

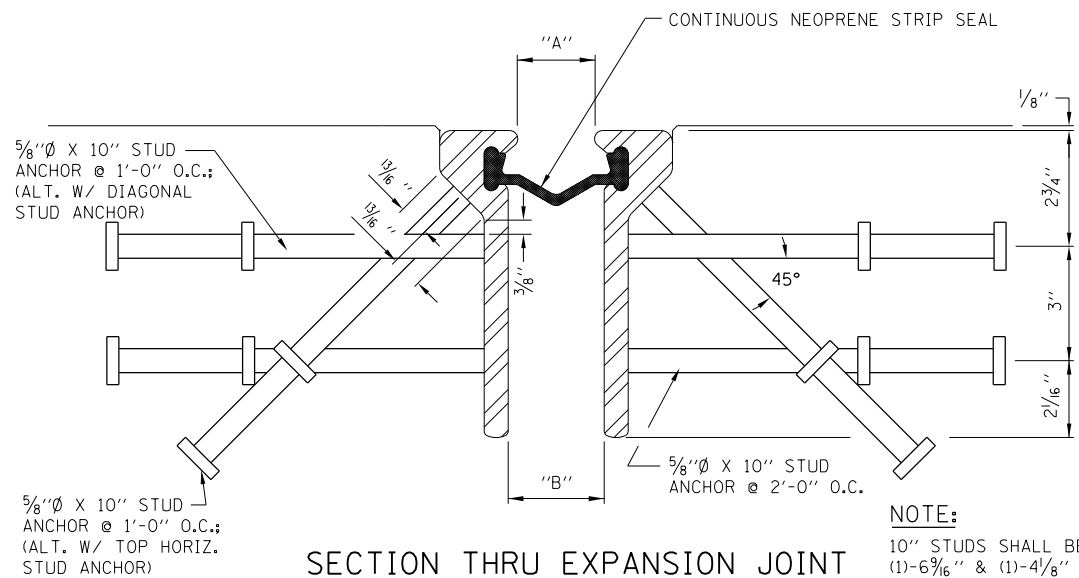
Illinois Tollway Base Sheet Revisions			
Section M	Base Sheet Drawings		
	Drawing	Modification Summary	Effective: 03-31-2016
	All	The electronic (pdf) version of the Standard Drawing are now made searchable (text).	
Erosion Sediment Control (ESC)-Series 200			
M-ESC-205	Sediment Basin Dewatering Device		
	Revised Note 7, removed proprietary name from skimmer device.		
Roadway (RDY)-Series 400			
M-RDY-408	Approach Slab, Mainline		
All	Changed Transverse Reinforcement size and spacing in the bottom mat of the bridge approach slab and transition approach shoulder slabs from #6@9" to #8@4" to be in conformance with IDOT ABD Memo 15.8.		
All	Changed Transverse Reinforcement size and spacing in the top mat of the bridge approach slab and transition approach shoulder slabs from #5@12" to #5@6" to be in conformance with IDOT ABD Memo 15.8.		
All	Changed Longitudinal Reinforcement size and spacing in the top mat of the bridge approach slab and transition approach shoulder slabs from #4@15" to #5@6" to be in conformance with IDOT ABD Memo 15.8.		
All	Added note *** to clarify that base sheet reinforcement is for approach slabs not located on retaining walls. If approach slab is placed on retaining wall, reinforcement shall be designed for TL-5 crash loading.		
All	Changed spacing and shape of both dx vertical bars in the barrier on the bridge approach slab and transition approach shoulder slab to match the vertical bars in the bridge parapet and moment slab barrier.		
All	Changed top mat reinforcement cover to 2.25" to be consistent with deck and moment slab clearances.		
Sheets 1,2	Updated Note to Designer for Drainage Structures. Designer to determine size, type and location.		
Sheets 1,2	Changed approach slab shoulder width requirements to match Structures Design Manual.		
Sheet 3	Added option of using subgrade aggregate, special under the transition approach slab.		
Sheet 3	Added additional Approach Slab Barrier Elevation to distinguish between non-integral and integral/semi-integral abutments.		
Sheet 3	Eliminated Optional Longitudinal Joint Within a Traffic Lane detail.		
Sheet 4	Changed Neoprene Sheet to Elastomeric Sheet to keep call out generic and not specific.		
Sheet 5	Revised Bill of Material to clarify Pay Items and Pay Item Numbers to be included.		
Sheet 5	Added note to Typical Barrier Transition Detail to clarify where the 1'-9" dimension should be measured.		
M-RDY-409	Approach Slab, Ramp		
All	Changed Transverse Reinforcement size and spacing in the bottom mat of the bridge approach slab and transition approach shoulder slabs from #6@9" to #8@4" to be in conformance with IDOT ABD Memo 15.8.		
All	Changed Transverse Reinforcement size and spacing in the top mat of the bridge approach slab and transition approach shoulder slabs from #5@12" to #5@6" to be in conformance with IDOT ABD Memo 15.8.		
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M-RDY-410	Reserved		
M-RDY-411	Emergency Turnaround Median Width ≥ 35 Ft		
Bridge (BRG)-Series 500			
M-BRG-506	Expansion Joint Repair		
	Base Sheet was removed since details did not match Special Provision.		
M-BRG-507	Crash Wall Modifications Median Piers		
	Note 4 - Changed Reinforcing bars to Reinforcement Bars.		
M-BRG-508	Crash Wall Modifications Shoulder Piers		
	Note 4 - Changed Reinforcing bars to Reinforcement Bars.		
M-BRG-525	Slopedwall Details		
Drainage (DRN)-Series 600			
M-DRN-601	Slope Drain		
	Revised storm sewer to "Class B, 12".		
M-DRN-602	Bioswale		

Tollway Base Sheet Revisions		
Section M	Base Sheet Drawings	
	Drawing	Modification Summary Effective: 03-31-2016
	Maintenance of Traffic (MOT)-Series 700	
	M-MOT-700	Temporary Concrete Barrier "Y" Connector Segment
		Revised Barrier Details Notes.
		Changed barrier edges chamfered from 1/2" to 1" on all edges (optional).
	Overhead Sign (OHS)-Series 720	
	M-OHS-720	Overhead Sign Structure Span Type Summary and Total Bill of Material
		Added Protective Coat (SQ YD) to Summary Table
		Clarified Class SI and Class DS Concrete are included in Foundation For Overhead Sign Structure.
	M-OHS-721	Overhead Sign Structure Cantilever Type Summary and Total Bill of Material
		Added Protective Coat (SQ YD) to Summary Table
		Clarified Class SI and Class DS Concrete are included in Foundation For Overhead Sign Structure.
	M-OHS-722	Overhead Sign Structure Entrance Monotube Type (Steel) Mainline Summary and Total Bill of Material
		Added Protective Coat (SQ YD) to Summary Table
		Clarified Class SI and Class DS Concrete are included in Foundation For Overhead Sign Structure.
		Clarified Concrete Structures is for Single Face Barrier and included in Summary Table and Total Bill of Material.
	M-OHS-723	Overhead Sign Structure Exit Monotube Type (Steel) Mainline Summary and Total Bill of Material
		Added Protective Coat (SQ YD) to Summary Table
		Clarified Class SI and Class DS Concrete are included in Foundation For Overhead Sign Structure.
		Clarified Concrete Structures is for Single Face Barrier and included in Summary Table and Total Bill of Material.
	M-OHS-724	Overhead Sign Structure Butterfly Type (Steel) Summary and Total Bill of Material
		Added Protective Coat (SQ YD) to Summary Table
		Clarified Class SI and Class DS Concrete are included in Foundation For Overhead Sign Structure.
		Removed Truss Extension for Mounting Walkway detail and references
		Added "L" column and removed TGL and TGL1 from the Summary Table
	M-OHS-725	Overhead Sign Structure Entrance Monotube Type (Steel) AET Ramp Summary and Total Bill of Material
		Added Protective Coat (SQ YD) to Summary Table
		Clarified Class SI and Class DS Concrete are included in Foundation For Overhead Sign Structure.
		Clarified Concrete Structures is for Single Face Barrier and included in Summary Table.
	M-OHS-726	Overhead Sign Structure Exit Monotube Type (Steel) AET Ramp Summary and Total Bill of Material
		Added Protective Coat (SQ YD) to Summary Table
		Clarified Class SI and Class DS Concrete are included in Foundation For Overhead Sign Structure.
		Clarified Concrete Structures is for Single Face Barrier and included in Summary Table.
	M-OHS-727	Overhead Sign Structure Exit Monotube Type (Steel) Cash-IPO Ramp Summary and Total Bill of Material
		Added Protective Coat (SQ YD) to Summary Table
		Clarified Class SI and Class DS Concrete are included in Foundation For Overhead Sign Structure.
		Clarified Concrete Structures is for Single Face Barrier and included in Summary Table.
	M-OHS-728	Overhead Sign Structure Span Type (Steel) Summary and Total Bill of Material
		Added Protective Coat (SQ YD) to Summary Table
		Clarified Class SI and Class DS Concrete are included in Foundation For Overhead Sign Structure.
	M-OHS-729	Overhead Sign Structure ITS Gantry Frame (Steel) Single Span Structure Details
	Sheet 1	Revised Material Specification Table to specify ASTM A500 Gr C & B for Frame & Mounting Beam HSS, respectively.
	Sheet 4	Removed Note 6, referring to ASTM requirements of HSS members.
	Sheet 5	Revised Note 1 to clarify requirements for Contractor when soil conditions are not met in the field.
	Sheet 5	Removed Protective Coat quantity since not required to be applied to shoulder foundation.
	Sheet 5	Updated anchor bolt note to allow ASTM F1554 bolts.
	Sheet 6	Revised Note 1 to clarify requirements for Contractor when soil conditions are not met in the field.
	Sheet 6	Removed Protective Coat quantity since not required to be applied to shoulder foundation.
	Sheet 7	Added note 5 to clarify limits of protective coat and revised protective coat quantity in Median Foundation Schedule.
	M-OHS-730	Overhead Sign Structure ITS Gantry Frame (Steel) Two-Span Structure Details
	Sheet 1	Revised Material Specification Table to specify ASTM A500 Gr C & B for Frame & Mounting Beam HSS, respectively.
	Sheet 4	Removed Note 6, referring to ASTM requirements of HSS members.
	Sheet 6	Revised Note 1 to clarify requirements for Contractor when soil conditions are not met in the field.
	Sheet 6	Removed Protective Coat quantity since not required to be applied to shoulder foundation.
	Sheet 6	Updated anchor bolt note to allow ASTM F1554 bolts.
	Sheet 7	Revised Note 1 to clarify requirements for Contractor when soil conditions are not met in the field.
	Sheet 7	Removed Protective Coat quantity since not required to be applied to shoulder foundation.
	Sheet 8	Added note 5 to clarify limits of protective coat and revised protective coat quantity in Median Foundation Schedule.
	Pole Assembly-Series 1000	
	M-ITS-1000	ELEVATION VIEWS POLE MOUNTED ITS ELEMENT ASSEMBLY
		Added 30A-2P NEMA 4X DISC MTD ON SUPPORT DETAIL.
	M-ITS-1001	GENERAL NOTES POLE MOUNTED ITS ELEMENT ASSEMBLY
		Added Note 16 regarding disconnect switch usage.
	M-ITS-1002	ITS STANDARD FOUNDATION: New Sheet
	Dynamic Message Sign (ITS) - Series 1100	
	M-ITS-1100	Revised conduit call-outs
	M-ITS-1103	Revised 30A-2P NEMA 4X DISC MTD ON SUPPORT DETAIL. Removed pad mounted transformer.
	M-ITS-1104	Revised 30A-2P NEMA 4X DISC MTD ON SUPPORT DETAIL. Revised Note 2 to eliminate 120/208V and pad mount.
	Cabinet Wiring-Series 1200	
	M-ITS-1200	Cabinet Wiring
	All	Added HOT3, NB, and GB to Duplex Receptacle.
	M-ITS-1255	Added HOT5 to Duplex Receptacle.
	M-ITS-1256	Deleted HOT5 from Video Distribution Panel.

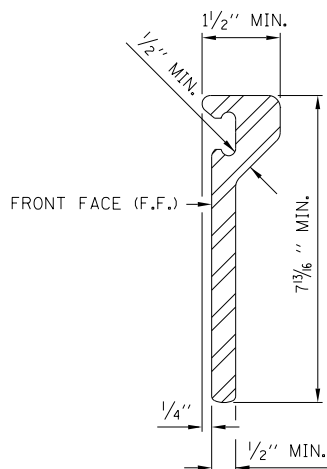
Tollway Base Sheet Revisions

Section M	Base Sheet Drawings		
	Drawing	Modification Summary	Effective: 03-31-2016
	Weigh-In-Motion - Series 1600		
	M-WIM-1600	WEIGH-IN-MOTION CABINET AND FOUNDATION DETAILS	
	M-WIM-1601	WEIGH-IN-MOTION IP CAMERA DETAILS	
	M-WIM-1602	WEIGH-IN-MOTION LOOP DETECTOR DETAILS	
	M-WIM-1603	WEIGH-IN-MOTION DETECTOR LOOP AND QUARTZ SENSOR DETAIL	
	M-WIM-1604	INSTALLATION DETAIL DETECTOR HOUSING & DETECTOR HOUSING ADAPTER	
	M-WIM-1605	WEIGH-IN-MOTION DETECTOR HOUSING DETAIL	
	Flashing Sign Beacon - Series 1700		
	M-ITS-1700	FLASHING SIGN BEACON INSTALLATION BREAKAWAY ELECTRICAL DETAIL	
	M-ITS-1701	FLASHING SIGN BEACON INSTALLATION WIRING DIAGRAM	
	Conduit Details at Integral Abutment-Series 1900		
	M-ITS-1900	CONDUIT DETAILS AT INTEGRAL ABUTMENT BRIDGE STANDARD SLOPE WALL	
	Business Systems (BUS)- Series 2500		
	M-BUS-2500	CABLE CONDUIT SCHEDULE AND GENERAL NOTES	
	M-BUS-2501	LEGEND SYMBOL LIST, ABBREVIATIONS AND EQUIPMENT SCHEDULES	
	M-BUS-2502	SINGLE LINE DIAGRAM AND UTILITY POWER CABLE/CONDUIT SCHEDULE	
	M-BUS-2503	CONTROL BUILDING LIGHTING PLAN AND MISCELLANEOUS DETAILS - MAIN PLAZA	
	M-BUS-2504	CONTROL BUILDING LIGHTING PLAN AND MISCELLANEOUS DETAILS - REMOTE PLAZA	
	M-BUS-2505	CONTROL BUILDING GROUNDING DETAILS - MAIN PLAZA	
	M-BUS-2506	CONTROL BUILDING GROUNDING DETAILS - REMOTE PLAZA	
	M-BUS-2507	GROUNDING SCHEMATIC	
	M-BUS-2508	CONTROL BUILDING MISCELLANEOUS DETAILS	
	M-BUS-2509	UPS SINGLE LINE AND WIRING DIAGRAM	
	M-BUS-2510	MISCELLANEOUS SCHEMATIC DIAGRAMS	
	M-BUS-2511	VIDEO POWER JUNCTION BOX DETAIL - MAIN PLAZA	
	M-BUS-2512	VIDEO POWER JUNCTION BOX DETAIL - REMOTE PLAZA	
	M-BUS-2513	VIDEO WATCHDOG CAMERA DETAILS	
	M-BUS-2514	RAMP PLAZA MONOTUBE DETAILS ACM AND IPO LANES	
	M-BUS-2515	LOOP JUNCTION BOX DETAIL	
	M-BUS-2516	CONTROL BUILDING LIGHTING AND RECEPTACLE PLAN - MAIN PLAZA	
	M-BUS-2517	CONTROL BUILDING LIGHTING AND RECEPTACLE PLAN -REMOTE PLAZA	
	M-BUS-2518	MISCELLANEOUS CROSS SECTION DETAILS	
	M-BUS-2519	COMED TRANSFORMER PAD DETAIL	
	M-BUS-2520	ELECTRICAL SITE PLAN - ACM AND IPO LANES	
	M-BUS-2521	UNDERGROUND ELECTRICAL PLAN - ACM AND IPO LANES - MAIN PLAZA	
	M-BUS-2522	PLAZA I-PASS PLANS - ACM AND IPO LANES	
	M-BUS-2523	UNDERGROUND ELECTRICAL PLAN - ACM AND IPO LANES - REMOTE PLAZA	
	M-BUS-2524	AUTOMATIC LANE ISLAND PLAN AND DETAILS 12 FOOT WIDE LANE	
	M-BUS-2525	IPASS ONLY (IPO) LANE ISLAND PLAN AND DETAILS 12 FOOT WIDE LANE	
	M-BUS-2526	TOLL EQUIPMENT WIRING DIAGRAM - ACM AND IPO LANES	
	M-BUS-2527	LOOP AND TREADLE INSTALLATION DETAILS - ACM AND IPO LANES	
	M-BUS-2528	CONTROL BUILDING TSIC - ACM AND IPO LANES - MAIN PLAZA	
	M-BUS-2529	CONTROL BUILDING TSIC - ACM AND IPO LANES - REMOTE PLAZA	
	M-BUS-2530	TSIC TERMINAL BLOCK LAYOUT - ACM AND IPO LANES	
	M-BUS-2531	CONTROL BUILDING EQUIPMENT LAYOUT - ACM AND IPO LANES - MAIN PLAZA	
	M-BUS-2532	CONTROL BUILDING EQUIPMENT LAYOUT - ACM AND IPO LANES - REMOTE PLAZA	
	M-BUS-2533	CONTROL BUILDING R3 RACK - MAIN PLAZA	
	M-BUS-2534	CONTROL BUILDING R3 RACK - REMOTE PLAZA	
	M-BUS-2535	MISCELLANEOUS DETAILS -ACM AND IPO LANES	
	M-BUS-2536	PANELBOARD SCHEDULES FOR TP1 AND TP2 - ACM AND IPO LANES	
	M-BUS-2537	PANELBOARD SCHEDULES FOR MDP AND UPS UNITS - ACM AND IPO LANES	
	M-BUS-2538	FIBER INTERCONNECTIONS BETWEEN MAIN AND REMOTE PLAZAS - ACM AND IPO LANES	
	M-BUS-2539	PLAZA LANE CONTROL SIGNAL - ACM AND IPO LANES	
	M-BUS-2540	TRAFFIC LIGHT DETAILS - ACM LANES	
	M-BUS-2541	TRAFFIC LIGHT DETAILS - IPO LANES	
	M-BUS-2542	ELECTRICAL SITE PLAN AET LANES	
	M-BUS-2543	UNDERGROUND CONDUIT PLAN - MAIN PLAZA	
	M-BUS-2544	UNDERGROUND CONDUIT PLAN - MAIN PLAZA PLAN - REMOTE PLAZA	
	M-BUS-2545	CONTROL BUILDING EQUIPMENT LAYOUT - REMOTE PLAZA	
	M-BUS-2546	CONTROL BUILDING EQUIPMENT LAYOUT - MAIN PLAZA	
	M-BUS-2547	CONTROL BUILDING TSIC - MAIN AND REMOTE PLAZAS - AET LANES	
	M-BUS-2548	TSIC TERMINAL BLOCK LAYOUT - ACM AND IPO LANES REMOTE PLAZAS - AET LANES	
	M-BUS-2549	PANELBOARD SCHEDULES - MAIN PLAZA AET LANES	
	M-BUS-2550	PANELBOARD SCHEDULES - REMOTE PLAZA AET LANES	
	M-BUS-2551	WIRING DIAGRAM - AET 1-LANE LAYOUT	
	M-BUS-2552	WIRING DIAGRAM - AET 3-LANE LAYOUT	
	M-BUS-2553	LOOP PLAN - AET 1-LANE LAYOUT	
	M-BUS-2554	LOOP PLAN - AET 3-LANE LAYOUT	
	M-BUS-2555	VES WASH SYSTEM ENCLOSURE DETAIL	
	M-BUS-2556	VES WASH SYSTEM PANEL DETAIL	
	M-BUS-2557	VES WASH SYSTEM FLOW DIAGRAM AND MECHANICAL DETAIL	
	M-BUS-2558	VES WASH SYSTEM SUGGESTED CONDUIT ROUTING	
	M-BUS-2559	VES WASH SYSTEM MISCELLANEOUS POWER WIRING DIAGRAM	
	M-BUS-2560	VES WASH SYSTEM CONTROL SWITCH SCHEMATIC	

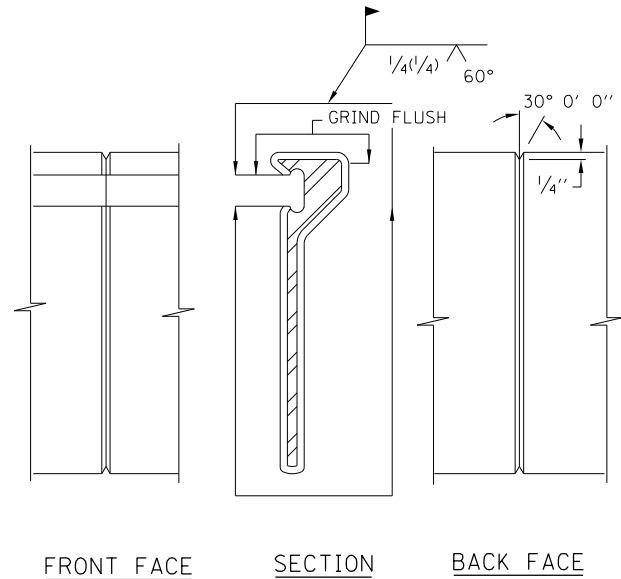
New Sheet



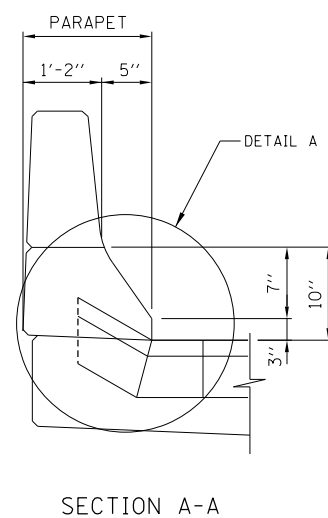
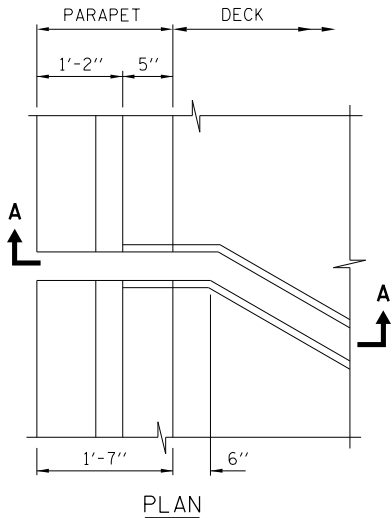
NOTE:  
DIMENSIONS "A" AND "B" ARE PERPENDICULAR TO THE EXPANSION JOINT



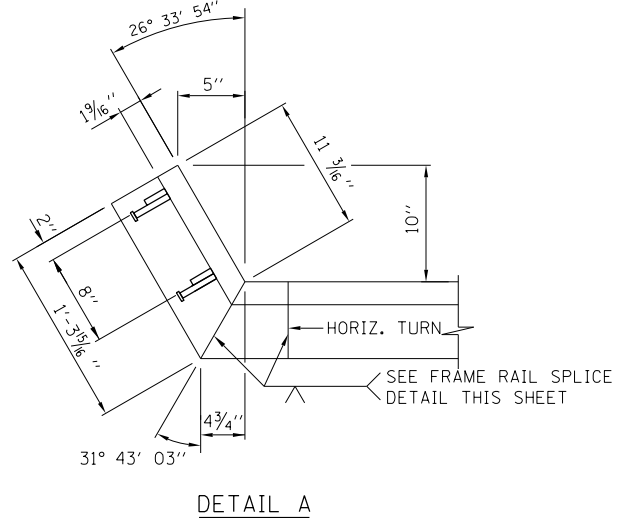
NOTE:  
10" STUDS SHALL BE MADE OF (1)-6 3/16" & (1)-4 1/8" (LENGTH BEFORE WELDING) PIGGY-BACKED.



NOTE:  
WELD ON FRONT SIDE OF FRAME MAY BE OMITTED AT STAGE CONSTRUCTION LINES



UPTURN AT PARAPET



- NOTES:
1. WORK THIS DRAWING WITH THE BASE SHEET FOR EXPANSION JOINT FRAME RAIL SUPPORT SYSTEM.
  2. EXPANSION JOINT SHALL FOLLOW ROADWAY GRADE & CROSS SLOPE. EXPANSION JOINT TO BE SET TO GRADE BY ATTACHING FRAME RAILS TO BACKWALL AND BEAMS.
  3. FRAME RAILS AND OTHER STEEL SHALL BE AASHTO M270 GRADE 36, (ASTM A36).
  4. STUD ANCHORS SHALL BE AASHTO M169 (ASTM A108).
  5. EXPANSION ANCHORS SHALL BE IN ACCORDANCE WITH THE ILLINOIS TOLLWAY SUPPLEMENTAL SPECIFICATIONS, SECTION 1211.
  6. FRAME RAIL ASSEMBLY SHALL BE FABRICATED IN 20 FT. MAXIMUM LENGTHS. SHOP AND FIELD SPLICES SHALL BE PLACED AT CROWN BREAKS, CONSTRUCTION STAGE LINES, AND TRANSVERSE BREAKS IN DECK.
  7. AT SPLICES, A CONTINUOUS GROUND SMOOTH WELD SHALL BE PROVIDED EXCEPT ON SURFACES IN LOCKING CONTACT WITH SEAL WHICH SHALL HAVE NO BURRS.
  8. ALL STUD ANCHORS TO BE ELECTRIC ARC END WELDED WITH COMPLETE FUSION.
  9. AFTER FABRICATION IS COMPLETE FRAME RAILS SHALL BE HOT DIPPED GALVANIZED IN ACCORDANCE WITH AASHTO M111 (ASTM A123).
  10. CORRESPONDING SECTIONS SHALL BE TEMPORARILY SHOP ASSEMBLED, CHECKED FOR FIT, AND MATCH MARKED WITH STENCIL AND BLACK PAINT FOR SHIPMENT.
  11. NEOPRENE SEAL SHALL BE CONTINUOUS. FACTORY VULCANIZED HORIZONTAL MITERS SHALL BE REQUIRED FOR ALL SKEWS.
  12. NEOPRENE SEAL SHALL BE INSTALLED CONTINUOUS. SPLICING OF SEAL IN THE FIELD IS NOT PERMITTED.
  13. NEOPRENE SEAL SHALL BE BONDED TO THE FRAME RAILS WITH AN ADHESIVE MEETING THE REQUIREMENTS OF ASTM D4070.
  14. SUPPORT PLATES, NUTS AND WASHERS CONNECTED TO FRAME RAILS SHALL BE HOT DIPPED GALVANIZED IN ACCORDANCE WITH AASHTO M111 AND M232 (ASTM A123 AND A153).
  15. SUPPORT PLATES ON STEEL GIRDERS SHALL BE WELDED IN ACCORDANCE WITH ARTICLES 505.04 (q) & 505.08 (n) OF THE IDOT STANDARD SPECIFICATIONS.
  16. FURNISHING AND INSTALLING EXPANSION JOINT FRAME RAIL SUPPORT SYSTEM SHALL BE INCLUDED IN THE COST OF BRIDGE EXPANSION JOINT SYSTEM.
  17. JOINT OPENINGS SHALL BE ADJUSTED IN ACCORDANCE WITH THE FIELD ENGINEER'S INSTRUCTIONS.
  18. UPON COMPLETION OF FIELD WELDING, THE CONTRACTOR SHALL CLEAN THE WELD AREA AND APPLY A COATING OF ORGANIC ZINC-RICH PAINT IN ACCORDANCE WITH SSPC-PS12.01.

NOTE TO DESIGNER

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M-BRG-500

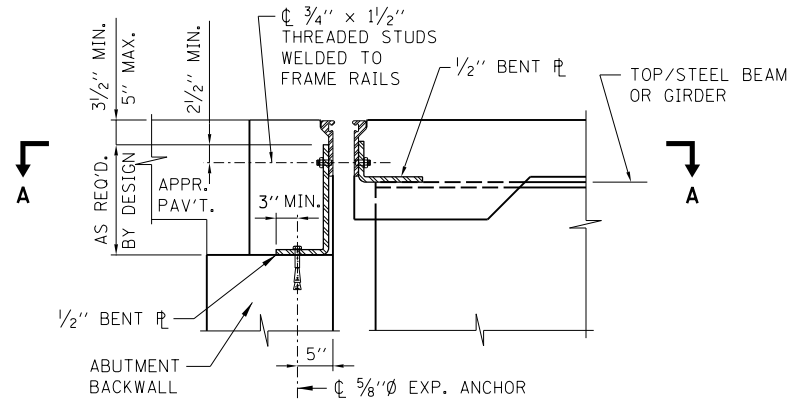


EXPANSION JOINT  
FRAME RAIL AND SEAL  
ALTERNATIVE A

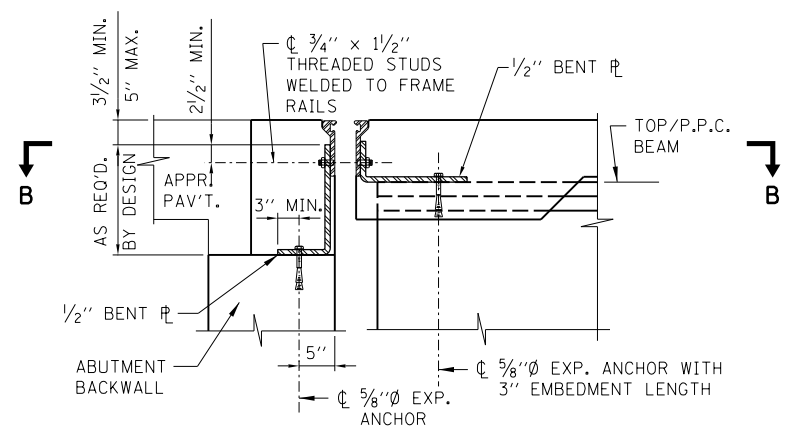
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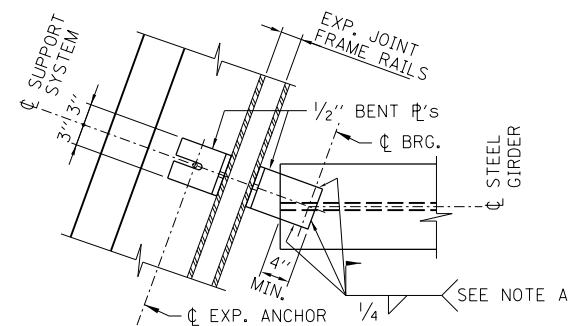




TYPICAL SECTION THRU EXP. JOINT AND  
SUPPORT SYSTEM AT STEEL GIRDERS

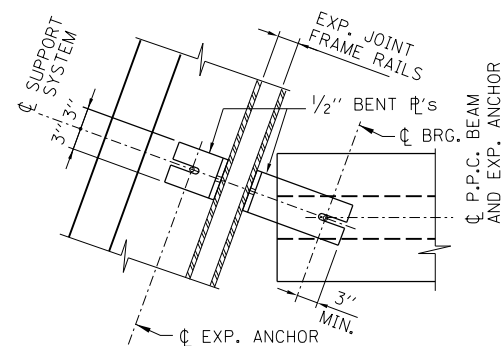


TYPICAL SECTION THRU EXP. JOINT AND  
SUPPORT SYSTEM AT P.P.C. BEAMS

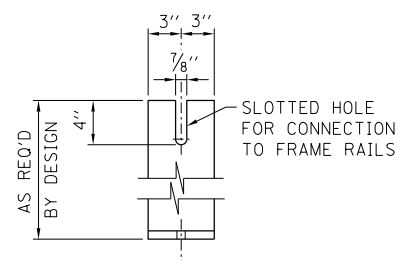


SECTION A-A

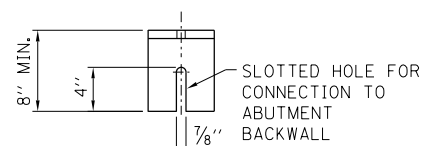
NOTE A:  
FIELD WELD AFTER SUPPORT SYSTEM IS ADJUSTED FOR THE OPENING AND  
HEIGHT REQUIREMENTS AND THE BENT PLATE ON THE OPPOSITE SIDE IS  
SECURED IN PLACE WITH EXPANSION ANCHOR INTO THE CONCRETE.



SECTION B-B

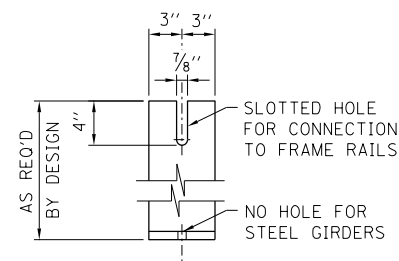


ELEVATION

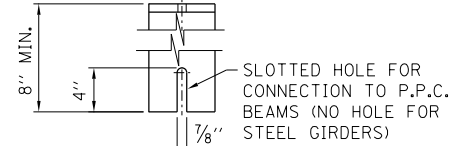


PLAN

BENT SUPPORT PLATE  
AT ABUTMENT



ELEVATION



PLAN

BENT SUPPORT PLATE  
AT BRIDGE DECK

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#### NOTE:

WORK THIS DRAWING WITH THE BASE SHEETS M-BRG-500 AND M-BRG-501 FOR EITHER EXPANSION JOINT FRAME RAIL AND SEAL ALTERNATIVE A OR ALTERNATIVE B.

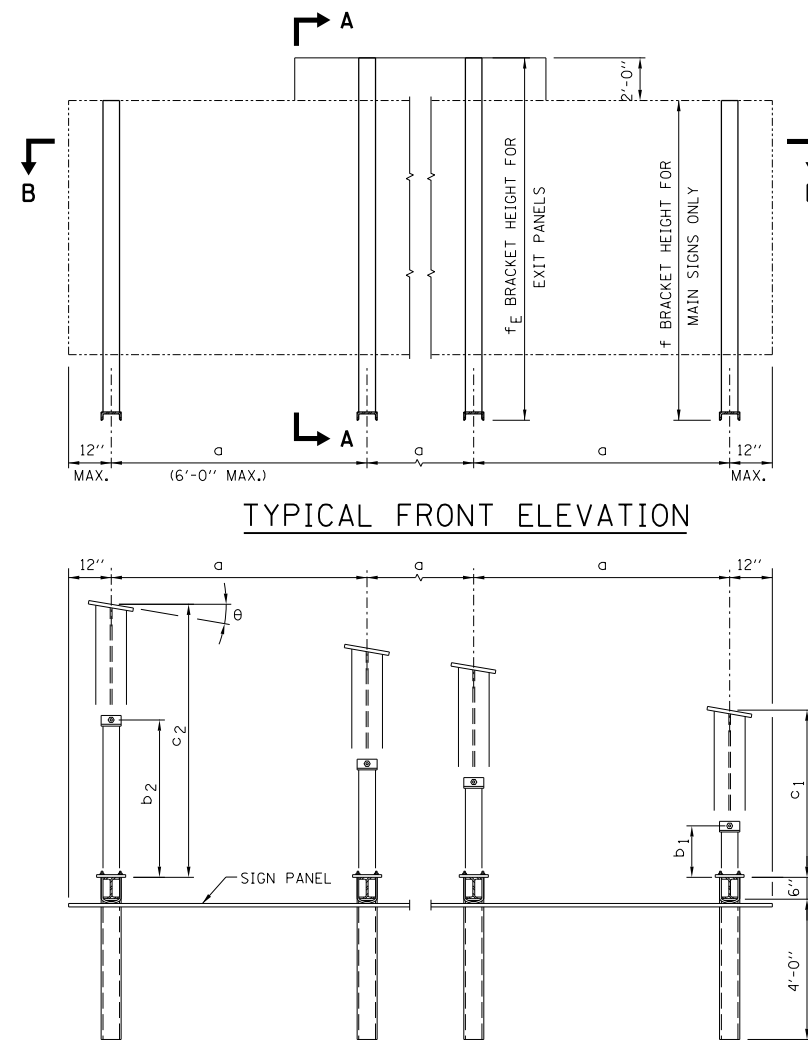
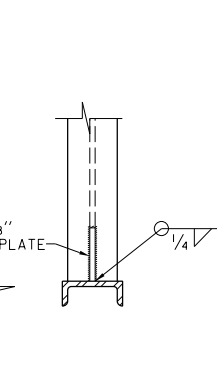
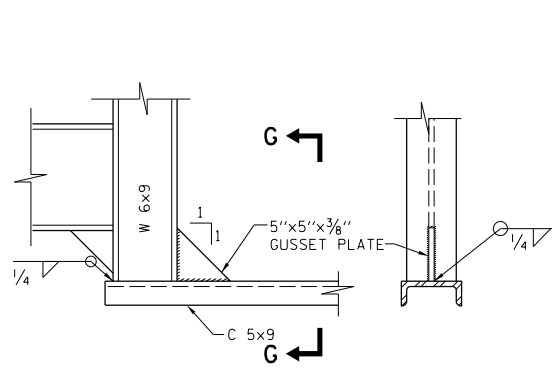
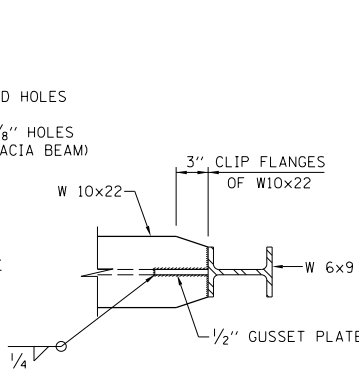
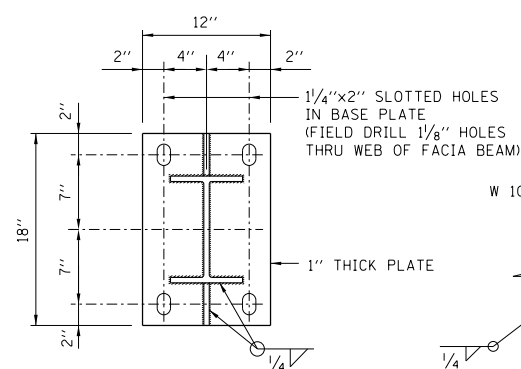
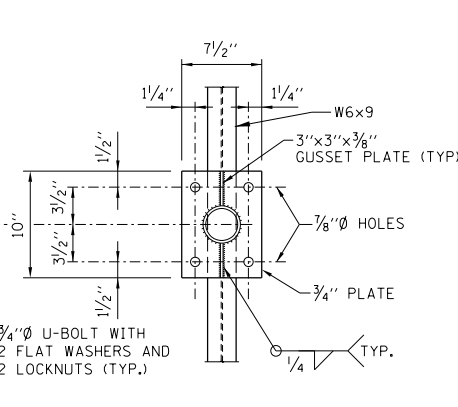
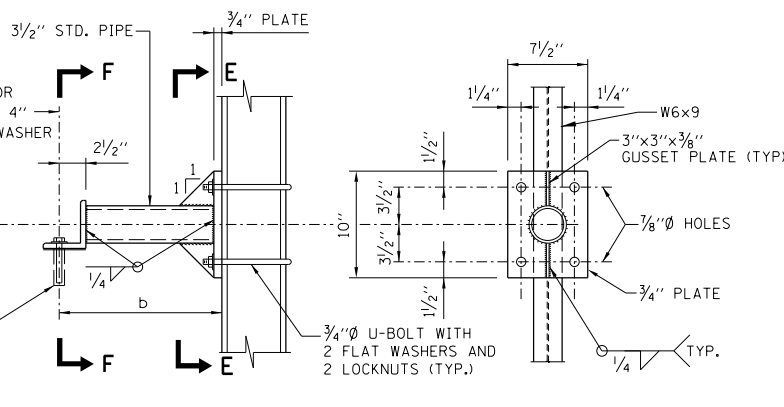
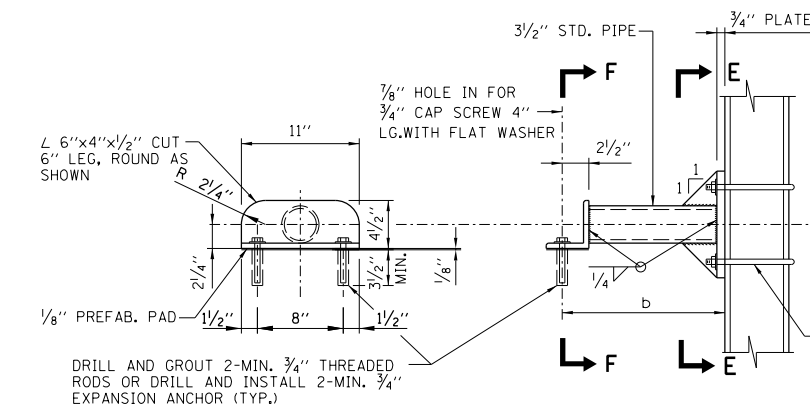
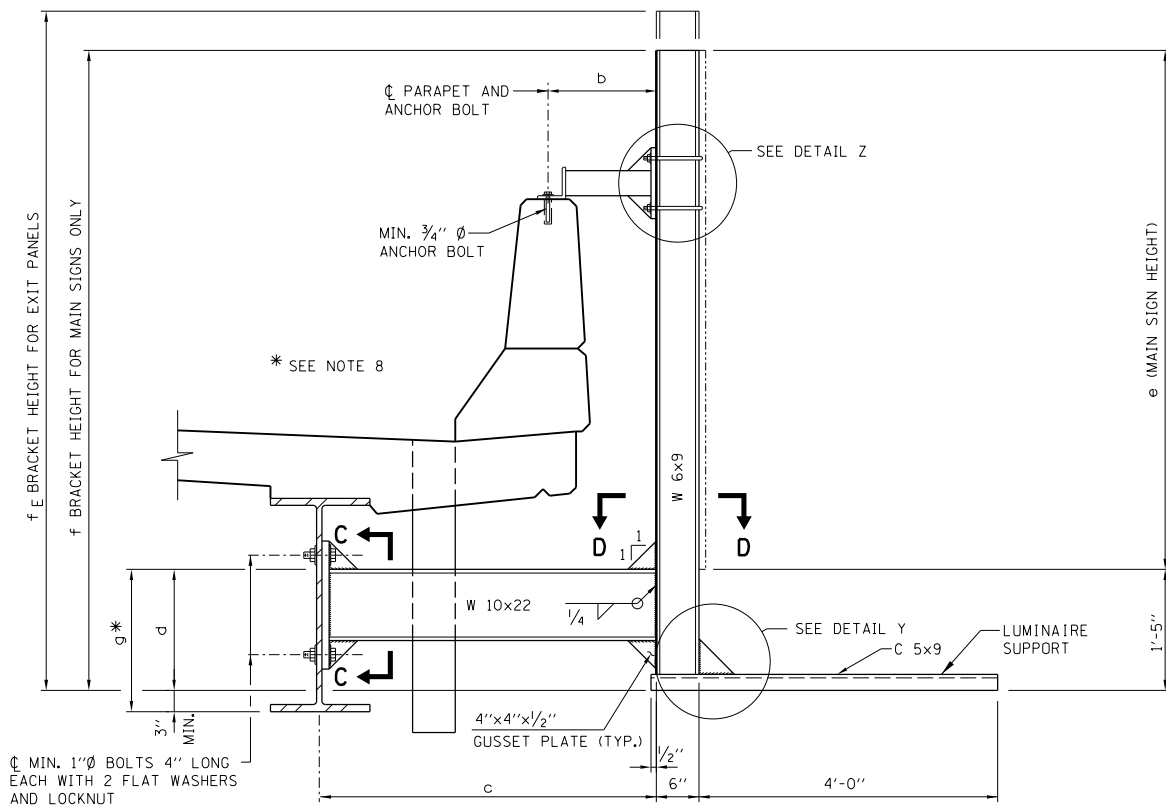
M-BRG-502



EXPANSION JOINT  
FRAME RAIL  
SUPPORT SYSTEM

DATE  
2-7-2012





SECTION B-B

## NOTES:

- ALL STRUCTURE STEEL SHAPES AND PLATES SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M-270 GRADE 36.
- ALL STRUCTURAL STEEL PIPE SHALL BE ASTM A53 GRADE B OR C WITH A MINIMUM YIELD OF 46,000 PSI. IF A500 PIPE IS SUBSTITUTED FOR A53 THEN THE OUTSIDE DIAMETER SHALL BE AS DETAILED AND THE WALL THICKNESS GREATER THAN OR EQUAL TO A53.
- ALL CAP SCREWS, BOLTS, U-BOLTS, WASHERS AND LOCKNUTS SHALL BE IN ACCORDANCE WITH ARTICLE 733.02 OF THE ILLINOIS TOLLWAY SUPPLEMENTAL SPECIFICATIONS AND SHALL BE GALVANIZED IN ACCORDANCE WITH AASHTO M-232.
- ALL WELDS TO BE CONTINUOUS UNLESS OTHERWISE SHOWN. ALL WELDING TO BE DONE IN ACCORDANCE WITH THE CURRENT AWS D1.1 STRUCTURAL WELDING CODE (STEEL) AND THE ILLINOIS TOLLWAY SUPPLEMENTAL SPECIFICATIONS.
- ALL FABRICATION SHALL BE COMPLETE AND READY FOR ASSEMBLY BEFORE GALVANIZING. NO PUNCHING, DRILLING, CUTTING, NOR WELDING SHALL BE PERMITTED AFTER GALVANIZING.
- ALL STRUCTURAL STEEL PLATES AND SHAPES SHALL BE HOT-DIPPED GALVANIZED IN ACCORDANCE WITH AASHTO M111.
- CONTRACTOR SHALL FIELD CHECK ALL BRIDGE DIMENSIONS SHOWN ON PLANS BEFORE SUBMITTING SHOP DRAWINGS.
- ALL HOLES DRILLED IN BRIDGE BEAM OR PLATE GIRDER SHALL BE LOCATED IN THE MIDDLE HALF OF THE WEB. THERE SHALL NOT BE ANY HOLES DRILLED IN THE WEB OF BEAM OR PLATE GIRDER CLOSER TO THE FLANGE THAN THE DEPTH OF BEAM DIVIDED BY FOUR (4) OR ONE-FOURTH (1/4) THE DEPTH OF THE BEAM. THE ENGINEER MAY ADJUST DIMENSION "g" TO MEET THE ABOVE CONDITION AND TO KEEP THE SIGN LEVEL.
- THE COST OF FURNISHING AND INSTALLING THE BEARING PADS AS HEREIN SPECIFIED SHALL BE INCLUDED WITH THE COST OF BRIDGE (STEEL) MOUNTED SIGN SUPPORT.
- PRE-FAB BEARING PADS: FABRIC BEARING PADS SHALL CONSIST OF A FABRIC AND RUBBER BODY MADE WITH NEW, UNVULCANIZED RUBBER AND UNUSED FABRIC FIBERS.
- METHOD OF MEASUREMENT SHALL BE IN ACCORDANCE WITH ARTICLE 733.08(b) OF ILLINOIS TOLLWAY SUPPLEMENTAL SPECIFICATIONS. THIS WORK WILL BE PAID FOR AT THE CONTRACT UNIT PRICE PER LINEAR FOOT FOR BRIDGE (STEEL) MOUNTED SIGN SUPPORT.
- SIGN STRUCTURE WIRING SHALL BE IN ACCORDANCE WITH THE ILLINOIS TOLLWAY SUPPLEMENTAL SPECIFICATIONS, SECTION 823.
- CENTER LINE OF EXPANSION ANCHOR INTO PARAPET SHALL BE AT LEAST 12" TO CENTER LINE OF OPEN JOINT IN PARAPET. ENGINEER SHALL VERIFY THE MINIMUM DISTANCES BETWEEN EXPANSION ANCHORS & PARAPET PRIOR TO ERECTION OF SIGN SUPPORT.

## NOTE TO DESIGNER

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SIGN NO.	ROUTE	STATION	BRIDGE NAME	SIGN SKEW ANGLE (θ)	NO. BR'K'TS f	NO. BR'K'TS f <sub>E</sub>	a	b <sub>1</sub>	b <sub>2</sub>	c <sub>1</sub>	c <sub>2</sub>	d	e	f	f <sub>E</sub>	g	MAIN SIGN SIZE	EXIT PANEL WIDTH

TOTAL BILL OF MATERIAL			
PAY ITEM	DESCRIPTION	UNIT	TOTAL

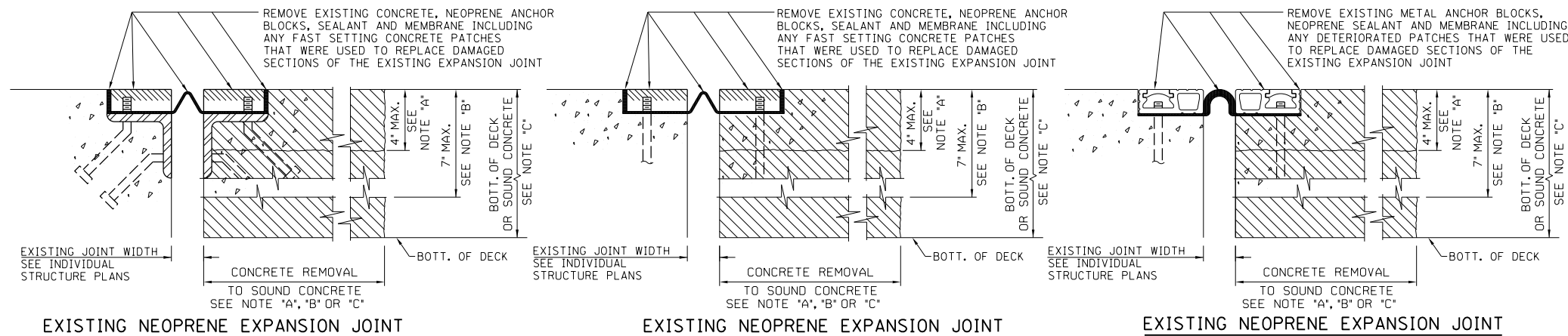
M-BRG-504

**Illinois Tollway**

BRIDGE (STEEL) MOUNTED SIGN SUPPORT

DATE  
2-7-2012





**NOTE A:**

REPAIR EXISTING JOINT BLOCKOUTS OR UNSOUND CONCRETE REMOVALS LESS THAN OR EQUAL TO 4" IN DEPTH WITH NOSING MATERIAL IN ACCORDANCE WITH THESE DETAILS AND THE ILLINOIS TOLLWAY GBSP SPECIAL PROVISION "BRIDGE EXPANSION JOINTS, REPLACEMENT AND RECONSTRUCTION".

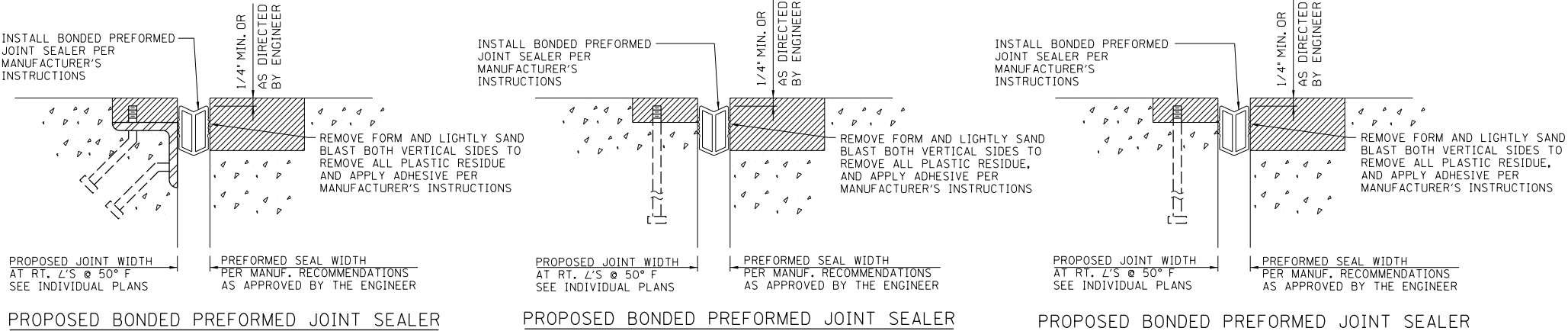
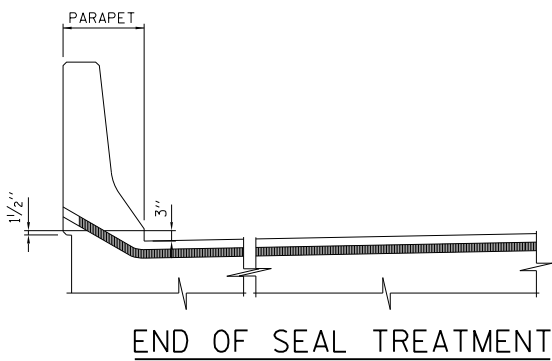
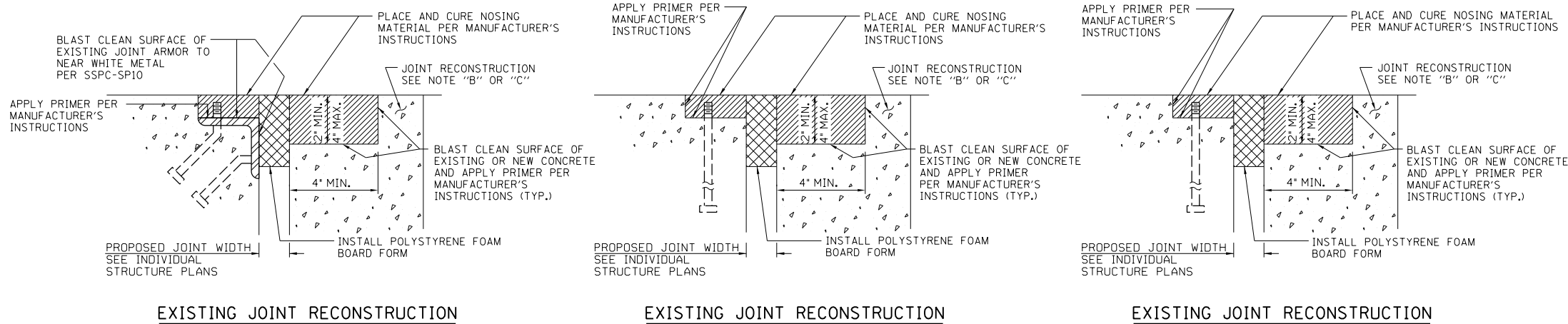
**NOTE B:**

WHEN DEPTH OF UNSOUND CONCRETE IS GREATER THAN 4" BUT LESS THAN 7", REMOVE BOTH SOUND AND UNSOUND CONCRETE TO A UNIFORM DEPTH OF 7" AND RECONSTRUCT THE JOINT WITH A 2" x 4" BLOCKOUT FOR NOSING MATERIAL IN ACCORDANCE WITH THESE DETAILS AND THE ILLINOIS TOLLWAY GBSP SPECIAL PROVISION "BRIDGE EXPANSION JOINTS, REPLACEMENT AND RECONSTRUCTION".

**NOTE C:**

SHOULD THE DEPTH OF UNSOUND CONCRETE EXCEED 7", AT ISOLATED LOCATIONS, REMOVE THE DETERIORATED CONCRETE TO THE BOTTOM OF THE BRIDGE DECK OR SOUND CONCRETE AS DETERMINED BY THE ENGINEER. THE JOINT SHALL BE RECONSTRUCTED WITH A 2" x 4" BLOCKOUT FOR NOSING MATERIAL IN ACCORDANCE WITH THESE DETAILS AND THE ILLINOIS TOLLWAY GBSP SPECIAL PROVISION "BRIDGE EXPANSION JOINTS, REPLACEMENT AND RECONSTRUCTION".

- NOTES:**
1. NEW CONCRETE SHALL BE CURED IN ACCORDANCE WITH ARTICLE 1020.13 (d) (3) OF THE IDOT STANDARD SPECIFICATIONS PRIOR TO PLACING THE NOSING MATERIAL.
  2. SAWCUT (2") AND REMOVE UNSOUND CONCRETE AND RECONSTRUCT THE EXISTING JOINT OPENING WITH NOSING MATERIAL IN ACCORDANCE WITH NOTES A, B AND C.J
  3. SHOULD THE DEPTH OF UNSOUND CONCRETE EXCEED 7", FOR MOST OF THE JOINT LENGTH, THE NOSING SHALL BE REPAIRED AS A FULL DEPTH CONCRETE REPAIR THE FULL LENGTH OF THE JOINT.



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TYPE "I" JOINT REPLACEMENT DETAILS      TYPE "II" JOINT REPLACEMENT DETAILS      TYPE "III" JOINT REPLACEMENT DETAILS

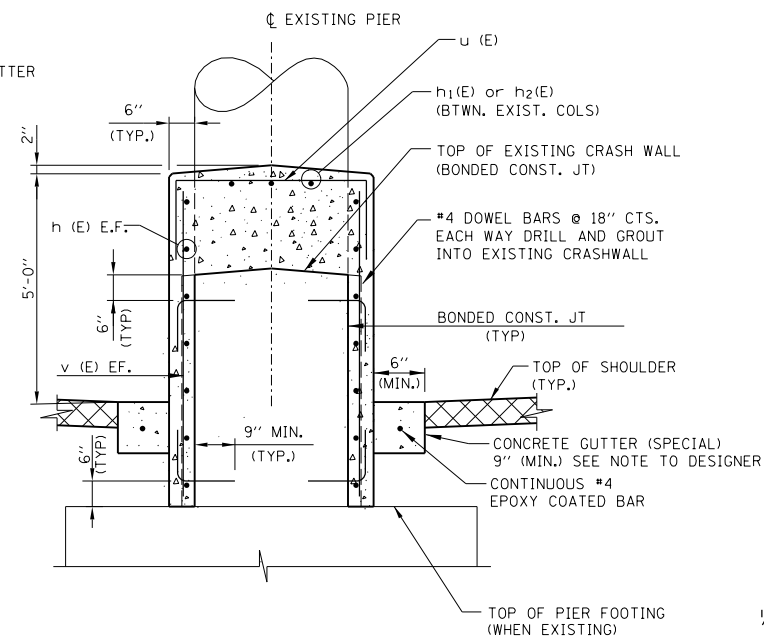
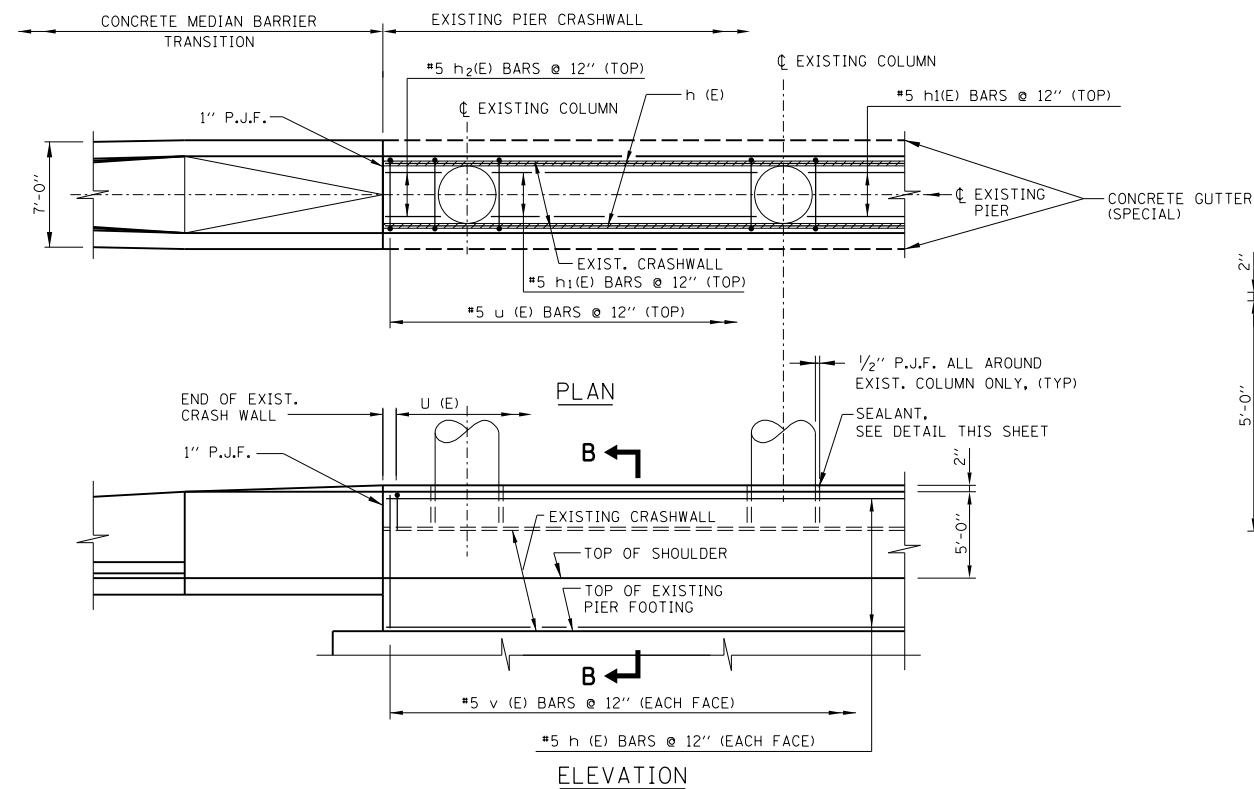
RESERVED

M-BRG-506



RESERVED

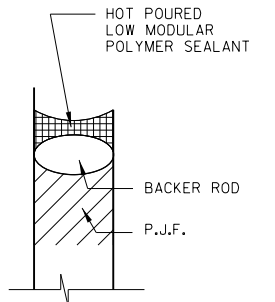
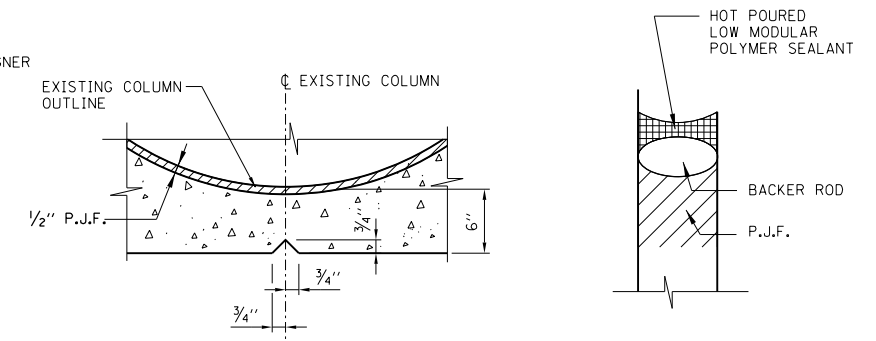
DATE  
3-31-2016



NOTE TO DESIGNER

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WHEN THERE IS A MINIMUM DISTANCE OF 6' FROM THE FACE OF THE PIER CRASHWALL TO THE OUTER EDGE OF GUTTER OF THE CONCRETE MEDIAN BARRIER TRANSITION BASE, A CONCRETE GUTTER (SPECIAL) SHALL BE INSTALLED ALONG THE LENGTH OF PIER CRASHWALL. WHEN THERE IS LESS THAN 6' DISTANCE AN ASPHALT SHOULDER SHALL BE PLACED TO THE FACE OF THE CRASHWALL. THE WIDTH OF THE PIER CRASHWALL AND GUTTER SHALL BE EQUAL TO THE ADJACENT MEDIAN BARRIER BASE.



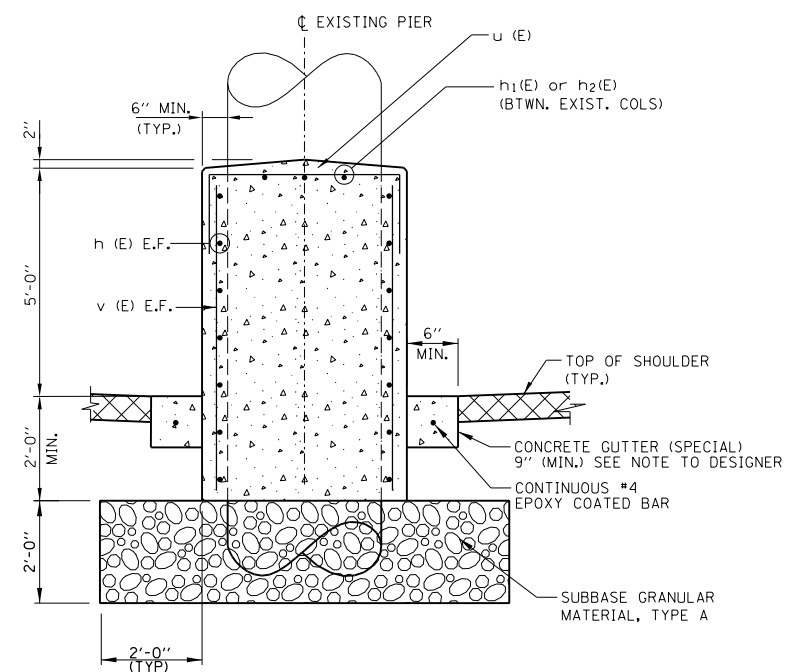
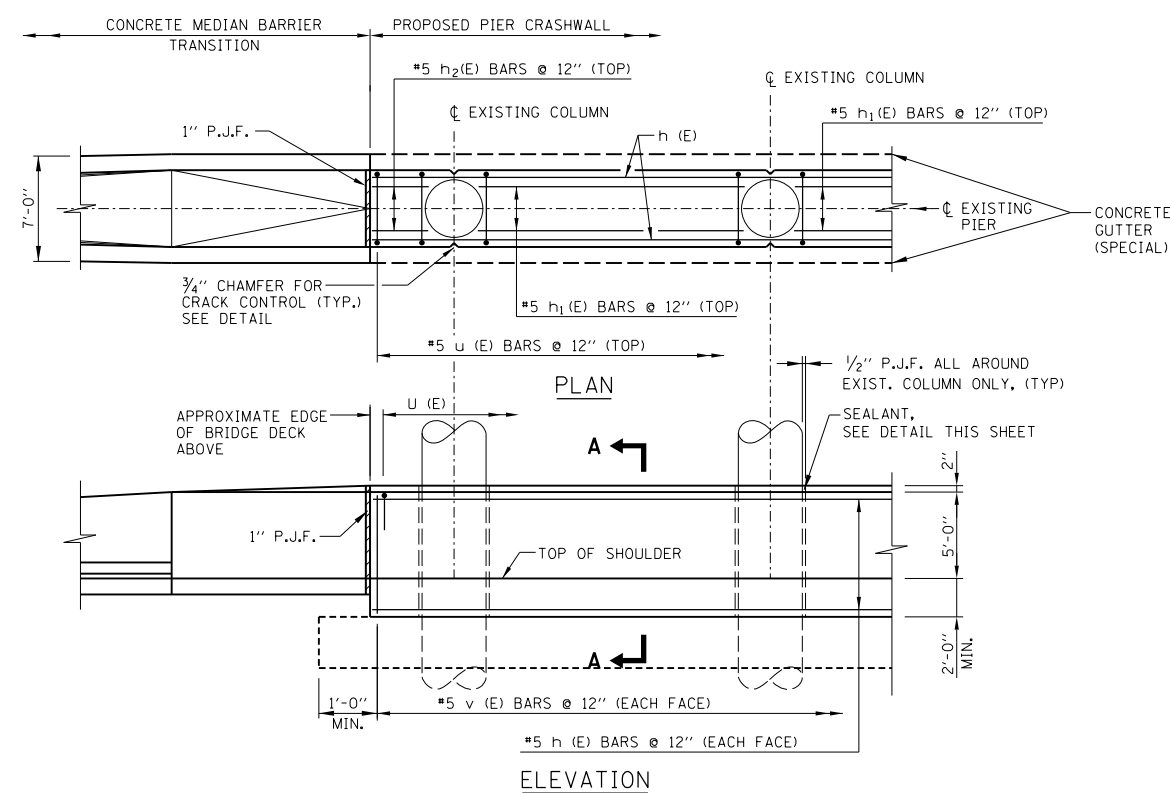
CRACK CONTROL DETAIL

REINFORCEMENT BARS OMITTED FOR CLARITY

### SEALANT DETAIL

NOTES:

1. REMOVE EXISTING CONCRETE CRASHWALL BACK TO FACE OF COLUMNS PRIOR TO PLACING CONCRETE AROUND EXISTING CRASHWALL AND COLUMNS. SURFACES TO RECEIVE NEW CONCRETE SHALL BE BLAST CLEANED. COST OF CLEANING SHALL BE INCLUDED IN THE COST OF CONCRETE REMOVAL.
2. CONCRETE MEDIAN BARRIER TRANSITION TAPER LENGTHS, PAY LIMITS AND MEASUREMENT, AND BASIS OF PAYMENT ALL IN ACCORDANCE WITH THE ILLINOIS TOLLWAY STANDARD DRAWING C13, C14 AND THE SPECIAL PROVISIONS.
3. THE CLEAR COVER FOR REINFORCEMENT BARS TO THE SURFACE OF CONCRETE SHALL BE 2" UNLESS OTHERWISE SHOWN.
4. REINFORCEMENT BARS DESIGNATED "E" SHALL BE EPOXY COATED.
5. EXPOSED CONCRETE EDGES SHALL HAVE 3/4"x45° CHAMFERS. CHAMFERS ON VERTICAL EDGES SHALL BE CONTINUED A MINIMUM OF ONE FOOT BELOW FINISHED GROUND LEVEL.
6. CONCRETE SEALANT SHALL BE APPLIED TO THE EXPOSED SURFACES OF ALL NEW AND/OR MODIFIED PIER CRASH WALLS.
7. E.F. DENOTES EACH FACE



## SECTION A-A

LEGEND:

 P.J.F.

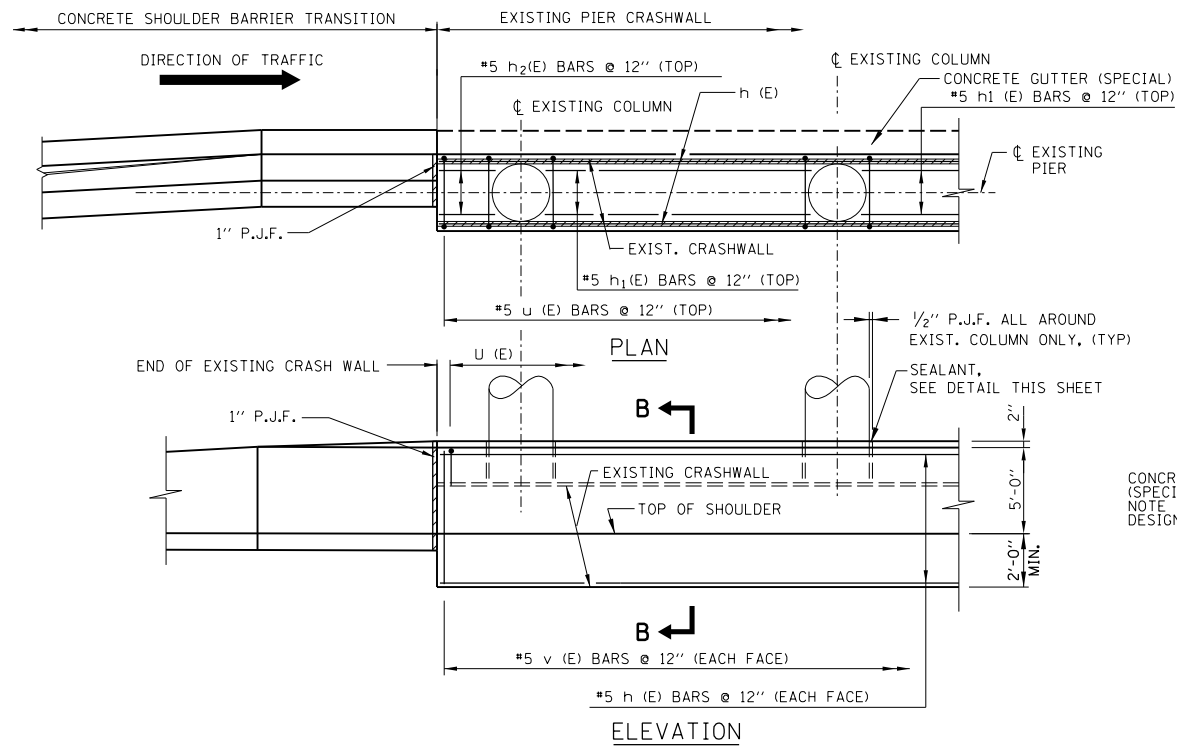
☐ NEW CONCRETE

 BITUMINOUS SHOULDER

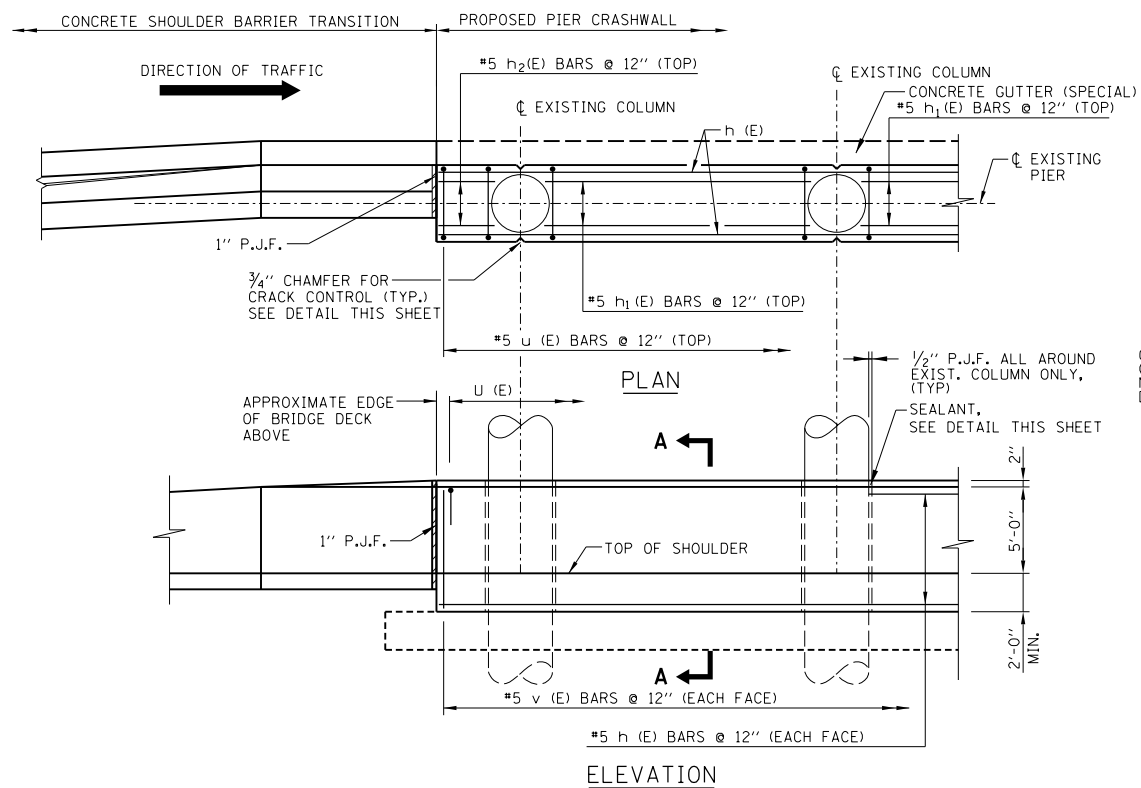
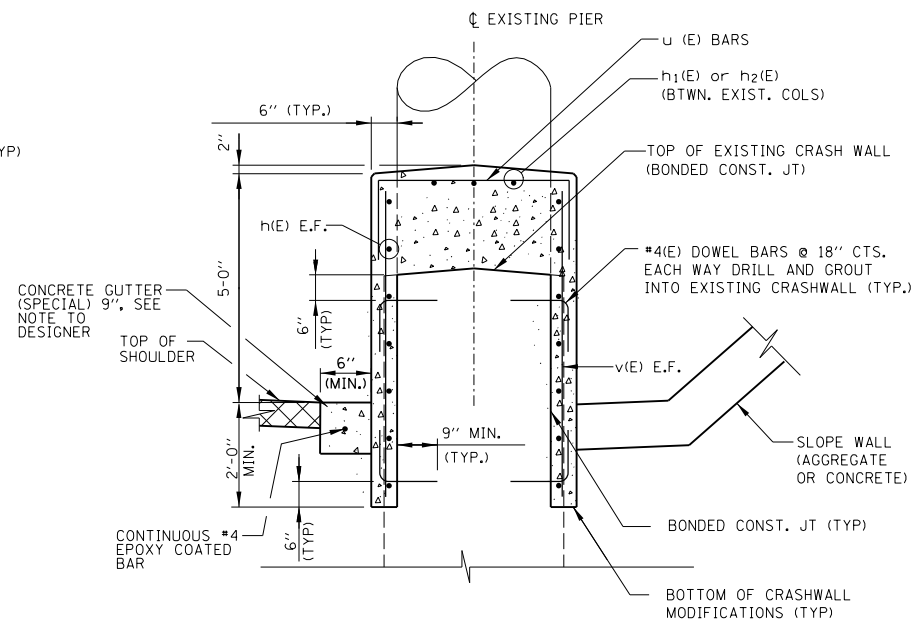
M-BRG-507

CRASH WALL MODIFICATIONS  
MEDIAN PIERS

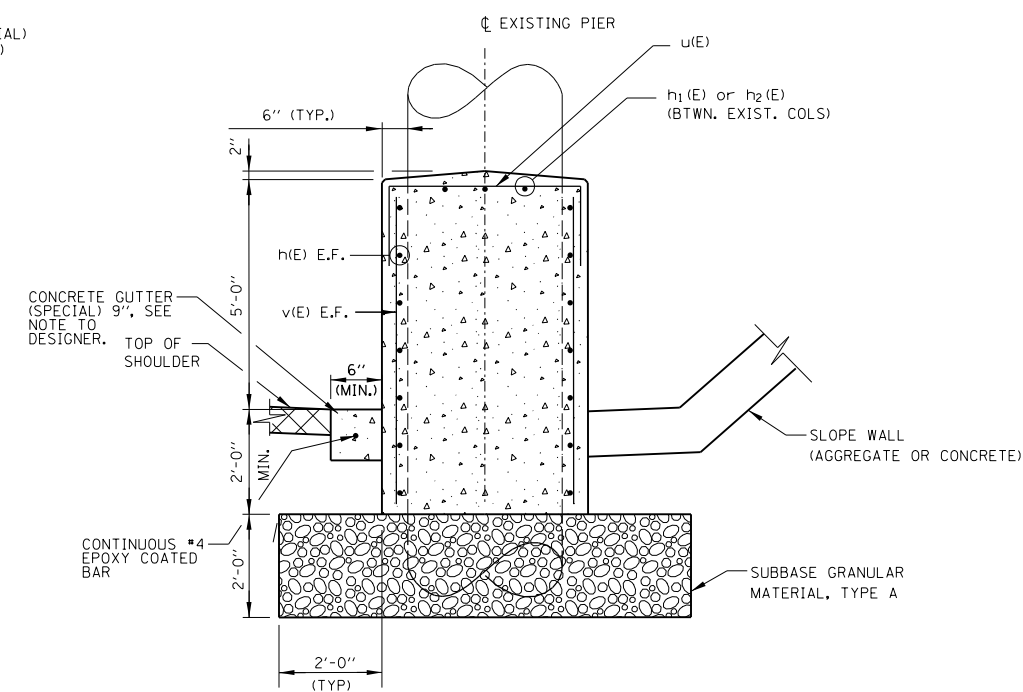
DATE  
3-31-2016



PROTECTION FOR EXISTING SHOULDER PIER  
WITH CRASH WALL



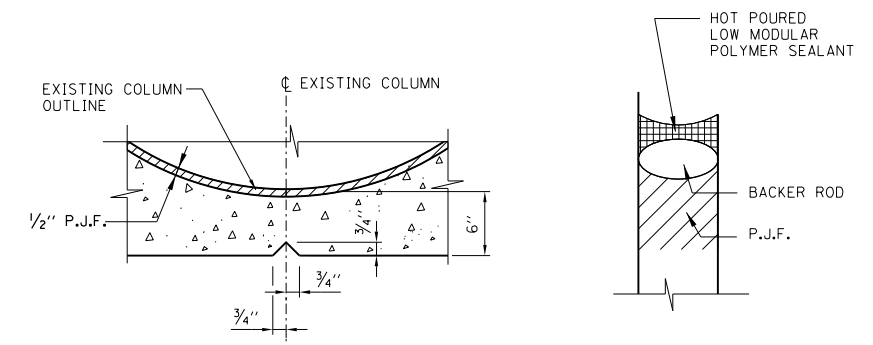
PROTECTION FOR EXISTING SHOULDER PIER  
WITHOUT CRASH WALL



## NOTE TO DESIGNER

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## CRACK CONTROL DETAIL

REINFORCEMENT BARS OMITTED FOR CLARITY

## SEALANT DETAIL

### NOTES:

1. REMOVE EXISTING CONCRETE CRASHWALL BACK TO FACE OF COLUMNS PRIOR TO PLACING CONCRETE AROUND EXISTING CRASHWALL AND COLUMNS. SURFACES TO RECEIVE NEW CONCRETE SHALL BE BLAST CLEANED. COST OF CLEANING SHALL BE INCLUDED IN THE COST OF CONCRETE REMOVAL.
2. CONCRETE SHOULDER MEDIAN BARRIER TRANSITION TAPER LENGTHS, PAY LIMITS AND MEASUREMENT, AND BASIS OF PAYMENT ALL IN ACCORDANCE WITH THE ILLINOIS TOLLWAY STANDARD DRAWING C7, C13, C14 AND THE SPECIAL PROVISIONS.
3. THE CLEAR COVER FOR REINFORCEMENT BARS TO THE SURFACE OF CONCRETE SHALL BE 2" UNLESS OTHERWISE SHOWN.
4. REINFORCEMENT BARS DESIGNATED "(E)" SHALL BE EPOXY COATED.
5. EXPOSED CONCRETE EDGES SHALL HAVE 3/4"x45° CHAMFERS. CHAMFERS ON VERTICAL EDGES SHALL BE CONTINUED A MINIMUM OF ONE FOOT BELOW FINISHED GROUND LEVEL.
6. CONCRETE SEALANT SHALL BE APPLIED TO THE EXPOSED SURFACES OF ALL NEW AND/OR MODIFIED PIER CRASH WALLS.
7. E.F. DENOTES EACH FACE

### LEGEND:

- P.J.F.
- NEW CONCRETE
- BITUMINOUS SHOULDER

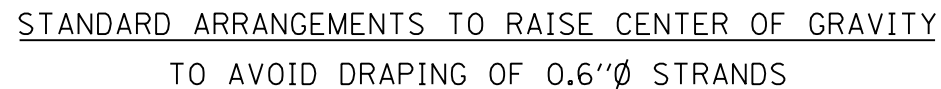
M-BRG-508



CRASH WALL MODIFICATIONS  
SHOULDER PIERS

DATE  
3-31-2016




$$\begin{aligned} A &= 632 \text{ SQ. IN.} \\ r^2 &= 158.20 \text{ IN.}^2 \\ Y_T &= 19.37 \text{ IN.} \\ Y_B &= -16.63 \text{ IN.} \\ I &= 99,980 \text{ IN.}^4 \\ S_T &= 5,162 \text{ IN.}^3 \\ S_B &= -6,012 \text{ IN.}^3 \\ \text{WT.} &= 658 \#/\text{FT.} \end{aligned}$$

PRE-TENSION

$$f'_S = 270,000 \text{ P.S.I.}$$

$$f_S = 0.75 \times 270,000 = 202,500 \text{ P.S.I.}$$




for low relaxation strands

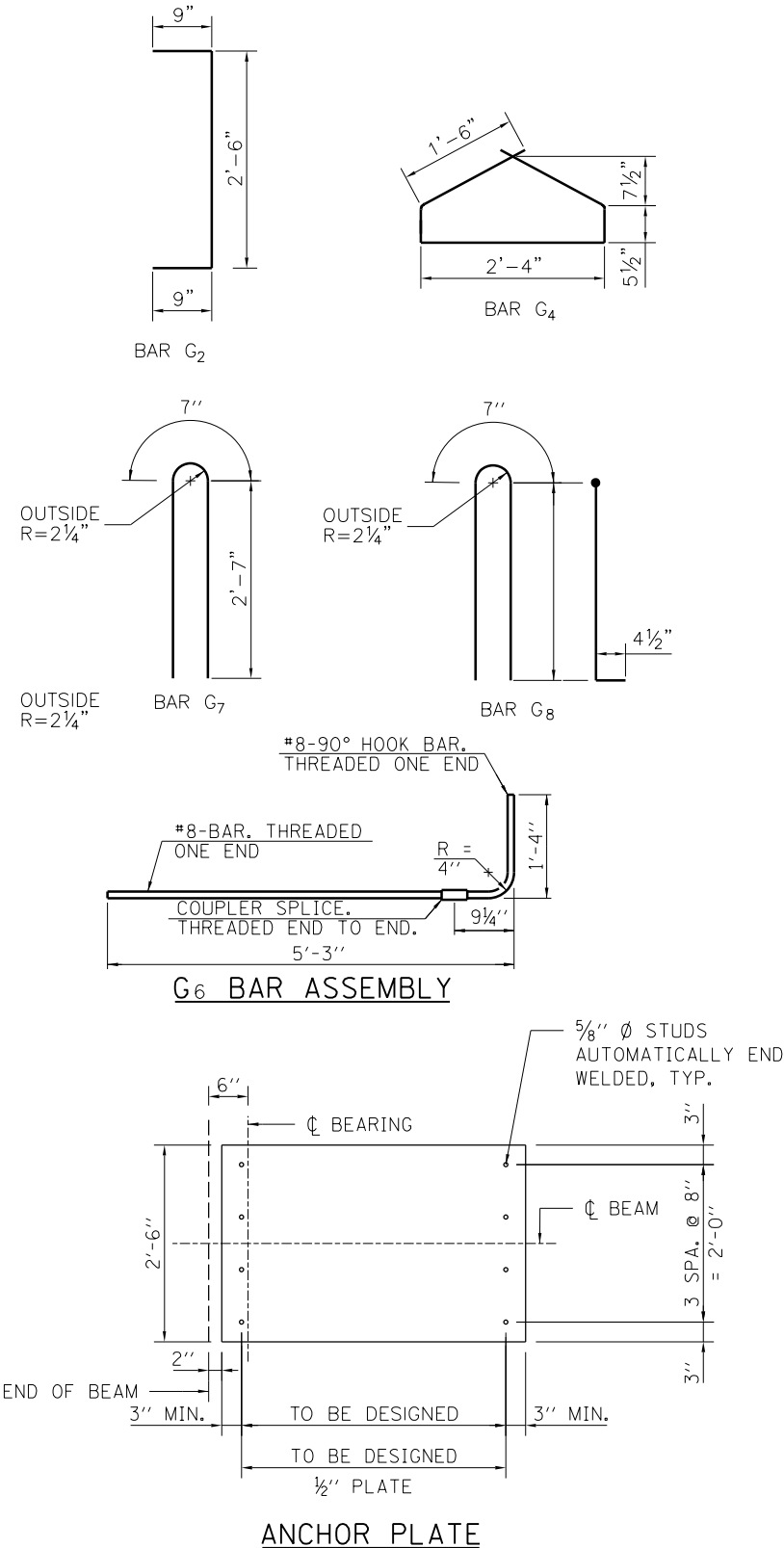
$$\text{Pi PER } 0.6" \varnothing \text{ STRAND} = 0.217 \times 202,500 = \underline{43.94 \text{ KIPS}}$$

$$\frac{y_B}{r^2} = \frac{-16.63}{158.20} = -0.10512 \text{ in/in}^2$$

$$f_B \text{ (init.)} = \frac{A_s f_s}{A} \left(1 + \frac{e_s y_B}{r^2}\right)$$

## BAR LIST

BAR	NO.	SIZE	LENGTH	SHAPE
G <sub>2</sub>	20	#6	4'-0"	
G <sub>4</sub>	46	#3	6'-3"	
G <sub>6</sub>	2	#8	6'-6"	
G <sub>7</sub>		#4	5'-9"	
G <sub>8</sub>		#4		
G <sub>9</sub>		#5	2'-7"	
G <sub>10</sub>		#4	2'-3"	
G <sub>11</sub>				



NOTES:

TOP OF BEAM TO BE ROUGH FLOATED AND BROOMED TRANSVERSELY, EXCEPT THE OUTSIDE 8" OF BEAM, WHICH SHALL RECEIVE A SMOOTH FINISH. AN APPROVED CONCRETE SEALER SHALL BE APPLIED TO ALL SMOOTH SURFACES INCLUDING THE OUTSIDE 8" OF THE TOP FLANGE.

THE BEAM SHALL BE PROVIDED WITH A SUITABLE LIFTING  
DEVICE FOR HANDLING AND ERECTING THE BEAMS.

STRANDS SHALL BE FLUSH WITH END OF BEAM. FOR BEAM ENDS EMBEDDED COMPLETELY IN CONCRETE, END OF STRANDS SHALL BE COATED WITH NON-BITUMINOUS JOINT SEALER. FOR BEAM ENDS THAT ARE FINALLY EXPOSED, COAT THE BEAM ENDS, EXPOSED STRAND ENDS AND ALL NON-BONDING SURFACES WITHIN 2 FEET OF THE BEAM ENDS WITH A NON-PIGMENTED EPOXY CONFORMING TO AASHTO M-235 TYPE III, GRADE 2, CLASS B OR C. THE EPOXY SHALL BE APPLIED AT LEAST 3 DAYS AFTER MOIST CURING HAS CEASED AND PRIOR TO THE APPLICATION OF THE SEALER.

ALL GIRDERS SHALL BE CAST FULL LENGTH AS SHOWN.

SPACING SHOWN FOR #4 STIRRUPS IS FOR GRADE 60 REINFORCEMENT.

PRESTRESSING STRANDS SHALL BE 0.6" DIA., 7-WIRE LOW, RELAXATION FOR ALL PATTERNS WITH AN ULTIMATE STRENGTH OF 270,000 psi. THE MAX NUMBER OF DRAPED 0.6"Ø STRANDS IS 8.

INSERTS FOR  $\frac{3}{4}$ " Ø THREADED DOWEL RODS, WHEN SPECIFIED AT EXPANSION JOINT ENDS, SHALL BE TWO-STRUT, FERRULE-TYPE FOR INTERIOR BEAMS AND SINGLE-FERRULE, FLARED-LOOP TYPE FOR EXTERIOR BEAMS.

NOTE TO DESIGNER

SPECIFY CONCRETE STRENGTH AS REQUIRED BY DESIGN FROM A MINIMUM OF 6,000 PSI TO A MAX. OF 8,000 PSI. MAXIMUM RELEASE STRENGTH IS 6,800 PSI.

REINFORCEMENT IN STANDARD END SECTION OF THE BEAM IS BASED ON THE STRAND PATTERNS LISTED ON THIS SHEET. USING DIFFERENT STRAND PATTERNS WILL REQUIRE A COMPLETE DESIGN OF THIS REINFORCEMENT. PRIOR APPROVAL FROM THE ILLINOIS TOLLWAY IS REQUIRED IF DESIGN OF THE END REINFORCEMENT IS REQUIRED.

THE DESIGN ENGINEER DETERMINES THE PROJECTION OF BAR G<sub>8</sub> BASED ON 1/2" MIN. HAUNCH AT EDGE OF BEAM, X-SLOPE, PROFILE GRADE LINE AND CALCULATED RESIDUAL BEAM CAMBER, INCLUDING THE CAMBER MULTIPLIER OF 1.8. THIS VALUE CAN VARY AND SHOULD BE GIVEN FOR EACH 1/3 OF THE BEAM LENGTH. PROVIDE VALUES THAT MAINTAIN 3" MIN. DECK EMBEDMENT AND 2 1/2" CLEAR FROM TOP OF DECK WHILE ACCOUNTING FOR ±3/4" VARIANCE IN ACTUAL CAMBER VERSUS THE CALCULATED RESIDUAL CAMBER.

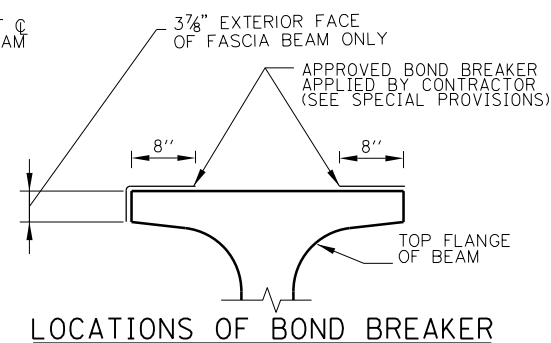
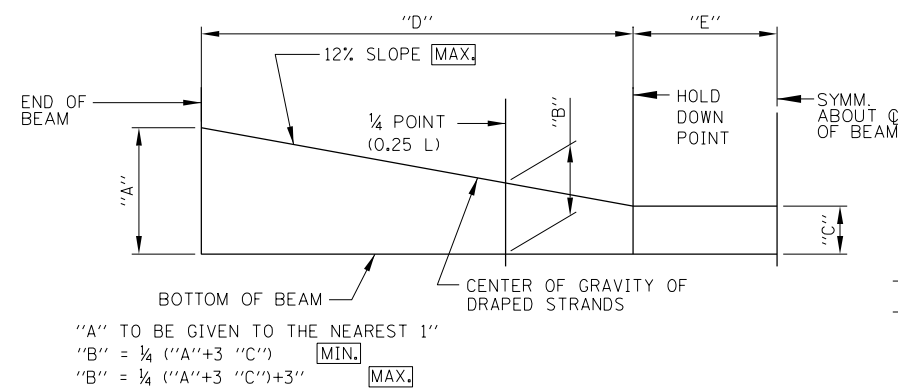
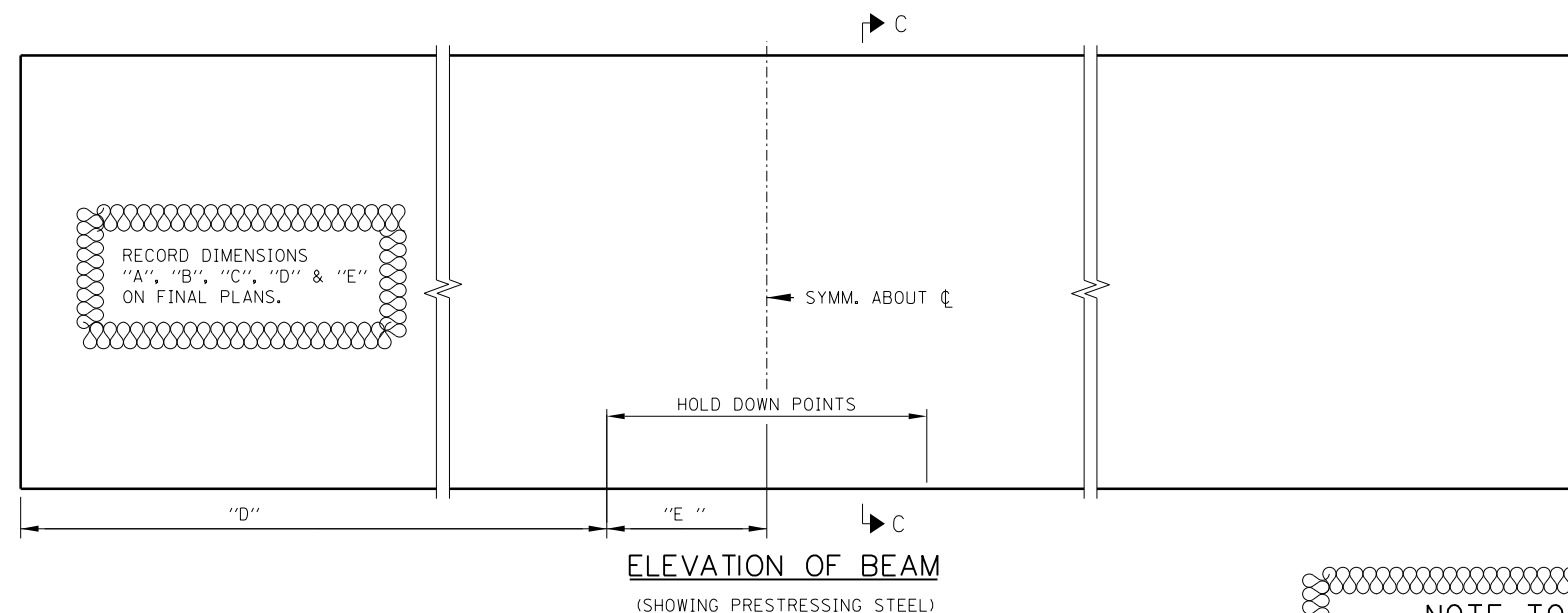
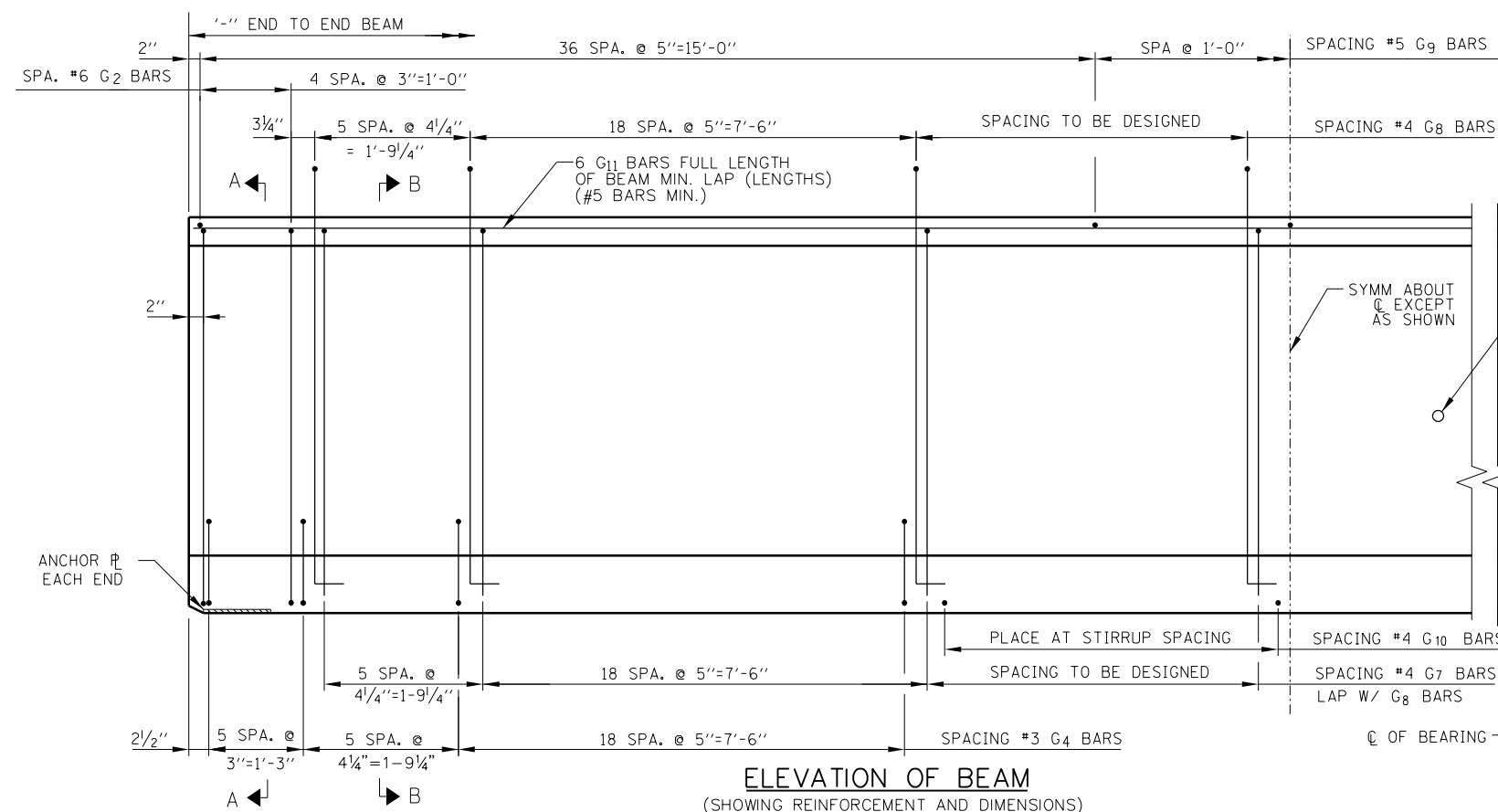
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### 36" PPC BULB-T BEAM DETAILS

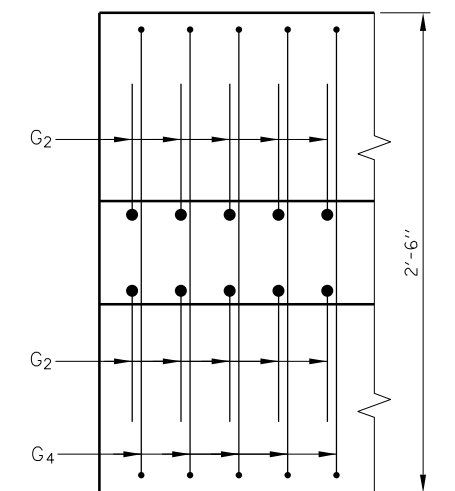
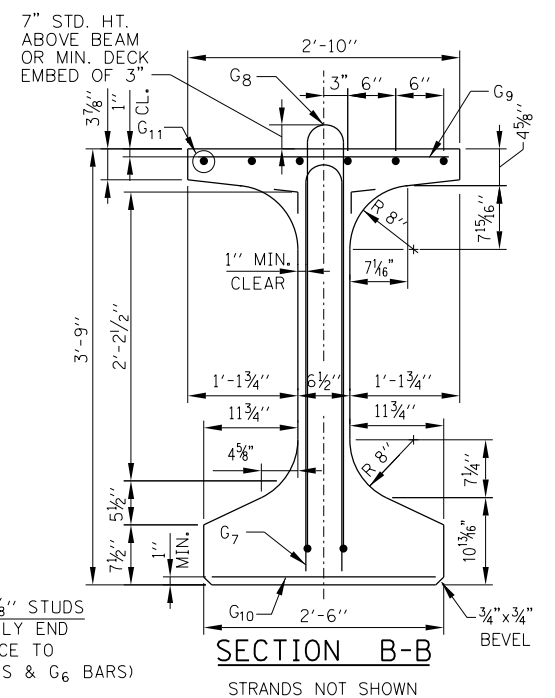
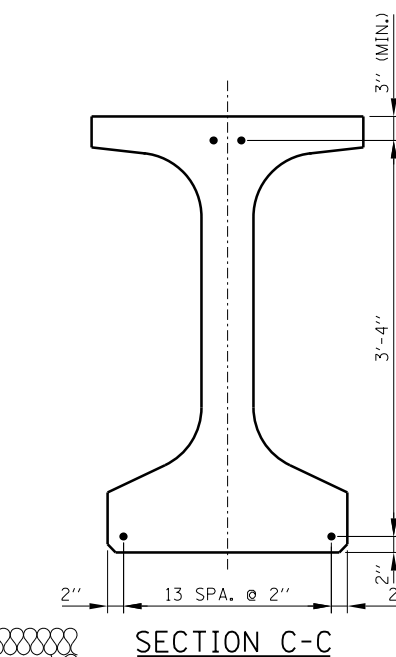
DATE  
7-15-2013





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PLAN-BOTTOM FLANGE DETAIL  
AT END OF BEAM

NOTE:

WORK THIS SHEET WITH BASE SHEET M-BRG-512.

M-BRG-511



45" PPC BULB-T  
BEAM

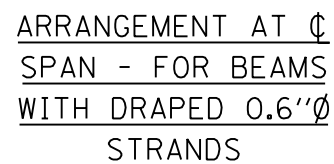
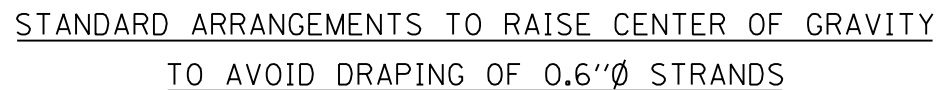
DATE  
7-17-2013

## BILL OF MATERIAL

ITEM	UNIT	TOTAL
FURNISHING AND ERECTING SHALLOW-DEPTH PRECAST PRESTRESSED CONCRETE BULB-T BEAM, 45"	FOOT	

DATE  
7-15-2015





$A = 798 \text{ SQ. IN.}$   
 $r^2 = 402.41 \text{ IN.}^2$   
 $y_T = 27.70 \text{ IN.}$   
 $y_B = -26.30 \text{ IN.}$   
 $I = 321,049 \text{ IN.}^4$   
 $S_T = 11,592 \text{ IN.}^3$   
 $S_B = -12,205 \text{ IN.}^3$   
 $WT. = 831\#/FT.$

$$f'_S = 270,000 \text{ P.S.I.}$$

$$f_S = 0.75 \times 270,000 = 202,500 \text{ P.S.I.}$$

for low relaxation strands

$$P_i \text{ PER } 0.6" \varnothing \text{ STRAND} = 0.217 \times 202,500 = \underline{43.94 \text{ KIPS}}$$

$$\frac{y_B}{r^2} = \frac{-26.30}{402.41} = -0.06536 \text{ in/in}^2$$

$$f_B (\text{init.}) = \frac{A_s f_s}{A} \left(1 + \frac{e_s y_B}{r^2}\right)$$

Figure 10.10 shows the dimensions of the roof and wall framing members. The left diagram shows a vertical wall section with a width of 9 inches and a height of 4 feet 0 inches. The right diagram shows a roof section with a total width of 2 feet 4 inches, a peak height of 1 foot 6 inches, and a vertical height of 7 1/2 inches from the base to the peak. The roof is labeled BAR G4.



INSERTS FOR 3\*4"Ø THREADED DOWEL RODS, WHEN SPECIFIED AT EXPANSION JOINT ENDS, SHALL BE TWO-STRUT, FERRULE-TYPE FOR INTERIOR BEAMS AND SINGLE-FERRULE, FLARED-LOOP TYPE FOR EXTERIOR BEAMS.

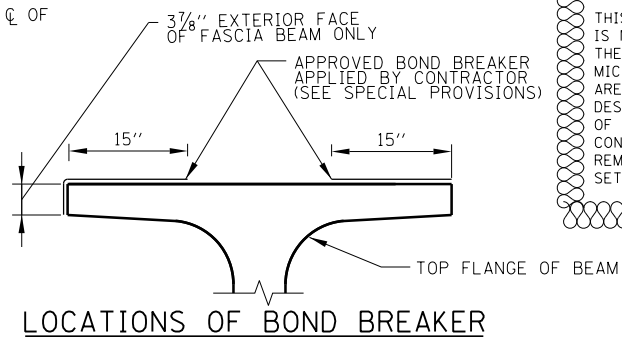
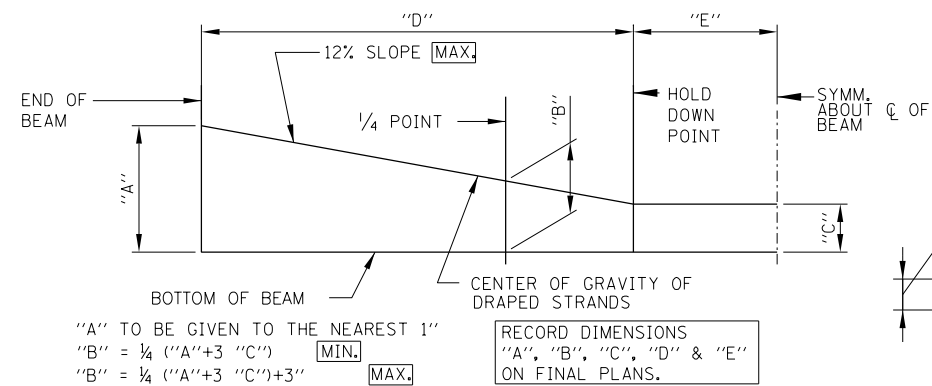
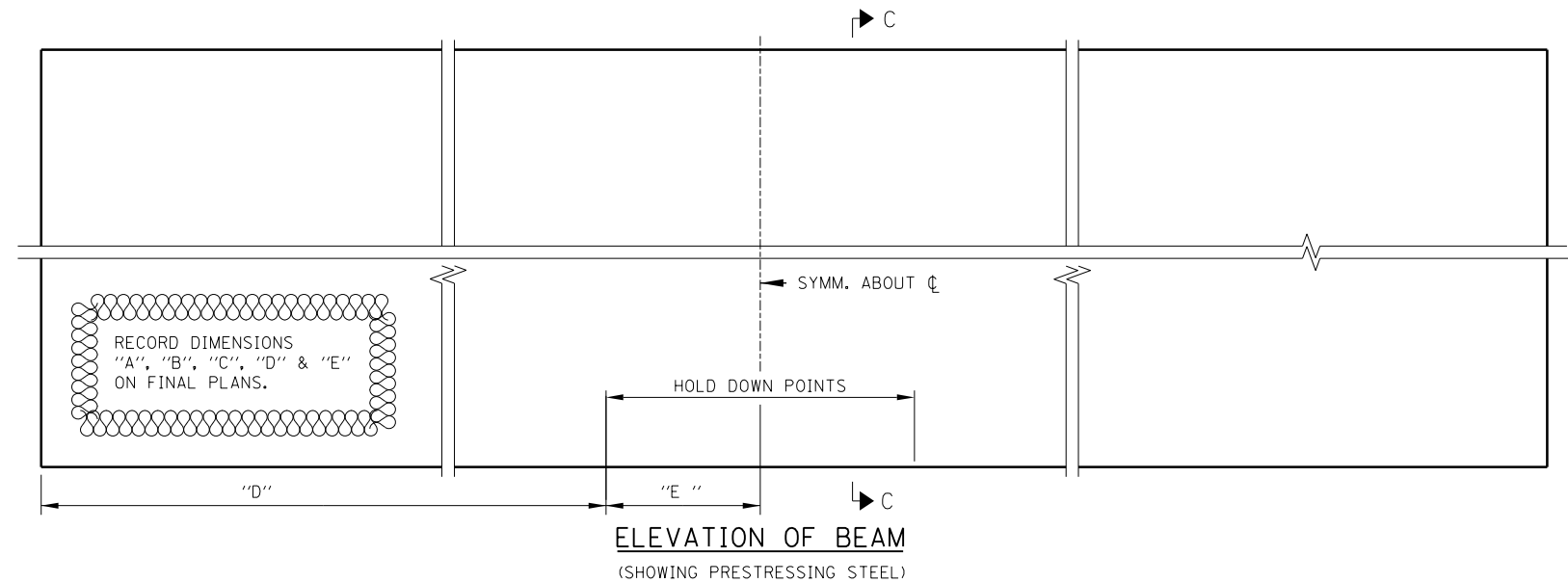
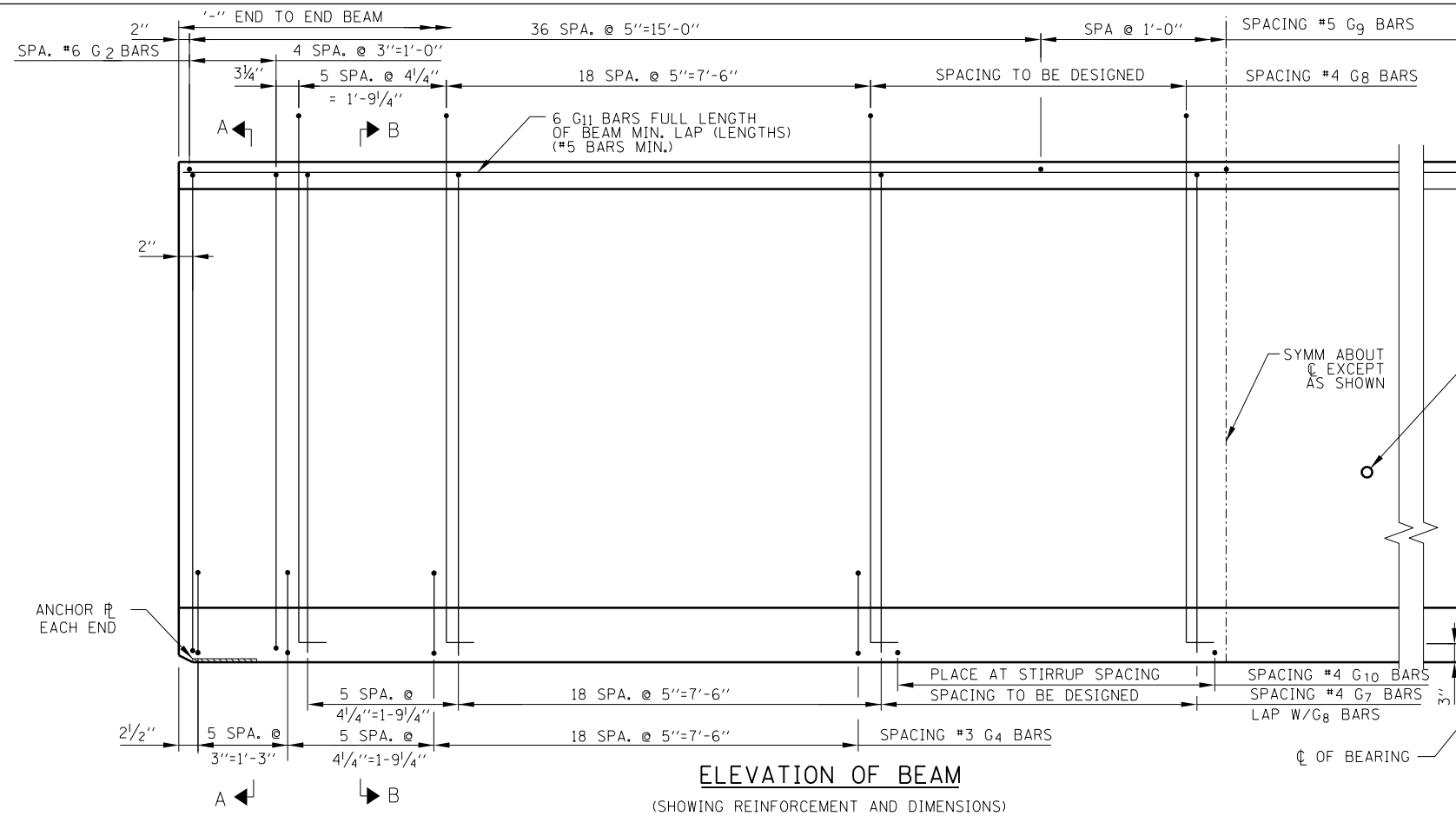
THIS BASE SHEET SHOWS TYPICAL NEW CONSTRUCTION BUT IT IS NOT A STANDARD DRAWING. IT REQUIRES COMPLETION BY THE DESIGNER PRIOR TO INSERTION INTO A CONTRACT. MICROSTATION FILES AND THE "CADD STANDARDS MANUAL" ARE AVAILABLE ON THE ILLINOIS TOLLWAY WEBSITE. THE DESIGNER SHALL ACCEPT THE RESPONSIBILITY OF THE DESIGN OF THIS SHEET UPON ITS COMPLETION AND INSERTION INTO A CONTRACT. ALL "NOTE TO DESIGNER" BOXES SHALL BE REMOVED PRIOR TO INSERTION OF THE SHEET INTO THE PLAN SET.

1. SPECIFY CONCRETE STRENGTH AS REQUIRED BY DESIGN FROM A MINIMUM OF 6,000 PSI TO A MAX. OF 8,000 PSI. MAXIMUM RELEASE STRENGTH IS 6,800 PSI.
2. REINFORCEMENT IN STANDARD END SECTION OF THE BEAM IS BASED ON THE STRAND PATTERNS LISTED ON THIS SHEET. USING DIFFERENT STRAND PATTERNS WILL REQUIRE A COMPLETE DESIGN OF THIS REINFORCEMENT. PRIOR APPROVAL FROM THE ILLINOIS TOLLWAY IS REQUIRED IF DESIGN OF THE END REINFORCEMENT IS REQUIRED.
3. THE DESIGN ENGINEER DETERMINES THE PROJECTION OF BAR  $G_8$  BASED ON  $\frac{1}{2}"$  MIN. HAUNCH AT EDGE OF GIRDER, X-SLOPE, PROFILE GRADE LINE AND CALCULATED RESIDUAL BEAM CAMBER, INCLUDING THE CAMBER MULTIPLIER OF 1.8. THIS VALUE CAN VARY AND SHOULD BE GIVEN FOR EACH  $\frac{1}{3}$  OF THE BEAM LENGTH. PROVIDE VALUES THAT MAINTAIN 3" MIN. DECK EMBEDMENT AND  $2\frac{1}{2}"$  CLEAR FROM TOP OF DECK WHILE ACCOUNTING FOR  $\pm\frac{3}{4}"$  VARIANCE IN ACTUAL CAMBER VERSUS THE CALCULATED RESIDUAL CAMBER.



54" PPC BULB-T  
BEAM DETAILS

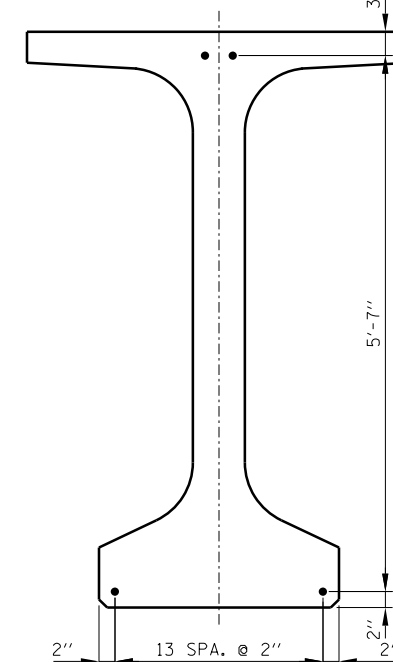
DATE  
7-17-2013



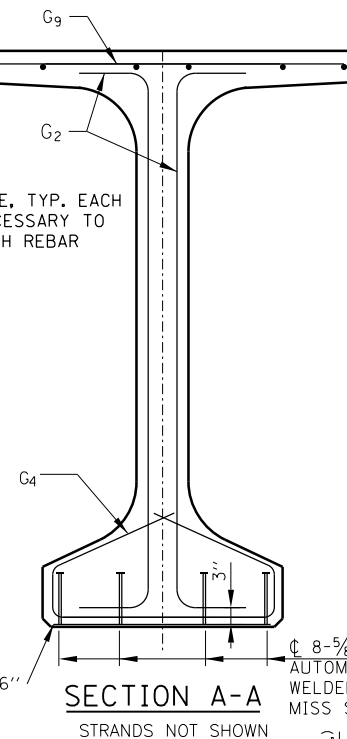
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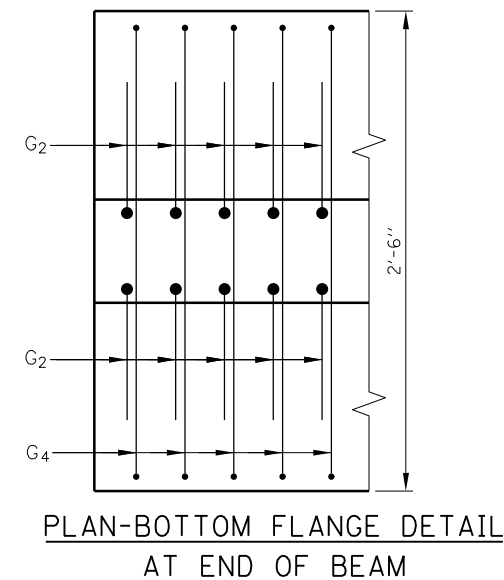
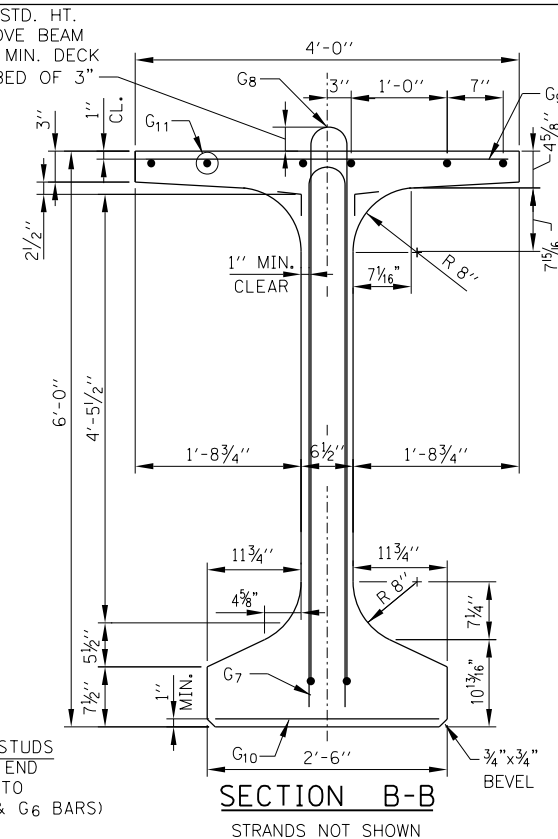
### SECTION C-C



### SECTION A-A



CL 8-5/8" Ø x 6 3/8" STUDS AUTOMATICALLY END WELDED (SPACE TO MISS STRANDS & G<sub>6</sub> BARS)



### NOTE:

WORK THIS SHEET WITH BASE SHEET M-BRG-516.

M-BRG-515

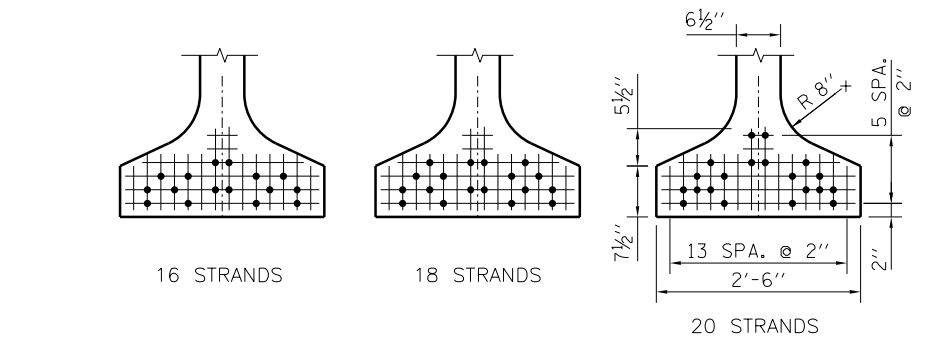


72" PPC BULB-T BEAM

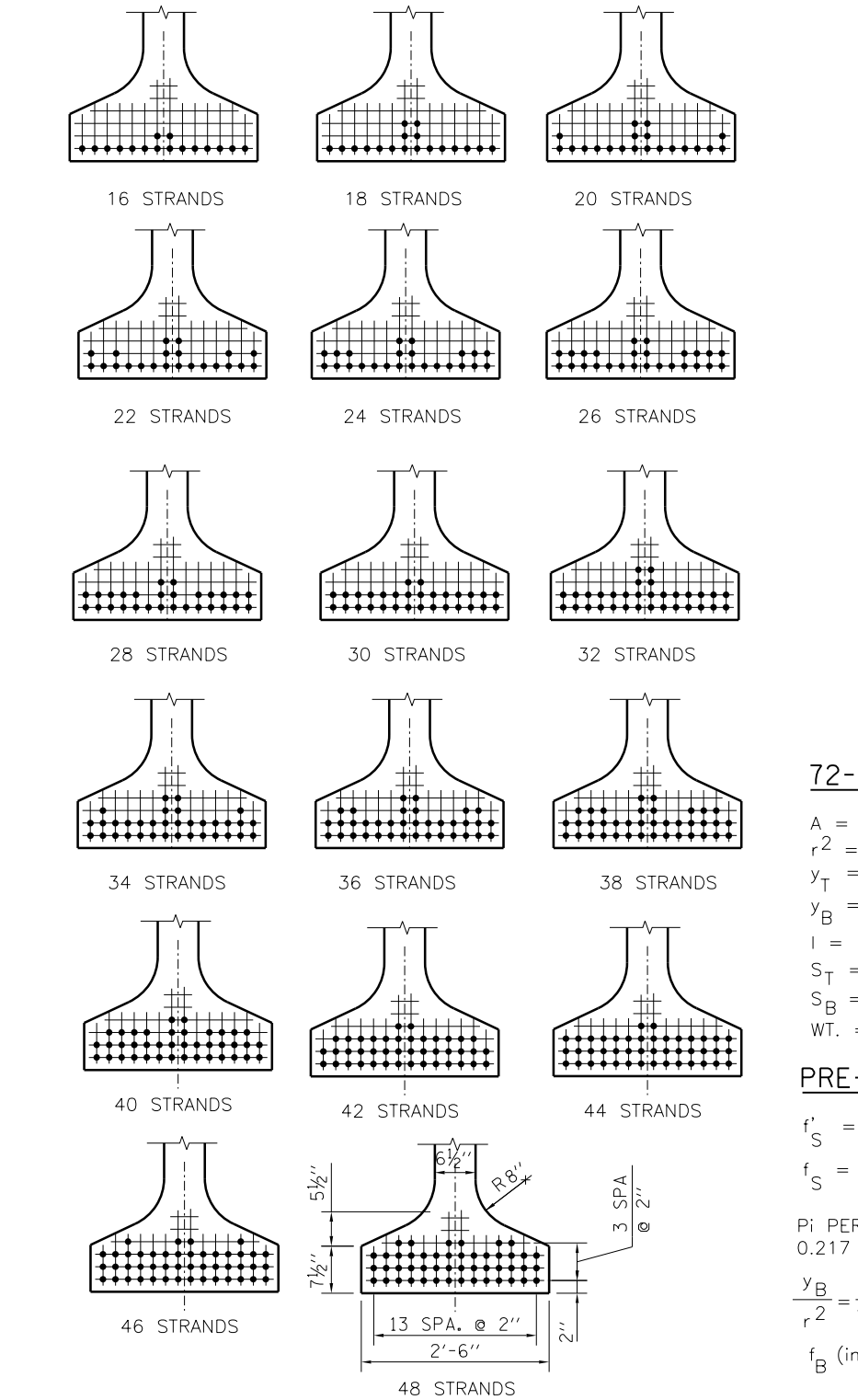
DATE  
3-1-2014

### BILL OF MATERIAL

ITEM	UNIT	TOTAL
FURNISHING AND ERECTING SHALLOW-DEPTH PRECAST PRESTRESSED CONCRETE BULB-T BEAM, 72"	FOOT	



# STANDARD ARRANGEMENTS TO RAISE CENTER OF GRAVITY TO AVOID DRAPING OF 0.6"Ø STRANDS



## 72-BT BEAM

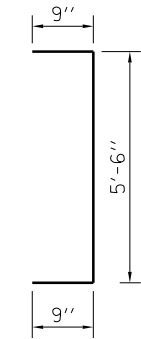
$A = 915 \text{ SQ. IN.}$   
 $r^2 = 717.5 \text{ IN.}^2$   
 $y_T = 37.13 \text{ IN.}$   
 $y_B = -34.87 \text{ IN.}$   
 $I = 656,426 \text{ IN.}^4$   
 $S_T = 17,680 \text{ IN.}^3$   
 $S_B = -18,825 \text{ IN.}^3$   
 $WT. = 953 \text{ \#/FT.}$

## PRE-TENSION

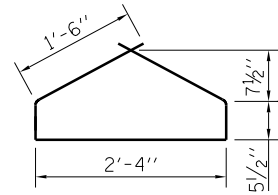
$f'_S = 270,000 \text{ P.S.I.}$   
 $f_S = 0.75 \times 270,000 = 202,500 \text{ P.S.I.}$   
 for low relaxation strands  
 $P_i \text{ PER } 0.6" \text{ Ø STRAND} = 0.217 \times 202,500 = 43.94 \text{ KIPS}$   
 $\frac{y_B}{r^2} = \frac{-34.87}{717.50} = -0.0486 \text{ in/in}^2$   
 $f_B \text{ (init.)} = \frac{A_S f_S}{A} (1 + \frac{e_s y_B}{r^2})$

## BAR LIST

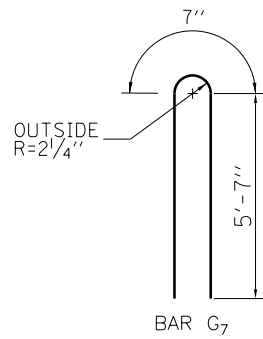
BAR	NO.	SIZE	LENGTH	SHAPE
G <sub>2</sub>	20	#6	7'-0"	
G <sub>4</sub>	58	#3	6'-3"	
G <sub>6</sub>	2	#8	6'-6"	
G <sub>7</sub>		#4	11'-9"	
G <sub>8</sub>		#4		
G <sub>9</sub>		#5	3'-9"	
G <sub>10</sub>		#4	2'-3"	
G <sub>11</sub>				



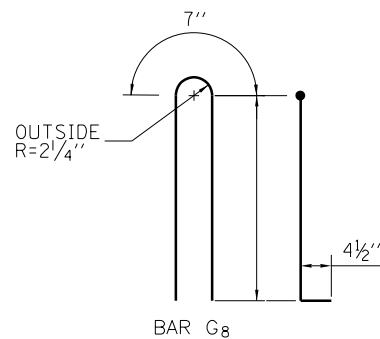
BAR G<sub>2</sub>



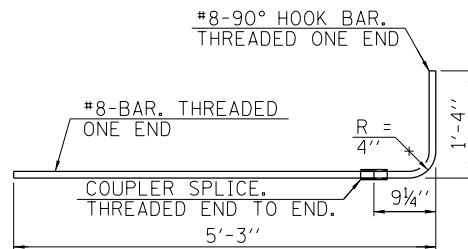
BAR G<sub>4</sub>



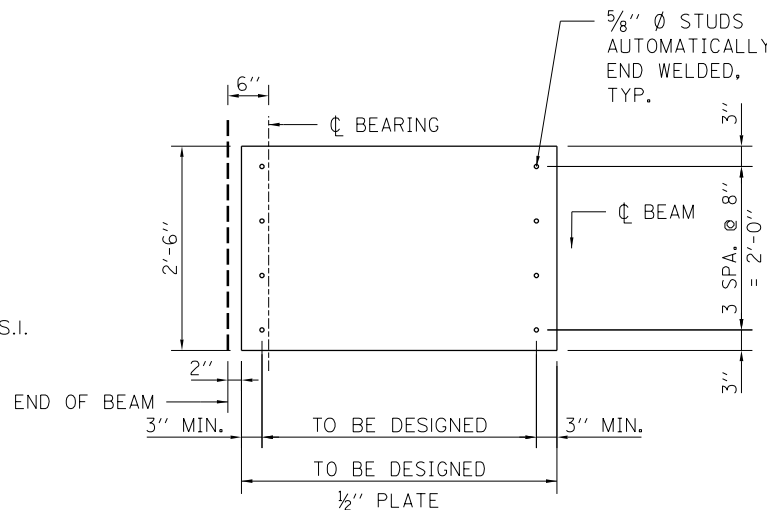
BAR G<sub>7</sub>



BAR G<sub>8</sub>



G<sub>6</sub> BAR ASSEMBLY



ANCHOR PLATE

## NOTES:

TOP OF BEAM TO BE ROUGH FLOATED AND BROOMED TRANSVERSELY, EXCEPT THE OUTSIDE 15" OF BEAM, WHICH SHALL RECEIVE A SMOOTH FINISH. AN APPROVED CONCRETE SEALER SHALL BE APPLIED TO ALL SMOOTH SURFACES INCLUDING THE OUTSIDE 15" OF THE TOP FLANGE.

THE BEAMS SHALL BE PROVIDED WITH A SUITABLE LIFTING DEVICE FOR HANDLING AND ERECTING THE BEAMS.

STRANDS SHALL BE FLUSH WITH END OF BEAM. FOR BEAM ENDS EMBEDDED COMPLETELY IN CONCRETE, END OF STRANDS SHALL BE COATED WITH NON-BITUMINOUS JOINT SEALER. FOR BEAM ENDS THAT ARE FINALLY EXPOSED, COAT THE BEAM ENDS, EXPOSED STRAND ENDS AND ALL NON-BONDING SURFACES WITHIN 2 FEET OF THE BEAM ENDS WITH A NON-PIGMENTED EPOXY CONFORMING TO AASHTO M-235 TYPE III, GRADE 2, CLASS B OR C. THE EPOXY SHALL BE APPLIED AT LEAST 3 DAYS AFTER MOIST CURING HAS CEASED AND PRIOR TO THE APPLICATION OF THE SEALER.

ALL BEAMS SHALL BE CAST FULL LENGTH AS SHOWN.

SPACING SHOWN FOR #4 STIRRUPS IS FOR GRADE 60 REINFORCEMENT.

PRESTRESSING STRANDS SHALL BE 0.6" DIA., 7-WIRE LOW, RELAXATION FOR ALL PATTERNS WITH AN ULTIMATE STRENGTH OF 270,000 psi. THE MAX NUMBER OF DRAPED 0.6"Ø STRANDS IS 8.

INSERTS FOR 3/4"Ø THREADED DOWEL RODS, WHEN SPECIFIED AT EXPANSION JOINT ENDS, SHALL BE TWO-STRUT, FERRULE-TYPE FOR INTERIOR BEAMS AND SINGLE-FERRULE, FLARED-LOOP TYPE FOR EXTERIOR BEAMS.

## NOTE TO DESIGNER

THIS BASE SHEET SHOWS TYPICAL NEW CONSTRUCTION BUT IT IS NOT A STANDARD DRAWING. IT REQUIRES COMPLETION BY THE DESIGNER PRIOR TO INSERTION INTO A CONTRACT. MICROSTATION FILES AND THE "CADD STANDARDS MANUAL" ARE AVAILABLE ON THE ILLINOIS TOLLWAY WEBSITE. THE DESIGNER SHALL ACCEPT THE RESPONSIBILITY OF THE DESIGNER OF THIS SHEET UPON ITS COMPLETION AND INSERTION INTO A CONTRACT. ALL "NOTE TO DESIGNER" BOXES SHALL BE REMOVED PRIOR TO INSERTION OF THE SHEET INTO THE PLAN SET.

## NOTES:

- SPECIFY CONCRETE STRENGTH AS REQUIRED BY DESIGN FROM A MINIMUM OF 6,000 PSI TO A MAX. OF 8,000 PSI. MAXIMUM RELEASE STRENGTH IS 6,800 PSI.
- REINFORCEMENT IN STANDARD END SECTION OF THE BEAM IS BASED ON THE STRAND PATTERNS LISTED ON THIS SHEET. USING DIFFERENT STRAND PATTERNS WILL REQUIRE A COMPLETE DESIGN OF THIS REINFORCEMENT. PRIOR APPROVAL FROM THE ILLINOIS TOLLWAY IS REQUIRED IF DESIGN OF THE END REINFORCEMENT IS REQUIRED.
- THE DESIGN ENGINEER DETERMINES THE PROJECTION OF BAR G<sub>8</sub> BASED ON 1/2" MIN. HAUNCH AT EDGE OF GIRDER, X-SLOPE, PROFILE GRADE LINE AND CALCULATED RESIDUAL BEAM CAMBER, INCLUDING THE CAMBER MULTIPLIER OF 1.8. THIS VALUE CAN VARY AND SHOULD BE GIVEN FOR EACH OF THE BEAM LENGTH. PROVIDE VALUES THAT MAINTAIN 3" MIN. DECK EMBEDMENT AND 2 1/2" CLEAR FROM TOP OF DECK WHILE ACCOUNTING FOR ± 3/4" VARIANCE IN ACTUAL CAMBER VERSUS THE CALCULATED RESIDUAL CAMBER.
- FOR LATERAL STABILITY DURING LIFTING THESE GIRDER LENGTHS MAY REQUIRE PICK-UP POINT LOCATIONS GREATER THAN DISTANCE d (GIRDER DEPTH) FROM THE ENDS OF THE GIRDER. THE DESIGNER SHALL ASSUME THE PICK-UP POINTS WILL BE AT THE POINTS FROM THE END OF THE GIRDER AND PROVIDE EXTRA NON-PRESTRESSED STEEL IN THE TOP FLANGE, IF REQUIRED, AND CHECK THE CONCRETE STRENGTH NEAR THE LIFT LOCATION BASED ON f<sub>ci</sub>. A NOTE SHALL BE PLACED ON THE GIRDER DETAILS SHEET TO REFLECT THE GIRDER WAS ANALYZED FOR POTENTIAL LIFT AT THE 1/10 POINT.

M-BRG-516

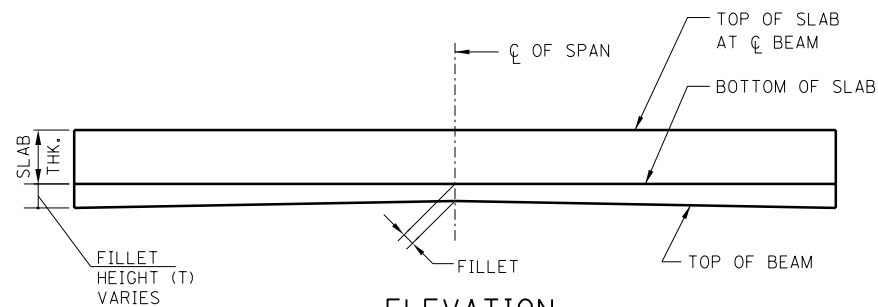


72" PPC BULB-T  
BEAM DETAILS

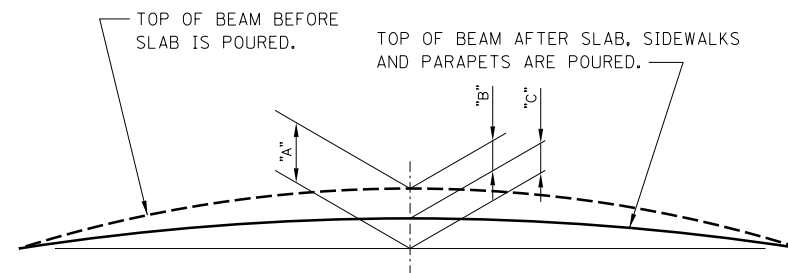
DATE  
3-1-2014

ARRANGEMENT AT 1/4 SPAN - FOR BEAMS WITH DRAPED 0.6"Ø STRANDS



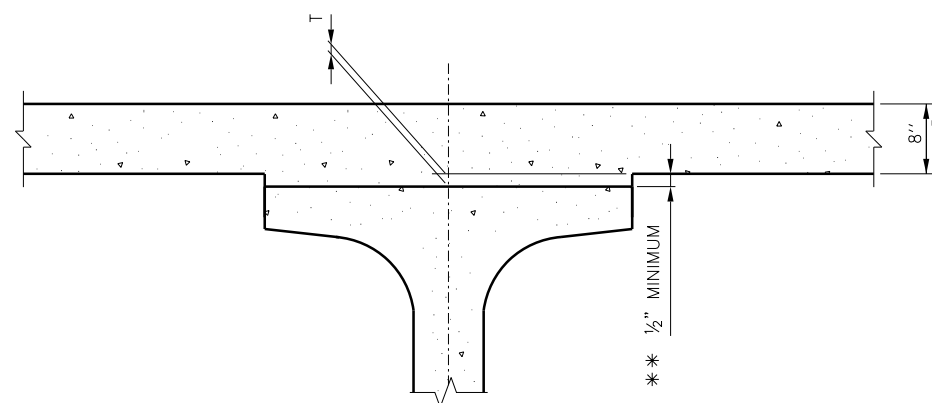


ELEVATION

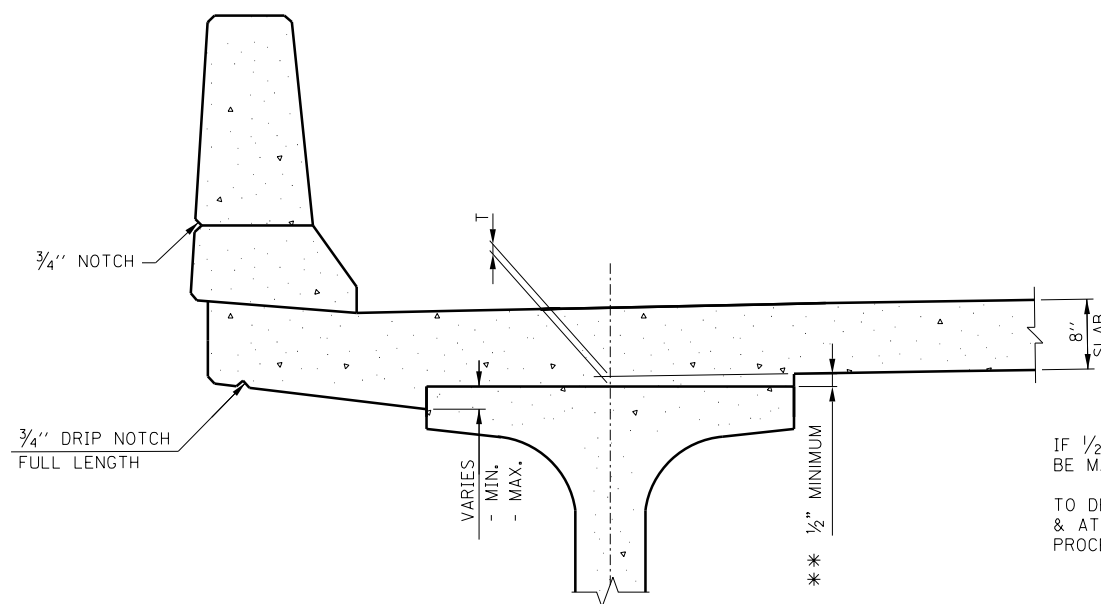


CAMBER & DEFLECTION DIAGRAM

- \* "A" = PRESTRESS CAMBER
- \* "B" = DEAD LOAD DEFLECTION
- \* "C" = RESIDUAL CAMBER
- \* ROUND OFF TO NEAREST 1/8"



ALL GIRDER SIZES  
INTERIOR GIRDER DETAIL

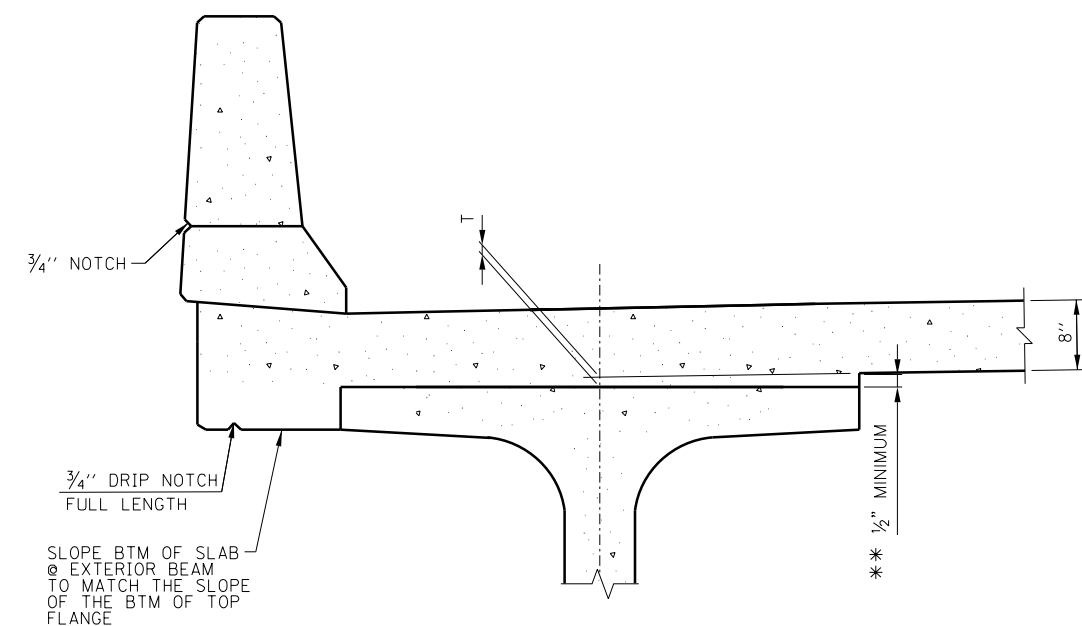


36" & 45" PPC BULB-T BEAMS  
SLAB HAUNCH DETAIL

IF 1/2" MINIMUM FILLET HEIGHT AT THE EDGE OF BEAM CANNOT BE MAINTAINED, NOTIFY THE ENGINEER OF RECORD.

TO DETERMINE 'T', ELEV. OF TOP OF BEAMS AT C OF STRUCTURE UNITS & AT 1/10 POINTS OF EACH SPAN SHALL BE TAKEN. THEN FOLLOW THIS PROCESS:

TOP OF DECK ELEV. AT FINAL GRADE  
 - TOP OF BEAM ELEVATION  
 + DEAD LOAD DEFLECTION  
 - SLAB THICKNESS  
 = FILLET HEIGHT 'T'



54" & 72" PPC BULB-T BEAMS  
SLAB HAUNCH DETAIL

## NOTE TO DESIGNER

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### NOTES:

1. PRESENT PRACTICE IS TO USE A MINIMUM "FILLET" (AT EDGE OF BEAM FLANGE) OF 1/2" FOR DESIGN CALCULATIONS. THE MINIMUM FILLET (AT EDGE OF BEAM FLANGE) ALLOWED IN CONSTRUCTION IS 1/2".
- \*\* 2. IF 1/2" MINIMUM FILLET HEIGHT AT EDGE OF BEAM CANNOT BE MAINTAINED DURING CONSTRUCTION, THE GRADE LINE MAY BE RAISED BY UP TO 1/2" FROM THE PLAN PROFILE AT THE DISCRETION OF THE DESIGNER. 3" MINIMUM DECK EMBEDMENT OF THE TIE BAR SHALL BE MAINTAINED. THE PLAN SLAB THICKNESS SHALL BE HELD.
3. USE THE CALCULATED THEORETICAL AVERAGE "FILLET HEIGHT" AT CENTERLINE OF FLANGE FOR COMPUTING THE FILLET CONCRETE QUANTITY.
4. USE TOP OF DECK ELEVATIONS AND CALCULATED "FILLET HEIGHT" AT CENTERLINE OF BEAM FOR COMPUTING BEAM SEAT ELEVATIONS AT SUBSTRUCTURES.
5. FOR SKEWS < 10°, PLACE INTERMEDIATE DIAPHRAGMS IN A STRAIGHT LINE. REFER TO SHEETS M41-BRG, M42-BRG AND M43-BRG. PROVIDE OFFSET FOR SKEWS > 10°.
6. DIAPHRAGM SPACING: FOR SPANS < 80'-0", PLACE ONE DIAPHRAGM AT MID-LENGTH OF BEAM. FOR SPANS OVER 80'-0", PLACE AT 1/3 AND 2/3 POINTS.

M-BRG-517



36", 45", 54" AND 72"  
PPC BULB-T BEAMS DETAILS

DATE  
8-26-2013

INTERIOR BEAM

ATTACHMENT TO CHANNEL

NOTES:

ALL DIAPHRAGM ASSEMBLY MATERIAL SHALL BE PAID FOR AT THE CONTRACT LUMP SUM PRICE BID FOR FURNISHING AND ERECTING STRUCTURAL STEEL.

EACH DIAPHRAGM BETWEEN BEAMS SHALL CONSTITUTE ONE UNIT.

ALL DIAPHRAGM STRUCTURAL STEEL SHALL BE ASTM A709  
GRADE 36 OR 50. ALL BOLTS, NUTS AND WASHERS SHALL BE  
ASTM A325 TYPE 1.

ALL DIAPHRAGM STRUCTURAL STEEL SHOWN SHALL BE HOT-DIPPED GALVANIZED. ALL BOLTS, NUTS AND WASHERS SHALL BE HOT-DIPPED GALVANIZED IN ACCORDANCE WITH ASTM A153 CLASS C. GALVANIZED NUTS SHALL BE TAPPED OVERSIZED IN ACCORDANCE WITH THE REQUIREMENTS OF ASTM A563 AND SHALL MEET THE REQUIREMENTS OF SUPPLEMENTARY REQUIREMENT S1 OF ASTM A563, LUBRICANT AND TEST FOR COATED NUTS.

FOR SPANS EQUAL TO OR LESS THAN 80'-0", PLACE ONE DIAPHRAGM AT MID-LENGTH OF BEAM. FOR SPANS OVER 80'-0", PLACE AT  $\frac{1}{3}$  AND  $\frac{2}{3}$  POINTS.

DETAIL B

SECTION AT INTERIOR BEAMS THRU  
DIAPHRAGM FOR SKEW ANGLES > 10°

SECT. A-A  
(FOR EXTERIOR ATTACHMENT)

PLAN FOR SKEW ANGLES  $< 10^\circ$

### PLAN FOR SKEW ANGLES $> 10^\circ$

DIAPHRAGM FACE

NOTE TO DESIGNER

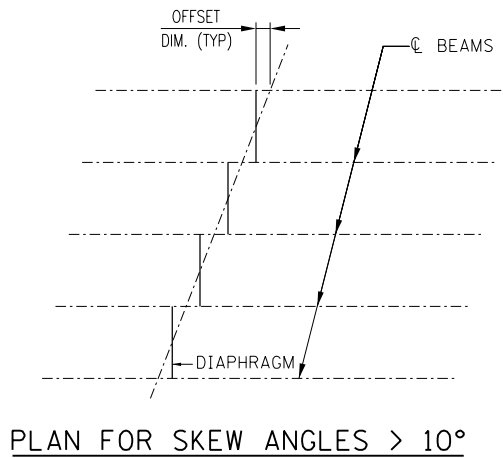
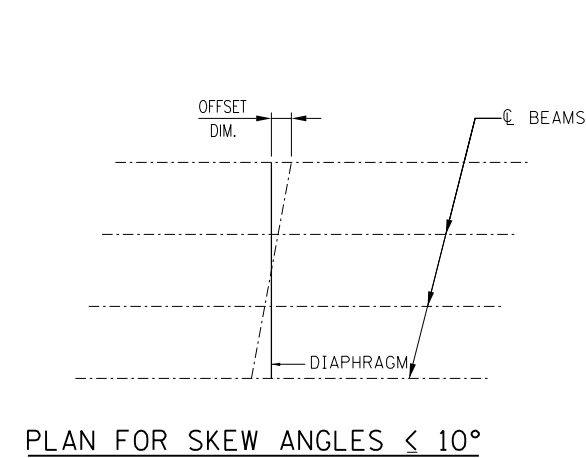
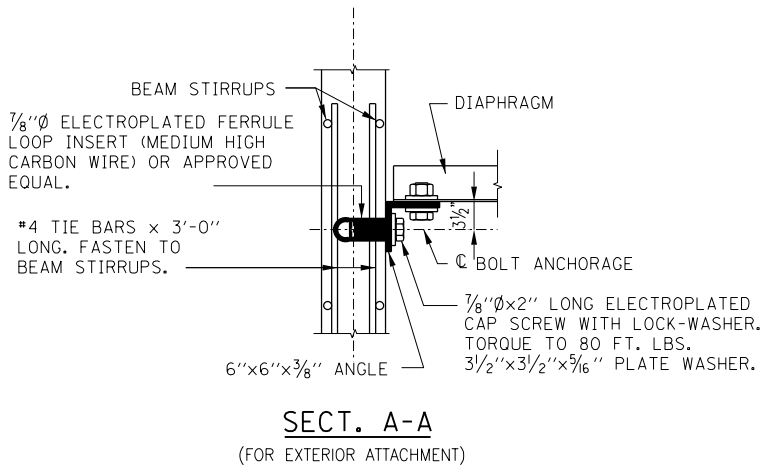
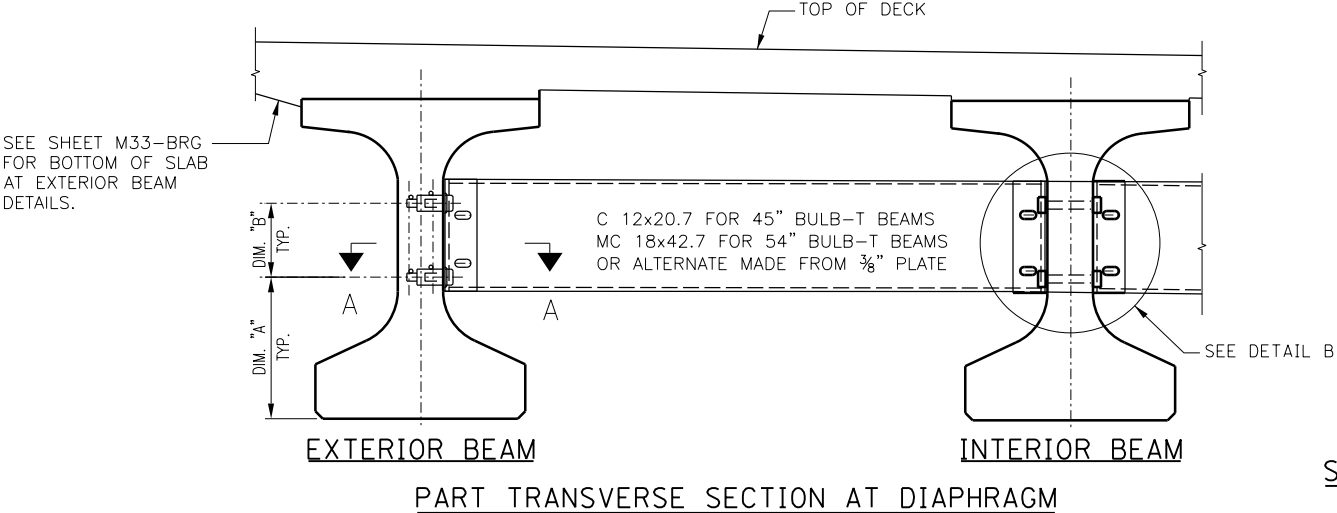
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M-BRG-518



36" PPC BULB-T BEAM  
INTERIOR STEEL DIAPHRAGMS

DATE  
4-2-2014

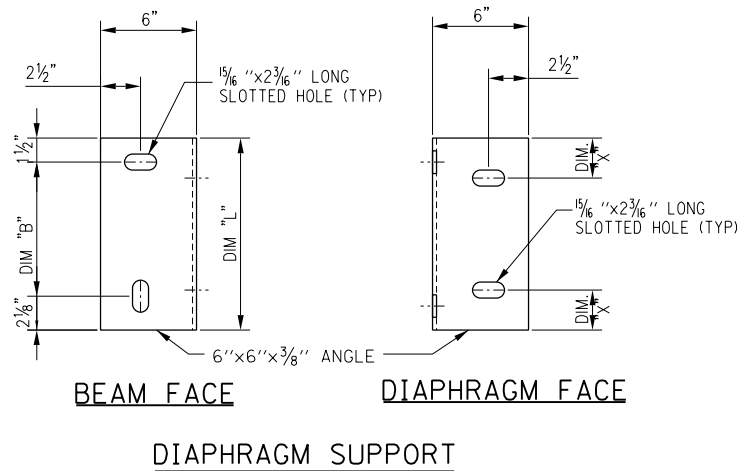
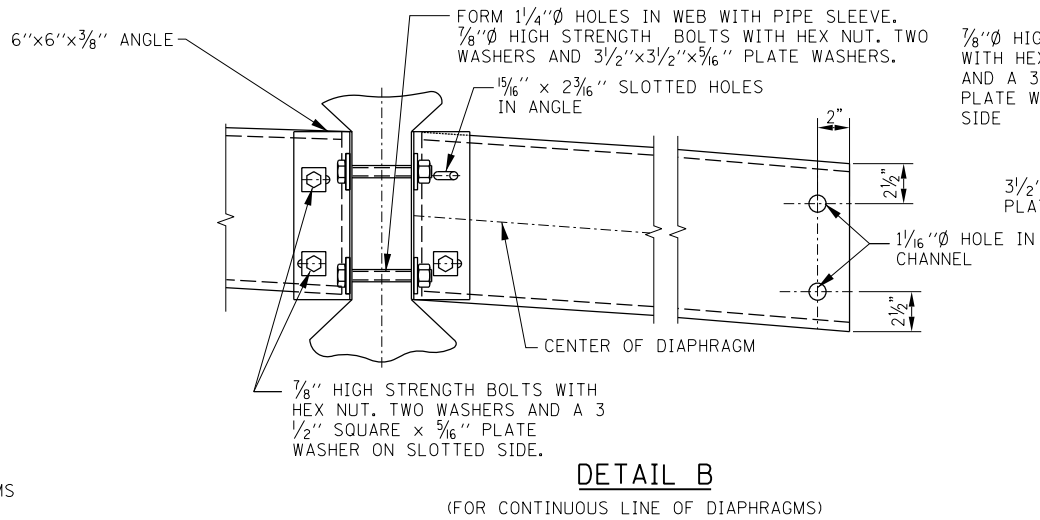


TABLE

BEAM	DIM. "A"	DIM. "B"	DIM. "L"	* DIM. "X"
45" BULB-T	1'-9 1/8"	8 7/8"	1'-0 1/2"	2 3/4"
54" BULB-T	1'-9 1/8"	1'-5 7/8"	1'-9 1/2"	4 1/4"

SECTION THRU ALTERNATE DIAPHRAGM

\*DIM "X" = 2 1/2" FOR ALTERNATE PLATE DIAPHRAGM



NOTES:

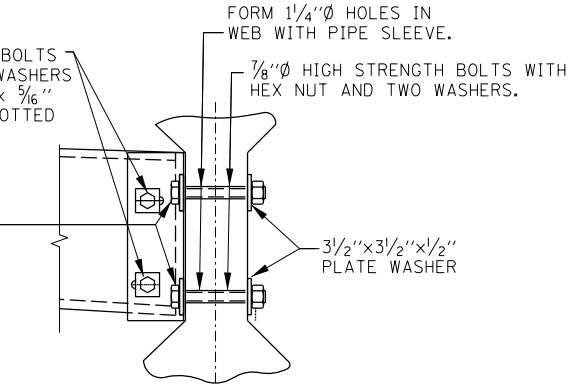
ALL DIAPHRAGM ASSEMBLY MATERIAL SHALL BE PAID FOR AT THE CONTRACT LUMP SUM PRICE BID FOR FURNISHING AND ERECTING STRUCTURAL STEEL.

EACH DIAPHRAGM BETWEEN BEAMS SHALL CONSTITUTE ONE UNIT.

ALL DIAPHRAGM STRUCTURAL STEEL SHALL BE ASTM A709 GRADE 36 OR 50. ALL BOLTS, NUTS AND WASHERS SHALL BE ASTM A325 TYPE 1.

ALL DIAPHRAGM STRUCTURAL STEEL SHOWN SHALL BE HOT-DIPPED GALVANIZED. ALL BOLTS, NUTS AND WASHERS SHALL BE HOT-DIPPED GALVANIZED IN ACCORDANCE WITH ASTM A153 CLASS C. GALVANIZED NUTS SHALL BE TAPPED OVERSIZED IN ACCORDANCE WITH THE REQUIREMENTS OF ASTM A563 AND SHALL MEET THE REQUIREMENTS OF SUPPLEMENTARY REQUIREMENT S1 OF ASTM A563, LUBRICANT AND TEST FOR COATED NUTS.

FOR SPANS EQUAL TO OR LESS THAN 80'-0", PLACE ONE DIAPHRAGM AT MID-LENGTH OF BEAM. FOR SPANS OVER 80'-0", PLACE AT 1/3 AND 2/3 POINTS.



NOTE TO DESIGNER

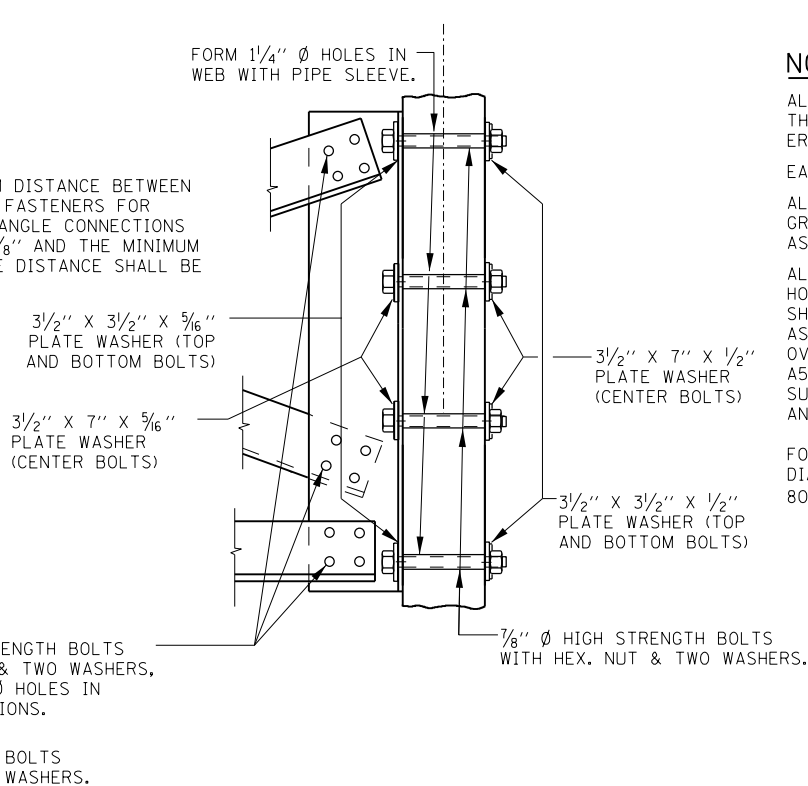
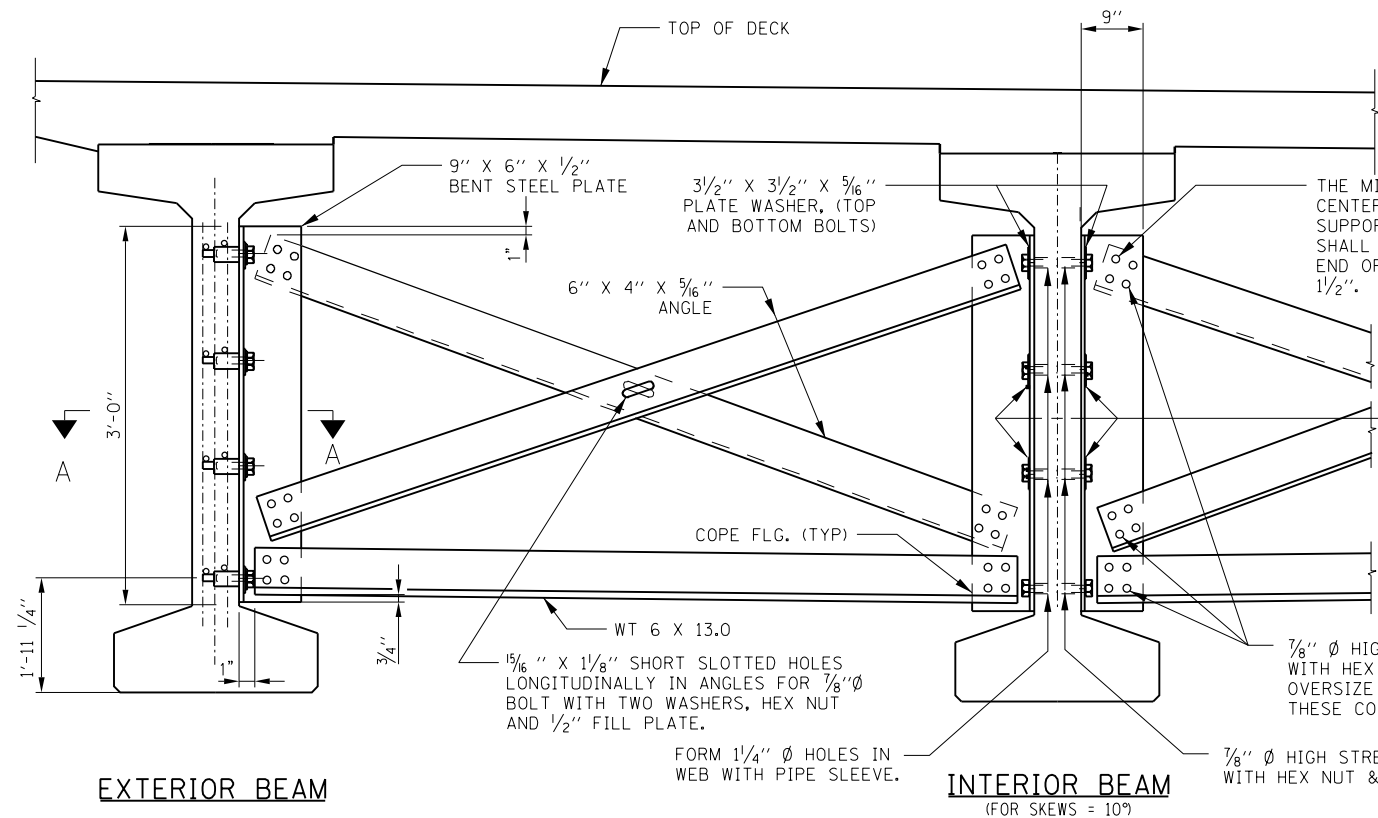
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M-BRG-519



45" PPC BULB-T AND  
54" PPC BULB-T BEAMS  
INTERIOR STEEL DIAPHRAGMS

DATE  
8-26-2013



# NOTES:

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EACH DIAPHRAGM BETWEEN BEAMS SHALL CONSTITUTE ONE UNIT.

ALL DIAPHRAGM STRUCTURAL STEEL SHALL BE ASTM A709 GRADE 36 OR 50. ALL BOLTS, NUTS AND WASHERS SHALL BE ASTM A325 TYPE 1.

ALL DIAPHRAGM STRUCTURAL STEEL SHOWN SHALL BE HOT-DIPPED GALVANIZED. ALL BOLTS, NUTS AND WASHERS SHALL BE HOT-DIPPED GALVANIZED IN ACCORDANCE WITH ASTM A153 CLASS C. GALVANIZED NUTS SHALL BE TAPPED OVERSIZED IN ACCORDANCE WITH THE REQUIREMENTS OF ASTM A563 AND SHALL MEET THE REQUIREMENTS OF SUPPLEMENTARY REQUIREMENT S1 OF ASTM A563, LUBRICANT AND TEST FOR COATED NUTS.

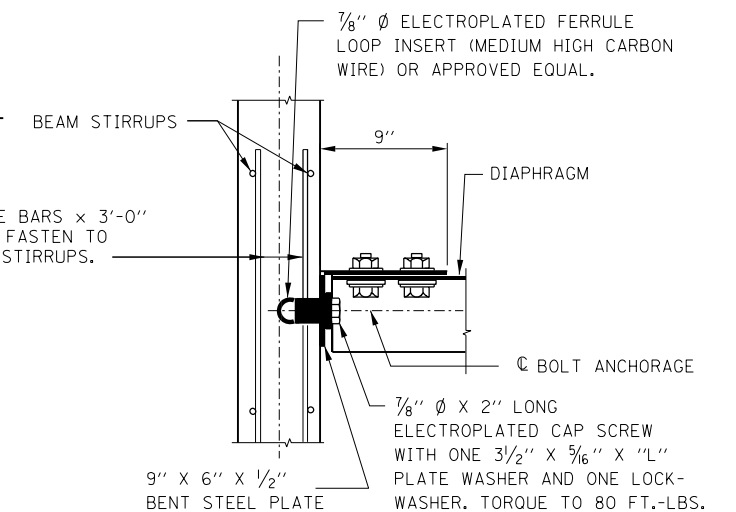
FOR SPANS EQUAL TO OR LESS THAN 80'-0", PLACE ONE DIAPHRAGM AT MID-LENGTH OF BEAM. FOR SPANS OVER 80'-0", PLACE AT 1/3 AND 2/3 POINTS.

PART TRANSVERSE SECTION AT DIAPHRAGM

SECTION AT INTERIOR BEAMS THRU DIAPHRAGM FOR SKEW ANGLES > 10°

## NOTE TO DESIGNER

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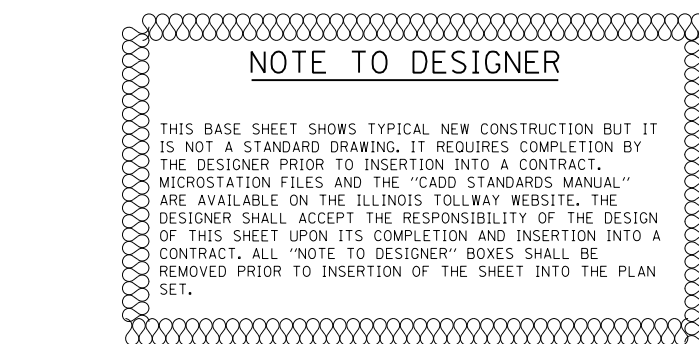


## SECT. A-A

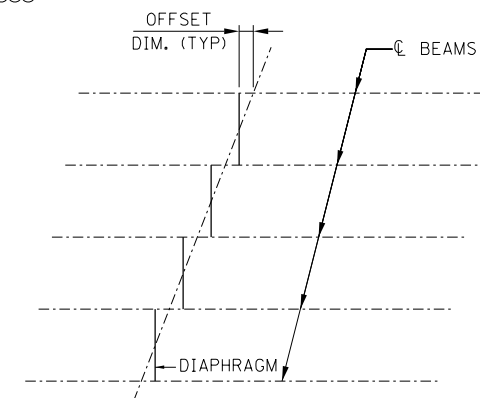
(FOR EXTERIOR ATTACHMENT)

"L" = 3 1/2": TOP & BOTTOM BOLTS  
"L" = 7": CENTER BOLTS

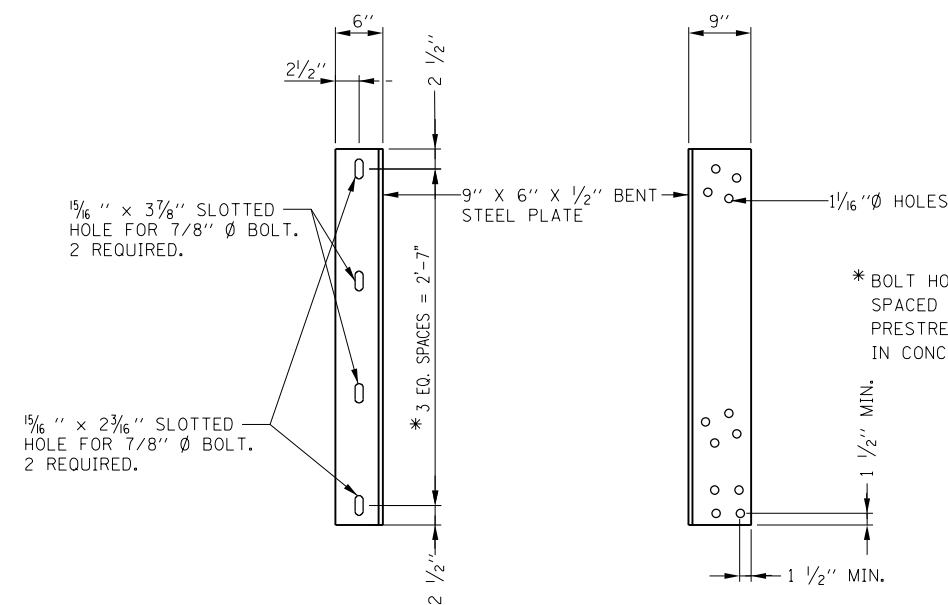
\* BOLT HOLES SHALL BE SPACED SO AS TO MISS PRESTRESSED STRANDS IN CONCRETE BEAMS.



PLAN FOR SKEW ANGLES < 10°



PLAN FOR SKEW ANGLES > 10°



BASE FACE

DIAPHRAGM FACE

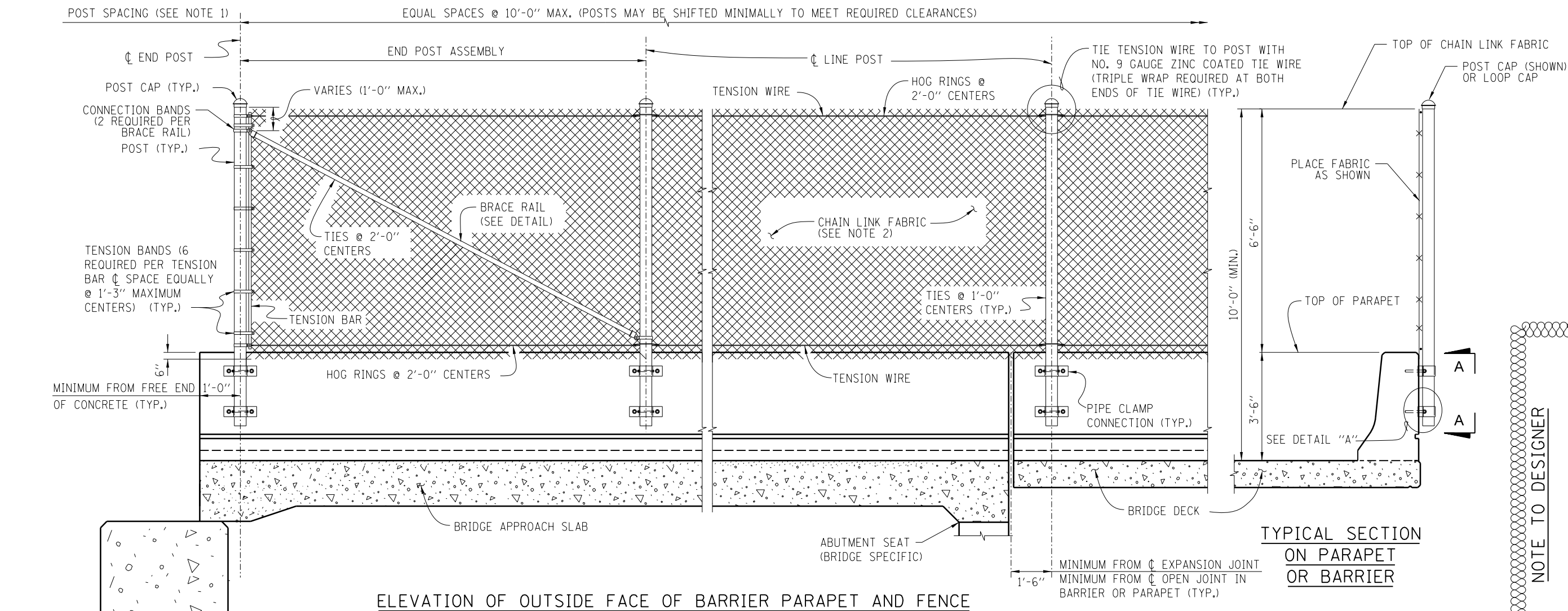
DIAPHRAGM SUPPORT

M-BRG-520



72" PPC BULB-T BEAM  
INTERIOR STEEL DIAPHRAGMS

DATE  
3-1-2014



ELEVATION OF OUTSIDE FACE OF BARRIER PARAPET AND FENCE

TYPICAL SECTION  
ON PARAPET  
OR BARRIER

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\* FENCING SHALL NOT ANCHOR TO THE TOP OF PARAPETS.

DESIGNER NOTES:

1. PULL POST ASSEMBLY IS REQUIRED AT MAXIMUM INTERVALS OF 200'. SEE SHEET 2 OF THIS SERIES.
2. FABRIC SHALL NOT BE SPLICED BY PICKETS. FABRIC SPLICES IF REQUIRED SHALL ONLY OCCUR AT POSTS AT A MINIMUM OF 100 FT. BETWEEN SPLICES. (ADD THIS NOTE TO PLANS.)
3. RAILROAD BRIDGE FENCE SHALL BE DETAILED ON SUPERSTRUCTURE DRAWING.
4. COORDINATE LIMITS OF RAILROAD BRIDGE FENCE WITH SPECIFIC RAILROAD REQUIREMENTS.

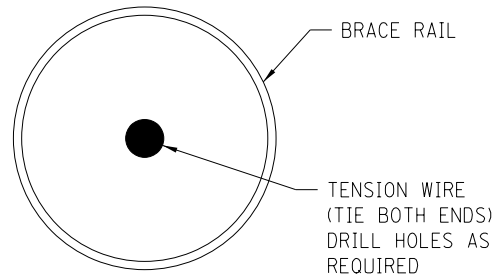
SHEET 1 OF 2  
M-BRG-521



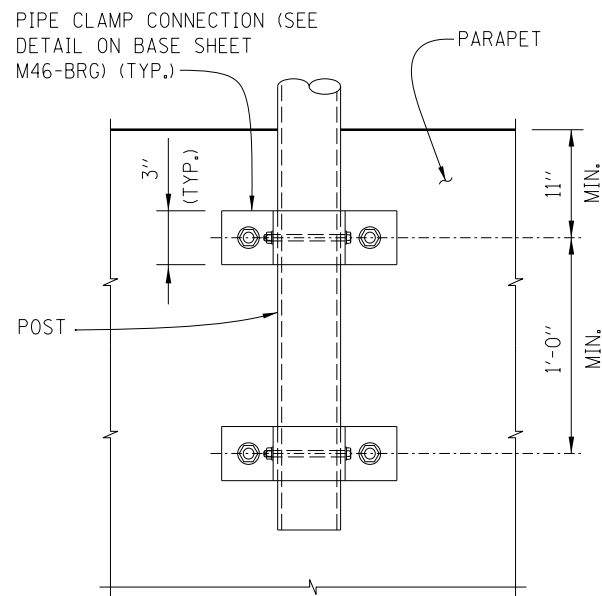
RAILROAD  
BRIDGE FENCE

DATE  
4-13-2014

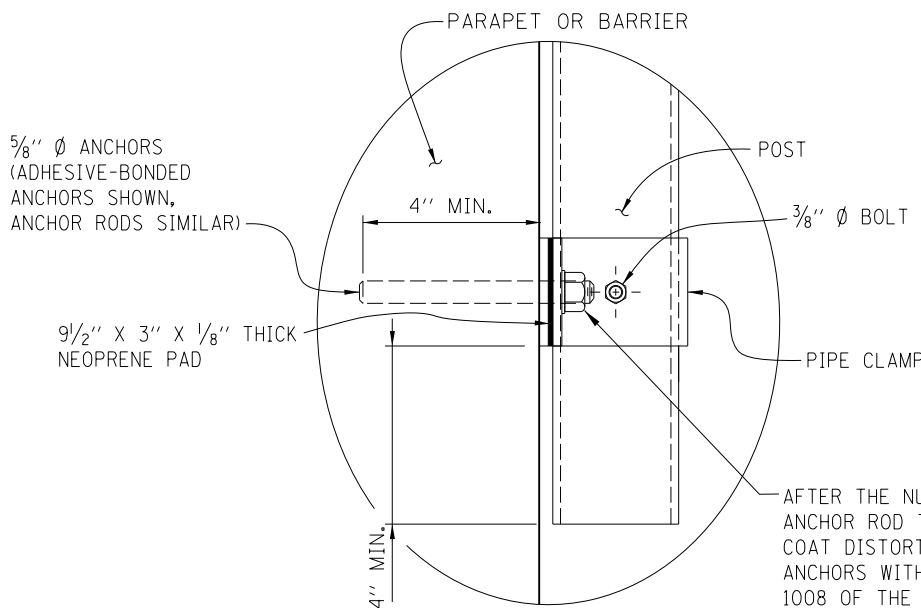
PILE BENT  
SUPPORT



BRACE RAIL DETAIL

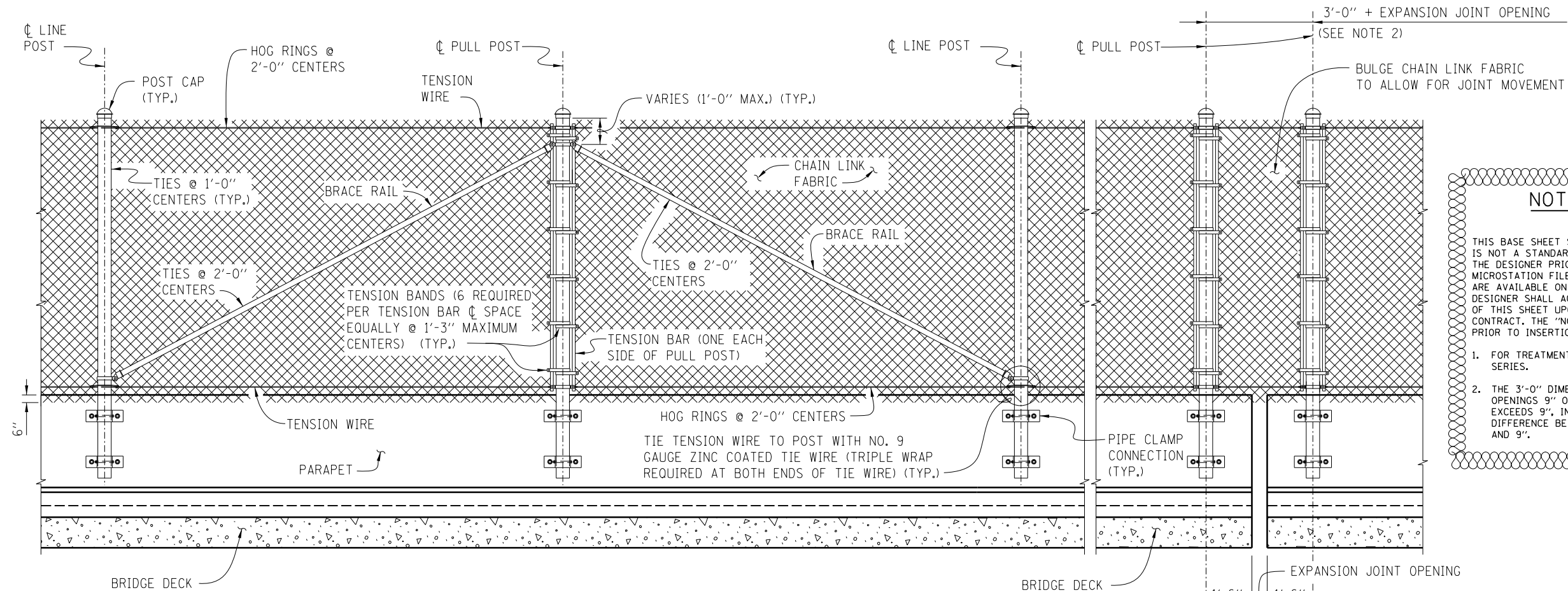


VIEW A-A



DETAIL A

AFTER THE NUTS HAVE BEEN TIGHTENED, DISTORT THE ANCHOR ROD THREADS TO PREVENT REMOVAL OF THE NUTS. COAT DISTORTED THREADS AND EXPOSED TRIMMED ENDS OF ANCHORS WITH A COATING IN ACCORDANCE WITH SECTION 1008 OF THE STANDARD SPECIFICATIONS.



**PULL POST ASSEMBLY DETAIL FOR BARRIER PARAPET FENCE**

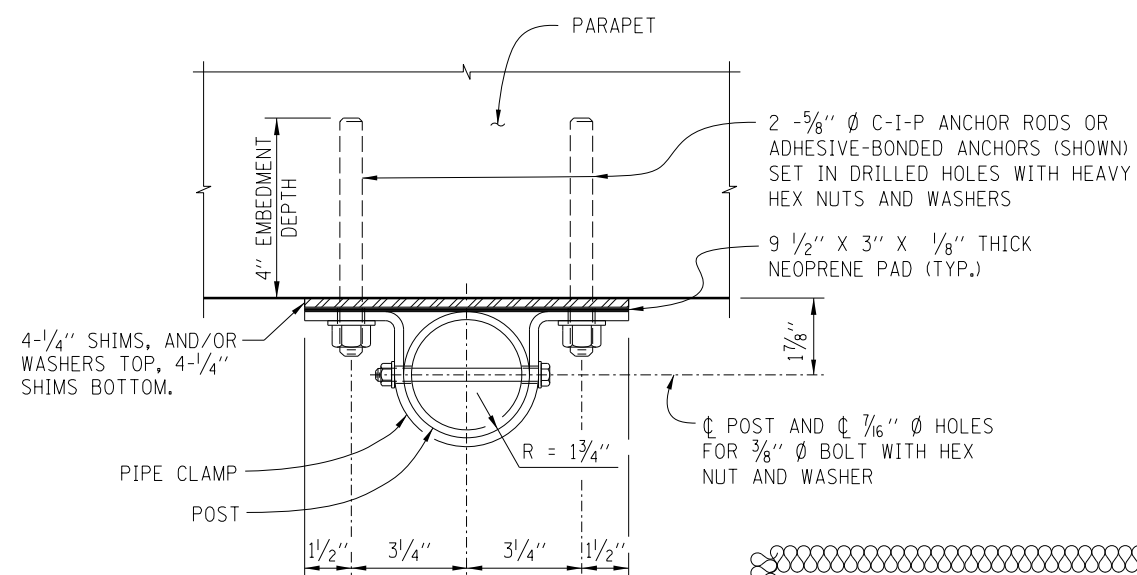
**EXPANSION ASSEMBLY DETAIL**

(REQUIRED ONLY AT EXPANSION JOINT LOCATIONS WHERE TOTAL MOVEMENT EXCEEDS 6")

**NOTE TO DESIGNER**

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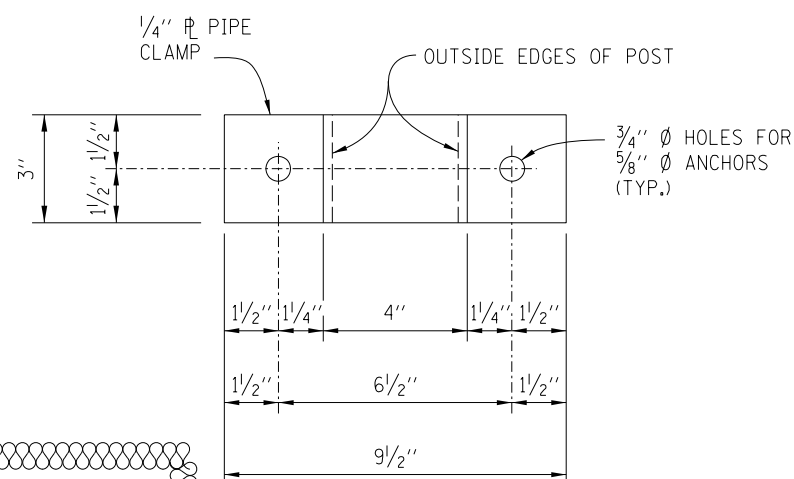
1. FOR TREATMENT AT BRIDGE ENDS, SEE SHEET 1 OF THIS SERIES.
2. THE 3'-0" DIMENSION SHOWN IS FOR EXPANSION JOINT OPENINGS 9" OR LESS. IF THE EXPANSION JOINT OPENING EXCEEDS 9", INCREASE THIS DIMENSION BY THE DIFFERENCE BETWEEN THE EXPANSION JOINT OPENING AND 9".



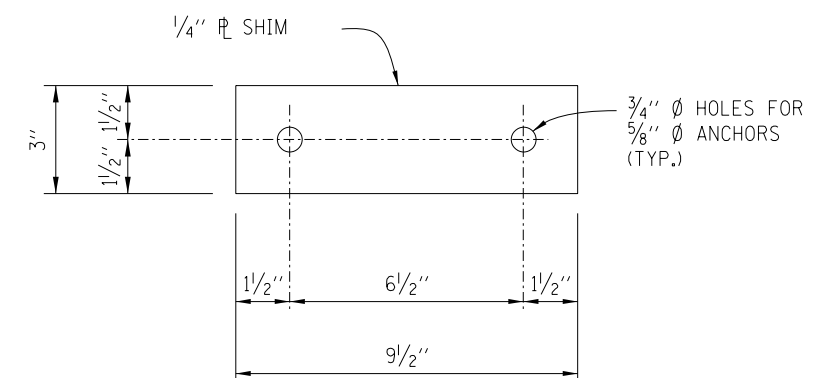
**PIPE CLAMP CONNECTION DETAIL**

**NOTES:**

1. FOR TREATMENT AT BRIDGE ENDS, SEE BASE SHEET M45-BRG.
2. THE 3'-0" DIMENSION SHOWN IS FOR EXPANSION JOINT OPENINGS 9" OR LESS. IF THE EXPANSION JOINT OPENING EXCEEDS 9", INCREASE THIS DIMENSION BY THE DIFFERENCE BETWEEN THE EXPANSION JOINT OPENING AND 9".



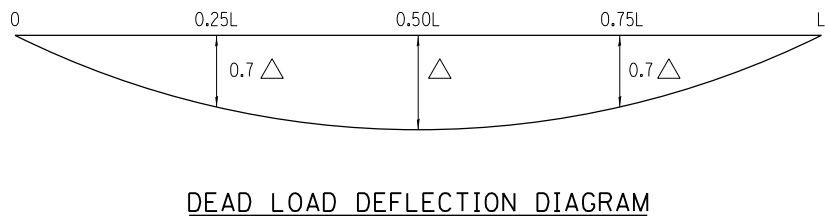
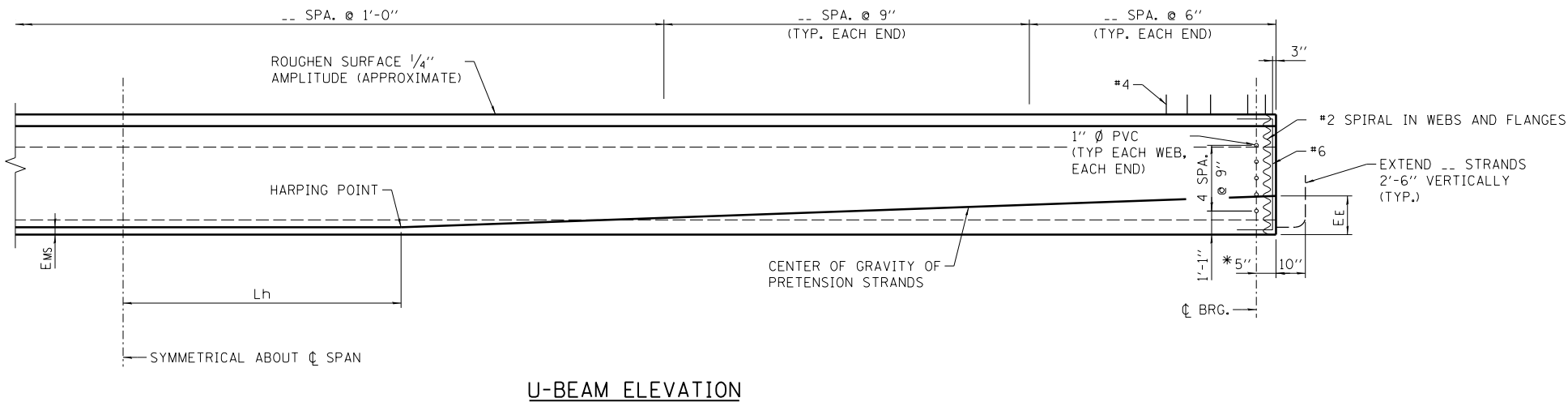
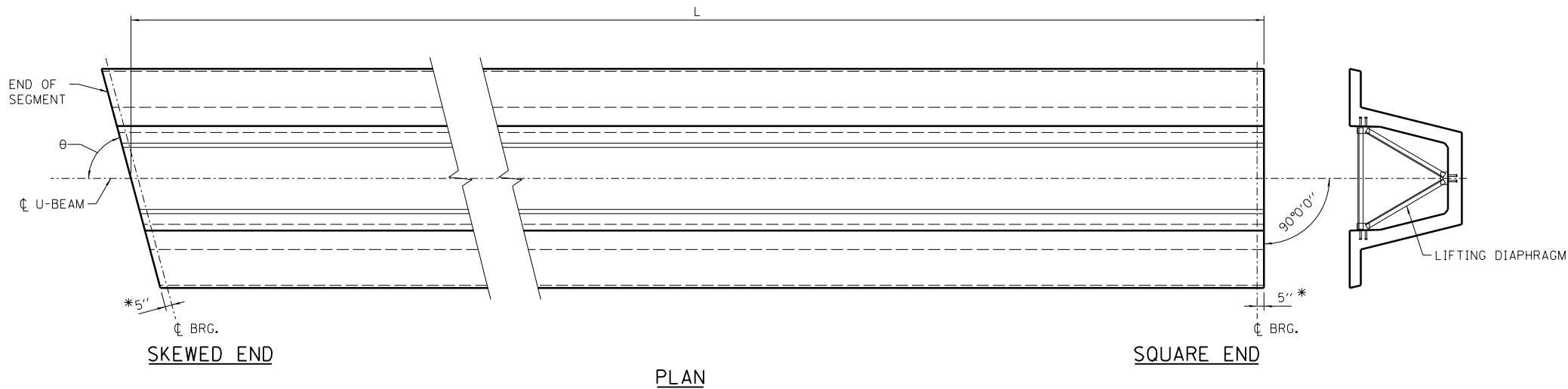
**PIPE CLAMP DETAIL**



**SPACER DETAIL**

(MUST BE MANUFACTURED FROM AN INCOMPRESSIBLE MATERIAL (I.E., STEEL OR ALUMINUM))





U-BEAM SCHEDULE																		
SPAN NO.	GIRDER NO.	L (Ft)	Fw (In.)	D (In.)	Θ (Deg.)	Tw (In.)	Tb (In.)	Lh (Ft)	A <sub>S</sub> * In. <sup>2</sup>	DEBOND STRANDS (PERCENT)	E <sub>E</sub> (In.)	E <sub>MS</sub> (In.)	F <sub>J</sub> (Kips)	F <sub>f</sub> (Kips)	CONCRETE STRENGTH		Δ (In.)	PREDICTED CAMBER (in.)
															f' <sub>CI</sub> (psi)	f' <sub>C</sub> (psi)		

**NOTES:**

TOP OF BEAM TO BE ROUGH FLOATED AND BROOMED TRANSVERSELY, EXCEPT THE OUTSIDE 8" OF BEAM, WHICH SHALL RECEIVE A SMOOTH FINISH. AN APPROVED CONCRETE SEALER SHALL BE APPLIED TO ALL SMOOTH SURFACES INCLUDING THE OUTSIDE 8" OF THE TOP FLANGE.

DO NOT APPLY CONCRETE SEALER TO SURFACES RECEIVING APPLICATION OF CONCRETE STAINING.

THE BEAM SHALL BE PROVIDED WITH A SUITABLE LIFTING DEVICE FOR HANDLING AND ERECTING THE BEAMS.

STRANDS SHALL BE FLUSH WITH END OF BEAM. FOR BEAM ENDS EMBEDDED COMPLETELY IN CONCRETE, END OF STRANDS SHALL BE COATED WITH NON-BITUMINOUS JOINT SEALER. FOR BEAM ENDS THAT ARE FINALLY EXPOSED, COAT THE BEAM ENDS, EXPOSED STRAND ENDS AND ALL NON-BONDING SURFACES WITHIN 2 FEET OF THE BEAM ENDS WITH A NON-PIGMENTED EPOXY CONFORMING TO AASHTO M-235 TYPE III, GRADE 2, CLASS B OR C. THE EPOXY SHALL BE APPLIED AT LEAST 3 DAYS AFTER MOIST CURING HAS CEASED AND PRIOR TO THE APPLICATION OF THE SEALER.

ALL U-BEAMS SHALL BE CAST FULL LENGTH AS SHOWN.

SPACING SHOWN FOR #4 STIRRUPS IS FOR GRADE 60 REINFORCEMENT. IF THE FABRICATOR CHOOSES TO BUILD A BAR STEEL CAGE BY WELDING LONGITUDINAL REINFORCEMENT TO THE #4 STIRRUPS, ONE OPTION IS AVAILABLE:

USE ASTM A706, GRADE 60 REINFORCEMENT AND THE STIRRUP SPACING AS SHOWN ON THE PLANS.

PRESTRESSING STRANDS SHALL BE 0.6" DIA., 7-WIRE LOW, RELAXATION FOR ALL PATTERNS WITH AN ULTIMATE STRENGTH OF 270,000 psi. THE MAX NUMBER OF DRAPED 0.6"Ø STRANDS IS 8.

A<sub>s</sub>\* = MINIMUM AREA OF THE PRESTRESSING STEEL.  
d<sub>s</sub> = NOMINAL STRAND DIAMETER.  
f<sub>su</sub> = ULTIMATE STRENGTH OF THE PRESTRESSING STEEL.  
F<sub>j</sub> = JACKING FORCE PER U-BEAM.  
F<sub>f</sub> = FINAL FORCE PER U-BEAM AFTER ALL LOSSES.  
f<sub>ci</sub> = REQUIRED CONCRETE STRENGTH AT RELEASE OF PRESTRESS FORCE.  
f<sub>cu</sub> = REQUIRED CONCRETE STRENGTH AT 28 DAYS OF AGE.  
L = LENGTH OF U-BEAM ALONG THE GRADE OF THE U-BEAM.  
Delta = DEFLECTION AT CENTERLINE OF SPAN DUE TO CAST-IN-PLACE SLAB, SIDEWALK AND PARAPETS.  
P = PROJECTION, 6" IN THE MIDDLE 1/3 OF THE MEMBER VARYING TO THE SPECIFIED HAUNCH AT THE BEARING PLUS 4".  
Theta = BRIDGE SKEW ANGLE

PREDICTED CAMBER IS THE CAMBER FOR THE GIRDER ALONE AT \_\_\_ DAYS.

**DESIGNER NOTES:**

SPECIFY CONCRETE STRENGTH AS REQUIRED BY DESIGN FROM A MINIMUM OF 6,000 PSI TO A MAX. OF 8,500 PSI.

REINFORCEMENT IN STANDARD END SECTION OF THE BEAM IS BASED ON THE STRAND PATTERNS LISTED ON SHEET M48. USING DIFFERENT STRAND PATTERNS WILL REQUIRE A COMPLETE DESIGN OF THIS REINFORCEMENT. PRIOR APPROVAL FROM THE ILLINOIS TOLLWAY IS REQUIRED IF DESIGN OF THE END REINFORCEMENT IS REQUIRED.

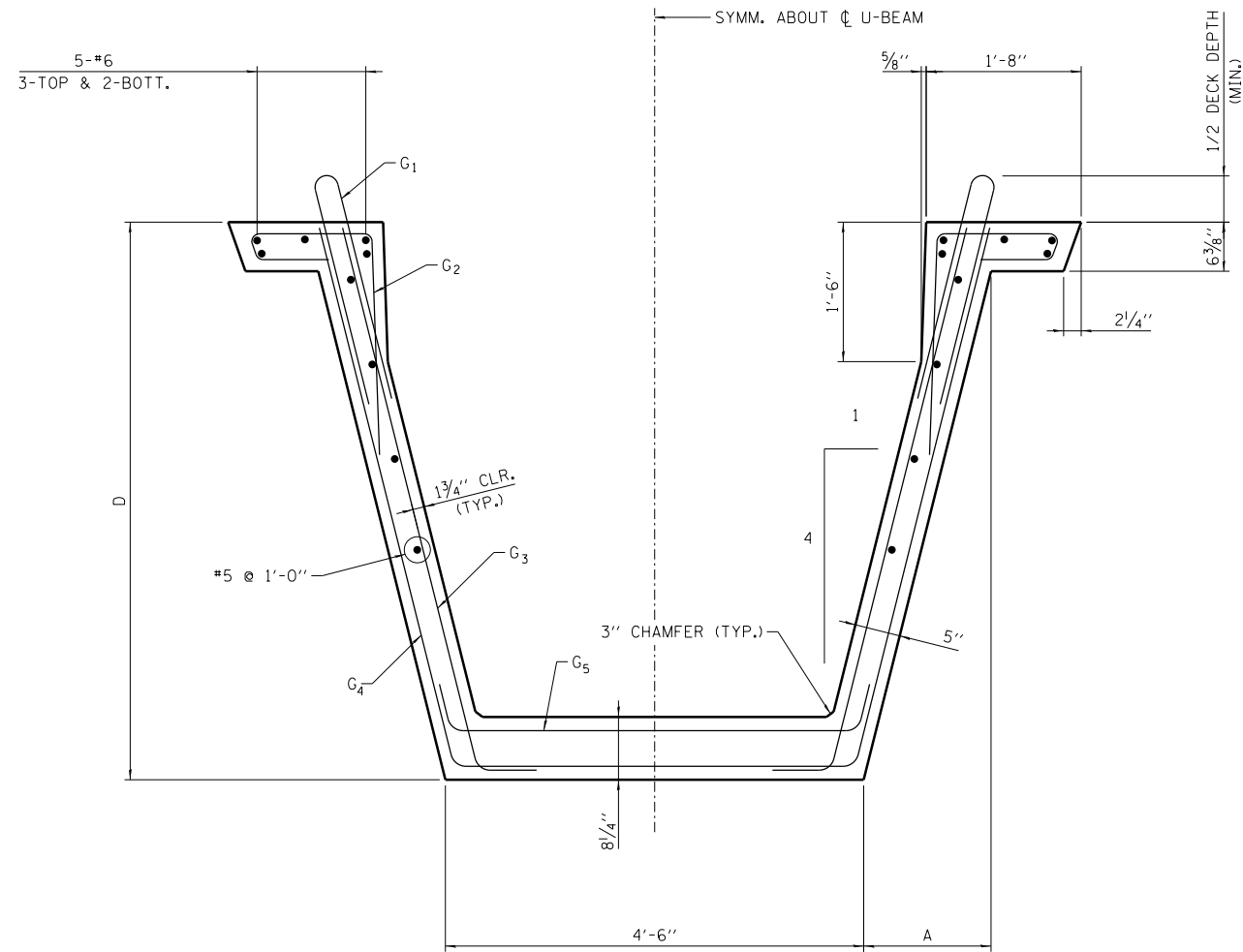
THE DESIGN ENGINEER DETERMINES THE PROJECTION OF BAR G1 BASED ON 2" MIN. HAUNCH AT EDGE OF BEAM, X-SLOPE, PROFILE GRADE LINE AND CALCULATED RESIDUAL BEAM CAMBER, INCLUDING THE CAMBER MULTIPLIER OF 1.4. THIS VALVE CAN VARY AND SHOULD BE GIVEN FOR EACH OF THE BEAM LENGTH. PROVIDE VALUES THAT MAINTAIN 3" MIN. DECK EMBEDMENT AND 2" CLEAR FROM TOP OF DECK WHILE ACCOUNTING FOR ±3/4" VARIANCE IN ACTUAL CAMBER VERSUS THE CALCULATED RESIDUAL CAMBER.

DIMENSIONS NOTED WITH (\*) ARE A FUNCTION OF THE DESIGN REQUIREMENTS AND MAY VARY.

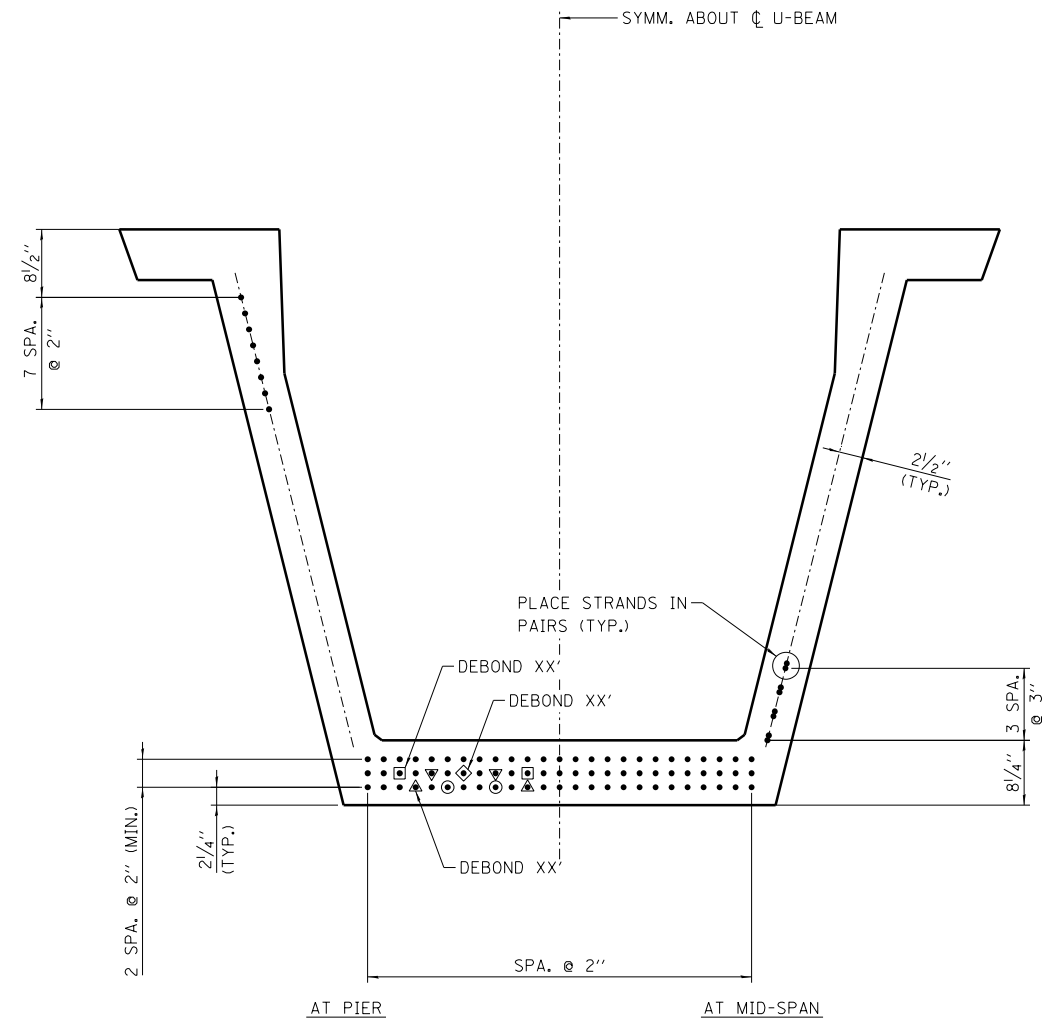
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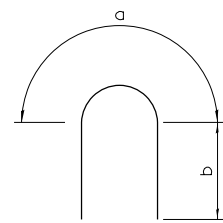




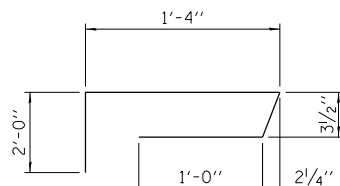
**TYPICAL U-BEAM SECTION**  
(REINFORCEMENT SHOWN AT SPAN)



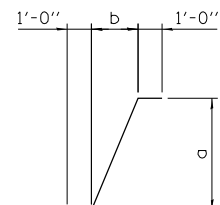
**TYPICAL U-BEAM PRESTRESSING**  
(PRETENSIONING)



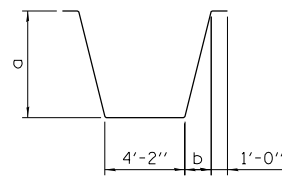
BAR G<sub>1</sub>



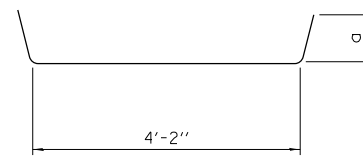
BAR G<sub>2</sub>



BAR G<sub>3</sub>



BAR G<sub>4</sub>



BAR G<sub>5</sub>

**BAR LIST**

BAR	NO.	SIZE	LENGTH	SHAPE
G <sub>1</sub>	0	#4	X'-X''	U
G <sub>2</sub>				U
G <sub>3</sub>				U
G <sub>4</sub>				U
G <sub>5</sub>				U

**VARIABLE DIMENSIONS**

BAR	a	b
G <sub>1</sub>		
G <sub>2</sub>		
G <sub>3</sub>		
G <sub>4</sub>		
G <sub>5</sub>		

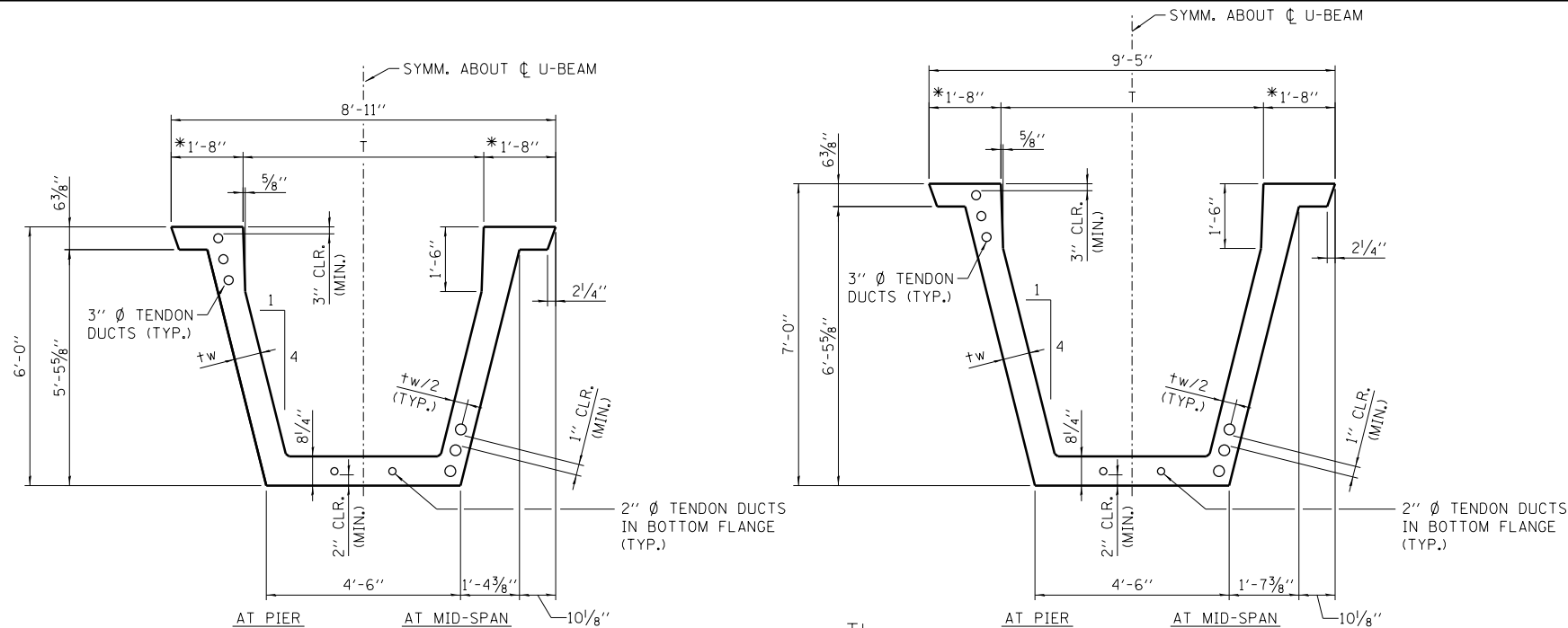
**BEAM TABLE**

D	A
48"	10 3/8"
60"	1'-1 3/8"
72"	1'-4 3/8"

**NOTE TO DESIGNER**

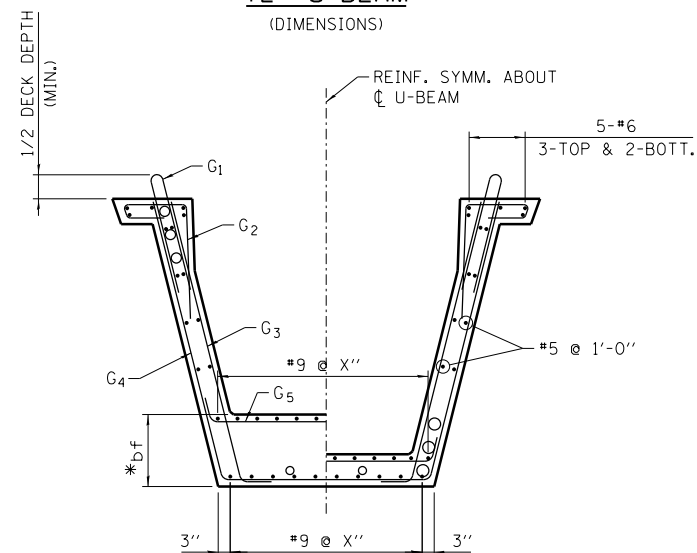
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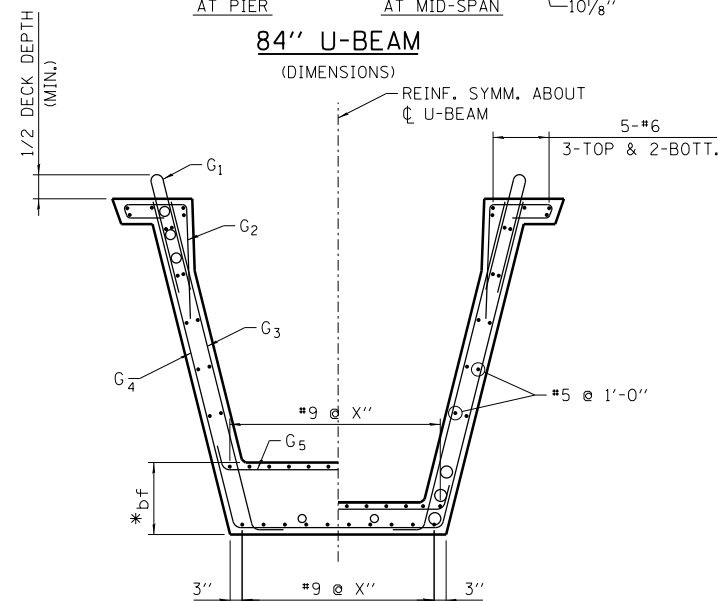


**72" U-BEAM**  
(DIMENSIONS)

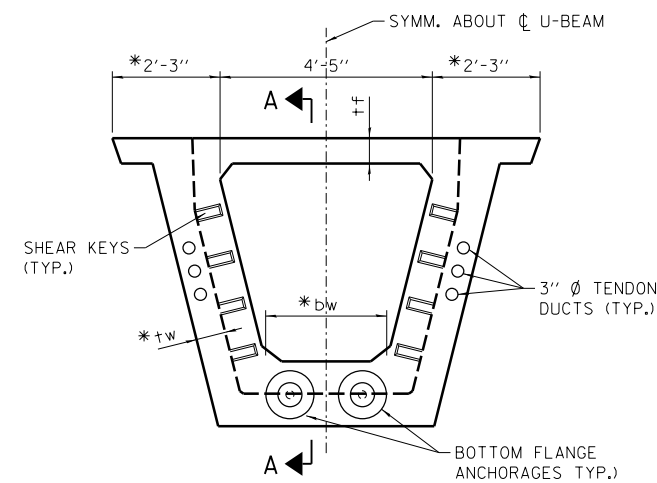
**84" U-BEAM**  
(DIMENSIONS)



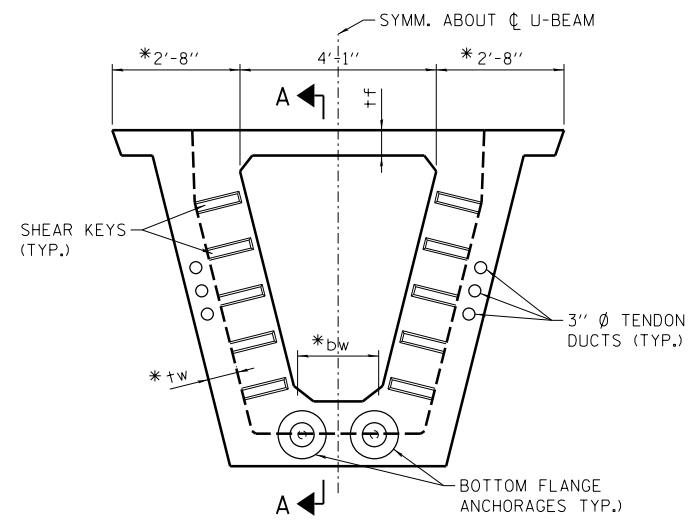
**72" U-BEAM**  
(REINFORCEMENT)



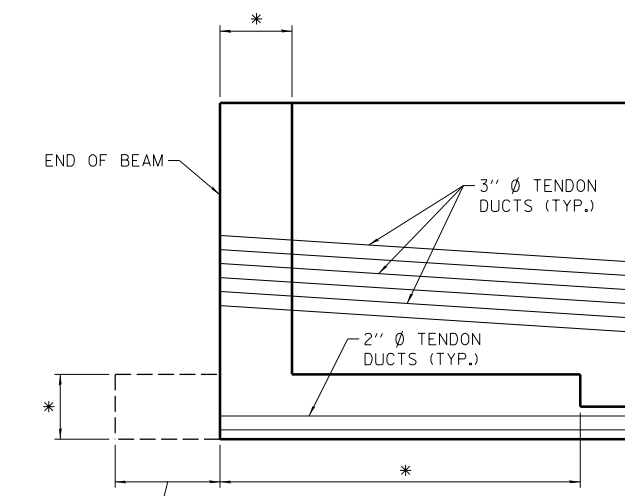
**84" U-BEAM**  
(REINFORCEMENT)



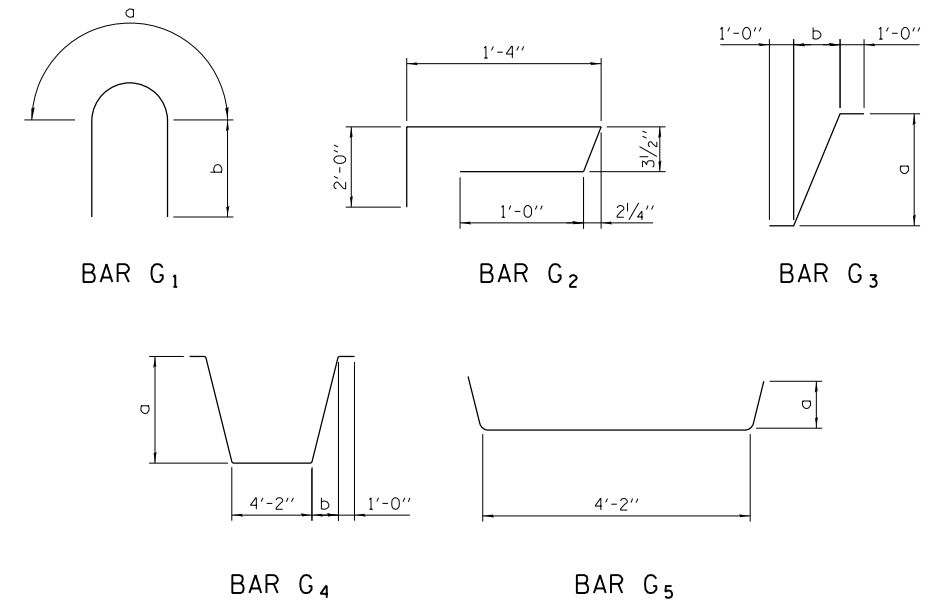
**72" U-BEAM**  
(END SECTION)



**84" U-BEAM**  
(END SECTION)



**SECTION A-A**  
(END SECTION)



BAR	NO.	SIZE	LENGTH	SHAPE
G1	0	#4	X'-X"	U
G2				U
G3				U
G4				U
G5				U

BAR	a	b
G1		
G2		
G3		
G4		
G5		

**VARIABLE DIMENSIONS**

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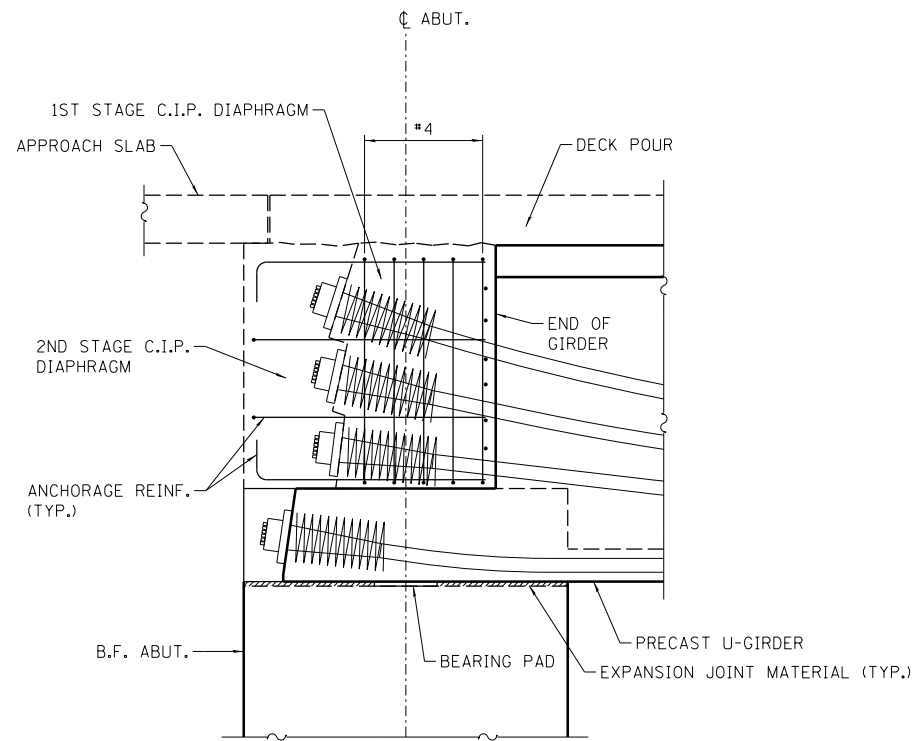
DIMENSIONS NOTED WITH (\*) ARE A FUNCTION OF THE DESIGN REQUIREMENTS AND MAY VARY.

SHEET 1 OF 3  
M-BRG-523

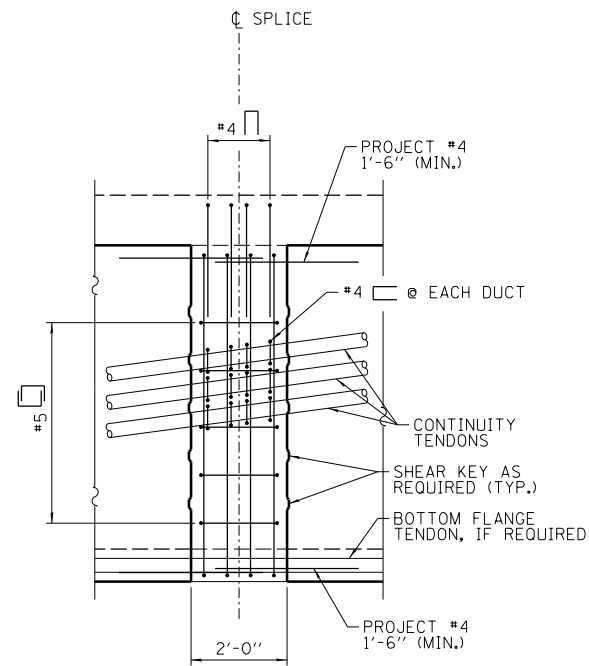


72" & 84"  
PPC U-BEAM  
POST-TENSIONED

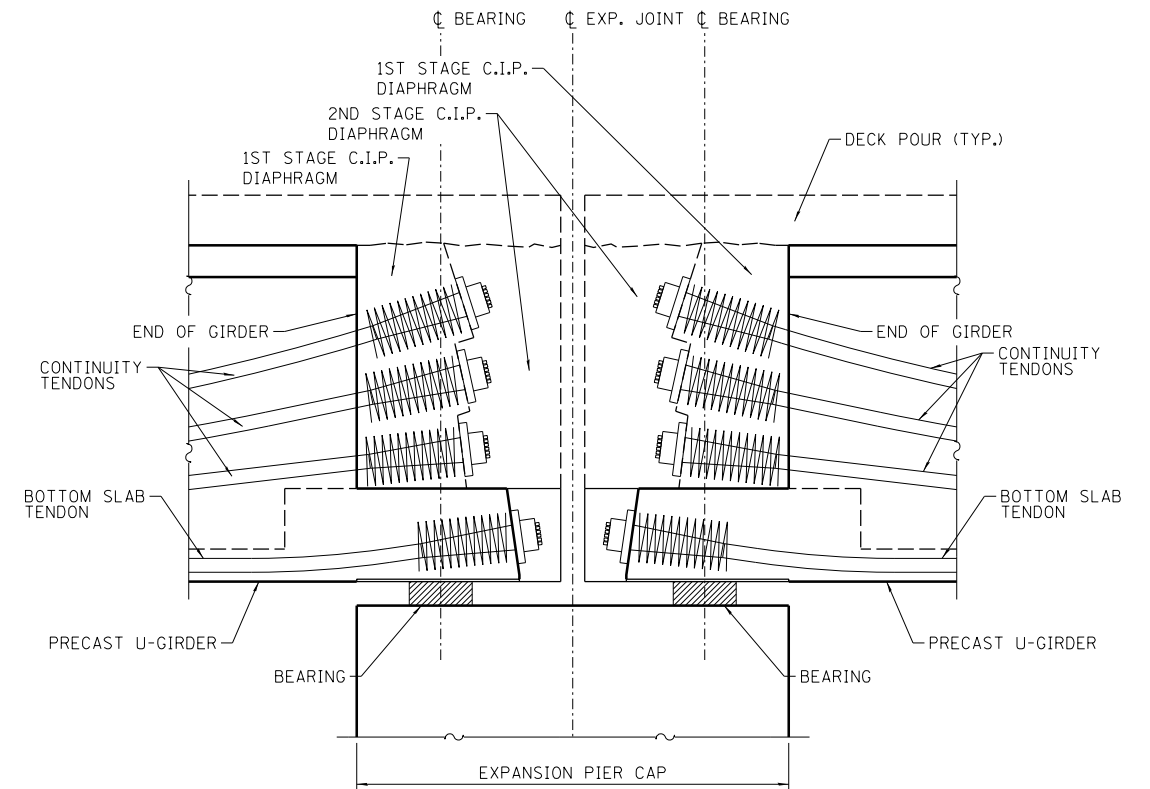
DATE  
12-19-2014



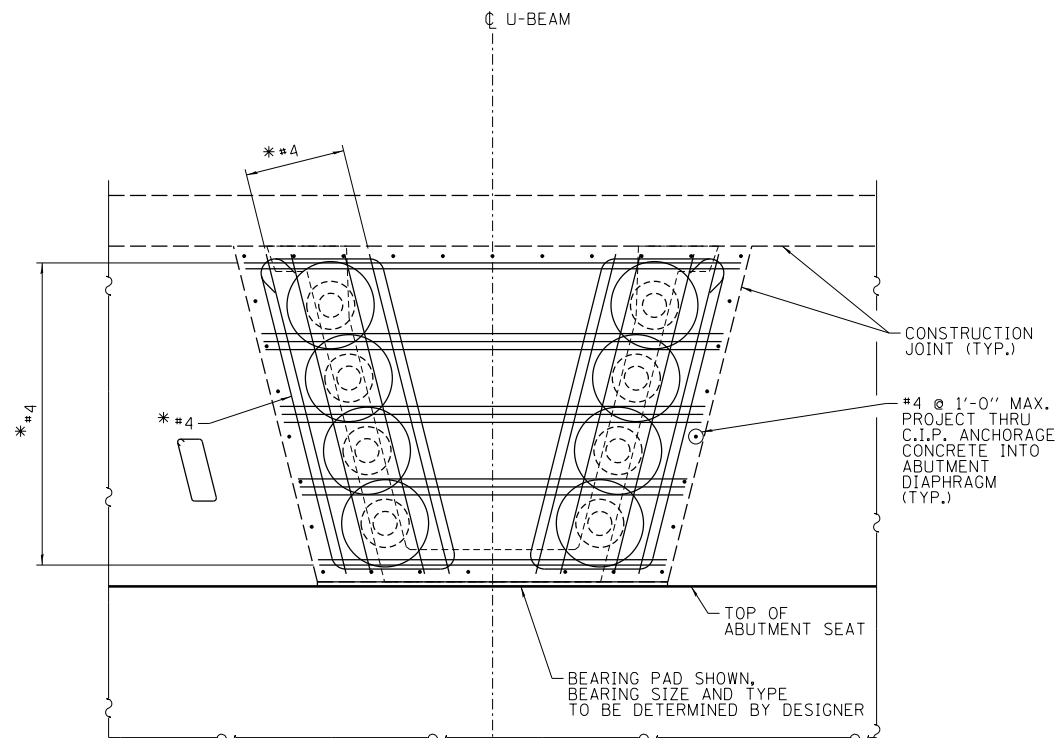
INTEGRAL ABUTMENT



SPLICE DETAIL



EXPANSION PIER



END VIEW  
(INTEGRAL ABUTMENT)

DIAPHRAGM DETAILS

### NOTE TO DESIGNER

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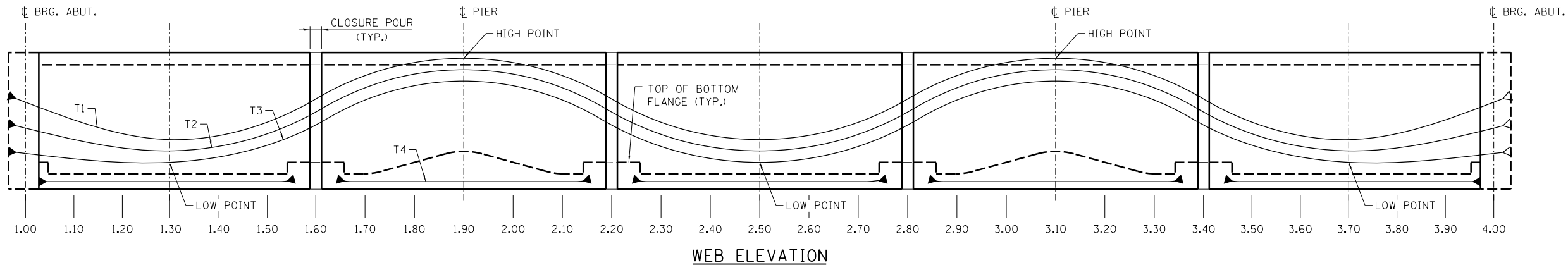
SHEET 2 OF 3  
M-BRG-523



72" & 84"  
PPC U-BEAM  
POST-TENSIONED

DATE  
12-19-2014

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\$FILE\$

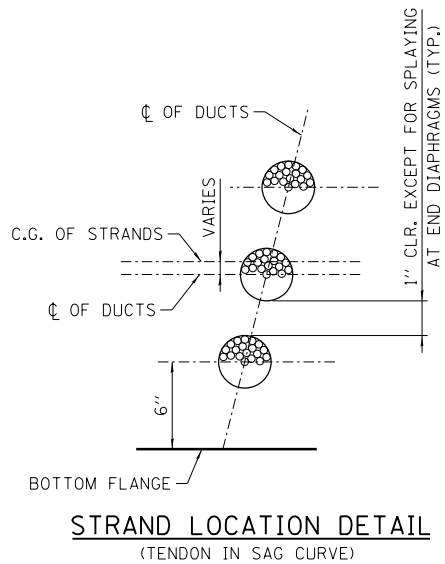


	LOCATION																																					
TENDON	1.00	1.10	1.20	1.30	1.40	1.50	1.60	1.70	1.80	1.90	2.00	2.10	2.20	2.30	2.40	2.50	2.60	2.70	2.80	2.90	3.00	3.10	3.20	3.30	3.40	3.50	3.60	3.70	3.80	3.90	4.00							
T1	X.XX'																																					
T2	X.XX'																																					
T3	X.XX'																																					
T4	X.XX'																																					

#### TENDON PROFILE

#### LEGEND

- ▶— - DENOTES LIVE END
- ◀— - DENOTES DEAD END



#### NOTES:

REINFORCING THAT INTERFERES WITH THE PRESTRESSING TENDON ALIGNMENT SHALL BE ADJUSTED AS APPROVED BY THE ENGINEER.

WHERE DEAD END ANCHORAGE AND TENDONS ARE ACCESSIBLE, THE ANCHORAGE SYSTEM AND LENGTH OF PROJECTING PRESTRESSING STEEL SHALL PERMIT JACKING WITH THE SAME JACKING EQUIPMENT THAT WAS USED ON THE LIVE END.

DEVIATIONS FROM THE DUCT PATTERN, DUCT SIZE, AND STRAND SIZE ASSUMED IN THE DESIGN MUST BE APPROVED BY THE ENGINEER.

THE DEFLECTION SHOWN IS POSITIVE DOWNWARD, IT INCLUDES THE INSTANTANEOUS EFFECTS OF DEAD LOAD AND PRESTRESSING, AND A FACTOR OF THREE (3) MULTIPLIER TO ACCOUNT FOR LONG TERM CREEP. FORMED WEB ELEVATIONS MUST BE ADJUSTED UPWARD FOR AN INDICATED POSITIVE DEFLECTION.

USE LOW-RELAXATION STRANDS MEETING THE REQUIREMENTS OF ASTM A416 GRADE 270.

#### STRESSING SEQUENCE:

TENDONS MAY BE JACKED FROM BOTH ENDS, EITHER SIMULTANEOUSLY OR SEQUENTIALLY, OR 1/2 THE TENDONS MAY BE JACKED FROM EACH END. IF 1/2 THE TENDONS ARE JACKED FROM EACH END THE JACKING FORCE SHALL BE INCREASED \_\_\_\_KIPS. IF JACKING FORCE OR STEEL AREA IS GREATER THAN ASSUMED IN THE DESIGN, PRESTRESSING QUANTITIES SHALL NOT BE ADJUSTED.

NO MORE THAN 1/2 OF THE PRESTRESSING FORCE IN ANY WEB MAY BE STRESSED BEFORE AN EQUAL FORCE IS STRESSED IN THE ADJACENT WEBS. AT NO TIME DURING THE STRESSING OPERATIONS WILL MORE THAN 10% OF THE TOTAL PRESTRESSING FORCE BE APPLIED ECCENTRICALLY ABOUT THE CENTERLINE OF THE STRUCTURE.

AT THE CONTRACTORS OPTION, THE PRESTRESSING FORCE MAY VARY ±5% FROM THE THEORETICAL FORCE PER WEB PROVIDED THE TOTAL P(JACK) FORCE IS OBTAINED AND IS DISTRIBUTED SYMMETRICALLY ABOUT THE CENTERLINE OF THE TYPICAL SECTION. P(JACK) IS THE SUM OF THE PEAK FORCES REACHED DURING JACKING IN EACH TENDON.

BOTTOM FLANGE TENDONS TO BE STRESSED AT CASTING YARD OR ON SITE BEFORE CLOSURE POURS ARE FORMED AND CAST.

#### DESIGN:

DESIGN IS BASED ON  $k=0.0002$  AND  $\mu=0.14$ . P(JACK) AT THE JACKING ENDS INCLUDES FRICTION, ANCHOR SET OF 0.375" AT THE JACKING END, ELASTIC SHORTENING, AND PROVISIONS FOR AN ADDITIONAL \_\_ KSI LONG TERM LOSS IN STRESS.

DUCT PATTERN AS SHOWN, WITH \_\_\_ INCH DIAMETER LOW-RELAXATION STRANDS IN \_\_\_ O.D. DUCTS WAS ASSUMED IN THE DESIGN.

P(JACK) = \_\_\_\_ KIPS TOTAL AT JACKING ENDS  
 $A_s \bullet$  MINIMUM = \_\_\_\_ SQ. IN.  
 $f'_s$  = 270 KSI  
 $f'_c$  = 8500 PSI AT 28 DAYS FIELD COMPRESSIVE STRENGTH  
 $f'_{ci}$  = 6000 PSI AT STRESSING

◆ DESIGNATES CRITICAL POINTS FOR P(JACK). THE CONTRACTOR SHALL SUBMIT ELONGATION AND JACKING CALCULATIONS BASED ON  $KL+\mu\alpha$  (INCLUDING ANCHOR SET IF ANY) AND INITIAL STRESS (INITIAL STRESS RATIO TIMES JACKING STRESS BEFORE LONG TERM LOSSES) AT THE POINTS LABELED "◆" AND TABULATED BELOW.

#### NOTE TO DESIGNER

THIS BASE SHEET SHOWS TYPICAL NEW CONSTRUCTION BUT IT IS NOT A STANDARD DRAWING. IT REQUIRES COMPLETION BY THE DESIGNER PRIOR TO INSERTION INTO A CONTRACT. MICROSTATION FILES AND THE "CADD STANDARDS MANUAL" ARE AVAILABLE ON THE ILLINOIS TOLLWAY WEBSITE. THE DESIGNER SHALL ACCEPT THE RESPONSIBILITY OF THE DESIGN OF THIS SHEET UPON ITS COMPLETION AND INSERTION INTO A CONTRACT. ALL "NOTE TO DESIGNER" BOXES SHALL BE REMOVED PRIOR TO INSERTION OF THE SHEET INTO THE PLAN SET.

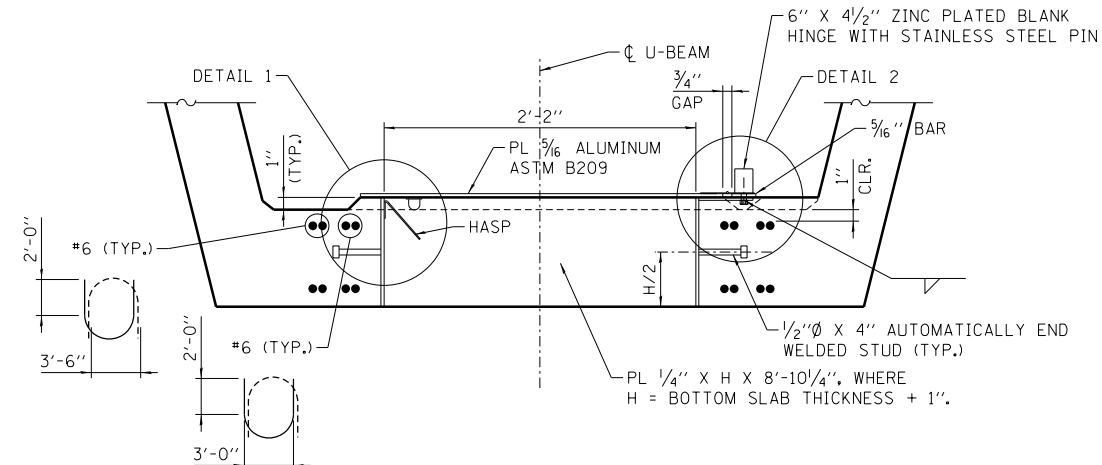
SHEET 3 of 3  
M-BRG-523



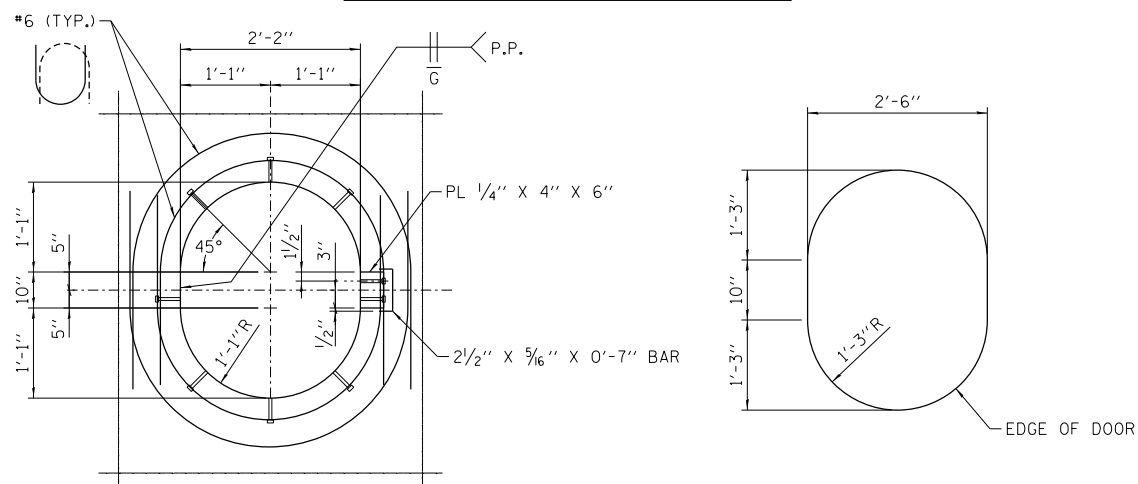
72" & 84"  
PPC U-BEAM  
POST-TENSIONED

DATE  
12-19-2014

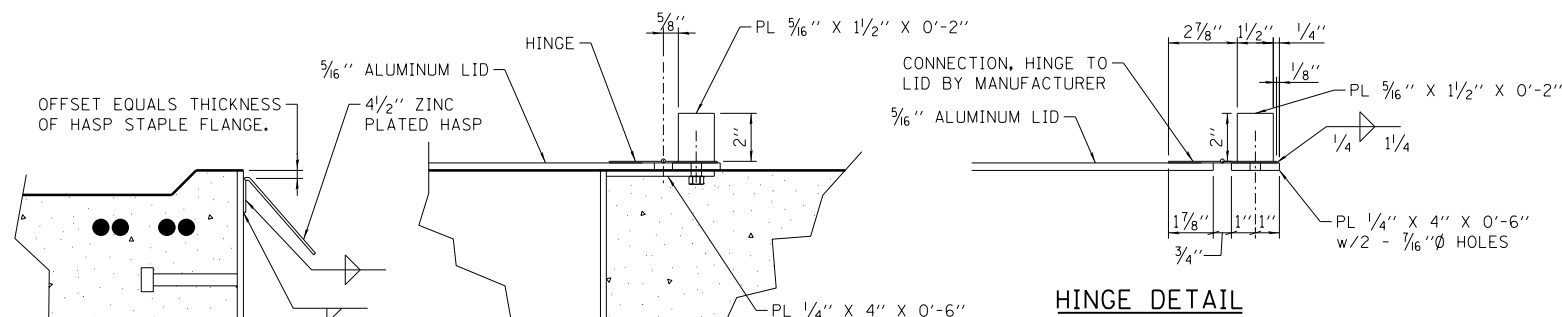
#### PATH DETAILS



SECTION THROUGH ACCESS DOOR



ACCESS DOOR DETAILS

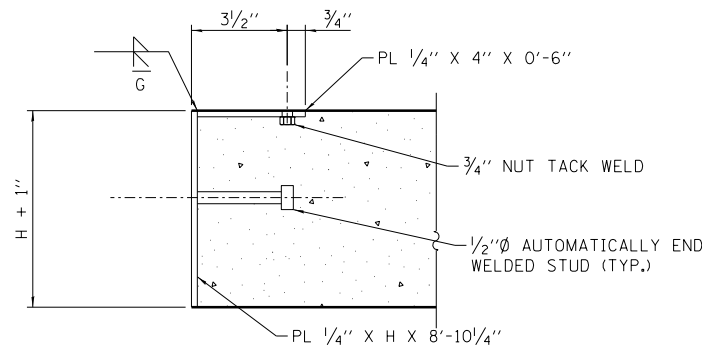


HINGE DETAIL

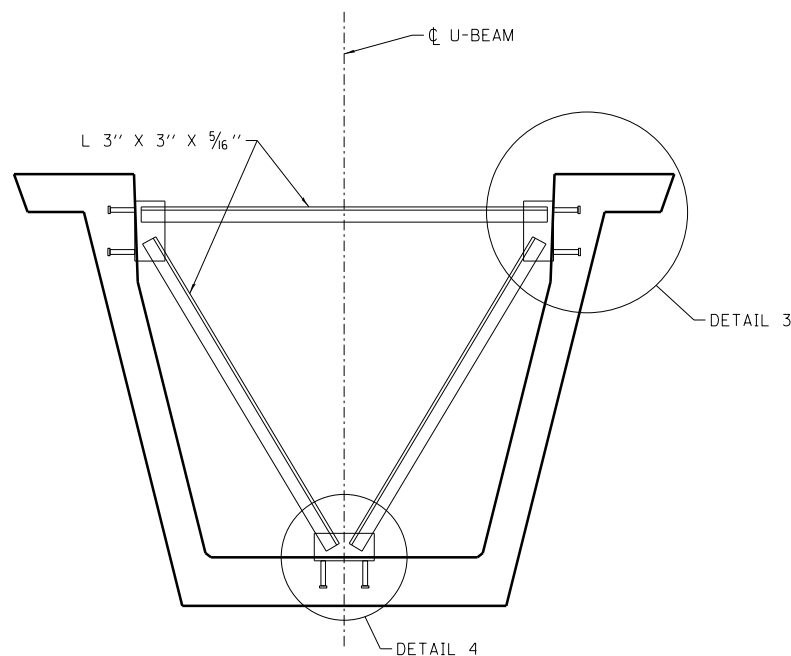


DETAIL 1

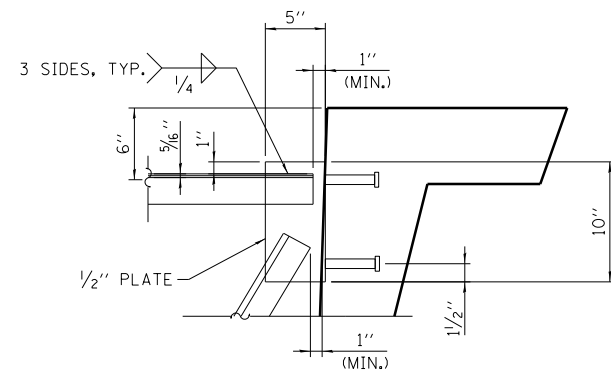
DETAIL 2



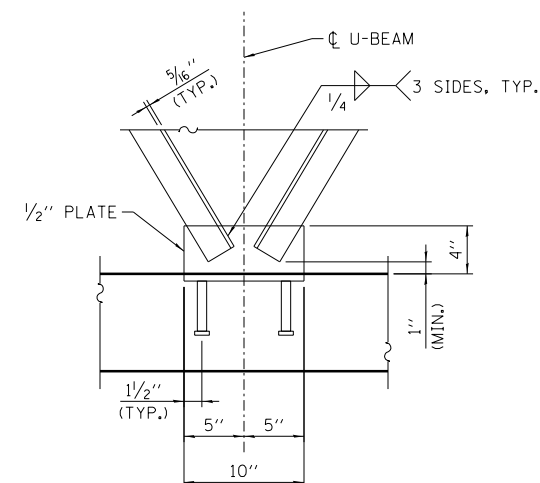
SECTION



LIFTING DIAPHRAGM



DETAIL 3



DETAIL 4

NOTE TO DESIGNER

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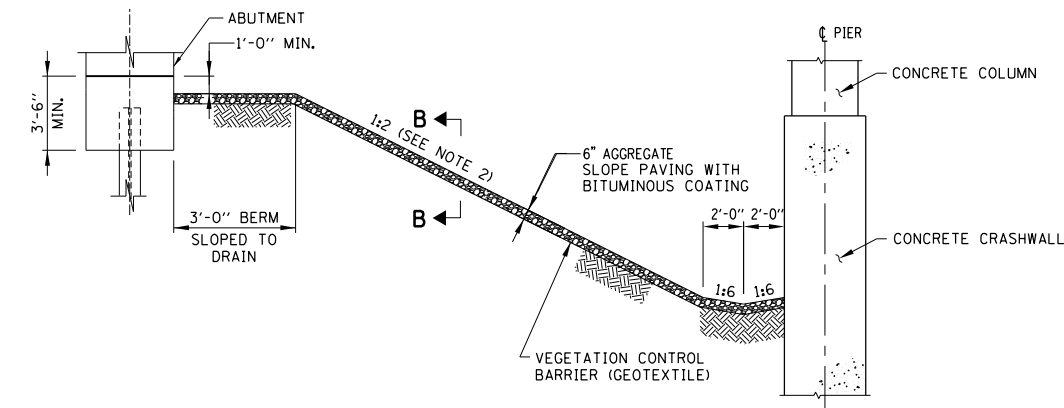
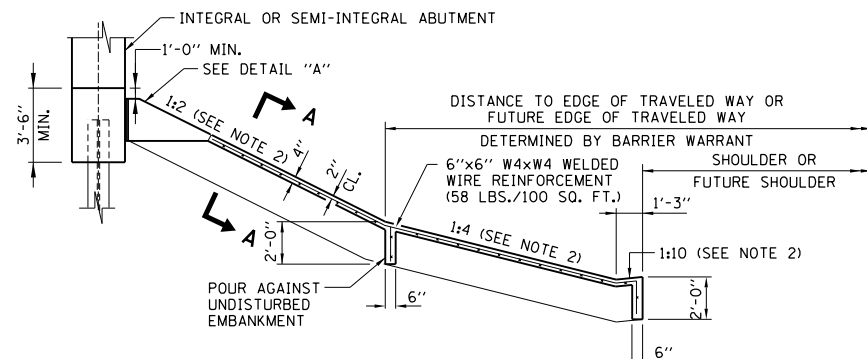
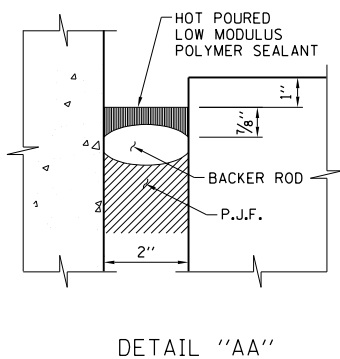
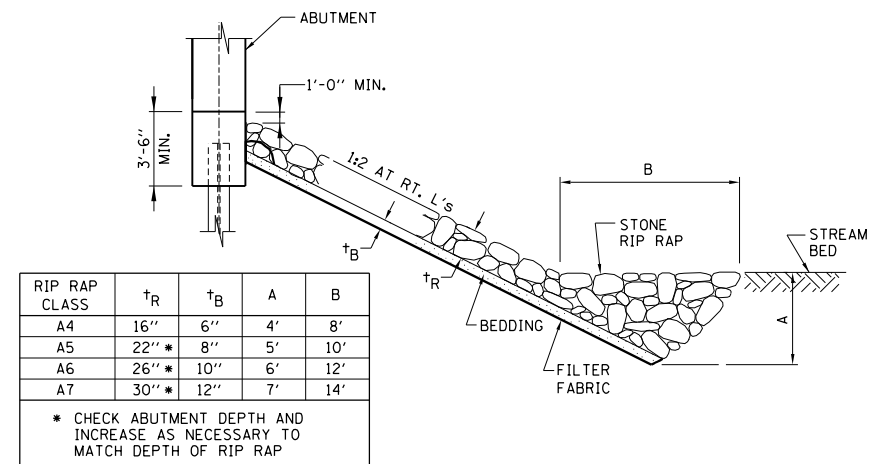
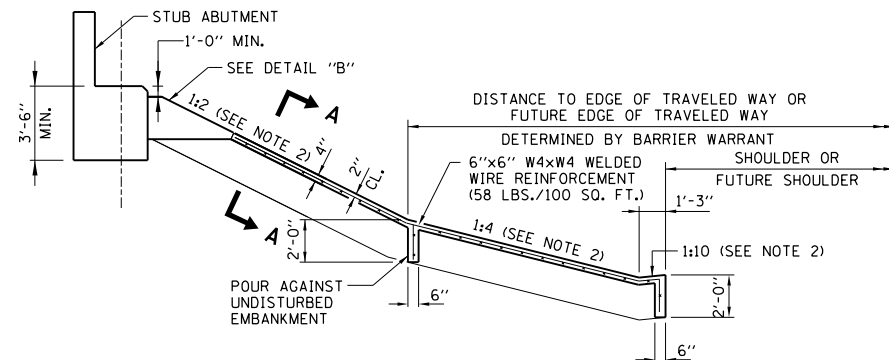
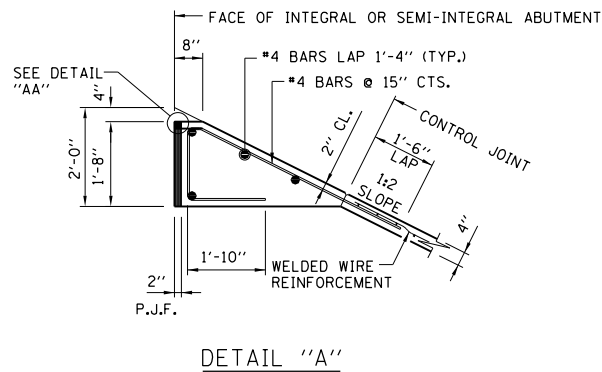
M-BRG-524



PPC U-BEAM  
MISCELLANEOUS DETAILS

DATE  
12-19-2014

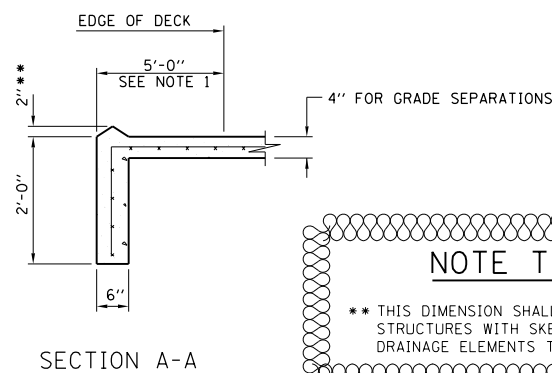
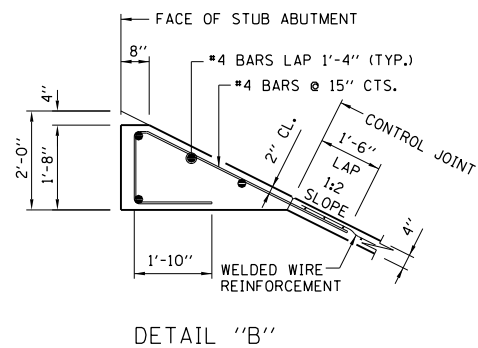




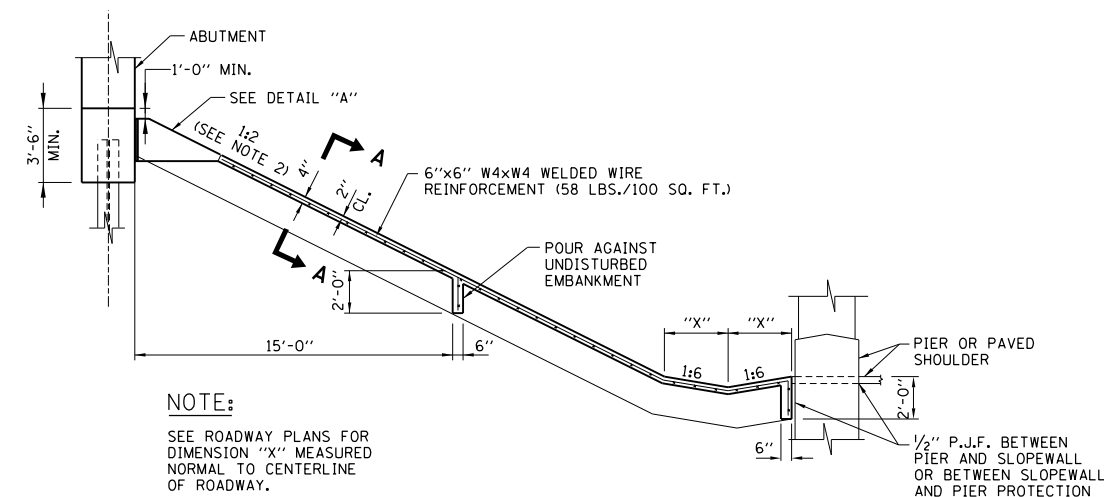
NOTE:  
SEALANT, BACKER ROD AND PJF SHALL MEET THE REQUIREMENTS OF SECTIONS 1050 AND 1051 OF THE STANDARD SPECIFICATIONS.

## SLOPE WALLS FOR BRIDGES OVER ILLINOIS TOLLWAY

## ILLINOIS TOLLWAY BRIDGES OVER RAILROADS



NOTE TO DESIGNER  
\*\* THIS DIMENSION SHALL BE INCREASED TO 4" FOR STRUCTURES WITH SKEWS OF 10° OR GREATER AND DRAINAGE ELEMENTS THAT OUTLET ONTO SLOPEWALL.

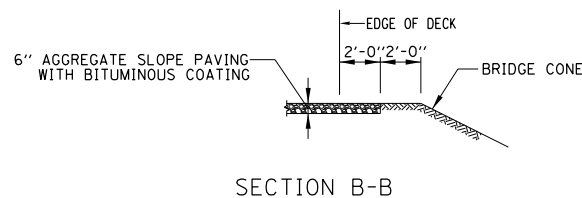


NOTE:  
SEE ROADWAY PLANS FOR DIMENSION "X" MEASURED NORMAL TO CENTERLINE OF ROADWAY.

## NOTE TO DESIGNER

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DESIGNER SHALL REMOVE ALL DETAILS THAT DO NOT APPLY.



## NOTES:

- DIMENSIONS SHALL BE 2'-0" IF DECK DRAINS ARE NOT PROVIDED.
- DIMENSIONS MARKED THUS ARE MEASURED NORMAL TO CENTERLINE OF ROADWAY OR TRACK.
- ALL SLOPES ARE EXPRESSED AS UNITS OF VERTICAL DISPLACEMENT TO UNITS OF HORIZONTAL DISPLACEMENT (V:H).

## ILLINOIS TOLLWAY BRIDGES OVER CROSSROADS

M-BRG-525



SLOPEWALL DETAILS

DATE  
3-31-2016