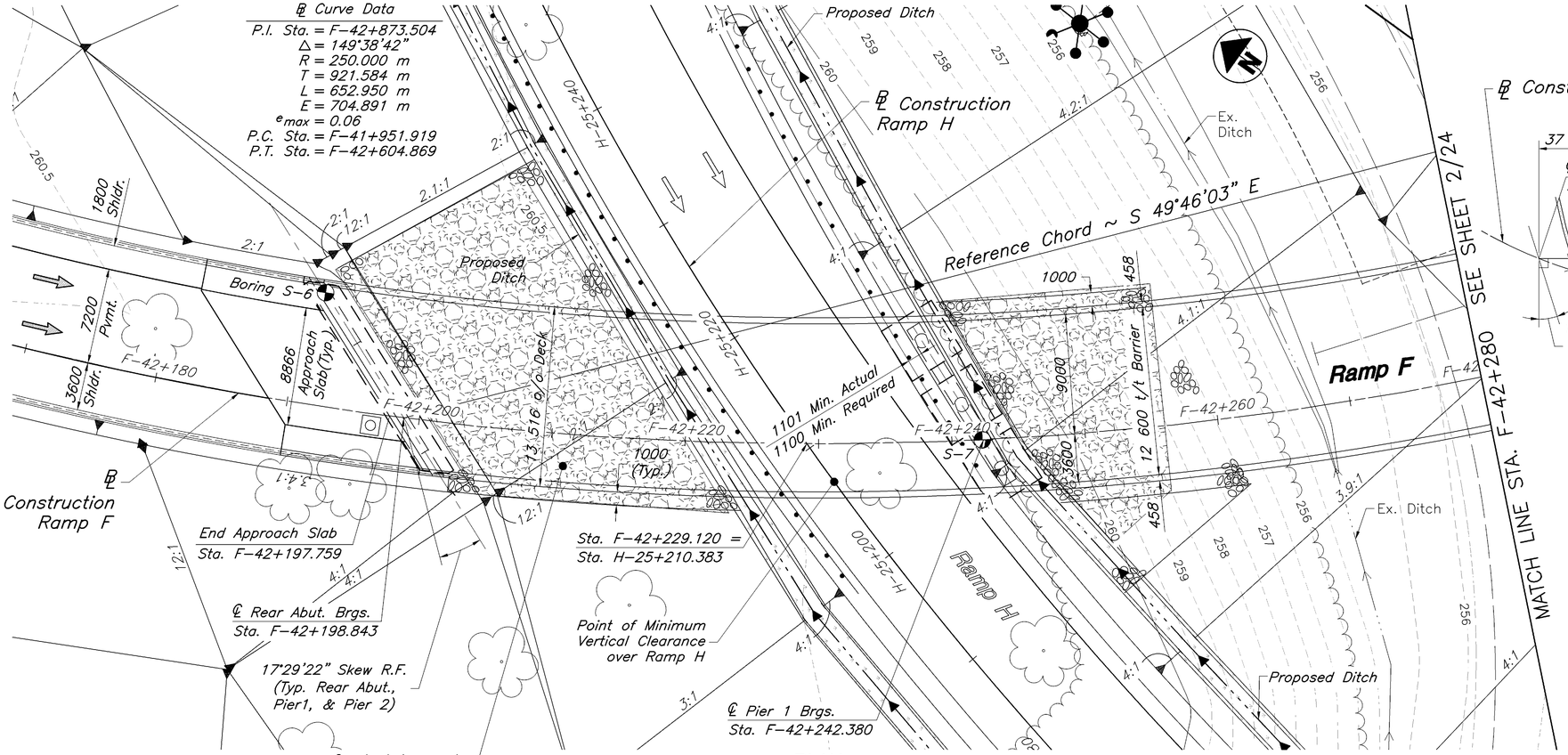
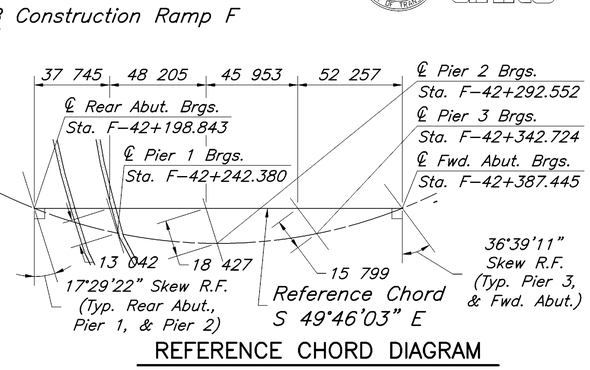
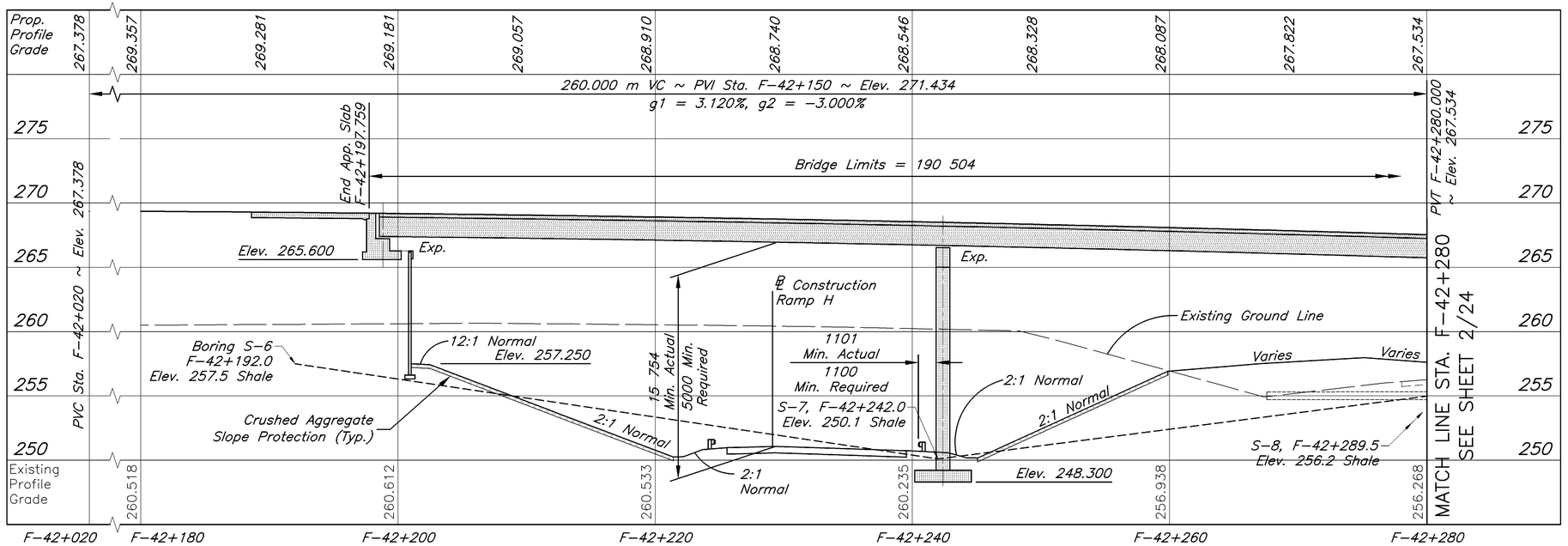


PLAN



REFERENCE CHORD DIAGRAM



PROFILE ALONG ℄ CONSTRUCTION RAMP F

DESIGN DESIGNATION

Current Year A.D.T. (2000) = 17 270
Design Year A.D.T. (2020) = 26 990
Design Year A.D.T.T. (2020) = 1350

BENCH MARKS

1. BP on S. Side of E. Abut. of S.R.–161 Bridge over I.R.–270, 7.470 m S. of C/L of Eastbound Lanes of S.R.–161.

Elev. 261.585

NOTES

1. Earthwork Limits shown are approximate. Actual Slopes shall conform to Plan Cross Sections.
2. All dimensions are in millimeters unless otherwise noted. Stations and Elevations are in Meters.
3. No Utilities, existing or proposed, are within the Vicinity of the Bridge.
4. See Roadway Plans for Drainage Collection Structures beyond Bridge Limits.

LEGEND:

Current Soil Boring Location

Proposed Settlement Platform location. See Sheet 43 for Notes and Details.

PROPOSED STRUCTURE DATA

TYPE: 4–Span Continuous Curved Steel Girder with a Composite Reinforced Concrete Deck on Reinforced Concrete Spread Footing Abutments and Cap & Column Piers.
SPAN: 37 745; 48 205; 45 953; 52 257 Along Reference Chord
ROADWAY: 12 600 t/t Barrier
DESIGN LOADING: MS22.5 & Alternate Military Loading (Case II)
SKEW: 17°29'22" R.F. (Rear Abut., Pier 1, & Pier 2) 36°39'11" R.F. (Pier 3 & Fwd. Abut.) to Reference Chord
ALIGNMENT: 250.000 m Curve Left
WEARING SURFACE: Monolithic Concrete
APPROACH SLABS: AS–1–81M (9150 Long, T=425)
SUPERELEVATION: 0.06
LATITUDE: N40°04'54" **LONGITUDE:** W82°54'30"

metric units

EMH inc
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170 MILL STREET GAHANNA, OHIO 43230

DESIGNED SCK | DRAWN SCK | REVIEWED JEM 12/22/97 | DATE

CHECKED CJS | REVISED | STRUCTURE FILE NUMBER 2516616

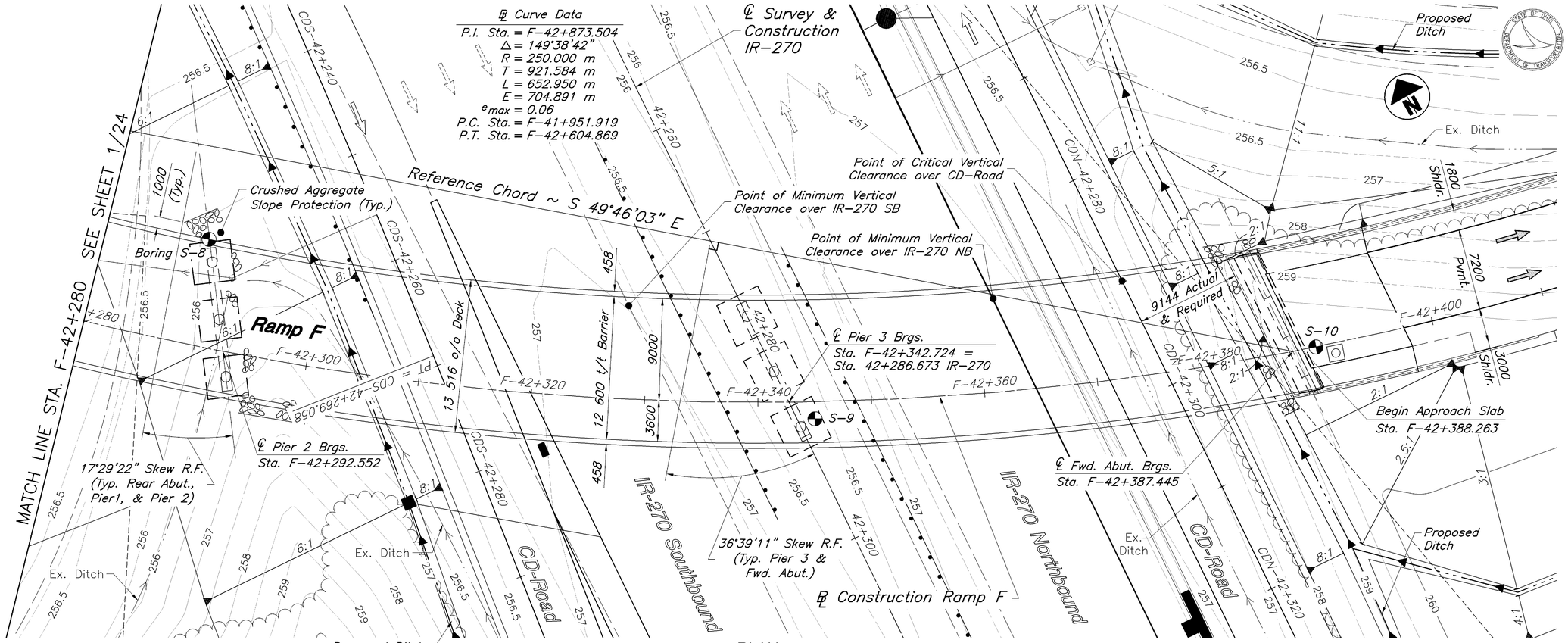
FRANKLIN COUNTY
STA. F–42+197.759
STA. F–42+388.263

SITE PLAN
BRIDGE NO. FRA–270–49208
RAMP F OVER RAMP H & IR–270

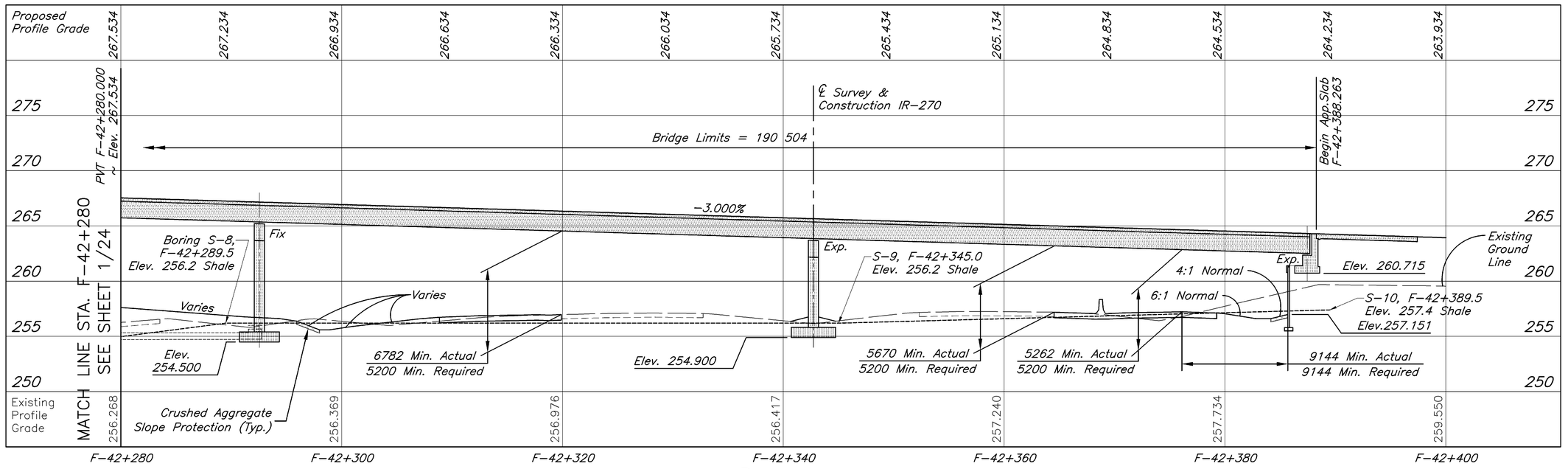
FRA–270–40.260

1/24

902/1039



PLAN



PROFILE ALONG ℄ CONSTRUCTION RAMP F

metric units

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DESIGNED	DRAWN	REVIEWED	DATE
SCK	SCK	JEM	12/22/97
CHECKED	REVISED	STRUCTURE FILE NUMBER	
CJS		2516616	

FRANKLIN COUNTY
STA. F-42+197.759
STA. F-42+388.263

SITE PLAN

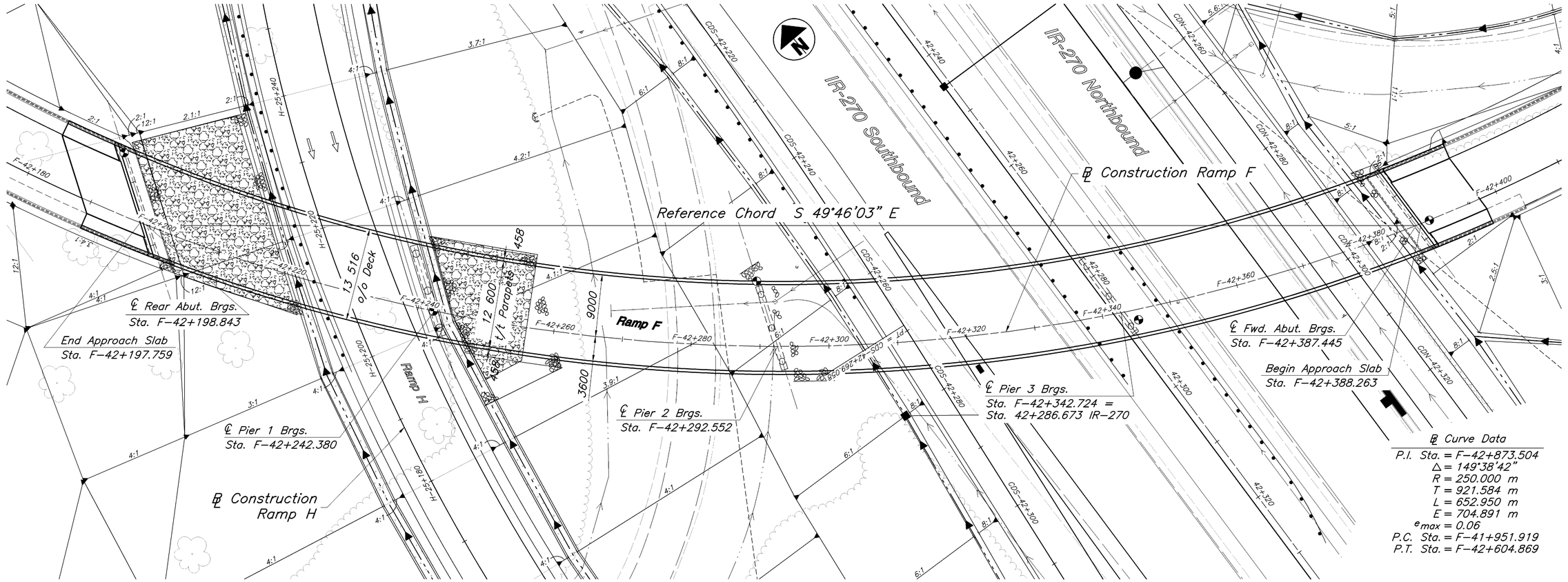
BRIDGE NO. FRA-270-49208
RAMP F OVER RAMP H & IR-270

FRA-270-40.260

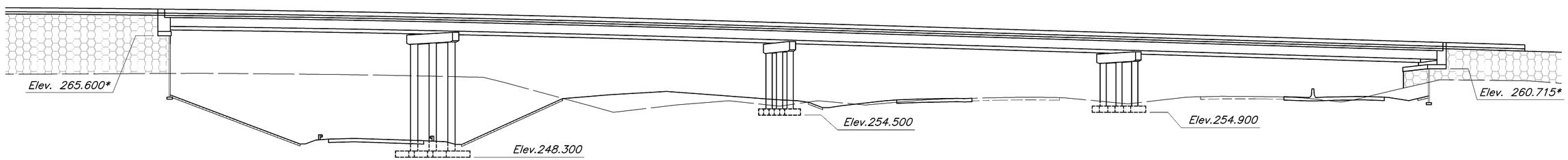
2 / 24

903
1039

metric units



GENERAL PLAN



ELEVATION

* – This Elevation Represents
The Bottom Of Footing (Hidden)

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DESIGNED	DRAWN	REVIEWED	DATE
GB	GB	JEM	04/13/01
CHECKED	REVISED	STRUCTURE FILE NUMBER	
LMG		2516616	

GENERAL PLAN AND ELEVATION

BRIDGE NO. FRA-270-49208
RAMP F OVER RAMP H & IR-270

FRA-270-40.260

3 / 24

904
1039

REFER to the following Standard Bridge Drawings:

AS–1–81	Dated (Revised)	07–19–02
BR–1	Dated (Revised)	07–19–02
EXJ–4–87	Dated (Revised)	07–19–02
GSD–1–96	Dated (Revised)	07–19–02

and to Supplemental Specifications:

864	Dated	07–11–00
894	Dated	10–18–02
898	Dated	01–17–03

DESIGN SPECIFICATIONS: This structure conforms to "Standard Specifications for Highway Bridges" adopted by the American Association of State Highway and Transportation Officials, 1996, including the 1997, 1998 and 1999 Interim Specifications, and the ODOT Bridge Design Manual.

DESIGN LOADING:
MS–22.5, Case II and the Alternate Military Loading.
Future wearing surface (FWS) of 2.87 KPa.

DESIGN DATA:
Concrete Class HP – compressive strength 31.0 MPa (superstructure)
Concrete Class QSC1 – compressive strength 27.5 MPa (substructure)

Reinforcing steel – ASTM A615M or A996M
Grade 420 minimum yield strength 420 MPa.
Spiral reinforcing may be plain bars, ASTM A82M or A615M.
Structural Steel
ASTM A709 Grade 50–yield strength 350 MPa

DECK PROTECTION METHOD: Epoxy coated reinforcing steel, 65 mm concrete cover, class HP concrete, and Treating of Concrete Surfaces.

MONOLITHIC WEARING SURFACE is assumed, for design purposes, to be 25 mm thick.

EMBANKMENT CONSOLIDATION: The MSE backfill shall be constructed approximately 45 days in advance of the abutment construction. Abutment construction shall begin only when the settlement rate decreases to the satisfaction of the engineer.

FOUNDATION BEARING PRESSURE: Abutment footings as designed, produce a maximum bearing pressure of 0.186 MPa. The allowable bearing pressure is 0.240 MPa.
Pier footings shall be placed in bedrock at the elevation shown. Pier footings, as designed, produce a maximum bearing pressure of 0.399 MPa. The allowable bearing pressure is 0.400 MPa.

ITEM 898, QC/QA CONCRETE, CLASS QSC1, SUBSTRUCTURE, AS PER PLAN: In addition to the requirements of Item 898, reference monuments shall be installed in each abutment spread footing. Each spread footing shall have two reference monuments installed , one at each end of the footing. The reference monument shall consist of a 25 M, or larger, epoxy coated rebar. It shall be embedded into the footing at least 150 mm and extend vertically 100 to 150 mm above the top of the footing. A 150 diameter, schedule 40, plastic pipe shall be installed around the reference monument; shall be vertical; and the top of the pipe shall be at the finished grade. The pipe shall have a removable, schedule 40, plastic cap. The pipe shall be centered on the reference monument. The bottom of the pipe shall be permanently attached to the top of the footing.

UTILITY LINES: The Utility(ies) shall bore all expense involved in relocating (installing) the affected utility lines. The Contractor and Utility(ies) are to cooperate by arranging their work in such a manner that inconvenience to either will be held to a minimum.

DOWEL HOLES: This item shall include the drilling or forming of holes into concrete and the furnishing and placing of grout into holes.

ITEM 503–UNCLASSIFIED EXCAVATION, INCLUDING SHALE, AS PER PLAN: Item 503 Excavation for Structures shall be measured as if the requirements of 201, 202, and 203 have been met in accordance with 503.11, even though the phasing of construction results in construction of the bridge prior to roadway excavation below. Undrained pits resulting from construction of bridge foundations prior to roadway construction shall be dewatered by mechanical methods or temporarily backfilled to prevent ponding. Costs for dewatering and/or temporary backfill with subsequent re–excavation shall be included in the Unit Price Bid for Item 503.

SETTING BEARINGS: The temperature of the steel is critical in setting the bearings. Note #2 on Sheet 20/24, which is modified from the normal setting temperature ranges, shall be strictly adhered to.

ITEM 514 – FIELD PAINTING OF STRUCTURAL STEEL, FINISH COAT: The Urethane top coat for the paint system shall be federal color standard No. 14062 (Dark Green).

metric units

The below table shall be completed for each installed reference monument.

PROJECT NUMBER	FRA 270–40.260	MAXIMUM BEARING PRESSURE	0.186 MPa
BRIDGE NUMBER	FRA–270–49208	STRUCTURE FILE NUMBER	2516616
REAR ABUTMENT		LEFT MONUMENT	RIGHT MONUMENT
AFTER FOOTING CONCRETE IS PLACED			
BEFORE PLACEMENT OF SUPERSTRUCTURE MEMBERS			
BEFORE DECK PLACEMENT			
AFTER DECK PLACEMENT			
PROJECT COMPLETED			
BENCHMARK LOCATION			

PROJECT NUMBER	FRA 270–40.260	MAXIMUM BEARING PRESSURE	0.177 MPa
BRIDGE NUMBER	FRA–270–49208	STRUCTURE FILE NUMBER	2516616
FORWARD ABUTMENT		LEFT MONUMENT	RIGHT MONUMENT
AFTER FOOTING CONCRETE IS PLACED			
BEFORE PLACEMENT OF SUPERSTRUCTURE MEMBERS			
BEFORE DECK PLACEMENT			
AFTER DECK PLACEMENT			
PROJECT COMPLETED			
BENCHMARK LOCATION			

ESTIMATED QUANTITIES

CALCULATED BY: CJS/LMG DATE: 03/08/01
CHECKED BY: LMG/JMG DATE: 03/15/01

ITEM	ITEM EXT.	TOTAL	UNIT	DESCRIPTION	AS PER PLAN	REAR ABUT.	PIER 1	PIER 2	PIER 3	FWD. ABUT.	SUPER.	GENERAL	AS BUILT
503	21103	275	CU. METER	UNCLASSIFIED EXCAVATION, INCLUDING SHALE, AS PER PLAN	4/24		140	46	89				
509	10000	176,443	KILOGRAM	EPOXY COATED REINFORCING STEEL		3192	12,368	7156	8426	2590	142,711		
511	52000	LUMP		CLASS HP CONCRETE, TEST SLAB							LUMP		
513	10100	LUMP		STRUCTURAL STEEL MEMBERS, LEVEL 5							LUMP		
513	20000	11,979	EACH	WELDED STUD SHEAR CONNECTORS							11,979		
514	00300	LUMP		FIELD PAINTING STRUCTURAL STEEL, INTERMEDIATE COAT	4/24						LUMP		
514	00401	LUMP		FIELD PAINTING STRUCTURAL STEEL, FINISH COAT, AS PER PLAN	4/24						LUMP		
516	11210	32	METER	STRUCTURAL EXPANSION JOINT INCLUDING ELASTOMERIC STRIP SEAL							32		
516	13900	10	SQ. METER	51mm PREFORMED EXPANSION JOINT FILLER		5				5			
516	44201	4	EACH	ELASTOMERIC BEARING WITH INTERNAL LAMINATES AND LOAD PLATE (NEOPRENE), AS PER PLAN (430x735x96.3 PAD, 460x765x79.7 AVG. PLATE)	20/24		4						
516	44201	4	EACH	ELASTOMERIC BEARING WITH INTERNAL LAMINATES AND LOAD PLATE (NEOPRENE), AS PER PLAN (420x610x92.5 PAD, 450x860x86.5 AVG. PLATE)	20/24			4					
516	44201	4	EACH	ELASTOMERIC BEARING WITH INTERNAL LAMINATES AND LOAD PLATE (NEOPRENE), AS PER PLAN (430x735x96.3 PAD, 460x765x80.7 AVG. PLATE)	20/24				4				
516	44401	4	EACH	ELASTOMERIC BEARING WITH INTERNAL LAMINATES AND LOAD PLATE (NEOPRENE), AS PER PLAN (380x508x160.5 PAD, 405x640x56.5 AVG. PLATE)	20/24	4							
516	44401	4	EACH	ELASTOMERIC BEARING WITH INTERNAL LAMINATES AND LOAD PLATE (NEOPRENE), AS PER PLAN (380x508x160.5 PAD, 405x640x57.5 AVG. PLATE)	20/24					4			
518	21200	52	CU. METER	POROUS BACKFILL WITH FILTER FABRIC		29				23			
518	40000	29	METER	150mm PERFORATED CORRUGATED PLASTIC PIPE		16				13			
518	40010	9	METER	150mm NON–PERFORATED CORRUGATED PLASTIC PIPE, INCLUDING SPECIALS		7				2			
526	30000	162	SQ. METER	REINFORCED CONCRETE APPROACH SLABS (T = 425 mm)								162	
864	10100	1658	SQ. METER	SEALING OF CONCRETE SURFACES (EPOXY – URETHANE)		71	201	119	100	55	1112		
894	10000	835	CU. METER	HIGH PERFORMANCE CONCRETE, FOR BRIDGE DECK WITH WARRANTY							835		
898	20001	374	CU. METER	QC/QA CONCRETE, CLASS QSC1, SUBSTRUCTURE, AS PER PLAN	4/24	64	117	70	74	49			

The Contractor shall establish a benchmark for determining elevations for the above table. The benchmark shall be the same throughout the project and shall be independent of all structures. Completed tables shall become part of the District's project plan records and a copy shall be sent to the Office of Structural Engineering.

ABBREVIATION LEGEND

Ex. = Existing
Brgs. = Bearings
NB = North Bound
SB = South Bound
Abut. = Abutment
Sta. = Station
R.F. = Right Forward
L.F. = Left Forward
Clr. = Clear
t/t = Toe to Toe
o/o = Out to Out
Min. = Minimum
Typ. = Typical
C.J. = Construction Joint
N.F. = Near Face
F.F. = Far Face
ø = Diameter
PEJF = Preformed Expansion Joint Filler
Elev. = Elevation
FTG. = Footing
R.A. = Rear Abutment
F.A. = Forward Abutment
P = Pier
B = Beam
℄ = Centerline
Bott. = Bottom
Fwd. = Forward
c/c = Center to Center
Ea. = Each
℗ = Plate
Std. = Indicates a Standard Bend at the End of a Bar
INCR = Increment
STR = Straight

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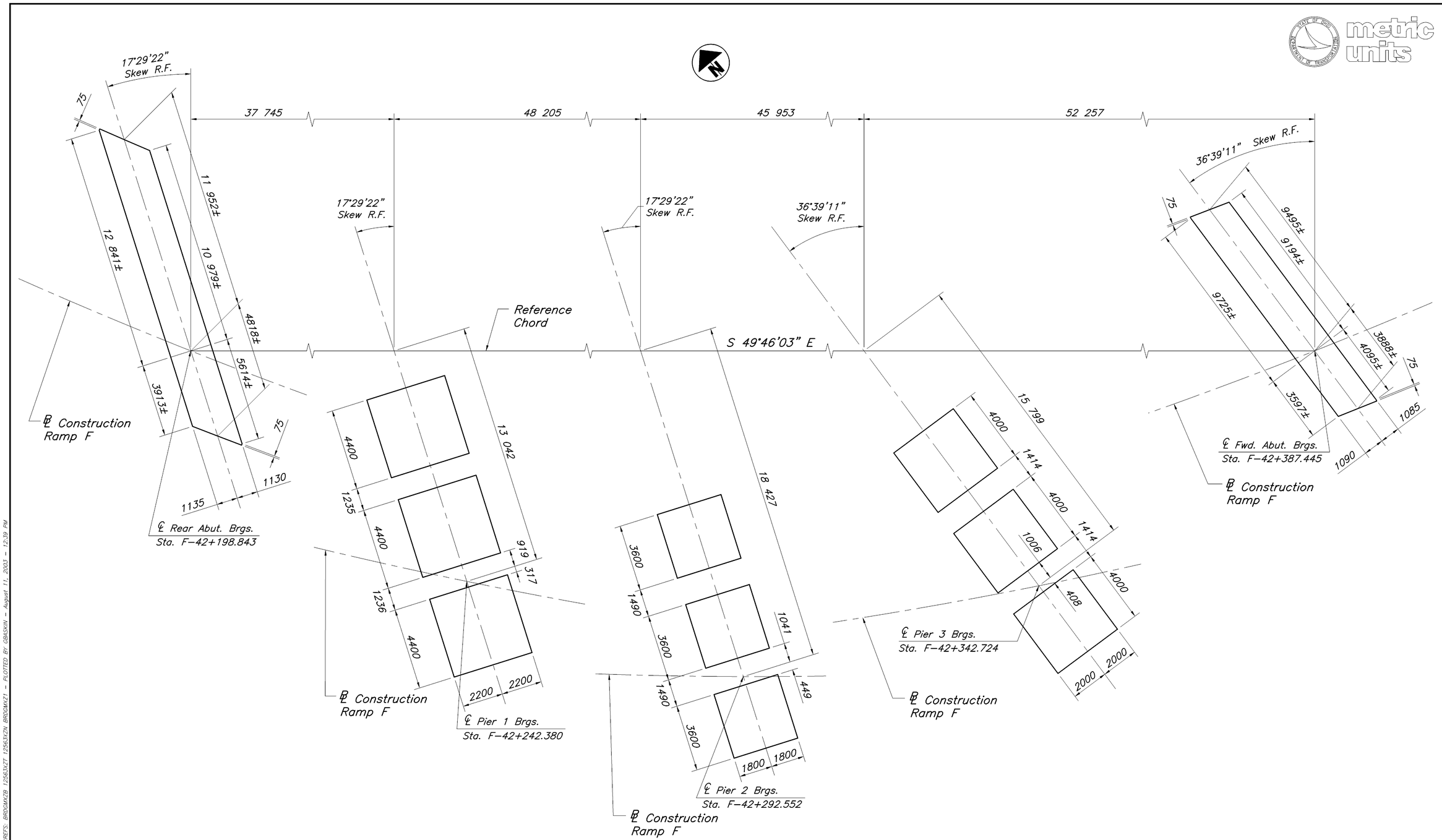
REVIEWED JEM 04/13/01 | STRUCTURE FILE NUMBER 2516616
DRAWN GB | REVISED
DESIGNED CJS|LMG | CHECKED LMG|JMG

GENERAL NOTES & ESTIMATED QUANTITIES

BRIDGE NO. FRA–270–49208
RAMP F OVER RAMP H & IR–270

FRA–270–40.260



FOUNDATION PLAN

metric units

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EVANS, MECHWART, HAMBLETON & TILTON, INC.
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DESIGNED	DRAWN	REVIEWED	DATE
LMG	GB	JEM	04/13/01
CHECKED	REVISED	STRUCTURE FILE NUMBER	
JMG		2516616	

FOUNDATION PLAN
BRIDGE NO. FRA–270–49208
RAMP F OVER RAMP H & IR–270

FRA–270–40.260

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906
1039

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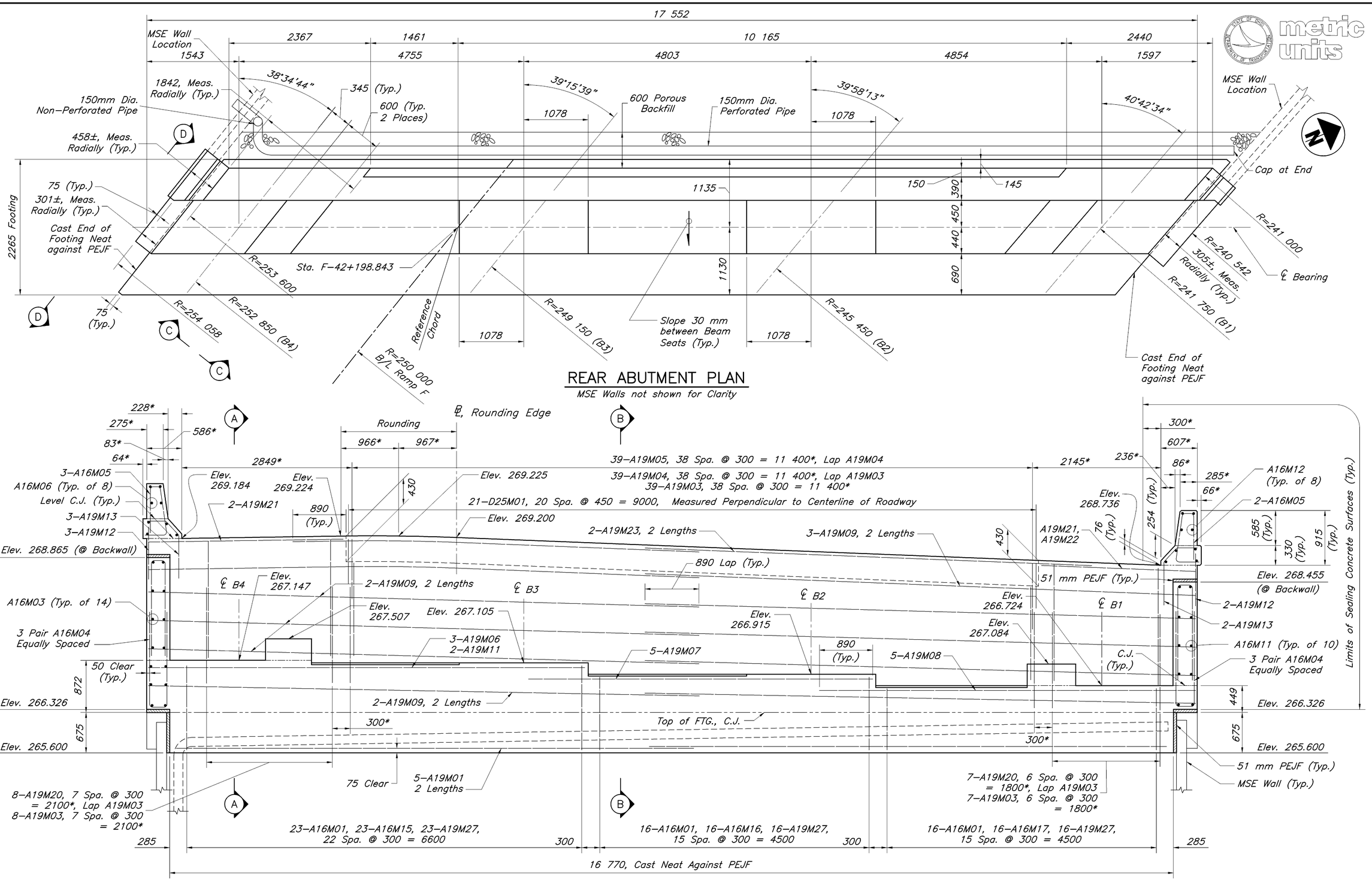

REAR ABUTMENT ELEVATION

Superstructure not shown for Clarity
All Dimensions Measured @ ℄ Bearing, Unless Noted

* – Measured along Top of Backwall (N.F.)

metric units

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DESIGNED	DRAWN	REVIEWED	DATE
LMG	GB	JEM	04/13/01
CHECKED	REVISED	STRUCTURE FILE NUMBER	
JMG		2516616	

REAR ABUTMENT PLAN & ELEVATION

BRIDGE NO. FRA-270-49208
RAMP F OVER RAMP H & IR-270

FRA-270-40.260

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907
1039

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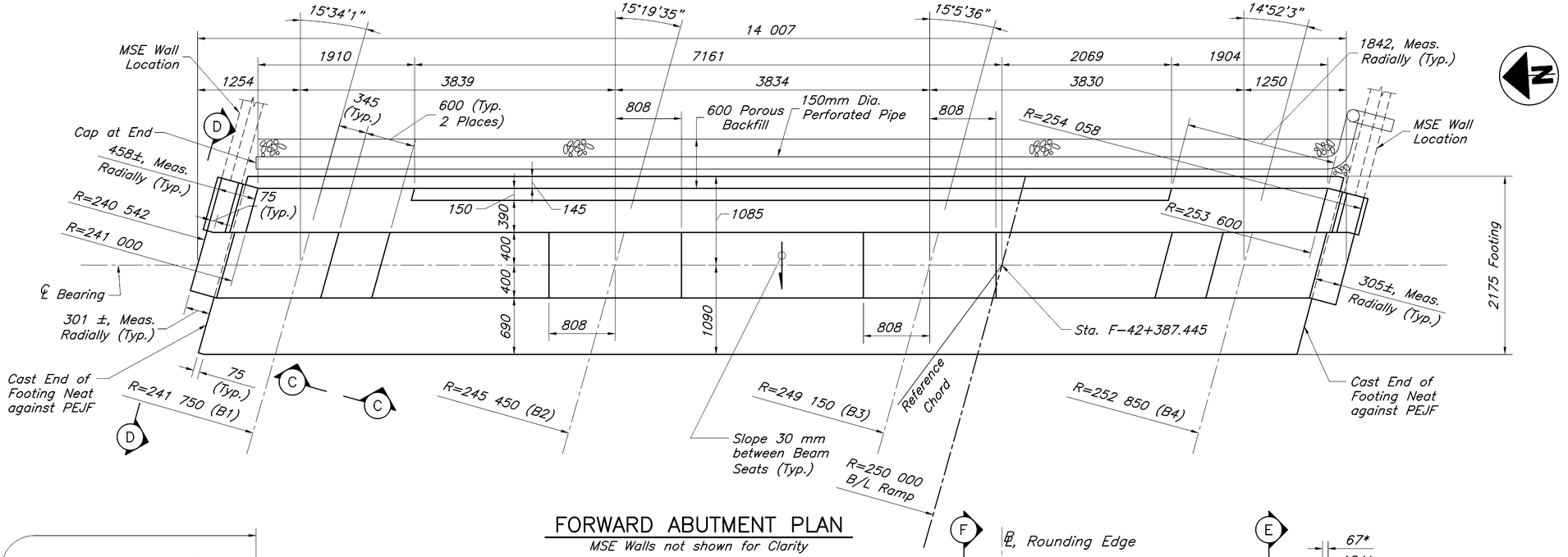
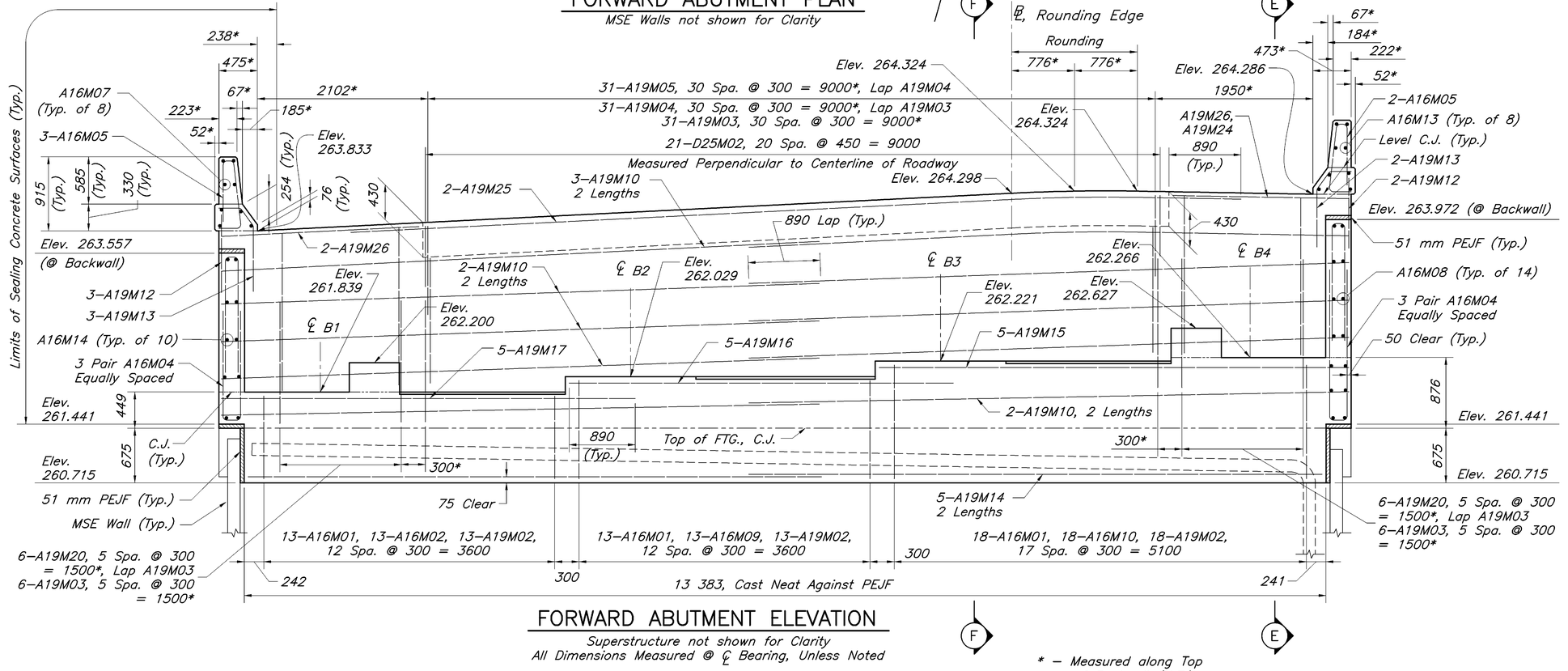
metric units



FORWARD ABUTMENT PLAN

MSE Walls not shown for Clarity



FORWARD ABUTMENT ELEVATION

Superstructure not shown for Clarity
All Dimensions Measured @ ℄ Bearing, Unless Noted

* – Measured along Top of Backwall (N.F.)

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CHECKED	REVISED	STRUCTURE FILE NUMBER	
JMG		2516616	

ELEVATION

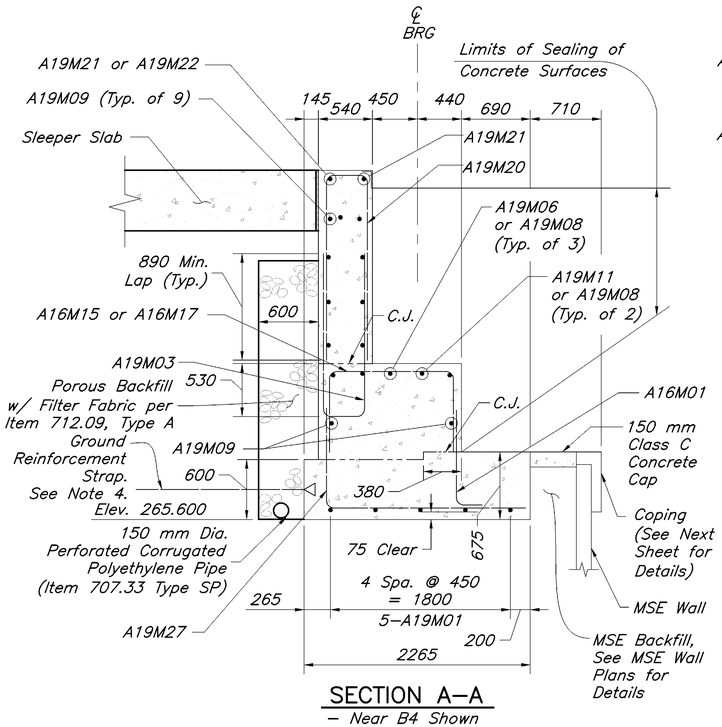
FORWARD ABUTMENT PLAN & ELEVATION

BRIDGE NO. FRA-270-49208
RAMP F OVER RAMP H & IR-270

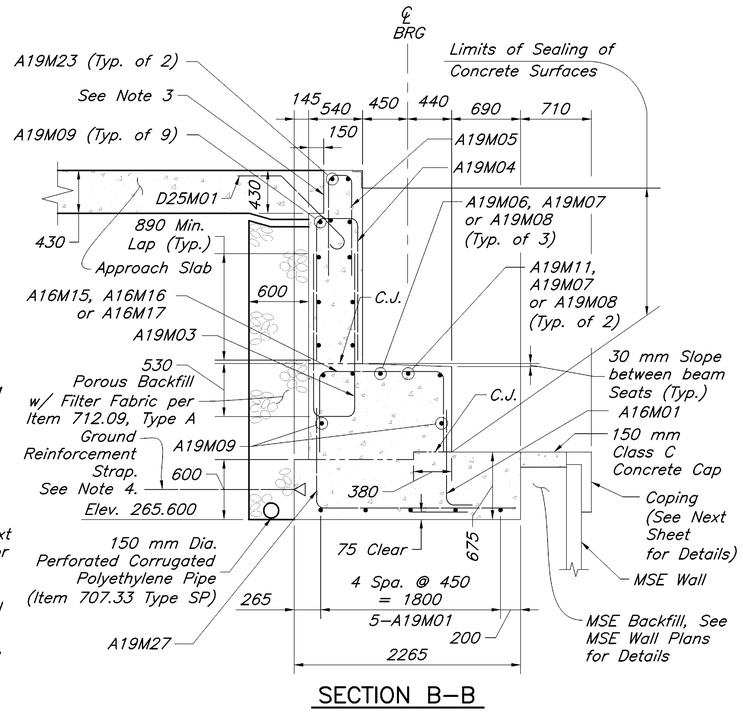
FRA-270-40.260

7 / 24

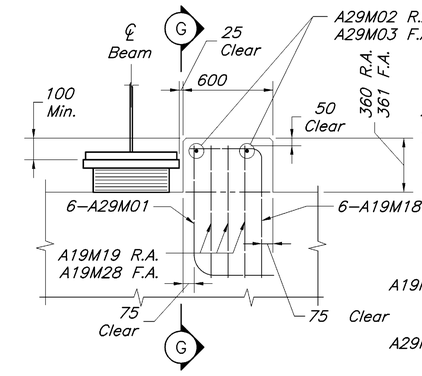
908
1039



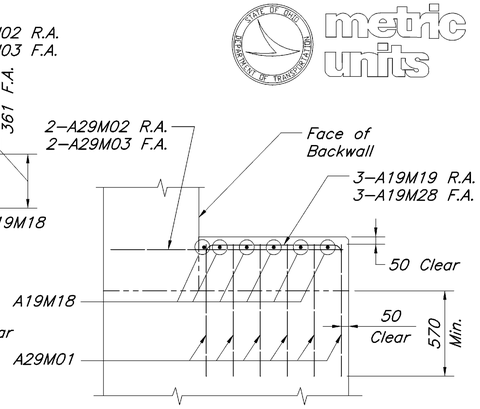
SECTION A–A
– Near B4 Shown
– Near B1 Similar



SECTION B–B

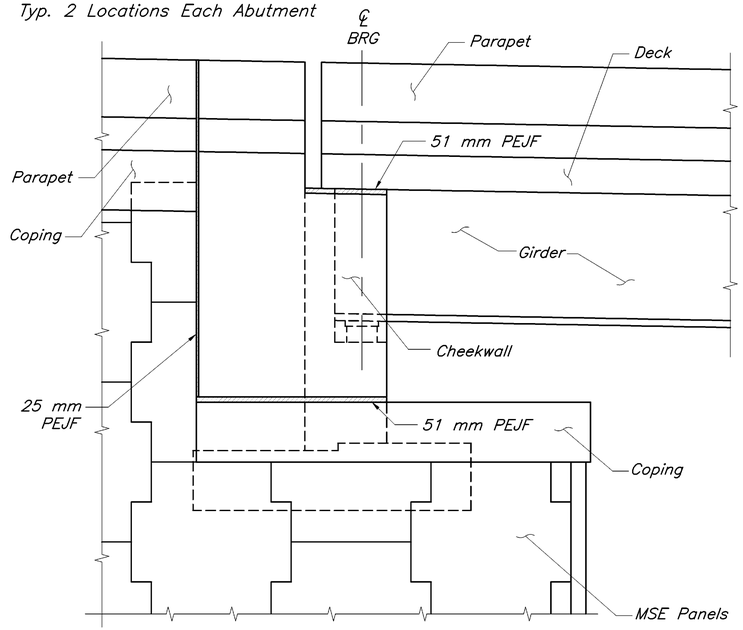


VIEW C–C

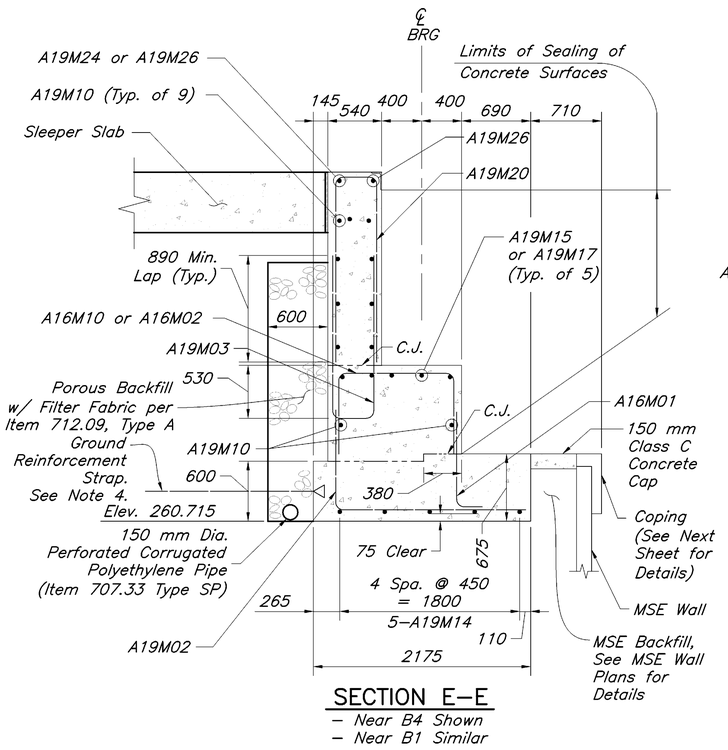


SECTION G–G

Notes: Concrete Cover Will Be 50 mm Unless Otherwise Noted.
Typ. 2 Locations Each Abutment



VIEW D–D
Right Rear Shown, Others Similar



SECTION E–E
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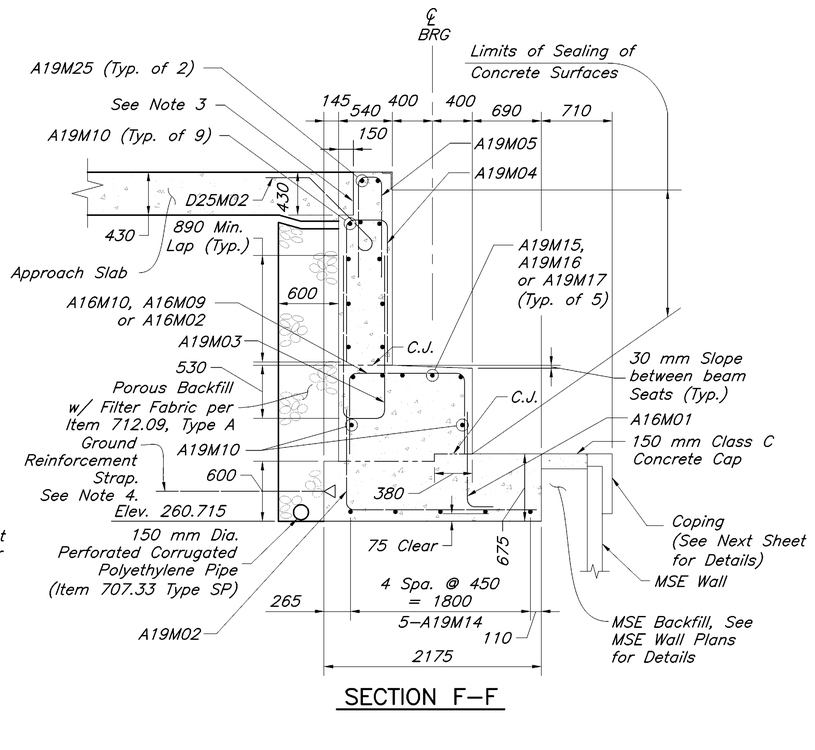
– Near B1 Similar



SECTION F–F

NOTES

1. *BACKWALL CONCRETE: In addition to SS 898, backwall concrete above the optional construction joint at the approach slab seat shall not be placed until after the deck concrete in the span adjacent to the abutment has been placed.*
2. *INSTALLATION OF SEAL: During installation of the support/armor for the superstructure side of the expansion joint seal, the seating of beams on bearings shall be carefully observed to assure that positive bearing is maintained. Proper elevation of the support/armor shall be achieved by adjusting the connection angles and bolts between beam and expansion joint.*
3. *POROUS BACKFILL WITH FILTER FABRIC: 600 mm Thick shall extend up to the plane of the subgrade, to 300 mm below the embankment surface, and laterally to the ends of the MSE Walls.*
4. *STRIPS: See proprietary Wall Shop Drawings for strip details in abutment footings. Strips are to be placed prior to pouring footing concrete.*

metric units

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LMG	GB	JEM	04/13/01
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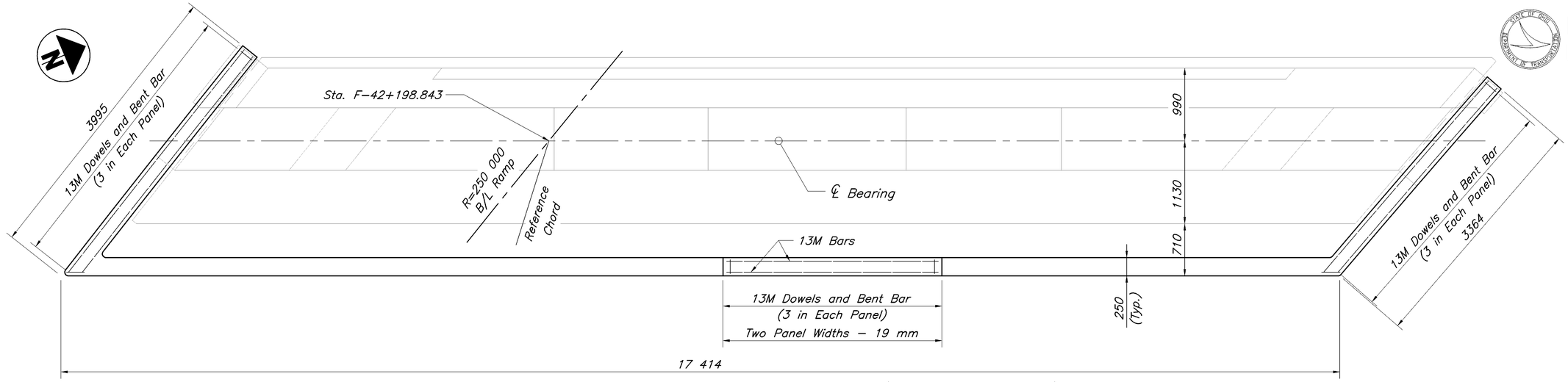
JMG		2516616	

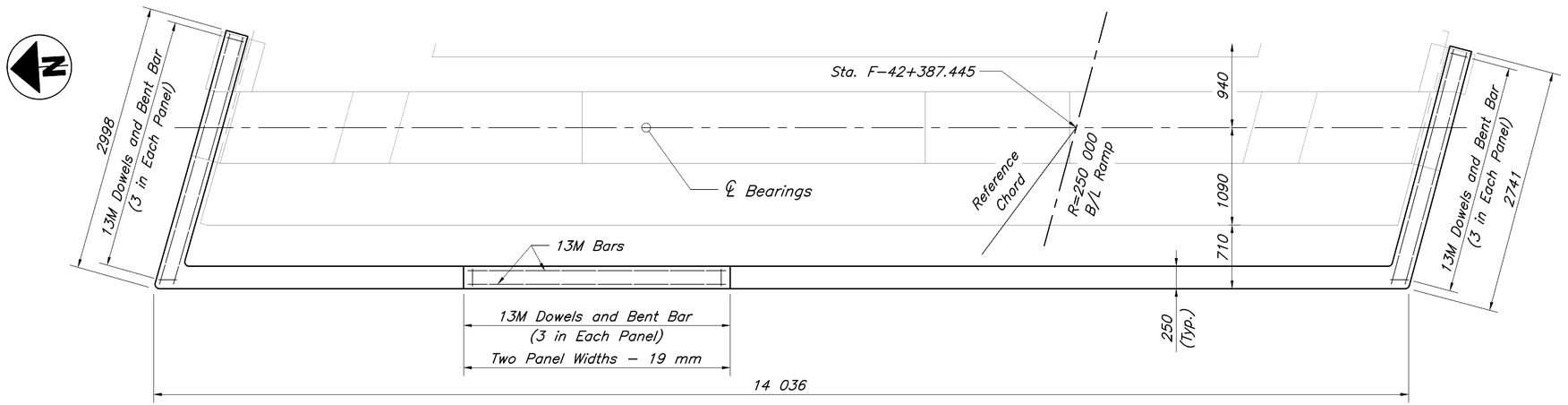
ABUTMENT DETAILS

BRIDGE NO. FRA–270–49208
RAMP F OVER RAMP H & IR–270

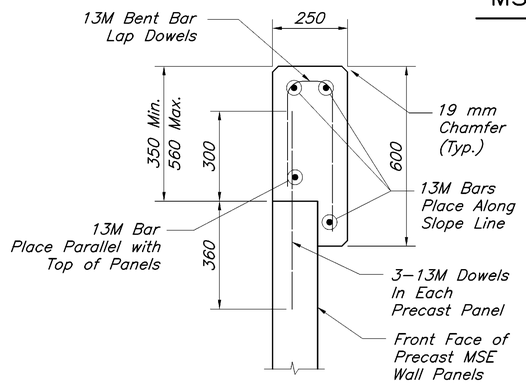
FRA–270–40.260



MSE WALL COPING SCHEMATIC PLAN (REAR ABUTMENT)



MSE WALL COPING SCHEMATIC PLAN (FORWARD ABUTMENT)

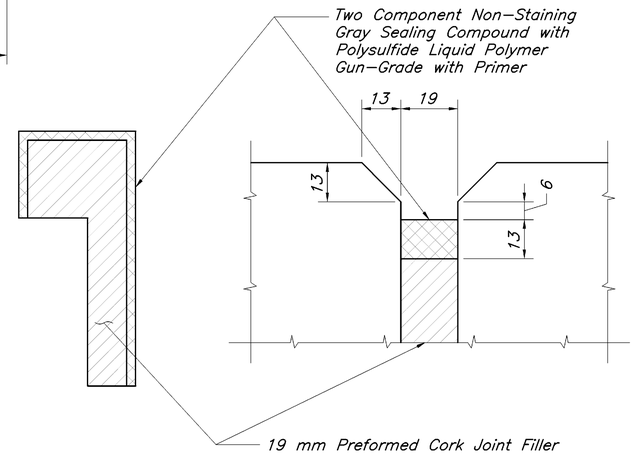


MSE WALL COPING

See Note 1

NOTES:

1. *Construction joints in coping shall be at 2 panel intervals and coincide approximately with centerline of panel joint. Reinforcing steel shall be stopped 50 mm short of each side of the joints.*
2. *Provide 13 mm expansion joints every 9150 mm or less to coincide with panel joints.*
3. *Quantities of concrete, reinforcing steel, and expansion joint material for coping are included with MSE walls for payment.*



COPING EXPANSION JOINT DETAIL

metric units

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CONSULTING ENGINEERS & SURVEYORS
EVANS, MECHWART, HAMBLETON & TILTON, INC.
170 MILL STREET GAHANNA, OHIO 43230

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LMG	GB	JEM	04/13/01
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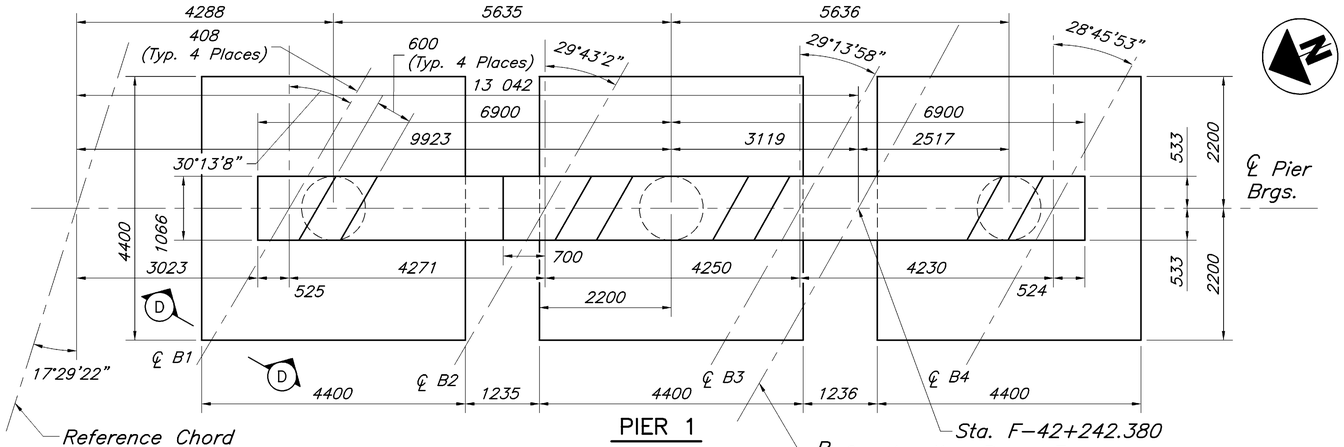
JMG		2516616	

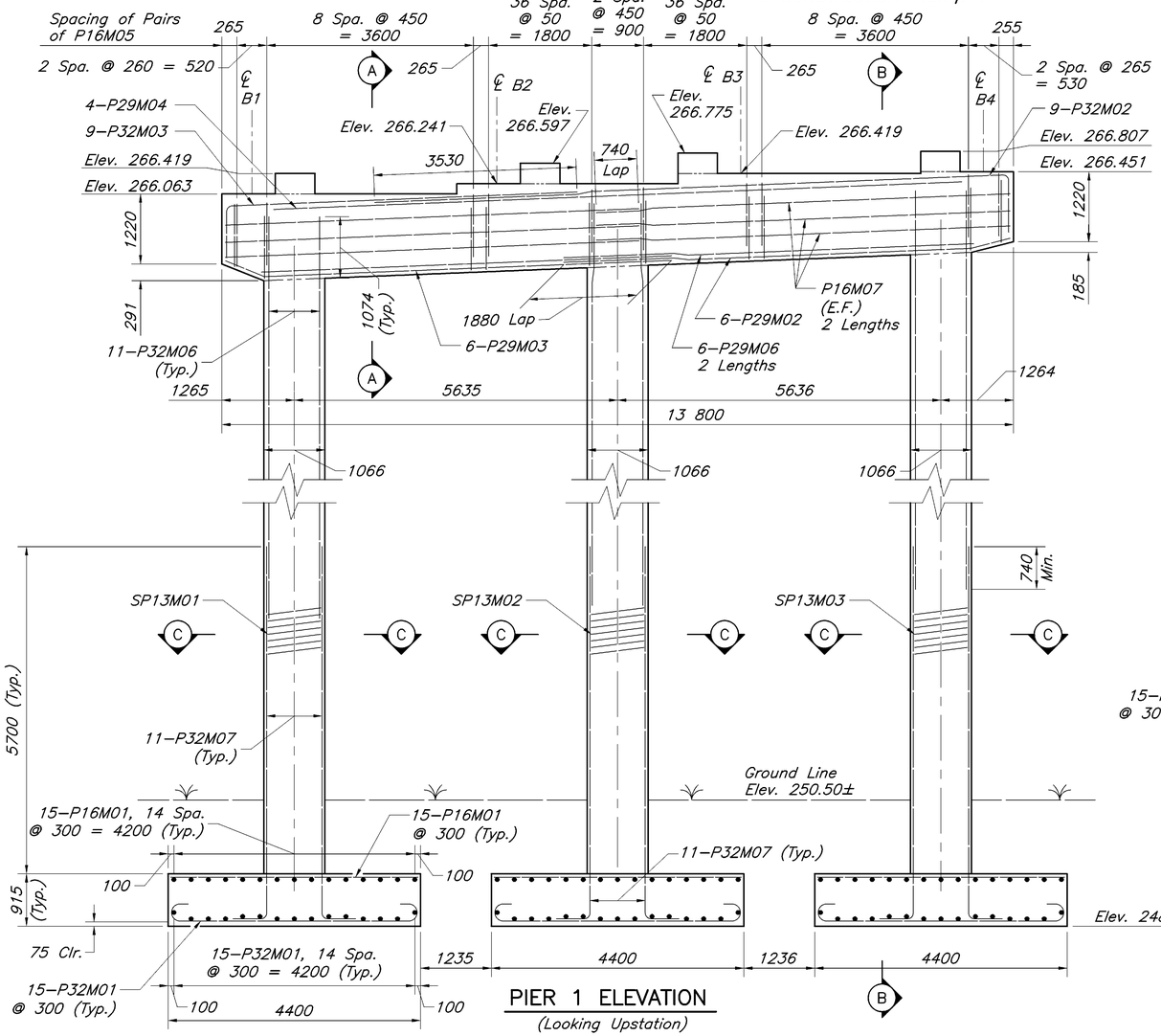
MSE WALL COPING DETAILS

BRIDGE NO. FRA–270–49208
RAMP F OVER RAMP H & IR–270

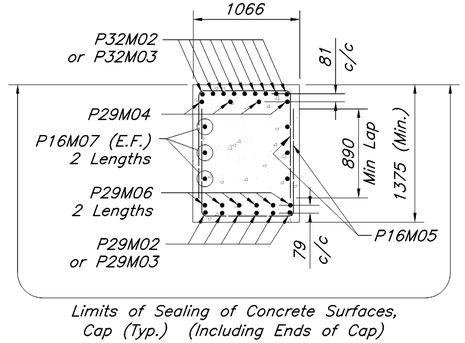
FRA–270–40.260



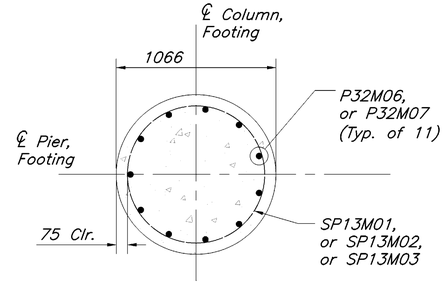
PIER 1



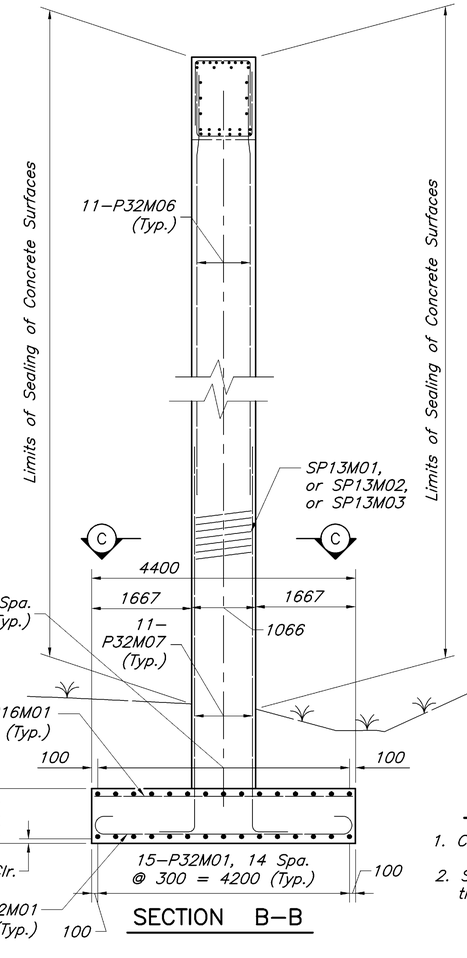
PIER 1 ELEVATION
(Looking Upstation)



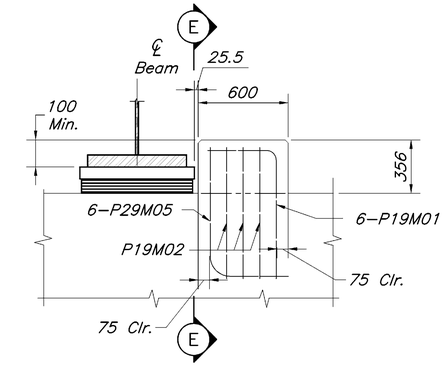
SECTION A-A



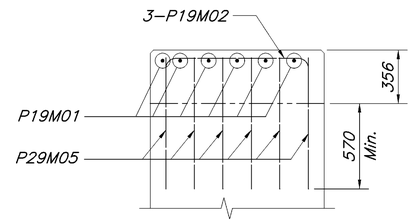
SECTION C-C



SECTION B-B



VIEW D-D
Typ. 4 Locations / Pier



VIEW E-E

NOTES

1. Concrete Cover will be 50 mm unless otherwise noted.
2. Spiral Reinforcing to extend a minimum of 50 mm into the Pier Cap.

metric units

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170 MILL STREET GAHANNA, OHIO 43230

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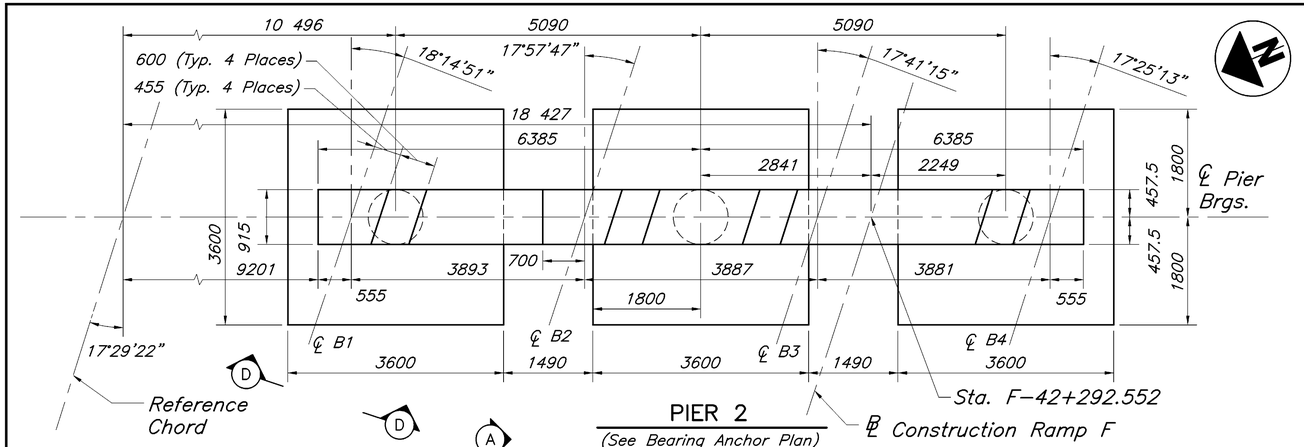
PIER 1 PLAN & ELEVATION

BRIDGE NO. FRA-270-40.260
RAMP F OVER RAMP H & IR-270

FRA-270-40.260

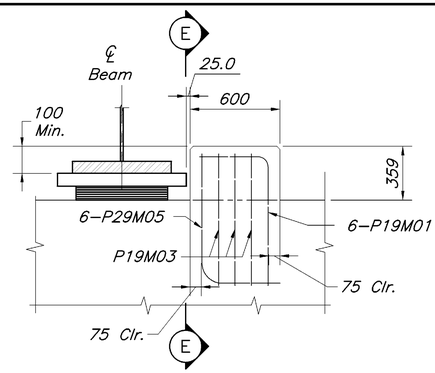
10/24

911/1039



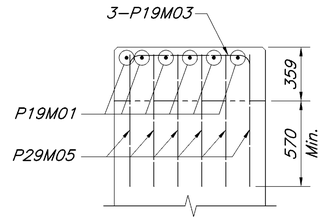
PIER 2

(See Bearing Anchor Plan)

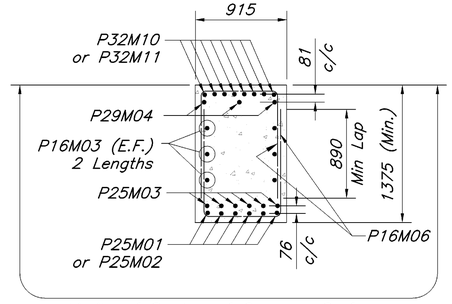


VIEW D-D

Typ. 4 Locations / Pier

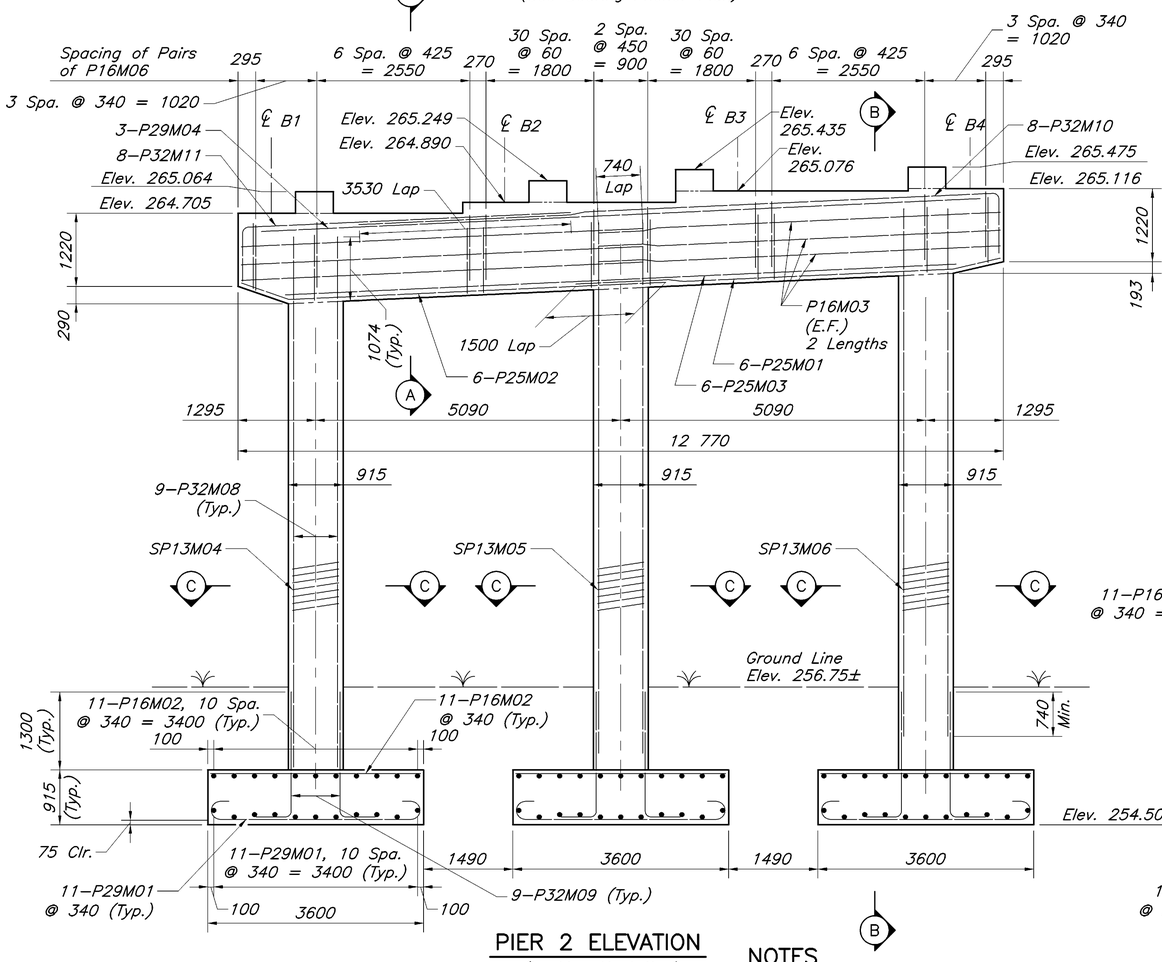


VIEW E-E



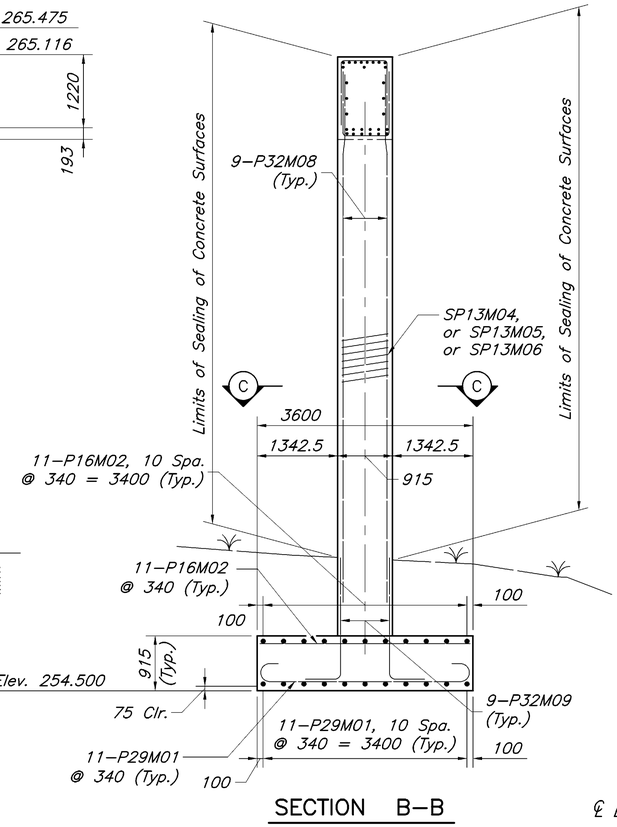
Limits of Sealing of Concrete Surfaces, Cap (Typ.) (Including Ends of Cap)

SECTION A-A

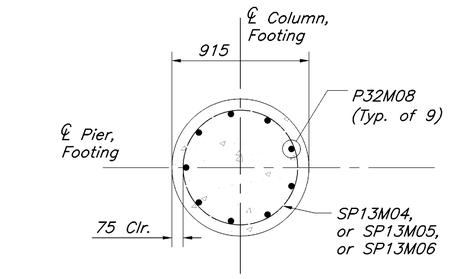


PIER 2 ELEVATION

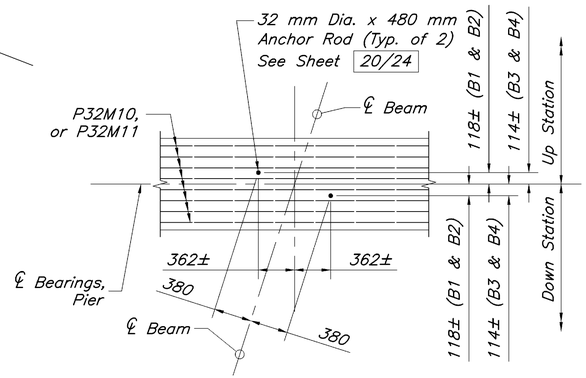
(Looking Upstation)



SECTION B-B



SECTION C-C



BEARING ANCHOR PLAN

See Note 1

NOTES

1. *BRIDGE SEAT REINFORCING:* Reinforcing Steel in the Vicinity of the Bridge Seat shall be accurately placed to avoid Interference with the Drilling of Bearing Anchor Holes or the Pre-setting of Bearing Anchors.
2. Concrete Cover will be 50 mm unless otherwise noted.
3. Spiral Reinforcing to extend a minimum of 50 mm into the Pier Cap.

metric units

STATE OF OHIO DEPARTMENT OF TRANSPORTATION

EMH inc
CONSULTING ENGINEERS & SURVEYORS
EVANS, MECHWART, HAMBLETON & TILTON, INC.
170 MILL STREET GAHANNA, OHIO 43230

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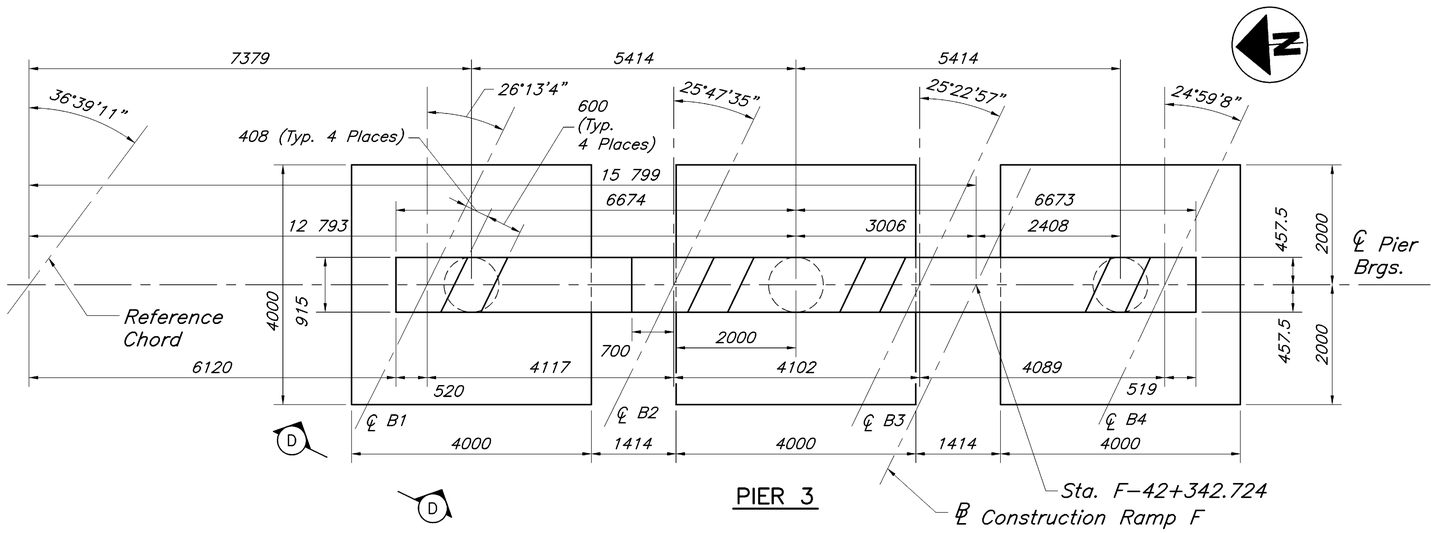
PIER 2 PLAN & ELEVATION

BRIDGE NO. FRA-270-49208
RAMP F OVER RAMP H & IR-270

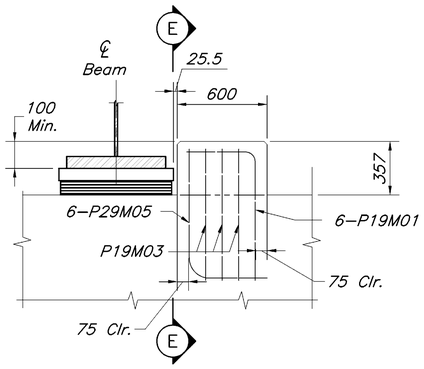
FRA-270-40.260

11/24

912
1039

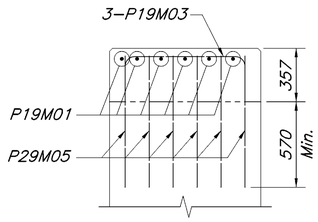


PIER 3

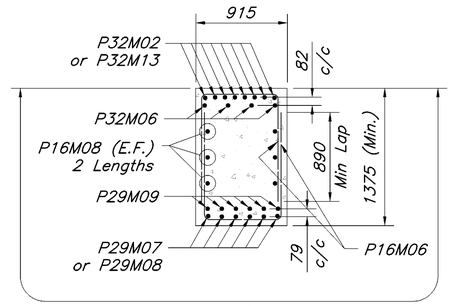


VIEW D–D

Typ. 4 Locations / Pier

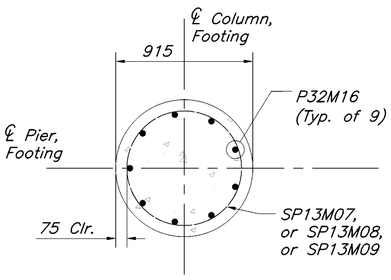


VIEW E–E

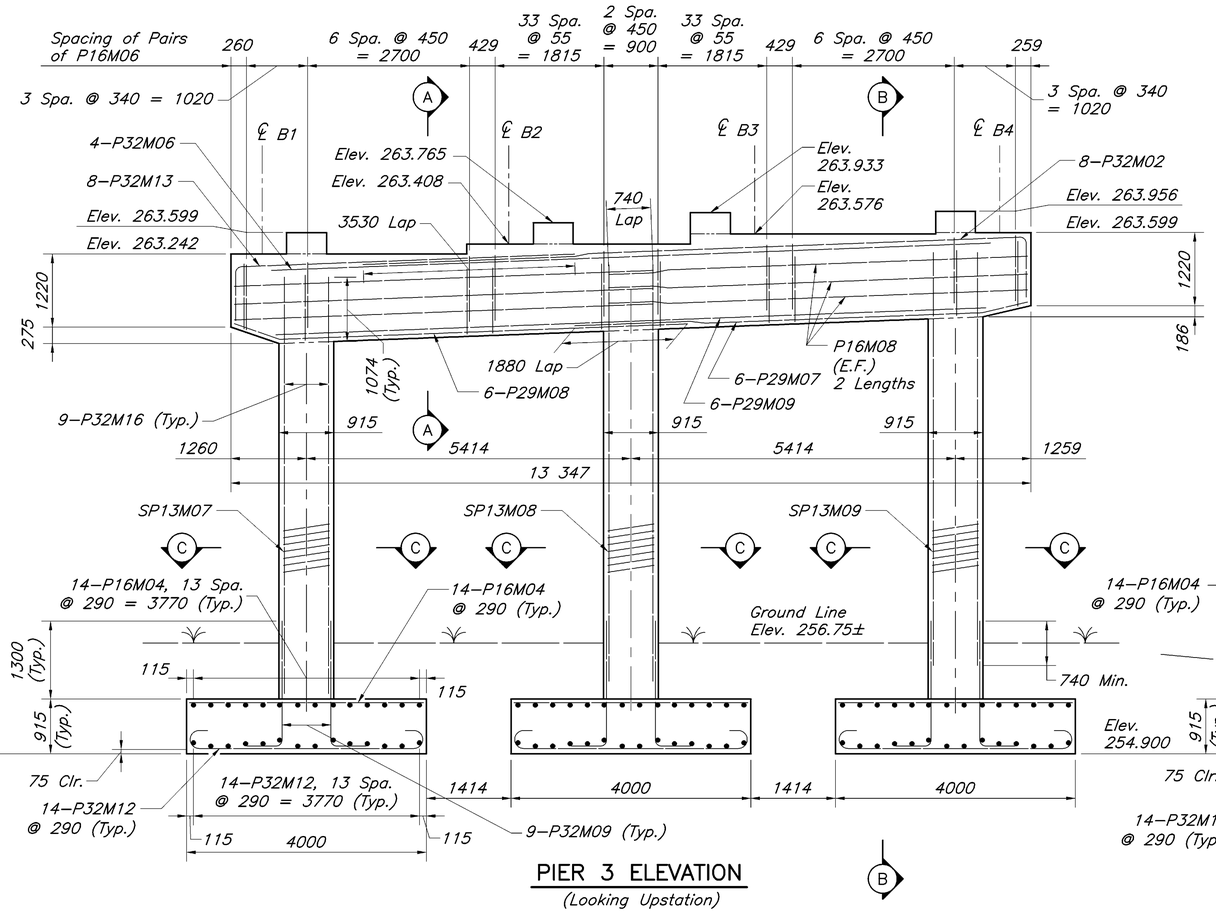


Limits of Sealing of Concrete Surfaces, Cap (Typ.) (Including Ends of Cap)

SECTION A–A

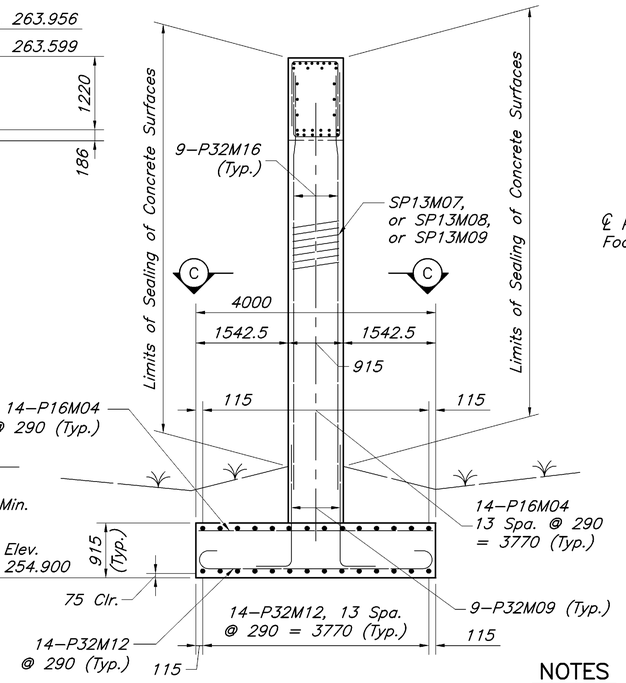


SECTION C–C



PIER 3 ELEVATION

(Looking Upstation)



SECTION B–B

NOTES

1. Concrete Cover will be 50 mm unless otherwise noted.
2. Spiral Reinforcing to extend a minimum of 50 mm into the Pier Cap.

metric units

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170 MILL STREET GAHANNA, OHIO 43230

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PIER 3 PLAN & ELEVATION

BRIDGE NO. FRA–270–49208
RAMP F OVER RAMP H & IR–270

FRA–270–40.260

12/24

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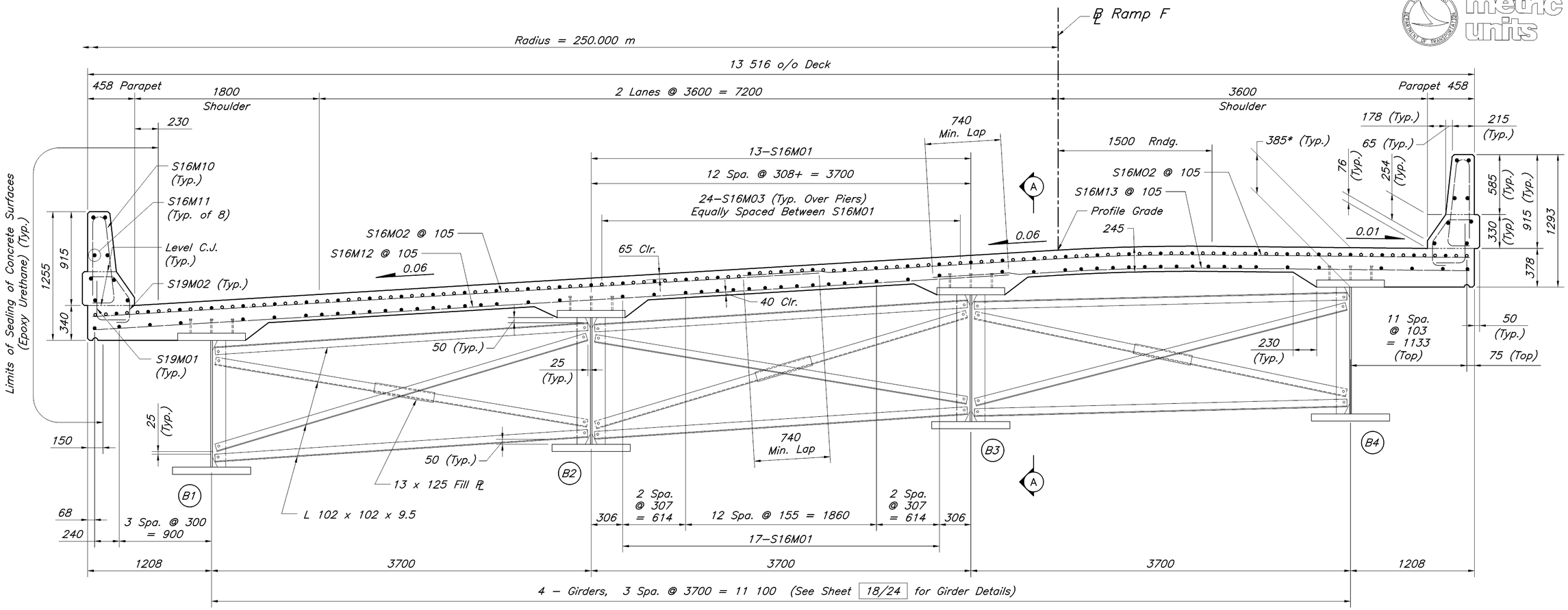
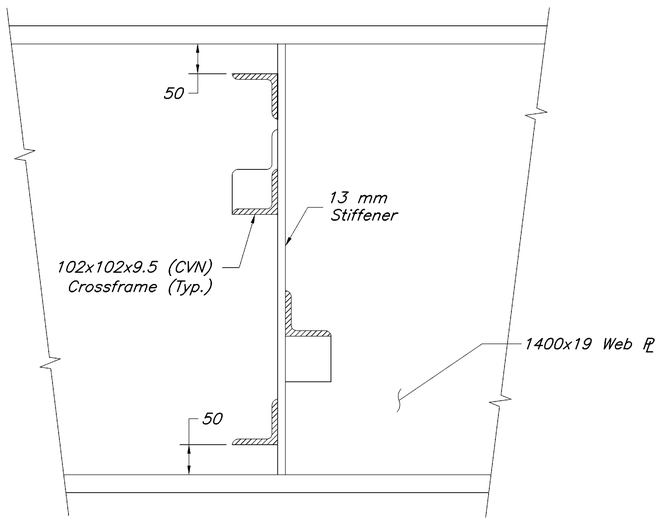
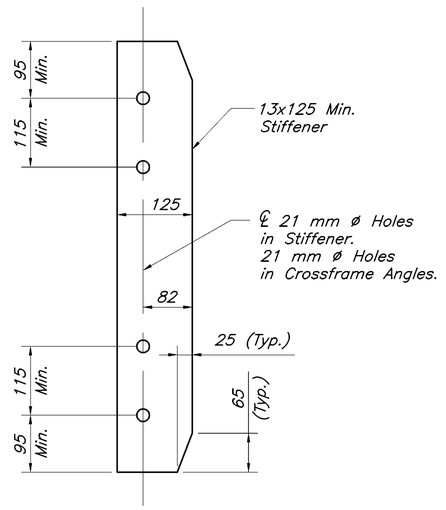


TRANSVERSE SECTION



SECTION A–A



CONNECTION ℄ DETAIL

LEGEND:

*** DECK SLAB CONCRETE QUANTITY:** The estimated quantity of deck slab concrete is based on the constant deck slab thickness, as shown, plus the quantity of concrete that forms each beam/ girder haunch. The estimate assumes a constant haunch thickness of 50 mm and a constant haunch width outside the edge of each beam/ girder flange of 230 mm. Deviate from this haunch thickness as necessary to place the deck surface at the finished grade. The allowable tolerance for the haunch width outside the edge of each beam/ girder flange is ±75 mm.

THE HAUNCH THICKNESS was measured at the centerline of the beam/ girder, from the surface of the deck to the bottom of the top flange minus the deck slab thickness. The area of all embedded steel plates has been deducted from the haunch quantity in accordance with 511.24.

NOTES:

1. All beam and cross frame material shall meet specific minimum notch toughness requirements (CVN), as specified in 711.01 of the CMS.
2. Intermediate cross frames are Type 3, with the addition of a top horizontal member. See standard drawing GSD–1–96.
3. End cross frames shall conform to standard drawing GSD–1–96, sheet 2/3, with additional information from standard drawing EXJ–4–87, sheet 1/5.

metric units

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EVANS, MECHWART, HAMBLETON & TILTON, INC.
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TYPICAL TRAVERSE SECTION

BRIDGE NO. FRA–270–49208
RAMP F OVER RAMP H & IR–270

FRA–270–40.260

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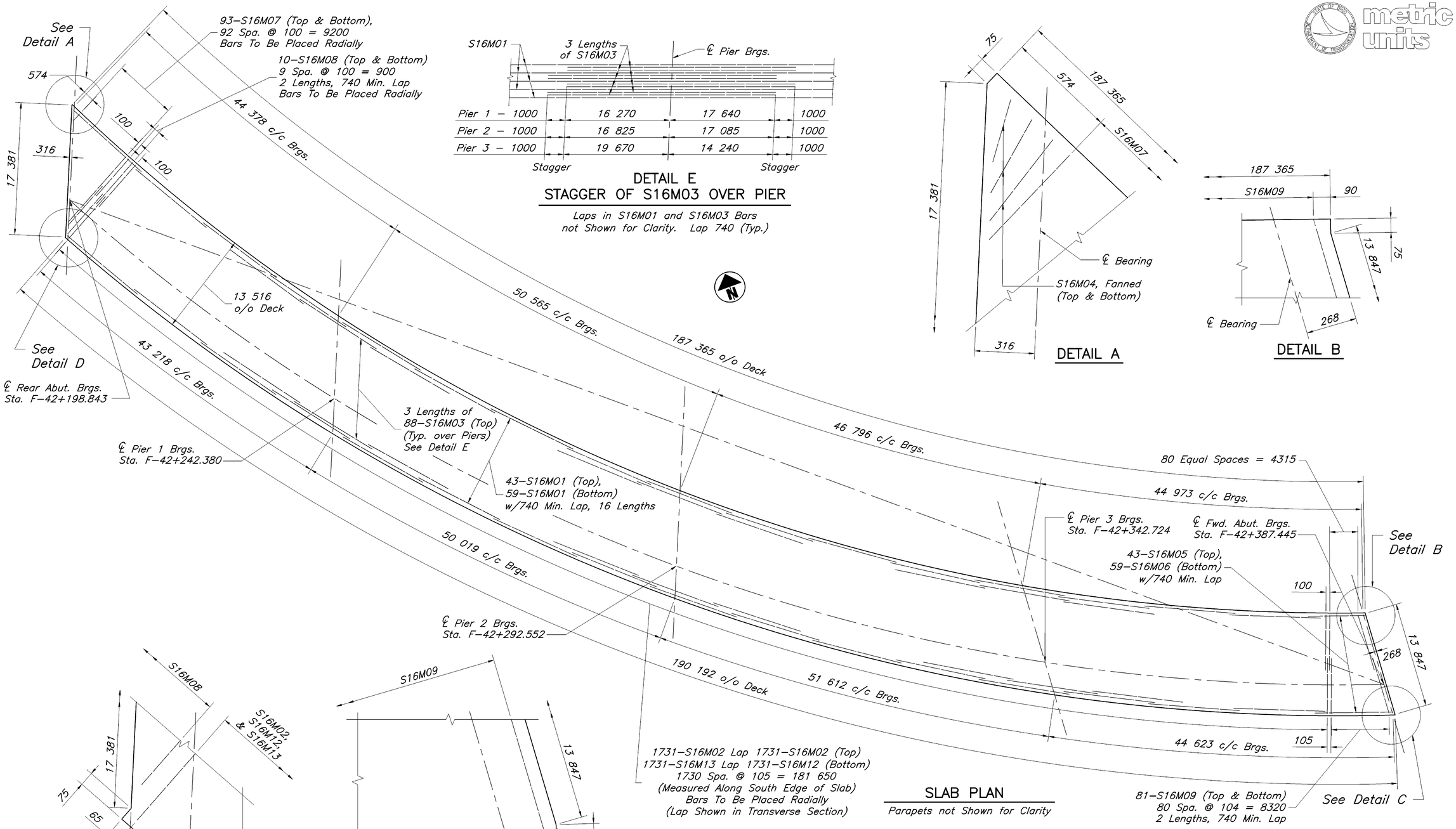
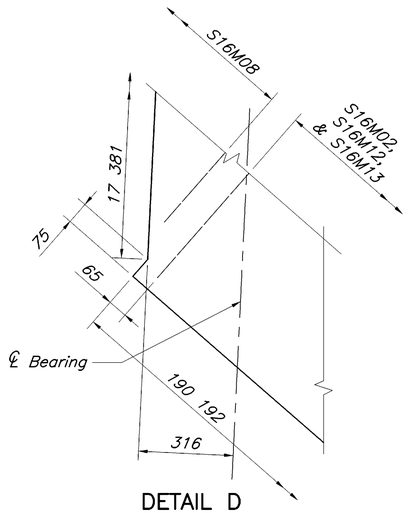


DETAIL E
STAGGER OF S16M03 OVER PIER

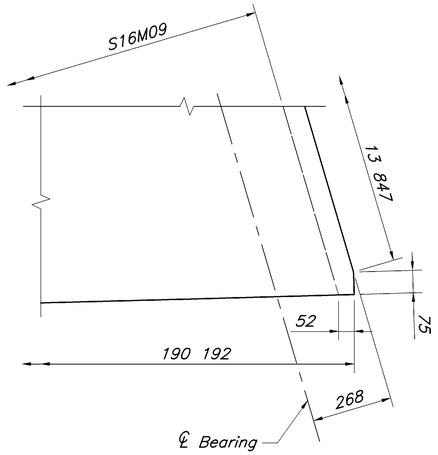
Laps in S16M01 and S16M03 Bars not Shown for Clarity. Lap 740 (Typ.)

DETAIL A

DETAIL B



DETAIL D



DETAIL C

metric units

EMH&T INC. CONSULTING ENGINEERS & SURVEYORS
EVANS, MECHWART, HAMBLETON & TILTON, INC.
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SLAB PLAN

BRIDGE NO. FRA–270–4920
RAMP F OVER RAMP H & IR–270

FRA–270–40.260

14/24

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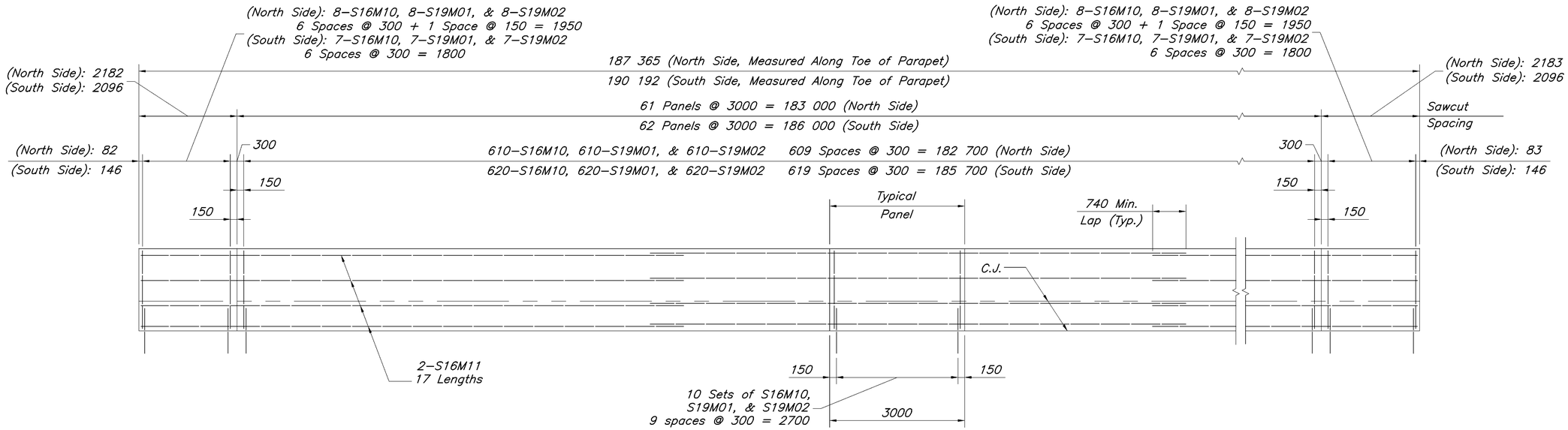
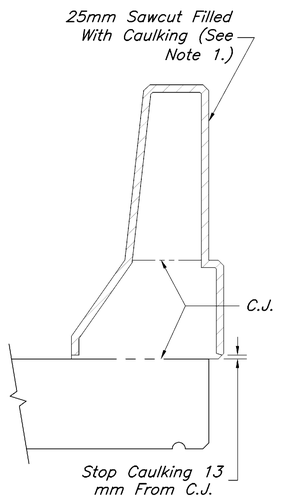


PARAPET ELEVATION

Slab Not Shown for Clarity
North Side Inside Elevation Shown
South Side Elevation Similar



PARAPET SAWCUT DETAIL

NOTES

1. The Cost of Sawcutting and Caulking shall be Included with Item 894, Class HP Concrete for Payment.
2. For Typical Cross Section within Bridge Limits, See Sheet 13/24
3. For Slab Plan and Additional Notes, See Sheet 14/24

metric units

EMH inc
CONSULTING ENGINEERS & SURVEYORS
EVANS, MECHWART, HAMBLETON & TILTON, INC.
170 MILL STREET GAHANNA, OHIO 43230

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PARAPET DETAILS
BRIDGE NO. FRA–270–49208
RAMP F OVER RAMP H & IR–270

FRA–270–40.260

15/24

916
1039

SCREED ELEVATION

LOCATION	SPAN 1															
	℄ BRG. REAR ABUT.		1/5 SPAN 1		2/5 SPAN 1		1/2 SPAN 1		3/5 SPAN 1		SPLICE		4/5 SPAN 1		℄ BRG PIER 1	
	STATION	ELEVATION	STATION	ELEVATION	STATION	ELEVATION	STATION	ELEVATION	STATION	ELEVATION	STATION	ELEVATION	STATION	ELEVATION	STATION	ELEVATION
INSIDE TOE	42+191.158	268.730	42+201.406	268.669	42+211.028	268.566	42+215.642	268.498	42+220.140	268.419	42+224.244	268.334	42+228.825	268.242	42+237.148	268.063
(B1)	42+191.828	268.769	42+202.017	268.707	42+211.591	268.603	42+216.183	268.535	42+220.661	268.456	42+224.972	268.366	42+229.310	268.278	42+237.601	268.099
(B2)	42+195.053	268.960	42+204.963	268.893	42+214.304	268.788	42+218.793	268.717	42+223.176	268.637	42+227.605	268.542	42+231.652	268.457	42+239.791	268.277
(B3)	42+198.149	269.150	42+207.798	269.081	42+216.919	268.972	42+221.311	268.900	42+225.602	268.824	42+229.506	268.732	42+233.913	268.637	42+241.905	268.455
℄, ROUNDING EDGE	42+198.843	269.194	42+208.434	269.124	42+217.507	269.014	42+221.877	268.942	42+226.148	268.864	42+230.163	268.771	42+234.422	268.678	42+242.380	268.496
CENTER OF ROUNDING	42+199.450	269.219	42+208.991	269.150	42+218.021	269.039	42+222.634	268.963	42+226.625	268.887	42+230.633	268.794	42+234.867	268.701	42+242.796	268.519
ROUNDING EDGE	42+200.052	269.218	42+209.544	269.149	42+218.532	269.038	42+222.124	268.961	42+227.100	268.883	42+231.100	268.792	42+235.309	268.698	42+243.210	268.516
(B4)	42+201.125	269.192	42+210.529	269.122	42+219.442	269.010	42+224.202	268.930	42+227.945	268.854	42+231.498	268.771	42+236.097	268.669	42+243.947	268.487
OUTSIDE TOE	42+201.714	269.178	42+211.070	269.107	42+219.943	268.995	42+224.477	268.917	42+228.410	268.838	42+232.389	268.747	42+236.531	268.653	42+244.353	268.470

LOCATION	SPAN 2															
	1/5 SPAN 2		SPLICE		2/5 SPAN 2		1/2 SPAN 2		3/5 SPAN 2		SPLICE		4/5 SPAN 2		℄ BRG PIER 2	
	STATION	ELEVATION	STATION	ELEVATION	STATION	ELEVATION	STATION	ELEVATION	STATION	ELEVATION	STATION	ELEVATION	STATION	ELEVATION	STATION	ELEVATION
INSIDE TOE	42+248.540	267.833	42+250.892	267.788	42+259.402	267.597	42+264.663	267.466	42+269.821	267.326	42+277.640	267.085	42+279.863	267.017	42+289.580	266.707
(B1)	42+248.944	267.869	42+251.601	267.816	42+259.764	267.633	42+265.004	267.502	42+270.144	267.362	42+278.426	267.107	42+280.151	267.053	42+289.837	266.744
(B2)	42+250.898	268.047	42+253.211	268.001	42+261.511	267.812	42+266.657	267.682	42+271.707	267.542	42+279.551	267.296	42+281.546	267.234	42+291.078	266.929
(B3)	42+252.788	268.225	42+254.892	268.183	42+263.202	267.991	42+268.257	267.862	42+273.220	267.721	42+280.740	267.483	42+282.898	267.414	42+292.281	267.115
℄, ROUNDING EDGE	42+253.213	268.266	42+255.532	268.219	42+263.583	268.032	42+268.617	267.903	42+273.561	267.762	42+281.126	267.522	42+283.202	267.456	42+292.552	267.157
CENTER OF ROUNDING	42+253.586	268.289	42+255.901	268.241	42+263.917	268.055	42+268.933	267.925	42+273.860	267.786	42+281.404	267.546	42+283.469	267.480	42+292.789	267.182
ROUNDING EDGE	42+253.956	268.286	42+256.269	268.238	42+264.248	268.052	42+269.247	267.922	42+274.157	267.782	42+281.681	267.543	42+283.734	267.476	42+293.025	267.181
(B4)	42+254.616	268.257	42+256.869	268.210	42+264.840	268.023	42+269.807	267.894	42+274.686	267.753	42+281.637	267.531	42+284.207	267.449	42+293.447	267.155
OUTSIDE TOE	42+254.979	268.240	42+257.284	268.192	42+265.166	268.007	42+270.115	267.878	42+274.978	267.737	42+282.446	267.499	42+284.468	267.433	42+293.678	267.140

LOCATION	SPAN 3															
	1/5 SPAN 3		SPLICE		2/5 SPAN 3		1/2 SPAN 3		3/5 SPAN 3		SPLICE		4/5 SPAN 3		℄ BRG PIER 3	
	STATION	ELEVATION	STATION	ELEVATION	STATION	ELEVATION	STATION	ELEVATION	STATION	ELEVATION	STATION	ELEVATION	STATION	ELEVATION	STATION	ELEVATION
INSIDE TOE	42+299.828	266.406	42+301.182	266.369	42+309.789	266.119	42+314.674	265.974	42+319.500	265.826	42+324.283	265.675	42+328.992	265.528	42+338.294	265.245
(B1)	42+300.111	266.443	42+301.839	266.394	42+310.098	266.155	42+314.995	266.009	42+319.834	265.861	42+324.920	265.700	42+329.351	265.562	42+338.677	265.279
(B2)	42+301.481	266.627	42+303.099	266.581	42+311.592	266.338	42+316.550	266.190	42+321.450	266.040	42+326.302	265.885	42+331.086	265.733	42+340.529	265.445
(B3)	42+302.807	266.811	42+303.969	266.780	42+313.038	266.521	42+318.055	266.372	42+323.012	266.218	42+328.111	266.054	42+332.764	265.905	42+342.320	265.613
℄, ROUNDING EDGE	42+303.106	266.853	42+304.501	266.815	42+313.363	266.563	42+318.394	266.413	42+323.364	266.258	42+328.294	266.099	42+333.141	265.945	42+342.724	265.652
CENTER OF ROUNDING	42+303.368	266.877	42+304.766	266.840	42+313.649	266.587	42+318.691	266.437	42+323.672	266.281	42+328.614	266.121	42+333.472	265.967	42+343.077	265.674
ROUNDING EDGE	42+303.628	266.876	42+305.030	266.839	42+313.932	266.586	42+318.985	266.435	42+323.979	266.278	42+328.932	266.119	42+333.801	265.961	42+343.428	265.669
(B4)	42+304.092	266.849	42+305.099	266.823	42+314.438	266.558	42+319.511	266.407	42+324.525	266.249	42+329.017	266.102	42+334.387	265.930	42+344.053	265.636
OUTSIDE TOE	42+304.347	266.834	42+305.759	266.796	42+314.716	266.542	42+319.801	266.390	42+324.826	266.233	42+329.811	266.071	42+334.710	265.913	42+344.398	265.619

LOCATION	SPAN 4													
	1/5 SPAN 4		SPLICE		2/5 SPAN 4		1/2 SPAN 4		3/5 SPAN 4		4/5 SPAN 4		℄ BRG FWD ABUT	
	STATION	ELEVATION	STATION	ELEVATION	STATION	ELEVATION	STATION	ELEVATION	STATION	ELEVATION	STATION	ELEVATION	STATION	ELEVATION
INSIDE TOE	42+347.907	264.983	42+350.359	264.919	42+357.358	264.732	42+362.029	264.602	42+366.667	264.466	42+375.853	264.168	42+384.933	263.846
(B1)	42+348.254	265.017	42+350.815	264.951	42+357.670	264.768	42+362.325	264.638	42+366.947	264.503	42+376.101	264.206	42+385.149	263.885
(B2)	42+349.931	265.191	42+352.213	265.134	42+359.181	264.951	42+363.755	264.825	42+368.298	264.691	42+377.298	264.397	42+386.199	264.075
(B3)	42+351.554	265.367	42+353.959	265.307	42+360.643	265.134	42+365.139	265.012	42+369.606	264.880	42+378.458	264.588	42+387.216	264.267
℄, ROUNDING EDGE	42+351.919	265.407	42+354.293	265.349	42+360.972	265.176	42+365.451	265.054	42+369.901	264.923	42+378.720	264.632	42+387.445	264.311
CENTER OF ROUNDING	42+352.239	265.430	42+354.607	265.373	42+361.261	265.200	42+365.724	265.079	42+370.159	264.948	42+378.949	264.658	42+387.646	264.337
ROUNDING EDGE	42+352.557	265.427	42+354.919	265.370	42+361.548	265.199	42+365.996	265.079	42+370.416	264.948	42+379.177	265.216	42+387.845	264.336
(B4)	42+353.125	265.397	42+355.465	265.340	42+362.059	265.171	42+366.480	265.052	42+370.874	264.923	42+379.583	264.634	42+388.202	264.312
OUTSIDE TOE	42+353.437	265.380	42+355.781	265.323	42+362.341	265.155	42+366.747	265.036	42+371.126	264.908	42+379.807	264.619	42+388.398	264.299

NOTE

The Screed Elevations Shown are for the Deck Slab Surface Prior to Concrete Placement. Allowance has been made for Anticipated Calculated Dead Load Deflections.

metric units

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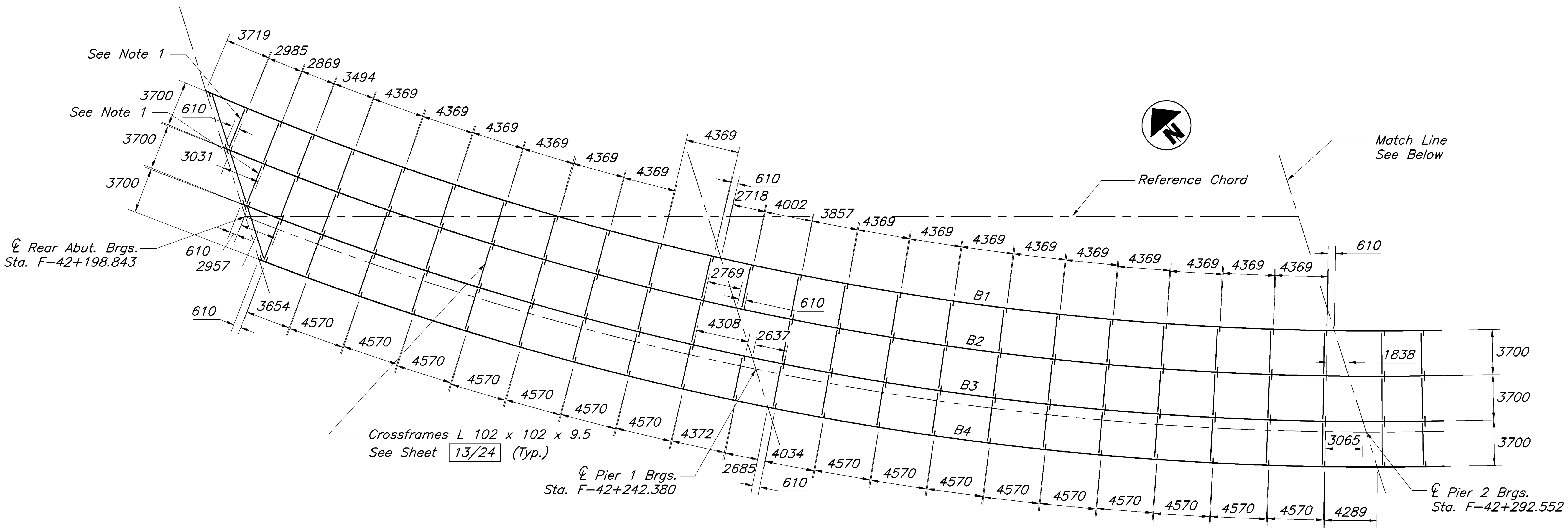
REVIEWED JEM DATE 04/13/01
STRUCTURE FILE NUMBER 2516616
DRAWN JMG REVISED
DESIGNED JMG CHECKED LMG

SCREED TABLE
BRIDGE NO. FRA-270-49208
RAMP F OVER RAMP H & IR-270

FRA-270-40.260



FRAMING PLAN

FRAMING PLAN

NOTES:

1. Provide larger erection bolt holes at this Crossframe location: In Crossframe Members 1 1/16" Wide x 1 3/8" Long (slotted) [17 mm x 35 mm]; In Stiffeners – 13/16 Diameter [21 mm]. Final bolting and welding shall not be completed until after the deck concrete has been placed.

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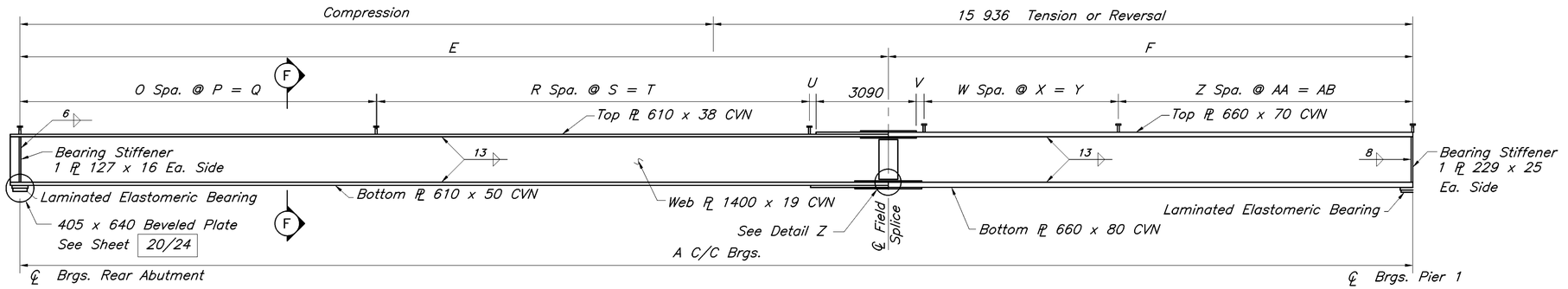
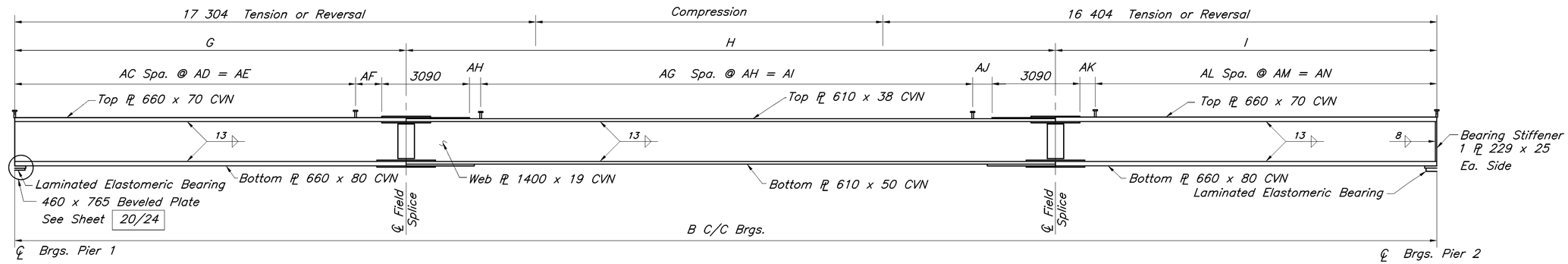
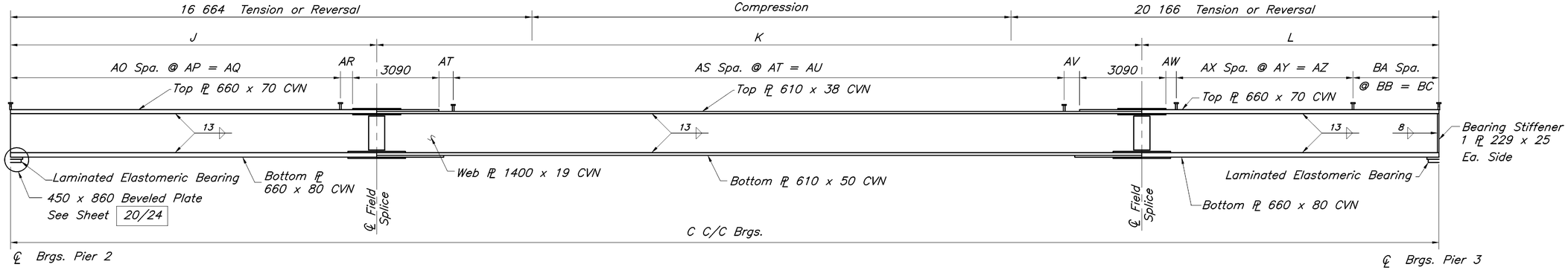
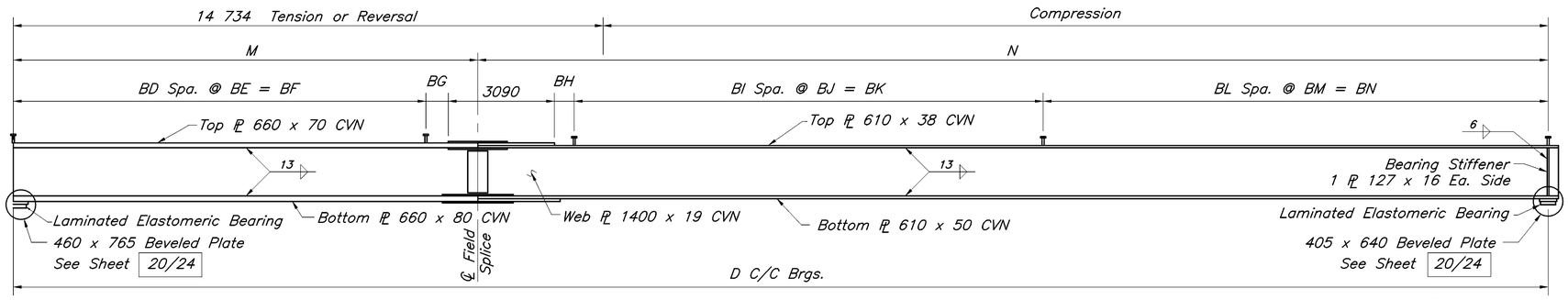
FRAMING PLAN
BRIDGE NO. FRA–270–49208
RAMP F OVER RAMP H & IR–270

FRA–270–40.260









Notes:

1. Welded attachments of supports for concrete deck finishing machine may be to areas of the fascia stringer flanges designated "compression". Attachments shall not be made to areas designated as tension. Fillet welds to compression flanges shall not be closer than 25 mm from the edge of flange, and not more than 50 mm long, and not be smaller than 6 mm for thicknesses up to 19 mm and 8 mm for greater than 19 mm thick.
2. See Sheet 20/24 for bearing details.
3. See Sheet 20/24 for Section F–F.
4. Price of Bearing Plate to be included with Item 513 for payment.
5. All dimensions are measured along centerline of beam.
6. All beam splice material shall meet specified minimum notch toughness requirements (CVN), as specified in 711.01 of the CMS.
7. For beam values See Sheet 19/24.

metric units

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BEAM ELEVATIONS

BRIDGE NO. FRA-270-49208
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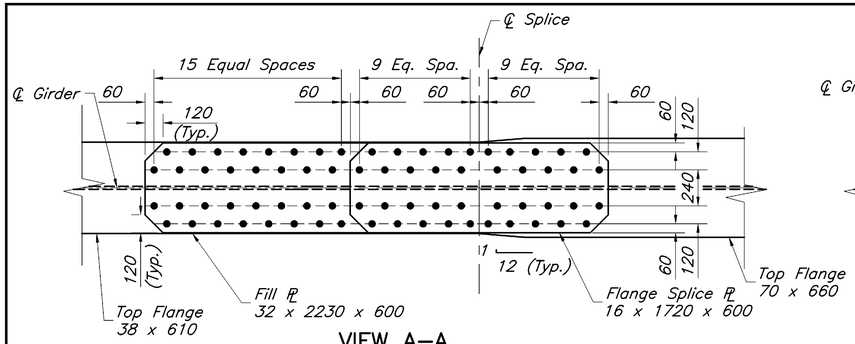
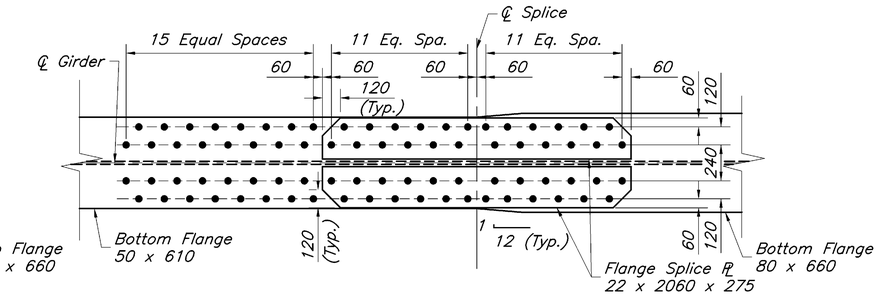
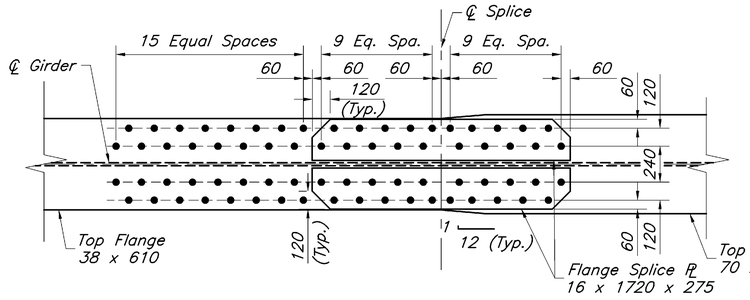
FRA-270-40.260



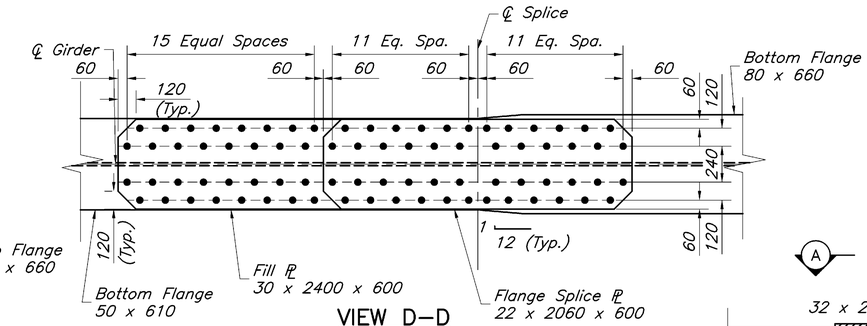
VIEW A–A



VIEW C–C



VIEW B–B



VIEW D–D

NOTES:

ALLOWABLE STRESSES:
Structural Steel ASTM A709, Yield Stress = 350 MPa.
High Strength Bolts ASTM A–325M (Type 1) Allowable Stress = 211 MPa.

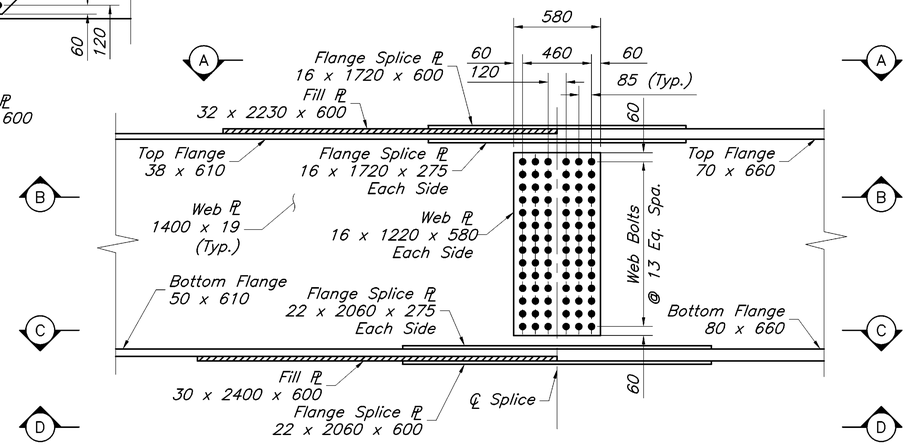
FASTENERS:
29 mm Diameter High Strength Bolts ASTM A–325M (Type 1).

SPLICE MATERIAL WEIGHT:
Splice material weight plus the weight of fills, where required, shall be included with the structural steel quantity for payment.

FABRICATION AND ASSEMBLY:
Beam ends at splices shall be cut and fit as per plan. The opening between beam ends after assembly shall not exceed 6mm.

FILLS:
Fills shown on the project plans and shop drawings shall be dimensioned to the nearest 2mm in thickness, but not less than 3mm thick, based on the dimensions for detailing and intended relative position of the abutting flanges and webs to be spliced. However, in the final shop assembly, fills shall be furnished with mill tolerances. The actual fills used in the splice shall be such as to compensate for differences in total thickness or relative positions of more than 2mm.

All shapes and plates shall be designated (CVN). And shall meet specified minimum notch toughness requirements as specified in 711.01 of CMS.



BEAM VALUES FOR SHEET 18/24

BEAM	VARIABLES																						
	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)	F (mm)	G (mm)	H (mm)	I (mm)	J (mm)	K (mm)	L (mm)	M (mm)	N (mm)	O	P (mm)	Q (mm)	R	S (mm)	T (mm)	U (mm)	V (mm)	W	X (mm)
Beam 1	44 262	50 512	47 229	44 939	32 050	12 212	13 538	25 940	11 034	11 606	22 320	13 303	11 737	33 202	50	220	11 000	85	220	18 700	120	137	29	205
Beam 2	43 923	50 354	48 551	44 838	31 996	11 927	13 177	25 896	11 281	11 839	22 780	13 932	11 508	33 330	70	160	11 200	108	170	18 360	170	108	31	195
Beam 3	43 607	50 205	49 869	44 743	31 294	12 313	12 987	25 760	11 458	11 692	24 060	14 117	11 643	33 100	70	160	11 200	111	160	17 760	60	117	32	185
Beam 4	43 311	50 064	51 184	44 652	30 781	12 530	13 130	25 050	11 884	11 846	24 190	15 148	11 602	33 050	70	160	11 200	93	185	17 205	85	136	31	195

BEAM	VARIABLES																						
	Y (mm)	Z	AA (mm)	AB (mm)	AC	AD (mm)	AE (mm)	AF (mm)	AG	AH (mm)	AI (mm)	AJ (mm)	AK (mm)	AL	AM (mm)	AN (mm)	AO	AP (mm)	AQ (mm)	AR (mm)	AS	AT (mm)	AU (mm)	AV (mm)
Beam 1	5 945	31	170	5 270	66	190	12 540	138	108	195	21 060	225	124	67	150	10 050	56	190	10 640	106	88	200	17 600	60
Beam 2	6 045	33	150	4 950	79	155	12 245	72	128	165	21 120	115	97	74	140	10 360	68	160	10 880	63	109	165	17 985	170
Beam 3	5 920	39	140	5 460	82	145	11 890	193	140	150	21 000	150	142	84	125	10 500	73	145	10 585	203	125	155	19 375	70
Beam 4	6 045	30	185	5 550	75	160	12 000	209	119	170	20 230	190	80	71	155	11 005	63	170	10 710	215	114	170	19 380	180

BEAM	VARIABLES																
	AW (mm)	AX	AY (mm)	AZ (mm)	BA	BB (mm)	BC (mm)	BD	BE (mm)	BF (mm)	BG (mm)	BH (mm)	BI	BJ (mm)	BK (mm)	BL	BM (mm)	BN (mm)
Beam 1	143	57	175	9 975	15	155	2 325	55	195	10 725	152	97	63	220	13 860	83	205	17 015
Beam 2	88	64	155	9 920	20	155	3 100	65	160	10 400	212	176	80	175	14 000	106	160	16 960
Beam 3	81	68	145	9 860	24	140	3 360	66	160	10 560	179	159	84	165	13 860	109	155	16 895
Beam 4	174	57	175	9 975	24	175	4 200	57	185	10 545	136	81	70	200	14 000	96	175	16 800

metric units

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SPLICE DETAILS

BRIDGE NO. FRA–270–49208
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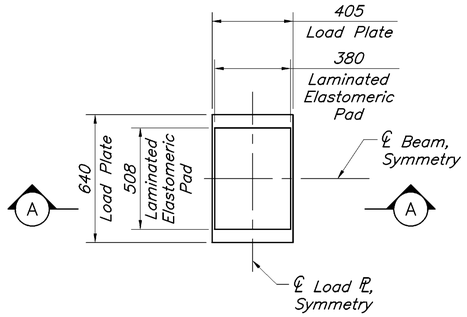
FRA–270–40.260

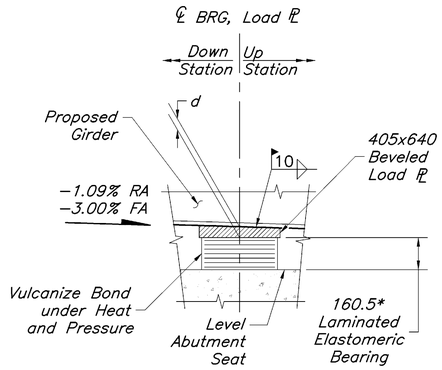
19/24

920
1039



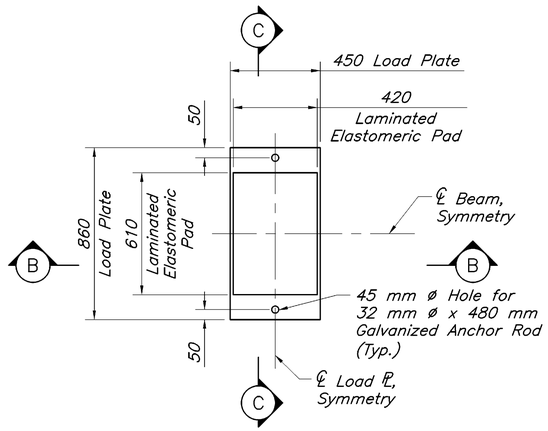
ABUTMENT LOAD PLATE DETAIL

Beam Not Shown for Clarity



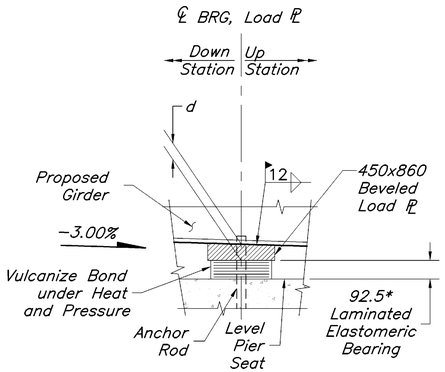
SECTION A–A

** See Table for Laminate Thickness*



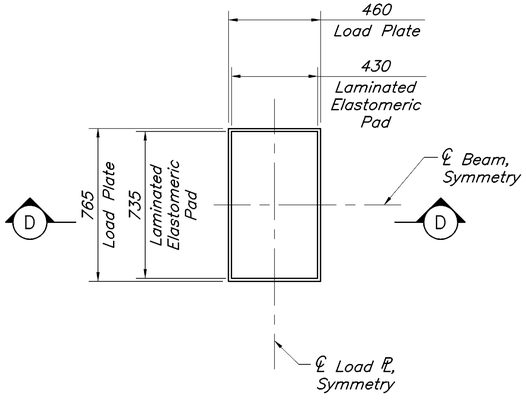
PIER 2 LOAD PLATE DETAILS

Beam Not Shown for Clarity



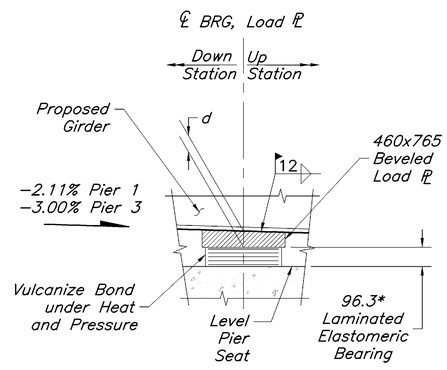
SECTION B–B

** See Table for Laminate Thickness*



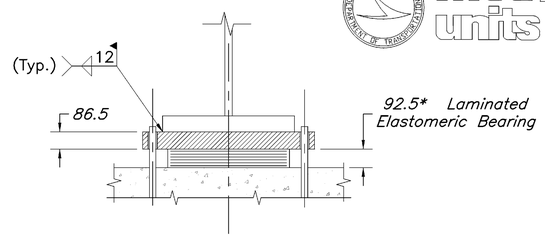
PIERS 1 & 3 LOAD PLATE DETAILS

Beam Not Shown for Clarity



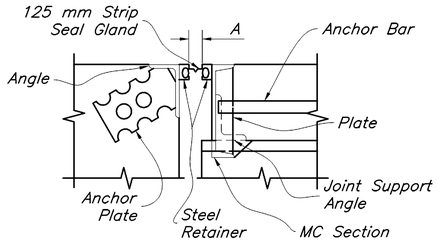
SECTION D–D

** See Table for Laminate Thickness*



SECTION C–C

** See Table for Laminate Thickness*

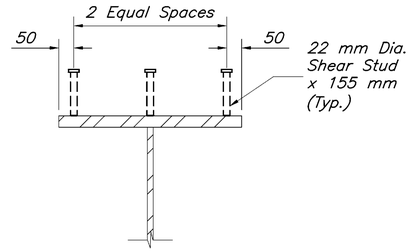


TYPICAL EXPANSION JOINT SECTION

See Std. DWG, EXJ–4–87 for Additional Details & Notes

EXPANSION JOINT SETTING DIMENSIONS		
	STATION 42+197.952	STATION 42+388.159
TEMPERATURE (°C)	DIMENSION "A" (mm)	DIMENSION "A" (mm)
0	75	77
5	71	71
10	67	67
15	62	61
20	58	56
25	53	50
30	49	45
35	44	39

LAMINATED ELASTOMERIC BEARING DATA					
	Rear Abutment	Pier 1	Pier 2	Pier 3	Forward Abutment
Max. Dead Load Reaction (KN)	736	2508	2158	2508	736
Max. Live Load Reaction (KN)	438	918	900	918	438
Max. Total Design Load (KN)	1174	3426	3058	3426	1174
Exterior Elastomeric Layer (mm)	2x12.7 = 25.4	2x8.0 = 16.0	2x8.8 = 17.6	2x8.0 = 16.0	2x12.7 = 25.4
Interior Elastomeric Layer (mm)	6x20.3 = 121.8	4x17.7 = 70.8	5x12.7 = 63.5	4x17.7 = 70.8	6x20.3 = 121.8
Steel Plate Laminates (mm)	7x1.9 = 13.3	5x1.9 = 9.5	6x1.9 = 11.4	5x1.9 = 9.5	7x1.9 = 13.3
Load Plate "d" (@ C/L BRGS.) (mm)	56.5	79.7	86.5	80.7	57.5
Total Thickness (@ C/L BRGS.) (mm)	217	176	179	177	218



SECTION F–F

Shear Studs

LAMINATED ELASTOMERIC BEARING NOTES

1. *Welding of the beam to the load plate shall be controlled so that the plate temperature at the elastomer bonded surface does not exceed 150°C as determined by use of pyrometric sticks or other temperature monitoring devices.*
2. *If the steel is erected at an ambient temperature higher than 26°C or lower than 4°C and the bearing shear deflection exceeds 1/6 of the bearing height at 15°C ± 5°C, the girders shall be raised to allow the bearings to return to their undeformed shape at 15°C ± 5°C. In addition, if the steel is erected at an ambient temperature higher than 15°C and the bearing shear deflection at the abutment exceeds 1/6 of the bearing height at 10°C ± 5°C, the girders shall be raised at the abutments to allow the bearings to return to their undeformed shape at 10°C ± 5°C.*
3. *ELASTOMERIC BEARINGS shall be Grade 3, 60 durometer elastomer. Bearings were designed under section 14.6.6 of section 14, Bearings, Division I, Design.*
4. *The steel load plate shall be bonded by vulcanization to the elastomer during the molding process.*

metric units

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SUPERSTRUCTURE DETAILS
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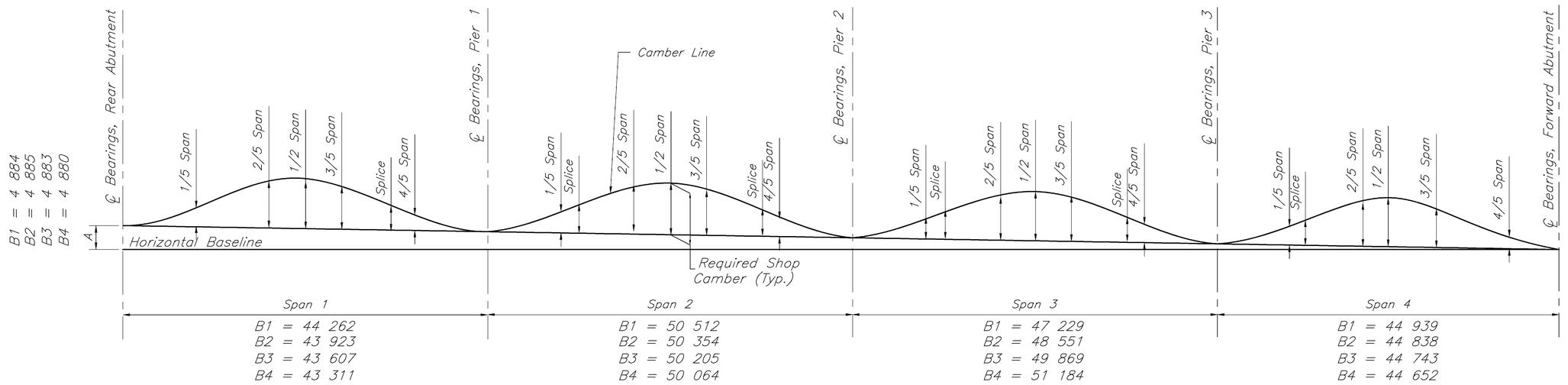
921/1039



CAMBER DIAGRAM

TABLE OF DEFLECTION AND CAMBER

BEAM	CAMBER \ LOCATION	SPAN 1						SPAN 2							SPAN 3							SPAN 4					
		1/5 SPAN	2/5 SPAN	1/2 SPAN	3/5 SPAN	SPLICE	4/5 SPAN	1/5 SPAN	SPLICE	2/5 SPAN	1/2 SPAN	3/5 SPAN	SPLICE	4/5 SPAN	1/5 SPAN	SPLICE	2/5 SPAN	1/2 SPAN	3/5 SPAN	SPLICE	4/5 SPAN	1/5 SPAN	SPLICE	2/5 SPAN	1/2 SPAN	3/5 SPAN	4/5 SPAN
B1	DEFLECTION DUE TO WEIGHT OF STEEL	13	19	19	16	10	7	4	7	11	13	12	6	6	3	4	7	8	7	4	2	7	10	16	19	20	14
	DEFLECTION DUE TO SLAB	44	63	61	51	33	21	12	20	35	40	39	21	19	7	10	19	20	17	9	4	26	36	59	69	72	50
	DEFLECTION DUE TO REMAINING DEAD LOAD	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0
	ADJUST REQUIRED FOR VERTICAL CURVE	39	59	62	59	49	39	51	63	77	80	77	55	51	45	52	67	70	67	57	45	41	49	61	64	61	41
	CAMBER LOSS DUE TO HEAT CURVING	8	11	10	9	6	4	2	4	6	7	7	4	3	2	2	5	5	4	2	1	4	6	9	11	11	8
	REQUIRED SHOP CAMBER *	104	153	153	135	98	71	69	94	129	140	135	86	79	57	68	98	103	95	72	52	78	101	146	164	165	113
B2	DEFLECTION DUE TO WEIGHT OF STEEL	13	19	18	16	10	7	4	7	11	13	12	7	6	3	5	8	9	8	5	2	8	11	18	21	22	15
	DEFLECTION DUE TO SLAB	44	64	61	51	32	21	13	21	37	42	40	22	19	10	13	25	26	22	13	5	28	39	65	77	79	55
	DEFLECTION DUE TO REMAINING DEAD LOAD	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0
	ADJUST REQUIRED FOR VERTICAL CURVE	38	57	59	57	47	38	50	60	74	77	74	54	50	46	53	69	72	69	59	46	39	47	59	61	59	39
	CAMBER LOSS DUE TO HEAT CURVING	7	10	9	8	5	3	2	3	6	6	6	4	3	2	2	5	5	4	2	1	4	6	9	11	11	8
	REQUIRED SHOP CAMBER *	102	151	148	132	94	69	69	91	128	138	132	87	78	61	73	107	112	103	79	54	79	103	152	171	172	117
B3	DEFLECTION DUE TO WEIGHT OF STEEL	13	20	19	18	11	7	4	7	12	13	12	7	6	4	5	9	10	8	5	2	9	12	20	24	24	17
	DEFLECTION DUE TO SLAB	45	65	62	57	34	21	13	21	37	43	40	22	18	12	16	29	31	25	14	5	31	43	70	82	85	59
	DEFLECTION DUE TO REMAINING DEAD LOAD	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1
	ADJUST REQUIRED FOR VERTICAL CURVE	36	54	56	54	46	36	48	57	72	75	72	53	48	47	53	70	74	70	60	47	38	46	57	59	57	38
	CAMBER LOSS DUE TO HEAT CURVING	6	9	8	8	5	3	2	3	5	6	5	3	3	2	3	5	5	4	2	1	4	5	9	10	10	7
	REQUIRED SHOP CAMBER *	100	149	146	138	96	67	67	88	126	137	129	85	75	65	77	113	120	107	81	55	82	106	157	176	177	122
B4	DEFLECTION DUE TO WEIGHT OF STEEL	15	21	20	17	11	7	5	7	12	14	13	7	6	5	6	11	11	9	5	2	10	14	23	26	27	19
	DEFLECTION DUE TO SLAB	48	67	64	52	35	21	13	21	37	42	39	22	17	14	18	33	34	27	15	4	33	46	75	88	91	63
	DEFLECTION DUE TO REMAINING DEAD LOAD	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1
	ADJUST REQUIRED FOR VERTICAL CURVE	35	52	54	52	45	35	46	56	69	72	69	52	46	48	53	72	75	72	63	48	37	44	55	57	55	37
	CAMBER LOSS DUE TO HEAT CURVING	6	8	8	6	4	3	2	3	5	5	5	3	2	2	3	5	5	4	2	1	3	5	8	9	9	7
	REQUIRED SHOP CAMBER *	104	149	147	128	95	66	66	84	123	133	126	84	71	69	80	121	125	112	85	55	83	109	162	181	183	127

** If Girders are curved by mechanical means, the Heat Curving Camber Portion shall be disregarded. required Camber will therefore be adjusted down accordingly.*

metric units

EMH&T INC. CONSULTING ENGINEERS & SURVEYORS
EVANS, MECHWART, HAMBLETON & TILTON, INC.
170 MILL STREET GAHANNA, OHIO 43230

DESIGNED	DRAWN	REVIEWED	DATE
JMG	JMG	JEM	04/13/01
CHECKED	REVISED	STRUCTURE FILE NUMBER	
LMG		2516616	

CAMBER DIAGRAM
BRIDGE NO. FRA-270-49208
RAMP F OVER RAMP H & IR-270

FRA-270-40.260

21/24

922
1039

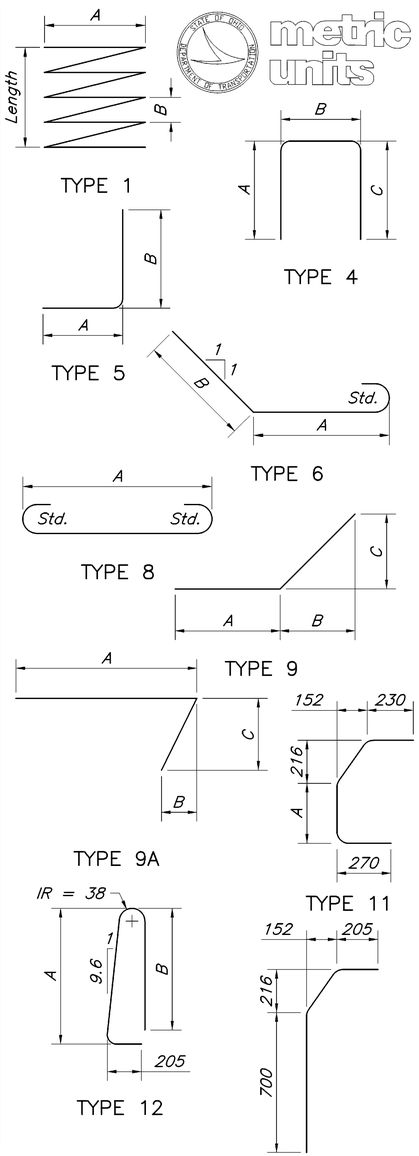
D:\PROJECT\509049\DWG\BROOMSON.DWG - 4 XREFS: BROOMX28 12563X27 12563X2N BROOMX21 - PLOTTED BY GBASKIN - August 11, 2003 - 1:52 PM

ABUTMENTS

MARK	NUMBER REQUIRED REAR	FWD.	TOTAL	LENGTH (mm)	WEIGHT (kg)	TYPE	DIMENSION A	B	C	INCR.
A16M01	55	44	99	1165	179	5	255	950		
A16M02		13	13	1905	38	4	370	1240	370	
A16M03	14		14	1800	39	STR				
A16M04	12	12	24	3305	123	4	1590	200	1590	
A16M05	5	5	10	1825	28	12	840	765		
A16M06	8		8	600	7	STR				
A16M07		8	8	460	6	STR				
A16M08		14	14	1250	27	STR				
A16M09		13	13	2285	46	4	560	1240	560	
A16M10		18	18	2665	74	4	750	1240	750	
A16M11	10		10	1650	26	STR				
A16M12	8		8	300	4	STR				
A16M13		8	8	360	4	STR				
A16M14		10	10	1330	21	STR				
A16M15	23		23	2755	98	4	750	1330	750	
A16M16	16		16	2375	59	4	560	1330	560	
A16M17	16		16	1995	50	4	370	1330	370	
A19M01	10		10	8850	198	STR				
A19M02		44	44	2880	283	5	1930	1000		
A19M03	54	43	97	4040	876	4	1850	440	1850	
A19M04	39	31	70	2980	466	4	1320	440	1320	
A19M05	39	31	70	2190	343	4	1000	290	1000	
A19M06	3		3	6500	44	STR				
A19M07	5		5	5750	64	STR				
A19M08	5		5	6550	73	STR				
A19M09	22		22	9200	452	STR				
A19M10		22	22	7460	367	STR				
A19M11	2		2	7230	32	STR				
A19M12	5	5	10	915	20	STR				
A19M13	5	5	10	1150	26	15				
A19M14		10	10	7100	159	STR				
A19M15		5	5	5600	63	STR				
A19M16		5	5	4680	52	STR				
A19M17		5	5	5125	57	STR				
A19M18	12	12	24	1280	69	5	450	880		
A19M19	6		6	2670	36	4	880	1010	880	
A19M20	15	12	27	3620	218	4	1640	440	1640	
A19M21	3		3	2810	19	STR				
A19M22	1		1	2400	5	STR				
A19M23	4		4	7200	64	STR				
A19M24		1	1	1860	4	STR				
A19M25		2	2	11150	50	STR				
A19M26		3	3	2260	15	STR				
A19M27	55		55	2970	365	5	2020	1000		
A19M28		6	6	2385	32	4	880	725	880	
A29M01	12	12	24	1315	160	5	525	880		
A29M02	4		4	1700	34	STR				
A29M03		4	4	1280	26	STR				
D25M01	21		21	1795	150	6	1115	430		
D25M02		21	21	1570	131	6	890	430		
				TOTAL	5782					

PIERS

MARK	NUMBER REQUIRED Pier 1	Pier 2	Pier 3	TOTAL	LENGTH (mm)	WEIGHT (kg)	TYPE	DIMENSION A	B	C	INCR.
SP13M01	1			1	15390	387	1	916	115		
SP13M02	1			1	15615	393	1	916	115		
SP13M03	1			1	15840	398	1	916	115		
SP13M04		1		1	7835	168	1	765	115		
SP13M05		1		1	8065	173	1	765	115		
SP13M06		1		1	8300	178	1	765	115		
SP13M07			1	1	5985	130	1	765	115		
SP13M08			1	1	6190	134	1	765	115		
SP13M09			1	1	6395	138	1	765	115		
P16M01	90			90	4300	601	STR				
P16M02		66		66	3500	359	STR				
P16M03		12		12	6720	125	STR				
P16M04			84	84	3900	508	STR				
P16M05	194			194	3045	917	4	1085	950	1085	
P16M06		166	178	344	2895	1546	4	1085	800	1085	
P16M07	12			12	7250	135	STR				
P16M08			12	12	7000	130	STR				
P19M01	24	24	24	72	1280	206	5	450	880		
P19M02	12			12	2760	74	4	880	1100	880	
P19M03		12	12	24	2515	135	4	880	855	880	
P25M01		6		6	7120	170	9	6305	802	147	
P25M02		6		6	7150	170	9	6305	781	311	
P25M03		6		6	11200	267	STR				
P29M01		66		66	4260	1423	8	3500			
P29M02	6			6	7825	238	9	7115	695	147	
P29M03	6			6	7860	239	9	7115	679	302	
P29M04	4	3		7	12000	425	STR				
P29M05	24	24	24	72	1315	479	5	525	880		
P29M06	12			12	7150	434	STR				
P29M07			6	6	7595	231	9	6815	764	147	
P29M08			6	6	7620	231	9	6815	749	289	
P29M09			6	6	11850	360	STR				
P32M01	90			90	5160	2974	8	4300			
P32M02	9		8	17	12000	1306	9A	11100	39	1000	
P32M03	9			9	6950	401	9	6150	36	900	
P32M06	33		4	37	12000	2843	STR				
P32M07	33			33	7000	1479	5	560	6540		
P32M08		27		27	8850	1530	STR				
P32M09		27	27	54	2600	899	5	560	2140		
P32M10		8		8	11600	594	9A	10700	46	1000	
P32M11		8		8	6360	326	9	5560	41	900	
P32M12			84	84	4760	2561	8	3900			
P32M13			8	8	6500	333	9	5700	34	900	
P32M16			27	27	6950	1202	STR				
					TOTAL	27950					



SUPERSTRUCTURE

MARK	NO.	LENGTH (mm)	WEIGHT (kg)	TYPE	DIMENSION A	B	C	INCR.
S16M01	1632	12000	30394	STR				
S16M02	3462	7150	38417	STR				
S16M03	792	12130	14910	STR				
S16M04	2 Series of 3	340 to 540	4	STR				100
S16M05	1 Series of 43	7500 to 10230	592	STR				65
S16M06	1 Series of 59	8560 to 10300	863	STR				30
S16M07	2 Series of 93	600 to 11940	1810	STR				115 to 130

SUPERSTRUCTURE

MARK	NO.	LENGTH (mm)	WEIGHT (kg)	TYPE	DIMENSION A	B	C	INCR.
S16M08	40	7050	438	STR				
S16M09	324	7350	3696	STR				
S16M10	1260	1825	3569	12	840	765		
S16M11	272	11900	5024	STR				
S16M12	1731	9000	24179	STR				
S16M13	1731	5300	14239	STR				
S19M01	1260	705	1985	5	280	475		
S19M02	1260	920	2591	11	260			
		TOTAL	142711					

NOTES:

1. BAR DIMENSIONS shown are out to out, unless otherwise indicated.
2. All lengths are given in millimeters.
3. All reinforcing to be epoxy coated.
4. Connectors and dowel bars used with epoxy coated bars shall be epoxy coated. Coating for both connectors and bars shall conform to the same specifications. Coatings which have been damaged or which otherwise do not meet specifications with respect to color, continuity, and uniformly may be repaired as directed by the Engineer or they shall be replaced with material which meets the specifications.
5. Connectors and dowel bars shall conform with Item 509.
6. The Bar Size Number is specified on the plans in the Bar Mark Column. The First Two Digits indicates the Bar Size Number. For example, A16M01 is Abutment "16M" bar. Bar Dimensions shown are Out to Out unless otherwise indicated. "R" indicates inside Radius, unless otherwise noted. "Std." written in place of a dimension indicates a Standard bend at the end of the bar.

metric units

EMH inc
CONSULTING ENGINEERS & SURVEYORS
EVANS, MECHWART, HAMBLETON & TILTON, INC.
170 MILL STREET GAHANNA, OHIO 43230

DESIGNED	DRAWN	REVIEWED	DATE
LMG	GB	JEM	04/13/01
CHECKED	REVISED	STRUCTURE FILE NUMBER	
JMG		2516616	

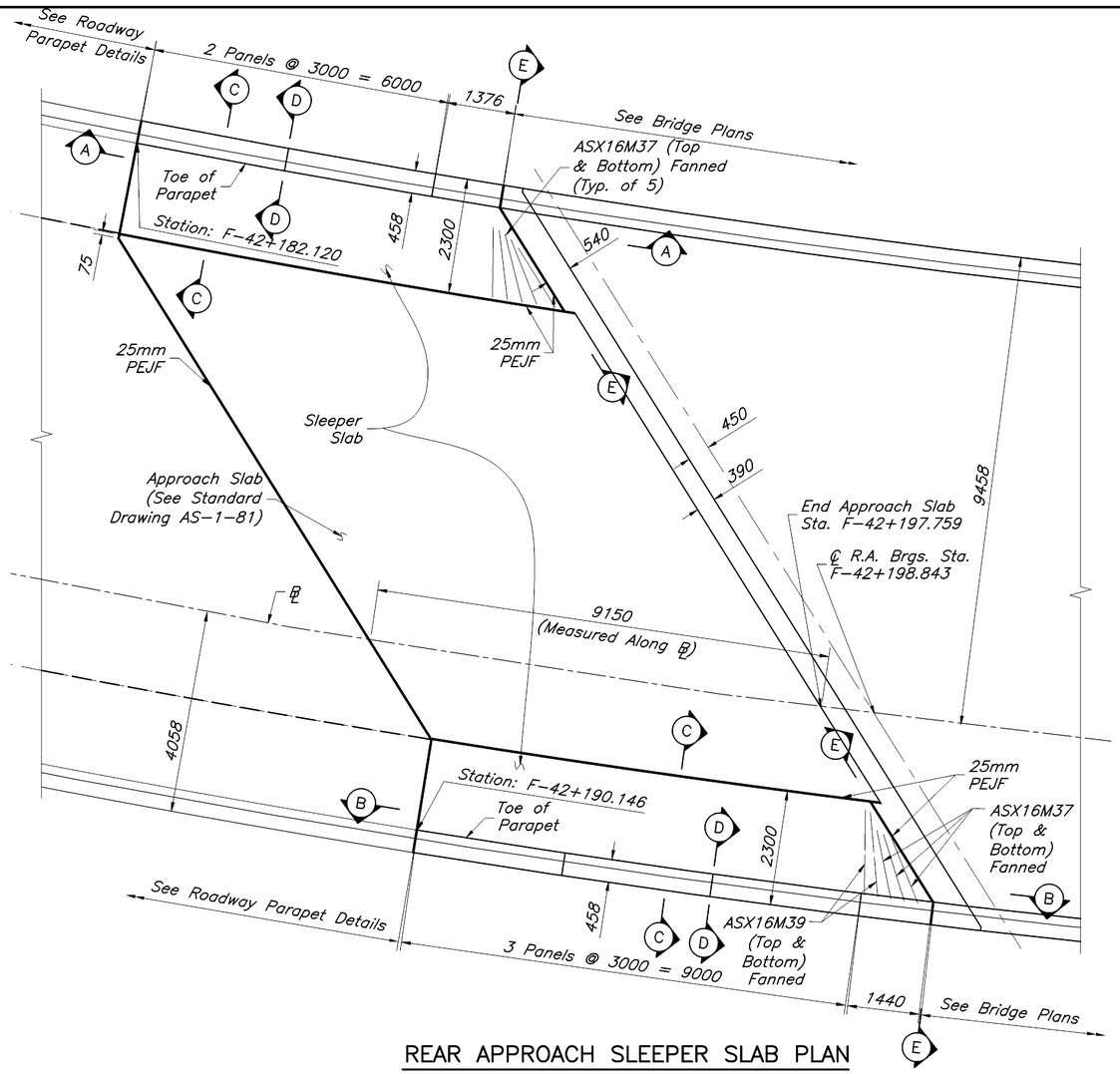
REINFORCING STEEL LIST

BRIDGE NO. FRA-270-49208
RAMP F OVER RAMP H & IR-270

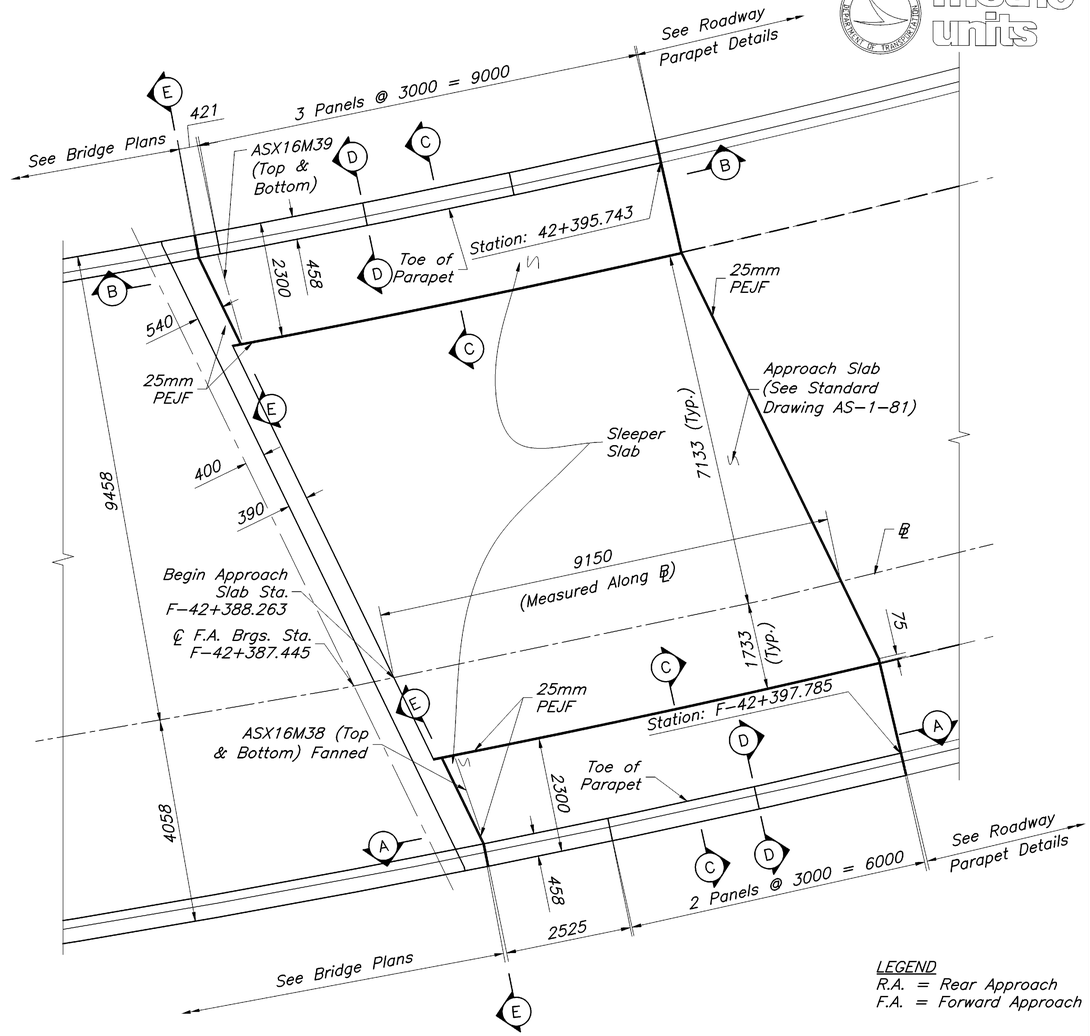
FRA-270-40.260

22/24

923
1039

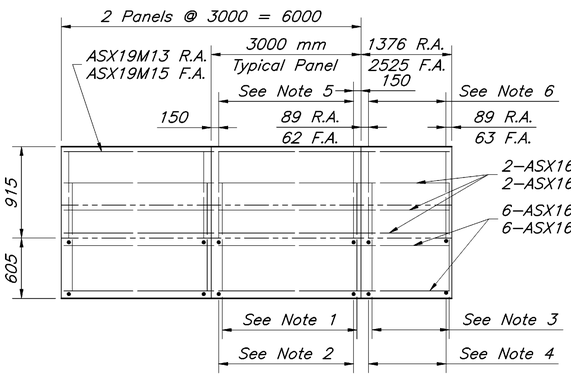


REAR APPROACH SLEEPER SLAB PLAN

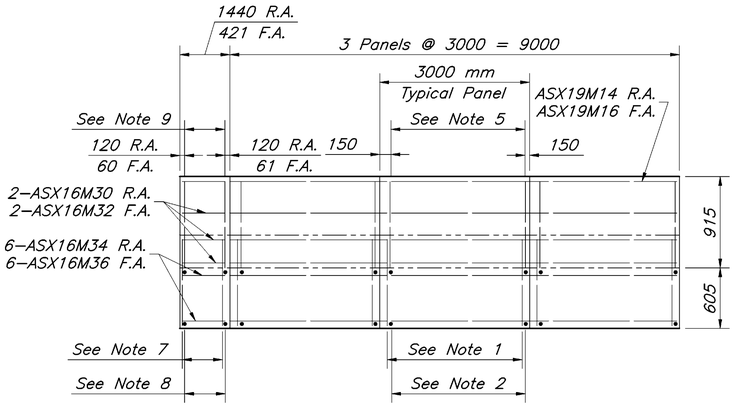


FORWARD APPROACH SLEEPER SLAB PLAN

LEGEND
R.A. = Rear Approach
F.A. = Forward Approach



SECTION A–A
Dimensions Measured Along Toe of Parapet



SECTION B–B
Dimensions Measured Along Toe of Parapet

NOTES:

1. *10–ASY19M01, 9 Spa. @ 300 = 2700*
   10–ASY19M02, 9 Spa. @ 300 = 2700
   19–ASY19M03, 18 Spa. @ 150 = 2700
2. *10–ASX16M01, 9 Spa. @ 300 = 2700 (Top),*
   10–ASX16M02, 9 Spa. @ 300 = 2700 (Bottom)
3. *5–ASY19M01, 4 Spa. @ 300 = 1200 R.A.*
   5–ASY19M02, 4 Spa. @ 300 = 1200 R.A.
   9–ASY19M03, 8 Spa. @ 150 = 1200 R.A.
   9–ASY19M01, 8 Spa. @ 300 = 2400 F.A.
   9–ASY19M02, 8 Spa. @ 300 = 2400 F.A.
   17–ASY19M03, 16 Spa. @ 150 = 2400 F.A.
4. *5–ASX16M01, 4 Spa. @ 300 = 1200, (Top) R.A.,*
   5–ASX16M02, 4 Spa. @ 300 = 1200 (Bottom) R.A.
   9–ASX16M01, 8 Spa. @ 300 = 2400 (Top) F.A.,
   9–ASX16M02, 8 Spa. @ 300 = 2400 (Bottom) F.A.
5. *10–ASY16M01, 9 Spa. @ 300 = 2700*
   Lap ASY19M01
6. *5–ASY16M01, 4 Spa. @ 300 = 1200*
   Lap ASY19M01 R.A.
   9–ASY16M01, 8 Spa. @ 300 = 2400
   Lap ASY19M01 F.A.
7. *5–ASY19M01, 4 Spa. @ 300 = 1200 R.A.*
   5–ASY19M02, 4 Spa. @ 300 = 1200 R.A.
   9–ASY19M03, 8 Spa. @ 150 = 1200 R.A.
   2–ASY19M01, 1 Spa. @ 300 = 300 F.A.
   2–ASY19M02, 1 Spa. @ 300 = 300 F.A.
   3–ASY19M03, 2 Spa. @ 150 = 300 F.A.
8. *2–ASX16M39, 3–ASX16M37*
   (Top & Bottom) Fanned R.A.
   1–ASX16M39 (Top & Bottom) Fanned F.A.
9. *5–ASY16M01, 4 Spa. @ 300 = 1200 R.A.,*
   Lap ASY19M01
   2–ASY16M01, 1 Spa. @ 300 = 300 F.A.,
   Lap ASY19M01

metric units

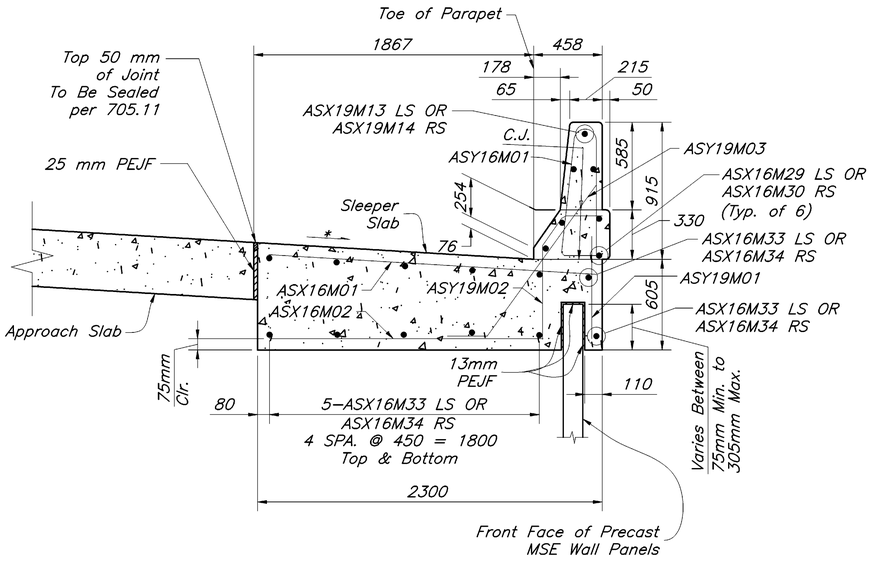
EMH Inc
CONSULTING ENGINEERS & SURVEYORS
EVANS, MECHWART, HAMBLETON & TILTON, INC.
170 MILL STREET GAHANNA, OHIO 43230

DESIGNED	DRAWN	REVIEWED	DATE
JMG	JMG	JEM	04/13/01
CHECKED	REVISED	STRUCTURE FILE NUMBER	
CJS		2516616	

APPROACH SLEEPER SLAB DETAILS

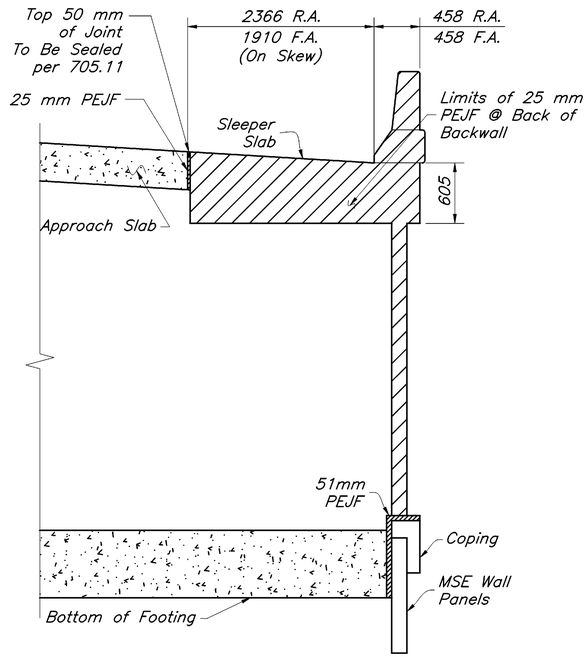
BRIDGE NO. FRA-270-49208
RAMP F OVER RAMP H & IR-270

FRA-270-40.260

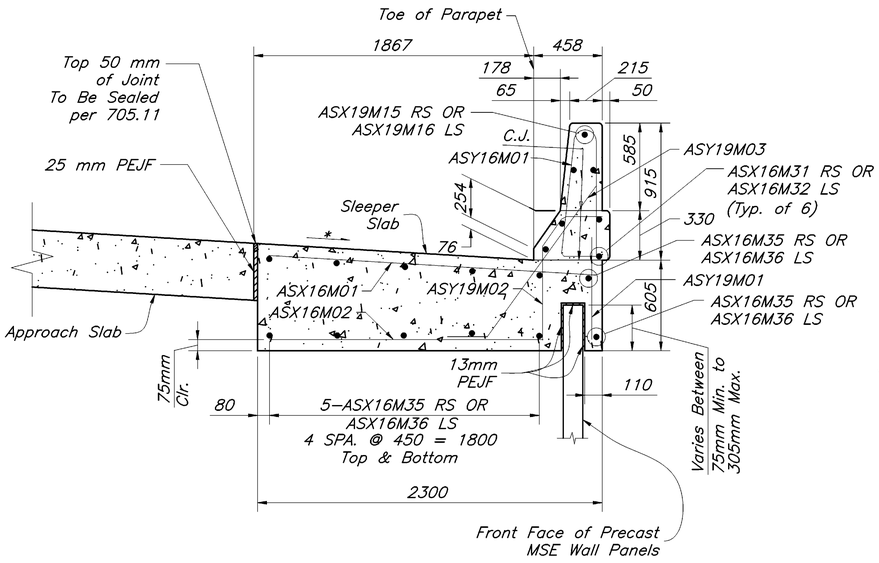


SECTION C–C
Rear Approach

* Top Surface of Sleeper Slab shall be defined by the applicable Roadway Cross–Section

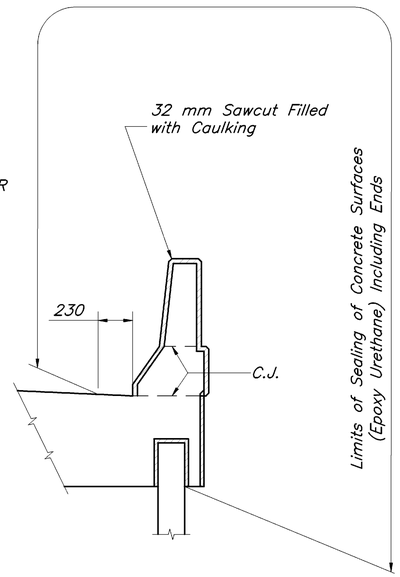


SECTION E–E
Right Rear Shown
Others Similar



SECTION C–C
Forward Approach

* Top Surface of Sleeper Slab shall be defined by the applicable Roadway Cross–Section



SECTION D–D
At Sawcut Joint
Reinforcing Not Shown For Clarity

DESIGN SPECIFICATIONS: "Standard Specifications For Highway Bridges" adopted by AASHTO, 1996, Including the 1997, 1998, & 1999 Interim Specifications.

DESIGN DATA:
Concrete Class S f'c = 31 MPa, Reinforcing Steel ASTM A615M, A616M, or A617M Grade 420 fy = 420 MPa.

CONTROL JOINTS FOR CONCRETE PARAPETS:
The joints shall be constructed by sawing 32 mm deep along perimeter of the parapet as soon as the saw can be operated without damaging the concrete.

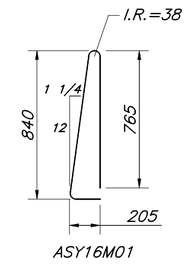
The use of an edge guide, fence, or jog is required to insure that the cut joint is straight, true, and aligned on all faces of the parapet. The joint width shall be the width of the saw blade, a nominal width of 6 mm.

The perimeter of the deflection control joint shall be sealed with a caulking material to a minimum depth of 25 mm conforming to federal specification TT–S–00227E. The bottom 13 mm of the inside face of the parapet should be left unsealed to allow any water which may enter the joint to escape.

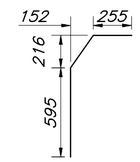
SAWCUT: Shall be Placed as Shown.

QUANTITIES of concrete, reinforcing steel, deflection joint sawcut, and caulking material for Parapet are included with MSE walls for payment.

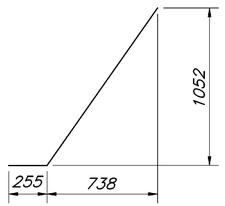
LEGEND
LS = Left Side
RS = Right Side
R.A. = Rear Approach
F.A. = Forward Approach



ASY16M01



ASY19M02



ASY19M03

APPROACH PARAPET/SLEEPER SLAB REINFORCING BAR LIST

MARK	NUMBER	LENGTH	TYPE	INCR.
ASX16M01	114	2200	STR.	
ASX16M02	114	1915	STR.	
ASX16M29	6	7275	STR.	
ASX16M30	6	10340	STR.	
ASX16M31	6	8425	STR.	
ASX16M32	6	9320	STR.	
	2 Sets	7260		
ASX16M33	of	TO	STR.	330
	6	8910		
	2 Sets	8775		
ASX16M34	of	TO	STR.	315
	6	10350		
	2 Sets	8345		
ASX16M35	of	TO	STR.	95
	6	8820		
	2 Sets	8885		
ASX16M36	of	TO	STR.	80
	6	9285		
ASX16M37	16	1400	STR.	
ASX16M38	2	1500	STR.	
ASX16M39	6	1700	STR.	
ASX19M13	1	7275	STR.	
ASX19M14	1	10340	STR.	
ASX19M15	1	8425	STR.	
ASX19M16	1	9320	STR.	
ASY16M01	121	1825	BENT	
ASY19M01	121	810	STR.	
ASY19M02	121	1065	BENT	
ASY19M03	228	1515	BENT	

metric units

EVANS, MECHWART, HAMBLETON & TILTON, INC.
CONSULTING ENGINEERS & SURVEYORS
170 MILL STREET GAHANNA, OHIO 43230

DESIGNED	DRAWN	CHECKED	REVIEWED	DATE
JMG	JMG	CJS	JEM	04/13/01

REVISED
STRUCTURE FILE NUMBER 2516616

APPROACH SLEEPER SLAB DETAILS
BRIDGE NO. FRA–270–49208
RAMP F OVER RAMP H & IR–270

FRA–270–40.260

24/24

925/1039