



TRANSPORTATION CABINET

Frankfort, Kentucky 40622
www.transportation.ky.gov/

Steven L. Beshear
Governor

Michael W. Hancock, P.E.
Secretary

December 6, 2013

CALL NO. 200
CONTRACT ID NO.
131212 Addendum # 2

Subject: Marshall Trigg County, 121GR13D012 - NHPP 0801 (098)
Letting December 20, 2013

- (1) Revised - Plan Sheets - R2, S2, S134, S183, S184A, S184B, S187, S192, S194, S206, S207, S207A, S207B, S208, S208A, S208B, S209, S209A, S210, S211, S212, S213, S216, S217, S260, S261, S274
- (2) Revised - Cover Page - PAGE 1 of 403
- (3) Revised - Completion Dates - Page 4 of 403
- (4) Revised - Multiple Notes - Various Pages
- (5) Revised - Bid Items - Page 397-403 of 403
- (6) Delete - Pages 27thru44, 216thru233, 207thru215, 234thru238 of 403

Proposal revisions are available at
<http://transportation.ky.gov/Construction-Procurement>

Plan Revisions are available at: <http://www.lynnimaging.com/kytransportation/>

If you have any questions, please contact us at (502) 564-3500.

Sincerely,

A handwritten signature in blue ink that reads "Ryan Griffith".

Ryan Griffith
Director
Division of Construction Procurement

RG:jj

Enclosures



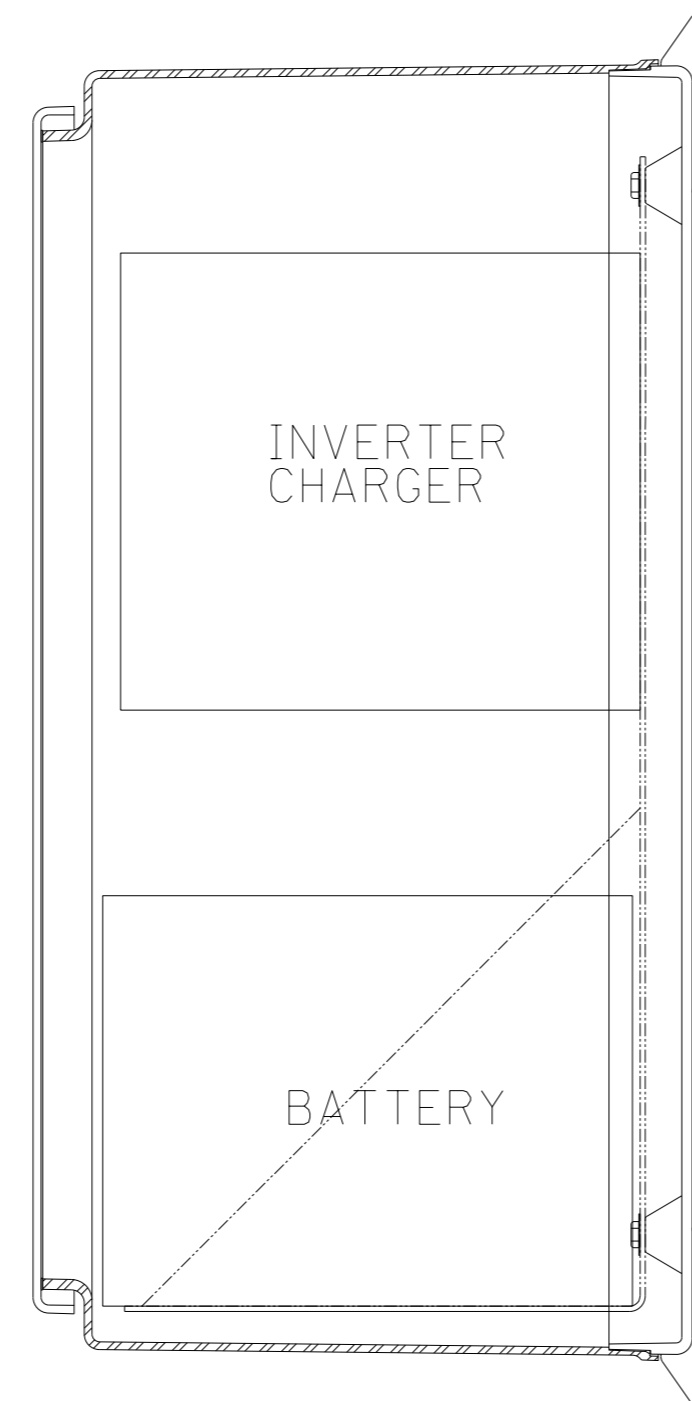
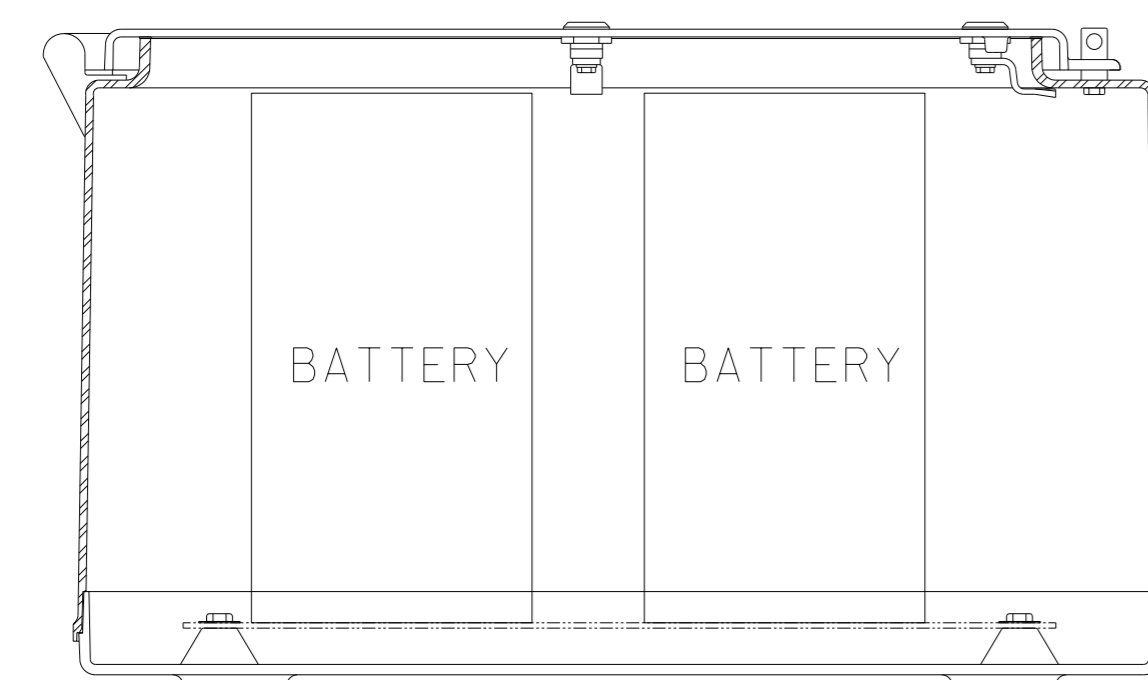
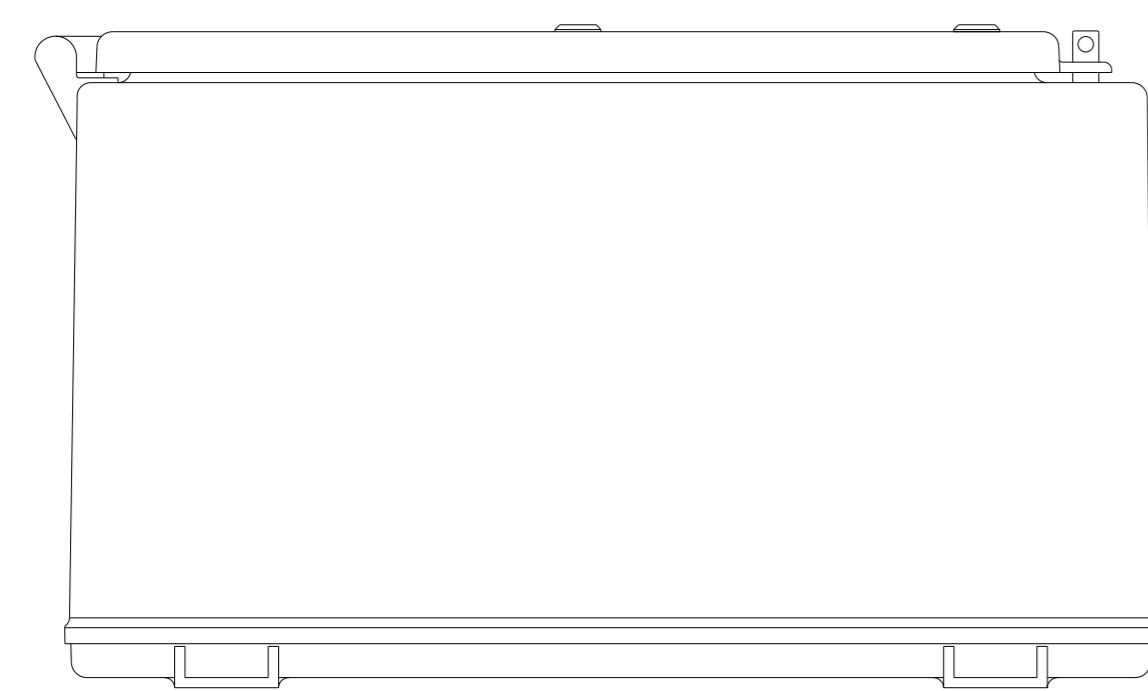
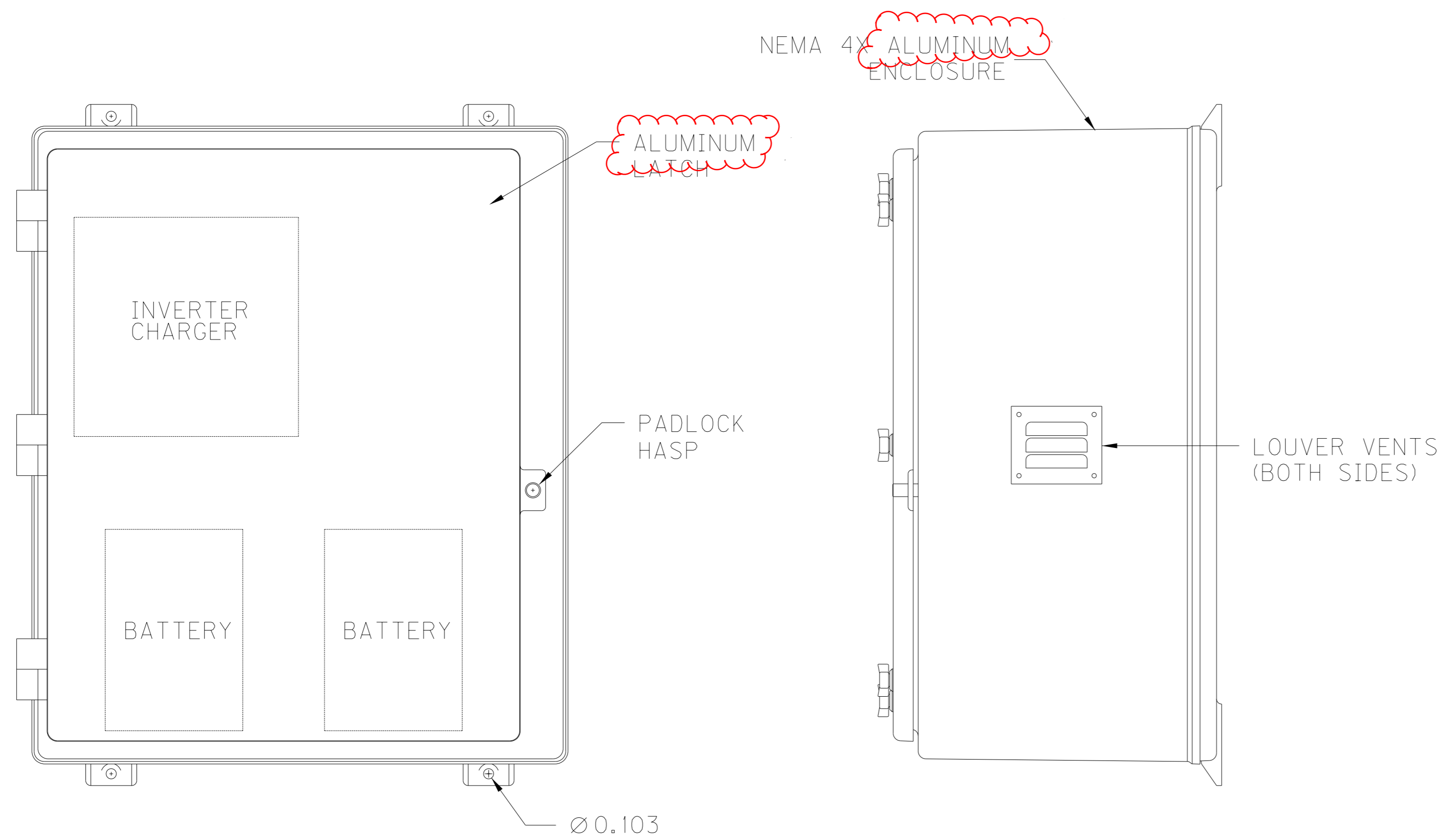
An Equal Opportunity Employer M/F/D

FILE NAME: F:\KYTC\LAND BETWEEN THE LAKES\LIGHTING\SHEETS\S271 S274 DETAILS.DGN

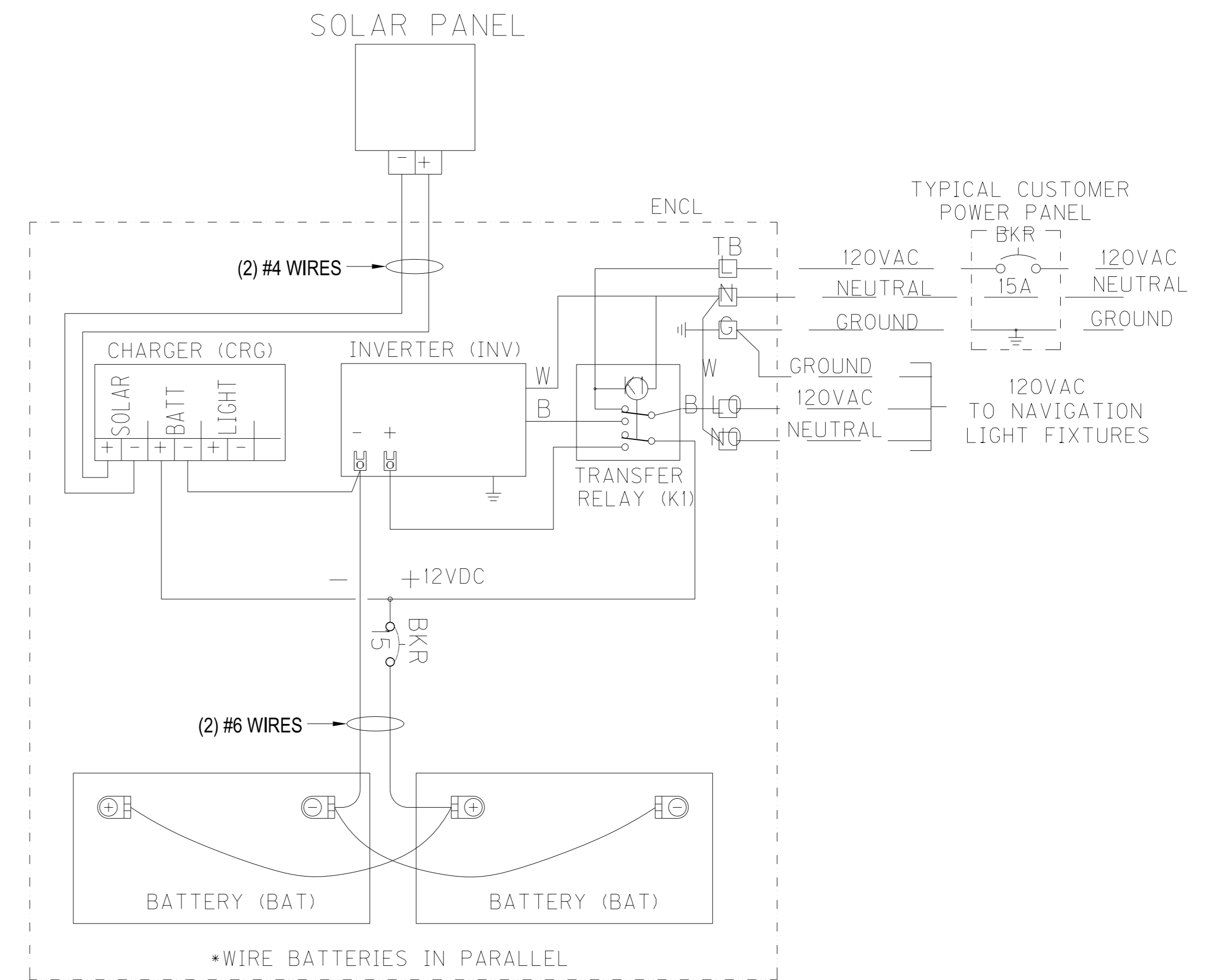
USER: H1to
DATE PLOTTED: December 5, 2013

E-SHEET NAME:

MicroStation v8.11.9.357



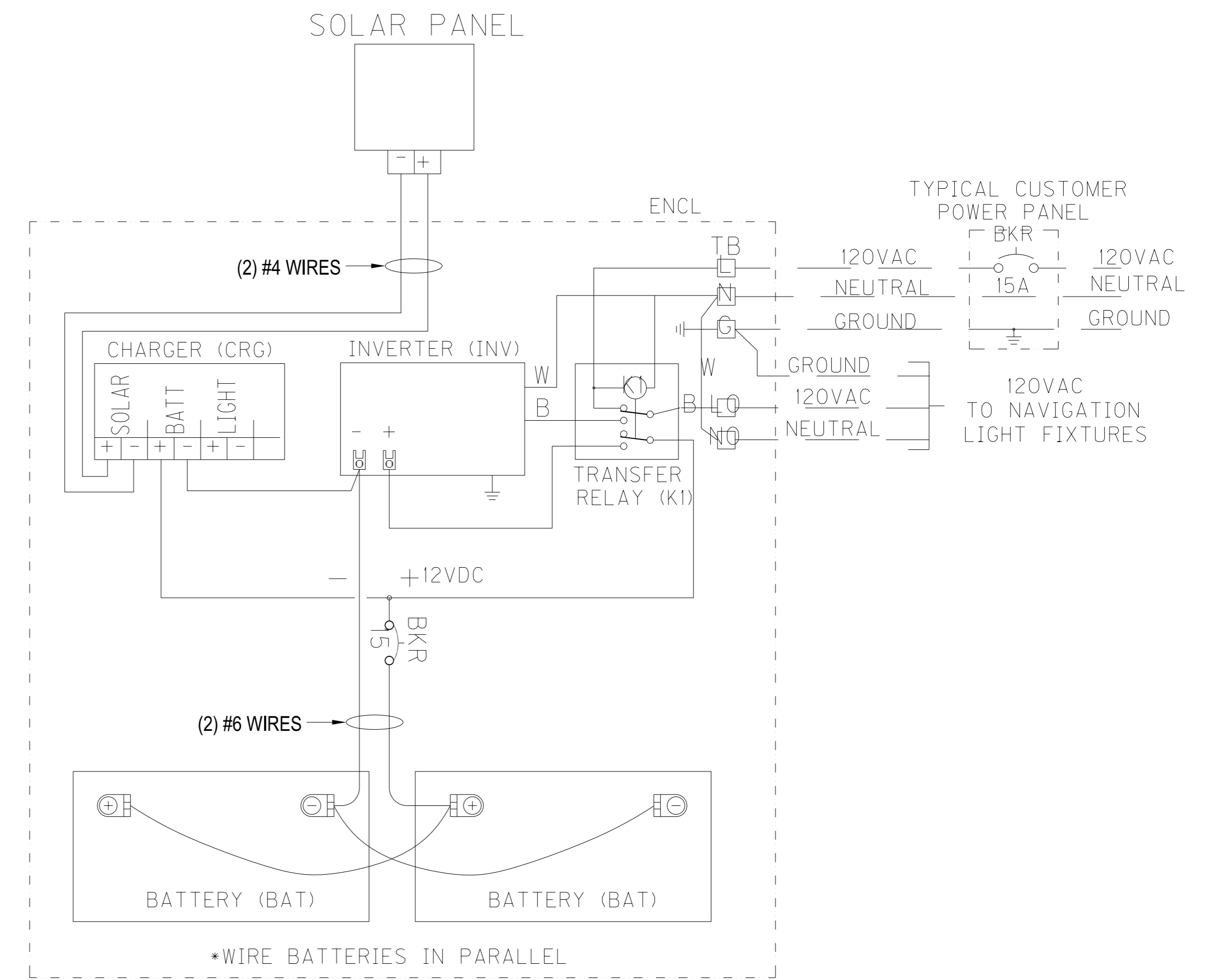
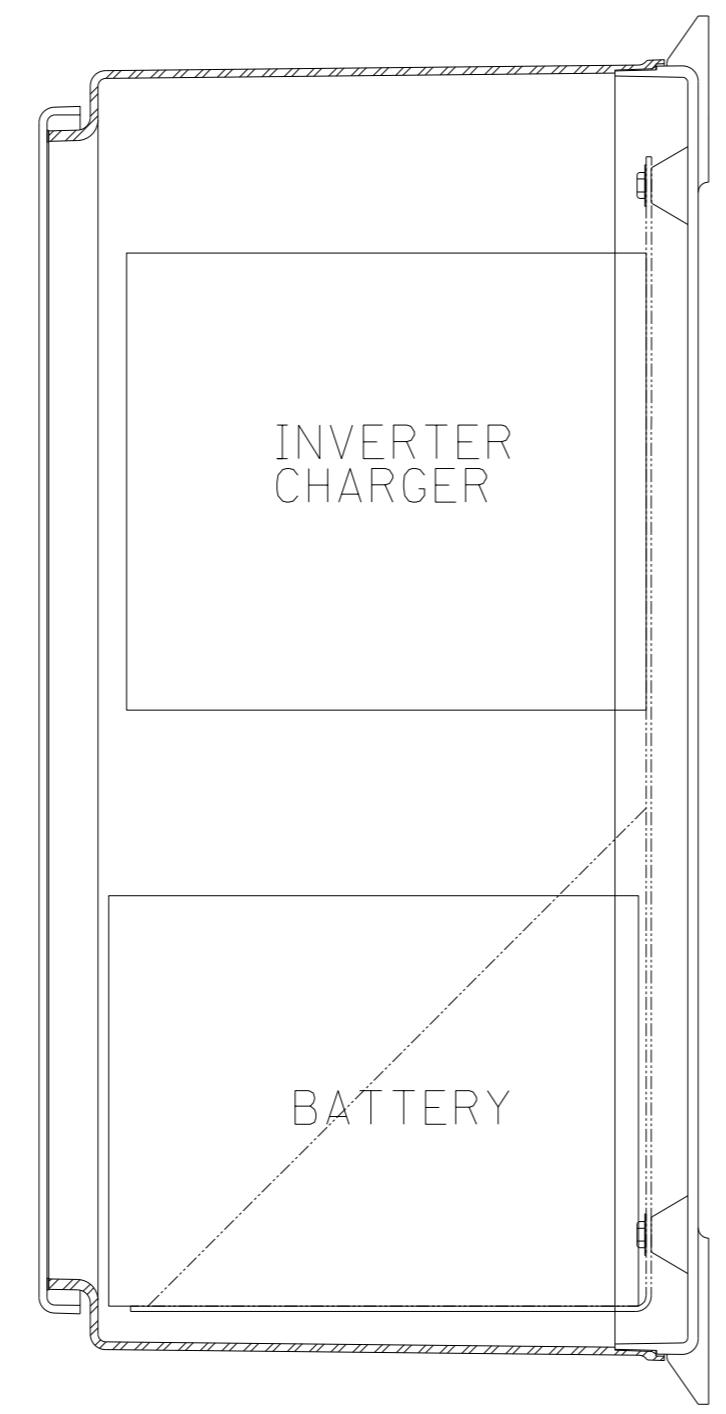
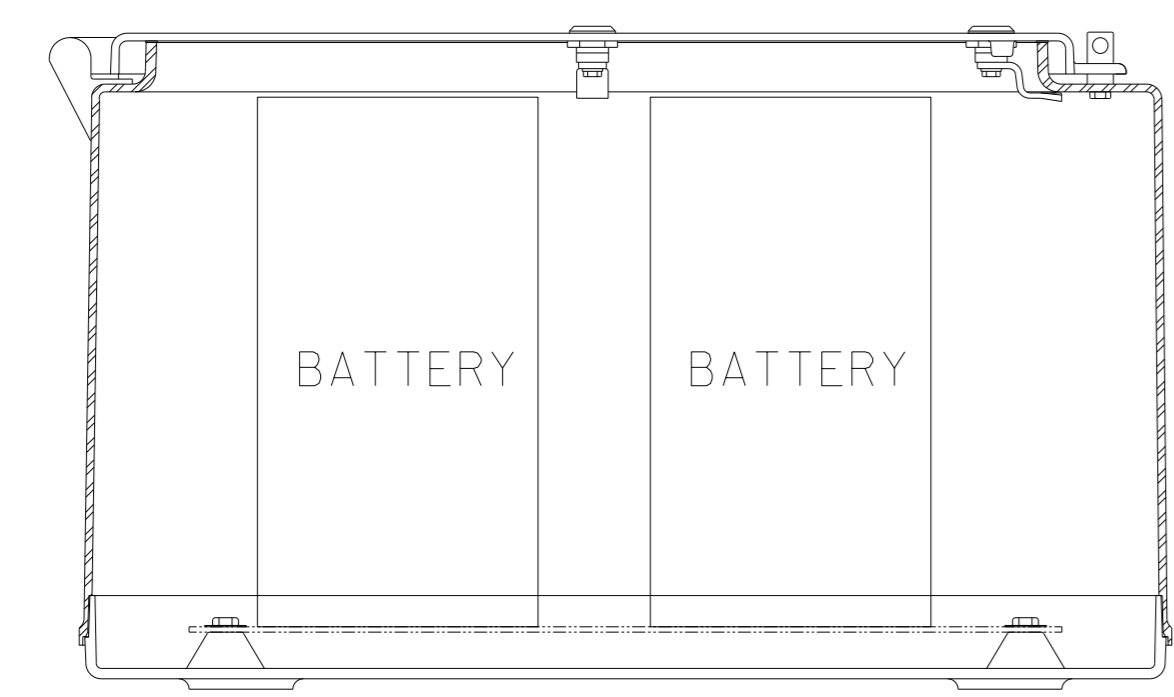
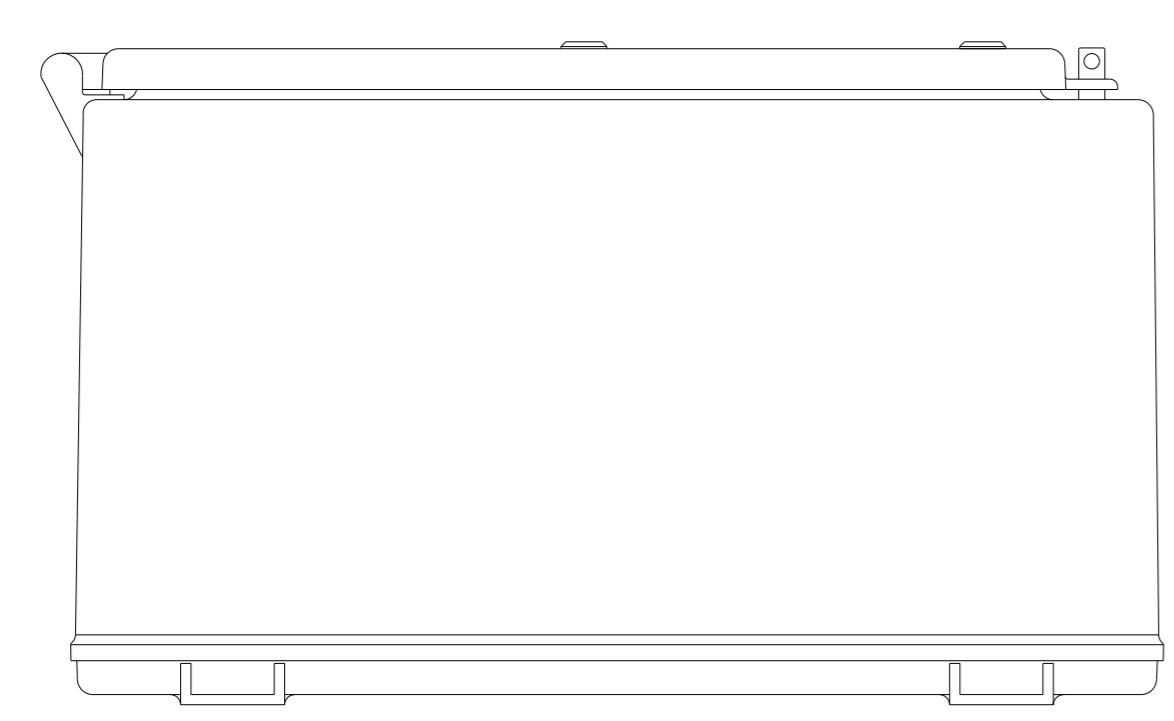
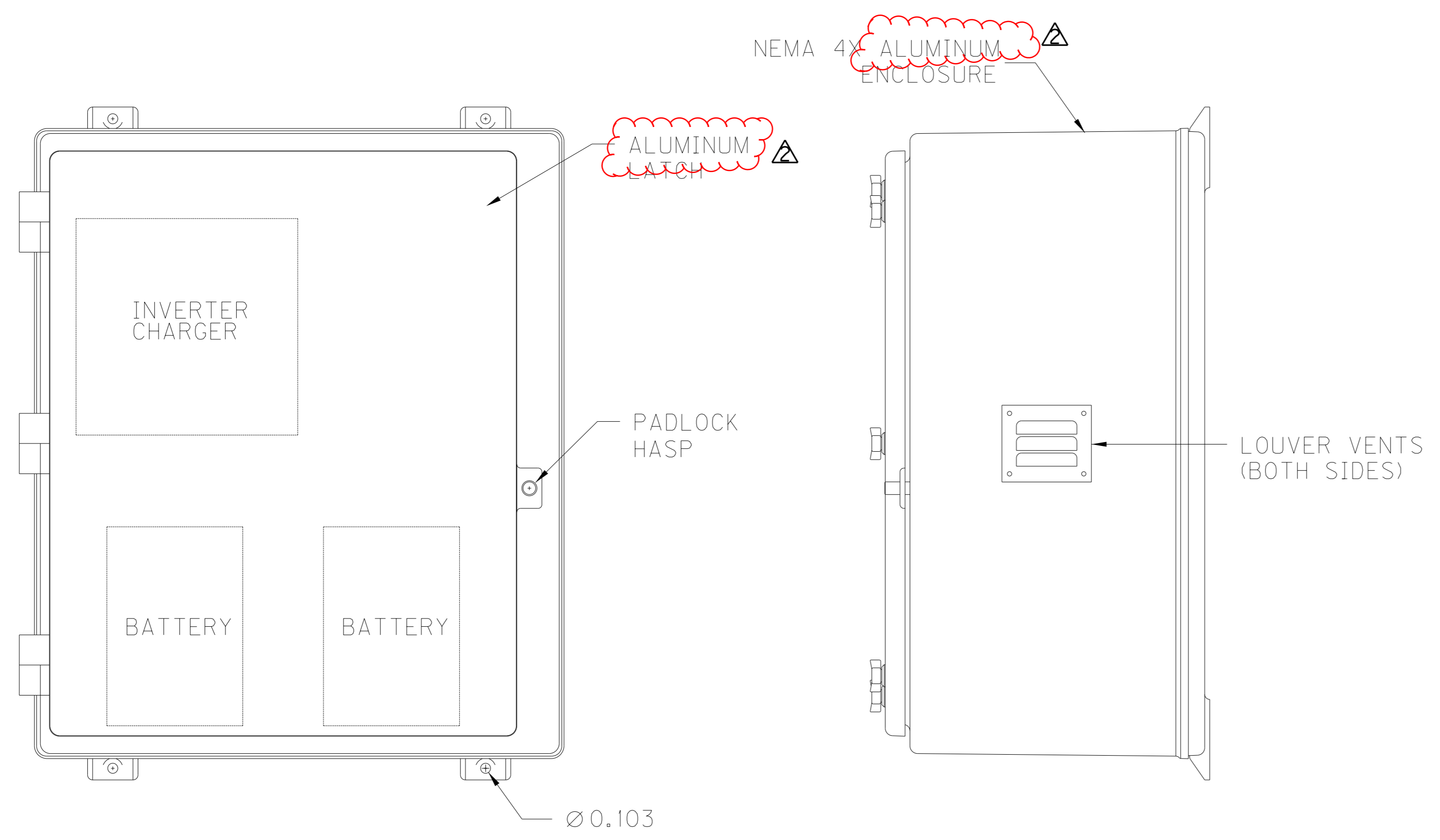
- NOTES:
- ENCLOSURE TO BE NEMA 4X ALUMINUM
 - ALL COMPONENTS ARRANGED FOR WALL MOUNTING.
 - CABINET DIMENSIONS SHALL BE DETERMINED BASED ON MANUFACTURER DESIGN



ITEM NUMBER
01-180.70

ADDENDUM	11/25/13
ADDENDUM	12/5/13
REVISION	DATE
DATE: NOVEMBER, 2013	CHECKED BY
DESIGNED BY: LAT	
DETAILED BY: LAT	
Commonwealth of Kentucky DEPARTMENT OF HIGHWAYS	
MARSHALL / TRIGG	
ROUTE US68	CROSSING KENTUCKY LAKE
SOLAR POWERED BATTERY BACKUP DETAILS	
PREPARED BY BARR & PREVOST ENGINEERING TESTING SURVEYING	SHEET NO. S274 DRAWING NO. 24686

FILE NAME: F:\KYTC\LAND BETWEEN THE LAKES\LIGHTING\SHEETS\S271 S274 DETAILS.DGN
 USER: H1to
 DATE PLOTTED: December 5, 2013
 E-SHEET NAME:
 MicroStation v8.11.9.357



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FILE NAME: F:\K\KTC\LAND BETWEEN THE LAKES\LIGHTING\SHEETS\S260-S261-LIGHTING NOTES.DGN
 USER: I11fo
 DATE PLOTTED: December 5, 2013
 E-SHEET NAME: MicroStation v8.11.9.357

PATHWAY DELINEATION LIGHTING

GENERAL:

THE PATHWAY DELINEATION LIGHTING SHALL BE IN THE COMBINATION RAIL (SEE DETAILS SHEET S268). THE HSS STEEL RAIL WITH LED ILLUMINATION STRIP LIGHTING, SERIES LIA/D, CUSTOM DESIGNED LED, NICHIA WHITE LAMP DS SERIES ILLUMINATION ASSEMBLIES, HIGH LUMINOUS INTENSITY WHITE LIGHT LEDS. LIGHTING ASSEMBLIES SHALL BE PRE-APPROVED BY THE ENGINEER.

BASIC DESIGN:

THE DESIGN SHALL BE A COMPLETE READY TO INSTALL FIXTURE THAT INCLUDES:

1. ILLUMINATION ASSEMBLY WITH DIRECT VIEW LEDS.
2. ELECTRONIC CONTROL CIRCUITS ENCLOSED IN SEALED FLEXIBLE RIBBED POLYCARBONATE CO-EXTRUSIONS 40 FEET IN LENGTH.
3. REMOTE DRIVER ENCLOSURES.

EXTRUSION SHALL CONSIST OF UV STABILIZED, 94V-2 FLAMMABILITY RATING AND SHALL HAVE A GALVANIZED FINISH. THIS PRODUCT SHALL BE LISTED BY AN INDEPENDENT LABORATORY.

MOUNTING:

THIS INSTALLATION SHALL INCLUDE ONE NICHIA WHITE LAMP DS SERIES LEDS INNGON TYPE F 5MM THROUGH-HOLE LEDS WITH 50,000 PERFORMANCE HRS TO 70LM @20MA. ATTACHED INSIDE THE FENCE RAIL WITH A JUNCTION BOX EVERY 80 FEET.

ELECTRICAL:

ALL ASSEMBLIES ARE NOMINALLY RATED AT 24VDC. THEY ARE DESIGNED FOR INSTALLATION USING CLASS 2 WIRING METHODS. THE LED DRIVER SHALL HAVE OUTPUT CAPABILITY OF 100.0W 4.1A AND 24.0V, WITH IN/OUT CAPABILITIES OF 117W, 120V/240V, .42A, WITH HARD WIRED LEAD, CONSTANT VOLTAGE OUTPUT, AND AN OUTDOOR RATED SYSTEM.

AN ADDITIONAL FOOT OF EXTRA WIRE SHALL BE INCLUDED BEFORE AND AFTER EACH CIRCUIT TO ACCOUNT FOR THE EXPANSION THAT MAY OCCUR WITH ANY STRUCTURE.

COST FOR THIS ITEM SHALL INCLUDE ALL DRIVERS, SPLICES, ATTACHMENT HARDWARE, LABOR, EQUIPMENT, MATERIALS AND INCIDENTALS, AS WELL AS AN ADDITIONAL 10% OF THE LED ILLUMINATION ASSEMBLES.

AESTHETIC (ARCH) LIGHTING

GENERAL:

THE AESTHETIC (ARCH) LIGHTING SHALL CONSIST OF LED STRIP LIGHTING ASSEMBLIES, SERIES LIA/D CUSTOM DESIGNED LED, NICHIA WHITE LAMP DS SERIES ILLUMINATION ASSEMBLIES, HIGH LUMINOUS INTENSITY WHITE LIGHT LEDS OR EQUIVALENT.

BASIC DESIGN:

ASSEMBLIES SHALL INCLUDE ILLUMINATION BOARDS WITH DIRECT VIEW LEDS AND ELECTRONIC CONTROL CIRCUITS ENCLOSED IN SEALED FLEXIBLE RIBBED POLYCARBONATE CO-EXTRUSIONS 40 FEET IN LENGTH (UNLESS OTHERWISE DIRECTED IN THE FIELD). EXTRUSION SHALL CONSIST OF UV STABILIZED, 94V-2 FLAMMABILITY RATING. THE LIGHTING ASSEMBLY SHALL BE INSTALLED SO THAT AT 10 FEET DOWN THE CABLES FROM THE ARCH, THE FOOTCANDLES ARE LESS THAN 40% OF THE TOTAL FOOTCANDLES.

MOUNTING:

THE MOUNTING ASSEMBLY SHALL INCLUDE STAINLESS STEEL MOUNTING CLIPS AND ARTICULATING BRACKETS, AS DETAILED SEE SHEET S269. ALL CONDUIT AND MOUNTING HARDWARE SHALL BE PAINTED THE SAME COLOR AS THE ARCH RIB, FEDERAL NO. 37722. THE FIXTURES SHALL NOT RUN CONTINUOUS PAST A RAIL SPLICE/RAIL JOINT.

ELECTRICAL:

ALL ASSEMBLIES ARE NOMINALLY RATED AT 24VDC. THEY ARE DESIGNED FOR INSTALLATION USING CLASS 2 WIRING METHODS. THE LED DRIVER SHALL HAVE OUTPUT CAPABILITY OF 100.0W 4.1A AND 24.0V, WITH IN/OUT CAPABILITIES OF 117W, 120V/240V, .42A, WITH HARD WIRED LEAD, CONSTANT VOLTAGE OUTPUT AND AN OUTDOOR RATED SYSTEM.

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COST FOR THIS ITEM SHALL INCLUDE ALL DRIVERS, SPLICES, ATTACHMENT HARDWARE, LABOR, EQUIPMENT, MATERIALS AND INCIDENTALS.

SOLAR POWERED BATTERY BACK-UP

GENERAL:

THIS INSTALLATION SHALL BE A B&B ROADWAY SOLAR BATTERY BACK-UP SYSTEM OR APPROVED EQUAL AND SHALL CONSIST OF ALL COMPONENTS NECESSARY FOR CONSTRUCTION OF A 12 VOLT SOLAR POWERED BACK-UP LIGHTING SYSTEM FOR US 68/KY 80 KENTUCKY LAKE BRIDGE REPLACEMENT PROJECT, AS DETAILED ELSEWHERE IN THESE PLANS. WHEN IN USE THE LIGHTING SYSTEM SHALL BE REQUIRED TO OPERATE FOR A MINIMUM OF 10 DAYS AND SHALL INCLUDE NAVIGATION LIGHTS AND THE WIRELESS MONITORING SYSTEM.

THE COMPLETED SYSTEM SHALL CONFORM TO THE REQUIREMENTS OF THE U.S. COAST GUARD AND ALL OTHER APPLICABLE REGULATORY AGENCIES.

SYSTEM DESIGN:

THE SYSTEM SHALL BE DESIGNED TO UTILIZE SOLAR ELECTRIC MODULES WITH FOUR (4) 265Ah BATTERIES AS THE BACK-UP POWER SOURCE TO PROVIDE CONTINUOUS POWER FOR THE NAVIGATION LIGHTING, AS WELL AS THE WIRELESS MONITORING SYSTEM. THE SYSTEM MUST BE DESIGNED FOR OPERATION AT AN AVERAGE MONTHLY INSOLATION ON A HORIZONTAL SURFACE, INSOLATION AT TILT, AND AVERAGE MONTHLY TEMPERATURES AT THIS SIGHT.

SOLAR MODULES AND MOUNTING STRUCTURE:

THE SOLAR ELECTRIC PANELS SHALL BE TRIPLE JUNCTION SOLAR CELLS WITH AN UNBREAKABLE CONSTRUCTION. THE SOLAR PANELS SHALL CONSIST OF TWO (2) 140W, TEMPERED GLASS PANELS OR EQUIVALENT TO SUPPLY ENOUGH POWER TO OPERATE THE 20 NAVIGATION LIGHTS AND THE WIRELESS MONITORING SYSTEM. THE CELL SHALL BE ENCAPSULATED TO PROTECT FROM AN ENVIRONMENT CONSISTENT WITH BRIDGE LOCATION IN WHICH IT IS MOUNTED. EACH MODULE SHALL PROVIDE A WEATHER TIGHT JUNCTION BOX FOR CONNECTING THE ARRAY OUTPUT CABLE TO THE MARINE RATED TERMINALS. THE MODULES SHALL BE DESIGNED TO PROVIDE RATED POWER OUTPUT FOR A MINIMUM OF FIFTEEN (15) YEARS. AS SHOWN ON THE PLANS, THE SOLAR PANELS WILL POWER THE UPSTREAM AND DOWNSTREAM NAVIGATION LIGHTS, AND THE WIRELESS MONITORING SYSTEM. THE PANELS WILL BE APPROPRIATELY SIZED FOR THE INSTALLATION AND SHALL TAKE INTO CONSIDERATION ESH (WINTERTIME EQUIVALENT SUN HOURS) AND SPECIFIED LAMP POWER REQUIREMENTS.

A SUPPORT POLE AND ALL HARDWARE NECESSARY FOR MOUNTING THE PANEL AND WIRING NECESSARY TO CONNECT THE PANEL TO THE CONTROLLER SHALL BE INCLUDED.

THE SOLAR ELECTRIC MODULES SHALL BE DESIGNED TO BE SECURELY ATTACHED TO POLE NEAR THE POWER SERVICE. THE MANUFACTURER SHALL PROVIDE A SCHEMATIC DIAGRAM SHOWING THE ATTACHMENT. MOUNTING BRACKETS AND ARMS SHALL BE FABRICATED FROM ALUMINUM STRUCTURE MATERIALS SUFFICIENT TO PROVIDE NECESSARY STABILITY FOR THE PANEL ARRAY. PANEL ORIENTATION SHALL BE ADJUSTABLE TO FACILITATE MAXIMUM SOLAR INPUT. SHOP DRAWINGS DETAILING THE MOUNTING SYSTEM FOR THE SOLAR PANELS SHALL BE SUBMITTED FOR APPROVAL PRIOR TO FABRICATION. ALL MOUNTING HARDWARE FOR ATTACHMENT TO THE BRIDGE SHALL BE STAINLESS.

THE CONTRACTOR SHALL SUBMIT TO THE ENGINEER FOR APPROVAL FOR SHOP DRAWINGS FOR CABINETS, MOUNTING BRACKETS, AND OTHER STRUCTURAL ITEMS PRIOR TO THE FABRICATIONS OF THESE ITEMS.

SOLAR CONTROLS:

THE SYSTEM SHALL UTILIZE A SOLID STATE INTEGRATED CONTROL UNIT CAPABLE OF MANAGING BATTERY CHARGING AND LIGHTING OUTPUT CONTROL. THESE FUNCTIONS SHALL BE ACCOMPLISHED WITHIN A SINGLE CABINET IN EACH SPECIFIED LOCATION.

THE CHARGE CONTROL PORTION OF THE CONTROL UNIT SHALL BE DESIGNED SUCH THAT IT DRAWS POWER ONLY FROM THE SOLAR ARRAY WHEN POWER IS AVAILABLE AS TO REDUCE PARASITIC LOAD ON THE SYSTEM. UNITS SHALL USE AMBIENT TEMPERATURE SENSOR TO ADJUST THE CHARGE TERMINATION POINT (TEMPERATURE COMPENSATED CHARGING) THUS PROLONGING THE BATTERY LIFE. THE CHARGE CIRCUIT SHALL ALSO EMPLOY A PULSE-WIDTH MODULATIONS ALGORITHM FOR CHARGING THE BATTERIES AND SHALL BE OF SOLID STATE SERIES SWITCH TYPE CONFIGURATION.

ON BOARD SHORT CIRCUIT PROTECTION SHALL BE PROVIDED. THE CONTROLS SHALL HAVE THE ABILITY TO DETECT DAY AND NIGHT THROUGH A PV ARRAY (DUSK TILL DAWN ACTIVATOR). THE LOAD CONTROL FUNCTION SHALL INCORPORATE A LOW VOLTAGE DISCONNECT (LVD) CIRCUIT TO DISCONNECT POWER TO THE CONTROL CIRCUIT WHEN BATTERY VOLTAGE FALLS TO A LOW STATE OF CHARGE (TYPICALLY 20%).

SYSTEM ENCLOSURE:

THE SYSTEM SHALL UTILIZE A SINGLE ENCLOSURE FOR EASE OF INSTALLATION. THE ENCLOSURE SHALL BE FABRICATED FROM ALUMINUM WITH A MINIMUM THICKNESS OF 0.125". THE CABINET SHALL PROVIDE SCREENED LOUVERED VENTS ON EACH SIDE OF EACH COMPARTMENT. THE LOUVERED SCREENING SHALL BE ALUMINUM FOR LONGEVITY. AND INTEGRAL RAIN LIP SHALL BE PROVIDED AT THE TOP OF THE MAIN CABINET BODY TO MINIMIZE ENTRY OF THE RAIN.

THE MAINTENANCE ENTRANCE SHALL BE HINGED DOUBLE LOCKING. THIS ENTRANCE SHALL HAVE A NEOPRENE GASKET AROUND THE ENTIRE EDGE. THE ENTRANCE SHALL BE SECURED WITH A STANDARD TRAFFIC SIGNAL CONTROLLER CABINET CORBIN #2 LOCK. THE KEYHOLE FOR THIS LOCK SHALL HAVE A DEEP COVER ATTACHED TO THE DOOR WITH A SINGLE RIVET. THE BATTERY COMPARTMENT SHALL HAVE INSULATING SHEETING AROUND ENCLOSURE WALL, THE AROUND THE BATTERY AND THE CABINET SHALL BE OF SUFFICIENT SIZE TO HOUSE THE BATTERY AND ALL CONTROL COMPONENTS AND ALLOW SUFFICIENT ROOM FOR ROUTINE MAINTENANCE. MINIMUM SIZE: 16' HIGH x 15' WIDE AND 9' DEEP. ALL CONDUIT ATTACHMENTS TO THIS CABINET SHALL BE MADE TO THE BASE OF THE CABINET TO MINIMIZE MOISTURE PENETRATION.

BATTERY:

THE BATTERY FOR THIS LOCATION SHALL BE A 265Ah VALVE REGULATED, GEL CELL MAINTENANCE FREE, AND NON-SPILLABLE. IT SHALL BE A DEEP CYCLE MARINE BATTERY AND SHALL BE 12 VOLT MINIMUM 90 AMP HOUR.

SYSTEM WIRING:

THE SYSTEM SHALL FEATURE A COLOR CODED WIRING HARNESS FOR THE PARTICULAR LIGHTING/LAMPS AND SOLAR ARRAY OUTPUT. A KEYED LOCKING CONNECTOR SHALL BE UTILIZED IN THE HARNESS TO ALLOW LAMPS TO BE QUICKLY AND EASILY DISCONNECTED FROM THE CONTROL ELECTRONICS. AN INTEGRAL FUSE ASSEMBLY SHALL BE INCLUDED IN THE LAMP POSITIVE WIRE OF THE HARNESS. ALL CONNECTIONS SHALL BE TERMINATED WITH CRIMPED SPADE TERMINALS FOR EASY INSTALLATION AND MAINTENANCE.

THE OUTPUT HARNESS FOR THE SOLAR ARRAY SHALL CONSIST OF A JACKETED PAIR OF CONDUCTORS. THE SIZE OF THE CONDUCTORS SHALL BE APPROPRIATE TO THE SOLAR ARRAY OUTPUT CURRENT. JACKETS SHALL BE OF UV RESISTANT PVC OR XLT MATERIAL. MARINE TERMINALS SHALL BE UTILIZED FOR INSTALLATION AND MAINTENANCE. ALL WIRING SHALL BE ENCASED IN FLEXIBLE CONDUIT TO PROTECT FROM VANDALISM. ALL CONDUCTORS SHALL BE SIZED IN ACCORDANCE WITH NATIONAL ELECTRIC CODE REQUIREMENTS AND SHALL BE TYPE THHN OR THWN.

INVERTER/CHARGER:

THE INVERTER/CHARGER WILL NEED TO ASSIST THE SOLAR POWERED BATTERY BACK-UP WITH TRANSFERRING POWER IN THE EVENT THE BATTERY BACK-UP NEEDS TO BE UTILIZED.

A VERSATILE INVERTER/CHARGER WITH AUTO TRANSFER SWITCHING WHICH SERVES AS AN AUTO INVERTER FOR ALTERNATIVE ENERGY OR EXPORT APPLICATIONS, SUCH AS AN UNINTERRUPTIBLE POWER SUPPLY (UPS).

CONDUIT:

FOR THE SOLAR AND POWER CABLE TO CONTROL PANELS CONDUIT EXPANSION SLEEVE SHALL BE PROVIDED AT ALL LOCATIONS THAT CROSS ALL EXPANSION JOINTS. THE COST OF THE CONDUIT EXPANSION SLEEVE IS INCIDENTAL TO THE PRICE OF THE CONDUIT.

FLEXIBLE CONDUIT SHALL BE USED FOR ALL THE ARCH LIGHTING



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DATE: NOVEMBER, 2013	CHECKED BY	
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DETAILED BY: LAT		
Commonwealth of Kentucky DEPARTMENT OF HIGHWAYS		
COUNTY MARSHALL / TRIGG		
ROUTE US68	CROSSING KENTUCKY LAKE	
LIGHTING NOTES		
PREPARED BY BARR & PREVOST ENGINEERING TESTING SURVEYING		SHEET NO. S261 DRAWING NO. 24686

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THE SYSTEM SHALL UTILIZE A SOLID STATE INTEGRATED CONTROL UNIT CAPABLE OF MANAGING BATTERY CHARGING AND LIGHTING OUTPUT CONTROL. THESE FUNCTIONS SHALL BE ACCOMPLISHED WITHIN A SINGLE CABINET IN EACH SPECIFIED LOCATION.

THE CHARGE CONTROL PORTION OF THE CONTROL UNIT SHALL BE DESIGNED SUCH THAT IT DRAWS POWER ONLY FROM THE SOLAR ARRAY WHEN POWER IS AVAILABLE AS TO REDUCE PARASITIC LOAD ON THE SYSTEM. UNITS SHALL USE AMBIENT TEMPERATURE SENSOR TO ADJUST THE CHARGE TERMINATION POINT (TEMPERATURE COMPENSATED CHARGING) THUS PROLONGING THE BATTERY LIFE. THE CHARGE CIRCUIT SHALL ALSO EMPLOY A PULSE-WIDTH MODULATIONS ALGORITHM FOR CHARGING THE BATTERIES AND SHALL BE OF SOLID STATE SERIES SWITCH TYPE CONFIGURATION.

ON BOARD SHORT CIRCUIT PROTECTION SHALL BE PROVIDED. THE CONTROLS SHALL HAVE THE ABILITY TO DETECT DAY AND NIGHT THROUGH A PV ARRAY (DUSK TILL DAWN ACTIVATOR). THE LOAD CONTROL FUNCTION SHALL INCORPORATE A LOW VOLTAGE DISCONNECT (LVD) CIRCUIT TO DISCONNECT POWER TO THE CONTROL CIRCUIT WHEN BATTERY VOLTAGE FALLS TO A LOW STATE OF CHARGE (TYPICALLY 20%).

SYSTEM ENCLOSURE:

THE SYSTEM SHALL UTILIZE A SINGLE ENCLOSURE FOR EASE OF INSTALLATION. THE ENCLOSURE SHALL BE FABRICATED FROM ALUMINUM WITH A MINIMUM THICKNESS OF 0.125". THE CABINET SHALL PROVIDE SCREENED LOUVERED VENTS ON EACH SIDE OF EACH COMPARTMENT. THE LOUVERED SCREENING SHALL BE ALUMINUM FOR LONGEVITY. AND INTEGRAL RAIN LIP SHALL BE PROVIDED AT THE TOP OF THE MAIN CABINET BODY TO MINIMIZE ENTRY OF THE RAIN.

THE MAINTENANCE ENTRANCE SHALL BE HINGED DOUBLE LOCKING. THIS ENTRANCE SHALL HAVE A NEOPRENE GASKET AROUND THE ENTIRE EDGE. THE ENTRANCE SHALL BE SECURED WITH A STANDARD TRAFFIC SIGNAL CONTROLLER CABINET CORBIN #2 LOCK. THE KEYHOLE FOR THIS LOCK SHALL HAVE A DEEP COVER ATTACHED TO THE DOOR WITH A SINGLE RIVET. THE BATTERY COMPARTMENT SHALL HAVE INSULATING SHEETING AROUND ENCLOSURE WALL, THE AROUND THE BATTERY AND THE CABINET SHALL BE OF SUFFICIENT SIZE TO HOUSE THE BATTERY AND ALL CONTROL COMPONENTS AND ALLOW SUFFICIENT ROOM FOR ROUTINE MAINTENANCE. MINIMUM SIZE: 16' HIGH x 15' WIDE AND 9' DEEP. ALL CONDUIT ATTACHMENTS TO THIS CABINET SHALL BE MADE TO THE BASE OF THE CABINET TO MINIMIZE MOISTURE PENETRATION.

BATTERY:

THE BATTERY FOR THIS LOCATION SHALL BE A 265Ah VALVE REGULATED, GEL CELL MAINTENANCE FREE, AND NON-SPILLABLE. IT SHALL BE A DEEP CYCLE MARINE BATTERY AND SHALL BE 12 VOLT MINIMUM 90 AMP HOUR.

SYSTEM WIRING:

THE SYSTEM SHALL FEATURE A COLOR CODED WIRING HARNESS FOR THE PARTICULAR LIGHTING/LAMPS AND SOLAR ARRAY OUTPUT. A KEYED LOCKING CONNECTOR SHALL BE UTILIZED IN THE HARNESS TO ALLOW LAMPS TO BE QUICKLY AND EASILY DISCONNECTED FROM THE CONTROL ELECTRONICS. AN INTEGRAL FUSE ASSEMBLY SHALL BE INCLUDED IN THE LAMP POSITIVE WIRE OF THE HARNESS. ALL CONNECTIONS SHALL BE TERMINATED WITH CRIMPED SPADE TERMINALS FOR EASY INSTALLATION AND MAINTENANCE.

THE OUTPUT HARNESS FOR THE SOLAR ARRAY SHALL CONSIST OF A JACKETED PAIR OF CONDUCTORS. THE SIZE OF THE CONDUCTORS SHALL BE APPROPRIATE TO THE SOLAR ARRAY OUTPUT CURRENT. JACKETS SHALL BE OF UV RESISTANT PVC OR XLT MATERIAL. MARINE TERMINALS SHALL BE UTILIZED FOR INSTALLATION AND MAINTENANCE. ALL WIRING SHALL BE ENCASED IN FLEXIBLE CONDUIT TO PROTECT FROM VANDALISM. ALL CONDUCTORS SHALL BE SIZED IN ACCORDANCE WITH NATIONAL ELECTRIC CODE REQUIREMENTS AND SHALL BE TYPE THHN OR THWN.

INVERTER/CHARGER:

THE INVERTER/CHARGER WILL NEED TO ASSIST THE SOLAR POWERED BATTERY BACK-UP WITH TRANSFERRING POWER IN THE EVENT THE BATTERY BACK-UP NEEDS TO BE UTILIZED.

A VERSATILE INVERTER/CHARGER WITH AUTO TRANSFER SWITCHING WHICH SERVES AS AN AUTO INVERTER FOR ALTERNATIVE ENERGY OR EXPORT APPLICATIONS, SUCH AS AN UNINTERRUPTIBLE POWER SUPPLY (UPS).

CONDUIT:



FOR THE SOLAR AND POWER CABLE TO CONTROL PANELS CONDUIT EXPANSION SLEEVE SHALL BE PROVIDED AT ALL LOCATIONS THAT CROSS ALL EXPANSION JOINTS. THE COST OF THE CONDUIT EXPANSION SLEEVE IS INCIDENTAL TO THE PRICE OF THE CONDUIT.

FLEXIBLE CONDUIT SHALL BE USED FOR ALL THE ARCH LIGHTING

FILE NAME: F:\KYTC\LAND BETWEEN THE LAKES\LIGHTING\SHEETS\S260-S261-LIGHTING NOTES.DGN

USER: I11fo
DATE PLOTTED: December 5, 2013

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DESIGNED BY: LAT		
DETAILED BY: LAT		
Commonwealth of Kentucky DEPARTMENT OF HIGHWAYS		
COUNTY MARSHALL / TRIGG		
ROUTE US68	CROSSING KENTUCKY LAKE	
LIGHTING NOTES		
ITEM NUMBER		PREPARED BY
01-180.70		
		SHEET NO. S261 DRAWING NO. 24686



NAVIGATION LIGHTING

GENERAL:

THE CENTER CHANNEL NAVIGATION LIGHT SHALL BE DESIGNED FOR USE AS A MARINE SIGNAL LIGHT FOR MARKING CENTER OF CHANNEL FOR FIXED SPANS, AND SHALL MEET OR EXCEED ALL COAST GUARD RECOMMENDATIONS AND REQUIREMENTS PERTAINING TO CENTER OF CHANNEL MARKING SIGNALS.

THE CHANNEL MARGIN LIGHT SHALL BE DESIGNED FOR USE AS A MARINE SIGNAL LIGHT FOR MARKING THE CHANNEL MARGIN, AND SHALL MEET OR EXCEED ALL COAST GUARD RECOMMENDATIONS AND REQUIREMENTS PERTAINING TO CHANNEL MARGIN AND OBSTRUCTION MARKING SIGNALS.

HOUSING AND GENERAL CONSTRUCTION:

THE HOUSING SHALL BE OF CAST ALUMINUM. CASTING ALLOY USED SHALL BE SUITABLE FOR MARINE ENVIRONMENT. CONSTRUCTION SHALL BE RAIN TIGHT AND FULLY GASKETED. THE LIGHT ASSEMBLY SHALL BE DESIGNED FOR HEAVY DUTY, LONG LIFE SERVICE. DESIGN SHALL PROVIDE READY ACCESS FOR LAMP SERVICE.

LENS:

LENS SHALL BE TEMPERED FRESNEL GLASS. INSIDE LENS DIAMETER SHALL MEASURE APPROXIMATELY 7 INCHES, OUTSIDE LENS DIAMETER SHALL MEASURE APPROXIMATELY 8 INCHES. LENS SHALL HAVE A WIDE ANGLE OF DIVERGENCE SUITABLE FOR HIGH MOUNTING ON BRIDGES OR STRUCTURES. THE ANGLE OF DIVERGENCE SHALL NOT BE LESS THAN 27 DEGREES.

CENTER CHANNEL LIGHT LENSES SECTION SHALL BE 360° MARINE GREEN.

CHANNEL MARGIN LIGHT LENSES SHALL BE 180° RED.

LAMPS AND RECEPTACLES:

LAMPS SHALL HAVE A RATED LIFE OF 100,000 HOURS AND SHALL BE OF A ROUGH SERVICE DESIGN WITH MULTIPLE FILAMENT SUPPORT FINGERS. MEDIUM BASE RECEPTACLE SHALL BE RATED FOR 250V, 660W, AND SHALL BE PORCELAIN WITH A NICKEL-PLATED BRASS SHELL TO RESIST LAMP FREEZING.

CENTER CHANNEL LAMP SHALL BE 1.44 W, 120 VOLT, LED A-19 SHAPE, CLEAR, WITH DUAL LAMPS AND RECEPTACLE.

CHANNEL MARGIN LAMPS SHALL BE 1.8 W, 120 VOLT, LED A-19 SHAPE, CLEAR.

STEM:

CENTER CHANNEL LIGHTS AND CHANNEL MARGIN LIGHTS ON PIERS 1-3 AND 6-9 SHALL BE AS FOLLOWS:

LAMP FIXTURE HEAD SHALL BE SUSPENDED FROM THE SWIVEL ON A 1/2 INCHES SCHEDULE 40 PIPE, 1.90 INCHES O.D. (48MM). PIPE MATERIAL SHALL BE GALVANIZED STEEL. DIMENSION FROM CENTER OF SWIVEL TO FOCAL PLANE OF LENS SHALL BE 48 INCHES (1219MM).

CHANNEL MARGIN LIGHTS ON PIERS 4 AND 5 SHALL BE AS FOLLOWS:

LAMP FIXTURE AND BASE SHALL BE INSTALLED ON THE TOPS OF THE PIERS AS SHOWN IN THE DETAILS OF THIS PLAN SET AND SHALL BE MOUNTED ON THE 1/2 INCHES SCHEDULE 40 PIPE, 1.90" O.D. (48MM) PIPE MATERIAL SHALL BE GALVANIZED STEEL.

SWIVEL:

THE SWIVEL DESIGN SHALL PROVIDE FOR ALL WIRING TO BE COMPLETELY CONTAINED INSIDE THE LIGHT ASSEMBLY. GASKETS AND O-RINGS SHALL BE USED TO PROVIDE A WEATHER-TIGHT ASSEMBLY. SWIVEL SHALL BE OF HEAVY-DUTY CONSTRUCTION, CAST OF THE SAME MATERIAL AS THE FIXTURE HEAD. SPINDLE SHALL BE OF STAINLESS STEEL.

AUTOMATIC LATCH:

AN AUTOMATIC LATCH SHALL HOLD THE LIGHT SECURELY IN NORMAL OPERATING AND SERVICE POSITIONS. A FIRM PULL ON THE SERVICE CHAIN SHALL AUTOMATICALLY RELEASE THE LATCH, ALLOWING THE FIXTURE TO PIVOT. AS THE LIGHT IS RAISED, LATCH SHALL AUTOMATICALLY ENGAGE TO HOLD LIGHT IN THE SERVICE POSITION. SERVICE POSITION SHALL BE 30° FROM VERTICAL. FIXTURE ASSEMBLY SHALL BE DUAL -HANDED (I.E. LIGHT MAY BE PULLED UP FROM EITHER SIDE).

MOUNTING:

BASE SHALL BE CAST OF THE SAME MATERIAL AS THE FIXTURE HEAD. LIGHT ASSEMBLY SHALL MOUNT VIA FOUR 1/2 INCH DIAMETER BOLTS THROUGH THE BASE, PROVIDED BY INSTALLER TO SUIT INSTALLATION.

SERVICE CHAIN:

A STAINLESS STEEL, #25 SASH TYPE SERVICE CHAIN SHALL BE PROVIDED TO FACILITATE RAISING AND LOWERING LIGHTS FOR SERVICE. THIS DOES NOT APPLY TO CHANNEL MARGIN LIGHTS ON PIERS 4 AND 5.

JUNCTION BOX:

A CAST JUNCTION BOX WITH GASKETED ACCESS COVER SHALL BE PROVIDED. JUNCTION BOX SHALL BE OF THE SAME MATERIAL AS THE FIXTURE ASSEMBLY AND SHALL MATCH THE NAVIGATION LIGHT BASE FOOTPRINT. ORIENTATION OF JUNCTION BOX SHALL BE CAPABLE OF ROTATION IN 90 DEGREE INCREMENTS.

WIRELESS MONITORING SYSTEM

MONITORING SYSTEM:

A MONITORING SYSTEM SHALL BE INSTALLED TO MONITOR THE STATUS OF EACH INDIVIDUAL NAVIGATION LIGHTING UNITS. THE LIGHTING MONITORING SYSTEM SHALL CONSIST OF AN AUTANI MANAGER APPLIANCE AND ENERGY CENTER SOFTWARE OR APPROVED EQUAL. THIS SYSTEM SHALL BE WIRELESS AND WILL BE POWERED BY THE 12 VOLT FEED FROM THE CONTROL CABINET TO THE INDIVIDUAL NAVIGATION LIGHT VIA A MONITORING MODULE MOUNTED INSIDE THE CONTROL CABINET.

THE MONITORING SYSTEM SHALL BE INSTALLED IN THE CONTROL CABINET ON A SHELF DEDICATED TO THE MONITORING SYSTEM. THE SECTION IN THE CONTROL CABINET THAT HOUSES THE MONITORING SYSTEM WILL HAVE THE NECESSARY COMMUNICATIONS EQUIPMENT TO RELAY MONITORING INFORMATION TO THE DISTRICT OFFICE BY STANDARD WIRELESS COMMUNICATION. THE MONITORING SYSTEM SHALL BE CAPABLE OF SENSING CURRENT FLOW AND VOLTAGE FOR EACH OF THE NAVIGATION LIGHTS, AS WELL AS FAULT CONDITIONS. THE MONITORING SYSTEM SHALL ALSO MONITOR THE STATUS OF THE SOLAR POWERED BATTERY BACK-UP SYSTEM.

THE CONTRACTOR SHALL COORDINATE INTERCONNECTION OF MONITORING SYSTEM WITH THE NAVIGATION LIGHTING SYSTEM TO ENSURE SEAMLESS OPERATION OF BOTH SYSTEMS.

THE PURPOSE OF THIS MONITORING SYSTEM IS TO PROVIDE A COMPLETE, PROGRAMMABLE, INTELLIGENT, NETWORKABLE, AND EXPANDABLE LOW VOLTAGE MONITORING SYSTEM FOR THE NAVIGATIONAL LIGHTING AS DESCRIBED HEREIN AND SHOWN ON THE SCHEMATIC DRAWINGS AND SCHEDULES.

THE CONTRACTOR WILL FURNISH AND INSTALL A COMPLETE MICROPROCESSOR BASED, ADDRESSABLE, NETWORKABLE DISTRIBUTED INTELLIGENT LOW VOLTAGE LIGHTING COMMUNICATION SYSTEM FOR CENTRALIZED MONITORING. THE SYSTEM SHALL INCLUDE THE FOLLOWING, BUT NOT LIMITED TO: RELAYS, CONTROLLERS, LIGHT LEVEL SENSORS, RADIO FREQUENCY TRANSCEIVERS, LOW VOLTAGE CONTROL POWER AND DATA LINE WIRING, SOFTWARE, PROGRAMMING, CUSTOM GRAPHICAL SCREENS, AND MISCELLANEOUS COMPONENTS AS REQUIRED FOR A COMPLETE, OPERABLE LIGHTING MONITORING SYSTEM. ALL SYSTEM COMPONENTS SHALL ARRIVE AT THE JOB SITE COMPLETELY FACTORY PRE-WIRED AND READY FOR FIELD INSTALLATION. ALL CONNECTIONS SHALL BE CLEARLY AND PERMANENTLY LABELED TO FACILITATE CORRECT AND EASY TERMINATION OF EQUIPMENT.

THE SYSTEM SHALL HAVE A ONE YEAR WARRANTY ON PARTS AND MATERIALS. THE WARRANTY SHALL START ON THE DATE OF ACCEPTANCE OF THE JOB BY THE KENTUCKY TRANSPORTATION CABINET. THE NAVIGATIONAL LIGHTING MONITORING SYSTEM SHALL CONSIST OF A WIRELESS NETWORK. WIRELESS MONITORING SHALL BE POSSIBLE FROM A 5 MILE LINE OF SIGHT DISTANCE TO OR FROM THE CLOSEST TRANSCEIVER IN AN URBAN ENVIRONMENT OR WITH WIRELESS REPEATERS, A MAXIMUM DETERMINED BY APPLICATION. FULLY PROGRAMMABLE CIRCUIT DIAGNOSTIC CAPABILITY AND ALARMING VIA PERSONAL COMPUTER (PC) SHALL BE POSSIBLE FOR THE FIXTURES.

THE CURRENT TRANSFORMERS SHALL BE HARDWIRED FROM THE LIGHTING CONTROL SECTION TO THE MONITOR SYSTEM SECTION IN THE SAME CABINET.

THE MONITOR NETWORK SHALL CONFORM TO THE FOLLOWING:

WIRELESS MONITORS SHALL OPERATE WITH AN UNLICENSED FCC BAND, UTILIZING SPREAD SPECTRUM AND FREQUENCY HOPPING TECHNOLOGY. LIGHTING MONITORS SHALL BE TRANSPARENT ACROSS MODEM, RJ-00, RS-232, USB, RS-485, ETHERNET (LAN), WIRED, AND WIRELESS LIGHTING MONITORING NETWORK.

ALL OF THE DATA ACCUMULATION EXECUTED OVER THE WIRELESS RF NETWORK SHALL BE AUTOMATICALLY ERROR CHECKED. SYSTEMS THAT DO NOT PROVIDE SEND/ACKNOWLEDGE ERROR CHECKING SHALL NOT BE ACCEPTABLE. NETWORK SHALL BE VIA ONE-WAY HIGH-SPEED DIGITAL COMMUNICATIONS.

PASSWORD PROTECTED ACCESS VIA THE MODEM SHALL BE POSSIBLE FOR INTEROPERABLE CONNECTION FROM AN OFF-SITE BASED PC FOR FACTORY PROGRAMMING AND SUPPORT AND OWNER ACCESS.

SYSTEM COMMUNICATIONS SHALL INCLUDE THE MODEM AND BRIDGE TO THE LIGHTING MONITORING SYSTEM. FACTORY PROGRAMMING AND TROUBLESHOOTING ASSISTANCE SHALL BE AVAILABLE VIA THE MODEM USING A DEDICATED, FAX COMPATIBLE, ANALOG TELEPHONE LINE.

THE SYSTEM SHALL BE CAPABLE OF ACCEPTING ANY NUMBER OF COMMANDS OR COMMAND SEQUENCES ALLOWING PROGRAMS TO RUN CONTINUOUSLY.

CONTRACTOR SHALL FURNISH AND INSTALL ENCLOSURES, WIRELESS ROUTER, ANTENNA, ANTENNA CABLING, POWER SUPPLY, DATA CABLES, AND ALL CONNECTORS AND HARDWARE REQUIRED FOR COMMUNICATIONS. WIRELESS ROUTER SHALL BE SIERRA WIRELESS RAVEN XT OR APPROVED EQUAL AND SHALL SUPPORT AT&T EDGE/3G SERVICES. ANTENNA SHALL BE LOIRD ANTENEX TRAB806/17103P OR APPROVED EQUAL.

THE CONTRACTOR SHALL DELIVER THE ROUTER TO CENTRAL OFFICE TRAFFIC OPERATIONS FOR PROVISIONING ON THE KYTC APN. THE CABINET WILL PROVISION THE ROUTER WITHIN 4 WEEKS OF RECEIPT AND RETURN VIA MAIL TO THE CONTRACTOR.

THE CABINET WILL PAY FOR THE MONTHLY PLAN CHARGES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CONFIGURING THE ROUTER. THE CONTRACTOR SHALL CONFIGURE THE ROUTER TO ALLOW REMOTE ACCESS BY THE CABINET.

PROGRAMMABLE LIGHTING DIAGNOSTICS RELAYS:

INDIVIDUALLY PROGRAMMABLE RELAY/DIAGNOSTIC MODULES SHALL BE MICROPROCESSOR BASED, NETWORKABLE, AND ABLE TO SWITCH CIRCUITS, AS REQUIRED. RELAY MODULES SHALL BE HOUSE IN APPROPRIATE ENCLOSURES, FULLY PRE-WIRED. ENCLOSURES SHALL BE FABRICATED FROM ALUMINUM FOR ATTACHMENT TO THE BRACKET ON WHICH THE NAVIGATION CONTROL CABINET IS MOUNTED.

ALL MONITOR MODULES SHOULD BE CAPABLE OF CURRENT AND VOLTAGE SENSING AND ON/OFF STATUS REPORT. THE LIGHTING MONITORING SYSTEM SOFTWARE SHALL AUTOMATICALLY ACCUMULATE THE DATA FROM ALL DIAGNOSTICS SENSORS IN THE SYSTEM. THE INFORMATION SHALL BE ACCESSIBLE IN THE FORM OF A DATABASE OR SPREADSHEET ALLOWING THE USER TO CONFIGURE HOW THE INFORMATION IS PROCESSED AND ARCHIVED.

THE SYSTEM SHALL BE CAPABLE OF SENSING CURRENT AND VOLTAGE, AS WELL AS FAULT CONDITIONS.

EACH RELAY/DIAGNOSTIC MODULE SHALL BE SELF-CONTAINED AND OPERATE INDEPENDENTLY FROM OTHER SERVICES ON THE NETWORK. IF ONE MODULE FAILS FOR ANY REASON, ONLY THE FUNCTIONS ASSOCIATED WITH THAT MODULE ARE AFFECTED, THE REST OF THE SYSTEM CONTINUES TO OPERATE NORMALLY.

ALL CONTROL ENCLOSURES SHALL BE DESIGNED FOR SIMPLE REMOVAL AND REPLACEMENT WITHOUT THE NEED OF SPECIAL TOOLS OR REWIRING, OTHER THAN THE SIMPLE DISCONNECTION OR RECONNECTION.

EACH LIGHTING MONITOR SHALL BE EQUIPPED WITH AN INTELLIGENT STAND ALONE MICROPROCESSOR CPU BOARD, WITH AN ON-BOARD COMMUNICATION PART, I/O CAPABILITY SUFFICIENT TO OPERATE THE REQUIRED NUMBER OF DEVICES WITHIN THE ENCLOSURE, PLUS SUPPORT EXTERIOR DEVICES AS NECESSARY.

NETWORKING:

UP TO 64,000 CONTROLLER NETWORKED ON A WIRELESS SYSTEM.

NONVOLATILE MEMORY:

PROGRAMMED DATA BEING STORED IN STATIC RAM SHALL BE PROTECTED FROM LOSS DURING POWER FAILURE. THE CPU BASED REAL TIME SHALL BE PROTECTED BY A RECHARGEABLE NICAD OR LITHIUM BATTERY CAPABLE OF WITHSTANDING UP TO A 30 DAY POWER LOSS.

PROGRAMMABLE WIRELESS RF LINKING:

PROVIDE WIRELESS LINKING EXPANDABILITY WITH WIRELESS CARD SLOT IN COMMUNICATIONS HUB. WIRELESS LINK SHALL PROVIDE FULL FUNCTION ZONE CONTROL AND DATA ACCUMULATION, DIAGNOSTICS, INCLUDING CURRENT SENSING, AND VOLTAGE SENSING.

WIRELESS COMMUNICATIONS SHALL BE BI-DIRECTIONAL. RF TRANSCEIVER SHALL OPERATE IN AN UNLICENSED FCC ISM BAND, FCC/IC CERTIFIED. RF RANGE SHALL BE A MINIMUM OF A MILE LINE OF SIGHT. MAXIMUM DISTANCES OF UP TO 20 MILES ARE SUBJECT TO URBAN ENVIRONMENTAL CONDITIONS AND OBSTRUCTIONS. SURGE PROTECTION SHALL BE A MINIMUM 2500 VOLTS TO GROUND. EQUIPMENT SHALL OPERATE AT A VOLTAGE OF 12 VDC. EQUIPMENT SHALL BE CAPABLE OF OPERATING AT TEMPERATURES RANGING FROM -40° C TO 65° C AND 95% RELATIVE HUMIDITY AND AT A RELATIVE HUMIDITY FROM 0-95% NON-CONDENSING. PROVIDE DEPENDENT RF LINK WHERE SPECIFIED, ONE FOR EACH TRANSCEIVER USED.

SYSTEM SOFTWARE:

PROVIDE LIGHTING CONTROL SOFTWARE FOR USE WITH IBM COMPATIBLE PC. SOFTWARE SHALL CONSIST OF SYSTEM SET UP SCREEN, SYSTEM MANAGER SCREEN, AND GRAPHIC CONTROL SCREEN.

CUSTOM GRAPHICAL SCREENS:

PROVIDE CUSTOM GRAPHICAL SITE SCREENS USING CAD DRAWINGS OF THE SITE PROVIDED BY THE KENTUCKY TRANSPORTATION CABINET TO SERVE AS BACKGROUNDS FOR THE SITE ZOOM SCREENS. PROVIDE A CUSTOM GRAPHICAL SCREEN FOR EACH INTERSECTION OF CONTROL. FROM THERE THE USER SHALL BE ABLE TO ACCESS EACH FIXTURE INDIVIDUALLY, VIEW FIXTURE STATUS, DIAGNOSTIC FILES AND DATA LOGS.

DATA ACCUMULATION AND ARCHIVES:

THE LIGHTING MONITOR SYSTEM SOFTWARE SHALL ALLOW ALL TYPES OF DATA FROM THE SYSTEM TO BE LOGGED AND ARCHIVED. DATA SHALL BE ACCESSIBLE VIA SPREADSHEET OR DATABASE AND CONTAIN THE FOLLOWING:

1. NAVIGATION LIGHTING
 - A. VOLTAGE LEVELS FOR EACH VOLTAGE SENSOR.
 - B. CURRENT DRAWN PER FIXTURE.
 - C. TRUE AND REAL POWER.
 - D. TIME AND DATE STAMPING, AS REQUIRED BY USER.
2. PATHWAY DELINEATION LIGHTING
 - A. CURRENT DRAWN FOR EACH FIXTURE.
 - B. TIME AND DATE STAMPING, AS REQUIRED BY THE USER.

ENCLOSURES:

EXPOSED WIRELESS TRANSCEIVER MODULES WILL BE WATER TIGHT, DIE CAST ALUMINUM.

THE CONTRACTOR SHALL SUBMIT TO THE ENGINEER FOR APPROVAL, SHOP DRAWINGS FOR CABINET, MOUNTING BRACKETS, AND OTHER STRUCTURAL ITEMS PRIOR TO FABRICATION OF THESE ITEMS.

FACTORY SERVICE SUPPORT AND START-UP:

THE MANUFACTURER MUST PROVIDE FACTORY ASSEMBLY AND TESTING OF ALL MONITOR STATIONS AND ASSORTED APPARATUS. MONITOR MODULES SHALL BE FACTORY PROGRAMMED PER PROJECT SPECIFICATIONS. ALL REQUIRED SOFTWARE SHALL BE INSTALLED PRIOR TO THE FACTORY SHIPMENT OR UPLOADED FROM THE FACTORY VIA MODEM LINK.

AN ON-SITE FACTORY START-UP BY QUALIFIED TECHNICIAN SHALL BE REQUIRED AND PROVIDED AS A PART OF THE SYSTEM PACKAGE. START-UP WILL NOT BE PERFORMED UNLESS AND UNTIL THE SYSTEM INSTALLATION IS COMPLETE AND A FAX COMPATIBLE PHONE LINE HAS BEEN INSTALLED FOR THE SYSTEM. START-UP SHALL INCLUDE SYSTEM INSPECTION, ADDITIONAL SOFTWARE INSTALLATION, IF NECESSARY, PROGRAM TESTING, TRAINING, AND TROUBLESHOOTING ASSISTANCE, IF SELECTED. SUPPORT VIA MODEM FROM FACTORY FOR DIRECT SYSTEM DIAGNOSIS AND PROGRAMMING ASSISTANCE WILL BE PROVIDED AT NO CHARGE UNTIL SUCH TIME AS THE FINAL ACCEPTANCE OF THE COMPLETE SYSTEM HAS BEEN ACHIEVED. THE MANUFACTURER SHALL PROVIDE A COMPLETE SUBMITTAL PACKAGE FOR APPROVAL PRIOR TO SHIPMENT. THE PACKAGE SHALL CONSIST OF PRODUCT CUTS AND SPECIFICATIONS, BILL OF MATERIALS, WARRANTY INFORMATION, WIRE RISER DIAGRAMS, AND FIELD WIRING INSTRUCTIONS. IN ADDITION TO THE SUBMITTAL A SET OF INSTALLATION, OPERATOR, AND MAINTENANCE MANUALS SHALL BE SHIPPED WITH THE

FILE NAME: F:\KYTC\LAND BETWEEN THE LAKES\LIGHTING\SHEETS\S260-S261-LIGHTING NOTES.DGN

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01-180.70		BARR & PREVOST ENGINEERING TESTING SURVEYING
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NAVIGATION LIGHTING

GENERAL:

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THE CHANNEL MARGIN LIGHT SHALL BE DESIGNED FOR USE AS A MARINE SIGNAL LIGHT FOR MARKING THE CHANNEL MARGIN, AND SHALL MEET OR EXCEED ALL COAST GUARD RECOMMENDATIONS AND REQUIREMENTS PERTAINING TO CHANNEL MARGIN AND OBSTRUCTION MARKING SIGNALS.

HOUSING AND GENERAL CONSTRUCTION:

THE HOUSING SHALL BE OF CAST ALUMINUM. CASTING ALLOY USED SHALL BE SUITABLE FOR MARINE ENVIRONMENT. CONSTRUCTION SHALL BE RAIN-TIGHT AND FULLY GASKETED. THE LIGHT ASSEMBLY SHALL BE DESIGNED FOR HEAVY DUTY, LONG LIFE SERVICE. DESIGN SHALL PROVIDE READY ACCESS FOR LAMP SERVICE.

LENS:

LENS SHALL BE TEMPERED FRESNEL GLASS. INSIDE LENS DIAMETER SHALL MEASURE APPROXIMATELY 7 INCHES, OUTSIDE LENS DIAMETER SHALL MEASURE APPROXIMATELY 8 INCHES. LENS SHALL HAVE A WIDE ANGLE OF DIVERGENCE SUITABLE FOR HIGH MOUNTING ON BRIDGES OR STRUCTURES. THE ANGLE OF DIVERGENCE SHALL NOT BE LESS THAN 27 DEGREES.

CENTER CHANNEL LIGHT LENSES SECTION SHALL BE 360° MARINE GREEN.

CHANNEL MARGIN LIGHT LENSES SHALL BE 180° RED.

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CENTER CHANNEL LAMP SHALL BE 1.44 W, 120 VOLT, LED A-19 SHAPE, CLEAR, WITH DUAL LAMPS AND RECEPTACLE.

CHANNEL MARGIN LAMPS SHALL BE 1.8 W, 120 VOLT, LED A-19 SHAPE, CLEAR.

STEM:

CENTER CHANNEL LIGHTS AND CHANNEL MARGIN LIGHTS ON PIERS 1-3 AND 6-9 SHALL BE AS FOLLOWS:

LAMP FIXTURE HEAD SHALL BE SUSPENDED FROM THE SWIVEL ON A 1/2 INCHES SCHEDULE 40 PIPE, 1.90 INCHES O.D. (48MM). PIPE MATERIAL SHALL BE GALVANIZED STEEL. DIMENSION FROM CENTER OF SWIVEL TO FOCAL PLANE OF LENS SHALL BE 48 INCHES (1219MM).

CHANNEL MARGIN LIGHTS ON PIERS 4 AND 5 SHALL BE AS FOLLOWS:

LAMP FIXTURE AND BASE SHALL BE INSTALLED ON THE TOPS OF THE PIERS AS SHOWN IN THE DETAILS OF THIS PLAN SET AND SHALL BE MOUNTED ON THE 1/2 INCHES SCHEDULE 40 PIPE, 1.90"O.D. (48MM) PIPE MATERIAL SHALL BE GALVANIZED STEEL.

SWIVEL:

THE SWIVEL DESIGN SHALL PROVIDE FOR ALL WIRING TO BE COMPLETELY CONTAINED INSIDE THE LIGHT ASSEMBLY. GASKETS AND O-RINGS SHALL BE USED TO PROVIDE A WEATHER-TIGHT ASSEMBLY. SWIVEL SHALL BE OF HEAVY-DUTY CONSTRUCTION, CAST OF THE SAME MATERIAL AS THE FIXTURE HEAD. SPINDLE SHALL BE OF STAINLESS STEEL.

AUTOMATIC LATCH:

AN AUTOMATIC LATCH SHALL HOLD THE LIGHT SECURELY IN NORMAL OPERATING AND SERVICE POSITIONS. A FIRM PULL ON THE SERVICE CHAIN SHALL AUTOMATICALLY RELEASE THE LATCH, ALLOWING THE FIXTURE TO PIVOT. AS THE LIGHT IS RAISED, LATCH SHALL AUTOMATICALLY ENGAGE TO HOLD LIGHT IN THE SERVICE POSITION. SERVICE POSITION SHALL BE 30° FROM VERTICAL. FIXTURE ASSEMBLY SHALL BE DUAL -HANDED (I.E. LIGHT MAY BE PULLED UP FROM EITHER SIDE).

MOUNTING:

BASE SHALL BE CAST OF THE SAME MATERIAL AS THE FIXTURE HEAD. LIGHT ASSEMBLY SHALL MOUNT VIA FOUR 1/2 INCH DIAMETER BOLTS THROUGH THE BASE, PROVIDED BY INSTALLER TO SUIT INSTALLATION.

SERVICE CHAIN:

A STAINLESS STEEL, #25 SASH TYPE SERVICE CHAIN SHALL BE PROVIDED TO FACILITATE RAISING AND LOWERING LIGHTS FOR SERVICE. THIS DOES NOT APPLY TO CHANNEL MARGIN LIGHTS ON PIERS 4 AND 5.

JUNCTION BOX:

A CAST JUNCTION BOX WITH GASKETED ACCESS COVER SHALL BE PROVIDED. JUNCTION BOX SHALL BE OF THE SAME MATERIAL AS THE FIXTURE ASSEMBLY AND SHALL MATCH THE NAVIGATION LIGHT BASE FOOTPRINT. ORIENTATION OF JUNCTION BOX SHALL BE CAPABLE OF ROTATION IN 90 DEGREE INCREMENTS.

WIRELESS MONITORING SYSTEM

MONITORING SYSTEM:

A MONITORING SYSTEM SHALL BE INSTALLED TO MONITOR THE STATUS OF EACH INDIVIDUAL NAVIGATION LIGHTING UNITS. THE LIGHTING MONITORING SYSTEM SHALL CONSIST OF AN AUTANI MANAGER APPLIANCE AND ENERGY CENTER SOFTWARE OR APPROVED EQUAL. THIS SYSTEM SHALL BE WIRELESS AND WILL BE POWERED BY THE 12 VOLT FEED FROM THE CONTROL CABINET TO THE INDIVIDUAL NAVIGATION LIGHT VIA A MONITORING MODULE MOUNTED INSIDE THE CONTROL CABINET.

THE MONITORING SYSTEM SHALL BE INSTALLED IN THE CONTROL CABINET ON A SHELF DEDICATED TO THE MONITORING SYSTEM. THE SECTION IN THE CONTROL CABINET THAT HOUSES THE MONITORING SYSTEM WILL HAVE THE NECESSARY COMMUNICATIONS EQUIPMENT TO RELAY MONITORING INFORMATION TO THE DISTRICT OFFICE BY STANDARD WIRELESS COMMUNICATION. THE MONITORING SYSTEM SHALL BE CAPABLE OF SENSING CURRENT FLOW AND VOLTAGE FOR EACH OF THE NAVIGATION LIGHTS, AS WELL AS FAULT CONDITIONS. THE MONITORING SYSTEM SHALL ALSO MONITOR THE STATUS OF THE SOLAR POWERED BATTERY BACK-UP SYSTEM.

THE CONTRACTOR SHALL COORDINATE INTERCONNECTION OF MONITORING SYSTEM WITH THE NAVIGATION LIGHTING SYSTEM TO ENSURE SEAMLESS OPERATION OF BOTH SYSTEMS.

THE PURPOSE OF THIS MONITORING SYSTEM IS TO PROVIDE A COMPLETE, PROGRAMMABLE, INTELLIGENT, NETWORKABLE, AND EXPANDABLE LOW VOLTAGE MONITORING SYSTEM FOR THE NAVIGATIONAL LIGHTING AS DESCRIBED HEREIN AND SHOWN ON THE SCHEMATIC DRAWINGS AND SCHEDULES.

THE CONTRACTOR WILL FURNISH AND INSTALL A COMPLETE MICROPROCESSOR BASED, ADDRESSABLE, NETWORKABLE DISTRIBUTED INTELLIGENT LOW VOLTAGE LIGHTING COMMUNICATION SYSTEM FOR CENTRALIZED MONITORING. THE SYSTEM SHALL INCLUDE THE FOLLOWING, BUT NOT LIMITED TO: RELAYS, CONTROLLERS, LIGHT LEVEL SENSORS, RADIO FREQUENCY TRANSCEIVERS, LOW VOLTAGE CONTROL POWER AND DATA LINE WIRING, SOFTWARE, PROGRAMMING, CUSTOM GRAPHICAL SCREENS, AND MISCELLANEOUS COMPONENTS AS REQUIRED FOR A COMPLETE, OPERABLE LIGHTING MONITORING SYSTEM. ALL SYSTEM COMPONENTS SHALL ARRIVE AT THE JOB SITE COMPLETELY FACTORY PRE-WIRED AND READY FOR FIELD INSTALLATION. ALL CONNECTIONS SHALL BE CLEARLY AND PERMANENTLY LABELED TO FACILITATE CORRECT AND EASY TERMINATION OF EQUIPMENT.

THE SYSTEM SHALL HAVE A ONE YEAR WARRANTY ON PARTS AND MATERIALS. THE WARRANTY SHALL START ON THE DATE OF ACCEPTANCE OF THE JOB BY THE KENTUCKY TRANSPORTATION CABINET. THE NAVIGATIONAL LIGHTING MONITORING SYSTEM SHALL CONSIST OF A WIRELESS NETWORK. WIRELESS MONITORING SHALL BE POSSIBLE FROM A 5 MILE LINE OF SIGHT DISTANCE TO OR FROM THE CLOSEST TRANSCEIVER IN AN URBAN ENVIRONMENT OR WITH WIRELESS REPEATERS, A MAXIMUM DETERMINED BY APPLICATION. FULLY PROGRAMMABLE CIRCUIT DIAGNOSTIC CAPABILITY AND ALARMING VIA PERSONAL COMPUTER (PC) SHALL BE POSSIBLE FOR THE FIXTURES.

THE CURRENT TRANSFORMERS SHALL BE HARDWIRED FROM THE LIGHTING CONTROL SECTION TO THE MONITOR SYSTEM SECTION IN THE SAME CABINET.

THE MONITOR NETWORK SHALL CONFORM TO THE FOLLOWING:

WIRELESS MONITORS SHALL OPERATE WITH AN UNLICENSED FCC BAND, UTILIZING SPREAD SPECTRUM AND FREQUENCY HOPPING TECHNOLOGY. LIGHTING MONITORS SHALL BE TRANSPARENT ACROSS MODEM, RJ-00, RS-232, USB, RS-485, ETHERNET (LAN), WIRED, AND WIRELESS LIGHTING MONITORING NETWORK.

ALL OF THE DATA ACCUMULATION EXECUTED OVER THE WIRELESS RF NETWORK SHALL BE AUTOMATICALLY ERROR CHECKED. SYSTEMS THAT DO NOT PROVIDE SEND/ACKNOWLEDGE ERROR CHECKING SHALL NOT BE ACCEPTABLE. NETWORK SHALL BE VIA ONE-WAY HIGH-SPEED DIGITAL COMMUNICATIONS.

PASSWORD PROTECTED ACCESS VIA THE MODEM SHALL BE POSSIBLE FOR INTEROPERABLE CONNECTION FROM AN OFF-SITE BASED PC FOR FACTORY PROGRAMMING AND SUPPORT AND OWNER ACCESS.

SYSTEM COMMUNICATIONS SHALL INCLUDE THE MODEM AND BRIDGE TO THE LIGHTING MONITORING SYSTEM. FACTORY PROGRAMMING AND TROUBLESHOOTING ASSISTANCE SHALL BE AVAILABLE VIA THE MODEM USING A DEDICATED, FAX COMPATIBLE, ANALOG TELEPHONE LINE.

THE SYSTEM SHALL BE CAPABLE OF ACCEPTING ANY NUMBER OF COMMANDS OR COMMAND SEQUENCES ALLOWING PROGRAMS TO RUN CONTINUOUSLY.

CONTRACTOR SHALL FURNISH AND INSTALL ENCLOSURES, WIRELESS ROUTER, ANTENNA, ANTENNA CABLING, POWER SUPPLY, DATA CABLES, AND ALL CONNECTORS AND HARDWARE REQUIRED FOR COMMUNICATIONS. WIRELESS ROUTER SHALL BE SIERRA WIRELESS RAVEN XT OR APPROVED EQUAL AND SHALL SUPPORT AT&T EDGE/3G SERVICES. ANTENNA SHALL BE LOIRD ANTENEX TRAB806/17103P OR APPROVED EQUAL.

THE CONTRACTOR SHALL DELIVER THE ROUTER TO CENTRAL OFFICE TRAFFIC OPERATIONS FOR PROVISIONING ON THE KYTC APN. THE CABINET WILL PROVISION THE ROUTER WITHIN 4 WEEKS OF RECEIPT AND RETURN VIA MAIL TO THE CONTRACTOR.

THE CABINET WILL PAY FOR THE MONTHLY PLAN CHARGES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CONFIGURING THE ROUTER. THE CONTRACTOR SHALL CONFIGURE THE ROUTER TO ALLOW REMOTE ACCESS BY THE CABINET.

PROGRAMMABLE LIGHTING DIAGNOSTICS RELAYS:

INDIVIDUALLY PROGRAMMABLE RELAY/DIAGNOSTIC MODULES SHALL BE MICROPROCESSOR BASED, NETWORKABLE, AND ABLE TO SWITCH CIRCUITS, AS REQUIRED. RELAY MODULES SHALL BE HOUSE IN APPROPRIATE ENCLOSURES, FULLY PRE-WIRED. ENCLOSURES SHALL BE FABRICATED FROM ALUMINUM FOR ATTACHMENT TO THE BRACKET ON WHICH THE NAVIGATION CONTROL CABINET IS MOUNTED.

ALL MONITOR MODULES SHOULD BE CAPABLE OF CURRENT AND VOLTAGE SENSING AND ON/OFF STATUS REPORT. THE LIGHTING MONITORING SYSTEM SOFTWARE SHALL AUTOMATICALLY ACCUMULATE THE DATA FROM ALL DIAGNOSTICS SENSORS IN THE SYSTEM. THE INFORMATION SHALL BE ACCESSIBLE IN THE FORM OF A DATABASE OR SPREADSHEET ALLOWING THE USER TO CONFIGURE HOW THE INFORMATION IS PROCESSED AND ARCHIVED.

THE SYSTEM SHALL BE CAPABLE OF SENSING CURRENT AND VOLTAGE, AS WELL AS FAULT CONDITIONS.

EACH RELAY/DIAGNOSTIC MODULE SHALL BE SELF-CONTAINED AND OPERATE INDEPENDENTLY FROM OTHER SERVICES ON THE NETWORK. IF ONE MODULE FAILS FOR ANY REASON, ONLY THE FUNCTIONS ASSOCIATED WITH THAT MODULE ARE AFFECTED, THE REST OF THE SYSTEM CONTINUES TO OPERATE NORMALLY.

ALL CONTROL ENCLOSURES SHALL BE DESIGNED FOR SIMPLE REMOVAL AND REPLACEMENT WITHOUT THE NEED OF SPECIAL TOOLS OR REWIRING, OTHER THAN THE SIMPLE DISCONNECTION OR RECONNECTION.

EACH LIGHTING MONITOR SHALL BE EQUIPPED WITH AN INTELLIGENT STAND ALONE MICROPROCESSOR CPU BOARD, WITH AN ON-BOARD COMMUNICATION PART, I/O CAPABILITY SUFFICIENT TO OPERATE THE REQUIRED NUMBER OF DEVICES WITHIN THE ENCLOSURE, PLUS SUPPORT EXTERIOR DEVICES AS NECESSARY.

NETWORKING:

UP TO 64,000 CONTROLLER NETWORKED ON A WIRELESS SYSTEM.

NONVOLATILE MEMORY:

PROGRAMMED DATA BEING STORED IN STATIC RAM SHALL BE PROTECTED FROM LOSS DURING POWER FAILURE. THE CPU BASED REAL TIME SHALL BE PROTECTED BY A RECHARGEABLE NICAD OR LITHIUM BATTERY CAPABLE OF WITHSTANDING UP TO A 30 DAY POWER LOSS.

PROGRAMMABLE WIRELESS RF LINKING:

PROVIDE WIRELESS LINKING EXPANDABILITY WITH WIRELESS CARD SLOT IN COMMUNICATIONS HUB. WIRELESS LINK SHALL PROVIDE FULL FUNCTION ZONE CONTROL AND DATA ACCUMULATION, DIAGNOSTICS, INCLUDING CURRENT SENSING, AND VOLTAGE SENSING.

WIRELESS COMMUNICATIONS SHALL BE BI-DIRECTIONAL. RF TRANSCEIVER SHALL OPERATE IN AN UNLICENSED FCC ISM BAND, FCC/IC CERTIFIED. RF RANGE SHALL BE A MINIMUM OF A MILE LINE OF SIGHT. MAXIMUM DISTANCES OF UP TO 20 MILES ARE SUBJECT TO URBAN ENVIRONMENTAL CONDITIONS AND OBSTRUCTIONS. SURGE PROTECTION SHALL BE A MINIMUM 2500 VOLTS TO GROUND. EQUIPMENT SHALL OPERATE AT A VOLTAGE OF 12 VDC. EQUIPMENT SHALL BE CAPABLE OF OPERATING AT TEMPERATURES RANGING FROM -40° C TO 65° C AND 95% RELATIVE HUMIDITY AND AT A RELATIVE HUMIDITY FROM 0-95% NON-CONDENSING. PROVIDE DEPENDENT RF LINK WHERE SPECIFIED, ONE FOR EACH TRANSCEIVER USED.

SYSTEM SOFTWARE:

PROVIDE LIGHTING CONTROL SOFTWARE FOR USE WITH IBM COMPATIBLE PC. SOFTWARE SHALL CONSIST OF SYSTEM SET UP SCREEN, SYSTEM MANAGER SCREEN, AND GRAPHIC CONTROL SCREEN.

CUSTOM GRAPHICAL SCREENS:

PROVIDE CUSTOM GRAPHICAL SITE SCREENS USING CAD DRAWINGS OF THE SITE PROVIDED BY THE KENTUCKY TRANSPORTATION CABINET TO SERVE AS BACKGROUNDS FOR THE SITE ZOOM SCREENS. PROVIDE A CUSTOM GRAPHICAL SCREEN FOR EACH INTERSECTION OF CONTROL. FROM THERE THE USER SHALL BE ABLE TO ACCESS EACH FIXTURE INDIVIDUALLY, VIEW FIXTURE STATUS, DIAGNOSTIC FILES AND DATA LOGS.

DATA ACCUMULATION AND ARCHIVES:

THE LIGHTING MONITOR SYSTEM SOFTWARE SHALL ALLOW ALL TYPES OF DATA FROM THE SYSTEM TO BE LOGGED AND ARCHIVED. DATA SHALL BE ACCESSIBLE VIA SPREADSHEET OR DATABASE AND CONTAIN THE FOLLOWING:

1. NAVIGATION LIGHTING
 - A. VOLTAGE LEVELS FOR EACH VOLTAGE SENSOR.
 - B. CURRENT DRAWN PER FIXTURE.
 - C. TRUE AND REAL POWER.
 - D. TIME AND DATE STAMPING, AS REQUIRED BY USER.
2. PATHWAY DELINEATION LIGHTING
 - A. CURRENT DRAWN FOR EACH FIXTURE.
 - B. TIME AND DATE STAMPING, AS REQUIRED BY THE USER.

ENCLOSURES:

EXPOSED WIRELESS TRANSCEIVER MODULES WILL BE WATER TIGHT, DIE CAST ALUMINUM.

THE CONTRACTOR SHALL SUBMIT TO THE ENGINEER FOR APPROVAL, SHOP DRAWINGS FOR CABINET, MOUNTING BRACKETS, AND OTHER STRUCTURAL ITEMS PRIOR TO FABRICATION OF THESE ITEMS.

FACTORY SERVICE SUPPORT AND START-UP:

THE MANUFACTURER MUST PROVIDE FACTORY ASSEMBLY AND TESTING OF ALL MONITOR STATIONS AND ASSORTED APPARATUS. MONITOR MODULES SHALL BE FACTORY PROGRAMMED PER PROJECT SPECIFICATIONS. ALL REQUIRED SOFTWARE SHALL BE INSTALLED PRIOR TO THE FACTORY SHIPMENT OR UPLOADED FROM THE FACTORY VIA MODEM LINK.

AN ON-SITE FACTORY START-UP BY QUALIFIED TECHNICIAN SHALL BE REQUIRED AND PROVIDED AS A PART OF THE SYSTEM PACKAGE. START-UP WILL NOT BE PERFORMED UNLESS AND UNTIL THE SYSTEM INSTALLATION IS COMPLETE AND A FAX COMPATIBLE PHONE LINE HAS BEEN INSTALLED FOR THE SYSTEM. START-UP SHALL INCLUDE SYSTEM INSPECTION, ADDITIONAL SOFTWARE INSTALLATION, IF NECESSARY, PROGRAM TESTING, TRAINING, AND TROUBLESHOOTING ASSISTANCE, IF SELECTED. SUPPORT VIA MODEM FROM FACTORY FOR DIRECT SYSTEM DIAGNOSIS AND PROGRAMMING ASSISTANCE WILL BE PROVIDED AT NO CHARGE UNTIL SUCH TIME AS THE FINAL ACCEPTANCE OF THE COMPLETE SYSTEM HAS BEEN ACHIEVED. THE MANUFACTURER SHALL PROVIDE A COMPLETE SUBMITTAL PACKAGE FOR APPROVAL PRIOR TO SHIPMENT. THE PACKAGE SHALL CONSIST OF PRODUCT CUTS AND SPECIFICATIONS, BILL OF MATERIALS, WARRANTY INFORMATION, WIRE RISER DIAGRAMS, AND FIELD WIRING INSTRUCTIONS. IN ADDITION TO THE SUBMITTAL A SET OF INSTALLATION, OPERATOR, AND MAINTENANCE MANUALS SHALL BE SHIPPED WITH THE

FILE NAME: F:\KYTC\LAND BETWEEN THE LAKES\LIGHTING\SHEETS\S260-S261-LIGHTING NOTES.DGN

USER: lfht DATE PLOTTED: December 5, 2013

E-SHEET NAME:

MicroStation v8.11.9.357

		ADDENDUM 2	12/5/13
REVISION		DATE	
DATE: NOVEMBER, 2013		CHECKED BY	
DESIGNED BY: LAT			
DETAILED BY: LAT			
Commonwealth of Kentucky DEPARTMENT OF HIGHWAYS			
MARSHALL / TRIGG			
ROUTE US68	CROSSING KENTUCKY LAKE		
LIGHTING NOTES			
ITEM NUMBER		PREPARED BY	
01-180.70		BARR & PREVOST ENGINEERING TESTING SURVEYING	
		SHEET NO. S260 DRAWING NO. 24686	



SLAB BILL OF REINFORCEMENT

MARK	TYPE	NO.	SIZE	LENGTH		LOCATION	A		B		C		D	
				FT	IN		FT	IN	FT	IN	FT	IN		
STAINLESS STEEL REINFORCEMENT														
S501SS	STR	80	#5	5	6	TOP OF SLAB AROUND DRAINS								
S502SS	14s	454	#5	8	0	END OF SLAB	0	11	2	8				
S503SS	36s	226	#5	8	6	END OF SLAB	2	1	0	4	3	6		
S504SS	14s	226	#5	6	8	END OF SLAB	1	2	1	9				
S505SS	22s	228	#5	5	11	END OF SLAB	2	10	2	1	1	0		
S506SS	26s	660	#5	4	3	CURB	1	1	0	8	1	1	1	6
S507SS	2s	8	#5	6	2	CURB	2	9	0	8				
S508SS	2s	8	#5	9	2	CURB	4	3	0	8				
S509SS	STR	20	#5	1	8	CURB								
S601SS	STR	2648	#6	38	10	TOP SLAB (TRANS.)								
S602SS	STR	1044	#6	60	0	TOP SLAB (LONG.)								
S603SS	5s	228	#6	22	0	TOP SLAB (LONG.)	2	0	20	0				
S604SS	STR	32	#6	39	4	END OF SLAB (TRANS.)								
S605SS	STR	4	#6	25	0	CURB								
A615 STEEL REINFORCEMENT EPOXY COATED														
S510E	STR	1017	#5	60	0	BOTTOM SLAB (LONG.)								
S511E	STR	226	#5	23	0	BOTTOM SLAB (LONG.)								
S606E	STR	885	#6	34	5	BOTTOM SLAB (TRANS.)								
S607E	STR	885	#6	44	5	BOTTOM SLAB (TRANS.)								

MEDIAN BILL OF REINFORCEMENT

MARK	TYPE	NO.	SIZE	LENGTH		LOCATION	A		B		C		D	
				FT	IN		FT	IN	FT	IN	FT	IN		
STAINLESS STEEL REINFORCEMENT														
M501SS	29s	656	#5	5	4	MEDIAN BARRIER	0	10	1	8				
M502SS	30s	642	#5	5	2	MEDIAN BARRIER								
M503SS	STR	81	#5	60	0	MEDIAN BARRIER (LONG.)								
M504SS	STR	18	#5	22	0	MEDIAN BARRIER (LONG.)								
M505SS	30s	14	#5	5	6 1/2	MEDIAN BARRIER (TRANSITION)	0	6 1/2	0	0	2 SETS OF 7 BARS			
				5	2		0	2	0	0	INCREMENT EACH BAR BY 3/4"			
M601SS	29s	18	#6	5	4	MEDIAN BARRIER (TRANSITION)	0	10	1	8				
M602SS	30s	18	#6	5	9 1/2	MEDIAN BARRIER (TRANSITION)	0	9 1/2	0	0	2 SETS OF 9 BARS			
				5	6 1/2		0	6 1/2	0	0	INCREMENT EACH BAR BY 3/8"			

TRAFFIC & COMBINATION RAIL BILL OF REINFORCEMENT

MARK	TYPE	NO.	SIZE	LENGTH		LOCATION	A		B		C		D	
				FT	IN		FT	IN	FT	IN	FT	IN		
STAINLESS STEEL REINFORCEMENT														
R501SS	17s	1312	#5	5	0	TRAFFIC & COMB. RAIL BARRIERS	2	1	0	8	0	10		
R502SS	2s	1312	#5	4	4	TRAFFIC & COMB. RAIL BARRIERS	1	10	0	8				
R503SS	STR	108	#5	60	0	TRAFFIC & COMB. RAIL BARRIERS (LONG.)								
R504SS	STR	24	#5	22	0	TRAFFIC & COMB. RAIL BARRIERS (LONG.)								
R505SS	STR	16	#5	1	8	TRAFFIC & COMB. RAIL BARRIERS (LONG.)								
R601SS	17s	36	#6	5	0	TRAFFIC & COMB. RAIL BARRIERS	2	1	0	8				
R602SS	2s	16	#6	7	4	TRAFFIC & COMB. RAIL BARRIERS	3	4	0	8				
R603SS	2s	20	#6	4	4	TRAFFIC & COMB. RAIL BARRIERS	1	10	0	8				

NOTES

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2. MEDIAN BARRIER REINFORCEMENT IS INCLUDED IN THE UNIT PRICE BID FOR STAINLESS STEEL REINFORCEMENT. MEDIAN BARRIER CONCRETE IS INCLUDED IN THE UNIT PRICE BID FOR CONCRETE CLASS "AA".
3. USE STIRRUP BEND DIAMETERS FOR BARS DESIGNATED BY THE SUFFIX (S) IN THE BILL OF REINFORCEMENT.
4. FOR BAR BEND DETAILS SEE SHEET NO. S011.
5. FOR CURB DETAILS SEE SHEET NO. S248.

FILE NAME: C:\PW\81-LOCAL\BAKER_PROJECTS\CWETHINGTON\DOI41582\S24686_SBOR.DGN

USER: Morylo, Dwyer
DATE PLOTTED: November 25, 2013

E-SHEET NAME: S24686 217

MicroStation v8.11.7.469

REVISED BILL OF REINFORCEMENT		11/25/13
REVISION		DATE
DATE: NOVEMBER 15, 2013	CHECKED BY	
DESIGNED BY: ACK	MJD	
DETAILED BY: MJD	ACK	
Commonwealth of Kentucky DEPARTMENT OF HIGHWAYS		
COUNTY MARSHALL / TRIGG		
ROUTE US68	CROSSING KENTUCKY LAKE	
SLAB BILL OF REINFORCEMENT		
ITEM NUMBER	PREPARED BY	
01-180.70	Baker	
	MICHAEL BAKER JR. INC. 9750 ORMSBY STATION ROAD SUITE 210 LOUISVILLE, KY 40223	
	SHEET NO. S217 DRAWING NO. 24686	



FILE NAME: C:\PW\81-LOCAL\BAKER_PROJECTS\CWETHINGTON\DOI4582\S24686_SBOR.DGN

USER: Morylo,Dwyer
DATE PLOTTED: November 25, 2013

E-SHEET NAME: S24686 217

MicroStation v8.ii.7.469

SLAB BILL OF REINFORCEMENT

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				FT	IN		FT	IN	FT	IN	FT	IN		
STAINLESS STEEL REINFORCEMENT														
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S505SS	22s	228	#5	5	11	END OF SLAB	2	10	2	1	1	0		
S506SS	26s	660	#5	4	3	CURB	1	1	0	8	1	1	1	6
S507SS	2s	8	#5	6	2	CURB	2	9	0	8				
S508SS	2s	8	#5	9	2	CURB	4	3	0	8				
S509SS	STR	20	#5	1	8	CURB								
A615 STEEL REINFORCEMENT EPOXY COATED														
S510E	STR	1017	#5	60	0	BOTTOM SLAB (LONG.)								
S51E	STR	226	#5	23	0	BOTTOM SLAB (LONG.)								
S606E	STR	885	#6	34	5	BOTTOM SLAB (TRANS.)								
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MEDIAN BILL OF REINFORCEMENT

MARK	TYPE	NO.	SIZE	LENGTH		LOCATION	A		B		C		D	
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M505SS	30s	14	#5	5	6 1/2	MEDIAN BARRIER (TRANSITION)	0	6 1/2	0	0	2 SETS OF 7 BARS			
				5	2		0	2	0	0	INCREMENT EACH BAR BY 3/4"			
M601SS	29s	18	#6	5	4	MEDIAN BARRIER (TRANSITION)	0	10	1	8				
M602SS	30s	18	#6	5	9 1/2	MEDIAN BARRIER (TRANSITION)	0	9 1/2	0	0	2 SETS OF 9 BARS			
				5	6 1/2		0	6 1/2	0	0	INCREMENT EACH BAR BY 3/8"			

TRAFFIC & COMBINATION RAIL BILL OF REINFORCEMENT

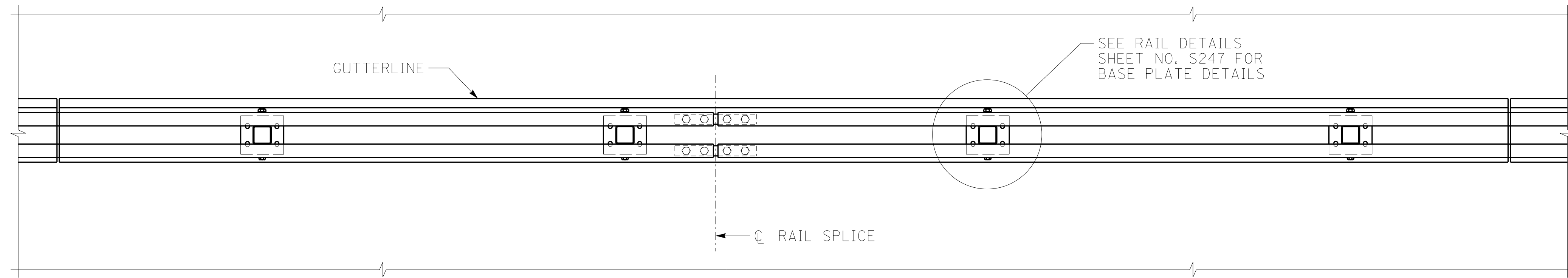
MARK	TYPE	NO.	SIZE	LENGTH		LOCATION	A		B		C		D	
				FT	IN		FT	IN	FT	IN	FT	IN		
STAINLESS STEEL REINFORCEMENT														
R501SS	17s	1312	#5	5	0	TRAFFIC & COMB. RAIL BARRIERS	2	1	0	8	0	10		
R502SS	2s	1312	#5	4	4	TRAFFIC & COMB. RAIL BARRIERS	1	10	0	8				
R503SS	STR	108	#5	60	0	TRAFFIC & COMB. RAIL BARRIERS (LONG.)								
R504SS	STR	24	#5	22	0	TRAFFIC & COMB. RAIL BARRIERS (LONG.)								
R505SS	STR	16	#5	1	8	TRAFFIC & COMB. RAIL BARRIERS (LONG.)								
R601SS	17s	36	#6	5	0	TRAFFIC & COMB. RAIL BARRIERS	2	1	0	8				
R602SS	2s	16	#6	7	4	TRAFFIC & COMB. RAIL BARRIERS	3	4	0	8				
R603SS	2s	20	#6	4	4	TRAFFIC & COMB. RAIL BARRIERS	1	10	0	8				

NOTES

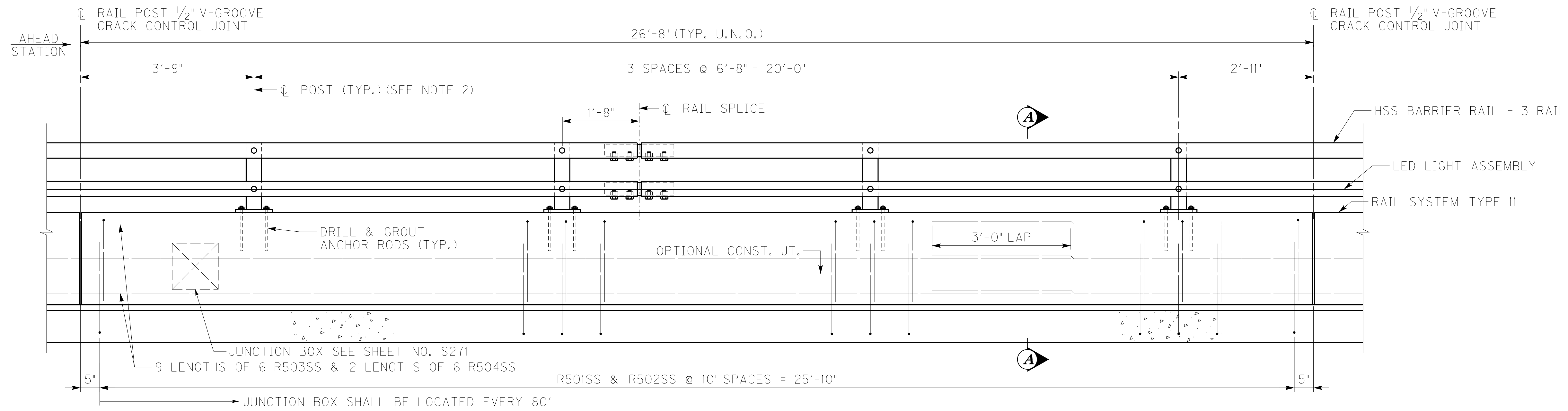
1. TRAFFIC & COMBINATION RAIL BILL OF REINFORCEMENT IS FOR INFORMATION ONLY. TRAFFIC & COMBINATION RAIL REINFORCEMENT AND CONCRETE IS INCLUDED IN THE UNIT PRICE BID FOR RAILING TYPE II.
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4. FOR BAR BEND DETAILS SEE SHEET NO. S011.
5. FOR CURB DETAILS SEE SHEET NO. S248.



REVISION		DATE
△ REVISED BILL OF REINFORCEMENT		11/25/13
DATE: NOVEMBER 15, 2013	CHECKED BY	
DESIGNED BY: ACK	MJD	
DETAILED BY: MJD	ACK	
Commonwealth of Kentucky DEPARTMENT OF HIGHWAYS		
COUNTY MARSHALL / TRIGG		
ROUTE US68	CROSSING KENTUCKY LAKE	
SLAB BILL OF REINFORCEMENT		
ITEM NUMBER	PREPARED BY	SHEET NO.
01-180.70	Baker	S217
	MICHAEL BAKER JR. INC. 9750 ORMSBY STATION ROAD SUITE 210 LOUISVILLE, KY 40223	DRAWING NO. 24686

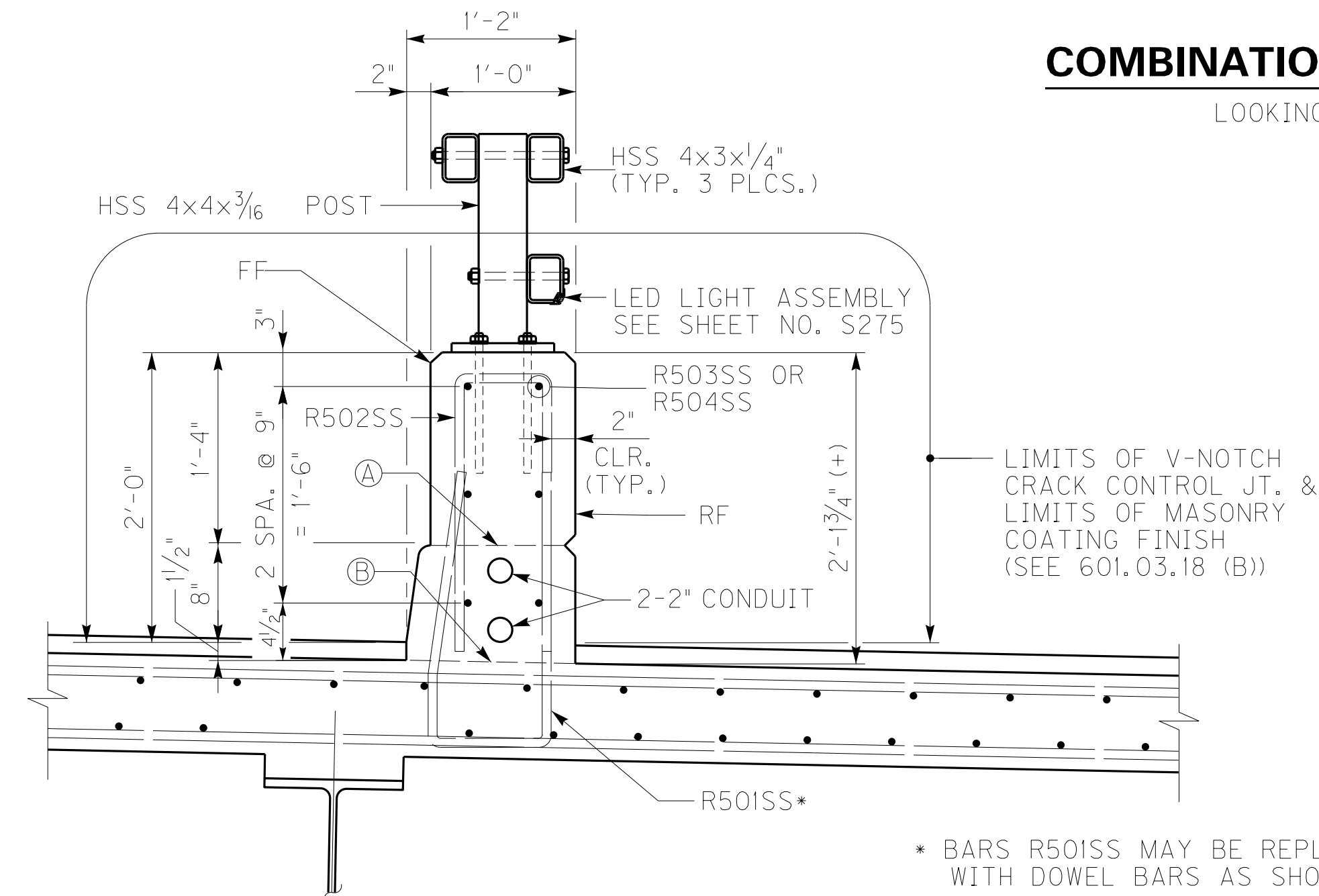


COMBINATION RAIL PLAN



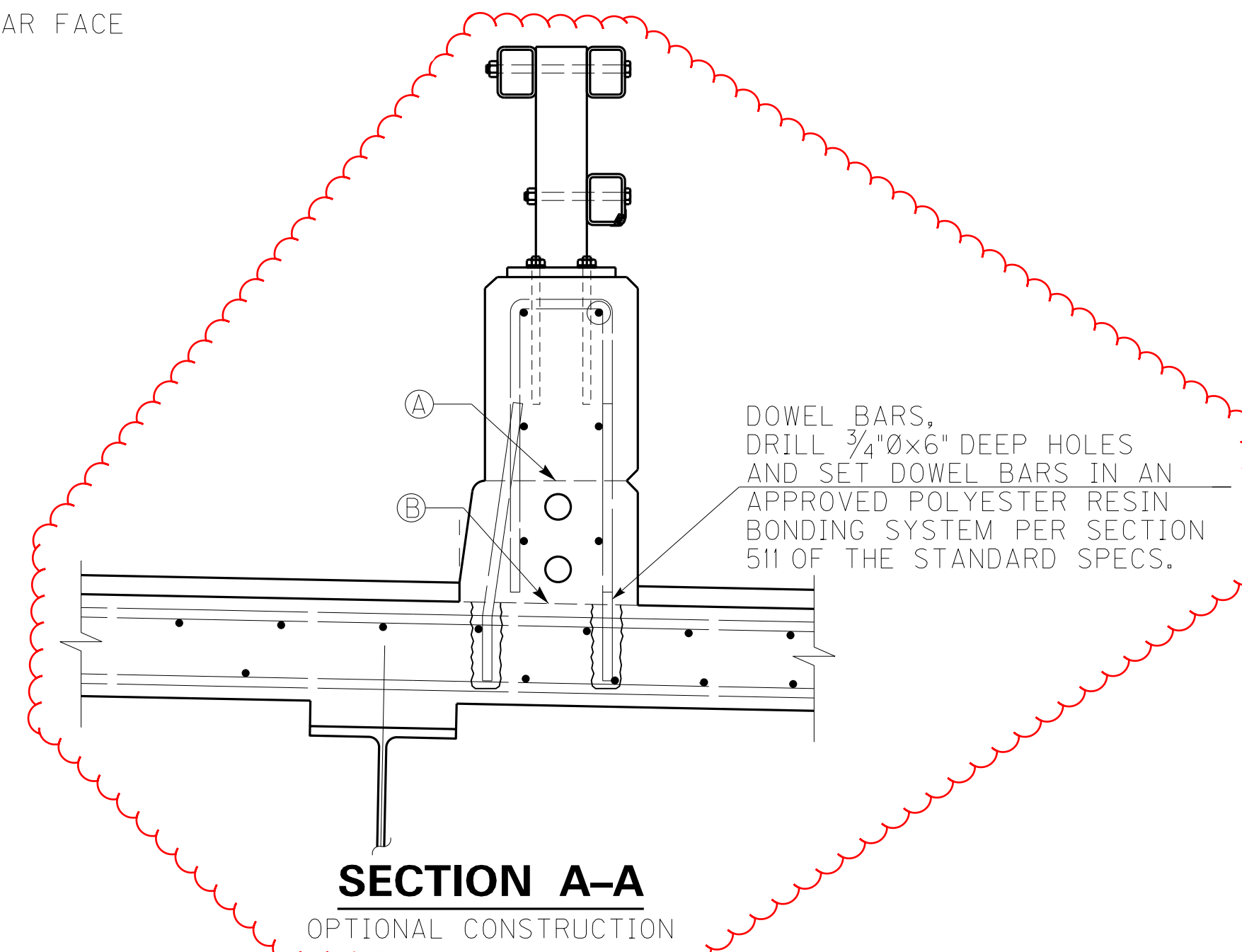
COMBINATION RAIL ELEVATION

LOOKING AT REAR FACE



SECTION A-A
LOOKING AHEAD STATION

* BARS R501SS MAY BE REPLACED WITH DOWEL BARS AS SHOWN.



SECTION A-A
OPTIONAL CONSTRUCTION

LEGEND

- Ⓐ PERMISSIBLE CONSTRUCTION JOINT.
- Ⓑ MANDATORY ROUGHENED CONSTRUCTION JOINT. CONCRETE ABOVE THIS JOINT SHALL BE PLACED AFTER THE SLAB HAS BEEN PROPERLY CURED.
- RF DENOTES REAR FACE
- FF DENOTES FRONT FACE

NOTES

1. CLASS "AA" CONCRETE IS USED THROUGHOUT SPAN 5 BARRIER.
2. FOR CRACK CONTROL JOINT AND RAIL POST SPACING, SEE SHEET NOS. S211 - S212.
3. FOR RAIL DETAILS, SEE SHEET NO. S247.
4. FOR SLAB TYPICAL SECTION, SEE SHEET NO. S210.
5. FOR SLAB BILL OF REINFORCEMENT SEE SHEET NO. S217.
6. FOR PATH DELINEATION LIGHTING, SEE SHEET NO. S275.
7. GROUT SHALL CONFORM TO KYTC SPECIFICATION SECTION 601.
8. 2" CONDUIT IS INCIDENTAL TO THE PATH DELINEATION LIGHTING.
9. THE OVERLAY SHALL MEET THE REQUIREMENT FOR LATEX MODIFIED CONCRETE FOR NEW STRUCTURES IN ACCORDANCE WITH 606.03.17 (B).
10. LED LIGHT ASSEMBLY IS INCLUDED IN THE PAY ITEM PATH DELINEATION LIGHTING.

Δ ADDED SECTION A-A OPTIONAL CONSTR.		11/25/13
REVISION		
DATE: NOVEMBER 15, 2013	CHECKED BY	
DESIGNED BY: ACK	DMB	
DETAILED BY: MJD	ACK	

Commonwealth of Kentucky
DEPARTMENT OF HIGHWAYS

COUNTY
MARSHALL / TRIGG

ROUTE CROSSING
US68 KENTUCKY LAKE

COMBINATION RAIL DETAILS



ITEM NUMBER	PREPARED BY	SHEET NO.
01-180.70	Baker	S216

MICHAEL BAKER JR., INC.
9750 ORMSBY STATION ROAD
SUITE 210
LOUISVILLE, KY 40223

DRAWING NO.
24686

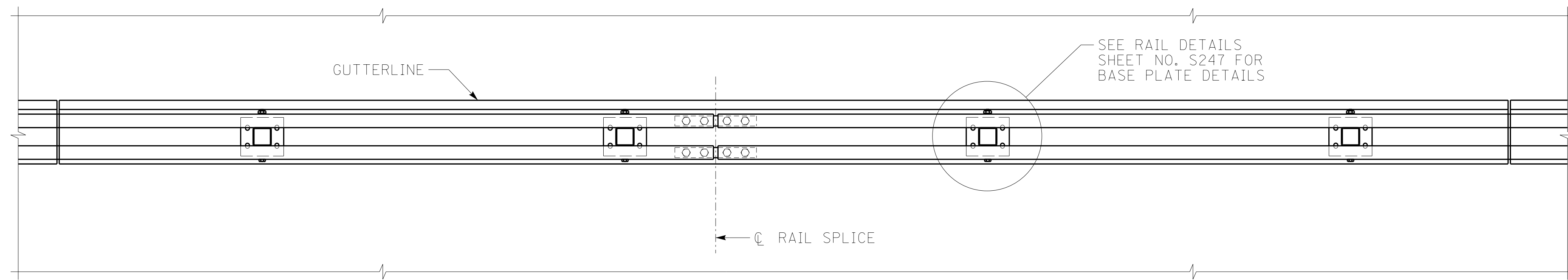
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USER: Moryko,Dwyer
DATE PLOTTED: November 25, 2013

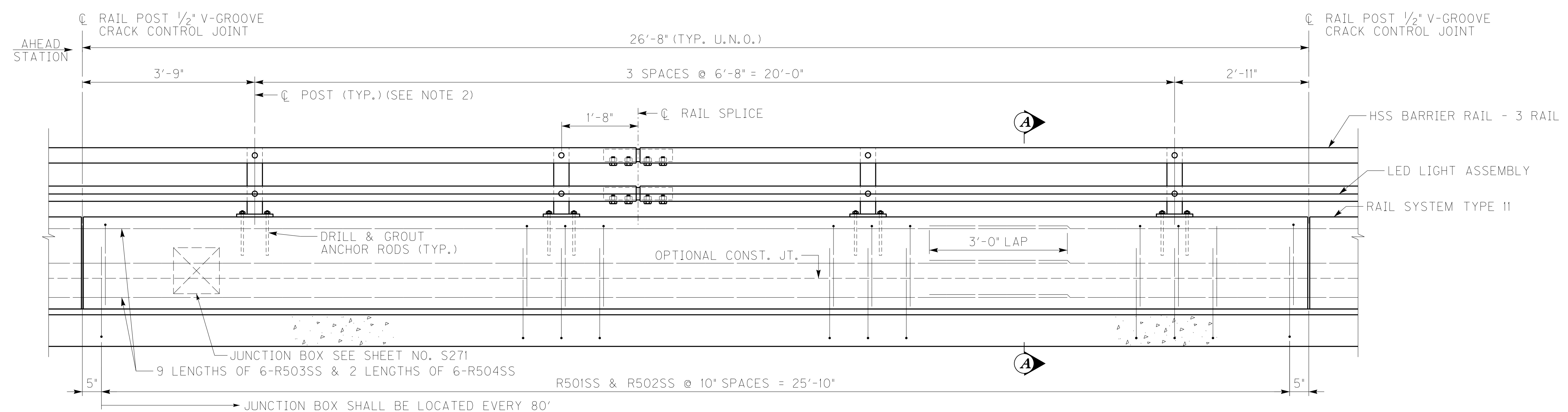
E-SHEET NAME: S24686 216

MicroStation v8.11.7.469

FILE NAME: C:\P\WB1-LOCAL\BAKER_PROJECTS\CWETHINGTON\DM4582\S24686 RD06.DGN
 USER: Moryko,Dwyer
 DATE PLOTTED: November 25, 2013
 E-SHEET NAME: S24686 216
 MicroStation v8.11.7.469

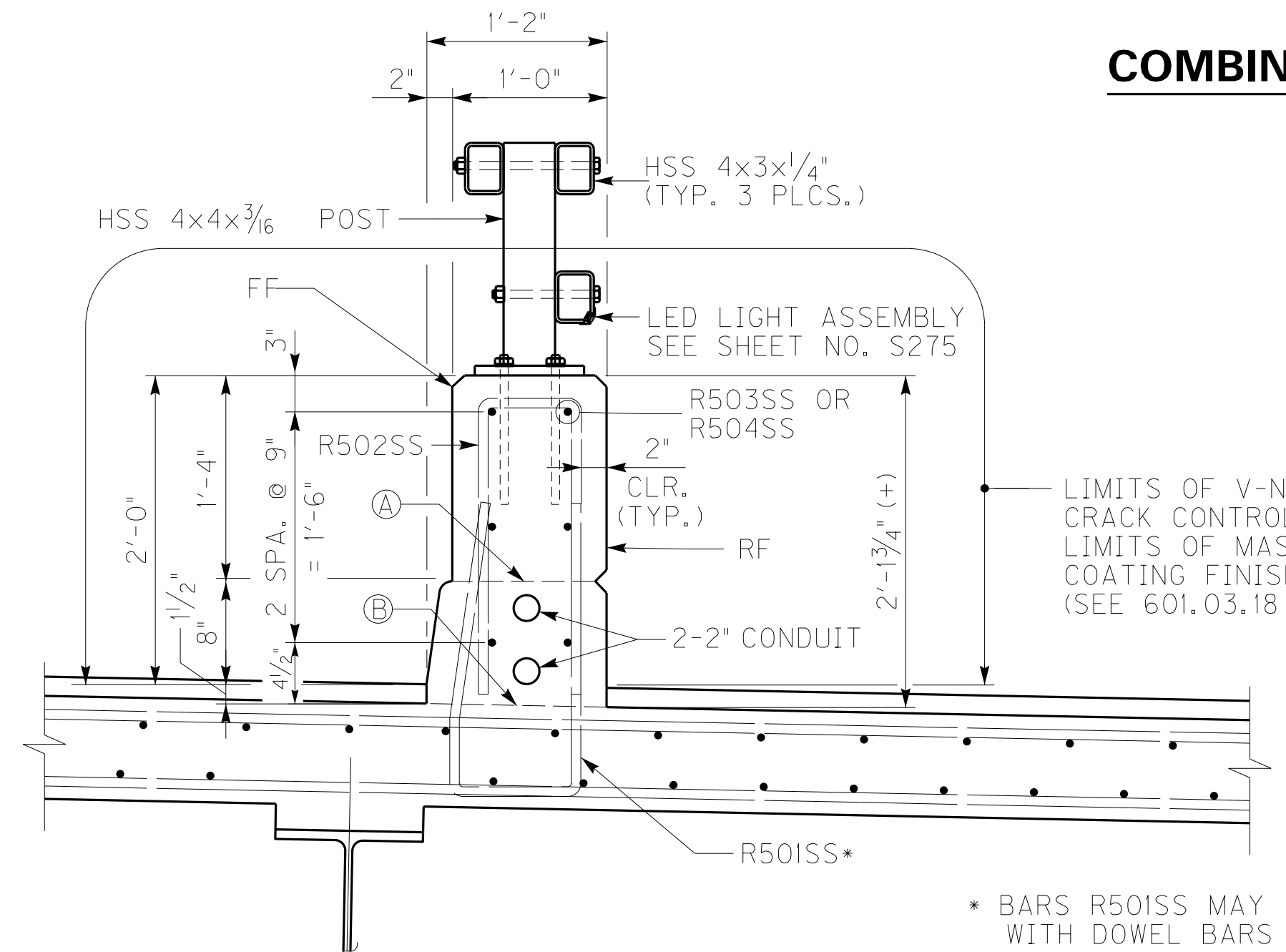


COMBINATION RAIL PLAN

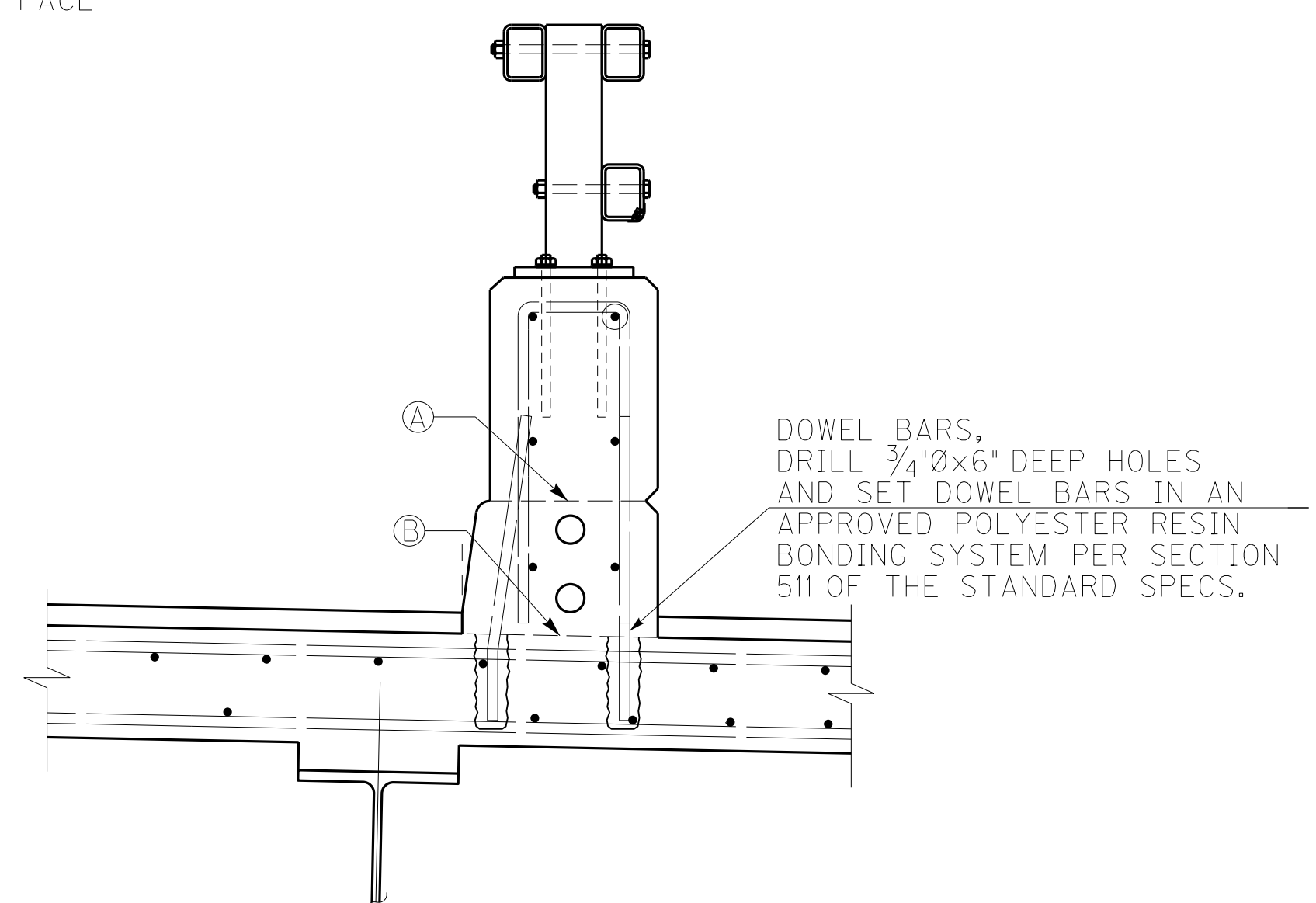


COMBINATION RAIL ELEVATION

LOOKING AT REAR FACE



SECTION A-A
LOOKING AHEAD STATION



SECTION A-A
OPTIONAL CONSTRUCTION

* BARS R501SS MAY BE REPLACED WITH DOWEL BARS AS SHOWN.

LEGEND

- Ⓐ PERMISSIBLE CONSTRUCTION JOINT.
- Ⓑ MANDATORY ROUGHENED CONSTRUCTION JOINT. CONCRETE ABOVE THIS JOINT SHALL BE PLACED AFTER THE SLAB HAS BEEN PROPERLY CURED.
- RF DENOTES REAR FACE
- FF DENOTES FRONT FACE

NOTES

1. CLASS "AA" CONCRETE IS USED THROUGHOUT SPAN 5 BARRIER.
2. FOR CRACK CONTROL JOINT AND RAIL POST SPACING, SEE SHEET NOS. S211 - S212.
3. FOR RAIL DETAILS, SEE SHEET NO. S247.
4. FOR SLAB TYPICAL SECTION, SEE SHEET NO. S210.
5. FOR SLAB BILL OF REINFORCEMENT SEE SHEET NO. S217.
6. FOR PATH DELINEATION LIGHTING, SEE SHEET NO. S275.
7. GROUT SHALL CONFORM TO KYTC SPECIFICATION SECTION 601.
8. 2" CONDUIT IS INCIDENTAL TO THE PATH DELINEATION LIGHTING.
9. THE OVERLAY SHALL MEET THE REQUIREMENT FOR LATEX MODIFIED CONCRETE FOR NEW STRUCTURES IN ACCORDANCE WITH 606.03.17 (B).
10. LED LIGHT ASSEMBLY IS INCLUDED IN THE PAY ITEM PATH DELINEATION LIGHTING.

Δ ADDED SECTION A-A OPTIONAL CONSTR.		11/25/13
REVISION		DATE
DATE: NOVEMBER 15, 2013	CHECKED BY	
DESIGNED BY: ACK	DMB	
DETAILED BY: MJD	ACK	

Commonwealth of Kentucky
DEPARTMENT OF HIGHWAYS

COUNTY
MARSHALL / TRIGG

ROUTE **US68** CROSSING **KENTUCKY LAKE**

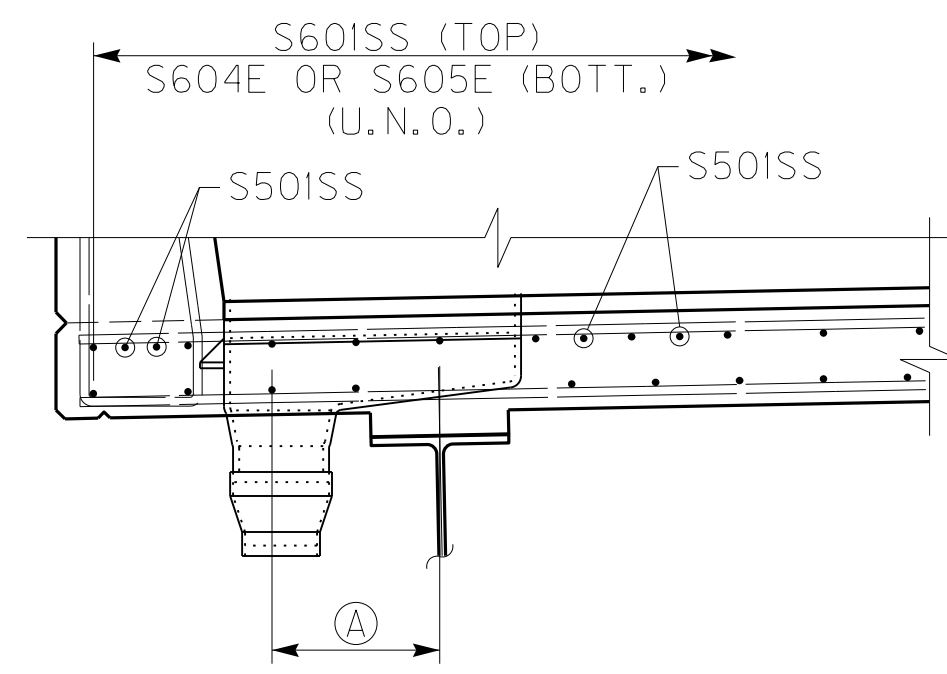
COMBINATION RAIL DETAILS



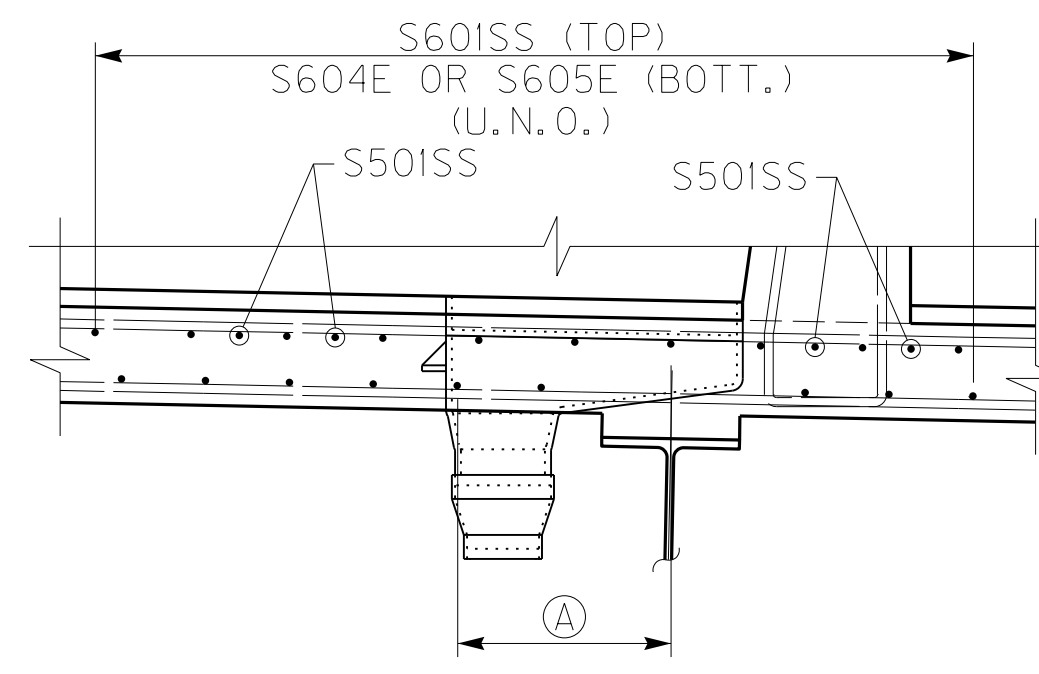
ITEM NUMBER	PREPARED BY	SHEET NO.
01-180.70	MICHAEL BAKER JR., INC. 9750 ORMSBY STATION ROAD SUITE 210 LOUISVILLE, KY 40223	S216



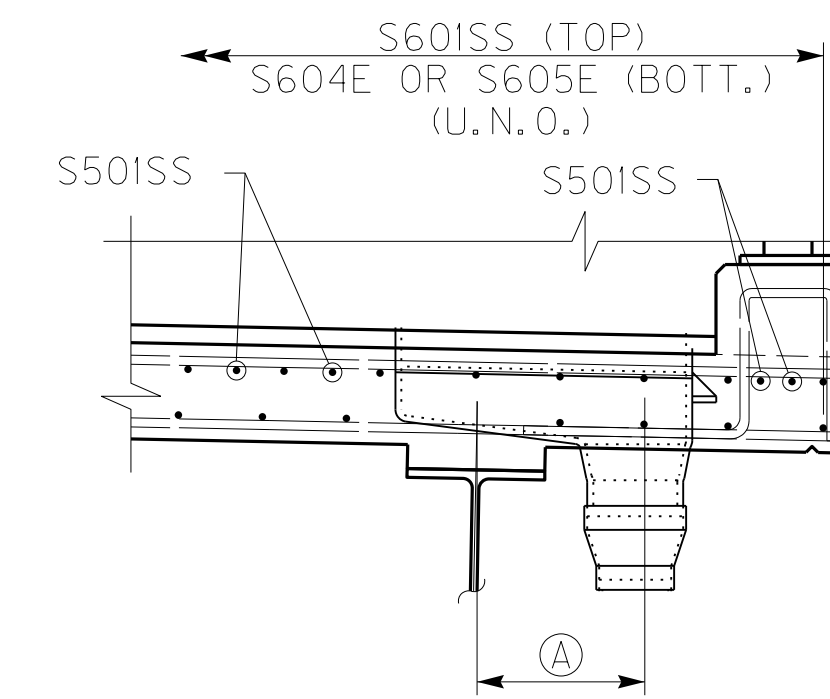
DRAWING NO.
24686



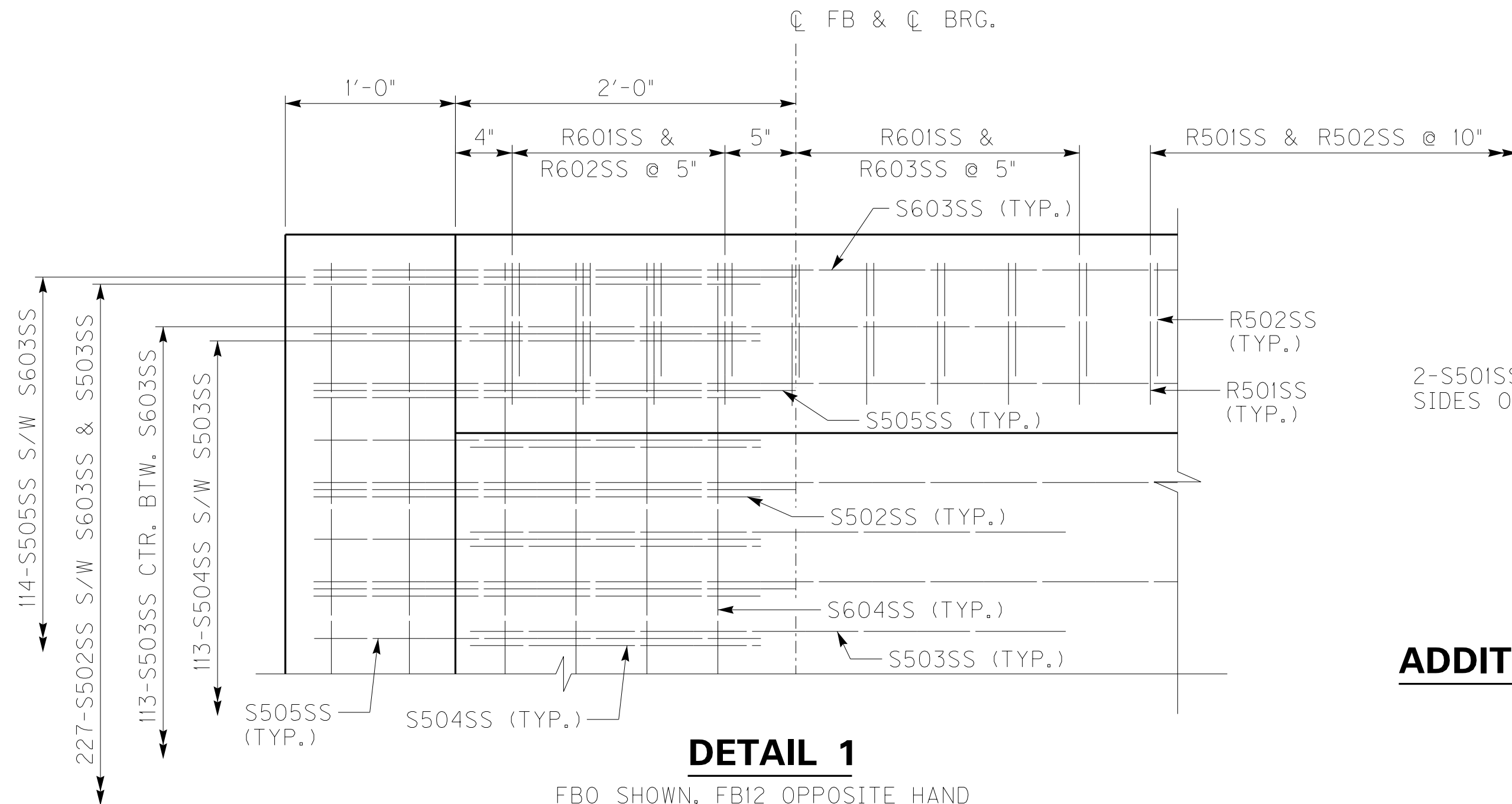
SECTION THRU DECK DRAIN
AT STRINGER S1



SECTION THRU DECK DRAIN
AT STRINGER S7

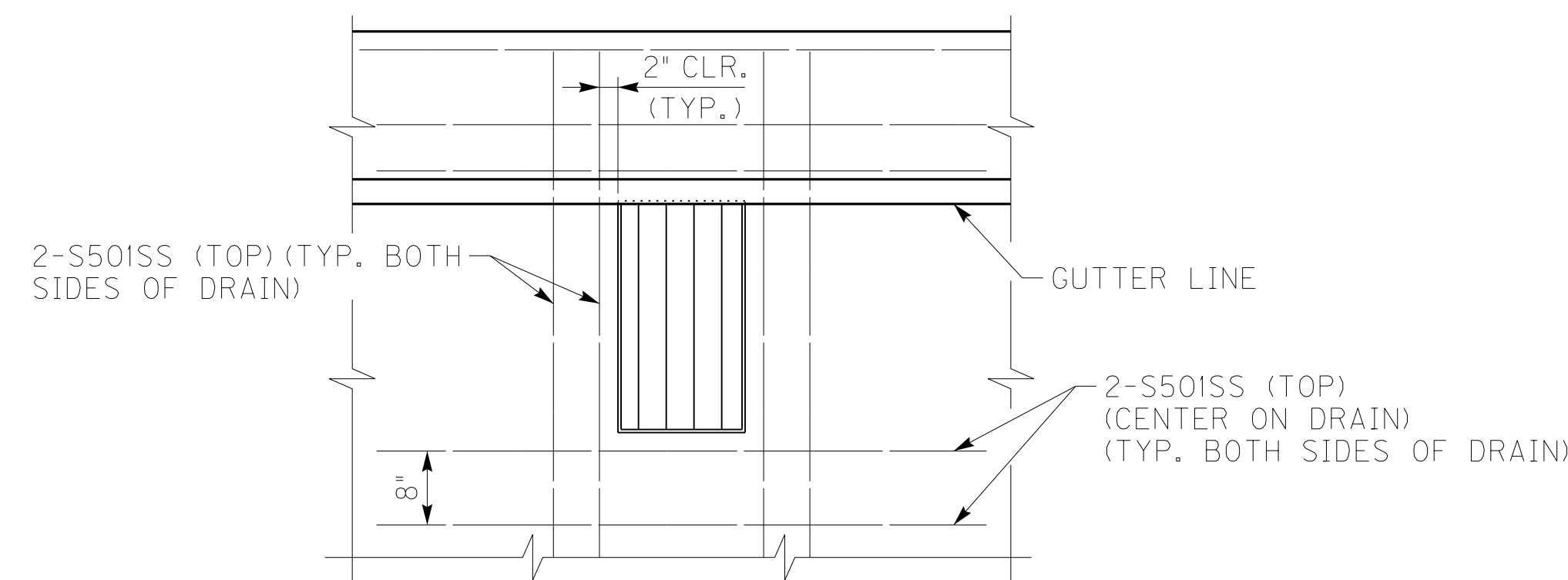


SECTION THRU DECK DRAIN
AT STRINGER S8

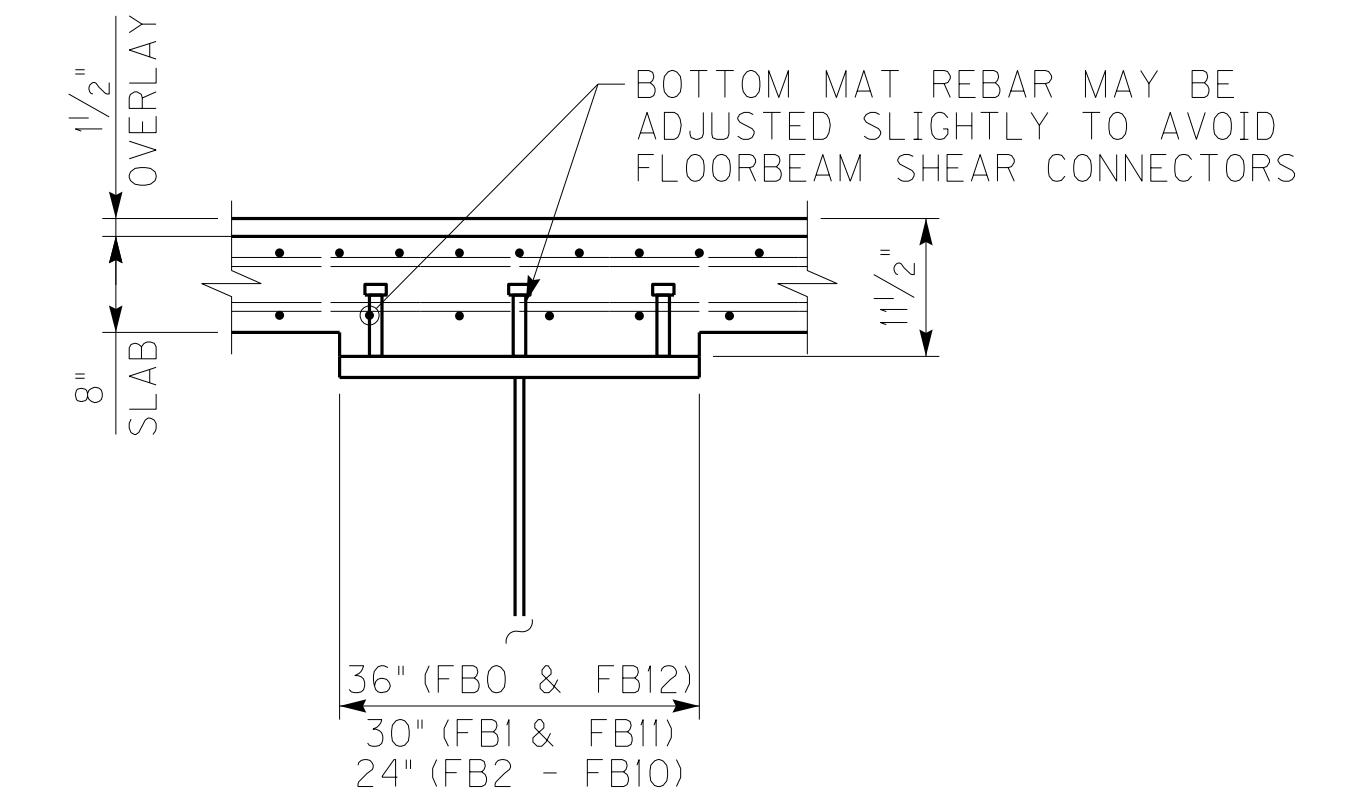


DETAIL 1

FBO SHOWN, FB12 OPPOSITE HAND
TRANSVERSE DECK REINFORCEMENT NOT SHOWN FOR CLARITY



ADDITIONAL SLAB REINFORCEMENT AT DECK DRAIN
TYPICAL EACH DECK DRAIN



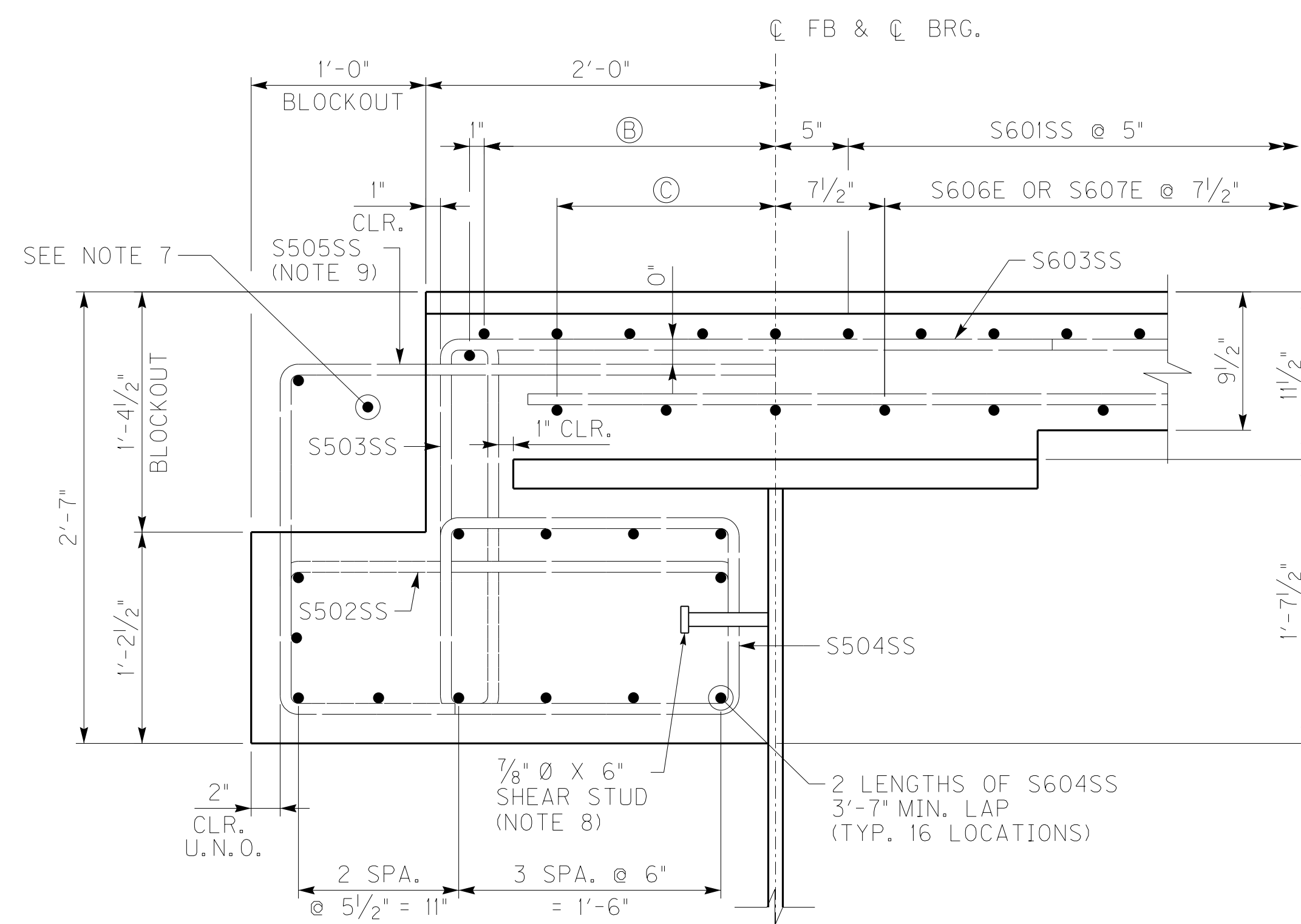
HAUNCH DETAIL AT FLOORBEAM

NOTES

- FOR GENERAL NOTES SEE SHEETS NOS. S004-S006A.
- FOR PLAN OF SLAB SEE SHEET NOS. S211-S212.
- FOR SLAB TYPICAL SECTION SEE SHEET NO. S210.
- FOR SLAB BILL OF REINFORCEMENT SEE SHEET NO. S217.
- FOR DECK DRAIN LOCATIONS SEE SHEET NO. S199.
- FOR MODULAR EXPANSION JOINT DETAILS SEE SHEET NO. S206.
- INTERLINK THIS BAR WITH MODULAR EXPANSION JOINT ANCHORAGES AS RECOMMENDED BY JOINT MANUFACTURER.
- FOR SHEAR STUD SPACING SEE END FLOORBEAM DETAILS, SHEET NO. S186.
- THE S505SS BARS IN THE BLOCKOUT SHALL BE SPLICED WITH THE S603SS BARS IN THE SLAB AND ANCHORED INTO THE CONCRETE BELOW THE BLOCKOUT. BARS THAT INTERFERE WITH THE MODULAR JOINT INSTALLATION SHALL BE CUT AS NECESSARY TO CLEAR THE MODULAR JOINT ASSEMBLY.

LEGEND

- Ⓐ CUT AND/OR REPOSITION SLAB REINFORCEMENT TO ACCOMMODATE DECK DRAINS.
- Ⓑ 2 LENGTHS OF 5-S601SS @ 5" = 1'-8"
- Ⓒ 1 LENGTH OF 3-S606E & 1 LENGTH OF 3-S607E @ 7 1/2" = 1'-3"



SECTION A-A

FILE NAME: C:\P\W\81-LOCAL\BAKER_PROJECTS\CWETHINGTON\DOI41582\S24686_SLO2.DGN

USER: MorYoloDwyer
DATE PLOTTED: November 25, 2013

E-SHEET NAME: S24686 213

MicroStation v8.11.7.469

REVISED BAR NAME		11/25/13
REVISION		DATE
DATE: NOVEMBER 15, 2013	CHECKED BY	
DESIGNED BY: ACK	DMB	
DETAILED BY: MJD	ACK	

Commonwealth of Kentucky
DEPARTMENT OF HIGHWAYS

COUNTY
MARSHALL / TRIGG

ROUTE
US68

CROSSING
KENTUCKY LAKE

SLAB DETAILS



ITEM NUMBER

01-180.70

PREPARED BY

Baker

MICHAEL BAKER JR. INC.
9750 ORMSBY STATION ROAD
SUITE 210
LOUISVILLE, KY 40223

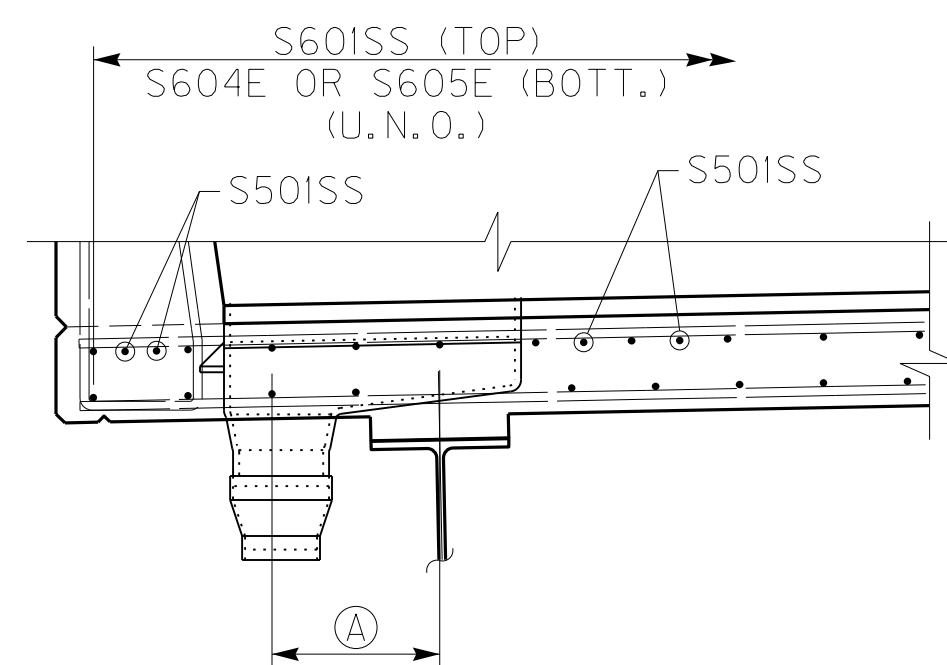
SHEET NO.

S213

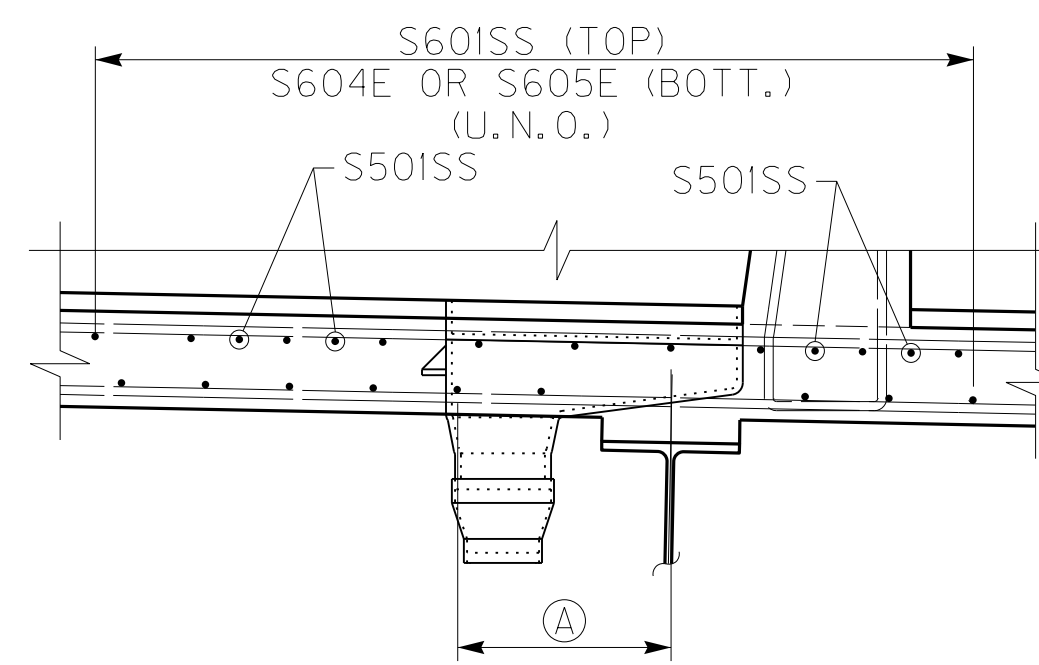
DRAWING NO.

24686

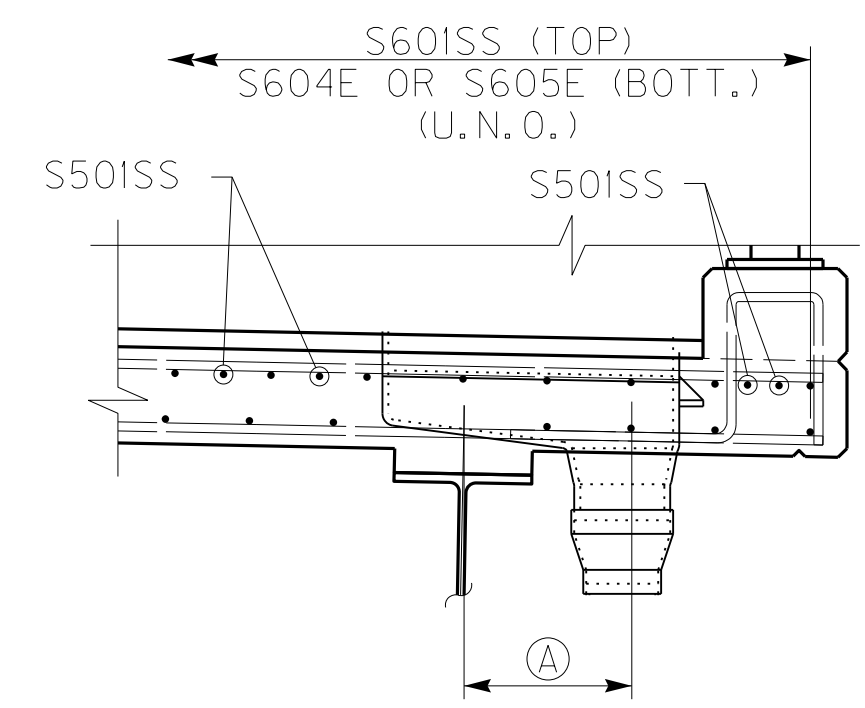
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 USER: MorYoloDwyer
 DATE PLOTTED: November 25, 2013
 E-SHEET NAME: S24686 213
 MicroStation v8.11.7.469



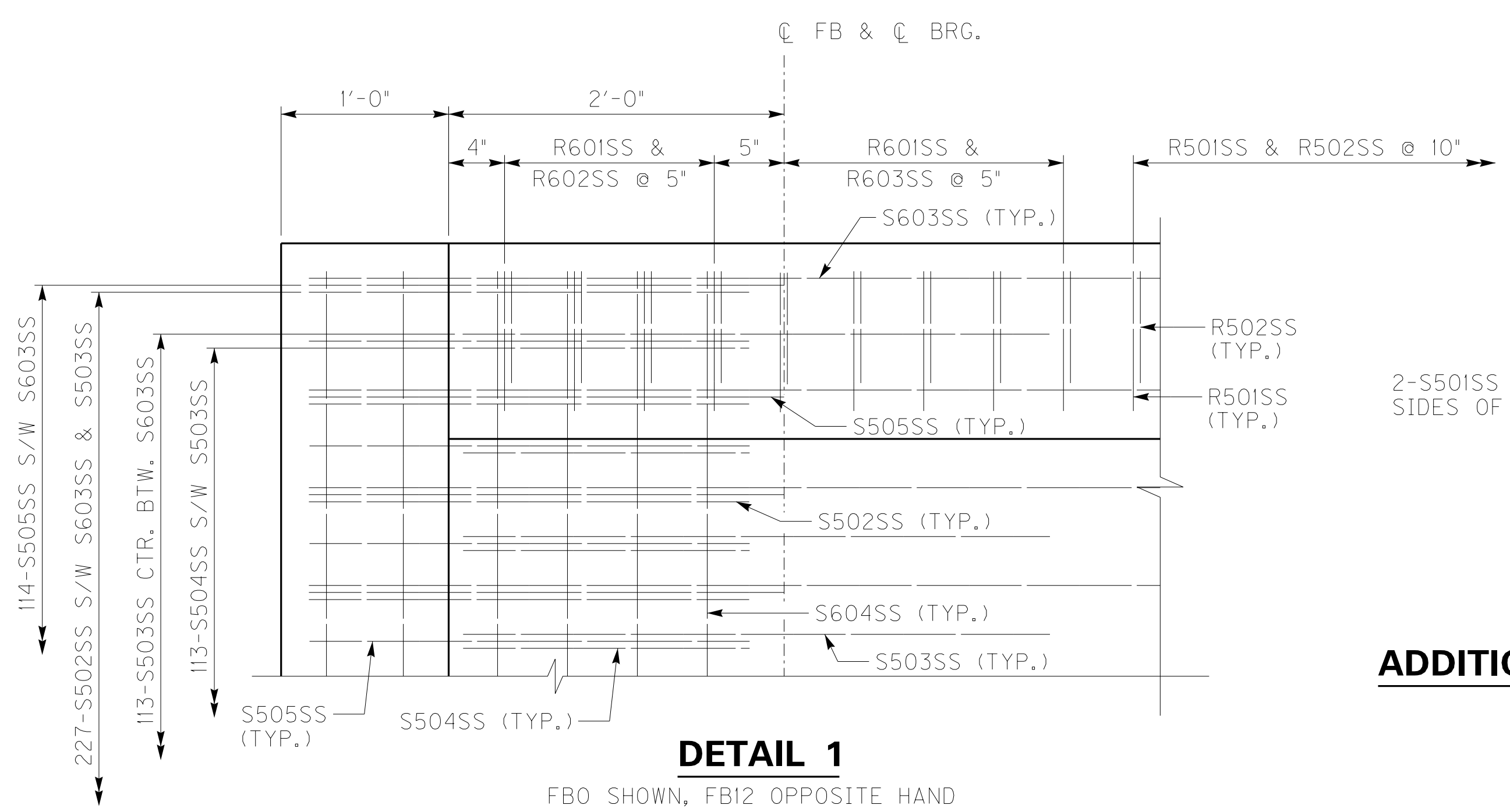
SECTION THRU DECK DRAIN
AT STRINGER S1



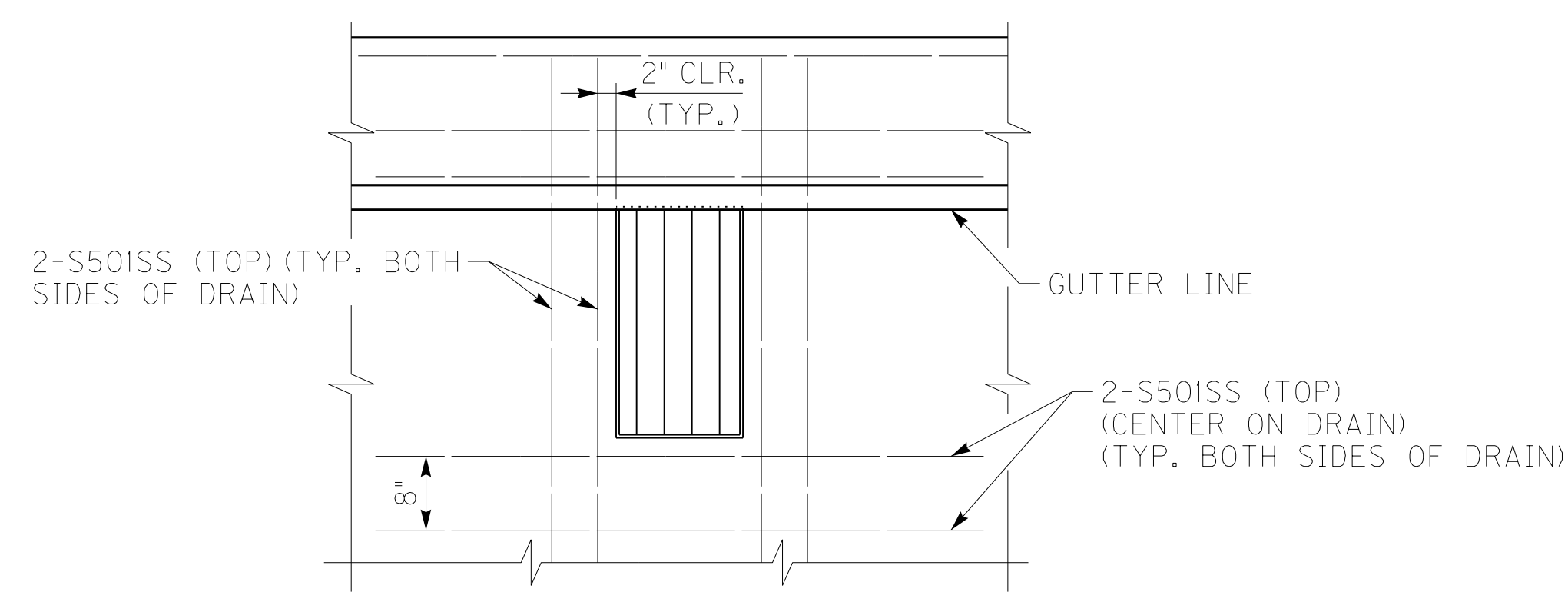
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AT STRINGER S7



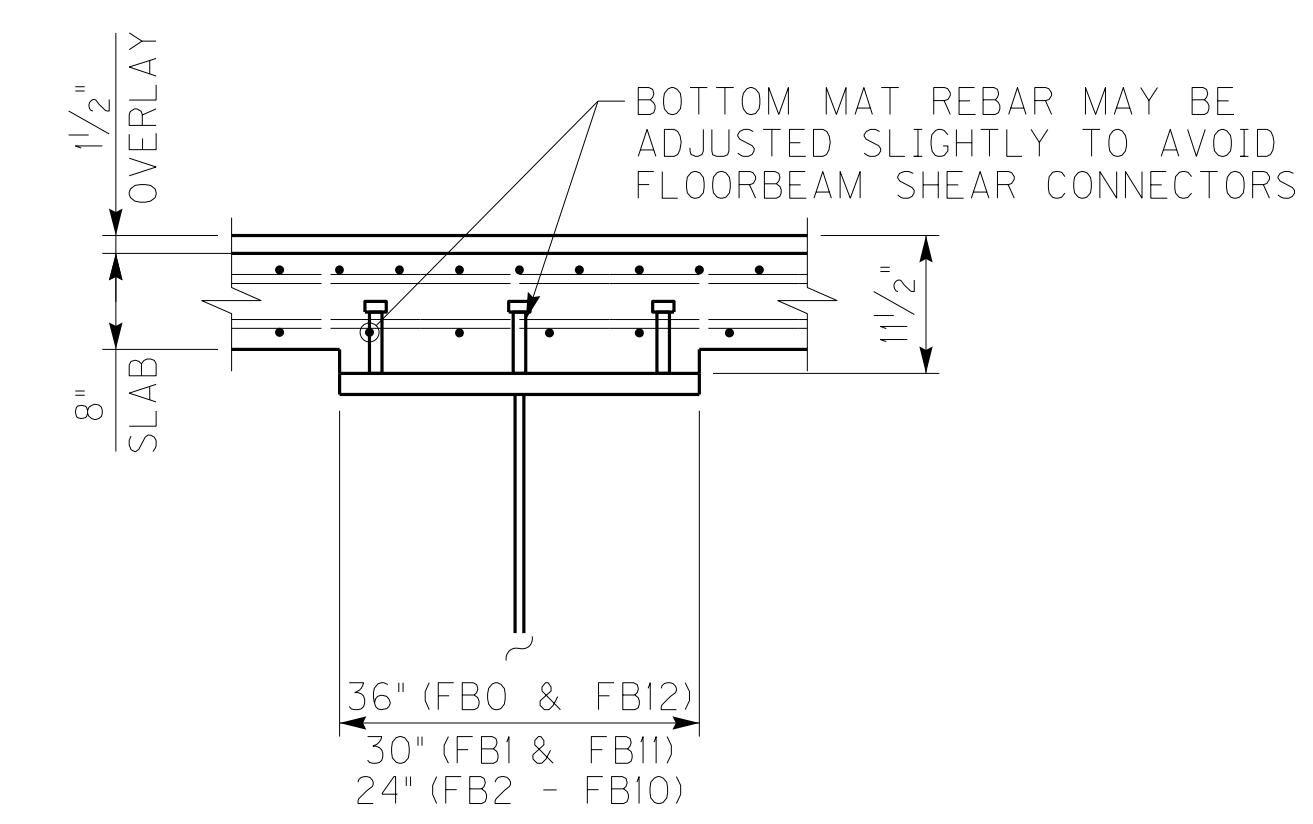
SECTION THRU DECK DRAIN
AT STRINGER S8



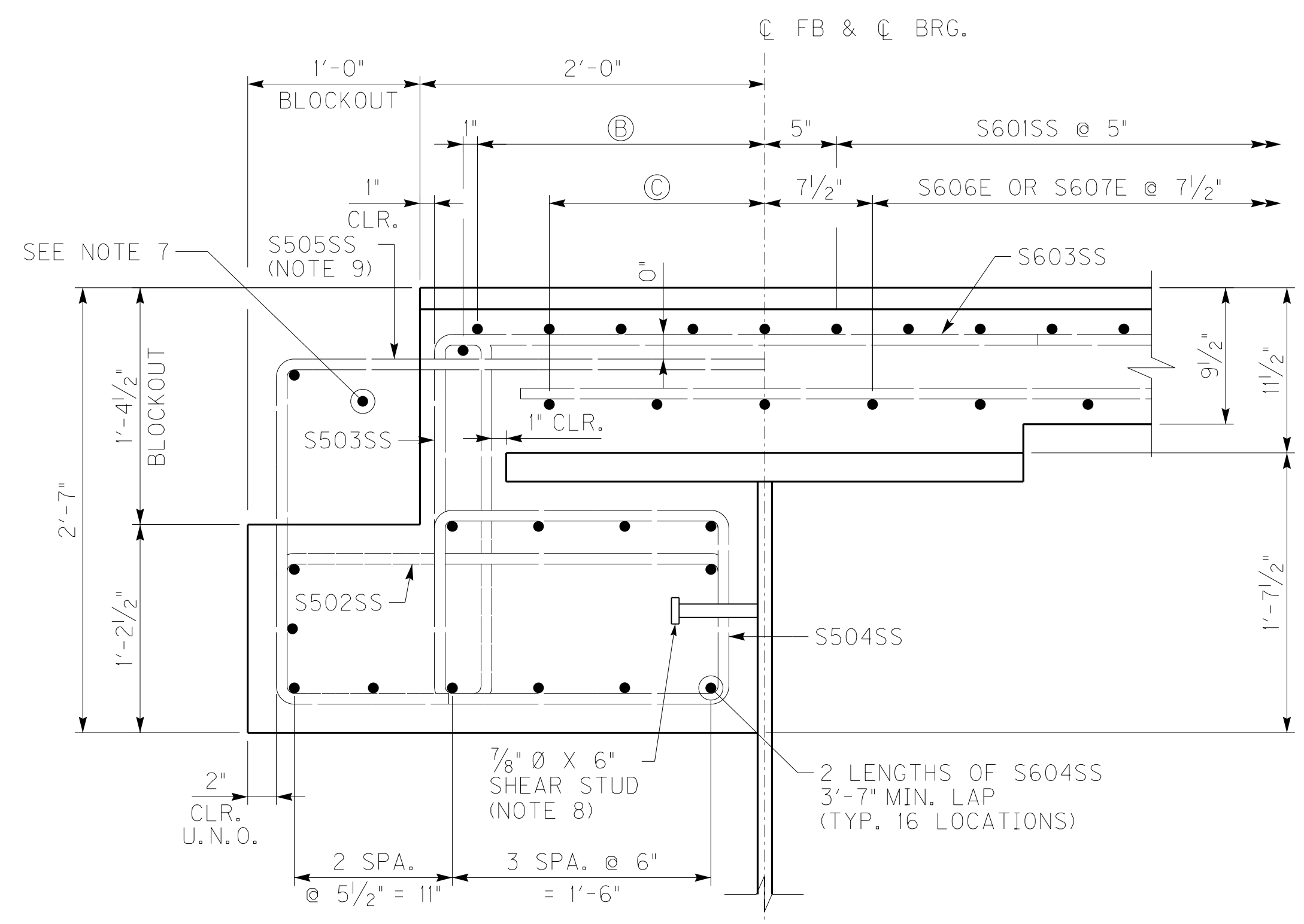
DETAIL 1
FBO SHOWN, FB12 OPPOSITE HAND
TRANSVERSE DECK REINFORCEMENT NOT SHOWN FOR CLARITY



ADDITIONAL SLAB REINFORCEMENT AT DECK DRAIN
TYPICAL EACH DECK DRAIN



HAUNCH DETAIL AT FLOORBEAM



SECTION A-A

NOTES

- FOR GENERAL NOTES SEE SHEETS NOS. S004-S006A.
- FOR PLAN OF SLAB SEE SHEET NOS. S211-S212.
- FOR SLAB TYPICAL SECTION SEE SHEET NO. S210.
- FOR SLAB BILL OF REINFORCEMENT SEE SHEET NO. S217.
- FOR DECK DRAIN LOCATIONS SEE SHEET NO. S199.
- FOR MODULAR EXPANSION JOINT DETAILS SEE SHEET NO. S206.
- INTERLINK THIS BAR WITH MODULAR EXPANSION JOINT ANCHORAGES AS RECOMMENDED BY JOINT MANUFACTURER.
- FOR SHEAR STUD SPACING SEE END FLOORBEAM DETAILS, SHEET NO. S186.
- THE S505SS BARS IN THE BLOCKOUT SHALL BE SPLICED WITH THE S603SS BARS IN THE SLAB AND ANCHORED INTO THE CONCRETE BELOW THE BLOCKOUT. BARS THAT INTERFERE WITH THE MODULAR JOINT INSTALLATION SHALL BE CUT AS NECESSARY TO CLEAR THE MODULAR JOINT ASSEMBLY.

LEGEND

- Ⓐ CUT AND/OR REPOSITION SLAB REINFORCEMENT TO ACCOMMODATE DECK DRAINS.
- Ⓑ 2 LENGTHS OF 5-S601SS @ 5" = 1'-8"
- Ⓒ 1 LENGTH OF 3-S606E & 1 LENGTH OF 3-S607E @ 7 1/2" = 1'-3"



ITEM NUMBER	01-180.70
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REVISION	DATE
REVISED BAR NAME	11/25/13
DATE: NOVEMBER 15, 2013	CHECKED BY
DESIGNED BY: ACK	DMB
DETAILED BY: MJD	ACK

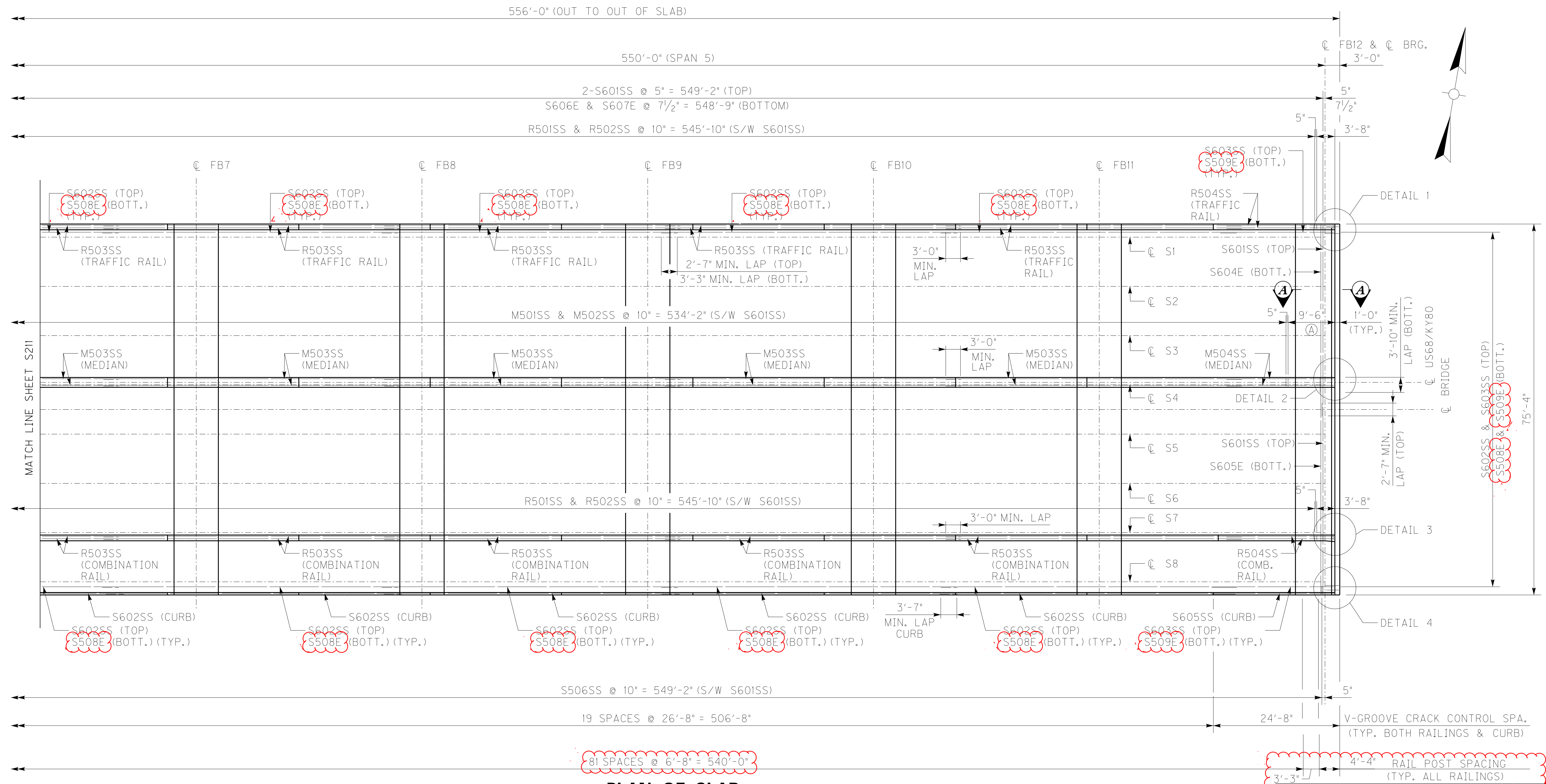
Commonwealth of Kentucky
DEPARTMENT OF HIGHWAYS
 COUNTY
MARSHALL / TRIGG

ROUTE **US68** CROSSING **KENTUCKY LAKE**

SLAB DETAILS

PREPARED BY
Baker
 MICHAEL BAKER JR., INC.
 9750 ORMSBY STATION ROAD
 SUITE 210
 LOUISVILLE, KY 40223

SHEET NO.
S213
 DRAWING NO.
24686

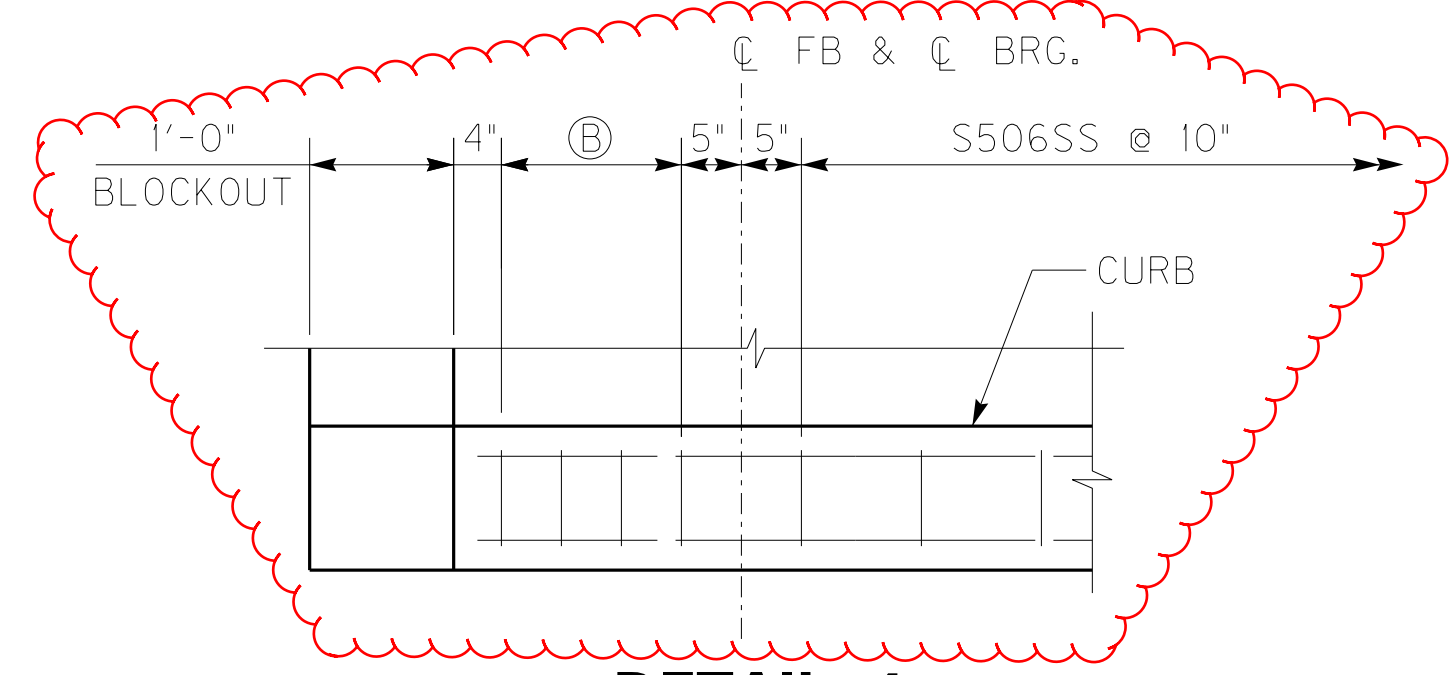


PLAN OF SLAB

PARTIAL SPAN 5
DECK DRAINS NOT SHOWN FOR CLARITY

NOTES

- FOR SECTION A-A AND DETAIL 1, SEE SHEET NO. S213.
- FOR SLAB BILL OF REINFORCEMENT SEE SHEET NO. S217.
- FOR MODULAR EXPANSION JOINT DETAILS SEE SHEET NO. S206 - S209A.
- FOR SLAB TYPICAL SECTION SEE SHEET NO. S210.
- FOR TRAFFIC RAIL DETAILS SEE SHEET NO. S215.
- FOR COMBINATION RAIL DETAILS SEE SHEET NO. S216.
- FOR CURB DETAILS SEE SHEET NO. S248.
- FOR DETAILS 2 & 3 SEE SHEET NO. S211.



DETAIL 4

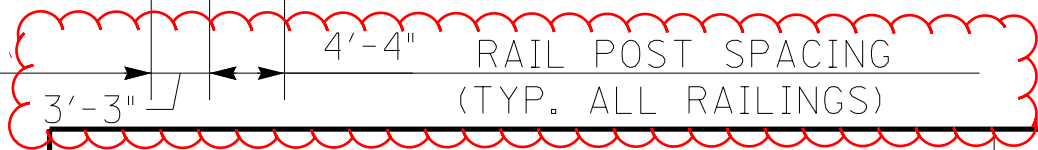
FBO SHOWN, FB12 OPPOSITE HAND
TYP. DECK REINFORCEMENT NOT SHOWN FOR CLARITY

LEGEND

- Ⓐ MEDIAN TRANSITION
SEE SHEET NO. S208B
- Ⓑ S507SS & S508SS



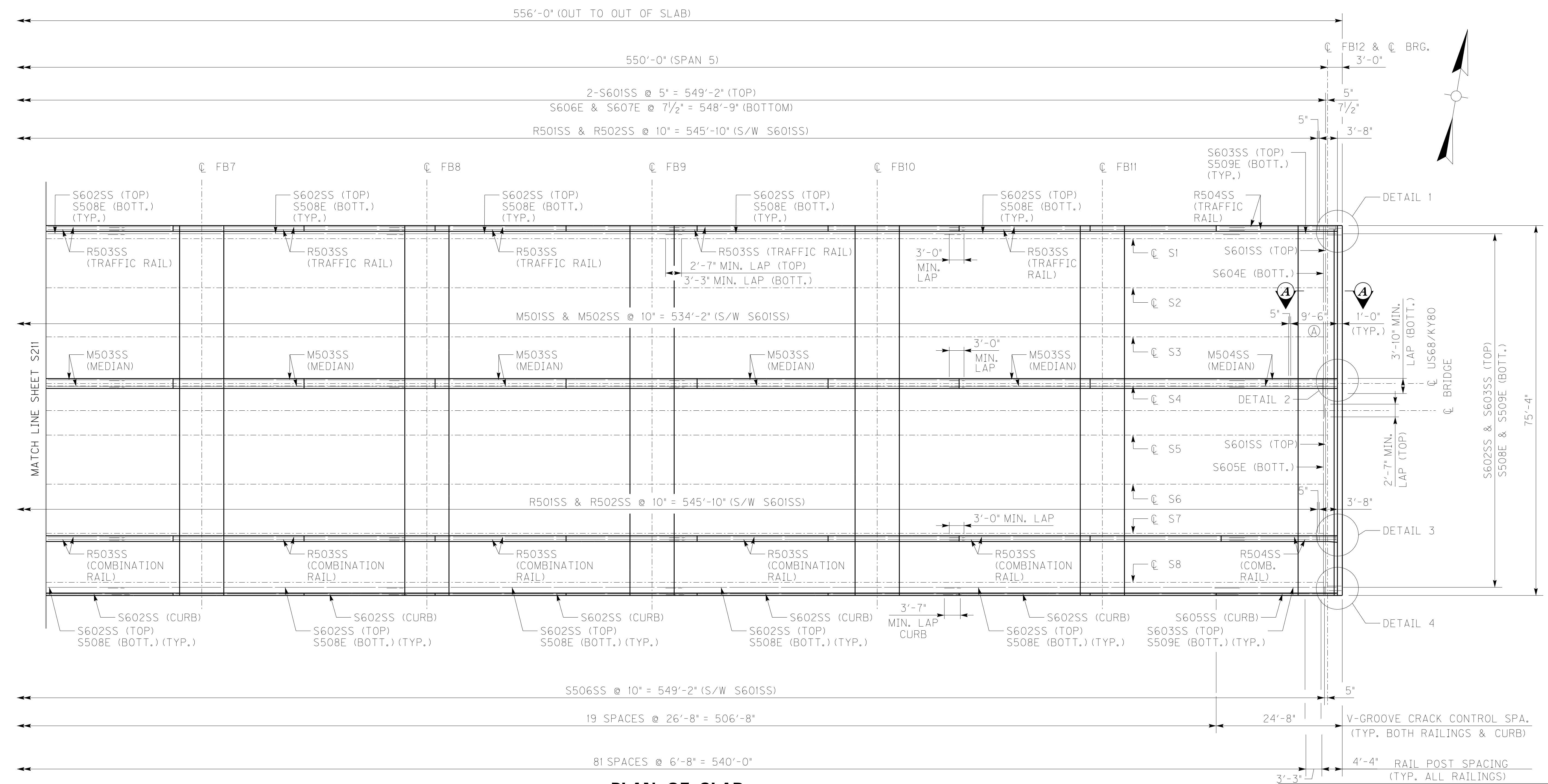
ITEM NUMBER	01-180.70
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REVISED POST SPACING & DETAIL 4 REVISION DATE: NOVEMBER 15, 2013 DESIGNED BY: ACK DETAILED BY: MJD		CHECKED BY LEV ACK DATE: 11/25/13
Commonwealth of Kentucky DEPARTMENT OF HIGHWAYS COUNTY MARSHALL / TRIGG		
ROUTE US68	CROSSING KENTUCKY LAKE	
PLAN OF SLAB PREPARED BY Baker		
SHEET NO. S212 DRAWING NO. 24686		SHEET NO. S212 DRAWING NO. 24686

FILE NAME: C:\PW\81-LOCAL\BAKER_PROJECTS\CWETHINGTON\DOI4582\S24686_PS02.DGN
 USER: Moryko,Dwyer
 DATE PLOTTED: November 25, 2013
 E-SHEET NAME: S24686 212
 MicroStation v8.11.7.469

FILE NAME: C:\PW\81-LOCAL\BAKER_PROJECTS\CWETHINGTON\DOI4582\S24686_PS02.DGN
 USER: MCFY\J.Dwyer
 DATE PLOTTED: November 25, 2013
 E-SHEET NAME: S24686 212
 MicroStation v8.11.7.469

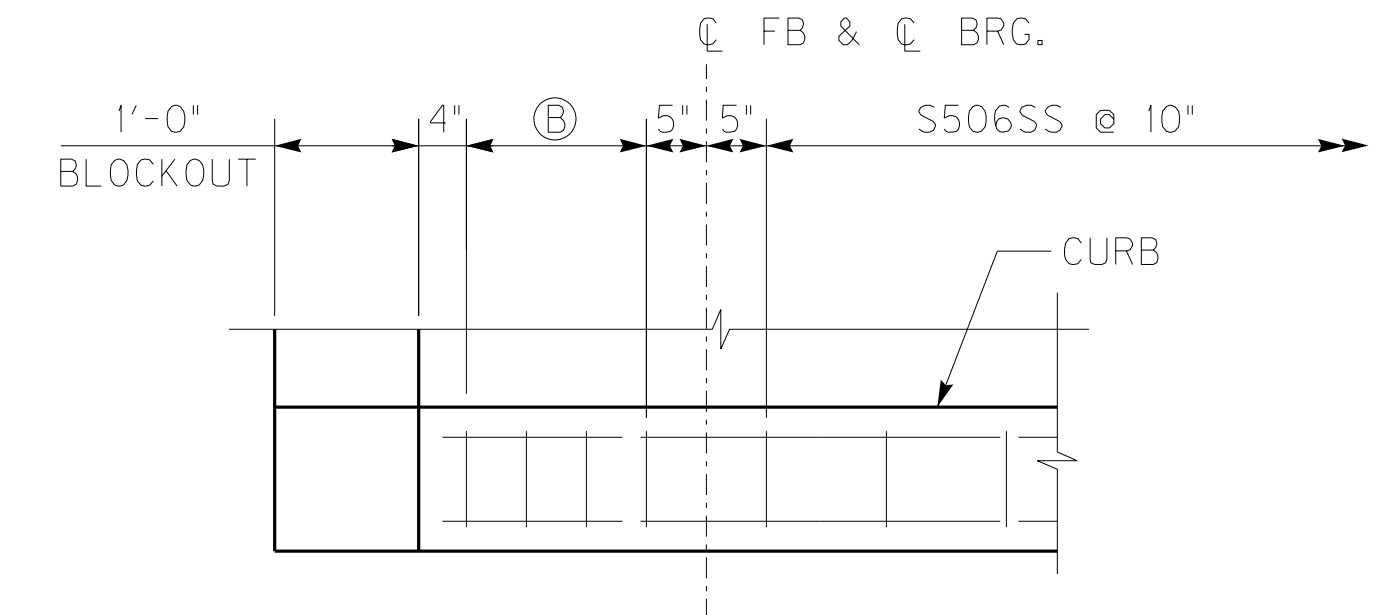


PLAN OF SLAB

PARTIAL SPAN 5
 DECK DRAINS NOT SHOWN FOR CLARITY

NOTES

- FOR SECTION A-A AND DETAIL 1, SEE SHEET NO. S213.
- FOR SLAB BILL OF REINFORCEMENT SEE SHEET NO. S217.
- FOR MODULAR EXPANSION JOINT DETAILS SEE SHEET NO. S206 - S209A.
- FOR SLAB TYPICAL SECTION SEE SHEET NO. S210.
- FOR TRAFFIC RAIL DETAILS SEE SHEET NO. S215.
- FOR COMBINATION RAIL DETAILS SEE SHEET NO. S216.
- FOR CURB DETAILS SEE SHEET NO. S248.
- FOR DETAILS 2 & 3 SEE SHEET NO. S211.



DETAIL 4

FBO SHOWN, FB12 OPPOSITE HAND
 TYP. DECK REINFORCEMENT NOT SHOWN FOR CLARITY

LEGEND

- (A) MEDIAN TRANSITION
SEE SHEET NO. S208B
- (B) S507SS & S508SS



ITEM NUMBER	01-180.70
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REVISED POST SPACING & DETAIL 4		11/25/13
REVISION		DATE
DATE: NOVEMBER 15, 2013	CHECKED BY	
DESIGNED BY: ACK	LEV	
DETAILED BY: MJD	ACK	
Commonwealth of Kentucky DEPARTMENT OF HIGHWAYS		
COUNTY MARSHALL / TRIGG		
ROUTE US68	CROSSING KENTUCKY LAKE	
PLAN OF SLAB		
PREPARED BY		SHEET NO.
Baker		S212
		DRAWING NO. 24686
MICHAEL BAKER JR., INC. 9750 ORMSBY STATION ROAD SUITE 210 LOUISVILLE, KY 40223		

556'-0" (OUT TO OUT OF SLAB)

550'-0" (SPAN 5)

2 LENGTHS OF 1319 - S601SS @ 5" = 549'-2" (TOP)
 1 LENGTH OF 879-S606E & 1 LENGTH OF 879-S607E @ 7 1/2" = 548'-9" (BOTTOM)

656 - R501SS & 656-R502SS @ 10" = 545'-10" (S/W S601SS)

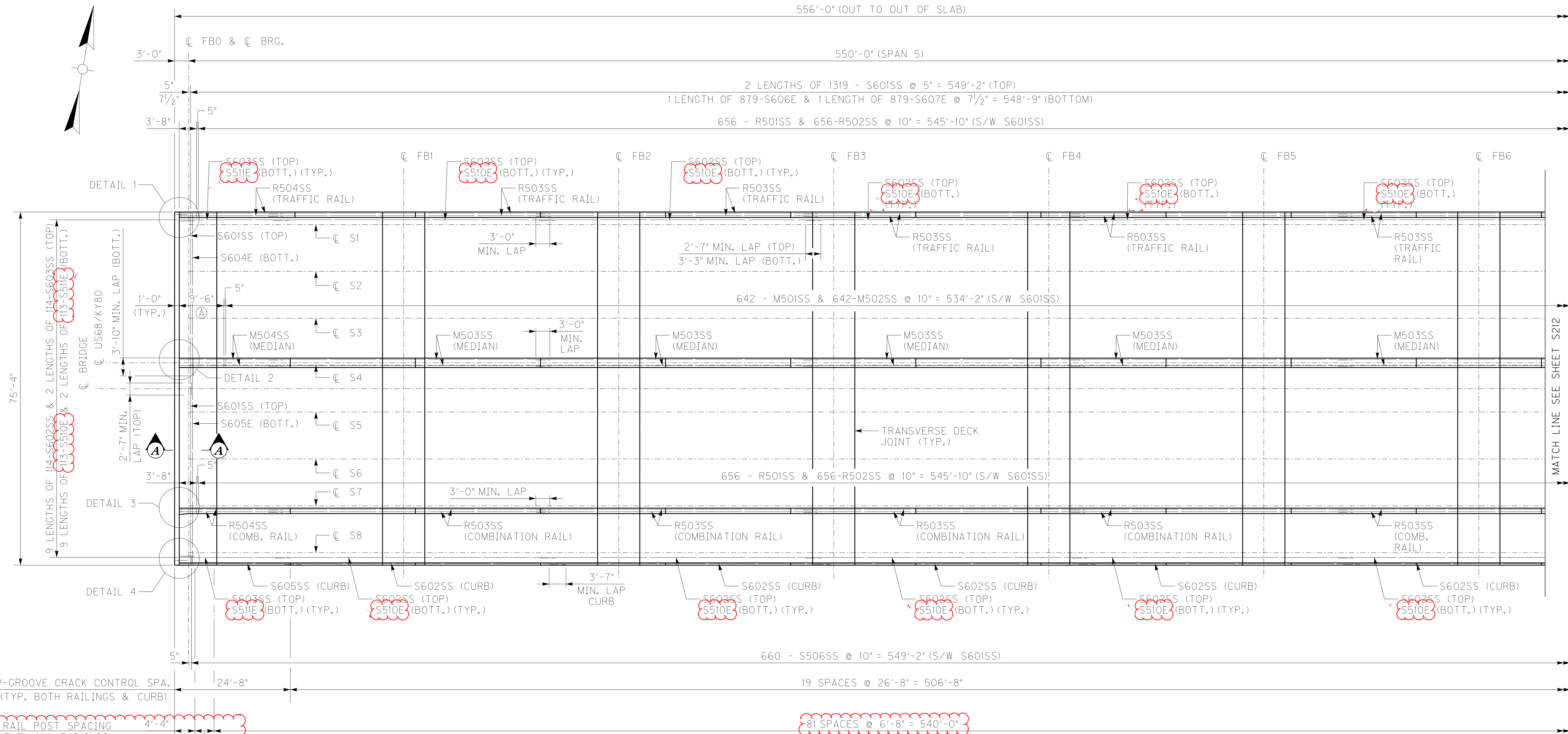
642 - M501SS & 642-M502SS @ 10" = 534'-2" (S/W S601SS)

656 - R501SS & 656-R502SS @ 10" = 545'-10" (S/W S601SS)

660 - S506SS @ 10" = 549'-2" (S/W S601SS)

19 SPACES @ 26'-8" = 506'-8"

81 SPACES @ 6'-8" = 540'-0"



PLAN OF SLAB

PARTIAL SPAN 5
 DECK DRAINS NOT SHOWN FOR CLARITY

NOTES

- FOR GENERAL NOTES, SEE SHEET NOS. S004 - S006A.
- FOR SECTION A-A AND DETAIL 1, SEE SHEET NO. S213.
- FOR SLAB BILL OF REINFORCEMENT, SEE SHEET NO. S217.
- FOR MODULAR EXPANSION JOINT DETAILS, SEE SHEET NOS. S206 - S209A.
- FOR SLAB TYPICAL SECTION, SEE SHEET NO. S210.
- FOR TRAFFIC RAIL DETAILS, SEE SHEET NO. S215.
- FOR COMBINATION RAIL DETAILS, SEE SHEET NO. S216.
- FOR CURB DETAILS, SEE SHEET NO. S248.
- FOR DETAIL 4, SEE SHEET NO. S212.

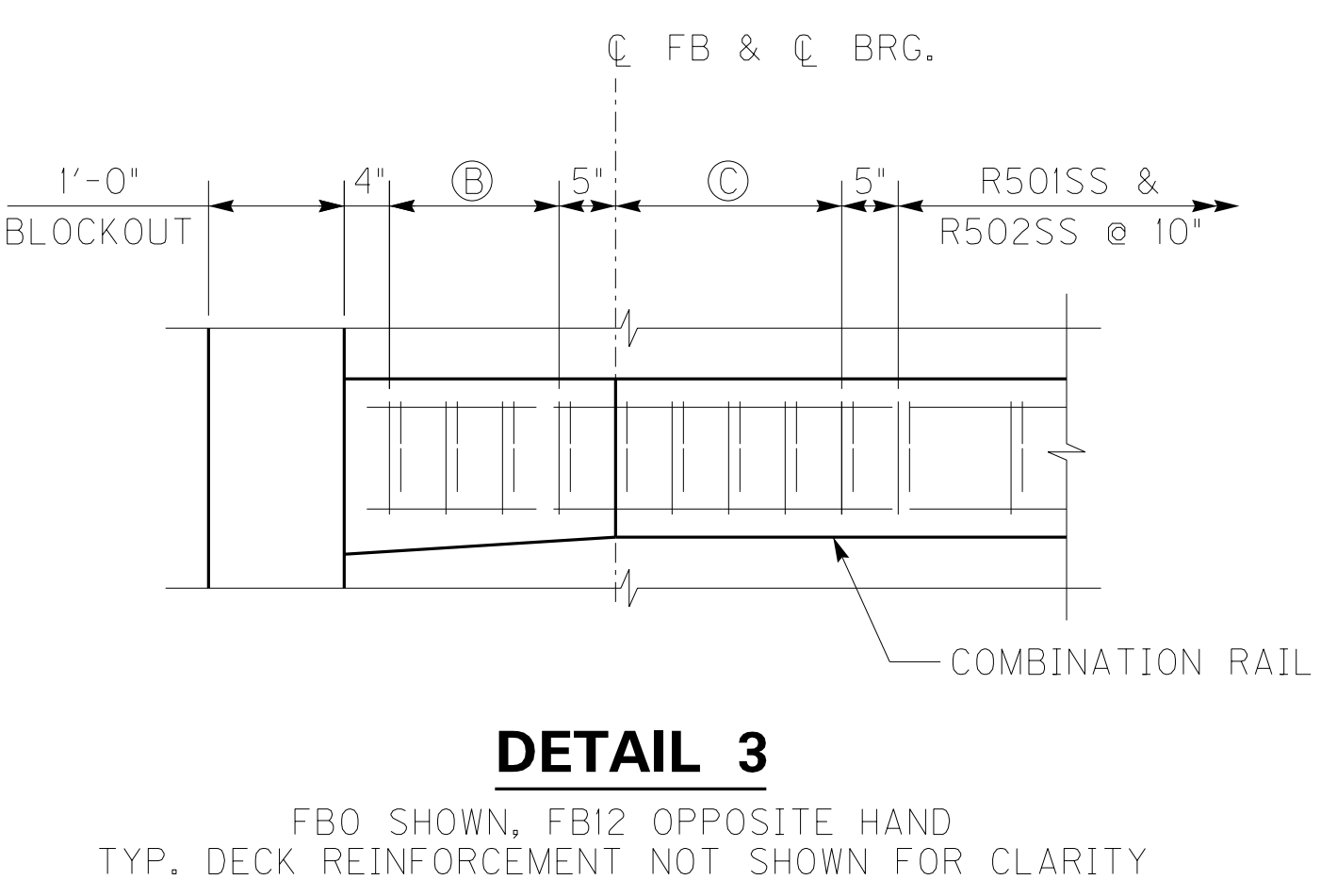
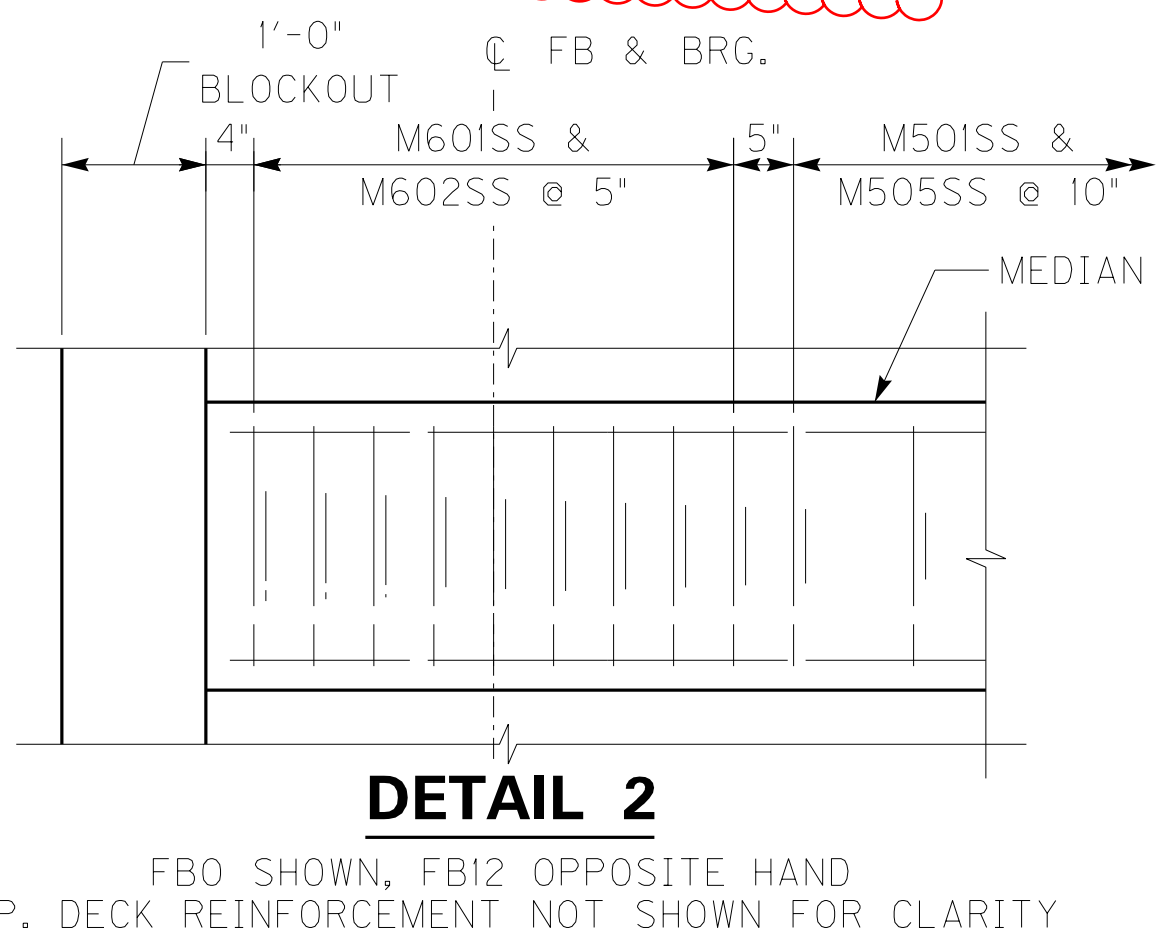
LEGEND

- (A) MEDIAN TRANSITION
SEE SHEET NO. S208B
- (B) R601SS & R602SS @ 5"
- (C) R601SS & R603SS @ 5"



ITEM NUMBER	01-180.70
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REVISION DATE: NOVEMBER 15, 2013 DESIGNED BY: ACK CHECKED BY: LEV DETAILED BY: MJD ACK		11/25/13
Commonwealth of Kentucky DEPARTMENT OF HIGHWAYS COUNTY MARSHALL / TRIGG		
ROUTE US68	CROSSING KENTUCKY LAKE	
PLAN OF SLAB		
PREPARED BY Baker	MICHAEL BAKER JR., INC. 9750 ORMSBY STATION ROAD SUITE 210 LOUISVILLE, KY 40223	SHEET NO. S211 DRAWING NO. 24686



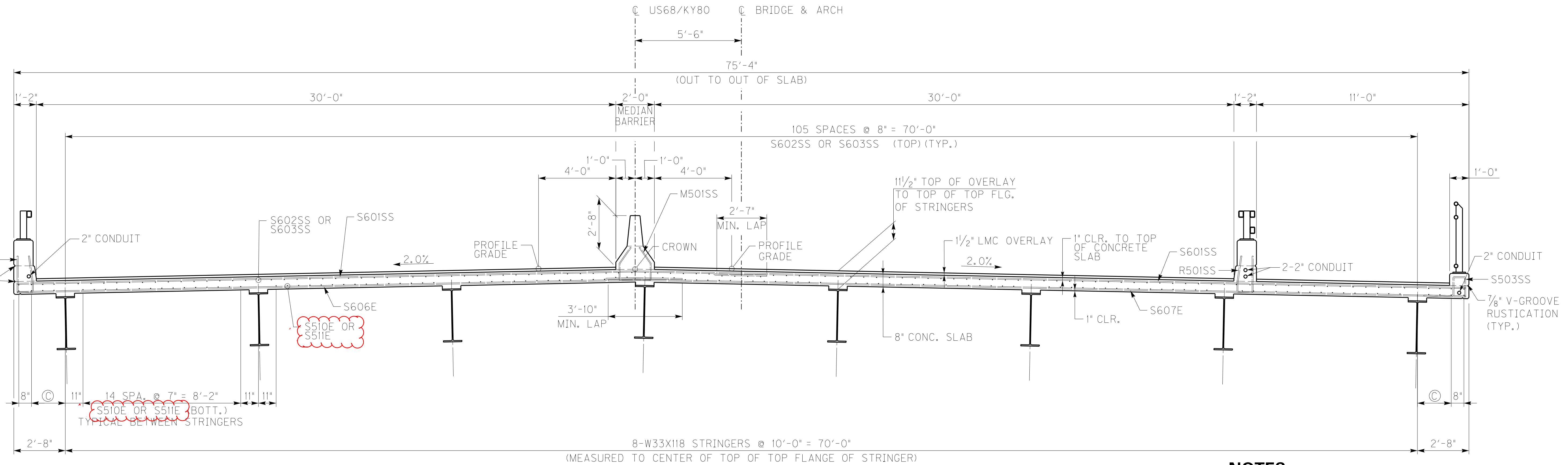
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 USER: Moryko,Dwyer
 DATE PLOTTED: November 25, 2013
 E-SHEET NAME: S24686 211
 MicroStation v8.11.7.469

FILE NAME: C:\PWW81-LOCAL\BAKER_PROJECTS\CWETHINGTON\DOI4582\S24686_SLO1.DGN

USER: Moryko,Dwyer
DATE PLOTTED: November 25, 2013

E-SHEET NAME: S24686 210

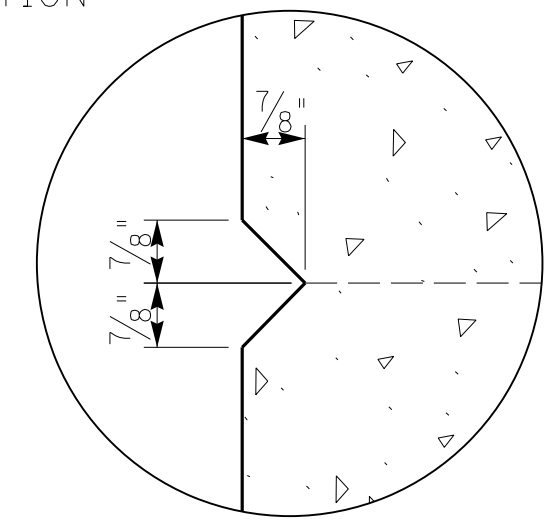
MicroStation v8.11.7.469



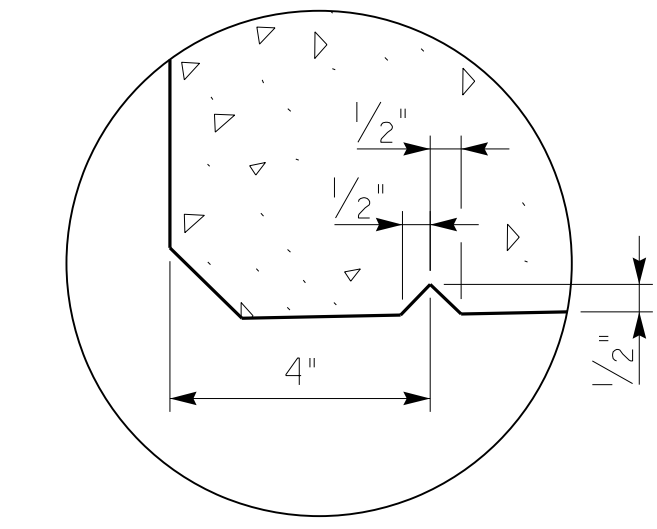
NOTES

1. "SS" IN THE BAR NAME INDICATES STAINLESS STEEL REINFORCING BARS. SEE SPECIAL NOTE FOR STAINLESS STEEL REINFORCEMENT BARS.
2. CLASS "AA" CONCRETE IS TO BE USED THROUGHOUT THE SPAN 5 SLAB AND BARRIERS.
3. 2" CONDUIT IS INCIDENTAL TO THE PATH DELINEATION LIGHTING AND NAVIGATION LIGHTING.
4. FOR GENERAL NOTES SEE SHEETS NOS. S004 - S006A.
5. FOR SLAB DETAILS SEE SHEETS NO. S213.
6. FOR TRAFFIC RAIL DETAILS, SEE SHEET NO. S215.
7. FOR COMBINATION RAIL DETAILS, SEE SHEET NO. S216.
8. FOR CURB AND PEDESTRIAN RAIL DETAILS SEE SHEET NOS. S248 - S250.
9. FOR SLAB BILL OF REINFORCEMENT SEE SHEET NO. S217.
10. THE OVERLAY SHALL MEET THE REQUIREMENT FOR LATEX CONCRETE OVERLAY FOR NEW STRUCTURES IN ACCORDANCE WITH 606.03.17 (B).

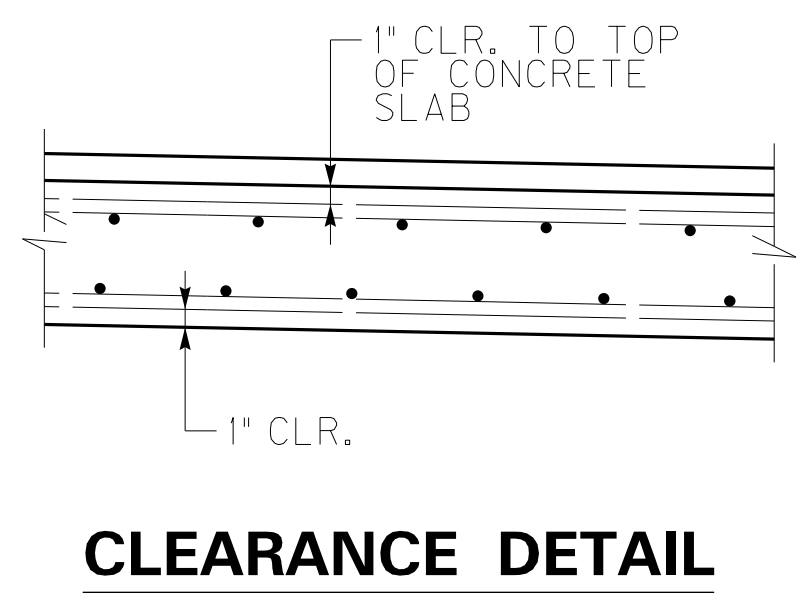
TYPICAL SECTION
LOOKING AHEAD STATION



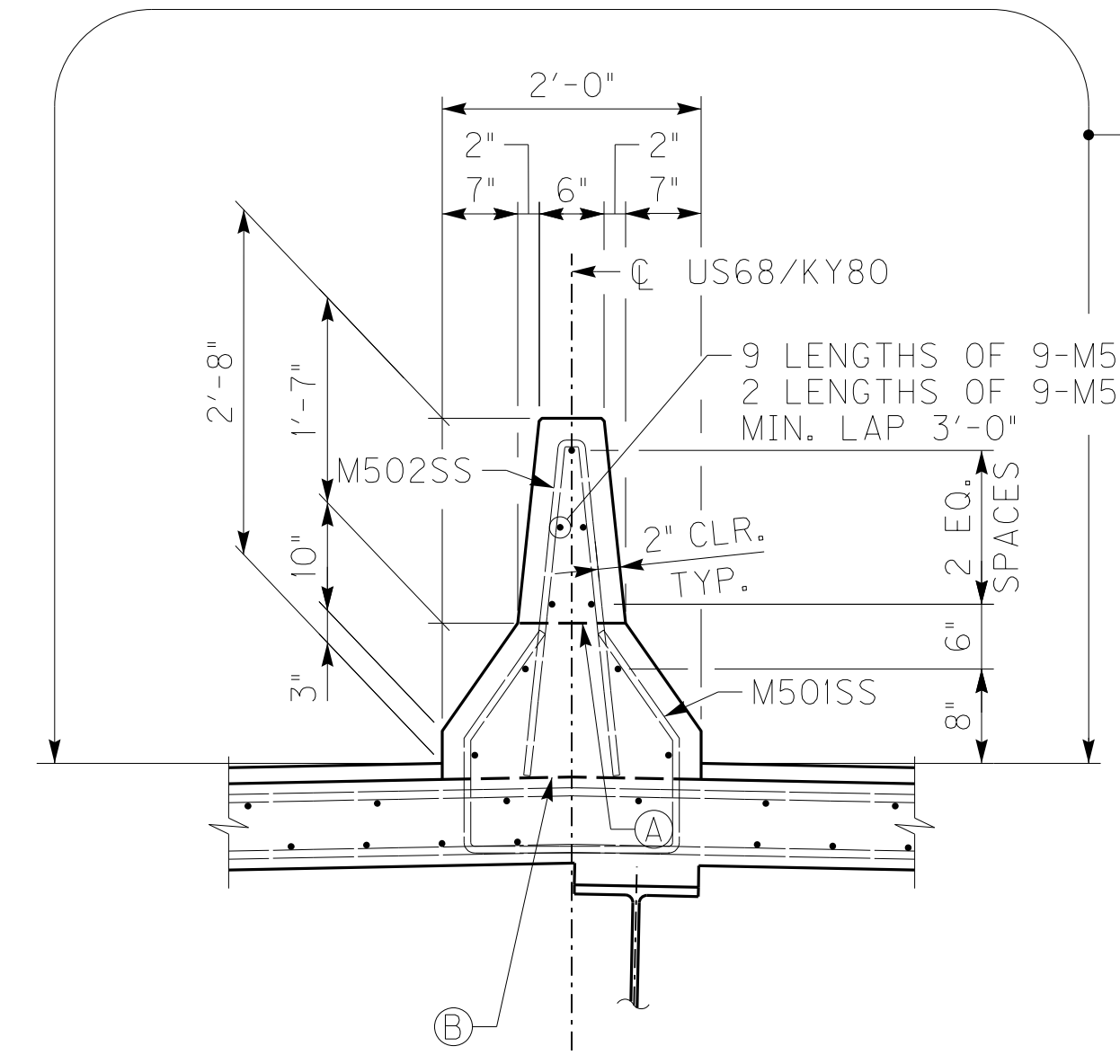
7/8" "V-GROOVE" RUSTICATION



DRIP NOTCH DETAIL



CLEARANCE DETAIL

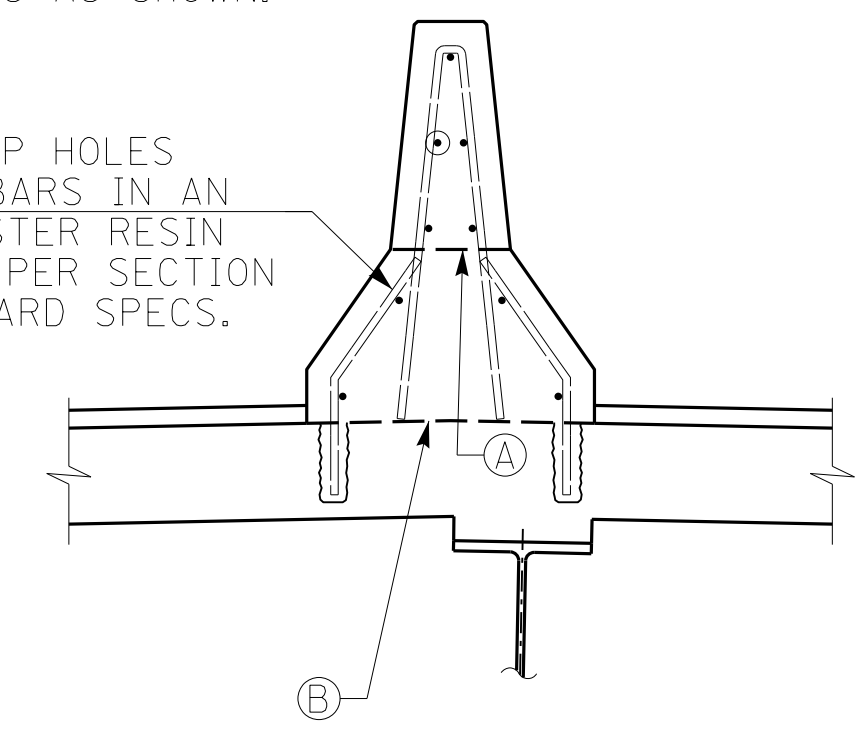


MEDIAN BARRIER DETAIL

LIMITS OF V-NOTCH CRACK CONTROL JT. & LIMITS OF MASONRY COATING FINISH (SEE 601.03.18 (B))

* BARS M501SS MAY BE REPLACED WITH DOWEL BARS AS SHOWN.

DOWEL BARS, DRILL 3/4"x6" DEEP HOLES AND SET DOWEL BARS IN AN APPROVED POLYESTER RESIN BONDING SYSTEM PER SECTION 511 OF THE STANDARD SPECS.



OPTIONAL MEDIAN BARRIER CONNECTION

LEGEND

- (A) PERMISSIBLE CONSTRUCTION JOINT.
- (B) MANDATORY ROUGHENED CONSTRUCTION JOINT. CONCRETE ABOVE THIS JOINT SHALL BE PLACED AFTER THE SLAB HAS BEEN PROPERLY CURED.
- (C) 3 SPA. @ 7" = 1'-9" S602SS OR S603SS (TOP) S510E OR S511E (BOTT.) TYP. EA. OVERHANG



ITEM NUMBER	01-180.70
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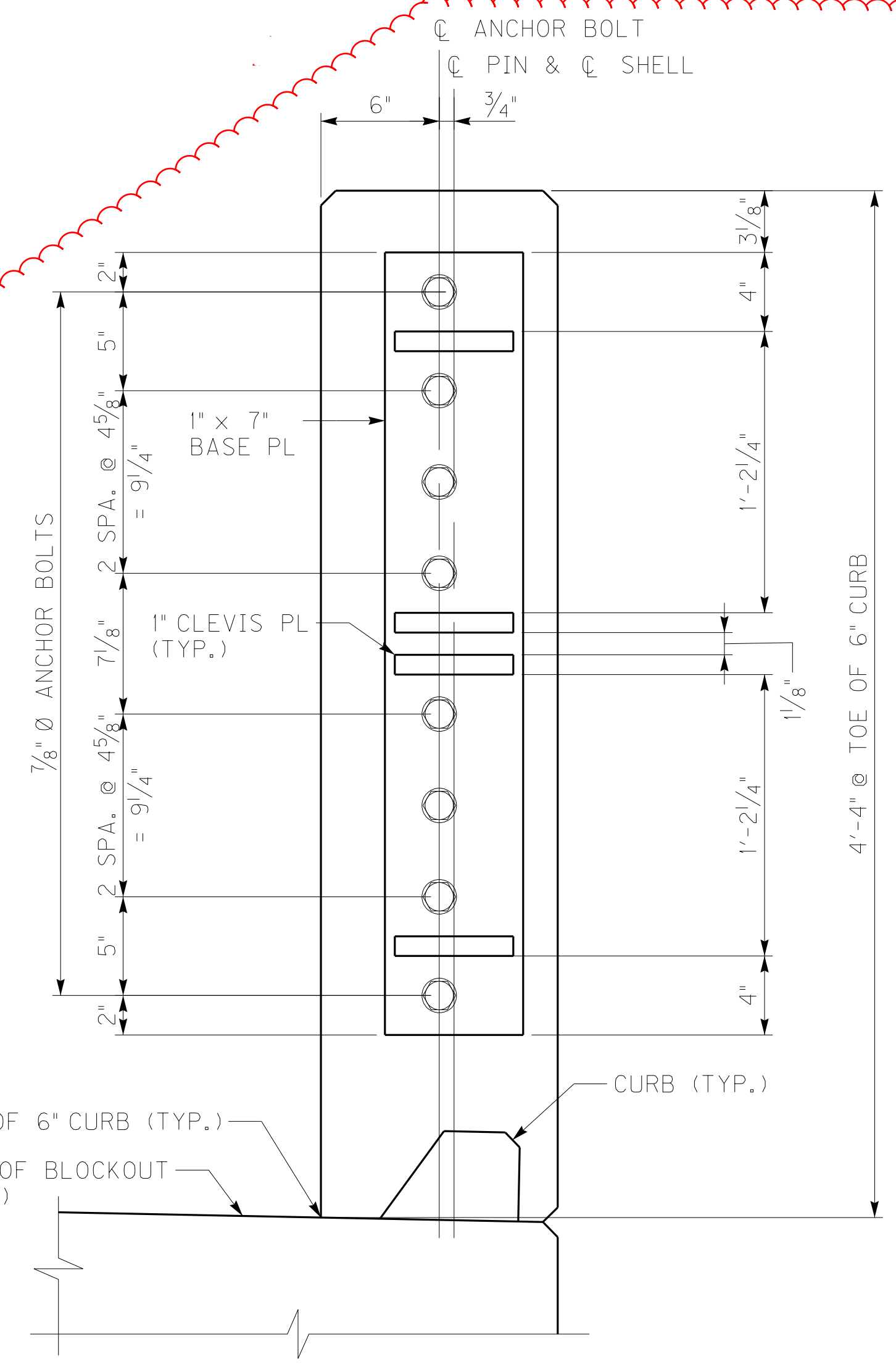
REVISION		DATE
REVISION		11/25/13
DATE: NOVEMBER 15, 2013	CHECKED BY	
DESIGNED BY: ACK	LEV	
DETAILED BY: MJD	ACK	
Commonwealth of Kentucky		
DEPARTMENT OF HIGHWAYS		
COUNTY		
MARSHALL / TRIGG		
ROUTE	CROSSING	
US68	KENTUCKY LAKE	
SLAB TYPICAL SECTION		
PREPARED BY		SHEET NO.
MICHAEL BAKER JR., INC.		S210
9750 ORMSBY STATION ROAD		DRAWING NO.
SUITE 210		24686
LOUISVILLE, KY 40223		

FILE NAME: C:\PW\81-LOCAL\BAKER_PROJECTS\CWETHINGTON\041582\S24686_Eu16.DGN

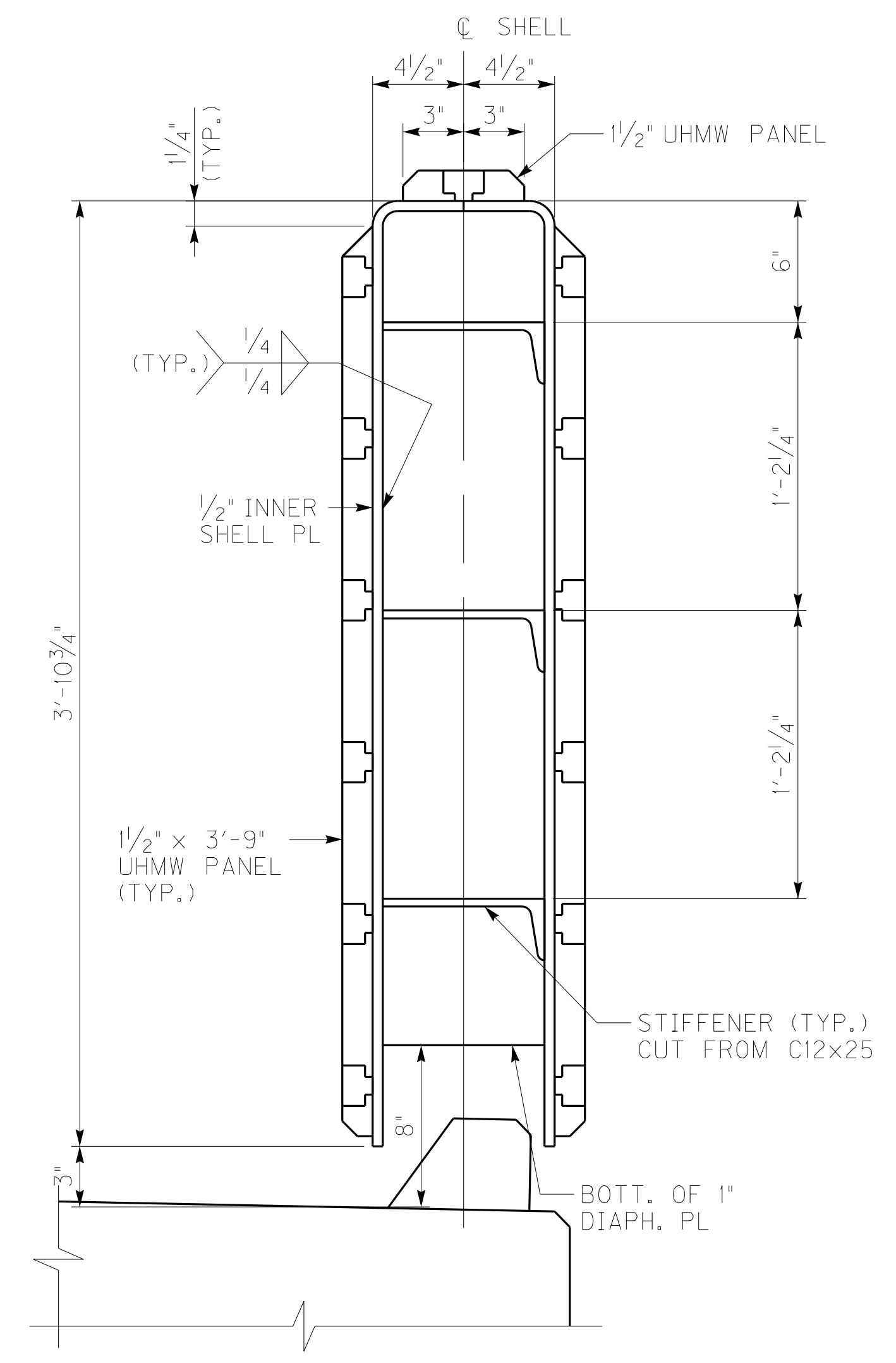
USER: Moryko,Dwyer
DATE PLOTTED: November 25, 2013

E-SHEET NAME: S24686 207A

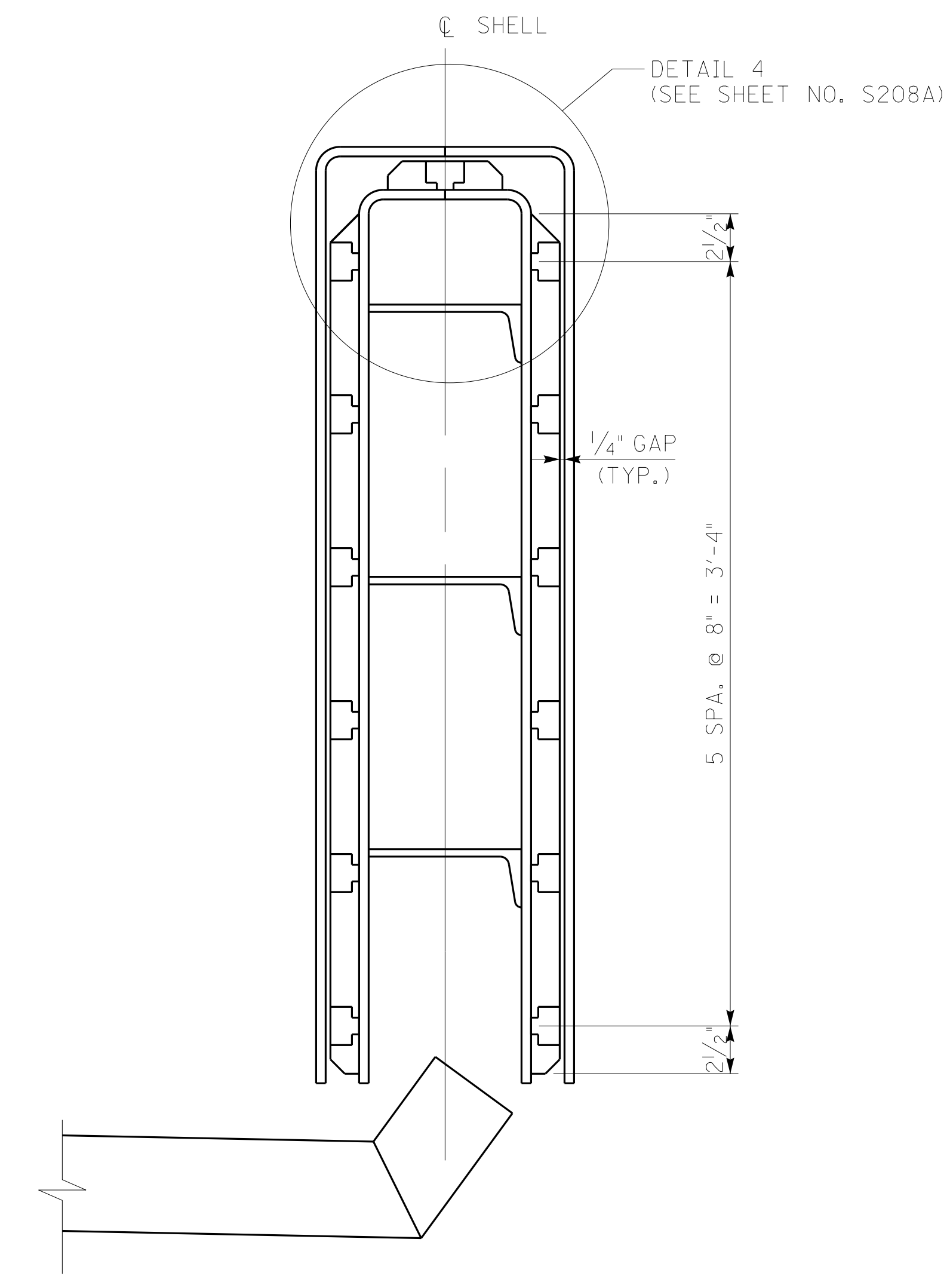
MicroStation v8.11.7.469



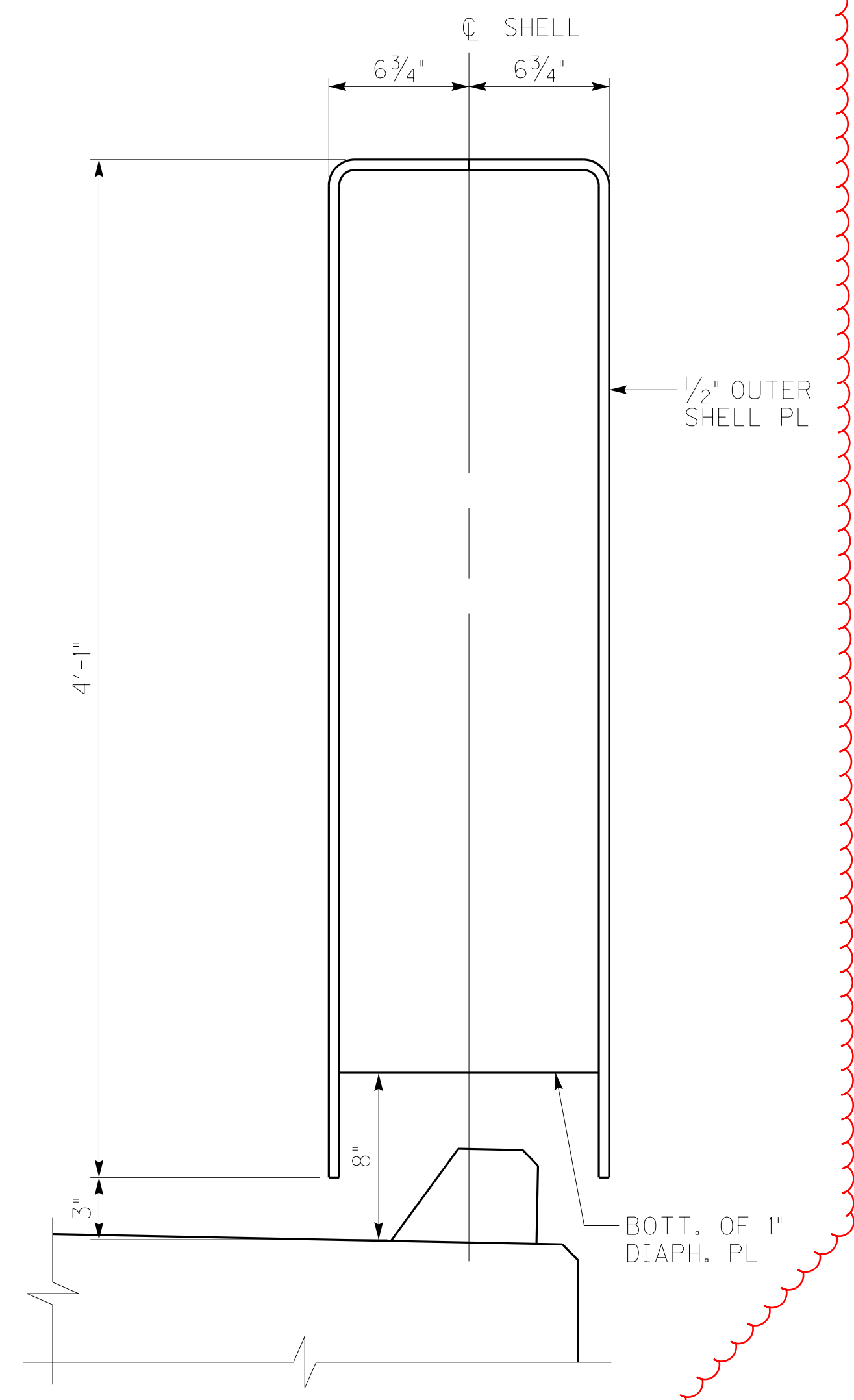
SECTION W-W
MAIN SPAN SHOWN
APPROACH SPAN OPPOSITE HAND



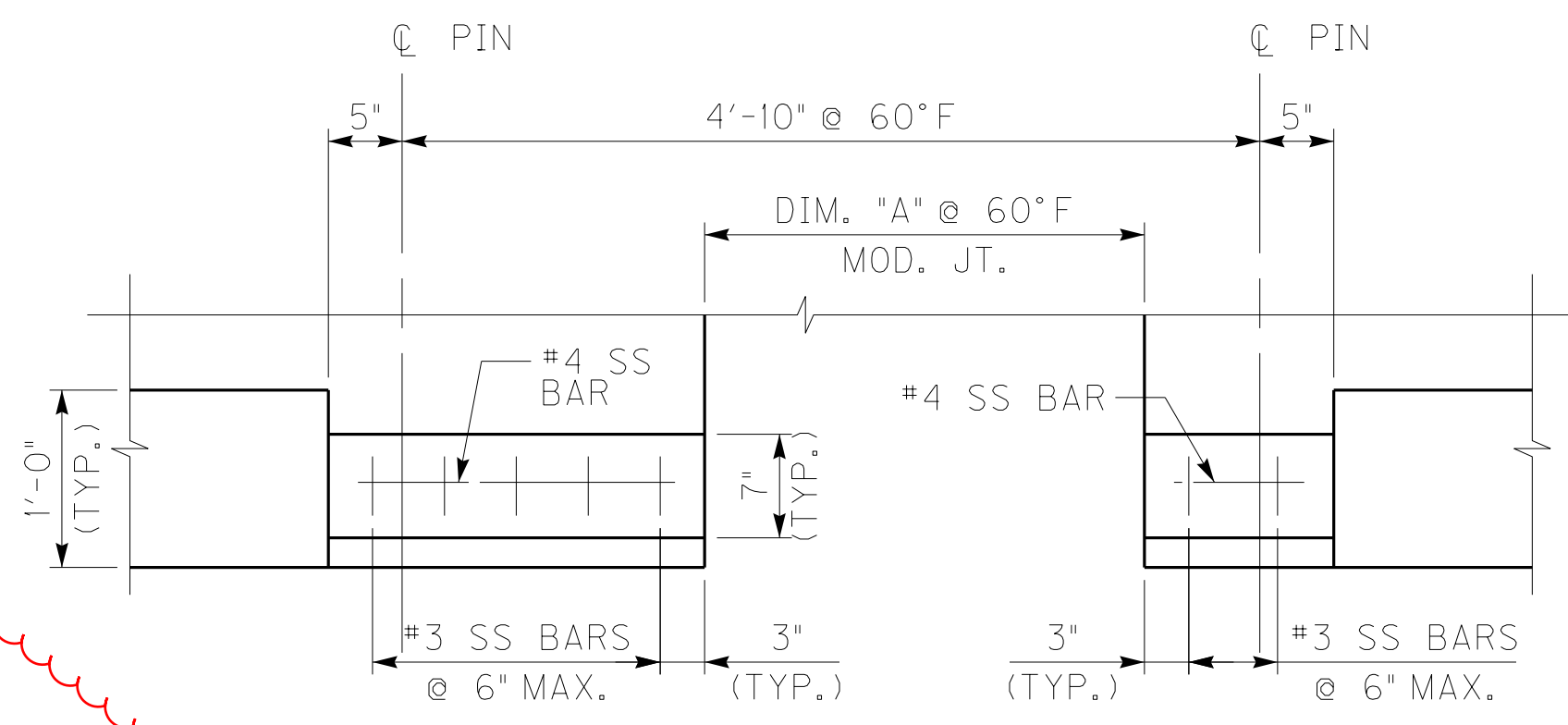
SECTION T-T



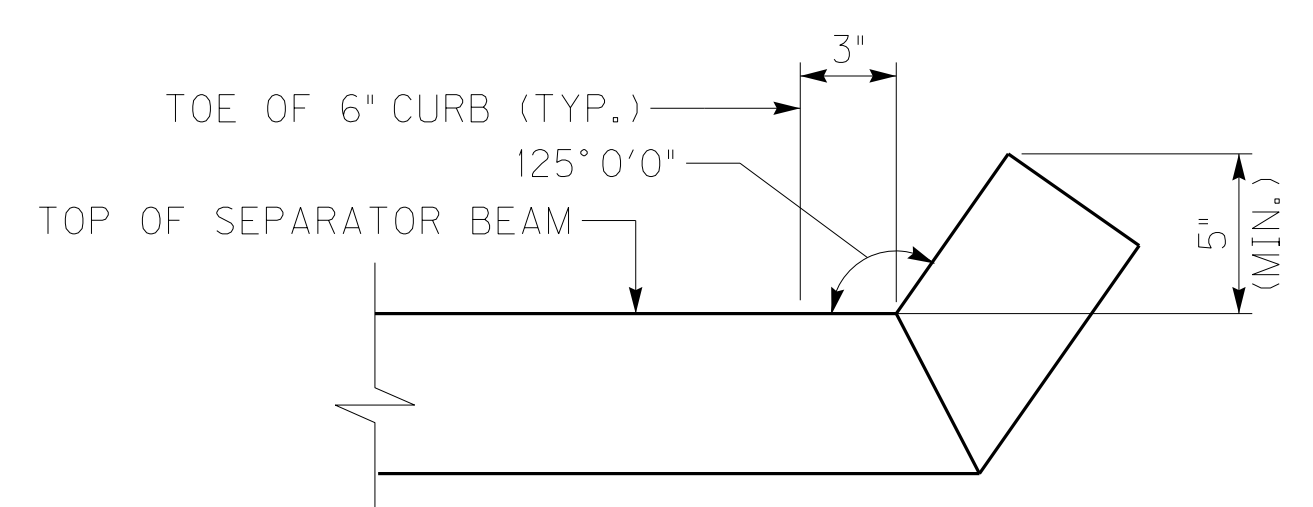
SECTION U-U



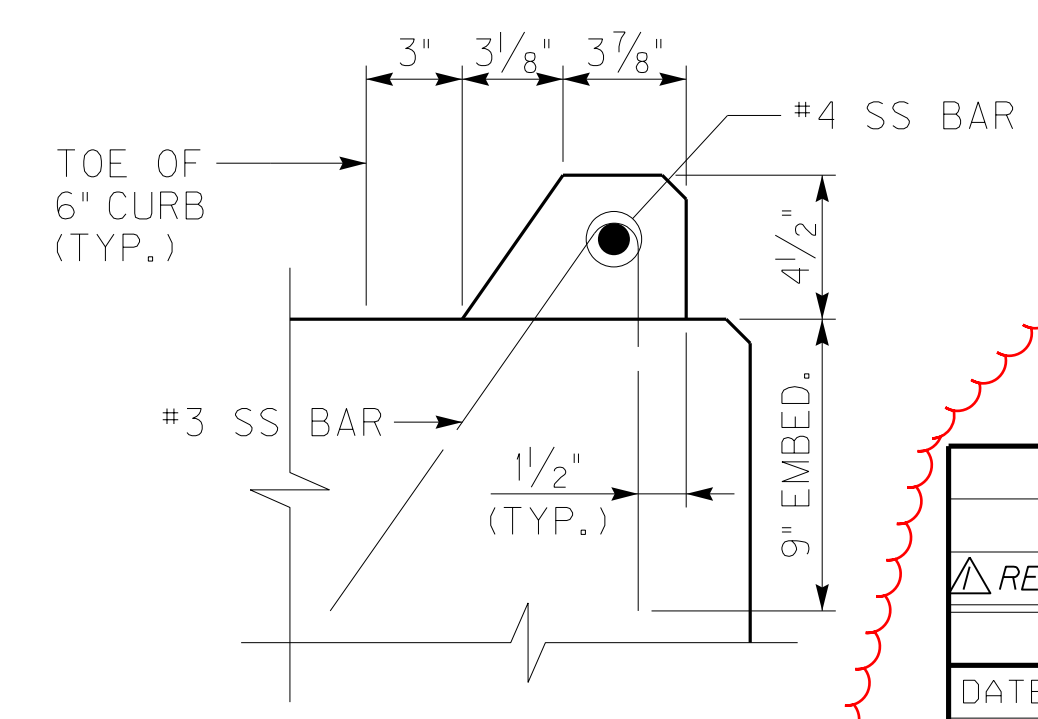
SECTION V-V



CURB PLAN
CONTRACTOR SHALL PROVIDE BILL OF REINFORCEMENT FOR #3 SS & #4 SS BARS TO FIT JOINT SELECTED



UPTURN DETAIL



CURB DETAIL

NOTES

1. FOR CLEVIS DETAIL, INSIDE AND OUTSIDE SHELL PIN PLATE DETAIL, AND UHMW PANEL FASTENER DETAIL, SEE SHEET NO. S208A.
2. THE COST TO FURNISH AND INSTALL CURB COVER PLATE, INCLUDING CURB UNDER SHELL PLATES, SHALL BE INCLUDED IN THE COST OF MODULAR EXPANSION JOINT.

REVISED 12-6-13

REVISION		DATE
REVISOR		DATE
DATE: NOVEMBER 15, 2013	CHECKED BY	
DESIGNED BY: DMB	TJT	
DETAILED BY: MJD	DMB	
Commonwealth of Kentucky DEPARTMENT OF HIGHWAYS		
COUNTY MARSHALL / TRIGG		
ROUTE US68	CROSSING KENTUCKY LAKE	
MODULAR EXP. JOINT DETAILS - 8		
ITEM NUMBER 01-180.70	PREPARED BY Baker	SHEET NO. S209A DRAWING NO. 24686

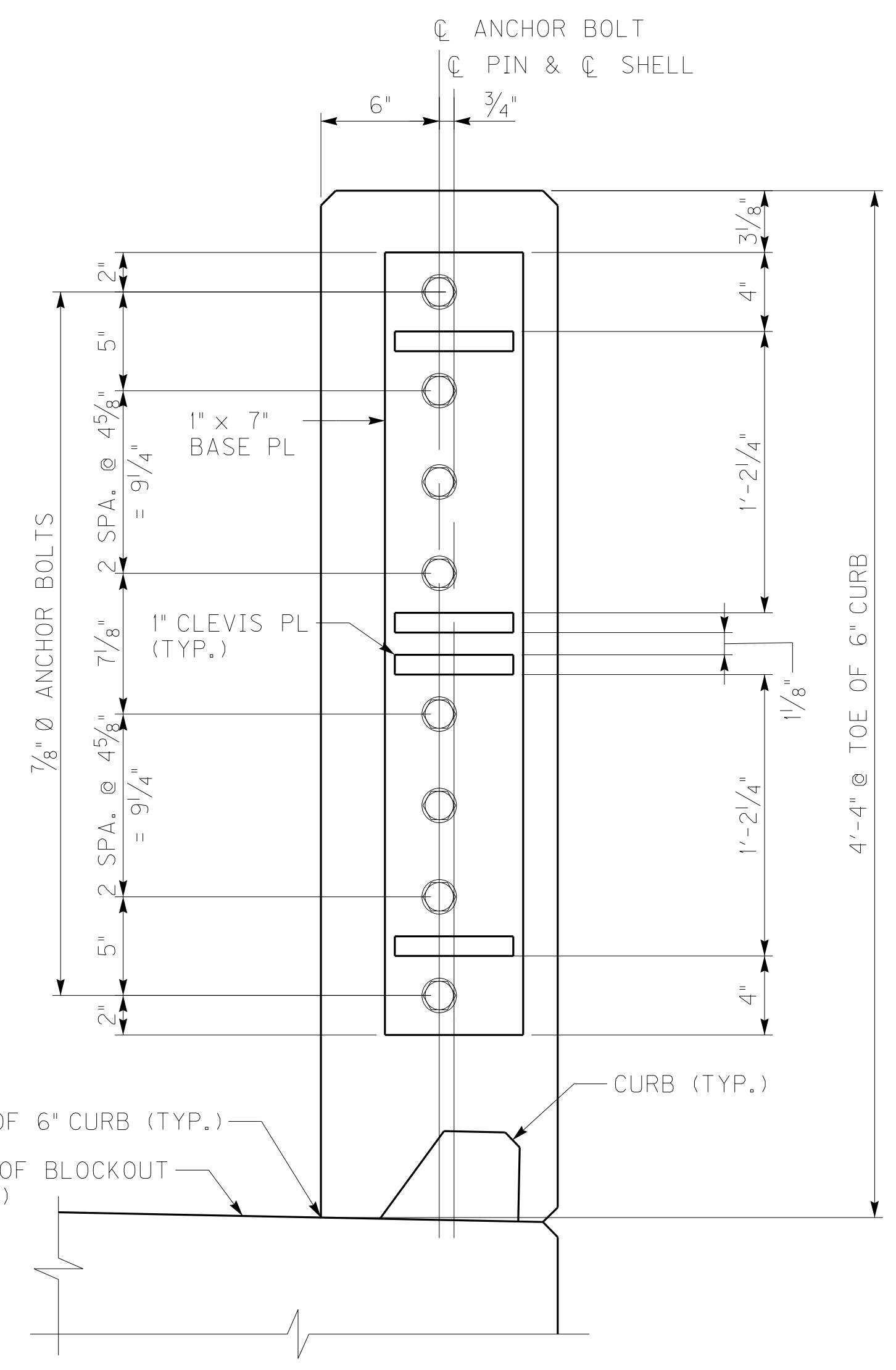


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USER: Mgr\jcd\dwyer
DATE PLOTTED: November 25, 2013

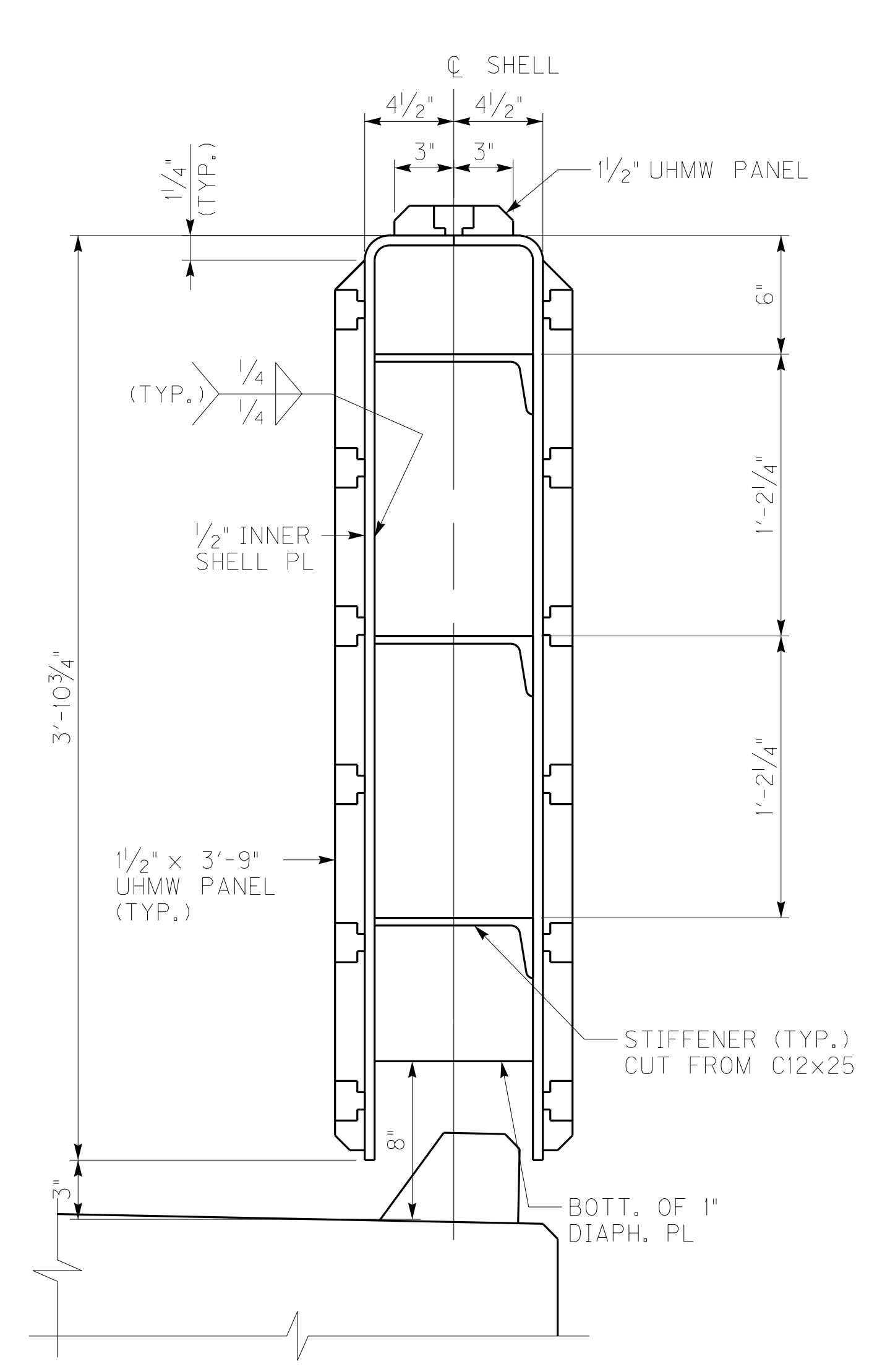
E-SHEET NAME: S24686_207A

MicroStation v8.11.7.469

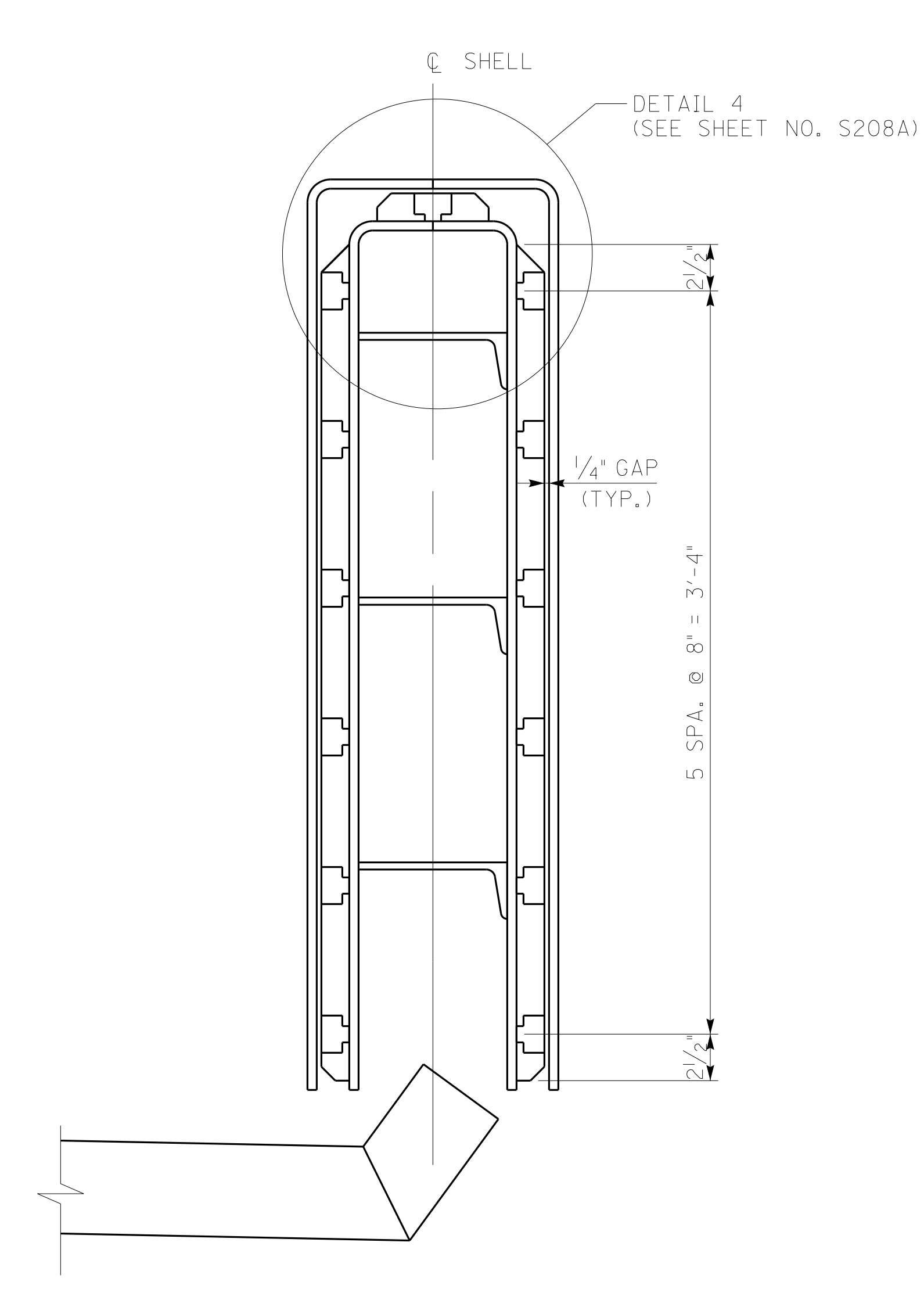


SECTION W-W

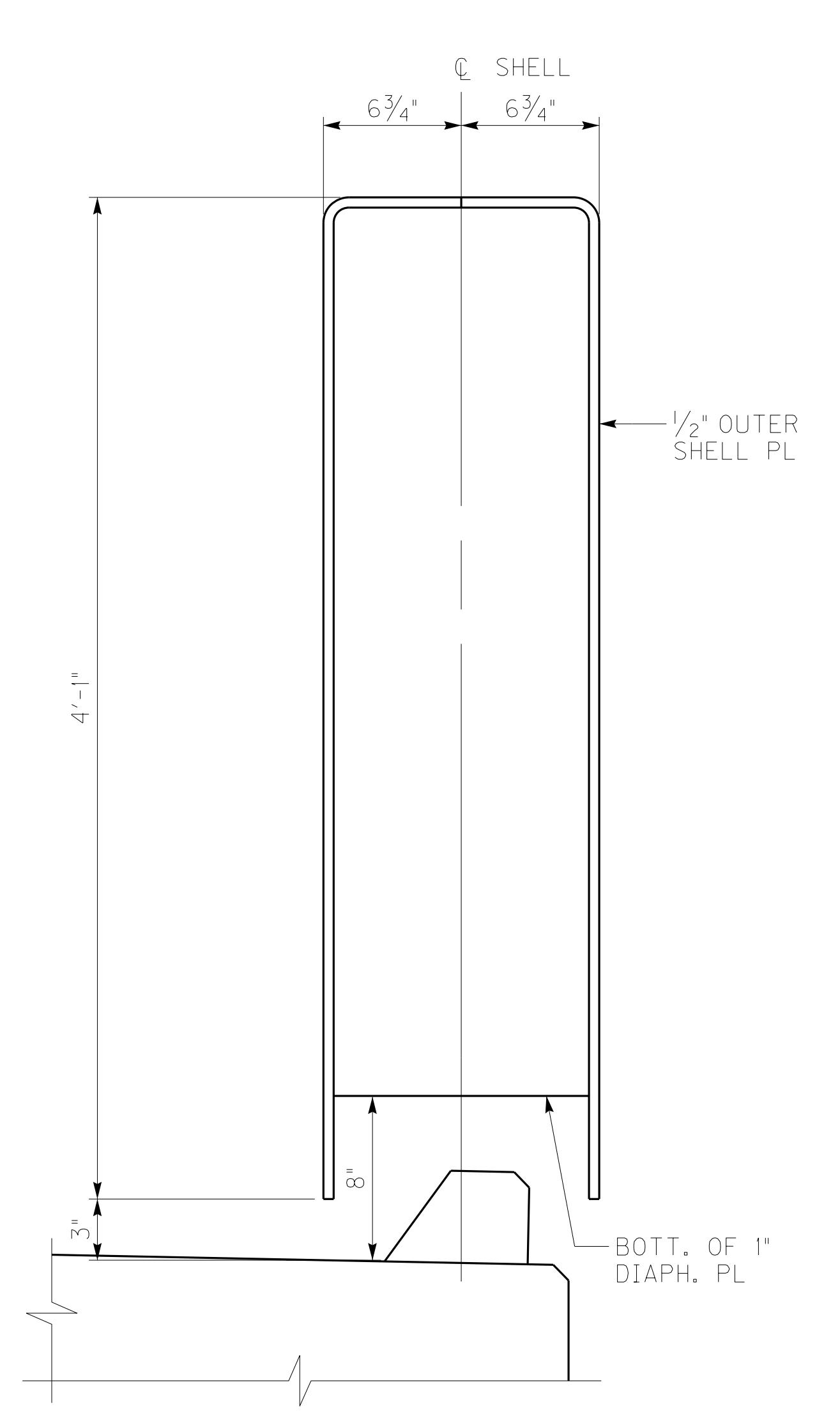
MAIN SPAN SHOWN
APPROACH SPAN OPPOSITE HAND



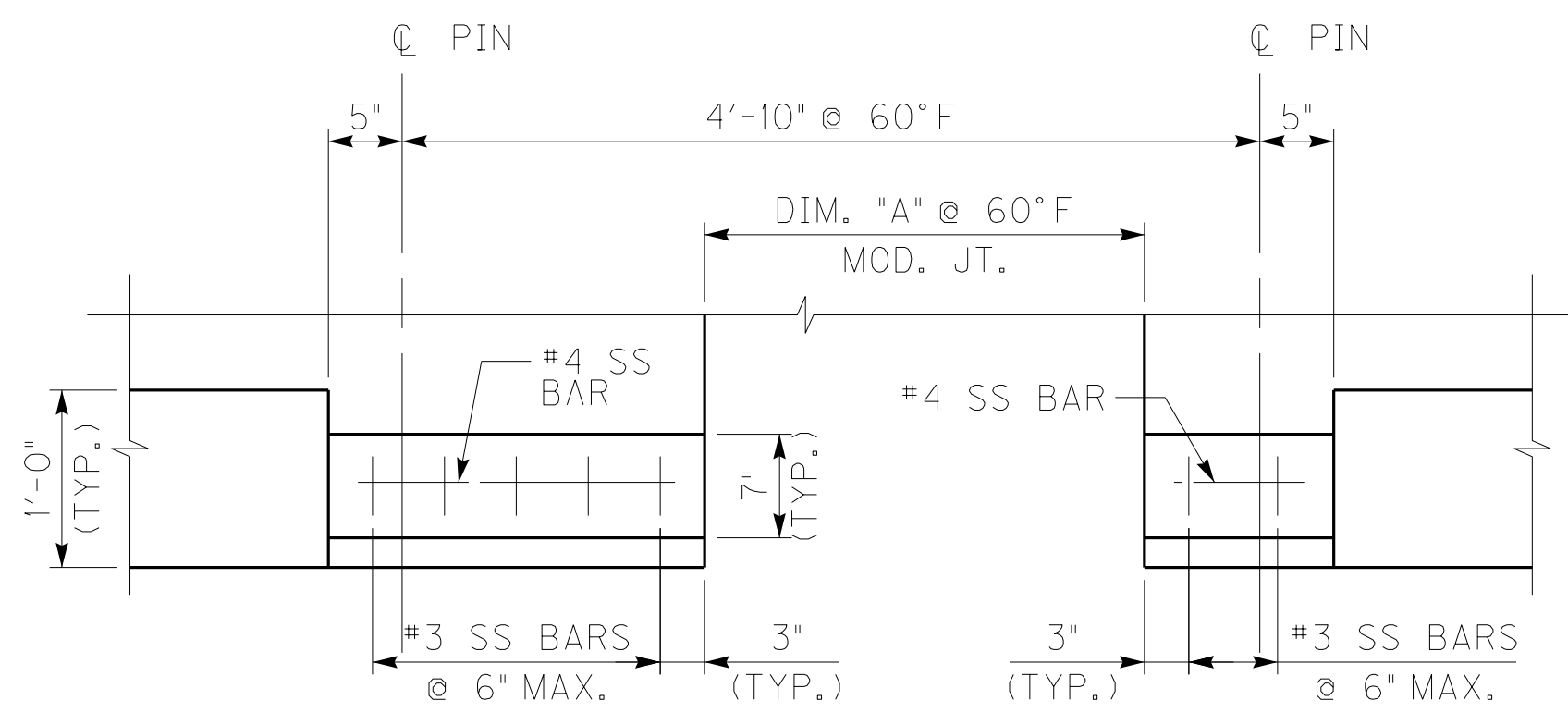
SECTION T-T



SECTION U-U

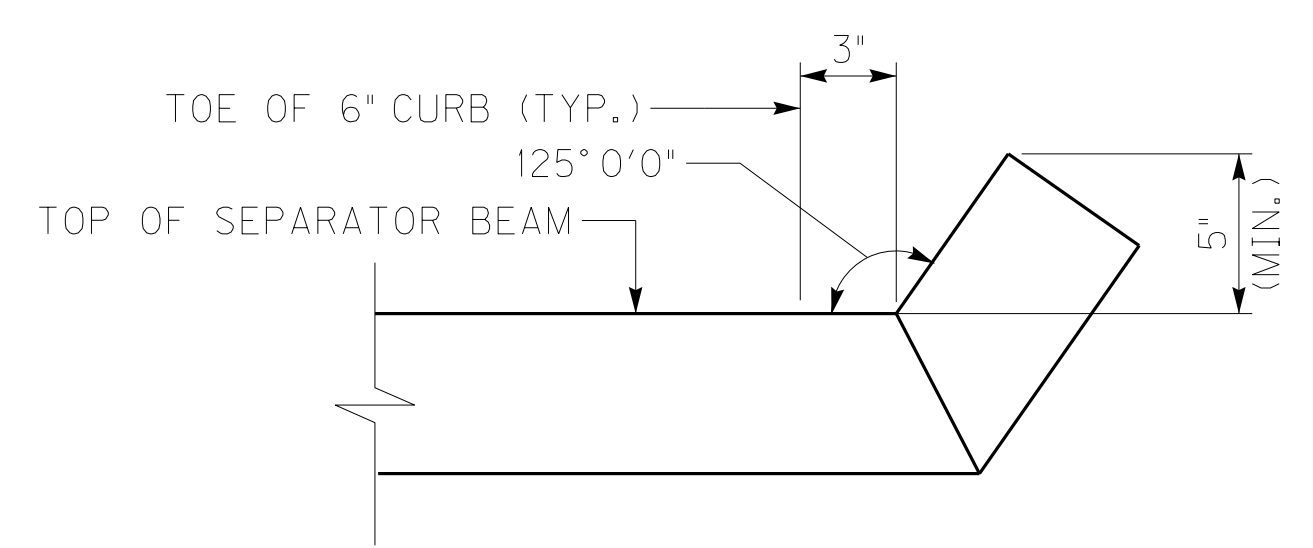


SECTION V-V

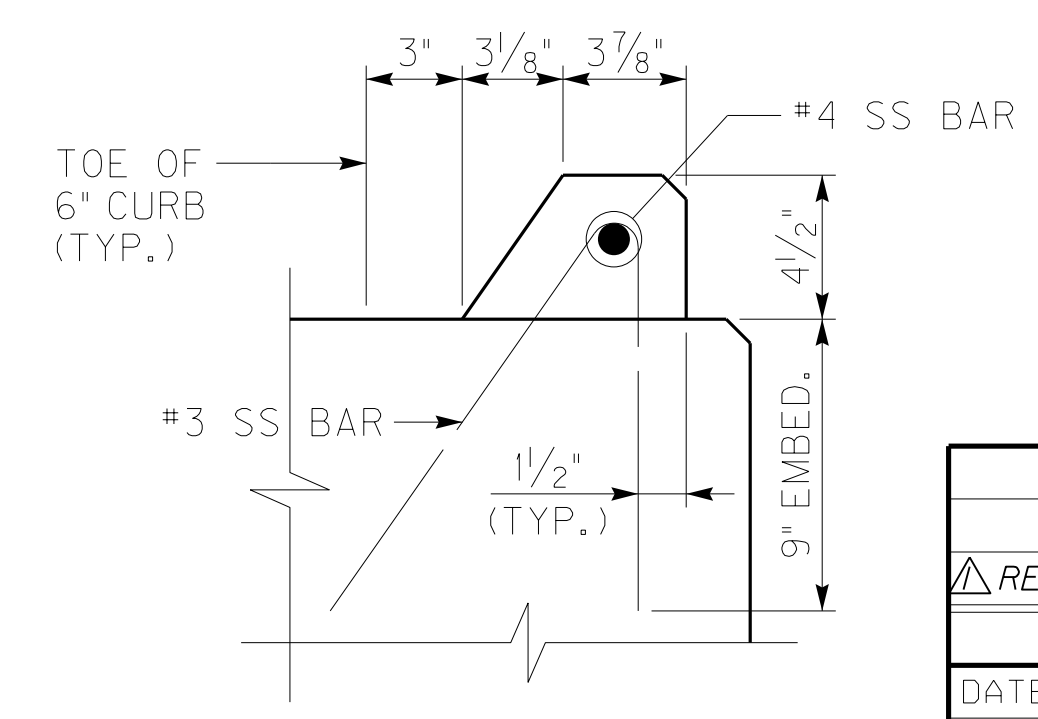


CURB PLAN

CONTRACTOR SHALL PROVIDE BILL OF REINFORCEMENT FOR #3 SS & #4 SS BARS TO FIT JOINT SELECTED



UPTURN DETAIL



CURB DETAIL

NOTES

1. FOR CLEVIS DETAIL, INSIDE AND OUTSIDE SHELL PIN PLATE DETAIL, AND UHMW PANEL FASTENER DETAIL, SEE SHEET NO. S208A.
2. THE COST TO FURNISH AND INSTALL CURB COVER PLATE, INCLUDING CURB UNDER SHELL PLATES, SHALL BE INCLUDED IN THE COST OF MODULAR EXPANSION JOINT.



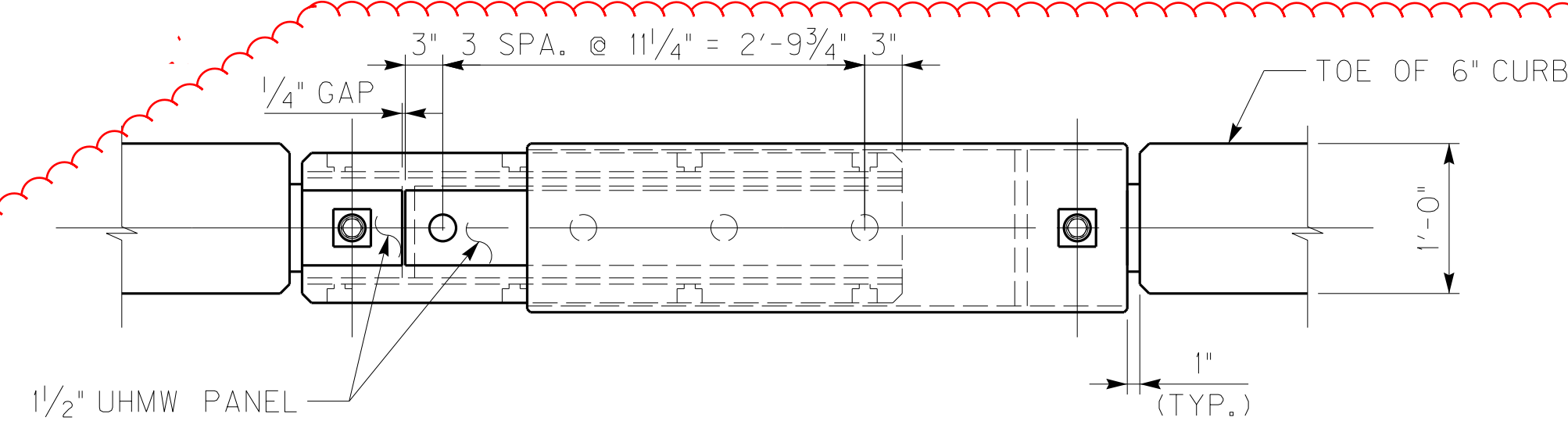
ITEM NUMBER	01-180.70
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REVISION		DATE
1	REVISED SHEET	11/25/13
DATE: NOVEMBER 15, 2013	DESIGNED BY: DMB	CHECKED BY: TJT
DESIGNED BY: DMB	DATE: NOVEMBER 15, 2013	DETAILED BY: MJD
DETAILED BY: MJD	DATE: NOVEMBER 15, 2013	

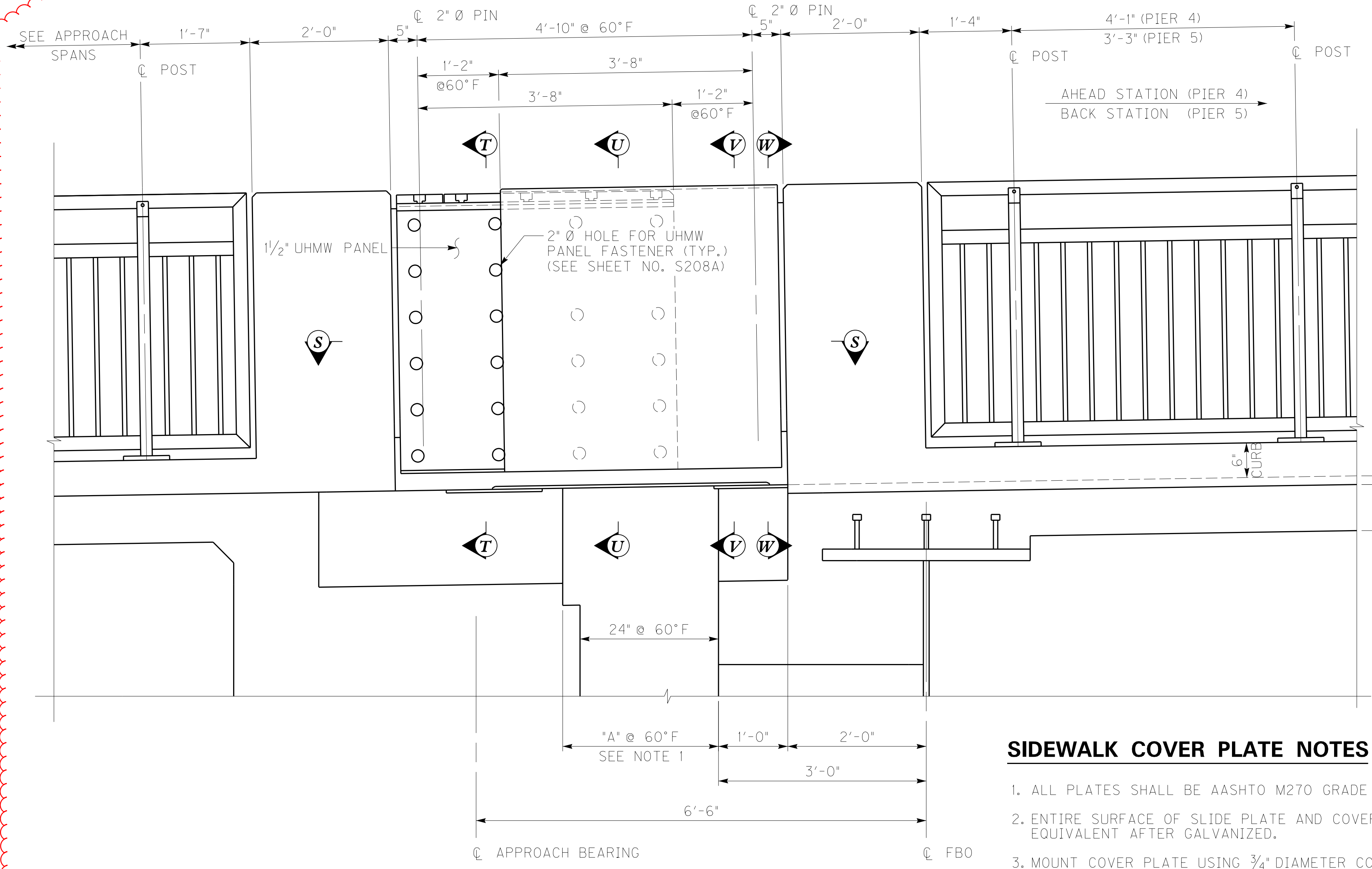
Commonwealth of Kentucky
DEPARTMENT OF HIGHWAYS
COUNTY
MARSHALL / TRIGG

ROUTE US68	CROSSING KENTUCKY LAKE
MODULAR EXP. JOINT DETAILS - 8	
PREPARED BY Baker	SHEET NO. S209A
MICHAEL BAKER JR., INC. 9750 ORMSBY STATION ROAD SUITE 210 LOUISVILLE, KY 40223	DRAWING NO. 24686

FILE NAME: C:\PW\81-LOCAL\BAKER_PROJECTS\CWETHINGTON\DOI4582\S24686 E.U5.DGN
 USER: Moryko,Dwyer
 DATE PLOTTED: November 25, 2013
 E-SHEET NAME: S24686 209
 MicroStation v8.11.7.469

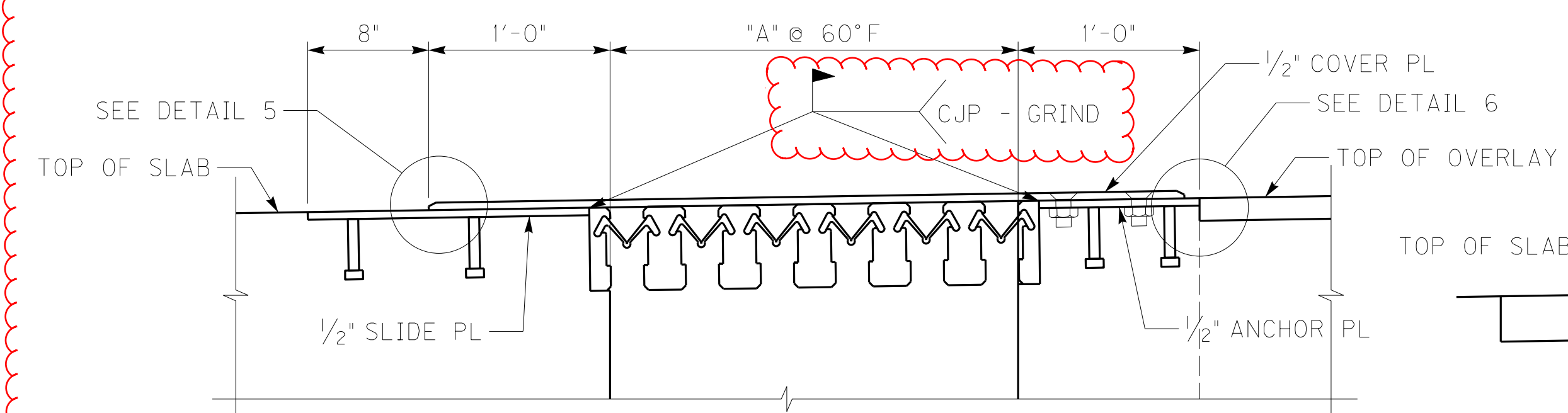


CURB PLAN

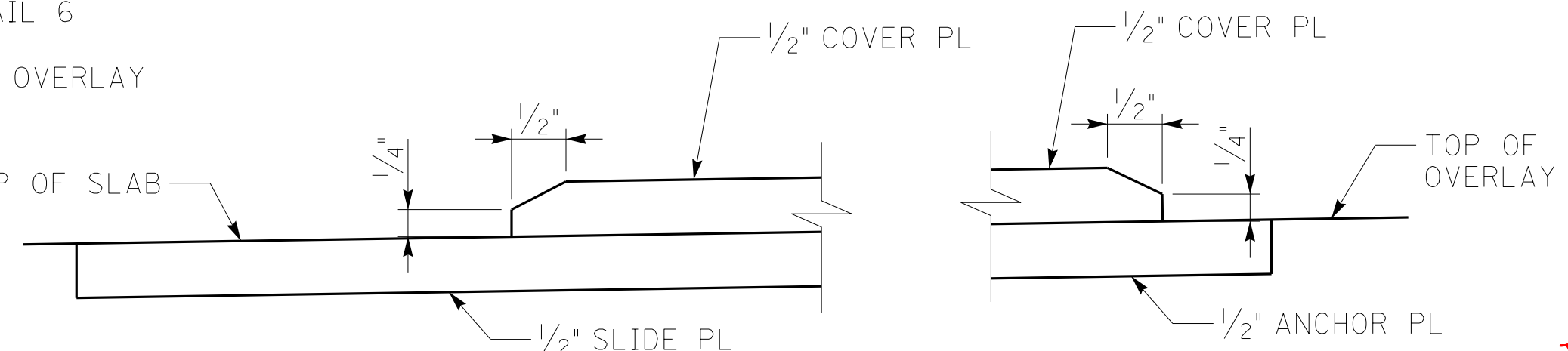


SECTION E-E

CURB COVER PL / PEDESTRIAN RAIL



SECTION D-D



DETAIL 5

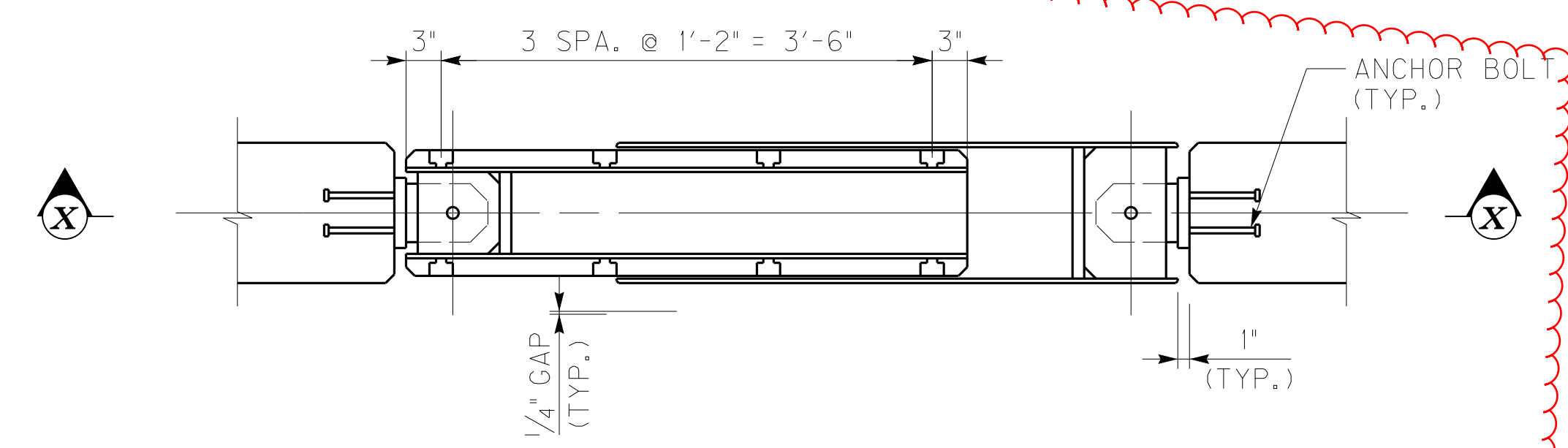
DETAIL 6

NOTES

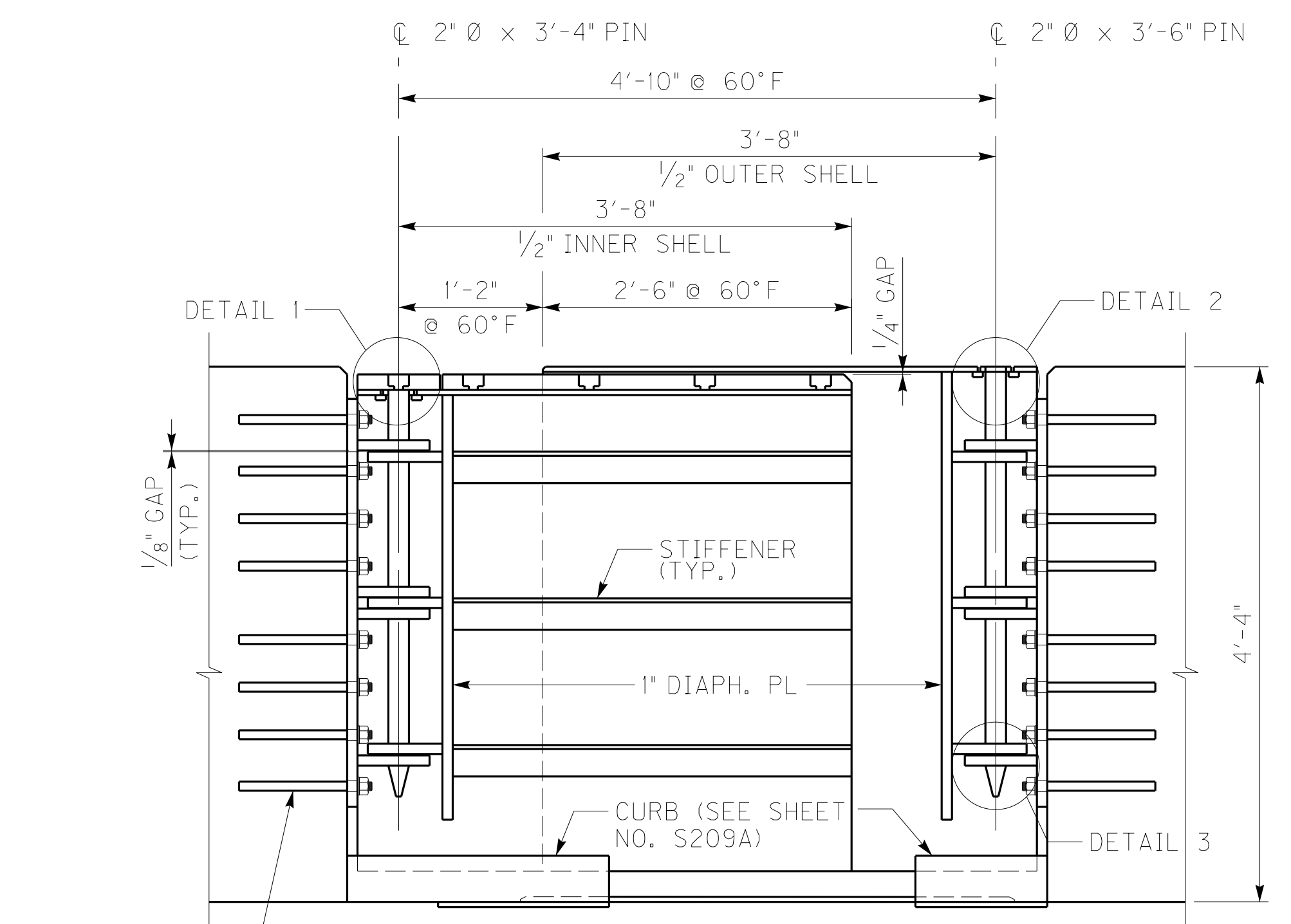
1. FOR "A" @ 60° F. SEE SHEET NO. S206.
2. FOR SLAB DETAILS SEE SHEET NO. S211.
3. FOR PEDESTRIAN RAILING DETAILS SEE SHEET NOS. S248 & S249.
4. FOR MODULAR EXPANSION JOINT NOTES, SEE SHEET NOS. S206 AND S207A.
5. FOR DETAILS 1, 2 & 3, SEE SHEET NO. S207.

SIDEWALK COVER PLATE NOTES

1. ALL PLATES SHALL BE AASHTO M270 GRADE 50 AND GALVANIZED AFTER FABRICATION.
2. ENTIRE SURFACE OF SLIDE PLATE AND COVER PLATE SHALL BE COATED WITH "SLIPNOT" OR EQUIVALENT AFTER GALVANIZED.
3. MOUNT COVER PLATE USING 3/4" DIAMETER COUNTERSUNK CAP SCREWS WITH NUTS TACK WELDED TO BACK OF ANCHOR PLATE AND COVERED WITH PLASTIC END CAP.
4. MOUNT SLIDE PLATE AND ANCHOR PLATE WITH 1/2" x 6" STUD ANCHORS AND 1/2" x 2" STUD ANCHORS OVER BOXES ONLY.
5. COVER PLATES SHALL BE MOUNTED ON MAIN SPAN SIDE OF JOINT AND SHALL SLIDE ON APPROACH SIDE.



SECTION S-S



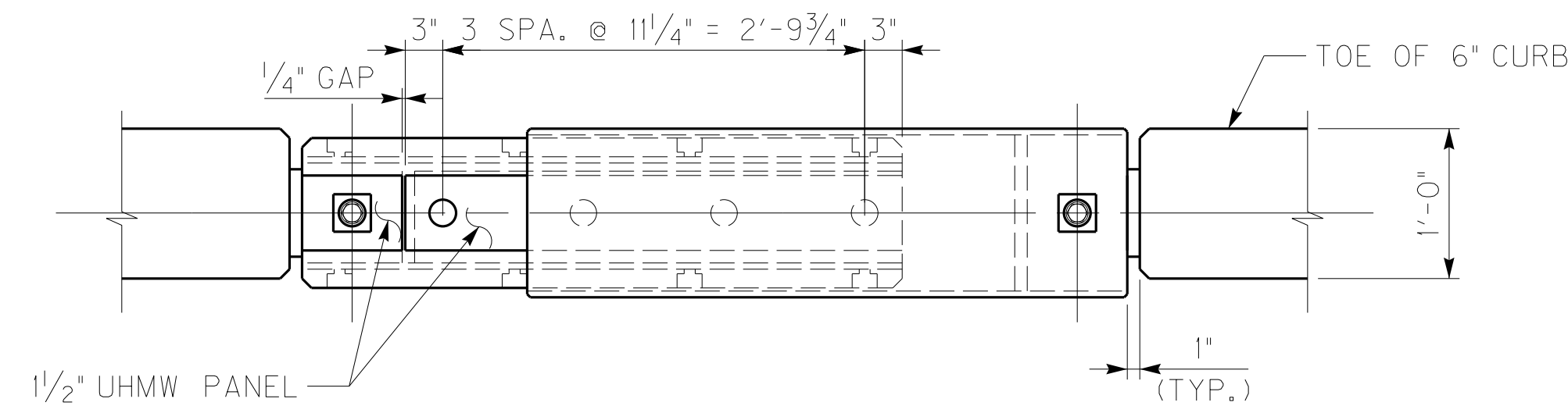
SECTION X-X

REVISED 12-6-13

REVISION		DATE
Δ REVISED SHEET		11/25/13
DATE: NOVEMBER 15, 2013	DESIGNED BY: DMB	CHECKED BY: TJT
DESIGNED BY: DMB	DESIGNED BY: MJD	CHECKED BY: DMB
Commonwealth of Kentucky DEPARTMENT OF HIGHWAYS		
COUNTY MARSHALL / TRIGG		
ROUTE US68	CROSSING KENTUCKY LAKE	
MODULAR EXP. JOINT DETAILS - 7		
ITEM NUMBER 01-180.70	PREPARED BY Baker	SHEET NO. S209 DRAWING NO. 24686



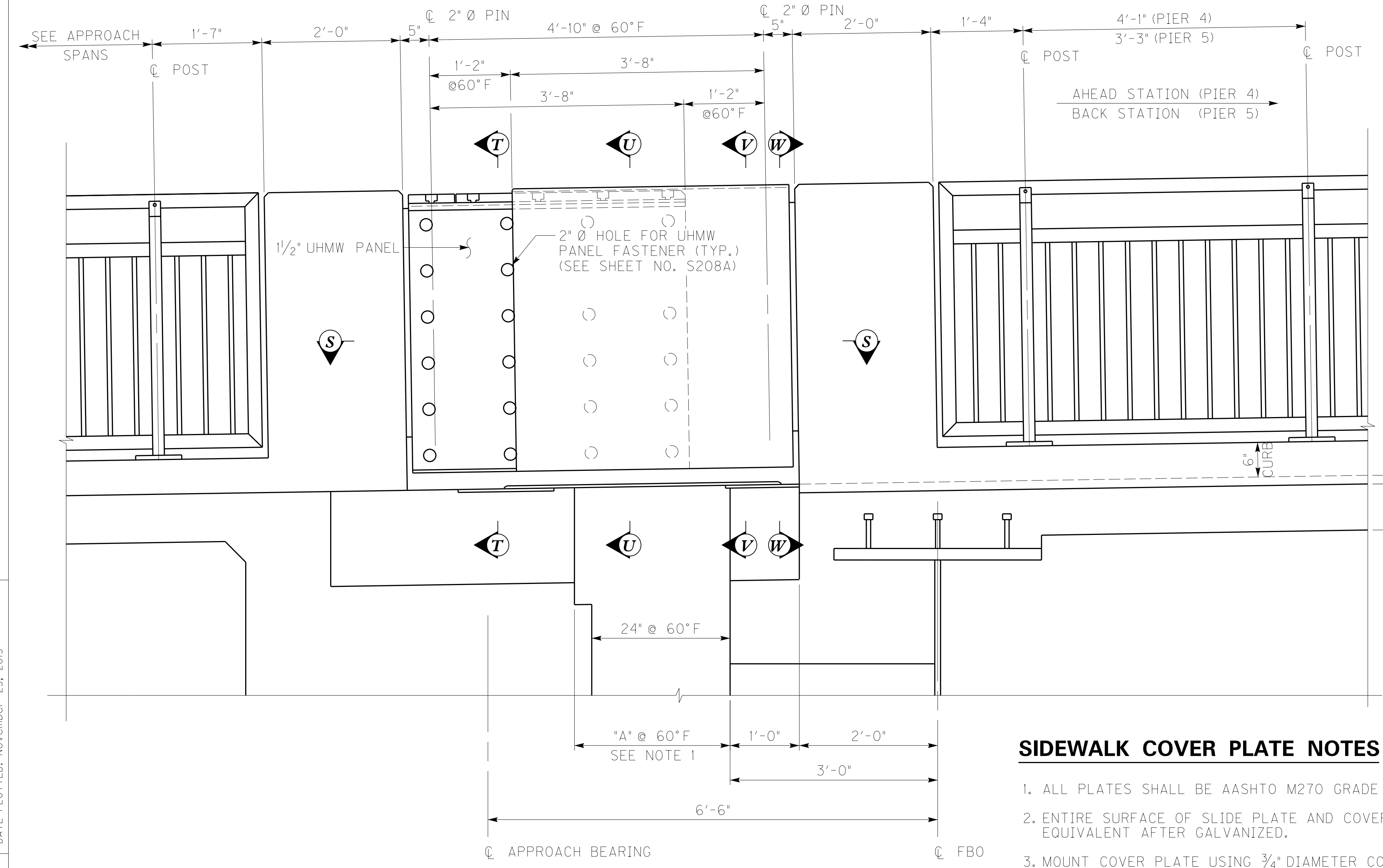
FILE NAME: C:\PW\81-LOCAL\BAKER_PROJECTS\CWETHINGTON\DOI41582\S24686_EUJ5.DGN
 USER: MCR\jcd\dwyer
 DATE PLOTTED: November 25, 2013
 E-SHEET NAME: S24686 209
 MicroStation v8.11.7.469



CURB PLAN

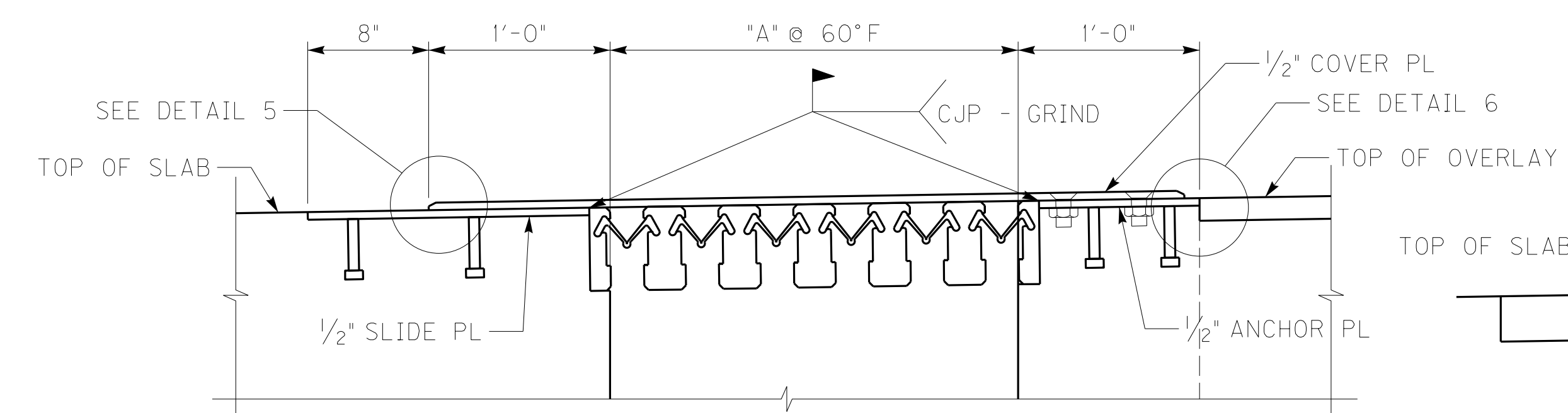
NOTES

1. FOR "A" @ 60° F. SEE SHEET NO. S206.
2. FOR SLAB DETAILS SEE SHEET NO. S211.
3. FOR PEDESTRIAN RAILING DETAILS SEE SHEET NOS. S248 & S249.
4. FOR MODULAR EXPANSION JOINT NOTES, SEE SHEET NOS. S206 AND S207A.
5. FOR DETAILS 1, 2 & 3, SEE SHEET NO. S207.

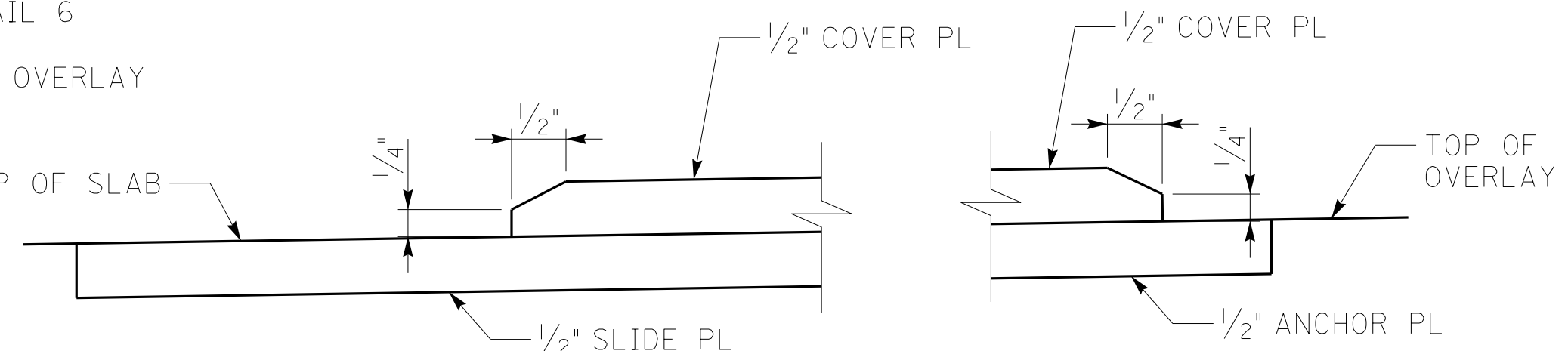


SECTION E-E

CURB COVER PL / PEDESTRIAN RAIL



SECTION D-D

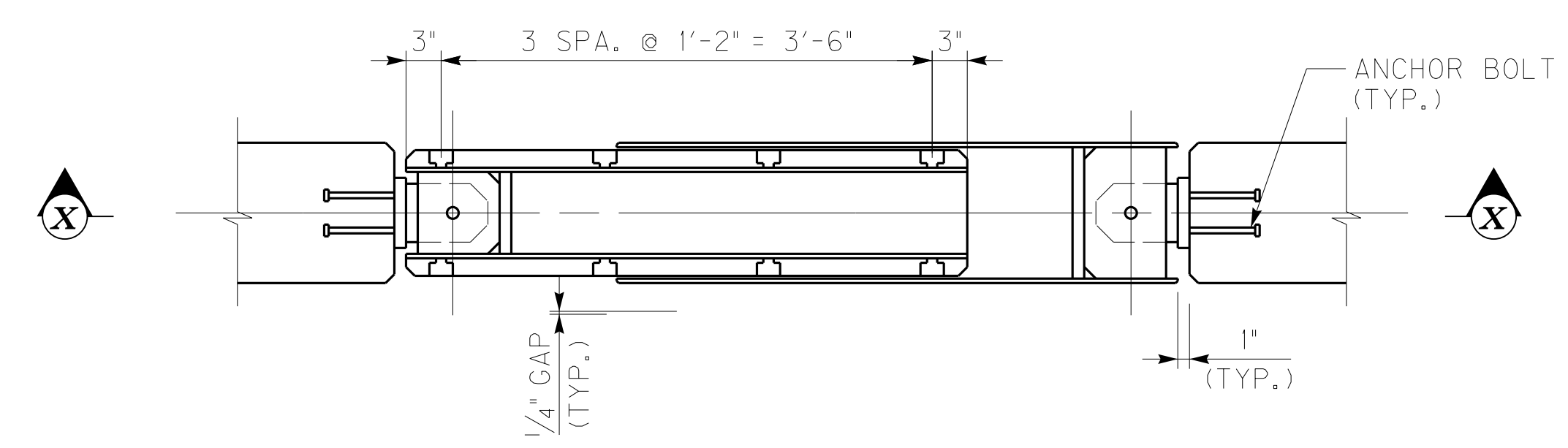


DETAIL 5

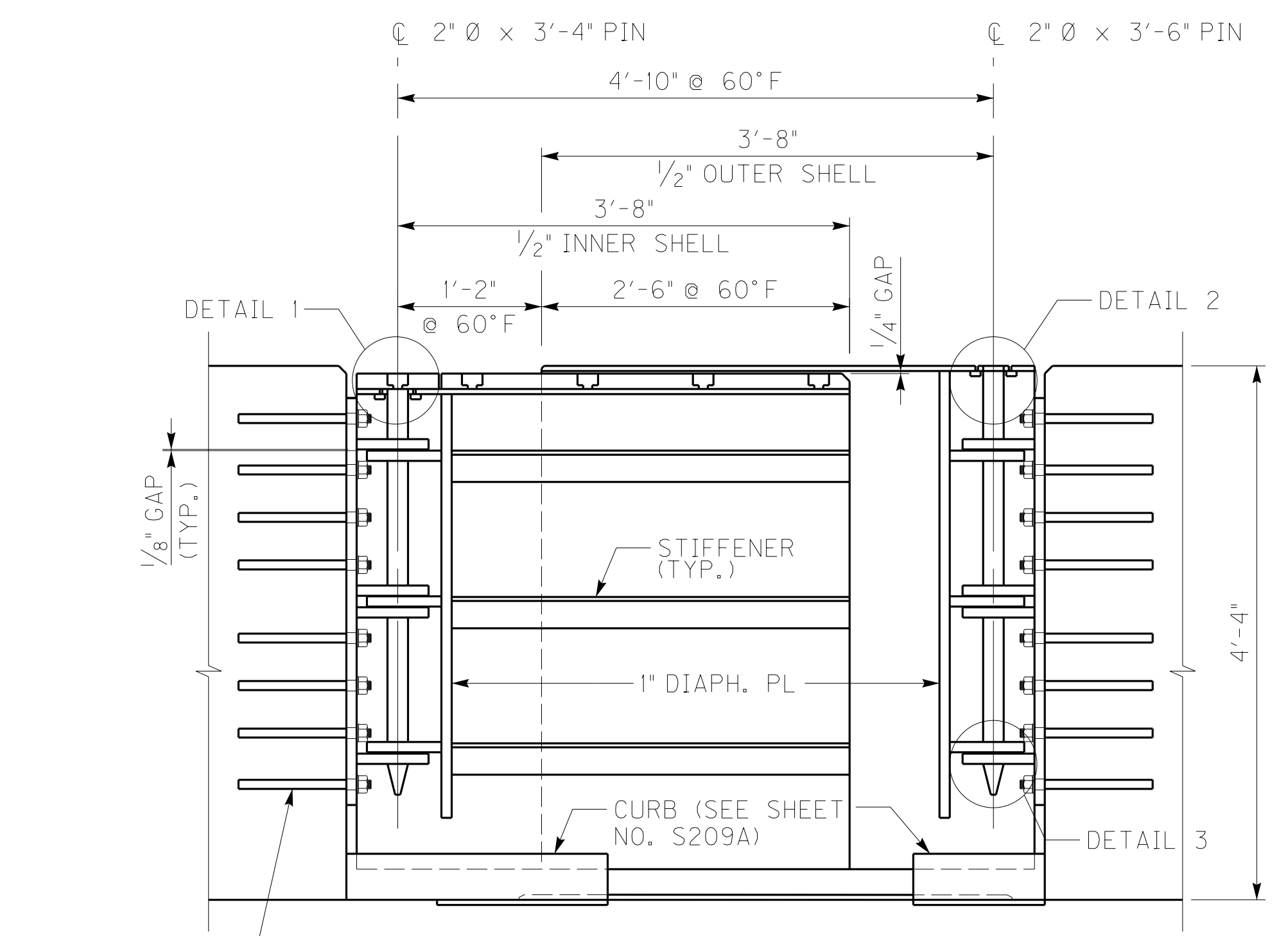
DETAIL 6

SIDEWALK COVER PLATE NOTES

1. ALL PLATES SHALL BE AASHTO M270 GRADE 50 AND GALVANIZED AFTER FABRICATION.
2. ENTIRE SURFACE OF SLIDE PLATE AND COVER PLATE SHALL BE COATED WITH "SLIPNOT" OR EQUIVALENT AFTER GALVANIZED.
3. MOUNT COVER PLATE USING 3/4" DIAMETER COUNTERSUNK CAP SCREWS WITH NUTS TACK WELDED TO BACK OF ANCHOR PLATE AND COVERED WITH PLASTIC END CAP.
4. MOUNT SLIDE PLATE AND ANCHOR PLATE WITH 1/2" x 6" STUD ANCHORS AND 1/2" x 2" STUD ANCHORS OVER BOXES ONLY.
5. COVER PLATES SHALL BE MOUNTED ON MAIN SPAN SIDE OF JOINT AND SHALL SLIDE ON APPROACH SIDE.



SECTION S-S



SECTION X-X



ITEM NUMBER	01-180.70
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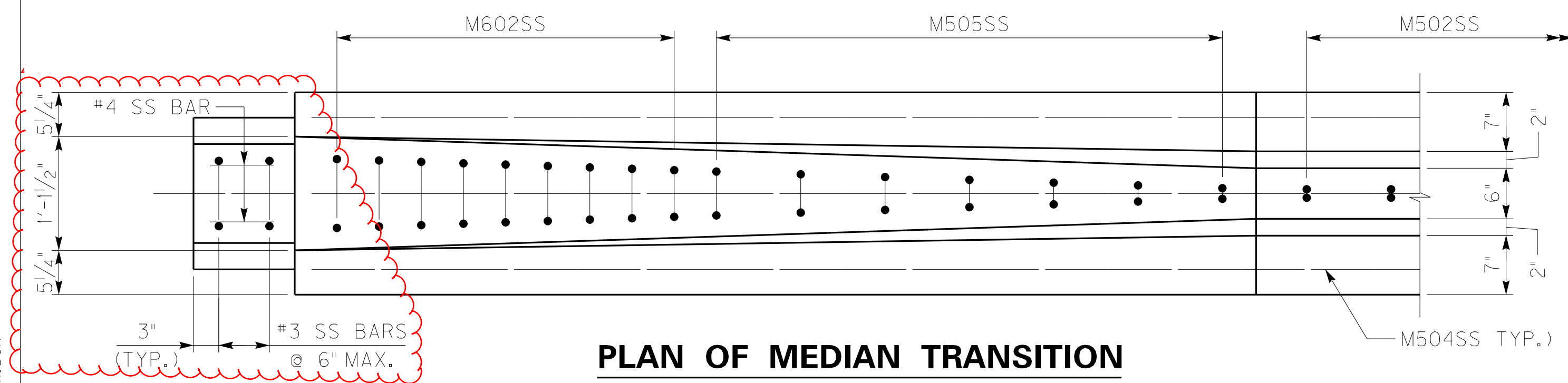
REVISION		DATE
		11/25/13
DATE: NOVEMBER 15, 2013	CHECKED BY: TJT	
DESIGNED BY: DMB	DETAILED BY: MJD	
Commonwealth of Kentucky DEPARTMENT OF HIGHWAYS COUNTY MARSHALL / TRIGG		
ROUTE US68	CROSSING KENTUCKY LAKE	
MODULAR EXP. JOINT DETAILS - 7		
PREPARED BY: Baker		SHEET NO. S209 DRAWING NO. 24686

FILE NAME: C:\PW\81-LOCAL\BAKER_PROJECTS\CWETHINGTON\DOI41582\S24686 -EJT.DGN

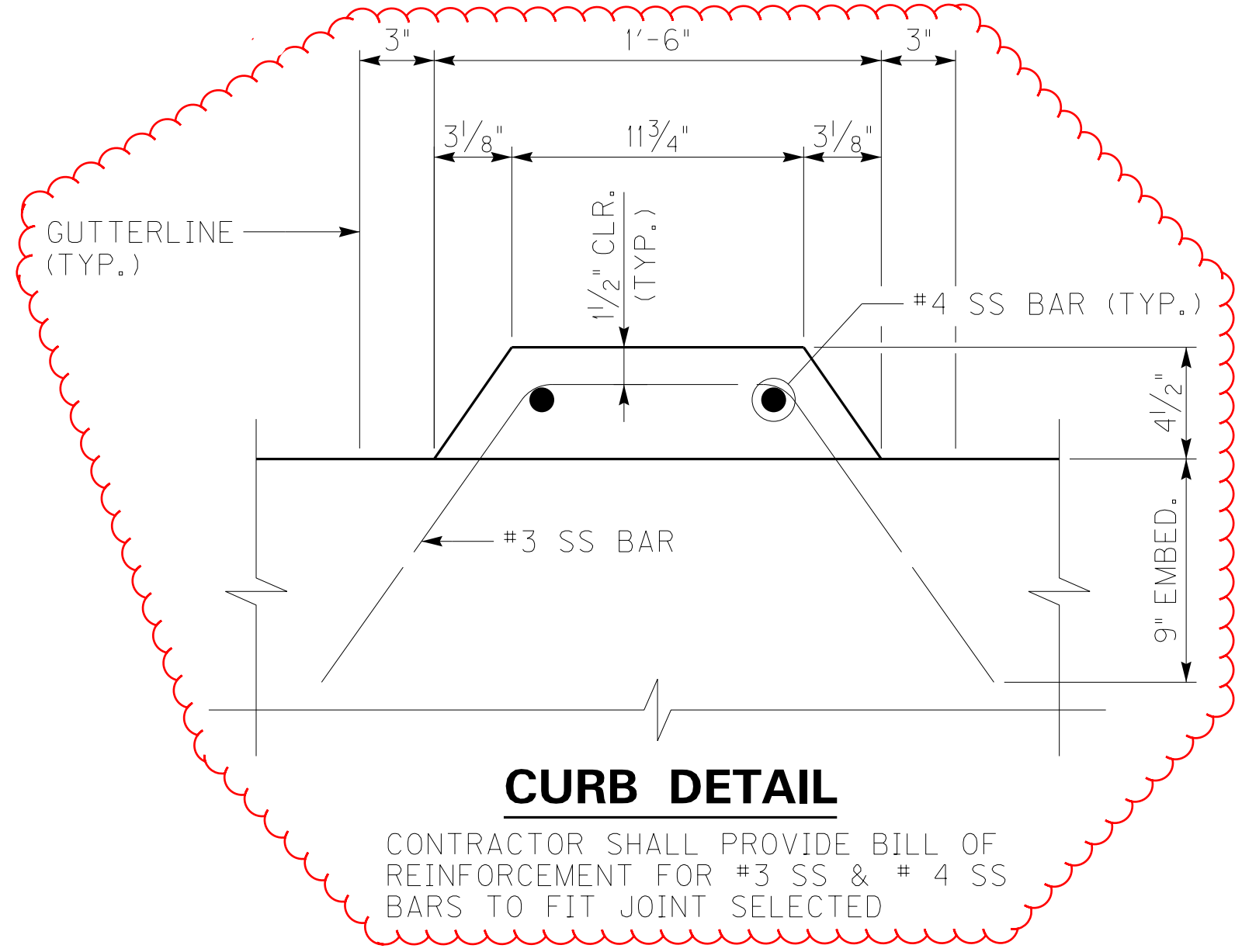
USER: Mgr\jcd\dwyer
DATE PLOTTED: November 25, 2013

E-SHEET NAME: S24686 208B

MicroStation v8.11.7.469

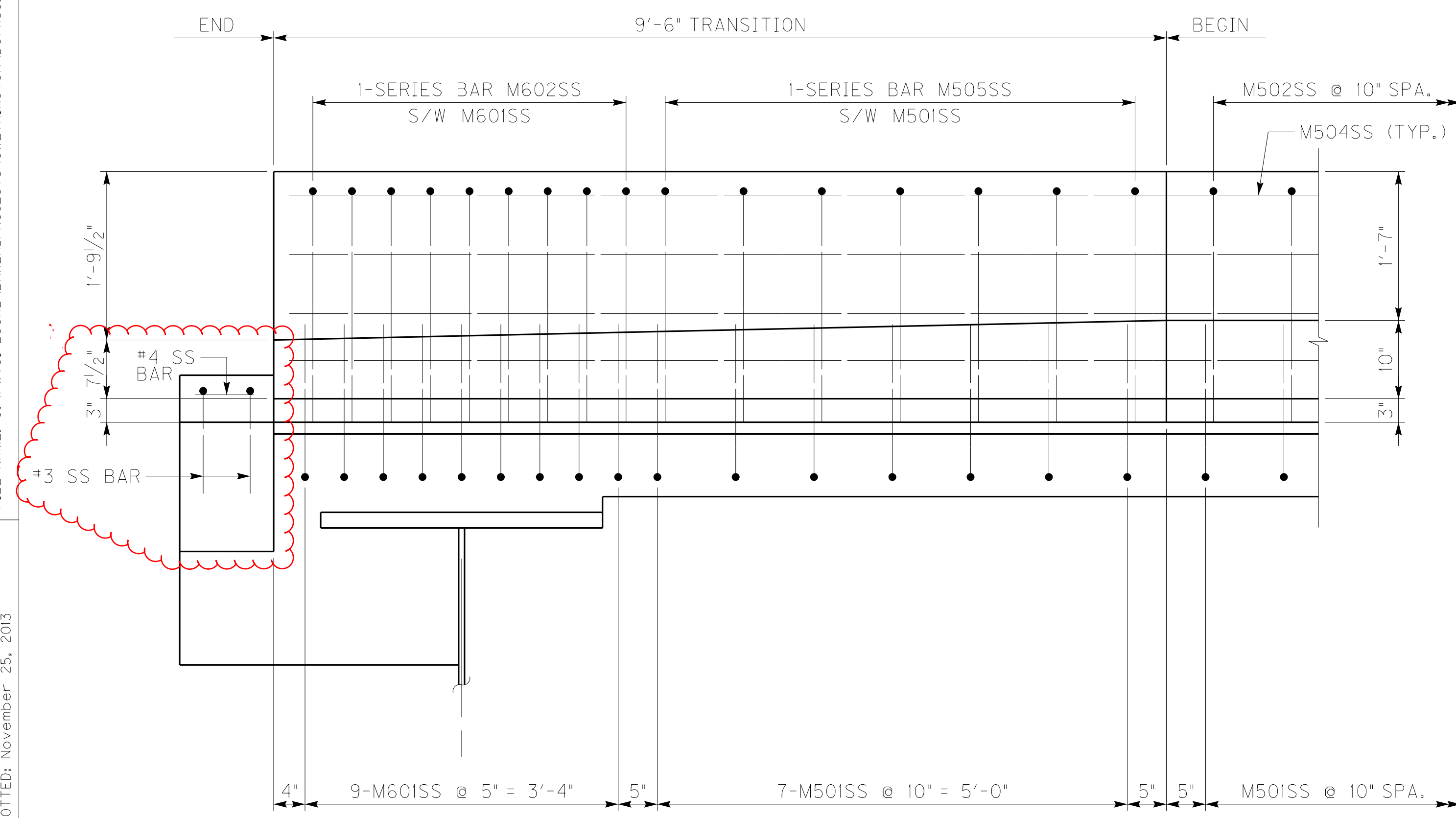


PLAN OF MEDIAN TRANSITION

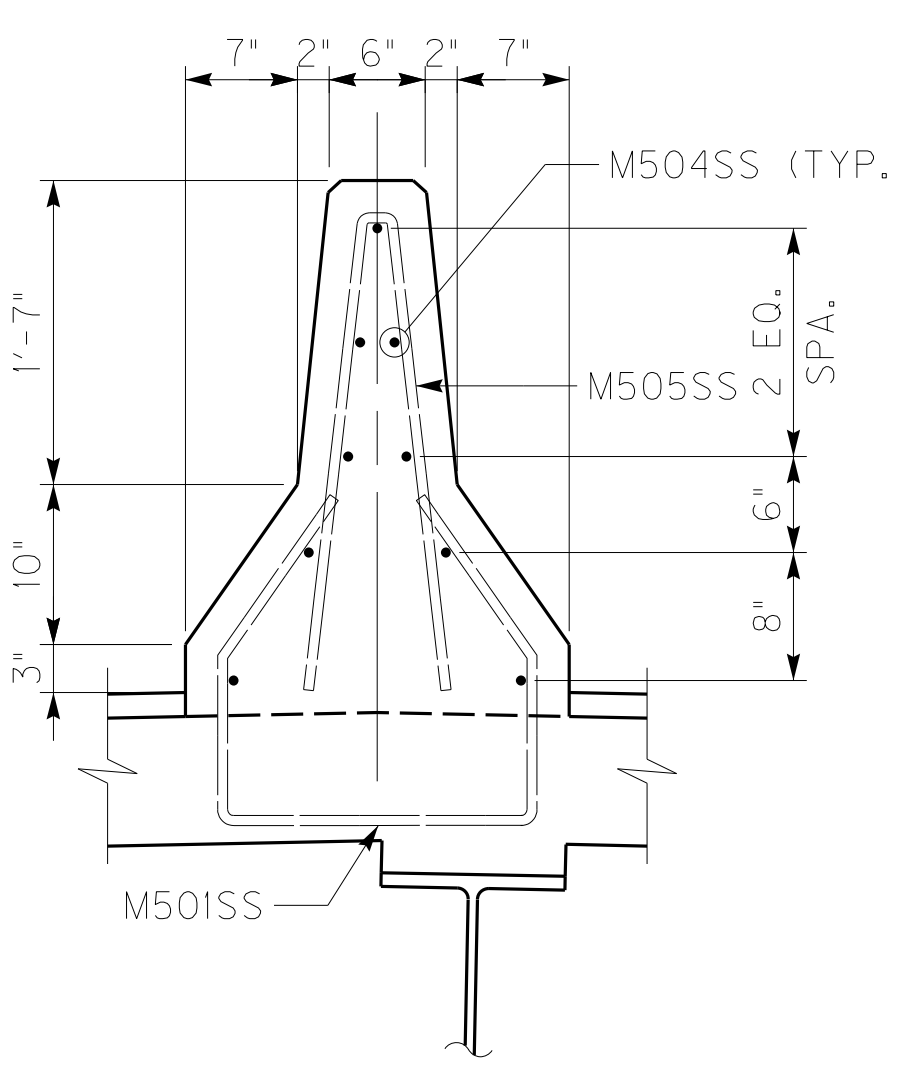


CURB DETAIL

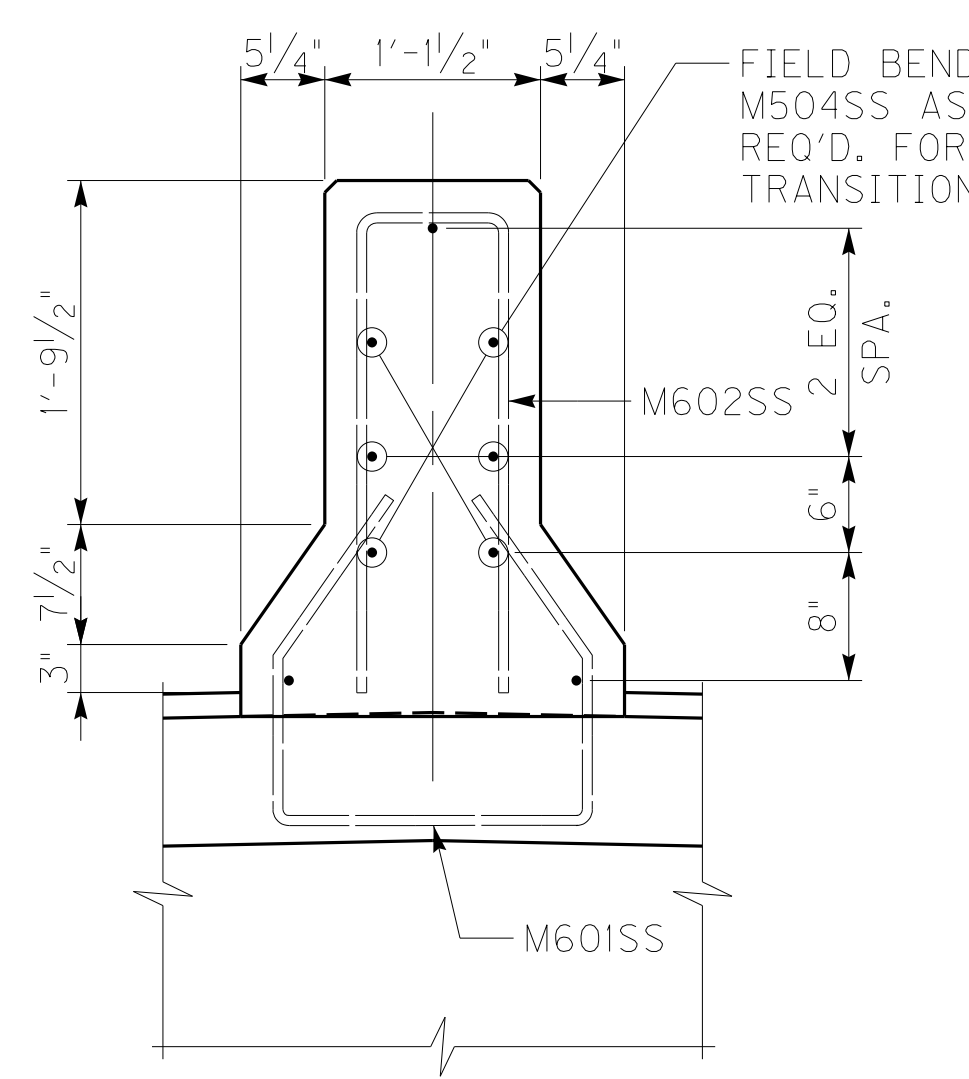
CONTRACTOR SHALL PROVIDE BILL OF REINFORCEMENT FOR #3 SS & #4 SS BARS TO FIT JOINT SELECTED



ELEVATION OF MEDIAN TRANSITION



BEGIN SECTION



END SECTION

MEDIAN TRANSITION

NOTES

1. FOR MODULAR EXP. JOINT NOTES, SEE SHEET NO. S207A.

ADD CURB DETAILS	11/25/13
REVISION	DATE
DATE: NOVEMBER 15, 2013	CHECKED BY
DESIGNED BY: DMB	TJT
DETAILED BY: MJD	DMB

Commonwealth of Kentucky
DEPARTMENT OF HIGHWAYS

COUNTY
MARSHALL / TRIGG

ROUTE CROSSING
US68 KENTUCKY LAKE

MODULAR EXP. JOINT DETAILS - 6



ITEM NUMBER	01-180.70
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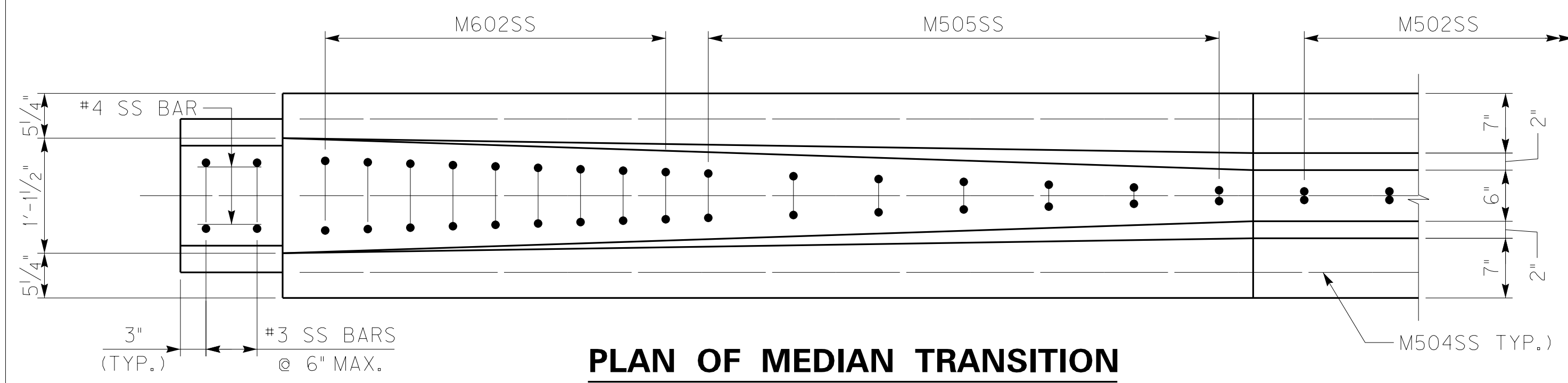
PREPARED BY	MICHAEL BAKER JR., INC. 9750 ORMSBY STATION ROAD SUITE 210 LOUISVILLE, KY 40223	SHEET NO. S208B
Baker		DRAWING NO. 24686

FILE NAME: C:\PW\81-LOCAL\BAKER_PROJECTS\CWETHINGTON\DOI41582\S24686 -EJTI.DGN

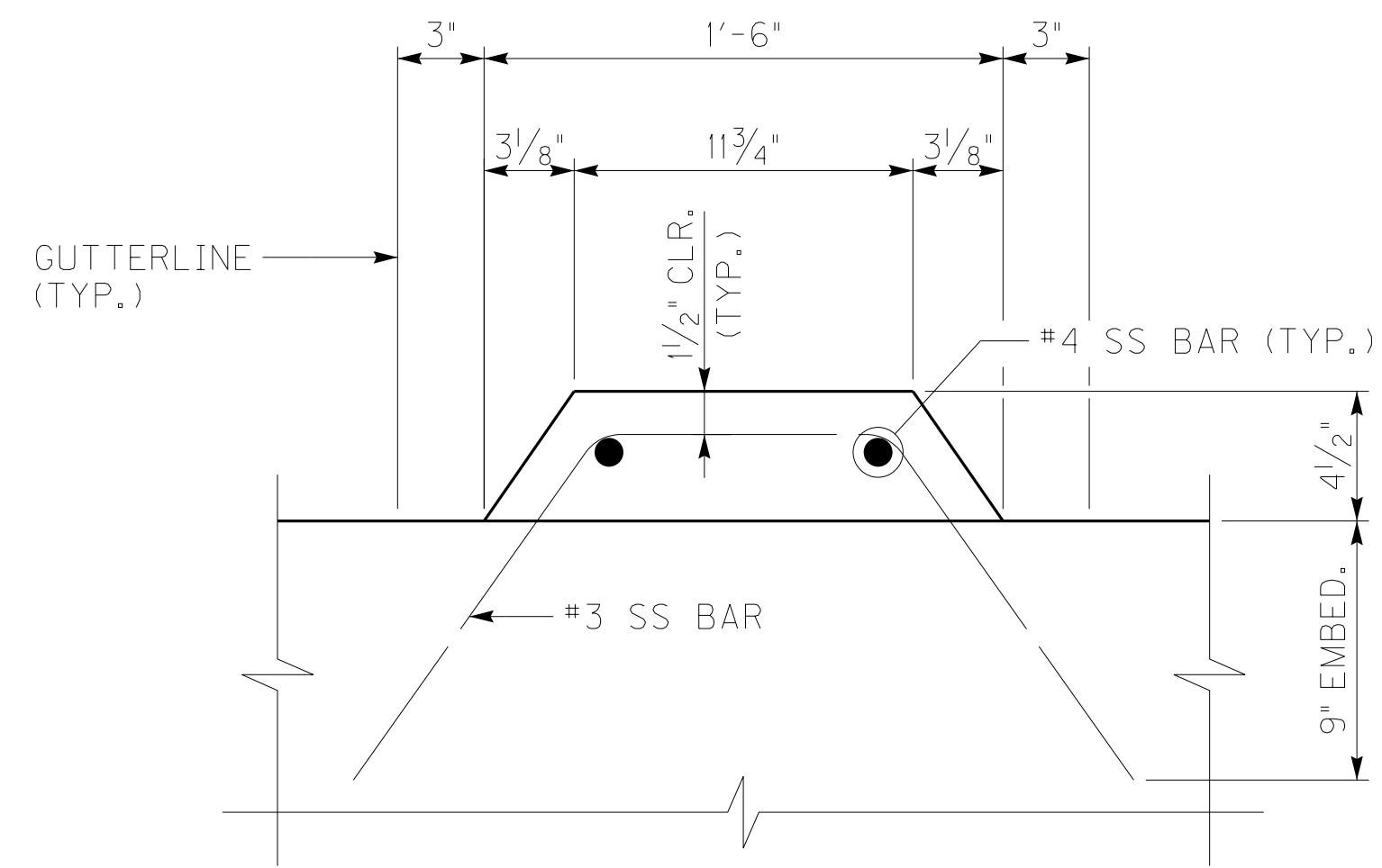
USER: Mgr\jdo,Dwyer
DATE PLOTTED: November 25, 2013

E-SHEET NAME: S24686 208B

MicroStation v8.11.7.469

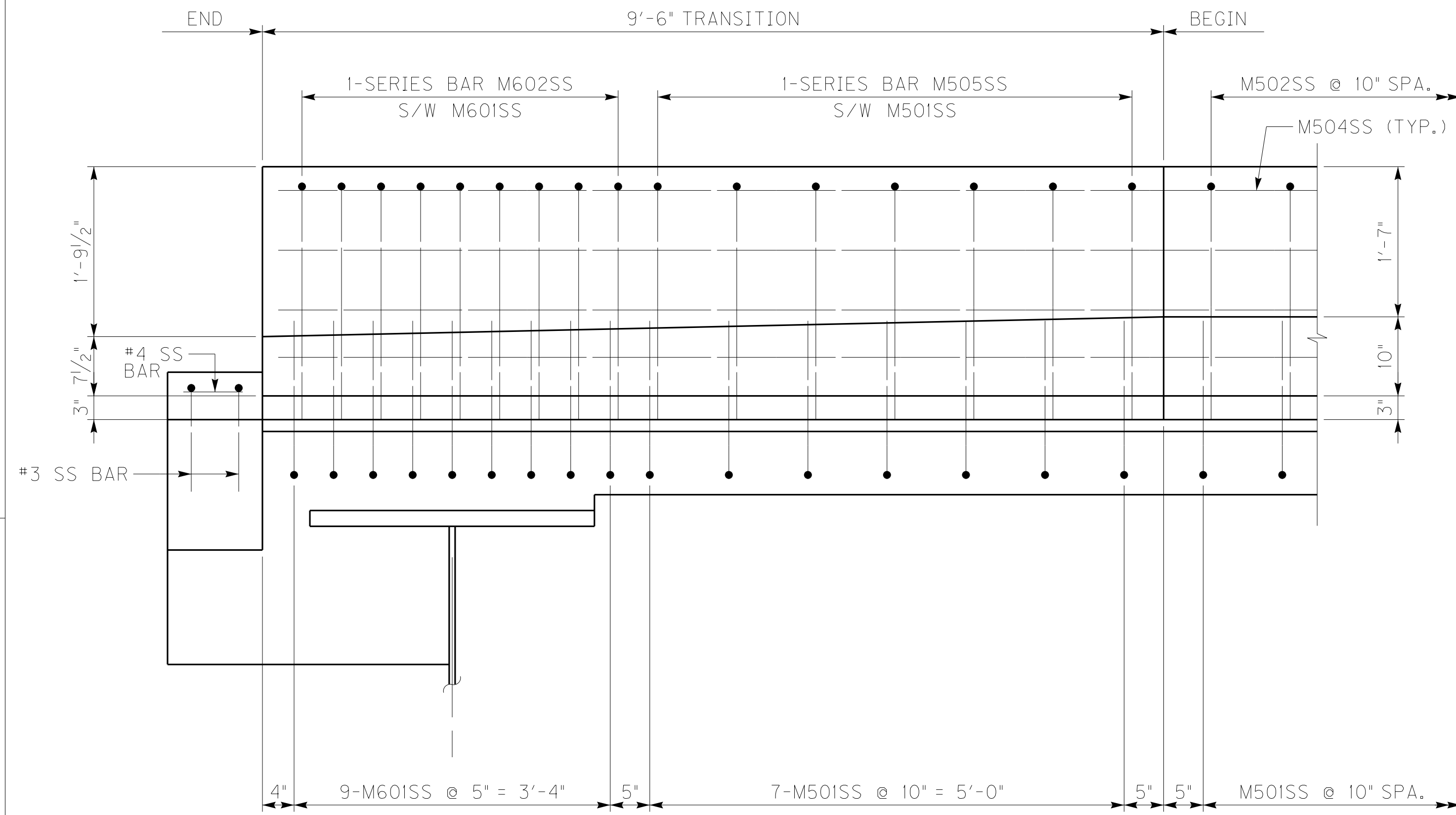


PLAN OF MEDIAN TRANSITION

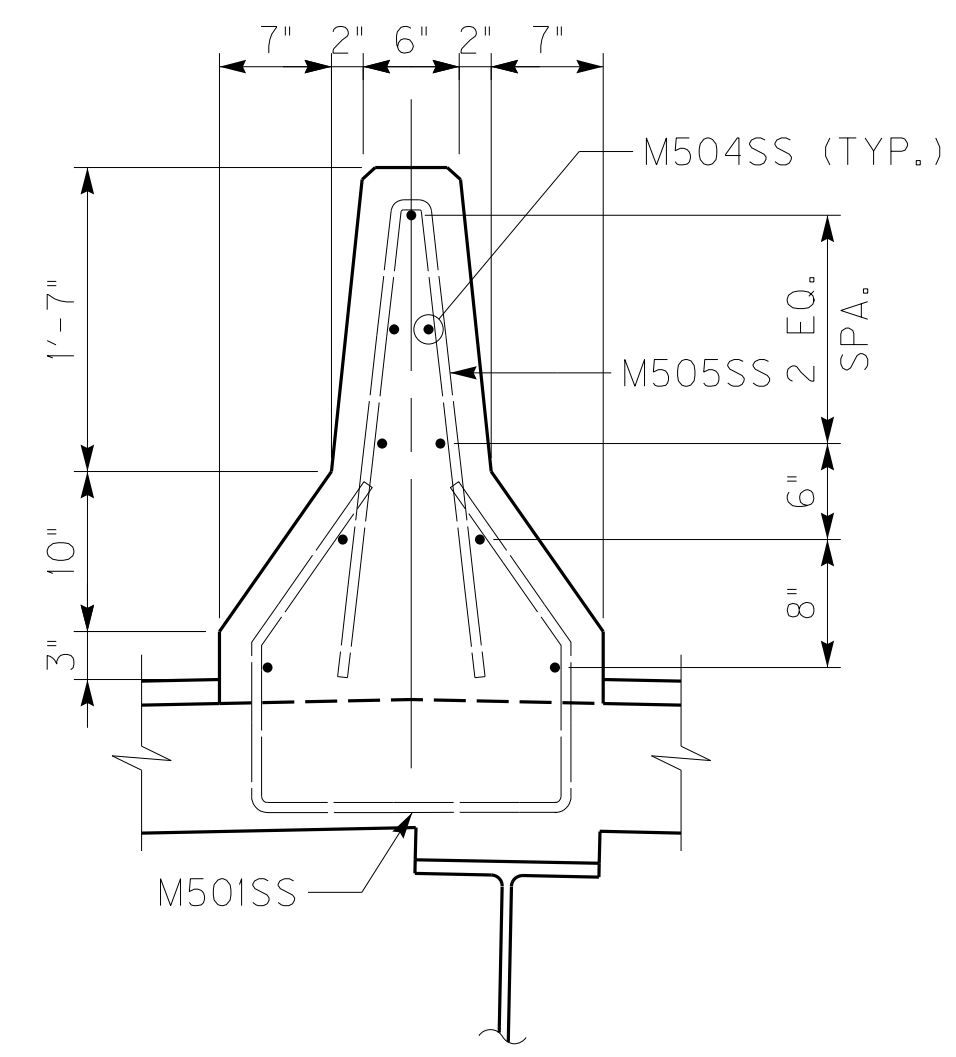


CURB DETAIL

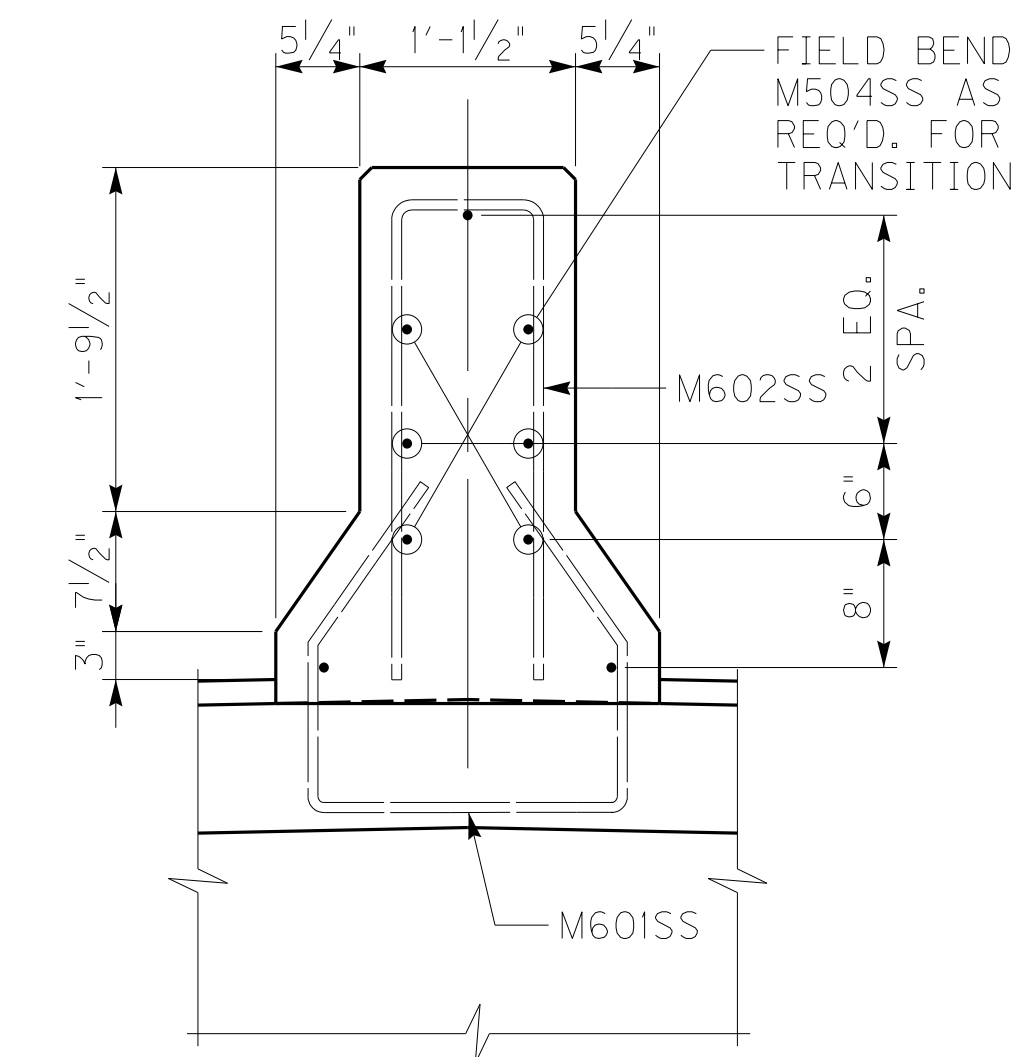
CONTRACTOR SHALL PROVIDE BILL OF REINFORCEMENT FOR #3 SS & #4 SS BARS TO FIT JOINT SELECTED



ELEVATION OF MEDIAN TRANSITION



BEGIN SECTION



END SECTION

MEDIAN TRANSITION

NOTES

1. FOR MODULAR EXP. JOINT NOTES, SEE SHEET NO. S207A.

ADD CURB DETAILS		11/25/13
REVISION		DATE
DATE: NOVEMBER 15, 2013	CHECKED BY	
DESIGNED BY: DMB	TJT	
DETAILED BY: MJD	DMB	

**Commonwealth of Kentucky
DEPARTMENT OF HIGHWAYS**

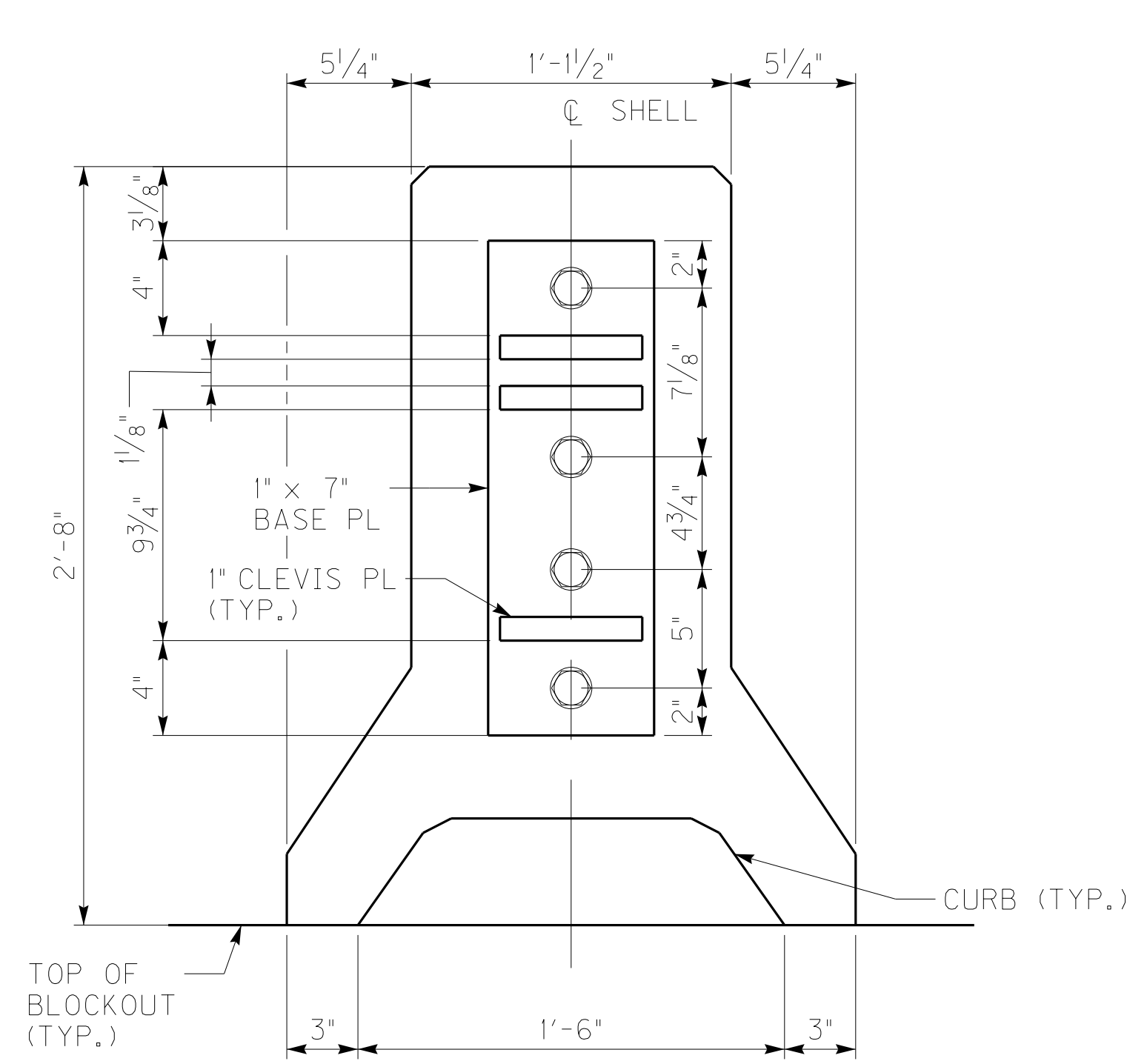
MARSHALL / TRIGG

ROUTE **US68** CROSSING **KENTUCKY LAKE**
MODULAR EXP. JOINT DETAILS - 6

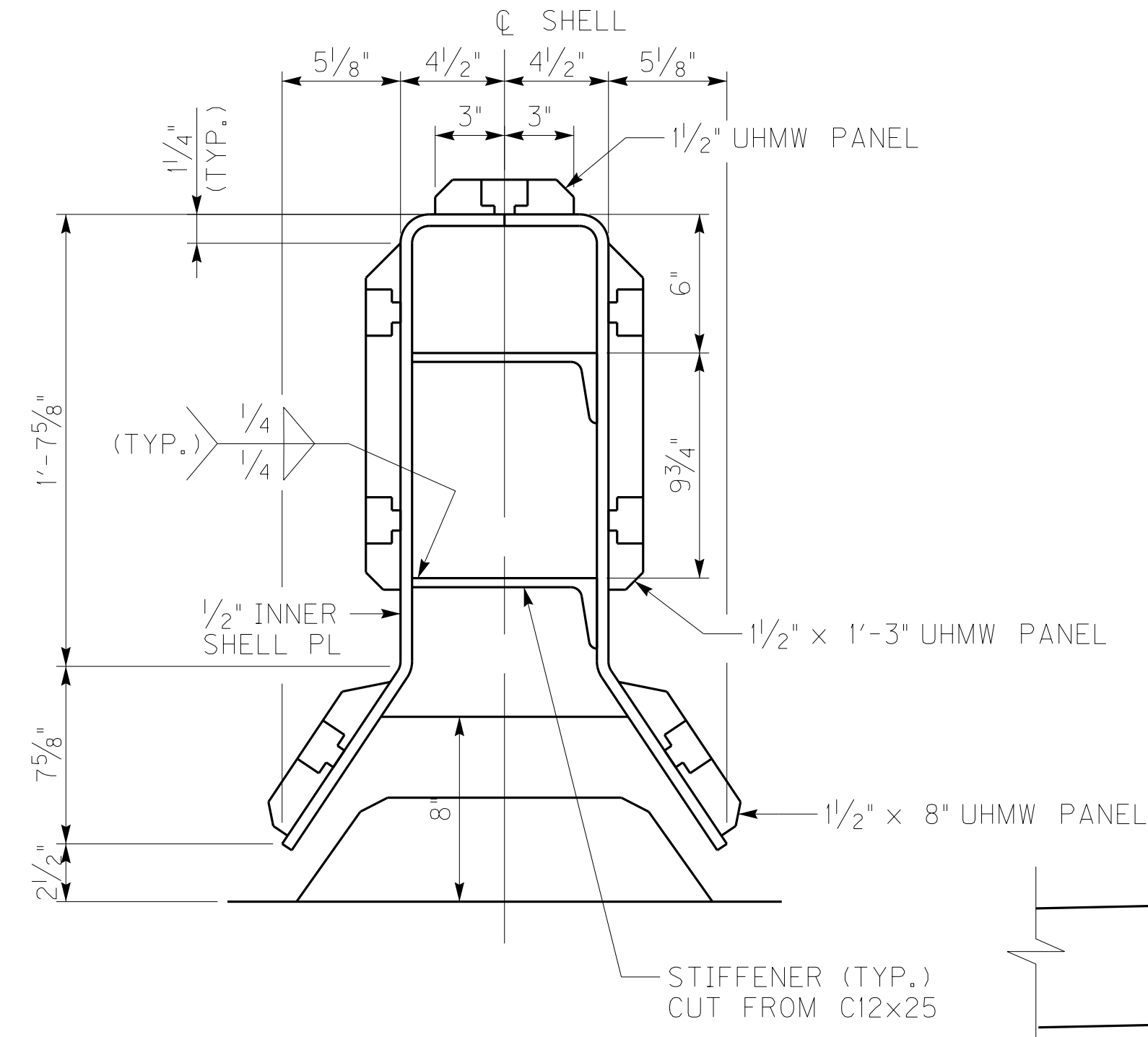


ITEM NUMBER	01-180.70
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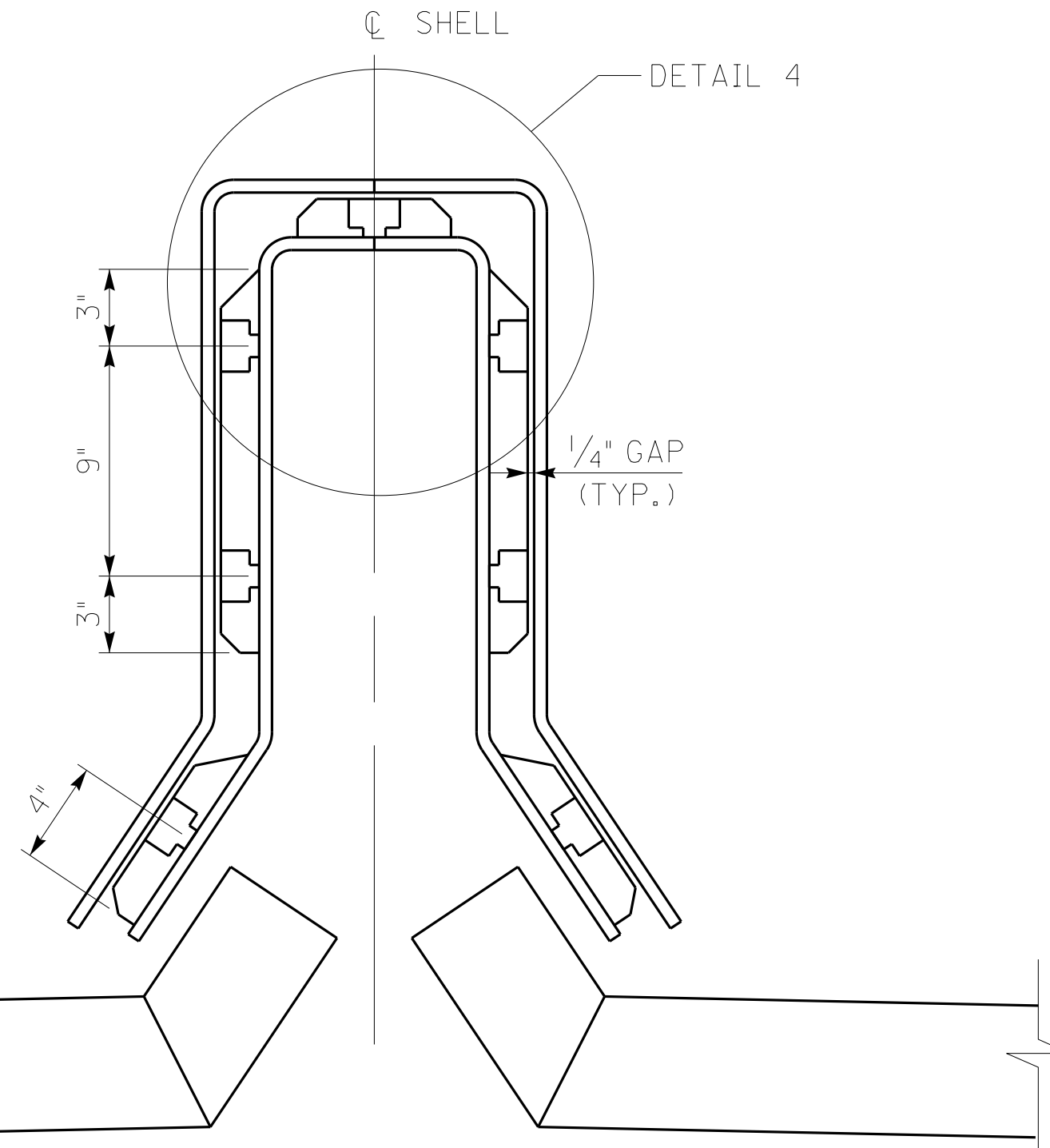
PREPARED BY	MICHAEL BAKER JR., INC. 9750 ORMSBY STATION ROAD SUITE 210 LOUISVILLE, KY 40223	SHEET NO. S208B
Baker		DRAWING NO. 24686



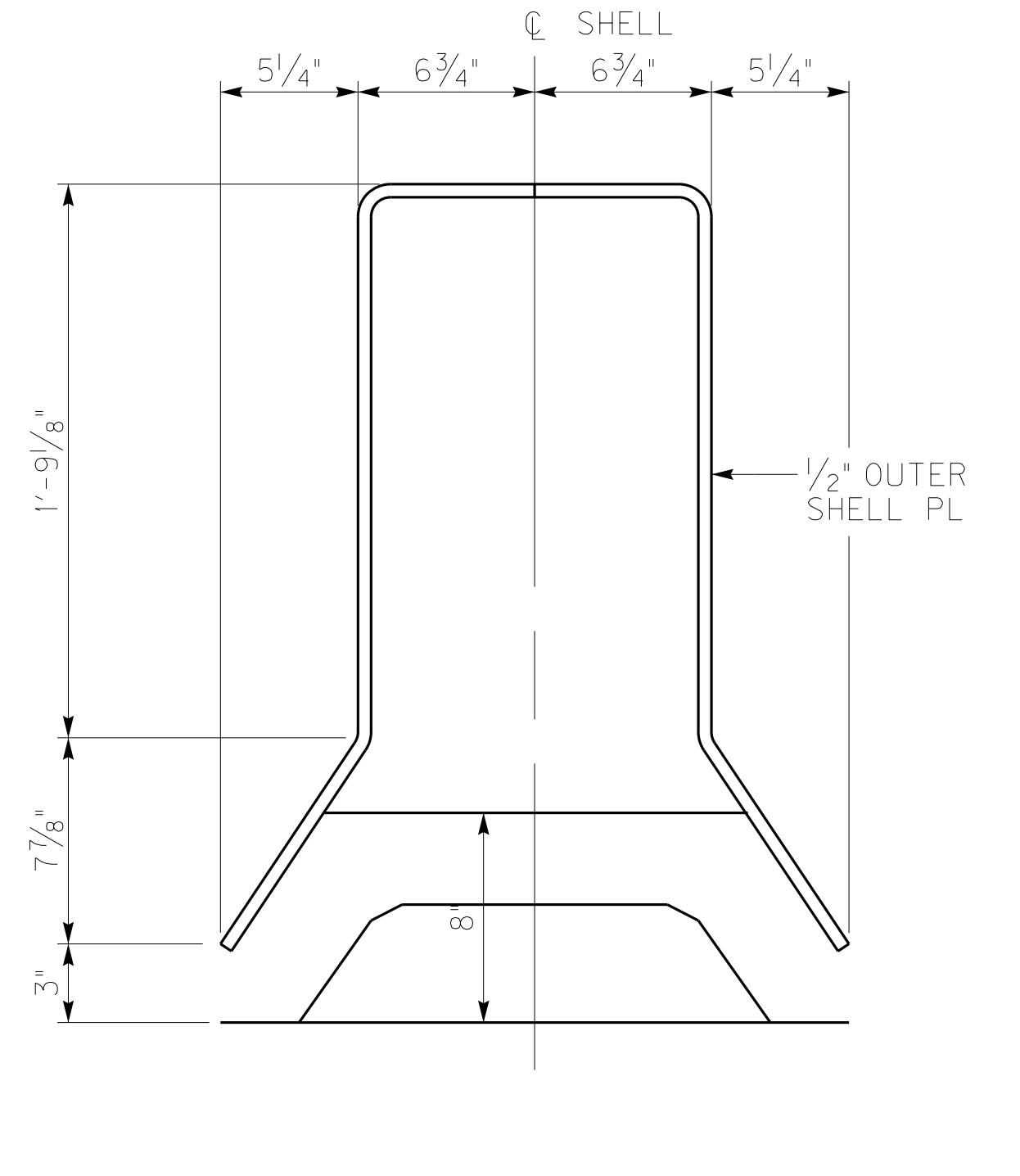
SECTION N-N



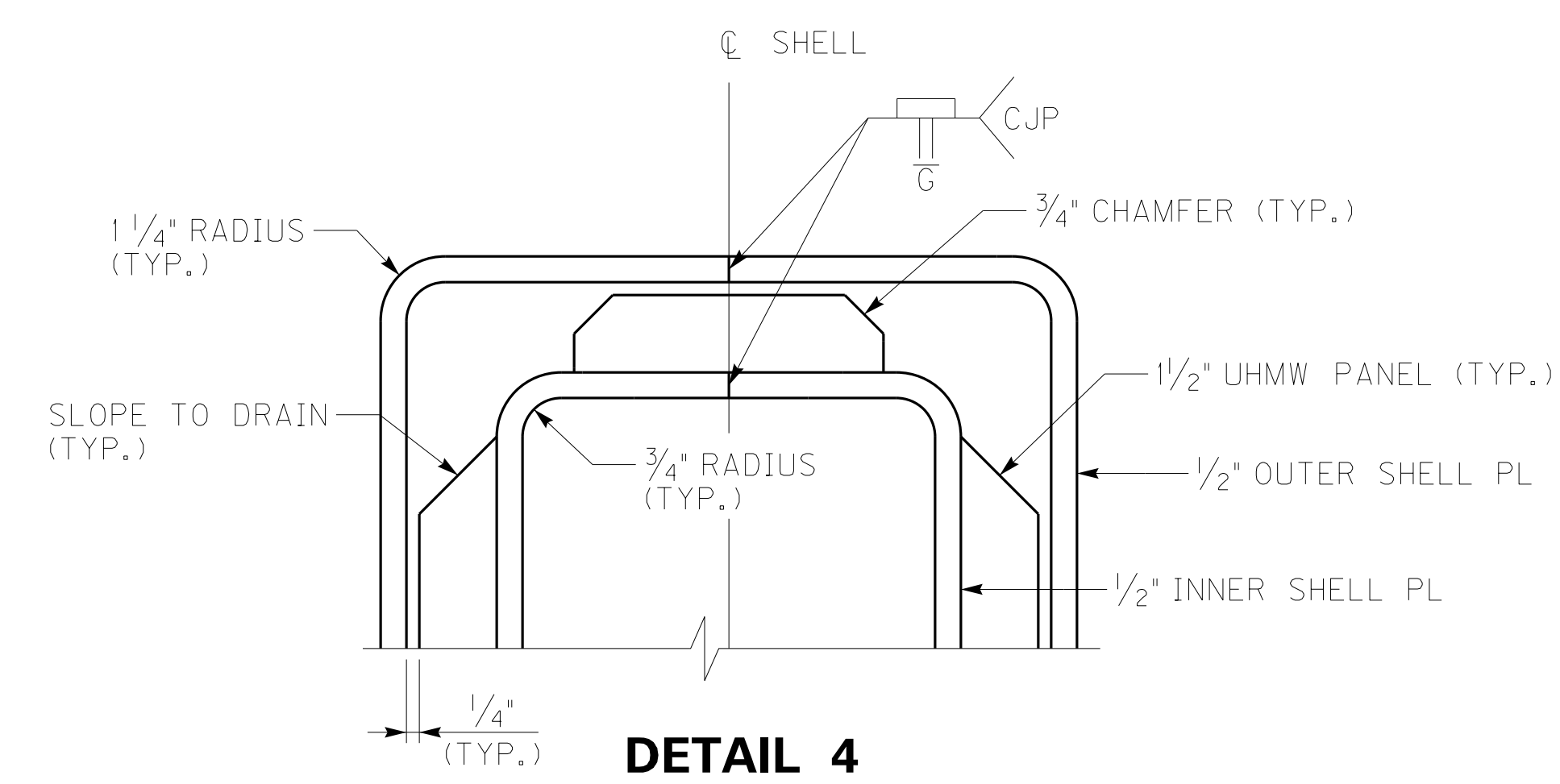
SECTION O-O



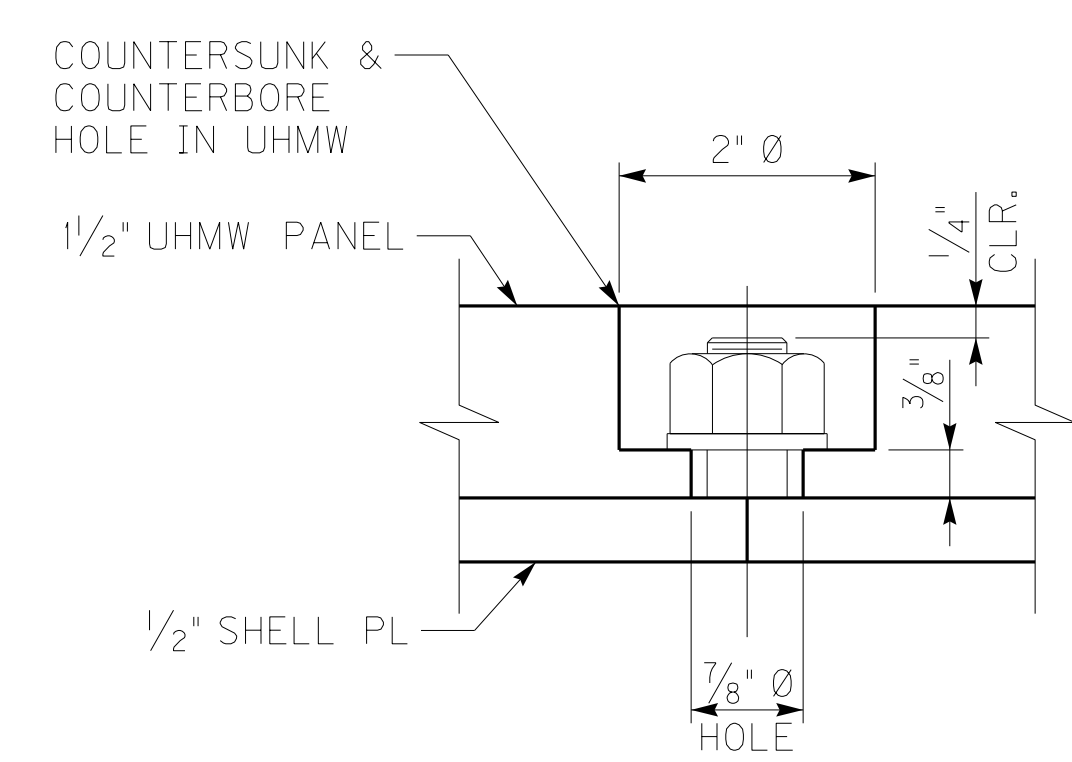
SECTION P-P



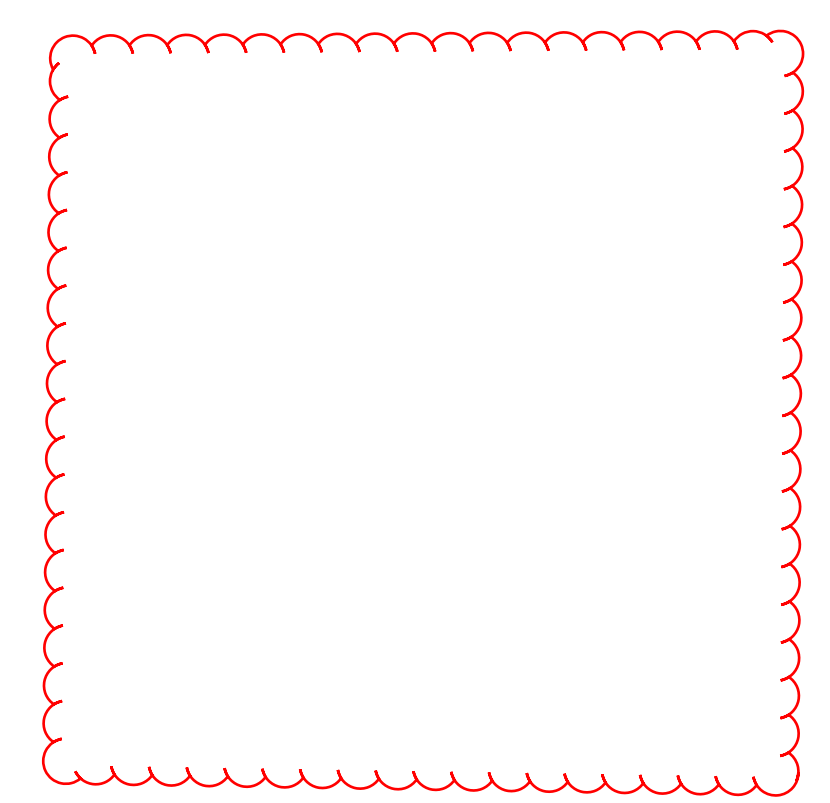
SECTION Q-Q



DETAIL 4

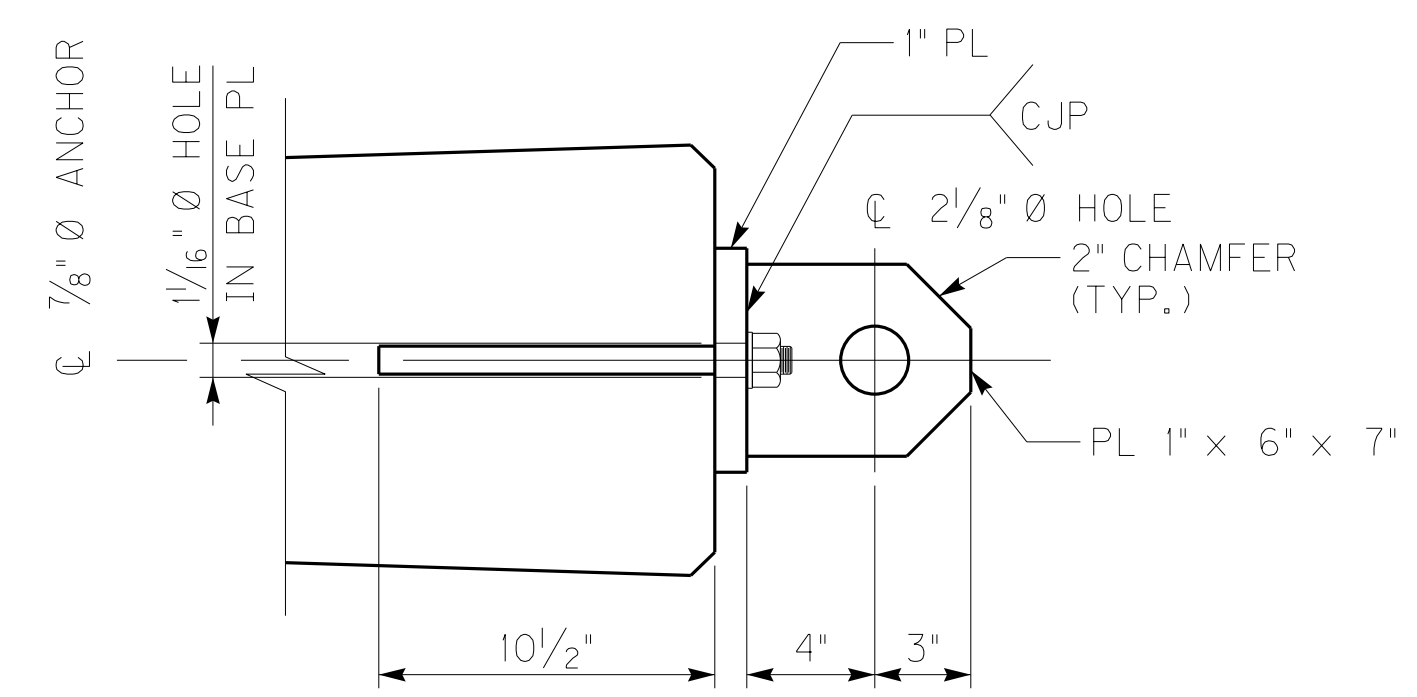


UHMW PANEL FASTENER DETAIL

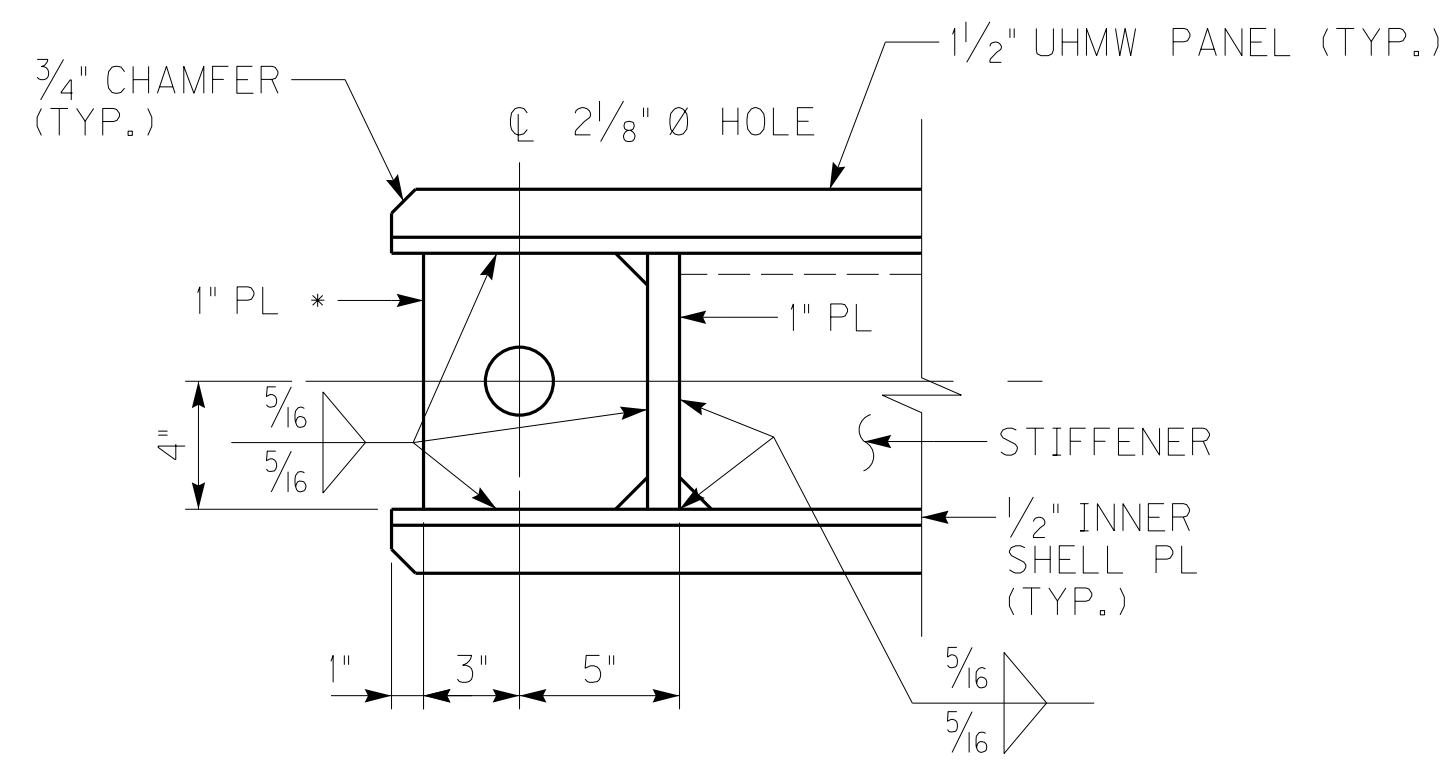


NOTES

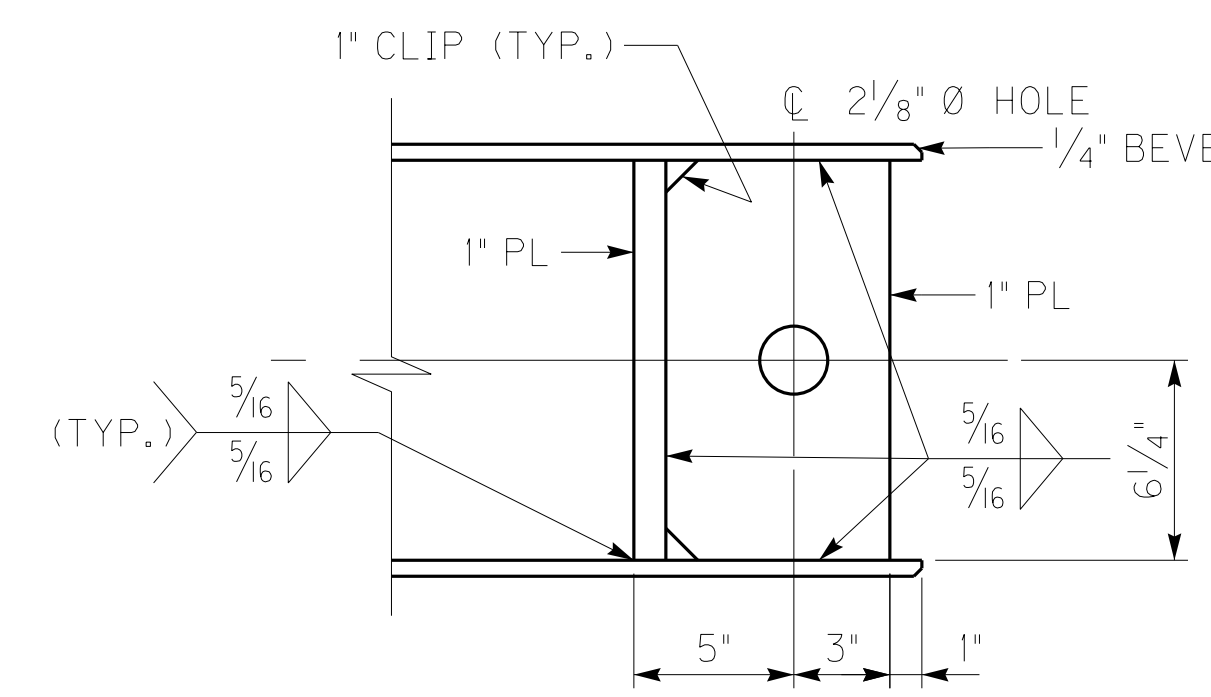
1. FOR MODULAR EXPANSION JOINT NOTES, SEE SHEET NOS. S206 AND S207A.



CLEVIS DETAIL



INSIDE SHELL PIN PL DETAIL



OUTSIDE SHELL PIN PL DETAIL

LEGEND

* SPACING TO MATCH STIFFENER SPACING



ITEM NUMBER	01-180.70
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REMOVE CURB DETAIL		11/25/13
REVISION		DATE
DATE: NOVEMBER 15, 2013	CHECKED BY	
DESIGNED BY: DMB	TJT	
DETAILED BY: MJD	DMB	
Commonwealth of Kentucky DEPARTMENT OF HIGHWAYS		
COUNTY MARSHALL / TRIGG		
ROUTE US68	CROSSING KENTUCKY LAKE	
MODULAR EXP. JOINT DETAILS - 5		
PREPARED BY		SHEET NO.
Baker		S208A
MICHAEL BAKER JR., INC. 9750 ORMSBY STATION ROAD SUITE 210 LOUISVILLE, KY 40223		DRAWING NO. 24686

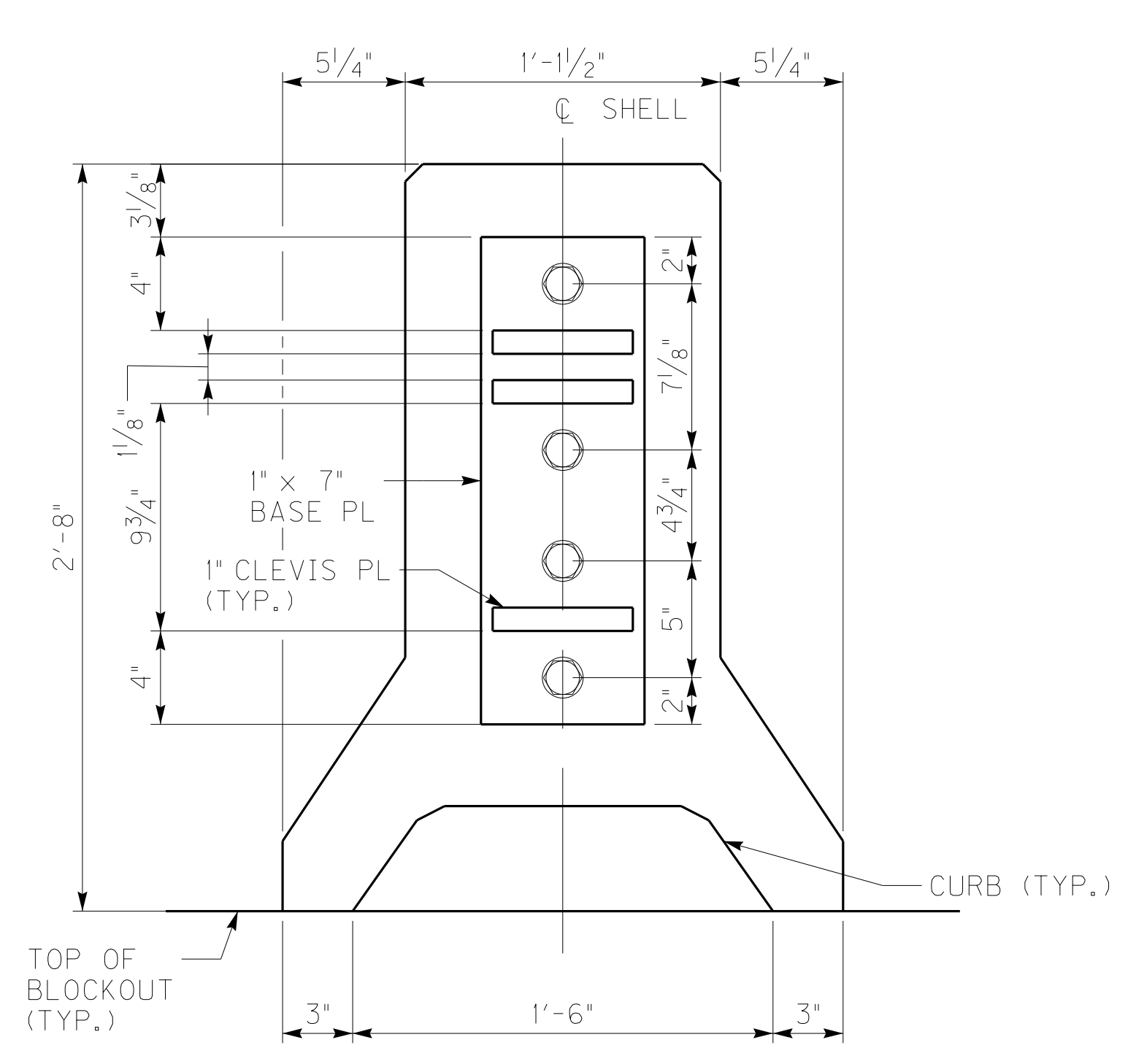
FILE NAME: C:\P\W81-LOCAL\BAKER_PROJECTS\CWETHINGTON\DOI41582\S24686_EJ01.DGN
 USER: MCFYJO.Dwyer
 DATE PLOTTED: November 25, 2013
 E-SHEET NAME: S24686_208A
 MicroStation v8.11.7.469

FILE NAME: C:\PW\81-LOCAL\BAKER_PROJECTS\CWETHINGTON\DOI41582\S24686_EJ01.DGN

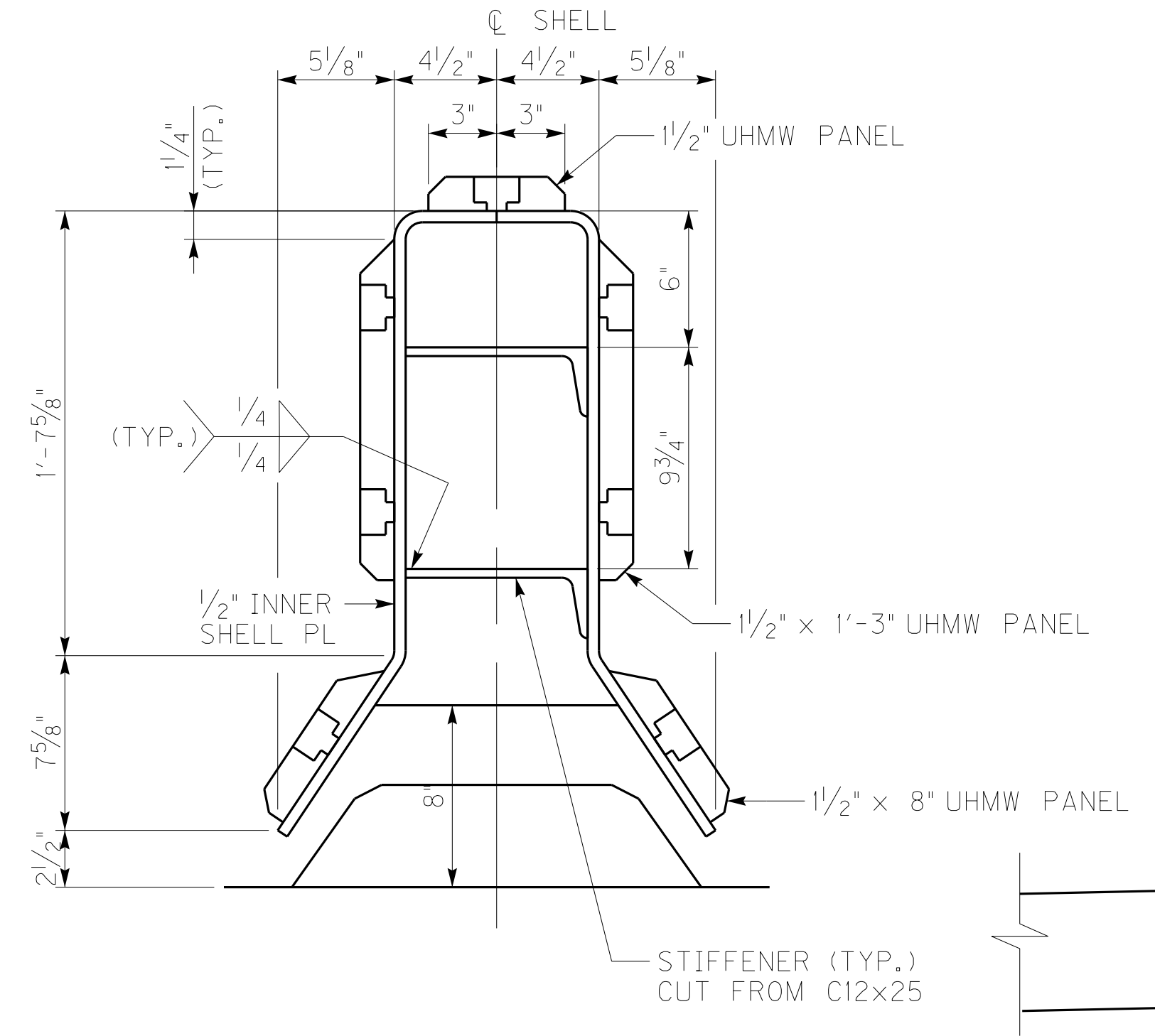
USER: MCFY\jcdwyer
DATE PLOTTED: November 25, 2013

E-SHEET NAME: S24686_208A

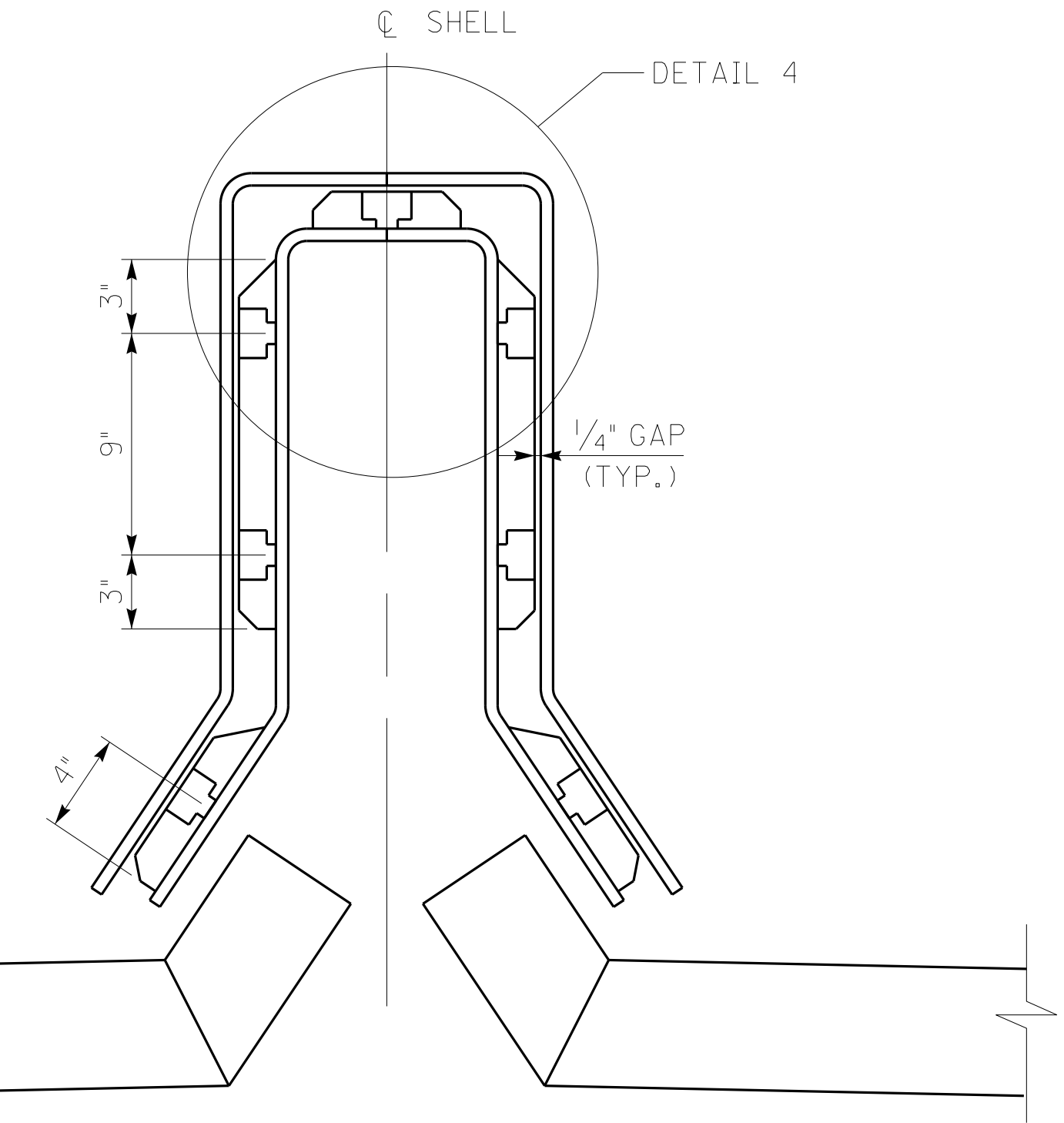
MicroStation v8.11.7.469



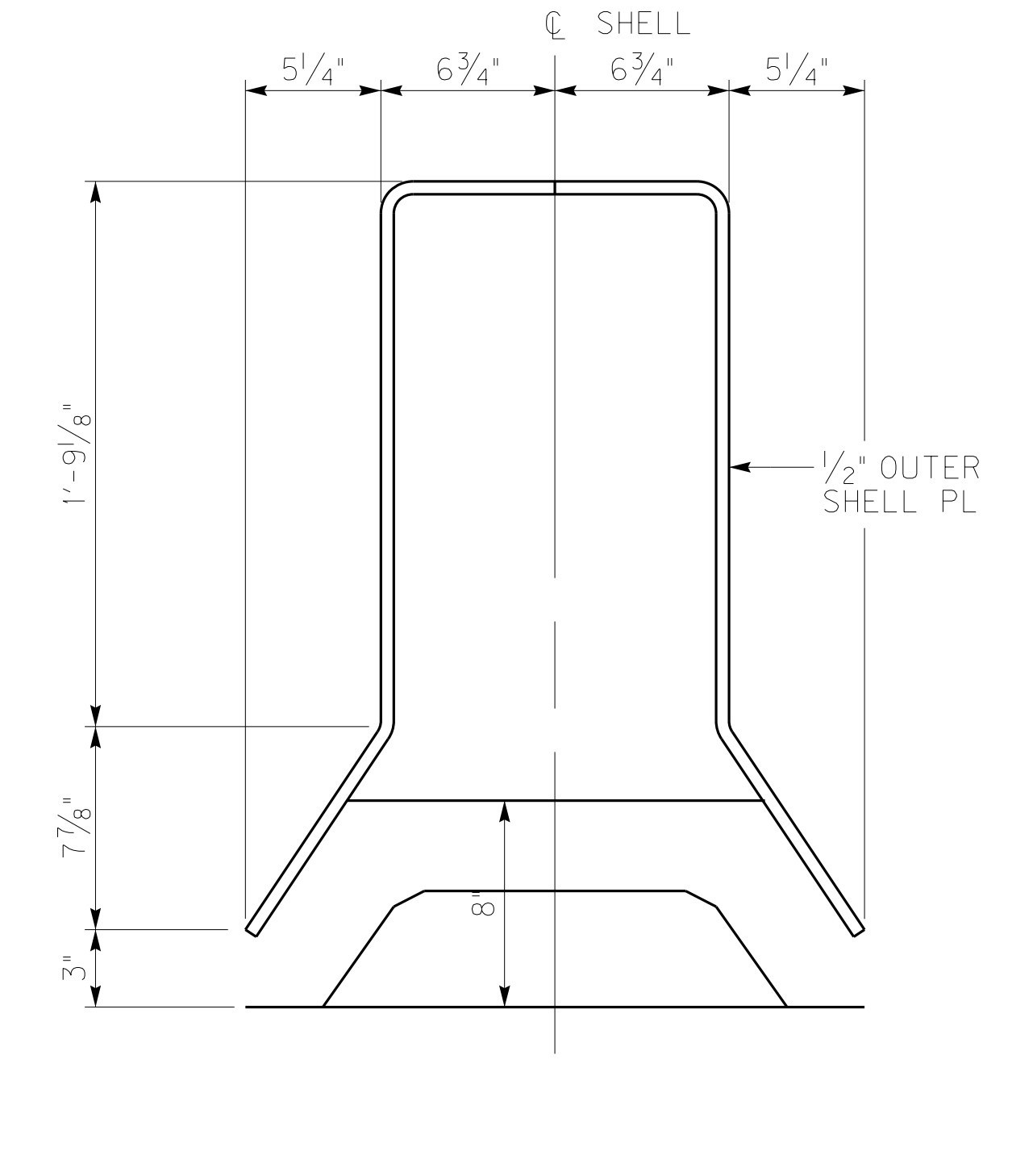
SECTION N-N



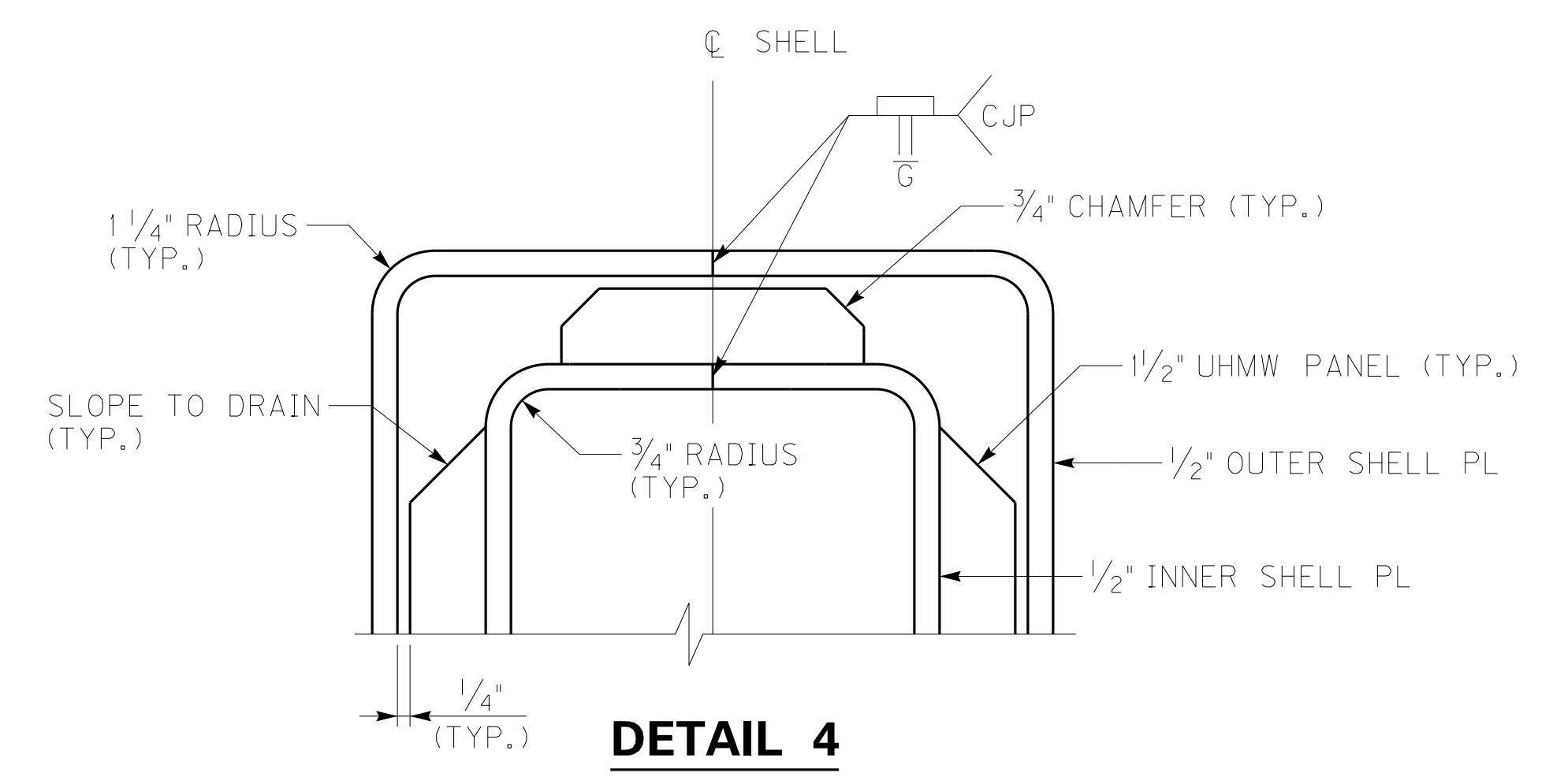
SECTION O-O



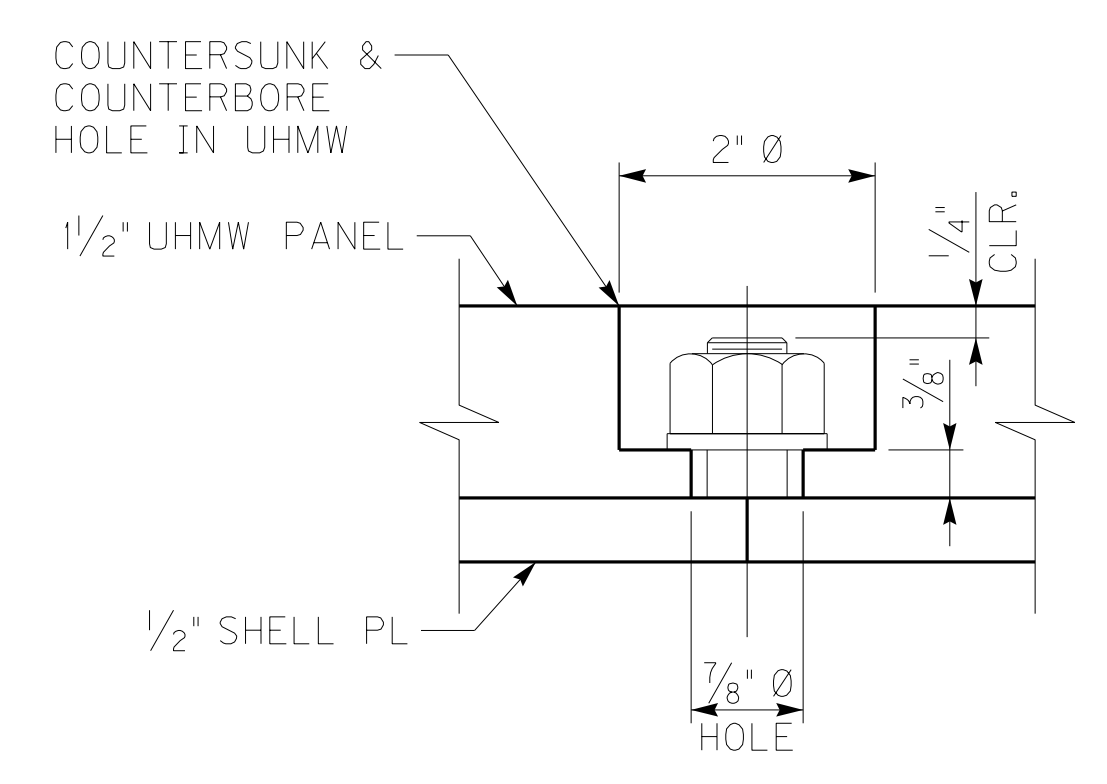
SECTION P-P



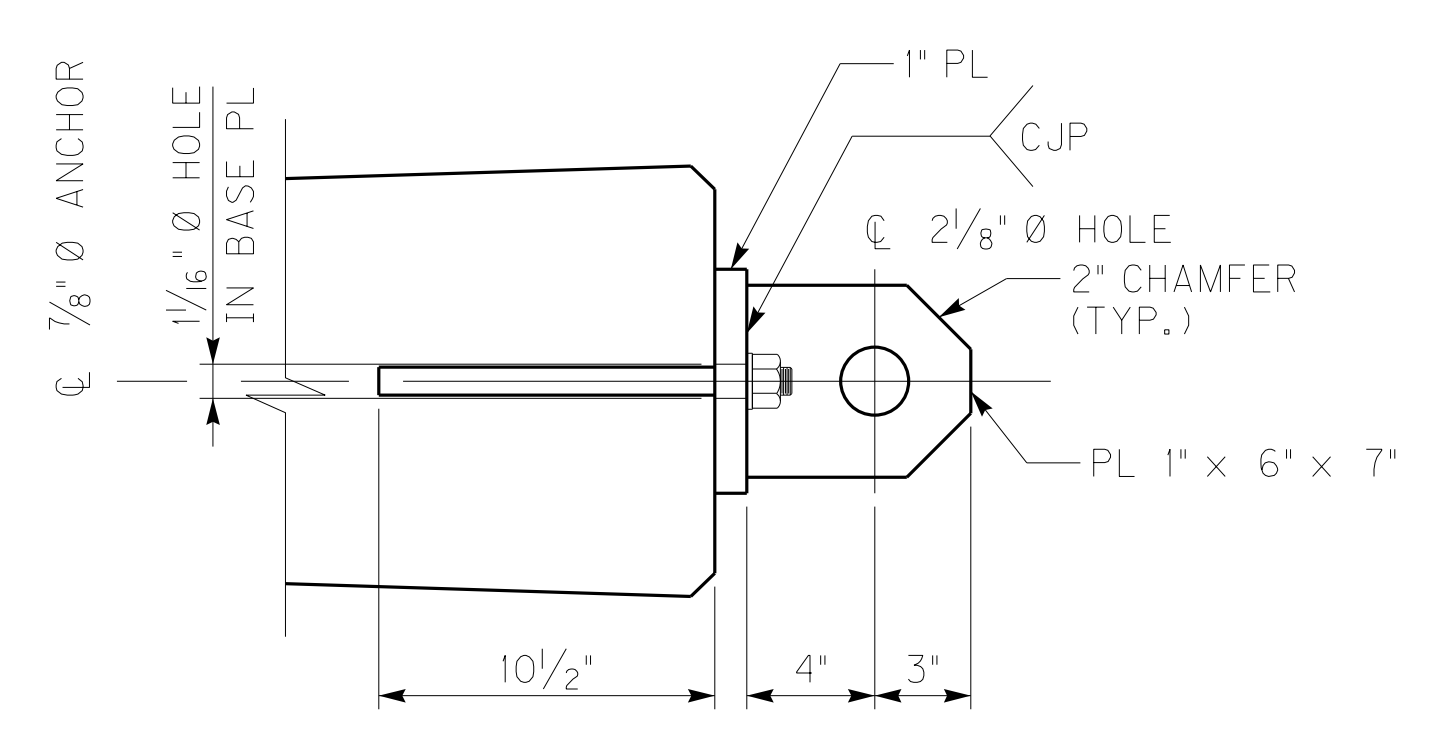
SECTION Q-Q



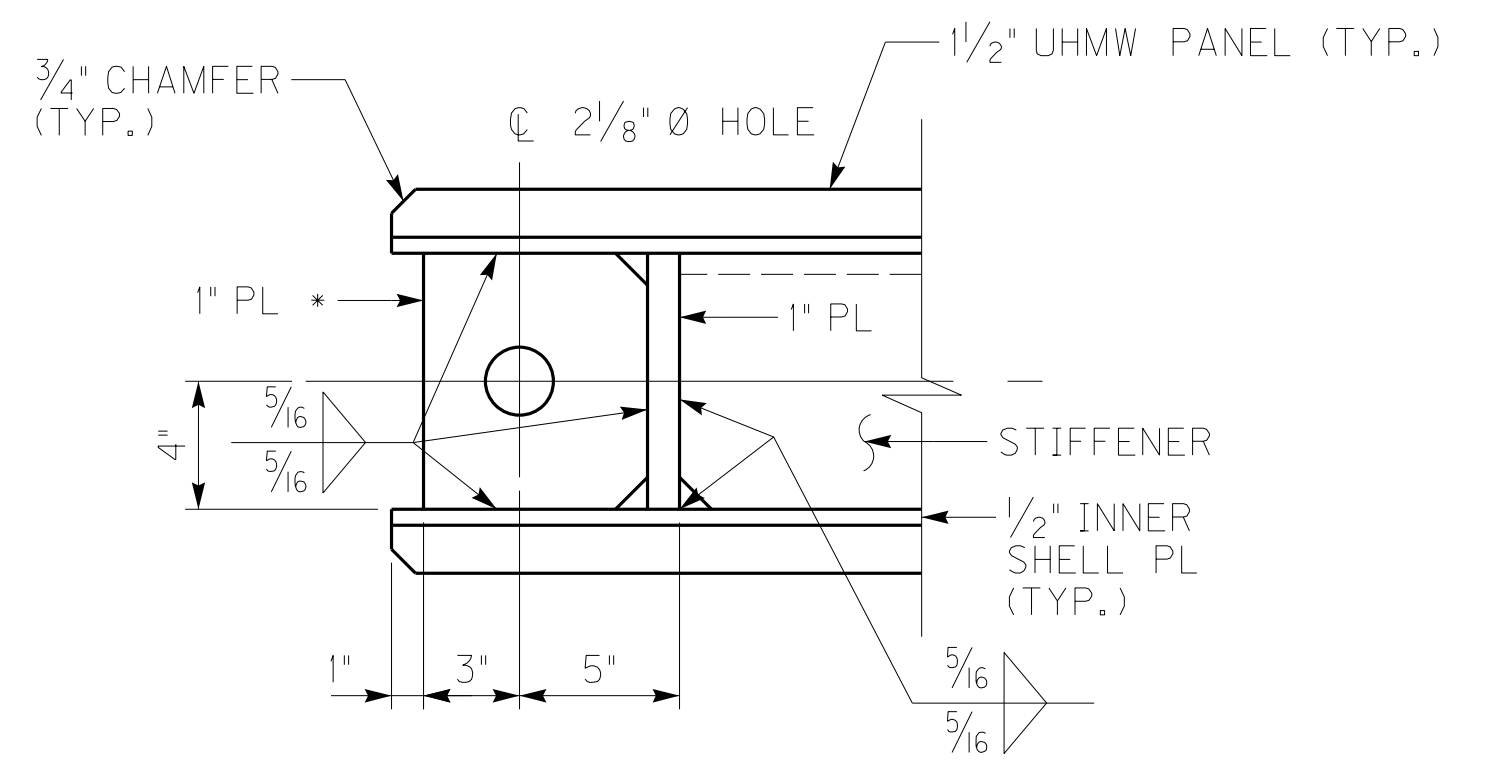
DETAIL 4



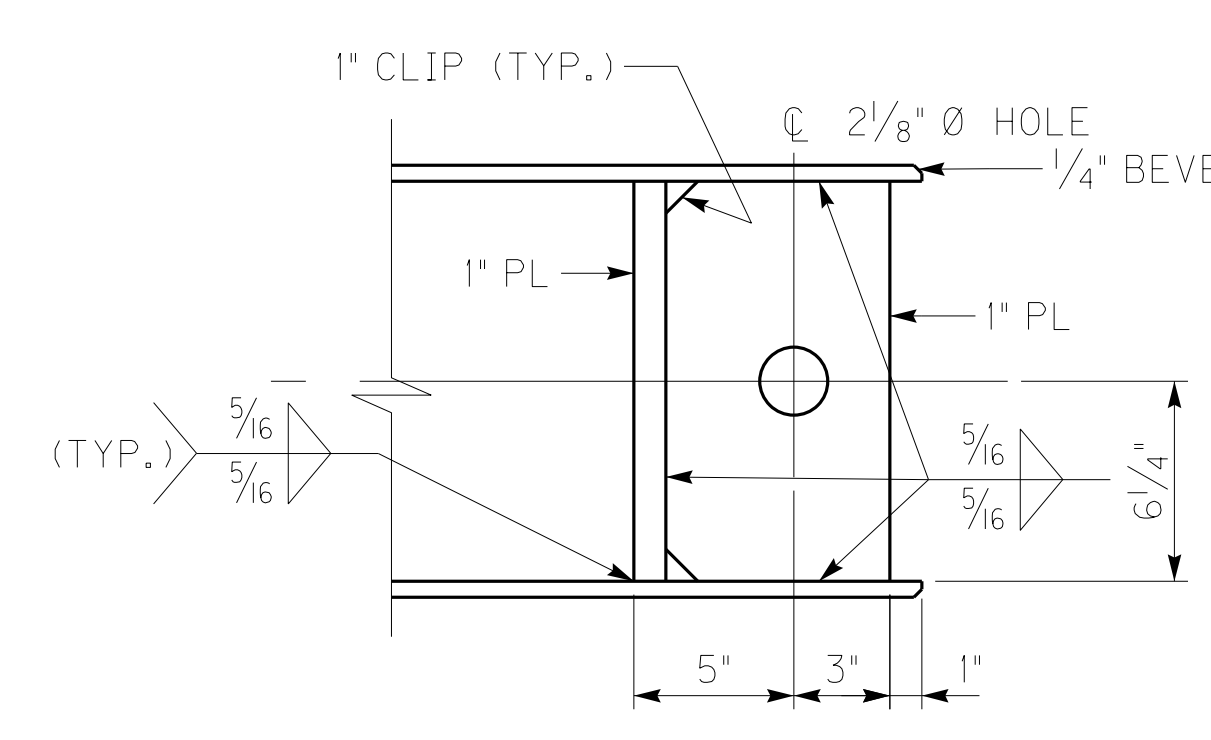
UHMW PANEL FASTENER DETAIL



CLEVIS DETAIL



INSIDE SHELL PIN PL DETAIL



OUTSIDE SHELL PIN PL DETAIL

NOTES

- 1. FOR MODULAR EXPANSION JOINT NOTES, SEE SHEET NOS. S206 AND S207A.

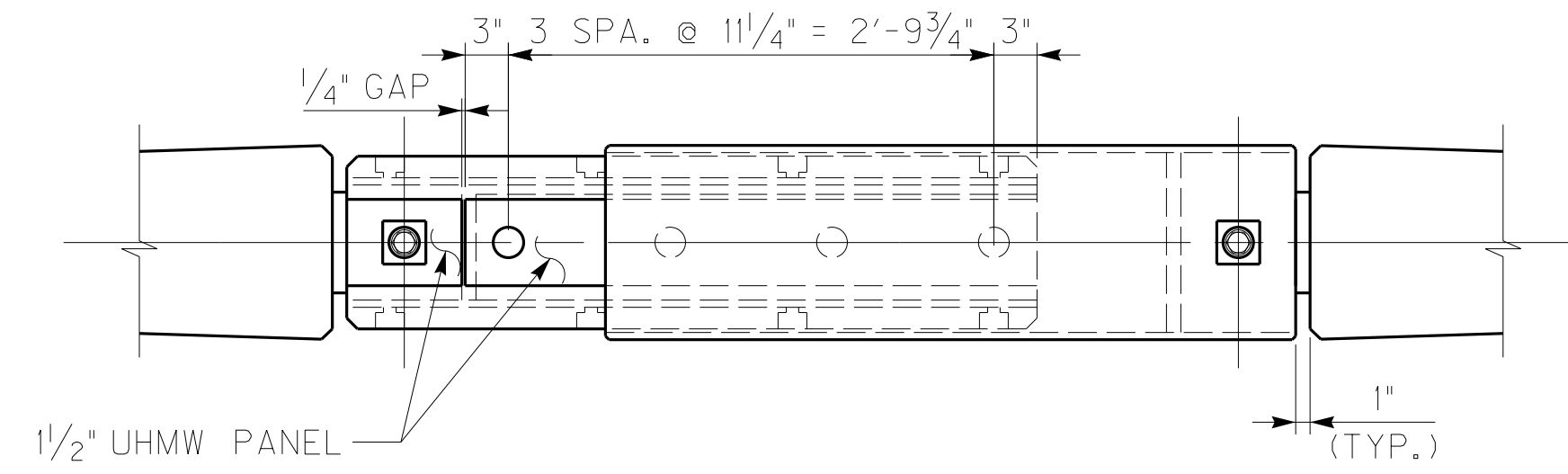
LEGEND

- * SPACING TO MATCH STIFFENER SPACING

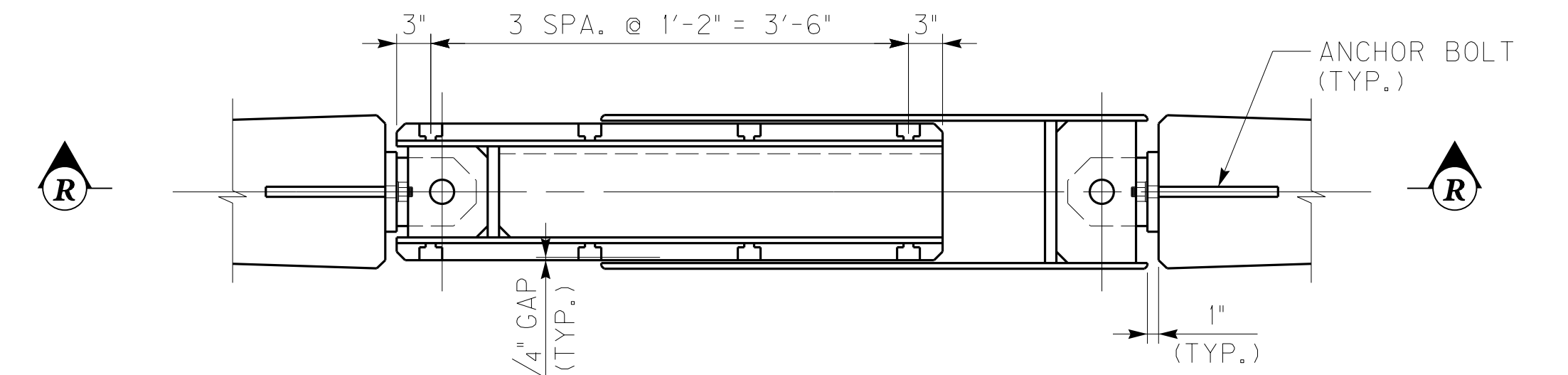


ITEM NUMBER	01-180.70
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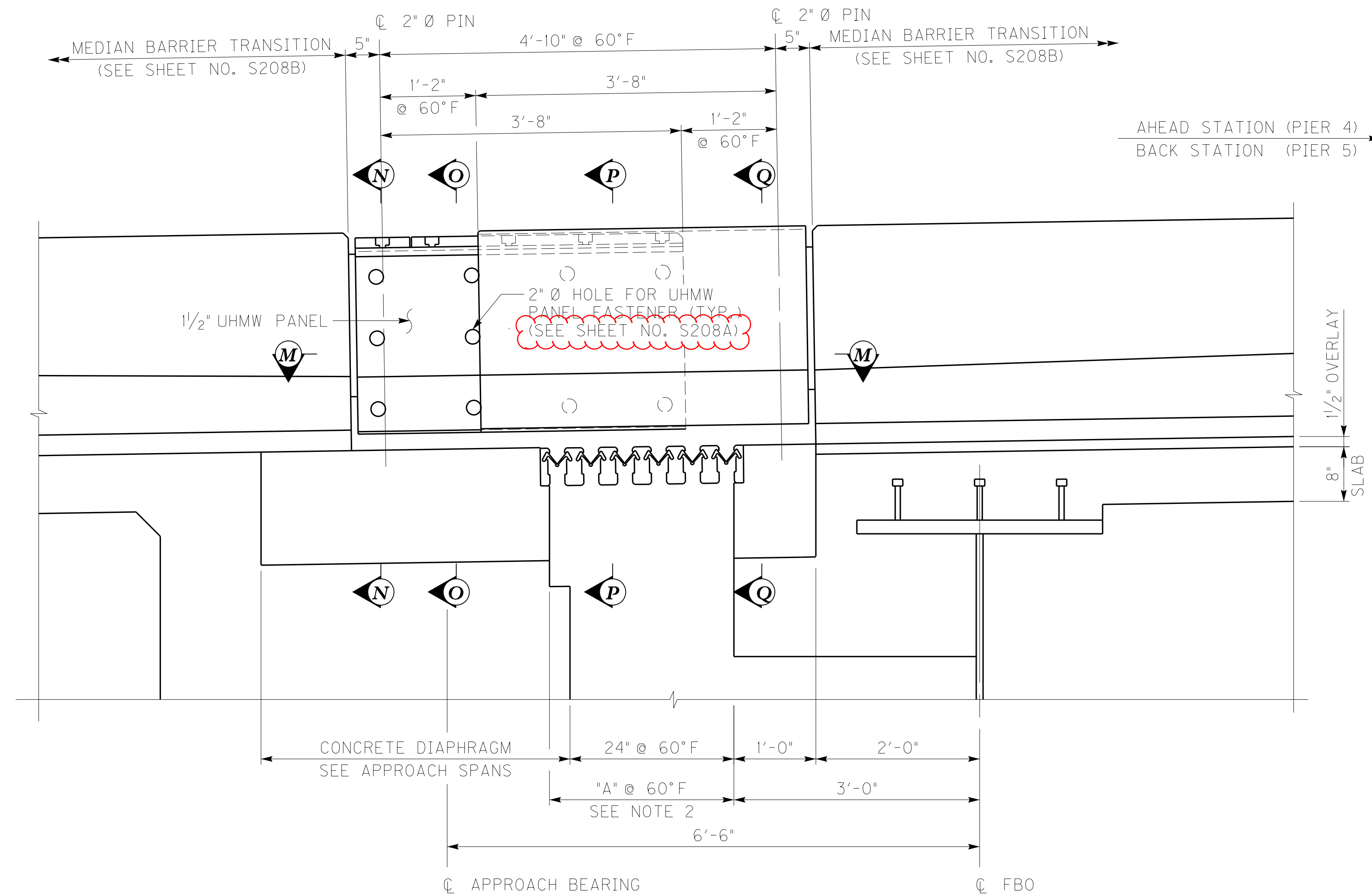
REMOVE CURB DETAIL		11/25/13
REVISION		DATE
DATE: NOVEMBER 15, 2013	CHECKED BY	
DESIGNED BY: DMB	TJT	
DETAILED BY: MJD	DMB	
Commonwealth of Kentucky DEPARTMENT OF HIGHWAYS		
COUNTY MARSHALL / TRIGG		
ROUTE US68	CROSSING KENTUCKY LAKE	
MODULAR EXP. JOINT DETAILS - 5		
PREPARED BY	SHEET NO.	
Baker	S208A	
MICHAEL BAKER JR., INC. 9750 ORMSBY STATION ROAD SUITE 210 LOUISVILLE, KY 40223	DRAWING NO. 24686	



PLAN MEDIAN BARRIER

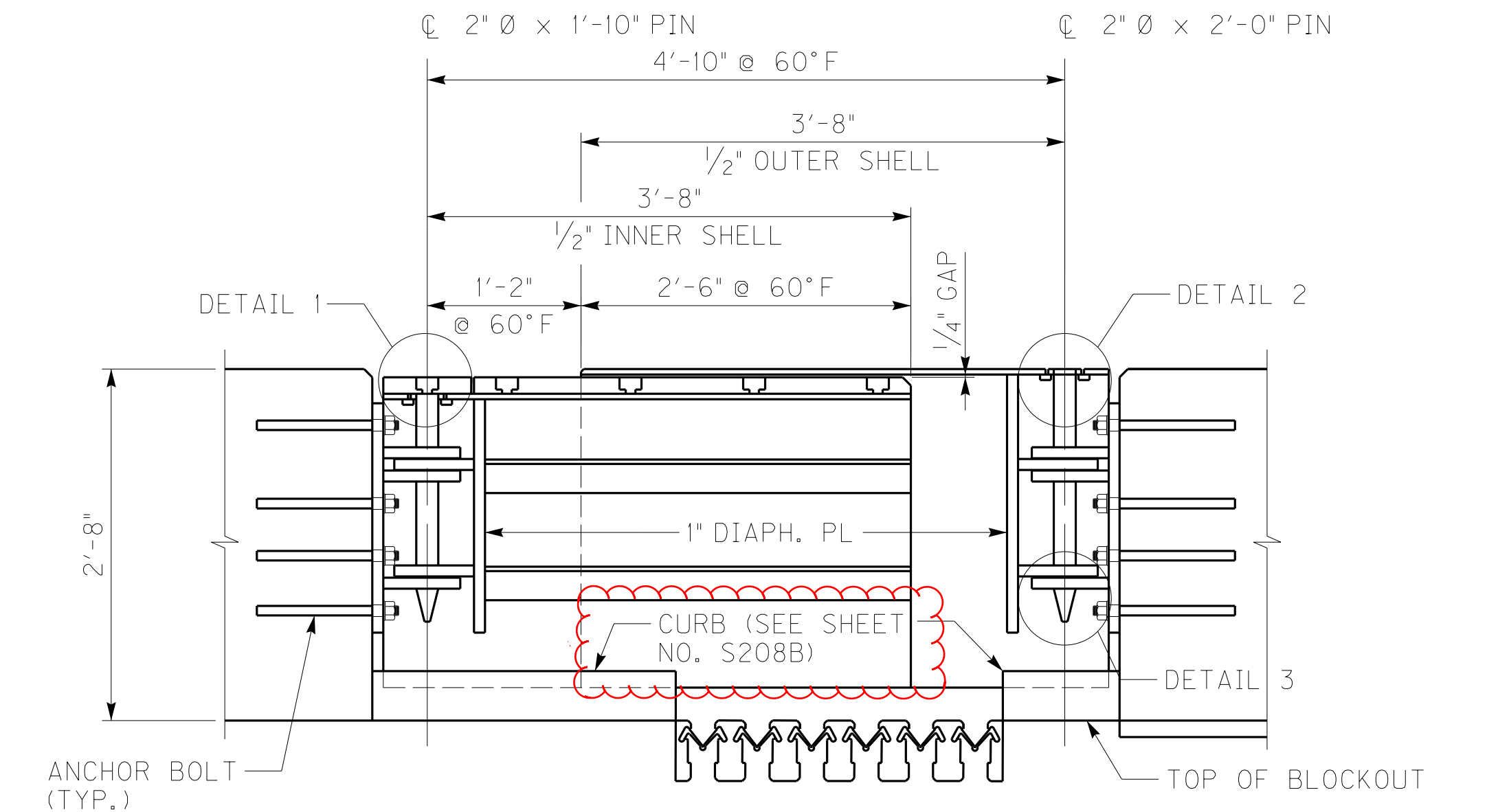


SECTION M-M



SECTION C-C

LOOKING NORTH



SECTION R-R

NOTES

1. FOR MODULAR EXPANSION JOINT NOTES, SEE SHEET NOS. S206 AND S207A.
2. FOR SECTIONS N-N, O-O, P-P AND Q-Q, SEE SHEET NO. S208A.
3. FOR DETAILS 1, 2 & 3, SEE SHEET NO. S207.

FILE NAME: C:\PW\81-LOCAL\BAKER_PROJECTS\CWETHINGTON\DOI41582\S24686 EJOB.DGN

USER: Mgr\jcd\dwyer
DATE PLOTTED: November 25, 2013

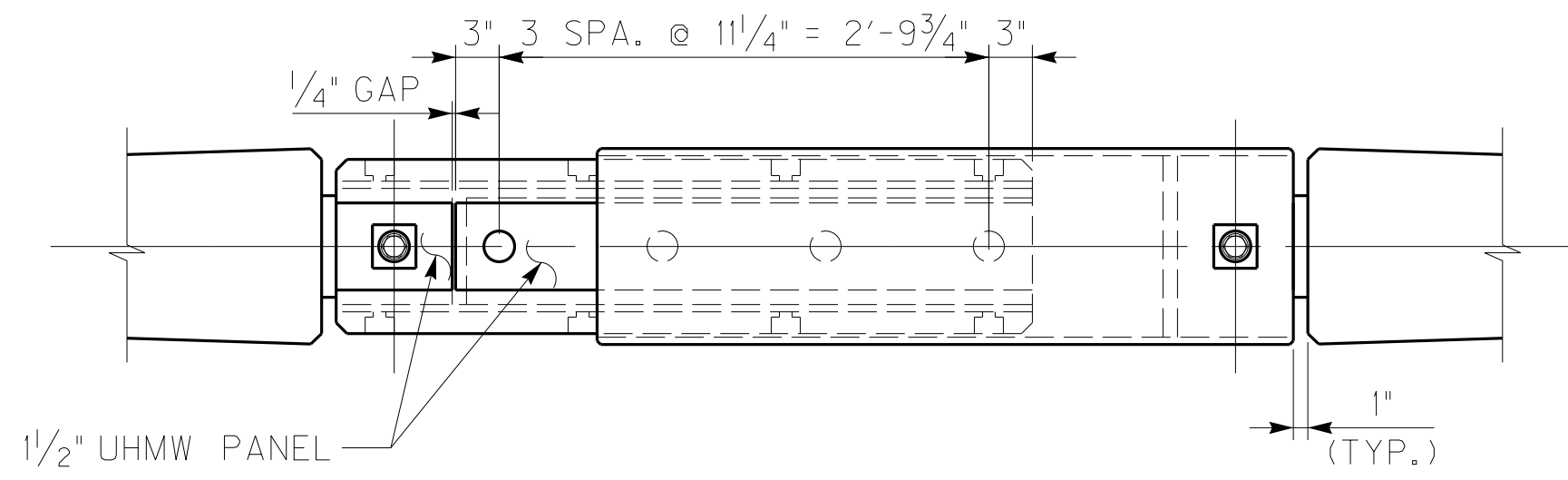
E-SHEET NAME: S24686 208

MicroStation v8.ii.7.469

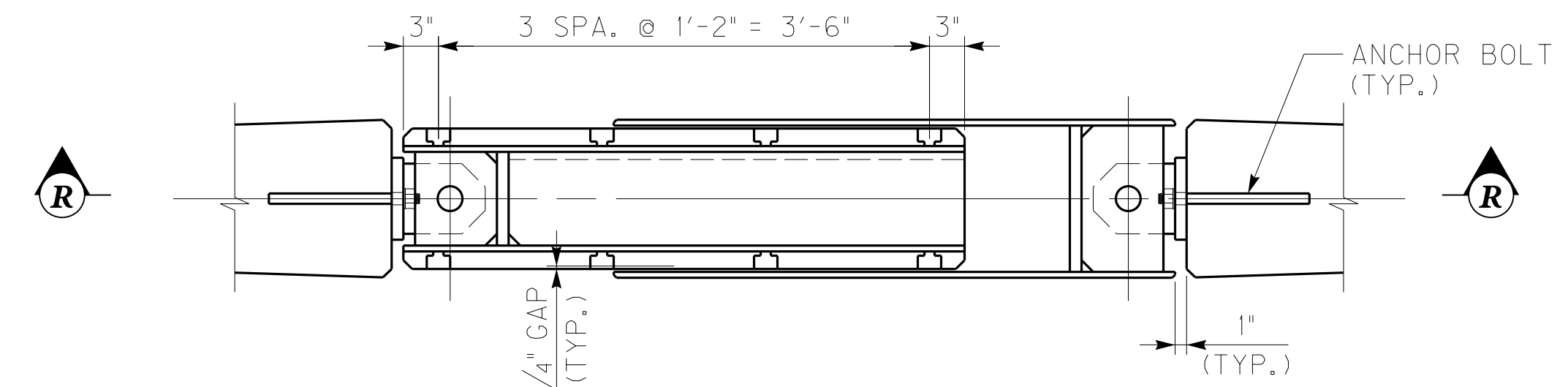
ADD CURB, ADD SHEET REF.		11/25/13
REVISION		DATE
DATE: NOVEMBER 15, 2013	CHECKED BY	
DESIGNED BY: DMB	TJT	
DETAILED BY: MJD	DMB	
Commonwealth of Kentucky DEPARTMENT OF HIGHWAYS		
COUNTY MARSHALL / TRIGG		
ROUTE US68	CROSSING KENTUCKY LAKE	
MODULAR EXP. JOINT DETAILS - 4		
ITEM NUMBER	PREPARED BY	SHEET NO.
01-180.70	Baker	S208
	MICHAEL BAKER JR. INC. 9750 ORMSBY STATION ROAD SUITE 210 LOUISVILLE, KY 40223	DRAWING NO. 24686



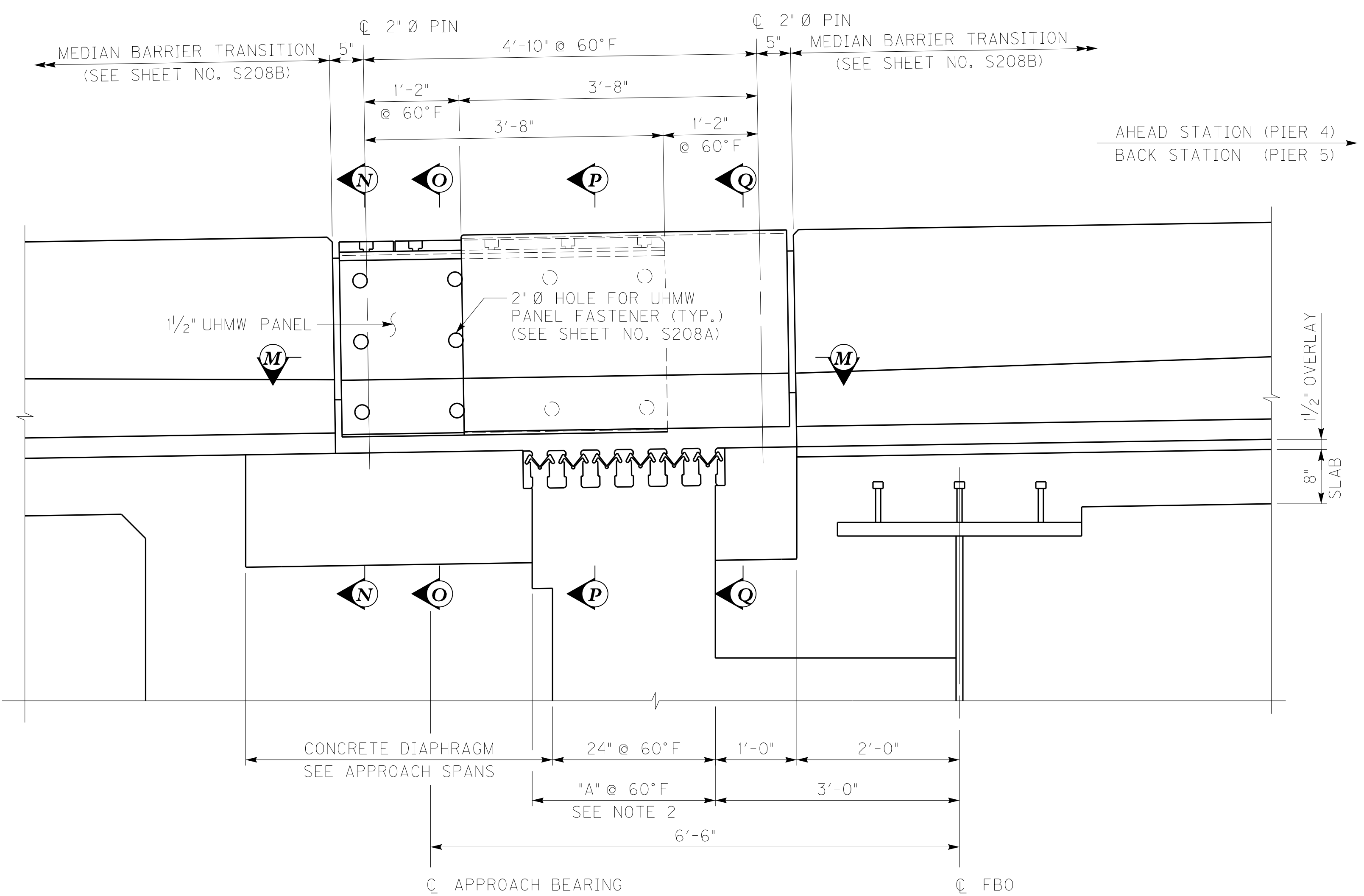
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 USER: Mgr\jcd\dwyer
 DATE PLOTTED: November 25, 2013
 E-SHEET NAME: S24686 208
 MicroStation v8.ii.7.469



PLAN MEDIAN BARRIER

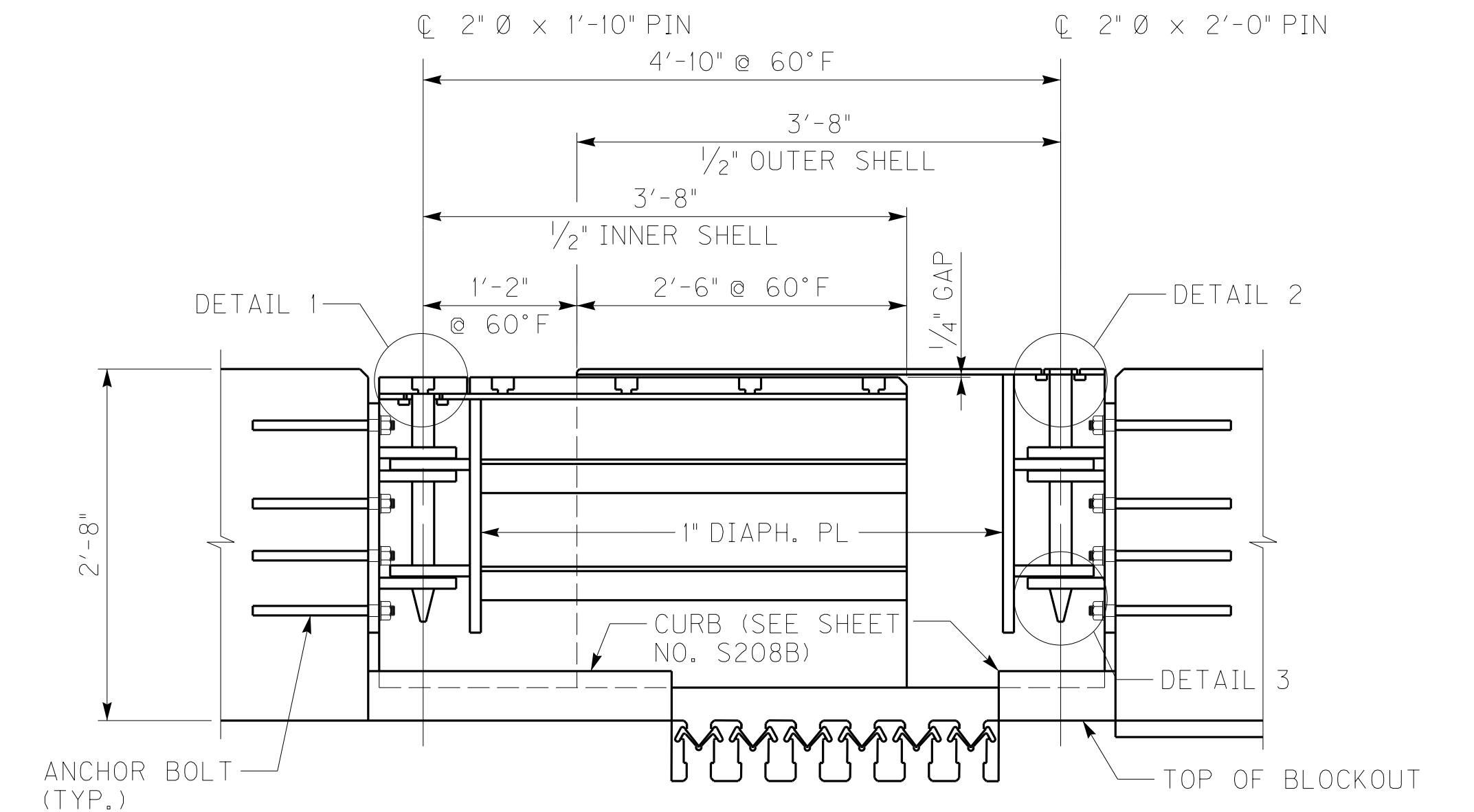


SECTION M-M



SECTION C-C

LOOKING NORTH



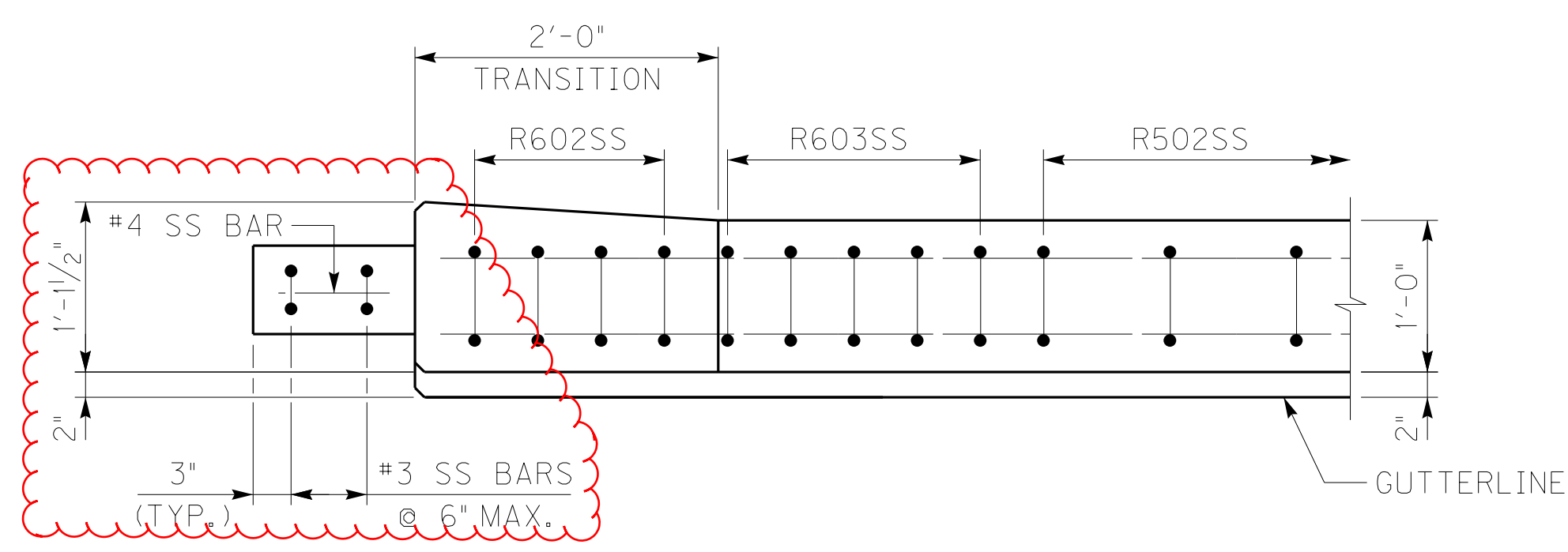
SECTION R-R

NOTES

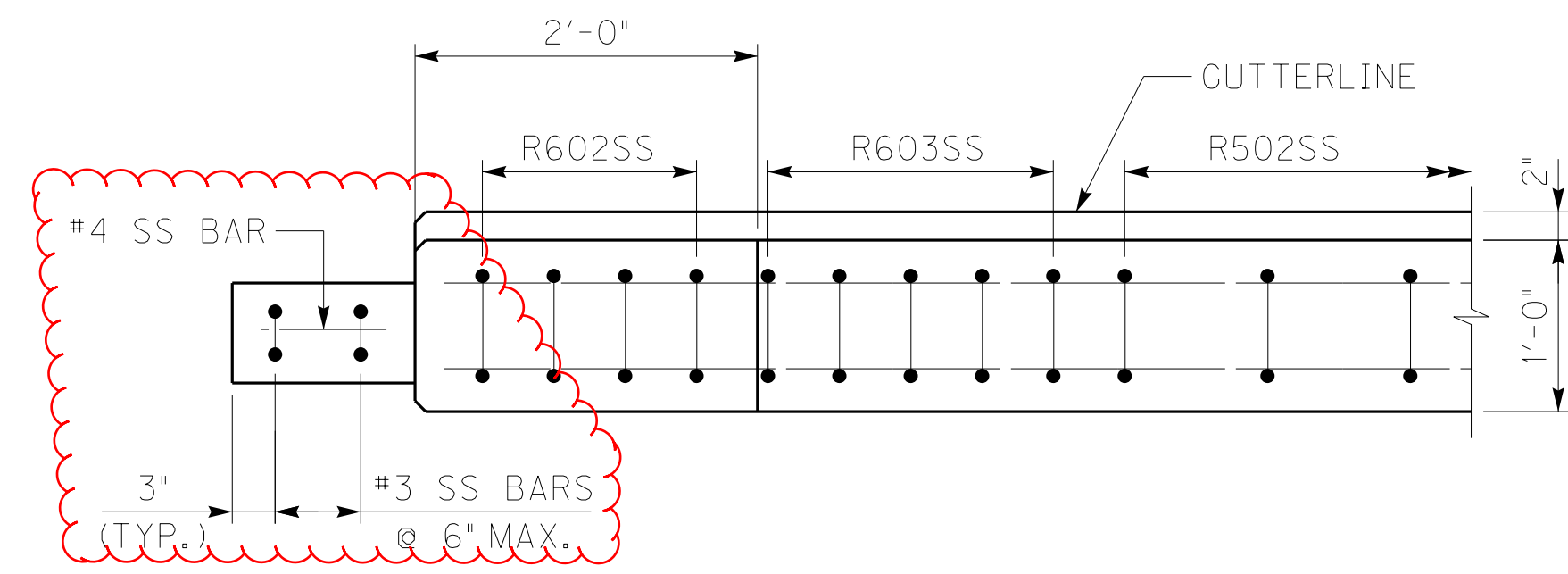
1. FOR MODULAR EXPANSION JOINT NOTES, SEE SHEET NOS. S206 AND S207A.
2. FOR SECTIONS N-N, O-O, P-P AND Q-Q, SEE SHEET NO. S208A.
3. FOR DETAILS 1, 2 & 3, SEE SHEET NO. S207.

ADD CURB, ADD SHEET REF.		11/25/13
REVISION		DATE
DATE: NOVEMBER 15, 2013	CHECKED BY	
DESIGNED BY: DMB	TJT	
DETAILED BY: MJD	DMB	
Commonwealth of Kentucky DEPARTMENT OF HIGHWAYS		
COUNTY MARSHALL / TRIGG		
ROUTE US68	CROSSING KENTUCKY LAKE	
MODULAR EXP. JOINT DETAILS - 4		
ITEM NUMBER	PREPARED BY	SHEET NO.
01-180.70	Baker	S208
	MICHAEL BAKER JR. INC. 9750 ORMSBY STATION ROAD SUITE 210 LOUISVILLE, KY 40223	DRAWING NO. 24686

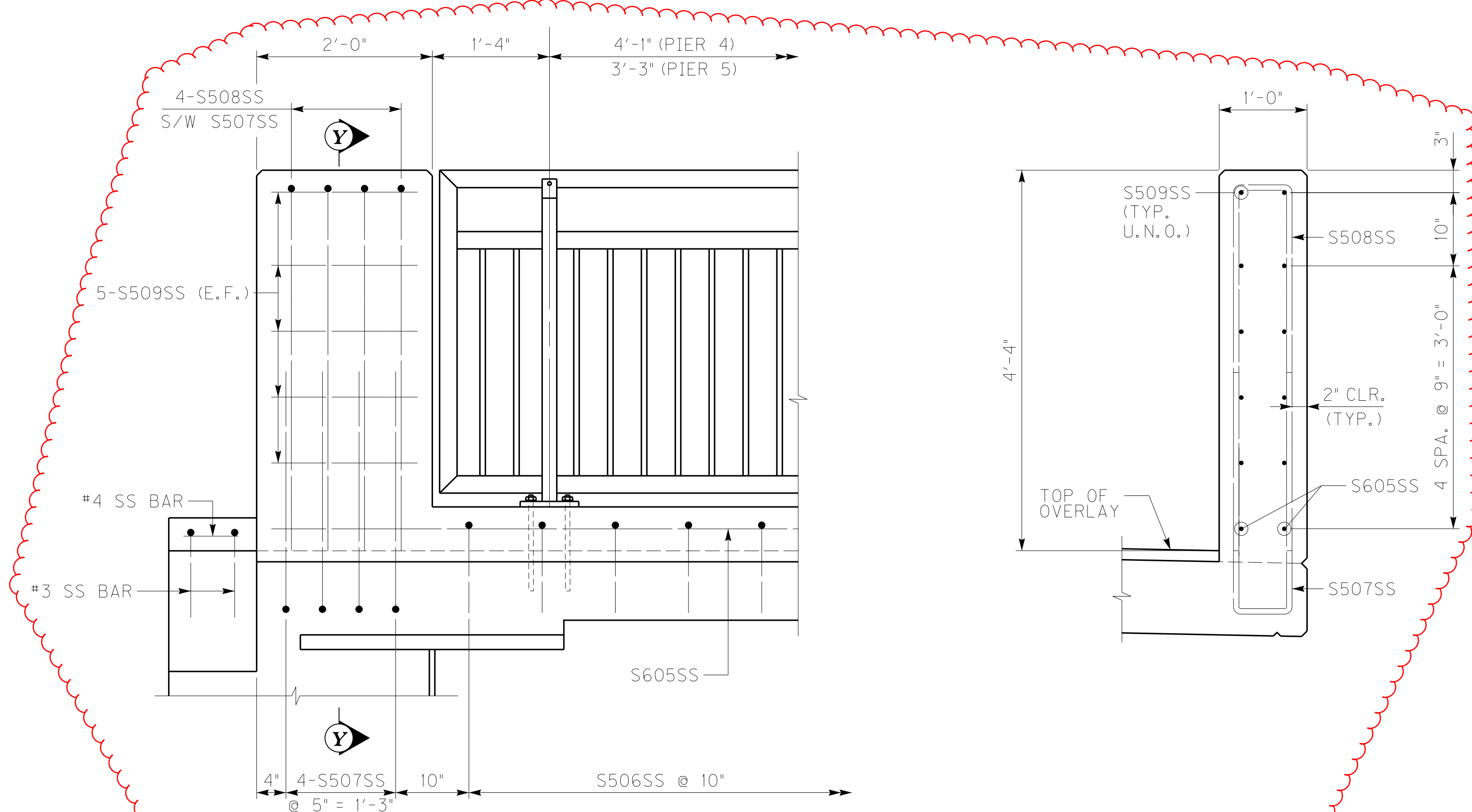




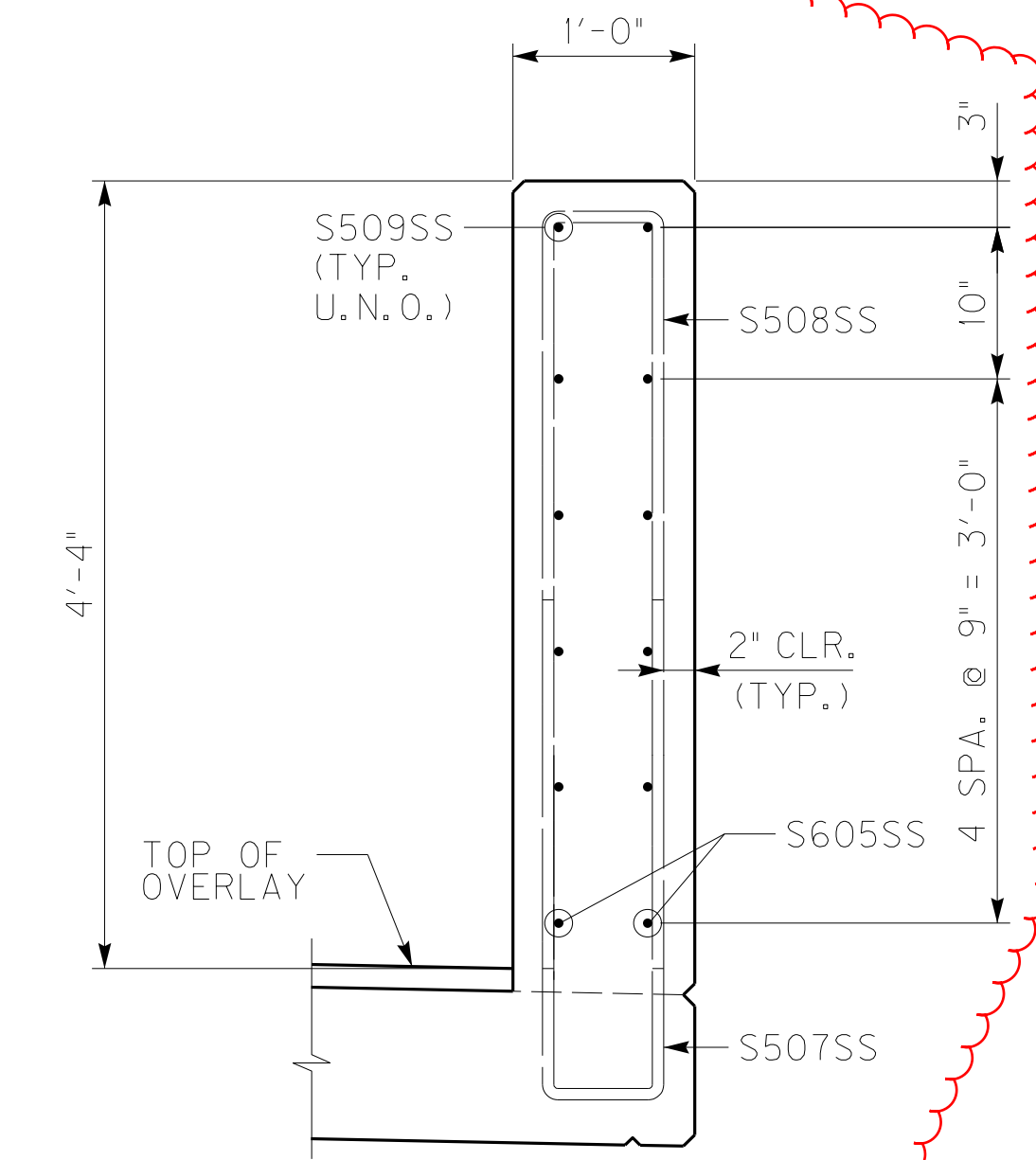
PLAN OF COMBINATION BARRIER



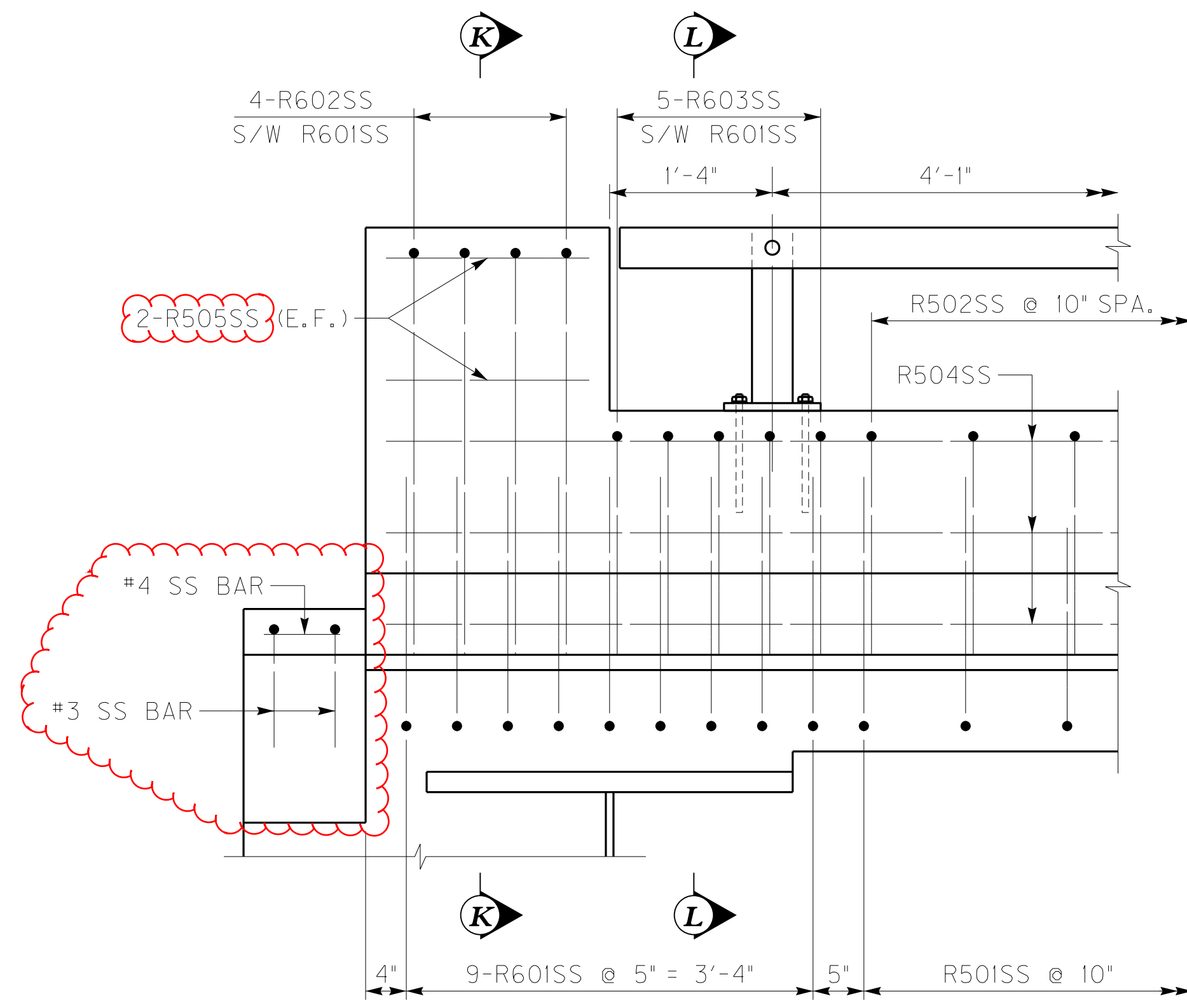
PLAN OF TRAFFIC BARRIER



ELEVATION OF PEDESTRIAN RAILING CURB

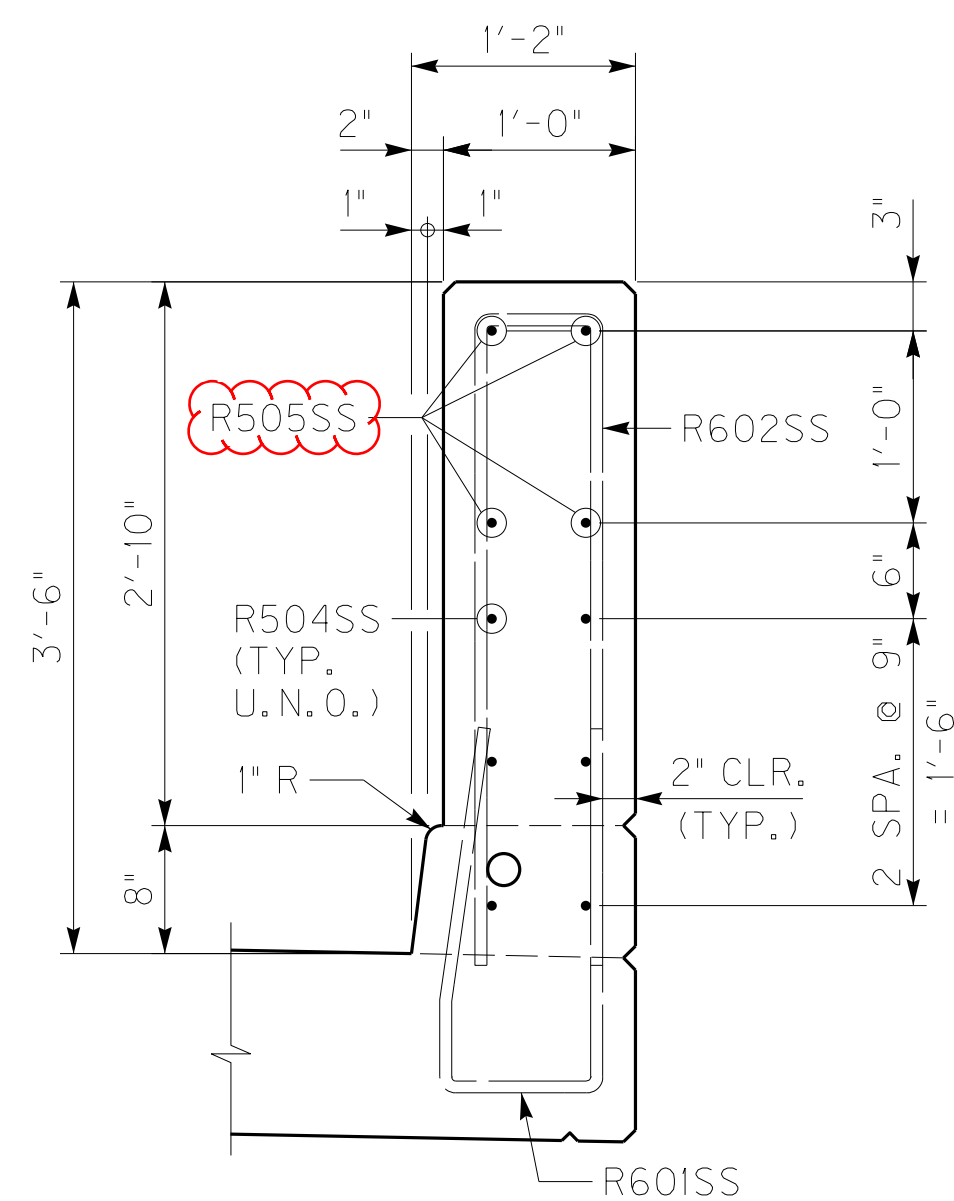


SECTION Y-Y

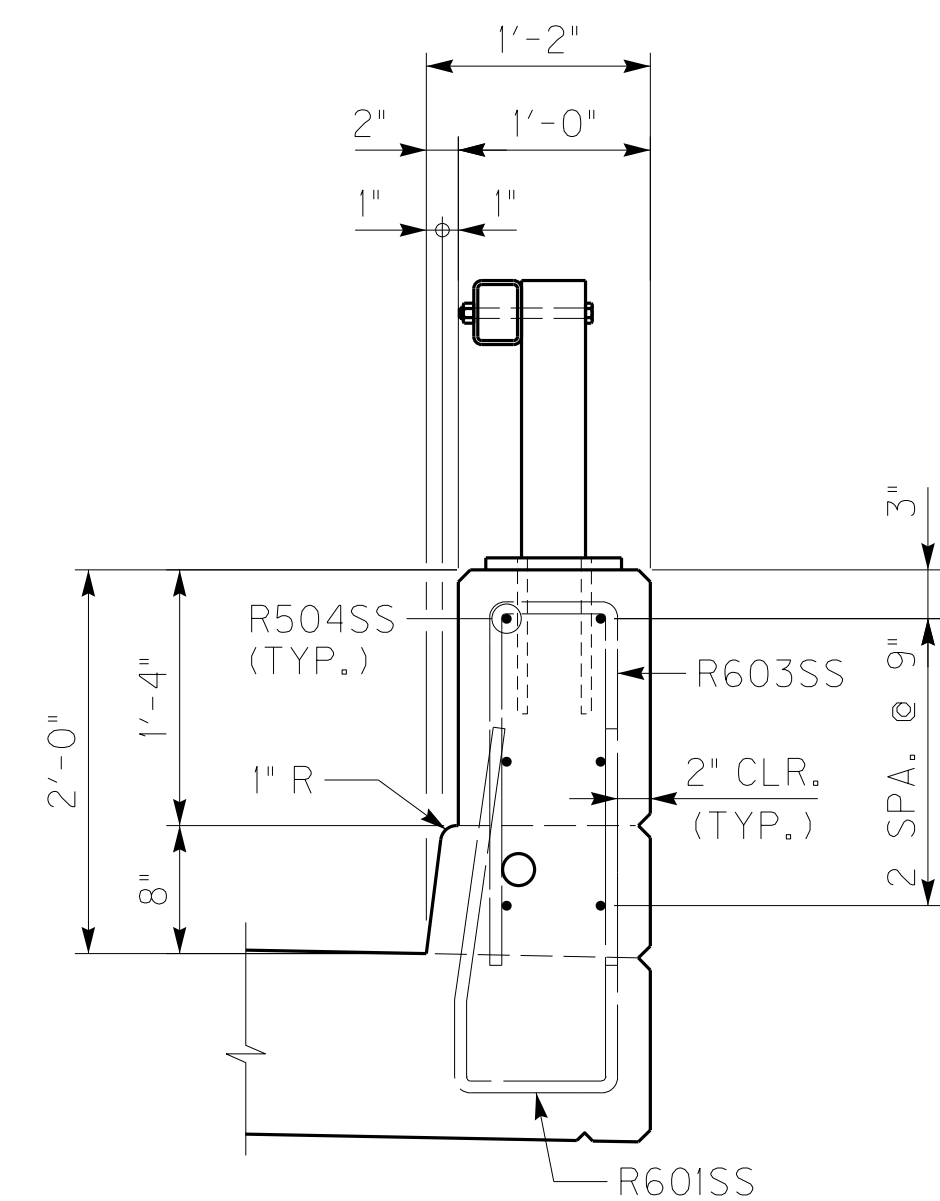


ELEVATION OF TRAFFIC BARRIER

COMBINATION BARRIER SIMILAR



SECTION K-K



SECTION L-L

NOTES

1. FOR MODULAR EXPANSION JOINT NOTES, SEE SHEET NOS. S206 AND S207A.
2. FOR PEDESTRIAN RAILING CURB NOTES, SEE SHEET NO. S209.

ADD PED. RAIL CURB DETAILS, CHANGED BAR NAMES		11/25/13
REVISION		DATE
DATE: NOVEMBER 15, 2013	CHECKED BY	
DESIGNED BY: DMB	TJT	
DETAILED BY: MJD	DMB	

Commonwealth of Kentucky
DEPARTMENT OF HIGHWAYS

COUNTY
MARSHALL / TRIGG

ROUTE **US68** CROSSING **KENTUCKY LAKE**
MODULAR EXP. JOINT DETAILS - 3



ITEM NUMBER

01-180.70

Baker

PREPARED BY
MICHAEL BAKER JR., INC.
9750 ORMSBY STATION ROAD
SUITE 210
LOUISVILLE, KY 40223

SHEET NO.
S207B
DRAWING NO.
24686

FILE NAME: C:\PW\81-LOCAL\BAKER_PROJECTS\CWETHINGTON\DOI41582\S24686_EJ14.DGN

USER: MorYuoDwyer
DATE PLOTTED: November 25, 2013

E-SHEET NAME: S24686_207B

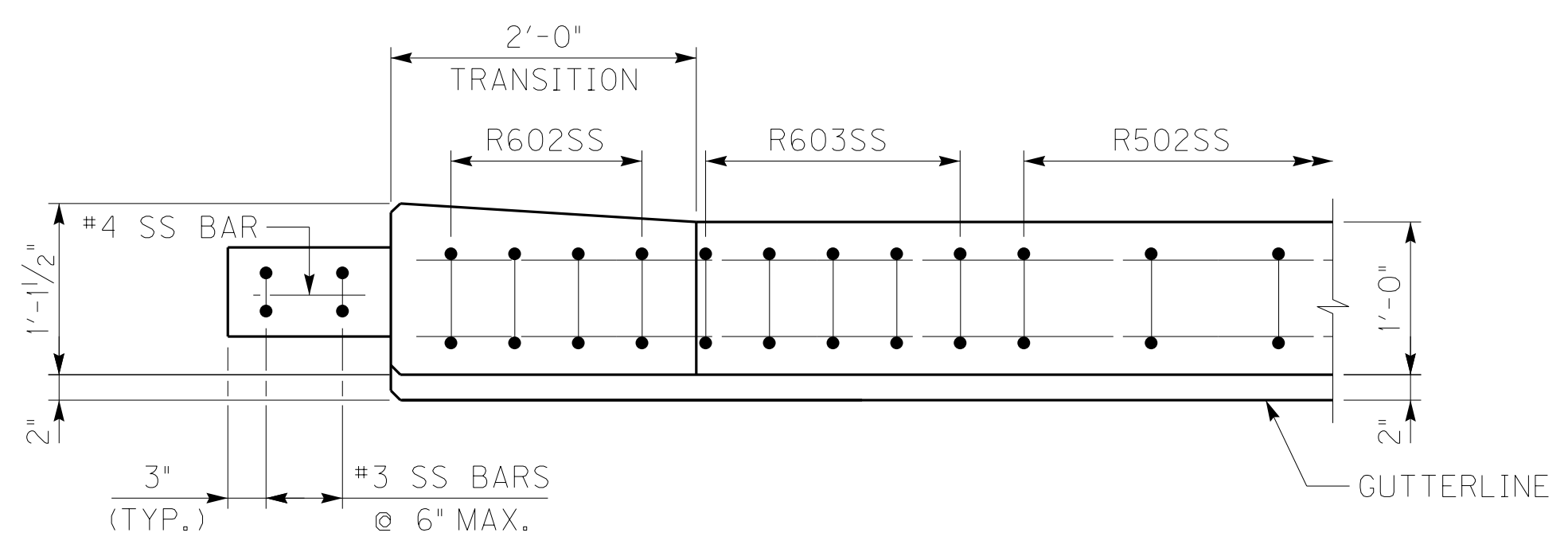
MicroStation v8.11.7.469

FILE NAME: C:\PW\81-LOCAL\BAKER_PROJECTS\CWETHINGTON\DOI41582\S24686_EJ14.DGN

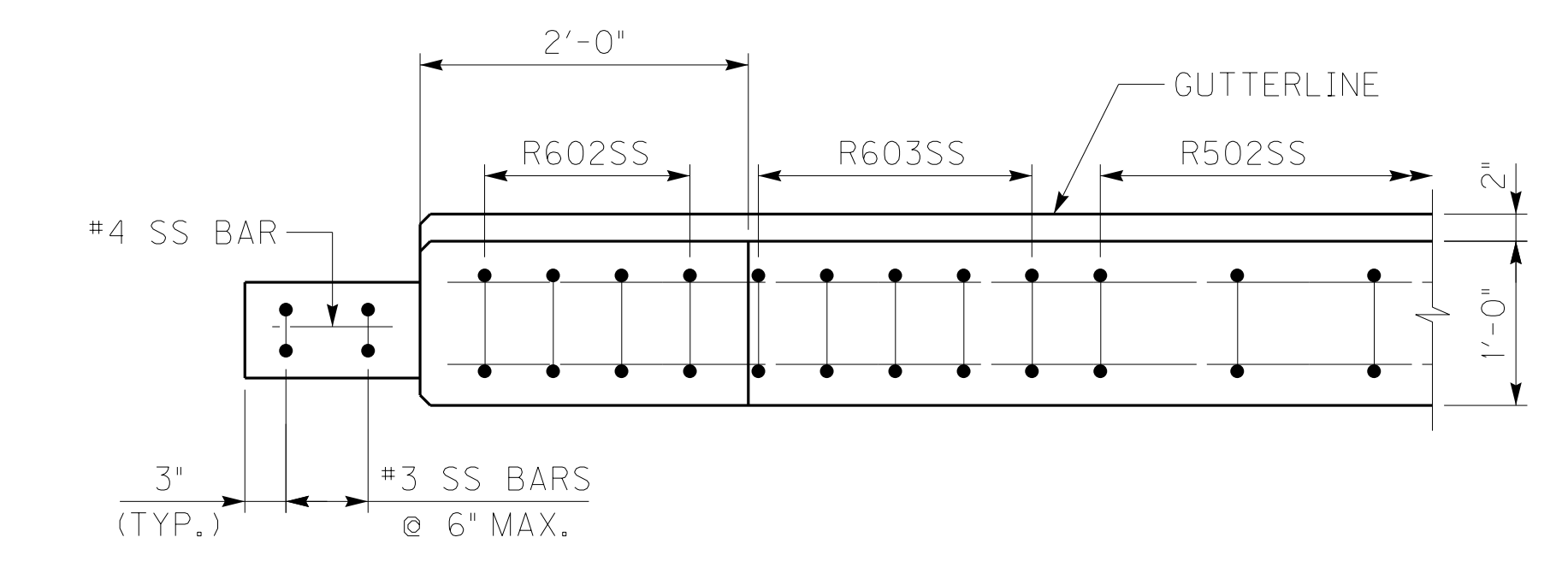
USER: Mgr\jcd\dwyer
DATE PLOTTED: November 25, 2013

E-SHEET NAME: S24686 207B

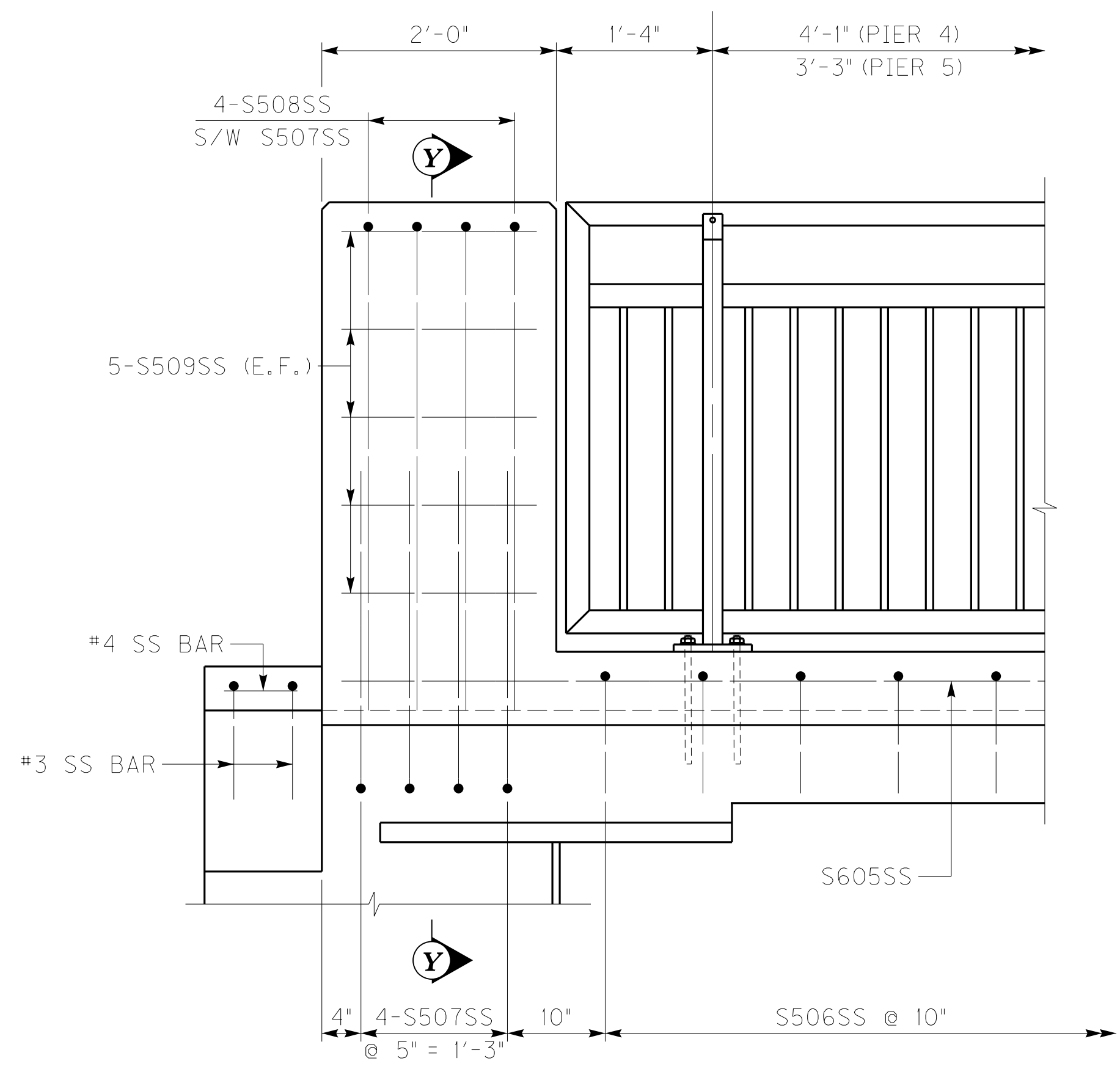
MicroStation v8.11.7.469



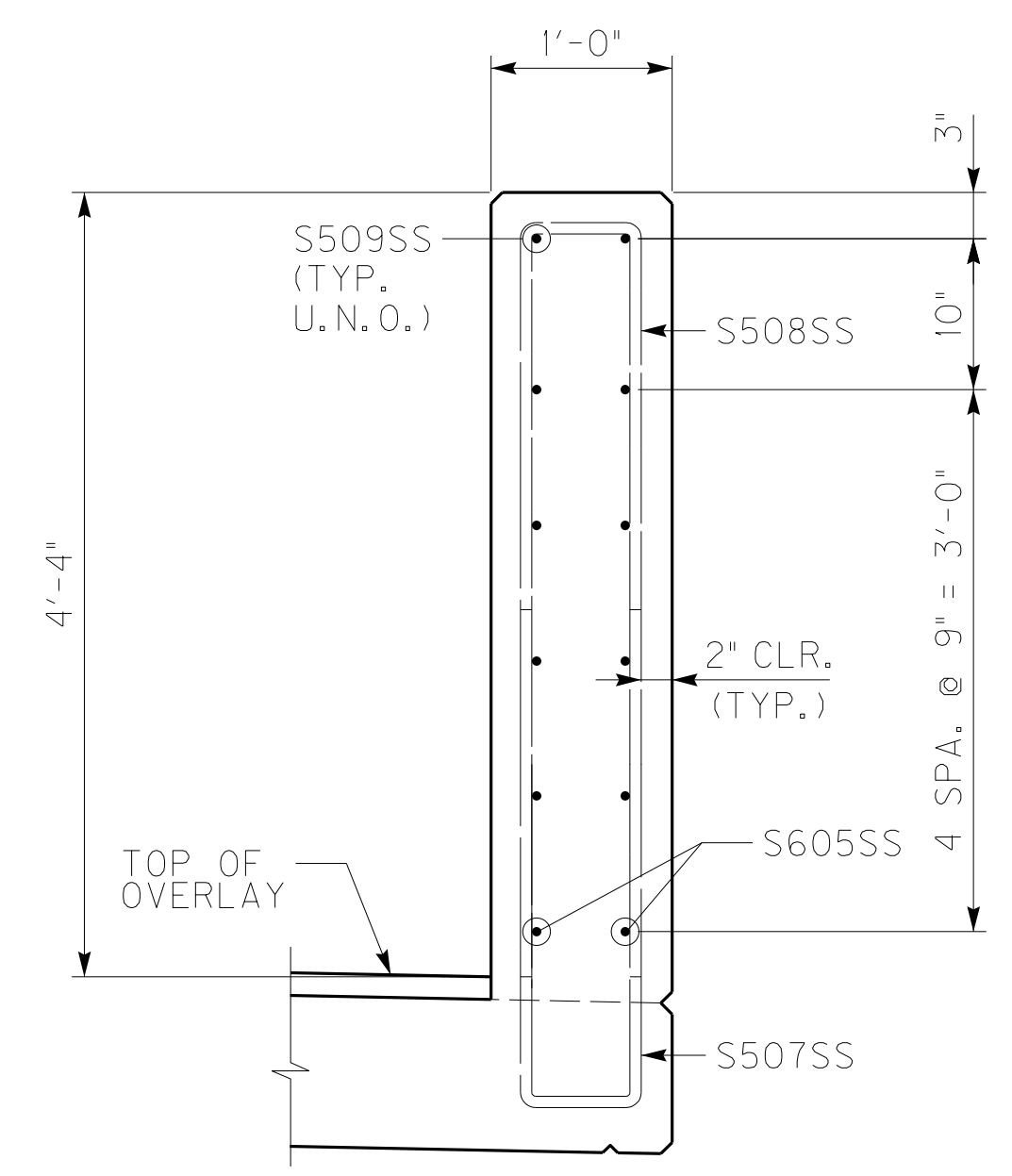
PLAN OF COMBINATION BARRIER



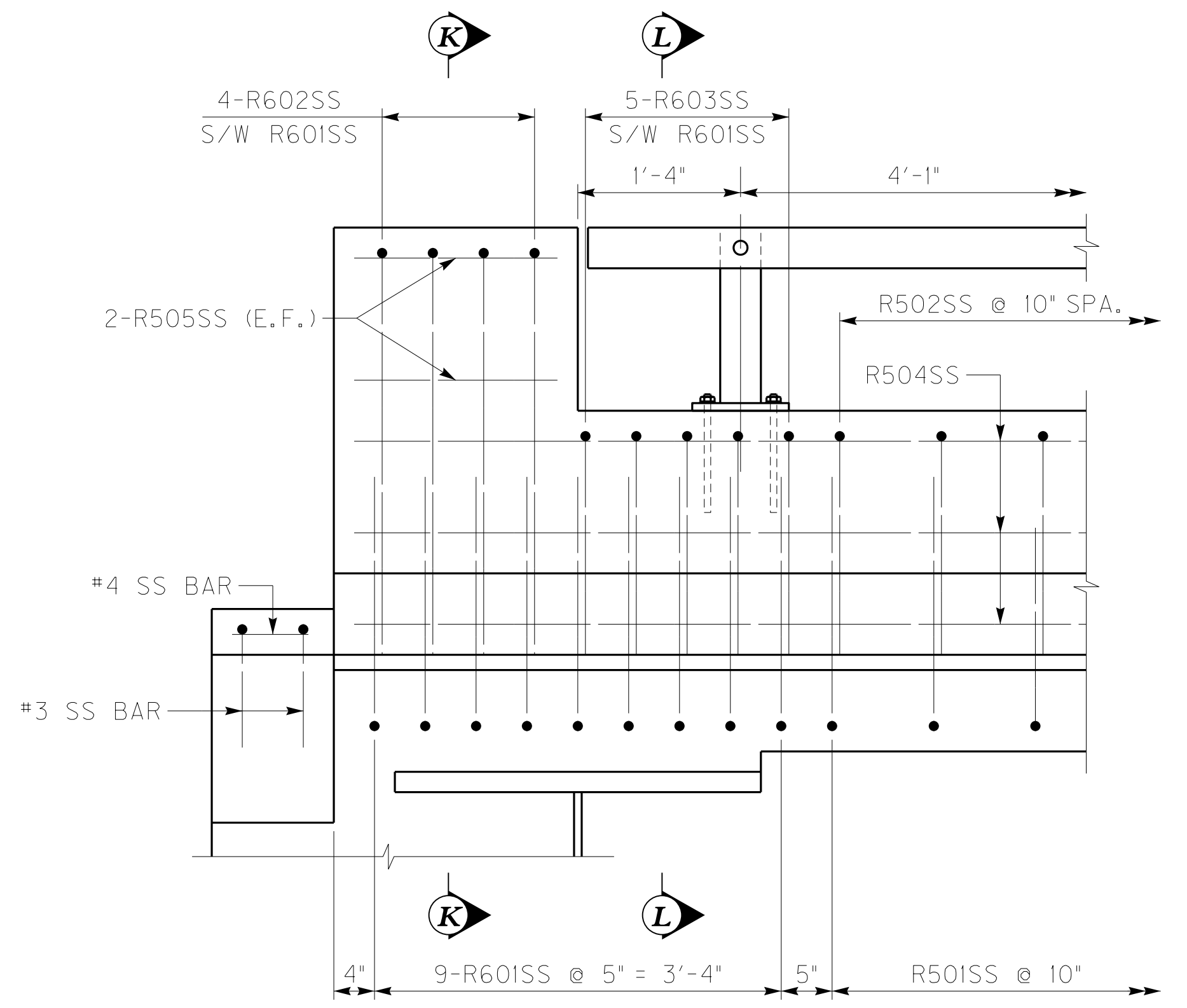
PLAN OF TRAFFIC BARRIER



ELEVATION OF PEDESTRIAN RAILING CURB

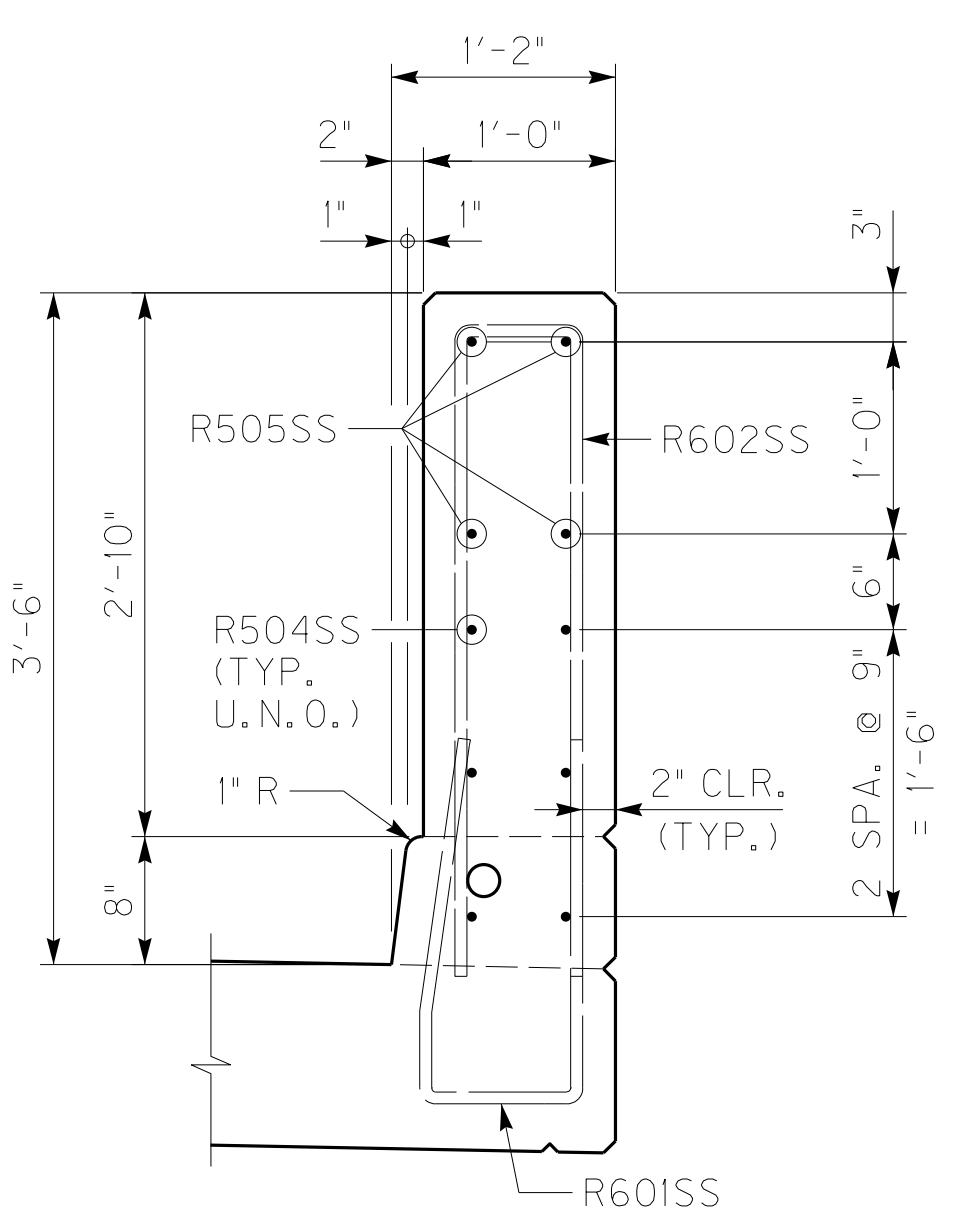


SECTION Y-Y

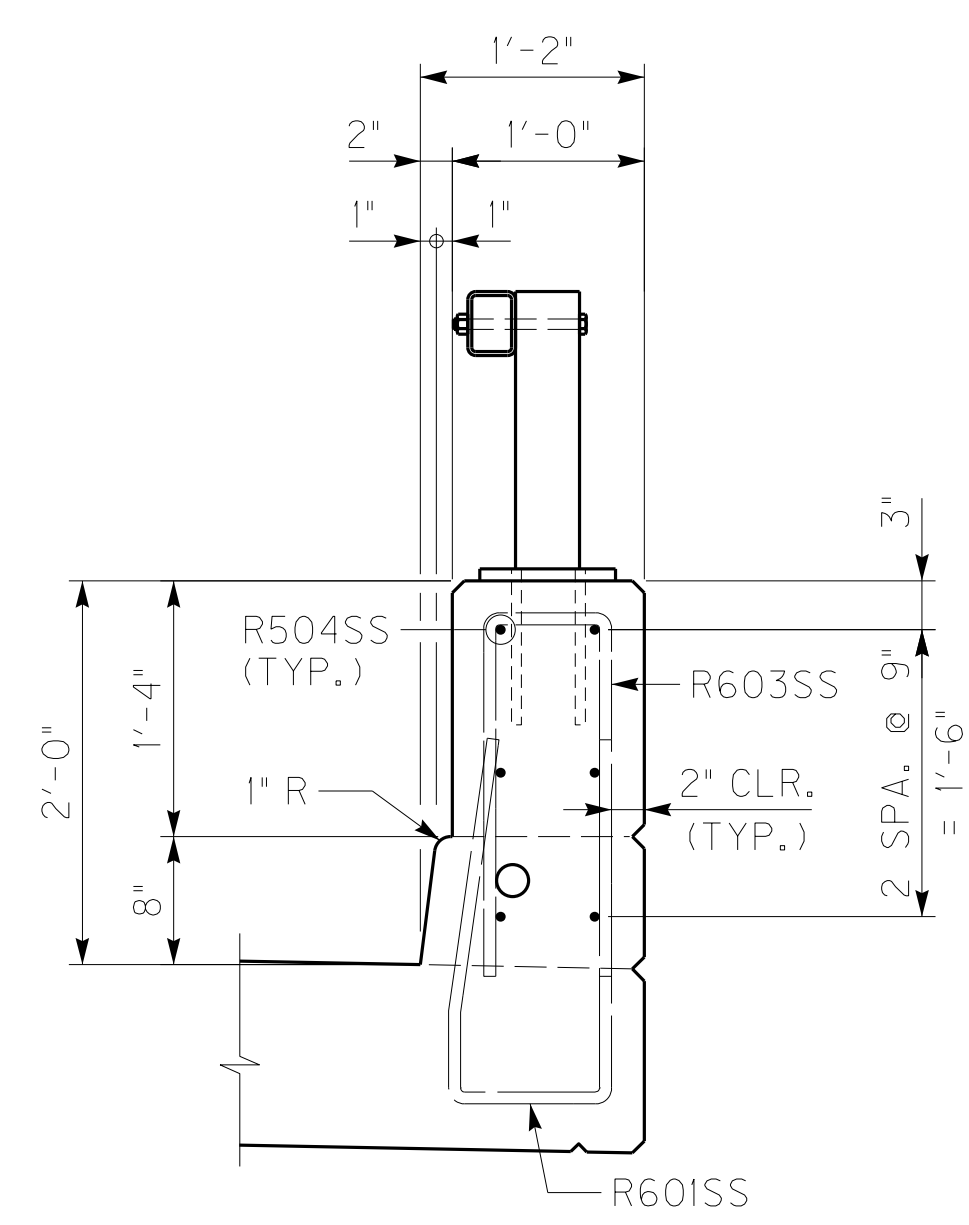


ELEVATION OF TRAFFIC BARRIER

COMBINATION BARRIER SIMILAR



SECTION K-K



SECTION L-L

NOTES

1. FOR MODULAR EXPANSION JOINT NOTES, SEE SHEET NOS. S206 AND S207A.
2. FOR PEDESTRIAN RAILING CURB NOTES, SEE SHEET NO. S209.

ADD PED. RAIL CURB DETAILS, CHANGED BAR NAMES		11/25/13
REVISION		DATE
DATE: NOVEMBER 15, 2013	CHECKED BY	
DESIGNED BY: DMB	TJT	
DETAILED BY: MJD	DMB	

Commonwealth of Kentucky
DEPARTMENT OF HIGHWAYS

COUNTY
MARSHALL / TRIGG

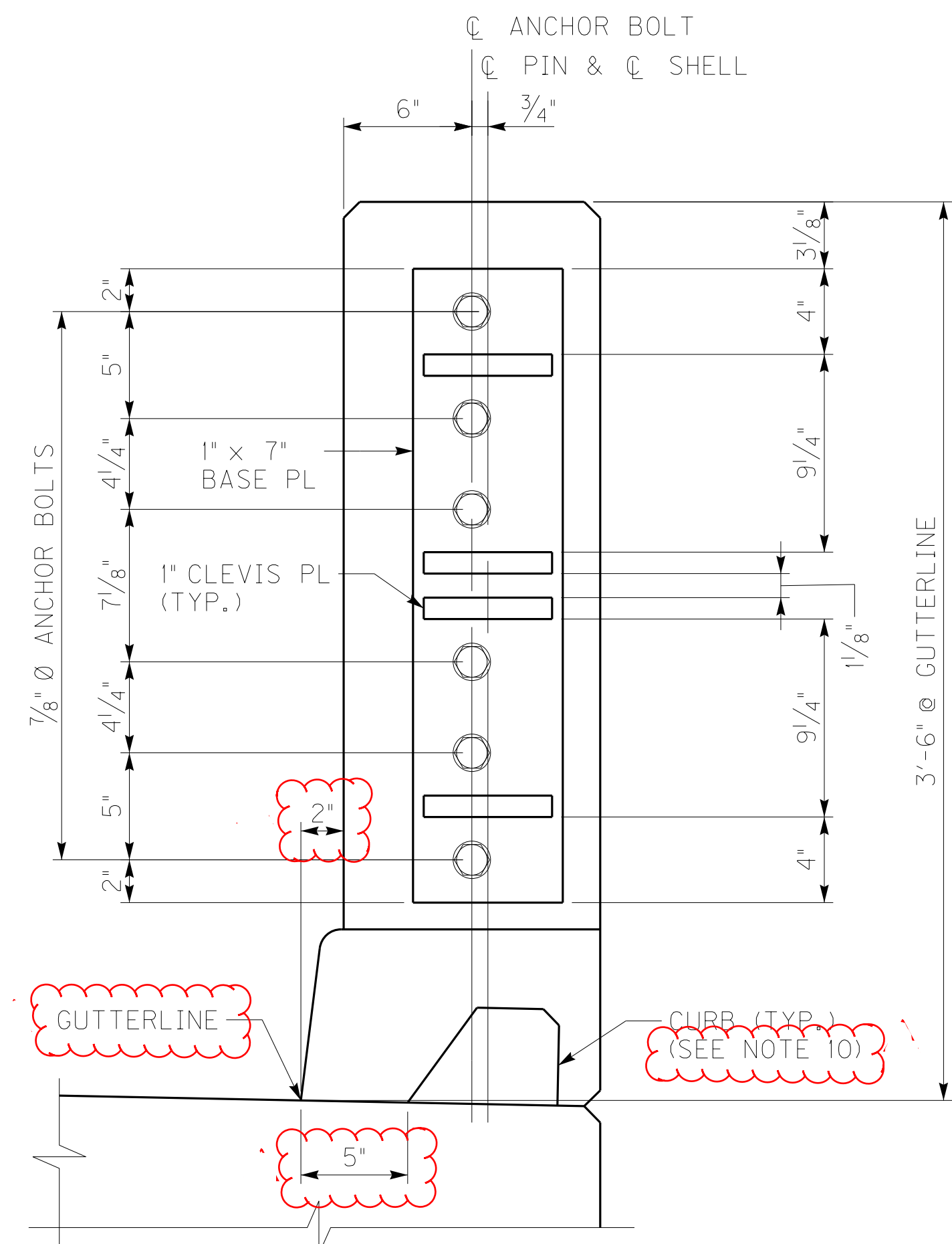
ROUTE **US68** CROSSING **KENTUCKY LAKE**
MODULAR EXP. JOINT DETAILS - 3



ITEM NUMBER	PREPARED BY	SHEET NO.
01-180.70	MICHAEL BAKER JR., INC. 9750 ORMSBY STATION ROAD SUITE 210 LOUISVILLE, KY 40223	S207B

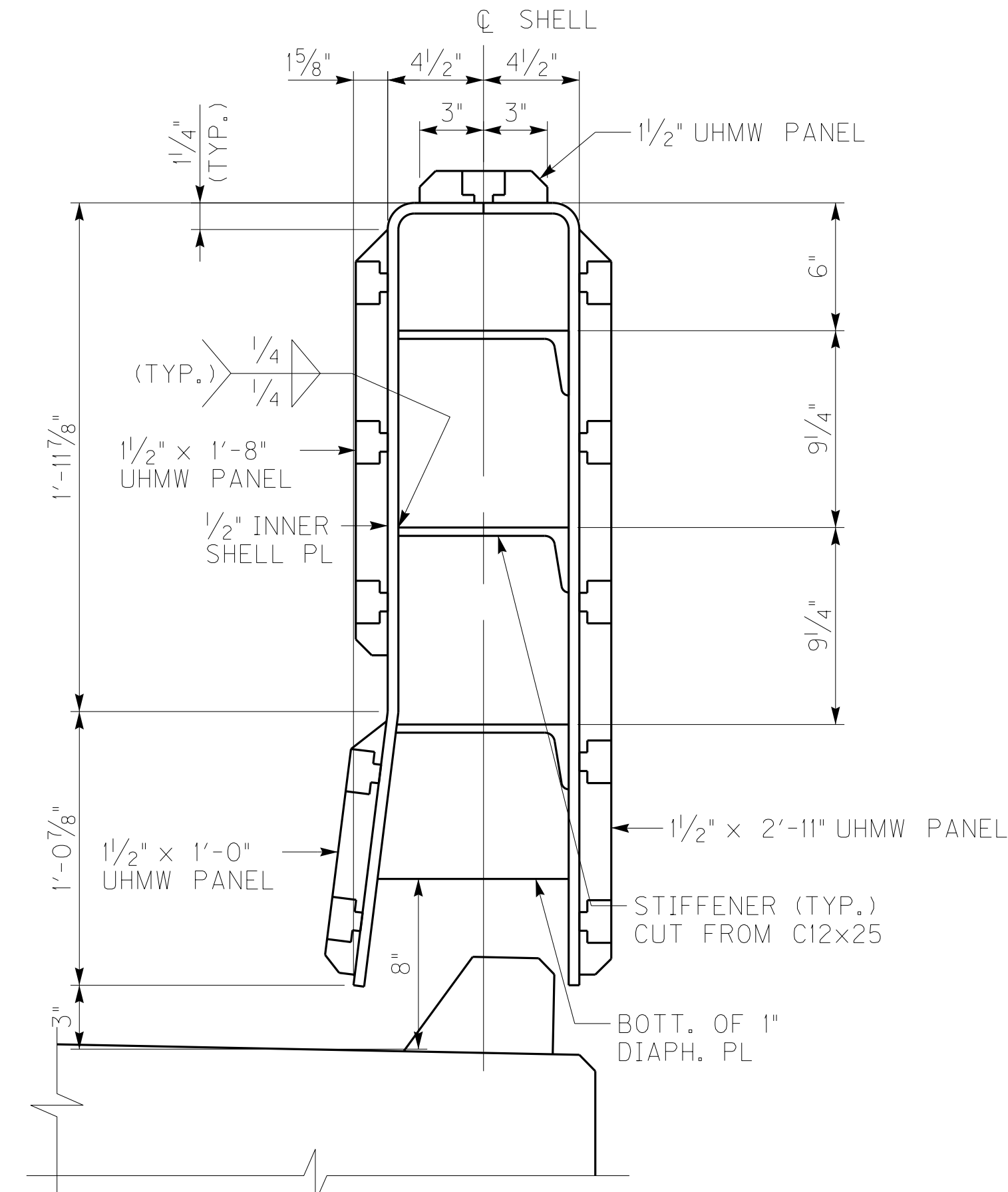


DRIVING NO.
24686

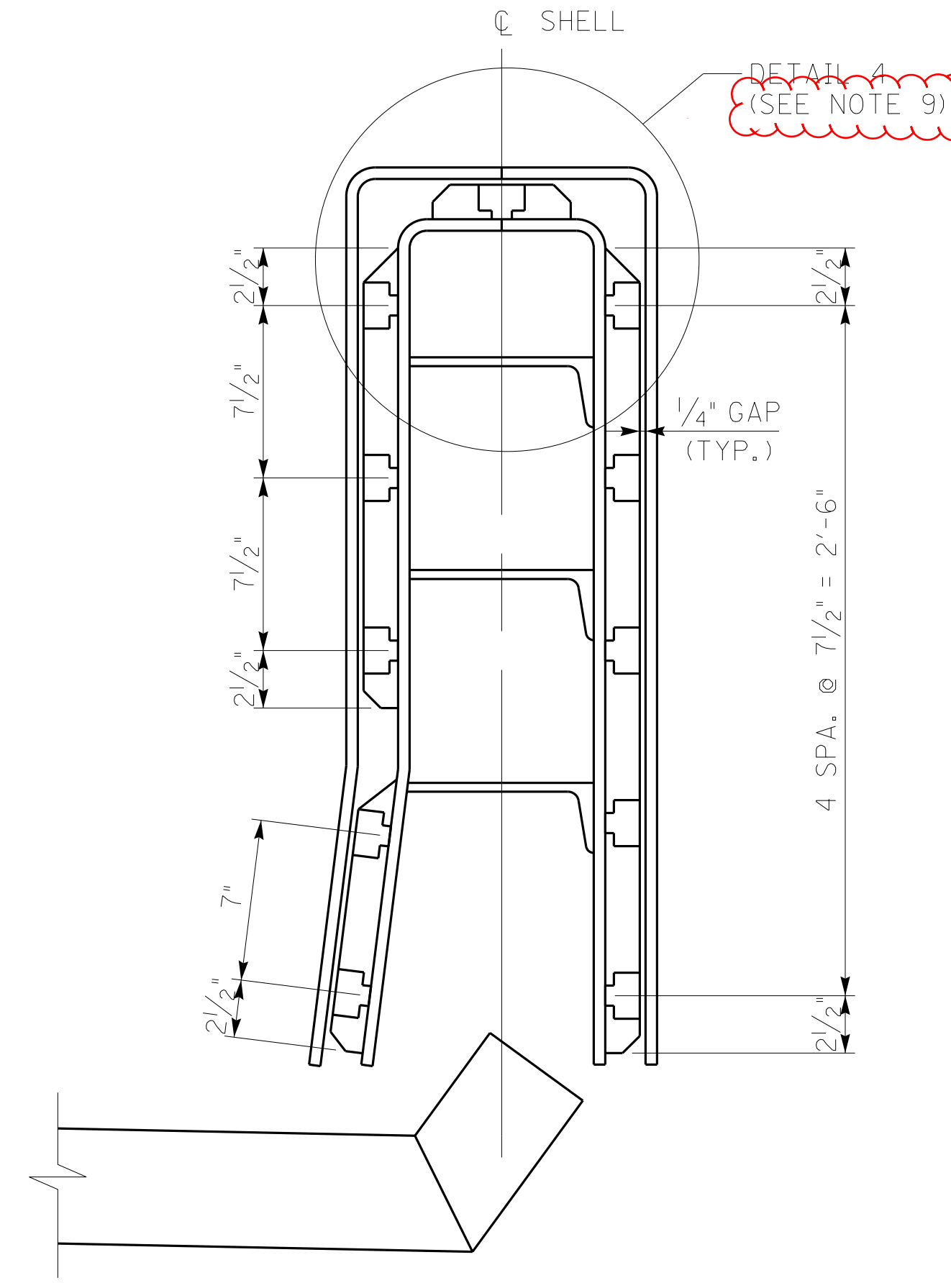


SECTION G-G

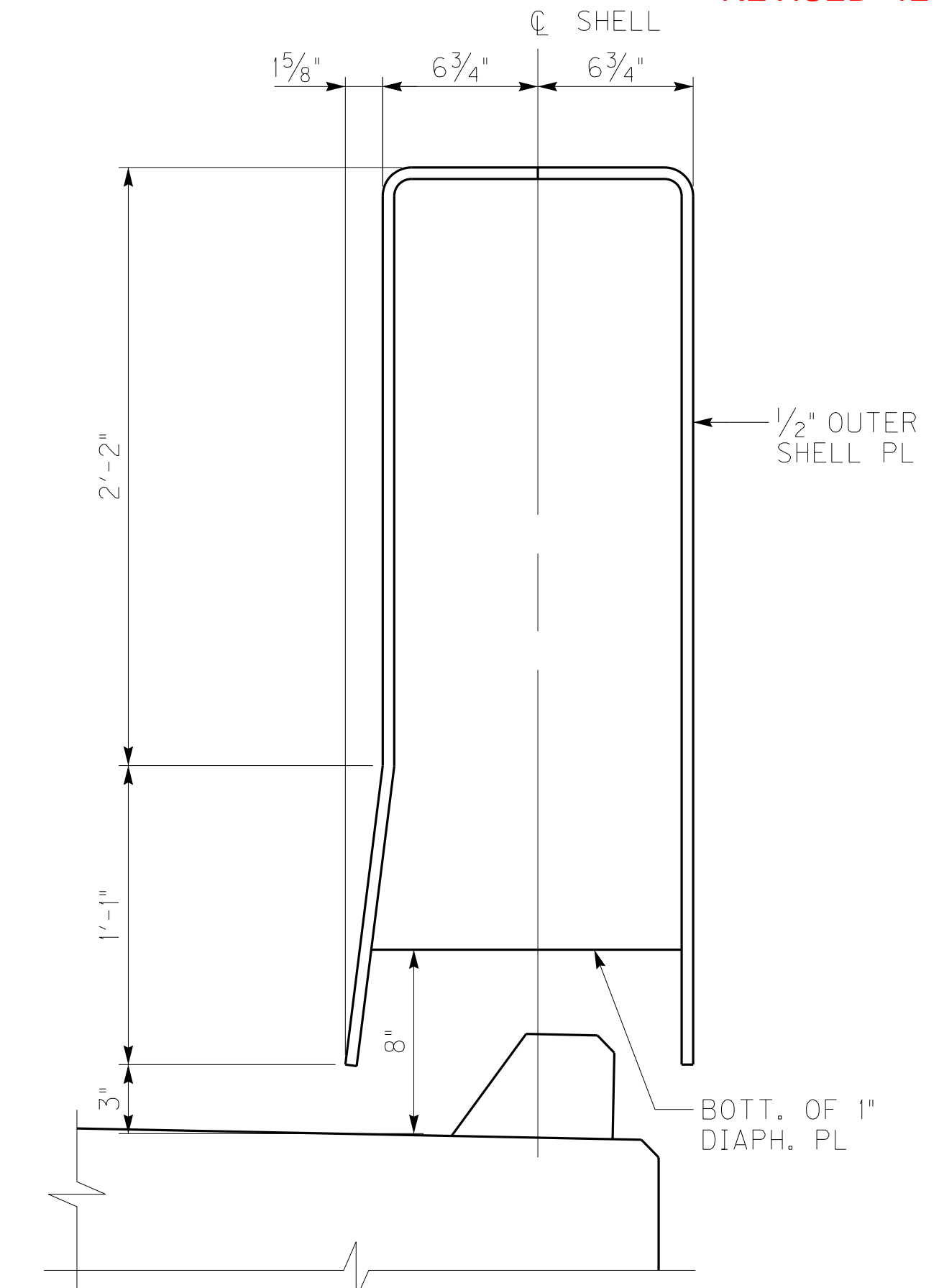
APPROACH SPAN SHOWN
MAIN SPAN OPP. HAND



SECTION H-H



SECTION I-I



SECTION J-J

NOTES

1. FOR GENERAL NOTES SEE SHEET NOS. S004-S006A.
2. ALL STRUCTURAL STEEL SHALL BE ASTM A709 GRADE 50 AND SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A123.
3. FILL BLOCKOUT WITH CLASS "AA" CONCRETE. ENSURE BLOCKOUT BELOW THE SUPPORT BOXES IS COMPLETELY FILLED WITH CONCRETE.
4. PIN MATERIAL SHALL CONFORM TO ASTM A449 GRADE 58 AND SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A153.
5. THREADED STUDS AND CONCRETE ANCHOR STUDS SHALL CONFORM TO ASTM A108.
6. HEX HEAD BOLTS SHALL CONFORM TO ASTM A325 AND SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A153.
7. ANCHOR BOLTS SHALL CONFORM TO ASTM F1554 GRADE 105.
8. UHMW PANELS SHALL CONFORM TO FQ1000 UHMW. COLOR TO MATCH GALVANIZED STEEL.
9. FOR CLEVIS DETAIL, DETAIL 4, INSIDE SHELL PIN PL DETAIL, OUTSIDE SHELL PIN PL DETAIL AND UHMW PANEL FASTENER DETAIL, SEE SHEET NO. S208A.
10. FOR CURB AND REBAR DETAILS, SEE SHEET NO. S209A.
11. FOR CONDUIT IN BARRIERS AND CURB, SEE SHEET NO. S271.
12. COVER PLATE SHOP DRAWING SUBMITTAL SHALL INCLUDE THE BARRIER AND CURB CONDUIT EXPANSION FITTING FOR REVIEW AND ACCEPTANCE. SEE SPECIAL NOTE FOR MODULAR EXPANSION JOINT.



REV. NOTES, REMOVED CURB DETAIL		11/25/13
REVISION		DATE
DATE: NOVEMBER 15, 2013	CHECKED BY	
DESIGNED BY: DMB	TJT	
DETAILED BY: MJD	DMB	

Commonwealth of Kentucky
DEPARTMENT OF HIGHWAYS

COUNTY
MARSHALL / TRIGG

ROUTE **US68** CROSSING **KENTUCKY LAKE**

MODULAR EXP. JOINT DETAILS - 2



ITEM NUMBER	01-180.70
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PREPARED BY
Baker

MICHAEL BAKER JR., INC.
9750 ORMSBY STATION ROAD
SUITE 210
LOUISVILLE, KY 40223

SHEET NO.
S207A

DRAWING NO.
24686

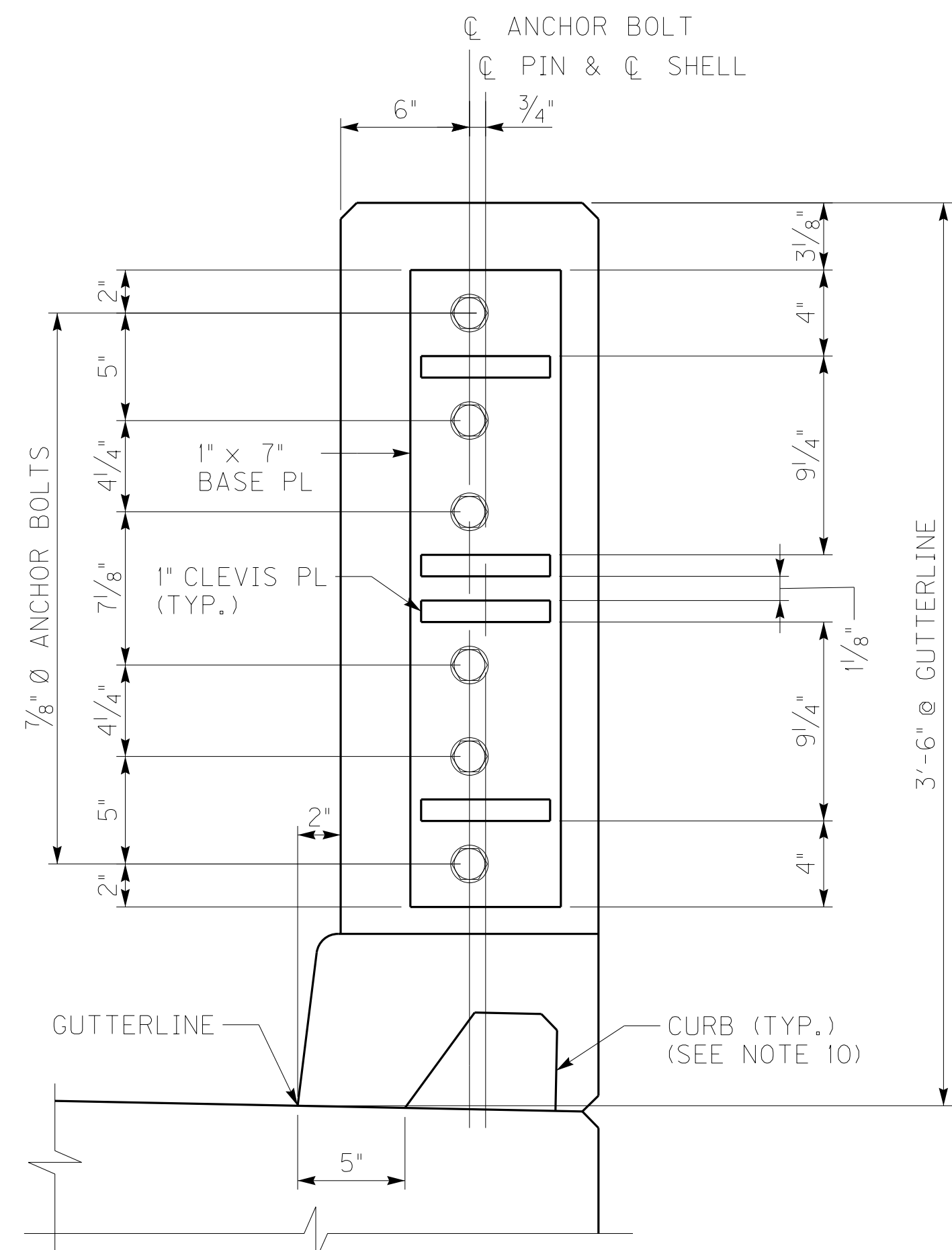
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 USER: Mgr\jcd\dwyer
 DATE PLOTTED: November 25, 2013
 E-SHEET NAME: S24686 207A
 MicroStation v8.11.7.469

FILE NAME: C:\PWV81-LOCAL\BAKER_PROJECTS\CWETHINGTON\DOI4582\S24686 EJOB.DGN

USER: Mgr\jcd\jcdwyer
DATE PLOTTED: November 25, 2013

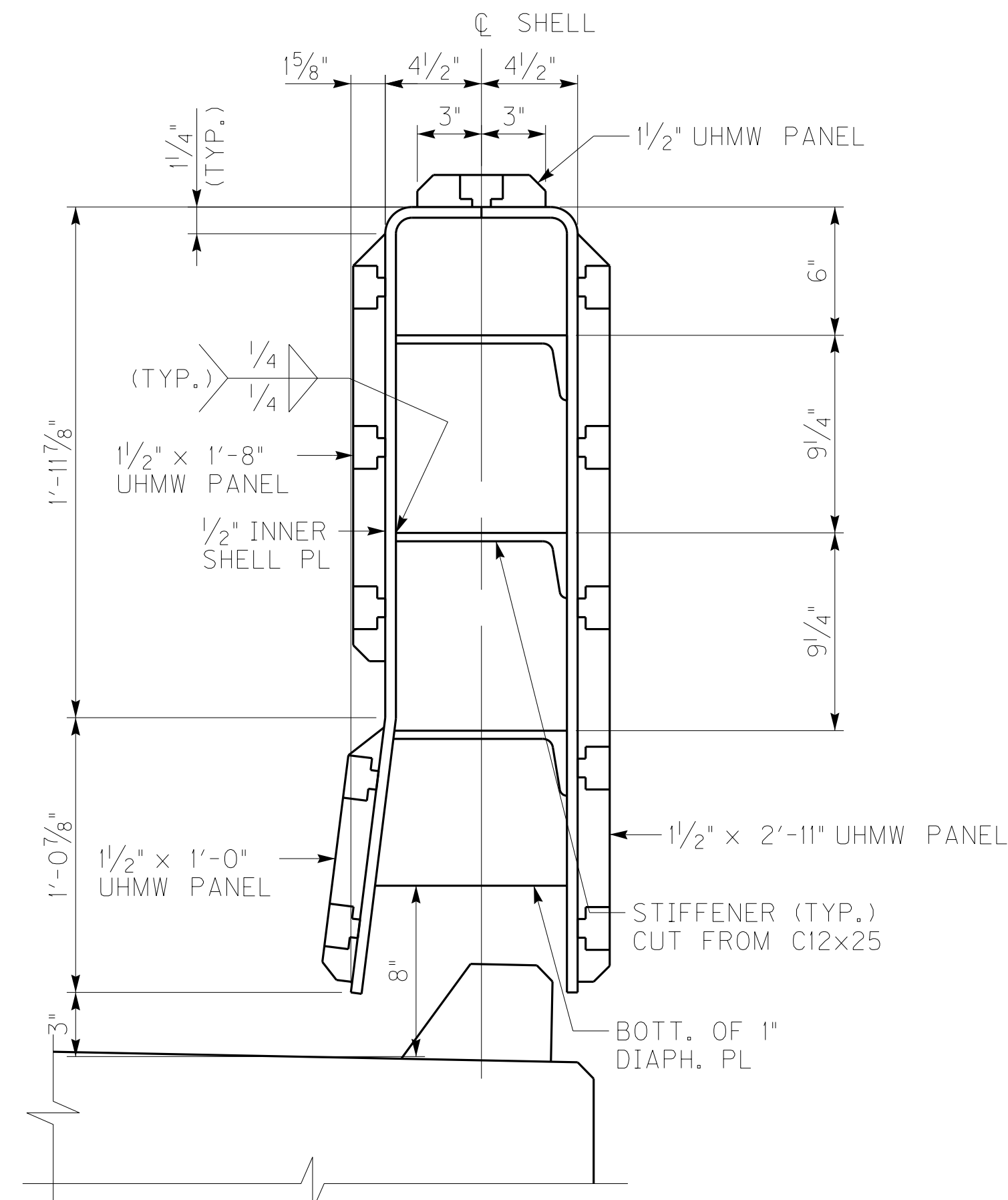
E-SHEET NAME: S24686 207A

MicroStation v8.11.7.469

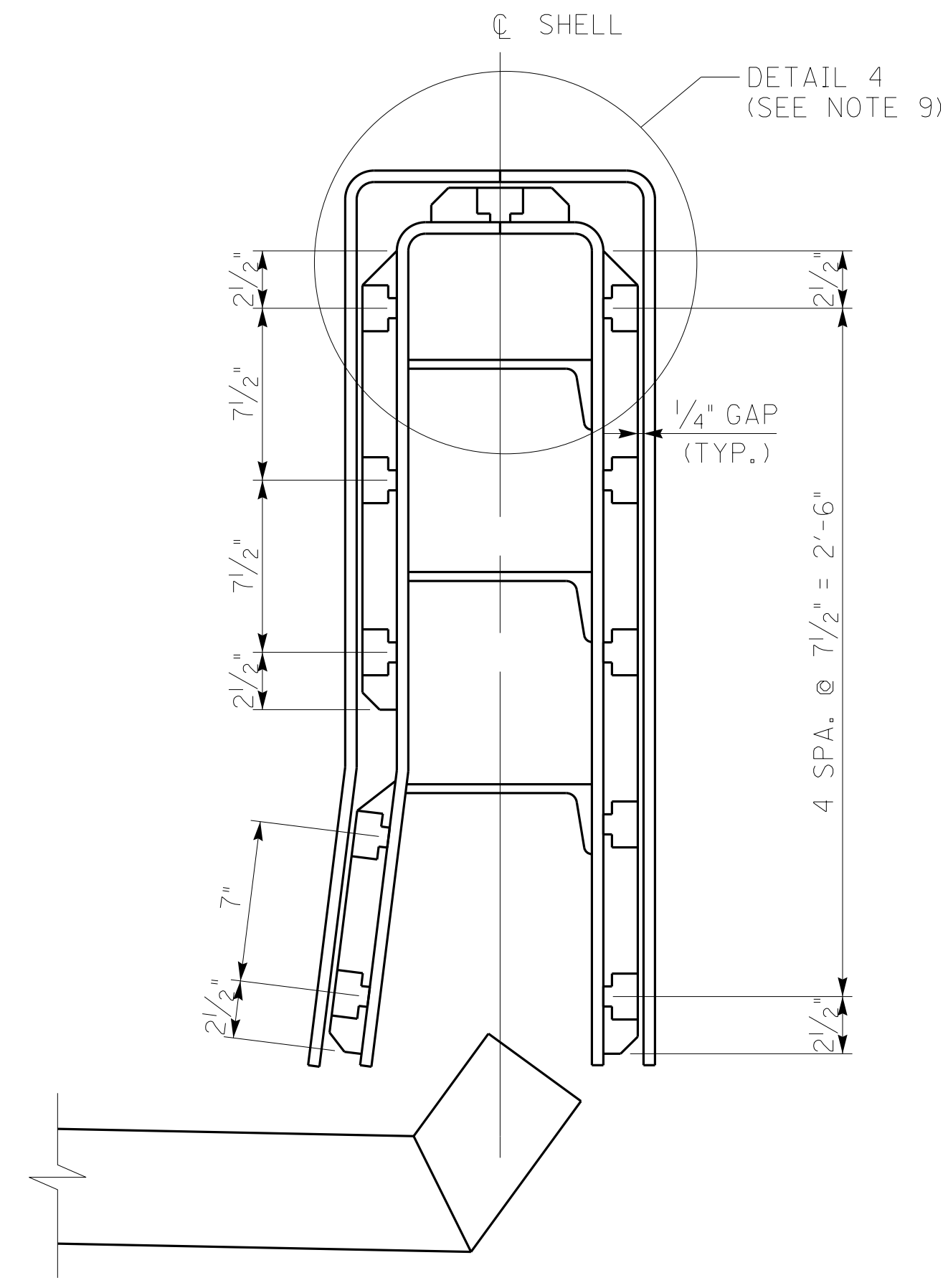


SECTION G-G

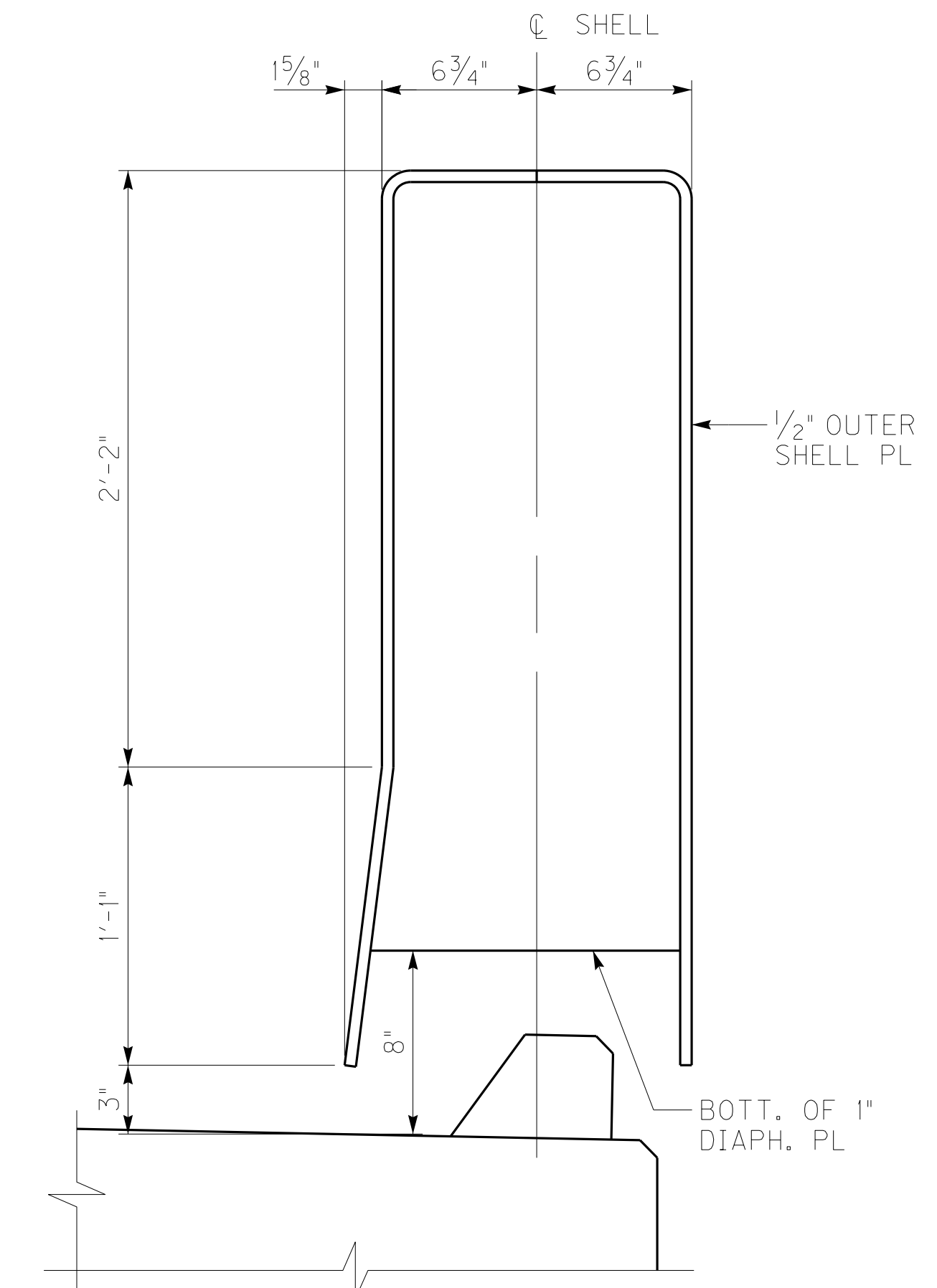
APPROACH SPAN SHOWN
MAIN SPAN OPP. HAND



SECTION H-H



SECTION I-I



SECTION J-J

NOTES

- FOR GENERAL NOTES SEE SHEET NOS. S004-S006A.
- ALL STRUCTURAL STEEL SHALL BE ASTM A709 GRADE 50 AND SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A123.
- FILL BLOCKOUT WITH CLASS "AA" CONCRETE. ENSURE BLOCKOUT BELOW THE SUPPORT BOXES IS COMPLETELY FILLED WITH CONCRETE.
- PIN MATERIAL SHALL CONFORM TO ASTM A449 GRADE 58 AND SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A153.
- THREADED STUDS AND CONCRETE ANCHOR STUDS SHALL CONFORM TO ASTM A108.
- HEX HEAD BOLTS SHALL CONFORM TO ASTM A325 AND SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A153.
- ANCHOR BOLTS SHALL CONFORM TO ASTM F1554 GRADE 105.
- UHMW PANELS SHALL CONFORM TO FQ1000 UHMW. COLOR TO MATCH GALVANIZED STEEL.
- FOR CLEVIS DETAIL, DETAIL 4, INSIDE SHELL PIN PL DETAIL, OUTSIDE SHELL PIN PL DETAIL AND UHMW PANEL FASTENER DETAIL, SEE SHEET NO. S208A.
- FOR CURB AND REBAR DETAILS, SEE SHEET NO. S209A.
- FOR CONDUIT IN BARRIERS AND CURB, SEE SHEET NO. S271.
- COVER PLATE SHOP DRAWING SUBMITTAL SHALL INCLUDE THE BARRIER AND CURB CONDUIT EXPANSION FITTING FOR REVIEW AND ACCEPTANCE. SEE SPECIAL NOTE FOR MODULAR EXPANSION JOINT.

REV. NOTES, REMOVED CURB DETAIL		11/25/13
REVISION		DATE
DATE: NOVEMBER 15, 2013	CHECKED BY	
DESIGNED BY: DMB	TJT	
DETAILED BY: MJD	DMB	

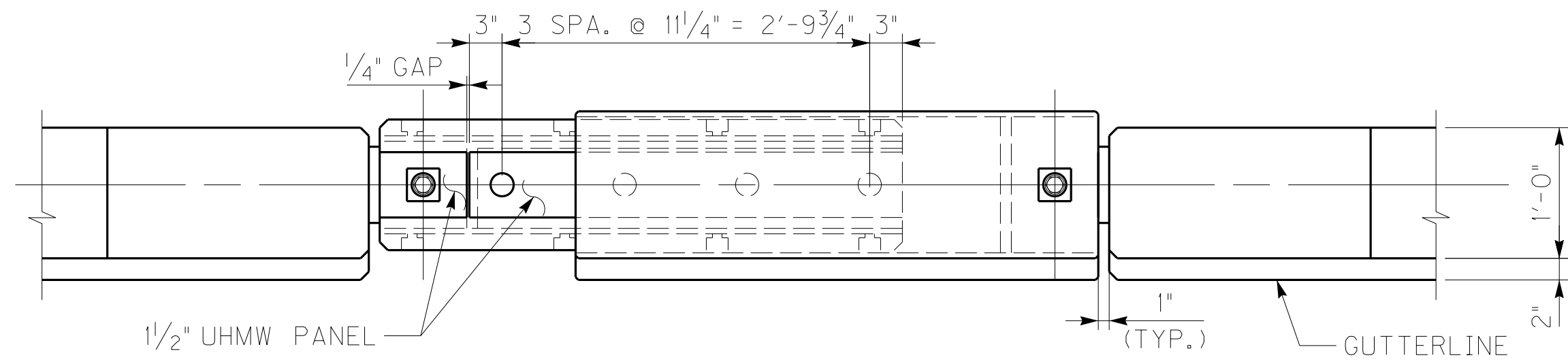
Commonwealth of Kentucky
DEPARTMENT OF HIGHWAYS

COUNTY
MARSHALL / TRIGG

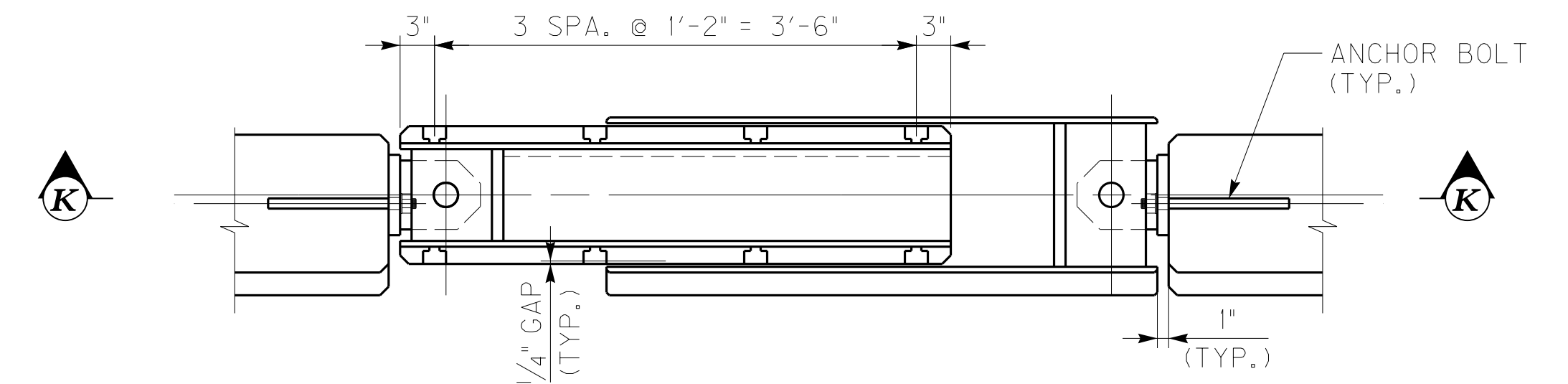
ROUTE **US68** CROSSING **KENTUCKY LAKE**
MODULAR EXP. JOINT DETAILS - 2



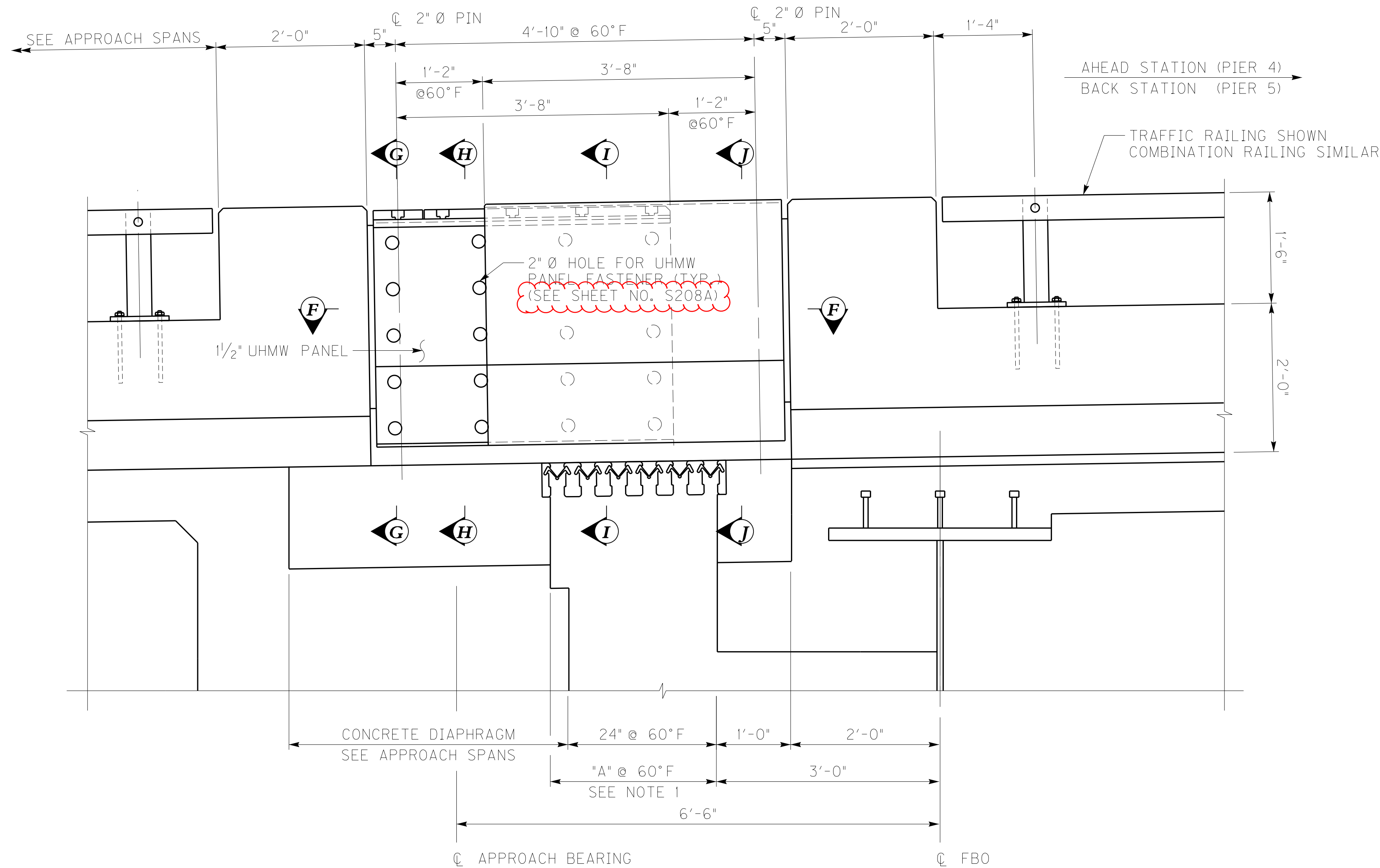
ITEM NUMBER	PREPARED BY	SHEET NO.
01-180.70	Baker MICHAEL BAKER JR., INC. 9750 ORMSBY STATION ROAD SUITE 210 LOUISVILLE, KY 40223	S207A DRAWING NO. 24686



TRAFFIC BARRIER PLAN

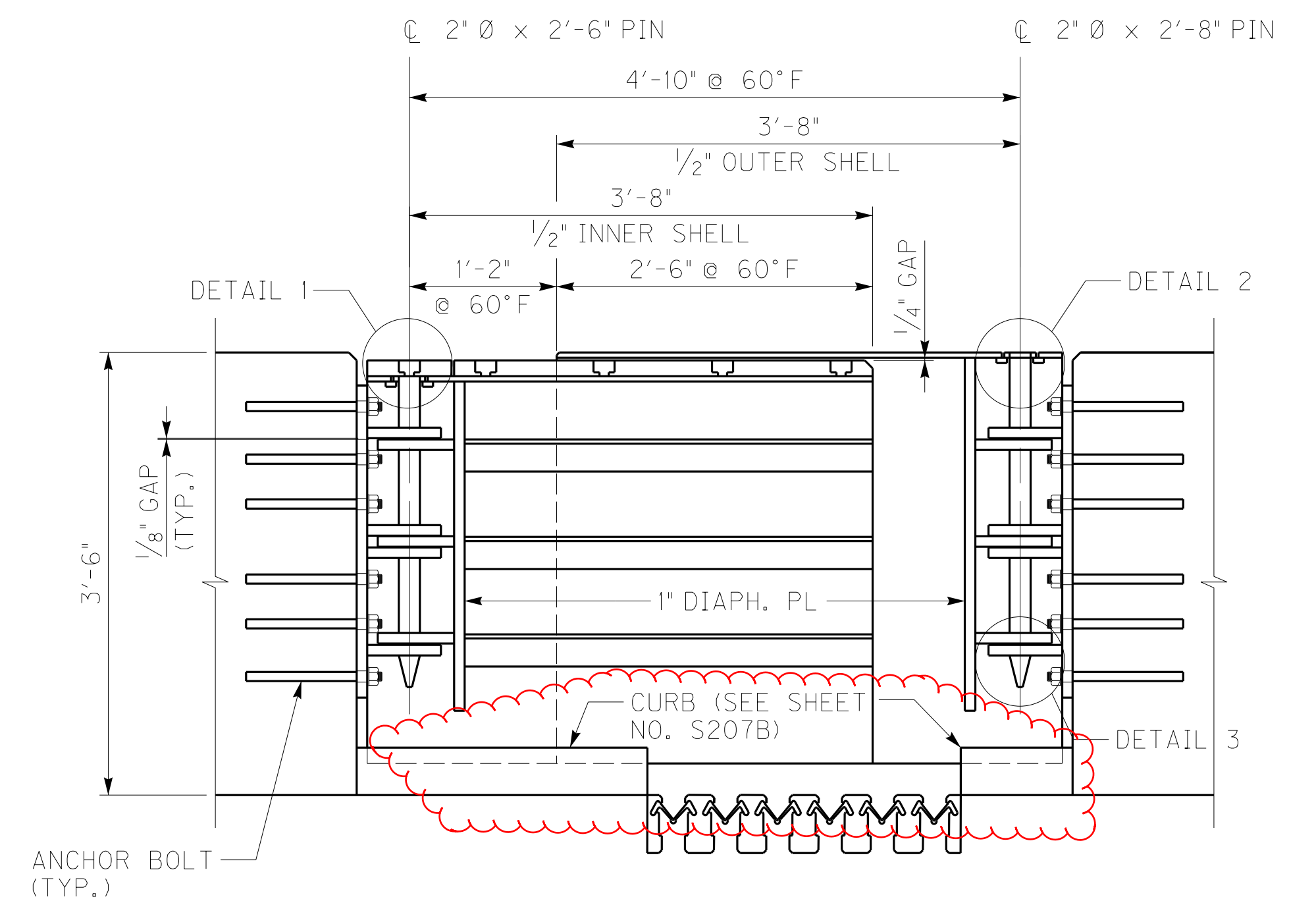


SECTION F-F



SECTION A-A

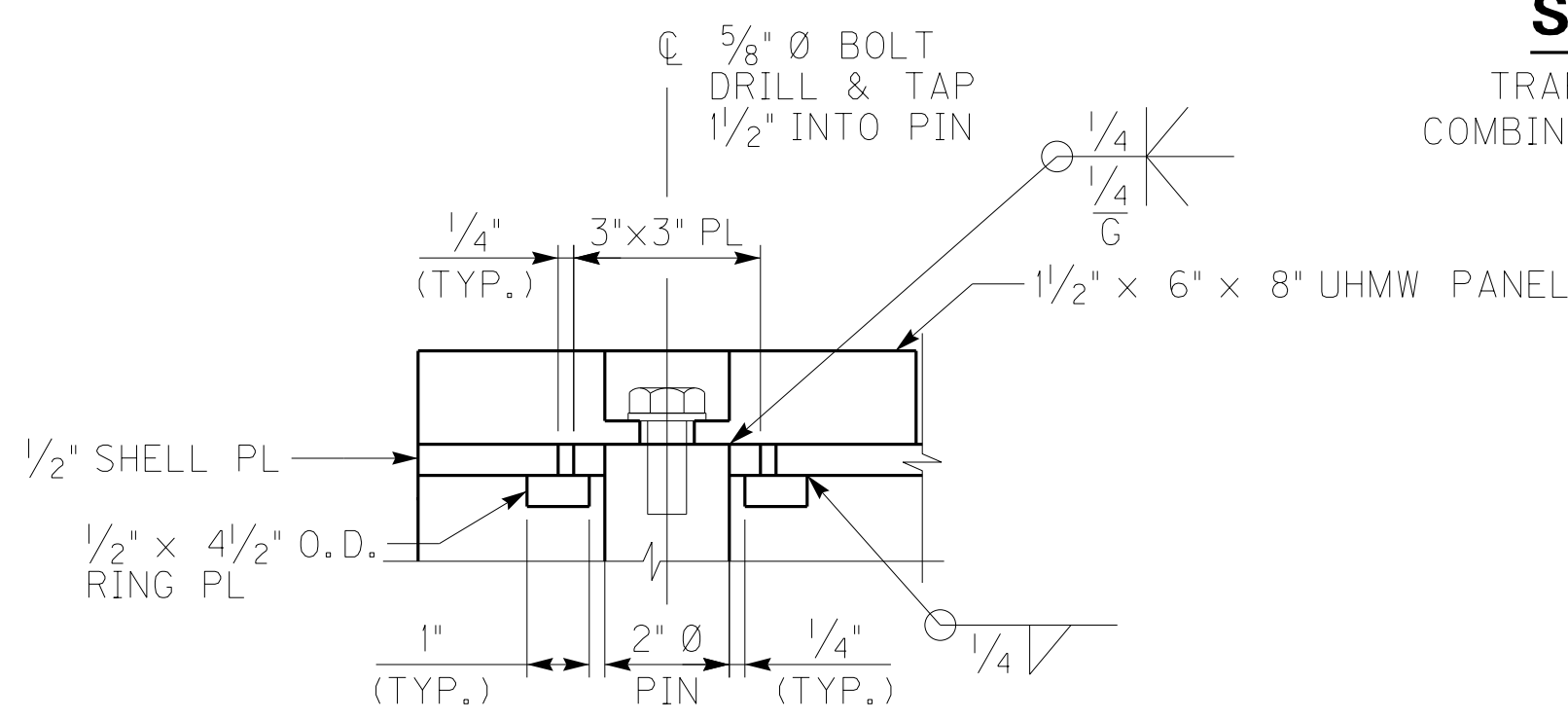
TRAFFIC BARRIER SHOWN
COMBINATION BARRIER SIMILAR



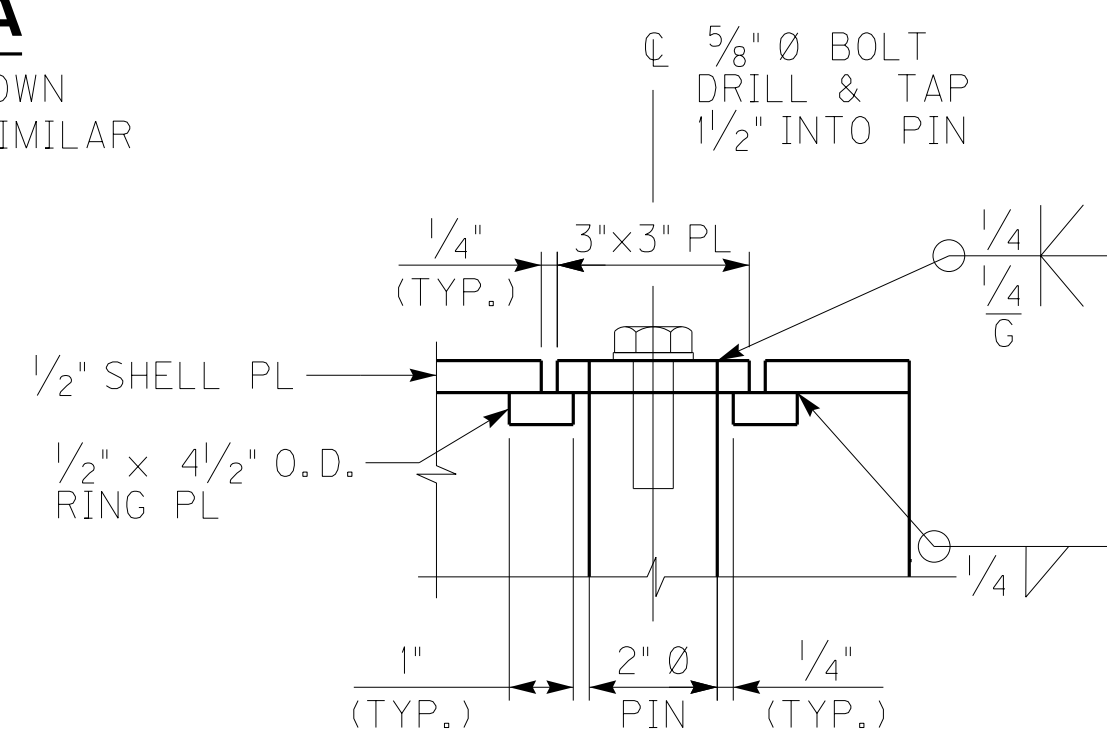
SECTION K-K

NOTES

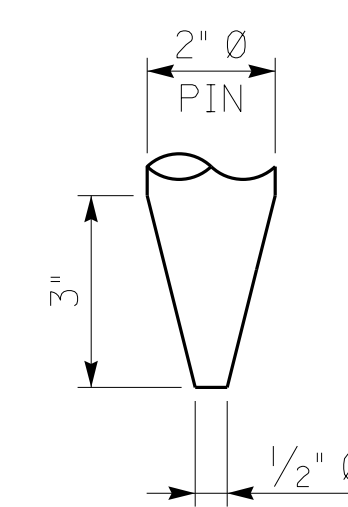
1. FOR MODULAR EXPANSION JOINT NOTES, SEE SHEET NOS. S206 AND S207A.
2. FOR SECTIONS G-G, H-H, I-I, AND J-J, SEE SHEET NO. S207A.



DETAIL 1



DETAIL 2



DETAIL 3



ITEM NUMBER	01-180.70
-------------	-----------

ADD CURB, ADD SHEET REF.		11/25/13
REVISION		DATE
DATE: NOVEMBER 15, 2013	CHECKED BY	
DESIGNED BY: DMB	TJT	
DETAILED BY: MJD	DMB	
Commonwealth of Kentucky DEPARTMENT OF HIGHWAYS		
COUNTY MARSHALL / TRIGG		
ROUTE US68	CROSSING KENTUCKY LAKE	
MODULAR EXP. JOINT DETAILS - 1		
PREPARED BY		SHEET NO.
Baker		S207
MICHAEL BAKER JR., INC. 9750 ORMSBY STATION ROAD SUITE 210 LOUISVILLE, KY 40223		DRAWING NO. 24686

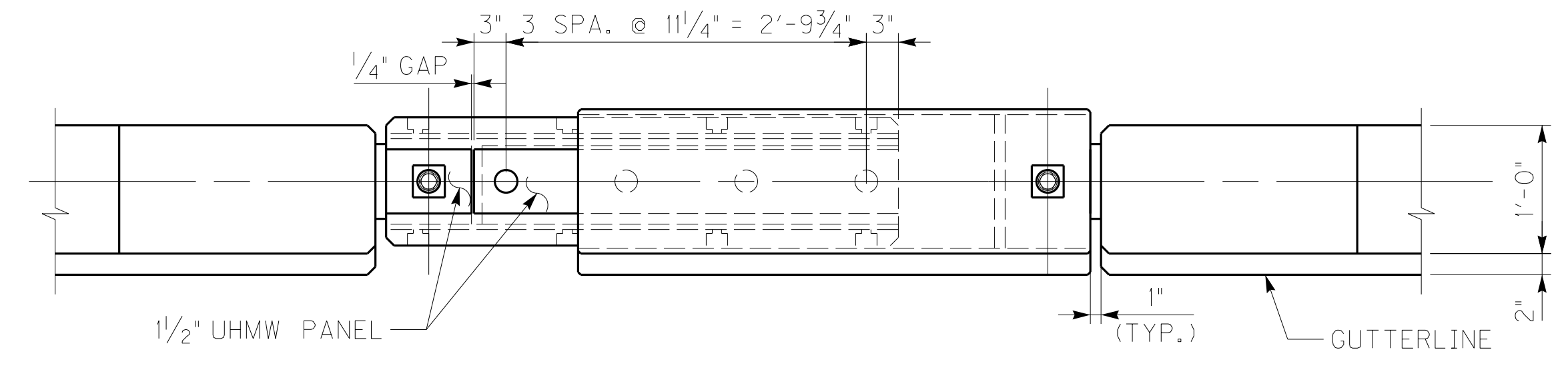
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USER: Mgr\jcd\dwyer
DATE PLOTTED: November 25, 2013

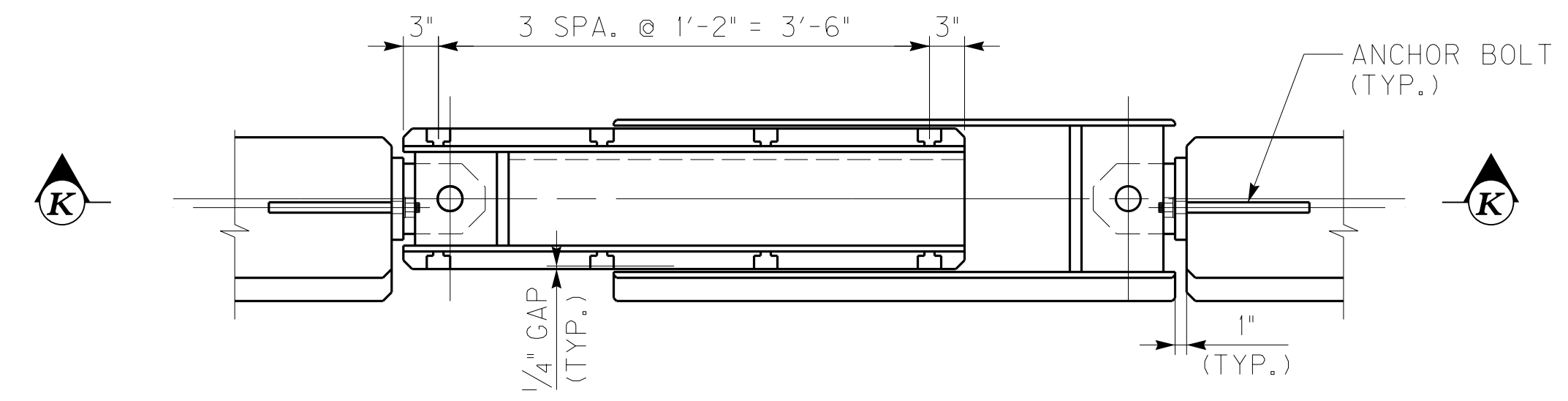
E-SHEET NAME: S24686 207

MicroStation v8.11.7.469

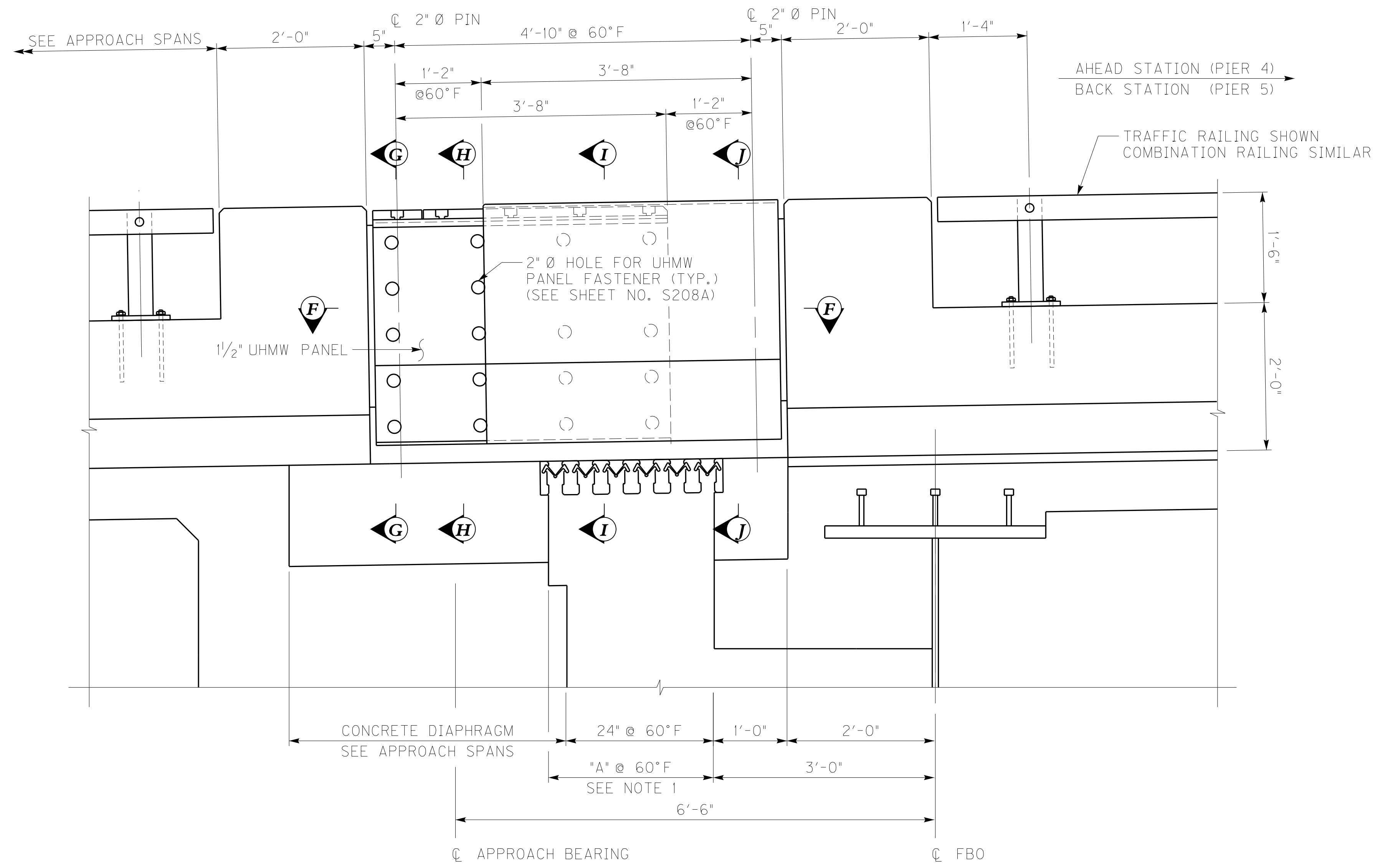
FILE NAME: C:\PW\81-LOCAL\BAKER_PROJECTS\CWETHINGTON\DOI41582\S24686 EJO2.DGN
 USER: Mgr\jcd\dwyer
 DATE PLOTTED: November 25, 2013
 E-SHEET NAME: S24686 207
 MicroStation v8.11.7.469



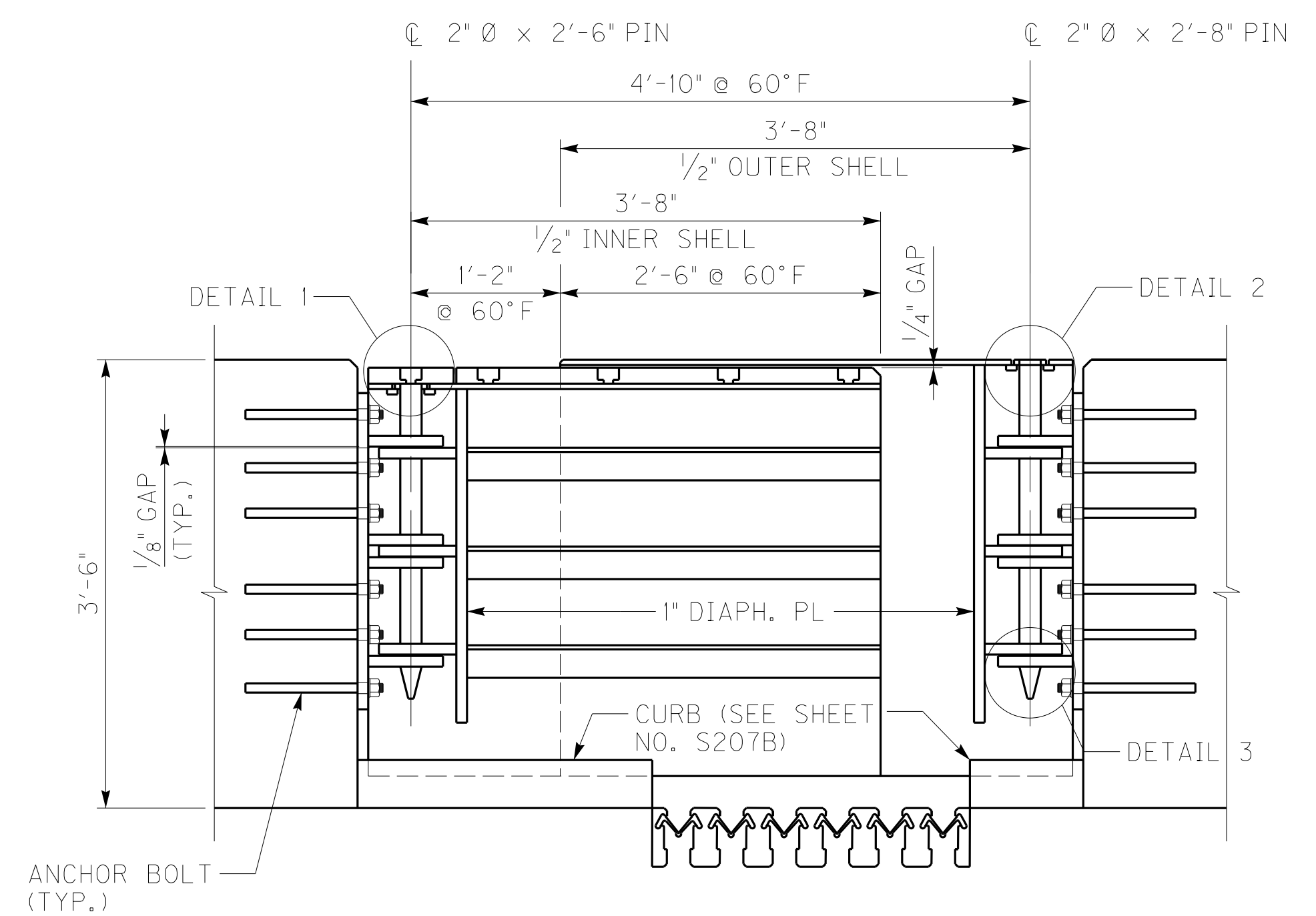
TRAFFIC BARRIER PLAN



SECTION F-F



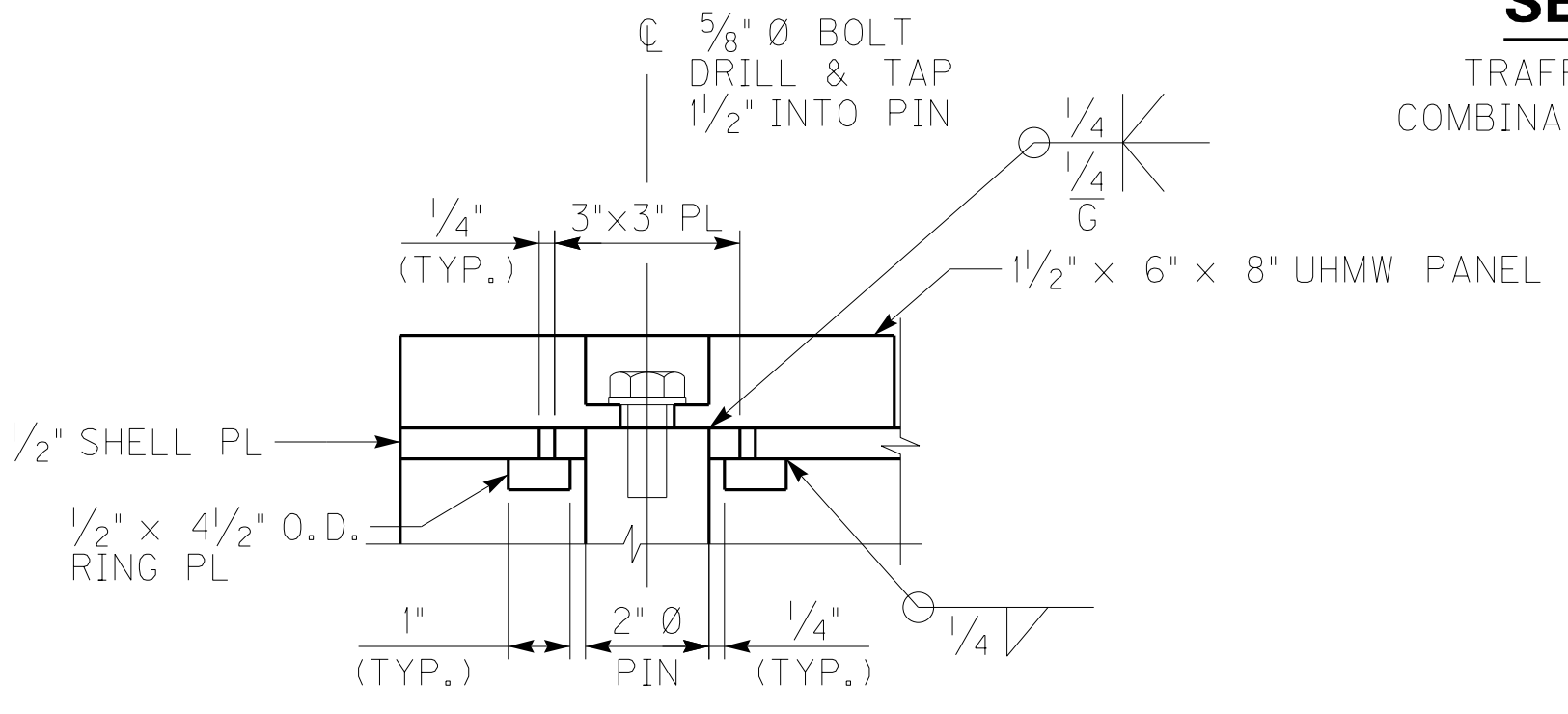
SECTION A-A



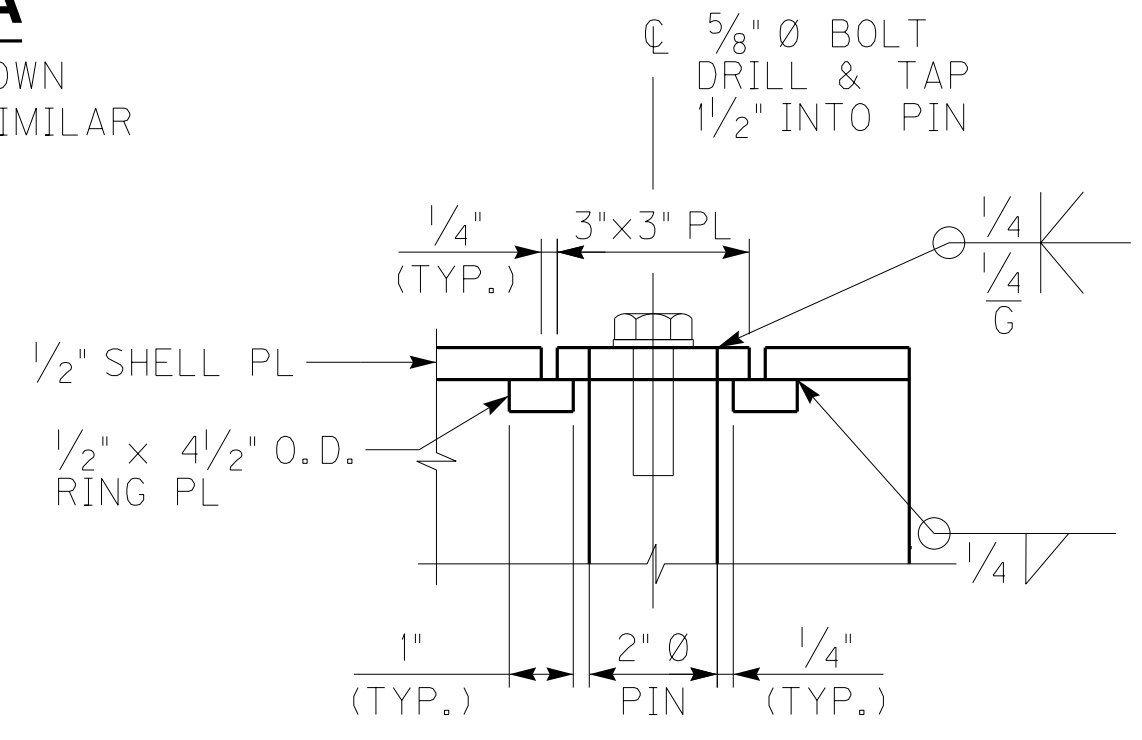
SECTION K-K

NOTES

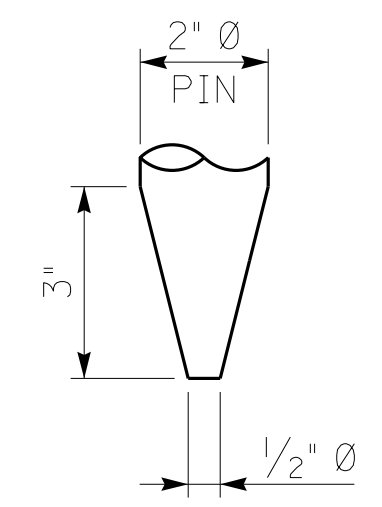
- 1. FOR MODULAR EXPANSION JOINT NOTES, SEE SHEET NOS. S206 AND S207A.
- 2. FOR SECTIONS G-G, H-H, I-I, AND J-J, SEE SHEET NO. S207A.



DETAIL 1



DETAIL 2



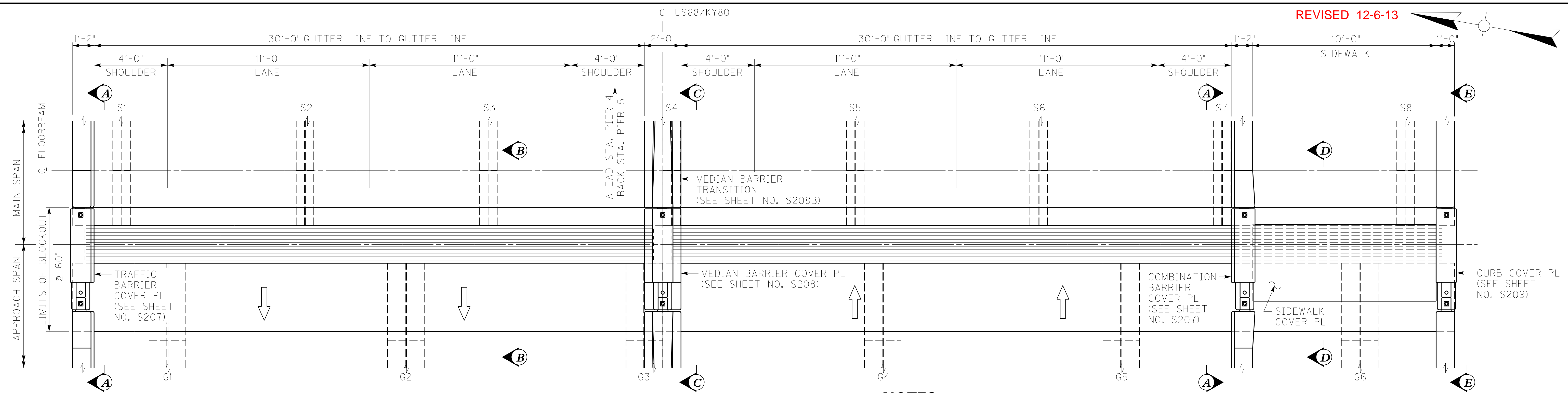
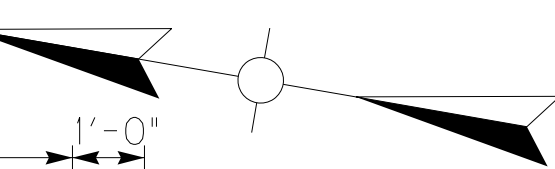
DETAIL 3



ITEM NUMBER	01-180.70
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ADD CURB, ADD SHEET REF.		11/25/13
REVISION		DATE
DATE: NOVEMBER 15, 2013	CHECKED BY	
DESIGNED BY: DMB	TJT	
DETAILED BY: MJD	DMB	
Commonwealth of Kentucky DEPARTMENT OF HIGHWAYS		
COUNTY MARSHALL / TRIGG		
ROUTE US68	CROSSING KENTUCKY LAKE	
MODULAR EXP. JOINT DETAILS - 1		
PREPARED BY	MICHAEL BAKER JR., INC. 9750 ORMSBY STATION ROAD SUITE 210 LOUISVILLE, KY 40223	SHEET NO. S207 DRAWING NO. 24686
Baker		

REVISED 12-6-13



PLAN - JOINT AT PIER 4

JOINT AT PIER 5 OPPOSITE HAND

NOTES

1. STEEL PLATE, BARS AND SHAPES SHALL CONFORM TO AASHTO M270 GRADE 50 UNLESS NOTED OTHERWISE.
2. THE MODULAR JOINT SYSTEM AND BLOCK OUT DETAILS ARE CONCEPTUAL DETAILS FOR A MODULAR JOINT DESIGNED TO ACCOMMODATE LONGITUDINAL, TRANSVERSE, AND ROTATIONAL SEISMIC MOVEMENTS WHILE ALSO SATISFYING THE THERMAL MOVEMENTS.
3. DUE TO VARIATIONS IN MODULAR JOINTS BETWEEN VARIOUS MANUFACTURERS, THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE FINAL DESIGN AND DETAILING OF THE BLOCK OUT BASED ON THE SELECTED MODULAR JOINT.
4. MODULAR EXPANSION JOINTS SHALL PROVIDE FOR A TOTAL LONGITUDINAL MOVEMENT OF 24 INCHES AND TRANSVERSE MOVEMENT OF +/- 9 INCHES AND SHALL COMPLY WITH SPECIAL NOTE FOR MODULAR EXPANSION JOINT.
5. THE SEAL INSTALLATION WIDTH AT 60 DEG F SHALL BE SET TO LIMIT THE ROADWAY SURFACE GAP IN THE TRANSVERSE JOINT TO 3 INCHES PER AASHTO 14.5.3.2, BUT THE 3 INCH MAXIMUM GAP DOES NOT APPLY TO SEISMIC MOVEMENT WHICH MAY NECESSITATE THE USE OF A LARGER SEAL.

USING A MODERATE CLIMATE TEMPERATURE RANGE THE "A" @ 60 DEG DIMENSION SHALL BE SET TO NOT EXCEED THE FOLLOWING VALUES: FOR SIX 4 INCH SEALS: "A" @ 60 DEG = "A" MIN PLUS 9.8 INCHES. FOR EIGHT 3 INCH SEALS: "A" @ 60 DEG = "A" MIN PLUS 13.0 INCHES

"A" MIN IS THE SUM OF THE CENTER BEAMS WHEN FULLY CLOSED. THIS DIMENSION WILL BE CONSTANT FOR THE APPROVED MODULAR JOINT SYSTEM; HOWEVER, IT WILL VARY BETWEEN JOINT MANUFACTURERS AND THE NUMBER OF SEALS USED.

6. MODULAR JOINT DIMENSIONS A, B, C, AND D SHALL BE LIMITED TO THE FOLLOWING VALUES:

DIMENSION "A" = 35 INCHES
 DIMENSION "B" = 45 INCHES
 DIMENSION "C" = 12 INCHES
 DIMENSION "D" = 18 INCHES

7. THE FOLLOWING PARTIAL LIST OF MANUFACTURERS ARE BELIEVED TO BE CAPABLE OF SUPPLYING A MODULAR JOINT SYSTEM MEETING THESE CRITERIA BUT SHALL CONFORM TO THE REQUIREMENTS IN THE SPECIAL NOTE FOR MODULAR EXPANSION JOINT:

SUPPLIER 1: D.S.BROWN COMPANY
 SUPPLIER 2: MAGEBA USA
 SUPPLIER 3: TECHSTAR, INC.
 SUPPLIER 4: WATSON BOWMAN ACME CORP.

8. FOR SECTION D-D SEE SHEET NO. S209A.
9. FOR ADDITIONAL NOTES SEE SHEET NO. S207A.

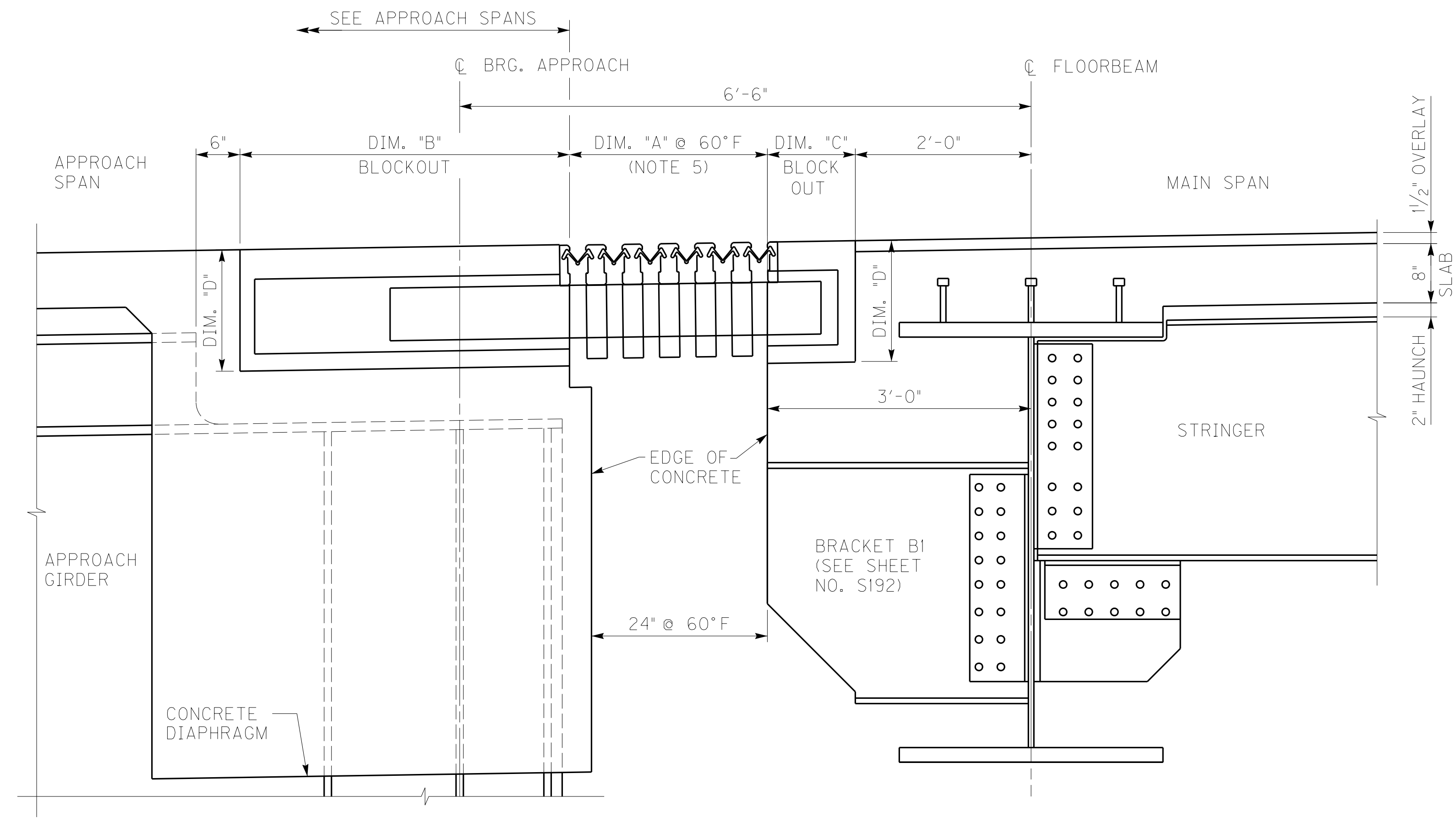
10. SHOP DRAWING SUBMITTAL SHALL INCLUDE ANY REQUIRED MODIFICATION TO BLOCKOUT REINFORCING STEEL TO ACCOMMODATE THE SELECTED EXPANSION JOINT SYSTEM.

LEGEND

- ↑ INDICATES TRAFFIC DIRECTION
- S1 DENOTES STRINGER NUMBER
- G1 DENOTES GIRDER NUMBER



ITEM NUMBER	01-180.70
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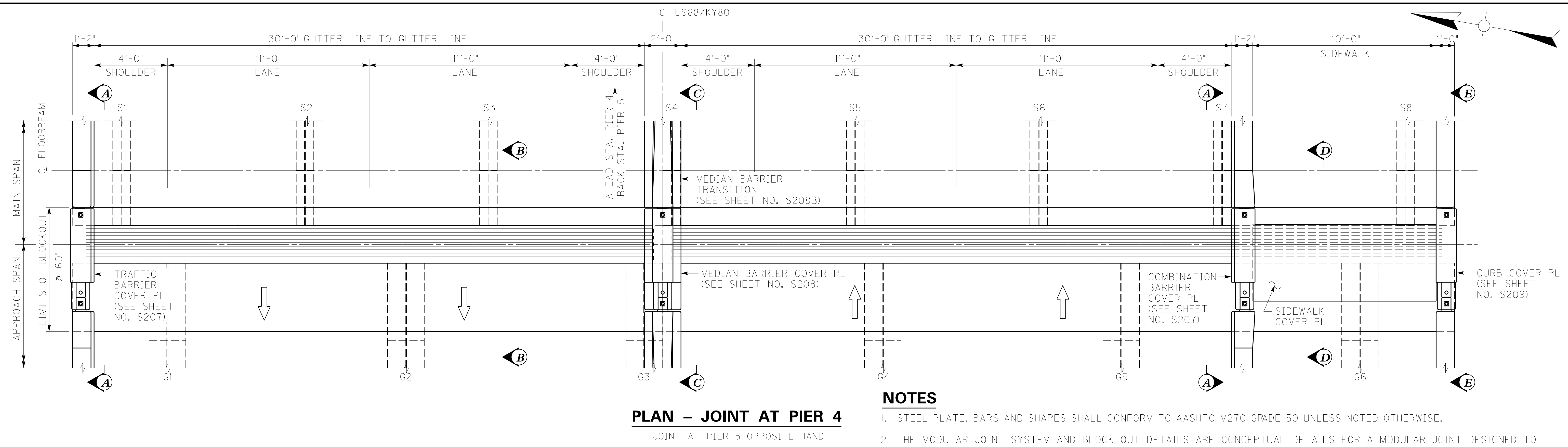


SECTION B-B

ADD NOTE 10		11/25/13
REVISION		DATE
DATE: NOVEMBER 15, 2013	CHECKED BY	
DESIGNED BY: DMB	TJT	
DETAILED BY: CDR	DMB	
Commonwealth of Kentucky DEPARTMENT OF HIGHWAYS		
COUNTY MARSHALL / TRIGG		
ROUTE US68	CROSSING KENTUCKY LAKE	
MODULAR EXPANSION JOINT		
PREPARED BY		SHEET NO.
MICHAEL BAKER JR., INC. 9750 ORMSBY STATION ROAD SUITE 210 LOUISVILLE, KY 40223		S206
Baker		DRAWING NO. 24686

FILE NAME: C:\PWW81-LOCAL\BAKER_PROJECTS\CWETHINGTON\DOI4582\S24686 EJO7.DGN
 USER: Mgr\jdo\dwyer
 DATE PLOTTED: November 25, 2013
 E-SHEET NAME: S24686 206
 MicroStation v8.11.7.469

FILE NAME: C:\P\W\B1-LOCAL\BAKER_PROJECTS\CWETHINGTON\DOI4582\S24686 EJO7.DGN
 USER: MGR\J.Dwyer
 DATE PLOTTED: November 25, 2013
 E-SHEET NAME: S24686 206
 MicroStation v8.11.7.469



PLAN - JOINT AT PIER 4
 JOINT AT PIER 5 OPPOSITE HAND

NOTES

1. STEEL PLATE, BARS AND SHAPES SHALL CONFORM TO AASHTO M270 GRADE 50 UNLESS NOTED OTHERWISE.
2. THE MODULAR JOINT SYSTEM AND BLOCK OUT DETAILS ARE CONCEPTUAL DETAILS FOR A MODULAR JOINT DESIGNED TO ACCOMMODATE LONGITUDINAL, TRANSVERSE, AND ROTATIONAL SEISMIC MOVEMENTS WHILE ALSO SATISFYING THE THERMAL MOVEMENTS.
3. DUE TO VARIATIONS IN MODULAR JOINTS BETWEEN VARIOUS MANUFACTURERS, THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE FINAL DESIGN AND DETAILING OF THE BLOCK OUT BASED ON THE SELECTED MODULAR JOINT.
4. MODULAR EXPANSION JOINTS SHALL PROVIDE FOR A TOTAL LONGITUDINAL MOVEMENT OF 24 INCHES AND TRANSVERSE MOVEMENT OF +/- 9 INCHES AND SHALL COMPLY WITH SPECIAL NOTE FOR MODULAR EXPANSION JOINT.
5. THE SEAL INSTALLATION WIDTH AT 60 DEG F SHALL BE SET TO LIMIT THE ROADWAY SURFACE GAP IN THE TRANSVERSE JOINT TO 3 INCHES PER AASHTO 14.5.3.2, BUT THE 3 INCH MAXIMUM GAP DOES NOT APPLY TO SEISMIC MOVEMENT WHICH MAY NECESSITATE THE USE OF A LARGER SEAL.

USING A MODERATE CLIMATE TEMPERATURE RANGE THE "A" @ 60 DEG DIMENSION SHALL BE SET TO NOT EXCEED THE FOLLOWING VALUES: FOR SIX 4 INCH SEALS: "A" @ 60 DEG = "A" MIN PLUS 9.8 INCHES. FOR EIGHT 3 INCH SEALS: "A" @ 60 DEG = "A" MIN PLUS 13.0 INCHES

"A" MIN IS THE SUM OF THE CENTER BEAMS WHEN FULLY CLOSED. THIS DIMENSION WILL BE CONSTANT FOR THE APPROVED MODULAR JOINT SYSTEM; HOWEVER, IT WILL VARY BETWEEN JOINT MANUFACTURERS AND THE NUMBER OF SEALS USED.

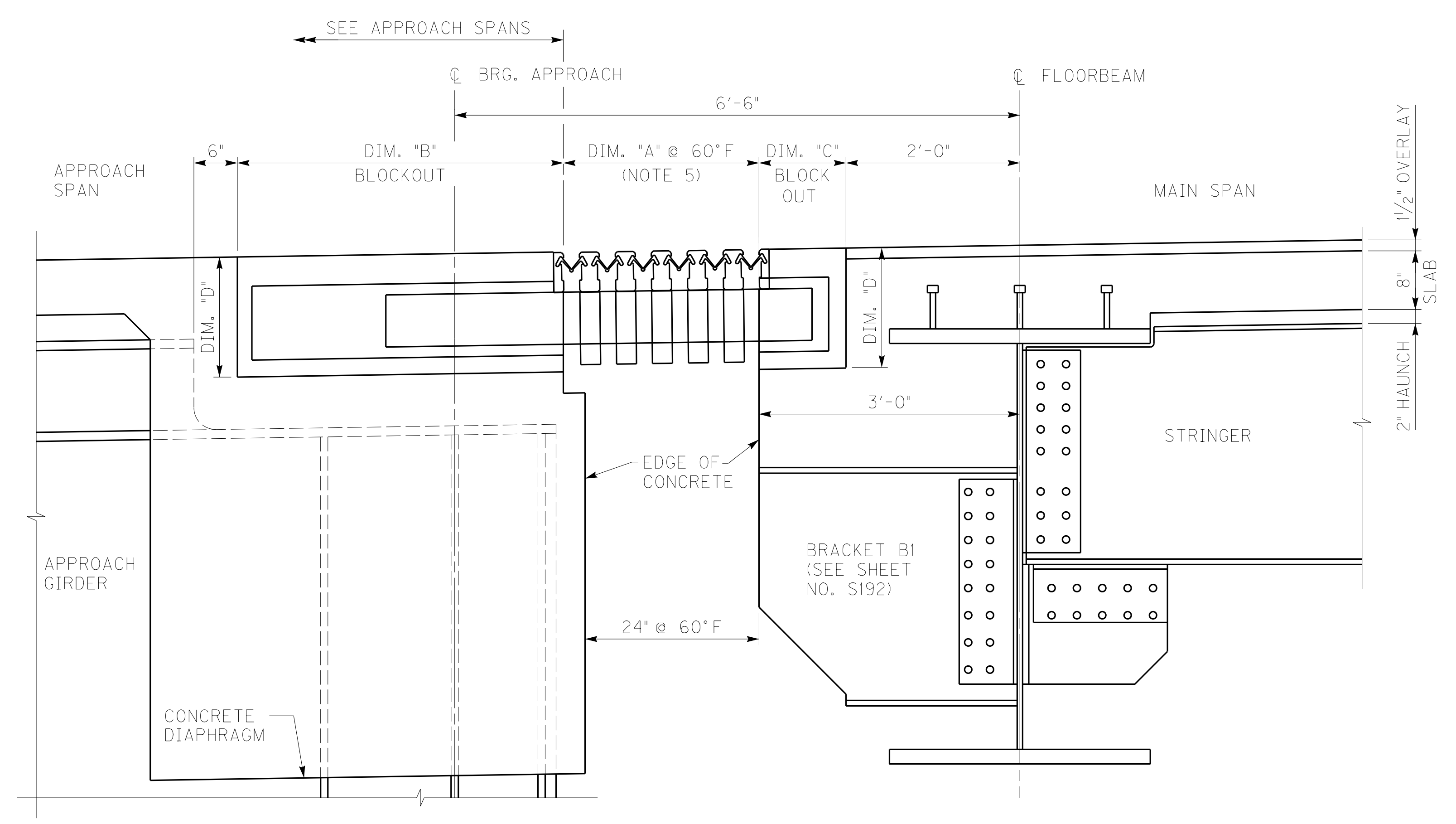
6. MODULAR JOINT DIMENSIONS A, B, C, AND D SHALL BE LIMITED TO THE FOLLOWING VALUES:
 DIMENSION "A" = 35 INCHES
 DIMENSION "B" = 45 INCHES
 DIMENSION "C" = 12 INCHES
 DIMENSION "D" = 18 INCHES

7. THE FOLLOWING PARTIAL LIST OF MANUFACTURERS ARE BELIEVED TO BE CAPABLE OF SUPPLYING A MODULAR JOINT SYSTEM MEETING THESE CRITERIA BUT SHALL CONFORM TO THE REQUIREMENTS IN THE SPECIAL NOTE FOR MODULAR EXPANSION JOINT:
 SUPPLIER 1: D.S.BROWN COMPANY
 SUPPLIER 2: MAGEBA USA
 SUPPLIER 3: TECHSTAR, INC.
 SUPPLIER 4: WATSON BOWMAN ACME CORP.

8. FOR SECTION D-D SEE SHEET NO. S209A.
9. FOR ADDITIONAL NOTES SEE SHEET NO. S207A.
10. SHOP DRAWING SUBMITTAL SHALL INCLUDE ANY REQUIRED MODIFICATION TO BLOCKOUT REINFORCING STEEL TO ACCOMMODATE THE SELECTED EXPANSION JOINT SYSTEM.

LEGEND

- ↑ INDICATES TRAFFIC DIRECTION
- S1 DENOTES STRINGER NUMBER
- G1 DENOTES GIRDER NUMBER



SECTION B-B

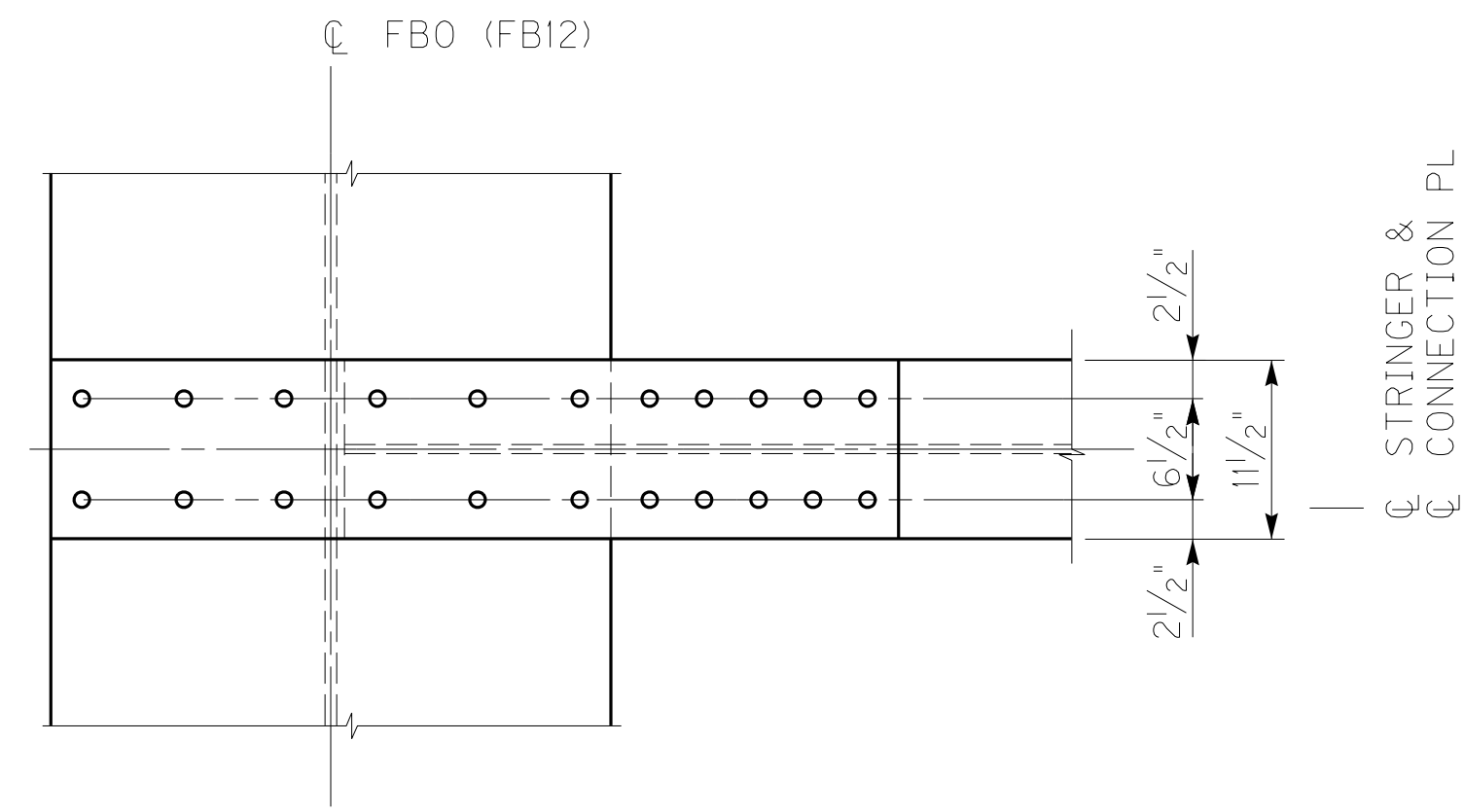


ITEM NUMBER	01-180.70
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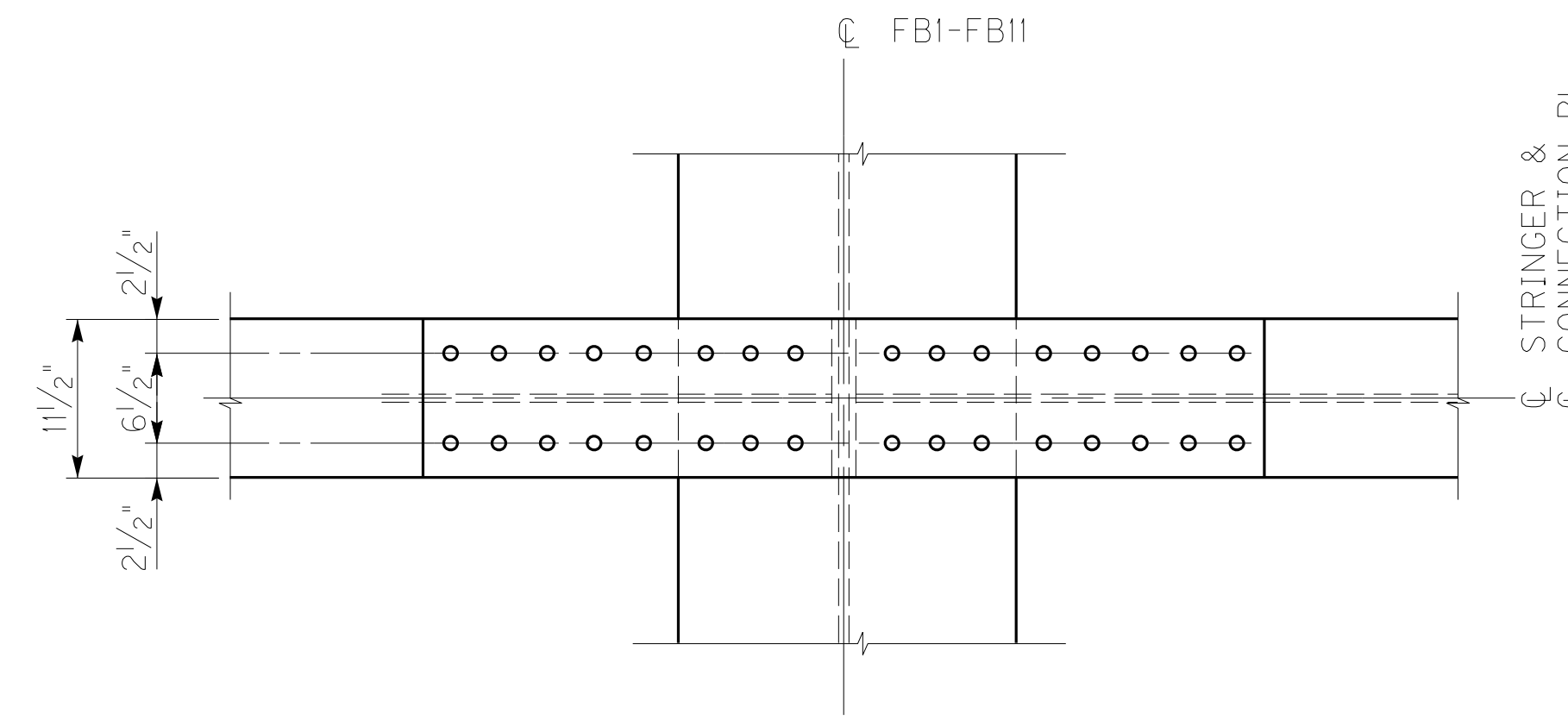
ADD NOTE 10		11/25/13
REVISION		DATE
DATE: NOVEMBER 15, 2013	CHECKED BY	
DESIGNED BY: DMB	TJT	
DETAILED BY: CDR	DMB	
Commonwealth of Kentucky DEPARTMENT OF HIGHWAYS		
COUNTY MARSHALL / TRIGG		
ROUTE US68	CROSSING KENTUCKY LAKE	
MODULAR EXPANSION JOINT		
PREPARED BY		SHEET NO.
Baker		S206
MICHAEL BAKER JR., INC. 9750 ORMSBY STATION ROAD SUITE 210 LOUISVILLE, KY 40223		DRAWING NO. 24686

NOTES

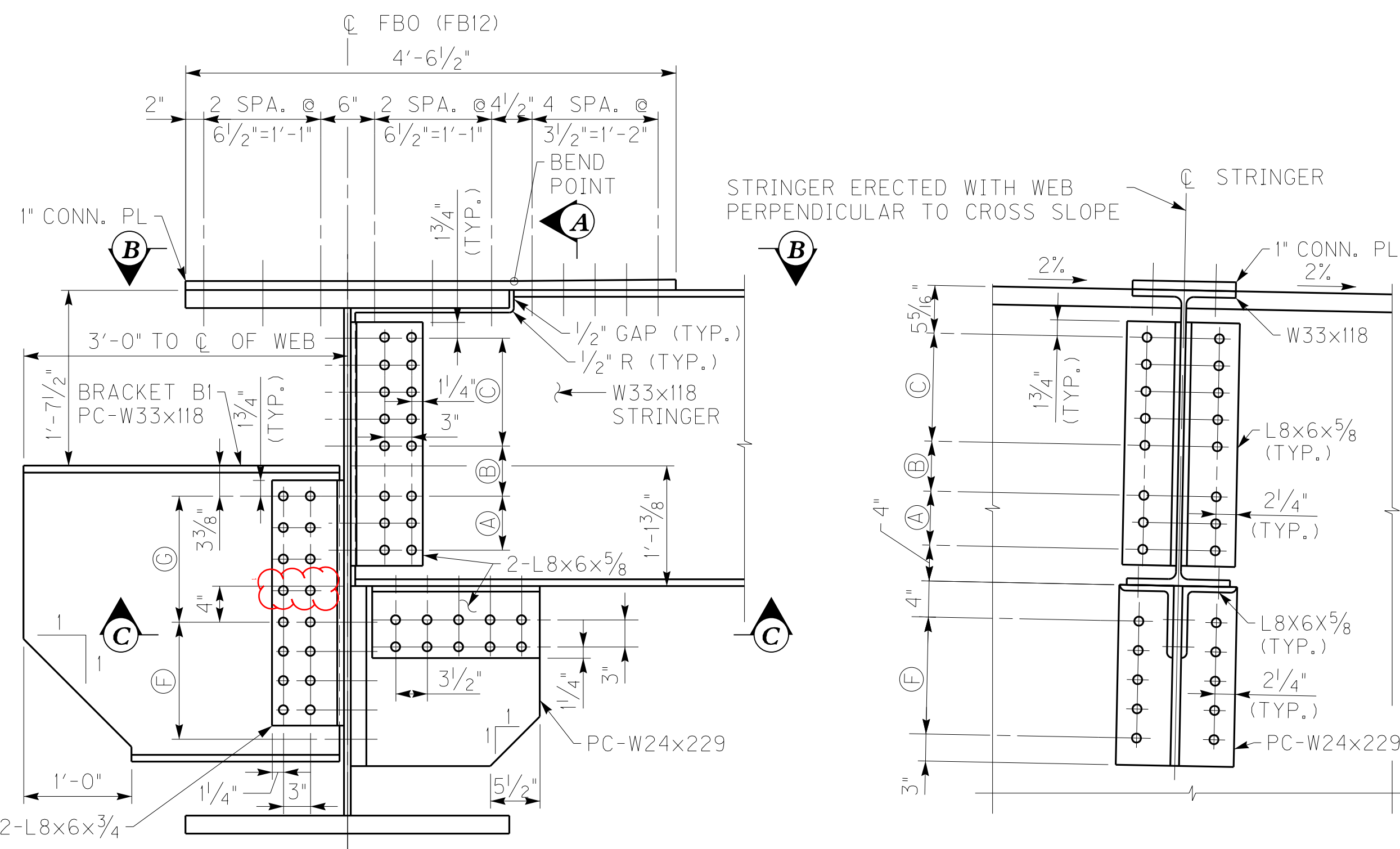
1. FOR GENERAL NOTES, SEE SHEET NO. S004-S006A.
2. FOR DETAIL 1 & 2 LOCATIONS SEE SHEET NO. S192.
3. BOLT HOLES IN STRINGER WEBS AND FLANGES SHALL BE OVERSIZED.
4. BOLT HOLES IN THE FLOORBEAM, THE STRINGER CONNECTION PLATES AND SHAPES SHALL BE STANDARD SIZE.
5. FOR BOLT TIGHTENING SEQUENCE, SEE DECK POURING SEQUENCE, SHEET NO. S214.
6. ALL BOLTS SHALL BE 1" DIAMETER A325-X HIGH STRENGTH BOLTS.
7. STRINGER ROLLED SECTIONS, CONNECTION PLATES AND SHAPES SHALL CONFORM TO AASHTO M270 GRADE 50W AND SHALL BE CVN TESTED.
8. FOR FLOORBEAM DETAILS SEE SHEET NOS. S187-S188.
9. FOR MODULAR JOINT DETAIL, SEE SHEET NO. S206.



SECTION B-B

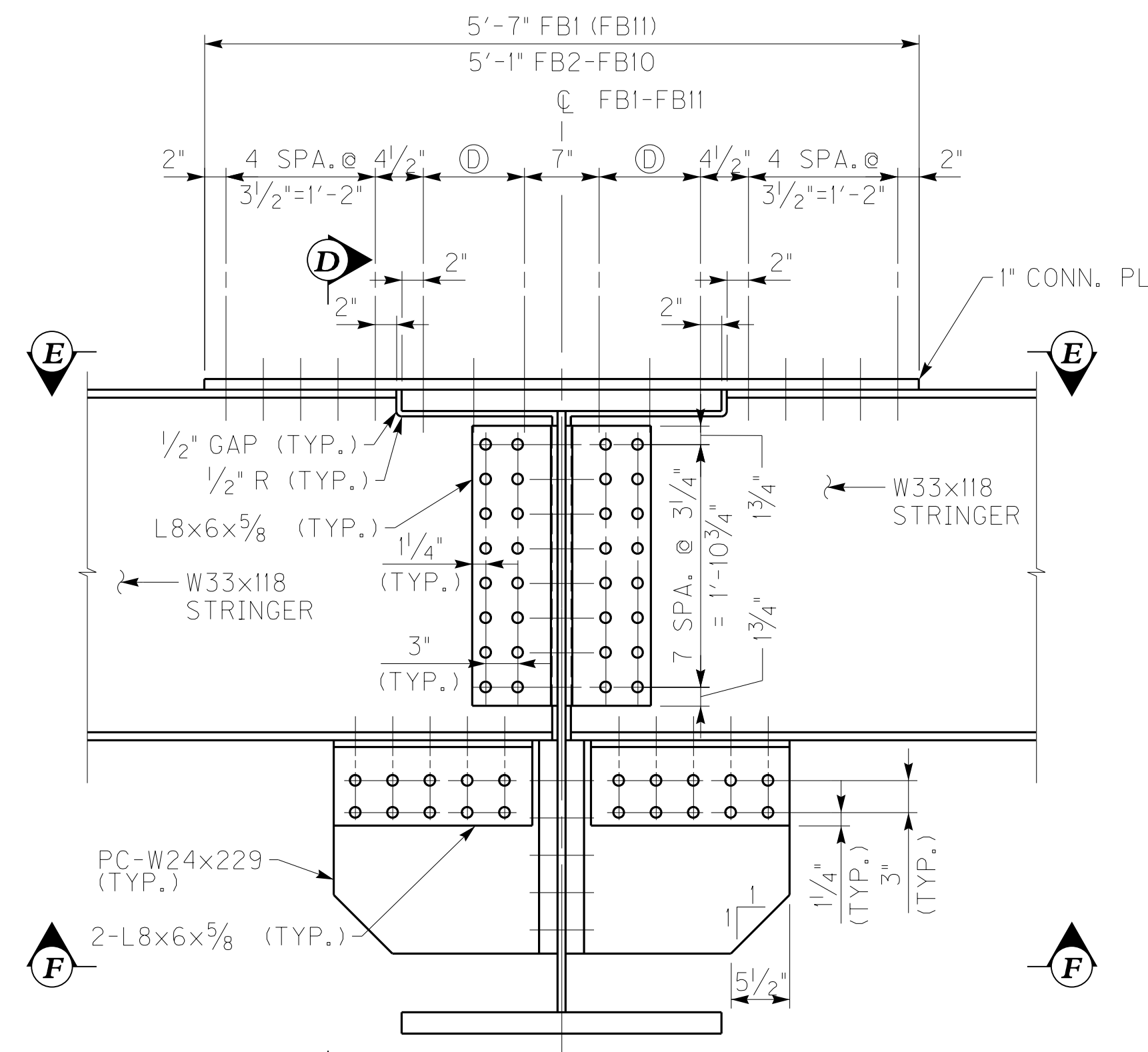


SECTION E-E



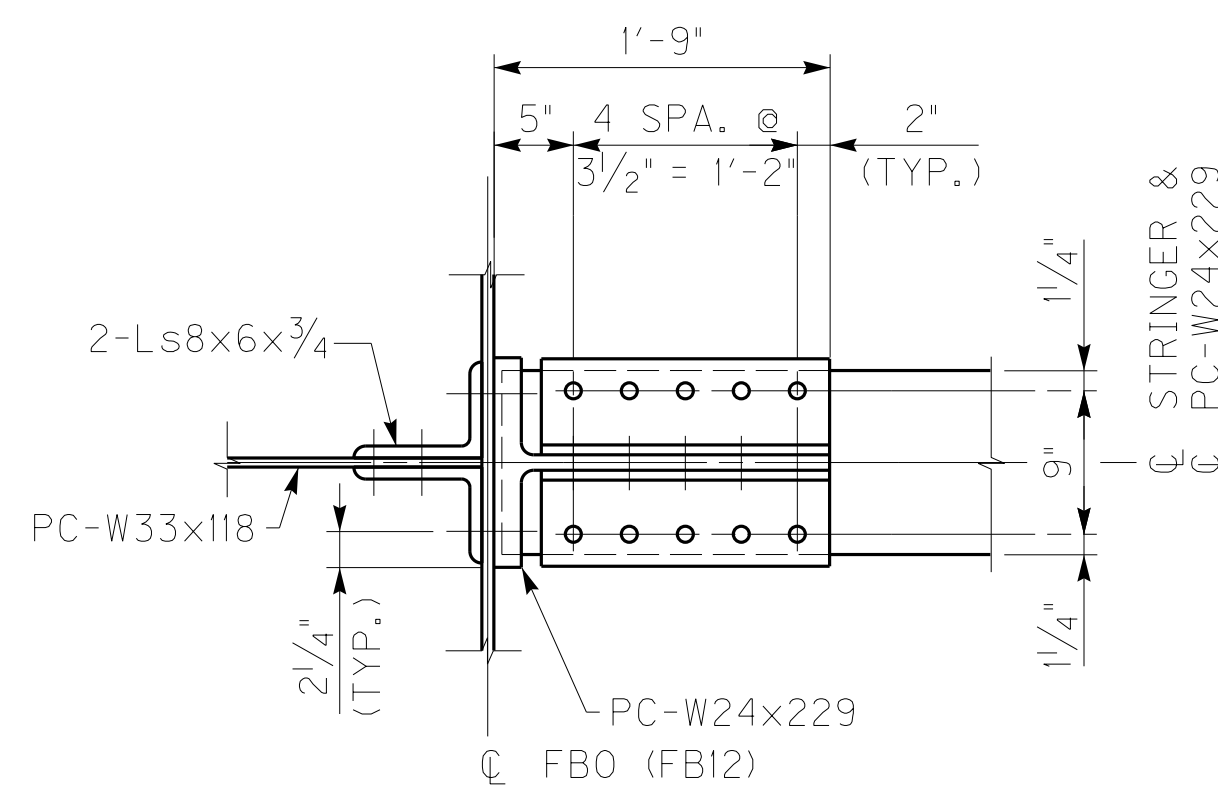
DETAIL 1

SECTION A-A



DETAIL 2

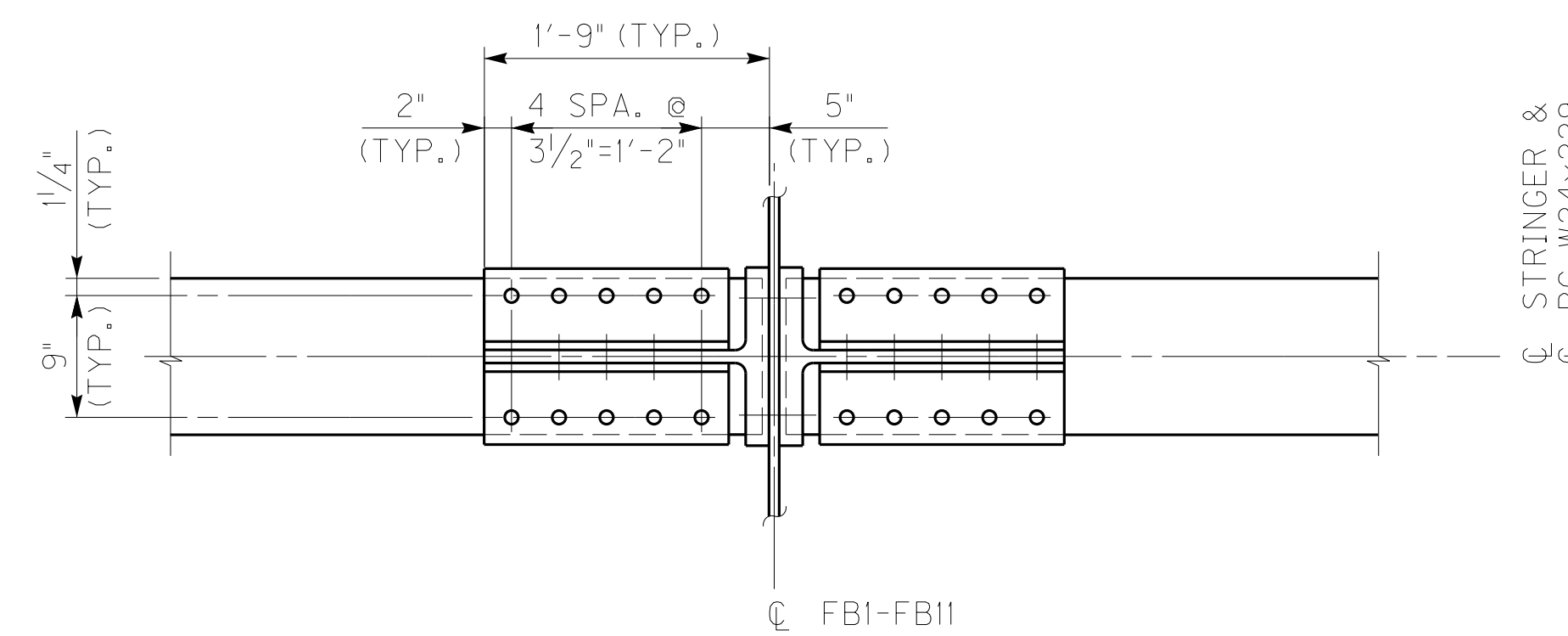
SECTION D-D



SECTION C-C

LEGEND

- (A) 2 SPA. @ 3" = 6"
- (B) 5 5/16"
- (C) 4 SPA. @ 3" = 1'-0"
- (D) 2 SPA. @ 4 3/4" = 9 1/2" (FBI & FB11)
2 SPA. @ 3 1/4" = 6 1/2" (FB2-FB10)
- (E) 4 SPA. @ 3 1/2" = 1'-2"
- (F) 4 SPA. @ 3 1/4" = 1'-1"
- (G) 4 SPA. @ 3 1/2" = 1'-2"



SECTION F-F

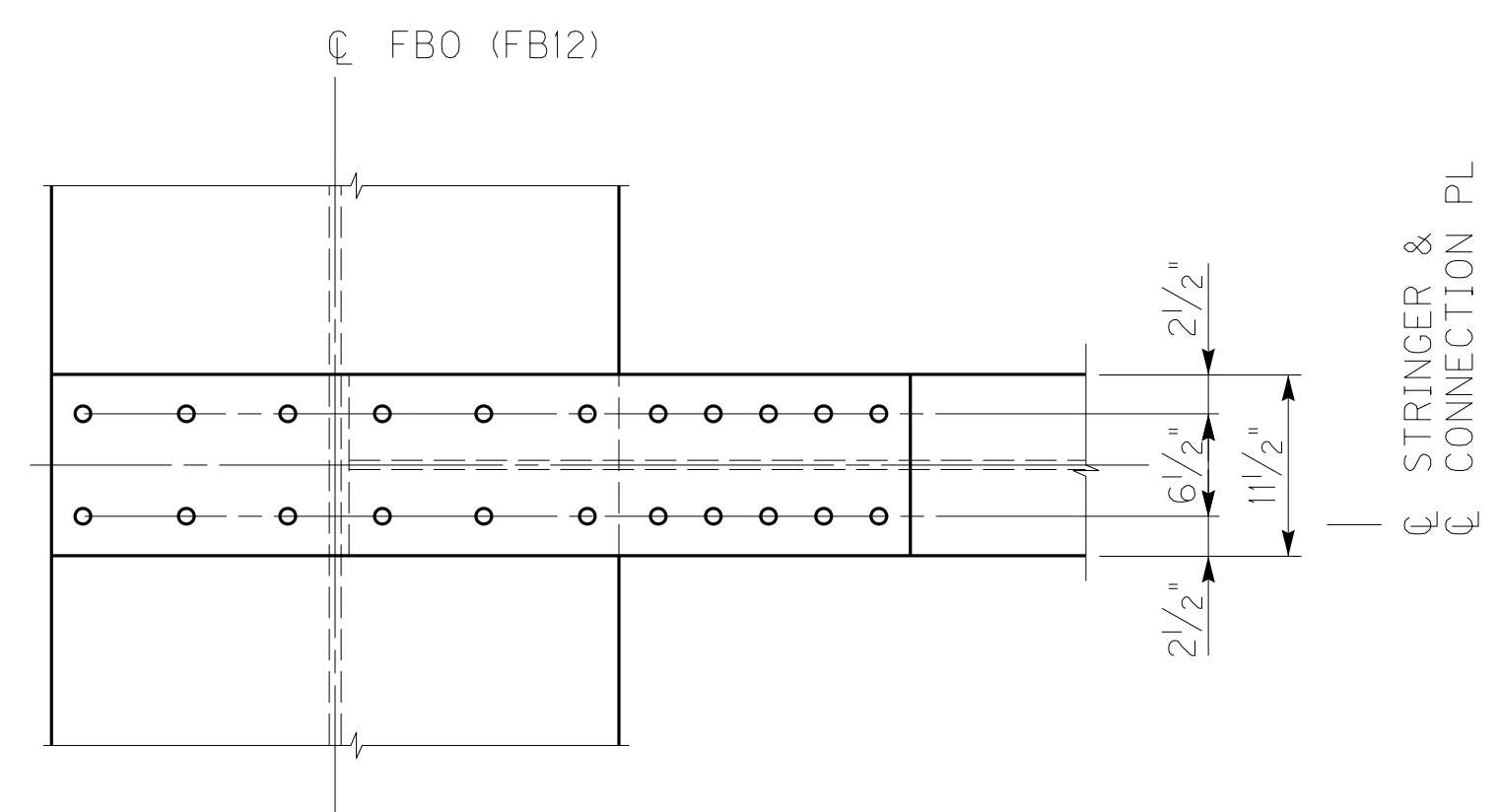


ITEM NUMBER
01-180.70

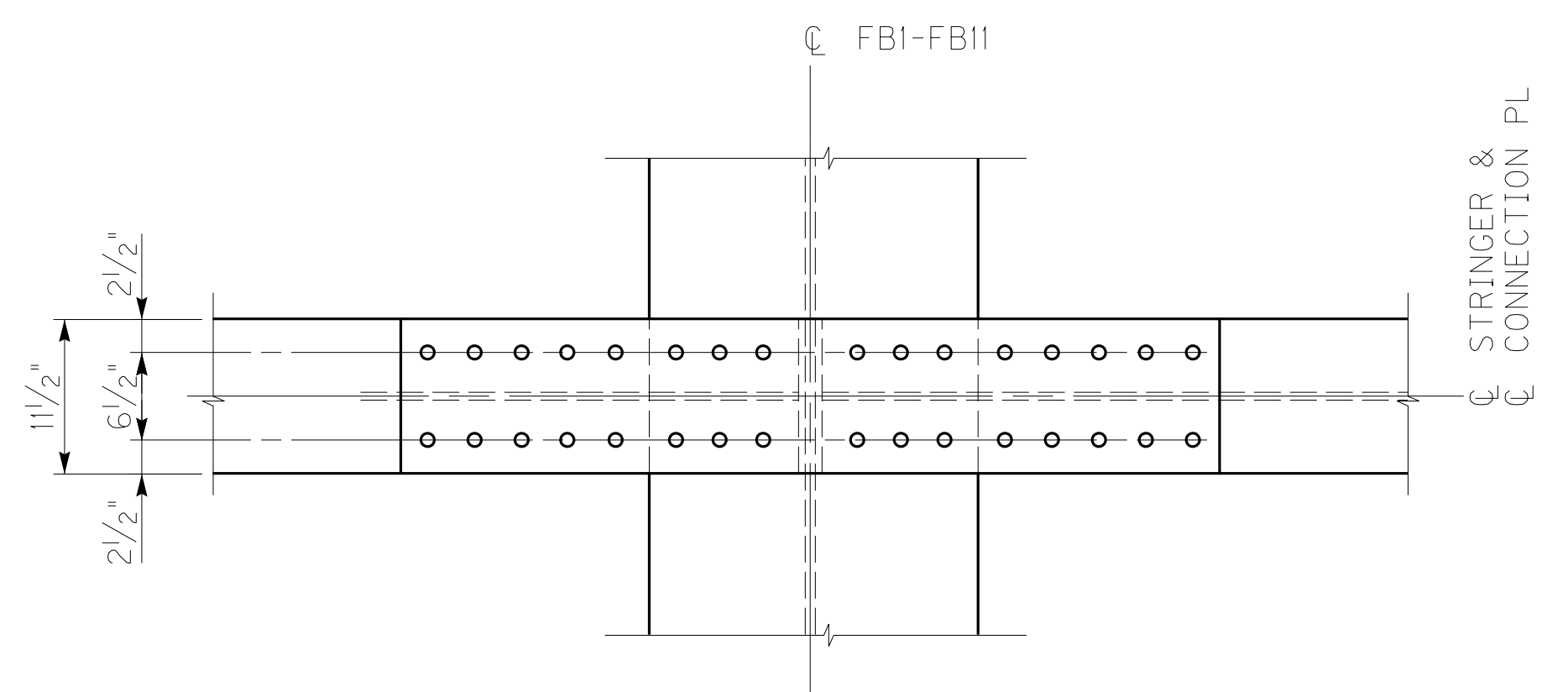
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Commonwealth of Kentucky DEPARTMENT OF HIGHWAYS COUNTY MARSHALL / TRIGG			
ROUTE US68		CROSSING KENTUCKY LAKE	
STRINGER DETAILS			
PREPARED BY Baker		MICHAEL BAKER JR., INC. 9750 ORMSBY STATION ROAD SUITE 210 LOUISVILLE, KY 40223	
		SHEET NO. S194 DRAWING NO. 24686	

FILE NAME: C:\P\WB1-LOCAL\BAKER_PROJECTS\CWETHINGTON\DOI4582\S24686_STO3.DGN
 USER: Moryko.Dwyer
 DATE PLOTTED: November 25, 2013
 E-SHEET NAME: S24686 194
 MicroStation v8.11.7.469

FILE NAME: C:\PWW81-LOCAL\BAKER_PROJECTS\CWETHINGTON\DOI4582\S24686_ST03.DGN
 USER: Mgr\jcd\dwyer
 DATE PLOTTED: November 25, 2013
 E-SHEET NAME: S24686 194
 MicroStation v8.11.7.469



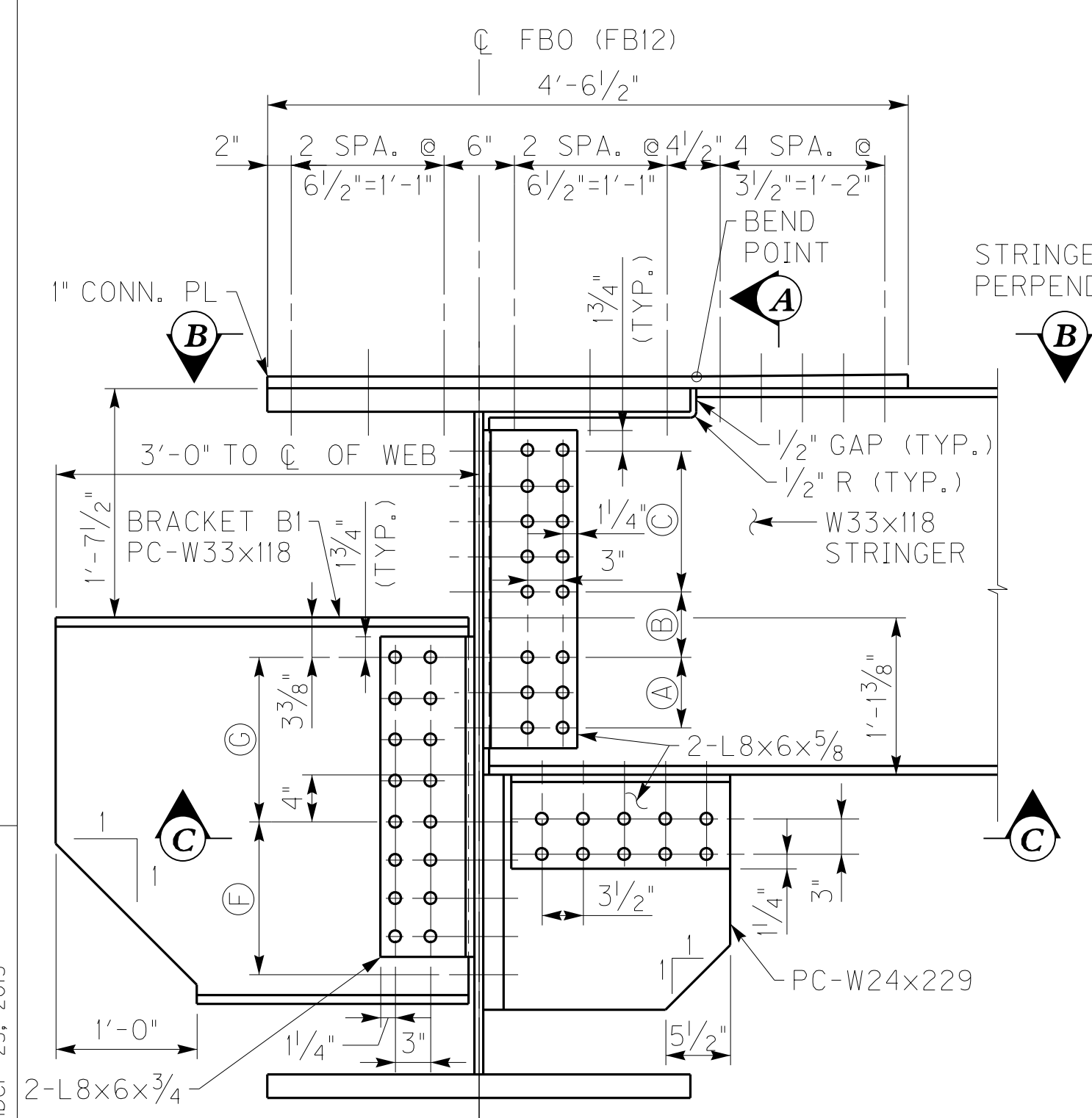
SECTION B-B



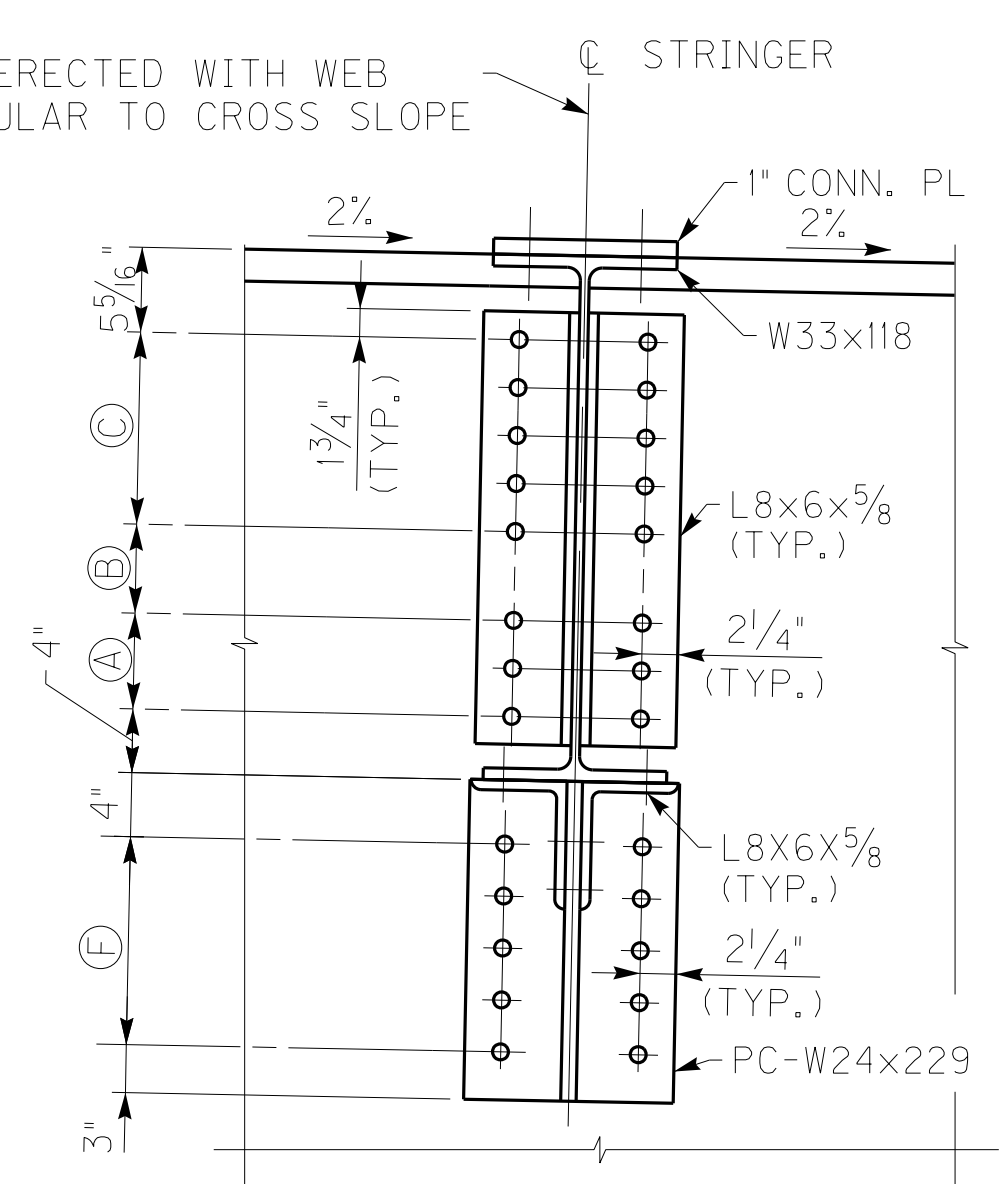
SECTION E-E

NOTES

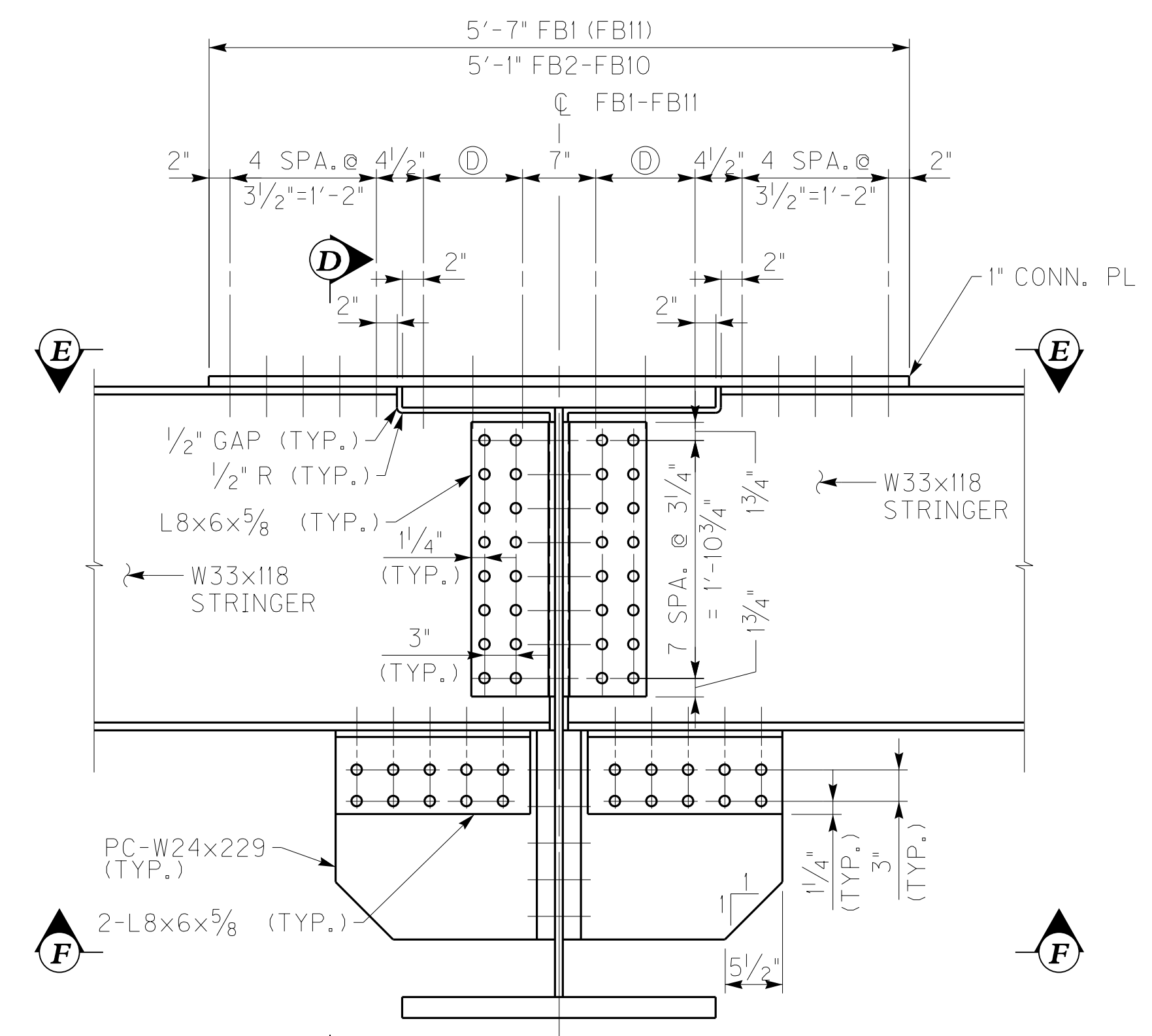
1. FOR GENERAL NOTES, SEE SHEET NO. S004-S006A.
2. FOR DETAIL 1 & 2 LOCATIONS SEE SHEET NO. S192.
3. BOLT HOLES IN STRINGER WEBS AND FLANGES SHALL BE OVERSIZED.
4. BOLT HOLES IN THE FLOORBEAM, THE STRINGER CONNECTION PLATES AND SHAPES SHALL BE STANDARD SIZE.
5. FOR BOLT TIGHTENING SEQUENCE, SEE DECK POURING SEQUENCE, SHEET NO. S214.
6. ALL BOLTS SHALL BE 1" DIAMETER A325-X HIGH STRENGTH BOLTS.
7. STRINGER ROLLED SECTIONS, CONNECTION PLATES AND SHAPES SHALL CONFORM TO AASHTO M270 GRADE 50W AND SHALL BE CVN TESTED.
8. FOR FLOORBEAM DETAILS SEE SHEET NOS. S187-S188.
9. FOR MODULAR JOINT DETAIL, SEE SHEET NO. S206.



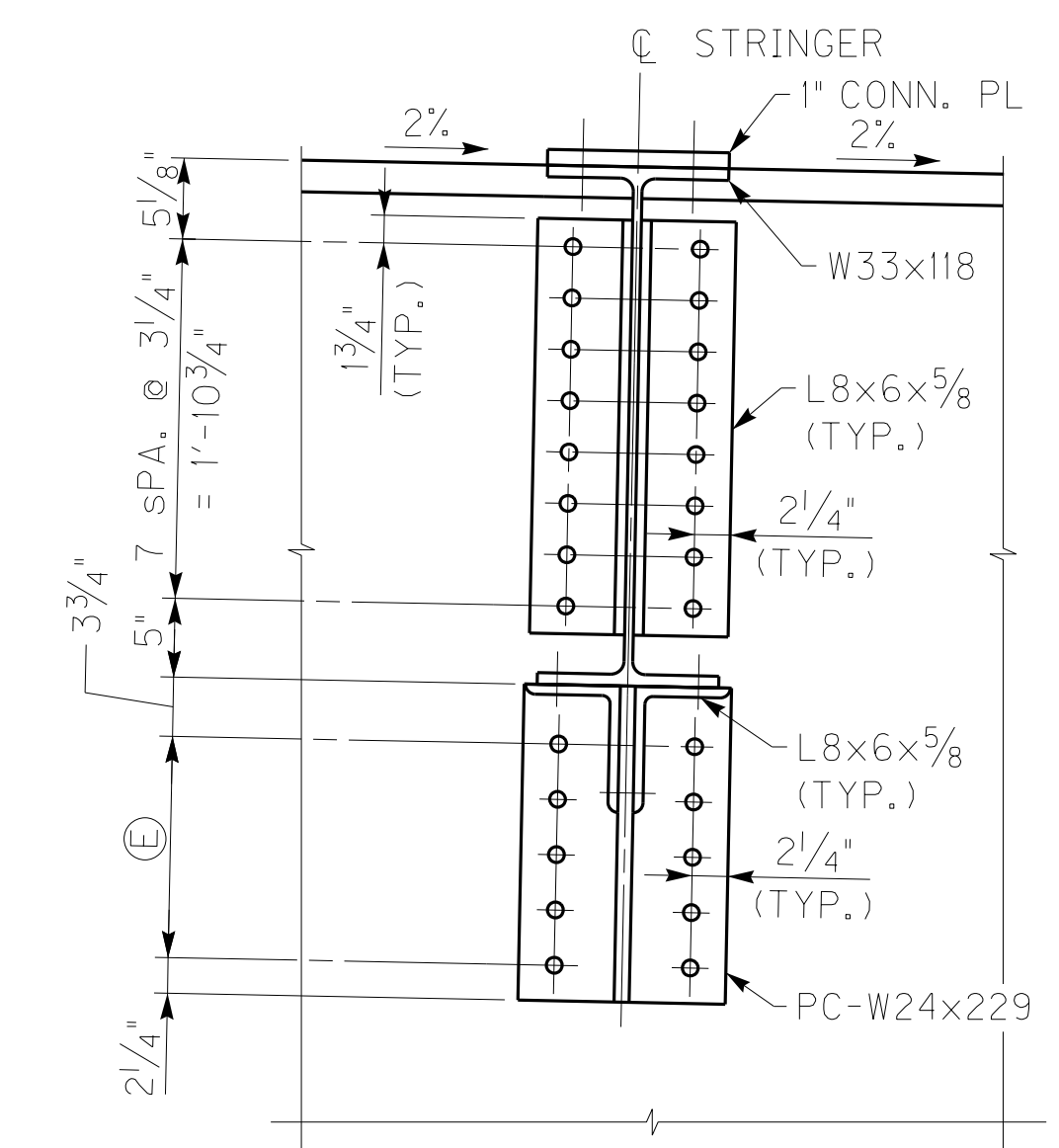
DETAIL 1



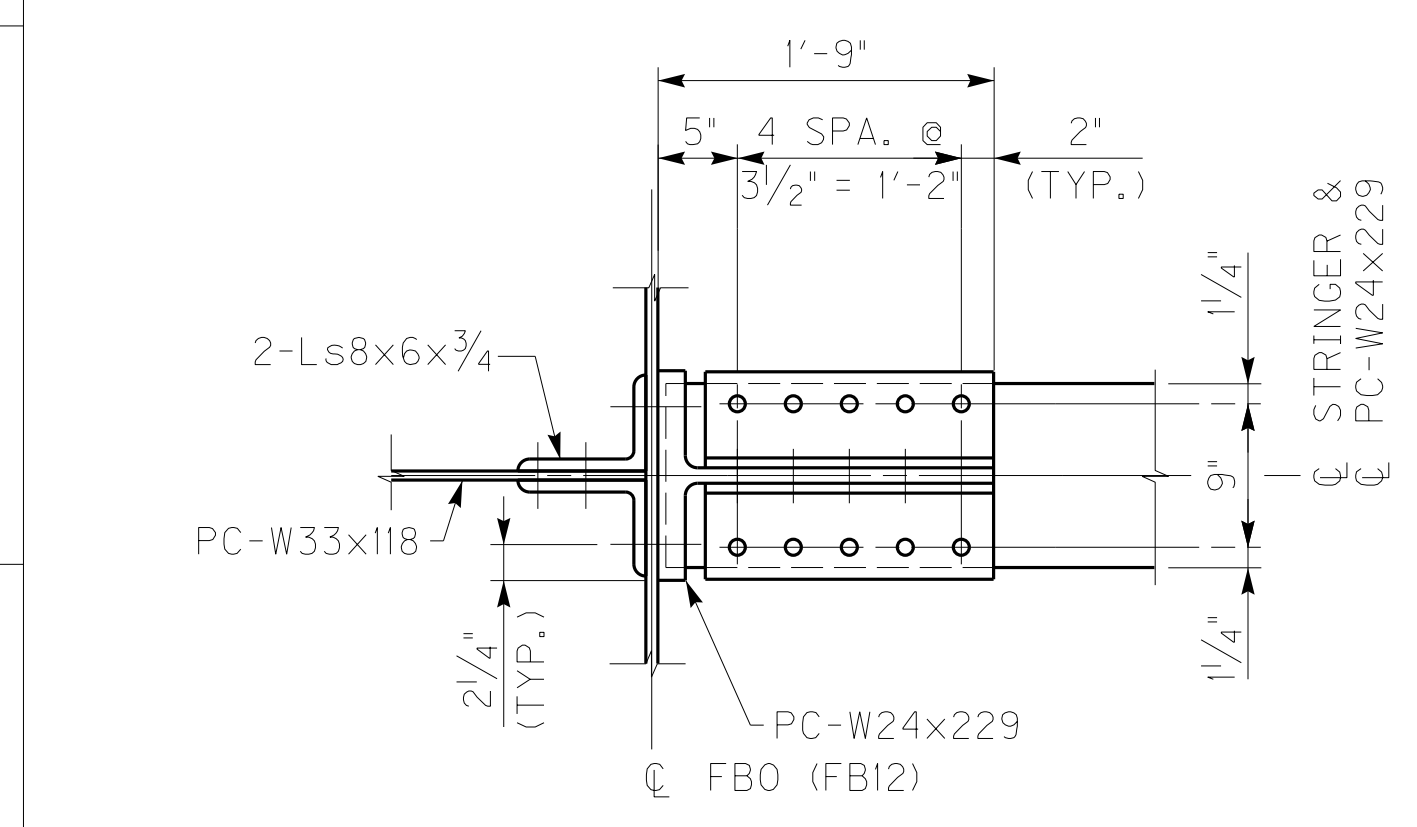
SECTION A-A



DETAIL 2



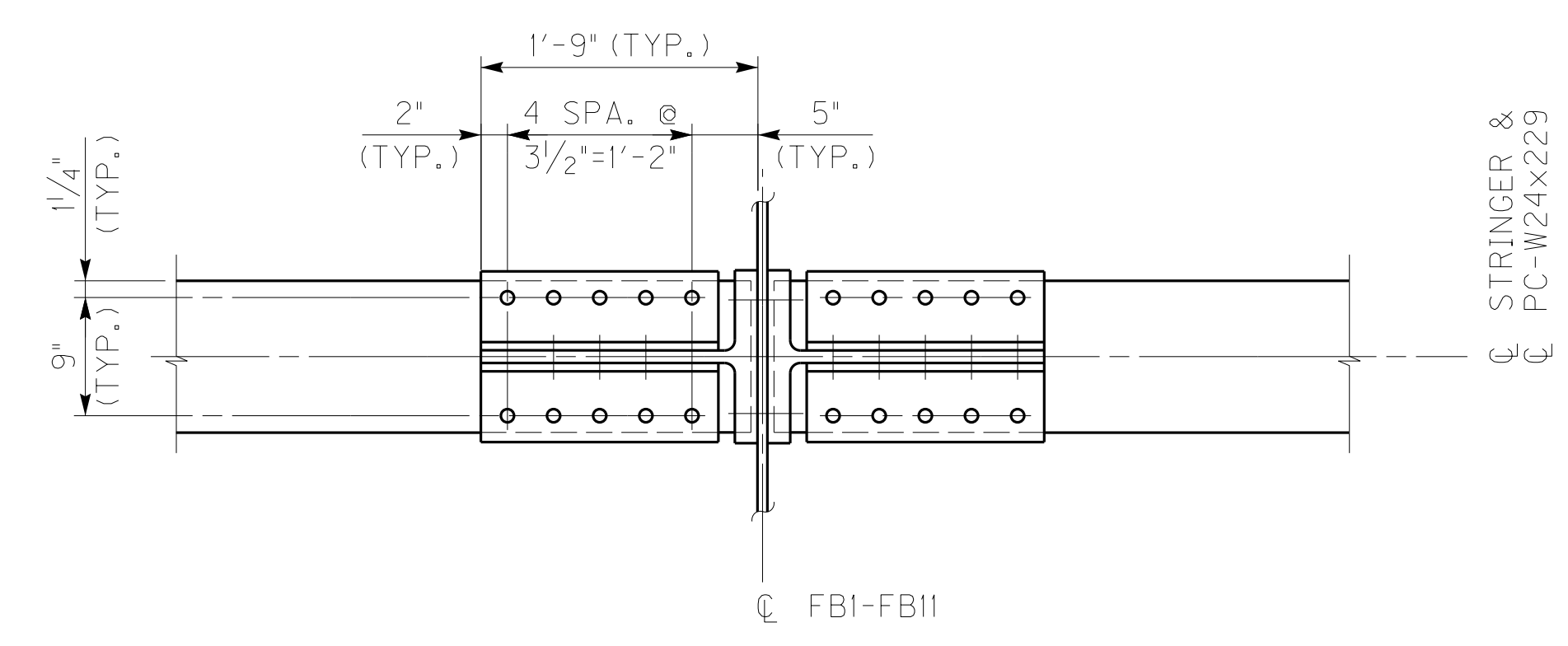
SECTION D-D



SECTION C-C

LEGEND

- (A) 2 SPA. @ 3" = 6"
- (B) 5 5/16"
- (C) 4 SPA. @ 3" = 1'-0"
- (D) 2 SPA. @ 4 3/4" = 9 1/2" (FBI & FB11)
2 SPA. @ 3 1/4" = 6 1/2" (FB2-FB10)
- (E) 4 SPA. @ 3 1/2" = 1'-2"
- (F) 4 SPA. @ 3 1/4" = 1'-1"
- (G) 4 SPA. @ 3 1/2" = 1'-2"



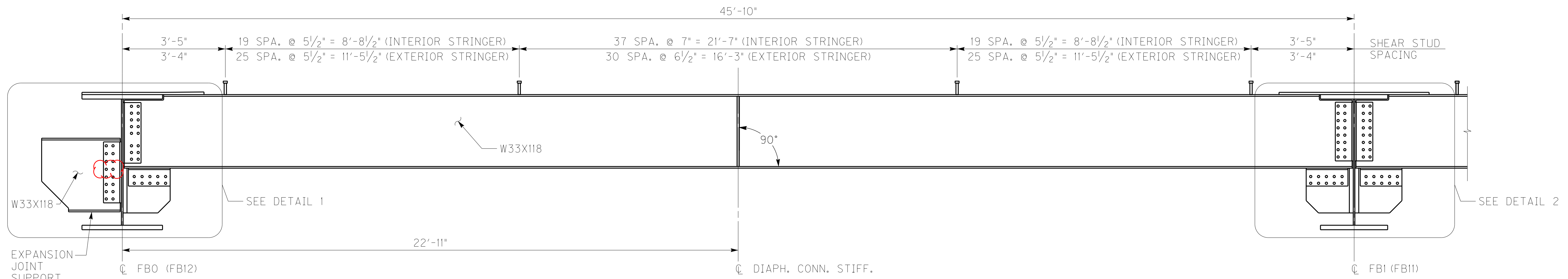
SECTION F-F



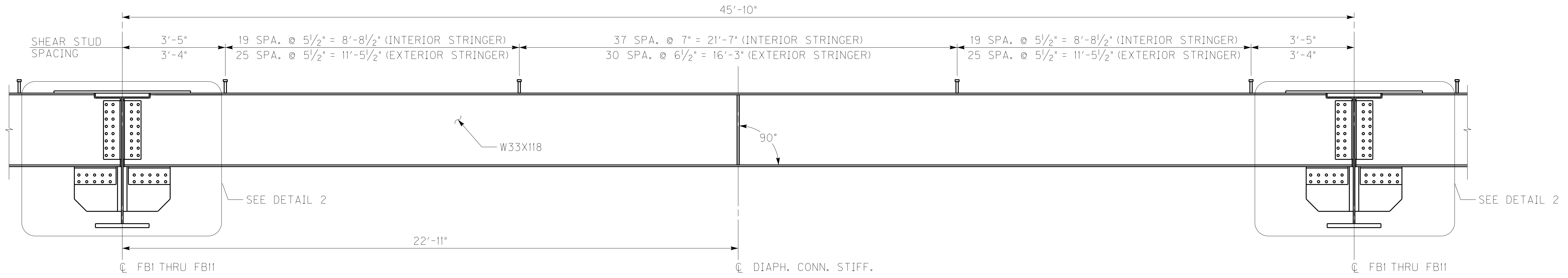
ITEM NUMBER	01-180.70
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REVISION DATE: NOVEMBER 15, 2013 DESIGNED BY: CYY DETAILED BY: CEW		CHECKED BY RMS CYY	11/25/13 DATE
Commonwealth of Kentucky DEPARTMENT OF HIGHWAYS <small>COUNTY</small> MARSHALL / TRIGG			
ROUTE US68	CROSSING KENTUCKY LAKE		
STRINGER DETAILS			
PREPARED BY Baker			SHEET NO. S194 DRAWING NO. 24686
MICHAEL BAKER JR., INC. 9750 ORMSBY STATION ROAD SUITE 210 LOUISVILLE, KY 40223			

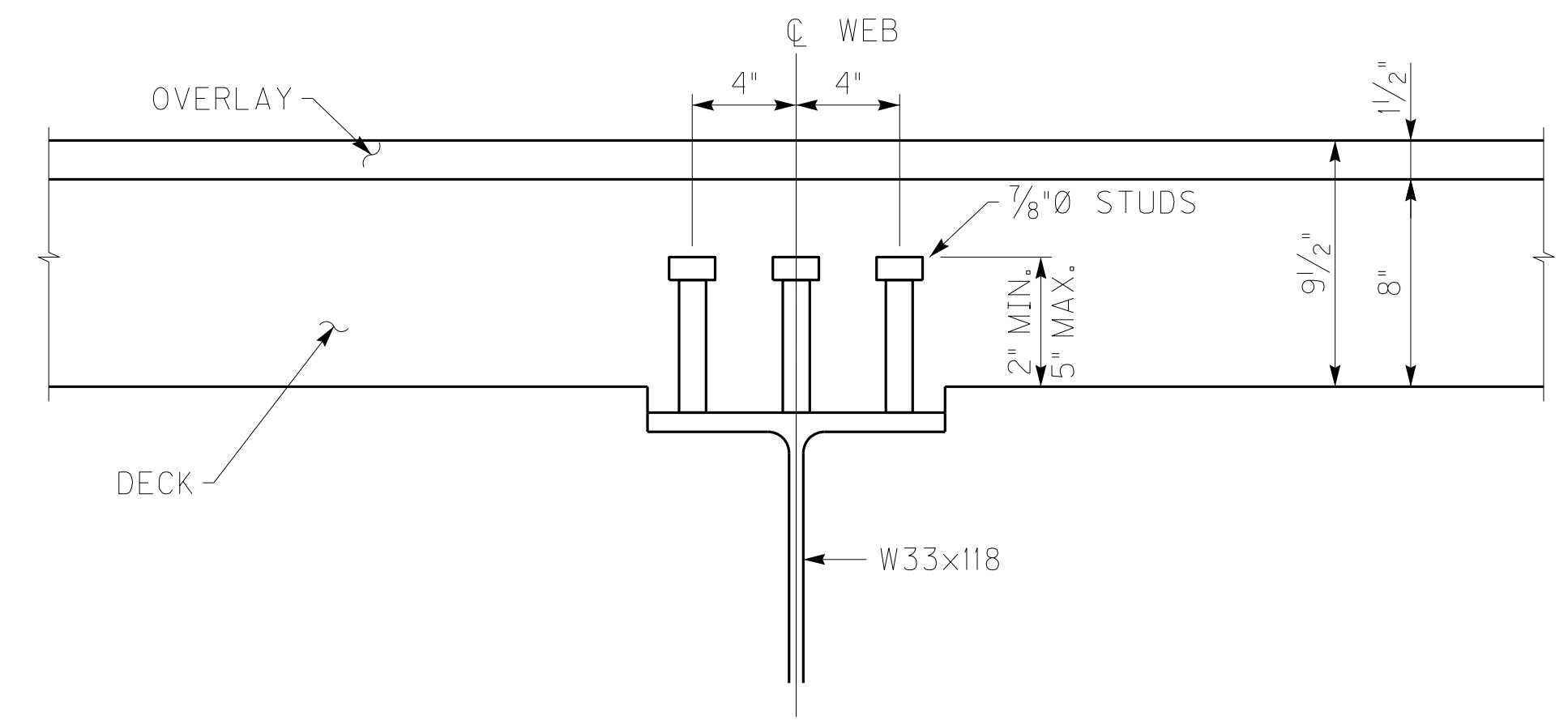
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 USER: Mgr\jcd\dwyer
 DATE PLOTTED: November 25, 2013
 E-SHEET NAME: S24686 192
 MicroStation v8.11.7.469



STRINGER ELEVATION
TYPICAL FOR END PANEL STRINGERS



STRINGER ELEVATION
TYPICAL FOR INTERIOR PANEL STRINGERS



STRINGER STUD DETAIL
USE 7/8"Ø GRANULAR OR SOLID FLUX FILLED HEADED STUDS, AUTOMATICALLY END WELDED. STUDS SHALL BE ATTACHED TO STRINGERS IN FIELD.

NOTES

- FOR GENERAL NOTES SEE SHEET NOS. S004-S006A.
- FOR DETAILS 1 & 2, SEE SHEET NO. S194.
- FOR DIAPHRAGM DETAILS, SEE SHEET NO. S196.
- FOR FLOORBEAM DETAILS, SEE SHEET NOS. S187-S188.
- FOR STRINGER CAMBER, TURN NATURAL CAMBER UPWARD.
- FOR STRINGER DEFLECTION, SEE SHEET NO. S193.
- ALL STRUCTURAL STEEL FOR STRINGERS AND STRINGER CONNECTION PLATES SHALL CONFORM TO AASHTO M270 GRADE 50W AND SHALL BE CVN TESTED.
- STRINGERS SHALL BE ERECTED WITH THE WEB PERPENDICULAR TO CROSS SLOPE.



ITEM NUMBER	01-180.70
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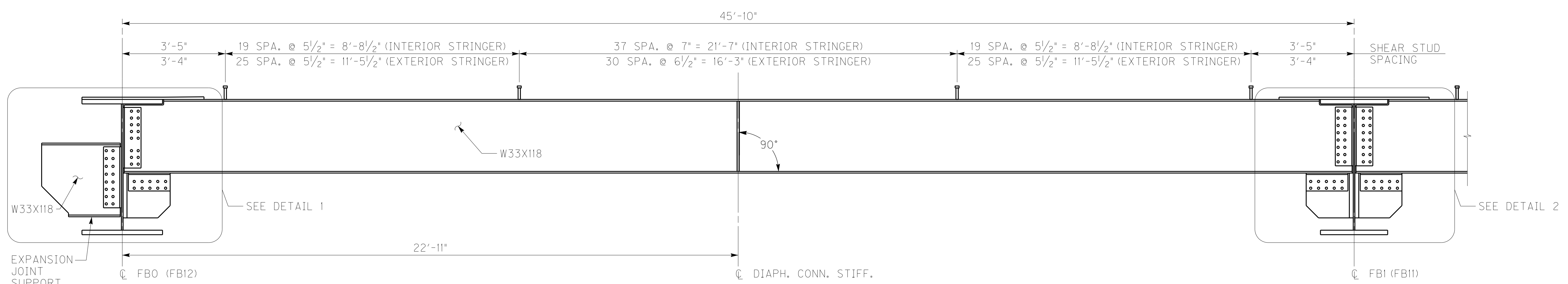
REVISION		DATE
REVISED BRACKET BI CONNECTION		11/25/13
DATE: NOVEMBER 15, 2013	CHECKED BY	
DESIGNED BY: ACK	LEV/RMS	
DETAILED BY: MJD	ACK	
Commonwealth of Kentucky		
DEPARTMENT OF HIGHWAYS		
COUNTY		
MARSHALL / TRIGG		
ROUTE	CROSSING	
US68	KENTUCKY LAKE	
STRINGER ELEVATION		
PREPARED BY		SHEET NO.
MICHAEL BAKER JR., INC.		S192
9750 ORMSBY STATION ROAD		DRAWING NO.
SUITE 210		24686
LOUISVILLE, KY 40223		

FILE NAME: C:\PW\81-LOCAL\BAKER_PROJECTS\CWETHINGTON\DOI4582\S24686 ST01.DGN

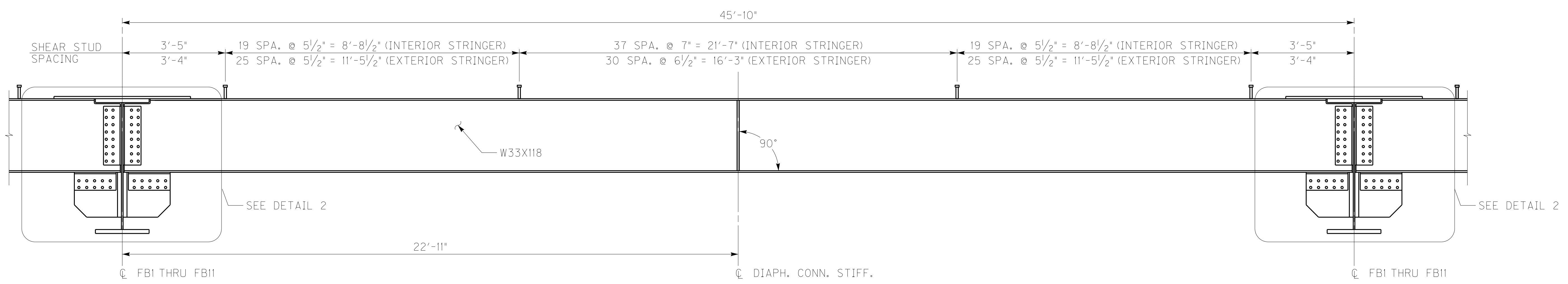
USER: Moryko,Dwyer
DATE PLOTTED: November 25, 2013

E-SHEET NAME: S24686 192

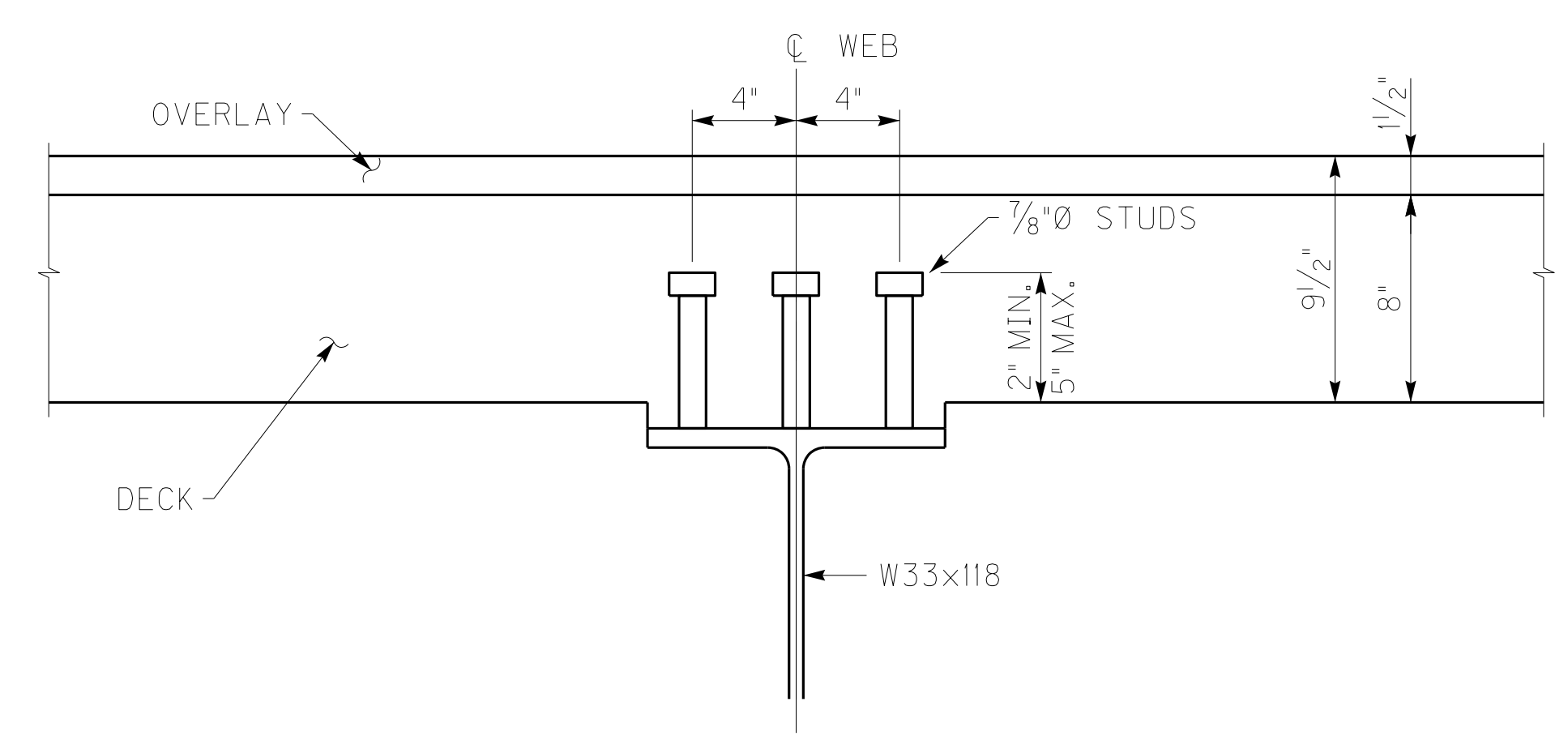
MicroStation v8.11.7.469



STRINGER ELEVATION
TYPICAL FOR END PANEL STRINGERS



STRINGER ELEVATION
TYPICAL FOR INTERIOR PANEL STRINGERS



STRINGER STUD DETAIL

USE 7/8"Ø GRANULAR OR SOLID FLUX FILLED HEADED STUDS, AUTOMATICALLY END WELDED. STUDS SHALL BE ATTACHED TO STRINGERS IN FIELD.

NOTES

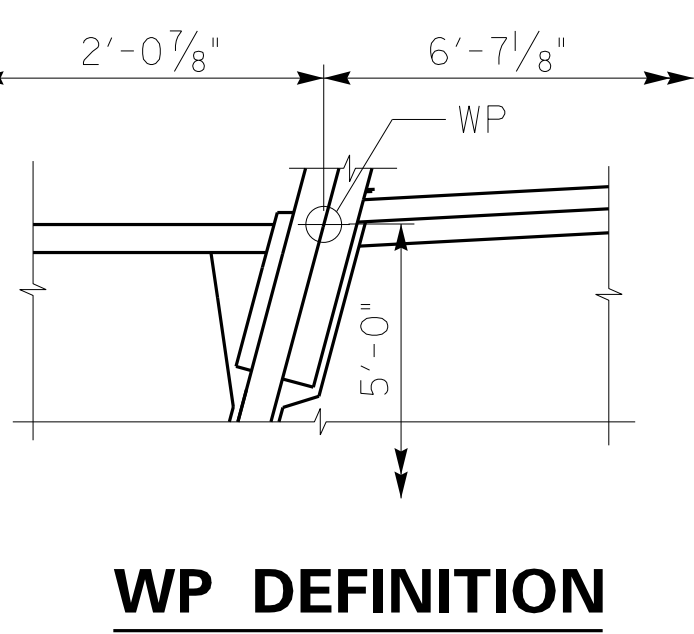
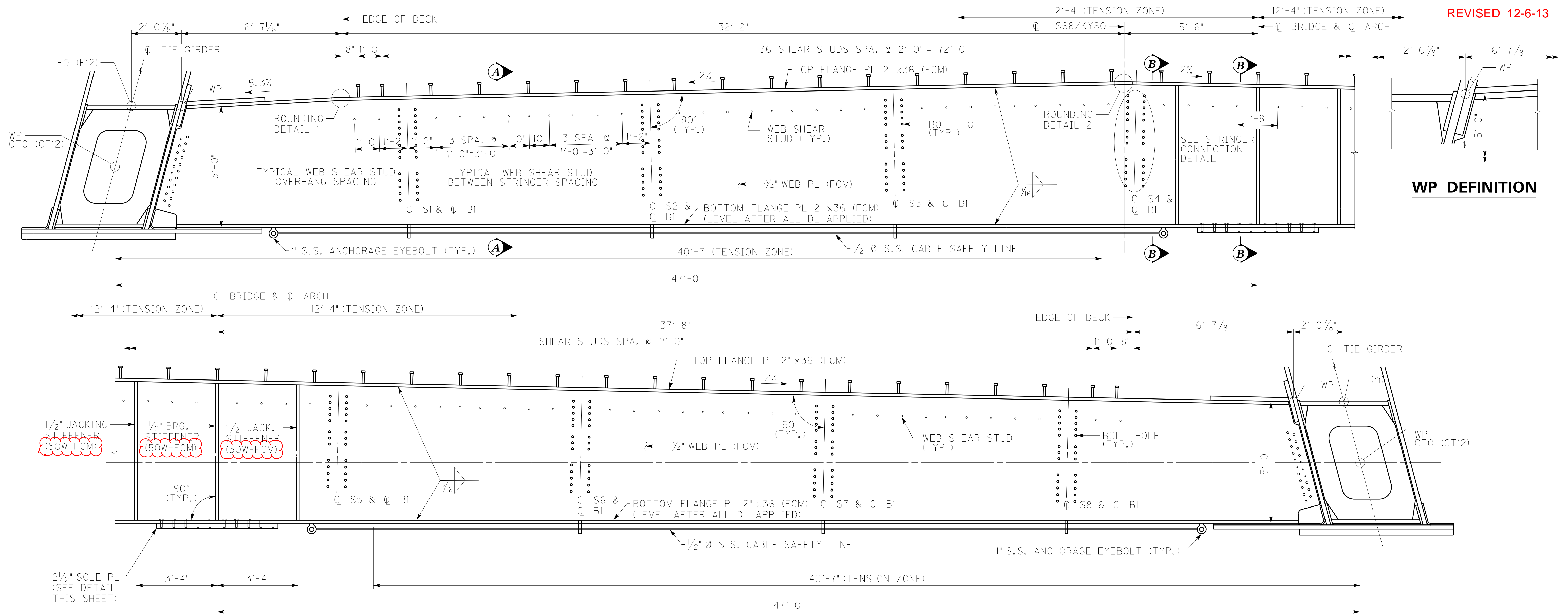
- FOR GENERAL NOTES SEE SHEET NOS. S004-S006A.
- FOR DETAILS 1 & 2, SEE SHEET NO. S194.
- FOR DIAPHRAGM DETAILS, SEE SHEET NO. S196.
- FOR FLOORBEAM DETAILS, SEE SHEET NOS. S187-S188.
- FOR STRINGER CAMBER, TURN NATURAL CAMBER UPWARD.
- FOR STRINGER DEFLECTION, SEE SHEET NO. S193.
- ALL STRUCTURAL STEEL FOR STRINGERS AND STRINGER CONNECTION PLATES SHALL CONFORM TO AASHTO M270 GRADE 50W AND SHALL BE CVN TESTED.
- STRINGERS SHALL BE ERECTED WITH THE WEB PERPENDICULAR TO CROSS SLOPE.



ITEM NUMBER	01-180.70
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REVISION		DATE
REVISED BRACKET BI CONNECTION		11/25/13
DATE: NOVEMBER 15, 2013	CHECKED BY	
DESIGNED BY: ACK	LEV/RMS	
DETAILED BY: MJD	ACK	
Commonwealth of Kentucky DEPARTMENT OF HIGHWAYS		
COUNTY MARSHALL / TRIGG		
ROUTE US68	CROSSING KENTUCKY LAKE	
STRINGER ELEVATION		
PREPARED BY		SHEET NO.
MICHAEL BAKER JR., INC. 9750 ORMSBY STATION ROAD SUITE 210 LOUISVILLE, KY 40223		S192
Baker		DRAWING NO. 24686

FILE NAME: C:\PW\81-LOCAL\BAKER_PROJECTS\CWETHINGTON\DOI4582\S24686_FBO2.DGN
 USER: Mgr\jcdwyer
 DATE PLOTTED: November 25, 2013
 E-SHEET NAME: S24686 1B7
 MicroStation v8.11.7.469

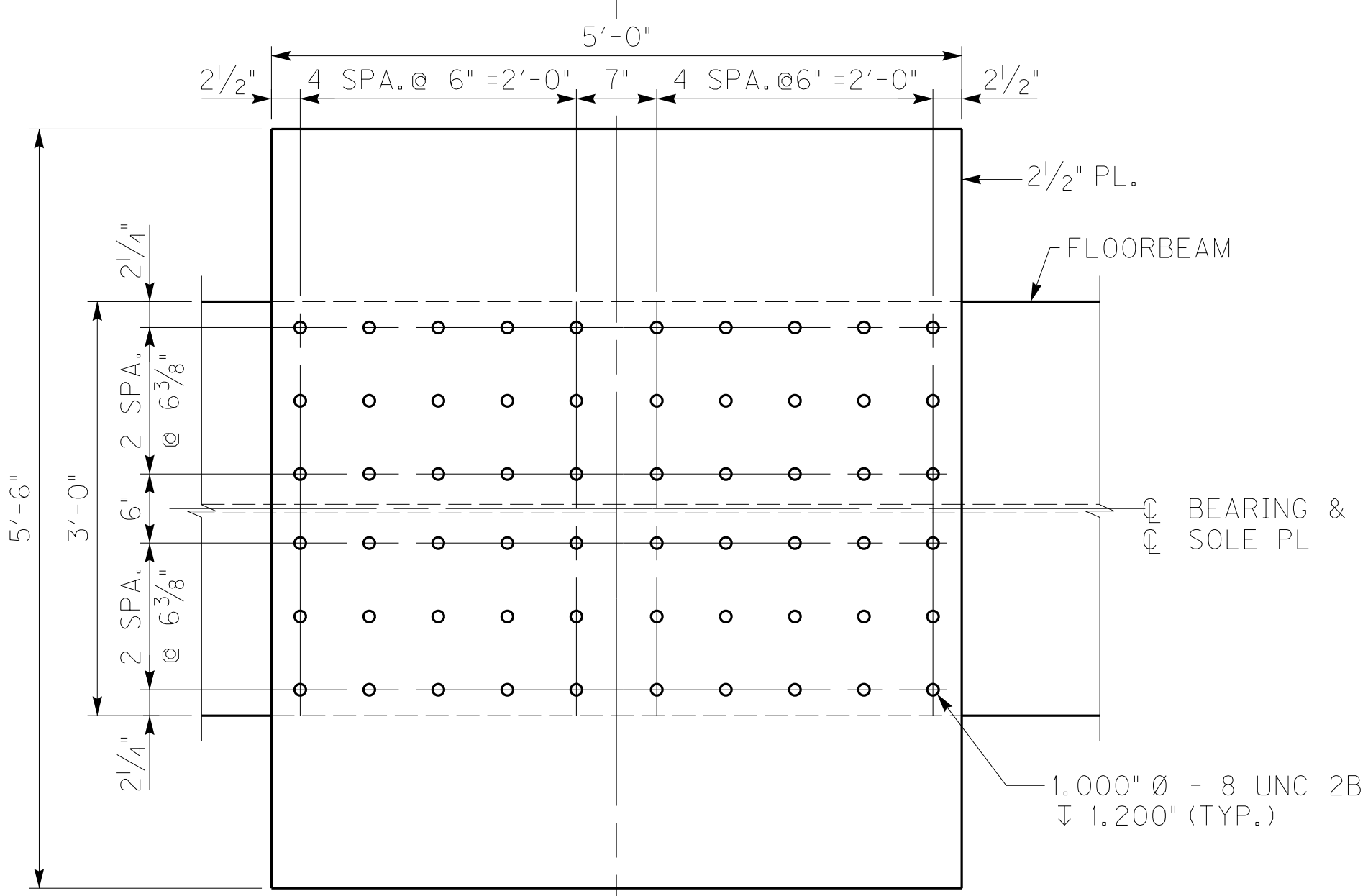


END FLOORBEAM ELEVATION

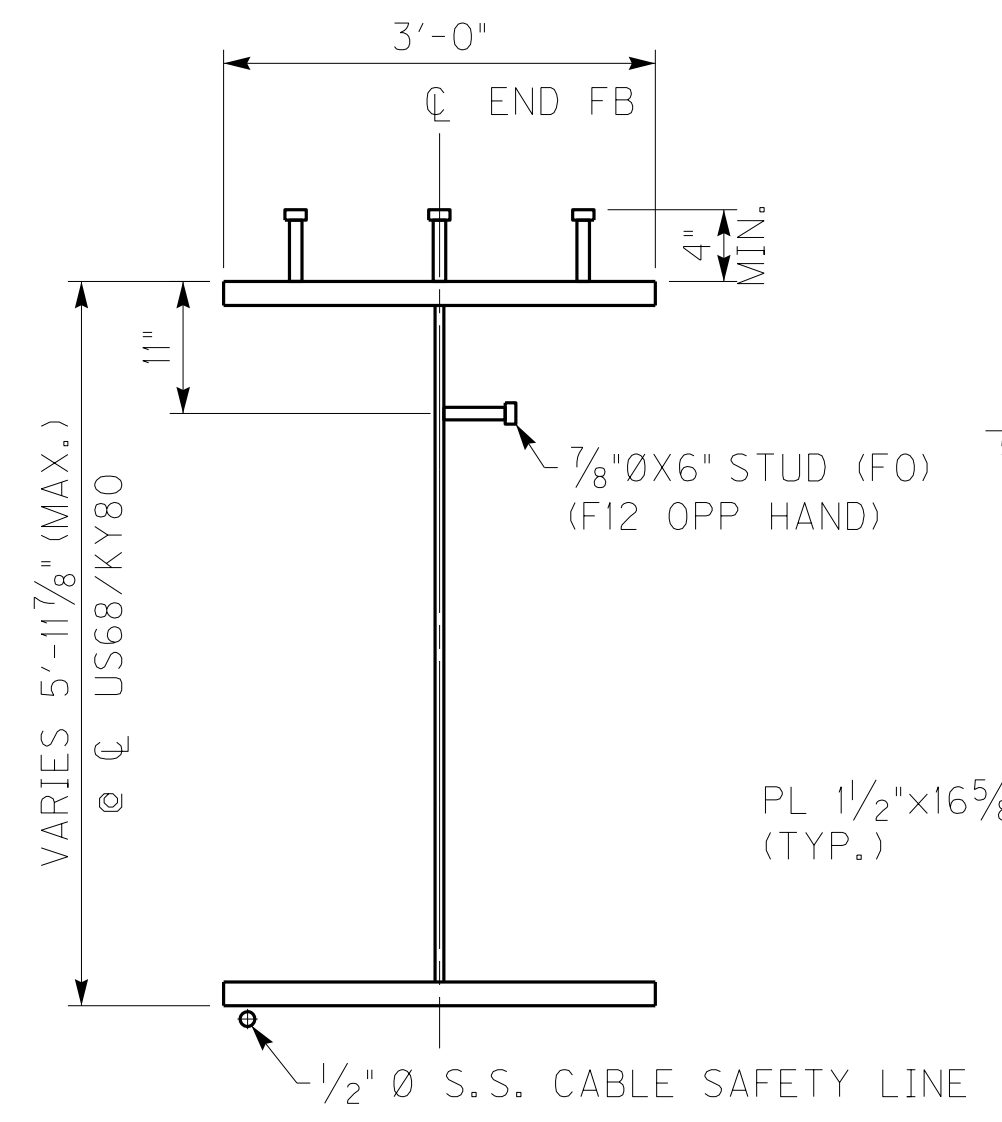
FBO LOOKING AHEAD STATION
 FBI2 LOOKING BACK STATION

NOTES

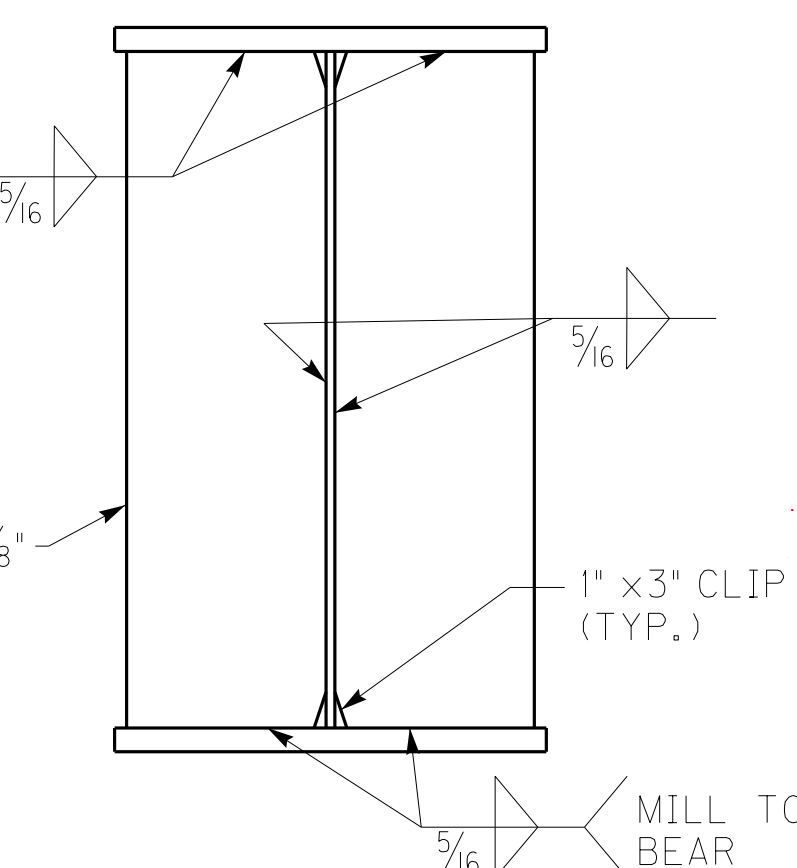
- FOR GENERAL NOTES, SEE SHEET NOS. S004-S006A.
- ALL BOLTS SHALL BE 1" DIAMETER A325-X HIGH STRENGTH BOLTS.
- END FLOORBEAMS SHALL CONFORM TO AASHTO M270 GRADE HPS 70W AND SHALL BE FCM TESTED WHERE INDICATED.
- THE SOLE PLATE SHALL CONFORM TO AASHTO M270 GRADE 50W AND SHALL BE CVN TESTED.
- FOR END FLOORBEAM CONNECTIONS SEE SHEET NOS. S152-S154.
- FOR STRINGER CONNECTION DETAILS SEE SHEET NO. S194.
- FOR TYPE B BEARING DETAILS SEE SHEET NOS. S202 & S205.
- FOR SHEAR STUD DETAIL, WELD TERMINATION DETAIL, ROUNDING DETAIL 1 & ROUNDING DETAIL 2 SEE SHEET NO. S188.
- FOR FLOORBEAM CAMBER SEE SHEET NO. S189.
- THE JACKING AND BRG. STIFFENERS SHALL CONFORM TO AASHTO M270 GRADE 50W AND SHALL BE FCM TESTED.



TYPE B BEARING SOLE PL DETAIL



SECTION A-A



SECTION B-B

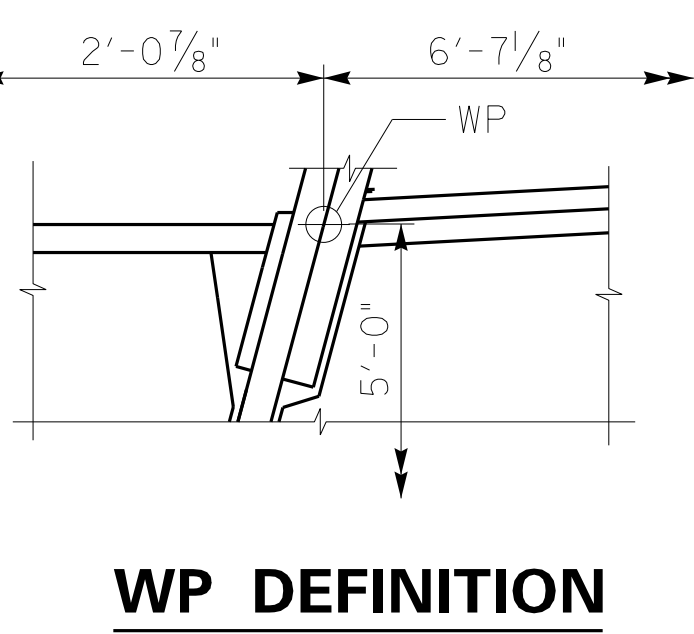
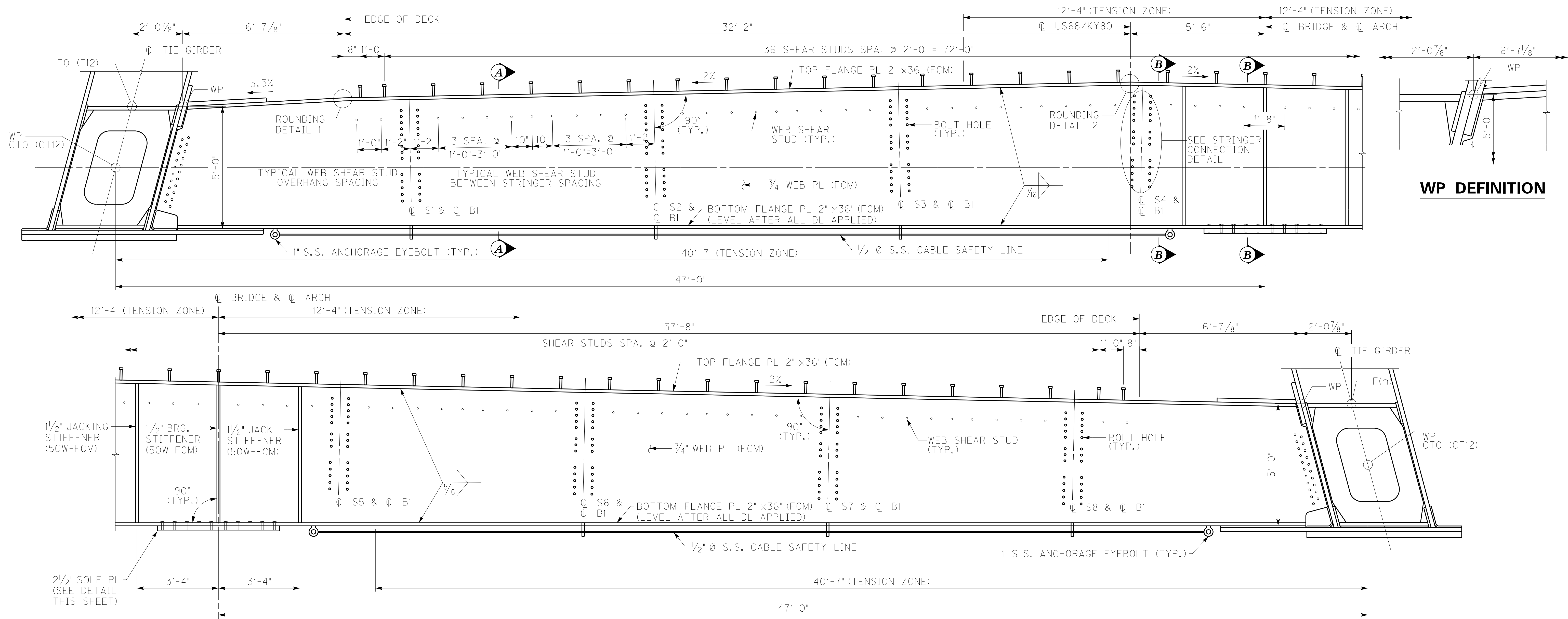
JACKING STIFFENER
 BEARING STIFFENER



ITEM NUMBER	01-180.70
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ADD FCM TO STIFFENERS, ADD NOTE 10		11/25/13
REVISION		DATE
DATE: NOVEMBER 15, 2013	CHECKED BY	
DESIGNED BY: JCS	RMS	
DETAILED BY: MJD	JCS/ACK	
Commonwealth of Kentucky DEPARTMENT OF HIGHWAYS		
COUNTY MARSHALL / TRIGG		
ROUTE US68	CROSSING KENTUCKY LAKE	
END FLOORBEAM		
PREPARED BY		SHEET NO.
MICHAEL BAKER JR., INC. 9750 ORMSBY STATION ROAD SUITE 210 LOUISVILLE, KY 40223		S187
Baker		DRAWING NO. 24686

FILE NAME: C:\PW\81-LOCAL\BAKER_PROJECTS\CWETHINGTON\DOI4582\S24686_FBO2.DGN
 USER: Mgr\jcd\dwyer
 DATE PLOTTED: November 25, 2013
 E-SHEET NAME: S24686 1B7
 MicroStation v8.11.7.469

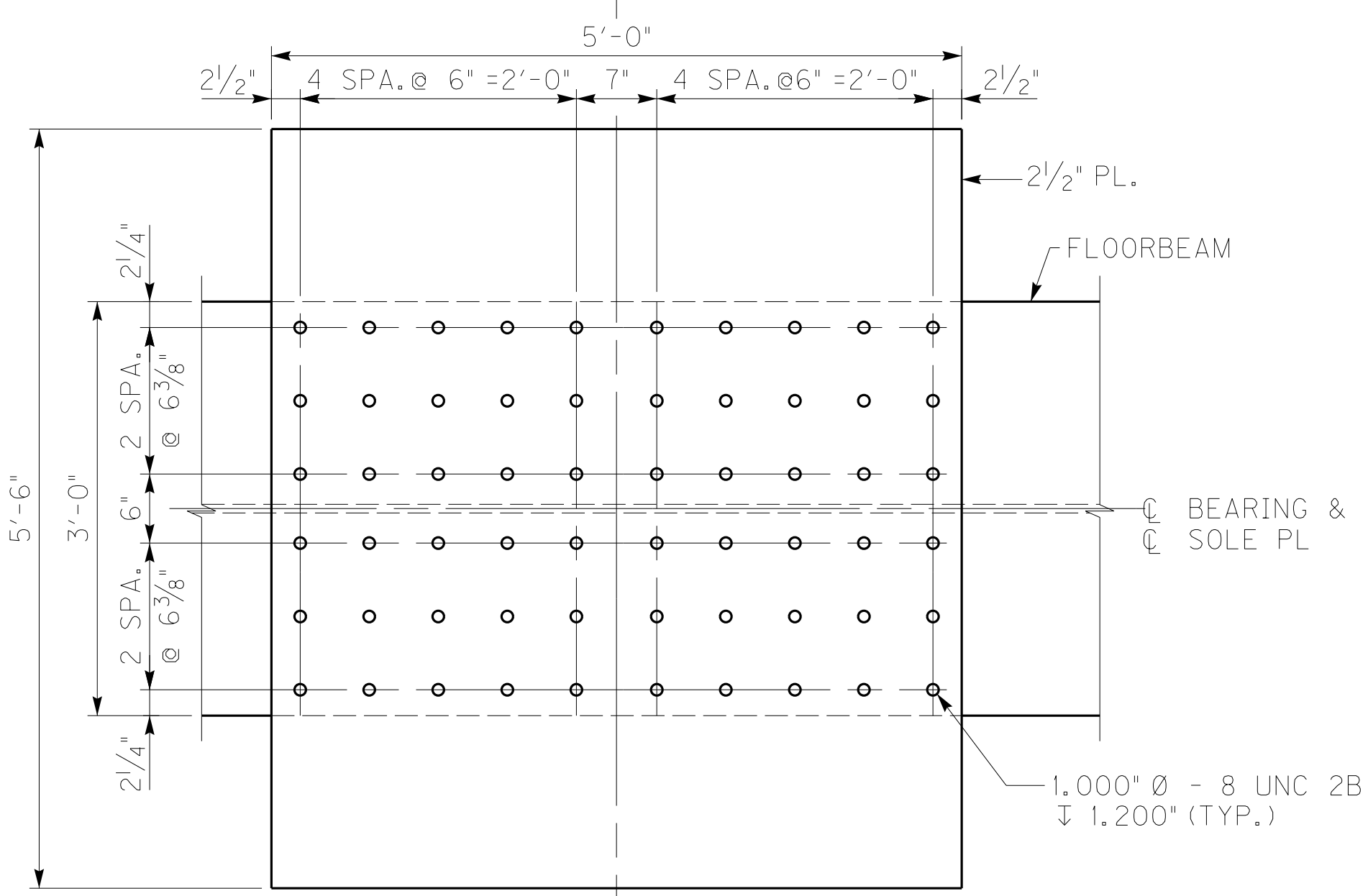


END FLOORBEAM ELEVATION

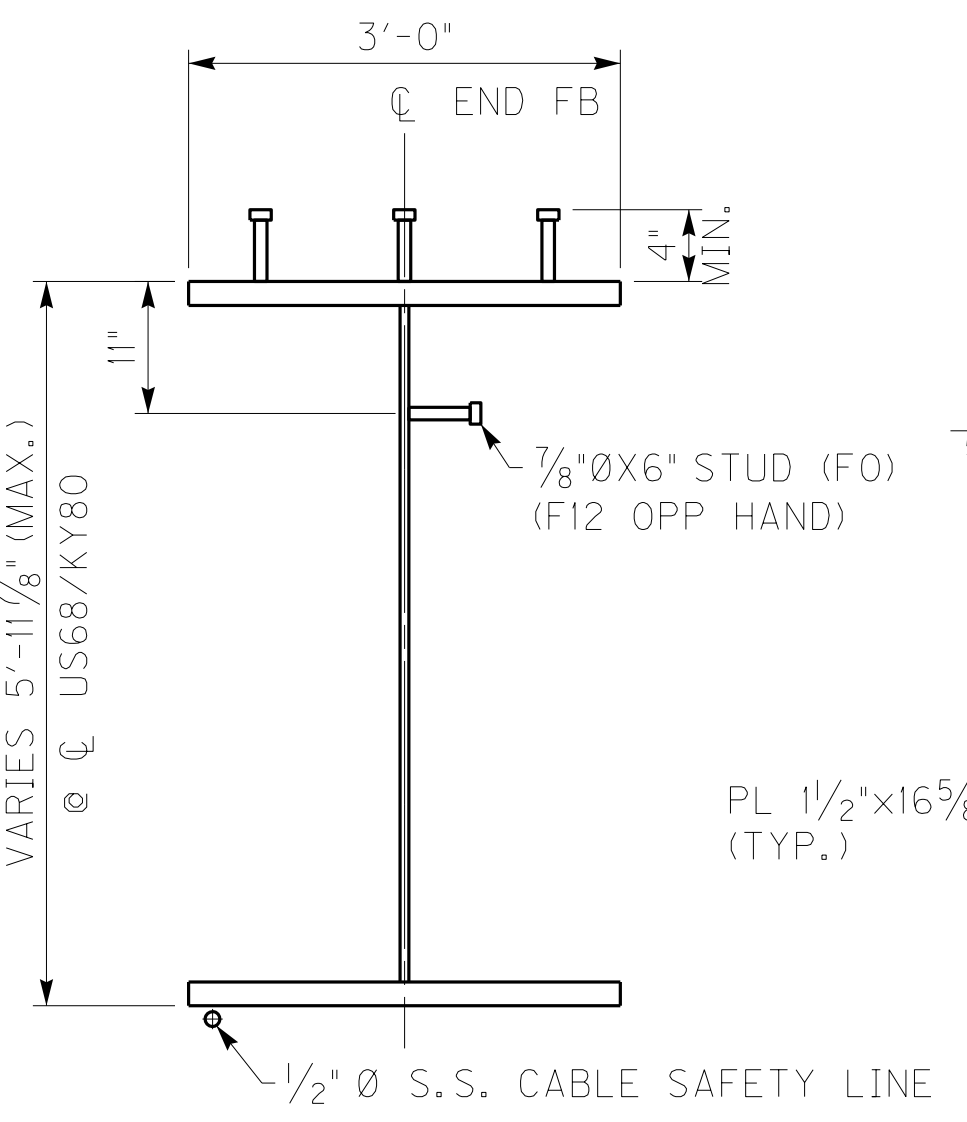
FBO LOOKING AHEAD STATION
 FBI2 LOOKING BACK STATION

NOTES

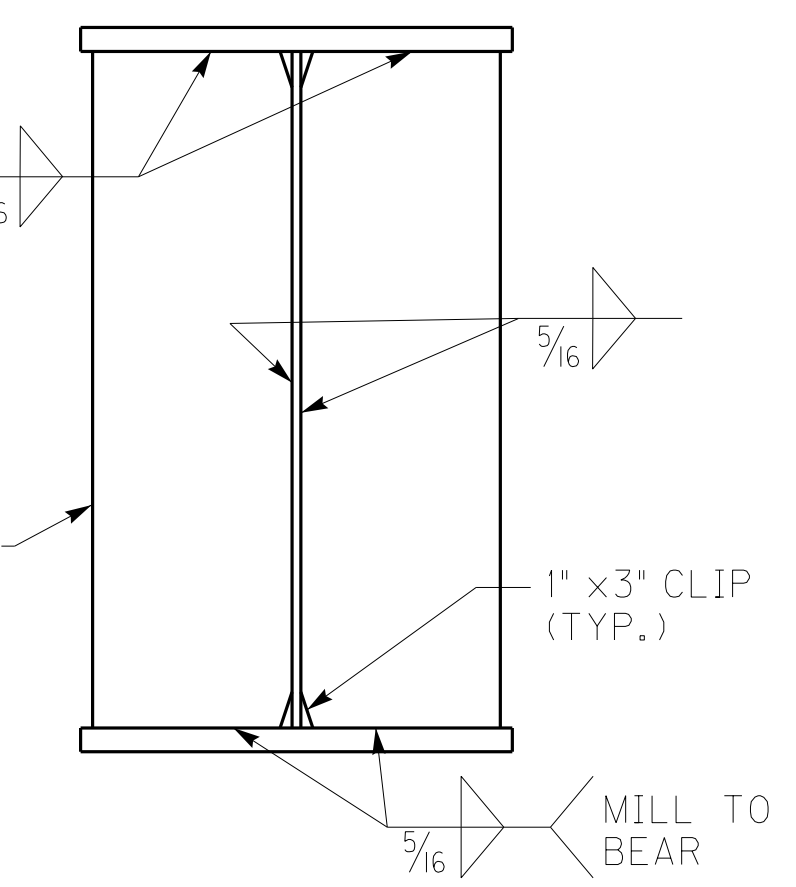
- FOR GENERAL NOTES, SEE SHEET NOS. S004-S006A.
- ALL BOLTS SHALL BE 1" DIAMETER A325-X HIGH STRENGTH BOLTS.
- END FLOORBEAMS SHALL CONFORM TO AASHTO M270 GRADE HPS 70W AND SHALL BE FCM TESTED WHERE INDICATED.
- THE SOLE PLATE SHALL CONFORM TO AASHTO M270 GRADE 50W AND SHALL BE CVN TESTED.
- FOR END FLOORBEAM CONNECTIONS SEE SHEET NOS. S152-S154.
- FOR STRINGER CONNECTION DETAILS SEE SHEET NO. S194.
- FOR TYPE B BEARING DETAILS SEE SHEET NOS. S202 & S205.
- FOR SHEAR STUD DETAIL, WELD TERMINATION DETAIL, ROUNDING DETAIL 1 & ROUNDING DETAIL 2 SEE SHEET NO. S188.
- FOR FLOORBEAM CAMBER SEE SHEET NO. S189.
- THE JACKING AND BRG. STIFFENERS SHALL CONFORM TO AASHTO M270 GRADE 50W AND SHALL BE FCM TESTED.



TYPE B BEARING SOLE PL DETAIL



SECTION A-A



SECTION B-B

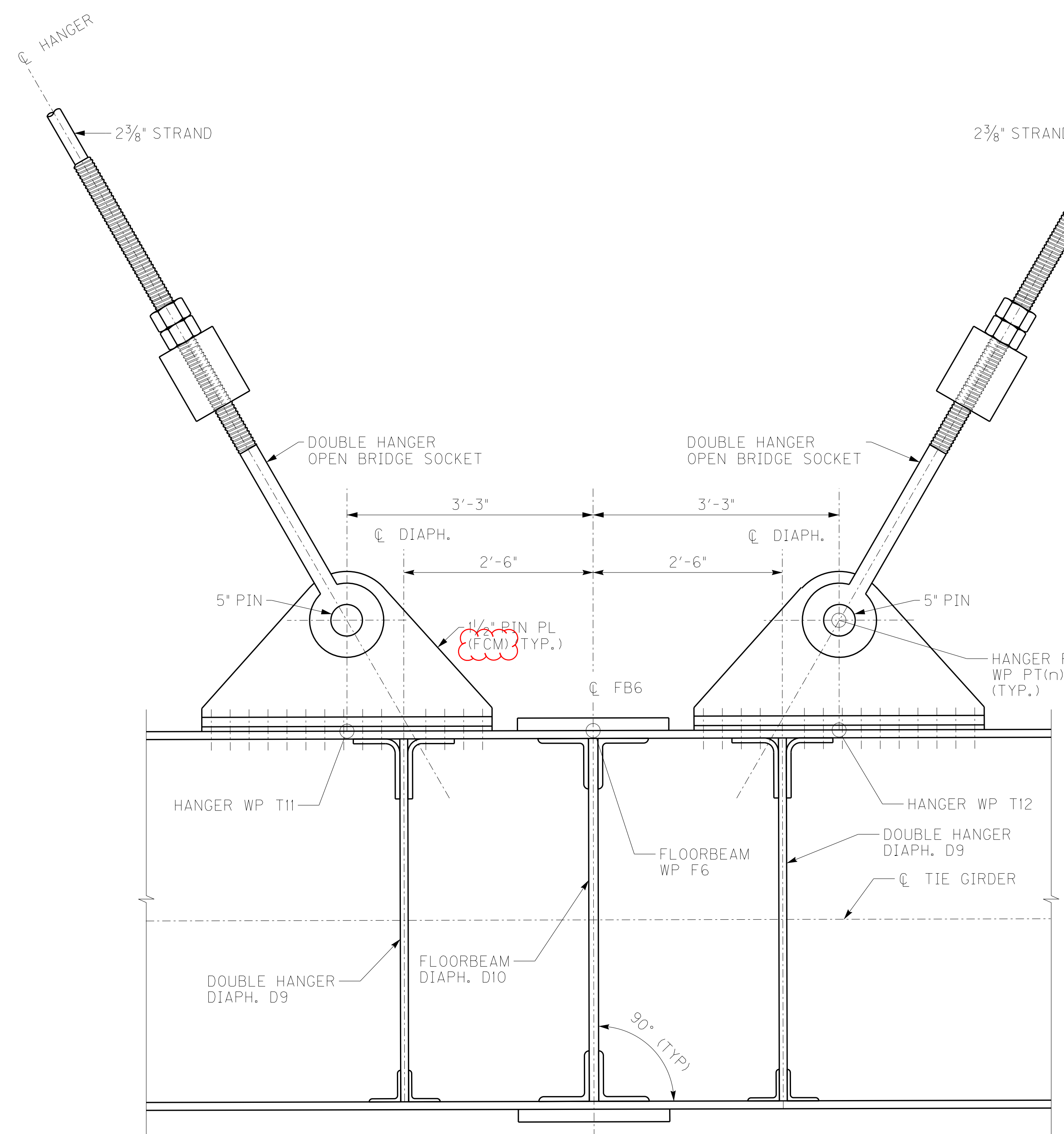
JACKING STIFFENER
 BEARING STIFFENER



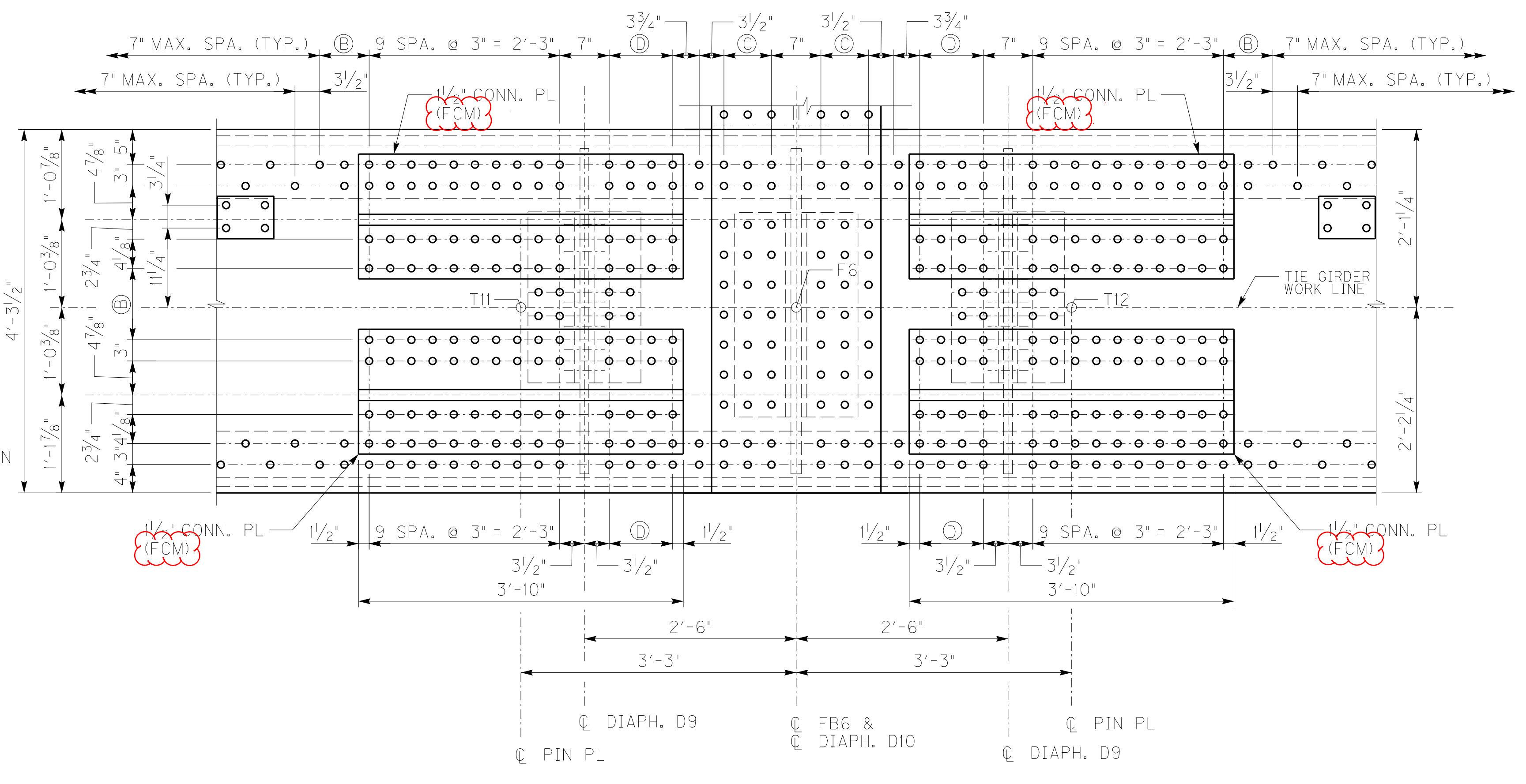
ITEM NUMBER	01-180.70
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ADD FCM TO STIFFENERS, ADD NOTE 10		11/25/13
REVISION		DATE
DATE: NOVEMBER 15, 2013	CHECKED BY	
DESIGNED BY: JCS	RMS	
DETAILED BY: MJD	JCS/ACK	
Commonwealth of Kentucky DEPARTMENT OF HIGHWAYS		
COUNTY MARSHALL / TRIGG		
ROUTE US68	CROSSING KENTUCKY LAKE	
END FLOORBEAM		
PREPARED BY		SHEET NO.
MICHAEL BAKER JR., INC. 9750 ORMSBY STATION ROAD SUITE 210 LOUISVILLE, KY 40223		S187
Baker		DRAWING NO. 24686

FILE NAME: C:\PWW81-LOCAL\BAKER_PROJECTS\CWETHINGTON\DOI41582\S24686 TIE10.DGN
 USER: Mgr\jdo,dwyer
 DATE PLOTTED: November 25, 2013
 E-SHEET NAME: S24686 1B4B
 MicroStation v8.11.7.469



HANGER CONNECTION AT TIE
 FB6
 FOR HANGER LAYOUT SEE SHEET NO. S135



PLAN - HANGER PIN PL CONNECTION TO TIE
 FB6

LEGEND

- Ⓐ 3 EQ. SPA. = 10"
- Ⓑ 2 SPA. @ 3 1/2" = 7"
- Ⓒ 2 SPA. @ 3 3/8" = 6 3/4"
- Ⓓ 3 SPA. @ 3" = 9"

NOTES

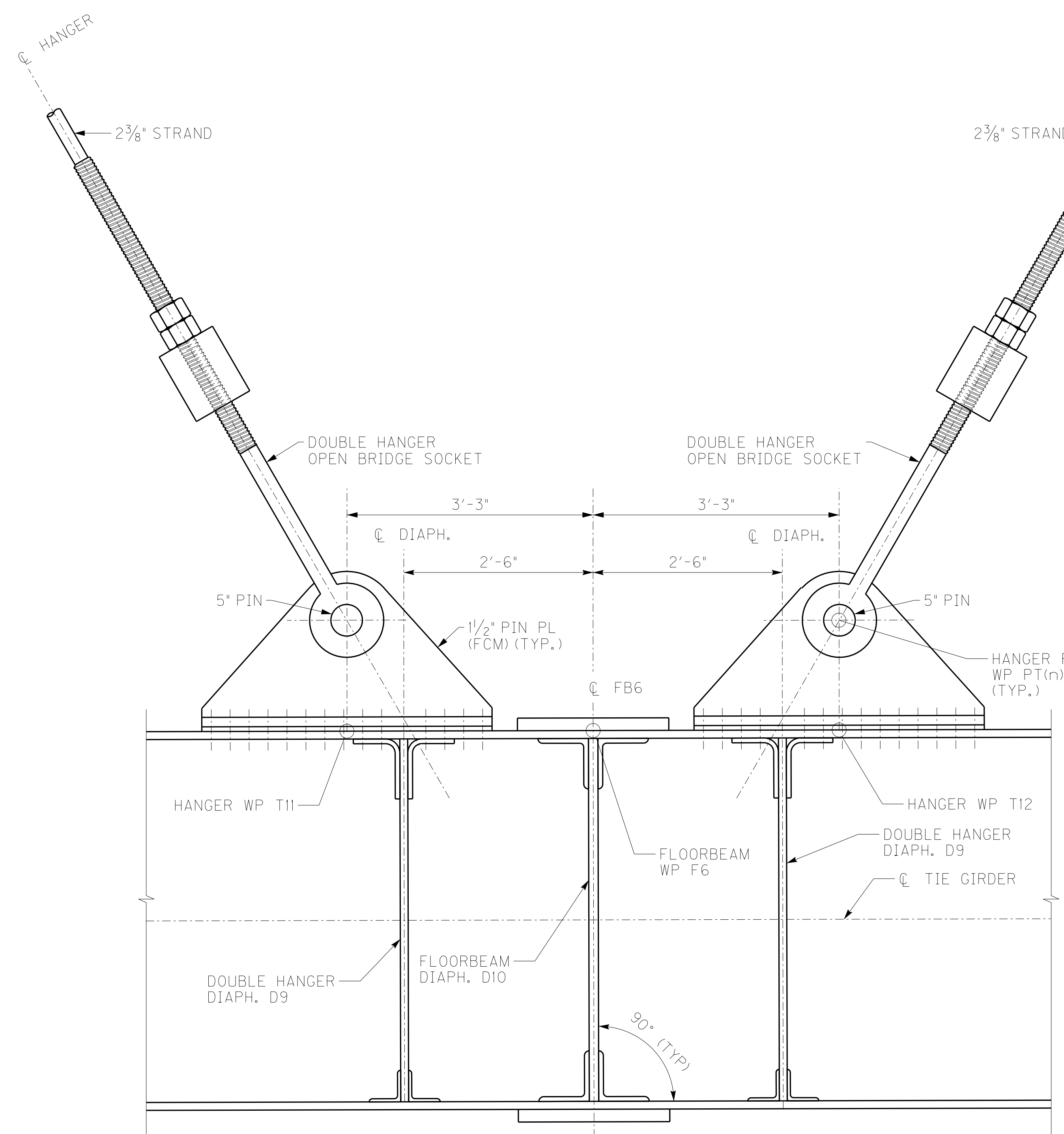
1. FOR TIE HANGER CONNECTION NOTES SEE SHEET NO. S183.
2. FOR FB6 CONNECTION PL AND BOLTING PATTERN, SEE SHEET NO. S191A.



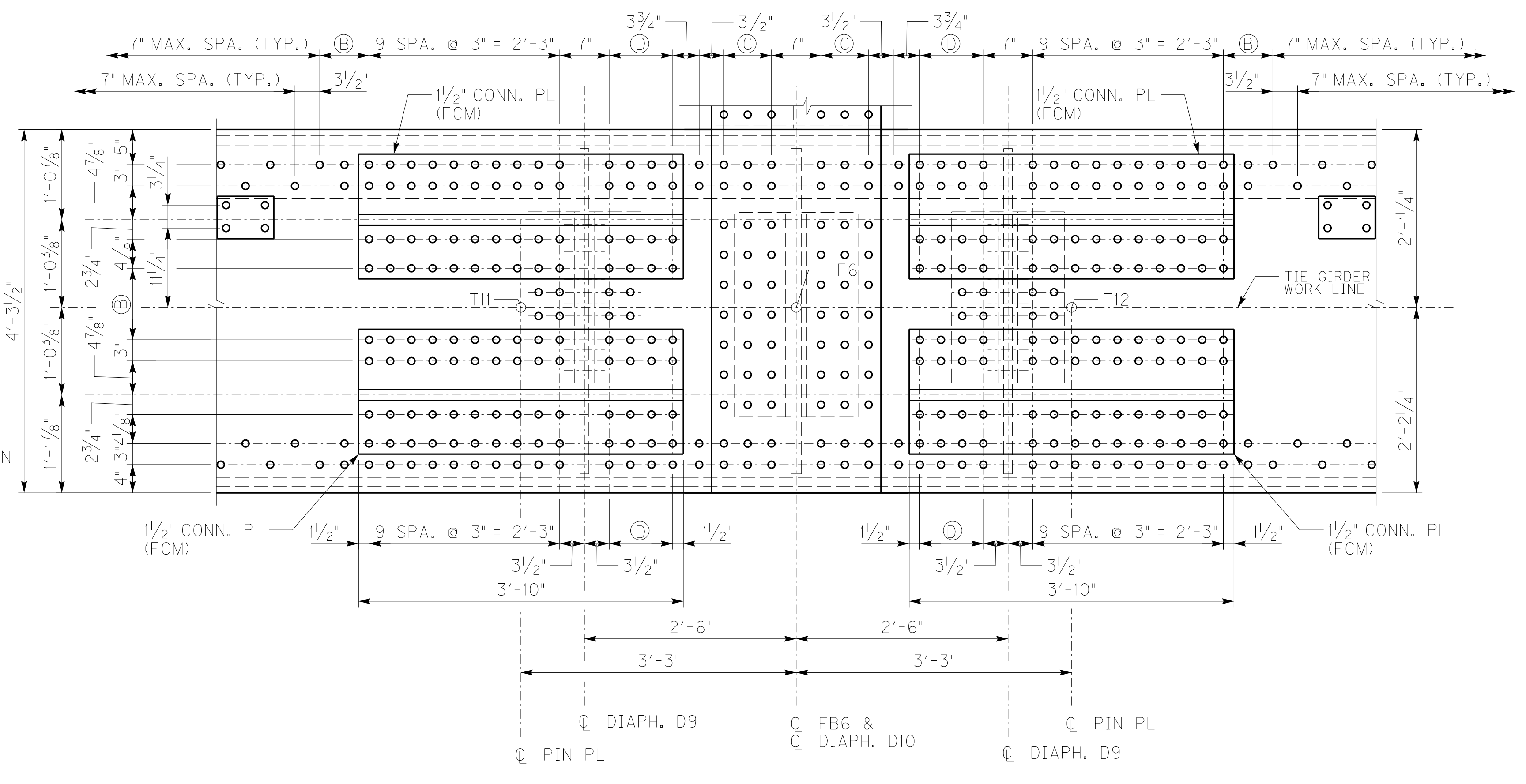
ITEM NUMBER	01-180.70
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COMMONWEALTH OF KENTUCKY DEPARTMENT OF HIGHWAYS COUNTY MARSHALL / TRIGG	
ROUTE US68	CROSSING KENTUCKY LAKE
TIE HANGER CONN. - 4	
PREPARED BY Baker	SHEET NO. S184B DRAWING NO. 24686
MICHAEL BAKER JR., INC. 9750 ORMSBY STATION ROAD SUITE 210 LOUISVILLE, KY 40223	

FILE NAME: C:\PWW81-LOCAL\BAKER_PROJECTS\CWETHINGTON\DOI41582\S24686 TIE10.DGN
 USER: Mgr\jdo,dwyer
 DATE PLOTTED: November 25, 2013
 E-SHEET NAME: S24686 1B4B
 MicroStation v8.11.7.469



HANGER CONNECTION AT TIE
 FB6
 FOR HANGER LAYOUT SEE SHEET NO. S135



PLAN - HANGER PIN PL CONNECTION TO TIE
 FB6

- LEGEND**
- Ⓐ 3 EQ. SPA. = 10"
 - Ⓑ 2 SPA. @ 3 1/2" = 7"
 - Ⓒ 2 SPA. @ 3 3/8" = 6 3/4"
 - Ⓓ 3 SPA. @ 3" = 9"

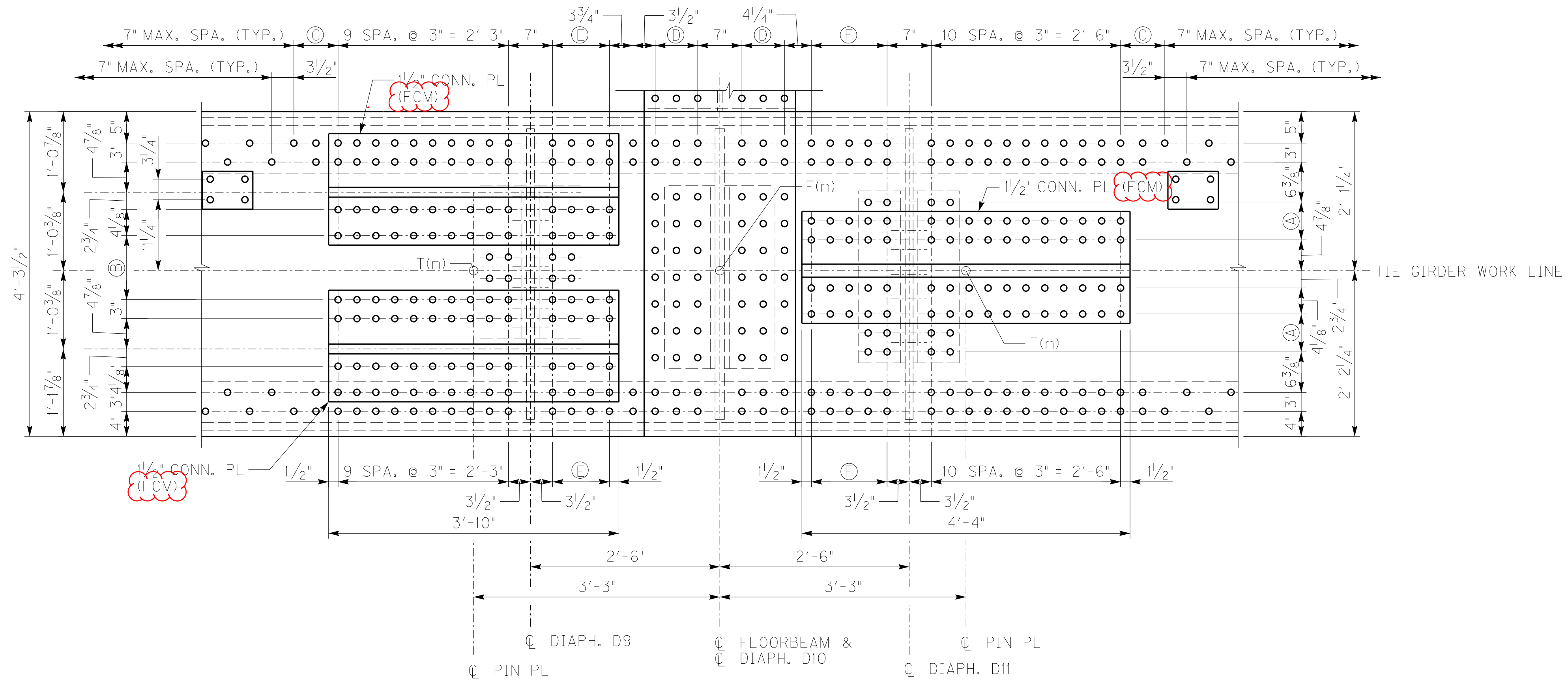
- NOTES**
1. FOR TIE HANGER CONNECTION NOTES SEE SHEET NO. S183.
 2. FOR FB6 CONNECTION PL AND BOLTING PATTERN, SEE SHEET NO. S191A.



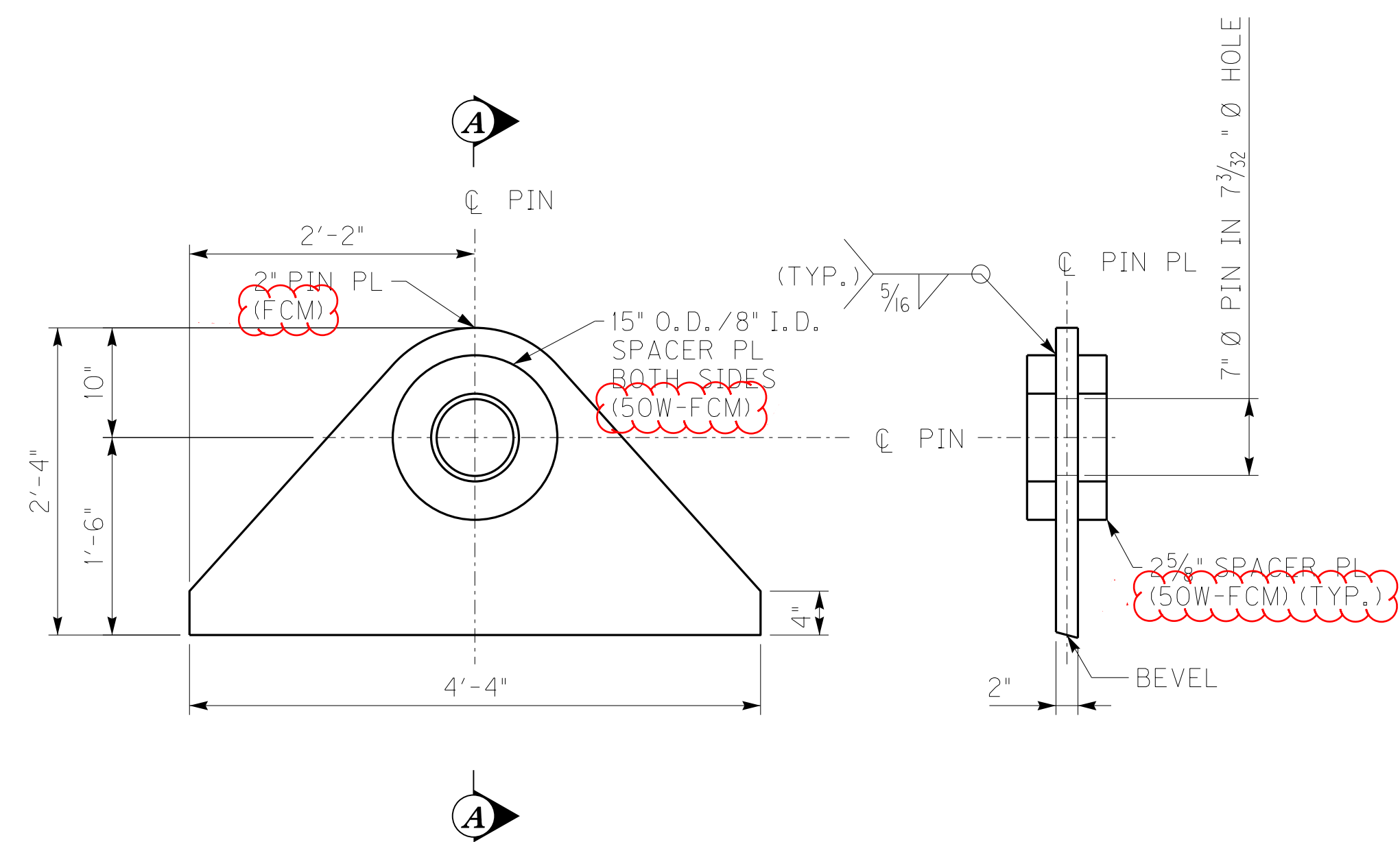
ITEM NUMBER	01-180.70
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REVISION DATE: NOVEMBER 15, 2013 DESIGNED BY: DMB DETAILED BY: MJD		CHECKED BY RTH DMB/JCS
Commonwealth of Kentucky DEPARTMENT OF HIGHWAYS COUNTY MARSHALL / TRIGG		
ROUTE US68	CROSSING KENTUCKY LAKE	
TIE HANGER CONN. - 4		
PREPARED BY Baker	MICHAEL BAKER JR., INC. 9750 ORMSBY STATION ROAD SUITE 210 LOUISVILLE, KY 40223	SHEET NO. S184B DRAWING NO. 24686

FILE NAME: C:\PWW81-LOCAL\BAKER_PROJECTS\CWETHINGTON\DOI4582\S24686 TIE02.DGN
 USER: Mgr\jco,Dwyer
 DATE PLOTTED: November 25, 2013
 E-SHEET NAME: S24686 1B4A
 MicroStation v8.ii.7.469



PLAN - HANGER PIN PL CONNECTION TO TIE
 FB2-FB5 SHOWN; FB7-FB10 OPPOSITE HAND



**FB2-FB5 (FB7-FB10)
 SINGLE HANGER
 PIN PL**
 DIMENSIONS GIVEN AT ϕ PL

SECTION A-A

LEGEND

- (A) 2 SPA. @ 3" = 6"
- (B) 3 EQ. SPA. = 10"
- (C) 2 SPA. @ 3 1/2" = 7"
- (D) 2 SPA. @ 3 3/8" = 6 3/4"
- (E) 3 SPA. @ 3" = 9"
- (F) 4 SPA. @ 3" = 1'-0"

NOTES

1. FOR TIE HANGER CONNECTION NOTES SEE SHEET NO. S183.
2. FOR FB2-FB5 (FB7-FB10) CONNECTION PL AND BOLTING PATTERN, SEE SHEET NO. S191.
3. FOR DOUBLE HANGER PIN PLATE DETAIL, SEE SHEET NO. S184.



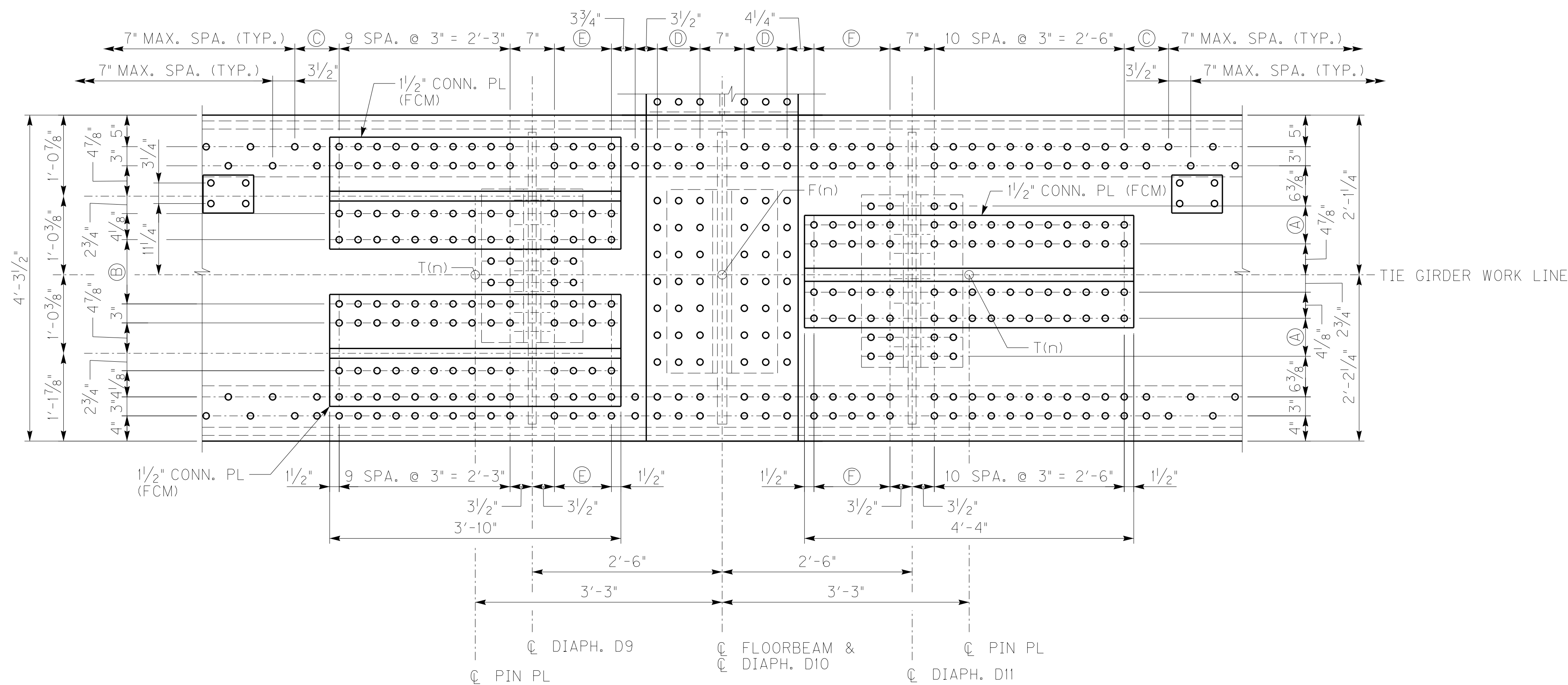
ITEM NUMBER	01-180.70
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ADD FCM TO PIN PL, CONN. PL & SPACER		11/25/13
REVISION		DATE
DATE: NOVEMBER 15, 2013	CHECKED BY	
DESIGNED BY: DMB	RTH	
DETAILED BY: MJD	DMB/JCS	

**Commonwealth of Kentucky
 DEPARTMENT OF HIGHWAYS**

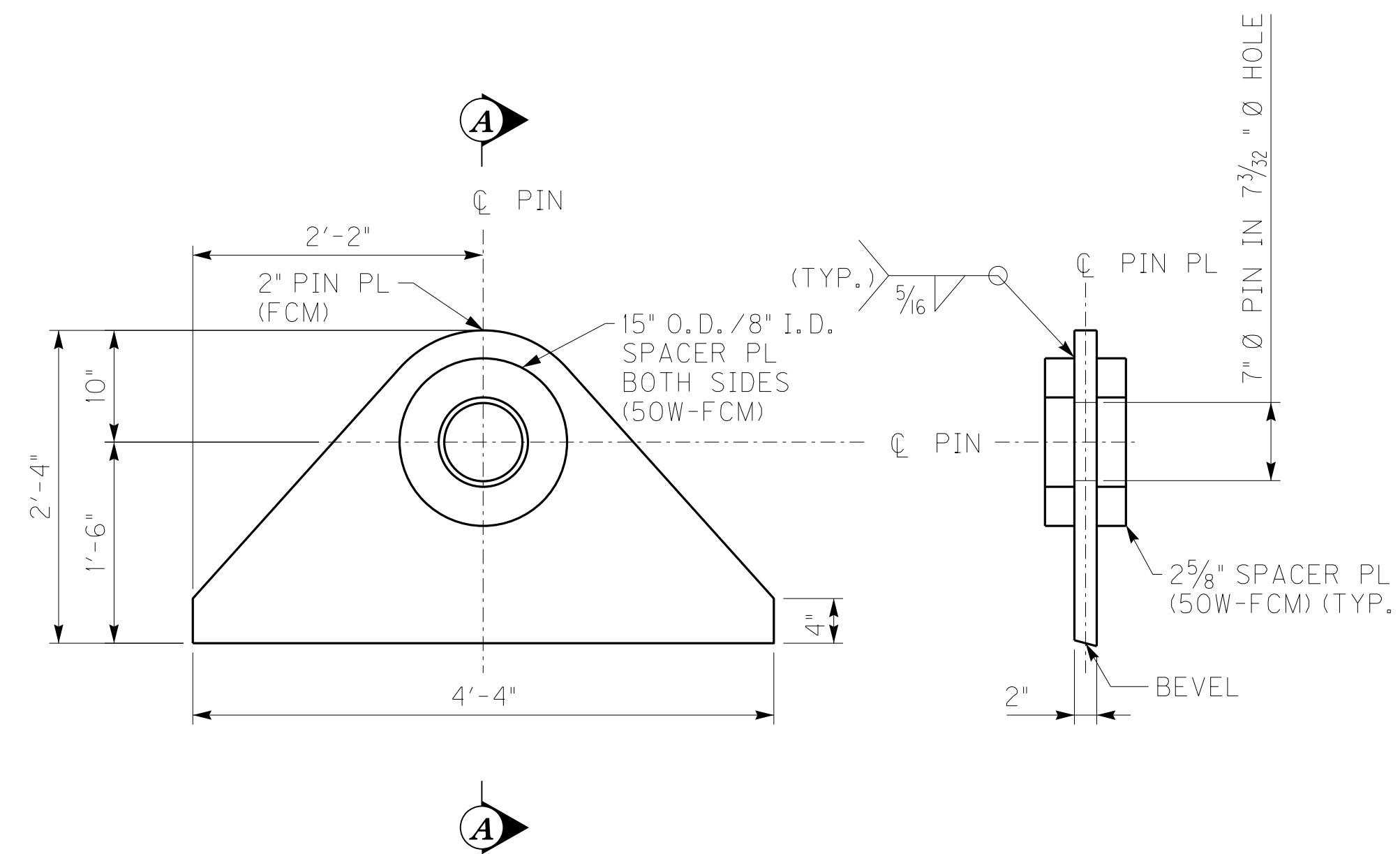
COUNTY
MARSHALL / TRIGG

ROUTE US68	CROSSING KENTUCKY LAKE
TIE HANGER CONN. - 3	
PREPARED BY Baker	SHEET NO. S184A
MICHAEL BAKER JR., INC. 9750 ORMSBY STATION ROAD SUITE 210 LOUISVILLE, KY 40223	DRAWING NO. 24686



PLAN - HANGER PIN PL CONNECTION TO TIE

FB2-FB5 SHOWN; FB7-FB10 OPPOSITE HAND



**FB2-FB5 (FB7-FB10)
SINGLE HANGER
PIN PL**

DIMENSIONS GIVEN AT \varnothing PL

SECTION A-A

LEGEND

- (A) 2 SPA. @ 3" = 6"
- (B) 3 EQ. SPA. = 10"
- (C) 2 SPA. @ 3 1/2" = 7"
- (D) 2 SPA. @ 3 3/8" = 6 3/4"
- (E) 3 SPA. @ 3" = 9"
- (F) 4 SPA. @ 3" = 1'-0"



ITEM NUMBER	01-180.70
-------------	-----------

NOTES

1. FOR TIE HANGER CONNECTION NOTES SEE SHEET NO. S183.
2. FOR FB2-FB5 (FB7-FB10) CONNECTION PL AND BOLTING PATTERN, SEE SHEET NO. S191.
3. FOR DOUBLE HANGER PIN PLATE DETAIL, SEE SHEET NO. S184.

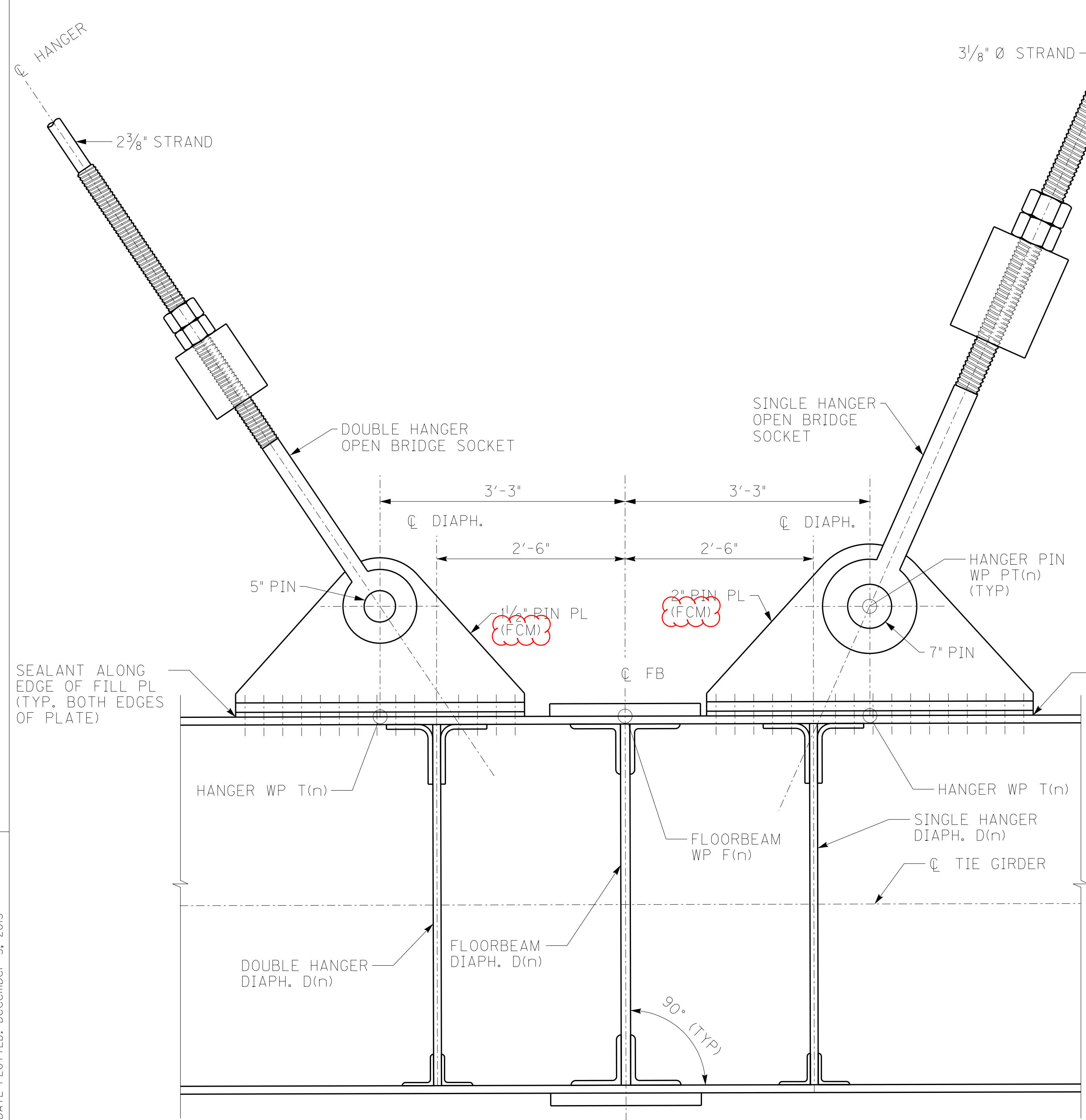
ADD FCM TO PIN PL, CONN. PL & SPACER		11/25/13
REVISION		DATE
DATE: NOVEMBER 15, 2013	CHECKED BY	
DESIGNED BY: DMB	RTH	
DETAILED BY: MJD	DMB/JCS	
Commonwealth of Kentucky DEPARTMENT OF HIGHWAYS		
COUNTY MARSHALL / TRIGG		
ROUTE US68	CROSSING KENTUCKY LAKE	
TIE HANGER CONN. - 3		
PREPARED BY	SHEET NO.	
Baker	S184A	
MICHAEL BAKER JR., INC. 9750 ORMSBY STATION ROAD SUITE 210 LOUISVILLE, KY 40223	DRAWING NO.	24686

FILE NAME: C:\P\W\B1-LOCAL\BAKER_PROJECTS\CWETHINGTON\DOI4582\S24686_CD01.DGN

USER: Mgr\jcd\dwyer
DATE PLOTTED: December 3, 2013

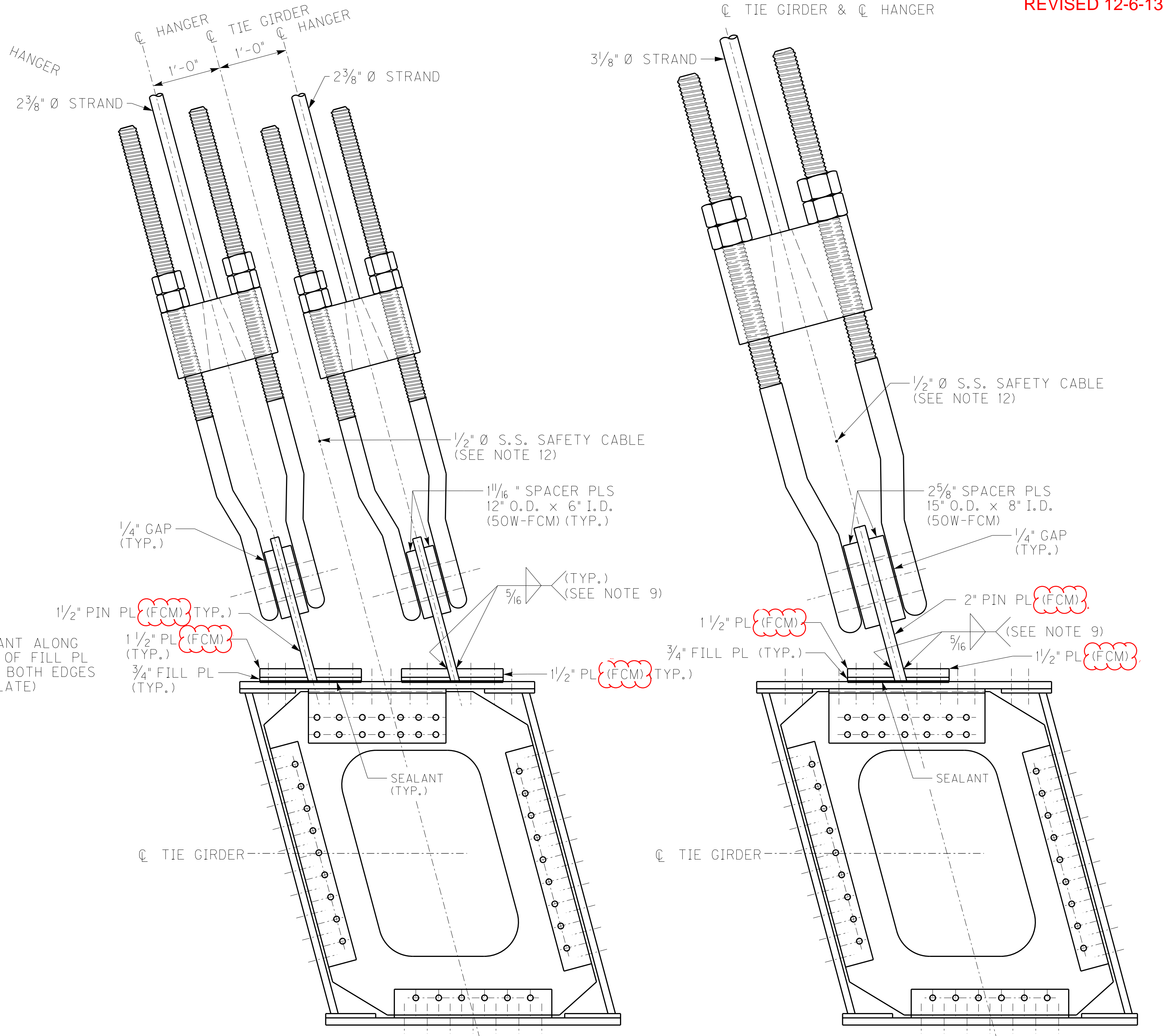
E-SHEET NAME: S24686 1B3

MicroStation v8.11.7.469



HANGER CONNECTION AT TIE

FB2-FB5 SHOWN; FB7-FB10 OPP. HAND
FB1 (FB11) SIMILAR
FOR HANGER LAYOUT SEE SHEET NO. S135



DOUBLE HANGER CONNECTION

SINGLE HANGER CONNECTION

TIE HANGER CONNECTION NOTES

- HANGER CONNECTION PIN PLATES AND CONN. PLATES SHALL CONFORM TO AASHTO M270 GRADE HPS 70W AND SHALL BE FCM TESTED.
- BOLTS SHALL BE 1" DIAMETER A325-X HIGH STRENGTH BOLTS.
- FOR HANGER AND HANGER PIN WORK POINT COORDINATES SEE SHEET NOS. S135 & S137.
- FOR HANGER NOTES SEE SHEET NO. S144.
- FOR FLOORBEAM DIAPHRAGMS SEE SHEET NOS. S190-S191A.
- FOR DOUBLE HANGER AND SINGLE HANGER PIN PLATES SEE SHEET NO. S184.
- FOR FB6 TIE HANGER CONNECTION SEE SHEET NO. S184A.
- FOR DOUBLE HANGER AND SINGLE HANGER DIAPHRAGMS SEE SHEET NO. S185.
- FILLET WELD TERMINATION SHALL BE MINIMUM 6" BEYOND EDGE OF PLATE.
- PROVIDE WATERTIGHT SEALANT COMPATIBLE WITH STEEL COMPONENTS AS APPROVED BY THE ENGINEER. APPLY SEALANT PER MANUFACTURER'S RECOMMENDATIONS TO ALL EDGES OF FILL PLATES AS NOTED.
- SEALANT, TOOLS, LABOR AND INCIDENTAL MATERIALS SHALL BE INCLUDED IN THE UNIT PRICE BID FOR STRUCTURAL STEEL.
- CONTRACTOR SHALL ENSURE THAT 1/2" Ø S.S. SAFETY CABLE IS A MINIMUM OF 1" CLEAR OF OPEN BRIDGE SOCKET AT FINAL CONDITION.

△ ADDED HPS	12/06/13
△ ADD FCM TO PIN PL, CONN. PL & SPACER	11/25/13
REVISION	
DATE: NOVEMBER 15, 2013	CHECKED BY
DESIGNED BY: DMB	RTH
DETAILED BY: MJD	DMB

Commonwealth of Kentucky
DEPARTMENT OF HIGHWAYS
COUNTY
MARSHALL / TRIGG

ROUTE **US68** CROSSING **KENTUCKY LAKE**

TIE HANGER CONN. - 1



ITEM NUMBER	01-180.70
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PREPARED BY
Baker

MICHAEL BAKER JR., INC.
9750 ORMSBY STATION ROAD
SUITE 210
LOUISVILLE, KY 40223

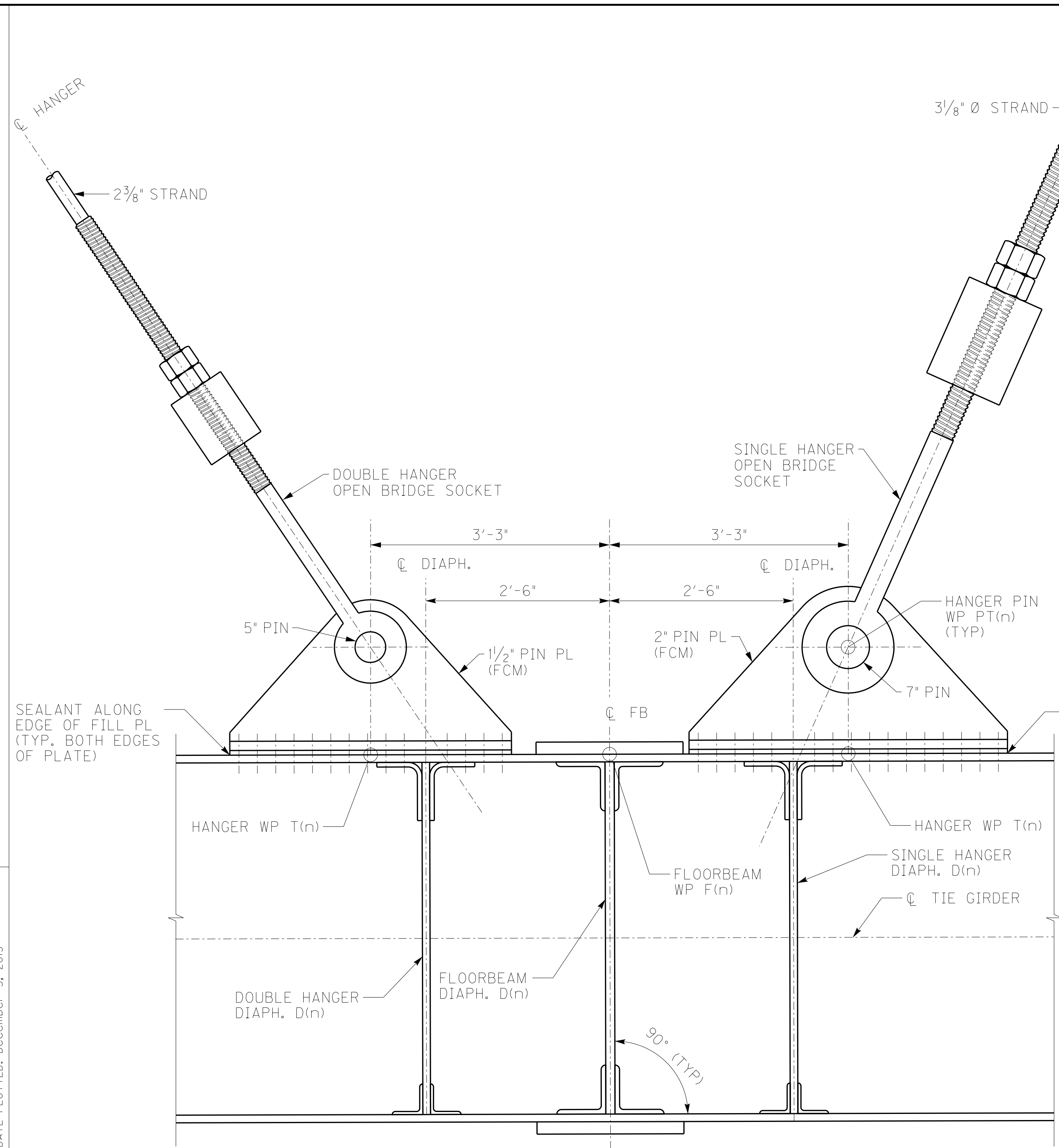
SHEET NO.
S183
DRAWING NO.
24686

FILE NAME: C:\P\W\B1-LOCAL\BAKER_PROJECTS\CWETHINGTON\DOI4582\S24686_CD01.DGN

USER: Mgr\jcd\dwyer
DATE PLOTTED: December 3, 2013

E-SHEET NAME: S24686 1B3

MicroStation v8.11.7.469

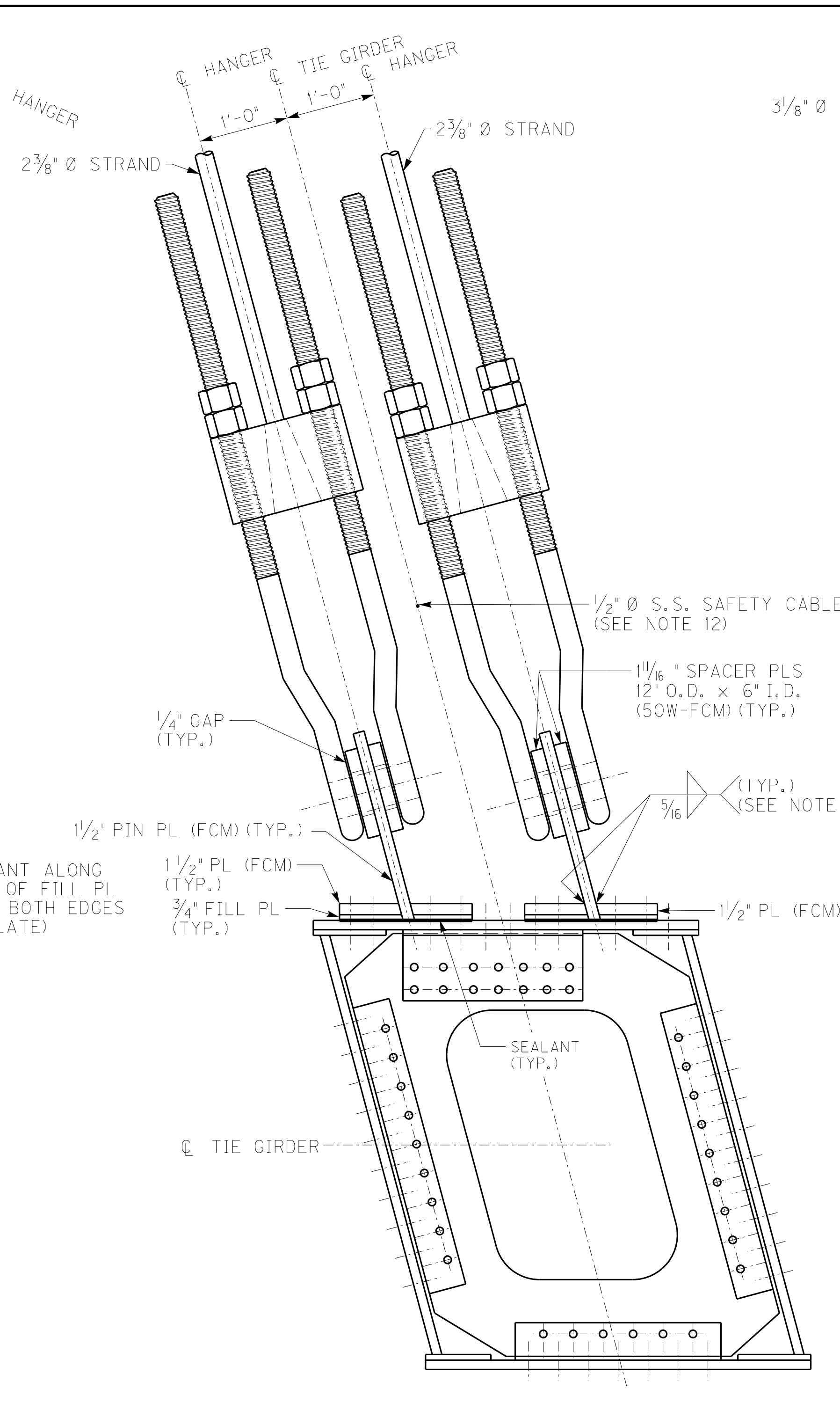


HANGER CONNECTION AT TIE

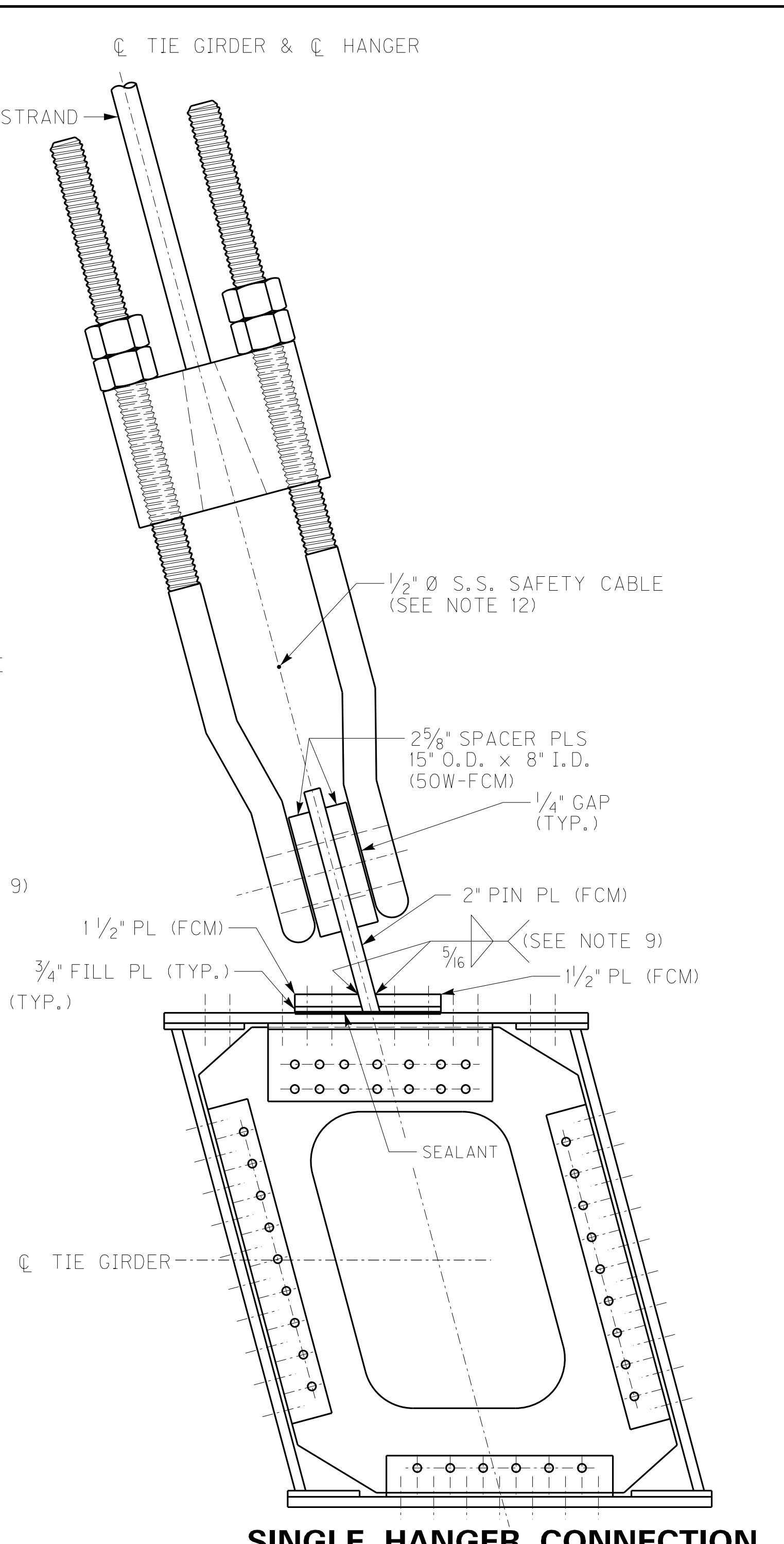
FB2-FB5 SHOWN; FB7-FB10 OPP. HAND
FB1 (FB11) SIMILAR
FOR HANGER LAYOUT SEE SHEET NO. S135

TIE HANGER CONNECTION NOTES

1. HANGER CONNECTION PIN PLATES AND CONN. PLATES SHALL CONFORM TO AASHTO M270 GRADE HPS 70W AND SHALL BE FCM TESTED.
2. BOLTS SHALL BE 1" DIAMETER A325-X HIGH STRENGTH BOLTS.
3. FOR HANGER AND HANGER PIN WORK POINT COORDINATES SEE SHEET NOS. S135 & S137.
4. FOR HANGER NOTES SEE SHEET NO. S144.
5. FOR FLOORBEAM DIAPHRAGMS SEE SHEET NOS. S190-S191A.
6. FOR DOUBLE HANGER AND SINGLE HANGER PIN PLATES SEE SHEET NO. S184.
7. FOR FB6 TIE HANGER CONNECTION SEE SHEET NO. S184A.
8. FOR DOUBLE HANGER AND SINGLE HANGER DIAPHRAGMS SEE SHEET NO. S185.
9. FILLET WELD TERMINATION SHALL BE MINIMUM 6" BEYOND EDGE OF PLATE.
10. PROVIDE WATERTIGHT SEALANT COMPATIBLE WITH STEEL COMPONENTS AS APPROVED BY THE ENGINEER. APPLY SEALANT PER MANUFACTURER'S RECOMMENDATIONS TO ALL EDGES OF FILL PLATES AS NOTED.
11. SEALANT, TOOLS, LABOR AND INCIDENTAL MATERIALS SHALL BE INCLUDED IN THE UNIT PRICE BID FOR STRUCTURAL STEEL.
12. CONTRACTOR SHALL ENSURE THAT 1/2" Ø S.S. SAFETY CABLE IS A MINIMUM OF 1" CLEAR OF OPEN BRIDGE SOCKET AT FINAL CONDITION.



DOUBLE HANGER CONNECTION



SINGLE HANGER CONNECTION

△ ADDED HPS	12/06/13
△ ADD FCM TO PIN PL, CONN. PL & SPACER	11/25/13
REVISION	
DATE: NOVEMBER 15, 2013	CHECKED BY
DESIGNED BY: DMB	RTH
DETAILED BY: MJD	DMB

Commonwealth of Kentucky
DEPARTMENT OF HIGHWAYS

COUNTY
MARSHALL / TRIGG

ROUTE US68	CROSSING KENTUCKY LAKE
TIE HANGER CONN. - 1	

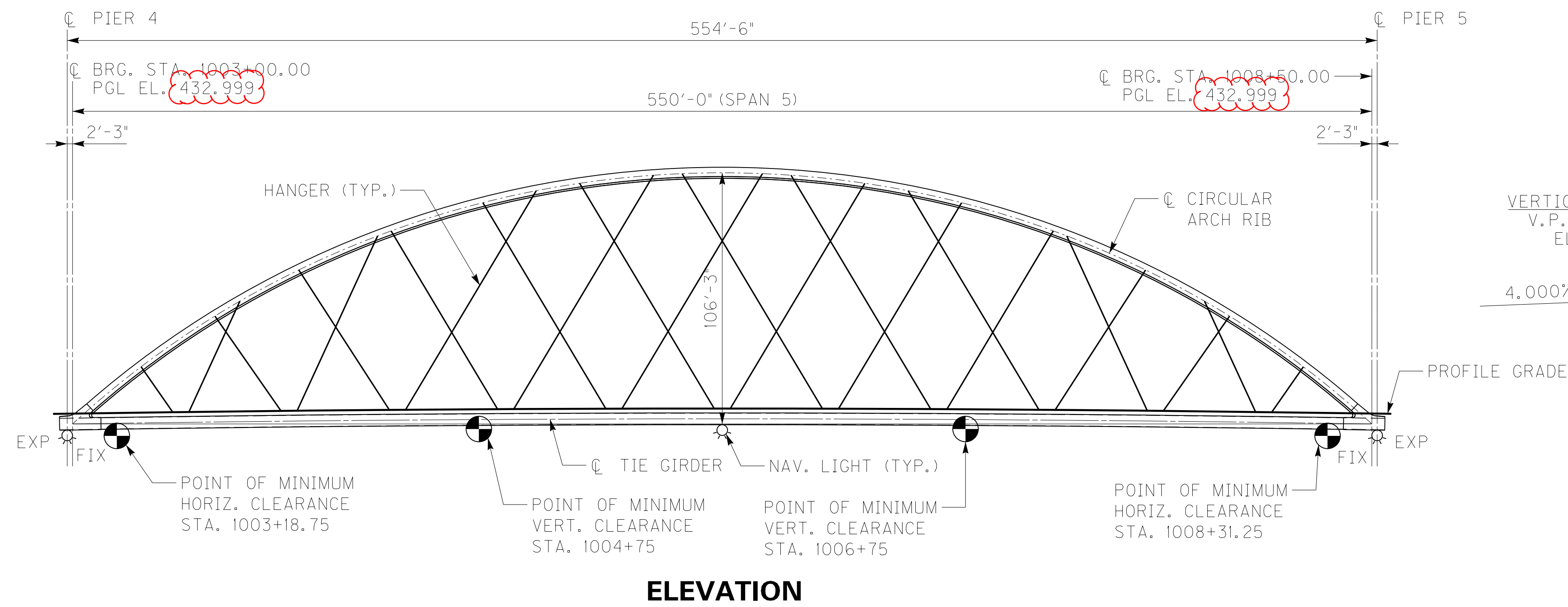
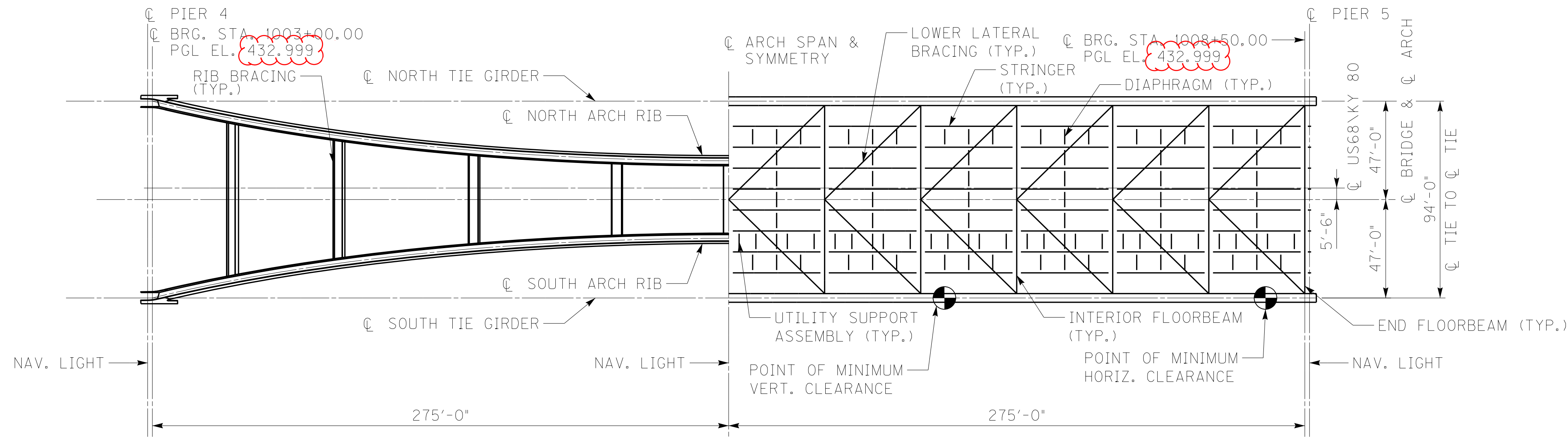
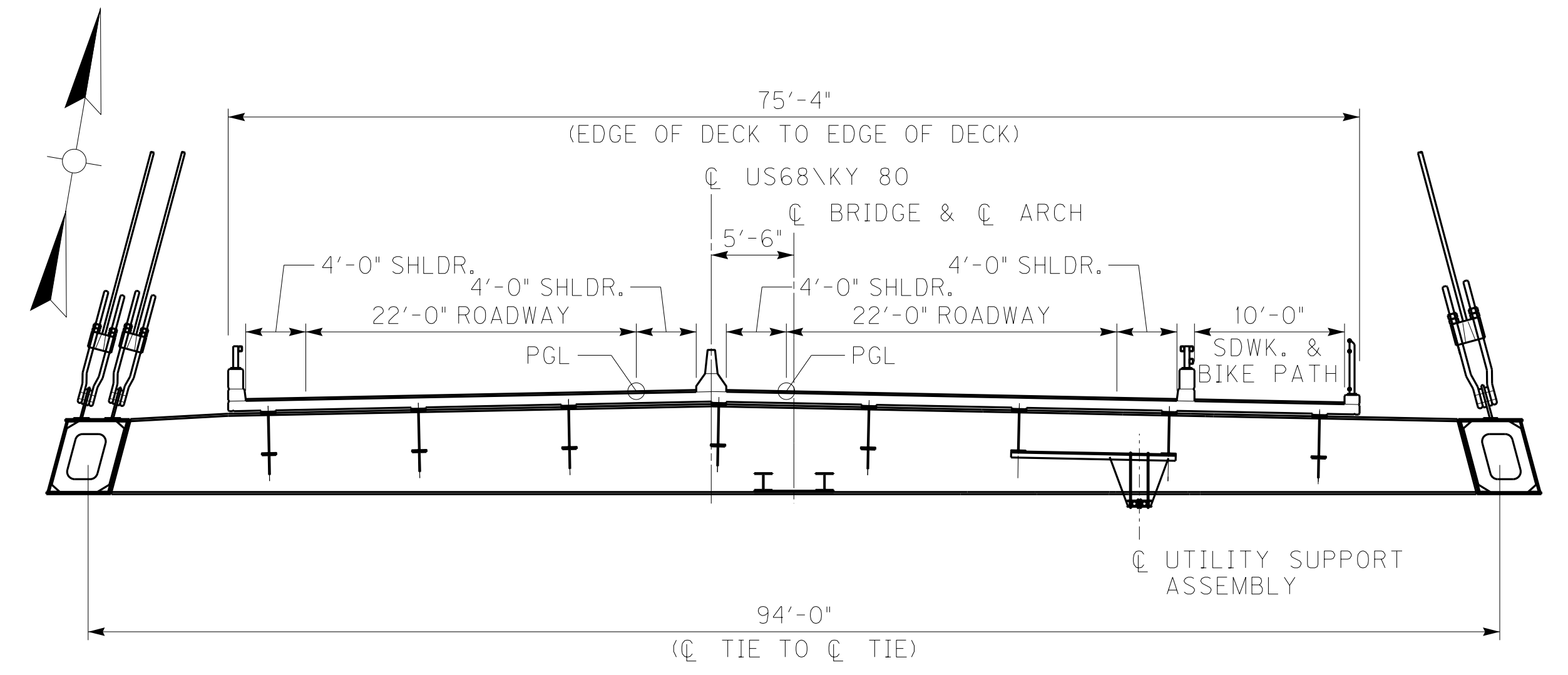
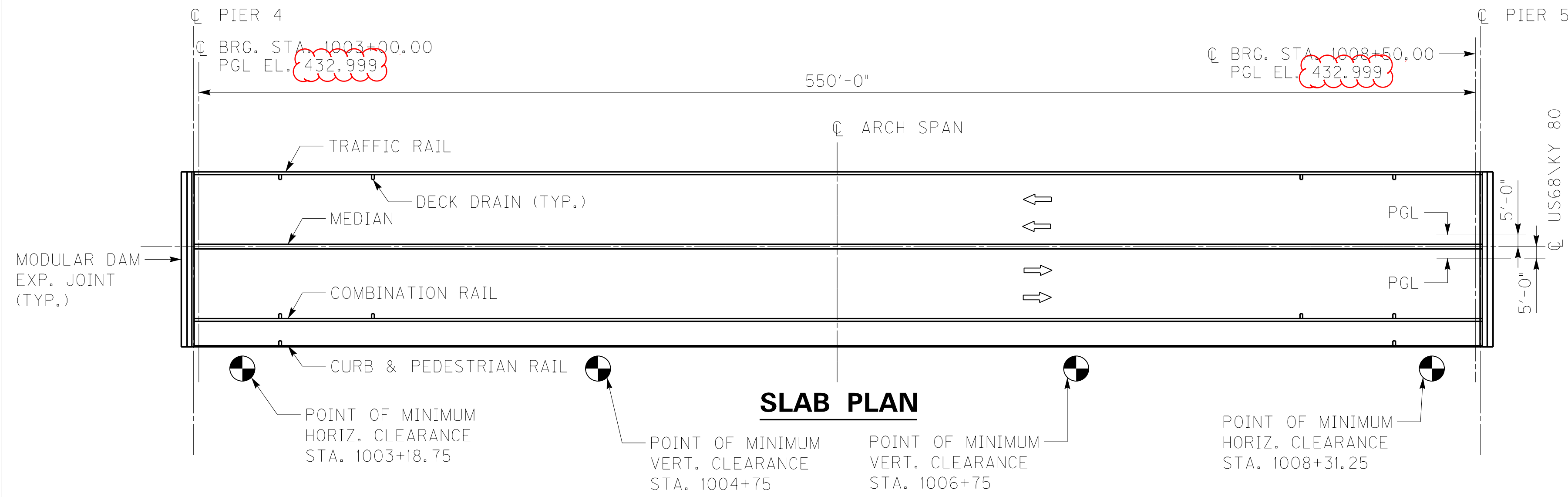
PREPARED BY
Baker

MICHAEL BAKER JR., INC.
9750 ORMSBY STATION ROAD
SUITE 210
LOUISVILLE, KY 40223

SHEET NO.
S183
DRAWING NO.
24686



ITEM NUMBER	01-180.70
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VERTICAL CURVE DATA
V.P.I. 1005+75.00
ELEV. 449.16
1400' V.C.

4.000% 4.000%

NOTES

- FOR GENERAL NOTES, SEE SHEET NOS. S004 - S006A.
- FOR ARCH-KEY ELEVATION, SEE SHEET NO. S133.
- FOR ARCH RIB, TIE GIRDER, FLOORBEAM, HANGER AND RIB BRACING GEOMETRY, SEE SHEET NOS. S135 - S138.
- FOR FRAMING PLAN-ARCH SPAN, SEE SHEET NO. S186.
- FOR DECK DRAIN LOCATIONS, SEE SHEET NO. S199.
- FOR MODULAR EXPANSION JOINT DETAILS, SEE SHEET NOS. S206 - S209.
- FOR NAVIGATION LIGHTING DETAILS, SEE SHEET NOS. S263 - S267.
- FOR UTILITIES, SUPPORTS AND DETAILS SEE SHEET NOS. S197 - S198.

REVISED ELEVATIONS		12/06/13
REVISION		DATE
DATE: NOVEMBER 15, 2013	CHECKED BY	
DESIGNED BY: CY Y	DMB	
DETAILED BY: MJD	CY Y	

Commonwealth of Kentucky
DEPARTMENT OF HIGHWAYS

COUNTY
MARSHALL / TRIGG

ROUTE **US68** CROSSING **KENTUCKY LAKE**
MAIN SPAN ARCH GEOMETRY - 1



ITEM NUMBER
01-180.70

PREPARED BY
Baker

MICHAEL BAKER JR., INC.
9750 ORMSBY STATION ROAD
SUITE 210
LOUISVILLE, KY 40223

SHEET NO.
S134

DRAWING NO.
24686

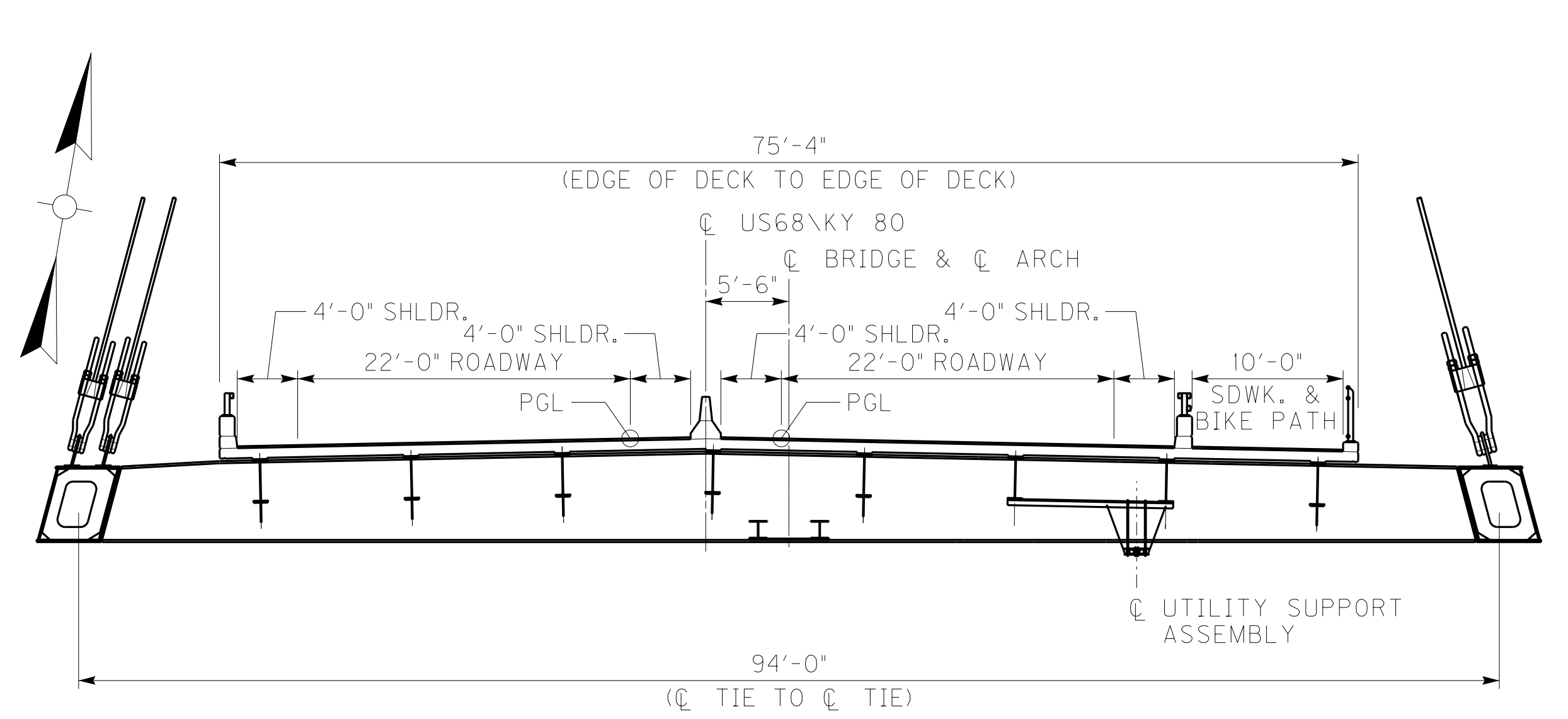
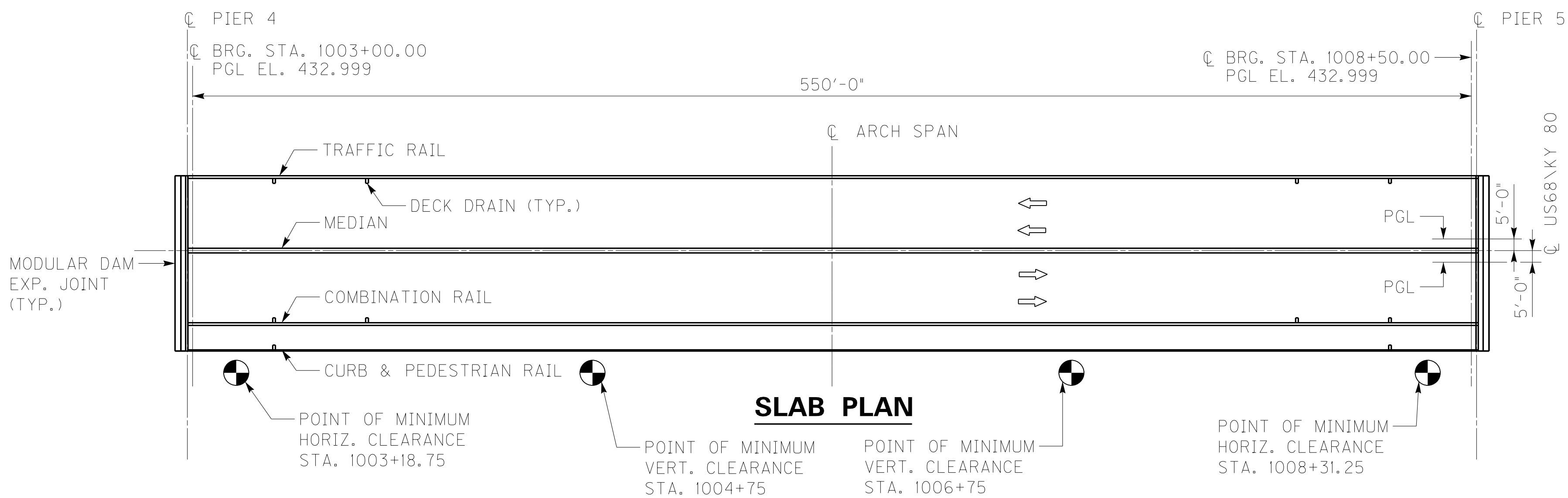
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USER: CWETHINGTON
DATE PLOTTED: November 21, 2013

E-SHEET NAME: S24686 134

MicroStation v8.11.9.459

FILE NAME: C:\P\W81-LOCAL\BAKER_PROJECTS\CWETHINGTON\DOI41582\S24686_A001.DGN
 USER: CWETHINGTON
 DATE PLOTTED: November 21, 2013
 E-SHEET NAME: S24686 134
 MicroStation v8.11.9.459



LOOKING UPSTATION
 LEFT SIDE OF SECTION SHOWING DOUBLE HANGER CONFIGURATION
 RIGHT SIDE OF SECTION SHOWING SINGLE HANGER CONFIGURATION

NOTES

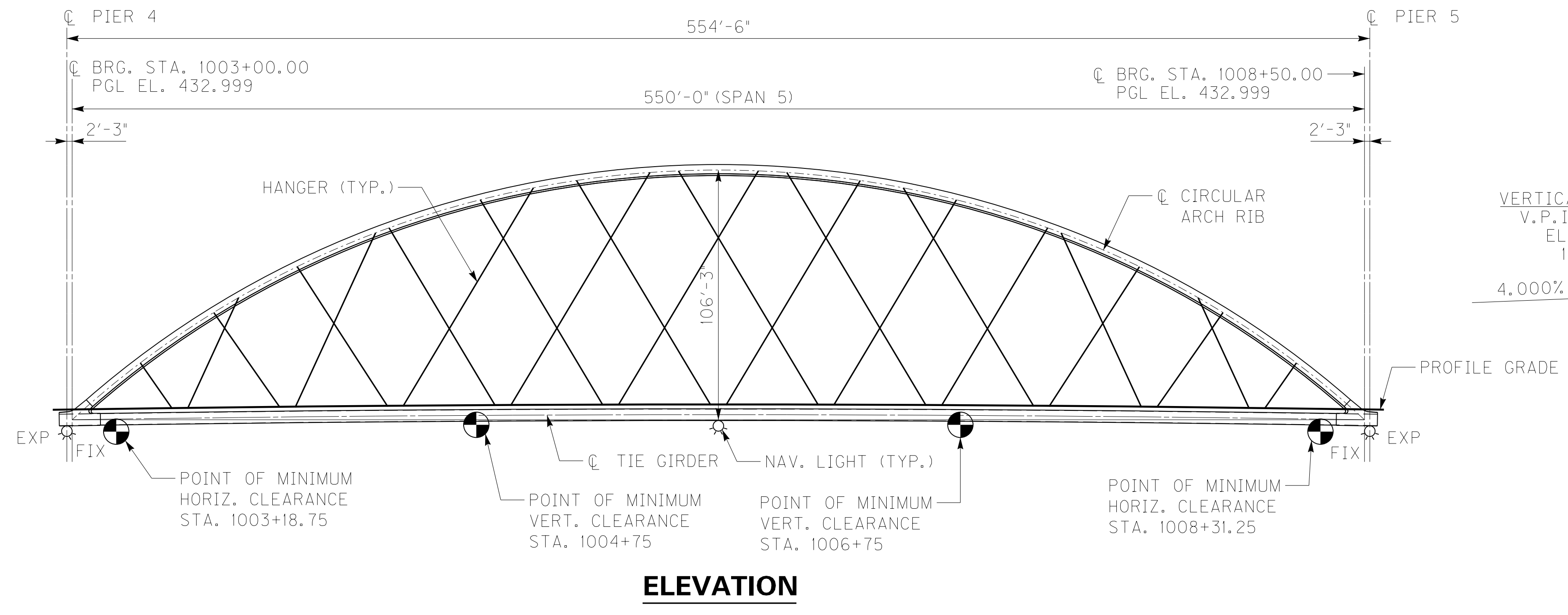
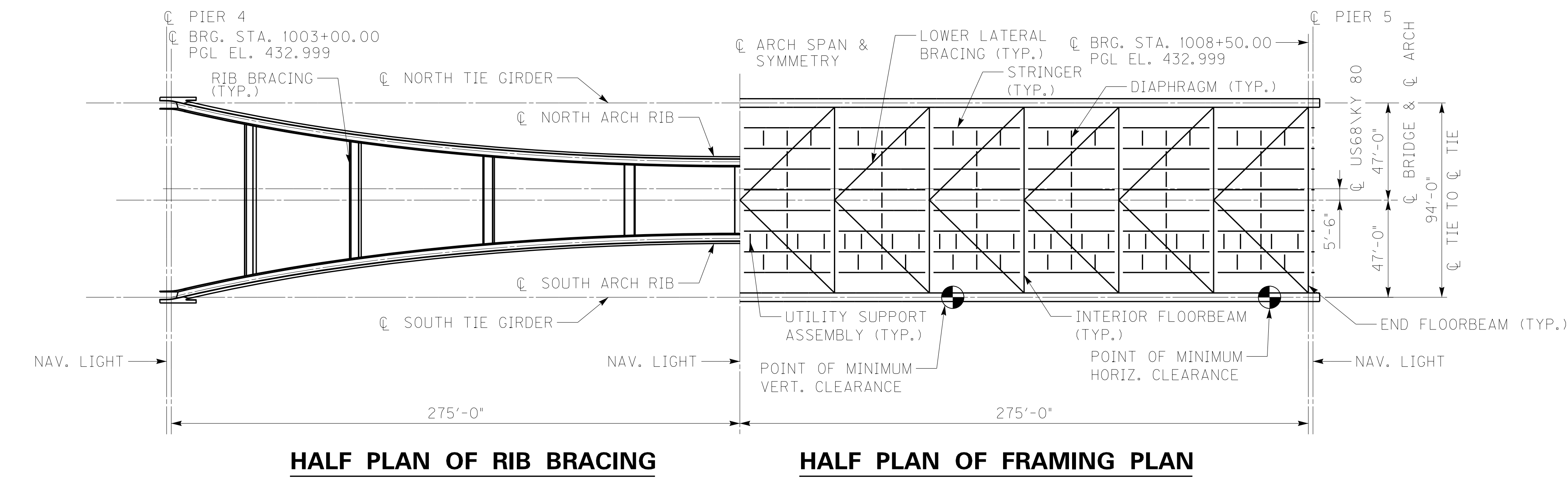
- FOR GENERAL NOTES, SEE SHEET NOS. S004 - S006A.
- FOR ARCH-KEY ELEVATION, SEE SHEET NO. S133.
- FOR ARCH RIB, TIE GIRDER, FLOORBEAM, HANGER AND RIB BRACING GEOMETRY, SEE SHEET NOS. S135 - S138.
- FOR FRAMING PLAN-ARCH SPAN, SEE SHEET NO. S186.
- FOR DECK DRAIN LOCATIONS, SEE SHEET NO. S199.
- FOR MODULAR EXPANSION JOINT DETAILS, SEE SHEET NOS. S206 - S209.
- FOR NAVIGATION LIGHTING DETAILS, SEE SHEET NOS. S263 - S267.
- FOR UTILITIES, SUPPORTS AND DETAILS SEE SHEET NOS. S197 - S198.

REVISION	DATE
REVISED ELEVATIONS	12/06/13
DATE: NOVEMBER 15, 2013	CHECKED BY: DMB
DESIGNED BY: CY Y	DMB
DETAILED BY: MJD	CY Y

Commonwealth of Kentucky
DEPARTMENT OF HIGHWAYS
 COUNTY
MARSHALL / TRIGG

ROUTE US68	CROSSING KENTUCKY LAKE
MAIN SPAN ARCH GEOMETRY - 1	
ITEM NUMBER 01-180.70	PREPARED BY Baker
SHEET NO. S134 DRAWING NO. 24686	

MICHAEL BAKER JR., INC.
 9750 ORMSBY STATION ROAD
 SUITE 210
 LOUISVILLE, KY 40223



VERTICAL CURVE DATA
 V.P.I. 1005+75.00
 ELEV. 449.16
 1400' V.C.
 4.000% 4.000%



COUNTY OF	ITEM NO.	SHEET NO.
MARSHALL/ TRIGG	1-180.70	R2J

AVOIDANCE ALTERNATIVES FOR WATER RELATED IMPACTS

THE PROPOSED ROADWAY CROSSES THE KENTUCKY LAKE, LAKE BARKLEY, AND A NUMBER OF SMALL STREAMS. AVOIDANCE OF THESE CROSSINGS IS NOT POSSIBLE, AS THE MAIN OBJECTIVE OF THE PROJECT IS TO REPLACE THE EXISTING, STRUCTURALLY DEFICIENT BRIDGES AND RESTRUCTURE THE ALIGNMENT. THE BRIDGE SPANS WILL BE ARRANGED SO AS TO KEEP THE MAIN CHANNELS OPEN AND UNOBSTRUCTED TO FLOW. THE ABUTMENTS MAY BE SKEWED SLIGHTLY TO THE FLOW DIRECTION, BUT PERPENDICULAR TO THE ROADWAY, TO MIMIC THE CURRENT FOOTPRINT OF THE EXISTING BRIDGE. THE USE OF RIP RAP WILL BE LIMITED TO THE CHANNEL BANKS, AND USED ONLY IN THE IMMEDIATE VICINITY OF THE STRUCTURE. ALL IN-LAKE CONSTRUCTION WILL CONTAIN EROSION PREVENTION AND SEDIMENTATION CONTROL (EPSC) MEASURES TO INCLUDE BUT NOT BE LIMITED TO:

ALL WATER LEAVING THE CONSTRUCTION SITE VIA DITCH OR SHEET FLOW WILL BE CONTROLLED BY SEDIMENT TRAPS OF SILT FENCE TO LIMIT SEDIMENT THAT MIGHT REACH THE STREAMS. EROSION CONTROL PLANS WILL BE DEVELOPED AND INCLUDED WITH THE PLAN SET. THESE PLANS WILL BE UPDATED BY THE CONTRACTOR AS CONSTRUCTION PROCEEDS. ALL EROSION AND SEDIMENT DEVICES WILL BE SIZED TO PROPERLY PREVENT OR RETAIN SEDIMENT FROM LEAVING THE PROJECT SITE.

ADDITIONAL MITIGATION AND MINIMIZATION PROCEDURES WILL BE:

1) IN AREAS NOT TREATED WITH RIP RAP OR OTHERWISE STABILIZED, RE-VEGETATION OF STREAM BANK AND RIPARIAN ZONES SHALL OCCUR CONCURRENTLY WITH THE PROJECT PROGRESSION. SPECIES OF GRASSES, SHRUBS, AND TREES THAT ARE INDIGENOUS TO THE AREA OR THOSE RECOMMENDED BY THE DIVISION OF ENVIRONMENTAL ANALYSIS BIOLOGIST FOR DISTRICT 1, COMMONWEALTH OF KENTUCKY TRANSPORTATION CABINET, SHOULD BE PLANTED.

2) TO THE MAXIMUM EXTENT PRACTICABLE, ALL WORK SHALL BE PERFORMED DURING LOW FLOW CONDITIONS.

3) THE FILL CREATED BY DISCHARGE AND/OR DEPOSITION OF ANY DREDGED OR EXCAVATED MATERIALS ONSHORE, AND ALL EARTHWORK OPERATIONS, SHALL BE CARRIED OUT IN SUCH A WAY THAT SEDIMENT RUNOFF AND SOIL EROSION TO THE WATERCOURSE ARE CONTROLLED AND MINIMIZED. BEST MANAGEMENT PRACTICES FOR WATER POLLUTION CONTROL SHALL BE INCORPORATED INTO PROJECT DESIGN PLANS ACCORDING TO SECTION 213.03.01 OF THE KENTUCKY STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, CURRENT EDITION.

4) HEAVY EQUIPMENT (BULLDOZERS, CRANES, BACKHOES, DRAG LINES, ETC.), IF REQUIRED FOR THIS PROJECT, SHOULD NOT BE USED OR OPERATED WITHIN THE STREAM CHANNEL. IN THOSE INSTANCES WHERE SUCH IN-STREAM WORK IS UNAVOIDABLE, THEN IT SHALL BE PERFORMED IN SUCH A MANNER AND DURATION AS TO MINIMIZE RE-SUSPENSION OF SEDIMENTS AND DISTURBANCE TO SUBSTANCES AND BANK OR RIPARIAN VEGETATION.

5) SPOIL MATERIALS FROM THE WATERCOURSE OF ON-SHORE OPERATION, INCLUDING SLUDGE DEPOSITS, SHALL NOT BE DUMPED INTO WATERCOURSES AS SPECIFIED UNDER SECTION 404 GUIDELINES OF THE CLEAN WATER ACT. DURING THE DREDGING OF APPROXIMATELY 100,000 CUBIC YARDS OF MATERIAL FROM THE KENTUCKY LAKE BOTTOM, A TURBIDITY CURTAIN OR SIMILAR MEASURE WILL BE USED TO REDUCE SILTATION. AREA FOR DEPOSIT OF DREDGED MATERIALS SHALL BE PROVIDED WITH TEMPORARY DIKES OR BULKHEADS FOR SEPARATION AND RETENTION OF SETTLEABLE SOLIDS. DREDGE SPOIL WILL BE DEPOSITED IN A LOCATION THAT IS TO BE APPROVED BY THE TENNESSEE VALLEY AUTHORITY, U.S. ARMY CORPS OF ENGINEERS, AND KENTUCKY DIVISION OF WATER PRIOR TO DEPOSITION.

6) MEASURES SHALL BE TAKEN TO PREVENT OR CONTROL SPILLS OF FUELS, LUBRICANTS, OR ANY OTHER MATERIALS USED IN CONSTRUCTION FROM ENTERING THE WATERCOURSE.

7) ANY FILL OR RIP-RAP SHALL BE OF SUCH COMPOSITION THAT IT WILL NOT ADVERSELY AFFECT THE BIOLOGICAL, CHEMICAL, OR PHYSICAL PROPERTIES OF THE RECEIVING WATERS AND/OR CAUSE VIOLATION VOLUME 1 OF 1 PAGE 11 OF 119 OF WATER QUALITY STANDARDS. IF RIP-RAP IS UTILIZED, IT IS TO BE OF SUCH SIZE AND WEIGHT THAT BANK STRESS OR SLUMP CONDITIONS WILL NOT BE CREATED BECAUSE OF ITS PLACEMENT, AS SPECIFIED IN SECTION 703 OF THE KENTUCKY STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, CURRENT EDITION.

ADDITIONALLY, THE CONTRACTOR SHALL ADHERE TO THE FOLLOWING MEASURES SPECIFICALLY AIMED AT THE USE OF HABITAT BY BATS:

- SEASONAL RESTRICTIONS PLACED UPON THE DECONSTRUCTION OF THE OLD BRIDGES ONCE THE NEW BRIDGES ARE OPERATIONAL. CONTRACTOR WILL DECONSTRUCT THE EXISTING BRIDGE DECKS DURING THE PERIOD OF TIME WHEN BATS ARE NOT PRESENT (NOVEMBER 15 - MARCH 15)

- CONSTRUCTION ACTIVITIES (EXCLUDING BRIDGE DECK POURING) WILL OCCUR ONLY DURING DAYLIGHT HOURS IN AND NEAR THE STREAM DURING THE SEASON OF POTENTIAL OCCUPATION BY BATS (APRIL 1 - NOVEMBER 14). BECAUSE OF INCREASED HEAT AND HUMIDITY EXPERIENCED DURING THE SUMMER MONTHS, DECK POURING MAY NEED TO OCCUR DURING TIMES WHEN *M. GRISESCENS* ACTIVELY FORAGE. POURING OF CONCRETE DURING NIGHT-TIME HOURS ALLOWS FOR PROPER CURATION TO INCREASE STRUCTURAL INTEGRITY AND LONG-TERM SUSTAINABILITY OF THE BRIDGE DECK. THE KENTUCKY TRANSPORTATION CABINET FEELS THAT DECK-POURING ACTIVITIES OCCURRING AT NIGHT WILL NOT ALTER THE BEHAVIORAL PATTERNS OF *M. GRISESCENS* POTENTIALLY FORAGING OVER THE LARGE LAKES AND STREAM NETWORKS DURING THESE PERIODS.

- TO REDUCE EROSION AND SEDIMENTATION EFFECTS OF HIGHWAY CONSTRUCTION PROJECTS, CONTRACTOR IS BOUND BY THE TENETS OF KPDES PERMIT NO. KYRIO FOR ALL CONSTRUCTION PROJECTS INVOLVING SOIL DISTURBANCE. FOR THE SUBJECT PROJECT, A SITE SPECIFIC EROSION CONTROL PLAN (ECP), HAS BEEN DEVELOPED IN ORDER TO OUTLINE POTENTIAL WATER QUALITY ISSUES BY DETERMINING INDIVIDUAL DISTURBED DRAINAGE AREAS (DDA) WHERE CONSTRUCTION SITE EFFLUENT WILL BE DISCHARGED OFF-SITE OR INTO WATERS OF THE COMMONWEALTH (SEE APPENDIX C). WITHIN THE ECP, SEDIMENT CONTROL STRUCTURES HAVE BEEN MARKED AT EACH DDA DISCHARGE POINT. THESE STRUCTURES ARE SUGGESTIONS BASED ON ENGINEERING PRACTICES DEVELOPED BY THE DESIGN ENGINEER.

- ACCORDING TO SECTION 213.03.01 OF THE KENTUCKY TRANSPORTATION CABINET STANDARD SPECIFICATIONS, A BEST MANAGEMENT PRACTICES (BMP) PLAN (IN ACCORDANCE WITH KPDES PERMIT NO. KYRIO) WILL BE DEVELOPED JOINTLY BY THE RESIDENT ENGINEER AND THE CONTRACTOR PRIOR TO THE PRECONSTRUCTION CONFERENCE. THE BMP PLAN WILL BE DEVELOPED UTILIZING INFORMATION CONTAINED WITHIN THE ECP. THROUGH PROGRESSION OF THE PROJECT, THE BMP PLAN WILL BE UPDATED IN ORDER TO ADDRESS THE EVER-CHANGING ON-SITE CONDITIONS TO ASSURE THE OVERALL GOAL OF EROSION CONTROL AND SEDIMENT CONTAINMENT. THE BMP PLAN SHALL BE MODIFIED WHEN THERE IS A CHANGE IN DESIGN, CONSTRUCTION, OPERATION OR MAINTENANCE OF THE SITE WHICH HAS A SIGNIFICANT EFFECT ON THE POTENTIAL FOR THE DISCHARGE OF POLLUTANTS TO WATERS OF THE COMMONWEALTH. THE BMP SHALL ALSO BE AMENDED IF ANY ASPECT (DURING INSPECTIONS CONDUCTED BY THE RESIDENT ENGINEER AND CONTRACTOR SIMULTANEOUSLY EVERY 7 DAYS OR AFTER RAIN EVENTS GREATER THAN 0.5") IS DETERMINED TO BE INEFFECTIVE IN CONTROLLING THE DISCHARGE OF POLLUTANTS TO WATERS OF THE COMMONWEALTH. ANY CHANGES IN THE BMP PLAN SHALL BE IMPLEMENTED WITHIN 7 DAYS OF THE MONITORING OR ACTION EVENT. APPROPRIATE DOCUMENTATION OF CHANGES IN THE BMP PLAN WILL BE MAINTAINED THROUGHOUT THE DURATION OF THE PROJECT. FURTHER, APPROPRIATE DOCUMENTATION (PICTURES, MONITORING LOG, ETC.) OF INSPECTIONS WILL BE MAINTAINED ON THE CONSTRUCTION SITE.

- IT IS EXPECTED THAT IMPACTS TO THE RIPARIAN CORRIDOR WILL BE NEGLIGIBLE-TO-NONEEXISTENT AS THE VAST MAJORITY WORK WILL BE PERFORMED ON THE EXISTING ROADBED. PRIOR TO ANY DISTURBANCE OF VEGETATION (IF ANY) WILL BE REMOVED IN ORDER TO MINIMIZE RIPARIAN DISTURBANCE. ALL AREAS WILL BE REPLANTED WITH NATIVE SPECIES AS NECESSARY. PLANTING LISTS WILL BE DEVELOPED FOR CONSTRUCTION PERSONNEL BY THE DEC AND THE KYTC BIOLOGIST.

- A PREMIUM WILL BE PLACED ON KEEPING DEBRIS ATTRIBUTED TO PHASE I AND II REMOVAL OUT OF THE WATER. DEBRIS THAT DOES ENTER THE STREAM WILL BE REMOVED IMMEDIATELY. DUE TO ON-SITE RESTRAINTS, EQUIPMENT WILL BE USED ON THE BARGES, BANKS, AND IF NECESSARY VIA A PAD AT THE EDGE OF THE WATER.

- PLACING OF CONCRETE FOR PIERS AND/OR DECKING WILL BE DONE SUCH THAT SPILLS INTO THE STREAM DO NOT OCCUR. IN THE UNFORESEEN EVENT THAT SPILLAGE DOES OCCUR, THE FRANKFORT USFWS OFFICE WILL BE NOTIFIED AND THE RESIDENT ENGINEER SHALL HALT THE ACTIVITY IMMEDIATELY AND NOT RESUME UNTIL APPROPRIATE REMEDIAL ACTIONS HAVE BEEN IMPLEMENTED.

- EQUIPMENT CLEANING/STAGING AREAS WILL BE LOCATED SUCH THAT RUNOFF FROM THESE AREAS WILL NOT DIRECTLY ENTER THE WATER. FILTRATION OF EFFLUENT FROM EQUIPMENT CLEANING/STAGING AREAS WILL BE LOCATED SUCH THAT EFFLUENT WILL BE FILTERED THROUGH VEGETATED AREAS AND/OR PROPER SEDIMENT CONTROL STRUCTURES LOCATED BETWEEN THE STAGING AREA AND THE WATER; THEREFORE, MINIMIZING THE POTENTIAL FOR IMPACTS SUCH AS SEDIMENTATION AND POLLUTION.

- THE PROPOSED BRIDGES HAVE BEEN DESIGNED TO REDUCE IMPACTS TO THE WATER BY MINIMIZING THE NUMBER OF NEW PIERS IN THE LAKES. ALL OF THE EXISTING PIERS WILL BE REMOVED.

- DURING FOOTER/PIER CONSTRUCTION, COFFER DAMS, SEDIMENT CURTAINS, AND/OR SANDBAGS AND PUMPS MAY UTILIZED IN ORDER TO BE ABLE TO PLACE CONCRETE IN THE FOOTERS. IF SO, WATER REMOVED FROM INSIDE THE COFFER DAMS OR SANDBAGGED AREAS WILL BE FILTERED USING AN APPROVED SEDIMENT FILTRATION METHOD PRIOR TO RELEASE INTO THE WATER.

- USFWS AND THE KYTC BIOLOGIST SHALL BE CONTACTED BY THE KYTC DISTRICT 1 ENVIRONMENTAL COORDINATOR AT LEAST ONE WEEK PRIOR TO THE START OF CONSTRUCTION FOR THE PROPOSED PROJECT.

ARCHAEOLOGICAL MATERIALS

IF ARCHAEOLOGICAL MATERIALS ARE UNCOVERED DURING CONSTRUCTION, ALL CONSTRUCTION WORK IN THAT AREA OF FIND(S) WOULD CEASE. STAFF ARCHAEOLOGISTS EITHER KYTC (502-564-7250) AND KHC SHPO (502-564-7005) OFFICE WOULD BE CONTACTED IMMEDIATELY SO THAT REPRESENTATIVES OF THAT OFFICE MAY HAVE THE OPPORTUNITY TO EXAMINE AND EVALUATE THE MATERIALS. IMMEDIATELY SO THAT REPRESENTATIVES OF THAT OFFICE MAY HAVE THE OPPORTUNITY TO EXAMINE AND EVALUATE THE MATERIALS. IF HUMAN REMAINS ARE DISCOVERED DURING CONSTRUCTION, ALL ACTIVITY IN THE VICINITY OF THE REMAINS WOULD CEASE IMMEDIATELY, AND THE STATE MEDICAL EXAMINER AND THE APPROPRIATE LOCAL LAW ENFORCEMENT AGENCY WOULD BE CONTACTED. IF MATERIALS ARE DISCOVERED ON ANY FEDERALLY OWNED PROPERTY, THEN REPRESENTATIVES OF THE ADMINISTERING AGENCY ALSO WOULD BE CONTACTED.

MITIGATION OF IMPACTS TO THREATENED/ENDANGERED SPECIES-OSPREY

IN ADDITION TO OTHER REQUIRED MITIGATION; THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE REMOVAL OF ALL OSPREY NESTS CURRENTLY ON THE EGGNER'S FERRY BRIDGE AND THE SUBSEQUENT REMOVAL OF ANY NEW NESTS BEING BUILT WHILE THE NEW KENTUCKY LAKE BRIDGE IS UNDER CONSTRUCTION, AND UNTIL ALL PARTS OF THE EXISTING BRIDGE ABOVE THE WATER LINE HAVE BEEN DECONSTRUCTED AND REMOVED FROM THE PROJECT SITE. THE CURRENTLY EXISTING NESTS MUST BE REMOVED BEFORE FEBRUARY 1, 2014, AND ANY SUBSEQUENT NESTS BEING BUILT WOULD NEED TO BE REMOVED BEFORE ANY EGGS ARE LAID. ONCE EGGS OR YOUNG BIRDS ARE IN A NEST, THEY MUST NOT BE DISTURBED. IT SHOULD BE NOTED THAT OSPREY COULD NEST ANYWHERE ON THE STRUCTURE, AT THE HIGHEST POINT ON THE SUPERSTRUCTURE OR ON THE ABUTMENTS ETC. THE KYTC DISTRICT ENVIRONMENTAL COORDINATOR SHALL BE NOTIFIED TWENTY FOUR HOURS IN ADVANCE OF ANY REMOVAL OF A NEST SO THAT THE STATUS OF THE NEST CAN BE VERIFIED AND THE SUBSEQUENT REMOVAL DOCUMENTED. PRIOR TO BEGINNING ANY CONSTRUCTION ACTIVITY ON SITE, THE CONTRACTOR SHALL MEET WITH THE KYTC DISTRICT ONE COORDINATOR FOR ASSISTANCE WITH IDENTIFYING OSPREY NESTS ETC., AND TO DETERMINE IF THERE ARE ANY NESTS ON THE STRUCTURE THAT NEED TO BE REMOVED IMMEDIATELY. THIS MITIGATION REQUIREMENT IS INTENDED TO MINIMIZE THE POSSIBILITY OF ANY POTENTIAL DELAYS TO THE PROJECT SCHEDULE. ALL COSTS ASSOCIATED WITH CARRYING OUT THIS MITIGATION REQUIREMENT SHALL BE BORNE BY THE CONTRACTOR AND ARE INCIDENTAL TO THE PROJECT.

EROSION CONTROL NOTES

SEE EROSION CONTROL NOTES FOR ADDITIONAL NOTES SPECIFIC TO EROSION CONTROL.

EDGE KEY

THIS WORK INCLUDES CUTTING OUT THE EXISTING ASPHALT SURFACE TO A MINIMUM DEPTH AND WIDTH AS DETAILED ELSEWHERE IN THE PLANS SO THAT THE NEW SURFACE MAY HEEL INTO THE EXISTING SURFACE. THE CONTRACT UNIT PRICE BID LINEAR FOOT FOR "EDGE KEY" INCLUDES ALL NECESSARY MATERIALS, LABOR AND EQUIPMENT NECESSARY TO PERFORM THE WORK AND DISPOSE OF THE REMOVED ASPHALT MATERIAL.

CONSTRUCTION ENTRANCES

CONSTRUCTION ENTRANCES SHOWN ARE APPROXIMATE. THESE ENTRANCES MAY REMAIN IN PLACE AND BE USED BY THE CONTRACTOR OF THIS PROJECT IF APPROVED BY THE ENGINEER. THE CONTRACTOR SHALL SUBMIT CONSTRUCTION ENTRANCE PLAN TO ENGINEER FOR APPROVAL. THE CONTRACTOR SHALL REMOVE ALL CONSTRUCTION ENTRANCES POST CONSTRUCTION.

MAINTENANCE OF TRAFFIC CROSSEOVERS

UPON COMPLETION OF CONSTRUCTION, THE DISTURBED LIMITS OF THE MAINTENANCE OF TRAFFIC CROSSEOVERS SHALL BE RETURNED TO ORIGINAL CONDITIONS. RESTORING DISTURBED LIMITS IS INCIDENTAL TO MAINTAIN AND CONTROL TRAFFIC LUMP SUM.

FILE NAME: \\PEWINSZ\JOBS\KDOT\LAKE_BRIDGES\ADDENDUMS\ADDENDUM #2_R0020.DGN

USER: andr@w-b DATE_PLOTTED: December 4, 2013

E-SHEET NAME: R0020CGN

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COUNTY OF	ITEM NO.	SHEET NO.
MARSHALL/TRIGG	1-180.70	R2J

AVOIDANCE ALTERNATIVES FOR WATER RELATED IMPACTS

THE PROPOSED ROADWAY CROSSES THE KENTUCKY LAKE, LAKE BARKLEY, AND A NUMBER OF SMALL STREAMS. AVOIDANCE OF THESE CROSSINGS IS NOT POSSIBLE, AS THE MAIN OBJECTIVE OF THE PROJECT IS TO REPLACE THE EXISTING, STRUCTURALLY DEFICIENT BRIDGES AND RESTRUCTURE THE ALIGNMENT. THE BRIDGE SPANS WILL BE ARRANGED SO AS TO KEEP THE MAIN CHANNELS OPEN AND UNOBSTRUCTED TO FLOW. THE ABUTMENTS MAY BE SKEWED SLIGHTLY TO THE FLOW DIRECTION, BUT PERPENDICULAR TO THE ROADWAY, TO MIMIC THE CURRENT FOOTPRINT OF THE EXISTING BRIDGE. THE USE OF RIP RAP WILL BE LIMITED TO THE CHANNEL BANKS, AND USED ONLY IN THE IMMEDIATE VICINITY OF THE STRUCTURE. ALL IN-LAKE CONSTRUCTION WILL CONTAIN EROSION PREVENTION AND SEDIMENTATION CONTROL (EPSC) MEASURES TO INCLUDE BUT NOT BE LIMITED TO:

ALL WATER LEAVING THE CONSTRUCTION SITE VIA DITCH OR SHEET FLOW WILL BE CONTROLLED BY SEDIMENT TRAPS OF SILT FENCE TO LIMIT SEDIMENT THAT MIGHT REACH THE STREAMS. EROSION CONTROL PLANS WILL BE DEVELOPED AND INCLUDED WITH THE PLAN SET. THESE PLANS WILL BE UPDATED BY THE CONTRACTOR AS CONSTRUCTION PROCEEDS. ALL EROSION AND SEDIMENT DEVICES WILL BE SIZED TO PROPERLY PREVENT OR RETAIN SEDIMENT FROM LEAVING THE PROJECT SITE.

ADDITIONAL MITIGATION AND MINIMIZATION PROCEDURES WILL BE:

1) IN AREAS NOT TREATED WITH RIP RAP OR OTHERWISE STABILIZED, RE-VEGETATION OF STREAM BANK AND RIPARIAN ZONES SHALL OCCUR CONCURRENTLY WITH THE PROJECT PROGRESSION. SPECIES OF GRASSES, SHRUBS, AND TREES THAT ARE INDIGENOUS TO THE AREA OR THOSE RECOMMENDED BY THE DIVISION OF ENVIRONMENTAL ANALYSIS BIOLOGIST FOR DISTRICT 1, COMMONWEALTH OF KENTUCKY TRANSPORTATION CABINET, SHOULD BE PLANTED.

2) TO THE MAXIMUM EXTENT PRACTICABLE, ALL WORK SHALL BE PERFORMED DURING LOW FLOW CONDITIONS.

3) THE FILL CREATED BY DISCHARGE AND/OR DEPOSITION OF ANY DREDGED OR EXCAVATED MATERIALS ONSHORE, AND ALL EARTHWORK OPERATIONS, SHALL BE CARRIED OUT IN SUCH A WAY THAT SEDIMENT RUNOFF AND SOIL EROSION TO THE WATERCOURSE ARE CONTROLLED AND MINIMIZED. BEST MANAGEMENT PRACTICES FOR WATER POLLUTION CONTROL SHALL BE INCORPORATED INTO PROJECT DESIGN PLANS ACCORDING TO SECTION 213.03.01 OF THE KENTUCKY STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, CURRENT EDITION.

4) HEAVY EQUIPMENT (BULLDOZERS, CRANES, BACKHOES, DRAG LINES, ETC.), IF REQUIRED FOR THIS PROJECT, SHOULD NOT BE USED OR OPERATED WITHIN THE STREAM CHANNEL. IN THOSE INSTANCES WHERE SUCH IN-STREAM WORK IS UNAVOIDABLE, THEN IT SHALL BE PERFORMED IN SUCH A MANNER AND DURATION AS TO MINIMIZE RE-SUSPENSION OF SEDIMENTS AND DISTURBANCE TO SUBSTANCES AND BANK OR RIPARIAN VEGETATION.

5) SPOIL MATERIALS FROM THE WATERCOURSE OF ON-SHORE OPERATION, INCLUDING SLUDGE DEPOSITS, SHALL NOT BE DUMPED INTO WATERCOURSES AS SPECIFIED UNDER SECTION 404 GUIDELINES OF THE CLEAN WATER ACT. DURING THE DREDGING OF APPROXIMATELY 100,000 CUBIC YARDS OF MATERIAL FROM THE KENTUCKY LAKE BOTTOM, A TURBIDITY CURTAIN OR SIMILAR MEASURE WILL BE USED TO REDUCE SILTATION. AREA FOR DEPOSIT OF DREDGED MATERIALS SHALL BE PROVIDED WITH TEMPORARY DIKES OR BULKHEADS FOR SEPARATION AND RETENTION OF SETTLEABLE SOLIDS. DREDGE SPOIL WILL BE DEPOSITED IN A LOCATION THAT IS TO BE APPROVED BY THE TENNESSEE VALLEY AUTHORITY, U.S. ARMY CORPS OF ENGINEERS, AND KENTUCKY DIVISION OF WATER PRIOR TO DEPOSITION.

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- CONSTRUCTION ACTIVITIES (EXCLUDING BRIDGE DECK POURING) WILL OCCUR ONLY DURING DAYLIGHT HOURS IN AND NEAR THE STREAM DURING THE SEASON OF POTENTIAL OCCUPATION BY BATS (APRIL 1 - NOVEMBER 14). BECAUSE OF INCREASED HEAT AND HUMIDITY EXPERIENCED DURING THE SUMMER MONTHS, DECK POURING MAY NEED TO OCCUR DURING TIMES WHEN *M. GRISESCENS* ACTIVELY FORAGE. POURING OF CONCRETE DURING NIGHT-TIME HOURS ALLOWS FOR PROPER CURATION TO INCREASE STRUCTURAL INTEGRITY AND LONG-TERM SUSTAINABILITY OF THE BRIDGE DECK. THE KENTUCKY TRANSPORTATION CABINET FEELS THAT DECK-POURING ACTIVITIES OCCURRING AT NIGHT WILL NOT ALTER THE BEHAVIORAL PATTERNS OF *M. GRISESCENS* POTENTIALLY FORAGING OVER THE LARGE LAKES AND STREAM NETWORKS DURING THESE PERIODS.

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MITIGATION OF IMPACTS TO THREATENED/ENDANGERED SPECIES-OSPREY

IN ADDITION TO OTHER REQUIRED MITIGATION; THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE REMOVAL OF ALL OSPREY NESTS CURRENTLY ON THE EGGNER'S FERRY BRIDGE AND THE SUBSEQUENT REMOVAL OF ANY NEW NESTS BEING BUILT WHILE THE NEW KENTUCKY LAKE BRIDGE IS UNDER CONSTRUCTION, AND UNTIL ALL PARTS OF THE EXISTING BRIDGE ABOVE THE WATER LINE HAVE BEEN DECONSTRUCTED AND REMOVED FROM THE PROJECT SITE. THE CURRENTLY EXISTING NESTS MUST BE REMOVED BEFORE FEBRUARY 1, 2014, AND ANY SUBSEQUENT NESTS BEING BUILT WOULD NEED TO BE REMOVED BEFORE ANY EGGS ARE LAID. ONCE EGGS OR YOUNG BIRDS ARE IN A NEST, THEY MUST NOT BE DISTURBED. IT SHOULD BE NOTED THAT OSPREY COULD NEST ANYWHERE ON THE STRUCTURE, AT THE HIGHEST POINT ON THE SUPERSTRUCTURE OR ON THE ABUTMENTS ETC. THE KYTC DISTRICT ENVIRONMENTAL COORDINATOR SHALL BE NOTIFIED TWENTY FOUR HOURS IN ADVANCE OF ANY REMOVAL OF A NEST SO THAT THE STATUS OF THE NEST CAN BE VERIFIED AND THE SUBSEQUENT REMOVAL DOCUMENTED. PRIOR TO BEGINNING ANY CONSTRUCTION ACTIVITY ON SITE, THE CONTRACTOR SHALL MEET WITH THE KYTC DISTRICT ONE COORDINATOR FOR ASSISTANCE WITH IDENTIFYING OSPREY NESTS ETC., AND TO DETERMINE IF THERE ARE ANY NESTS ON THE STRUCTURE THAT NEED TO BE REMOVED IMMEDIATELY. THIS MITIGATION REQUIREMENT IS INTENDED TO MINIMIZE THE POSSIBILITY OF ANY POTENTIAL DELAYS TO THE PROJECT SCHEDULE. ALL COSTS ASSOCIATED WITH CARRYING OUT THIS MITIGATION REQUIREMENT SHALL BE BORNE BY THE CONTRACTOR AND ARE INCIDENTAL TO THE PROJECT.

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SEE EROSION CONTROL NOTES FOR ADDITIONAL NOTES SPECIFIC TO EROSION CONTROL.

EDGE KEY

THIS WORK INCLUDES CUTTING OUT THE EXISTING ASPHALT SURFACE TO A MINIMUM DEPTH AND WIDTH AS DETAILED ELSEWHERE IN THE PLANS SO THAT THE NEW SURFACE MAY HEEL INTO THE EXISTING SURFACE. THE CONTRACT UNIT PRICE BID LINEAR FOOT FOR "EDGE KEY" INCLUDES ALL NECESSARY MATERIALS, LABOR AND EQUIPMENT NECESSARY TO PERFORM THE WORK AND DISPOSE OF THE REMOVED ASPHALT MATERIAL.

CONSTRUCTION ENTRANCES

CONSTRUCTION ENTRANCES SHOWN ARE APPROXIMATE. THESE ENTRANCES MAY REMAIN IN PLACE AND BE USED BY THE CONTRACTOR OF THIS PROJECT IF APPROVED BY THE ENGINEER. THE CONTRACTOR SHALL SUBMIT CONSTRUCTION ENTRANCE PLAN TO ENGINEER FOR APPROVAL. THE CONTRACTOR SHALL REMOVE ALL CONSTRUCTION ENTRANCES POST CONSTRUCTION.

MAINTENANCE OF TRAFFIC CROSSEOVERS

UPON COMPLETION OF CONSTRUCTION, THE DISTURBED LIMITS OF THE MAINTENANCE OF TRAFFIC CROSSEOVERS SHALL BE RETURNED TO ORIGINAL CONDITIONS. RESTORING DISTURBED LIMITS IS INCIDENTAL TO MAINTAIN AND CONTROL TRAFFIC LUMP SUM.

CHANGED NOTE

FILE NAME: \\PEWINSZ\JOBS\KDOT\LAKE_BRIDGES\ADDENDUMS\ADDENDUM #2_R0020.DGN
USER: andr@w-b
DATE_PLOTTED: December 4, 2013
E-SHEET NAME: R0020CGN
MicroStation v8.11.9.357



CALL NO. 200

CONTRACT ID. 131212

MARSHALL - TRIGG COUNTIES

FED/STATE PROJECT NUMBER 121GR13D012 - NHPP 0801 (098)

DESCRIPTION CADIZ-AURORA ROAD (US 68/KY 80)

WORK TYPE BRIDGE WITH GRADE, DRAIN & SURFACE

PRIMARY COMPLETION DATE 9/30/2016

LETTING DATE: December 20,2013

Sealed Bids will be received electronically through the Bid Express bidding service until 10:00 AM EASTERN STANDARD TIME December 20,2013. Bids will be publicly announced at 10:00 AM EASTERN STANDARD TIME.

PLANS AVAILABLE FOR THIS PROJECT.

DBE CERTIFICATION REQUIRED - 8%

REQUIRED BID PROPOSAL GUARANTY: Not less than 5% of the total bid.

ADMINISTRATIVE DISTRICT - 01

CONTRACT ID - 131212

121GR13D012 - NHPP 0801 (098)

COUNTY - MARSHALL

PCN - DE07900681312

FD52 079 0068 027-029

CADIZ-AURORA ROAD (US 68/KY 80) (MP 27.801) CADIZ-AURORA; BRIDGE OVER KENTUCKY LAKE. (MP 28.146), A DISTANCE OF 0.95 MILES.BRIDGE WITH GRADE, DRAIN & SURFACE SYP NO. 01-00180.70.

GEOGRAPHIC COORDINATES LATITUDE 36:46:21.00 LONGITUDE 88:07:18.00

COUNTY - TRIGG

PCN - DE11100681312

FD52 111 0068 000-001

CADIZ-AURORA ROAD (US 68/KY 80) (MP 0.00) CADIZ-AURORA; BRIDGE OVER KENTUCKY LAKE. (MP 0.378), A DISTANCE OF 0.95 MILES.BRIDGE WITH GRADE, DRAIN & SURFACE SYP NO. 01-00180.70.

GEOGRAPHIC COORDINATES LATITUDE 36:47:00.00 LONGITUDE 87:55:00.00

COMPLETION DATE(S):

COMPLETED BY 11/15/2015	SEE NOTE FOR SPECIFIED INTERMEDIATE MILESTONE
COMPLETED BY 09/30/2016	APPLIES TO ENTIRE CONTRACT
COMPLETED BY 06/15/2016	SEE NOTE FOR SPECIFIED INTERMEDIATE MILESTONE
COMPLETED BY 03/15/2016	SEE NOTE FOR SPECIFIED INTERMEDIATE MILESTONE

AND MINIMIZED. BEST MANAGEMENT PRACTICES FOR WATER POLLUTION CONTROL SHALL BE INCORPORATED INTO PROJECT DESIGN PLANS ACCORDING TO SECTION 213.03.01 OF THE KENTUCKY STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, CURRENT EDITION.

4) HEAVY EQUIPMENT (BULLDOZERS, CRANES, BACKHOES, DRAG LINES, ETC.), IF REQUIRED FOR THIS PROJECT, SHOULD NOT BE USED OR OPERATED WITHIN THE STREAM CHANNEL. IN THOSE INSTANCES WHERE SUCH IN-STREAM WORK IS UNAVOIDABLE, THEN IT SHALL BE PERFORMED IN SUCH A MANNER AND DURATION AS TO MINIMIZE RE-SUSPENSION OF SEDIMENTS AND DISTURBANCE TO SUBSTRATES AND BANK OR RIPARIAN VEGETATION.

5) SPOIL MATERIALS FROM THE WATERCOURSE OF ON-SHORE OPERATIONS, INCLUDING SLUDGE DEPOSITS, SHALL NOT BE DUMPED INTO WATERCOURSES AS SPECIFIED UNDER SECTION 404 GUIDELINES OF THE CLEAN WATER ACT. DURING THE DREDGING OF APPROXIMATELY 100,000 CUBIC YARDS OF MATERIAL FROM THE KENTUCKY LAKE BOTTOM, A TURBIDITY CURTAIN OR SIMILAR MEASURE WILL BE USED TO REDUCE SILTATION. AREA FOR DEPOSIT OF DREDGED MATERIALS SHALL BE PROVIDED WITH TEMPORARY DIKES OR BULKHEADS FOR SEPARATION AND RETENTION OF SETTLEABLE SOLIDS. DREDGE SPOIL WILL BE DEPOSITED IN A LOCATION THAT IS TO BE APPROVED BY THE TENNESSEE VALLEY AUTHORITY, U.S. ARMY CORPS OF ENGINEERS, AND KENTUCKY DIVISION OF WATER PRIOR TO DEPOSITION.

6) MEASURES SHALL BE TAKEN TO PREVENT OR CONTROL SPILLS OF FUELS, LUBRICANTS, OR ANY OTHER MATERIALS USED IN CONSTRUCTION FROM ENTERING THE WATERCOURSE.

7) ANY FILL OR RIP-RAP SHALL BE OF SUCH COMPOSITION THAT IT WILL NOT ADVERSELY AFFECT THE BIOLOGICAL, CHEMICAL, OR PHYSICAL PROPERTIES OF THE RECEIVING WATERS AND/OR CAUSE VIOLATION VOLUME 1 OF 1 PAGE 11 OF 119 OF WATER QUALITY STANDARDS. IF RIP-RAP IS UTILIZED, IT IS TO BE OF SUCH SIZE AND WEIGHT THAT BANK STRESS OR SLUMP CONDITIONS WILL NOT BE CREATED BECAUSE OF ITS PLACEMENT, AS SPECIFIED IN SECTION 703 OF THE KENTUCKY STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, CURRENT EDITION.

ADDITIONALLY, THE CONTRACTOR SHALL ADHERE TO THE FOLLOWING MEASURES SPECIFICALLY AIMED AT THE USE OF HABITAT BY BATS:

* SEASONAL RESTRICTIONS PLACED UPON THE DECONSTRUCTION OF THE OLD BRIDGES ONCE THE NEW BRIDGES ARE OPERATIONAL. CONTRACTOR WILL DECONSTRUCT THE EXISTING BRIDGE DECKS DURING THE PERIOD OF TIME WHEN BATS ARE NOT PRESENT (NOVEMBER 15- MARCH 15).

* CONSTRUCTION ACTIVITIES (EXCLUDING BRIDGE DECK POURING) WILL OCCUR ONLY DURING DAYLIGHT HOURS IN AND NEAR THE STREAM DURING THE SEASON OF POTENTIAL OCCUPATION BY BATS (APRIL 1- NOVEMBER 14). BECAUSE OF INCREASED HEAT AND HUMIDITY EXPERIENCED DURING THE SUMMER MONTHS, DECK POURING MAY NEED TO OCCUR DURING TIMES WHEN *M. GRISESCENS* ACTIVELY FORAGE. POURING OF CONCRETE DURING NIGHT-TIME HOURS ALLOWS FOR PROPER CURATION TO INCREASE STRUCTURAL INTEGRITY AND LONG-

THESE AREAS WILL NOT DIRECTLY ENTER THE WATER. FILTRATION OF EFFLUENT FROM EQUIPMENT CLEANING/STAGING AREAS WILL BE LOCATED SUCH THAT EFFLUENT WILL BE FILTERED THROUGH VEGETATED AREAS AND/OR PROPER SEDIMENT CONTROL STRUCTURES LOCATED BETWEEN THE STAGING AREA AND THE WATER; THEREFORE, MINIMIZING THE POTENTIAL FOR IMPACTS SUCH AS SEDIMENTATION AND POLLUTION.

* THE PROPOSED BRIDGES HAVE BEEN DESIGNED TO REDUCE IMPACTS TO THE WATER BY MINIMIZING THE NUMBER OF NEW PIERS IN THE LAKES. ALL OF THE EXISTING PIERS WILL BE REMOVED.

* DURING FOOTER/PIER CONSTRUCTION, COFFER DAMS, SEDIMENT CURTAINS, AND/OR SANDBAGS AND PUMPS MAY BE UTILIZED IN ORDER TO BE ABLE TO PLACE CONCRETE IN THE FOOTERS. IF SO, WATER REMOVED FROM INSIDE THE COFFER DAMS OR SANDBAGGED AREAS WILL BE FILTERED USING AN APPROVED SEDIMENT FILTRATION METHOD PRIOR TO RELEASE INTO THE WATER.

* USFWS AND THE KYTC BIOLOGIST SHALL BE CONTACTED BY THE KYTC DISTRICT 1 ENVIRONMENTAL COORDINATOR AT LEAST ONE WEEK PRIOR TO THE START OF CONSTRUCTION FOR THE PROPOSED PROJECT.

ARCHAEOLOGICAL MATERIALS

IF ARCHAEOLOGICAL MATERIALS ARE UNCOVERED DURING CONSTRUCTION, ALL CONSTRUCTION WORK IN THE AREA OF THE FIND(S) WOULD CEASE. STAFF ARCHAEOLOGISTS EITHER KYTC (502-564-7250) OR KHC SHPO (502-564-7005) OFFICE WOULD BE CONTACTED IMMEDIATELY SO THAT REPRESENTATIVES OF THAT OFFICE MAY HAVE THE OPPORTUNITY TO EXAMINE AND EVALUATE THE MATERIALS. IF HUMAN REMAINS ARE DISCOVERED DURING CONSTRUCTION, ALL ACTIVITY IN THE VICINITY OF THE REMAINS WOULD CEASE IMMEDIATELY, AND THE STATE MEDICAL EXAMINER AND THE APPROPRIATE LOCAL LAW ENFORCEMENT AGENCY WOULD BE CONTACTED. IF MATERIALS ARE DISCOVERED ON ANY FEDERALLY OWNED PROPERTY, THEN REPRESENTATIVES OF THE ADMINISTERING AGENCY ALSO WOULD BE CONTACTED.

MITIGATION OF IMPACTS TO THREATENED/ENDANGERED SPECIES-OSPREY

IN ADDITION TO OTHER REQUIRED MITIGATION; THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE REMOVAL OF ALL OSPREY NESTS CURRENTLY ON THE EGGNER'S FERRY BRIDGE AND THE SUBSEQUENT REMOVAL OF ANY NEW NESTS BEING BUILT WHILE THE NEW KENTUCKY LAKE BRIDGE IS UNDER CONSTRUCTION, AND UNTIL ALL PARTS OF THE EXISTING BRIDGE ABOVE THE WATER LINE HAVE BEEN DECONSTRUCTED AND REMOVED FROM THE PROJECT SITE. THE CURRENTLY EXISTING NESTS MUST BE REMOVED BEFORE FEBRUARY 1, 2014, AND ANY SUBSEQUENT NESTS BEING BUILT WOULD NEED TO BE REMOVED BEFORE ANY EGGS ARE LAID. ONCE EGGS OR YOUNG BIRDS ARE IN A NEST, THEY MUST **NOT** BE DISTURBED. IT SHOULD BE NOTED THAT OSPREY COULD NEST ANYWHERE ON THE STRUCTURE, AT THE HIGHEST POINT OF THE SUPERSTRUCTURE OR ON THE ABUTMENTS ETC. THE KYTC DISTRICT ONE ENVIRONMENTAL COORDINATOR SHALL BE NOTIFIED TWENTY FOUR HOURS IN ADVANCE OF ANY REMOVAL OF A NEST SO THAT THE STATUS OF THE NEST CAN BE VERIFIED AND THE SUBSEQUENT REMOVAL DOCUMENTED. PRIOR TO BEGINNING ANY CONSTRUCTION ACTIVITY ON SITE, THE CONTRACTOR SHALL MEET WITH THE KYTC DISTRICT ONE COORDINATOR FOR ASSISTANCE WITH IDENTIFYING OSPREY NESTS ETC., AND TO DETERMINE IF THERE ARE ANY NESTS ON THE STRUCTURE THAT NEED TO BE REMOVED IMMEDIATELY. THIS MITIGATION REQUIREMENT IS INTENDED TO MINIMIZE THE POSSIBILITY OF ANY POTENTIAL DELAYS TO THE PROJECT SCHEDULE. ALL COSTS ASSOCIATED WITH CARRYING OUT THIS MITIGATION REQUIREMENT SHALL BE BORNE BY THE CONTRACTOR AND

SPECIAL NOTE FOR DYNAMIC PILE TESTING

Marshall/Trigg Counties Item No. 1-180.70, CID 13-1212
Kentucky Lake Bridge

1.0 GENERAL

1.1 Scope of Work

The scope of work includes furnishing all labor, equipment and analyses associated with dynamic testing of driven piles as specified in this Special Note and in general accordance with ASTM D4945, High-Strain Dynamic Testing of Piles. Dynamic testing involves attaching strain transducers and accelerometers, as defined in Section 2.3.2 of this Special Note, to the pile near the pile head during initial driving or at an appropriate location during restrrike testing. A cable or wireless transmission connects the gages near the pile head with the Pile Driving Monitoring Hardware located a safe distance from the pile. The piles that are to be tested must be of sufficient extra length to ensure that gages are not driven into the ground or water, unless the gages are specifically designed for underwater use. The purpose of the dynamic pile testing is to ensure that applicable design criteria and design codes are met.

For the purposes of this Special Note, "Department" refers to the Kentucky Department of Highways and/or consultants acting on behalf of the Department of Highways. "Engineer" is defined in Section 101.03 of the Standard Specifications.

1.2 Test Locations

Perform testing on piles designated in the plans or as directed by the Engineer. The Department reserves the right to require the contractor to perform initial drive and/or restrrike dynamic testing on additional piles or previously tested piles or additional restrrikes without dynamic testing, if deemed necessary to ensure that applicable bridge design criteria and design codes are met. Contingency testing quantities are included in the contract drawings.

1.3 Personnel Qualifications

Perform dynamic pile testing using the services of an independent Dynamic Pile Testing Consultant with qualified personnel assigned to this project as described below.

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Kentucky Lake Bridge

Personnel should demonstrate experience similar to the type and magnitude of the project.

- Pile Driving Monitoring – A licensed professional engineer with a minimum of 5 years dynamic pile testing and analysis experience or who has achieved Advanced or better certification under the High-Strain Dynamic Pile Testing Examination or Certification process of the Pile Driving Contractors Association or Foundation QA.
- Wave Equation and Pile Driving Analyses – A licensed professional engineer with a minimum of ten (10) years dynamic pile testing and analysis experience or who has achieved Master or better certification under the High-Strain Dynamic Pile Testing Examination or Certification process of the Pile Driving Contractors Association or Foundation QA.

1.4 Equipment

Supply equipment such as gages, cables or wireless transmitters, etc. conforming to ASTM D4945, High-Strain Dynamic Testing of Piles and furnished by the dynamic testing consultant. Submit the product name and manufacturer of the hardware and software components below for acceptance by the Department in Submittal Number 2. If requested by the Department, submit additional information including technical specifications, etc.

- Pile Driving Modeling – Wave Equation Software
- Pile Driving Monitoring – Hardware & Software
- Pile Driving Analysis – Signal Matching Software

1.5 Submittals and General Testing & Analysis Requirements

Make submittals via SharePoint software in accordance with the Project requirements for submittals. See Tables 1 and 2 below. The Department will respond to the Contractor regarding acceptability of submittals within ten (10) business days. A “Business Day” is defined as any day except Saturdays, Sundays and Holidays, as defined in Section 101.03 of the Standard Specifications.

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Kentucky Lake Bridge

Table 1 – Schedule of Dynamic Pile Testing Submittals

Submittal Number	Submittal Item	Calendar Days	Event
1	Proposed independent dynamic pile testing consultant, and a listing of assigned personnel and their experience and qualifications.	30 After	Notice to Begin Work
2	Details of the hardware and software components, method of testing, and materials to be used. Include gage calibration documentation. Include pile hammer warm-up procedure for restrrike tests. Include anticipated delivery and training dates for E-Saximeters.	45 Before	Start of Pile Driving/Monitoring
3	Complete <i>Pile and Driving Equipment Data Form</i> (Figure 1 of the Special Note) and the results of wave equation analyses.	30 Before	Start of Pile Driving/Monitoring
4	Preliminary report(s) as defined in Section 3.1 of this Special Note.	2 After (48 hrs.)	Completion of Each Field Test
5	Summary Report(s) as defined in Section 3.2 of this Special Note.	10 After	Completion of All Field Tests

Provide all submittals and reports in .pdf format

Table 2 – General Testing and Analysis Requirements

Item	Requirements
Wave Equation Analysis	Perform analyses in Table 3 and sufficient additional analyses as needed to define performance for all combinations of piles, driving systems, and subsurface conditions anticipated.
End of Initial Driving Test Frequency (EOD)	Minimum of two piles for each substructure or as directed by the Engineer. At piers containing only three piles, test all three piles.
Beginning of Restrike Test Frequency (BOR)	Minimum of two piles for each substructure or as directed by the Engineer.
Time Interval between End of Initial Driving and Restrike Tests	Perform restrrike tests on dynamically tested piles at 72 hours (68 to 108 hours after end of drive) and 168 hours (164 to 240 hours after end of drive) after driving unless directed otherwise by the Engineer. At piers containing only three piles, test all three piles at 72 hours and only the center pile at 168 hours.
Pile Driving Analyses using Signal Matching Techniques	For each End of Initial Driving Test and each Restrike Test

Perform testing, analyses and reporting in accordance with this table and ASTM D4945, *High-Strain Dynamic Testing of Piles*.

Perform and submit wave equation analyses for one pipe pile at each end bent location and one pipe pile of each diameter within the station ranges indicated below using the representative pier for each driving hammer and system proposed for use. Perform analyses to demonstrate that the pile hammer has sufficient energy to install the piles to the design tip elevation and 75 and 100 percent of the required nominal axial resistances (RNAR) without overstressing or damaging the piles. Dynamic testing results will determine the driving criteria and control the final pile tip elevation.

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Table 3- Wave Equation Analyses Locations	
Pier or End Bent Group	Representative Pier or End Bent for Wave Equation Analyses
End Bent 1	End Bent 1
Pier 1	Pier 1
Piers 2 and 3	Pier 3
Pier 4	Pier 4
Pier 5	Pier 5
Pier 6	Pier 6
Piers 7 and 8	Pier 8
Pier 9	Pier 9
End Bent 2	End Bent 2

2.0 TESTING AND ANALYSES

2.1 Preconstruction Wave Equation Analyses

At least 30 calendar days before beginning pile driving, submit to the Department the completed Pile and Driving Equipment Data Form (Figure 1 of this Special Note) and preconstruction wave equation analyses performed by the Independent Dynamic Pile Testing Consultant in accordance with Table 1 in this Special Note and a summary report of the results. The required driving criteria are outlined in Sections 2.3.1 and 2.3.2 of the Special Note for Steel Pipe Piles - Install. Perform wave equation analyses based upon the production pile lengths (i.e. cutoff elevation minus lowest anticipated pile tip elevation) but with the piles driven to the production pile Estimated Pile Tip Elevations provided in the Contract Drawings.

Prior to bidding, additional wave equation analyses may be performed by the bidders to select the appropriate driving system. Bidders are advised to retain an engineering consultant to perform independent wave equation analyses in order to select hammer(s) that meets the specified requirements for this project. This engineering consultant should meet the criteria for “Wave Equation and Pile Driving Analyses” in Section 1.3 of this Special Note and have extensive experience performing wave equation analyses, dynamic pile testing and signal matching analyses on projects with pile and hammer sizes similar to those to be used on this project.

The purpose of the wave equation analyses is to assess the ability of all proposed pile driving systems to install piles per the outlined driving criteria. Model the 72-inch-diameter pipe piles with the constrictor plates with a single toe using radiation damping, limiting the Smith damping factor in the radiation damping model to a maximum value of

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0.4 feet/sec. Select the pile hammers for the 72-inch-diameter pipe piles at the pier locations and 30-inch-diameter pipe piles at the end bents based upon the criteria described below.

Select hammer(s) and driving system components with the following characteristics:

- Capable of producing 0.33 to 0.1 inches of set (3 to 10 blows per inch) when verifying 75% and 100% of the Required Nominal Axial Resistance (RNAR) as shown in the contract drawings;
- Produce driving stresses not exceeding 90% of the yield stress of the steel based on wave equation analysis;
- Capable of varying the stroke or energy to control driving stresses and blow counts. The results of wave equation analyses may be used to assess the need for varying the stroke or energy; and
- Refer to the Special Note for Steel Pipe Piles - Install for additional driving system criteria, including minimum hammer energies based upon pipe pile diameters and type of substructure.

Do not mobilize hammer(s) to site until the wave equation analysis and hammer selection have been reviewed and accepted by the Department.

In the Wave Equation Summary Report, include:

- Explanation of how the piles were modeled;
- brief discussion of how the soil parameters were selected;
- brief discussion of the hammer, helmet and cushion properties selected for the model;
- drivability graph relating pile resistance (i.e. capacity), blow count and driving stresses with depth;
- bearing graph relating the pile resistance (i.e. capacity) to the pile driving resistance which indicates blow count versus resistance (i.e. capacity) and stroke or energy;
- constant resistance (i.e. capacity) analysis or inspectors chart to assist the Department in determining the required driving resistance at other field-observed strokes or energy; and
- discussion and interpretation of the results.

2.1.1 The Department will base acceptance of the proposed pile driving system upon the wave equation analyses indicating that the proposed system can meet the driving criteria outlined in Section 2.3.1 of the Special Note for Steel Pipe Piles - Install.

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2.1.2 If any changes or modifications are made to the approved pile driving system, submit additional wave equation analyses in accordance with Section 2.1 of this Special Note.

2.2 High-Strain Dynamic Pile Testing

2.2.1 Perform dynamic pile testing at the locations and frequency required in accordance with Table 4 and Section 1.2 in this Special Note and at the locations indicated on the project plans.

2.2.2 Dynamic pile testing involves monitoring the response of a pile subjected to heavy impact applied by the pile hammer at the pile head. The testing will provide information on the driving stresses, pile resistance (i.e. capacity), structural integrity, and hammer efficiency.

2.2.3 Engage an independent dynamic pile testing consultant and qualified personnel in accordance with Section 1.3 of this Special Note. Prior to testing, the Department will review the proposed independent dynamic pile testing consultant, the experience and qualifications of assigned personnel, details of the method of testing, a list of equipment, and the method of analysis of test results for acceptance.

2.2.4 Perform all field testing and measurements in the presence of the Engineer or authorized representative.

2.2.5 Remote Dynamic Pile Testing where data is collected in the field and sent to the office of the Dynamic Pile Testing Consultant will not be allowed on this project. The testing consultant is required to have at least one person meeting the requirements for "Pile Driving Monitoring" as defined in Section 1.3 of the Special Note for Dynamic Pile Testing in the field during all dynamic pile testing. "Wireless" technology that eliminates cables from the test pile to the data acquisition equipment will be allowed.

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Table 4 - Dynamic Load Testing Summary			
Substructure / Pile	Dynamic Pile Load Testing (Number of Tests)		
	End of Drive and During Drive	72-Hour Restrike	168-Hour Restrike
End Bent 1 / Test Piles	3	3	3
Pier 1 / Test Piles	1	1	1
Pier 1 / Production Piles	2	2	--
Pier 2 / Test Piles	1	1	1
Pier 2 / Production Piles	2	2	--
Pier 3 / Test Piles	1	1	1
Pier 3 / Production Piles	2	2	--
Pier 4 / Test Piles	2	2	2
Pier 5 / Test Piles	2	2	2
Pier 6 / Test Piles	2	2	2
Pier 7 / Test Piles	1	1	1
Pier 7 / Production Piles	2	2	--
Pier 8 / Test Piles	1	1	1
Pier 8 / Production Piles	2	2	--
Pier 9 / Test Piles	1	1	1
Pier 9 / Production Piles	2	2	--
End Bent 2 / Test Piles	3	3	3

Note: The Department reserves the right to require additional dynamic load tests

2.3 Field Testing

2.3.1 Equipment

Perform dynamic pile testing field measurements using equipment, software and recording equipment approved in accordance with Section 1.4 of this Special Note. Consultant will analyze the data collected at the end of initial driving and the beginning of restrike using accepted signal matching techniques and software.

Provide safe access to the piles allowing the independent testing consultant to attach the gages, including man lifts, shelters, etc.

2.3.2 Monitoring During Driving

During pile driving, instrument the piles and monitor them with testing equipment satisfying the requirements of Section 1.4 of this Special Note. Prior to lifting the pile to be dynamically tested in to place, provide a minimum of 3 feet of clearance to the gage locations on the pile for pile preparation, and prepare holes

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for gage attachment. Attach gages a minimum of two diameters below the pile head.

- Install strain transducers and accelerometers near the head of each pile to be tested, and use a compatible measuring and recording system to record the data during driving. If desired, install fully waterproof underwater wires, transducers, accelerometers and all other applicable devices that have been waterproofed by their manufacturer. Provide training by the manufacturer of the underwater devices for the Pile Driving Monitoring Engineer(s) to ensure that they understand how to properly use the underwater devices. Submit a letter of certification from the manufacturer stating that the underwater devices have been properly waterproofed and that includes the name(s) of the engineer(s) who will be using them stating that they have been trained to be proficient in the use of the underwater devices. Consider the anticipated variations in lake level and the selected pile length above the design cut-off elevation when planning the dynamic pile load testing;
- Install a minimum of two and four sets of transducers/accelerometers (equally spaced around the pile), for the 30- and 72-inch-diameter piles, respectively;
- Appropriately position and fix the equipment required to be attached to the pile to the satisfaction of the Engineer and the testing consultant. Monitor, and re-tighten gages as needed during testing. Replace defective gages as needed during testing;
- Use the testing equipment to monitor pile stresses during driving to prevent pile damage and ensure pile integrity and resistance (i.e. capacity); and
- Do not exceed driving stresses of 45 ksi (90% of specified 50 ksi yield stress steel) or 40.5 ksi (90% of specified 45 ksi yield stress steel).
- Refer to the driving criteria in Sections 2.3.1 and 2.3.2 of the Special Notes for Steel Pipe Piles-Install.

2.3.3 Preparation of the Pile Head

Preparation of the pile head for the application of dynamic test load may involve, where appropriate, trimming the head, cleaning, and building up the pile using materials that, at the time of testing, safely withstand the impact stresses. Provide an impact surface that is flat and at right angles to the pile axis.

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2.3.4 Dynamic Measurement and Analysis

Monitor pile driving when pile driving begins unless otherwise allowed by the Engineer. Record and process the data immediately in the field by the pile driving monitoring equipment and software. Unless monitoring indicates that additional driving will damage the pile, continue pile driving and monitoring until the driving criteria outlined in Sections 2.3.1 and 2.3.2 of Special Note for Steel Pipe Piles-Install is satisfied. Make any required adjustments to the fuel and/or power setting of the hammer if necessary to verify the resistance within the specified range of blow counts or to meet other applicable testing objectives. When the level of the gages is within 1 foot of any obstruction endangering the survival of gages or cables, halt driving and remove gages from the pile. If additional driving is required, remove the obstruction or splice the pile and reattach the gages near the head of the next pile segment prior to resuming driving. For each initial drive and restrike dynamic pile test, as defined in Section 5.0 of this Special Note, perform pile driving analysis using signal matching techniques for up to three (3) selected hammer blows per each test (as defined in Section 5.0 of this Special Note) to determine the relative resistance (capacity) from end bearing and skin friction along the length of the pile.

- Perform beginning of restrike (BOR) tests at the frequency indicated in Table 2 and Table 4 of this Special Note with the time interval between end of initial driving and beginning of restrike in accordance with Table 2 and Table 4 of this Special Note. During restrike, instrument and monitor the pile in a manner similar to that used during initial driving. For each restrike test, perform pile driving analysis using signal matching techniques for selected blows from the beginning of restrike to determine the relative resistance from end bearing and skin friction along the length of the pile.
- Record set per each hammer blow or for a known number of hammer blows during BOR tests. If underwater gages are used, weld a bracket on the side of the pile beneath the hammer bonnet, with a visually observable extension above the waterline for the purpose of set measurements. Use surveying equipment and the bracket to measure the set per hammer blow. The Department will consider alternate methods if proposed by the Contractor.
- Perform restrike tests with a warmed-up hammer (if applicable) by striking the pile a maximum of 5 blows unless testing equipment indicates overstressing or damage to the pile. Include the hammer warm-up procedure in Submittal No. 2 per Table 1 of this Special Note.

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If hammer warm-up is not required, the hammer operation should at least be checked and confirmed by a qualified operator prior to each restrike.

- If directed by the Engineer, advance the pile and perform re-drive dynamic testing immediately after performing a restrike test. Perform signal matching on one or more selected hammer blows (up to two) at the end of the re-drive.
- If overstressing or damage to the pile is indicated, immediately discontinue driving and notify the Engineer. If the contractor overdrives the pile during restrike testing, and disturbs the set up of the skin resistance, additional wait/setup time may be required by the Engineer. In the event initial restrike testing indicates a pile resistance below the specified resistance, additional driving may be required as directed by the Engineer.
- The Engineer may require dynamic pile testing on additional piles beyond those listed in Table 4 if inconclusive results are obtained or unusual driving conditions are encountered. These restrikes will be paid using the established unit bid prices.
- Evaluate pile resistance and integrity based on the standard procedure used in practice.
- Provide the Department within 48 hours with tabular records of the dynamic pile testing field measurements obtained at the end of initial driving and at the beginning of restrike, which includes the signal matching results.

2.4 Dynamic Testing Overruns

If the Engineer directs the contractor to perform dynamic testing which results in dynamic testing overruns or performed tests which exceed the total contract plan quantities (including contingency quantities) for one (1) or more of the four (4) dynamic testing bid items, the Department will consider requests by the contractor to grant time extension(s) for one or more of the specified milestone dates. Submit any requests for time extension(s) of the specified milestone(s) in writing to the Engineer as soon as possible and no later than 10 calendar days after being directed to perform the additional dynamic test(s). Include justification to show how performing the additional dynamic test(s) will directly impact the contractor's schedule and adversely affect the ability of the contractor to meet one or more of the milestone dates. The Department will not consider any requests for time extensions which are not submitted within 10 calendar days and/or do not meet the above requirements. The Department will pay for any dynamic tests which result in dynamic testing overruns at the contract unit bid price.

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3.0 DYNAMIC PILE TEST REPORTS

3.1 Preliminary Dynamic Pile Test Reports

Submit a preliminary test report for each pile tested (for both End of Drive (EOD) and Beginning of Restrike (BOR) tests) for review by the Department. In the reports, include narrative, tabular as well as graphical presentation of the dynamic test results versus depth of the pile tested. Also include the following:

- Maximum force applied to the pile head.
- Maximum pile head velocity.
- Maximum energy imparted to the pile.
- Assumed soil damping factor and wave speed.
- Static resistance (i.e. capacity) estimate.
- Maximum compressive and tensile forces in the pile.
- Pile integrity.
- Blows per inch.
- Stroke length.
- Datum elevation and description of datum (i.e. template, water surface, mudline, etc.).
- Mudline elevation.
- Indication of drive time and any delays experienced during driving.
- Elevation of soil inside the pipe pile above the constrictor plate at end of drive and beginning of restrike.
- Elevation of soil inside the pipe piles at the end bents at end of drive and indicate whether plugging has occurred in the pipe pile.
- Pile tip elevation at beginning and end of test.
- Signal matching analysis for EOD and/or BOR. Both BOR and EOD if a re-drive is required. Use a single-toe model with radiation damping, limiting the radiation damping Smith damping factor to 0.4 feet/sec for the 72-inch-diameter pipe piles.
- Impact of driving shoe on the signal matching model.
- Number of usable (in-calibration and operational) accelerometers and strain gages.
- Actual elapsed hours since end of drive, for restrikes only.
- Refined wave equation based upon dynamic testing analysis, including inspector's chart for the pile resistance values specified by the Engineer for each specific substructure.

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Provide data files of the results for independent analyses by the Department.

3.2 Dynamic Pile Test Summary Report

Submit a summary report, including signal matching, for each pile tested for review by the Department. Include the results of hammer performance, pile driving stresses, and pile resistance during initial driving and restrike for all piles tested. Resolve any issues between the saximeter, inspector's records and the blow counts recorded on the dynamic testing equipment in the summary report. Also include the following for both EOD and BOR tests:

- Pile number and location.
- Date of testing and date of pile installation.
- Pile identification number and location.
- All information provided in preliminary reports not listed here.
- Hammer type, stroke length, hammer energy and other relevant details.
- Blow selected for signal matching analysis.
- Maximum compressive and tensile stresses, stroke, and resistance (i.e. capacity) versus penetration depth.
- Temporary compression.
- Pile integrity and location of damage, if any.
- Force/velocity versus time trace.
- Wave up and wave down versus time trace
- Force/velocity match curve.
- Resistance distribution along the pile.
- Detailed graphical and tabular results from blow analyzed using signal matching techniques and software.
- Narrative description of toe model used in the signal matching model and the damping model for the 72-inch-diameter pipe piles.
- Discussion of impact of the constrictor plate on the pile impedance, wave speed and any other dynamic properties of the pile for the 72-inch-diameter pipe piles.
- Discussion of match quality and impacts assumptions within the signal matching model may have had on the match quality of the signal matching results.
- Narrative describing the data, results, and their interpretation.

4.0 INCIDENTAL EQUIPMENT

At least fourteen (14) calendar days prior to the beginning of dynamic testing, provide two electronic devices to aid in recording pile hammer blows, stroke, and

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energy such as an “E-Saximeter” or accepted equivalent meeting the specifications on Page 16 of this Special Note. This device will immediately become property of the Department for use on this project.

At least one (1) calendar day prior to the beginning of dynamic testing, provide field training by someone proficient in the use of the device to ensure that approximately 3 to 5 employees of the Department are competent in the use of the device. This training may be performed by a representative of the independent Dynamic Pile Testing Consultant who is proficient in the use of the device or a manufacturer’s representative. The required training time is anticipated to be no more than one day.

The cost of furnishing this device and providing the training is incidental to the contract price for the “Dynamic Pile Testing” items and no separate payment will be made.

5.0 MEASUREMENT

Bidders are cautioned that contract quantities for bid items covered in this Special Note are based on the Department’s pre-bid estimates and are subject to increases or decreases based on the conditions encountered. Payment for authorized and accepted quantities will be at the contract unit bid price regardless of increases or decreases in quantities. The Overrun and Underrun Formulas defined in Section 104.02.02 of the Standard Specifications does not apply to the items covered in this Special Note.

DYNAMIC PILE TESTING

Dynamic pile testing on test piles and selected production piles will be measured per each. Payment for each restrike test performed will be separate from payment for each test performed during initial driving. Payment for each test will include pile driving monitoring, pile driving analysis (including wave equation and signal matching work) performed and preparation of applicable reports. Payment for the below described work, includes all material, equipment, tools, labor, reporting and any other incidental work, costs, and delays incurred by the Contractor necessary to complete these items.

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5.1 Dynamic Pile Testing-On Water-Initial

Initial drive is the end of drive (EOD) condition, when the initial driving conditions defined in the Special Note for Steel Pipe Piles-Install occur. On water refers to the bridge piers where access will be from barges situated on the lake.

5.2 Dynamic Pile Testing-On Land-Initial

Initial drive is the end of drive (EOD) condition, when the initial driving conditions defined in the Special Note for Steel Pipe Piles-Install occur. On land refers to the end bents where the piles can be accessed from land.

5.3 Dynamic Pile Testing-On Water-Restrike

Restrike is applying hammer blows to the pile head after a prescribed time period to determine the pile resistance at the specified time period. Apply no more than five (5) hammer blows during restrike after the specified time period has elapsed. The cost of any re-drive dynamic testing performed immediately after restrike is incidental to the restrike test. On water refers to the bridge piers where access will be from barges situated on the lake. Include cost of all contractor equipment, labor, incidental items and delays required to perform the restrike. The Department will pay the established Dynamic Pile Testing-On Water-Restrike contract unit bid price for all restrikes.

5.4 Dynamic Pile Testing-On Land-Restrike

Restrike is applying hammer blows to the pile head after a prescribed time period to determine the pile resistance at the specified time period. Apply no more than five (5) hammer blows during restrike after the specified time period has elapsed. The cost of any re-drive dynamic testing performed immediately after restrike is incidental to the restrike test. On land refers to the end bents where the piles can be accessed from land. Include cost of all contractor equipment, labor, incidental items, and delays required to perform the restrike.

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6.0 PAYMENT

Payment will be made under:

BID ITEM CODE	ITEM	UNIT
23233EC	DYNAMIC PILE TESTING - ON WATER – INITIAL	EACH
23233EC	DYNAMIC PILE TESTING - ON WATER – RESTRIKE	EACH
23233EC	DYNAMIC PILE TESTING - ON LAND - INITIAL	EACH
23233EC	DYNAMIC PILE TESTING - ON LAND - RESTRIKE	EACH

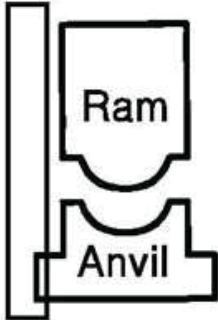
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Contract No.: _____ Structure Name and/or No.: _____
 Project: _____

 County: _____ Pile Driving Contractor or Subcontractor: _____

 _____ (Piles driven by)

Hammer Components



Hammer

Manufacturer: _____ Model No.: _____
 Hammer Type: _____ Serial No.: _____
 Manufacturers Maximum Rated Energy: _____ (ft-lbs)
 Stroke at Maximum Rated Energy: _____ (ft)
 Range in Operating Energy: _____ to _____ (ft-lbs)
 Range in Operating Stroke: _____ to _____ (ft)
 Ram Weight: _____ (lbs)
 Modifications: _____



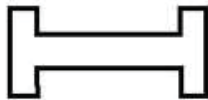
Striker Plate

Weight: _____ (lbs) Diameter: _____ (in)
 Thickness: _____ (in)



Hammer Cushion

Material #1	Material #2 (for Composite Cushion)
Name: _____	Name: _____
Area: _____ (in ²)	Area: _____ (in ²)
Thickness/Plate: _____ (in)	Thickness/Plate: _____ (in)
No. of Plates: _____	No. of Plates: _____
Total Thickness of Hammer Cushion: _____	



Helmet (Drive Head)

Weight: _____ (lbs)



Pile Cushion

Material: _____
 Area: _____ (in²) Thickness/Sheet: _____ (in)
 No. of Sheets: _____
 Total Thickness of Pile Cushion: _____ (in)



Pile

Pile Type: _____
 Wall Thickness: _____ (in) Taper: _____
 Cross Sectional Area: _____ (in²) Weight/Meter: _____
 Ordered Length: _____ (ft)
 Design Load: _____ (kips)
 Ultimate Pile Capacity: _____ (kips)
 Description of Splice: _____

 Driving Shoe/Closure Plate Description: _____

 Submitted By: _____ Date: _____
 Telephone No.: _____ Fax No.: _____

Figure 1

Pile and Driving Equipment Data Form (From FHWA-HI-097-014)

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E-Saximeter Specifications

Physical:

Size: 100mm X 190mm X 50mm (4 inches X 7.5 inches X 2 inches)
Weight: 0.54 kg (1.19 lb.)
Temperature range: 10 to 40°C (50 to 104°F) operating
Power: built-in rechargeable battery w/ 16 hour min duration
Display: LCD, 4 Lines x 16 characters, viewing area 62 mm by 26 mm (2.5 inches by 1 inch)
Keypad: Large key (1.27 mm²), non tactile

Electronic:

32 bit CICS Micro CPU up to 50 MHz
10 bit 2 channel analog to digital converter; 8 bit 2 channel digital to analog converter
Internal microphone 70 to 115 dB Standard Type A
USB drive for data transfer
8 MB internal RAM

Functional and Other:

Maximum blow detection rate: 68 bpm for open end diesel hammers; 300 bpm for all others
Furnished with SAXLINK program for data transfer
Operates in English or SI units
Full one year warranty
Technical manual included

SPECIAL NOTE FOR STEEL PIPE PILES – FURNISH

This Special Provision shall apply to all steel pipe piling. The Pile thickness shall be as indicated in the Contract Plans. It supplements information provided in Section 604 pertaining to “cast-in-place concrete piles”, “cast-in-place piles”, “cast-in-place pile shells”, “steel pipe piles”, “steel shells” or “pile shells”, except as modified herein. Where a conflict exists between this Special Note and Section 604, the provisions herein shall govern.

Section references herein are to the Department’s 2012 Standard Specifications for Road and Bridge Construction except as noted otherwise.

1.0 DESCRIPTION. This work consists of fabricating and furnishing steel pipe piles and test piles to their final length, including constrictor plates and pile shoes of the sizes required for installation and as shown on the Contract Plans. This includes performing all other incidental work as described herein and as measured in Section 8 of this Special Note. Within these provisions “final length” has the meaning defined in Section 8.

2.0 MATERIALS.

02.01 Steel Pipe Piles, including Test Piles. Piles with wall thickness greater than 1 in. shall conform to ASTM A572, Grade 50. Piles with wall thicknesses not greater than 1 in. shall conform to either ASTM A572, Grade 50, or ASTM A252, Grade 3.

The carbon equivalency in all steel pipe piles, regardless of wall thickness, shall not exceed 0.45 percent, using the following formula from AWS D1.1 to calculate the percent carbon equivalent:

$$CE = C + (Mn + Si)/6 + (Cr + Mo + V)/5 + (Ni + Cu)/15$$

Sulfur content in all steel pipe piles shall be limited to 0.05%.

02.02 Welded Studs. Welded studs at footing connection shall conform to ASTM A108.

02.03 Pile Shoes. Conform to ASTM A 148, Grade 90/60 or ASTM A694, Grade F60.

02.04 Constrictor Plate and Stiffeners. Conform to ASTM A 572, Grade 50.

Steel in constrictor plates and stiffeners shall satisfy the same carbon equivalency and sulfur content limitations as required for steel pipes in Section 2.01 of this Special Note.

02.05 Concrete. For pipe pile concrete infill see Special Note for STEEL PIPE PILES – INSTALL.

02.06 Steel Reinforcement. For reinforcing steel in concrete infill see Special Note for STEEL PIPE PILES – INSTALL.

3.0 EQUIPMENT.

03.01 Equipment for Driving. Installation is not part of this Special Provision.

Conform to Special Note for STEEL PIPE PILES - INSTALL in the Contract Documents.

4.0 FABRICATION.

04.01 Steel Pipe Piles. Fabrication of steel pipe piles with wall thicknesses greater than 1 in. shall conform to American Petroleum Institute Specification 2B (API 2B), including dimensional tolerances. API 2B Appendix A, Supplementary Requirements SR1 through SR4, shall not apply. Spiral welded pipe (SWP) with wall thickness greater than 1 in. shall not be permitted.

Fabrication of steel pipe piles with wall thicknesses not greater than 1 in. shall conform to either: API 2B, including dimensional tolerances; or ASTM A252, including dimensional tolerances plus these additional tolerance requirements:

- Circumference: The outside circumference at any point in a length of pipe shall be within $\pm 1\%$ of the nominal circumference or within $\pm \frac{3}{4}$ in., whichever is less.
- Straightness: The straightness shall not vary more than 0.001 times the length of the pile (1/8 in. in any 10-ft length.)
- Studs for footing connection shall be field welded and tested in accordance with AWS D1.1.

04.02 Pile Shoes. Pile shoe shall consist of cast steel or machined steel open-ended, inside flange cutting shoe of the size shown on the plans. Pile shoes shall have full contact with pile cross-section at the tip of the pipe to avoid stress concentration and possible damage to the pile during installation.

04.03 Constrictor Plate and Stiffeners. Conform to Section 607 and the Contract Plans.

04.04 Welding Procedure and Operator Qualifications. Conform to API 2B.

04.05 Shop Welding. Shop welding of steel pipe piling is defined as welding performed at the pipe manufacturer's facility. Shop welding of steel pipe piles shall conform to API 2B.

04.06 Field Welding. Field welding of steel pipe piling is defined as welding performed after the material has been transported from the pipe manufacturer's facility. Field welding of pipe splices (girth welds) shall conform to the requirements of API 2B and the following:

- A. Girth welds shall be complete joint penetration welds conforming to AWS D1.1.
- B. Welds shall be located at least 12 in. away from a skelp end weld.

- C. Match marking of pipe ends at the manufacturing or fabrication facility is recommended for piling to ensure weld joint fit-up. Prior to positioning any 2 sections of steel pipe to be spliced by field welding, including those that have been match marked at the manufacturing or fabrication facility, the Contractor shall equalize the offsets of the pipe ends to be joined and match mark the pipe ends.
- D. Welds made in the flat position or vertical position (where the longitudinal pipe axis is horizontal) shall be single-vee or double-vee groove welds. Welds made in the horizontal position (where the longitudinal pipe axis is vertical) shall be single-bevel groove welds. Joint fit-ups shall conform to the requirements in AWS D1.1, Section 5.22.3.1, "Girth Weld Alignment (Tubular)," and these special provisions.
- E. For field welding limited to attaching backing rings and handling devices, the preheat and interpass temperature shall be in conformance with the requirements in AWS D1.1, Section 3.5, "Minimum Preheat and Interpass Temperature Requirements," and with AWS D1.1 Table 3.2, Category C.
- F. The minimum preheat and interpass temperature for production splice welding and for making repairs shall be 150°F, regardless of the pipe pile wall thickness or steel grade. In the event welding is disrupted, preheating to 150°F must occur before welding is resumed.
- G. Welds shall not be water quenched. Welds shall be allowed to cool unassisted to ambient temperature.

5.0 INSPECTION AND REPAIR.

Mill test reports: Furnish notarized certified mill test reports to the Engineer and Department showing that all materials furnished conform to the specifications.

Inspection and repair of welds shall conform to API 2B except Subsection 7.3 shall be modified for field splices (girth welds) as follows:

25% of each girth weld shall be examined by radiographic or ultrasonic inspection in accordance with the requirements of: Section 6, and Part E with Paragraph 6.12.3, and Part F with Paragraph 6.13.3.1, of AWS D1.1. The Engineer may select several locations on a given splice. The cover pass must be ground smooth at locations to be tested. If repairs are required in a portion of the tested weld:

1. Perform NDT on the repaired portion.
2. Perform additional NDT on untested areas on each side of the repaired portion. The length of additional NDT on each side of the repaired portion must equal 10 percent of the pipe's outside circumference.
3. After this additional 20 percent of NDT is performed, and if additional repairs are required, determine and document the total cumulative repair lengths from all NDT. If the cumulative weld repair length is equal to or more than 10 percent of the pipe's

outside circumference, then perform NDT on the entire weld.

6.0 HANDLING. Working drawings shall be submitted to the Engineer before attaching handling devices to steel pipe piling. Welds used to attach handling devices to steel pipe piling shall be aligned parallel to the axis of the pile and shall conform to the requirements for field welding specified herein. Working drawings shall include locations, handling and fitting device details, and connection details. Attachments shall not be made to steel pipe piling until the working drawings are approved in writing by the Engineer. The Contractor shall allow the Engineer 15 Business Days for review, as described for rolled steel sections in Special Note for Shop Drawings and Welding Procedures.

7.0 SUBMITTALS. Conform to Special Note for Shop Drawings and Welding Procedures. The following submittals are required:

1. Pile fabrication details
2. Pile fabrication section lengths
3. Pile field splice details and procedures
4. Constrictor plate fabrication details
5. Pile shoe fabrication details
6. Schedule for fabrication and delivery
7. Repair procedures for any fabrication defects

8.0 MEASUREMENT.

08.01 Pipe Piles - Furnish. Quantity for Furnishing Steel Pipe Piles will be measured per linear foot. Payment for the furnished piles does not include pile shoes, constrictor plates, concrete fill or reinforcement for concrete fill, but payment shall include splices and all incidental material and labor necessary to install the piles to their final length.

“Final length” is defined as:

- the distance between the PILE CUTOFF ELEVATION and the LOWEST ANTICIPATED PILE TIP ELEVATION indicated in the plans at locations where the PILE TIP ELEVATION AS DRIVEN is not deeper than the LOWEST ANTICIPATED PILE TIP ELEVATION.
- the distance between the PILE CUTOFF ELEVATION indicated in the plans and the PILE TIP ELEVATION AS DRIVEN at locations where the PILE TIP ELEVATION AS DRIVEN is deeper than the LOWEST ANTICIPATED PILE TIP ELEVATION..

08.02 Test Piles (Pipe) - Furnish. Quantity for Furnishing Steel Pipe Test Piles will be measured per linear foot. Payment for the furnished test piles does not include pile shoes, constrictor plates, concrete fill or reinforcement for concrete fill, but payment shall include splices and all incidental material and labor necessary to install the piles to their final length. “Final length” is defined as:

- the distance between the PILE CUTOFF ELEVATION and 20 feet below the LOWEST ANTICIPATED PILE TIP ELEVATION indicated in the plans at locations where the PILE TIP ELEVATION AS DRIVEN is not deeper than 20 feet below the LOWEST ANTICIPATED PILE TIP ELEVATION.

- the distance between the PILE CUTOFF ELEVATION indicated in the plans and the PILE TIP ELEVATION AS DRIVEN at locations where the PILE TIP ELEVATION AS DRIVEN is deeper than 20 feet below the LOWEST ANTICIPATED PILE TIP ELEVATION.

08.03 Pile Shoes for Steel Pipe Pile. Payment for pile shoes shall be at the contract unit price per each individual unit and shall include all material, labor and incidentals to fabricate, furnish and attach the shoes to the pile ends prior to driving.

08.04 Constrictor Plates for Steel Pipe Pile. Payment for constrictor plate shall be at the contract unit price per each individual unit and shall include all material, labor and incidentals to fabricate, furnish and attach the constrictor plates to the piles prior to driving.

9.0 PAYMENT. The Department will make payment for the completed and accepted quantities under the following:

<u>Code</u>	<u>Pay Item</u>	<u>Pay Unit</u>
24618EC	PIPE PILES (FURNISH – 72 IN - 2 IN)	LF
24618EC	PIPE PILES (FURNISH – 30 IN – 1 IN)	LF
8033	TEST PILES (FURNISH – 72 IN PIPE - 2 IN)	LF
8033	TEST PILES (FURNISH – 30 IN PIPE - 1 IN)	LF
24627EC	OPEN END INSIDE FIT CUTTING SHOE (72 IN - 2 IN)	EACH
24627EC	OPEN END INSIDE FIT CUTTING SHOE (30 IN – 1 IN)	EACH
24628EC	PILE CONSTRICTOR PLATE (72 IN - 2 IN)	EACH

Bidders are cautioned that contract quantities for bid items covered in this Special Note are based on the Department’s pre-bid estimates and are subject to increases or decreases based on the conditions encountered. Payment for authorized and accepted quantities will be at the contract unit bid price regardless of increases or decreases in quantities. The Overrun and Underrun Formulas defined in Section 104.02.02 of the Standard Specifications does not apply to the items covered in this Special Note.

SPECIAL NOTE FOR STEEL PIPE PILES-INSTALL

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1.0 SCOPE OF WORK

The following sections provide the requirements for driven steel pipe pile installation, schedule requirements for submittals, and Contractor/Department Responsibilities. The Department will not honor any proposal submitted by the Contractor to change pile types.

1.1 Driven Pipe Pile Installation Objectives and Qualifications

The scope of work includes furnishing all labor, driving equipment, ancillary equipment necessary, templates and analyses associated with installation of driven steel pipe piles as specified in this Special Note and in general accordance with Section 604 of the Standard Specifications, except as modified by this Special Note. Driven pile installation includes installing 30-inch outside diameter, open-ended steel pipe piles with driving shoes at the end bent locations and installing 72-inch outside diameter, open-ended steel pipe piles with driving shoes and internal steel constrictor plates at the approach span pier and main span pier locations per the plans, project specifications and this Special Note. Refer to the Special Note for Steel Pipe Piles-Furnish and the Special Note for Dynamic Pile Testing for additional information regarding the manufacture/fabrication and the testing of the pipe piles.

Bidders are cautioned to expect difficult subsurface conditions at this site. Bidders are encouraged to consult available geological literature including but not necessarily limited to Fairdealing and Fenton Geologic Quadrangle Maps and the U.S. Geological Survey Professional Paper 1151-H, "The Geology of Kentucky -- A Text to Accompany the Geologic Map of Kentucky", Edited by Robert C. McDowell. Additional geotechnical information may be available via the KYTC Division of Construction Procurement Website under "Project Related Information". The referenced geological literature and geotechnical information are for information only and are not contract documents. However, available subsurface data are included in the bridge plans which are contract documents.

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Dense chert and sand layers and residual chert interbedded with residual clay were encountered during geotechnical explorations. Some of this material was extremely difficult to penetrate using conventional geotechnical rotary drilling equipment with diamond-impregnated casing bits and carbide tricone roller bits. Although sand- and gravel-sized chert particles were sampled, it is possible that chert particles which are larger than gravel-sized will be encountered during the construction. Bidders are advised to factor any and all risks associated with the conditions at the site into their bids.

For the purposes of this Special Note, "Department" refers to the Kentucky Department of Highways and/or consultants acting on behalf of the Department of Highways. "Engineer" is defined in Section 101.03 of the Standard Specifications.

1.1.1 Bridge Pier Contractor's Qualifications

- 1.1.1.1 Qualifications of Bridge Pier Pile Driving Contractor or Subcontractor: Submit qualifications demonstrating that the Contractor has at least ten (10) years experience in heavy marine construction including at least three (3) projects in heavy marine construction, and including at least two (2) projects in a marine environment installing driven cylindrical piles (steel pipe or concrete shell) at least 30 inches in diameter and driven greater than 60 feet in penetration.
- 1.1.1.2 Supervisor of pier pipe pile installation: Submit qualifications showing that the Supervisor of the pipe pile installation has at least five (5) years supervisory experience within the last ten (10) years in heavy marine construction, with experience on at least two (2) projects installing driven cylindrical piles (steel pipe or concrete shell) 30 inches or larger in diameter and driven greater than 60 feet in penetration. Some or all of the experience may be with a different contractor.
- 1.1.1.3 Employ an independent testing agency for Dynamic Pile Testing. Submit qualifications of the testing agency and personnel per Section 1.3 of the Special Note for Dynamic Pile Testing.
- 1.1.1.4 Employ a Professional Land Surveyor and/or Professional Engineer licensed in the State of Kentucky with at least three (3) years experience in project survey control for projects of

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similar type and complexity, including preconstruction layout of bridge foundations and determining as-built locations and elevations of driven piles.

1.1.2 End Bent Construction Qualifications

1.1.2.1 Qualifications of Bridge End Bent Pile Driving Contractor or Subcontractor: Submit qualifications showing that the Contractor has had at least five (5) years experience pile driving construction, and at least two (2) projects installing driven cylindrical piles (steel pipe or concrete shell) of at least 15 inches in diameter and driven greater than 30 feet in penetration.

1.1.2.2 Supervisor of end bent pipe pile installation: Submit qualifications showing that the Supervisor of the end bent, open-ended, pipe piles has at least five (5) years supervisory experience with pile driving and at least two (2) projects installing driven cylindrical piles (steel pipe or concrete shell) 15 inches or larger in diameter and driven greater than 30 feet in penetration. Some or all of the experience may be with a different contractor.

1.1.2.3 Employ an independent testing agency for Dynamic Pile Testing. Submit qualifications of the testing agency and personnel per the Special Note for Dynamic Pile Testing.

1.1.2.4 Employ a Professional Land Surveyor and/or Professional Engineer licensed in the State of Kentucky with at least three (3) years experience in project survey control for projects of similar type and complexity, including preconstruction layout of bridge foundations and determining as-built locations and elevations of driven piles.

1.1.3 Install 72-inch outside diameter, open-ended, pipe piles with steel constrictor plates to the specified driving criteria at the locations and depths specified in the contract documents. Refer to the Subsurface Data Sheets in the plans and additional geotechnical information posted on the Division of Construction Procurement's website for the anticipated materials that the piles will be driven through.

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- 1.1.4 Install 30-inch outside diameter, open-ended pipe piles to the specified driving criteria at the locations and estimated depths specified in the contract documents. Refer to the Subsurface Data Sheets and additional geotechnical information posted on the Division of Construction Procurement's website for the anticipated materials that the piles will be driven through.
- 1.1.5 Perform and submit wave equation analyses per Section 1.5 of the Special Note for Dynamic Pile Testing. Dynamic testing results will be used to determine the driving criteria and control the final pile tip elevation.
- 1.1.6 Subcontract an independent pile testing firm to perform dynamic monitoring on the test piles. Provide the pile testing firm necessary assistance including, but not limited to, crane assistance and safety equipment, and safe access to the top of the piles prior to pile driving to facilitate installation and/or repair of the instruments. Refer to the Special Note for Dynamic Pile Testing for additional details. The test piles will also serve as production piles, once the test piles are accepted.
- 1.1.7 Perform layout, elevation and location survey control, provide templates and support spuds, and measurement and marking in general accordance with the requirements of Standard Specification Section 201.
- 1.1.8 Provide and perform all field and shop pile splicing per Special Note for Steel Pipe Piles-Furnish.
- 1.1.9 Perform 72-hour restrike dynamic testing on each test pile indicated on the plans. Perform restrikes on additional test piles and/or production piles as selected by the Department. The target time is 72 hours but the Department will allow these restrikes to be performed between 68 to 108 hours after end of drive and this range applies to any reference to a 72-hour restrike even if not explicitly stated. The Department will determine the need of additional restrike dynamic tests based on results of the initial restrikes. The Department will pay for additional restrikes based upon the applicable established unit prices for restrikes. The Department will pay for additional restrike dynamic tests based on the applicable established unit bid prices for restrikes.
- 1.1.10 Perform 168-hour restrikes on designated test piles, unless additional restrikes are indicated on the plans. The target time is 168 hours but the Department will allow these restrikes to be performed between 162 to 240

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hours after end of drive and this range applies to any reference to a 168-hour restrike even if not explicitly stated. Perform restrikes on additional test piles and/or production piles as selected by the Department. The Department will determine the need of additional restrikes based on results of the initial restrikes and reserves the right to add restrike testing. The Department will pay for additional restrike dynamic testing based on the applicable established unit bid prices for restrike dynamic testing.

- 1.1.11 Furnish and place reinforcing steel in the pipe piles to connect with the pile caps and fill the pipe piles with concrete as shown on the contract documents.
- 1.1.12 After completing the pipe pile cut-offs, all unused excess materials become the property and responsibility of the Contractor to legally dispose of off-site at no additional cost to the Department.

1.2 Pre-Activity Meeting

A pre-activity meeting to cover the activities in the Special Note for Steel Pipe Piles-Install and the Special Note for Dynamic Pile Testing will be scheduled and shall occur after all the submittal items in Sections 1.3 and 2.1 of this Special Note have been submitted and accepted by the Department and not later than three (3) weeks prior to commencement of pile driving testing and construction activities. As a minimum, this meeting shall be attended by representatives of the Prime Contractor and Pile Driving Sub-Contractor(s) (if applicable) including the pile driving supervisor(s), Department District personnel as designated by the Branch Manager for Project Delivery and Preservation, Central Office Construction, Geotechnical Branch, and applicable Department Consultants. No pile construction or testing activity shall be performed until the contractor's final submittals have been accepted as having satisfactorily resolved all review comments and the pre-activity meeting has been held.

1.3 Materials

1.3.1 Steel Pipe Piles

Conform to Special Note for Steel Pipe Piles-Furnish and contract drawings and specifications.

1.3.2 Driving Shoes

Fit each steel pipe pile with a driving shoe. Conform to Special Note for Steel Pipe Piles-Furnish.

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1.3.3 Constrictor Plate and Stiffeners

Pipe piles at the pier substructure locations will contain steel constrictor plates and stiffeners installed on the interior of the pipe piles as indicated in the project plans.

1.3.4 Field Splices

Conform to Special Note for Steel Pipe Piles-Furnish and applicable contract drawing details.

1.3.5 Concrete

Class A, Mod (Pipe Pile Infill) – Provide Class A Modified Concrete conforming to contract drawings and Standard Specifications.

1.3.6 Reinforcing Steel

Conform to contract drawings and Standard Specifications.

1.4 Pile Driving Equipment

1.4.1 General - Acceptance of Driving System: Furnish all accepted pile driving equipment (including the hammer, hammer cushion, drive head, pile cushion, and other appurtenances to be furnished by the Contractor). Acceptance will be based on the requirements per the Special Note for Dynamic Pile Testing. Obtain acceptance prior to mobilizing the pile-driving equipment and beginning the pile driving. Include the description for verifying hammer performance during testing and production driving.

Submit results of the wave equation analyses demonstrating that the piles can be driven to the required length and at 75 and 100% of the required nominal axial resistances (RNAR) as indicated in the plans using the selected driving system without damage to the piles.

During pile driving operations, use the accepted driving system. No changes in the driving system or equipment will be allowed unless the Contractor has submitted revised pile driving equipment data and wave equation analyses for the corresponding driving criteria and pile stresses and the Department has accepted the revised submittal.

The Department's acceptance of the pile driving equipment does not relieve the Contractor of its responsibility to drive the piles, free of

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damage, as specified in this Special Note and/or other applicable contract documents.

1.4.2 Hammers:

- 1.4.2.1 Drive the 72-inch outside diameter steel pipe piles with hammer(s) having a rated energy of at least 589,000 ft-lbs and conforming to this Special Note and the Special Note for Dynamic Pile Testing. Select the hammer(s) to suit the conditions expected to be encountered. Repair or replace any hammer system which malfunctions and results in failure to deliver the required rated energy as determined by dynamic pile testing. If repairs do not result in the hammer's ability to deliver the required rated energy, replace it with a different hammer of the same type or an alternate hammer type, as accepted by the Department at no additional cost to the Department. Use the same hammer(s) to drive the test piles and the production piles at each pier. Submersible hammers are permitted. The Department will allow the Contractor to drive the 72-inch outside diameter steel pipe piles with a smaller impact hammer (rated energy lower than 589,000 ft-lbs) to the Highest Allowable Tip Elevation indicated on the contract drawings, provided that the Contractor can show through wave equation analyses the Highest Allowable Pile Tip Elevation can be achieved with the smaller impact hammer.
- 1.4.2.2 Drive the 30-inch outside diameter steel pipe piles with hammer(s) having a rated energy of at least 100,000 ft-lbs and conforming to this Special Note and the Special Note for Dynamic Pile Testing. Select the hammer(s) to suit the conditions expected to be encountered. Repair or replace any hammer system which malfunctions and results in failure to deliver the required rated energy as determined by dynamic pile testing. If repairs do not result in the hammer's ability to deliver the required rated energy, replace it with a different hammer of the same type or an alternate hammer type, as accepted by the Department at no additional cost to the Department. Use the same hammer(s) to drive the test piles and the production piles at each end bent.

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- 1.4.2.3 The Contractor may use a vibratory hammer to initially install the top section of the piles at the piers, only if the proposed equipment and procedures are submitted in writing and accepted by the Department in writing. Do not use a vibratory hammer to advance the pile tip below a depth of 50 feet below the encountered mudline.
- 1.4.2.4 The Contractor may use a vibratory hammer to initially install the top section of the piles at the end bents, only if the proposed equipment and procedures are submitted in writing and accepted by the Department in writing. Do not use a vibratory hammer to advance the pile tip below Elevation 310 feet.
- 1.4.3 Hammer Cushions - Equip all impact driving equipment, where required, with a cushion of suitable material thickness to prevent damage to the pile or hammer and to ensure uniform driving behavior. Provide hammer cushions made of durable manufactured materials which will retain uniform properties during driving. Wood, wire rope, and asbestos hammer cushions will not be permitted. Place a striker plate on the hammer cushion to ensure uniform compression of the cushion material. The Department may inspect the hammer cushion prior to beginning pile driving and after each 100 hours of pile driving. Replace the hammer cushion when the thickness is less than 75 percent of the original cushion thickness. Include appropriate cushion material and thickness in the wave equation analyses.
- 1.4.4 Helmets – Fit piles driven with impact hammers with an adequate helmet to uniformly distribute the hammer energy to the pile head. Align the helmet axially with the hammer and pile. Fit the helmet around the pile in such a manner to prevent transfer of torsional forces during driving, while maintaining proper alignment of the hammer and pile. Cut off the pile square, and position the helmet to hold the pile in line with the axis of the hammer. Locate the helmet plane and perpendicular to the longitudinal axis of the pile to prevent eccentric impacts from the drive head.
- 1.4.5 Pile Cushion – Provide pile cushion, where required, with dimensions such that the hammer energy is uniformly distributed to the pile head, when a pile cushion is required. Include appropriate cushion material and thickness in the wave equation analyses.

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2.0 CONSTRUCTION

2.1 Submittals: Make submittals via SharePoint software in accordance with the Project requirements for submittals. The following submittals related to the installation of pipe piles shall be submitted by the Contractor as soon as possible after award notice and no later than 15 business days prior to start of the pile installation for review and acceptance by the Department, unless the submittal date is specifically addressed in a different Special Note. The Department will respond to the Contractor regarding acceptability of submittals within 10 business days. A "Business Day" is defined as any day except Saturdays, Sundays and Holidays, as defined in Section 101.03 of the Standard Specifications.

Conform to all submittal requirements of the Contract, including submitting the information specified herein:

2.1.1 Bridge Pier Construction Qualifications – Refer to Section 1.1.1

2.1.2 End Bent Construction Qualifications – Refer to Section 1.1.2

2.1.3 Sequence of Operations: Submit a Sequence of Operations Plan, showing the order and sequence for each pile installation, for review and acceptance by the Department prior to driving piles. Prepare the Sequence of Operations Plan to minimize impacts to adjacent construction and the existing bridge. Conform the Sequence of Operation Plan to the requirements in the contract plans and specifications and the Special Notes.

2.1.4 Shop Drawings: Submit shop drawings showing pipe pile sizes, drive shoe details, joint or splice details, welding, pick up points, and other items pertinent to the pile design and handling.

2.1.5 Pile Installation Equipment and Methods:
Items to be submitted as part of this section:

2.1.5.1 The manufacturer's literature, including technical and performance literature for the pile driving hammer, the cushions, and other equipment for pile driving.

2.1.5.2 The details of the monitoring system for determination of the elevation of the pile tip during and after driving.

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- 2.1.5.3 The details of equipment and procedures for clearing obstructions encountered during pipe pile installation such as drilling, jetting, augering, or excavation.
- 2.1.5.4 Provide a project hazard analysis for the pile driving operations that will be incorporated into the project safety plan that will be submitted by the Contractor.

2.1.6 Pile Design:

Items to be submitted as part of this section:

- 2.1.6.1 See Special Note for Steel Pipe Piles-Furnish for a list of required submittals regarding pipe pile manufacturing and materials.
- 2.1.6.2 Qualifications and experience of the Contractor's Licensed Professional Engineer performing the wave equation analyses conforming to the qualifications and experience outlined in the Special Note for Dynamic Pile Testing.
- 2.1.6.3 The results of calculations using wave equation analyses of piles performed by a Professional Engineer, per the Special Note for Dynamic Pile Testing, that demonstrate that the equipment, cushions and cap are capable of installing the pipe piles without damage to the pile due to driving stresses. See Special Note for Dynamic Pile Testing for further details and requirements.
- 2.1.6.4 Settlement monitoring at the End Bents is part of the causeway expansion currently under construction under a separate contract. This data is critical for determining when the end bent piles can be driven. Settlement criteria have been met at End Bent 2. Drive End Bent 1 piles after telltale readings show less than 1/8 inch (0.01 feet) of settlement over a four week period. The Department will respond regarding the driving of the end bent piles within five calendar days after reviewing the data submitted by the causeway expansion contractor.

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2.1.7. Site Plan and Pile Location Data:

2.1.7.1 Submit a Site Plan including the method to access the site (barge access, timber cribbing, any trestles, etc.), the proposed equipment laydown area, the method to secure the area from unauthorized access, the method of providing temporary support of the equipment, and methods of erosion control as required per the contract plans and specifications. The plan will be subject to the review and written acceptance of the United States Coast Guard (USCG) who will coordinate other reviews with applicable governmental agencies. The review period for this USCG review can be assumed as 30 calendar days. Extension of Contract time will be administered as prescribed in Section 108.07, unless otherwise noted. Comply with the stipulations established by the applicable governmental agencies as included in applicable permits. If requested by the permitting agencies following review of the Contractor's plan, modify the submittal and proposed methods at no additional cost to the Department. The Department will not be liable for any delay or associated costs as a result of rejection of the Contractor's submittal by the permitting agencies.

2.1.7.2 Within ten (10) days after the completion of all pile driving at each pier or end bent location including all restrikes, submit to the Department a final as-driven pile location drawing, certified by a Kentucky Licensed Professional Land Surveyor and/or Engineer. The plan shall be to scale and include the following:

2.1.7.2.1 North arrow and graphical scale.

2.1.7.2.2 Identify each pile by a separate number consistent with the Contract Documents.

2.1.7.2.3 The elevation of each pile top to the nearest one-tenth (0.1) foot prior to and after cutting it off.

2.1.7.2.4 Deviation in feet, to the nearest one-tenth (0.1) foot, of the axial center of the pile at cutoff elevation from the design location and coordinates of the final location of the axial center of the pile at cutoff elevation.

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- 2.1.7.2.5 The elevation to the nearest one-tenth (0.1) foot of the pile tip to the top of the internal steel constrictor plate after final driving.
 - 2.1.7.2.6 The deviation, to the nearest ¼-inch per foot, of the pile axis from vertical.
 - 2.1.8 Quality Control Plan for Pile Installation: Prepare a written Quality Control Plan for Pile Installation. The plan shall address all aspects of construction including materials, equipment and operations both in preparation for construction, construction, as well as related testing, monitoring and acceptance. Submit the plan to the Department for review and acceptance.
- 2.2 Pile Lengths and Order Lists:
 - 2.2.1 Furnish all piles in accordance with the Contract Documents and the Contractor's accepted submittals.
 - 2.2.2 There is no direct payment for any pile length above the cut-off elevation that the contractor requires to install the test piles or production piles. Determine the necessary test pile or pile length above the cut-off elevation depending on the Contractor's equipment, approach and schedule (i.e. means and methods) and considering potential variations in lake levels and construction schedule.
 - 2.2.3 The Department will pay the full furnish price for test piles from the cut-off elevation to 20 feet below the lowest anticipated pile tip elevation as shown in the contract plans, provided the actual accepted test pile tip elevation is between the highest allowable pile tip elevation and 20 feet below the lowest anticipated pile tip elevation.
 - 2.2.4 The Department will pay the full furnish price for production pipe piles from the cut-off elevation to the lowest anticipated pile tip elevation as shown in the contract plans, provided the actual accepted test pile tip elevation is between the highest allowable pile tip elevation and the lowest anticipated pile tip elevation.
 - 2.2.5 The contractor has an option of submitting a written request to the Engineer to order production pipe piles after test piles have been driven and revised estimated pile tip elevations and lowest anticipated pile tip

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elevations have been determined by the Engineer. If the Engineer allows the contractor to exercise this option, the furnish pipe pile pay length may be modified based on updated pile tip elevation estimates. The Department will not grant any extension of contract time for the Contractor to exercise this option.

- 2.2.6 Any splicing required to advance a test pile to 20 feet below the lowest anticipated pile tip listed in the plans or a production pile to the lowest anticipated pile tip listed in the plans will be incidental to the applicable furnish test pile or furnish pile unit price described in the Special Note for Steel Pipe Piles-Furnish. Prior to splicing it may be necessary to perform restrike dynamic testing per the Special Note for Dynamic Pile Testing to verify that the specified percentage of required nominal axial resistance and/or specified driving criteria cannot be achieved.
- 2.2.7 Stockpile any production pile or test pile cut-offs, 30-inch or 72-inch, 5 feet or longer for use as splices and maintain a written inventory of available splice lengths. No double payment for furnish pile quantity or furnish test pile quantity and no direct payment for storage and handling of these sections will be made by the Department for these stockpiled cut-off sections.
- 2.2.8 If driving test piles deeper than 20 feet below the lowest anticipated pile tip specified in the plans is required to achieve the target percentage of required nominal axial resistance, splice stockpiled cut-off sections of the appropriate pile diameter to the top of the test pile. The Department will specify the splice length, which is anticipated to be a minimum of 10 feet. "Splice Pile" (30-inch or 72-inch) payment will be per the pay item in this Special Note for each pile splice performed. Prior to splicing it may be necessary to allow the pile to set up to determine if the applicable driving criteria can be achieved. "Test Piles Install" will be per the pay item in this Special Note (30-inch or 72-inch). No payment for furnish pile will be made when stockpiled cut-offs are used.
- 2.2.9 If driving production piles deeper than the lowest anticipated pile tip listed in the plans is required to achieve the target percentage of required nominal resistance, splice stockpiled cut-off sections of the appropriate diameter to the top of the pile. The Department will specify the splice length, which is anticipated to be a minimum of 10 feet. "Splice Piles" (30-inch or 72-inch) payment will be per the applicable

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pay item in this Special Note. "Piles-Install" (30-inch or 72-inch) payment will be per the applicable pay item in this Special Note. No payment for furnish pile will be made when stockpiled cut-offs are used.

- 2.2.10 If a splice is required and no stockpile cut-offs are available to splice to the test pile or production pile, furnish additional pile of the length specified by the Department for the splice length per the applicable established furnish pile contract price (30-inch or 72-inch) in the Special Note for Steel Pipe Pile - Furnish. The full length of the furnished splice length will be paid per the appropriate contract furnish price. The test pile or production pile installed will be paid per the applicable contract install pay item based upon the actual length that the splice is driven. The splice will be paid per the applicable contract splice pay item in this Special Note.

2.3 Pipe Pile Installation

- 2.3.1 Driving Criteria for the Test Piles: Unless directed otherwise by the Engineer, drive the test piles on which dynamic testing is performed to the highest allowable pile tip elevation at the convenience of the contractor. Then, drive piles in accordance with the following installation criteria, whichever occurs first:
- 2.3.1.1 The End of Driving (EOD) Resistance is 75% of the Required Nominal Axial Resistance (RNAR) or to the Estimated Pile Tip Elevation, whichever occurs first. This assumes a setup factor (SF) of 1.33 (= 100% / 75%). This setup factor may be adjusted based on the actual setup observed as testing proceeds. Note that the percentage of RNAR and Elevation criteria are subject to change if directed by the Engineer.
 - 2.3.1.2 Driving stresses exceed 45 ksi (90% of 50 ksi yield stress) or 40.5 ksi (90% of 45 ksi yield stress).
 - 2.3.1.3 A set of 0.07 inch/blow (i.e. a blow count of 15 blows per inch) is obtained for a sustained (1 foot) length of pile penetration and the pile is driven to at least the highest allowable pile tip elevation indicated on the project plans.
 - 2.3.1.4 After prescribed waiting periods, perform Beginning of Restrike (BOR) tests on the designated test piles. The target 72-hour

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BOR resistance is 85% of the Required Nominal Axial Resistance (RNAR). The target 168-hour BOR resistance is 90% of the Required Nominal Axial Resistance (RNAR). The Department will use data from these restrrike tests to evaluate the long-term static resistance of the piles.

2.3.1.5 Unless otherwise directed by the Engineer, re-drive the test pile until the criteria is achieved in Sections 2.3.1.2 or 2.3.1.3 of this Special Note or to 18 feet below the Lowest Anticipated Pile Tip Elevation shown in the contract plans, whichever occurs first. If directed by the Engineer, perform a 72-hour (68 to 108 hours after initial drive) restrrike.

2.3.1.6 If the target percentage of RNAR at EOD or BOR condition cannot be achieved prior to achieving a pile tip elevation of 20 feet below anticipated lowest pile tip elevation, the Department will specify a splice length and direct the contractor to perform the splice and continue to drive the test pile until the specified criteria is satisfied as described in Sections 2.3.1.1 to 2.3.1.4 of this Special Note.

2.3.2 Driving Criteria for the Production Piles: Drive the production piles to the highest allowable pile tip elevation at the convenience of the contractor. Upon completion of the test pile driving and submission of the dynamic testing reports for end of drive and beginning of restrrike as the testing is completed, the Engineer will provide End of Driving (EOD) and Beginning of Restrike (BOR) driving criteria for the remaining production piles at each substructure within three business days of receiving the dynamic testing results.

2.3.2.1 At Piers 1 to 3 and Piers 7 to 9, drive the production piles below the highest allowable pile tip elevation with dynamic testing to the EOD criteria set in Section 2.3.1.1 of this Special Note or to EOD criteria established from the test pile at the given pier.

2.3.2.2 At Piers 1 to 3 and Piers 7 to 9, restrrike the production piles at 72 hours (68 to 108 hours after initial drive) after EOD with dynamic testing to the 72-hour BOR criteria set in Section 2.3.1.4 of this Special Note or to the driving criteria established from the test pile at the given pier.

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- 2.3.2.3 If the production piles at Piers 1 to 3 and Piers 7 to 9 do not achieve the 72-hour BOR criteria prior to reaching the lowest anticipated pile tip elevation, the Department will specify a splice length and direct the contractor to perform the splice and continue to drive the pile until the driving criteria is satisfied. Splices will first be made using the stockpiled cut-off sections of appropriate pile diameter.
- 2.3.2.4 At the End Bents and Piers 4 to 6, drive the production piles below the highest allowable pile tip elevation to the EOD criteria established by the Engineer from the test pile results.
- 2.3.2.5 If the production piles at the End Bents and Piers 4 to 6 do not achieve the established EOD or 72-hour BOR driving criteria prior to reaching the lowest anticipated pile tip elevation, the Department will specify a splice length and direct the contractor to perform the splice and continue to drive the pile until the driving criteria is satisfied. Splices will first be made using the stockpiled cut-off sections of appropriate pile diameter.
- 2.3.3 Inspection of Pipe Piles: Provide man- lifts, crane-lifts, or other equipment as may be required or requested. If dynamic testing or hammer blows indicate potential pile damage during driving and if directed by the Engineer, the Contractor will be required to stop driving inspect the exterior and interior portions of the pipe piles above the water surface using photographs or videos and provide the resulting documentation to the Engineer immediately. Additionally, the Contractor will be required to measure and report the elevation of the soil plug and water surface inside the pile to the Department immediately before and after each driving and/or restrike "session" that begins or ends at or below the highest allowable pile tip elevation. No pipe pile will be accepted unless the required information is submitted to and accepted by the Department.
- 2.3.4 Perform all work in this section in accordance with the accepted Quality Control Plan for the Pile Installation per Section 2.1.8 of this Special Note.
- 2.3.5 Sequence: Drive all test piles at a pier or end bent, as specified on the plans, including the restrikes, until accepted by the Department before any of the production piles at that pier or end bent are driven below the highest allowable tip elevation. Restrike indicated test piles at 72 hours and 168 hours following the end of the initial driving. The Department will provide the recommended production pile EOD and BOR driving criteria based upon the dynamic pile testing results within 3 business days of receiving the dynamic pile testing report at each substructure.

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Drive the remaining production piles below the highest allowable pile tip elevation by driving those located nearest the existing bridge first and in a sequence so as to minimize the impacts on the existing bridge foundations and to reduce the potential effects of densification on the installation of the rest of the piles within a pier.

Perform a 72-hour restrike on all test piles after the end of the initial driving and any production piles selected by the Department. At each pier and end bent location, restrike the test piles and up to two (2) production piles at 168 hours (162 to 240 hours), if selected by the Department. If a submersible hammer is planned to be used below the water surface, propose a method of measuring the pile set per blow during restrike tests for review and acceptance by the Engineer.

- 2.3.6 Cleanout: After final driving and restrike, clean out the pipe pile removing materials to the elevation shown on the Contract Drawings. Use methods as needed and appropriate, including but not limited to excavating, augering, chiseling, air-lifting or jetting to remove the materials encountered, which do not result in damage to the driven pipe pile.

At all times during excavation, maintain the water or drill fluid level inside the pipe no more than 5 feet below the surrounding lake level including during fluctuations resulting from operation of the dam. Do not dewater the interior of the pipe pile without prior acceptance by the Department.

In no case remove any materials below the constrictor plate.

Remove soil from the interior of the pipe pile to the designated level shown on the contract drawings to create a level soil surface within the pile. Remove all loose/soft silt, clay, sand, gravel and all other soil materials above the top of the designated cleanout elevation shown on the contract drawings, unless otherwise accepted by the Department.

- 2.3.7 Determination of pile resistance:

Evaluate the nominal resistance of each test pile and selected production piles using dynamic pile testing as described in the Special Note for Dynamic Pile Testing.

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2.3.8 Preparation for Driving:

2.3.8.1 Layout and Elevation and Location Control: Layout all pile locations. Establish a benchmark at each of the proposed driving locations on an object that is not influenced by surrounding lake levels to the nearest 0.1-foot, and is referenced to the project elevation datum and visible above maximum anticipated surrounding lake level.

Verify the tip elevation of driven piles to the nearest 0.1-foot relative to the project elevation datum. Confirm each pile tip elevation prior to and following pile restrike, and as required by the Engineer.

2.3.8.2 Templates: Pile driving templates or other acceptable means and methods proposed in writing by the Contractor and accepted in writing by the Engineer are deemed temporary works and are incidental to the construction of the permanent works. Include a description of the templates necessary to align and maintain the piles at their proper location and alignment in the Quality Control Plan for Pile Installation. Adjust the template(s) as necessary to prevent the tip of the piles from moving (i.e. "walking") from their planned location. Securely fix the templates using temporary spud piles and/or other appropriate bracing and supports at the option of the Contractor. Situate the template configurations and spud piles so as not to injure or displace driven piles nor interfere with pile driving or other portions of the work. Use templates or other means and methods proposed in writing by the Contractor and accepted in writing by the Engineer to maintain the pile location and verticality until all piles in the pier group have been driven at least to the highest allowable tip elevation. Ensure that the location and alignment are maintained throughout pile installation and that the tolerances in Section 2.3.9.3 are achieved until the piles are accepted and incorporated into the substructure pile cap. At the end bents, the Contractor may submit a written request to the Engineer to remove portions of the templates (or other means and method proposed in writing by the Contractor and accepted in writing by the Engineer) prior

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to acceptance of all piles in the end bent. Dismantle and remove the templates and temporary bracing, supports and spud piles in a manner so as not to damage, or misalign completed piling. Templates, bracing, supports, spud piles and other materials necessary to meet the requirements of this subsection remain the property of the Contractor. Repair any damage to the pipe piles as a result of the construction and removal of all materials necessary to meet the requirements of this subsection at no additional cost to the Department.

- 2.3.8.3 Measurement and Marking of Piles: Clearly and accurately mark all piles prior to installation at 1-foot vertical intervals and marked numerically at 5 feet vertical intervals starting at the pile tip.

Notify the Department of the total measured length of each pile and allow the Department to verify the length and accept the pile marking prior to the start of driving.

During driving, provide a graduated gauge 24 inches in length, with 1-inch increments clearly marked, and that is used as part of an elevation monitoring system situated at template (or other observable) level to allow verification of the final driving resistance for each pile driven. Secure and reference the monitoring system to an object that is not influenced by changes in surrounding lake levels.

If a submersible hammer is planned to be used below the water surface, provide a method of measuring the pile set per blow during restrike tests that is reviewed and accepted by the Engineer.

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2.3.9 Pile Driving Records:

2.3.9.1 Test Pile Driving Records: For each test pile driven, keep records of the number of blows for each foot of penetration for the entire pile and the penetration (to the nearest 1/8 inch) under the final series of blows (pile set over the last 10 hammer blows). Include the type and size of hammer used, rate of hammer operation and stroke, type and dimensions of driving helmet and cushion block in the records. Include the date, starting time, total driving time, pile location and identification number, pile type and size, "ground" or "mudline" elevation from which the pile is driven, elevation of soil within the interior of the pile above the constrictor plate, and final elevation of the pile tip and butt in the records. Indicate the elevation to which soil or interior of pipe pile was removed prior to concrete placement, volume and elevations of concrete, and pipe pile fill that was placed in the pile. Provide a copy of the records to the Engineer at the conclusion of each day's driving.

2.3.9.2 Production Pile Driving Records: Keep records for each production pile driven of the number of blows for each foot of penetration for approximately the last 10 feet of pile length (estimated upon the test pile driving results) and the penetration (to the nearest 1/8 inch) under the final series of blows to confirm the the end of driving (EOD) criteria or beginning of 72-hour restrike criteria (BOR) (pile set over the last ten (10) hammer blows and stroke, if applicable). Include the type and size of hammer used, rate of hammer operation and stroke, type and dimensions of driving helmet and cushion block in the records. Include the date, starting time, total driving time, pile location and identification number, pile type and size, "ground" or "mudline" elevation from which the pile is driven, elevation of soil within the interior of the pile above the constrictor plate, and final elevation of the pile tip and butt in the records. Indicate the elevation to which soil in the interior of pipe pile was removed prior to concrete placement, volume and elevations of concrete, and pipe pile fill that was placed in the pile. Provide a copy of the records to the Engineer at the conclusion of each day's driving.

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2.3.9.3 Driven Pile Location and Alignment Tolerances: Drive all piles at the locations and alignments shown on the Contract Drawings unless otherwise directed or accepted in writing by the Engineer. Drive piles to within an axial tolerance not to exceed 1/4-inch per foot variation from the vertical. Drive the piles such that the final position of the axial center of driven foundation piles, measured in the plane of the cut-off elevation, does not deviate from the design location by more than 6 inches. Do not manipulate the piles after driving in order to force them into a tolerable position.

Perform accepted corrective action(s), as may be required, including replacement of misaligned piles and/or furnishing materials at no additional cost to the Department. Remove, or, if space allows and as allowed by the Engineer, cut-off the misaligned piles and then redrive or replace misaligned piles to the satisfaction of the Engineer.

2.3.9.4 Pile Heave and Restriking: Determine and record the elevation of the top of each pile immediately after driving and re-striking and again after completion of the driving of all piles in the group. Redrive any pile, by either the restrike criteria or to the original tip elevation, whichever is the greater distance, which has heaved more than 0.5-inch. Restrike the piles in accordance with this Special Note.

2.3.10 Defective, Damaged or Broken Piles:

Do not subject the piles to excessive or undue injury or stresses or to splitting or excessive deformation as a result of the driving operations and procedures. Correct any defective, damaged, or broken pile(s) by one of the following methods as accepted by the Engineer:

2.3.10.1 Withdraw the pile and replace with a new, and if necessary, longer pile; or

2.3.10.2 Cut off the defective or damaged pile at an elevation accepted by the Engineer, and splice another section to provide the required final elevation.

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2.3.10.3 Perform any and all such remedial materials and work at no additional expense to the Department.

2.3.11 Pile Cut-offs:

2.3.11.1 Do not cut-off piles until all piles within a group have been checked for heave and until all required restriking has been completed to the satisfaction of the Engineer. Re-drive any piles exhibiting heave of 0.5 inches or more to the required resistance or original tip elevation, whichever is deeper.

2.3.11.2 Unless otherwise specified, cut off all piles perpendicular to the longitudinal axis of the pile at the elevations specified on the Contract Drawings. Save all applicable cut-offs per Section 2.2.7.

2.3.11.3 The cut-offs may be used in splicing or building up other piles as required until all pipe pile driving is complete. Upon completion of the work, all unused or excess materials become the property of the Contractor to be legally disposed of off-site.

3.0 METHOD OF MEASUREMENT

Bidders are cautioned that contract quantities for bid items covered in this Special Note are based on the Department's pre-bid estimates and are subject to increases or decreases based on the conditions encountered. Payment for authorized and accepted quantities will be at the contract unit bid price regardless of increases or decreases in quantities. The Overrun and Underrun Formulas defined in Section 104.02.02 of the Standard Specifications does not apply to the items covered in this Special Note.

3.1 PILES - INSTALL – 30 IN PIPE – 1 IN will be measured for payment, calculated from the bottom of pile cap elevation to the as-driven tip elevation at the end bents, inspected and accepted in accordance with the Contract Documents and/or as directed by the Engineer. Pile length from cut-off to bottom of pile cap will not be measured or paid for installation.

3.2 PILES - INSTALL - 72 IN PIPE – 1 IN will be measured for payment, calculated from the measured mudline to the as-driven tip elevation at pier locations, inspected and accepted in accordance with the Contract Documents and/or as

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- directed by the Engineer. Pile length from cut-off to mudline will not be measured or paid for installation. The mudline varies at the pier locations and will be defined as the mudline at each pile location which will be reported to the Engineer as measured by the Contractor in the presence of the Engineer.
- 3.3 TEST PILES - INSTALL - 30 IN PIPE – 1 IN will be measured for payment, calculated from the bottom of pile cap elevation to the actual driven pile tip elevation, inspected and accepted in accordance with the Contract Documents and/or as directed by the Engineer. Pile length from cut-off to bottom of pile cap will not be measured or paid for installation.
- 3.4 TEST PILES - INSTALL - 72 IN PIPE – 2 IN will be measured for payment, calculated from the measured mudline to the actual driven pile tip elevation, inspected and accepted in accordance with the Contract Documents and/or as directed by the Engineer. Pile length from cut-off to mudline will not be measured or paid for installation. The mudline varies at the pier locations and will be defined as the mudline at each pile location which will be reported to the Engineer as measured by the Contractor in the presence of the Engineer.
- 3.5 SPLICE PILES - 30 IN PIPE – 1 IN – Payment for SPLICE PILE – 30-IN PIPE – 1 IN will be at the contract unit price per each and shall include all material, labor, any cutting and incidentals to perform the splice per the project plans and the applicable section of the Special Note for Steel Pipe Piles-Furnish. Splice piles will only be applicable when the Department directs the contractor to drive the test pile to an elevation that is greater than 20 feet below the lowest anticipated pile tip elevation or directs the contractor to drive the production pipe pile to an elevation that is below the lowest anticipated pile tip elevation. Any splicing required to advance a test pile to 20 feet below the lowest anticipated pile tip listed in the plans or advance a pipe pile to the lowest anticipated pile tip elevation listed in the plans will be incidental to the applicable test pile furnish or pipe pile furnish unit price described in the Special Note for Steel Pipe Piles-Furnish.
- 3.6 SPLICE PILES - 72 IN PIPE – 2 IN – Payment for SPLICE PILE – 72-IN PIPE – 2 IN will be at the contract unit price per each and shall include all material, labor, any cutting and incidentals to perform the splice per the project plans and the applicable section of the Special Note for Steel Pipe Piles-Furnish. Splice pile will only be applicable when the Department directs the contractor to drive the test pile to an elevation that is greater than 20 feet below the lowest anticipated pile tip elevation or directs the contractor to drive the pipe pile to an elevation that

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is below the lowest anticipated pile tip elevation. Any splicing required to advance a test pile to 20 feet below the lowest anticipated pile tip listed in the plans or advance a production pipe pile to the lowest anticipated pile tip elevation listed in the plans will be incidental to the applicable test pile furnish or pipe pile furnish unit price described in the Special Note for Steel Pipe Piles-Furnish.

4.0 PAYMENT

Payment will be made under:

BID ITEM CODE	ITEM	UNIT
08033	TEST PILES - INSTALL - 30 IN PIPE -1 IN	LF
08033	TEST PILES - INSTALL - 72 IN PIPE - 2 IN	LF
24618EC	PILES – INSTALL - 30 IN PIPE -1 IN	LF
24618EC	PILES – INSTALL - 72 IN PIPE – 2 IN	LF
24618EC	SPLICE PILES – 30 IN PIPE – 1 IN	EACH
24619EC	SPLICE PILES – 72 IN PIPE – 2 IN	EACH

SPECIAL NOTE FOR STEEL ERECTION - ARCH SPAN

1.0 DESCRIPTION. This work shall consist of fabricating, furnishing and installing the arch span superstructure, including tied arch rib, tie girder, knuckle, hanger attachments, floor beams, stringers and bracing. (Note: This work does not cover fabrication and installation of the arch hanger system, which is covered under Special Note for Bridge Strand Hangers.)

Materials and workmanship shall be in accordance with the KYTC Standard Specifications for Road and Bridge Construction, 2012 Edition (KYTC); AASHTO/ AWS D1.5M/D1.5 “Bridge Welding Code”; AWS D1.1/D1.1M “Structural Welding Code – Steel”; the Contract Drawings; and this Special Note.

Where a conflict exists between this Special Note and KYTC Section 607, the provisions herein shall govern.

2.0 MATERIALS. Materials shall conform to the Contract Drawings and KYTC Section 607.

3.0 ERECTION ANALYSIS AND STABILITY.

3.1 Steel Erection Responsibility. The stability of the structure during erection, and the final geometry of the structure, is the responsibility of the Contractor. The Contractor shall retain an erection engineer for the purpose of evaluating the stability, state of stress and geometry of the structure during and after erection. The contractor should retain a wind specialist to evaluate wind loads during construction which are appropriate for the proposed erection scheme chosen. The Contractor shall erect the bridge in a safe manner without over stressing the structural components during erection and shall leave the structure in a state of stress compatible with the design.

Structural steel shall be in conformance with KYTC Section 607. Steel erection shall be in conformance with the AASHTO/NSBA “Steel Bridge Erection Guide Specification”, S10.1-2007.

3.2 Conceptual Erection Sequence. The assumed erection sequence, as described in the General Note “Arch Erection and Camber” in the Contract Drawings, is that the arch rib, tie, bracing and floor system is constructed on blocking in the “no-load condition” with four bearing support points. The blocking is assumed to be removed only after the superstructure steel is completely erected. This would require floating in of the completed steel superstructure for placement on top of Piers 4 and 5. The Contractor may choose and develop any sequence that can safely erect the bridge without overstress or damage to the structural steel. The design of any necessary shoring / falsework and its foundations is the responsibility of the contractor.

3.3 Arch Erection And Camber. In addition to the full analysis of the completed structure, load capacity and stability of the main span arch structure has been verified for the completely erected steel superstructure, prior to deck placement. The General Note “Arch Erection and Camber” details the assumed erection and deck pour sequence that is

consistent with the camber diagrams shown on the Contract Drawings and the load capacity of the fully-erected structure. No provision in either the camber or structural capacity of the members has been included for erection stresses.

The load capacity and stability verification of a partially completed arch span in the various stages of erection prior to installation of all steel members is the responsibility of the Contractor. The Contractor shall evaluate the partially completed structure in accordance with the same design provisions used for the permanent structure except as indicated herein. Wind loads for the final structure are given on the Contract Drawings and are based on a project specific wind study and wind tunnel testing performed by RWDI and corresponds to a mean hourly wind speed of 69.6 mph at deck level. During construction, wind loads are predicted to correspond to a 10-year mean hourly velocity of 60.5 mph at the deck level. The RWDI report did not evaluate any construction stage configuration of the arch. The contractor should retain a wind specialist to evaluate wind loads during construction which are appropriate for the proposed erection scheme chosen.

No uplift at bearings shall be allowed in any construction phase.

3.4 Changes to the Structure. Any changes to the structural steel system shown in the Contract Plans require reanalysis for load capacity and stability for both construction and permanent load conditions, including seismic. Diaphragm action of the stay-in-place forms shall be neglected in all analyses.

Dead load deflection, camber and stringer haunch thickness are based on the erection and slab pouring sequences as described in the General Note “Arch Erection and Camber” and as shown in the plans. Any deviation from this sequence will need to be evaluated by the Contractor’s engineer to determine the effect on camber, dead load deflection and structural member stresses. This evaluation must be submitted to the Engineer for review and approval by the Engineer of Record.

4.0 QUALIFICATIONS AND SUBMITTALS.

4.1 Erector Qualifications. Structural steel shall be erected by a qualified, competent erection contractor. To establish qualification the erection contractor shall submit to the Department proof of their experience on previous projects of equivalent complexity which, at a minimum, include the following:

- A) Any one lift using two or more cranes/derricks/poles,
- B) Steel spans over water or active railroad/rapid transit tracks,
- C) Erection with floating equipment,
- D) Field splicing primary members while held in place by erection equipment

The Department shall determine whether the submitted evidence is satisfactory to establish qualification and competency.

4.2 Erection Procedure.

General. The Contractor shall submit a detailed erection procedure to the Engineer for each bridge structural unit, prepared and sealed by a professional engineer

licensed in Kentucky. The professional engineer who prepares the erection procedure and calculations shall have experience in steel erection of similar size, complexity, and scope. The procedure shall address all requirements for erection of the structural steel into the final designed configuration and satisfy all written comments from the Engineer of Record and the Department or its agents prior to the start of erection. The procedure, as a minimum, shall include the following information:

Drawings.

- A) Plan of the work area showing permanent support structures (piers and abutments), roads, waterways (including navigational channel), overhead and underground utilities, and other information pertinent to erection.
- B) Erection sequence for all members noting any temporary support conditions, such as holding crane positions, temporary supports, falsework, etc. Member reference marks, when reflected on the erection plan, should be the same as used on shop detail drawings.
- C) Primary member delivery location and orientation.
- D) Location of each crane for each primary member pick, showing radius and crane support (barges, mats, etc.).
- E) Capacity chart for each crane configuration and boom length used in the work.
- F) Center of gravity locations for primary members.
- G) Detail, weight, capacity, and arrangement of all rigging for primary member picks.
- H) Lifting weight of primary member picks, including all rigging and pre-attached elements.
- I) Details of any temporary lifting devices to be bolted or welded to permanent members, including: method and place (shop or field) of attachment; capacity; and method, time and crew responsible for removal.
- J) Bolted splice assembly requirements.
- K) Lifting/handling procedure for any primary member that has a lifted length-to-width ratio (l/b) greater than 85.
- L) Blocking details for bridge bearings.

Calculations.

- A) Design calculations indicating the load capacity and verifying the stability of temporary supports for structure and crane(s) for each pick and release.
- B) Calculations to substantiate structural adequacy and stability of all steel members for each step of bridge assembly, including documentation of the wind loads and other construction loads assumed to be applied.
- C) Calculations to verify adequate capacity of contractor-fabricated rigging such as lift beams, welded lugs, spreader beams, beam clamps, etc. Submit manufacturers' certification or catalog cuts for pre-engineered devices.
- D) Geometrical information that will be used to monitor the structure during erection to ensure that the final geometry of the structure is as indicated on the plans.

SPECIAL NOTE FOR STAINLESS STEEL REINFORCEMENT

1.0 DESCRIPTION. The Contractor shall use stainless steel reinforcement bars in the concrete deck slab, curb, and sidewalk, as indicated in the plans. Reinforcement bars shown in the Plans marked with the suffix "SS" shall be stainless steel as described herein.

The work shall be performed in accordance with the applicable requirements of sections 602 and 811 of the standard specifications.

2.0 MATERIALS.

Grade and Type: The Contractor shall supply test results certifying that the materials conform to Grade 60 or 75 deformed reinforcement bars per ASTM A955, including the annex, and must conform to one of the following UNS designations; S24100, S32205, S32304, S20910, S30400, S31603, S31653, S32101, S32201, or S31803.

All bars shall be of the same UNS designation.

Chemical Composition: Material shall conform to that specified in ASTM A276, Table 1, Chemical Requirements.

Heat Treatment: Bars may be furnished in one of the heat treatment conditions listed in ASTM A955, and as needed to meet the requirements of this specification.

Finish: Bars are to be supplied free of dirt, mill scale, oil, and debris by pickling. Bars shall be fabricated and bent using equipment that has been thoroughly cleaned or otherwise modified to prohibit contamination of the stainless steel from fragments of carbon steel or other contaminants.

Reinforcing bars displaying rust/oxidation, questionable blemishes, or that deviate from round shall be subject to rejection.

Bending: Bending shall be performed in accordance with Section 602 of the Standard Specifications and ASTM A955.

Manufacturers: Manufacturers shall be selected from "Reinforcing Steel Manufacturers" listed in KYTC's "List of Approved Materials" (<http://transportation.ky.gov/materials/pages/List-Of-Approved-Materials.aspx>). The Contractor is responsible for ensuring that all materials supplied meet the Contract requirements.

Fabricators: Fabricators shall be selected from "Reinforcing Steel Fabricators" listed in KYTC's "List of Approved Materials" (<http://transportation.ky.gov/materials/pages/List-Of-Approved-Materials.aspx>).

Control of Material: Samples for testing shall be supplied to the KYTC Materials Laboratory for testing, generally following applicable provisions of KM-101. One sample per heat per bar size shall be supplied. Each sample shall consist of two five-foot-long specimens.

Mill Test Reports: Reports shall be provided for the Project and shall:

1. Be from the supplying mill verifying that the stainless reinforcement provided has been sampled and tested and the test results meet the Contract requirements;
2. Include a copy of the chemical analysis of the steel provided, with the UNS designation, the heat lot identification and the source of the metal if obtained as ingots from another mill;
3. Include a copy of tensile strength, yield strength and elongation tests on each of the sizes (diameter in millimeters) of stainless steel reinforcement provided.
4. Permit positive determination that the reinforcement provided is that which the test results cover.
5. Include a statement certifying that the materials are being melted and manufactured in the United States.

3.0 CONSTRUCTION.

Methods: Construction methods shall conform to Section 602 of the Standard Specifications except as modified below:

Ship, handle, store, and place the stainless steel reinforcement bars according to the applicable provisions with the following additions and exceptions:

1. Prior to shipping ensure that all chains and steel bands will not come into direct contact with the stainless steel reinforcement bars. Place wood or other soft materials (i.e., thick cardboard) under the tie-downs. Alternatively, use nylon or polypropylene straps to secure the stainless steel reinforcement bars.

The ends of the test pieces shall be socketed with sockets of the same design as those proposed for use in the construction. The strands, in single part tests, shall develop a minimum ultimate strength equal to the value stipulated in the applicable ASTM specification for the material being used and for the size of strand or rope specified. If, after six or more tests of straight strand of each size have been made, the Engineer and KYTC find that the strength and elasticity have sufficient uniformity, one test on a straight strand of each size may be made thereafter from each manufactured length of strand of each size, instead of one from each prestressed length. The strand shall show a well-defined and uniform elastic stretch and recovery after prestressing.

C. Hanger Assemblies. The Contractor shall prepare at least two (2) specimens of hanger of each strand size, at least 25 diameters long, with sockets (selected at random from those prepared for use) attached to each end, and these specimens shall be stressed to destruction. Under this test, the specimens shall develop the ultimate strength. Material and method of socketing shall be the same for both the tests and the actual hanger strand. The sockets in every instance shall be of sufficient strength to produce failure in the strand material. Sockets used for the tests may not be reused in the actual construction.

If an assembly should fail in the anchorage of the strand in the socket, or if a socket should break or otherwise fail at less than the specified ultimate load during the tests, six (6) additional assemblies shall be fabricated and the tests repeated. If one or more sockets fail during additional tests, the entire lot shall be rejected and new sockets furnished and tested.

Certified test reports covering all the tests specified shall be furnished to the Engineer and KYTC. No claims for delay will be considered for testing or failure to submit required testing documentation in a timely manner.

Shop Inspection. The Engineer reserves the right to visit the manufacturer's fabrication shop for purposes of inspecting the manufacturing, assembly and testing of the hanger assemblies.

6.0 IDENTIFICATION, STORAGE & HANDLING. Identification marks shall be used on the strand to facilitate erection and the Contractor shall use suitable means to protect the strands in transit and during the handling and erection. Strands shall be properly coiled or rolled on reels. Any kinked or damaged strand will be rejected. Straightening of bent wires will not be permitted.

7.0 INSTALLATION. Hangers shall be installed so that the strands at each panel will be equally stressed. Necessary adjustment shall be provided through the use of threaded sockets.

The hanger strand shall be erected with sockets in the same relative position to each other as when the strands were measured and the sockets installed, with the markings along the length of the strand in a straight line.

Spacers shall be located at the intersection of network hangers. Spacers shall incorporate an elastomeric element for purposes of providing a degree of damping and shall hold the individual ropes or strands of each hanger in their correct geometric relationship.

The Engineer will confirm the procedure, opening and alignment prior to concrete placement. After confirmation, remove the finger plates or sliding plates before concreting. Cast and cure the expansion joint breakout per KYTC specifications. Place concrete under the expansion dams, vibrate until the concrete is forced through air holes, and strike off excess concrete. After the concrete has cured, clean air holes and fill with an approved sealer.

Install the fabric trough and the finger or sliding plates according to the Contract Documents and shop drawings. Do not splice the drain trough, unless indicated. If splices are indicated, use splices vulcanized by the manufacturer. Do not use longitudinal splices.

7.0 SUBMITTALS. Submit shop drawings, for each location, type and model of expansion device used. Shop drawings shall include, but not be limited to, the following:

- A. Complete details of all components and sections showing all materials used in the expansion joints.
- B. A listing of all applicable KYTC, ASTM and AASHTO specifications.
- C. Name and address of the manufacturer, and location of the fabrication plant.
- D. Name and telephone number of the manufacturer's representative who will be responsible for coordination of production, inspection, sampling and testing.
- E. Welding procedures used in the expansion joint assembly manufacture clearly described and detailed.
- F. Table of longitudinal offsets for installation at varying temperatures. Use 60°F as the mean temperature.

Joint shop drawings and neoprene trough shop drawings shall be coordinated to ensure that joints and troughs will fit when field assembled. Fabrication shall not commence until the approved shop drawings are in the hands of the Inspector and fabricator and the Engineer has authorized fabrication.

8.0 MEASUREMENT. Quantity for Finger Expansion Joint will be measured per linear foot from inside face of north traffic railing to inside face of pedestrian railing curb. The unit price for Finger Expansion Joint will be full compensation for furnishing, fabricating, installing structural steel tooth plates, roadway joint seals, drainage troughs, catch basins, downspouts, sidewalk plate, barrier and curb cover plates and all material, labor, equipment, tools and incidentals necessary to complete the work as specified in the Contract Documents.

9.0 PAYMENT.

<u>Code</u>	<u>Pay Item</u>	<u>Pay Unit</u>
23859EC	FINGER EXPANSION JOINT	LF

Any proposed corrective procedure shall be submitted to the Engineer for approval before corrective work is begun.

8.0 SUBMITTALS. The Contractor shall submit details of the MBS to be used together with installation and waterproofing plans to the Engineer for approval prior to fabrication of the MBS.

The shop plans shall include, but not be limited to the following:

- plan and section views of the MBS for each movement rating and roadway width, showing dimensions and tolerances.
- all center beam/support bar joints and all shop and field splices
- complete details of all components and sections showing all material incorporated into the MBS
- all ASTM, AASHTO or other material designations
- welding procedure specifications
- corrosion protection system
- method of installation, including, but not limited to: sequence; installation gap setting for various temperatures; support during placement of the concrete; lifting locations and lifting mechanisms; and installation at curbs
- temperature adjustment devices and opening dimensions relative to installation temperature
- any required changes to the blockout reinforcement in order to accommodate the MBS. The design and detail of the reinforcing steel shall meet or exceed the minimum requirement provided in the design plans.
- design calculations in accordance with Section 3 of this Special Note

The Contractor shall also submit the following test reports and certificates for review and approval:

- Manufacturer's certificate of compliance with the AISC Quality Certification Program, Simple Steel Bridges.
- Certification that welding inspection personnel are qualified and certified as welding inspectors under AWS QC1, Standard for Qualification and Certification of Welding Inspectors. Documentation that any personnel performing nondestructive evaluation (NDH) are certified by ASNT.
- Manufacturer's certificate of compliance for the PTFE sheeting or fabric.
- Certification that MBS passed the Prequalification Tests required in Section 1.3.
- Certification that the bearings, springs, and equidistant devices are the same formulation, manufacturer and configuration that were used in the Prequalification Tests required in Section 1.3. In each certification, the name and address of the Manufacturer of the springs, bearings and equidistant devices shall be provided.

The Contractor shall submit for the Engineer's approval a written maintenance and part replacement plan prepared by the joint manufacturer. This plan shall include a list of parts and instructions for maintenance inspection, acceptable wear tolerances, methods for determining wear, and procedures for replacing worn parts.

Contractor shall submit details of the barrier rail conduit expansion fitting in conjunction with the modular joint barrier rail cover plate details for review and acceptance.

Fabrication shall not commence until the approved shop drawings are in the hands of the Inspector and fabricator and the Engineer has authorized fabrication.

9.0 MEASUREMENT. Quantity for Modular Expansion Joint will be measured per linear foot from inside face of north traffic railing to inside face of pedestrian railing curb. The unit price will be full compensation for furnishing, fabricating and installing MBJS, including sidewalk plate and all barrier and curb cover plates, and all material, labor, equipment, tools and incidentals necessary to complete the work as specified in the Contract Documents.

10.0 PAYMENT.

<u>Code</u>	<u>Pay Item</u>	<u>Pay Unit</u>
24610EC	MODULAR EXPANSION JOINT	LF

SPECIAL NOTE FOR STRUCTURE LIGHTNING PROTECTION

Marshall - Trigg Counties
US 68/KY80 Bridge over Kentucky Lake – Drawing No. 24686

1.0 DESCRIPTION AND SCOPE OF WORK

- 1.1 Perform all work in accordance with the Kentucky Transportation Cabinet, Department of Highway's 2008 Standard Specifications for Road and Bridge Construction and applicable Supplemental Specifications, the Standard Drawings, this Note, and the attached detail drawings. Section references are to the Standard Specifications.
- 1.2 This work shall include the design, furnishing and installation of a complete structure lightning protection system on the entire bridge. At a minimum the following work is included:
 - 1.2.1 Design of a Lightning Protection System meeting the requirements of the Specifications, Plans and this Special Note.
 - 1.2.2 Preparation and submittal for approval of shop drawings for Structure Lightning Protection System.
 - 1.2.3 Furnishing all labor, materials, tools, and equipment necessary for installation of Structure Lightning Protection System.
 - 1.2.4 Any other work specified as part of this contract.

2.0 GENERAL

The Structure Lightning Protection for the bridge shall be in accordance with the latest edition of ANSI/NFPA 780-2011 lightning protection installation standards, ANSI/UL 96 lightning protection components and UL96A installation requirements for lightning protection systems. Protection shall include, but not be limited to air terminals, bonding, interconnecting conductors, and grounding as required under the provisions of UL 96A, NFPA 780, and as specified in excess of the referenced standards herein.

3.0 DESIGN

- 3.1 The contractor shall design and prepare calculations, and shop drawings for the Structure Lightning Protection System. All design documents shall be stamped by a Professional Engineer registered in the State of Kentucky. Design calculations and shop drawings shall be submitted to the engineer for review and approval. The contractor shall receive engineer's approval prior to purchasing any materials or equipment for the Structure Lightning Protection System.

- 3.2 The Lightning Protection System shall be designed to continue to function

after the design seismic event.

- 3.3 The structure shall be bonded at each of the main bearings at each Pier and at End Bents 1 & 2. An insulated grounding conductor shall be run inside the bridge piers and exothermically connected to the bridge steel piles. At each end bents, a separate grounding conductor shall be run in FRE Conduit down the face of the pier and to the ground rods.
- 3.4 No welding will be allowed on any arch members or plates designated as fracture critical. All other welding must be approved by the Engineer. Only welding as shown on the approved shop drawings will be allowed.

4.0 MATERIALS

- 4.1 All materials shall comply in weight, size and composition with the requirements of the Underwriters' Laboratories, Inc., the National Fire Protection Association Code and OSHA relating to the height of the structure.
- 4.2 All rods, cables, ground rods, and connectors used in the system shall carry an UL Label "A" & "B" and all lightning air terminals shall carry the Manufacturer's name.
 - 4.2.1 Conductors: Conductors shall consist of commercially pure copper cable, sized in accordance with NFPA Code.
 - 4.2.2 Conductor Fasteners: Conductor fasteners shall be an approved type of noncorrosive metal having ample strength to support conductor.

5.0 INSTALLATION

- 5.1 General
 - 5.1.1 All ungrounded sizable metallic objects within 6' of the arch or metal connected to the arch, railings barrier rails etc. shall be bonded to the system with approved fittings and conductors.
 - 5.1.2 Copper materials connecting to steel shall be lead-coated.
 - 5.1.3 Connection between metals shall be made with approved exothermic welds.
 - 5.1.4 All materials shall be fastened to eliminate any possibility of displacement and subsequent maintenance.

5.2 Air Terminals

5.2.1 Air terminals shall be approved type extending not less than 10 inches above the top chord of the arch and shall be securely anchored.

5.2.2 Air terminals shall not extend higher than 24 inches except with individual approval or as required by OSHA. Terminals 23 inches and less shall be spaced 20 feet apart.

5.2.3 Terminals 24 inches and higher shall be spaced 25 feet apart or as required by codes.

5.3 Conductors: Conductors shall be run concealed.

5.4 Conductor Fasteners: Space 3'-0" O.C. max.

5.5 Ground Connection

5.5.1 Drive to the required depth to reach permanent moisture but in no case less than 11'-6". In case of rock ledge or other conditions making compliance impossible, trench or other grounding will be permitted, providing it will pass UL requirements.

6.0 MEASUREMENT

Structure Lightning Protection. Measurement will be lump sum and include the design, shop drawing preparation, and installation of the Structure Lightning Protection.

7.0 PAYMENT

Structure Lightning Protection. Payment at the contract unit price is full compensation for all work required by this note including the design, prepare shop drawings, and to provide all materials, labor, equipment, tools, and incidentals necessary to complete the work as specified by this note. Apportion accordingly to the work involved in respective units.

Payment will be made under:

BID ITEM CODE

23868EC

STRUCTURE LIGHTNING PROTECTION

LS

The Department will consider payment as full compensation for all work required by this note.

SPECIAL NOTE FOR REMOVAL OF EXISTING BRIDGE

1.0 DESCRIPTION. The Contractor shall remove the existing Eggner's Ferry Bridge structure to the limits indicated on the plans in accordance with KYTC Standard Specification Section 203 "Removal of Structures and Obstructions" and the following special note. Where a conflict exists between these special notes and Section 203, the provisions in these special notes shall govern.

2.0 CONSTRUCTION. Special conditions within the project permits relate to demolition and removal of the Eggner's Ferry Bridge. Comply with the conditions stated in all permits. Bridge decks are a habitat of the Grey Bat. Perform demolition of the bridge deck between November 15th and March 15th of the same winter season.

Take ownership and dispose of all materials removed with the exception of the Span 'E' Truss.

Existing span 'E' is identified as the parallel chord truss replacement superstructure erected in 2012 after a vessel collision collapsed the original span. Salvage the steel superstructure truss of existing span 'E'. After removing the bridge deck slab from the structural steel, lower the truss Span 'E' intact onto a barge and transport to the Eddyville Port Authority for storage. The Span 'E' truss shall remain the property of the Department.

Obtain a lease for the Department with the Port for a period of six months, on a monthly basis. The lease shall be in the Department's name. If the Port is unavailable to store the steel span, or if the terms of the Lease are unacceptable to the Department, the Contractor shall coordinate with other potential storage location property owners and with the Department to secure an alternate lease.

The representation of existing bridge on plan sheets is for information only. The contractor is referred to the existing bridge plans to determine approximate quantities for removal. The contractor is responsible for location and protection of all existing utilities.

The production of the demolition plan and procedures is the responsibility of the contractor. The demolition plan must clearly demonstrate the safety and feasibility of all proposed operations. All submittal components must be sealed by a professional engineer licensed in the Commonwealth of Kentucky.

Obtain all necessary licenses, training and permits for the handling of and use of explosives, if used.

Blasting of superstructure steel truss spans with explosives will be acceptable to the Department.

The use of explosives under water may or may not be acceptable to all governing agencies. The Contractor shall obtain all necessary permits, licenses, certifications, etc. for use of explosives. The Contractor shall contact the appropriate governing agencies prior to the use of explosives and provide confirmation to the Department that the necessary permits, licenses, certifications, etc. have been obtained.

Submit the demolition plan to the Engineer six months prior to scheduled demolition.

The engineer will coordinate submission to the United States Coast Guard. Do not proceed with demolition until the engineer has received a copy of written acceptance of the demolition plan from the United States Coast Guard. Do not proceed with demolition until the demolition plan is returned by the Engineer as approved by the United States Coast Guard.

Schedule the removal of those trusses and piers obstructing the navigation channel to occur as the first activities. This is not intended to preclude the Contractor from also working at

SPECIAL NOTE FOR INTERMEDIATE MILESTONES

INTERMEDIATE MILESTONES - The following intermediate milestones are specified for this contract with the following dates:

- **Bridge Open to Traffic: November 15, 2015**
- **Removal of Existing Bridge Deck: March 15, 2016**
- **Removal to Clear the Navigation Channel: June 15, 2016**

The **Bridge Open to Traffic** milestone is defined as the condition that exists when bridge and roadway work is sufficiently complete to provide a minimum of two lanes open to traffic on the new bridge, with both directions open to traffic at all times, including the following:

1. Each direction shall have a minimum of one 11 ft. lanes, a 2 ft. outside shoulder and, if divided from opposing traffic shall also have a 2 ft. inside shoulder,
2. The full width of bridge deck shall be cast and completed including overlays where applicable,
3. Painting of all Arch Span structural steel,
4. All safety features shall be in place including but not limited to guardrail, all traffic barriers except portions noted below, signs, and pavement markings.
5. After the new bridge is open to traffic, the existing bridge shall be permanently closed to the public.

Work not required to be completed by the Bridge Open to Traffic date includes:

6. Items related to the multi-use path not on bridge,
7. Painting of Approach Spans structural steel,
8. pedestrian railings,
9. metal rails and posts of traffic barrier if traffic is protected by temporary barrier,
10. path delineation lighting,
11. arch aesthetic lighting,
12. parking areas, and
13. seeding.

As approved by the Engineer, short-term temporary lane shifts to complete minor punch list items after the Bridge Open to Traffic date may be allowed.

An incentive of \$20,000 per calendar day will be paid for each day, or portion thereof, that the work associated with this milestone is completed earlier than the Bridge Open to Traffic date. The maximum incentive payment for this milestone will be \$1,500,000.

If the work associated with this milestone is not complete on or before the Bridge Open to Traffic date, no incentive will be paid and only disincentive fees will apply.

A disincentive fee of \$20,000 per calendar day, or portion thereof, will be assessed for this milestone. There will be no maximum disincentive fee.

The **Removal of Existing Bridge Deck** milestone is defined as the condition that exists when the concrete bridge deck from end bent to end bent on the Eggners Ferry Bridge has been completely demolished and removed from the structure.

The **Removal to Clear the Navigation Channel** milestone is defined as the condition that exists when the Span B truss, Span C truss, Span D truss, and those two piers between the above Spans have been demolished and removed. Work not required to be completed by the Removal to Clear the Navigation Channel date includes: removal of the Span A truss, Span E truss, Span F Truss, removal of the approach spans stringers, removal of the other piers, removal of end bents, disposal of demolished material and transport of Span 'E' to storage. The Navigation Channel will be determined to be cleared when the Engineer has authorized the Helper Boat to be demobilized, according to Section 6.0 of the Special Note for Helper Boat.

An incentive of \$5,000 per calendar day will be paid for each day, or portion thereof, that the work associated with this milestone is completed earlier than the Removal to Clear the Navigation Channel date. The maximum incentive payment for this milestone will be \$250,000.

If the work associated with this milestone is not complete on or before the Removal to Clear the Navigation Channel date, no incentive will be paid and only disincentive fees will apply. A disincentive fee of \$5,000 per calendar day, or portion thereof, will be assessed for this milestone. There will be no maximum disincentive fee.

The maximum cumulative total of all incentive payments in this contract will be \$1,750,000.

Disincentive fees and liquidated damages will be cumulative.

The Project Completion Date is September 30, 2016.

U.S. Department of
Homeland Security

United States
Coast Guard



Commander
Eighth Coast Guard District

1222 Spruce Street, Room 2.102D
St. Louis, MO 63103-2832
Staff Symbol: dwb
Phone: (314) 269-2382
Fax: (314) 269-2737
Email: david.a.orzechowski@uscg.mil
www.uscg.mil/d8/westernriversbridges

16593.22/41.7 TNR
November 4, 2013

Mr. Michael P. McGregor, P.E.
Transportation Branch Manager
for Project Development
Office of Highway District One
5501 Kentucky Dam Road
Paducah, KY 42003

Subj: EGGNERS FERRY BRIDGE REPLACEMENT, MILE 41.7, TENNESSEE RIVER

Dear Mr. McGregor:

Your application requesting approval of the location and plans for a proposed bridge at mile 41.7 over the Tennessee River has been approved. Bridge Permit (11-13-8) dated October 28, 2013 is enclosed.

It is essential that we be kept informed of any events that could affect navigation during construction of the bridge. A representative from your office should be specifically instructed to keep our office informed of the progress of construction with particular reference to any and all events that may have an effect on navigation. The information received regarding the work will be disseminated to mariners by radio and written notices.

Your attention is directed to Condition (2) of the permit that requires plans for cofferdams, temporary causeways, work bridges, falsework bents, or any other temporary structures that will be placed in the water to facilitate construction of this bridge to be approved by this office. Construction of this bridge must be accomplished with minimal interference with navigation. To this end, construction schedules, plans and erection schemes should be submitted to us at the earliest possible time so that approval can be assured prior to commencing work.

Navigation lights and retro-reflective panels for the bridge are prescribed in enclosure (2a). The lights and reflective panels, prescribed in accordance with Title 33, Code of Federal Regulations, Part 118, shall be installed at the locations and in the manner shown in enclosure (2b), which is a marked-up copy of the permit drawings.

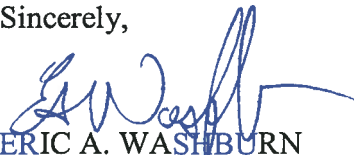
You are required by Condition (6) of the Permit to install vertical clearance gauges. The gauges shall be installed as prescribed in enclosure (3) which is a copy of Coast Guard instructions for installing vertical clearance gauges on bridges.

Subj: EGGNERS FERRY BRIDGE REPLACEMENT,
MILE 41.7, TENNESSEE RIVER

16593.22/41.7 TNR
November 4, 2013

Please acknowledge receipt of the Permit. If you have any questions concerning our jurisdiction or requirements, you can contact David Orzechowski at 314-269-2382.

Sincerely,



ERIC A. WASHBURN
Bridge Administrator, Western Rivers
By direction of the District Commander

Enclosures: (1) USCG Bridge Permit (11-13-8), dtd October 28, 2013 w/approved dwgs
(2) a. Navigation Lights Narrative
b. Navigation Lighting Scheme
(3) Vertical Clearance Gauge Requirement

Copy: USCGC CIMARRON w/o encls
SECTOR OHV w/o encls
MSU Paducah w/o encls
CDRUSAED Nashville w/encl (1)

U.S. Department of
Homeland Security

United States
Coast Guard



BRIDGE PERMIT

2 8 OCT 2013

(11-13-8)

WHEREAS by Title V of an act of Congress approved August 2, 1946, entitled "General Bridge Act of 1946," as amended (33 U.S.C. 525-533), the consent of Congress was granted for the construction, maintenance and operation of bridges and approaches thereto over the navigable waters of the United States;

AND WHEREAS the Secretary of Homeland Security has delegated the authority of Section 502(b) of that act to the Commandant, U.S. Coast Guard by Department of Homeland Security Delegation Number: 0170.1;

AND WHEREAS before construction is commenced, the Commandant must approve the location and plans of any such bridge and may impose any specific conditions relating to the construction, maintenance and operation of the structure deemed necessary in the interest of public navigation, such conditions to have the force of law;

AND WHEREAS the - COMMONWEALTH OF KENTUCKY - has submitted for approval the location and plans of a bridge to be constructed across the Tennessee River (Kentucky Lake) between Aurora and The Land Between The Lakes, Kentucky;

NOW THEREFORE, This is to certify that the location and plans dated 2 July 2013 are hereby approved by the Commandant, subject to the following conditions:

1. No deviation from the approved plans may be made either before or after completion of the structure unless the modification of said plans has previously been submitted to and received the approval of the Commandant.

2. The construction of falsework, pilings, cofferdams or other obstructions, if required, and the scheme for constructing the bridge shall be in accordance with plans submitted to and approved by the Commander, Eighth Coast Guard District, prior to construction of the bridge. All work shall be so conducted that the free navigation of the waterway is not unreasonably interfered with and the present navigable depths are not impaired. Timely notice of any and all events that may affect navigation shall be given to the District Commander during construction of the bridge. The channel or channels through the structure shall be promptly cleared of all obstructions placed therein or caused by the construction of the bridge to the satisfaction of the District Commander, when in the judgment of the District Commander the construction work has reached a point where such action should be taken, but in no case later than 90 days after the bridge has been opened to traffic.

ENCLOSURE()

Continuation Sheet

**Bridge across the Tennessee River between Aurora and
The Land Between The Lakes, Kentucky**

28 OCT 2013
BRIDGE PERMIT

(11-13-8)

3. Issuance of this permit does not relieve the permittee of the obligation or responsibility for compliance with the provisions of any other law or regulation as may be under the jurisdiction of any federal, state or local authority having cognizance of any aspect of the location, construction or maintenance of said bridge.

4. A bridge fendering system shall be installed and maintained in good condition by and at the expense of the owner of the bridge when so required by the District Commander. Said installation and maintenance shall be for the safety of navigation and be in accordance with plans submitted to and approved by the District Commander prior to its construction.

5. Clearance gauges shall be installed and maintained in a good and legible condition by and at the expense of the owner of the bridge when so required by the District Commander. The type of gauges and the locations in which they are to be installed will be submitted to the District Commander for approval.

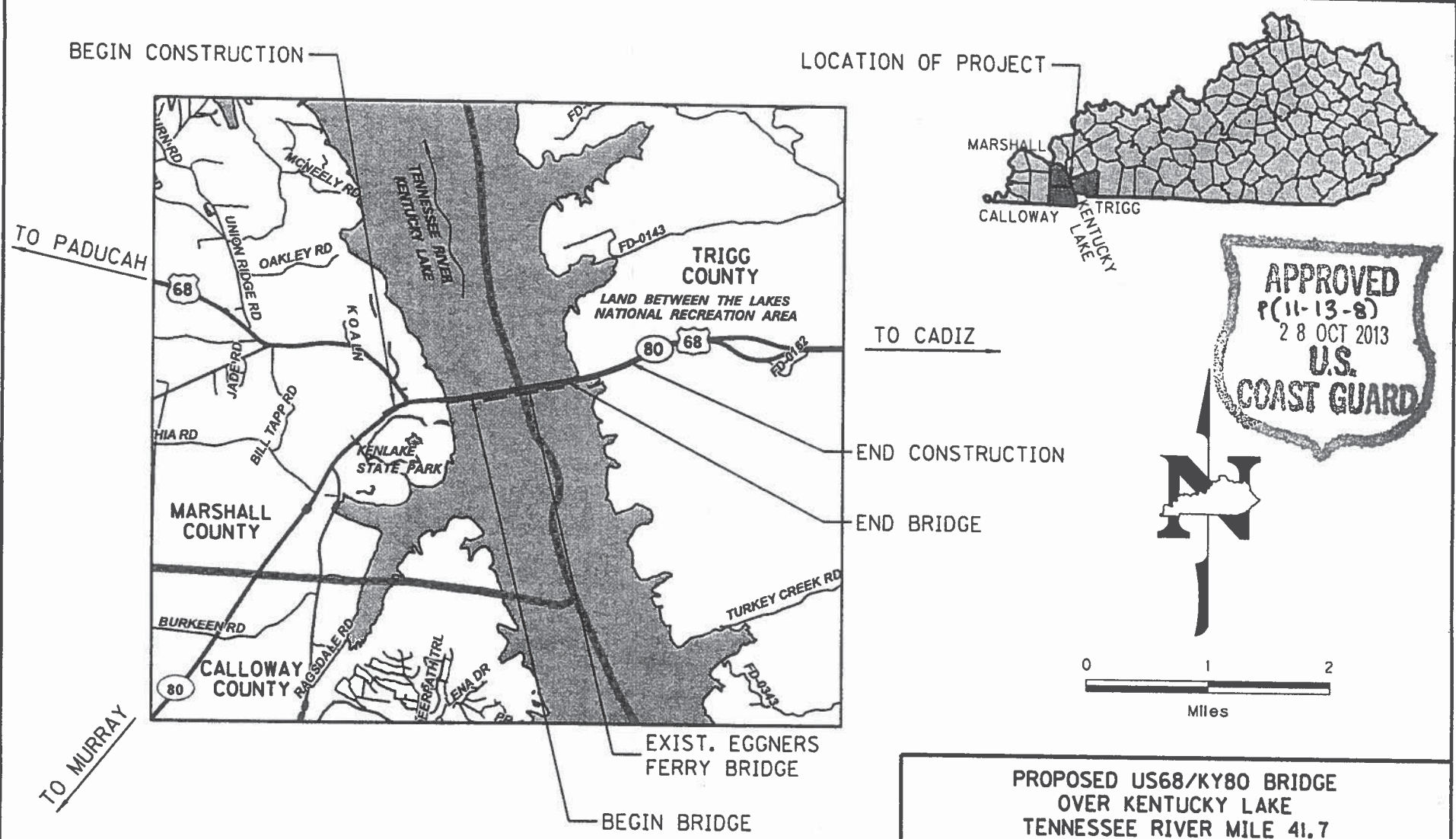
6. All parts of the existing to-be-replaced Eggners Ferry Bridge across the Tennessee River, mile 41.7, not utilized in the new bridge shall be removed down to or below the mud line or natural ground line except for the existing piers 2, 3, 4, 5 and 6 which shall be removed down to or below elevation 330.0 feet, Mean Sea Level. The waterway shall be cleared to the satisfaction of the District Commander. A period of 90 days subsequent to the opening to traffic of the new bridge, mile 41.7, will be allowed for such removal and clearance.

7. When the proposed bridge is no longer used for transportation purposes, it shall be removed in its entirety or to an elevation deemed appropriate by the District Commander and the waterway cleared to the satisfaction of the District Commander. Such removal and clearance shall be completed by and at the expense of the owner of the bridge upon due notice from the District Commander.

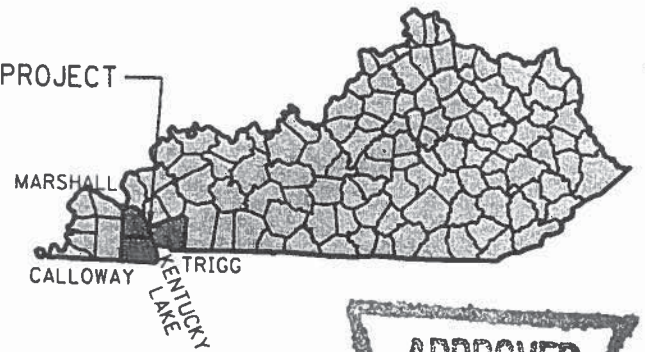
8. The approval hereby granted shall cease and be null and void unless construction of the bridge is commenced within five years and completed within eight years after the date of this permit.



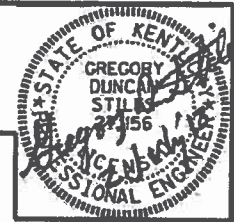
Brian L. Dunn
Chief, Office of Bridge Programs
U.S. Coast Guard
By direction of the Commandant



VICINITY MAP



THE DESIGN OF THE PROPOSED US 68/KY 80 OVER KENTUCKY LAKE BRIDGE MEETS AASHTO STANDARDS AND HAS BEEN DESIGNED TO WITHSTAND VESSEL IMPACT. THE TYPICAL VESSEL WHICH THE MAIN PIERS WERE DESIGNED TO WITHSTAND IS THE 15-BARGE TOW WITH JUMBO HOPPER INLAND RIVER BARGES AND A 8400-HP TUG. PIERS FURTHER FROM THE NAVIGATION CHANNEL WERE DESIGNED TO WITHSTAND GRADUALLY SMALLER VESSELS.

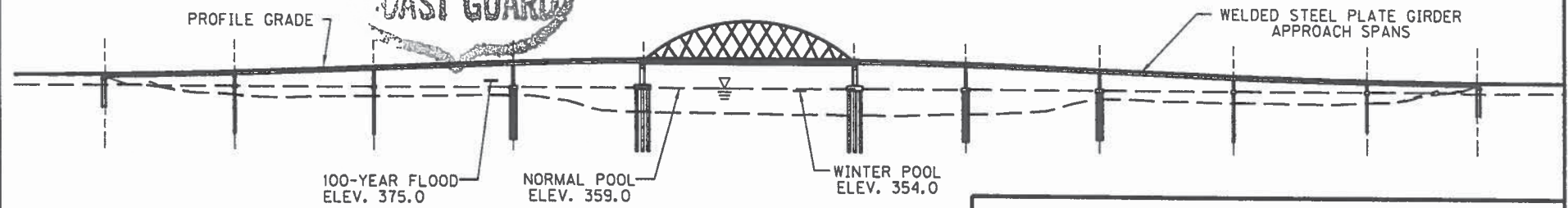
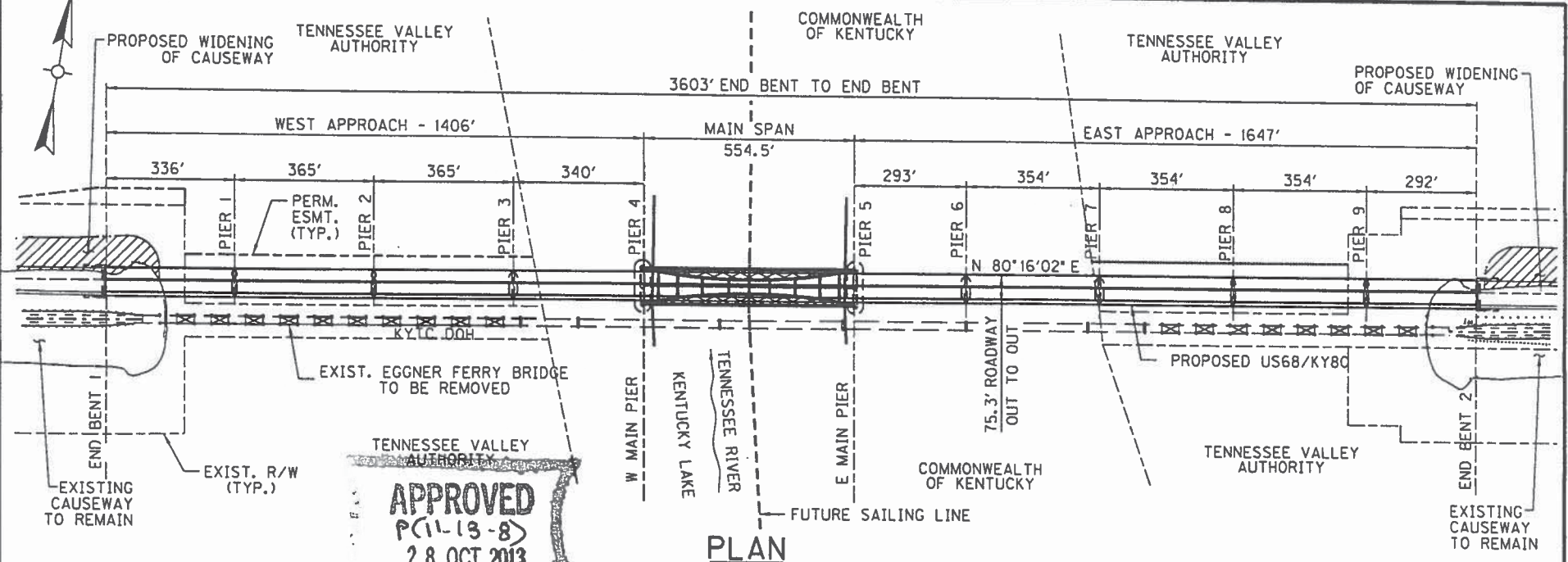


Baker

MICHAEL BAKER JR., INC.
 9750 ORMSBY STATION ROAD, SUITE 210
 LOUISVILLE, KY 40223

PROPOSED US68/KY80 BRIDGE OVER KENTUCKY LAKE TENNESSEE RIVER MILE 41.7 MARSHALL AND TRIGG COUNTIES BETWEEN AURORA, KY AND THE LAND BETWEEN THE LAKES	
APPLICATION BY: KENTUCKY TRANSPORTATION CABINET DEPARTMENT OF HIGHWAYS	
KYTC BRIDGE ITEM NO. 01-180.70	
DATE: JULY 2, 2013	SHEET 1 OF 3

FILE NAME: C:\P\101-121GR15D012\PROJECT\KENTUCKY LAKE US68 KY80 BRIDGE.dwg



ELEVATION

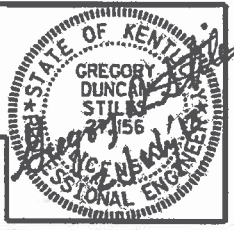
ELEVATIONS SHOWN ON THESE DRAWINGS ARE REFERENCED TO 1929 NGVD.



THE DESIGN OF THE PROPOSED US 68/KY 80 OVER KENTUCKY LAKE BRIDGE MEETS AASHTO STANDARDS AND HAS BEEN DESIGNED TO WITHSTAND VESSEL IMPACT. THE TYPICAL VESSEL WHICH THE MAIN PIERS WERE DESIGNED TO WITHSTAND IS THE 15-BARGE TOW WITH JUMBO HOPPER INLAND RIVER BARGES AND A 8400-HP TUG. PIERS FURTHER FROM THE NAVIGATION CHANNEL WERE DESIGNED TO WITHSTAND GRADUALLY SMALLER VESSELS.

Baker

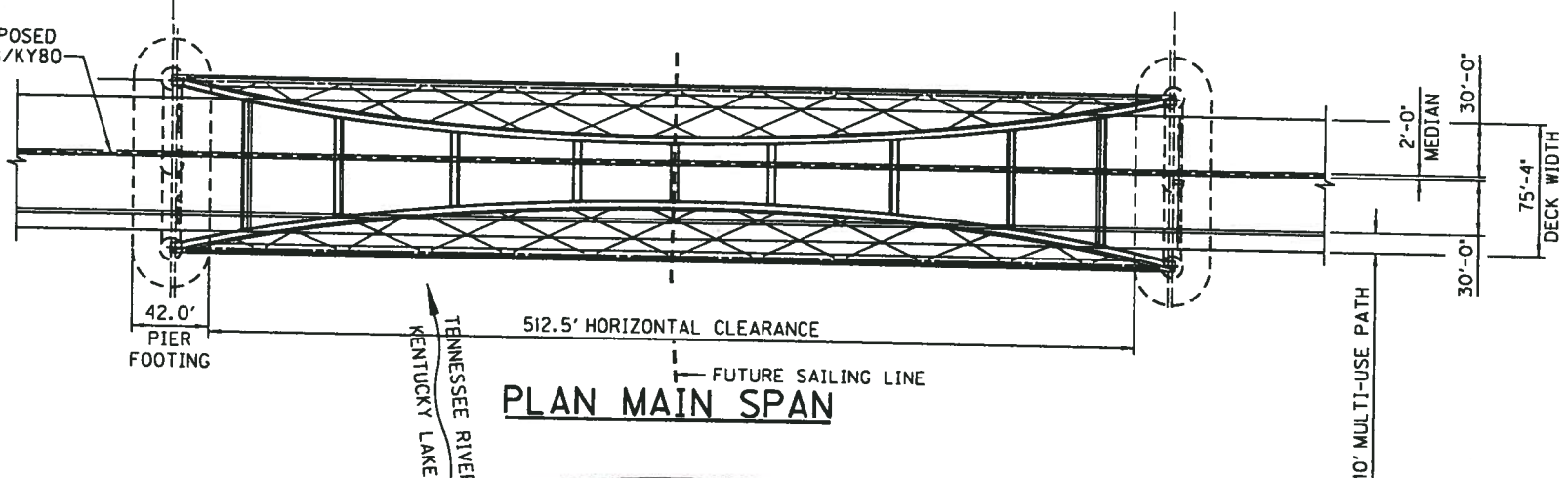
MICHAEL BAKER JR., INC.
 9750 ORMSBY STATION ROAD, SUITE 210
 LOUISVILLE, KY 40223



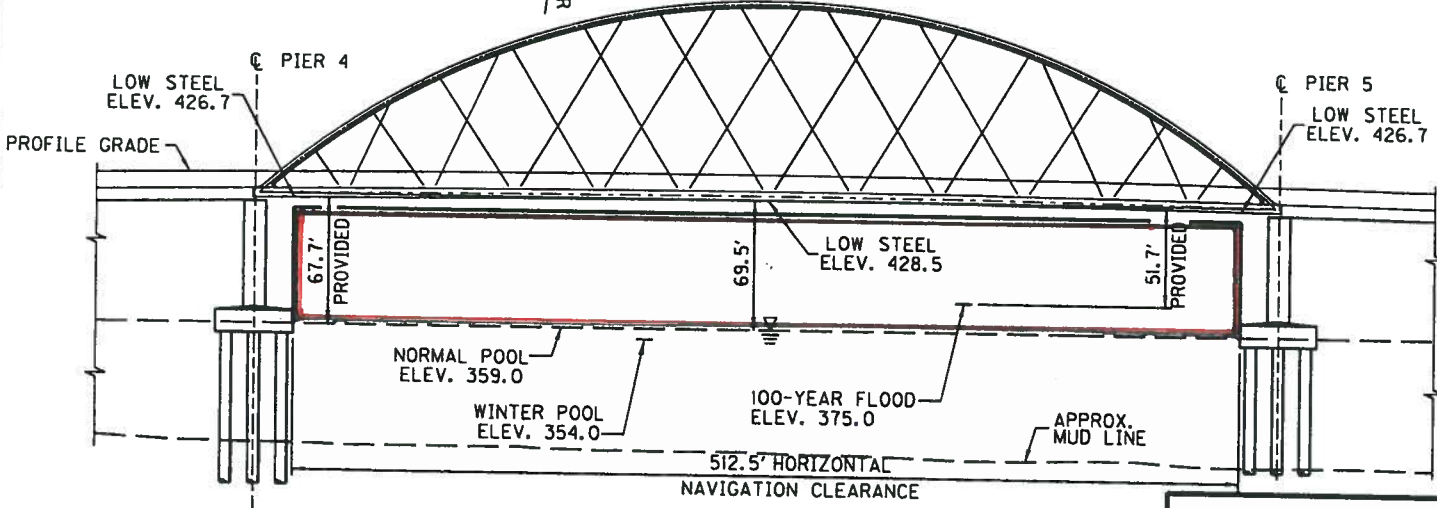
<p>PROPOSED US68/KY80 BRIDGE OVER KENTUCKY LAKE TENNESSEE RIVER MILE 41.7 MARSHALL AND TRIGG COUNTIES BETWEEN AURORA, KY AND THE LAND BETWEEN THE LAKES</p>	
<p>APPLICATION BY: KENTUCKY TRANSPORTATION CABINET DEPARTMENT OF HIGHWAYS</p>	
<p>KYTC BRIDGE ITEM NO. 01-180.70</p>	
<p>DATE: JULY 2, 2013</p>	<p>SHEET 2 OF 3</p>

FILE NAME: G:\P\18-KY-01-180-70\PROJECTS\01-180-70\121GR13D012\121GR13D012.dwg USDC FORNBT 08.10A

PROPOSED
 US68/KY80



PLAN MAIN SPAN

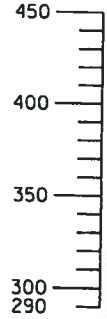
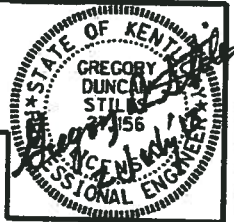


ELEVATION MAIN SPAN

ELEVATIONS SHOWN ON THESE DRAWINGS ARE REFERENCED TO 1929 NGVD.



THE DESIGN OF THE PROPOSED US 68/KY 80 OVER KENTUCKY LAKE BRIDGE MEETS AASHTO STANDARDS AND HAS BEEN DESIGNED TO WITHSTAND VESSEL IMPACT. THE TYPICAL VESSEL WHICH THE MAIN PIERS WERE DESIGNED TO WITHSTAND IS THE 15-BARGE TOW WITH JUMBO HOPPER INLAND RIVER BARGES AND A 8400-HP TUG. PIERS FURTHER FROM THE NAVIGATION CHANNEL WERE DESIGNED TO WITHSTAND GRADUALLY SMALLER VESSELS.



PROPOSED US68/KY80 BRIDGE
 OVER KENTUCKY LAKE
 TENNESSEE RIVER MILE 41.7
 MARSHALL AND TRIGG COUNTIES
 BETWEEN AURORA, KY AND
 THE LAND BETWEEN THE LAKES

APPLICATION BY:
 KENTUCKY TRANSPORTATION CABINET
 DEPARTMENT OF HIGHWAYS

KYTC BRIDGE ITEM NO. 01-180.70

DATE: JULY 2, 2013

SHEET 3 OF 3

Baker

MICHAEL BAKER JR., INC.
 9750 ORMSBY STATION ROAD, SUITE 210
 LOUISVILLE, KY 40223

**NAVIGATION LIGHTS FOR
EGGERS FERRY BRIDGE,
MILE 41.7, TENNESSEE RIVER**

The center of the navigation span (between piers no. 4 and 5) shall be marked by a range of two green lights. Each green light shall show through a horizontal arc of 360 degrees and shall be securely mounted just below the outermost edge of the bridge span structure in line with the axis of the channel so as to be visible from an approaching vessel.

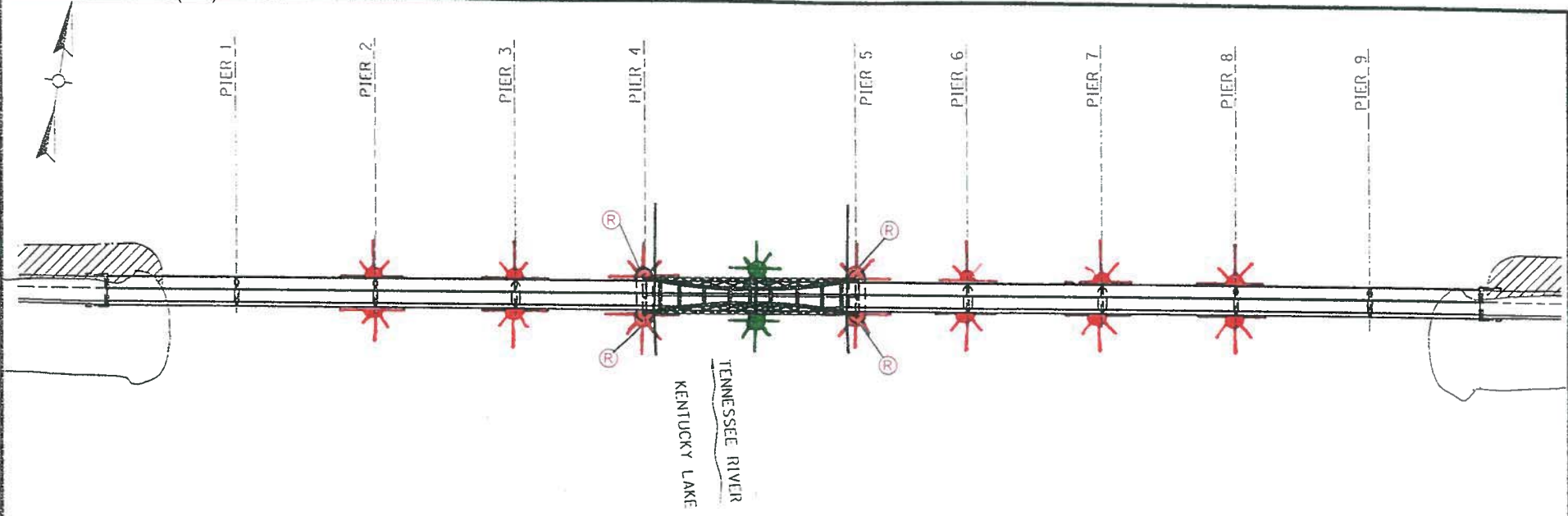
The upstream and downstream side of piers no. 2, 3, 4, 5, 6, 7 and 8 shall be marked with red lights. Each red light shall show through a horizontal arc of 180 degrees and shall be securely mounted just below the outermost edge of the bridge to show 90 degrees on either side of a line parallel to this axis of the channel so as to be visible from an approaching vessel.

Each margin of the channel piers (no. 4 and 5), one on the upstream side and one on the downstream side shall be marked with high intensity red retro-reflective material, which measures two feet per side. The high intensity red retro-reflective panels should be placed near the top of the red navigation lights so as to effectively reflect the searchlight of an approaching vessel but not positioned so as to obscure the red navigation lights.

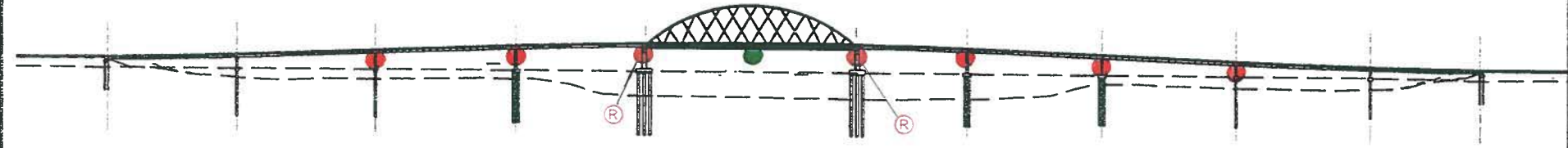
The lights and retro-reflective panels prescribed above shall be displayed from sunset to sunrise each night of the year and at other times when the visibility is less than one mile. The lights shall be of sufficient candlepower as to be visible against the background lighting at a distance of at least 2,000 yards 90% of the nights of the year.

Responsibility of the owner does not cease upon installation of the prescribed lights and retro-reflective panels. Provision for maintaining all lights and reflectors prescribed herein should be included in the planning for initial installation. A continuing program of inspection and maintenance is necessary to insure that the lights and panels are properly displayed.

This is enclosure (2a) to CGD8 (dwb) ltr dated November 4, 2013






PLAN



ELEVATION

Marking / Lighting Legend

-  = 360° Green
-  = 180° Red
-  = Red High Intensity Retro-reflective Panel

**NAVIGATION LIGHTING PLAN
 EGGNERS FERRY BRIDGE
 MILE 41.7, TENNESSEE RIVER**

Commander
 Eighth Coast Guard District
 1222 Spruce Street
 St. Louis, MO 63103

Navigational lights and/or other signals
 Prescribed per Title 33 CFR Part 118

Eric Washburn 11/2/12
 ERIC A. WASHBURN (Date)
 Bridge Administrator

ENCLOSURE (26)

**VERTICAL CLEARANCE GAUGES
FOR
EGGERS FERRY BRIDGE,
MILE 41.7, TENNESSEE RIVER**

Vertical clearance gauges shall be installed on the upstream side of the right descending channel pier no. 5 and the downstream side of the left descending channel pier no. 4. The E Series, 36-inch standard numerals shall be used unless the width of the pier will not accommodate this size gauge, in which case the largest numeral compatible with the width of the pier shall be used. The line indicating the topmost numeral of the gauge shall be at least three feet above elevation 375.2 feet m.s.l. (regulated high water). The line indicating the bottom numeral shall be no more than five feet above elevation 359.0 feet m.s.l., (normal pool stage).

The gauge prescribed herein shall read from top to bottom and measure the distance from low steel to the bottom of the foot marks.

Responsibility of the owner does not cease upon installation of the prescribed clearance gauge. Provision for maintaining the clearance gauge prescribed herein should be included in the planning for initial installation. A continuing program of inspection and maintenance is necessary to ensure that the clearance gauge is accurate and properly displayed.

This is enclosure (3) to CGD8 (dwb) ltr dated Noevember 4, 2013

PROPOSAL BID ITEMS

131212

Page 1 of 7

Report Date 12/6/13

Section: 0001 - PAVING

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	FP	AMOUNT
0010	00001		DGA BASE	21,669.00	TON		\$	
0020	00003		CRUSHED STONE BASE	994.00	TON		\$	
0030	00018		DRAINAGE BLANKET-TYPE II-ASPH	7,208.00	TON		\$	
0040	00212		CL2 ASPH BASE 1.00D PG64-22	693.00	TON		\$	
0050	00214		CL3 ASPH BASE 1.00D PG64-22	19,791.00	TON		\$	
0060	00309		CL2 ASPH SURF 0.50D PG64-22	2,152.00	TON		\$	
0070	00324		CL3 ASPH SURF 0.50B PG64-22	3,150.00	TON		\$	

Section: 0002 - ROADWAY

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	FP	AMOUNT
0080	00071		CRUSHED AGGREGATE SIZE NO 57	979.00	TON		\$	
0090	00078		CRUSHED AGGREGATE SIZE NO 2	29.00	TON		\$	
0100	00100		ASPHALT SEAL AGGREGATE	72.00	TON		\$	
0110	00103		ASPHALT SEAL COAT	9.00	TON		\$	
0120	01000		PERFORATED PIPE-4 IN	7,479.00	LF		\$	
0130	01001		PERFORATED PIPE-6 IN	2,315.00	LF		\$	
0140	01010		NON-PERFORATED PIPE-4 IN	525.00	LF		\$	
0150	01011		NON-PERFORATED PIPE-6 IN	192.00	LF		\$	
0160	01020		PERF PIPE HEADWALL TY 1-4 IN	4.00	EACH		\$	
0170	01021		PERF PIPE HEADWALL TY 1-6 IN	1.00	EACH		\$	
0180	01024		PERF PIPE HEADWALL TY 2-4 IN	15.00	EACH		\$	
0190	01028		PERF PIPE HEADWALL TY 3-4 IN	4.00	EACH		\$	
0200	01029		PERF PIPE HEADWALL TY 3-6 IN	1.00	EACH		\$	
0210	01032		PERF PIPE HEADWALL TY 4-4 IN	4.00	EACH		\$	
0220	01033		PERF PIPE HEADWALL TY 4-6 IN	1.00	EACH		\$	
0230	01741		CORED HOLE DRAINAGE BOX CON-6 IN	8.00	EACH		\$	
0240	01982		DELINEATOR FOR GUARDRAIL MONO DIRECTIONAL WHITE	82.00	EACH		\$	
0250	01984		DELINEATOR FOR BARRIER - WHITE	86.00	EACH		\$	
0260	01985		DELINEATOR FOR BARRIER - YELLOW	173.00	EACH		\$	
0270	02014		BARRICADE-TYPE III	4.00	EACH		\$	
0280	02091		REMOVE PAVEMENT	2,809.00	SQYD		\$	
0290	02159		TEMP DITCH	5,885.00	LF		\$	
0300	02160		CLEAN TEMP DITCH	17,655.00	LF		\$	
0310	02200		ROADWAY EXCAVATION	51,362.00	CUYD		\$	
0320	02204		SPECIAL EXCAVATION	3,974.00	CUYD		\$	
0330	02241		RESHAPING AND COMPACTING	2,586.00	LF		\$	
0340	02242		WATER	2.00	MGAL		\$	
0350	02381		REMOVE GUARDRAIL	7,059.00	LF		\$	
0360	02432		WITNESS POST	3.00	EACH		\$	
0370	02436		R/W MARKER RURAL TYPE 3	7.00	EACH		\$	
0380	02483		CHANNEL LINING CLASS II	98.00	TON		\$	
0390	02545		CLEARING AND GRUBBING (APPROXIMATELY 1.5 ACRES IN MARSHALL COUNTY)	1.00	LS		\$	

PROPOSAL BID ITEMS

131212

Page 2 of 7

Report Date 12/6/13

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	FP	AMOUNT
0400	02562		TEMPORARY SIGNS (FOR TRAFFIC MAINTENANCE)	1,167.00	SQFT		\$	
0410	02570		PROJECT CPM SCHEDULE SEE DESIGN FOR SPECIAL NOTE	1.00	LS		\$	
0420	02585		EDGE KEY	240.00	LF		\$	
0430	02596		FABRIC-GEOTEXTILE TYPE I	12,241.00	SQYD		\$	
0440	02599		FABRIC-GEOTEXTILE TYPE IV	10,052.00	SQYD		\$	
0450	02600		FABRIC GEOTEXTILE TY IV FOR PIPE	1,882.00	SQYD	\$2.00	\$	\$3,764.00
0460	02650		MAINTAIN & CONTROL TRAFFIC (TRIGG COUNTY)	1.00	LS		\$	
0470	02650		MAINTAIN & CONTROL TRAFFIC (MARSHALL COUNTY)	1.00	LS		\$	
0480	02673		PRECAST VEHICLE STOP	172.00	LF		\$	
0490	02696		SHOULDER RUMBLE STRIPS-SAWED	6,560.00	LF		\$	
0500	02701		TEMP SILT FENCE	5,885.00	LF		\$	
0510	02703		SILT TRAP TYPE A	33.00	EACH		\$	
0520	02704		SILT TRAP TYPE B	33.00	EACH		\$	
0530	02705		SILT TRAP TYPE C	33.00	EACH		\$	
0540	02706		CLEAN SILT TRAP TYPE A	99.00	EACH		\$	
0550	02707		CLEAN SILT TRAP TYPE B	99.00	EACH		\$	
0560	02708		CLEAN SILT TRAP TYPE C	99.00	EACH		\$	
0570	02709		CLEAN TEMP SILT FENCE	17,655.00	LF		\$	
0580	02726		STAKING (TRIGG COUNTY)	1.00	LS		\$	
0590	02726		STAKING (MARSHALL COUNTY)	1.00	LS		\$	
0600	02731		REMOVE STRUCTURE (EGGNER FERRY BRIDGE)	1.00	LS		\$	
0610	02998		MASONRY COATING	2,173.00	SQYD		\$	
0620	03144		CONC MEDIAN BARRIER TYPE 9C1	3,343.00	LF		\$	
0630	05950		EROSION CONTROL BLANKET	2,534.00	SQYD		\$	
0640	05952		TEMP MULCH	170,660.00	SQYD		\$	
0650	05953		TEMP SEEDING AND PROTECTION	16,343.00	SQYD		\$	
0660	05966		TOPDRESSING FERTILIZER	18.00	TON		\$	
0670	05985		SEEDING AND PROTECTION	163,432.00	SQYD		\$	
0680	05989		SPECIAL SEEDING CROWN VETCH	170,661.00	SQYD		\$	
0690	06510		PAVE STRIPING-TEMP PAINT-4 IN	38,850.00	LF		\$	
0700	06514		PAVE STRIPING-PERM PAINT-4 IN	43,862.00	LF		\$	
0710	06550		PAVE STRIPING-TEMP REM TAPE-W	8,772.00	LF		\$	
0720	06551		PAVE STRIPING-TEMP REM TAPE-Y	12,208.00	LF		\$	
0730	06574		PAVE MARKING-THERMO CURV ARROW	6.00	EACH		\$	
0740	06575		PAVE MARKING-THERMO COMB ARROW	2.00	EACH		\$	
0750	06592		PAVEMENT MARKER TYPE V-B W/R	119.00	EACH		\$	
0760	06593		PAVEMENT MARKER TYPE V-B Y/R	173.00	EACH		\$	
0770	08019		CYCLOPEAN STONE RIP RAP	19,269.00	TON		\$	
0780	10020NS		FUEL ADJUSTMENT	72,080.00	DOLL	\$1.00	\$	\$72,080.00
0790	10030NS		ASPHALT ADJUSTMENT	100,825.00	DOLL	\$1.00	\$	\$100,825.00
0800	20060ES719		GUARDRAIL STEEL W BEAM-S FACE CR	5,472.00	LF		\$	
0810	20062ES719		GUARDRAIL TERMINAL SECT NO.1 CR	6.00	EACH		\$	
0820	20206EC		PAVE MARK HANDICAP SYMBOL	2.00	EACH		\$	
0830	20285ES719		GUARDRAIL END TREATMENT TY 2A-CR	1.00	EACH		\$	
0840	20382ES719		G/R CONN TO BRIDGE END TY A-CR	4.00	EACH		\$	
0850	21325ND		CONSTRUCTION TRAILER	1.00	LS		\$	

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LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	FP	AMOUNT
0860	23131ER701		PIPELINE VIDEO INSPECTION	561.00	LF		\$	
0870	23143EN		DECORATIVE HANDRAIL (STEEL POWDER COATED FINISH)	1,977.00	LF		\$	
0880	23162EN		GUARDRAIL CONN TO BR END TY A-1 CR	4.00	EACH		\$	
0890	23274EN11F		TURF REINFORCEMENT MAT 1	1,078.00	SQYD		\$	
0900	23394EC		CRASH CUSHION TY VI CLASS C TL3-1	1.00	EACH		\$	
0910	23651ES719		G/R END TREATMENT TY 1-CR	1.00	EACH		\$	
0920	23912EC		WEB CAMERA CONST MONITORING SYSTEM	1.00	LS		\$	
0930	23979EC		CRASH CUSHION TY VI CLASS C TL3	2.00	EACH		\$	
0940	24620EC		HELPER BOAT	1.00	LS		\$	
0950	24626EC		PROJECT INSPECTION BOAT	1.00	LS		\$	
0960	24636EC		GUARDRAIL TERMINAL SECT NO.3 CR	2.00	EACH		\$	
0970	24637EC		GUARDRAIL STEEL W BEAM-D FACE CR	2,768.00	LF		\$	
0980	30000		REMOVABLE BOLLARD	3.00	EACH		\$	

Section: 0003 - DRAINAGE

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	FP	AMOUNT
0990	00440		ENTRANCE PIPE-15 IN	65.00	LF		\$	
1000	00443		ENTRANCE PIPE-24 IN	130.00	LF		\$	
1010	00521		STORM SEWER PIPE-15 IN	189.00	LF		\$	
1020	00522		STORM SEWER PIPE-18 IN	289.00	LF		\$	
1030	01202		PIPE CULVERT HEADWALL-15 IN	1.00	EACH		\$	
1040	01204		PIPE CULVERT HEADWALL-18 IN	2.00	EACH		\$	
1050	01208		PIPE CULVERT HEADWALL-24 IN	2.00	EACH		\$	
1060	01432		SLOPED BOX OUTLET TYPE 1-15 IN	3.00	EACH		\$	
1070	01505		DROP BOX INLET TYPE 5B	1.00	EACH		\$	
1080	01538		DROP BOX INLET TYPE 7	1.00	EACH		\$	
1090	01621		CONC MED BARR BOX INLET TY 9B1	2.00	EACH		\$	
1100	08100		CONCRETE-CLASS A (FOR END ANCHORS)	2.82	CUYD		\$	
1110	23952EC		DRAINAGE JUNCTION BOX TY B	1.00	EACH		\$	

Section: 0004 - BRIDGE - WEST APPROACH

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	FP	AMOUNT
1120	02231		STRUCTURE GRANULAR BACKFILL	1,115.00	CUYD		\$	
1130	02599		FABRIC-GEOTEXTILE TYPE IV	328.00	SQYD		\$	
1140	02998		MASONRY COATING	5,578.00	SQYD		\$	
1150	08001		STRUCTURE EXCAVATION-COMMON	2,483.00	CUYD		\$	
1160	08033		TEST PILES (INSTALL 30 IN PIPE PILE - 1 IN)	459.00	LF		\$	
1170	08033		TEST PILES (INSTALL 72 IN PIPE PILE - 2 IN)	448.00	LF		\$	
1180	08033		TEST PILES (FURNISH 30 IN PIPE PILE - 1 IN)	468.00	LF		\$	
1190	08033		TEST PILES (FURNISH 72 IN PIPE PILE - 2 IN)	516.00	LF		\$	
1200	08100		CONCRETE-CLASS A REVISED: 11-26-13	2,078.00	CUYD		\$	
1210	08101		CONCRETE-CLASS A MOD	258.00	CUYD		\$	
1220	08104		CONCRETE-CLASS AA REVISED: 11-26-13	3,943.00	CUYD		\$	
1230	08150		STEEL REINFORCEMENT	517,011.00	LB		\$	

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LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	FP	AMOUNT
1240	08151		STEEL REINFORCEMENT-EPOXY COATED	1,251,172.00	LB		\$	
1250	08160		STRUCTURAL STEEL (APPROACH SPANS, APPROXIMATELY 9,276,108 LBS.)	1.00	LS		\$	
1260	08170		SHEAR CONNECTORS(APPROXIMATELY 22,604 LBS) REVISED: 11-26-13	1.00	LS		\$	
1270	08267		NAVIGATION LIGHTING	1.00	LS		\$	
1280	08500		APPROACH SLAB	204.00	SQYD		\$	
1290	08820		DRAIN PIPE-6 IN (FIBERGLASS)	200.00	LF		\$	
1300	20154ND		DRAIN ASSEMBLY	16.00	EACH		\$	
1310	23233EC		DYNAMIC PILE TESTING (ON WATER - RESTRIKE)	15.00	EACH		\$	
1320	23233EC		DYNAMIC PILE TESTING (ON LAND - INITIAL)	5.00	EACH		\$	
1330	23233EC		DYNAMIC PILE TESTING (ON LAND - RESTRIKE)	10.00	EACH		\$	
1340	23233EC		DYNAMIC PILE TESTING (ON WATER - INITIAL)	9.00	EACH		\$	
1350	23538EC		PEDESTRIAN RAIL	1,452.00	LF		\$	
1360	23859EC		FINGER EXPANSION JOINT	74.00	LF		\$	
1370	23868EC		STRUCTURE LIGHTNING PROTECTION	1.00	LS		\$	
1380	24538ED		RAIL SYSTEM TYPE 11	2,880.00	LF		\$	
1390	24550EC		VIBRATION MONITORING	1.00	LS		\$	
1400	24606ED		HSS BARRIER RAIL - 3 RAIL	1,429.00	LF		\$	
1401	24607ED		HSS BARRIER RAIL - 1 RAIL ADDED: 12-6-13	1,451.00	LF		\$	
1410	24611EC		SEISMIC DAMPERS (BENT ENDS)	6.00	EACH		\$	
1420	24611EC		SEISMIC DAMPERS (PIERS 4 & 5)	6.00	EACH		\$	
1430	24614EC		DISK EXPANSION BEARING	12.00	EACH		\$	
1440	24616EC		PATH DELINEATION LIGHTING	1.00	LS		\$	
1450	24617EC		INSTALL (AT&T DUCTBANK)	1,407.00	LF		\$	
1460	24618EC		PIPE PILES (INSTALL 72 IN PIPE PILE - 2 IN)	836.00	LF		\$	
1470	24618EC		PIPE PILES (FURNISH 30 IN PIPE PILE - 1 IN)	3,393.00	LF		\$	
1480	24618EC		PIPE PILES (INSTALL 30 IN PIPE PILE - 1 IN)	3,585.00	LF		\$	
1490	24618EC		PIPE PILES (FURNISH 72 IN PIPE PILE - 2 IN)	909.00	LF		\$	
1500	24619EC		SPLICE PILES (30 IN PIPE PILE - 1 IN)	13.00	EACH		\$	
1510	24619EC		SPLICE PILES (72 IN PIPE PILE - 2 IN)	3.00	EACH		\$	
1520	24627EC		OPEN END INSIDE FIT CUTTING SHOE (72 IN - 2 IN)	9.00	EACH		\$	
1530	24627EC		OPEN END INSIDE FIT CUTTING SHOE (30 IN - 1 IN)	28.00	EACH		\$	
1540	24628EC		PILE CONSTRICTOR PLATE (72 IN - 2 IN)	9.00	EACH		\$	
1550	24629EC		DECORATIVE FENCE PANEL	17.00	EACH		\$	

Section: 0005 - BRIDGE - EAST APPROACH

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	FP	AMOUNT
1560	02231		STRUCTURE GRANULAR BACKFILL	1,115.00	CUYD		\$	
1570	02599		FABRIC-GEOTEXTILE TYPE IV	328.00	SQYD		\$	
1580	02998		MASONRY COATING	6,760.00	SQYD		\$	
1590	08001		STRUCTURE EXCAVATION-COMMON	2,371.00	CUYD		\$	
1600	08033		TEST PILES (FURNISH - 30 IN PIPE - 1 IN)	441.00	LF		\$	

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LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	FP	AMOUNT
1610	08033		TEST PILES (INSTALL - 30 IN PIPE - 1 IN)	435.00	LF		\$	
1620	08033		TEST PILES (FURNISH 17 IN PIPE PILE - 2 IN)	914.00	LF		\$	
1630	08033		TEST PILES (INSTALL - 72 IN - 2 IN)	706.00	LF		\$	
1640	08100		CONCRETE-CLASS A REVISED: 11-26-13	2,811.00	CUYD		\$	
1650	08101		CONCRETE-CLASS A MOD (PIPE PILE INFILL)	627.00	CUYD		\$	
1660	08104		CONCRETE-CLASS AA REVISED: 11-26-13	4,565.00	CUYD		\$	
1670	08150		STEEL REINFORCEMENT	729,951.00	LB		\$	
1680	08151		STEEL REINFORCEMENT-EPOXY COATED	1,468,512.00	LB		\$	
1690	08160		STRUCTURAL STEEL (APPROACH SPAN, APPROXIMATELY 10,339,811 LBS.)	1.00	LS		\$	
1700	08170		SHEAR CONNECTORS (APPROXIMATELY 33,489 LBS.) REVISED: 11-26-13	1.00	LS		\$	
1710	08267		NAVIGATION LIGHTING	1.00	LS		\$	
1720	08500		APPROACH SLAB	204.00	SQYD		\$	
1730	08820		DRAIN PIPE-6 IN (FIBERGLASS)	270.00	LF		\$	
1740	20154ND		DRAIN ASSEMBLY	22.00	EACH		\$	
1750	23233EC		DYNAMIC PILE TESTING (ON WATER - INITIAL)	13.00	EACH		\$	
1760	23233EC		DYNAMIC PILE TESTING (ON WATER - RESTRIKE)	23.00	EACH		\$	
1770	23233EC		DYNAMIC PILE TESTING (ON LAND - RESTRIKE)	10.00	EACH		\$	
1780	23233EC		DYNAMIC PILE TESTING (ON LAND - INITIAL)	5.00	EACH		\$	
1790	23538EC		PEDESTRIAN RAIL	1,696.00	LF		\$	
1800	23859EC		FINGER EXPANSION JOINT	74.00	LF		\$	
1810	23868EC		STRUCTURE LIGHTNING PROTECTION	1.00	LS		\$	
1820	24538ED		RAIL SYSTEM TYPE 11	3,378.00	LF		\$	
1830	24550EC		VIBRATION MONITORING	1.00	LS		\$	
1840	24606ED		HSS BARRIER RAIL - 3 RAIL	1,678.00	LF		\$	
1841	24607ED		HSS BARRIER RAIL - 1 RAIL ADDED: 12-6-13	1,700.00	LF		\$	
1850	24611EC		SEISMIC DAMPERS (END BENTS)	6.00	EACH		\$	
1860	24611EC		SEISMIC DAMPERS (PIERS 4 & 5)	6.00	EACH		\$	
1870	24614EC		DISK EXPANSION BEARING	12.00	EACH		\$	
1880	24616EC		PATH DELINEATION LIGHTING	1.00	LS		\$	
1890	24617EC		INSTALL (AT&T DUCTBANK)	1,651.00	LF		\$	
1900	24618EC		PIPE PILES (FURNISH - 30 IN - 1 IN)	3,185.00	LF		\$	
1910	24618EC		PIPE PILES (INSTALL - 30 IN - 1 IN)	3,385.00	LF		\$	
1920	24618EC		PIPE PILES (FURNISH - 72 IN PIPE PILE - 2 IN)	1,445.00	LF		\$	
1930	24618EC		PIPE PILES (INSTALL - 72 IN PIPE PILE - 2 IN)	1,197.00	LF		\$	
1940	24619EC		SPLICE PILES (30 IN PIPE - 1 IN)	13.00	EACH		\$	
1950	24619EC		SPLICE PILES (72 IN PIPE PILE - 2 IN)	5.00	EACH		\$	
1960	24627EC		OPEN END INSIDE FIT CUTTING SHOE (30 IN - 1 IN)	28.00	EACH		\$	
1970	24627EC		OPEN END INSIDE FIT CUTTING SHOE (72 IN - 2 IN)	14.00	EACH		\$	
1980	24628EC		PILE CONSTRICTOR PLATE (72 IN - 2 IN)	14.00	EACH		\$	
1990	24629EC		DECORATIVE FENCE PANEL	20.00	EACH		\$	

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Section: 0006 - BRIDGE - MAIN SPAN

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	FP	AMOUNT
2000	02998		MASONRY COATING REVISED: 11-26-13	5,369.00	SQYD		\$	
2010	08033		TEST PILES (FURNISH 72 IN PIPE PILE - 2 IN)	760.00	LF		\$	
2020	08033		TEST PILES (INSTALL 72 IN PIPE PILE - 2 IN)	468.00	LF		\$	
2030	08100		CONCRETE-CLASS A	7,174.00	CUYD		\$	
2040	08101		CONCRETE-CLASS A MOD (PIPE PILE INFILL)	2,066.00	CUYD		\$	
2050	08104		CONCRETE-CLASS AA REVISED: 11-26-13	1,119.00	CUYD		\$	
2060	08150		STEEL REINFORCEMENT	1,463,804.00	LB		\$	
2070	08151		STEEL REINFORCEMENT-EPOXY COATED	458,567.00	LB		\$	
2080	08160		STRUCTURAL STEEL (ARCH SPAN, APPROXIMATELY 4,741,044 LBS.) REVISED: 11-26-13	1.00	LS		\$	
2090	08170		SHEAR CONNECTORS (APPROXIMATELY 32,503 LBS.) REVISED: 11-26-13	1.00	LS		\$	
2100	08267		NAVIGATION LIGHTING	1.00	LS		\$	
2110	08534		CONCRETE OVERLAY-LATEX	180.00	CUYD		\$	
2120	08752		PAINT CLEARANCE GAUGES	1.00	LS		\$	
2130	08820		DRAIN PIPE-6 IN (FIBERGLASS)	36.00	LF		\$	
2140	20154ND		DRAIN ASSEMBLY	10.00	EACH		\$	
2150	23233EC		DYNAMIC PILE TESTING (ON WATER - INITIAL)	8.00	EACH		\$	
2160	23233EC		DYNAMIC PILE TESTING (ON WATER - RESTRIKE)	16.00	EACH		\$	
2170	23538EC		PEDESTRIAN RAIL REVISED: 11-26-13	550.00	LF		\$	
2180	23868EC		STRUCTURE LIGHTNING PROTECTION	1.00	LS		\$	
2190	24112EC		STEEL REINFORCEMENT STAINLESS STEEL REVISED: 11-26-13 REVISED: 12-6-13	283,401.00	LB		\$	
2200	24538ED		RAIL SYSTEM TYPE 11	1,108.00	LF		\$	
2210	24550EC		VIBRATION MONITORING	1.00	LS		\$	
2220	24606ED		HSS BARRIER RAIL - 3 RAIL	550.00	LF		\$	
2221	24607ED		HSS BARRIER RAIL - 1 RAIL ADDED: 12-6-13	550.00	LF		\$	
2230	24608EC		BRIDGE STRAND HANGER-FABRICATE & INSTALL (APPROXIMATE LENGTH - 5,440 LF)	1.00	LS		\$	
2240	24610EC		MODULAR EXPANSION JOINT REVISED: 11-26-13	148.00	LF		\$	
2250	24612EC		SEISMIC ISOLATION BEARING - TYPE A	4.00	EACH		\$	
2260	24613EC		SEISMIC ISOLATION BEARING - TYPE B	2.00	EACH		\$	
2270	24615EC		ARCH FEATURE LIGHTING	1.00	LS		\$	
2280	24616EC		PATH DELINEATION LIGHTING	1.00	LS		\$	
2290	24617EC		INSTALL (AT&T DUCTBANK)	556.00	LF		\$	
2300	24618EC		PIPE PILES (INSTALL 72 IN PIPE PILE - 2 IN) REVISED: 12-6-13	2,368.00	LF		\$	
2310	24618EC		PIPE PILES (FURNISH 72 IN PIPE PILES - 2 IN)	4,080.00	LF		\$	
2320	24619EC		SPLICE PILES (72 IN PIPE - 2 IN) REVISED: 12-6-13	2.00	EACH		\$	
2330	24627EC		OPEN END INSIDE FIT CUTTING SHOE (72 IN - 2 IN)	28.00	EACH		\$	

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LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	FP	AMOUNT
2340	24628EC		PILE CONSTRICTOR PLATE (72 IN - 2 IN)	28.00	EACH		\$	
2350	24629EC		DECORATIVE FENCE PANEL	7.00	EACH		\$	

Section: 0007 - MOBILIZATION & DEMOBILIZATION

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	FP	AMOUNT
2360	02568		MOBILIZATION	1.00	LS		\$	
2370	02569		DEMOBILIZATION	1.00	LS		\$	