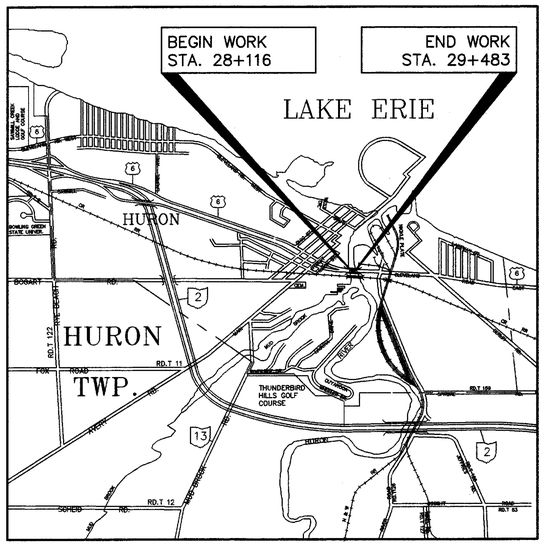

LOCATION MAP

Latitude 41°–23'–23" N
Longitude 82°–33'–12" W

1 .5 0 1 2 4

SCALE IN KILOMETERS

Portion to be improved
State & Federal Routes
U.S. Route
Other Roads

STATE OF OHIO
DEPARTMENT OF TRANSPORTATION

ERI-6-28.839

CITY OF HURON
ERIE COUNTY

metric units

PROJECT DESCRIPTION

Rehabilitation of the existing structure over the Huron River by replacement of Span 15, substructure patching, bridge drainage system modification and improvement, and wearing course retexturing.

1997 SPECIFICATIONS

The standard specifications of the State of Ohio, Department of Transportation, including changes and supplemental specifications listed in the proposal shall govern this improvement.

I hereby approve these plans and declare that the making of this improvement will not require the closing to traffic of the highway and that provisions for the maintenance and safety of traffic will be as set forth on the plans and estimates.

Approved Mary Ellen Franklin
Date 12-15-98 District Deputy Director

Approved Gordon Proctor /mh
Date 2-24-99 Director, Department of Transportation

INDEX OF SHEETS

* SHEET NUMBER 64 NOT USED

DESIGN DESIGNATION

Current Year (1998) A.D.T.	=	11,380
Design Year (2018) A.D.T.	=	14,800
D.H.V. (2018)	=	1,480
D(Directional Distribution)	=	55%
T(24 Hour)	=	3%
V(Design Speed)	=	60 k.p.h.
V(Legal Speed)	=	35 m.p.h.
Functional Classification	=	URBAN PRINCIPAL ARTERIAL

DESIGN EXCEPTIONS
None Required

STRUCTURE PLANS REVIEWED by URS GREINER

STATE OF OHIO JOSEPH R. CIUNI 50129 REGISTERED PROFESSIONAL ENGINEER

SPECIAL PROVISIONS
WATERWAY PERMIT NWP#3 DATED: 1-28-98

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

Prepared By:

adache–ciuni–lynn associates
CONSULTING ENGINEERS 4401 ROCKSIDE ROAD, CLEVELAND, OHIO 44131

STANDARD CONSTRUCTION DRAWINGS										SUPPLEMENTAL SPECIFICATIONS	
DRAWING. NO.	DATE	DRAWING NO.	DATE	DRAWING NO.	DATE	DRAWING NO.	DATE	DRAWING NO.	DATE	NUMBER	DATE
RM–3.1M	10–21–97	EXJ–4–87M	2–18–97							806	9–9–97
RM–4.2M	10–21–97									815	5–30–96
										844	1–6–99
MT–35.10M	1–30–95	PCB–91M	3–20–95							863	9–9–97
MT–35.11M	1–30–95									910	7–28–98
MT–95.30M	4–25–94									954	9–9–97
MT–95.32M	4–25–94										
MT–95.41M	4–25–94	TC–41.20M	7–1–94							842	1–6–99
MT–95.81M	4–25–94	TC–42.10M	3–31–94							899	10–21–98
MT–101.60M	4–25–94	TC–42.20M	3–31–94							814	6–2–98
MT–110.20M	3–1–96	TC–52.10M	7–29–94							904	5–5–98
MT–110.30M	3–1–96	TC–52.20M	7–29–94							905	4–1–98
										906	5–5–98

FEDERAL PROJECT NO. TE21-G990(284)
PID NO. 12011
STATE JOB NO.
RAILROAD INVOLVEMENT NONE
ERI–6–28.839
1 / 92

ERI-6-28.883
990630
DIST. 03
09-0169
PID # 12011

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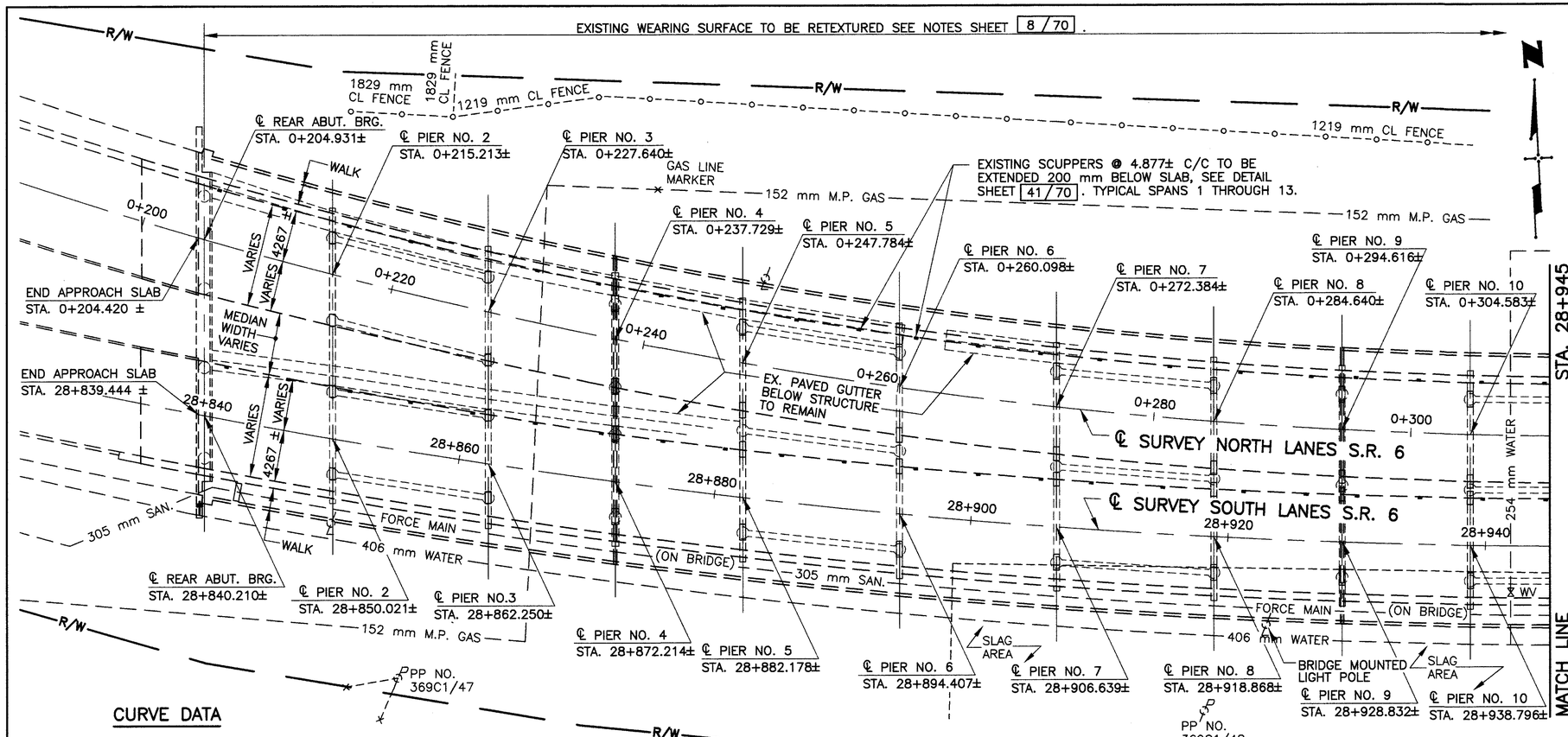
PLOT SCALE 1:1



CURVE DATA

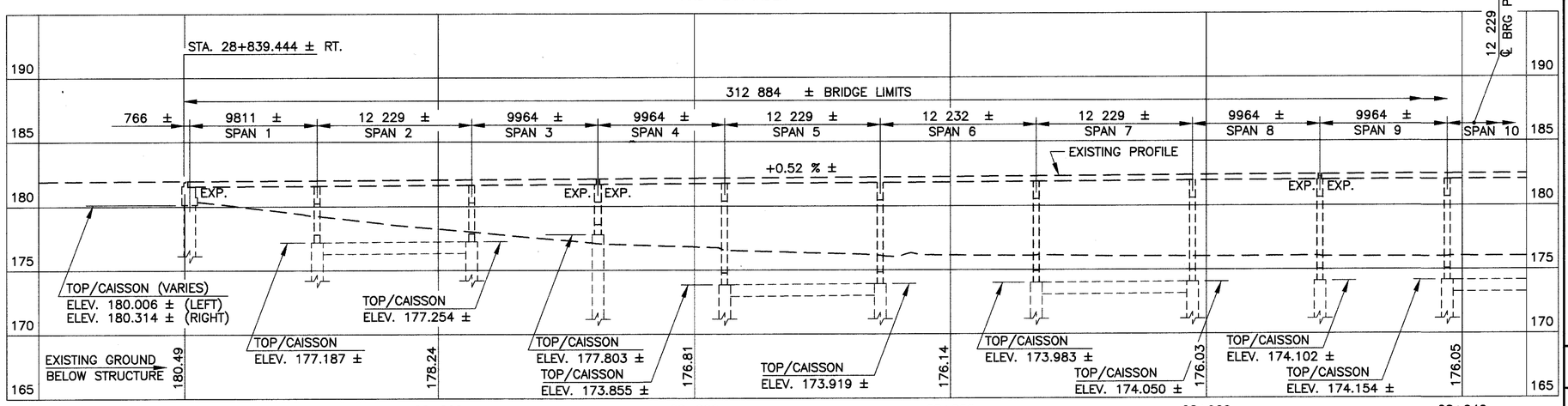
℄ SURVEY SOUTH LANES STATE ROUTE 6	℄ SURVEY NORTH LANES STATE ROUTE 6
P.I. STA. 28+779.626 ±	P.I. STA. 0+200.247 ±
Δ = 34° 39' ± LEFT	Δ = 34° 39' ± LEFT
R = 582.125 m ±	R = 394.859 m ±
T = 181.590 m ±	T = 123.174 m ±
L = 352.044 m ±	L = 238.794 m ±

† BENCH MARK:
TOP OF CHISELED SQUARE IN TOP OF WINGWALL (REAR ABUT.) AT SOUTHWEST CORNER OF BRIDGE
STA. 28+841 ± , 6900 mm ± RIGHT
ELEVATION = 182.584

GENERAL PLAN

SEE SHEET 3 / 70 FOR A GENERAL DESCRIPTION OF PROPOSED WORK, AND PLAN INDEX

NOTE:
ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE NOTED. ELEVATIONS AND STATIONS ARE IN METERS.



ELEVATION

STRUCTURE PLANS REVIEWED BY URS CONSULTANTS,
J.T.H. DATE 9-24-98

EXISTING STRUCTURE

TYPE: SPANS 1–13 AND 17–23 CONTINUOUS CONCRETE SLAB ON REINFORCED CONCRETE SUBSTRUCTURE. SPANS 14 AND 16 SIMPLE SPAN RIVETED STEEL PLATE GIRDERS (A–7) WITH REINFORCED CONCRETE DECK. SPAN 15 SIMPLE SPAN RIVETED PLATE GIRDERS AND FLOOR BEAMS (ASTM A–7) WITH OPEN GRID STEEL DECK. SPANS 14, 15 AND 16 SUPPORTED ON REINFORCED CONCRETE SUBSTRUCTURE.

SPANS: 9811 mm±, 12 229 mm±, 9964 mm±, 9964 mm±, 12 229 mm±, 12 232 mm±, 12 229 mm±, 2 @ 9964 mm±, 12 229 mm±, 12 232 mm±, 12 229 mm±, 10 040 mm±, 24 841 mm±, 36 576 mm±, 24 841 mm±, 9982 mm±, 2 @ 12 192 mm±, 2 @ 9906 mm±, 12 192 mm±, 9754 mm± c/c BRGS. ALONG ℄ SURVEY SOUTH LANES (IN CURVE) ALONG ℄ SURVEY (IN TANGENT)

ROADWAY: 2 AT 7670 mm± TOE OF DEFLECTOR BARRIER TO TOE MEDIAN CURB, WITH 1220 mm± MEDIAN CURB AND 1524 mm± SIDEWALKS

LOADING: S – 20 – 40

SKEW: SPANS 1–9 0° NORMAL TO TANGENT BASELINE EXTENDED BACK FROM P.T., SPANS 10–23 0°.

WEARING SURFACE: SPANS 1–14, 16–23 32 mm LATEX MODIFIED CONCRETE OVERLAY, SPAN 15 OPEN GRID STEEL.

ALIGNMENT: 582.125 m± CURVE LEFT AND TANGENT (℄ SURVEY S.R. 6)

APPROACH SLABS: 4572 mm± LONG WITH 25 mm± ASPHALT CONCRETE WEARING SURFACE.

SUPERELEVATION: 0.018 (WEST END) AND NONE (NORMAL CROWN)

DATE BUILT: 1946

LATITUDE: 41°–23'–23"
LONGITUDE: 82°–33'–12"

STRUCTURE FILE NUMBER: 2201984

PROPOSED STRUCTURE
(SPAN 15 REPLACEMENT)

PROPOSED WORK: REPLACE EXISTING CHANNEL SPAN (SPAN 15) SUPERSTRUCTURE WITH NEW REINFORCED CONCRETE DECK AND STRUCTURAL STEEL GIRDERS.

TYPE: SPANS 1–14 AND 16–23 SAME AS EXISTING SPAN 15 NEW COMPOSITE A572 STRUCTURAL STEEL PLATE GIRDERS WITH REINFORCED CONCRETE DECK SUPPORTED ON EXISTING REINFORCED CONCRETE PIERS (MODIFIED).

SPANS: SAME AS EXISTING

ROADWAY: SAME AS EXISTING

DESIGN LOADING: SPAN 15 SUPERSTRUCTURE AND DECK: MS18 (CASE II) AND ALTERNATE MILITARY LOADING.

SKEW: SAME AS EXISTING

WEARING SURFACE: SPAN 15 – MONOLITHIC CONCRETE REST OF DECK – SAME AS EXISTING

ALIGNMENT: SAME AS EXISTING

APPROACH SLABS: SAME AS EXISTING

SUPERELEVATION: NONE (NORMAL CROWN SPAN 15)

TRAFFIC DATA

AVERAGE DAILY TRAFFIC (1998) = 11,380
AVERAGE DAILY TRAFFIC (2018) = 14,800
AVERAGE DAILY TRUCK TRAFFIC (2018) = 444

adache–ciuni–lynn associates
CONSULTING ENGINEERS
4401 ROCKSIDE RD. CLEVELAND, OHIO 44131

DESIGNED	DRAWN	REVIEWED	DATE
TMJ	TMJ	TAB	12/97
CHECKED	REVISED	STRUCTURE FILE NUMBER	
LPC		2201984	

GENERAL PLAN AND ELEVATION

BRIDGE NUMBER ERI–6–28839
OVER HURON RIVER

ERI–6–28.839

1 / 70

23 / 92

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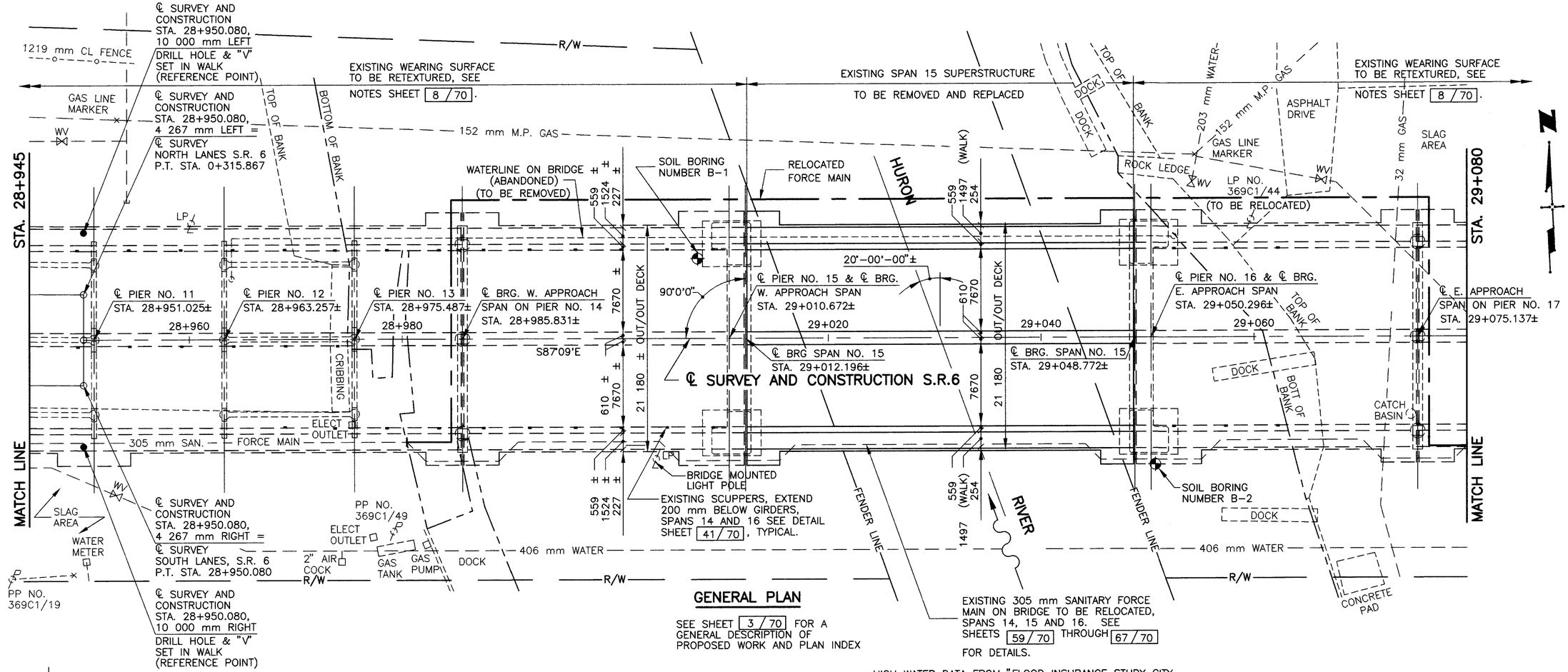
PLOT SCALE 5:1

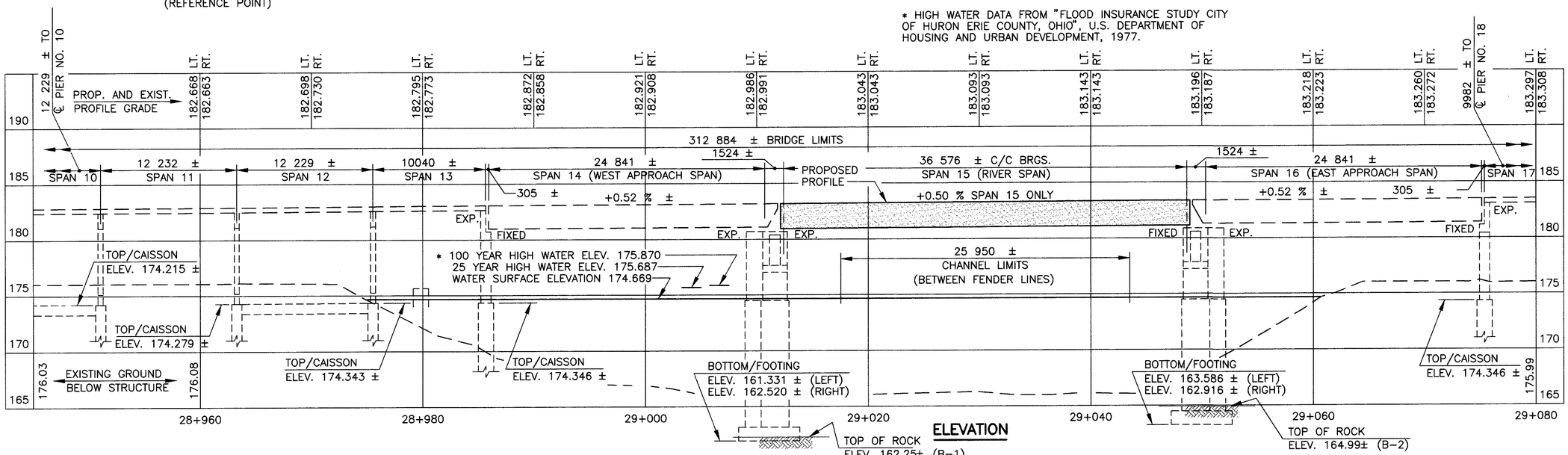


GENERAL PLAN

SEE SHEET 3 / 70 FOR A GENERAL DESCRIPTION OF PROPOSED WORK AND PLAN INDEX

EXISTING 305 mm SANITARY FORCE MAIN ON BRIDGE TO BE RELOCATED, SPANS 14, 15 AND 16. SEE SHEETS 59 / 70 THROUGH 67 / 70 FOR DETAILS.

* HIGH WATER DATA FROM "FLOOD INSURANCE STUDY CITY OF HURON ERIE COUNTY, OHIO", U.S. DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT, 1977.



ELEVATION

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4401 ROCKSIDE RD. CLEVELAND, OHIO 44131

DESIGNED TMJ | DRAWN TMJ | REVIEWED TAB | DATE 12/97
CHECKED LPC | REVISED | STRUCTURE FILE NUMBER 2201984

GENERAL PLAN AND ELEVATION

BRIDGE NUMBER ERI-6-28839
OVER HURON RIVER

ERI-6-28.839

2 / 70

24 / 92

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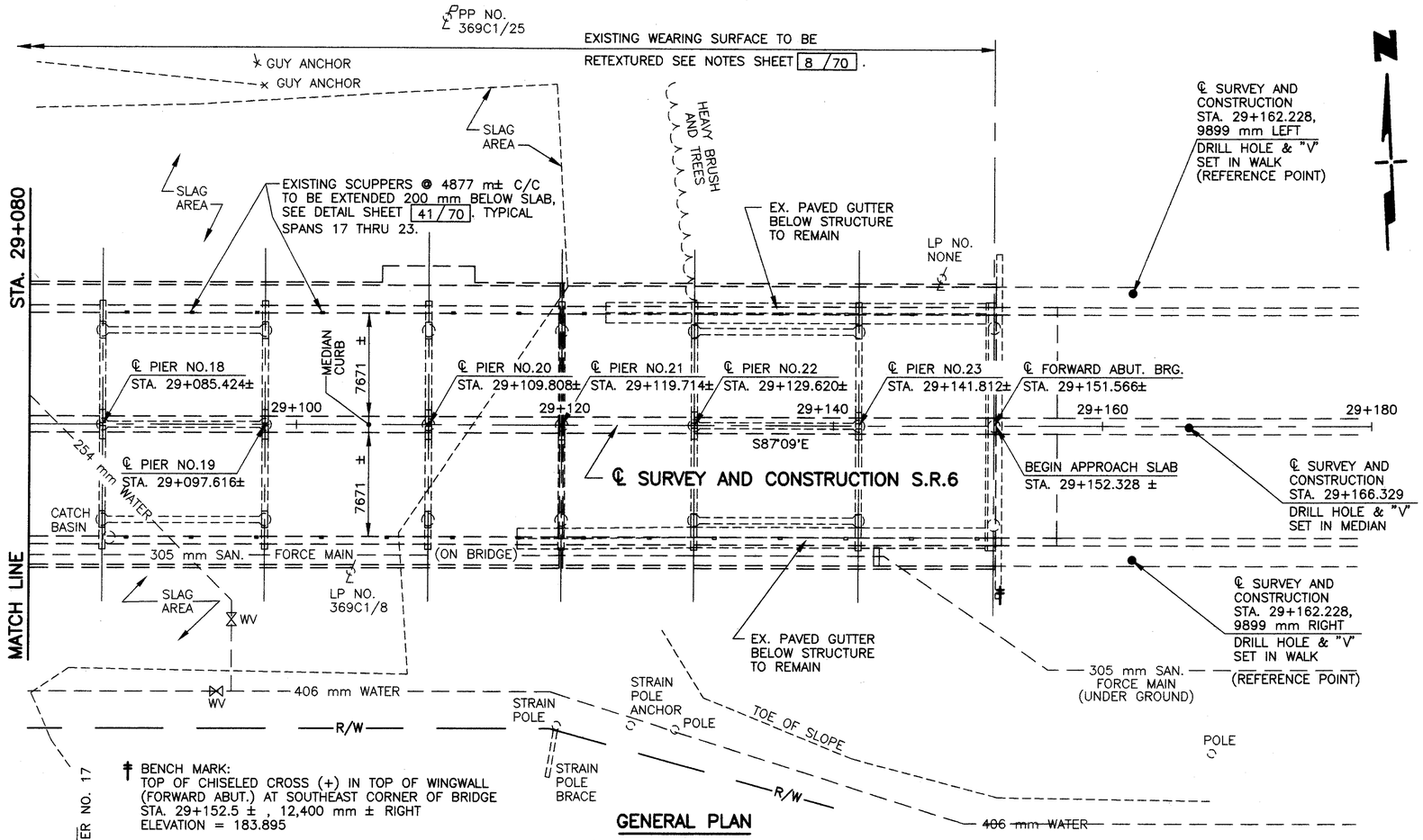
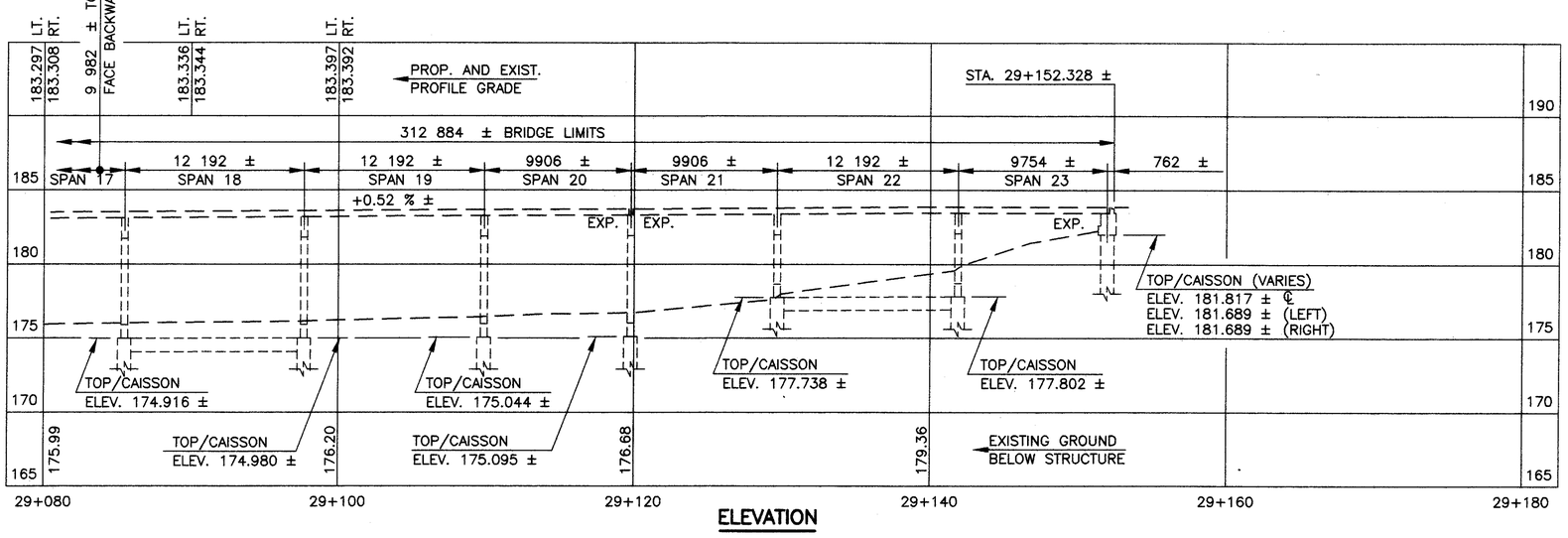
PLOT SCALE 5:1



GENERAL PLAN



ELEVATION

PROPOSED WORK:

1. REMOVE THE EXISTING SUPERSTRUCTURE OF SPAN 15 USING PART WIDTH CONSTRUCTION. RAISE THE SEATS AT PIERS 15 AND 16 FOR SPAN 15. CONSTRUCT NEW SUPERSTRUCTURE FOR SPAN 15 WITH STRUCTURAL STEEL PLATE GIRDERS AND A COMPOSITE REINFORCED CONCRETE DECK.
2. REPLACE EXISTING EXPANSION JOINTS AT PIERS NO. 15 AND NO. 16 WITH NEW STRIP SEAL EXPANSION JOINTS.
3. EXTEND ALL THE EXISTING SCUPPERS IN SPANS 1 THROUGH 14 AND 16 THROUGH 23 TO 200 mm BELOW THE EXISTING DECK OR SUPERSTRUCTURE FRAMING.
4. PATCH EXISTING REINFORCED CONCRETE DECKS AND SUBSTRUCTURE UNITS.
5. PAINT EXISTING BRIDGE RAILING AND SUPERSTRUCTURE STEEL IN SPANS 14 AND 16.
6. RELOCATE THE EXISTING SANITARY FORCE MAIN FROM THE SOUTH SIDE OF THE STRUCTURE TO THE NORTH SIDE, SPANS 14, 15 AND 16 ONLY.

STRUCTURAL PLANS INDEX:

* SHEET NUMBER 42/70 NOT USED.

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4401 ROCKSIDE RD. CLEVELAND, OHIO 44131

DESIGNED	DRAWN	REVIEWED	DATE
TMJ	TMJ	TAB	12/97
CHECKED	REVISED	STRUCTURE FILE NUMBER	
LPC		2201984	

GENERAL PLAN AND ELEVATION
BRIDGE NUMBER ERI–6–28839
OVER HURON RIVER

ERI–6–28.839

3/70

25/92

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PLOT SCALE 5:1

REFERENCE SHALL BE MADE TO STANDARD DRAWINGS:

EXJ-4-87M	REVISED	02-18-97
PCB-91M	DATED	03-20-95

AND TO SUPLEMENTAL SPECIFICATIONS:

815	DATED	05-30-96
844	DATED	01-04-99
863	DATED	09-09-97
910	DATED	7-28-98
954	DATED	09-09-97

DESIGN SPECIFICATIONS:

THIS STRUCTURE CONFORMS TO "STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES" ADOPTED BY THE AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS, 1996, AND THE ODOT BRIDGE DESIGN MANUAL.

DESIGN LOADING:

SPAN 15 SUPERSTRUCTURE AND DECK:

MS18, CASE II AND THE ALTERNATE MILITARY LOADING.

DESIGN DATA:

CONCRETE CLASS S – COMPRESSIVE STRENGTH 31.0 MPa (SUPERSTRUCTURE)

CONCRETE CLASS C – COMPRESSIVE STRENGTH 27.5 MPa (SUBSTRUCTURE)

REINFORCING STEEL – ASTM A615M, A616M OR A617M GRADE 400 MINIMUM YIELD STRENGTH 400 MPa.

STRUCTURAL STEEL – ASTM A709M, GRADE 345 – YIELD STRENGTH 345 MPa
ASTM A709M, GRADE 250 – YIELD STRENGTH 250 MPa

DECK PROTECTION METHOD:

EPOXY COATED REINFORCING STEEL.

65 MM CONCRETE COVER.

MONOLITHIC WEARING SURFACE IS ASSUMED, FOR DESIGN PURPOSES, TO BE 25 mm THICK.

SEQUENCE OF OPERATIONS:

THE FOLLOWING NARRATIVE IS DESCRIPTIVE OF THE GENERAL SEQUENCE OF PHASED DEMOLITION AND CONSTRUCTION TO BE USED IN RECONSTRUCTING SPAN 15 AND REHABILITATING THE REST OF THIS BRIDGE. ADDITIONAL DETAILS OF THE PHASED DEMOLITION AND CONSTRUCTION ARE SHOWN ON SHEETS 11/70 AND 12/70 THE CONTRACTOR SHALL SUBMIT IN WRITING HIS/HER PROPOSED METHODS AND SEQUENCE FOR PERFORMING THIS WORK TO THE DIRECTOR FOR REVIEW AND APPROVAL PRIOR TO COMMENCING WORK.

PHASE 2:

ESTABLISH PHASE 2 TRAFFIC MAINTENANCE AND SHIFT TRAFFIC (2 LANES) TO THE RIGHT SIDE OF THE BRIDGE.

INSTALL PORTABLE CONCRETE BARRIER ON EXISTING STEEL GRID DECK IN SPAN 15 AS DETAILED IN THE PLANS.

REMOVE LEFT SIDE OF SUPERSTRUCTURE IN SPAN 15 TO THE LIMITS SHOWN IN THE PLANS.

CONSTRUCT NEW BRIDGE SEATS ON PIERS 15 AND 16 FOR THE LEFT PORTION OF PROPOSED SUPERSTRUCTURE, FOR SPAN 15.

ERECT NEW PLATE GIRDERS FOR LEFT PORTION OF SPAN 15 (GIRDERS 'A', 'B' AND 'C').

INSTALL NEW STRIP SEAL EXPANSION JOINTS AT PIER 15 AND 16 FOR LEFT PORTION OF SPAN 15.

CONSTRUCT NEW REINFORCED CONCRETE DECK FOR LEFT PORTION OF SPAN 15.

INSTALL NEW STEEL PEDESTRIAN RAILINGS ON LEFT SIDE OF DECK IN SPAN 15.

WHILE TRAFFIC IS MAINTAINED ON RIGHT SIDE OF BRIDGE,

THE EXISTING STEEL RAILING ON THE LEFT SIDE OF THE EXISTING BRIDGE SHALL BE DISASSEMBLED, REFINISHED AND REINSTALLED.

RELOCATE THE EXISTING SANITARY FORCE MAIN FROM THE RIGHT SIDE OF THE BRIDGE TO THE LEFT SIDE OF THE BRIDGE IN SPANS 14, 15 AND 16.

PHASE 3:

ESTABLISH PHASE 3 TRAFFIC MAINTENANCE AND SHIFT TRAFFIC (2 LANES) TO THE LEFT SIDE OF THE BRIDGE.

REMOVE THE REMAINING EXISTING SUPERSTRUCTURE IN SPAN 15.

CONSTRUCT NEW BRIDGE SEATS ON PIERS 15 AND 16 FOR THE RIGHT PORTION OF THE PROPOSED SUPERSTRUCTURE FOR SPAN 15.

ERECT PLATE GIRDERS FOR RIGHT PORTION OF SPAN 15 (GIRDERS 'D', 'E' AND 'F').

INSTALL NEW STRIP SEAL EXPANSION JOINTS AT PIERS 15 AND 16 FOR RIGHT PORTION OF SPAN 15.

CONSTRUCT NEW REINFORCED CONCRETE DECK FOR RIGHT PORTION OF SPAN 15.

TIE PHASE 2 FRAMING TO THE PHASE 3 FRAMING IN SPAN 15 BY INSTALLING CROSSFRAMES BETWEEN GIRDERS C AND D. CONNECTION BOLTS SHALL BE TIGHTENED TO A HAND SNUG CONDITION.

INSTALL NEW STEEL PEDESTRIAN RAILING ON RIGHT SIDE OF DECK IN SPAN 15.

WHILE TRAFFIC IS MAINTAINED ON LEFT SIDE OF BRIDGE,

THE EXISTING STEEL RAILINGS ON THE RIGHT SIDE OF THE EXISTING BRIDGE SHALL BE DISASSEMBLED, REFINISHED AND REINSTALLED.

PHASE 4:

POUR DECK SLAB CLOSURE STRIP AND APPLY HMWM AT CONSTRUCTION JOINTS.

FULLY TIGHTEN CROSSFRAME CONNECTION BOLTS BETWEEN GIRDERS 'C' AND 'D'.

RE-ESTABLISH NORMAL TRAFFIC PATTERNS.

THE FOLLOWING ITEMS OF WORK ON THE BRIDGE ARE INDEPENDENT OF TRAFFIC MAINTENANCE CONSIDERATIONS:

EXTEND ALL THE EXISTING SCUPPERS IN SPANS 1 THROUGH 14 AND 16 THROUGH 23 TO 200 MILLIMETERS BELOW THE EXISTING DECK OR SUPERSTRUCTURE FRAMING.

SOUND THE UNDERSIDE OF THE EXISTING CONCRETE DECKS IN SPANS 1 THROUGH 14 AND 16 THROUGH 23, REMOVING ALL LOOSE, DELAMINATED OR DETERIORATED CONCRETE. IN SPANS 1 THROUGH 14 AND 16 THROUGH 23, ALL REMOVAL AREAS ARE TO BE CLEANED AND SEALED.

PATCH AND SEAL EXISTING CONCRETE SUBSTRUCTURE UNITS AS SHOWN ON THE PLANS.

PAINT THE EXISTING STEEL SUPERSTRUCTURE IN SPANS 14 AND 16.

ITEM 202-PORTIONS OF STRUCTURE REMOVED, OVER 6 METER SPAN, AS PER PLAN:

DESCRIPTION:

THIS WORK SHALL CONSIST OF THE REMOVAL OF THE EXISTING STEEL GRID DECK, CONCRETE SIDEWALKS, STEEL BARRIERS, STEEL RAILINGS, DECK JOINTS AND THE STEEL SUPERSTRUCTURE AND ASSOCIATED APPURTENANCES IN SPAN 15, AS SHOWN IN THE PLANS AND THE EXISTING ABANDONED WATERLINE IN SPANS 14, 15 AND 16. THIS REMOVAL SHALL BE PERFORMED IN PHASES AS SHOWN IN THE PLANS. THE USE OF EXPLOSIVES, HEADACHE BALLS AND/OR HOE-RAMS WILL NOT BE PERMITTED. THE METHOD OF REMOVAL SHALL BE APPROVED BY THE ENGINEER.

PROTECTION OF TRAFFIC:

PRIOR TO DEMOLITION OF ANY PORTIONS OF THE EXISTING SUPERSTRUCTURE, THE CONTRACTOR SHALL SUBMIT PLANS FOR THE PROTECTION OF TRAFFIC (VEHICULAR, PEDESTRIAN, BOAT, ETC.) ADJACENT TO AND/OR UNDER THE STRUCTURE TO THE DIRECTOR FOR APPROVAL. THESE PLANS SHALL INCLUDE PROVISIONS FOR ANY DEVICES AND STRUCTURES THAT MAY BE NECESSARY TO ENSURE SUCH PROTECTION. TEMPORARY VERTICAL CLEARANCES SPECIFIED ON THE PLANS OR IN THE PROPOSAL SHALL BE MAINTAINED AT ALL TIMES EXCEPT AS OTHERWISE APPROVED BY THE DIRECTOR.

WORK IN AND OVER THE HURON RIVER:

ALL CONSTRUCTION OPERATIONS IN AND OVER THE HURON RIVER SHALL CONFORM TO THE REQUIREMENTS OF THE U.S. COAST GUARD.
THE CONTRACTOR SHALL NOTIFY THE COMMANDER, NINTH COAST GUARD DISTRICT, BRIDGE BRANCH, 1240 E. NINTH STREET, CLEVELAND, OHIO 44199 (TELEPHONE, 216-902-6084), TEN DAYS IN ADVANCE OF COMMENCEMENT OF WORK IN AND ABOVE THE RIVER SO THAT NAVIGATION INTERESTS MAY BE NOTIFIED OF THE PRESENCE OF CONSTRUCTION EQUIPMENT, THE CONTRACTOR SHALL NOTIFY THE SAME OFFICE WHEN THE WORK IS COMPLETED. THE CONTRACTOR SHALL PROVIDE AND MAINTAIN NAVIGATION LIGHTS AND OTHER NAVIGATION SIGNALS OR FACILITIES WHICH MAY BE REQUIRED BY THE U.S. COAST GUARD ON TEMPORARY CONSTRUCTION OR VESSELS. REFER TO THE BOAT MAINTENANCE OF TRAFFIC PLANS, SHEET 10/70.

REMOVAL METHODS:

CONCRETE MAY BE REMOVED BY CUTTING AND BY MEANS OF HAND OPERATED PNEUMATIC HAMMERS EMPLOYING POINTED OR BLUNTED CHISEL TYPE TOOLS. FOR REMOVALS ABOVE STEEL MEMBERS, A HAMMER HEAVIER THAN 16 KILOGRAM BUT NOT TO EXCEED 41 KILOGRAM MAY BE USED AT THE APPROVAL OF THE ENGINEER, TO ENSURE ADEQUATE DEPTH CONTROL AND TO PREVENT NICKING OR GOUGING ANY PRIMARY STEEL MEMBERS TO REMAIN. THE WEIGHT OF THE HAMMER SHALL BE APPROVED BY THE ENGINEER.

PLOT SCALE: 1 = 100
G:\DGN\BRIDGE\GENNOTES 10-13-97 1:51:49 pm EST

adache-ciuni-lynn associates
CONSULTING ENGINEERS
4401 ROCKSIDE RD. CLEVELAND, OHIO 44131

DESIGNED	DRAWN	REVIEWED	DATE
AJM	TES	TAB	12/97
CHECKED	REVISED	STRUCTURE FILE NUMBER	
LPC		2201984	

STRUCTURE GENERAL NOTES

BRIDGE NUMBER ERI-6-28839
OVER HURON RIVER

ERI-6-28.839

LOADING LIMITATIONS:

NO PART OF THE STRUCTURE SHALL BE SUBJECTED TO UNIT STRESSES THAT EXCEED 136.5% OF THE ALLOWABLE UNIT STRESSES GIVEN IN THE AASHTO STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES DUE EITHER TO DEMOLITION, ERECTION OR CONSTRUCTION METHODS, OR TO THE USE OR MOVEMENT OF DEMOLITION OR ERECTION EQUIPMENT ON OR ACROSS THE STRUCTURE. STRUCTURAL ANALYSIS COMPUTATIONS, BY A REGISTERED PROFESSIONAL ENGINEER, SHOWING THE ALLOWABLE STRESSES AND THE MAXIMUM STRESSES PRODUCED BY THE CONTRACTOR'S METHODS OR EQUIPMENT SHALL BE SUBMITTED TO THE DIRECTOR FOR REVIEW AND APPROVAL AT LEAST TWO WEEKS PRIOR TO THE START OF THE WORK.

PAYMENT:

THIS WORK WILL BE PAID FOR AT THE CONTRACT LUMP SUM PRICE BID FOR ITEM 202–PORTIONS OF STRUCTURE REMOVED, OVER 6 METER SPAN, AS PER PLAN, WHICH PRICE AND PAYMENT SHALL BE FULL COMPENSATION FOR ALL LABOR, EQUIPMENT, MATERIALS AND INCIDENTALS NECESSARY TO COMPLETE THE WORK IN CONFORMANCE WITH THESE REQUIREMENTS, WITH PERTINENT PROVISIONS OF 202, AND TO THE SATISFACTION OF THE ENGINEER.

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 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 TO SS SECTION 863.07.

CONTRACT BID PRICES SHALL BE BASED UPON A RECOGNITION OF THE UNCERTAINTIES DESCRIBED ABOVE AND UPON A PREBID 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.

REPLACEMENT OF EXISTING REINFORCING STEEL:

ANY EXISTING REINFORCING BARS WHICH ARE TO BE INCORPORATED INTO THE NEW WORK AND WHICH ARE MADE UNUSABLE BY THE CONTRACTOR'S CONCRETE REMOVAL OPERATIONS SHALL BE REPLACED WITH NEW STEEL AT THE CONTRACTOR'S COST. ANY EXISTING REINFORCING BARS DEEMED BY THE ENGINEER TO BE UNUSABLE BECAUSE OF CORROSION SHALL BE REPLACED WITH NEW STEEL. COST OF ADDITIONAL REINFORCING STEEL SHALL BE INCLUDED WITH THE APPROPRIATE CONCRETE ITEM.

CONCRETE PARAPETS:

AS SOON AS A CONCRETE SAW CAN BE OPERATED WITHOUT DAMAGING THE FRESHLY PLACED CONCRETE, 25 mm DEEP CONTROL JOINTS SHALL BE SAWED INTO THE PERIMETER OF THE CONCRETE PARAPET. THE SAW CUT SHALL BE MADE IN THE COMPLETE CIRCUMFERENCE OF THE PARAPET, STARTING AND ENDING AT THE ELEVATION OF THE CONCRETE DECK. THE SAWCUTS SHALL BE PLACED AT A MINIMUM OF 2000 mm AND A MAXIMUM OF 3000 mm CENTERS. THE USE OF AN EDGE GUIDE, FENCE, OR JIG IS REQUIRED TO INSURE THAT THE CUT JOINT IS STRAIGHT, TRUE, AND ALIGNED ON ALL FACES OF THE PARAPET. THE JOINT WIDTH SHALL BE THE WIDTH OF THE SAW BLADE, A NOMINAL WIDTH OF 6 mm. THE PERIMETER OF THE DEFLECTION CONTROL JOINT SHALL BE SEALED TO A MINIMUM DEPTH OF 25 mm WITH A CAULKING MATERIAL CONFORMING TO FEDERAL SPECIFICATION, TT–S–00227E TO A MINIMUM DEPTH OF 25 mm.

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

THE WORK UNDER THIS ITEM SHALL CONFORM TO THE REQUIREMENTS OF ITEM 516, THE STANDARD DRAWING EXJ–4–87M AND THE DETAILS SHOWN IN THESE PLANS. EXISTING JOINT ARMOR AT THE ENDS OF SPANS 14 AND 16 SHALL BE MODIFIED AND USED AS PART OF THE JOINT ARMOR FOR THE NEW EXPANSION JOINTS AS DETAILED IN THE PLANS.

THE JOINTS SHALL BE INSTALLED PART–WIDTH AS SHOWN IN THE PLANS. THE JOINT SEAL SHALL BE SUPPLIED AND INSTALLED IN A SINGLE PIECE.

PAYMENT FOR THIS WORK WILL BE MADE AT THE CONTRACT PRICE BID PER METER FOR ITEM 516 – STRUCTURAL EXPANSION JOINT INCLUDING ELASTOMERIC STRIP SEAL, AS PER PLAN.

RAILING, GENERAL

STEEL RAILINGS ON THE BRIDGE SHALL BE REHABILITATED INCLUDING PROVIDING NEW POSTS ON THE NEW DECK FOR SPAN 15 AND SEVERAL NEW RAILING PANELS AT THE ENDS OF SPAN 15. EXISTING STEEL RAILING PANELS AND POSTS FOR SPANS 1 THROUGH 14 AND SPANS 16 THROUGH 23 SHALL BE REHABILITATED FOR REUSE AS DESCRIBED BELOW.

ITEM 517 – RAILING, MISC.: NEW RAILING POST

UNDER THIS ITEM, NEW STRUCTURAL STEEL POSTS SHALL BE FABRICATED AND INSTALLED ON SPAN 15 OF THE BRIDGE.

NEW POSTS SHALL BE FABRICATED AND INSTALLED IN ACCORDANCE WITH THE REQUIREMENTS OF SUPPLEMENTAL 863 AND AS DETAILED ON THE PLANS. THE POSTS SHALL BE FABRICATED USING ASTM A709M, GRADE 250 STEEL.

THE FABRICATED POSTS SHALL HAVE THEIR SURFACE PREPARED AND SHOP PAINTED IN ACCORDANCE WITH THE REQUIREMENTS OF ITEM 514–FIELD PAINTING, MISC.: COMPLETE SHOP PAINTING OF STRUCTURAL STEEL.

THE PAINTED POSTS SHALL BE INSTALLED AT THE LOCATIONS SHOWN IN THE PLANS. A CONTINGENCY QUANTITY OF TWO (2) POSTS IS INCLUDED FOR REPLACEMENT OF DETERIORATED EXISTING POSTS AS DIRECTED BY THE ENGINEER.

PAYMENT FOR THIS WORK SHALL BE MADE AT THE CONTRACT PRICE BID PER EACH FOR ITEM 517 – RAILING, MISC.: NEW RAILING POST, WHICH PRICE SHALL INCLUDE ALL MATERIAL, EQUIPMENT AND LABOR NECESSARY TO COMPLETE THIS WORK.

ITEM 517 – RAILING, MISC.: NEW RAILING PANEL

UNDER THIS ITEM, NEW STRUCTURAL STEEL RAILING PANELS SHALL BE FABRICATED AND INSTALLED ON THE BRIDGE.

NEW RAILING PANELS SHALL BE FABRICATED AND INSTALLED IN ACCORDANCE WITH THE REQUIREMENTS OF SUPPLEMENTAL 863 AND AS DETAILED ON THE PLANS. THE PANELS SHALL BE FABRICATED USING ASTM A709M, GRADE 250 STEEL.

THE FABRICATED PANELS SHALL HAVE THEIR SURFACES PREPARED AND SHOP PAINTED IN ACCORDANCE WITH THE REQUIREMENTS OF ITEM 514–FIELD PAINTING, MISC.: COMPLETE SHOP PAINTING OF STRUCTURAL STEEL.

THE PAINTED PANELS SHALL BE INSTALLED AT THE LOCATIONS SHOWN IN THE PLANS. A CONTINGENCY QUANTITY OF ONE (1) PANEL IS INCLUDED FOR REPLACEMENT OF A DETERIORATED EXISTING RAILING PANEL AS DIRECTED BY THE ENGINEER.

PAYMENT FOR THIS WORK SHALL BE MADE AT THE CONTRACT PRICE BID PER EACH FOR ITEM 517 – RAILING, MISC.: NEW RAILING PANEL, WHICH PRICE SHALL INCLUDE ALL MATERIAL, EQUIPMENT AND LABOR NECESSARY TO COMPLETE THIS WORK.

ITEM 517 – RAILING, MISC.: RAILING PANEL REMOVED AND REINSTALLED.

UNDER THIS ITEM, ALL THE EXISTING STEEL RAILING PANELS ON THE BRIDGE SHALL BE CAREFULLY REMOVED FROM THE EXISTING POSTS AND MATCH MARKED TO IDENTIFY THEIR INSTALLED LOCATIONS. RAILING REMOVAL AND REINSTALLATION SHALL BE PROPERLY COORDINATED WITH THE PROJECT CONSTRUCTION PHASING.

THE PANELS SHALL BE TRANSPORTED TO A STEEL FABRICATION SHOP FOR CLEANING, AND PAINTING IN ACCORDANCE WITH THE REQUIREMENTS OF ITEM 514–FIELD PAINTING MISC.: COMPLETE SHOP PAINTING OF STRUCTURAL STEEL.

THE PAINTED PANELS SHALL BE PROPERLY PROTECTED FROM DAMAGE UNTIL THEY ARE REINSTALLED. RAILING PANELS SHALL BE REINSTALLED IN THEIR PROPER LOCATION ON EXISTING OR NEW PAINTED POSTS IN ACCORDANCE WITH SUPPLEMENTAL 863 AND AS DETAILED ON THE PLANS. ALL NEW HARDWARE SHALL BE PROVIDED FOR REINSTALLATION.

PAYMENT FOR THIS WORK SHALL BE MADE AT THE CONTRACT PRICE BID PER EACH FOR ITEM 517 – RAILING, MISC.: RAILING PANEL REMOVED AND REINSTALLED, WHICH PRICE SHALL INCLUDE ALL MATERIAL, EQUIPMENT AND LABOR NECESSARY TO COMPLETE THIS WORK.

RAILING, MISC.: EXISTING RAILING PANEL REPAIRED

THIS ITEM OF WORK SHALL CONSIST OF THE REPAIR OF EXISTING STEEL RAILING PANELS PREVIOUSLY REMOVED FROM THE STRUCTURE UNDER ITEM 517–RAILING, MISC.: RAILING PANEL REMOVED AND REINSTALLED. REPAIRS SHALL BE MADE USING ASTM A709M, GRADE 250 STEEL, IN ACCORDANCE WITH APPLICABLE PROVISIONS OF SUPPLEMENTAL 863 AND AS DETAILED IN THE PLANS. ALL REPAIRS SHALL BE MADE FOLLOWING REMOVAL OF THE PANEL AND PRIOR TO PAINTING. REPAIRS SHALL BE MADE ONLY TO THOSE PANELS SPECIFICALLY IDENTIFIED FOR REPAIR BY THE ENGINEER.

THE FOLLOWING CONTINGENCY QUANTITIES HAVE BEEN CARRIED TO THE STRUCTURE QUANTITIES, SHEET 9 / 70 . THESE QUANTITIES SHALL BE USED AS DIRECTED BY THE ENGINEER TO REPAIR DETERIORATED RAILING PANELS.

ITEM	DESCRIPTION	QUANTITY	UNIT
517	RAILING, MISC.: RAILING PANEL CHANNEL REPAIRED	40	EACH
517	RAILING, MISC.: RAILING CONNECTION ANGLE REPAIRED	10	EACH
517	RAILING, MISC.: RAILING PANEL SPINDLE REPAIRED	5	EACH

PAYMENT FOR THESE ITEMS SHALL BE MADE AT THE UNIT PRICE BID PER EACH. WHICH PRICE SHALL CONSTITUTE FULL COMPENSATION FOR ALL LABOR, MATERIALS AND EQUIPMENT NECESSARY TO COMPLETE THE REPAIRS IN ACCORDANCE WITH THE PLANS AND SPECIFICATIONS.

PLOT SCALE: 1 = 100

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DESIGNED AJM | DRAWN TES | CHECKED LPC | REVISED | REVIEWED TAB | DATE 12/97 | STRUCTURE FILE NUMBER 2201984

STRUCTURE GENERAL NOTES
BRIDGE NUMBER ERI–6–28839
OVER HURON RIVER

ERI–6–28.839

ITEM SPECIAL – SOUNDING CONCRETE DECK BOTTOM:

THIS WORK SHALL CONSIST OF SUPPLYING THE MATERIALS, LABOR AND EQUIPMENT NECESSARY FOR SOUNDING DECK BOTTOMS IN ORDER THAT THE ENGINEER MAY CONFIRM THE AREAS OF DETERIORATED CONCRETE MARKED IN THE FIELD AND SHOWN ON THE PLANS. THE CONTRACTOR SHALL SOUND THE DECK BOTTOM OF SPANS 1 THROUGH 14, AND 16 THROUGH 23 WITH HAMMERS, IN THE VICINITY OF MARKED AREAS AND REMOVE SPALLS, DELAMINATIONS AND LOOSE CONCRETE IN THE DECK BOTTOM. SPALLS FORMING ARE EVIDENCED BY A VISIBLE EDGE.

THE PAY AREA UNDER THIS ITEM SHALL BE THE NUMBER OF SQUARE METERS THAT ARE SATISFACTORILY SOUNDED, CLEANED OF DETERIORATED CONCRETE, AND ACCEPTED. THE ACCEPTED QUANTITIES WILL BE PAID FOR AT THE CONTRACT PRICE BID PER SQUARE METER FOR ITEM SPECIAL – SOUNDING CONCRETE DECK BOTTOM, WHICH PRICE AND PAYMENT SHALL BE FULL COMPENSATION FOR FURNISHING ALL MATERIAL, LABOR AND EQUIPMENT NECESSARY TO COMPLETE THE WORK AS DESCRIBED ABOVE.

MODIFICATION AND REPAIR OF EXISTING CONCRETE ELEMENTS

GENERAL

EXISTING REINFORCED CONCRETE STRUCTURAL ELEMENTS WHICH ARE INCORPORATED IN THIS STRUCTURE ARE TO BE MODIFIED AND/OR REPAIRED. A CONDITION SURVEY WAS PERFORMED IN SEPTEMBER AND OCTOBER OF 1995. REPAIR AREAS WERE DETERMINED BY VISUAL INSPECTION AND SOUNDING, AND DELINEATED FOR REPAIR BY PAINTING. THE STRUCTURAL ELEMENTS INSPECTED INCLUDE THE ABUTMENTS (EXPOSED SURFACES ONLY), THE PIERS (EXPOSED SURFACES ONLY), AND THE DECK SLABS (DECK BOTTOM ONLY). THE RECORDS OF THIS INSPECTION ARE THE BASIS FOR THE REPAIR PLANS AS DETAILED IN SHEETS 13/70 THROUGH 30/70 AND SHEETS 50/70 THROUGH 56/70.

ABUTMENTS:

DELINEATED AREAS ON THE FORWARD ABUTMENT SHALL BE REPAIRED PER THE REQUIREMENTS OF ITEM 520 – PNEUMATICALLY PLACED MORTAR, AS PER PLAN, AND SEALED PER THE REQUIREMENTS OF ITEM SPECIAL – SEALING OF CONCRETE SURFACES (EPOXY).

NO REPAIRS WERE NECESSARY ON THE REAR ABUTMENT AT THE TIME OF INSPECTION.

REFER TO SHEET 13/70 FOR ABUTMENT REPAIR DETAILS.

PIERS:

DELINEATED AREAS ON PIERS 4, 7 THROUGH 12, AND 17 THROUGH 23 SHALL BE REPAIRED PER THE REQUIREMENTS OF ITEM 520 – PNEUMATICALLY PLACED MORTAR, AS PER PLAN, AND SEALED PER THE REQUIREMENTS OF ITEM SPECIAL – SEALING OF CONCRETE SURFACES (EPOXY).

DELINEATED AREAS ON PIER 14 SHALL BE REPAIRED PER THE REQUIREMENTS OF ITEM 519 – PATCHING CONCRETE STRUCTURES. A REINFORCED CONCRETE PAD SHALL BE CONSTRUCTED ON PIER 14 PER THE REQUIREMENTS OF ITEM 511 – CLASS 'C' CONCRETE, PIER, AS PER PLAN. PATCHED AREAS AND THE REINFORCED CONCRETE PAD SHALL BE SEALED PER THE REQUIREMENTS OF ITEM SPECIAL – SEALING OF CONCRETE SURFACES (EPOXY).

DELINEATED AREAS ON PIERS 15 AND 16 SHALL BE REPAIRED PER THE REQUIREMENTS OF ITEM 519 – PATCHING CONCRETE STRUCTURES. NEW BRIDGE SEATS SHALL BE CONSTRUCTED ON PIERS 15 AND 16 PER THE REQUIREMENTS OF ITEM 511 – CLASS "C" CONCRETE, PIER, AS PER PLAN. A CATHODIC PROTECTION SYSTEM SHALL BE INSTALLED ON PIERS 15 AND 16 PER THE REQUIREMENTS OF ITEM SPECIAL – CATHODIC PROTECTION SYSTEM FOR PIERS 15 AND 16 AFTER THE COMPLETION OF THE ABOVE REPAIRS AND MODIFICATIONS.

NO REPAIRS WERE NECESSARY ON PIERS 2, 3, 5, 6 AND 13 AT THE TIME OF INSPECTION.

REFER TO SHEETS 14/70 THROUGH 30/70 FOR PIER REPAIR DETAILS.

REFER TO SHEETS 31/70 AND 32/70 FOR PIER 15 AND 16 MODIFICATION DETAILS.

REFER TO SHEETS 33/70 THROUGH 37/70 FOR PIER 15 AND 16 CATHODIC PROTECTION SYSTEM DETAILS.

SUPERSTRUCTURE:

DELINEATED AREAS ON THE DECK SLAB UNDERSIDE IN SPANS 1 THROUGH 14 AND 16 THROUGH 23 SHALL BE INSPECTED AND CLEANED PER THE REQUIREMENTS OF ITEM SPECIAL – SOUNDING CONCRETE DECK BOTTOM, AND SEALED PER THE REQUIREMENTS OF ITEM SPECIAL – SEALING OF CONCRETE SURFACES (EPOXY).

REFER TO SHEETS 50/70 THROUGH 56/70 FOR DECK SLAB REPAIR DETAILS.

ADDITIONAL REQUIREMENTS:

A. CUTLINE CONSTRUCTION JOINT PREPARATION:

SAW CUT BOUNDARIES OF PROPOSED CONCRETE REMOVALS 25 mm DEEP. REMOVE CONCRETE TO A ROUGH SURFACE. WHERE PRACTICABLE, THE EXISTING REINFORCING STEEL WHERE REQUIRED IN THE PLANS SHALL BE LEFT IN PLACE. INSTALL DOWEL BARS IF SPECIFIED. PRIOR TO CONCRETE PLACEMENT ABRASIVELY CLEAN JOINT SURFACE AND EXPOSED REINFORCEMENT TO REMOVE LOOSE AND DISINTEGRATED CONCRETE AND LOOSE RUST. THE JOINT SURFACE AND EXPOSED REINFORCEMENT SHALL BE THOROUGHLY CLEANED OF ALL DIRT, DUST, OR OTHER FOREIGN MATERIAL BY THE USE OF WATER, AIR UNDER PRESSURE, OR OTHER METHODS THAT PRODUCE SATISFACTORY RESULTS. CONCRETE BONDING SURFACES SHALL BE WET WITHOUT FREE WATER AS CONCRETE IS PLACED.

B. SUBSTRUCTURE CONCRETE REMOVAL:

SUBSTRUCTURE CONCRETE REMOVAL SHALL BE BY MEANS OF APPROVED PNEUMATIC HAMMERS EMPLOYING POINTED AND BLUNT CHISEL TOOLS. HYDRAULIC HOE-RAM TYPE HAMMERS WILL NOT BE PERMITTED. THE WEIGHT OF THE HAMMER SHALL NOT BE MORE THAN 16 KILOGRAMS FOR REMOVAL WITHIN 450 mm OF PORTIONS TO BE PRESERVED. OUTSIDE THE 450 mm LIMIT, A HAMMER HEAVIER THAN 16 KILOGRAMS, BUT NOT TO EXCEED 41 KILOGRAMS, 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.

CONTINGENCY QUANTITIES:

THE FOLLOWING CONTINGENCY QUANTITIES HAVE BEEN CARRIED TO THE STRUCTURAL QUANTITIES, SHEET 9/70. THESE QUANTITIES SHALL BE USED AS DIRECTED BY THE ENGINEER TO REPAIR NEW OR INCREASED AREAS OF DETERIORATION ON THE ABUTMENTS, PIERS AND DECK SLABS NOT DELINEATED DURING THE 1995 CONDITION SURVEY. USE OF THE CONTINGENCY QUANTITIES IS NOT LIMITED TO ELEMENTS SCHEDULED FOR REPAIR IN THESE PLANS. THAT IS, THESE QUANTITIES MAY BE USED ON ELEMENTS LISTED AS REQUIRING NO REPAIR AT THE TIME OF INSPECTION.

ITEM	DESCRIPTION	QUANTITY	UNIT
519	PATCHING CONCRETE STRUCTURES	200	SQ. METERS
520	PNEUMATICALLY PLACED MORTAR, AS PER PLAN	100	SQ. METERS
SPECIAL	SOUNDING CONCRETE DECK BOTTOM	100	SQ. METERS
SPECIAL	SEALING CONCRETE SURFACES (EPOXY)	400	SQ. METERS

NO PAYMENT WILL BE MADE FOR ANY PORTION OF THESE CONTINGENCY QUANTITIES UNLESS THEIR USE IS SPECIFICALLY AUTHORIZED BY THE ENGINEER.

ITEM 842 – CLASS C CONCRETE, PIER, AS PER PLAN

THIS ITEM OF WORK SHALL CONSIST OF CONSTRUCTING A REINFORCED CONCRETE PAD ON PIER 14, AND RECONSTRUCTING THE BRIDGE SEAT OF PIERS 15 AND 16. ALL OF THE PROVISIONS OF ITEM 842 OF THE SUPPLEMENTAL SPECIFICATIONS SHALL APPLY, EXCEPT AS MODIFIED HEREIN.

EXISTING CONCRETE SURFACES AS SHOWN IN THE PLANS SHALL BE ROUGHENED AND CLEANED AND AN EPOXY BONDING AGENT APPLIED PRIOR TO FORMING AND PLACING THE NEW CONCRETE IN ORDER TO ENSURE AN INTEGRAL BOND BETWEEN THE PROPOSED AND EXISTING CONCRETE. DOWEL HOLES SHALL BE DRILLED AND ANCHOR BOLTS SHALL BE PROVIDED AND INSTALLED AS DETAILED IN THE PLANS. ALL LABOR, MATERIALS AND EQUIPMENT NECESSARY TO SATISFY THESE REQUIREMENTS SHALL BE CONSIDERED INCIDENTAL TO ITEM 842 – CLASS 'C' CONCRETE, PIERS, AS PER PLAN.

ITEM 520 – PNEUMATICALLY PLACED MORTAR, AS PER PLAN:

ALL OF THE PROVISIONS OF ITEM 520 OF THE CONSTRUCTION AND MATERIAL SPECIFICATIONS SHALL APPLY, EXCEPT AS MODIFIED HEREIN. THIS ITEM SHALL INCLUDE ANY TEMPORARY SHORING REQUIRED DURING THE PATCHING OPERATIONS TO ENSURE STRUCTURAL INTEGRITY OF THE MEMBER BEING PATCHED.

DESCRIPTION:

THIS ITEM APPLIES TO THE SURFACE REPAIR OF CONCRETE STRUCTURES USING SHOTCRETE APPLIED (PNEUMATICALLY PLACED) MORTAR AND INCLUDES THE REMOVAL OF CONCRETE, CONCRETE SURFACE PREPARATION, THE FURNISHING AND PLACING OF REINFORCING STEEL INCLUDING WIRE FABRIC, DOWELS AND/OR EXPANSION ANCHOR BOLTS WHEN REQUIRED, AND THE PREPARING AND APPLYING OF THE MORTAR IN THE AREAS SHOWN OR NOTED ON THE PLANS OR WHEN DIRECTED BY THE ENGINEER. THE THICKNESS OF THE MORTAR SHALL NOT BE LESS THAN 13 mm.

SURFACE PREPARATION:

AFTER THE DAMAGED CONCRETE IS REMOVED ALL SURFACES TO WHICH THE MORTAR IS TO BOND, INCLUDING EXPOSED REINFORCING STEEL AND THE WORK FACE OF ANY PREVIOUSLY PLACED MORTAR, SHALL BE CLEANED BY ABRASIVE BLASTING OR ULTRA HIGH PRESSURE WATER BLASTING NOT MORE THAN 24 HOURS PRIOR TO THE PLACEMENT OF THE MORTAR. STEEL SURFACES SHALL BE CLEANED TO THE NEARWHITE (SA 2 1 /2/SSPC-SP10) PREPARATION GRADE. BLASTING ABRASIVES CONTAINING MORE THAN 1% FREE SILICA WILL NOT BE ALLOWED. THESE SURFACES SHALL BE MADE FREE OF SPALLS, LAITANCE, AND ALL CONTAMINANTS DETRIMENTAL TO THE ACHIEVEMENT OF AN ADEQUATE BOND. ULTRA-HIGH PRESSURE HYDRO-DEMOLITION OF 138 MPa OR MORE IS AN ACCEPTABLE METHOD OF SURFACE PREPARATION.

PLOT SCALE: 1 = 100
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STRUCTURE GENERAL NOTES
BRIDGE NUMBER ERI-6-28839
OVER HURON RIVER

ERI-6-28.839

6/70

28/92

MATERIALS:

THE REQUIREMENTS FOR 520.06 AND 520.07 SHALL BE VOID. MORTAR UTILIZED MUST MEET THE FOLLOWING CRITERIA:

A. IF THE MORTAR IS A PRE-PACKAGED, BRANDED ENTITY, PREPARATION IN EITHER THE WET OR DRY PROCESS SHALL CONFORM TO MANUFACTURER'S RECOMMENDATIONS.

B. IF THE MIX USED EMPLOYS MATERIALS BATCHED AT THE JOBSITE, BATCHED BY THE SHOTCRETING CONTRACTOR HIMSELF PRIOR TO USE ON THE JOBSITE, OR SUPPLIED IN A READY MIX TRUCK, THE INGREDIENTS OF THESE MIXES MUST BE READILY DOCUMENTABLE, IN BOTH QUALITY AND QUANTITY. THIS APPLIES TO BOTH QUALIFICATION TESTING PRIOR TO JOBSITE APPLICATION AND FOR JOBSITE APPLICATION.

SHOTCRETE MORTAR WILL MEET THE FOLLOWING TEST REQUIREMENTS:

COMPRESSIVE STRENGTH: (ASTM C-109, 75 mm CUBES)

1	DAY.	.12.5 MPa
7	DAY.	.38.0 MPa
28	DAY.	.48.5 MPa

FLEXURAL STRENGTH: (ASTM C-78)

7	DAY.	.8.0 MPa
28	DAY.	.10.5 MPa

TENSILE STRENGTH: (ASTM C-496)

7	DAY.	.4.0 MPa
28	DAY.	.5.5 MPa

MODULUS OF ELASTICITY: (ASTM C-469) @ 28 DAYS. . . . . .24,150 MPa TO 27,600 MPa

BOND STRENGTH (ASTM C882 MODIFIED) . . . . . .12.0 MPa
* - MORTAR SCRUBBED SUBSTRATE

CHLORIDE ION PERMEABILITY (AASHTO T-277) . . . . . .500 COULOMBS OR LESS

THE MORTAR MAY CONTAIN MICROSILICA, POLYMERS, WATER REDUCING AGENTS OR OTHER ADDITIVES IN ANY COMBINATION THAT WILL PRODUCE THE REQUIRED PERFORMANCE.

PLACING:

THE MORTAR SHALL BE PNEUMATICALLY PLACED.

WHEN WET MIX SHOTCRETING IS EMPLOYED, THE NOZZLE OPERATOR MUST BE ABLE TO DEMONSTRATE EXPERIENCE AND CAPABILITY IN THE SHOTCRETE APPLICATION PROCESS.

WHEN DRY MIX SHOTCRETING IS EMPLOYED, THE NOZZLE OPERATOR MUST BE QUALIFIED ACCORDING TO THE GUIDELINES PRESENTED IN ACI 506 R 85.

IF THE FLOW OF MATERIAL AT THE NOZZLE IS NOT UNIFORM, RESULTING IN SLUGS, POCKETS, OR SLOUGHING OF THE SHOTCRETE, THE NOZZLE OPERATOR SHALL DIRECT THE NOZZLE AWAY FROM THE REPAIR AREA UNTIL THE FAULTY CONDITIONS ARE CORRECTED. SUCH DEFECTS SHALL BE REPLACED AS THE WORK PROGRESSES.

SHOTCRETING SHALL BE TEMPORARILY SUSPENDED IF RAIN OCCURS WHICH MAY CAUSE WASHOUTS OR SLOUGHING OF THE REPAIR SURFACE. MORTAR SHALL BE PLACED ONLY WHEN THE AMBIENT TEMPERATURE IS AT LEAST 4 DEGREES C AND RISING AND THE TEMPERATURE OF THE STRUCTURE TO BE REPAIRED IS AT LEAST 10 DEGREES C.

THE CONTRACTOR SHALL COOL THE INGREDIENTS OR TAKE OTHER APPROPRIATE MEASURES WHEN PREMATURE STIFFENING OF THE MORTAR OCCURS IN WARM WEATHER.

THE MORTAR SHALL BE PNEUMATICALLY PLACED CONTINUOUSLY ON VERTICAL AND OVERHEAD SURFACES UNLESS OTHERWISE DIRECTED BY THE ENGINEER.

PRECONSTRUCTION TESTING:

AN INVESTIGATION SHALL BE MADE PRIOR TO THE START OF THE WORK TO CHECK THE OPERATION OF THE EQUIPMENT, THE QUALIFICATIONS OF THE APPLICATION CREWS, AND TO ENSURE THAT A SATISFACTORY QUALITY OF PNEUMATICALLY PLACED MORTAR CAN BE PRODUCED.

TEST PANELS SHALL BE FABRICATED BY SHOOTING MORTAR ONTO THE PLYWOOD BOTTOM OF A SQUARE 455 mm X 455 mm OPEN BOX THAT IS 200 mm DEEP. REINFORCEMENT IN THE LARGER SIZES AND TIGHTER SPACING FOUND IN A BRIDGE SHALL BE INCORPORATED IN OTHER TEST PANELS WHICH ARE 610 mm SQUARE. THE BOXES SHALL BE MOUNTED VERTICALLY OR HORIZONTALLY TO SIMULATE THE ACTUAL JOB CONDITION. THE MORTAR SHALL BE APPLIED USING THE PERSONNEL, EQUIPMENT, AND PROCEDURES PROPOSED FOR THE JOB UNTIL THE BOX IS FULL. THE MIXING WATER SHALL BE ADJUSTED TO PROVIDE MORTAR OF THE PROPER CONSISTENCY AS RECOMMENDED BY THE MANUFACTURER. THE QUANTITY OF MIXING WATER INTRODUCED INTO THE MIX SHALL BE MEASURABLE AND SHALL BE DOCUMENTED DURING ANY SHOTCRETE APPLICATION PROCEDURE.

THREE CORES SHALL BE TAKEN FROM EACH PANEL AND TESTED ACCORDING TO ASTM C 42 BY AN INDEPENDENT TESTING LABORATORY APPROVED BY THE STATE. A COMPRESSIVE STRENGTH OF AT LEAST 48.5 MPa AT 28 DAYS WILL BE REQUIRED. ADDITIONAL CORES SHALL BE TAKEN AND TESTED AS NECESSARY TO VERIFY THAT THE TEST PANEL MORTAR MEETS ALL THE REQUIREMENTS OF MATERIALS SECTION B.

THE PANELS SHALL ALSO BE BROKEN SO THAT THE INTERIOR PORTIONS CAN BE CAREFULLY EXAMINED. THEY SHALL BE SUBSTANTIALLY FREE OF HOLLOW AREAS AND SAND POCKETS AND THE MORTAR SHALL BE WELL BONDED TO THE REINFORCEMENT.

EACH CREW MUST FABRICATE SATISFACTORY PANELS SIMULATING THE ACTUAL ON SITE CONDITIONS (E.G. VERTICAL OR OVERHEAD APPLICATION) BEFORE APPLYING THE MORTAR TO THE STRUCTURE.

INSPECTION AND TESTING:

ALL PATCHED AREAS SHALL BE SOUNDED AFTER CURING AND BEFORE FINAL ACCEPTANCE. ALL UNSOUND AREAS AND AREAS EXHIBITING CRACKING SHALL BE REMOVED AND REPATCHED.

THE ACCEPTANCE OF THE SHOTCRETED MORTAR WILL ALSO BE BASED ON CORES TAKEN FROM PATCHED AREAS AND TEST PANELS ON AN ALTERNATING BASIS AND TESTING AS FOLLOWS:

@ 35 SQUARE METERS SHOOT PANEL AND TEST
@ 70 SQUARE METERS IN-PLACE CORE TEST
@ 105 SQUARE METERS SHOOT PANEL AND TEST
@ 140 SQUARE METERS IN-PLACE CORE TEST

THE LOCATION OF THE IN-PLACE CORES WILL BE DETERMINED BY THE ENGINEER. ONE IN-PLACE CORE WILL BE TAKEN FOR EACH 70 SQUARE METERS OF SHOTCRETING. THE CORES SHALL EXTEND COMPLETELY THROUGH THE PATCHED AREA AND INTO THE UNDERLYING SOUND CONCRETE AT LEAST 50 mm. THE CORES WILL BE VISUALLY INSPECTED AT THE SITE BY THE ENGINEER FOR HOLLOW AREAS, SAND POCKETS, VOIDS AROUND THE REINFORCING STEEL AND LACK OF BOND TO THE UNDERLYING CONCRETE.

ADDITIONAL 455 mm X 455 mm X 200 mm DEEP TEST PANELS SHALL BE SHOT FOR EACH 70 SQUARE METERS OF SHOTCRETING THROUGHOUT THE ENTIRE PATCHING OPERATION AND CORES SHALL BE TAKEN TO VERIFY THE PROPERTIES OF THE MORTAR PRODUCED.

THE AVERAGE 28-DAY COMPRESSIVE STRENGTH OF THE CORES AS DETERMINED ACCORDING TO ASTM C42 BY AN INDEPENDENT LABORATORY SHALL BE NOT LESS THAN 41.5 MPa AND NO CORE SHALL TEST LOWER THAN 34.5 MPa. CORES TAKEN FROM TEST PANELS SHALL BE TESTED TO VERIFY THAT THE MORTAR MEETS ALL THE REQUIREMENTS IN MATERIALS SECTION B.

ALL PATCHES DETERMINED TO BE DEFECTIVE BY SOUNDING, VISIBLE CRACKS, UNACCEPTABLE CORES OR TESTS SHALL BE REMOVED, REPLACED AND CORED. PATCH REPLACEMENT WILL CONTINUE UNTIL ONLY ACCEPTABLE PATCHES REMAIN. CORE HOLES SHALL BE SURFACE PREPPED AS DESCRIBED ABOVE AND FILLED BY HAND PACKING WITH A MORTAR THAT MEETS ALL THE REQUIREMENTS OF MATERIALS SECTION B.

ALL TEST PANEL, CORING, REPAIR OF CORE HOLES, INDEPENDENT LABORATORY TESTING OF THE CORES AND REPLACEMENT OF THE REJECTED AREAS WILL BE THE RESPONSIBILITY OF THE CONTRACTOR AND INCLUDED IN THE UNIT BID PRICE FOR THIS ITEM.

BASIS OF PAYMENT:

PAYMENT SHALL BE MADE AT THE CONTRACT UNIT BID PRICE FOR:

ITEM	UNIT	DESCRIPTION
520	SQ. METER	PNEUMATICALLY PLACED MORTAR, AS PER PLAN

ITEM 863 - STRUCTURAL STEEL, MISC.: FORCE MAIN BRACKETS

THIS ITEM SHALL CONSIST OF THE FURNISHING AND ERECTION OF THE STRUCTURAL STEEL BRACKETS WHICH SUPPORT THE RELOCATED SANITARY FORCE MAIN AND THE COMPLETE ACCESS PLATFORM AS DETAILED IN THESE PLANS. ALL OF THE PROVISIONS OF SUPPLEMENTAL SPECIFICATION 863 SHALL APPLY, EXCEPT AS MODIFIED HEREIN.

ALL STRUCTURAL STEEL USED FOR THE FABRICATION OF THE BRACKETS AND PLATFORM SHALL BE ASTM A709M, GRADE 345. HIGH STRENGTH BOLTS SHALL BE A325M, GALVANIZED, OF THE DIAMETER DETAILED IN THE PLANS. ANCHOR BOLTS FOR THE ATTACHMENT OF THE BRACKETS TO CONCRETE MEMBERS MAY BE EITHER HIGH STRENGTH STEEL, GALVANIZED OR STAINLESS STEEL.

THE COST OF FIELD DRILLING EXISTING STIFFENER ANGLES IN SPANS 14 AND 16 FOR THE ATTACHMENT OF HANGER BRACKET "A" SHALL BE CONSIDERED INCIDENTAL TO THIS ITEM. THE COST OF PROVIDING AND INSTALLING ANCHOR BOLTS FOR HANGER BRACKET "C" THE ACCESS PLATFORM AND THE FIXED POINT BRACKETS SHALL BE CONSIDERED INCIDENTAL TO THIS ITEM.

ALL FORCE MAIN BRACKETS AND THE COMPLETE ACCESS PLATFORM SHALL BE SHOP PAINTED IN ACCORDANCE WITH THE REQUIREMENTS OF ITEM 514-FIELD PAINTING, MISC.: COMPLETE SHOP PAINTING OF STRUCTURAL STEEL. REFER TO THE STRUCTURAL GENERAL NOTES FOR A DESCRIPTION OF THIS PAY ITEM.

PAYMENT FOR THIS ITEM SHALL BE MADE AT THE LUMP SUM CONTRACT PRICE BID FOR ITEM 863 -*STRUCTURAL STEEL MEMBERS MISC, LEVEL FABRICATION* FORCE MAIN BRACKETS, WHICH PRICE SHALL CONSTITUTE FULL COMPENSATION FOR ALL LABOR, MATERIALS AND EQUIPMENT NECESSARY TO FURNISH AND INSTALL THE BRACKETS IN ACCORDANCE WITH THE PLANS AND SPECIFICATIONS.

PLOT SCALE: 1 = 100
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STRUCTURE GENERAL NOTES
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29 / 92

PAINTING – GENERAL:

STEEL PORTIONS OF THE EXISTING AND PROPOSED BRIDGE SUPERSTRUCTURE SHALL BE PAINTED. FOLLOWING IS A DESCRIPTION OF THE PAINTING METHODS TO BE USED FOR THE VARIOUS PORTIONS OF THE SUPERSTRUCTURE.

THE EXISTING SUPERSTRUCTURE STEEL IN SPANS 14 AND 16 SHALL BE FIELD PAINTED IN ACCORDANCE WITH THE REQUIREMENTS OF SUPPLEMENTAL SPECIFICATION 815–FIELD PAINTING OF EXISTING STEEL, SYSTEM OZEU. NEW STEEL SUPPORT BRACKETS FOR THE RELOCATED FORCE MAIN IN SPAN 14 AND 16 SHALL BE COMPLETELY SHOP PAINTED IN ACCORDANCE WITH THE REQUIREMENTS OF ITEM 514–FIELD PAINTING MISC.: COMPLETE SHOP PAINTING OF STRUCTURAL STEEL.

THE PROPOSED SUPERSTRUCTURE STEEL AND NEW STEEL SUPPORT BRACKETS FOR THE RELOCATED FORCE MAIN IN SPAN 15 SHALL BE COMPLETELY SHOP PAINTED IN ACCORDANCE WITH ITEM 514–FIELD PAINTING, MISC.: COMPLETE SHOP PAINTING OF STRUCTURAL STEEL.

EXISTING PEDESTRIAN RAILING PANELS ARE TO BE REPAINTED FOR THE FULL LENGTH OF THE BRIDGE. ALL EXISTING RAILING PANELS ARE TO BE REMOVED AND MATCH MARKED FOR REINSTALLATION. ALL EXISTING RAILING PANELS SHALL BE SHOP PAINTED IN ACCORDANCE WITH THE REQUIREMENTS OF ITEM 514–FIELD PAINTING MISC.: COMPLETE SHOP PAINTING OF STRUCTURAL STEEL.

EXISTING STEEL RAILING POSTS IN SPANS 1 THROUGH 14 AND 16 THROUGH 23 ARE TO REMAIN IN PLACE. ALL EXISTING RAILING POSTS SHALL BE FIELD PAINTED IN ACCORDANCE WITH THE REQUIREMENTS OF SUPPLEMENTAL SPECIFICATION 815–FIELD PAINTING OF EXISTING STEEL, SYSTEM OZEU.

NEW RAILING POSTS ARE BEING PROVIDED FOR SPAN 15. NEW RAILING PANELS ARE BE PROVIDED TO FIT BETWEEN THE EXISTING POSTS ON SPAN 14 AND 16 AND THE NEW POSTS AT THE ENDS OF SPAN 15. THESE POSTS AND PANELS SHALL BE SHOP PAINTED IN ACCORDANCE WITH THE REQUIREMENTS OF ITEM 514–FIELD PAINTING, MISC.: COMPLETE SHOP PAINTING OF STRUCTURAL STEEL.

PAYMENT FOR PAINTING THE VARIOUS ITEMS AS DESCRIBED ABOVE SHALL BE MADE AT THE CONTRACT LUMP SUM PRICES BID FOR THE APPROPRIATE ITEMS AS SPECIFIED IN THE NOTES.

ITEM 514–FIELD PAINTING, MISC.: COMPLETE SHOP PAINTING OF STRUCTURAL STEEL:

THE WORK UNDER THIS ITEM SHALL CONSIST OF SUPPLYING THE MATERIALS, LABOR AND EQUIPMENT NECESSARY TO PROPERLY PREPARE AND COMPLETELY SHOP PAINT STRUCTURAL STEEL.

SURFACE PREPARATION, COATING MATERIALS AND REQUIRED COATING THICKNESS SHALL ALL BE IN ACCORDANCE WITH THE REQUIREMENTS FOR SYSTEM OZEU AS DETAILED IN SUPPLEMENTAL SPECIFICATION 815.

THE THREE SEPARATE COATS: PRIMER, INTERMEDIATE AND FINISH COATS SHALL BE APPLIED IN THE SHOP WITH ALLOWANCE FOR PROPER CURING OF EACH COAT. THE FINISH COATED GIRDERS AND OTHER PIECES SHALL NOT BE HANDLED OR MOVED UNTIL PROPERLY CURED.

ONLY THE ORGANIC ZINC PRIMER SHALL BE APPLIED TO CERTAIN SURFACES IN THE SHOP. MASK OR OTHERWISE PROTECT THESE SURFACES FROM THE APPLICATION OF THE INTERMEDIATE AND FINISH COATS, INCLUDING OVERSPRAY. THESE SURFACES INCLUDE:

1. FAYING SURFACES OF MAIN GIRDER SPLICES, SPLICE PLATES, BOTTOM OF FLANGES AT BEARINGS, CROSSFRAMES AND END CROSSFRAMES.
2. EXTERNAL SURFACES OF FIELD BOLTED CONNECTIONS (INCLUDING THE EXTERNAL SURFACES AND EDGES OF SPLICE PLATES.
3. SURFACES THAT WILL BE IN CONTACT WITH CONCRETE. DO NOT APPLY ANY COATING WITHIN 50 mm OF LOCATIONS DESIGNATED FOR FIELD WELDING.

THE CONTRACTOR SHALL USE EXTREME CARE IN HANDLING THE STEEL IN THE SHOP, DURING SHIPPING, DURING FIELD STORAGE AND ERECTION AND DURING SUBSEQUENT CONSTRUCTION OF THE BRIDGE.

ALL AREAS DAMAGED DURING SHIPPING, HANDLING ERECTION OR SUBSEQUENT CONSRUCTION SHALL BE PROPERLY RECOATED IN THE FIELD. THE AREAS OUTLINED ABOVE SHALL RECEIVE FIELD INTERMEDIATE AND FINISH COATS. PROPER SURFACE PREPARATION SHALL BE PROVIDED AND THE INDIVIDUAL COATS OF PAINT SHALL BE FEATHERED INTO ADJACENT LAYERS. ALL FIELD CLEANING, COATING AND TOUCH–UP PAINTING OF DAMAGED AND UNCOATED AREAS IS INCLUDED IN THE COST OF THIS ITEM.

PAYMENT FOR THIS WORK SHALL BE MADE AT THE CONTRACT LUMP SUM PRICE BID FOR ITEM 514–FIELD PAINTING, MISC.: COMPLETE SHOP PAINTING OF STRUCTURAL STEEL.

ITEM 518 – SCUPPER LENGTHENING, AS PER PLAN

UNDER THIS ITEM, THE EXISTING SCUPPERS IN THE CONTINUOUS SLAB PORTIONS OF THE BRIDGE (SPANS 1 THROUGH 13 AND SPANS 17 THOUGH 23) SHALL BE LENGTHENED AS DETAILED IN THE PLANS.

ALL STEEL SECTIONS, PIPES, STRUCTURAL STEEL TUBES, BOLTS AND ANCHOR BOLTS SHOWN ON THE PLANS SHALL BE GALVANIZED IN ACCORDANCE WITH SECTION 711.02 OF THE CMS. THE STEEL EXTENSIONS AND SUPPORTS SHALL BE FABRICATED AND INSTALLED IN ACCORDANCE WITH SUPPLEMENTAL SPECIFICATION 863.

PAYMENT FOR THIS WORK SHALL BE MADE AT THE CONTRACT PRICE BID PER EACH FOR ITEM 518 – SCUPPER LENGTHENING, AS PER PLAN.

ITEM 844 - HIGH PERFORMANCE CONCRETE, AS PER PLAN
THE DESIGN MIX SHALL BE MIX NO. 4 LIMESTONE. THE OPTION OF SLIPFORM CONSTRUCTION OF THE BRIDGE RAILING PER 511.081 IS **NOT** PERMITTED.

SEALING OF CONCRETE SURFACES
THE SEALER SHALL BE THE " BUFF" COLOR MEETING FEDERAL COLOR STANDARD No. 37722 AS PER THE DETAILS IN THE PLANS.

IN ADDITION TO THE AREAS SHOWN IN THE PLANS, PIERS 14 AND 17 SHALL BE SEALED WITH EPOXY SEALER 300 MM (1'-0") BELOW THE BEAM SEAT, THE BEAM SEAT WHICH IS 560 MM (1'-10") AND THE BACKWALL WHICH IS 1.68 METERS (5'-6") THEN LATERALLY 17.84 METERS (58'-6"). THE LATERAL LIMITS DO NOT INCLUDE THE AREAS UNDER THE SIDEWALK. THE QUANTITY HAS BEEN ESTIMATED AT **91** SQUARE METERS (108.30 SQ. YD.) WHICH INCLUDES BOTH PIERS.

FOR ADDITIONAL NOTES SEE THE PROPOSAL NOTE TITLED " SEALING OF CONCRETE SURFACES".

ITEM *614* – MAINTENANCE OF TRAFFIC, MISC.: MAINTENANCE OF BOAT TRAFFIC

IN ADDITION TO ITEM 107.09 AND APPLICABLE PROVISIONS OF ITEM 614 OF THE CONSTRUCTION AND MATERIALS SPECIFICATIONS, THE FOLLOWING REQUIREMENTS SHALL BE COMPLIED WITH DURING THE REMOVAL AND REPLACEMENT OF SPAN 15, REHABILITATION AND MODIFICATION OF PIERS 15 AND 16, AND ANY OTHER OPERATIONS WHICH MAY AFFECT BOAT TRAFFIC ON THE HURON RIVER.

1) ANY BARGES USED DURING CONSTRUCTION SHALL BE REMOVED FROM THE MAIN CHANNEL DURING HOURS OF DARKNESS ON WORKDAYS, AND AT ALL TIMES DURING WEEKENDS AND HOLIDAYS; OR LOCATED BEHIND THE CHANNEL MARKERS AS PROVIDED BY THE BOAT MAINTENANCE OF TRAFFIC PLAN.

2) BOAT TRAFFIC MAY BE STOPPED FOR SHORT PERIODS OF TIME IF HAZARDOUS CONDITIONS EXIST AND SATISFACTORY FLAGGING FACILITIES ARE PROVIDED.

3) *SEE PLAN NOTE ON SHEET 3 "WORK IN AND OVER THE HURON RIVER".*

THE CONTRACTOR SHALL FURNISH, INSTALL, MAINTAIN, REMOVE AND RESET AS NECESSARY HAZARD WARNING REGULATORY BOUYS AND LIGHTED CHANNEL MARKER BOUYS. THE BOUYS AND LIGHTING SYSTEM (30FPM) SHALL BE USCG APPROVED AS SUPPLIED BY: TIDELAND SIGNAL CORPORATION, P.O.B. 52430, HOUSTON, TEXAS 77052, TELEPHONE (713)681–6101; AUTOMATIC POWER INC., NAVIGATIONAL AIDS, P.O.B. 23078, HOUSTON, TEXAS, 77223–0738, TELEPHONE (713)228–5208; SMITH AND NEPHEW INC., P.O.B. 578, DEPT. B, GERMANTOWN, WISCONSIN 53022, TELEPHONE 1(800)228–3693; OR APPROVED EQUAL. THE NECESSARY LIGHTS, HARDWARE AND ANCHORING DEVICES AS RECOMMENDED BY THE MANUFACTURER SHALL ALSO BE PROVIDED.

WHEN NO LONGER NEEDED TO MAINTAIN BOAT TRAFFIC, AND AS DIRECTED BY THE ENGINEER, THE CONTRACTOR SHALL REMOVE THE DEVICES. ALL MATERIALS INCLUDING LIGHTS, HARDWARE AND ANCHORING DEVICES SHALL BECOME THE PROPERTY OF THE STATE OF OHIO, DEPARTMENT OF TRANSPORTATION.

PAYMENT FOR THIS WORK SHALL BE MADE AT THE CONTRACT LUMP SUM PRICE BID FOR ITEM *614 – MAINTAINING* TRAFFIC, MISC.: BOAT TRAFFIC. WHICH PRICE SHALL CONSTITUTE FULL COMPENSATION FOR ALL LABOR, MATERIALS AND EQUIPMENT NECESSARY TO PERFORM THIS WORK IN ACCORDANCE WITH THESE SPECIFICATIONS.

ITEM 518 – SCUPPER VERTICAL EXTENSION, TYPE 1, AS PER PLAN

ITEM 518 – SCUPPER VERTICAL EXTENSION, TYPE 2, AS PER PLAN

UNDER THIS ITEM, THE EXISTING SCUPPERS IN SPANS 14 AND 16 SHALL BE VERTICALLY EXTENDED AS DETAILED IN THE PLANS.

ALL STEEL SECTIONS, PIPES, STRUCTURAL STEEL TUBES, BOLTS AND ANCHOR BOLTS SHOWN ON THE PLANS SHALL BE GALVANIZED IN ACCORDANCE WITH SECTION 711.02 OF THE CMS. THE STEEL EXTENSIONS AND SUPPORTS SHALL BE FABRICATED AND INSTALLED IN ACCORDANCE WITH SS 863.

PAYMENT FOR THIS WORK SHALL BE MADE AT THE CONTRACT PRICE BID PER EACH FOR ITEM 518 – VERTICAL EXTENSION, *AS PER PLAN, TYPE 1* OR ITEM 518 SCUPPER VERTICAL EXTENSION, *AS PER PLAN* TYPE 2.

PLOT SCALE: 1 = 100
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DESIGNED	DRAWN	REVIEWED	DATE
AJM	TES	TAB	12/97
CHECKED	REVISED	STRUCTURE FILE NUMBER	
LPC		2201984	

STRUCTURE GENERAL NOTES
BRIDGE NUMBER ERI–6–28839
OVER HURON RIVER

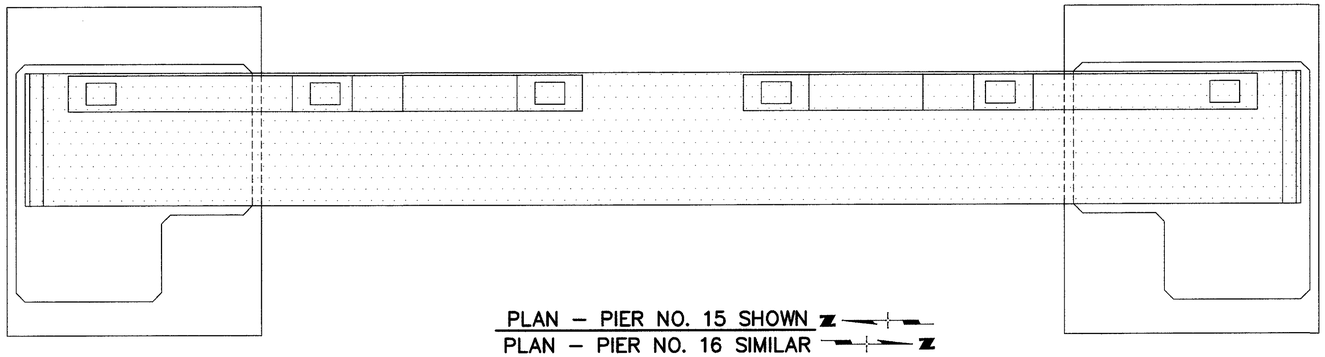
ERI–6–28.839

NOTES:

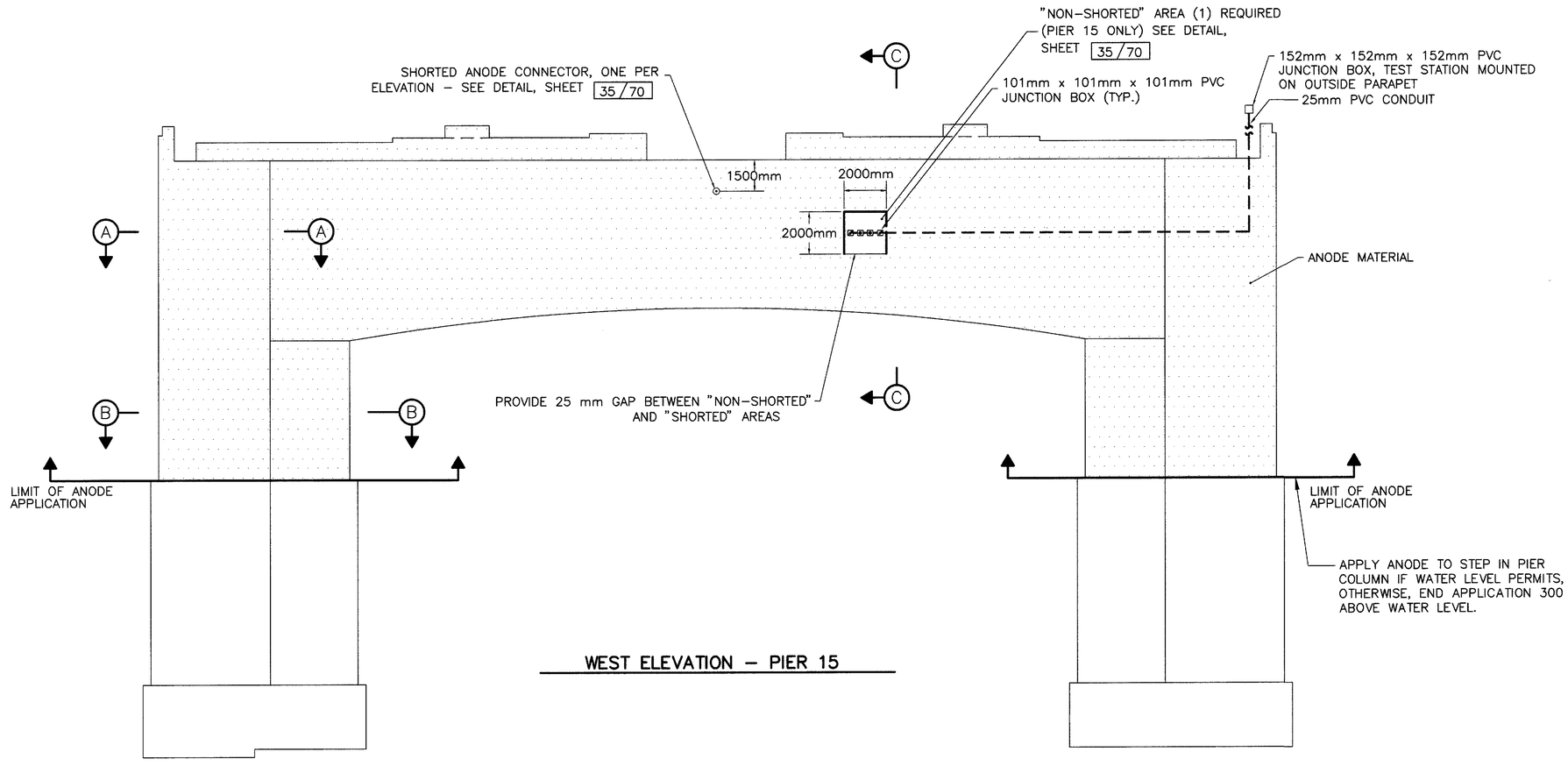
REFER TO SHEET 35/70 FOR SECTIONS AND DETAILS.

REFER TO SHEETS 36/70 AND 37/70 FOR CATHODIC PROTECTION SYSTEM SPECIFICATIONS.

REFER TO SHEETS 31/70 AND 32/70 FOR PIER DIMENSIONS AND ELEVATIONS NOT SHOWN.



PLAN – PIER NO. 15 SHOWN
PLAN – PIER NO. 16 SIMILAR



WEST ELEVATION – PIER 15

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PIER NOS. 15 & 16 CATHODIC PROTECTION PLAN

BRIDGE NUMBER ERI–6–28839
OVER HURON RIVER

ERI–6–28.839

33/70

55/92

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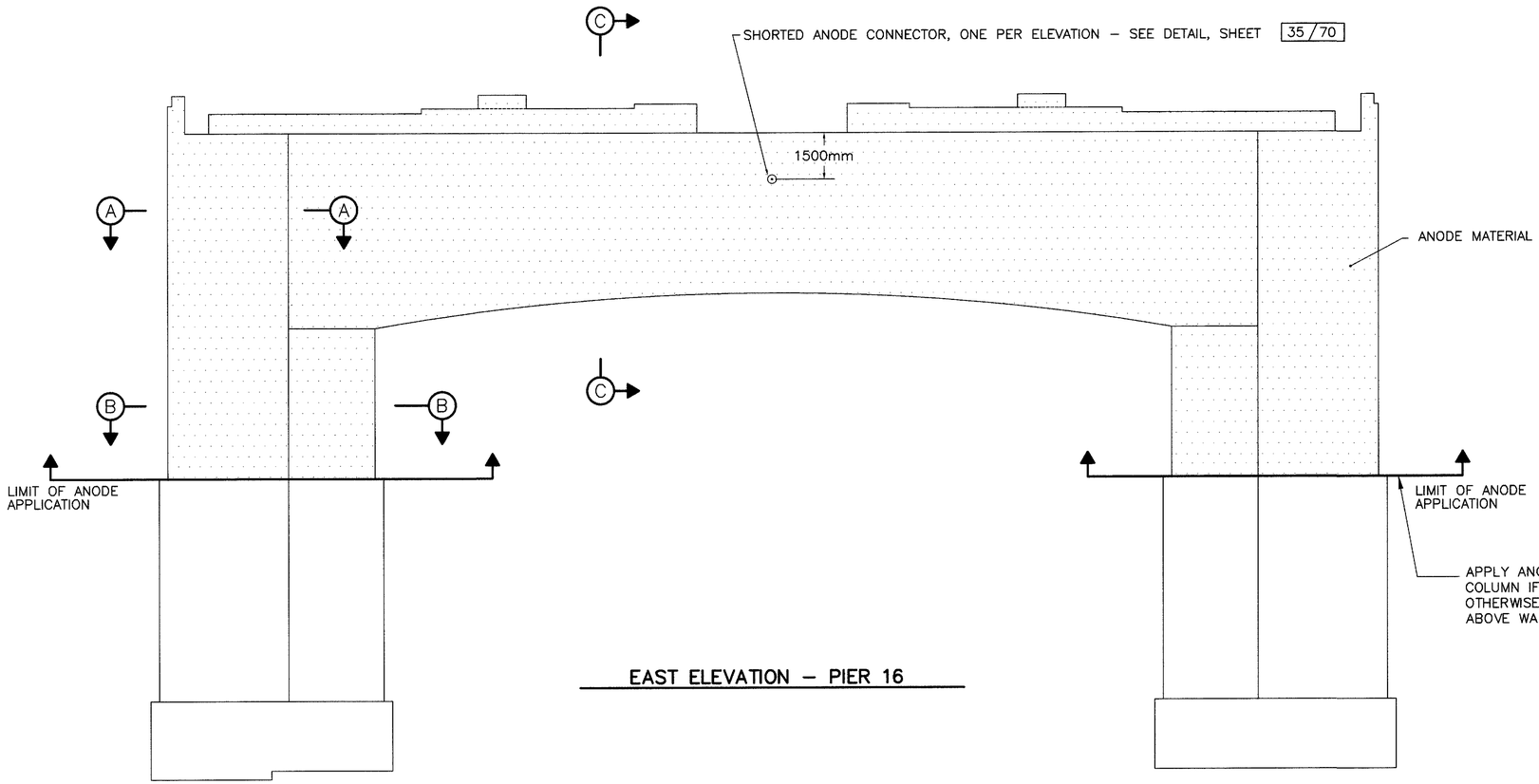
PLOT SCALE: 1=50



EAST ELEVATION – PIER 16

NOTES:

REFER TO SHEET 35/70 FOR SECTIONS AND DETAILS.

REFER TO SHEETS 36/70 AND 37/70 FOR CATHODIC PROTECTION SYSTEM SPECIFICATIONS.

REFER TO SHEETS 31/70 AND 32/70 FOR PIER DIMENSIONS AND ELEVATIONS NOT SHOWN.

SUMMARY OF QUANTITIES *

ITEM No.	DESCRIPTION	PIER 15	PIER 16
1	THERMALLY SPRAYED AL/Zn ANODE	345 SQ METER	351 SQ METER
2	REFERENCE ELECTRODES AND GROUNDS	2 EA	–
3	SYSTEM NEGATIVE	1 EA	–
4	NON–SHORTED ANODE CONNECTORS	1 EA	–
5	SHORTED ANODE CONNECTORS	2 EA	2 EA
6	CONDUIT AND JUNCTION BOX	LOT	–

* ESTIMATED QUANTITIES PROVIDED FOR REFERENCE PURPOSES ONLY. COMPLETED SYSTEMS TO BE PAID FOR UNDER THE CONTRACT LUMP SUM PRICE BID FOR ITEM SPECIAL – CATHODIC SYSTEM.

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PIER NOS. 15 & 16 CATHODIC PROTECTION PLAN

BRIDGE NUMBER ERI–6–28839
OVER HURON RIVER

ERI–6–28.839

34/70

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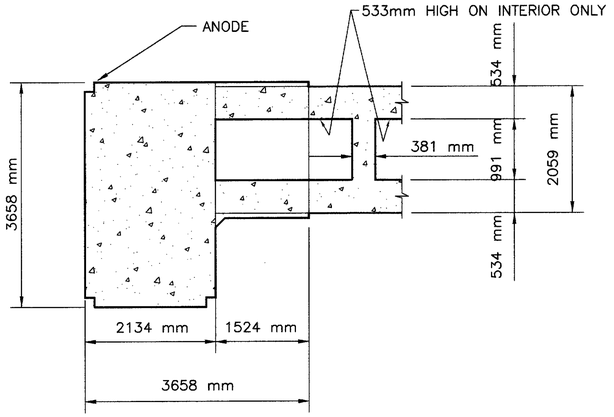
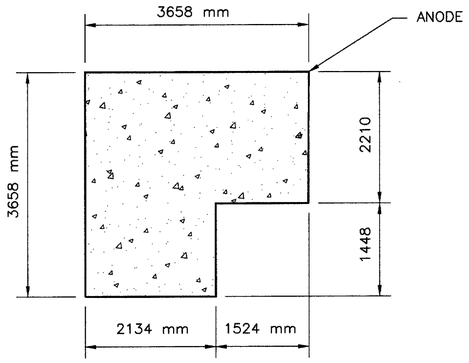
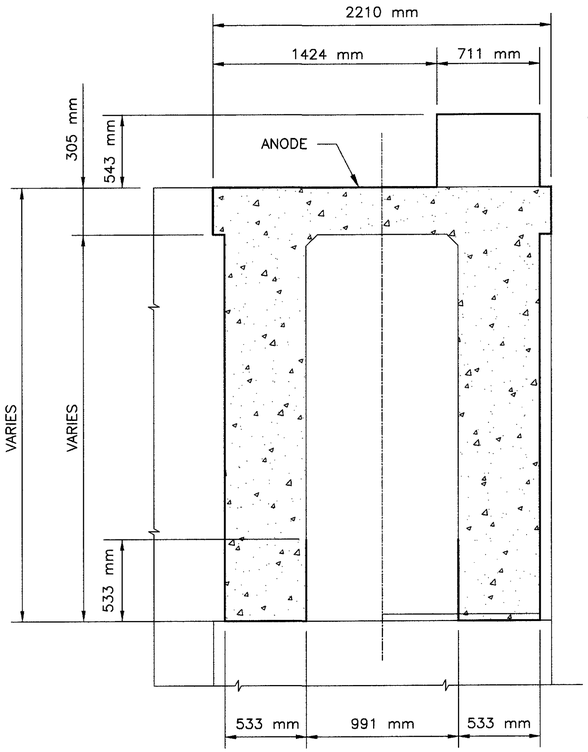
PLOT SCALE: 1=50



SECTION A–A



SECTION B–B

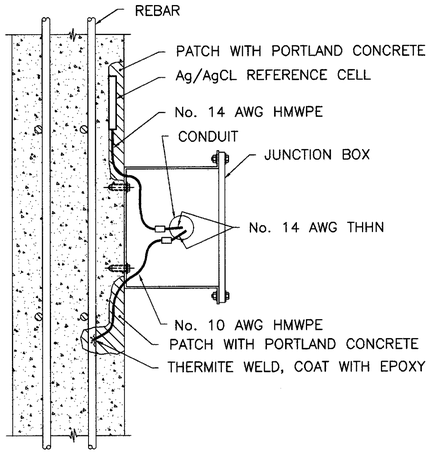


SECTION C–C

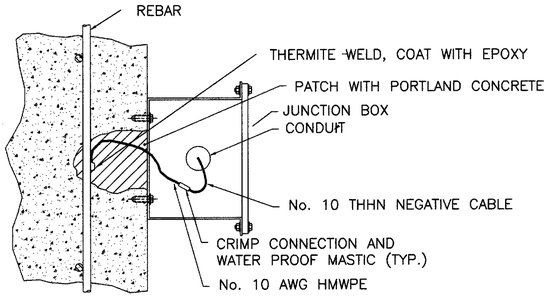
NOTES:

REFER TO SHEETS 36/70 AND 37/70 FOR CATHODIC PROTECTION SYSTEM SPECIFICATIONS.

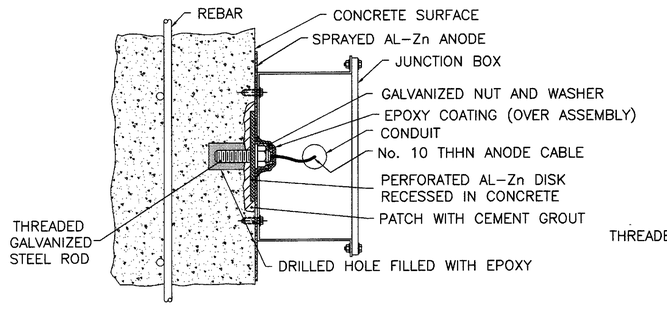
REFER TO SHEETS 31/70 AND 32/70 FOR PIER DIMENSIONS AND ELEVATIONS NOT SHOWN.



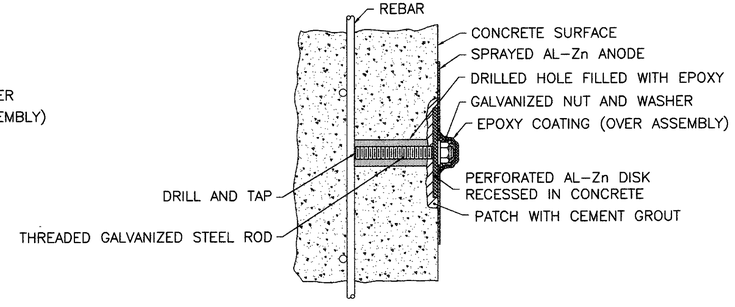
REFERENCE CELL DETAIL
NON–SHORTED AREA ONLY (N.T.S.)



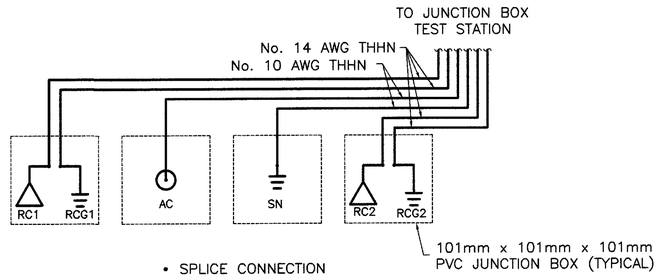
SYSTEM NEGATIVE DETAIL
NON–SHORTED AREA ONLY (N.T.S.)



NON–SHORTED ANODE CONNECTOR FOR
AL–Zn ANODE SYSTEM
(N.T.S.)



SHORTED ANODE CONNECTOR FOR
AL–Zn ANODE SYSTEM
(N.T.S.)



WIRING SCHEMATIC FOR NON–SHORTED SECTION

LEGEND
AC = ANODE CONNECTOR
RC = REFERENCE CELL
RCG = REFERENCE CELL GROUND
SN = SYSTEM NEGATIVE

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PIER NOS. 15 & 16 CATHODIC PROTECTION PLAN

BRIDGE NUMBER ERI–6–28839
OVER HURON RIVER

ERI–6–28.839

35/70

57/92

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PLOT SCALE: 1=50

ITEM SPECIAL – CATHODIC SYSTEM

1.0 DESCRIPTION. THIS SPECIFICATION PERTAINS TO THE UNIFORM APPLICATION, BY THERMAL SPRAYING, OF AN ALUMINUM–ZINC ANODE ON THE SURFACE OF CONCRETE PIERS, FOR THE PURPOSE OF STOPPING REINFORCING CORROSION BY GALVANIC CATHODIC PROTECTION (CP). WHEN ELECTRICALLY SHORTED TO THE REINFORCING STEEL IN THE CONCRETE, A SMALL DIRECT CURRENT WILL PASS FROM THE SACRIFICIAL ANODE THROUGH THE CONCRETE TO THE STEEL, THEREBY CATHODICALLY PROTECTING THE STEEL FROM ANY FURTHER CORROSION.

THE ELECTRICALLY SHORTED CP SYSTEM SHALL CONSIST OF AN ALUMINUM–ZINC ANODE COATING, ANODE CONNECTORS, AND ALL NECESSARY WIRING. IN ADDITION, A NON–ELECTRICALLY SHORTED AREA SHALL ALSO BE INSTALLED, FOR THE PURPOSE OF MONITORING THE CP SYSTEM PERFORMANCE. THE NON–SHORTED SYSTEM CONSISTS OF AN ALUMINUM–ZINC ANODE COATING, ANODE CONNECTORS, EMBEDDED REFERENCE CELLS, SYSTEM GROUNDS, AND ALL NECESSARY WIRING.

THE CP SYSTEM FURNISHED SHALL INCLUDE ALL THE MATERIALS IDENTIFIED IN THESE SPECIFICATIONS AND ON THE DRAWINGS. REQUEST FOR SUBSTITUTION OF ANY MATERIALS MUST CONTAIN APPROPRIATE DOCUMENTATION THAT SUCH SUBSTITUTIONS ARE EQUAL TO THE SPECIFIED ITEM.

THE THERMAL SPRAY OPERATOR SHALL HAVE ADEQUATE TECHNICAL TRAINING, SHOP AND FIELD EXPERIENCE TO SAFELY AND PROFICIENTLY APPLY THIS SACRIFICIAL ANODE COATING ON CONCRETE STRUCTURES. THE OPERATOR SHALL DEMONSTRATE THE ABILITY TO SET UP, OPERATE AND SECURE THERMAL SPRAY EQUIPMENT. THE CONTRACTOR SHALL SUBMIT A VALIDATION OF OPERATOR QUALIFICATION RECORDS.

THE FOLLOWING ARE STANDARDS THAT MUST BE OBSERVED:

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM):
ASTMD1002 STRENGTH PROPERTIES OF ADHESIVES IN SHEAR BY TENSION LOADING
ASTMD 4285 STANDARD TEST METHOD FOR INDICATING OIL OR WATER IN COMPRESSED AIR
ASTMD 4541 STANDARD TEST METHOD FOR PULL–OFF STRENGTH OF COATINGS USING PORTABLE ADHESION TESTERS

FEDERAL SPECIFICATIONS:
BB–O–925 OXYGEN, TECHNICAL, GAS AND LIQUID, FOR THERMAL SPRAYING.
BB–A–106 ACETYLENE, TECHNICAL, DISSOLVED, FOR FLAME SPRAYING.

2.0 MATERIALS AND EQUIPMENT. THE MATERIALS AND EQUIPMENT THAT THE CONTRACTOR SHALL SUPPLY AND PROVIDE INCLUDE, BUT ARE NOT LIMITED TO, THE FOLLOWING:

2.1 ABRASION OF CONCRETE SURFACE. THE ABRASIVE BLASTING EQUIPMENT SHALL BE CONVENTIONAL, AIR PRESSURE–TYPE BLASTER. A MAXIMUM OF 550 kPa SHALL BE MAINTAINED AT THE BLAST NOZZLE.

THE ABRASIVE MATERIAL SHALL BE CLEAN AND DRY NON–METALLIC GRIT WITH NO MINERAL CONSTITUENTS WHICH TEND TO BREAK DOWN AND REMAIN ON THE SURFACE IN VISIBLE QUANTITY. THE ABRASIVE SIZE SHALL BE SELECTED FROM 20–40 MESH, AND SHALL BE HARD AND ANGULAR IN SHAPE. NO ABRASIVES THAT HAVE BEEN USED TO REMOVE OIL AND/OR GREASE SHALL BE REUSED.

COMPRESSED AIR USED FOR ABRASIVE BLASTING SHALL BE CLEAN, OIL–FREE AND DRY PER ASTM D 4285. AIR LINE FILTERS AND MOISTURE SEPARATORS SHALL BE INSTALLED UPSTREAM FROM THE BLASTING EQUIPMENT. THESE SHALL BE INSPECTED DAILY FOR CLEANLINESS AND CORRECT OPERATION.

2.2 ALUMINUM–ZINC ALLOY APPLICATION EQUIPMENT. THE APPLICATION EQUIPMENT SHALL BE ELECTRIC–ARC OR OXYACETYLENE COMBUSTION SPRAY TYPE. INPUT REQUIREMENTS FOR OXYACETYLENE COMBUSTION SPRAY ARE: OXYGEN AT 2.69 CU. METER/HOUR, ACETYLENE AT 105 kPa AND 1.42 CU. METER/HOUR, AND ATOMIZING AIR AT 690 kPa AND 0.88 CU. METER/HOUR.

THE CONTRACTOR IS RESPONSIBLE FOR MAKING THE NECESSARY MODIFICATIONS TO THE METALLIZING SYSTEM REQUIRED TO SPRAY THE ALUMINUM–ZINC ALLOY WIRE.

2.3 ALUMINUM–ZINC ALLOY ANODE SYSTEM. THE ALUMINUM–ZINC ALLOY SHALL BE FURNISHED IN WIRE FORM HAVING A NOMINAL DIAMETER OF 3.18 mm. THE WIRE SHALL HAVE THE FOLLOWING COMPOSITION:
AL–20ZN–0.2IN

THE ANODE CONNECTOR SHALL CONSIST OF A PERFORATED ALUMINUM–ZINC ALLOY DISK, GALVANIZED STUD, NUT AND WASHERS. THE DISK SHALL BE THE SAME MATERIAL AS THE ALLOY WIRE. THE ANODE CONNECTOR SHALL BE DISK SHAPE AND SHALL BE 89 mm IN DIAMETER AND 19 mm THICK, AS SHOWN ON THE DRAWINGS. THE DISK SHALL HAVE A MINIMUM OF 8 HOLES 19 mm IN DIAMETER.

THE ANODE WIRES AND ANODE CONNECTORS SHALL BE KEPT CLEAN, DRY AND FREE OF OXIDES AT ALL TIMES.

2.4 REFERENCE ELECTRODES. THE REFERENCE ELECTRODE SHALL BE SILVER–SILVER CHLORIDE DESIGNED FOR PERMANENT INSTALLATION IN CONCRETE STRUCTURES. THE ELECTRODE SHALL BE SUPPLIED WITH A BLACK NO. 14 AWG STRANDED COPPER LEAD WIRE WITH HMWPE TYPE INSULATION.

THE LEAD WIRE TO REFERENCE ELECTRODE CONNECTION SHALL BE COMPLETELY SEALED TO PREVENT MOISTURE PENETRATION INTO THE CONNECTION.

2.5 EPOXY MATERIAL. THE EPOXY FOR THE ANODE CONNECTORS SHALL BE CONCRESIVE AEX 1419 AS MANUFACTURED BY ADHESIVE ENGINEERING CO., DP–420 BY 3M CO., OR APPROVED EQUAL.

2.6 GASES FOR FLAME SPRAYING. OXYGEN GAS SHALL BE EQUAL OR EQUIVALENT TO FEDERAL SPECIFICATION BB–O–925 – OXYGEN, TECHNICAL, GAS AND LIQUID, FOR THERMAL SPRAYING.

THE ACETYLENE GAS SHALL BE EQUAL OR EQUIVALENT TO FEDERAL SPECIFICATION BB–A–106 – ACETYLENE, TECHNICAL, DISSOLVED, FOR FLAME SPRAYING. OTHER FUEL GASES AS SPECIFIED BY THE THERMAL SPRAY EQUIPMENT MANUFACTURER OR PROPANE MAY ALSO BE USED.

3.0 INSTALLATION. THE CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS. THE CONTRACTOR SHALL COORDINATE INSTALLATION OF THE CATHODIC PROTECTION SYSTEM AND COMPONENTS WITH ALL OTHER OPERATIONS, SUCH AS REPAIR OF CONCRETE, ETC., IF NECESSARY. SPECIAL CAUTION AND SCHEDULING MAY BE REQUIRED TO PREVENT DAMAGE OF INSTALLED COMPONENTS BY THE SUBSEQUENT OPERATIONS.

3.1 INSTALLATION SEQUENCE. INSTALLATION SHALL PROCEED IN ACCORDANCE WITH THE FOLLOWING SEQUENCE.

3.1.1 INSTALLATION OF REFERENCE ELECTRODES AND REFERENCE ELECTRODE GROUNDS. ALL INSTRUMENTATION SHALL BE INSTALLED AS DETAILED ON THE DRAWINGS AND AT THE LOCATIONS SHOWN. THIS WORK SHALL BE CONDUCTED SIMULTANEOUSLY WITH CONCRETE REPAIRS, IF ANY REPAIR IS NECESSARY.

THE REFERENCE ELECTRODES SHALL BE LOCATED ACCORDING TO THE LAYOUT PLANS. AFTER LOCATING THE REINFORCING STEEL IN THE CONCRETE AT EACH LOCATION WITH A PACHOMETER, THE CONTRACTOR SHALL EXCAVATE AN AREA APPROXIMATELY 100 mm X 200 mm TO THE DEPTH OF THE REINFORCING STEEL USING CAUTION SO AS NOT EXPOSE THE STEEL IN THE EXCAVATION.

AFTER PROPERLY INSTALLING THE REFERENCE ELECTRODE IN THE EXCAVATED AREA, THE AREA SHALL BE BACKFILLED WITH ADEQUATELY AIR–ENTRAINED CONCRETE PATCHING MATERIAL.

THE REFERENCE ELECTRODE WIRE(S) SHALL BE ROUTED TO THE LOCATION WHERE THE JUNCTION BOX WILL BE INSTALLED. THE REFERENCE ELECTRODE WIRE SHALL BE SPLICED TO A AWG NO. 14 WIRE WITH THHN INSULATION IN THE JUNCTION BOX AND ROUTED IN THE CONDUIT TO THE TEST STATION.

3.1.2 INSTALLATION OF SYSTEM GROUNDS (FOR NON–SHORTED ANODE SYSTEM ONLY). THIS WORK SHALL BE CONDUCTED SIMULTANEOUSLY WITH CONCRETE REPAIRS, IF ANY REPAIR IS NECESSARY. AT EACH OF THE LOCATIONS SPECIFIED ON THE LAYOUT PLANS, A SYSTEM GROUND WIRE SHALL BE CONNECTED TO THE REINFORCING STEEL.

THE SYSTEM GROUND WIRES SHALL BE NO. 10 AWG COPPER WIRES WITH HMWPE INSULATION. THE CONNECTION OF EACH GROUND WIRE TO THE REINFORCING STEEL SHALL BE MADE USING THE THERMITE BRAZING OR WELDING PROCESS, IN ACCORDANCE WITH APPROPRIATE MANUFACTURERS INSTRUCTIONS. THE CONNECTIONS AND ANY EXPOSED COPPER STRANDED WIRES IN THE EXCAVATED AREA SHALL BE COMPLETELY COATED WITH A 100 PERCENT SOLID EPOXY, BEFORE THE AREA IS REPAIRED WITH APPROVED CEMENT PATCHING MATERIALS.

EACH SYSTEM GROUND WIRE SHALL THEN BE ROUTED TO A NEARBY PVC JUNCTION BOX, WHERE IT SHALL BE SPLICED (WATER PROOF) TO A #10 AWG COPPER WIRE WITH THHN INSULATION LEAD WIRE AND ROUTED IN THE CONDUIT TO THE TEST STATION.

A REFERENCE CELL GROUND WIRE OF #10 AWG WITH HMWPE INSULATION SHALL BE INSTALLED AS INDICATED IN SECTION 3.1.2.

3.1.3 INSTALLATION OF ANODE CONNECTOR (FOR NON–SHORTED ANODE SYSTEM ONLY). THIS SHALL BE INSTALLED AT EACH LOCATION DESIGNATED IN THE LAYOUT PLANS, USING THE FOLLOWING PROCEDURES:

1. USING A CONCRETE COVER METER OR PACHOMETER, LOCATE THE EXACT POSITIONS OF REINFORCING STEEL AT THE LOCATION, WHERE A NON–SHORTED–SYSTEM ANODE CONNECTOR IS TO BE INSTALLED. MARK A SPOT BETWEEN THESE POSITIONS – AVOIDING THE STEEL.

2. AT THE SPOT, DRILL A 20 mm DIAMETER BY 30 mm DEEP HOLE INTO THE CONCRETE, MAKING SURE NO STEEL IS EXPOSED.

3. CHIP AN AREA, OF APPROXIMATELY 100 mm DIAMETER AND TO A MINIMUM DEPTH OF 25 mm, IN THE CONCRETE SURROUNDING THIS DRILLED HOLE WHERE THE ANODE CONNECTOR DISK IS TO BE INSTALLED. THE CHIPPED AREA SHALL BE FILLED WITH CEMENTITIOUS GROUT. PRIOR TO HARDENING OF THE GROUT, PLACE THE ANODE CONNECTOR DISK AND PRESS IT AGAINST THE GROUT SO THAT THE DISK IS RECESSED INTO THE GROUT SURFACE, AS SHOWN IN THE PLANS.

4. INSERT A 6.4 mm DIAMETER GALVANIZED, THREADED ROD (STUD) INTO THE DRILLED HOLE, AND SECURE THE ROD IN THE HOLE BY BACKFILLING WITH AN EPOXY ADHESIVE. THE THREADED ROD MUST EXTEND TO THE OUTER CONCRETE SURFACE TO FACILITATE ATTACHMENT OF THE ANODE CONNECTOR DISK.

5. THEN SECURE THE GALVANIZED WASHER AND NUT OVER THE ANODE CONNECTOR DISK.

3.1.4 INSTALLATION OF ANODE CONNECTOR (FOR SHORTED SYSTEM ONLY). ANODE CONNECTORS PROVIDE THE ELECTRICAL CONNECTION BETWEEN THE SACRIFICIAL ANODE AND THE REINFORCING STEEL. FOR EACH ANODE CONNECTOR, A THREADED GALVANIZED ROD (STUD) WILL BE ATTACHED TO THE REINFORCING STEEL TO FACILITATE ATTACHMENT OF THE ANODE CONNECTOR DISK. THE FOLLOWING PROCEDURES SHALL BE FOLLOWED:

1. USING A CONCRETE COVER METER OR PACHOMETER, LOCATE REINFORCING STEEL AT THE LOCATION WHERE A SHORTED–SYSTEM ANODE CONNECTOR IS TO BE INSTALLED.

2. DRILL A 25 mm DIAMETER HOLE INTO THE CONCRETE TO EXPOSE THE REINFORCING STEEL .

3. CHIP AN AREA, OF APPROXIMATELY 100 mm DIAMETER AND TO A MINIMUM DEPTH OF 25 mm, IN THE CONCRETE SURROUNDING THIS DRILLED HOLE WHERE THE ANODE CONNECTOR DISK IS TO BE INSTALLED. THE CHIPPED AREA SHALL BE FILLED WITH CEMENTITIOUS GROUT. PRIOR TO HARDENING OF THE GROUT, PLACE THE ANODE CONNECTOR DISK AND PRESS IT AGAINST THE GROUT SO THAT THE DISK IS RECESSED INTO THE GROUT SURFACE, AS SHOWN IN THE PLANS.

4. ATTACH A 6.4 mm DIAMETER GALVANIZED, THREADED ROD (STUD) TO THE EXPOSED STEEL, USING THE TAPPING METHOD. THE THREADED ROD MUST EXTEND TO THE OUTER CONCRETE SURFACE TO FACILITATE ATTACHMENT OF THE ANODE CONNECTOR DISK.

5. THE THREADED ROD OF THE ANODE CONNECTOR SHALL THEN BE SECURED INSIDE THE DRILL HOLE WITH AN EPOXY ADHESIVE.

6. SECURE THE GALVANIZED WASHER AND NUT OVER THE ANODE CONNECTOR DISK.

3.1.5 PREPARATION OF THE CONCRETE SURFACE. WORK PERFORMED UNDER THIS SECTION CONSISTS OF ROUGHENING AND CLEANING THE CONCRETE SURFACES, BY ABRASIVE BLASTING, SO THAT AN ADEQUATE BOND BETWEEN THE CONCRETE AND THE THERMAL SPRAYED ALUMINUM–ZINC ALLOY CAN BE SECURED. THE MAIN PURPOSE IS TO REMOVE DUST, GRIT, COATINGS, CHALK MARKS, PAINTS, CURING COMPOUNDS, AND OTHER SUBSTANCES WHICH MIGHT INHIBIT BONDING OF THE ANODE TO THE CONCRETE.

ABRASIVE BLASTING OF A PARTICULAR AREA SHALL NOT TAKE PLACE MORE THAN 24 HOURS BEFORE APPLICATION OF SACRIFICIAL ANODE COATING. FURTHERMORE, ABRASIVE BLASTING SHALL NOT BEGIN BEFORE CONCRETE REPAIRS ARE COMPLETED AND PATCH MATERIALS ARE ALLOWED TO CURE PROPERLY. ABRASIVE BLASTING SHALL NOT TAKE PLACE ON SURFACES THAT WILL BE WET OR DAMP FOLLOWING BLASTING. THE INSULATION ON ALL EXPOSED WIRING SHALL BE COVERED WITH SHIELDING MATERIAL OF SUFFICIENT ABRASION RESISTANCE TO PREVENT DAMAGE FROM THE ABRASIVE BLASTING OPERATIONS.

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DESIGNED CORRPRO | DRAWN CORRPRO | REVIEWED TAB | DATE 12/97
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PIER NOS. 15 & 16 CATHODIC PROTECTION PLAN
BRIDGE NUMBER ERI–6–28839 OVER HURON RIVER

ERI–6–28.839

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PLOT SCALE: 1=50

3.1.6 APPLICATION OF ALUMINUM–ZINC ANODE COATING. ALL ANODE CONNECTORS SHALL BE INSTALLED BEFORE APPLICATION OF THE ANODE COATING ON THE SURFACE OF THE DESIGNATED CONCRETE (SEE LAYOUT PLANS). THE CONTRACTOR SHALL FURNISH LABOR, MATERIALS, AND EQUIPMENT FOR INSTALLATION OF THE ANODE.

1. THE SACRIFICIAL ANODE SHALL BE APPLIED WITHIN 24 HOURS AFTER PREPARATION OF THE CONCRETE SURFACE.

2. SURFACES SHALL BE THOROUGHLY VACUUMED OR BLOWN CLEAN WITHIN 15 MINUTES BEFORE THERMAL SPRAYING OF THE AREA IS STARTED. ANY OIL, GREASE, SOIL, WATER, OR OTHER FOREIGN MATTER THAT MAY HAVE DEPOSITED ON THE SURFACE AFTER THE SURFACE PREPARATION HAS BEEN COMPLETED, SHALL BE REMOVED BEFORE SPRAY APPLICATION. COATING APPLICATION SHALL ONLY BE PERFORMED WHEN THE CONCRETE SURFACE IS CLEAN AND DRY.

3. ALL METALLIC COMPONENTS OR APPURTENANCES SUCH AS DRAIN PIPES, CONDUIT, OR BEARING STEEL PLATES SHALL BE ISOLATED FROM THE ANODE AND TEMPORARILY COVERED WITH A SUITABLE MASKING MATERIALS WHICH SHALL EXTEND, FROM THE OBJECTS, BY AT LEAST 25 mm ON THE CONCRETE SURFACES.

4. THE INSTALLATION AREAS SHALL BE ENCLOSED DURING SPRAYING FOR DUST CONTAINMENT. THE ENCLOSURE SHALL CONSIST OF TARPS, PANELS, OR OTHER METHODS TO PREVENT DUST FROM ESCAPING THE IMMEDIATE AREA SUCH THAT IT WOULD CONSTITUTE A HEALTH HAZARD. PERSONNEL CONDUCTING SPRAYING OPERATIONS WITHIN THE ENCLOSURE SHALL BE PROVIDED WITH A HOOD WITH EXTERNAL AIR SUPPLY FOR RESPIRATION ACCORDING TO OSHA 19–10–134.

5. WHEN THE CONCRETE SURFACE TEMPERATURE IS LESS THAN 5 DEGREES CELSIUS ABOVE THE DEW POINT, THE SACRIFICIAL ANODE SHALL NOT BE SPRAYED WITHOUT ENCLOSURE AND DEHUMIDIFYING EQUIPMENT. THE DEW POINT SHALL BE DETERMINED USING A PSYCHROMETER. THERMAL SPRAYING SHALL NOT BE PERFORMED WHEN THERE IS EXCESSIVE WIND THAT COULD INTERFERE WITH THE OPERATION.

6. DURING APPLICATION, THE THERMAL SPRAY NOZZLE SHALL BE MAINTAINED AT A TRAVEL SPEED AND A DISTANCE FROM THE WORK SURFACE SUCH THAT ANODE DEPOSIT EFFICIENCY AND BOND STRENGTH ARE MAXIMIZED. TRAVEL SPEED SHALL BE APPROXIMATELY 300 mm PER SECOND. THE DISTANCE FROM THE NOZZLE TO THE SURFACE SHOULD BE APPROXIMATELY 150 mm.

7. THIS STEP DIFFERS FOR THE NON–SHORTED AND THE SHORTED SYSTEMS. THEREFORE, FOLLOW THE APPROPRIATE STEPS OUTLINED BELOW, ACCORDING TO THE DESIGNATION OF AN AREA (SEE LAYOUT PLANS):

FOR NON–SHORTED SYSTEM ONLY: THE SPRAY APPLICATION OF THE SACRIFICIAL ANODE SHALL BEGIN BY METALLIZING THE AREA(S) IN WHICH THE ANODE CONNECTOR WAS INSTALLED. FIRST, CONNECT A VOLTMETER BETWEEN THE THREADED ROD AND A SYSTEM GROUND, TO DETECT ELECTRICAL SHORT CIRCUITS BETWEEN THE ANODE AND THE REINFORCING STEEL. BEGIN BY SPRAYING THE ANODE, IN A CONTINUOUS COATING, OVER THE CONNECTOR DISK AND THEN PROCEEDING TOWARD THE SURROUNDING CONCRETE, TO FACILITATE SHORT CIRCUIT DETECTION, WHILE WATCHING THE VOLTMETER FOR ANY SHARP VOLTAGE DROP (I.E., TO NEAR 0 MILLIVOLT), WHICH IS A DEFINITE INDICATION OF A SHORT CIRCUIT. WHEN A SHORT CIRCUIT IS DETECTED, ALL INSTALLATION WORK SHALL STOP UNTIL THE SHORT IS IDENTIFIED AND ELIMINATED.

FOR SHORTED SYSTEM ONLY: THE SPRAY APPLICATION OF THE SACRIFICIAL ANODE SHALL BEGIN BY METALLIZING THE AREA(S) IN WHICH THE ANODE CONNECTOR WAS INSTALLED. BEGIN BY SPRAYING THE ANODE, IN A CONTINUOUS COATING, OVER THE CONNECTOR DISK AND THEN PROCEEDING TOWARD THE SURROUNDING CONCRETE.

8. THE COATING SHOULD BE APPLIED IN MULTIPLE PASSES AND SHOULD OVERLAP ON EACH PASS IN A CROSSHATCH PATTERN TO ENSURE COMPLETE COVERAGE. UNIFORM GUN MOVEMENT SHOULD BE USED TO ENSURE CONSISTENT THICKNESS. SUFFICIENT SACRIFICIAL ANODE WILL BE SPRAYED TO ACHIEVE A THICKNESS OF 300 MICRONS. THE THICKNESS OF THE COATING SHALL BE MEASURED AT A MINIMUM OF 5 LOCATIONS PER APPROX. 10 SQ. METER USING DUCT TAPE AS FOLLOWS:

A) ATTACH PIECES OF DUCT TAPE (25 mm X 25 mm) ON CONCRETE SURFACE.
B) SPRAY THE SACRIFICIAL ANODE ONTO THE DUCT TAPE.
C) REMOVE THE DUCT TAPE WITH THE SPRAYED ANODE COATING.
D) SEPARATE THE SPRAYED COATING ANODE FROM THE DUCT TAPE.
E) MEASURE THE THICKNESS OF THE ANODE COATING WITH A CALIPER OR MICROMETER.

THE MAXIMUM TOLERANCES OF THE COATING THICKNESS ARE 50 MICRONS. THE CONCRETE AREAS LEFT UNCOATED, AFTER THE REMOVAL OF PIECES OF THE DUCT TAPE, SHALL THEN BE SPRAYED TO RESTORE THE ANODE COATING.

9. THE ALUMINUM–ZINC ALLOY ANODE WIRE IS RELATIVELY DUCTILE; THEREFORE, THE WIRE SHALL BE CAREFULLY HANDLED TO PREVENT SHARP BENDS OR NICKS. TO READILY SPRAY COILED ANODE WIRE FOR USE IN A FLAME SPRAY GUN, A STRAIGHTENING DEVICE IS RECOMMENDED.

10. COMPRESSED AIR USED FOR SPRAYING SHALL BE CLEAN, OIL–FREE AND DRY, PER ASTM D 4285. AIR LINE FILTERS AND MOISTURE SEPARATORS SHALL BE INSTALLED UPSTREAM FROM THE SPRAYING EQUIPMENT. THESE SHALL BE INSPECTED DAILY FOR CLEANLINESS AND CORRECT OPERATION. ANY INDICATION OF MALFUNCTION IN THE EQUIPMENT, INDICATED BY OIL OR WATER IN THE FILTER OR TRAPS, SHALL BE CORRECTED IMMEDIATELY.

11. THE ANODE COATING SHALL NOT CONTAIN ANY LUMPS, BLISTERS, COARSE TEXTURE, OR LOOSELY ADHERING PARTICLES, NOR SHALL IT CONTAIN ANY CRACKS, PINHOLES, OR CHIPS WHICH EXPOSE THE CONCRETE SUBSTRATE. UNACCEPTABLE AREAS SHALL BE REPAIRED. REPAIR WORK SHALL BE CONDUCTED AS FOLLOWS:

A) REMOVE ALL DEGRADED ANODE COATING BY SCRAPING OR STRIP BLASTING OR BOTH. DURING THIS PROCESS, LIGHT BLASTING SHALL BE APPLIED TO THE AREAS WITHOUT EXPOSING LARGE AGGREGATES.

B) RE–APPLY SACRIFICIAL ANODE.

C) INSPECT THE SPRAYED ANODE THICKNESS, AS DESCRIBED ABOVE.

3.1.7 COMPLETION OF INSTALLATION OF THE ANODE CONNECTORS. THIS STEP DIFFERS FOR THE NON– SHORTED AND THE SHORTED SYSTEMS. THEREFORE, FOLLOW THE APPROPRIATE STEPS, OUTLINED BELOW, IN ACCORDANCE TO THE DESIGNATION OF AN AREA (SEE LAYOUT PLANS):

FOR NON–SHORTED ANODE CONNECTORS. SECURELY ATTACH A RED NO. 10 AWG THHN COPPER LEAD WIRE BETWEEN THE ANODE CONNECTOR DISK AND THE GALVANIZED WASHER AND NUT – MAKING SURE THAT THE NUT IS FIRMLY TIGHTENED. ENCLOSE THE CONNECTION WITH A PVC JUNCTION BOX, BEFORE ROUTING THE LEAD WIRE THROUGH A CONDUIT TO THE TEST STATION ANOTHER JUNCTION BOX, WHERE IT IS TO BE CONNECTED (THROUGH A 0.1 OHM RESISTOR) TO A SYSTEM NEGATIVE.

FOR SHORTED ANODE CONNECTORS: CHECK TO MAKE SURE THAT THE GALVANIZED WASHER AND NUT ARE TIGHTLY SECURED OVER THE ANODE CONNECTOR DISK AND ATTACHED TO THE GALVANIZED AND THREADED ROD. THEN COVER THE WASHER–AND–NUT ASSEMBLY WITH EPOXY ADHESIVE.

3.1.8 ADHESION TESTING. AFTER THE SACRIFICIAL ANODE COATING IS APPLIED, ADHESION STRENGTH SHALL BE MEASURED TOENSURE ADEQUATE BOND.

ADHESION STRENGTH WILL BE MEASURED WITH A PROCEQ, MODEL DYNA Z 5, OR EQUAL. A MINIMUM OF ONE ADHESION TEST SHALL BE PERFORMED PER 45 SQ. METER OF CONCRETE SURFACE AREA. THE TARGET ADHESION STRENGTH OF THE SACRIFICIAL ANODE COATING SHALL BE GREATER THAN 103.5 kPa. THE CONTRACTOR SHALL REMOVE THE ANODE COATING FROM AREAS, WHERE THE ADHESION STRENGTH IS BELOW 345 kPa, AND RECOAT WITH ANODE, IN ACCORDANCE WITH THESE SPECIFICATIONS.

3.1.9 INSTALLATION OF JUNCTION BOXES AND CONDUIT.

1. THE CONTRACTOR SHALL INSTALL SCHEDULE 40 PVC CONDUIT AND JUNCTION BOXES FOR THE CATHODIC PROTECTION SYSTEM.

2. ALL CONDUIT JOINTS, FITTINGS, COUPLINGS AND ADAPTERS SHALL BE JOINTED BY MEANS OF A SOLVENT CEMENT OR AS RECOMMENDED BY THE CONDUIT MANUFACTURER.

3. THE JUNCTION BOXES AND THE CONDUIT SHALL BE SECURED ON THE CONCRETE SURFACE USING STAINLESS STEEL (GRADE 304 OR 316) BOLTS WITH A VINYLESTER ADHESIVE RESIN.

4. THE CONDUIT SHALL BE SECURED ON THE CONCRETE SURFACE USING NON–METALLIC CLAMPS OR HANGERS TO THE STRUCTURE IN CONFORMANCE WITH THE PERTINENT ELECTRICAL CODES.

5. ANY CONDUIT SECTIONS TO BE BENT MUST BE HEATED EVENLY OVER THE ENTIRE LENGTH OR THE CURVE. ONLY ELECTRICAL HEATERS DESIGNED SPECIFICALLY FOR THE SIZE AND PURPOSE OF BENDING NON–METALLIC CONDUIT SHALL BE USED. CONDUIT BENDING SHALL BE PERFORMED ACCORDING TO CONDUIT MANUFACTURER S RECOMMENDATIONS. FOR BLIND BENDS OR FOR COMPOUND TURNS IN A CONDUIT RUN, THE HEATED CONDUIT MAY BE SOLVENT CEMENTED IN PLACE WHILE STILL FLEXIBLE. THE USE OF TORCHES OR OTHER FLAME–TYPE DEVICES SHALL NOT BE PERMITTED. PVC CONDUIT SECTIONS THAT WERE EXPOSED TO EXCESSIVE HEATING, AS EVIDENT BY BROWN DISCOLORATION, SHALL BE DISCARDED.

3.1.10 INSTALLATION OF ELECTRICAL WIRING.

1. WIRING FOR THE CATHODIC PROTECTION SYSTEM SHALL BE PERFORMED IN ACCORDANCE TO THE PLANS AND MATERIAL SPECIFICATIONS.

2. ALL WIRING SHALL BE INSTALLED OR ROUTED IN PVC CONDUIT.

3. ALL CATHODIC PROTECTION WIRES SHALL BE IDENTIFIED IN THE JUNCTION BOXES, AND AT THE TEST STATION USING DURABLE IDENTIFICATION TAGS. EACH WIRE SHALL BE CLEARLY MARKED AS TO ITS FUNCTION. CARE SHALL BE TAKEN TO IDENTIFY EACH WIRE CORRECTLY IN ACCORDANCE WITH THE LEGEND SHOWN IN ANY SCHEMATIC WIRING DIAGRAM.

4. ALL CONNECTIONS AND WIRE SPLICES SHALL BE HOUSED IN JUNCTION BOXES AND ENCAPSULATED TO PREVENT ANY MOISTURE INTRUSION AND ALSO TO PROVIDE ELECTRICAL INSULATION FROM OTHER NEARBY CONNECTIONS OR WIRES.

4.0 ENERGIZATION AND TESTING OF THE SYSTEM. IN THE TEST STATION JUNCTION BOX, CONNECT THE ANODE LEAD WIRE FROM THE NON–SHORTED ANODE CONNECTOR TO A SYSTEM GROUND, THROUGH A 0.1 OHM SHUNT. (ALWAYS PROPERLY SEAL ALL CONNECTIONS IN THE JUNCTION BOXES WITH WATERPROOF MATERIALS TO PREVENT FUTURE MOISTURE INTRUSION.) AT THE TEST STATION, PROPERLY MARK EACH WIRE AND ITS FUNCTION WITH DURABLE IDENTIFICATION TAGS.

LIKEWISE, ROUTE ALL LEAD WIRES FROM THE EMBEDDED REFERENCE ELECTRODES AND THEIR GROUNDS, WITHOUT SPLICES, TO THE TEST STATION AND PROPERLY MARK THE WIRES.

MEASURE AND RECORD THE CIRCUIT RESISTANCE BETWEEN THE ANODE AND THE STEEL, THE VOLTAGE DROP ACROSS EACH SHUNT, AND THE POTENTIAL OF THE STEEL IN THE TEST STATION JUNCTION BOX.

5.0 MEASUREMENT AND PAYMENT. THE ACCEPTED INSTALLATION OF THE COMPLETED CATHODIC *SYSTEM, PROTECTION* FOR PIERS 15 AND 16 SHALL BE PAID FOR AT THE CONTRACT LUMP SUM PRICE BID FOR ITEM SPECIAL – CATHODIC PROTECTION SYSTEM FOR PIERS 15 AND 16, WHICH PRICE SHALL CONSTITUTE FULL COMPENSATION FOR ALL LABOR, MATERIALS, HANDLING INSTALLATION, EQUIPMENT, SURFACE PREPARATION APPLICATION, TESTING INCIDENTALS AND REPAIRS AS NECESSARY TO PROVIDE A COMPLETE, FUNCTIONING SYSTEM.

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DESIGNED CORRPRO | DRAWN CORRPRO | REVIEWED TAB | DATE 12/97
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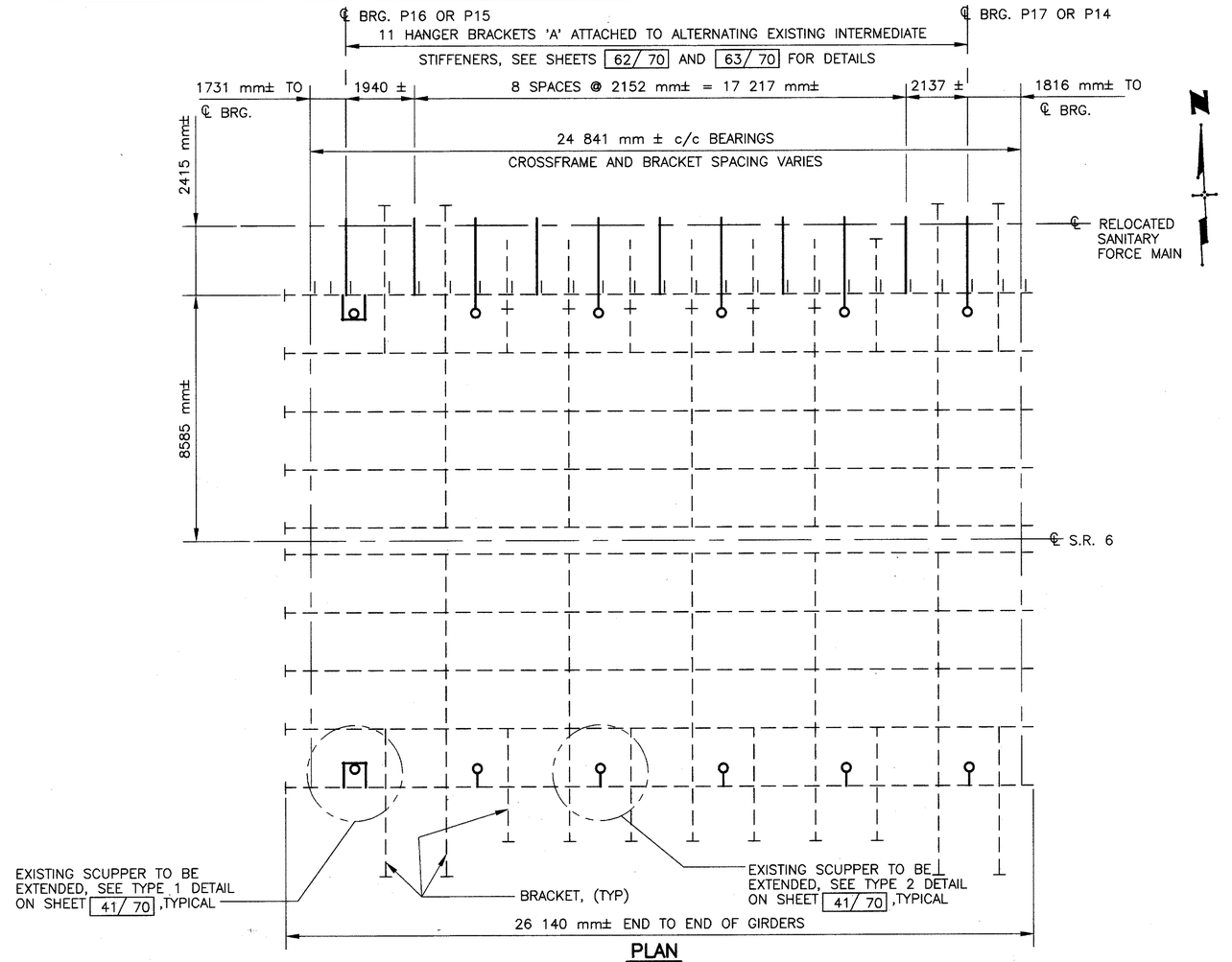
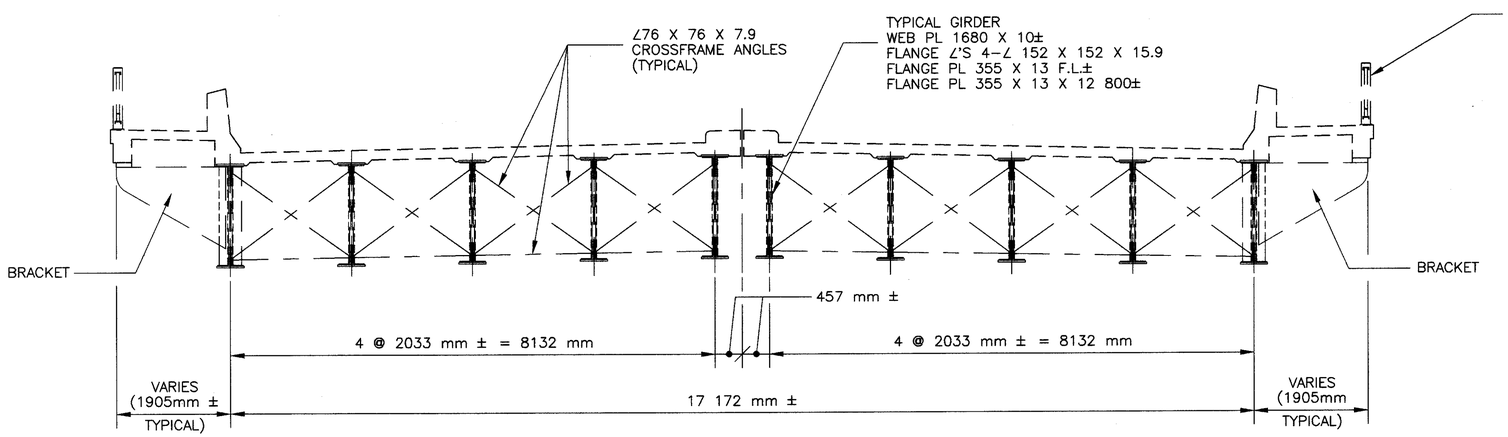
PIER NOS. 15 & 16 CATHODIC PROTECTION PLAN
BRIDGE NUMBER ERI–6–28839
OVER HURON RIVER

ERI–6–28.839



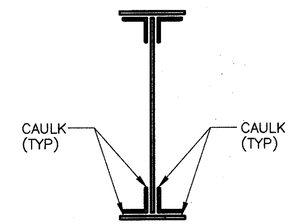
PLAN

SPAN 16 SHOWN,
SPAN 14 OPPOSITE HAND



SECTION

RELOCATED SANITARY FORCE MAIN NOT SHOWN
SEE SHEETS 81-89 FOR DETAILS.



CAULKING DETAIL

NOTES:

INFORMATION PROVIDED IS SCHEMATIC IN NATURE. THE CONTRACTOR MAY REVIEW THE EXISTING CONSTRUCTION DRAWINGS AND MUST FIELD VERIFY ALL EXISTING DIMENSIONS.

EXISTING SPANS 14 AND 16 ARE TO BE FIELD PAINTED IN THEIR ENTIRETY IN ACCORDANCE WITH THE REQUIREMENTS OF THE VARIOUS PAY ITEMS FOR ITEM 815 – FIELD PAINTING OF EXISTING STEEL, SYSTEM OZEU.

THE FOLLOWING IS A LISTING OF THE PRIMARY STRUCTURAL MEMBERS TO BE FIELD PAINTED:

- –RIVETED BUILT–UP GIRDERS
- –FULL CROSSFRAME BAYS
- –PARTIAL CROSSFRAME BAYS
- –BRACKETS
- –BALCONY BRACKETS (NOT SHOWN)
- –MISCELLANEOUS DETAIL METAL (JOINTS, BEARINGS, SCUPPERS, ETC..)
- –ALL OTHER NON–SPECIFIED STRUCTURAL STEEL DETAILS

JOINTS BETWEEN THE BOTTOM FLANGE ANGLE AND WEB PLATE, AND BOTTOM FLANGE ANGLE AND BOTTOM FLANGE PLATE SHALL BE CAULKED IN ACCORDANCE WITH THE REQUIREMENTS OF ITEM – 815 CAULKING. SEE DETAIL, THIS SHEET.

BRACKET "A" SHALL BE ATTACHED TO EXISTING INTERMEDIATE STIFFENER ANGLES. THE COST OF FIELD DRILLING THE EXISTING ANGLES SHALL BE CONSIDERED INCIDENTAL TO THE COST OF ITEM 863 – STRUCTURAL STEEL, MISC.: FORCE MAIN BRACKETS.

BRACKET 'A' SHALL BE SHOP PAINTED IN ACCORDANCE WITH THE REQUIREMENTS OF ITEM 514–FIELD PAINTING, MISC.: COMPLETE SHOP PAINTING OF STRUCTURAL STEEL.

FOR DETAIL 1 AND DETAIL 2, SEE SHEET 41/ 70 .

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FRAMING PLAN, SPANS 14 AND 16

BRIDGE NUMBER ERI–6–28839
OVER HURON RIVER

ERI–6–28.839

38/70

60/92

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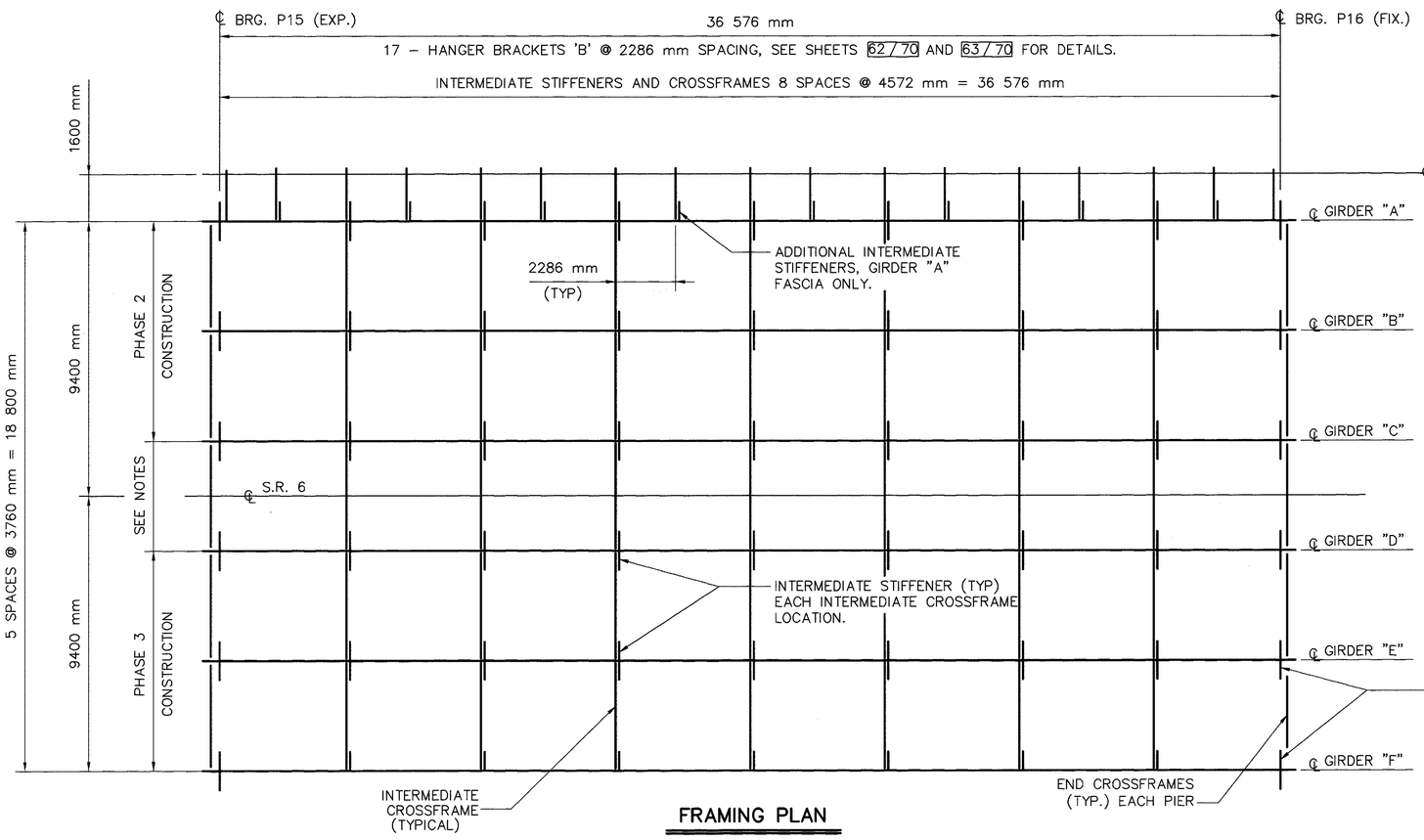
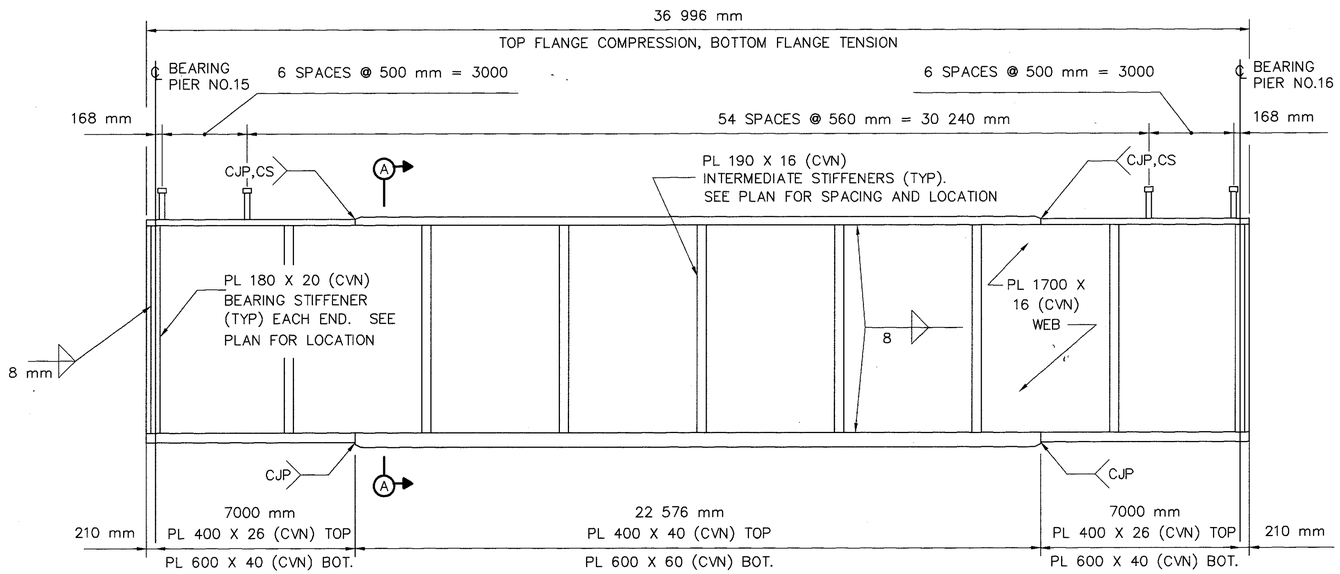
PLOT SCALE 1:100



FRAMING PLAN



GIRDER ELEVATION

NOTES

WHERE A SHAPE OR PLATE IS DESIGNATED (CVN) THE MATERIAL SHALL MEET SPECIFIED MINIMUM NOTCH TOUGHNESS REQUIREMENTS AS SPECIFIED IN 711.01.

HIGH STRENGTH BOLTS SHALL BE 22 mm DIAMETER A325M, GALVANIZED, UNLESS OTHERWISE NOTED.

WELDED ATTACHMENT OF SUPPORTS FOR CONCRETE DECK FINISHING MACHINE MAY BE MADE TO AREAS OF THE FASCIA STRINGER FLANGES DESIGNATED "COMPRESSION". ATTACHMENTS SHALL NOT BE MADE TO AREAS DESIGNATED "TENSION". FILLET WELDS TO COMPRESSION FLANGES SHALL BE NOT CLOSER THAN 25 mm FROM EDGE OF FLANGE, BE NOT MORE THAN 50 mm LONG, AND BE NOT SMALLER THAN THE MINIMUM SIZE REQUIRED BY AASHTO.

ALL STRUCTURAL STEEL SHALL BE, ASTM A709M, GRADE 345, UNLESS OTHERWISE NOTED. ALL NEW STRUCTURAL STEEL FOR SPAN 15 SHALL BE COMPLETELY SHOP PAINTED IN ACCORDANCE WITH THE REQUIREMENTS OF ITEM 514–FIELD PAINTING, MISC.: COMPLETE SHOP PAINTING OF STRUCTURAL STEEL.

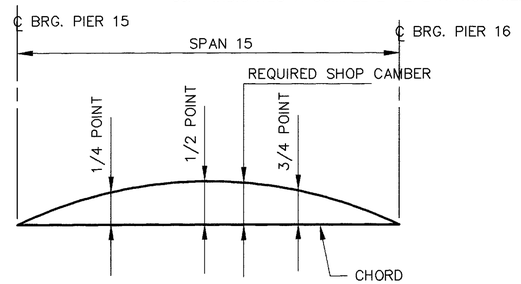
INTERMEDIATE CROSSFRAMES BETWEEN GIRDERS 'C' AND 'D' SHALL BE INSTALLED DURING PHASE 3 CONSTRUCTION AND THE BOLTS INSTALLED IN A HAND SNUG POSITION ONLY. AFTER THE CONCRETE FOR THE PHASE 4 DECK IS PLACED THE CROSSFRAME BOLTS MAY BE FULLY TIGHTENED.

FOR ELASTOMERIC BEARING DETAILS, SEE SHEET 43/70

REFER TO SHEET 41/70 FOR SECTION A–A CROSSFRAME AND STIFFENER DETAILS.

"CS" INDICATES BUTT WELD SUBJECT TO COMPRESSIVE STRESSES ONLY.

"CJP" INDICATES A COMPLETE PENETRATION WELD.



LAYOUT DIAGRAM

A POSITIVE CAMBER VALUE INDICATES THE CAMBER IS ABOVE THE CHORD BETWEEN ADJACENT BEARINGS IN THAT SPAN.

DEFLECTION AND CAMBER TABLE
(mm)

		SPAN 15			
		1/4		1/2	3/4
BEAMS A & F	DEFLECTION DUE TO WEIGHT OF STEEL	13		18	13
	DEFLECTION DUE TO REMAINING DEAD LOAD	51		72	51
	REQUIRED SHOP CAMBER	64		90	64
BEAMS B,C,D, & E	DEFLECTION DUE TO WEIGHT OF STEEL	13		18	13
	DEFLECTION DUE TO REMAINING DEAD LOAD	57		81	57
	REQUIRED SHOP CAMBER	70		99	70

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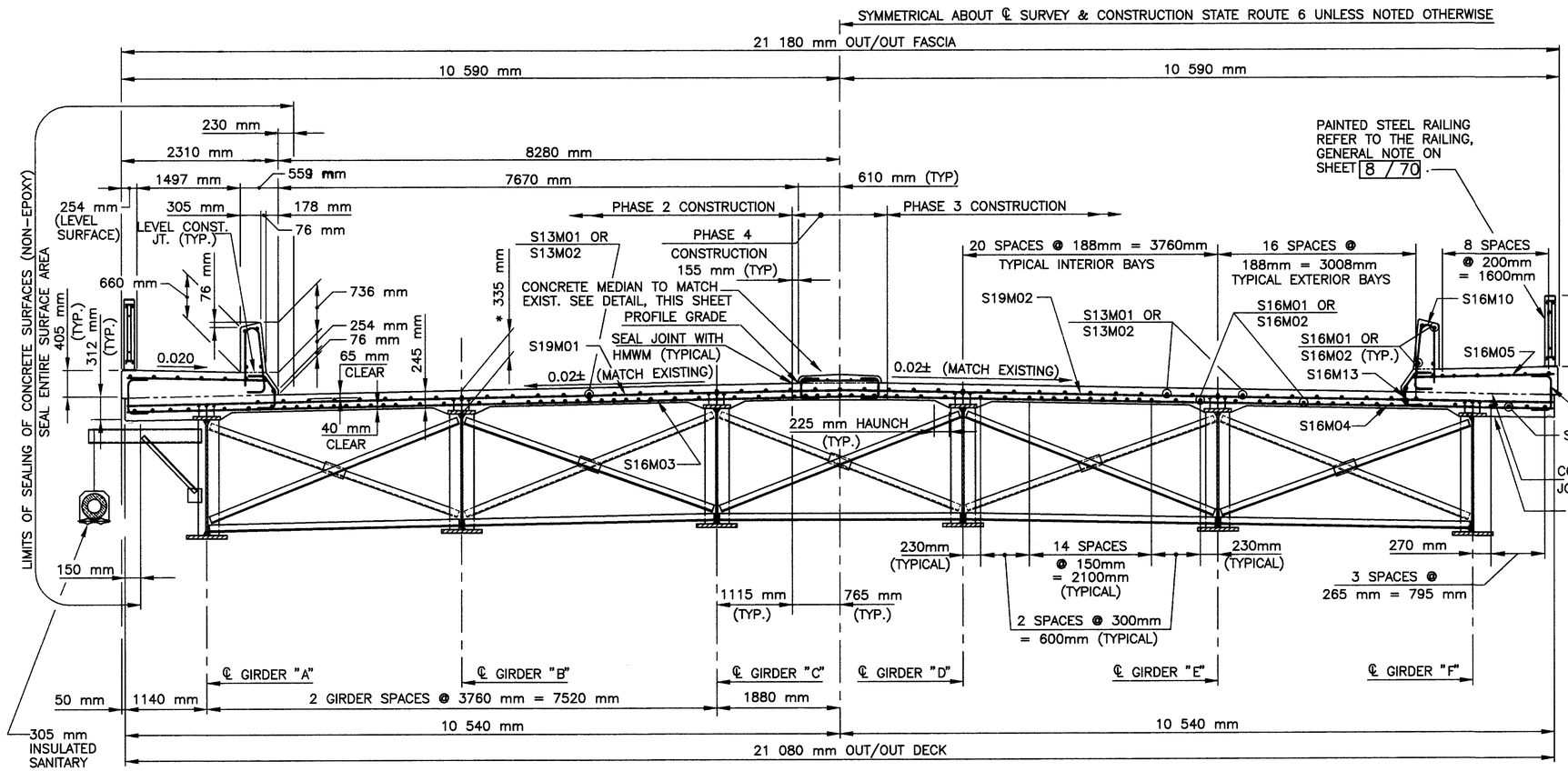
FRAMING PLAN – SPAN 15
BRIDGE NUMBER ERI–6–28839 OVER HURON RIVER

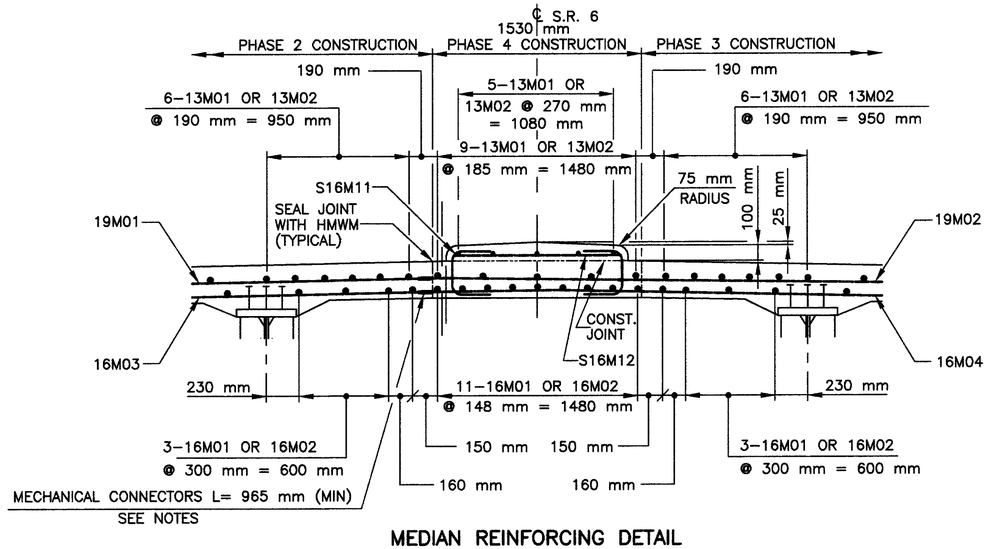
ERI–6–28.839

39/70

61/92



TRANSVERSE SECTION – SPAN 15



MEDIAN REINFORCING DETAIL

NOTES:

*DECK SLAB DEPTH: THE DISTANCE SHOWN FROM THE TOP OF THE DECK SLAB TO THE BOTTOM OF THE TOP FLANGE IS THE THEORETICAL DESIGN DIMENSION INCLUDING THE DESIGN HAUNCH THICKNESS OF 50 mm. THE QUANTITY OF DECK CONCRETE TO BE PAID FOR SHALL BE BASED UPON THIS DIMENSION, MINUS THE DESIGN HAUNCH THICKNESS, EVEN THOUGH DEVIATION FROM IT MAY BE NECESSARY BECAUSE THE TOP FLANGE OF THE GIRDER MAY NOT HAVE THE EXACT CAMBER OR CONFORMATION REQUIRED TO PLACE IT PARALLEL TO THE FINISHED GRADE. DEDUCTION SHALL BE MADE FOR VOLUME OF ENCASED STEEL PLATES AS PER *842*.18.

A HAUNCH WIDTH OF 225 mm SHALL BE USED FOR COMPUTING QUANTITY OF CONCRETE. HOWEVER, THE HAUNCH WIDTH MAY VARY BETWEEN 150 mm AND 300 mm.

FOR INTERMEDIATE CROSS FRAME DETAILS, SEE SHEET 40 / 70 .

FOR STRUCTURAL GENERAL NOTES, SEE SHEETS 4 / 70 THROUGH 8 / 70.

FOR FRAMING PLAN, SEE SHEET 39 / 70.

FOR SLAB PLAN, SEE SHEET 47 / 70.

FOR DECK SCREED ELEVATIONS, SEE SHEET 48 / 70 .

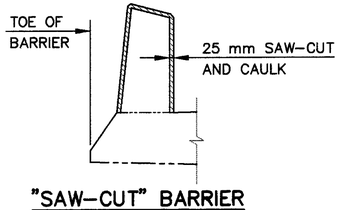
FOR REINFORCING STEEL LIST AND BAR BENDING DIAGRAMS, SEE SHEET 49 / 70 .

FOR RAILING DETAILS, SEE SHEET 57 / 70 .

FOR DRAINAGE DETAIL THRU SIDEWALK BARRIER, SEE SECTION B-B SHEET 47 / 70 .

FIELD BEND TRANSVERSE BARS TO FIT CROWN. BENDING SHALL BE INCLUDED WITH ITEM 844 FOR PAYMENT. EPOXY COATED BARS DAMAGED BY FIELD BENDING SHALL BE REPAIRED AS PER 709.00 AT NO ADDITIONAL COST TO THE STATE.

AN APPROVED TYPE OF MECHANICAL CONNECTOR FOR REINFORCING BARS SHALL BE PROVIDED WHERE REQUIRED. INSTALLATION OF THE CONNECTOR SHALL CONFORM WITH THE MANUFACTURER'S RECOMMENDED PROCEDURES. IF A DOWEL BAR SPLICE TYPE OF CONNECTOR IS FURNISHED THE MINIMUN DOWEL BAR TO BE FURNISHED WITH THE CONNECTOR SHALL BE GIVEN BY THE DIMENSION 'L' SHOWN ON THE PLAN. CONNECTORS SHALL BE EPOXY COATED AND THE COATING SHALL CONFORM TO THE SAME SPECIFICATION REINFORCING STEEL. COATINGS WHICH HAVE BEEN DAMAGED SHALL BE REPAIRED ACCORDING TO 709.00 OF THE CMS. CONNECTOR SHALL CONFORM WITH 509 AND BE INCLUDED FOR PAYMENT WITH ITEM 844 HIGH PERFORMANCE CONCRETE, SUPERSTRUCTURE (DECK).



"SAW-CUT" BARRIER JOINT DETAIL

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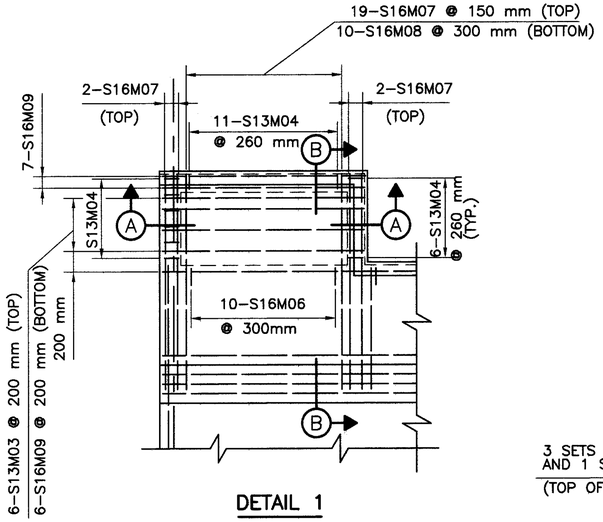
DESIGNED	DRAWN	REVIEWED	DATE
MJL	TMJ/RCK	TAB	12/97
CHECKED	REVISED	STRUCTURE FILE NUMBER	
AJM		2201984	

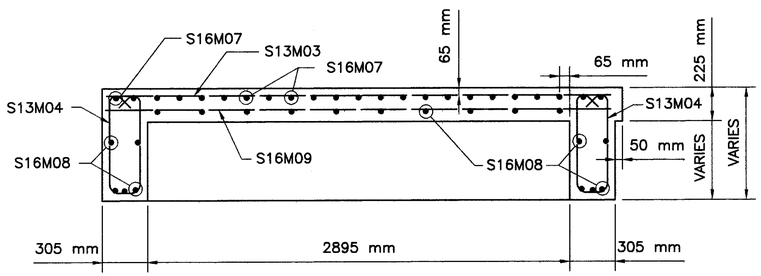
TRANSVERSE SECTION-SPAN 15
BRIDGE NUMBER ERI-6-28839
OVER HURON RIVER

ERI-6-28.839

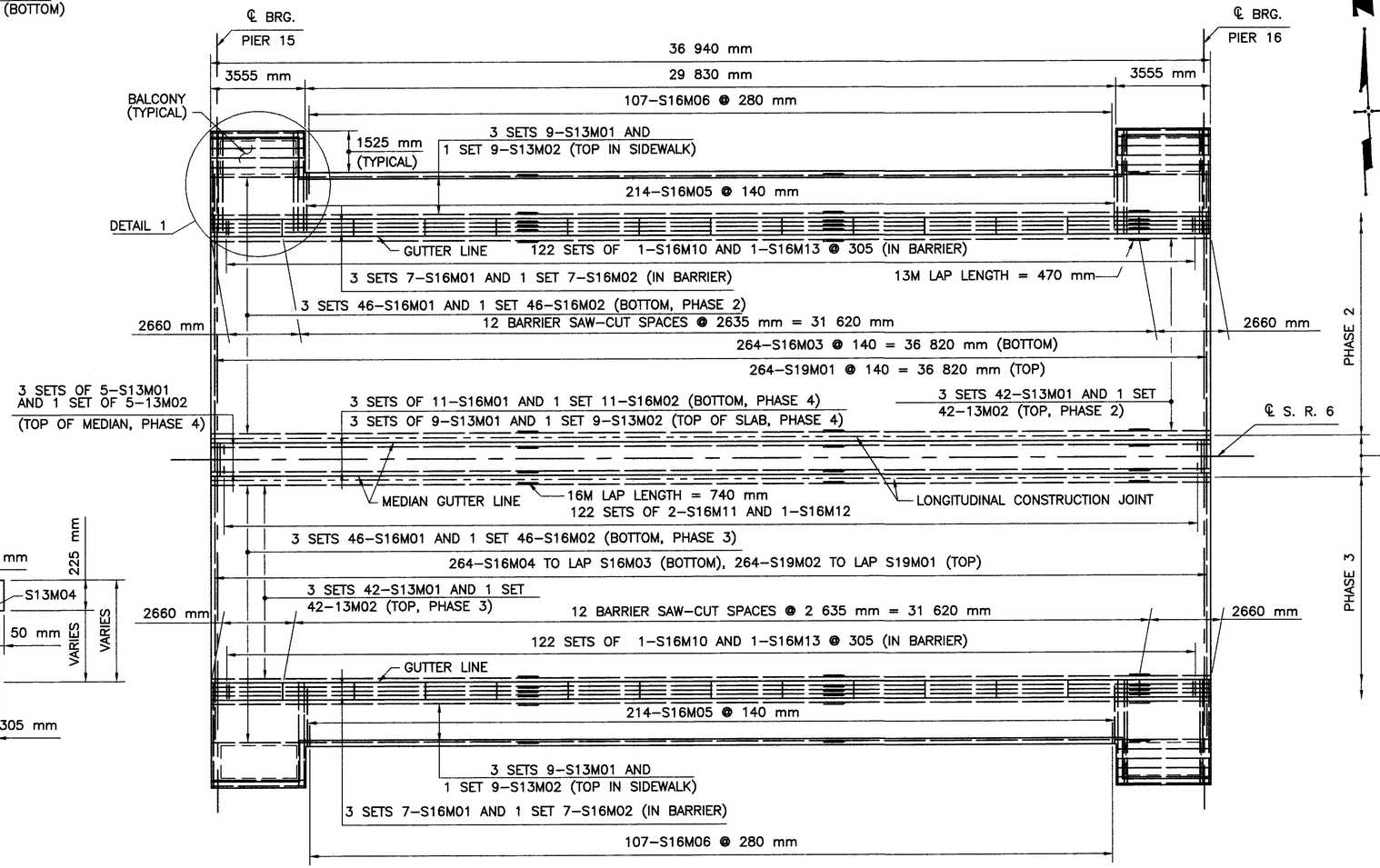


DETAIL 1

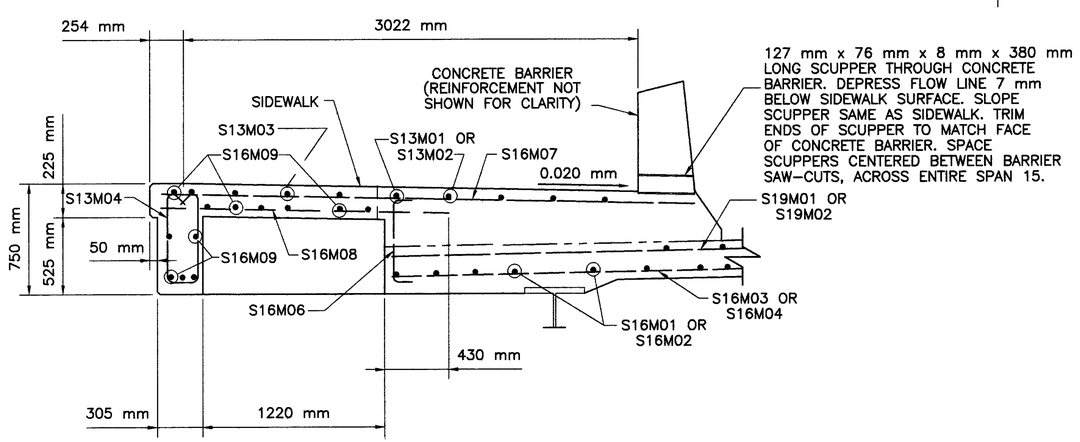
(TYPICAL AT ALL FOUR (4) CORNERS)



SECTION A–A



SLAB PLAN



127 mm x 76 mm x 8 mm x 380 mm LONG SCUPPER THROUGH CONCRETE BARRIER. DEPRESS FLOW LINE 7 mm BELOW SIDEWALK SURFACE. SLOPE SCUPPER SAME AS SIDEWALK. TRIM ENDS OF SCUPPER TO MATCH FACE OF CONCRETE BARRIER. SPACE SCUPPERS CENTERED BETWEEN BARRIER SAW–CUTS, ACROSS ENTIRE SPAN 15.

SECTION B–B

NOTES:

THE TRANSVERSE DECK REINFORCING BARS SHALL BE FIELD BENT TO CONFORM TO THE ROADWAY CROWN. FIELD BENDING SHALL BE INCLUDED WITH ITEM 844 – HIGH PERFORMANCE CONCRETE, SUPERSTRUCTURE (DECK) FOR PAYMENT.

FOR STRUCTURAL GENERAL NOTES, SEE SHEET 4 / 70 .

FOR ESTIMATED QUANTITIES, SEE SHEET 9 / 70 .

FOR REINFORCING BAR SCHEDULES AND BAR BENDING DIAGRAMS, SEE SHEET 49 / 70 .

FOR FRAMING PLAN, SEE SHEET 39 / 70 .

FOR TRANSVERSE SECTION SEE SHEET 46 / 70 .

FOR SCREED TABLE SEE SHEET 48 / 70 .

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SLAB PLAN
BRIDGE NUMBER ERI–6–28839
OVER HURON RIVER

ERI–6–28.839

PLOT SCALE: 1 = 100
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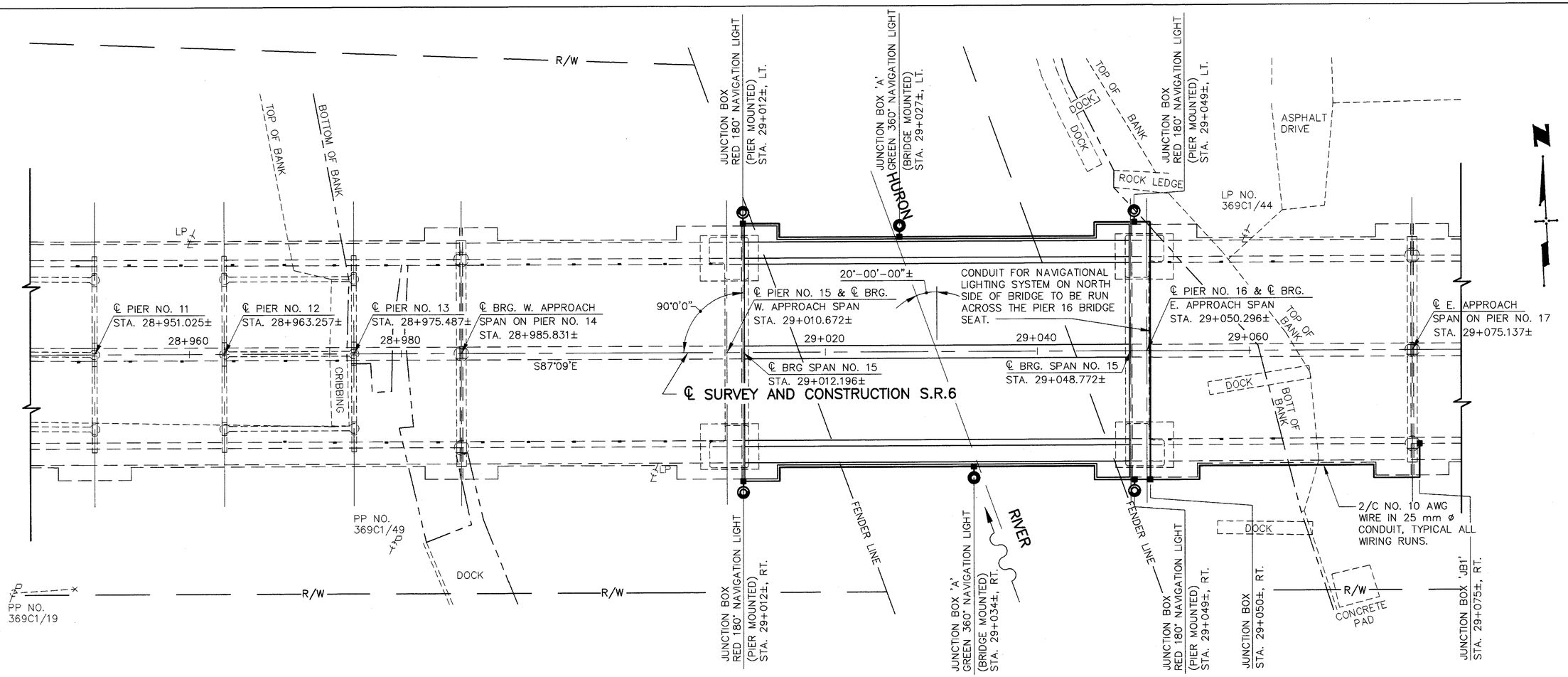
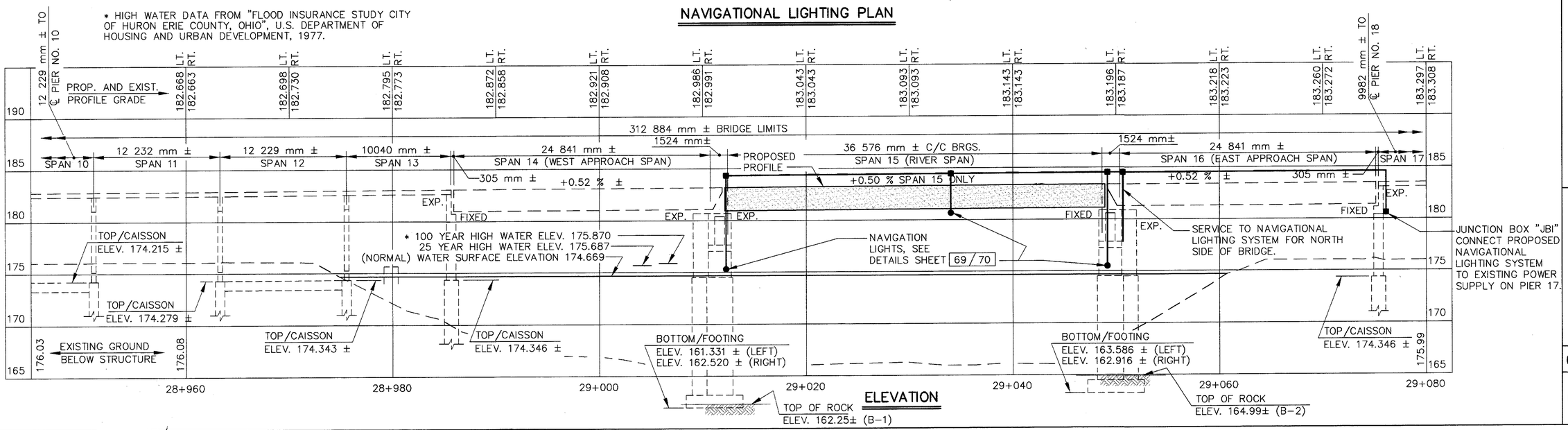


NAVIGATIONAL LIGHTING PLAN



ELEVATION

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LPC	TES	TAB	12/97
CHECKED	REVISED	STRUCTURE FILE NUMBER	
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NAVIGATIONAL LIGHTING PLAN

BRIDGE NUMBER ERI-6-28839
OVER HURON RIVER

ERI-6-28.839

68/70

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92

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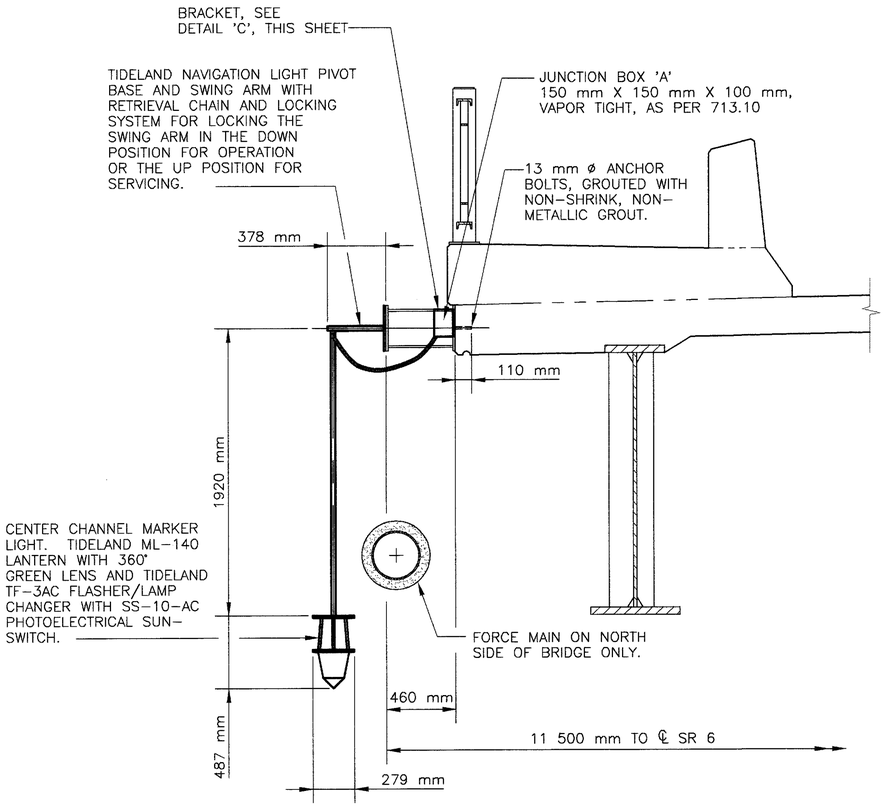
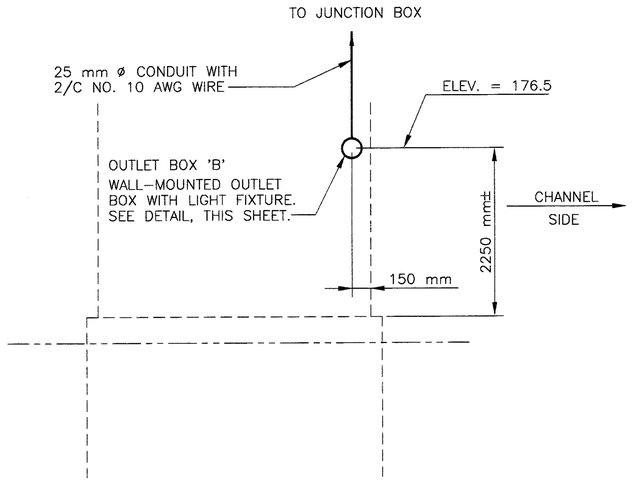
PLOT SCALE: 5:1



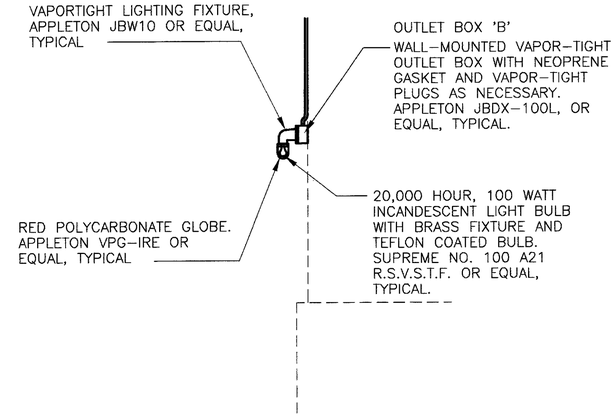
360° GREEN CENTER CHANNEL MARKER

2 INSTALLATIONS SPAN 15



180° RED SIDE CHANNEL MARKER

2 INSTALLATIONS PIER 15
2 INSTALLATIONS PIER 16

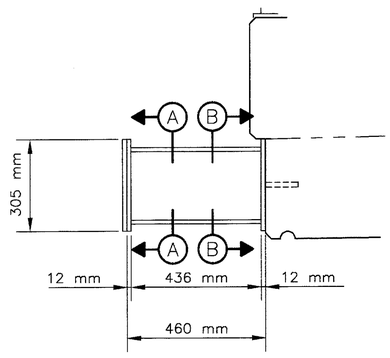


SIDE CHANNEL MARKER DETAIL

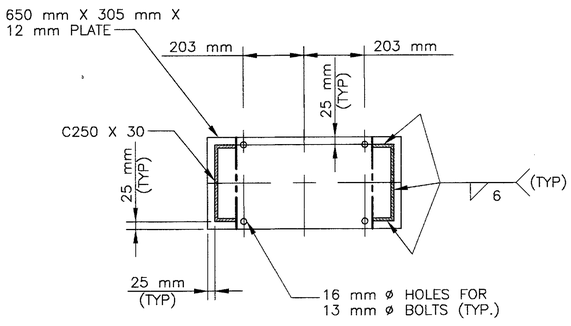
NOTES:

REFER TO SHEET 68 / 70 FOR MARKER LIGHT LOCATIONS.

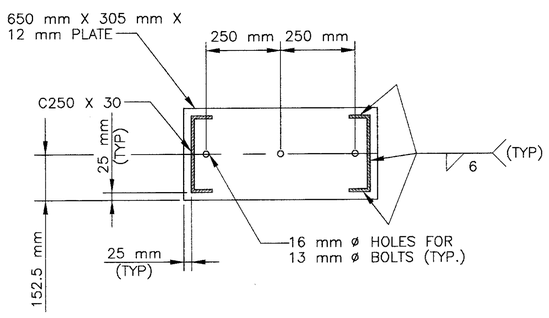
REFER TO SHEET 70 / 70 FOR SPECIFICATIONS GOVERNING THIS WORK.



DETAIL 'C'



SECTION A-A



SECTION B-B

BRACKET DETAILS

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NAVIGATIONAL LIGHTING DETAILS
BRIDGE NUMBER ERI-6-28839
OVER HURON RIVER

ERI-6-28.839

69 / 70

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92

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PLOT SCALE 1:20

NAVIGATIONAL LIGHTING – GENERAL

THE EXISTING NAVIGATIONAL LIGHTING SYSTEM ON BRIDGE NUMBER ERI–6–28839 OVER THE HURON RIVER SHALL BE REMOVED, AND A NEW NAVIGATIONAL LIGHTING SYSTEM INSTALLED IN ACCORDANCE WITH THE REQUIREMENTS OF THESE SPECIFICATIONS AND THE DETAILS OF THE PLANS. IN GENERAL, THE NEW SYSTEM WILL CONSIST OF RED SIDE CHANNEL MARKER LIGHTS LOCATED ON THE NORTH AND SOUTH COLUMNS OF PIERS 15 AND 16; GREEN CENTER CHANNEL MARKER LIGHTS LOCATED ON THE NORTH AND SOUTH FASCIA OF SPAN 15; AND THE NECESSARY CONDUIT – ENCASED SERVICE LINES TO POWER THE LIGHTS. THE NEW SERVICE LINES SHALL BE CONNECTED TO THE EXISTING POWER SUPPLY LOCATED ON THE SOUTH COLUMN OF PIER 17.

PRIMARY ELEMENTS OF THE LIGHTING SYSTEM SHALL CONSIST OF COMPONENTS MANUFACTURED BY THE APPLETON ELECTRIC COMPANY, TIDELAND SIGNAL CORPORATION, B&B ELECTROMATIC CORPORATION, AUTOMATIC POWER INC. NAVIGATIONAL AIDS OR APPROVED EQUALS. CONDUIT–ENCASED SERVICES AND THE CONNECTION TO THE EXISTING POWER SUPPLY SHALL BE CONSTRUCTED OF INDIVIDUAL ELEMENTS (CONDUIT, CONDUIT BENDS, CONDUIT ANCHORS, WIRE, PULL BOXES, JUNCTION BOXES, MISCELLANEOUS DETAIL ITEMS, ETC.) WHICH CONFORM TO CURRENT INDUSTRY STANDARDS AND THE REQUIREMENTS OF CMS ITEM 625. IN ADDITION TO THE ABOVE REQUIREMENTS, THE COMPLETE INSTALLATION SHALL BE SUBJECT TO THE APPROVAL AND ACCEPTANCE OF THE UNITED STATES COAST GUARD.

ITEM 202 – REMOVAL MISC.: REMOVAL OF EXISTING NAVIGATIONAL LIGHTING SYSTEM

THE EXISTING NAVIGATIONAL LIGHTING SYSTEM SHALL BE REMOVED IN ITS ENTIRETY TO THE EXISTING POWER SUPPLY ON PIER 16. REMOVAL OPERATIONS SHALL BE PERFORMED IN ACCORDANCE WITH APPLICABLE PROVISIONS OF CMS ITEMS 202 AND 625. ALL NAVIGATIONAL LIGHTING ASSEMBLIES AND/OR FIXTURES REMOVED SHALL REMAIN THE PROPERTY OF THE STATE OF OHIO. THE CONTRACTOR SHALL DELIVER THESE ITEMS TO THE PROJECT ENGINEER FOR STORAGE OR DISPOSAL. THE UNITED STATES COAST GUARD, NINTH DISTRICT, CLEVELAND, OHIO (216) 902–6086 SHALL BE CONTACTED A MINIMUM OF TWO WEEKS PRIOR TO COMMENCING WITH THIS REMOVAL OPERATION. TEMPORARY NAVIGATIONAL AIDS REQUIRED FOR THE MAINTENANCE OF BOAT TRAFFIC SHALL BE IN PLACE AND OPERATIONAL PRIOR TO COMMENCING WITH THIS REMOVAL OPERATION.

PAYMENT FOR THIS WORK SHALL BE MADE AT THE CONTRACT LUMP SUM PRICE BID FOR ITEM 202 – REMOVAL MISC.: REMOVAL OF EXISTING NAVIGATIONAL LIGHTING SYSTEM, WHICH PRICE SHALL CONSTITUTE FULL COMPENSATION FOR ALL LABOR, MATERIALS AND EQUIPMENT NECESSARY TO PERFORM THIS WORK IN ACCORDANCE WITH THESE SPECIFICATIONS.

ITEM 625 – LIGHTING MISC.: SERVICE TO NAVIGATION LIGHTING, AS PER PLAN:

THIS ITEM OF WORK SHALL CONSIST OF PROVIDING ELECTRICAL SERVICE FROM THE EXISTING POWER SUPPLY ON PIER 16 TO THE VARIOUS NAVIGATIONAL LIGHTING ASSEMBLIES. THE LIMITS OF THIS WORK EXTEND FROM THE POWER SUPPLY TO JUNCTION BOX "A" FOR THE CENTER CHANNEL MARKERS, AND TO OUTLET BOX "B" FOR THE SIDE CHANNEL MARKERS. ALL CONDUIT, CONDUIT BENDS, CONDUIT ANCHORS, WIRE, PULL BOXES, JUNCTION BOXES AND MISCELLANEOUS INCIDENTAL ITEMS SHALL BE FURNISHED AND INSTALLED. EXPANSION PROVISIONS FOR THE CONDUIT RUNS SHALL BE MADE AS NECESSARY AT THE PIER 15, 16 AND 17 EXPANSION JOINTS.

A SCHEMATIC PLAN OF THE DESIRED SERVICE ROUTING IS SHOWN ON SHEET 68/70. THE COMPLETED INSTALLATION SHALL BE VAPOR–TIGHT. JUNCTION BOXES SHALL BE PROVIDED AT A MAXIMUM SPACING OF 15 METERS. THE MAXIMUM TOTAL BEND IN A CONDUIT RUN BETWEEN PULL BOXES SHALL NOT EXCEED 270°. ALL ELEMENTS COMPRISING THE LIGHTING SERVICE AND THE COMPLETED INSTALLATION SHALL COMPLY WITH APPLICABLE PROVISIONS OF CMS ITEM 625 AND UNITED STATES COAST GUARD REGULATIONS.

PAYMENT FOR THIS WORK SHALL BE MADE AT THE CONTRACT LUMP SUM PRICE BID FOR ITEM 625 – LIGHTING MISC.: SERVICE TO NAVIGATION LIGHTING, AS PER PLAN, WHICH PRICE SHALL CONSTITUTE FULL COMPENSATION FOR ALL LABOR, MATERIALS AND EQUIPMENT NECESSARY TO COMPLETE THIS INSTALLATION IN ACCORDANCE WITH THESE SPECIFICATIONS.

ITEM 625 – LIGHTING MISC.: SIDE CHANNEL MARKER LIGHTS, AS PER PLAN:

THIS ITEM OF WORK CONSISTS OF FURNISHING AND INSTALLING FOUR (4) WALL MOUNTED SIDE CHANNEL MARKER LIGHTS INCLUDING THE OUTLET BOX, LIGHT FIXTURE AND ALL INCIDENTALS NECESSARY TO COMPLETE THE INSTALLATION. APPLICABLE PROVISIONS OF CMS ITEM 625 SHALL BE ADHERED TO.

THE MARKER LIGHTS SHALL BE EQUIPPED WITH RED, 180° LENSES AND SHALL BE AS MANUFACTURED BY APPLETON ELECTRIC COMPANY, TIDELAND SIGNAL CORPORATION, B&B ELECTROMATIC CORPORATION OR APPROVED EQUAL.

PAYMENT FOR THIS WORK SHALL BE MADE AT THE CONTRACT LUMP SUM PRICE BID FOR ITEM 625 – LIGHTING MISC.: SIDE CHANNEL MARKER LIGHTS, AS PER PLAN WHICH PRICE SHALL CONSTITUTE FULL COMPENSATION FOR ALL LABOR, MATERIALS AND EQUIPMENT NECESSARY TO COMPLETE THIS INSTALLATION INCLUDING OUTLET BOX "B", THE LIGHTING FIXTURES AND ALL INCIDENTALS IN ACCORDANCE WITH THESE SPECIFICATIONS.

ITEM 625 – LIGHTING MISC.: CENTER CHANNEL MARKER LIGHTS, AS PER PLAN:

THIS ITEM OF WORK CONSISTS OF FURNISHING AND INSTALLING TWO (2) PIVOTING, SUSPENDED CENTER CHANNEL MARKER LIGHTS INCLUDING THE MOUNTING BRACKETS AND INCIDENTALS NECESSARY TO COMPLETE THE INSTALLATION. APPLICABLE PROVISIONS OF CMS ITEM 625 SHALL BE ADHERED TO.

THE MARKER LIGHTS SHALL BE EQUIPPED WITH GREEN, 360° LENSES AND SHALL BE AS MANUFACTURED BY TIDELAND SIGNAL CORPORATION, B&B ELECTROMATIC CORPORATION, AUTOMATIC POWER INC. NAVIGATIONAL AIDS OR APPROVED EQUAL.

THE PIVOT ASSEMBLY SHALL BE SUPPLIED BY THE MANUFACTURER OF THE CENTER CHANNEL MARKER LIGHT. THE PIVOT ASSEMBLY SHALL HAVE A LOCKING SYSTEM CAPABLE OF LOCKING IN THE UP POSITION FOR SERVICING AND IN THE DOWN POSITION FOR NORMAL OPERATION. THE PIVOT ASSEMBLY SHALL BE GALVANIZED. THE RETRIEVAL CHAIN SHALL BE SASH TYPE STAINLESS STEEL #35, RATED FOR A SERVICE LOAD OF 1 KILO–NEWTON.

THE MOUNTING BRACKET SHALL BE FABRICATED AND ERECTED IN ACCORDANCE WITH THE PROVISIONS OF CMS ITEM 513. THE MOUNTING BRACKET SHALL BE GALVANIZED IN ACCORDANCE WITH THE PROVISIONS OF CMS ITEM 513 AND 711.02. ANCHOR BOLTS FOR THE MOUNTING BRACKET SHALL BE PROVIDED AND INSTALLED IN ACCORDANCE WITH THE REQUIREMENTS OF CMS ITEMS 509 AND 510.

PAYMENT FOR THIS WORK SHALL BE MADE AT THE CONTRACT LUMP SUM PRICE BID FOR ITEM 625 – LIGHTING MISC.: CENTER CHANNEL MARKER LIGHTS, AS PER PLAN, WHICH PRICE SHALL CONSTITUTE FULL COMPENSATION FOR ALL LABOR, MATERIALS AND EQUIPMENT NECESSARY TO COMPLETE THIS INSTALLATION INCLUDING JUNCTION BOX "A", THE MOUNTING BRACKET, THE PIVOTING LIGHT FIXTURE AND ALL INCIDENTALS IN ACCORDANCE WITH THESE SPECIFICATIONS.

UNITED STATES COAST GUARD, NINTH DISTRICT
1240 EAST NINTH STREET
CEVELAND, OHIO 44199–2060
(216)902–6086

TIDELAND SIGNAL CORPORATION
P.O. BOX 52430
HOUSTON, TEXAS 77052
(713)681–6101

AUTOMATIC POWER INC., NAVIGATIONAL AIDS
P.O. BOX 23078
HOUSTOM, TEXAS 77223–0738
(713)228–5208

SMITH AND NEPHEW, INC.
P.O. BOX 578, DEPT. B
GERMANTOWN, WISCONSIN 53022
1(800)228–3693

APPLETON ELECTRIC COMPANY
1701 WEST WELLINGTON AVENUE
CHICAGO, ILLINOIS 60657
(312)327–7200

B&B ELECTRONIC CORPORATION
P.O. BOX 99
NORWOOD, LOUISIANA 70761
(504)629–5234

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CONSULTING ENGINEERS
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NAVIGATIONAL LIGHTING NOTES
BRIDGE NUMBER ERI–6–28839
OVER HURON RIVER

ERI–6–28.839

70/70

92/92

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