seal (1 3/4" size).

The contract price shall be payment in full for furnishing all materials, equipment, and labor to complete the work as specified, including elastomeric seals, steel extrusions and joint armor and all structural steel shop welded thereto, temporary support bars and fasteners, shop coating and painting as per plan, material testing, and shop drawings.

MODULAR EXPANSION JOINTS

A. DESCRIPTION: This item shall consist of furnishing and installing shop fabricated modular expansion joint systems, of the general size, configuration, and joint movement specified; in accordance with these special provisions and within reasonable close conformity to the lines, elevations, locations, details, and notes shown on the plans.

The expansion joints shall be as manufactured by Watson-Bowman and Acme Corporation, P.O. Box 9, Getzville, New York, 14068; The D. S. Brown Company, North Baltimore, Ohio 45872; or an approved alternate.

All work shall conform to approved shop drawings, prepared in conformance with Section 501.05. Shop drawings shall include procedures for: installation of neoprene seal; replacement of neoprene seal; and replacement of springs and sliding bearings.

The expansion joint shall seal the deck surface to prevent water from passing through to below the deck. The expansion joint components shall be designed to support an HS 20-44 truck loading, per AASHTO Specifications, and a 100% impact fraction per ODOT Supplemental Specifications. Detailed design calculations shall be prepared by a Registered Professional Engineer and shall bear his signature and number of professional engineering seal. Three copies of the calculations shall be submitted to the Director and receive approval prior to starting fabrication. The joint armor and anchorage system shall be as detailed on the plans. The expansion joint seals shall in combination accomodate a 5.8 inch movement over a temperature range of minus 30 degrees Farenheit to plus 120 degrees Farenheit, without binding or debonding.

B. MATERIALS

1. Manufactured components: Including the edge beams, separation beam, neoprene seals, support bars, bearings, springs and support bar boxes shall be furnished by one manufacturer.

All steel members or components shall be ASTM A36 or ASTM A588 structural steel. Stainless steel shall be used for contact areas of steel on sliding surfaces. Connection bolts shall be ASTM A307 or A325. Fasteners securing removable and replaceable items shall be stainless steel.

The elastomeric sealing element shall be a polychloroprene (neoprene) locking box seal. The seal shall be one piece full length of the expansion joint. The seal elements shall have end plugs.

The sealing elements shall conform to ASTM designation D2628, modified to omit the recovery test and as noted herein:

PROPERTY	REQUIREMENTS	ASTM METHOD
Hardness Type A Durometer	60±7	D 2240 Modified

The neoprene seals shall be installed with a lubricant/adhesive recommended by the seal manufacturer.

Support bar bearings shall be fabricated from polyurethane compound with polytetrafluorethylene (PTFE) self-lubricating surfaces.

Equalization springs which work counter to the compression forces of the sealing elements shall be used to maintain equalized expansion properties for each element across the joint. The springs shall be a dense polyurethane foam elastomer.

The support bars shall incorporate stainless steel sliding surfaces to minimize resistance to joint movements; be supported above, below and laterally as required to prevent lifting, transmit bearing loads, and maintain positioning of bar; and shall be not less than two inches in width and three inches in height.

The neoprene seals, support bar bearings, and equalization springs shall be removable and replaceable.

2. Joint armor, and anchors: Shall meet the requirements of CMS Section 513. All members shall be ASTM A36 or ASTM A588 structural steel. Connection bolts shall be ASTM A307 or A325. Fasteners for removable plates shall be stainless steel.

C. FABRICATION

The expansion joints shall be fabricated according to CMS Section 513. The joints shall be shop assembled with all components except neoprene seals, in a unit, or units no smaller than one half the bridge width. The shop assembled unit(s) shall include the roadway channels and all anchor plates for both sides of the joint.

The shop assembled unit(s) shall be adjusted to proper alignment and secured for shipping, ready to be set in place in the new construction.

D. COATING

All steel components, except stainless steel and areas in contact with the neoprene seals, shall be shop coated with an organic zinc prime coat, an epoxy intermediate coat, and a urethane finish coat. Areas to be field welded shall be left unpainted. All abrasions, and unfinished areas shall be coated in the field. The coating shall be in accordance with the field coating new and existing steel specification.

MODULAR EXPANSION JOINTS CONTINUED

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RICHLAND ENGINEERING LIMITED
MANSFIELD, OHIO

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SUPERSTRUCTURE

BRIDGE NO. LOR-611-0358
OVER BLACK RIVER

LORAIN COUNTY S R 611

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
DAP	KH	KH	RON	DHT	9/6/88	

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MODULAR EXPANSION JOINTS CONTINUED

E. INSTALLATION

The bridge structural steel, and abutment backwall to the level of the approach slab seat, shall be in place before installing the expansion joints. The joint halves shall be placed, adjusted to position with temporary supports so that abutting ends of joint units are properly aligned. Care shall be taken to maintain exact alignment of adjacent ends of the steel edge beams and units shall be securely welded together. The bridge side of the assembled joint shall be secured to the superstructure steel. Temporary supports on the abutment side of the joint shall be provided to maintain proper vertical alignments.

After the superstructure concrete has been placed the joint shall be adjusted for the correct temperature setting and the upper portion of the backwall shall be placed. Temporary supports for vertical alignment shall be retained until the backwall concrete has been placed.

The steel surfaces in contact with the neoprene seal elements shall be solvent cleaned to remove oil and grease and then sandblasted immediately prior to installing the seals. The surfaces shall be blast cleaned to a near-white, grade SA 2-1/2 per ASTM D2200. The seals shall be installed with the recommended adhesive in accordance with the manufacturer's recommendations. The bonding surfaces shall be clean, dry and warmer than 45°F.

The complete, installed expansion devices shall be tested for water-tightness, by filling the joint opening, or portions thereof designated by the engineer, with water for a period of not less than one hour. Leaking seals shall be removed. The bonding surfaces cleaned of all adhesive, and the seals replaced and retested.

The joint assembly manufacturer shall furnish technical assistance to the Contractor and Engineer, through the services of a technical representative, during installation of the first expansion joint system, and/or subsequent joints if necessitated by special conditions. Where special instructions are not contained herein or elsewhere in the specifications, direction for the installation shall be according to the recommendations of the technical representative.

The Contractor shall be responsible for informing the manufacturer of the date of installation, advance notice shall be given with sufficient time for proper coordination and scheduling of operations.

F. PAYMENT

Payment will be made for the length of joint acceptably installed as measured horizontally from end to end of neoprene seal. The cost of all labor, materials and equipment necessary for the complete expansion joint installation including manufactured components, joint armor, anchors, anchor attachment angles, shop and field coating, shop drawings and testing, shall be included in the unit price bid, per lineal foot, for Item 516 - Structural steel modular expansion joint including neoprene seals (6" size).

RAILING, GALVANIZED STEEL TUBE: The tubular steel railing shall conform to the requirements of ASTM A 500, Grade B as modified below and shall be galvanized according to ASTM A 123 or ASTM A 153.

Tubular steel from all heats supplied shall be tested for toughness in accordance with ASTM E 436, Standard Method for Drop-Weight Tear Tests of Ferritic Steels, except as modified herein. Tubing test samples shall be taken at the Fabricator's shop and tested prior to delivery of the railing to the Contractor. The taking of the test samples shall be witnessed and the testing shall be performed by an independent testing laboratory. Certified test data shall be submitted for review and approval as per 501.07 of the Construction and Material Specifications.

Testing shall be done at the expense of the railing Fabricator on test specimens obtained from galvanized tubing with the same heat number as that being used. Testing shall be conducted at a temperature of 0 F (-18 C) on 2"x 9" specimens supported to provide a 7-inch clear span. Galvanizing shall not be removed from the specimens. Three 2"x 9" test specimens shall be cut from each of the unwelded sides for a total of nine specimens.

The three specimens from the side with the lowest average shear area shall be disregarded when calculating the final average shear area. The final average shear area shall then be calculated using the six remaining specimens. If the average shear area falls below 50 percent, material from the heat represented by these tests shall be rejected, except that if the average shear area is 30 percent or greater, one retest at a sampling frequency three times that of the first test, and with no samples excluded in calculating the average, will be permitted. Material not having a 50 percent average shear area upon retest shall be rejected.

To facilitate acceptance or rejection of the material, the manufacturer of the tubing shall, before galvanizing, identify the product with the steel heat number (or with some number that is traceable to the heat number) and his own unique identification code. The identification method shall be such that identification shall be on only one face of the section, be repeated at intervals no greater than four feet, and not extend into the curved surface of the tubing at the corners.

FLASHING: Shall include all nylon reinforced neoprene sheet, stainless steel fasteners, adhesives and incidentals necessary for a complete installation which conducts drainage to the area below the structural steel or into drain troughs. The material shall be 3/32 inch thick general purpose, heavy duty elastomeric sheet nylon reinforced neoprene sheet (NRNS) of nylon fabric encased in a neoprene polymer. The material shall be "Fairprene" number NN-0003 as manufactured by the Dupont Company, Fabrics and Finishes Department, Specialty Products Division, Wilmington, Delaware, "Wingprene Style N" as manufactured by the Goodyear Tire & Rubber Company, or approved equal.

The one ply material shall conform to ASTM D751 and the following:

Thickness	-0.093 inch ± 0.01 inch
Minimum breaking strength grab	-700 x 700 lb.
Minimum adhesion	-1" strip, 2" min. - 9 lbs.
Minimum mullins bursting strength	-1,400 psi
Heat aging after 70 hours, 180° bend with cracking	-212°F
Low temperature brittleness	-ASTM D2136
Pass flex test after 5 hours at	-minus 40°

Adhesives for splices and bonding shall be Fairprene Neoprene Adhesive NZ-5140 as manufactured by the Dupont Company, Chemlok 220/205 as manufactured by Hughson Chemicals, Lord Corporation, Erie, Pennsylvania, or approved equal. The adhesive shall be used in accordance with the manufacturer's recommendations. All surfaces where adhesive is to be placed shall be thoroughly cleaned of all rust, dirt, water, and other foreign materials before adhesive is applied. Steel surfaces shall be sandblasted. All splices shall be lapped as detailed on the plans. Pressure shall be applied to jointed pieces until adhesive sets.

Fabrication, handling, splicing and installation of the NRNS shall be in strict accordance with manufacturer's recommendations.

Stainless steel for fasteners and washers shall be AISI Type 304.

The NRNS material, adhesive, fasteners, fabrication and installation shall be included for payment as flashing, per lineal foot of joint or drain, with the applicable Item 518 - Flashing, expansion joint, deflection joint, or roadway drain.

DRAIN TROUGH: Shall include all materials necessary to collect and conduct the drainage including supports, fittings, new drain trough, reused drain trough and incidentals. New material shall be A36 steel.

PATCHING CONCRETE STRUCTURES: Existing deteriorated concrete shall be repaired at the abutment seats shown on the plans and where directed by the Engineer. The piers are not intended to be included in the area to be patched.

The Engineer shall sound the abutments and outline the areas to be removed. Where the bond between the concrete and reinforcing bar has been destroyed or where more than one-half of the periphery of such a bar has been exposed, the adjacent concrete shall be removed to a depth that will provide a minimum one and one half (1-1/2) inch clearance around the bar except where other reinforcing bars make this impracticable. After completion of the secondary removal operation, the Engineer will resound the areas to insure that only solid concrete remains. Concrete may be removed by chipping or hand dressing. Chipping hammers shall not be heavier than the nominal 35 pound class. Where existing reinforcing bars would be less than one inch from the proposed finished surface of concrete, they shall, if practical, be driven back into recesses cut in the masonry to obtain that coverage unless otherwise approved by the Engineer.

The perimeter of the patch areas shall be saw cut to a minimum one inch depth, or to the reinforcing steel if less than one inch.

Cleaning shall precede application of the patching material by not more than 24 hours. The surface to be patched and the exposed reinforcing steel shall be thoroughly cleaned by sandblasting to Grade SA-1, followed by an air blast. It may be necessary to use hand tools to remove scale from the reinforcing steel. Surfaces shall be made free of spall, laitance and all traces of foreign material. If necessary, detergent cleaning shall precede blast cleaning to insure the removal of contaminants detrimental to achieving an adequate bond. All unchipped surfaces that will receive new concrete shall be mechanically roughened.

Deteriorated reinforcing steel with greater than 20% loss of section and an exposed length greater than 30 diameters shall have a new reinforcing steel bar of comparable size added for the full exposed length. An allowance of 200 pounds of steel has been included with Item 509 for this purpose.

Forms shall be erected flush with the faces of repair areas to insure that the concrete does not escape from the patch area.

The coarse aggregate for the patching material shall be the largest practical and allowable size for the thickness of the patch.

Welded steel wire fabric reinforcement shall be required for all patches including top horizontal surfaces. The reinforcement shall be secured in place by 3/8" diameter adhesive anchors at maximum 12" centers in both directions as well as tied to exposed reinforcing steel. Adhesive anchors shall be embedded at least 3 1/2" in existing concrete.

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RICHLAND ENGINEERING LIMITED
MANSFIELD, OHIO

GENERAL NOTES
SUPERSTRUCTURE

BRIDGE NO. LOR-611-0358
OVER BLACK RIVER

LORAIN COUNTY S.R. 611

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
DAP	KH	KH	RDN	DHT	9/6/88	

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CORROSION MONITORING SYSTEM: This work shall consist of furnishing and installing three corrosometers located within the bridge deck, three junction boxes attached to the underside of the deck, one junction box attached to a floorbeam, conduit, and incidentals necessary to complete the installation. The corrosometers shall be Matcor Corrosometer PR-CPBD-13 to be compatible with ODOT's present metering equipment. The junction boxes accessible from catwalks shall be cast iron, 10" x 6" x 4", Nema type 3R with hinged cover and mounting lugs. The junction box on the underside of the deck at the abutment shall be cast iron, 10"x6"x4", Nema type 3R with screwed cover and mounting lugs. The junction box on the floorbeam stiffener at the abutment shall be cast iron, 6"x4"x4", Nema type 3R with hinged cover and mounting lugs. Furnish working drawings per General Note Sheet 3 of 81. The cost of all materials, labor and equipment necessary to complete this work shall be included in the lump sum price bid for Item Special-Corrosion monitoring system.

POST-TENSIONING RODS shall be ASTM A722-Type II, deformed, Uncoated High-Strength Steel Bar for Prestressing Concrete. The rods shall be complete with anchorage plates and nuts. Initial loads for each of the rods shall be as shown on plan details. The ultimate tensile strength of the rods shall be 150,000 psi with a minimum yield strength of 120,000 psi. The 1 3/8" diameter rods shall have a minimum effective area of 1.58 sq. inch, and the 1" diameter rods shall have a minimum effective area of 0.85 sq. inch. The floorbeam rods approach a unit stress of 66,000 p.s.i. under full dead and live load. The truss rods have a maximum unit stress of 44,000 p.s.i. under dead and live load combinations.

The post-tensioning rod material is designated "CVN", and is required to meet notch toughness requirements. The material shall have a minimum longitudinal Charpy V-notch (CVN) energy absorption value of 4 ft. lb. @ 40 degrees F. Sampling and testing procedures shall be in accordance with ASTM A673. The (P) frequency of piece testing shall be used, and the test data shall be provided as required by 501.07.

A minimum of 10% of the post-tensioning rod, anchorage plate and nut assemblies shall be tested in the field by the Contractor prior to their installation in the final structure. The assemblies shall be short-term loaded to 150% of the design unit stress of 66,000 psi (156,000 lb. for 1 3/8" diameter rod and 84,000 lb. for 1" diameter rod.) per each rod. The assembly shall fully recover all initial dimensions with no permanent deformation. The test assembly, load and dimensional measuring devices shall be furnished by the Contractor subject to the approval of the Engineer. All tests shall be performed and recorded by the Contractor only with the presence of the Engineer.

After placing the rods on the structure the rods shall be tensioned to the designated initial loads by calibrated hydraulic jacks. The pressure gage calibration records shall be furnished to the Engineer. The jacks shall be recalibrated when requested by the Engineer. The tensioning device shall allow for tightening the nuts to hold the level of tension in the rods. The elongation of the rod shall be measured and recorded for each location by the Contractor.

The rods may be tensioned individually or as a group. Individually tensioned rods shall be alternately tensioned in at least 2 successive cycles to assure equal and full initial load in each rod in a group.

The post-tensioning rod clamps shall not be tightened until after the rods are fully loaded. Make sure that the clamps are loose and not binding during the tensioning process.

Working Drawings per the General Note Sheet 3 of 81 shall be furnished for the materials, installation apparatus and test assembly.

The post-tensioning rods and hardware shall be shop painted with inorganic zinc per the "Shop Painting New Structural Steel" Note Sheet 5 of 81.

The cost of all labor, materials, and equipment necessary for the installation of the rods including all hardware, testing, working drawings and shop painting, shall be included for payment in the unit price bid, per pound, for Item Special-Post-tensioning rod.

SUBSTRUCTURE DRAIN HOLE SCREENING: There are existing drain holes in the pier legs and south abutment of the bridge. Some of the drain holes are closed and some are open. The closed drain holes are to be opened and all of the drain holes are to be covered with screening.

The wood and/or masonry plugs are to be completely removed from the drain holes. Trapped water may escape from the drain holes. The water in the voids in the piers is not to be pumped.

New screens are to be installed to completely cover the drain holes to keep out birds and rodents. The screen material shall be flattened expanded metal, 1/2" No. 16, stainless steel type 304. The strand shall have a minimum thickness of 0.050". The screen material shall have a minimum weight of 0.86 pounds per square foot. The screen material shall be as manufactured by McNichols Co., Tampa, Florida; Ametco, Willoughby, Ohio; or an approved equal. The screen material shall be bond sheared so that there are no sharp protruding edges.

The screens shall be secured to the concrete substructure face with a minimum of 4 anchors per screen. The anchors shall be 1/4" diameter, 1 3/4" minimum length, expansion type anchors installed per manufacturers instructions with a minimum embedment depth of 1". The anchors shall have a threaded end, washer and nut, all of type 304 stainless steel. The anchors shall be as manufactured by Hilti Fastening Systems, Ramset Fastening Systems, or approved equal.

Payment for all labor, materials, and equipment required for screening the drain holes including removals, screening and anchors shall be included in the unit price bid, per each, for Item Special-Substructure drain hole screening.

EPOXY SEALING OF CONCRETE SURFACES: All exposed existing and new concrete surfaces of the abutment seats, abutment backwalls, abutment, breastwalls, and pier seats, shall be sealed with an epoxy sealer per Proposal Note No. 110-84. Abutment wingwalls, retaining wall, pier leg vertical surfaces, and pier webs are not to be sealed.

SIDEWALK JOINT SEALING, POURED POLYURETHANE WITH FOAM BACKUP shall consist of sealing the sidewalk joints at truss members with bitumen impregnated foam and poured polyurethane joint sealer in accordance with these specifications, in reasonably close conformity with the plans, and manufacturer's specifications and recommendations, or as directed by the Engineer.

The bitumen impregnated foam material shall be a precompressed self-adhesive joint sealant such as Emseal PSCA, Permaband 8100 or an approved equal. Emseal U.S.A., Inc. is located at 344 Mill Road in Stamford, CT 06903; Telephone (203) 322-3828. Permaband is available from Permaquik (Canada) Ltd. which is located at 3043 Universal Drive in Mississauga, Ontario L4X2E2; Telephone (416) 625-9444.

The poured polyurethane material is a two-part, cold applied chemically curing, self leveling elastomeric, polyurethane joint sealant. It shall be "FX-551" as manufactured by Fox Industries Incorporated; "Urexpan NR-200" as manufactured by Pecora Corporation; or an approved equal.

All materials shall be stored and incorporated in the work as recommended by the manufacturer. A manufacturer's representative for each product shall be present at the job site until such time as he and the Engineer are sure that the Contractor is qualified in all aspects of joint sealing.

The joint faces to which the seal must adhere shall be clean and free of foreign material such as dirt, dust, grease, form oil, release agents and any other material detrimental to adhesion of the sealant.

Joint seal shall be installed only when the joint is dry and its temperature is above 50°F. The foam seal shall be removed from the packaging and its narrow edge inserted into the joint opening. The face with the self-adhesive backing shall be pressed against one side of the joint so that foam is held in place while it recovers.

At temperatures above 70°F, the material will recover in a few hours. At temperatures below 70° the recovery shall be accelerated by heating the material with an open flame, gas burner, infra-red lamp or hot-air blower.

A continuous length of joint seal shall be achieved by joining individual strips only by means of scarfed joints cut at 45° or less relative to the sides of the joint. The scarfed ends must be pushed well past one another. The seal shall not be pulled or stretched so that gaps between successive lengths are prevented.

Polyurethane joint seal shall be poured over the full length of the bitumen impregnated foam seal previously installed in the open joint and shall be applied only when the joint is dry and its temperature is above 50°F. The poured joint sealer shall act as a second seal on top of the bitumen impregnated foam joint seal. The installed and cured material shall be full depth and shall be bonded to the sides of the joint. Any unbonded section shall be removed and replaced at the Contractor's expense. Dams as required to contain the poured sealer shall be incidental to this item of work.

The method of measurement for this item shall be the linear feet of joint seal on the bridge sidewalk that are complete, in place and accepted.

The accepted quantities of sealed sidewalk joint shall be paid for at the contract unit price per linear foot, which price and payment shall be full compensation for preparing the surfaces, furnishing and placing all materials, supplying the manufacturer's representatives and all other material, labor and equipment necessary to complete the joint seal according to specifications. Payment will be made under Item Special - Sidewalk joint sealing, poured polyurethane with foam backup.

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RICHLAND ENGINEERING LIMITED
MANSFIELD, OHIO

GENERAL NOTES
SUPERSTRUCTURE

BRIDGE NO. LOR-611-0358
OVER BLACK RIVER

LORAIN COUNTY SR 611

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
DAP	KH	KH	RON	DHT	9/6/88	10/3/88

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RELOCATING SPANS AND BEARINGS: Previous inspections, measurements and studies of Bridge LOR-611-0358 have identified movement of the substructure from its original position. A construction project in 1982 relocated span No. 1, pier No. 1 fixed bearings, and rear abutment expansion bearings. A separate construction project to stabilize piers No. 1 and 2 is to be completed prior to performing this work.

The work includes repositioning fixed and expansion bearings longitudinally and laterally to properly align the superstructure joints. Repositioning the fixed bearings in any direction and the expansion bearings laterally requires moving the connected superstructure span.

The estimated dimensions for relocating the bearings as detailed in the plans sheet 53 and 54 of 81 are:

	Longitudinal	Lateral
Pier No. 1 fixed bearing	0.10' South	0.31' East
Pier No. 2 expansion bearing	0.50' South*	0.37' East
Pier No. 5 expansion bearing	0.18' North*	0' East
Forward abutment expansion bearing	0.22' North*	0' East

* Lower shoe only.

The actual dimensions for relocating bearings shall be as directed by the District Bridge Engineer based on the latest available studies and measurements.

See "Sequence of Construction" General Note sheet 3 of 81 for limitations on relocation work.

The Contractor shall be responsible for the design and installation of an adequate support and jacking system capable of raising and moving the spans and bearings as indicated. The Contractor shall be responsible for properly arranging all temporary supports so as not to damage or induce overstress in any existing bridge members. A sufficient number of jacks of adequate capacity shall be used to offset the dead load reaction of the structure for vertical lift, and offset frictional forces and binding which resist longitudinal or lateral movements. The estimated existing dead load reactions at the substructure units are as follows:

	West Bearing	East Bearing
Pier No. 1	519 tons	453 tons
Pier No. 2	463 tons	402 tons
Pier No. 5	461 tons	400 tons
Forward Abutment	139 tons	120 tons

The Contractor shall furnish jacks with a total minimum capacity of 150% of the estimated existing dead load. The structure shall not be raised more than 4 inches to remove and/or relocate the bearing.

Temporary jacks, blocking, and roller devices or low friction sliders shall be used for support on top of the substructure units. The existing structure members may be reinforced with material added only with the approval of the Engineer. The members at pier No. 1 were built-up for the 1982 relocation project.

The Contractor shall submit details of the proposed temporary support system and methods and procedures for moving the spans and bearings to the Engineer for approval prior to beginning work. The submittal shall indicate materials, member sizes, spacings, jack point locations, jacking loads, method of horizontal movement, and installation and removal procedures. Detailed plans of the temporary support shall be prepared by a Registered Professional Engineer and shall bear his signature and number of professional engineering seal. The Contractor shall submit three (3) copies of the plans and two (2) copies of the design calculations to the Director, at last fifteen (15) days prior to beginning work and receive approval before starting. Attachments made by welding to any structural member shall be approved by the Director before such attachments are made. Details of the attachments shall be submitted as part of the support plans, or independently by a similar submission. Approval of the plans shall not relieve the Contractor of responsibility for the behavior of the supports or the work necessary to move the spans and bearings.

Prior to relocating span No. 1 it may be necessary to "free-up" the expansion joint at panel No. 12 by cutting, cleaning or lubricating parts in contact.

Expansion rockers and lower seats shall be completely removed and cleaned and painted per the "Field Painting of New and Existing Steel" General Note prior to placing in their final position. The Contractor may, at his option, furnish all new material in lieu of reusing existing material. If the Contractor chooses to furnish new material, it shall be of equivalent size and configuration in accordance with Items 513 and 516, at no additional cost. Existing steel castings may be replaced with weldments.

Existing bridge seats shall be prepared per 516.05 as necessary to provide a smooth and level seat for the bearings in the new positions.

After all relocation work is complete all jacks and temporary support material shall be removed.

Payment for all labor, materials, and equipment required for relocating spans and bearings, including all temporary supports, jacking, bearing removal, bearing installation, and submittals shall be included in the price bid as follows:

Item Special - Lump - Relocating Span No. 1 and Pier No. 1 fixed bearings.
Item Special - Lump - Relocating Span No. 3 and Pier No. 2 expansion bearings.
Item Special - Lump Relocating Span No. 5 and Pier No. 5 fixed bearings.
Item Special - Lump - Relocating Span No. 6 and Forward Abutment expansion bearings.

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RICHLAND ENGINEERING LIMITED
MANSFIELD, OHIO

GENERAL NOTES
SUPERSTRUCTURE
BRIDGE NO. LOR-611-0358
OVER BLACK RIVER

LORAIN COUNTY S R 611

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
DAP	KH	KH	RDN	DHT	9/6/88	

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FIELD PAINTING OF NEW AND EXISTING STEEL, SYSTEM OZEU

DESCRIPTION

This item shall consist of furnishing all necessary labor, materials, and equipment to clean and paint all new and existing steel surfaces as specified herein with the following coatings:

New steel - Inorganic Zinc Prime Coat
Existing steel (except inside truss box members)
- Organic Zinc Prime Coat
Existing steel inside truss box members
- Aluminum Epoxy Prime Coat
All steel - Epoxy Intermediate Coat
All steel - Urethane Finish Coat

AREAS TO BE COATED

All new and existing structural steel components and steel castings including stringers, floorbeams, post-tensioning rods, trusses, bracing, joints, bridge drainage items, galvanized curbs, galvanized roadway railing, bridge sidewalk railing, galvanized steel electrical conduits, conduit supports, junction boxes, and incidentals, shall be prepared and coated in accordance with these plans and notes. Welded epoxy coated concrete filled steel grid roadway deck and sidewalk shall have the bottom surface only, coated with the urethane finish coat.

The intent is to coat all the new and existing structural steel of the entire bridge LOR-611-0358 from the rear abutment at the south end station 188+90± to the forward abutment at the north end station 205+97±. The inside and outside of truss box sections are included. The sidewalk railing on the rear and forward abutment approach wingwall and retaining wall is included.

All new steel and post-tensioning rods shall be shop coated in accordance with these notes for surface preparation and prime coat, except that the prime coat material shall be inorganic zinc. New galvanized steel does not require a prime coat. Shop painting shall be included in the price bid for the applicable steel item.

The interior surfaces of truss box members shall be prepared and coated in accordance with these notes except that the abrasive blasting shall be to grade Sa 1 according to SSPC-SP7 (brush-off blast cleaning) and the prime coat shall be aluminum epoxy. The interior surfaces of box members shall be prepared and primed before exterior surfaces.

The Painting Contractor is cautioned to become familiar with other work included in these plans and coordinate his work. See "Sequence of Construction," Note Sheet 3 of 81.

Painting work shall be performed in two stages. Stage 1 painting work shall be performed after the existing deck and sidewalk is removed and before new steel grid is installed. Stage 2 painting work shall be performed after all other structure and lighting work is complete.

Stage 1 painting includes surface preparation, prime coat, intermediate coat, and finish coat on existing steel and intermediate and finish coats on new steel for roadway stringers, sidewalk stringers, diaphragms, sidewalk struts, access hatch framing, lower lateral bracing, top flange of floorbeams, top angles of sidewalk support brackets, portion of pedestrian railing to be hidden by sidewalk, and truss members from 2 feet above the deck to 2 feet below the deck. Members and connections are included. The top of the top flange of stringers is included. The top, sides, and bottom of the top flange of floorbeams is included.

Stage 2 painting includes all remaining unpainted steel surfaces and repairing damaged and inadequate Stage 1 work.

PRE-PAINTING CONFERENCE

Prior to any structure demolition work, a meeting will be held to discuss materials, construction sequence, testing, and inspection. The meeting shall be attended by the Project Engineer, District Construction Engineer, District Bridge Engineer, Central Office Construction personnel, Project Painting Inspector(s), General Contractor, Structural Steel Contractor, and Painting Contractor. This meeting will be separate from the pre-construction conference.

MATERIALS

Organic Zinc Prime Coat

This coating shall consist of a zinc dust filled, two or three component epoxy polyamide, and selected additives as required:

A. Physical Requirements	Minimum
1. Total Solids, % by weight of paint	70
2. Pigment, % by weight of total solids	83
3. Total zinc dust, % by weight of pigment	93
4. Total zinc, % by weight of total solids	77
5. Total solids, % by volume, ASTM D2697	45
6. Color, greenish gray approximating	FS-595A-34159

B. Qualitative Requirements

1. Mixing shall conform to Section 5.2, SSPC-Paint 20 using only a high shear (Jiffy) mixer.
2. Pot life at 77 degrees F and 50% R.H. - 6 hours min.
3. Storage life-Section 5.4, SSPC-Paint 20
4. Mudcracking-Section 5.7, SSPC-Paint 20

C. Material Quality Assurance*

	Variance
1. Hardener Component	
a. Nonvolatiles, % by weight	± 2
b. Weight/Gallon	± 0.2 lb.
c. Viscosity	± 5 KU or ± 5 sec., Ford Cup
2. Zinc/Resin Component	
a. Total Zinc metal	± 2.0
b. Weight/Gallon	± 0.4 lbs.
c. Viscosity	See 1 c
d. Nonvolatiles, % by Weight	± 2

*Variance within the mean of the tests of the previously submitted sample for qualification.

FIELD PAINTING OF NEW AND EXISTING STEEL CONTINUED
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RICHLAND ENGINEERING LIMITED
MANSFIELD, OHIO

GENERAL NOTES
SUPERSTRUCTURE

BRIDGE NO. LOR-611-0358
OVER BLACK RIVER

LORAIN COUNTY SR 611

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
DAP	KH	KH	RDN	DHT	9/6/88	

AS BUILT 6/91

GENERAL NOTES

FIELD PAINTING OF NEW AND EXISTING STEEL CONTINUED

Epoxy Intermediate Coat

This coating shall be a two-part product composed of a base component and a curing agent suitable for application over the epoxy-polyamide zinc rich primer.

The base component shall contain an epoxy resin together with color pigments, mineral fillers, gellant, leveling agent, and volatile solvents. The curing agent component shall contain a liquid polyamide resin and volatile solvent. The coating shall also meet the following:

A. Physical Requirements

1. Finish: Matte
2. Color: White, FS-595A-37925
3. Components: Two, mixed prior to application
4. Volume Solids: 50.0% minimum
5. Pot Life: 6 hours, minimum
6. Curing Time:
   a. Set-to-touch: 4 hours @ 77 degrees F Minimum
   b. To Recoat: 24 hours @ 77 degrees F Maximum
   c. Fully cured: 7 days @ 50 degrees F
7. Fineness of Grind, Hegman 3 minimum
8. V.O.C. maximum - 3.5 lbs./gal., as applied

B. Material Quality Assurance*

Test	Variance*
1. Weight per gallon	± 0.2 lbs.
2. Viscosity, Krebs Units	± 5
Ford Seconds	± 5
3. Total Solids, % by weight	± 2
4. Pigment, % by weight	± 2
5. Nonvolatile Vehicle, % by weight	± 2

*Variance shall be within the noted range based upon the test average of the previously submitted sample.

Urethane Finish Coat

This coating shall be a two component polyester and/or acrylic aliphatic urethane and shall be suitable for use as a finish coat over the white epoxy polyamide intermediate coat.

A. Physical Requirements

1. Finish: Specular Gloss, 60 degree: 85% Minimum; 70% Minimum after 3000 hours weathering resistance
2. Volume Solids: 42%, Minimum
3. Cure (Dry) Time at 79 degrees F and 50% RH
   To Touch: 30 Minutes, Minimum
   2 Hours, Maximum
4. Pot Life: 4 hours at 75 degrees F, Minimum
5. V.O.C. maximum - 3.5 lbs./gal., as applied
6. Colors
   a. Gray FS-595A - 16440 for all surfaces except galvanized steel curb and galvanized steel tube roadway railing faces which are to be OSHA (or Safety) yellow.

B. Material Quality Assurance*

1. Analysis (for each component)

Test	Variance*
a. Weight Per Gallon	± 0.2 lbs.
b. Viscosity, Krebs Units	± 5
Ford Seconds	± 5
c. Total Solids, by Weight	± 2%
d. Pigment, by Weight	± 2%
e. Nonvolatile Vehicle	± 2%

*Variance shall be within the noted range based upon the test average of the previously submitted sample.

Inorganic Zinc Prime Coat

This coating shall consist of a zinc-dust filled, one or two component, inorganic zinc primer compatible with the OZEU system and produced by the same manufacturer. The inorganic zinc primer shall only be used for shop coating new steel.

Color shall be similar to organic zinc primer.

Aluminum Epoxy Prime Coat

This coating shall consist of an aluminum epoxy primer suitable for existing steel interiors of truss box members that have been prepared with a brush-off blast cleaning. The aluminum epoxy primer shall be compatible with the OZEU system and produced by the same manufacturer.

Performance Requirements

The coating system which consists of the organic zinc prime coat, the epoxy intermediate coat, and the urethane topcoat shall be tested prior to use.

Three panels for each of the specified tests shall be prepared to the requirements of the ASTM D 609 except that the thickness shall be 1/8 inch minimum, the surface shall be blast cleaned to equal, as nearly as is practical, the standard Sa 2-1/2 of ASTM D 2200 (Steel Structures Painting Council SSPC-SP10 meets this requirement), and the surface shall have a nominal height of profile of 1 to 2.5 mils using appropriate replica tape. The panels shall be coated and permitted to cure in accordance with the manufacturer's printed instructions. The coating thickness in the system to be tested shall be as follows:

Organic Zinc: 3.0 - 5.0 Mils

Epoxy: 5.0 - 7.0 Mils

Urethane: 2.0 - 4.0 Mils

The coating system shall pass each of the following tests:

(A) Fresh water resistance (ASTM D 870). The panel shall be scribed as per ASTM D 1654 to the depth of the base metal in the form of an "X" having at least 2-inch legs and then immersed in fresh tap water at (75 degrees ± 5 degrees F). After 30 days of immersion, the panel shall show no rusting nor shall the coating show any blistering or softening.

(B) Salt water resistance (ASTM D 870). The panel shall be scribed as specified in "A" above and then immersed in a water solution of 5 percent sodium chloride at 75 degrees F ± 5 degrees F. The panels shall show no rust nor shall the coating exhibit any blistering or softening after 7, 14 and 30 days. The sodium chloride solution shall be replaced with a fresh solution after the examination at 7 and 14 days.

(C) Weathering resistance. The panel shall be tested in accordance with ASTM G-26 Method A, Type BH. The panel shall be placed on test at the beginning of a wet cycle. After 3000 hours continuous exposure, the coating shall show no blistering or loss of adhesion, nor shall the panel show any rusting.

(D) Salt fog resistance. The panel shall be scribed as specified in "A" above, and then tested in accordance with ASTM B 117. After 3000 hours of continuous exposure the coating shall show no loss of bond nor shall it show rusting or blistering beyond 1/16 inch from the center of the scribe mark.

(E) Elcometer adhesion test, ASTM D 4541. The panel shall be tested in accordance with the following: lightly sand the coating surface and aluminum dolly, and apply a quick set adhesive. Allow the adhesive to cure overnight. Scribe the coating and adhesive around the dolly prior to testing. Make a minimum of four trials to failure and report the average. An average of 400 psi is considered acceptable.

FIELD PAINTING OF NEW AND EXISTING STEEL CONTINUED
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RICHLAND ENGINEERING LIMITED
MANSFIELD, OHIO

GENERAL NOTES
SUPERSTRUCTURE

BRIDGE NO. LOR-611-0358
OVER BLACK RIVER

LORAIN COUNTY S.R. 611

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
DAP	KH	KH	RDN	DHT	9/6/88	

AS BUILT 6/91

GENERAL NOTES

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FIELD PAINTING OF NEW AND EXISTING STEEL CONTINUED

Prequalification

Prior to approval, the Contractor shall submit to the Director copies of the manufacturer's certified test data showing that the coating system complies with the performance requirements of this specification. The certified test data shall also state the following physical properties for each coating:

1) Weight per gallon
2) Solids, % by weight
3) Solids, % by volume
4) Viscosity
5) Drying time
6) V.O.C. content, lb. per gallon

The test data shall be developed by an independent testing laboratory approved by the Director and shall include the brand name of the paint, name of manufacturer, number of lot tested, and date of manufacture. Each coating shall be from the manufacturer's standard line of products.

The following items shall also be submitted to the Director prior to approval:

1) Manufacturer's technical data sheet for each coating.
2) Material safety data sheet for each coating.
3) Enough components to produce a one gallon sample of each coating.
4) A one quart sample of the thinner to be used with each coating.

When the coating has been approved by the Director, further performance testing by the manufacturer will not be required unless the formulation or manufacturing process has been changed, in which case new certified test results will be required.

Sampling

Acceptance variances shall be established by the State of Ohio, Central Office Testing Lab.

Two one pint samples of each lot and each coating shall be submitted to the Laboratory (and approved) prior to use.

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INTERIM PROVISIONS FOR USING SYSTEM OZEU

The above testing and prequalification requirements will be effective as of December 31, 1988. In the interim, the following coating systems will be acceptable for use:

Producer	Coats	Products
Ameron Protective	1st	Amercoat 68 A
Coatings Division	2nd	Amercoat 383 HS
201 North Berry St.	3rd	Amercoat 450 GL
Brea, CA 92621 Inorganic zinc prime		Dimecote 9
Aluminum epoxy prime		Amerlok 400AL
Carboline	1st	Carboline 658
320 Hanley Industrial Ct.	2nd	Carboline 190 HB
St. Louis, MO 63144	3rd	Carboline 134
Inorganic zinc prime		#
Aluminum epoxy prime		#
Porter Paint Company	1st	Zinc Lock 308
400 South 13 Street	2nd	MCR 43
Louisville, KY 40201	3rd	Hythane
Inorganic zinc prime		351
Aluminum epoxy prime		7900 Magmamastic
Tnemec Company	1st	90-94 Theme-Zinc
P.O. Box 1749	2nd	Series 66 Epoxoline
Kansas City, MO 64141	3rd	Series 72 Endura Shield II
Inorganic zinc prime		90E-75 Theme-Zinc
Aluminum epoxy prime		Series 135 Chem-Build
Valspar Corporation	1st	MZ-4
901 N. Greenwood Ave.	2nd	Val-Chem 89 Epoxy
Kankakee, IL 60901	3rd	40 Series Urethane
Inorganic zinc prime		#
Aluminum epoxy prime		#
Devoe-Napko	1st	Zinc Prime 115
P.O. Box 7600	2nd	547 Chemfast Epoxy
Louisville, KY 40207	3rd	369 Prufthane
Inorganic zinc prime		#
Aluminum epoxy prime		#
Glidden Coatings & Resins	1st	Glid-Zinc Organic Coating
16451 Sprague Road	2nd	5431/5434 Hi Solids Epoxy
Strongsville, OH 44136	3rd	Glid-Thane II
Inorganic zinc prime		Glid-Guard Glid-Zinc 5536/5537
Aluminum epoxy prime		Glid-Guard Metallite Hi-Build Epoxy 5475/5476
Sherwin Williams Company	1st	Zinc Clad 7
Cleveland District Office	2nd	Tile Clad II Enamel
761 Beta Drive	3rd	Hi-Bild Alphatic Polyurethane Enamel
Mayfield Village, OH 44143 Inorganic zinc prime		Zinclad 1 (or 2)
Aluminum epoxy prime		Epoxy Mastic
P.P.G. Industries	1st	Aquapon Zinc Rich
9933 Lawler Avenue	2nd	Aquapon 97-3
Suite 260	3rd	Pitthane
Skokie, IL 60077 Inorganic zinc prime		#
Aluminum epoxy prime		#

As approved by the Director.

This interim list shall in no way be construed to mean these coating systems will be approved for use after December 31, 1988.

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QUALITY CONTROL

Contractor Quality Control Specialist

At the preconstruction meeting, the Contractor shall designate one individual on each project as a Quality Control Specialist (only one person per project will be necessary unless the Contractor is working at more than three (3) sites simultaneously). In which case, it will be necessary to provide an additional Quality Control Specialist for each additional three sites being painted simultaneously. This person shall be the same individual for the life of the project. This person will not be a member of the Contractor's production staff (ie. he will not sandblast, paint, etc.). He shall be trained and equipped with tools and equipment to provide quality control on all facets of the work and shall have a thorough understanding of the plans and specifications pertaining to this project. He shall be responsible for inspecting the equipment at the specified intervals, the abrasives, and the work, at all quality control points. He shall also be responsible for verifying that all work is done within the specified work limitations. He shall cooperate with the Inspector and compare and document quality control readings. he shall have the authority to stop work and the responsibility to inform the Contractor's foreman of nonconforming work.

This person does not in any way relieve the Inspector of his responsibilities to control, inspect, and document the work in compliance with the specifications.

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MANSFIELD, OHIO

GENERAL NOTES
SUPERSTRUCTURE

BRIDGE NO. LOR-611-0358
OVER BLACK RIVER

LORAIN COUNTY S.R. 611

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
DAP	KH	KH	RON	DHT	9/6/88	

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FIELD PAINTING OF NEW AND EXISTING STEEL CONTINUED

Quality Control Points

Quality control points (QCP) are points in time when one phase of the work is complete and ready for inspection by both the Contractor and the Engineer prior to continuing with the next operational step. At these points: The Contractor shall afford access to inspect all affected surfaces. If inspection indicates a deficiency, that phase of the work shall be corrected in accordance with these specifications prior to beginning the next phase of work. Discovery of defective work or material after a Quality Control Point is past or failure of the final product before final acceptance, shall not in any way prevent rejection or obligate the State of Ohio to final acceptance.

Quality Control Points (QCP)	(PURPOSE)
1.) Washing	Remove water soluble oil, grease. salt, dirt, etc.
2.) Solvent Cleaning	Remove asphaltic cement, oil, grease, salt, dirt, etc., not removed during washing
3.) Abrasive Blasting	Blasted surface to receive paint
4.) Prime Coat Application	Check surface cleanliness, apply prime coat check coating thickness
5.) Caulking	Caulk areas as required
6.) Intermediate Coat Application	Check surface cleanliness, apply intermediate coat, check coating thickness
7.) Finish Coat	Check surface cleanliness, apply finish coat, check coating thickness
8.) Final Review	Visual inspection of system for acceptance and check total system thickness.

SURFACE PREPARATION

This item shall consist of washing, solvent cleaning, and abrasive cleaning of each structure.

Washing (QCP #1)

Prior to abrasive blasting, all surfaces to be painted shall be washed with potable water having a nozzle pressure of at least 1,000 PSI and a delivery rate of not less than 4 gallons per minute. (QCP #1) The Contractor, shall provide equipment specifications to verify the above. The equipment shall also be equipped with gauges to verify the pressure. The water shall contain tri-sodium phosphate detergent at a rate specified by the manufacturer, to remove water soluble oil, grease, salt and dirt. Before the surfaces dry, the bridge shall be rinsed to remove all remaining detergent. The nozzle shall be held at a maximum of twelve (12) inches from the surface being washed or rinsed. After the surface is rinsed and allowed to dry, it shall be checked for remaining visible dirt. Surfaces shall be rewashed and rinsed as necessary to remove all remaining dirt. The finish coat shall be applied within three (3) months of washing the structure.

All dirt, sand, bird nestings, bird droppings and debris shall be completely removed from the truss box members, scuppers, bulb angles, pier and abutment seats and all other sections of the bridge as directed by the Engineer before abrasive blasting.

Solvent Cleaning (QCP #2)

After washing, all traces of asphaltic cement, oil, grease, diesel fuel deposits, and other soluble contaminants which remain, shall be removed by solvent cleaning (QCP #2) (see SSPC-SP 1 Solvent Cleaning for recommended practices). Under no circumstances shall any abrasive blasting be done to areas with asphaltic cement, oil, grease, or diesel fuel deposits. All solvent cleaned areas shall be rewashed as previously noted.

Abrasive Blasting (QCP #3)

All steel to be painted shall be blast cleaned to grade Sa 2 1/2 according to SSPC-SP10 (near-white blast cleaning) and SSPC-VIS 1 (pictorial surface preparation standards for painting steel surfaces). Steel shall be maintained in a blast cleaned condition until it has received a prime coat of paint.

The interior surfaces of truss box members that are inaccessible to near white blast cleaning, shall be cleaned per SSPC-SP7-Brush-off blast cleaning to SSPC-VIS-1 pictorial standard (grade Sa 1 per ASTM D2200) in lieu of near white blast cleaning. The interior surfaces of box members shall be prepared and primed before exterior surfaces.

Galvanized steel (including corrugated steel bridge flooring), adjacent concrete, and other surfaces not intended to be painted, shall be masked to prevent damage from sandblasting and painting operations.

Open air, dry abrasive blasting using silica sand shall not be allowed.

Black boiler slag abrasives shall be checked for oil contamination before use. A small sample of abrasives shall be added to ordinary tap water. Any detection of a oil film on the surface of the water shall be cause for rejection. This test shall be conducted on each load of black abrasives delivered to the job site.

The surface profile shall be a minimum of one (1) mils and a maximum of two and one half (2.5) mils. Abrasives of a size suitable to develop the required surface profile shall be used. Blasting shall not proceed when the steel temperature is within five (5) degrees of the dew point. Dew point shall be defined as the temperature at which moisture condenses on the steel surfaces. All fins, tears, slivers, and burred or sharp edges that are present on any steel member after blasting shall be removed by grinding and the area reblasted. (QCP #3)

All abrasives and residue shall be removed from surfaces to be painted with a vacuum system equipped with a brush-type cleaning tool, or by double blowing. Double blowing shall consist of two completely separate passes. If the double blowing method is used, the top surfaces of all structural steel, including top and bottom flanges, longitudinal stiffeners, splice plates, hangers, etc. shall be vacuumed after the double blowing operations are completed. No painting is permitted during the blowing operations and no blowing is permitted around freshly painted areas which have not dried. The steel shall then be kept dust free and primed within eight (8) hours after blast cleaning. If the steel is not primed within eight (8) hours, the steel shall be reblasted. No dust or abrasives from adjacent work shall be left on the finish coat.

The Contractor shall perform the following test (and the Inspector will verify) to insure that the air is not contaminated: blow air from the nozzle for thirty (30) seconds onto a white cloth or blotter held in a rigid frame. If any oil or other contaminants are present on the cloth or blotter, abrasive blasting shall be suspended until the problem is corrected and verified by another test. This test shall be done at the start of each shift and at four (4) hour intervals.

The Contractor shall remove all blasting residues from the roadway, pedestrian walkways, gutters and other drainage facilities at the end of each day's work. Care shall be taken to keep all blasting residues out of drains or catch basins. Nearby drains and catch basins shall be covered during blasting operations. Blasting residue shall not be permitted on surfaces which are being used by vehicles or pedestrians. The blasting residues shall be disposed of outside the highway right of way.

The Material Safety Data Sheet (MSDS) shall be provided at the preconstruction meeting for all abrasives to be used on this project. No work shall start until the MSDS has been submitted.

FIELD PAINTING OF NEW AND EXISTING STEEL CONTINUED
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RICHLAND ENGINEERING LIMITED
MANSFIELD, OHIO

GENERAL NOTES
SUPERSTRUCTURE

BRIDGE NO. LOR-611-0358
OVER BLACK RIVER

LORAIN COUNTY S.R.611

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
DAP	KH	KH	RDN	DHT	9/6/88	

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GENERAL NOTES

FIELD PAINTING OF NEW AND EXISTING STEEL CONTINUED

Job Site Visual Standards

Job site visual standards include preparation of test section, subsequent test section, and photographs of approved test section. Job site visual standards shall be used in addition to the SSPC-VIS-1 standard for blasting. Before any abrasive blasting is started, the Contractor will prepare a test section on the first bridge to be painted. The test section will be a representative area to be blast cleaned. (Approximately 20-30 sq. ft.) The test section area shall be photographed after the Engineer and the Contractor agree that the area has been blast cleaned according to plan requirements. Only after a test section area has been approved and documented by photographs, may the Contractor proceed with his blast cleaning operations. The job site visual standards (photographs) shall be used in addition to plan specifications to determine acceptance of blast cleaning procedures. If, in the opinion of the Contractor or Engineer, a subsequent bridge is not indicative of the bridge on which the test section was performed, he may request another test section.

TESTING EQUIPMENT

The Contractor shall provide the Engineer the following testing equipment in good working order, for the duration of the project. When the Contractor's people are working at different locations simultaneously, additional test equipment shall be provided for each crew for the type of work being performed. When no test equipment is available, no work shall be performed.

1. A camera with the following features and 5 (unless otherwise specified on plans) rolls of color film.

   A. Uses self developing color print film
   B. Lens with auto focus system
   C. Focuses from two (2) feet or less to infinity
   D. Built-in fill flash

2. One (1) Spring micrometer and 1 roll of coarse and 3 (unless otherwise specified on plans) rolls of extra-coarse replica tape.

3. One (1) Positector 2000 and the calibration plates as per the NBS calibration standards in accordance with ASTM D-1186.

4. One (1) Sling Psychrometer - Used to calculate relative humidity and dew point temperature.

For information about any of the above equipment (except the camera) contact:

Defelsko Corporation
410G Cedar Street
Ogdensburg, NY 13669
Telephone: 1-800-448-3835

Zormco Corporation
P.O. Box 25444
Cleveland, OH 44125-0444
Telephone: 216-441-6100

KTA-Tator Inc.
115 Technology Drive
Pittsburgh, PA 15275
Telephone: 412-788-1300

HANDLING

All paint and thinner shall be delivered to the project site in original, unopened containers with labels intact. Minor damage to containers is acceptable provided the container has not been punctured.

Paint shall be stored at the temperature recommended by the manufacturer to prevent paint deterioration.

Each container of paint and thinner shall be clearly marked or labeled to show paint identification, component, color, lot number, stock number, date of manufacture, and information and warnings as may be required by Federal and State laws.

All containers of paint and thinner shall remain unopened until required for use. The label information shall be legible and shall be checked at the time of use.

Paint which has livered, gelled or otherwise deteriorated during storage shall not be used: However, thixotropic materials which can be stirred to attain normal consistency may be used.

The oldest paint of each kind shall be used first. In every case, paint is to used before its shelf life has expired.

Section 109.07 of the Construction and Material Specifications regarding payment for materials on hand, shall not apply.

The Contractor shall furnish shipping invoices for all materials used on the project to the Engineer, prior to use.

MIXING AND THINNING

All ingredients in any container of paint shall be thoroughly mixed immediately before use and shall be agitated often enough during application to maintain a uniform composition; however, the primer shall be continuously mixed. Paint shall be carefully examined after mixing for uniformity and to verify that no unmixed pigment remains on the bottom of the container. The paint shall be mixed with a high shear mixer (such as a Jiffy Mixer). Paddle mixers or paint shakers are not allowed. Paint shall not be mixed or kept in suspension by means of an air stream bubbling under the paint surface.

All paint shall be strained after mixing. Strainers shall be of a type to remove only skins and undesirable matter, but not to remove the pigment.

No thinner shall be added to the paint without the Engineer's approval, and only if necessary for proper application as recommended by the manufacturer. When the use of thinner is permissible, thinner shall be added slowly to the paint during the mixing process. All thinning shall be done under supervision of the Engineer. In no case shall more thinner be added than that recommended by the manufacturer's printed instructions. Only thinners recommended and supplied by the paint manufacturer may be added to the paint. No other additives shall be added to the paint.

Catalysts, curing agents, or hardeners which are separate packages shall be added to the base paint only after the latter has been thoroughly mixed. The proper volume of the catalyst shall then be slowly poured into the required volume of base with constant agitation. Do not pour off the liquid which has separated from the pigment and then add the catalyst to the settled pigment, to aid mixing. The mixture shall be used within the pot life specified by the manufacturer. Therefore only enough paint should be catalyzed for prompt use. Most mixed, catalyzed paints cannot be stored, and unused portions of these shall be discarded at the end of each working day.

FIELD PAINTING OF NEW AND EXISTING STEEL CONTINUED
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RICHLAND ENGINEERING LIMITED
MANSFIELD, OHIO

GENERAL NOTES
SUPERSTRUCTURE

BRIDGE NO. LOR-611-0358
OVER BLACK RIVER

LORAIN COUNTY S.R.611

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
DAP	KH	KH	RON	DHT	9/6/88	

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GENERAL NOTES

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LOR-611-03.57

FIELD PAINTING OF NEW AND EXISTING STEEL CONTINUED

COATING APPLICATION

General

All structural steel, scuppers, bulb angles, expansion joints, steel railing, exposed steel piling, drain troughs and other areas as indicated in the plans shall be painted. Galvanized surfaces shall not be painted unless otherwise noted on plans.

The following methods of application are permitted for use by this specification, as long as they are compatible with the paint being used: brush, spray, or any combination of these methods unless specified differently in the plans. Daubers or sheepskins may be used for places of difficult access when no other method is practical.

If the surface is degraded or contaminated after surface preparation and before painting, the surface shall be restored before painting application. In order to prevent degradation or contamination of cleaned surface, the prime coat of paint shall be applied within eight (8) hours after blast cleaning as required in surface preparation above.

Cleaning and painting shall be so programmed that dust or other contaminants do not fall on wet, newly-painted surfaces. Surfaces not intended to be painted shall be suitably protected from the effects of cleaning and painting operations. Overspray and pigeon droppings shall be removed with a stiff bristle brush, wire screen, or a water wash with sufficient pressure to remove overspray without damaging the paint. The overspray must be removed before applying the next coat. All abrasives and residue shall be removed from painted surfaces before recoating, with a vacuum system equipped with a brush type cleaning tool, or by double blowing. Double blowing shall consist of two completely separate passes. If the double blowing method is used, the top surfaces of all structural steel, including top and bottom flanges, longitudinal stiffeners, splice plates, hangers, etc., shall be vacuumed after the double blowing operations are completed.

No visible abrasives from adjacent work shall be left on the finish coat. Abrasives on the finish coat shall be removed.

If brush application of the coating is used, it shall produce a smooth coat. Care shall be taken to work the paint into all crevices, corners, and around all bolt and rivet heads.

Spray Application (General)

All spray application of paint shall be in accordance with the following:

Primer ingredients shall be kept uniformly mixed in the spray pot or container during application, by continuous mechanical agitation.

Spray equipment shall be kept clean so that dirt, dried paint and other foreign materials are not deposited in the paint film. Any solvent left in the equipment shall be completely removed before using.

Paint shall be applied in a uniform layer with overlapping at the edges of the spray pattern. The border of the spray pattern shall be painted first; with the painting of the interior of the spray pattern to follow, before moving to the next spray pattern area. A spray pattern area is such that the gun shall be held perpendicular to the surface and at a distance which will ensure that a wet layer of paint is deposited on the surface. The trigger of the gun should be released at the end of each stroke. All bolts and rivet heads shall be sprayed from at least two (2) directions or brushed to insure coverage.

Each spray operator shall demonstrate to the Engineer his ability to apply the paint as specified. Any operator who does not demonstrate this ability shall not spray.

If mud cracking occurs, the affected area shall be cleaned to bare metal in accordance with surface preparation above and repainted.

All gaps and crevices 1/8 inch or less shall be filled with primer. Those larger than 1/8 inch and those not filled with primer shall be caulked.

All spray equipment used shall be suitable for use with the specified paint. Paint manufacturer's equipment recommendations shall be consulted in the event of paint application problems.

If air spray is used, traps or separators shall be provided to remove oil and condensed water from the air. The traps or separators must be of adequate size and must be drained periodically during operations. The following test shall be done by the Contractor and verified by the Engineer to insure that the traps or separators are working properly. Blow air from the spray gun for thirty (30) seconds onto a white cloth or blotter held in a rigid frame. If any oil, water or other contaminants are present on the cloth or blotter: painting shall be suspended until the problem is corrected and verified by another test. This test shall be done at the start of each shift and at four (4) hour intervals. This is not required for an airless sprayer.

Application Approval

The beginning of the application of each of the three different coats shall be subject to inspection and approval. The purpose of this inspection is to detect any defects which might result from the Contractor's method of application. If any defects are discovered, the Contractor shall make all necessary adjustments to his method of application to eliminate these defects before proceeding with application.

Temperature

Paint shall not be applied when the temperature of the air, steel, or paint is below 50 degrees F. Paint shall not be applied when the steel surface temperature is expected to drop below 50 degrees F before the paint has dried.

Moisture

Paint shall not be applied during rain, fog or mist, or when the steel surface temperature is less than 5 degrees F above the dew point. Paint shall not be applied to wet or damp surfaces or on frosted or ice-coated surfaces. Paint shall not be applied when the relative humidity is greater than 85%.

Damage

Damaged areas of paint shall be removed, the surface again prepared to the original specifications with appropriate equipment and repainted with the same number of coats of paint of the same kind as the undamaged areas.

Continuity

Each coat of paint shall be applied as a continuous film of uniform thickness free of all defects such as holidays, runs, sags, etc.. All thin spots or areas missed shall be repainted and permitted to dry before the next coat of paint is applied.

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RICHLAND ENGINEERING LIMITED
MANSFIELD, OHIO

GENERAL NOTES
SUPERSTRUCTURE

BRIDGE NO. LOR-611-0358
OVER BLACK RIVER

LORAIN COUNTY S.R. 611

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
DAP	KH	KH	RDN	DHT	9/6/88	

AS BUILT 6/91

GENERAL NOTES

FHWA REGION	STATE	PROJECT	
5	OHIO		

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LORAIN COUNTY
LOR-611-03.57

FIELD PAINTING OF NEW AND EXISTING STEEL CONTINUED

Dry Film Thickness

Each coat of paint shall have the following mil thickness measured above the peaks:

Organic Zinc Prime Coat	- 3.0 - 5.0 Mils
Inorganic Zinc Prime Coat	- 3.0 - 5.0 Mils
Aluminum Epoxy Prime Coat	- 3.0 - 5.0 Mils
Epoxy Intermediate Coat	- 5.0 - 7.0 Mils
Urethane Finish Coat	- 2.0 - 4.0 Mils

Prime thickness, cumulative prime and intermediate thickness, and cumulative prime, intermediate and finish thickness shall be determined by use of Type 2 magnetic gage in accordance with the following:

Five (5) separate spot measurement spaced evenly over each 100 square feet of area to be measured. Three (3) gage readings shall be made for each spot measurement of either the substrate or the paint. Move the probe a distance of one to three inches for each new gage reading. Discard any unusually high or low gage reading that cannot be repeated consistently. Take the average (mean) of the three gage readings as the spot measurement. The average of five spot measurements for each such 100 square foot area shall not be less that the specified thickness. No single spot measurement in any 100 square foot area shall be less than 80% of the specified thickness. Any one of three readings which are average to produce each spot measurement, may under-run by a greater amount. The five spot measurements shall be made for each 100 square feet of area as follows:

1. For structures not exceeding 300 square feet in area, each 100 square foot area shall be measured.

2. For structures not exceeding 1,000 square feet in area, three 100 square foot areas shall be randomly selected and measured.

3. For structures exceeding 1,000 square feet in area, the first 1,000 square feet shall be measured as stated in section 2 and for each additional 1,000 square feet, or increment thereof, one 100 square foot area shall be randomly selected and measured.

4. If the dry film thickness for any 100 square foot area (sections 2 & 3 is not in compliance with the requirements of paragraph 1 of this section, then each 100 square foot area shall be measured.

5. Other size areas or number of spot measurements may be specified in the contract plans as appropriate for the size and shape of the structure to be measured.

If the final cumulative paint system thickness in any area exceeds sixteen (16) mils, the paint system in that area shall be removed and re-applied.

Prime, Intermediate And Finish Coat Application
(QCP #4, #6 & #7)

Each coat of paint shall be in a proper state of cure or dryness before the application of the succeeding coat. Paint shall be considered ready for recoating when an additional coat can be applied without the development of any detrimental film irregularities, such as lifting, wrinkling or loss of adhesion of the undercoat. The time interval between coating applications shall be in compliance with manufacture's written instructions and in no case more than ten (10) days between the prime and intermediate coats and five (5) days between the intermediate and finish coats. Any coat which has dried more than the above allotted time without recoating shall be removed and the steel reblasted to Sa 2 1/2. These requirements shall be waived for covering the prime coat on new steel.

The completion date (month and year) of the finish coat shall be stenciled in a contrasting color on each bridge at a location directed by the Engineer. The letters "OZEU" shall precede the date painted.

CAULKING QCP #5

After prime coat application, all open joints 1/8 inch wide and greater, areas indicated on the plans, and locations directed by the Engineer, shall be caulked using a two component, 100% solids epoxy mastic.

The material shall be one of the following:

MANUFACTURER

Mark 198
Poly-Carb
33095 Bainbridge Road
Solon, OH 44139
216-248-1223

A-788 Splash Zone Compound
Koppers Company, Inc.
Midwestern District
Sales Office
188 Industrial Drive
Elmhurst, IL 60126
312-530-6300

Sikadur Injection Gel
Sika Chemical Corp.
Lyndhurst, N.J. 07071
201-933-8801

SAFETY REQUIREMENTS AND PRECAUTIONS

The Contractor is required to meet the applicable safety requirements of the Ohio Industrial Commission in addition to the scaffolding requirements specified below.

The Material Safety Data Sheets (MSDS) shall be provided at the preconstruction meeting for all paints and thinners used on this project. No work shall start until the MSDS has been submitted.

INSPECTION ACCESS

In addition to the requirement of 105.11, the contractor shall furnish, erect, and move scaffolding and other appropriate equipment, to permit the Inspector the opportunity to inspect (closely observe), all affected surfaces. This opportunity shall be provided to the Inspector during all phases of the work and continue for a period of at least ten (10) working days after each structure has been completely painted. When scaffolding is used, it shall be provided in accordance with the following requirements.

When scaffolding, or the hangers attached to the scaffolding are supported by horizontal wire ropes, or when scaffolding is placed directly under the surface to be painted, the following requirements shall be complied with:

When scaffolding is suspended forty three inches or more below the surface to be painted, two rows of guardrail shall be placed on all sides of the scaffolding. One row of guardrail shall be placed at forty two inches above the scaffolding and the other row at twenty inches above the scaffolding.

When the scaffolding is suspended at least twenty one inches, but less than forty three inches below the surface to be painted, a row of guardrail shall be placed on all sides of the scaffolding at twenty inches above the scaffolding.

Two rows of guardrail shall be placed on all sides of scaffolding not previously mentioned. The rows of guardrail shall be placed at forty two and twenty inches above scaffolding, as previously mentioned.

All scaffolding must be at least twenty four inches wide when guardrail is used and twenty eight inches wide when the scaffolding is suspended less than twenty one inches below the surface to be painted and guardrail is not used. If two or more scaffolding are laid parallel to achieve the proper width, they must be rigidly attached to each other to preclude any differential movement.

All guardrail shall be constructed as a substantial barrier which is securely fastened in place and is free from protruding objects such as nails, screws and bolts. There shall be an opening in the guardrail, properly located, to allow the Inspector access onto the scaffolding.

The rails and uprights shall be either metal or wood. If pipe railing is used, the railing shall have a nominal diameter of no less than one and one half inches. If structural steel railing is use, the rails shall be 2 X 2 X 3/8 inch steel angles or other metal shapes of equal or greater strength. If wood railing is used, the railing shall be 2 X 4 inch (nominal) stock. All uprights shall be spaced at no more than 8 feet on center. If wood uprights are used, the uprights shall be 2 X 4 inches (nominal) stock.

FIELD PAINTING OF NEW AND EXISTING STEEL CONTINUED
Sheet 19 of 81

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RICHLAND ENGINEERING LIMITED
MANSFIELD, OHIO

GENERAL NOTES
SUPERSTRUCTURE

BRIDGE NO. LOR-611-0358
OVER BLACK RIVER

LORAIN COUNTY S.R. 611

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
DAP	KH	KH	RDN	DHT	9/6/88	

AS BUILT 6/91

GENERAL NOTES

FHWA REGION	STATE	PROJECT	
5	OHIO		

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LORAIN COUNTY
LOR-611-03.57

FIELD PAINTING OF NEW AND EXISTING STEEL CONTINUED

When the surface to be inspected is more than fifteen feet above the ground or water, and the scaffolding is supported from the structure being painted, the Contractor shall provide the Inspector with a safety belt and lifeline. The lifeline shall not allow a fall greater than six feet. The Contractor shall provide a method of attaching the lifeline to the structure independent of the scaffolding, cables, or brackets supporting the scaffolding.

When scaffolding is more than two and one half feet above the ground, the Contractor shall provide a ladder for access onto the scaffolding. The ladder and any equipment used to attach the ladder to the structure shall be capable of supporting 250 pounds with a safety factor of at least four (4). All rungs, steps, cleats, or treads shall have uniform spacing and shall not exceed twelve inches on center. At least one side rail shall extend at least thirty six inches above the landing near the top of the ladder.

An additional landing shall be required when the distance from the ladder to the point where the scaffolding may be accessed, exceeds twelve inches. The landing shall be a minimum of at least twenty four inches wide and twenty four inches long. It shall also be of adequate size and shape so that the distance from the landing to the point where the scaffolding is accessed does not exceed twelve inches. The landing shall be rigid and firmly attached to the ladder; however, it shall not be supported by the ladder. The scaffolding shall be capable of supporting a minimum of one thousand pounds.

In addition to the aforementioned requirements, the Contractor is still responsible to observe and comply with all Federal, State and local laws, ordinances, regulations, orders and decrees.

The Contractor shall furnish all necessary traffic control to permit inspection during and after all phases of the project.

PROTECTION OF PERSONS AND PROPERTY

The Contractor shall collect, remove and dispose of all buckets, rags or other discarded materials and shall leave the job site in a clean condition.

The Contractor shall protect all portions of the structure which are not to be painted, against damage or disfigurement by splashes, spatters, and smirches of paint.

The Contractor shall install and maintain suitable shields to prevent damage to adjacent buildings, parked cars, trucks, boats, or vehicles traveling on, over, or under structures being painted. They shall be suitably anchored and reinforced to prevent interfering with normal traffic operations in the open lanes. Payment for the shields shall be included as incidental to the applicable field coating operation. Work shall be suspended when damage to adjacent buildings, motor vehicles, boats, or other property is occurring.

When or where any direct or indirect damage or injury is done to public or private property, the Contractor shall restore, at his own expense, such property, to a condition similar or equal to that existing before such damage or injury was done.

POLLUTION CONTROL

The Contractor shall take all necessary precautions to comply with pollution control laws, rules or regulations of Federal, State or local agencies.

WORK LIMITATIONS

All field work shall be done between April 15 and October 15. Further work limitations shall be as designated in the plans.

METHOD OF MEASUREMENT

Field painting of structural steel is based on lump sum item. The organic zinc prime coat and the aluminum epoxy prime coat is included with "Field Painting of Existing Steel, Prime Coat, System OZEU" for payment. The inorganic zinc shop prime coat is included with the price bid for the applicable steel item.

BASIS OF PAYMENT

Payment for field painting will be made at the contract prices for:

Item	Unit	Description
Special	Lump Sum	Field Painting of Existing Steel, Surface Preparation, System OZEU
Special	Lump Sum	Field Painting of Existing Steel, Prime Coat, System OZEU
Special	Lump Sum	Field Painting of New and Existing Steel, Intermediate Coat, System OZEU
Special	Lump Sum	Field Painting of New and Existing Steel, Finish Coat, System OZEU
Special	Linear Foot	Caulking

19/81

RICHLAND ENGINEERING LIMITED
MANSFIELD, OHIO

GENERAL NOTES
SUPERSTRUCTURE

BRIDGE NO. LOR-611-0358
OVER BLACK RIVER

LORAIN COUNTY S.R.611

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
DAP	KH	KH	RDN	DHT	9/6/88	

AS BUILT 6/91

FHWA REGION	STATE	PROJECT	
5	OHIO		

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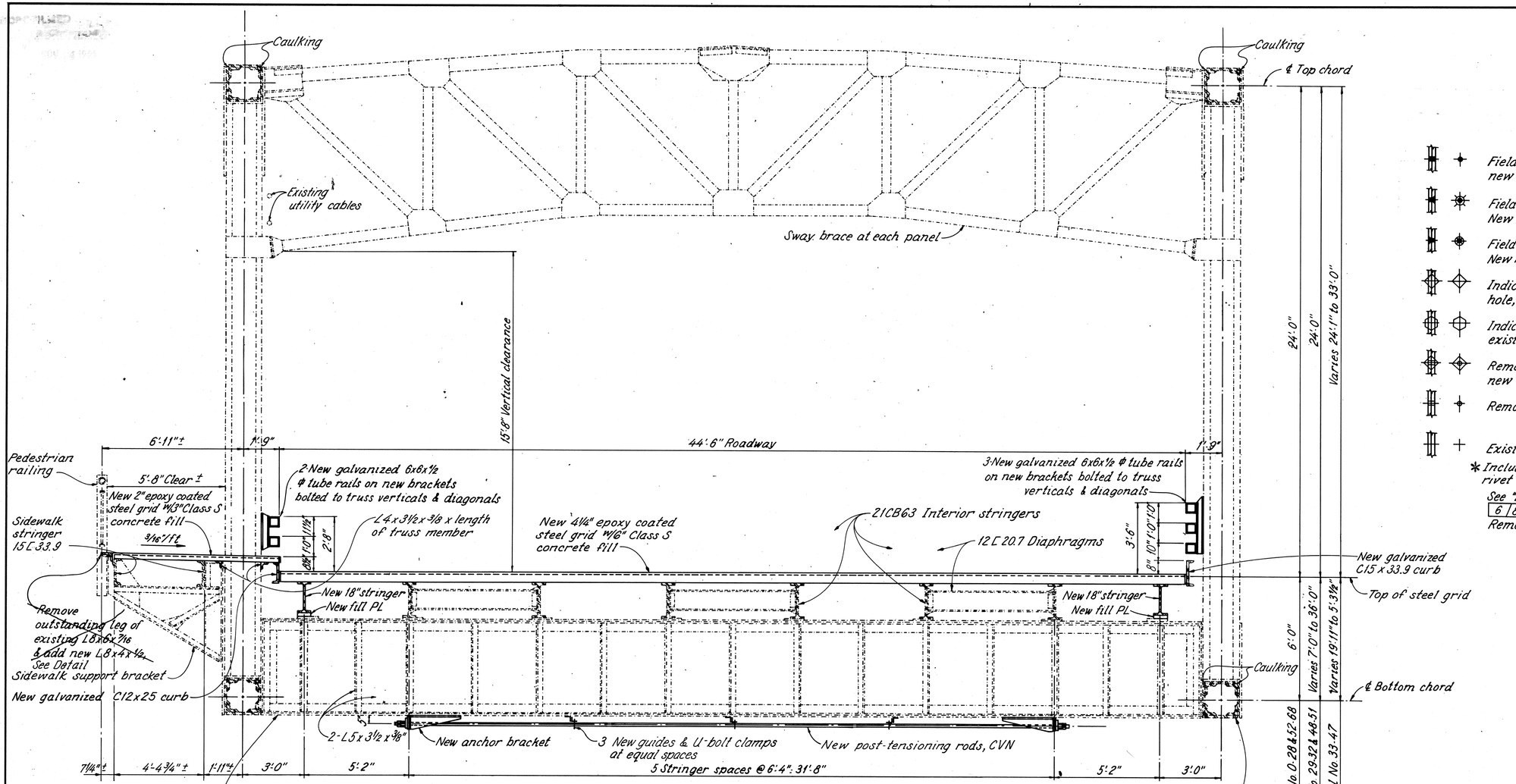
LORAIN COUNTY
LOR-611-3.57

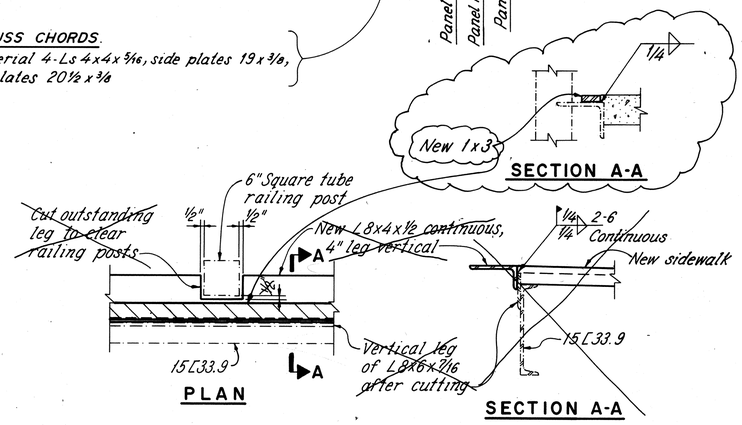


PROPOSED TRANSVERSE SECTION

FLOORBEAM MATERIAL PANEL No. 0-35 & 45-68.
Web PL 54 x 1/2 (52 x 1/2 @ Panel No. 35 & 53 x 1/2 @ Panel No. 45)
Flange 4-Ls 6x6x3/8 (Ls 6x6x3/4 @ Panel No. 35 & 45)
Top & bottom cover plates 14 x 3/4

FLOORBEAM MATERIAL PANEL No. 36-44.
Web PL 45 x 1/2
Flange 4-Ls 6x6x3/4
Top & bottom cover plates 14 x 1

BOTTOM & TOP TRUSS CHORDS.
Minimum material 4-Ls 4x4x5/16, side plates 19 x 3/8, top & bottom plates 20 1/2 x 3/4



SIDEWALK - RAILING CLOSURE ANGLE DETAIL

BOLT LEGEND

- Field bolt, nut and full head. New material to new material.
- Field bolt, nut and countersunk head near side. New material to new material.
- Field bolt, nut and countersunk head far side. New material to new material.
- Indicates new material to existing rivet or bolt hole, when added to field bolt symbol above.
- Indicates new material to field drilled new or existing steel, when added to field bolt symbol above.
- Remove existing rivet, or bolt where noted, for new bolted connection. *
- Remove existing rivet. *
- Existing rivet to remain.

* Included for payment with Item 202 - Remove existing rivet or bolt.

See "Bolted Connection to Existing Steel" note sheet 6/81 and "Existing Rivet and Structural Steel Removal" note sheet 4/81 for hole preparation.

NOTES

MATERIALS shown are existing unless otherwise noted.

STEEL GRID DETAILS: See sheets 56/81 and 57/81.

RAILING DETAILS: See sheets 70/81 thru 72/81.

CURB DETAILS: See sheet 64/81 & 65/81

FRAMING PLANS: See sheets 25/81 and 26/81.

CVN: See note sheet 10/81.

CAULKING: See Details sheet 49/81.

LEGEND

New material
Existing material

20/81

RICHLAND ENGINEERING LIMITED
MANSFIELD, OHIO

TRANSVERSE SECTION
SUPERSTRUCTURE
BRIDGE NO. LOR-611-0358
OVER BLACK RIVER

LORAIN COUNTY S.R. 611

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
RDN	RDN	ULS	DAP	DHT	9/6/88	10/3/88

AS BUILT 6/91

FHWA REGION	STATE	PROJECT	
5	OHIO		

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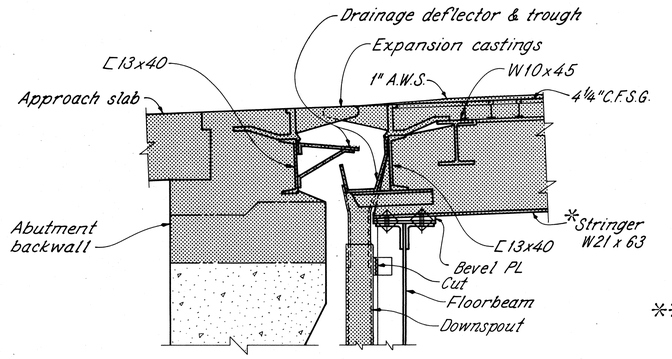
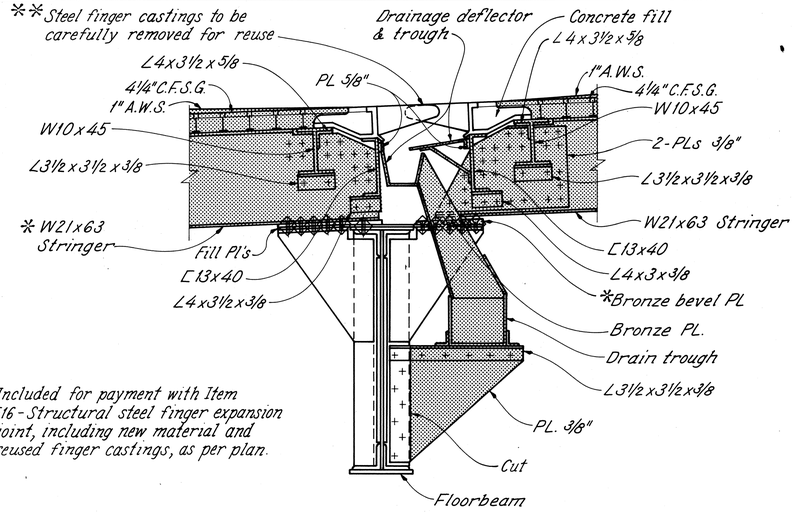
LORAIN COUNTY
LOR-611-3.57

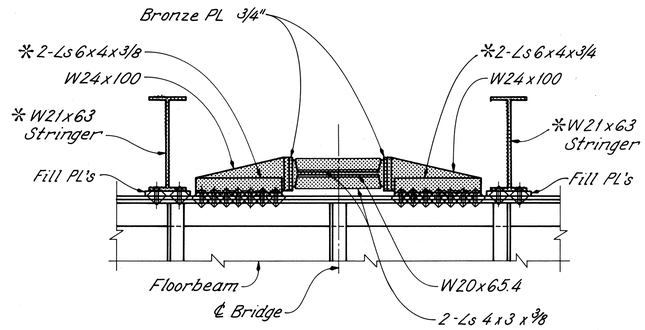


SECTION THRU ROADWAY
REAR ABUTMENT SHOWN, FORWARD ABUTMENT SIMILAR

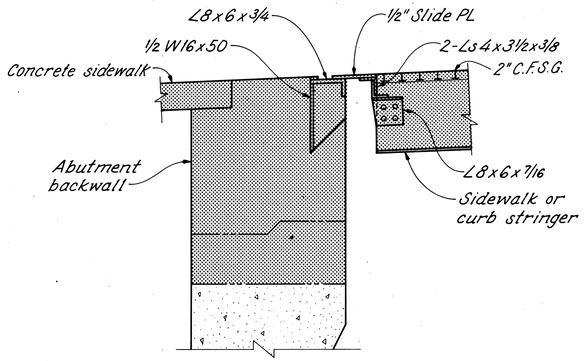


** Included for payment with Item 516 - Structural steel finger expansion joint, including new material and reused finger castings, as per plan.

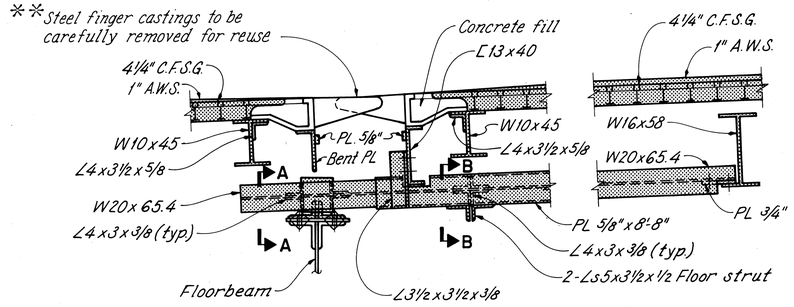
SECTION THRU ROADWAY



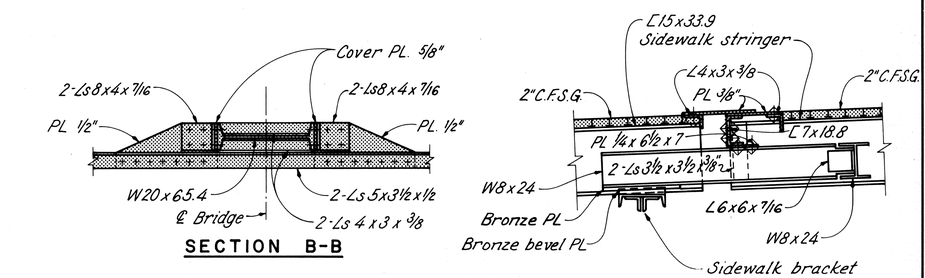
SECTION A-A



SECTION THRU SIDEWALK



EXPANSION TONGUE AT ℄ ROADWAY

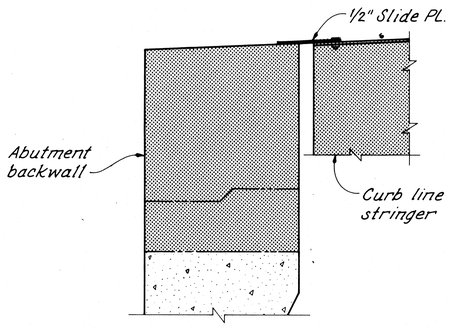


SECTION B-B

SECTION THRU SIDEWALK

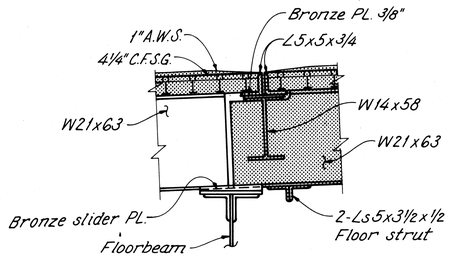
SECTIONS THRU EXPANSION JOINT AT PANEL 12 (SHOWN)

(PANEL 35 SIMILAR)

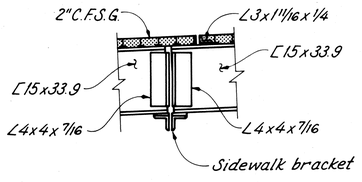


SECTION AT EAST TRUSS

SECTIONS THRU EXPANSION JOINTS AT ABUTMENTS



SECTION THRU ROADWAY



SECTION THRU SIDEWALK

SECTIONS THRU DEFLECTION JOINT AT PANEL 18 (SHOWN)

(PANELS 28,45,52 & 62 SIMILAR)

NOTES

*REMOVE indicated items with care by removing connection rivets to allow reuse of remaining steel support.

BOLT LEGEND: See sheet 20/81.

ADDITIONAL DETAILS & NOTES: See sheet 21/81.

LEGEND

Indicates material to be removed per Item 202 - Portions of structure removed.

C.F.S.G.: Concrete filled steel grid

A.W.S.: Asphalt wearing surface

22/81

RICHLAND ENGINEERING LIMITED
MANSFIELD, OHIO

REMOVAL DETAILS-2

SUPERSTRUCTURE
BRIDGE NO. LOR-611-0358
OVER BLACK RIVER

LORAIN COUNTY S.R. 611

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
RDN	RDN	JLS	DAP	DHT	9/6/88	

AS BUILT 6/91

FHWA REGION	STATE	PROJECT	
5	OHIO		

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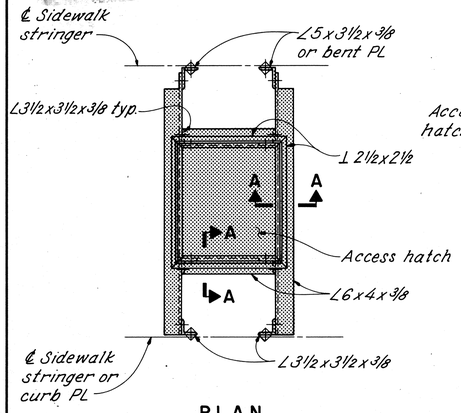
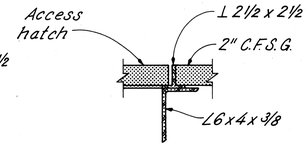
LORAIN COUNTY
LOR-611-3.57



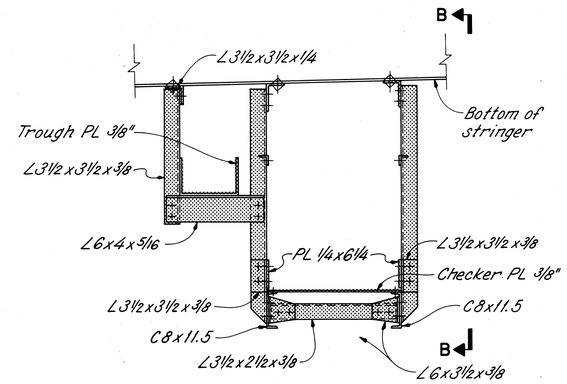
PLAN



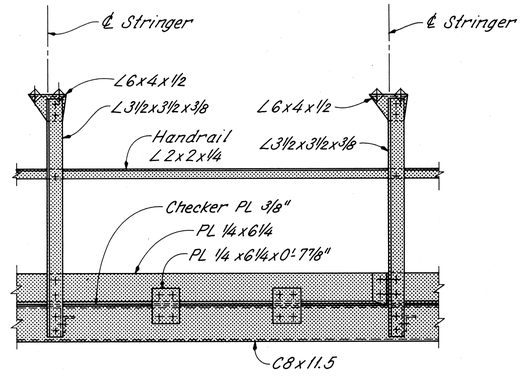
SECTION A-A

ACCESS HATCH FRAMING

PANEL POINTS 10, 20, 32, 35, 38, 42, 44, 48, 60

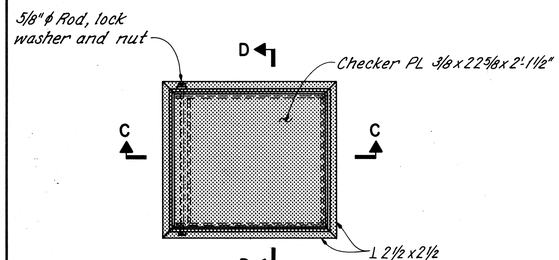


ELEVATION

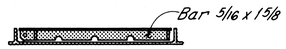


VIEW B-B

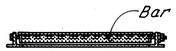
CATWALK AT PANEL POINT 38



ELEVATION



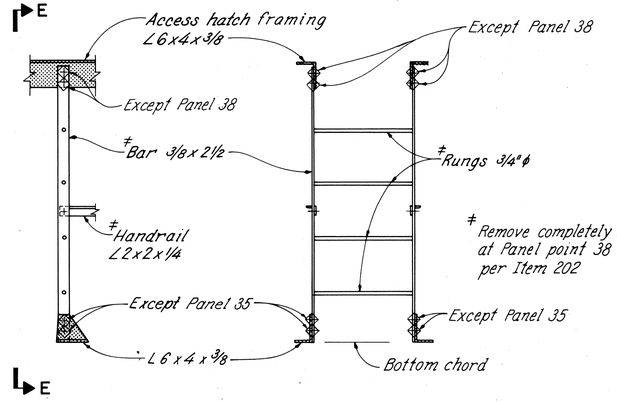
SECTION C-C



SECTION D-D

ACCESS HATCH

9 LOCATIONS

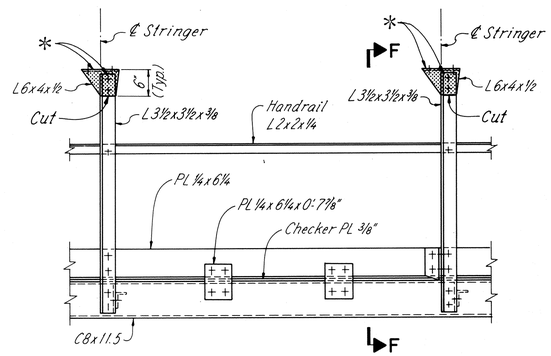


ELEVATION

SECTION E-E

LADDER DETAIL

PANEL POINTS 35, 38, 42 & 44



ELEVATION

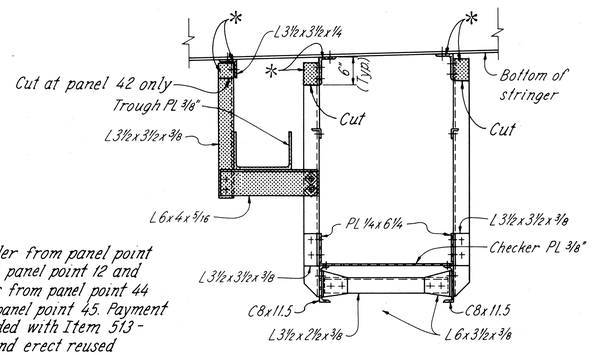
*Angles removed with stringer at panels 35 & 44. Angles to remain at panel 42.

NOTES: See sheet 21/81.

LEGEND

▨ - Indicates material to be removed per Item 202 - Portions of structure removed.

C.F.S.G. - Concrete filled steel grid.



SECTION F-F

Note: Catwalk and ladder from panel point 42 is to be reused at panel point 12 and catwalk and ladder from panel point 44 is to be reused at panel point 45. Payment for removal included with Item 513 - Dismantle, move and erect reused catwalk and ladder, as per plan.

CATWALK AT PANEL POINTS 35, 42 & 44

23/81

RICHLAND ENGINEERING LIMITED
MANSFIELD, OHIO

REMOVAL DETAILS-3

SUPERSTRUCTURE
BRIDGE NO. LOR-611-0358
OVER BLACK RIVER

LORAIN COUNTY S.R. 611

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
RDN	RDN	JLS	DAP	DHT	9/16/88	

AS BUILT 6/91

FHWA REGION	STATE	PROJECT	
5	OHIO		

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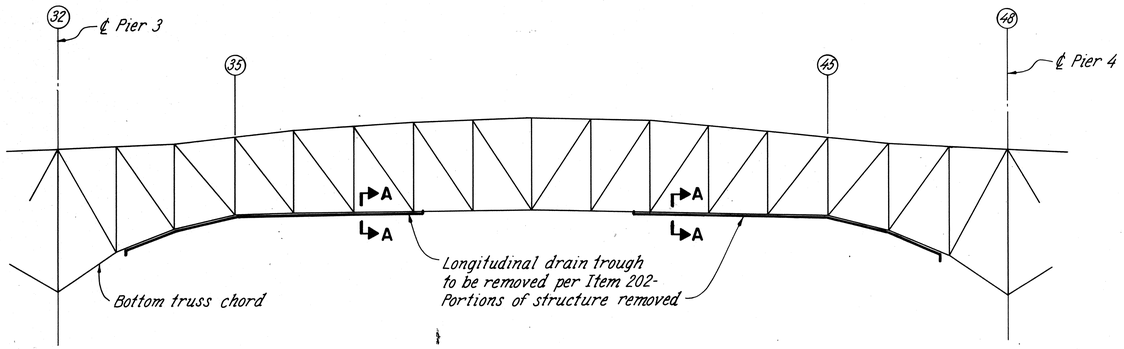
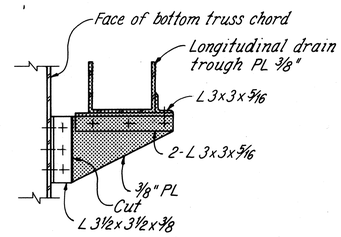
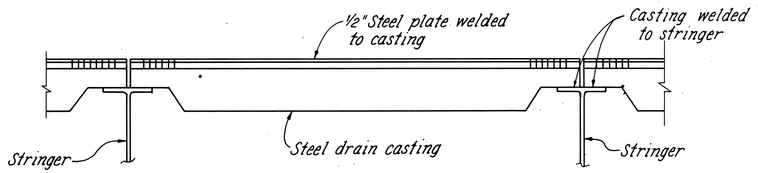
LORAIN COUNTY
LOR-611- 3.57



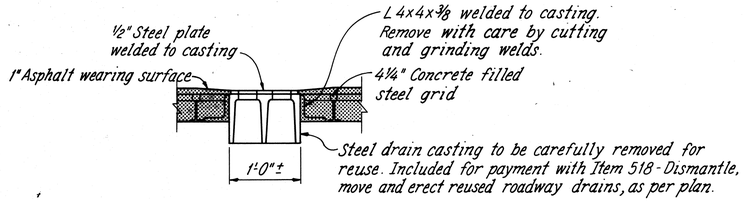
EAST TRUSS ELEVATION (SHOWN)
WEST TRUSS ELEVATION (OPPOSITE HAND)



SECTION A-A



TRANSVERSE SECTION



LONGITUDINAL SECTION

ROADWAY DRAIN CASTINGS
(13 LOCATIONS x 7 EA. = 91 CASTINGS)

NOTES: See sheet 21/81.

LEGEND

▒ - Indicates material to be removed per Item 202 - Portions of structure removed.

24/81

RICHLAND ENGINEERING LIMITED
MANSFIELD, OHIO

REMOVAL DETAILS-4
SUPERSTRUCTURE
BRIDGE NO. LOR-611-0358
OVER BLACK RIVER

LORAIN COUNTY S.R. 611

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
RDN	JPS	JPS	DAP	DHT	9/6/88	

AS BUILT 6/91

N80914

FHWA REGION	STATE	PROJECT	
5	OHIO		

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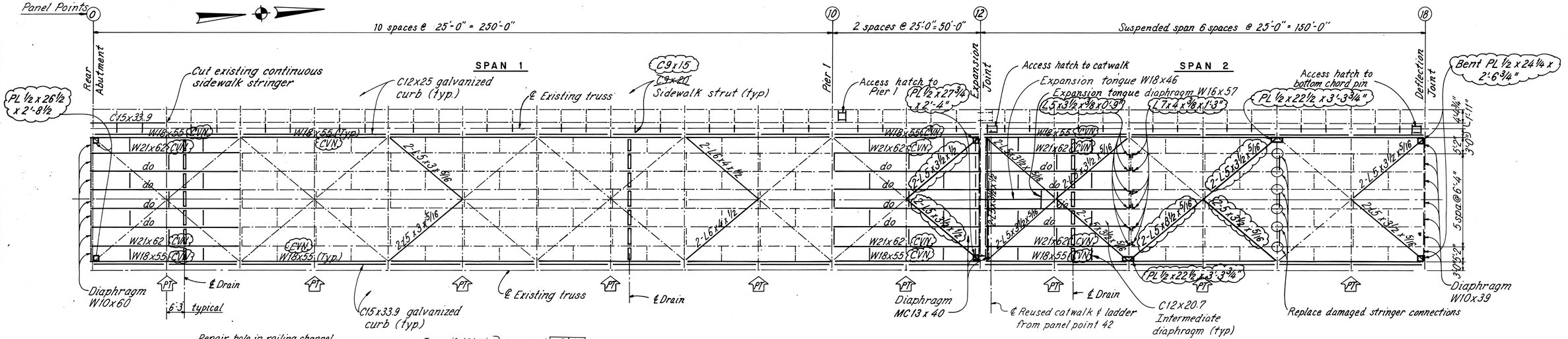
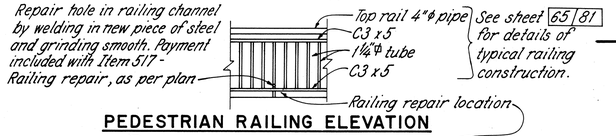
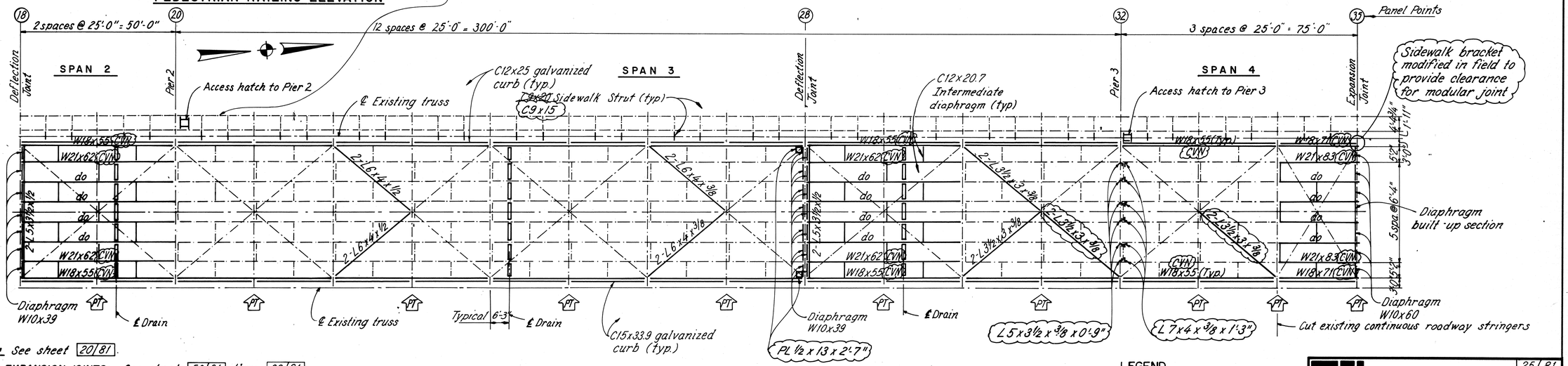
LORAIN COUNTY
LOR-611-3.57





PEDESTRIAN RAILING ELEVATION

FLOOR FRAMING PLAN - PANELS No. 0-18



FLOOR FRAMING PLAN - PANELS No. 18-35

NOTES

TYPICAL SECTION: See sheet 20/81.
DECK & SIDEWALK EXPANSION JOINTS: See sheets 58/81 thru 62/81.
DECK & SIDEWALK DEFLECTION JOINTS: See sheet 63/81.
DRAINAGE DETAILS: See sheet 68/81 and 69/81.
ACCESS HATCH DETAILS: See sheet 66/81.
CATWALK DETAILS: See sheet 67/81.
STRINGER & DIAPHRAGM DETAILS: See sheets 27/81 thru 33/81.
FLOORBEAM POST-TENSIONING DETAILS: See sheet 34/81.
FLOORBEAM TO TRUSS STRENGTHENING DETAILS: See sheet 38/81.
LOWER LATERAL BRACING DETAILS: See sheet 35/81 and 36/81.

LEGEND
—— New material
-·-·- Existing material
PT Indicates floorbeam to be post tensioned

CVN - Charpy V-Notch 15 Ft.-Lbs. @ +40°F

25/81

RICHLAND ENGINEERING LIMITED
MANSFIELD, OHIO

FRAMING PLAN - I
SUPERSTRUCTURE
BRIDGE NO. LOR-611-0358
OVER BLACK RIVER

LORAIN COUNTY S.R. 611

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
DAP	DAP	EFW	RDN	DHT	9/16/88	

AS BUILT 6/91

FHWA REGION	STATE	PROJECT	
5	OHIO		

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LORAIN COUNTY
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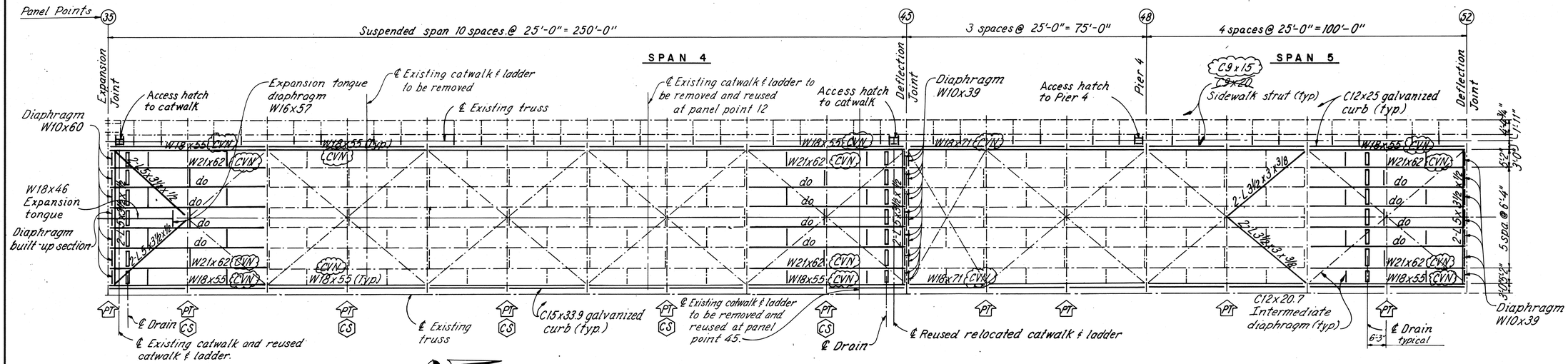
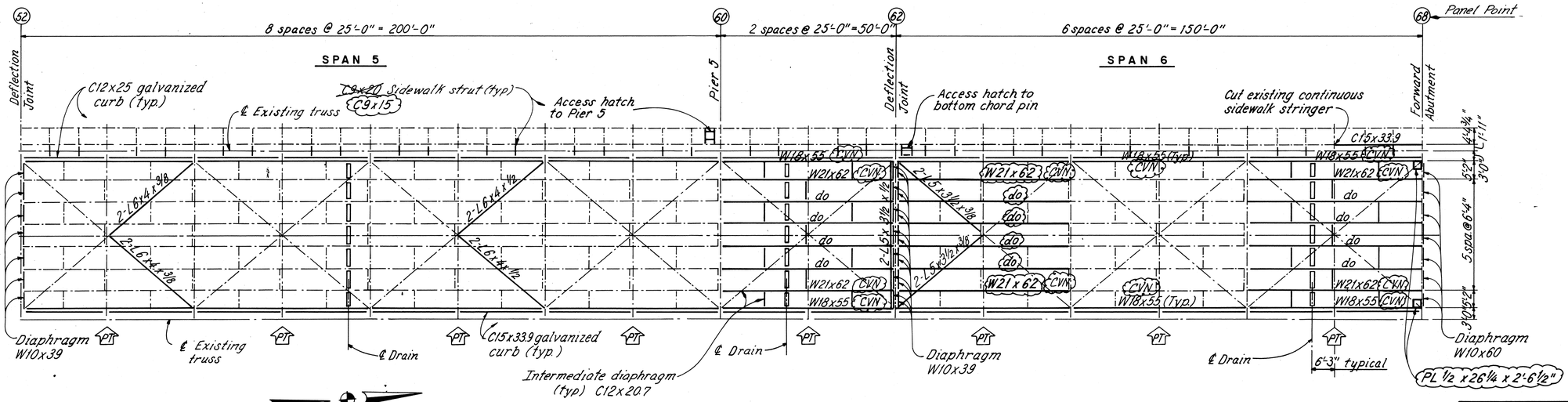


FLOOR FRAMING PLAN - PANELS No. 35-52



FLOOR FRAMING PLAN - PANELS No. 52-68

CVN - Charpy V-Notch 15 Ft.-Lbs @ +40°F

LEGEND

- New material
- Existing material
- PT Floorbeam to be post-tensioned
- CS Floorbeam to truss connection to be strengthened

NOTES: See sheet 25/81.

26/81

RICHLAND ENGINEERING LIMITED
MANSFIELD, OHIO

FRAMING PLAN - 2
SUPERSTRUCTURE
BRIDGE NO. LOR-611-0358
OVER BLACK RIVER

LORAIN COUNTY SR. 611

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
DAP	DAP	EFW	RDN	DHT	9/6/88	

AS BUILT 6/91

FHWA REGION	STATE	PROJECT		42
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LORAIN COUNTY
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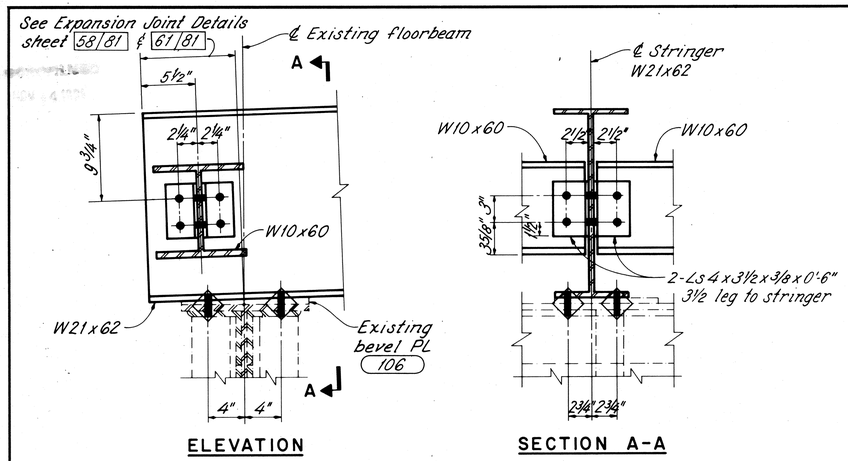
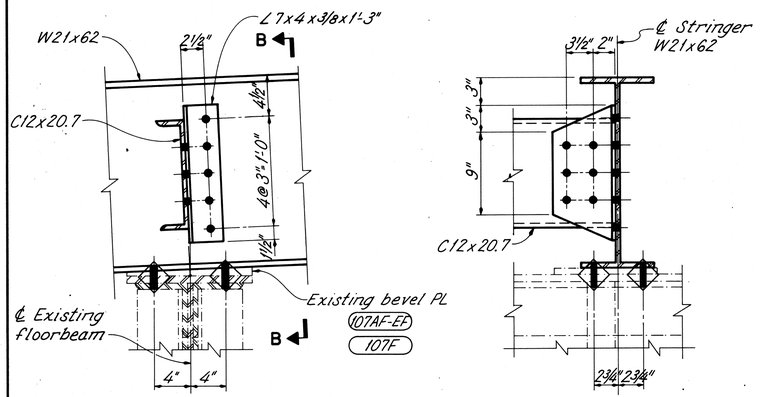


ELEVATION SECTION A-A

INTERIOR STRINGERS - PANEL POINT 0 (SHOWN)

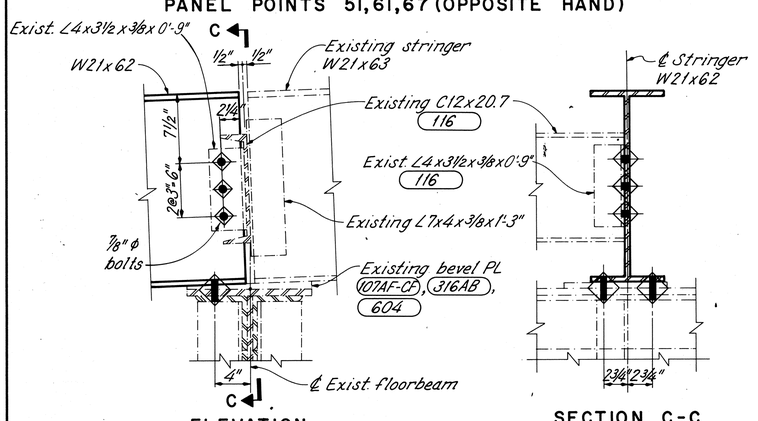
PANEL POINT 68 (OPPOSITE HAND)



ELEVATION SECTION B-B

INTERIOR STRINGERS - PANEL POINTS 1, 11, 13, 19, 29 (SHOWN)

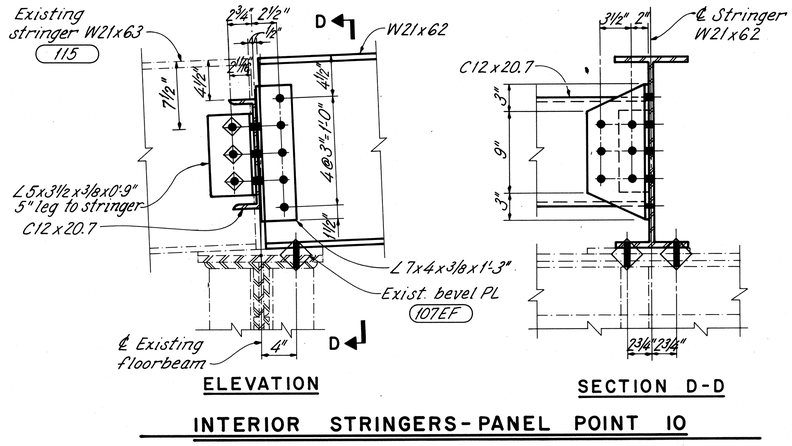
PANEL POINTS 51, 61, 67 (OPPOSITE HAND)



ELEVATION SECTION C-C

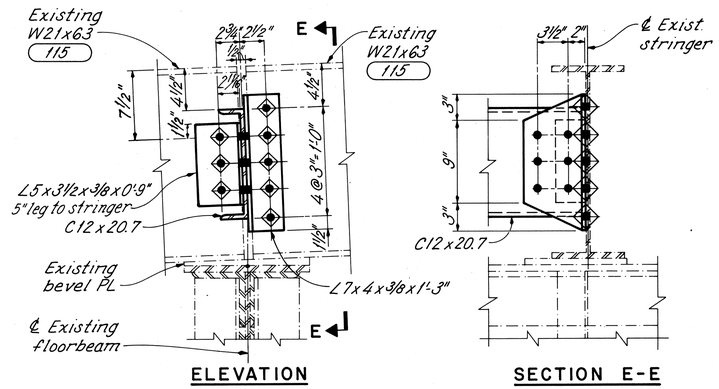
INTERIOR STRINGERS - PANEL POINTS 2, 14, 20, 30, 37 (SHOWN)

PANEL POINTS 43, 50, 60, 66 (OPPOSITE HAND)



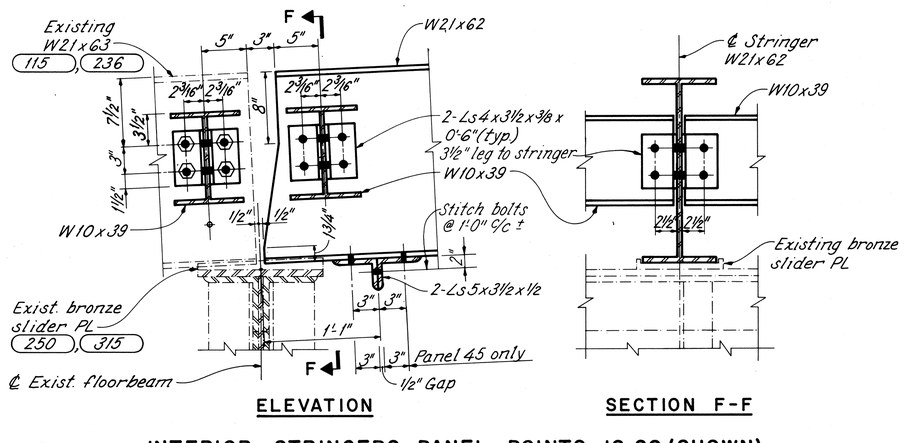
ELEVATION SECTION D-D

INTERIOR STRINGERS - PANEL POINT 10



ELEVATION SECTION E-E

INTERIOR STRINGERS - PANEL POINT 16



ELEVATION SECTION F-F

INTERIOR STRINGERS - PANEL POINTS 18, 28 (SHOWN)

PANEL POINTS 45, 52, 62 (OPPOSITE HAND)

NOTES

MATERIALS *shown are new unless otherwise noted.*

TRANSVERSE SECTION: *See sheet* 20/81.

FRAMING PLANS: *See sheets* 25/81 & 26/81.

STRINGER & DIAPHRAGM DETAILS *are to be worked with: Removal detail sheets* 21/81 *and* 22/81, *new expansion joint detail sheets* 58/81 *thru* 62/81, *new deflection joint detail sheet* 63/81, *and lower lateral bracing detail sheet* 35/81 & 36/81.

EXISTING HOLES *in existing reused material shall be used to locate new bolts. Existing connectors are typically ⅞" ϕ rivets.*

BOLTS *shall be 1" ϕ unless otherwise noted.*

BOLT LEGEND: *See sheet* 20/81.

(000) *indicates shop drawing sheet number where member is detailed.*

LEGEND

- - - - - - - *Existing material*

——— *New material*

27/81

RICHLAND ENGINEERING LIMITED
MANSFIELD, OHIO

STRINGER & DIAPHRAGM DETAILS - I

SUPERSTRUCTURE
BRIDGE NO. LOR-611-0358
OVER BLACK RIVER
LORAIN COUNTY S.R. 611

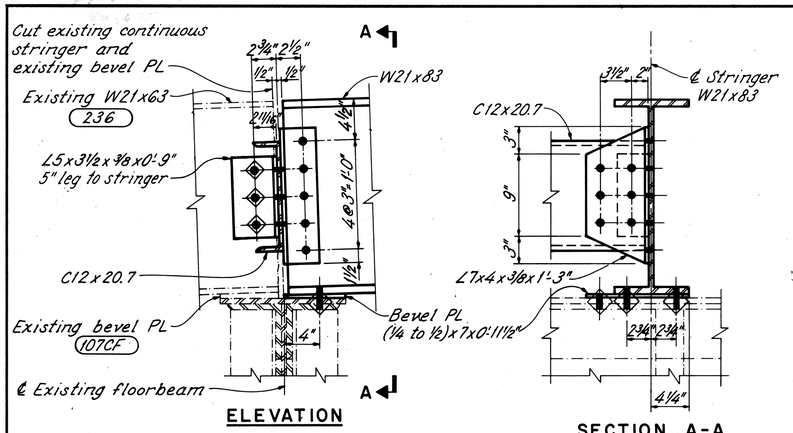
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
RDN	RDN	JLS	DAP	DHT	9/6/88	

AS BUILT 6/91

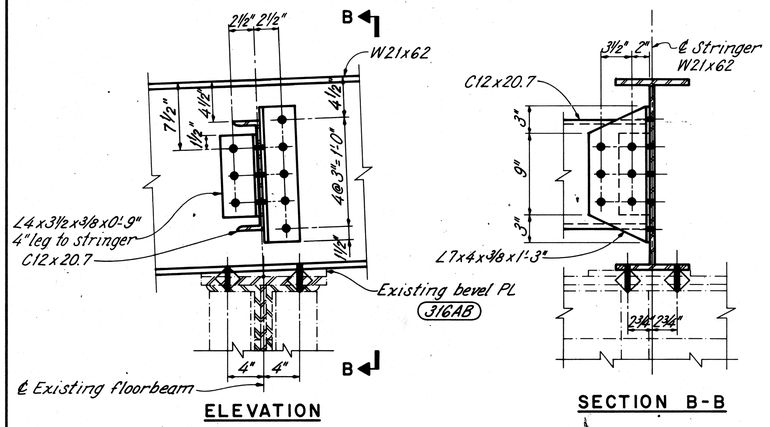
N60479

FHWA REGION	STATE	PROJECT		43
5	OHIO			

LORAIN COUNTY
LOR-611-3.57

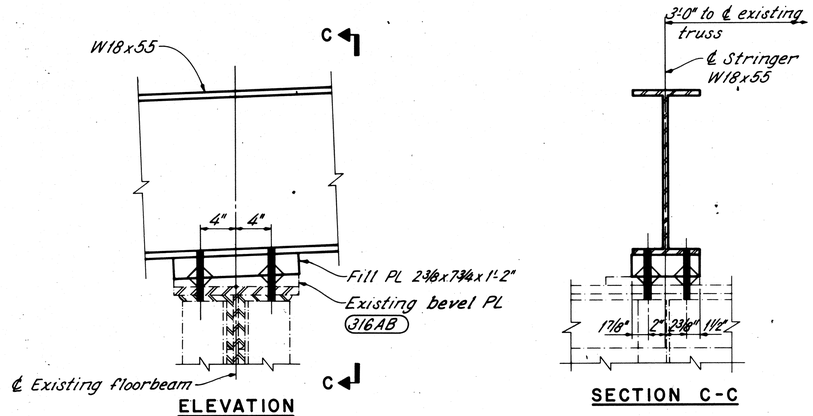


INTERIOR STRINGERS - PANEL POINT 34



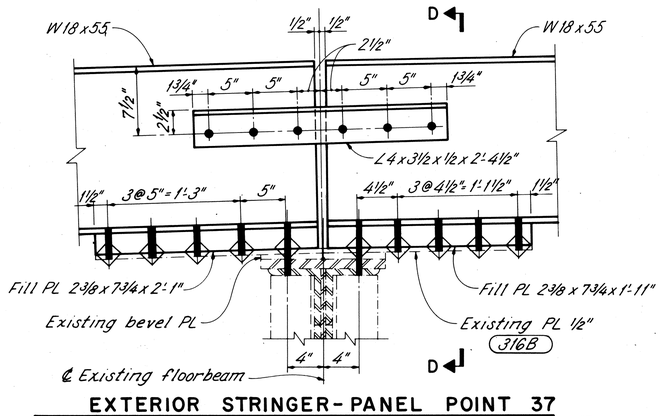
INTERIOR STRINGERS - PANEL POINT 36 (SHOWN)

PANEL POINT 44 (OPPOSITE HAND)

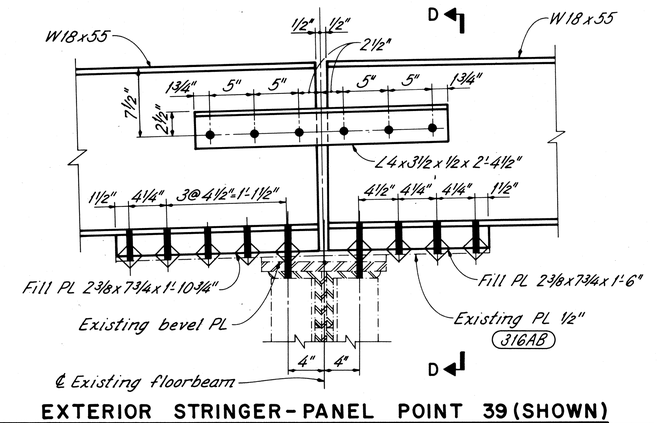


EXTERIOR STRINGER - PANEL POINTS 36,38,40 (SHOWN)

PANEL POINTS 42,44 (OPPOSITE HAND)

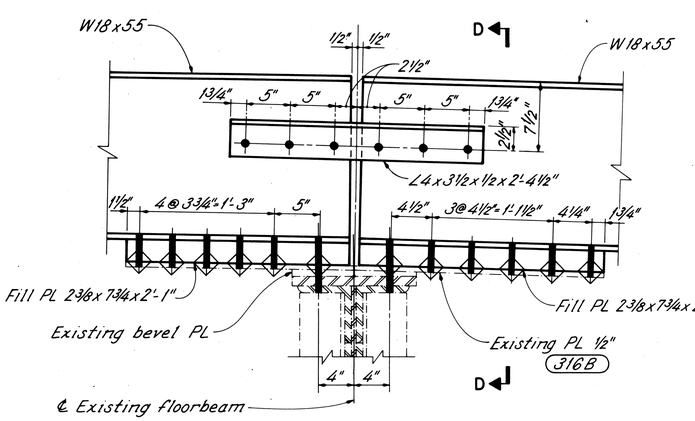


EXTERIOR STRINGER - PANEL POINT 37

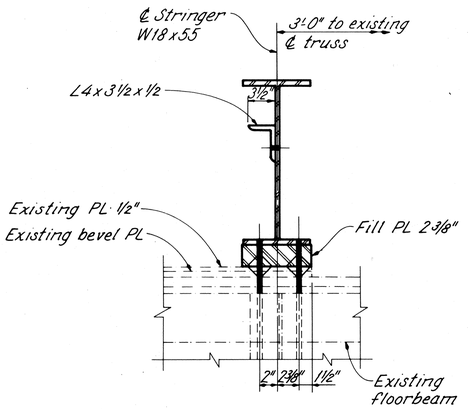


EXTERIOR STRINGER - PANEL POINT 39 (SHOWN)

PANEL POINT 41 (OPPOSITE HAND)



EXTERIOR STRINGER - PANEL POINT 43



SECTION D-D

NOTES

CUT MATERIAL to be ground smooth and cleaned, as necessary, to accept paint.

ADDITIONAL NOTES: See sheet 27/81.

LEGEND

- - - - - - - Existing material

——— New material

28/81

RICHLAND ENGINEERING LIMITED
MANSFIELD, OHIO

STRINGER & DIAPHRAGM DETAILS - 2
SUPERSTRUCTURE
BRIDGE NO. LOR-611-0358
OVER BLACK RIVER
LORAIN COUNTY S.R. 611

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
RDN	RDN	JLS	DAP	DHT	9/6/88	

AS BUILT 6/91

FHWA REGION	STATE	PROJECT	
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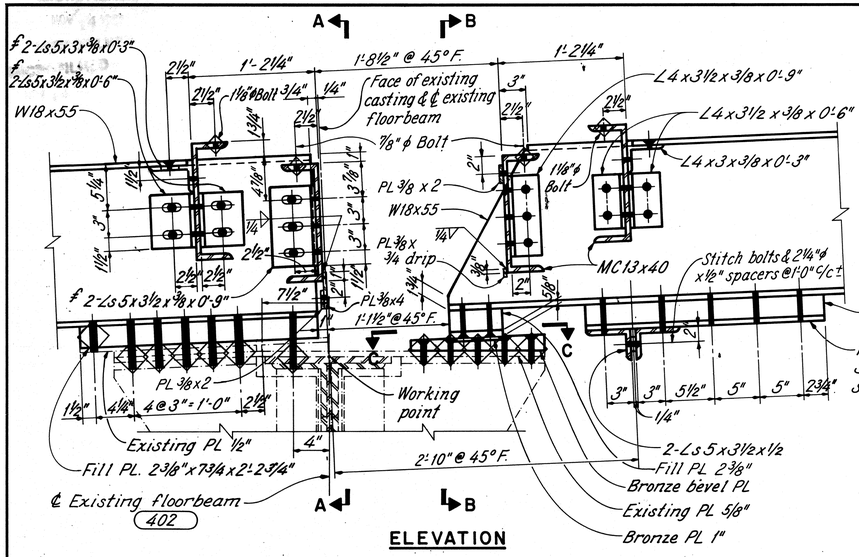
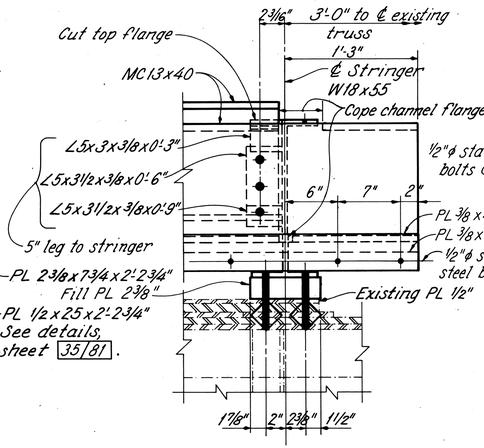
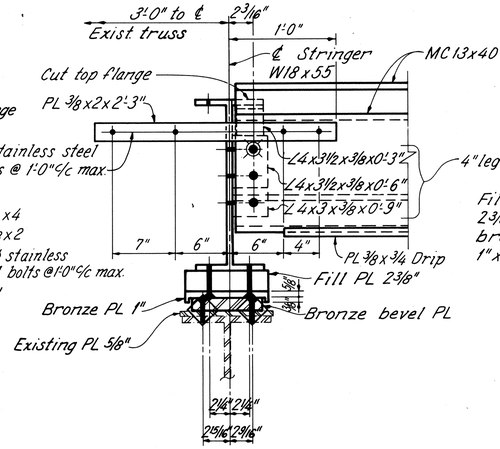
LORAIN COUNTY
LOR-611-3.57



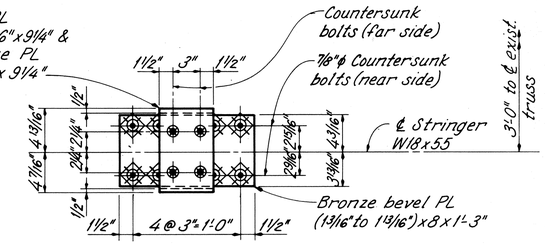
ELEVATION



SECTION A-A



SECTION B-B



SECTION C-C

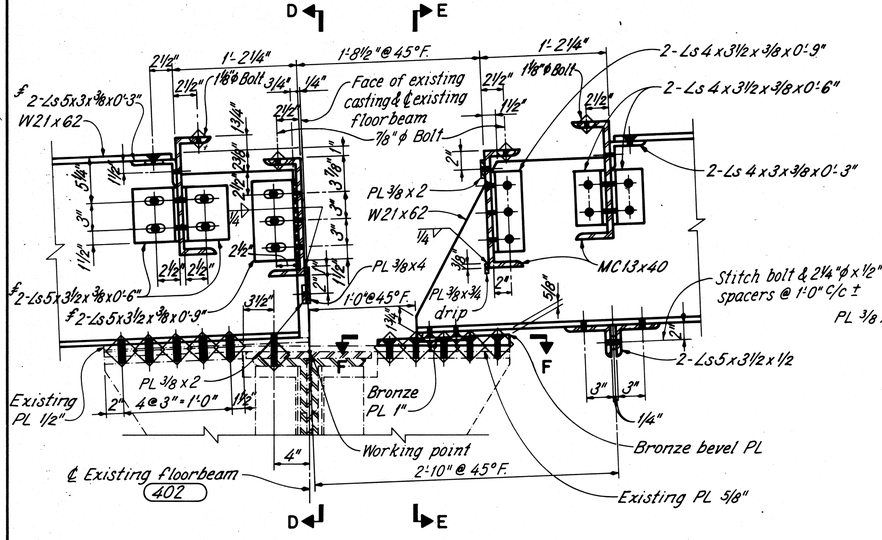
EXTERIOR STRINGERS - PANEL POINT 12

℄ - with 2" long slotted holes in angle leg against stringer for longitudinal adjustment.

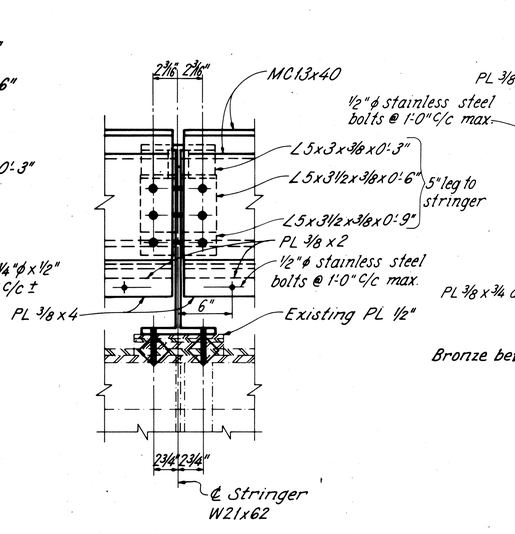
LEGEND

Existing material

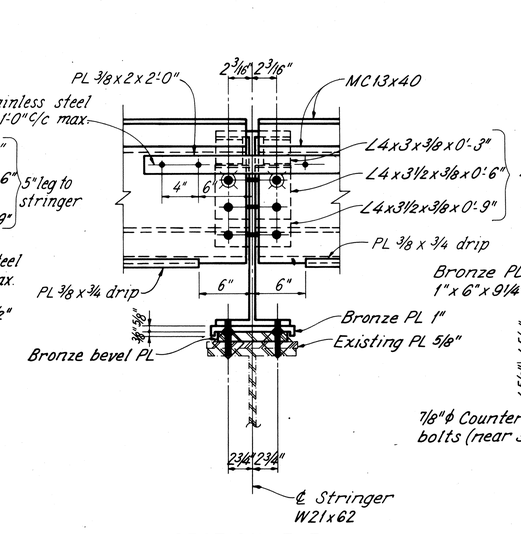
New material



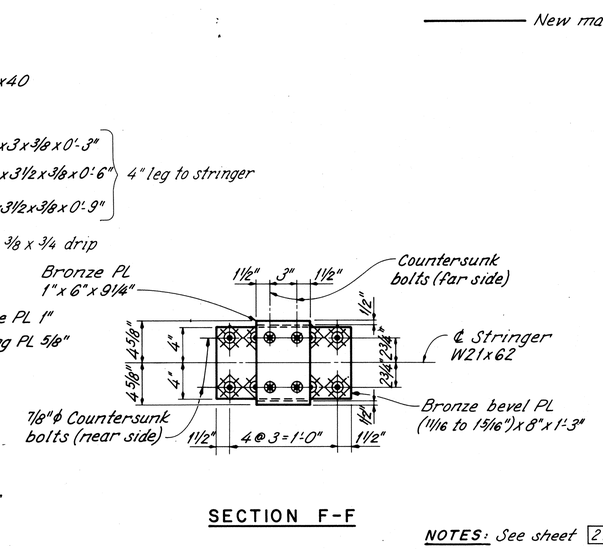
ELEVATION



SECTION D-D



SECTION E-E



SECTION F-F

INTERIOR STRINGERS - PANEL POINT 12

NOTES: See sheet 27/81.

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RICHLAND ENGINEERING LIMITED
MANSFIELD, OHIO

STRINGER & DIAPHRAGM DETAILS - 3

SUPERSTRUCTURE
BRIDGE NO. LOR-611-0358
OVER BLACK RIVER
LORAIN COUNTY S.R. 611

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
RDN	RDN	JLS	DAP	DHT	9/6/88	

AS BUILT 6/91

FHWA REGION	STATE	PROJECT	
5	OHIO		

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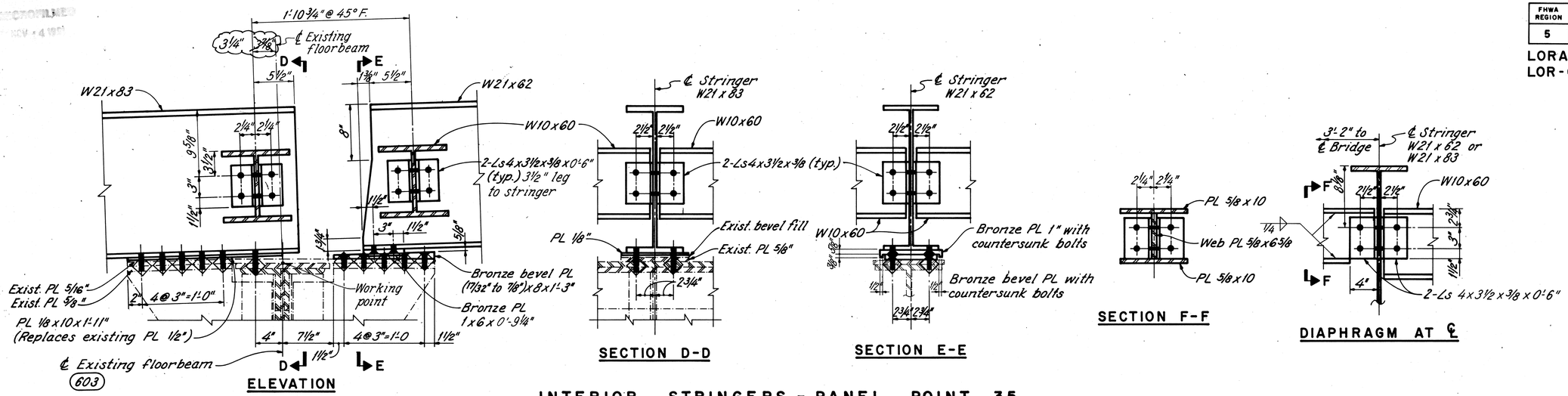
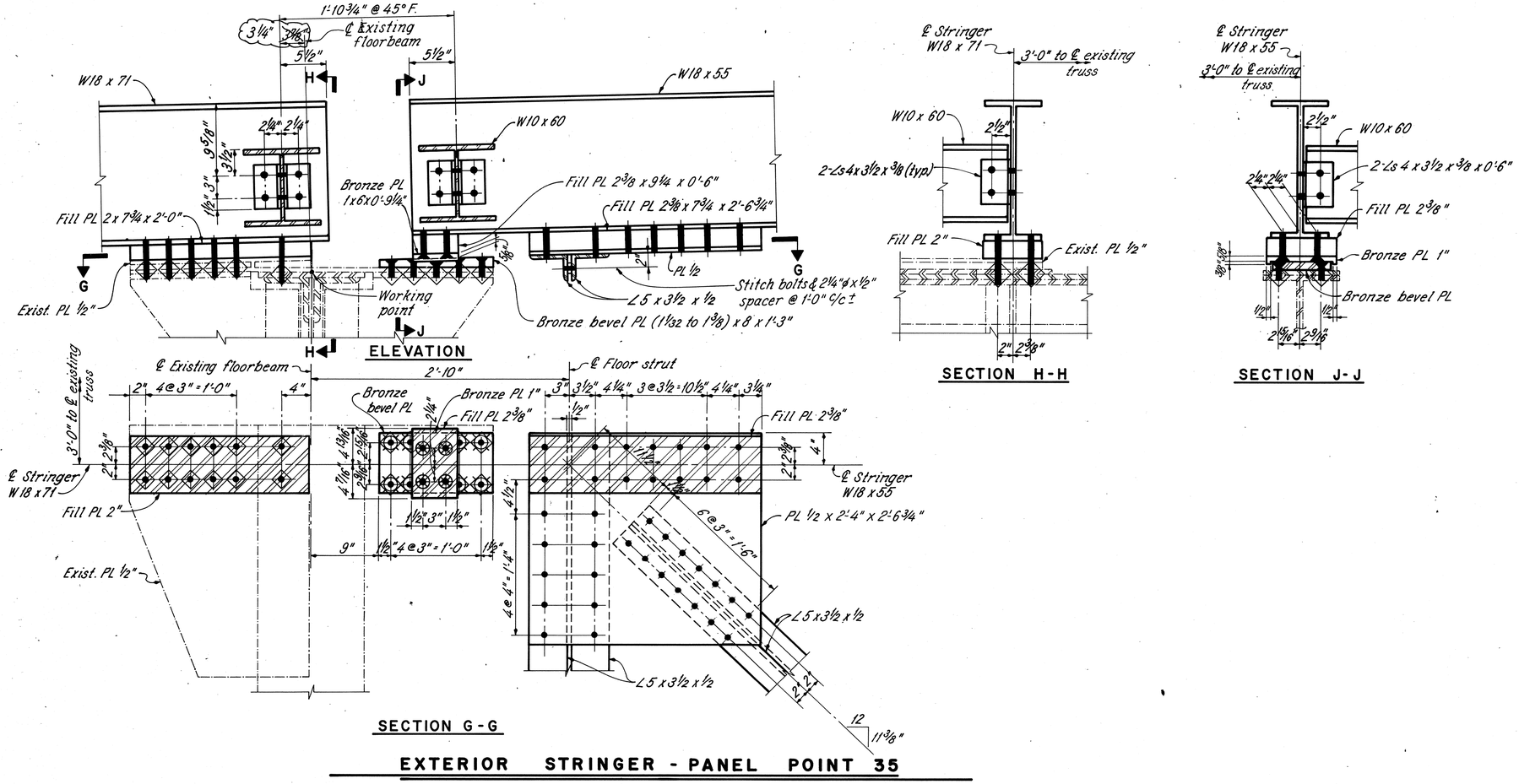
LORAIN COUNTY
LOR-611-3.57



INTERIOR STRINGERS - PANEL POINT 35



EXTERIOR STRINGER - PANEL POINT 35

NOTES: See sheet 27/81

LEGEND

Existing material

New material

30/81

RICHLAND ENGINEERING LIMITED
MANSFIELD, OHIO

STRINGER & DIAPHRAGM DETAILS - 4
SUPERSTRUCTURE
BRIDGE NO. LOR-611-0358
OVER BLACK RIVER
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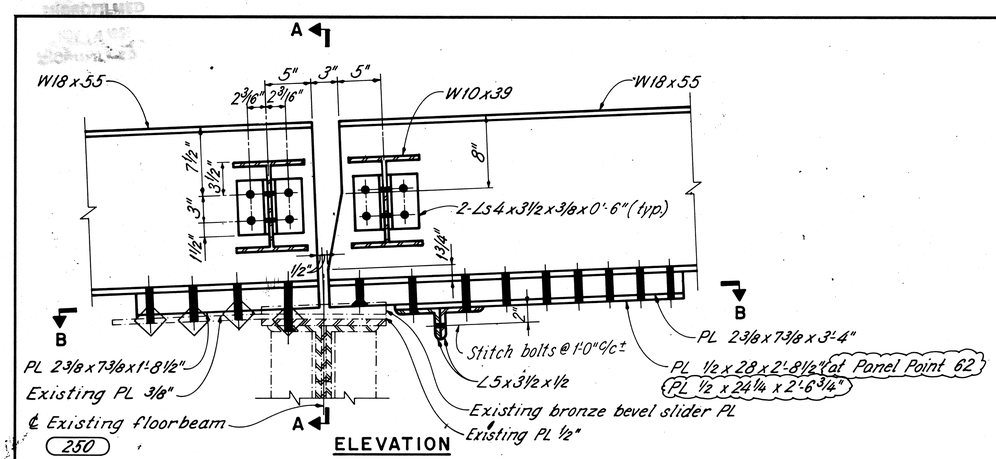
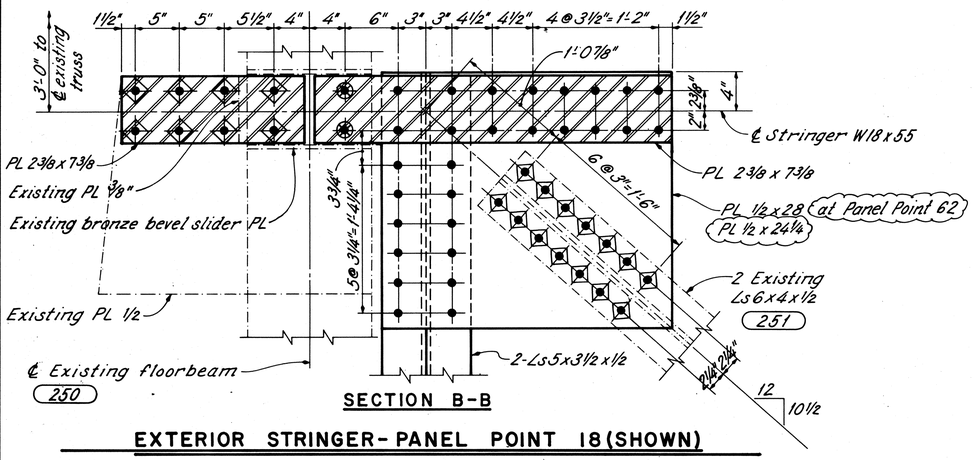


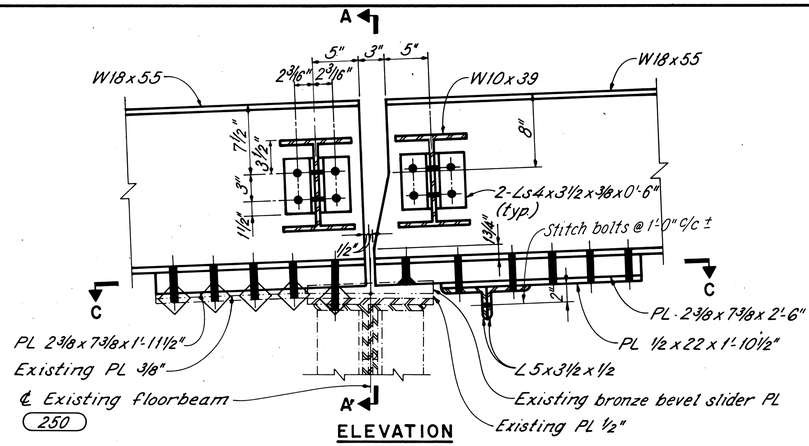
ELEVATION



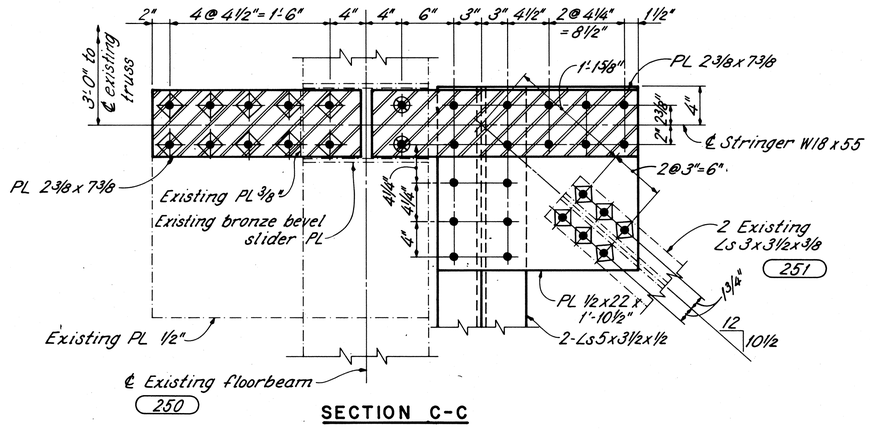
SECTION B-B

EXTERIOR STRINGER - PANEL POINT 18 (SHOWN)

PANEL POINT 62 (OPPOSITE HAND)



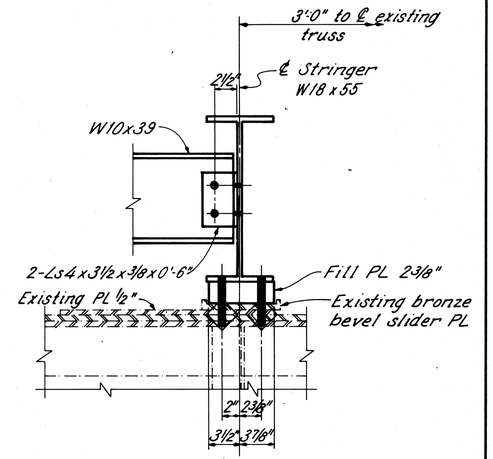
ELEVATION



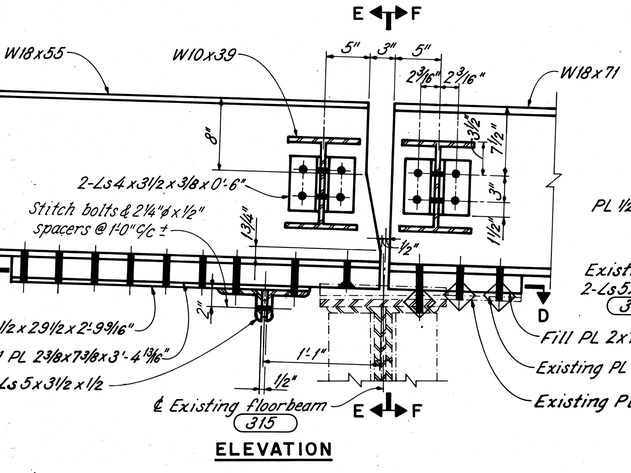
SECTION C-C

EXTERIOR STRINGER - PANEL POINT 28 (SHOWN)

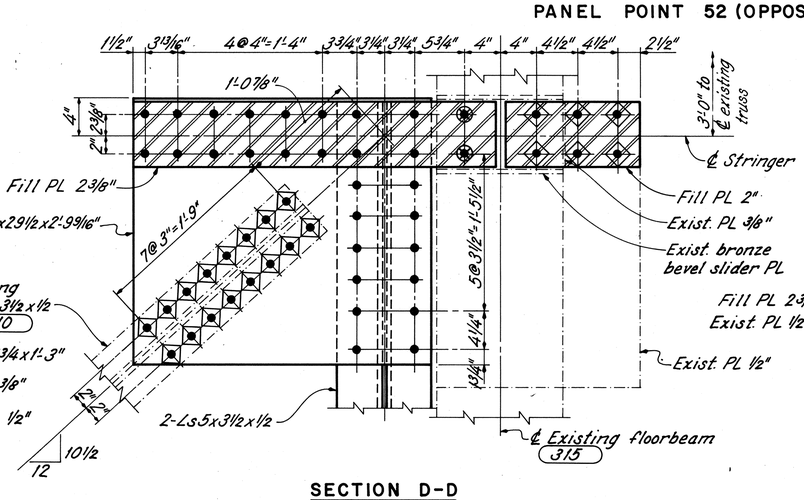
PANEL POINT 52 (OPPOSITE HAND)



SECTION A-A

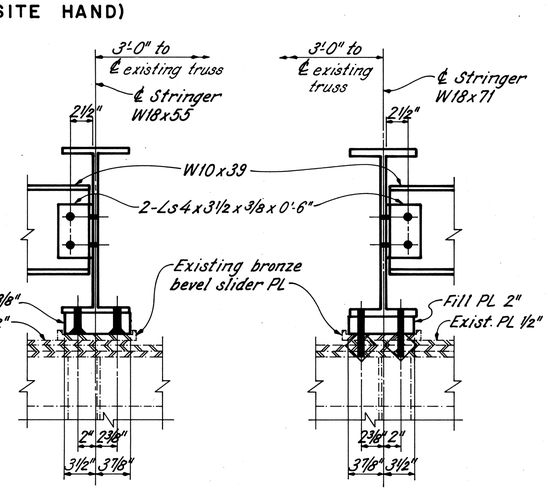


ELEVATION



SECTION D-D

EXTERIOR STRINGER - PANEL POINT 45



SECTION E-E

SECTION F-F

LEGEND

Existing material

New material

NOTES: See sheet 27/81.

31/81

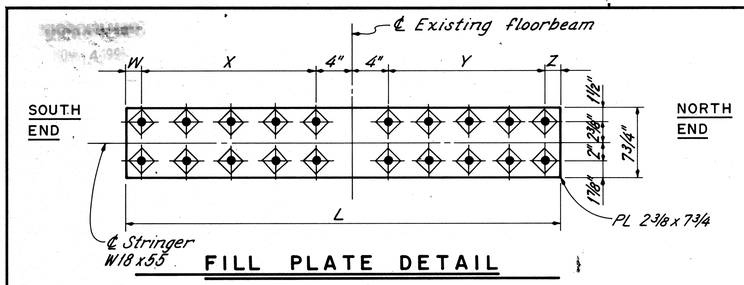
RICHLAND ENGINEERING LIMITED
MANSFIELD, OHIO

STRINGER & DIAPHRAGM DETAILS - 5

SUPERSTRUCTURE
BRIDGE NO. LOR-611-0358
OVER BLACK RIVER
LORAIN COUNTY S.R. 611

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
RDN	RDN	JLS	DAP	DHT	9/6/88	

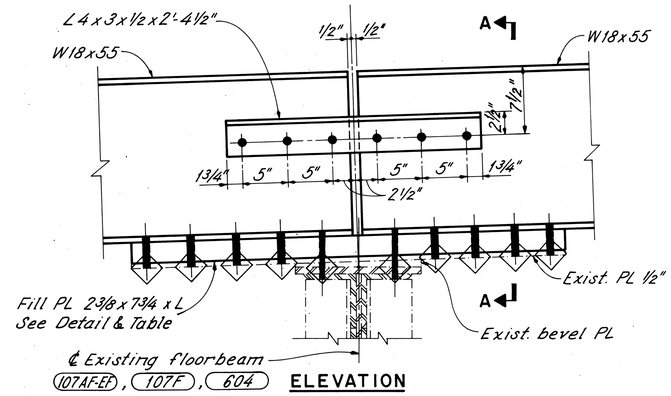
AS BUILT 6/91



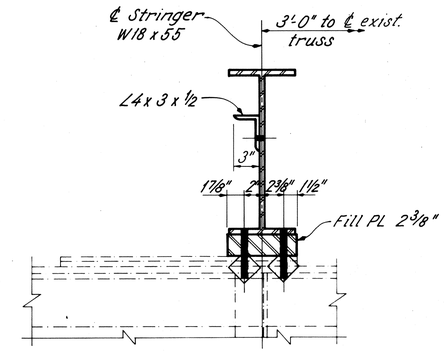
FILL PLATE DETAIL

FILL PLATE

PANEL POINT	LENGTH L	W	X=HOLE SPACING LEFT TO RIGHT	Y=HOLE SPACING LEFT TO RIGHT	Z
2	4'-01/2"	13/4"	3@5"=1'-3", 4 1/2"	3@4 1/2"=1'-11/2", 4"	13/4"
4	3'-10 1/2"	13/4"	4", 3@4 1/2"=1'-11/2"	3@4 1/2"=1'-11/2", 4"	13/4"
6	4'-01/2"	13/4"	4", 3@4 1/2"=1'-11/2"	4 1/2", 3@5"=1'-3"	13/4"
8	4'-8 1/4"	2"	4 1/2", 3@5"=1'-3"	5@5"=2'-1"	13/4"
10	5'-11/2"	13/4"	5@5"=2'-1"	5@5"=2'-1"	13/4"
14	3'-3 1/4"	11/4"	5", 5", 5 1/2"	4 1/2", 4 1/2", 4 1/4"	11/2"
16	3'-3 3/4"	11/2"	4 1/4", 4 1/2", 4 1/2"	5 1/2", 5", 5"	11/4"
20	5'-6 1/4"	13/4"	4@4"=1'-4", 4 1/2", 4 1/2"	6@5"=2'-6"	11/2"
22	5'-2 1/2"	11/2"	4@5 1/2"=1'-10", 4 1/2"	4 1/2", 4@5"=1'-8"	13/4"
24	4'-4 1/8"	13/8"	5@4 1/2"=1'-10 1/2"	4@4 1/2"=1'-6"	2"
26	4'-0"	2"	4@4 1/2"=1'-6"	4@4 1/2"=1'-6"	2"
30,32	3'-2"	2"	4 1/4", 4 1/4", 4 1/2"	4 1/2", 4 1/4", 4 1/4"	2"
48,50	3'-2"	2"	4 1/4", 4 1/4", 4 1/2"	4 1/2", 4 1/4", 4 1/4"	2"
54	4'-0"	2"	4@4 1/2"=1'-6"	4@4 1/2"=1'-6"	2"
56	4'-4 1/8"	2"	4@4 1/2"=1'-6"	5@4 1/2"=1'-10 1/2"	13/8"
58	5'-2 1/2"	13/4"	4@5"=1'-8", 4 1/2"	4 1/2", 4@5 1/2"=1'-10"	11/2"
60	5'-6 1/4"	11/2"	6@5"=2'-6"	4 1/2", 4 1/2", 4@4"=1'-4"	13/4"
64,66	3'-6"	2"	3@5"=1'-3"	3@5"=1'-3"	2"



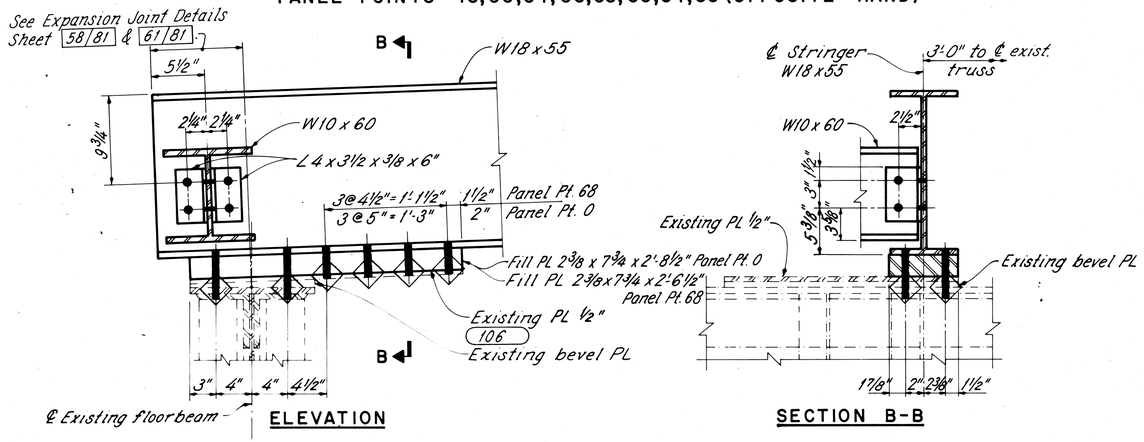
ELEVATION



SECTION A-A

EXTERIOR STRINGER-PANEL POINT 2 (SHOWN)

PANEL POINTS 4,6,8,10,14,16,20,22,24,26,30,32 (SIMILAR)
PANEL POINTS 48,50,54,56,58,60,64,66 (OPPOSITE HAND)

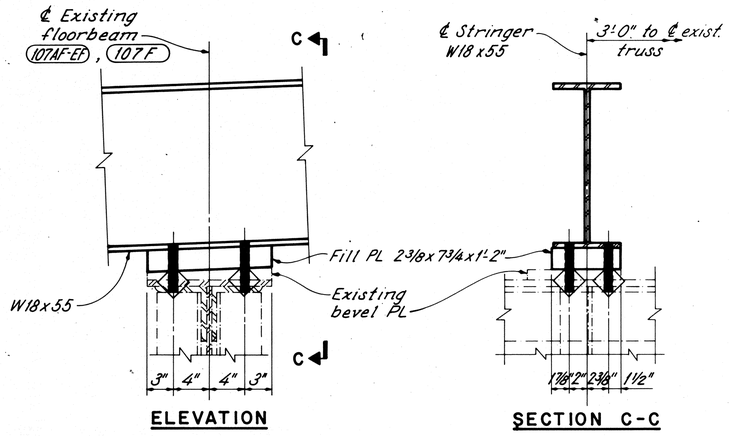


ELEVATION

SECTION B-B

EXTERIOR STRINGER-PANEL POINT 0 (SHOWN)

PANEL POINT 68 (OPPOSITE HAND)

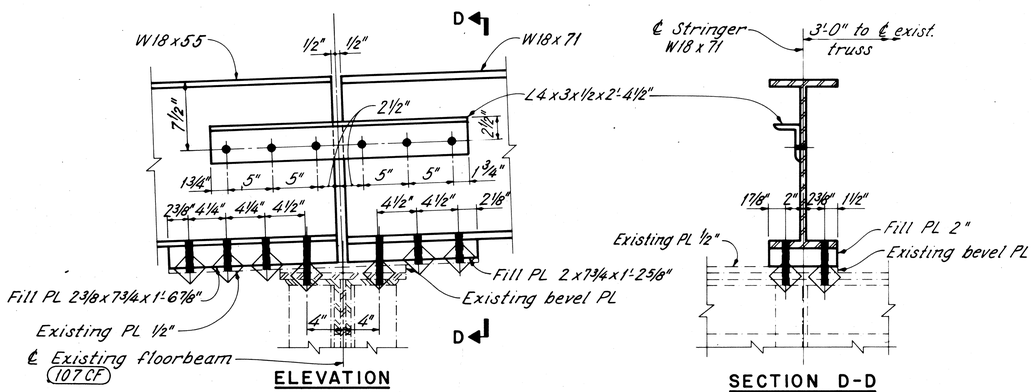


ELEVATION

SECTION C-C

EXTERIOR STRINGER-PANEL POINTS 1,3,5,7,9,11,13,15,17,19,21,23,25,27,29,31,33 (SHOWN)

PANEL POINT 47,49,51,53,55,57,59,61,63,65,67 (OPPOSITE HAND)



ELEVATION

SECTION D-D

EXTERIOR STRINGER-PANEL POINT 34 (SHOWN)

PANEL POINT 46 (OPPOSITE HAND)

NOTES: See sheet 27/81

LEGEND

Existing material

New material

FHWA REGION	STATE	PROJECT		
5	OHIO			

47

LORAIN COUNTY
LOR-611-3.57

32/81

RICHLAND ENGINEERING LIMITED
MANSFIELD, OHIO

STRINGER & DIAPHRAGM DETAILS - 6
SUPERSTRUCTURE
BRIDGE NO. LOR-611-0358
OVER BLACK RIVER

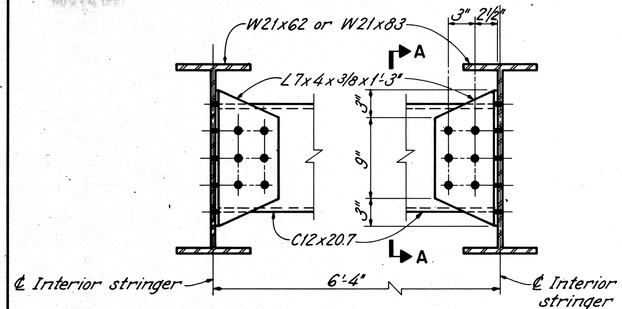
LORAIN COUNTY S.R. 611

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
RDN	RDN	JLS	DAP	DHT	9/6/88	

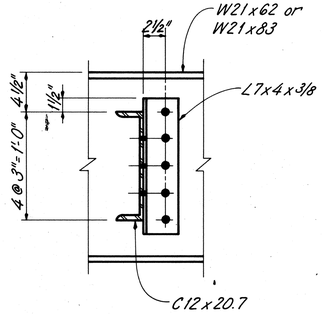
AS BUILT 6/91

FHWA REGION	STATE	PROJECT		48
5	OHIO			

LORAIN COUNTY
LOR-611-3.57



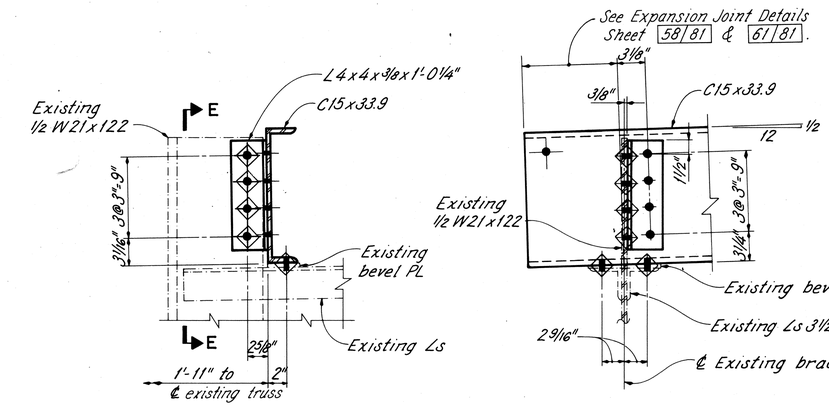
ELEVATION



SECTION A-A

TYPICAL INTERMEDIATE DIAPHRAGM

(interior stringers)

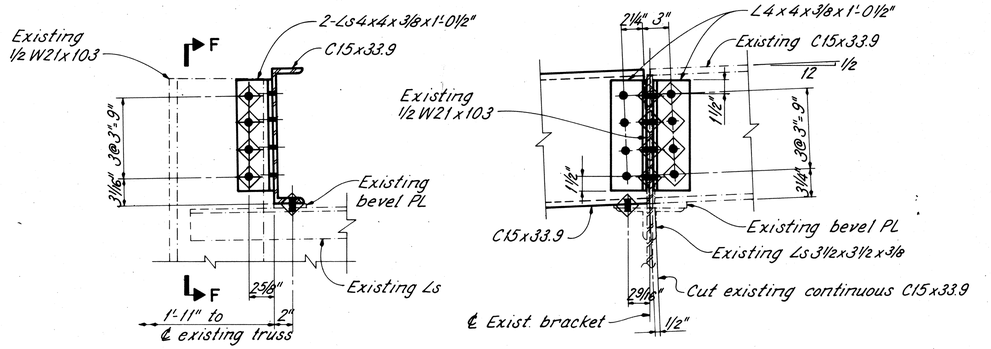


ELEVATION

SECTION E-E

INTERIOR SIDEWALK STRINGER-PANEL POINT 0 (SHOWN)

PANEL POINT 68 (OPPOSITE HAND)

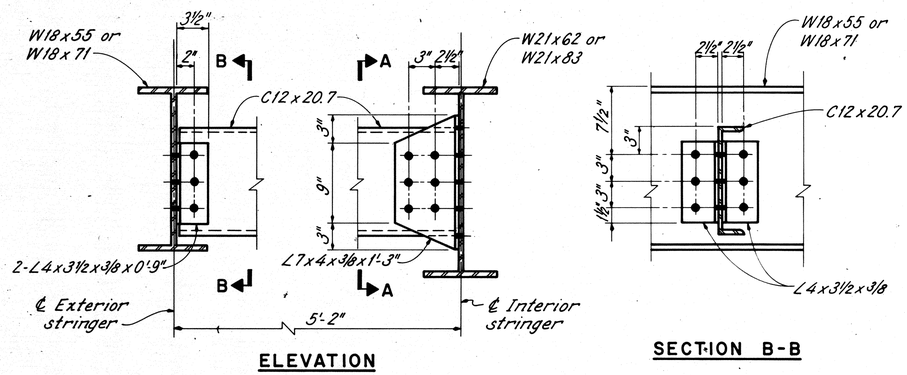


ELEVATION

SECTION F-F

INTERIOR SIDEWALK STRINGER-PANEL POINT 1 (SHOWN)

PANEL POINT 67 (OPPOSITE HAND)

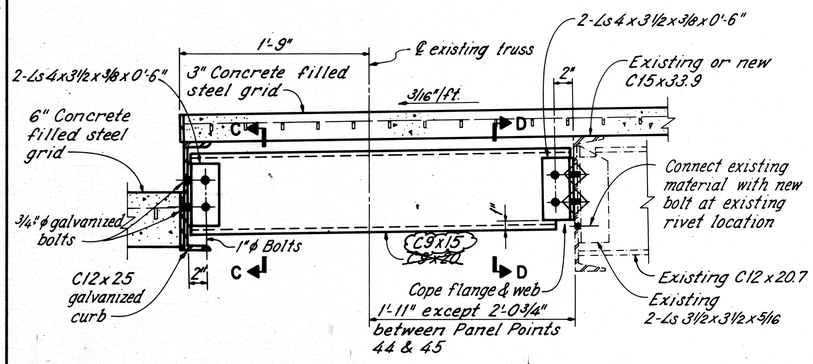


ELEVATION

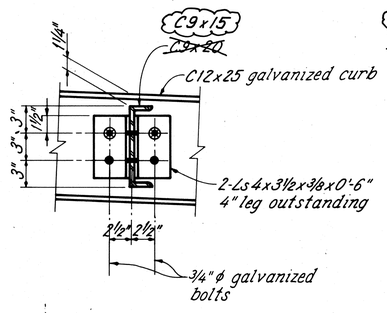
SECTION B-B

TYPICAL INTERMEDIATE DIAPHRAGM

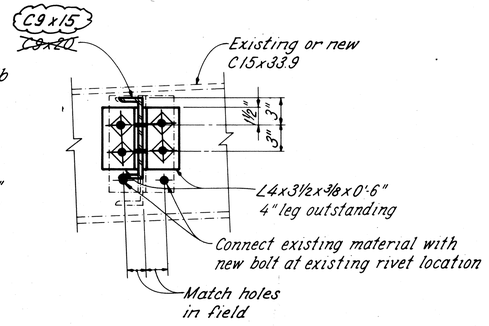
(exterior to interior stringers)



ELEVATION



SECTION C-C



SECTION D-D

TYPICAL SIDEWALK STRUT

NOTES

CUT MATERIALS to be ground smooth and cleaned, as necessary, to accept paint.

ADDITIONAL NOTES: See sheet 27/81.

LEGEND

Existing material

New material

RICHLAND ENGINEERING LIMITED
MANSFIELD, OHIO

33/81

STRINGER & DIAPHRAGM DETAILS - 7

SUPERSTRUCTURE
BRIDGE NO. LOR-611-0358
OVER BLACK RIVER
LORAIN COUNTY S.R. 611

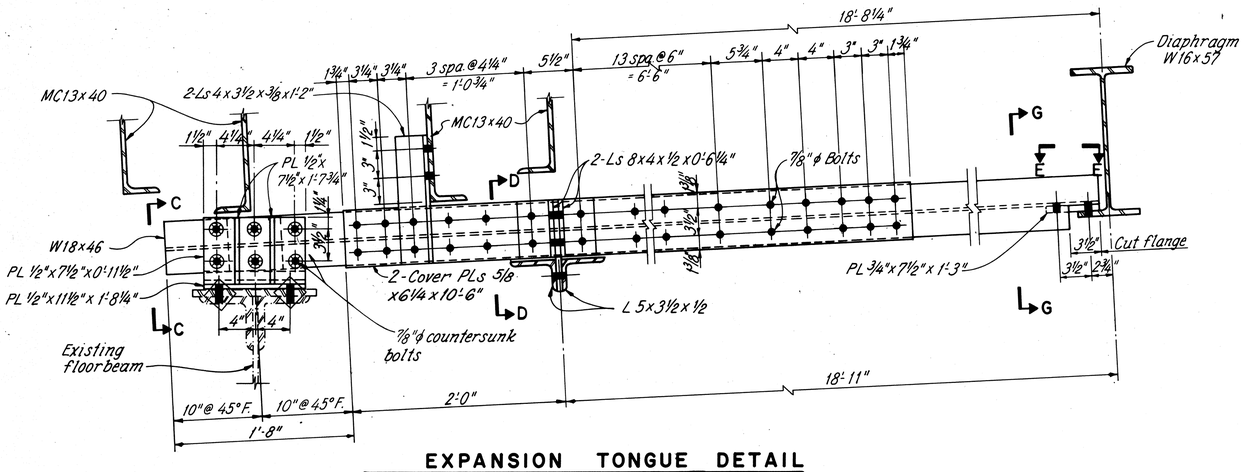
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
RDN	RDN	JLS	DAP	DHT	9/6/88	

AS BUILT 6/91

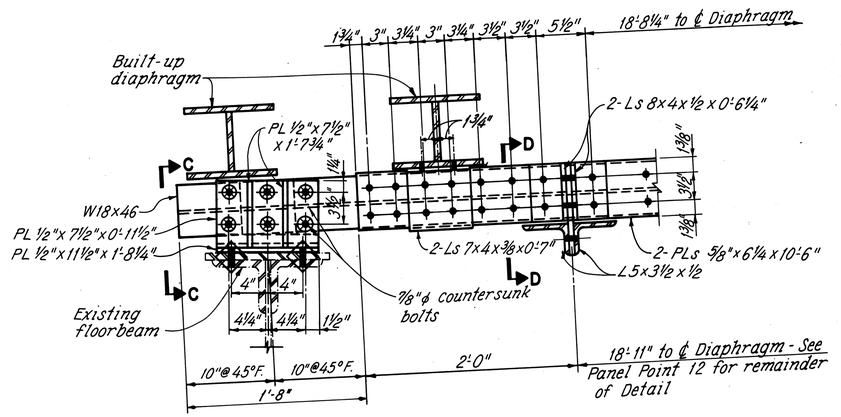
FHWA REGION	STATE	PROJECT	
5	OHIO		

49

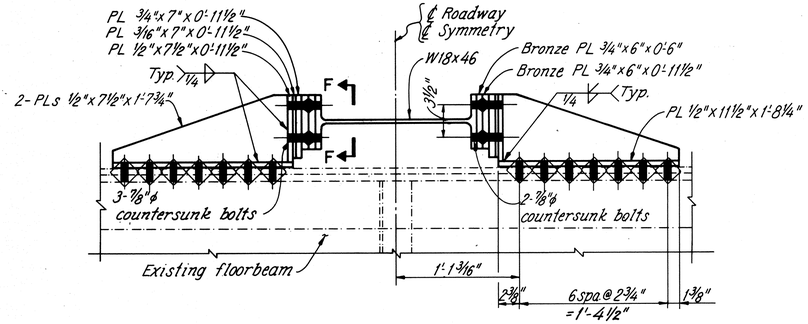
LORAIN COUNTY
LOR-611-3.57



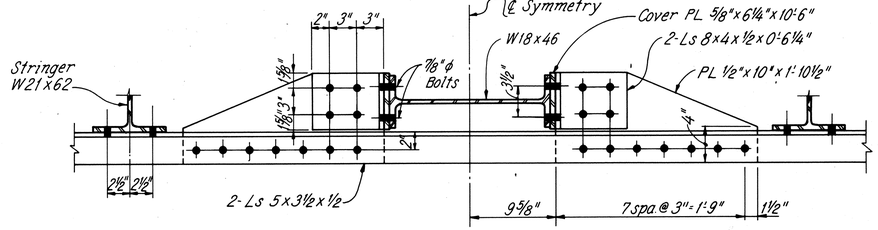
EXPANSION TONGUE DETAIL
AT PANEL POINT 12



EXPANSION TONGUE DETAIL
AT PANEL POINT 35



SECTION C-C



SECTION D-D

NOTES

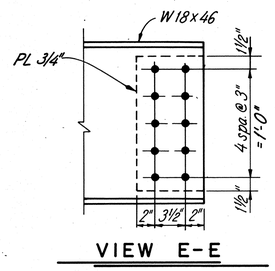
MATERIALS *shown are new unless otherwise noted.*

BOLTS *shown are 1"ϕ unless otherwise noted.*

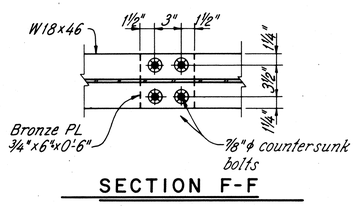
BOLT LEGEND: *See sheet* 20/81 .

STRINGER & DIAPHRAGM DETAILS: *See sheet* 29/81 *and* 30/81 .

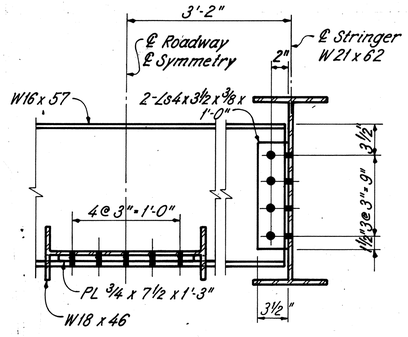
REMOVAL DETAILS: *See sheet* 22/81



VIEW E-E



SECTION F-F



SECTION G-G

LEGEND

Existing material

New material

34/81

RICHLAND ENGINEERING LIMITED
MANSFIELD, OHIO

EXPANSION TONGUE DETAILS

SUPERSTRUCTURE
BRIDGE NO. LOR-611-0358
OVER BLACK RIVER

LORAIN COUNTY S.R. 611

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
RDN	JPS	JPS	DAP	DHT	9/6/88	

AS BUILT 6/91

FHWA REGION	STATE	PROJECT	
5	OHIO		

50

LORAIN COUNTY
LOR-611-03.57

NOTES

BOLTS: shall be 1"ϕ unless otherwise noted.

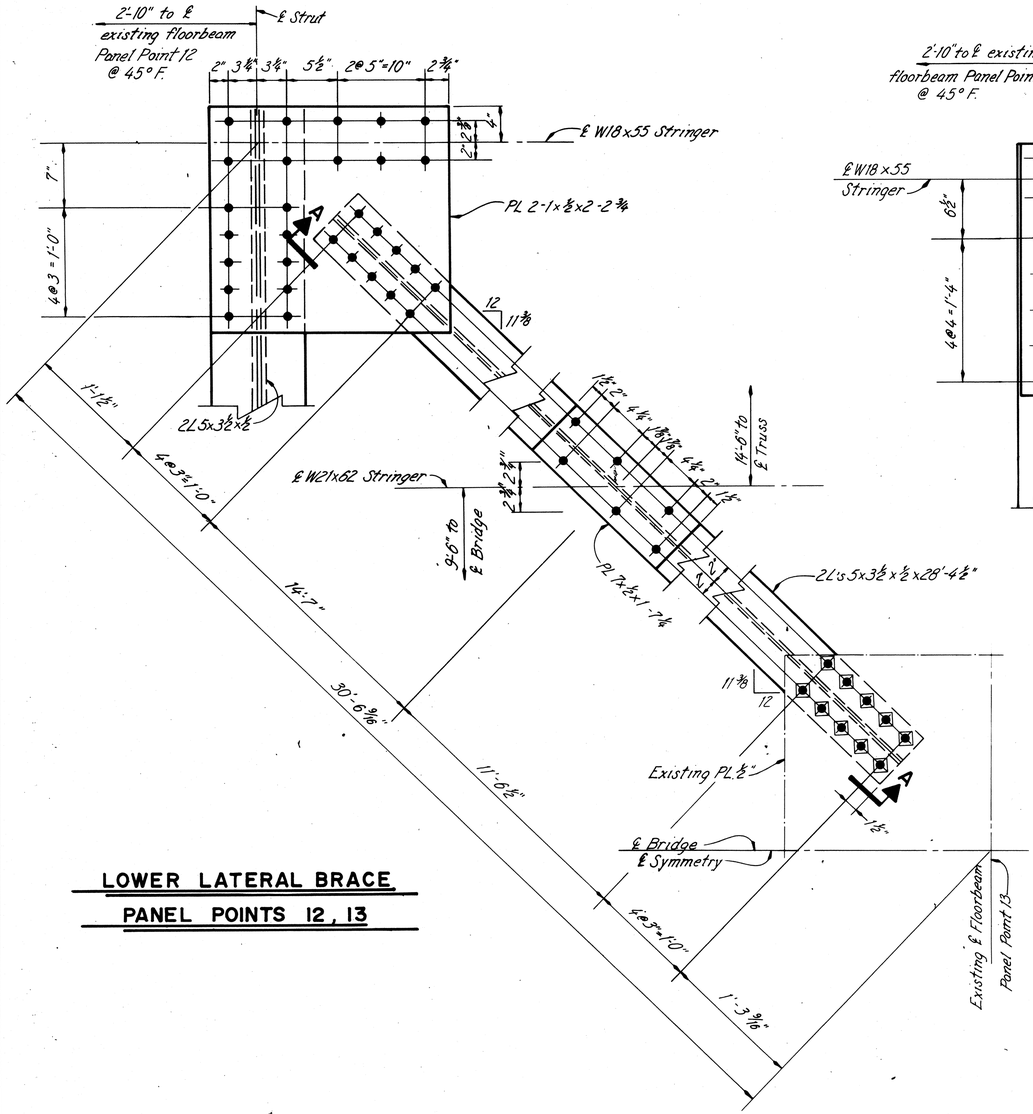
EXISTING HOLES in existing reused material shall be used for locating new bolts. Existing connections are ⅞"ϕ rivets.

FRAMING PLANS: See sheets 25/81 and 26/81.

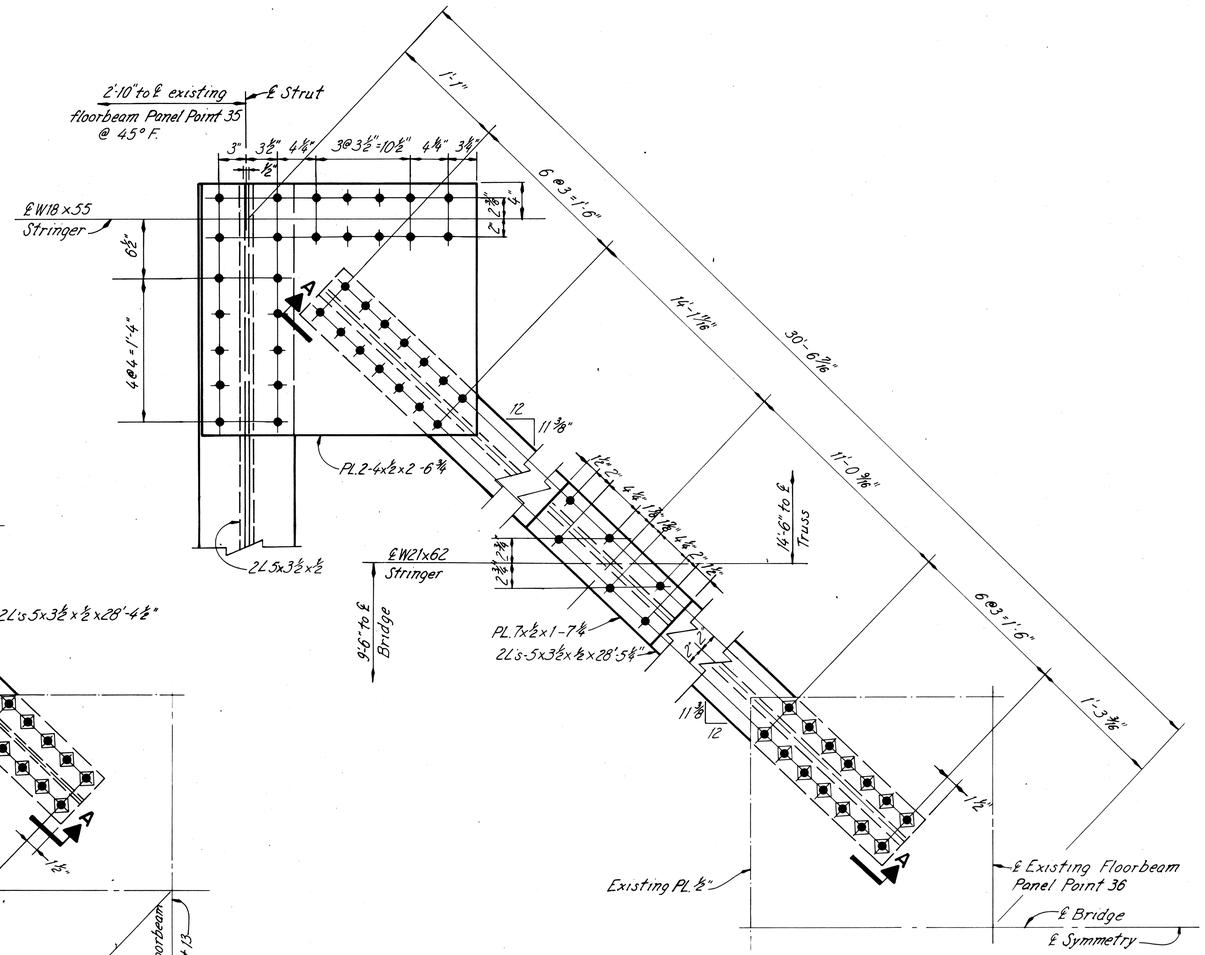
STRINGER DETAILS: See sheets 27/81 thru 33/81.

BOLT LEGEND: See Sheet 20/81.

MATERIALS shown are new unless otherwise noted.



LOWER LATERAL BRACE
PANEL POINTS 12, 13

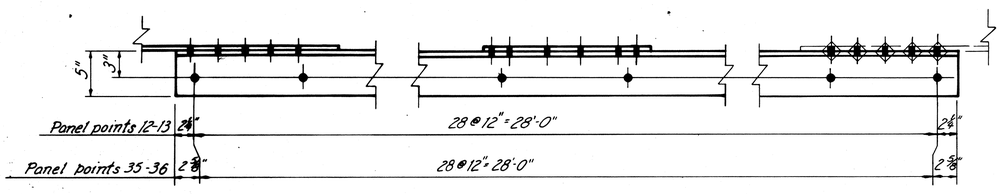


LOWER LATERAL BRACE
PANEL POINTS 35, 36

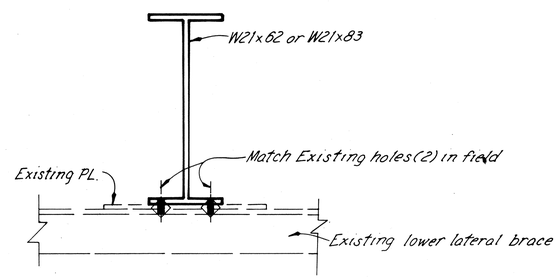
LEGEND

Existing material

New material



SECTION A-A



STRINGER TO LOWER LATERAL BRACE CONNECTION

Typical @ 38 Locations

35/81

RICHLAND ENGINEERING LIMITED
MANSFIELD, OHIO

LOWER LATERAL BRACING DETAILS - 1
SUPERSTRUCTURE
BRIDGE NO. LOR-611-0358
OVER BLACK RIVER
LORAIN COUNTY S.R.611

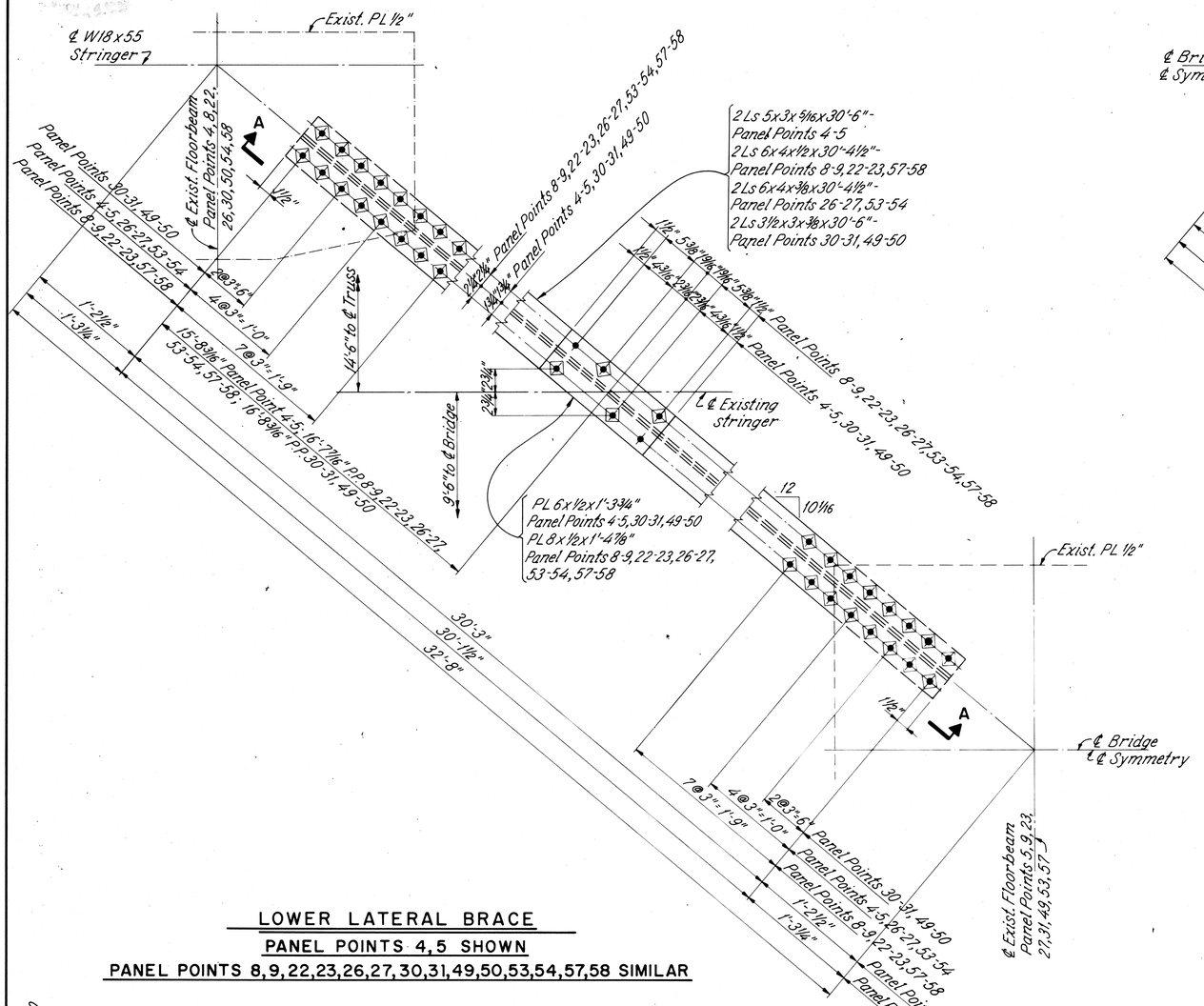
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
RDN	RDN	EFW	DAP	DHT	9/6/88	

AS BUILT 6/91

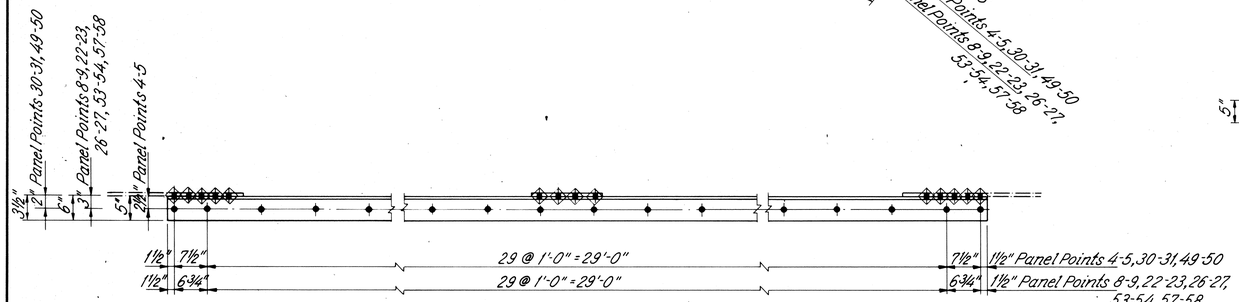
FHWA REGION	STATE	PROJECT	
5	OHIO		

51

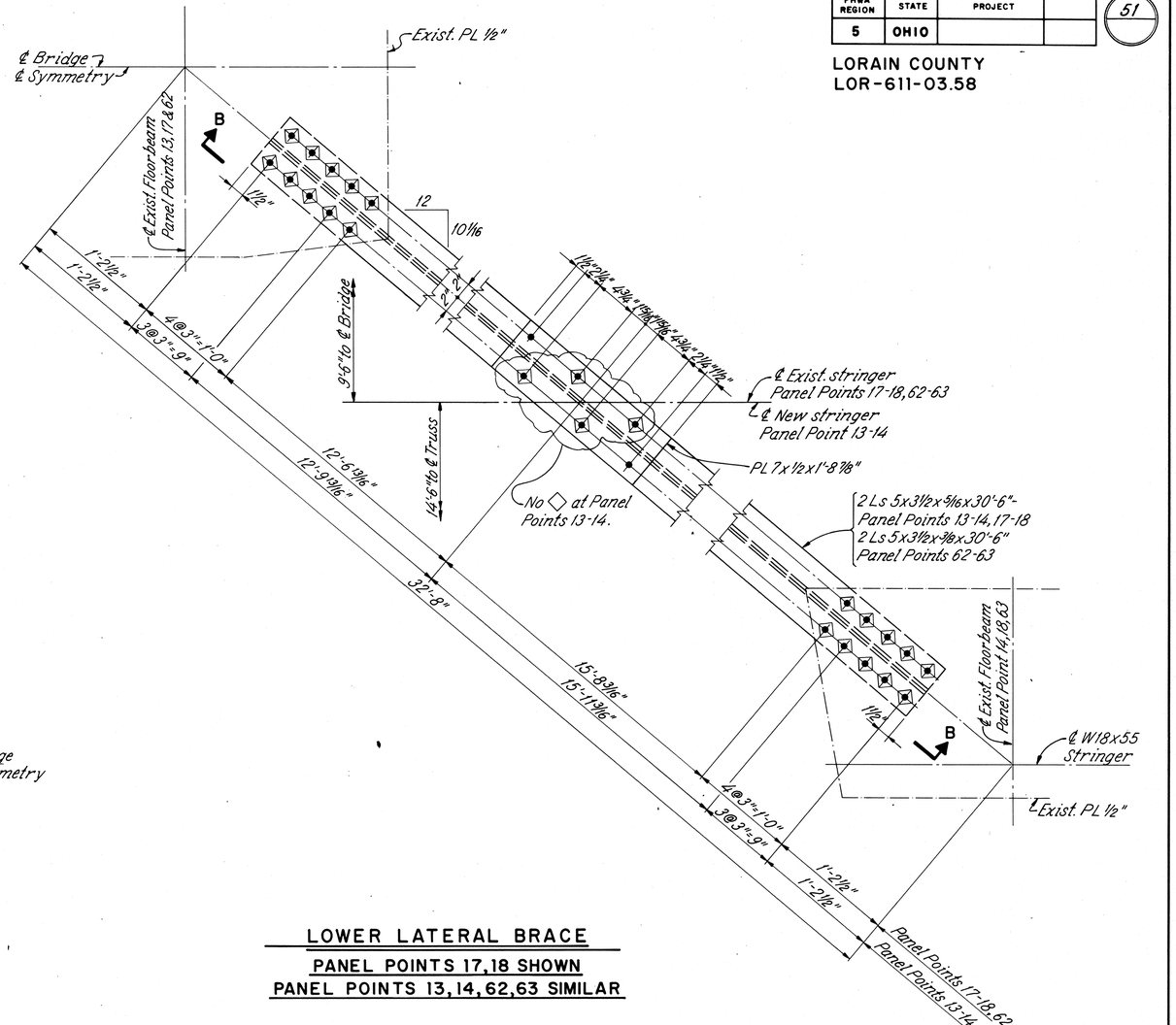
LORAIN COUNTY
LOR-611-03.58



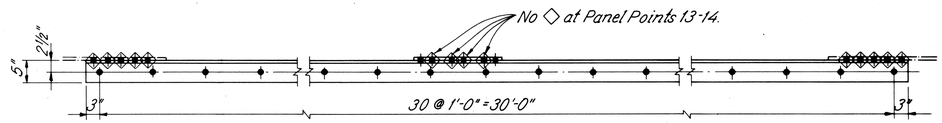
LOWER LATERAL BRACE
PANEL POINTS 4,5 SHOWN
PANEL POINTS 8,9,22,23,26,27,30,31,49,50,53,54,57,58 SIMILAR



SECTION A-A



LOWER LATERAL BRACE
PANEL POINTS 17,18 SHOWN
PANEL POINTS 13,14,62,63 SIMILAR



SECTION B-B

NOTES: See sheet 35/81.

36/81

RICHLAND ENGINEERING LIMITED
MANSFIELD, OHIO

LOWER LATERAL BRACING
DETAILS - 2
SUPERSTRUCTURE
BRIDGE NO. LOR-611-0358
OVER BLACK RIVER

LORAIN COUNTY S.R. 611

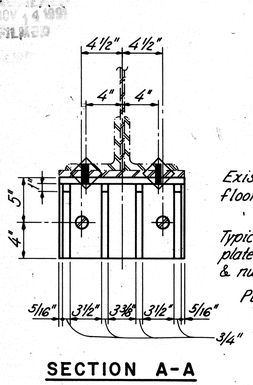
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
RON	RON	RHU	DAP	DHT	9/6/88	

AS BUILT 6/91

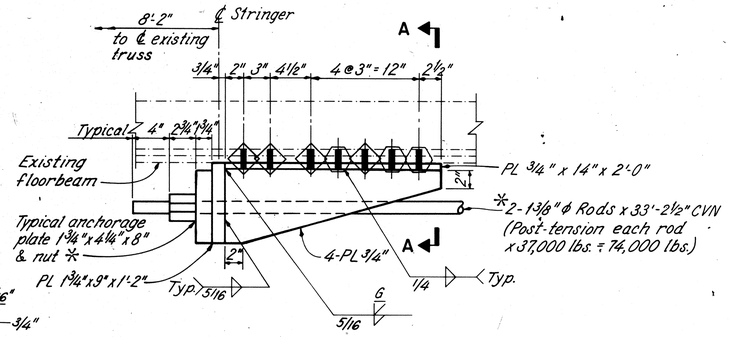
FHWA REGION	STATE	PROJECT	
5	OHIO		

52

LORAIN COUNTY
LOR-611-3.57



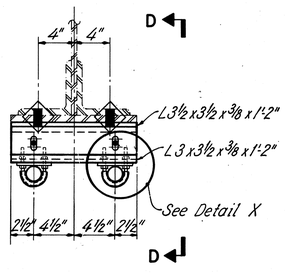
SECTION A-A



ELEVATION

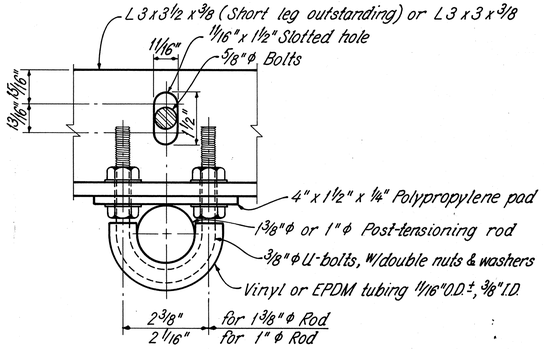
FLOORBEAM POST-TENSIONING BRACKET NO. 1

(PANELS 1,3,5,7,9,11,13,15,17,19,21,23,25,27,29,31,33,34,46,47,49,51,53, 55,57,59,61,63,65,67 = 30 TOTAL)



GUIDE NO. 1

(AT BRKT. NO. 1 & 3 LOCATIONS)



DETAIL X

NOTES

MATERIALS shown are new unless otherwise noted.

EXISTING HOLES in existing reused material shall be used for locating new bolts. Existing connectors are ⅞" ϕ rivets.

CONNECTION BOLTS shall be 1" ϕ unless otherwise noted.

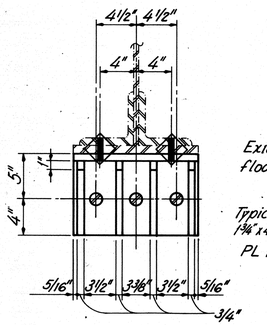
TRANSVERSE SECTION: See sheet 20/81.

FRAMING PLAN: See sheets 25/81 & 26/81.

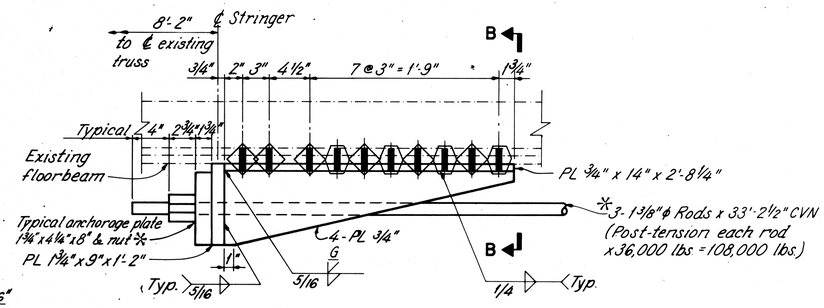
POST-TENSIONING RODS: See General Notes sheet 10/81.

BOLT LEGEND: See sheet 20/81.

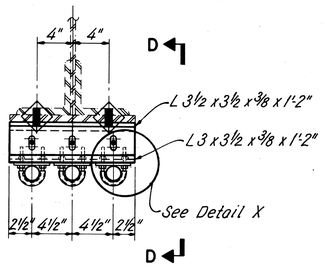
CVN: See note sheet 10/81.



SECTION B-B



ELEVATION

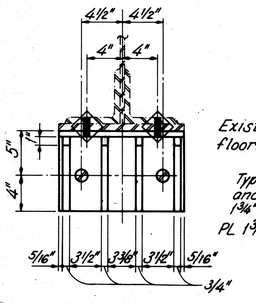


GUIDE NO. 2

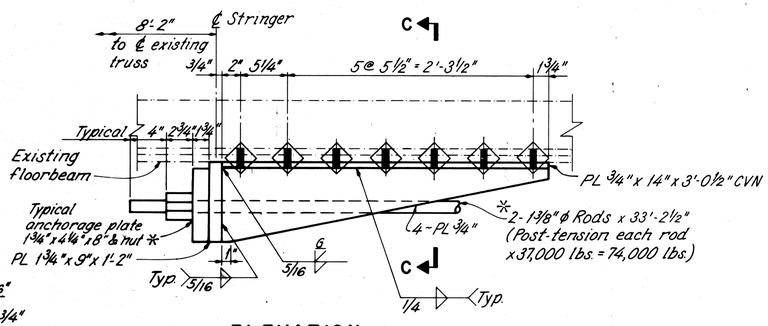
(AT BRKT. NO. 2, LOCATIONS)

FLOORBEAM POST-TENSIONING BRACKET NO. 2

(PANELS 36,38,40,42,44 = 5 TOTAL)



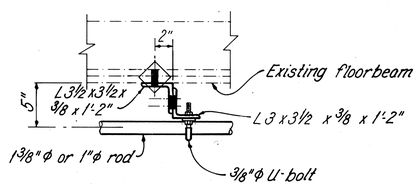
SECTION C-C



ELEVATION

FLOORBEAM POST-TENSIONING BRACKET NO. 3

(PANEL 35)



SECTION D-D

LEGEND

Existing material

New material

* To be included with Item Special, Post-tensioning rod, for payment.

37/81

RICHLAND ENGINEERING LIMITED
MANSFIELD, OHIO

FLOORBEAM STRENGTHENING POST-TENSIONING DETAILS
SUPERSTRUCTURE
BRIDGE NO. LOR-611-0358
OVER BLACK RIVER
LORAIN COUNTY S.R. 611

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
RDN	RDN	JLS	DAP	DHT	9/16/88	10/3/88

AS BUILT 6/91

FHWA REGION	STATE	PROJECT	
5	OHIO		

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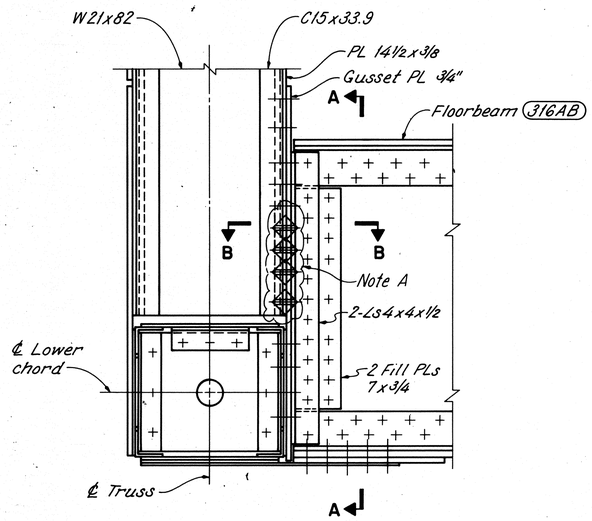
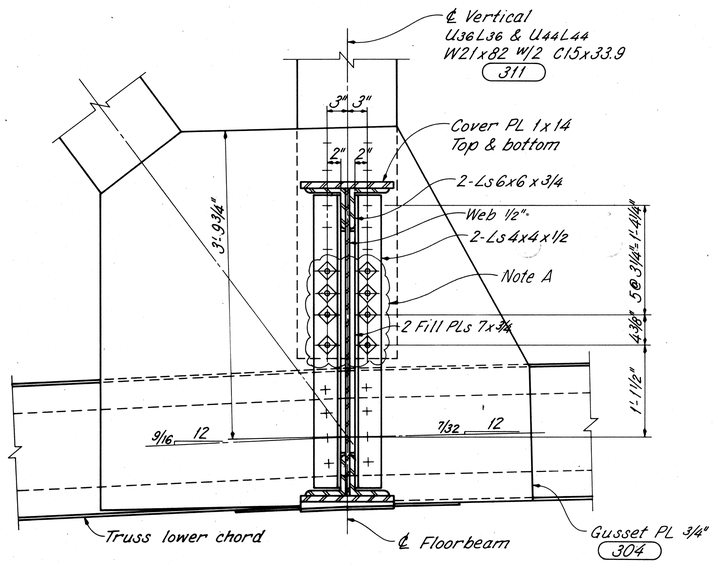
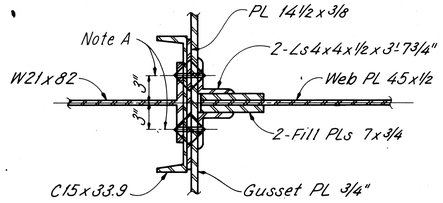
LORAIN COUNTY
LOR-611-3.57



ELEVATION



SECTION A-A - (East truss and West truss)



SECTION B-B

NOTES

MATERIALS shown are existing unless otherwise noted.

EXISTING HOLES in existing reused materials shall be used for locating new bolts. Existing connectors are 7/8"ϕ rivets.

NEW BOLTS shall be 1"ϕ unless otherwise noted.

FRAMING PLAN: See sheet (26/81).

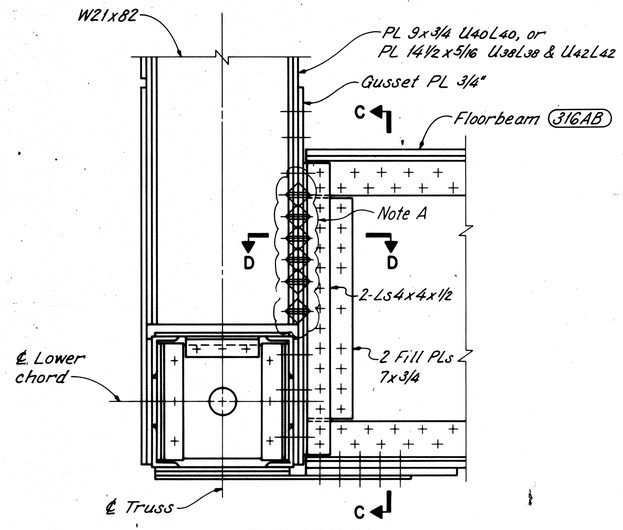
BOLT LEGEND: See sheet (20/81).

(000) indicates shop drawing sheet number where member is detailed.

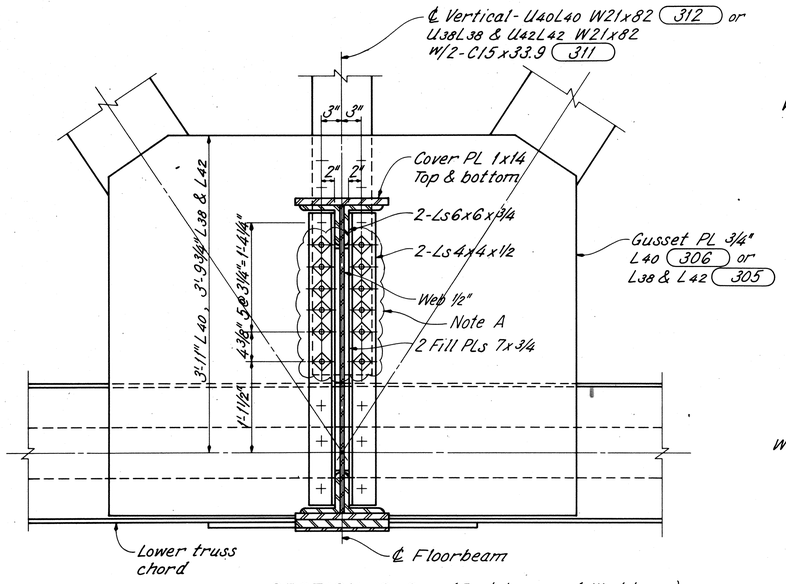
NOTE A: Remove existing rivet and install new bolt only. No other new material.

FLOORBEAM TO TRUSS CONNECTION-PANEL POINT 36(SHOWN)

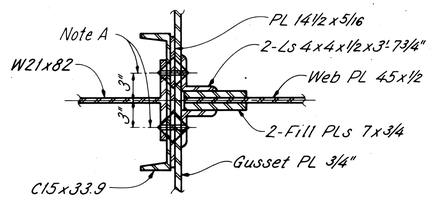
PANEL POINT 44(OPPOSITE HAND)



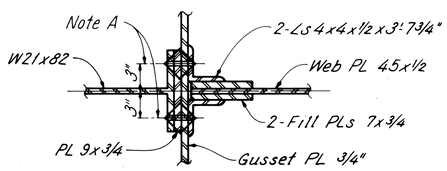
ELEVATION



SECTION C-C - (East truss and West truss)



SECTION D-D
L38 & L42



SECTION D-D
L40

FLOORBEAM TO TRUSS CONNECTION-PANEL POINT 40(SHOWN)

PANEL POINTS 38,42(SIMILAR)

RICHLAND ENGINEERING LIMITED
MANSFIELD, OHIO

38/81

FLOORBEAM STRENGTHENING CONNECTION DETAILS
SUPERSTRUCTURE
BRIDGE NO. LOR-611-0358
OVER BLACK RIVER
LORAIN COUNTY S.R. 611

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
RDN	JLS	JLS	DAP	DHT	3/6/88	

AS BUILT 6/91

FHWA REGION	STATE	PROJECT	
5	OHIO		

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LORAIN COUNTY
LOR-611-3.57

NOTES

MATERIALS shown are existing unless otherwise noted.

EXISTING HOLES in existing reused material shall be used for locating new bolts. Existing connectors are 7/8"ϕ rivets.

CONNECTION BOLTS shall be 1"ϕ unless otherwise noted.

BOLT LEGEND: See sheet 20/81.

POST-TENSIONING RODS: See General Notes sheet 10/81.

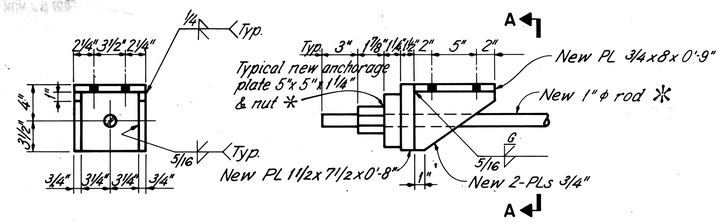
GENERAL PLAN: See sheet 1/81 for members to be strengthened.

CVN: See note sheet 10/81.

DETAIL X: See sheet 37/81

POURED POLYURETHANE AND FOAM BACKUP: See General Notes sheet 10/81 for pay item description

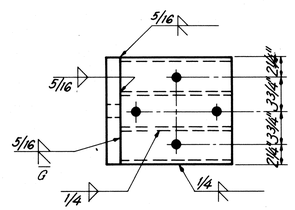
POST TENSIONING FORCE	
WEST TRUSS MEMBER	EACH ROD(LBS)
L9 U10	26,000
U13 L14	5,000
U34 L35	33,000
U45 U46	33,000
U35 L36	16,000
L44 U45	16,000
L66 U67	5,000
U31 U32	29,000
U48 U49	29,000
U32 U33	25,000
U47 U48	25,000
L38 L39	5,000
L41 L42	5,000
L39 L40	37,000
L40 L41	37,000



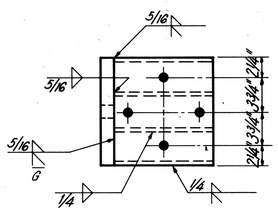
SECTION A-A ELEVATION

TRUSS POST-TENSIONING BRACKET NO. 1

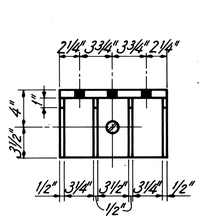
(L9 U10, U13 L14, U34 L35, U35 L36, L44 U45, L45 U46, L66 U67, U31 U32, U48 U49, L38 L39, L39 L40, L40 L41, L41 L42 - 52 total required)



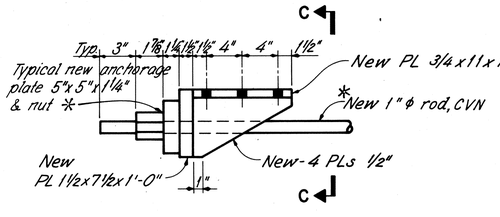
PLAN



PLAN



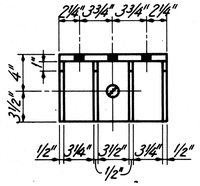
SECTION C-C



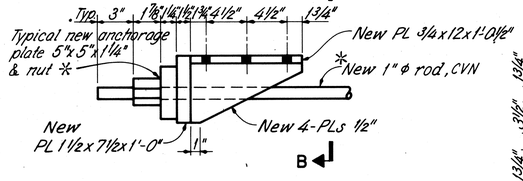
ELEVATION

TRUSS POST-TENSIONING BRACKET NO. 3

(U32 U33 & U47 U48 - 4 total required)



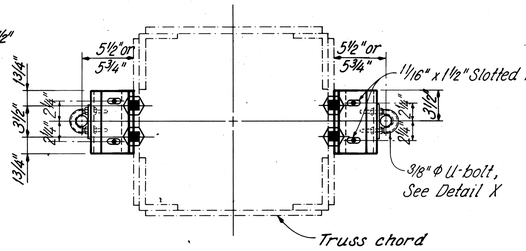
SECTION B-B



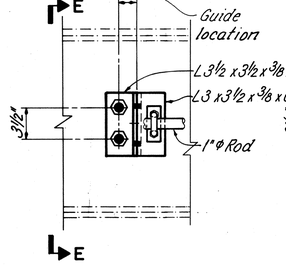
ELEVATION

TRUSS POST-TENSIONING BRACKET NO. 2

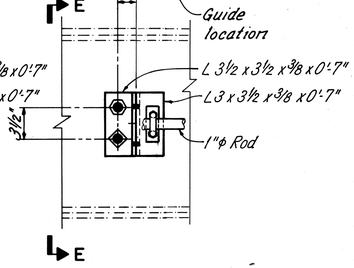
(U32 U33 & U47 U48 - 4 total required)



SECTION E-E



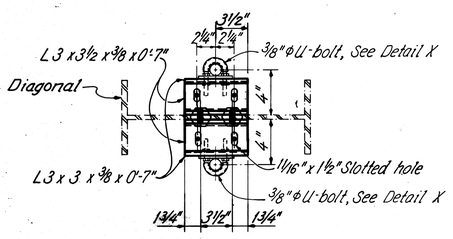
ELEVATION 1
(4 locations)



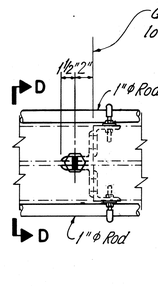
ELEVATION 2
(4 locations)

TRUSS UPPER & LOWER CHORD GUIDE

(8 Locations)



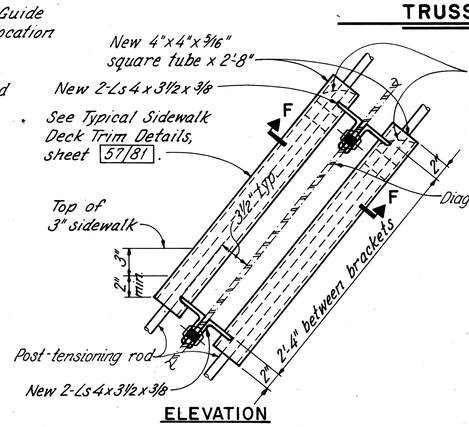
SECTION D-D



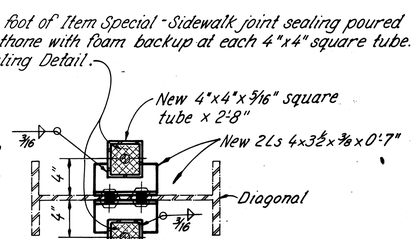
ELEVATION

TRUSS DIAGONAL TOP GUIDE

(14 Locations)



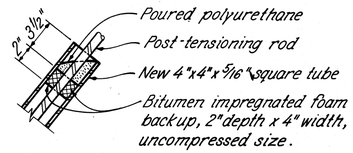
ELEVATION



SECTION F-F

TRUSS DIAGONAL BOTTOM GUIDE

(7 Locations)



SEALING DETAIL

LEGEND

Existing material

New material

* To be included with Item Special, Post-tensioning rod, for payment.

RICHLAND ENGINEERING LIMITED
MANSFIELD, OHIO

39/81

TRUSS MEMBER STRENGTHENING POST-TENSIONING-1
SUPERSTRUCTURE
BRIDGE NO. LOR-611-0358
OVER BLACK RIVER

LORAIN COUNTY S.R. 611

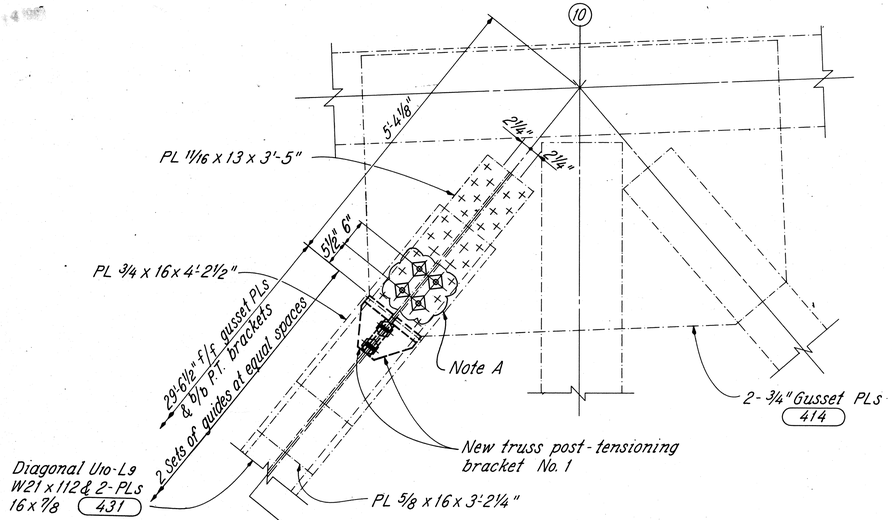
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
RDN	RDN	JLS	DAP	DHT	3/16/88	10/3/88

AS BUILT 6/91

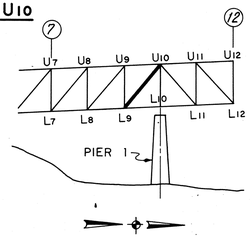
FHWA REGION	STATE	PROJECT	
5	OHIO		

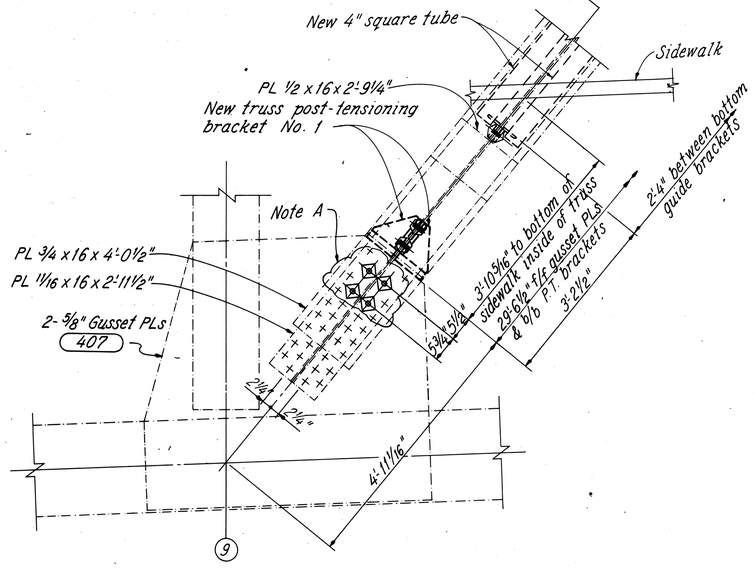
55

LORAIN COUNTY
LOR-611-3.57

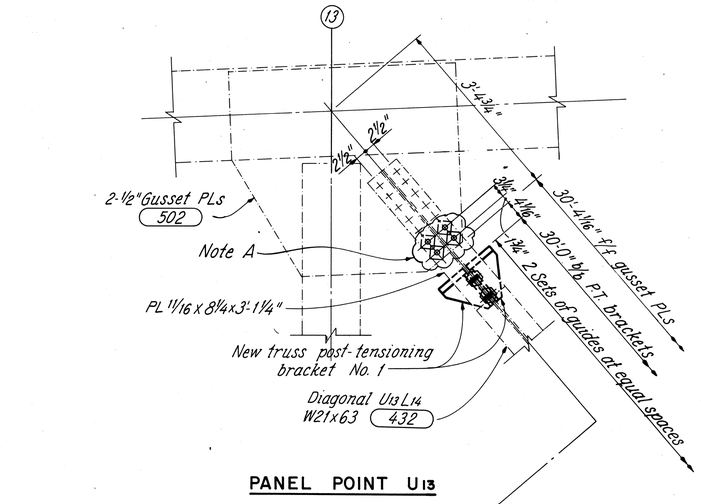


PANEL POINT U10

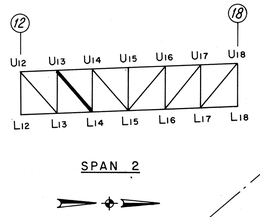


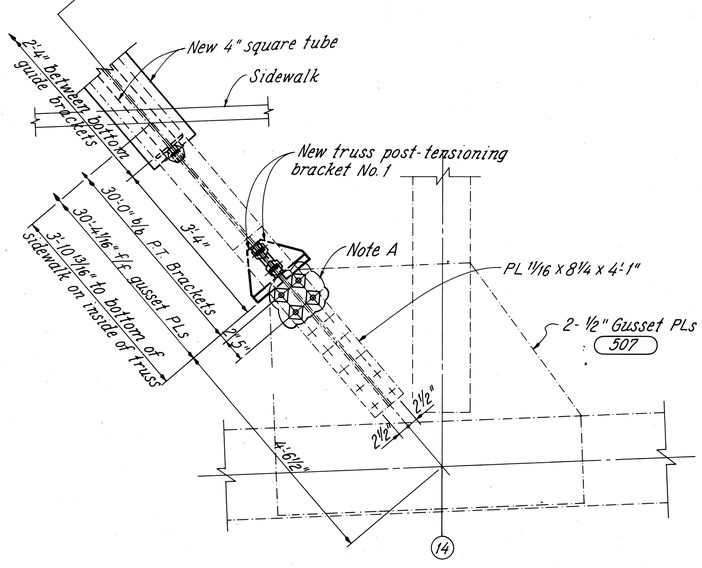


PANEL POINT L9



PANEL POINT U13





PANEL POINT L14

WEST TRUSS DIAGONALS

NOTES

(000) indicates shop drawing sheet number where member is detailed.

ADDITIONAL NOTES & DETAILS: See sheet 39/81.

P.T. - Post tensioning

NOTE A: Remove existing rivet and install new bolt only. No other new material. Inside and outside members.

LEGEND

- Existing material
- New material

40/81

RICHLAND ENGINEERING LIMITED
MANSFIELD, OHIO

TRUSS MEMBER STRENGTHENING POST-TENSIONING-2
SUPERSTRUCTURE
BRIDGE NO. LOR-611-0358
OVER BLACK RIVER

LORAIN COUNTY S.R. 611

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
RDN	RDN	JLS	DAP	DHT	9/6/88	10/3/88

AS BUILT 6/91

FHWA REGION	STATE	PROJECT	
5	OHIO		

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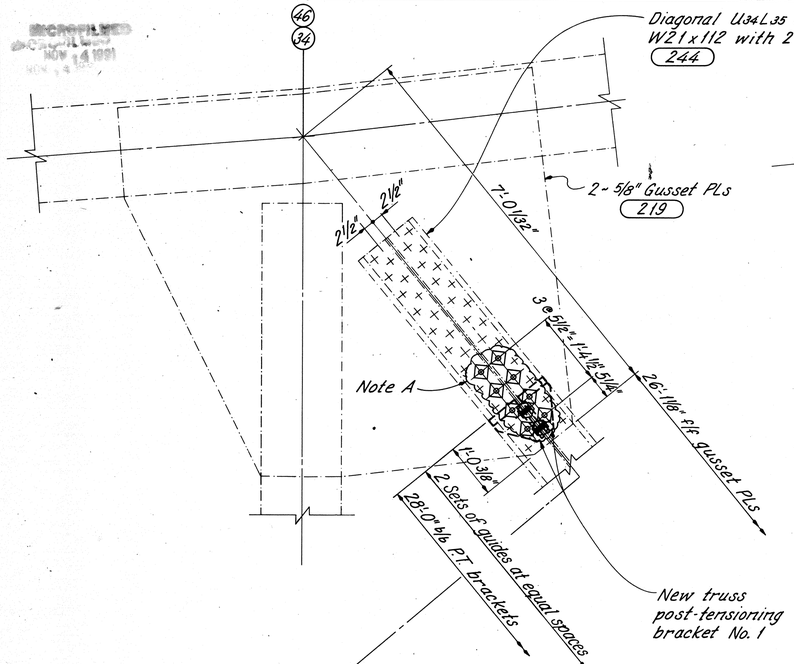
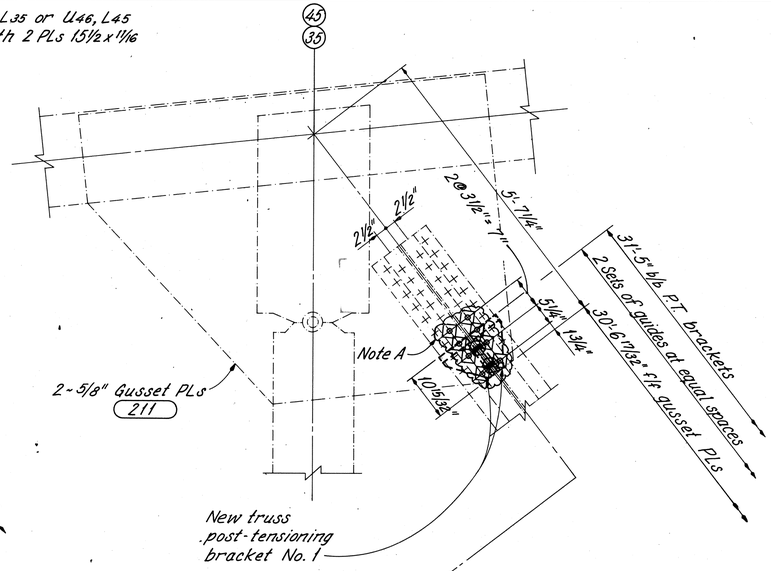
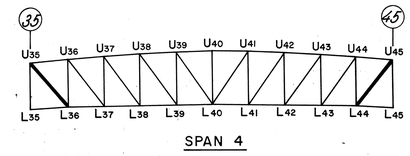
LORAIN COUNTY
LOR-611-3.57



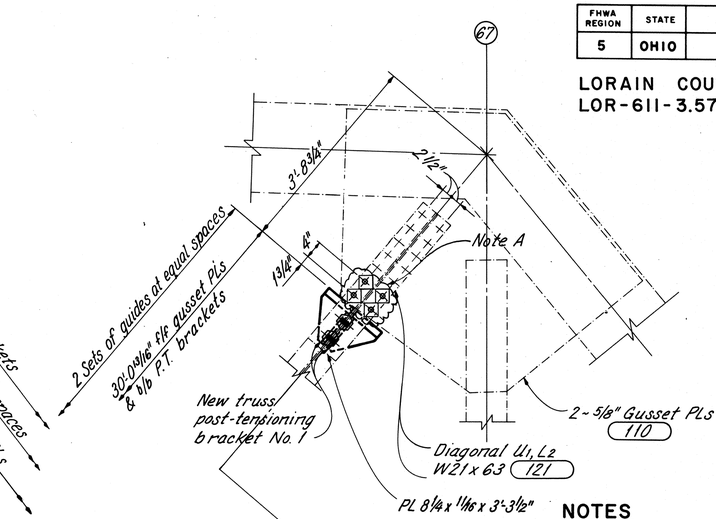
PANEL POINT U34 (SHOWN), U46 (OPPOSITE HAND)



PANEL POINT U35 (SHOWN), U45 (OPPOSITE HAND)



SPAN 4



PANEL POINT U67

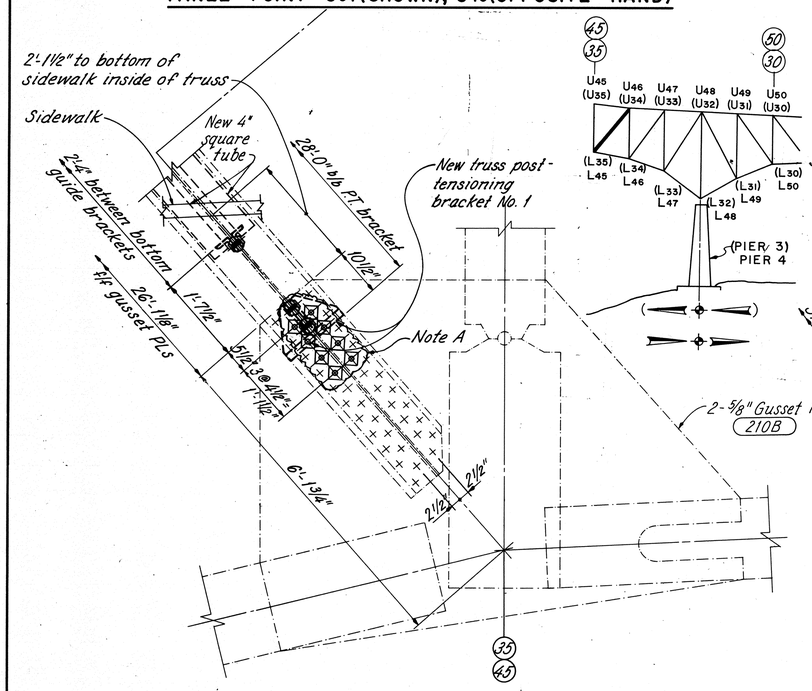
NOTES

NOTE A: Remove existing rivet and install new bolt only. No other new material. Inside and outside members.

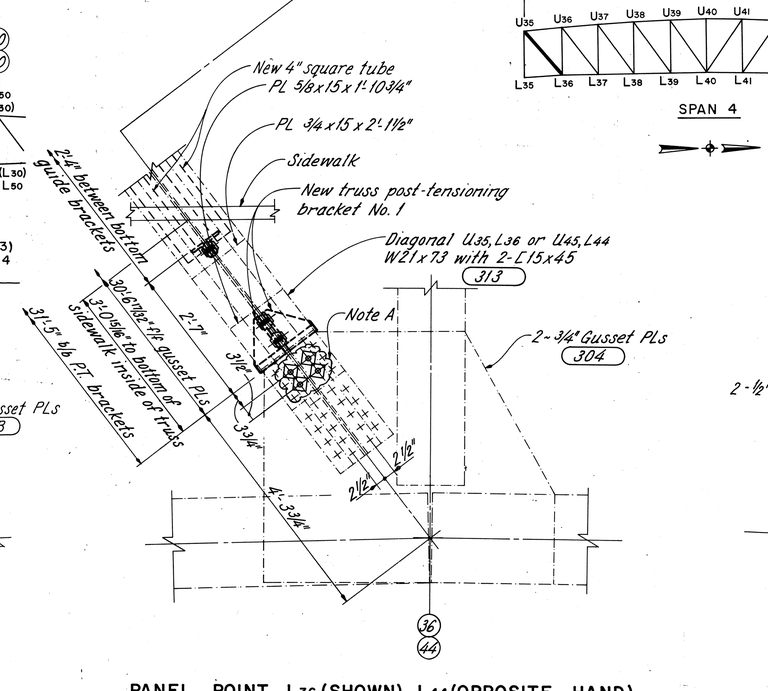
(000) indicates shop drawing sheet number where member is detailed.

ADDITIONAL NOTES & DETAILS: See sheet 39/81.

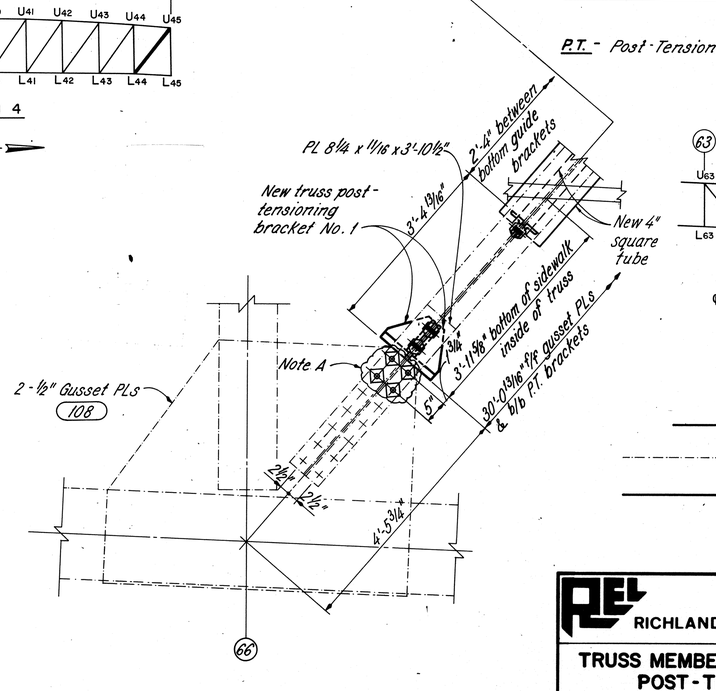
P.T. - Post-Tensioning



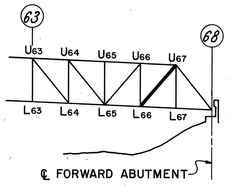
PANEL POINT L35 (SHOWN), L45 (OPPOSITE HAND)



PANEL POINT L36 (SHOWN), L44 (OPPOSITE HAND)



PANEL POINT L66



LEGEND

Existing material

New material

WEST TRUSS DIAGONALS

41/81

RICHLAND ENGINEERING LIMITED
MANSFIELD, OHIO

TRUSS MEMBER STRENGTHENING
POST-TENSIONING-3
SUPERSTRUCTURE
BRIDGE NO. LOR-611-0358
OVER BLACK RIVER

LORAIN COUNTY — S.R. 611

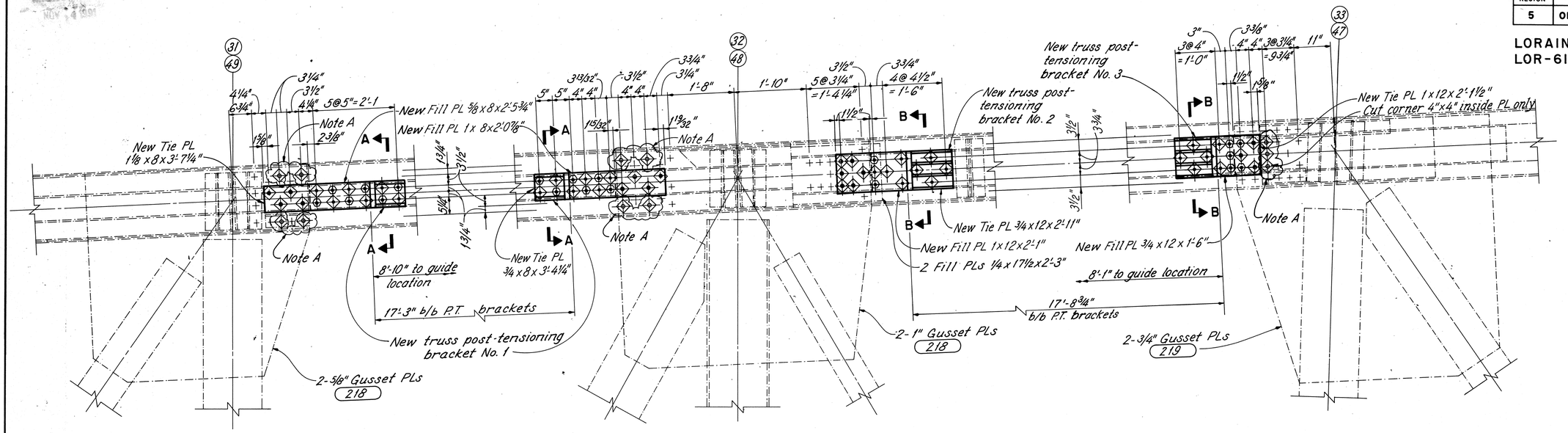
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
RON	RON	JLS	DAP	DHT	9/16/88	10/3/88

AS BUILT 6/91

FHWA REGION	STATE	PROJECT	
5	OHIO		

57

LORAIN COUNTY
LOR-611-3.57



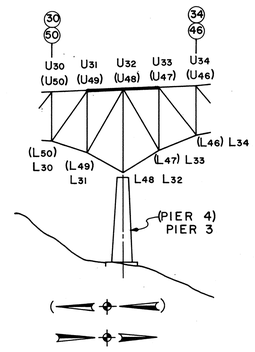
PANEL POINT U31 (SHOWN), U49 (OPPOSITE HAND)

PANEL POINT U32 (SHOWN), U48 (OPPOSITE HAND)

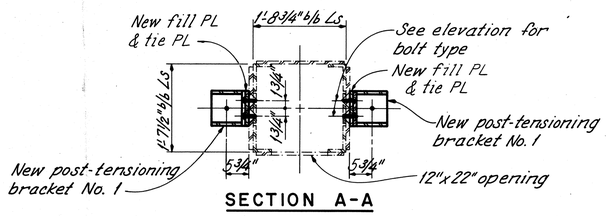
PANEL POINT U33 (SHOWN), U47 (OPPOSITE HAND)

Main Material U31, U32 & U48, U49
4-Ls 6 x 4 x ⅝
2-Web PLs 19 x ⅞
2-Fill PLs 7 x ½
2-Cover PLs 20 x ⅝
(218)

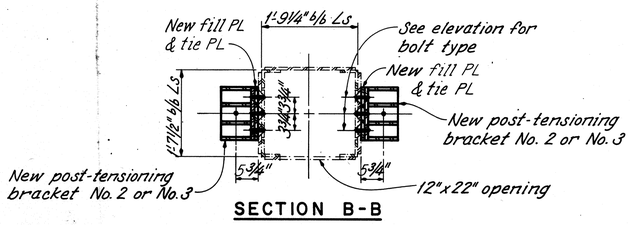
Main Materials U32, U33 & U47, U48
4-Ls 4 x 4 x 9/16
2-Web PLs 19 x ⅝
2-Fill PLs 11 x ⅝
2-Cover PLs 20 x ½
(219)



WEST TRUSS UPPER CHORD



SECTION A-A



SECTION B-B

NOTES

(000) *indicates shop drawing sheet number where member is detailed.*

ADDITIONAL NOTES & DETAILS: See sheet 39/81.

P.T. - Post Tension

NOTE A: Remove existing rivet and install new bolt only. No other new material. Inside and outside members.

LEGEND

Existing material

New material

42/81

RICHLAND ENGINEERING LIMITED
MANSFIELD, OHIO

TRUSS MEMBER STRENGTHENING
POST-TENSIONING-4
SUPERSTRUCTURE
BRIDGE NO. LOR-611-0358
OVER BLACK RIVER

LORAIN COUNTY S.R. 611

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
RDN	RDN	JLS	DAP	DHT	9/6/88	

AS BUILT 6/91

FHWA REGION	STATE	PROJECT	
5	OHIO		

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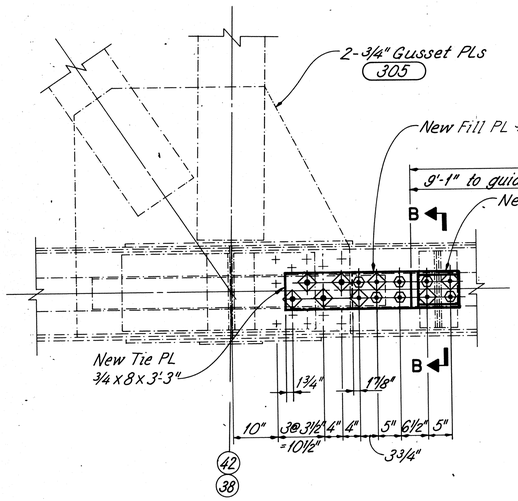
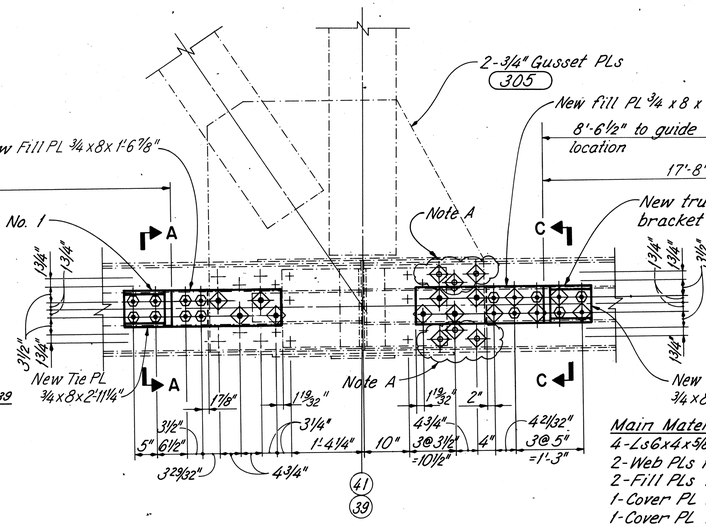
LORAIN COUNTY
LOR-611-3.57



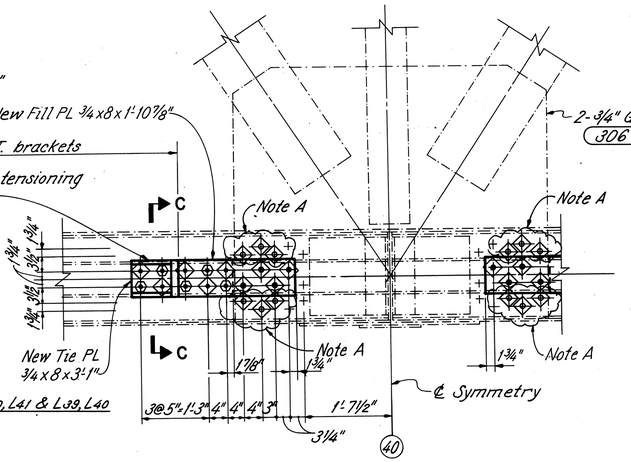
PANEL POINT L38 (SHOWN), L42 (OPPOSITE HAND)

Main Materials L42, L41 & L38, L39
4-Ls 6 x 4 x 5/8
2-Web PLs 19 x 13/16
1-Cover PL 20 x 1/2
1-Cover PL 20 x 5/8
305 306



PANEL POINT L39 (SHOWN), L41 (OPPOSITE HAND)

Main Materials L40, L41 & L39, L40
4-Ls 6 x 4 x 5/8
2-Web PLs 19 x 13/16
2-Fill PLs 7 x 1/2
1-Cover PL 20 x 1/2
1-Cover PL 20 x 5/8
305 306



PANEL POINT L40

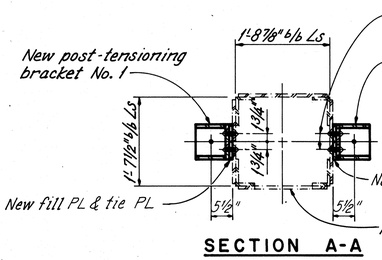
NOTES

000 indicates shop drawing sheet number where member is detailed.

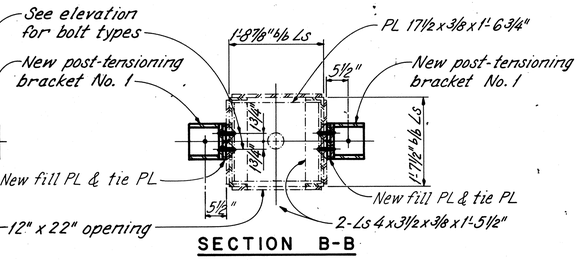
ADDITIONAL NOTES & DETAILS: See sheet 39/81.

P.T.- Post-Tensioning

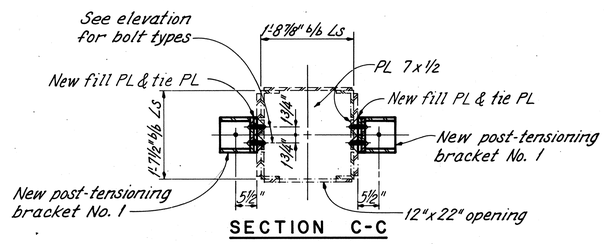
NOTE A: Remove existing rivet and install new bolt only. No other new material. Inside and outside members.



SECTION A-A

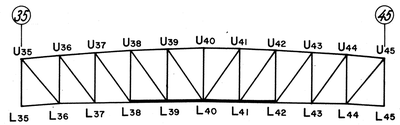


SECTION B-B



SECTION C-C

WEST TRUSS LOWER CHORD



SPAN 4

LEGEND

Existing material

New material

43/81

RICHLAND ENGINEERING LIMITED
MANSFIELD, OHIO

TRUSS MEMBER STRENGTHENING
POST-TENSIONING-5
SUPERSTRUCTURE
BRIDGE NO. LOR-611-0358
OVER BLACK RIVER

LORAIN COUNTY S.R. 611

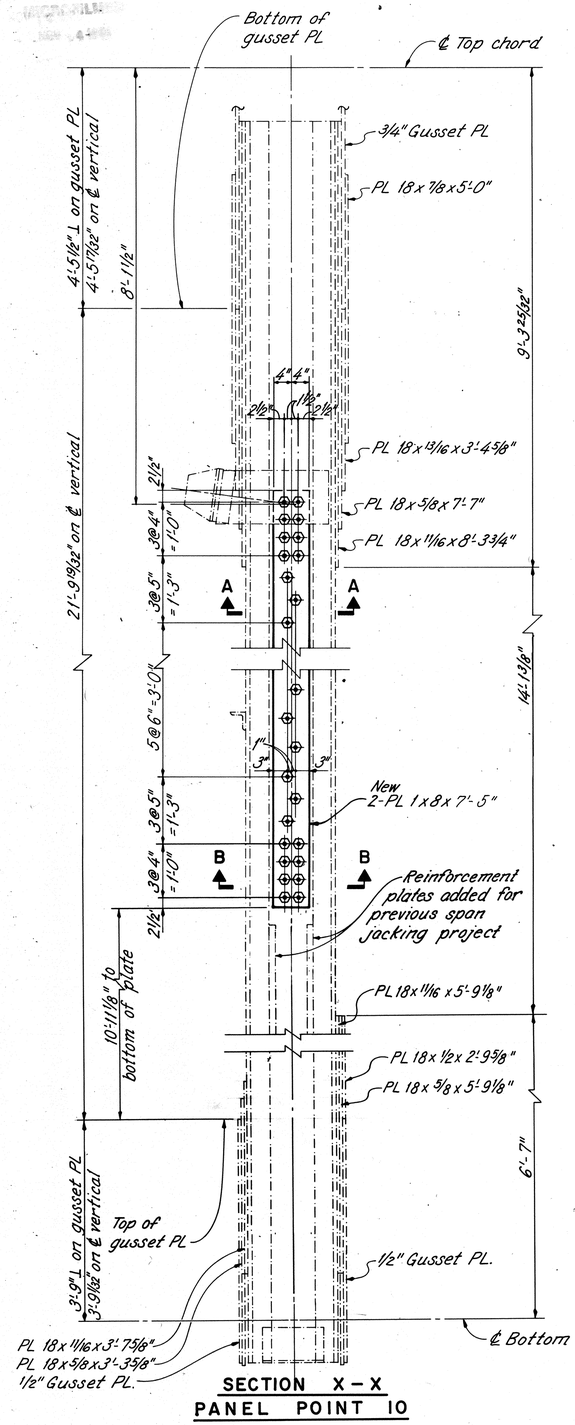
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
RDN	RDN	JLS	DAP	DHT	9/6/88	

AS BUILT 6/91

FHWA REGION	STATE	PROJECT	
5	OHIO		

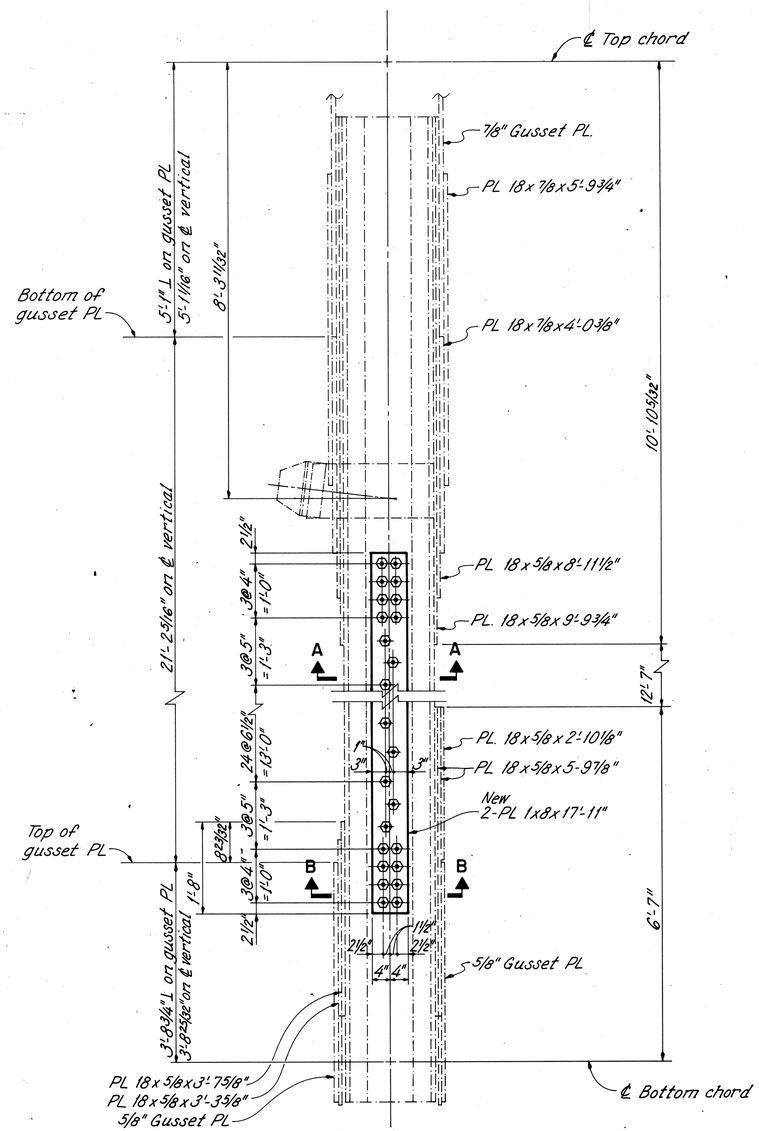
59

LORAIN COUNTY
LOR-611-3.57



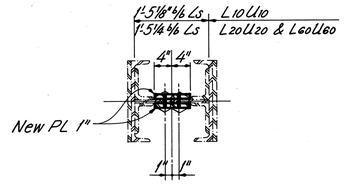
SECTION X-X
PANEL POINT 10

Main Material L10U10
2-C18x42.7
1-Web PL 16 1/2 x 11/16
2-Cover PLs 18 x 7/8
4-Ls 7 x 4 x 11/16
(423)

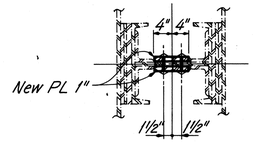


SECTION Y-Y
PANEL POINTS 20 & 60

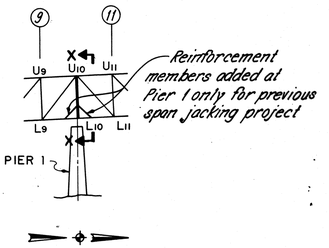
Main Material L20U20 & L60L60
2-C18x42.7
1-Web PL 16 3/4 x 9/16
2-Cover PLs 18 x 7/8
4-Ls 7 x 4 x 9/16
(231)

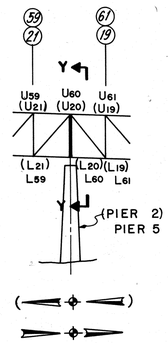


SECTION A-A



SECTION B-B





NOTES

BOLTS shall be 1" ϕ unless otherwise noted.

BOLT LEGEND: See sheet 20/81.

EXISTING HOLES in existing reused material shall be used for locating new bolts. Existing connectors are 7/8" ϕ rivets.

(000) indicates shop drawing sheet number where member is detailed.

MATERIALS shown are existing unless otherwise noted.

GENERAL PLAN: See sheet 1/81 for members to be strengthened.

LEGEND

——— New material
-·-·-·- Existing material

WEST TRUSS VERTICALS

44/81

RICHLAND ENGINEERING LIMITED
MANSFIELD, OHIO

TRUSS MEMBER STRENGTHENING ADDED PLATES - 1

SUPERSTRUCTURE
BRIDGE NO. LOR-611-0358
OVER BLACK RIVER
LORAIN COUNTY S.R. 611

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
RDN	JLS	JLS	DAP	DHT	9/16/98	

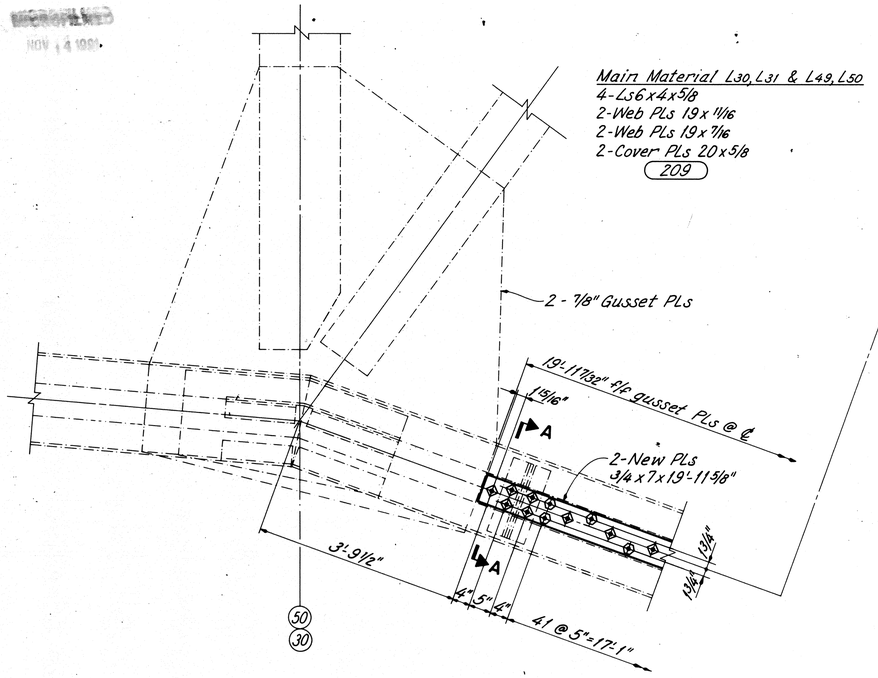
AS BUILT 6/91

FHWA REGION	STATE	PROJECT	
5	OHIO		

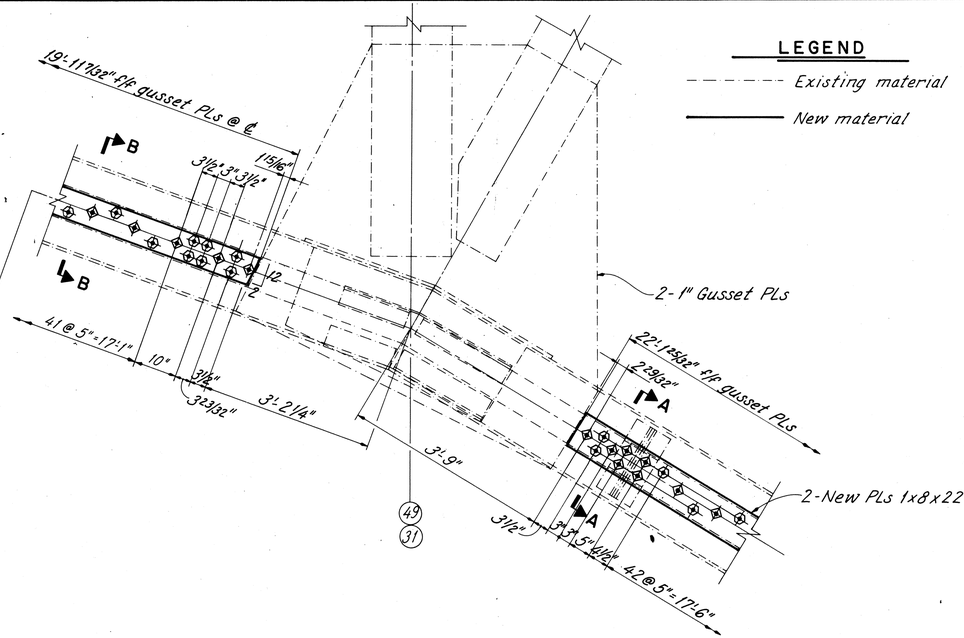
60

LORAIN COUNTY
LOR-611-3.57

Main Material L30, L31 & L49, L50
4-Ls6x4x5/8
2-Web Pls 19x 11/16
2-Web Pls 19x 7/16
2-Cover Pls 20x5/8
209



PANEL POINT L30 (SHOWN), L50 (OPPOSITE HAND)

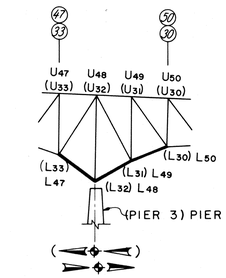


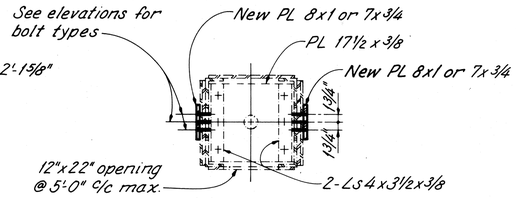
PANEL POINT L31 (SHOWN), L49 (OPPOSITE HAND)

LEGEND

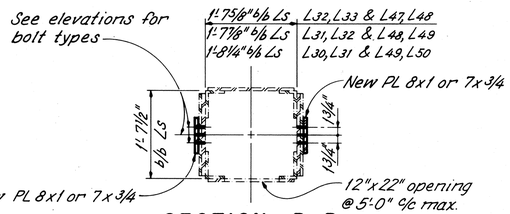
Existing material

New material

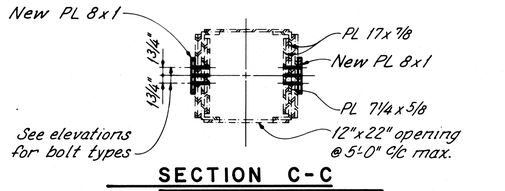




SECTION A-A



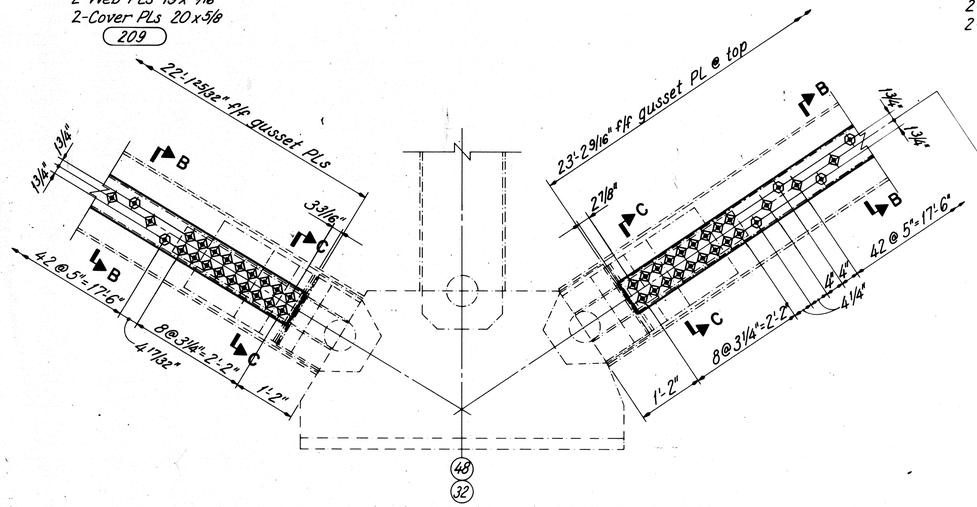
SECTION B-B



SECTION C-C

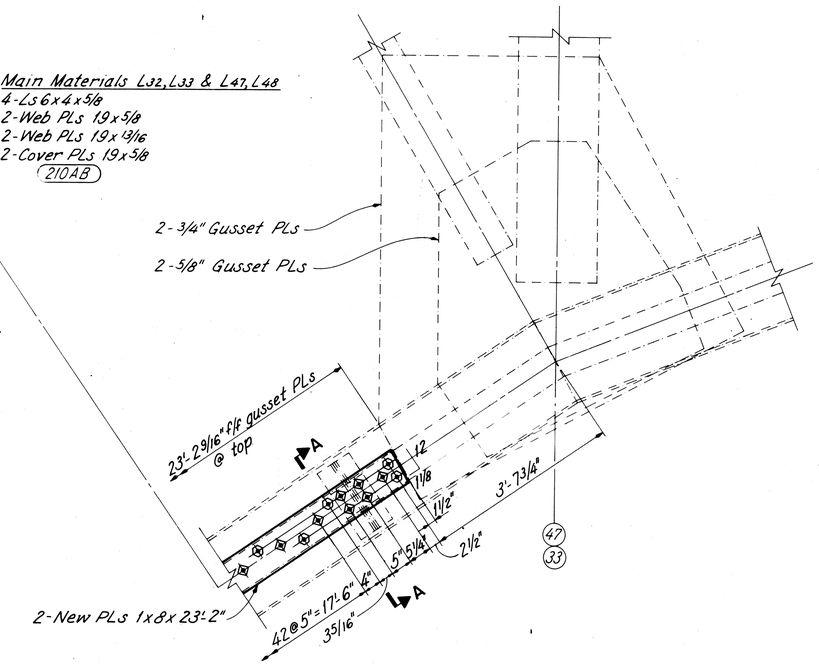
NOTES: See sheet 44/81.

Main Materials L31, L32 & L48, L49
4-Ls 6x4x5/8
2-Web PLs 19x5/8
2-Web PLs 19x 11/16
2-Cover PLs 20x5/8
209



PANEL POINT L32 (SHOWN), L48 (OPPOSITE HAND)

Main Materials L32, L33 & L47, L48
4-Ls 6x4x5/8
2-Web PLs 19x5/8
2-Web PLs 19x 13/16
2-Cover PLs 19x5/8
210AB



PANEL POINT L33 (SHOWN), L47 (OPPOSITE HAND)

WEST TRUSS LOWER CHORD

45/81

RICHLAND ENGINEERING LIMITED
MANSFIELD, OHIO

TRUSS MEMBER STRENGTHENING
ADDED PLATES - 2
SUPERSTRUCTURE
BRIDGE NO. LOR-611-0358
OVER BLACK RIVER
LORAIN COUNTY S.R. 611

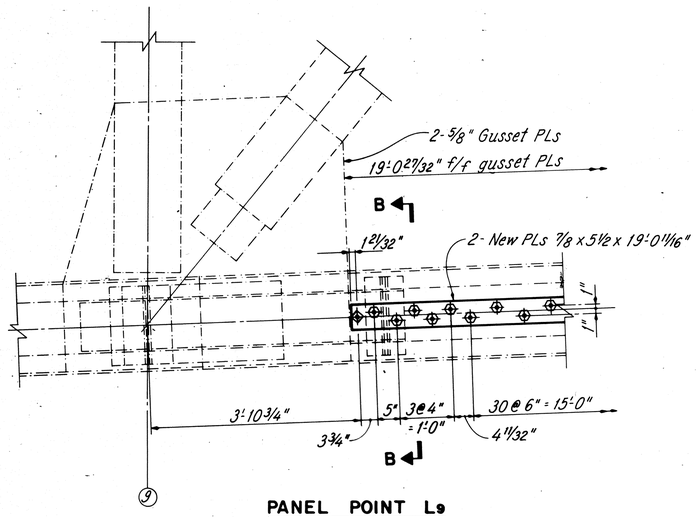
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
RDN	JLS	JLS	DAP	DHT	9/16/88	

AS BUILT 6/91

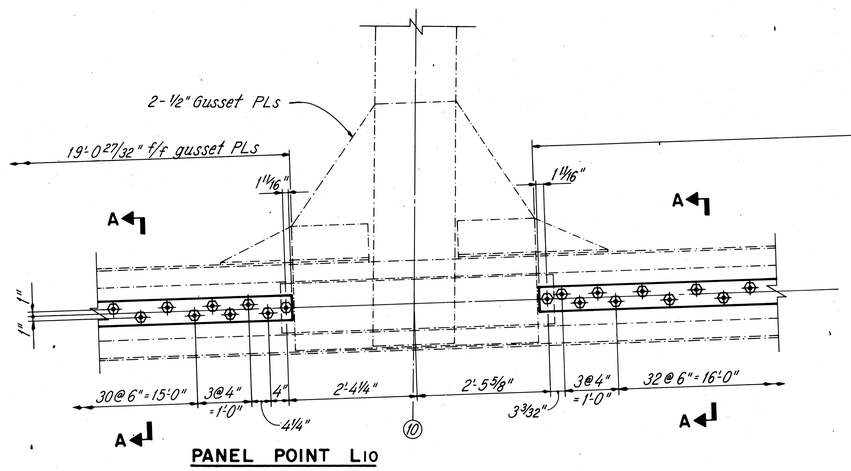
FHWA REGION	STATE	PROJECT	
5	OHIO		

61

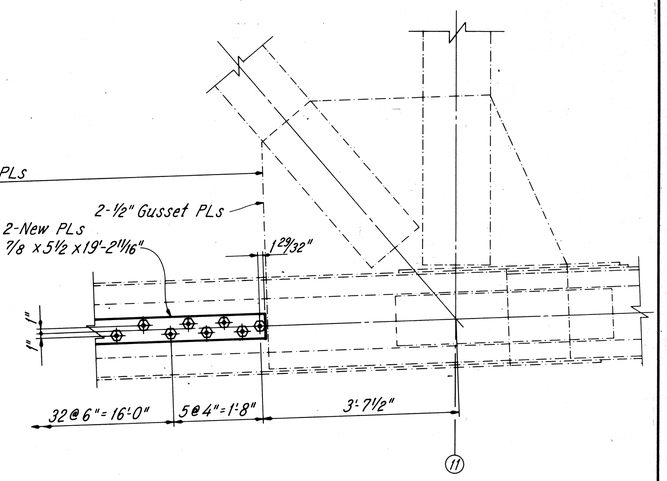
LORAIN COUNTY
LOR-611-3.57



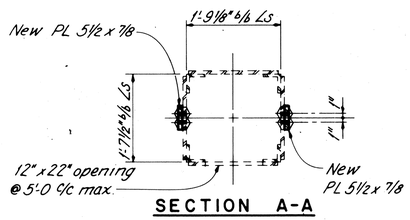
PANEL POINT L9



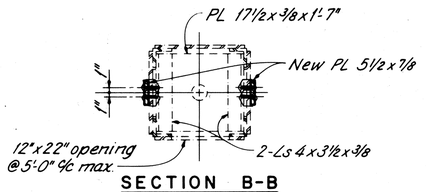
PANEL POINT L10



PANEL POINT L11



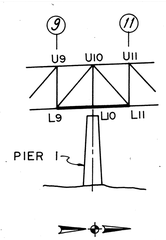
SECTION A-A



SECTION B-B

Main Materials L9-L11
4-Ls 4 x 4 x 5/8
2-Web PLs 1.9 x 1 1/16
1-Cover PL 20 1/2 x 1/2
1-Cover PL 20 1/2 x 5/8
(408)

WEST TRUSS LOWER CHORD



LEGEND

Existing material

New material

NOTES: See sheet 44/81.

46/81

RICHLAND ENGINEERING LIMITED
MANSFIELD, OHIO

TRUSS MEMBER STRENGTHENING
ADDED PLATES - 3
SUPERSTRUCTURE
BRIDGE NO. LOR-611-0358
OVER BLACK RIVER
LORAIN COUNTY S.R. 611

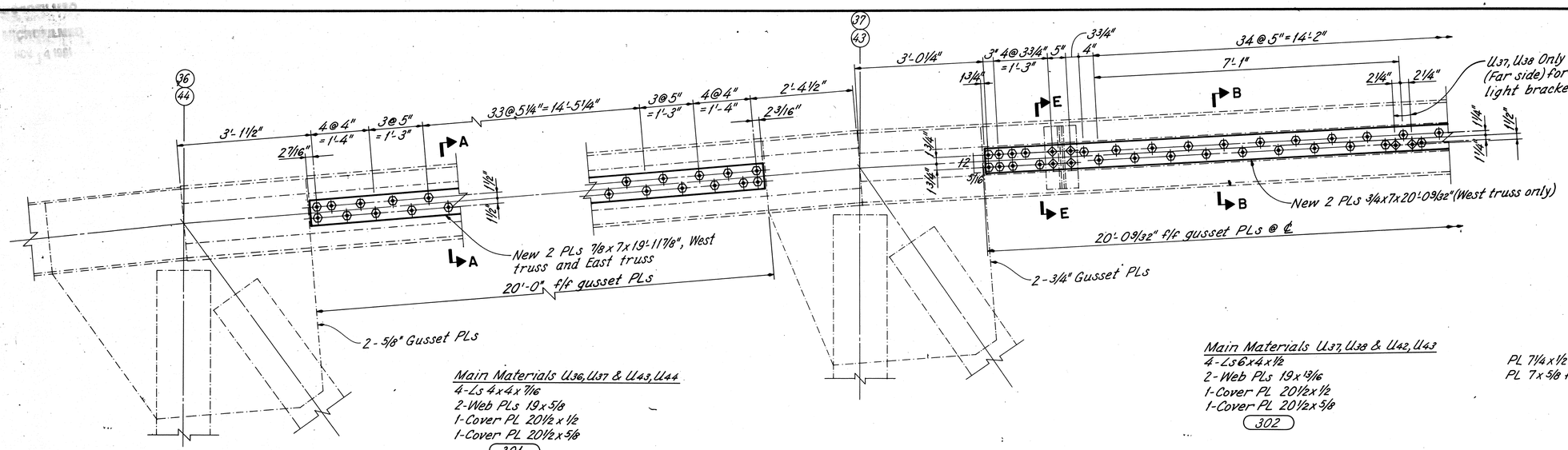
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
RDN	JLS	JLS	DAP	DHT	9/6/88	

AS BUILT 6/91

FHWA REGION	STATE	PROJECT	
5	OHIO		

62

LORAIN COUNTY
LOR-611-3.57



Main Materials U36, U37 & U43, U44
4-Ls 4x4x7/16
2-Web PLs 19x5/8
1-Cover PL 20 1/2 x 1/2
1-Cover PL 20 1/2 x 5/8
301

PANEL POINT U36 (SHOWN), U44 (OPPOSITE HAND)

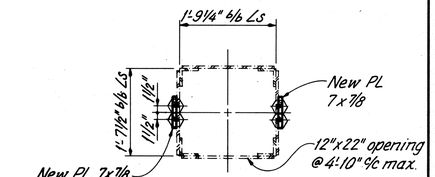
PANEL POINT U37 (SHOWN), U43 (OPPOSITE HAND)

Main Materials U37, U38 & U42, U43
4-Ls6x4x1/2
2-Web PLs 19x13/16
1-Cover PL 20 1/2 x 1/2
1-Cover PL 20 1/2 x 5/8
302

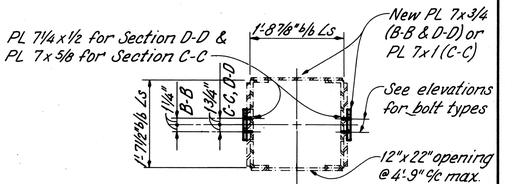
LEGEND

Existing material

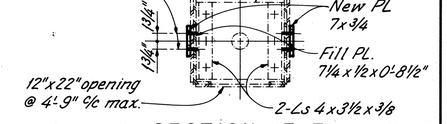
New material



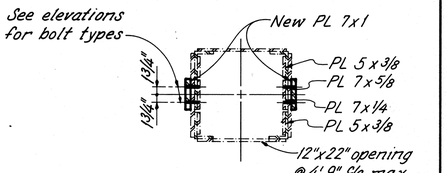
SECTION A-A



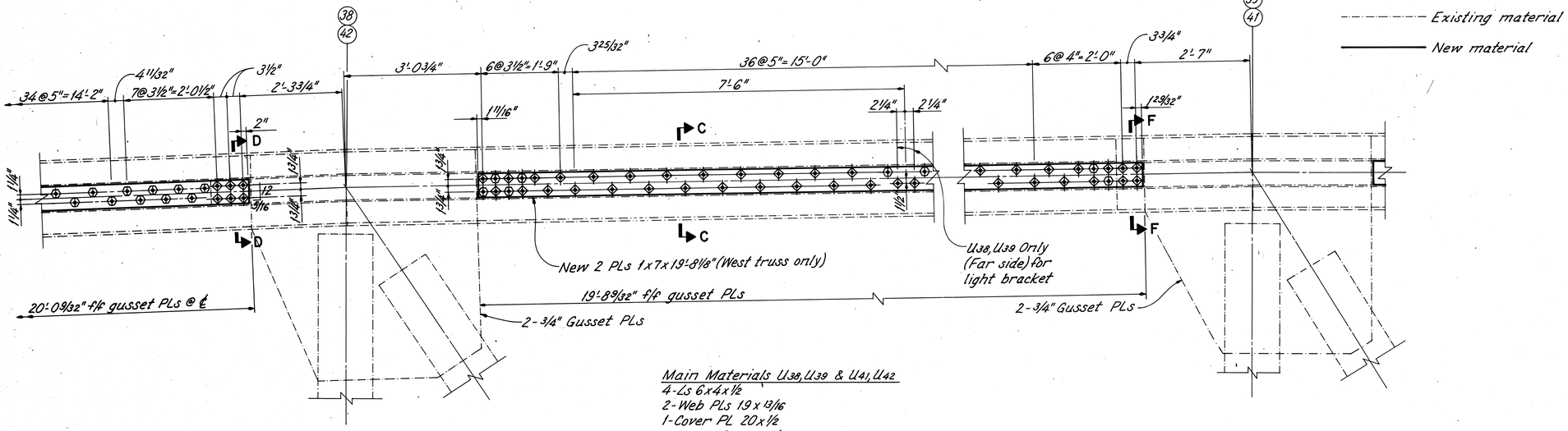
SECTION B-B
SECTION C-C
SECTION D-D



SECTION E-E



SECTION F-F



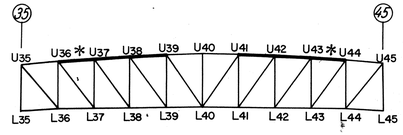
Main Materials U38, U39 & U41, U42
4-Ls 6x4x1/2
2-Web PLs 19x13/16
1-Cover PL 20x1/2
1-Cover PL 20x5/8
302

PANEL POINT U38 (SHOWN), U42 (OPPOSITE HAND)

PANEL POINT U39 (SHOWN), U41 (OPPOSITE HAND)

EAST & WEST TRUSS UPPER CHORD

(EXCEPT AS NOTED)



SPAN 4

* West truss & East truss

NOTES: See sheet 44/81.

47/81

RICHLAND ENGINEERING LIMITED
MANSFIELD, OHIO

TRUSS MEMBER STRENGTHENING
ADDED PLATES-4
SUPERSTRUCTURE
BRIDGE NO. LOR-611-0358
OVER BLACK RIVER
LORAIN COUNTY S.R. 611

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
RDN	JLS	JLS	DAP	DHT	9/16/88	

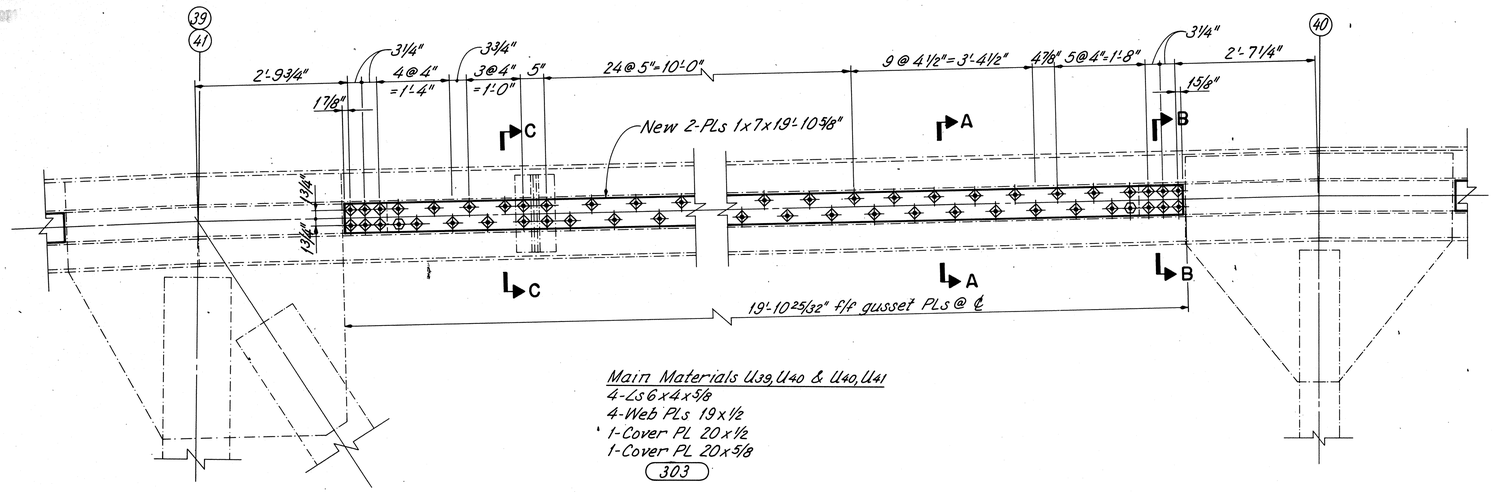
AS BUILT 6/91

N3607P

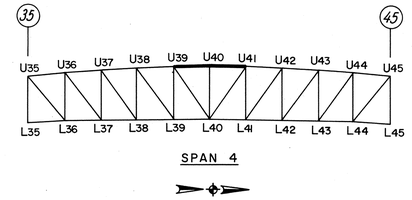
FHWA REGION	STATE	PROJECT	
5	OHIO		

63

LORAIN COUNTY
LOR-611-3.57

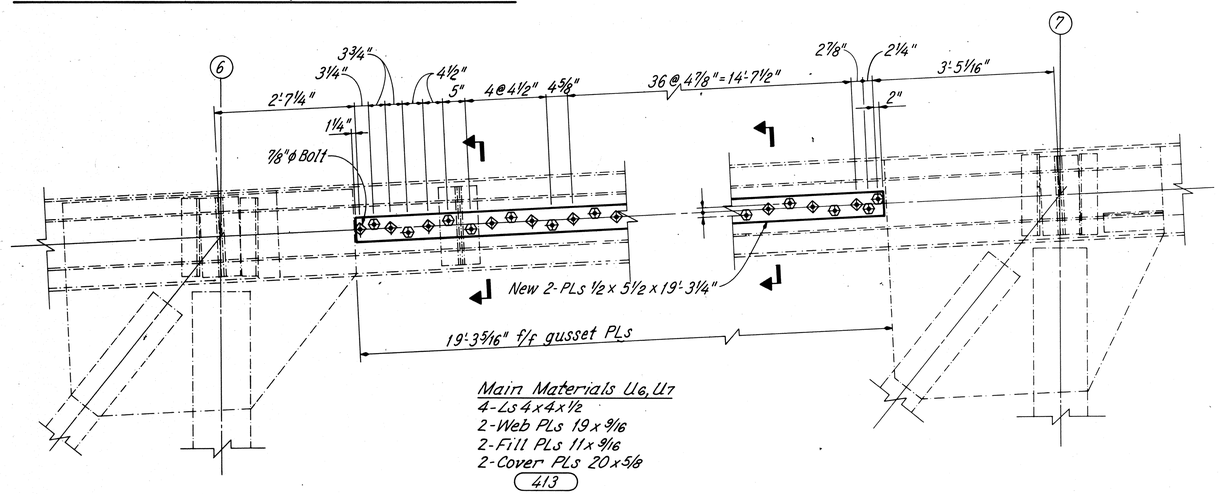


Main Materials U39,U40 & U40,U41
4-Ls 6x4x5/8
4-Web PLs 19x1/2
1-Cover PL 20x1/2
1-Cover PL 20x5/8
303



SPAN 4

PANEL POINT U39(SHOWN), U41 (OPPOSITE HAND)

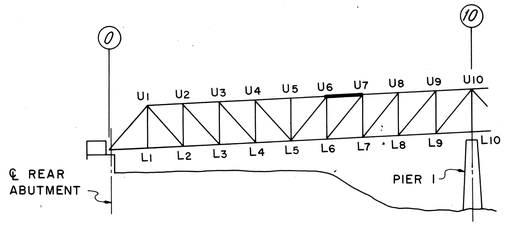


Main Materials U6,U7
4-Ls 4x4x1/2
2-Web PLs 19x9/16
2-Fill PLs 11x9/16
2-Cover PLs 20x5/8
413

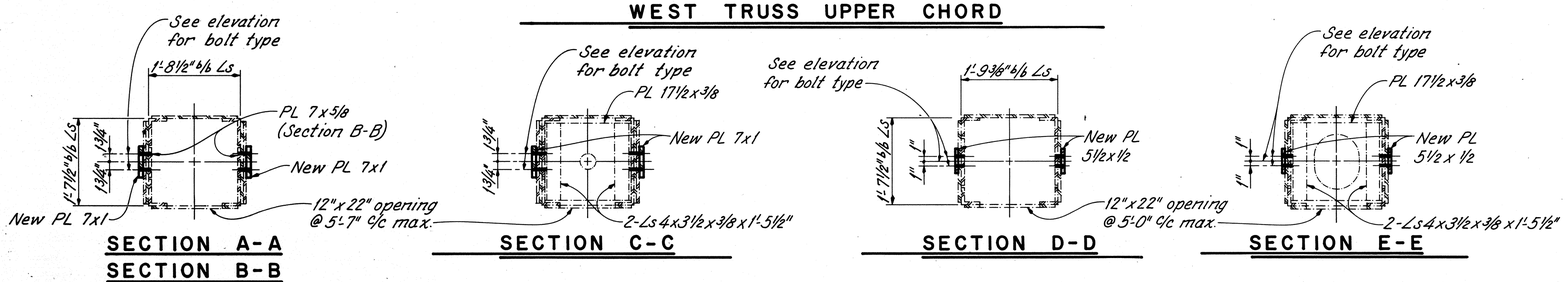
PANEL POINT U6

PANEL POINT U7

PANEL POINT U40



WEST TRUSS UPPER CHORD



LEGEND

Existing material

New material

NOTES: See sheet 44/81.

48/81

RICHLAND ENGINEERING LIMITED
MANSFIELD, OHIO

TRUSS MEMBER STRENGTHENING
ADDED PLATES-5
SUPERSTRUCTURE
BRIDGE NO. LOR-611-0358
OVER BLACK RIVER

LORAIN COUNTY S.R. 611

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
RDN	JLS	JLS	DAP	DHT	9/6/88	

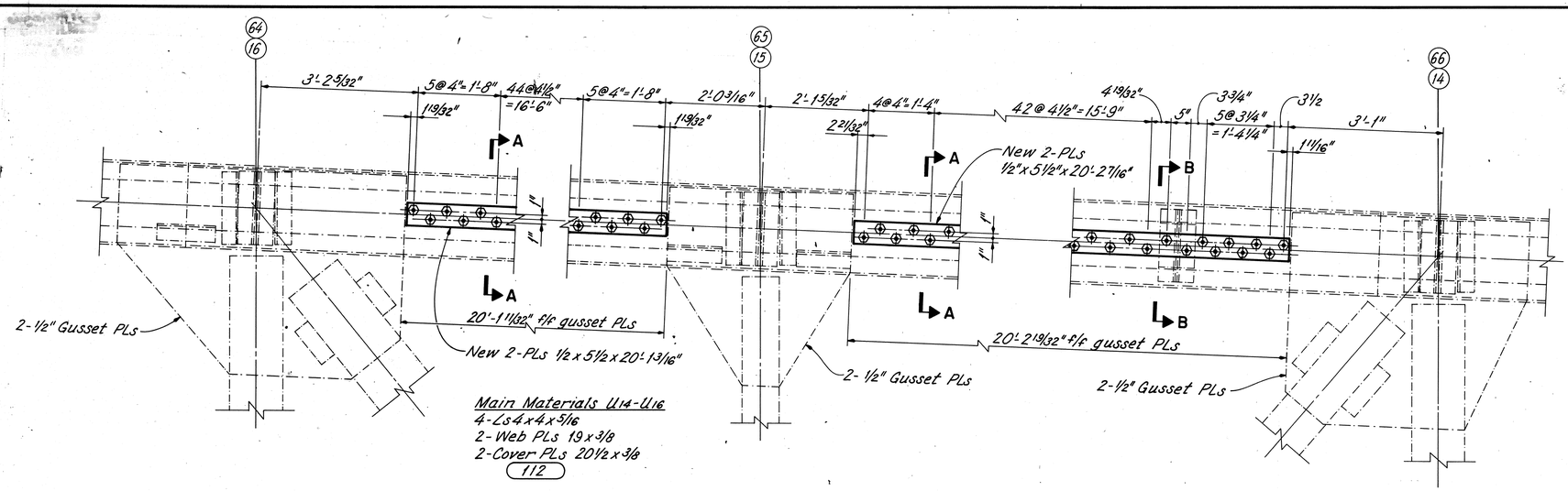
AS BUILT 6/91

160679

FHWA REGION	STATE	PROJECT	
5	OHIO		

64

LORAIN COUNTY
LOR-611-3.57

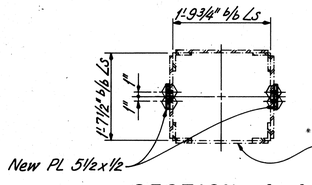


PANEL POINT U64 (SHOWN), U16 (OPPOSITE HAND)

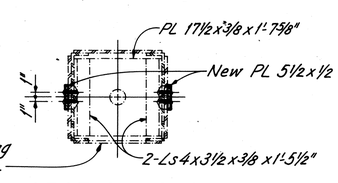
PANEL POINT U65 (SHOWN), U15 (OPPOSITE HAND)

PANEL POINT U66 (SHOWN), U14 (OPPOSITE HAND)

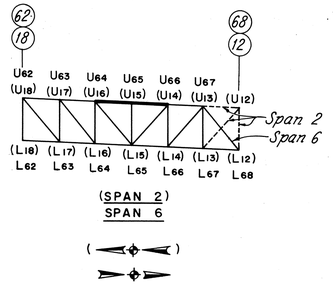
WEST TRUSS UPPER CHORD



SECTION A-A



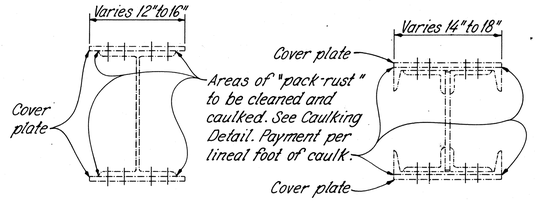
SECTION B-B



(SPAN 2)
SPAN 6

TYPICAL SECTION THRU
UPPER OR LOWER * TRUSS CHORD

* East side only.



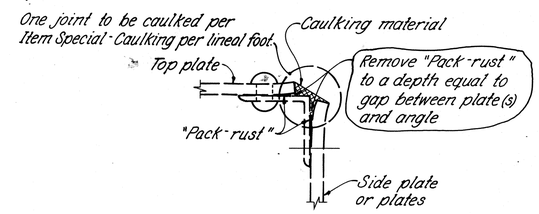
TYPICAL SECTION THRU
TRUSS VERTICALS AND DIAGONALS ℄

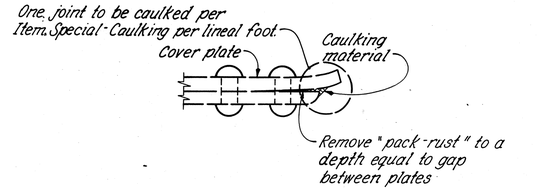
℄ Clean and caulk top 2 corners only.

LEGEND

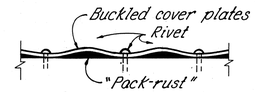
Existing material

New material





CAULKING DETAILS



EXISTING TRUSS MEMBER COVER PLATE CONDITION

U10 L10	U3 L4	U21 L22	U60 L59
U18 L18	U4 L5	U30 L29	U60 L61
U20 L20	U8 L7	U33 L34	
U32 L32	U9 L8	U34 L35	
U48 L48	U10 L9	U46 L45	
U60 L60	U10 L11	U46 L47	
U62 L62	U11 L12	U50 L51	
	U20 L19	U59 L58	
	U20 L21		

NOTES: See sheet 44/81.

49/81

RICHLAND ENGINEERING LIMITED
MANSFIELD, OHIO

TRUSS MEMBER STRENGTHENING
ADDED PLATES-6
SUPERSTRUCTURE
BRIDGE NO. LOR-611-0358
OVER BLACK RIVER

LORAIN COUNTY S.R. 611

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
RDN	JLS	JLS	DAP	DHT	9/6/88	10/3/88

AS BUILT 6/91

FHWA REGION	STATE	PROJECT	
5	OHIO		

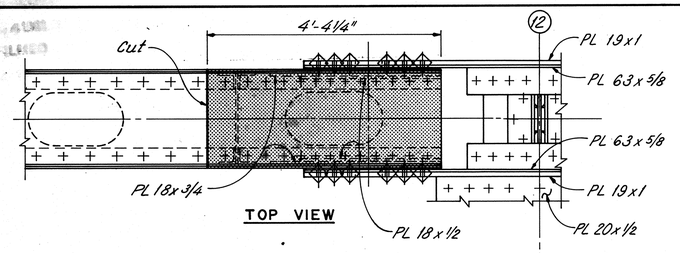
65

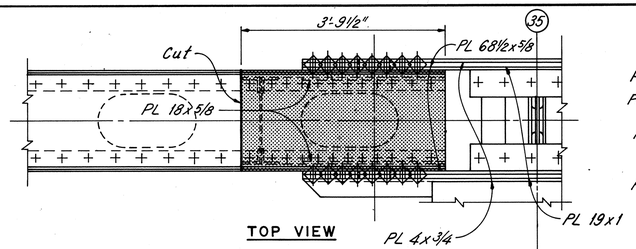
LORAIN COUNTY
LOR-611-3.57

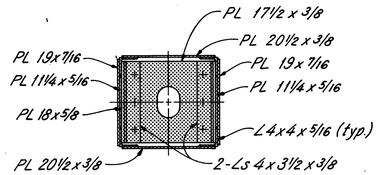
NOTES

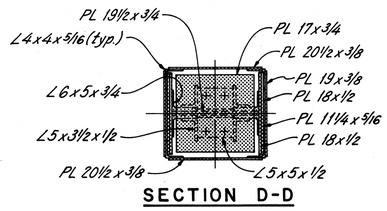
CUT: Material cuts to be ground smooth and cleaned, as necessary, to accept paint.

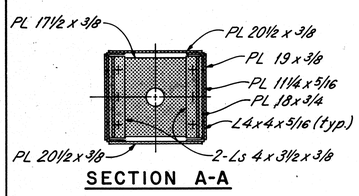
BOLT LEGEND: See sheet 20/81. Some rivets to be removed have countersunk heads on both ends.

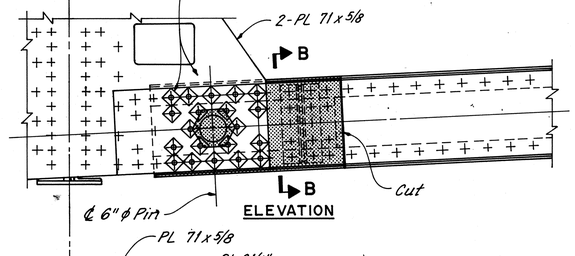


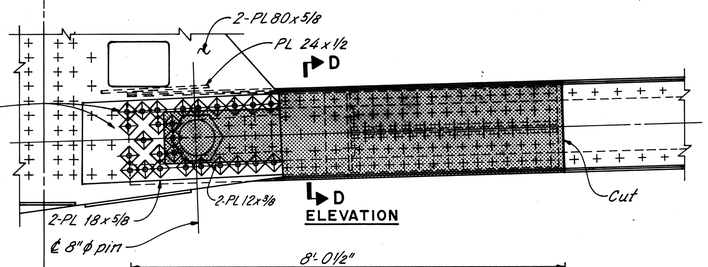


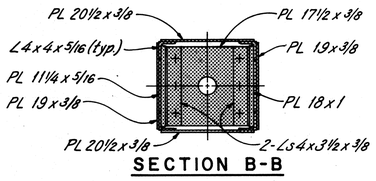


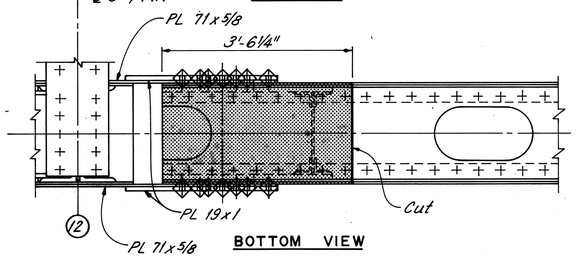


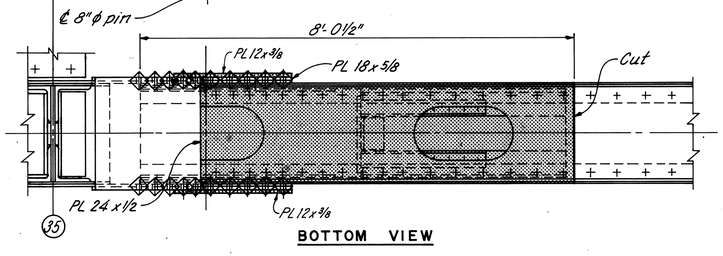








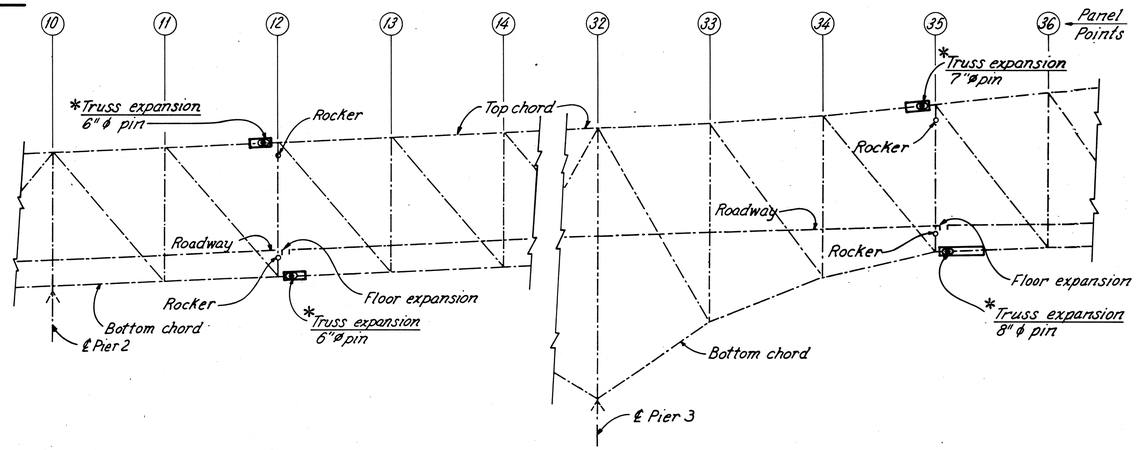




PANEL NO. 12 - REMOVAL DETAILS

PANEL NO. 35 - REMOVAL DETAILS

* For east truss and west truss: Remove existing pin; remove portion of truss chord; insert portion of new chord extension in truss chord; install new guide plates; install remainder of new truss chord extension; and install new pins. See sheets 51/81 and 52/81 for details of new materials.



PARTIAL TRUSS ELEVATION

LEGEND

▨ - Indicates material to be removed per Item 202 - Portions of structure removed.

50/81

RICHLAND ENGINEERING LIMITED
MANSFIELD, OHIO

TRUSS EXPANSION - I
SUPERSTRUCTURE
BRIDGE NO. LOR-611-0358
OVER BLACK RIVER

LORAIN COUNTY — S.R.611

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
DAP	DAP	JLS	RDN	DHT	9/6/88	

AS BUILT 6/91

FHWA REGION	STATE	PROJECT		66
5	OHIO			

LORAIN COUNTY
LOR-611-3.57

NOTES

LOCATIONS of truss expansion joints, see sheet 50/81.

SECTIONS A-A, B-B, C-C & PIN DETAILS: See sheet 52/81.

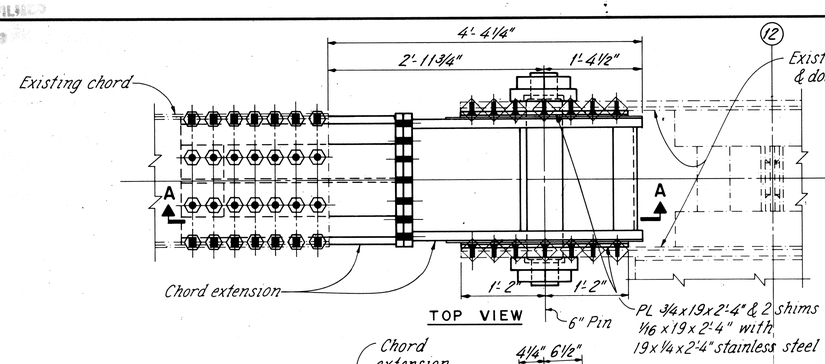
MATERIALS shown are new unless otherwise noted.

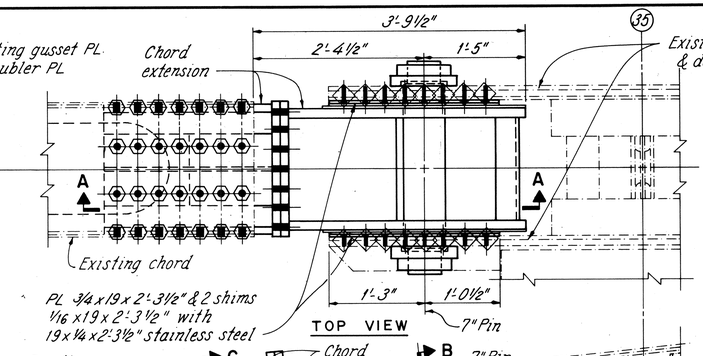
BOLT LEGEND: See sheet 20/81.

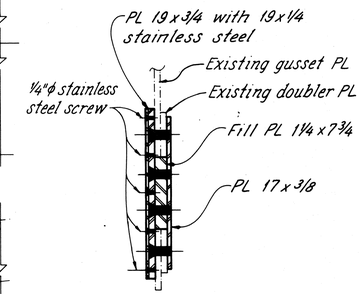
(000) indicates shop drawing sheet number where member is detailed.

BOLTS are 1" diameter unless otherwise noted.

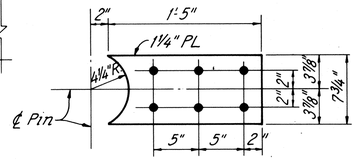
FASTENER DETAILS: See sheet 52/81.



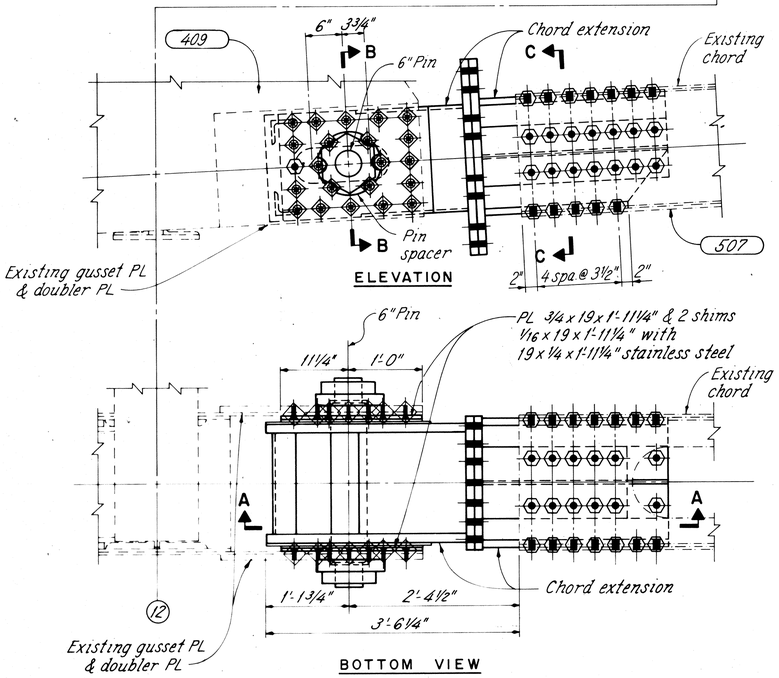




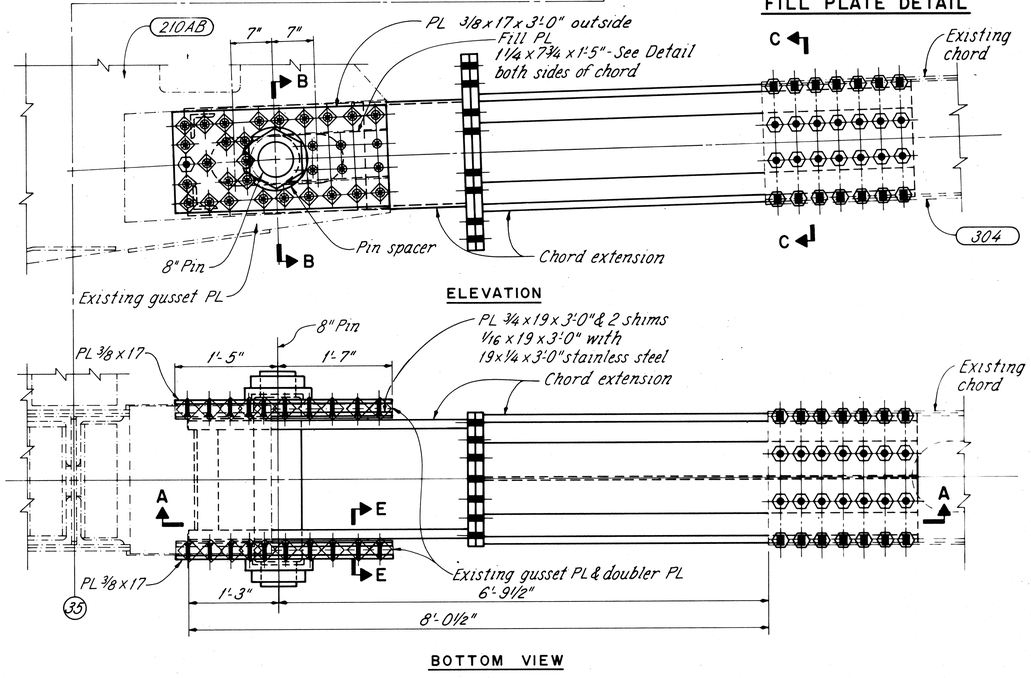
SECTION E-E



FILL PLATE DETAIL



PANEL NO. 12



PANEL NO. 35

LEGEND

Existing material
New material

51/81

RICHLAND ENGINEERING LIMITED
MANSFIELD, OHIO

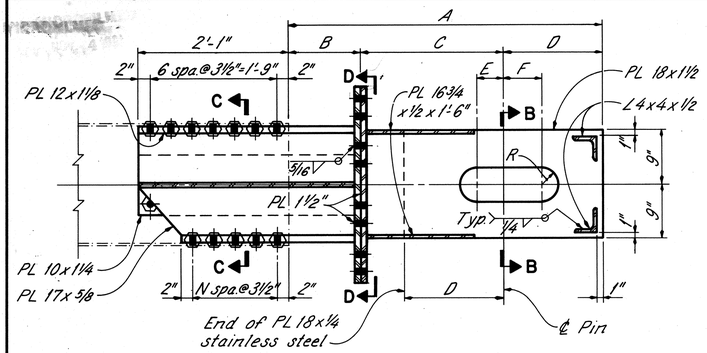
TRUSS EXPANSION-2

SUPERSTRUCTURE
BRIDGE NO. LOR-611-0358
OVER BLACK RIVER

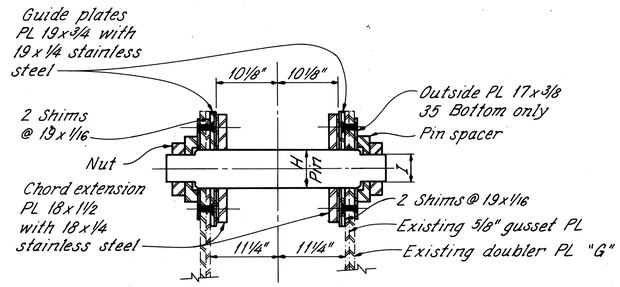
LORAIN COUNTY S.R.611

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
DAP	JLS	JLS	RDN	DHT	9/6/88	

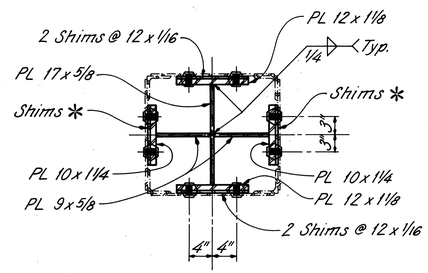
AS BUILT 6/91



LONGITUDINAL SECTION A-A



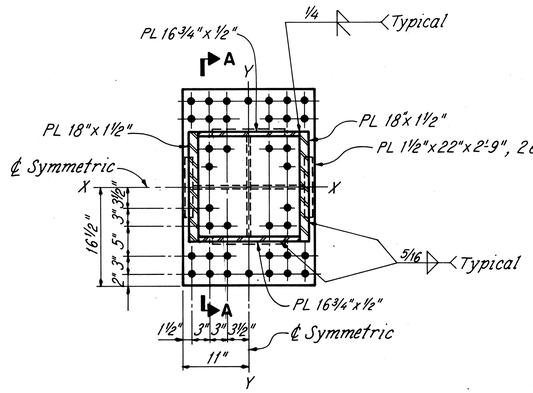
TRANSVERSE SECTION B-B THRU PIN



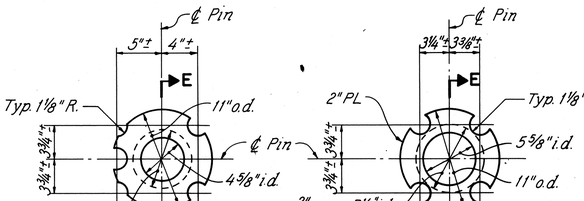
SHIMS *

For 12 top & 35 bottom ~ 1@10x⅛ ℄ 1@10x1/16
For 12 bottom ~ 2@10x1/16
For 35 top ~ 2@10x⅛ ℄ 1@10x1/16

SECTION C-C

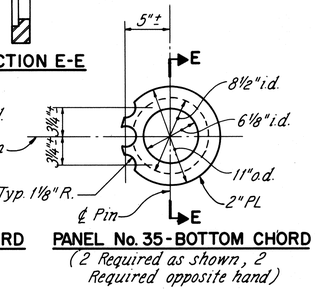


SECTION D-D



PANEL No. 12 - TOP CHORD
(2 Required as shown, 2 Required opposite hand)

PANEL No. 35 - TOP CHORD
(2 Required as shown, 2 Required opposite hand)



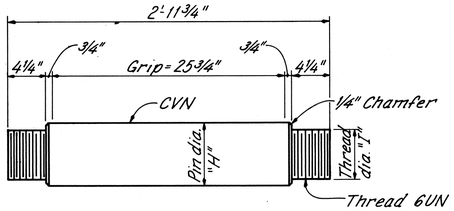
SECTION E-E

PANEL No. 12 - BOTTOM CHORD
(4 Required)

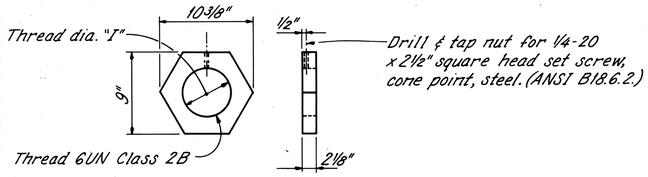
PANEL No. 35 - BOTTOM CHORD
(2 Required as shown, 2 Required opposite hand)

PIN SPACER DETAIL

TABLE OF DIMENSIONS											
LOCATION	DIMENSION										
	A	B	C	D	E	F	R	N	G	H	I
12 Top	4'-4¼"	1'-0¼"	1'-11½"	1'-4½"	4¼"	6½"	31/64"	4	1"	6"	4½"
12 Bottom	3'-6¼"	7½"	1'-9"	1'-1¾"	3¾"	6"	31/64"	4	1"	6"	4½"
35 Top	3'-9½"	4½"	2'-0"	1'-5"	6"	6"	33/64"	2	1"	7"	5½"
35 Bottom	8'-0½"	4'-0½"	2'-9"	1'-3"	7"	7"	41/64"	6	5/8"	8"	6"

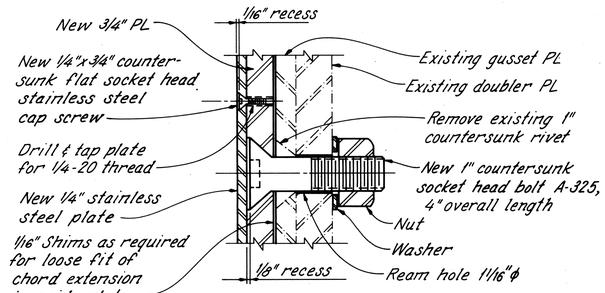


PIN - CHROME PLATED

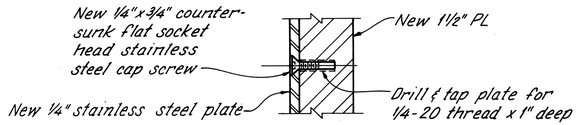


NUT

PIN DETAILS



NEW GUIDE PLATES



NEW CHORD EXTENSION

FASTENER DETAILS

FHWA REGION	STATE	PROJECT	
5	OHIO		

67

LORAIN COUNTY
LOR-611-3.57

NOTES

STAINLESS STEEL FACING PLATES shall be ASTM A167, Type 304. Stainless steel fasteners shall be AISI Type 304. Plates shall have a No. 2B finish. Payment for stainless steel plates and fasteners shall be per Item 513 - Stainless steel facing plates.

STAINLESS STEEL FASTENERS shall be spaced to stitch the stainless steel face plate to the back up steel plate. Maximum spacing between fasteners in any direction shall be 5". Maximum distance from an edge of stainless steel plate shall be 2". Minimum edge distance shall be 1".

PINS & NUTS: See General Notes sheet 6/81.

LOCATIONS OF SECTIONS A-A, B-B, C-C: See sheet 51/81.

BOLT LEGEND: See sheet 20/81.

BOLTS are 1" diameter unless otherwise noted.

GUIDE PLATES (PL ¾"x19" attached to the existing gusset plates) shall have pin holes shop finished to size. New guide plates shall be placed against existing gusset plate with new pin in position before holes for 1" connection bolts are reamed.

LEGEND

R. - Radius
i.d. - Inside diameter
o.d. - Outside diameter

52/81

RICHLAND ENGINEERING LIMITED
MANSFIELD, OHIO

TRUSS EXPANSION - 3
SUPERSTRUCTURE
BRIDGE NO. LOR-611-0358
OVER BLACK RIVER

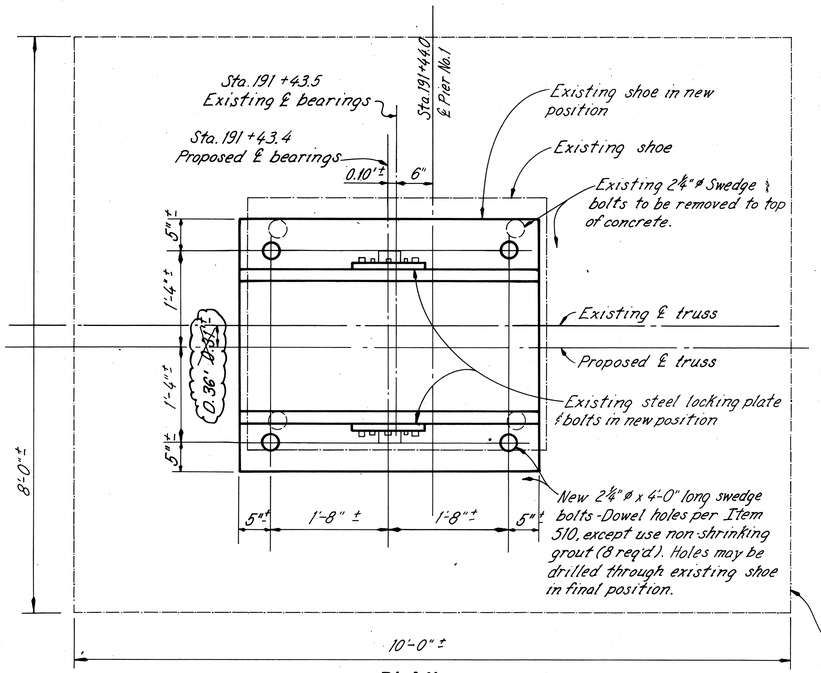
LORAIN COUNTY — S.R. 611

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
DAP	DAP	JLS	RDN	DHT	3/6/88	

AS BUILT 6/91

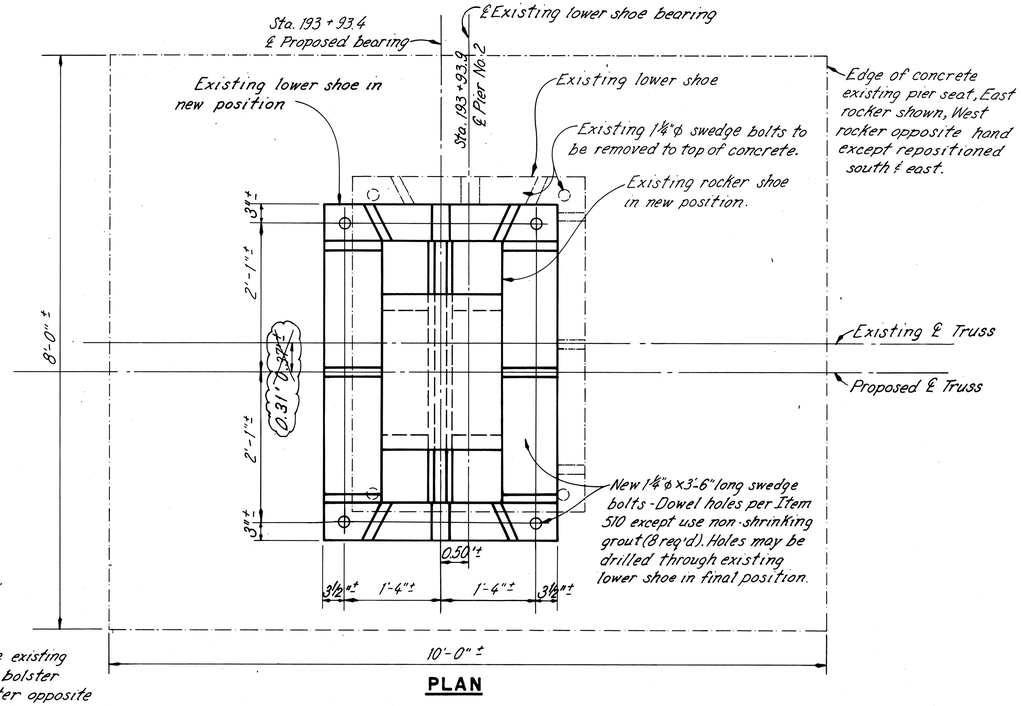
FHWA REGION	STATE	PROJECT		68
5	OHIO			

LORAIN COUNTY
LOR-611-03.57



PLAN

Edge of concrete existing pier seat, East bolster shown, West bolster opposite hand except repositioned south ℄ east.



PLAN

NOTES

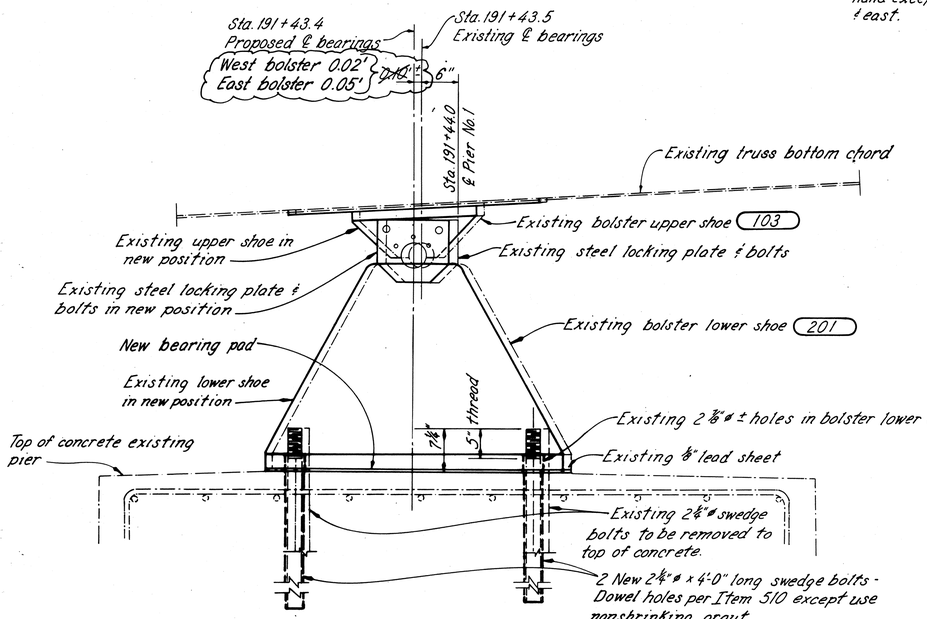
(000) indicates shop drawing sheet number where member is detailed.

EXISTING LEAD SHEET AND SWEDGE BOLTS shall be removed per Item 202 - Portions of structure removed.

NEW BEARING PAD shall be ⅛" sheet lead 711.19 or preformed bearing pad 711.21. Payment shall be included with Item 516 - ⅛" sheet lead or preformed bearing pad.

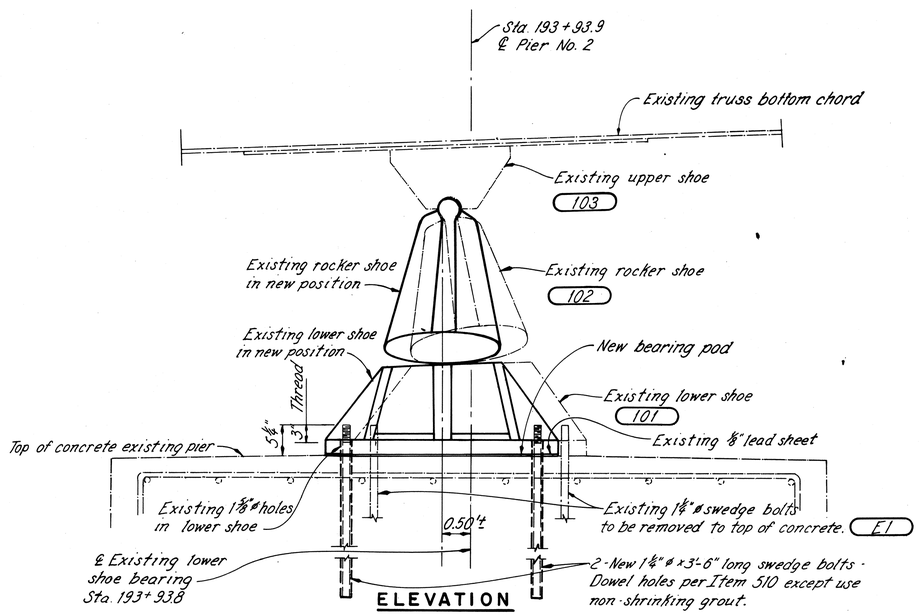
SWEDGE ANCHOR BOLTS shall include nuts and washers for payment per each with Item 513 - each size, swedge anchor bolt.

RELOCATING SPANS AND BEARINGS See General Note sheet 11/81 for description of work.



ELEVATION

PIER NO. 1



ELEVATION

PIER NO. 2

5/3/81

RICHLAND ENGINEERING LIMITED
MANSFIELD, OHIO

TRUSS BEARING RELOCATION - I
SUPERSTRUCTURE
BRIDGE NO. LOR-611-0358
OVER BLACK RIVER

LORAIN COUNTY S.R. 611

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
RDN	RDN	EFW	DAP	DHT	9/6/88	

AS BUILT 6/91

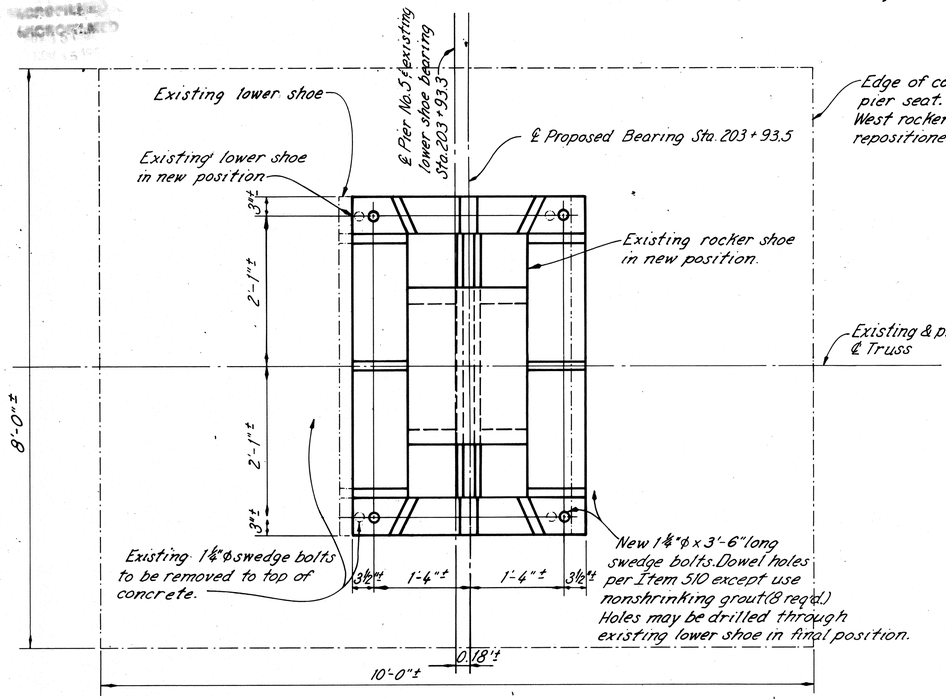
FHWA REGION	STATE	PROJECT		69
5	OHIO			

LORAIN COUNTY
LOR-611-03.57

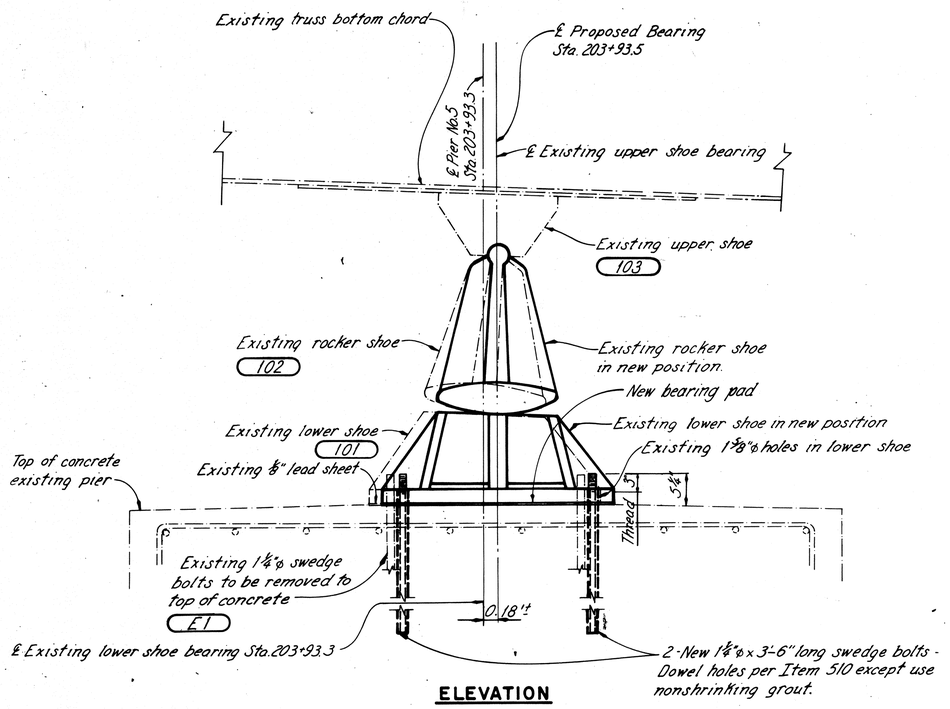
NOTES:

(000) indicates shop drawing sheet number where member is detailed.

ADDITIONAL NOTES: See sheet 53/81

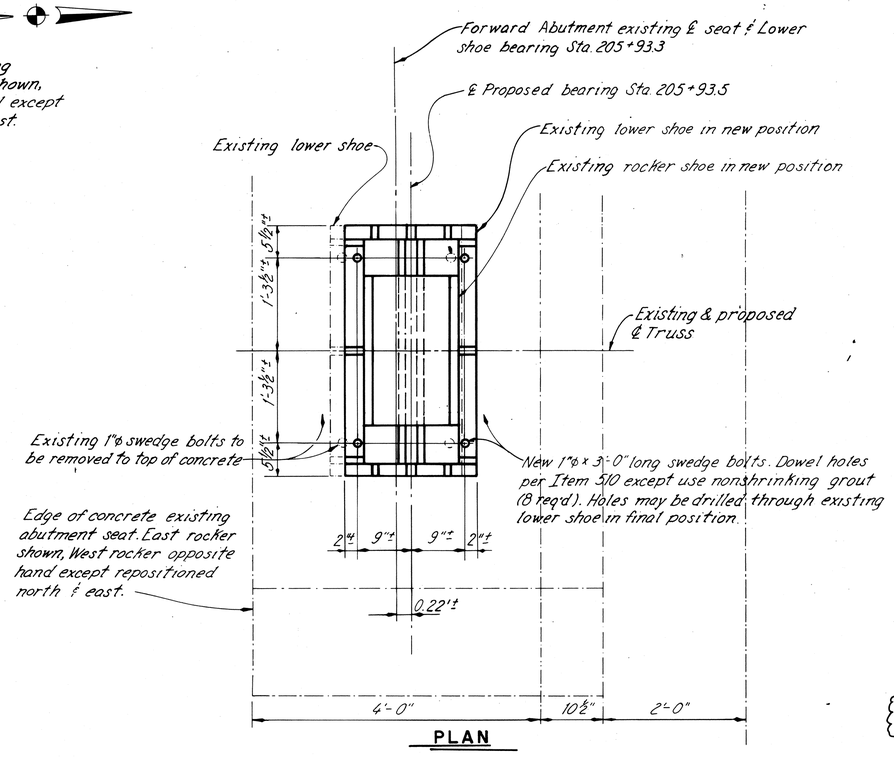


PLAN



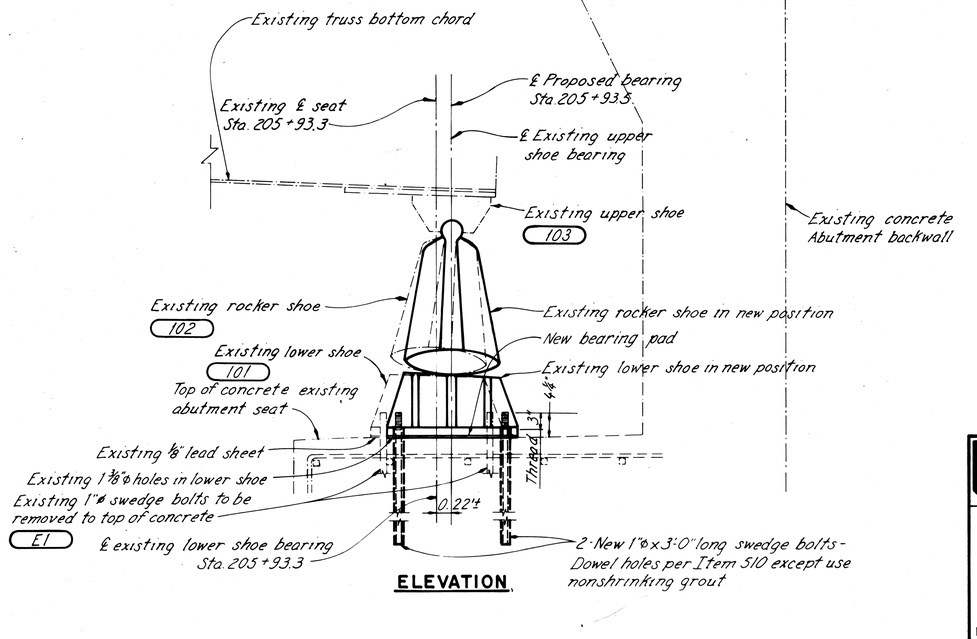
ELEVATION

PIER NO. 5



PLAN

Rear Abutment Rockers were also set vertical.



ELEVATION

FORWARD ABUTMENT

RICHLAND ENGINEERING LIMITED
MANSFIELD, OHIO

54/81

TRUSS BEARING RELOCATION-2
SUPERSTRUCTURE
BRIDGE NO. LOR-611-0358
OVER BLACK RIVER

LORAIN COUNTY — S.R. 611

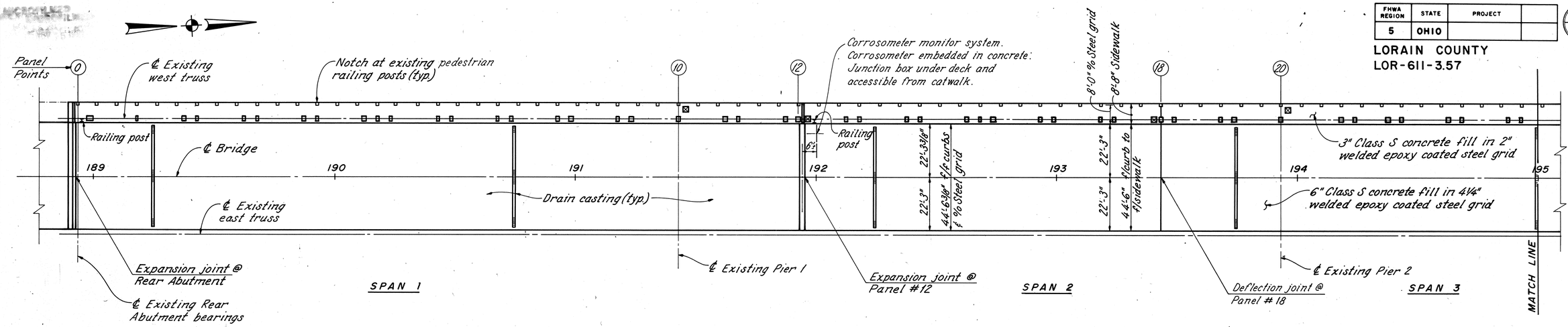
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
RDN	RDN	EFW	DAP	DHT	9/6/88	

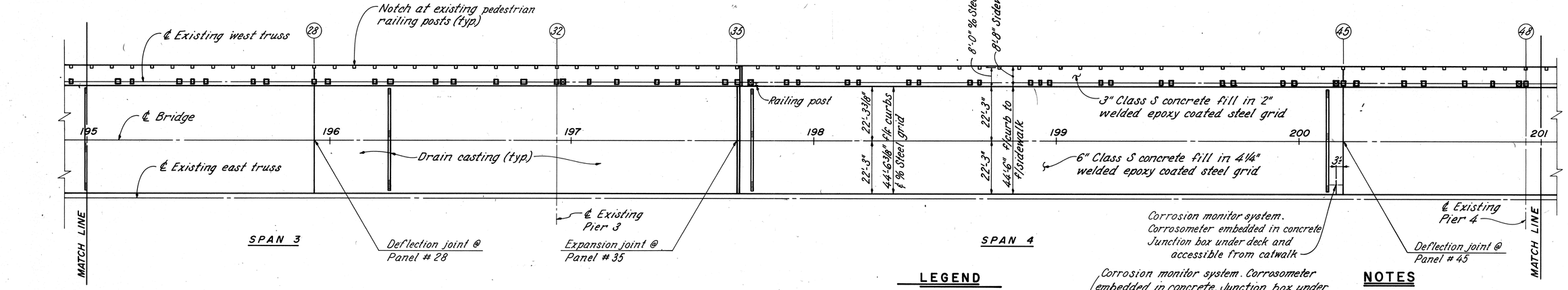
AS BUILT 6/91

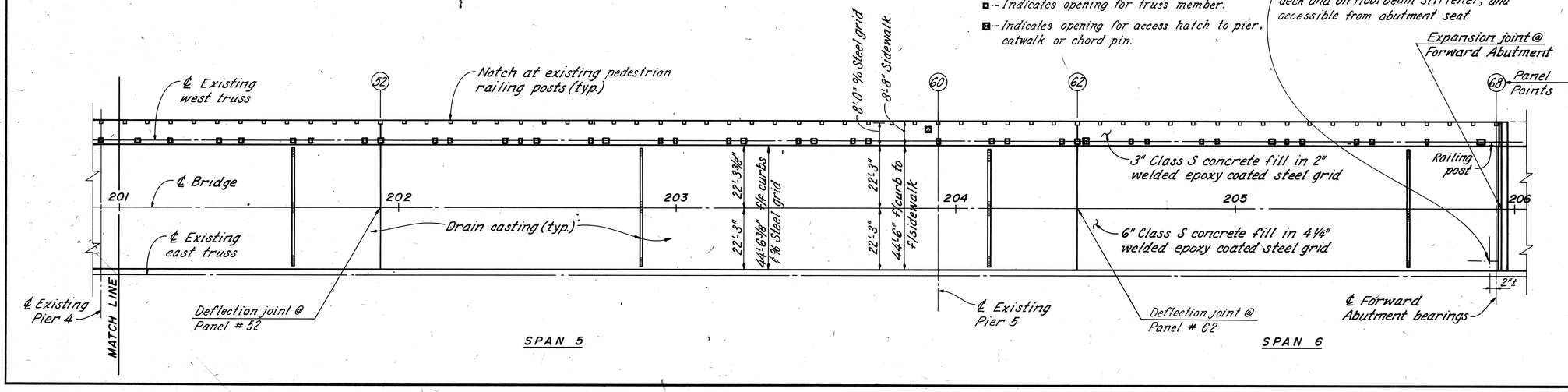
FHWA REGION	STATE	PROJECT	
5	OHIO		

70

LORAIN COUNTY
LOR-611-3.57







LEGEND

- ▫ – Indicates opening for truss member.
- ▨ – Indicates opening for access hatch to pier, catwalk or chord pin.

NOTES

MATERIALS shown are new unless otherwise noted.
STEEL GRID DETAILS: See sheet 56/81 & 57/81
TRANSVERSE SECTION: See sheet 20/81.
CURB DETAILS: See sheet 64/81 & 65/81
DECK & SIDEWALK EXPANSION JOINTS: See sheets 58/81 thru 62/81.
DECK & SIDEWALK DEFLECTION JOINTS: See sheet 63/81.
DRAINAGE DETAILS: See sheet 69/81.
ACCESS HATCH DETAILS: See sheet 66/81.
CORROSION MONITORING SYSTEM: See General Note sheet 10/81. See Detail sheet 56/81.

55/81

RICHLAND ENGINEERING LIMITED
MANSFIELD, OHIO

DECK & SIDEWALK PLAN
SUPERSTRUCTURE
BRIDGE NO. LOR-611-0358
OVER BLACK RIVER

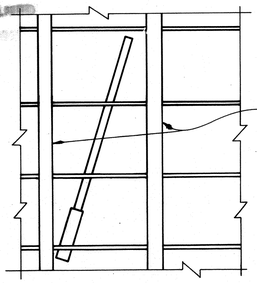
LORAIN COUNTY — S.R. 611

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
RDN	RDN	JLS	DAP	DHT	9/6/88	

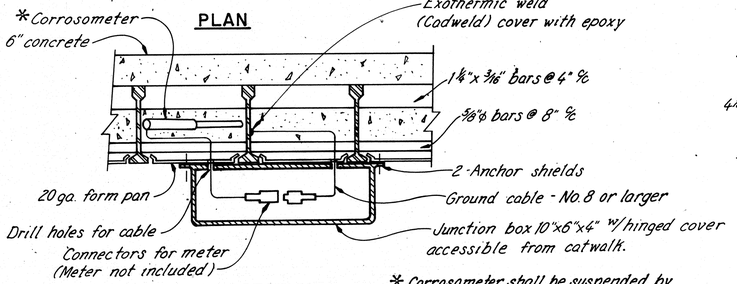
AS BUILT 6/91

FHWA REGION	STATE	PROJECT		71
5	OHIO			

LORAIN COUNTY
LOR-611-03.57

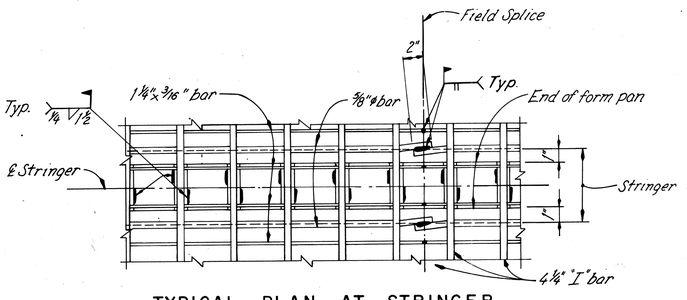


PLAN

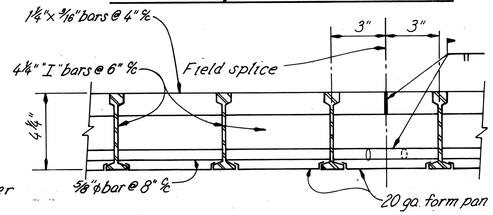


SECTION
PANEL POINTS 12 and 45

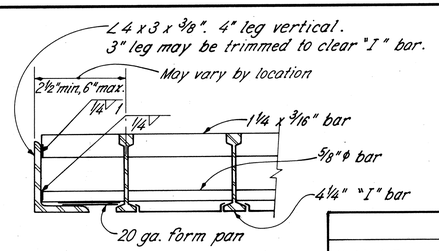
*Corrosometer shall be suspended by non-conductive materials so as not to touch any steel members.



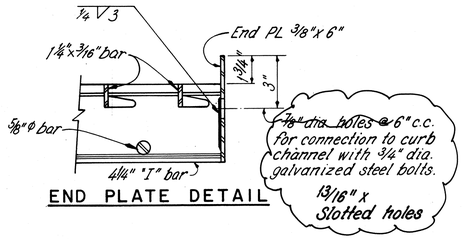
TYPICAL PLAN AT STRINGER



TYPICAL LONGITUDINAL SECTION



DETAIL AT DRAINS & PANEL NO. 12 EXPANSION JOINT



END PLATE DETAIL

REQUIRED MATERIAL PROPERTIES		
Welded Epoxy Coated Steel Material	Minimum Weight Steel Only (lb. per sq. ft.)	Minimum Section Modulus of Steel Only Bottom (in.3 per ft.)
4¼" grid	15.3	3.09
2" grid	9.4	1.60

NOTES

CONCRETE FILL is not shown in details.

MATERIAL: The steel grid shall be fabricated of ASTM A-36 steel. The steel grid deck panels and form pans shall be epoxy coated after fabrication. See General Notes sheet 7/81 for additional specifications.

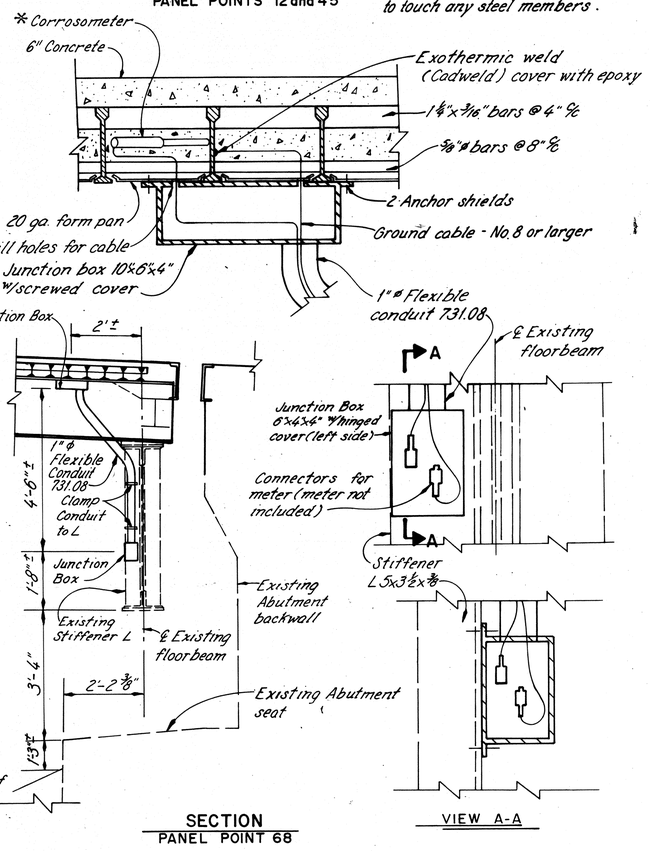
CORROSION MONITOR LOCATIONS: See sheet 55/81.

CURB DETAILS: See sheet 64/81 & 65/81.

DECK & SIDEWALK PLAN: See sheet 55/81.

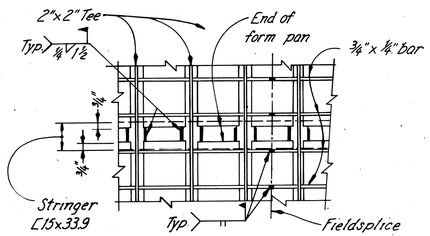
MAIN BARS, "I" bar and "Tee" bars shall be located at joints according to details on sheets 58/81 thru 62/81. Non-standard panel lengths and bar spaces shall be used for an intermediate panel or panels to complete the deck.

4 1/4" WELDED EPOXY COATED STEEL GRID

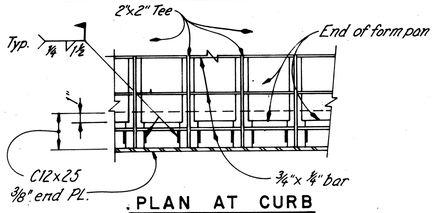


SECTION
PANEL POINT 68

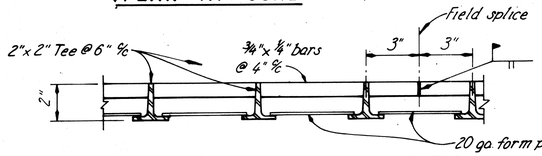
CORROSION MONITOR DETAILS



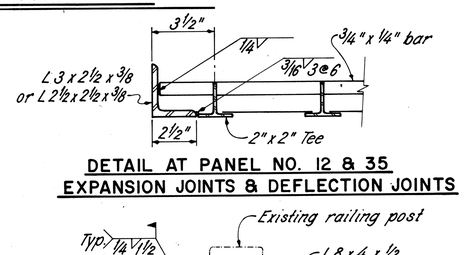
TYPICAL PLAN AT STRINGER



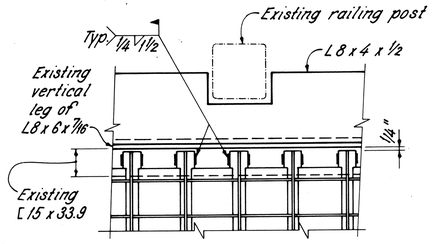
PLAN AT CURB



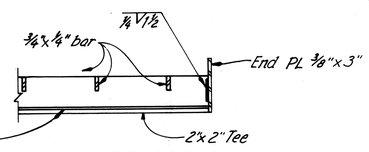
TYPICAL LONGITUDINAL SECTION



DETAIL AT PANEL NO. 12 & 35
EXPANSION JOINTS & DEFLECTION JOINTS



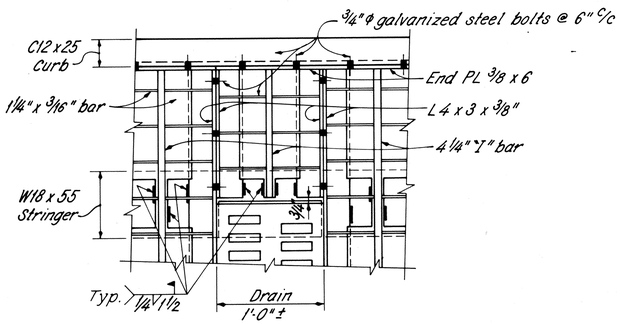
PLAN AT RAILING



END PLATE DETAIL

TYPICAL LONGITUDINAL SECTION

2" WELDED EPOXY COATED STEEL GRID



4¼" STEEL GRID AT ROADWAY DRAINS

56/81

RICHLAND ENGINEERING LIMITED
MANSFIELD, OHIO

STEEL GRID DETAILS - I

SUPERSTRUCTURE
BRIDGE NO. LOR-611-0358
OVER BLACK RIVER
LORAIN COUNTY S.R. 611

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
RDN	EFW	EFW	DAP	DHT	9/6/88	

AS BUILT 6/91

FHWA REGION	STATE	PROJECT	
5	OHIO		

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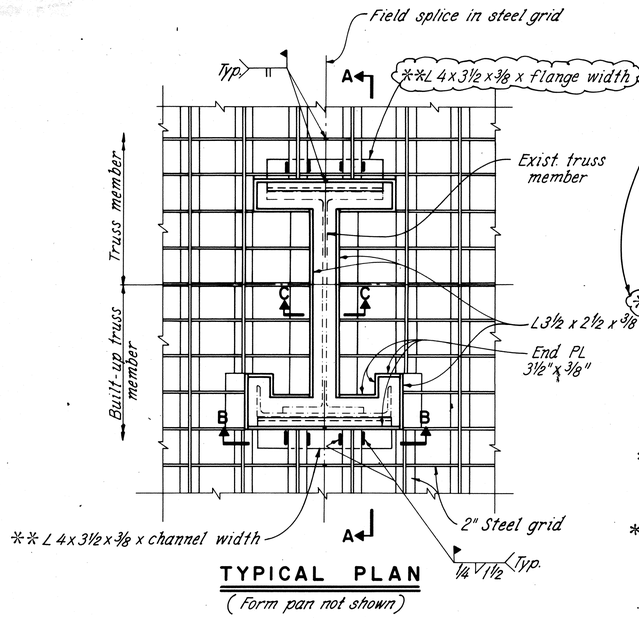
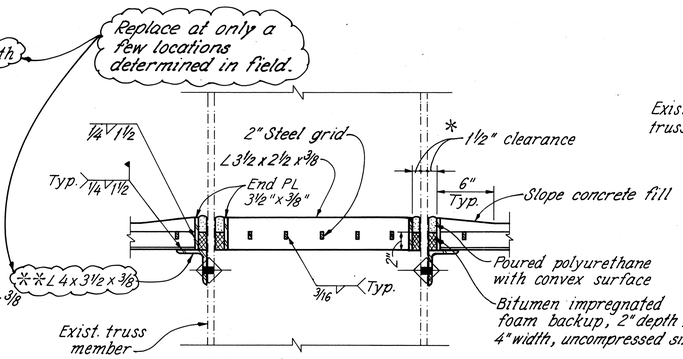
LORAIN COUNTY
LOR-611-3.57



TYPICAL PLAN
(Form pan not shown)

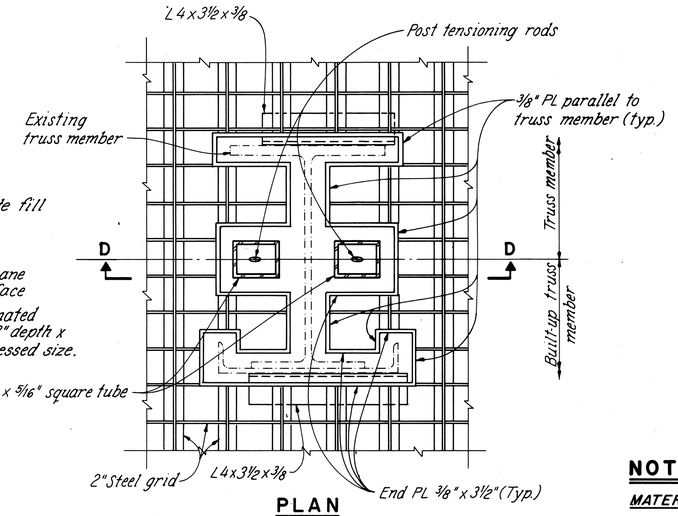
2" STEEL GRID AT TRUSS MEMBERS



SECTION A-A

* Maintain a minimum of 1" clearance and a maximum of 2" clearance around entire truss member.

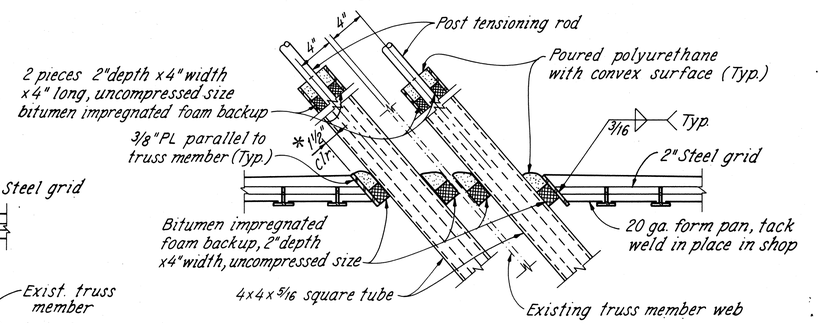
** L 4x3½x⅜ Sidewalk support angle on curb side only at verticals, on both sides of diagonals. Included for payment with Item 513 - New A36 structural steel.



PLAN
(Form pan not shown)

2" STEEL GRID AT STRENGTHENED TRUSS MEMBER

(See Typical Plan for additional information)



SECTION D-D
AT STRENGTHENED DIAGONAL

NOTES

MATERIALS shown are new unless otherwise noted.

BOLTS: shall be 1"Φ unless otherwise noted.

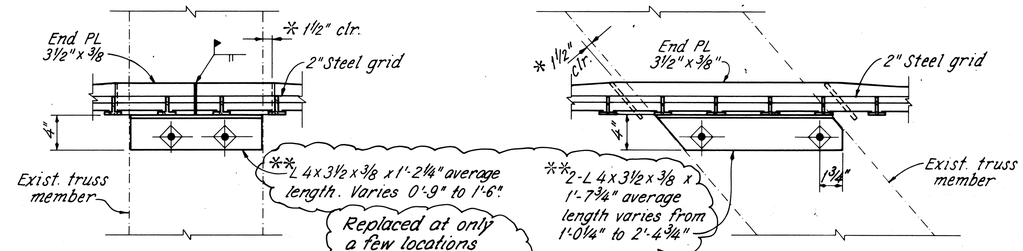
BOLT LEGEND: See sheet 20|81.

STEEL GRID DETAILS: See sheet 56|81.

POURED POLYURETHANE AND FOAM BACKUP: See General Notes sheet 10|81 for pay item description.

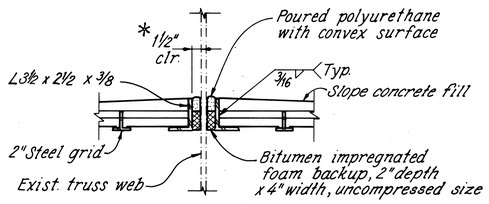
TRUSS MEMBER HOLES IN 2" STEEL GRID shall be accurately located and cut in ½" plywood templates and checked for fit prior to removing the existing sidewalk. Templates shall be marked for identification. Measured distances between control marks on the templates shall be made and recorded on the templates. The templates shall be used for preparing shop drawing and as a check for size during shop fabrication. The contractor shall be responsible for final fit and clearances to truss members within tolerances. Steel grid panels not within tolerances shall be removed from the job site and a new shop fabricated piece furnished. The cost for templates and measurements shall be included for payment with Item 513 - 2" welded epoxy coated steel grid, as per plan.

ADDITIONAL NOTES: See sheet 56|81.

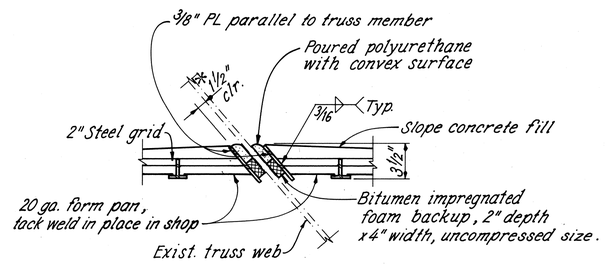


SECTION B-B
AT VERTICAL

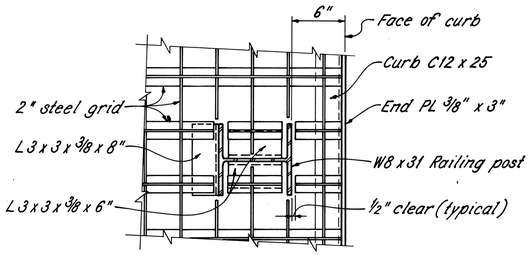
SECTION B-B
AT DIAGONAL



SECTION C-C
AT VERTICAL



SECTION C-C
AT DIAGONAL



PLAN
(Form pan not shown)

2" STEEL GRID AT RAILING POST

LEGEND

Existing material

New material

57|81

RICHLAND ENGINEERING LIMITED
MANSFIELD, OHIO

STEEL GRID DETAILS-2

SUPERSTRUCTURE
BRIDGE NO. LOR-611-0358
OVER BLACK RIVER

LORAIN COUNTY S.R. 611

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
RDN	JPS	JPS	DAP	DHT	9/6/88	

AS BUILT 6/91

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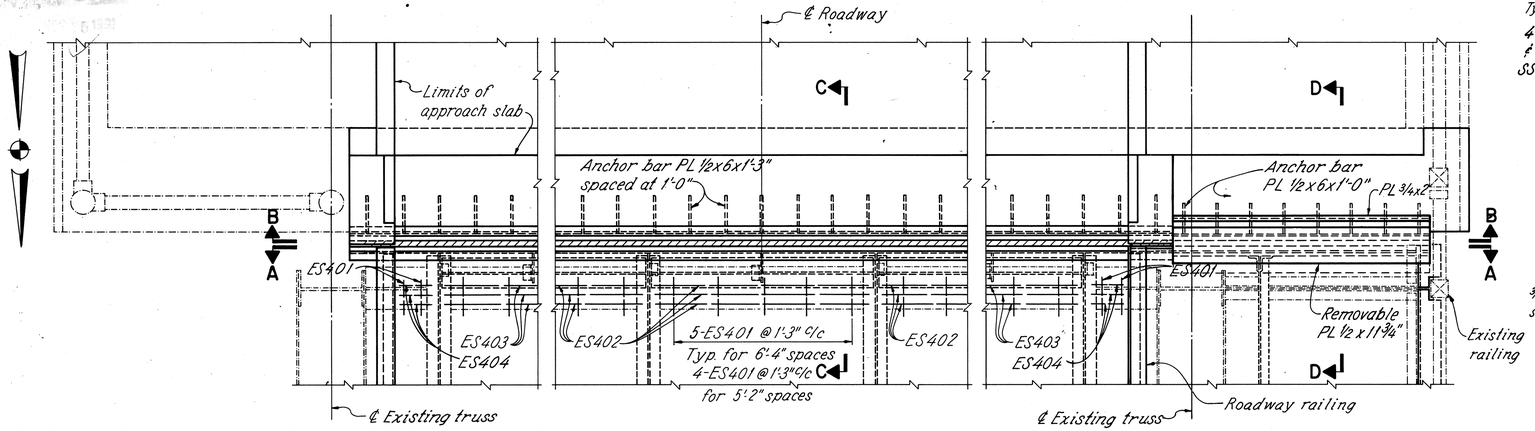
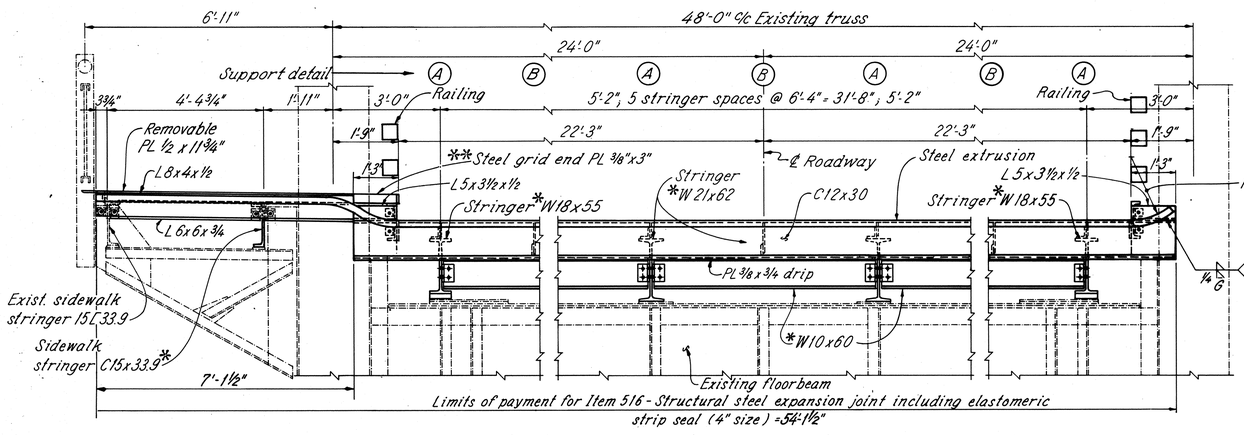
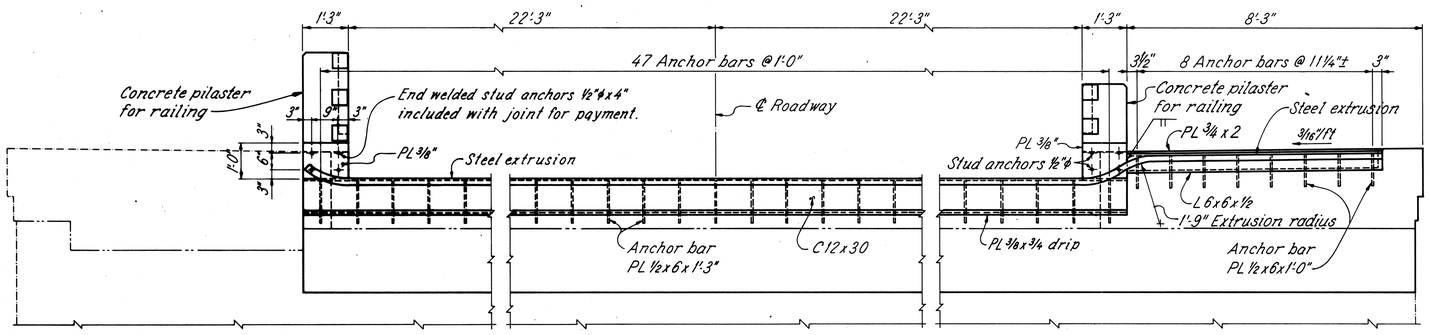


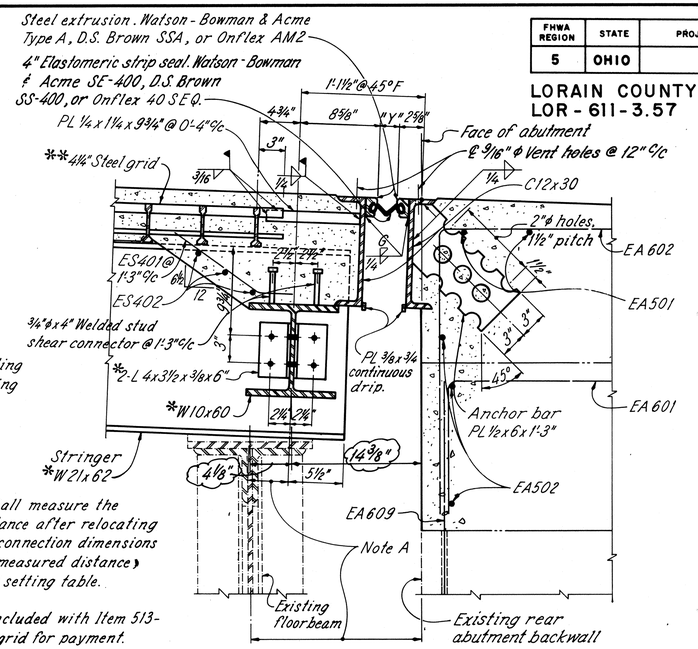
PARTIAL PLAN



SECTION A-A



SECTION B-B

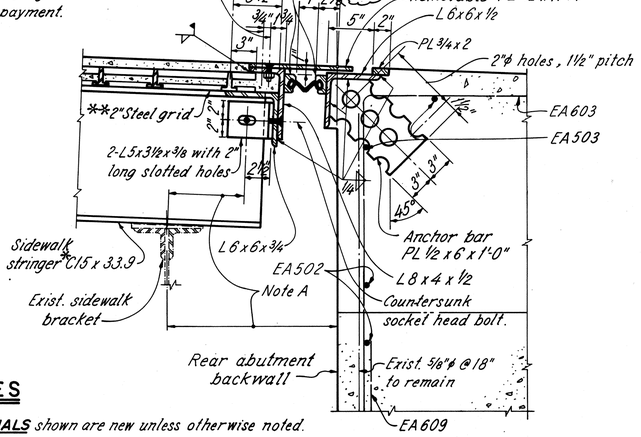


NOTE A: The Contractor shall measure the floorbeam to backwall distance after relocating spans and bearings. Final connection dimensions shall be calculated using measured distance) plan dimensions and joint setting table.

** Indicates material to be included with Item 513 - Welded epoxy coated steel grid for payment.

* Indicates material to be included with Item 513 - New A36 structural steel for payment. All other steel to be included with Item 516 - Structural steel expansion joints including elastomeric strip seals (4" size) for payment.

JOINT SETTING TABLE		
TEMPERATURE °F	DIMENSION	
	"Y"	"X"
35°	2 7/16"	3 9/16"
45°	2¼"	3"
55°	2 1/16"	2 13/16"
65°	1⅞"	2 5/8"
75°	1 11/16"	2 7/16"
85°	1½"	2¼"



SECTION D-D

NOTES

MATERIALS shown are new unless otherwise noted.

REMOVAL DETAILS: See sheets 21/81 & 22/81.

CURB DETAILS: See sheet 64/81.

SUPPORT DETAILS: See sheet 62/81.

BOLTS shall be 1"ϕ unless otherwise noted.

STRINGER & DIAPHRAGM DETAILS: See sheets 27/81, 32/81 & 33/81.

STEEL GRID DETAILS: See sheet 56/81.

STRUCTURAL STEEL JOINTS INCLUDING ELASTOMERIC SEALS: See General Notes on sheet 7/81 for additional specifications.

BOLT LEGEND: See sheet 20/81.

TYPICAL JOINT DETAILS: See sheet 62/81.

REINFORCING STEEL SCHEDULE: See sheet 62/81.

LEGEND

Existing material

New material

RICHLAND ENGINEERING LIMITED
MANSFIELD, OHIO

58/81

EXPANSION JOINT AT REAR ABUTMENT

SUPERSTRUCTURE
BRIDGE NO. LOR-611-0358
OVER BLACK RIVER

LORAIN COUNTY S.R.611

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
RDN	RHU	KH	DAP	DHT	9/6/88	

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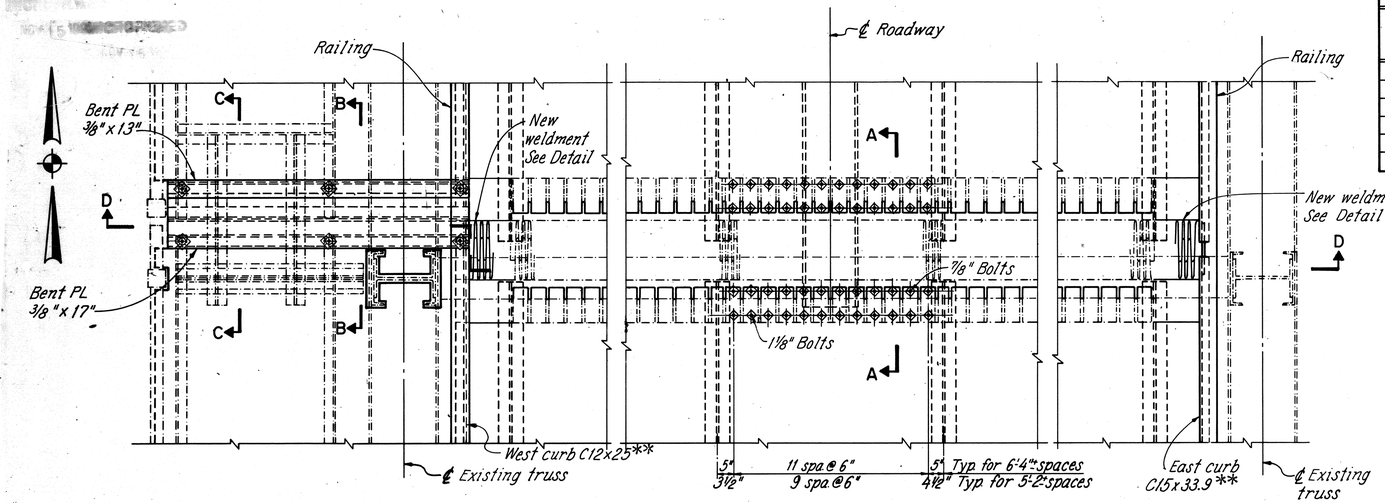
FHWA REGION	STATE	PROJECT		74
5	OHIO			

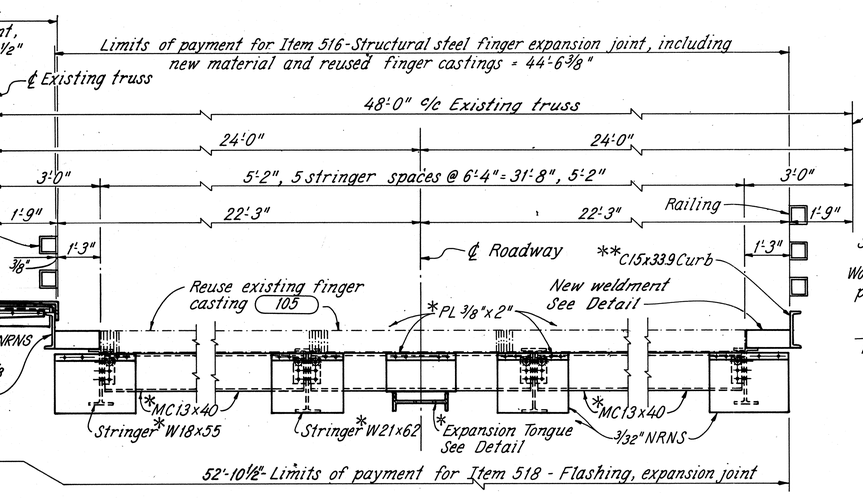
LORAIN COUNTY
LOR-611-3.57

JOINT SETTING TABLE			
TEMP. °F	DIMENSION "Y"		
35°	1'-8 7/16"		
45°	1'-8"		
55°	1'-7 5/8"		
65°	1'-7 3/16"		
75°	1'-6 3/4"		
85°	1'-6 5/16"		

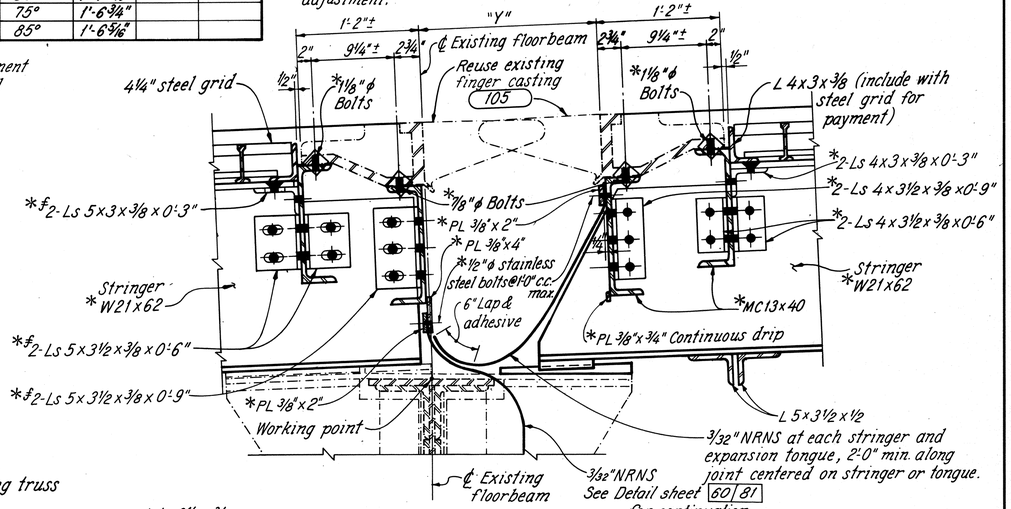
* Indicates materials to be included with Item 513 - New A36 structural steel for payment.
** Indicates materials to be included with Item 513 - New A36 galvanized structural steel - curbs, for payment.
£ With 2" long slotted holes in angle leg against stringer for longitudinal adjustment.

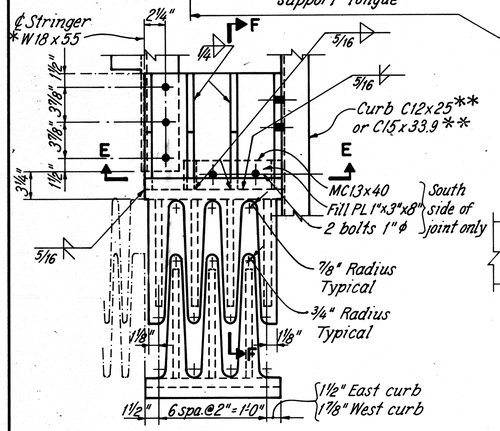


PARTIAL PLAN - PANEL POINT 12



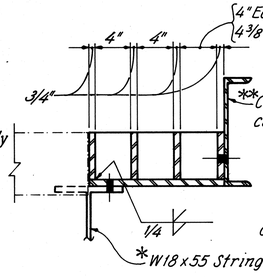
SECTION A-A



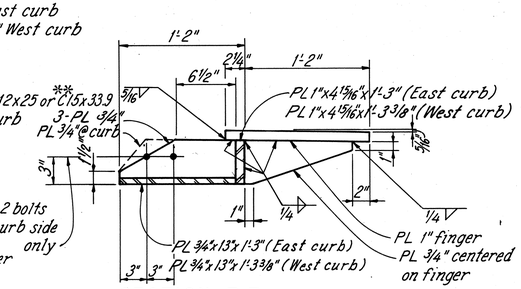


PLAN

SECTION D-D

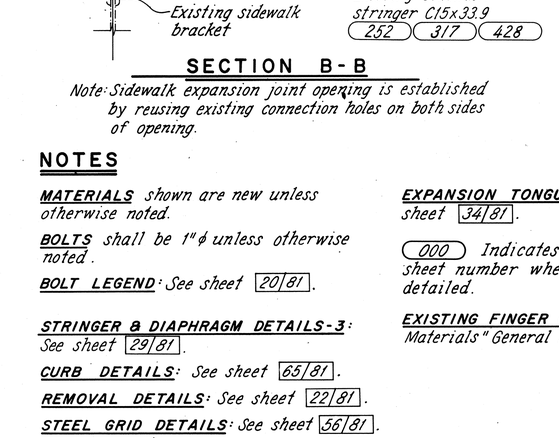


SECTION E-E

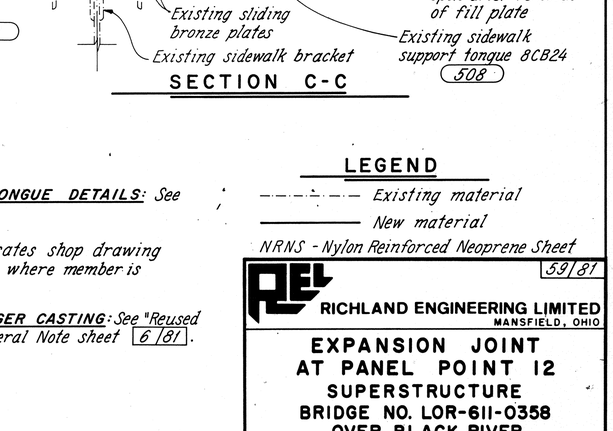


SECTION F-F

NEW WELDMENT DETAIL



SECTION B-B



SECTION C-C

Note: Sidewalk expansion joint opening is established by reusing existing connection holes on both sides of opening.

NOTES

MATERIALS shown are new unless otherwise noted.

BOLTS shall be 1"ø unless otherwise noted.

BOLT LEGEND: See sheet 20/81.

STRINGER & DIAPHRAGM DETAILS-3: See sheet 29/81.

CURB DETAILS: See sheet 65/81.

REMOVAL DETAILS: See sheet 22/81.

STEEL GRID DETAILS: See sheet 56/81.

EXPANSION TONGUE DETAILS: See sheet 34/81.

(000) Indicates shop drawing sheet number where member is detailed.

EXISTING FINGER CASTING: See "Reused Materials" General Note sheet 6/81.

LEGEND

Existing material
New material
NRNS - Nylon Reinforced Neoprene Sheet

59/81

RICHLAND ENGINEERING LIMITED
MANSFIELD, OHIO

EXPANSION JOINT AT PANEL POINT 12
SUPERSTRUCTURE
BRIDGE NO. LOR-611-0358
OVER BLACK RIVER

LORAIN COUNTY S.R. 611

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
RDN	JPS	JPS	DAP	DHT	9/6/88	

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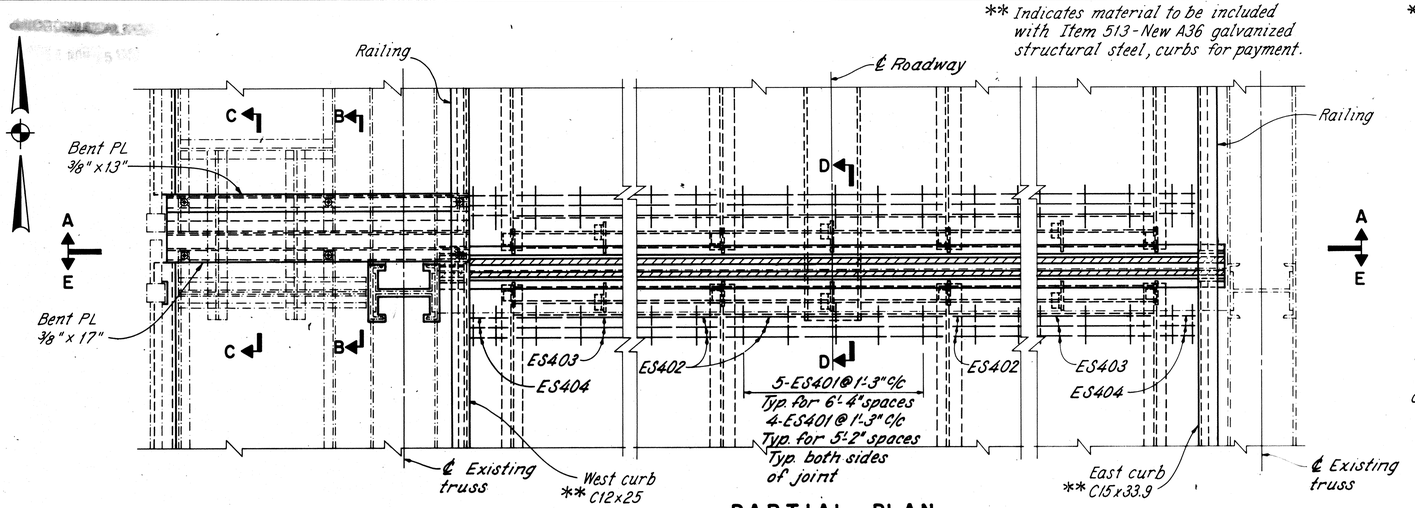
LORAIN COUNTY
LOR-611-0357

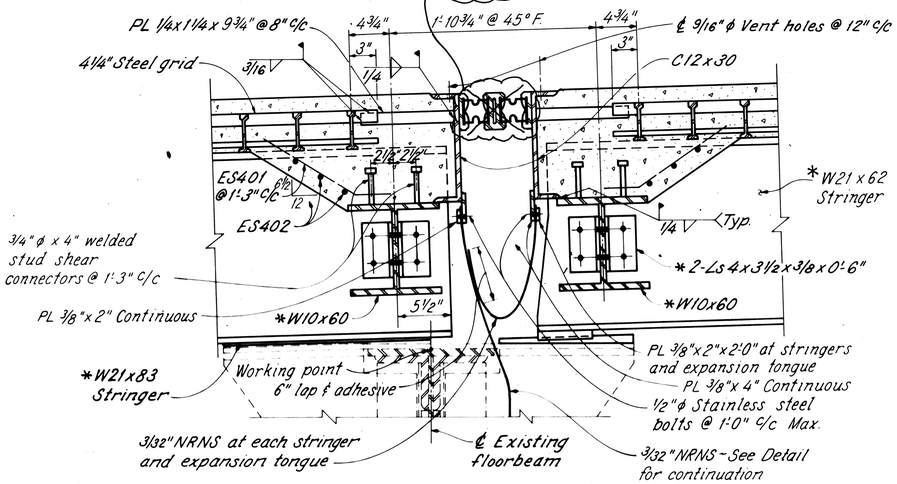
** Indicates material to be included with Item 513-New A36 galvanized structural steel, curbs for payment.



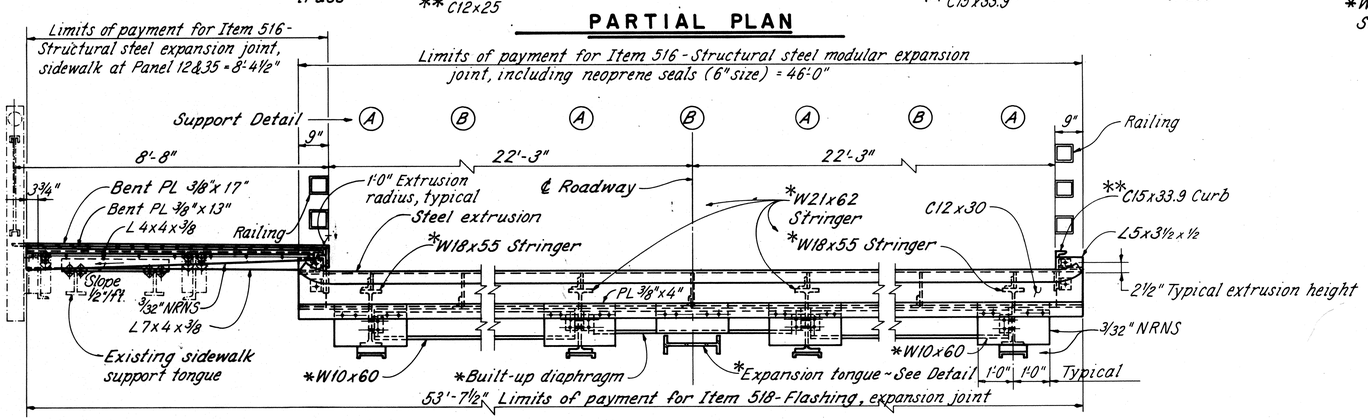
PARTIAL PLAN

* Indicates material to be included with Item 513-New A36 structural steel for payment. All other steel to be included with Item 516-Structural steel modular expansion joints including neoprene seals (6"size) for payment.

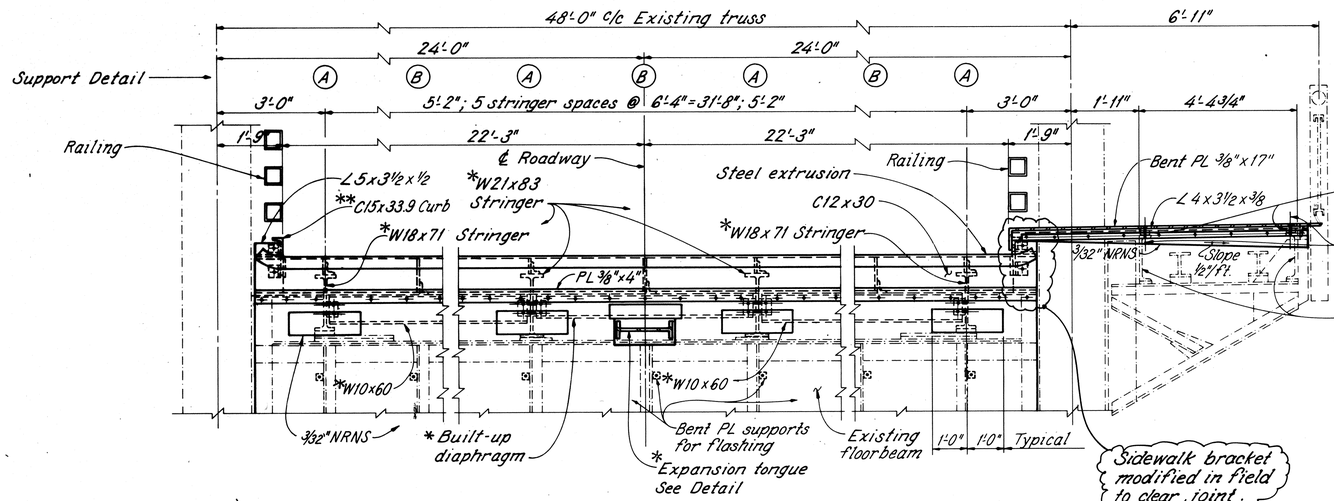
Double strip seal joint. See sheet 62/81 for note.



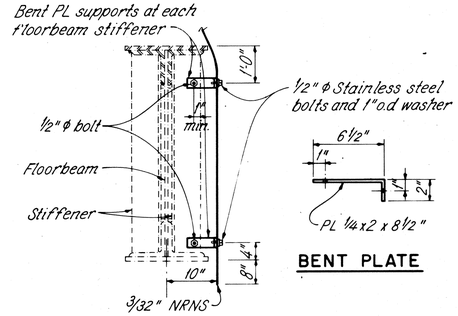
SECTION D-D



SECTION A-A



SECTION E-E



BENT PLATE

FLASHING SUPPORT DETAIL AT FLOORBEAMS PANEL POINTS 12, 18, 28, 35, 45, 52 & 62

Included with flashing for payment.

NOTES

MATERIALS shown are new unless otherwise noted.

BOLTS shall be 1"ϕ unless otherwise noted.

BOLT LEGEND: See sheet 20/81.

STRINGER & DIAPHRAGM DETAILS-4: See sheet 30/81.

CURB DETAILS: See sheet 65/81.

REMOVAL DETAILS: See sheet 22/81.

STEEL GRID DETAILS: See sheet 56/81.

EXPANSION TONGUE DETAILS: See sheet 34/81.

SECTION B-B & C-C: See sheet 59/81.

TYPICAL JOINT DETAILS: See sheet 62/81.

SUPPORT DETAILS: See sheet 62/81.

REINFORCING STEEL LIST: See sheet 62/81.

LEGEND

Existing material

New material

NRNS ~ Nylon reinforced neoprene sheet

60/81

RICHLAND ENGINEERING LIMITED
MANSFIELD, OHIO

EXPANSION JOINT AT PANEL POINT 35

SUPERSTRUCTURE
BRIDGE NO. LOR-611-0358
OVER BLACK RIVER

LORAIN COUNTY — S.R. 611

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
RDN	JLS	JLS	DAP	DHT	3/6/88	

AS BUILT 6/91

FHWA REGION	STATE	PROJECT	
5	OHIO		

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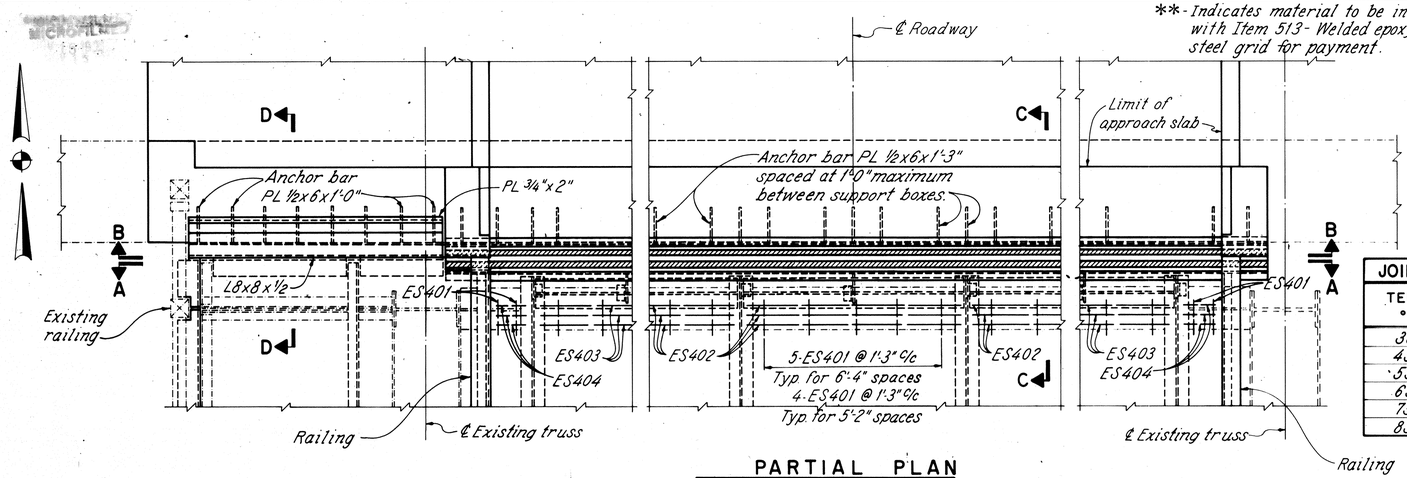
LORAIN COUNTY
LOR - 611 - 3.57

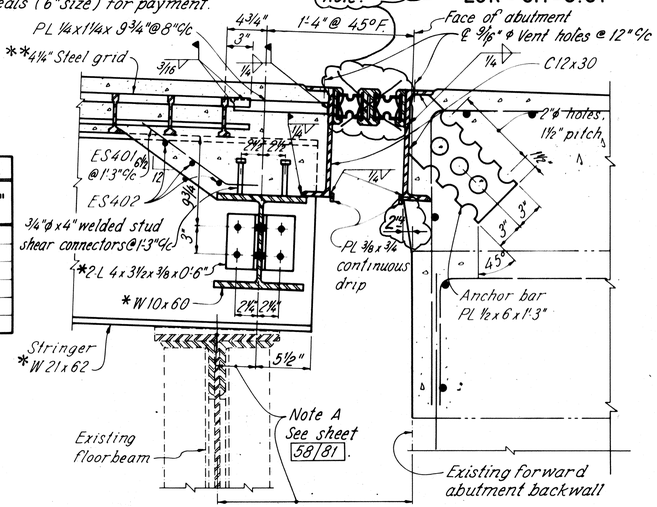
**-Indicates material to be included with Item 513 - Welded epoxy coated steel grid for payment.

*-Indicates material to be included with Item 513 - New A36 structural steel for payment. All other steel to be included with Item 516 - Structural steel modular expansion joints including neoprene seals (6" size) for payment.

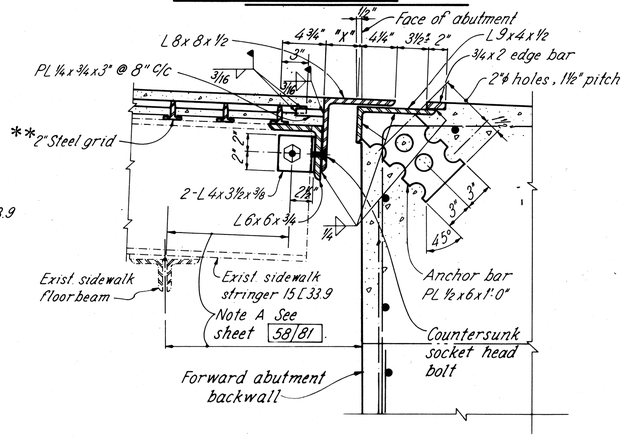


PARTIAL PLAN

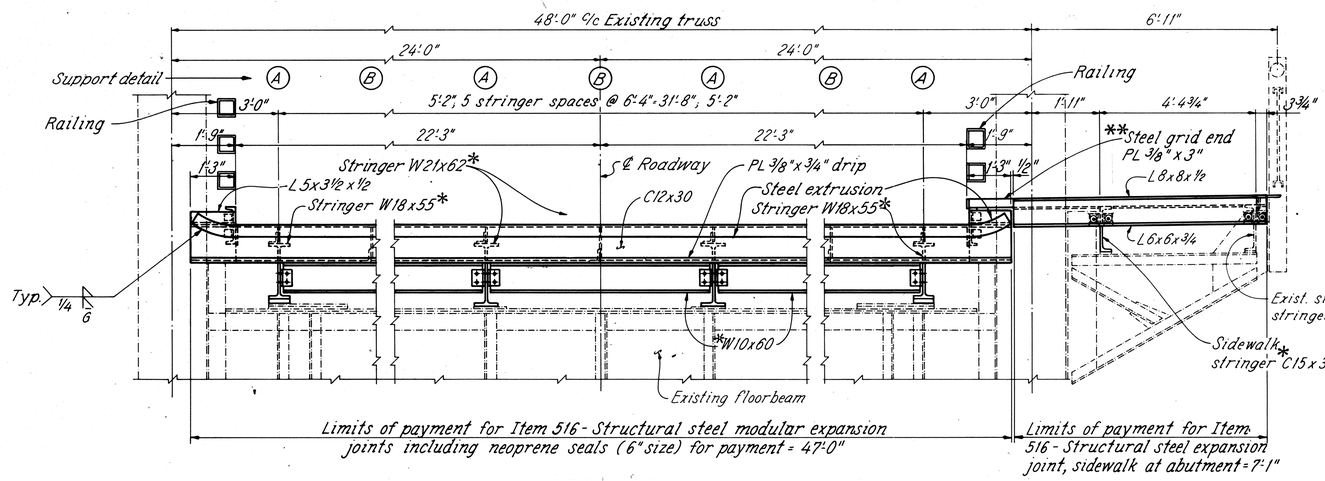
JOINT SETTING TABLE	
TEMP. °F	DIMENSION "X"
35°	4 1/8"
45°	3 3/4"
55°	3 3/8"
65°	2 15/16"
75°	2 9/16"
85°	2 3/16"



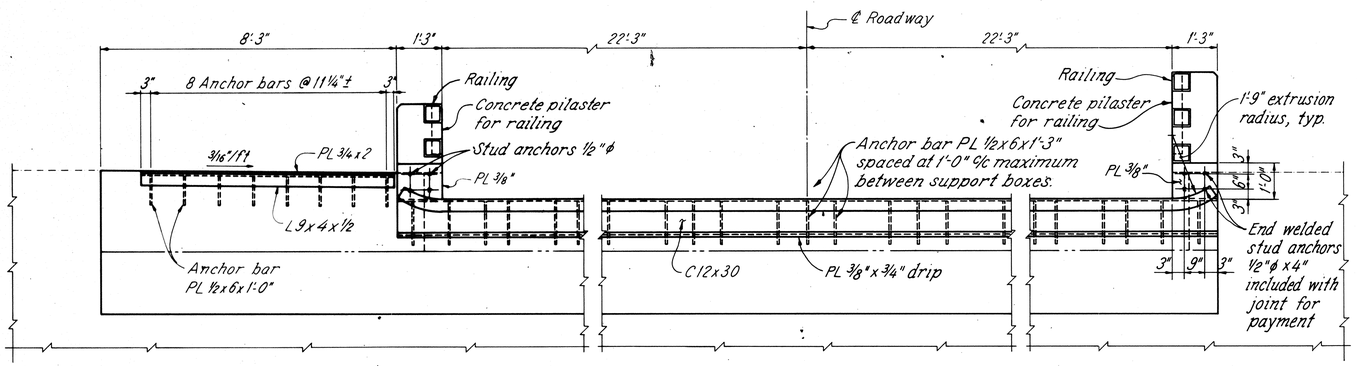
SECTION C-C



SECTION D-D



SECTION A-A



SECTION B-B

NOTES

MATERIALS shown are new unless otherwise noted.

REMOVAL DETAILS: See sheets 21/81 & 22/81.

CURB DETAILS: See sheet 64/81.

SUPPORT DETAILS: See sheet 62/81.

BOLTS shall be 1"ϕ unless otherwise noted.

STRINGER & DIAPHRAGM DETAILS: See sheets 27/81, 32/81 & 33/81.

STEEL GRID DETAILS: See sheet 56/81.

STRUCTURAL STEEL MODULAR EXPANSION JOINTS INCLUDING NEOPRENE SEALS: See General Notes on sheet 8/81 for additional specifications.

BOLT LEGEND: See sheet 20/81.

TYPICAL JOINT DETAILS: See sheet 62/81.

REINFORCING STEEL SCHEDULE: See sheet 62/81.

LEGEND

Existing material

New material

61/81

RICHLAND ENGINEERING LIMITED
MANSFIELD, OHIO

EXPANSION JOINT AT FORWARD ABUTMENT
SUPERSTRUCTURE
BRIDGE NO. LOR-611-0358 OVER BLACK RIVER

LORAIN COUNTY S.R. 611

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
RDN	RHU	KH	DAP	DHT	9/6/88	

AS BUILT 6/91

FHWA REGION	STATE	PROJECT	
5	OHIO		

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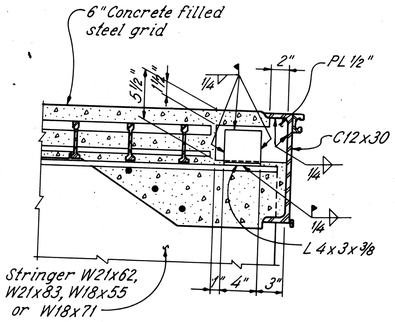
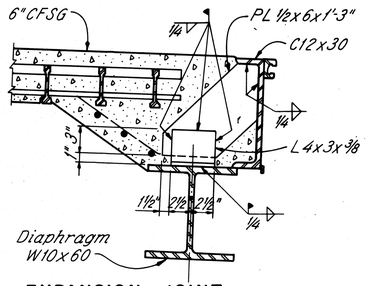
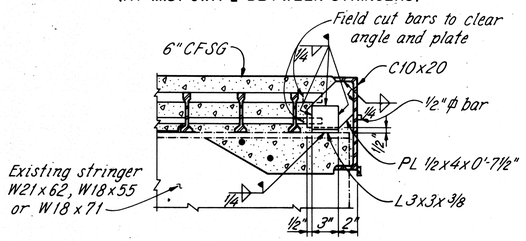
LORAIN COUNTY
LOR-611-3.57



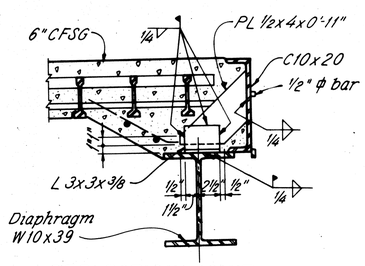
EXPANSION JOINT SUPPORT DETAIL (A)
(AT STRINGERS)



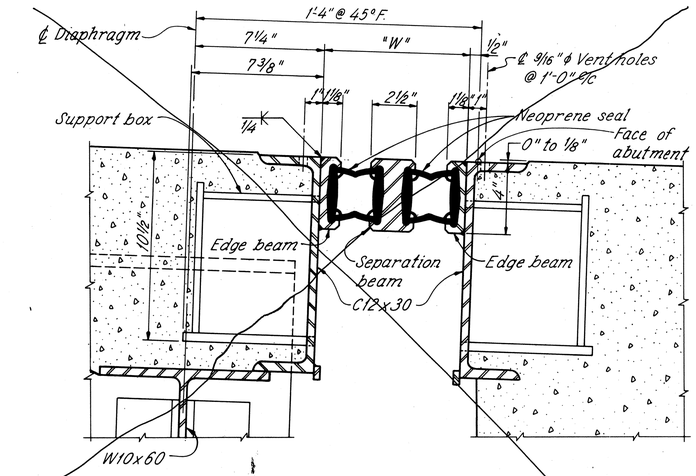
EXPANSION JOINT SUPPORT DETAIL (B)
(AT MIDPOINT ± BETWEEN STRINGERS)



DEFLECTION JOINT SUPPORT DETAIL (C)
(AT STRINGERS)



DEFLECTION JOINT SUPPORT DETAIL (D)
(AT MIDPOINT ± BETWEEN STRINGERS)

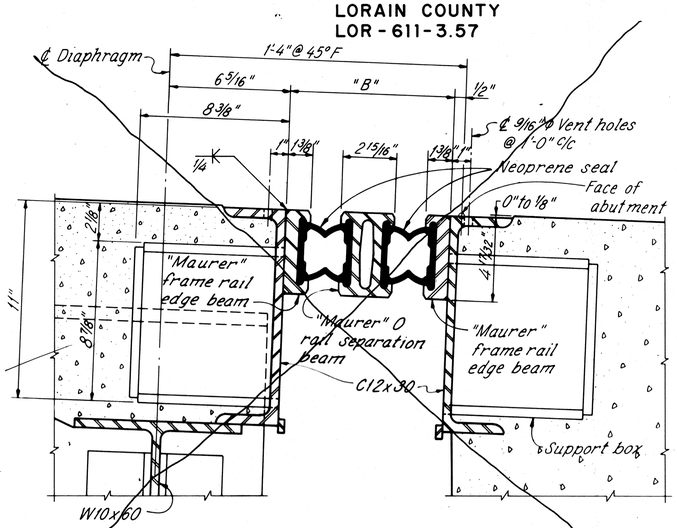


TYPICAL ROADWAY JOINT SECTION
(WATSON BOWMAN & ACME CORP.)
FORWARD ABUTMENT (SHOWN) AND PANEL 35 (SIMILAR)

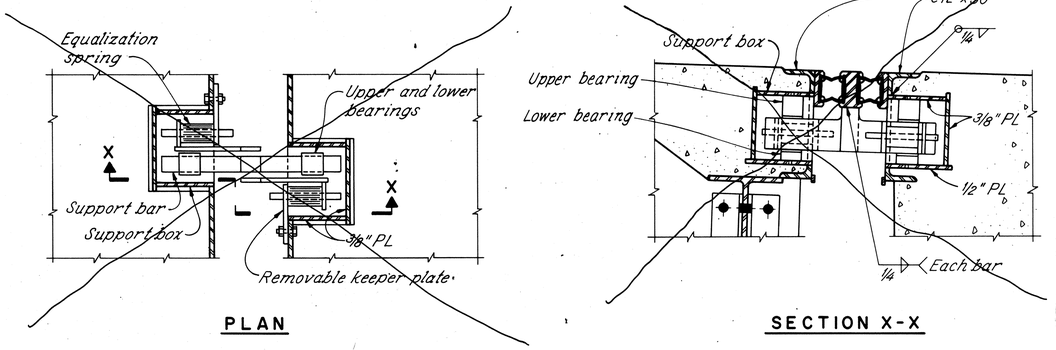
JOINT SETTING TABLE

TEMP. °F	PANEL 35		FORWARD ABUTMENT	
	DIMENSION "W"	DIMENSION "B"	DIMENSION "W"	DIMENSION "B"
35°	8 9/16"	9 1/2"	8 3/8"	9 3/16"
45°	8 1/4"	9 3/16"	8 1/4"	9 3/16"
55°	7 15/16"	8 7/8"	7 7/8"	8 13/16"
65°	7 3/8"	8 5/16"	7 7/16"	8 3/8"
75°	7 5/16"	8 1/4"	7 1/16"	8"
85°	7"	7 15/16"	6 11/16"	7 5/8"

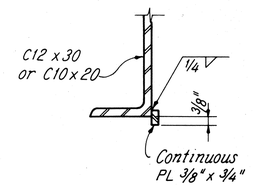
Note: As built modular joint, double strip seal "Robek" as fabricated by United Steel Fabricators, Inc. See shop drawings



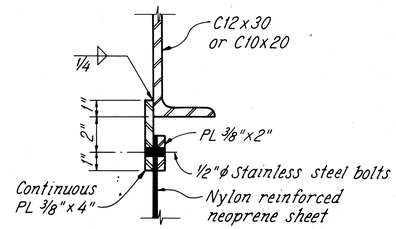
TYPICAL ROADWAY JOINT SECTION
(D.S. BROWN CO.)
FORWARD ABUTMENT (SHOWN) AND PANEL 35 (SIMILAR)



SUPPORT BAR AND BOX DETAIL



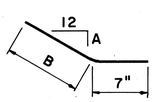
DRIP DETAIL



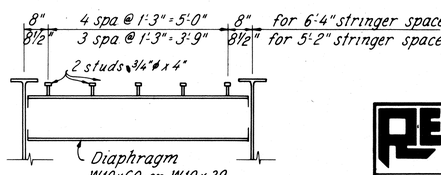
FLASHING CONNECTION DETAIL

EPOXY COATED REINFORCING STEEL - SUPERSTRUCTURE

MARK	JOINT LOCATION								NO.	LENGTH	TYPE	A	B	WEIGHT
	R.A.	18	28	35	45	52	62	F.A.						
ES401	37	-	-	74	-	-	-	37	148	1'-7"	1	6 1/2	1'-0"	156
ES402	15	20	20	30	20	20	20	15	160	6'-0"	Str.			641
ES403	6	8	8	12	8	8	8	6	64	4'-10"	Str.			207
ES404	6	8	8	12	8	8	8	6	64	1'-0"	Str.			43
ES405	-	74	74	-	74	74	74	-	370	1'-5"	1	5 3/4	10"	351
											TOTAL WEIGHT			1398



TYPE 1



WELDED STUD SHEAR CONNECTORS

62/81

RICHLAND ENGINEERING LIMITED
MANSFIELD, OHIO

JOINT DETAILS
SUPERSTRUCTURE
BRIDGE NO. LOR-611-0358
OVER BLACK RIVER

LORAIN COUNTY S.R. 611

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
RDN	RHU	UL	DAP	DHT	9/6/88	

AS BUILT 6/91

FHWA REGION	STATE	PROJECT	
5	OHIO		

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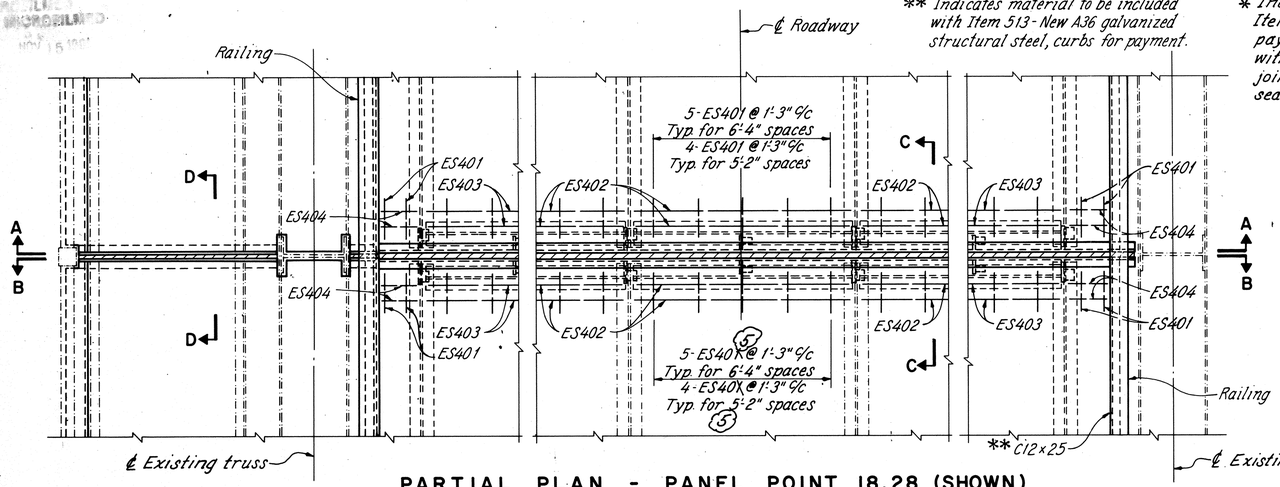
LORAIN COUNTY
LOR-611-3.57

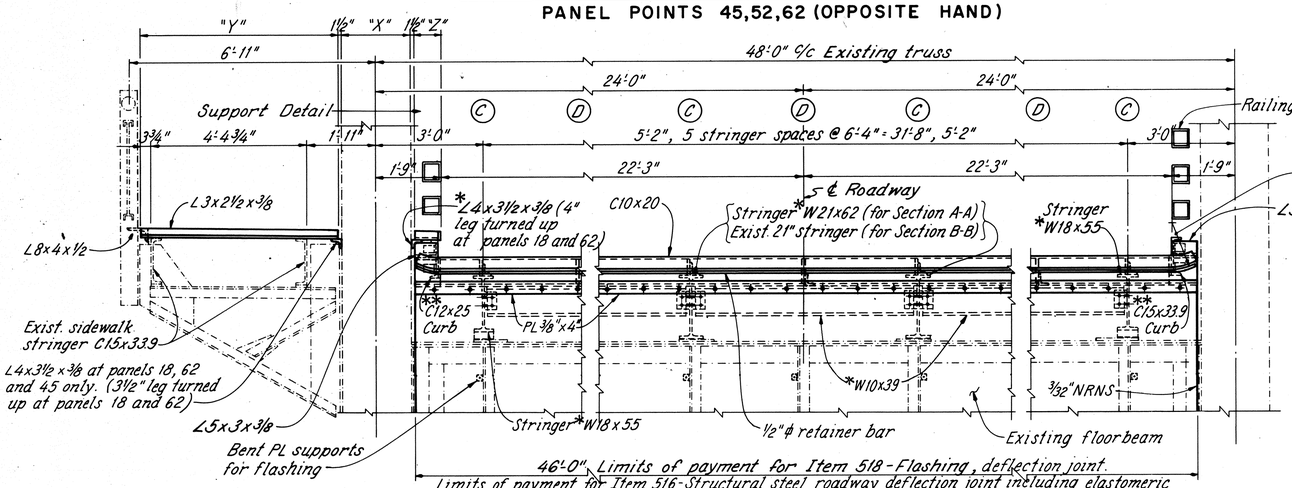
** Indicates material to be included with Item 513-New A36 galvanized structural steel, curbs for payment.

* Indicates material to be included with Item 513-New A36 structural steel for payment. All other steel to be included with Item 516-Structural steel deflection joints including elastomeric compression seals for payment.



PARTIAL PLAN - PANEL POINT 18,28 (SHOWN)

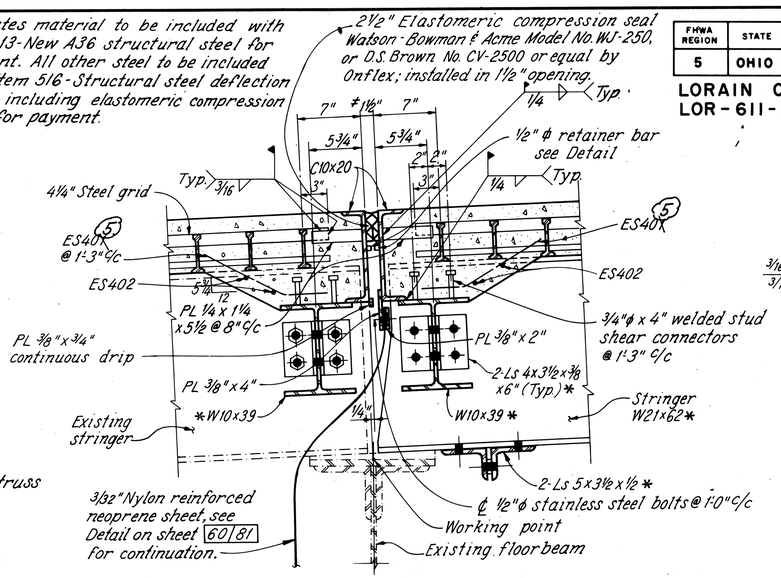
PANEL POINTS 45,52,62 (OPPOSITE HAND)



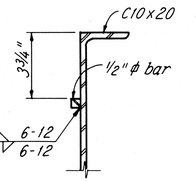
SECTION A-A (SHOWN)

SECTION B-B (OPP. HAND AS NOTED)

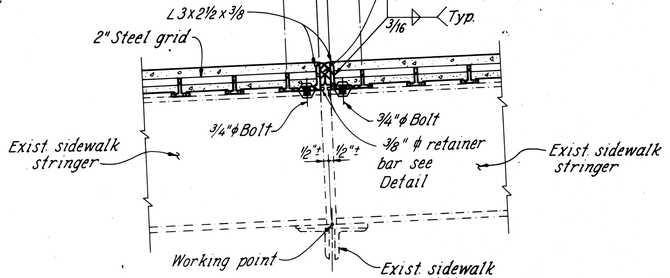
≠ No movement with temperature



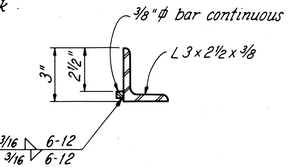
SECTION C-C



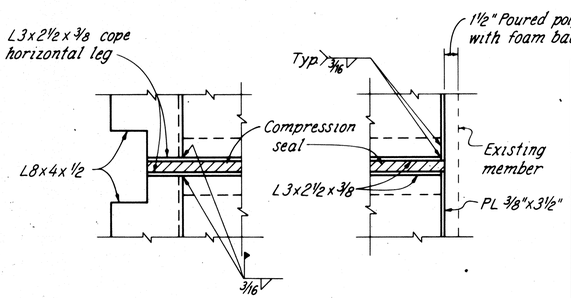
1/2" RETAINER BAR DETAIL



SECTION D-D



3/8" RETAINER BAR DETAIL



AT RAILING AT TRUSS VERTICAL
SIDEWALK JOINT DETAILS

TABLE OF DIMENSIONS

DIMENSION	PANEL 18&62	PANEL 28&52	PANEL 45
"X" ℅ existing member	1'-11⅞"±	1'-9¾"±	1'-9⅞"±
"Y" sidewalk joint	5'-6 1/16"	5'-7⅛"	5'-7 1/16"
"Z" curb joint	7 9/16"	8⅝"	8 9/16"
Limits of payment for Item 516-Structural steel sidewalk deflection joint including compression seal (1¾" size) ("Y" + "Z")	6'-1⅝"	6'-3¾"	6'-3⅝"

NOTES

REMOVAL DETAILS: See sheet 22/81.

CURB DETAILS: See sheet 64/81.

BOLTS shall be 1" ϕ unless otherwise noted.

STEEL GRID DETAILS: See sheets 56/81. & 57/81.

MATERIALS shown are new unless otherwise noted.

BOLT LEGEND: See sheet 20/81.

STRINGER & DIAPHRAGM DETAILS: See sheets 27/81 & 31/81.

SUPPORT DETAILS: See sheet 62/81.

REINFORCING STEEL SCHEDULE: See sheet 62/81.

LEGEND

- Existing material
- New material
- NRNS ~ Nylon reinforced neoprene sheet

63/81

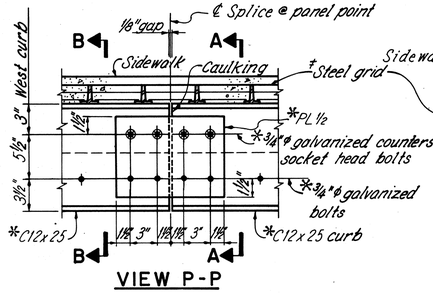
RICHLAND ENGINEERING LIMITED
MANSFIELD, OHIO

DEFLECTION JOINTS

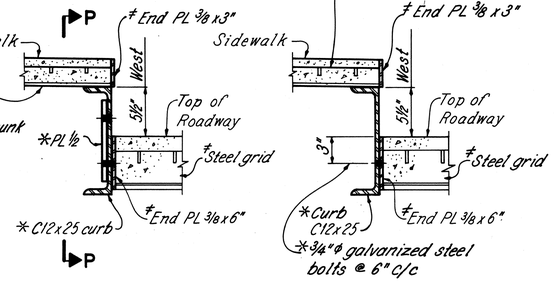
SUPERSTRUCTURE
BRIDGE NO. LOR-611-0358
OVER BLACK RIVER
LORAIN COUNTY S.R. 611

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
RDN	JPS	JPS	DAP	DHT	9/16/88	

AS BUILT 6/91

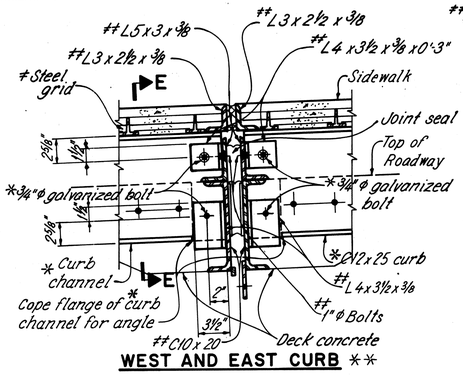


TYPICAL SPLICE ELEVATION

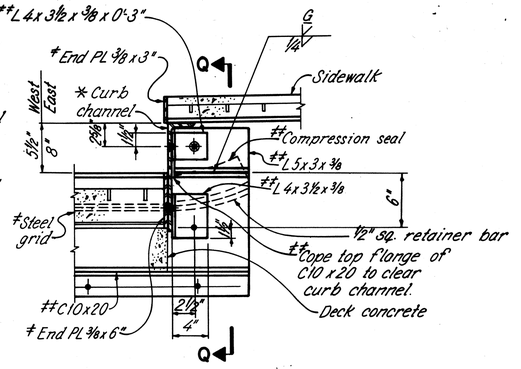


SECTION A-A

SECTION B-B
TYPICAL SECTION

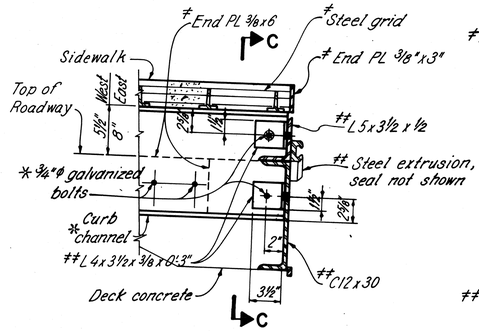


WEST AND EAST CURB **
ELEVATION AT DEFLECTION JOINT
VIEW Q-Q

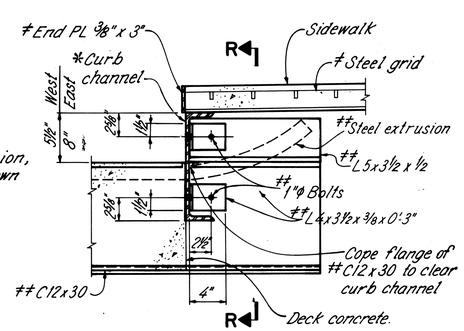


SECTION E-E

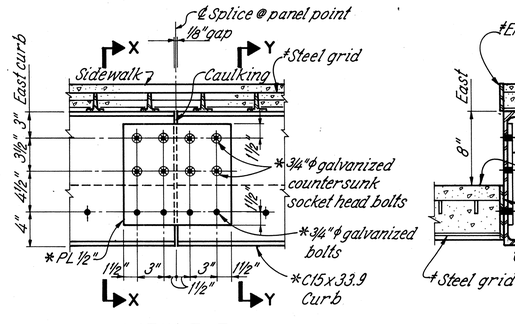
TYPICAL WEST CURB



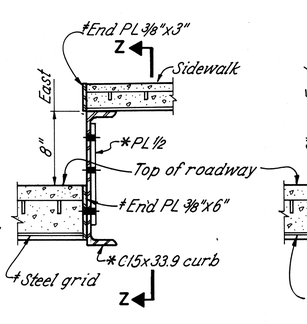
WEST AND EAST CURB **
ELEVATION AT REAR ABUTMENT
VIEW R-R .



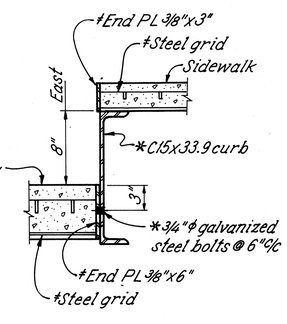
SECTION C-C



VIEW Z-Z
TYPICAL SPLICE ELEVATION



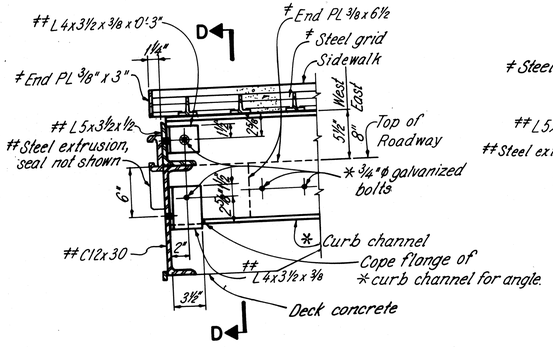
SECTION X-X



SECTION Y-Y
TYPICAL SECTION

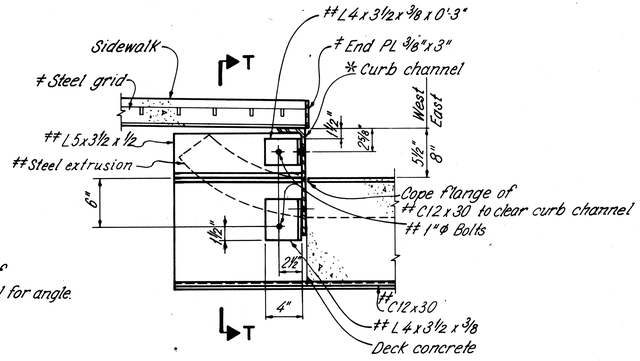
TYPICAL EAST CURB

Note: Curb channel-
*C12x25 West side
*C15x33.9 East side



WEST AND EAST CURB **
ELEVATION AT FORWARD ABUTMENT
VIEW T-T

** West curb shown. East curb similar without sidewalk.



SECTION D-D

≠ Indicates material to be included with Item 513 - Welded epoxy coated steel grid for payment.

* Indicates material to be included with Item 513 - New A36 galvanized structural steel for payment. Material to be galvanized after fabrication.

NOTES

MATERIALS shown are new unless otherwise noted.

TRANSVERSE SECTION: See sheet 20/81.

FRAMING PLAN: See sheet 25/81 and 26/81

BOLTS shall be ¾"ϕ galvanized bolts unless otherwise noted. All countersunk bolts shall have socket heads. Bolts connecting steel grid end plate to curb channel shall be shop drilled in the steel grid end plate and field drilled in the curb channel to match.

BOLT LEGEND: See sheet 20/81

ESTIMATED QUANTITY of structural steel is calculated locating a splice at the panel point locations. 60 splices for each curb are included in the estimated quantity.

DECK & SIDEWALK JOINT DETAILS: See sheet 58/81 thru 63/81.

STRINGER & DIAPHRAGM DETAILS: See sheet 33/81.

CURB DETAILS - 1
SUPERSTRUCTURE
BRIDGE NO. LOR-611-0358
OVER BLACK RIVER

LORAIN COUNTY S.R.611

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
RDN	KH	JLS	DAP	DHT	9/6/88	

RICHLAND ENGINEERING LIMITED
MANSFIELD, OHIO

64/81

AS BUILT 6/91

FHWA REGION	STATE	PROJECT	
5	OHIO		

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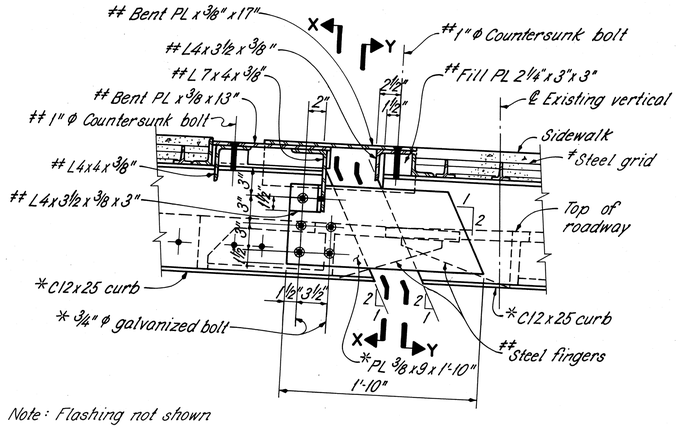
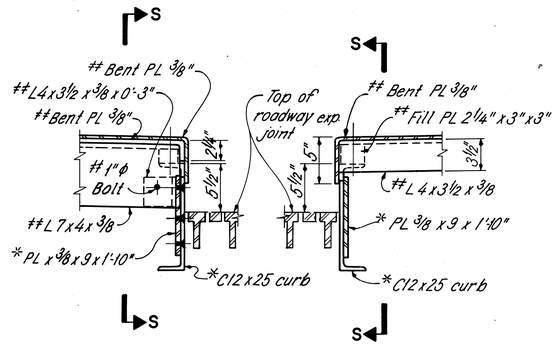
LORAIN COUNTY
LOR-611-3.57



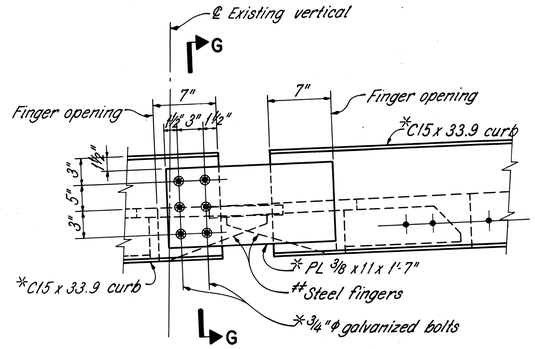
Note: Flashing not shown

WEST CURB ELEVATION AT PANEL POINT 12
VIEW S-S

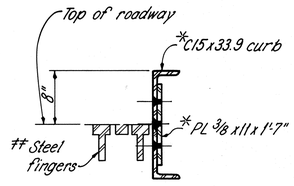


SECTION X-X

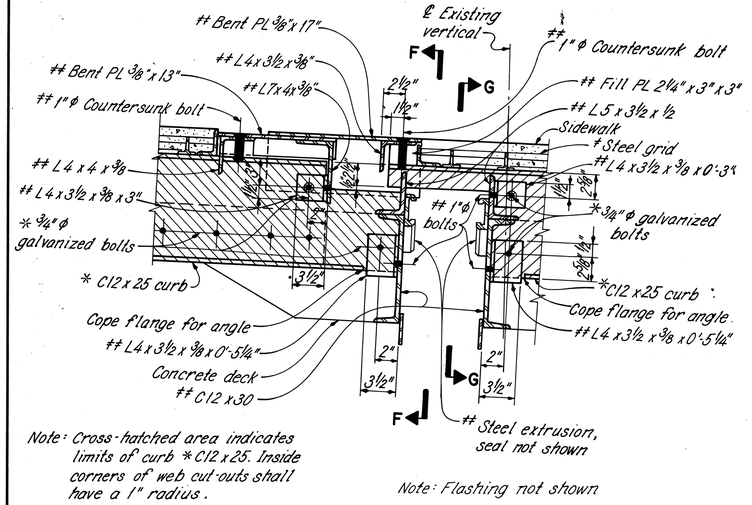
SECTION Y-Y



EAST CURB ELEVATION AT PANEL POINT 12



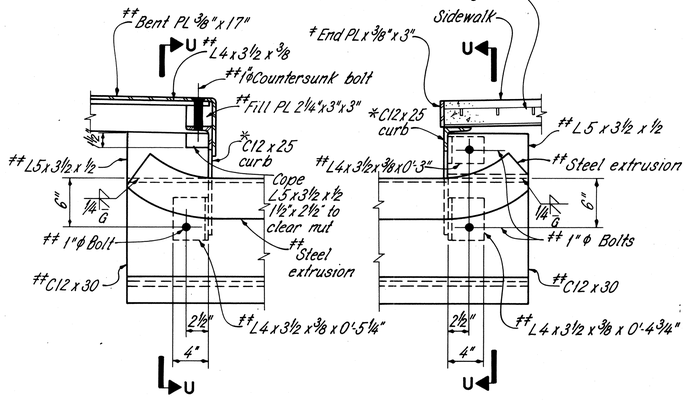
SECTION G-G



Note: Cross-hatched area indicates limits of curb * C12 x 25. Inside corners of web cut-outs shall have a 1" radius.

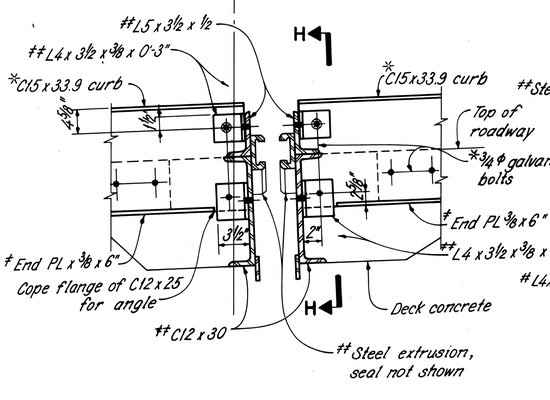
Note: Flashing not shown

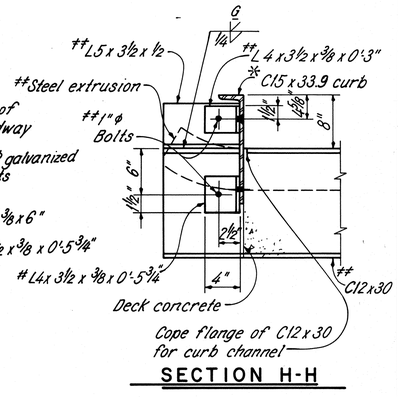
WEST CURB ELEVATION AT PANEL POINT 35
VIEW U-U



SECTION F-F

SECTION G-G





SECTION H-H

EAST CURB ELEVATION AT PANEL POINT 35

NOTES See sheet 64/81.

# Indicates material to be included with Item 513 - Welded epoxy coated steel grid for payment.

Indicates material to be included with Item 516 - Structural steel deflection or expansion joints for payment.

* Indicates material to be included with Item 513 - New A36 galvanized structural steel for payment. Material to be galvanized after fabrication.

65/81

RICHLAND ENGINEERING LIMITED
MANSFIELD, OHIO

CURB DETAILS - 2
SUPERSTRUCTURE
BRIDGE NO. LOR-611-0358
OVER BLACK RIVER

LORAIN COUNTY S.R. 611

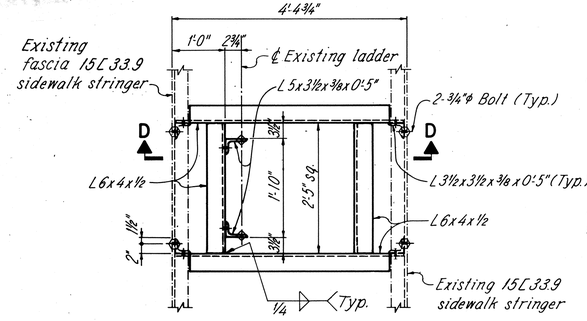
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
RDN	TWH	TWH	DAP	DHT	9/6/88	

AS BUILT 6/91

FHWA REGION	STATE	PROJECT	
5	OHIO		

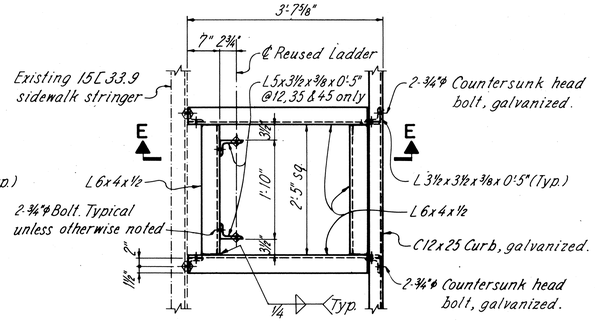
81

LORAIN COUNTY
LOR-611-3.57



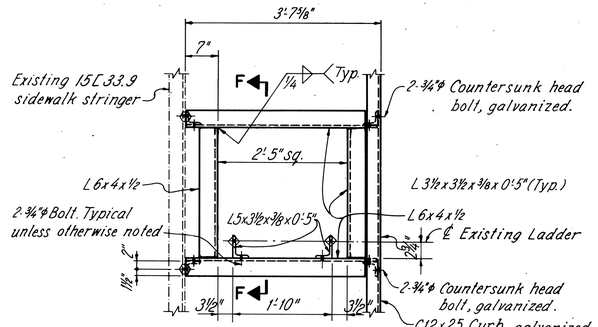
PLAN

PANEL POINTS 10, 20 & 60



PLAN

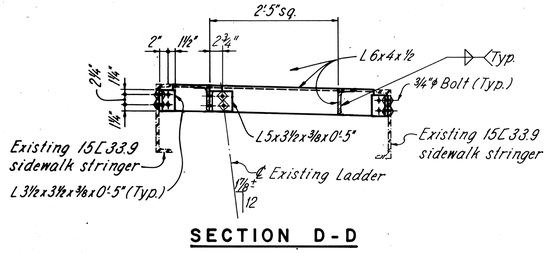
PANEL POINTS 12, 18, 35, 45 & 62



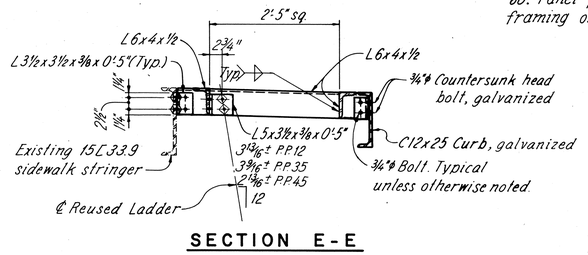
PLAN

PANEL POINTS 32 & 48

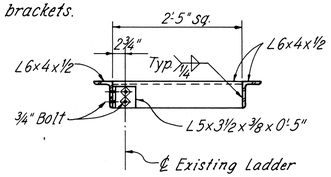
NOTE: Access hatch framing, ladder and ladder supports are at panel point 10, 12, 20, 32, 35, 45, 48 and 60. Panel point 18 and 62 are access hatch framing only with no ladder brackets.



SECTION D-D

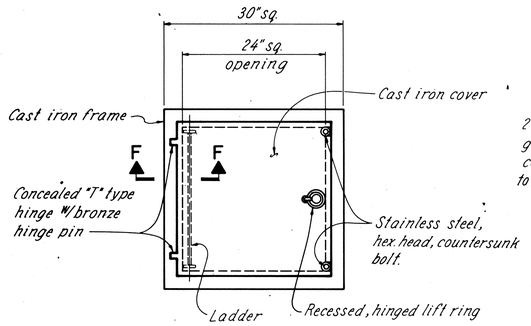


SECTION E-E

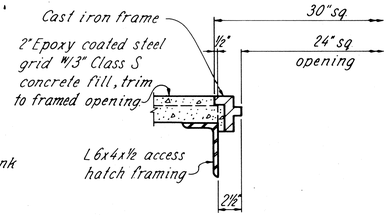


SECTION F-F

ACCESS HATCH FRAMING



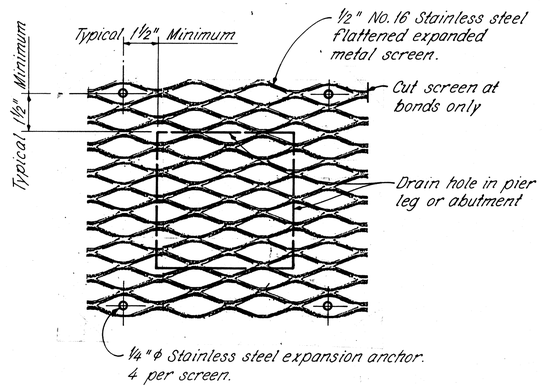
PLAN



SECTION F-F

ACCESS HATCH DETAIL

ACCESS HATCHES cast iron frame with square heavy duty lid shall be Neenah Foundry Company #R-6662-KH, East Jordan Iron Works, Inc. #8208, or equal. Minimum weight of frame and lid assembly shall be 340 lb. Furnish working drawings per General Note sheet 3 of 81.
The cost of all labor, material and equipment necessary for the complete installation of the cast iron frame, cover and all hardware, shall be included for payment, per each location, with Item Special-Access Hatches.



SUBSTRUCTURE DRAIN HOLE SCREENING DETAIL

See General Note sheet 10 of 81.

NOTES

BOLT LEGEND: See sheet 20/81.

MATERIALS shown are new unless otherwise noted.

LEGEND

Existing material

New material

66/81

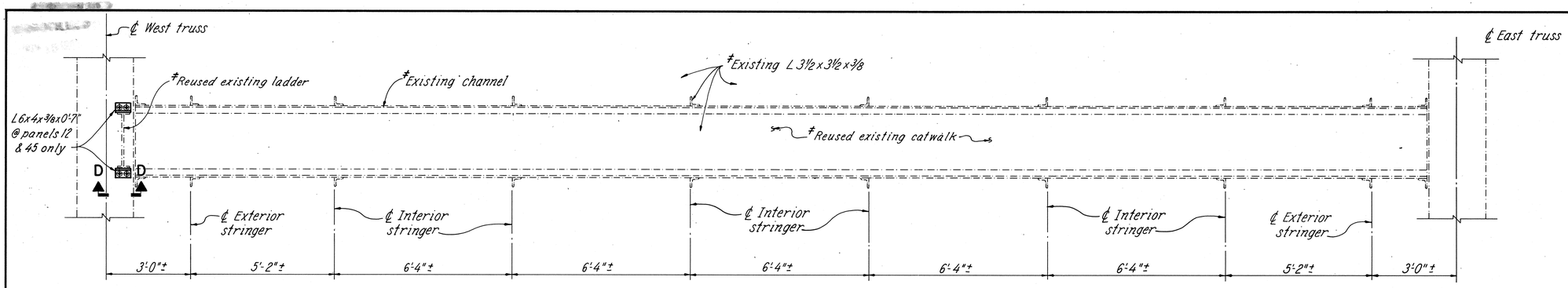
RICHLAND ENGINEERING LIMITED
MANSFIELD, OHIO

ACCESS HATCH DETAILS & SUBSTRUCTURE DRAIN HOLES
SUPERSTRUCTURE
BRIDGE NO. LOR-611-0358
OVER BLACK RIVER

LORAIN COUNTY S.R. 611

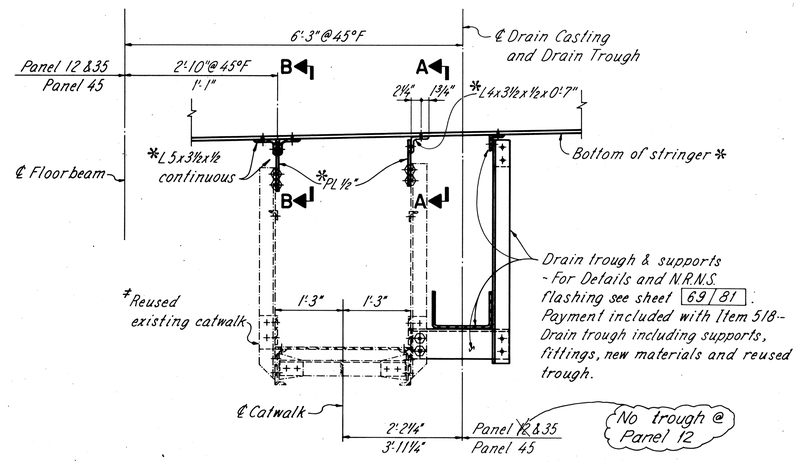
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
RDN	KH	KH	DAP	DHT	9/6/88	

AS BUILT 6/91

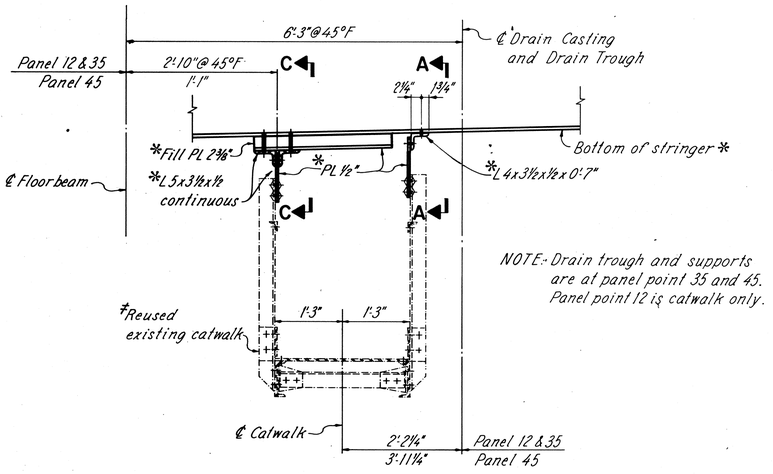


CATWALK PLAN

PANEL POINTS 12, 35 & 45

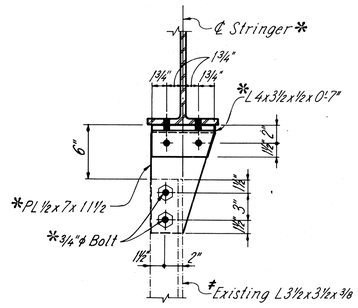


AT INTERIOR STRINGER

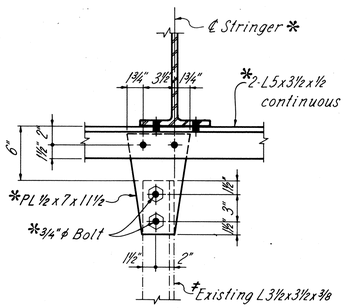


AT EXTERIOR STRINGER

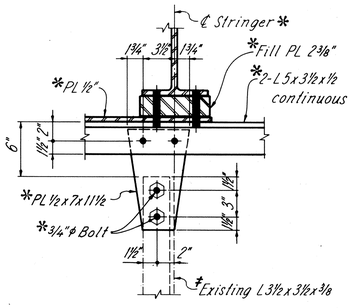
TYPICAL CATWALK SECTION



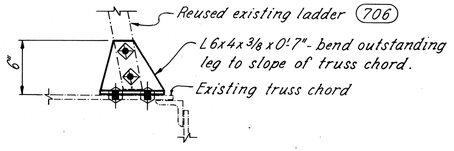
SECTION A-A



SECTION B-B



SECTION C-C



SECTION D-D

* Included for payment with Item 513:- New A36 structural steel.

≠ Included for payment with Item 513:- Dismantle, move and erect reused catwalk and ladder.

NOTES

BOLTS are 1" diameter unless noted.

BOLT LEGEND: See sheet 20/81.

MATERIALS shown are new unless otherwise noted.

(000) Indicates shop drawing sheet number where member is detailed.

REMOVAL DETAILS: See sheet 23/81.

LEGEND

- Existing material
- New material
- N.R.N.S. Nylon reinforced neoprene sheet

FHWA REGION	STATE	PROJECT	
5	OHIO		

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LORAIN COUNTY
LOR-611-3.57

67/81

RICHLAND ENGINEERING LIMITED
MANSFIELD, OHIO

CATWALK DETAILS

SUPERSTRUCTURE
BRIDGE NO. LOR-611-0358
OVER BLACK RIVER

LORAIN COUNTY — S.R. 611

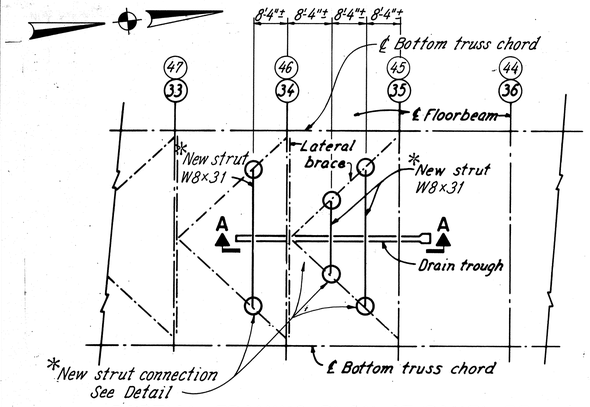
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
RDN	KH	KH	DAP	DHT	9/15/88	

AS BUILT 6/91

FHWA REGION	STATE	PROJECT	
5	OHIO		

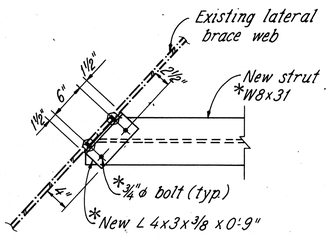
83

LORAIN COUNTY
LOR-611-3.57

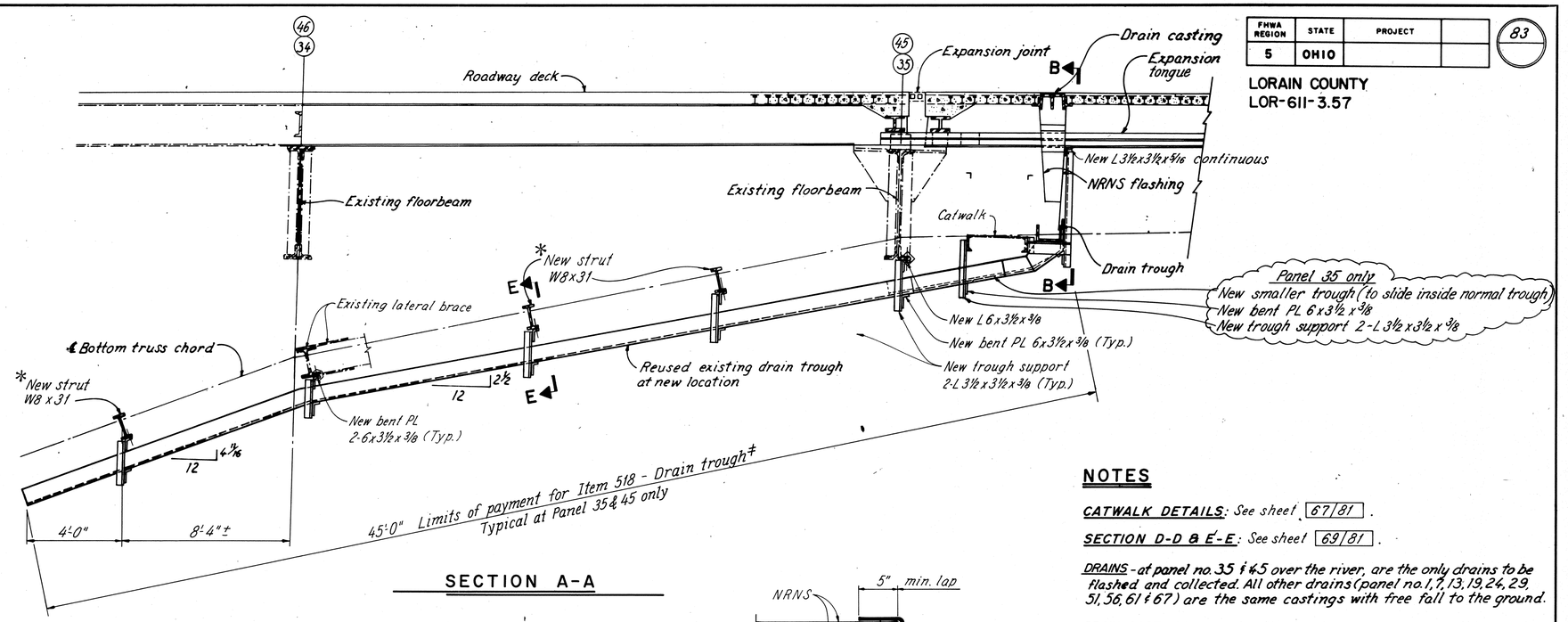


PARTIAL FRAMING PLAN AT PANEL 35

PANEL 45 SIMILAR



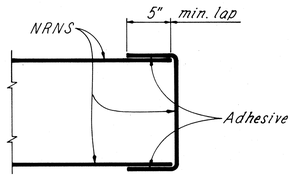
SECTION F-F



SECTION A-A

*Included for payment with Item 513 - New A36 structural steel (AISC Category III)

‡Including supports, fittings, new material and reused trough, as per plan.



SECTION C-C

NOTES

CATWALK DETAILS: See sheet 67/81 .

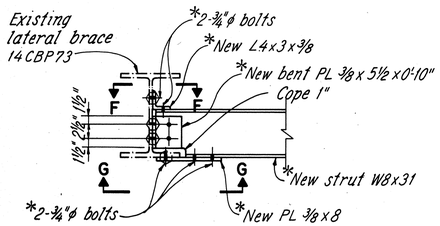
SECTION D-D & E-E: See sheet 69/81 .

DRAINS - at panel no. 35 & 45 over the river, are the only drains to be flashed and collected. All other drains (panel no. 1, 7, 13, 19, 24, 29, 51, 56, 61 & 67) are the same castings with free fall to the ground.

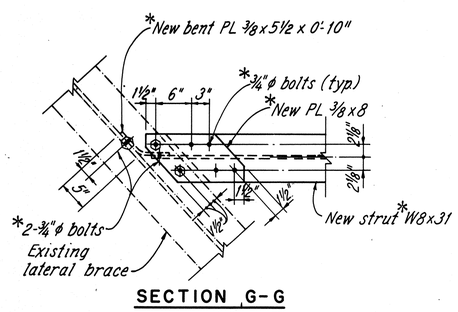
DRAIN CASTINGS - may be all new steel castings or reused existing castings at the contractors option. Reused existing castings must be carefully removed from the structure, have existing angles removed, and installed with shims to proper elevation. New castings must be similar in size and construction to existing castings.

NRNS - Nylon reinforced neoprene sheet.

END COLLECTOR DETAIL: See sheet 69/81 .

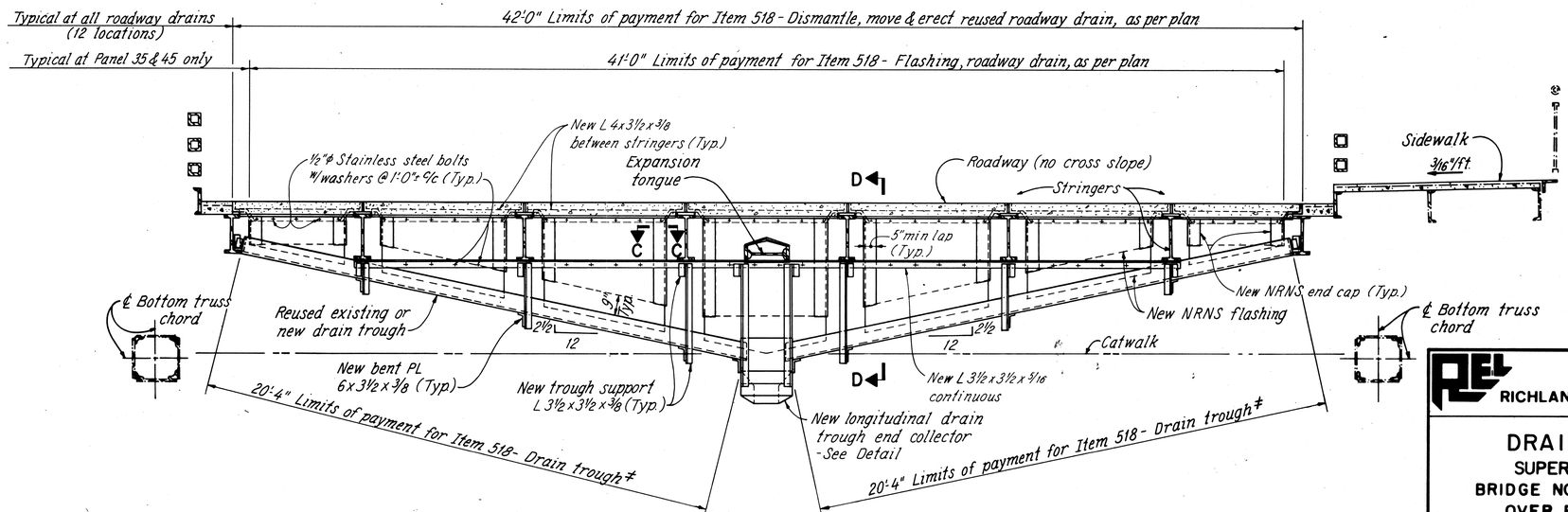


ELEVATION



SECTION G-G

*STRUT CONNECTION DETAIL



SECTION B-B

68/81

RICHLAND ENGINEERING LIMITED
MANSFIELD, OHIO

DRAINAGE - 1
SUPERSTRUCTURE
BRIDGE NO. LOR-611-0358
OVER BLACK RIVER

LORAIN COUNTY — S.R. 611

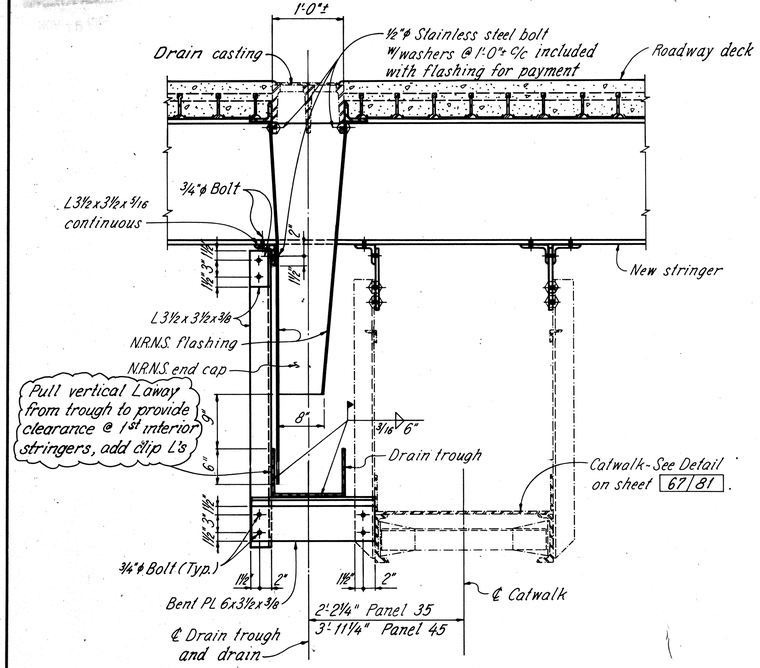
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
RDN	JPS	JPS	DAP	DHT	9/6/88	

AS BUILT 6/91

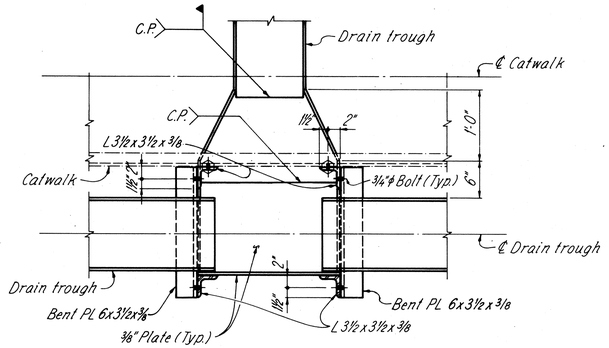
FHWA REGION	STATE	PROJECT	
5	OHIO		

84

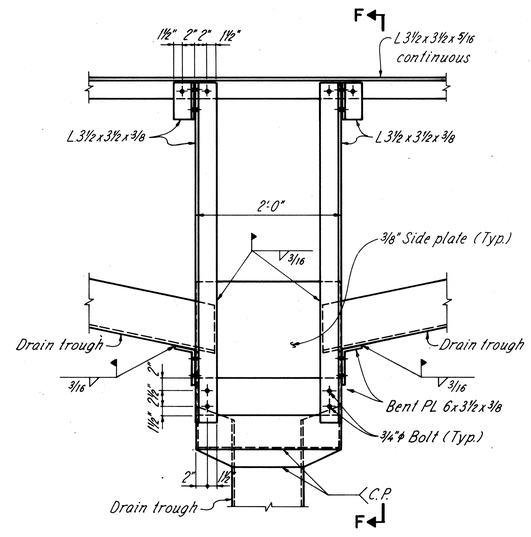
LORAIN COUNTY
LOR-611-3.57



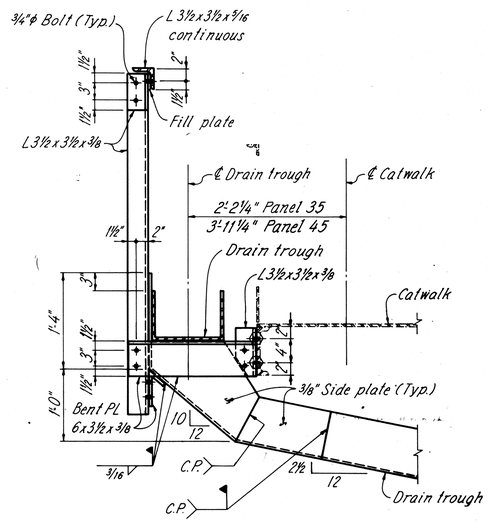
SECTION D-D



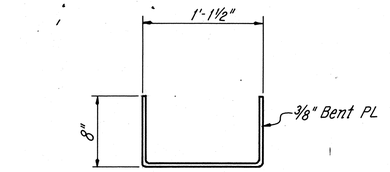
PLAN



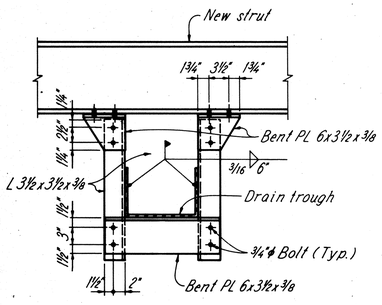
ELEVATION



SECTION F-F



NEW TROUGH DETAIL



SECTION E-E

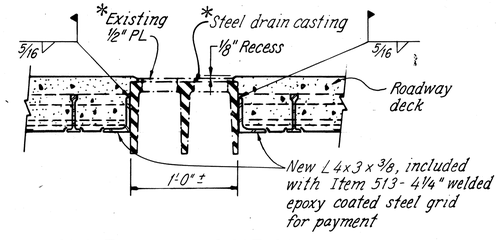
END COLLECTOR DETAIL

NOTES

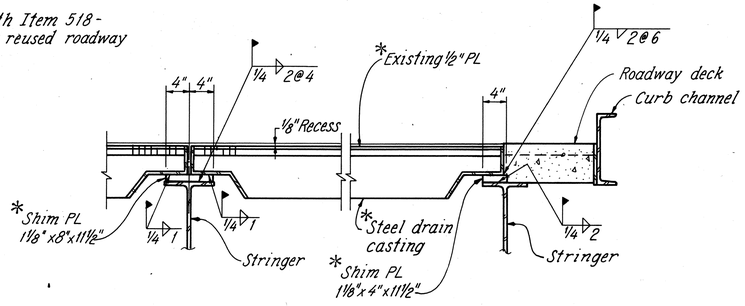
BOLT LEGEND: See sheet 20/81.

ADDITIONAL NOTES: See sheet 68/81.

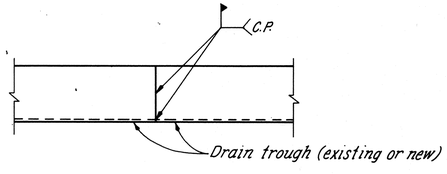
*Included for payment with Item 518 - Dismantle, move and erect reused roadway drains.



LONGITUDINAL SECTION



TRANSVERSE SECTION



TROUGH SPLICE DETAIL

LEGEND

Existing material

New material

NRNS - Nylon reinforced neoprene sheet

C.P - Complete penetration weld

TYPICAL ROADWAY DRAIN

PANEL 1,7,13,19,24,29,35,45,51,56,61&67 = 12 NEW LOCATIONS

6/91

RICHLAND ENGINEERING LIMITED
MANSFIELD, OHIO

DRAINAGE - 2
SUPERSTRUCTURE
BRIDGE NO. LOR-611-0358
OVER BLACK RIVER

LORAIN COUNTY S.R. 611

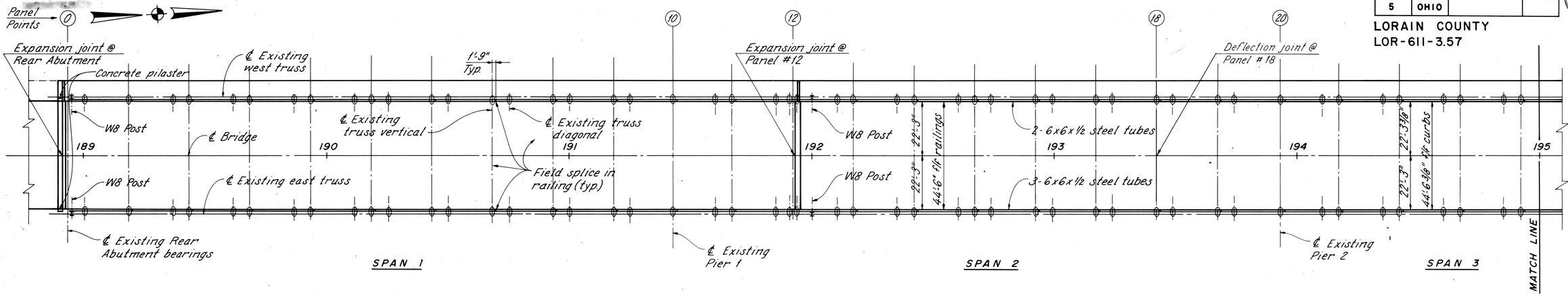
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
RDN	KH	KH	DAP	DHT	9/6/88	

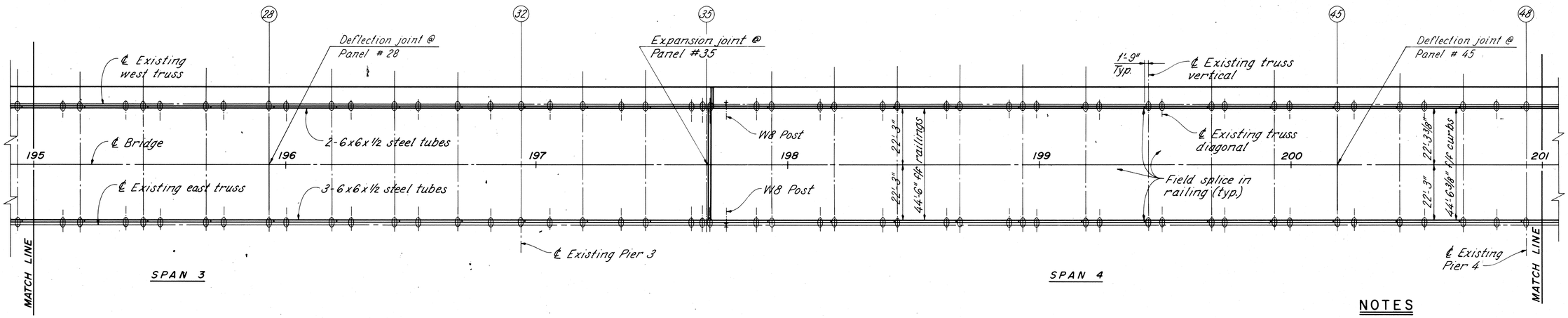
AS BUILT 6/91

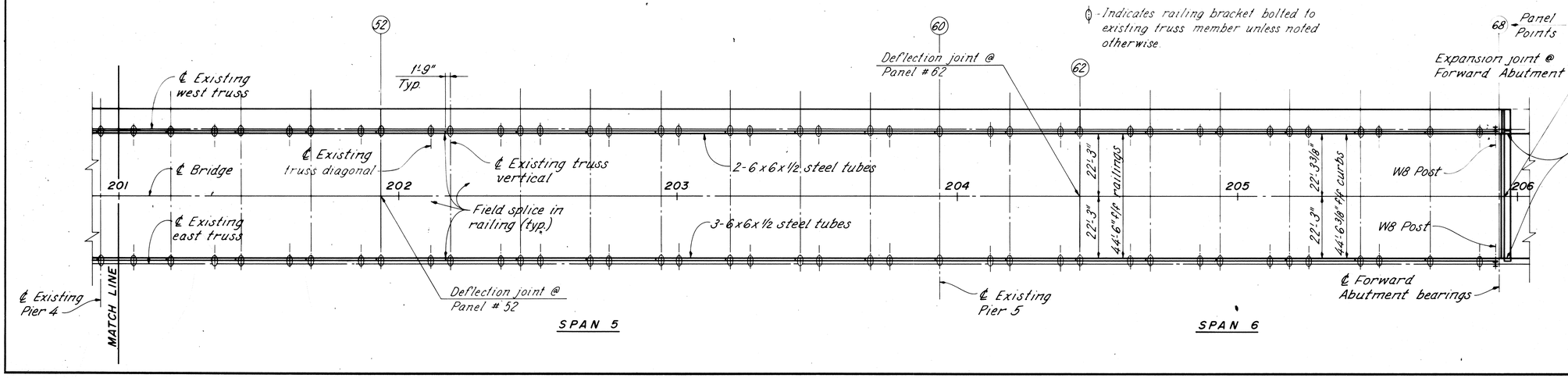
FHWA REGION	STATE	PROJECT	
5	OHIO		

85

LORAIN COUNTY
LOR-611-3.57







LEGEND

℄ - Indicates railing bracket bolted to existing truss member unless noted otherwise.

NOTES

MATERIALS shown are new unless otherwise noted.

TRANSVERSE SECTION: See sheet 20/81.

RAILING DETAILS: See sheets 71/81 & 72/81

W8 POST: Indicates W8x31 railing support at expansion joint. See Detail, sheet 72/81.

70/81

RICHLAND ENGINEERING LIMITED
MANSFIELD, OHIO

RAILING PLAN
SUPERSTRUCTURE
BRIDGE NO. LOR-611-0358
OVER BLACK RIVER

LORAIN COUNTY S.R. 611

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
RDN	RDN	JLS	DAP	DHT	9/6/88	

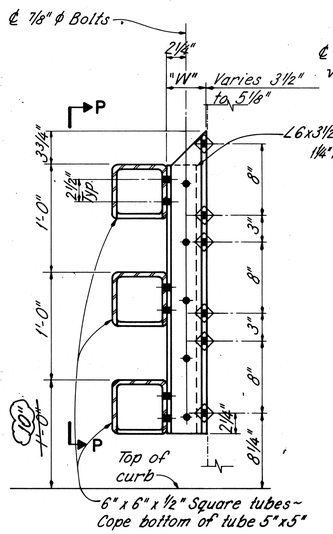
AS BUILT 6/91

760479

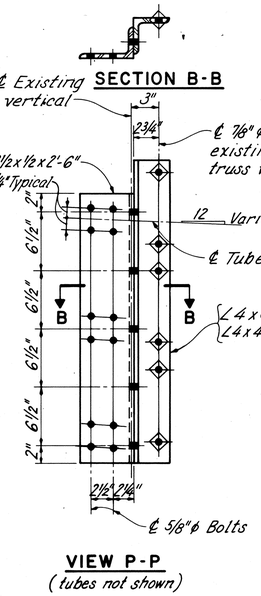
FHWA REGION	STATE	PROJECT	
5	OHIO		

86

LORAIN COUNTY
LOR-611-3.57

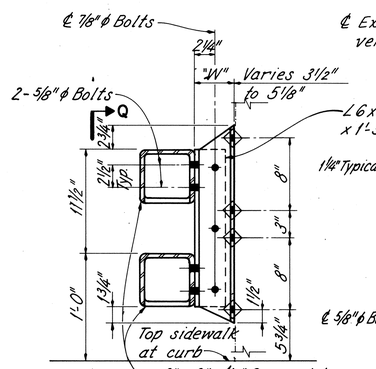


TRANSVERSE SECTION

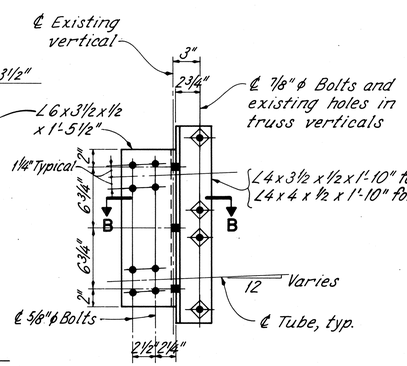


VIEW P-P
(tubes not shown)

RAILING SUPPORT EAST TRUSS VERTICALS
(TYPICAL UNLESS NOTED)

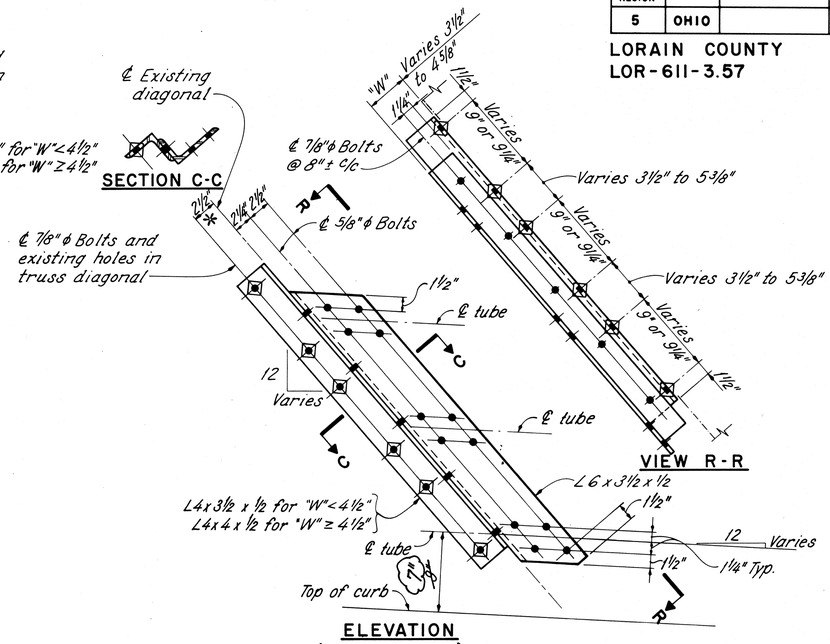


TRANSVERSE SECTION

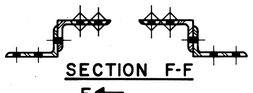


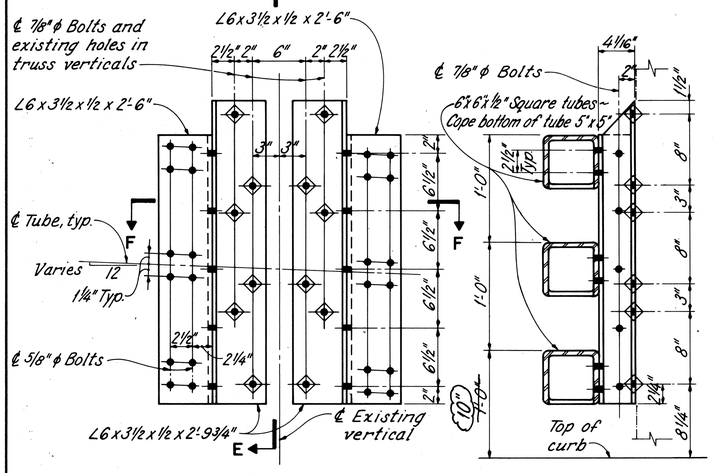
VIEW Q-Q
(tubes not shown)

RAILING SUPPORT-WEST TRUSS VERTICALS
(TYPICAL UNLESS NOTED)



RAILING SUPPORT-EAST TRUSS DIAGONALS



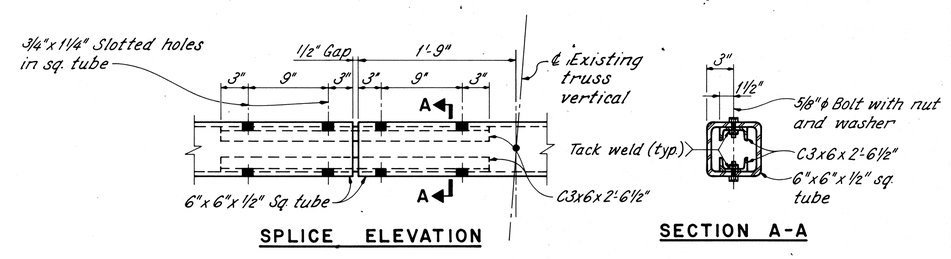


ELEVATION (tubes not shown) SECTION E-E

RAILING SUPPORT-EAST TRUSS VERTICALS
AT PANEL NO. 12 & 35

ELEVATION (tubes not shown) SECTION D-D

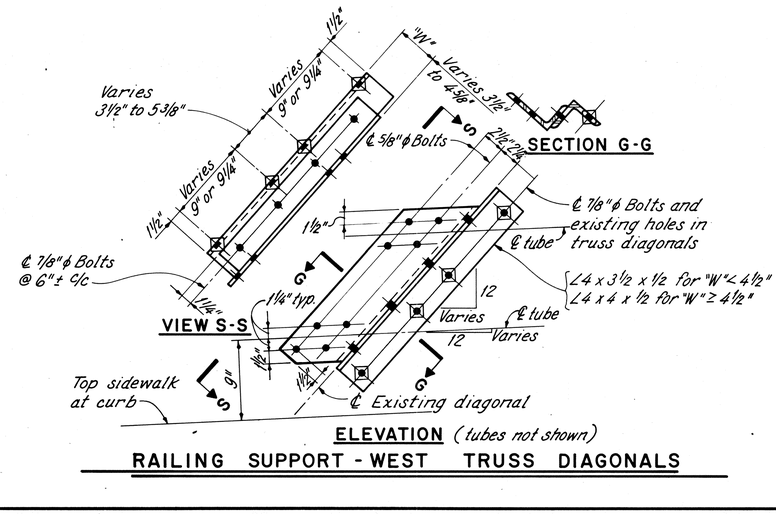
RAILING SUPPORT-WEST TRUSS VERTICALS
AT PANEL NO. 12 & 35



SPLICE ELEVATION SECTION A-A

SPLICE DETAILS
(TYPICAL UNLESS NOTED)

* Dimension = 3¾" from ℄ holes to ℄ existing truss diagonals L0L1 and L6&U6T. Gage on angles = 2½"



RAILING SUPPORT - WEST TRUSS DIAGONALS

NOTES: See sheet 72/81.

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RICHLAND ENGINEERING LIMITED
MANSFIELD, OHIO

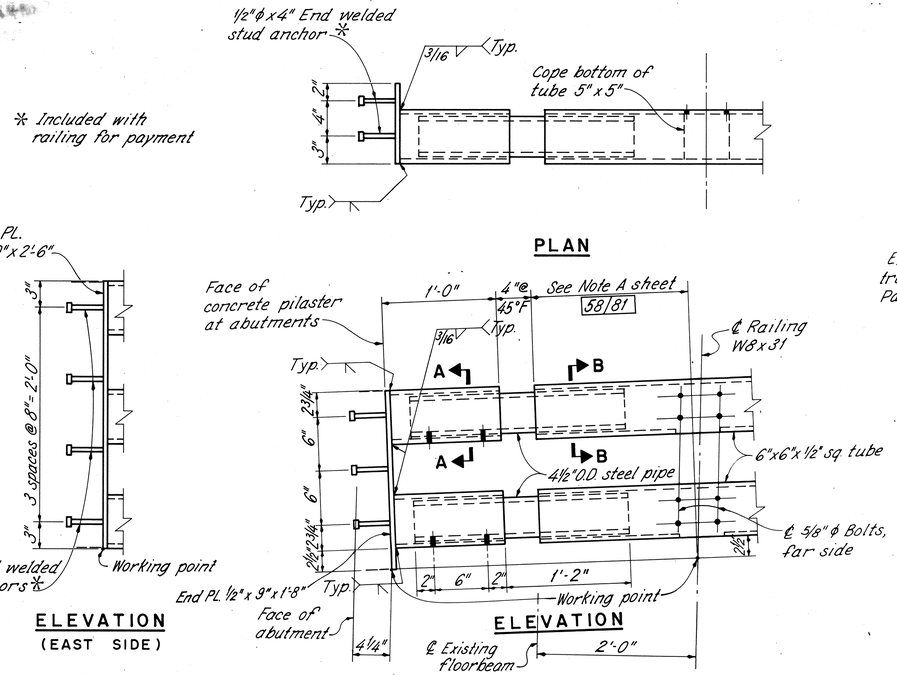
RAILING DETAILS-1
SUPERSTRUCTURE
BRIDGE NO. LOR-611-0358
OVER BLACK RIVER
LORAIN COUNTY S.R. 611

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
RDN	RDN	JLS	DAP	DHT	9/6/88	

AS BUILT 6/91

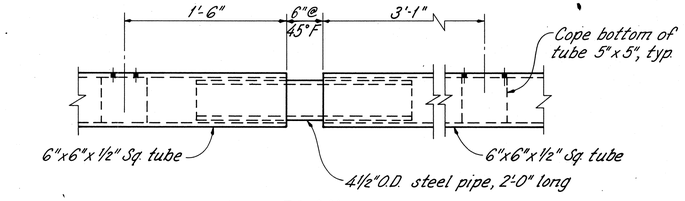
FHWA REGION	STATE	PROJECT		87
5	OHIO			

LORAIN COUNTY
LOR-611-3.57



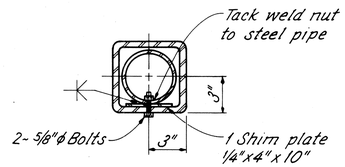
RAILING AT ABUTMENT EXPANSION JOINTS

(WEST SHOWN, EAST SIMILAR)

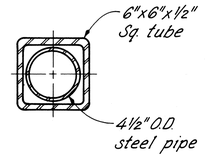


RAILING AT EXPANSION JOINTS

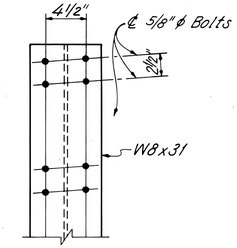
(PANELS 12 & 35)



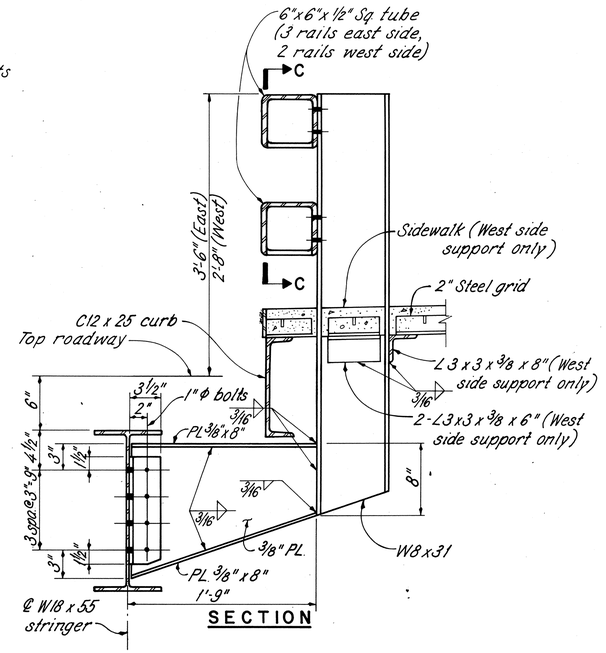
SECTION A-A



SECTION B-B



VIEW C-C
(tubes not shown)



RAILING SUPPORT AT EXPANSION JOINTS

(4 EAST & WEST SIDES = 8 LOCATIONS)

NOTES

MATERIALS *shown are new unless otherwise noted. Steel tubes shall be galvanized ASTM A500, Grade B.(See General Note sheet 9/81). All other new materials shall be A-36 galvanized steel. All connection bolts, nuts and washers shall be galvanized.*

EXISTING HOLES *in existing reused material shall be used for locating new bolts. Existing connectors are 3/4"ϕ rivets.*

TRANSVERSE SECTION: *See sheet 20/81.*

RAILING SUPPORT LOCATIONS: *See sheet 70/81.*

CONCRETE PILASTERS *at abutment, see sheets 78/81 and 79/81 for additional details.*

PAYMENT: *The cost of all labor, materials, and equipment necessary for the installation of the railing, including all supports and connections, shall be included for payment in the unit price bid per lineal foot of railing for Item 517- "Railing (galvanized double tube railing)" or "Railing (galvanized triple tube railing)".*

BOLT -LEGEND: *See sheet 20/81.*

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RICHLAND ENGINEERING LIMITED
MANSFIELD, OHIO

RAILING DETAILS-2

SUPERSTRUCTURE
BRIDGE NO. LOR-611-0358
OVER BLACK RIVER

LORAIN COUNTY S.R. 611

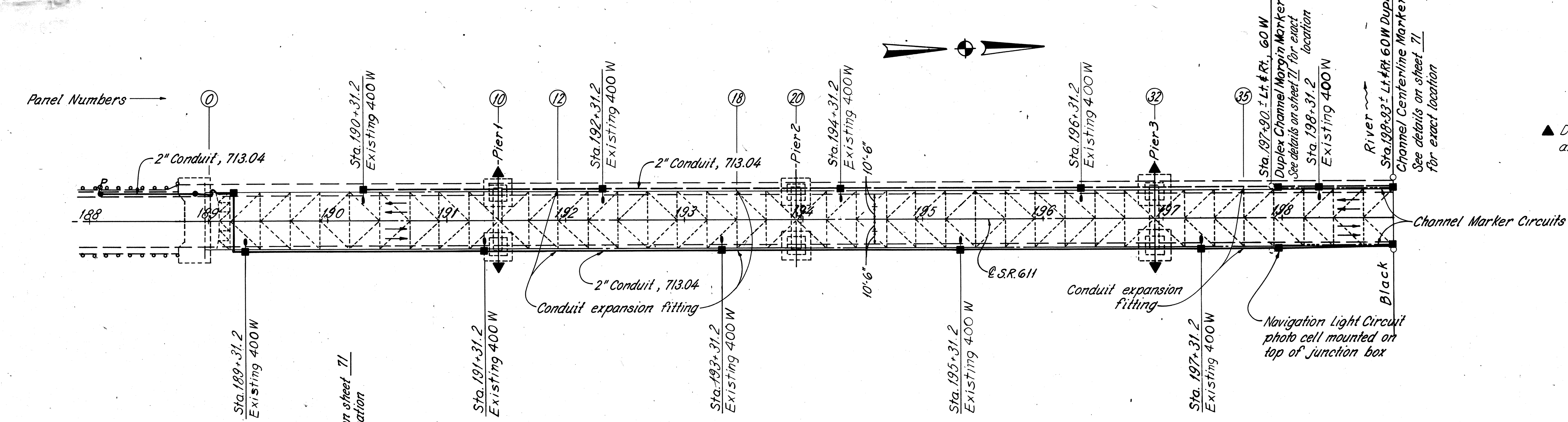
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
RDN	RDN	JLS	DAP	DHT	9/6/88	

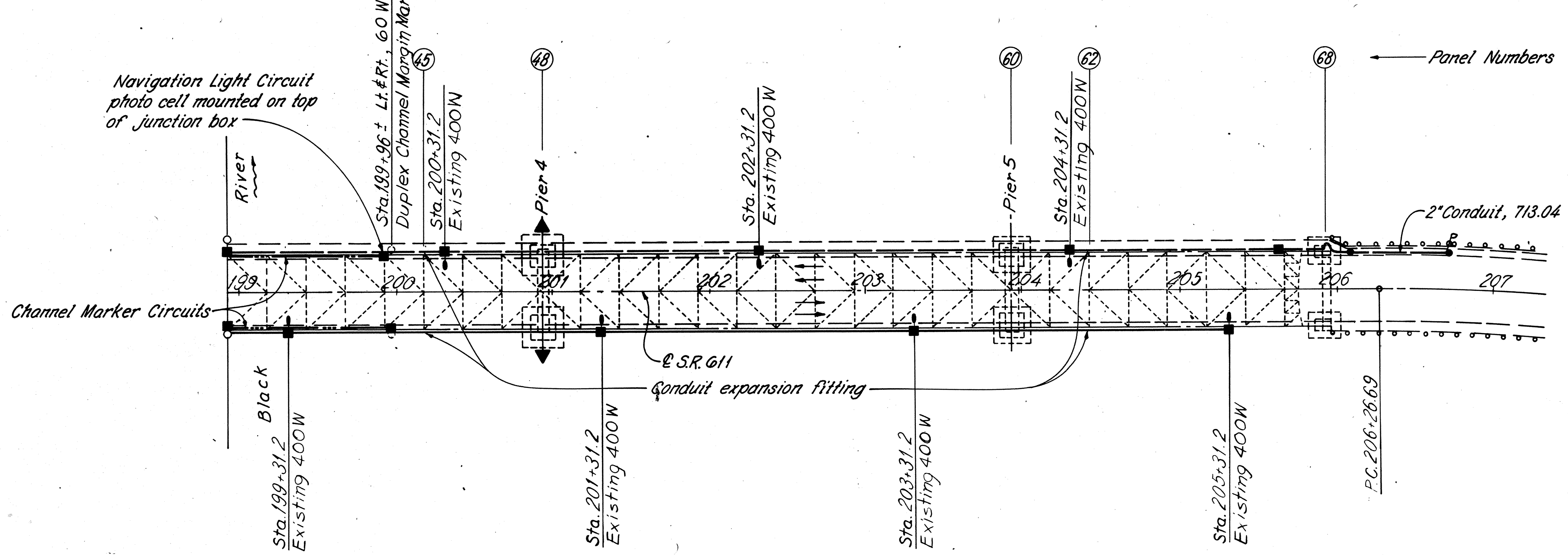
AS BUILT 6/91

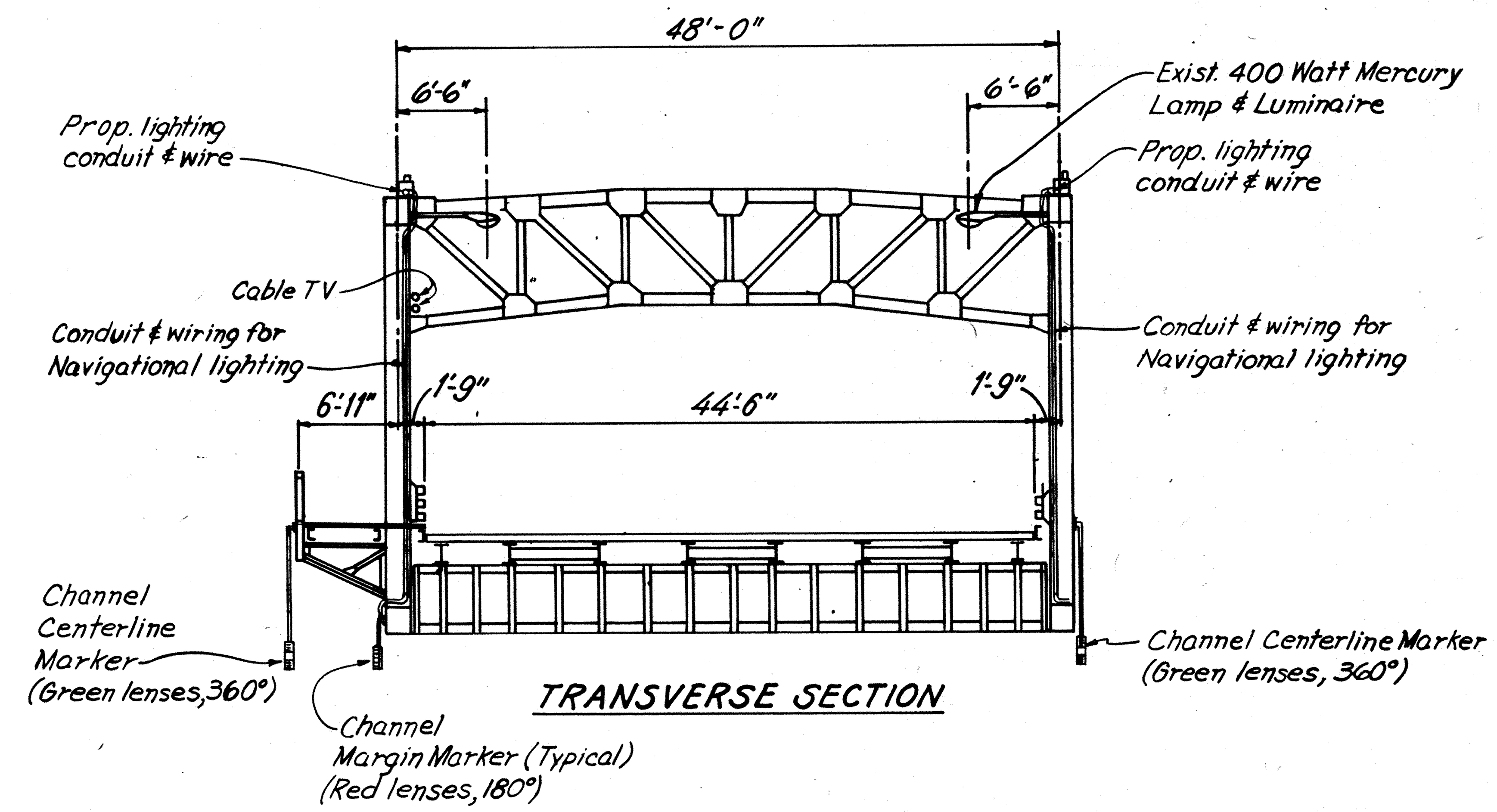
FHWA REGION	STATE	PROJECT	
5	OHIO		

LORAIN COUNTY
LOR-611-03.57

▲ Denotes Ground Rod for Structure Grounding System as per Item 625.02 and Std. Dwg. HL-7.







TRANSVERSE SECTION

PROPOSED NAVIGATIONAL LIGHTING
Wattage: 100 W
Light out relays
Fresnel lenses
Ownership: Lorain County

PROPOSED CIRCUIT VOLTAGE: 120V 2WIRE

EXISTING STREET LIGHTING
Type: Mercury Vapor
Wattage: 400 W
Lumen Rating: 22,500
Ownership: Ohio Edison

PROPOSED CIRCUIT VOLTAGE: 120/240V 3WIRE

LEGEND

- ○ Proposed Channel Margin or Centerline Marker
- ■ Proposed Junction box at existing light fixture
- ■ Proposed Junction box
- ● Proposed Pull box
- Existing Power Pole
- ——— Proposed Circuit A
- — — — Proposed Circuit B
- —·—·— Proposed Circuit C
- —··—··— Proposed Circuit D

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RICHLAND ENGINEERING LIMITED
MANSFIELD, OHIO

LIGHTING PLAN
SUPERSTRUCTURE
BRIDGE NO. LOR-611-0358
OVER BLACK RIVER

LORAIN COUNTY S.R. 611

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
EEL	JD	KH	RHU	DHT	9/6/88	

AS BUILT 6/91

FHWA REGION	STATE	PROJECT	
5	OHIO		

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LORAIN COUNTY
LOR-611-03.57

LIGHTING NOTES

SPECIFICATIONS: These notes are supplemental to Item 625 and 713 of the State of Ohio Department of Transportation Construction and Material Specifications.

Reference shall be made to standard construction drawings listed on the title sheet of these plans.

POWER SUPPLYING AGENCY for this project is:

Ohio Edison Company
6326 Lake Avenue
Elyria, Ohio 44035
Telephone: 216/324-5431

CONDUIT ON STRUCTURE: Expansion fittings shall be 0.2. Electrical Manufacturing Company Type AX-4 Crouse Hinds Type XJ-4, Appleton XJ-4 or approved equal. Four inch expansion fittings shall be located in conduit runs in excess of 150 feet and at the deflection joints at Panels 18, 45 and 62.

For expansion joints at Panels 12 and 35 expansion fittings shall be 0.2. Electrical Manufacturing Company Type AX-8, Crose Hinds Type XJ-8, Appleton XJ-8 or approved equal.

Expansion fittings shall have a copper bonding jumper. Installation of the expansion fittings shall be according to the manufacturer's recommendations for the temperature at the time of installation.

Payment shall be considered incidental to the conduit items of which they are a part.

JUNCTION BOX, 9" X 12" X 6" DEEP: The junction boxes shall be mounted as detailed on the drawings.

Boxes shall be NEMA-4, 713.10.

NAVIGATION LIGHTS: The navigation lights shall be maintained at all times during the shipping season through the use of the existing or proposed lighting fixtures. The existing wiring shall be maintained to all navigation lights until the proposed navigation lights are functional on the new wiring circuits. Battery powered lights may be used for temporary navigation lights subject to the approval of the Engineer. Temporary wiring to meet the National Electric code may be used, however conduit runs and wire gauge shall be subject to the approval of the Engineer at all times. Hours of operation shall be from dusk to daylight and as directed by the governing Coast Guard District.

Channel margin marker lights shall be Federal APD Type 1-P Catalogue No. 5901-251BX, Tideland Signal, B&B Electromatic or approved equal. The casting shall be bronze with two lamp receptacles, integrally mounted lamp relay, 100 watt lamps and 180° ~~green~~ red fresnel lens.

Channel centerline marker lights shall be Federal APD Type 6 PSU Catalogue No. 5901-209-13X, Tideland Signal, B&B Electromatic or approved equal. The casting shall be bronze with two lamp receptacles, integrally mounted lamp relay, 100 watt lamps and 360° green fresnel lens.

For additional details, see sheet 77 of 81.

REMOVAL OF THE EXISTING WIRING SYSTEM: When the existing wiring system is no longer needed to maintain the navigational lighting and before painting begins, the Contractor shall remove all conduit, wiring, clips, clips, brackets, pull boxes, supports and navigation lights. Items shall be disconnected by removing bolts whenever possible. Items welded to the existing structure shall be carefully cut away in such manner that the existing material to remain will not be gouged. Existing remaining material shall then be ground smooth. Navigation lights shall, upon removal, be stored on the project site for pickup by County forces.

The existing roadway light fixtures, brackets and arms shall not be disturbed except for hookup to the proposed wiring circuit.

Payment for the above shall be made under the lump sum price bid for Item 202 "Existing Lighting System Removed" which price and payment shall include the removal of all navigation lights, conduit, wiring, pull boxes and miscellaneous supports comprising the system and all labor, tools, equipment and materials necessary to remove all items comprising the roadway lighting system.

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RICHLAND ENGINEERING LIMITED
MANSFIELD, OHIO

LIGHTING NOTES

SUPERSTRUCTURE
BRIDGE NO. LOR-611-0358
OVER BLACK RIVER

LORAIN COUNTY S.R.611

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
EEL	TWH	WH	RHU	DHT	9/6/88	

AS BUILT 6/91

LIGHTING SUBSUMMARY

QUANTITIES	
CALCULATED	EEL 1/87
CHECKED	

FHWA REGION	STATE	PROJECT	
5	OHIO		

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LORAIN COUNTY
LOR-611-3.57

Sheet No.	Station From	Station To	Side	202 Existing Lighting System Removed	625 Trench, 24" Deep	Structure Grounding System	Ground Rod, 713.16	Pull Box, 18" Concrete	Junction Box, 9x12" x6" Deep As Per Plan	2" Conduit 713.04	1¼" Conduit 713.04	2" Liquid-Tight Flexible Conduit	No.4 AWG 5000 Volt Distribution Cable	No.10 AWG Pole and Bracket Cable	3/C No.10 AWG, 713.02	Connector Kit Type II	Connector Kit Type III A	Connector Kit Type III B	Cable Splicing Kit	Channel Centerline Marker Light	Channel Margin Marker Light	Power Service As Per Plan
				Lump	L.F.	Ea.	Ea.	Ea.	Ea.	L.F.	L.F.	L.F.	L.F.	L.F.	L.F.	Ea.	Ea.	Ea.	Ea.	Ea.	Ea.	Ea.
	188+10				10		1	1		20			75				2		2			1
	188+10	188+90	Lt.		80		1	1		80			270				2		2			
	188+90	189+20	Lt.		11				2	34		5	120				4					
	189+20	189+32	Lt.&Rt.						1	64			222		15	2						
	189+32	191+32	Rt.						1	200			630		15	2						
	191+32	193+32	Rt.						1	200	2		630		15	2						
	193+32	195+32	Rt.						1	200	2		630		15	2						
	195+32	197+33	Rt.						1	200	2		630		15	2						
	197+33	197+98	Rt.						1	65			225				1	2				
	197+98		Rt.						1		38			100	20	1					1	
	197+98	198+94	Rt.						1	96			530				2	1				
	198+94		Rt.						1		34			90	20	1				1		
	198+94	199+32	Rt.						1	38	2		250		15	2	1					
	199+32	199+98	Rt.						1	66			375				3					
	199+98		Rt.						1		38			100	20	1					1	
	199+98	201+32	Rt.						1	134	2		435		15	2						
	201+32	203+32	Rt.						1	200	2		630		15	2						
	203+32	205+32	Rt.						1	200	2		630		15	2						
	190+30	192+31	Lt.						1	200	2		630		15	2						
	192+31	194+32	Lt.						1	200	2		630		15	2						
	194+32	196+32	Lt.						1	200	2		630		15	2						
	196+32	197+98	Lt.						1	166	2		525		15	2						
	197+98		Lt.						1		38			100	20	1					1	
	197+98	198+31	Lt.						1	33			225				3					
	198+31	198+94	Lt.						1	63	2		375		15	2	1					
	198+94		Lt.						1		30			80	20	1				1		
	198+94	199+94	Lt.						1	100			500				2	1				
	199+94		Lt.						1		38			100	20	1					1	
	199+94	200+32	Lt.						1	38			150				1	2				
	200+32	202+32	Lt.						1	200	2		630		15	2						
	202+32	204+32	Lt.						1	200	2		630		15	2						
	204+32	205+65	Lt.						1	133	2		435		15	2						
	205+65	206+08	Lt.		11				2	34		5	120				4					
	206+08	206+72	Lt.		64		1	1		64			225				2		2			
	206+72				10		1	1		20			75				2		2			1
	188+10	206+72	Lt.&Rt.	Lump																		
	189+00±	205+95±	Lt.&Rt.			1																
		Totals		Lump	186	1	4	4	33	3448	246	10	12,062	570	375	40	30	6		2	4	2

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RICHLAND ENGINEERING LIMITED
MANSFIELD, OHIO

LIGHTING SUBSUMMARY
SUPERSTRUCTURE
BRIDGE NO. LOR-611-0358
OVER BLACK RIVER

LORAIN COUNTY S.R. 611

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
EEL	KH	KH	DAP	DHT	9/6/88	

AS BUILT 6/91

FHWA REGION	STATE	PROJECT	
5	OHIO		

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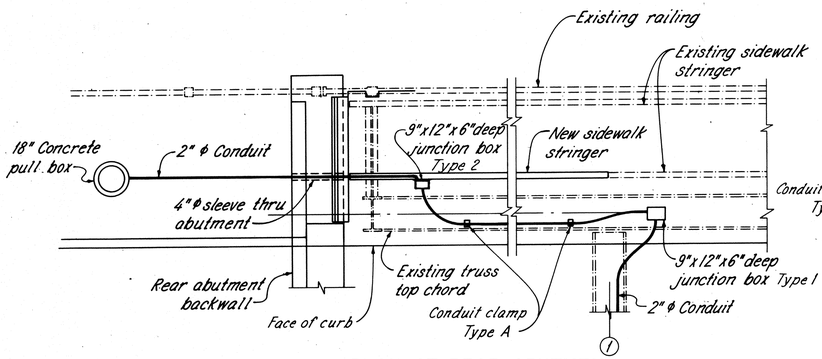
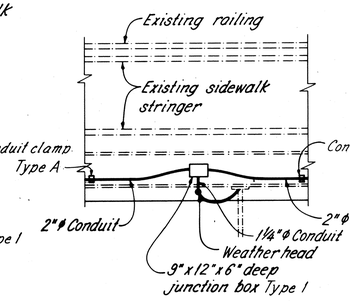
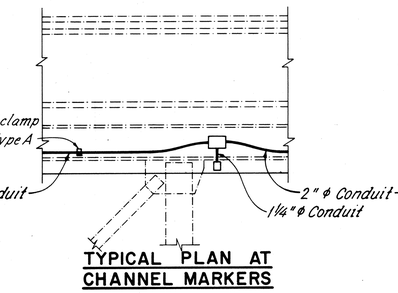
LORAIN COUNTY
LOR-611-3.57



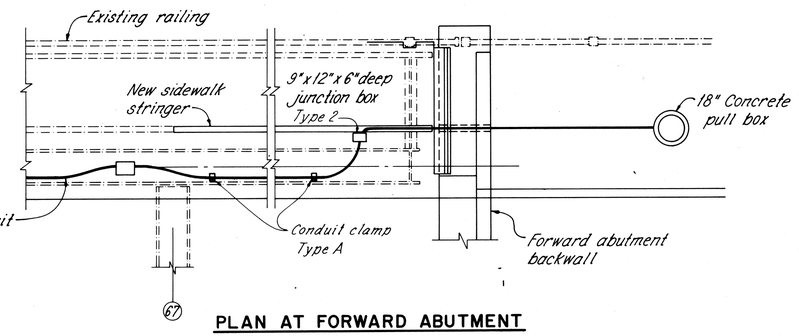
PLAN AT REAR ABUTMENT



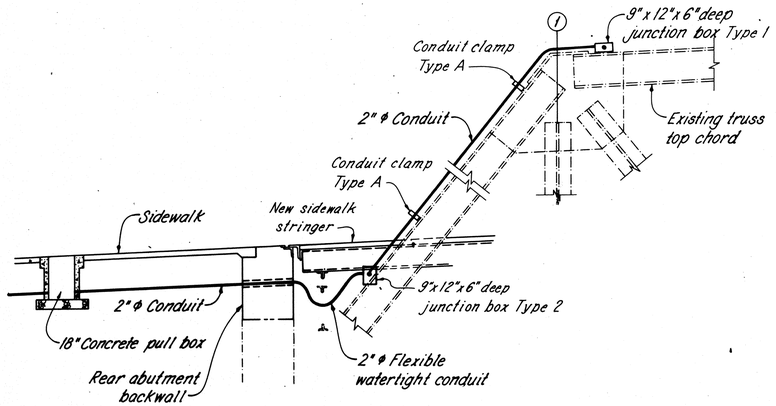
TYPICAL PLAN AT LUMINAIRE



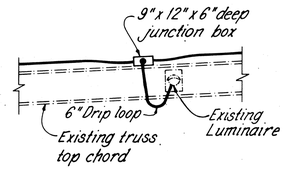
TYPICAL PLAN AT CHANNEL MARKERS



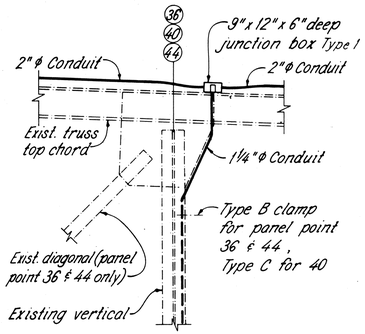
PLAN AT FORWARD ABUTMENT



ELEVATION AT REAR ABUTMENT

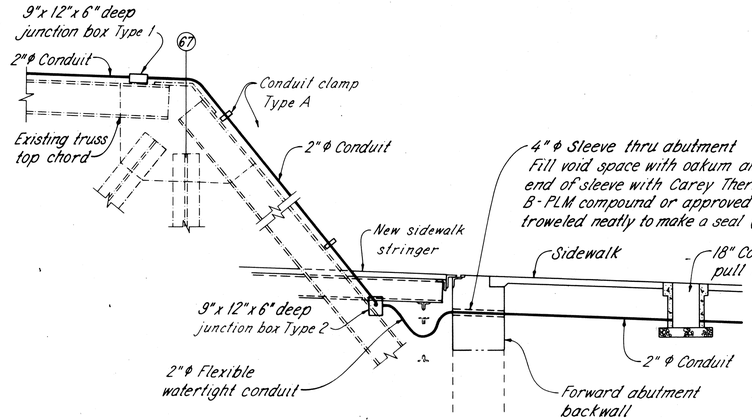


TYPICAL ELEVATION AT LUMINAIRE



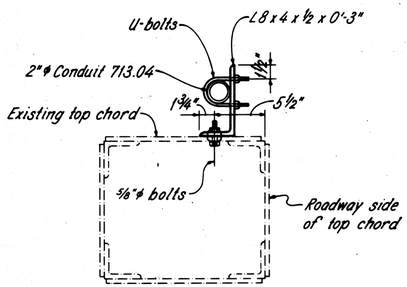
TYPICAL ELEVATION AT CHANNEL MARKERS

Panel Point 44 shown
Panel Point 40 similar
Panel Point 36 opposite hand

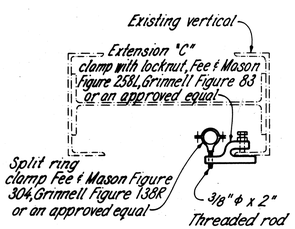


ELEVATION AT FORWARD ABUTMENT

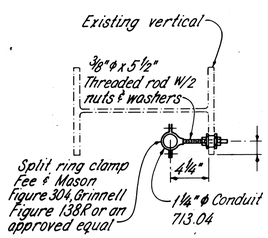
CONDUIT LAYOUT DETAIL



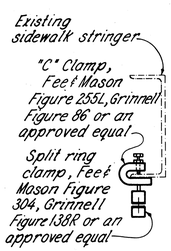
TYPE A
Top Chord



TYPE B
Panel Point 36 & 44
Vertical



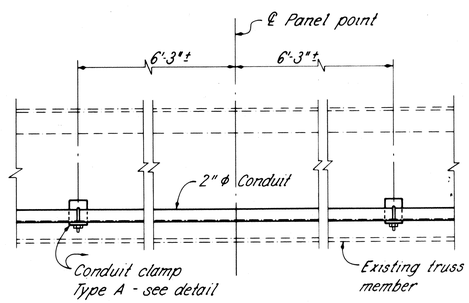
TYPE C
Panel Point 40
Vertical



TYPE D
Panel Point 40
Sidewalk Stringer

CONDUIT CLAMP DETAILS

Note: Conduit clamps fasteners and hardware shall be galvanized steel per 711.02 or mechanically galvanized. Conduit clamps, fasteners, hardware and drilling of holes shall be included as incidental to the pertinent Item 625 2" ϕ Conduit, 713.04 or Item 625 1¼" ϕ Conduit, 713.04



CONDUIT ATTACHMENT SPACING DETAIL

(Top chord)

NOTES

LIGHTING NOTES: See sheet 74/81

JUNCTION BOX MOUNTING TYPE 1 & 2: See Details Sheet 77/81

BOLT LEGEND: See sheet 20/81.

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RICHLAND ENGINEERING LIMITED
MANSFIELD, OHIO

LIGHTING DETAILS -1

SUPERSTRUCTURE
BRIDGE NO. LOR-611-0358
OVER BLACK RIVER

LORAIN COUNTY S.R.611

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
EEL	JPS	TW	DAP	DHT	9/6/88	

AS BUILT 6/91

FHWA REGION	STATE	PROJECT	
5	OHIO		

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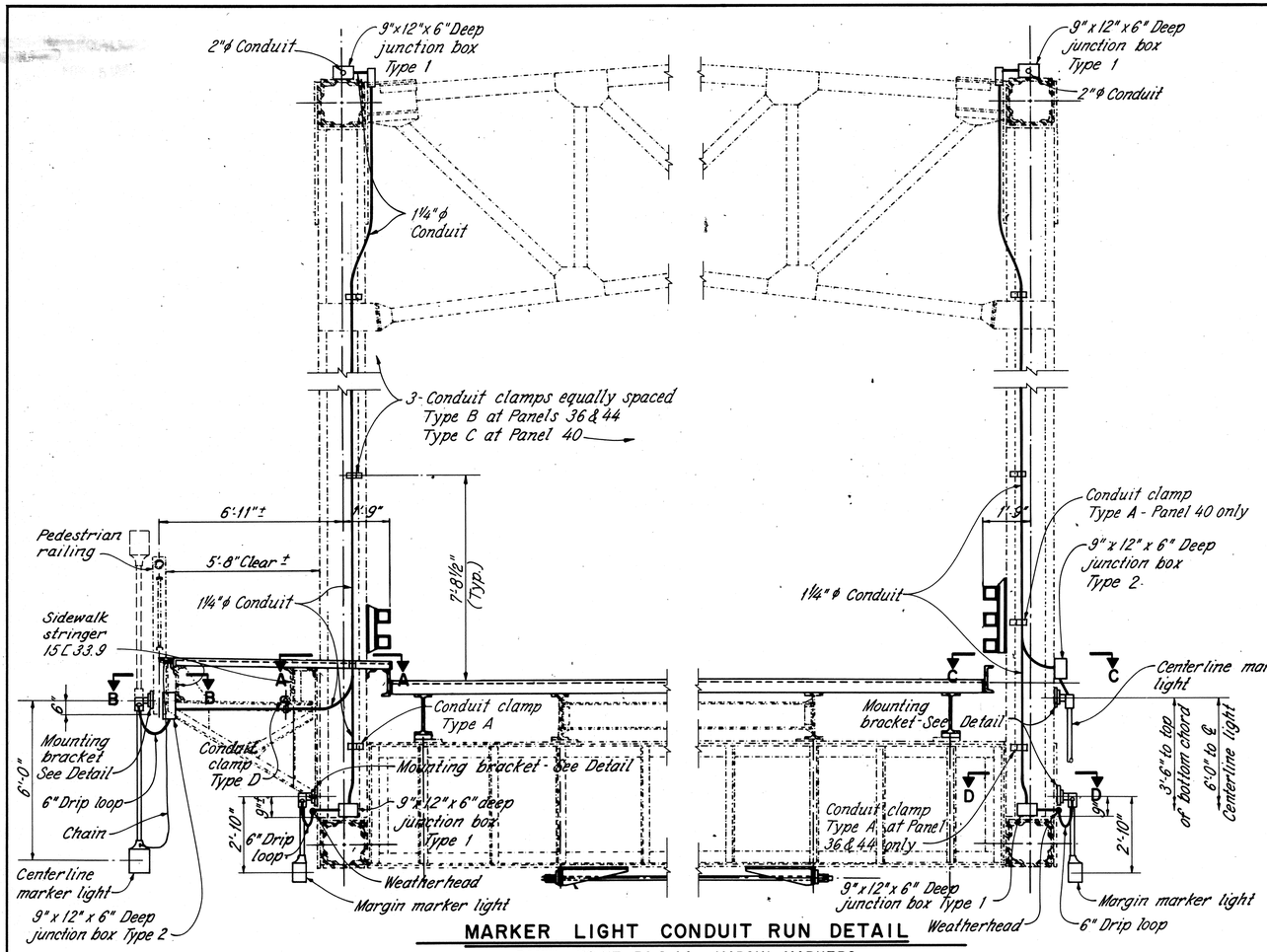
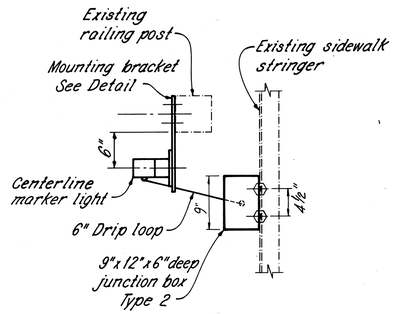
LORAIN COUNTY
LOR-611-3.57

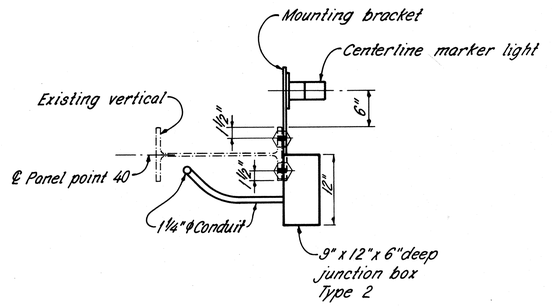


MARKER LIGHT CONDUIT RUN DETAIL

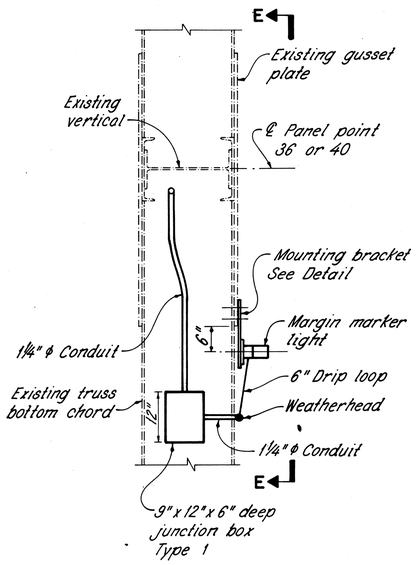
PANEL POINT 36 & 44 – MARGIN MARKERS
PANEL POINT 40 - CENTERLINE MARKERS



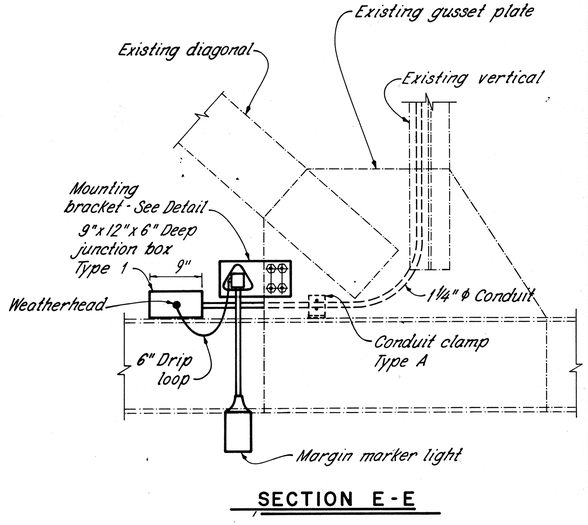
SECTION B-B



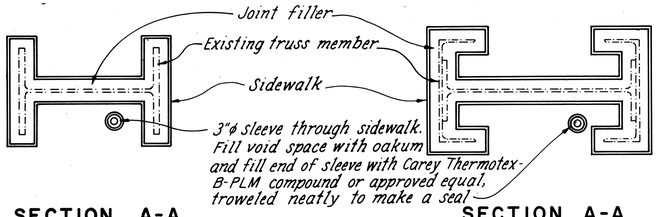
SECTION C-C



SECTION D-D

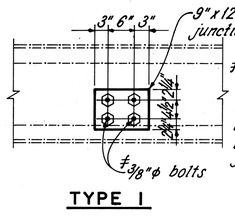


SECTION E-E



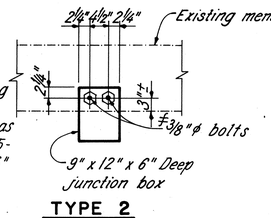
SECTION A-A
AT PANEL POINT 40

SECTION A-A
AT PANEL POINT 36 & 44



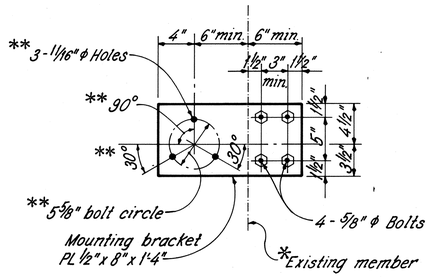
TYPE 1

≠Note: Galvanized fasteners and drilling of holes shall be included for payment as incidental to Item 625- Junction box, 9"x12"x6" deep.



TYPE 2

JUNCTION BOX MOUNTING DETAILS



MOUNTING BRACKET DETAIL#

* Gusset plate at margin marker light.
Railing post at west centerline marker light.
Vertical at east centerline marker light

** Mounting shown for marker lights manufactured by Federal APD Type 1P or Type 6 PSU. Brackets for other manufacturer's fixtures shall be sized to fit particular fixture, however material sizes shall be similar, subject to the approval of the Engineer.

#Note: Mounting brackets, fasteners and hardware shall be galvanized steel per 711.02, and shall be included for payment as incidental to the pertinent, Item 625- Channel centerline marker light or Item 625- Channel margin marker light.

NOTES

LIGHTING NOTES: See sheet 74/81.

CONDUIT CLAMPS TYPE A,B,C & D: See Details on sheet 76/81.

BOLT LEGEND: See sheet 20/81.

77/81

RICHLAND ENGINEERING LIMITED
MANSFIELD, OHIO

LIGHTING DETAILS - 2

SUPERSTRUCTURE
BRIDGE NO. LOR-611-0358
OVER BLACK RIVER

LORAIN COUNTY S.R.611

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
EEL	JPS	TWH	DAP	DHT	9/6/88	

AS BUILT 6/91

FHWA REGION	STATE	PROJECT	
5	OHIO		

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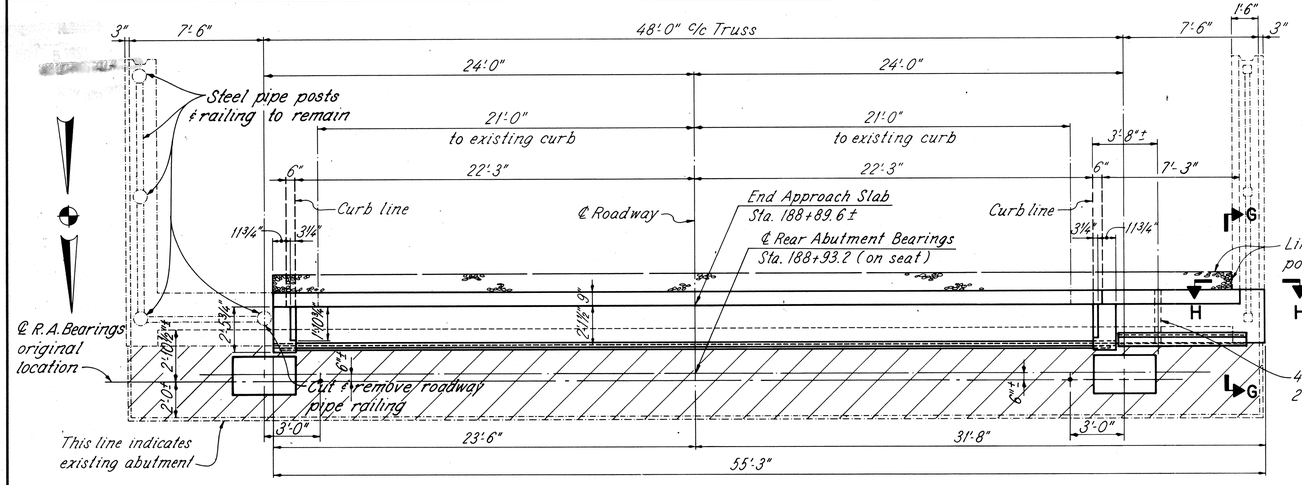
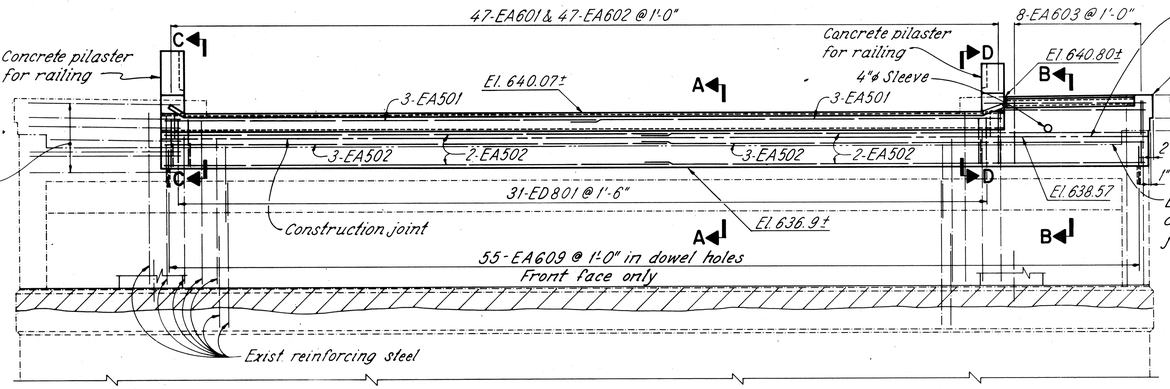
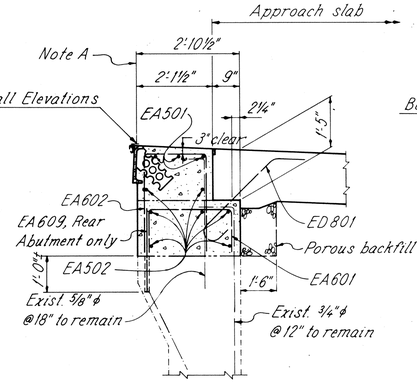
LORAIN COUNTY
LOR - 611 - 3.57



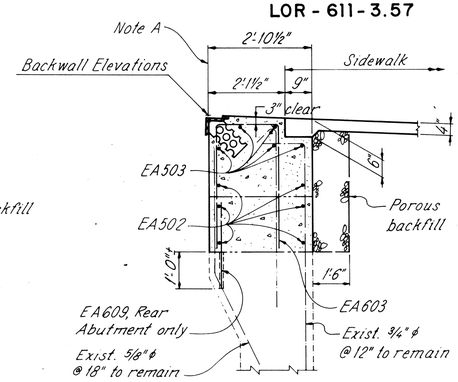
PLAN



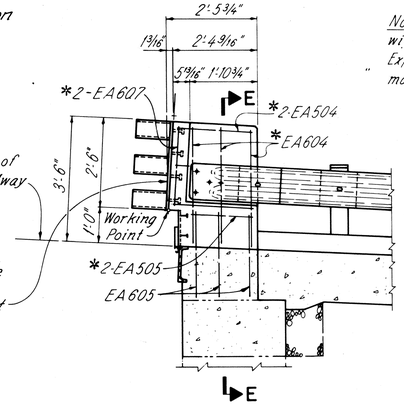
ELEVATION



SECTION A-A

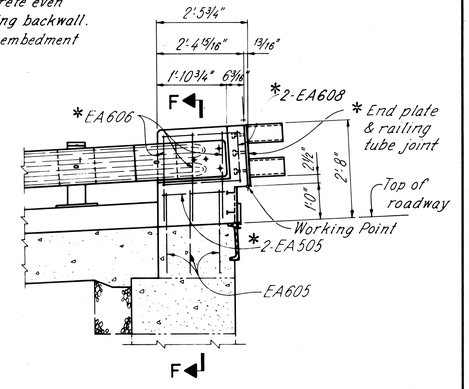


SECTION B-B



SECTION C-C

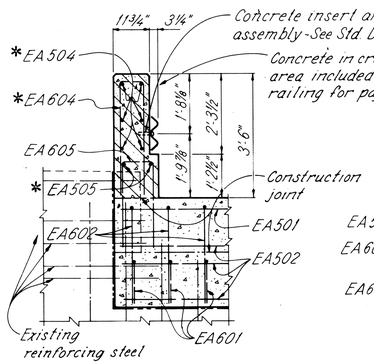
(Forward abutment opposite hand)



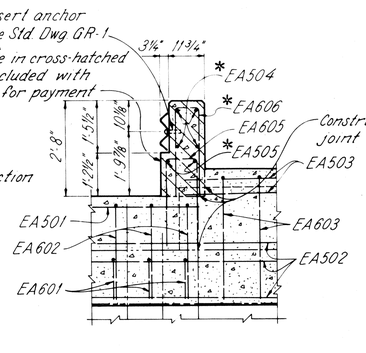
SECTION D-D

(Forward abutment opposite hand)

Note A: Hold new concrete even with the face of existing backwall. Expansion joint armor embedment may vary.

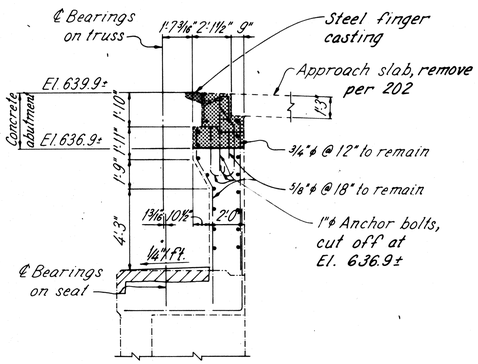


SECTION E-E

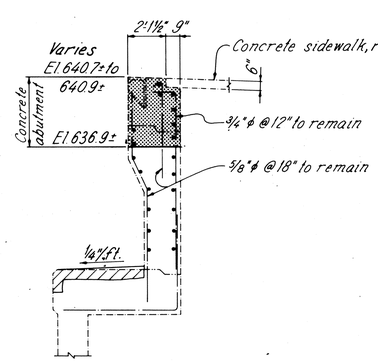


SECTION F-F

* Included with railing for payment



SECTION A-A



SECTION B-B

LEGEND

- Existing material
- New material
- Area to be repaired per Item 519 - Patching concrete structures, as per plan.
- Existing brass rod reference point.

REMOVAL SECTIONS

▨ - Indicates area to be removed per Item 202 - Portions of structure removed.

NOTES

EXISTING REINFORCING STEEL: Care shall be taken by the contractor in removing the abutment concrete, so as not to damage or remove existing vertical reinforcement. A minimum length of 2'-0" of the existing vertical bars shall be left for anchorage into new concrete.

SECTIONS G-G & H-H: See sheet 81/81.

ADDITIONAL NOTES: See sheet 79/81.

REINFORCING STEEL TABLE: See sheet 79/81.

78/81

RICHLAND ENGINEERING LIMITED
MANSFIELD, OHIO

REAR ABUTMENT
SUPERSTRUCTURE
BRIDGE NO. LOR-611-0358
OVER BLACK RIVER

LORAIN COUNTY S.R. 611

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
RDN	VL	KH	DAP	DHT	9/6/88	

AS BUILT 6/91

FHWA REGION	STATE	PROJECT	
5	OHIO		

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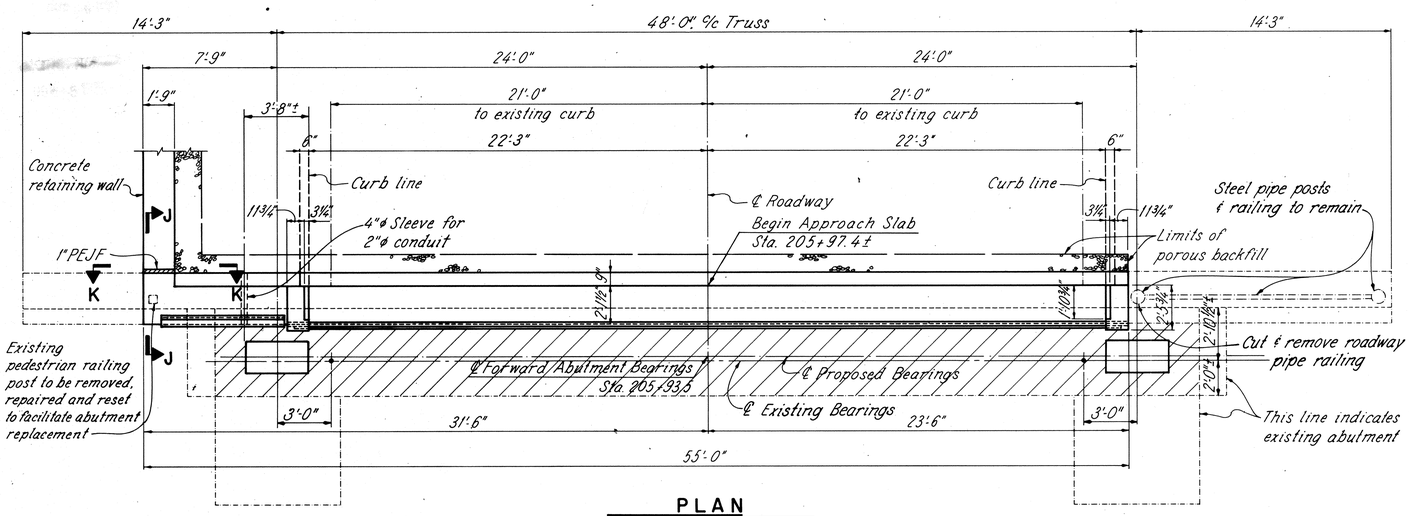
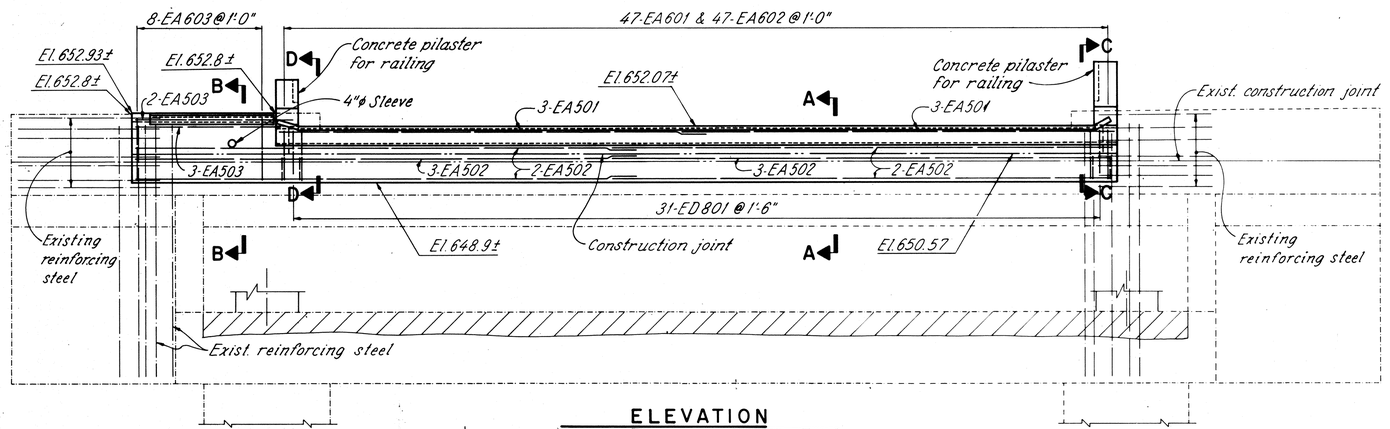
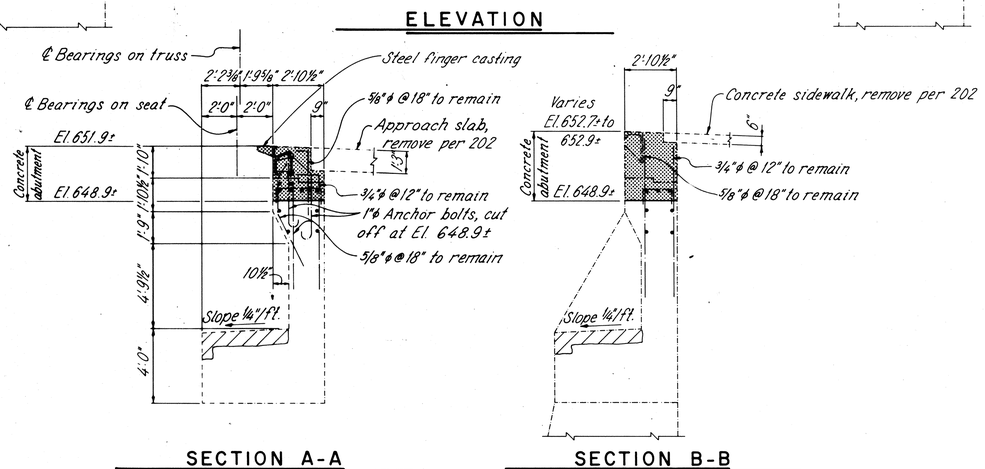
LORAIN COUNTY
LOR - 611 - 3.57



PLAN

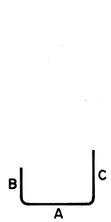


ELEVATION

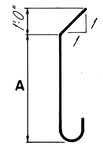


REMOVAL SECTIONS

▨ - Indicates area to be removed per Item 202 - Portions of structure removed.



TYPE 1



TYPE 2

EPOXY COATED REINFORCING STEEL - ABUTMENTS

MARK	REAR	FWD.	NO.	LENGTH	TYPE	A	B	C	D	E	WEIGHT
EA501	6	6	12	24'-0"	Str.						300
EA502	14	14	28	28'-0"	Str.						818
EA503	5	5	10	8'-5"	Str.						88
EA504	10	10	20	2'-0"	Str.						*
EA505	4	4	8	1'-4"	Str.						*
EA601	47	47	94	4'-10"	1	2'-6"	1'-4"	1'-4"			682
EA602	47	47	94	6'-9"	1	1'-9"	2'-8"	2'-8"			953
EA603	8	8	16	8'-5"	1	1'-9"	3'-6"	3'-6"			202
EA604	3	3	6	6'-7"	1	0'-7"	3'-2"	3'-2"			*
EA605	6	6	12	5'-3"	1	0'-11"	2'-4"	2'-4"			95
EA606	3	3	6	4'-11"	1	0'-7"	2'-4"	2'-4"			*
EA607	2	2	4	4'-7"	1	0'-11"	2'-0"	2'-0"			*
EA608	2	2	4	3'-3"	1	0'-11"	1'-4"	1'-4"			*
EA609	55		55	2'-6"	Str.						207
ED801	31	31	62	5'-4"	2	3'-0"					883
										TOTAL	4,228

* Included with railing for payment

NOTES

EXISTING REFERENCE POINTS *at the locations shown on the tops of the abutment seats shall be referenced prior to begining Item 519 - Patching concrete structures, as per plan. After concrete patching is complete new reference points shall be set at the same locations as the existing reference points.*

The new reference points shall consist of a ¾ inch diameter by 4 inch long brass rod set in non-shrink grout or epoxy adhesive, in a minimum 1¼ inch diameter hole cored 4-½ inches into the concrete. The top of the brass rod shall be set flush with the top of the concrete surface. After the grout sets, the brass rods shall be centerpunched at the exact reference point location.

All measurements, references and location work shall be performed under the supervision of a Professional Surveyor registered in the State of Ohio.

The cost of all labor, materials and equipment necessary for measurements, reference points and installation shall be included for payment as part of Item 519 - Patching concrete structures, as per plan.

POROUS BACKFILL *shall extend upwards to the plane of the subgrade and laterally as shown. Material shall be limited to durable gravel backfill. Stone or air-cooled blast furnace slag shall not be permitted.*

REINFORCING STEEL SPLICE LENGTHS *shall be 1'-4" for #5 bars and 1'-7" for #6 bars.*

DECK AND SIDEWALK JOINTS: *See Details sheet* 58/81 *and* 61/81.

REINFORCING STEEL: *Refer to CMS sections 106.03, 709, 709.01 through 709.05 and 709.08. Sufficient additional reinforcing steel shall be provided for sampling. Random samples shall be replaced in the structures by the additional steel, spliced in accordance with 509.08.*

EXISTING ANCHOR BOLTS *may be bent or removed where they interfere with new construction. 122-1"ø anchor bolts are located in the rear abutment and 84-1"ø anchor bolts are located in the forward abutment.*

RETAINING WALL *at the forward abutment, see details sheet* 80/81.

ADDITIONAL NOTES: *See sheet* 78/81.

SECTIONS A-A, B-B, C-C & D-D: *See sheet* 78/81.

SECTIONS J-J & K-K: *See sheet* 81/81.

LEGEND

- Existing material
- New material
- ▨ Area to be repaired per Item 519 - Patching concrete structures, as per plan.
- ✦ Existing brass rod reference point.

79/81

RICHLAND ENGINEERING LIMITED
MANSFIELD, OHIO

FORWARD ABUTMENT
SUPERSTRUCTURE
BRIDGE NO. LOR-611-0358
OVER BLACK RIVER

LORAIN COUNTY S.R. 611

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
RDN	VL	KH	DAP	DHT	9/6/88	

AS BUILT 6/91

FHWA REGION	STATE	PROJECT	
5	OHIO		

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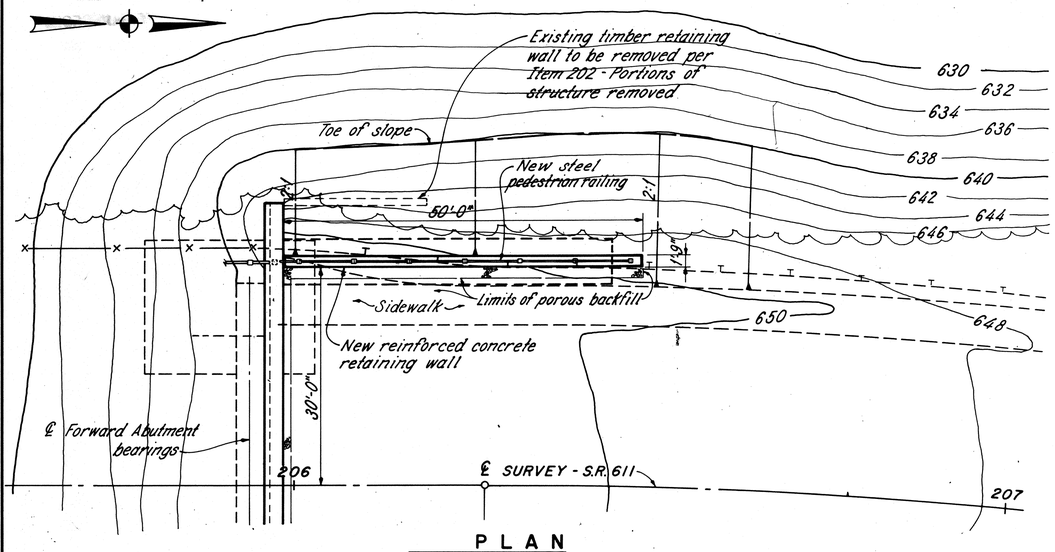
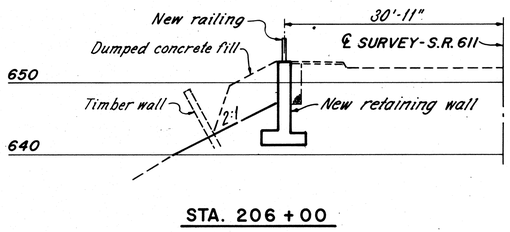
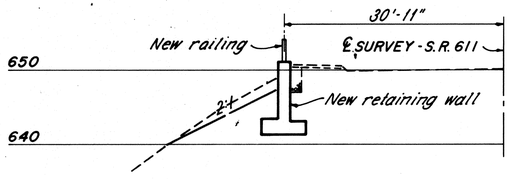
LORAIN COUNTY
LOR - 611 - 3.57



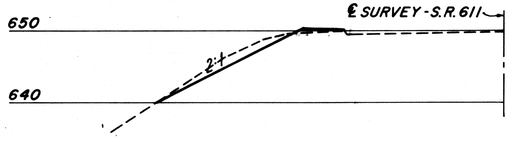
PLAN



STA. 206 + 00

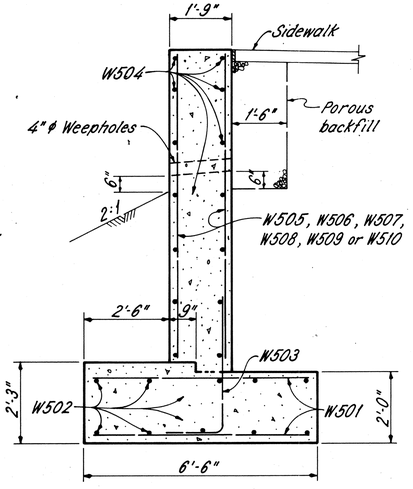


STA. 206 + 25

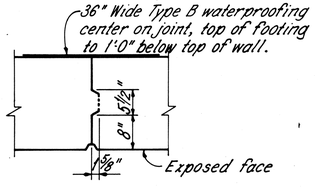


STA. 206 + 50

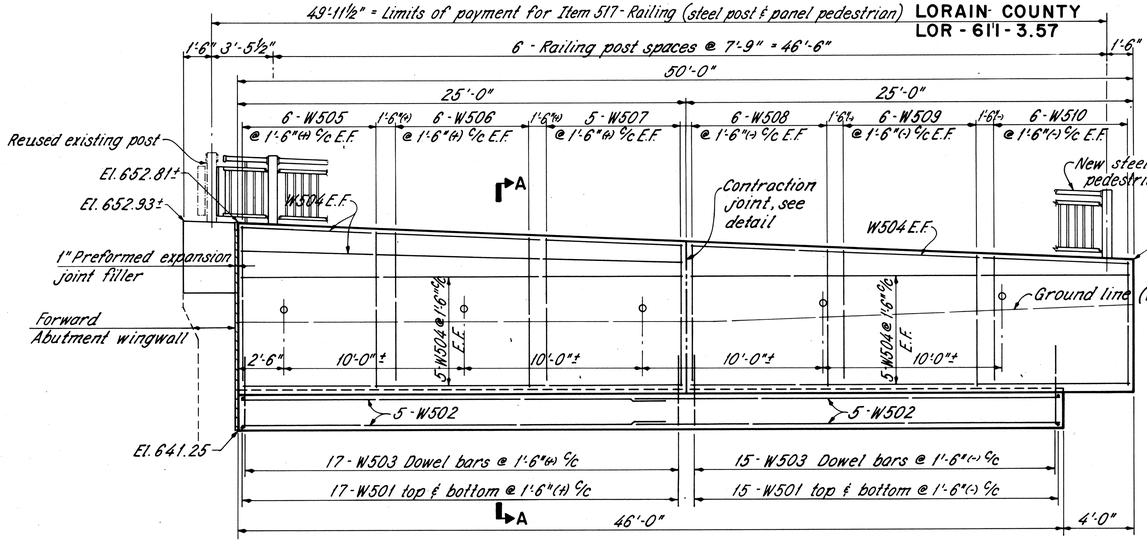
CROSS SECTIONS



SECTION A-A



CONTRACTION JOINT DETAIL



WALL ELEVATION

(East face shown)

A
B
TYPE 1

REINFORCING STEEL (Not epoxy coated)

MARK	NO.	LENGTH	TYPE	A	B	C	D	WEIGHT
W501	64	6'-0"	Str.					401
W502	20	23'-6"	Str.					490
W503	32	5'-6"	1	4'-1½"	1'-8"			189
W504	26	24'-8"	Str.					669
W505	12	8'-8"	Str.					109
W506	12	8'-4"	Str.					104
W507	10	8'-0"	Str.					83
W508	12	7'-8"	Str.					96
W509	12	7'-4"	Str.					92
W510	12	7'-0"	Str.					88
							TOTAL WEIGHT	2321

NOTES:

FORWARD ABUTMENT: See details sheet 79/81

PEDESTRIAN RAILING: See details sheet 81/81

POROUS BACKFILL shall extend upwards to the plane of the subgrade and from the abutment to the limits as shown. Material shall be limited to durable gravel backfill. Stone or air cooled blast furnace slag shall not be permitted.

REINFORCING STEEL SPLICE LENGTHS shall be a minimum of 1'-4" for #5 bars.

NOTATION: E.F. = Each Face

EXCAVATION for construction of the retaining wall shall be included for payment with Item 503 - Unclassified excavation, as per plan. Removal of dumped concrete fill shall be included as incidental to Item 503 - Unclassified excavation as per plan.

80/81

RICHLAND ENGINEERING LIMITED
MANSFIELD, OHIO

RETAINING WALL
SUPERSTRUCTURE
BRIDGE NO. LOR-611-0358
OVER BLACK RIVER

LORAIN COUNTY S.R. 611

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
RDN	TWH	TWH	DAP	DHT	9/6/88	

AS BUILT 6/91

FHWA REGION	STATE	PROJECT	
5	OHIO		

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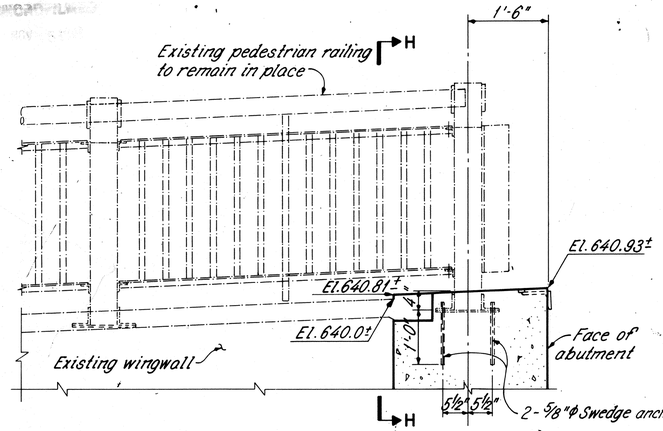
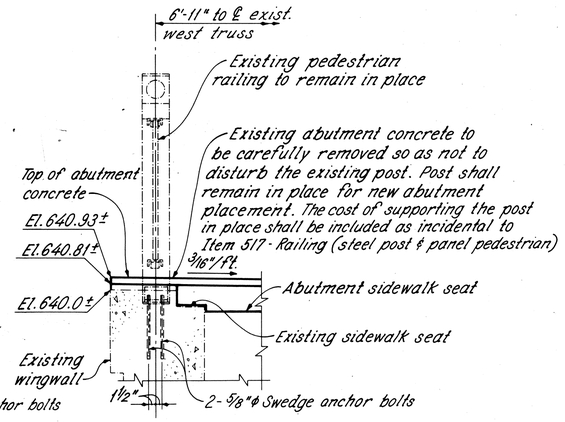
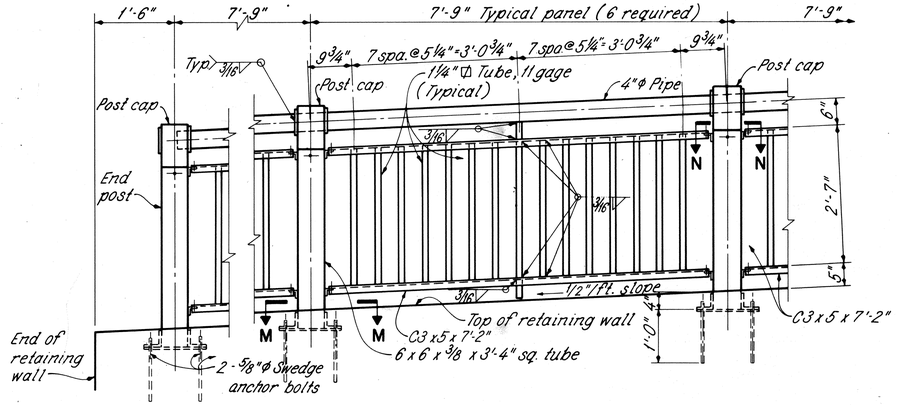
LORAIN COUNTY
LOR - 611 - 3.57



SECTION G - G

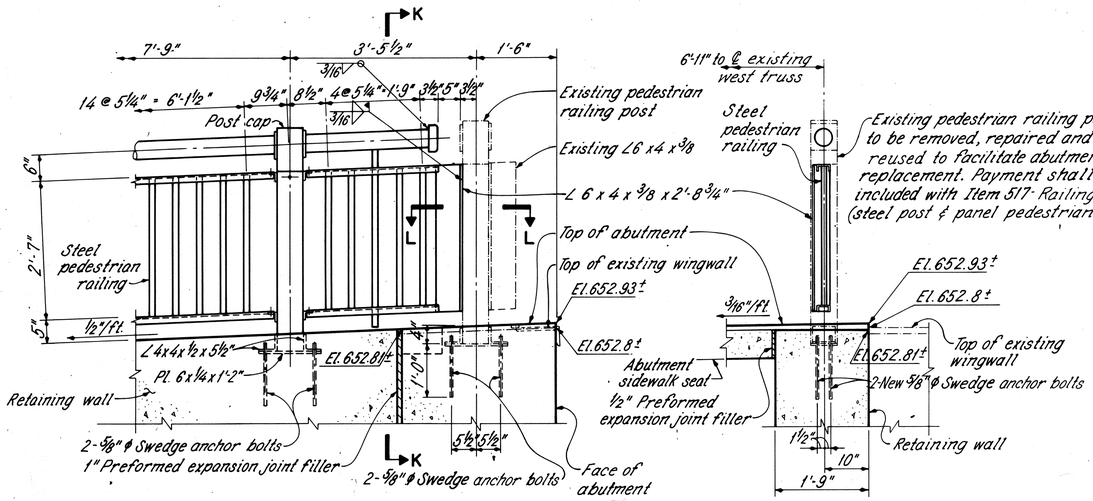


SECTION H - H



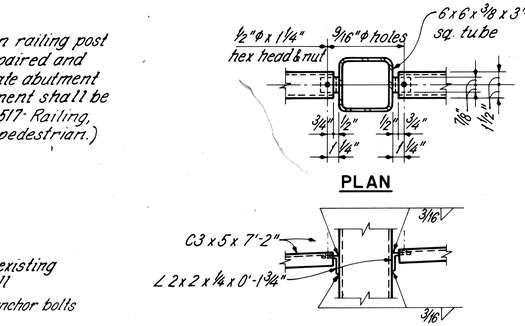
STEEL POST & PANEL PEDESTRIAN RAILING

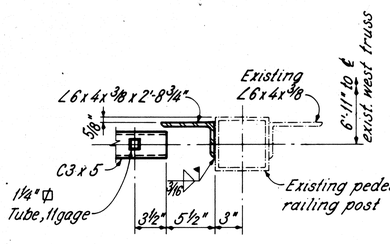
(West face shown)



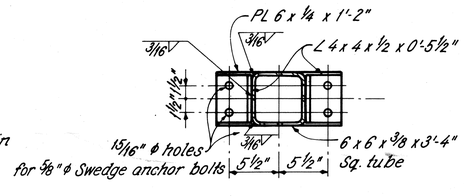
SECTION J - J

SECTION K - K

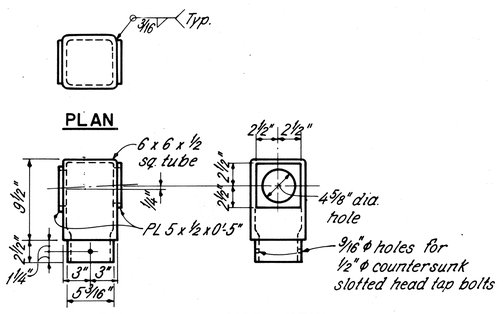




SECTION L - L



SECTION M - M



POST CAP DETAIL

NOTES

MATERIALS shown are new unless otherwise noted.

SWEDGE ANCHOR BOLTS shall include nuts and washers for payment per each with Item 513 - ⅝" diameter x 1'-2" swedge anchor bolt, as per plan. Thread 3".

LEGEND

- Existing material
- New material

81/81

RICHLAND ENGINEERING LIMITED
MANSFIELD, OHIO

ABUTMENT & RETAINING WALL DETAILS
SUPERSTRUCTURE
BRIDGE NO. LOR-611-0358
OVER BLACK RIVER

LORAIN COUNTY S.R.611

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
RDN	RDN	WH	DAP	DHT	9/6/88	

AS BUILT 6/91