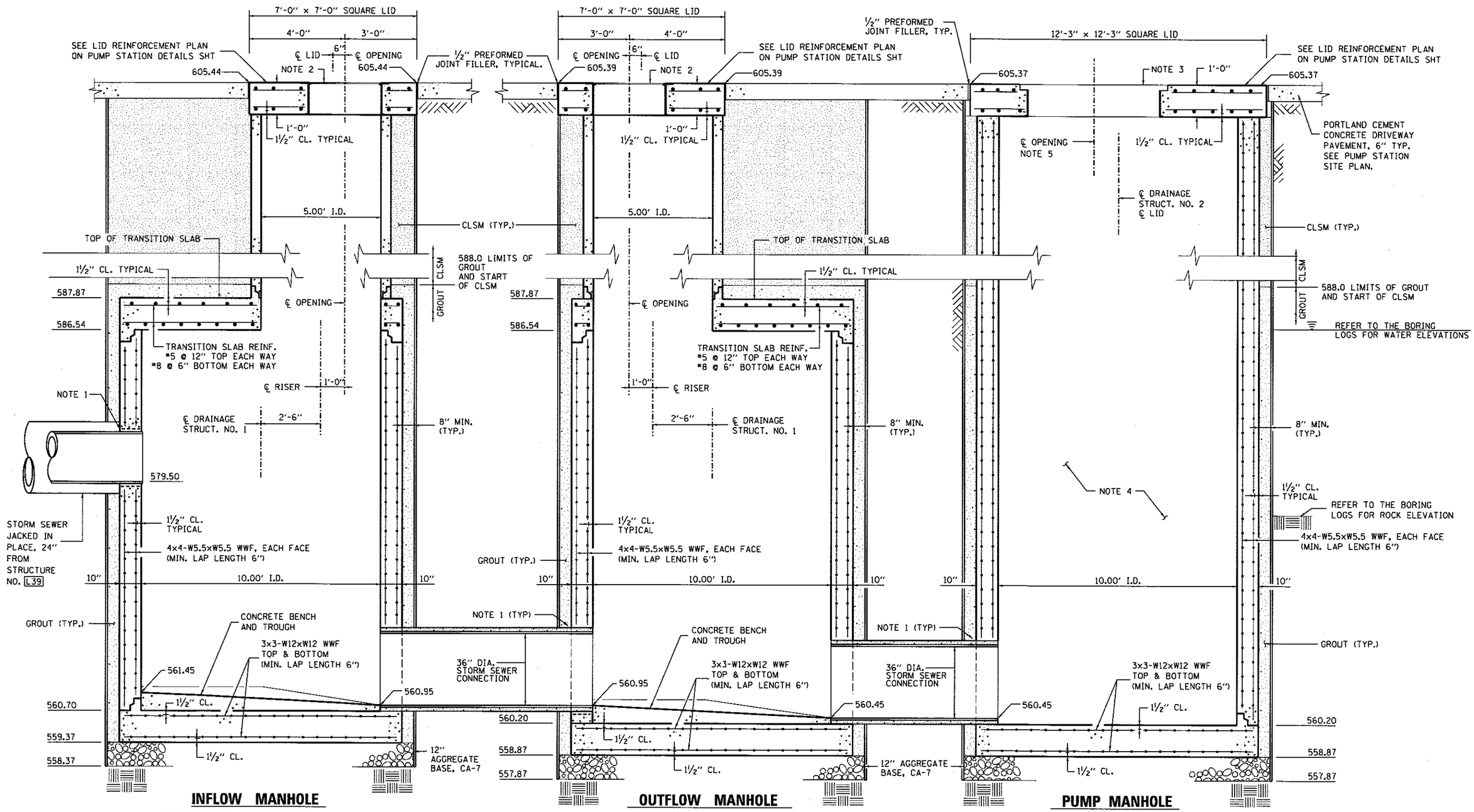

INFLOW MANHOLE
DRAINAGE STRUCTURES, NO. 1
PRECAST REINFORCED CONCRETE MANHOLE SECTIONS

SEE PUMP STATION -LAUREL STREET- DETAILS SHEET 5 FOR PLAN VIEW OF INFLOW MANHOLE.

OUTFLOW MANHOLE
DRAINAGE STRUCTURES, NO. 1
PRECAST REINFORCED CONCRETE MANHOLE SECTIONS

PUMP MANHOLE
DRAINAGE STRUCTURES, NO. 2
PRECAST REINFORCED CONCRETE MANHOLE SECTIONS

SECTION A–A
NOT TO SCALE

NOTES:

1. GROUT TYPICAL, SEE DETAIL ON PUMP STATION MECHANICAL LAYOUT SHEET.
2. 36" X 36" ALUMINUM ACCESS FRAME AND HATCH.
3. CUSTOM HATCH SYSTEM. SEE PUMP STATION DETAILS SHEET.
4. PUMPS AND PIPING REMOVED FOR CLARITY.
5. LOCATION OF THE HATCH & HINGED SIDE OF THE HATCH TO BE COORDINATED WITH THE PUMP MANUFACTURER.

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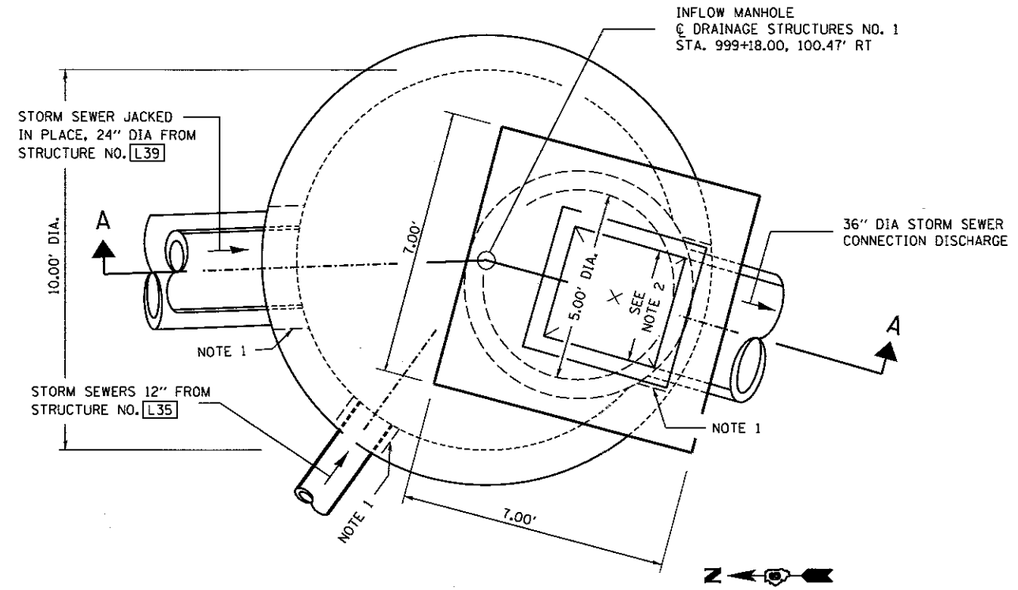
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

SPRINGFIELD RAIL IMPROVEMENTS PROJECT
SPRINGFIELD, SANGAMON COUNTY, ILLINOIS
PUMP STATION NO. 2 – LAUREL STREET – PRC DETAILS – 4

SCALE: | SHEET 4 OF 5 SHEETS | STA. | TO STA.

F.A.U RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
	14-00477-00-BR	SANGAMON	403	201
	09L0179B	CONTRACT NO. 93704		
	ILLINOIS FED. AID PROJECT			



LAUREL ST
INFLOW MANHOLE
DRAINAGE STRUCTURES, NO. 1

PRECAST REINFORCED CONCRETE MANHOLE SECTIONS
NOT TO SCALE
SEE PUMP STATION PRC DETAILS SHEET FOR SECTION A-A

NOTES:

1. GROUT TYPICAL, SEE DETAIL ON PUMP STATION MECHANICAL LAYOUT SHEET.
2. 36" X 36" ALUMINUM ACCESS FRAME AND HATCH.

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STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

SPRINGFIELD RAIL IMPROVEMENTS PROJECT
SPRINGFIELD, SANGAMON COUNTY, ILLINOIS
PUMP STATION NO. 2 – LAUREL STREET – DETAILS – 5

SCALE: | SHEET 5 OF 5 SHEETS | STA. | TO STA.

F.A.U RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
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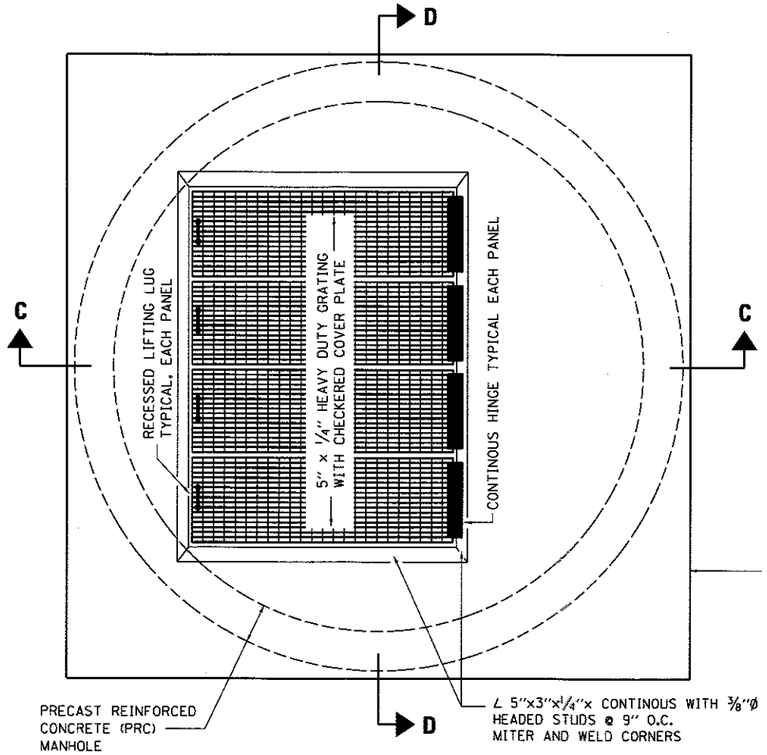
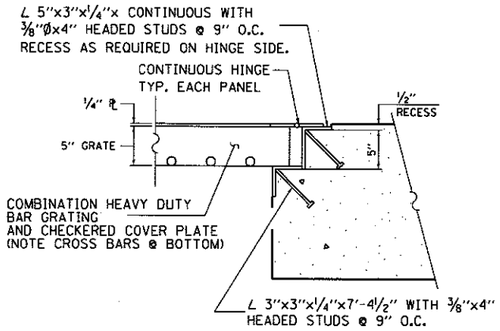
	09L0179B	CONTRACT NO. 93704		
	ILLINOIS FED. AID PROJECT			



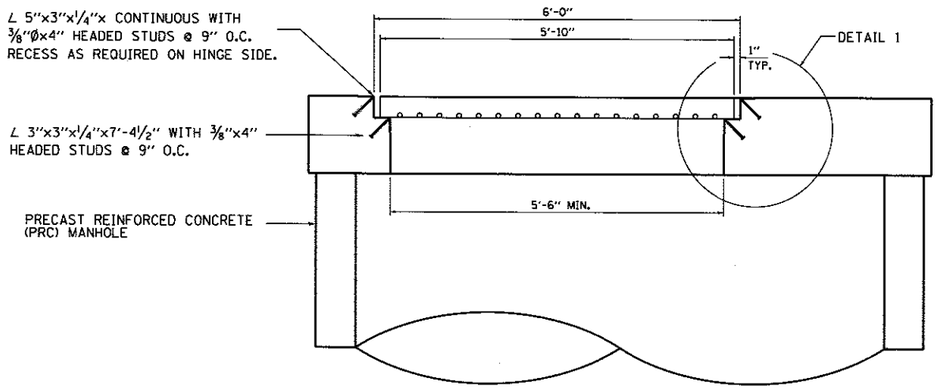
DRAINAGE STRUCTURES, NO. 2
PLAN

NOT TO SCALE

SEE SITE PLANS FOR ORIENTATION

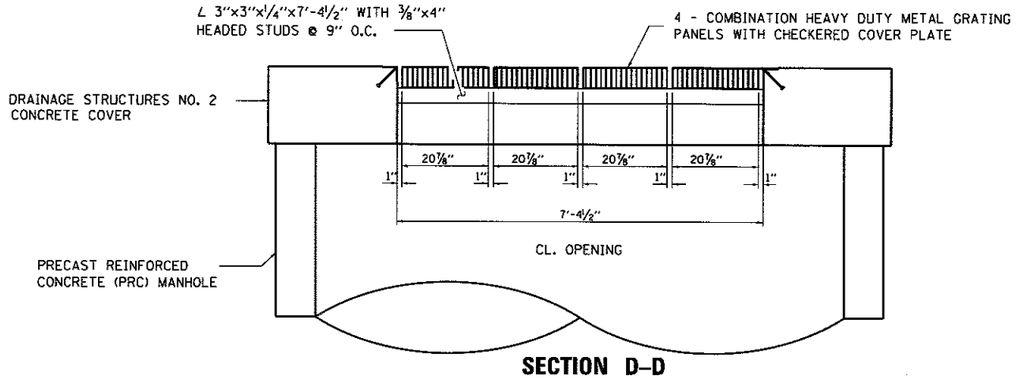


DETAIL 1



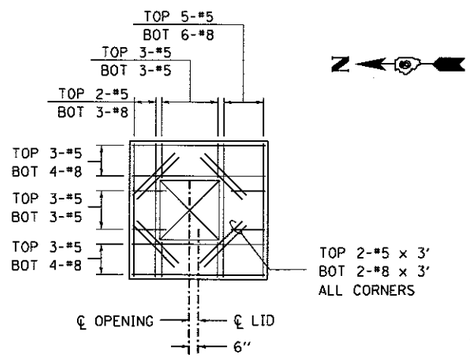
SECTION C–C

NOT TO SCALE



SECTION D–D

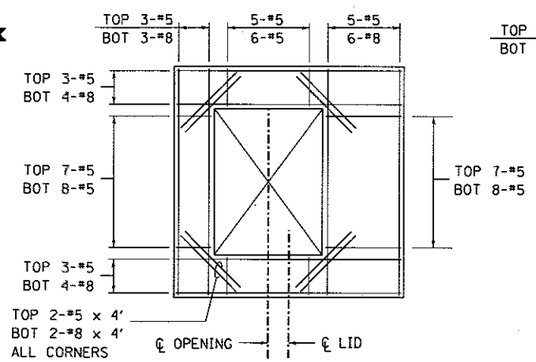
NOT TO SCALE



NOTE: 1 1/2" CLEAR COVER ON ALL REINFORCEMENT

DRAINAGE STRUCTURES, NO. 1
LID REINFORCING PLAN

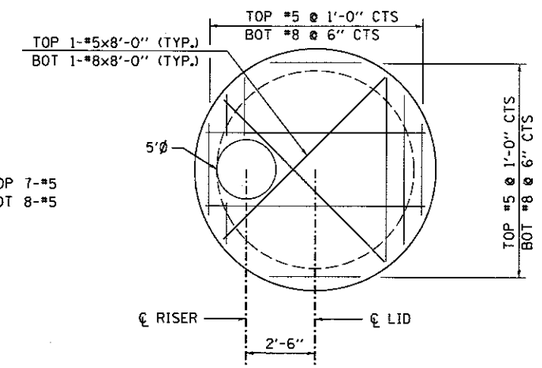
NOT TO SCALE



NOTE: 1 1/2" CLEAR COVER ON ALL REINFORCEMENT

DRAINAGE STRUCTURES, NO. 2
LID REINFORCING PLAN

NOT TO SCALE



NOTE: 1 1/2" CLEAR COVER ON ALL REINFORCEMENT

PUMP STATION – TRANSITION SLAB

NOT TO SCALE

DRAINAGE STRUCTURES, NO. 2 GRATING COVER NOTES:

1. LOADING: LIVE LOAD= AASHTO HL-93 TRUCK LOAD AND ALTERNATE TANDEM LOAD.
2. COMBINATION HEAVY DUTY WELDED STEEL W-SERIES GRATING AND WELDED 1/4" CHECKERED COVERED PLATE.
3. 22-W-4 GRATING: 5" X 1/4" PLAIN BEARING BARS @ 1 3/16" O.C. AND CROSS BARS @ 4" O.C.
4. GALVANIZED FINISH FOR GRATING, PLATE, ANGLES AND ACCESSORIES.
5. STEEL PLATE, BAR, AND ANGLES: AASHTO M270/ASTM A709, GRADE 36.
6. HEADED STUDS: AASHTO M169/ASTM A108, GRADE 1015, 1018, OR 1020 AUTOMATIC END WELDED TO BASE METAL.
7. WELD METAL: AWS D1.5
8. PROVIDE LIFTING LUG AND HINGE CONNECTION AT OPPOSITE ENDS OF EACH PANEL PER GRATING MANUFACTURERS STANDARD DETAILS CAPABLE OF SUPPORTING THE WEIGHT OF THE COMBINATION GRATING AND COVER PLATE, AND CAPABLE OF OPENING 180°.
9. LOCATION AND ARRANGEMENT OF THE HATCH TO BE COORDINATED WITH THE PUMP MANUFACTURER

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STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

SPRINGFIELD RAIL IMPROVEMENTS PROJECT
SPRINGFIELD, SANGAMON COUNTY, ILLINOIS
PUMP STATION DETAILS

SCALE: | SHEET 1 OF 1 SHEETS | STA. | TO STA.

F.A.U RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
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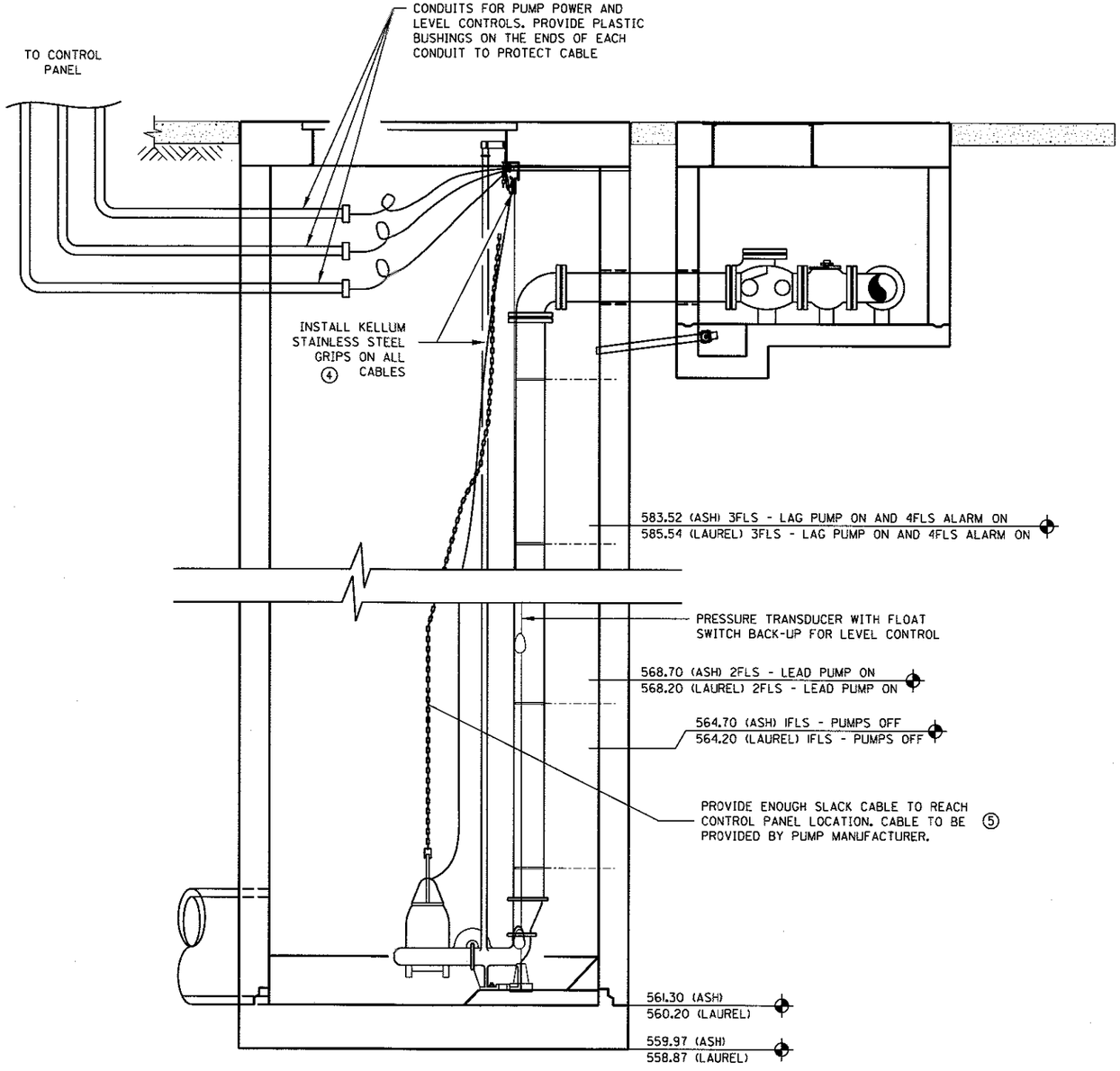
	09L0179B	CONTRACT NO. 93704		
	ILLINOIS FED. AID PROJECT			



ELECTRICAL ELEVATION
NOT TO SCALE

NOTES:

1. SHAFT SEAL FAILURE INSPECTION SHALL BE PART OF THE PUMPS ROUTINE MAINTENANCE.
2. THE PUMP CONTROLS SHALL INCORPORATE AN ALTERNATING RELAY TO EQUALIZE PUMP WEAR AND AUTOMATICALLY PROVIDE A STAND-BY.
3. VERIFY LEVEL SWITCH ELEVATIONS AND CABLE HANGAR LOCATIONS WITH ENGINEER AND PUMP MANUFACTURER REPRESENTATIVE.

GENERAL NOTES:

1. ALL ELECTRICAL EQUIPMENT INSTALLED IN THE WET WELL SHALL BE SUITABLE FOR USE IN CLASS I, DIV. I, GROUP D HAZARDOUS LOCATION AND SHALL CONFORM TO THE APPLICABLE SECTIONS OF NEC ARTICLES 500, 501, & 504 AS WELL AS ALL LOCAL CODES, ORDINANCES AND REQUIREMENTS.
2. ALL ELECTRICAL EQUIPMENT INSTALLED IN THE VALVE VAULT SHALL BE SUITABLE FOR USE IN CLASS I, DIVISION 2, GROUP D HAZARDOUS LOCATION AND SHALL CONFORM TO THE APPLICABLE SECTIONS OF NEC ARTICLES 500, 501, & 504 AS WELL AS ALL LOCAL CODES, ORDINANCES, AND REQUIREMENTS.
3. CONTRACTOR SHALL COORDINATE INSTALLATION OF ELECTRICAL EQUIPMENT, AND WORK WITH RESPECT TO PLUMBING, MECHANICAL, CONCRETE, EXCAVATION AND ALL OTHER WORK. COORDINATE THE INSTALLATION OF CONDUITS INTO THE WET WELL. USE NON-SHRINK GROUT AS REQUIRED TO SEAL CONDUIT PENETRATIONS.
4. ALL CONDUIT TERMINATIONS & OPENINGS IN ENCLOSURES SHALL BE SEALED WITH DUCT SEAL OR EQUAL.
5. LEVEL SENSING PRESSURE TRANSDUCER & BACK-UP FLOATS SHALL HAVE AN FM LISTED OR UL LISTED INTRINSICALLY SAFE BARRIER (SWITCHING AMPLIFIER) SUPPLIED FOR UNIT. INTRINSICALLY SAFE WIRING SHALL HAVE LIGHT BLUE COLORED INSULATION AND KEPT PHYSICALLY ISOLATED FROM OTHER CONDUCTORS. INTRINSICALLY SAFE WIRING AND EQUIPMENT SHALL BE INSTALLED PER ANSI/ISA RP12.6, UL 698A, AND NEC 504. CONDUITS WITH INTRINSICALLY SAFE WIRING SHALL TERMINATE IN THE CONTROL PANEL AT THE INTRINSICALLY SAFE WIRING SECTION.
6. METAL CONDUIT IN DIRECT CONTACT WITH EARTH OR CONCRETE SHALL BE PVC COATED FOR CORROSION PROTECTION.
7. ALL CONDUIT ENTRANCES INTO THE SERVICE BREAKER, PUMP CONTROL PANEL AND ANY OTHER NEMA 4 ENCLOSURES SHALL HAVE WATER TIGHT THREADED HUBS, UL LISTED NEMA 4, 4X FOR RESPECTIVE ENCLOSURE.
8. ALL BUSHINGS, HUBS, & FITTINGS BETWEEN CONDUITS OF DISSIMILAR METALS AND/OR BETWEEN CONDUITS AND ENCLOSURES OF A DISSIMILAR METAL SHALL BE SUITABLE FOR SUCH APPLICATIONS TO ELIMINATE THE POSSIBILITY OF GALVANIC ACTION.

SHEET LEGEND:

① MULTI-CONDUCTOR LIQUID LEVEL SENSING CABLE (WITH MAXIMUM DIAMETER OF 5/8") IN 2" PVC COATED RIGID ALUMINUM CONDUIT. CONDUIT SHALL BE SIZED FOR 25% MAXIMUM FILL TO CONFORM TO EXPLOSION PROOF CONDUIT SEAL REQUIREMENTS. ADJUST (ENLARGE) AS REQUIRED.

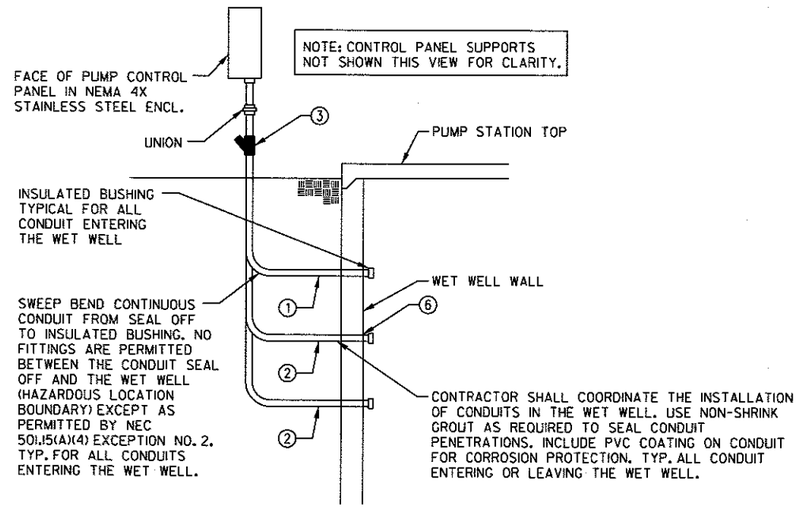
② SUBMERSIBLE PUMP MOTOR CABLE IN 3" PVC COATED RIGID ALUMINUM CONDUIT. CONDUIT SHALL BE SIZED FOR 25% MAXIMUM FILL TO CONFORM TO EXPLOSION PROOF CONDUIT SEAL REQUIREMENTS. ADJUST (ENLARGE) AS REQUIRED.

③ EXPLOSION PROOF CONDUIT SEAL SUITABLE FOR CLASS I, DIVISION I, GROUP D HAZARDOUS LOCATION, REQUIRED FOR ALL CONDUITS ENTERING OR LEAVING THE WET WELL OR VALVE VAULT INSTALLED IN CONFORMANCE WITH NEC 501 & MANUFACTURER'S DIRECTIONS. NOTE CONDUIT SEALS SHALL BE SIZED AS REQUIRED FOR THE RESPECTIVE CABLE FILL. CABLE FILL SHALL NOT EXCEED 25% FOR CONDUIT SEAL APPLICATION. CONDUIT SEALS SHALL BE THE FIRST FITTING AFTER THE CONDUIT LEAVES THE WET WELL AND EMERGES FROM GRADE & THE FIRST FITTING AFTER CONDUIT ENTERS THE VALVE VAULT.

④ HEAVY DUTY STAINLESS STEEL CABLE RACK ADEQUATELY SIZED FOR THE RESPECTIVE PUMP & LEVEL CABLES OR HEAVY DUTY NYLON SADDLE RACKS (CABLE HANGAR WITH 3" THROAT OPENING), UNDERGROUND DEVICES CAT. NO. 3SRI. MOUNT AT IMMEDIATELY INSIDE ACCESS HATCH WITH STAINLESS STEEL STRUT SUPPORT & STAINLESS STEEL HARDWARE. PROVIDE SUFFICIENT RACKS FOR EACH PUMP CABLE & LEVEL CABLES. EACH PUMP MOTOR SHALL HAVE 10' MINIMUM SLACK CABLE TO ALLOW FOR FUTURE REMOVAL AND REINSTALLATION. LOOP SLACK CABLES AROUND SADDLE RACK AND SECURE WITH CABLE TIES.

⑤ SUBMERSIBLE PUMP CABLE BY PUMP MANUFACTURER. VERIFY EACH PUMP MOTOR HAS A MINIMUM OF 10 FEET OF SLACK CABLE. (2 TYP.)

⑥ CONDUIT HOLES SHALL BE CORED THROUGH THE STRUCTURE WALLS OR PREFORMED DURING CASTING.



CONDUIT ENTRANCE TO PUMP STATION
NOT TO SCALE

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STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

SPRINGFIELD RAIL IMPROVEMENTS PROJECT
SPRINGFIELD, SANGAMON COUNTY, ILLINOIS
PUMP STATION ELECTRICAL DETAILS

SCALE: | SHEET 1 OF 3 SHEETS | STA. | TO STA.

F.A.U RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
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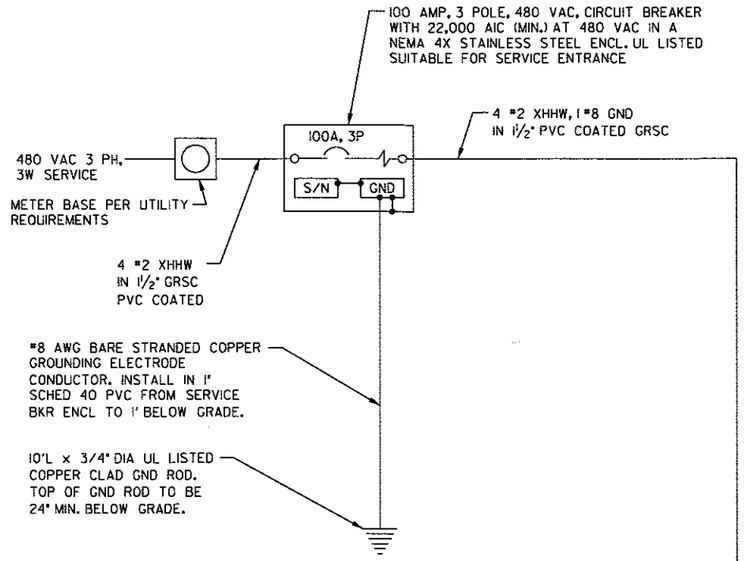
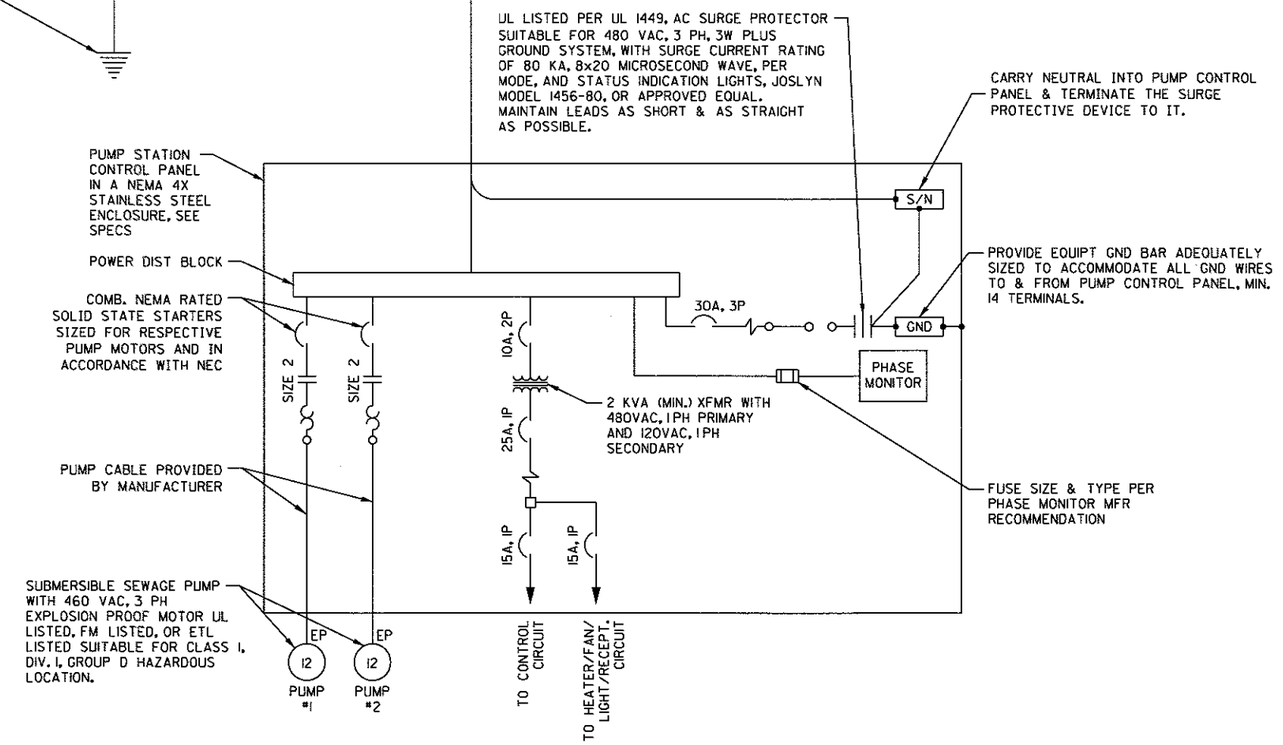
	09L0179B	CONTRACT NO. 93704		
	ILLINOIS FED. AID PROJECT			





PUMP STATION ELECTRICAL ONE LINE

NO SCALE

NOTES:

1. ALL ELECTRICAL EQUIPMENT SHALL BE INSTALLED IN CONFORMANCE WITH NFPA 70 (NEC MOST CURRENT ISSUE IN FORCE), THE RESPECTIVE EQUIPMENT MANUFACTURER'S DIRECTIONS AND ALL OTHER APPLICABLE LOCAL CODES, LAWS, ORDINANCES AND REQUIREMENTS IN FORCE. ANY INSTALLATIONS WHICH VOID THE U.L. LISTING, FM LISTING, ETL LISTING (OR OTHER THIRD PARTY LISTING) AND/OR THE MANUFACTURER'S WARRANTY OF A DEVICE SHALL NOT BE PERMITTED.
2. COORDINATE ELECTRIC SERVICE WORK WITH THE SERVING ELECTRIC UTILITY COMPANY,
   CITY WATER LIGHT & POWER
   SPRINGFIELD, ILLINOIS
   CHRIS HARNEY 217-321-1353
3. INCLUDE WEATHER PROOF ENGRAVED PHENOLIC LEGEND PLATE FOR SERVICE BREAKER LABELED "SERVICE DISCONNECT 480 VAC, 3 PH, 3W".
4. PUMP MOTOR SIZES MAY VARY DEPENDING UPON MANUFACTURER. PUMP MOTOR STARTERS SHALL BE SIZED FOR THE RESPECTIVE PUMP MOTOR FURNISHED AND SHALL BE NEMA SIZE 2 MINIMUM. VERIFY REQUIREMENTS WITH THE RESPECTIVE PUMP MOTOR MFR.
5. ALL METAL CONDUITS ENTERING SERVICE ENTRANCE EQUIPMENT SHALL BE GROUNDED USING GROUNDING BUSHINGS/ GROUNDING HUBS WITH GROUND CONDUCTOR FROM BUSHING TO RESPECTIVE ENCLOSURE GROUND BUS.
6. METAL CONDUIT IN DIRECT CONTACT WITH EARTH SHALL BE PVC COATED GRSC. METAL CONDUIT ENTERING THE SEWAGE PUMP STATION WET WELL SHALL BE PVC COATED RIGID ALUMINUM.
7. PROVIDE NEMA 4 HUBS FOR ALL CONDUITS ENTERING ENCLOSURES THAT ARE RATED NEMA 4 OR NEMA 4X TO MAINTAIN THE NEMA 4, 4X RATING OF THE ENCLOSURE. PROVIDE NEMA 4 HUBS FOR ALL CONDUITS ENTERING THE PANELBOARD ENCLOSURE.

ONE-LINE LEGEND

- SURGE PROTECTOR/TVSS DEVICE
- ELECTRIC UTILITY SERVICE METER AND BASE
- CAPACITOR
- TRANSFORMER
- CABLE TERMINAL OR LUGS
- (G) GENERATOR
- SIZE # — COMBINATION CIRCUIT BREAKER/STARTER WITH OVERLOAD PROTECTION. # = NEMA SIZE NO.
- GROUND - GROUND ROD, CHASSIS, BUS, OR AT EARTH POTENTIAL
- (M) MOTOR
- (M)EP EXPLOSION PROOF MOTOR
- (#) MOTOR, # = HORSEPOWER
- CIRCUIT BREAKER
- MCP — ADJUSTABLE MOTOR CIRCUIT PROTECTOR TYPE BREAKER
- THERMAL-MAGNETIC CIRCUIT BREAKER
- FUSE
- DISCONNECT SWITCH
- FUSIBLE DISCONNECT SWITCH
- THERMAL OVERLOAD PROTECTION
- EXPLOSION PROOF CONDUIT SEAL-OFF FITTING
- N O E L — TRANSFER SWITCH
- JUNCTION BOX WITH SPLICE
- GND — GROUND BUS OR LUG
- S/N — NEUTRAL BUS
- GND / S/N — PANELBOARD WITH MAIN BREAKER
- GND / S/N — PANELBOARD WITH MAIN MAIN LUGS

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STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

SPRINGFIELD RAIL IMPROVEMENTS PROJECT
SPRINGFIELD, SANGAMON COUNTY, ILLINOIS
PUMP STATION ELECTRICAL DETAILS – ASH STREET – 1
SCALE: | SHEET 1 OF 2 SHEETS | STA. | TO STA.

F.A.U RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
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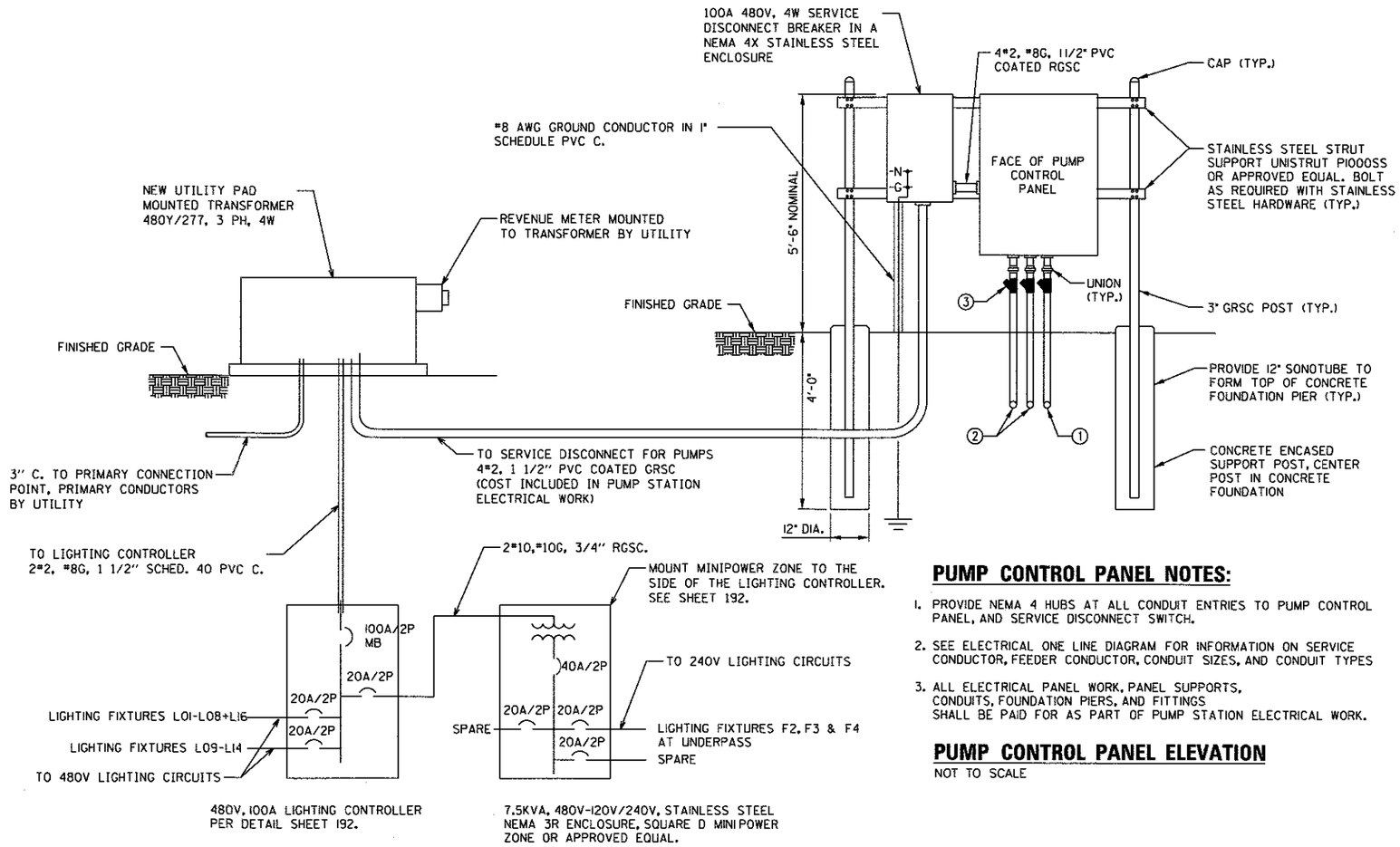
	09L0179B	CONTRACT NO. 93704		
	ILLINOIS FED. AID PROJECT			



SHEET LEGEND:

1. MULTI-CONDUCTOR LEVEL PROBE CABLE (WITH MAXIMUM DIAMETER OF 5/8") IN 2" PVC COATED RIGID ALUMINUM. CONDUIT SHALL BE SIZED FOR 25% MAXIMUM FILL TO CONFORM TO EXPLOSION PROOF CONDUIT SEAL REQUIREMENTS. ADJUST (ENLARGE) AS REQUIRED.
2. SUBMERSIBLE PUMP MOTOR CABLE IN 3" PVC COATED RIGID ALUMINUM. CONDUIT SHALL BE SIZED FOR 25% MAXIMUM FILL TO CONFORM TO EXPLOSION PROOF CONDUIT SEAL REQUIREMENTS. ADJUST (ENLARGE) AS REQUIRED.
3. EXPLOSION PROOF CONDUIT SEAL SUITABLE FOR CLASS I, DIVISION I, GROUP D HAZARDOUS LOCATION, REQUIRED FOR ALL CONDUITS ENTERING OR LEAVING THE WET WELL OR VALVE VAULT INSTALLED IN CONFORMANCE WITH NEC 501 & MANUFACTURER'S DIRECTIONS. NOTE CONDUIT SEALS SHALL BE SIZED AS REQUIRED FOR THE RESPECTIVE CABLE FILL. CABLE FILL SHALL NOT EXCEED 25% FOR CONDUIT SEAL APPLICATION. CONDUIT SEALS SHALL BE THE FIRST FITTING AFTER THE CONDUIT LEAVES THE WET WELL AND EMERGES FROM GRADE & THE FIRST FITTING AFTER CONDUIT ENTERS THE VALVE VAULT.

PUMP CONTROL PANEL NOTES:

1. PROVIDE NEMA 4 HUBS AT ALL CONDUIT ENTRIES TO PUMP CONTROL PANEL, AND SERVICE DISCONNECT SWITCH.
2. SEE ELECTRICAL ONE LINE DIAGRAM FOR INFORMATION ON SERVICE CONDUCTOR, FEEDER CONDUCTOR, CONDUIT SIZES, AND CONDUIT TYPES
3. ALL ELECTRICAL PANEL WORK, PANEL SUPPORTS, CONDUITS, FOUNDATION PIERS, AND FITTINGS SHALL BE PAID FOR AS PART OF PUMP STATION ELECTRICAL WORK.

PUMP CONTROL PANEL ELEVATION

NOT TO SCALE

ELECTRIC SERVICE INSTALLATION DETAIL

NOT TO SCALE

SERVICE NOTES:

1. CONTRACTOR SHALL VERIFY AND COORDINATE SERVICE ENTRANCE WORK WITH THE SERVING ELECTRIC UTILITY COMPANY.
2. ALL METAL CONDUITS TERMINATING IN SERVICE EQUIPMENT (METER BASE & SERVICE BREAKER) SHALL HAVE GROUND BUSHING TYPE HUBS WITH BONDING JUMPERS TO THE RESPECTIVE GND BUS.
3. SEE ELECTRICAL ONE-LINE DIAGRAM FOR CONDUIT & WIRE SIZES & TYPES.
4. UNLESS OTHERWISE NOTED, WORK SHOWN ON ELECTRIC SERVICE INSTALLATION DETAIL, INCLUDING COORDINATION WITH UTILITY COMPANY, SHALL BE PAID FOR AS ELECTRIC SERVICE INSTALLATION.

LEGEND PLATE SCHEDULE		
DEVICE	LEGEND PLATE LABELING	LETER HEIGHT/COLOR
100A SERVICE BREAKER	SERVICE DISCONNECT 480 VAC, 3 PH, 3 W	1/4" BLACK LETTERING ON A WHITE BACKGROUND
PUMP CONTROL PANEL ENCLOSURE	PUMP STATION CONTROL PANEL 480 VAC, 3 PH, 3 W	1/4" WHITE LETTERING ON A RED BACKGROUND

LEGEND PLATE SCHEDULE NOTES:

1. LEGEND PLATES SHALL BE WEATHERPROOF, ABRASION RESISTANT, PHENOLIC ENGRAVED MATERIAL. LETTERING SHALL BE SIZED AS NOTED ABOVE. SECURE LEGNED PLATES TO EQUIPMENT WITH MACHINE SCREWS AND/OR RIVETS. CONTRACTOR SHALL FIELD VERIFY THAT THE RESPECTIVE LETTERING HEIGHT AND LEGENDS WILL FIT ON THE RESPECTIVE EQUIPMENT AND ADJUST LETTERING HEIGHT WHERE APPLICABLE. SEE SPECIFICATIONS FOR THE PUMP CONTROL PANEL FOR ADDITIONAL LEGEND PLATES REQUIRED FOR THAT PANEL.
2. FURNISH & INSTALL A WEATHERPROOF WARNING LABEL FOR EACH METER SOCKET, SERVICE DISCONNECT, TRANSFER SWTICH, PANELBOARD & CONTROL PANEL TO WARN PERSONS OF POTENTIAL ELECTRIC ARC FLASH HAZARDS, PER THE REQUIREMENTS OF NEC 110.16 "FLASH PROTECTION". LABELS SHALL BE HAZARD COMMUNICATION SYSTEMS, LLC (190 OLD MILFORD RD., P.O. BOX 1174, MILFORD, PA 18337 PHONE: 1-887-748-0244) PART NO. H6010-9VWHBJ OR APPROVED EQUAL.

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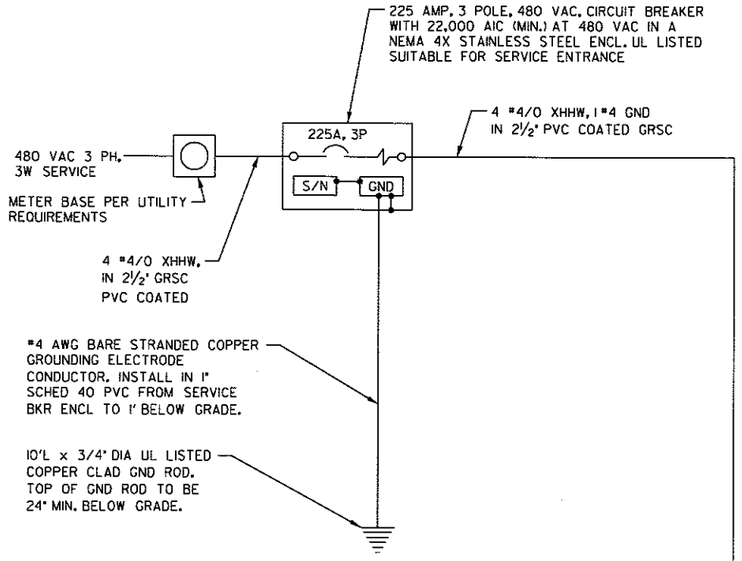
		DRAWN - SKB	REVISED -
Sheet	PLOT SCALE = 0.1667 '/ in.	CHECKED - MNM	REVISED -
	PLOT DATE = 2/24/2017	DATE -	REVISED -

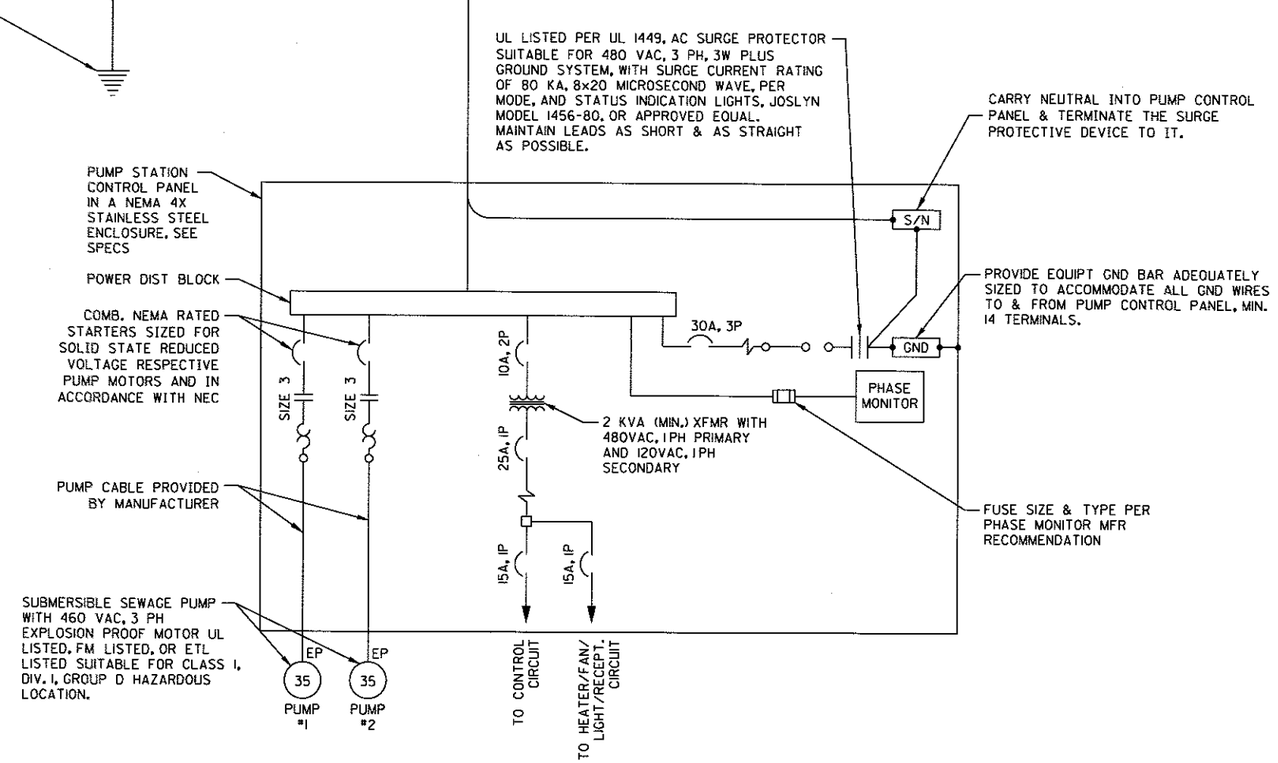
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

SPRINGFIELD RAIL IMPROVEMENTS PROJECT
SPRINGFIELD, SANGAMON COUNTY, ILLINOIS
PUMP STATION ELECTRICAL DETAILS – ASH STREET – 2

SCALE: | SHEET 2 OF 2 SHEETS | STA. | TO STA.

F.A.U RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
	14-00477-00-BR	SANGAMON	403	206
	09L0179B	CONTRACT NO. 93704		
	ILLINOIS FED. AID PROJECT			





PUMP STATION ELECTRICAL ONE LINE

NO SCALE

NOTES:

1. ALL ELECTRICAL EQUIPMENT SHALL BE INSTALLED IN CONFORMANCE WITH NFPA 70 (NEC MOST CURRENT ISSUE IN FORCE), THE RESPECTIVE EQUIPMENT MANUFACTURER'S DIRECTIONS AND ALL OTHER APPLICABLE LOCAL CODES, LAWS, ORDINANCES AND REQUIREMENTS IN FORCE. ANY INSTALLATIONS WHICH VOID THE U.L. LISTING, FM LISTING, ETL LISTING (OR OTHER THIRD PARTY LISTING) AND/OR THE MANUFACTURER'S WARRANTY OF A DEVICE SHALL NOT BE PERMITTED.
2. COORDINATE ELECTRIC SERVICE WORK WITH THE SERVING ELECTRIC UTILITY COMPANY,
   CITY WATER LIGHT & POWER
   SPRINGFIELD, ILLINOIS
   CHRIS HARNEY 217-321-1353
3. INCLUDE WEATHER PROOF ENGRAVED PHENOLIC LEGEND PLATE FOR SERVICE BREAKER LABELED "SERVICE DISCONNECT 480 VAC, 3 PH, 3W".
4. PUMP MOTOR SIZES MAY VARY DEPENDING UPON MANUFACTURER. PUMP MOTOR STARTERS SHALL BE SIZED FOR THE RESPECTIVE PUMP MOTOR FURNISHED AND SHALL BE NEMA SIZE 2 MINIMUM. VERIFY REQUIREMENTS WITH THE RESPECTIVE PUMP MOTOR MFR.
5. ALL METAL CONDUITS ENTERING SERVICE ENTRANCE EQUIPMENT SHALL BE GROUNDED USING GROUNDING BUSHINGS/ GROUNDING HUBS WITH GROUND CONDUCTOR FROM BUSHING TO RESPECTIVE ENCLOSURE GROUND BUS.
6. METAL CONDUIT IN DIRECT CONTACT WITH EARTH SHALL BE PVC COATED GRSC. METAL CONDUIT ENTERING THE SEWAGE PUMP STATION WET WELL SHALL BE PVC COATED RIGID ALUMINUM.
7. PROVIDE NEMA 4 HUBS FOR ALL CONDUITS ENTERING ENCLOSURES THAT ARE RATED NEMA 4 OR NEMA 4X TO MAINTAIN THE NEMA 4, 4X RATING OF THE ENCLOSURE. PROVIDE NEMA 4 HUBS FOR ALL CONDUITS ENTERING THE PANELBOARD ENCLOSURE.

ONE-LINE LEGEND

- SURGE PROTECTOR/TVSS DEVICE
- ELECTRIC UTILITY SERVICE METER AND BASE
- CAPACITOR
- TRANSFORMER
- CABLE TERMINAL OR LUGS
- (G) GENERATOR
- SIZE # — COMBINATION CIRCUIT BREAKER/STARTER WITH OVERLOAD PROTECTION. # = NEMA SIZE NO.
- GROUND - GROUND ROD, CHASSIS, BUS, OR AT EARTH POTENTIAL
- (M) MOTOR
- (M)EP EXPLOSION PROOF MOTOR
- (#) MOTOR, # = HORSEPOWER
- CIRCUIT BREAKER
- MCP — ADJUSTABLE MOTOR CIRCUIT PROTECTOR TYPE BREAKER
- THERMAL-MAGNETIC CIRCUIT BREAKER
- FUSE
- DISCONNECT SWITCH
- FUSIBLE DISCONNECT SWITCH
- THERMAL OVERLOAD PROTECTION
- EXPLOSION PROOF CONDUIT SEAL-OFF FITTING
- N / L / E — TRANSFER SWITCH
- JUNCTION BOX WITH SPLICE
- GND — GROUND BUS OR LUG
- S/N — NEUTRAL BUS
- GND / S/N — PANELBOARD WITH MAIN BREAKER
- GND / S/N — PANELBOARD WITH MAIN MAIN LUGS

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DESIGNED	MNM	7/20/2015
DRAWN	SKB	7/20/2015
REVIEWED	MNM	10/11/2016

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STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

SPRINGFIELD RAIL IMPROVEMENTS PROJECT
SPRINGFIELD, SANGAMON COUNTY, ILLINOIS
PUMP STATION ELECTRICAL DETAILS – LAUREL STREET – 1

SCALE: | SHEET 1 OF 2 SHEETS | STA. | TO STA.

F.A.U RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
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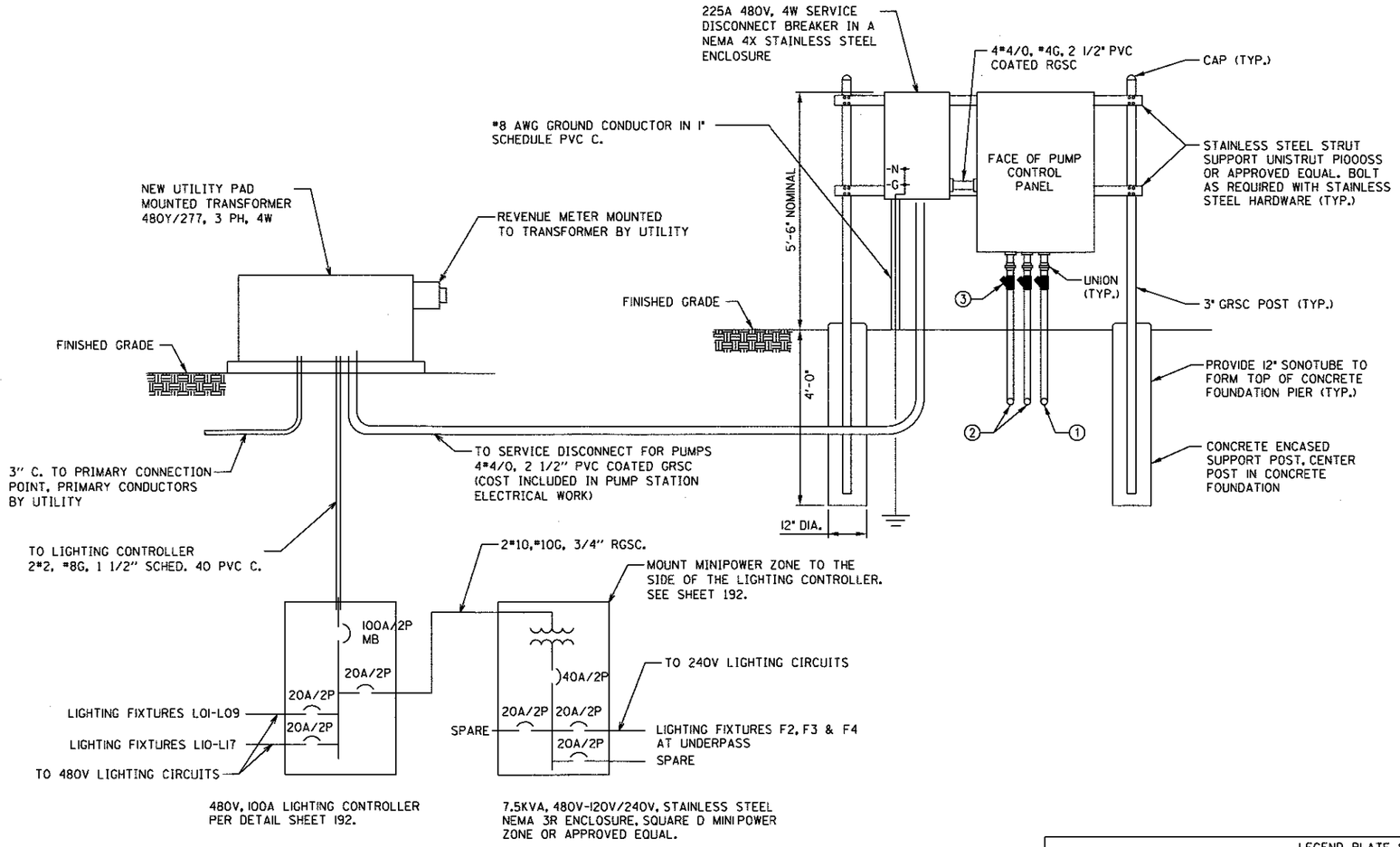
	09L0179B	CONTRACT NO. 93704		
	ILLINOIS FED. AID PROJECT			



ELECTRIC SERVICE INSTALLATION DETAIL

NOT TO SCALE

SERVICE NOTES:

1. CONTRACTOR SHALL VERIFY AND COORDINATE SERVICE ENTRANCE WORK WITH THE SERVING ELECTRIC UTILITY COMPANY.
2. ALL METAL CONDUITS TERMINATING IN SERVICE EQUIPMENT (METER BASE & SERVICE BREAKER) SHALL HAVE GROUND BUSHING TYPE HUBS WITH BONDING JUMPERS TO THE RESPECTIVE GND BUS.
3. SEE ELECTRICAL ONE-LINE DIAGRAM FOR CONDUIT & WIRE SIZES & TYPES.
4. UNLESS OTHERWISE NOTED, WORK SHOWN ON ELECTRIC SERVICE INSTALLATION DETAIL, INCLUDING COORDINATION WITH UTILITY COMPANY, SHALL BE PAID FOR AS ELECTRIC SERVICE INSTALLATION.

SHEET LEGEND:

1. MULTI-CONDUCTOR LEVEL PROBE CABLE (WITH MAXIMUM DIAMETER OF 5/8") IN 2" PVC COATED RIGID ALUMINUM. CONDUIT SHALL BE SIZED FOR 25% MAXIMUM FILL TO CONFORM TO EXPLOSION PROOF CONDUIT SEAL REQUIREMENTS. ADJUST (ENLARGE) AS REQUIRED.
2. SUBMERSIBLE PUMP MOTOR CABLE IN 3" PVC COATED RIGID ALUMINUM. CONDUIT SHALL BE SIZED FOR 25% MAXIMUM FILL TO CONFORM TO EXPLOSION PROOF CONDUIT SEAL REQUIREMENTS. ADJUST (ENLARGE) AS REQUIRED.
3. EXPLOSION PROOF CONDUIT SEAL SUITABLE FOR CLASS I, DIVISION I, GROUP D HAZARDOUS LOCATION, CROUSE HINDS EYS, APPLETON EYS, ESU, EY, KILLARK ENY, EY EYS OR O-Z GEDNEY EYA, EY, OR EZS SERIES, REQUIRED FOR ALL CONDUITS ENTERING OR LEAVING THE WET WELL OR VALVE VAULT INSTALLED IN CONFORMANCE WITH NEC 501& MANUFACTURER'S DIRECTIONS. NOTE CONDUIT SEALS SHALL BE SIZED AS REQUIRED FOR THE RESPECTIVE CABLE FILL. CABLE FILL SHALL NOT EXCEED 25% FOR CONDUIT SEAL APPLICATION. CONDUIT SEALS SHALL BE THE FIRST FITTING AFTER THE CONDUIT LEAVES THE WET WELL AND EMERGES FROM GRADE & THE FIRST FITTING AFTER CONDUIT ENTERS THE VALVE VAULT.

LEGEND PLATE SCHEDULE		
DEVICE	LEGEND PLATE LABELING	LETER HEIGHT/COLOR
225A SERVICE BREAKER	SERVICE DISCONNECT 480 VAC, 3 PH, 3 W	1/4" BLACK LETTERING ON A WHITE BACKGROUND
PUMP CONTROL PANEL ENCLOSURE	PUMP STATION CONTROL PANEL 480 VAC, 3 PH, 3 W	1/4" WHITE LETTERING ON A RED BACKGROUND

LEGEND PLATE SCHEDULE NOTES:

1. LEGEND PLATES SHALL BE WEATHERPROOF, ABRASION RESISTANT, PHENOLIC ENGRAVED MATERIAL. LETTERING SHALL BE SIZED AS NOTED ABOVE. SECURE LEGNED PLATES TO EQUIPMENT WITH MACHINE SCREWS AND/OR RIVETS. CONTRACTOR SHALL FIELD VERIFY THAT THE RESPECTIVE LETTERING HEIGHT AND LEGENDS WILL FIT ON THE RESPECTIVE EQUIPMENT AND ADJUST LETTERING HEIGHT WHERE APPLICABLE. SEE SPECIFICATIONS FOR THE PUMP CONTROL PANEL FOR ADDITIONAL LEGEND PLATES REQUIRED FOR THAT PANEL.
2. FURNISH & INSTALL A WEATHERPROOF WARNING LABEL FOR EACH METER SOCKET, SERVICE DISCONNECT, TRANSFER SWTICH, PANELBOARD & CONTROL PANEL TO WARN PERSONS OF POTENTIAL ELECTRIC ARC FLASH HAZARDS, PER THE REQUIREMENTS OF NEC 110.16 "FLASH PROTECTION". LABELS SHALL BE HAZARD COMMUNICATION SYSTEMS, LLC (190 OLD MILFORD RD., P.O. BOX 1174, MILFORD, PA 18337 PHONE: 1-887-748-0244) PART NO. H6010-9VWHBJ OR APPROVED EQUAL.

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FINAL

DESIGNED	MNM	7/20/2015
DRAWN	SKB	7/20/2015
REVIEWED	MNM	10/11/2016

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STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

SPRINGFIELD RAIL IMPROVEMENTS PROJECT
SPRINGFIELD, SANGAMON COUNTY, ILLINOIS
PUMP STATION ELECTRICAL DETAILS – LAUREL STREET – 2

SCALE: | SHEET 2 OF 2 SHEETS | STA. | TO STA.

F.A.U RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
	14-00477-00-BR	SANGAMON	403	208
	09L0179B	CONTRACT NO. 93704		
	ILLINOIS FED. AID PROJECT			

F.A.U RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
7991 7992	14-00477-00-BR	SANGAMON	403	209
	ILLINOIS	CONTRACT NO. 93704		

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROPOSED HIGHWAY PLANS
USABLE SEGMENT II

F.A.U. ROUTE 7991 (LAUREL STREET) & F.A.U. ROUTE 7992 (ASH STREET)
AT 10TH ST. CORRIDOR / RR UNDERPASS

SECTION 14–00477–00–BR

PROJECT TIG–5146(098)

RECONSTRUCTION

CITY OF SPRINGFIELD, SANGAMON COUNTY
C–96–203–17

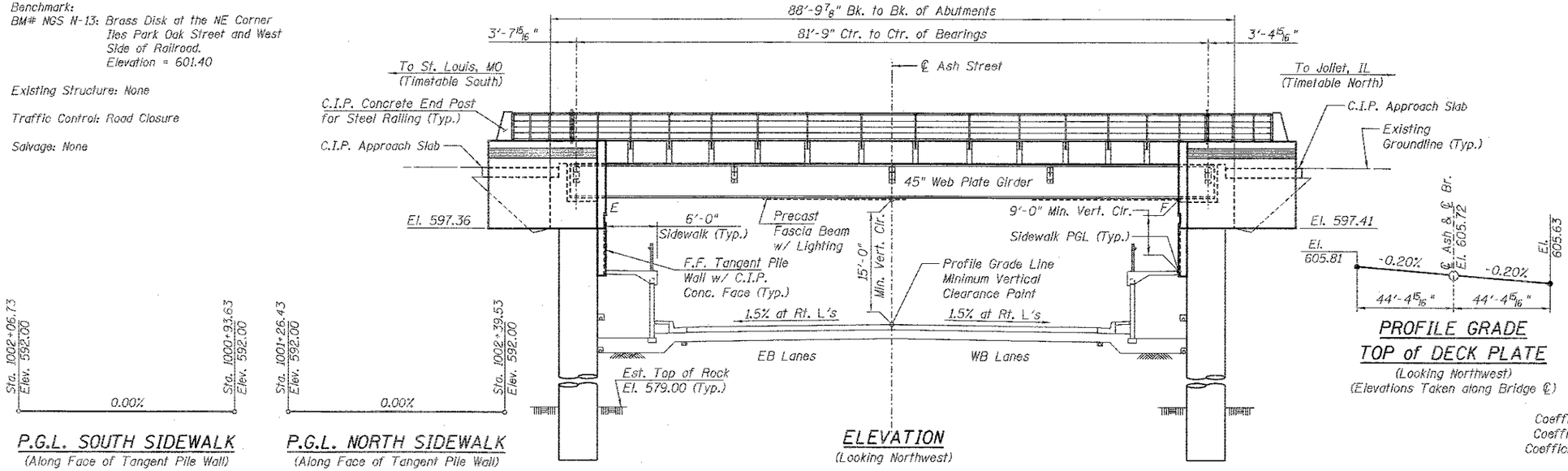
VOLUME II
STRUCTURES
&
CROSS SECTIONS

Benchmark:
BM# NGS N-13: Brass Disk at the NE Corner Iles Park Oak Street and West Side of Railroad.
Elevation = 601.40

Existing Structure: None

Traffic Control: Road Closure

Salvage: None



P.G.L. SOUTH SIDEWALK
(Along Face of Tangent Pile Wall)

P.G.L. NORTH SIDEWALK
(Along Face of Tangent Pile Wall)

ELEVATION
(Looking Northwest)

PROFILE GRADE TOP of DECK PLATE
(Looking Northwest)
(Elevations Taken along Bridge ℄)

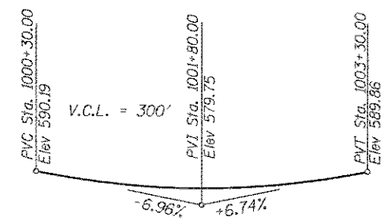
LOADING COOPER E-80
Impact: Diesel Impact
Allow 30" of Ballast Dead Load

DESIGN SPECIFICATIONS
2013 AREMA Specifications
Live Load Deflection: L/640
Composite Design for Deflection Requirements
Design Speed: 50 m.p.h.

DESIGN STRESSES
FIELD UNITS
f'c = 4,000 psi
fy = 60,000 psi (Reinforcement)
fy = 50,000 psi (ASTM A709 Grade 50)

PRECAST UNITS
f'c = 6,500 psi
f'ci = 5,000 psi
f'pu = 270,000 psi (½" ϕ Low Lax Strands)
fpbt = 201,960 psi (½" ϕ Low Lax Strands)
fy = 60,000 psi (Reinforcement)

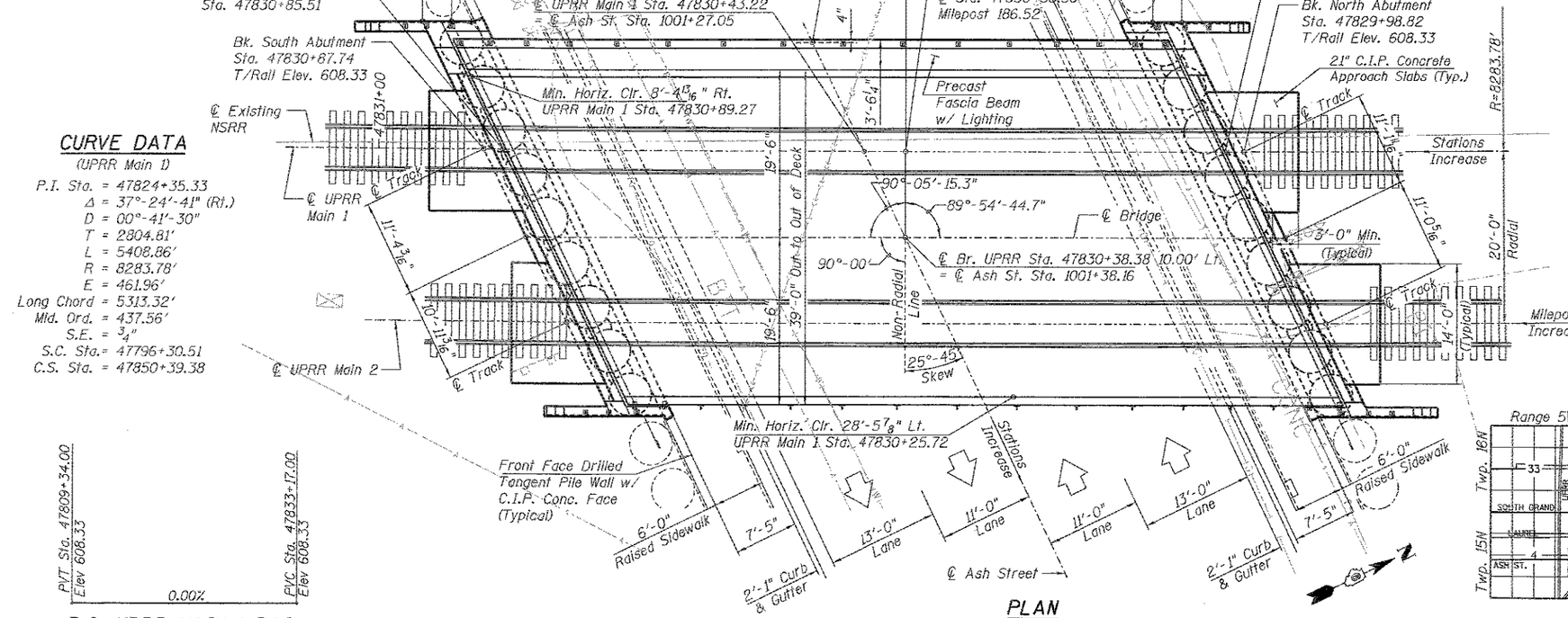
SEISMIC DATA
AREMA
Coefficient of Horiz. Acceleration, 100 Year (A_{100}) = < 0.04g
Coefficient of Horiz. Acceleration, 475 Year (A_{475}) = < 0.04g
Coefficient of Horiz. Acceleration, 2400 Year (A_{2400}) = 0.095g
Soil Site Coefficient (S) = 1.0



PROFILE GRADE - ASH ST.
Along ℄ of Ash Street

SIGNATURE
02-27-2017
DATE
LIC. EXP. DATE: 11-30-2018

I certify that to the best of my knowledge, information and belief, this bridge design is structurally adequate for the design loading shown on the plans. The design is an economical one for the style of structure and complies with requirements of the current AREMA Specifications.

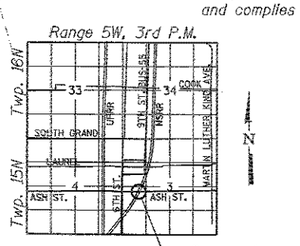


PLAN

CURVE DATA
(UPRR Main 1)

P.I. Sta. = 47824+35.33
Δ = 37°-24'-41" (Rt.)
D = 00°-41'-30"
T = 2804.81'
L = 5408.86'
R = 8283.78'
E = 461.96'
Long Chord = 5313.32'
Mid. Ord. = 437.56'
S.E. = 3/4"
S.C. Sta. = 47796+30.51
C.S. Sta. = 47850+39.38

P.G. UPRR MAIN 1 RAIL
(Along Top of Rail)



LOCATION SKETCH

GENERAL PLAN & ELEVATION
UPRR (MP 186.52) over ASH STREET
F.A.U. 7992 - SECTION 14-00477-00-BR
SANGAMON COUNTY
UPRR SUBDIVISION - SPRINGFIELD
STATION 47830+38.38
STRUCTURE NO. 084-9954

DESIGNED	MNM	6/17/14
DRAWN	DAP	6/1/14
REVIEWED	JGT	10/10/2016

FINAL

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PLOT DATE = 2/27/2017

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		REVISED -
		REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

GENERAL PLAN AND ELEVATION
STRUCTURE NO. 084-9954
SHEET NO. 1 OF 21 SHEETS

F.A.U. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
	14-00477-00-BR	SANGAMON	403	210
		CONTRACT NO. 93704		
	ILLINOIS FED. AID PROJECT			

GENERAL NOTES

1. Fasteners shall be ASTM A325 Type 1, mechanically galvanized bolts. Bolts $\frac{7}{8}$ in. ϕ, holes $\frac{15}{16}$ in. ϕ, unless otherwise noted.
2. Calculated weight of Structural Steel, ASTM A709, Gr. 50 = 680,710 lbs.
   ASTM A36, Gr. 36 = 83,720 lbs.
3. All structural steel shall be ASTM A709 Grade 50 unless otherwise noted on the plans. The deck plate shall be ASTM A36.
4. All substructure concrete shall have a compressive strength of 4,000 psi at 28 days.
5. No field welding is permitted except as specified in the contract documents.
6. Reinforcement bars designated (E) shall be epoxy coated.
7. Bearing seat surfaces shall be constructed or adjusted to the designated elevations within a tolerance of $\frac{1}{8}$ inch (0.01 ft.). Adjustment shall be made either by grinding the surface or by shimming the bearings.
8. Concrete Sealer shall be applied to the following surfaces:
   Abutments - inside face of backwall, inside face of cheekwall, top of cap, entire concrete facing attached to abutment caps and drilled shaft (except surfaces coated with surface color treatment).
   Superstructure - entire exposed surface of precast prestressed fascia beam and curb (except surfaces coated with surface color treatment), concrete railing end post.
   Anti-Graffiti Protection System shall be applied to the following surfaces:
   Abutments - concrete facing, wingwall and cheekwall surfaces coated with concrete surface color treatment.
   Superstructure - surfaces coated with concrete surface color treatment.
9. The Inorganic Zinc Rich Primer / Acrylic / Acrylic Paint System shall be used for shop and field painting of new structural steel except where otherwise noted. The color of the final finish coat for all interior steel surfaces, exterior bottom of deck plate, steel curb, shall be gray, Munsell No. 5B 7/1. The color of the final finish coat for the exterior and bottom flange of the fascia beams and exterior cantilever support bracket shall be blue, Munsell No. 10B 3/6.
10. Waterproofing shall be applied to the backside of the abutment cap and backwall and backside of wingwalls for surfaces below ground. This shall be according to Article 503.18 of the Std. Spec. Cost included with Concrete Structures.

Drilled shaft cross-hole sonic log (CSL) testing:

A) Drilled shafts shall be evaluated by cross-hole sonic log testing. Testing pipes shall be installed in each drilled shaft to facilitate the logging process, which will follow completion of each shaft.

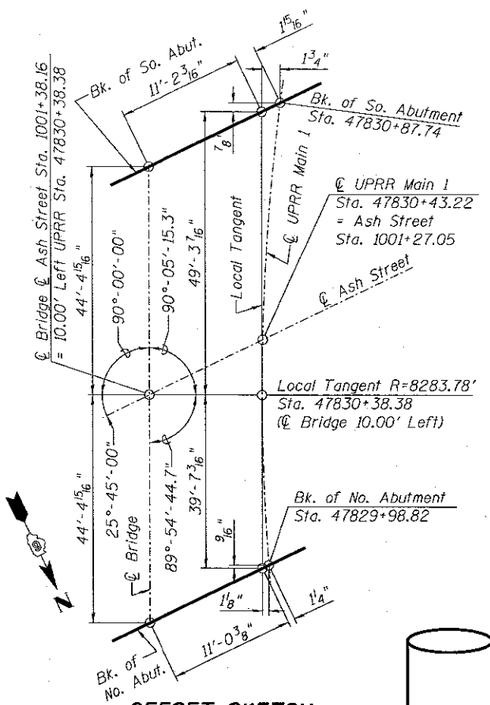
B) Furnish and install six standard 2 inch nominal diameter steel pipes (ASTM A53, Grade B) for use in CSL testing of each drilled shaft. Pipes shall be equally spaced around the interior of the reinforcing steel cage.

C) Pipes shall be sufficiently regular and free from defects so as to permit the free and unobstructed passage of the probes. Pipes shall be installed such that all internal joints are flush. Pipes shall be watertight with clean internal and external faces, the latter to ensure good bond between the concrete and the pipes.

D) Pipes shall be fitted with a screw-on watertight shoe and cap and shall be securely fixed to the interior of the reinforcing steel cage. Watertight joints shall be used to achieve the required length. The pipes shall be filled with water and plugged or capped before concrete placement. The upper end of the pipe shall not be left open during or after concrete placement. The pipes shall extend at least 2'-6" above the top of the drilled shaft concrete. The lower end of the pipes shall extend to the bottom of the shaft. Do not extend pipes into rock sockets with smaller diameter than drilled shafts.

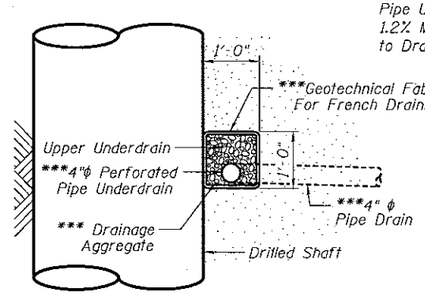
E) Allow up to 21 days for the Engineer to perform CSL testing. Grout the access ducts after the Engineer's approval of the testing results.

F) CSL testing will be completed by the Engineer at no cost to the Contractor. If CSL test results are unsatisfactory according to the Engineer, the Contractor shall propose a method of correction including designs if required to the Engineer for approval. The correction shall be at the expense of the Contractor.



OFFSET SKETCH

INDEX OF SHEETS

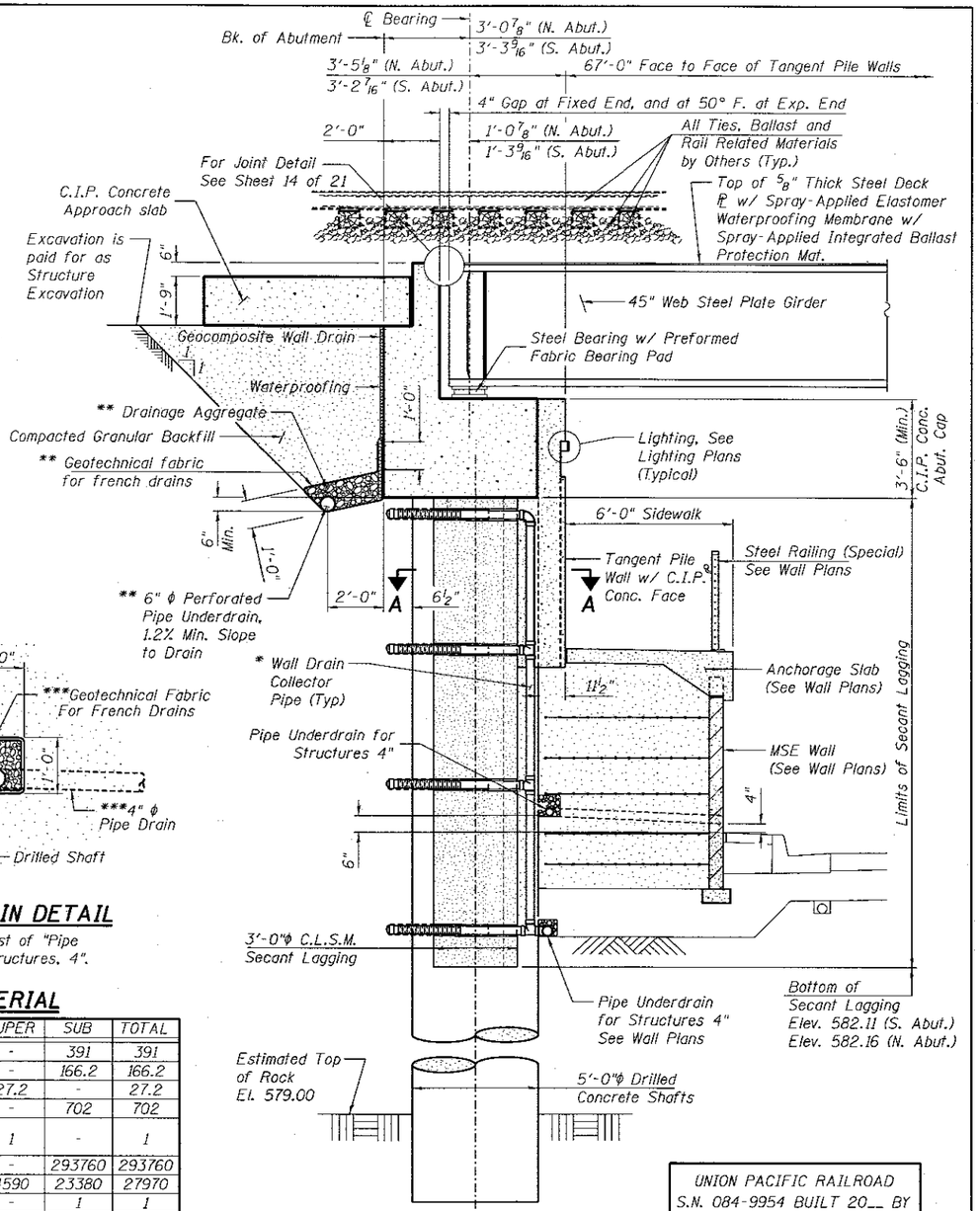


PIPE UNDERDRAIN DETAIL

***Included in the cost of "Pipe Underdrains for Structures, 4".

TOTAL BILL OF MATERIAL

ITEM	UNIT	SUPER	SUB	TOTAL
Structure Excavation	Cu. Yd.	-	391	391
Concrete Structures	Cu. Yd.	-	166.2	166.2
Concrete Superstructure	Cu. Yd.	27.2	-	27.2
Form Liner Textured Surface	Sq. Ft.	-	702	702
Furnishing and Erecting Structural Steel, Bridge No. 1	L. Sum	1	-	1
Reinforcement Bars	Pound	-	293760	293760
Reinforcement Bars, Epoxy Coated	Pound	4590	23380	27970
Name Plates	Each	-	1	1
Drilled Shaft in Soil	Cu. Yd.	-	240.7	240.7
Drilled Shaft in Rock	Cu. Yd.	-	301.0	301.0
Membrane Waterproofing (Special)	Sq. Ft.	3794	-	3794
Concrete Sealer	Sq. Ft.	1649	1868	3517
Geocomposite Wall Drain	Sq. Yd.	-	65	65
Anti-Graffiti Protection System	Sq. Ft.	340	198	538
Concrete Surface Color Treatment	Sq. Ft.	340	198	538
Granular Backfill for Structures	Cu. Yd.	-	124	124
Steel Railing (Special)	Foot	203	-	203
Pipe Underdrains for Structures, 4"	Foot	-	115	115
Pipe Underdrains for Structures, 6"	Foot	-	114	114
Precast Prestressed Concrete Fascia Beam, No. 1	L. Sum	1	-	1
Secant Lagging	Cu. Ft.	-	1724	1724
Crosshole Sonic Logging Access Ducts	Foot	-	4740	4740



ABUTMENT SECTION

(At Rt. L's to Back of Abutment)

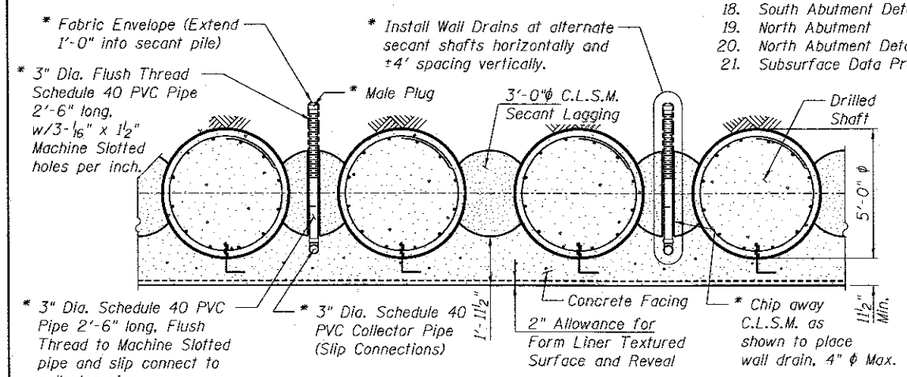
UNION PACIFIC RAILROAD
S.N. 084-9954 BUILT 20__ BY
CITY OF SPRINGFIELD
SEC. 14-00477-00-BR
STATION 47830+38.38
MILE POST 186.52
LOADING COOPER E-80

NAME PLATE

See Std. 515001

Notes:
South Abutment Section Shown North Similar.

** Included in the cost of "Pipe Underdrains for Structures, 6". For additional drainage details see Roadway Plans.



SECTION A-A

* Included in the cost of "Pipe Underdrains for Structures, 4".

	DESIGNED	DRAWN	REVIEWED
FINAL	MNM 6/17/14	DAP 6/1/14	JGT 10/11/2016

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STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

GENERAL DATA
STRUCTURE NO. 084-9954
SHEET NO. 2 OF 21 SHEETS

F.A.I. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
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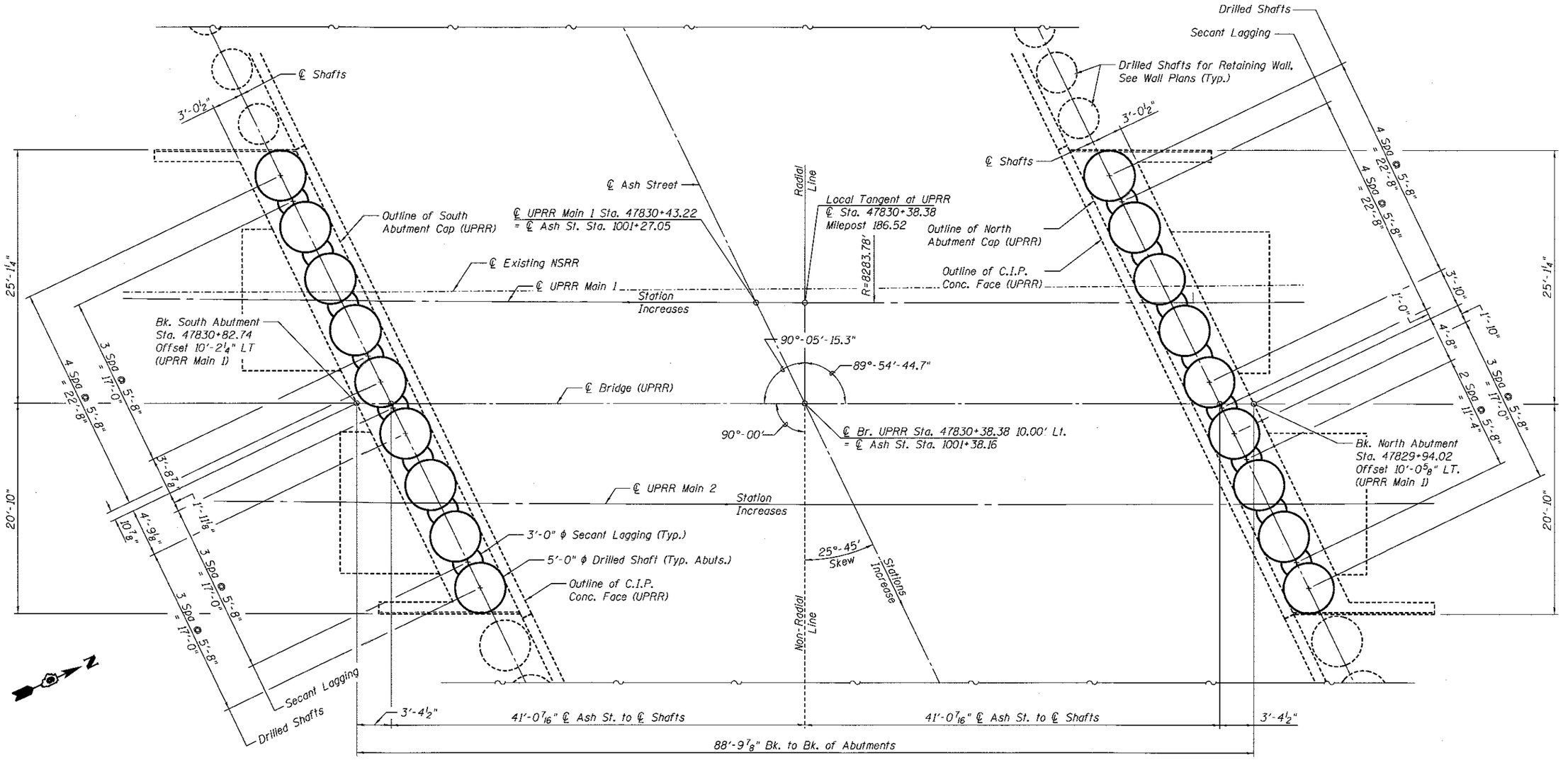
		CONTRACT NO. 93704		
	ILLINOIS FED. AID PROJECT			



FOUNDATION LAYOUT PLAN

Notes:
See Roadway Plans for existing utilities and topography.

	MNM	6/17/14
DESIGNED	DAP	6/1/14
DRAWN	JGT	10/11/2016
REVIEWED		

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	PLOT DATE = 2/24/2017	CHECKED - MNM	REVISED -

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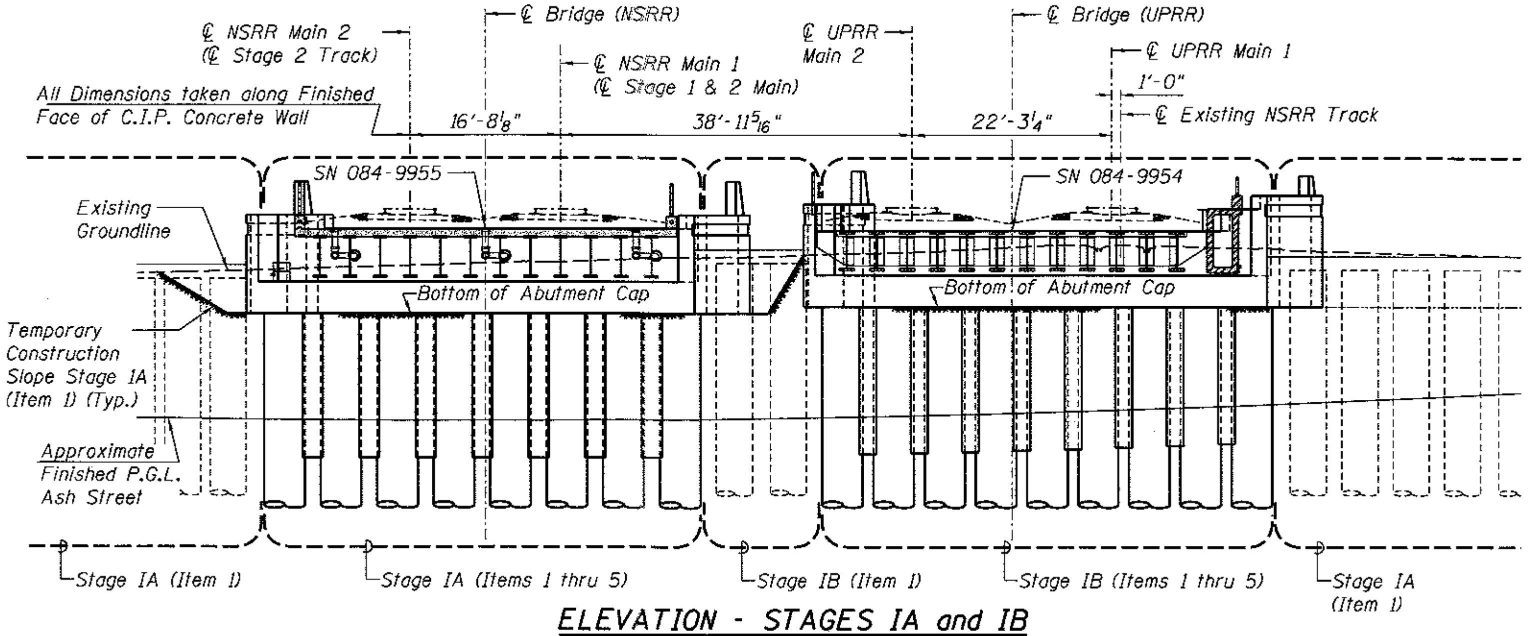
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

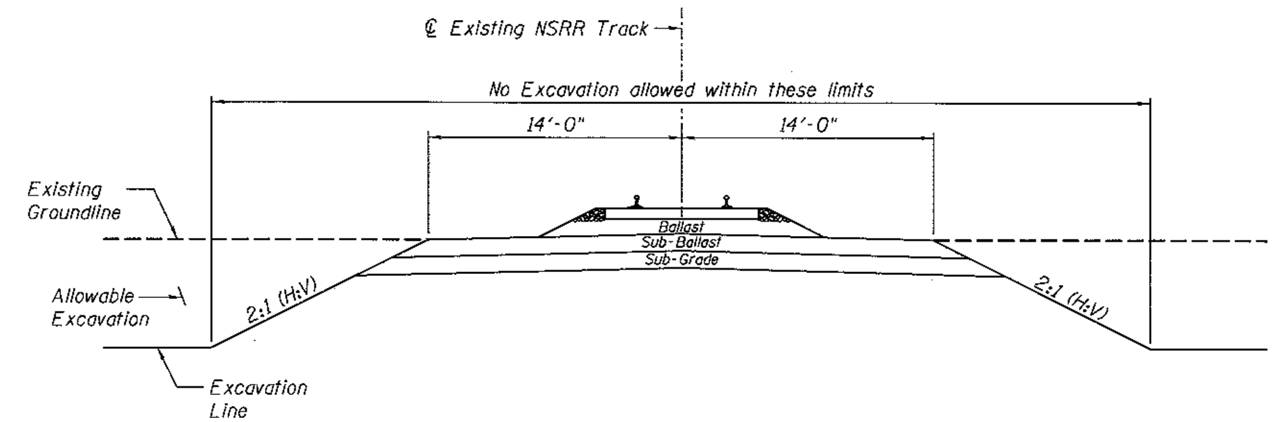
FOUNDATION LAYOUT
STRUCTURE NO. 084-9954
SHEET NO. 3 OF 21 SHEETS

F.A.U. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
	14-00477-00-BR	SANGAMON	403	212
		CONTRACT NO. 93704		
	ILLINOIS FED. AID PROJECT			

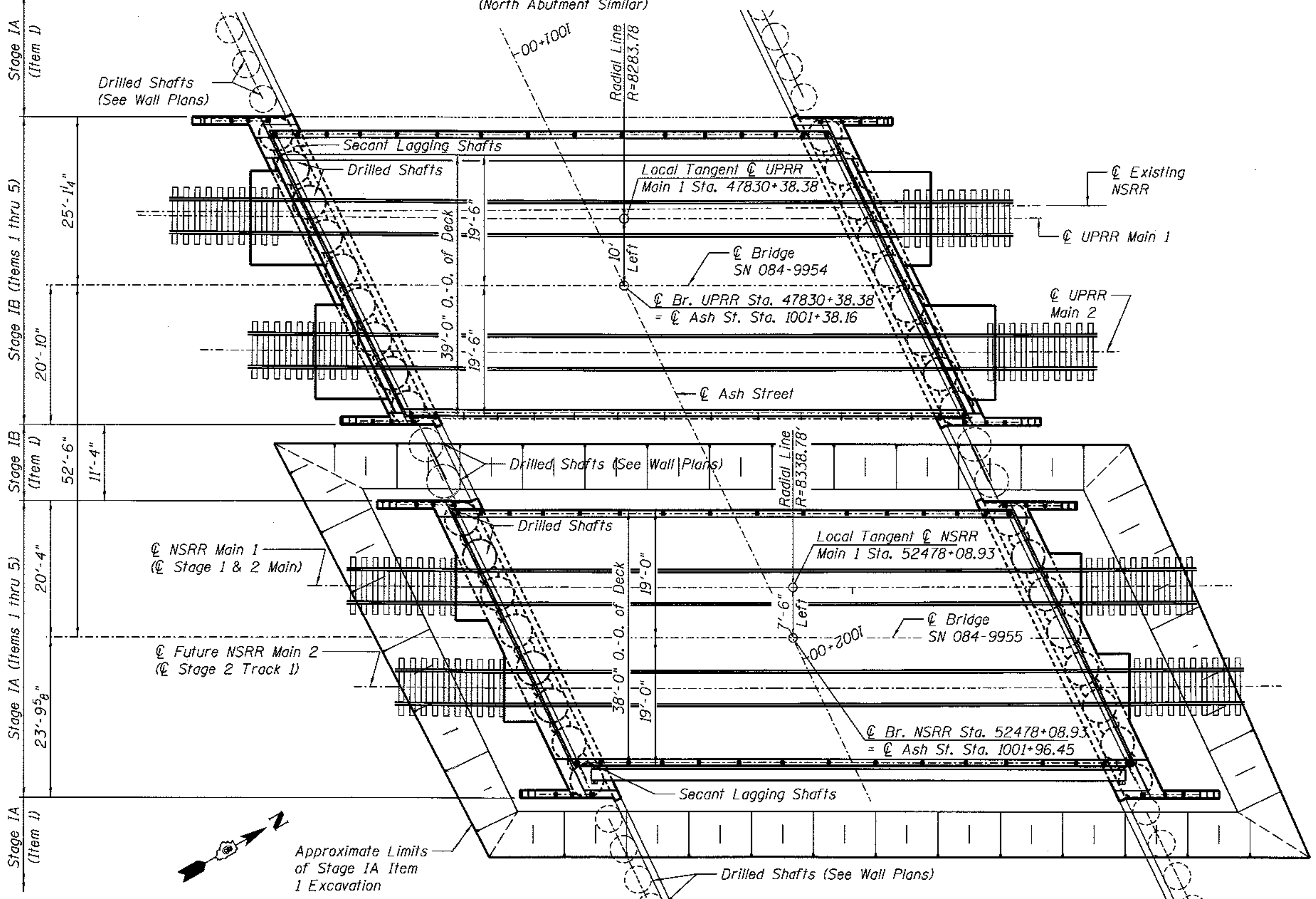


ELEVATION - STAGES IA and IB

(South Abutments Elevation View - Looking South)
(North Abutment Similar)



ALLOWABLE EXCAVATION SECTION - STAGE IA



PLAN - STAGE CONSTRUCTION

CONSTRUCTION SEQUENCE

Stage IA: Rail traffic will be maintained on existing NSRR track.

1. NSRR structure:
   Excavate down to the elevation of the bottom of abutment caps at the NSRR Bridge.
   Drill and place the Secant Lagging and Tangent shafts for the North and South abutments.
   Retaining Walls:
   Excavate down to the top of the Tangent shafts.
   Drill and place the Tangent shafts for the retaining wall east of NSRR Bridge and West of existing NSRR tracks.
2. Construct cast-in-place concrete abutment caps for NSRR structure.
3. Excavate down to the bottom elevation of the C.I.P. concrete facing for the abutments and construct the facing.
4. Place Compacted Granular Backfill behind the abutments.
5. Place the superstructure for NSRR Structure.

Stage IB: Rail traffic will be maintained on Stage I track

1. UPRR Structure:
   Excavate down to the elevation of the bottom of abutment caps at the UPRR Bridge.
   Drill and place the Secant Lagging and Tangent shafts for the North and South abutments.
   Retaining Walls:
   Excavate down to the top of the Tangent shafts.
   Drill and place the Tangent shafts for the retaining wall between the two bridges.
2. Construct cast-in-place concrete abutment caps for UPRR structure.
3. Excavate down to the bottom elevation of the C.I.P. concrete facing for the abutments and construct the facing.
4. Place Compacted Granular Backfill behind the abutments.
5. Place the superstructure for UPRR Structure.
6. Complete remaining excavation to required elevations for roadway construction.
7. Complete remaining upper retaining wall facing and construct M.S.E. wall and complete remaining roadway work.

FINAL

DESIGNED	MNM	6/17/14
DRAWN	DAP	6/1/14
REVIEWED	JGT	10/11/2016

pw:\\spj-svr306.hanson.dom:Hanson Projects\Documents\29Jobs\09L0179B\CAD\Struct\Ash-10th\Sheet\084-9954-XXXXX-004-Stage Const Det.dgn

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	PLOT SCALE = 0:1.999996 '/' / in.	DRAWN - DAP	REVISED -
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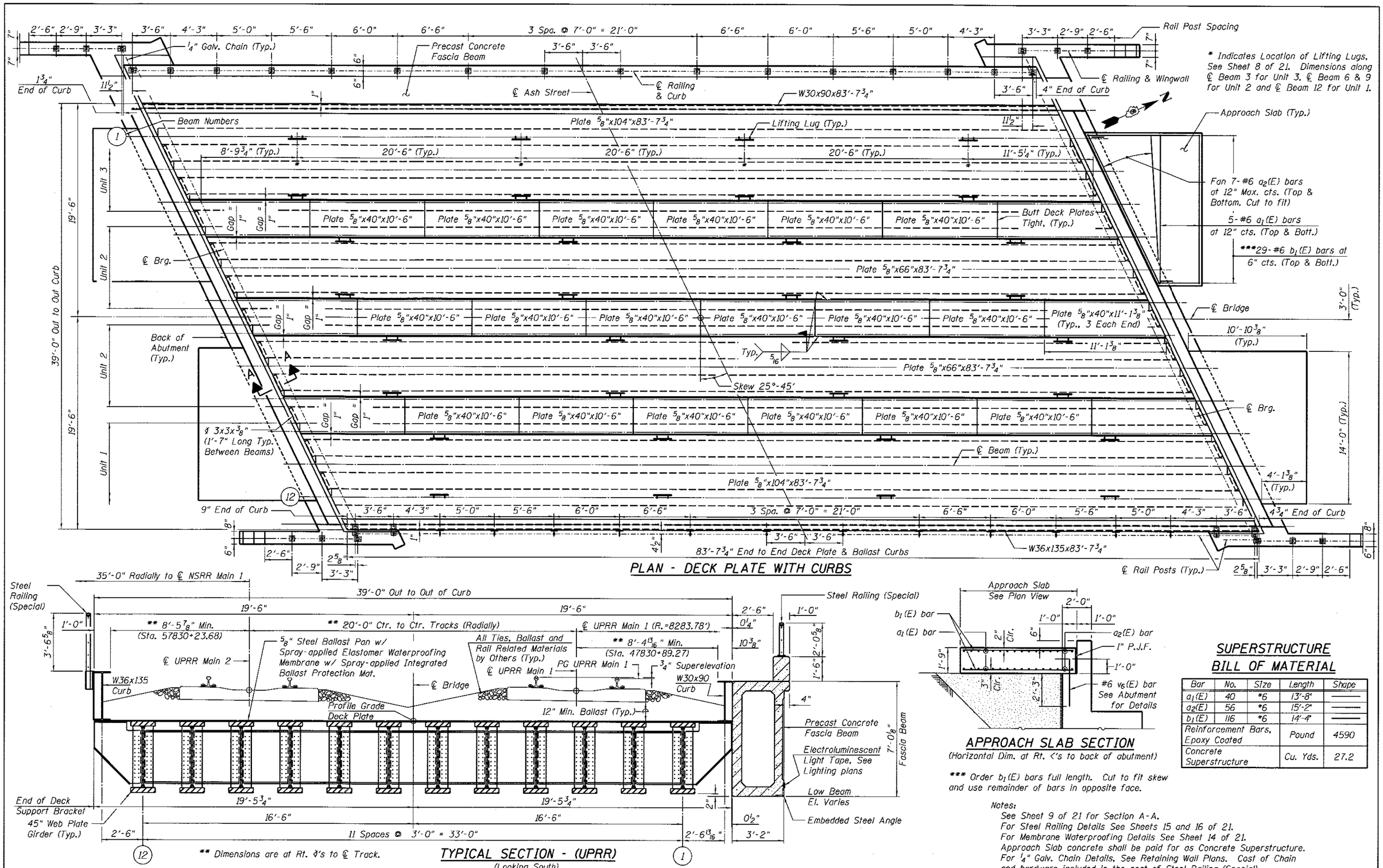
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

STAGE CONSTRUCTION DETAILS
STRUCTURE NO. 084-9954

SHEET NO. 4 OF 21 SHEETS

F.A.U. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
	14-00477-00-BR	SANGAMON	403	213
		CONTRACT NO. 93704		
	ILLINOIS FED. AID PROJECT			



PLAN - DECK PLATE WITH CURBS

TYPICAL SECTION - (UPRR)

(Looking South)

APPROACH SLAB SECTION

(Horizontal Dim. at Rt. ℄'s to back of abutment)

*** Order $b_1(E)$ bars full length. Cut to fit skew and use remainder of bars in opposite face.

SUPERSTRUCTURE BILL OF MATERIAL

Bar	No.	Size	Length	Shape
$a_1(E)$	40	#6	13'-8"	
$a_2(E)$	56	#6	15'-2"	
$b_1(E)$	116	#6	14'-4"	
Reinforcement Bars, Epoxy Coated			Pound	4590
Concrete Superstructure			Cu. Yds.	27.2

Notes:
- See Sheet 9 of 21 for Section A-A.
- For Steel Railing Details See Sheets 15 and 16 of 21.
- For Membrane Waterproofing Details See Sheet 14 of 21.
- Approach Slab concrete shall be paid for as Concrete Superstructure.
- For 1/4" Galv. Chain Details, See Retaining Wall Plans. Cost of Chain and hardware included in the cost of Steel Railing (Special).

FINAL

DESIGNED	MNM	6/17/14
DRAWN	DAP	6/1/14
REVIEWED	JGT	10/11/2016

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STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

SUPERSTRUCTURE
STRUCTURE NO. 084-9954
SHEET NO. 5 OF 21 SHEETS

F.A.U. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
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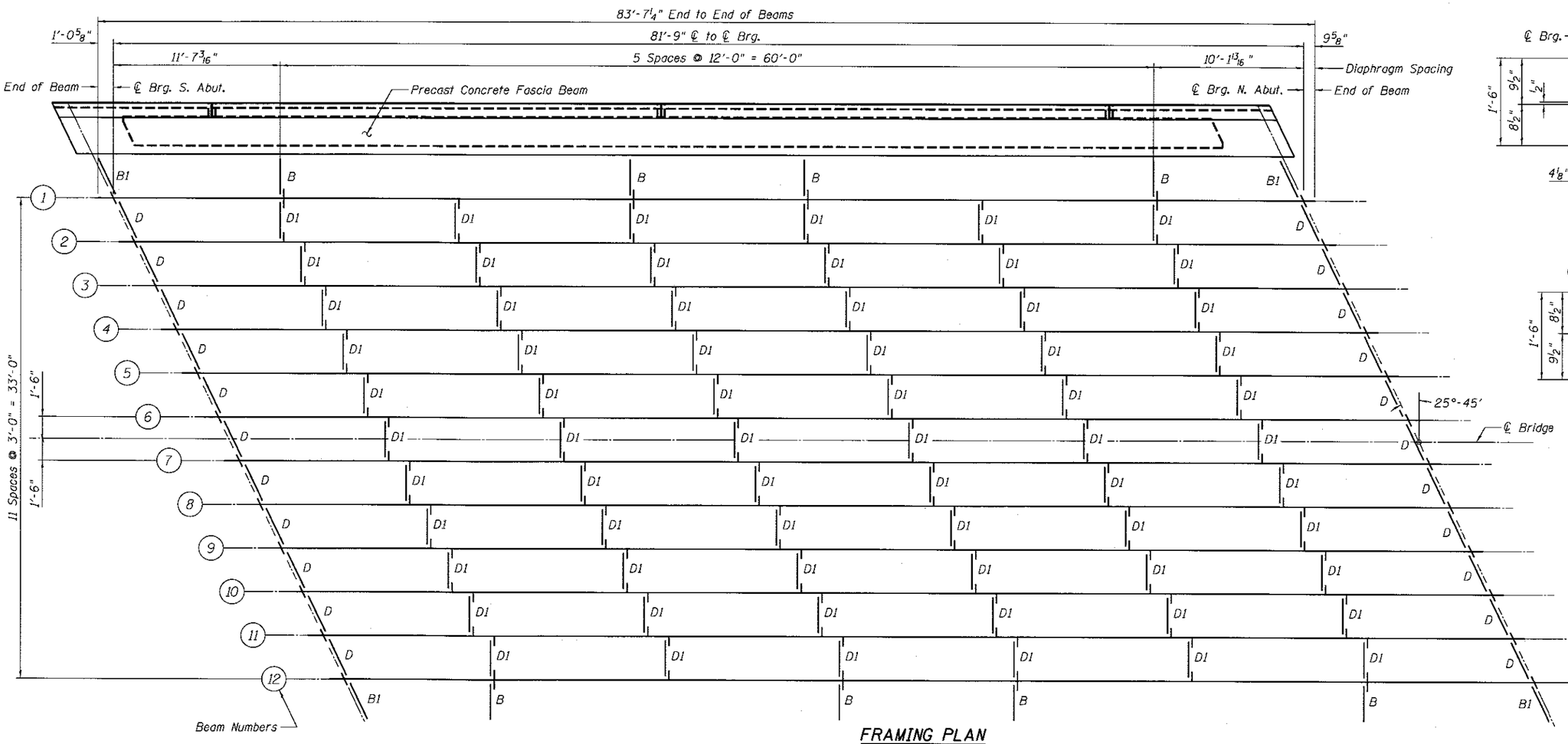
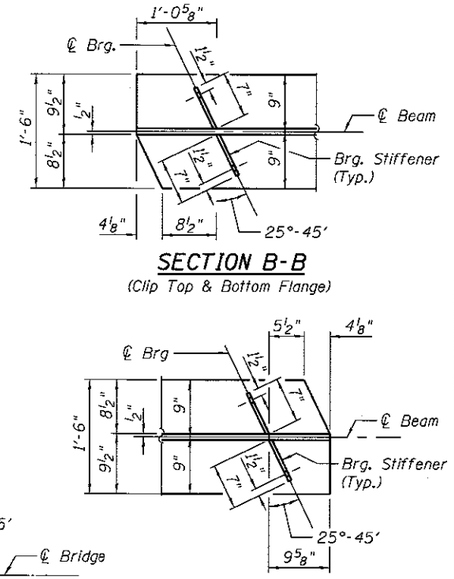
		CONTRACT NO. 93704		
	ILLINOIS FED. AID PROJECT			

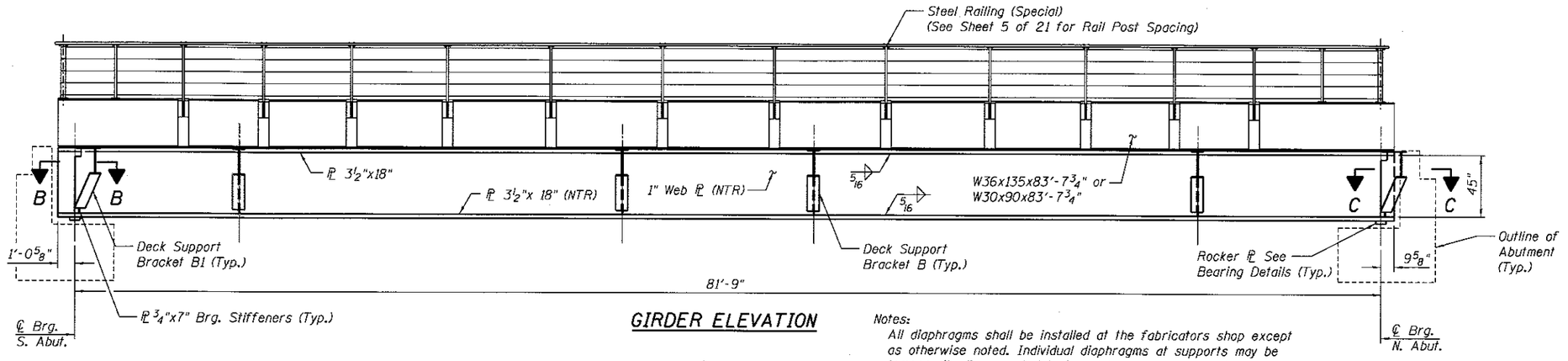


FRAMING PLAN



SECTION B-B
(Clip Top & Bottom Flange)

SECTION C-C
(Clip Top & Bottom Flange)



GIRDER ELEVATION

Notes:
All diaphragms shall be installed at the fabricators shop except as otherwise noted. Individual diaphragms at supports may be temporarily disconnected to install bearing anchor rods.

Load carrying components designated "NTR" shall conform to the Impact Testing Requirement, Zone 2.

DESIGNED	MNM	6/17/14
DRAWN	DAP	6/1/14
REVIEWED	JGT	10/31/2016

FINAL

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STRUCTURAL STEEL
STRUCTURE NO. 084-9954
SHEET NO. 6 OF 21 SHEETS

F.A.U. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
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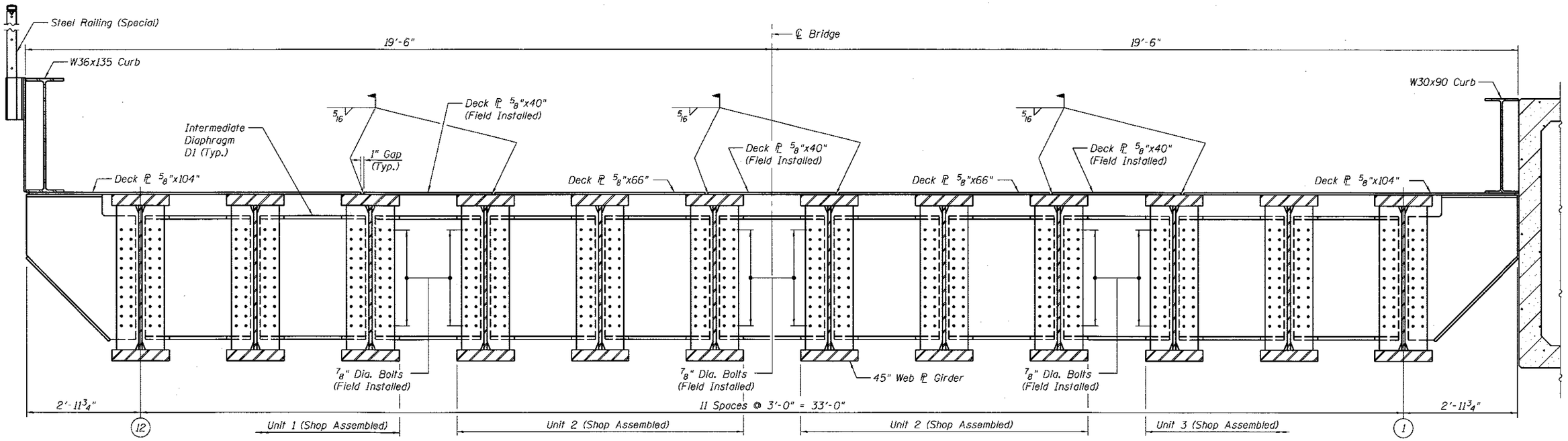
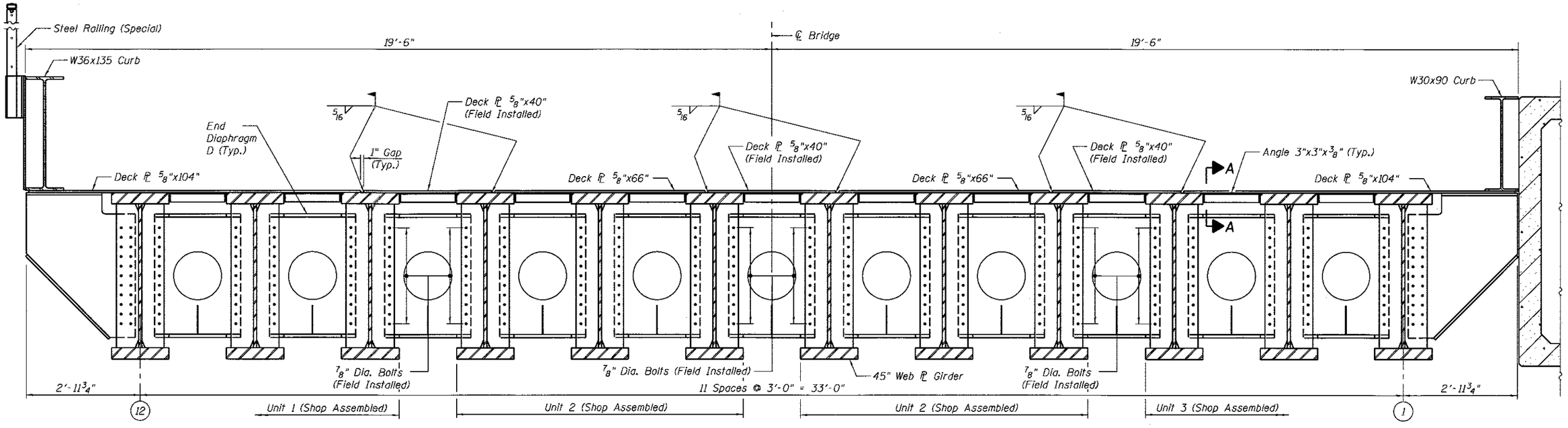
		CONTRACT NO. 93704		
	ILLINOIS FED. AID PROJECT			



SECTION - ASSEMBLED SPAN AT INTERIOR DIAPHRAGM

(Looking South)



SECTION - ASSEMBLED SPAN AT END DIAPHRAGM

(Looking South)

Notes:
Bolts shall be 7/8" ϕ placed in 15/16" ϕ holes unless otherwise noted.
Steel shall conform to ASTM A709 Gr. 50, unless otherwise noted.
See Sheet 9 of 21 for Section A-A.

DESIGNED	MNM	6/17/14
DRAWN	DAP	6/1/14
REVIEWED	JGT	10/11/2016

FINAL

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STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

STRUCTURAL STEEL DETAILS (SHEET 1 OF 3)
STRUCTURE NO. 084-9954
SHEET NO. 7 OF 21 SHEETS

F.A.U. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
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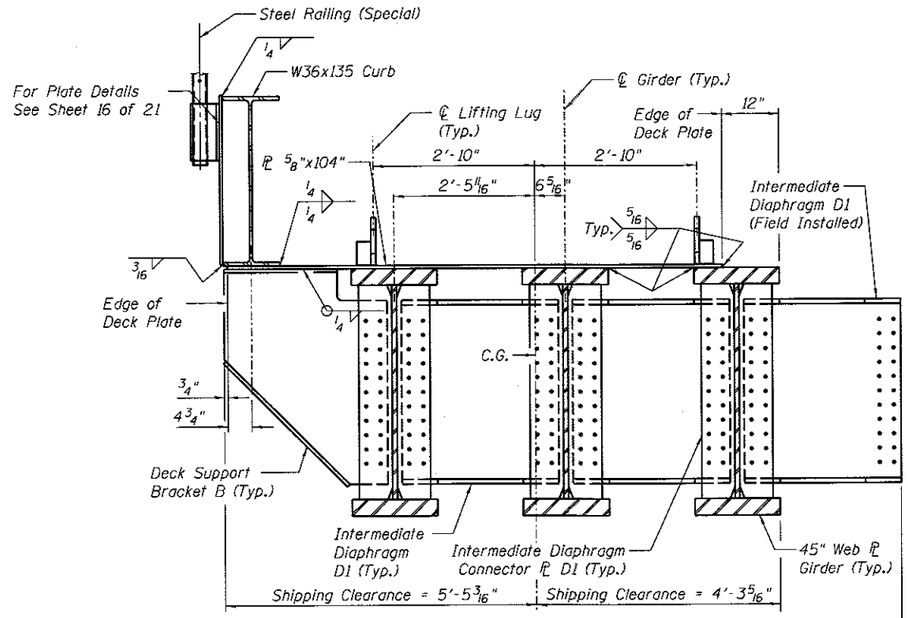
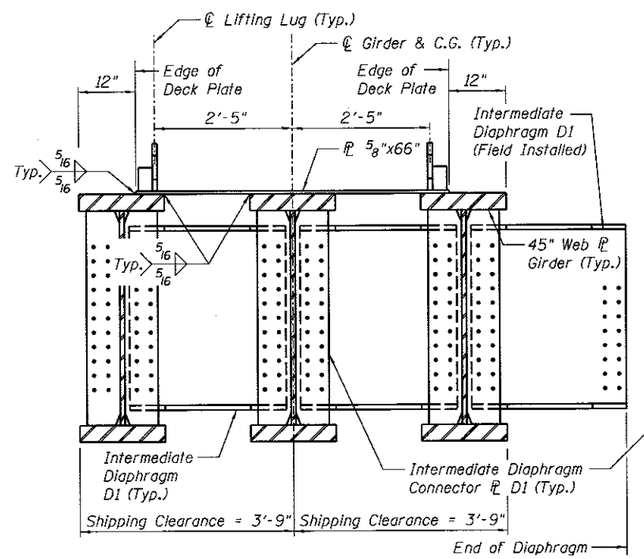
		CONTRACT NO. 93704		
		ILLINOIS FED. AID PROJECT		



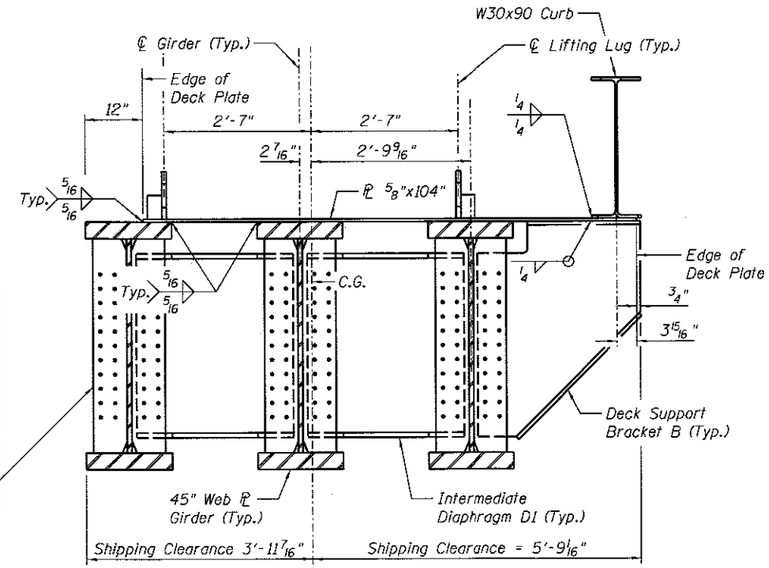
AT INTERIOR DIAPHRAGM UNIT 1

(Looking South)



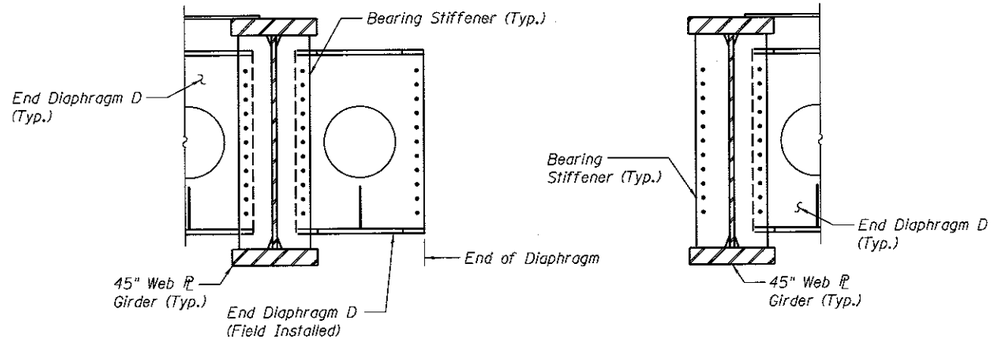
AT INTERIOR DIAPHRAGM UNIT 2

(Looking South)



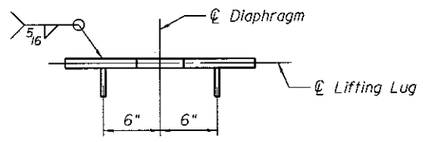
AT INTERIOR DIAPHRAGM UNIT 3

(Looking South)



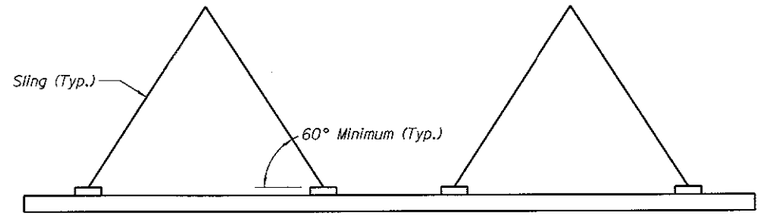
AT END DIAPHRAGM

(Partial Section shown, End Diaphragm Sections are similar to Interior Diaphragm Sections except as noted above)



PLAN

LIFTING LUG DETAIL



TYPICAL ELEVATION

LIFTING DIAGRAM

Notes:
Bolts shall be 7/8" ϕ placed in 15/16" ϕ holes unless otherwise noted.
Steel shall conform to ASTM A709 Gr. 50, unless otherwise noted.
After assembled span is in final position, lifting lugs shall be burned or ground off in a manner that will not damage the waterproofing system.

FINAL

DESIGNED	MNM	6/17/14
DRAWN	DAP	6/17/14
REVIEWED	JGT	10/17/2016

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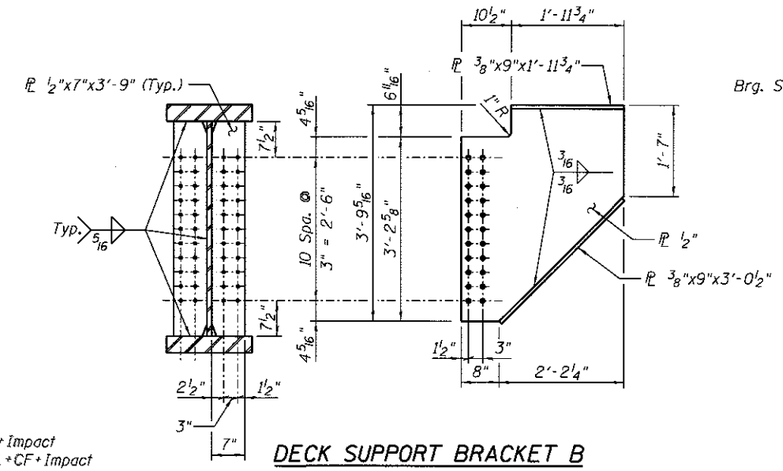
STRUCTURAL STEEL DETAILS (SHEET 2 OF 3)
STRUCTURE NO. 084-9954
SHEET NO. 8 OF 21 SHEETS

F.A.U. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
	14-00477-00-BR	SANGAMON	403	217
		CONTRACT NO. 93704		
	ILLINOIS FED. AID PROJECT			

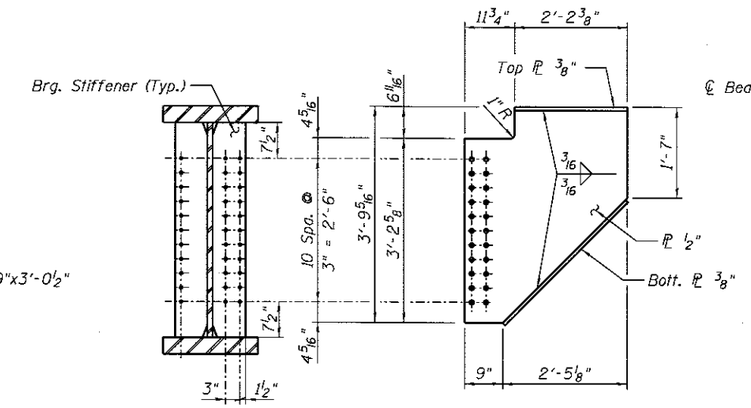
INTERIOR BEAM MOMENT & SHEAR TABLE

Description	Max Moment	Max Shear
Dead Load	1,504.6 ft.-k	73.4 k
Live Load	2,261.5 ft.-k	126.8 k
Centrifugal Force	28.6 ft.-k	1.4 k
Impact	717.1 ft.-k	40.2 k
Total	4,511.8 ft.-k	241.8 k
Section	45" PG	
Steel	ASTM A709, Gr. 50, NTR Zone 2	
Net I	81,818 in^4	
Net S (Bott.)	3,147 in^3	
FST (Bott.)	17.2 ksi	
Gross I	81,818 in^4	
Gross S (Top)	3,147 in^3	
FSC (Top)	17.2 ksi	
(LL+I) Deflection	1.48 in	
Allowable (LL+I) Deflection	1.54 in	

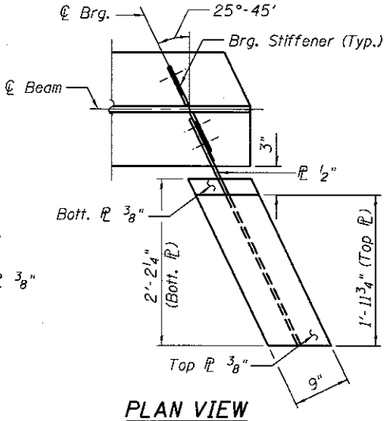
I - Non-composite moment of inertia of the steel section
S - Non-composite section modulus of the steel section
FST - Max unfactored tension stress in the section due to DL+LL+CF+Impact
FSC - Max unfactored compression stress in the section due to DL+LL+CF+Impact



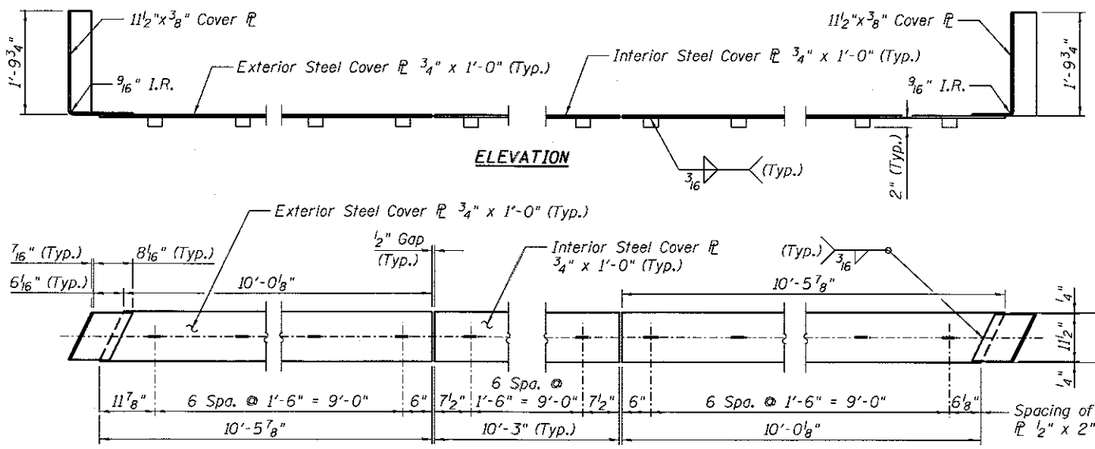
DECK SUPPORT BRACKET B

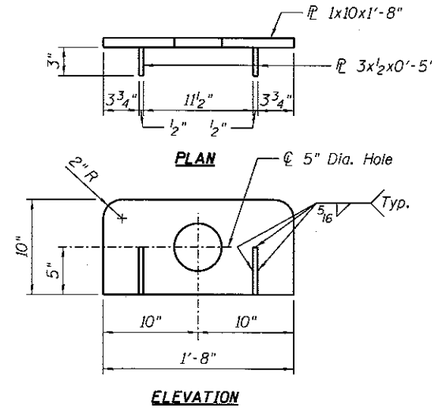


DECK SUPPORT BRACKET B1
Horiz. Dimensions Along Skew

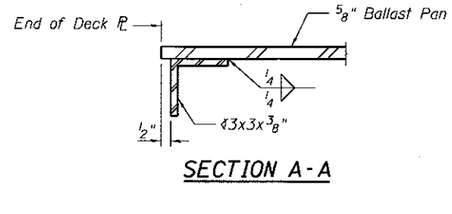


PLAN VIEW
DECK SUPPORT BRACKET B1

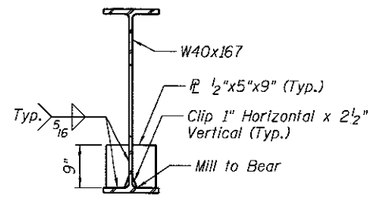




LIFTING LUG



SECTION A-A



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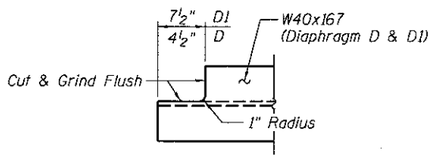

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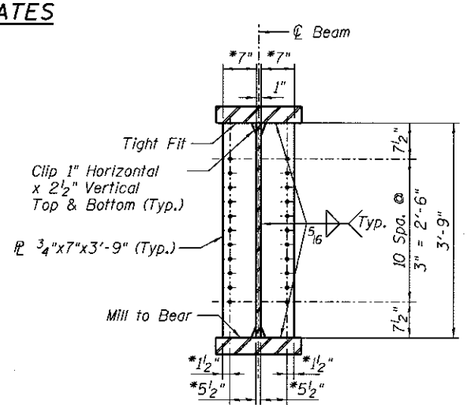
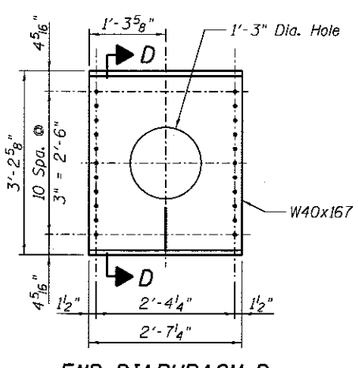
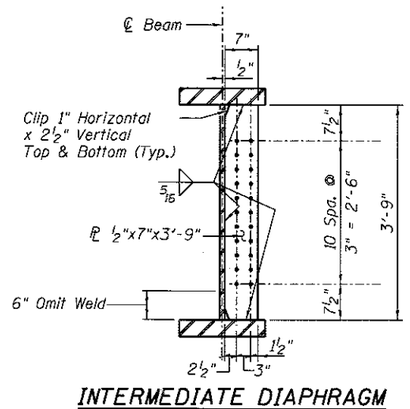


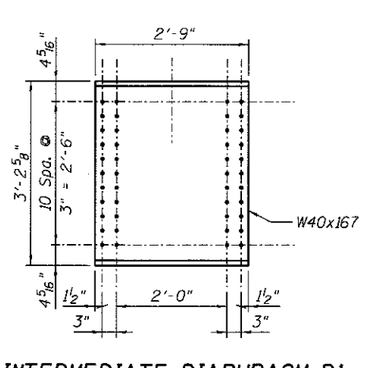
BEARING STIFFENER
*Dimensions Along Skew



END DIAPHRAGM D



INTERMEDIATE DIAPHRAGM
CONNECTOR PLATE D1



INTERMEDIATE DIAPHRAGM D1

Notes:
All diaphragms shall be installed at the fabricators shop except as otherwise noted. Individual diaphragms at supports may be temporarily disconnected to install bearing anchor rods.
Load carrying components designated "NTR" shall conform to the Impact Testing Requirement, Zone 2.
Bolts shall be 7/8" ϕ placed in 15/16" ϕ holes unless otherwise noted.
Steel shall conform to ASTM A709 Gr. 50, unless otherwise noted.

DESIGNED	MNM	6/17/14
DRAWN	DAP	6/1/14
REVIEWED	JGT	10/31/2016

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STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

STRUCTURAL STEEL DETAILS (SHEET 3 OF 3)
STRUCTURE NO. 084-9954
SHEET NO. 9 OF 21 SHEETS

F.A.U. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
	14-00477-00-BR	SANGAMON	403	218
		CONTRACT NO. 93704		
		ILLINOIS FED. AID PROJECT		

Galvanized embedded cover brg. angle 3"x3"x$\frac{1}{2}$" (at fixed end only). See Sheet 11 of 21 for details.

83'-7$\frac{3}{4}$" End-to-End of beam

6$\frac{3}{4}$"

U(E) (Typ.)

4'-0"

74 Spa. @ 1'-0" cts. = 74'-0"

1'-9" (Typ.)

1'-3$\frac{3}{8}$"

U_1(E)

#4 S_1(E) bar Top & Bott.. (E.E.)

Galvanized embedded cover brg. plate (at expansion end only). See Sheet 11 of 21

$\frac{1}{4}$" ϕ Vent holes Top (Typ.)

3" (Typ.)

1'-2$\frac{5}{8}$"

6"

6"

3$\frac{1}{2}$" (Typ.)

3$\frac{1}{4}$" ϕ Drain holes bott. (Typ.)

3'-6"

2'-6"

3'-2"

1'-4"

1'-0"

4"

11"

14" (Typ.)

25.75° Skew

9$\frac{7}{8}$"

℄ 2" ϕ Holes for 1$\frac{1}{4}$" ϕ Threaded Rod (F1554 Gr. 55) embedded 24" into Abutment Cap w/ 4"x4"x$\frac{5}{16}$" ℗ washer under nut in formed 3" deep grout pockets in top of beam (at fixed end only). See Detail 'B' this sheet.

4'-0"

21'-7"

20'-0"

20'-0"

22'-0$\frac{3}{4}$"

Spa. #4 A(E) bars Top & #4 S(E) bars Top & Bottom

Fan 2-#4 S_1(E) bars Top & Bottom, cut to fit. (E.E.)

7 Spa. @ 6" cts. = 3'-6"

℄ Lifting Loops, (3) at each end. See "Lifting Loop Detail".

PLAN

1$\frac{1}{4}$" ϕ Conduit

3" Radius

Top of Beam

6"

5$\frac{1}{2}$"

$\frac{1}{2}$"

embedment

6'-6"

5-$\frac{1}{2}$" ϕ 270 ksi Strands

6"

6"

6"

LIFTING LOOP DETAIL

83'-7$\frac{3}{4}$" End-to-End of beam

84-#4 D(E) bars at 12" cts.

9$\frac{7}{8}$"

A(E)

4-#4 B_1(E) bars, See Section A-A

4-#4 B_2(E) bars, See Section A-A

A

4-#4 B_2(E) bars, See Section A-A

4-#4 B_1(E) bars, See Section A-A

A(E)

B

2"x4" drain opening (Typ.)

60° min. angle of lift

1'-6"

7"

8'-6$\frac{1}{8}$"

5'-10$\frac{1}{8}$" Void

7"

S_1(E)

S(E)

U(E)

S_1(E)

Curb Joint (Typ.) See Sheet 11 of 21 for details

Formed 3" deep grout pockets for washer, nut and non-shrink grout. Bottom of pocket dimensions of 4"x4" and top dimensions of 8"x8". (at fixed end only) See Detail 'B' this sheet.

Embedded 6"x6"x1" Angle, Galvanized w/ $\frac{3}{4}$"ϕx4" Studs Galvanized @ 2'-0" cts. Alternate Spacing (space to miss strands) See Sections A-A & B-B (82 Studs Req'd. per bm.)

Note: See Sheet 11 of 21 for recess in Fascia Beam.

S_1(E)

S(E)

U(E)

S_1(E)

2'-0"

5-#4 U_1(E) bars (E.E.)

Embedded Plate 1$\frac{1}{8}$", Expansion end only

U_1(E)

A

B

ELEVATION

(Looking East)

BAR A(E)

1'-0"

3'-3"

4"

8"

10"

1'-7"

1'-9"

10"

BAR D(E)

S(E)

S_1(E)

2'-8"

3'-0"

4'-5"

BARS S(E) & S_1(E)

6'-7"

1'-3"

BAR U(E)

1'-3"

2'-10"

2'-6$\frac{5}{8}$"

2'-6"

BAR U_1(E)

℄ 2"ϕ Hole

4"

4"

Non-Shrink Grout

1"

3"

2"

2"

2"

Finished Top of Precast Fascia Beam

DETAIL 'B'

1'-0"

2'-6"

3"

B_1(E) or B_2(E) (Typ.)

D(E)

2" Cl. Typ.

1$\frac{1}{2}$" Cl.

1'-6"

3"

12"

7"

6"

4"

A(E)

S(E)

3" Cl.

7"

2'-0"

7"

1" Recess

3" Typ.

3" Typ.

1'-0"

S(E)

7"

7'-0$\frac{1}{8}$"

5'-10$\frac{1}{8}$" Void

B(E), adjust to miss studs (Typ.)

Embedded 6" Galv. Angle

8"

2$\frac{1}{4}$" Cl.

11 Spa. @ 2" cts.

8"

12 Strands

℄ 3" Strands

SECTION A-A

(12 ~ $\frac{1}{2}$"ϕ 270 ksi low relaxation strands)

6x2-#8 B(E) bars @ 6" cts., Full Length

8"

4"

℄ Lifting Loops

1'-2$\frac{5}{8}$"

6"

6"

1'-3$\frac{3}{8}$"

6" projection

See "Lifting Loop Detail"

11x2-#8 B(E) bars @ 7" Each Face, Full Length

11"

7"

S_1(E)

4-#4 U(E) bars each end

S_1(E)

U_1(E)

1" Recess

B(E)

℄ $\frac{3}{4}$"ϕx4" Studs

Embedded 6" Galv. Angle

Embedded 1$\frac{1}{8}$" Plate

SECTION B-B

(12 ~ $\frac{1}{2}$"ϕ 270 ksi low relaxation strands)

℄ Fascia Beam

1$\frac{3}{8}$" ϕ Holes 1" deep in top ℗ for 1$\frac{1}{4}$" ϕ pintles. Thread or press fit in Base ℗. (2 Required per Brg.)

Embedded Galvanized ℗ 1$\frac{1}{8}$"

1"

6"

1'-0"

1'-0"

7"

9$\frac{1}{2}$"

9$\frac{1}{2}$"

9$\frac{1}{2}$"

9$\frac{1}{2}$"

6"

1'-1"

1'-1"

6"

Bearing ℗ 1$\frac{1}{8}$" w/ Stainless Steel ℗ $\frac{1}{8}$". $\frac{1}{8}$" fillet weld all around.

℄ $\frac{3}{4}$" ϕ x 4" Studs automatically end welded (4 Required per Bearing)

Side Retainer (Typical)

1"

1"

℄ 1$\frac{1}{2}$" ϕ x 18" Anchor Bolt (F1554 Gr. 55) w/ 3"x3"x$\frac{5}{16}$" ℗ washer under nut. Blockouts in cap to be filled after beams are in place.

1'-10$\frac{3}{8}$"

1'-10$\frac{3}{8}$"

1" Fabric Pads w/ $\frac{1}{8}$" Layer PTFE bonded per manufacturer's recommendations

SECTION C-C

Abut. Backwall (F.F.)

C

℄ Brg.

1'-0$\frac{13}{16}$"

4$\frac{7}{16}$"

6"

12"

6"

2$\frac{3}{8}$" Brg. Ht.

See Detail 'A' this sheet

C

1'-5$\frac{1}{4}$"

EXP. BEARING ELEVATION

(Horiz. Dimensions along ℄ Beam)

Edge of Beam (Typ.)

25°-45'

3'-2"

1$\frac{1}{4}$" (Typ.)

End of Beam

1'-9$\frac{5}{8}$"

11$\frac{9}{16}$"

10$\frac{1}{16}$"

℄ Brg.

Outline of S.S. Plate

Brg. & Embedded ℗

Side Retainer (Typ.)

EXP. BEARING PLAN

Embedded Bearing ℗

Bearing ℗ w/attached S.S. ℗

5$\frac{5}{16}$

5$\frac{5}{8}$" Cir.

6"

4 $\frac{7}{8}$"

5$\frac{1}{2}$"

5$\frac{5}{8}$"

S.S. ℗ $\frac{1}{8}$"

Fabric Bearing Pad w/ PTFE

$\frac{1}{4}$"

1"

SIDE RETAINER

Equivalent rolled angle with stiffeners will be allowed in lieu of welded plates.

5$\frac{5}{16}$

1$\frac{1}{2}$"

℄ 1$\frac{3}{4}$"ϕ Hole

5$\frac{5}{8}$"

3$\frac{1}{2}$"

8"

5$\frac{5}{8}$"

3$\frac{1}{2}$"

2$\frac{3}{4}$"

5$\frac{1}{2}$"

1$\frac{1}{2}$"

6$\frac{13}{16}$"

6"

Embedded Galvanized ℗ 1$\frac{1}{8}$"

Bearing ℗ 1$\frac{1}{8}$"

1" Fabric Pad w/PTFE layer

Stainless Steel ℗ $\frac{1}{8}$"

$\frac{1}{8}$"

$\frac{1}{2}$"

1"

6$\frac{11}{16}$" (Typ.)

1$\frac{1}{4}$" (Typ.)

$\frac{1}{8}$" c.f.w.

DETAIL 'A'

7$\frac{8}{16}$"

3" R.

1"

1$\frac{1}{4}$"ϕ

PINTLE

MINIMUM BAR LAP

#4 bar = 2'-0"

#8 bar = 4'-6"

Notes:

See Sheet 11 of 21 for Notes.

BAR LIST ONE BEAM ONLY

(For Fabrication Only)

Bar	No.	Size	Length	Shape
A(E)	89	#4	5'-3"	
B(E)	56	#8	44'-0"	
B_1(E)	8	#4	21'-4"	
B_2(E)	8	#4	19'-8"	
D(E)	84	#4	5'-5"	
S(E)	178	#4	11'-6"	
S_1(E)	12	#4	11'-10"	
U(E)	8	#4	9'-1"	
U_1(E)	10	#4	6'-7"	

FINAL

	MNM	6/17/14
DESIGNED	DAP	6/1/14
DRAWN	JGT	10/11/2016
REVIEWED		

pw:\\spi-svr326.hanson.dom:Hanson Projects\Documents\09Jobs\09L0179B\CAD\Struct\Ash-18th\Sheet\084-9954-XXXXX-010-Precast Fascia Beam.dgn

FILE NAME =

HANSON

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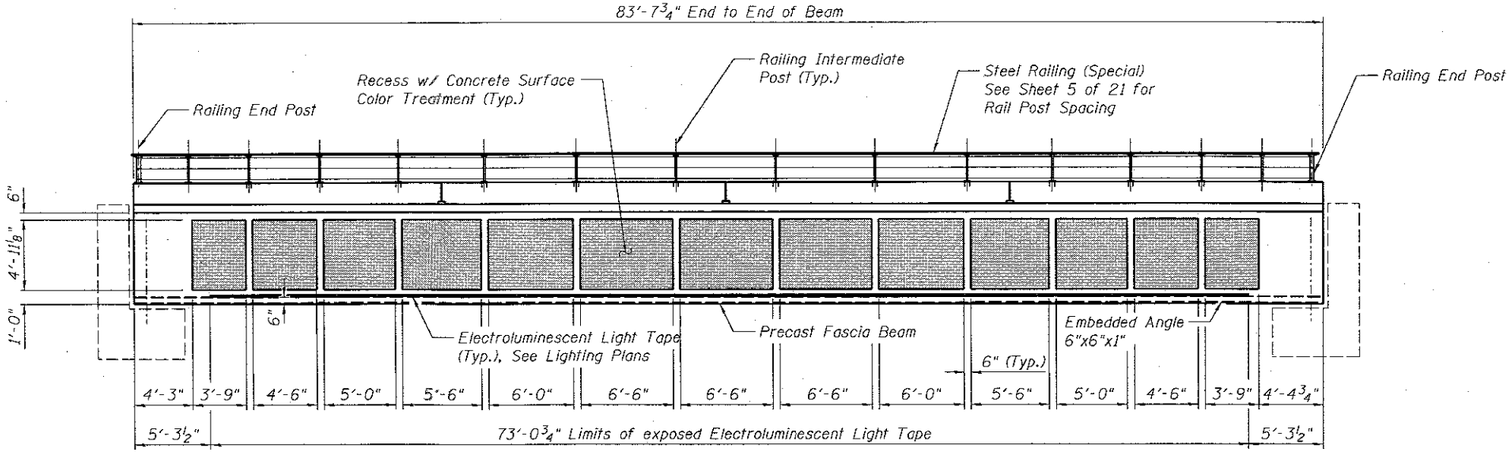
	CHECKED - JGT	REVISED -	
PLOT SCALE = 01.999998 '/ in.	DRAWN - DAP	REVISED -	
PLOT DATE = 2/24/2017	CHECKED - MNM	REVISED -	

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

PRECAST FASCIA BEAM
STRUCTURE NO. 084-9954

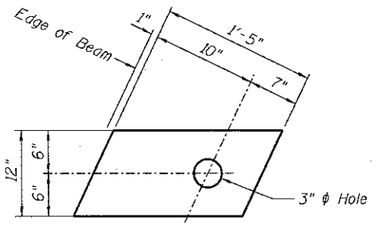
SHEET NO. 10 OF 21 SHEETS

F.A.U. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
	14-00477-00-BR	SANGAMON	403	219
		CONTRACT NO. 93704		
		ILLINOIS FED. AID PROJECT		

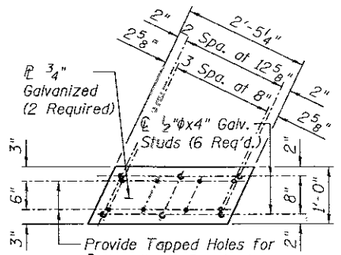


ELEVATION PRECAST FASCIA BEAM

(Looking East. Horizontal Dimensions along outside face of web)

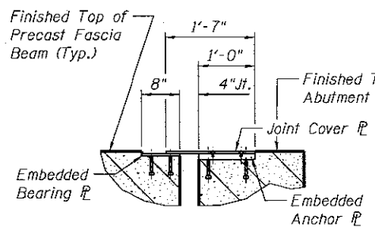


FABRIC BEARING PAD



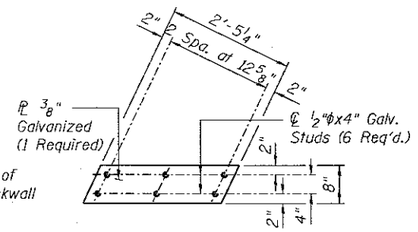
EMBEDDED ANCHOR PLATE

(1 Required at Each Abutment Backwall)



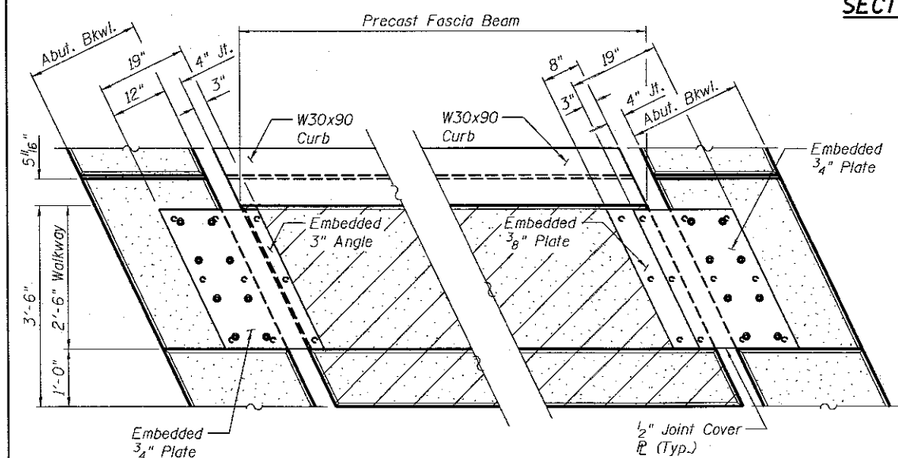
SECTION AT EXPANSION JOINT

(At Rt. 4's to Bk. of Abut.)



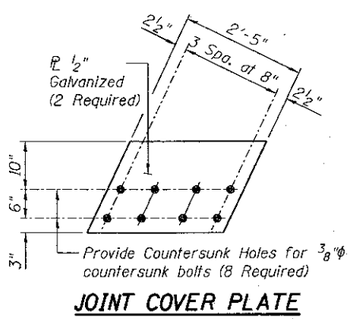
EMBEDDED BEARING PLATE

(1 Required at Expansion End of Fascia Beam)



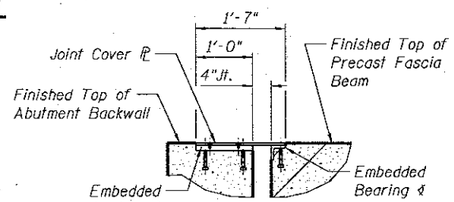
PLAN - FIXED JT. COVER AT NORTH ABUTMENT

PLAN - EXPANSION JT. COVER AT SOUTH ABUTMENT



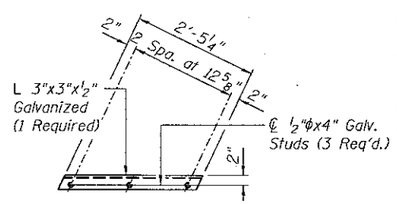
JOINT COVER PLATE

(1 Required at each Fascia Beam Joint)



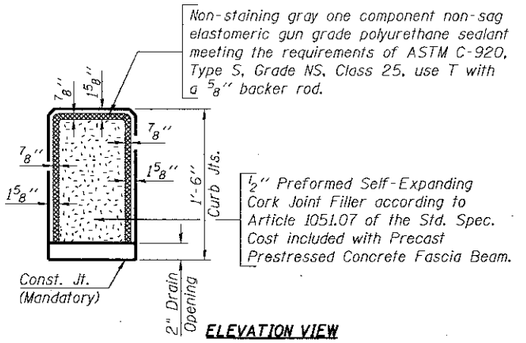
SECTION AT FIXED JOINT

(At Rt. 4's to Bk. of Abut.)

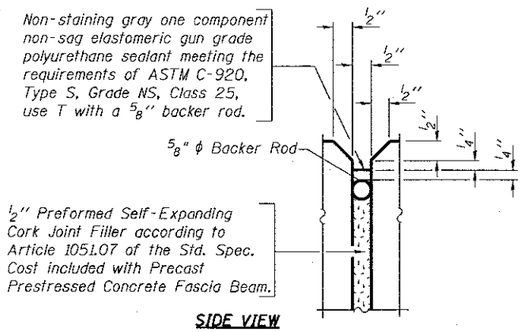


EMBEDDED BEARING ANGLE

(1 Required at Fixed End of Fascia Beam)



ELEVATION VIEW



SIDE VIEW

CURB JOINT DETAILS

Notes:

For Railing Details See Sheet 15 of 21.

All (embedded and separate) hardware, angles, bearing plates, side retainers, anchor bolts, threaded rods, nuts, washers and pintles shall be galvanized according to AASHTO M111 and ASTM 385 or M232 as applicable.

Prestressing steel shall be uncoated high strength, low relaxation 7-wire strand, Grade 270. The nominal diameter shall be 1/2" and the nominal cross-sectional area shall be 0.153 sq. in.

Reinforcement bars shall conform to ASTM A 706, Grade 60.

Two 1/8" fabric adjusting shims of the dimensions of the bearing pads shall be provided for each bearing pad location.

All bearing pads shall be 1" thick. Omit holes when using expansion bearings. Expansion bearing pad shall be bonded to the substructure.

Expansion bearing pad shall have PTFE bonded to top surface. PTFE surface shall be bonded according to manufacturers recommendations.

Corrosion Inhibitor, per Article 1020.05(b)(12) and 1021.07 of the Standard Specifications, shall be used in the concrete for Precast Prestressed Concrete Fascia Beams. Compressive strength of prestressed concrete, f'c, shall be 6500 psi. Compressive strength of prestressed concrete at release, f'ci, shall be 5000 psi. Embedded angles, Side Retainers, Anchor Bolts, plates, studs, bearing pads, Threaded Rods, Non-Shrink Grout and accessories shall be included in the cost of Precast Prestressed Concrete Fascia Beam.

Concrete curb shall be cast with the precast fascia beam and included in the cost of Precast Prestressed Concrete Fascia Beam.

Anchor bolts shall be ASTM F1554 all-thread (or an Engineer-approved alternate material) of the grade(s) and diameter(s) specified. The corresponding specified grade of AASHTO M314 anchor bolts may be used in lieu of ASTM F1554.

Anchor bolts and Threaded Rods shall be installed in blockouts with Non-Shrink Grout meeting the material requirements of Article 1024.02 of the Standard Specifications. Blockouts shall be clean prior to grouting and grout installed according to manufactures recommendations. Cost for non-shrink grout shall be included in the cost of Concrete Structures.

All references and details for the Precast Fascia Beam on this sheet are applicable to the C.I.P. Fascia Beam Alternative shown on sheet 12 of 21 except for prestressing requirements.

BILL OF MATERIAL

ITEM	UNIT	TOTAL
Precast Prestressed Concrete Fascia Beam, No. 1	L. Sum	1
Concrete Surface Color Treatment	Sq. Ft.	340

FINAL		
DESIGNED	MNM	6/17/14
DRAWN	DAP	6/17/14
REVIEWED	JGT	10/17/2016

p:\\spi-svr386.hanson.dom\Hanson Projects\Documents\89Jobs\89L01798\CAD\Struct\Ash-18th\Sheet\084-9954-XXXXX-811-Precast Fascia Beam Det.dgn

FILE NAME =	USER NAME = Johns80944	DESIGNED - MNM	REVISED -
HANSON		CHECKED - JGT	REVISED -
	PLOT SCALE = 81.999996 '/ in.	DRAWN - DAP	REVISED -
	PLOT DATE = 5/25/2017	CHECKED - MNM	REVISED -

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STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

PRECAST FASCIA BEAM DETAILS
STRUCTURE NO. 084-9954
SHEET NO. 11 OF 21 SHEETS

F.A.U. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
	14-00477-00-BR	SANGAMON	403	220
		CONTRACT NO. 93704		
	ILLINOIS FED. AID PROJECT			

Galvanized embedded cover brg. angle 3"x3"x$\frac{1}{2}$" (at fixed end only). See Sheet 11 of 21 for details.

83'-7$\frac{3}{4}$" End-to-End of beam

6$\frac{3}{4}$"

4'-0"

74 Spa. @ 1'-0" cts. = 74'-0"

U(E) (Typ.)

U_1(E)

#4 S_1(E) bar Top & Bott., (E.E.)

Galvanized embedded cover brg. plate (at expansion end only). See Sheet 11 of 21

$\frac{1}{4}$" ϕ Vent holes Top (Typ.)

3" (Typ.)

3$\frac{1}{2}$" (Typ.)

4" (Typ.)

$\frac{3}{4}$" ϕ Drain holes bott. (Typ.)

3'-6" | 2'-6" | 3'-2" | 1'-4" | 11"

1'-0" | 4" | 11"

25.75° Skew

9$\frac{7}{8}$"

℄ 3" ϕ Holes for 1$\frac{1}{4}$" ϕ Threaded Rod (F1554 Gr. 55) embedded 24" into Abutment Cap w/ 4"x4"x$\frac{5}{16}$" ℙ washer under nut in formed 3" deep grout pockets in top of beam (at fixed end only). See Detail 'B' this sheet.

4'-0" | 21'-7" | 20'-0" | 20'-0" | 22'-0$\frac{3}{4}$"

Spa. #4 A(E) bars Top & #4 S(E) bars Top & Bottom

7 Spa. @ 6" cts. = 3'-6"

Fan 2-#4 S_1(E) bars Top & Bottom, cut to fit, (E.E.)

S(E) | 2'-8" | 4'-5"

S_1(E) | 3'-0"

BARS S(E) & S_1(E)

6'-7" | 1'-3"

BAR U(E)

PLAN

83'-7$\frac{3}{4}$" End-to-End of beam

84-#4 D(E) bars at 12" cts.

9$\frac{7}{8}$"

A(E)

4-#4 B_1(E) bars, See Section A-A

4-#4 B_2(E) bars, See Section A-A

A ↰

4-#4 B_2(E) bars, See Section A-A

4-#4 B_1(E) bars, See Section A-A

A(E)

B ↰

2"x4" drain opening (Typ.)

1'-6" | 7" | 5'-10$\frac{1}{8}$" Void | 7" | 8'-6$\frac{1}{8}$"

S_1(E) | S(E) | U(E) | S_1(E)

Curb Joint (Typ.) See Sheet 11 of 21 for details

Embedded 6"x6"x1" Angle, Galvanized w/ $\frac{3}{4}$"ϕx4" Studs Galvanized @ 2'-0" cts. Alternate Spacing (space to miss Reinf. Bars) See Sections A-A & B-B (82 Studs Req'd. per bm.)

Note: See Sheet 11 of 21 for recess in Fascia Beam.

Formed 3" deep grout pockets for washer, nut and non-shrink grout. Bottom of pocket dimensions of 4"x4" and top dimensions of 8"x8". (at fixed end only) See Detail 'B' this sheet.

2'-0"

5-#4 U_1(E) bars (E.E.)

Embedded Plate 1$\frac{1}{8}$", Expansion end only

U_1(E)

B ↲

1'-0" | 3'-3" | 4"

BAR A(E)

1'-3" | 2'-10" | 2'-6" | 2'-6$\frac{5}{8}$"

BAR U_1(E)

8" | 10" | 1'-7" | 1'-9" | 10"

BAR D(E)

ELEVATION

(Looking East)

A ↲

℄ 2"ϕ Hole

4" | 4"

Non-Shrink Grout

3" | 2" | 1" | 2" | 2"

Finished Top of C.I.P. Fascia Beam

DETAIL 'B'

Top & Bottom of Beam before Dead Load Deflection

End Beam | $\frac{3}{4}$" | 1" | $\frac{3}{4}$" | End Beam

4 Spa. @ 20'-10$\frac{15}{16}$" = 83'-7$\frac{3}{4}$"

CAMBER DIAGRAM

℄ Fascia Beam

1" | 6" | 1'-0" | 1'-0" | 7"

9$\frac{1}{2}$" | 9$\frac{1}{2}$" | 9$\frac{1}{2}$" | 9$\frac{1}{2}$"

6" | 1'-1" | 1'-1" | 6"

1$\frac{3}{8}$" ϕ Holes 1" deep in top ℙ for 1$\frac{1}{4}$" ϕ pintles. Thread or press fit in Base ℙ. (2 Required per Brg.)

℄ $\frac{3}{4}$" ϕ x 4" Studs automatically end welded (4 Required per Bearing)

Embedded Galvanized ℙ 1$\frac{1}{8}$"

Bearing ℙ 1$\frac{1}{8}$" w/ Stainless Steel ℙ $\frac{1}{8}$". $\frac{1}{8}$" fillet weld all around.

Side Retainer (Typical)

1" | 1"

℄ 1$\frac{1}{2}$" ϕ x 18" Anchor Bolt (F1554 Gr. 55) w/ 3"x3"x$\frac{5}{16}$" ℙ washer under nut. Blockouts in cap to be filled after beams are in place.

1'-10$\frac{3}{8}$" | 1'-10$\frac{3}{8}$"

1" Fabric Pads w/ $\frac{1}{8}$" Layer PTFE bonded per manufacturer's recommendations

SECTION C-C

Abut. Backwall (F.F.) C ↰

℄ Brg. | 1'-0$\frac{13}{16}$" | 4$\frac{7}{16}$"

6" | 12" | 6"

2$\frac{3}{8}$" Brg. Ht.

See Detail 'A' this sheet

1'-5$\frac{1}{4}$" C ↲

EXP. BEARING ELEVATION

(Horiz. Dimensions along ℄ Beam)

B ↲

Edge of Beam (Typ.)

25°-45'

3'-2"

$\frac{1}{4}$" (Typ.)

End of Beam

11$\frac{9}{16}$" | 10$\frac{1}{16}$" | 1'-9$\frac{5}{8}$"

℄ Brg.

Outline of S.S. Plate

Brg. & Embedded ℙ

Side Retainer (Typ.)

EXP. BEARING PLAN

Notes:
See Sheet 11 of 21 for Notes.
The Contractor may elect to construct the C.I.P. Fascia Beam instead of the Precast Fascia Beam. See Precast Prestressed Concrete Fascia Beam Special Provisions for additional information.

1'-0" | 2'-6"

B_1(E) or B_2(E) (Typ.)

D(E)

2" Cl. Typ.

1$\frac{1}{2}$" Cl.

3" | 12" | 7" | 6" | 4" | 3" Cl. | 7" | 1" Recess | 1'-0" | 7"

A(E) | S(E) | S(E)

7'-0$\frac{1}{8}$" | 5'-10$\frac{1}{8}$" Void

2'-0" | 3" Typ. | 3" Typ.

10x2-#8 B(E) bars @ 7" Each Face, Full Length

11" | 10" | 2$\frac{1}{4}$" Cl.

B_3(E), adjust to miss studs (Typ.)

Embedded 6" Galv. Angle

6x2-#10 B_3(E) bars @ 6" cts., Full Length

SECTION A-A

8" | 4"

6x2-#8 B(E) bars @ 6" cts., Full Length

S_1(E) | 4-#4 U(E) bars each end | S_1(E) | U_1(E) | B(E)

1" Recess

℄ $\frac{3}{4}$"ϕx4" Studs

Embedded 6" Galv. Angle

Embedded 1$\frac{1}{8}$" Plate

SECTION B-B

Embedded Bearing ℙ

Bearing ℙ w/attached S.S. ℙ

5$\frac{16}{}$ | 5$\frac{16}{}$

5$\frac{8}{}$" Cir.

6" | 4$\frac{7}{8}$" | 5$\frac{1}{2}$" | 5$\frac{8}{}$"

S.S. ℙ $\frac{1}{8}$"

Fabric Bearing Pad w/ PTFE

5" | $\frac{1}{4}$" | 1"

SIDE RETAINER

Equivalent rolled angle with stiffeners will be allowed in lieu of welded plates.

℄ 1$\frac{3}{4}$"ϕ Hole

1$\frac{1}{2}$" | 5$\frac{8}{}$" | 3$\frac{1}{2}$" | 8" | 5$\frac{8}{}$" | 3$\frac{1}{2}$" | 1$\frac{1}{2}$"

2$\frac{3}{4}$" | 5$\frac{1}{2}$"

6$\frac{13}{16}$" | 6"

Embedded Galvanized ℙ 1$\frac{1}{8}$"

Bearing ℙ 1$\frac{1}{8}$"

Stainless Steel ℙ $\frac{1}{8}$"

1" Fabric Pad w/PTFE layer

$\frac{1}{8}$" | $\frac{1}{8}$" | 1"

6$\frac{11}{16}$" (Typ.) | $\frac{1}{4}$" (Typ.) | $\frac{1}{8}$" c.f.w.

DETAIL 'A'

7$\frac{8}{}$" | 3" R. | 1" | 1$\frac{1}{4}$"ϕ

PINTLE

MINIMUM BAR LAP

#4 bar = 2'-0"
#8 bar = 4'-6"
#10 bar = 7'-3"

BAR LIST ONE BEAM ONLY

(For Fabrication Only)

Bar	No.	Size	Length	Shape
A(E)	89	#4	5'-3"	
B(E)	52	#8	44'-0"	
B_1(E)	8	#4	21'-4"	
B_2(E)	8	#4	19'-8"	
B_3(E)	12	#10	45'-4"	
D(E)	84	#4	5'-5"	
S(E)	178	#4	11'-6"	
S_1(E)	12	#4	11'-10"	
U(E)	8	#4	9'-1"	
U_1(E)	10	#4	6'-7"	

FINAL

DESIGNED	MNM	6/17/14
DRAWN	DAP	6/1/14
REVIEWED	JGT	10/11/2016

p:\\sp:-svr306.hanson.dom\Hanson Projects\Documents\09Jobs\09L0178\CAD\Struct\Ash-10th\Sheets\084-9954-XXXXX-012-CIP Fascia Beam A1.dgn

FILE NAME =

HANSON

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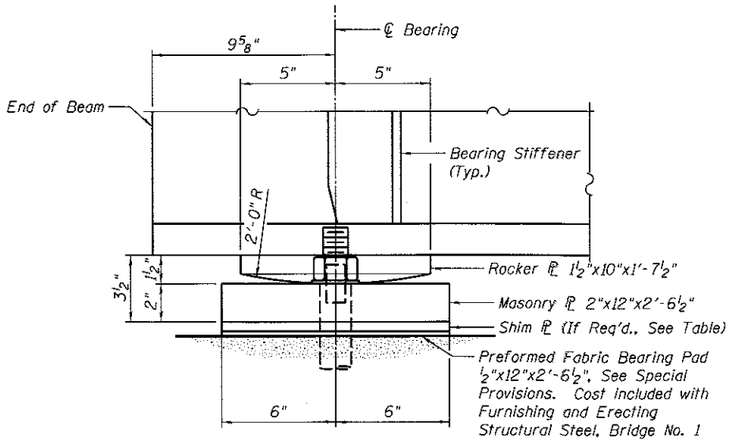
USER NAME = pop02275	DESIGNED - MNM	REVISED -	
	CHECKED - JGT	REVISED -	
PLOT SCALE = 81.999996 '/ in.	DRAWN - DAP	REVISED -	
PLOT DATE = 2/24/2017	CHECKED - MNM	REVISED -	

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

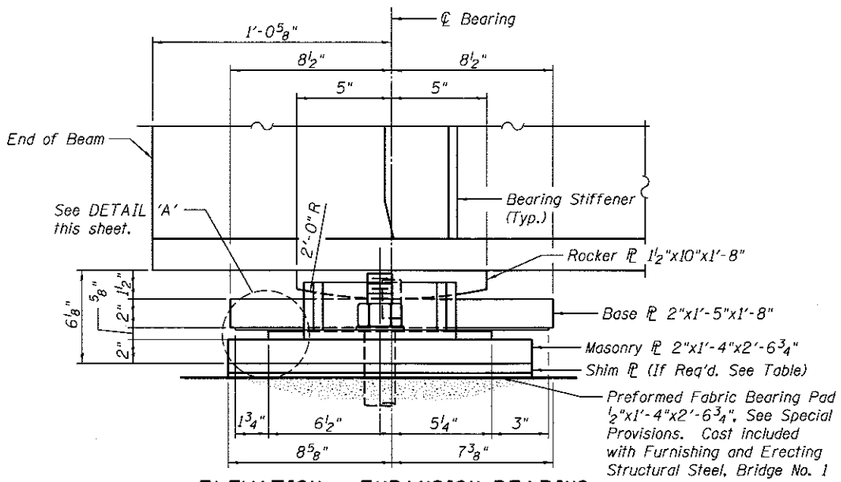
C.I.P. FASCIA BEAM ALTERNATIVE
STRUCTURE NO. 084-9954

SHEET NO. 12 OF 21 SHEETS

F.A.U. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
	14-00477-00-BR	SANGAMON	403	221
		CONTRACT NO. 93704		
	ILLINOIS FED. AID PROJECT			



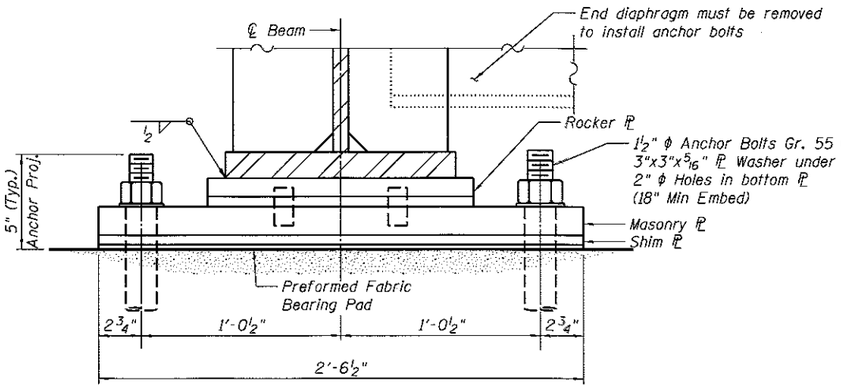
ELEVATION - FIXED BEARING



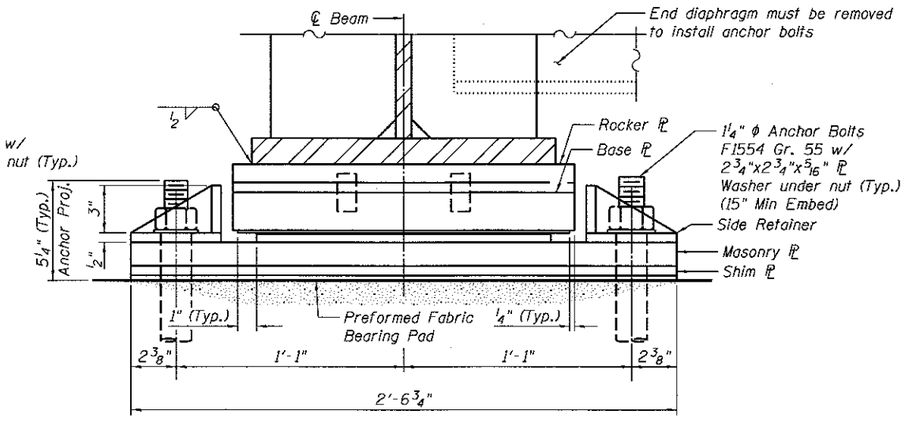
ELEVATION - EXPANSION BEARING

Notes:

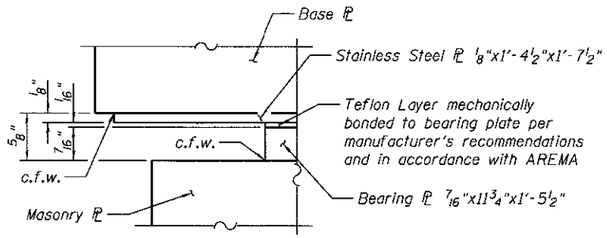
1. *The structural steel plates of the Bearing Assembly shall conform to the requirements of ASTM A709, Grade 50.*
2. *Teflon Layer shall be composed of virgin unfilled TFE resin, unfilled TFE sheets, or unfilled TFE fabric. Filler material, such as milled glass fibers, will not be allowed. Teflon layer shall conform to the requirements of AREMA Chapter 15.*
3. *The bearing assembly shall be according to Section 521 of the Standard Specifications where applicable. The bearing assembly and anchor bolts will not be paid for separately but included in the weight of Structural Steel for payment as "Furnishing and Erecting Structural Steel, Bridge No. 1".*
4. *Anchor bolts shall be ASTM F1554 all-thread (or an Engineer-approved alternate material) of the grade(s) and diameter(s) specified. The corresponding specified grade of AASHTO M314 anchor bolts may be used in lieu of ASTM F1554.*
5. *Anchor bolts shall be installed in blockouts with Non-Shrink Grout meeting the material requirements of Article 1024.02 of the Standard Specifications. Blockouts shall be clean prior to grouting and grout installed according to manufactures recommendations. Cost for non-shrink grout shall be included in the cost of Concrete Structures.*
6. *Two 1/8" adjusting shims shall be provided for each bearing assembly in addition to all other plates or shims and placed as shown on bearing details.*



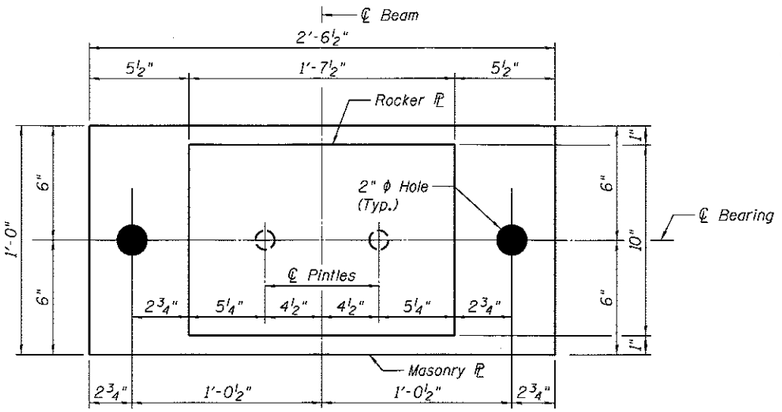
END VIEW - FIXED BEARING



END VIEW - EXPANSION BEARING

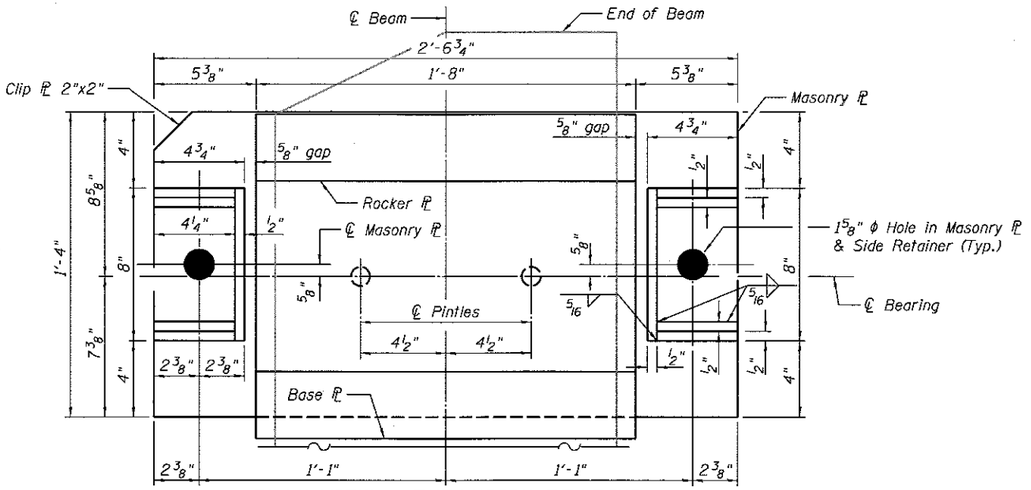


DETAIL 'A'



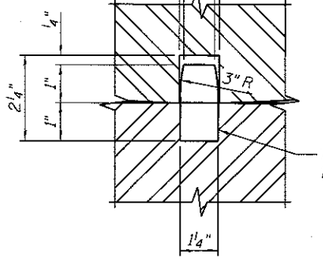
PLAN VIEW - FIXED BEARING

(Abutment Bearings - 12 required)



PLAN VIEW - EXPANSION BEARING

(Abutment Bearings - 12 required)



PINTLE DETAIL

* Shim Plate Thickness		
Abutment	Beam	Thickness
North/South	1	3/8"
North/South	2	3/8"
North/South	3	1/4"
North/South	4	1/4"
North/South	5	1/4"
North/South	6	1/8"
North/South	7	1/8"
North/South	8	1/8"
North/South	9	1/8"

* See notes for additional adjusting shims for all bearings.

FINAL			
DESIGNED	MNM	6/17/14	
DRAWN	DAP	6/1/14	
REVIEWED	JGT	10/11/2016	

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	PLOT SCALE = 01.999996 '' / in.	DRAWN - DAP	REVISED -
	PLOT DATE = 2/24/2017	CHECKED - MNM	REVISED -

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DEPARTMENT OF TRANSPORTATION

BEARING DETAILS
STRUCTURE NO. 084-9954
SHEET NO. 13 OF 21 SHEETS

F.A.U. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
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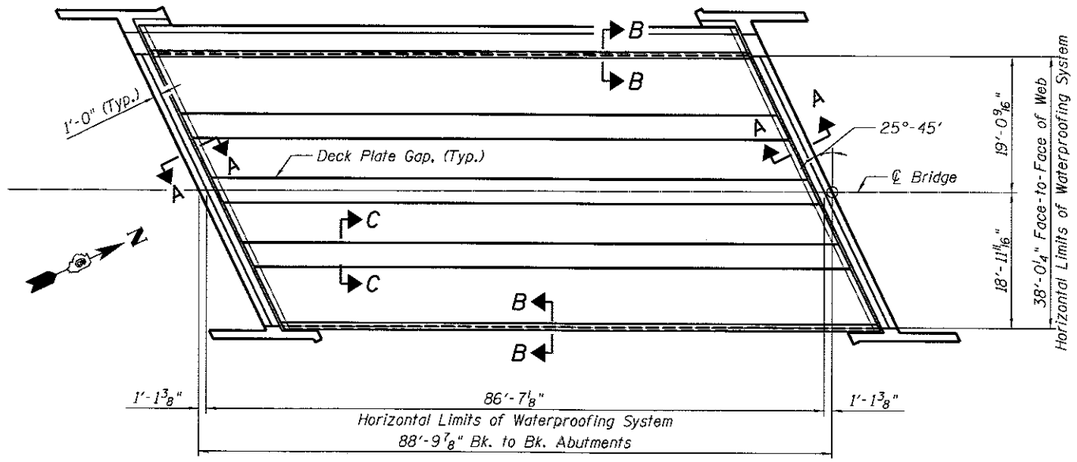
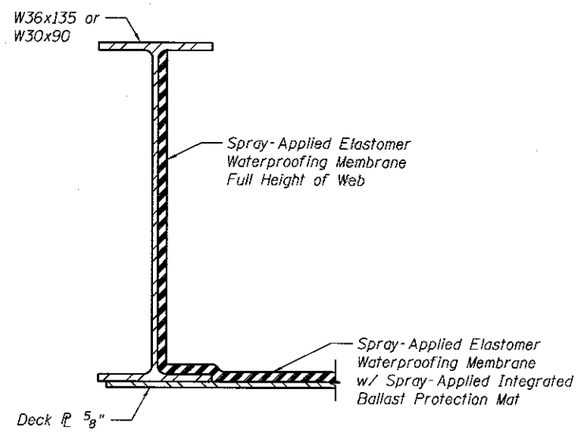
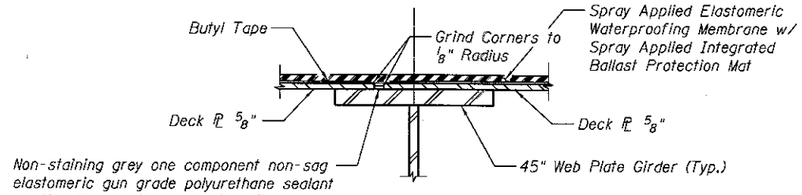
		CONTRACT NO. 93704		
		ILLINOIS FED. AID PROJECT		



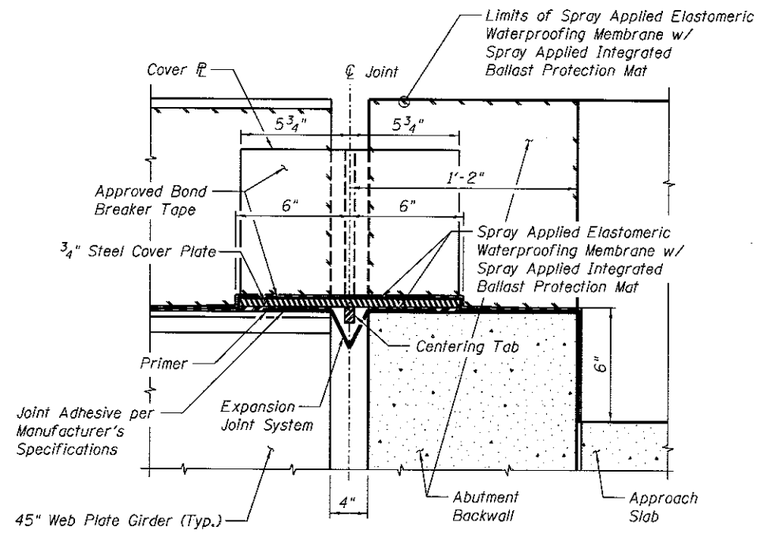
WATERPROOFING LIMITS PLAN



SECTION B-B



SECTION C-C



Note:
1. Bridge deck membrane continuous thru joint.
2. Typical Joint Detail shown for information only. Waterproofing installer shall determine final details in accordance with the manufacturer's recommendations.

SECTION A-A

(At Rt. 4's to Bk. of Abut.)

Notes:

1. Prepare surfaces and apply in accordance with Manufacturer's recommendations..
2. Structural steel cover plates shall be galvanized.
3. Cost of adhesive and bond breaker tape shall be included in the cost of "Membrane Waterproofing (Special)".
4. The cover plate is included in the weight of the Structural Steel and will be paid for as "Furnishing and Erecting Structural Steel, Bridge No. 1".
5. For cover plate details see Sheet 9 of 21.

BILL OF MATERIAL

ITEM	UNIT	TOTAL
Membrane Waterproofing (Special)	Sq. Ft.	3794

FINAL		
DESIGNED	MNM	6/17/14
DRAWN	DAP	6/1/14
REVIEWED	JGT	10/11/2016

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STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

MEMBRANE WATERPROOFING
STRUCTURE NO. 084-9954
SHEET NO. 14 OF 21 SHEETS

F.A.U. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
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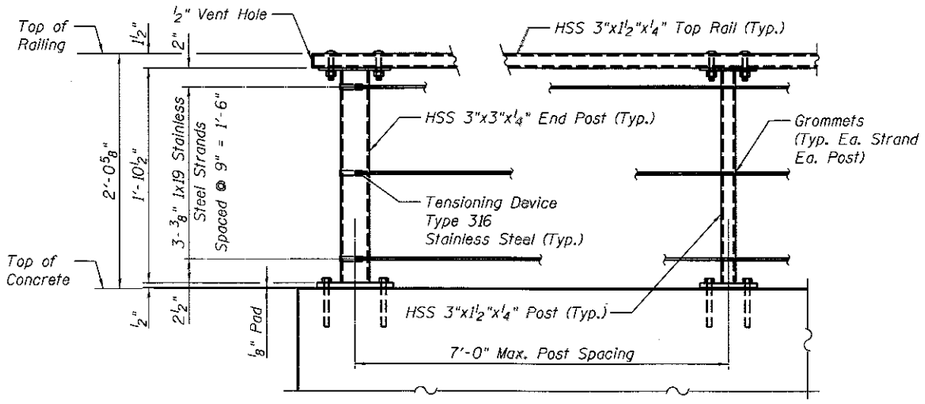
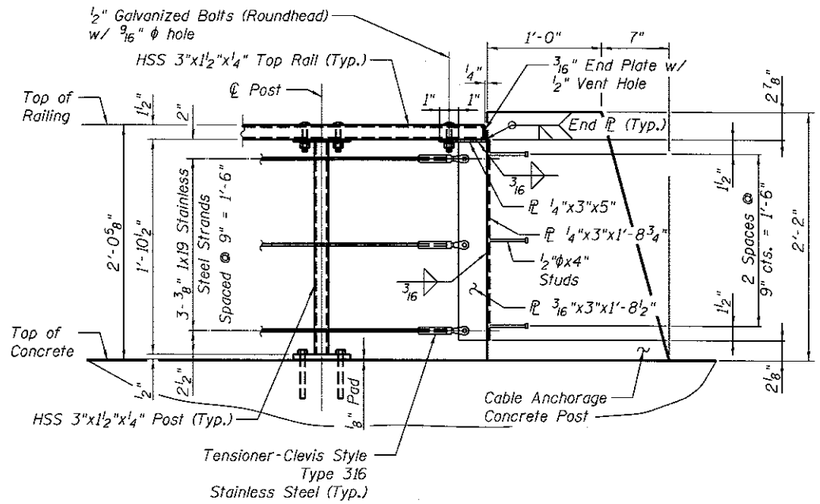
		CONTRACT NO. 93704		
	ILLINOIS FED. AID PROJECT			



END POST INTERMEDIATE POST



CABLE RAILING END PANEL

Notes:

Anchor rods shall be ASTM F1554, Gr. 55, galvanized steel all-thread (or an Engineer-approved alternate material) of the grade(s) and diameter(s) specified. The corresponding specified grade of AASHTO M314 anchor bolts may be used in lieu of ASTM F1554. The anchor rods shall be hot-dipped galvanized according to ASTM M232, Class C.

Tube segments shall have all corners ground to remove burrs or sharp projections.

All bolts, eyebolts, nuts and washers must satisfy the requirements of ASTM A307 Gr. A unless noted otherwise.

The Anchor rods shall be installed according to Article 509.06 of the Standard Specifications. Embedment shall be 4" min. or according to the manufactures specifications whatever is greater.

Structural steel plates and bars of the Steel Railing shall conform to the requirements of ASTM A36/36M.

Tubular steel posts shall be according to the requirements of ASTM A500, Grade B.

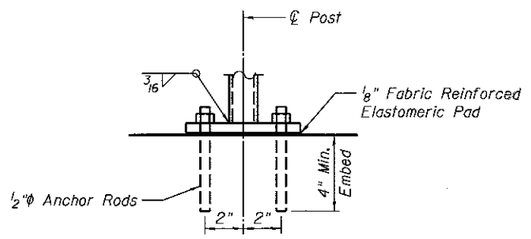
All steel rail members, with the exception of the stainless steel strand and fittings, shall be hot dipped galvanized according to 509.05 of the Standard Specifications.

All studs shall be ½"ϕx4" granular or solid flux filled headed studs automatically end welded to plates.

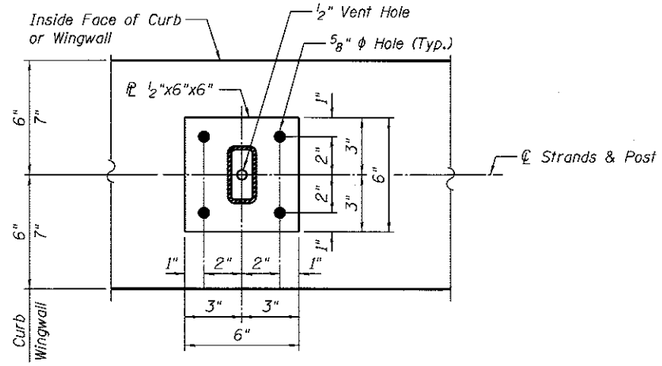
For top rail and post connection details See Sheet 16 of 21.

See Sheet 5 of 21 for rail post spacing.

See Retaining Wall Plans for chain attachment details.

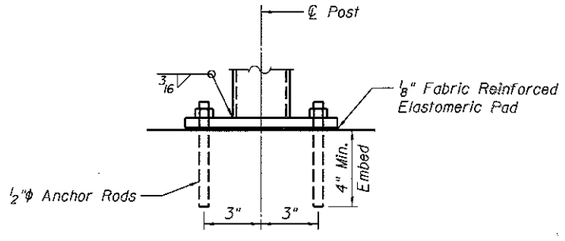


ANCHOR ROD DETAIL INTERMEDIATE POSTS

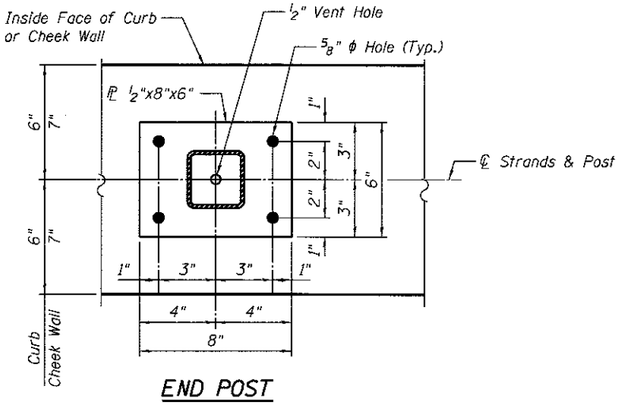


INTERMEDIATE POST

POST DETAIL - WEST SIDE



ANCHOR ROD DETAIL END POSTS



END POST

BILL OF MATERIAL

(Includes Railing along West & East side)

ITEM	UNIT	TOTAL
Steel Railing (Special)	Foot	203

FINAL

DESIGNED	MNM	6/11/14
DRAWN	DAP	6/1/14
REVIEWED	JGT	10/11/2016

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	PLOT DATE = 2/24/2017	CHECKED - MNM	REVISED -

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STATE OF ILLINOIS
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STEEL RAILING (SPECIAL) WESTSIDE
STRUCTURE NO. 084-9954
SHEET NO. 15 OF 21 SHEETS

F.A.U. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
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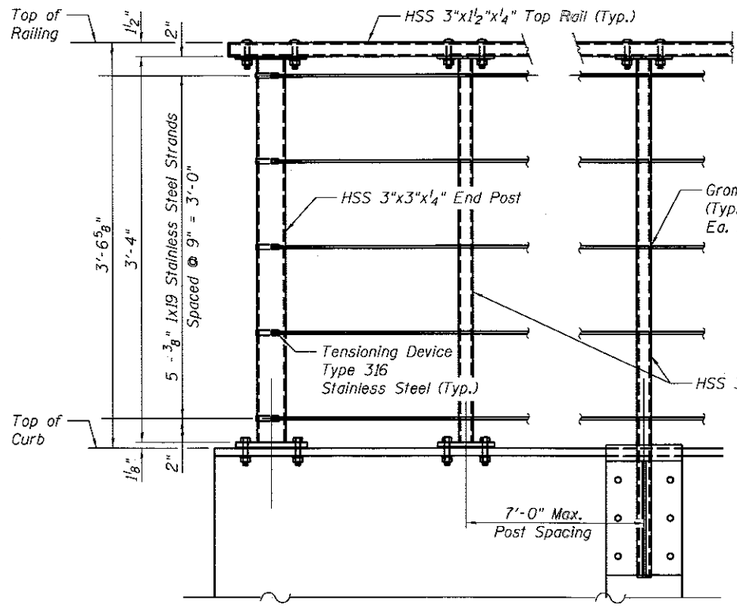
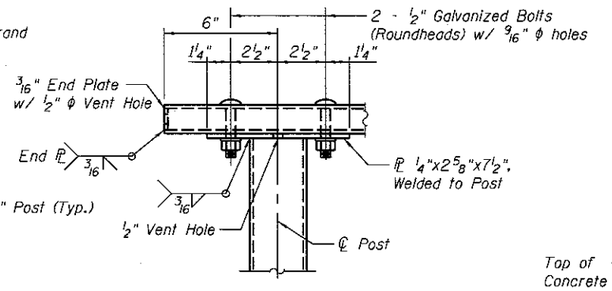
		CONTRACT NO. 93704		
	ILLINOIS	FED. AID PROJECT		

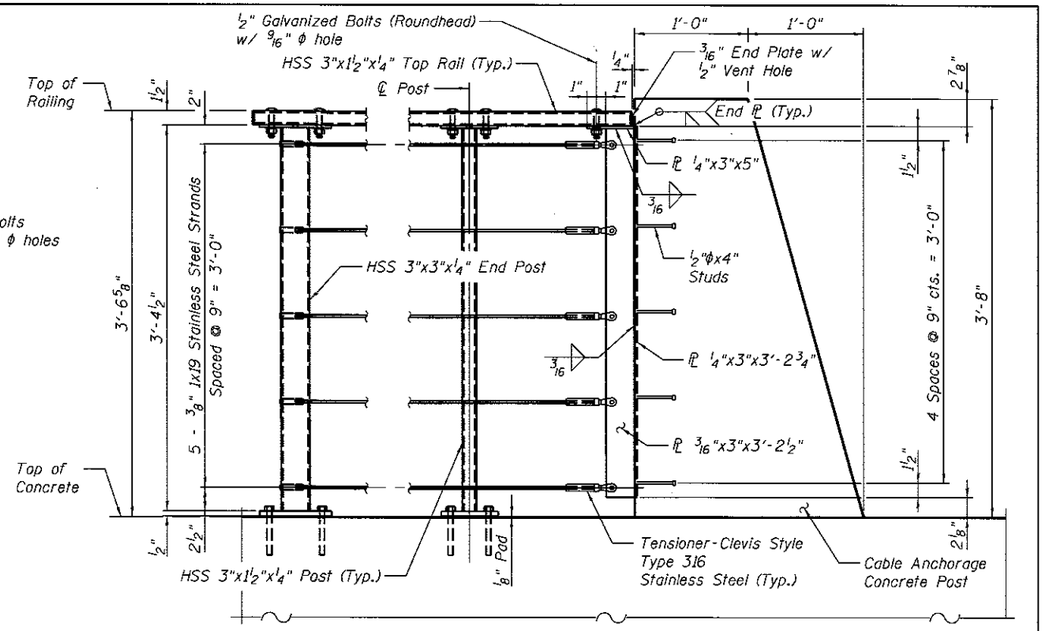


RAILING END PANEL - SUPERSTRUCTURE



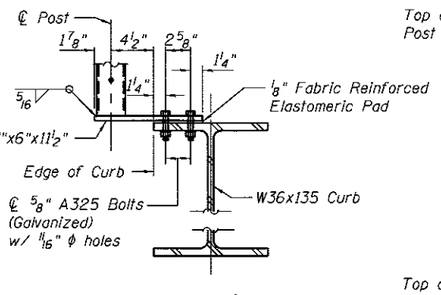
TYPICAL RAIL/END POST CONNECTION

(Strands not shown for clarity.)



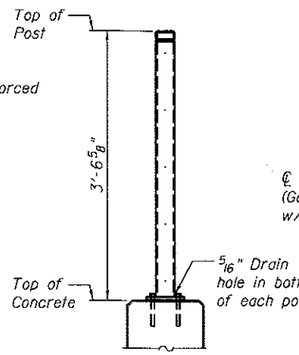
RAILING END PANEL - WINGWALL AND CHEEKWALL

Notes:
See Sheet 5 of 21 for rail post spacing.
See Sheet 15 of 21 for railing notes and anchor rod details.



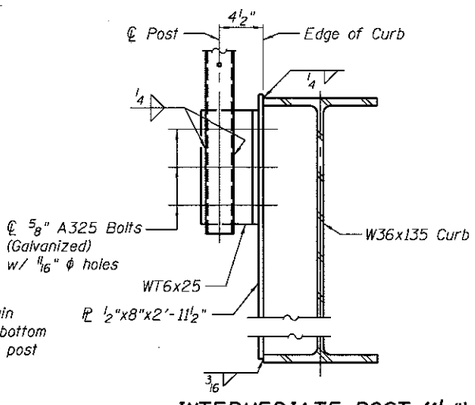
END POST (1½" & 3")

(Along Superstructure)



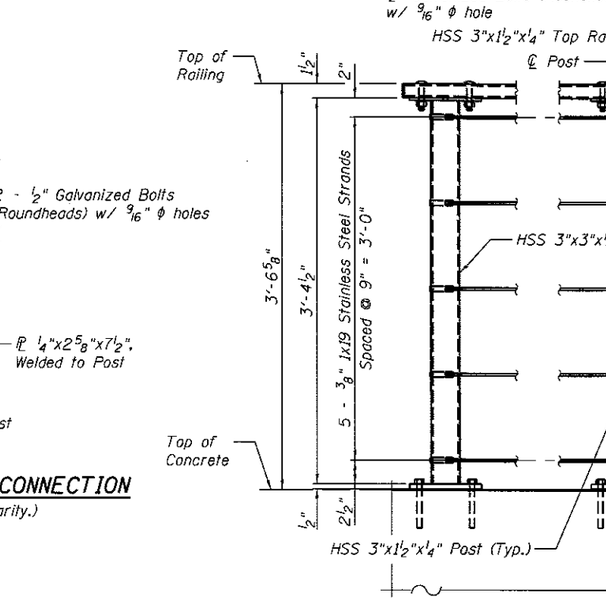
POST DETAIL - EAST SIDE

(On Cheek Wall and Wing Wall)

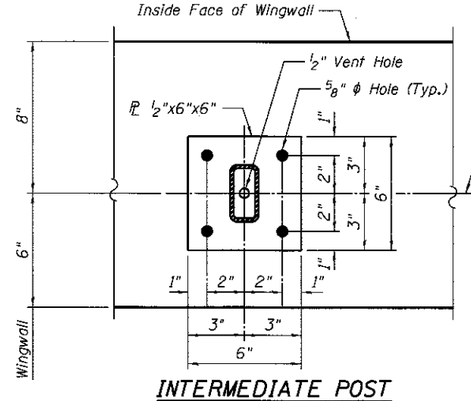


INTERMEDIATE POST (1½")

(Along Superstructure)



TOP RAIL - WITH SPLICE



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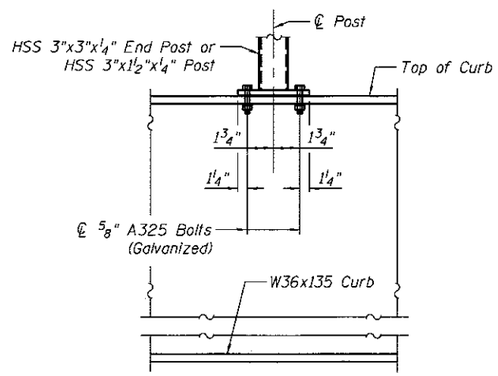
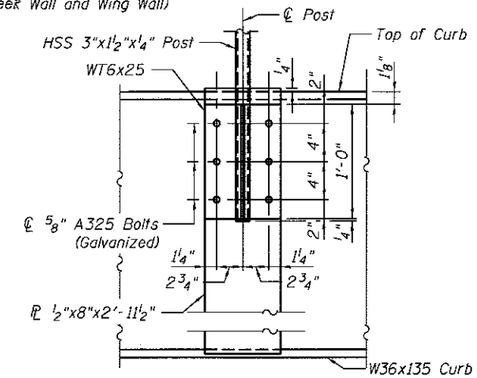


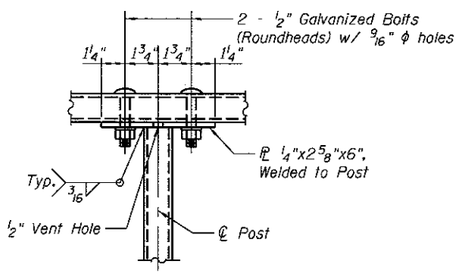
END POST (1½" & 3")

(Along Superstructure)



INTERMEDIATE POST (1½")

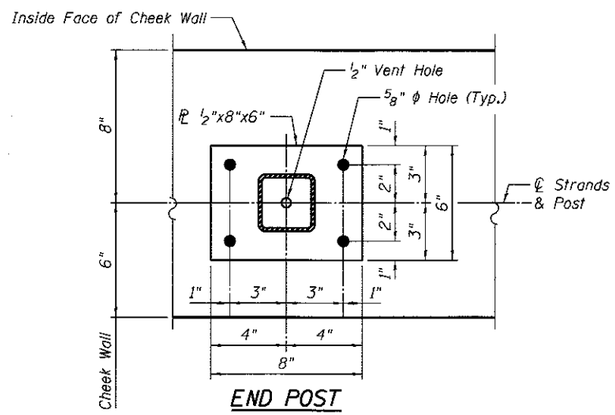
(Along Superstructure)



TOP RAIL - NO SPLICE

TYPICAL RAIL/POST CONNECTION

(Strands not shown for clarity.)



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REVIEWED	JGT	10/11/2016

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STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

STEEL RAILING (SPECIAL) EASTSIDE
STRUCTURE NO. 084-9954
SHEET NO. 16 OF 21 SHEETS

F.A.U. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
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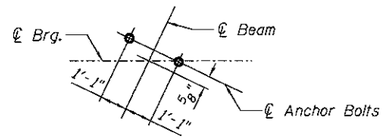
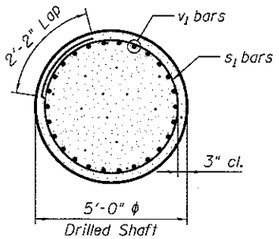
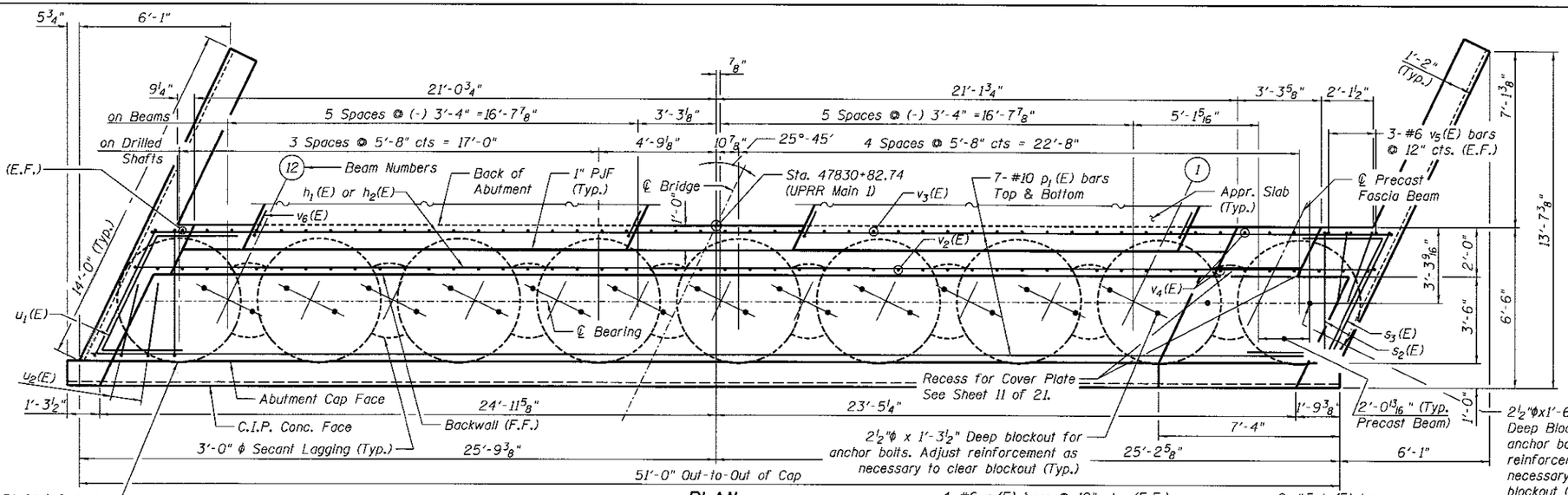
		CONTRACT NO. 93704		
	ILLINOIS FED. AID PROJECT			



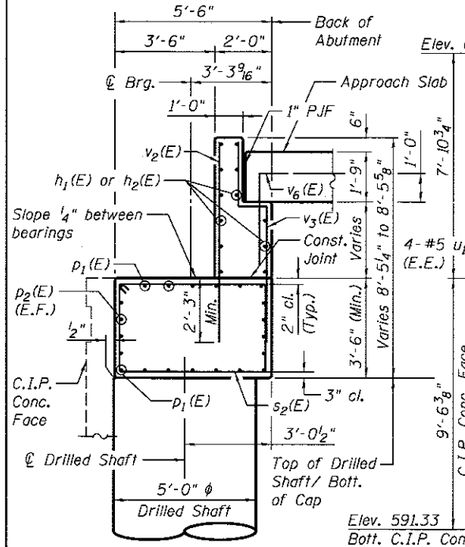
BLOCKOUT LAYOUT



SECTION B-B

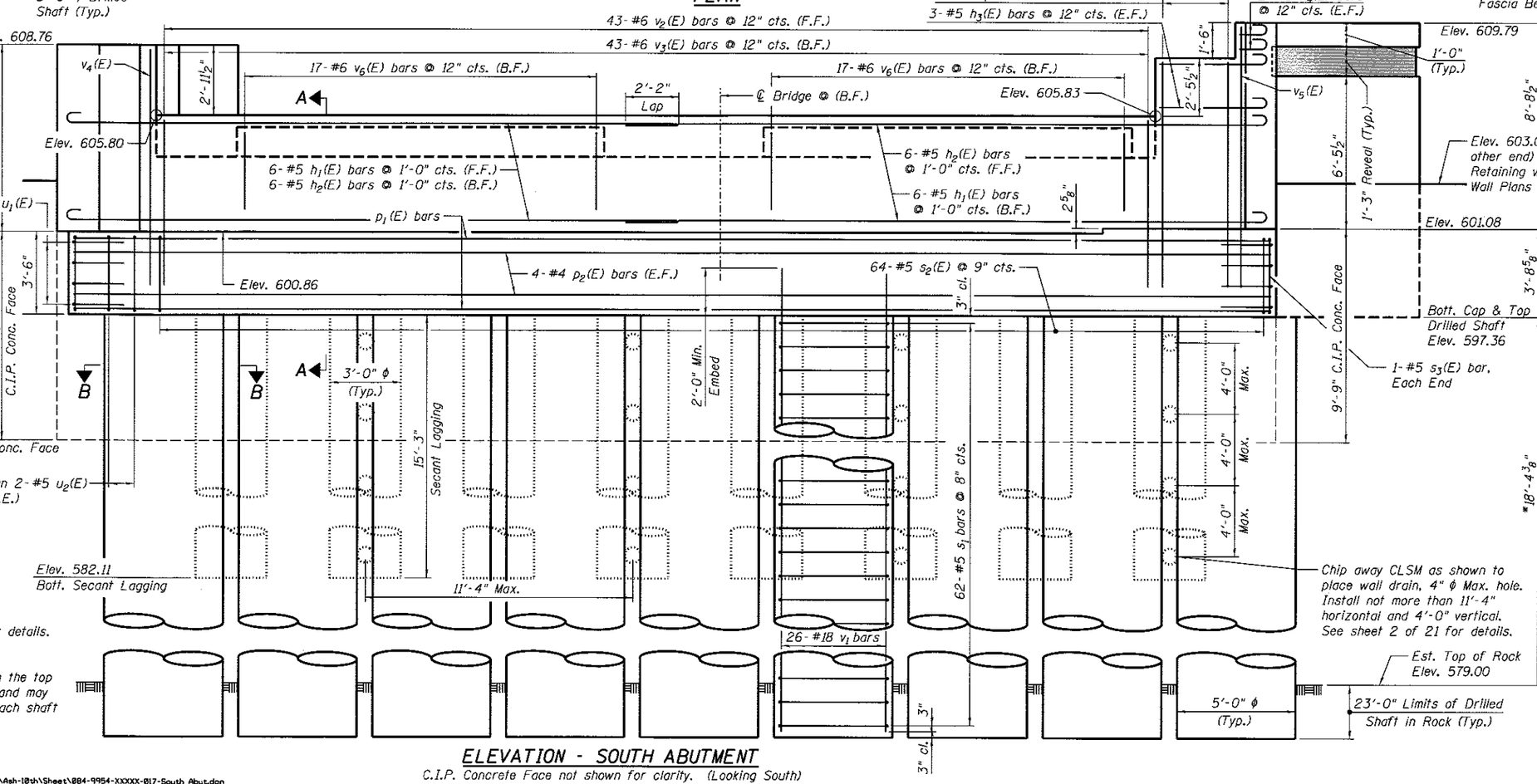


PLAN



SECTION A-A

(At Rt. 4's to Bk. of Abut.)



ELEVATION - SOUTH ABUTMENT

C.I.P. Concrete Face not shown for clarity. (Looking South)

Notes:
See Sheet 18 of 21 for C.I.P. Concrete Face and other details.

* The quantities and reinforcement detailing are based on the top of shaft and the estimated top of rock elevations shown and may change based on the actual top of rock encountered at each shaft and the final top of shaft elevation.

DESIGNED	MNM	6/17/14
DRAWN	DAP	6/1/14
REVIEWED	JGT	10/11/2016

FINAL

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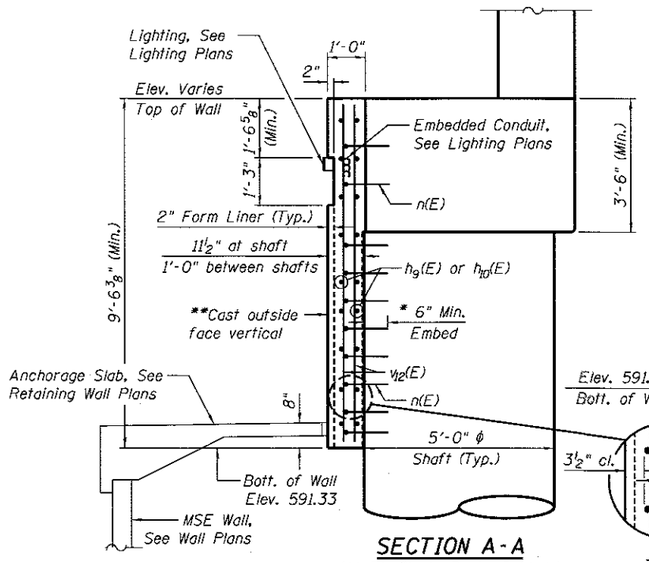
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

SOUTH ABUTMENT
STRUCTURE NO. 084-9954
SHEET NO. 17 OF 21 SHEETS

F.A.U. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
	14-00477-00-BR	SANGAMON	403	226
		CONTRACT NO. 93704		
	ILLINOIS FED. AID PROJECT			

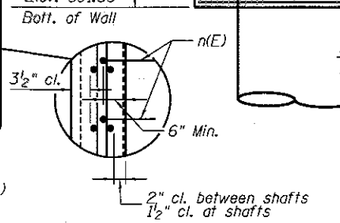
* Bars epoxy grouted shall have an embedment sufficient to develop 1.25 times the full capacity of the reinforcement bar.

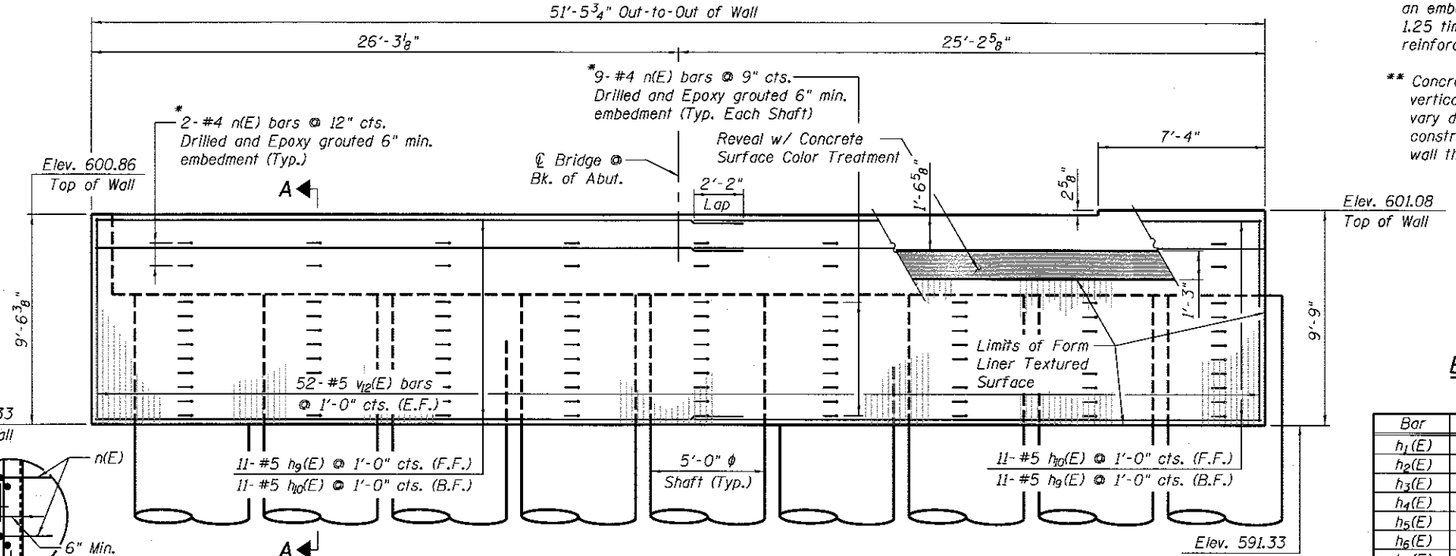
** Concrete wall face shall be cast vertically. Thickness of wall may vary due to abutment deflection and construction tolerances. The Min. wall thickness shall be 10½".



SECTION A-A

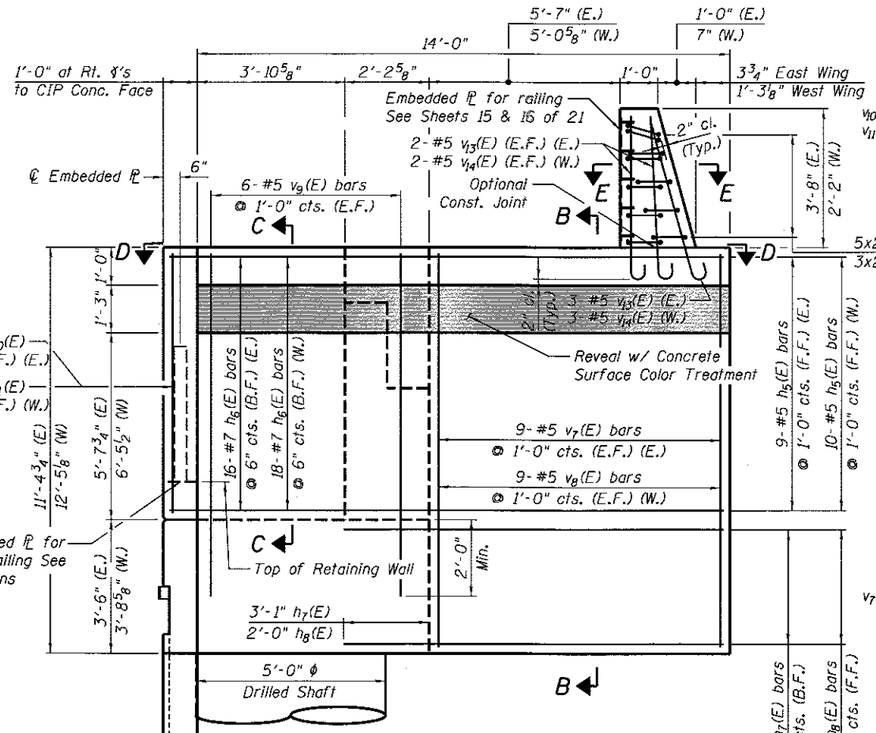
(At Rt. ℄'s to Back of Abut.)





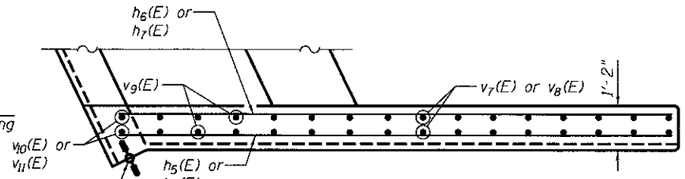
ELEVATION - C.I.P. CONCRETE FACE

(Looking South)



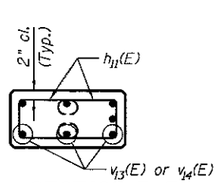
ELEVATION - TYPICAL END VIEW

(West Wing shown, East Wing similar)

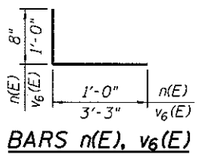


SECTION D-D - PLAN VIEW

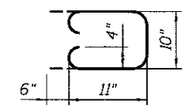
(West Wing shown, East Wing similar)



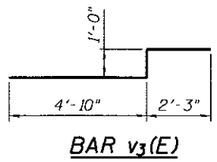
SECTION E-E



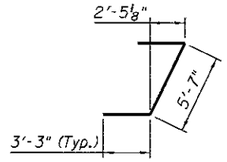
BARS n(E), v6(E)



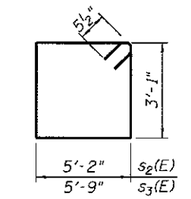
BAR h11(E)



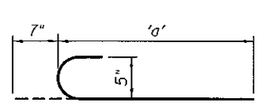
BAR v3(E)



BAR u1(E)

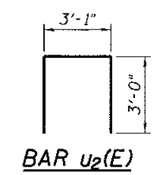


BARS s2(E), s3(E)

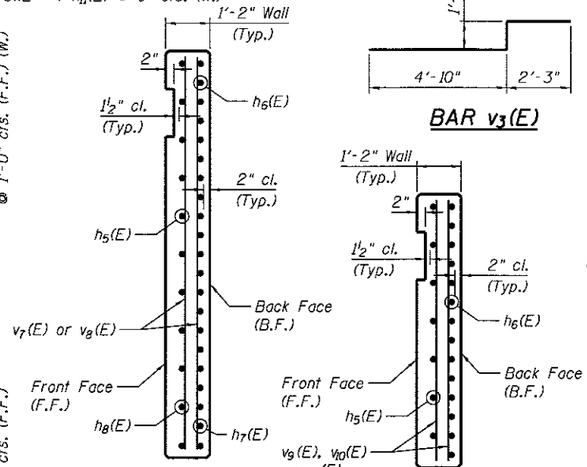


BARS h1(E), h2(E), h3(E), h4(E), v13(E), v14(E)

Bar	'a'
$h_1(E)$	23'-0"
$h_2(E)$	30'-0"
$h_3(E)$	6'-2"
$h_4(E)$	2'-11"
$v_{13}(E)$	4'-4"
$v_{14}(E)$	2'-10"



BAR u2(E)



WINGWALL SECTION B-B

CHEEKWALL SECTION C-C

Notes:
Pour step monolithically with cap.
Space cap reinforcement to miss blockouts for anchor bolts.
See Retaining Wall Plans for Expansion Joint Detail at each end of C.I.P. Concrete Facing.
See Lighting Plans of Conduit and J-Box embedments in Wall Facing.

BILL OF MATERIAL SOUTH ABUTMENT

Bar	No.	Size	Length	Shape
$h_1(E)$	12	#5	23'-7"	
$h_2(E)$	12	#5	30'-7"	
$h_3(E)$	6	#5	6'-9"	
$h_4(E)$	4	#5	3'-6"	
$h_5(E)$	19	#5	14'-3"	
$h_6(E)$	34	#7	14'-3"	
$h_7(E)$	14	#7	11'-4"	
$h_8(E)$	8	#5	10'-3"	
$h_9(E)$	22	#5	28'-6"	
$h_{10}(E)$	22	#5	24'-10"	
$h_{11}(E)$	16	#4	3'-8"	
n(E)	99	#4	1'-8"	
$p_1(E)$	14	#10	50'-8"	
$p_2(E)$	8	#4	50'-8"	
s_1	558	#5	16'-4"	
$s_2(E)$	64	#5	17'-5"	
$s_3(E)$	2	#5	18'-7"	
$u_1(E)$	8	#5	12'-1"	
$u_2(E)$	4	#5	9'-1"	
v_1	234	#18	43'-2"	
$v_2(E)$	43	#6	7'-1"	
$v_3(E)$	43	#6	8'-1"	
$v_4(E)$	10	#6	10'-0"	
$v_5(E)$	6	#6	11'-0"	
$v_6(E)$	34	#6	4'-3"	
$v_7(E)$	18	#5	10'-11"	
$v_8(E)$	18	#5	11'-11"	
$v_9(E)$	24	#5	10'-7"	
$v_{10}(E)$	2	#5	7'-5"	
$v_{11}(E)$	2	#5	8'-4"	
$v_{12}(E)$	104	#5	9'-3"	
$v_{13}(E)$	7	#5	4'-11"	
$v_{14}(E)$	7	#5	3'-5"	

Structure Excavation	Cu. Yds.	199
Concrete Structures	Cu. Yds.	83.6
Drilled Shaft in Soil	Cu. Yds.	120.2
Drilled Shaft in Rock	Cu. Yds.	150.5
Secant Lagging	Cu. Ft.	862
Form Liner Textured Surface	Sq. Ft.	346
Concrete Surface Color Treatment	Sq. Ft.	99
Reinforcement Bars	Pound	146880
Reinforcement Bars, Epoxy Coated	Pound	11690
Crosshole Sonic Logging Access Ducts	Foot	2369

FINAL

DESIGNED	MNM	6/17/14
DRAWN	DAP	6/1/14
REVIEWED	JGT	10/11/2016

pw:\\sp-svr306.hanson.dom:Hanson_Projects\Documents\09Jobs\09L01798\CAD\Struct\Ash-18th\Sheet\084-9954-XXXXX-018-South Abut Det.dgn

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HANSON		CHECKED - JGT	REVISED -
	PLOT SCALE = 811.999996 '/ in.	DRAWN - DAP	REVISED -
	PLOT DATE = 2/24/2017	CHECKED - MNM	REVISED -

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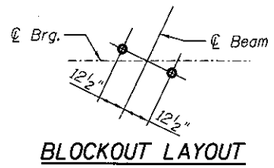
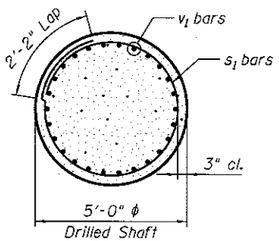
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

SOUTH ABUTMENT DETAILS
STRUCTURE NO. 084-9954
SHEET NO. 18 OF 21 SHEETS

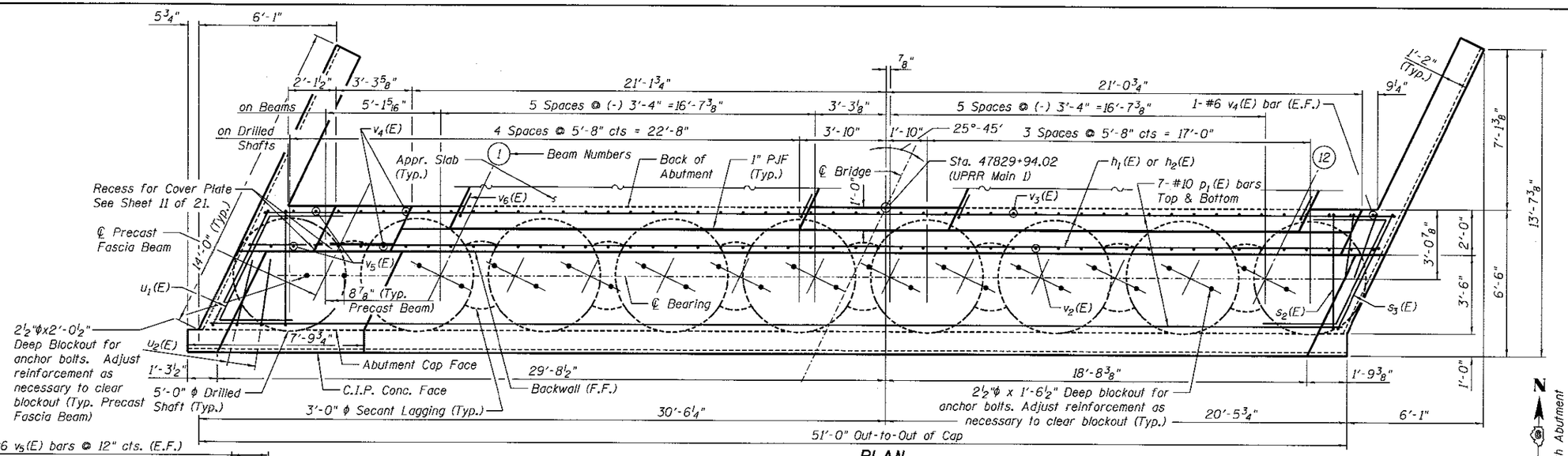
F.A.U. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
	14-00477-00-BR	SANGAMON	403	227
		CONTRACT NO. 93704		
	ILLINOIS FED. AID PROJECT			



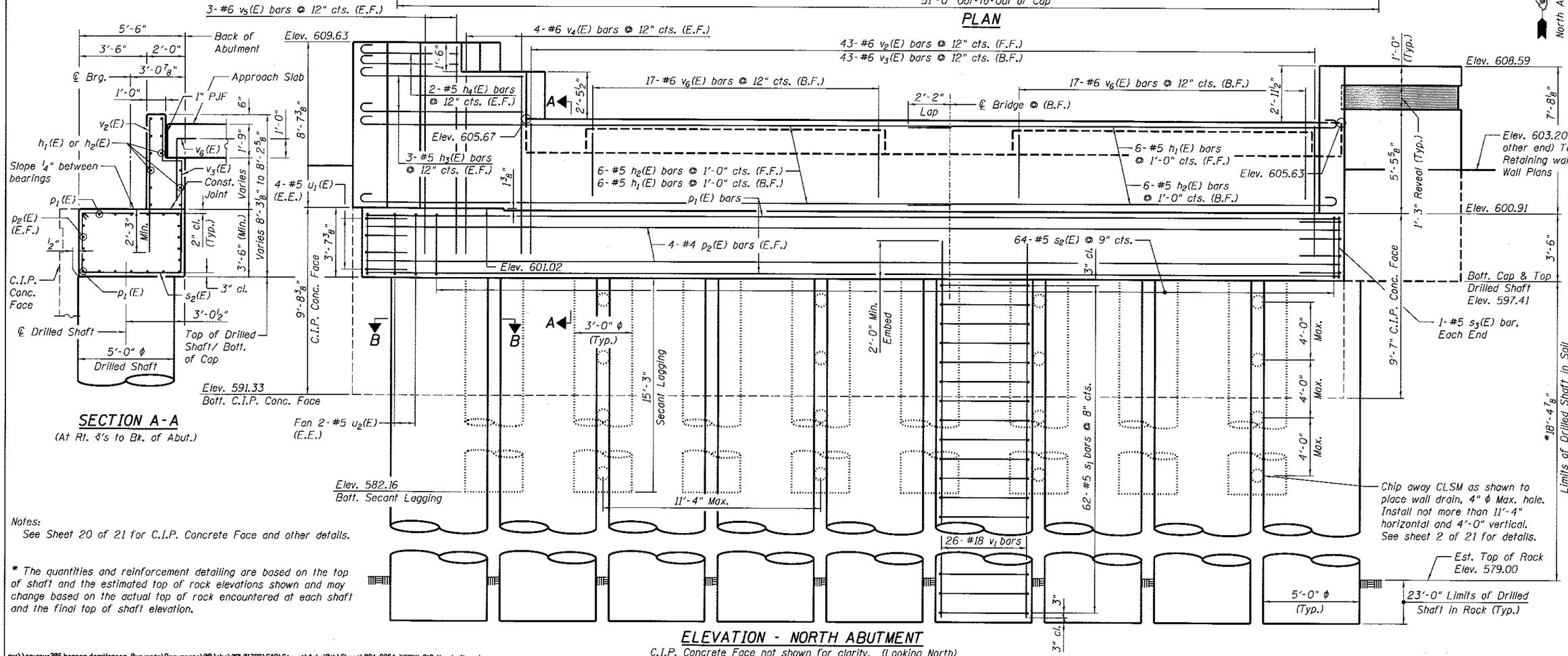
BLOCKOUT LAYOUT



SECTION B-B



PLAN



SECTION A-A

(At Rt. 4's to Bk. of Abut.)

Notes:

See Sheet 20 of 21 for C.I.P. Concrete Face and other details.

* The quantities and reinforcement detailing are based on the top of shaft and the estimated top of rock elevations shown and may change based on the actual top of rock encountered at each shaft and the final top of shaft elevation.

ELEVATION - NORTH ABUTMENT

C.I.P. Concrete Face not shown for clarity. (Looking North)

FINAL		
DESIGNED	MNM	6/17/14
DRAWN	DAP	6/1/14
REVIEWED	JGT	10/11/2016

pw:\\spi-svr386.hanson.dom:Hanson Projects\Documents\89Jobs\89L81798\CAD\Struct\Ash-18th\Sheet\084-9954-XXXXX-819-North Abut.dgn

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HANSON		CHECKED - JGT	REVISED -
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	PLOT DATE = 2/24/2017	CHECKED - MNM	REVISED -

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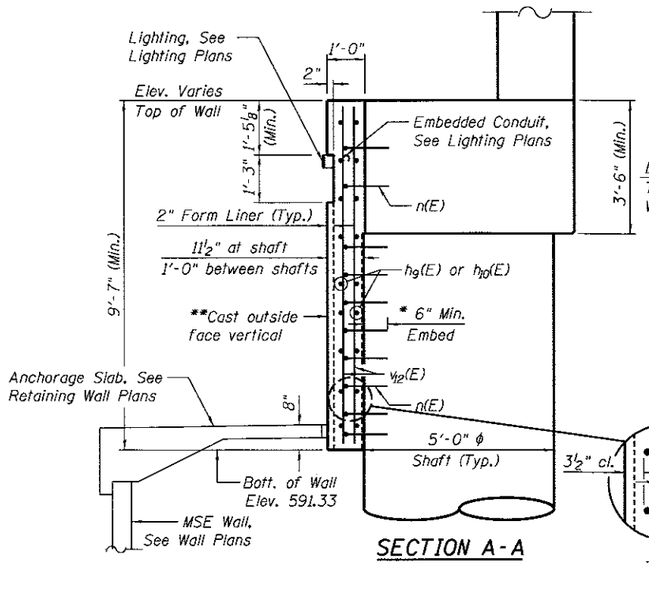
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

NORTH ABUTMENT
STRUCTURE NO. 084-9954
SHEET NO. 19 OF 21 SHEETS

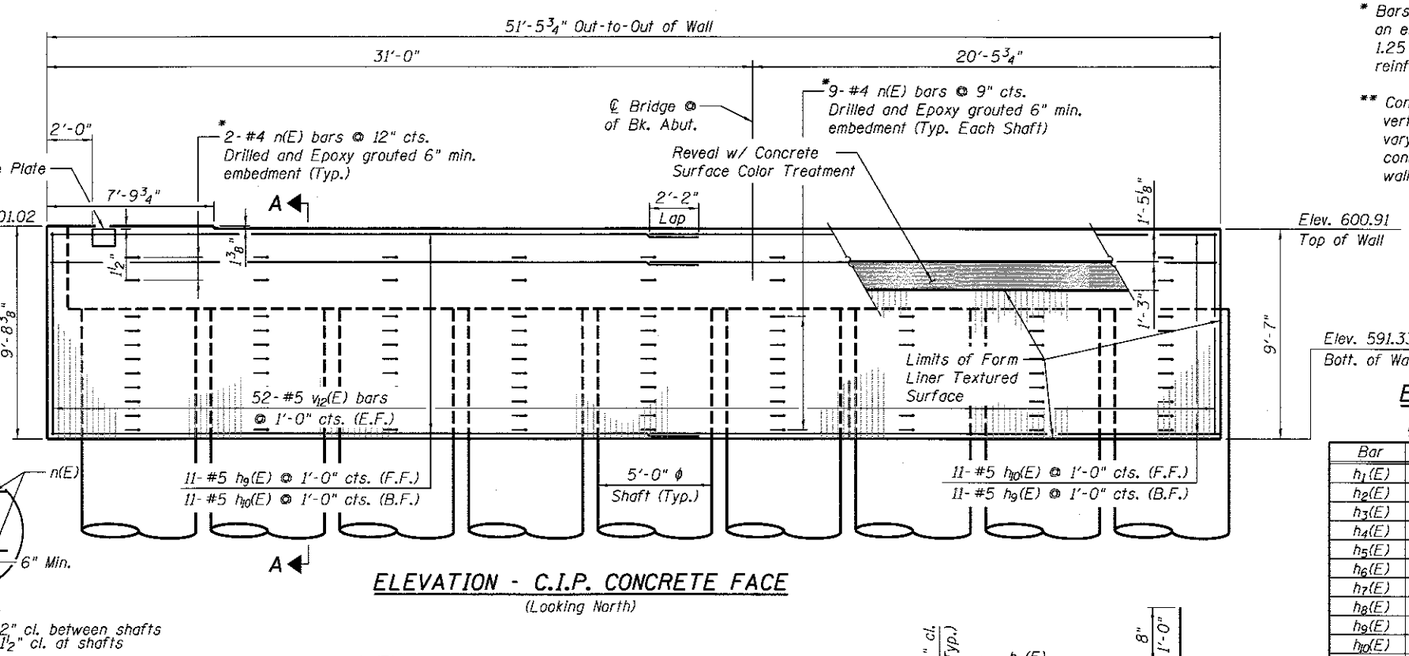
F.A.U. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
	14-00477-00-BR	SANGAMON	403	226
		CONTRACT NO. 93704		
	ILLINOIS FED. AID PROJECT			

* Bars epoxy grouted shall have an embedment sufficient to develop 1.25 times the full capacity of the reinforcement bar.

** Concrete wall face shall be cast vertically. Thickness of wall may vary due to abutment deflection and construction tolerances. The Min. wall thickness shall be $10\frac{1}{2}$".

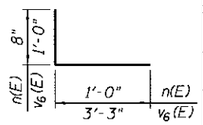


SECTION A-A



ELEVATION - C.I.P. CONCRETE FACE

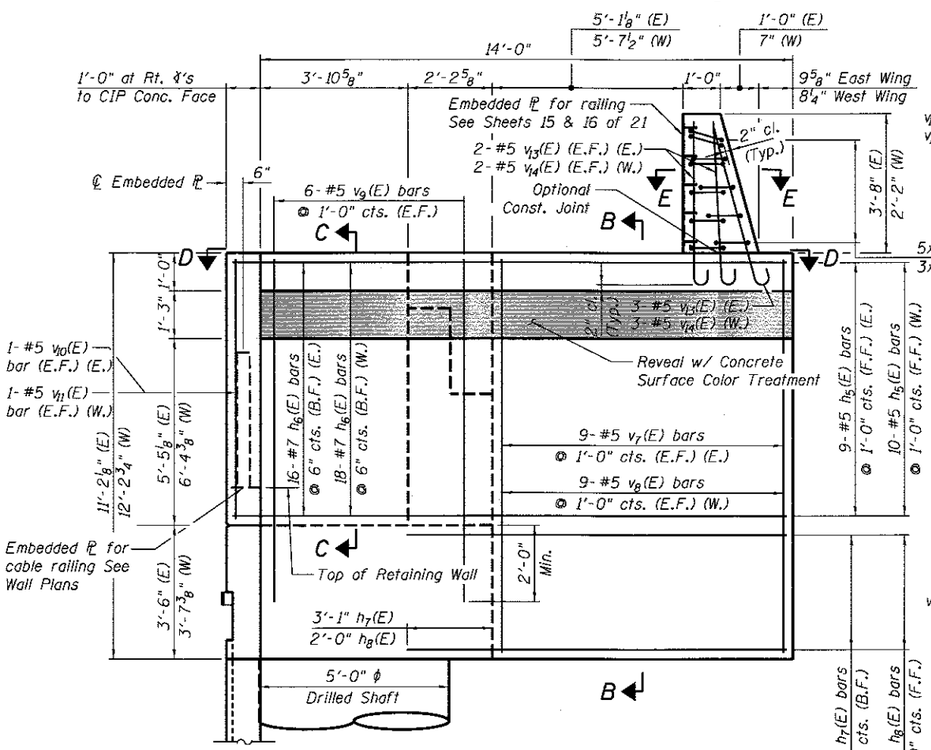
(Looking North)



BARS n(E), v6(E)

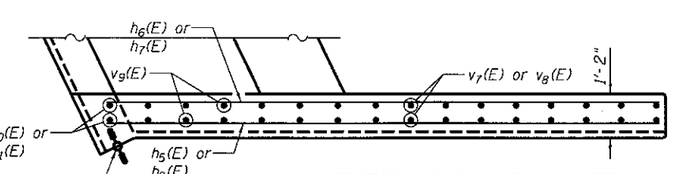
Bar	No.	Size	Length	Shape
$h_1(E)$	12	#5	23'-7"	
$h_2(E)$	12	#5	30'-7"	
$h_3(E)$	6	#5	6'-9"	
$h_4(E)$	4	#5	3'-6"	
$h_5(E)$	19	#5	14'-3"	
$h_6(E)$	34	#7	14'-3"	
$h_7(E)$	14	#7	11'-4"	
$h_8(E)$	8	#5	10'-3"	
$h_9(E)$	22	#5	28'-6"	
$h_{10}(E)$	22	#5	24'-10"	
$h_{11}(E)$	16	#4	3'-8"	
n(E)	99	#4	1'-8"	
$p_1(E)$	14	#10	50'-8"	
$p_2(E)$	8	#4	50'-8"	
s_1	558	#5	16'-4"	
$s_2(E)$	64	#5	17'-5"	
$s_3(E)$	2	#5	18'-7"	
$u_1(E)$	8	#5	12'-1"	
$u_2(E)$	4	#5	9'-1"	
v_1	234	#18	43'-2"	
$v_2(E)$	43	#6	7'-1"	
$v_3(E)$	43	#6	8'-1"	
$v_4(E)$	10	#6	10'-0"	
$v_5(E)$	6	#6	11'-0"	
$v_6(E)$	34	#6	4'-3"	
$v_7(E)$	18	#5	10'-11"	
$v_8(E)$	18	#5	11'-11"	
$v_9(E)$	24	#5	10'-7"	
$v_{10}(E)$	2	#5	7'-5"	
$v_{11}(E)$	2	#5	8'-4"	
$v_{12}(E)$	104	#5	9'-3"	
$v_{13}(E)$	7	#5	4'-11"	
$v_{14}(E)$	7	#5	3'-5"	

Structure Excavation	Cu. Yds.	192
Concrete Structures	Cu. Yds.	82.6
Drilled Shaft in Soil	Cu. Yds.	120.5
Drilled Shaft in Rock	Cu. Yds.	150.5
Secant Logging	Cu. Ft.	862
Form Liner Textured Surface	Sq. Ft.	356
Concrete Surface Color Treatment	Sq. Ft.	99
Reinforcement Bars	Pound	146880
Reinforcement Bars, Epoxy Coated	Pound	11690
Crosshole Sonic Logging Access Ducts	Foot	2371



ELEVATION - TYPICAL END VIEW

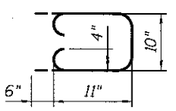
(East Wing shown, West Wing similar)



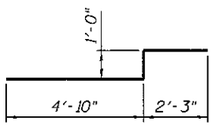
SECTION D-D - PLAN VIEW

(East Wing shown, West Wing similar)

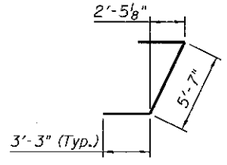
SECTION E-E



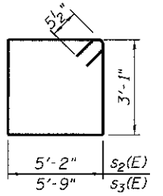
BAR $h_{11}(E)$



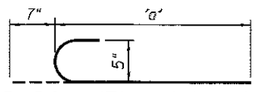
BAR $v_3(E)$



BAR $u_1(E)$

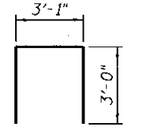


BARS $s_2(E)$, $s_3(E)$

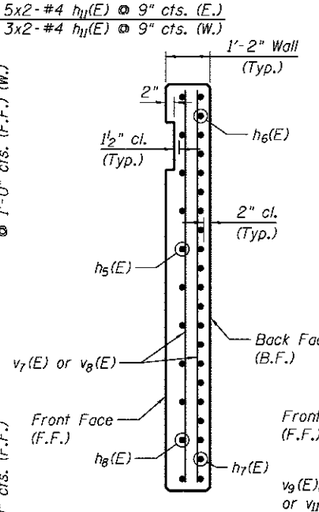


BARS $h_1(E)$, $h_2(E)$, $h_3(E)$, $h_4(E)$, $v_{13}(E)$, $v_{14}(E)$

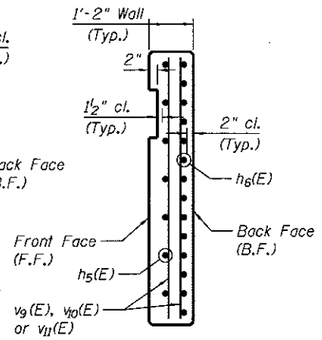
Bar	'a'
$h_1(E)$	23'-0"
$h_2(E)$	30'-0"
$h_3(E)$	6'-2"
$h_4(E)$	2'-11"
$v_{13}(E)$	4'-4"
$v_{14}(E)$	2'-10"



BAR $u_2(E)$



WINGWALL SECTION B-B



CHEEKWALL SECTION C-C

Notes:
Pour step monolithically with cap.
Space cap reinforcement to miss blockouts for anchor bolts.
See Retaining Wall Plans for Expansion Joint Detail at each end of C.I.P. Concrete Facing.
See Lighting Plans of Conduit and J-Box embedments in Wall Facing.

FINAL

DESIGNED	MNM	6/17/14
DRAWN	DAP	6/1/14
REVIEWED	JGT	10/11/2016

pw:\\spi-svr306.hanson.dom:Hanson Projects\Documents\89Jobs\89L0179B\CAD\Struct\Ash-18th\Sheets\084-9954-XXXXX-028-North Abut Det.dgn

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HANSON		CHECKED - JGT	REVISED -
© Copyright Hanson Professional Services Inc. 2017	PLOT SCALE = 01.999998 '/' / in.	DRAWN - DAP	REVISED -
	PLOT DATE = 2/24/2017	CHECKED - MNM	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

NORTH ABUTMENT DETAILS
STRUCTURE NO. 084-9954
SHEET NO. 20 OF 21 SHEETS

F.A.U. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
	14-00477-00-BR	SANGAMON	403	229
		CONTRACT NO. 93704		
		ILLINOIS FED. AID PROJECT		

B-039
Sta. 1000+66, 4' RT

	N	Qu	w%	
602.8				ASPHALT.
602.5				BRICK.
602.3	4		20	CONCRETE.
601.9				
599.3	6	1.96B	27	Black sand and cinders, trace gravel - FILL.
596.8	7	0.78B	26	Black silty CLAY, trace gravel, sand, and brick - FILL.
	4	0.89S	27	Gray-brown clayey SILT.
591.3	4	0.29B	27	Brown silty CLAY.
589.3	4	0.78B	25	Gray-brown clayey SILT.
	4	0.70B	24	
584.3	4	1.36B	24	Gray-tan silty CLAY.
579.8				
577.8	82	4.50P	15	Brown sandy clayey SHALE. (HIGHLY WEATHERED SHALE)
				Bottom of Hole = 25.0 feet

B-040
Sta. 1002+01, 3' RT

	N	Qu	w%	
602.6				ASPHALT.
602.1				BRICK.
601.8				AGGREGATE - crushed stone.
601.4	15	4.50P	22	
599.1	8	2.47B	28	Black cinders, gravel, and sand - FILL.
596.6	7		24	Black-gray silty CLAY, trace gravel - FILL.
	8		26	Gray-brown clayey SILT.
591.6	5	1.94B	23	Dark brown and gray clayey SILT.
589.1	5	1.05B	25	Dark brown and gray silty CLAY.
	5	0.78B	28	
584.1	5	1.36B	24	Blue-gray silty CLAY, some sand, trace gravel.
579.1	85/11"	4.50P	15	Brown-gray sandy clayey SHALE. (HIGHLY WEATHERED SHALE)
	83/11"	4.50P	14	
569.1	50/5"		9	Gray sandy SHALE.
	50/6"		7	
	50/4"		6	
553.8	50/3"		16	
				Bottom of Hole = 48.8 feet

B-030
Sta. 1002+30, 18' LT

	N	Qu	w%	
601.5				ASPHALT.
601.1				BRICK.
600.9	9		22	AGGREGATE - crushed stone.
600.4				
598.0	7	2.00P	26	Black silty clay, cinders, sand and brick - FILL.
596.5	4	0.62B	27	Brown and gray silty CLAY, trace gravel - FILL.
	6	1.47S	29	Brown-gray silty CLAY.
590.5	6	0.80P	22	Dark brown-gray silty CLAY.
	4	0.58B	27	
	4	1.05S	29	
583.0	7	1.94S	23	Blue-gray and brown silty CLAY. LL=44, PI=27
578.0	93/10"	4.50P	14	Brown and gray silty CLAY, trace sand. (HIGHLY WEATHERED SHALE)
	50/5"	4.50P	11	
568.0	50/4"	2.50P	13	Gray-brown clayey SHALE, trace sand.
	40.8			Rec. = 81% RQD = 72%
	23.2			Rec. = 97% RQD = 85%
	14.5			Rec. = 90% RQD = 19%
552.5				Bottom of Hole = 49.0 feet

LEGEND

- N — Standard Penetration Test N (blows/ft)
- Qu — Unconfined Strength (tsf)
- w% — Natural Moisture Content (%)
- DD ▽ 558.10 — Water Surface Elevation Encountered in Boring
  - DD = during drilling
  - Oh = at completion
  - 24h = 24 hours after completion

DESIGNED	MNM	6/17/14
DRAWN	DAP	6/1/14
REVIEWED	JGT	10/11/2016

FINAL

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	PLOT DATE = 2/24/2017	CHECKED - MNM	REVISED -

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STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

SUBSURFACE DATA PROFILE
STRUCTURE NO. 084-9954
SHEET NO. 21 OF 21 SHEETS

F.A.U. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
	14-00477-00-BR	SANGAMON	403	230
		CONTRACT NO. 93704		
	ILLINOIS FED. AID PROJECT			

Benchmark:
BM# NGS N-13: Brass Disk at the NE Corner Iles Park Oak Street and West Side of Railroad.
Elevation = 601.40

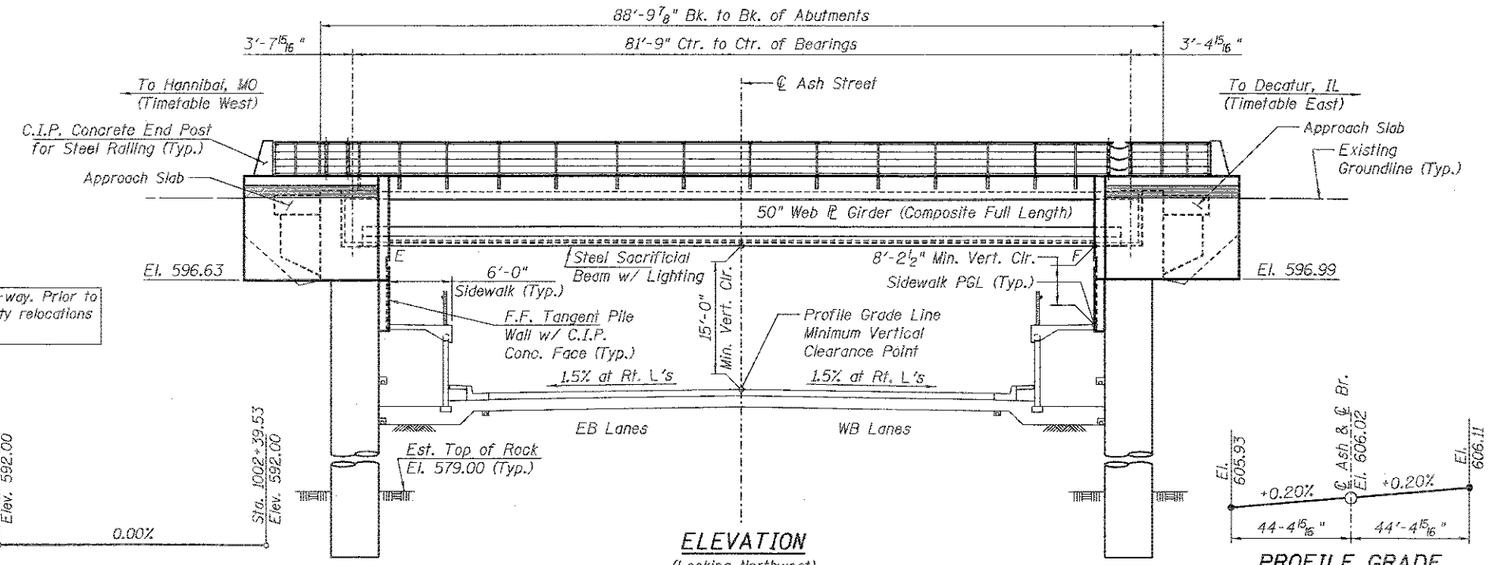
Existing Structure: None

Traffic Control: Road Closure

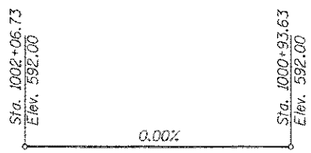
Salvage: None

Construction Sequence: For Sequence and Details, See UPRR Bridge (SN 084-9954)

Railroad utilities may exist within NSRR right-of-way. Prior to the start of any construction or excavation, utility relocations will have to be coordinated with the NSRR.



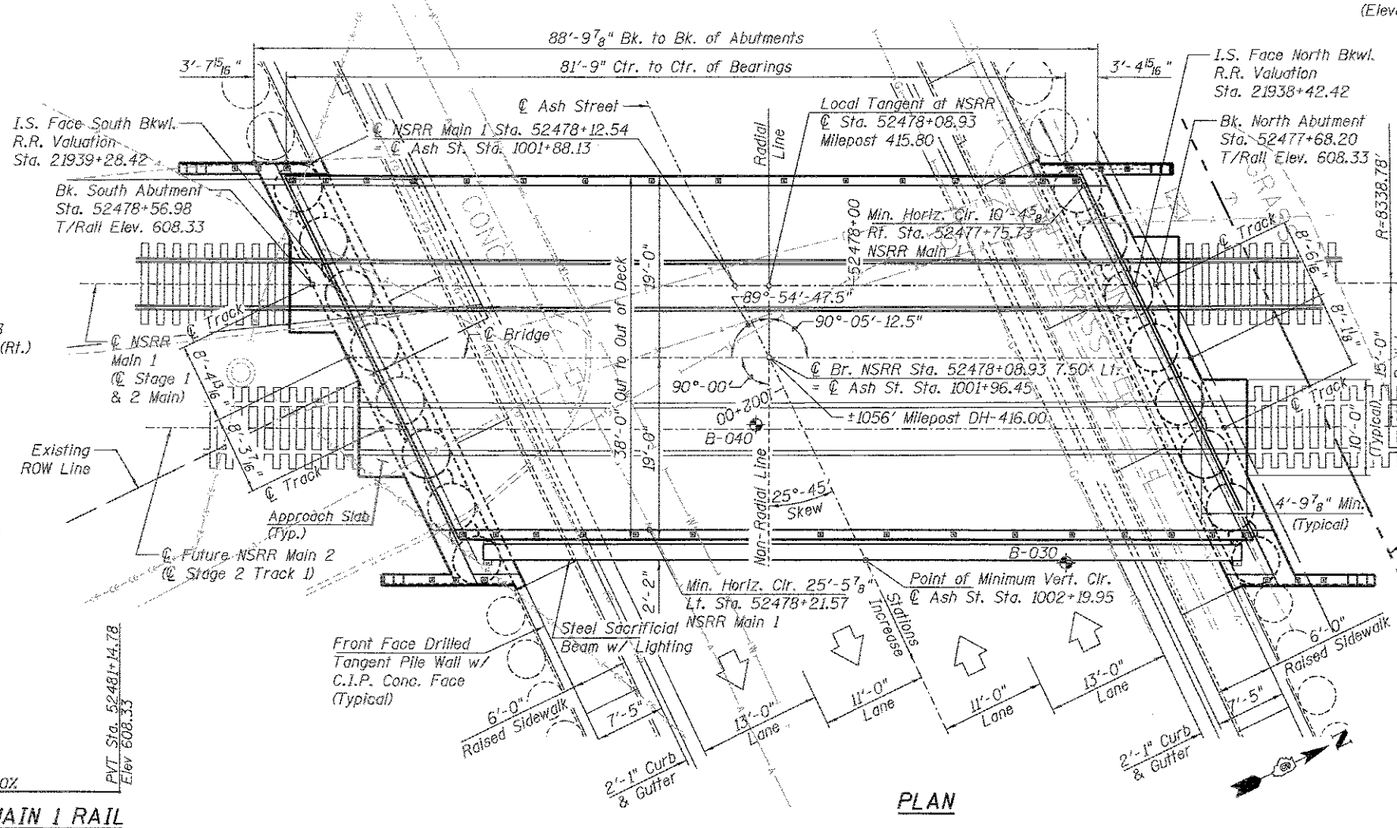
ELEVATION
(Looking Northwest)



P.G.L. SOUTH SIDEWALK
(Along Face of Tangent Pile Wall)

P.G.L. NORTH SIDEWALK
(Along Face of Tangent Pile Wall)

PROFILE GRADE CONCRETE DECK
(Looking Northwest)
(Elevations Taken along Bridge ℄)



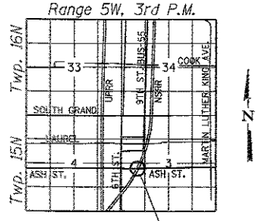
PLAN

Indicates Boring Location

CURVE DATA
(NSRR Main 1)

P.I. Sta. = 52472+27.28
Δ = 37°-24'-51" (Rt.)
D = 00°-41'-14"
T = 2823.67'
L = 5445.19'
R = 8338.78'
E = 465.10'
Long Chord = 5348.99'
Mid. Ord. = 440.53'
S.E. = 1"
S.C. Sta. = 52444+03.61
C.S. Sta. = 52498+48.80

P.G. NSRR MAIN 1 RAIL
(Along Top of Rail)



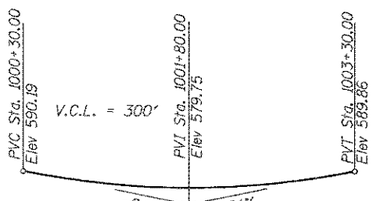
LOCATION SKETCH

LOADING COOPER E-80
Impact: Diesel Impact
Allow 6" of Future Ballast Dead Load

DESIGN SPECIFICATIONS
2013 AREMA Specifications
Live Load Deflection: L/640
Composite Design for Deflection Requirements
Design Speed: 50 m.p.h.

DESIGN STRESSES
FIELD UNITS
f'c = 4,000 psi
fy = 60,000 psi (Reinforcement)
fy = 50,000 psi (ASTM A709 Grade 50)

SEISMIC DATA
AREMA
Coefficient of Horiz. Acceleration, 100 Year (A_{100}) = < 0.04g
Coefficient of Horiz. Acceleration, 475 Year (A_{475}) = < 0.04g
Coefficient of Horiz. Acceleration, 2400 Year (A_{2400}) = 0.095g
Soil Site Coefficient (S) = 1.0



PROFILE GRADE - ASH ST.
Along ℄ of Ash Street

LICENSED STRUCTURAL ENGINEER
MICHAEL N. MENDENHALL
081-006657
STATE OF ILLINOIS

Michael N. Mendenhall
SIGNATURE
02-27-2017
DATE
LIC. EXP. DATE: 11-30-2018

I certify that to the best of my knowledge, information and belief, this bridge design is structurally adequate for the design loading shown on the plans. The design is an economical one for the style of structure and complies with requirements of the current AREMA Specifications.

GENERAL PLAN & ELEVATION
NSRR (MP DH-415.80) over ASH STREET
F.A.U. 7992 - SECTION 14-00477-00-BR
SANGAMON COUNTY
STATION 52478+08.93
STRUCTURE NO. 084-9955

DESIGNED	MNM	6/17/14
DRAWN	RAH	6/1/14
REVIEWED	JGT	10/11/2016

FINAL

pw:\\spr-pw306.hanson.dom:Hanson Projects\Documents\09Jobs\09L0179B\CAD\Struct\Ash-12th\Sheets\084-9955-XXXXX-001-GPE.dgn

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PLOT DATE = 2/27/2017

DESIGNED - MNM
CHECKED - JGT
DRAWN - RAH
CHECKED - MNM
REVISED -

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STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

GENERAL PLAN AND ELEVATION
STRUCTURE NO. 084-9955
SHEET NO. 1 OF 17 SHEETS

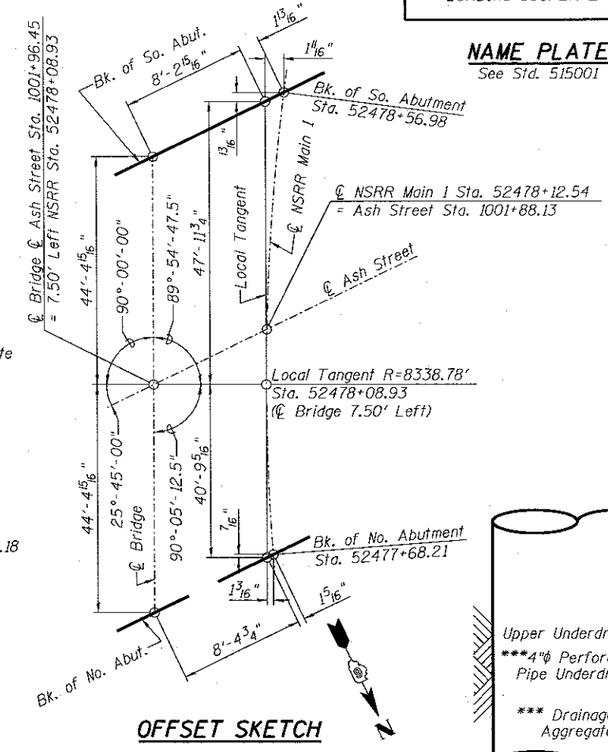
F.A.U. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
	14-00477-00-BR	SANGAMON	403	231
		CONTRACT NO. 93704		
		ILLINOIS FED. AID PROJECT		

GENERAL NOTES

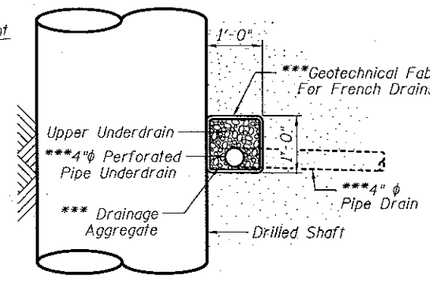
1. Fasteners shall be ASTM A325 Type 1, mechanically galvanized bolts. Bolts $\frac{7}{8}$ in. ϕ, holes $\frac{15}{16}$ in. ϕ, unless otherwise noted.
2. Calculated weight of Structural Steel, ASTM A709, Gr. 50 = 512,740 lbs.
   ASTM A36, Gr. 36 = 2,200 lbs.
   ASTM A500, Gr. B (46 ksi) = 20,420 lbs.
   ASTM A240, Type 304 (30 ksi) = 2,540 lbs.
3. All structural steel shall be ASTM A709 Grade 50 unless otherwise noted on the plans.
4. Stainless steel plate for the deck joints shall be according to ASTM A240, Type 304, Fy=30 k.s.i.
5. All substructure concrete shall have a compressive strength of 4,000 psi at 28 days.
6. No field welding is permitted except as specified in the contract documents.
7. Reinforcement bars designated (E) shall be epoxy coated.
8. If the Contractor elects to use cantilever forming brackets on the exterior beams or girders, the brackets shall be placed at the same locations as required for the hardwood blocks in Article 503.06(b) of the Standard Specifications. If additional cantilever forming brackets are required, hardwood blocking shall be wedged between the exterior and first interior beam at each of these additional bracket locations.
9. Protective coat shall not be applied to any surface.
10. Bearing seat surfaces shall be constructed or adjusted to the designated elevations within a tolerance of $\frac{1}{8}$ inch (0.01 ft.). Adjustment shall be made either by grinding the surface or by shimming the bearings.
11. Concrete Sealer shall be applied to the following surfaces:
    Abutments - inside face of backwall, inside face of cheekwall, top of cap, entire concrete facing attached to abutment caps and drilled shafts (except surfaces coated with concrete surface treatment).
    Superstructure - top and outside vertical faces of ballast curb and outside vertical face of deck, concrete railing end post (except surfaces coated with surface color and treatment).
12. Anti-Graffiti Protection System shall be applied to the following surfaces:
    Abutments - concrete facing, wingwall and cheekwall surfaces coated with concrete surface color treatment.
    Superstructure - surfaces coated with concrete surface color treatment.
13. The Inorganic Zinc Rich Primer / Acrylic / Acrylic Paint System shall be used for shop and field painting of new structural steel except where otherwise noted. The color of the final finish coat for all interior steel surfaces and sacrificial beam shall be gray, Munsell No. 5B 7/1. The color of the final finish coat for the exterior and bottom flange of the fascia beams shall be blue, Munsell No. 10B 3/6.
14. All fracture critical members (FCM) shall be fabricated in accordance with the Fracture Control Plan stated in AREMA Specifications, Chapter 15, Section 1.14.
15. Waterproofing shall be applied to the backside of the abutment cap and backwall and backside of wingwalls for surfaces below ground. This shall be according to Article 503.18 of the Std. Spec. Cost included with Concrete Structures.

NORFOLK SOUTHERN RAILROAD
S.N. 084-9955 BUILT 20__ BY
CITY OF SPRINGFIELD
SEC. 14-00477-00-BR
STATION 52478+08.93
MILE POST DH-415.80
LOADING COOPER E-80

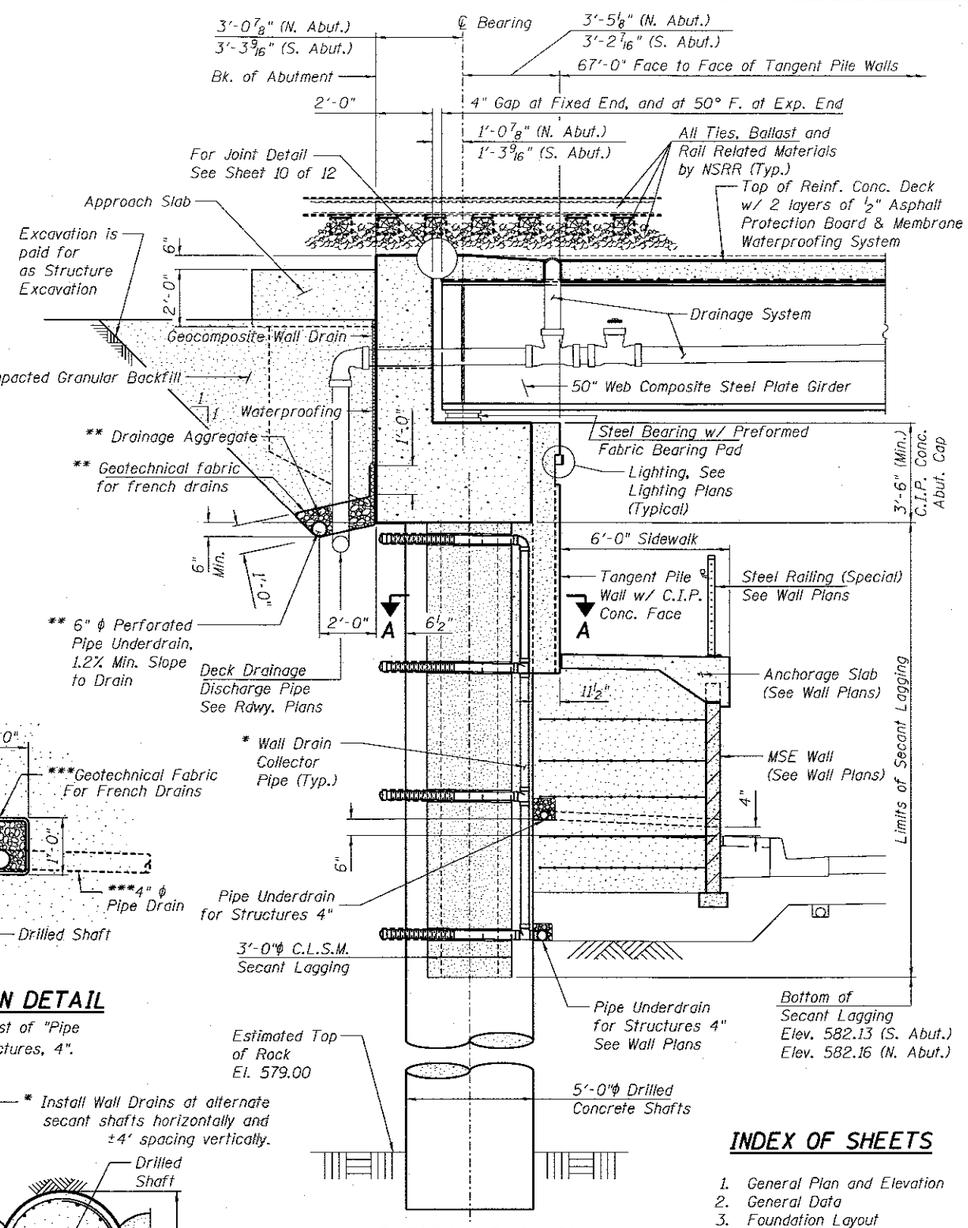
NAME PLATE
See Std. 515001



OFFSET SKETCH



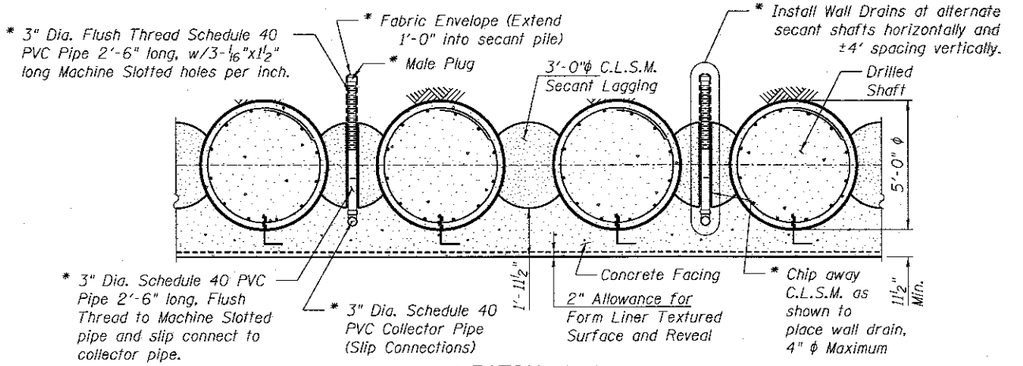
PIPE UNDERDRAIN DETAIL
***Included in the cost of "Pipe Underdrains for Structures, 4".



ABUTMENT SECTION
(At Rt. L's to Back of Abutment)

TOTAL BILL OF MATERIAL

ITEM	UNIT	SUPER	SUB	TOTAL
Structure Excavation	Cu. Yd.	-	439	439
Concrete Structures	Cu. Yd.	-	172.3	172.3
Concrete Superstructure	Cu. Yd.	104.4	-	104.4
Form Liner Textured Surface	Sq. Ft.	-	674	674
Furnishing and Erecting Structural Steel, Bridge No. 2	L. Sum	1	-	1
Stud Shear Connectors	Each	3984	-	3984
Reinforcement Bars	Pound	-	264080	264080
Reinforcement Bars, Epoxy Coated	Pound	25070	20500	45570
Name Plates	Each	-	1	1
Drilled Shaft in Soil	Cu. Yd.	-	207.2	207.2
Drilled Shaft in Rock	Cu. Yd.	-	267.6	267.6
Membrane Waterproofing	Sq. Ft.	3254	-	3254
Concrete Sealer	Sq. Ft.	624	1761	2385
Geocomposite Wall Drain	Sq. Yd.	-	73	73
Conduit Embedded in Structure, 4" dia., PVC	Foot	167	8	175
Anti-Graffiti Protection System	Sq. Ft.	9	194	203
Drainage System, No. 2	Each	1	-	1
Concrete Surface Color Treatment	Sq. Ft.	9	194	203
Floor Drains (Special)	Each	18	-	18
Granular Backfill for Structures	Cu. Yd.	-	150	150
Steel Railing (Special)	Foot	204	-	204
Pipe Underdrains for Structures, 4"	Foot	-	111	111
Pipe Underdrains for Structures, 6"	Foot	-	111	111
Secant Lagging	Cu. Ft.	-	1451	1451



SECTION A-A
* Included in the cost of "Pipe Underdrains for Structures, 4".

INDEX OF SHEETS

Notes:
South Abutment Section Shown North Similar (No Deck Drainage Discharge Pipe at N. Abut.)

** Included in the cost of "Pipe Underdrains for Structures, 6". For additional drainage details see Roadway Plans.

FINAL

	MNM	6/11/14
DESIGNED	DAP	6/1/14
DRAWN	JGT	10/11/2016
REVIEWED		

pw:\\spi-svr386.hanson.dom:Hanson Projects\Documents\89Jobs\89L81798\CAD\Struct\Ash-18th\Sheet\084-9955-XXXXX-002-General Data.dgn

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PLOT DATE = 5/25/2017

DESIGNED - MNM
CHECKED - JGT
DRAWN - DAP
CHECKED - MNM

REVISED -
REVISED -
REVISED -
REVISED -

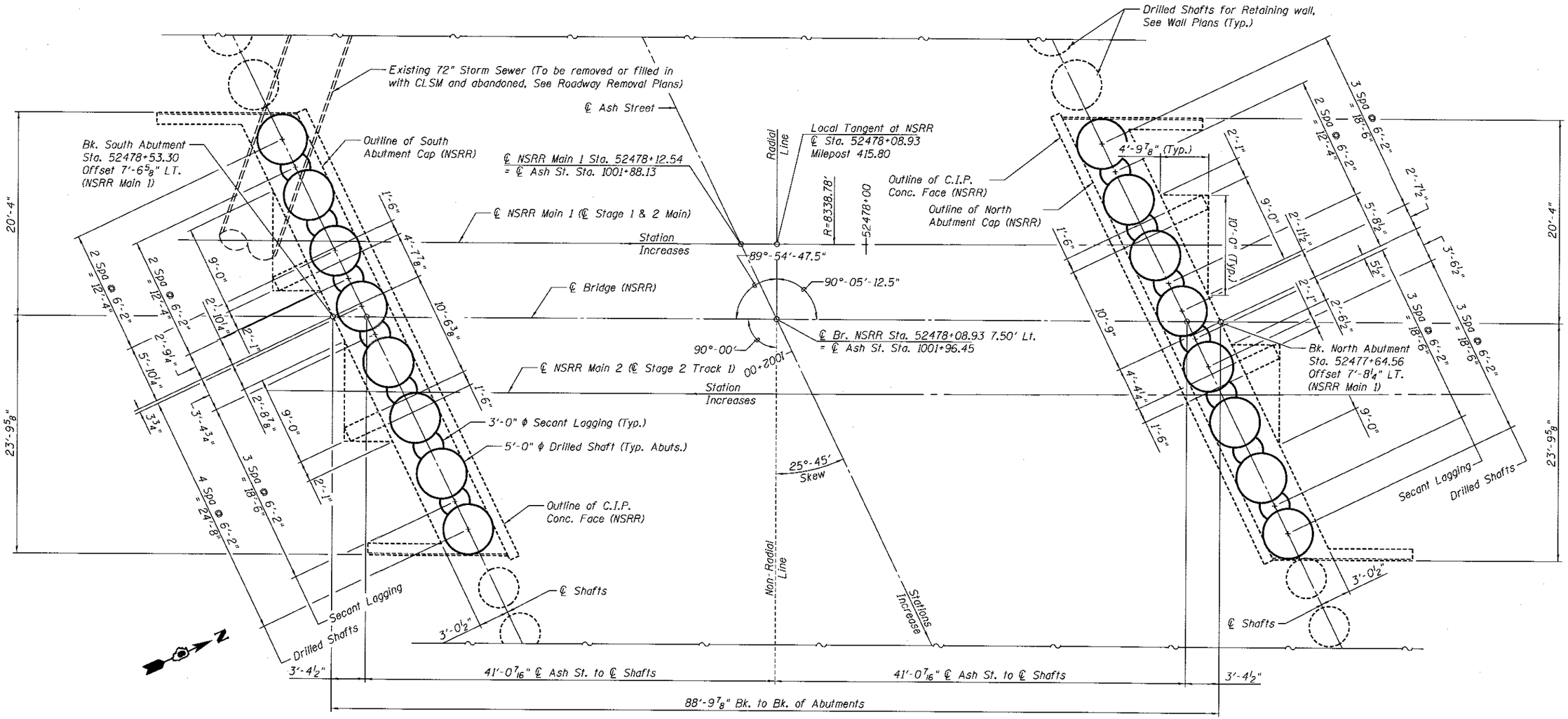
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

GENERAL DATA
STRUCTURE NO. 084-9955
SHEET NO. 2 OF 17 SHEETS

F.A.U. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
	14-00477-00-BR	SANGAMON	403	232
		CONTRACT NO. 93704		
	ILLINOIS FED. AID PROJECT			

Notes:
See Roadway Plans for existing utilities and topography.

Drilling through the existing 72"ϕ S.S. shall be included in the cost of Drilled Shaft in Soil and Secant Lagging.



FOUNDATION LAYOUT PLAN

FINAL

DESIGNED	MNM	6/17/14
DRAWN	DAP	6/1/14
REVIEWED	JGT	10/11/2016

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	CHECKED - JGT	REVISED -	
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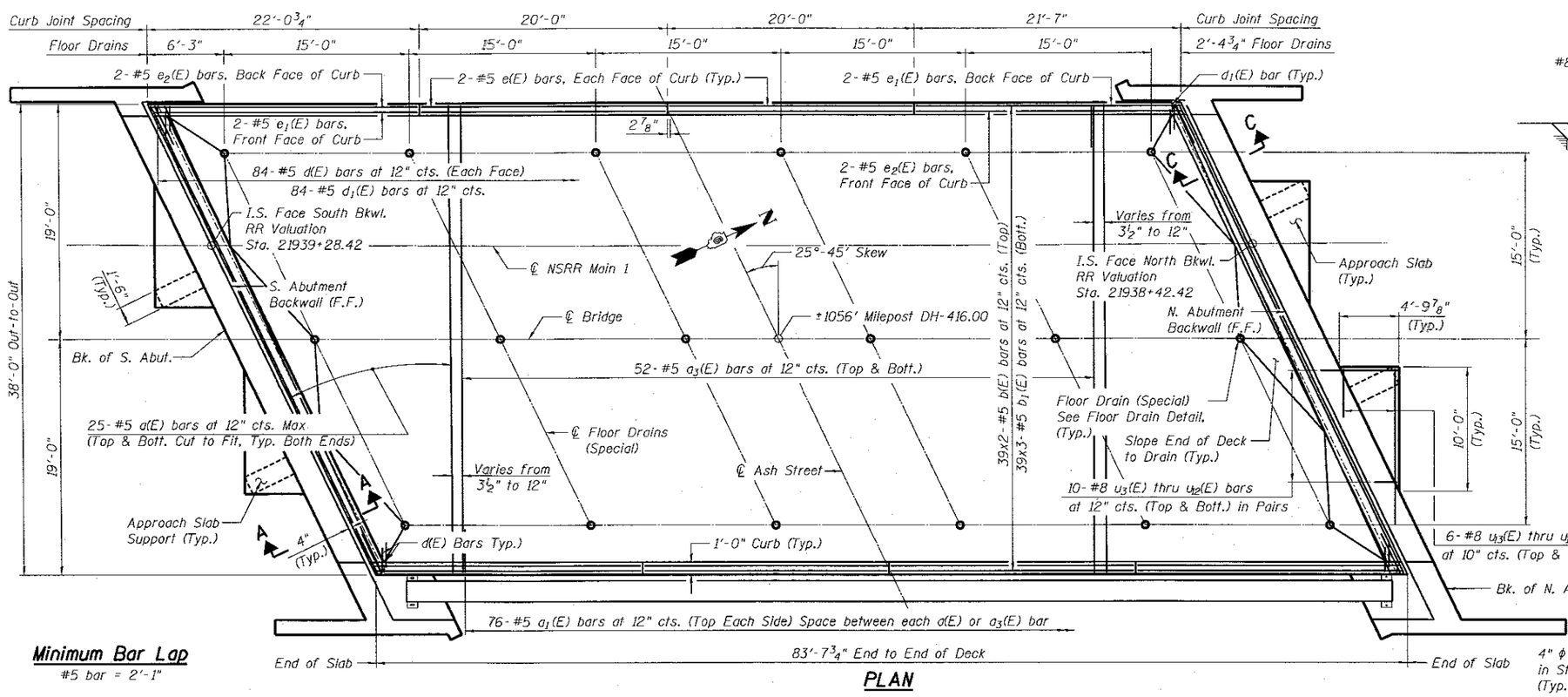
PLOT DATE = 2/24/2017	CHECKED - MNM	REVISED -	

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

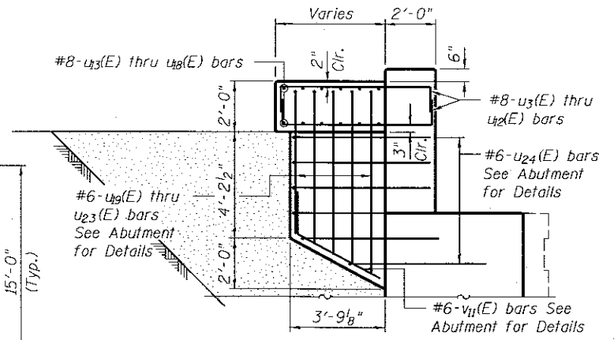
FOUNDATION LAYOUT
STRUCTURE NO. 084-9955
SHEET NO. 3 OF 17 SHEETS

F.A.U. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
	14-00477-00-BR	SANGAMON	403	233
		CONTRACT NO. 93704		
	ILLINOIS FED. AID PROJECT			



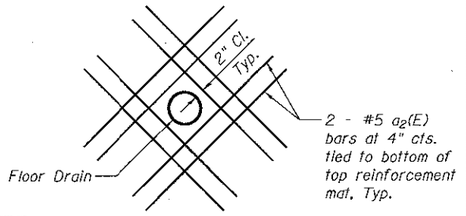
PLAN

Minimum Bar Lap
#5 bar = 2'-1"

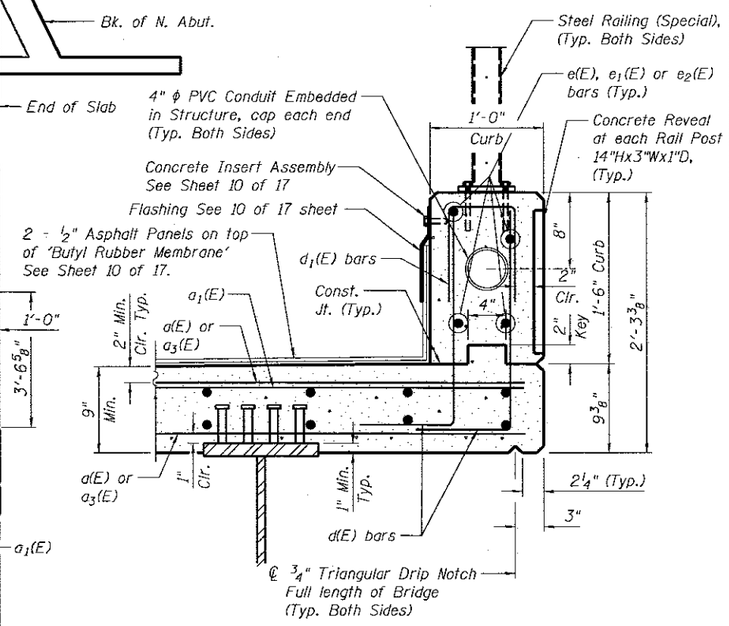


APPROACH SLAB SECTION

(Horizontal Dimensions at Rt. ℄'s to back of abutment)



FLOOR DRAIN DETAIL



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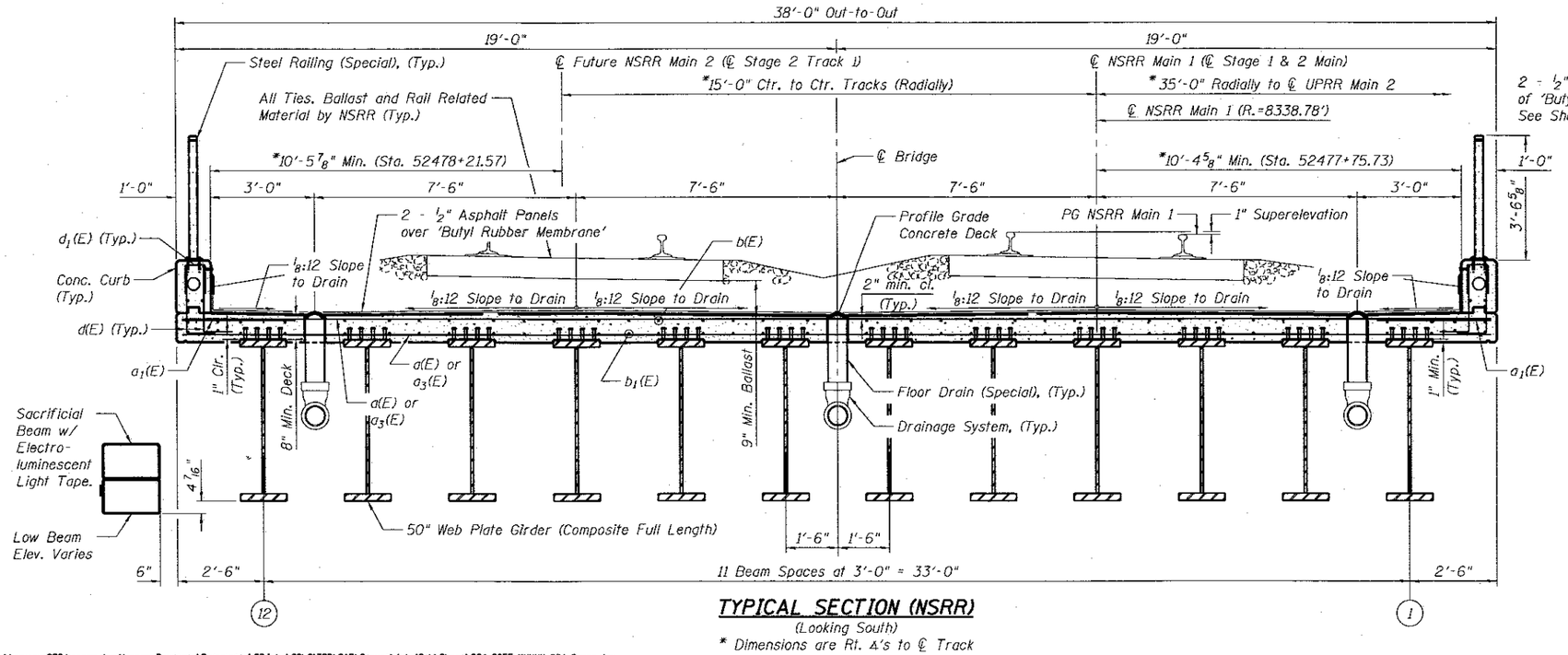

TYPICAL SECTION (NSRR)

(Looking South)
* Dimensions are Rt. A's to ℄ Track

Notes:
1. For Steel Railing Details See Sheet 12 of 17.
2. For Membrane Waterproofing Details See Sheet 10 of 17.
3. Shift bars to miss floor drains, do not cut.
4. Bars indicated thus 39x2-#5 etc. indicates 39 lines of bars with 2 lengths per line.
5. For Concrete Deck End Dam Details at Joints, Joint Details, Sections A-A and C-C. See Sheet 10 of 17.
6. Approach Slab concrete shall be paid for as Concrete Superstructure.

FINAL

DESIGNED	MNM	6/17/14
DRAWN	DAP	6/1/14
REVIEWED	JGT	10/11/2016

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STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

SUPERSTRUCTURE
STRUCTURE NO. 084-9955
SHEET NO. 4 OF 17 SHEETS

F.A.U. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
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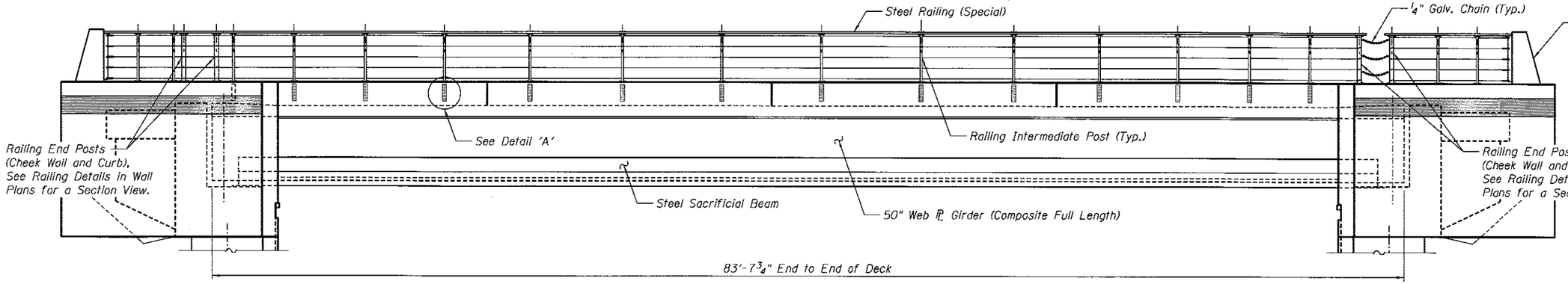
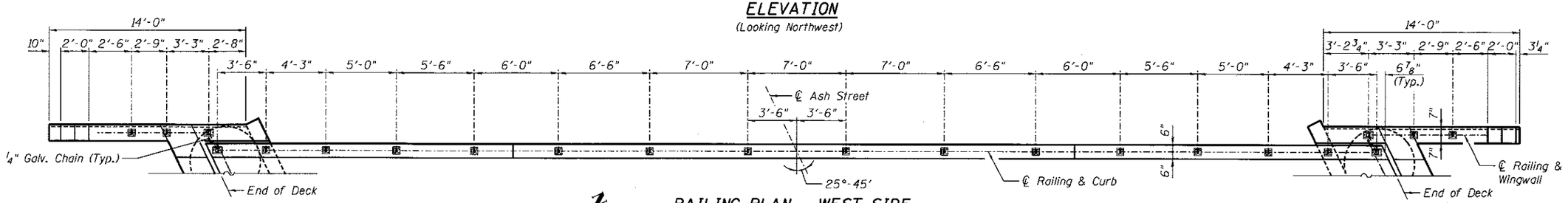
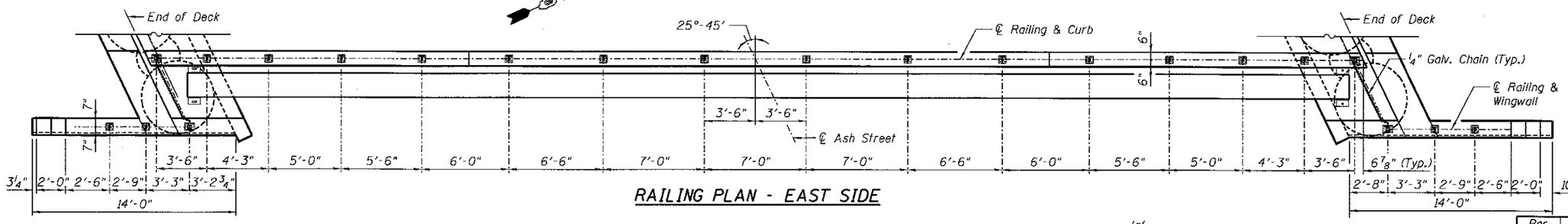
		CONTRACT NO. 93704		
		ILLINOIS FED. AID PROJECT		



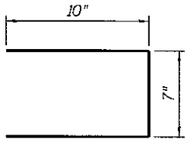
ELEVATION
(Looking Northwest)



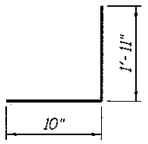
RAILING PLAN - WEST SIDE



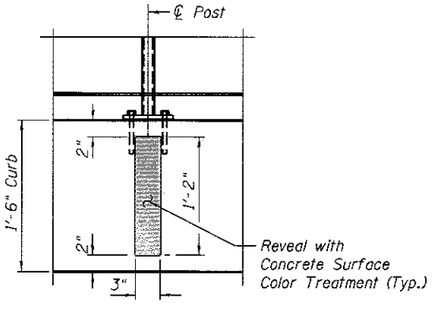
RAILING PLAN - EAST SIDE



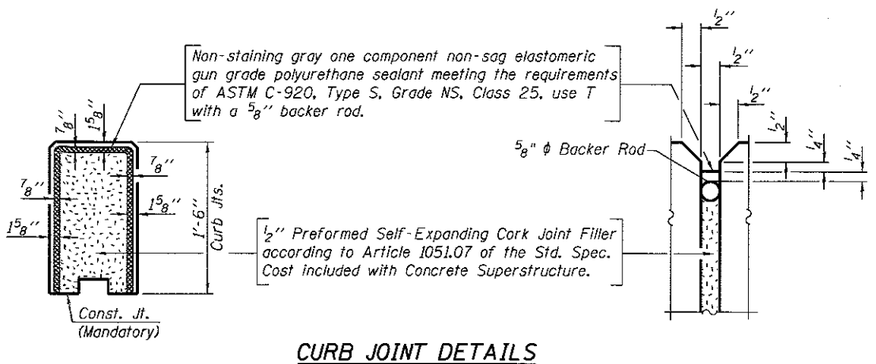
BAR d_1(E)



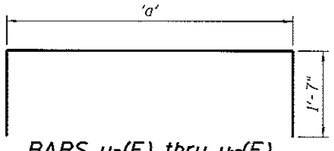
BAR d(E)



DETAIL 'A'



CURB JOINT DETAILS



BARS u_3(E) thru u_{18}(E)

Bar	'a'
u_3(E)	6'-1"
u_4(E)	5'-7"
u_5(E)	5'-2"
u_6(E)	4'-8"
u_7(E)	4'-2"
u_8(E)	3'-8"
u_9(E)	3'-2"
u_{10}(E)	2'-9"
u_{11}(E)	2'-3"
u_{12}(E)	1'-9"
u_{13}(E)	3'-10"
u_{14}(E)	5'-6"
u_{15}(E)	7'-3"
u_{16}(E)	9'-0"
u_{17}(E)	10'-9"
u_{18}(E)	12'-5"

SUPERSTRUCTURE BILL OF MATERIAL

Bar	No.	Size	Length	Shape
a(E)	100	*5	41'-10"	
a_1(E)	152	*5	3'-6"	
a_2(E)	144	*5	2'-6"	
a_3(E)	104	*5	37'-8"	
b(E)	78	*5	42'-9"	
b_1(E)	117	*5	29'-3"	
u_3(E)	8	*8	9'-3"	
u_4(E)	8	*8	8'-9"	
u_5(E)	8	*8	8'-4"	
u_6(E)	8	*8	7'-10"	
u_7(E)	8	*8	7'-4"	
u_8(E)	8	*8	6'-10"	
u_9(E)	8	*8	6'-4"	
u_{10}(E)	8	*8	5'-11"	
u_{11}(E)	8	*8	5'-5"	
u_{12}(E)	8	*8	4'-11"	
u_{13}(E)	8	*8	7'-0"	
u_{14}(E)	8	*8	8'-8"	
u_{15}(E)	8	*8	10'-5"	
u_{16}(E)	8	*8	12'-2"	
u_{17}(E)	8	*8	13'-11"	
u_{18}(E)	8	*8	15'-7"	
d(E)	336	*5	2'-9"	
d_1(E)	168	*5	2'-3"	
e(E)	16	*5	19'-8"	
e_1(E)	8	*5	21'-4"	
e_2(E)	8	*5	21'-8"	
Reinforcement Bars, Epoxy Coated			Pound	25070
Concrete Superstructure			Cu. Yds.	104.4
Conduit Embedded in Structure, 4" dia., PVC			Foot	167
Floor Drains (Special)			Each	18
Concrete Surface Color Treatment			Sq. Ft.	9

Note: For steel railing details see sheet 12 of 17. For concrete railing end post details see sheets 14 & 16 of 17. For 1/4" Galv. Chain details, see retaining wall plans. Cost of chain and hardware shall be included in the cost of Steel Railing (Special).

DESIGNED	DAP	6/17/14
DRAWN	MNM	6/1/14
REVIEWED	JGT	10/11/2016

FINAL

pw:\\spi-svr306.hanson.dom:Hanson Projects\Documents\09Jobs\09L0179S\CAD\Struct\Ash-10th\Sheet\084-9955-XXXXX-005-Super Det.dgn

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	PLOT DATE = 2/24/2017	CHECKED - MNM	REVISED -

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STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

SUPERSTRUCTURE DETAILS
STRUCTURE NO. 084-9955
SHEET NO. 5 OF 17 SHEETS

F.A.U. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
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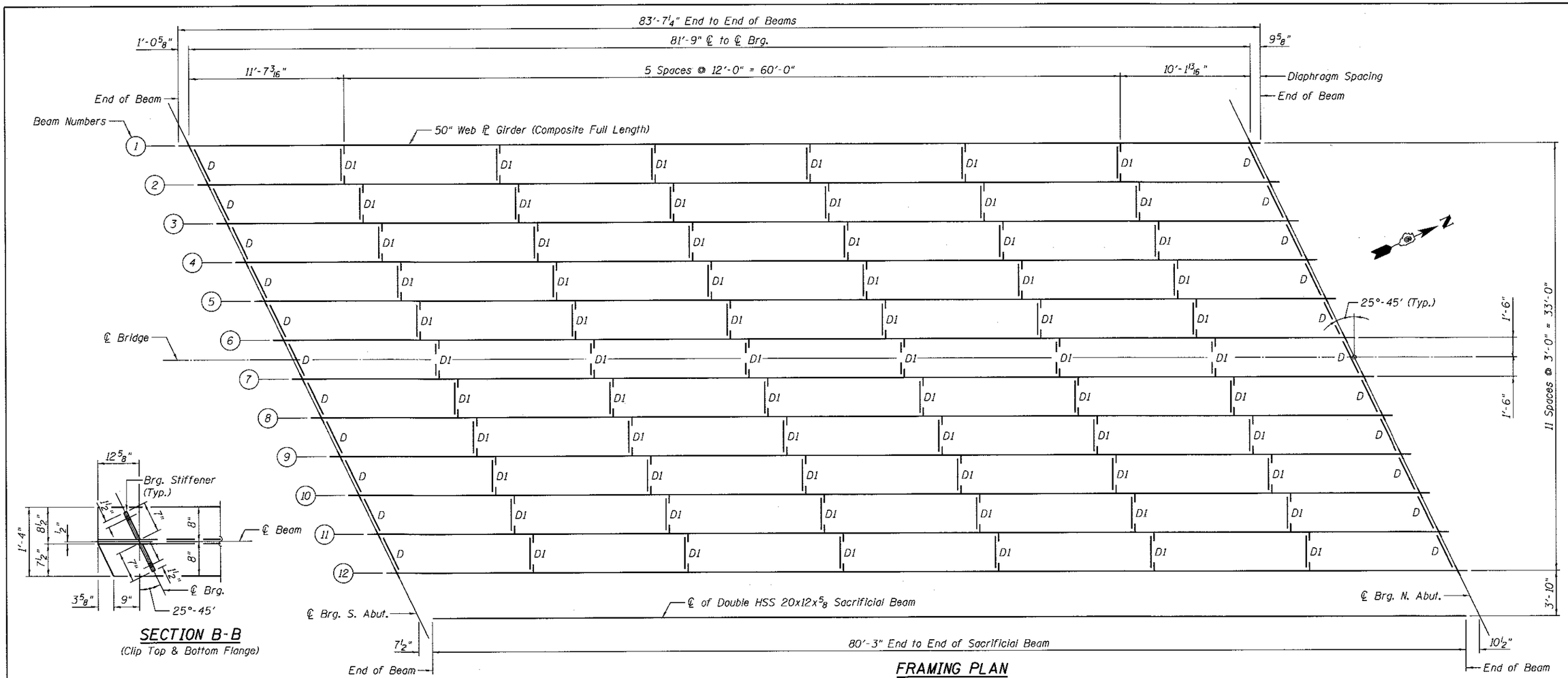
		CONTRACT NO. 93704		
		ILLINOIS FED. AID PROJECT		



Notes:

All diaphragms shall be installed as steel is erected and secured with erection pins and bolts except as otherwise noted. Individual cross frames or diaphragms at supports may be temporarily disconnected to install bearing anchor rods.

Load carrying components designated "FCM" shall conform to the Impact Testing Requirement, Zone 2.

Floor Drains shall be located clear of all diaphragms.

For Section A-A, See Sheet 7 of 17.

FINAL		
DESIGNED	MNM	6/17/14
DRAWN	DAP	6/1/14
REVIEWED	JGT	10/11/2016

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HANSON		CHECKED - JGT	REVISED -
© Copyright Hanson Professional Services Inc. 2017	PLOT SCALE = 0.999996 '/ in.	DRAWN - DAP	REVISED -
	PLOT DATE = 2/24/2017	CHECKED - MNM	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

STRUCTURAL STEEL
STRUCTURE NO. 084-9955
SHEET NO. 6 OF 17 SHEETS

F.A.U. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
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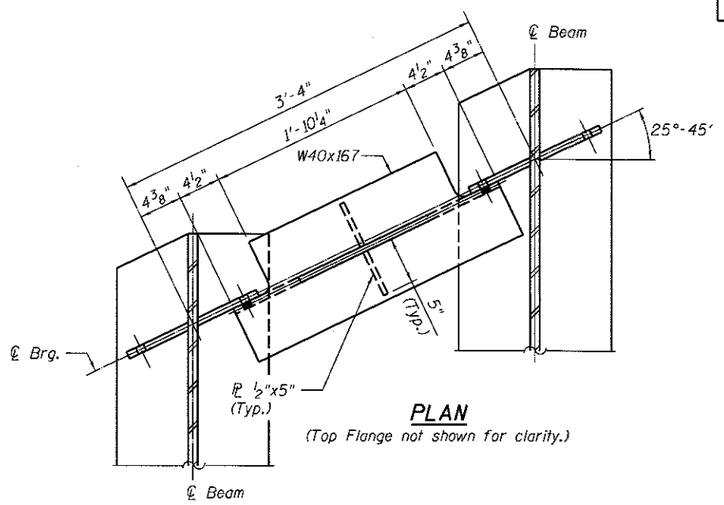
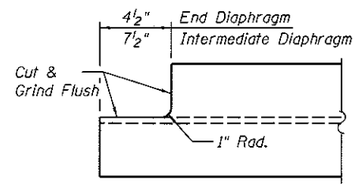
		CONTRACT NO. 93704		
	ILLINOIS FED. AID PROJECT			



PLAN

(Top Flange not shown for clarity.)



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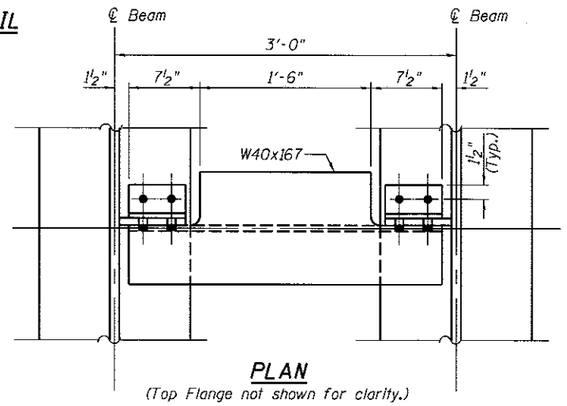


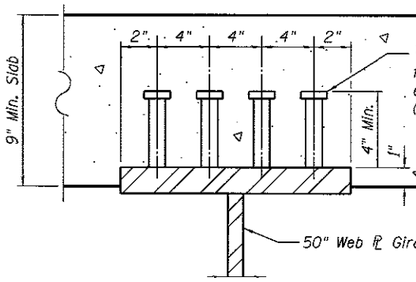
PLAN

(Top Flange not shown for clarity.)

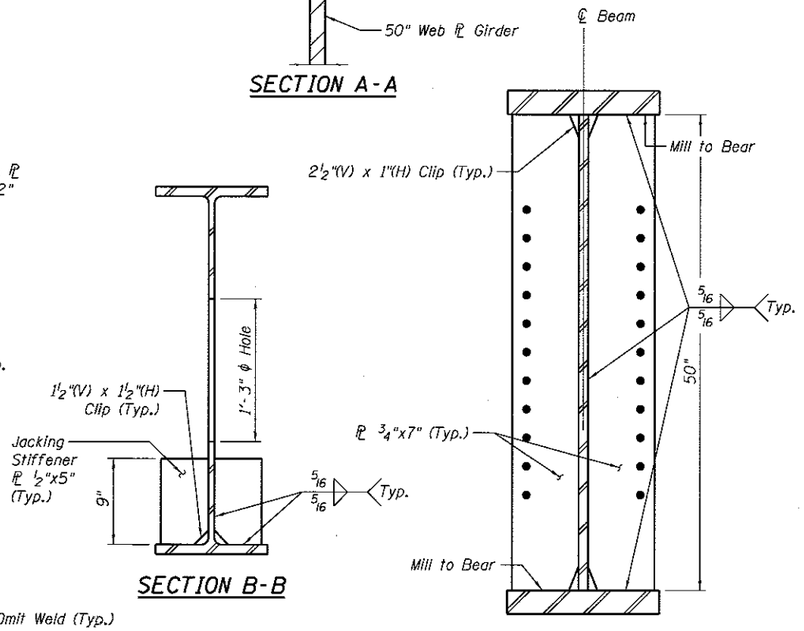
MOMENT & SHEAR TABLE FOR INTERIOR BEAMS

DESCRIPTION	MAX MOMENT	MAX SHEAR
Dead Load	1,380.3 ft.-k	67.3 k
Live Load	2,261.5 ft.-k	126.8 k
Centrifugal Force	21.0 ft.-k	1.0 k
Impact	717.1 ft.-k	40.2 k
Total	4,379.9 ft.-k	235.3 k
Section	50" PG	
Steel	ASTM A709, GR 50, FCM ZONE 2	
Net I	58,617 in^4	
Net S (Bott.)	1,988 in^3	
FST (Bott.)	26.44 ksi	
Gross I	65,583 in^4	
Gross S (Top)	2,385 in^3	
FSC (Top)	22.0 ksi	
(LL+I) Deflection	1.34 in	
Allowable (LL+I) Deflection	1.54 in	

I - Non-composite moment of inertia of the steel section
S - Non-composite section modulus of the steel section
FST - Max unfactored tension stress in the steel section due to DL+LL+CF+Impact
FSC - Max unfactored compression stress in the steel section due to DL+LL+CF+Impact

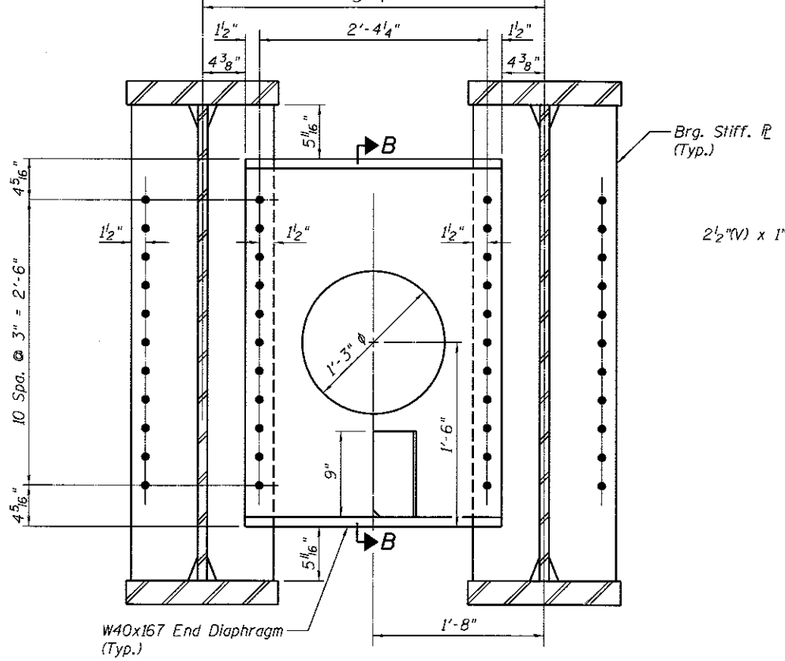


SECTION A-A



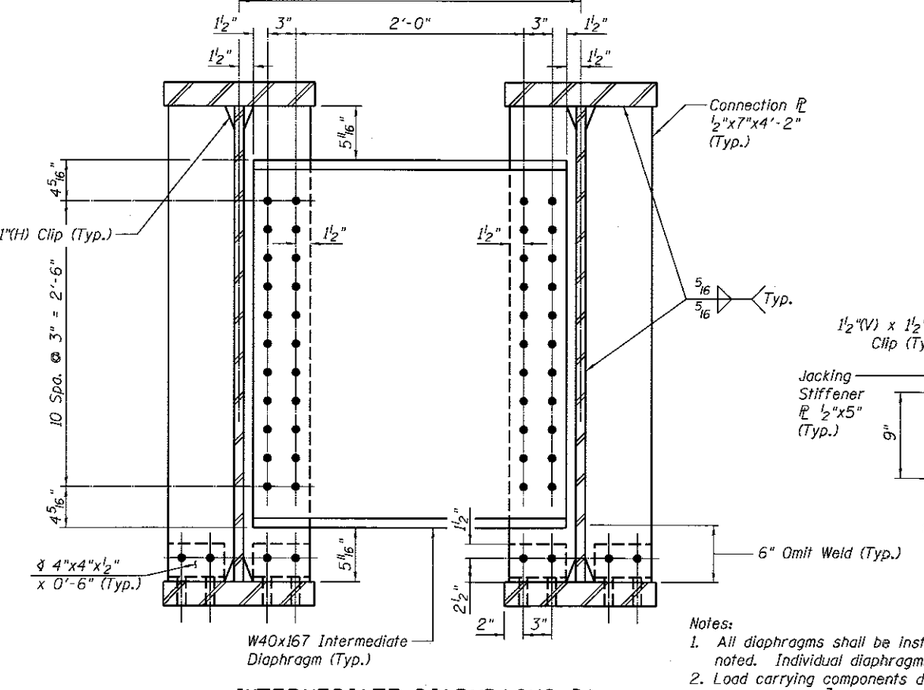
SECTION B-B

BEARING STIFFENER DETAIL



END DIAPHRAGMS-D

(Dimensions along ℄ of Bearing unless otherwise noted)



INTERMEDIATE DIAPHRAGMS-DI

Notes:
1. All diaphragms shall be installed as steel is erected and secured with erection pins and bolts except as otherwise noted. Individual diaphragms at supports may be temporarily disconnected to install bearing anchor rods.
2. Load carrying components designated "FCM" shall conform to the Impact Testing Requirement, Zone 2.
3. Bolts shall be ⅞" ϕ placed in 15/16" ϕ holes unless otherwise noted.
4. Steel shall conform to ASTM A709 Gr. 50 unless otherwise noted.
5. See sheet 11 of 17 for holes in interior diaphragms for drainage system.

DESIGNED	MNM	6/17/14
DRAWN	DAP	6/1/14
REVIEWED	JGT	10/11/2016

FINAL

pw:\\spi-swr386.hanson.dom:Hanson Projects\Documents\89Jobs\89L01798\CAD\Struct\Ash-18th\Sheet\084-9955-XXXXX-007-Struct Steel Detdgn

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	PLOT DATE = 2/24/2017	CHECKED - MNM	REVISED -

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STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

STRUCTURAL STEEL DETAILS
STRUCTURE NO. 084-9955
SHEET NO. 7 OF 17 SHEETS

F.A.U. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
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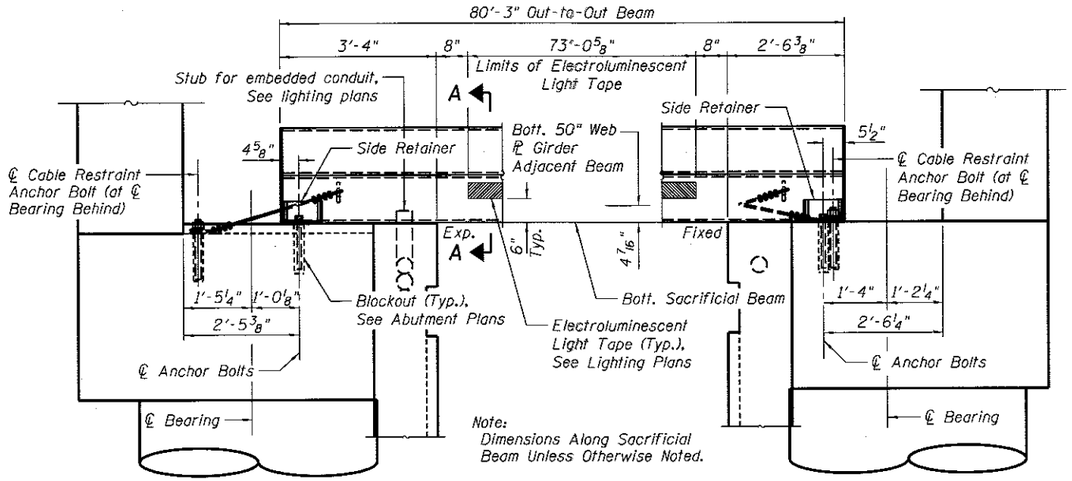
		CONTRACT NO. 93704		
		ILLINOIS FED. AID PROJECT		

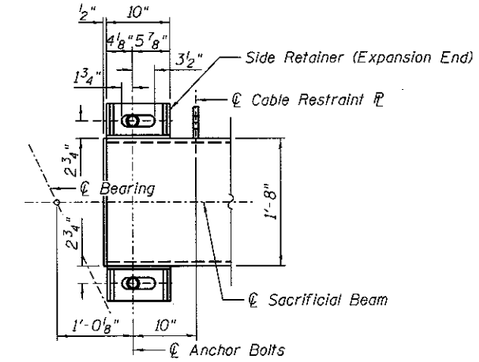


ELEVATION - SOUTH ABUTMENT

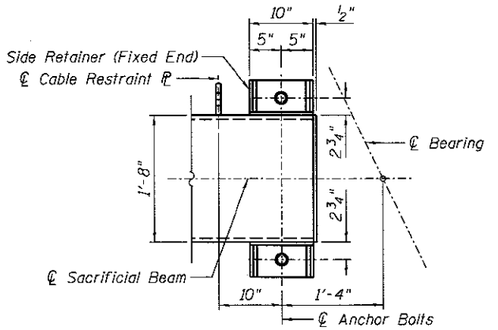
Cheek Wall Not Shown for Clarity.
(Looking West)

ELEVATION - NORTH ABUTMENT

Cheek Wall Not Shown for Clarity.
(Looking West)



DETAIL - SOUTH ABUTMENT



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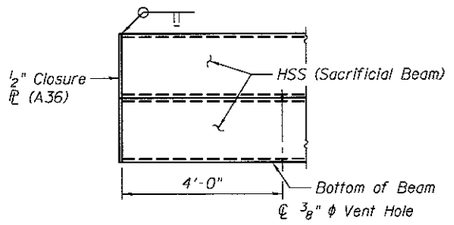
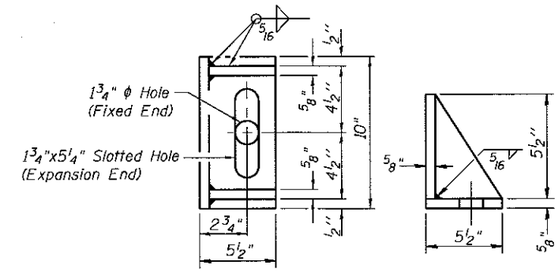
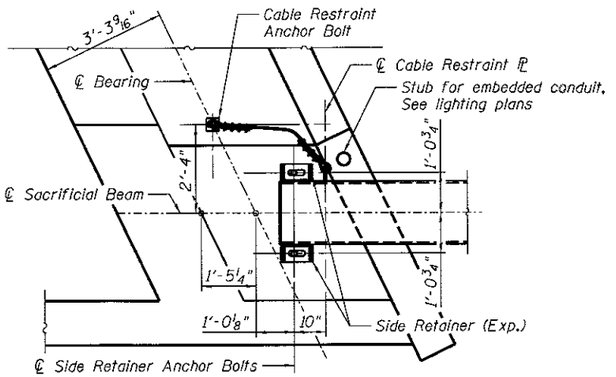


CLOSURE PLATE DETAIL

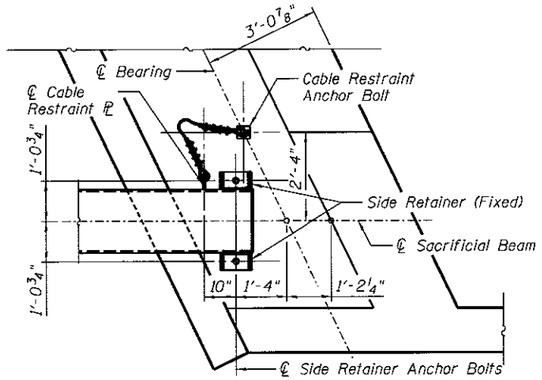


SIDE RETAINER

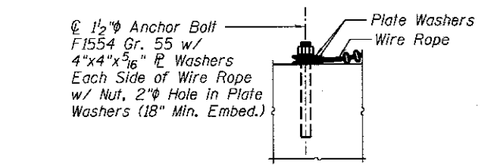
Equivalent rolled angle with stiffeners will be allowed in lieu of welded plates.



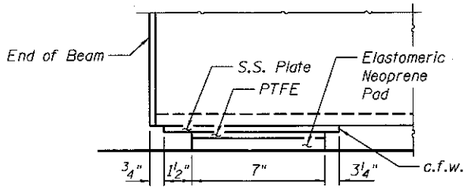
PLAN - SOUTH ABUTMENT



PLAN - NORTH ABUTMENT

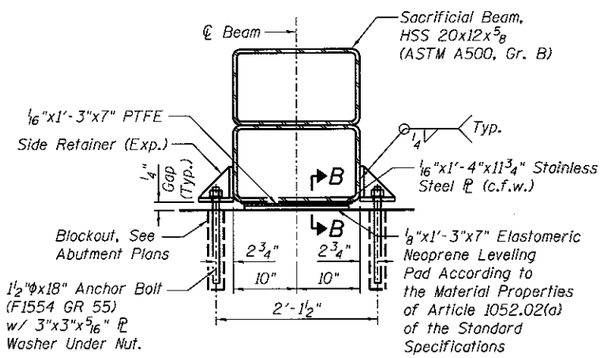


CABLE RESTRAINT ANCHOR BOLT DETAIL

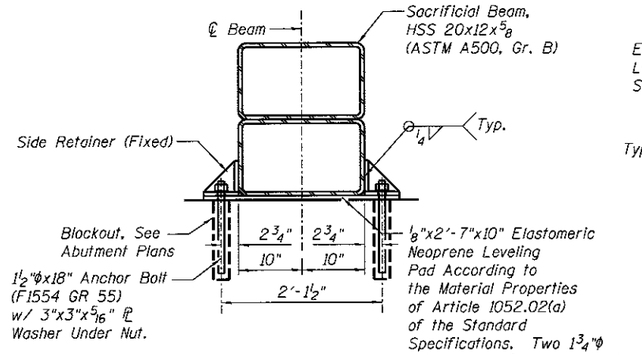


SECTION B-B

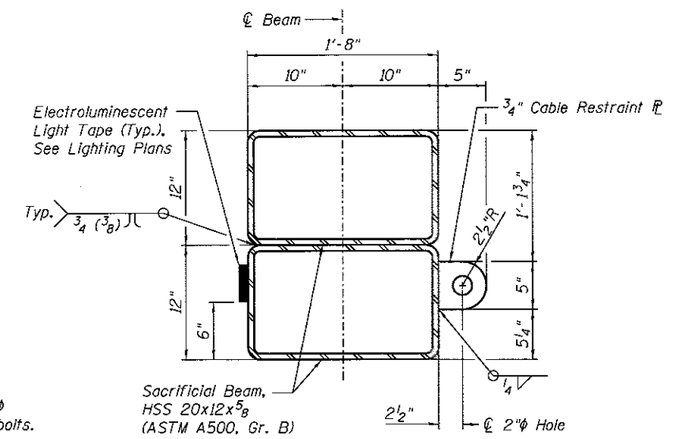
(Expansion End)



TYPICAL SECTION AT EXPANSION END



TYPICAL SECTION AT FIXED END



SECTION A-A

Notes:

3/4" wire rope shall be according to AASHTO M30, Type II, Class A coating, EIPS. Use 1 wire rope thimble and 4 wire rope clips per end according to the manufacturer's recommendation.

Cost for elastomeric neoprene and elastomeric neoprene leveling pad w/ PTFE surface, wire rope and accessories shall be included in the cost of "Furnishing and Erecting Structural Steel, Bridge No. 2".

Anchor bolts shall be ASTM F1554 all-thread (or an Engineer-approved alternate material) of the grade(s) and diameter(s) specified. The corresponding specified grade of AASHTO M314 anchor bolts may be used in lieu of ASTM F1554.

Anchor bolts shall be installed in blockouts with Non-Shrink Grout meeting the material requirements of Article 1024.02 of the Standard Specifications.

Blockouts shall be clean prior to grouting and grout installed according to manufactures recommendations.

The PTFE shall be bonded directly to the leveling pad according to the manufacturers recommendations.

FINAL		
DESIGNED	MNM	6/17/14
DRAWN	DAP	6/1/14
REVIEWED	JGT	10/11/2016

pw:\\spi-svr-386.hanson.dom:Hanson Projects\Documents\09Jobs\89L0179B\CAD\Struct\Ash-18th\Sheet\084-9955-XXXXX-088-Sacrificial Beam Det.dgn

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	PLOT DATE = 2/24/2017	CHECKED - MNM	REVISED -

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STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

SACRIFICIAL BEAM DETAILS
STRUCTURE NO. 084-9955
SHEET NO. 8 OF 17 SHEETS

F.A.U. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
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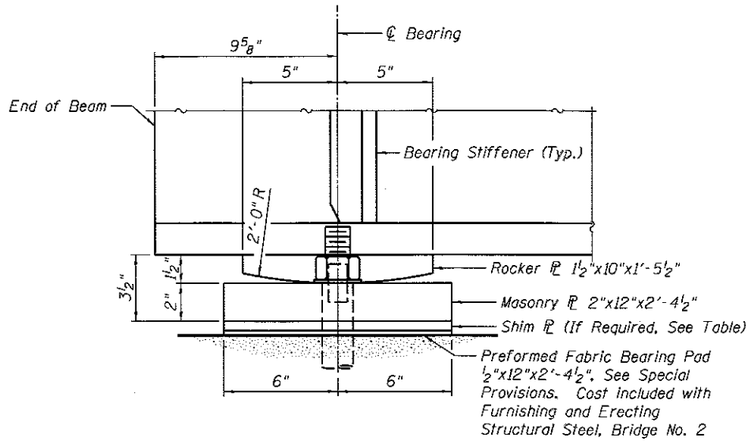
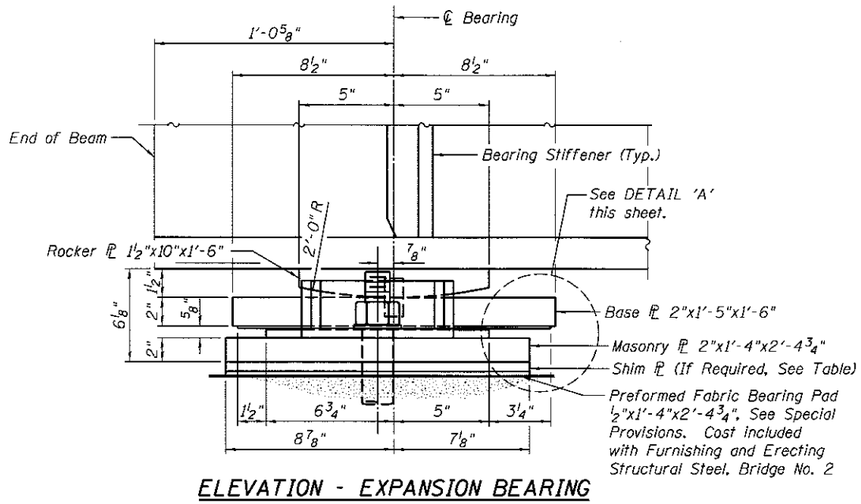
		CONTRACT NO. 93704		
	ILLINOIS FED. AID PROJECT			



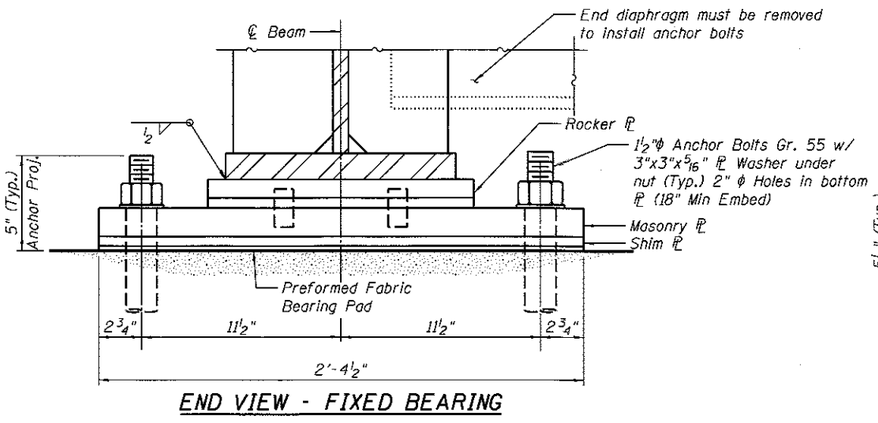
ELEVATION - FIXED BEARING



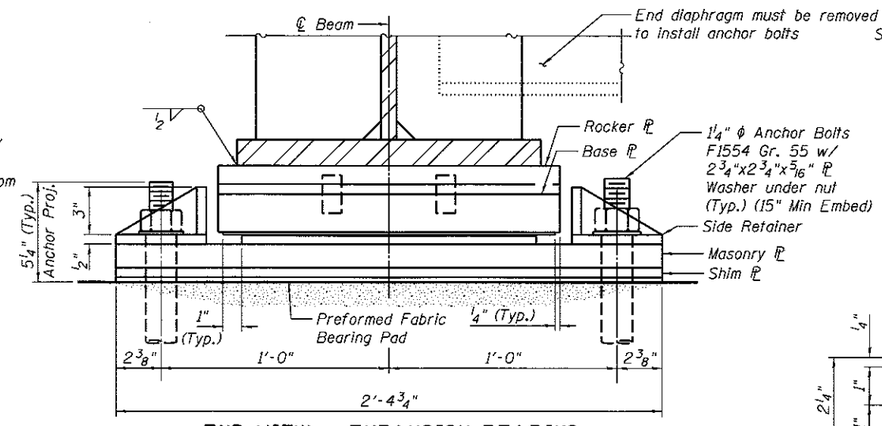
ELEVATION - EXPANSION BEARING

Notes:

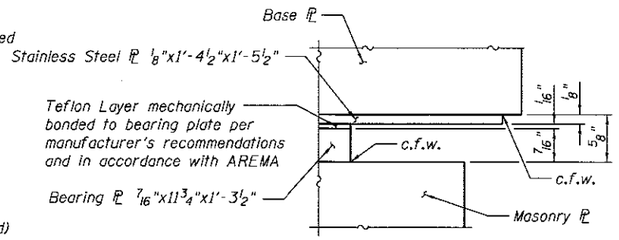
1. The structural steel plates of the Bearing Assembly shall conform to the requirements of ASTM A709, Grade 50.
2. Teflon Layer shall be composed of virgin unfilled TFE resin, unfilled TFE sheets, or unfilled TFE fabric. Filler material, such as milled glass fibers, will not be allowed. Teflon layer shall conform to the requirements of AREMA Chapter 15.
3. The bearing assembly shall be according to Section 521 of the Standard Specifications where applicable. The bearing assembly and anchor bolts will not be paid for separately but included in the weight of Structural Steel for payment as "Furnishing and Erecting Structural Steel, Bridge No. 2".
4. Anchor bolts shall be ASTM F1554 all-thread (or an Engineer-approved alternate material) of the grade(s) and diameter(s) specified. The corresponding specified grade of AASHTO M314 anchor bolts may be used in lieu of ASTM F1554.
5. Anchor bolts shall be installed in blockouts with Non-Shrink Grout meeting the material requirements of Article 1024.02 of the Standard Specifications. Blockouts shall be clean prior to grouting and grout installed according to manufactures recommendations. Cost for non-shrink grout shall be included in the cost of Concrete Structures.
6. Two 1/8" adjusting shims shall be provided for each bearing assembly in addition to all other plates or shims and placed as shown on bearing details.



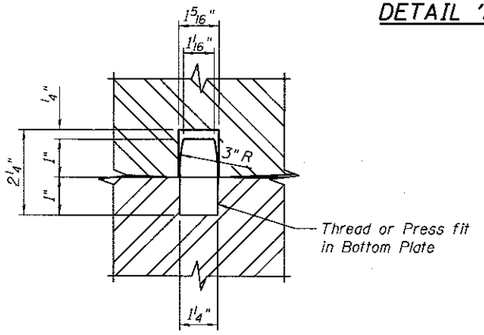
END VIEW - FIXED BEARING



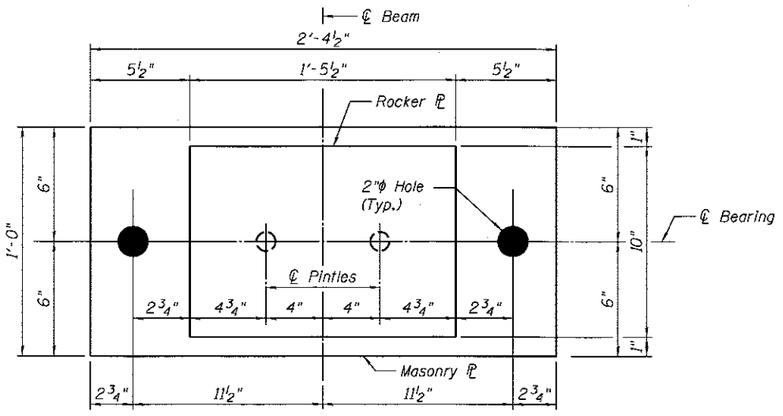
END VIEW - EXPANSION BEARING



DETAIL 'A'

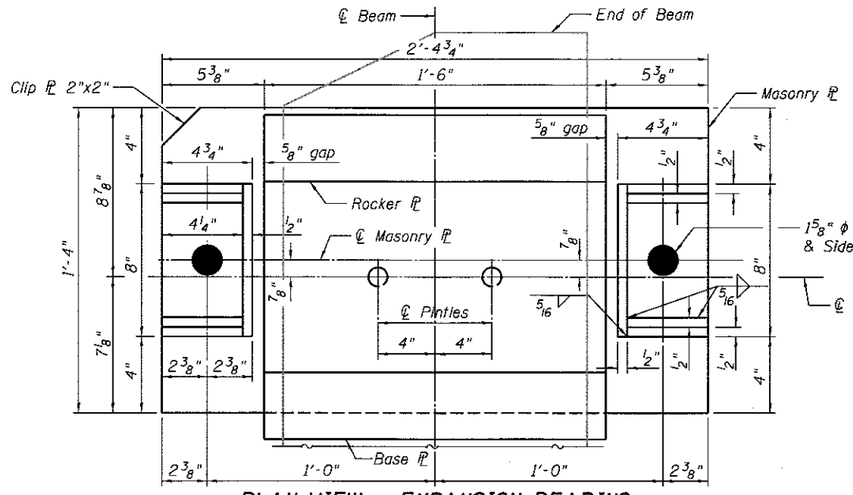


PINTLE DETAIL



PLAN VIEW - FIXED BEARING

(Abutment Bearings - 12 required)



PLAN VIEW - EXPANSION BEARING

(Abutment Bearings - 12 required)

* See notes for additional adjusting shims for all bearings.

* Shim Plate Thickness			* Shim Plate Thickness		
Abutment	Beams	Thickness	Abutment	Beams	Thickness
South	4	1/8"	North	1	1/8"
South	5	1/8"	North	2	1/8"
South	6	1/8"	North	3	1/8"
South	7	1/8"	North	4	1/4"
South	8	1/4"	North	5	1/4"
South	9	1/4"	North	6	1/4"
South	10	1/4"	North	7	1/4"
South	11	3/8"	North	8	3/8"
South	12	3/8"	North	9	3/8"
			North	10	3/8"
			North	11	1/2"
			North	12	1/2"

DESIGNED	MNM	6/17/14
DRAWN	DAP	6/1/14
REVIEWED	JGT	10/11/2016

FINAL

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	PLOT DATE = 2/24/2017	CHECKED - MNM	REVISED -

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STATE OF ILLINOIS
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BEARING DETAILS
STRUCTURE NO. 084-9955
SHEET NO. 9 OF 17 SHEETS

F.A.U. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
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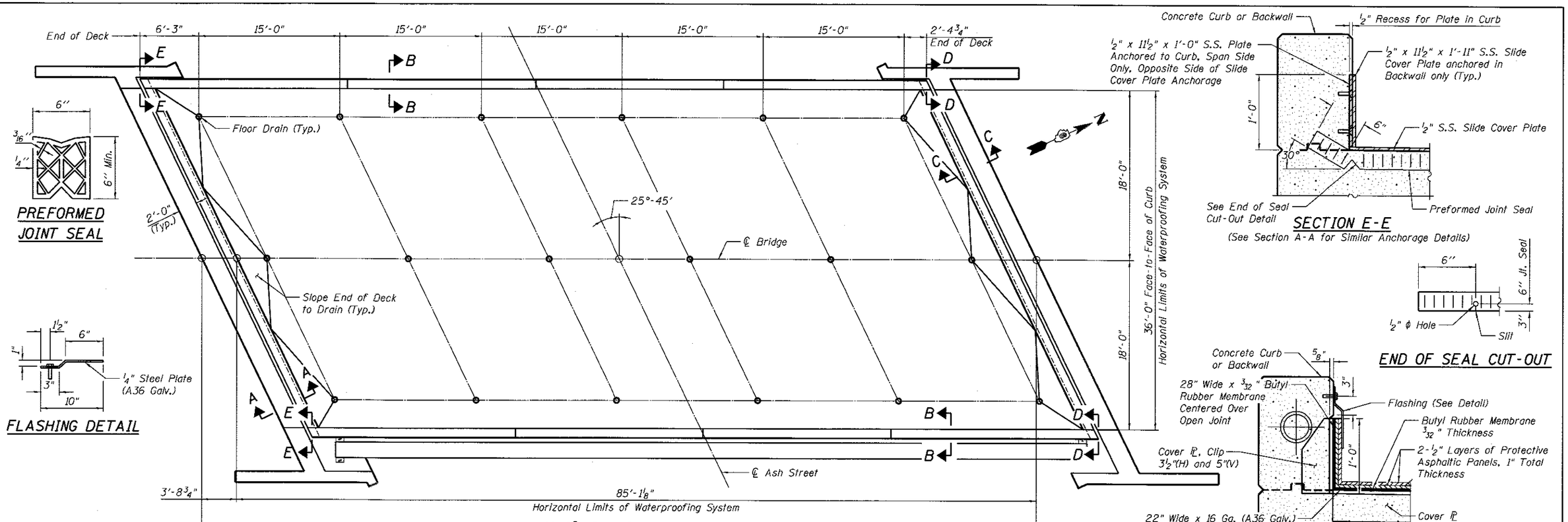
		CONTRACT NO. 93704		
	ILLINOIS FED. AID PROJECT			



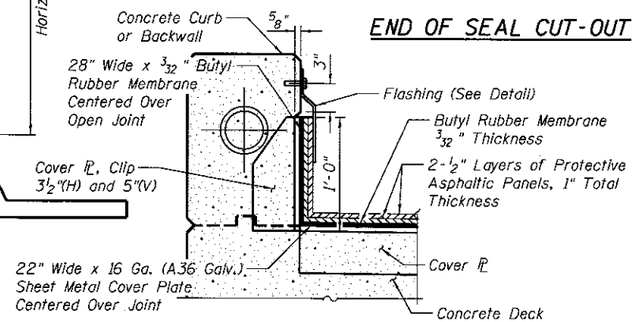
PREFORMED JOINT SEAL

FLASHING DETAIL

SECTION E-E

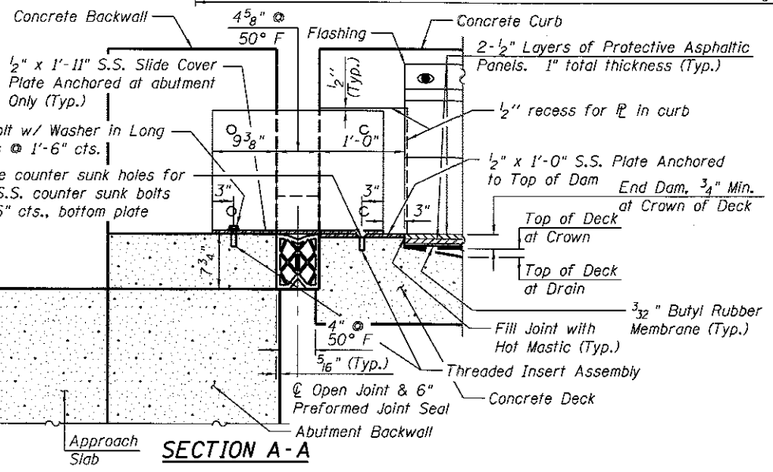
(See Section A-A for Similar Anchorage Details)

END OF SEAL CUT-OUT



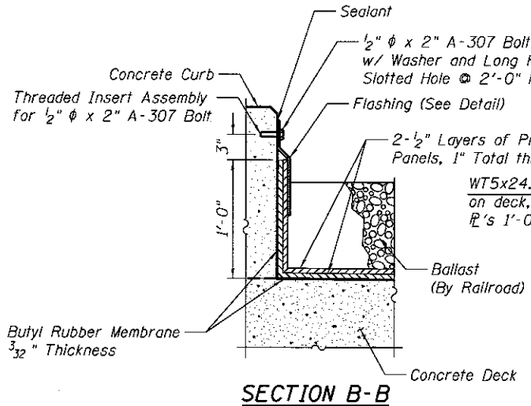
SECTION D-D

(Flashing, Membrane & Protection Panels Shall Extend to step in backwall)

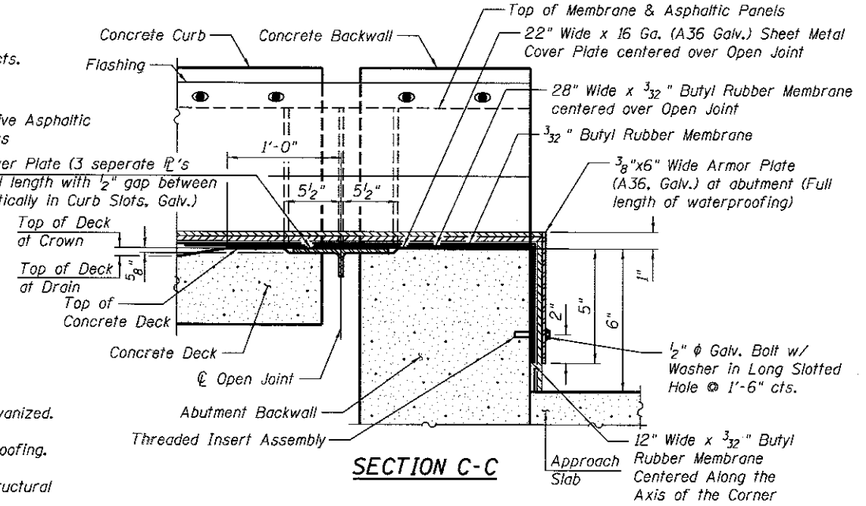


SECTION A-A

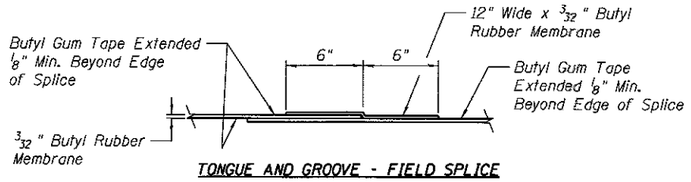
WATERPROOFING LIMITS PLAN



SECTION B-B



SECTION C-C



TONGUE AND GROOVE - FIELD SPLICE

BUTYL RUBBER MEMBRANE SPLICE DETAIL

Notes:

1. All structural steel plates, bolts, and washers for cover plates and waterproofing shall be galvanized.
2. Discontinue flashing at open joint over expansion abutment.
3. Cost of threaded inserts, sealant and tape shall be included in the cost of Membrane Waterproofing.
4. The cover plate, sheet metal cover, armor plate, flashing, bolts and washers are included in the weight of Structural Steel and will be paid for as "Furnishing and Erecting Structural Steel, Bridge No. 2".
5. Cost of Preformed Joint Seal is included with Concrete Superstructure.
6. Protective Asphaltic Panels shall be installed in two layers with joints staggered on the half sheet module, and shall be carefully placed to ensure tight proximity to adjacent members. No adhesive shall be used in the installation of the panels. After placing the second layer, unavoidable gaps shall be filled with a compatible sealing compound and the entire top surface of the asphaltic panels shall be given a mop coat of hot asphalt to completely fill the joints between the panels.

BILL OF MATERIAL

ITEM	UNIT	TOTAL
Membrane Waterproofing	Sq. Ft.	3254

FINAL		
DESIGNED	MNM	6/17/14
DRAWN	DAP	6/1/14
REVIEWED	JGT	10/11/2016

p:\\spi-svr306.hanson.dom\Hanson Projects\Documents\09Jobs\09L81798\CAD\Struct\Ash-10th\Sheet\084-9955-XXXXX-010-Waterproofing.dgn

FILE NAME =	USER NAME = pop82275	DESIGNED - MNM	REVISED -
HANSON		CHECKED - JGT	REVISED -
	PLOT SCALE = 0.999998 '/ in.	DRAWN - DAP	REVISED -
	PLOT DATE = 2/24/2017	CHECKED - MNM	REVISED -

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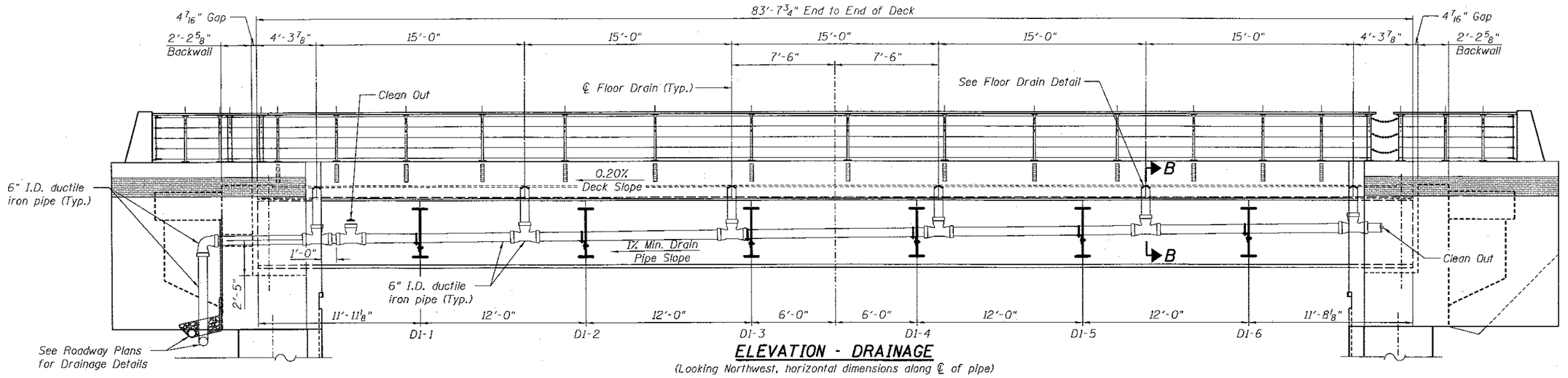
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

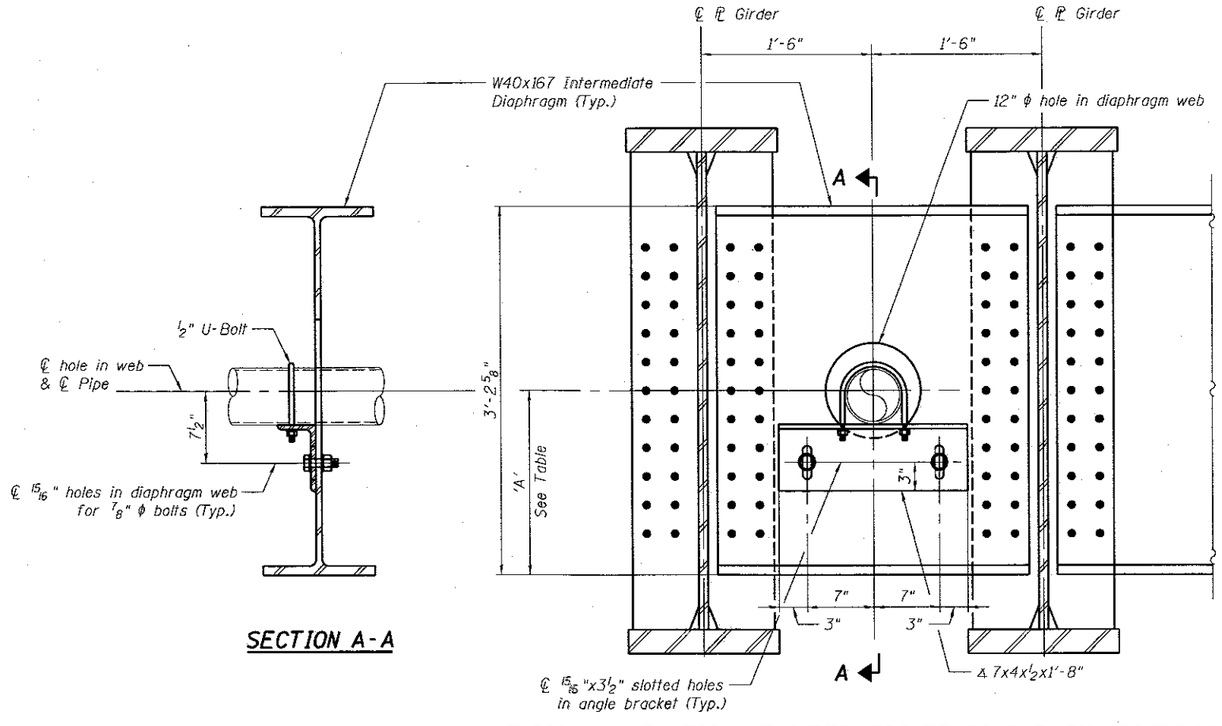
MEMBRANE WATERPROOFING
STRUCTURE NO. 084-9955
SHEET NO. 10 OF 17 SHEETS

F.A.U. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
	14-00477-00-BR	SANGAMON	403	240
		CONTRACT NO. 93704		
		ILLINOIS FED. AID PROJECT		



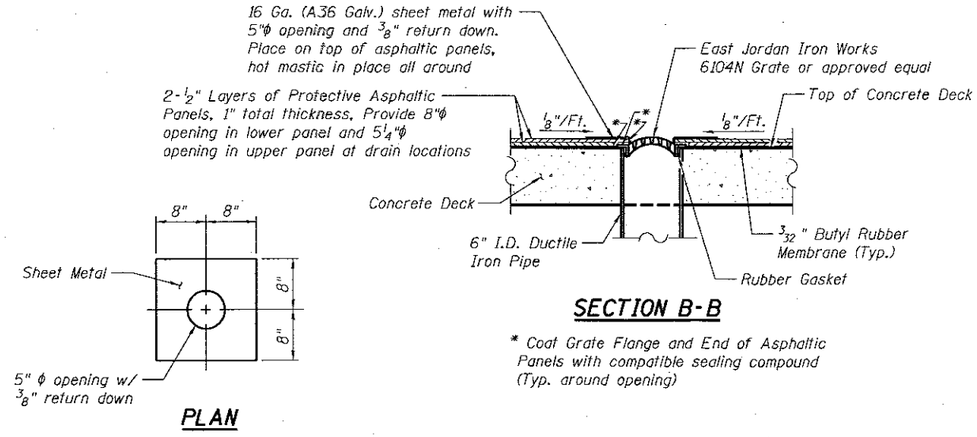
ELEVATION - DRAINAGE

(Looking Northwest, horizontal dimensions along ℄ of pipe)



SECTION A-A

TYPICAL ELEVATION AT INTERMEDIATE DIAPHRAGM PENETRATION



SECTION B-B

* Coat Grate Flange and End of Asphaltic Panels with compatible sealing compound (Typ. around opening)

PLAN

FLOOR DRAIN DETAIL

Notes:

1. All drain pipes shall be 6" I.D. All pipes, tees, bells and bends shall be Class 54 Ductile Iron.
2. Use minimum 1% fall on drain pipes.
3. Cost of angle brackets, bolts, u-bolts, sheet metal, mastic and other hardware shall be included in the cost of Drainage System.
4. For additional drainage details See Roadway Plans.
5. The Drainage System shall allow a movement of 2 1/4" each way between the superstructure and substructure.

DIMENSION 'A' TABLE

LOCATION	DIMENSION 'A'
D1-1	1'-3 3/4"
D1-2	1'-5 1/8"
D1-3	1'-6 5/8"
D1-4	1'-8"
D1-5	1'-9 1/2"
D1-6	1'-10 7/8"

BILL OF MATERIAL

ITEM	UNIT	TOTAL
Drainage System, No. 2	Each	1

FINAL	DESIGNED	MNM 6/17/14
	DRAWN	DAP 6/7/14
	REVIEWED	JGT 10/21/2016

pw:\\spi-svr386.hanson.dom:Hanson Projects\Documents\89Jobs\89L81798\CAD\Struct\Ash-18th\Sheet\084-9955-XXXXX-811-Drain Sys Det.dgn

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	PLOT SCALE = 0.999996 '/ in.	DRAWN - DAP	REVISED -	
	PLOT DATE = 5/25/2017	CHECKED - MNM	REVISED -	

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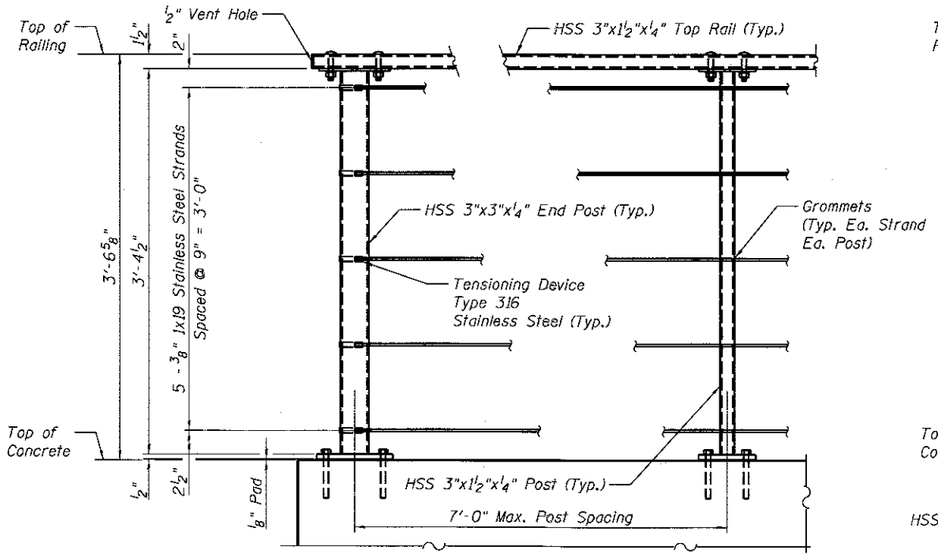
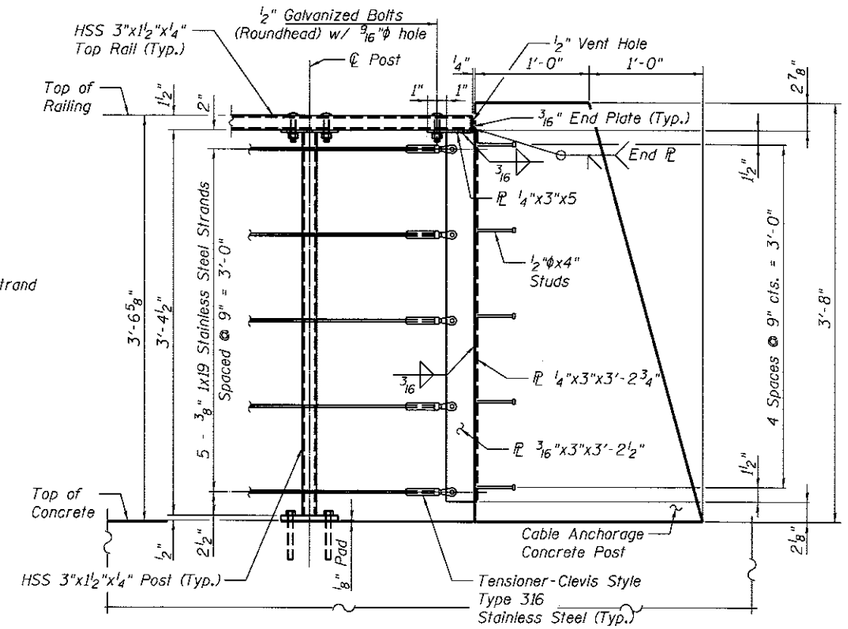
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

DRAINAGE SYSTEM DETAILS
STRUCTURE NO. 084-9955
SHEET NO. 11 OF 17 SHEETS

F.A.U. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
	14-00477-00-BR	SANGAMON	403	241
		CONTRACT NO. 93704		
		ILLINOIS FED. AID PROJECT		



END POST INTERMEDIATE POST



CABLE RAILING END PANEL
RAILROAD BRIDGE

Notes:

Anchor rods shall be ASTM F1554, Grade 55, galvanized steel all-thread (or an Engineer-approved alternate material) of the grade(s) and diameter(s) specified. The corresponding specified grade of AASHTO M314 anchor rods may be used in lieu of ASTM F1554. The anchor rods shall be hot-dipped galvanized according to AASHTO M232, Class C.

Tube segments shall have all corners ground to remove burrs or sharp projections.

All bolts, eyebolts, nuts and washers must satisfy the requirements of ASTM A307 Gr. A unless noted otherwise.

The anchor rods shall be installed according to Article 509.06 of the Standard Specifications. Embedment shall be 4'' min. or according to the manufactures specifications whatever is greater.

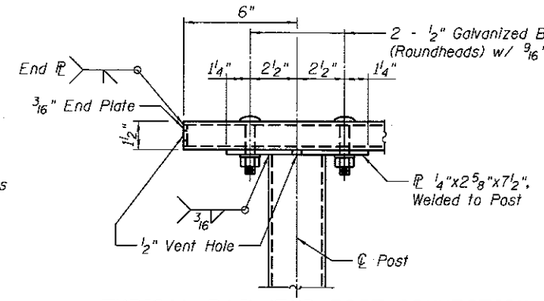
Structural steel plates and bars of the Steel Railing shall conform to the requirements of ASTM A36/36M.

Tubular steel posts shall be according to the requirements of ASTM A500, Grade B.

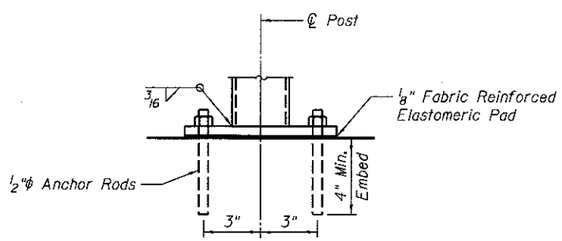
All steel rail members, with the exception of the stainless steel strand and fittings, shall be hot dipped galvanized according to 509.05 of the Standard Specifications.

All studs shall be ½"ϕx4" granular or solid flux filled headed studs automatically end welded to plates.

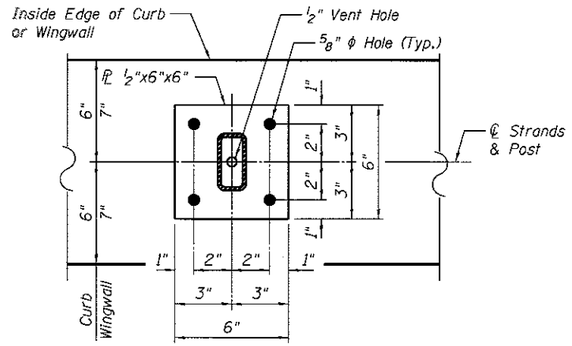
See Sheet 5 of 17 for rail post spacing. See retaining wall plans for chain attachment details.



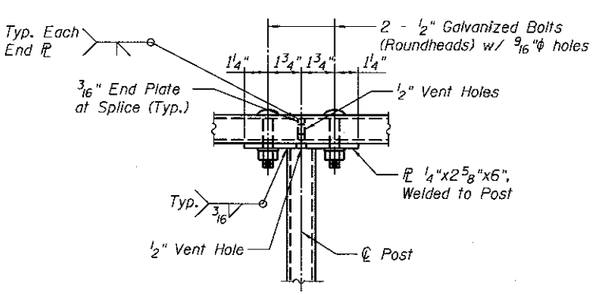
TYPICAL RAIL/END POST CONNECTION
(Strands not shown for clarity)



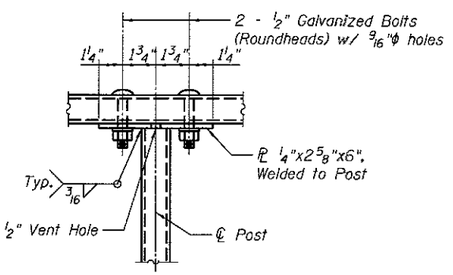
ANCHOR ROD DETAIL
INTERMEDIATE POSTS



STANDARD INTERMEDIATE POST



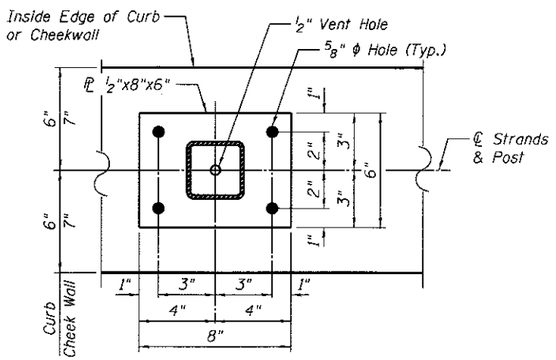
TOP RAIL - WITH SPLICE



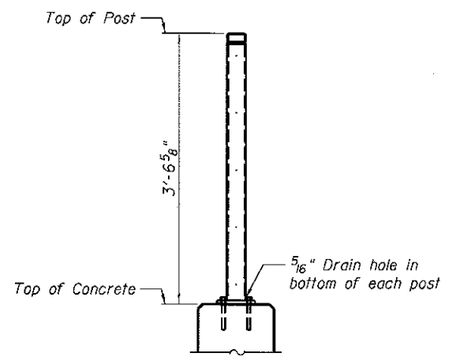
TOP RAIL - NO SPLICE

TYPICAL RAIL/POST CONNECTION
(Strands not shown for clarity)

ANCHOR ROD DETAIL
END POSTS



STANDARD END POST



POST DETAIL

BILL OF MATERIAL

ITEM	UNIT	TOTAL
Steel Railing (Special)	Foot	204

DESIGNED	MNM	6/17/14
DRAWN	DAP	6/1/14
REVIEWED	JGT	10/11/2016

FINAL

p:\\sp1-svr306.hanson.dom\Hanson Projects\Documents\89Jobs\89L81798\CAD\Struct\Ash-18th\Sheet\884-9955-XXXXX-812-Steel Railing (Special).dgn

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		CHECKED - JGT	REVISED -
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	PLOT DATE = 2/24/2017	CHECKED - MNM	REVISED -

HANSON

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STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

STEEL RAILING (SPECIAL)
STRUCTURE NO. 084-9955
SHEET NO. 12 OF 17 SHEETS

F.A.U. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
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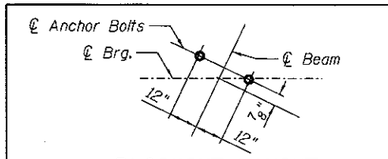
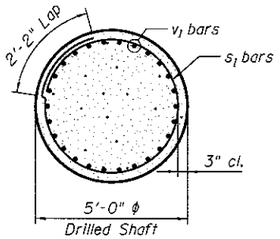
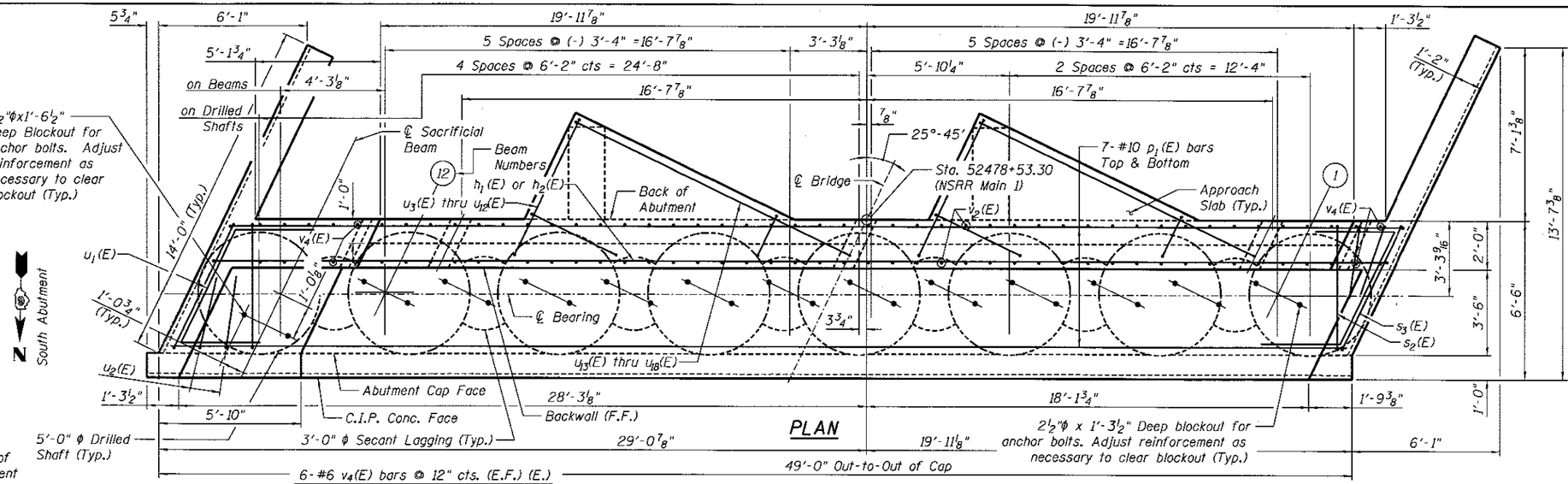
		CONTRACT NO. 93704		
		ILLINOIS FED. AID PROJECT		



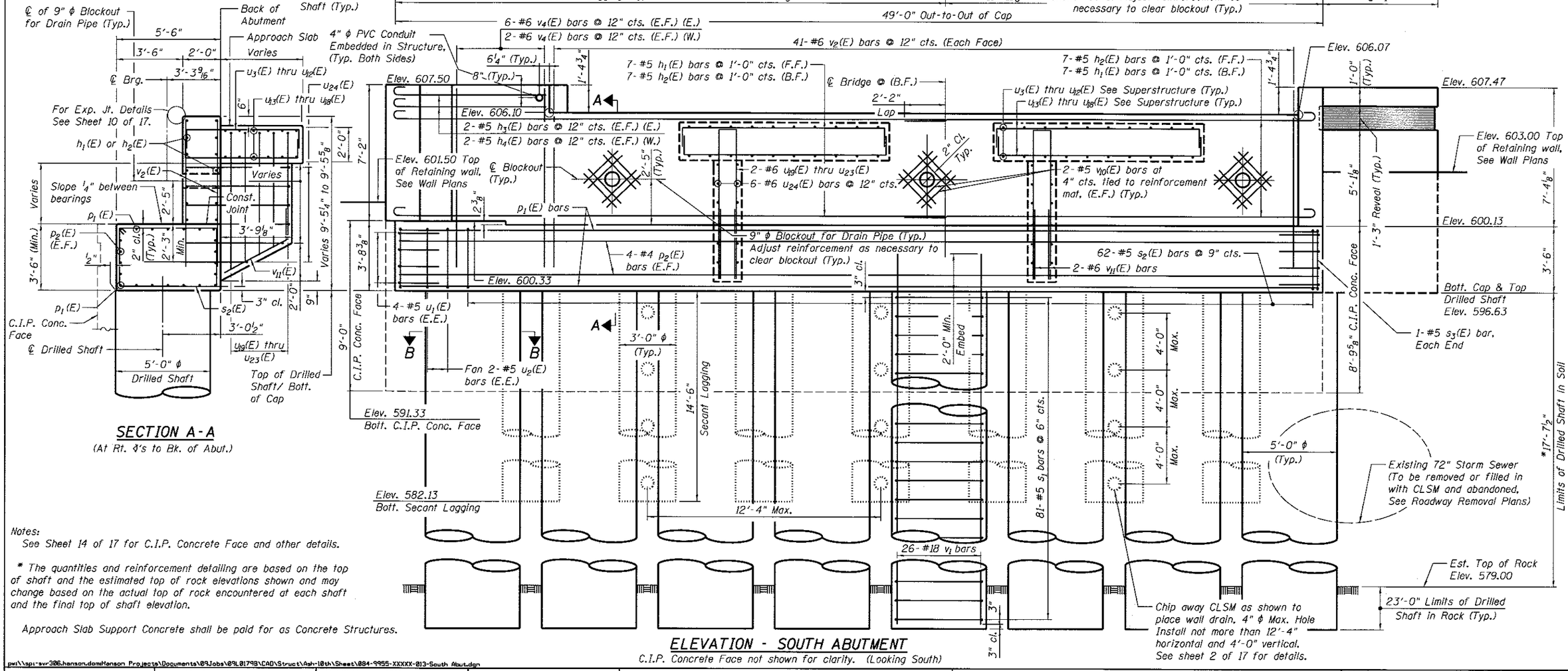
BLOCKOUT LAYOUT



SECTION B-B



PLAN



SECTION A-A

(At Rt. 4's to Bk. of Abut.)

ELEVATION - SOUTH ABUTMENT

C.I.P. Concrete Face not shown for clarity. (Looking South)

Notes:

See Sheet 14 of 17 for C.I.P. Concrete Face and other details.

* The quantities and reinforcement detailing are based on the top of shaft and the estimated top of rock elevations shown and may change based on the actual top of rock encountered at each shaft and the final top of shaft elevation.

Approach Slab Support Concrete shall be paid for as Concrete Structures.

	MNM	DAP	JGT
DESIGNED	6/17/14		
DRAWN	6/1/14		
REVIEWED	10/11/2016		

FINAL

pw:\\spi-svr306.hanson.dom:Hanson Projects\Documents\09Jobs\09L01798\CAD\Struct\Ash-10th\Sheet\084-9955-XXXXX-013-South Abut.dgn

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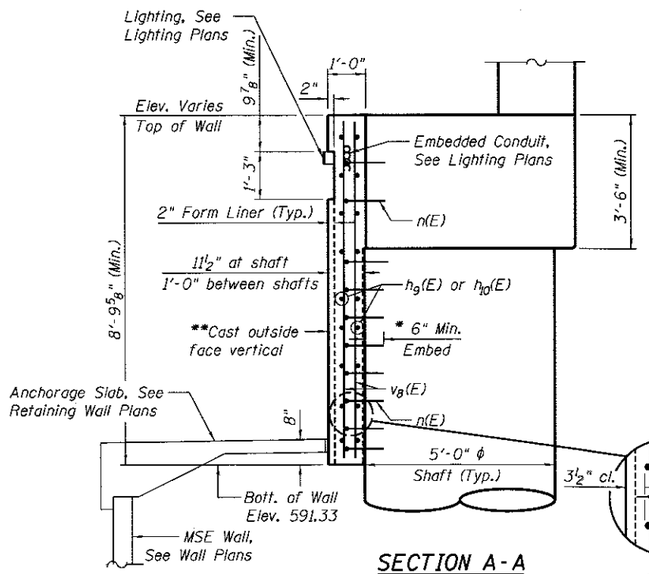
HANSON		CHECKED - JGT	REVISED -
© Copyright Hanson Professional Services Inc. 2017	PLOT SCALE = 0.999996 '/ in.	DRAWN - DAP	REVISED -
	PLOT DATE = 2/24/2017	CHECKED - MNM	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

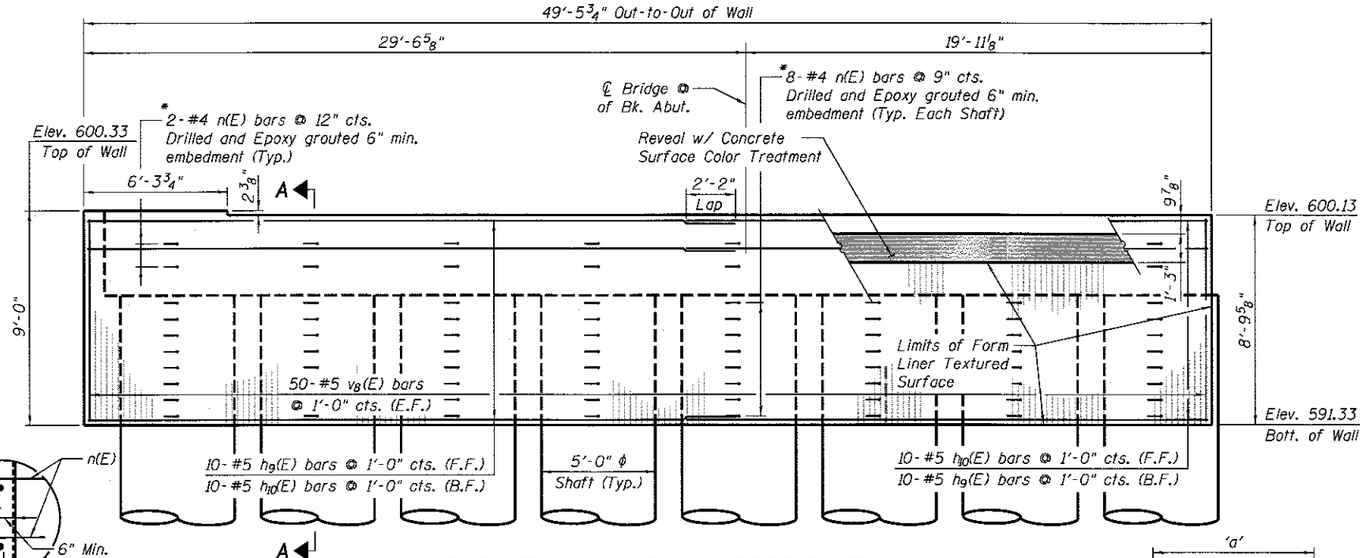
SOUTH ABUTMENT
STRUCTURE NO. 084-9955
SHEET NO. 13 OF 17 SHEETS

F.A.U. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
	14-00477-00-BR	SANGAMON	403	243
		CONTRACT NO. 93704		
		ILLINOIS FED. AID PROJECT		



SECTION A-A

(At Rt. ℄'s to Back of Abut.)

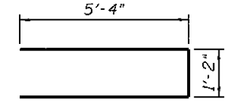


ELEVATION - C.I.P. CONCRETE FACE

(Looking South)

* Bars epoxy grouted shall have an embedment sufficient to develop 1.25 times the full capacity of the reinforcement bar.

** Concrete wall face shall be cast vertically. Thickness of wall may vary due to abutment deflection. The Min. wall thickness shall be 10½".

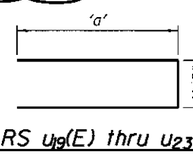


BAR u_{24}(E)

BILL OF MATERIAL SOUTH ABUTMENT

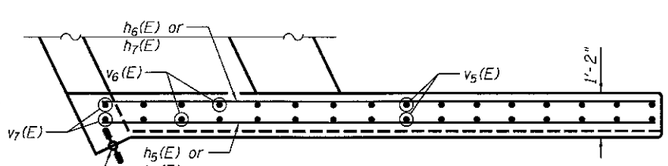
Bar	No.	Size	Length	Shape
h_1(E)	14	#5	26'-10"	
h_2(E)	14	#5	25'-2"	
h_3(E)	4	#5	6'-6"	
h_4(E)	4	#5	2'-7"	
h_5(E)	16	#5	14'-3"	
h_6(E)	30	#7	14'-3"	
h_7(E)	14	#7	11'-4"	
h_8(E)	8	#5	10'-3"	
h_9(E)	20	#5	29'-5"	
h_{10}(E)	20	#5	22'-0"	
h_{11}(E)	20	#4	3'-8"	
n(E)	80	#4	1'-8"	
p_1(E)	14	#10	48'-8"	
p_2(E)	8	#4	48'-8"	
s_1	648	#5	16'-4"	
s_2(E)	62	#5	17'-5"	
s_3(E)	2	#5	18'-7"	
u_1(E)	8	#5	12'-1"	
u_2(E)	4	#5	9'-1"	
u_{19}(E)	2	#6	12'-4"	
u_{20}(E)	2	#6	13'-2"	
u_{21}(E)	2	#6	14'-0"	
u_{22}(E)	2	#6	14'-8"	
u_{23}(E)	2	#6	15'-6"	
u_{24}(E)	12	#6	11'-10"	
v_1	208	#18	42'-9"	
v_2(E)	82	#6	8'-1"	
v_4(E)	16	#6	9'-6"	
v_5(E)	36	#5	10'-4"	
v_6(E)	24	#5	9'-2"	
v_7(E)	4	#5	6'-8"	
v_8(E)	100	#5	8'-7"	
v_9(E)	14	#5	4'-11"	
v_{10}(E)	48	#5	2'-6"	
v_{11}(E)	4	#6	5'-4"	

Structure Excavation	Cu. Yds.	224
Concrete Structures	Cu. Yds.	86.4
Drilled Shaft in Soil	Cu. Yds.	102.5
Drilled Shaft in Rock	Cu. Yds.	133.8
Secant Lagging	Cu. Ft.	717
Form Liner Textured Surface	Sq. Ft.	333
Concrete Surface Color Treatment	Sq. Ft.	97
Reinforcement Bars	Pound	131970
Reinforcement Bars, Epoxy Coated	Pound	10310
Conduit Embedded in Structure, 4" dia., PVC	Foot	4



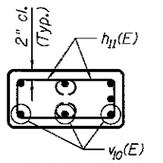
BARS u_{19}(E) thru u_{23}(E)

Bar	'a'
u_{19}(E)	5'-8"
u_{20}(E)	6'-1"
u_{21}(E)	6'-6"
u_{22}(E)	6'-10"
u_{23}(E)	7'-3"

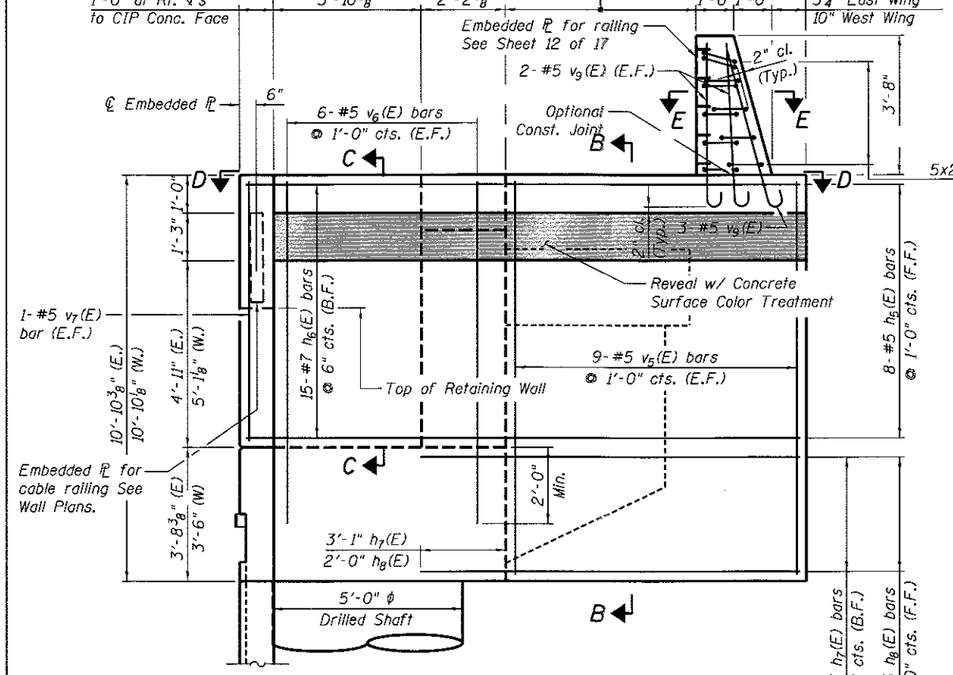


SECTION D-D - PLAN VIEW

(West Wing shown, East Wing similar)

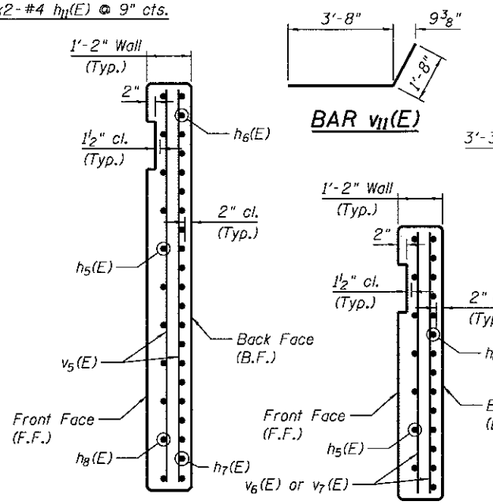


SECTION E-E



ELEVATION - TYPICAL END VIEW

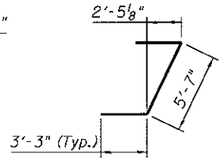
(West Wing shown, East Wing similar)



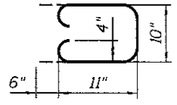
WINGWALL SECTION B-B

CHEEKWALL SECTION C-C

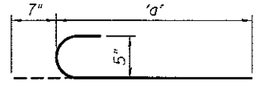
BAR v_{11}(E)



BAR u_1(E)

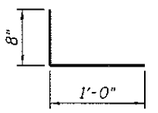


BAR h_{11}(E)

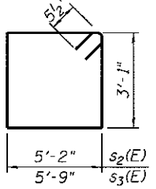


BARS h_1(E), h_2(E), h_3(E), h_4(E), v_9(E)

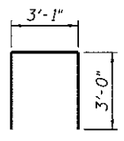
Bar	'a'
h_1(E)	26'-3"
h_2(E)	24'-7"
h_3(E)	5'-11"
h_4(E)	2'-0"
v_9(E)	4'-4"



BAR n(E)



BARS s_2(E), s_3(E)



BAR u_2(E)

Notes:
Pour step monolithically with cap.
Space cap reinforcement to miss blockouts for anchor bolts.
See Retaining Wall Plans for Expansion Joint Detail at each end of C.I.P. Concrete Facing.
See Lighting Plans of Conduit and J-Box embedments in Wall Facing.

FINAL	DESIGNED	MNM	6/17/14
	DRAWN	DAP	6/1/14
	REVIEWED	JGT	10/11/2016

pw:\\spi-svr386.hanson.dom:Hanson Projects\Documents\89Jobs\89L81798\CAD\Struct\Ash-18th\Sheet\884-9955-XXXXX-014-South Abut Det.dgn

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HANSON		CHECKED - JGT	REVISED -
	PLOT SCALE = 81.999998 '/ / in.	DRAWN - DAP	REVISED -
	PLOT DATE = 2/24/2017	CHECKED - MNM	REVISED -

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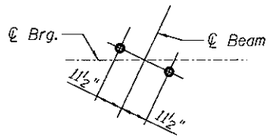
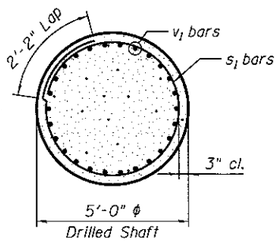
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

SOUTH ABUTMENT DETAILS
STRUCTURE NO. 084-9955
SHEET NO. 14 OF 17 SHEETS

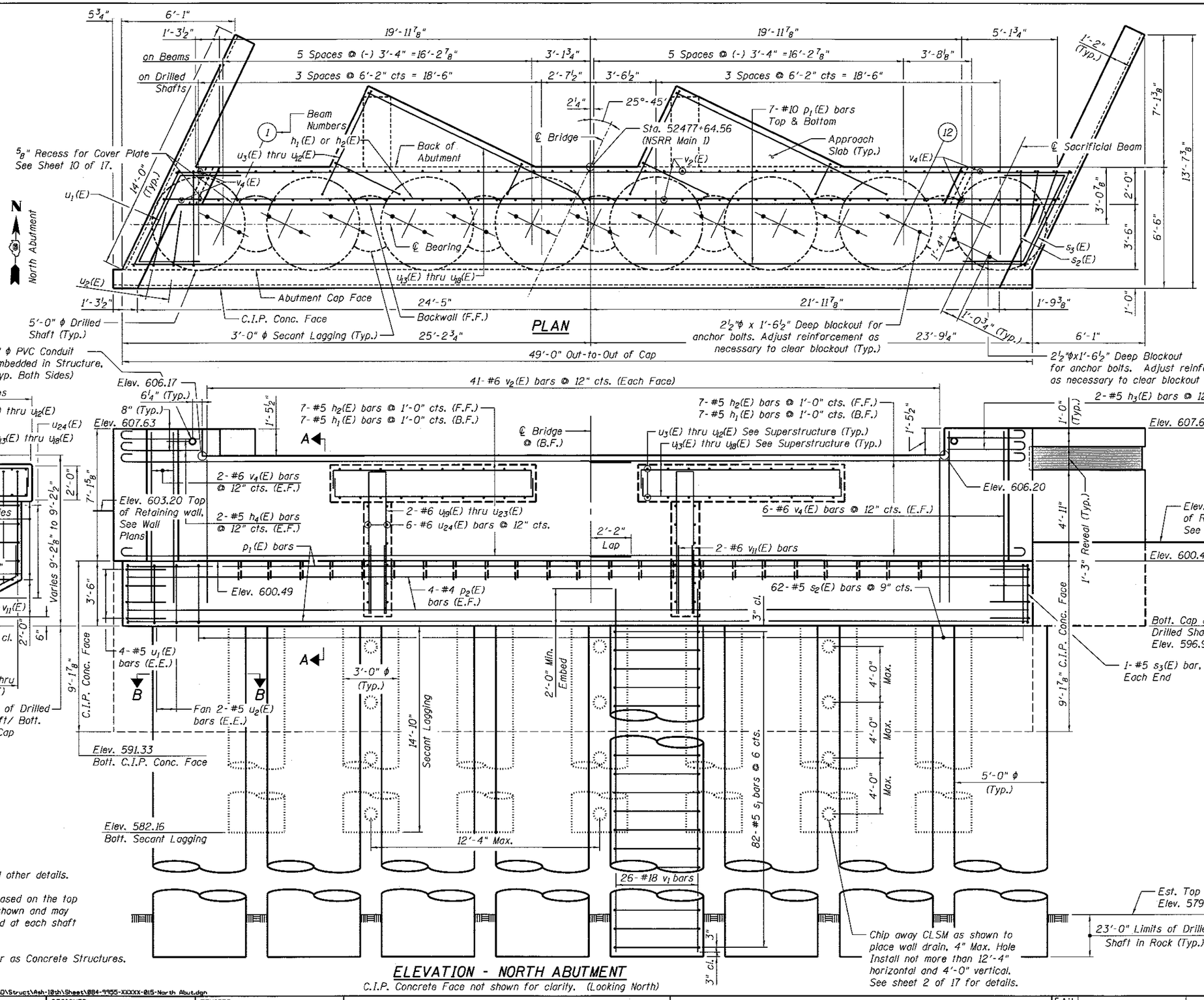
F.A.U. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
	14-00477-00-BR	SANGAMON	403	244
		CONTRACT NO. 93704		
		ILLINOIS FED. AID PROJECT		



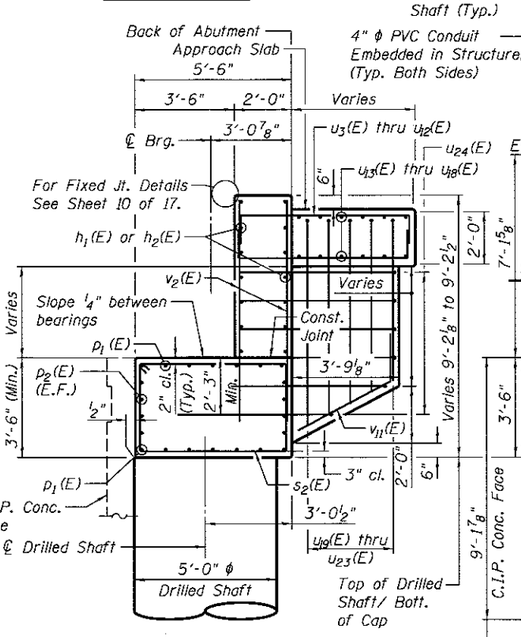
BLOCKOUT LAYOUT



SECTION B-B



PLAN



SECTION A-A

(At Rt. ℄'s to Bk. of Abut.)

ELEVATION - NORTH ABUTMENT

C.I.P. Concrete Face not shown for clarity. (Looking North)

Notes:

See Sheet 16 of 17 for C.I.P. Concrete Face and other details.

* The quantities and reinforcement detailing are based on the top of shaft and the estimated top of rock elevations shown and may change based on the actual top of rock encountered at each shaft and the final top of shaft elevation.

Approach Slab Support Concrete shall be paid for as Concrete Structures.

FINAL		
DESIGNED	MNM	6/17/14
DRAWN	DAP	6/1/14
REVIEWED	JGT	30/11/2016

pw:\\spi-svr306.hanson.dom:Hanson Projects\Documents\89Jobs\89L8179B\CAD\Struct\Ash-18th\Sheet\884-9955-XXXXX-015-North Abut.dgn

FILE NAME =

HANSON

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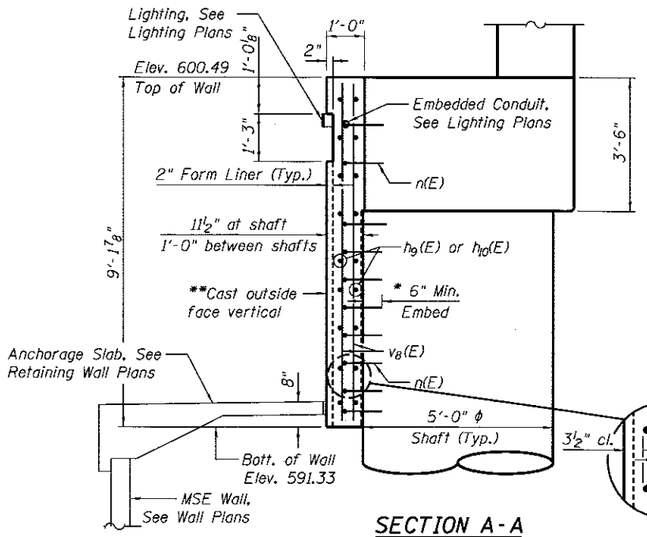
USER NAME = pop80275	DESIGNED - MNM	REVISED -	
	CHECKED - JGT	REVISED -	
PLOT SCALE = 81.999998 '/ / in.	DRAWN - DAP	REVISED -	
PLOT DATE = 2/24/2017	CHECKED - MNM	REVISED -	

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

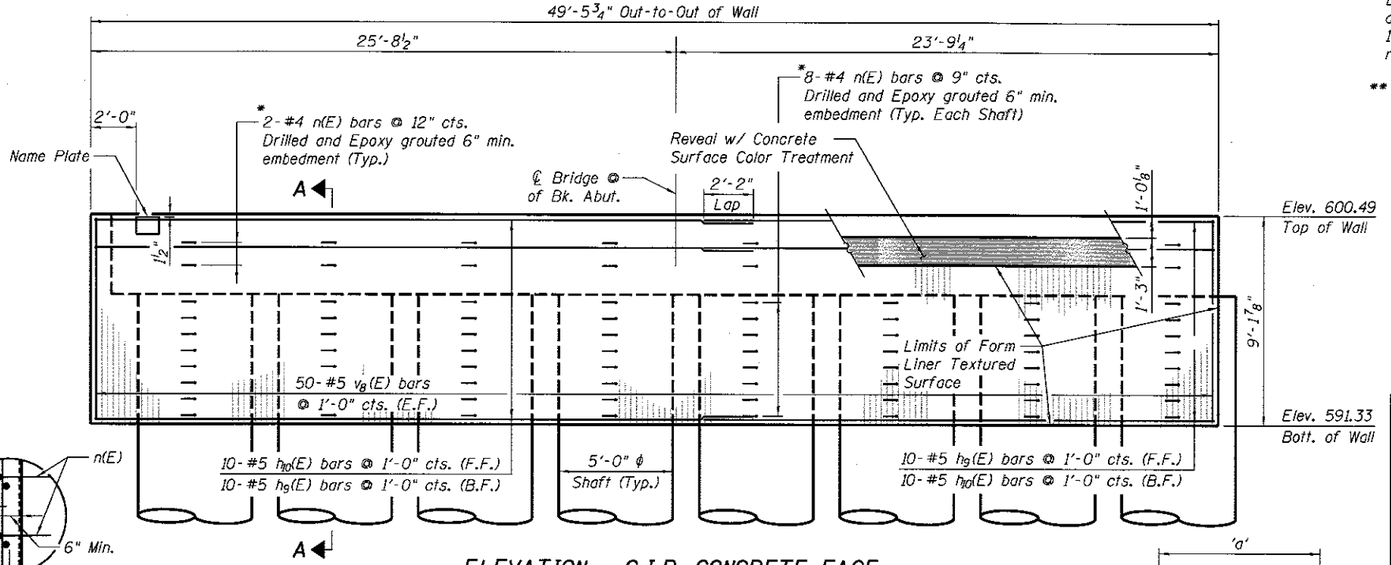
NORTH ABUTMENT
STRUCTURE NO. 084-9955
SHEET NO. 15 OF 17 SHEETS

F.A.U. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
	14-00477-00-BR	SANGAMON	403	245
		CONTRACT NO. 93704		
		ILLINOIS FED. AID PROJECT		



SECTION A-A

(At Rt. ℄'s to Back of Abut.)

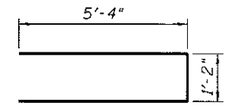


ELEVATION - C.I.P. CONCRETE FACE

(Looking North)

* Bars epoxy grouted shall have an embedment sufficient to develop 1.25 times the full capacity of the reinforcement bar.

** Concrete wall face shall be cast vertically. Thickness of wall may vary due to abutment deflection. The Min. wall thickness shall be 10 1/2".

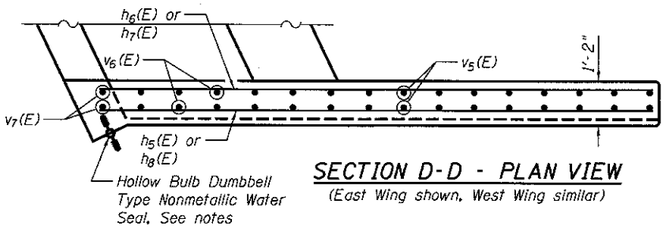


BAR $u_{24}(E)$

BILL OF MATERIAL
NORTH ABUTMENT

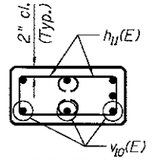
Bar	No.	Size	Length	Shape
$h_1(E)$	14	#5	26'-10"	
$h_2(E)$	14	#5	25'-2"	
$h_3(E)$	4	#5	6'-6"	
$h_4(E)$	4	#5	2'-7"	
$h_5(E)$	16	#5	14'-3"	
$h_6(E)$	30	#7	14'-3"	
$h_7(E)$	14	#7	11'-4"	
$h_8(E)$	8	#5	10'-3"	
$h_9(E)$	20	#5	29'-5"	
$h_{10}(E)$	20	#5	22'-0"	
$h_{11}(E)$	20	#4	3'-8"	
$n(E)$	80	#4	1'-8"	
$p_1(E)$	14	#10	48'-8"	
$p_2(E)$	8	#4	48'-8"	
s_1	656	#5	16'-4"	
$s_2(E)$	62	#5	17'-5"	
$s_3(E)$	2	#5	18'-7"	
$u_1(E)$	8	#5	12'-1"	
$u_2(E)$	4	#5	9'-1"	
$u_{19}(E)$	2	#6	12'-4"	
$u_{20}(E)$	2	#6	13'-2"	
$u_{21}(E)$	2	#6	14'-0"	
$u_{22}(E)$	2	#6	14'-8"	
$u_{23}(E)$	2	#6	15'-6"	
$u_{24}(E)$	12	#6	11'-10"	
v_1	208	#18	42'-9"	
$v_2(E)$	82	#6	8'-1"	
$v_4(E)$	16	#6	9'-6"	
$v_5(E)$	36	#5	10'-4"	
$v_6(E)$	24	#5	9'-2"	
$v_7(E)$	4	#5	6'-8"	
$v_8(E)$	100	#5	8'-7"	
$v_9(E)$	14	#5	4'-11"	
$v_{11}(E)$	4	#6	5'-4"	

Structure Excavation	Cu. Yds.	215
Concrete Structures	Cu. Yds.	85.9
Drilled Shaft in Soil	Cu. Yds.	104.7
Drilled Shaft in Rock	Cu. Yds.	133.8
Secant Lagging	Cu. Ft.	734
Form Liner Textured Surface	Sq. Ft.	341
Concrete Surface Color Treatment	Sq. Ft.	97
Reinforcement Bars	Pound	132110
Reinforcement Bars, Epoxy Coated	Pound	10190
Conduit Embedded in Structure, 4" dia., PVC	Foot	4

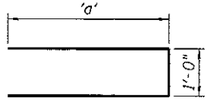


SECTION D-D - PLAN VIEW

(East Wing shown, West Wing similar)

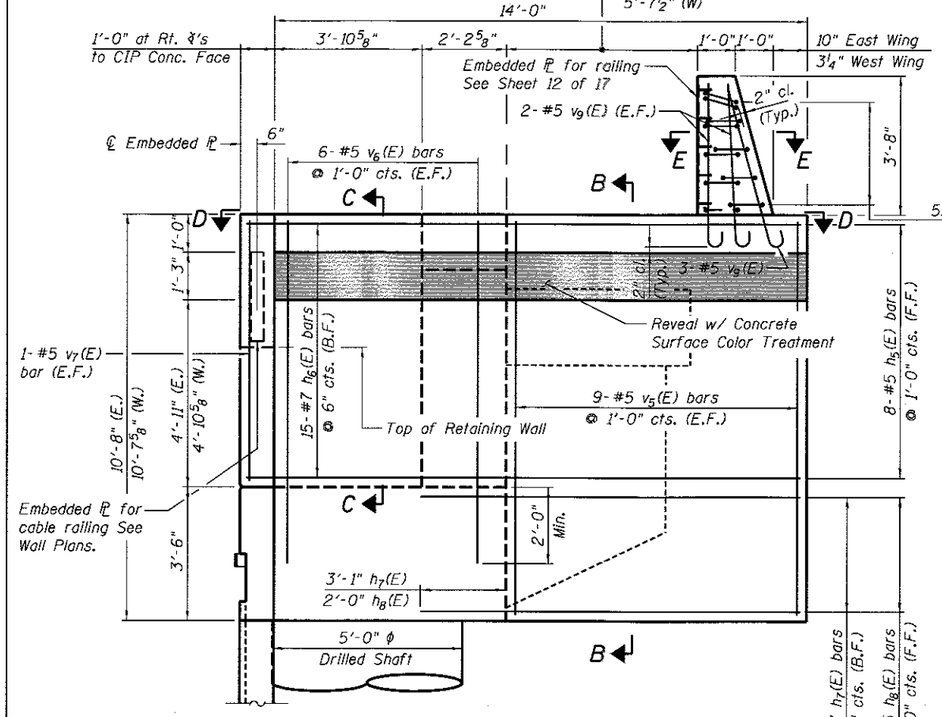


SECTION E-E



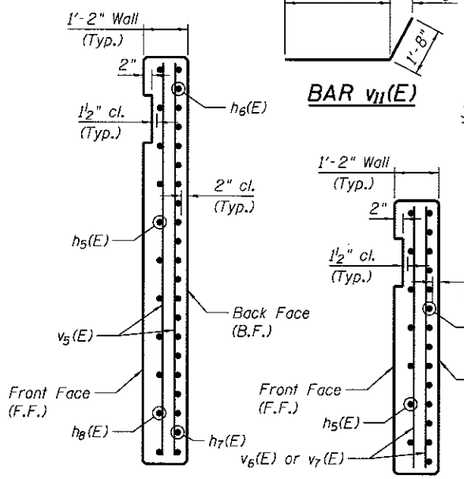
BARS $u_{19}(E)$ thru $u_{23}(E)$

Bar	'a'
$u_{19}(E)$	5'-8"
$u_{20}(E)$	6'-1"
$u_{21}(E)$	6'-6"
$u_{22}(E)$	6'-10"
$u_{23}(E)$	7'-3"



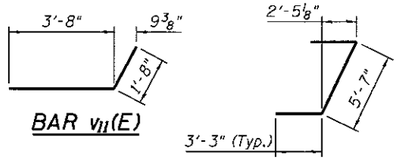
ELEVATION - TYPICAL END VIEW

(East Wing shown, West Wing similar)



WINGWALL SECTION B-B

CHEEKWALL SECTION C-C

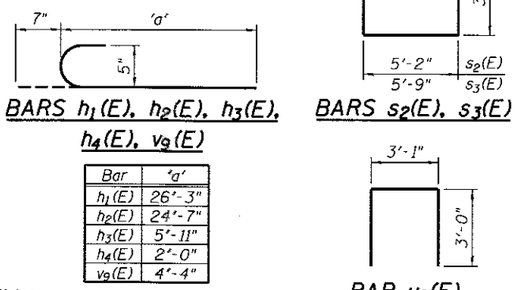


BAR $v_{11}(E)$

BAR $u_1(E)$

BAR $h_{11}(E)$

BAR n(E)



BARS $h_1(E)$, $h_2(E)$, $h_3(E)$, $h_4(E)$, $v_9(E)$

Bar	'a'
$h_1(E)$	26'-3"
$h_2(E)$	24'-7"
$h_3(E)$	5'-11"
$h_4(E)$	2'-0"
$v_9(E)$	4'-4"

BARS $s_2(E)$, $s_3(E)$

BAR $u_2(E)$

Notes:
Space cap reinforcement to miss blockouts for anchor bolts.
See Retaining Wall Plans for Expansion Joint Detail at each end of C.I.P. Concrete Facing.
See Lighting Plans of Conduit and J-Box embedments in Wall Facing.

FINAL	DESIGNED	MNM	6/17/14
	DRAWN	DAP	6/1/14
	REVIEWED	JGT	10/31/2016

pw:\\spi-svr386.hanson.dom:Hanson Projects\Documents\89Jobs\89L81798\CAD\Struct\Ash-10th\Sheet\084-9955-XXXXX-016-North Abut Detail.dgn

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HANSON		CHECKED - JGT	REVISED -
	PLOT SCALE = 61.999996 '/ in.	DRAWN - DAP	REVISED -
	PLOT DATE = 2/24/2017	CHECKED - MNM	REVISED -

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STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

NORTH ABUTMENT DETAILS
STRUCTURE NO. 084-9955
SHEET NO. 16 OF 17 SHEETS

F.A.U. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
	14-00477-00-BR	SANGAMON	403	246
		CONTRACT NO. 93704		
	ILLINOIS FED. AID PROJECT			

B-039
Sta. 1000+66, 4' RT

	N	Qu	w%	
602.8				ASPHALT.
602.5				BRICK.
602.3	4		20	CONCRETE.
601.9				
599.3	6	1.96B	27	Black sand and cinders, trace gravel - FILL.
596.8	7	0.78B	26	Black silty CLAY, trace gravel, sand, and brick - FILL.
	4	0.89S	27	Gray-brown clayey SILT.
591.3	4	0.29B	27	Brown silty CLAY.
589.3	4	0.78B	25	Gray-brown clayey SILT.
	4	0.70B	24	
584.3	4	1.36B	24	Gray-tan silty CLAY.
579.8	82	4.50P	15	Brown sandy clayey SHALE. (HIGHLY WEATHERED SHALE)
577.8				Bottom of Hole = 25.0 feet

B-040
Sta. 1002+01, 3' RT

	N	Qu	w%	
602.6				ASPHALT.
602.1				BRICK.
601.8	15	4.50P	22	AGGREGATE - crushed stone.
601.4				
599.1	8	2.47B	28	Black cinders, gravel, and sand - FILL.
596.6	7		24	Black-gray silty CLAY, trace gravel - FILL.
	8		26	Gray-brown clayey SILT.
591.6	5	1.94B	23	Dark brown and gray clayey SILT.
589.1	5	1.05B	25	Dark brown and gray silty CLAY.
	5	0.78B	28	
584.1	5	1.36B	24	Blue-gray silty CLAY, some sand, trace gravel.
579.1	85/11"	4.50P	15	Brown-gray sandy clayey SHALE. (HIGHLY WEATHERED SHALE)
	83/11"	4.50P	14	
569.1	50/5"		9	Gray sandy SHALE.
	50/6"		7	
	50/4"		6	
553.8	50/3"		16	
				Bottom of Hole = 48.8 feet

B-030
Sta. 1002+30, 18' LT

	N	Qu	w%	
601.5				ASPHALT.
601.1				BRICK.
600.9	9		22	AGGREGATE - crushed stone.
600.4				
598.0	7	2.00P	26	Black silty clay, cinders, sand and brick - FILL.
596.5	4	0.62B	27	Brown and gray silty CLAY, trace gravel - FILL.
	6	1.47S	29	Brown-gray silty CLAY.
590.5	6	0.80P	22	Dark brown-gray silty CLAY.
	4	0.58B	27	
	4	1.05S	29	
583.0	7	1.94S	23	Blue-gray and brown silty CLAY. LL=44, PI=27
578.0	93/10"	4.50P	14	Brown and gray silty CLAY, trace sand. (HIGHLY WEATHERED SHALE)
	50/5"	4.50P	11	
568.0	50/4"	2.50P	13	Gray-brown clayey SHALE, trace sand.
	40.8			Rec. = 81% RQD = 72%
	23.2			Rec. = 97% RQD = 85%
	14.5			Rec. = 90% RQD = 19%
552.5				Bottom of Hole = 49.0 feet

LEGEND

N	Standard Penetration Test N (blows/ft)
Qu	Unconfined Strength (tsf)
w%	Natural Moisture Content (%)
DD ▽ 558.10	Water Surface Elevation Encountered in Boring DD = during drilling Oh = at completion 24h = 24 hours after completion

FINAL

DESIGNED	MNM	6/17/14
DRAWN	DAP	6/1/14
REVIEWED	JGT	10/11/2016

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HANSON		CHECKED - JGT	REVISED -
	PLOT SCALE = @1.999996 '/ / in.	DRAWN - DAP	REVISED -
	PLOT DATE = 2/24/2017	CHECKED - MNM	REVISED -

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STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

SUBSURFACE DATA PROFILE
STRUCTURE NO. 084-9955
SHEET NO. 17 OF 17 SHEETS

F.A.U. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
	14-00477-00-BR	SANGAMON	403	247
		CONTRACT NO. 93704		
	ILLINOIS FED. AID PROJECT			

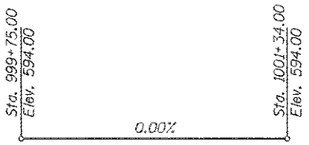
Benchmark:
BM# JHF-2: Chiseled 'X' on SW Bolt of Gas Station Sign SE Quadrant of 9th Street and Laurel Street.
Elevation = 605.788

Existing Structure: None

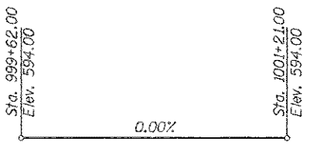
Traffic Control: Road Closure

Salvage: None

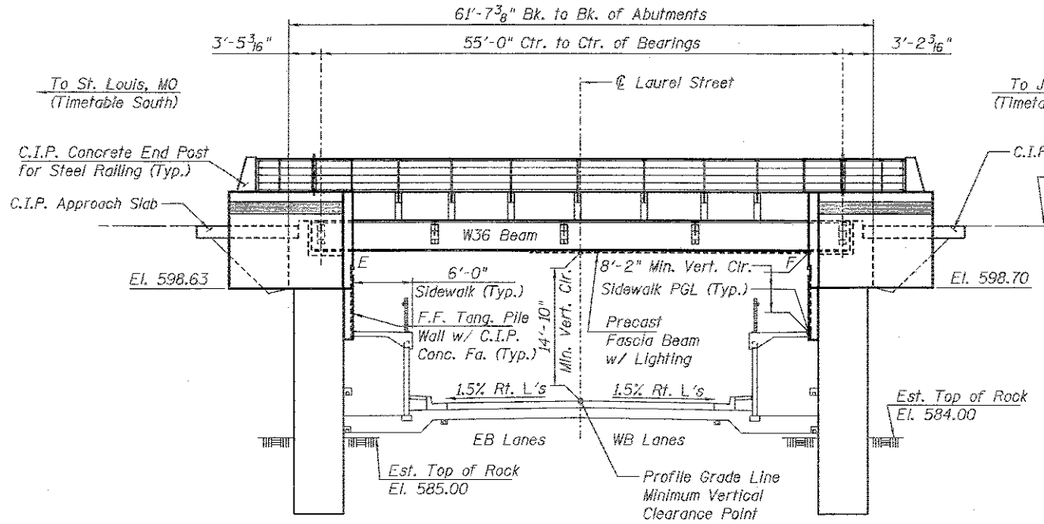
Construction Sequence: For Sequence and Details, See NSRR Bridge (SN 084-9957)



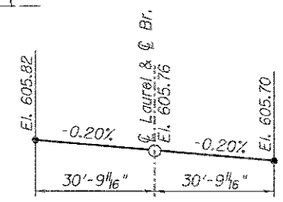
P.G.L. NORTH SIDEWALK
(Along Face of Tangent Pile Wall)



P.G.L. SOUTH SIDEWALK
(Along Face of Tangent Pile Wall)



ELEVATION
(Looking Northwest)



PROFILE GRADE TOP of DECK PLATE
(Looking Northwest)
(Elevations Taken along Bridge ℄)

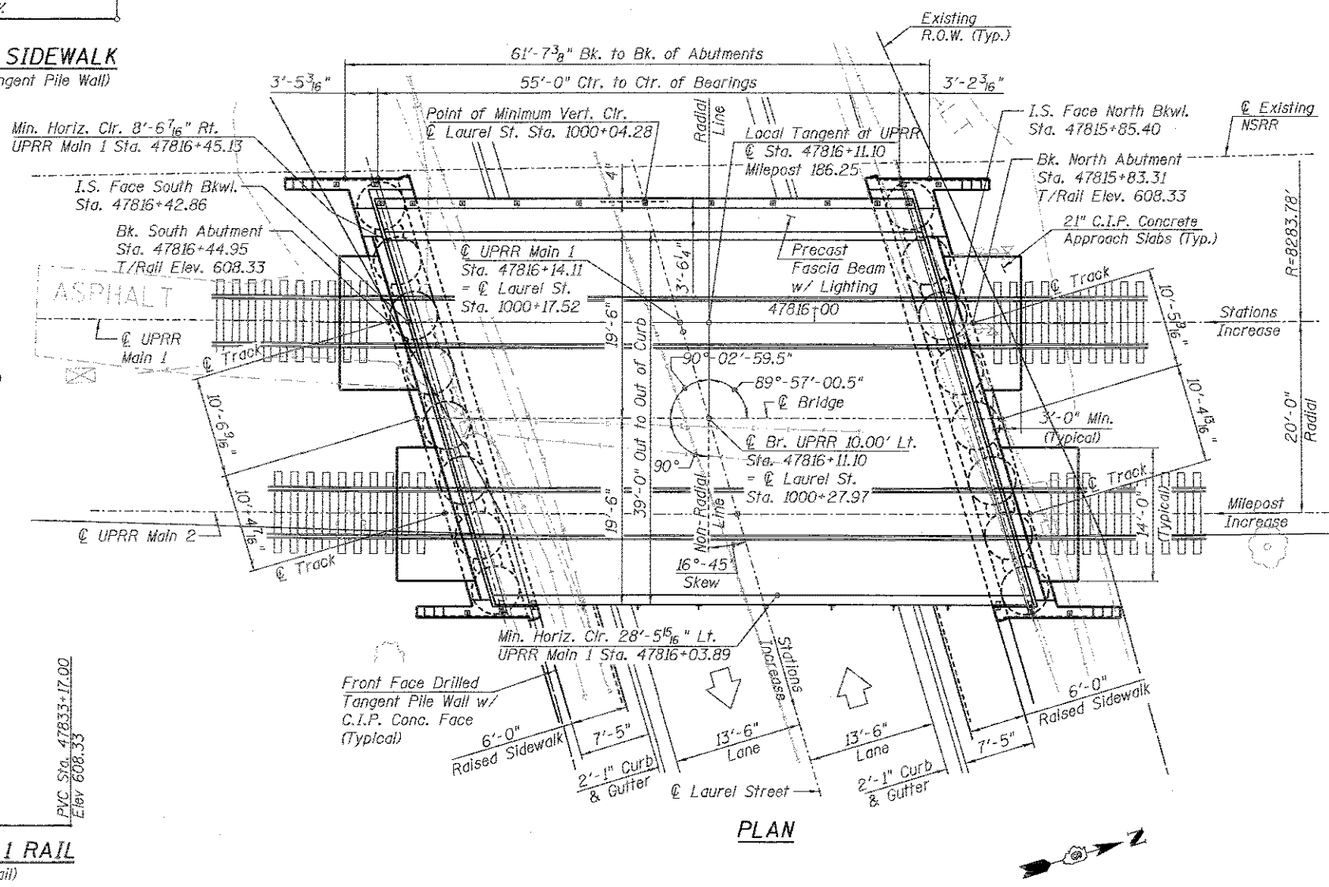
LOADING COOPER E-80
Impact: Diesel Impact
Allow 30" of Ballast Dead Load

DESIGN SPECIFICATIONS
2014 AREMA Specifications
Live Load Deflection: L/640
Composite Design for Deflection Requirements
Design Speed: 50 m.p.h.

DESIGN STRESSES
FIELD UNITS
f'c = 4,000 psi
fy = 60,000 psi (Reinforcement)
fy = 50,000 psi (ASTM A709 Grade 50)

PRECAST UNITS
f'c = 6,500 psi
f'ci = 5,000 psi
f'pu = 270,000 psi (½" ϕ Low Lax Strands)
fpbt = 201,960 psi (½" ϕ Low Lax Strands)
fy = 60,000 psi (Reinforcement)

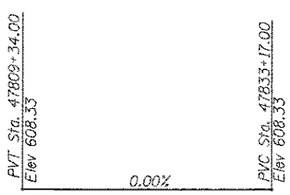
SEISMIC DATA
AREMA
Coefficient of Horiz. Acceleration, 100 Year (A_{100}) = < 0.04g
Coefficient of Horiz. Acceleration, 475 Year (A_{475}) = < 0.04g
Coefficient of Horiz. Acceleration, 2400 Year (A_{2400}) = 0.095g
Soil Site Coefficient (S) = 1.0



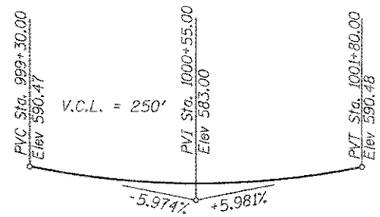
PLAN

CURVE DATA
(UPRR Main 1)

P.I. Sta. = 47824+35.33
Δ = 37°-24'-41" (Rt.)
D = 00°-41'-30"
T = 2804.81'
L = 5408.86'
R = 8283.78'
E = 461.96'
Long Chord = 5313.32'
Mid. Ord. = 437.56'
S.E. = 3/4"
S.C. Sta. = 47796+30.51
C.S. Sta. = 47850+39.38



P.G. UPRR MAIN 1 RAIL
(Along Top of Rail)



PROFILE GRADE - LAUREL ST.
Along ℄ of Laurel Street

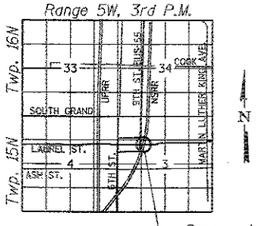
MICHAEL N. MENDENHALL
081-006657
REGISTERED STRUCTURAL ENGINEER
STATE OF ILLINOIS

SIGNATURE

02-27-2017
DATE

LIC. EXP. DATE - 11-30-2018

I certify that to the best of my knowledge, information and belief, this bridge design is structurally adequate for the design loading shown on the plans. The design is an economical one for the style of structure and complies with requirements of the current AREMA Specifications.



LOCATION SKETCH

GENERAL PLAN & ELEVATION
UPRR (MP 186.25) over LAUREL STREET
F.A.U. 7991-SECTION 14-00477-00-BR
SANGAMON COUNTY
UPRR SUBDIVISION - SPRINGFIELD
STATION 47816+11.10
STRUCTURE NO. 084-9956

DESIGNED	MNM	10/03/14
DRAWN	RAH	10/03/14
REVIEWED	JGT	10/11/2016

FINAL

pw:\\spi-svr306.hansen.dom:Hansen Projects\Documents\89Jobs\89L0179B\CAD\Struct\Laurel\Sheet\084-9956-XXXXX-001-GPE.dgn

HANSON

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USER NAME = pop80275	DESIGNED - MNM	REVISED -	
	CHECKED - JGT	REVISED -	
PLOT SCALE = 80.999998 '/ in.	DRAWN - RAH	REVISED -	
PLOT DATE = 2/27/2017	CHECKED - MNM	REVISED -	

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

GENERAL PLAN AND ELEVATION
STRUCTURE NO. 084-9956
SHEET NO. 1 OF 21 SHEETS

F.A.U. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
	14-00477-00-BR	SANGAMON	403	248
		CONTRACT NO. 93704		
	ILLINOIS FED. AID PROJECT			

GENERAL NOTES

1. Fasteners shall be ASTM A325 Type 1, mechanically galvanized bolts. Bolts $\frac{7}{8}$in. ϕ, holes $\frac{15}{16}$in. ϕ, unless otherwise noted.
2. Calculated weight of Structural Steel, ASTM A709, Gr. 50 = 290.070 lbs.
   ASTM A36, Gr. 36 = 56.820 lbs.
3. All structural steel shall be ASTM A709 Grade 50 unless otherwise noted on the plans. The deck plate shall be ASTM A36.
4. All substructure concrete shall have a compressive strength of 4,000 psi at 28 days.
5. No field welding is permitted except as specified in the contract documents.
6. Reinforcement bars designated (E) shall be epoxy coated.
7. Bearing seat surfaces shall be constructed or adjusted to the designated elevations within a tolerance of $\frac{1}{8}$ inch (0.01 ft.). Adjustment shall be made either by grinding the surface or by shimming the bearings.
8. Concrete Sealer shall be applied to the following surfaces:
   Abutments - inside face of backwall, inside face of cheekwall, top of cap, entire concrete facing attached to abutment caps and drilled shafts (except surfaces coated with concrete surface treatment).
   Superstructure - entire exposed surface of precast prestressed fascia beam and curb (except surfaces coated with surface color treatment), concrete railing end post.
9. Anti-Graffiti Protection System shall be applied to the following surfaces:
   Abutments - concrete facing, wingwall and cheekwall surfaces coated with concrete surface color treatment.
   Superstructure - surfaces coated with concrete surface color treatment.
10. The Inorganic Zinc Rich Primer / Acrylic / Acrylic Paint System shall be used for shop and field painting of new structural steel except where otherwise noted. The color of the final finish coat for all interior steel surfaces, exterior bottom of deck plate, steel curb, shall be gray, Munsell No. 5B 7/1. The color of the final finish coat for the exterior and bottom flange of the fascia beams and exterior cantilever support bracket shall be blue, Munsell No. 10B 3/6.
11. Waterproofing shall be applied to the backside of the abutment cap and backwall and backside of wingwalls for surfaces below ground. This shall be according to Article 503.18 of the Std. Spec. Cost included with Concrete Structures.

Drilled shaft cross-hole sonic log (CSL) testing:

A) Drilled shafts shall be evaluated by cross-hole sonic log testing. Testing pipes shall be installed in each drilled shaft to facilitate the logging process, which will follow completion of each shaft.

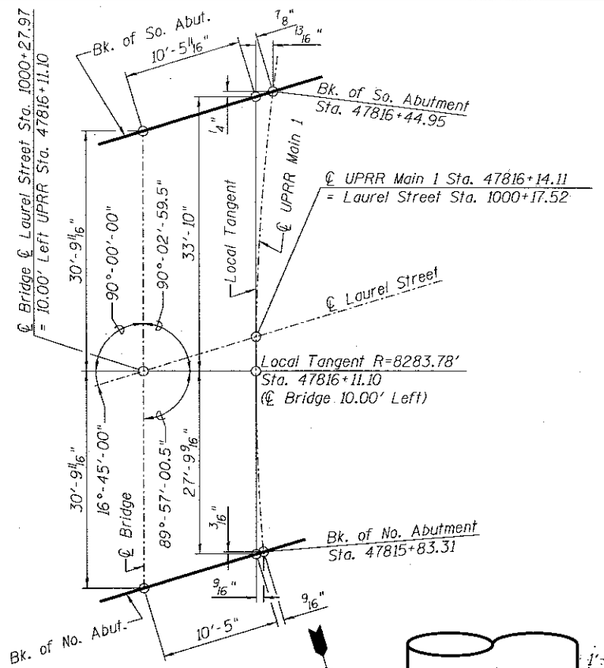
B) Furnish and install six standard 2 inch nominal diameter steel pipes (ASTM A53, Grade B) for use in CSL testing of each drilled shaft. Pipes shall be equally spaced around the interior of the reinforcing steel cage.

C) Pipes shall be sufficiently regular and free from defects so as to permit the free and unobstructed passage of the probes. Pipes shall be installed such that all internal joints are flush. Pipes shall be watertight with clean internal and external faces, the latter to ensure good bond between the concrete and the pipes.

D) Pipes shall be fitted with a screw-on watertight shoe and cap and shall be securely fixed to the interior of the reinforcing steel cage. Watertight joints shall be used to achieve the required length. The pipes shall be filled with water and plugged or capped before concrete placement. The upper end of the pipe shall not be left open during or after concrete placement. The pipes shall extend at least 2'-6" above the top of the drilled shaft concrete. The lower end of the pipes shall extend to the bottom of the shaft. Do not extend pipes into rock sockets with smaller diameter than drilled shafts.

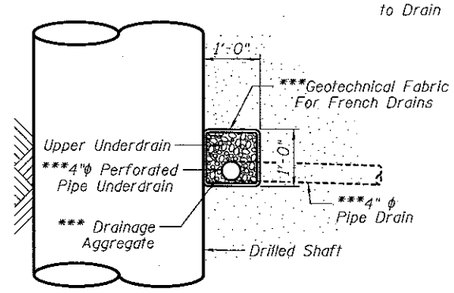
E) Allow up to 21 days for the Engineer to perform CSL testing. Grout the access ducts after the Engineer's approval of the testing results.

F) Testing will be completed by the Engineer at no cost to the Contractor. If test results are unsatisfactory according to the Engineer, the Contractor shall propose a method of correction including designs if required to the Engineer for approval. The correction shall be at the expense of the Contractor.



OFFSET SKETCH

INDEX OF SHEETS

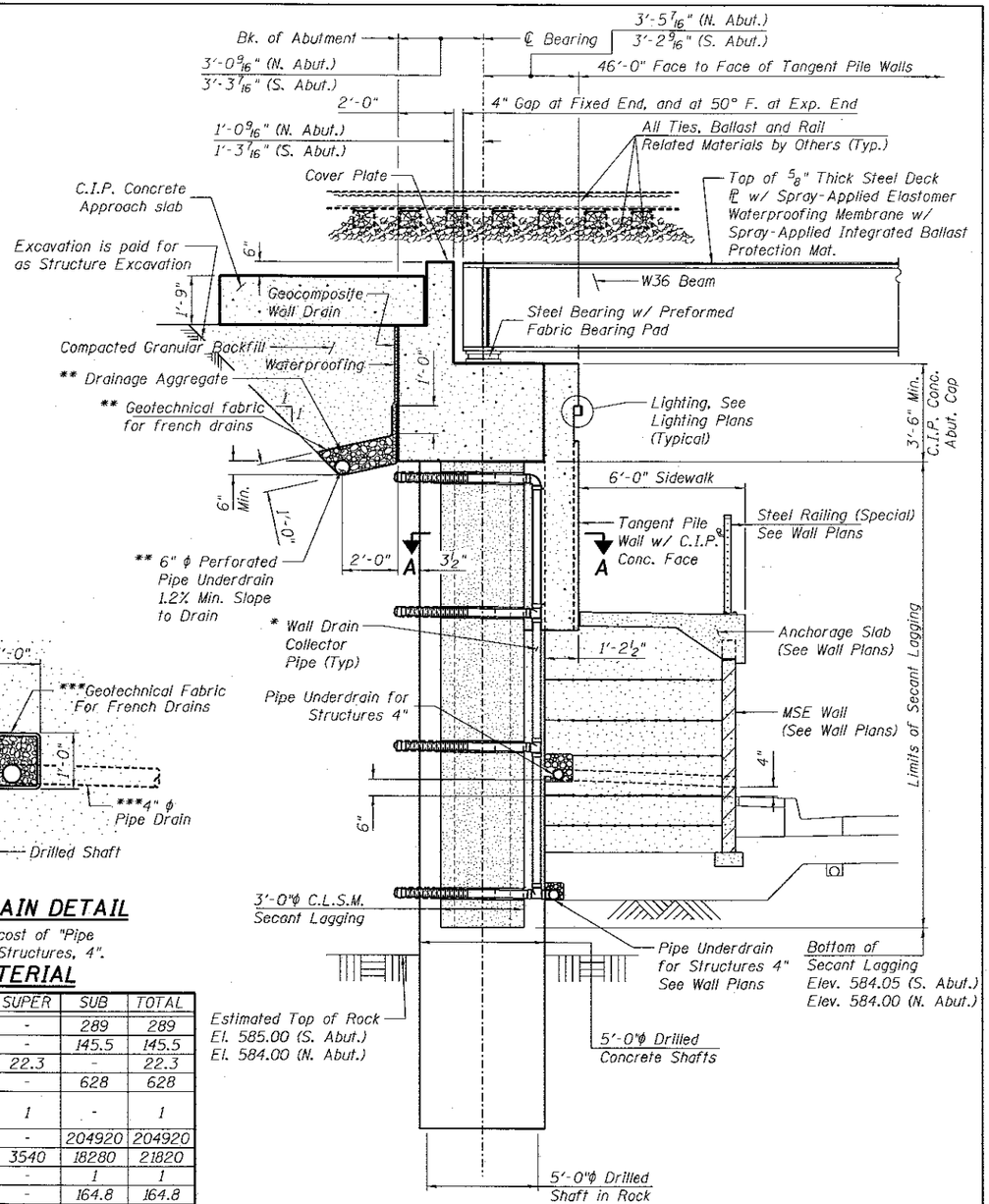


PIPE UNDERDRAIN DETAIL

***Included in the cost of "Pipe Underdrains for Structures, 4".

TOTAL BILL OF MATERIAL

ITEM	UNIT	SUPER	SUB	TOTAL
Structure Excavation	Cu. Yd.	-	289	289
Concrete Structures	Cu. Yd.	-	145.5	145.5
Concrete Superstructure	Cu. Yd.	22.3	-	22.3
Form Liner Textured Surface	Sq. Ft.	-	628	628
Furnishing and Erecting Structural Steel, Bridge No. 3	L. Sum	1	-	1
Reinforcement Bars	Pound	-	204920	204920
Reinforcement Bars, Epoxy Coated	Pound	3540	18280	21820
Name Plates	Each	-	1	1
Drilled Shaft in Soil	Cu. Yd.	-	164.8	164.8
Drilled Shaft in Rock	Cu. Yd.	-	267.6	267.6
Membrane Waterproofing (Special)	Sq. Ft.	2616	-	2616
Concrete Sealer	Sq. Ft.	1070	1642	2712
Geocomposite Wall Drain	Sq. Yd.	-	49	49
Anti-Graffiti Protection System	Sq. Ft.	172	180	352
Concrete Surface Color Treatment	Sq. Ft.	172	180	352
Granular Backfill for Structures	Cu. Yd.	-	84	84
Steel Railing (Special)	Foot	141	-	141
Pipe Underdrains for Structures, 4"	Foot	-	110	110
Pipe Underdrains for Structures, 6"	Foot	-	105	105
Precast Prestressed Concrete Fascia Beam, No. 3	L. Sum	1	-	1
Secant Lagging	Cu. Ft.	-	1449	1449
Crosshole Sonic Logging Access Ducts	Foot	-	3808	3808



ABUTMENT SECTION

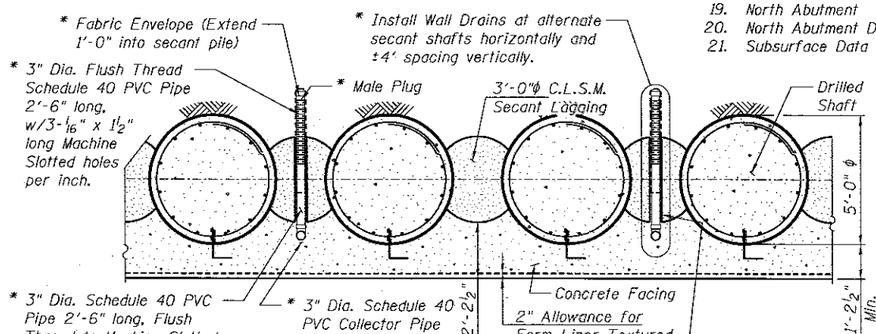
(At Rt. L's to Back of Abutment)

Notes:
South Abutment Section Shown North Similar
** Included in the cost of "Pipe Underdrains for Structures, 6". For additional drainage details see Roadway Plans.

UNION PACIFIC RAILROAD
S.N. 084-9956 BUILT 20__ BY
CITY OF SPRINGFIELD
SEC. 14-00477-00-BR
STATION 47816+11.10
MILE POST 186.25
LOADING COOPER E-80

NAME PLATE

See Std. 515001



SECTION A-A

* Included in the cost of "Pipe Underdrains for Structures, 4".

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FINAL	MNM 10/03/14	RAH 10/03/14	JGT 10/17/2016

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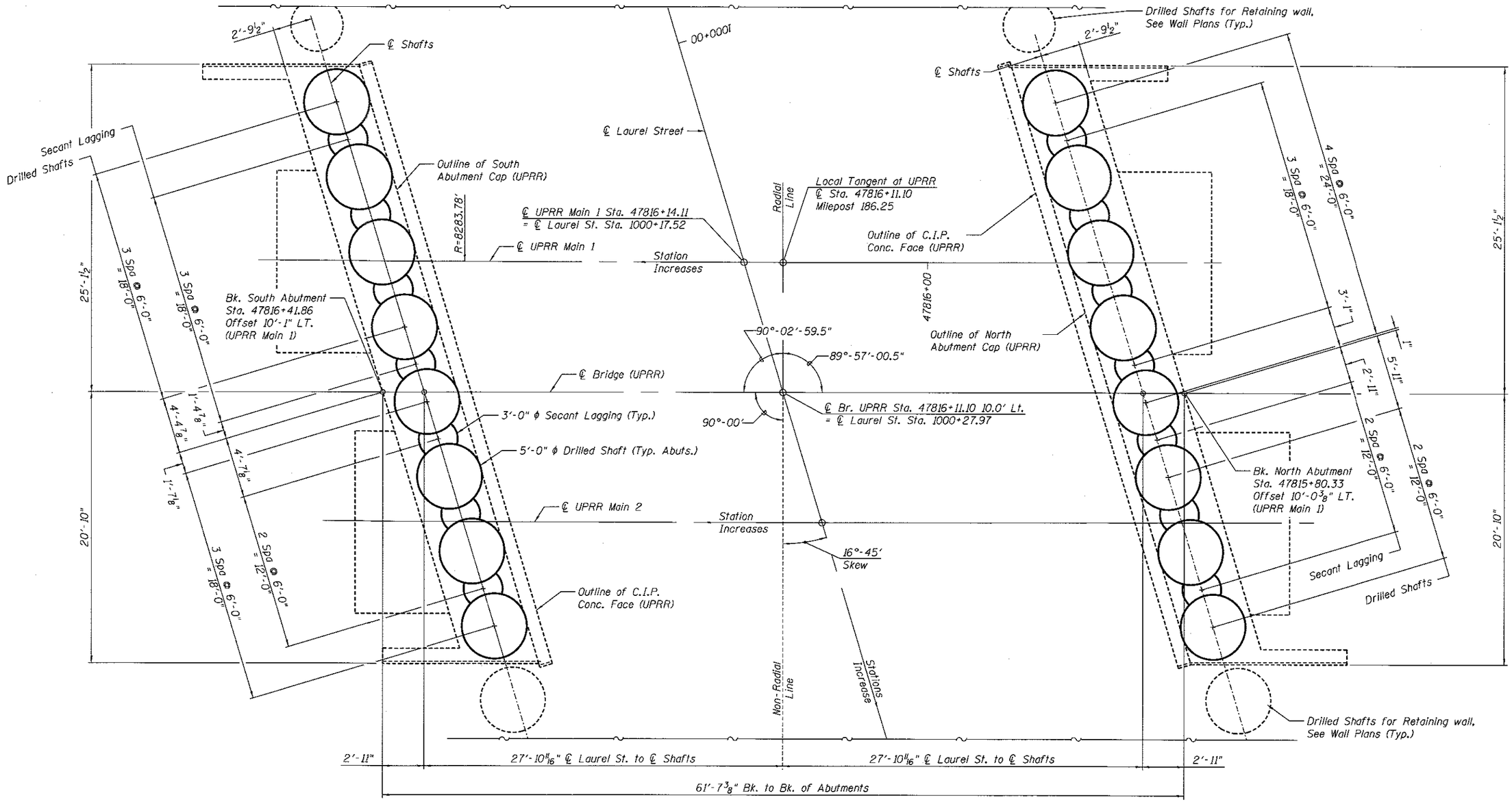
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

GENERAL DATA
STRUCTURE NO. 084-9956
SHEET NO. 2 OF 21 SHEETS

F.A.U. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
	14-00477-00-BR	SANGAMON	403	249
		CONTRACT NO. 93704		
	ILLINOIS FED. AID PROJECT			

Notes:
See Roadway Plans for existing utilities and topography.



FOUNDATION LAYOUT PLAN

FINAL

DESIGNED	JGT	12/25/14
DRAWN	DAP	12/25/14
REVIEWED	JGT	10/11/2016

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STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

FOUNDATION LAYOUT
STRUCTURE NO. 084-9956
SHEET NO. 3 OF 21 SHEETS

F.A.U. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
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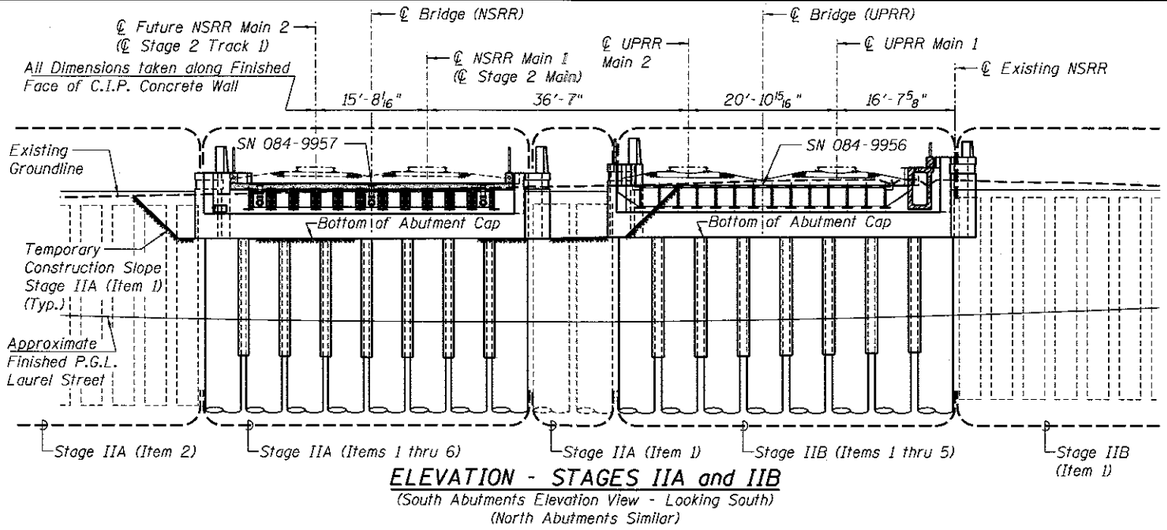
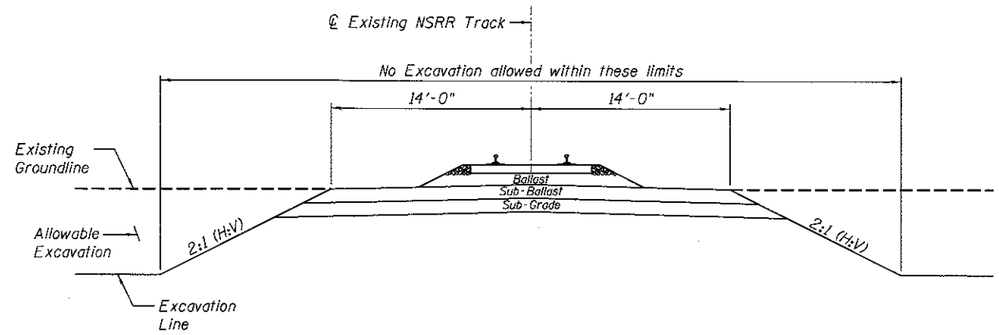
		CONTRACT NO. 93704		
	ILLINOIS FED. AID PROJECT			

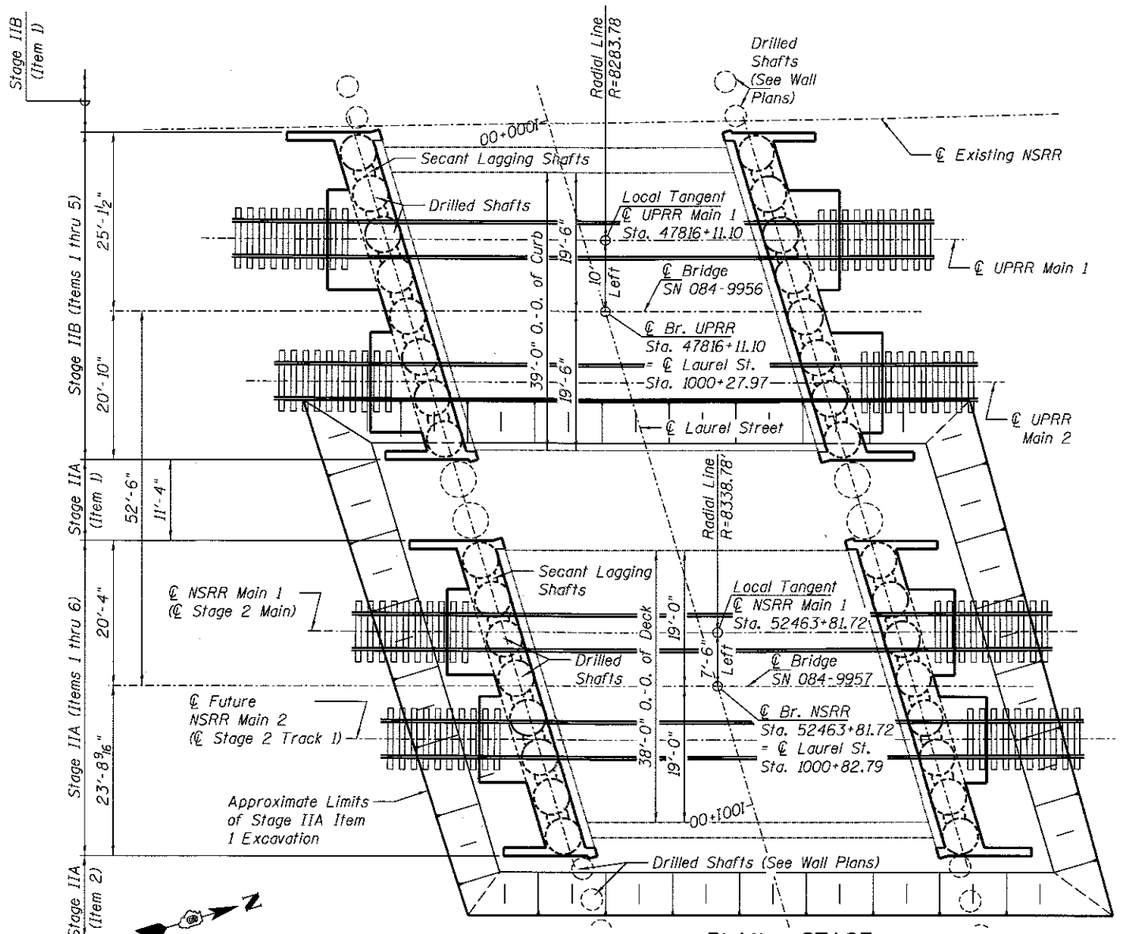


ELEVATION - STAGES IIA and IIB

(South Abutments Elevation View - Looking South)
(North Abutments Similar)



ALLOWABLE EXCAVATION SECTION - STAGE IIA



PLAN - STAGE

CONSTRUCTION SEQUENCE

Stage IIA: Rail traffic will be maintained on Stage I track.

1. NSRR structure:
   Excavate down to the elevation of the bottom of abutment caps at the NSRR Bridge.
   Drill and place the Secant Lagging and Tangent shafts for the North and South abutments.
   Retaining Walls:
   Excavate down to the the top of the Tangent shafts.
   Drill and place Tangent shafts for the retaining walls between the bridge abutments
2. Excavate down to the top of the Tangent shafts. Drill and place Tangent shafts for retaining walls East of the NSRR Bridge.
3. Construct cast-in-place concrete abutment caps for NSRR structure.
4. Excavate down to the bottom elevation of the C.I.P. concrete facing for the abutments and construct the facing.
5. Place Compacted Granular Backfill behind the abutments.
6. Place the superstructure for NSRR Structure.

Stage IIB: Rail traffic will be maintained on Stage II track.

1. UPRR structure:
   Excavate down to the elevation of the bottom of abutment caps at the UPRR Bridge.
   Drill and place the Secant Lagging and Tangent shafts for the North and South abutments.
   Retaining Wall:
   Excavate down to the top of the Tangent shafts.
   Drill and place Tangent shafts for retaining walls West of the bridges.
2. Construct cast-in-place concrete abutment caps for UPRR structure.
3. Excavate down to the bottom elevation of the C.I.P. concrete facing for the abutments and construct the facing.
4. Place Compacted Granular Backfill behind the abutments.
5. Place the superstructure for UPRR Structure.
6. Complete remaining excavation to required elevations for roadway construction.
7. Complete remaining upper retaining wall facing and construct M.S.E. wall and Complete Remaining Roadway Work.

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STATE OF ILLINOIS
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STAGE CONSTRUCTION DETAILS
STRUCTURE NO. 084-9956
SHEET NO. 4 OF 21 SHEETS

F.A.U. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
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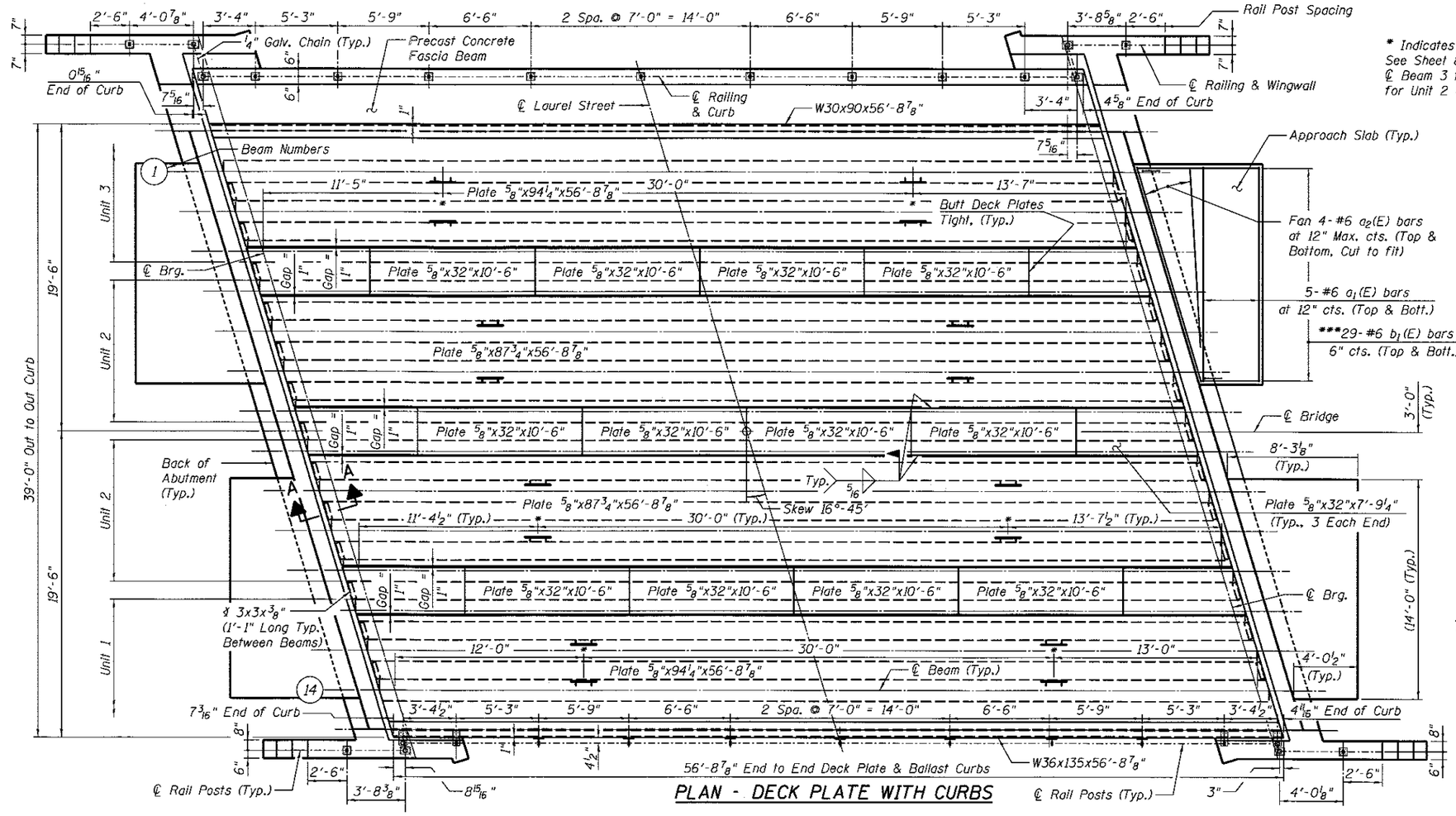
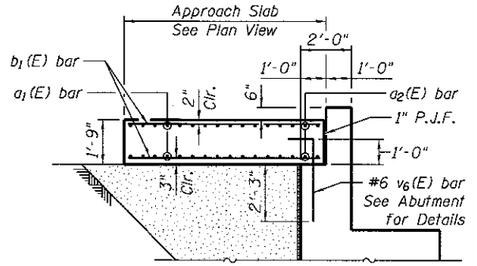
		CONTRACT NO. 93704		
	ILLINOIS FED. AID PROJECT			



PLAN - DECK PLATE WITH CURBS

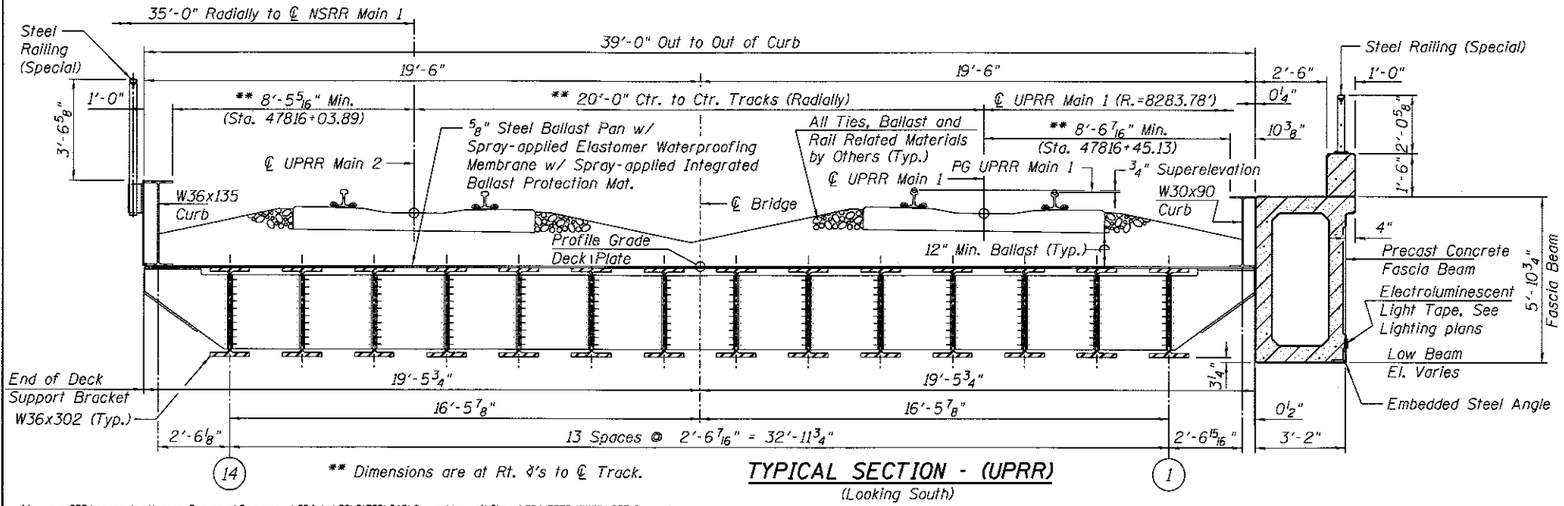
* Indicates Location of Lifting Lugs. See Sheet 8 of 21. Dimensions along ℄ Beam 3 for Unit 3, ℄ Beam 7 & 11 for Unit 2 and ℄ Beam 14 for Unit 1.



APPROACH SLAB SECTION

(Horizontal Dim. at Rt. ℄'s to back of abutment)

*** Order b1(E) bars full length. Cut to fit skew and use remainder of bars in opposite face.



** Dimensions are at Rt. ℄'s to ℄ Track.

TYPICAL SECTION - (UPRR)

(Looking South)

SUPERSTRUCTURE BILL OF MATERIAL

Bar	No.	Size	Length	Shape
a1(E)	40	#6	13'-8"	——
a2(E)	32	#6	14'-3"	——
b1(E)	116	#6	11'-8"	——
Reinforcement Bars, Epoxy Coated			Pound	3540
Concrete Superstructure			Cu. Yds.	22.3

Notes:
- See Sheet 9 of 21 for Section A-A.
- For Steel Railing Details See Sheets 15 and 16 of 21.
- For Membrane Waterproofing Details See Sheet 14 of 21.
- Approach Slab concrete shall be paid for as Concrete Superstructure.
- For 1/4" Galv. Chain Details, See Retaining Wall Plans. Cost of Chain and hardware included in the cost of Steel Railing (Special).

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STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

SUPERSTRUCTURE
STRUCTURE NO. 084-9956
SHEET NO. 5 OF 21 SHEETS

F.A.U. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
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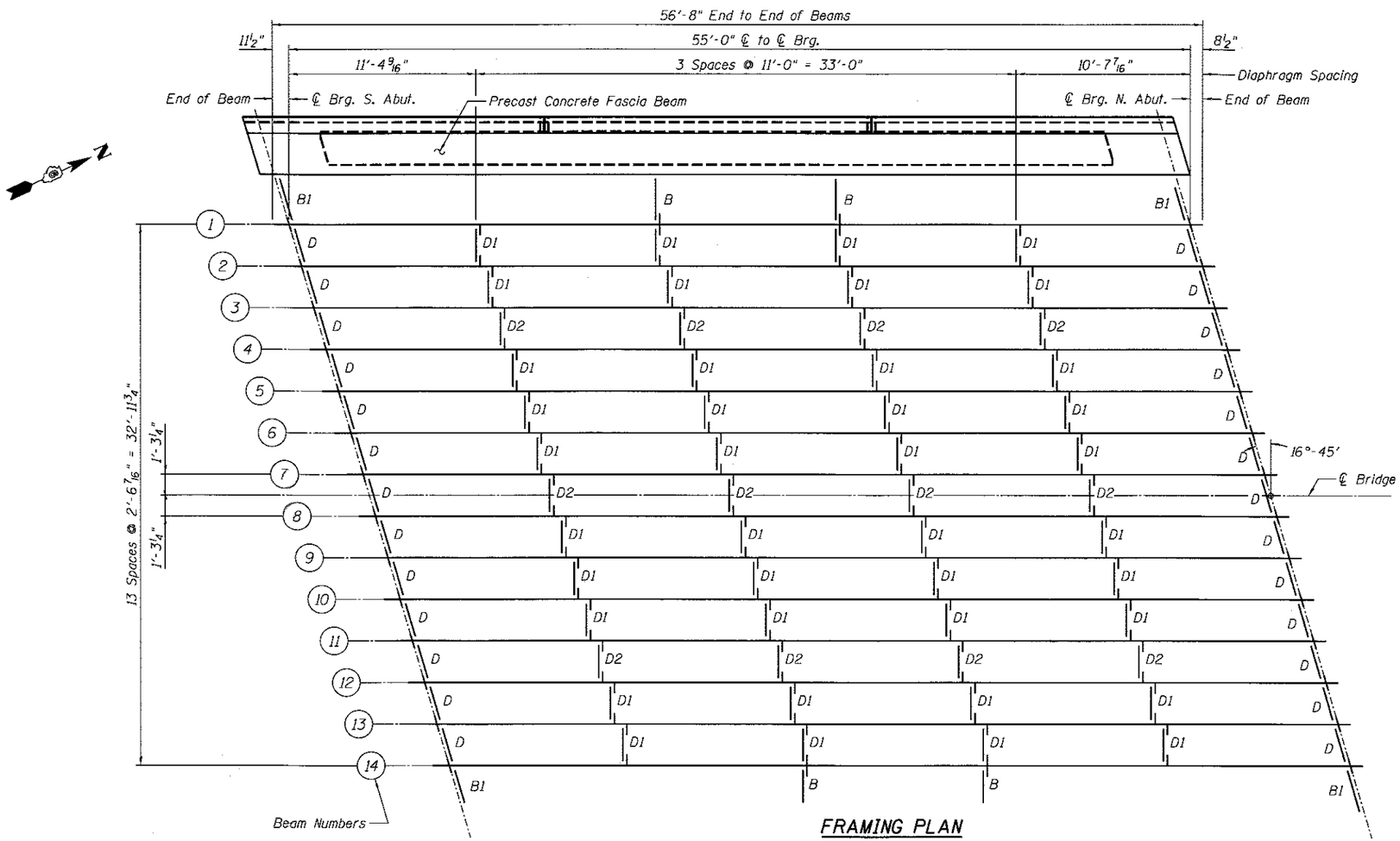
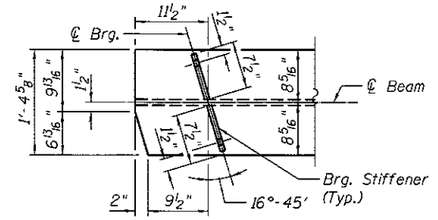
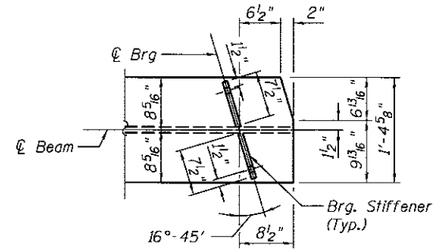
		ILLINOIS FED. AID PROJECT		



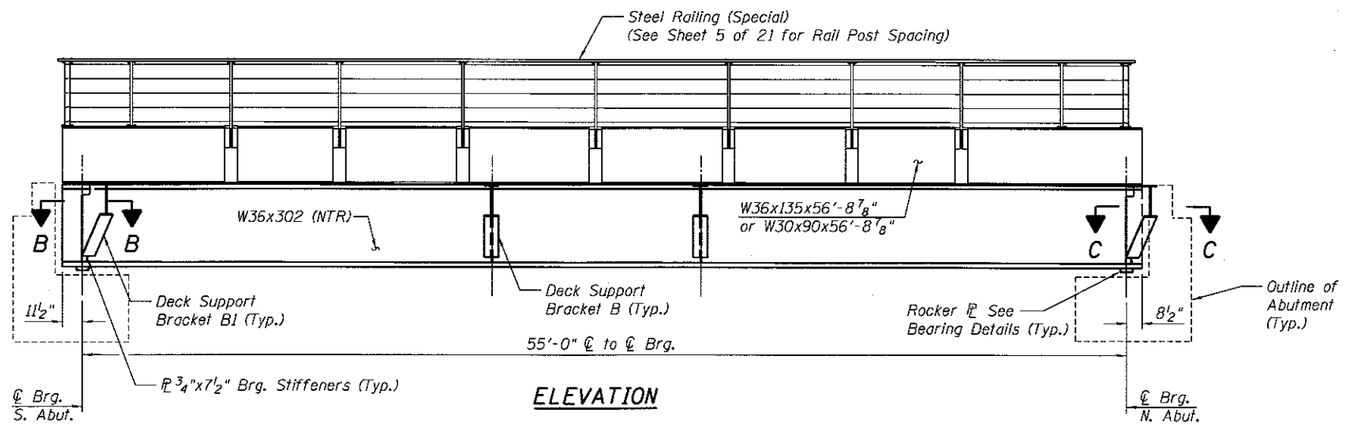
FRAMING PLAN



SECTION B-B
(Clip Top & Bottom Flange)



SECTION C-C
(Clip Top & Bottom Flange)



ELEVATION

Notes:
All diaphragms shall be installed at the fabricators shop except as otherwise noted. Individual diaphragms at supports may be temporarily disconnected to install bearing anchor rods.

Load carrying components designated "NTR" shall conform to the Impact Testing Requirement, Zone 2.

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PLOT DATE = 2/24/2017	CHECKED - JGT	REVISED -	

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

STRUCTURAL STEEL
STRUCTURE NO. 084-9956
SHEET NO. 6 OF 21 SHEETS

F.A.U. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
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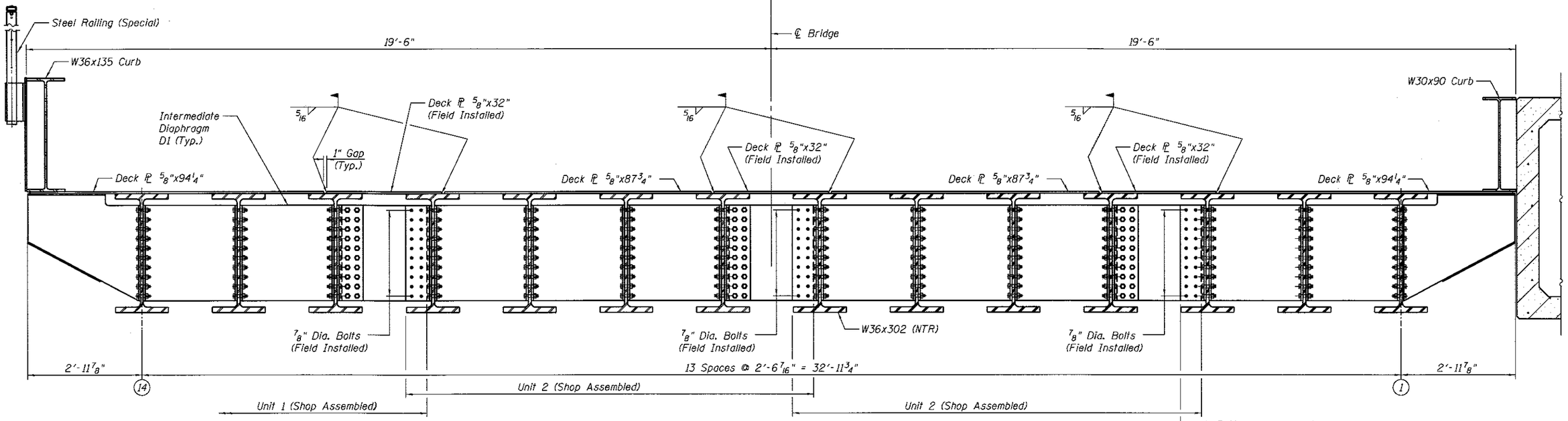
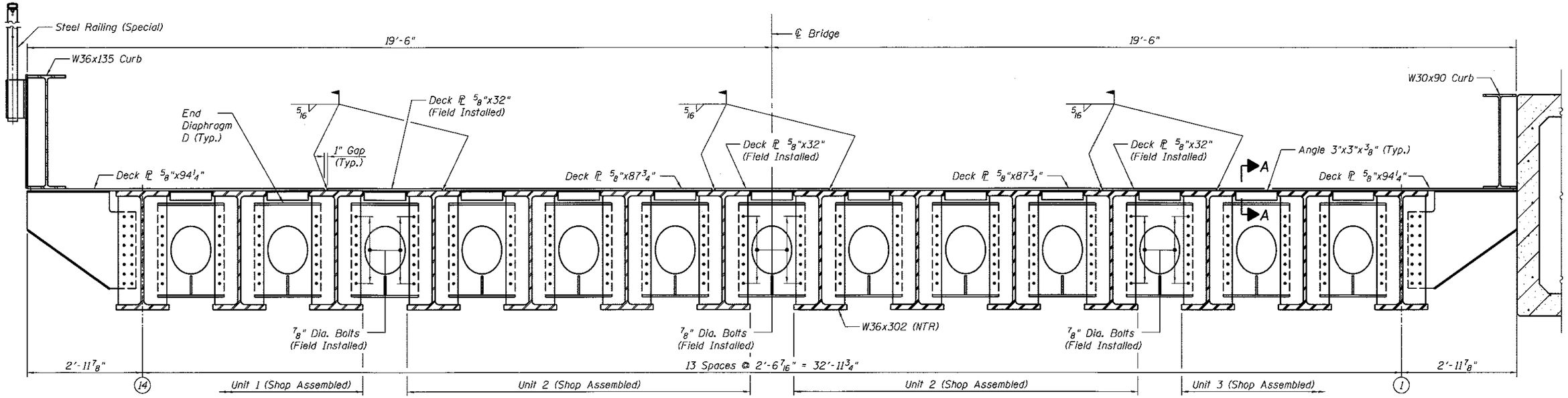
		CONTRACT NO. 93704		
	ILLINOIS FED. AID PROJECT			



SECTION - ASSEMBLED SPAN AT INTERIOR DIAPHRAGM

(Looking South)



SECTION - ASSEMBLED SPAN AT END DIAPHRAGM

(Looking South)

Notes:
Bolts shall be 7/8" ϕ placed in 15/16" ϕ holes unless otherwise noted.
Steel shall conform to ASTM A709 Gr. 50, unless otherwise noted.
See Sheet 9 of 21 for Section A-A.

DESIGNED	JGT	12/25/14
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REVIEWED	JGT	10/11/2016

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STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

STRUCTURAL STEEL DETAILS (SHEET 1 OF 3)
STRUCTURE NO. 084-9956
SHEET NO. 7 OF 21 SHEETS

F.A.U. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
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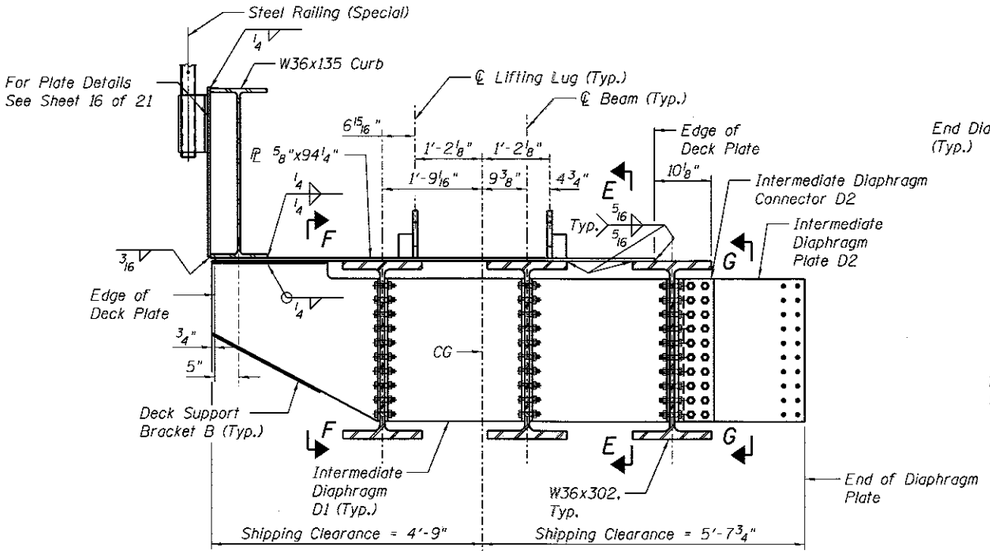
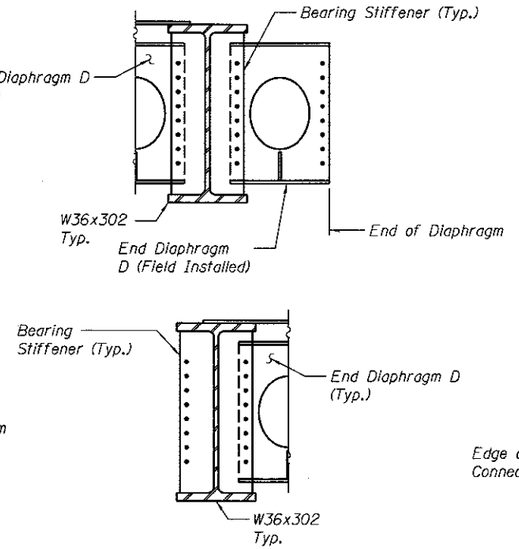
		CONTRACT NO. 93704		
		ILLINOIS FED. AID PROJECT		



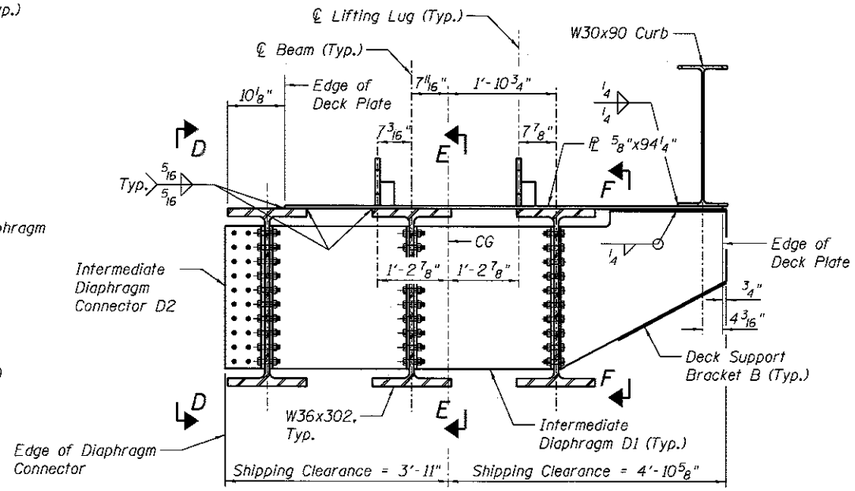
AT INTERIOR DIAPHRAGM UNIT 1

(Looking South)



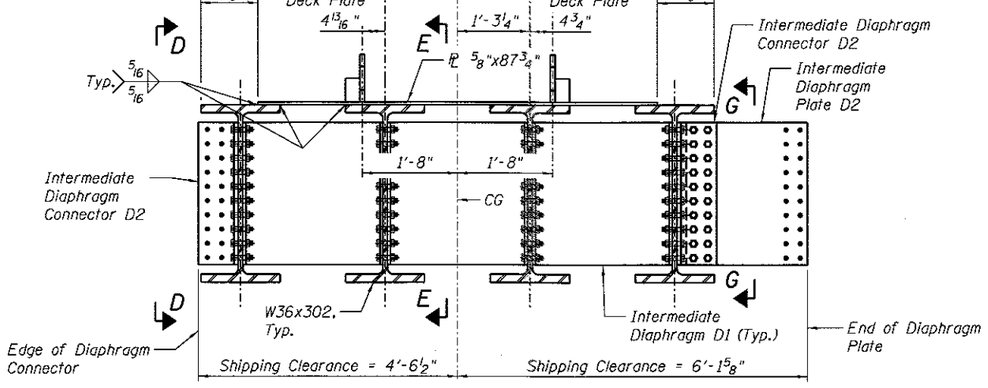
AT END DIAPHRAGM

(Partial Section shown. End Diaphragm Sections are similar to Interior Diaphragm Sections except as noted above)



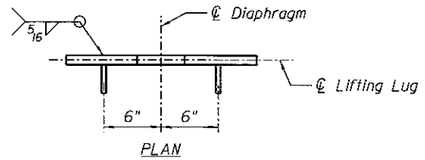
AT INTERIOR DIAPHRAGM UNIT 3

(Looking South)

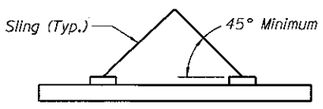


AT INTERIOR DIAPHRAGM UNIT 2

(Looking South)

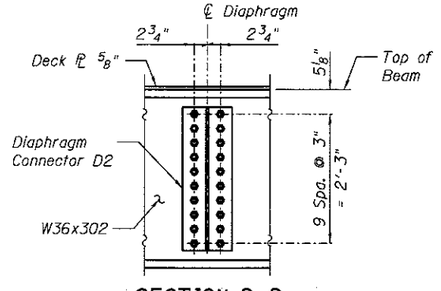


LIFTING LUG DETAIL

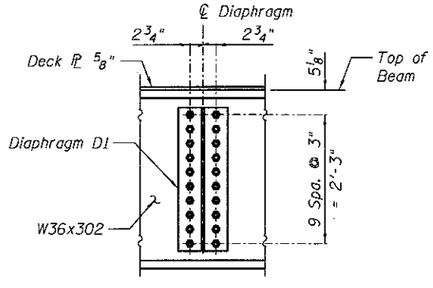


LIFTING DIAGRAM

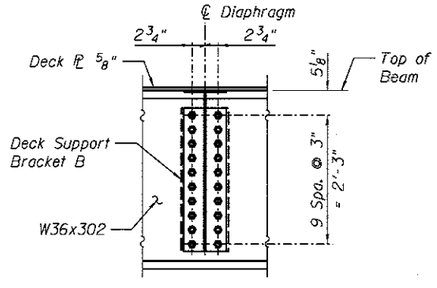
Notes:
Bolts shall be 7/8" ϕ placed in 15/16" ϕ holes unless otherwise noted.
Steel shall conform to ASTM A709 Gr. 50, unless otherwise noted.
After assembled span is in final position, lifting lugs shall be burned or ground off in a manner that will not damage the waterproofing system.



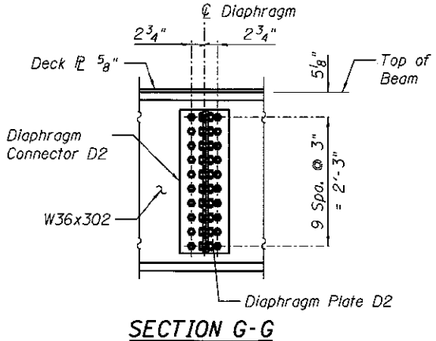
SECTION D-D



SECTION E-E



SECTION F-F



SECTION G-G

DESIGNED	JGT	12/25/14
DRAWN	DAP	12/25/14
REVIEWED	JGT	10/11/2016

FINAL

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USER NAME = pop00275		DESIGNED - JGT	REVISED -
		CHECKED - MNM	REVISED -
PLOT SCALE = 01.999996 '' / in.		DRAWN - DAP	REVISED -
PLOT DATE = 2/24/2017		CHECKED - JGT	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

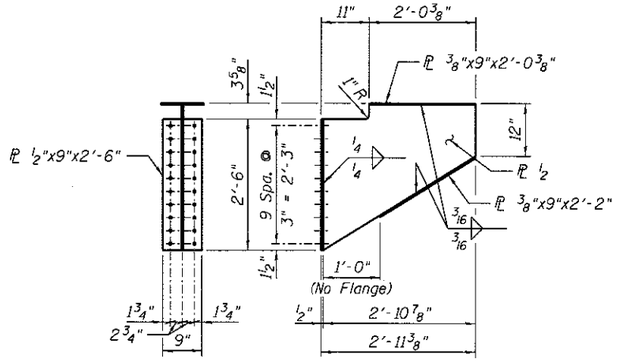
STRUCTURAL STEEL DETAILS (SHEET 2 OF 3)
STRUCTURE NO. 084-9956
SHEET NO. 8 OF 21 SHEETS

F.A.U. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
	14-00477-00-BR	SANGAMON	403	255
		CONTRACT NO. 93704		
		ILLINOIS FED. AID PROJECT		

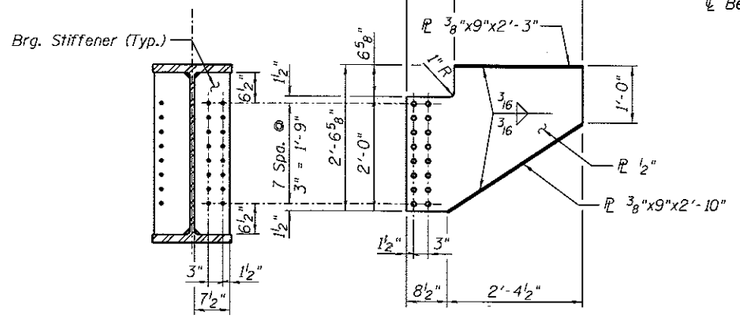
INTERIOR BEAM MOMENT & SHEAR TABLE

Description	Max Moment	Max Shear
Dead Load	488.4 ft.-k	34.5 k
Live Load	893.2 ft.-k	74.1 k
Centrifugal Force	11.0 ft.-k	0.8 k
Impact	339.4 ft.-k	28.2 k
Total	1732.0 ft.-k	138.6 k
Section	W36x302	
Steel	ASTM A709, Gr. 50, NTR Zone 2	
Net I	20,742 in^4	
Net S (Bott.)	1,112 in^3	
FST (Bott.)	18.7 ksi	
Gross I	21,100 in^4	
Gross S (Top)	1,130 in^3	
FSC (Top)	18.4 ksi	
(LL+I) Deflection	1.03 in	
Allowable (LL+I) Deflection	1.03 in	

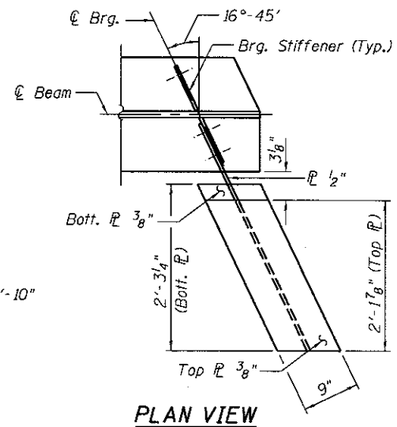
I - Non-composite moment of inertia of the steel section
S - Non-composite section modulus of the steel section
FST - Max unfactored tension stress in the section due to DL+LL+CF+Impact
FSC - Max unfactored compression stress in the section due to DL+LL+CF+Impact



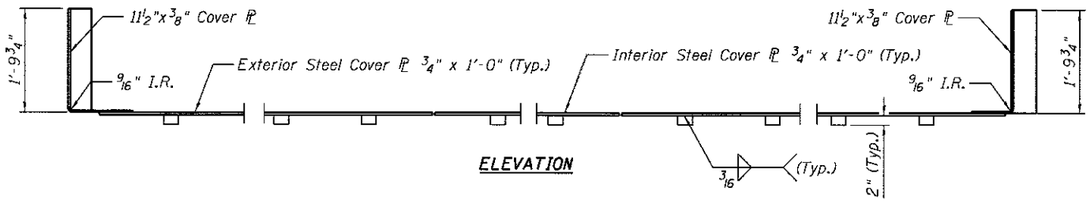
DECK SUPPORT BRACKET B
At Intermediate Diaphragm



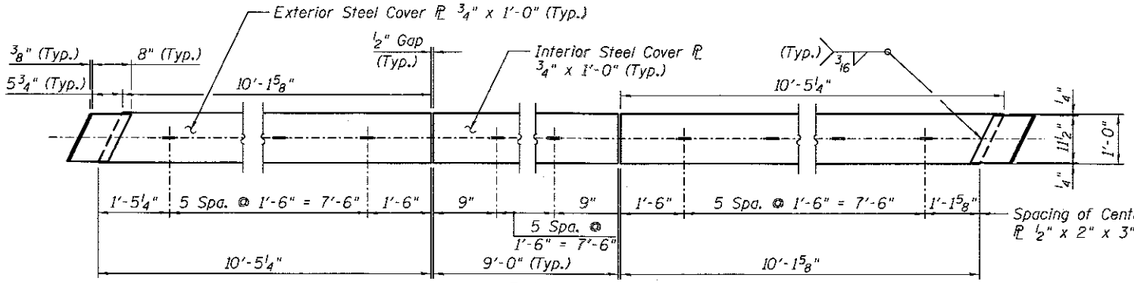
DECK SUPPORT BRACKET B1
Horiz. Dimensions Along Skew



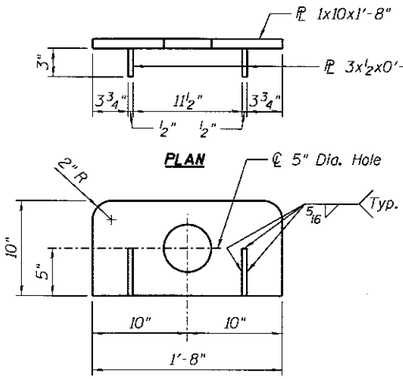
PLAN VIEW
DECK SUPPORT BRACKET B1



ELEVATION



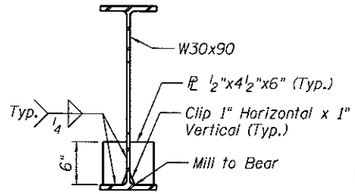
PLAN
COVER PLATES



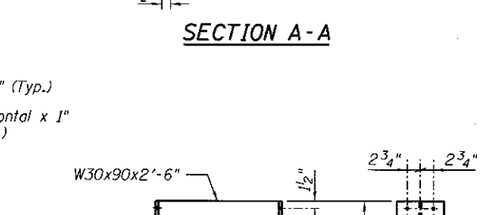
PLAN

ELEVATION

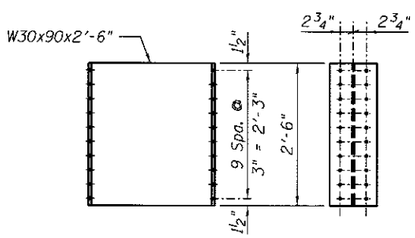
LIFTING LUG



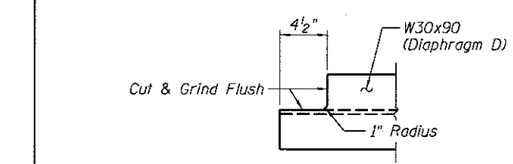
SECTION H-H



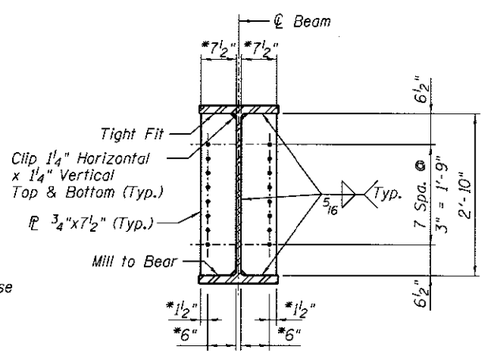
SECTION A-A



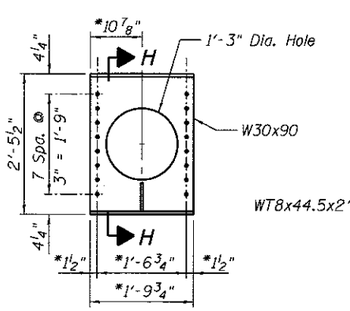
INTERMEDIATE DIAPHRAGM D1



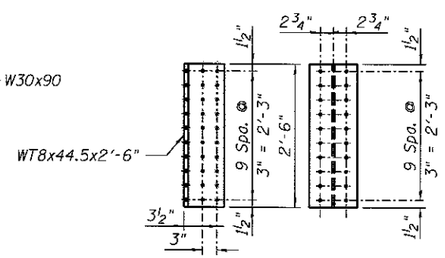
COPE DETAIL



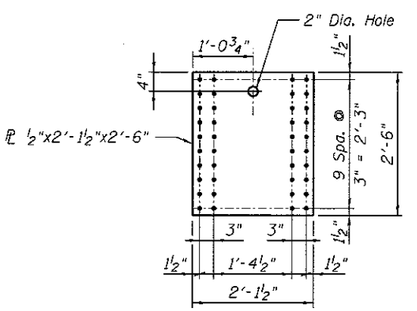
BEARING STIFFENER
*Dimensions Along Skew



END DIAPHRAGM D
*Dimensions Along Skew



INTERMEDIATE DIAPHRAGM CONNECTOR D2



INTERMEDIATE DIAPHRAGM PLATE D2

Notes:
All diaphragms shall be installed at the fabricators shop except as otherwise noted. Individual diaphragms at supports may be temporarily disconnected to install bearing anchor rods.
Load carrying components designated "NTR" shall conform to the Impact Testing Requirement, Zone 2.
Bolts shall be 7/8" ϕ placed in 15/16" ϕ holes unless otherwise noted.
Steel shall conform to ASTM A709 Gr. 50, unless otherwise noted.

FINAL

DESIGNED	JGT	12/25/14
DRAWN	DAP	12/25/14
REVIEWED	JGT	10/11/2016

pw:\\spi-svr386.hanson.dom:Hanson Projects\Documents\09Jobs\09L81798\CAD\Struct\Laurel\Sheet\084-9956-XXXXX-009-Struct Steel Det_03.dgn

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USER NAME = pop80275	DESIGNED - JGT	REVISED -	
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PLOT SCALE = 01.999996 '1' / in.	DRAWN - DAP	REVISED -	
PLOT DATE = 2/24/2017	CHECKED - JGT	REVISED -	

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

STRUCTURAL STEEL DETAILS (SHEET 3 OF 3)
STRUCTURE NO. 084-9956
SHEET NO. 9 OF 21 SHEETS

F.A.U. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
	14-00477-00-BR	SANGAMON	403	256
		CONTRACT NO. 93704		
	ILLINOIS FED. AID PROJECT			

Galvanized embedded cover brg. angle 3"x3"x1/2" (at fixed end only). See Sheet 11 of 21 for details.

56'-8 7/8" End-to-End of beam

4 3/4"

U(E) (Typ.)

4'-0"

48 Spa. @ 1'-0" cts. = 48'-0"

2'-0" (Typ.)

1'-3 3/4"

U1(E)

#4 S1(E) bar Top & Bott., (E.E.)

1'-24"

1'-0"

3 1/2" (Typ.)

3/4" ϕ Drain holes bott. (Typ.)

Galvanized embedded cover brg. plate (at expansion end only). See Sheet 11 of 21

1/4" ϕ Vent holes Top (Typ.)

3" (Typ.)

4" (Typ.)

3'-6"

2'-6"

3'-2"

1'-4"

11"

1'-0"

4"

11"

16.75° Skew

8 7/8"

℄ 2" ϕ Holes for 1 1/4" ϕ Threaded Rod (F1554 Gr. 55) embedded 24" into Abutment Cap w/ 4"x4"x5/16" ℍ washer under nut in formed 3" deep grout pockets in top of beam (at fixed end only). See Detail 'B' this sheet.

4'-0"

18'-4 7/16"

20'-0"

Spa. #4 A(E) bars Top & #4 S(E) bars Top & Bottom

18'-4 7/16"

7 Spa. @ 6" cts. = 3'-6"

℄ Lifting Loops, (2) at each end. See "Lifting Loop Detail".

Fan 1-#4 S1(E) bars Top & Bottom, cut to fit. (E.E.)

PLAN

BAR A(E)

8"

10"

1'-7"

1'-9"

10"

BAR D(E)

3" Radius

1 1/4" ϕ Conduit

Top of Beam

1'-0"

8"

4"

5'-5 1/2"

4 - 1/2" ϕ 270 ksi strands

6"

6"

Fan at ±6" cts.

Fan at ±6" cts.

LIFTING LOOP DETAIL

56'-8 7/8" End-to-End of beam

57-#4 D(E) bars at 12" cts.

8 7/8"

A(E)

4-#4 B1(E) bars, See Section A-A

4-#4 B2(E) bars, See Section A-A

A

4-#4 B1(E) bars, See Section A-A

A(E)

B

2"x4" drain opening (Typ.)

60° min. angle of lift

1'-6"

7"

7'-4 3/4"

4'-8 3/4" Void

S1(E)

S(E)

U(E)

S1(E)

Formed 3" deep grout pockets for washer, nut and non-shrink grout. Bottom of pocket dimensions of 4"x4" and top dimensions of 8"x8". (at fixed end only) See Detail 'B' this sheet.

Embedded 6"x6"x1" Angle. Galvanized w/ 3/4"ϕx4" Studs Galvanized @ 2'-0" cts. Alternate Spacing (space to miss strands) See Sections A-A & B-B (58 Studs Req'd. per bm.)

Curb Joint (Typ.) See Sheet 11 of 21 for details

Note: See Sheet 11 of 21 for recess in Fascia Beam.

S1(E)

S(E)

U(E)

S1(E)

2'-0"

7"

5-#4 U1(E) bars (E.E.)

A

Embedded Plate 1 1/8", Expansion end only

U1(E)

B

ELEVATION

(Looking East)

BARS S(E) & S1(E)

S(E) 2'-8"

S1(E) 2'-10"

3'-11"

5'-5"

1'-3"

BAR U(E)

℄ 2"ϕ Hole

4"

4"

Non-Shrink Grout

1"

3"

2"

2"

2"

Finished Top of Precast Fascia Beam

DETAIL 'B'

1'-6"

2'-6"

3"

B1(E) or B2(E) (Typ.)

2" Cl. Typ.

D(E)

1 1/2" Cl.

1'-6"

3"

12"

7"

6"

4"

A(E)

S(E)

3" Cl.

5'-10 3/4"

4'-8 3/4" Void

7"

2'-0"

7"

1" Recess

1'-0"

3" Typ.

3" Typ.

S(E)

7"

B(E), adjust to miss studs (Typ.)

Embedded 6" Galv. Angle

8 1/2"

2 1/4" Cl.

7 Spa. @ 3" cts.

8 Strands

8 1/2"

℄ 3" Strands

11"

9x2-#6 B(E) bars @ 7" Each Face, Full Length

SECTION A-A

(8 ~ 1/2"ϕ 270 ksi low relaxation strands)

6x2-#6 B(E) bars @ 6" cts., Full Length

8"

4"

℄ Lifting Loops

1'-2 1/4"

1'-0"

1'-3 3/4"

1'-0" Projection

See "Lifting Loop Detail"

S1(E)

4-#4 U(E) bars each end

S1(E)

U1(E)

B(E)

1" Recess

℄ 3/4"ϕx4" Studs

Embedded 6" Galv. Angle

Embedded 1 1/8" Plate

SECTION B-B

(8 ~ 1/2"ϕ 270 ksi low relaxation strands)

℄ Fascia Beam

Embedded Galvanized ℙ 1 1/8"

Bearing ℙ 1 3/4" w/ Stainless Steel ℙ 1/8". 1/8" fillet weld all around.

1 3/8" ϕ Holes 1" deep in top ℙ for 1 1/4" ϕ pintles. Thread or press fit in Base ℙ. (2 Required per Brg.)

℄ 3/4" ϕ x 4" Studs automatically end welded (4 Required per Bearing)

1" 6" 1'-0" 1'-0" 7"

9 1/2" 9 1/2" 9 1/2" 9 1/2"

6" 1'-1" 1'-1" 6"

Side Retainer (Typical)

℄ 1 1/2" ϕ x 18" Anchor Bolt (F1554 Gr. 55) w/ 3"x3"x5/16" ℍ washer under nut. Blockouts in cap to be filled after beams are in place.

1"

1"

1'-10 3/8"

1'-10 3/8"

1" Fabric Pads w/ 1/8" Layer PTFE bonded per manufacturer's recommendations

SECTION C-C

Abut. Backwall (F.F.)

C

℄ Brg.

11 15/16"

4 3/16"

6" 1'-0" 6"

See Detail 'A' this sheet

3" Brg. Ht.

1'-4 1/8"

C

EXP. BEARING ELEVATION

(Horiz. Dimensions along ℄ Beam)

16°-45'

Edge of Beam (Typ.)

3'-2"

1/4" (Typ.)

End of Beam

1'-11"

11 7/16"

11 7/16"

℄ Brg.

Outline of S.S. Plate

Brg. & Embedded ℙ

Side Retainer (Typ.)

EXP. BEARING PLAN

Embedded Bearing ℙ

Bearing ℙ w/attached S.S. ℙ

5/8" Clr.

5/16

6"

℄ 1 3/4"ϕ Hole

5/8"

3 1/2"

8"

1/2"

2 3/4"

5 1/2"

S.S. ℙ 1/8"

Fabric Bearing Pad w/ PTFE

5/8"

4 7/8"

5/8"

5 1/2"

1/4"

1"

SIDE RETAINER

Equivalent rolled angle with stiffeners will be allowed in lieu of welded plates.

5 15/16"

6"

Embedded Galvanized ℙ 1 1/8"

Bearing ℙ 1 3/4"

Stainless Steel ℙ 1/8"

1" Fabric Pad w/PTFE layer

1/8"

1/8"

1"

6 1/4" (Typ.)

1/8" c.f.w.

1/4" (Typ.)

DETAIL 'A'

7/8"

1"

3" R.

1 1/4"ϕ

PINTLE

Notes:
See Sheet 11 of 21 for Notes.

BAR LIST ONE BEAM ONLY

(For Fabrication Only)

Bar	No.	Size	Length	Shape
A(E)	63	#4	5'-3"	
B(E)	48	#6	29'-6"	
B1(E)	8	#4	18'-0"	
B2(E)	4	#4	19'-8"	
D(E)	57	#4	5'-5"	
S(E)	126	#4	10'-6"	
S1(E)	8	#4	10'-8"	
U(E)	8	#4	7'-11"	
U1(E)	10	#4	5'-11"	

MINIMUM BAR LAP

#4 bar = 2'-0"
#6 bar = 2'-7"

FINAL

DESIGNED	JGT	12/25/14
DRAWN	DAP	12/25/14
REVIEWED	JGT	10/11/2016

pw:\\spi-svr386.hanson.dom:Hanson Projects\Documents\09Jobs\09L81798\CAD\Struct\Laurel\Sheet\084-9956-XXXXX-810-Precast Fascia Beam.dgn

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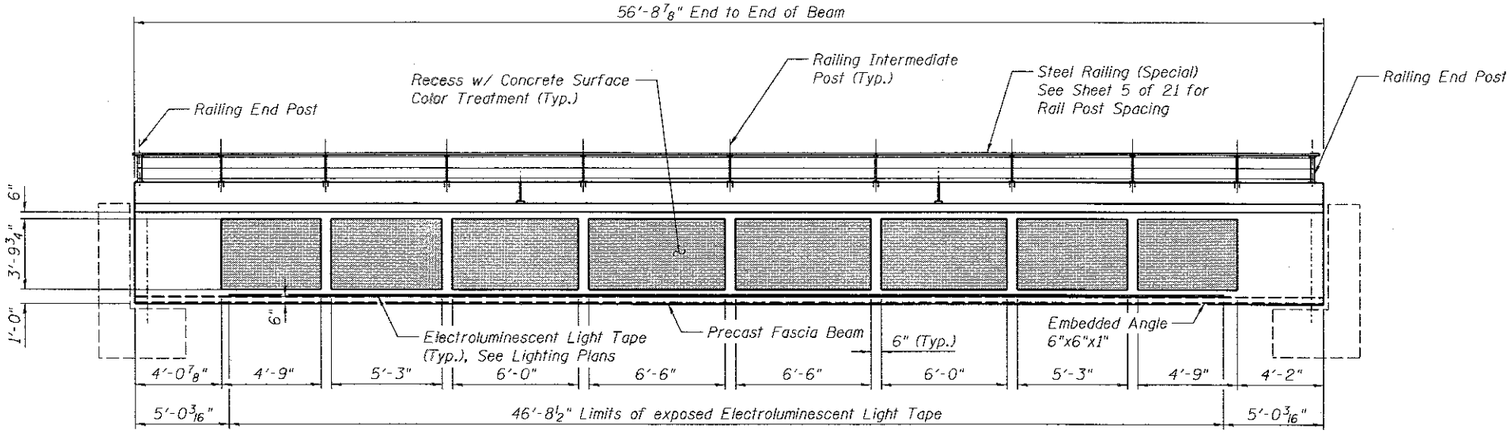
USER NAME = pop80275	DESIGNED - JGT	REVISED -
	CHECKED - MNM	REVISED -
PLOT SCALE = 81.999998 '/ in.	DRAWN - DAP	REVISED -
PLOT DATE = 2/24/2017	CHECKED - JGT	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

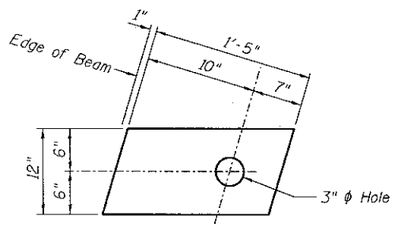
PRECAST FASCIA BEAM
STRUCTURE NO. 084-9956
SHEET NO. 10 OF 21 SHEETS

F.A.U. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
	14-00477-00-BR	SANGAMON	403	257
		CONTRACT NO. 93704		
	ILLINOIS FED. AID PROJECT			

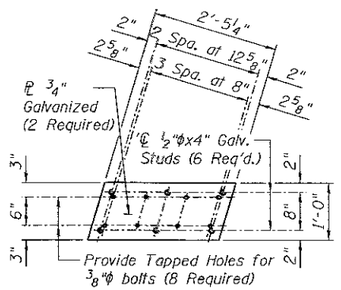


ELEVATION PRECAST FASCIA BEAM

(Looking East, Horizontal Dimensions along outside face of web)

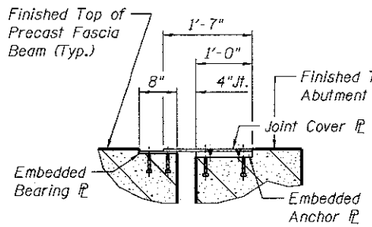


FABRIC BEARING PAD



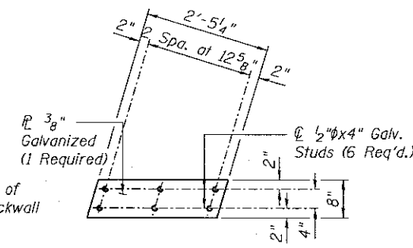
EMBEDDED ANCHOR PLATE

(1 Required at Each Abutment Backwall)



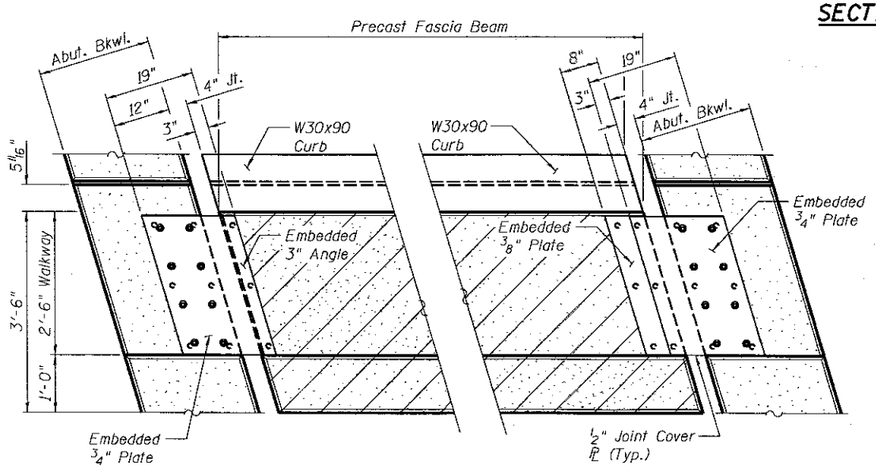
SECTION AT EXPANSION JOINT

(At Rt. ℄'s to Bk. of Abut.)



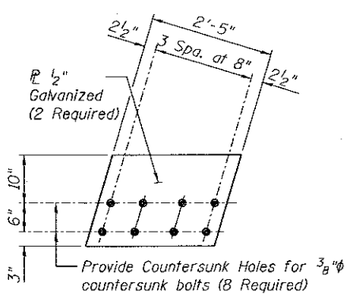
EMBEDDED BEARING PLATE

(1 Required at Expansion End of Fascia Beam)



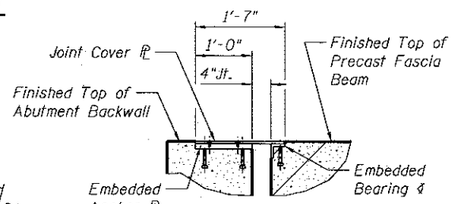
PLAN - FIXED JT. COVER AT NORTH ABUTMENT

PLAN - EXPANSION JT. COVER AT SOUTH ABUTMENT



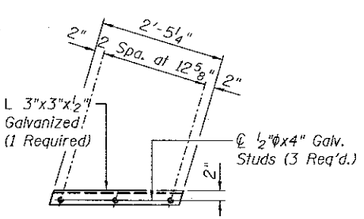
JOINT COVER PLATE

(1 Required at each Fascia Beam Joint)



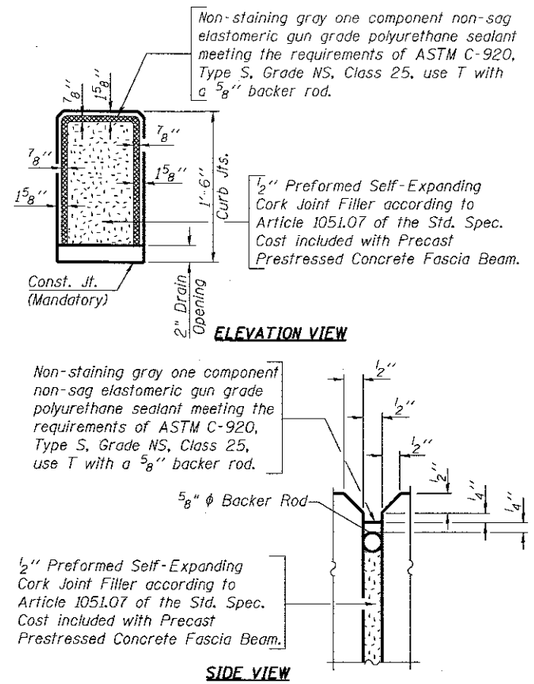
SECTION AT FIXED JOINT

(At Rt. ℄'s to Bk. of Abut.)



EMBEDDED BEARING ANGLE

(1 Required at Fixed End of Fascia Beam)



CURB JOINT DETAILS

Notes:

For Railing Details See Sheet 15 of 21.

All (embedded and separate) hardware, angles, bearing plates, side retainers, anchor bolts, threaded rods, nuts, washers and pintles shall be galvanized according to AASHTO M111 and ASTM 385 or M232 as applicable.

Prestressing steel shall be uncoated high strength, low relaxation 7-wire strand, Grade 270. The nominal diameter shall be 1/2" and the nominal cross-sectional area shall be 0.153 sq. in.

Reinforcement bars shall conform to ASTM A 706, Grade 60.

Two 1/8" fabric adjusting shims of the dimensions of the bearing pads shall be provided for each bearing pad location.

All bearing pads shall be 1" thick. Omit holes when using expansion bearings. Expansion bearing pad shall be bonded to the substructure.

Expansion bearing pad shall have PTFE bonded to top surface. PTFE surface shall be bonded according to manufacturers recommendations.

Corrosion Inhibitor, per Article 1020.05(b)(12) and 1021.07 of the Standard Specifications, shall be used in the concrete for Precast Prestressed Concrete Fascia Beams. Compressive strength of prestressed concrete, f'c, shall be 6500 psi. Compressive strength of prestressed concrete at release, f'ci, shall be 5000 psi. Embedded angles, Side Retainers, Anchor Bolts, plates, studs, bearing pads, Threaded Rods, Non-Shrink Grout and accessories shall be included in the cost of Precast Prestressed Concrete Fascia Beam.

Concrete curb shall be cast with the precast fascia beam and included in the cost of Precast Prestressed Concrete Fascia Beam.

Anchor bolts shall be ASTM F1554 all-thread (or an Engineer-approved alternate material) of the grade(s) and diameter(s) specified. The corresponding specified grade of AASHTO M314 anchor bolts may be used in lieu of ASTM F1554.

Anchor bolts and Threaded Rods shall be installed in blockouts with Non-Shrink Grout meeting the material requirements of Article 1024.02 of the Standard Specifications. Blockouts shall be clean prior to grouting and grout installed according to manufactures recommendations. Cost for non-shrink grout shall be included in the cost of Concrete Structures.

All references and details for the Precast Fascia Beam on this sheet are applicable to the C.I.P. Fascia Beam Alternative shown on sheet 12 of 21 except for prestressing requirements.

BILL OF MATERIAL

ITEM	UNIT	TOTAL
Precast Prestressed Concrete Fascia Beam, No. 3	L. Sum	1
Concrete Surface Color Treatment	Sq. Ft.	172

FINAL

DESIGNED	JGT	12/25/14
DRAWN	DAP	12/25/14
REVIEWED	JGT	10/17/2016

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	CHECKED - MNM	REVISED -	
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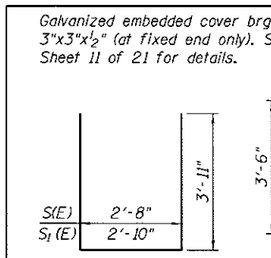
PLOT DATE = 5/25/2017	CHECKED - JGT	REVISED -	

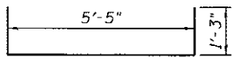
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

PRECAST FASCIA BEAM DETAILS
STRUCTURE NO. 084-9956
SHEET NO. 11 OF 21 SHEETS

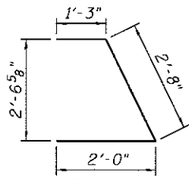
F.A.U. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
	14-00477-00-BR	SANGAMON	403	258
		CONTRACT NO. 93704		
	ILLINOIS FED. AID PROJECT			



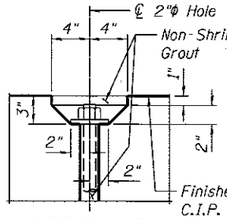
BARS S(E) & S_1(E)



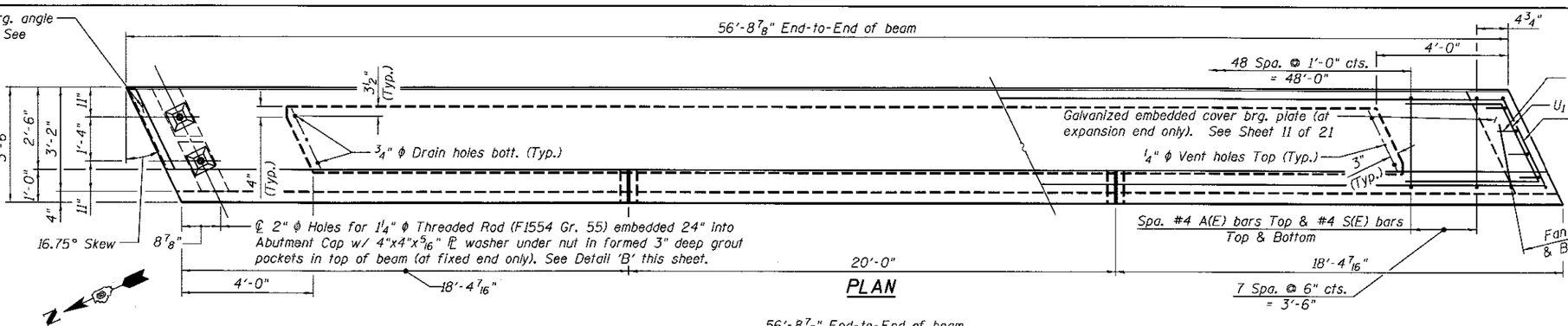
BAR U(E)



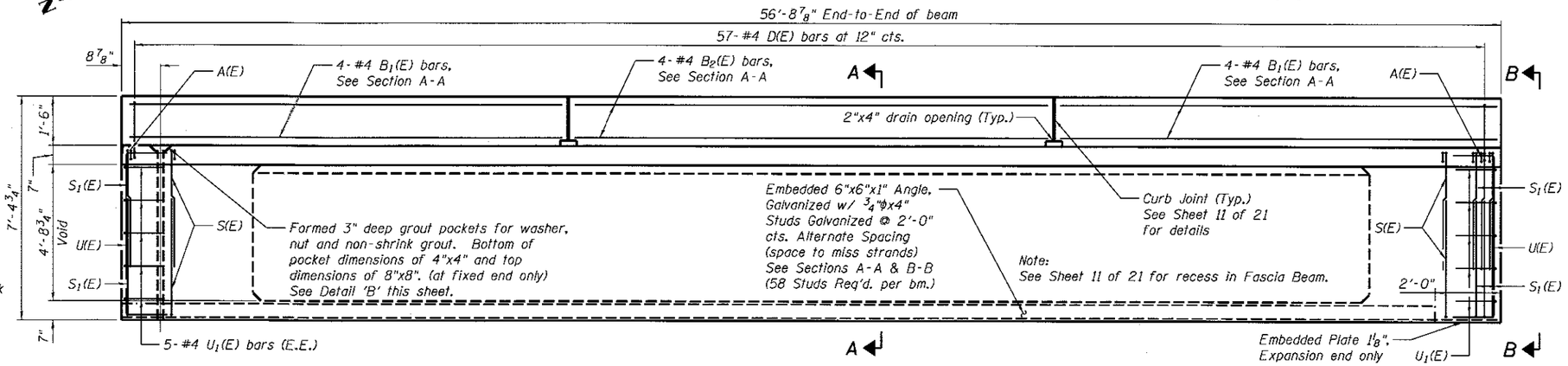
BAR U_1(E)



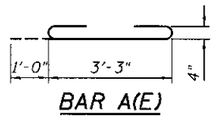
DETAIL 'B'



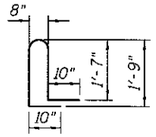
PLAN



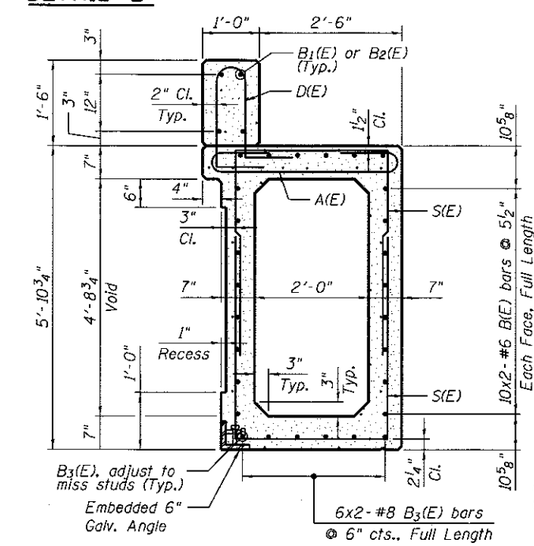
ELEVATION
(Looking East)



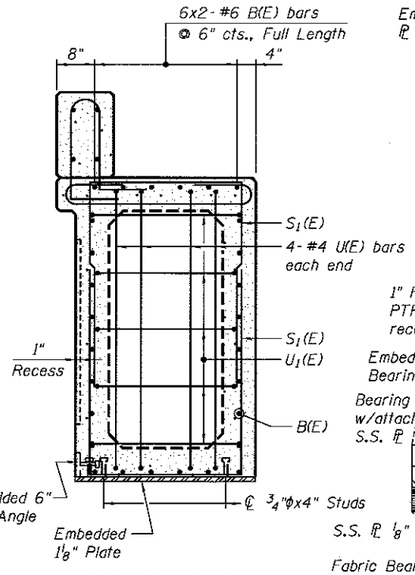
BAR A(E)



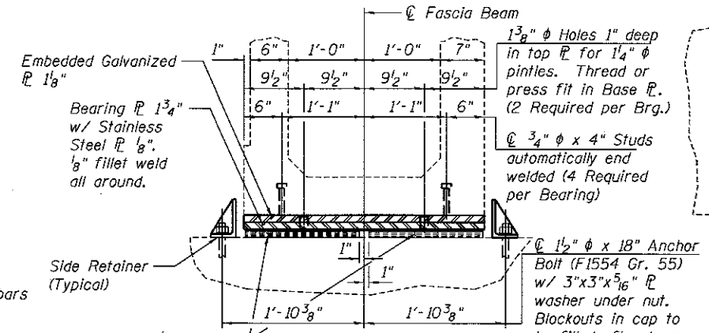
BAR D(E)



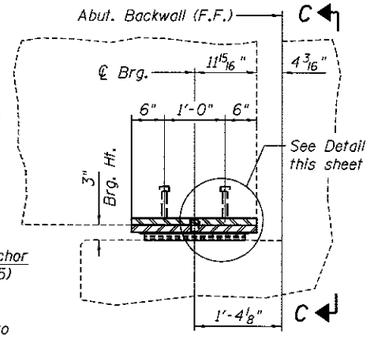
SECTION A-A



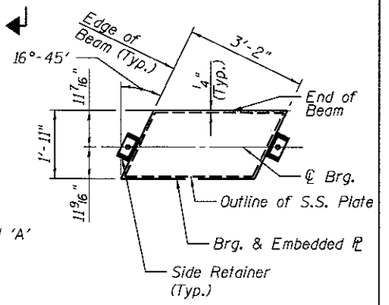
SECTION B-B



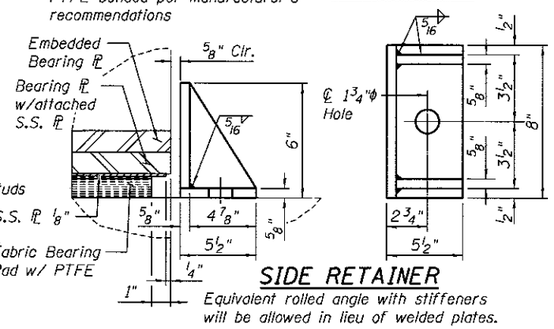
SECTION C-C



EXP. BEARING ELEVATION
(Horiz. Dimensions along ℄ Beam)

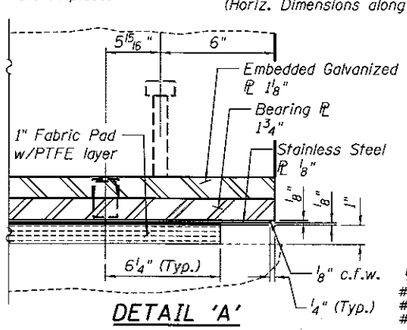


EXP. BEARING PLAN

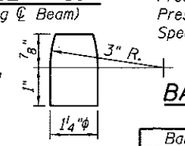


SIDE RETAINER

Equivalent rolled angle with stiffeners will be allowed in lieu of welded plates.



DETAIL 'A'



PINTLE

MINIMUM BAR LAP

#4 bar = 2'-0"
#6 bar = 2'-7"
#8 bar = 4'-6"

Notes:
See Sheet 11 of 21 for Notes.
The Contractor may elect to construct the C.I.P. Fascia Beam instead of the Precast Fascia Beam. See Precast Prestressed Concrete Fascia Beam Special Provisions for additional information.

BAR LIST ONE BEAM ONLY
(For Fabrication Only)

Bar	No.	Size	Length	Shape
A(E)	63	#4	5'-3"	
B(E)	52	#6	29'-6"	
B_1(E)	8	#4	18'-0"	
B_2(E)	4	#4	19'-8"	
B_3(E)	12	#8	30'-6"	
D(E)	57	#4	5'-5"	
S(E)	126	#4	10'-6"	
S_1(E)	8	#4	10'-8"	
U(E)	8	#4	7'-11"	
U_1(E)	10	#4	5'-11"	

	JGT	12/25/14
	DAP	12/25/14
	JGT	10/11/2016

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DRAWN
REVIEWED

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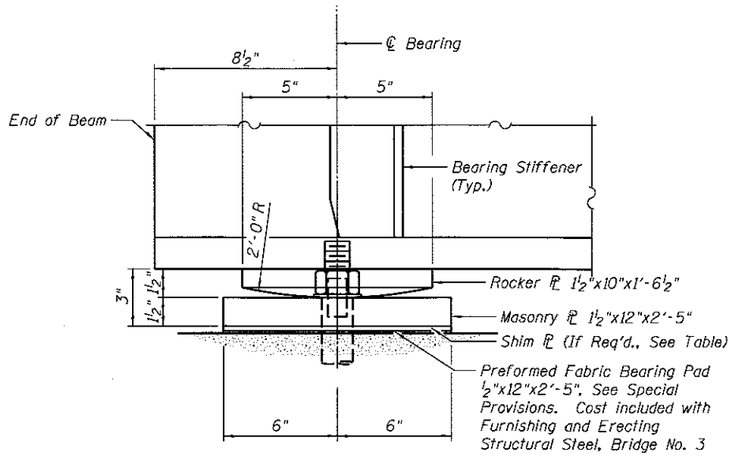
PLOT DATE = 2/24/2017	CHECKED - JGT	REVISED -

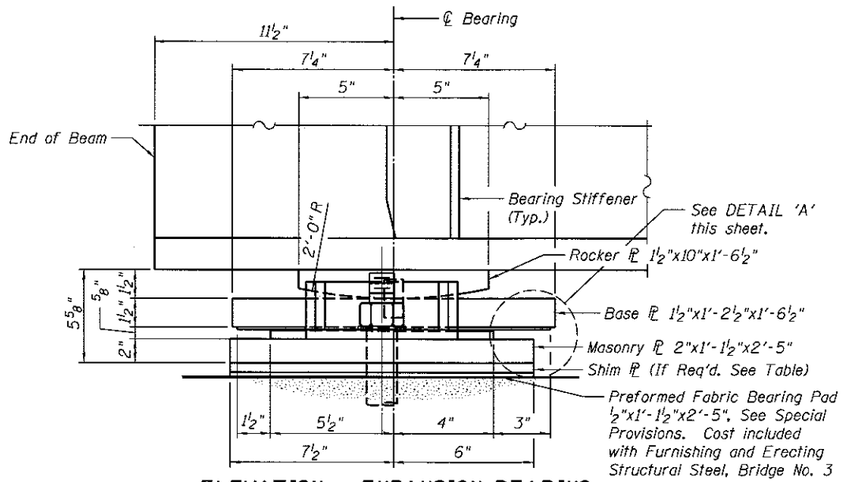
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

C.I.P. FASCIA BEAM ALTERNATIVE
STRUCTURE NO. 084-9956
SHEET NO. 12 OF 21 SHEETS

F.A.U. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
	14-00477-00-BR	SANGAMON	403	259
		CONTRACT NO. 93704		
	ILLINOIS FED. AID PROJECT			



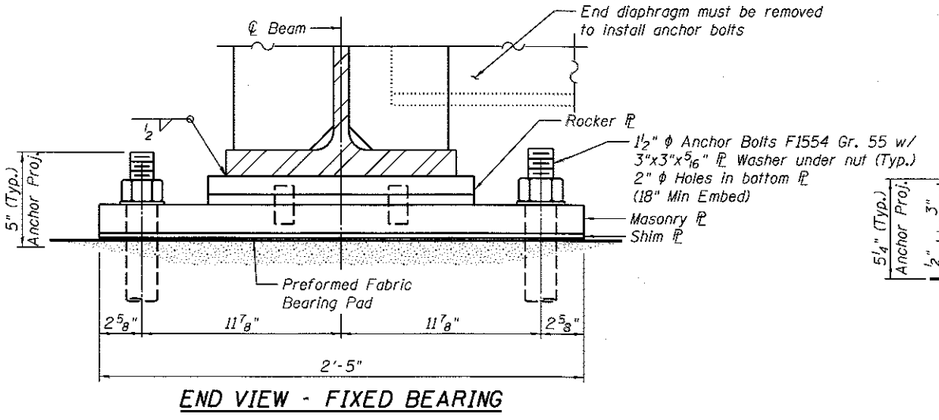
ELEVATION - FIXED BEARING



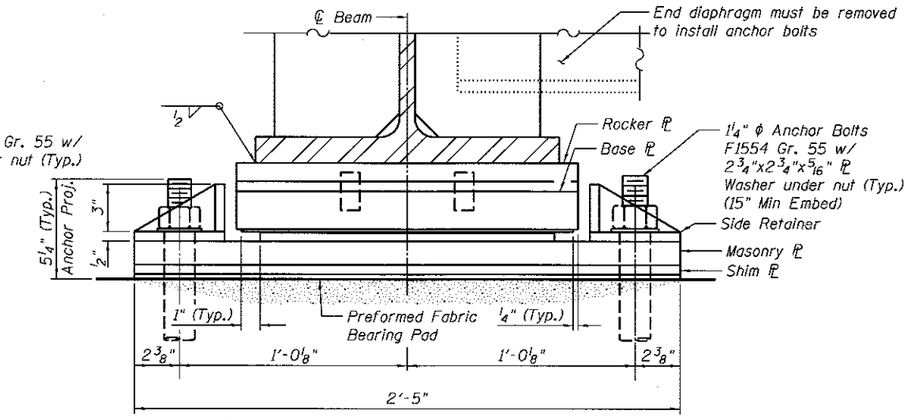
ELEVATION - EXPANSION BEARING

Notes:

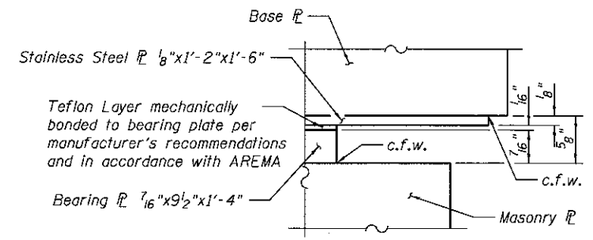
1. The structural steel plates of the Bearing Assembly shall conform to the requirements of ASTM A709, Grade 50.
2. Teflon Layer shall be composed of virgin unfilled TFE resin, unfilled TFE sheets, or unfilled TFE fabric. Filler material, such as milled glass fibers, will not be allowed. Teflon layer shall conform to the requirements of AREMA Chapter 15.
3. The bearing assembly shall be according to Section 521 of the Standard Specifications where applicable. The bearing assembly and anchor bolts will not be paid for separately but included in the weight of Structural Steel for payment as "Furnishing and Erecting Structural Steel, Bridge No. 3".
4. Anchor bolts shall be ASTM F1554 all-thread (or an Engineer-approved alternate material) of the grade(s) and diameter(s) specified. The corresponding specified grade of AASHTO M314 anchor bolts may be used in lieu of ASTM F1554.
5. Anchor bolts shall be installed in blockouts with Non-Shrink Grout meeting the material requirements of Article 1024.02 of the Standard Specifications. Blockouts shall be clean prior to grouting and grout installed according to manufactures recommendations. Cost for non-shrink grout shall be included in the cost of Concrete Structures.
6. Two ⅛" adjusting shims shall be provided for each bearing assembly in addition to all other plates or shims and placed as shown on bearing details.



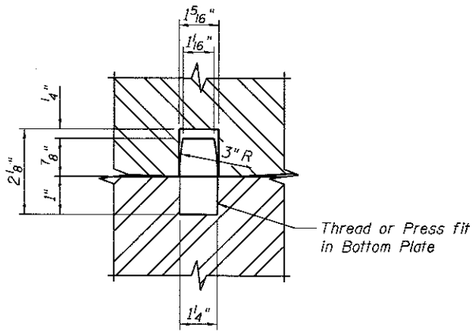
END VIEW - FIXED BEARING



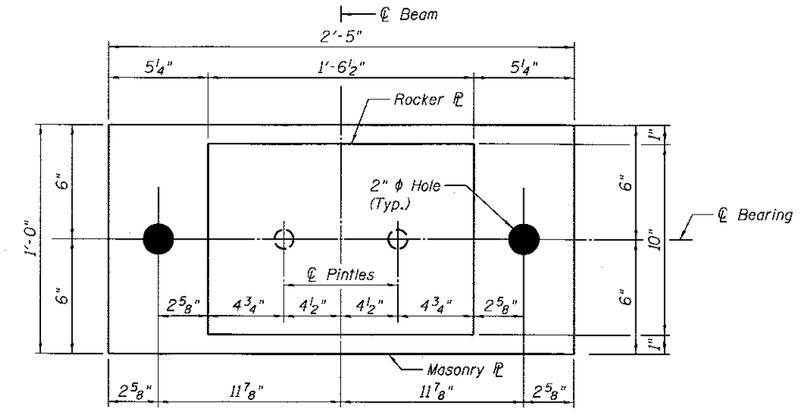
END VIEW - EXPANSION BEARING



DETAIL 'A'

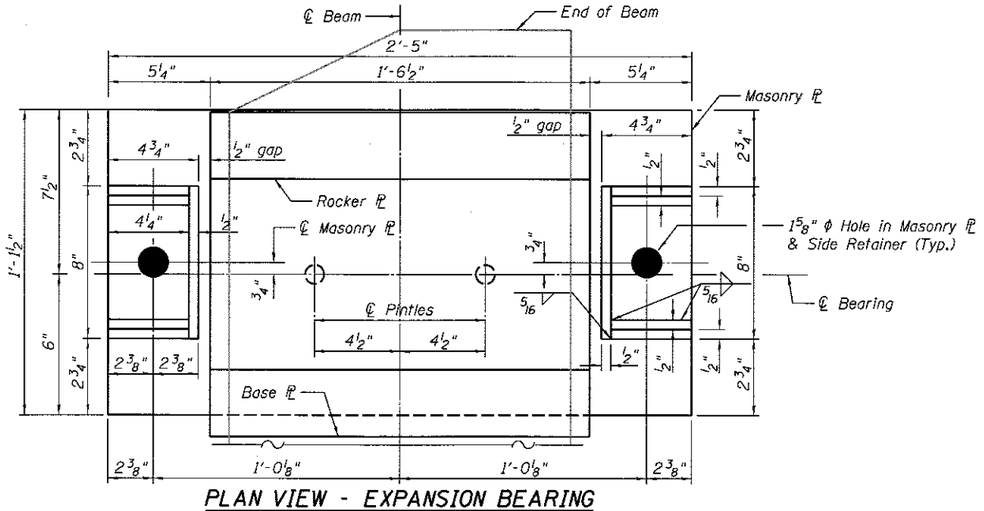


PINTLE DETAIL



PLAN VIEW - FIXED BEARING

(Abutment Bearings - 14 required)



PLAN VIEW - EXPANSION BEARING

(Abutment Bearings - 14 required)

* Shim Plate Thickness		
Abutment	Beam	Thickness
North/South	9	⅛"
North/South	8	⅛"
North/South	7	⅛"
North/South	6	⅛"
North/South	5	⅛"
North/South	4	⅛"
North/South	3	¼"
North/South	2	¼"
North/South	1	¼"

* See notes for additional adjusting shims for all bearings.

DESIGNED	JGT	12/25/14
DRAWN	DAP	12/25/14
REVIEWED	JGT	10/11/2016

FINAL

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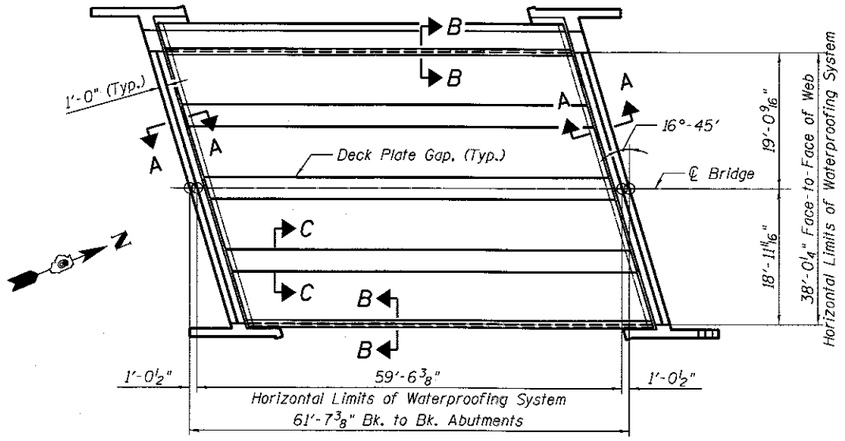
PLOT SCALE = 0.999996 '/ in.	DRAWN - DAP	REVISED -	
PLOT DATE = 2/24/2017	CHECKED - JGT	REVISED -	

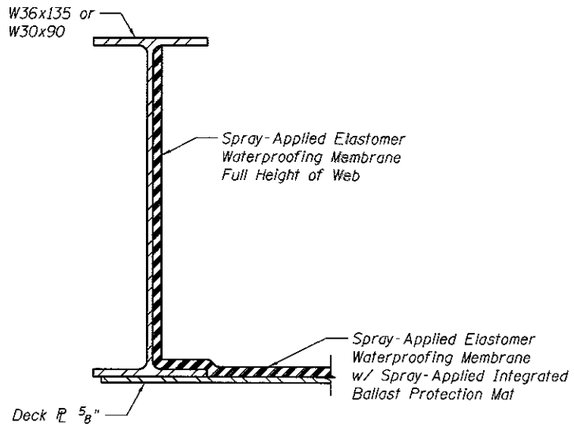
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

BEARING DETAILS
STRUCTURE NO. 084-9956
SHEET NO. 13 OF 21 SHEETS

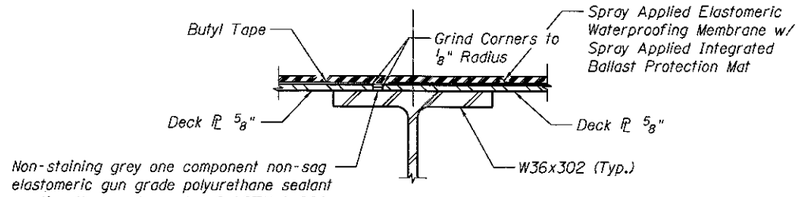
F.A.U. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
	14-00477-00-BR	SANGAMON	403	260
		CONTRACT NO. 93704		
		ILLINOIS FED. AID PROJECT		



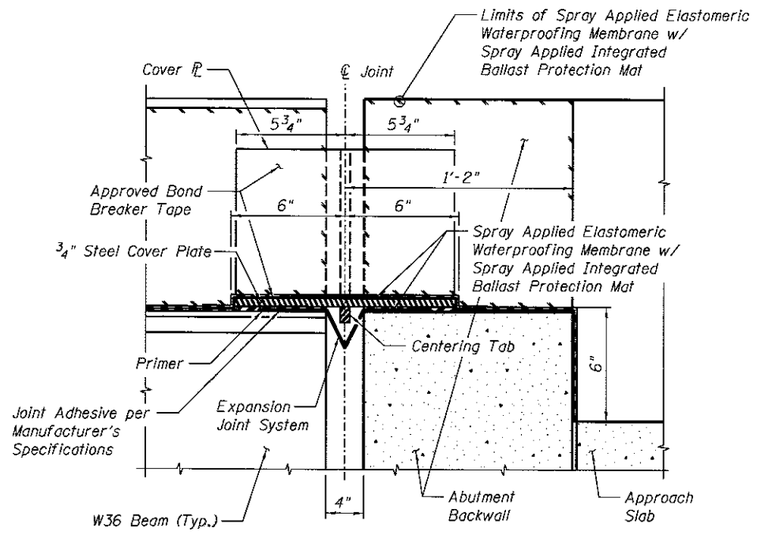
WATERPROOFING LIMITS PLAN



SECTION B-B



SECTION C-C



Note:
1. Bridge deck membrane continuous thru joint.
2. Typical Joint Detail shown for information only. Waterproofing installer shall determine final details in accordance with the manufacturer's recommendations.

SECTION A-A

(At Rt. 4's to Bk. of Abut.)

Notes:

1. Prepare surfaces and apply in accordance with Manufacturer's recommendations..
2. Structural steel cover plates shall be galvanized.
3. Cost of adhesive and bond breaker tape shall be included in the cost of "Membrane Waterproofing (Special)".
4. The cover plate is included in the weight of the Structural Steel and will be paid for as "Furnishing and Erecting Structural Steel, Bridge No. 3".
5. For cover plate details see Sheet 9 of 21.

BILL OF MATERIAL

ITEM	UNIT	TOTAL
Membrane Waterproofing (Special)	Sq. Ft.	2616

FINAL

DESIGNED	JGT	12/25/14
DRAWN	DAP	12/25/14
REVIEWED	JGT	10/11/2016

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HANSON		CHECKED - MNM	REVISED -
	PLOT SCALE = 0.999996 '' / in.	DRAWN - DAP	REVISED -
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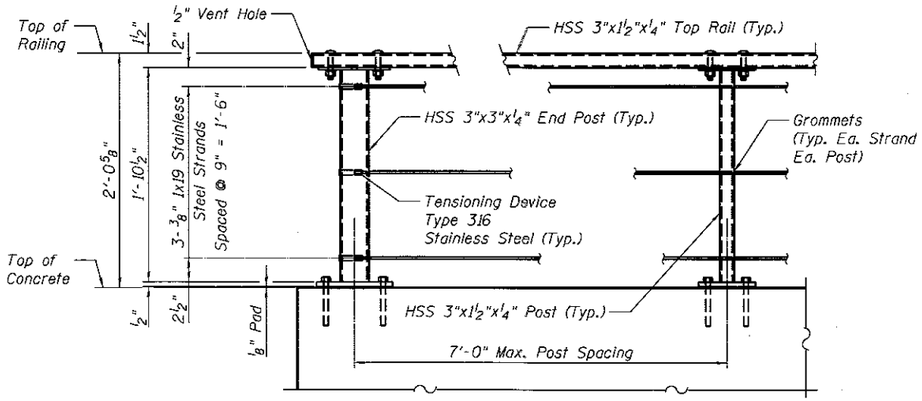
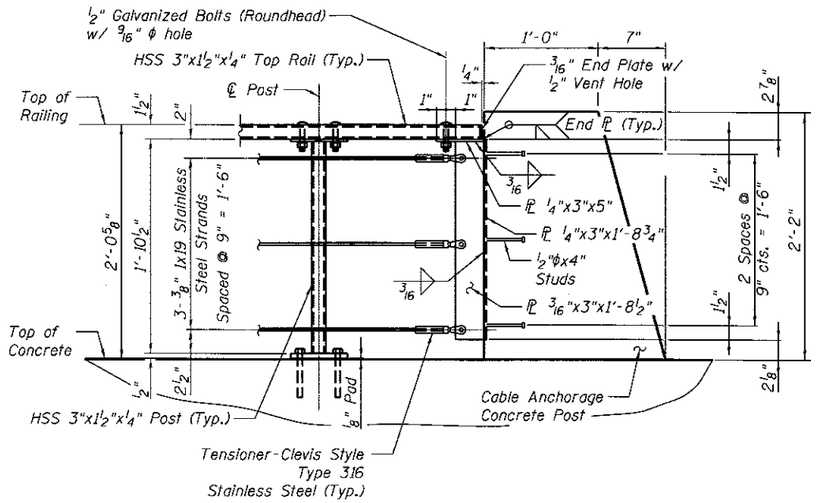
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

MEMBRANE WATERPROOFING
STRUCTURE NO. 084-9956
SHEET NO. 14 OF 21 SHEETS

F.A.U. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
	14-00477-00-BR	SANGAMON	403	261
		CONTRACT NO. 93704		
	ILLINOIS FED. AID PROJECT			



END POST INTERMEDIATE POST



CABLE RAILING END PANEL

Notes:

Anchor rods shall be ASTM F1554, Gr. 55, galvanized steel all-thread (or an Engineer-approved alternate material) of the grade(s) and diameter(s) specified. The corresponding specified grade of AASHTO M314 anchor bolts may be used in lieu of ASTM F1554. The anchor rods shall be hot-dipped galvanized according to ASTM M232, Class C.

Tube segments shall have all corners ground to remove burrs or sharp projections.

All bolts, eyebolts, nuts and washers must satisfy the requirements of ASTM A307 Gr. A unless noted otherwise.

The Anchor rods shall be installed according to Article 509.06 of the Standard Specifications. Embedment shall be 4" min. or according to the manufactures specifications whatever is greater.

Structural steel plates and bars of the Steel Railing shall conform to the requirements of ASTM A36/36M.

Tubular steel posts shall be according to the requirements of ASTM A500, Grade B.

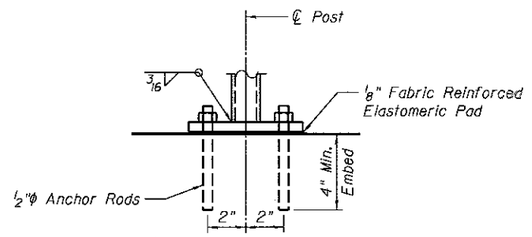
All steel rail members, with the exception of the stainless steel strand and fittings, shall be hot dipped galvanized according to 509.05 of the Standard Specifications.

All studs shall be ½"ϕx4" granular or solid flux filled headed studs automatically end welded to plates.

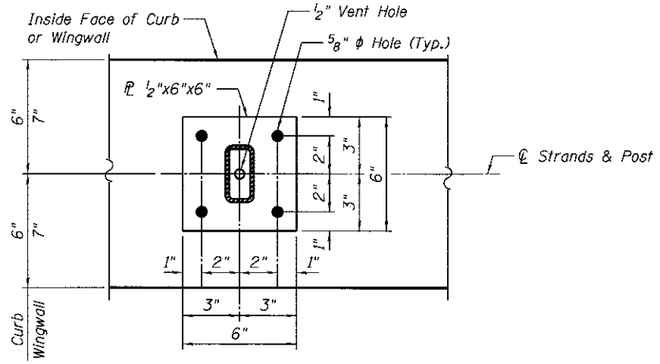
For top rail and post connection details See Sheet 16 of 21.

See Sheet 5 of 21 for rail post spacing.

See Retaining Wall Plans for chain attachment details.

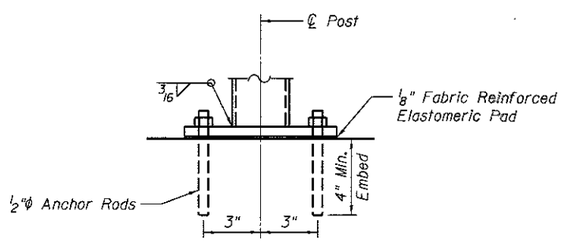


ANCHOR ROD DETAIL INTERMEDIATE POSTS

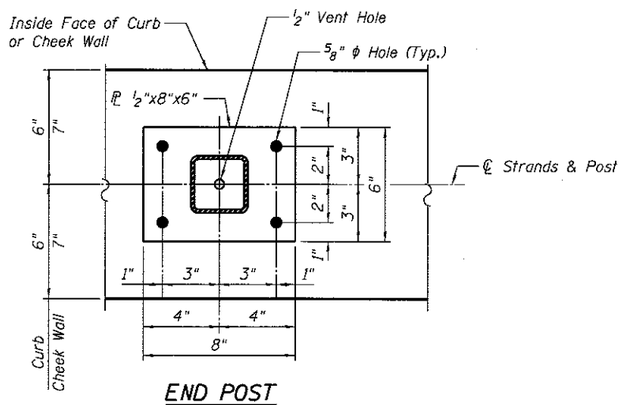


INTERMEDIATE POST

POST DETAIL - WEST SIDE



ANCHOR ROD DETAIL END POSTS



END POST

BILL OF MATERIAL

(Includes Railing along West & East side)

ITEM	UNIT	TOTAL
Steel Railing (Special)	Foot	141

DESIGNED	JGT	12/25/14
DRAWN	DAP	12/25/14
REVIEWED	JGT	10/11/2016

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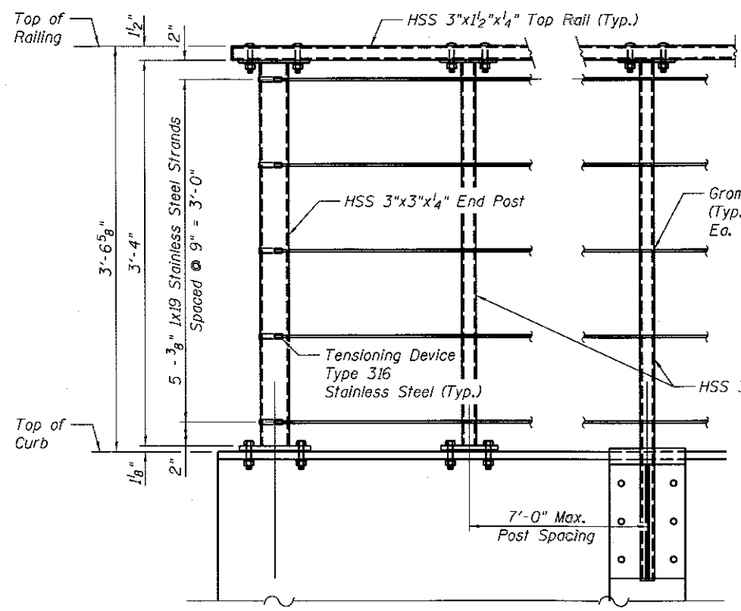
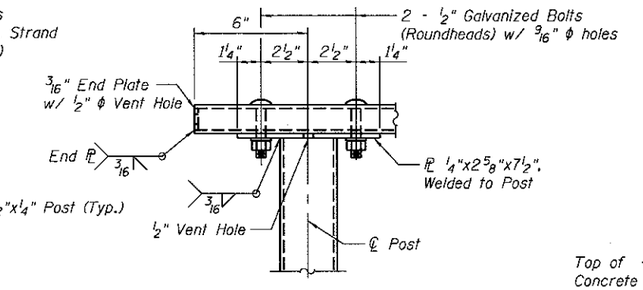
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

STEEL RAILING (SPECIAL) WESTSIDE
STRUCTURE NO. 084-9956
SHEET NO. 15 OF 21 SHEETS

F.A.U. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
	14-00477-00-BR	SANGAMON	403	262
		CONTRACT NO. 93704		
		ILLINOIS FED. AID PROJECT		

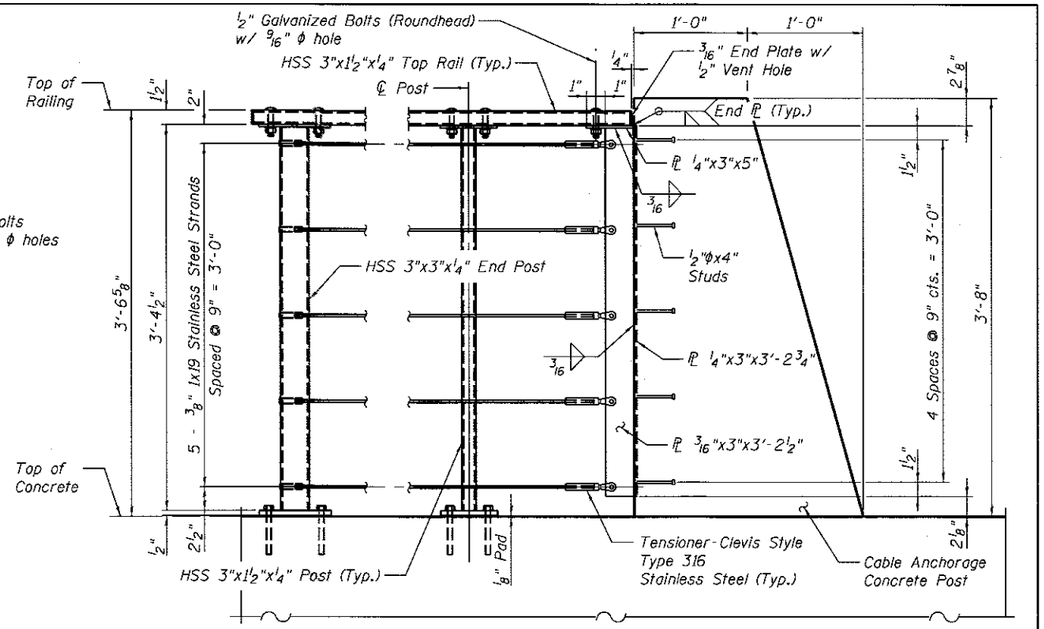


RAILING END PANEL - SUPERSTRUCTURE



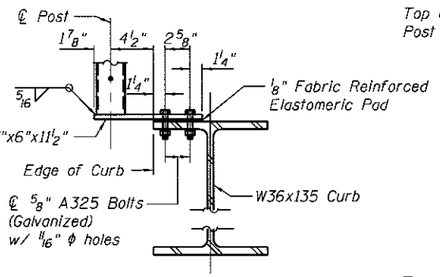
TYPICAL RAIL/END POST CONNECTION

(Strands not shown for clarity.)



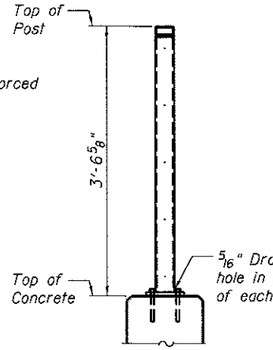
RAILING END PANEL - WINGWALL AND CHEEKWALL

Notes:
See Sheet 5 of 21 for rail post spacing.
See Sheet 15 of 21 for railing notes and anchor rod details.



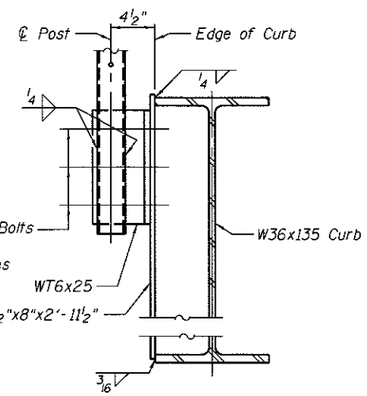
END POST (1½" & 3")

(Along Superstructure)



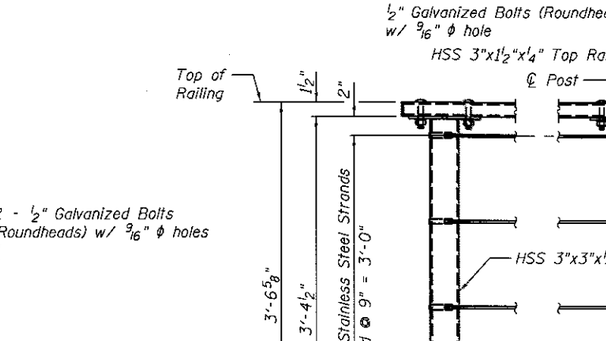
POST DETAIL - EAST SIDE

(On Cheek Wall and Wing Wall)

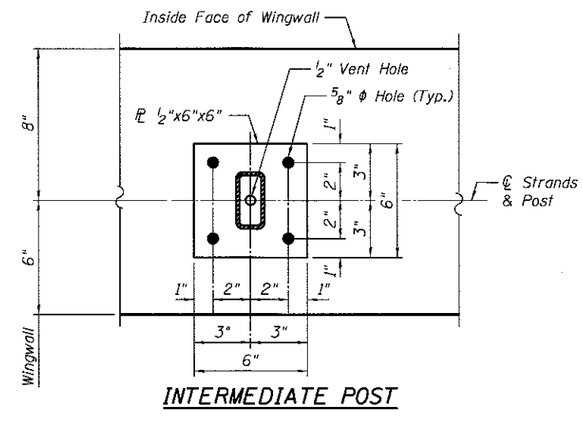


INTERMEDIATE POST (1½")

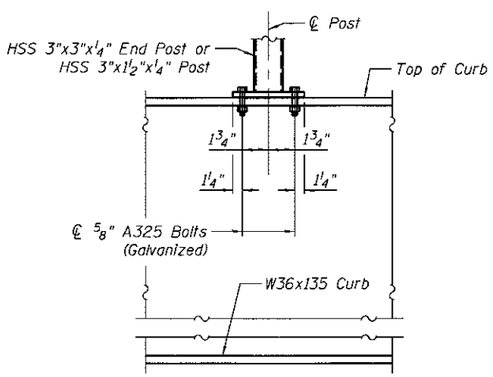
(Along Superstructure)



TOP RAIL - WITH SPLICE

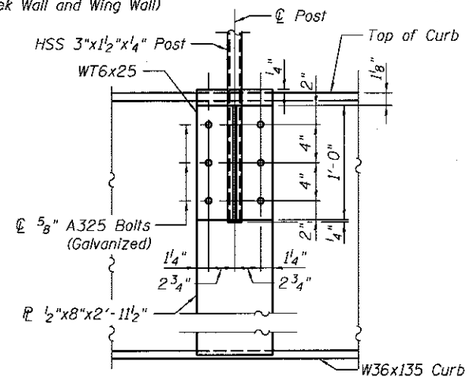


INTERMEDIATE POST



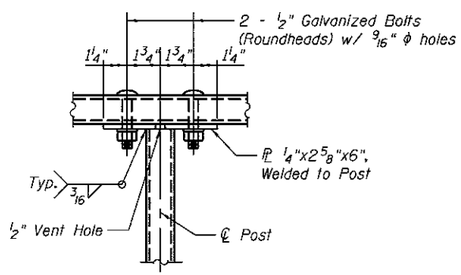
END POST (1½" & 3")

(Along Superstructure)



INTERMEDIATE POST (1½")

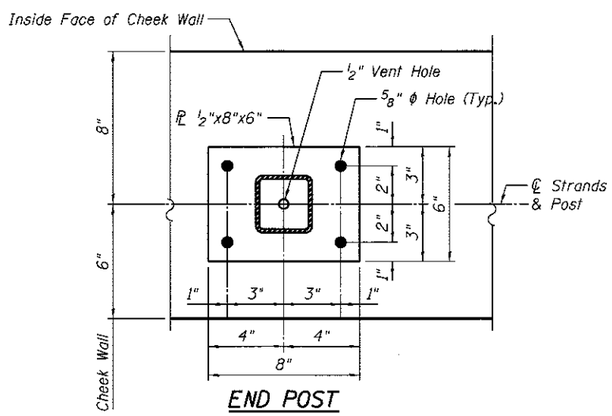
(Along Superstructure)



TOP RAIL - NO SPLICE

TYPICAL RAIL/POST CONNECTION

(Strands not shown for clarity.)



END POST

FINAL	
DESIGNED	JGT 12/25/14
DRAWN	DAP 12/25/14
REVIEWED	JGT 10/11/2016

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	CHECKED - MNM	REVISED -	
PLOT SCALE = 0.999996 '/ IN.	DRAWN - DAP	REVISED -	
PLOT DATE = 2/24/2017	CHECKED - JGT	REVISED -	

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

STEEL RAILING (SPECIAL) EASTSIDE
STRUCTURE NO. 084-9956
SHEET NO. 16 OF 21 SHEETS

F.A.U. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
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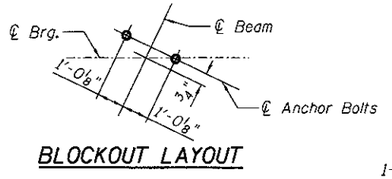
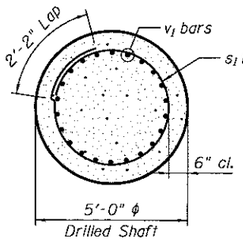
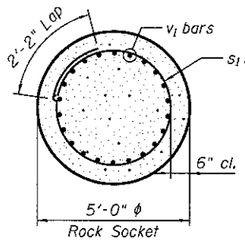
		CONTRACT NO. 93704		
	ILLINOIS FED. AID PROJECT			



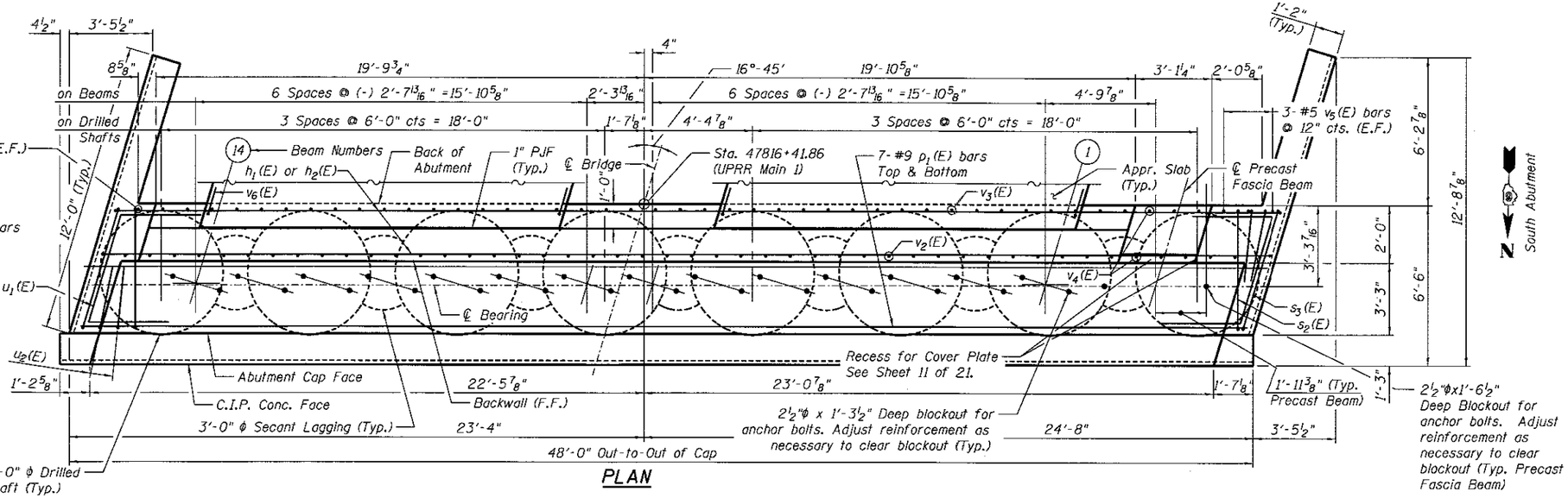
BLOCKOUT LAYOUT



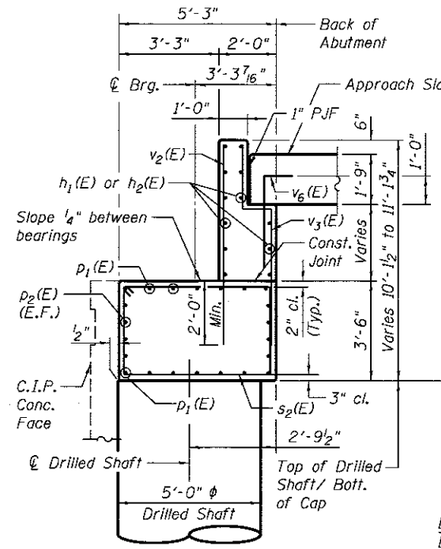
SECTION B-B



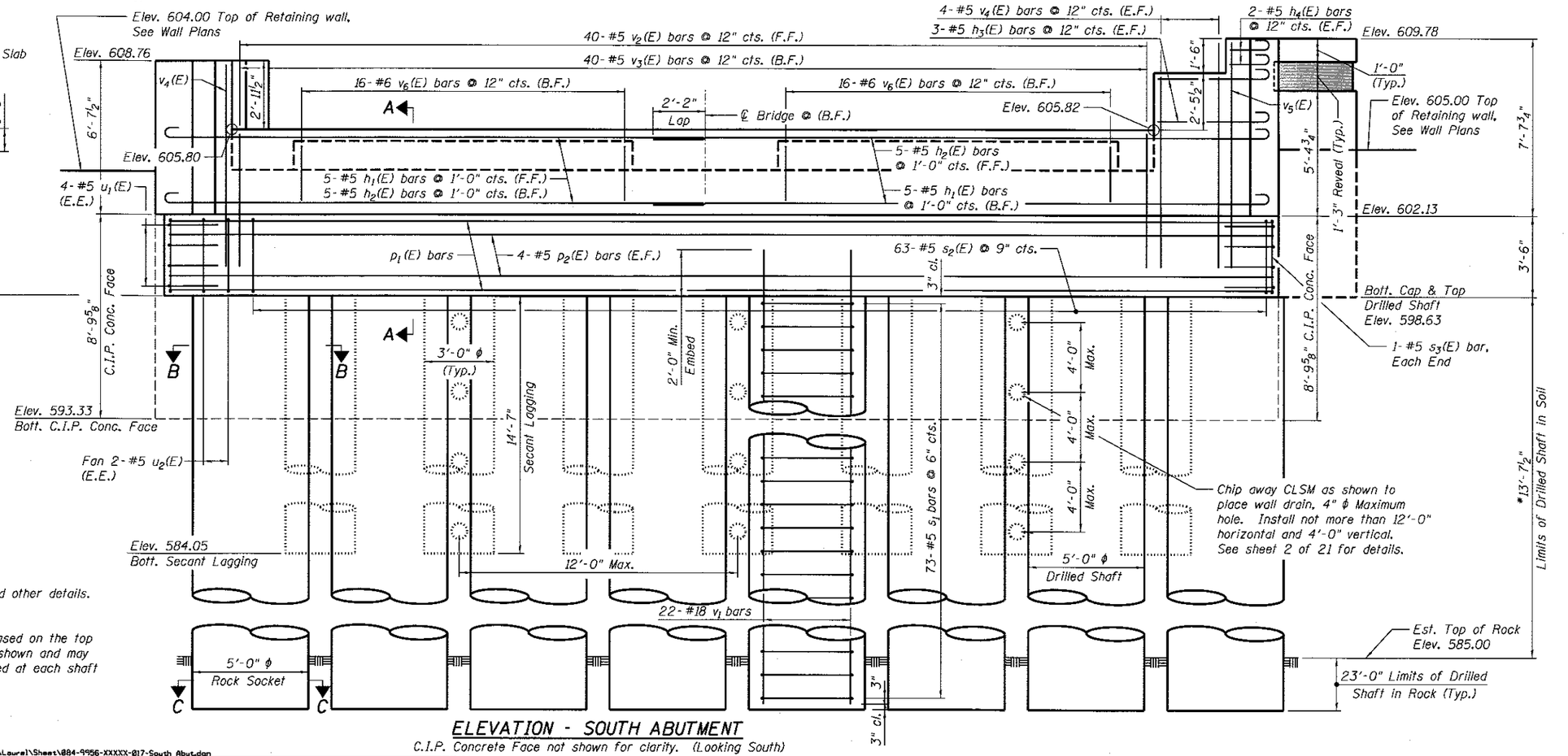
SECTION C-C



PLAN



SECTION A-A
(At Rt. ℄'s to Bk. of Abut.)



ELEVATION - SOUTH ABUTMENT
C.I.P. Concrete Face not shown for clarity. (Looking South)

Notes:
See Sheet 18 of 21 for C.I.P. Concrete Face and other details.

* The quantities and reinforcement detailing are based on the top of shaft and the estimated top of rock elevations shown and may change based on the actual top of rock encountered at each shaft and the final top of shaft elevation.

DESIGNED	JGT	12/25/14
DRAWN	DAP	12/25/14
REVIEWED	JGT	10/11/2016

FINAL

pw:\\spi-svr306.hanson.dom:Hanson Projects\Documents\09Jobs\09L81798\CAD\Struct\Laura\Sheets\084-9956-XXXXX-017-South Abut.dgn

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	PLOT SCALE = 81.999996 '/ IN.	DRAWN - DAP	REVISED -
	PLOT DATE = 2/24/2017	CHECKED - JGT	REVISED -

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STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

SOUTH ABUTMENT
STRUCTURE NO. 084-9956
SHEET NO. 17 OF 21 SHEETS

F.A.U. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
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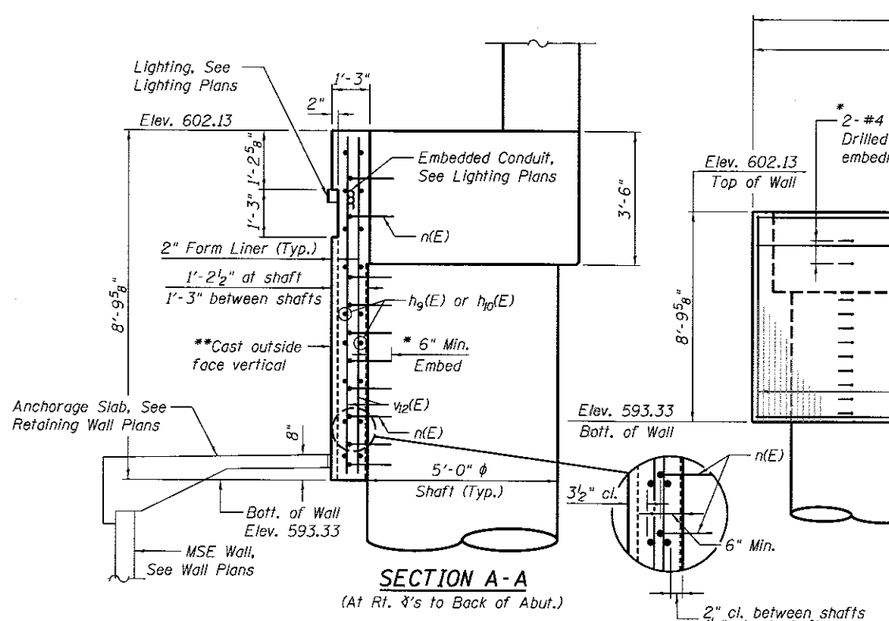
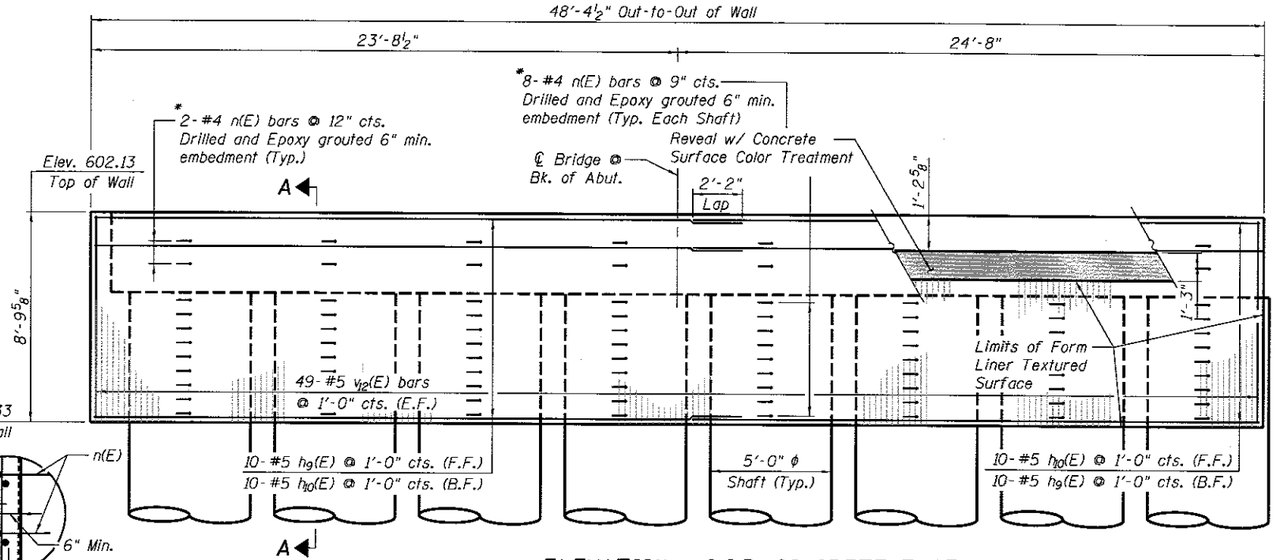
		CONTRACT NO. 93704		
		ILLINOIS FED. AID PROJECT		



SECTION A-A

(At Rt. ℄'s to Back of Abut.)

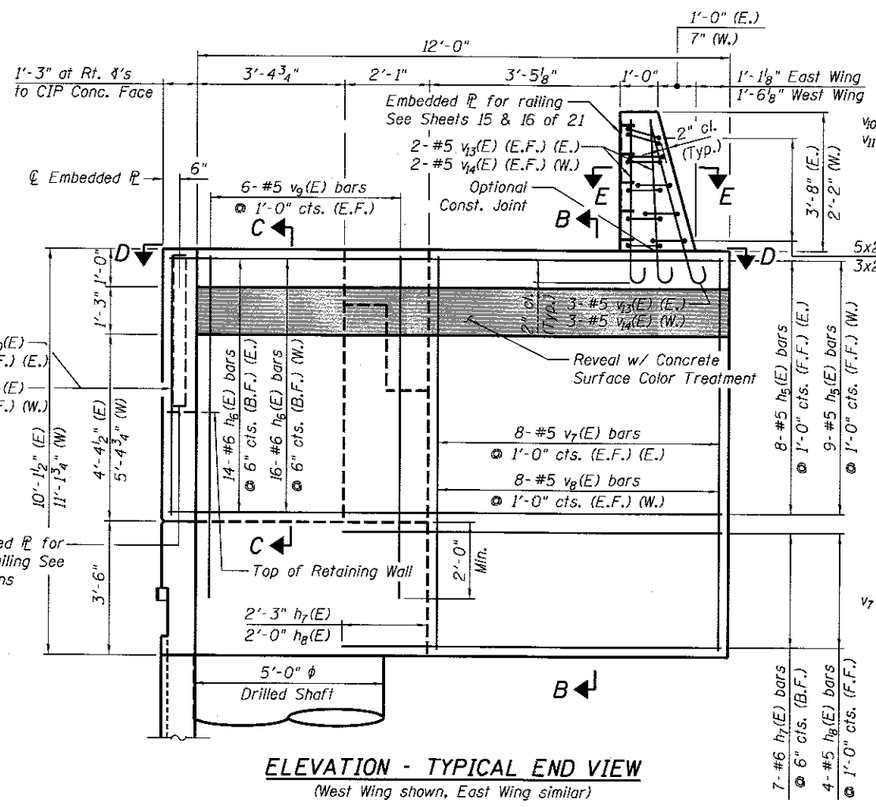


ELEVATION - C.I.P. CONCRETE FACE

(Looking South)

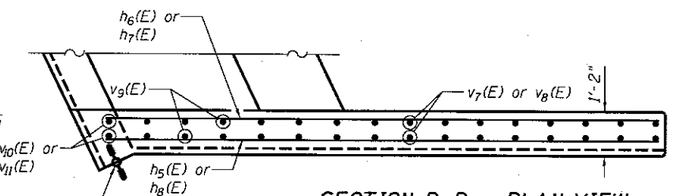
* Bars epoxy grouted shall have an embedment sufficient to develop 1.25 times the full capacity of the reinforcement bar.

** Concrete wall face shall be cast vertically. Thickness of wall may vary due to abutment deflection and construction tolerances. The Min. wall thickness shall be 10 1/2".



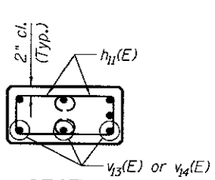
ELEVATION - TYPICAL END VIEW

(West Wing shown, East Wing similar)

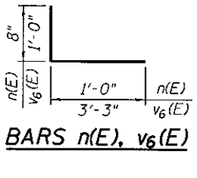


SECTION D-D - PLAN VIEW

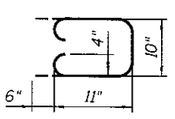
(West Wing shown, East Wing similar)



SECTION E-E



BARS n(E), v6(E)



BAR h11(E)

WINGWALL SECTION B-B

BAR v3(E)

BAR u1(E)

CHEEKWALL SECTION C-C

BARS h1(E), h2(E), h3(E), h4(E), v13(E), v14(E)

Bar	'a'
h1(E)	21'-6"
h2(E)	28'-2"
h3(E)	5'-11"
h4(E)	2'-9"
v13(E)	4'-4"
v14(E)	2'-10"

BARS s2(E), s3(E)

BAR u2(E)

BILL OF MATERIAL SOUTH ABUTMENT

Bar	No.	Size	Length	Shape
h1(E)	10	#5	22'-1"	
h2(E)	10	#5	28'-9"	
h3(E)	6	#5	6'-6"	
h4(E)	4	#5	3'-4"	
h5(E)	17	#5	12'-6"	
h6(E)	30	#6	12'-6"	
h7(E)	14	#6	8'-9"	
h8(E)	8	#5	8'-6"	
h9(E)	20	#5	26'-0"	
h10(E)	20	#5	24'-6"	
h11(E)	16	#4	3'-8"	
n(E)	80	#4	1'-8"	
p1(E)	14	#9	47'-8"	
p2(E)	8	#5	47'-8"	
s1	584	#5	14'-9"	
s2(E)	63	#5	16'-11"	
s3(E)	2	#5	17'-5"	
u1(E)	8	#5	11'-6"	
u2(E)	4	#5	9'-1"	
v1	176	#18	38'-6"	
v2(E)	40	#5	5'-6"	
v3(E)	40	#5	6'-6"	
v4(E)	10	#5	8'-6"	
v5(E)	6	#5	9'-6"	
v6(E)	32	#6	4'-3"	
v7(E)	16	#5	9'-8"	
v8(E)	16	#5	10'-8"	
v9(E)	24	#5	9'-6"	
v10(E)	2	#5	6'-2"	
v11(E)	2	#5	7'-2"	
v12(E)	98	#5	8'-6"	
v13(E)	7	#5	4'-11"	
v14(E)	7	#5	3'-5"	

Structure Excavation	Cu. Yds.	146
Concrete Structures	Cu. Yds.	72.9
Drilled Shaft In Soil	Cu. Yds.	79.3
Drilled Shaft In Rock	Cu. Yds.	133.8
Secant Lagging	Cu. Ft.	722
Form Liner Textured Surface	Sq. Ft.	307
Concrete Surface Color Treatment	Sq. Ft.	90
Reinforcement Bars	Pound	101140
Reinforcement Bars, Epoxy Coated	Pound	9140
Crosshole Sonic Logging Access Ducts	Foot	1878

Notes:
Space cap reinforcement to miss blockouts for anchor bolts.
See Retaining Wall Plans for Expansion Joint Detail at each end of C.I.P. Concrete Facing.
See Lighting Plans of Conduit and J-Box embedments in Wall Facing.

FINAL		
DESIGNED	JGT	12/25/14
DRAWN	DAP	12/25/14
REVIEWED	JGT	10/11/2016

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		CHECKED - HGN	REVISED -
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	PLOT DATE = 2/24/2017	CHECKED - JGT	REVISED -

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STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

SOUTH ABUTMENT DETAILS
STRUCTURE NO. 084-9956
SHEET NO. 18 OF 21 SHEETS

F.A.U. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
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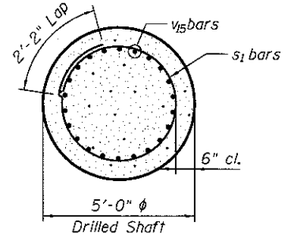
		CONTRACT NO. 93704		
	ILLINOIS FED. AID PROJECT			



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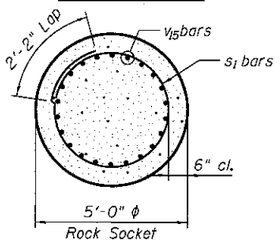

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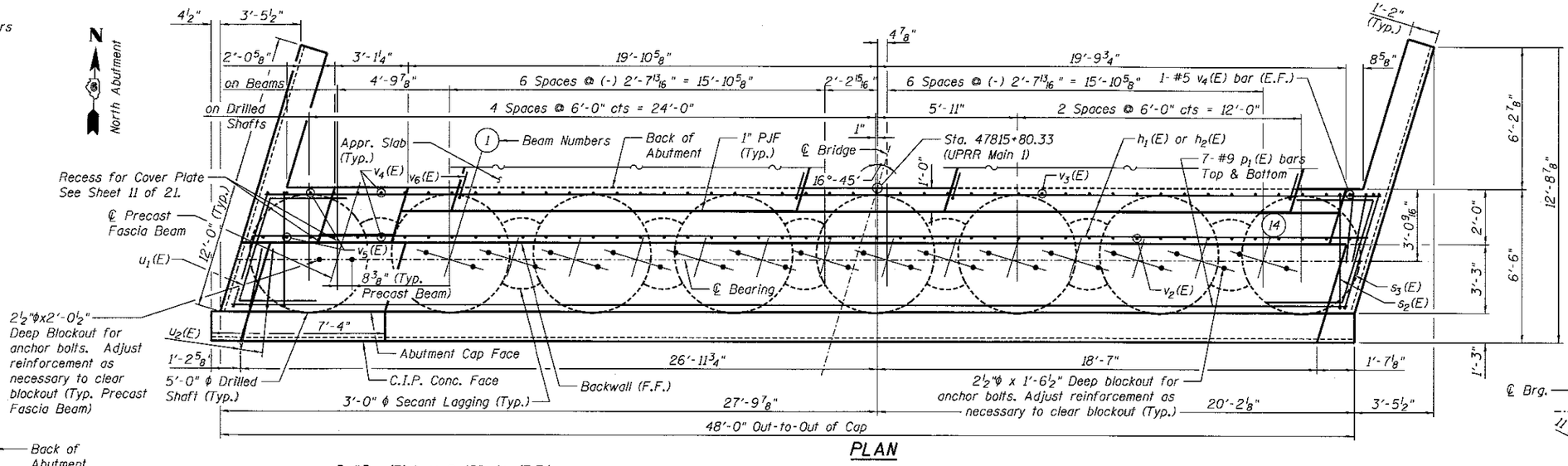
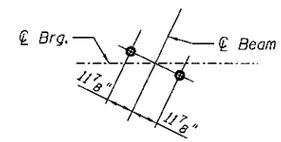
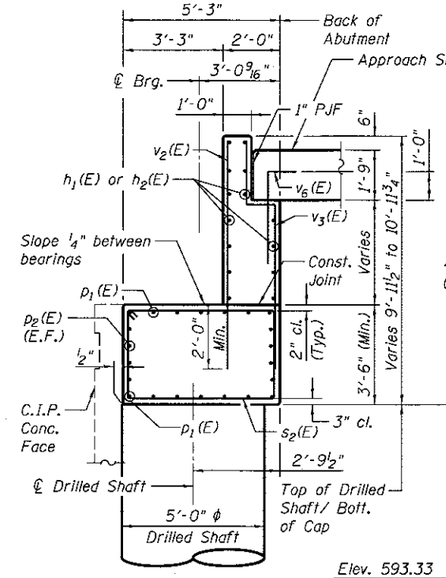


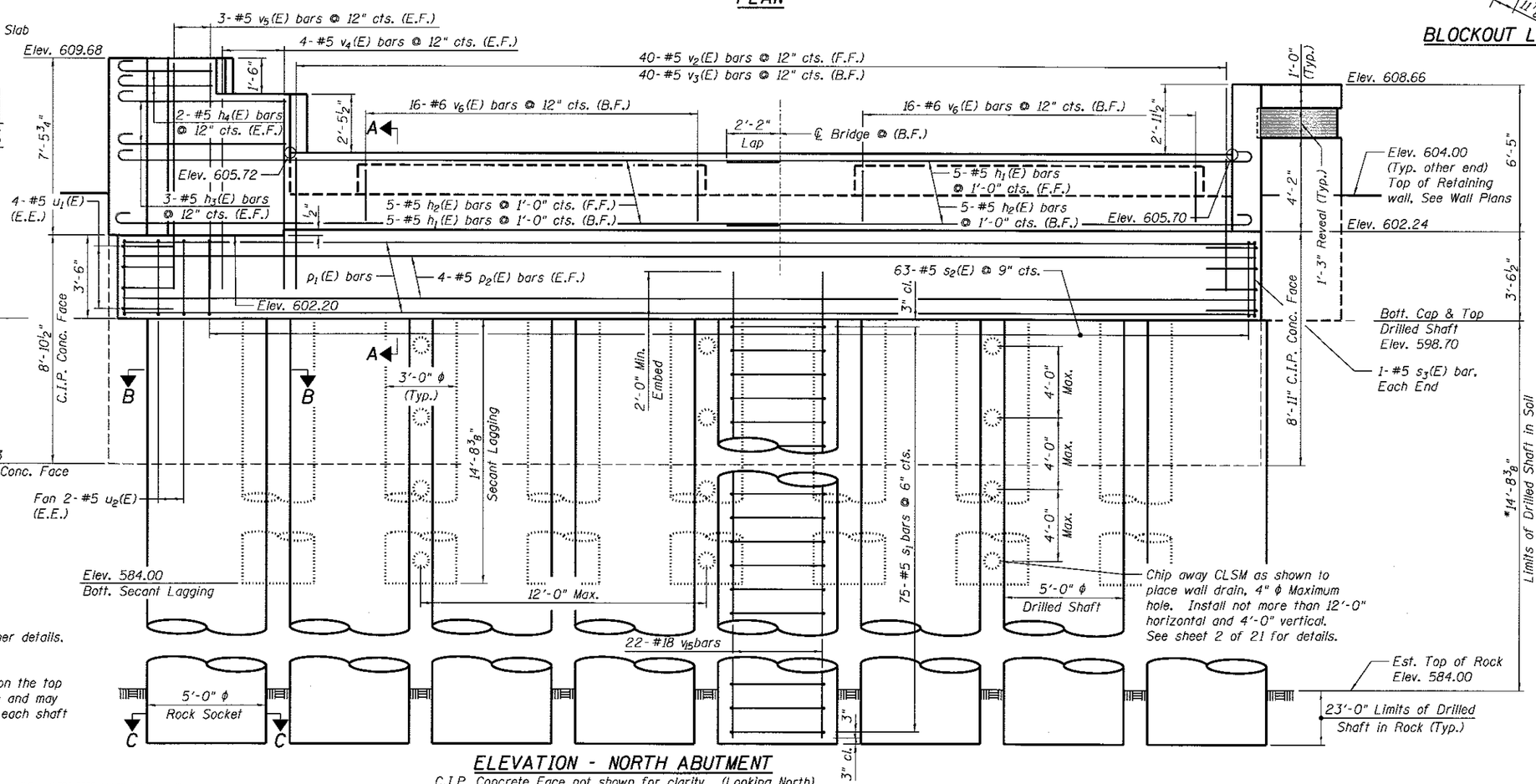
PLAN



BLOCKOUT LAYOUT



SECTION A-A
(At Rt. 4's to Bk. of Abut.)



ELEVATION - NORTH ABUTMENT
C.I.P. Concrete Face not shown for clarity. (Looking North)

Notes:
See Sheet 20 of 21 for C.I.P. Concrete Face and other details.

* The quantities and reinforcement detailing are based on the top of shaft and the estimated top of rock elevations shown and may change based on the actual top of rock encountered at each shaft and the final top of shaft elevation.

FINAL

DESIGNED	JGT	12/25/14
DRAWN	DAP	12/25/14
REVIEWED	JGT	10/11/2016

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		CHECKED - HGN	REVISED -
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	PLOT DATE = 2/24/2017	CHECKED - JGT	REVISED -

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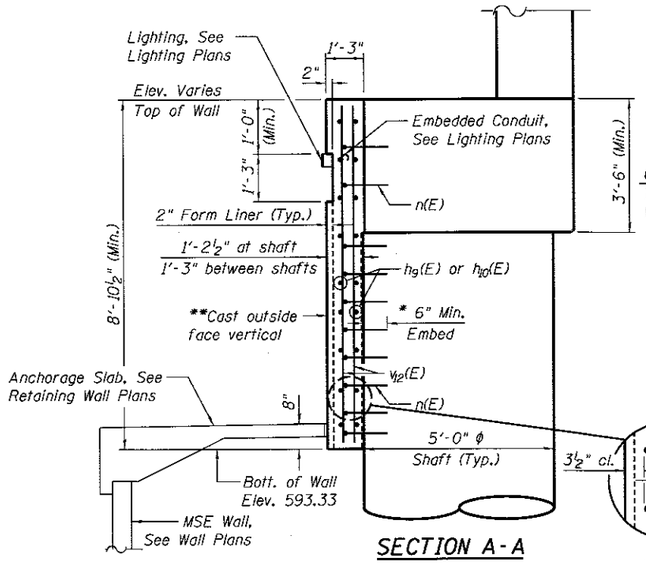
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

NORTH ABUTMENT
STRUCTURE NO. 084-9956
SHEET NO. 19 OF 21 SHEETS

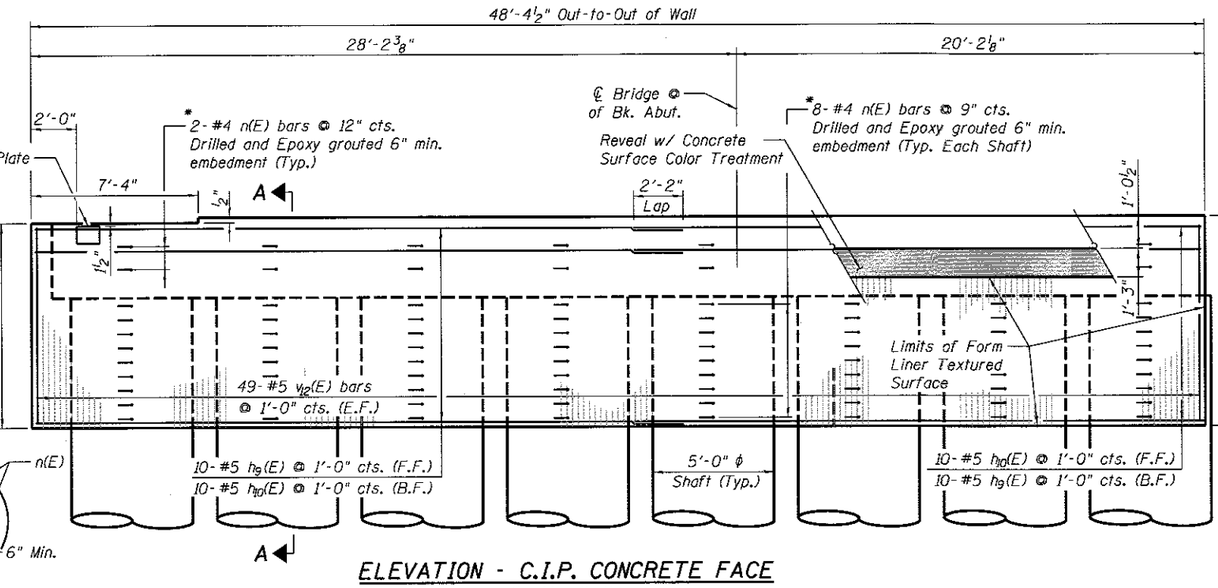
F.A.U. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
	14-00477-00-BR	SANGAMON	403	266
		CONTRACT NO. 93704		
	ILLINOIS FED. AID PROJECT			

* Bars epoxy grouted shall have an embedment sufficient to develop 1.25 times the full capacity of the reinforcement bar.

** Concrete wall face shall be cast vertically. Thickness of wall may vary due to abutment deflection and construction tolerances. The Min. wall thickness shall be 10½".



SECTION A-A



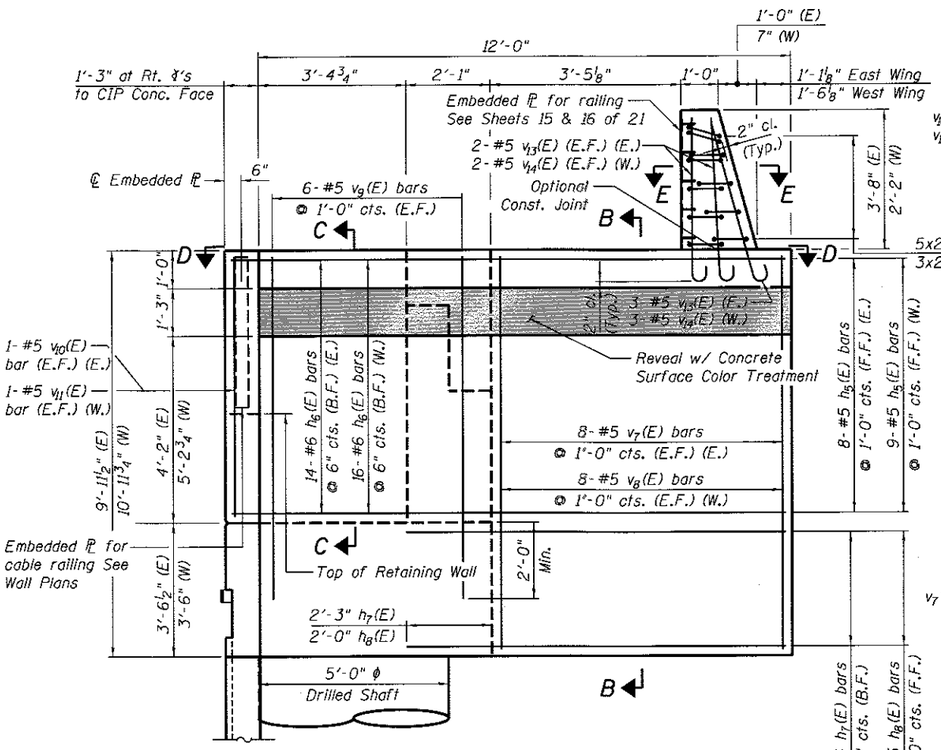
ELEVATION - C.I.P. CONCRETE FACE

(Looking North)

BILL OF MATERIAL NORTH ABUTMENT

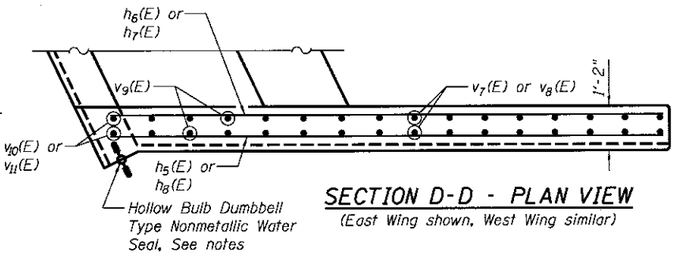
Bar	No.	Size	Length	Shape
$h_1(E)$	10	#5	22'-1"	
$h_2(E)$	10	#5	28'-9"	
$h_3(E)$	6	#5	6'-6"	
$h_4(E)$	4	#5	3'-4"	
$h_5(E)$	17	#5	12'-6"	
$h_6(E)$	30	#6	12'-6"	
$h_7(E)$	14	#6	8'-9"	
$h_8(E)$	8	#5	8'-6"	
$h_9(E)$	20	#5	26'-0"	
$h_{10}(E)$	20	#5	24'-6"	
$h_{11}(E)$	16	#4	3'-8"	
n(E)	80	#4	1'-8"	
$p_1(E)$	14	#9	47'-8"	
$p_2(E)$	8	#5	47'-8"	
s_1	600	#5	14'-9"	
$s_2(E)$	63	#5	16'-11"	
$s_3(E)$	2	#5	17'-5"	
$u_1(E)$	8	#5	11'-6"	
$u_2(E)$	4	#5	9'-1"	
v_{15}	176	#18	39'-6"	
$v_2(E)$	40	#5	5'-6"	
$v_3(E)$	40	#5	6'-6"	
$v_4(E)$	10	#5	8'-6"	
$v_5(E)$	6	#5	9'-6"	
$v_6(E)$	32	#6	4'-3"	
$v_7(E)$	16	#5	9'-8"	
$v_8(E)$	16	#5	10'-8"	
$v_9(E)$	24	#5	9'-6"	
$v_{10}(E)$	2	#5	6'-2"	
$v_{11}(E)$	2	#5	7'-2"	
$v_{12}(E)$	98	#5	8'-6"	
$v_{13}(E)$	7	#5	4'-11"	
$v_{14}(E)$	7	#5	3'-5"	

Structure Excavation	Cu. Yds.	143
Concrete Structures	Cu. Yds.	72.6
Drilled Shaft in Soil	Cu. Yds.	85.5
Drilled Shaft in Rock	Cu. Yds.	133.8
Secant Lagging	Cu. Ft.	727
Form Liner Textured Surface	Sq. Ft.	321
Concrete Surface Color Treatment	Sq. Ft.	90
Reinforcement Bars	Pound	103780
Reinforcement Bars, Epoxy Coated	Pound	9140
Crosshole Sonic Logging Access Ducts	Foot	1930



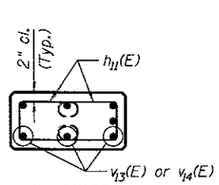
ELEVATION - TYPICAL END VIEW

(East Wing shown, West Wing similar)

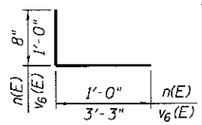


SECTION D-D - PLAN VIEW

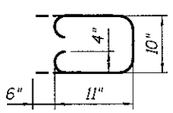
(East Wing shown, West Wing similar)



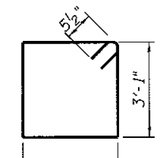
SECTION E-E



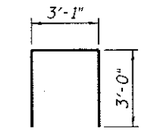
BARS n(E), v6(E)



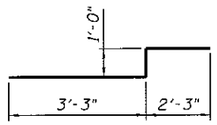
BAR h11(E)



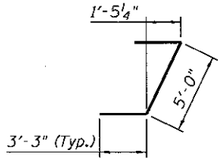
BARS s2(E), s3(E)



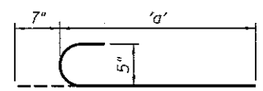
BAR u2(E)



BAR v3(E)

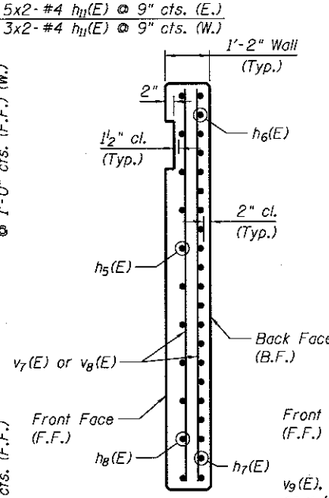


BAR u1(E)

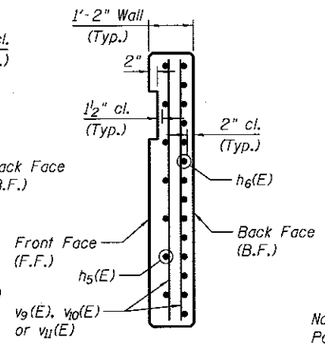


Bar	'a'
$h_1(E)$	21'-6"
$h_2(E)$	28'-2"
$h_3(E)$	5'-11"
$h_4(E)$	2'-9"
$v_{13}(E)$	4'-4"
$v_{14}(E)$	2'-10"

BARS $h_1(E)$, $h_2(E)$, $h_3(E)$, $h_4(E)$, $v_{13}(E)$, $v_{14}(E)$



WINGWALL SECTION B-B



CHEEKWALL SECTION C-C

Notes:
Pour step monolithically with cap.
Space cap reinforcement to miss blockouts for anchor bolts.
See Retaining Wall Plans for Expansion Joint Detail at each end of C.I.P. Concrete Facing.
See Lighting Plans of Conduit and J-Box embedments in Wall Facing.

DESIGNED	JGT	12/25/14
DRAWN	DAP	12/25/14
REVIEWED	JGT	10/11/2016

FINAL

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B-073
Sta. 998+58, 15' RT

	N	Qu	w%	
605.6				
605.18				ASPHALT.
604.77				AGGREGATE.
604.52	5	1.70P	32	CONCRETE.
602.10				Black very fine sandy silty CLAY.
	5		25	Brown and gray very fine sandy SILT, some clay.
599.60				
	8		23	Gray silty CLAY with cinders - FILL.
597.10				
	4	0.55B	24	Brown and gray very fine sandy clayey SILT - gasoline odor.
	3	1.28B	26	
591.60				
	5	1.55B	26	Brown and gray very fine sandy silty CLAY, some oxidized spots.
589.60				
	11	3.09S	19	Brown and gray very fine sandy silty CLAY, trace coarse sand and small gravel.
587.00				
	53	4.50P	14	Gray SHALE.
	50/5"	4.50P	13	
	50	4.50P	11	
	50/3"	4.50P	10	
	50/4"		8	
	50/5"		7	
	50/3"		6	
	14			Rec. = 93% RQD = 78%
551.60				

Bottom of Hole = 54.0 feet

B-068
Sta. 1001+00, 15' LT

	N	Qu	w%	
604.6				
604.27				ASPHALT.
604.02				BRICK.
603.52	4	2.00P	35	CONCRETE.
	3	2.00P	32	Black and gray very fine sandy silty CLAY, trace small gravel - FILL.
598.60				
	8	2.33S	24	Brown and gray very fine sandy SILT.
596.10				
	5	1.94B	21	Brown and gray very fine sandy clayey SILT.
593.60				
	4	1.00P	23	Reddish-brown and brown very fine sandy clayey SILT.
591.10				
	4	2.13S	26	Dark brown, brown and gray very fine sandy silty CLAY.
588.60				
	6	0.97S	28	Brown and gray very fine sandy silty CLAY, trace shale fragments.
586.10				
	64	4.50P	14	Brown and gray SHALE. (HIGHLY WEATHERED SHALE)
	50/4"	4.50P	13	
	50	4.50P	14	
571.10				
	50/5"		8	Gray SHALE, slightly sandy, micaceous.
	137			Rec. = 76% RQD = 64%
				Rec. = 78% RQD = 0%
				Rec. = 44% RQD = 27%
				Rec. = 88% RQD = 0%
	30			
553.60				

Bottom of Hole = 51.0 feet

LEGEND

N	Standard Penetration Test N (blows/ft)
Qu	Unconfined Strength (tsf)
w%	Natural Moisture Content (%)
DD ▽ 558.10	Water Surface Elevation Encountered in Boring DD = during drilling Oh = at completion 24h = 24 hours after completion

DESIGNED	JGT	12/25/14
DRAWN	DAP	12/25/14
REVIEWED	JGT	10/11/2016

FINAL

pw:\\spi-swr386.hanson.dom:Hanson Projects\Documents\89Jobs\89L8179B\CAD\Struct\Laurel\Sheets\084-9956-XXXXX-021-Sub Data Profile.dgn

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HANSON		CHECKED - HGN	REVISED -
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	PLOT DATE = 2/24/2017	CHECKED - JGT	REVISED -

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STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

SUBSURFACE DATA PROFILE
STRUCTURE NO. 084-9956
SHEET NO. 21 OF 21 SHEETS

F.A.U. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
	14-00477-00-BR	SANGAMON	403	268
		CONTRACT NO. 93704		
	ILLINOIS FED. AID PROJECT			

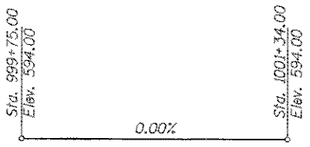
Benchmark:
BM# JHF-2: Chiseled 'X' on SW Bolt of Gas Station sign
SE Quadrant of 9th Street and Laurel Street.
Elevation = 605.788

Existing Structure: None

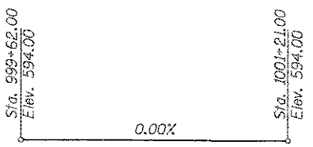
Traffic Control: Road Closure

Salvage: None

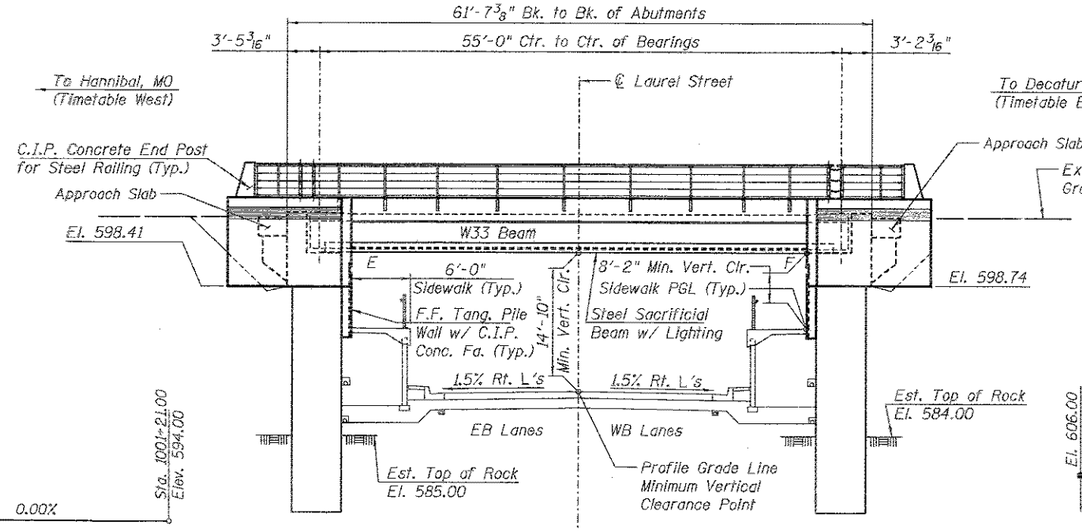
Railroad utilities may exist within NSRR right-of-way. Prior to the start of any construction or excavation, utility relocations will have to be coordinated with the NSRR.



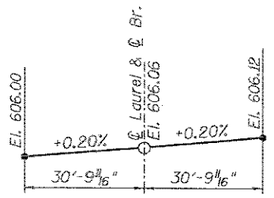
P.G.L. NORTH SIDEWALK
(Along Face of Tangent Pile Wall)



P.G.L. SOUTH SIDEWALK
(Along Face of Tangent Pile Wall)



ELEVATION
(Looking Northwest)



PROFILE GRADE
CONCRETE DECK
(Looking Northwest)
(Elevations Taken along Bridge ℄)

LOADING COOPER E-80

Impact: Diesel Impact
Allow 6" of Future Ballast Dead Load

DESIGN SPECIFICATIONS

2014 AREMA Specifications
Live Load Deflection: L/640
Composite Design for Deflection Requirements
Design Speed: 50 m.p.h.

DESIGN STRESSES

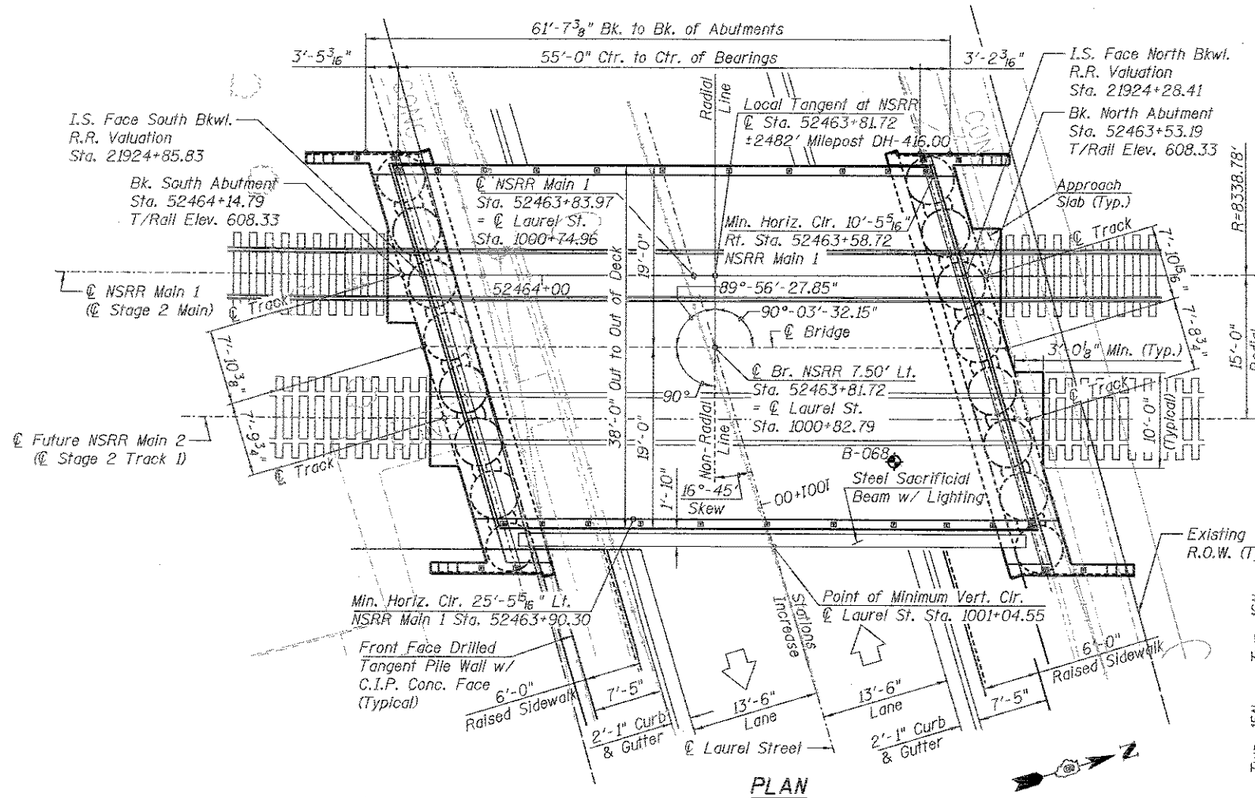
FIELD UNITS

f'c = 4,000 psi
fy = 60,000 psi (Reinforcement)
fy = 50,000 psi (ASTM A709 Grade 50)

SEISMIC DATA

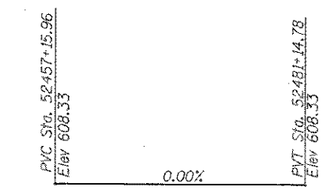
AREMA

Coefficient of Horiz. Acceleration, 100 Year (A_{100}) = < 0.04g
Coefficient of Horiz. Acceleration, 475 Year (A_{475}) = < 0.04g
Coefficient of Horiz. Acceleration, 2400 Year (A_{2400}) = 0.095g
Soil Site Coefficient (S) = 1.0

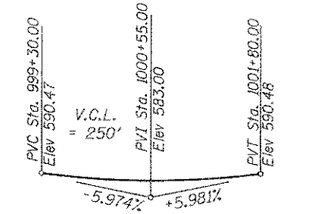


PLAN

Indicates Boring Location



P.G. NSRR MAIN 1 RAIL
(Along Top of Rail)

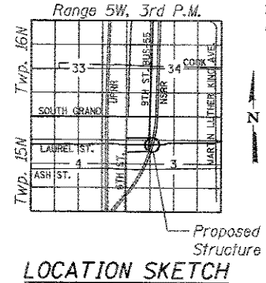


PROFILE GRADE - LAUREL ST.
Along ℄ of Laurel Street

CURVE DATA

(NSRR Main 1)

P.I. Sta. = 52472+27.28
Δ = 37°-24'-51" (Rt.)
D = 00°-41'-14"
T = 2823.67'
L = 5445.19'
R = 8338.78'
E = 465.10'
Long Chord = 5348.99'
Mid. Ord. = 440.53'
S.E. = 1"
S.C. Sta. = 52444+03.61
C.S. Sta. = 52498+48.80



LOCATION SKETCH

MICHAEL N. MENDENHALL
LICENSED STRUCTURAL ENGINEER
062-006657
STATE OF ILLINOIS

Michael N. Mendenhall
SIGNATURE
02-27-2017
DATE
LIC. EXP. DATE: 11-30-2018

I certify that to the best of my knowledge, information and belief, this bridge design is structurally adequate for the design loading shown on the plans. The design is an economical one for the style of structure and complies with requirements of the current AREMA Specifications.

GENERAL PLAN & ELEVATION
NSRR (MP DH-415.54) over LAUREL STREET
F.A.U. 7991-SECTION 14-00477-00-BR
SANGAMON COUNTY
STATION 52463+81.72
STRUCTURE NO. 084-9957

FINAL

DESIGNED	MNM	10/03/14
DRAWN	RAH	10/03/14
REVIEWED	JGT	10/17/2016

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USER NAME = pop00275	DESIGNED - MNM	REVISED -	
	CHECKED - JGT	REVISED -	
PLOT SCALE = 0.999998 '/ in.	DRAWN - RAH	REVISED -	
PLOT DATE = 2/27/2017	CHECKED - MNM	REVISED -	

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

GENERAL PLAN AND ELEVATION
STRUCTURE NO. 084-9957
SHEET NO. 1 OF 17 SHEETS

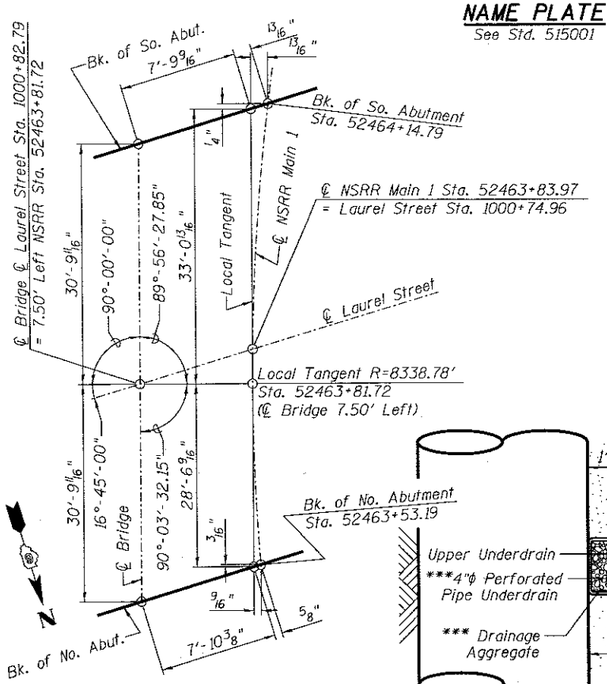
F.A.U. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
	14-00477-00-BR	SANGAMON	403	269
		CONTRACT NO. 93704		
	ILLINOIS FED. AID PROJECT			

GENERAL NOTES

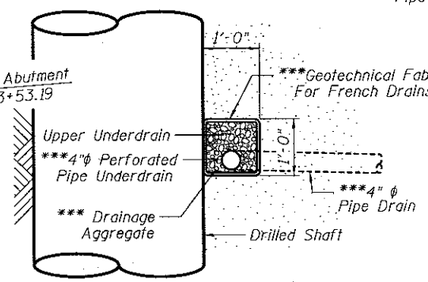
1. Fasteners shall be ASTM A325 Type 1, mechanically galvanized bolts. Bolts $\frac{7}{8}$in. ϕ, holes $\frac{15}{16}$ in. ϕ, unless otherwise noted.
2. Calculated weight of Structural Steel, ASTM A709, Gr. 50 = 233,780 lbs.
   ASTM A36, Gr. 36 = 1,620 lbs.
   ASTM A500, Gr. B (46 ksi) = 5,530 lbs.
   ASTM A240, Type 304 (30 ksi) = 2,400 lbs.
3. All structural steel shall be ASTM A709 Grade 50 unless otherwise noted on the plans.
4. Stainless steel plate for the deck joints shall be according to ASTM A240, Type 304, Fy=30 k.s.i.
5. All substructure concrete shall have a compressive strength of 4,000 psi at 28 days.
6. No field welding is permitted except as specified in the contract documents.
7. Reinforcement bars designated (E) shall be epoxy coated.
8. If the Contractor elects to use cantilever forming brackets on the exterior beams or girders, the brackets shall be placed at the same locations as required for the hardwood blocks in Article 503.06(b) of the Standard Specifications. If additional cantilever forming brackets are required, hardwood blocking shall be wedged between the exterior and first interior beam at each of these additional bracket locations.
9. Protective coat shall not be applied to any surface.
10. Bearing seat surfaces shall be constructed or adjusted to the designated elevations within a tolerance of $\frac{1}{8}$ inch (0.01 ft.). Adjustment shall be made either by grinding the surface or by shimming the bearings.
11. Concrete Sealer shall be applied to the following surfaces:
    Abutments - inside face of backwall, inside face of cheekwall, top of cap, entire concrete facing attached to abutment caps and drilled shafts (except surfaces coated with concrete surface treatment).
    Superstructure - top and outside vertical faces of ballast curb and outside vertical face of deck, concrete railing end post (except surfaces coated with surface color and treatment).
12. Anti-Graffiti Protection System shall be applied to the following surfaces:
    Abutments - concrete facing, wingwall and cheekwall surfaces coated with concrete surface color treatment.
    Superstructure - surfaces coated with concrete surface color treatment.
13. The Inorganic Zinc Rich Primer / Acrylic / Acrylic Paint System shall be used for shop and field painting of new structural steel except where otherwise noted. The color of the final finish coat for all interior steel surfaces and sacrificial beam shall be gray, Munsell No. 5B 7/1. The color of the final finish coat for the exterior and bottom flange of the fascia beams shall be blue, Munsell No. 10B 3/6.
14. Waterproofing shall be applied to the backside of the abutment cap and backwall and backside of wingwalls for surfaces below ground. This shall be according to Article 503.18 of the Std. Spec. Cost included with Concrete Structures.

NORFOLK SOUTHERN RAILROAD
S.N. 084-9957 BUILT 20__ BY
CITY OF SPRINGFIELD
SEC. 14-00477-00-BR
STATION 52463+81.72
MILE POST DH-415.54
LOADING COOPER E-80

NAME PLATE
See Std. 515001

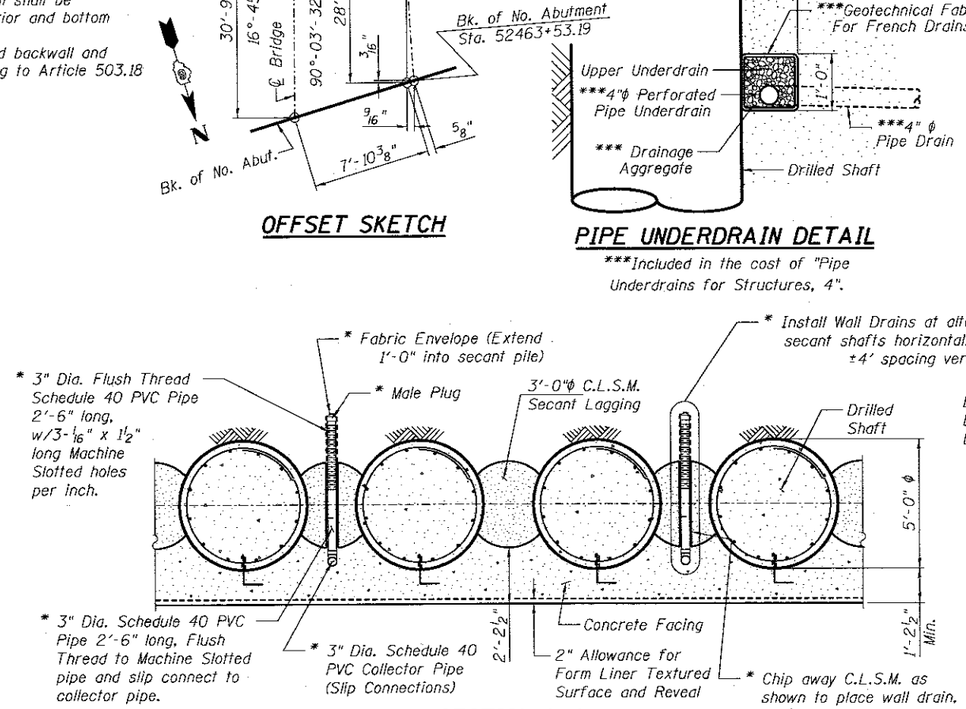


OFFSET SKETCH



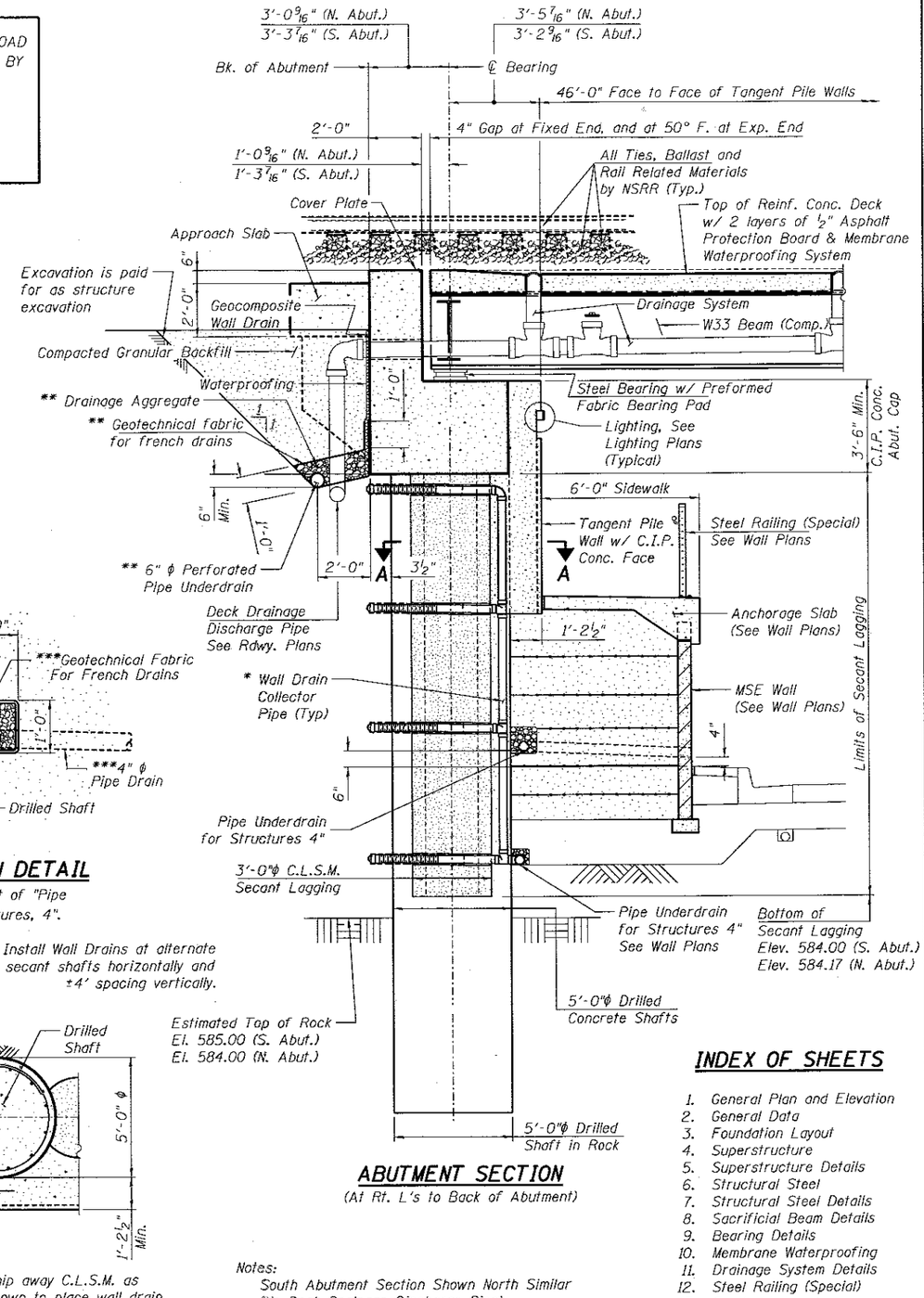
PIPE UNDERDRAIN DETAIL

***Included in the cost of "Pipe Underdrains for Structures, 4".



SECTION A-A

* Included in the cost of "Pipe Underdrains for Structures, 4".



ABUTMENT SECTION
(At Rt. L's to Back of Abutment)

Notes:
South Abutment Section Shown North Similar (No Deck Drainage Discharge Pipe)
** Included in the cost of "Pipe Underdrains for Structures, 6". For additional drainage details see Roadway Plans.

TOTAL BILL OF MATERIAL

ITEM	UNIT	SUPER	SUB	TOTAL
Structure Excavation	Cu. Yd.	-	301	301
Concrete Structures	Cu. Yd.	-	146.8	146.8
Concrete Superstructure	Cu. Yd.	70.5	-	70.5
Form Liner Textured Surface	Sq. Ft.	-	602	602
Furnishing and Erecting Structural Steel, Bridge No. 4	L. Sum	1	-	1
Stud Shear Connectors	Each	4032	-	4032
Reinforcement Bars	Pound	-	204120	204120
Reinforcement Bars, Epoxy Coated	Pound	14790	16260	31050
Name Plates	Each	-	1	1
Drilled Shaft in Soil	Cu. Yd.	-	163.8	163.8
Drilled Shaft in Rock	Cu. Yd.	-	267.6	267.6
Membrane Waterproofing	Sq. Ft.	2227	-	2227
Concrete Sealer	Sq. Ft.	451	1567	2018
Geocomposite Wall Drain	Sq. Yd.	-	61	61
Conduit Embedded in Structure, 4" dia., PVC	Foot	113	8	121
Anti-Graffiti Protection System	Sq. Ft.	6	176	182
Drainage System, No. 4	Each	1	-	1
Concrete Surface Color Treatment	Sq. Ft.	6	176	182
Floor Drains (Special)	Each	12	-	12
Granular Backfill for Structures	Cu. Yd.	-	86	86
Steel Railing (Special)	Foot	140	-	140
Pipe Underdrains for Structures, 4"	Foot	-	106	106
Pipe Underdrains for Structures, 6"	Foot	-	101	101
Secant Lagging	Cu. Ft.	-	1434	1434

INDEX OF SHEETS

DESIGNED	MNM	10/03/14
DRAWN	RAH	10/03/14
REVIEWED	JGT	10/11/2016

FINAL

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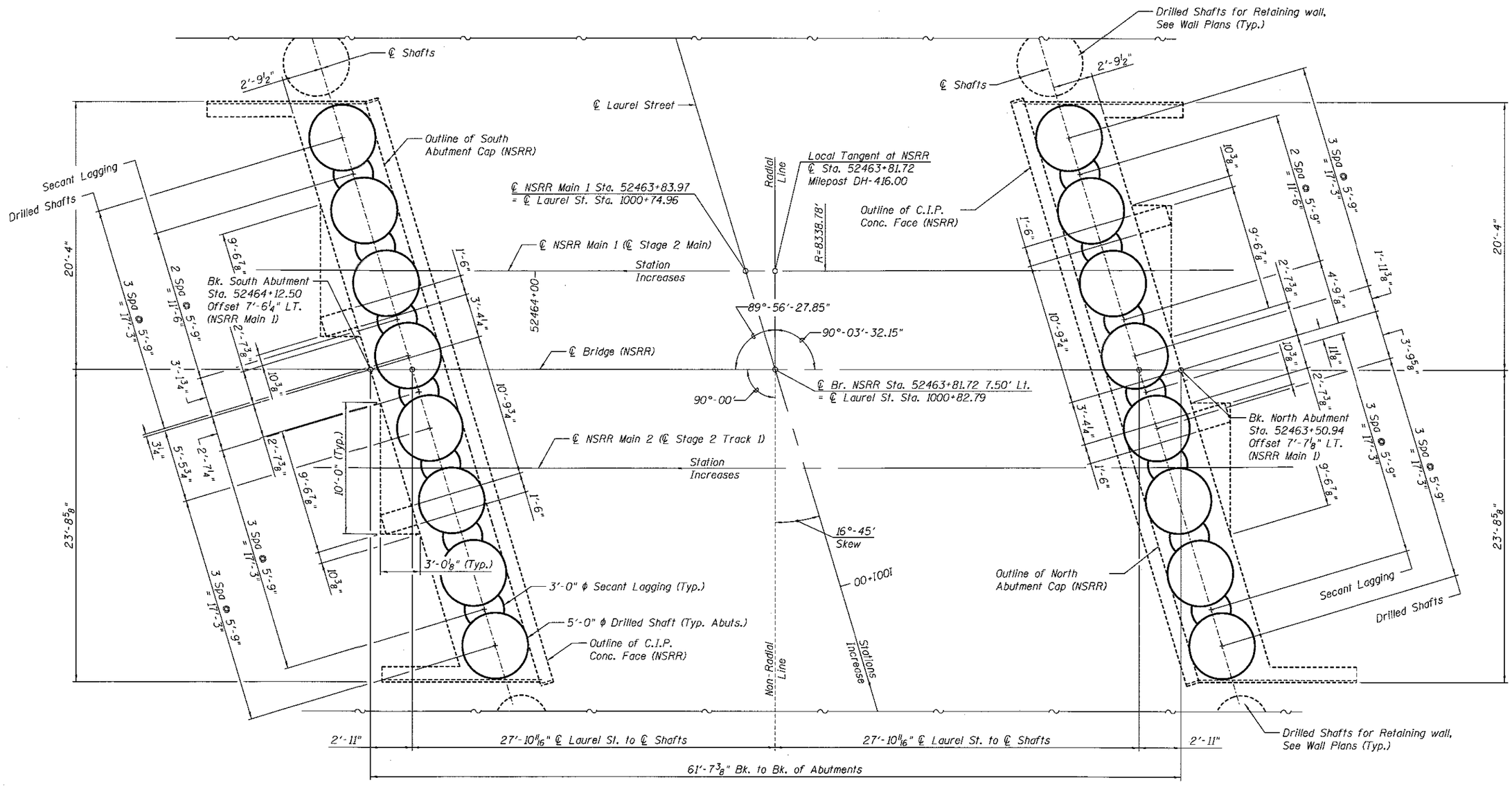
	CHECKED - JGT	REVISED -	
PLOT SCALE = 64.999996 '/ in.	DRAWN - RAH	REVISED -	
PLOT DATE = 5/25/2017	CHECKED - MNM	REVISED -	

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

GENERAL DATA
STRUCTURE NO. 084-9957
SHEET NO. 2 OF 17 SHEETS

F.A.I. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
	14-00477-00-BR	SANGAMON	403	270
		CONTRACT NO. 93704		
		ILLINOIS FED. AID PROJECT		

Notes:
See Roadway Plans for existing utilities and topography.



FOUNDATION LAYOUT PLAN

FINAL		
DESIGNED	JGT	12/25/14
DRAWN	DAP	12/25/14
REVIEWED	JGT	10/11/2016

pw:\\spi-svr308.hanson.dom:Hanson Projects\Documents\@9Jobs\@9_01798\CAD\Struct\Laurel\Sheet\084-9957-XXXXX-003-Foundation Layout.dgn

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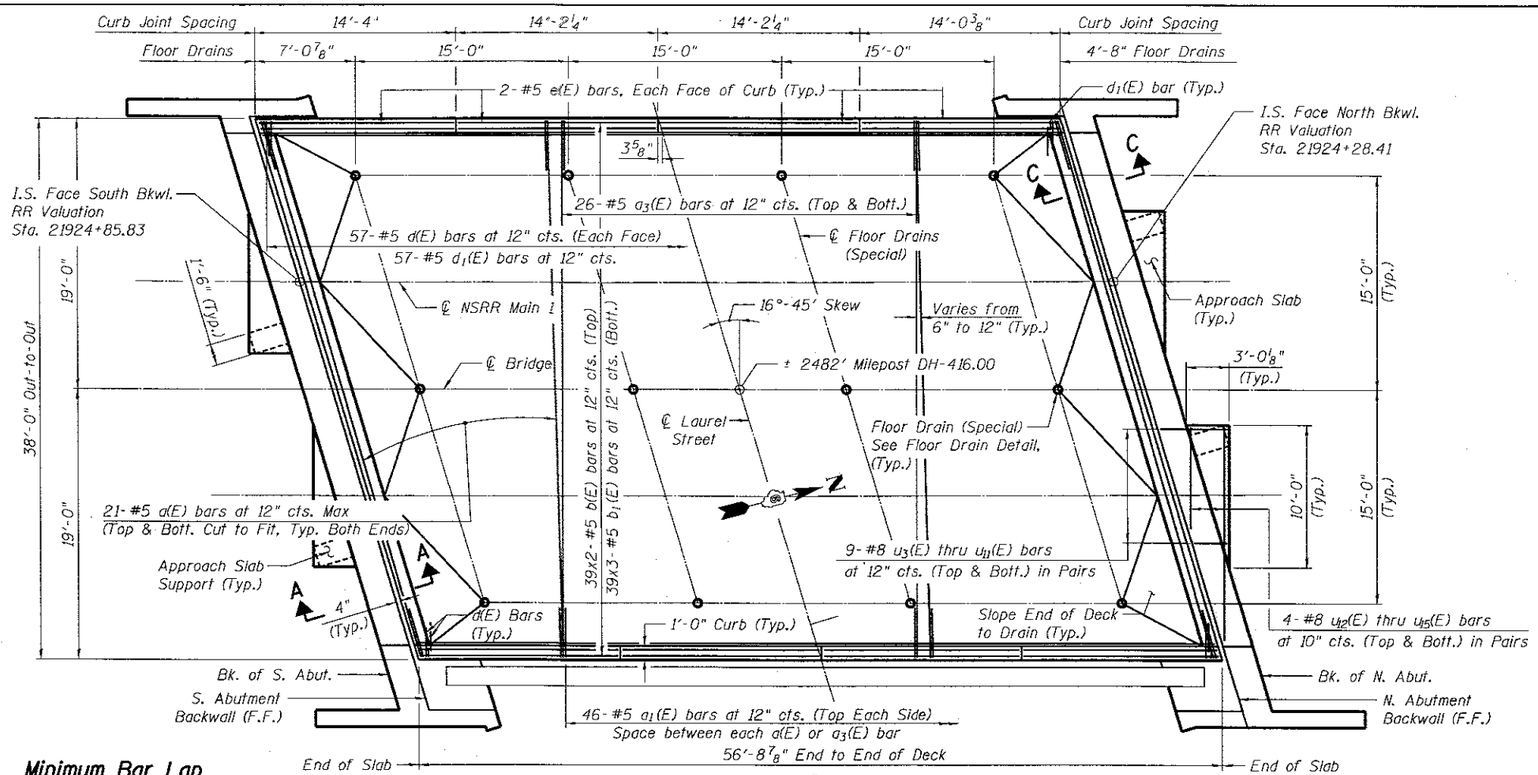
USER NAME = pop@0275	DESIGNED - JGT	REVISED -	
	CHECKED - HGN	REVISED -	
PLOT SCALE = 0.999996 '' / in.	DRAWN - DAP	REVISED -	
PLOT DATE = 2/24/2017	CHECKED - JGT	REVISED -	

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

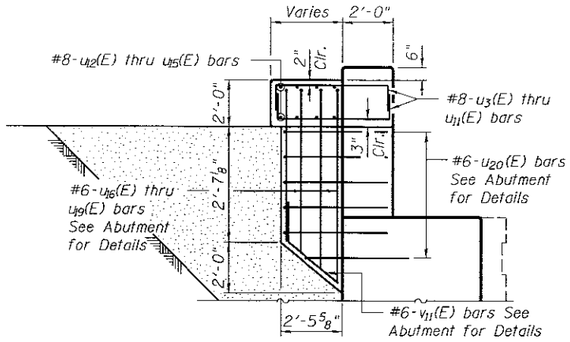
FOUNDATION LAYOUT
STRUCTURE NO. 084-9957
SHEET NO. 3 OF 17 SHEETS

F.A.U. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
	14-00477-00-BR	SANGAMON	403	271
		CONTRACT NO. 93704		
	ILLINOIS FED. AID PROJECT			



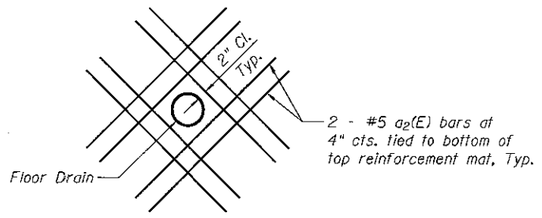
PLAN

Minimum Bar Lap
#5 bar = 2'-1"

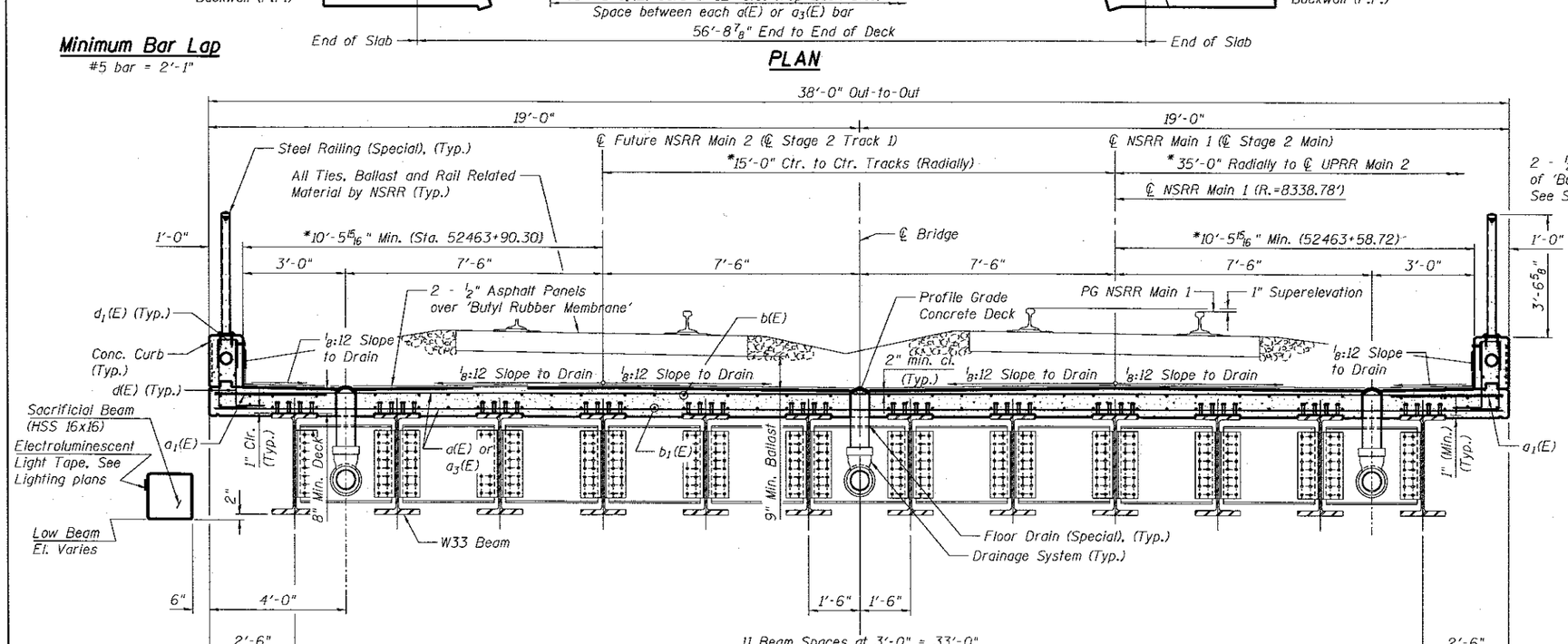


APPROACH SLAB SECTION

(Horizontal Dimensions at Rt. 4's to back of abutment)

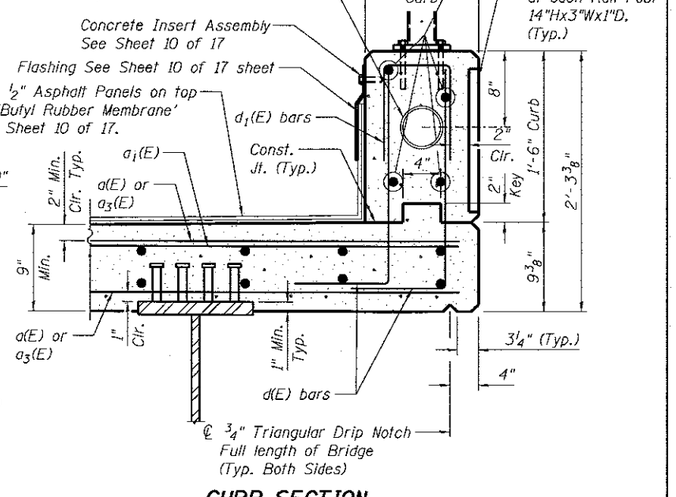


FLOOR DRAIN DETAIL



TYPICAL SECTION (NSRR)

(Looking South)
* Dimensions are Rt. 4's to ℄ Track



CURB SECTION

Notes:
1. For Steel Railing Details See Sheet 12 of 17.
2. For Membrane Waterproofing Details See Sheet 10 of 17.
3. Shift bars to miss floor drains, do not cut.
4. Bars indicated thus 39x2-#5 etc. indicates 39 lines of bars with 2 lengths per line.
5. For Concrete Deck End Dam Details at Joints, Joint Details, Sections A-A and C-C. See Sheet 10 of 17.
6. Approach Slab concrete shall be paid for as Concrete Superstructure.

FINAL

	JGT	12/25/14
DESIGNED	DAP	12/25/14
DRAWN	JGT	10/17/2016
REVIEWED		

p:\\spi-svr306.hanson.dom\Hanson Projects\Documents\09Jobs\09L01798\CAD\Struct\Laural\Sheet\084-9957-XXXXX-004-Super.dgn

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USER NAME = Johns80944	DESIGNED - JGT	REVISED -	
	CHECKED - SEG	REVISED -	
PLOT SCALE = 81.999996 '1' / in.	DRAWN - DAP	REVISED -	
PLOT DATE = 5/25/2017	CHECKED - JGT	REVISED -	

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

SUPERSTRUCTURE
STRUCTURE NO. 084-9957
SHEET NO. 4 OF 17 SHEETS

F.A.U. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
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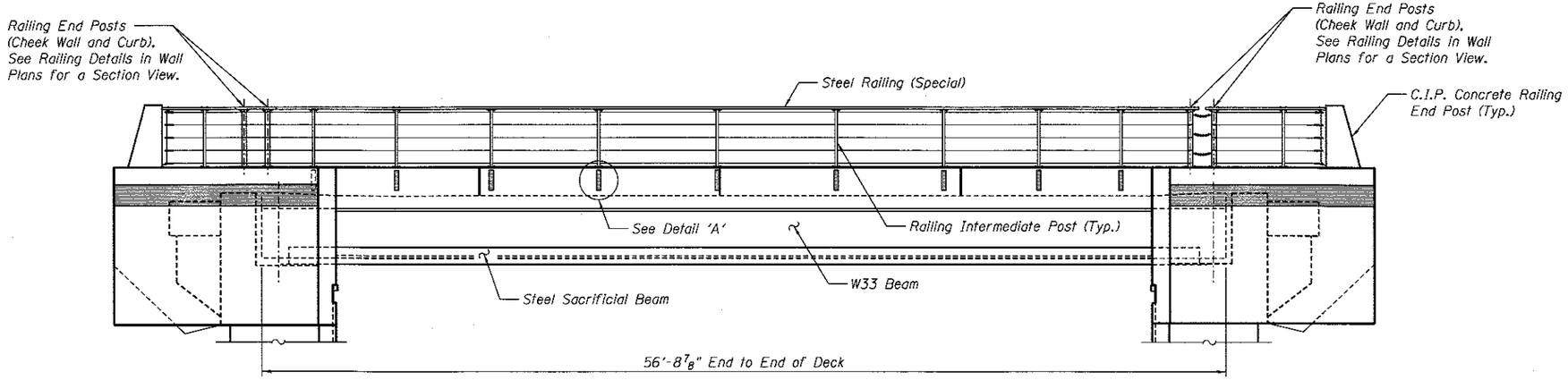
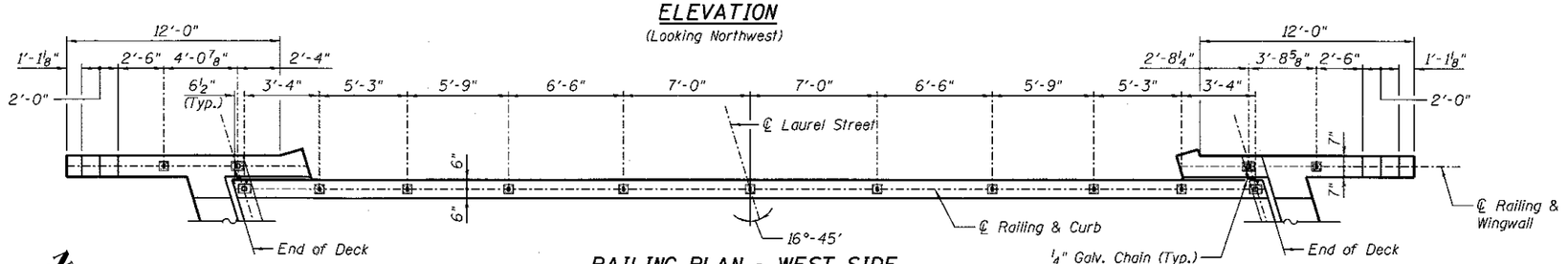
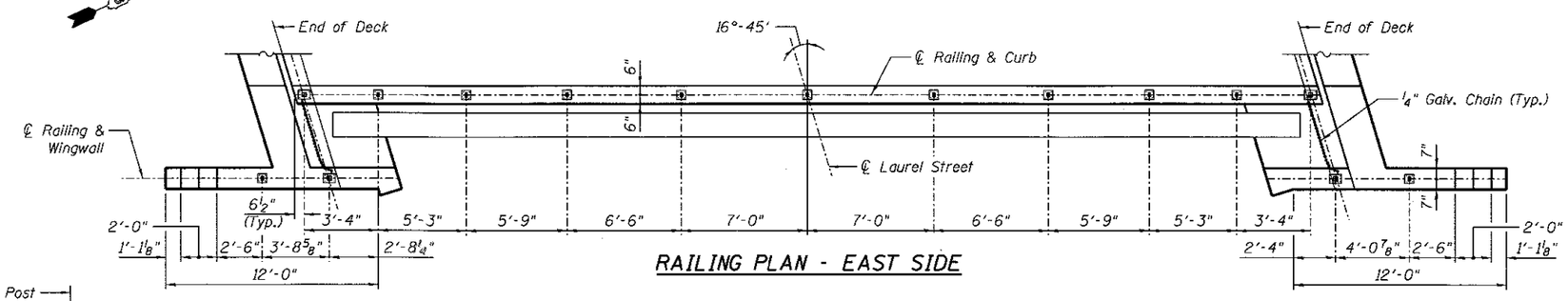
		CONTRACT NO. 93704		
	ILLINOIS FED. AID PROJECT			



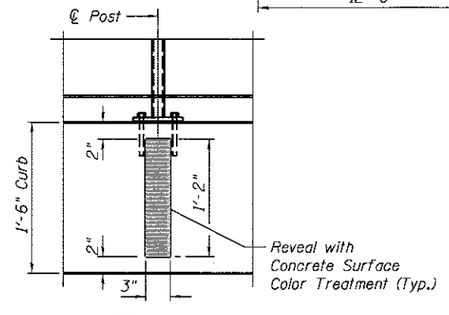
ELEVATION
(Looking Northwest)



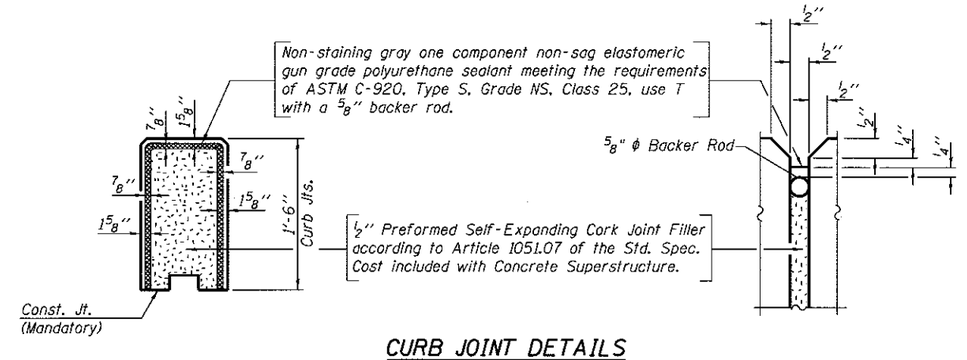
RAILING PLAN - WEST SIDE



RAILING PLAN - EAST SIDE

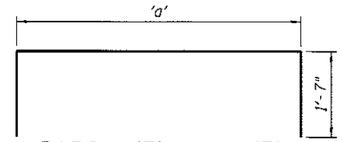


DETAIL 'A'



CURB JOINT DETAILS

Note: For steel railing details see sheet 12 of 17. For concrete railing end post details see sheets 14 & 16 of 17. For 1/4" Galv. Chain details, see retaining wall plans. Cost of chain and hardware shall be included in the cost of Steel Railing (Special).

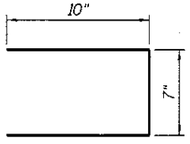


BARS u_3(E) thru u_{15}(E)

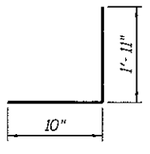
Bar	'a'
u_3(E)	4'-8"
u_4(E)	4'-4"
u_5(E)	4'-1"
u_6(E)	3'-9"
u_7(E)	3'-5"
u_8(E)	3'-2"
u_9(E)	2'-10"
u_{10}(E)	2'-6"
u_{11}(E)	2'-3"
u_{12}(E)	14'-10"
u_{13}(E)	12'-3"
u_{14}(E)	9'-8"
u_{15}(E)	7'-1"

SUPERSTRUCTURE BILL OF MATERIAL

Bar	No.	Size	Length	Shape
d(E)	84	#5	39'-3"	——
a_1(E)	92	#5	3'-6"	——
a_2(E)	96	#5	2'-6"	——
a_3(E)	52	#5	37'-8"	——
b(E)	78	#5	29'-4"	——
b_1(E)	117	#5	20'-3"	——
d(E)	228	#5	2'-9"	⌊
d_1(E)	114	#5	2'-3"	⌊⌋
e(E)	32	#5	13'-10"	——
u_3(E)	8	#8	7'-10"	⌐ ⌐
u_4(E)	8	#8	7'-6"	⌐ ⌐
u_5(E)	8	#8	7'-3"	⌐ ⌐
u_6(E)	8	#8	6'-11"	⌐ ⌐
u_7(E)	8	#8	6'-7"	⌐ ⌐
u_8(E)	8	#8	6'-4"	⌐ ⌐
u_9(E)	8	#8	6'-0"	⌐ ⌐
u_{10}(E)	8	#8	5'-8"	⌐ ⌐
u_{11}(E)	8	#8	5'-5"	⌐ ⌐
u_{12}(E)	8	#8	18'-0"	⌐ ⌐
u_{13}(E)	8	#8	15'-5"	⌐ ⌐
u_{14}(E)	8	#8	12'-10"	⌐ ⌐
u_{15}(E)	8	#8	10'-3"	⌐ ⌐
Reinforcement Bars, Epoxy Coated			Pound	14790
Concrete Superstructure			Cu. Yds.	70.5
Conduit Embedded in Structure, 4" dia., PVC			Foot	113
Floor Drains (Special)			Each	12
Concrete Surface Color Treatment			Sq. Ft.	6



BAR d_1(E)



BAR d(E)

DESIGNED	JGT	12/25/14
DRAWN	DAP	12/25/14
REVIEWED	JGT	10/11/2016

FINAL

pw:\\spi-sw386.hanson.domHanson Projects\Documents\0%Jobs\0%L61798\CAD\Struct\Laurel\Sheet\084-9957-XXXXX-005-Super Details.dgn

FILE NAME =	USER NAME = pop00275	DESIGNED - JGT	REVISED -
HANSON		CHECKED - SEG	REVISED -
	PLOT SCALE = 0.999998 '/ in.	DRAWN - DAP	REVISED -
	PLOT DATE = 2/24/2017	CHECKED - JGT	REVISED -

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STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

SUPERSTRUCTURE DETAILS
STRUCTURE NO. 084-9957
SHEET NO. 5 OF 17 SHEETS

F.A.U. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
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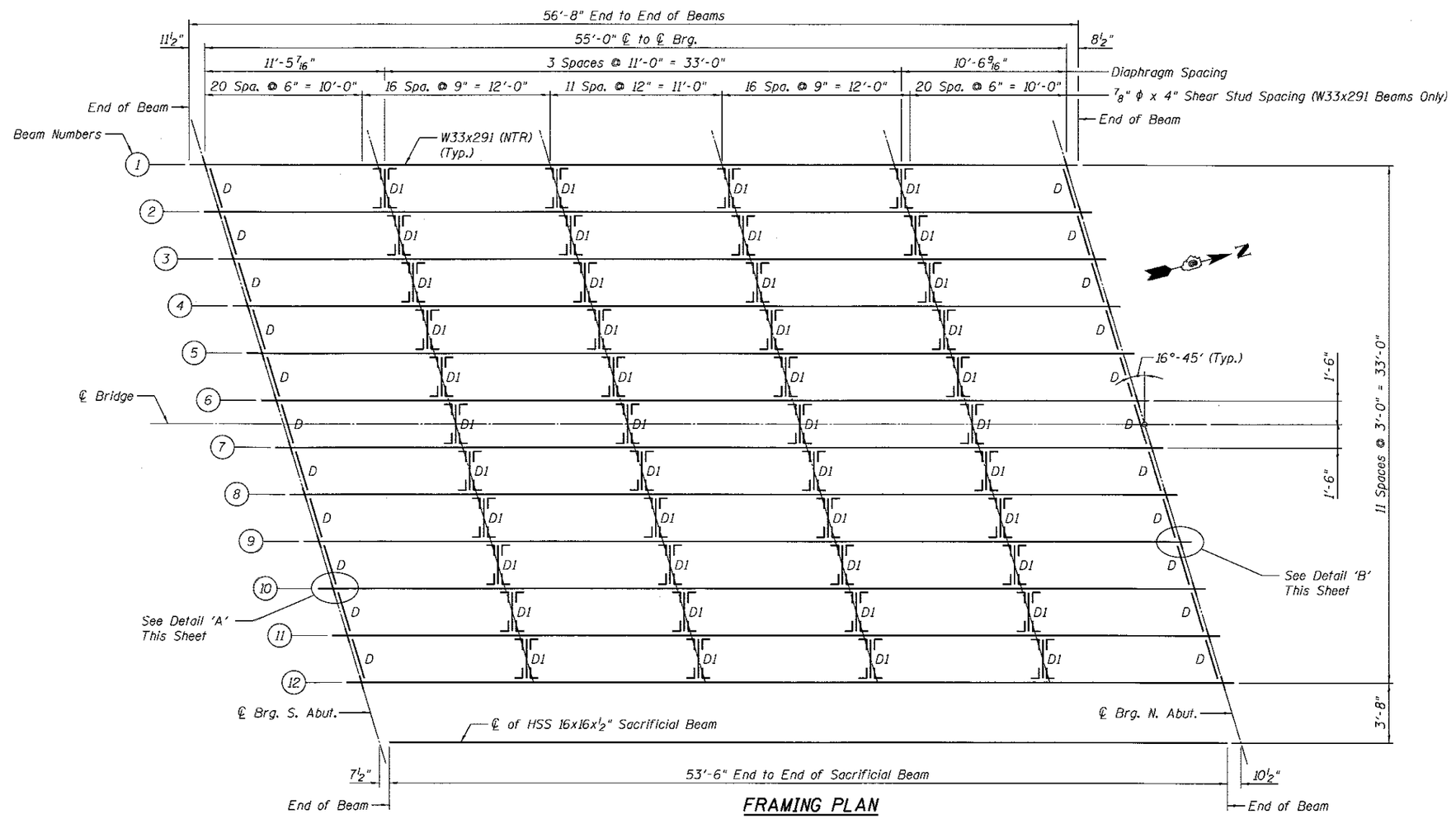
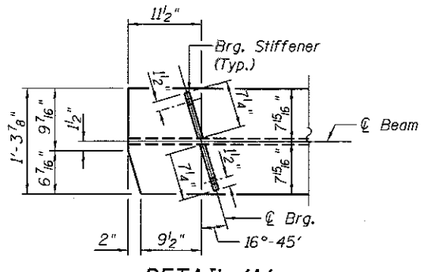
		CONTRACT NO. 93704		
	ILLINOIS FED. AID PROJECT			

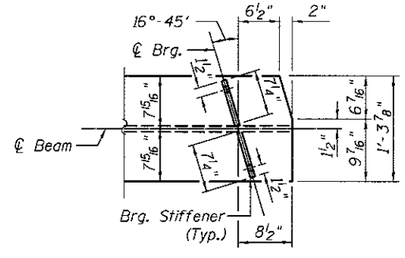


FRAMING PLAN



DETAIL 'A'

(Clip Top & Bottom Flange)



DETAIL 'B'

(Clip Top & Bottom Flange)

Notes:

All diaphragms shall be installed as steel is erected and secured with erection pins and bolts except as otherwise noted. Individual cross frames or diaphragms at supports may be temporarily disconnected to install bearing anchor rods.

Load carrying components designated "NTR" shall conform to the Impact Testing Requirement, Zone 2.

Floor Drains shall be located clear of all diaphragms.

FINAL

DESIGNED	JGT	12/25/14
DRAWN	DAP	12/25/14
REVIEWED	JGT	10/11/2016

pw:\\spi-svr306.hanson.dom:Hanson Projects\Documents\09Jobs\09L01798\CAD\Struct\Laurel\Sheet\084-9957-XXXXX-006-Struct Steel.dgn

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	CHECKED - SEG	REVISED -
PLOT SCALE = 01.999996 '' / in.	DRAWN - DAP	REVISED -
PLOT DATE = 2/24/2017	CHECKED - JGT	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

STRUCTURAL STEEL
STRUCTURE NO. 084-9957
SHEET NO. 6 OF 17 SHEETS

F.A.U. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
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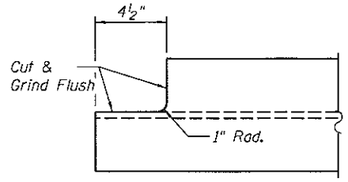
		CONTRACT NO. 93704		
	ILLINOIS FED. AID PROJECT			



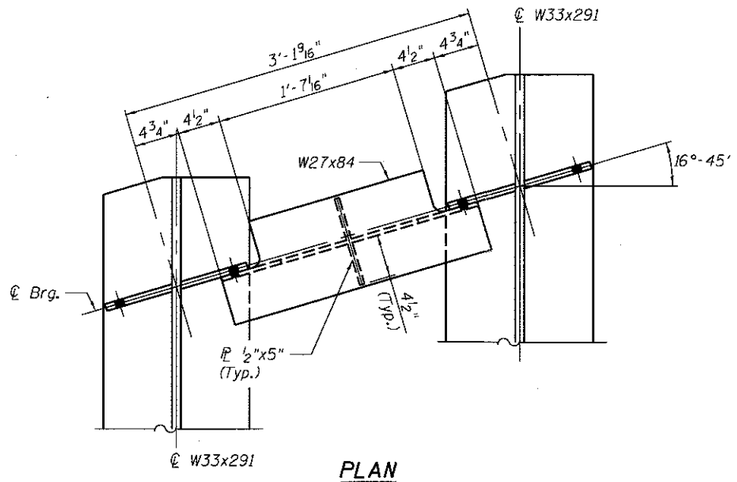
COPE DETAIL

Notes:
1. All diaphragms shall be installed as steel is erected and secured with erection pins and bolts except as otherwise noted. Individual diaphragms at supports may be temporarily disconnected to install bearing anchor rods.
2. Load carrying components designated "NTR" shall conform to the Impact Testing Requirement, Zone 2.
3. Bolts shall be ⅞" ϕ placed in 15/16" ϕ holes unless otherwise noted.
4. Steel shall conform to ASTM A709 Gr. 50 unless otherwise noted.
5. See sheet 11 of 17 for holes in interior diaphragms for drainage system.

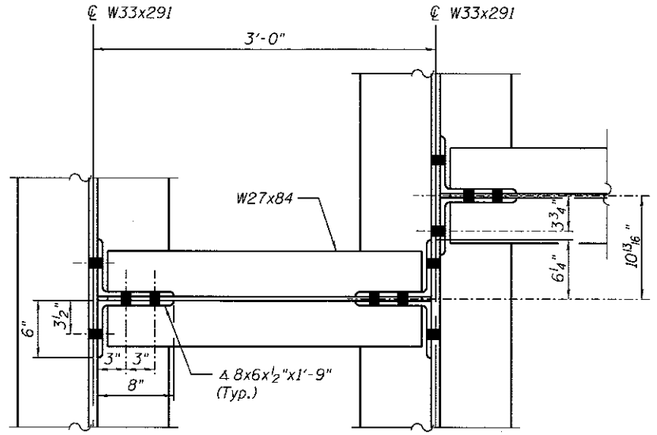
MOMENT & SHEAR TABLE FOR INTERIOR BEAMS

DESCRIPTION	MAX MOMENT	MAX SHEAR
Dead Load	547.5 Ft.-K	39.8 K
Live Load	1,116.6 Ft.-K	92.7 K
Centrifugal Force	9.5 Ft.-K	0.7 K
Impact	422.3 Ft.-K	35.0 K
Total	2,095.9 Ft.-K	168.2 K
Section	W33x291	
Steel	ASTM A709, GR 50, NTR ZONE 2	
Net I	17,458 IN^4	
Net S (Bott.)	1,003 IN^3	
FST (Bott.)	25.1 KSI	
Gross I	17,700 IN^4	
Gross S (Top)	1,020 IN^3	
FSC (Top)	24.7 KSI	
(LL+I) Deflection	0.99 IN	
Allowable (LL+I) Deflection	1.03 IN	

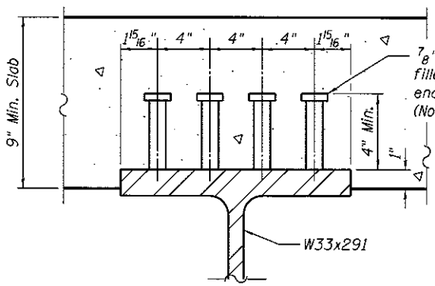
I - Non-composite moment of inertia of the steel section
S - Non-composite section modulus of the steel section
FST - Max unfactored tension stress in the section due to DL+LL+Impact
FSC - Max unfactored compression stress in the section due to DL+LL+Impact



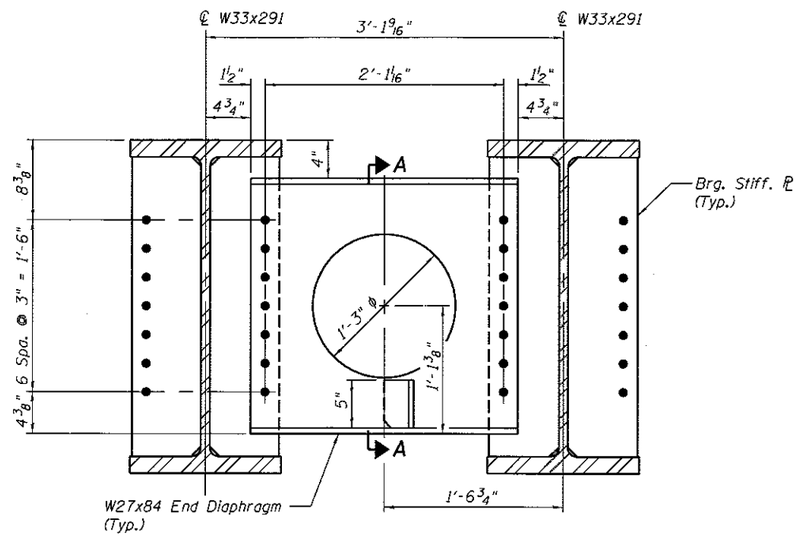
PLAN
(Top Flange not shown for clarity.)



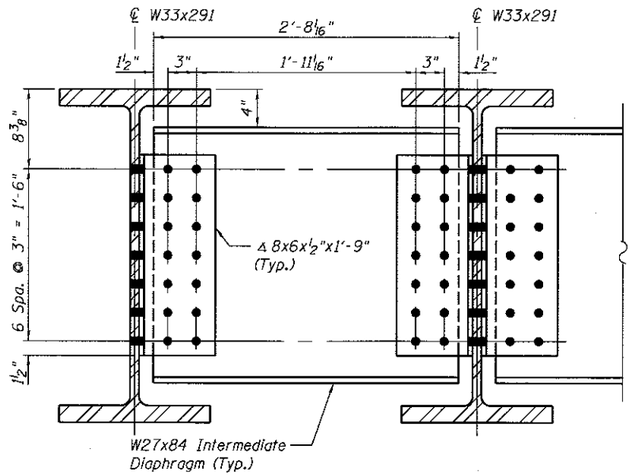
PLAN
(Top Flange not shown for clarity.)



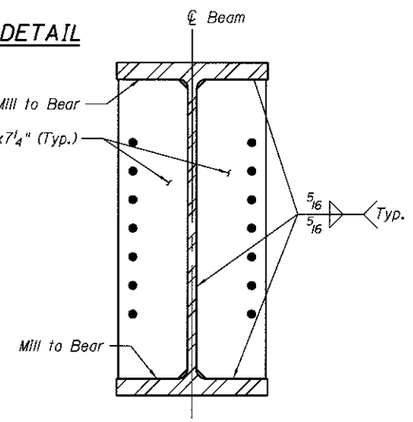
SHEAR STUD DETAIL



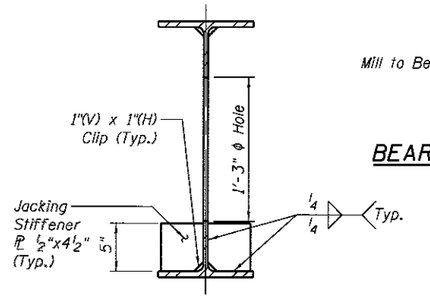
END DIAPHRAGMS-D
(Dimensions along ℄ of Bearing unless otherwise noted)



ELEVATION
INTERMEDIATE DIAPHRAMS-D1



BEARING STIFFENER DETAIL



SECTION A-A

DESIGNED	JGT	12/25/14
DRAWN	DAP	12/25/14
REVIEWED	JGT	10/11/2016

FINAL

pw:\\spi-svr306.hanson.dom:Hanson Projects\Documents\89Jobs\89L0179B\CAD\Struct\Laurel\Sheet\084-9957-XXXXX-007-Struct Steel Det.dgn

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	CHECKED - SEG	REVISED -	
PLOT SCALE = 0.999996 '/ in.	DRAWN - DAP	REVISED -	
PLOT DATE = 2/24/2017	CHECKED - JGT	REVISED -	

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

STRUCTURAL STEEL DETAILS
STRUCTURE NO. 084-9957
SHEET NO. 7 OF 17 SHEETS

F.A.U. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
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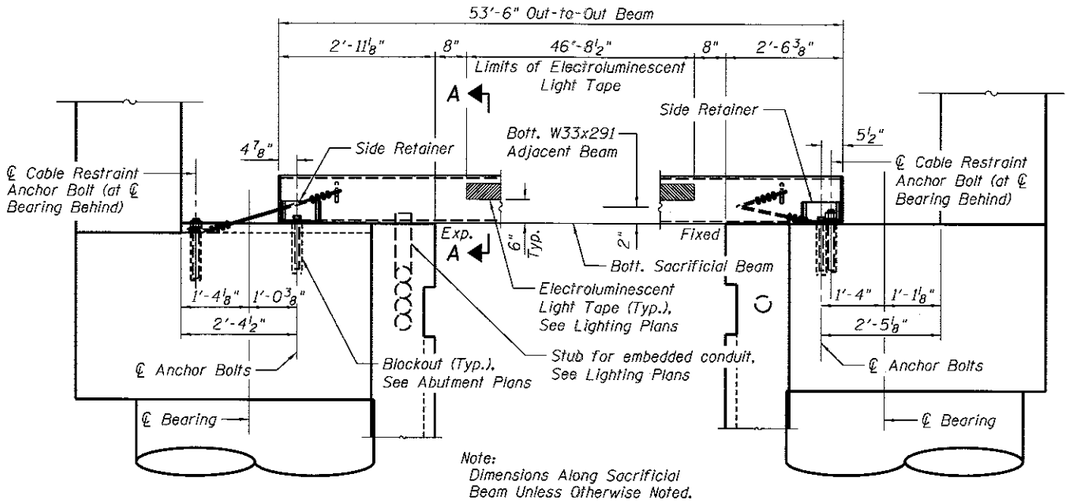
		CONTRACT NO. 93704		
	ILLINOIS FED. AID PROJECT			



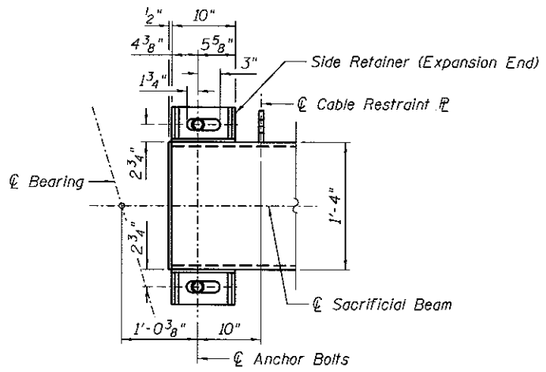
ELEVATION - SOUTH ABUTMENT

Cheek Wall Not Shown for Clarity.
(Looking West)

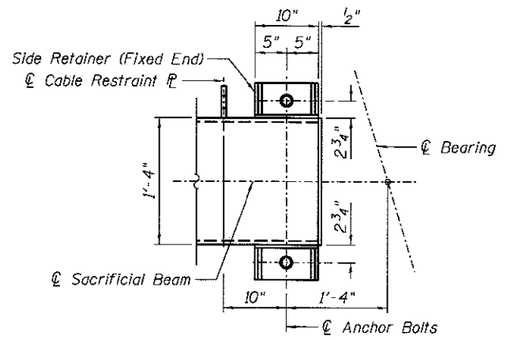
Note:
Dimensions Along Sacrificial Beam Unless Otherwise Noted.

ELEVATION - NORTH ABUTMENT

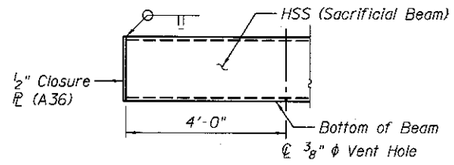
Cheek Wall Not Shown for Clarity.
(Looking West)



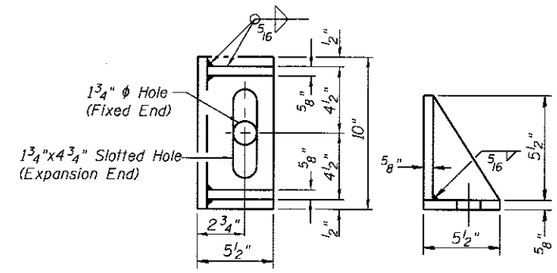
DETAIL - SOUTH ABUTMENT



DETAIL - NORTH ABUTMENT

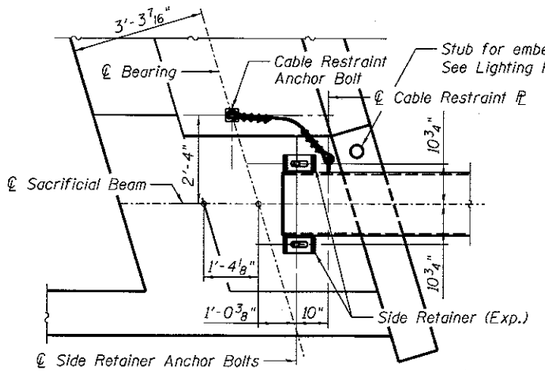


CLOSURE PLATE DETAIL

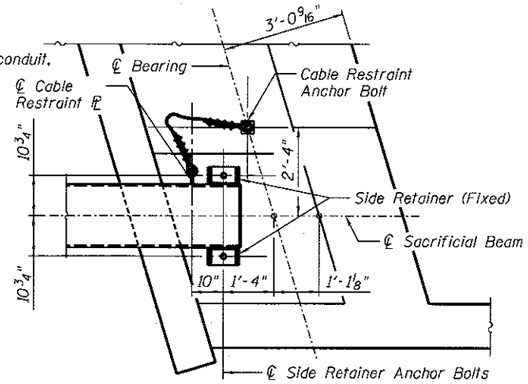


SIDE RETAINER

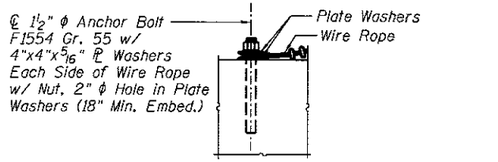
Equivalent rolled angle with stiffeners will be allowed in lieu of welded plates.



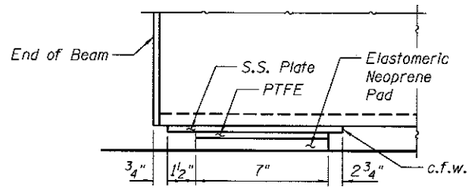
PLAN - SOUTH ABUTMENT



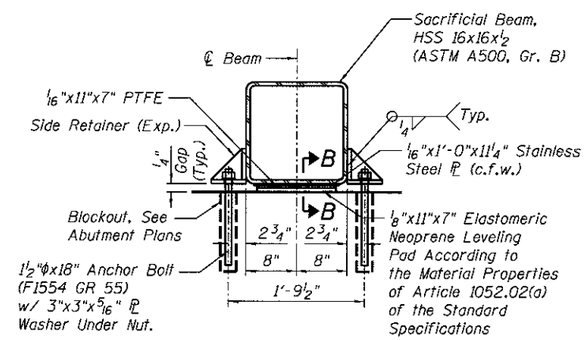
PLAN - NORTH ABUTMENT



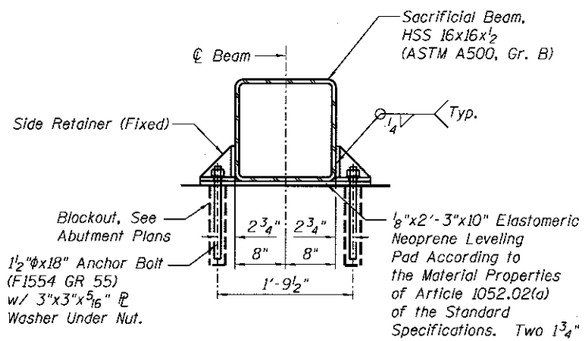
CABLE RESTRAINT ANCHOR BOLT DETAIL



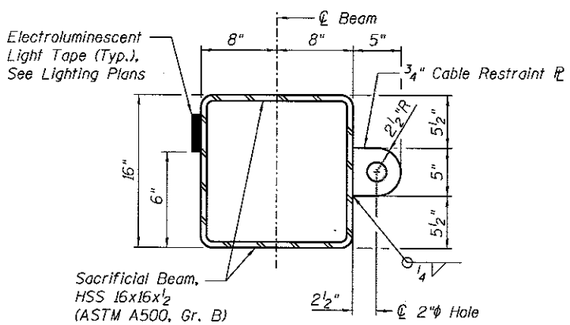
SECTION B-B
(Expansion End)



TYPICAL SECTION AT EXPANSION END



TYPICAL SECTION AT FIXED END



SECTION A-A

Notes:

3/4" wire rope shall be according to AASHTO M30, Type II, Class A coating, EIPS. Use 1 wire rope thimble and 4 wire rope clips per end according to the manufacturer's recommendation.

Cost for elastomeric neoprene and elastomeric neoprene leveling pad w/ PTFE surface, wire rope and accessories shall be included in the cost of "Furnishing and Erecting Structural Steel, Bridge No. 4".

Anchor bolts shall be ASTM F1554 all-thread (or an Engineer-approved alternate material) of the grade(s) and diameter(s) specified. The corresponding specified grade of AASHTO M314 anchor bolts may be used in lieu of ASTM F1554.

Anchor bolts shall be installed in blockouts with Non-Shrink Grout meeting the material requirements of Article 1024.02 of the Standard Specifications.

Blockouts shall be clean prior to grouting and grout installed according to manufactures recommendations.

The PTFE shall be bonded directly to the leveling pad according to the manufacturers recommendations.

FINAL		
DESIGNED	JGT	12/25/14
DRAWN	DAP	12/25/14
REVIEWED	JGT	10/11/2016

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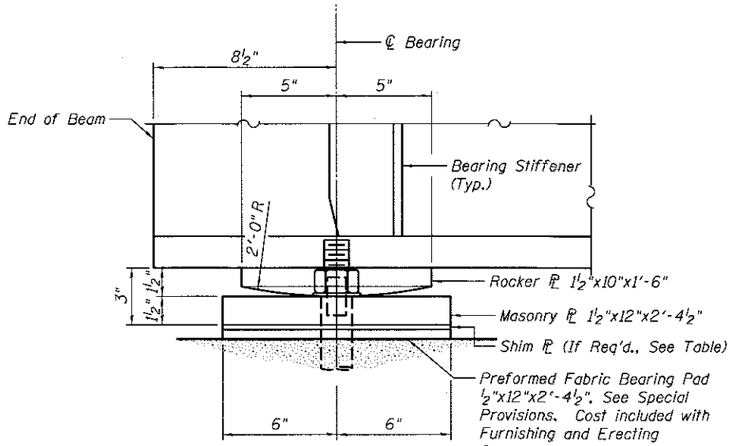
PLOT SCALE = 0.999996 '/ in.	DRAWN - DAP	REVISED -	
PLOT DATE = 2/24/2017	CHECKED - JGT	REVISED -	

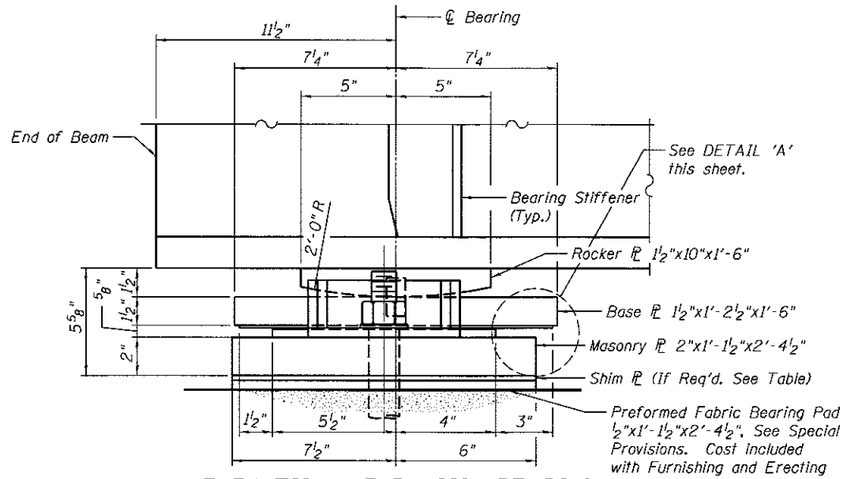
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

SACRIFICIAL BEAM DETAILS
STRUCTURE NO. 084-9957
SHEET NO. 8 OF 17 SHEETS

F.A.U. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
	14-00477-00-BR	SANGAMON	403	276
		CONTRACT NO. 93704		
	ILLINOIS FED. AID PROJECT			



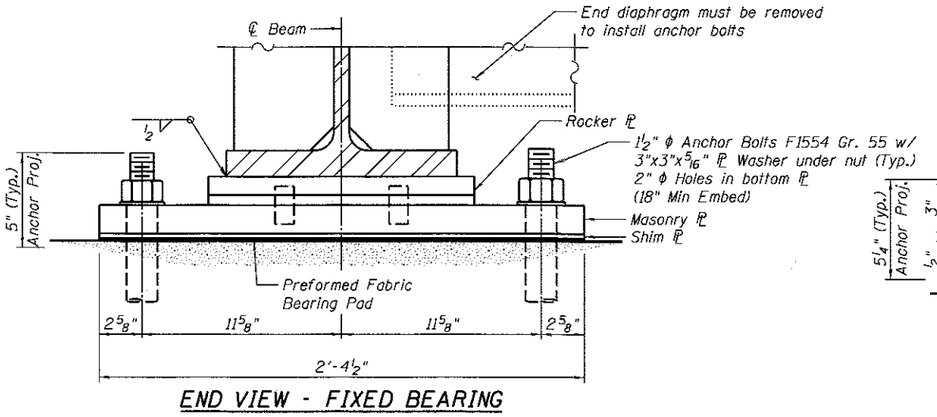
ELEVATION - FIXED BEARING



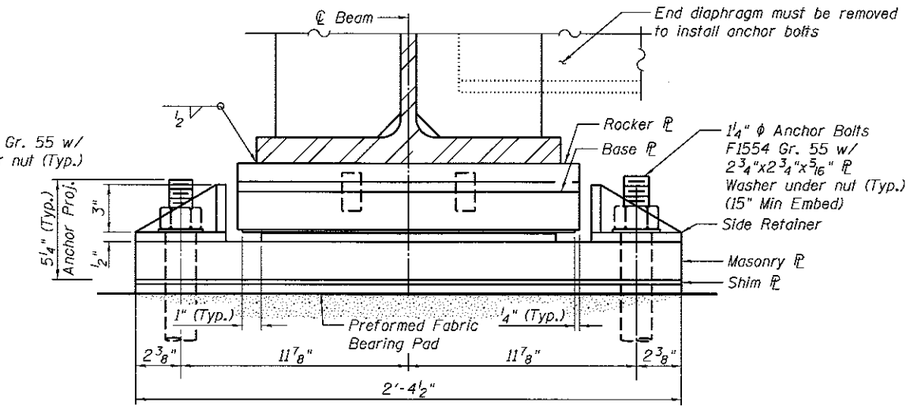
ELEVATION - EXPANSION BEARING

Notes:

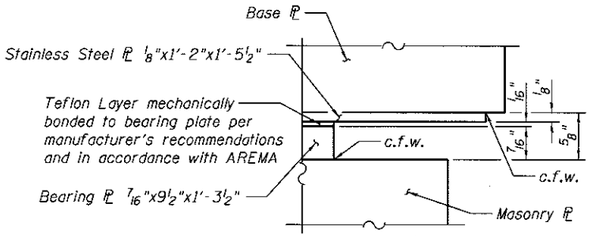
1. *The structural steel plates of the Bearing Assembly shall conform to the requirements of ASTM A709, Grade 50.*
2. *Teflon Layer shall be composed of virgin unfilled TFE resin, unfilled TFE sheets, or unfilled TFE fabric. Filler material, such as milled glass fibers, will not be allowed. Teflon layer shall conform to the requirements of AREMA Chapter 15.*
3. *The bearing assembly shall be according to Section 521 of the Standard Specifications where applicable. The bearing assembly and anchor bolts will not be paid for separately but included in the weight of Structural Steel for payment as "Furnishing and Erecting Structural Steel, Bridge No. 4".*
4. *Anchor bolts shall be ASTM F1554 all-thread (or an Engineer-approved alternate material) of the grade(s) and diameter(s) specified. The corresponding specified grade of AASHTO M314 anchor bolts may be used in lieu of ASTM F1554.*
5. *Anchor bolts shall be installed in blockouts with Non-Shrink Grout meeting the material requirements of Article 1024.02 of the Standard Specifications. Blockouts shall be clean prior to grouting and grout installed according to manufactures recommendations. Cost for non-shrink grout shall be included in the cost of Concrete Structures.*
6. *Two ⅛" adjusting shims shall be provided for each bearing assembly in addition to all other plates or shims and placed as shown on bearing details.*



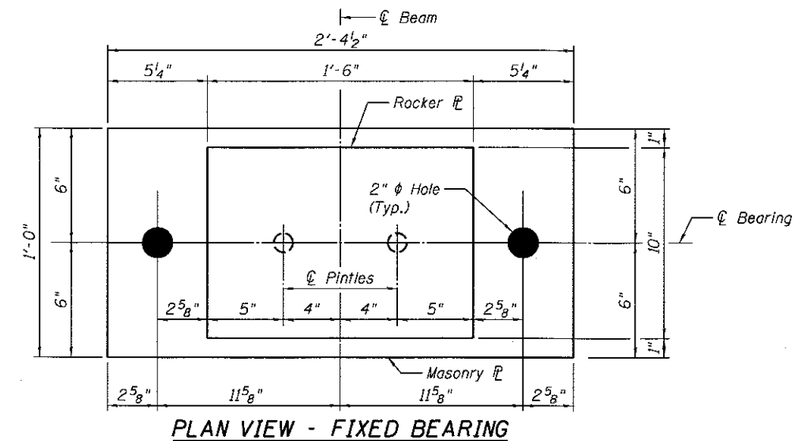
END VIEW - FIXED BEARING



END VIEW - EXPANSION BEARING

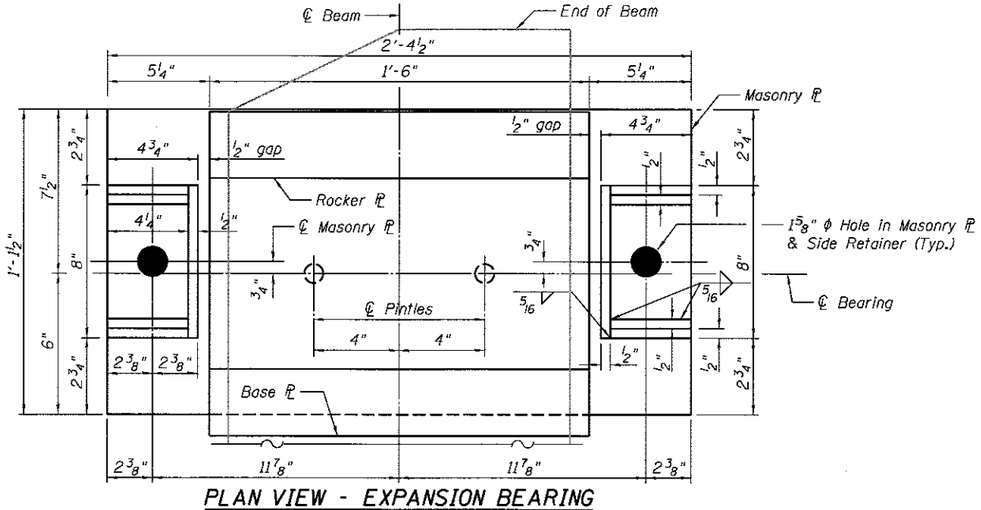


DETAIL 'A'



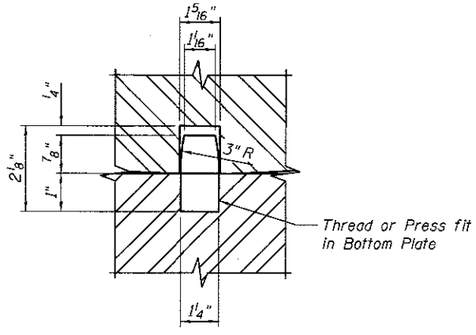
PLAN VIEW - FIXED BEARING

(Abutment Bearings - 12 required)



PLAN VIEW - EXPANSION BEARING

(Abutment Bearings - 12 required)



PINTLE DETAIL

* Shim Plate Thickness		
Abutment	Beam	Thickness
North/South	12	¼"
North/South	11	¼"
North/South	10	¼"
North/South	9	⅛"
North/South	8	⅛"
North/South	7	⅛"

* See notes for additional adjusting shims for all bearings.

FINAL		
DESIGNED	JGT	12/25/14
DRAWN	DAP	12/25/14
REVIEWED	JGT	10/11/2016

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STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

BEARING DETAILS
STRUCTURE NO. 084-9957
SHEET NO. 9 OF 17 SHEETS

F.A.U. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
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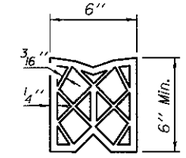
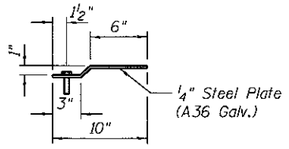
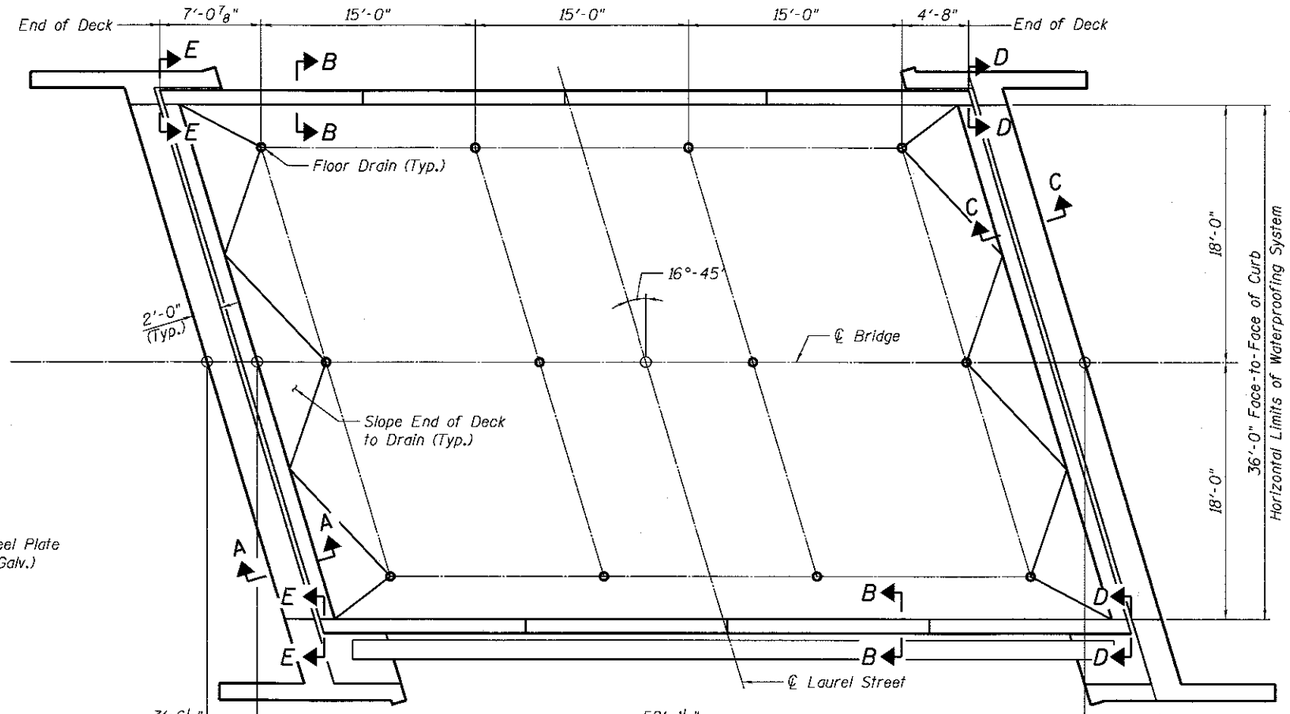
		CONTRACT NO. 93704		
		ILLINOIS FED. AID PROJECT		



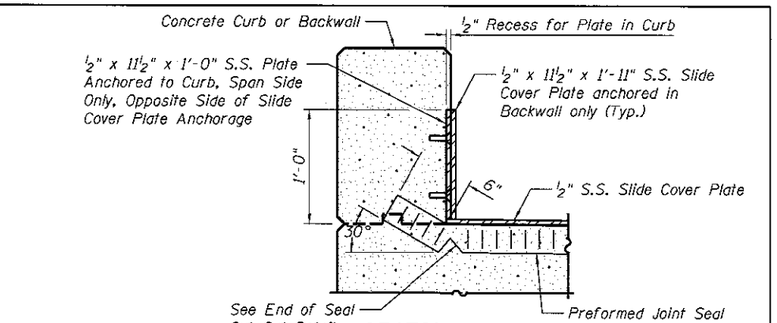
PREFORMED JOINT SEAL



FLASHING DETAIL

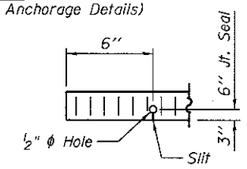


WATERPROOFING LIMITS PLAN

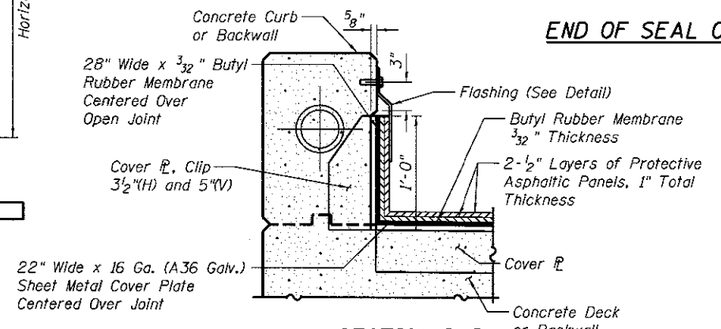


SECTION E-E

(See Section A-A for Similar Anchorage Details)

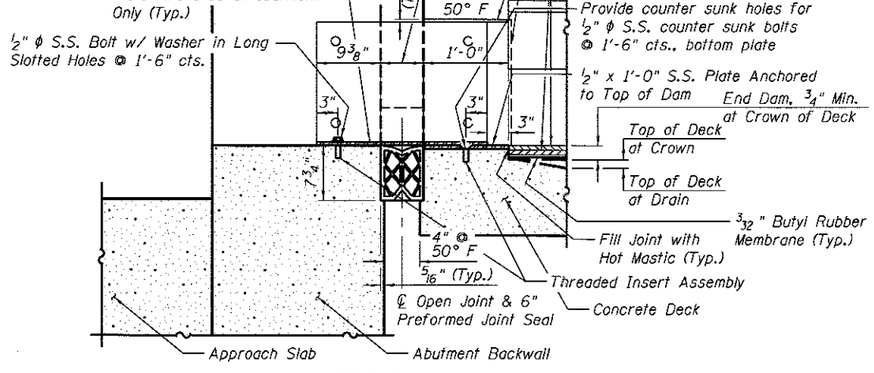


END OF SEAL CUT-OUT

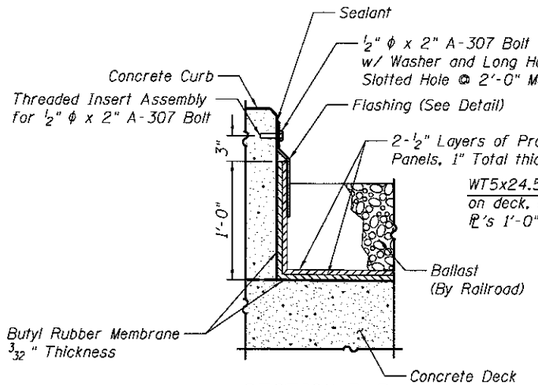


SECTION D-D

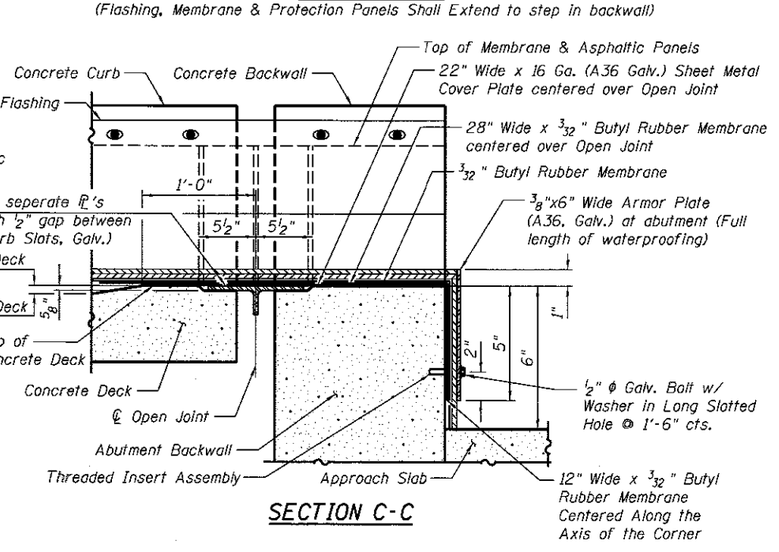
(Flashing, Membrane & Protection Panels Shall Extend to step in backwall)



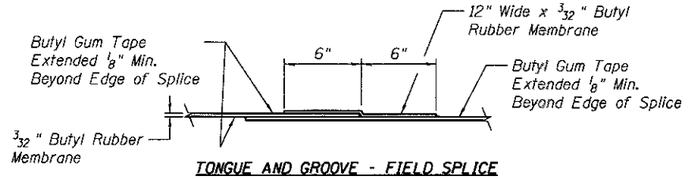
SECTION A-A



SECTION B-B



SECTION C-C



TONGUE AND GROOVE - FIELD SPLICE

BUTYL RUBBER MEMBRANE SPLICE DETAIL

Notes:

1. All structural steel plates, bolts, and washers for cover plates and waterproofing shall be galvanized.
2. Discontinue flashing at open joint over expansion abutment.
3. Cost of threaded inserts, sealant and tape shall be included in the cost of Membrane Waterproofing.
4. The cover plate, sheet metal cover, armor plate, flashing, bolts and washers are included in the weight of Structural Steel and will be paid for as "Furnishing and Erecting Structural Steel, Bridge No. 4".
5. Cost of Preformed Joint Seal is included with Concrete Superstructure.
6. Protective Asphaltic Panels shall be installed in two layers with joints staggered on the half sheet module, and shall be carefully placed to ensure tight proximity to adjacent members. No adhesive shall be used in the installation of the panels. After placing the second layer, unavoidable gaps shall be filled with a compatible sealing compound and the entire top surface of the asphaltic panels shall be given a mop coat of hot asphalt to completely fill the joints between the panels.

BILL OF MATERIAL

ITEM	UNIT	TOTAL
Membrane Waterproofing	Sq. Ft.	2227

DESIGNED	JGT	12/25/14
DRAWN	DAP	12/25/14
REVIEWED	JGT	10/11/2016

FINAL

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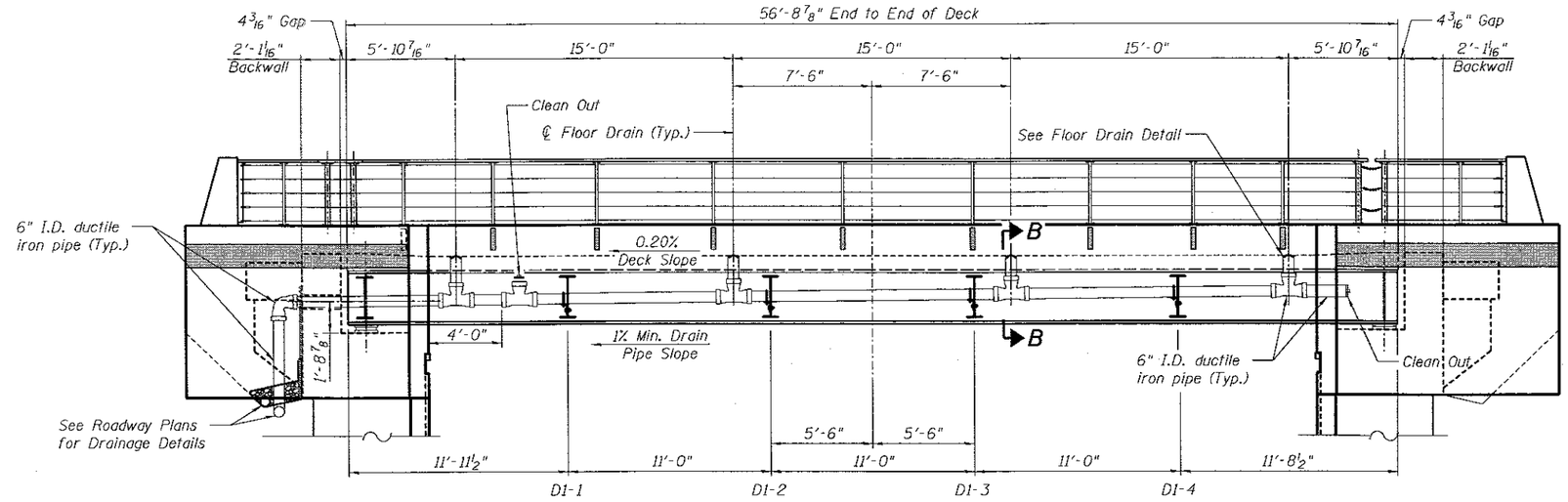
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

MEMBRANE WATERPROOFING
STRUCTURE NO. 084-9957
SHEET NO. 10 OF 17 SHEETS

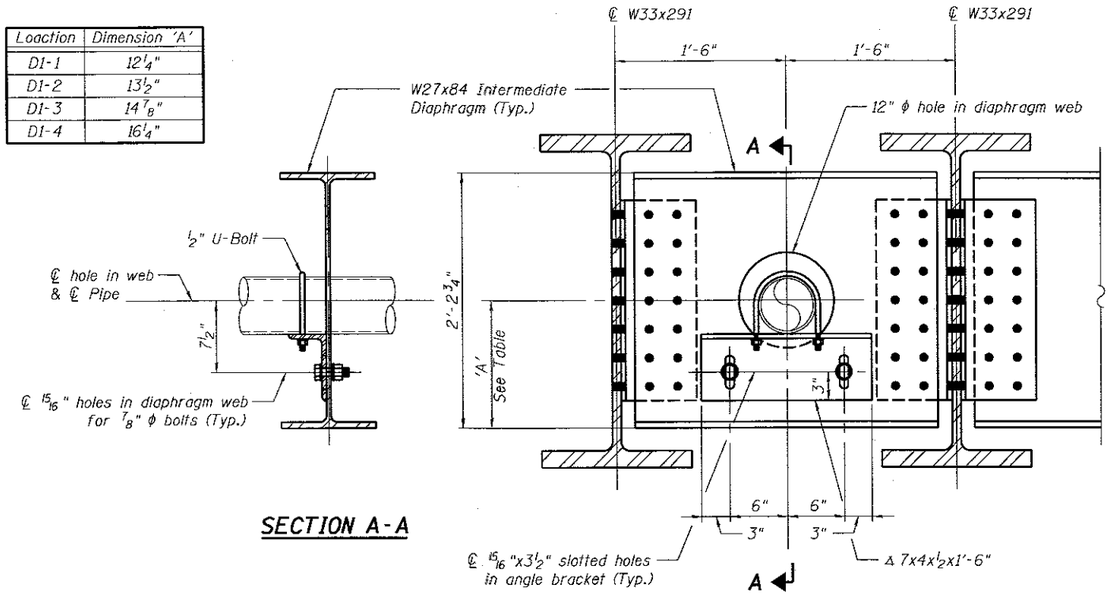
F.A.U. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
	14-00477-00-BR	SANGAMON	403	278
		CONTRACT NO. 93704		
	ILLINOIS FED. AID PROJECT			



ELEVATION - DRAINAGE

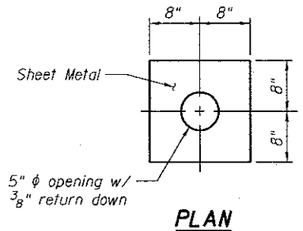
(Looking Northwest, horizontal dimensions along ℄ of pipe)

Loaction	Dimension 'A'
D1-1	12 1/4"
D1-2	13 1/2"
D1-3	14 7/8"
D1-4	16 1/4"

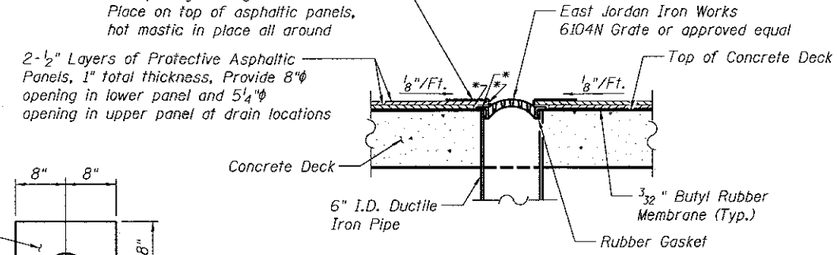


SECTION A-A

TYPICAL ELEVATION AT INTERMEDIATE DIAPHRAGM PENETRATION



PLAN



SECTION B-B

* Coat Grate Flange and End of Asphaltic Panels with compatible sealing compound (Typ. around opening)

FLOOR DRAIN DETAIL

Notes:

1. All drain pipes shall be 6" I.D. All pipes, tees, bells and bends shall be Class 54 Ductile Iron.
2. Use minimum 1% fall on drain pipes.
3. Cost of angle brackets, bolts, u-bolts, sheet metal, mastic and other hardware shall be included in the cost of Drainage System.
4. For additional drainage details See Roadway Plans.
5. The Drainage System shall allow a movement of 2 1/4" each way between the superstructure and substructure.

BILL OF MATERIAL

ITEM	UNIT	TOTAL
Drainage System, No. 4	Each	1

FINAL

DESIGNED	JGT	12/25/14
DRAWN	DAP	12/25/14
REVIEWED	JGT	10/11/2016

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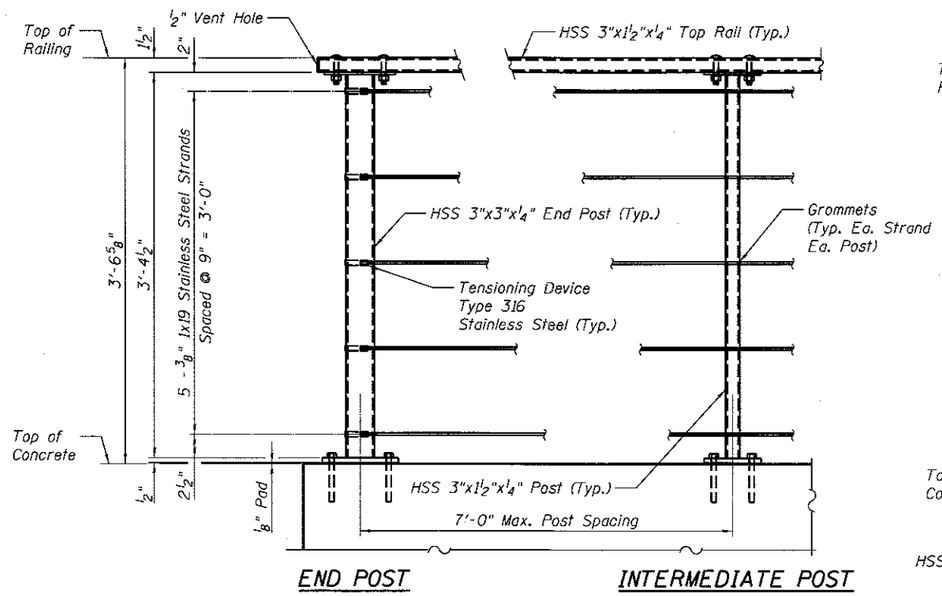
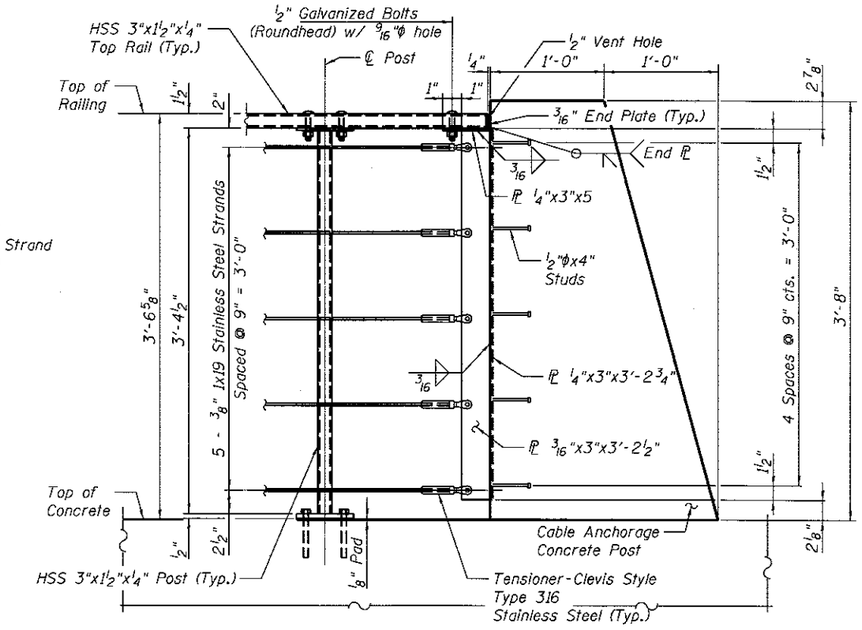
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

DRAINAGE SYSTEM DETAILS
STRUCTURE NO. 084-9957
SHEET NO. 11 OF 17 SHEETS

F.A.U. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
	14-00477-00-BR	SANGAMON	403	279
		CONTRACT NO. 93704		
	ILLINOIS FED. AID PROJECT			



END POST INTERMEDIATE POST



CABLE RAILING END PANEL
RAILROAD BRIDGE

Notes:

Anchor rods shall be ASTM F1554, Grade 55, galvanized steel all-thread (or an Engineer-approved alternate material) of the grade(s) and diameter(s) specified. The corresponding specified grade of AASHTO M314 anchor rods may be used in lieu of ASTM F1554. The anchor rods shall be hot-dipped galvanized according to AASHTO M232, Class C.

Tube segments shall have all corners ground to remove burrs or sharp projections.

All bolts, eyebolts, nuts and washers must satisfy the requirements of ASTM A307 Gr. A unless noted otherwise.

The anchor rods shall be installed according to Article 509.06 of the Standard Specifications. Embedment shall be 4" min. or according to the manufactures specifications whatever is greater.

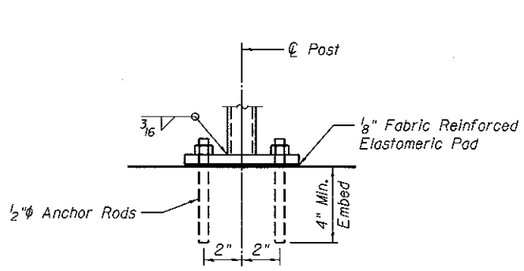
Structural steel plates and bars of the Steel Railing shall conform to the requirements of ASTM A36/36M.

Tubular steel posts shall be according to the requirements of ASTM A500, Grade B.

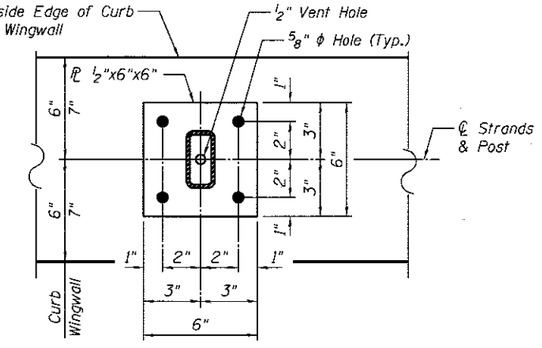
All steel rail members, with the exception of the stainless steel strand and fittings, shall be hot dipped galvanized according to 509.05 of the Standard Specifications.

All studs shall be ½"ϕx4" granular or solid flux filled headed studs automatically end welded to plates.

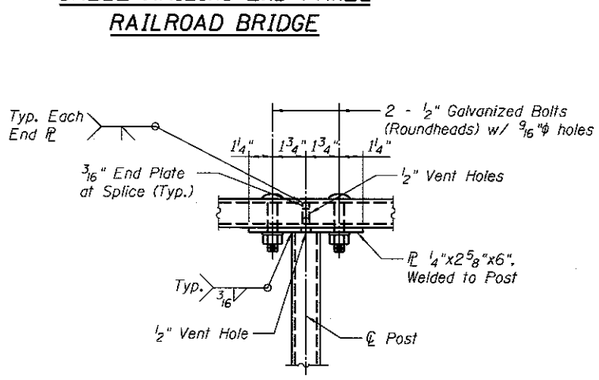
See Sheet 5 of 17 for rail post spacing. See retaining wall plans for chain attachment details.



ANCHOR ROD DETAIL
INTERMEDIATE POSTS



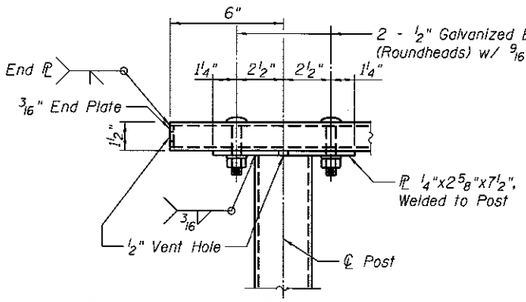
STANDARD INTERMEDIATE POST



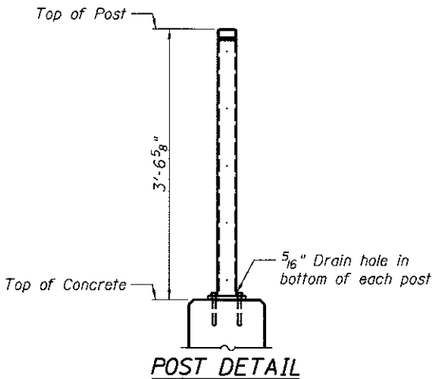
TOP RAIL - WITH SPLICE

TOP RAIL - NO SPLICE

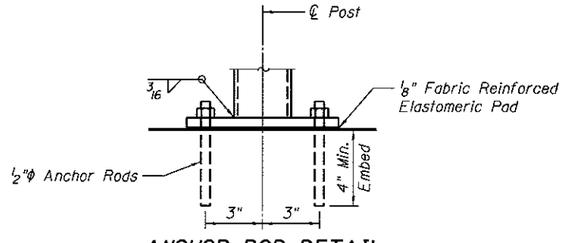
TYPICAL RAIL/POST CONNECTION
(Strands not shown for clarity)



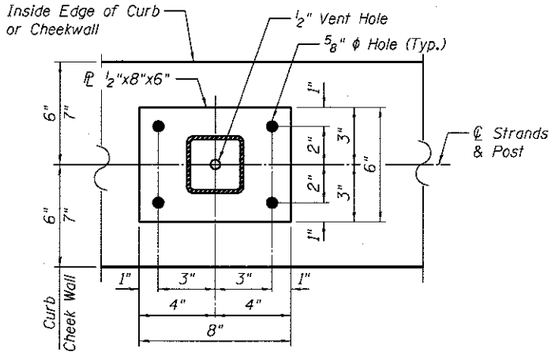
TYPICAL RAIL/END POST CONNECTION
(Strands not shown for clarity)



POST DETAIL



ANCHOR ROD DETAIL
END POSTS



STANDARD END POST

BILL OF MATERIAL

ITEM	UNIT	TOTAL
Steel Railing (Special)	Foot	140

DESIGNED	JGT	12/25/14
DRAWN	DAP	12/25/14
REVIEWED	JGT	10/11/2016

FINAL

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STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

STEEL RAILING (SPECIAL)
STRUCTURE NO. 084-9957
SHEET NO. 12 OF 17 SHEETS

F.A.U. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
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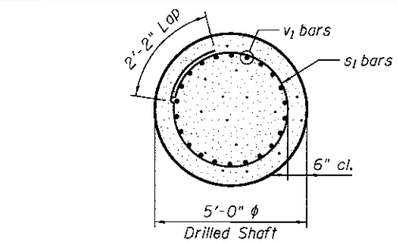
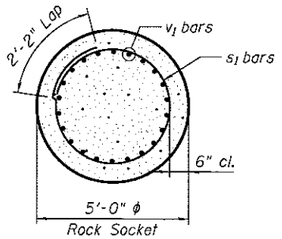
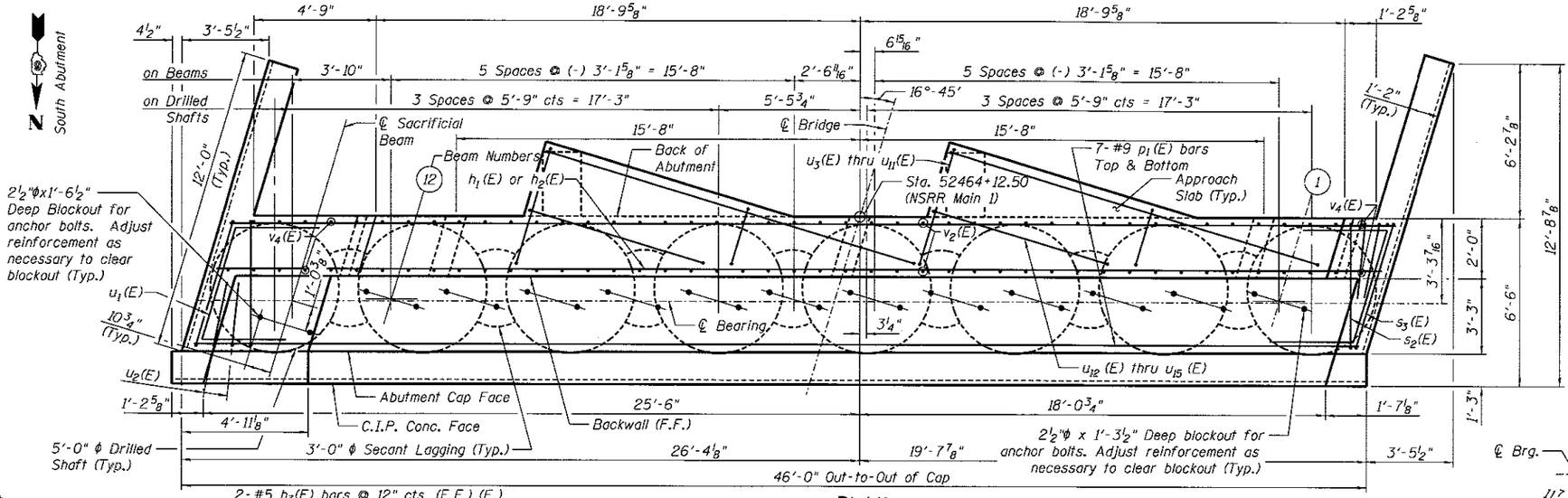
		CONTRACT NO. 93704		
		ILLINOIS FED. AID PROJECT		



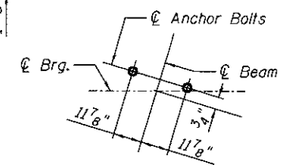
SECTION B-B



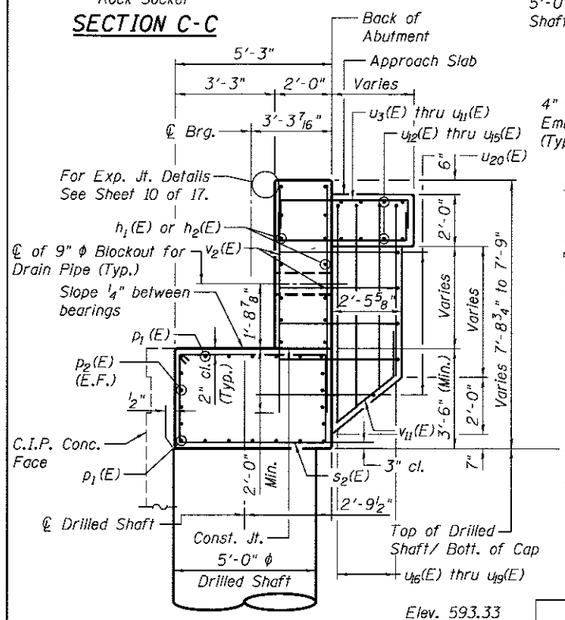
SECTION C-C



PLAN

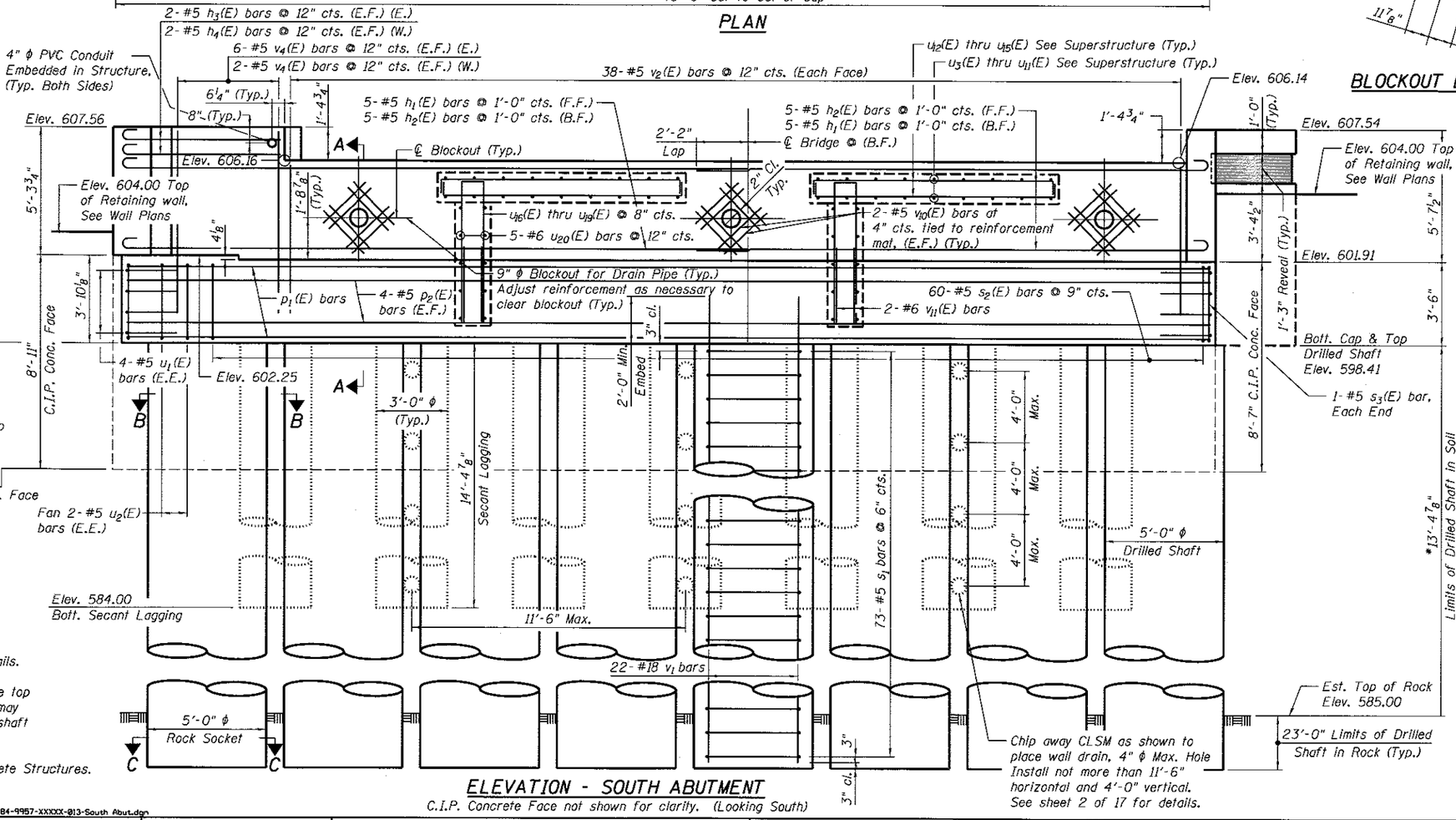


BLOCKOUT LAYOUT



SECTION A-A

(At Rt. 4's to Bk. of Abut.)



ELEVATION - SOUTH ABUTMENT

C.I.P. Concrete Face not shown for clarity. (Looking South)

Notes:

See Sheet 14 of 17 for C.I.P. Concrete Face and other details.

* The quantities and reinforcement detailing are based on the top of shaft and the estimated top of rock elevations shown and may change based on the actual top of rock encountered at each shaft and the final top of shaft elevation.

Approach Slab Support concrete shall be paid for as Concrete Structures.

FINAL	DESIGNED	JGT 12/25/14
	DRAWN	DAP 12/25/14
	REVIEWED	JGT 10/11/2016

pw:\\spi-svr306.hanson.dom:Hanson Projects\Documents\09Jobs\09_81798\CAD\Struct\Laurel\Sheet\084-9957-XXXXX-013-South Abut.dgn

FILE NAME =

HANSON

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USER NAME = pop80275	DESIGNED - JGT	REVISED -	
	CHECKED - HGN	REVISED -	
PLOT SCALE = 01.999998 '/ / in.	DRAWN - DAP	REVISED -	
PLOT DATE = 2/24/2017	CHECKED - JGT	REVISED -	

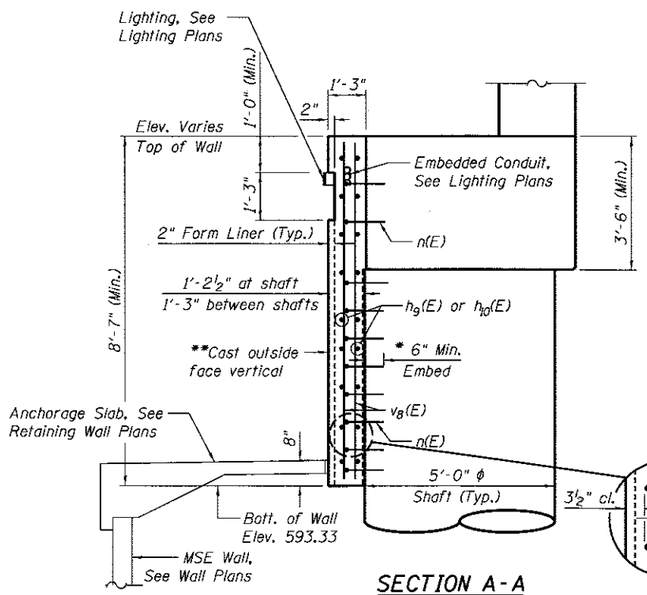
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

SOUTH ABUTMENT
STRUCTURE NO. 084-9957
SHEET NO. 13 OF 17 SHEETS

F.A.U. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
	14-00477-00-BR	SANGAMON	403	281
		CONTRACT NO. 93704		
		ILLINOIS FED. AID PROJECT		

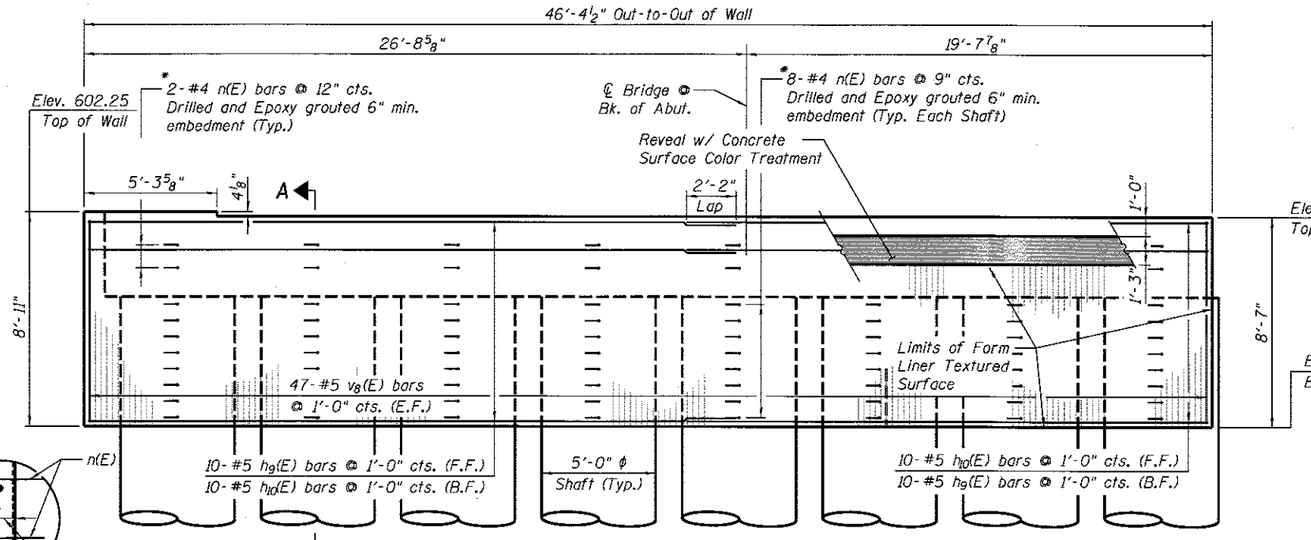
* Bars epoxy grouted shall have an embedment sufficient to develop 1.25 times the full capacity of the reinforcement bar.

** Concrete wall face shall be cast vertically. Thickness of wall may vary due to abutment deflection. The Min. wall thickness shall be 10½".



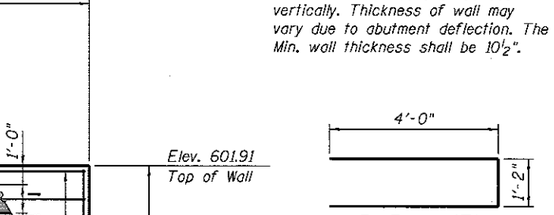
SECTION A-A

(At Rt. ℄'s to Back of Abut.)



ELEVATION - C.I.P. CONCRETE FACE

(Looking South)

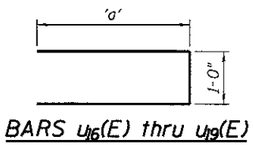


BAR u20(E)

BILL OF MATERIAL SOUTH ABUTMENT

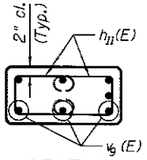
Bar	No.	Size	Length	Shape
h1(E)	10	#5	25'-1"	
h2(E)	10	#5	23'-9"	
h3(E)	4	#5	6'-0"	
h4(E)	4	#5	2'-6"	
h5(E)	12	#5	12'-6"	
h6(E)	24	#6	12'-6"	
h7(E)	14	#6	8'-11"	
h8(E)	8	#5	8'-6"	
h9(E)	20	#5	23'-2"	
h10(E)	20	#5	25'-4"	
h11(E)	20	#4	3'-8"	
n(E)	80	#4	1'-8"	
p1(E)	14	#9	45'-8"	
p2(E)	8	#5	45'-8"	
s1	584	#5	14'-9"	
s2(E)	60	#5	16'-11"	
s3(E)	2	#5	17'-5"	
u1(E)	8	#5	11'-6"	
u2(E)	4	#5	9'-1"	
u16(E)	2	#6	9'-2"	
u17(E)	2	#6	10'-0"	
u18(E)	2	#6	11'-4"	
u19(E)	2	#6	12'-6"	
u20(E)	10	#6	9'-2"	
v1	176	#18	38'-2"	
v2(E)	76	#5	6'-2"	
v4(E)	16	#5	7'-6"	
v5(E)	28	#5	8'-7"	
v6(E)	24	#5	7'-6"	
v7(E)	4	#5	5'-0"	
v8(E)	94	#5	8'-4"	
v9(E)	14	#5	4'-11"	
v10(E)	48	#5	2'-6"	
v11(E)	4	#6	4'-2"	

Structure Excavation	Cu. Yds.	154
Concrete Structures	Cu. Yds.	73.6
Drilled Shaft in Soil	Cu. Yds.	78.0
Drilled Shaft in Rock	Cu. Yds.	133.8
Secant Lagging	Cu. Ft.	713
Form Liner Textured Surface	Sq. Ft.	294
Concrete Surface Color Treatment	Sq. Ft.	88
Reinforcement Bars	Pound	100340
Reinforcement Bars, Epoxy Coated	Pound	8720
Conduit Embedded in Structure, 4" dia., PVC	Foot	4

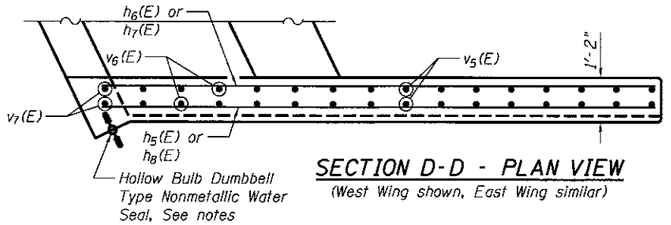


BARS u16(E) thru u19(E)

Bar	'a'
u16(E)	4'-1"
u17(E)	4'-6"
u18(E)	5'-2"
u19(E)	5'-9"

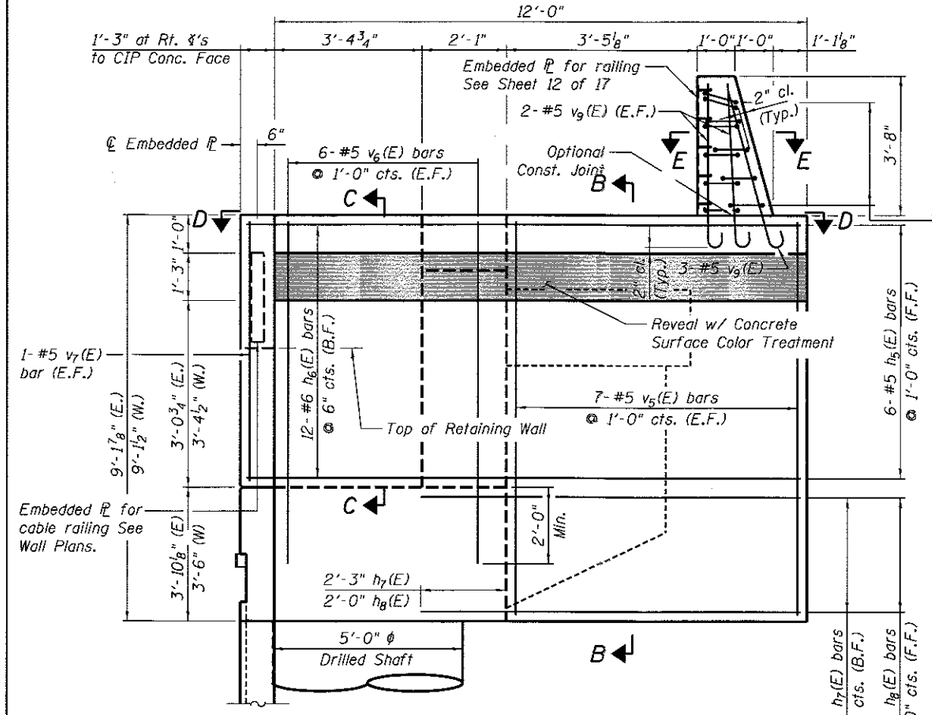


SECTION E-E



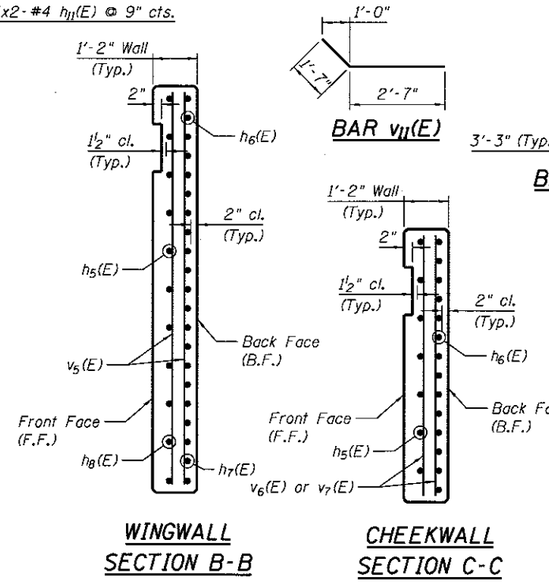
SECTION D-D - PLAN VIEW

(West Wing shown, East Wing similar)



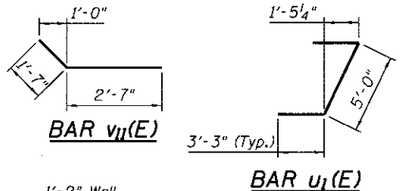
ELEVATION - TYPICAL END VIEW

(West Wing shown, East Wing similar)



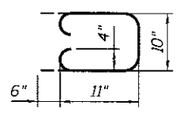
WINGWALL SECTION B-B

CHEEKWALL SECTION C-C

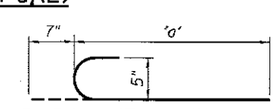


BAR v11(E)

BAR u1(E)

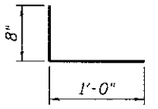


BAR h11(E)

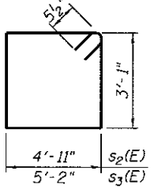


BARS h1(E), h2(E), h3(E), h4(E), v9(E)

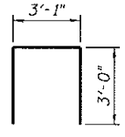
Bar	'a'
h1(E)	24'-6"
h2(E)	23'-2"
h3(E)	5'-5"
h4(E)	1'-11"
v9(E)	4'-4"



BAR n(E)



BARS s2(E), s3(E)



BAR u2(E)

Notes:
Pour step monolithically with cap.
Space cap reinforcement to miss blockouts for anchor bolts.
See Retaining Wall Plans for Expansion Joint Detail at each end of C.I.P. Concrete Facing.
See Lighting Plans of Conduit and J-Box embedments in Wall Facing.

	JGT	12/25/14
	DAP	12/25/14
	JGT	10/11/2016

FINAL

DESIGNED | DRAWN | REVIEWED

pw:\\spi-svr326.hanson.dom:Hanson Projects\Documents\89Jobs\89L01798\CAD\Struct\Laurel\Sheet\884-9957-XXXXX-014-South Abut Det.dgn

FILE NAME =	USER NAME = pop80275	DESIGNED - JGT	REVISED -
HANSON		CHECKED - HGN	REVISED -
	PLOT SCALE = 0.999996 '/ / in.	DRAWN - DAP	REVISED -
	PLOT DATE = 2/24/2017	CHECKED - JGT	REVISED -

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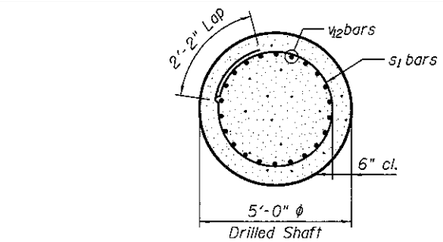
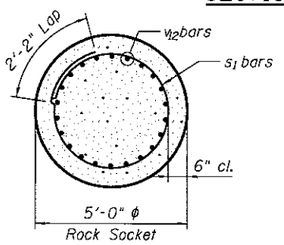
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

SOUTH ABUTMENT DETAILS
STRUCTURE NO. 084-9957
SHEET NO. 14 OF 17 SHEETS

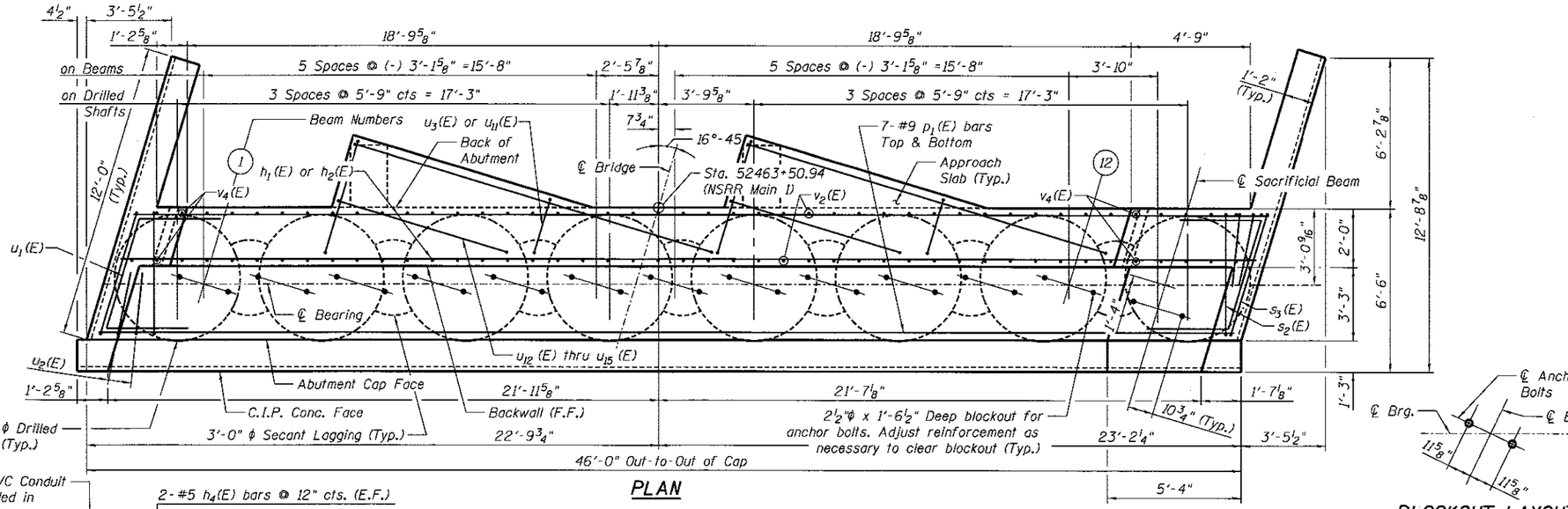
F.A.U. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
	14-00477-00-BR	SANGAMON	403	282
		CONTRACT NO. 93704		
	ILLINOIS FED. AID PROJECT			



SECTION B-B

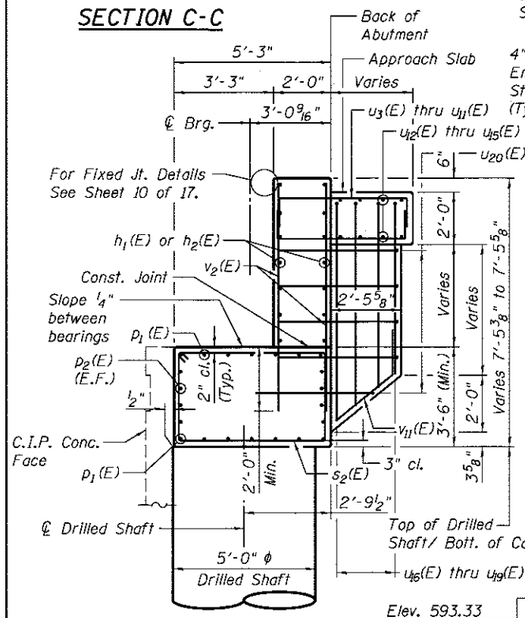


SECTION C-C



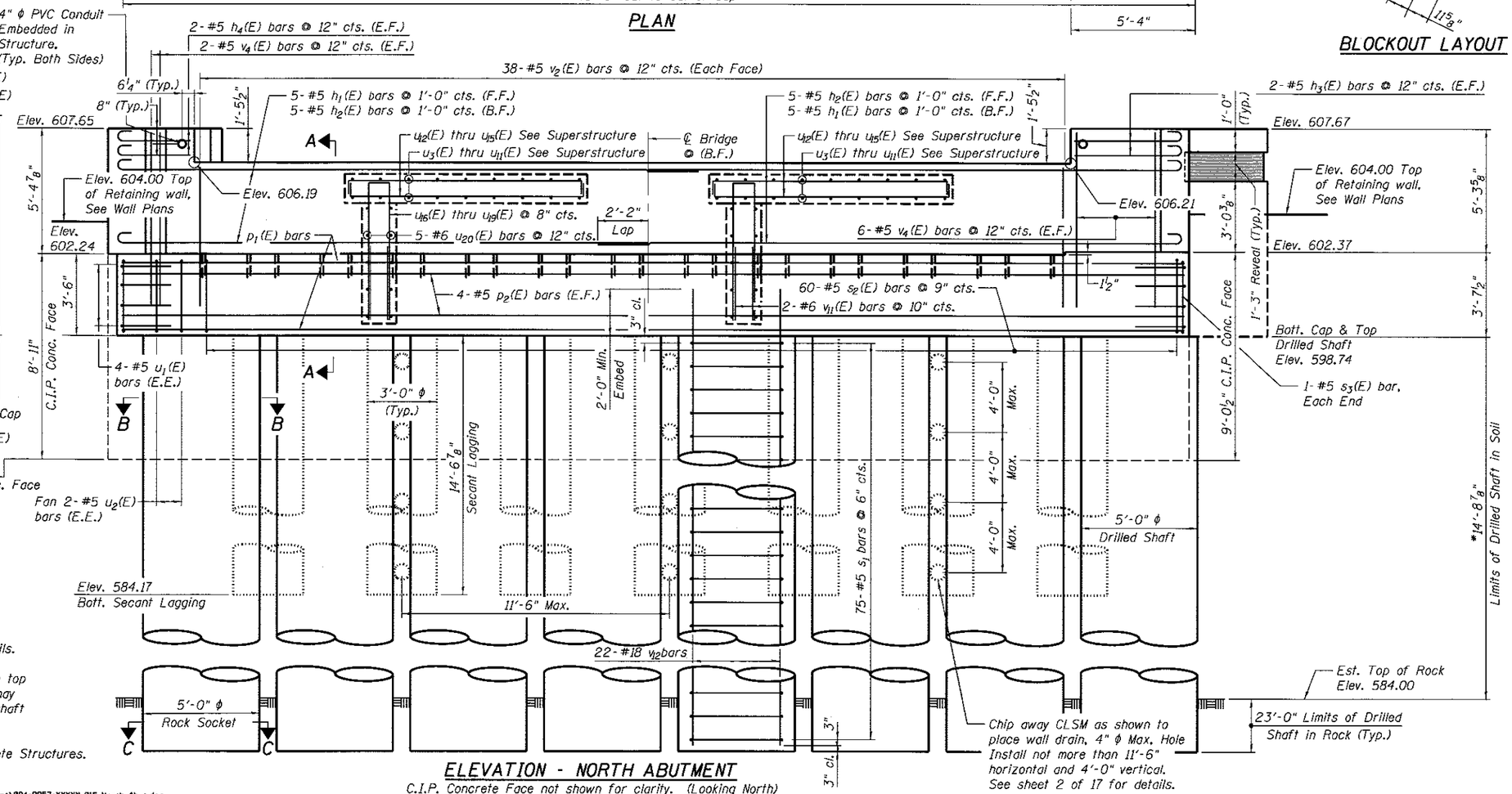
PLAN

BLOCKOUT LAYOUT



SECTION A-A

(At Rt. ℄'s to Bk. of Abut.)



ELEVATION - NORTH ABUTMENT

C.I.P. Concrete Face not shown for clarity. (Looking North)

Notes:
See Sheet 16 of 17 for C.I.P. Concrete Face and other details.

* The quantities and reinforcement detailing are based on the top of shaft and the estimated top of rock elevations shown and may change based on the actual top of rock encountered at each shaft and the final top of shaft elevation..

Approach Slab Support concrete shall be paid for as Concrete Structures.

DESIGNED	JGT	12/25/14
DRAWN	DAP	12/25/14
REVIEWED	JGT	10/17/2016

FINAL

p:\\sp1-svr385.hanson.dom\Hanson Projects\Documents\89Jobs\89L8179B\CAD\Struct\Laurel\Sheet\084-9957-XXXXX-015-North Abut.dgn

FILE NAME =	USER NAME = pop80275	DESIGNED - JGT	REVISED -
HANSON		CHECKED - HGN	REVISED -
	PLOT SCALE = 81.999996 '/ in.	DRAWN - DAP	REVISED -
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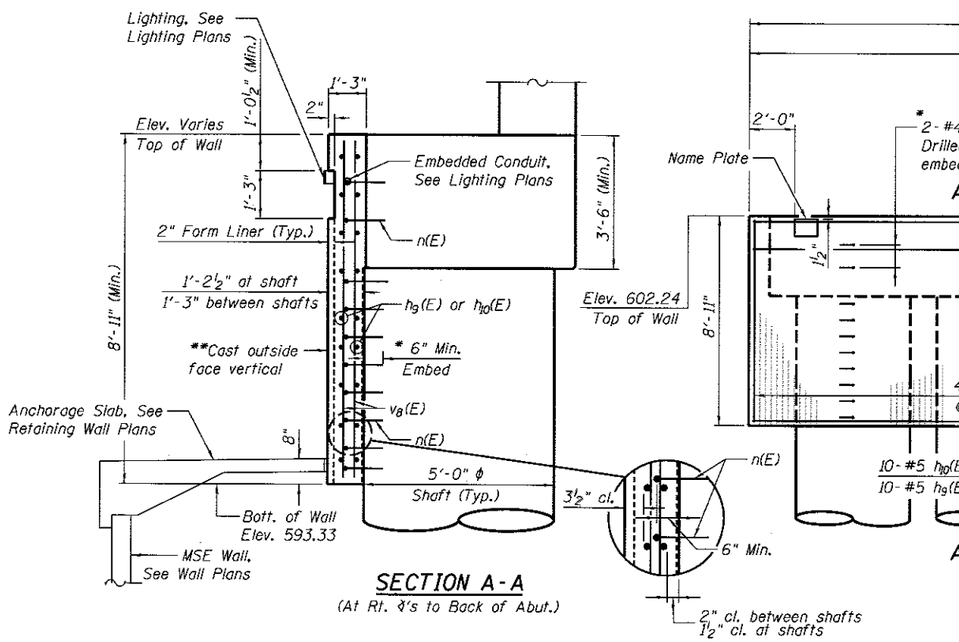
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

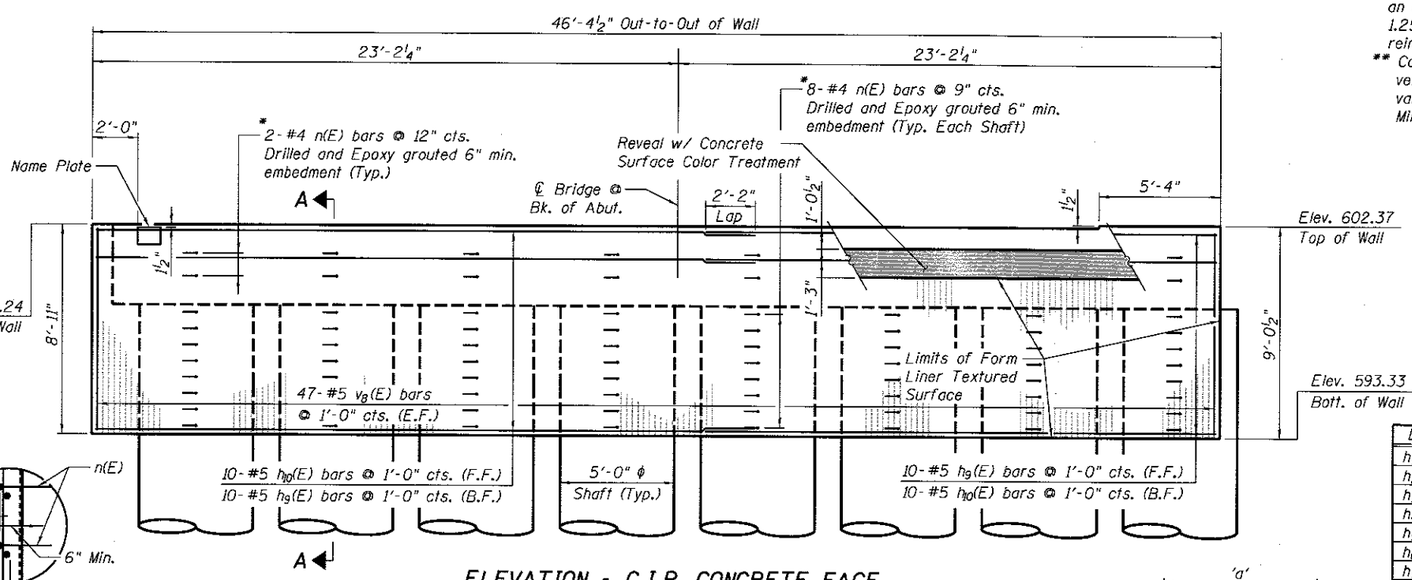
NORTH ABUTMENT
STRUCTURE NO. 084-9957
SHEET NO. 15 OF 17 SHEETS

F.A.U. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
	14-00477-00-BR	SANGAMON	403	283
		CONTRACT NO. 93704		
		ILLINOIS FED. AID PROJECT		

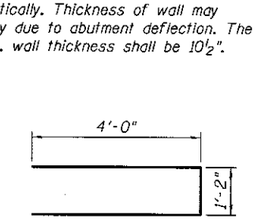
* Bars epoxy grouted shall have an embedment sufficient to develop 1.25 times the full capacity of the reinforcement bar.
** Concrete wall face shall be cast vertically. Thickness of wall may vary due to abutment deflection. The Min. wall thickness shall be 10½".



SECTION A-A
(At Rt. ℄'s to Back of Abut.)



ELEVATION - C.I.P. CONCRETE FACE
(Looking North)

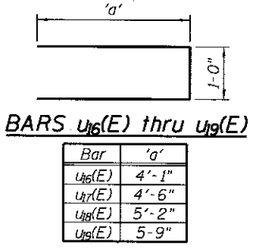


BAR $u_{20}(E)$

BILL OF MATERIAL
NORTH ABUTMENT

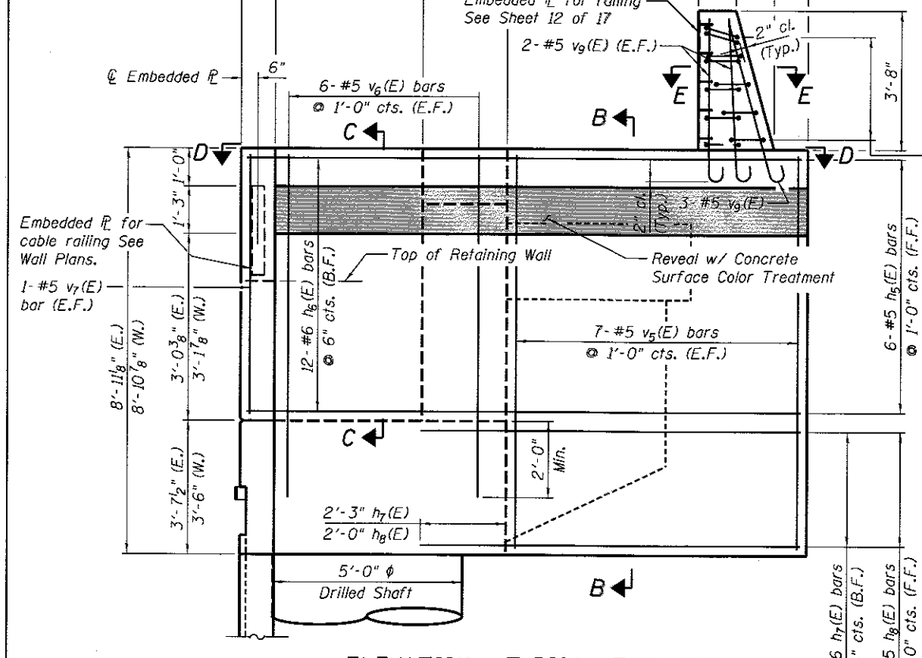
Bar	No.	Size	Length	Shape
$h_1(E)$	10	#5	25'-1"	
$h_2(E)$	10	#5	23'-9"	
$h_3(E)$	4	#5	6'-0"	
$h_4(E)$	4	#5	2'-6"	
$h_5(E)$	12	#5	12'-6"	
$h_6(E)$	24	#6	12'-6"	
$h_7(E)$	14	#6	8'-11"	
$h_8(E)$	8	#5	8'-6"	
$h_9(E)$	20	#5	23'-2"	
$h_{10}(E)$	20	#5	25'-4"	
$h_{11}(E)$	20	#4	3'-8"	
n(E)	80	#4	1'-8"	
$p_1(E)$	14	#9	45'-8"	
$p_2(E)$	8	#5	45'-8"	
s_1	600	#5	14'-9"	
$s_2(E)$	60	#5	16'-11"	
$s_3(E)$	2	#5	17'-5"	
$u_1(E)$	8	#5	11'-6"	
$u_2(E)$	4	#5	9'-1"	
$u_{16}(E)$	2	#6	9'-2"	
$u_{17}(E)$	2	#6	10'-0"	
$u_{18}(E)$	2	#6	11'-4"	
$u_{19}(E)$	2	#6	12'-6"	
$u_{20}(E)$	10	#6	9'-2"	
v_{12}	176	#18	39'-6"	
$v_2(E)$	76	#5	6'-2"	
$v_4(E)$	16	#5	7'-6"	
$v_5(E)$	28	#5	8'-7"	
$v_6(E)$	24	#5	7'-6"	
$v_7(E)$	4	#5	5'-0"	
$v_8(E)$	94	#5	8'-4"	
$v_9(E)$	14	#5	4'-11"	
$v_{11}(E)$	4	#6	4'-2"	

Structure Excavation	Cu. Yds.	147
Concrete Structures	Cu. Yds.	73.2
Drilled Shaft in Soil	Cu. Yds.	85.8
Drilled Shaft in Rock	Cu. Yds.	133.8
Secant Lagging	Cu. Ft.	721
Form Liner Textured Surface	Sq. Ft.	308
Concrete Surface Color Treatment	Sq. Ft.	88
Reinforcement Bars	Pound	103780
Reinforcement Bars, Epoxy Coated	Pound	7540
Conduit Embedded in Structure, 4" dia., PVC	Foot	4

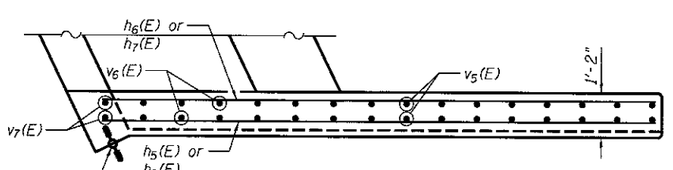


BARS $u_{16}(E)$ thru $u_{19}(E)$

Bar	'a'
$u_{16}(E)$	4'-1"
$u_{17}(E)$	4'-6"
$u_{18}(E)$	5'-2"
$u_{19}(E)$	5'-9"

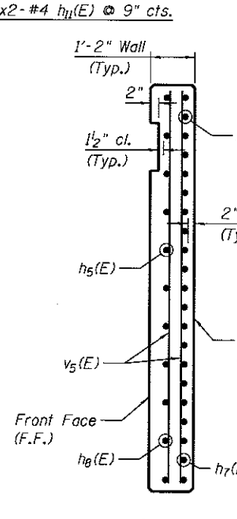


ELEVATION - TYPICAL END VIEW
(East Wing shown, West Wing similar)

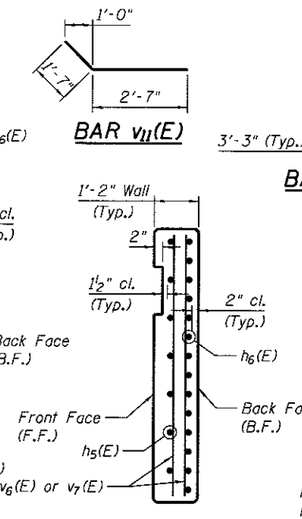


SECTION D-D - PLAN VIEW
(East Wing shown, West Wing similar)

SECTION E-E



WINGWALL SECTION B-B



CHEEKWALL SECTION C-C

Bar	'a'
$h_1(E)$	24'-6"
$h_2(E)$	23'-2"
$h_3(E)$	5'-5"
$h_4(E)$	1'-11"
$v_9(E)$	4'-4"

Notes:
Pour step monolithically with cap.
Space cap reinforcement to miss blockouts for anchor bolts.
See Retaining Wall Plans for Expansion Joint Detail at each end of C.I.P. Concrete Facing.
See Lighting Plans of Conduit and J-Box embedments in Wall Facing.

FINAL		
DESIGNED	JGT	12/25/14
DRAWN	DAP	12/25/14
REVIEWED	JGT	10/11/2016

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FILE NAME =	USER NAME = pop88275	DESIGNED - JGT	REVISED -
HANSON		CHECKED - HGN	REVISED -
	PLOT SCALE = @1.999996 '/ in.	DRAWN - DAP	REVISED -
	PLOT DATE = 2/24/2017	CHECKED - JGT	REVISED -

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STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

NORTH ABUTMENT DETAILS
STRUCTURE NO. 084-9957
SHEET NO. 16 OF 17 SHEETS

F.A.U. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
	14-00477-00-BR	SANGAMON	403	284
		CONTRACT NO. 93704		
	ILLINOIS FED. AID PROJECT			

B-073
Sta. 998+58, 15' RT

	N	Qu	w%	
605.6				ASPHALT.
605.18				AGGREGATE.
604.77				CONCRETE.
604.52	5	1.70P	32	Black very fine sandy silty CLAY.
602.10	5		25	Brown and gray very fine sandy SILT, some clay.
599.60	8		23	Gray silty CLAY with cinders - FILL.
597.10	4	0.55B	24	Brown and gray very fine sandy clayey SILT - gasoline odor.
	3	1.28B	26	
591.60	5	1.55B	26	Brown and gray very fine sandy silty CLAY, some oxidized spots.
589.60	11	3.09S	19	Brown and gray very fine sandy silty CLAY, trace coarse sand and small gravel.
587.00	53	4.50P	14	Gray SHALE.
	50/5"	4.50P	13	
	50	4.50P	11	
	50/3"	4.50P	10	
	50/4"		8	
	50/5"		7	
	50/3"		6	
	14			Rec. = 93% RQD = 78%
551.60				Bottom of Hole = 54.0 feet

B-068
Sta. 1001+00, 15' LT

	N	Qu	w%	
604.6				ASPHALT.
604.27				BRICK.
604.02				CONCRETE.
603.52	4	2.00P	35	Black and gray very fine sandy silty CLAY, trace small gravel - FILL.
	3	2.00P	32	
598.60	8	2.33S	24	Brown and gray very fine sandy SILT.
596.10	5	1.94B	21	Brown and gray very fine sandy clayey SILT.
593.60	4	1.00P	23	Reddish-brown and brown very fine sandy clayey SILT.
591.10	4	2.13S	26	Dark brown, brown and gray very fine sandy silty CLAY.
588.60	6	0.97S	28	Brown and gray very fine sandy silty CLAY, trace shale fragments.
586.10	64	4.50P	14	Brown and gray SHALE. (HIGHLY WEATHERED SHALE)
	50/4"	4.50P	13	
	50	4.50P	14	
571.10	50/5"		8	Gray SHALE, slightly sandy, micaceous.
	137			Rec. = 76% RQD = 64%
				Rec. = 78% RQD = 0%
				Rec. = 44% RQD = 27%
				Rec. = 88% RQD = 0%
	30			
553.60				Bottom of Hole = 51.0 feet

LEGEND

N	Standard Penetration Test N (blows/ft)
Qu	Unconfined Strength (tsf)
w%	Natural Moisture Content (%)
DD ▽ 558.10	Water Surface Elevation Encountered in Boring DD = during drilling Oh = at completion 24h = 24 hours after completion

FINAL

DESIGNED	JGT	12/25/14
DRAWN	DAP	12/25/14
REVIEWED	JGT	10/11/2016

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STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

SUBSURFACE DATA PROFILE
STRUCTURE NO. 084-9957
SHEET NO. 17 OF 17 SHEETS

F.A.U. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
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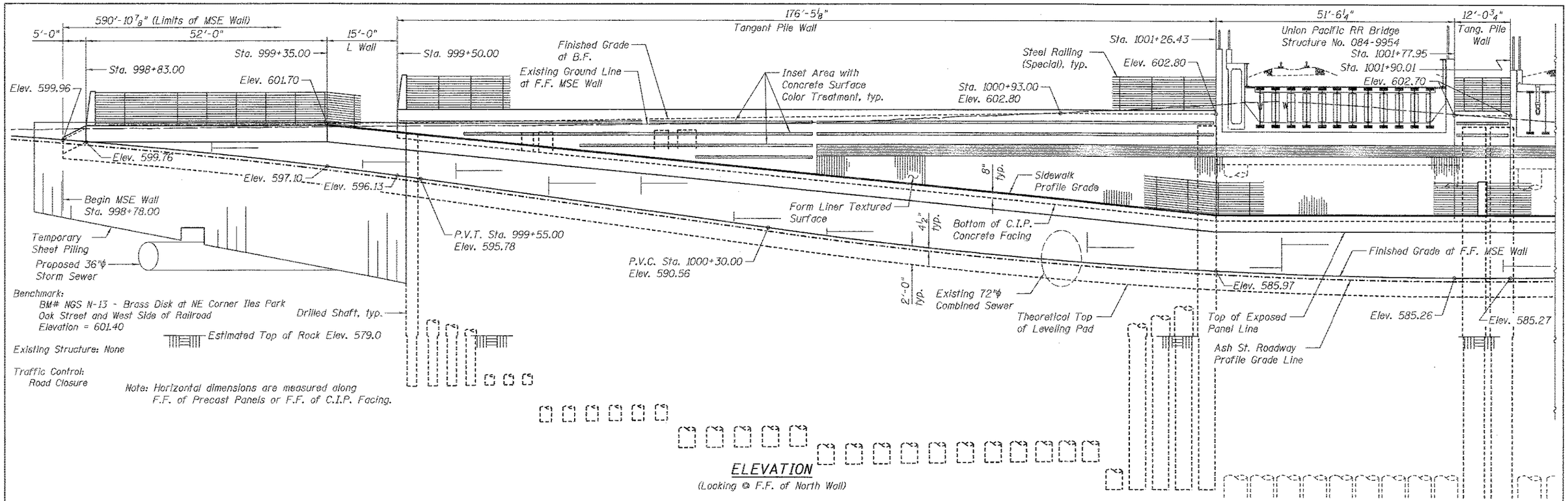
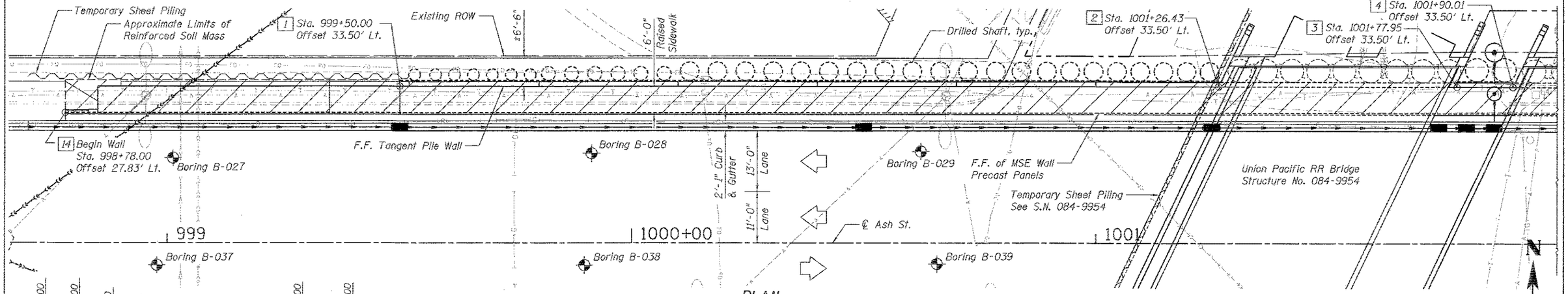
		CONTRACT NO. 93704		
	ILLINOIS FED. AID PROJECT			

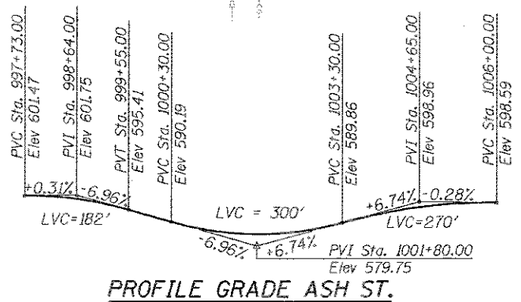


ELEVATION

(Looking @ F.F. of North Wall)



PLAN



PROFILE GRADE ASH ST.

Along ℄ of Ash St.

LICENSED STRUCTURAL ENGINEER — ROBERT CHANTOME 081-006048 — STATE OF ILLINOIS — Exp. Nov. 30, 2018

I certify that to the best of my knowledge, information and belief, this retaining wall design is structurally adequate for the design loading shown on the plans. The design is an economical one for the style of structure and complies with requirements of the current "AASHTO LRFD Specifications".

DESIGN SPECIFICATIONS

2012 AASHTO LRFD Bridge Design Specifications, 6th Edition with 2013 Interims

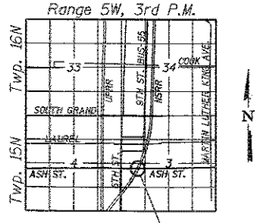
DESIGN STRESSES

FIELD UNITS

f'c = 4,000 psi
fy = 60,000 psi (Reinforcement)

PRECAST UNITS

f'c = 4,500 psi (Precast Panels)



LOCATION SKETCH

Note: Wall offsets are measured from ℄ Ash Street to the front face of precast panels or C.I.P. Facing.

F.F. - Front Face
B.F. - Back Face
3 = Control Point

GENERAL PLAN (SHEET 1 OF 4)
NORTH WALL-ASH ST.
F.A.U. 7992-SECTION 14-00477-00-BR
SANGAMON COUNTY
STATION 998+75.00 TO 1005+00.00

FINAL

DESIGNED	RGC	6/11/14
DRAWN	EJM	12/9/14
REVIEWED	KMS	10/12/2016

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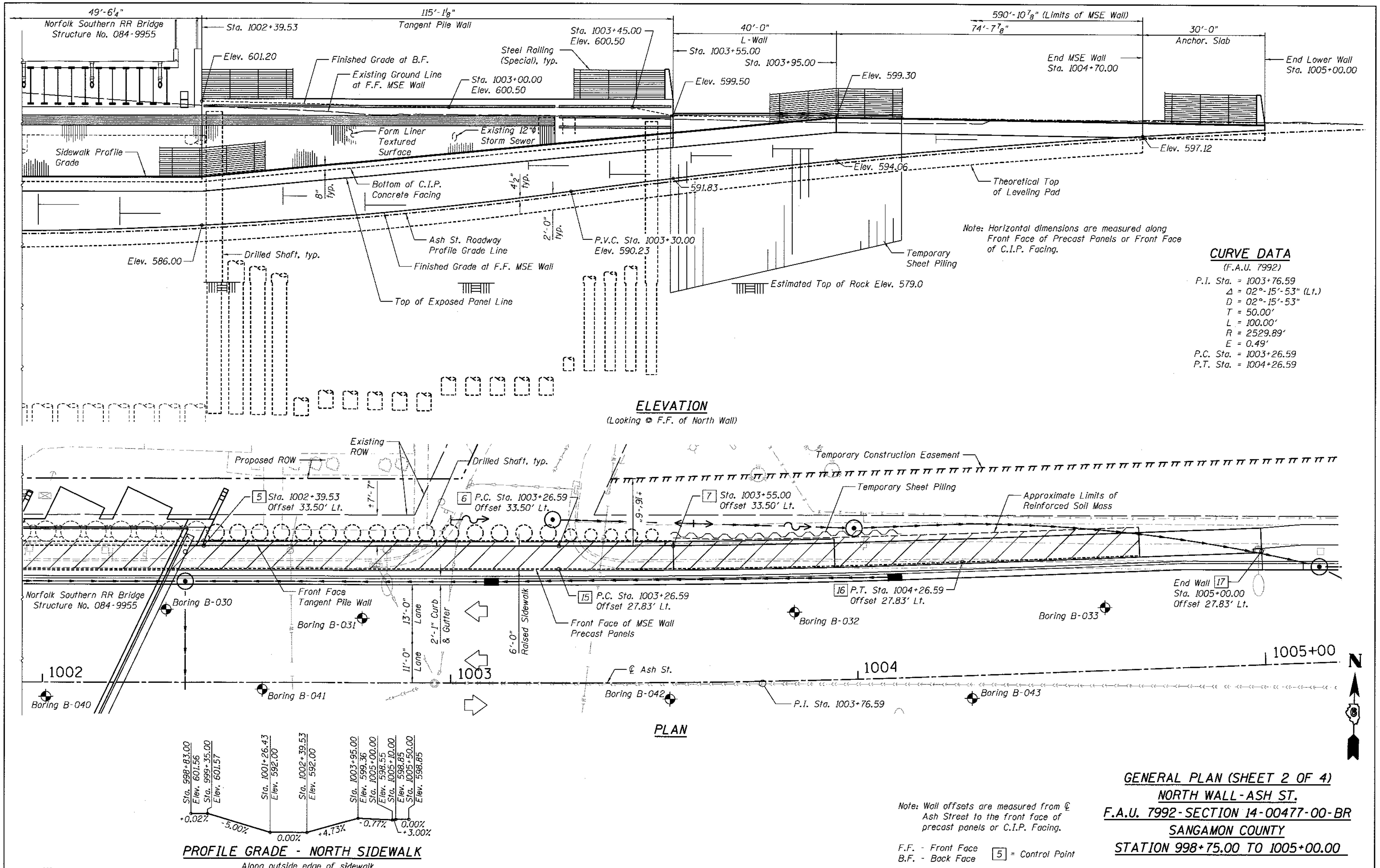
PLOT DATE = 2/27/2017	CHECKED - RGC	REVISED -	

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

GENERAL PLAN & ELEVATION (NORTH)
ASH STREET RETAINING WALLS
SHEET NO. 1 OF 34 SHEETS

F.A.U. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
	14-00477-00-BR	SANGAMON	403	286
		CONTRACT NO. 93704		
	ILLINOIS FED. AID PROJECT			



Note: Wall offsets are measured from ℄ Ash Street to the front face of precast panels or C.I.P. Facing.

F.F. - Front Face
B.F. - Back Face
5 = Control Point

GENERAL PLAN (SHEET 2 OF 4)
NORTH WALL-ASH ST.
F.A.U. 7992-SECTION 14-00477-00-BR
SANGAMON COUNTY
STATION 998+75.00 TO 1005+00.00

FINAL	DESIGNED RGC 6/11/14	DRAWN EJM 12/9/14	REVIEWED KMS 10/11/2016

USER NAME = pop00275	DESIGNED - RGC	REVISED -	STATE OF ILLINOIS DEPARTMENT OF TRANSPORTATION
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PLOT SCALE = 0.1667 '/ in.	DRAWN - EJM	REVISED -	
PLOT DATE = 2/24/2017	CHECKED - RGC	REVISED -	

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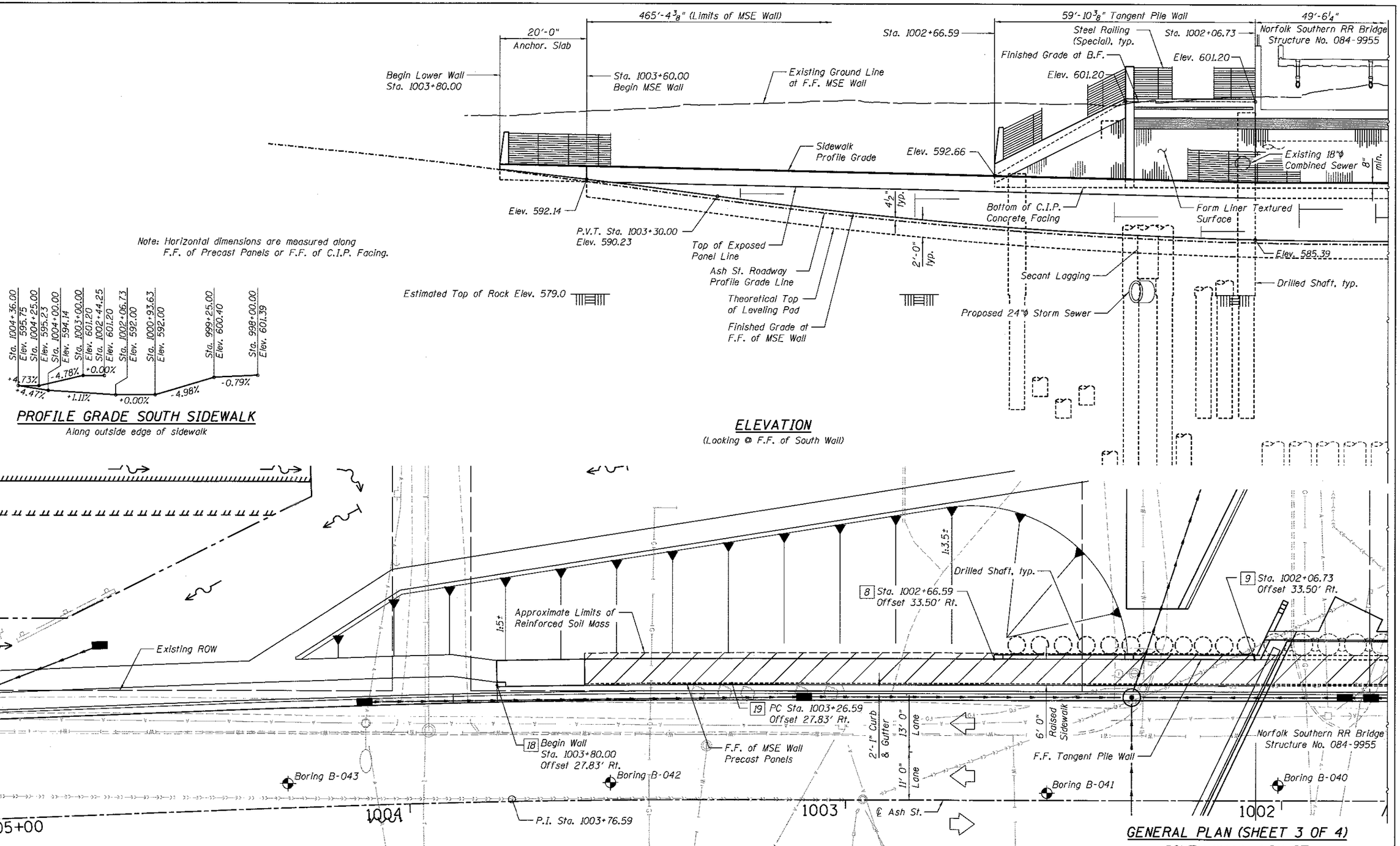
GENERAL PLAN & ELEVATION (NORTH)
ASH STREET RETAINING WALLS
SHEET NO. 2 OF 34 SHEETS

F.A.U. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
7992	14-00477-00-BR	SANGAMON	403	287
		CONTRACT NO. 93704		
		ILLINOIS FED. AID PROJECT		



GENERAL PLAN (SHEET 3 OF 4)
SOUTH WALL - ASH ST.
F.A.U. 7992 - SECTION 14-00477-00-BR
SANGAMON COUNTY
STATION 998+75.00 TO 1005+00.00

FINAL

DESIGNED	RGC	6/11/14
DRAWN	EJM	12/9/14
REVIEWED	KMS	10/31/2016

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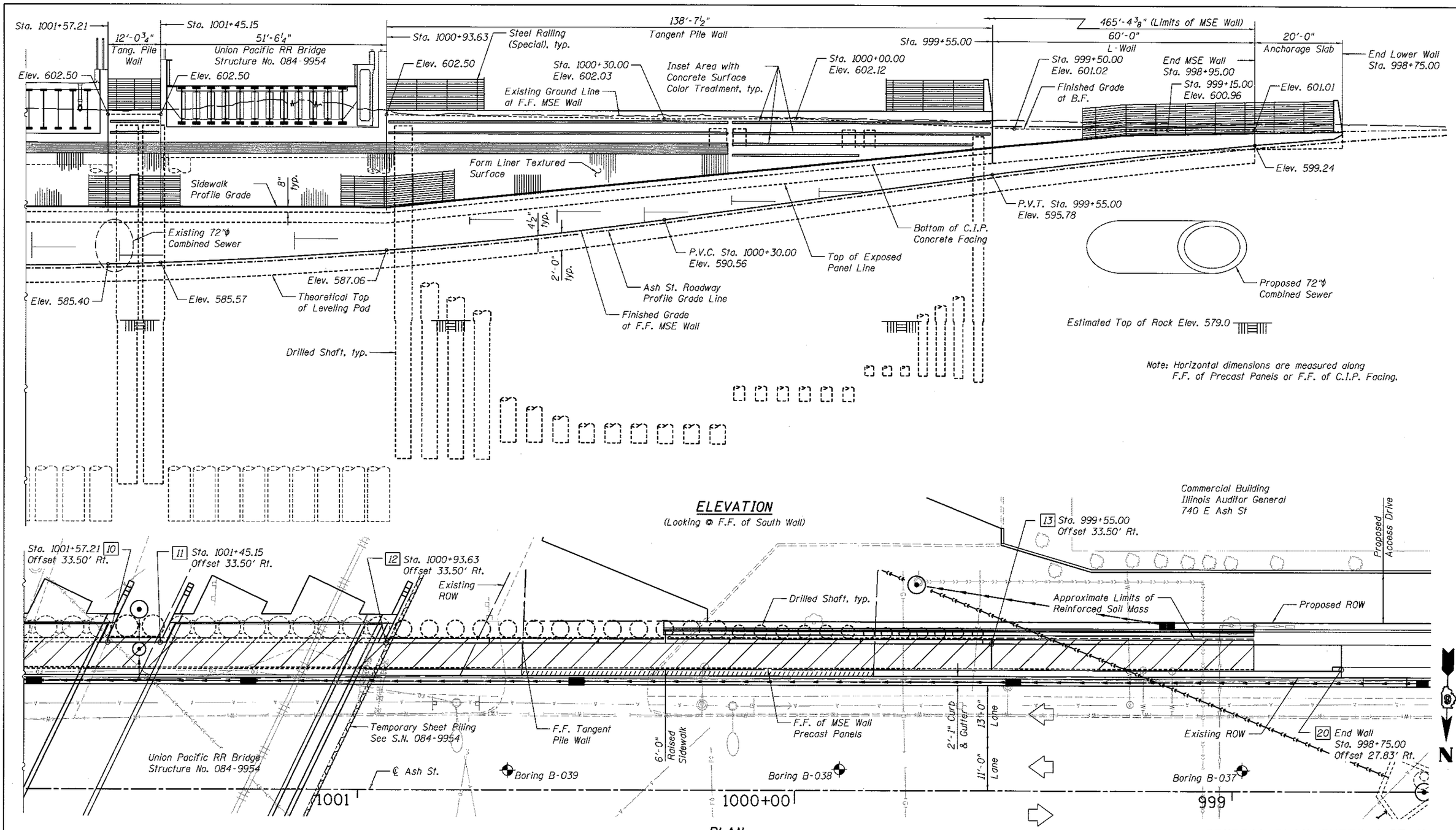
PLOT DATE = 2/24/2017	CHECKED - RGC	REVISED -	

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

GENERAL PLAN & ELEVATION (SOUTH)
ASH STREET RETAINING WALLS
SHEET NO. 3 OF 34 SHEETS

F.A.U. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
	14-00477-00-BR	SANGAMON	403	288
		CONTRACT NO. 93704		
	ILLINOIS FED. AID PROJECT			



ELEVATION

(Looking @ F.F. of South Wall)

PLAN

Note: Wall offsets are measured from ℄ Ash Street to the front face of precast panels or C.I.P. Facing.

F.F. - Front Face
B.F. - Back Face
12 = Control Point

GENERAL PLAN (SHEET 4 OF 4)
SOUTH WALL - ASH ST.
F.A.U. 7992 - SECTION 14-00477-00-BR
SANGAMON COUNTY
STATION 998+75.00 TO 1005+00.00

DESIGNED	RGC	6/11/14
DRAWN	EJM	12/9/14
REVIEWED	KMS	10/11/2016

FINAL

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PLOT DATE = 2/24/2017	CHECKED - RGC	REVISED -	

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

GENERAL PLAN & ELEVATION (SOUTH)
ASH STREET RETAINING WALLS
SHEET NO. 4 OF 34 SHEETS

F.A.U. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
	14-00477-00-BR	SANGAMON	403	289
		CONTRACT NO. 93704		
	ILLINOIS FED. AID PROJECT			

WALL CONTROL POINTS

Control Point	Station	Offset
1	999+50.00	33.50' LT
2	1001+26.43	33.50' LT
3	1001+77.95	33.50' LT
4	1001+90.01	33.50' LT
5	1002+39.53	33.50' LT
6	1003+26.59	33.50' LT
7	1003+55.00	33.50' LT
8	1002+66.59	33.50' RT
9	1002+06.73	33.50' RT
10	1001+57.21	33.50' RT
11	1001+45.15	33.50' RT
12	1000+93.63	33.50' RT
13	999+55.00	33.50' RT
14	998+78.00	27.83' LT
15	1003+26.59	27.83' LT
16	1004+26.59	27.83' LT
17	1005+00.00	27.83' LT
18	1003+80.00	27.83' RT
19	1003+26.59	27.83' RT
20	998+75.00	27.83' RT

Control Points 1-13 are to Front Face of C.I.P. Facing.
Control Points 14-20 are to Front Face of Precast Panels.

GENERAL NOTES

1. Reinforcement bars designated (E) shall be epoxy coated.
2. All substructure concrete shall have a compressive strength of 4,000 psi at 28 days.

SUGGESTED SEQUENCE OF CONSTRUCTION

Notes: See UPRR Bridge Plans (084-9954) for General Construction Sequence.

Sequence wall construction in coordination with east parking lot access closures at 740 East Ash Street. See Roadway General Notes for additional Commitments pertaining to access at this location.

1. Construct drilled shafts and secant lagging for upper wall.
2. Drive temporary sheet piling.
3. Complete roadway excavation while working under the new NS Railroad Bridge.
4. Construct lower (MSE) wall up to bottom of C.I.P. Facing of upper wall.
5. Construct C.I.P. Facing in front of drilled shafts.
6. Complete upper portion of lower wall.
7. Remove temporary sheet piling.
8. Construct cast-in-place anchorage slab.
9. Complete backfill behind upper wall.

INDEX OF SHEETS

TOTAL BILL OF MATERIAL

ITEM	UNIT	TOTAL
Structure Excavation	Cu. Yd.	48
Concrete Structures	Cu. Yd.	388.2
Form Liner Textured Surface	Sq. Ft.	1680
Reinforcement Bars	Pound	341390
Reinforcement Bars, Epoxy Coated	Pound	33050
Drilled Shaft in Soil	Cu. Yd.	807.0
Drilled Shaft in Rock	Cu. Yd.	421.4
Concrete Sealer	Sq. Ft.	16606
Geocomposite Wall Drain	Sq. Yd.	218
Anti-Graffiti Protection System	Sq. Ft.	630
Concrete Surface Color Treatment	Sq. Ft.	630
Steel Railing (Special)	Foot	1613
Temporary Sheet Piling	Sq. Ft.	2231
Mechanically Stabilized Earth Retaining Wall	Sq. Ft.	5585
Pipe Underdrains for Structures 4"	Foot	1691
Secant Lagging	Cu. Ft.	373

FINAL

DESIGNED	RGC	6/11/14
DRAWN	EJM	12/9/14
REVIEWED	KMS	10/11/2016

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PLOT DATE = 2/24/2017	CHECKED - RGC	REVISED -	

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

GENERAL DATA
ASH STREET RETAINING WALLS
SHEET NO. 5 OF 34 SHEETS

F.A.U. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
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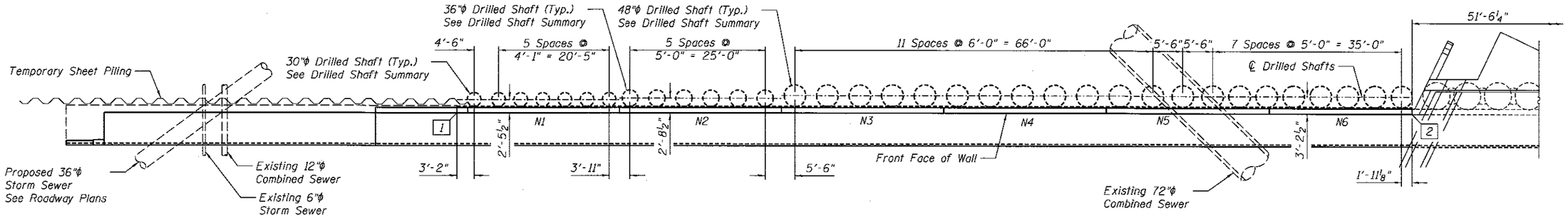
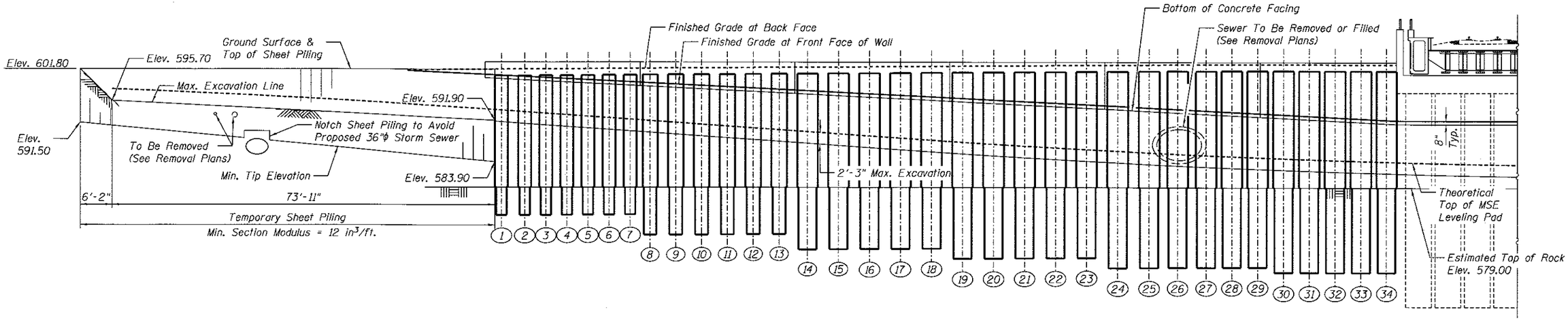
		CONTRACT NO. 93704		
	ILLINOIS FED. AID PROJECT			



PLAN

Note: All Dimensions are Measured Along Front Face of Wall



ELEVATION

Unfolded Along Face of Wall

DRILLED SHAFT SUMMARY

SHAFT NO.	CAGE DESIGNATION	LENGTH	BOTTOM ELEVATION	TOP ELEVATION	SHAFT NO.	CAGE DESIGNATION	LENGTH	BOTTOM ELEVATION	TOP ELEVATION
1	A1	27'-0"	573.58	600.58	18	C1	34'-0"	567.16	601.16
2	A1	27'-0"	573.61	600.61	19	C2	36'-0"	565.20	601.20
3	A1	27'-0"	573.64	600.64	20	C2	36'-0"	565.24	601.24
4	A1	27'-0"	573.66	600.66	21	C2	36'-0"	565.28	601.28
5	A1	27'-0"	573.69	600.69	22	C2	36'-0"	565.32	601.32
6	A1	27'-0"	573.72	600.72	23	C2	36'-0"	565.37	601.37
7	A1	27'-0"	573.75	600.75	24	C3	38'-0"	563.41	601.41
8	B1	31'-0"	569.78	600.78	25	C3	38'-0"	563.45	601.45
9	B1	31'-0"	569.81	600.81	26	C3	38'-0"	563.49	601.49
10	B1	31'-0"	569.85	600.85	27	C3	38'-0"	563.53	601.53
11	B1	31'-0"	569.88	600.88	28	C3	38'-0"	563.55	601.55
12	B1	31'-0"	569.92	600.92	29	C3	38'-0"	565.55	601.55
13	B1	31'-0"	569.95	600.95	30	C4	39'-0"	562.55	601.55
14	C1	34'-0"	566.99	600.99	31	C4	39'-0"	562.55	601.55
15	C1	34'-0"	567.03	601.03	32	C4	39'-0"	562.55	601.55
16	C1	34'-0"	567.07	601.07	33	C4	39'-0"	562.55	601.55
17	C1	34'-0"	567.11	601.11	34	C4	39'-0"	562.55	601.55

Note:
Cost of Drilling Through Existing Sewers Shall Be Included with Drilled Shafts in Soil.

2 = Control Point

BILL OF MATERIAL

ITEM	UNIT	TOTAL
Drilled Shafts in Soil	Cu. Yd.	280.4
Drilled Shafts in Rock	Cu. Yd.	131.9

FINAL

DESIGNED	RGC	6/17/14
DRAWN	EJM	12/9/14
REVIEWED	KMS	10/11/2016

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	PLOT DATE = 2/24/2017	CHECKED - RGC	REVISED -

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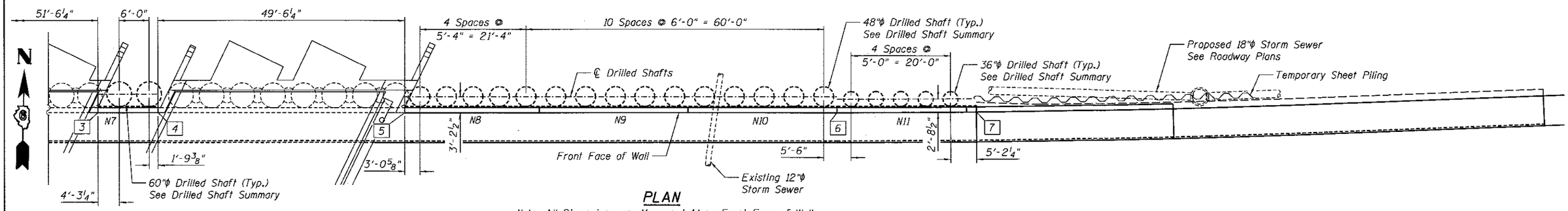
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

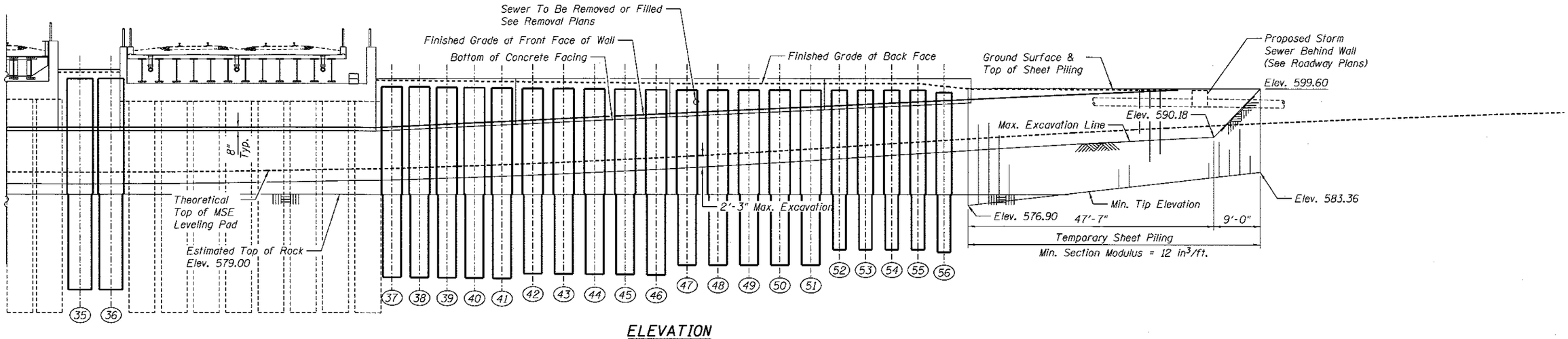
DRILLED SHAFTS – NORTH WALL
ASH STREET RETAINING WALLS
SHEET NO. 6 OF 34 SHEETS

F.A.U. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
	14-00477-00-BR	SANGAMON	403	291
		CONTRACT NO. 93704		
	ILLINOIS FED. AID PROJECT			



PLAN

Note: All Dimensions are Measured Along Front Face of Wall



ELEVATION

Unfolded Along Face of Wall

DRILLED SHAFT SUMMARY

SHAFT NO.	CAGE DESIGNATION	LENGTH	BOTTOM ELEVATION	TOP ELEVATION	SHAFT NO.	CAGE DESIGNATION	LENGTH	BOTTOM ELEVATION	TOP ELEVATION
35	D1	41'-0"	560.45	601.45	46	C2	36'-0"	563.32	599.32
36	D1	41'-0"	560.45	601.45	47	C1	34'-0"	565.25	599.25
37	C5	37'-0"	562.91	599.91	48	C1	34'-0"	565.25	599.25
38	C5	37'-0"	562.85	599.85	49	C1	34'-0"	565.25	599.25
39	C5	37'-0"	562.79	599.79	50	C1	34'-0"	565.25	599.25
40	C5	37'-0"	562.73	599.73	51	C1	34'-0"	565.25	599.25
41	C5	37'-0"	562.67	599.67	52	B1	31'-0"	568.25	599.25
42	C2	36'-0"	563.60	599.60	53	B1	31'-0"	568.25	599.25
43	C2	36'-0"	563.53	599.53	54	B1	31'-0"	568.25	599.25
44	C2	36'-0"	563.46	599.46	55	B1	31'-0"	568.25	599.25
45	C2	36'-0"	563.39	599.39	56	B1	31'-0"	567.78	598.78

5 = Control Point

BILL OF MATERIAL

ITEM	UNIT	TOTAL
Drilled Shafts in Soil	Cu. Yd.	202.2
Drilled Shafts in Rock	Cu. Yd.	112.8

FINAL

DESIGNED	RGC	6/11/14
DRAWN	EJM	12/9/14
REVIEWED	KMS	10/11/2016

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FILE NAME =

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PLOT DATE = 2/24/2017

DESIGNED - RGC
CHECKED - KMS
DRAWN - EJM
CHECKED - RGC

REVISED -
REVISED -
REVISED -
REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

DRILLED SHAFTS – NORTH WALL
ASH STREET RETAINING WALLS

SHEET NO. 7 OF 34 SHEETS

F.A.U. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
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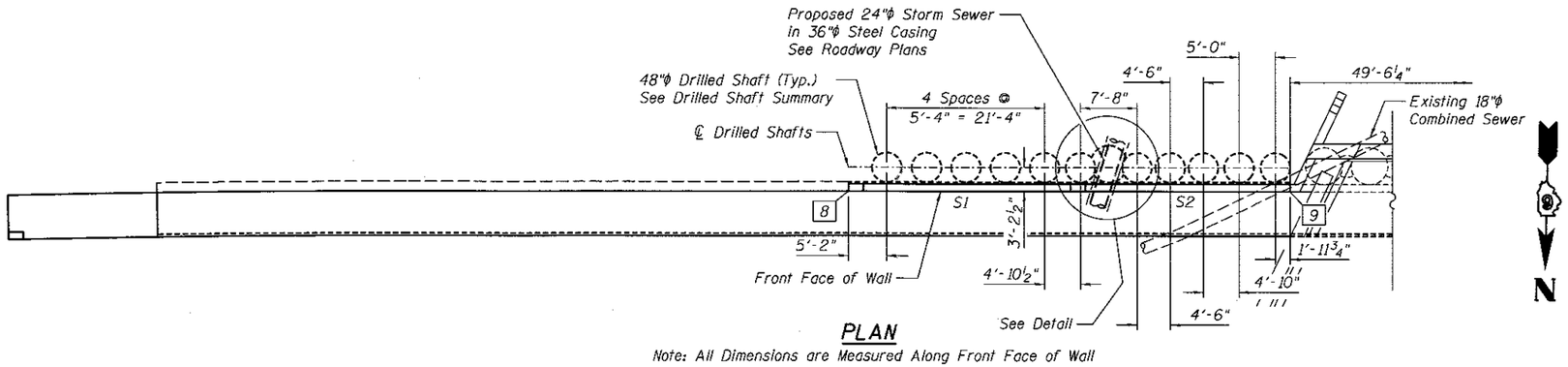
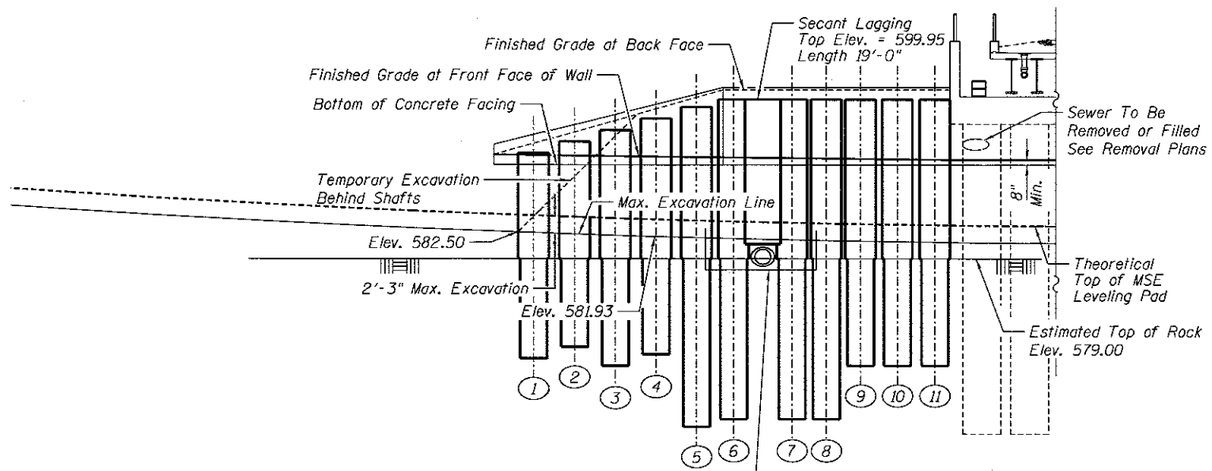
		CONTRACT NO. 93704		
	ILLINOIS FED. AID PROJECT			



PLAN

Note: All Dimensions are Measured Along Front Face of Wall

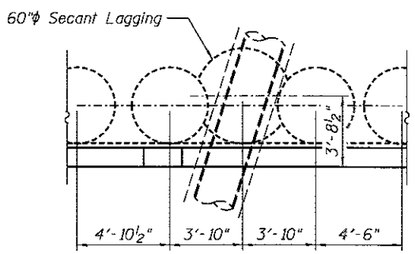


ELEVATION

Unfolded Along Face of Wall

DRILLED SHAFT SUMMARY

SHAFT NO.	CAGE DESIGNATION	LENGTH	BOTTOM ELEVATION	TOP ELEVATION
1	C8	27'-0"	565.88	592.88
2	C8	27'-0"	567.40	594.40
3	C7	31'-0"	564.92	595.92
4	C7	31'-0"	566.44	597.44
5	C9	42'-0"	556.95	598.95
6	C9	42'-0"	557.95	599.95
7	C9	42'-0"	557.95	599.95
8	C9	42'-0"	557.95	599.95
9	C6	35'-0"	564.95	599.95
10	C6	35'-0"	564.95	599.95
11	C6	35'-0"	564.95	599.95



SECANT LAGGING DETAIL

8 = Control Point

BILL OF MATERIAL

ITEM	UNIT	TOTAL
Drilled Shafts in Soil	Cu. Yd.	97.9
Drilled Shafts in Rock	Cu. Yd.	66.4
Secant Lagging	Cu. Ft.	373

FINAL

DESIGNED	RGC	6/11/14
DRAWN	EJM	12/9/14
REVIEWED	KMS	10/11/2016

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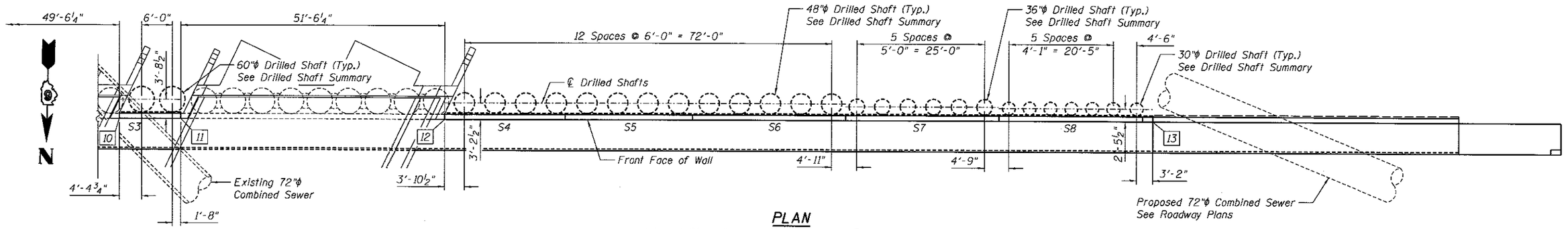
PLOT DATE = 2/24/2017	CHECKED - RGC	REVISED -	

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

DRILLED SHAFTS – SOUTH WALL
ASH STREET RETAINING WALLS

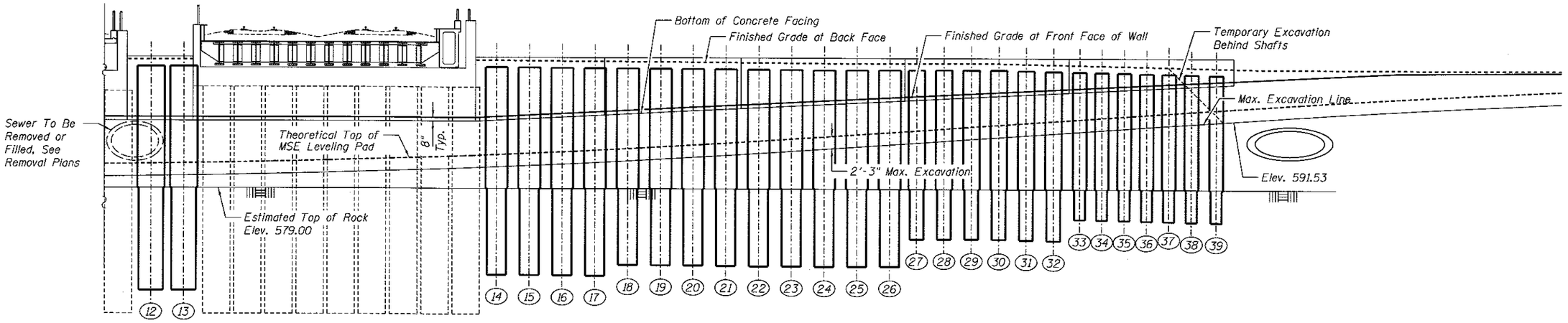
SHEET NO. 8 OF 34 SHEETS

F.A.U. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
	14-00477-00-BR	SANGAMON	403	293
		CONTRACT NO. 93704		
	ILLINOIS FED. AID PROJECT			



PLAN

Note: All Dimensions are Measured Along Front Face of Wall



ELEVATION

Unfolded Along Face of Wall

DRILLED SHAFT SUMMARY

SHAFT NO.	CAGE DESIGNATION	LENGTH	BOTTOM ELEVATION	TOP ELEVATION	SHAFT NO.	CAGE DESIGNATION	LENGTH	BOTTOM ELEVATION	TOP ELEVATION
12	D1	41'-0"	560.25	601.25	26	C2	36'-0"	564.82	600.82
13	D1	41'-0"	560.25	601.25	27	B1	31'-0"	569.83	600.83
14	C10	38'-0"	563.22	601.22	28	B1	31'-0"	569.85	600.85
15	C10	38'-0"	563.18	601.18	29	B1	31'-0"	569.86	600.86
16	C10	38'-0"	563.13	601.13	30	B1	31'-0"	569.82	600.82
17	C10	38'-0"	563.09	601.09	31	B1	31'-0"	569.71	600.71
18	C2	36'-0"	565.04	601.04	32	B1	31'-0"	569.60	600.60
19	C2	36'-0"	565.00	601.00	33	A1	27'-0"	573.50	600.50
20	C2	36'-0"	564.96	600.96	34	A1	27'-0"	573.41	600.41
21	C2	36'-0"	564.91	600.91	35	A1	27'-0"	573.32	600.32
22	C2	36'-0"	564.87	600.87	36	A1	27'-0"	573.23	600.23
23	C2	36'-0"	564.82	600.82	37	A1	27'-0"	573.14	600.14
24	C2	36'-0"	564.78	600.78	38	A1	27'-0"	573.05	600.05
25	C2	36'-0"	564.80	600.80	39	A1	27'-0"	572.95	599.95

Note:
Cost of Drilling Through Existing Sewers Shall
Be Included with Drilled Shafts in Soil.

12 = Control Point

BILL OF MATERIAL

ITEM	UNIT	TOTAL
Drilled Shafts in Soil	Cu. Yd.	226.5
Drilled Shafts in Rock	Cu. Yd.	110.3

FINAL

	RGC	6/11/14
DESIGNED	EJM	12/9/14
DRAWN	KMS	10/17/2016
REVIEWED		

p:\\sgi-svr386.hanson.dom\Hanson Projects\Documents\09Jobs\09L01798\CAD\Struct\Ash-10th\Sheets\09L01798-AshRetainingWallPlans

FILE NAME =

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USER NAME = pop00275
PLOT SCALE = 0.1667 '/ in.
PLOT DATE = 2/24/2017

DESIGNED - RGC | REVISED -
CHECKED - KMS | REVISED -
DRAWN - EJM | REVISED -
CHECKED - RGC | REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

DRILLED SHAFTS – SOUTH WALL
ASH STREET RETAINING WALLS
SHEET NO. 9 OF 34 SHEETS

F.A.U. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
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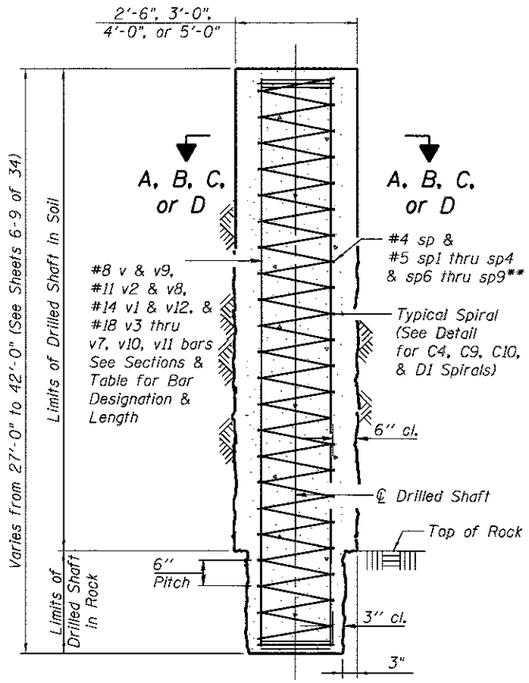
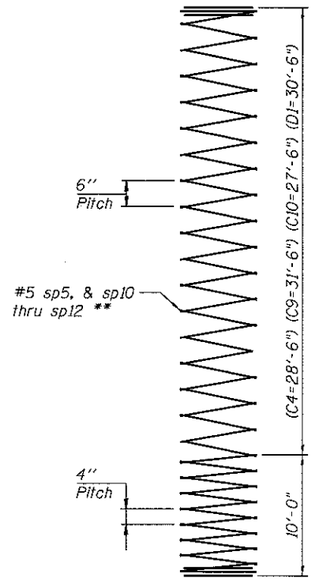
		CONTRACT NO. 93704		
	ILLINOIS FED. AID PROJECT			



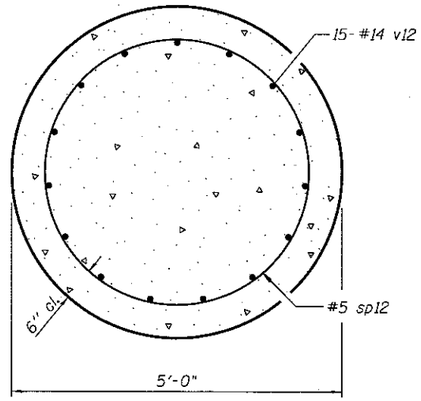
DRILLED SHAFT ELEVATION IN ROCK

Showing Reinforcement



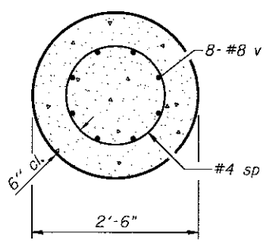
C4, C9, C10 & D1 SPIRAL DETAIL

** Provide 1½ extra turns top and bottom of each drilled shaft.



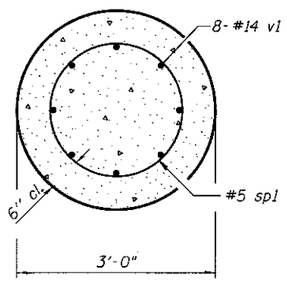
SECTION D-D

5'-0" Dia. Shafts
(Cage Designation D1)



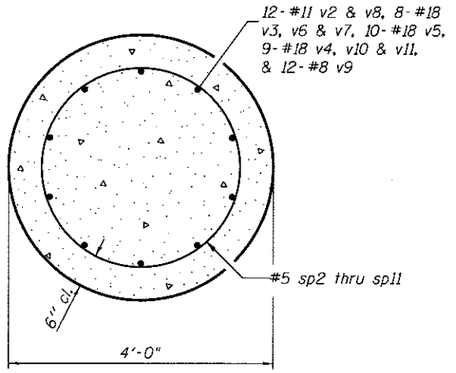
SECTION A-A

2'-6" Dia. Shafts
(Cage Designation A1)



SECTION B-B

3'-0" Dia. Shafts
(Cage Designations B1)



SECTION C-C

4'-0" Dia. Shafts
(Cage Designations C1-C10)

Cage Designation	Number Required	n	Bar	Number	Size	Length	Shape
A1	14	8	v	112	#8	26'-6"	———
B1	17	8	v1	136	#14	30'-6"	———
C1	10	12	v2	120	#11	33'-6"	———
C2	19	8	v3	152	#18	35'-6"	———
C3	6	9	v4	54	#18	37'-6"	———
C4	5	10	v5	50	#18	38'-6"	———
C5	5	8	v6	40	#18	36'-6"	———
C6	3	8	v7	24	#18	34'-6"	———
C7	2	12	v8	24	#11	30'-6"	———
C8	2	12	v9	24	#8	26'-6"	———
C9	4	9	v10	36	#18	41'-6"	———
C10	4	9	v11	36	#18	37'-6"	———
D1	4	15	v12	60	#14	40'-6"	———
A1	14	1	sp	14	#4	*26'-6"	∧∧∧∧∧
B1	17	1	sp1	17	#5	*30'-6"	∧∧∧∧∧
C1	10	1	sp2	10	#5	*33'-6"	∧∧∧∧∧
C2	19	1	sp3	19	#5	*35'-6"	∧∧∧∧∧
C3	6	1	sp4	6	#5	*37'-6"	∧∧∧∧∧
C4	5	1	sp5	5	#5	*38'-6"	∧∧∧∧∧
C5	5	1	sp6	5	#5	*36'-6"	∧∧∧∧∧
C6	3	1	sp7	3	#5	*34'-6"	∧∧∧∧∧
C7	2	1	sp8	2	#5	*30'-6"	∧∧∧∧∧
C8	2	1	sp9	2	#5	*26'-6"	∧∧∧∧∧
C9	4	1	sp10	4	#5	*41'-6"	∧∧∧∧∧
C10	4	1	sp11	4	#5	*37'-6"	∧∧∧∧∧
D1	4	1	sp12	4	#5	*40'-6"	∧∧∧∧∧
Reinforcement Bars						Pound	341390

* Length is height of spiral.

MIN. BAR LAPS FOR SPIRALS

#4 Bars = 2'-0" #5 Bars = 2'-6"

FINAL

DESIGNED	RGC	6/1/14
DRAWN	EJM	12/9/14
REVIEWED	KMS	10/17/2016

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FILE NAME =

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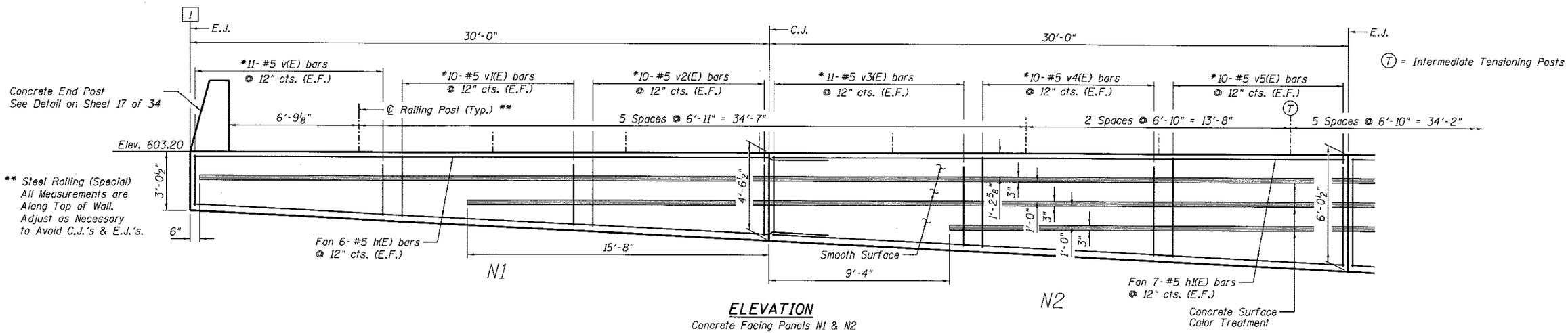
USER NAME = pap80275	DESIGNED - RGC	REVISED -	
	CHECKED - KMS	REVISED -	
PLOT SCALE = 0.1667 ' / in.	DRAWN - EJM	REVISED -	
PLOT DATE = 2/24/2017	CHECKED - RGC	REVISED -	

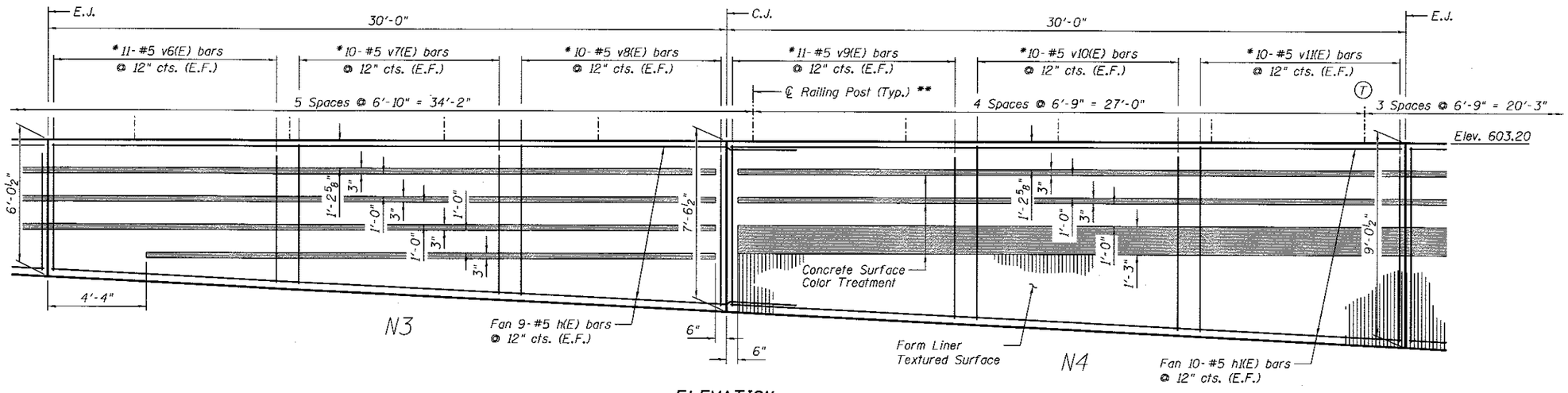
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

DRILLED SHAFT DETAILS
ASH STREET RETAINING WALLS
SHEET NO. 10 OF 34 SHEETS

F.A.U. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
	14-00477-00-BR	SANGAMON	403	295
		CONTRACT NO. 93704		
	ILLINOIS FED. AID PROJECT			



ELEVATION
Concrete Facing Panels N1 & N2



ELEVATION
Concrete Facing Panels N3 & N4

BILL OF MATERIAL

Bar	No.	Size	Length	Shape
h(E)	30	#5	33'-0"	——
h1(E)	34	#5	29'-8"	——
v(E)	22	#5	2'-9"	——
v1(E)	20	#5	3'-4"	——
v2(E)	20	#5	3'-10"	——
v3(E)	22	#5	4'-3"	——
v4(E)	20	#5	4'-10"	——
v5(E)	20	#5	5'-4"	——
v6(E)	22	#5	5'-9"	——
v7(E)	20	#5	6'-4"	——
v8(E)	20	#5	6'-10"	——
v9(E)	22	#5	7'-3"	——
v10(E)	20	#5	7'-10"	——
v11(E)	20	#5	8'-4"	——
Reinforcement Bars Epoxy Coated			Pound	3520
Concrete Structures			Cu. Yd.	30.0

Note: E.J. = Expansion Joint
C.J. = Construction Joint
E.F. = Each Face
* = Stagger Bars

1 = Control Point

MIN. BAR LAPS
#5 Bars = 2'-11"

	RGC	6/11/14
	EJM	12/9/14
	KMS	10/11/2016

FINAL
DESIGNED
DRAWN
REVIEWED

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HANSON
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	CHECKED - KMS	REVISED -	
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PLOT DATE = 2/24/2017	CHECKED - RGC	REVISED -	

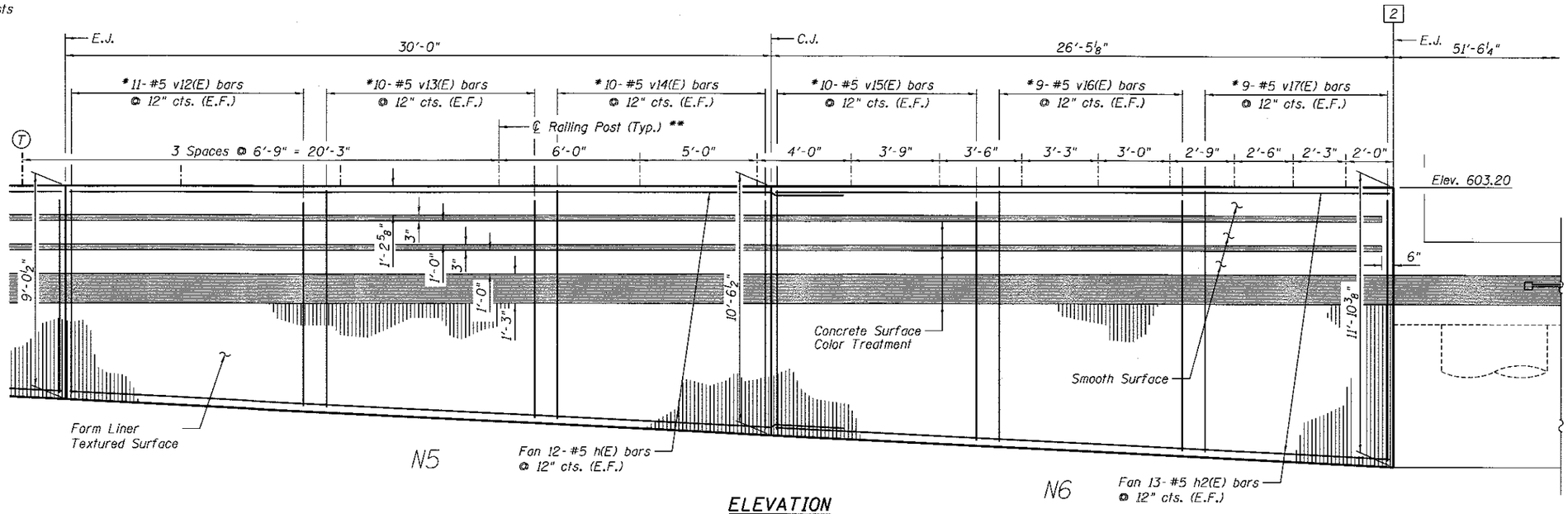
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

CONCRETE FACING – NORTH WALL
ASH STREET RETAINING WALLS
SHEET NO. 11 OF 34 SHEETS

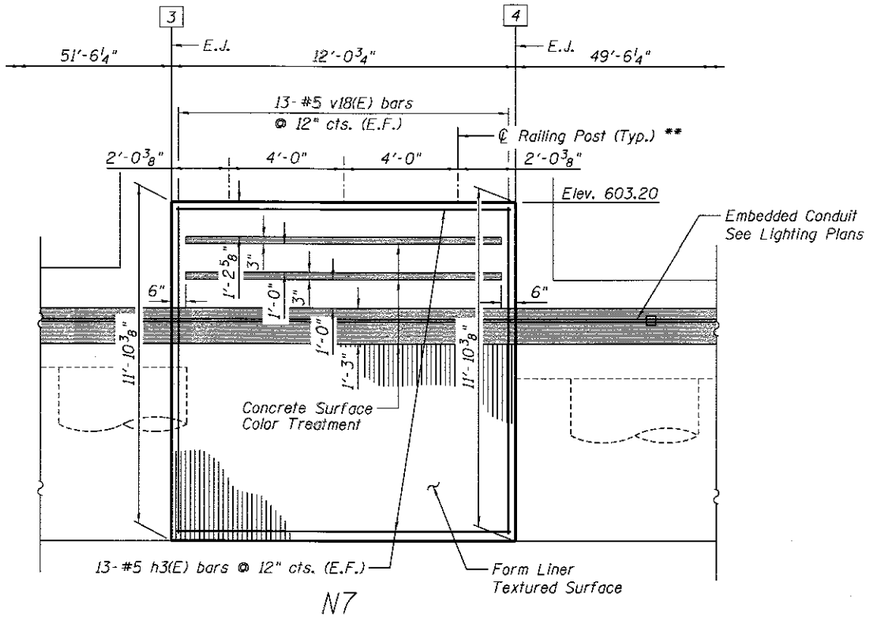
F.A.U. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
	14-00477-00-BR	SANGAMON	403	296
		CONTRACT NO. 93704		
	ILLINOIS FED. AID PROJECT			

Ⓣ = Intermediate Tensioning Posts

** Steel Railing (Special)
All Measurements are
Along Top of Wall.
Adjust as Necessary
to Avoid C.J.'s & E.J.'s.



ELEVATION
Concrete Facing Panels N5 & N6



ELEVATION
Concrete Facing Panel N7

BILL OF MATERIAL

Bar	No.	Size	Length	Shape
h(E)	24	#5	33'-0"	
h2(E)	26	#5	26'-1"	
h3(E)	26	#5	11'-8"	
v12(E)	22	#5	8'-9"	
v13(E)	20	#5	9'-4"	
v14(E)	20	#5	9'-10"	
v15(E)	20	#5	10'-3"	
v16(E)	18	#5	10'-9"	
v17(E)	18	#5	11'-2"	
v18(E)	26	#5	11'-6"	
Reinforcement Bars Epoxy Coated			Pound	3390
Concrete Structures			Cu. Yd.	31.4

Note: E.J. = Expansion Joint
C.J. = Construction Joint
E.F. = Each Face
* = Stagger Bars
3 = Control Point

MIN. BAR LAPS
#5 Bars = 2'-11"

FINAL	DESIGNED	RGC 6/11/14
	DRAWN	EJM 12/9/14
	REVIEWED	KMS 10/1/2016

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	PLOT DATE = 2/24/2017	CHECKED - RGC	REVISED -

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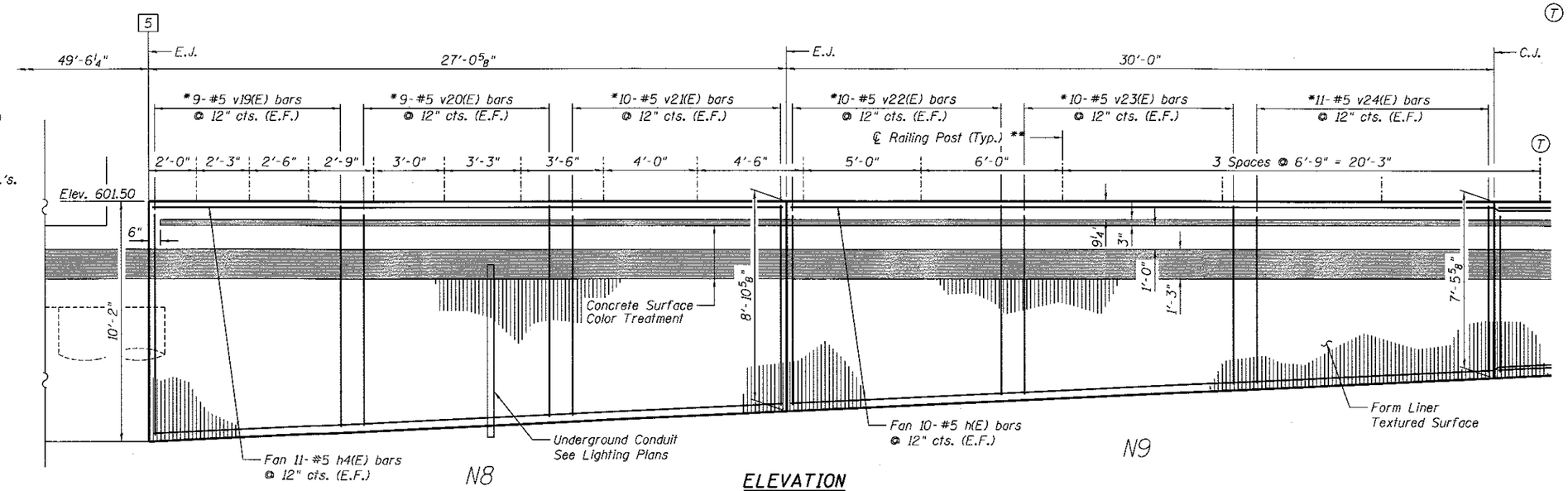
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

CONCRETE FACING – NORTH WALL
ASH STREET RETAINING WALLS
SHEET NO. 12 OF 34 SHEETS

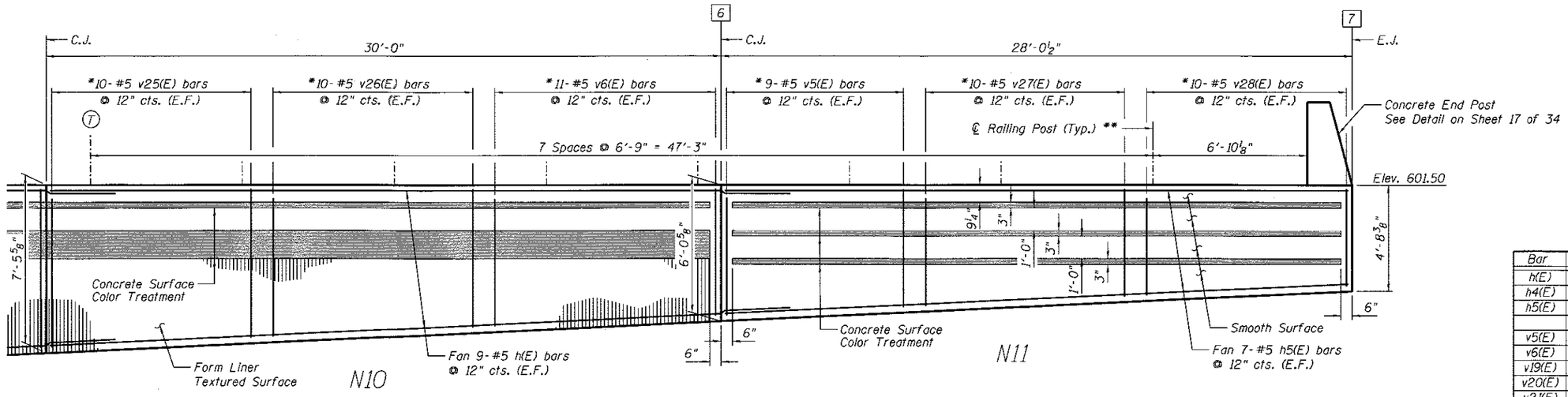
F.A.U. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
	14-00477-00-BR	SANGAMON	403	297
		CONTRACT NO. 93704		
	ILLINOIS FED. AID PROJECT			

Ⓣ = Intermediate Tensioning Posts

** Steel Railing (Special)
All Measurements are
Along Top of Wall.
Adjust as Necessary
to Avoid C.J.'s & E.J.'s.



ELEVATION
Concrete Facing Panels N8 & N9



ELEVATION
Concrete Facing Panels N10 & N11

Note: E.J. = Expansion Joint
C.J. = Construction Joint
E.F. = Each Face
* = Stagger Bars
6 = Control Point

MIN. BAR LAPS
#5 Bars = 2'-11"

BILL OF MATERIAL

Bar	No.	Size	Length	Shape
h(E)	38	#5	33'-0"	
h4(E)	22	#5	26'-8"	
h5(E)	14	#5	27'-8"	
v5(E)	18	#5	5'-4"	
v6(E)	22	#5	5'-9"	
v19(E)	18	#5	9'-6"	
v20(E)	18	#5	9'-1"	
v21(E)	20	#5	8'-7"	
v22(E)	20	#5	8'-2"	
v23(E)	20	#5	7'-8"	
v24(E)	22	#5	7'-2"	
v25(E)	20	#5	6'-9"	
v26(E)	20	#5	6'-3"	
v27(E)	20	#5	4'-11"	
v28(E)	20	#5	4'-5"	
Reinforcement Bars Epoxy Coated			Pound	4040
Concrete Structures			Cu. Yd.	36.0

FINAL

DESIGNED	RGC	6/11/14
DRAWN	EJM	12/9/14
REVIEWED	KMS	10/11/2016

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	PLOT SCALE = 0.1667 ' / in.	DRAWN - EJM	REVISED -
	PLOT DATE = 2/24/2017	CHECKED - RGC	REVISED -

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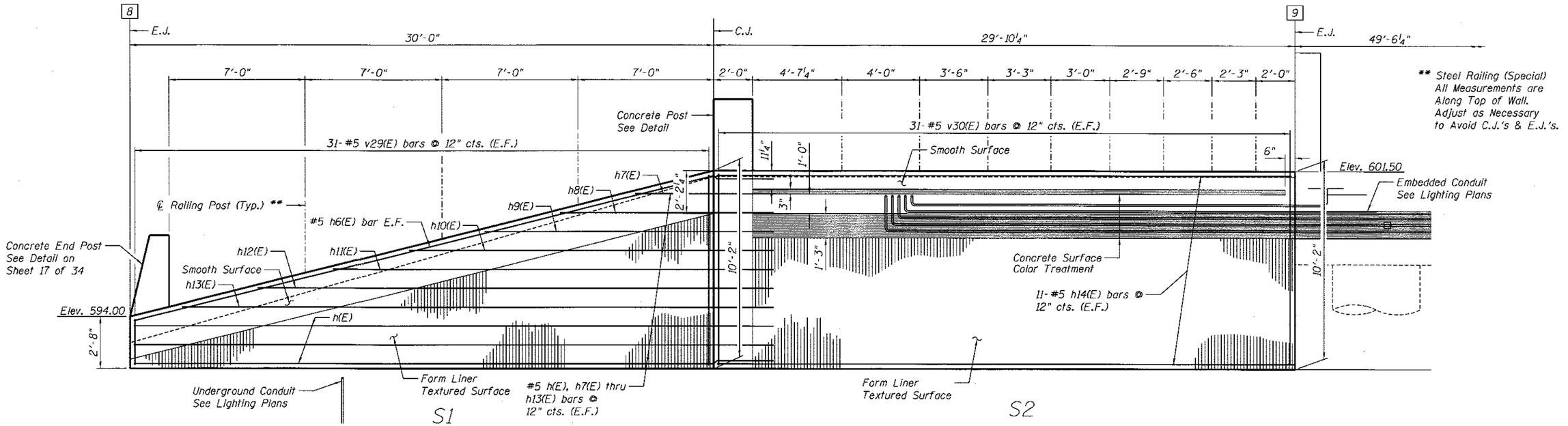
DEPARTMENT OF TRANSPORTATION

CONCRETE FACING – NORTH WALL
ASH STREET RETAINING WALLS
SHEET NO. 13 OF 34 SHEETS

F.A.U. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
	14-00477-00-BR	SANGAMON	403	298
		CONTRACT NO. 93704		
		ILLINOIS FED. AID PROJECT		



ELEVATION

Concrete Facing Panels S1 & S2

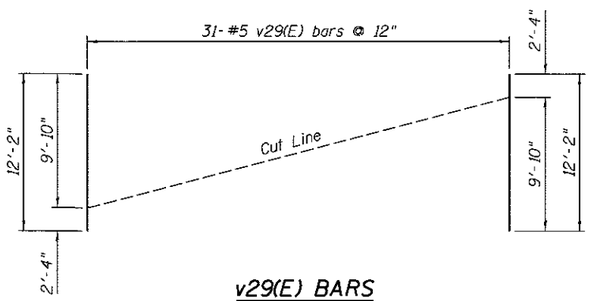
BILL OF MATERIAL

Bar	No.	Size	Length	Shape
d(E)	6	#4	5'-6"	
h(E)	6	#5	33'-0"	
h6(E)	2	#5	33'-10"	
h7(E)	2	#5	7'-7"	
h8(E)	2	#5	11'-6"	
h9(E)	2	#5	15'-6"	
h10(E)	2	#5	19'-5"	
h11(E)	2	#5	23'-4"	
h12(E)	2	#5	27'-3"	
h13(E)	2	#5	31'-2"	
h14(E)	22	#5	29'-6"	
s(E)	5	#4	5'-2"	
v29(E)	31	#5	12'-2"	
v30(E)	62	#5	9'-10"	
Reinforcement Bars Epoxy Coated			Pound	2310
Concrete Structures			Cu. Yd.	21.4

Note: E.J. = Expansion Joint
C.J. = Construction Joint
E.F. = Each Face
* = Stagger Bars
9 = Control Point

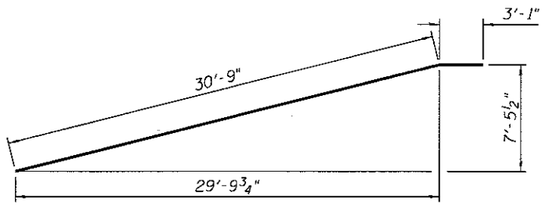
MIN. BAR LAPS

#4 Bars = 1'-10"
#5 Bars = 2'-11"

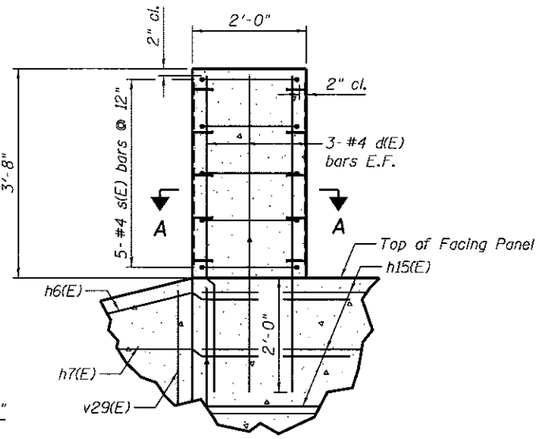


v29(E) BARS

Cut Bars to be Placed E.F.

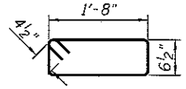


BAR h6(E)

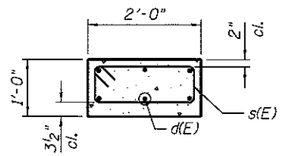


CABLE ANCHORAGE CONCRETE POST DETAIL

See Sheet 26 of 34 for Railing Connection Detail



BAR s(E)



SECTION A-A

FINAL

DESIGNED	RGC	6/11/14
DRAWN	EJM	12/9/14
REVIEWED	KMS	10/11/2016

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		CHECKED - KMS	REVISED -
	PLOT SCALE = 0.1667 ' / in.	DRAWN - EJM	REVISED -
	PLOT DATE = 2/24/2017	CHECKED - RGC	REVISED -

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CONCRETE FACING – SOUTH WALL
ASH STREET RETAINING WALLS
SHEET NO. 14 OF 34 SHEETS

F.A.U. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
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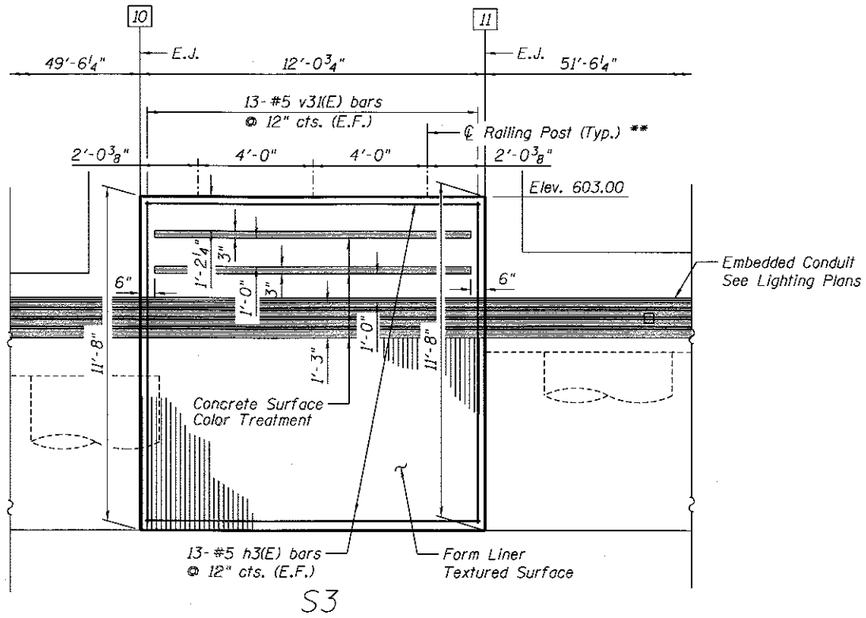
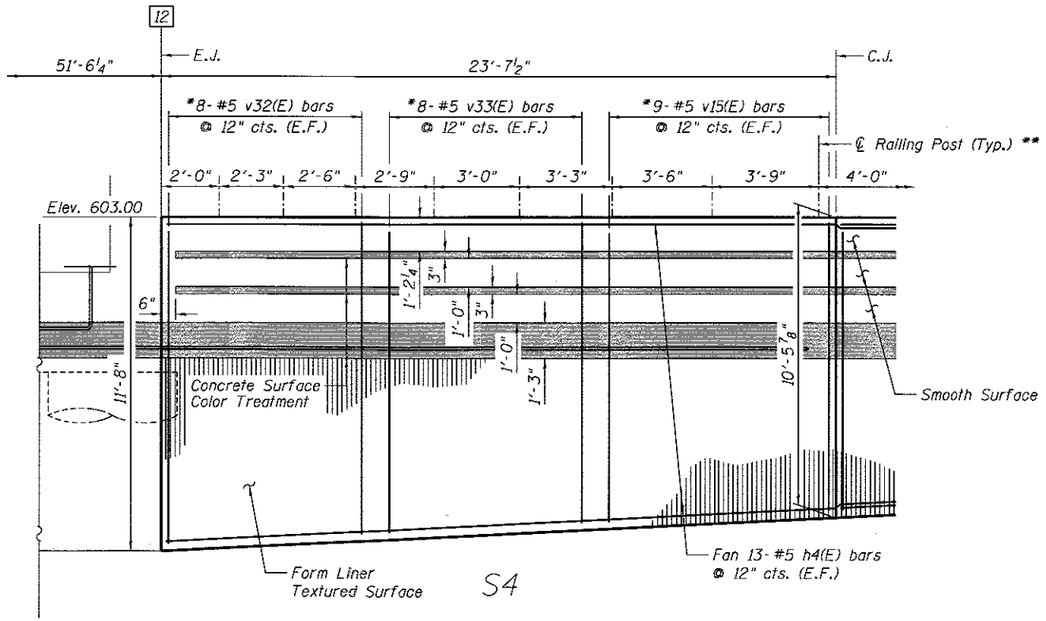
		CONTRACT NO. 93704		
	ILLINOIS FED. AID PROJECT			



ELEVATION

Concrete Facing Panel S3

** Steel Railing (Special)
All Measurements are
Along Top of Wall.
Adjust as Necessary
to Avoid C.J.'s & E.J.'s.



ELEVATION

Concrete Facing Panel S4

Note: E.J. = Expansion Joint
C.J. = Construction Joint
E.F. = Each Face
* = Stagger Bars
12 = Control Point

MIN. BAR LAPS

#5 Bars = 2'-11"

BILL OF MATERIAL

Bar	No.	Size	Length	Shape
h3(E)	26	#5	11'-8"	———
h4(E)	26	#5	26'-8"	———
v15(E)	18	#5	10'-3"	———
v31(E)	26	#5	11'-4"	———
v32(E)	16	#5	11'-0"	———
v33(E)	16	#5	10'-8"	———
Reinforcement Bars Epoxy Coated			Pound	1900
Concrete Structures			Cu. Yd.	17.3

FINAL

DESIGNED	RGC	6/11/14
DRAWN	EJM	12/9/14
REVIEWED	KMS	10/11/2016

pw:\\spi-svr305.hanson.dom:Hanson Projects\Documents\89Jobs\89L0179B\CAD\Struct\Ash-18th\Sheet\89L0179B-AshRetainingWallPlans

FILE NAME =	USER NAME = pop88275	DESIGNED - RGC	REVISED -
HANSON		CHECKED - KMS	REVISED -
	PLOT SCALE = 0.1667 ' / in.	DRAWN - EJM	REVISED -
	PLOT DATE = 2/24/2017	CHECKED - RGC	REVISED -

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STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

CONCRETE FACING – SOUTH WALL
ASH STREET RETAINING WALLS
SHEET NO. 15 OF 34 SHEETS

F.A.U. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
	14-00477-00-BR	SANGAMON	403	300
		CONTRACT NO. 93704		
	ILLINOIS FED. AID PROJECT			