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# CIVIL EAST CONSTRUCTION

## VOLUME 4A BRIDGES

THE PROPOSED SOUTHWEST LRT PROJECT IS NOT FINAL BUT IS STILL UNDER ENVIRONMENTAL REVIEW AND THE PROJECT IS SUBJECT TO CHANGE. THESE PLANS ARE NOT FINAL.

PLAN PACKAGE INDEX / DESCRIPTION

CIVIL EAST CONSTRUCTION

**VOLUME 1 - EXISTING CONDITIONS** 

**VOLUME 2 - CIVIL** 

VOLUME 3 - TRACKWORK

VOLUME 4A - BRIDGES

VOLUME 4B - BRIDGES

VOLUME 5 - TUNNELS

VOLUME 7 - UTILITIES
VOLUME 8 - DRAINAGE

VOLUME 11A - STATIONS VOLUME 11B - STATIONS VOLUME 12 - SYSTEMS

**VOLUME 6 - RETAINING WALLS** 

**VOLUME 10 - TRAFFIC / LIGHTING** 

VOLUME 9 - URBAN DESIGN / LANDSCAPE

THE COUNCIL, THROUGH THE DEVELOPMENT OF THESE PLANS, DOES NOT INTEND THAT THEY WILL PREJUDICE OR COMPROMISE ANY STATE OR FEDERAL ENVIRONMENTAL REVIEW OR OTHER LEGAL REQUIREMENTS. THESE PLANS DO NOT LIMIT THE PROJECT DESIGN ALTERNATIVES OR MITIGATIVE MEASURES THAT THE COUNCIL MAY UNDERTAKE IF THE PROPOSED SWLRT PROJECT PROCEEDS TO CONSTRUCTION.

THE COUNCIL WILL NOT TAKE FINAL ACTION ON THIS MATTER UNLESS THE COUNCIL PROCEEDS WITH THE PROJECT AFTER THE FTA'S RECORD OF DECISION AND THE COUNCIL'S DETERMINATION OF ADEQUACY.

WARNING: THIS RECORD MAY CONTAIN SENSITIVE SECURITY INFORMATION THAT IS CONTROLLED UNDER 49 CFR PARTS 15 AND 1520. NO PART OF THIS RECORD MAY BE DISCLOSED TO PERSONS WITHOUT A "NEED TO KNOW", AS DEFINED IN 49 CFR PARTS 15 AND 1520, EXCEPT WITH THE WRITTEN PERMISSION OF THE ADMINISTRATION OF THE TRANSPORTATION SECURITY ADMINISTRATION OR THE SECRETARY OF TRANSPORTATION. UNAUTHORIZED RELEASE MAY RESULT IN CIVIL PENALTY OR OTHER ACTION. FOR U.S. GOVERNMENT AGENCIES, PUBLIC DISCLOSURE IS GOVERNED BY 5 U.S.C. 552 AND 49 CFR PARTS 15 AND 1520.

60% SUBMISSION DATE: 09/28/15



		CIVIL EAST				CIVIL EAST					CIVIL EAST		$\overline{}$
SHT#	SHEET NAME	SHEET DESCRIPTION	STATION STATION RE	V SHT#	SHEET NAME	SHEET DESCRIPTION	STATION ST	TATION REV	SHT#	SHEET NAME	SHEET DESCRIPTION	STATION STATIO	ION REV
		VOLUME 4A - BRIDGES		65	CBR27C10-BRG-SUP-076	FUTURE POST-TENSIONING LAYOUT 2			18	CBRR0688-BRG-DTL-003	WIRE FENCE DETAILS		
1	E0-BRGA-CVR-001	COVER SHEET		66	CBR27C10-BRG-SUP-078	TRANSVERSE POST-TENSIONING DETAILS			19	CBRR0688-BRG-EXP-002	JOINT DETAILS		
2	E0-BRG-IDX-001	VOLUME INDEX OF PLAN SHEETS SHEET 1		67	CBR27C10-BRG-SUP-083	SUPERSTRUCTURE CONST. SCHEME 1			20	CBRR0688-BRG-DTL-004	JOINT DETAILS		
3	E0-BRG-IDX-002	VOLUME INDEX OF PLAN SHEETS SHEET 2		68	CBR27C10-BRG-RAL-001	WIRE FENCE			21	CBRR0688-BRG-EXP-001	BEARING ASSEMBLY DETAILS		
4	E0-GEN-KEY-001	GENERAL KEY MAP		69	CBR27C10-BRG-DTL-003	DRAINAGE DETAILS 1			22	CBRR0688-BRG-DTL-005	DETAILS		
5	E0-GEN-NTS-001	GENERAL LEGEND AND ABBREVIATIONS SHEET 1		70	CBR27C10-BRG-SUR-001	BRIDGE SURVEY 1			23	CBRR0688-BRG-DTL-006	DETAILS		
6	E0-GEN-NTS-002	GENERAL LEGEND AND ABBREVIATIONS SHEET 2		71	CBR27C10-BRG-SUR-002	BRIDGE SURVEY 2			24	CBRR0688-BRG-SUR-001	BRIDGE SURVEY		
		EXCELSIOR BLVD - BRIDGE 27C10		72	CBR27C10-BRG-SUR-003	BRIDGE SURVEY 3			25	CBRR0688-BRG-BOR-001	BRIDGE SURVEY PLAN		
	ODDOZOM DDO KEV		0544.05.0 0500.45.0	73	CBR27C10-BRG-SUR-004	BRIDGE SURVEY PLAN 1			26	CBRR0688-BRG-BOR-002	BRIDGE SURVEY PROFILE		
1	CBR27C10-BRG-KEY	KEY PLAN	2544+25.3 2560+45.3	74	CBR27C10-BRG-BOR-001	BRIDGE SURVEY PLAN 2			27	CBRR0688-BRG-BOR-003	BRIDGE SURVEY PROFILE		
3	CBR27C10-BRG-GPE-001 CBR27C10-BRG-GPE-002	GENERAL NOTES 1		75 76	CBR27C10-BRG-BOR-002 CBR27C10-BRG-BOR-003	BRIDGE SURVEY PLAN 3			28	CBRR0688-BRG-BOR-004	BRIDGE SURVEY PROFILE		-
4	CBR27C10-BRG-GPE-002 CBR27C10-BRG-GPE-003	GENERAL NOTES 2  GENERAL PLAN & ELEVATION 1		77	CBR27C10-BRG-BOR-003	BRIDGE SURVEY PLAN 4 BRIDGE SURVEY PROFILE 1			29 30	CBRR0688-BRG-DTL-001 CBRR0688-BRG-DTL-002	STAGING PLAN 1 STAGING PLAN 2		$\overline{}$
5	CBR27C10-BRG-GPE-003	GENERAL PLAN & ELEVATION 1  GENERAL PLAN & ELEVATION 2		78	CBR27C10-BRG-BOR-005	BRIDGE SURVEY PROFILE 2			31	CBRR0688-BRG-DTL-003	STAGING PLAN 2 STAGING PLAN 3		_
6	CBR27C10-BRG-GPE-005	GENERAL PLAN & ELEVATION 3		79	CBR27C10-BRG-BOR-006	BRIDGE SURVEY PROFILE 3			32	CBRR0688-BRG-DTL-004	STAGING PLAN 4		
7	CBR27C10-BRG-GPE-006	GENERAL PLAN & ELEVATION 4		80	CBR27C10-BRG-BOR-007	BRIDGE SURVEY PROFILE 4			- OZ	OBINIOSSO BINO BIE SOF			
8	CBR27C10-BRG-GPE-007	TRANSVERSE SECTION		81	CBR27C10-BRG-BOR-008	BRIDGE SURVEY PROFILE 5					BRIDGE R0689 - MINNEHAHA CREEK LRT		
9	CBR27C10-BRG-GPE-009	HORIZONTAL ALIGNMENT CONTROL PLAN		82	CBR27C10-BRG-BOR-009	BRIDGE SURVEY PROFILE 6			1	CBRR0689-BRG-GPE-001	GENERAL PLAN & ELEVATION		
10	CBR27C10-BRG-SUP-087	BRIDGE LAYOUT 1							2	CBRR0689-BRG-TRN-001	TRANSVERSE SECTION & QUANTITIES		
11	CBR27C10-BRG-SUP-088	BRIDGE LAYOUT 2		1		BRIDGE R0687 - MINNEHAHA CREEK TRAIL			3	CBRR0689-BRG-SUP-001	BRIDGE LAYOUT		
12	CBR27C10-BRG-ABT-002	WEST ABUTMENT FOOTING DETAILS		1	CBRR0687-BRG-GPE-001	GENERAL PLAN & ELEVATION			4	CBRR0689-BRG-ABT-001	WEST ABUTMENT DETAILS		
13	CBR27C10-BRG-ABT-003	WEST ABUTMENT DETAILS 1		2	CBRR0687-BRG-TRN-001	TRANSVERSE SECTION & QUANTITIES			5	CBRR0689-BRG-ABT-002	WEST ABUTMENT DETAILS		
14	CBR27C10-BRG-ABT-004	WEST ABUTMENT DETAILS 2		3	CBRR0687-BRG-SUP-003	BRIDGE LAYOUT			6	CBRR0689-BRG-ABT-003	WEST ABUTMENT DETAILS		
15	CBR27C10-BRG-ABT-005	WEST ABUTMENT DETAILS 3		4	CBRR0687-BRG-ABT-019	WEST ABUTMENT DETAILS			7	CBRR0689-BRG-ABT-005	EAST ABUTMENT DETAILS		
16	CBR27C10-BRG-ABT-010	EAST ABUTMENT FOOTING DETAILS		5	CBRR0687-BRG-ABT-016	WEST ABUTMENT DETAILS			8	CBRR0689-BRG-ABT-006	EAST ABUTMENT DETAILS		
17	CBR27C10-BRG-ABT-011	EAST ABUTMENT DETAILS 1		6	CBRR0687-BRG-ABT-018	WEST ABUTMENT DETAILS			9	CBRR0689-BRG-ABT-007	EAST ABUTMENT DETAILS		
18	CBR27C10-BRG-ABT-012	EAST ABUTMENT DETAILS 2		7	CBRR0687-BRG-ABT-017	WEST ABUTMENT DETAILS			10	CBRR0689-BRG-SUP-002	FRAMING PLAN		
19	CBR27C10-BRG-ABT-013	EAST ABUTMENT DETAILS 3		8	CBRR0687-BRG-ABT-004	EAST ABUTMENT DETAILS			11	CBRR0689-BRG-PCB-001	MN54 PRESTRESSED CONCRETE BEAM		
20	CBR27C10-BRG-PIR-001	PIER 1 FOOTING DETAILS		9	CBRR0687-BRG-ABT-003	EAST ABUTMENT DETAILS			12	CBRR0689-BRG-SUP-003	SUPERSTRUCTURE DETAILS		
21	CBR27C10-BRG-PIR-004	PIER 1 DETAILS		10	CBRR0687-BRG-ABT-005	EAST ABUTMENT DETAILS			13	CBRR0689-BRG-SUP-004	SUPERSTRUCTURE DETAILS		
22	CBR27C10-BRG-PIR-008	PIER 2 FOOTING DETAILS		11	CBRR0687-BRG-ABT-002	EAST ABUTMENT DETAILS			14	CBRR0689-BRG-SUP-005	SUPERSTRUCTURE DETAILS		
23	CBR27C10-BRG-PIR-011	PIER 2 DETAILS		12	CBRR0687-BRG-SUP-001	FRAMING PLAN			15	CBRR0689-BRG-RAL-001	CONCRETE PARAPET (TYPE P-1)		
24	CBR27C10-BRG-PIR-015	PIER 3 FOOTING DETAILS		13	CBRR0687-BRG-DTL-001	36M PRESTRESSED CONCRETE BEAM			16	CBRR0689-BRG-RAL-002	WIRE FENCE DETAILS		
25	CBR27C10-BRG-PIR-018	PIER 3 DETAILS		14	CBRR0687-BRG-SUP-004	SUPERSTRUCTURE DETAILS			17	CBRR0689-BRG-EXP-001	WATERPROOF EXPANSION JOINT DEVICE		
26	CBR27C10-BRG-PIR-022	PIER 4 FOOTING DETAILS		15	CBRR0687-BRG-SUP-006	SUPERSTRUCTURE DETAILS			18	CBRR0689-BRG-DTL-001	DETAILS		
27	CBR27C10-BRG-PIR-025	PIER 4 DETAILS		16	CBRR0687-BRG-SUP-005	SUPERSTRUCTURE DETAILS			19	CBRR0689-BRG-DTL-002	DETAILS		
28	CBR27C10-BRG-SUP-001	SEGMENT DESIGNATION 1		17	CBRR0687-BRG-SUP-002	SUPERSTRUCTURE DETAILS			20	CBRR0689-BRG-DTL-003	DETAILS		
29	CBR27C10-BRG-SUP-002	SEGMENT DESIGNATION 2		18	CBRR0687-BRG-DTL-009	CONCRETE PARAPET (TYPE P-1)			21	CBRR0689-BRG-DTL-004	DETAILS		
30	CBR27C10-BRG-SUP-003	SEGMENT DESIGNATION 3		19	CBRR0687-BRG-DTL-010	WIRE FENCE DETAILS			22	CBRR0689-BRG-DTL-005	DETAILS		
31	CBR27C10-BRG-SUP-004	SEGMENT DESIGNATION 5		20	CBRR0687-BRG-DTL-007	WATERPROOF EXPANSION DEVICE			23	CBRR0689-BRG-SUR-001	BRIDGE SURVEY PLAN		
32	CBR27C10-BRG-SUP-005 CBR27C10-BRG-SUP-006	SEGMENT DESIGNATION 5		21 22	CBRR0687-BRG-DTL-008 CBRR0687-BRG-DTL-003	APPROACH PANEL DETAILS			24 25	CBRR0689-BRG-BOR-001	BRIDGE SURVEY PROFILE		
34	CBR27C10-BRG-SUP-007	SEGMENT DESIGNATION 6 SEGMENT DESIGNATION 7		23	CBRR0687-BRG-DTL-003	DETAILS			26	CBRR0689-BRG-BOR-002 CBRR0689-BRG-STG-001	BRIDGE SURVEY PROFILE STAGING PLAN SHEET 1		
35	CBR27C10-BRG-SUP-008	SEGMENT DESIGNATION 7 SEGMENT DESIGNATION 8		24	CBRR0687-BRG-DTL-005	DETAILS			27	CBRR0689-BRG-STG-002	STAGING PLAN SHEET 2		
36	CBR27C10-BRG-SUP-009	SPANS 1 & 5 C.I.P. FRAMING PLAN		25	CBRR0687-BRG-DTL-006	DETAILS			21	CBN 10003-B10-010-002	STAGINGT EAR STILL TZ		
37	CBR27C10-BRG-SUP-010	SPANS 1 & 5 C.I.P. SECTION DETAILS		26	CBRR0687-BRG-DTL-011	DETAILS					BRIDGE 27C11 - LOUISIANA AVE S TRAIL		
38	CBR27C10-BRG-SUP-017	CANTILEVER SEGMENT DETAILS		27	CBRR0687-BRG-SUR-001	BRIDGE SURVEY			1	CBR27C11-BRG-GPE-001	GENERAL PLAN & ELEVATION		
39	CBR27C10-BRG-SUP-022	CLOSURE SEGMENT DETAILS		28	CBRR0687-BRG-BOR-001	BRIDGE SURVEY PLAN			2	CBR27C11-BRG-TRN-001	TRANSVERSE SECTION & QUANTITIES		
40	CBR27C10-BRG-SUP-025	PIER TABLES 1 & 4 DETAILS		29	CBRR0687-BRG-BOR-002	BRIDGE SURVEY PROFILE			3	CBR27C11-BRG-LYT-001	BRIDGE LAYOUT		
41	CBR27C10-BRG-SUP-032	PIER TABLES 2 & 3 DETAILS		30	CBRR0687-BRG-BOR-003	BRIDGE SURVEY PROFILE			4	CBR27C11-BRG-ABT-001	WEST ABUTMENT DETAILS		
42	CBR27C10-BRG-SUP-039	END DIAPHRAGM DETAILS		31	CBRR0687-BRG-DTL-012	STAGING PLAN 1			5	CBR27C11-BRG-ABT-002	WEST ABUTMENT DETAILS		
43	CBR27C10-BRG-SUP-045	TYPE I DEVIATION RIB DETAILS		32	CBRR0687-BRG-DTL-013	STAGING PLAN 2			6	CBR27C11-BRG-ABT-003	WEST ABUTMENT DETAILS		
44	CBR27C10-BRG-SUP-048	TYPE II DEVIATION RIB DETAILS		33	CBRR0687-BRG-DTL-014	STAGING PLAN 3			7	CBR27C11-BRG-ABT-004	WEST ABUTMENT DETAILS		
45	CBR27C10-BRG-SUP-051	BOTTOM SLAB ANCHOR BLOCK DETAILS 1		34	CBRR0687-BRG-DTL-015	STAGING PLAN 4			8	CBR27C11-BRG-ABT-005	EAST ABUTMENT DETAILS		
46	CBR27C10-BRG-SUP-053	BULKHEAD DETAILS				BRIDGE R0688 - MINNEHAHA CREEK FREIGHT			9	CBR27C11-BRG-ABT-006	EAST ABUTMENT DETAILS		
47	CBR27C10-BRG-SUP-054	CANTILEVER POST-TENSIONING LAYOUT 1				DAIDGE ROOG - WINNERARA CREEK PREIGHT			10	CBR27C11-BRG-ABT-007	EAST ABUTMENT DETAILS		
48	CBR27C10-BRG-SUP-055	CANTILEVER POST-TENSIONING LAYOUT 2		1	CBRR0688-BRG-GPE-001	GENERAL PLAN & ELEVATION			11	CBR27C11-BRG-ABT-008	EAST ABUTMENT DETAILS		
49	CBR27C10-BRG-SUP-056	CANTILEVER POST-TENSIONING LAYOUT 3		2	CBRR0688-BRG-SUP-001	TRANSVERSE SECTION & QUANTITIES			12	CBR27C11-BRG-PIR-001	PIER DETAILS		
50	CBR27C10-BRG-SUP-057	CANTILEVER POST-TENSIONING LAYOUT 4		3	CBRR0688-BRG-SUP-003	BRIDGE LAYOUT			13	CBR27C11-BRG-PIR-002	PIER DETAILS		
51	CBR27C10-BRG-SUP-058	CANTILEVER POST-TENSIONING DETAILS		4	CBRR0688-BRG-ABT-002	WEST ABUTMENT DETAILS			14	CBR27C11-BRG-SUP-001	FRAMING PLAN		-
52	CBR27C10-BRG-SUP-059	CONTINUITY WEB P.T. LAYOUT 1		5	CBRR0688-BRG-ABT-001	WEST ABUTMENT DETAILS			15	CBR27C11-BRG-PCB-001	36M PRESTRESSED CONCRETE BEAM DETAILS		
53	CBR27C10-BRG-SUP-060	CONTINUITY WEB P.T. LAYOUT 2		6	CBRR0688-BRG-ABT-003	WEST ABUTMENT DETAILS			16	CBR27C11-BRG-SUP-002	SUPERSTRUCTURE DETAILS		
54	CBR27C10-BRG-SUP-061	CONTINUITY WEB P.T. LAYOUT 3		7	CBRR0688-BRG-ABT-009	EAST ABUTMENT DETAILS			17	CBR27C11-BRG-SUP-003	SUPERSTRUCTURE DETAILS		-
55	CBR27C10-BRG-SUP-062	CONTINUITY WEB P.T. LAYOUT 4		8	CBRR0688-BRG-ABT-008	EAST ABUTMENT DETAILS			18	CBR27C11-BRG-SUP-004	SUPERSTRUCTURE DETAILS		-+
56	CBR27C10-BRG-SUP-063	CONTINUITY WEB P.T. LAYOUT 5		9	CBRR0688-BRG-ABT-016	EAST ABUTMENT DETAILS			19 20	CBR27C11-BRG-SUP-005	SUPERSTRUCTURE DETAILS  CONCRETE DARABET (TYPE D.1)		
57 58	CBR27C10-BRG-SUP-064 CBR27C10-BRG-SUP-065	CONTINUITY POST-TENSIONING LAYOUT 1  CONTINUITY POST-TENSIONING LAYOUT 2		10	CBRR0688-BRG-SUP-004 CBRR0688-BRG-STL-001	FRAMING PLAN GIRDER ELEVATION			21	CBR27C11-BRG-DTL-001 CBR27C11-BRG-DTL-002	CONCRETE PARAPET (TYPE P-1) WIRE FENCE DETAILS		-+
58 59	CBR27C10-BRG-SUP-065 CBR27C10-BRG-SUP-066	CONTINUITY POST-TENSIONING LAYOUT 2  CONTINUITY POST-TENSIONING LAYOUT 3		11	CBRR0688-BRG-STL-001 CBRR0688-BRG-STL-003	GIRDER ELEVATION  GIRDER DETAILS			21	CBR27C11-BRG-DTL-002 CBR27C11-BRG-DTL-003	WATERPROOF EXPANSION DEVICE		-
60	CBR27C10-BRG-SUP-066 CBR27C10-BRG-SUP-067	CONTINUITY POST-TENSIONING LAYOUT 4		13	CBRR0688-BRG-STL-004	GIRDER DETAILS			23	CBR27C11-BRG-DTL-003	APPROACH PANEL		-
61	CBR27C10-BRG-SUP-068	CONTINUITY POST-TENSIONING LAYOUT 5		14	CBRR0688-BRG-SUP-005	SUPERSTRUCTURE DETAILS & REINF.			24	CBR27C11-BRG-DTL-004	DETAILS		
62	CBR27C10-BRG-SUP-069	PIER TABLE POST-TENSIONING DETAILS 1		15	CBRR0688-BRG-STL-002	SUPERSTRUCTURE DETAILS & REINF.			25	CBR27C11-BRG-DTL-006	DETAILS		-
63	CBR27C10-BRG-SUP-072	END DIAPHRAGM P.T. DETAILS 1		16	CBRR0688-BRG-SUP-007	SUPERSTRUCTURE DETAILS & REINF.			26	CBR27C11-BRG-DTL-000	DETAILS		
64	CBR27C10-BRG-SUP-075	FUTURE POST-TENSIONING LAYOUT 1		17	CBRR0688-BRG-SUP-008	SUPERSTRUCTURE DETAILS & REINF.			27	CBR27C11-BRG-DTL-008	DETAILS		
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											<b>CIVIL EAST - VOLUME 4A</b>	. [-	
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NO. DATE BY CHECK DESIGN REVISION / SUBMITTAL

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CIVIL EAST - VOLUME 4A
BRIDGES
VOLUME INDEX OF PLAN SHEETS
SHEET 1

2 OF 373

60% SUBMISSION - 09/28/15

GENERAL SHEET NAME: E0-BRG-IDX - 001

		CIVIL EAST				CIVIL EAST				CIVIL EAST
SHT#	SHEET NAME	SHEET DESCRIPTION	STATION STATION REV SI	HT#	SHEET NAME	SHEET DESCRIPTION	STATION STATION REV	SHT#	SHEET NAME	SHEET DESCRIPTION STATION STATION R
		VOLUME 4A - BRIDGES (cont'd)				DETAILS		33	CBRR0691-BRG-SUR-001	BRIDGE SURVEY
28	CBR27C11-BRG-DTL-009	DETAILS		25	CBR27C13-BRG-DTL-003	DETAILS		34	CBRR0691-BRG-BOR-001	BRIDGE SURVEY PLAN
29	CBR27C11-BRG-SUR-001	BRIDGE SURVEY		26	CBR27C13-BRG-DTL-004	DETAILS		35	CBRR0691-BRG-BOR-002	BRIDGE SURVEY PROFILE
30	CBR27C11-BRG-SUR-002	BRIDGE SURVEY		27	CBR27C13-BRG-DTL-005	DETAILS				BRIDGE 27C14 - SOUTHERLY CONNECTOR OVER
31	CBR27C11-BRG-BOR-001	BRIDGE SURVEY PLAN		28	CBR27C13-BRG-DTL-006	DETAILS				OXFORD ST
32	CBR27C11-BRG-BOR-002	BRIDGE SURVEY PROFILE			CBR27C13-BRG-SUR-001	BRIDGE SURVEY		1	CBR27C14-BRG-GPE-001	GENERAL PLAN & ELEVATION
33	CBR27C11-BRG-BOR-003	BRIDGE SURVEY PROFILE				BRIDGE SURVEY		2	CBR27C14-BRG-TRN-001	TRANSVERSE SECTION & QUANTITIES
34	CBR27C11-BRG-STG-001	STAGING PLAN SHEET				BRIDGE SURVEY PLAN		3	CBR27C14-BRG-SUP-001	BRIDGE LAYOUT
35	CBR27C11-BRG-STG-002	STAGING PLAN SHEET				BRIDGE SURVEY PROFILE		4	CBR27C14-BRG-ABT-001	WEST ABUTMENT DETAILS 1
36 37	CBR27C11-BRG-STG-003	STAGING PLAN SHEET				BRIDGE SURVEY PROFILE		5 6	CBR27C14-BRG-ABT-002	WEST ABUTMENT DETAILS 2
31	CBR27C11-BRG-STG-004	STAGING PLAN SHEET				STAGING PLAN 1 STAGING PLAN 2		7	CBR27C14-BRG-ABT-003 CBR27C14-BRG-ABT-004	WEST ABUTMENT DETAILS 3 WEST ABUTMENT DETAILS 4
		BRIDGE 27C12 - LOUISIANA AVE S FREIGHT		33		BRIDGE R0690 - LOUISIANA STATION PEDESTRIAN		8	CBR27C14-BRG-ABT-005	EAST ABUTMENT DETAILS 1
1	CBR27C12-BRG-GPE-001	GENERAL PLAN & ELEVATION				UNDERPASS		9	CBR27C14-BRG-ABT-006	EAST ABUTMENT DETAILS 1
2	CBR27C12-BRG-SUP-001	TRANSVERSE SECTION & QUANTITIES		1	CBRR0690-BRG-GPE-001	GENERAL PLAN & ELEVATION		10	CBR27C14-BRG-ABT-007	EAST ABUTMENT DETAILS 3
3	CBR27C12-BRG-SUP-003	BRIDGE LAYOUT			CBRR0690-BRG-SUP-001	TRANSVERSE SECTION & QUANTITIES		11	CBR27C14-BRG-ABT-008	EAST ABUTMENT DETAILS 4
4	CBR27C12-BRG-ABT-002	WEST ABUTMENT DETAILS			CBRR0690-BRG-SUP-002	UNDERPASS LAYOUT		12	CBR27C14-BRG-ABT-009	WINGWALL DETAILS 1
5	CBR27C12-BRG-ABT-001	WEST ABUTMENT DETAILS			CBRR0690-BRG-SUP-003	FOOTING LAYOUT		13	CBR27C14-BRG-ABT-010	WINGWALL DETAILS 2
6	CBR27C12-BRG-ABT-003	WEST ABUTMENT DETAILS			CBRR0690-BRG-SUP-004	UNDERPASS STRUCTURE DETAILS & REINF. 1		14	CBR27C14-BRG-SUP-002	FRAMING PLAN
7	CBR27C12-BRG-ABT-004	EAST ABUTMENT DETAILS		6	CBRR0690-BRG-SUP-005	UNDERPASS STRUCTURE DETAILS & REINF. 2		15	CBR27C14-BRG-STL-001	GIRDER ELEVATION
8	CBR27C12-BRG-ABT-005	EAST ABUTMENT DETAILS		7	CBRR0690-BRG-SUP-006	UNDERPASS STRUCTURE DETAILS & REINF. 3		16	CBR27C14-BRG-STL-002	GIRDER DETAILS 1
9	CBR27C12-BRG-ATB-006	EAST ABUTMENT DETAILS		8	CBRR0690-BRG-SUP-007	UNDERPASS STRUCTURE DETAILS & REINF. 4		17	CBR27C14-BRG-STL-003	GIRDER DETAILS 2
10	CBR27C12-BRG-PIR-002	PIER DETAILS		9	CBRR0690-BRG-DTL-002	WIRE FENCE DETAILS		18	CBR27C14-BRG-SUP-003	SUPERSTRUCTURE DETAILS 1
11	CBR27C12-BRG-PIR-001	PIER DETAILS		10	CBRR0690-BRG-DTL-001	DETAILS 1		19	CBR27C14-BRG-SUP-004	SUPERSTRUCTURE DETAILS 2
12	CBR27C12-BRG-SUP-004	FRAMING PLAN		11	CBRR0690-BRG-DTL-003	DETAILS 2		20	CBR27C14-BRG-SUP-005	SUPERSTRUCTURE DETAILS 3
13	CBR27C12-BRG-STL-001	GIRDER ELEVATION				BRIDGE SURVEY		21	CBR27C14-BRG-SUP-006	SUPERSTRUCTURE DETAILS 4
14	CBR27C12-BRG-STL-003	GIRDER DETAILS				BRIDGE SURVEY PLAN		22	CBR27C14-BRG-RAL-001	WIRE FENCE DETAILS
15	CBR27C12-BRG-STL-004	GIRDER DETAILS				BRIDGE SURVEY PROFILE		23	CBR27C14-BRG-EXP-001	JOINT DETAILS 1
16	CBR27C12-BRG-SUP-005	SUPERSTRUCTURE DETAILS & REINF.				STAGING PLAN 1		24	CBR27C14-BRG-EXP-002	JOINT DETAILS 2
17	CBR27C12-BRG-SUP-007	SUPERSTRUCTURE DETAILS & REINF.				STAGING PLAN 2		25	CBR27C14-BRG-EXP-003	BEARING ASSEMBLY DETAILS
18	CBR27C12-BRG-SUP-006	SUPERSTRUCTURE DETAILS & REINF.		17	CBRR0690-BRG-STG-003	STAGING PLAN 3		26	CBR27C14-BRG-DTL-001	DETAILS 1
19 20	CBR27C12-BRG-SUP-008 CBR27C12-BRG-SUP-010	SUPERSTRUCTURE DETAILS & REINF. SUPERSTRUCTURE DETAILS & REINF.				LOUISIANA STATION LOAD TRANSFER PLATFORM		27 28	CBR27C14-BRG-DTL-002 CBR27C14-BRG-SUR-001	DETAILS 2 BRIDGE SURVEY
21	CBR27C12-BRG-STL-003	WIRE FENCE DETAILS & REINF.		VEO	CTIL ADDD FILL DILE CTAY OF			29	CBR27C14-BRG-SOR-001	BRIDGE SURVEY PLAN
22	CBR27C12-BRG-SUP-009	JOINT DETAILS		1 / ^=2-	STU-APPR-FILL-PILE-STAK-00 1	LOAD TRANSFER PLATORM DETAILS 1		30	CBR27C14-BRG-BOR-002	BRIDGE SURVEY PROFILE
23	CBR27C12-BRG-DTL-004	JOINT DETAILS		XF2	STU-APPR-FILL-PILE-STAK-00			00	OBINETOTA BING BOTT GOZ	DAIDOL GORVETT ROTTLE
24	CBR27C12-BRG-EXP-001	BEARING ASSEMBLY DETAILS		2 \	2	LOAD TRANSFER PLATORM DETAILS 2				
25	CBR27C12-BRG-DTL-002	DETAILS		a XE2-	STU-APPR-FILL-PILE-STAK-00			i		
26	CBR27C12-BRG-DTL-005	DETAILS		3	3	LOAD TRANSFER PLATORM DETAILS 3				
27	CBR27C12-BRG-SUR-001	BRIDGE SURVEY				PRINCE PASSA COUTUERLY CONNECTOR OVER LIFE		i		
28	CBR27C12-BRG-SUR-002	BRIDGE SURVEY				BRIDGE R0691 - SOUTHERLY CONNECTOR OVER LRT				
29	CBR27C12-BRG-BOR-001	BRIDGE SURVEY PLAN		1	CBRR0691-BRG-GPE-001	GENERAL PLAN & ELEVATION				
30	CBR27C12-BRG-BOR-002	BRIDGE SURVEY PROFILE		2	CBRR0691-BRG-TRN-001	TRANSVERSE SECTION & QUANTITIES		1		
31	CBR27C12-BRG-BOR-003	BRIDGE SURVEY PROFILE			CBRR0691-BRG-SUP-001	BRIDGE LAYOUT		l		
32	CBR27C12-BRG-STG-001	STAGING PLAN 1				WEST ABUTMENT DETAILS 1		l		
33	CBR27C12-BRG-STG-002	STAGING PLAN 2			CBRR0691-BRG-ABT-002	WEST ABUTMENT DETAILS 2		l		
34	CBR27C12-BRG-STG-003	STAGING PLAN 4			CBRR0691-BRG-ABT-003	WEST ABUTMENT DETAILS 3		l		
35	CBR27C12-BRG-STG-004	STAGING PLAN 4				WEST ABUTMENT DETAILS 4		ł		
		BRIDGE 27C13 - LOUISIANA AVE S LRT		-		EAST ABUTMENT DETAILS 1 EAST ABUTMENT DETAILS 2		ł		
1	CBR27C13-BRG-GPE-001	GENERAL PLAN & ELEVATION		<u> </u>		EAST ABUTMENT DETAILS 2		ł		
2	CBR27C13-BRG-GPE-001	TRANSVERSE SECTION & QUANTITIES				EAST ABUTMENT DETAILS 3		ł		
3	CBR27C13-BRG-1RN-001	BRIDGE LAYOUT				WINGWALL DETAILS 1		i		
4	CBR27C13-BRG-ABT-001	WEST ABUTMENT DETAILS				WINGWALL DETAILS 2		İ		
5	CBR27C13-BRG-ABT-002	WEST ABUTMENT DETAILS				PIER DETAILS 1		1		
6	CBR27C13-BRG-ABT-003	WEST ABUTMENT DETAILS				PIER DETAILS 2		İ		
7	CBR27C13-BRG-ABT-005	EAST ABUTMENT DETAILS		16		PIER DETAILS 3		Ī		
8	CBR27C13-BRG-ABT-006	EAST ABUTMENT DETAILS		17	CBRR0691-BRG-SUP-002	FRAMING PLAN		]		
9	CBR27C13-BRG-ABT-008	EAST ABUTMENT DETAILS		18	CBRR0691-BRG-STL-001	GIRDER ELEVATION				
10	CBR27C13-BRG-ABT-009	WINGWALL DETAILS				GIRDER DETAILS 1				
11	CBR27C13-BRG-ABT-010	WINGWALL DETAILS				GIRDER DETAILS 2		1		
12	CBR27C13-BRG-PIR-001	PIER DETAILS				GIRDER DETAILS 3				
13	CBR27C13-BRG-PIR-002	PIER DETAILS				SUPERSTRUCTURE DETAILS 1		l		
14	CBR27C13-BRG-PIR-003	PIER DETAILS				SUPERSTRUCTURE DETAILS 2		l		
15	CBR27C13-BRG-SUP-002	FRAMING PLAN		24	CBRR0691-BRG-SUP-005	SUPERSTRUCTURE DETAILS 3		l		

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

CBR27C13-BRG-DTL-001 CONCRETE SLOPE PAVING UNDER BRIDGES

MN45 PRESTRESSED CONCRETE BEAM

WATERPROOF E PANSION JOINT DEVICE

SUPERSTRUCTURE DETAILS

SUPERSTRUCTURE DETAILS
SUPERSTRUCTURE DETAILS

WIRE FENCE DETAILS

CONCRETE PARAPET (TYPE P-1)

17 CBR27C13-BRG-SUP-003

18 CBR27C13-BRG-SUP-004

19

22

23

CBR27C13-BRG-PCB-001

CBR27C13-BRG-SUP-005

CBR27C13-BRG-RAL-001

CBR27C13-BRG-RAL-002

CBR27C13-BRG-E P-001

**AECOM** 

SUPERSTRUCTURE DETAILS 4

SUPERSTRUCTURE DETAILS 5

BEARING ASSEMBLY DETAILS

WIRE FENCE DETAILS

JOINT DETAILS 1

JOINT DETAILS 2

DETAILS 1

DETAILS 2

25

27

29

31

32

28

CBRR0691-BRG-SUP-006

CBRR0691-BRG-RAL-001

CBRR0691-BRG-EXP-001

CBRR0691-BRG-EXP-002

CBRR0691-BRG-EXP-003

CBRR0691-BRG-DTL-001

CBRR0691-BRG-DTL-002





## **CIVIL EAST - VOLUME 4A BRIDGES VOLUME INDEX OF PLAN SHEETS**

SHEET 2

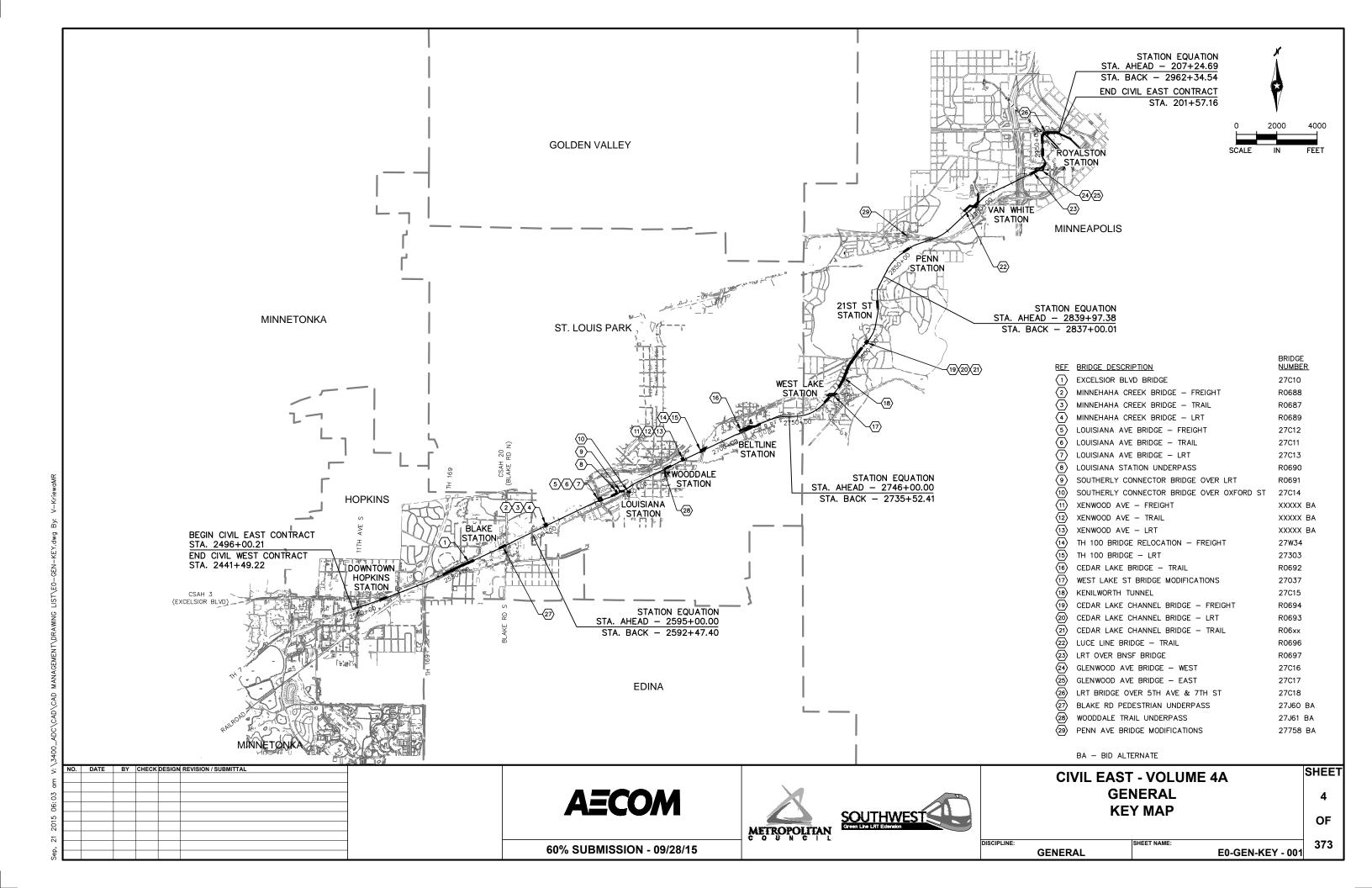
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#### TRACK LINETYPES TRACK SYMBOLS — — — — ROADWAY Q PROPOSED DIRECTIONAL LANE USE \* - TRACK € (LRT) — TRACK € (FRT) EXISTING DIRECTIONAL LANE USE **₩** RETAINING WALL BALLAST CURB PEDESTRIAN FLASHER ---- TUNNEL WALL AUTOMATIC GATE RAIL TURNOUT RAIL CROSSOVER (DOUBLE) FENCE / RAILING RAIL CROSSOVER (SINGLE) —— ID ——— ID ——— INTRUSION DETECTION φ POINT OF SWITCH (PS) CIVIL LINETYPES OCS POLE FOUNDATION - ---- - ROADWAY C RAIL LUBRICATOR TRACK (LRT) — TRACK ℚ (FRT) POINT OF INTERSECTION (PI) OF TURNOUT (TO) - RETAINING WALL (W2-200)RAILROAD CURVE NUMBER ---- BALLAST CURB ---- TUNNEL WALL ALL TURNOUTS AND CROSSOVERS TO BE EQUIPPED WITH POWER CONCRETE CURB AND GUTTER SWITCH MACHINES AND SWITCH HEATERS - SIDEWALK - DRIVEWAY CIVIL SYMBOLS - BRIDGE ----- SAWCUT ACCESSIBLE PEDESTRIAN CURB RAMP \_× \_\_\_\_× \_\_\_\_ FENCE (DESIGN VARIES) PROPOSED DIRECTIONAL LANE USE - · - · · - · - · - WATER EDGE — – – — EX ROW <del>2₽</del> EXISTING DIRECTIONAL LANE USE — - - - - - PROP ROW ---- PROP TCE AUTOMATIC GATE HANDICAP PARKING STALL STOP BAR TACTILE WARNING STRIP $\Box$ MEDIAN NOSE TPSS BUILDING (TPSS-SW###)

## SURVEY NOTES

- 1. THE HORIZONTAL DATUM OF THIS MAP IS BASED ON THE HENNEPIN COUNTY COORDINATE SYSTEM WHICH IS RELATED TO THE MINNESOTA STATE PLANE COORDINATE SYSTEM NAD 83 (2007) ADJUSTMENT SOUTH ZONE.
- 2. THE PLANIMETRIC FEATURES SHOWN ON THIS MAP ARE AS PREPARED BY AERO-METRIC, INC. FROM AERIAL DATA AND IMAGERY COLLECTED IN APRIL 2012, AS SUPPLEMENTED BY FIELD SURVEYS COMPLETED BY
- 3. HORIZONTAL POSITIONAL ACCURACY: USING THE NATIONAL STANDARD FOR SPATIAL DATA ACCURACY, THE DATA SET TESTED 0.14 FEET HORIZONTAL ACCURACY AT A 95% CONFIDENCE LEVEL.
- 4. VERTICAL POSITIONAL ACCURACY: USING THE NATIONAL STANDARD FOR SPATIAL DATA ACCURACY, THE DATA SET TESTED 0.10 FEET VERTICAL ACCURACY AT 95% CONFIDENCE LEVEL.

**AECOM** 

60% SUBMISSION - 09/28/15

SIGNAL OR INTERMEDIATE OR PLATFORM OR XING OR TUNNEL HOUSE OR ANY COMBINATION OF THESE





**CIVIL EAST - VOLUME 4A GENERAL LEGEND AND ABBREVIATIONS** 

**GENERAL** 

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## **ABBREVIATIONS**

ALGEBRAIC DIFFERENCE AVE AVENUE BGN BP BEGIN BEGINNING POINT BVCE BEGINNING VERTICAL CURVE ELEVATION BEGINNING VERTICAL CURVE STATION RI VD **ROULEVARD** BURLINGTON NORTHERN SANTA FE RAILWAY BNSF CURB AND GUTTER C&G CENTERI INF € CIR CIRCLE CANADIAN PACIFIC CPRAIL CANADIAN PACIFIC RAILWAY CURVE TO SPIRAL
COUNTY STATE AID HIGHWAY CS CSAH D&U DF DRAINAGE AND UTILITY DIRECT FIXATION DR DRIVE DTL DETAIL DRIVEWAY ACTUAL SUPERELEVATION (INCHES) Εa ĒΒ EAST BOUND  $\mathsf{EL} \ \mathsf{or} \ \mathsf{ELEV}$ **ELEVATION** FP FND POINT ESMT FASEMENT UNBALANCED SUPERELEVATION (INCHES) **EVCE** ENDING VERTICAL CURVE ELEVATION ENDING VERTICAL CURVE STATION **EVCS** EX **HCRRA** HENNEPIN COUNTY REGIONAL RAILROAD AUTHORITY LEFT HAND ΙN LANF LRT LIGHT RAIL TRANSIT CURVE LENGTH (FEET) SPIRAL LENGTH (FEET) Lc L<sub>S</sub> MIN MINIMUM MILES PER HOUR MPI S CITY OF MINNEAPOLIS MINNEAPOLIS PARK AND RECREATION BOARD **MPRB** NORTH NORTH BOUND NIC NO NOT IN CONTRACT NUMBER OMF OPERATIONS AND MAINTENANCE FACILITY ocs OVERHEAD CONTACT SYSTEM OH PC OVERHEAD POINT OF CURVE PERMANENT EASEMENT PITO POINT OF INTERSECTION OF TURNOUT PKWY PARKWAY POT POINT ON TANGENT POINT OF SWITCH POINT OF TANGENT PS PT

POINT OF VERTICAL INTERSECTION

RATE OF CHANGE VERTICAL CURVE

TEMPORARY CONSTRUCTION EASEMENT

TRACTION POWER SUBSTATION

RADIUS (FEET)

RIGHT HAND

RIGHT OF WAY SOUTH SOUTH BOUND SPIRAL TO CURVE SIGNAL COMMUNICATION

RAIL LUBRICATOR

SPIRAL TO TANGENT

TANGENT TO SPIRAL

VERTICAL CURVE

WEST BOUND

DATE BY CHECK DESIGN REVISION / SUBMITTA

DESIGN VELOCITY (MPH)

TRUNK HIGHWAY

ROAD

STREET

NOITATE

THROUGH TOP OF RAIL

**TYPICAL** UNDERGROUND

R RD

RL

r RH

ROW

STA TCE

THRU

TOR

TS TYP

UG

VC

WB

SIG-COMM

## TRAIL INDEX

ABBREVIATED NAME TRAIL 1 FULL NAME / LOCATION UNDER RED CIRCLE DR, LRT, AND YELLOW CIRCLE DR TRAIL 2 FROM TRAIL 1 TO GREEN CIRCLE DR OPUS STATION ACCESS FROM BREN RD E FROM BREN RD W TO TRAIL 5 TRAIL 3 TRAIL 4 TRAIL 5 FROM OPUS STATION TO GREEN CIRCLE DR TRAIL 6 FROM TRAIL 5 TO SMETANA RD CEDAR LAKE TRAIL CEDAR LAKE LRT REGIONAL TRAIL/FROM SHADY OAK STATION TO 11TH AVE CEDAR LAKE TRAIL CEDAR LAKE LRT REGIONAL TRAIL/WEST OF EXCELSIOR CEDAR LAKE TRAIL CEDAR LAKE LRT REGIONAL LRT TRAIL/BETWEEN EXCELSIOR AND KENILWORTH TRAIL CONNECTION MIDTOWN GREENWAY MIDTOWN GREENWAY/EAST OF KENILWORTH TRAIL CONNECTION TRAIL A KENILWORTH TRAIL (SECONDARY)/BETWEEN CEDAR-ISLES CHANNEL AND 21ST STREET STATION TRAIL B KENILWORTH TRAIL (SECONDARY)/BETWEEN 21ST STREET STATION AND PENN STATION TRAIL B CEDAR LAKE TRAIL (SECONDARY)/EAST OF PENN STATION TRAIL C 10' CONNECTOR TRAÎL FROM CEDAR LAKE LRT REGIONAL TRAIL TO TYLER AVE. 10' CONNECTOR TRAIL/BELTLINE STATION TO CEDAR LAKE LRT REGIONAL TRAIL TRAIL D KENILWORTH TRAIL KENILWORTH TRAIL (MAIN)/W LAKE ST TO PENN STATION CEDAR LAKE TRAIL CEDAR LAKE TRAIL (MAIN)/PENN STATION TO TH 394 KENILWORTH TRAIL (SECONDARY)/EAST OF W LAKE ST TRAIL E TRAIL F KENILWORTH TRAIL (SECONDARY)/WEST OF CEDAR LAKE PKWY KENILWORTH TRAIL (SECONDARY)/WEST OF PENN STATION TRAIL G CEDAR LAKE TRAIL (SECONDARY)/EAST OF PENN STATION

10' CONNECTOR TRAIL/EAST OF PENN STATION TO KENWOOD PKWY TRAIL G TRAIL H TRAIL CEDAR LAKE TRAIL (MAIN)/AT-GRADE CROSSING AT PENN STATION CEDAR LAKE TRAIL CEDAR LAKE TRAIL (SECONDARY)/NORTHWEST OF PENN STATION CEDAR LAKE TRAIL (SECONDARY)/NORTHWEST OF PENN STATION TRAIL J TRAIL K TRAIL L CEDAR LAKE TRAIL (SECONDARY)/EAST OF PENN STATION TRAIL N 8' CONNECTOR TRAIL FROM CEDAR LAKE TRAIL TO EDGEBROOOK DRIVE TRAIL O 8' CONNECTOR TRAIL FROM CEDAR LAKE TRAIL TO W LAKE STREET 8' CONNECTOR TRAIL FROM CEDAR LAKE TRAIL TO LOUISIANA AVE TRAIL P 10' CONNECTOR TRAIL FROM CEDAR LAKE TRAIL TO TH 7 SERVICE ROAD TRAIL Q TRAIL R 20' CONNECTOR TRAIL FROM VAN WHITE STATION TO CEDAR LAKE TRAIL TRAIL S TRAIL T 8' CONNECTOR TRAIL FROM VAN WHITE STATION TO VAN WHITE MEMORIAL BLVD TRAIL U 10' TRAIL PARALLEL TO CEDAR LAKE PKWY LUCE LINE TRAIL LUCE LINE REGIONAL TRAIL/ON BRIDGE OVER LIGHT RAIL CONNECTOR TRAIL TO LUCE LINE REGIONAL TRAIL WEST OF LIGHT RAIL CONNECTOR TRAIL TO LUCE LINE REGIONAL TRAIL WEST OF LIGHT RAIL TRAIL W

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## **CIVIL EAST - VOLUME 4A GENERAL** LEGEND AND ABBREVIATIONS

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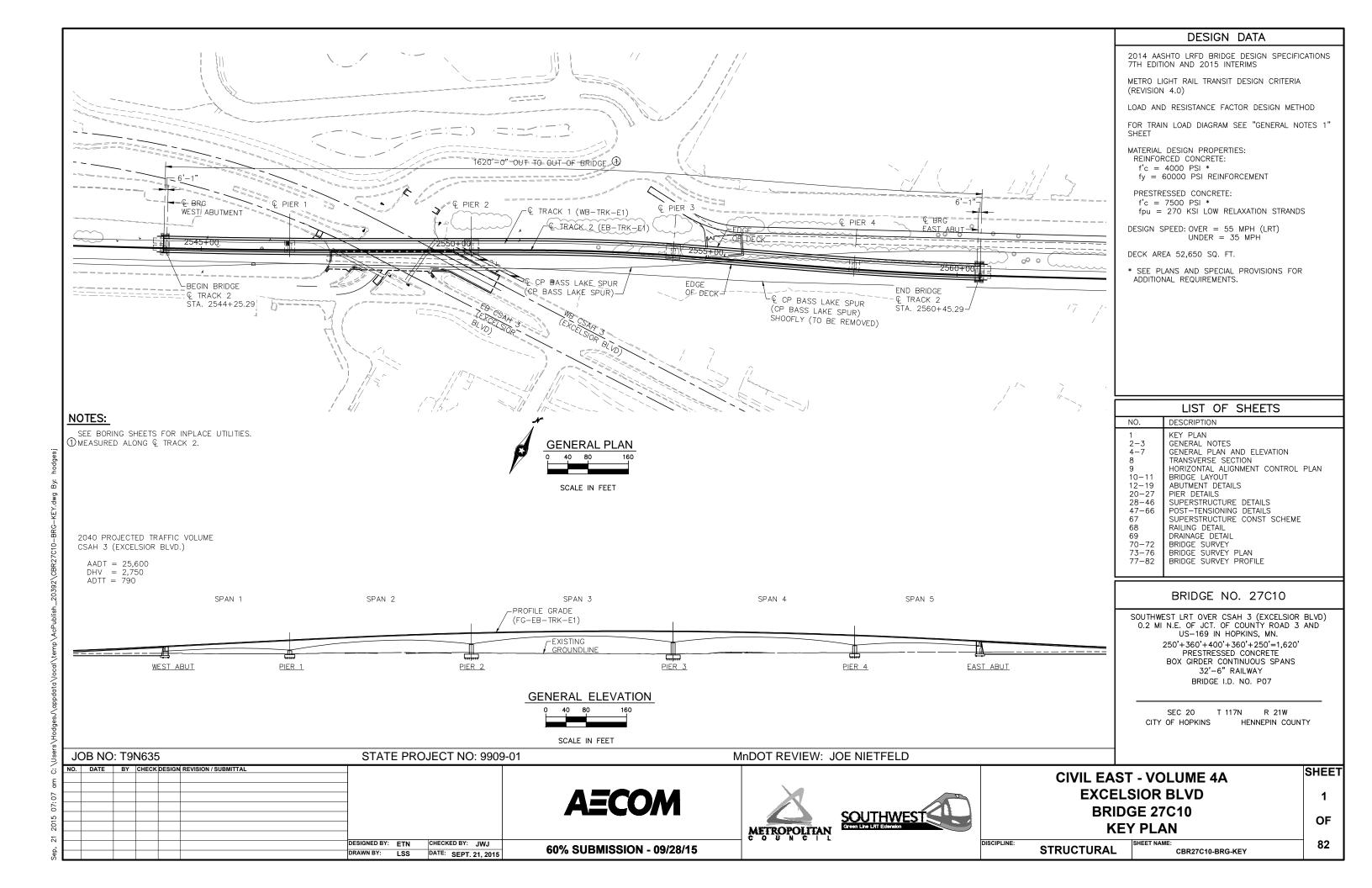
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SHEET 2

**GENERAL** E0-GEN-NTS - 002



#### CONSTRUCTION SPECIFICATIONS

1. METROPOLITAN COUNCIL SOUTHWEST LIGHT RAIL TRANSIT (SWLRT) CIVIL EAST CONSTRUCTION, BRIDGE SPECIAL PROVISIONS.

#### DESIGN SPECIFICATIONS

- 1. SWLRT DESIGN CRITERIA, REVISION 4.0, MARCH 2015, SECTION 18.
- 2. MINNESOTA DEPARTMENT OF TRANSPORTATION (MnDOT) LRFD BRIDGE DESIGN MANUAL, CURRENT REVISIONS AS OF DECEMBER 2014.
- 3. AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO) LRFD BRIDGE DESIGN SPECIFICATIONS, SEVENTH EDITION, 2014 AND SUBSEQUENT INTERIM SPECIFIC ATIONS THROUGH 2015
- 4. AASHTO GUIDE DESIGN SPECIFICATIONS FOR BRIDGE TEMPORARY WORKS, FIRST EDITION, 1995 AND SUBSEQUENT 2008 INTERIM REVISIONS.
- 5. COMITE EURO-INTERNATIONAL DE BETON FEDERATION INTERNATIONALE DE LA PRECONSTRAINTE (CEB-FIP) MODEL CODE FOR CONCRETE STRUCTURES, 1990, CHAPTER 2 MATERIAL PROPERTIES (FOR CONCRETE CREEP AND SHRINKAGE EFFECTS ONLY).
- MnDOT TECHNICAL MEMORANDA
- 7. MnDOT BRIDGE DETAILS MANUAL, PARTS I AND II

#### DATUM STATEMENT

ALL ELEVATIONS ARE BASED ON NORTH AMERICAN VERTICAL DATUM 1988 (NAVD 1988)

#### <u>CLEARANCES</u>

- 1. MINIMUM VERTICAL
- A. EXCELSIOR BOULEVARD 16'-4" TYPICAL; 14'-6" TEMPORARY CLEARANCE DURING CONSTRUCTION WITH FORM TRAVELER
- B. CP RAILWAY (FROM TOP OF RAIL)
- 2. MINIMUM HORIZONTAL (WITHOUT CRASH WALL OR PIER DESIGNED FOR COLLISION FORCE): A. EXCELSIOR BOULEVARD (FROM EDGE OF TRAVEL LANE) 30'-0"
- B. CP RAILWAY (FROM CENTERLINE TRACK)

#### DESIGN LOADING

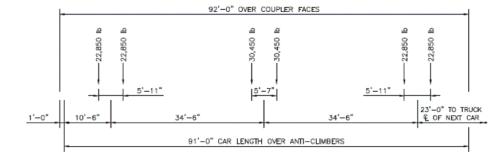
- 1. PERMANENT LOADS (DC, DW, EH, EV, ES)
- A. UNIT WEIGHT OF SUPERSTRUCTURE CIP CONCRETE:
- B. UNIT WEIGHT OF SUBSTRUCTURE CONCRETE: C. UNIT WEIGHT OF STRUCTURAL STEEL:
- 490 PCF D. RAILS & FASTENINGS PER TRACK (2 RAILS): 200 PLF (INCLUDES GUARD RAIL)
- E. BARRIER RAILING (EACH):
- 40 PLF (INCLUDES RAILING & 11/2" TALL CURB)

155 PCF

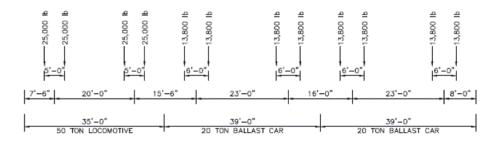
- F. EMERGENCY WALKWAY & DUCT BANK:
- 675 PLF LEFT; 595 PLF RIGHT G. TRACKWORK PLINTHS PER TRACK (2 RAILS): 400 PLE
- H. UTILITY ALLOWANCE

NO. DATE BY CHECK DESIGN REVISION / SUBMITTAL

- OVERHEAD CONTACT SYSTEM (OCS):
- VERTICAL AXIS LONGITUDINAL AXIS TRANSVERSE AXIS 5.0 LOAD (KIPS)  $\pm 1.0$ +5.0 MOMENT ABOUT (KIP-FT) ±15.0 ±85.0  $\pm 10.0$ J. UNIT WEIGHT OF SOIL: 125 PCF
- 2. LIVE LOADS (LL, PL, IM)
- A. LIVE LOAD (LL) MAXIMUM FORCE EFFECT FROM LIGHT RAIL VEHICLE (LRV) OR MAINTENANCE
- 1. LIGHT RAIL VEHICLE (LRV) NUMBER OF VEHICLES CONSIDERED IN AN LRV TRAIN VARIES FROM ONE, TWO, OR THREE CARS.



2. MAINTENANCE TRAIN - THE MAINTENANCE TRAIN CONSISTS OF ONE LOCOMOTIVE AND ONE, TWO, THREE, OR FOUR BALLAST CARS.



- B. PEDESTRIAN LIVE LOAD (PL) 90 PSF APPLIED TO SERVICE & EMERGENCY WALKWAYS. NO PEDESTRIAN LIVE LOAD CONSIDERATION WITH LRV OR MAINTENANCE TRAINS ON GUIDEWAY.
- C. DYNAMIC LIVE LOAD ALLOWANCE (IM) NOT APPLICABLE TO THE MAINTENANCE TRAIN OR IN THE DESIGN OF ABUTMENTS, BEARINGS, AND FOUNDATION ELEMENTS BELOW GROUND.
- 1. VERTICAL: APPLY PER AASHTO 3.6.2.1; 33% OF LIVE LOAD (LL).
- 2. ROCKING EFFECT: 20% OF LIVE LOAD (LL) APPLIED AS VERTICAL FORCE COUPLE.
- 3. CENTRIFUGAL & HUNTING FORCE (CE) WHEN CENTRIFUGAL FORCE AND HUNTING FORCE ACT SIMULTANEOUSLY, ONLY THE LARGER OF THE TWO FORCES IS CONSIDERED.
- A. CENTRIFUGAL FORCE: % OF LL WITHOUT IMPACT, CF =  $0.00117 \times S^2 \times D$  WHERE S = DESIGN SPEED (MPH) AND D = DEGREE OF CURVE, APPLIED TRANSVERSELY 6 FEET ABOVE THE TOP OF RAIL.
- B. HUNTING FORCE: 25% OF THE STANDARD LRV CENTER TRUCK LOADING (CENTER TWO AXLES) WITHOUT IMPACT APPLIED TRANSVERSELY AT THE TOP OF RAIL. FORCE ONLY APPLIED IN DESIGN OF TRACK PLINTHS AND TRANSVERSE RESTRAINT FOR BEARINGS (NO HUNTING FORCE APPLIED TO SUBSTRUCTURE AND/OR FOUNDATIONS).
- 4. LONGITUDINAL FORCE (LF) LF = 0.046xWxA WHERE W = VEHICLE WEIGHT (LRV OR MAINTENANCE TRAIN) AND A = ACCELERATION OR DECELERATION RATE (MPH/SEC). VEHICLE ACCELERATION & DECELERATION RATES TAKEN AS 3 MPH/SEC AND 6.5 MPH/SEC RESPECTIVELY. VEHICLE WEIGHT (W) TO CALCULATE DECELERATION FORCES REDUCED TO AW3 VEHICLE (143.0 KIPS PER CAR). LF APPLIED OVER THE LENGTH OF THE TRAIN IN A HORIZONTAL PLANE AT THE TOP OF LOW RAIL.
- 5. WIND LOADS (WS. WL)
- A. WIND ON STRUCTURE (WS) CALCULATE AND APPLY PER AASHTO 3.8 INCLUDING VERTICAL WIND PRESSURE PER AASHTO 3.8.2.
- 1. REFERENCE WIND VELOCITY, V<sub>30</sub>: 100 MPH
- 2. OPEN COUNTRY CONDITION ASSUMED IN SELECTION OF Vo AND Zo VALUES IN AASHTO TABLE 3.8.1.1-1
- B. WIND ON LIVE LOAD (WL) 225 PLF APPLIED TRANSVERSELY 6 FEET ABOVE THE TOP OF RAIL OVER A MAXIMUM LENGTH OF TWO, THREE CAR TRAINS.
- 6. SNOW LOAD (SG) 355 PLF (13.5 PSF IN WIDTH OF EMERGENCY WALKWAY & DUCT BANK AND 11 PSF BETWEEN WALKWAYS); APPLY IN STRENGTH LOAD COMBINATIONS ONLY.
- 7. CREEP & SHRINKAGE (CR, SH) CALCULATE STRAINS PER CEB-FIP, CHAPTER 2. MEAN ANNUAL RELATIVE HUMIDITY FOR DESIGN: 73%.
- 8. FRICTION FORCES (FR) FRICTION COEFFICIENT FOR PTFE/STAINLESS STEEL SLIDING SURFACE OF DISC BEARINGS ASSUMED IN DESIGN TO BE 0.06. BEARING FRICTIONAL FORCES DETERMINED USING THE PERMANENT DEAD LOAD REACTION ONLY.
- 9. THERMAL FORCES (TU, TG) APPLY LOAD FACTORS FOR UNIFORM TEMPERATURE,  $\gamma_{TU}$ , AND TEMPERATURE GRADIENT,  $\gamma_{\text{TG}}$ , PER AASHTO 3.4.1.
- A. UNIFORM TEMPERATURE (TU):
- 1. MEAN TEMPERATURE
- 2. THERMAL COFFEIGIENT:
- 3 SEASONAL VARIATION:
- 0.000006 IN/IN PER °F TU<sub>MAXDESIGN</sub> 120 °F (TEMPERATURE RISE 75 °F)
- TU<sub>MINDESIGN</sub> -30 °F (TEMPERATURE FALL 75 °F) 1.2 (THERMAL) 4. MOVEMENT FACTOR FOR BEARINGS & JOINTS:
  - 1.25 (CREEP & SHRINKAGE)
- B. TEMPERATURE GRADIENT (TG):
- 1. LONGITUDINAL TEMPERATURE GRADIENT PER AASHTO 3.12.3, ZONE 2.
- 2. REVERSIBLE LINEAR TRANSVERSE TEMPERATURE GRADIENT OF 10 °F BETWEEN INSIDE AND OUTSIDE OF BOX GIRDER
- C. RAIL-STRUCTURE INTERACTION FORCES:
- 1. RSI FORCES BASED UPON TEMPERATURE RISE OF 30 °F & TEMPERATURE FALL OF 120 °F FOR THE RAILS AND SEASONAL VARIATION SHOWN ABOVE FOR THE CONCRETE
- 2. RAIL SEAT ASSEMBLIES SPACED AT 30 INCH CENTERS ALONG RAIL WITH ASSUMED LONGITUDINAL RESTRAINT OF 3.0 KIPS AND STIFFNESS PRIOR TO SLIP OF 20.0 KIPS/INCH

10.EXTREME EVENTS (EQ, CT, DR, OF)

- A. EARTHQUAKE EFFECTS (EQ) SEISMIC ZONE 1, NO SEISMIC ANALYSIS REQUIRED.
- 1. MINIMUM SUPPORT LENGTH PER AASHTO 4.7.4.4.
- 2. MINIMUM HORIZONTAL DESIGN CONNECTION FORCE IN THE RESTRAINED DIRECTION BETWEEN THE SUPERSTRUCTURE AND SUBSTRUCTURE NOT LESS THAN 0.15 TIMES THE TRIBUTARY PERMANENT DEAD LOAD
- B. VEHICULAR COLLISION FORCE (CT) BRIDGE PIERS LOCATED WITHIN THE MINIMUM CLEARANCE RESTRICTION FOR A ROADWAY OR RAILROAD DESIGNED FOR A COLLISION FORCE OF 600 KIPS. COLLISION FORCE APPLIED AT AN ANGLE UP TO 15 DEGREES FROM THE TANGENT TO THE ROADWAY OR RAILWAY AND 5 FEET ABOVE THE GROUND OR TOP OF RAIL
- C. DERAILMENT LOAD (DR) CONSISTS OF THE STANDARD LRV CENTER TRUCK LOADING (CENTER TWO AXLES) PLUS A DERAILMENT IMPACT FACTOR OF 100% TRANSVERSELY. POSITIONED UP TO 5 FEET FROM THE CENTERLINE OF THE TRACK. LOAD FROM THE REMAINING LRV AXLES APPLIED AT THE RAIL LOCATIONS USING THE NORMAL IMPACT FACTOR OF 33%.
- D. RAIL BREAK (OF) STRUCTURE DESIGNED FOR THE POSSIBILITY OF ONE RAIL BREAK AT A TIME WITH NOT MORE THAN A 4" GAP.

#### 11. LOAD COMBINATIONS

- A. LOAD COMBINATIONS AT THE APPROPRIATE LIMIT STATES PER MODIFICATIONS IN SWLRT DESIGN CRITERIA SECTION 18.3 IN LIEU OF AASHTO TABLE 3.4.1-1.
- 1. LOAD FACTORS FOR PERMANENT LOADS,  $\gamma_{P}$ , PER AASHTO TABLE 3.4.1-2.
- 2. LOAD FACTORS FOR PERMANENT LOADS DUE TO SUPERIMPOSED DEFORMATIONS, YP, PER AASHTO TABLE 3.4.1-3. COMBINATIONS WITH CREEP & SHRINKAGE FACTORS OF ZERO (BEFORE TIME EFFECTS) ALSO CONSIDERED.
- B. ADDITIONAL LOAD COMBINATIONS INVESTIGATED AT THE SERVICE LIMIT STATE:
- 1. SERVICE V DC + DW + EH + EV + ES + WA + CR + SH + TG + EL + PS
- 2. CONSTRUCTION LOAD COMBINATIONS PER AASHTO 5.14.2.3.3.
- C. CONSTRUCTION LOAD COMBINATIONS INVESTIGATED AT THE STRENGTH LIMIT STATE PER AASHTO 5.14.2.3.4 AND 3.4.2.1.
- 1. LOAD FOR FORM TRAVELER (CEQ) AND DIFFERENTIAL DEAD LOAD OF CANTILEVER (DIFF) INCLUDED AND FACTORED WITH  $\gamma_{DC}$  IN AASHTO TABLE 3.4.1-1.
- 2. WIND UPLIFT ON CANTILEVER INCLUDED AND FACTORED WITH  $\gamma_{WS}$  IN AASHTO TABLE 3.4.1-1. LOAD FACTOR FOR WS & WUP IN STRENGTH III COMBINATION TAKEN AS 1.25.
- 3. CONSTRUCTION LIVE LOAD (CLL) AND WIND ON EQUIPMENT (WE) USED IN PLACE OF LL AND WL IN AASHTO TABLE 3.4.1-1. LOAD FACTOR FOR CLL IN STRENGTH I COMBINATION TAKEN AS 1.5.
- 4. ADDITIONAL CONSTRUCTION LOAD COMBINATIONS PER AASHTO 5.14.2.3.4 MODIFIED FOR ACCIDENTAL LOSS OF FORM TRAVELER (IMPACT DUE TO LOSS OF TRAVELER NOT APPLIED TO FOUNDATIONS):
- A. MAXIMUM FORCE EFFECTS: 1.1 X DC + 1.3 X [CEQ (APPLIED DOWNWARD ON ONE CANTILEVER) + CLL] + CEQ (APPLIED UPWARD ON ONE CANTILEVER)
- B. MINIMUM FORCE EFFECTS: DC + CEQ (APPLIED DOWNWARD ON ONE CANTILEVER) + CEQ (APPLIED UPWARD ON ONE CANTILEVER)

#### MATERIALS

1. CONCRETE (MINIMUM 28-DAY CYLINDER STRENGTH AS NOTED)

LOC ATION	MnDOT MIX DESIGNATION	MIN. COMPRESSIVE STRENGTH (PSI)
SUPERSTRUC TURE	3	7500
SUPERSTRUCTURE - WALKWAY & TRACKWORK PLINTHS	3\$52	4000
SUBSTRUCTURE - PIERS & ABUTMENTS	3B52	4000
SUBSTRUCTURE - FOOTINGS	1G52	4000
SUB STRUC TURE — BEARING PEDESTALS	3	4000

- 2. MASS CONCRETE SEE SPECIAL PROVISIONS.
- 3. REINFORCING STEEL
- A. ALL REINFORCING SHALL BE PLAIN (BLACK) IN CONFORMANCE WITH AASHTO M31 (ASTM A615), GRADE 60, WITH EXCEPTION OF BARS ENTIRELY EMBEDDED OR EXTENDING INTO PIERS WHICH SHALL BE EPOXY COATED. EPOXY COATED REINFORCING SHALL BE COATED IN ACCORDANCE WITH THE REQUIREMENTS OF AASHTO M284
- B. CONCRETE COVER REQUIREMENTS (UNLESS OTHERWISE NOTED IN THE PLANS):
- SUPERSTRUCTURE

A. SEGMENTAL BOX GIRDER: 2" EXTERIOR SURFACES; 1½" INTERIOR SURFACES B. WALKWAY & TRACKWORK PLINTHS:

2. SUBSTRUCTURE

A. PIER CAPS & COLUMNS:

B. FOOTINGS:

2" (MEASURED TO SPIRALS OR TIES)

C. ABUTMENTS:

			DESIGNED BY:		CHECKED BY: JWJ	
			DRAWN BY:	JWH	DATE: SEPT. 21, 2015	





**CIVIL EAST - VOLUME 4A EXCELSIOR BLVD BRIDGE 27C10 GENERAL NOTES 1** 

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4. PRESTRESSING STEEL:

A. STRANDS - AASHTO M203 (ASTM A416), SEVEN WIRE, GRADE 270, LOW RELAXATION

0.6" DIAMETER 1. STRAND SIZE: 2. APPARENT MODULUS OF ELASTICITY: 28,500 KSI

3. MAXIMUM JACKING STRESS: 0.81 F<sub>PU</sub> (0.9 F<sub>PY</sub>)

4. MAXIMUM ANCHORING STRESS 0.74 F<sub>PU</sub> A AT END OF SEATING ZONE: B. AT ANCHOR: 0.7 F<sub>PU</sub> 5. ANCHOR SET: 3/8"

6. FRICTION COEFFICIENT: 0.25 7. WOBBLE COEFFICIENT

A. EXTERNAL TENDONS: 0.0 B. INTERNAL TENDONS: 0.0002 PER FOOT

B. BARS - AASHTO M275 (ASTM A722), GRADE 150 (TYPE II) 1. APPARENT MODULUS OF ELASTICITY: 30.000 KSI

2. MAXIMUM JACKING STRESS:  $0.72 \, F_{PU} \, (0.9 \, F_{PY})$ 3. MAXIMUM ANCHORING STRESS

A. AT END OF SEATING ZONE:  $0.7 F_{PU}$ B. AT ANCHOR:  $0.7 F_{PU}$ 1/16" 4. ANCHOR SET:

0.0002 PER FOOT 5. WOBBLE COEFFICIENT:

C. TENDON DUCTS

1. TRANSVERSE DECK TENDONS - CORRUGATED HIGH-DENSITY POLYPROPYLENE FLAT DUCT

2. LONGITUDINAL EXTERNAL TENDONS - HIGH-DENSITY POLYETHYLENE

3. LONGITUDINAL INTERNAL TENDONS - CORRUGATED HIGH-DENSITY POLYPROPYLENE ROUND

4. LONGITUDINAL EXTERNAL TENDON DEVIATOR - RIGID STEEL (SCHEDULE 40) (GALVANIZED)

5. BARS - CORRUGATED HIGH-DENSITY POLYPROPYLENE

5. STEEL H-PILES - AASHTO M223 (ASTM A572), GRADE 50

6. DISC BEARINGS - AASHTO M270 (ASTM A709), GRADE 50. ALL STEEL SURFACES EXPOSED TO THE ATMOSPHERE SHALL BE PAINTED.

A. STUD ANCHOR BOLTS - AASHTO M164 (ASTM A325), TYPE 1

B. SWEDGED ANCHOR RODS - AASHTO M314 (ASTM F1554), GRADE 55

#### ALLOWABLE STRESSES / ANALYSIS ITEMS

A. SUPERSTRUCTURE DESIGNED FOR ALL APPLICABLE SERVICE AND STRENGTH LIMIT STATES AS DEFINED BY THE LOAD COMBINATIONS IN THE SWLRT DESIGN CRITERIA.

B. SUBSTRUCTURE DESIGNED FOR ALL APPLICABLE STRENGTH AND EXTREME EVENT LIMIT STATES AS DEFINED BY THE LOAD COMBINATIONS IN THE SWLRT DESIGN CRITERIA AND CHECKED AT THE SERVICE LIMIT STATE FOR THE CRACK CONTROL PROVISIONS IN AASHTO 5.7.3.4. CLASS 1 EXPOSURE CONDITION CONSIDERED FOR ALL MEMBERS WITH EXCEPTION THAT CLASS 2 EXPOSURE CONDITION CONSIDERED FOR PIER CAPS.

SUPERSTRUCTURE CONCRETE STRESSES AT THE SERVICE LIMIT STATE PER AASHTO 5.9.4 AND STRESSES FOR CONSTRUCTION LOAD COMBINATIONS PER AASHTO 5.14.2.3.

3 SEGMENT CASTING AND ERECTION

A. MINIMUM CONCRETE STRENGTH PRIOR TO RELEASING FORMWORK AND ADVANCING TRAVELERS: 4000 PSL

B. MINIMUM CONCRETE STRENGTH PRIOR TO STRESSING TRANSVERSE POST-TENSIONING: 4000

C. MINIMUM CONCRETE STRENGTH PRIOR TO STRESSING LONGITUDINAL POST-TENSIONING: 4000 PSI FOR CIP SEGMENTS & 2,500 PSI FOR CIP CLOSURE JOINTS

D. FOR PURPOSES OF DESIGN, AVERAGE AGE OF SEGMENTS FOR ADVANCEMENT OF FORM

E. FOR PURPOSES OF DESIGN, AVERAGE CASTING CYCLE FOR A PAIR OF SEGMENTS: 1 WEEK

#### BEARING REPLACEMENT

PROVISIONS HAVE BEEN MADE FOR JACKING OF THE SUPERSTRUCTURE FOR REPLACEMENT OF THE BEARINGS. JACKING LOCATIONS AND LOADS ARE AS SHOWN IN THE PLANS. SEE BEARING REPLACEMENT DETAILS FOR LIVE LOAD RESTRICTIONS.

#### **FOUNDATIONS**

SUBSTRUCTURE UNIT	REQUIRED FACTORED PILE BEARING RESISTANCE ØRN (TONS)	PILE TYPE & SIZE
WEST ABUTMENT	225	HP14x89
PIER 1	300	HP14x117
PIER 2	300	HP14x117
PIER 3	300	HP14x117
PIER 4	300	HP14x117
EAST ABUTMENT	225	HP14x89

RESISTANCE FACTOR FOR PILE DRIVING:

0.60 FOR H-PILING (WITHOUT PDA AND USE OF MnDOT MPF12 DRIVING FORMULA) 0.65 FOR H-PILING (WITH USE OF PDA)

ALL PILES SHALL BE WELDED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS. DRIVE-FIT SPLICES ARE NOT ALLOWED.

#### CONSTRUCTION NOTES

#### **ABBREVIATIONS**

ABUT ABUTMENT APPROX APPROXIMATE (0) ΒF BACK FACE ROULEVARD RIVD BOTT BOTTOM BRG BEARING CIP CAST IN PLACE СР

CANADIAN PACIFIC CS CURVE TO SPIRAL CENTERLINE CLEAR

CONST CONSTRUCTION DIA DIAMETER **EXPANSION** FB EAST BOUND EF EACH FACE EJ EXPANSION JOINT FLEV FLEVATION EACH SIDE

EXTERIOR FIXED FF FRONT FACE OR FAR FACE

FG FINISHED GRADE HORIZ HORIZONTAL H-PILE INSIDE FACE INT INTERIOR JΤ JOINT

EXT

KILOPOUND (1000 LBS) KIP KSF KIPS PER SQUARE FOOT KSI KIPS PER SQUARE INCH LIGHT RAIL VEHICLE IRV

MAX MAXIMUM MIN MINIMUM MPH MILES PER HOUR

MSE MECHANICALLY STABILIZED EARTH NF

NEAR FACE NO NUMBER

OCS OVERHEAD CONTACT SYSTEM OF

OUTSIDE FACE OPT OPTIONAL

PC POINT OF CURVATURE POINT OF COMPOUND CURVATURE

PCC PCF POUNDS PER CUBIC FOOT PDA PILE DRIVING ANALYZER PGL PROFILE GRADE LINE PΙ POINT OF INTERSECTION PLF POUNDS PER LINEAR FOOT PSI POUNDS PER SQUARE INCH

РΤ POINT OF TANGENCY OR POST-TENSIONING

POINT OF VERTICAL CURVE PVC PVI POINT OF VERTICAL INTERSECTION PVT POINT OF VERTICAL TANGENT

RADIUS RT RIGHT SPIRAL TO CURVE

SPA SPACED SPS SPACES ST SPIRAL TO TANGENT

STA STATION SYMM SYMMETRIC AL T&B TOP AND BOTTOM TBD TO BE DETERMINED

TOT TANGENT TO SPIRAL TS

TYP TYPIC AL VERT VERTIC AL WB WEST BOUND

WORK POINT

NO. DATE BY CHECK DESIGN REVISION / SUBMITTAL DESIGNED BY: ETN CHECKED BY: JWJ DATE: SEPT. 21, 2015

**AECOM** 





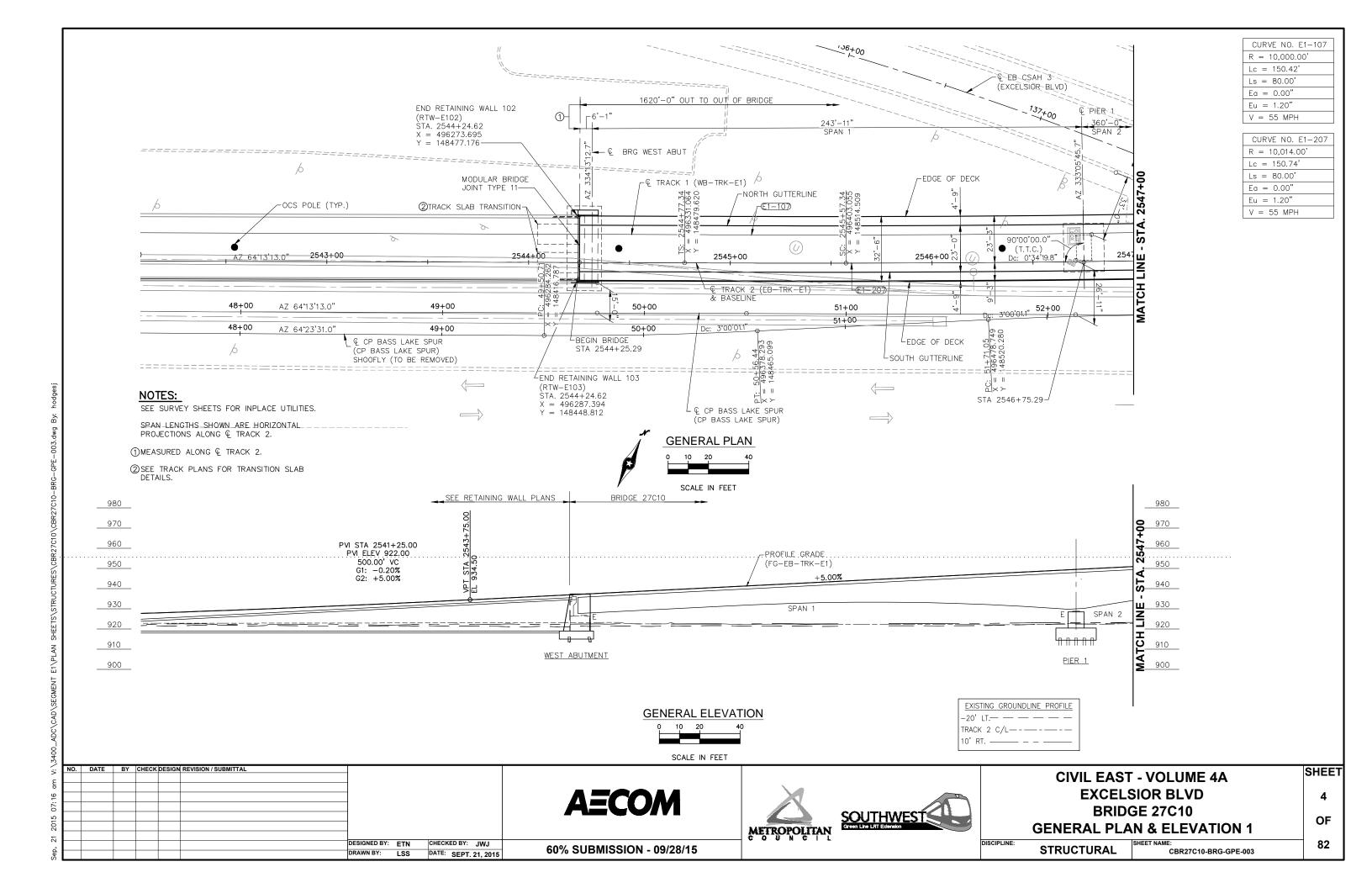
**CIVIL EAST - VOLUME 4A EXCELSIOR BLVD BRIDGE 27C10 GENERAL NOTES 2** 

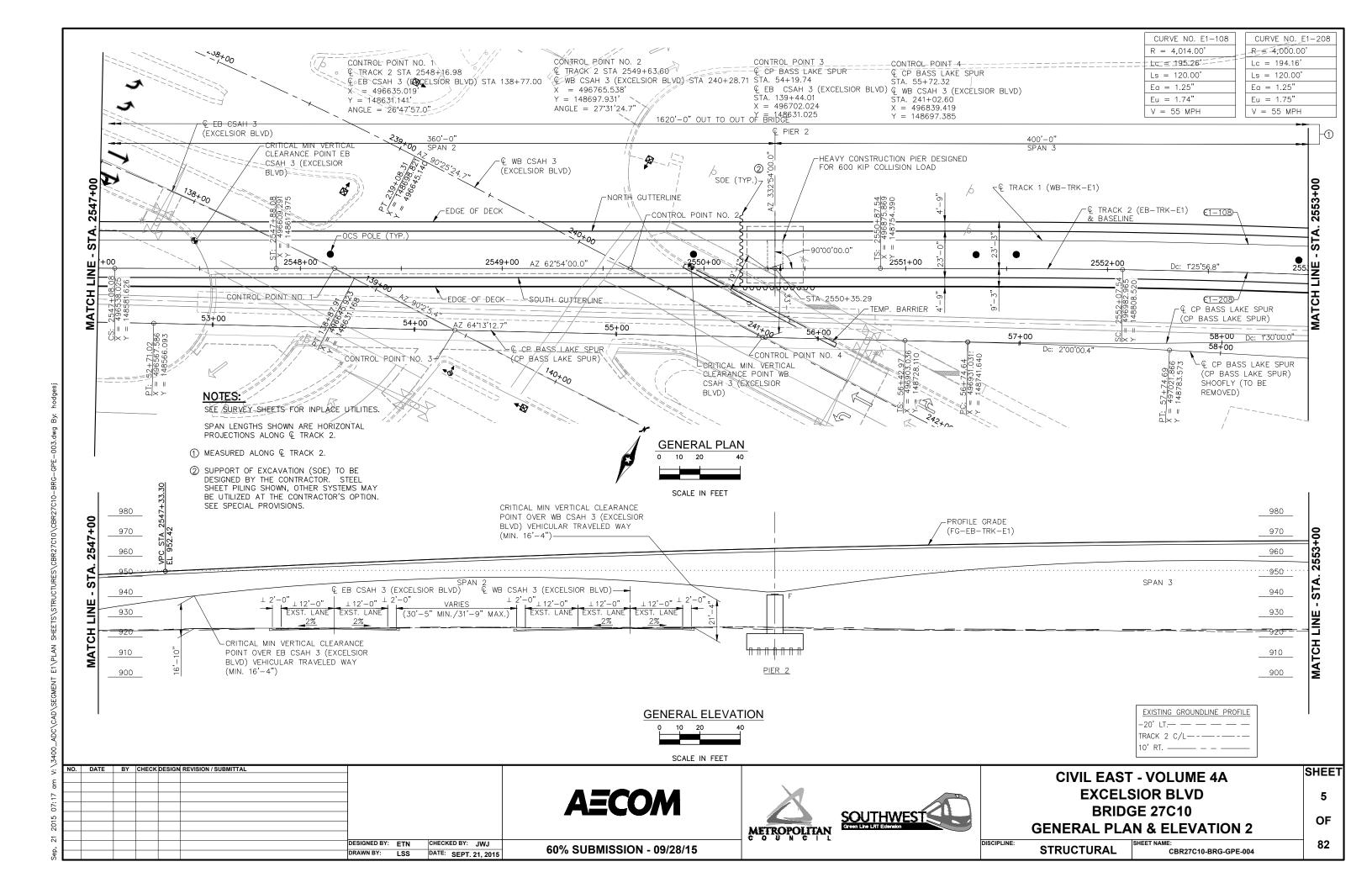
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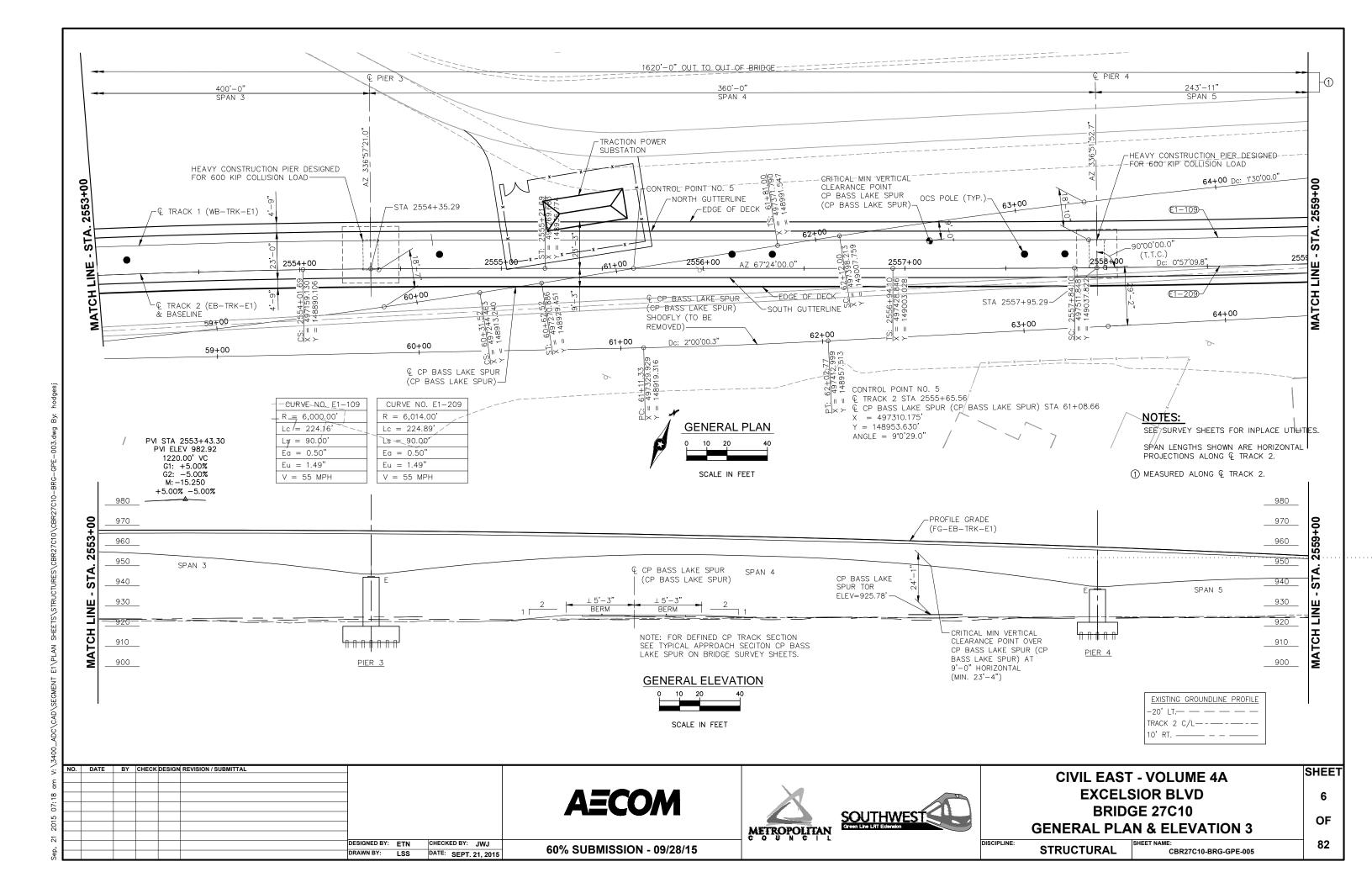
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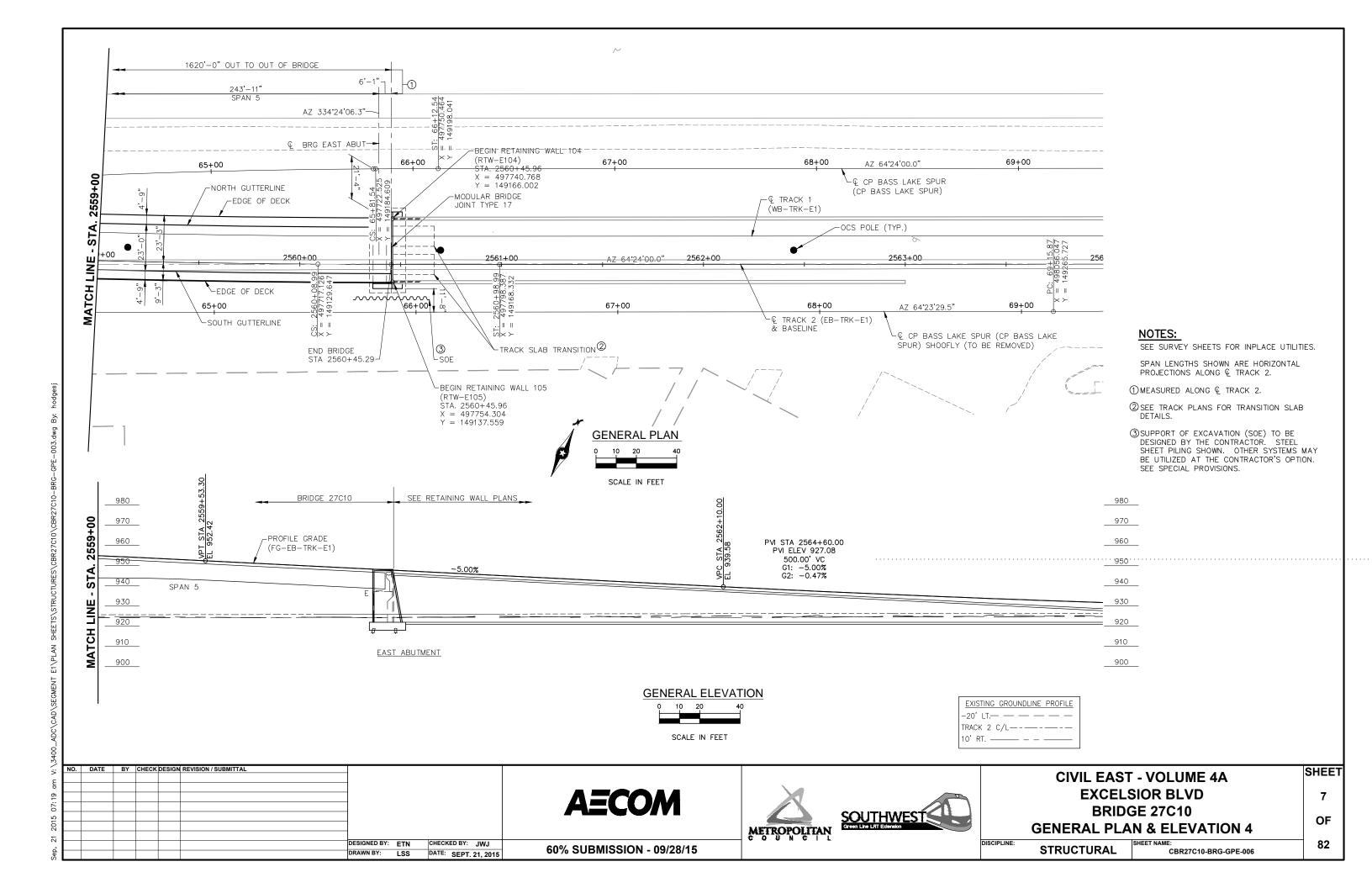
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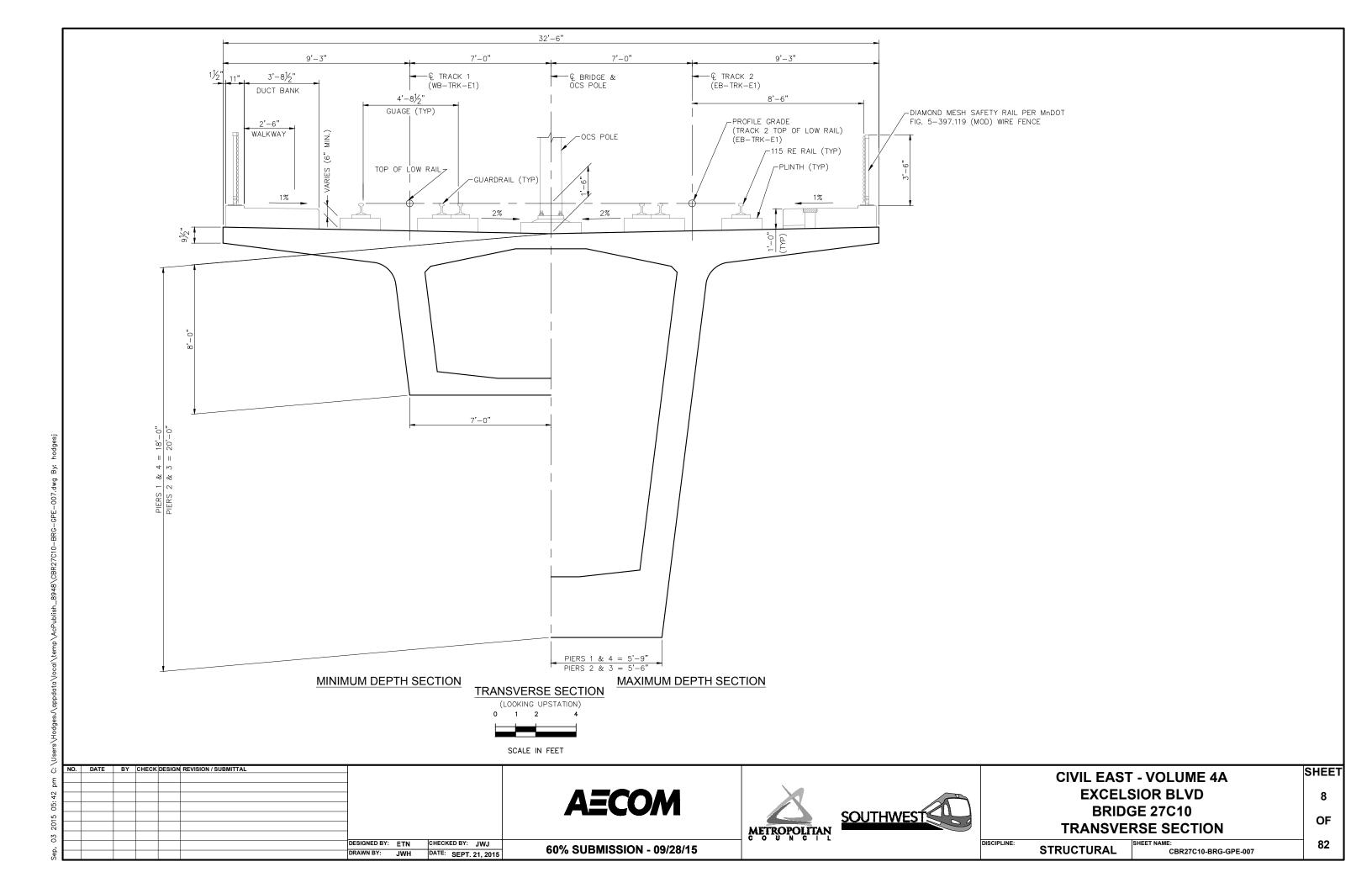
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	CURVE 1							
	STATION	COORDINATES						
	STATION	X	Y					
P.C.	2545+02.34	000000.000	000000.000					
P.I.		000000.000	000000.000					
P.C.C.	2545+57.31	000000.000	000000.000					
DELTA	00° 13′ 44.1″ LT.							
R	13,759.24'							
Lc	54.97'							

CURVE 2						
	STATION	COORDINATES				
	STATION	X	Y			
P.C.C.	2545+57.31	000000.000	000000.000			
P.I.		000000.000	000000.000			
P.C.C.	2547+07.95	000000.000	000000.000			
DELTA	00	0° 51′ 45.0″ LT.				
R						
Lc	150.64'					

	CURVE 3							
	STATION	COORDINATES						
	STATION	X	Υ					
P.C.C.	2547+07.95	000000.000	000000.000					
P.I.		000000.000	000000.000					
P.T.	2547+62.92	000000.000	000000.000					
DELTA	00	D* 13' 44.1" L	T.					
R	13,759.24							
Lc	54.97							

CURVE 4									
	STATION	COORDINATES							
	STATION	Х	Y						
P.C.	2551+07.38	000000.000	000000.000						
P.I.		000000.000	000000.000						
P.C.C.	2551+67.42	000000.000	000000.000						
DELTA	00° 21' 03.9" RT.								
R	9798.36'								
Lc	60.04'								

		CURVE 5				
	STATION	COORDINATES				
	STATION	X	Υ			
P.C.C.	2551+67.42	000000.000	000000.000			
P.I.		000000.000	000000.000			
P.C.C.	2552+07.48	000000.000	000000.000			
DELTA	00° 30′ 30.1″ RT.					
R	4515.15'					
Lc		40.06'				

	CURVE 6						
	STATION	COORDINATES					
	STATION	Х	Y				
P.C.C.	2552+07.48	000000.000	000000.000				
P.I.		000000.000	000000.000				
P.C.C.	2554+01.98	000000.000	000000.000				
DELTA	2	° 46' 52.1" R	Т.				
R							
Lc		194.50'					

	CURVE 7						
	STATION	COORI	DINATES				
	STATION	X	Y				
P.C.C.	2554+01.98	000000.000	000000.000				
P.I.		000000.000	000000.000				
P.C.C.	2554+42.05	+42.05 000000.000 000000.00					
DELTA	00	° 30' 30.5" R	T.				
R							
Lc		40.07'					

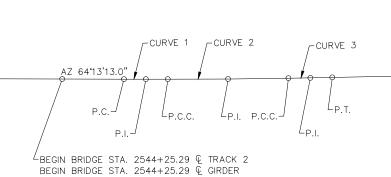
	CURVE 8							
	STATION	DINATES						
	STATION	X	Y					
P.C.C.	2554+42.05	000000.000	000000.000					
P.I.		000000.000	000000.000					
P.T.	2555+02.09	2555+02.09 000000.000 000000.0						
DELTA	00	0°21′03.9″R	Т.					
R		9798.36'						
Lc		60.04'						

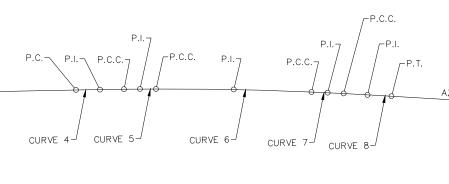
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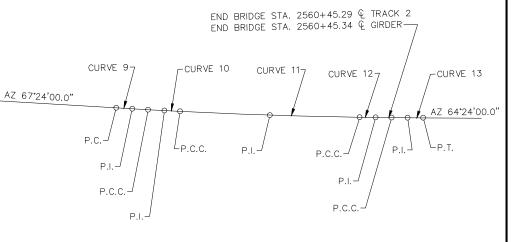
		CURVE 9									
P.C. 2557+04.50 000000.000 000000.00		CT A TIONI	COORDINATES								
		STATION	X	Υ							
	P.C.	2557+04.50	000000.000	000000.000							
P.I.   000000.000   000000.00	P.I.		000000.000	000000.000							
P.C.C. 2557+44.49 000000.000 000000.00	P.C.C.	2557+44.49	000000.000	000000.000							
DELTA 00° 06′ 17.0″ LT.	DELTA	00	00° 06′ 17.0″ LT.								
R 21,881.80'	R	21,881.80'									
Lc 39.99'	Lc		39.99'								

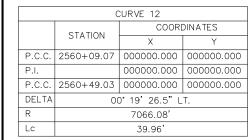
١		C	CURVE 10				
1		STATION COORDINATES					
1			X	Y			
1	P.C.C.	2557+44.49	000000.000	000000.000			
1	P.I.		000000.000	000000.000			
1	P.C.C.	2557+84.45	000000.000	000000.000			
1	DELTA	00° 19' 26.5" LT.					
1	R						
	Lc		39.96'				

	CURVE 11									
		STATION	COORDINATES							
		STATION	X	Y						
)	P.C.C.	2557+84.45	000000.000	000000.000						
)	P.I.		000000.000	000000.000						
)	P.C.C.	2560+09.07	000000.000	000000.000						
	DELTA	2	2° 08′ 32.9″ LT.							
	R 6007.00'									
	Lc		224.62'							









	C	CURVE 13				
	STATION	DINATES				
	STATION	X	Y			
P.C.C.	2560+49.03	000000.000	000000.000			
P.I.		000000.000	000000.000			
P.T.	2560+89.02	000000.000	000000.000			
DELTA	00	Т.				
R		21,881.80'				
Lc		39.99'				

	E1	NDING P.T.		
	STATION	COORDINATES		
	STATION	Х	Y	
P.T.	2562+00.00	000000.000	000000.000	

### NOTES:

STATIONS SHOWN IN TABLES ARE GIVEN ALONG & GIRDER ALIGNMENT.

ALIGNMENT SHOWN IS FOR LOCATION OF & GIRDER ONLY. FOR TRACK AND BASELINE ALIGNMENT SEE "GENERAL PLAN & ELEVATION" SHEETS.

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL				Т
						1			
						1			
						1			
						DESIGNED BY:		CHECKED BY: JWJ	
						DRAWN BY:	JWH	DATE: SEPT. 21, 2015	;

**AECOM** 



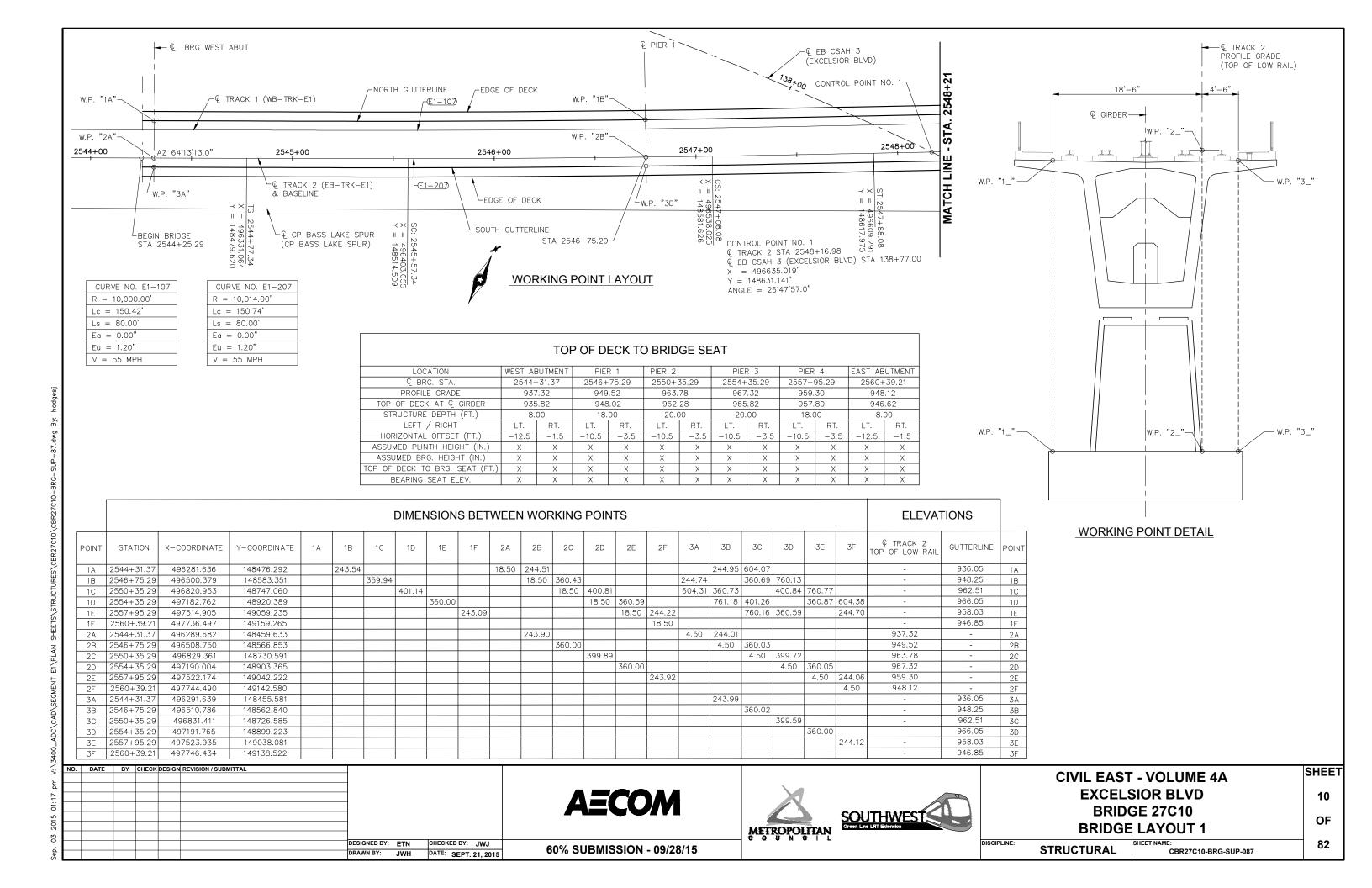


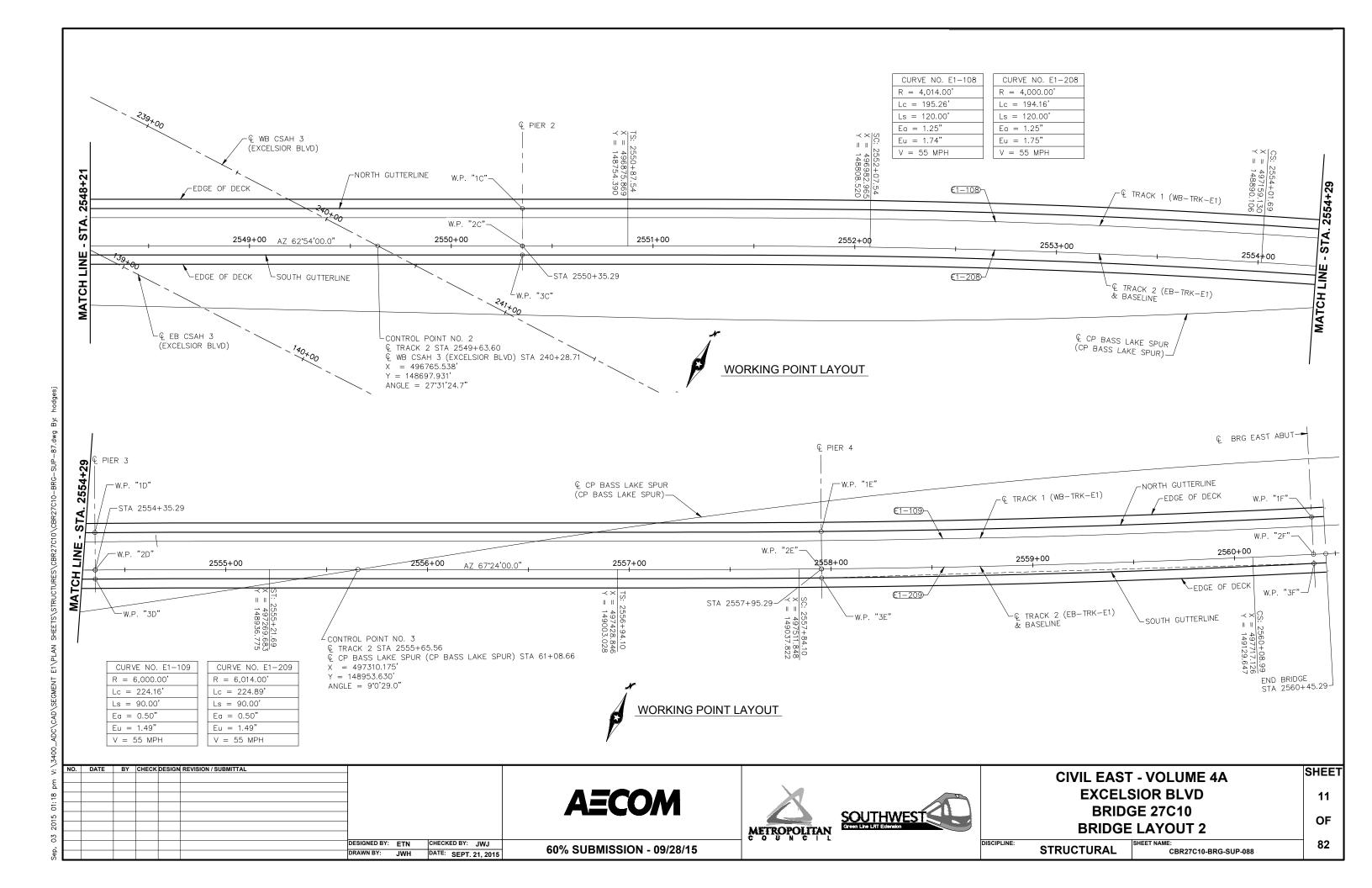
#### SHEET **CIVIL EAST - VOLUME 4A EXCELSIOR BLVD BRIDGE 27C10** HORIZONTAL ALIGNMENT CONTROL PLAN

**STRUCTURAL** 

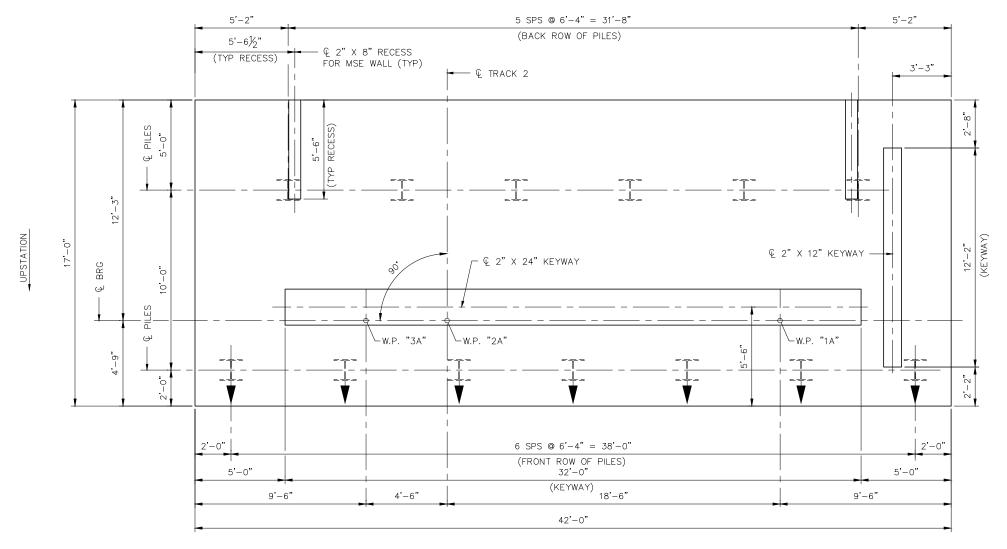
CBR27C10-BRG-GPE-009

OF 82





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**FOOTING PLAN** 

#### NOTES:

ALL PILES ARE ASTM A572, GRADE 50, HP14 X 89.

ALL PILES TO BE VERTICAL, UNLESS DENOTED OTHERWISE.

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NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL				
						DRAWN BY:	JWH	DATE: SEPT. 21, 2015	
						DESIGNED BY: DRAWN BY:		CHECKED BY: JWJ DATE: SEPT. 21, 20	

**AECOM** 

60% SUBMISSION - 09/28/15





CIVIL EAST - VOLUME 4A
EXCELSIOR BLVD
BRIDGE 27C10
WEST ABUTMENT FOOTING DETAILS

STRUCTURAL SHEET NAME: CBR27C10-BRG-ABT-002

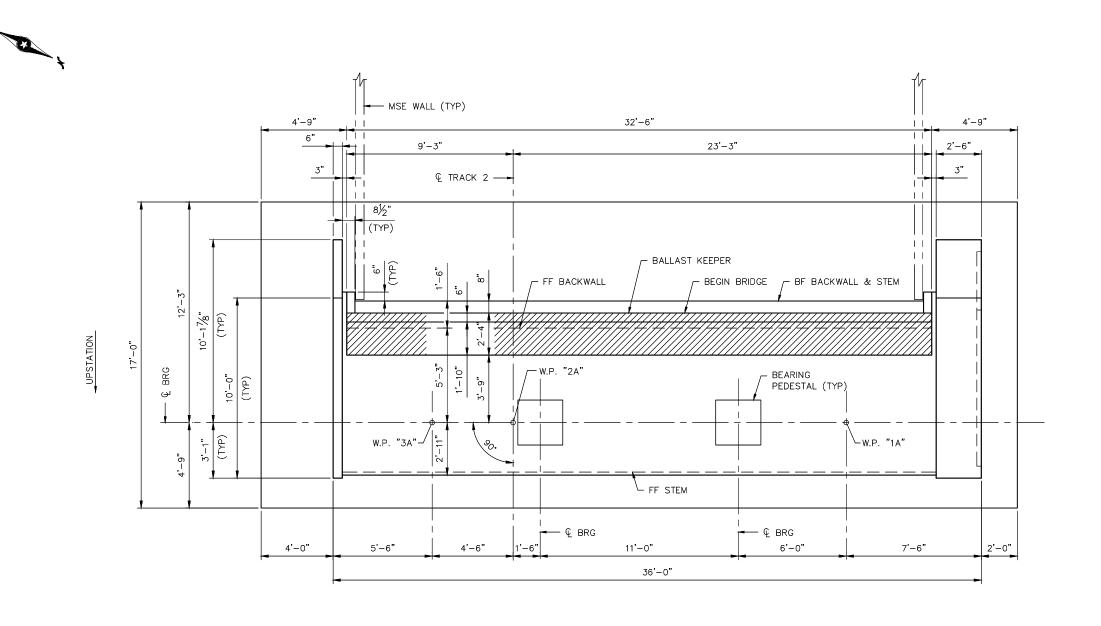
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PLAN

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BY CHECK DESIGN REVISION / SUBMITTAL

BY CHECK DESIGN REVISION / SUBMISSION - 09/28/15

CIVIL EAST - VOLUME 4A

EXCELSIOR BLVD

BRIDGE 27C10

WEST ABUTMENT DETAILS 1

OF

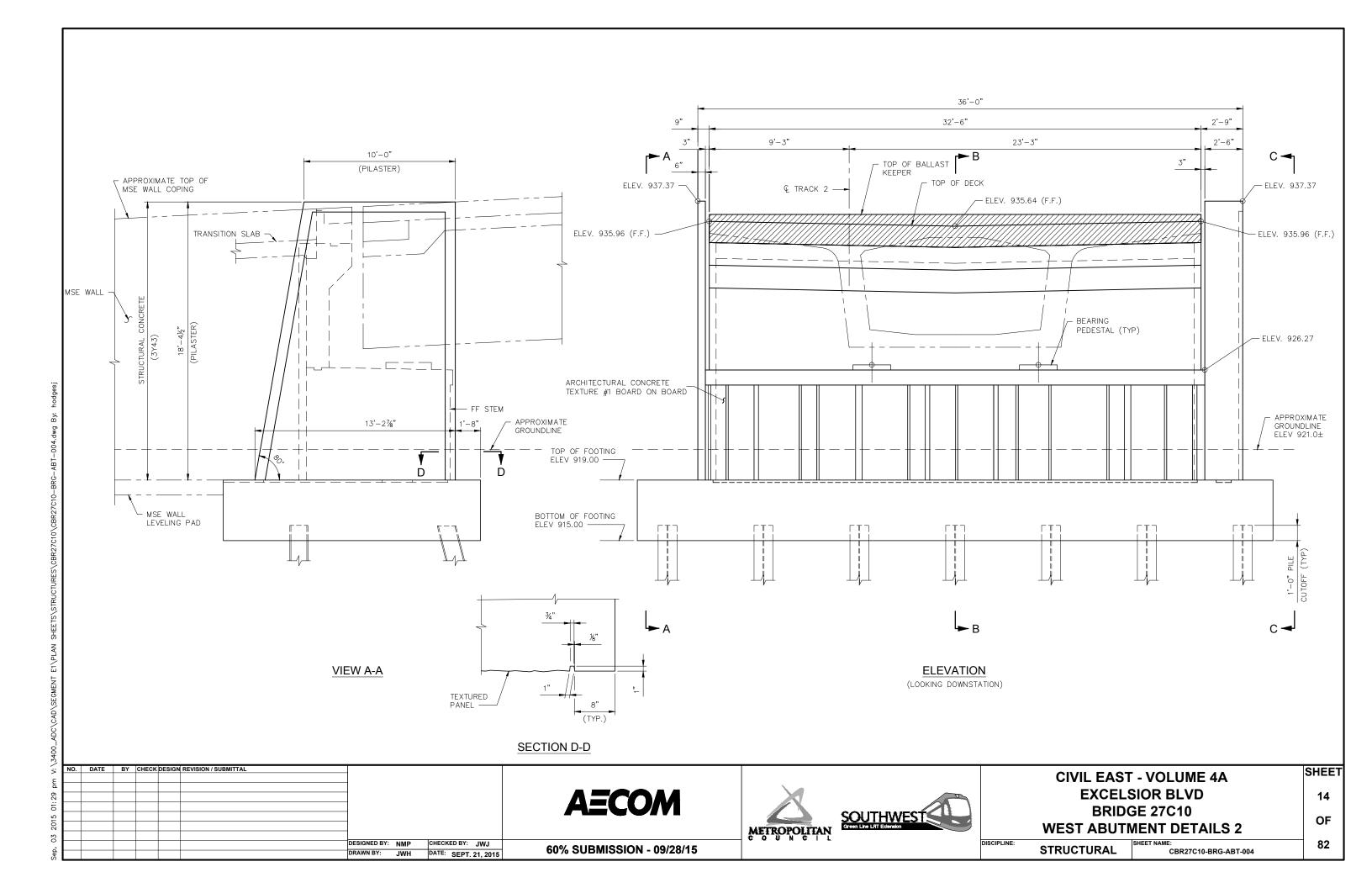
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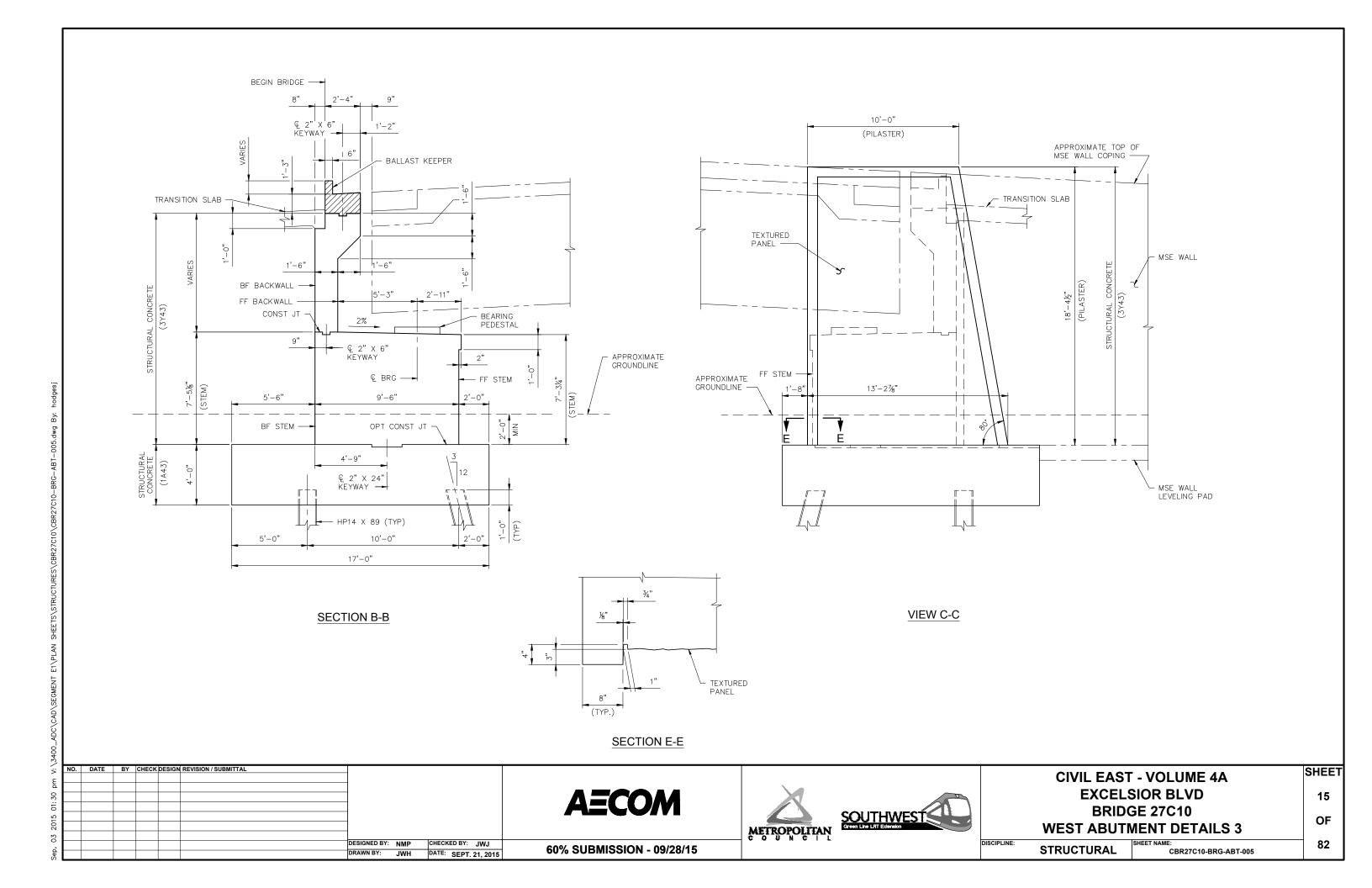
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DESIGNED BY: NMP DATE: SEPT. 21, 2015

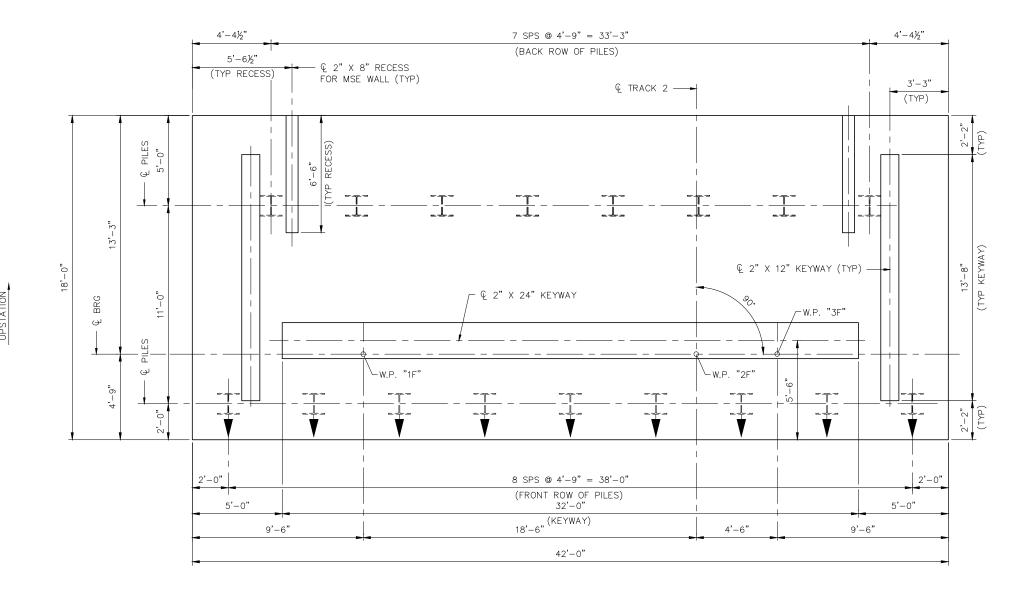
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CBR27C10-BRG-ABT-003

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#### **FOOTING PLAN**

ALL PILES ARE ASTM A572, GRADE 50, HP14 X 89. ALL PILES TO BE VERTICAL, UNLESS DENOTED OTHERWISE.

DATE: SEPT. 21, 2015

**AECOM** 

60% SUBMISSION - 09/28/15





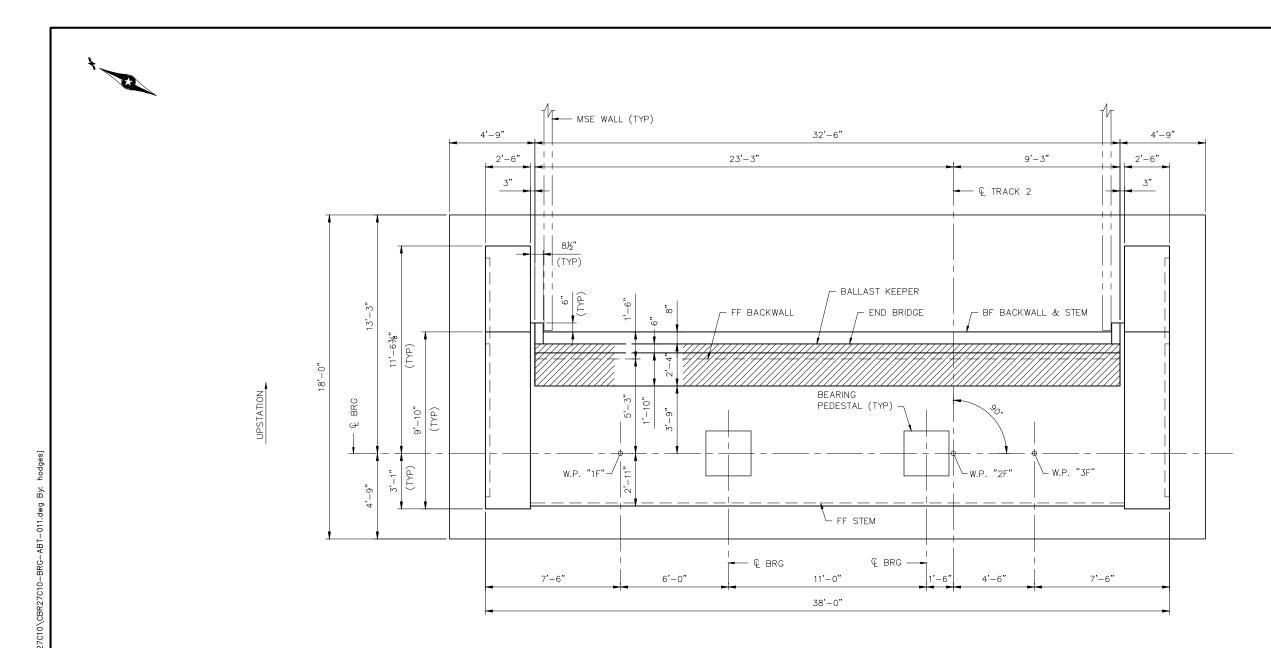
**CIVIL EAST - VOLUME 4A EXCELSIOR BLVD BRIDGE 27C10 EAST ABUTMENT FOOTING DETAILS**  SHEET

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OF

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**STRUCTURAL** CBR27C10-BRG-ABT-010



PLAN

DESIGNED BY: NMP CHECKED BY: JWJ DRAWN BY: JWH DATE: SEPT. 21, 2015

**AECOM** 





**CIVIL EAST - VOLUME 4A EXCELSIOR BLVD BRIDGE 27C10 EAST ABUTMENT DETAILS 1** 

CBR27C10-BRG-ABT-011

60% SUBMISSION - 09/28/15

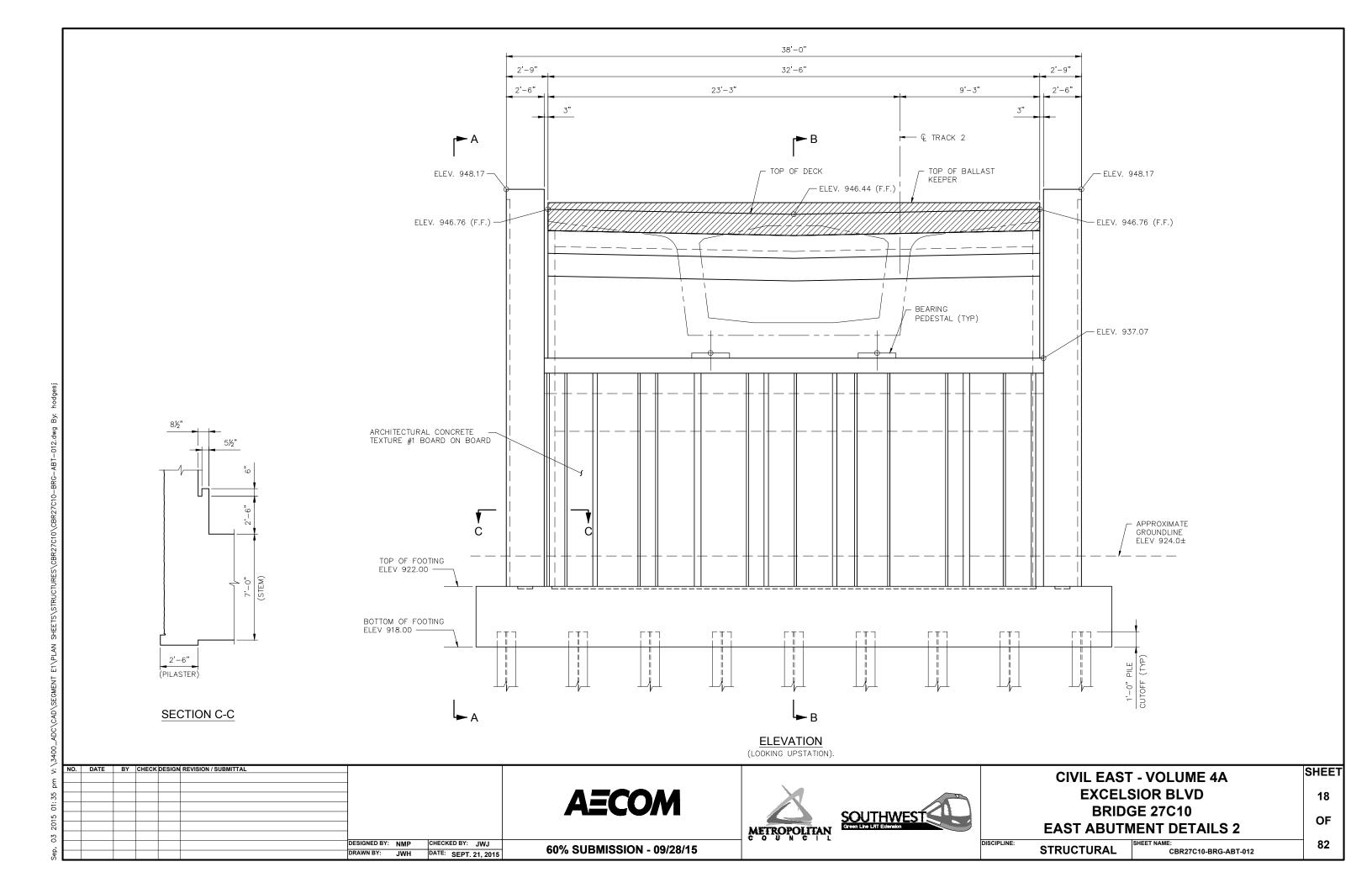
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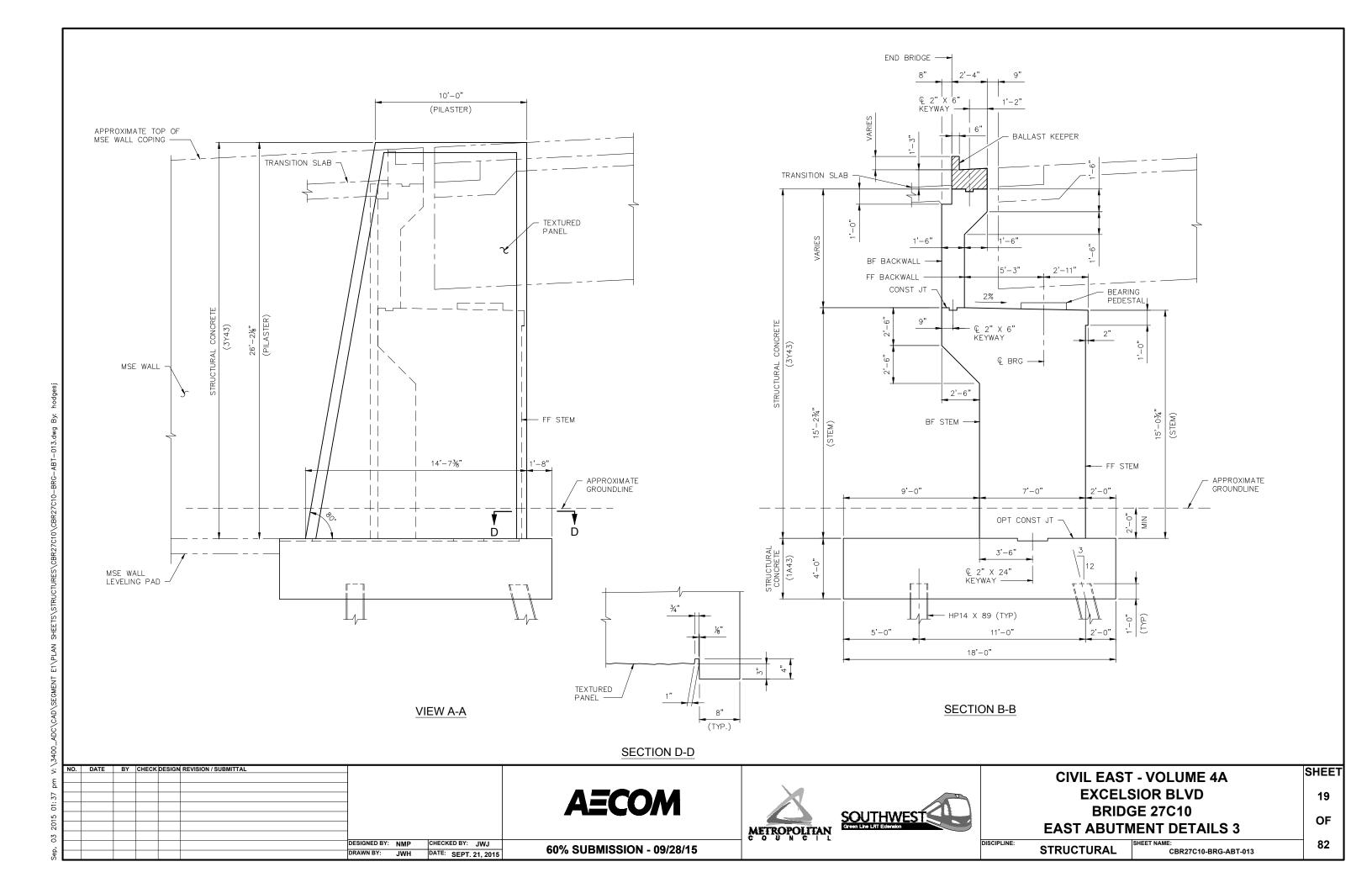
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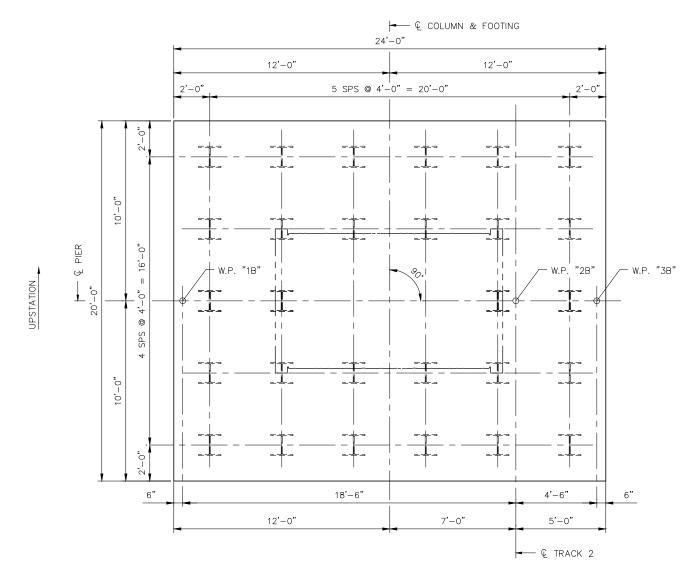
SHEET

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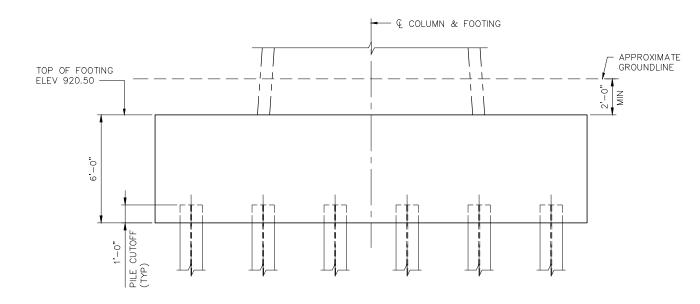
OF







**FOOTING PLAN** 



#### **FOOTING ELEVATION**

NOTES:

ALL PILES ARE ASTM A572, GRADE 50, HP14 X 117.

ALL PILES TO BE VERTICAL.

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r							DESIGNED BY:		CHECKED BY: JWJ	
r							DRAWN BY:	JWH	DATE: SEPT. 21, 2015	1

**AECOM** 

60% SUBMISSION - 09/28/15





**CIVIL EAST - VOLUME 4A EXCELSIOR BLVD BRIDGE 27C10 PIER 1 FOOTING DETAILS** 

CBR27C10-BRG-PIR-001

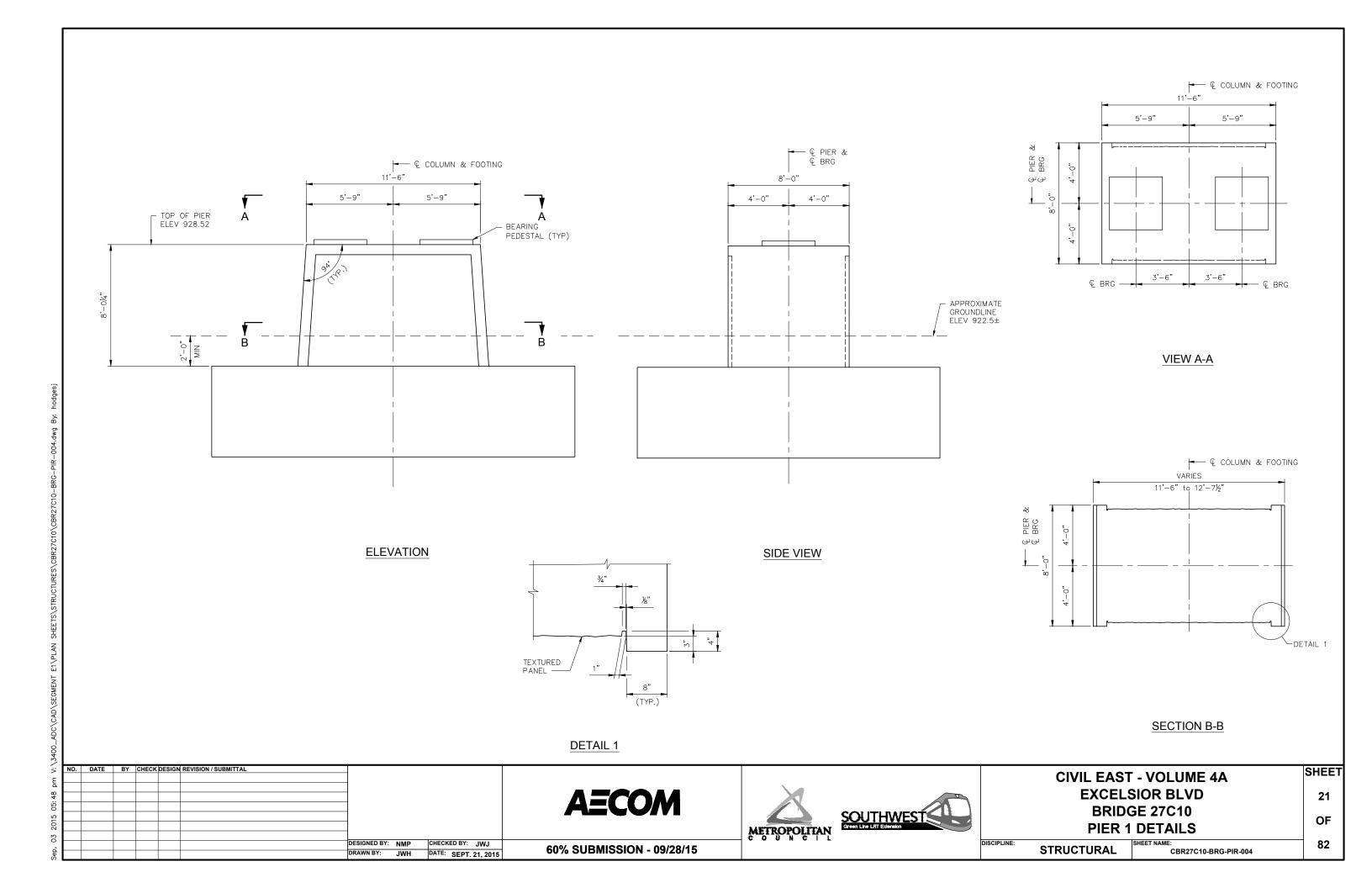
**STRUCTURAL** 

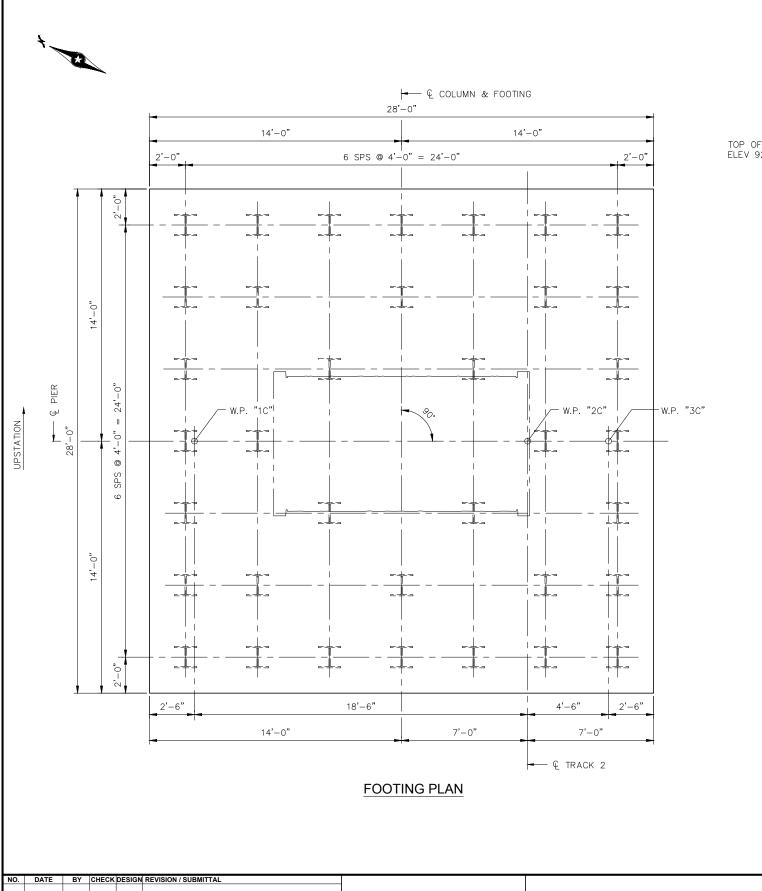
82

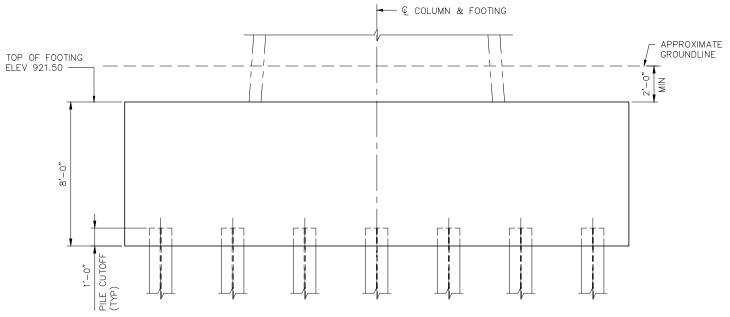
SHEET

20

OF







## FOOTING ELEVATION

NOTES:

ALL PILES ARE ASTM A572, GRADE 50, HP14 X 117.

ALL PILES TO BE VERTICAL.

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL				
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						DESIGNED BY:		CHECKED BY: JWJ	
						DRAWN BY:	JWH	DATE: SEPT. 21, 20	15

**AECOM** 





**CIVIL EAST - VOLUME 4A EXCELSIOR BLVD BRIDGE 27C10 PIER 2 FOOTING DETAILS** 

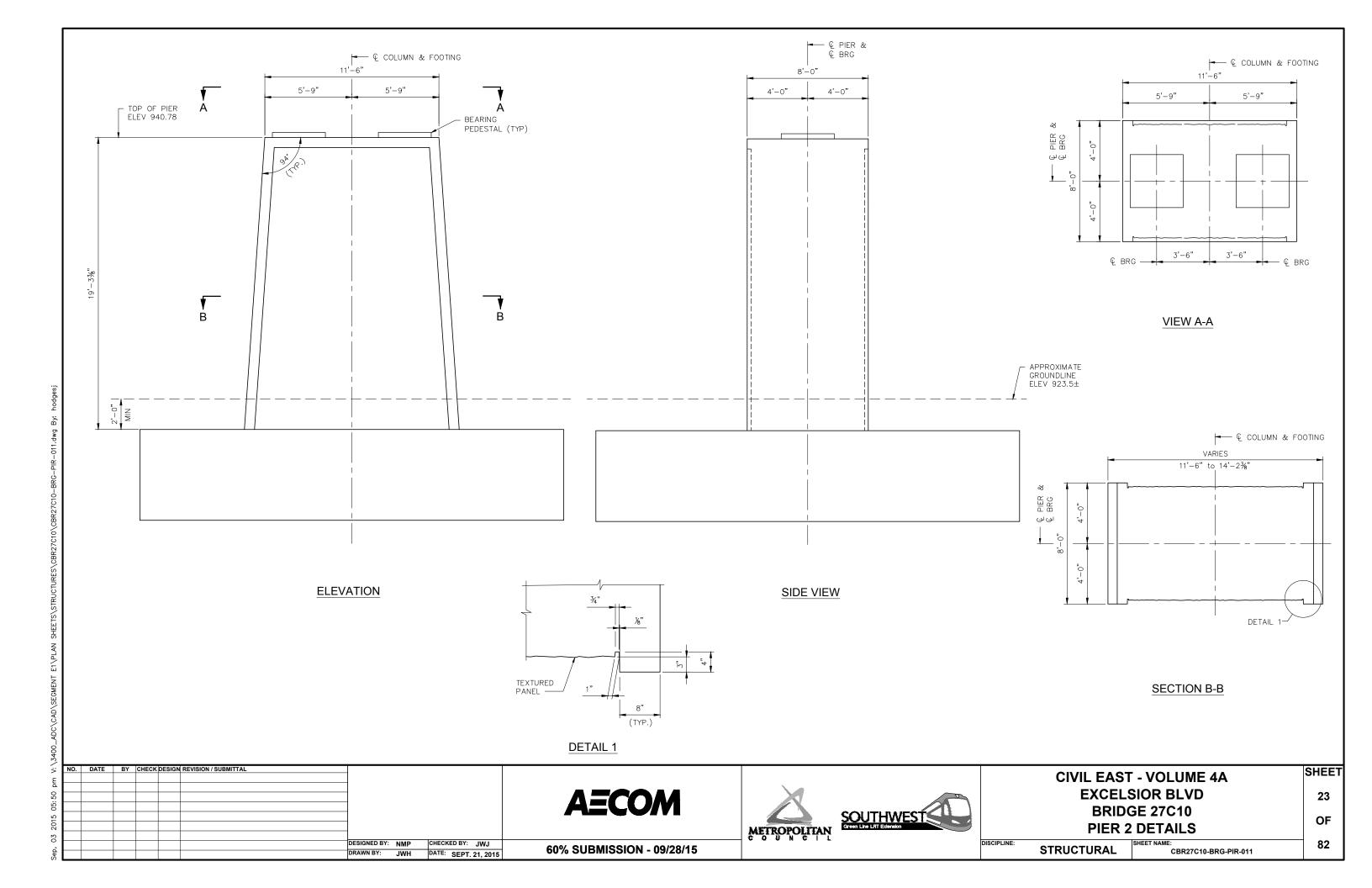
OF

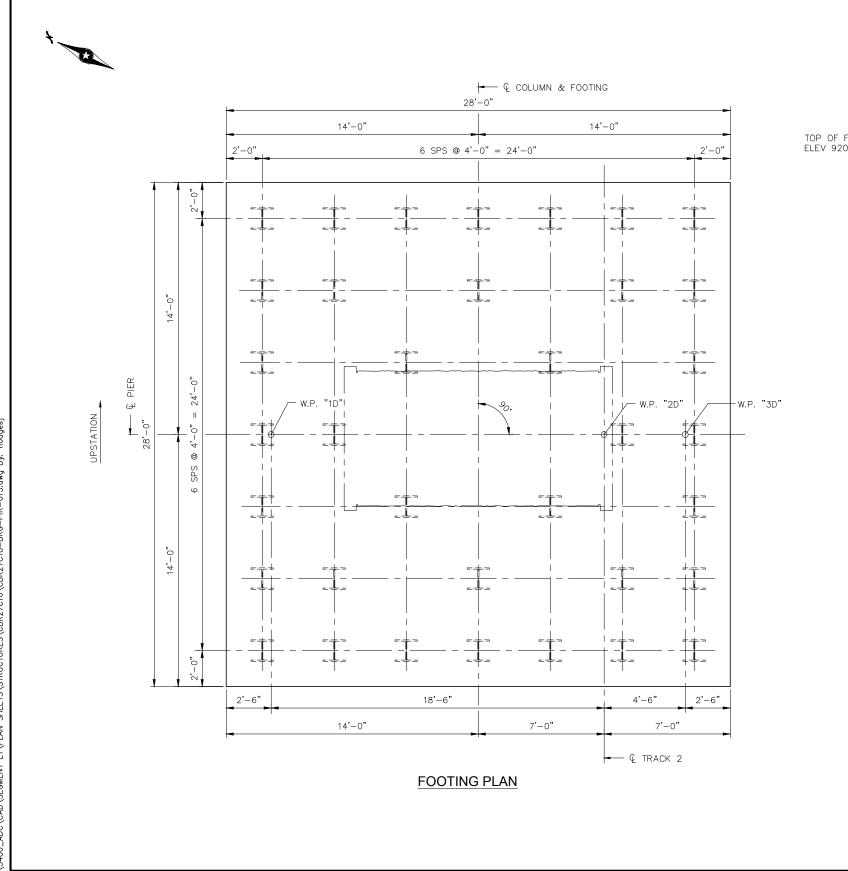
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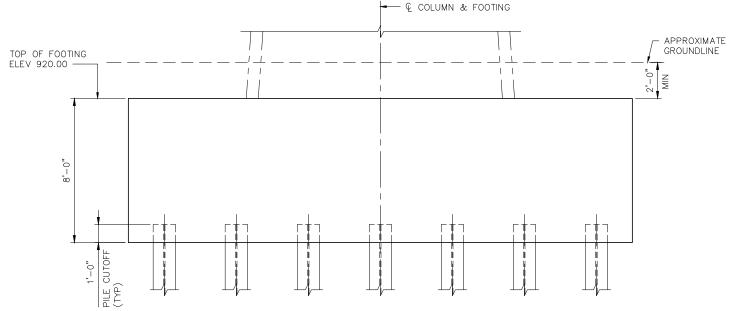
SHEET

**STRUCTURAL** 

CBR27C10-BRG-PIR-008







## **FOOTING ELEVATION**

NOTES:

ALL PILES ARE ASTM A572, GRADE 50, HP14 X 117.

ALL PILES TO BE VERTICAL.

NO. DATE BY CHECK DESIGN REVISION / SUBMITTAL

DESIGNED BY: NMP CHECKED BY: JWJ

DRAWN BY: JWH DATE: SEPT. 21, 2015

**AECOM** 

60% SUBMISSION - 09/28/15





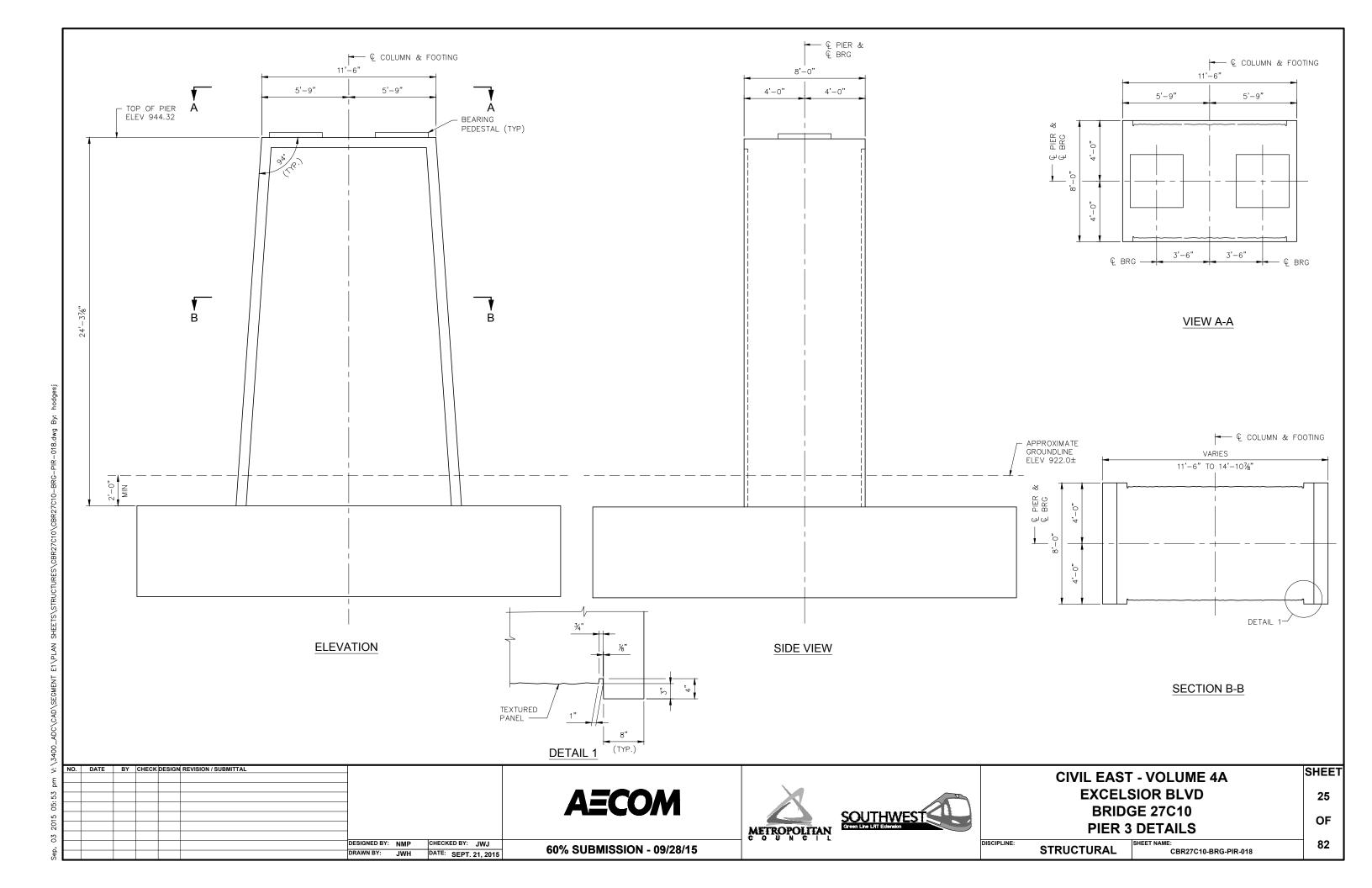
CIVIL EAST - VOLUME 4A
EXCELSIOR BLVD
BRIDGE 27C10
PIER 3 FOOTING DETAILS

OF

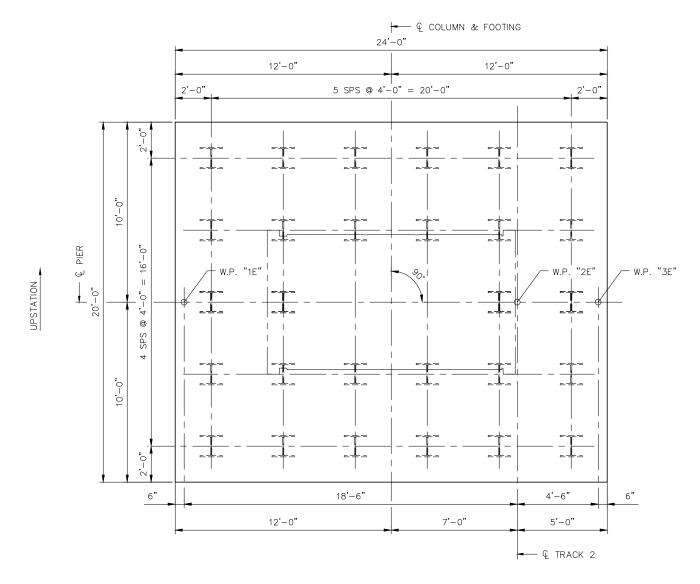
SHEET

STRUCTURAL SH

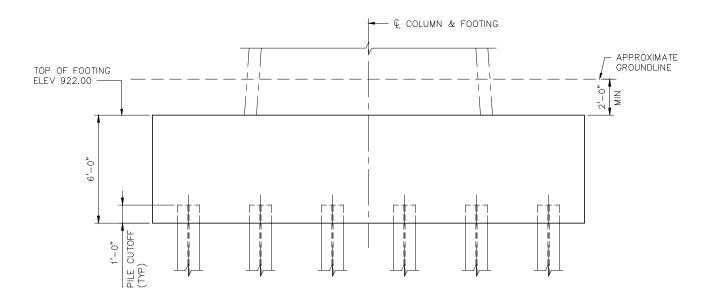
AME: CBR27C10-BRG-PIR-015 82



+



**FOOTING PLAN** 



**FOOTING ELEVATION** 

NOTES:

ALL PILES ARE ASTM A572, GRADE 50, HP14 X 117.

ALL PILES TO BE VERTICAL.

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2							DRAWN BY:	JWH	DATE: SEPT. 21, 2015	

**AECOM** 

60% SUBMISSION - 09/28/15





CIVIL EAST - VOLUME 4A
EXCELSIOR BLVD
BRIDGE 27C10
PIER 4 FOOTING DETAILS

OF

SHEET

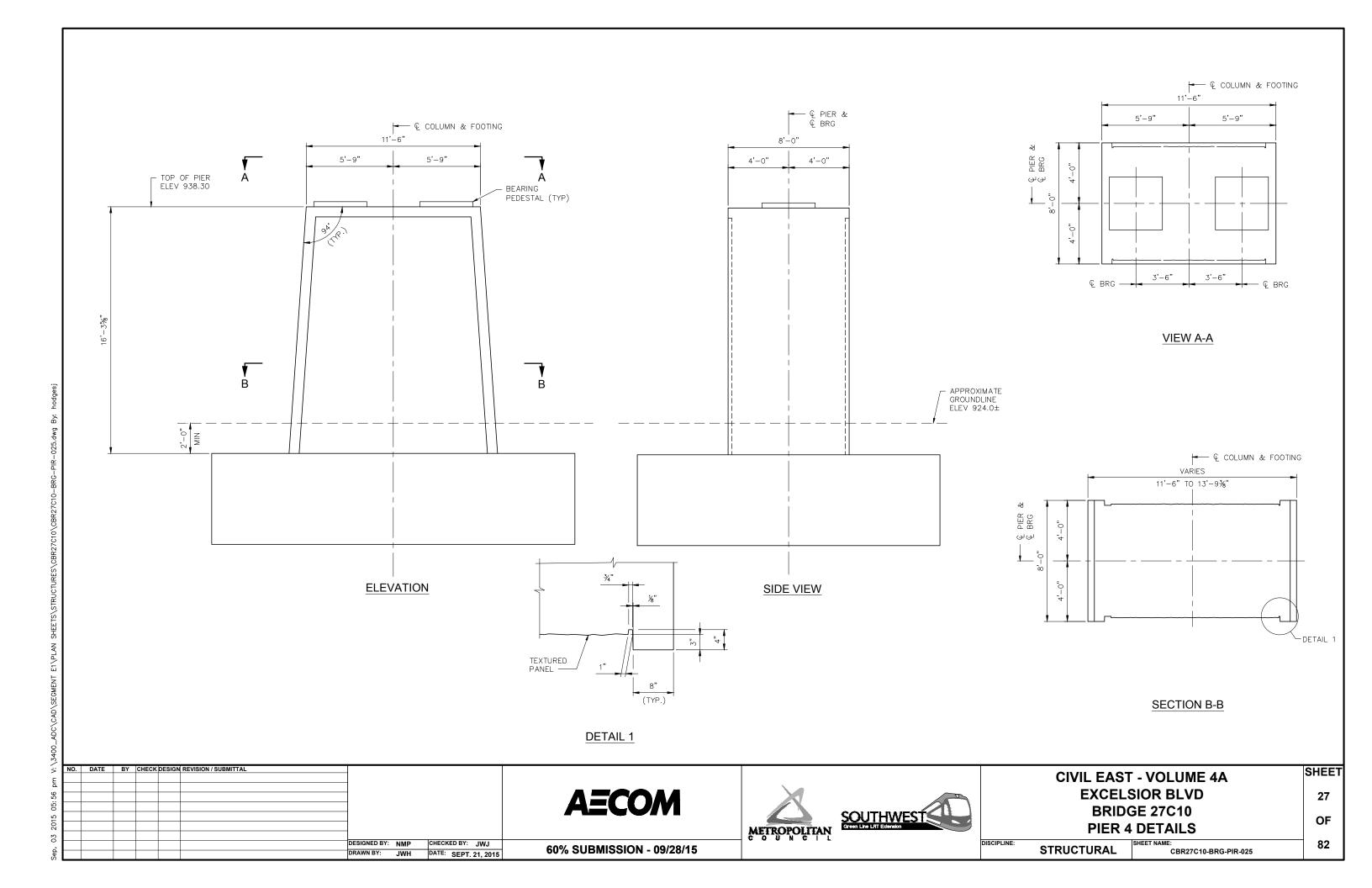
26

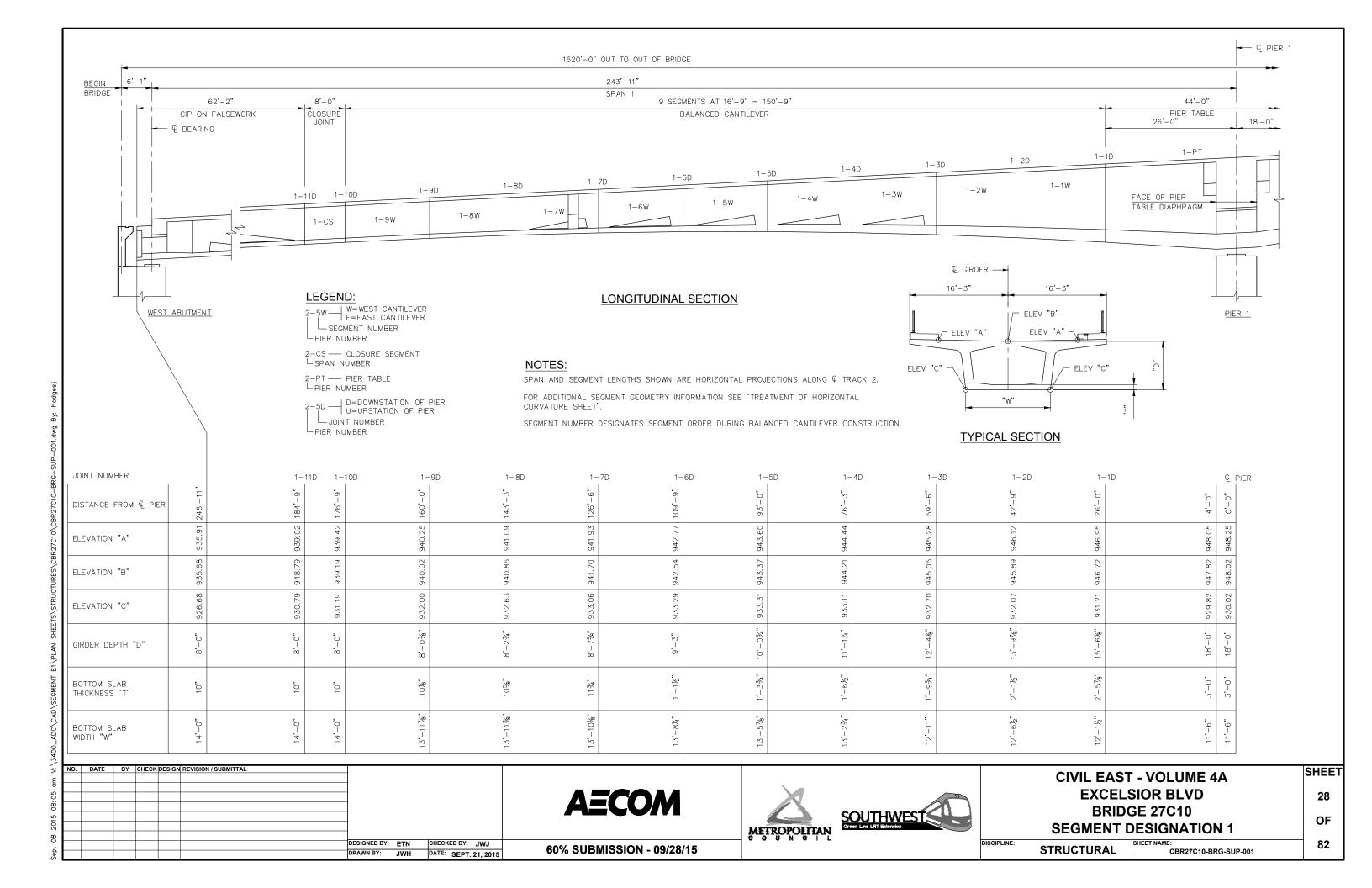
STRUCTURAL SH

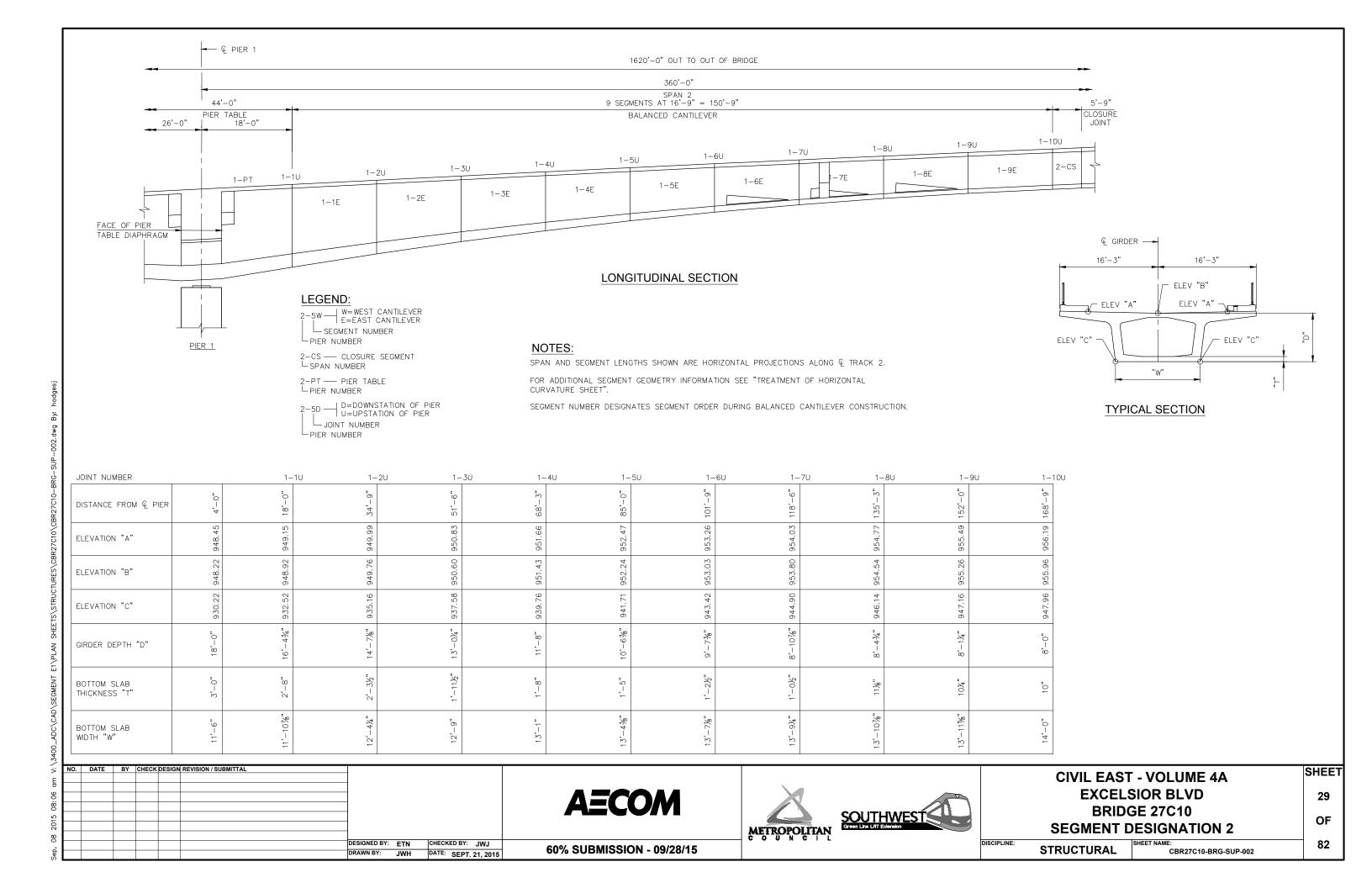
AME: CBR27C10-BRG-PIR-022

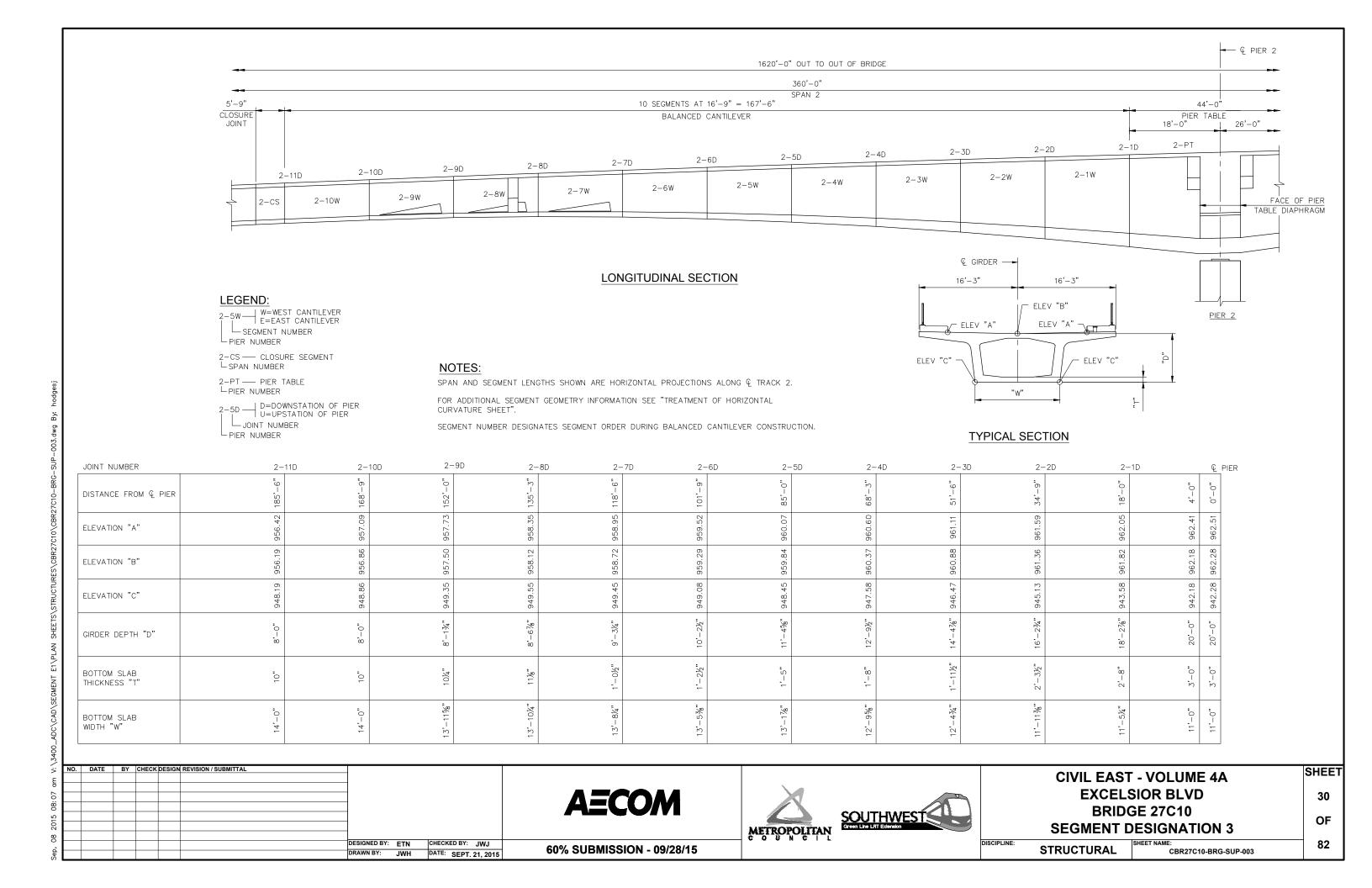
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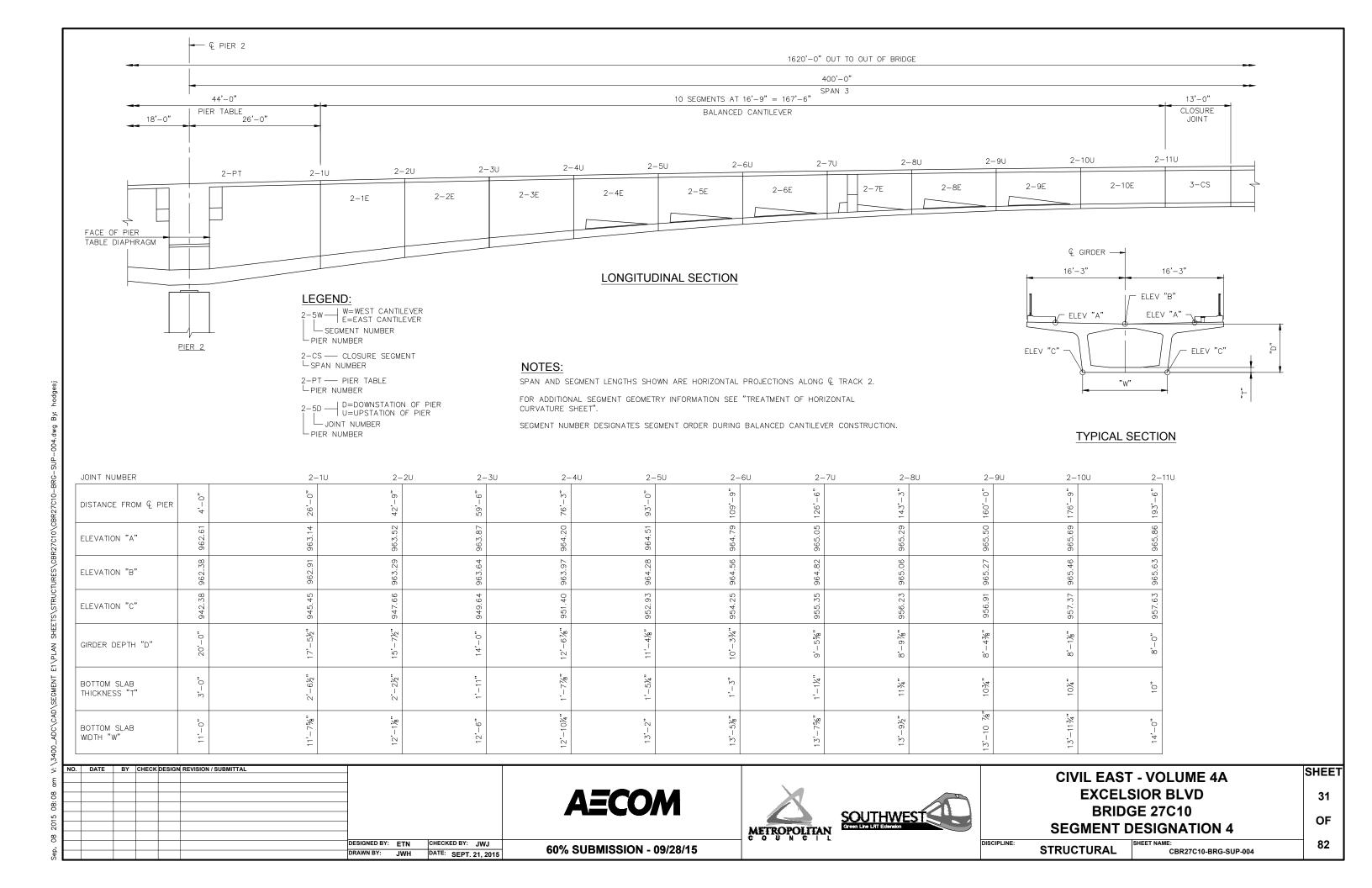
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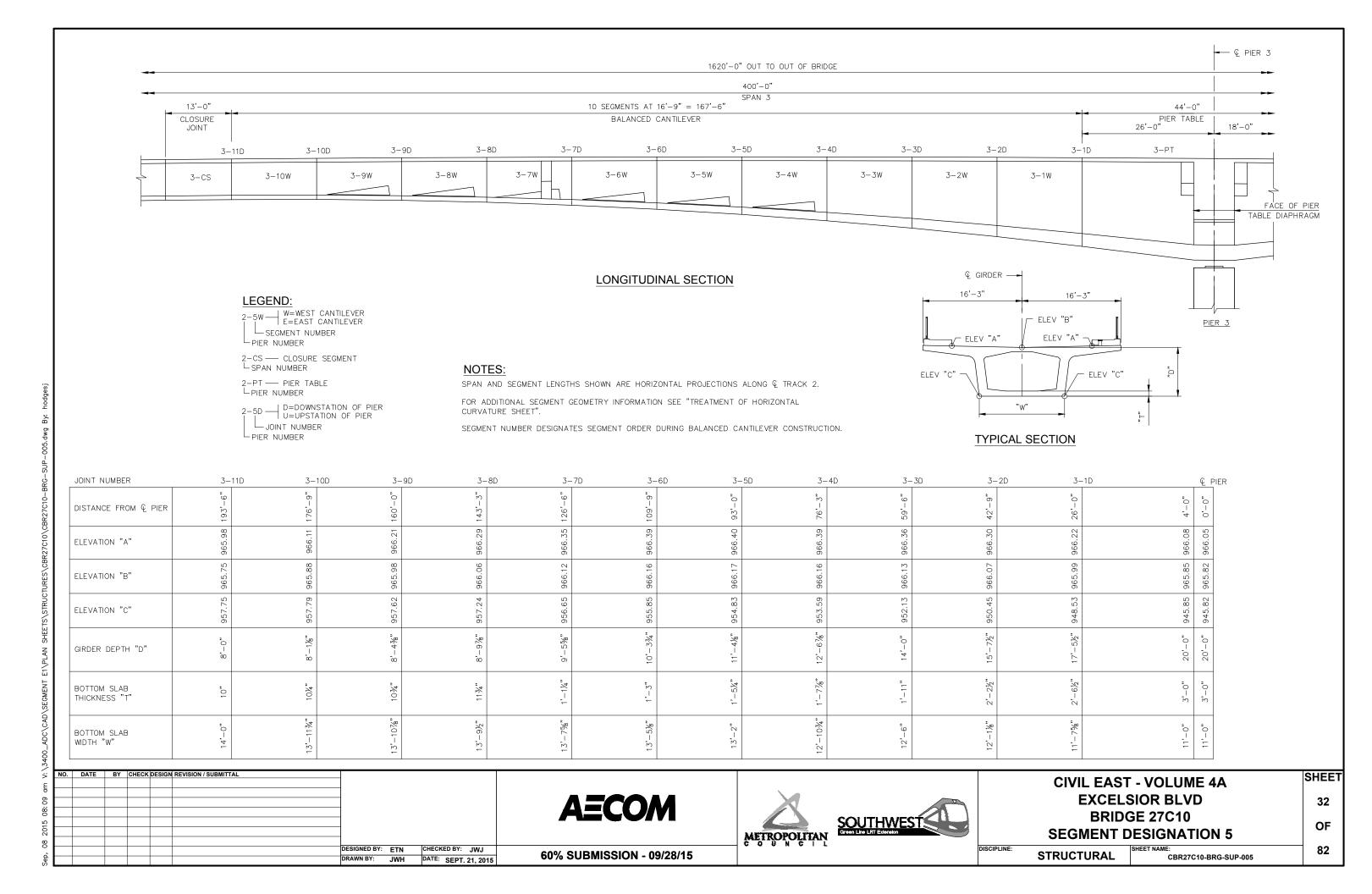


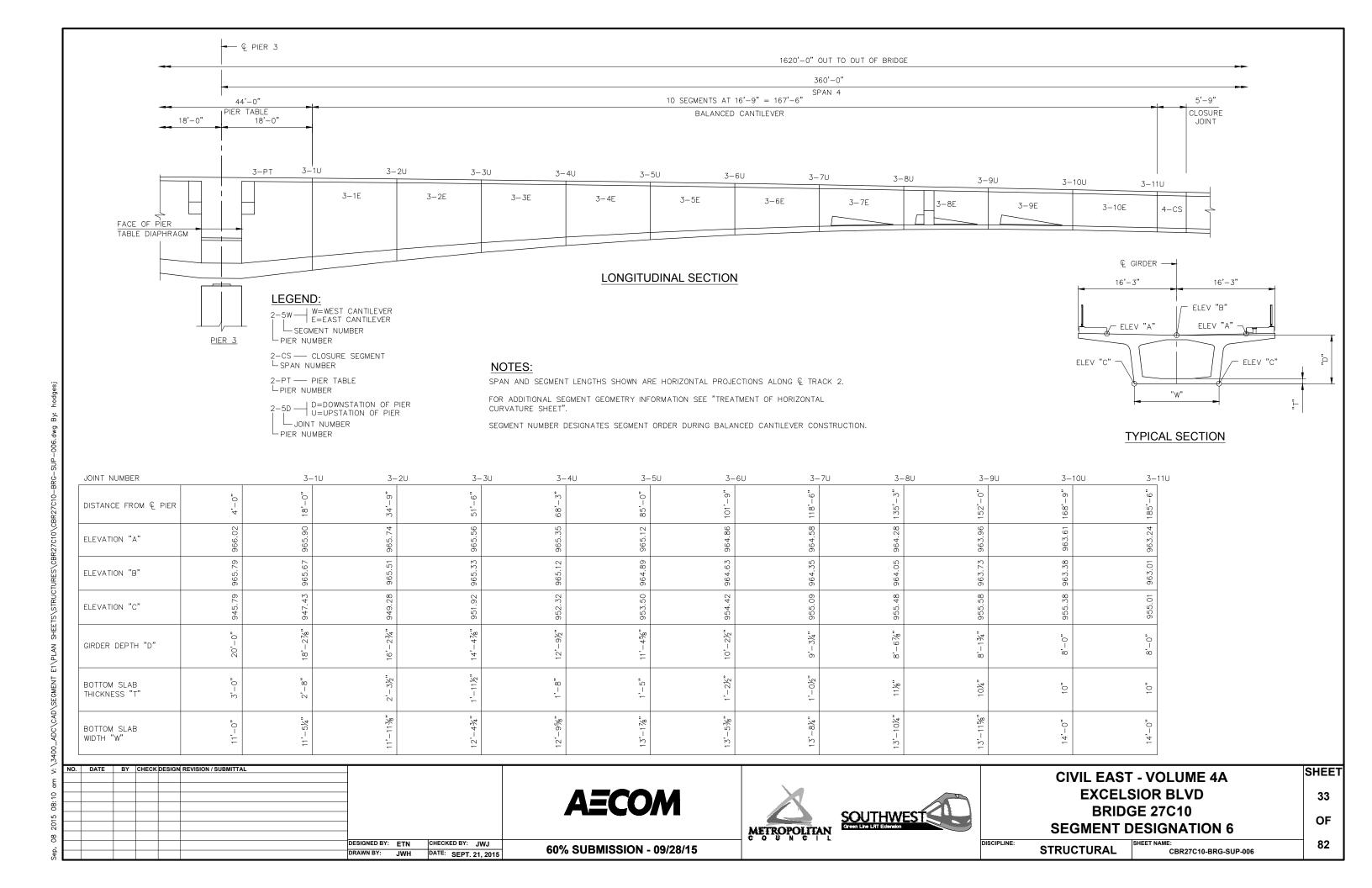


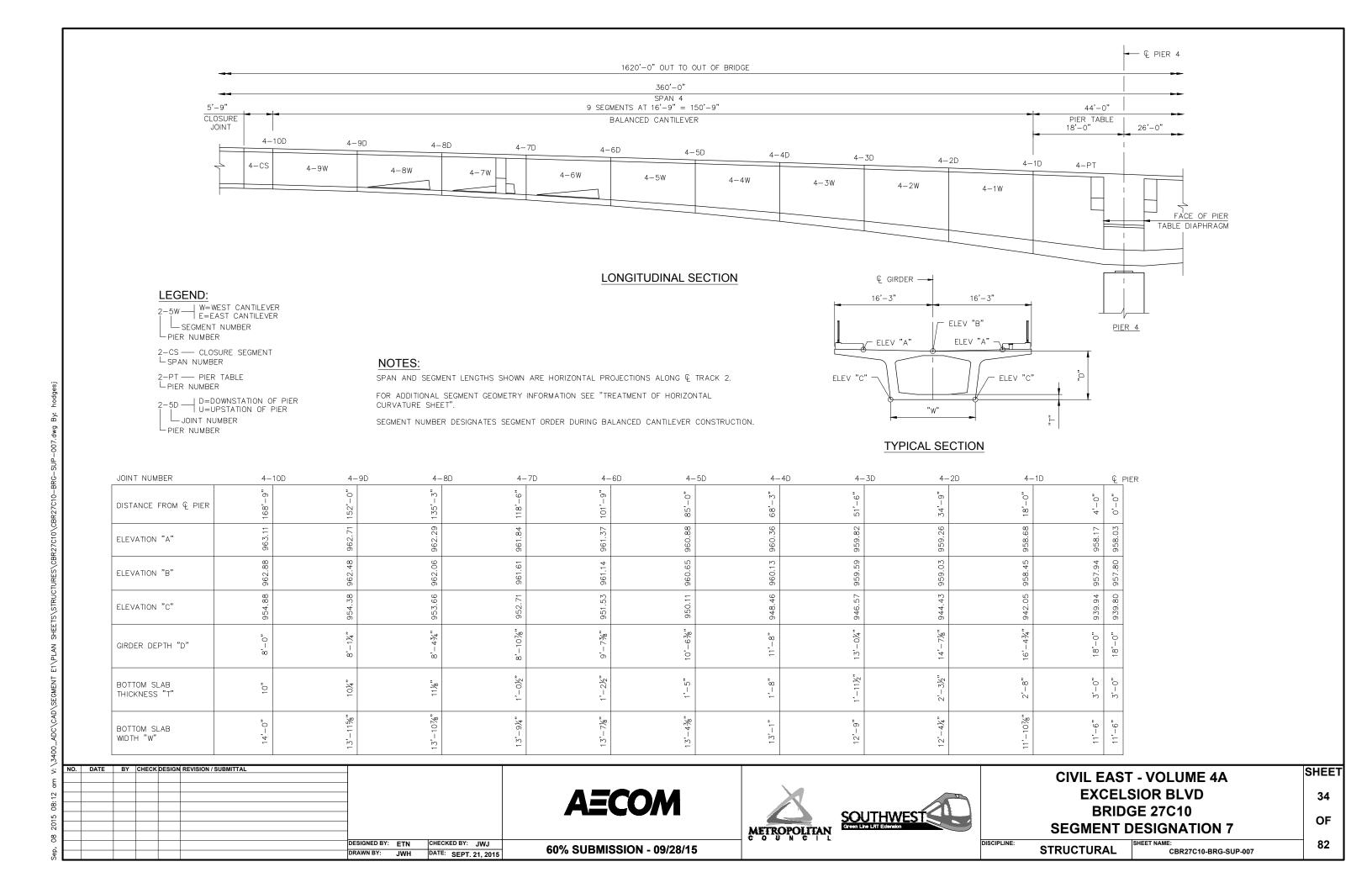


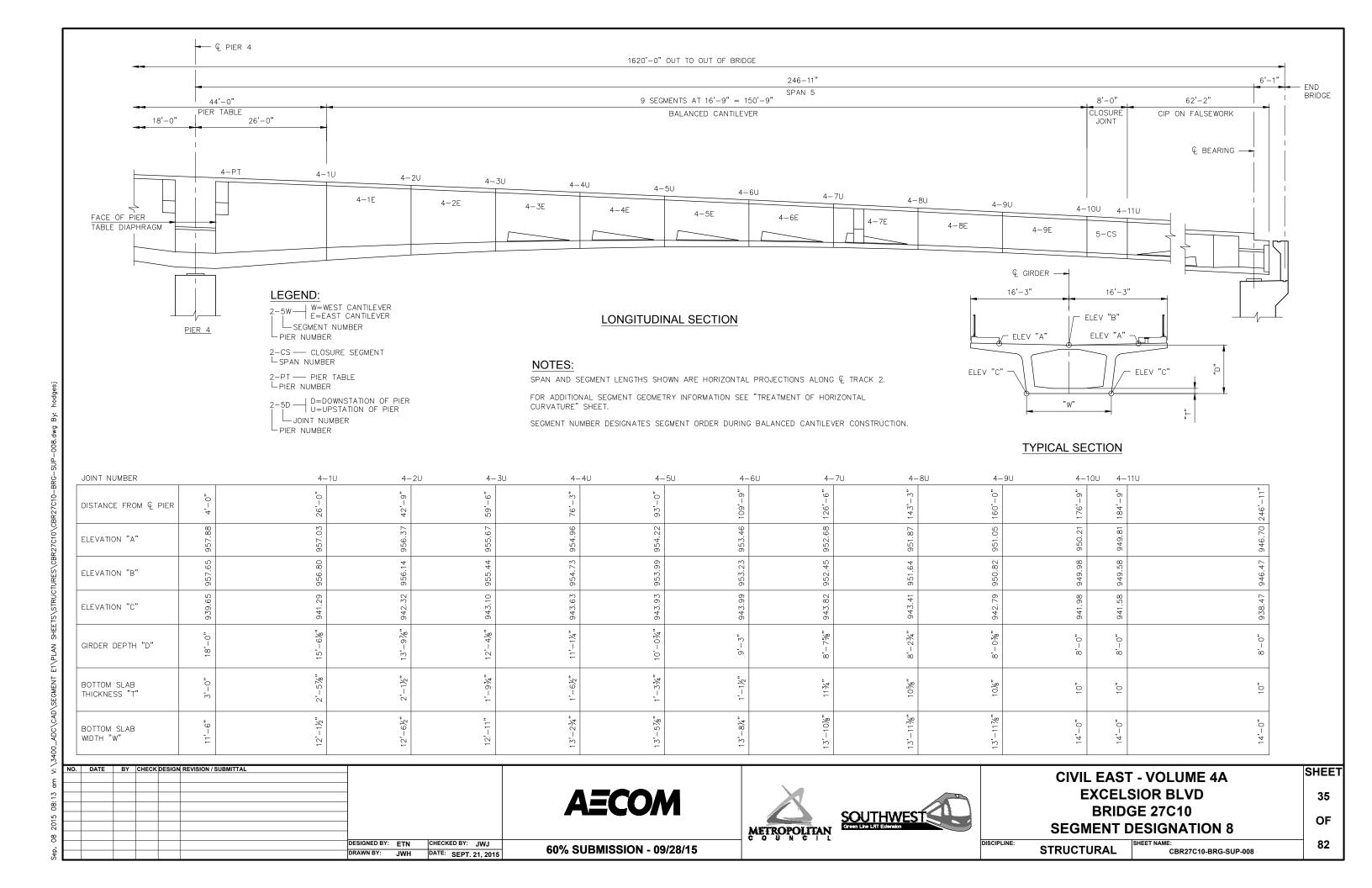




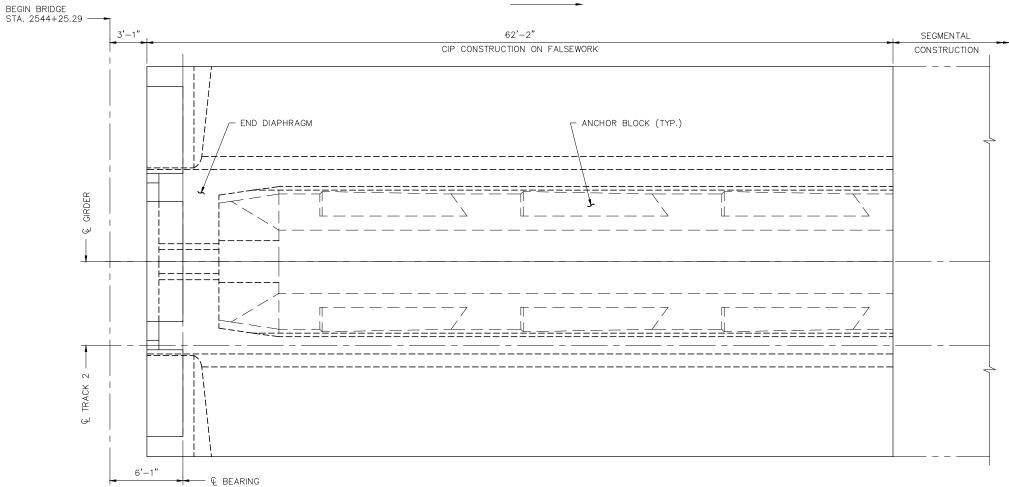








UPSTATION



## PARTIAL PLAN

(SPAN 1 SHOWN, SPAN 5 SIMILAR)

## NOTES:

FOR END DIAPHRAGM DIMENSIONS SEE "END DIAPHRAGM DETAILS" SHEET.

FOR BOTTOM SLAB ANCHOR BLOCK DIMENSIONS SEE "BOTTOM SLAB ANCHOR BLOCK DETAILS" SHEET.

NO.	DAIL	61	CHECK	DESIGN	REVISION / SUBMITTAL				
						DESIGNED BY:		CHECKED BY: JWJ	
						DRAWN BY:	JWH	DATE: SEPT. 21, 201	5

**AECOM** 

60% SUBMISSION - 09/28/15





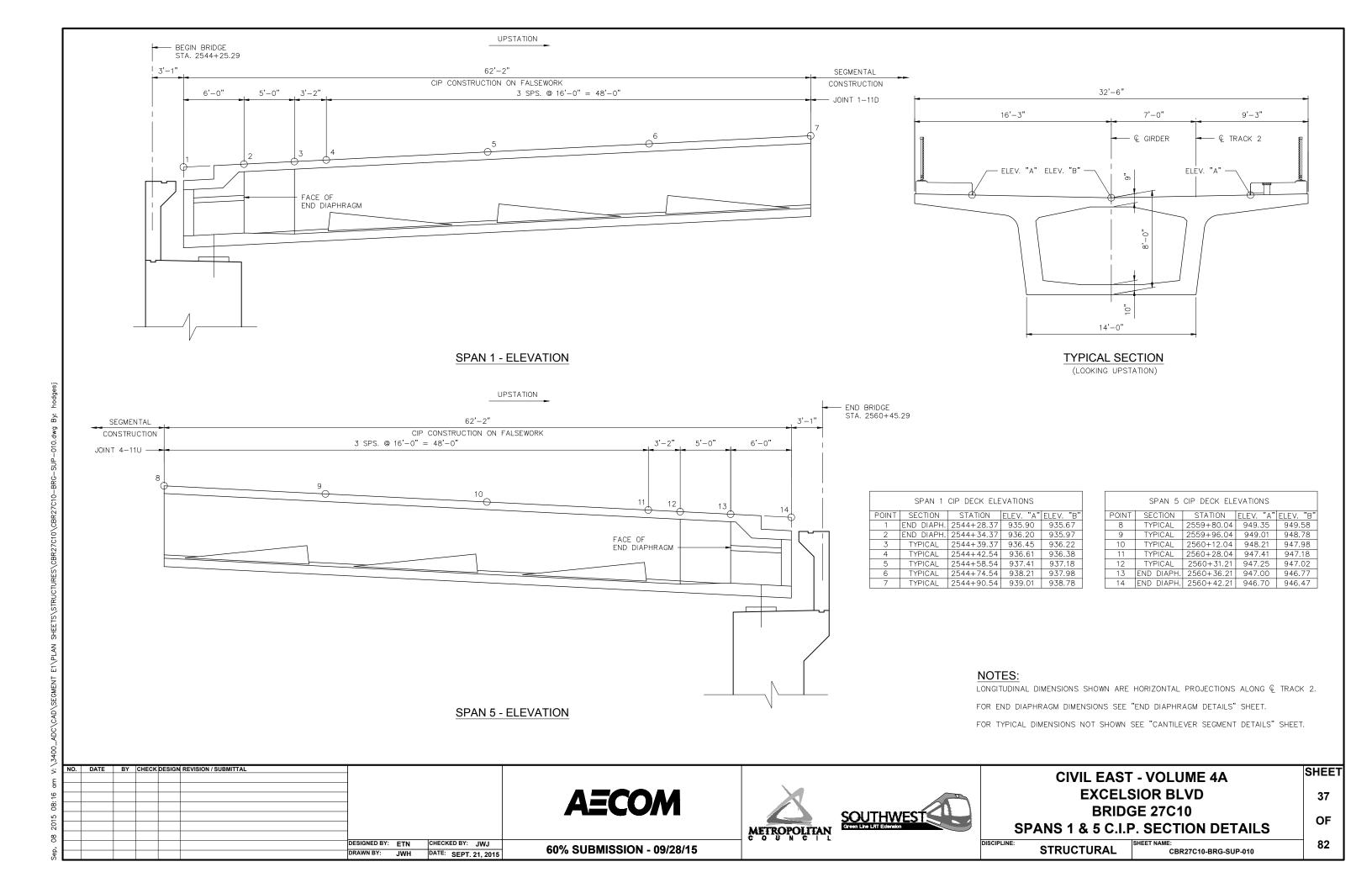
CIVIL EAST - VOLUME 4A
EXCELSIOR BLVD
BRIDGE 27C10
SPANS 1 & 5 C.I.P. FRAMING PLAN

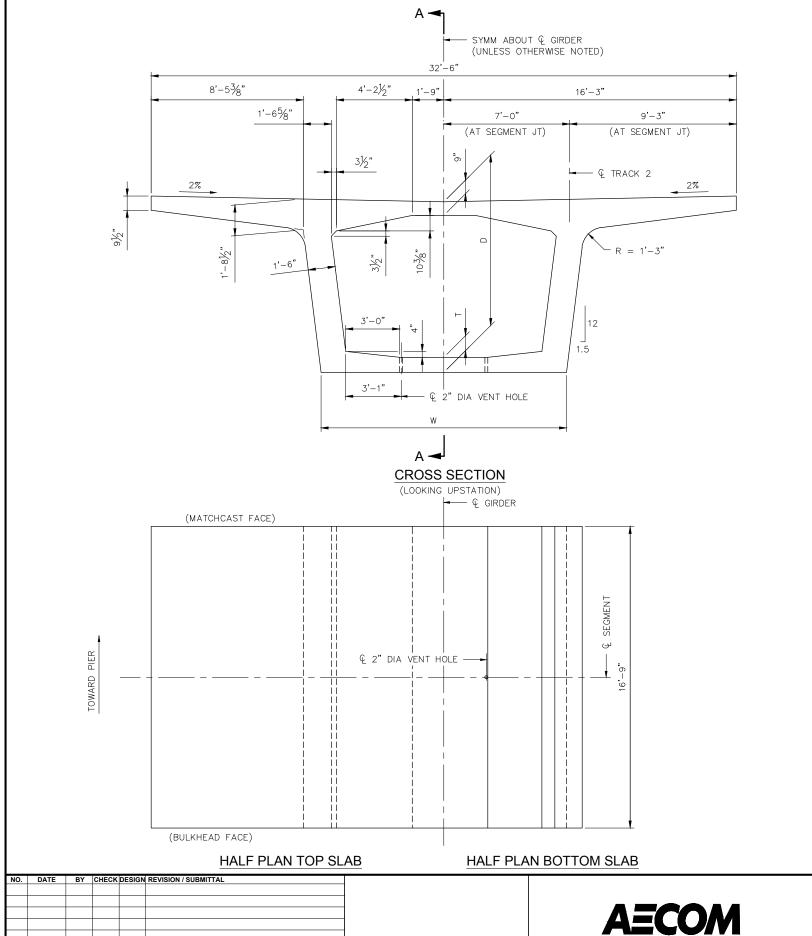
DISCIPLINE: STRUCTURAL SHEET NAME: CBR27C10-BRG-SUP-009

BRG-SUP-009 82

SHEET

OF

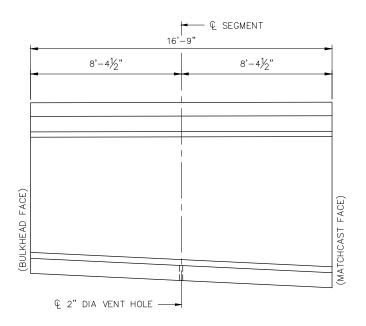




DESIGNED BY: ETN CHECKED BY: JWJ

DRAWN BY: JWH DATE: SEPT. 21, 2015

TOWARD PIER



## **SECTION A-A**

# NOTES:

FOR VARYING DIMENSIONS D, T, AND W SEE "SEGMENT DESIGNATION" SHEETS, SEGMENT JOINTS ARE TRUE VERTICAL.

ALL TRANSVERSE DIMENSIONS ARE MEASURED PERPENDICULAR TO  $\mathbb{Q}$  GIRDER.

LONGITUDINAL SEGMENT DIMENSIONS ARE HORIZONTAL PROJECTIONS ALONG  $\mathbb Q$  TRACK 2.



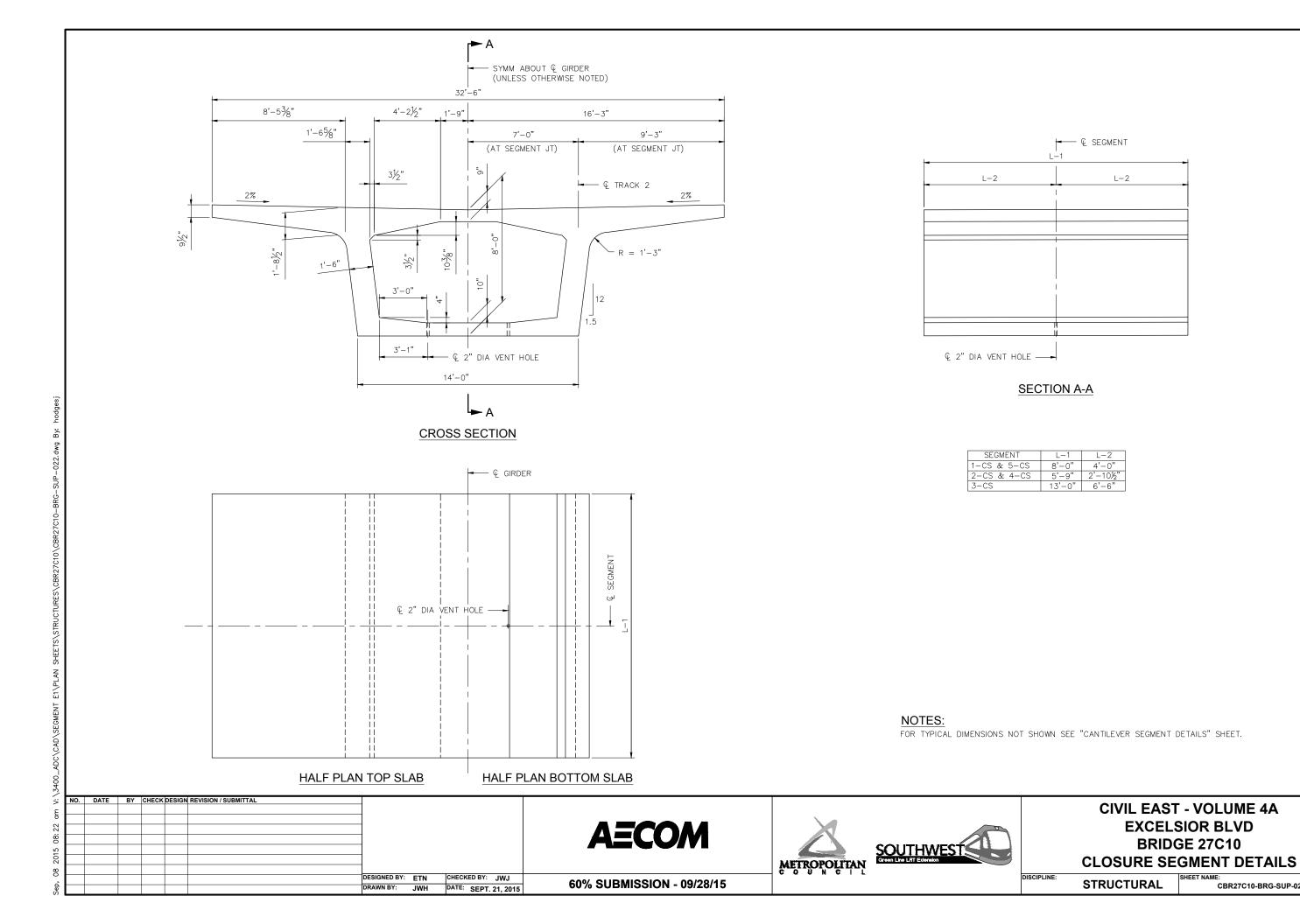
**CIVIL EAST - VOLUME 4A EXCELSIOR BLVD BRIDGE 27C10 CANTILEVER SEGMENT DETAILS**  SHEET

OF

82

DISCIPLINE: **STRUCTURAL** CBR27C10-BRG-SUP-017

60% SUBMISSION - 09/28/15

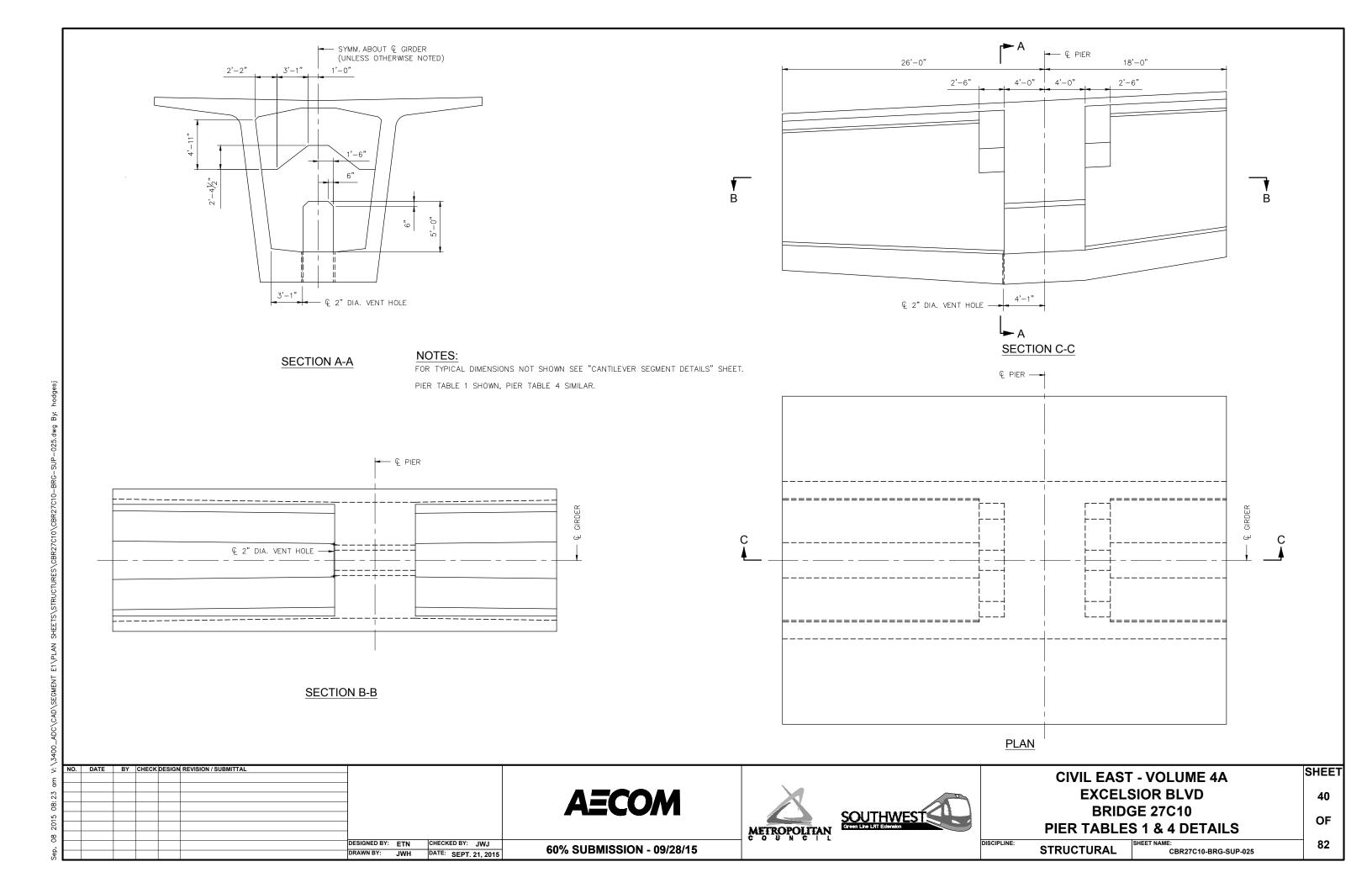


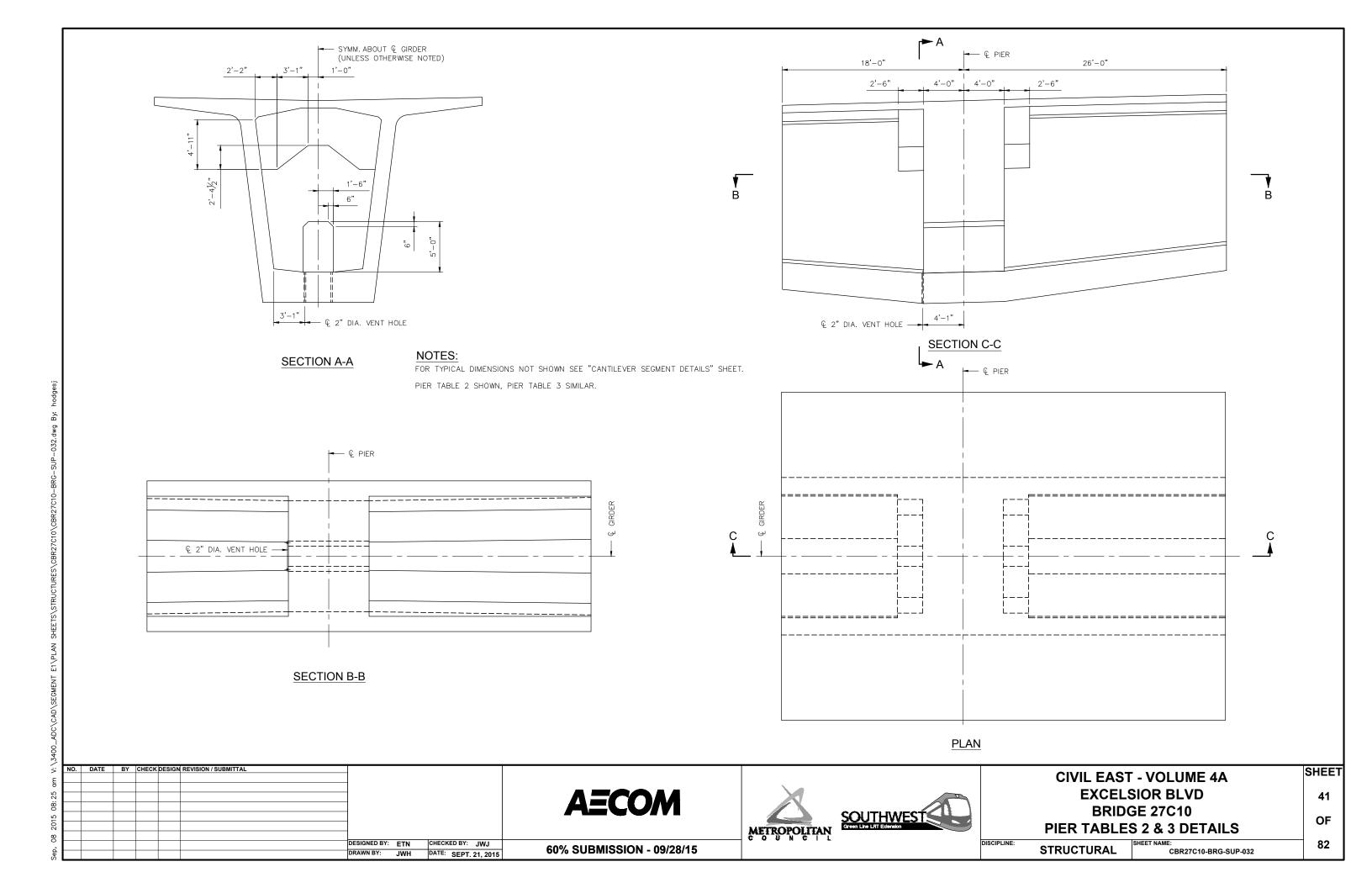
SHEET

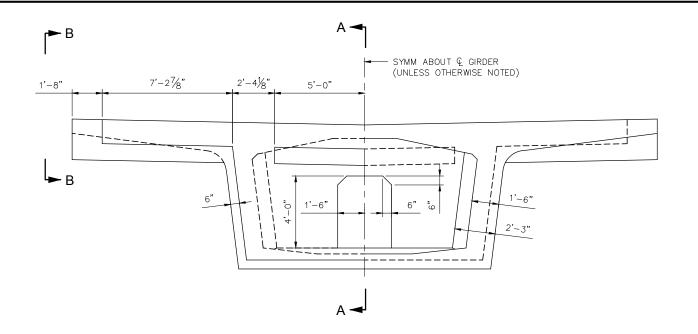
OF

82

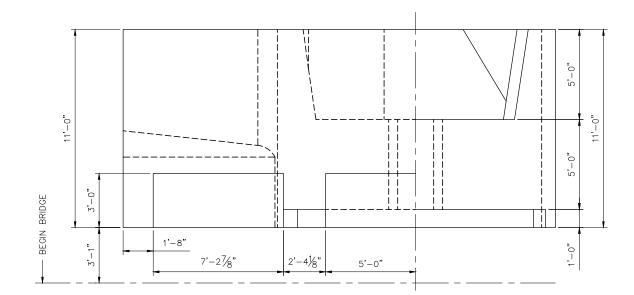
CBR27C10-BRG-SUP-022





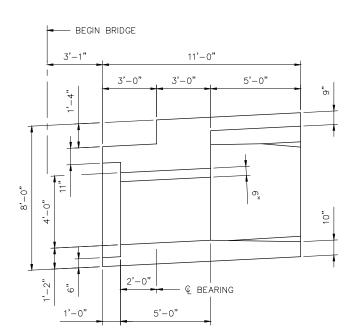


CROSS SECTION **EXPANSION JOINT FACE**  **CROSS SECTION** TYPICAL FACE

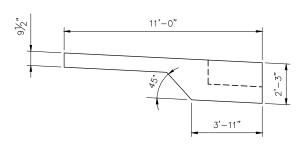


HALF PLAN TOP SLAB

HALF PLAN BOTTOM SLAB



## **SECTION A-A**



VIEW B-B

## NOTES:

FOR TYPICAL DIMENSIONS NOT SHOWN SEE "CANTILEVER SEGMENT DETAILS" SHEET. END DIAPHRAGM AT BEGIN BRIDGE SHOWN. DIAPHRAGM AT END BRIDGE SIMILAR.

DESIGNED BY: ETN CHECKED BY: JWJ DRAWN BY: JWH DATE: SEPT. 21, 2015

**AECOM** 

60% SUBMISSION - 09/28/15





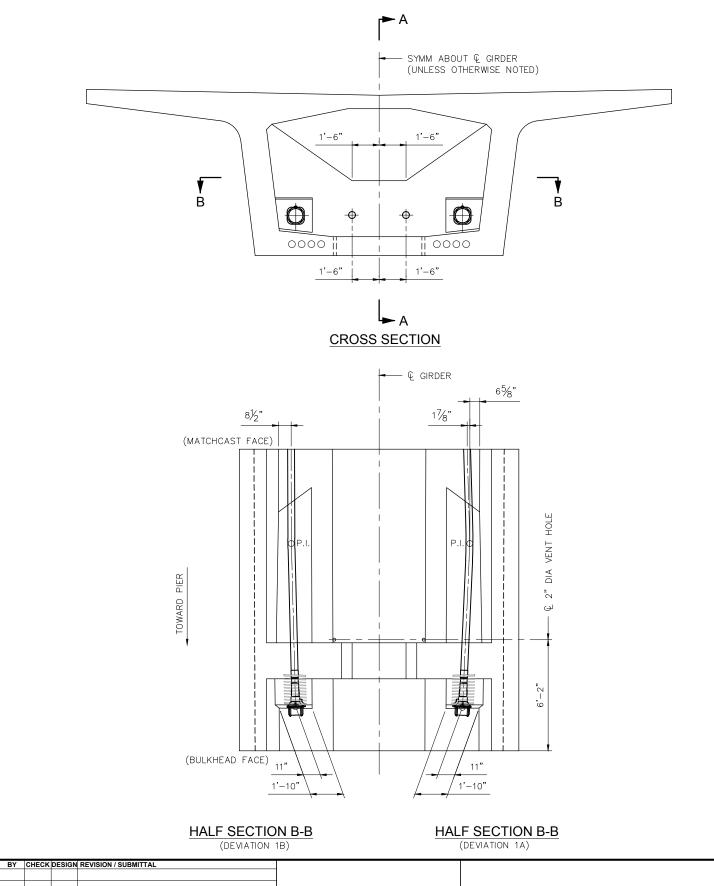
**CIVIL EAST - VOLUME 4A EXCELSIOR BLVD BRIDGE 27C10 END DIAPHRAGM DETAILS** 

OF

SHEET

82

**STRUCTURAL** CBR27C10-BRG-SUP-039



DESIGNED BY: ETN CHECKED BY: JWJ

DRAWN BY: JWH DATE: SEPT. 21, 2015

TOWARD PIER 13/4" 13/4" | ¥ ¬ R=40'-0" MIN. \* TOP OF BLISTER TO BE PARALLEL TO THE TOP OF BOTTOM SLAB 9'-0" 2'-6"

## SECTION A-A

## NOTES:

SOUTHWEST Green Line Little Extension

METROPOLITAN

FOR TYPICAL DIMENSIONS NOT SHOWN SEE "CANTILEVER SEGMENT DETAILS" SHEET. SPIRAL REINFORCEMENT SHALL BE DETERMINED BY THE POST-TENSIONING SUPPLIER. FOR LOCATION OF TYPE I DEVIATION RIBS SEE "CONTINUITY POST—TENSIONING LAYOUT" SHEETS.

**CIVIL EAST - VOLUME 4A EXCELSIOR BLVD BRIDGE 27C10 TYPE I DEVIATION RIB DETAILS** 

**STRUCTURAL** 

CBR27C10-BRG-SUP-045

DISCIPLINE:

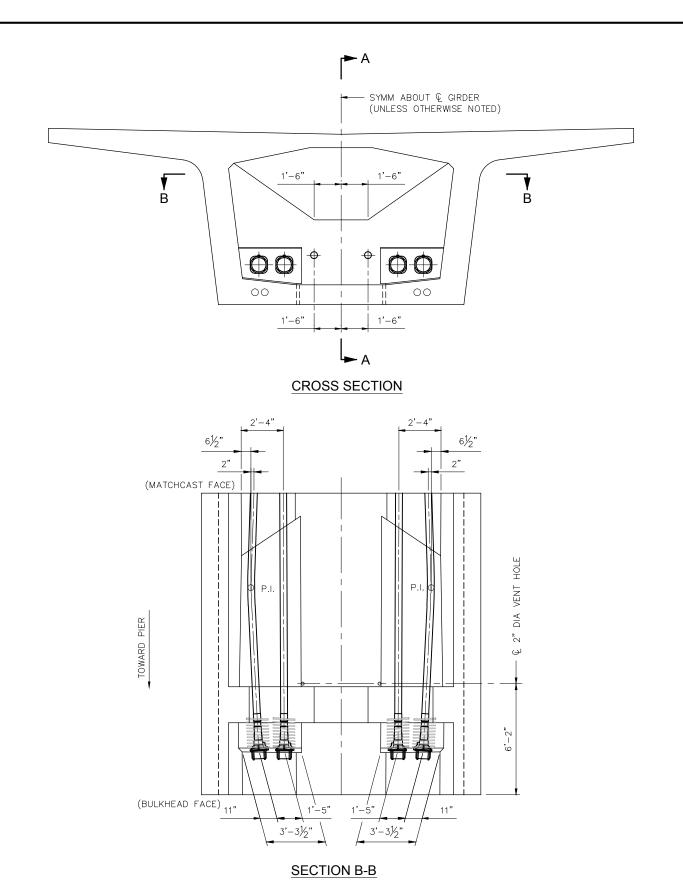
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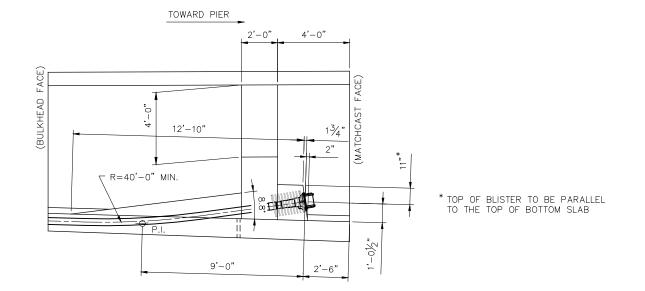
OF

82

**AECOM** 

60% SUBMISSION - 09/28/15





## SECTION A-A

#### NOTES:

FOR TYPICAL DIMENSIONS NOT SHOWN SEE "CANTILEVER SEGMENT DETAILS" SHEET. SPIRAL REINFORCEMENT SHALL BE DETERMINED BY THE POST-TENSIONING SUPPLIER. FOR LOCATION OF TYPE II DEVIATION RIBS SEE "CONTINUITY POST-TENSIONING LAYOUT" SHEETS.

DESIGNED BY: ETN CHECKED BY: JWJ DATE: SEPT. 21, 2015

**AECOM** 

60% SUBMISSION - 09/28/15





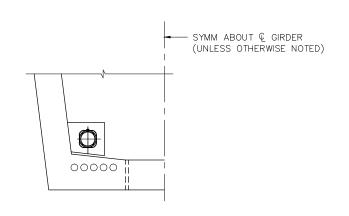
**CIVIL EAST - VOLUME 4A EXCELSIOR BLVD BRIDGE 27C10 TYPE II DEVIATION RIB DETAILS** 

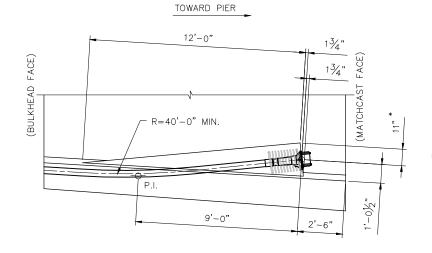
**STRUCTURAL** 

82 CBR27C10-BRG-SUP-048

SHEET

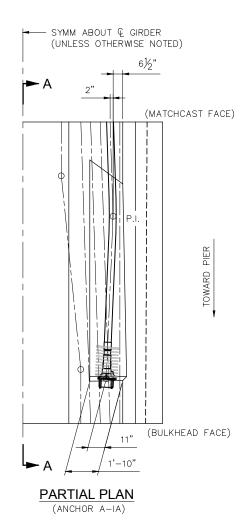
OF

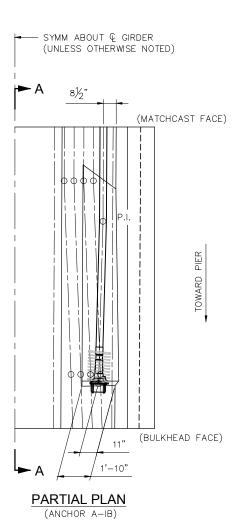




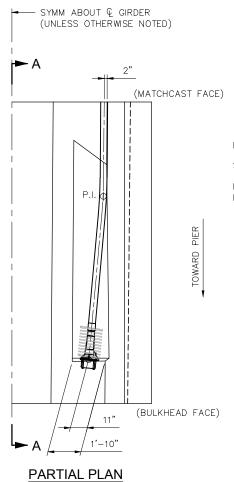
\* TOP OF BLISTER TO BE PARALLEL TO THE TOP OF BOTTOM SLAB

## PARTIAL CROSS SECTION





# **SECTION A-A**



#### NOTES:

FOR TYPICAL DIMENSIONS NOT SHOWN SEE "CANTILEVER SEGMENT DETAILS" SHEET.

SPIRAL REINFORCEMENT SHALL BE DETERMINED BY THE POST-TENSIONING SUPPLIER.

FOR LOCATION OF BOTTOM SLAB ANCHOR BLOCKS SEE "CONTINUITY POST-TENSIONING LAYOUT" SHEETS.

D. DATE BY CHECK DESIGN REVISION / SUBMITTAL

DESIGNED BY: ETN CHECKED BY: JWJ

DRAWN BY: JWH DATE: SEPT. 21, 2015

**AECOM** 

METROPOLITAN WETROPOLITAN



(ANCHOR A-IC)

CIVIL EAST - VOLUME 4A

EXCELSIOR BLVD

BRIDGE 27C10

BOTTOM SLAB ANCHOR BLOCK DETAILS 1

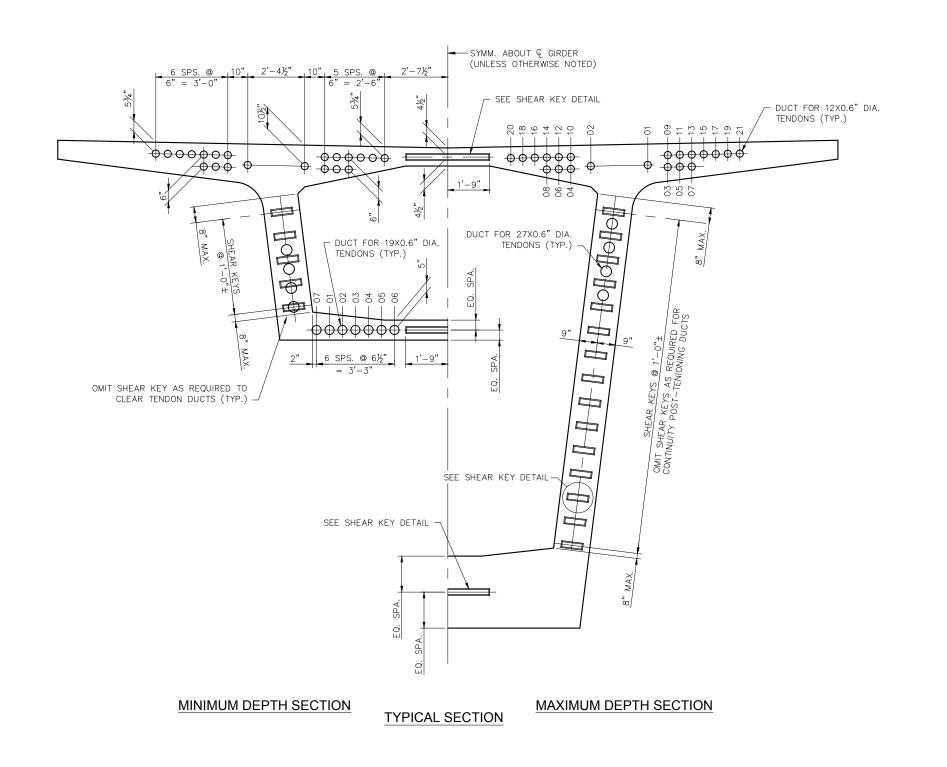
STRUCTURAL SHEET NAME: CBR27C10-BRG-SUP-051

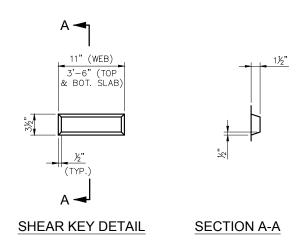
OF RG-SUP-051 OF 82

SHEET

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60% SUBMISSION - 09/28/15





# NOTES:

FOR SEGMENT DIMENSIONS SEE "CANTILEVER SEGMENT DETAILS"

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				DRAWN BY:	JWH	DATE: SEPT. 21, 2015	i

**AECOM** 

60% SUBMISSION - 09/28/15





CIVIL EAST - VOLUME 4A
<b>EXCELSIOR BLVD</b>
BRIDGE 27C10 (LRT)
BUI KHEAD DETAILS

OF 82

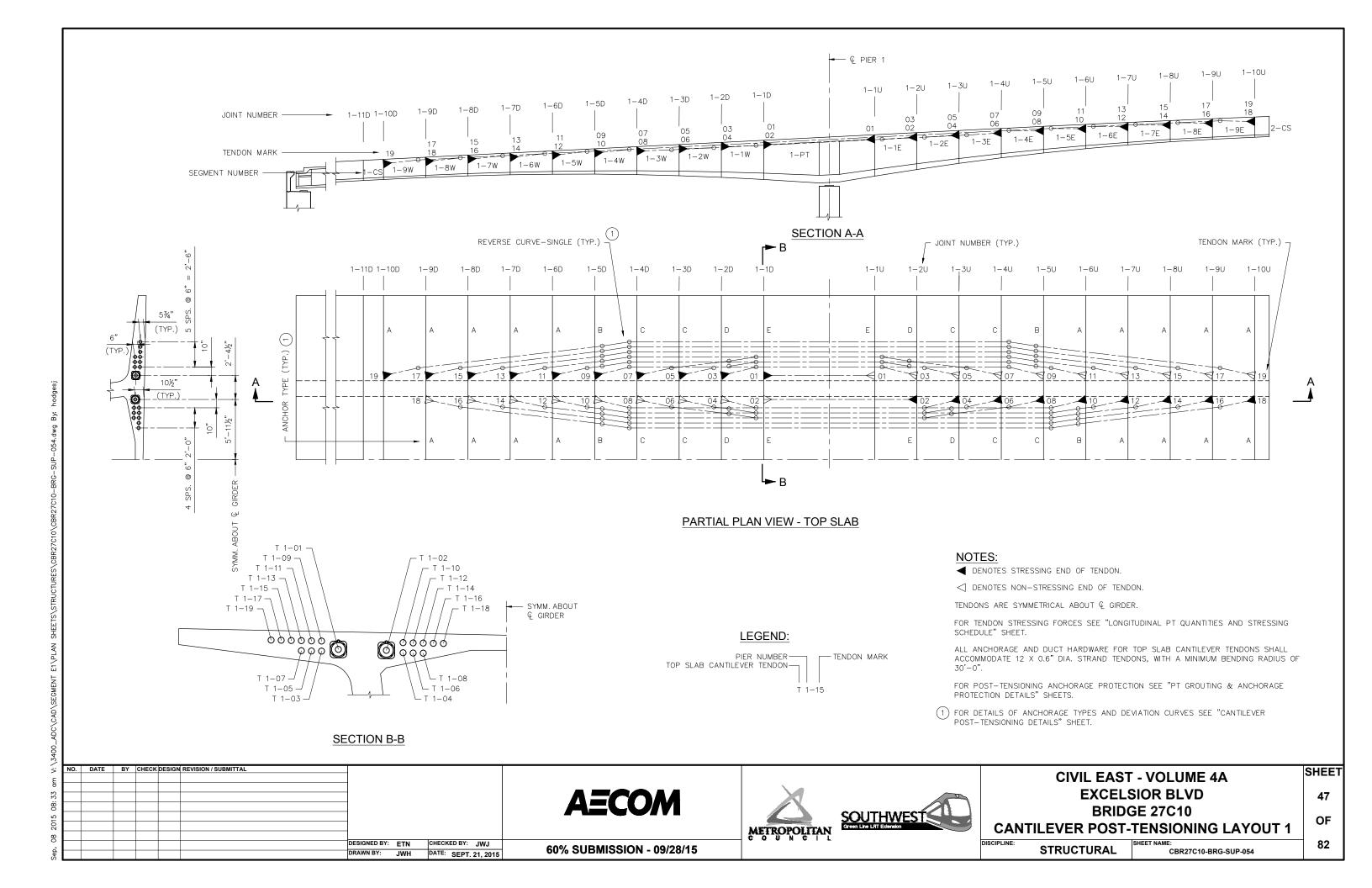
SHEET

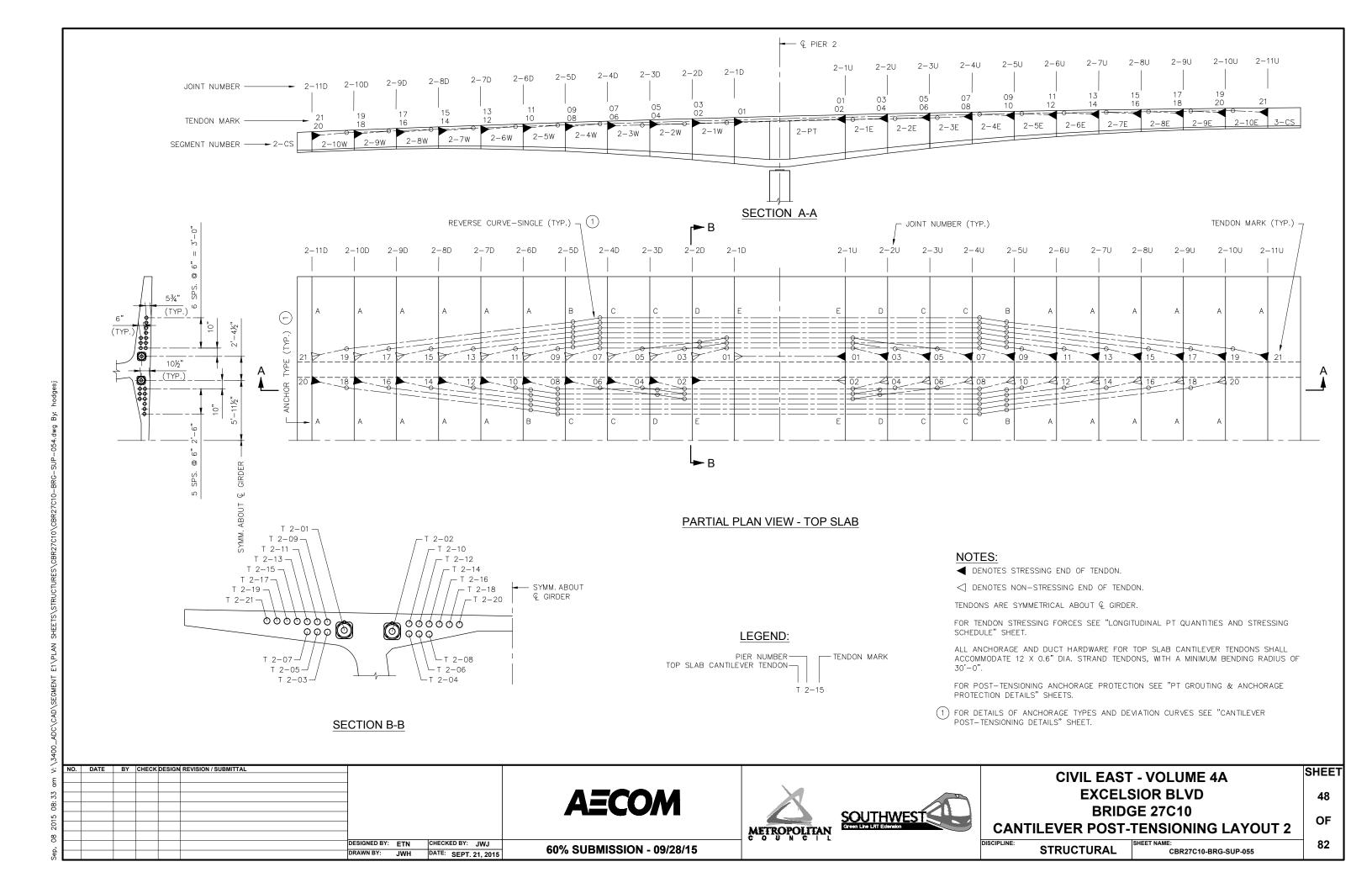
46

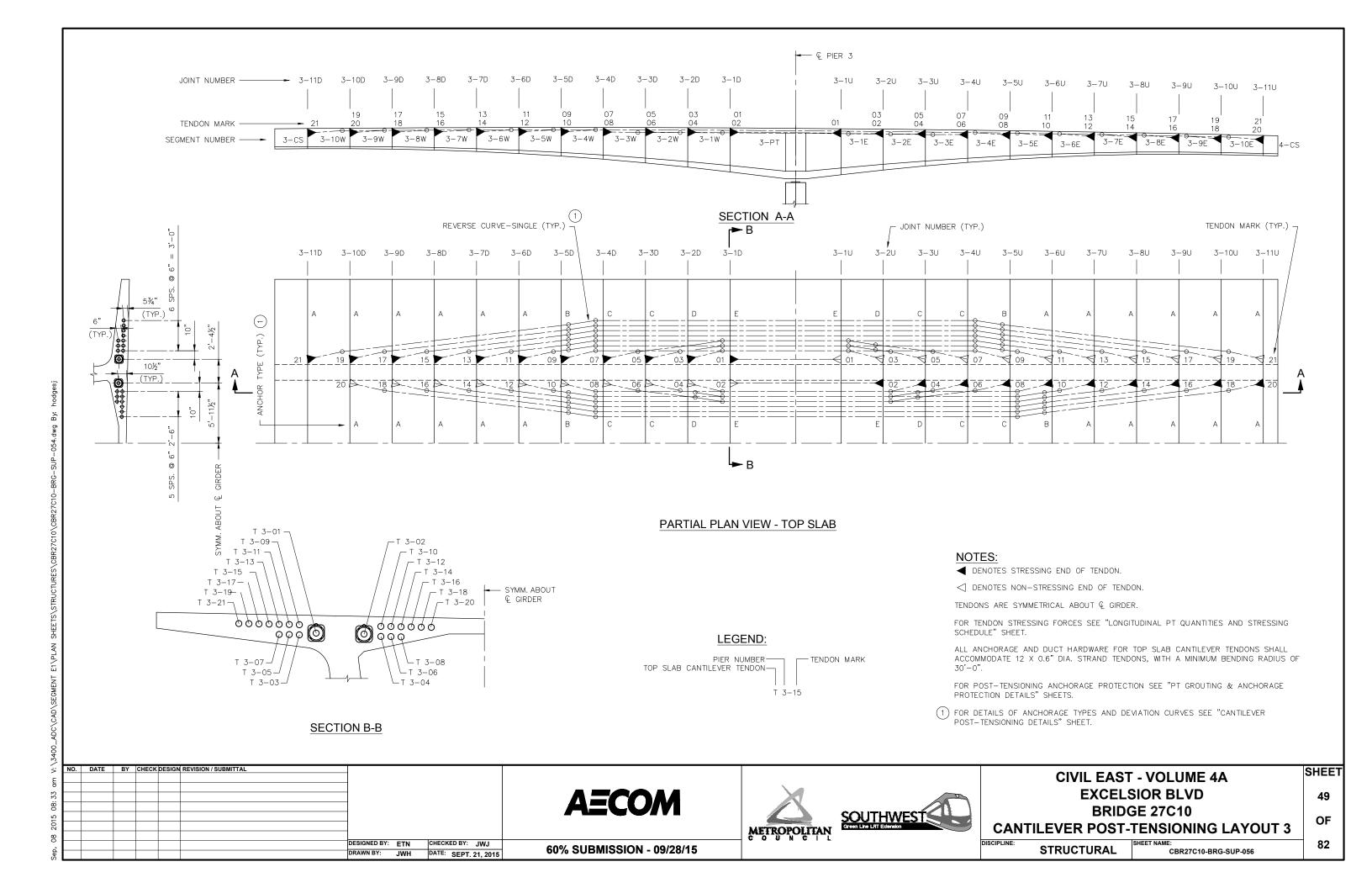
DISCIPLINE: **STRUCTURAL** 

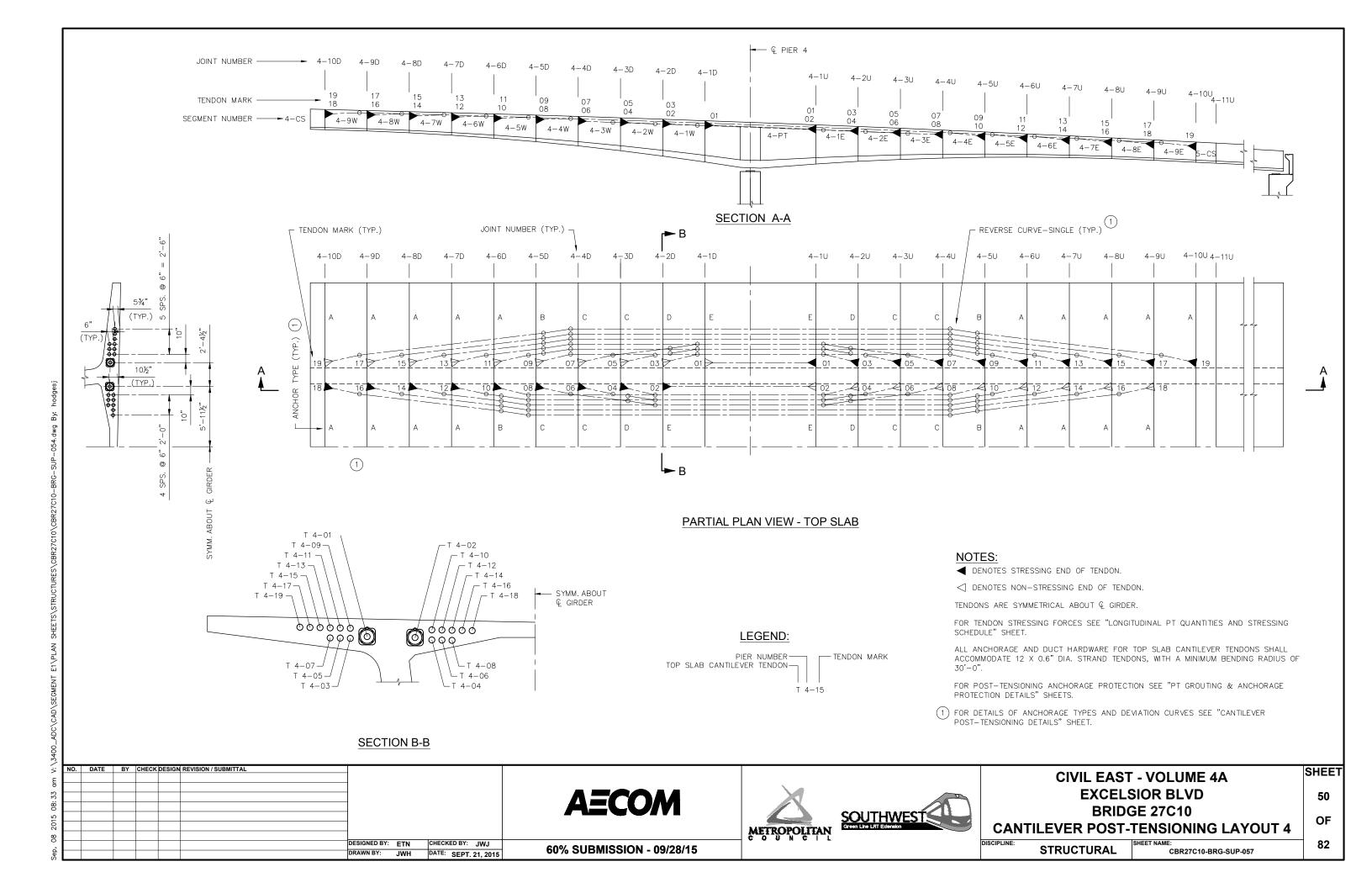
CBR27C10-BRG-SUP-053

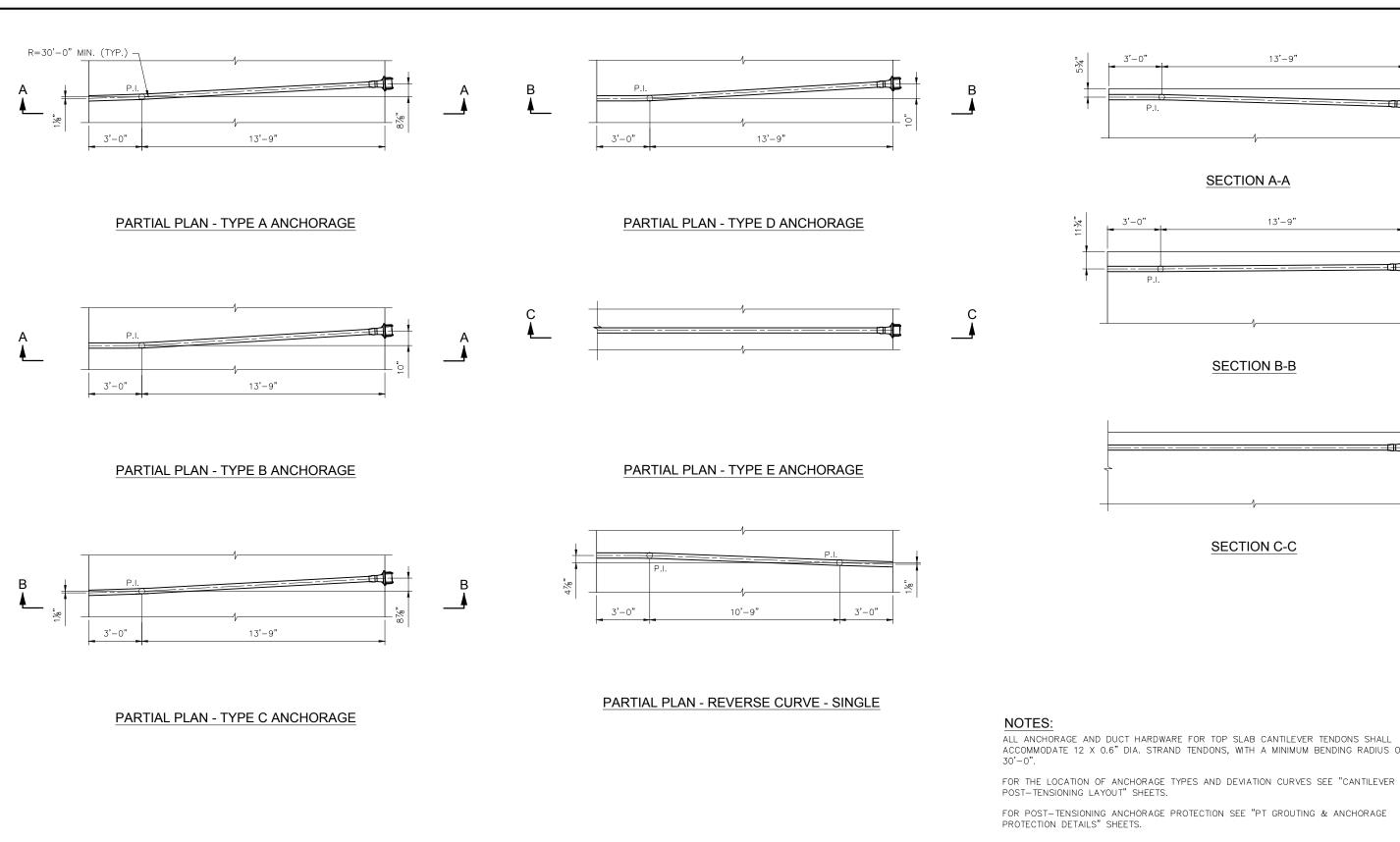
NO. DATE BY CHECK DESIGN REVISION / SUBMITTAL











ALL ANCHORAGE AND DUCT HARDWARE FOR TOP SLAB CANTILEVER TENDONS SHALL ACCOMMODATE 12 X 0.6" DIA. STRAND TENDONS, WITH A MINIMUM BENDING RADIUS OF

Ē							
54							
90							
2							
50.							
8							
-				DESIGNED BY:		CHECKED BY: JWJ	
Sep,				DRAWN BY:	JWH	DATE: SEPT. 21, 2015	

NO. DATE BY CHECK DESIGN REVISION / SUBMITTAL

**AECOM** 

60% SUBMISSION - 09/28/15





# **CIVIL EAST - VOLUME 4A EXCELSIOR BLVD BRIDGE 27C10 CANTILEVER POST-TENSIONING DETAILS**

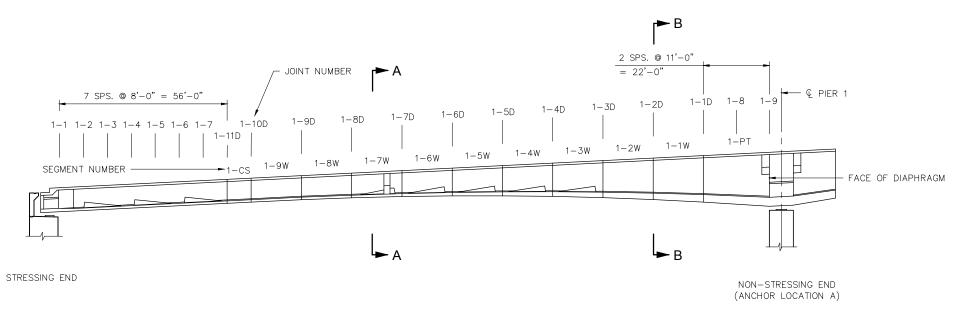
**STRUCTURAL** 

CBR27C10-BRG-SUP-058

OF 82

SHEET

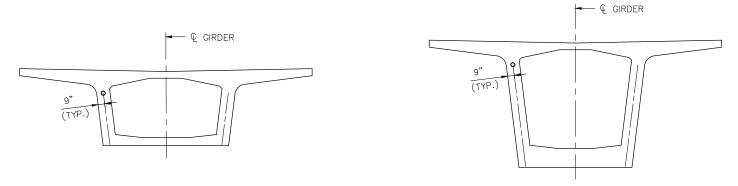
51



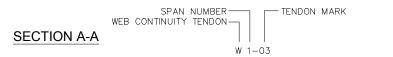
## **ELEVATION**

	ANCHOR	1-1	1-2	1-3	1-4	1-5	1-6	1-7	1-11D	1-10D	MID. SEGM.	1-9D	MID. SEGM.	1-8D	MID. SEGM.	1-7D	MID. SEGM.	1-6D	MID. SEGM.	1-5D	MID. SEGM.	1-4D	MID. SEGM.	1-3D	MID. SEGM.	1-2D
W 1-01	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"
W 1-02	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"
W 1-03	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"

	MID. SEGM.	1-1D	1-8	1-9	ANCHOR
W 1-01	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"
W 1-02	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"
W 1-03	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"



## LEGEND:



# SECTION B-B

## NOTES:

DIMENSIONS IN TABLE ARE VERTICAL DISTANCES FROM BOTTOM OF GIRDER TO  $\mathbb Q$  OF TENDON DUCTS AT SECTION JOINTS, MID-POINTS BETWEEN SECTIONS AND DIMENSIONED LOCATIONS.

ALL ANCHORAGE AND DUCT HARDWARE FOR WEB CONTINUITY TENDONS SHALL ACCOMMODATE 27 X 0.6" DIA. STRAND TENDONS.

FOR DETAILS OF ANCHORAGES AT END DIAPHRAGM SEE "END DIAPHRAGM POST-TENSIONING DETAILS" SHEET.

FOR TENDON STRESSING FORCES SEE "LONGITUDINAL PT QUANTITIES AND STRESSING SCHEDULE" SHEET.

FOR POST-TENSIONING ANCHORAGE PROTECTION SEE "PT GROUTING & ANCHORAGE PROTECTION DETAILS" SHEETS.

FOR FUTURE POST-TENSIONING LAYOUT SEE "FUTURE POST-TENSIOINING LAYOUT" SHEETS.

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL				П
						DESIGNED BY:	ETN	CHECKED BY: JWJ	T
						DRAWN BY:	JWH	DATE: SEPT. 21, 2015	1

**AECOM** 

60% SUBMISSION - 09/28/15

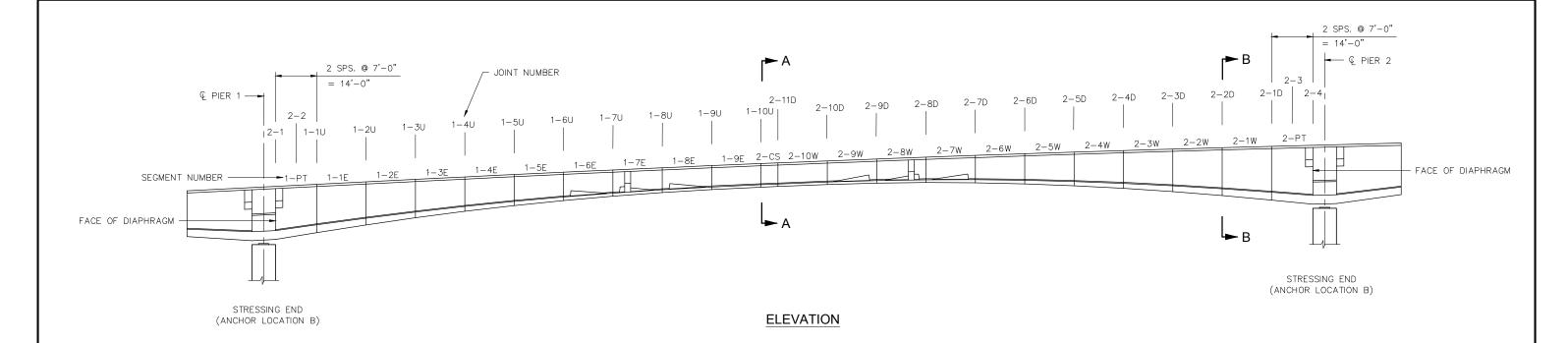




CIVIL EAST - VOLUME 4A
EXCELSIOR BLVD
BRIDGE 27C10
CONTINUITY WEB P.T. LAYOUT 1

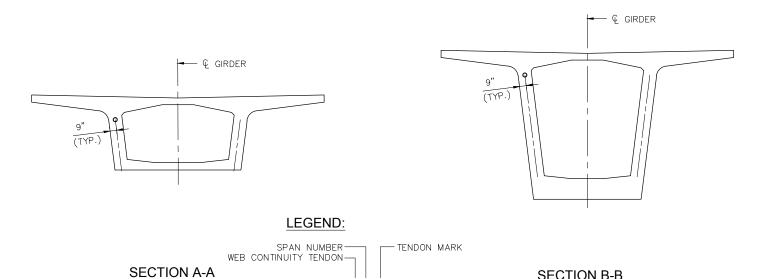
DISCIPLINE: STRUCTURAL SHEET NAME: CBR27C10-BRG-SUP-059

OF 82



	ANCHOR	2-1	2-2	1-1U	MID. SEGM.	1-2U					MID. SEGM.										1			I		
W 2-01	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"
W 2-02	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"
W 2-03	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"
W 2-04	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"

	2-9D	MID. SEGM.	2-8D	MID. SEGM.	2-7D	MID. SEGM.	2-6D	MID. SEGM.	2-5D	MID. SEGM.	2-4D	MID. SEGM.	2-3D	MID. SEGM.	2-2D	MID. SEGM.	2-1D	2-3	2-4	ANCHOR
W 2-01	X'-X"	x'-x"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	x'-x"	X'-X"	x'-x"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"
W 2-02	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	x'-x"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"
W 2-03	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	x'-x"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"
W 2-04	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"



W 2-03

## NOTES:

DIMENSIONS IN TABLE ARE VERTICAL DISTANCES FROM BOTTOM OF GIRDER TO & OF TENDON DUCTS AT SECTION JOINTS, MID-POINTS BETWEEN SECTIONS AND DIMENSIONED LOCATIONS.

ALL ANCHORAGE AND DUCT HARDWARE FOR WEB CONTINUITY TENDONS SHALL ACCOMMODATE 27 X 0.6" DIA. STRAND TENDONS.

FOR DETAILS OF ANCHORAGES AT END DIAPHRAGM SEE "END DIAPHRAGM POST-TENSIONING DETAILS" SHEET.

FOR TENDON STRESSING FORCES SEE "LONGITUDINAL PT QUANTITIES AND STRESSING

FOR POST-TENSIONING ANCHORAGE PROTECTION SEE "PT GROUTING & ANCHORAGE PROTECTION DETAILS" SHEETS.

FOR FUTURE POST-TENSIONING LAYOUT SEE "FUTURE POST-TENSIONING LAYOUT" SHEETS.

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-							DRAWN BY:	JWH	DATE: SEPT. 21, 2015	

**AECOM** 

60% SUBMISSION - 09/28/15

SECTION B-B

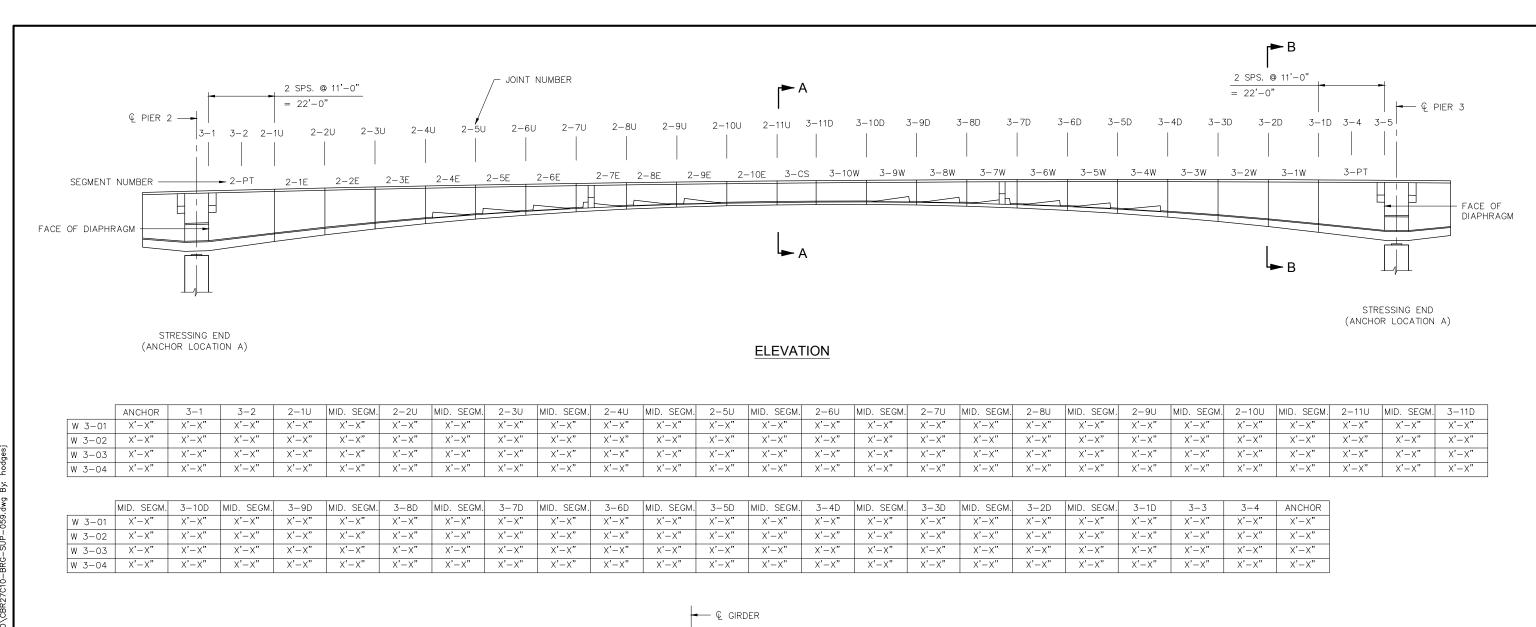


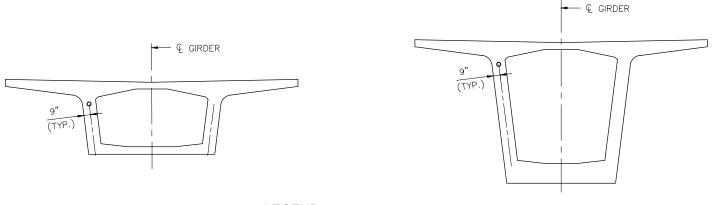


**CIVIL EAST - VOLUME 4A EXCELSIOR BLVD BRIDGE 27C10 CONTINUITY WEB P.T. LAYOUT 2** 

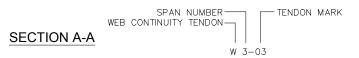
DISCIPLINE: **STRUCTURAL** CBR27C10-BRG-SUP-060

OF 82





# LEGEND:



# SECTION B-B

#### NOTES:

DIMENSIONS IN TABLE ARE VERTICAL DISTANCES FROM BOTTOM OF GIRDER TO  $\P$  OF TENDON DUCTS AT SECTION JOINTS, MID-POINTS BETWEEN SECTIONS AND DIMENSIONED LOCATIONS.

ALL ANCHORAGE AND DUCT HARDWARE FOR WEB CONTINUITY TENDONS SHALL ACCOMMODATE  $27 \times 0.6$ " DIA. STRAND TENDONS.

FOR DETAILS OF ANCHORAGES AT END DIAPHRAGM SEE "END DIAPHRAGM POST-TENSIONING DETAILS" SHEET.

FOR TENDON STRESSING FORCES SEE "LONGITUDINAL PT QUANTITIES AND STRESSING SCHEDULE" SHEET.

FOR POST-TENSIONING ANCHORAGE PROTECTION SEE "PT GROUTING & ANCHORAGE PROTECTION DETAILS" SHEETS.

FOR FUTURE POST-TENSIONING LAYOUT SEE "FUTURE POST-TENSIONING LAYOUT" SHEETS.

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**AECOM** 

60% SUBMISSION - 09/28/15

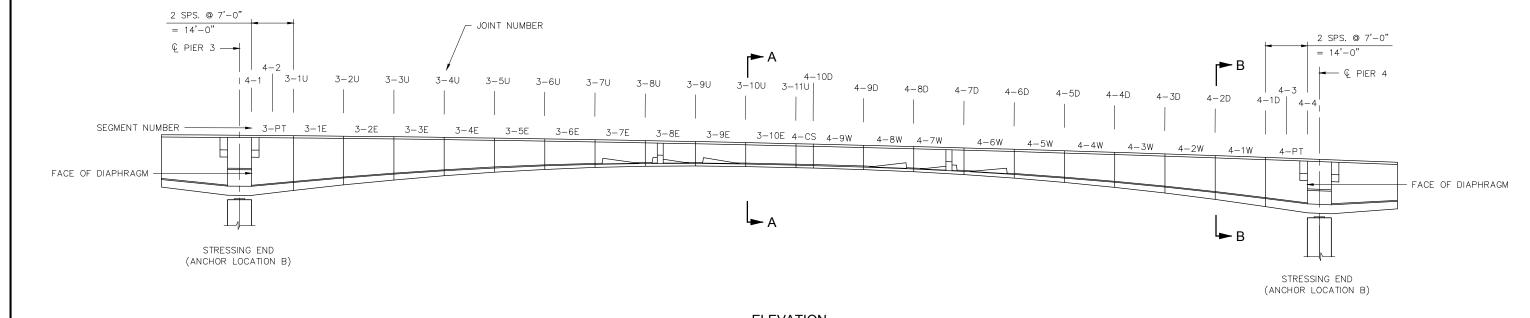




CIVIL EAST - VOLUME 4A
EXCELSIOR BLVD
BRIDGE 27C10
CONTINUITY WEB P.T. LAYOUT 3

DISCIPLINE: STRUCTURAL SHEET NAME: CBR27C10-BRG-SUP-061

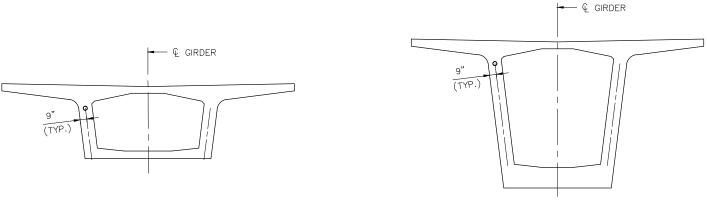
OF 82



## **ELEVATION**

	ANCHOR	4-1	4-2	3-1U	MID. SEGM.	3-2U	MID. SEGM.	3-3U	MID. SEGM.	3-4U	MID. SEGM.	3-5U	MID. SEGM.	3-6U	MID. SEGM.	3-7U	MID. SEGM.	3-8U	MID. SEGM.	3-9U	MID. SEGM.	3-10U	MID. SEGM.	3-11U	4-10D	MID. SEGM.
W 4-01	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	x'-x"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	x'-x"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"
W 4-02	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	x'-x"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	x'-x"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"
W 4-03	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	x'-x"	X'-X"	x'-x"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	x'-x"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"
W 4-04	X'-X"	X'-X"	X'-X"	x'-x"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	x'-x"	X'-X"	X'-X"	X'-X"	X'-X"	x'-x"

	4-9D	MID. SEGM.	4-8D	MID. SEGM.	4-7D	MID. SEGM.	4-6D	MID. SEGM.	4-5D	MID. SEGM.	4-4D	MID. SEGM.	4-3D	MID. SEGM.	4-2D	MID. SEGM.	4-1D	4-3	4-4	ANCHOR
W 4-01	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	x'-x"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"
W 4-02	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"
W 4-03	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	x'-x"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"
W 4-04	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"



# LEGEND:

SECTION A-A

WEB CONTINUITY TENDON

WEB CONTINUITY TENDON

W 4-03

SECTION B-B

## NOTES:

DIMENSIONS IN TABLE ARE VERTICAL DISTANCES FROM BOTTOM OF GIRDER TO  $\mathbb Q$  OF TENDON DUCTS AT SECTION JOINTS, MID-POINTS BETWEEN SECTIONS AND DIMENSIONED LOCATIONS.

ALL ANCHORAGE AND DUCT HARDWARE FOR WEB CONTINUITY TENDONS SHALL ACCOMMODATE 27 X 0.6" DIA. STRAND TENDONS.

FOR DETAILS OF ANCHORAGES AT END DIAPHRAGM SEE "END DIAPHRAGM POST-TENSIONING DETAILS" SHEET.

FOR TENDON STRESSING FORCES SEE "LONGITUDINAL PT QUANTITIES AND STRESSING SCHEDULE" SHEET.

FOR POST-TENSIONING ANCHORAGE PROTECTION SEE "PT GROUTING & ANCHORAGE PROTECTION DETAILS" SHEETS.

FOR FUTURE POST-TENSIONING LAYOUT SEE "FUTURE POST-TENSIOINING LAYOUT" SHEETS.

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**AECOM** 

60% SUBMISSION - 09/28/15

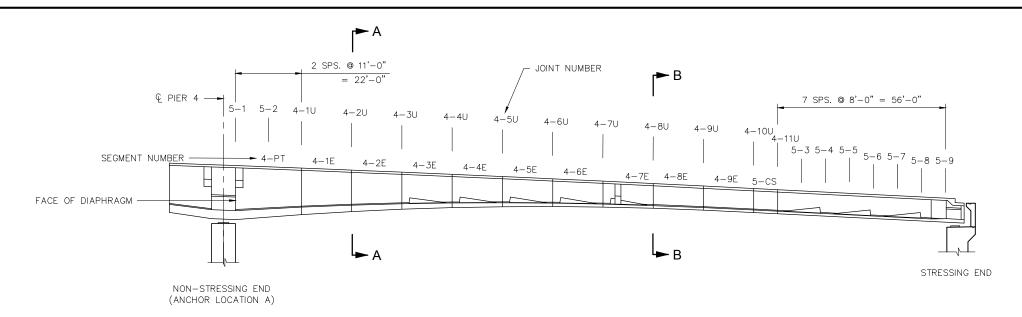




CIVIL EAST - VOLUME 4A
EXCELSIOR BLVD
BRIDGE 27C10
CONTINUITY WEB P.T. LAYOUT 4

DISCIPLINE: STRUCTURAL SHEET NAME: CBR27C10-BRG-SUP-062

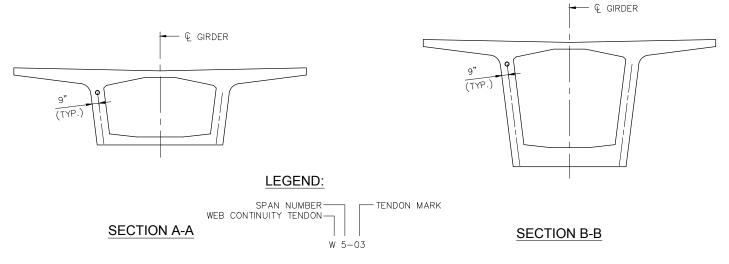
OF 82



## **ELEVATION**

	ANCHOR	5-1	5-2	4-1D	MID. SEGM.	4-2D	MID. SEGM.			4-4D	MID. SEGM.		MID. SEGM.	4-6D	MID. SEGM.	4-7D	MID. SEGM.	4-8D	MID. SEGM.	4-9D	MID. SEGM.	4-10D	5-3	5-4	5-5	5-6
W 5-01	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"
W 5-02	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"
W 5-03	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"

	MID. SEGM.	5-7	5-8	5-9	ANCHOR
W 5-01	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"
W 5-02	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"
W 5-03	X'-X"	X'-X"	X'-X"	X'-X"	X'-X"



## NOTES:

DIMENSIONS IN TABLE ARE VERTICAL DISTANCES FROM BOTTOM OF GIRDER TO  $\mathbb Q$  OF TENDON DUCTS AT SECTION JOINTS, MID-POINTS BETWEEN SECTIONS AND DIMENSIONED LOCATIONS.

ALL ANCHORAGE AND DUCT HARDWARE FOR WEB CONTINUITY TENDONS SHALL ACCOMMODATE 27 X 0.6" DIA. STRAND TENDONS.

FOR DETAILS OF ANCHORAGES AT END DIAPHRAGM SEE "END DIAPHRAGM POST-TENSIONING DETAILS" SHEET.

FOR TENDON STRESSING FORCES SEE "LONGITUDINAL PT QUANTITIES AND STRESSING SCHEDULE" SHEET.

FOR POST-TENSIONING ANCHORAGE PROTECTION SEE "PT GROUTING & ANCHORAGE PROTECTION DETAILS" SHEETS.

FOR FUTURE POST-TENSIONING LAYOUT SEE "FUTURE POST-TENSIOINING LAYOUT" SHEETS.

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**AECOM** 

60% SUBMISSION - 09/28/15





CIVIL EAST - VOLUME 4A
EXCELSIOR BLVD
BRIDGE 27C10
CONTINUITY WEB P.T. LAYOUT 5

B P.T. LAYOUT 5

T NAME:
CBR27C10-BRG-SUP-063

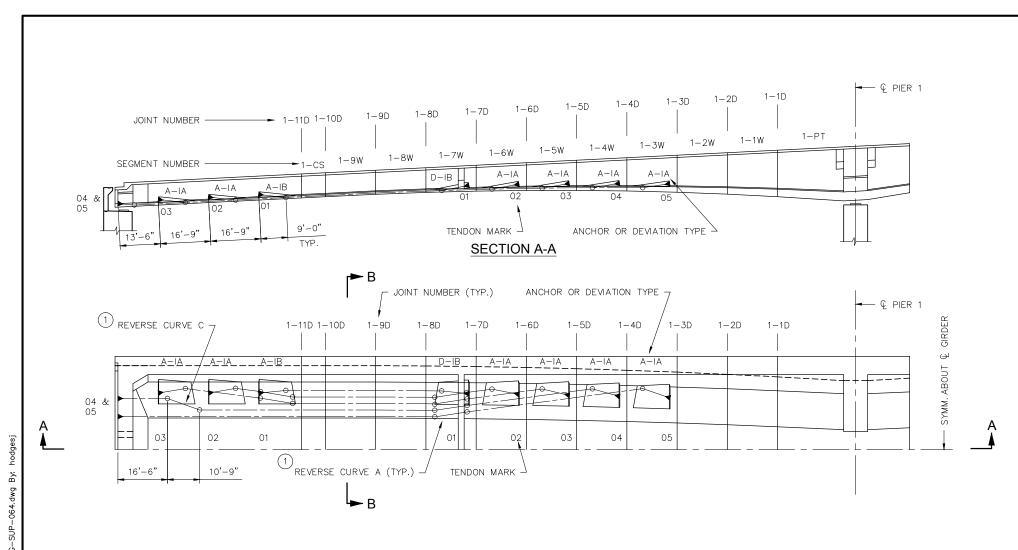
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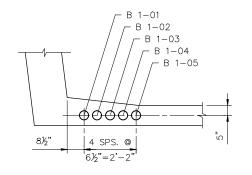
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STRUCTURAL SHEET NAME: CBR27C10-BR0

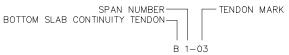
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#### PARTIAL PLAN VIEW - BOTTOM SLAB



# LEGEND:



#### **SECTION B-B**

#### NOTES:

- $\blacktriangleleft$  DENOTES STRESSING END OF TENDON.
- □ DENOTES NON-STRESSING END OF TENDON.

TENDONS ARE SYMMETRICAL ABOUT & GIRDER.

FOR TENDON STRESSING FORCES SEE "LONGITUDINAL PT QUANTITIES AND STRESSING SCHEDULE" SHEET.

ALL ANCHORAGE AND DUCT HARDWARE FOR BOTTOM SLAB CONTINUITY TENDONS SHALL ACCOMMODATE 19 X 0.6" DIA. STRAND TENDONS, WITH A MINIMUM BENDING RADIUS OF

FOR POST-TENSIONING ANCHORAGE PROTECTION SEE "PT GROUTING & ANCHORAGE PROTECTION DETAILS" SHEETS.

FOR ANCHOR BLOCK DETAILS SEE "BOTTOM SLAB ANCHOR BLOCK DETAILS".

FOR DEVIATION RIB DETAILS SEE "TYPE I DEVIATION RIB DETAILS".

(1) FOR DETAILS OF REVERSE CURVES SEE "CONTINUITY POST-TENSIONING LAYOUT 5" SHEET.

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL			
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						DRAWN BY:	JWH	DATE: SEPT. 21, 2015

**AECOM** 

60% SUBMISSION - 09/28/15





# **CIVIL EAST - VOLUME 4A EXCELSIOR BLVD BRIDGE 27C10 CONTINUITY POST-TENSIONING LAYOUT 1**

**STRUCTURAL** 

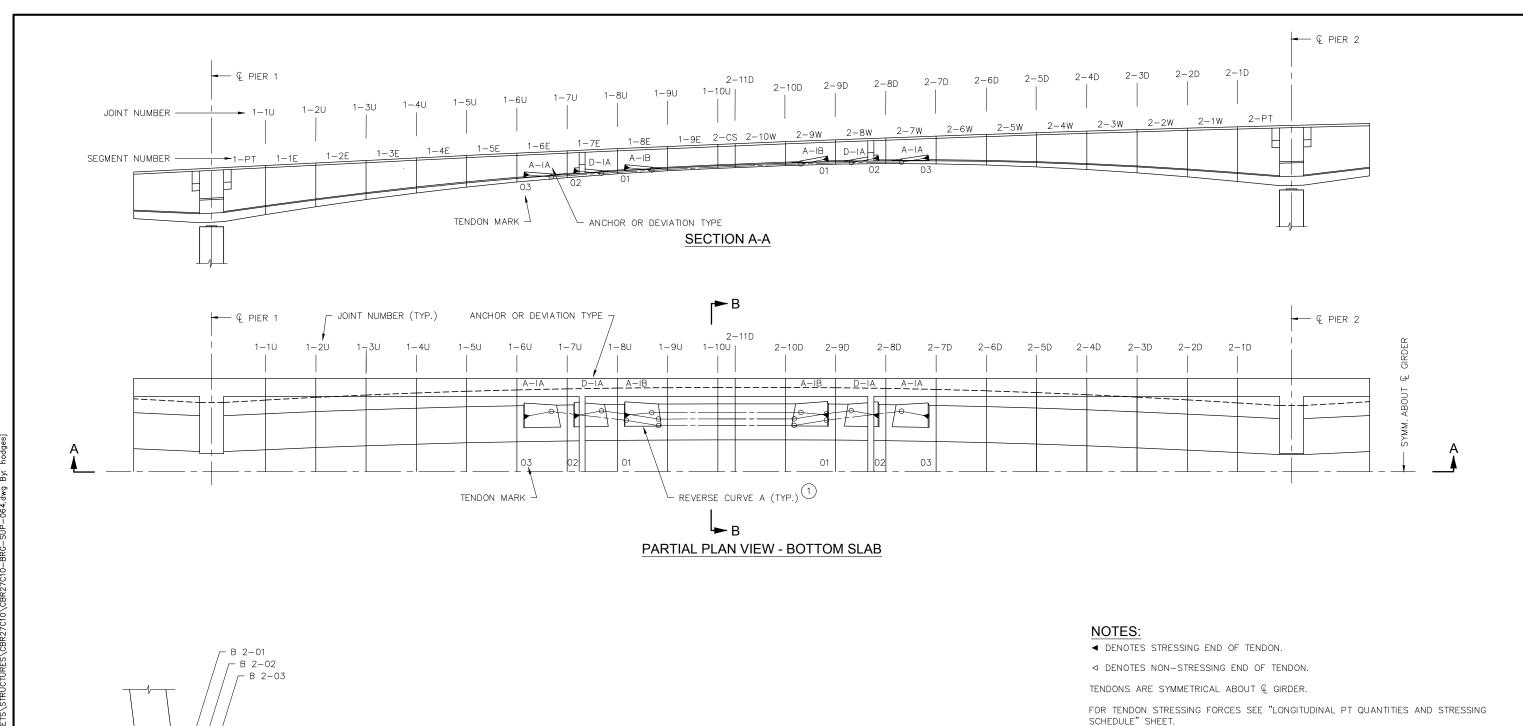
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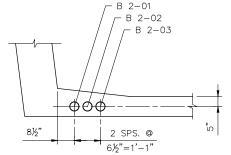
OF

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SHEET

57





**SECTION B-B** 

# LEGEND:

SPAN NUMBER-TENDON MARK BOTTOM SLAB CONTINUITY TENDON-B 2-03

ALL ANCHORAGE AND DUCT HARDWARE FOR BOTTOM SLAB CONTINUITY TENDONS SHALL ACCOMMODATE 19 X 0.6" DIA. STRAND TENDONS, WITH A MINIMUM BENDING RADIUS OF

FOR POST-TENSIONING ANCHORAGE PROTECTION SEE "PT GROUTING & ANCHORAGE PROTECTION DETAILS" SHEETS.

FOR ANCHOR BLOCK DETAILS SEE "BOTTOM SLAB ANCHOR BLOCK DETAILS".

FOR DEVIATION RIB DETAILS SEE "TYPE I DEVIATION RIB DETAILS".

(1) FOR DETAILS OF REVERSE CURVES SEE "CONTINUITY POST-TENSIONING LAYOUT 5" SHEET.

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**AECOM** 

60% SUBMISSION - 09/28/15



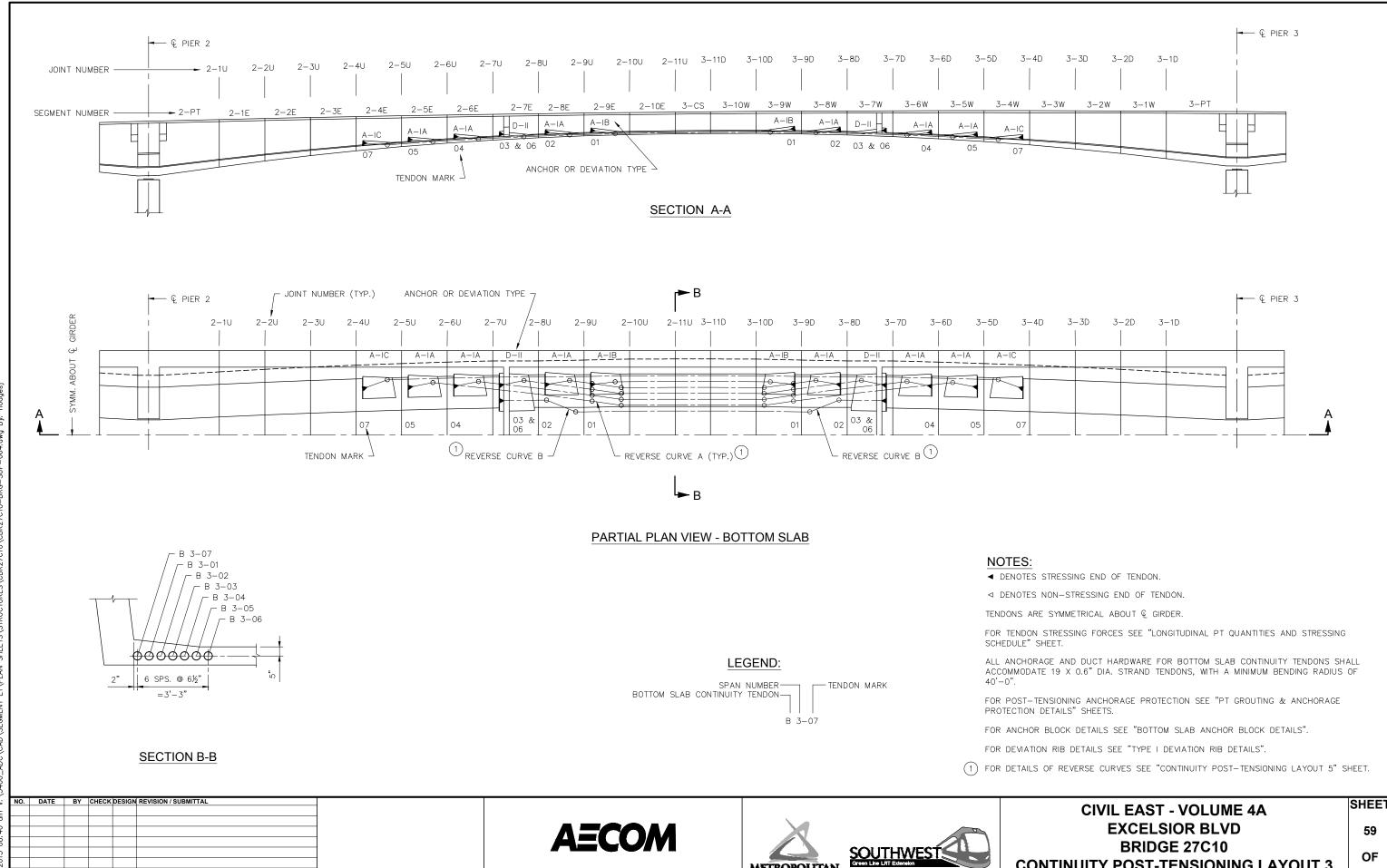


**CIVIL EAST - VOLUME 4A EXCELSIOR BLVD BRIDGE 27C10 CONTINUITY POST-TENSIONING LAYOUT 2** 

**STRUCTURAL** 

CBR27C10-BRG-SUP-065

OF 82



60% SUBMISSION - 09/28/15

DESIGNED BY: ETN CHECKED BY: JWJ

DRAWN BY: JWH

DATE: SEPT. 21, 2015

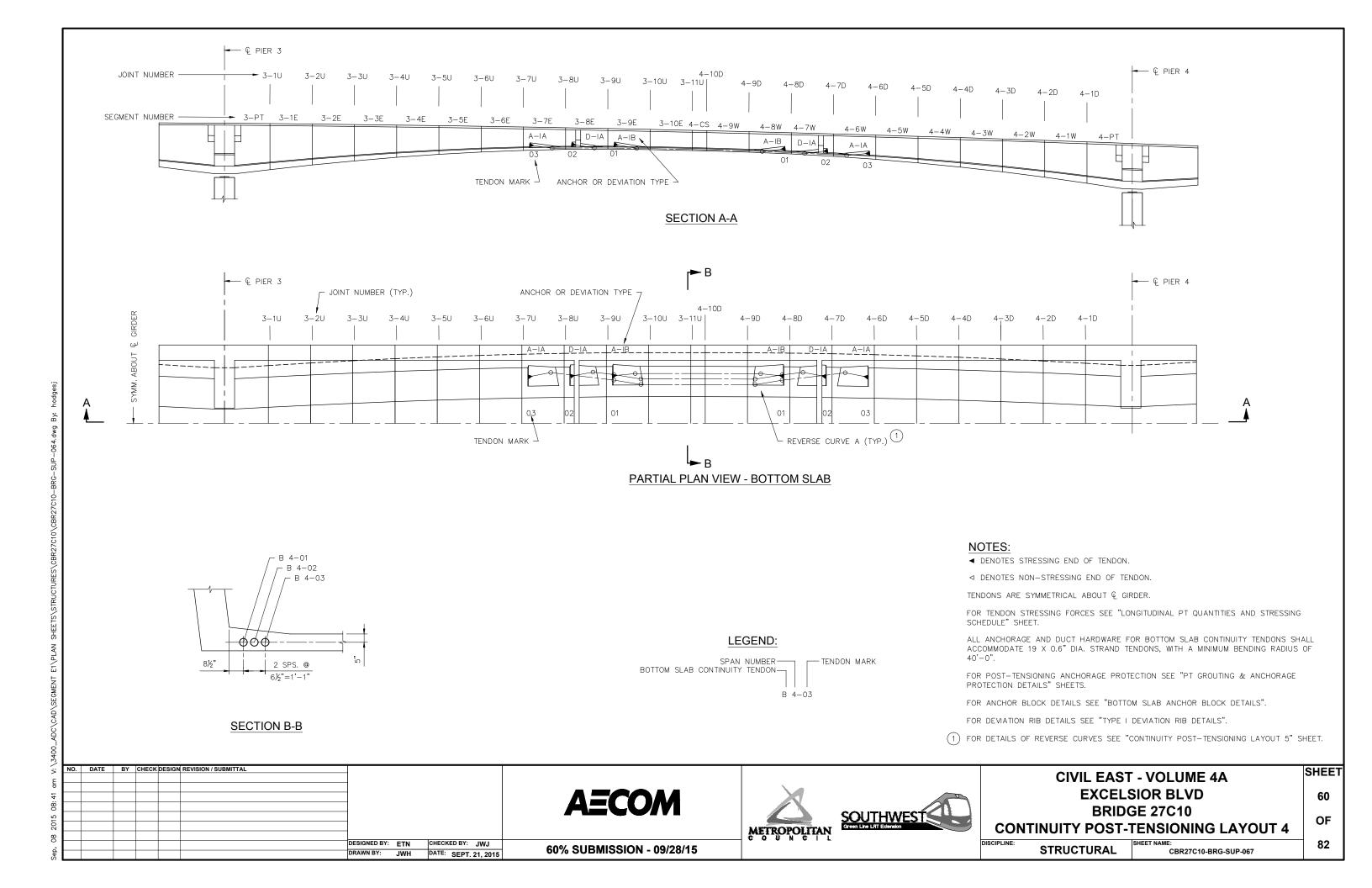
METROPOLITAN

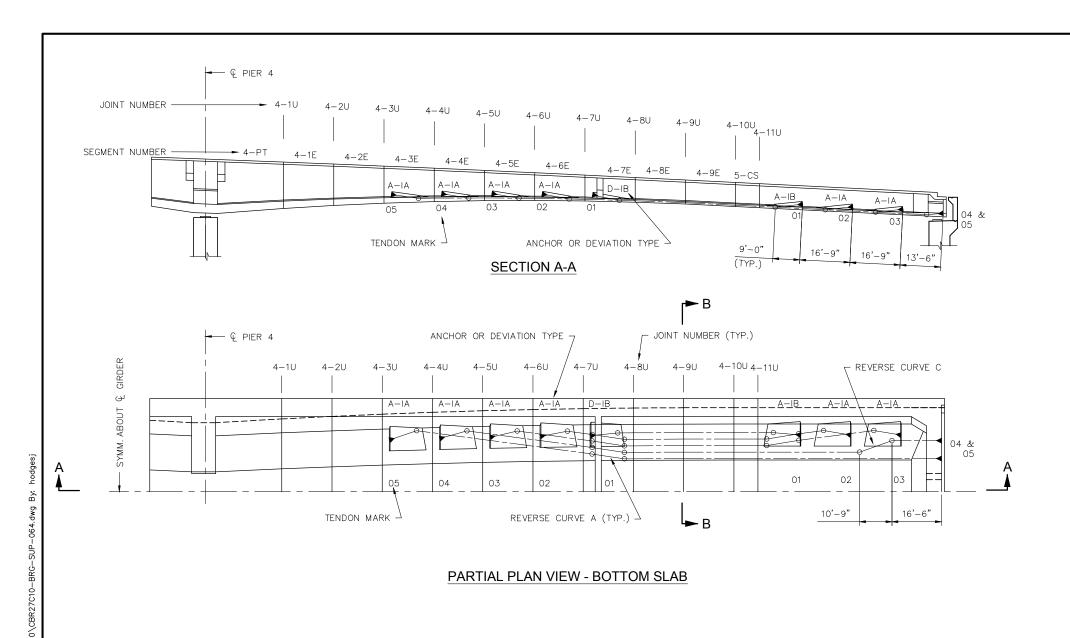
**CONTINUITY POST-TENSIONING LAYOUT 3** 

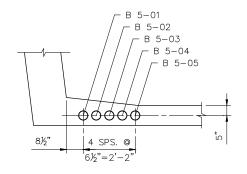
CBR27C10-BRG-SUP-066

**STRUCTURAL** 

82







#### SECTION B-B

#### NOTES:

- DENOTES STRESSING END OF TENDON.
- □ DENOTES NON-STRESSING END OF TENDON.

TENDONS ARE SYMMETRICAL ABOUT & GIRDER.

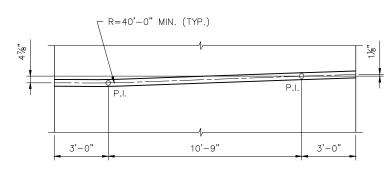
FOR TENDON STRESSING FORCES SEE "LONGITUDINAL PT QUANTITIES AND STRESSING SCHEDULE" SHEET.

ALL ANCHORAGE AND DUCT HARDWARE FOR BOTTOM SLAB CONTINUITY TENDONS SHALL ACCOMMODATE 19 X 0.6" DIA. STRAND TENDONS, WITH A MINIMUM BENDING RADIUS OF 40'-0".

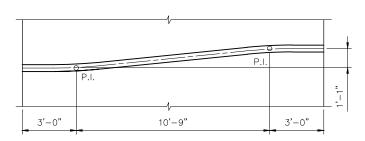
FOR POST-TENSIONING ANCHORAGE PROTECTION SEE "PT GROUTING & ANCHORAGE PROTECTION DETAILS" SHEETS.

FOR ANCHOR BLOCK DETAILS SEE "BOTTOM SLAB ANCHOR BLOCK DETAILS".

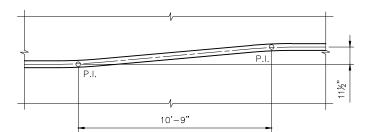
FOR DEVIATION RIB DETAILS SEE "TYPE I DEVIATION RIB DETAILS".



#### REVERSE CURVE A

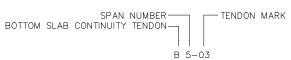


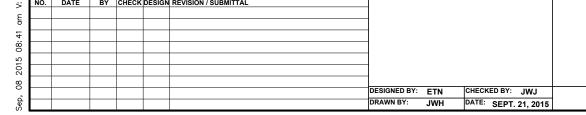
#### **REVERSE CURVE B**



#### REVERSE CURVE C

## LEGEND:





**AECOM** 

60% SUBMISSION - 09/28/15





CIVIL EAST - VOLUME 4A

EXCELSIOR BLVD

BRIDGE 27C10

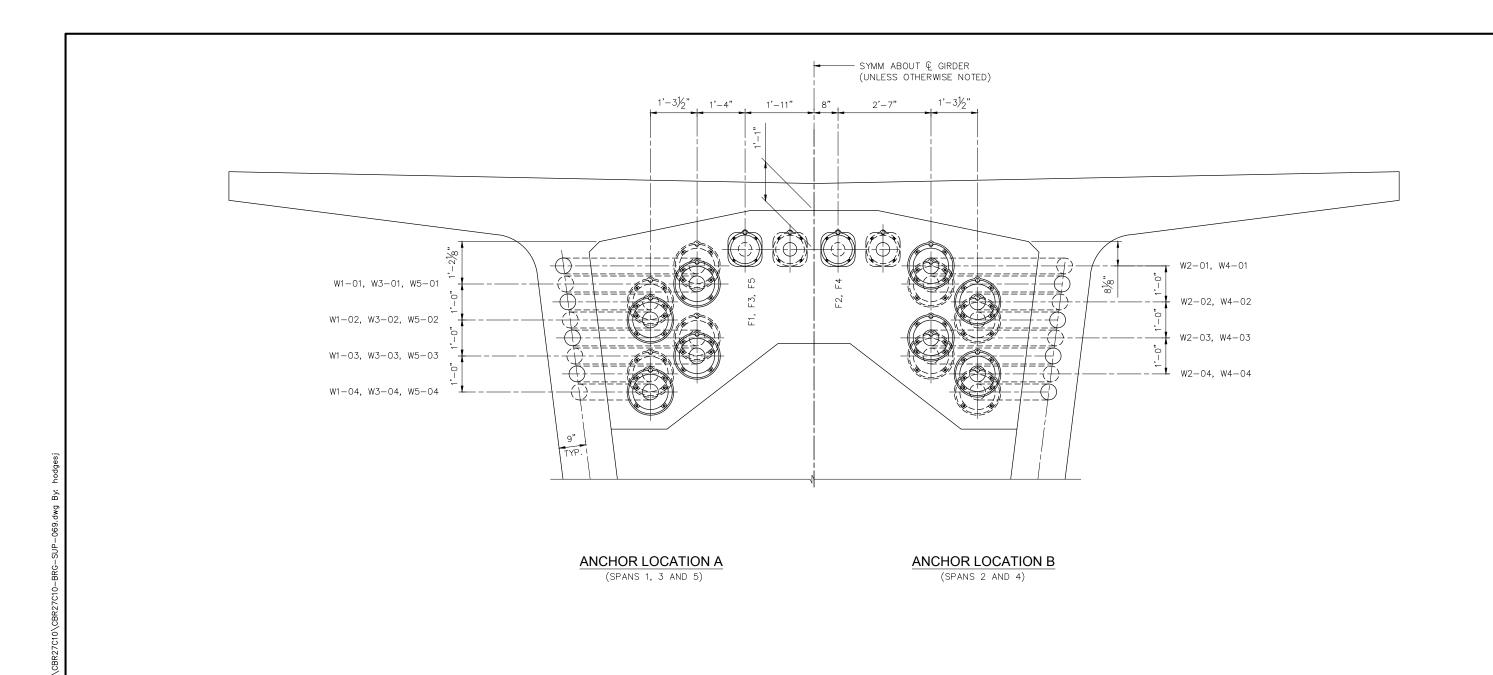
CONTINUITY POST-TENSIONING LAYOUT 5

STRUCTURAL SHEET NAME: CBR27C10-BRG-SUP-068

OF 82

SHEET

61



LEGEND:

SPAN NUMBER TENDON MARK
WEB CONTINUITY TENDON

W 1-03

FUTURE TENDON F 1 TENDON MARK

NOTES:

WORK THIS SHEET WITH "CONTINUITY WEB POST-TENSIONING LAYOUT" SHEETS.

DESIGNED BY: ETN CHECKED BY: JWJ
DRAWN BY: JWH DATE: SEPT. 21, 2015

**AECOM** 

60% SUBMISSION - 09/28/15

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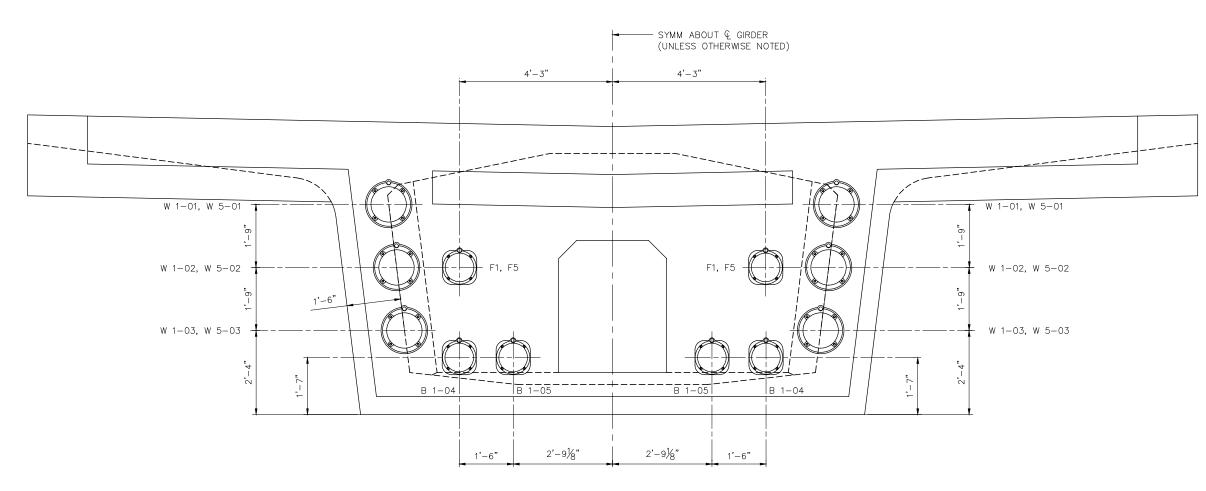
CIVIL EAST - VOLUME 4A
EXCELSIOR BLVD
BRIDGE 27C10
PIER TABLE POST-TENSIONING DETAILS 1

SHEET

OF

82

STRUCTURAL SHEET NAME: CBR27C10-BRG-SUP-069



END DIAPHRAGM CROSS SECTION - EXPANSION JOINT FACE



SPAN NUMBER TENDON MARK
WEB CONTINUITY TENDON

W 1-03

FUTURE TENDON F 1 TENDON MARK

### NOTES:

WORK THIS SHEET WITH "CONTINUITY WEB POST-TENSIONING LAYOUT" SHEETS.

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Г							DESIGNED BY:		CHECKED BY: JWJ	
Е							DRAWN BY:	JWH	DATE: SEPT. 21, 2015	

**AECOM** 

60% SUBMISSION - 09/28/15





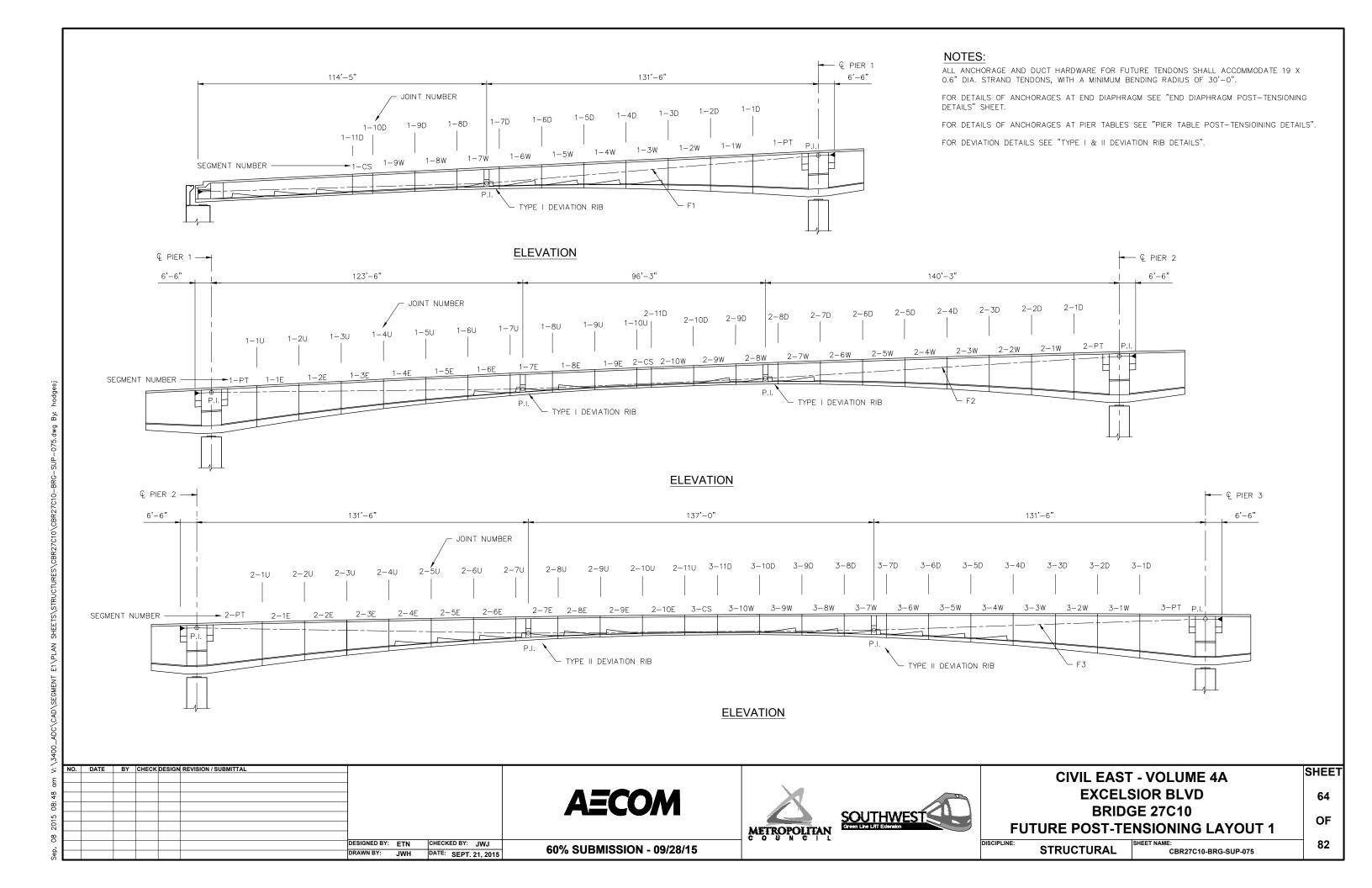
CIVIL EAST - VOLUME 4A
EXCELSIOR BLVD
BRIDGE 27C10
END DIAPHRAGM P.T. DETAILS 1

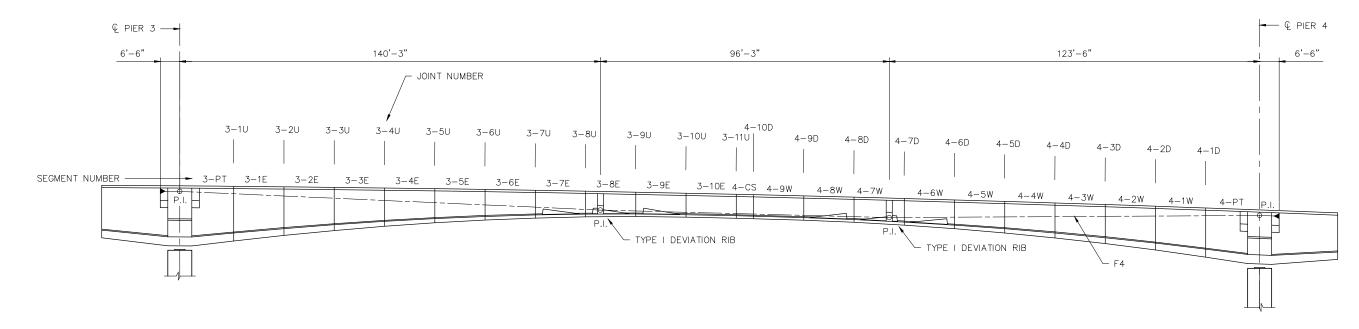
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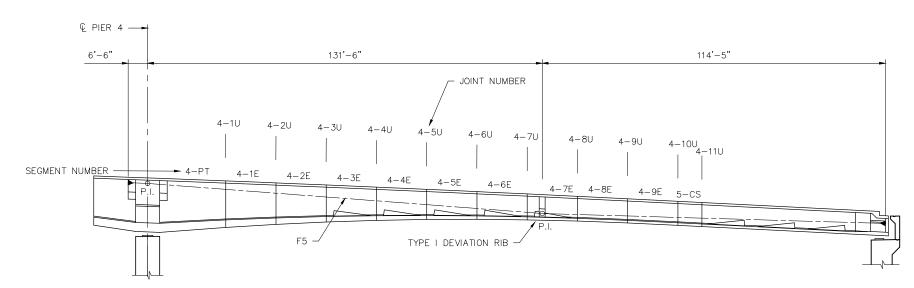
82

STRUCTURAL SHEET NAME: CBR27C10-BRG-SUP-072





## **ELEVATION**



# **ELEVATION**

#### NOTES:

ALL ANCHORAGE AND DUCT HARDWARE FOR FUTURE TENDONS SHALL ACCOMMODATE 19 X 0.6" DIA. STRAND TENDONS, WITH A MINIMUM BENDING RADIUS OF 30'-0".

FOR DETAILS OF ANCHORAGES AT END DIAPHRAGM SEE "END DIAPHRAGM POST-TENSIONING DETAILS" SHEET.

FOR DETAILS OF ANCHORAGES AT PIER TABLES SEE "PIER TABLE POST-TENSIOINING DETAILS".

FOR DEVIATION DETAILS SEE "TYPE | & | DEVIATION RIB DETAILS".

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL				
						DRAWN BY:	JWH	DATE: SEPT. 21, 2015	
	NO.	NO. DATE	NO. DATE BY	NO. DATE BY CHECK	NO. DATE BY CHECK DESIGN			DESIGNED BY: ETN	DESIGNED BY: ETN CHECKED BY: JWJ

**AECOM** 

60% SUBMISSION - 09/28/15





CIVIL EAST - VOLUME 4A
EXCELSIOR BLVD
BRIDGE 27C10
FUTURE POST-TENSIONING LAYOUT 2

DISCIPLINE:

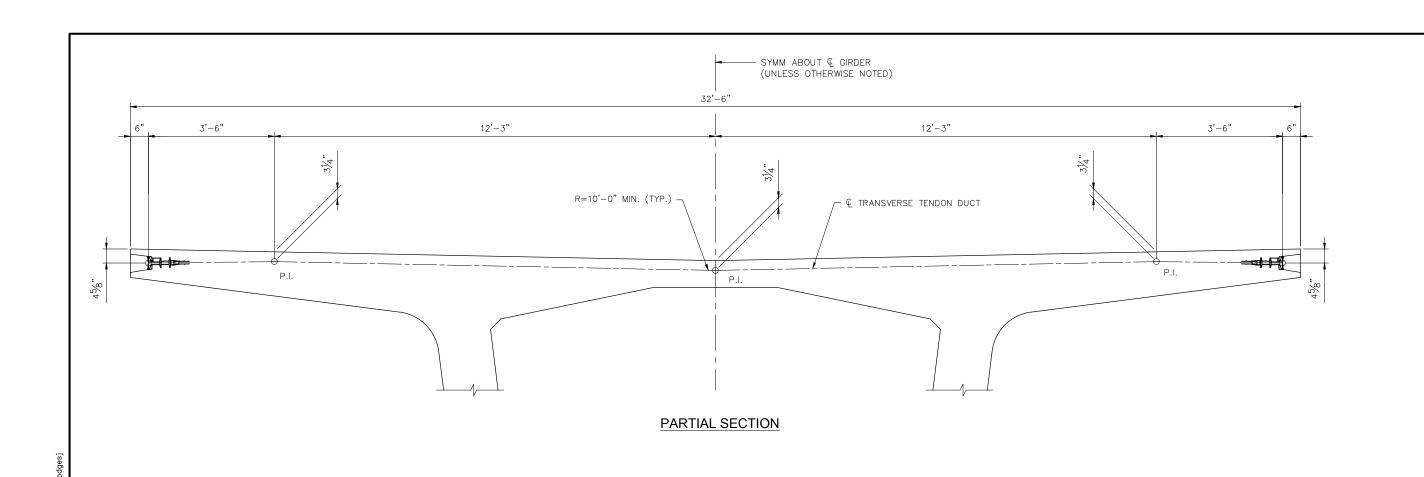
CBR27C10-BRG-SUP-076

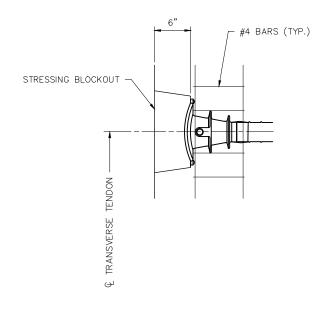
SHEET

OF

82

**STRUCTURAL** 





ANCHORAGE DETAIL

NOTES:

ALL TENDONS SHALL BE SINGLE-END STRESSED.

ADJACENT TRANSVERSE TENDONS SHALL BE STRESSED FROM ALTERNATE SIDES.

TENDON STRESSING FORCE SHALL BE 47 KIPS PER STRAND.

TRANSVERSE TENDONS SHALL BE STRESSED PRIOR TO STRIPPING FORMS.

DIMENSIONS SHOWN FOR ANCHORAGE RECESS MAY VARY DEPENDING UPON THE POST-TENSIONING SYSTEM USED.

COST OF REINFORCING BARS SHOWN SHALL BE CONSIDERED INCIDENTAL TO THE COST OF THE TRANSVERSE POST-TENSIONING.

PERMANENT PLASTIC END CAPS SHALL BE USED AT ANCHORS. END CAPS SHALL BE FILLED WITH GROUT DURING TENDON GROUTING.

INTENTIONALLY ROUGHEN ANCHORAGE BLOCKOUT TO AN AMPITUDE OF  $\rlap/4$ ". BLOCKOUT SHALL BE FILLED WITH NON-SHRINK EPOXY GROUT AND FINISHED TO MEET LINES OF THE STRUCTURAL ELEMENT.

TENDON WEIGHTS SHOWN IN QUANTITY TABLE ARE MEASURED FROM ANCHOR PLATE TO ANCHOR PLATE. ADDITIONAL STRAND BEYOND THE PLATES FOR JACKING AND WEIGHT OF ANY ANCHORAGE HARDWARE ARE NOT INCLUDED AND SHALL BE CONSIDERED INCIDENTAL TO THE COST OF THE TRANSVERSE POST—TENSIONING.

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL				$\overline{}$
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						DESIGNED BY:		CHECKED BY: JWJ	
						DRAWN BY:	JWH	DATE: SEPT. 21, 2015	

TENDON

31.51

31.51

31.51

31.51

31.51

31.51

TENDON NUMBER OF

TOTAL WEIGHT = XXXX.X (LBS)

TENDONS LENGTH (FT) WEIGHT (LBS) SEGMENTS WEIGHT (LBS)

TENDON SIZE NUMBER OF

4X0.6" DIA.

**AECOM** 

60% SUBMISSION - 09/28/15

METROPOLITAN



# **CIVIL EAST - VOLUME 4A EXCELSIOR BLVD BRIDGE 27C10** TRANSVERSE POST-TENSIONING DETAILS

**STRUCTURAL** 

CBR27C10-BRG-SUP-078

SHEET

OF

82

SEGMENT TYPE

CANTILEVER SEGMENT

PIER TABLE SEGMENT

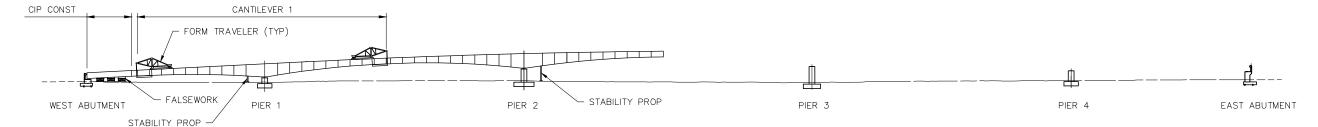
END DIAPHRAGM SEGMEN

5'-9" CLOSURE SEGMENT

8'-0" CLOSURE SEGMENT

13'-0" CLOSURE SEGMENT

- CONSTRUCT NEW CP BASS LAKE SPUR TRACK AND REMOVE EXISTING CP BASS LAKE MAIN AND SIDING TRACK WITHIN LIMITS OF THE BRIDGE CONSTRUCTION.
- CONSTRUCT WEST & EAST ABUTMENTS TO BASE OF BACKWALL AND PIERS 1 THRU 4.
- CONSTRUCT PIER TABLE FOR PIER 2 ON FALSEWORK AND INSTALL STABILITY PROP ON UPSTATION SIDE.
- ERECT FORM TRAVELERS ON PIER TABLE AT PIER 2 AND CONSTRUCT CANTILEVER 2 BY BALANCED CANTILEVER METHOD, CASTING DOWNSTATION SEGMENT PRIOR TO UPSTATION SEGMENT.

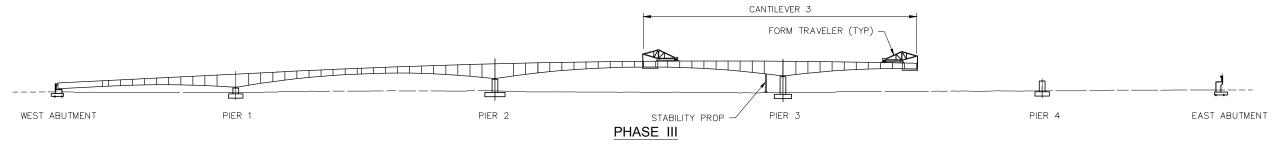


PHASE II

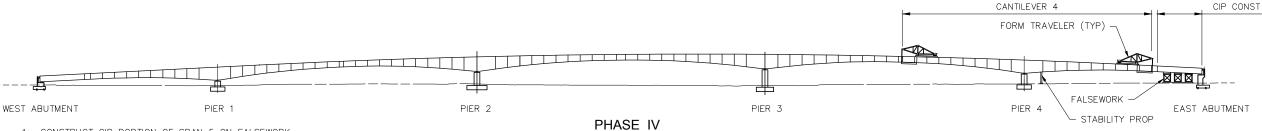
- CONSTRUCT CIP PORTION OF SPAN 1 ON FALSEWORK.

  CONSTRUCT PIER TABLE FOR PIER 1 ON FALSEWORK AND INSTALL STABILITY PROP ON DOWNSTATION SIDE.

  ERECT FORM TRAVELERS ON PIER TABLE AT PIER 1 AND CONSTRUCT CANTILEVER 1 BY BALANCED CANTILEVER METHOD, CASTING UPSTATION SEGMENT PRIOR TO DOWNSTATION SEGMENT.
- ADVANCE DOWNSTATION FORM TRAVELER AND CAST CLOSURE SEGMENT IN SPAN 1. STRESS CONTINUITY POST—TENSIONING IN SPAN 1. ADVANCE UPSTATION FORM TRAVELER AND CAST CLOSURE SEGMENT IN SPAN 2. STRESS CONTINUITY POST—TENSIONING IN SPAN 2.
- REMOVE FALSEWORK FOR CIP PORTION OF SPAN 1 AND STABILITY PROPS AT PIERS 1 & 2. CONSTRUCT WEST ABUTMENT BACKWALL



- CONSTRUCT PIER TABLE FOR PIER 3 ON FALSEWORK AND INSTALL STABILITY PROP ON DOWNSTATION SIDE.
- 2. ERECT FORM TRAVELERS ON PIER TABLE AT PIER 3 AND CONSTRUCT CANTILEVER 3 BY BALANCED CANTILEVER METHOD, CASTING UPSTATION SEGMENT PRIOR TO DOWNSTATION SEGMENT.
- ADVANCE DOWNSTATION FORM TRAVELER AND CAST CLOSURE SEGMENT IN SPAN 3. STRESS CONTINUITY POST-TENSIONING IN SPAN 3.
- 4. REMOVE STABILITY PROP AT PIER 3.



- CONSTRUCT CIP PORTION OF SPAN 5 ON FALSEWORK.
- CONSTRUCT PIER TABLE FOR PIER 4 ON FALSEWORK AND INSTALL STABILITY PROP ON UPSTATION SIDE.
- ERECT FORM TRAVELERS ON PIER TABLE AT PIER 4 AND CONSTRUCT CANTILEVER 4 BY BALANCED CANTILEVER METHOD, CASTING DOWNSTATION SEGMENT PRIOR TO UPSTATION SEGMENT.

  ADVANCE UPSTATION FORM TRAVELER AND CAST CLOSURE SEGMENT IN SPAN 5. STRESS CONTINUITY POST—TENSIONING IN SPAN 5.

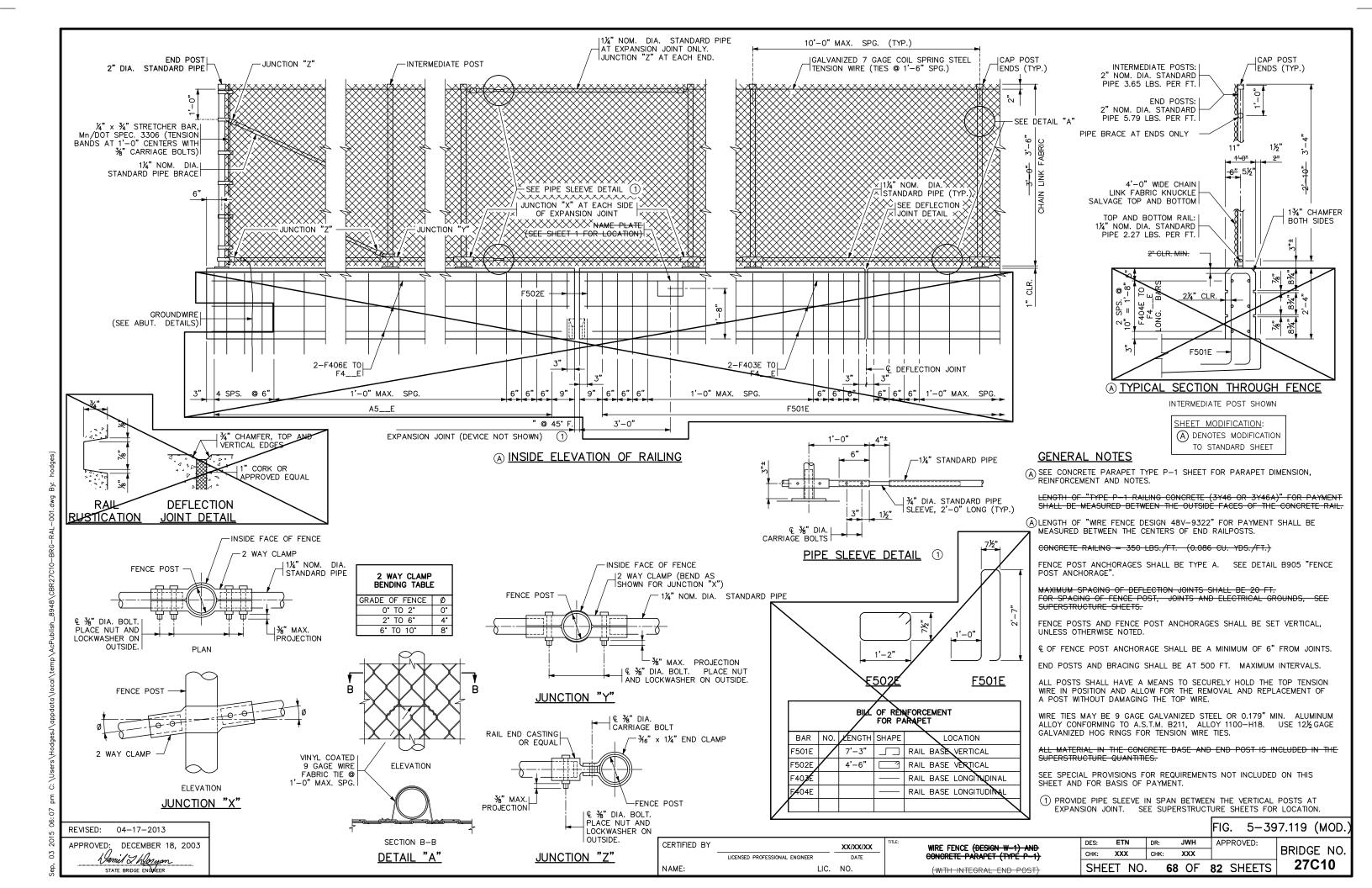
  ADVANCE DOWNSTATION FORM TRAVELER AND CAST CLOSURE SEGMENT IN SPAN 4. STRESS CONTINUITY POST—TENSIONING IN SPAN 4.

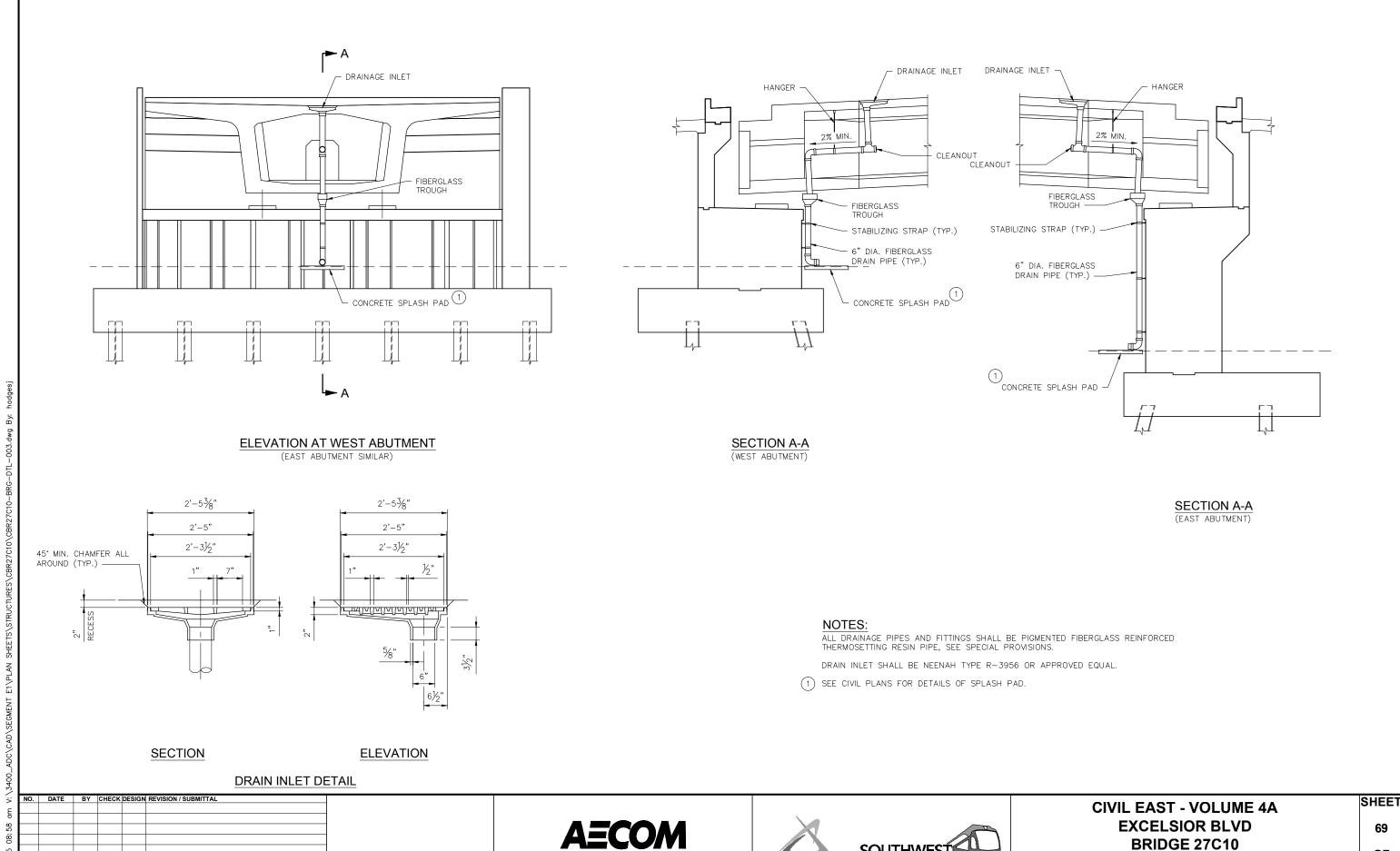
  REMOVE FALSEWORK FOR CIP PORTION OF SPAN 5 AND STABILITY PROP AT PIER 4. CONSTRUCT EAST ABUTMENT BACKWALL.

  CONSTRUCT RETAINING WALLS FOR APPROACHES AT WEST & EAST ABUTMENTS.

- INSTALL INTERIOR LIGHTING AND DRAINAGE. CONSTRUCT RAILINGS, DUCT BANKS, AND TRACK WORK.

> <u> </u>	IO. DATE	BY	CHECK DESIGN REVISION / SUBMITTAL					CIVIL EAS	T VOLUME 4A	SHEET		
臣								_	CIVIL EAST - VOLUME 4A			
:52						$\Lambda = C \cap M$		EXCEL	SIOR BLVD	67		
80						AECUM		RRID	BRIDGE 27C10			
5				2 — 3 3 2 3 2	SOUTHWEST							
25							METROPOLITAN Green Line Litt Extension	<sup>♥</sup> │ SUPERSTRUCTU	RE CONST. SCHEME 1	OF		
80				DESIGNED BY: ETN	CHECKED BY: JWJ		COUNCIL	DISCIPLINE:	SHEET NAME:	ا مما		
- L						60% SUBMISSION - 09/28/15		STRUCTURAL	CBR27C10-BRG-SUP-083	02		
ě				DRAWN BY: JWH	DATE: SEPT. 21, 2015	00 /0 00 DINIOO 10 14 - 03/20/10		STRUCTURAL	CBR2/C10-BRG-30P-003			





60% SUBMISSION - 09/28/15

DESIGNED BY: ETN CHECKED BY: JWJ

DATE: SEPT. 21, 2015

**SOUTHWEST** 

DISCIPLINE:

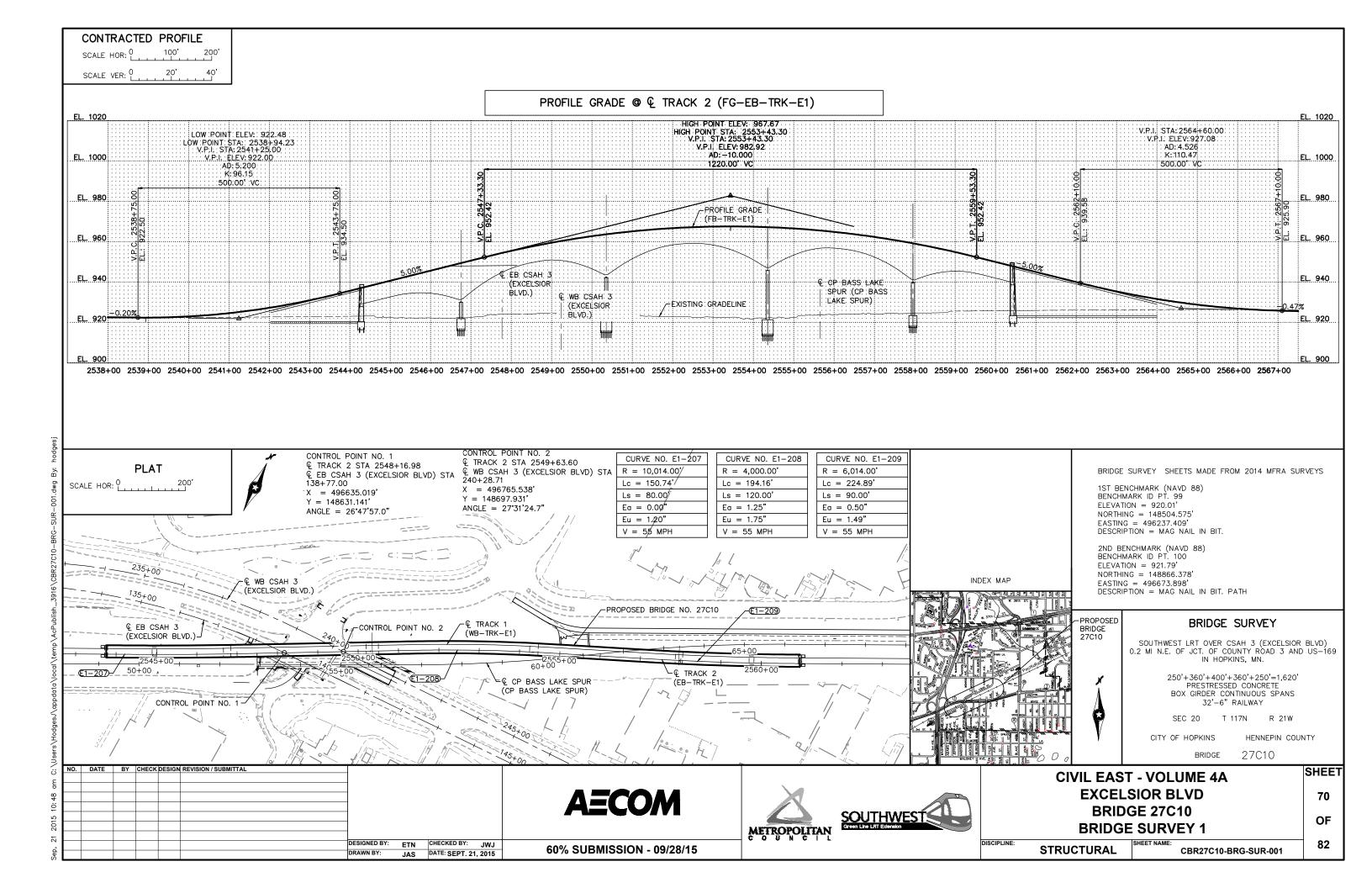
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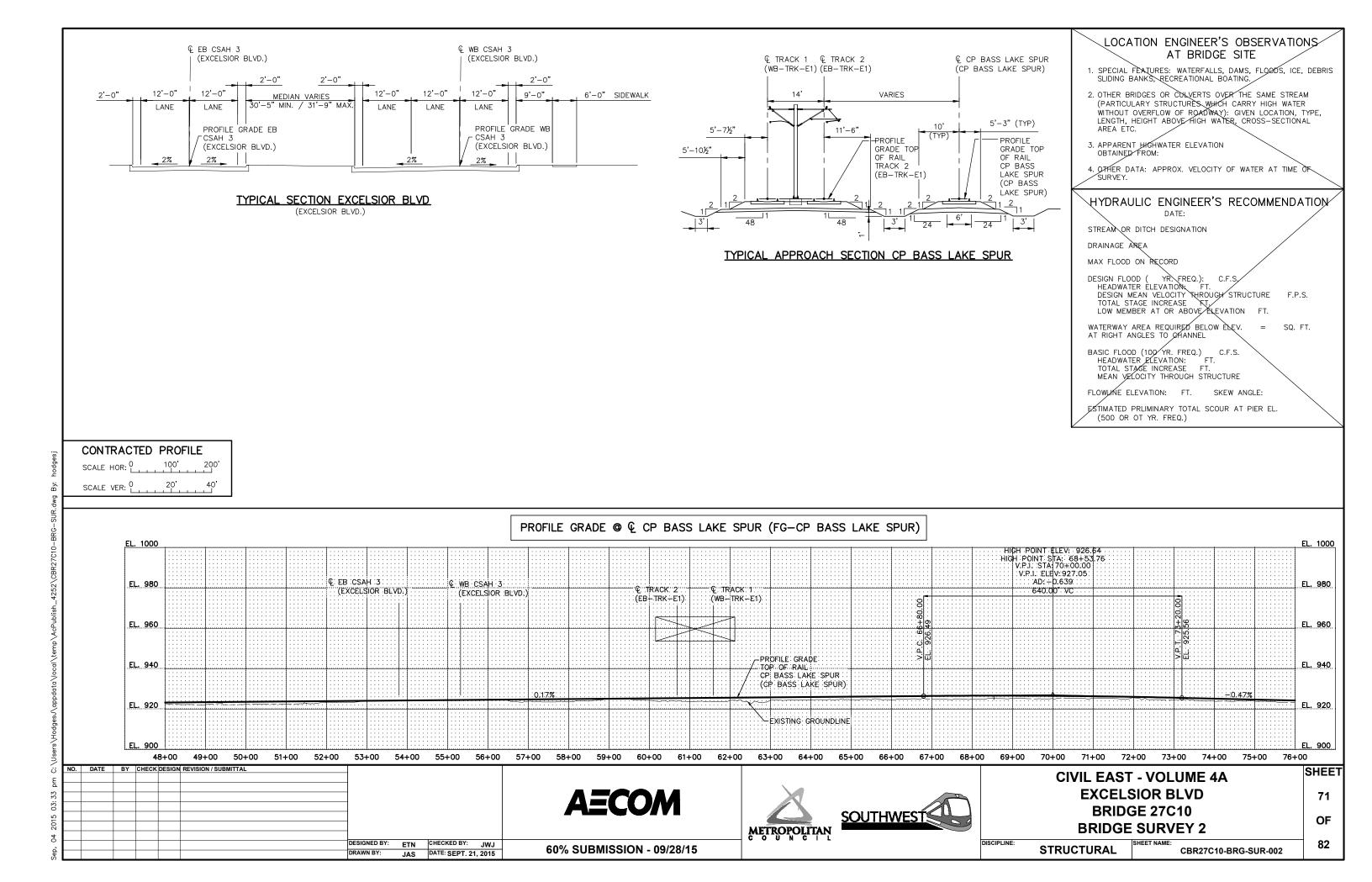
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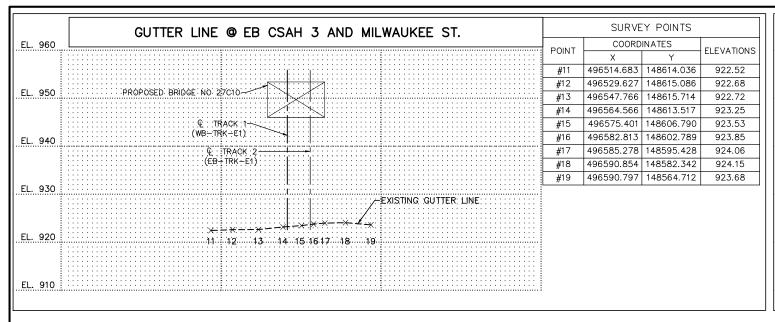
**DRAINAGE DETAILS 1** 

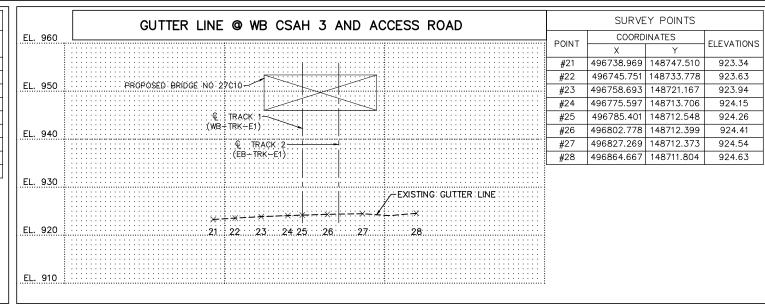
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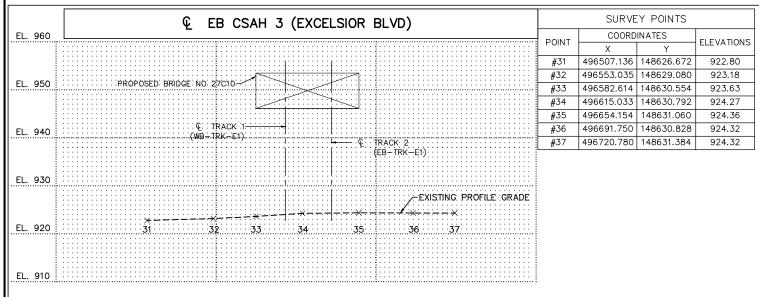
**STRUCTURAL** 

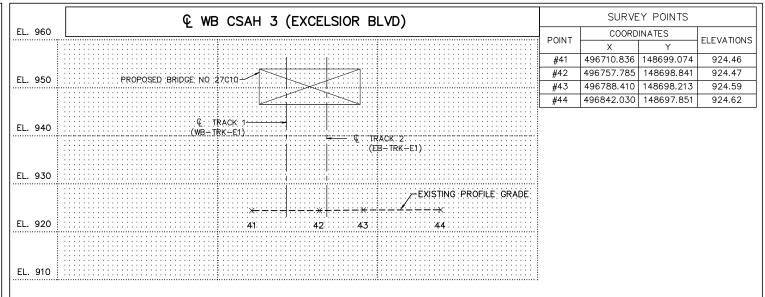


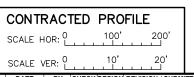












DESIGNED BY: ETN CHECKED BY: JWJ DRAWN BY: JAS DATE: SEPT. 21, 2015

**AECOM** 





CIVIL EAST - VOLUME 4A
<b>EXCELSIOR BLVD</b>
BRIDGE 27C10
<b>BRIDGE SURVEY 3</b>

**STRUCTURAL** CBR27C10-BRG-SUR-003

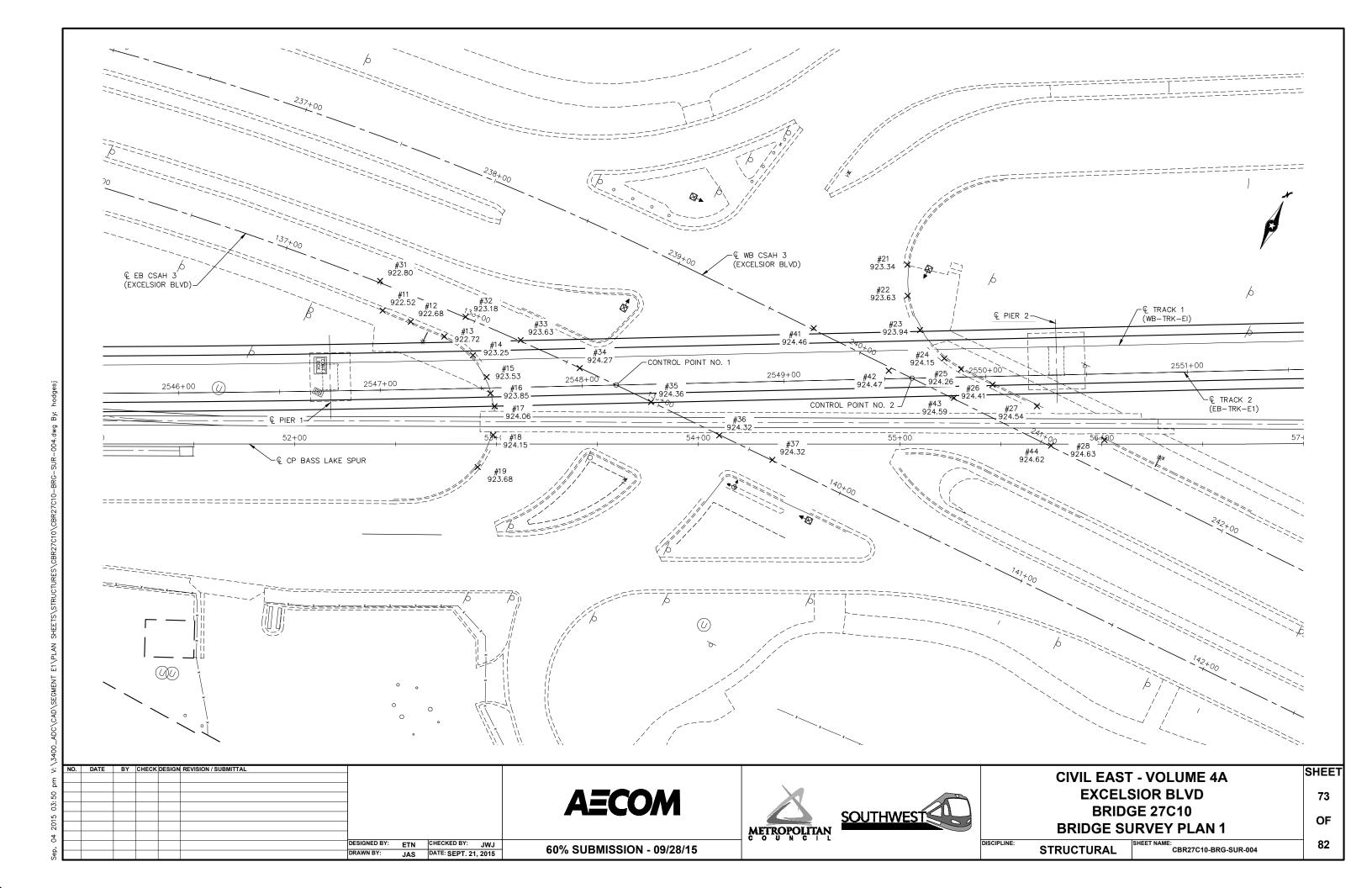
60% SUBMISSION - 09/28/15

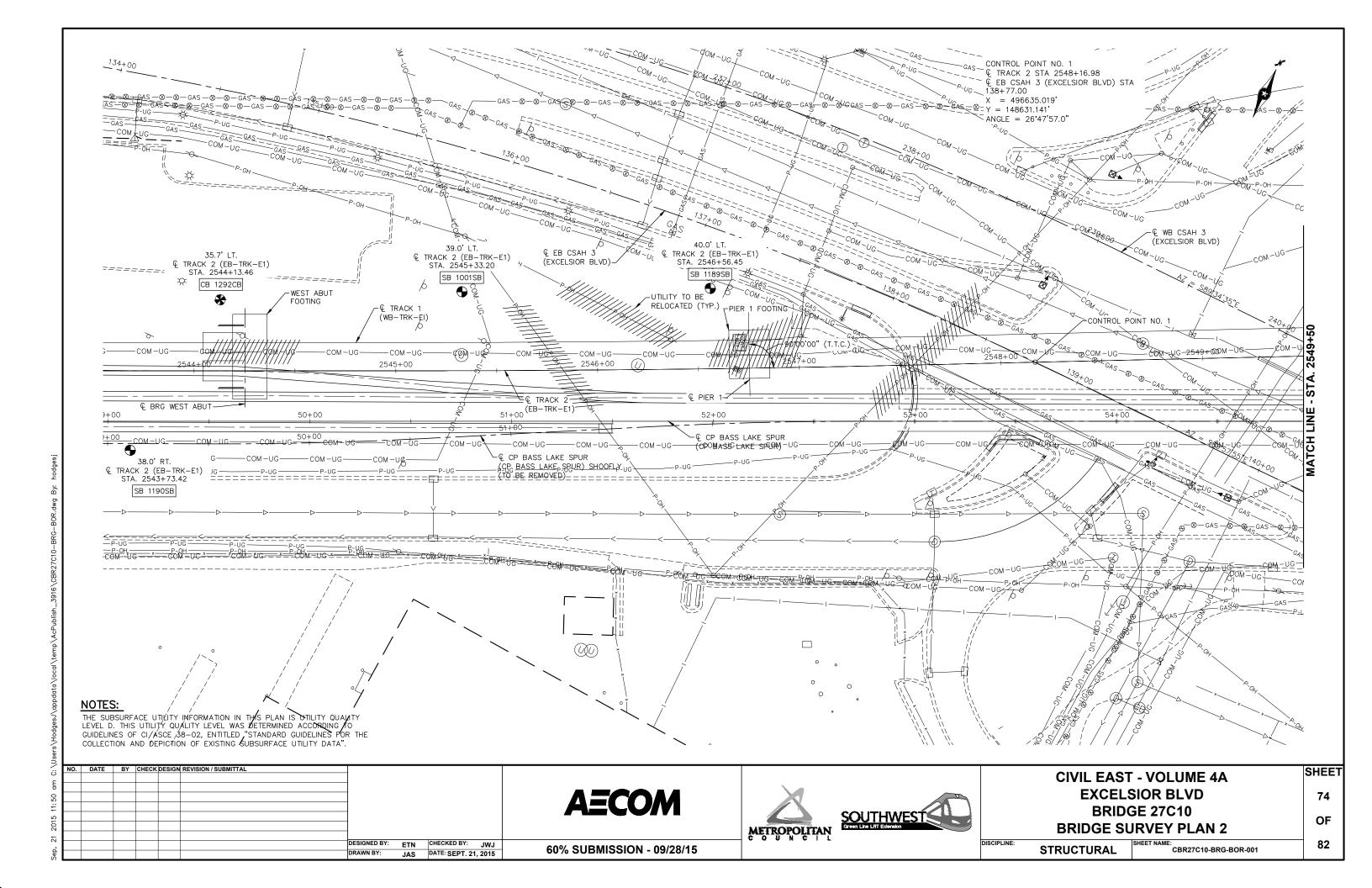
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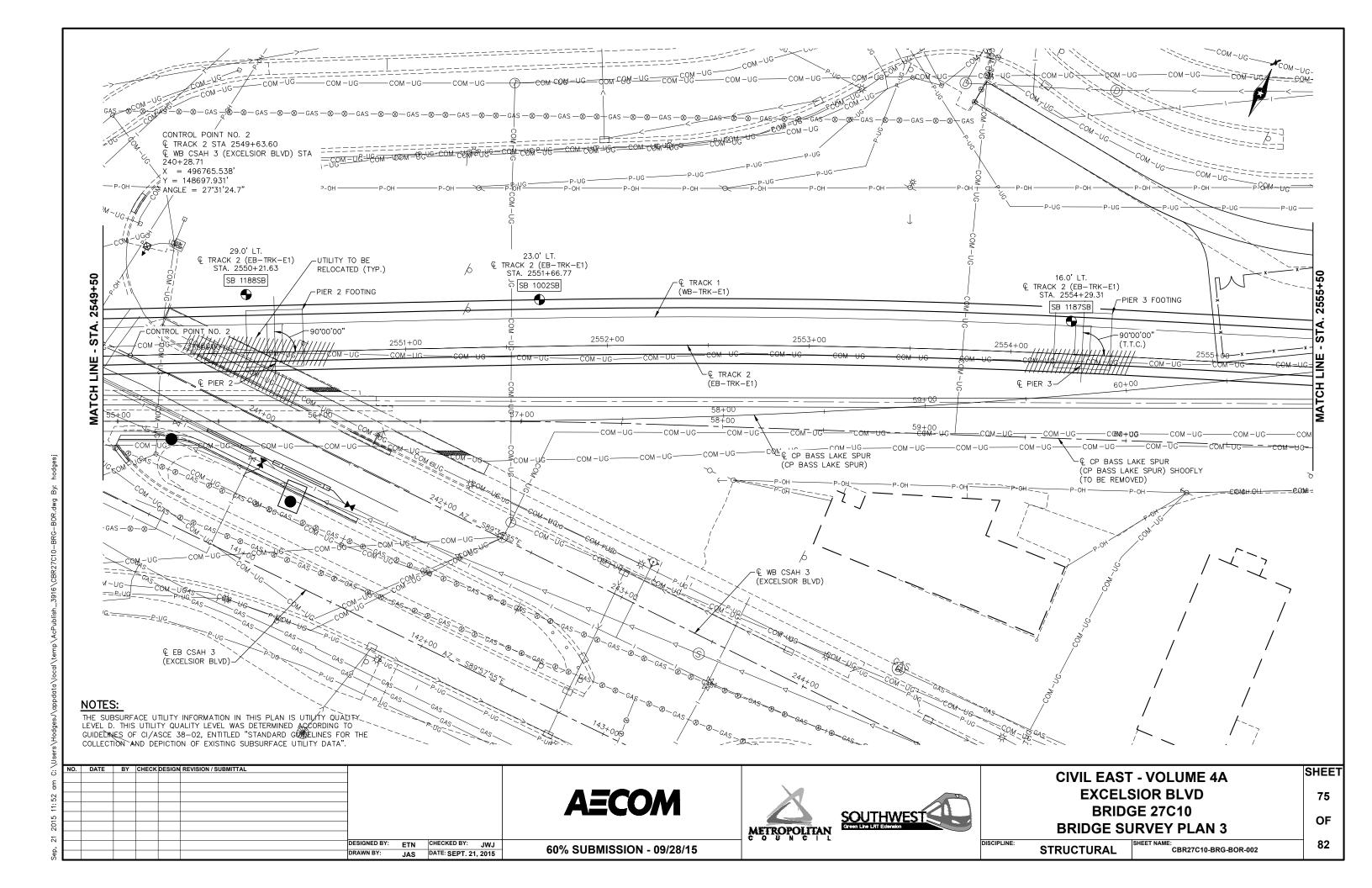
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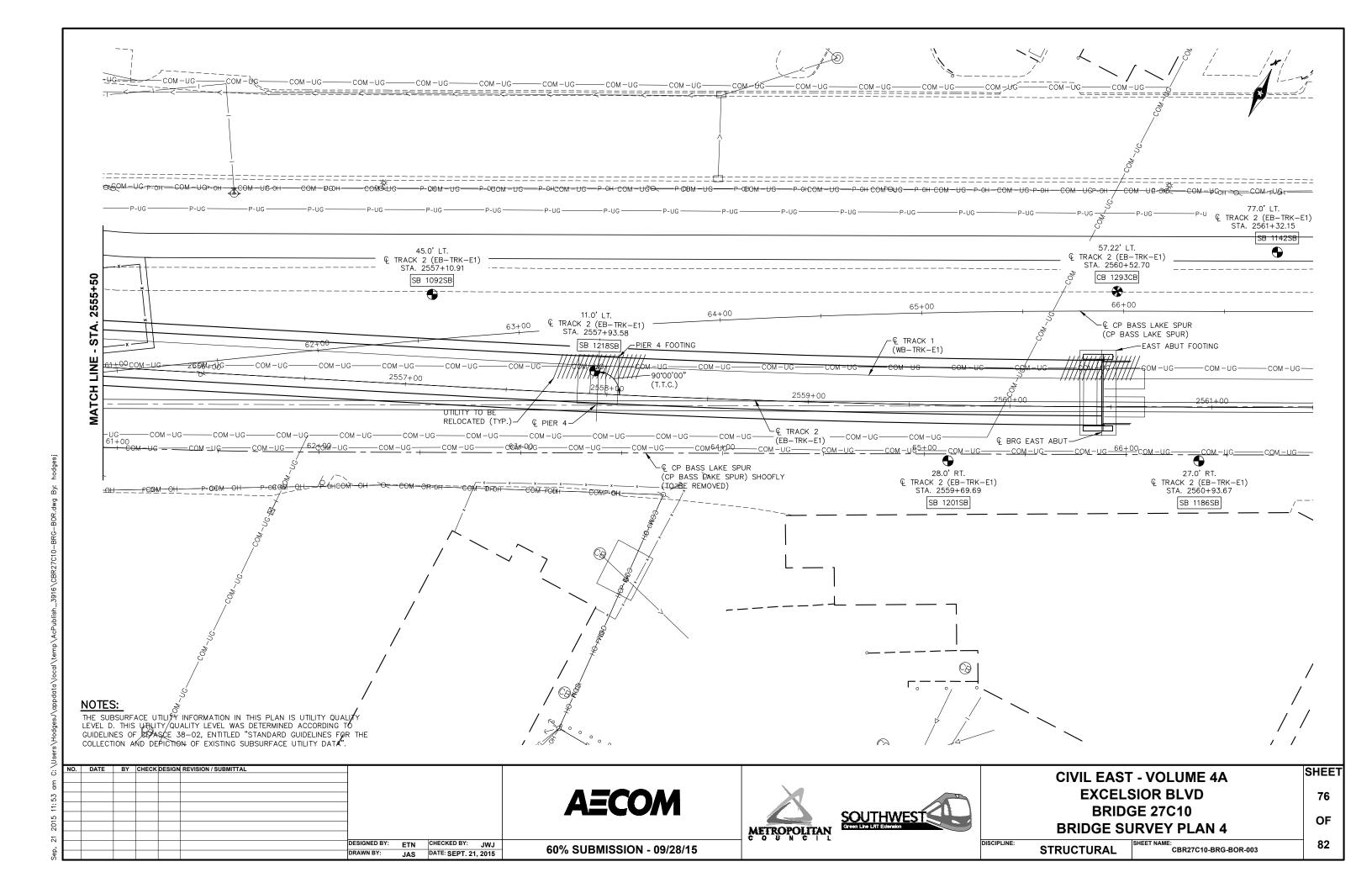
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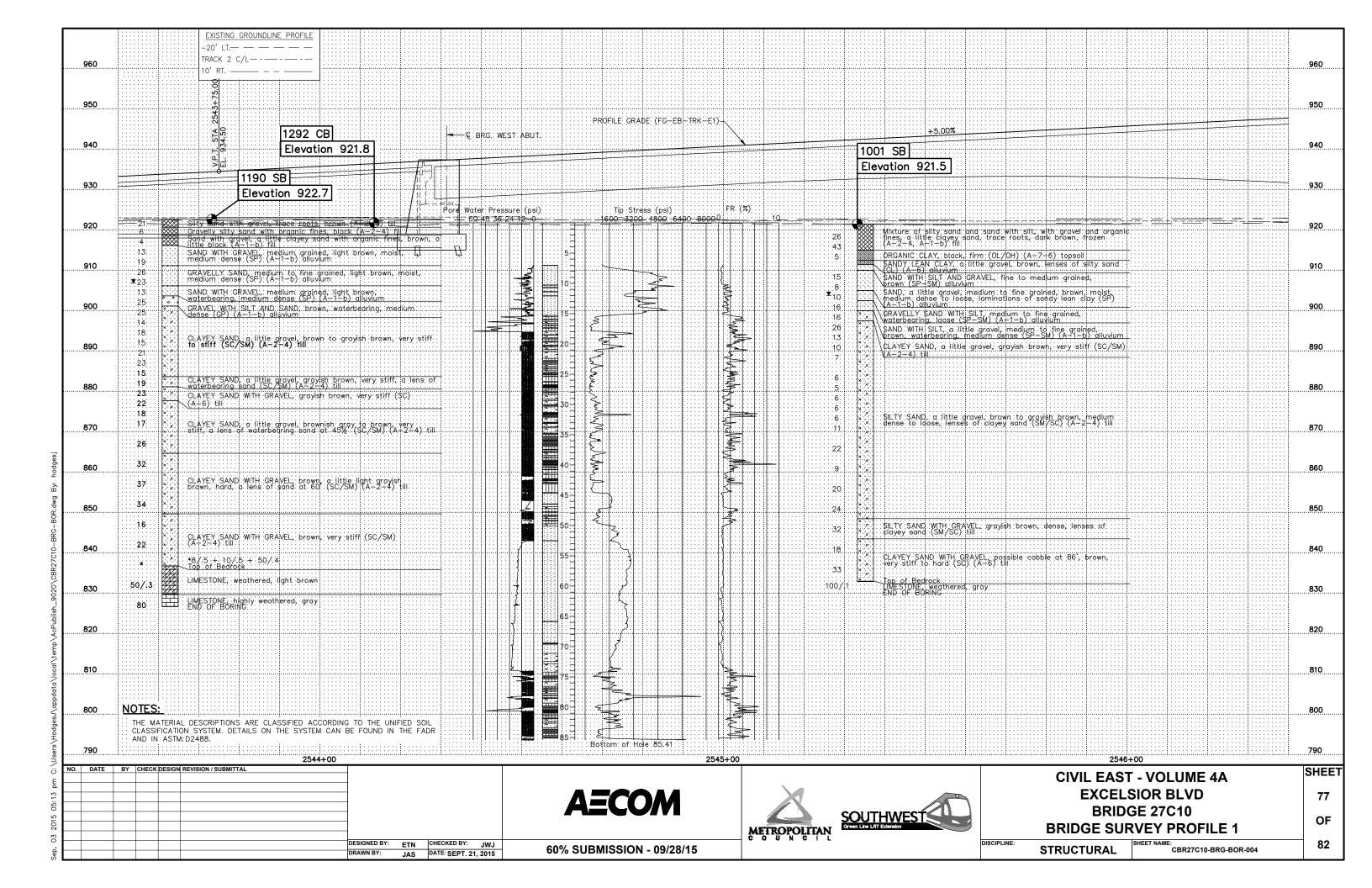
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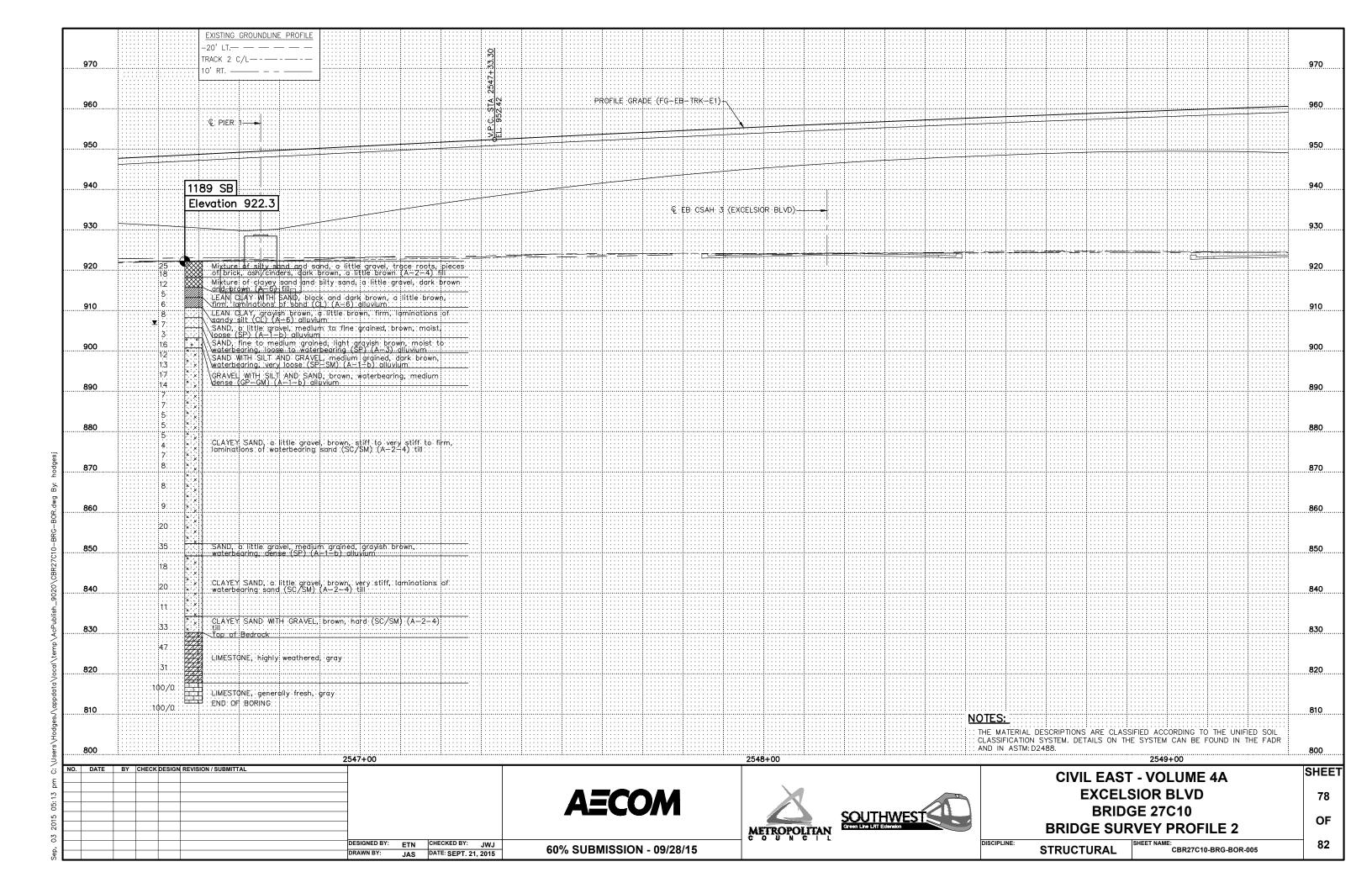


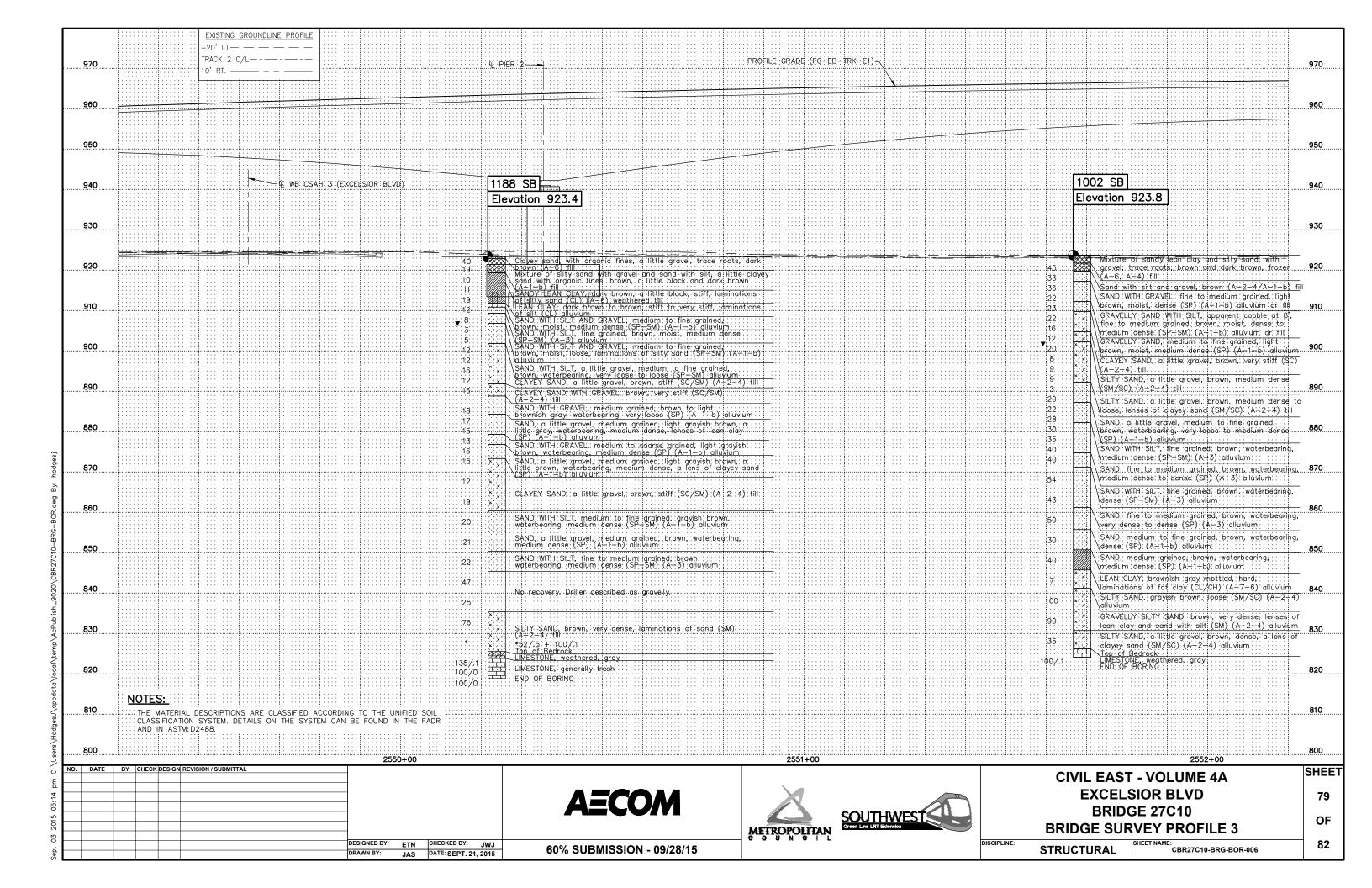


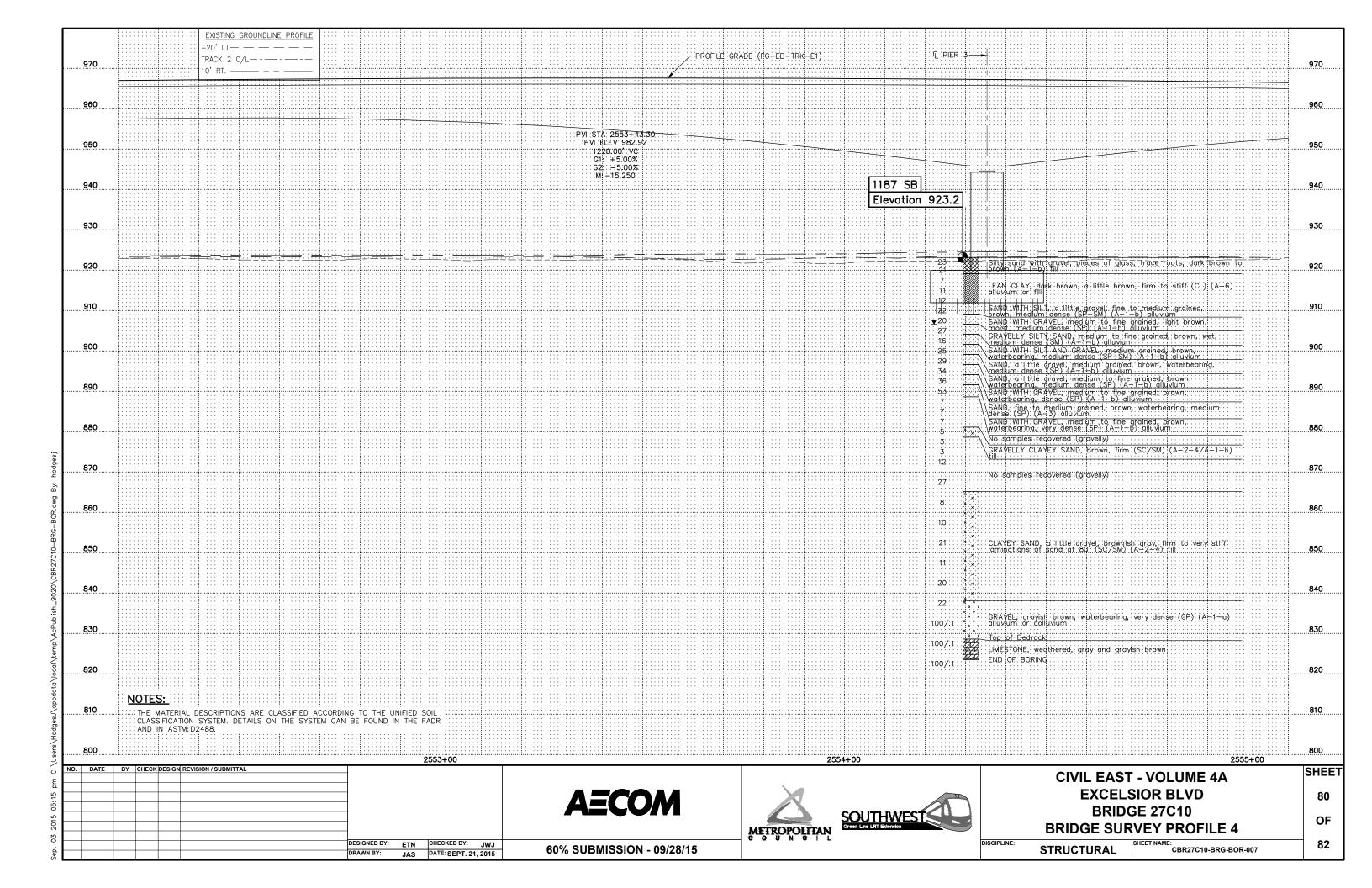


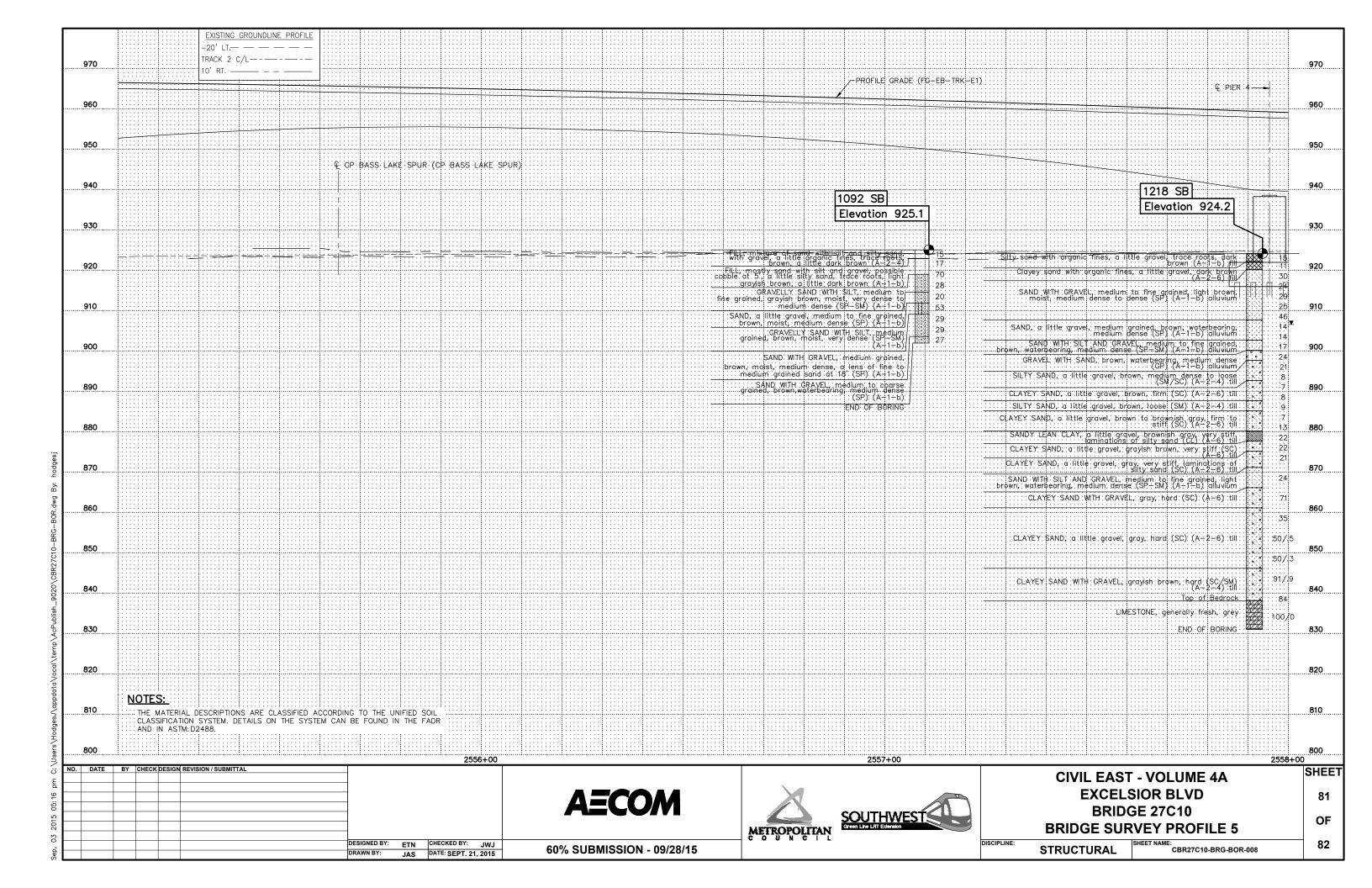


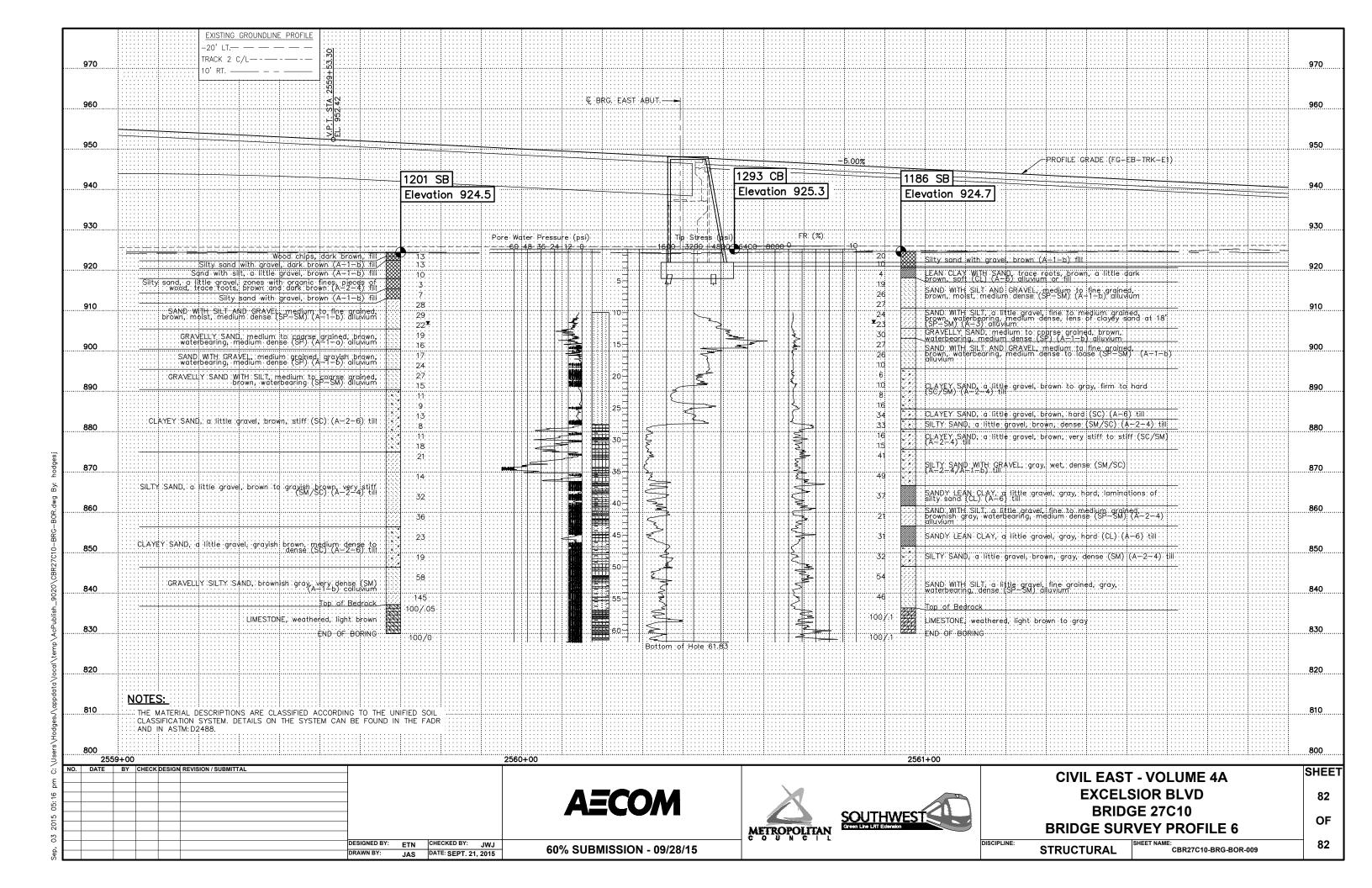


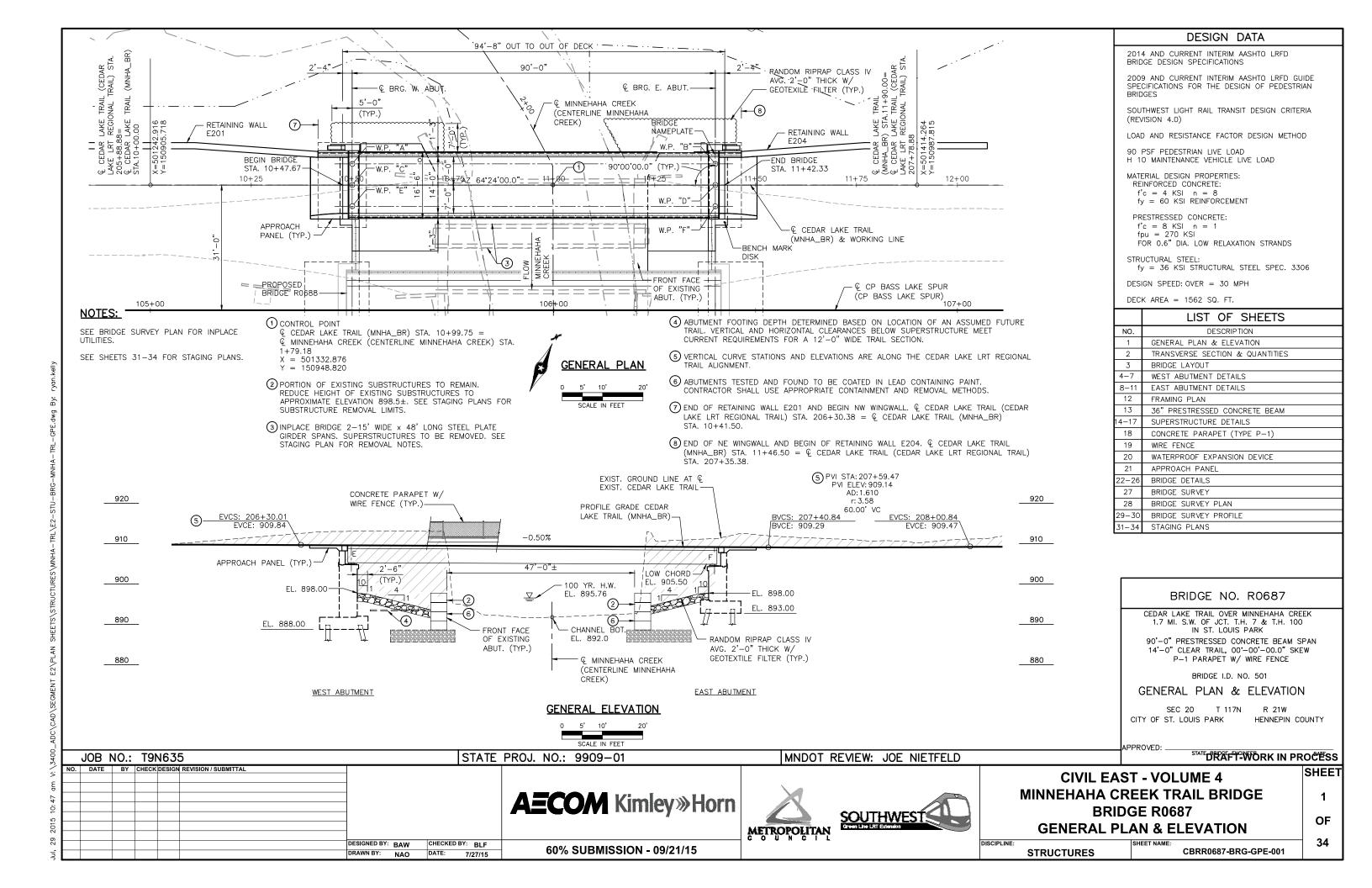


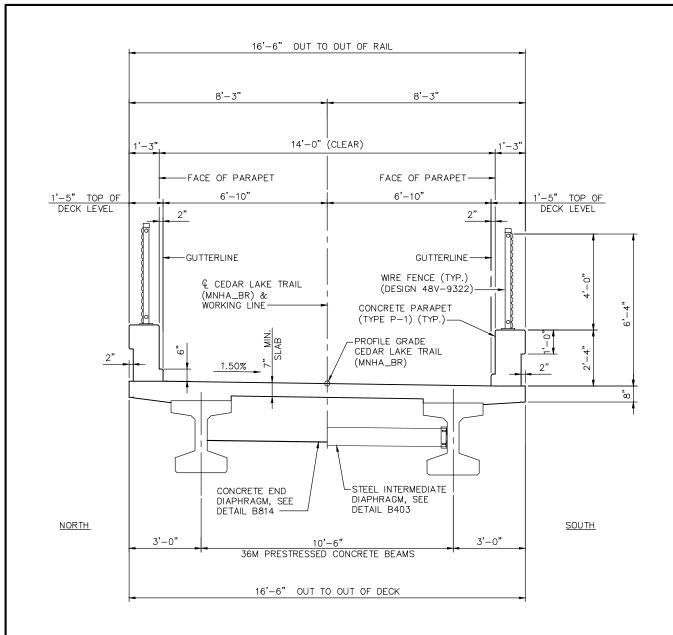












#### TRANSVERSE SECTION



#### **CONSTRUCTION NOTES:**

THE 2016 EDITION OF THE MINNESOTA DEPARTMENT OF TRANSPORTATION "STANDARD SPECIFICATIONS FOR CONSTRUCTION" SHALL GOVERN.

BRIDGE SEAT REINFORCEMENT SHALL BE CAREFULLY PLACED TO AVOID INTERFERENCE WITH DRILLING HOLES FOR ANCHOR RODS, THE BEAMS SHALL BE ERECTED IN FINAL POSITION PRIOR TO DRILLING HOLES FOR AND PLACING ANCHOR RODS.

THE BAR SIZES SHOWN IN THIS PLAN ARE IN U.S. CUSTOMARY DESIGNATIONS. THE FIRST DIGIT OR THE FIRST TWO DIGITS OF EACH BAR MARK INDICATE THE BAR SIZE.

BARS MARKED WITH THE SUFFIX "E" SHALL BE EPOXY COATED IN ACCORDANCE WITH SPEC. 3301.

THE SUBSURFACE UTILITY INFORMATION IN THIS PLAN IS UTILITY QUALITY LEVEL D. THIS UTILITY QUALITY LEVEL WAS DETERMINED ACCORDING TO THE GUIDELINES OF CI/ASCE 38-02, ENTITLED "STANDARD GUIDELINES FOR THE COLLECTION AND DEPICTION OF EXISTING SUBSURFACE UTILITY DATA".

THE PILE LOADS SHOWN IN THE PLANS AND THE CORRESPONDING NOMINAL PILE BEARING RESISTANCE (Rn) WERE COMPUTED USING LRFD METHODOLOGY. PILE BEARING RESISTANCE DETERMINED IN THE FIELD SHALL INCORPORATE THE METHODS AND/OR FORMULAS DESCRIBED IN THE SPECIAL

	SCHEDULE OF QUANTITIES FOR ENT	TRE BRIDGE	
ITEM NO.	ITEM	UNIT	QUANTITY
2401.501	STRUCTURAL CONCRETE (1G52)	CU. YD.	(P)
2401.501	STRUCTURAL CONCRETE (3B52)	CU. YD.	(P)
2401.513	TYPE P-1 (TL-2) RAILING CONCRETE (3S52)	LIN. FT.	(P)
2401.541	REINFORCEMENT BARS	POUND	(P)
2401.541	REINFORCEMENT BARS (EPOXY COATED)	POUND	(P)
2401.618	BRIDGE SLAB CONCRETE (3YHPC-M)	SQ. FT.	(P)
2402.591	EXPANSION JOINT DEVICES TYPE 4	LIN. FT.	(P)
2402.595	BEARING ASSEMBLY	EACH	(P)
2405.502	PRESTRESSED CONCRETE BEAMS 36M	LIN. FT.	(P)
2405.511	DIAPHRAGMS FOR TYPE 36M PRESTRESSED BEAMS	LIN. FT.	(P)
2411.618	ANTI-GRAFFITI COATING	SQ. FT.	(P)
2411.618	ARCHITECTURAL SURFACE FINISH (SPECIAL)	SQ. FT.	(P)
2411.618	ARCHITECTURAL CONCRETE TEXTURE (SPECIAL)	SQ. FT.	(P)
2442.501	REMOVE EXISTING BRIDGE	LUMP SUM	
2452.510	STEEL H-PILING DRIVEN 12"	LIN. FT.	
2452.511	STEEL H-PILING DELIVERED 12"	LIN. FT.	
2452.520	STEEL H-TEST PILE 75 FT LONG 12"	EACH	
2452.530	PILE TIP PROTECTION 12"	EACH	
2452.601	STEEL SHEET PILING (TEMPORARY)	LUMP SUM	
2502.502	DRAINAGE SYSTEM TYPE (B910)	LUMP SUM	
2511.501	RANDOM RIPRAP CLASS IV	CU. YD.	
2511.515	GEOTEXTILE FILTER TYPE VII	SQ. YD.	(P)
2557.501	WIRE FENCE DESIGN 48V-9322	LIN. FT.	(P)
2557.501	WIRE FENCE DESIGN 72V-9322	LIN. FT.	(P)

**DRAFT-WORK IN PROCESS** 

SHEET

2

OF

34

NO. DATE BY CHECK DESIGN REVISION / SUBMITTAL DESIGNED BY: BAW CHECKED BY: BLF DRAWN BY: NAO DATE: 7/27/15

**AECOM** Kimley»Horn

60% SUBMISSION - 09/21/15

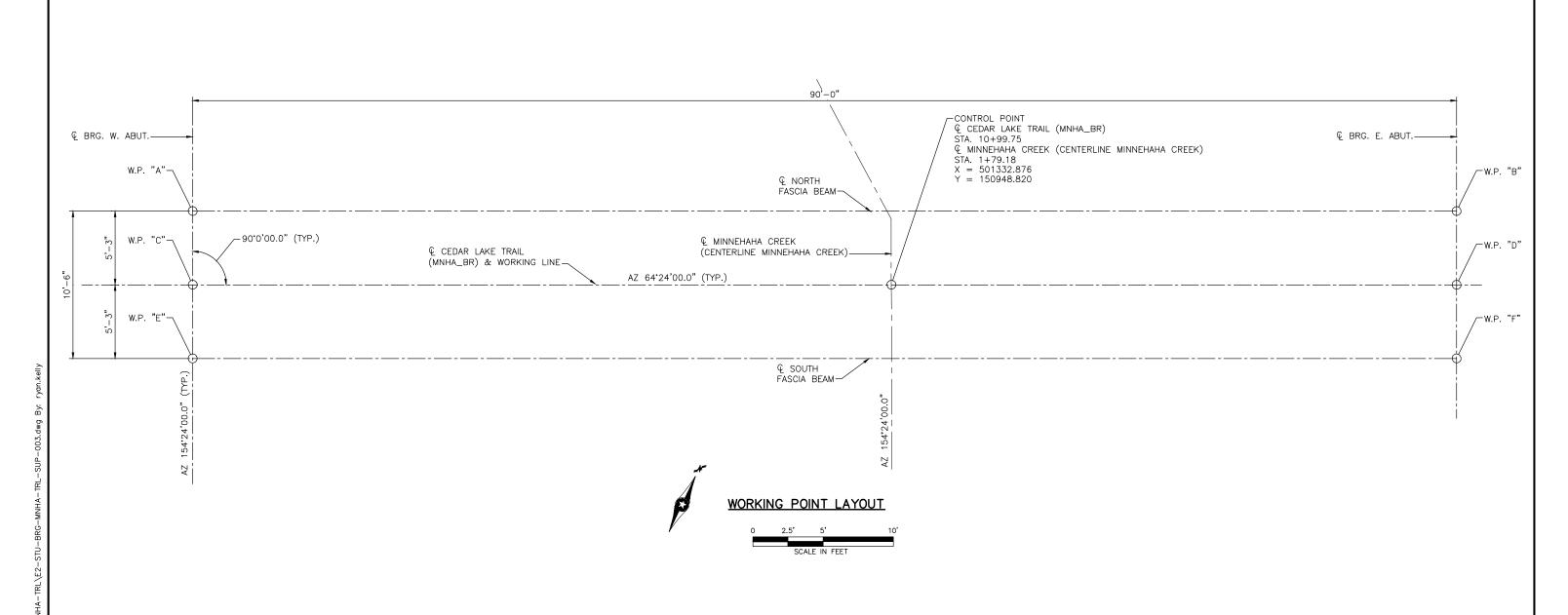
METROPOLITAN



# **CIVIL EAST - VOLUME 4** MINNEHAHA CREEK TRAIL BRIDGE **BRIDGE R0687 TRANSVERSE SECTION & QUANTITIES**

**STRUCTURES** 

CBRR0687-BRG-TRN-001



	DIMENSIONS BETWEEN WORKING POINTS						COORD	COORDINATES ELEVATIONS			S		
POINT	STATION	Α	В	С	D	E	F	Х	Υ	TOP OF SLAB	TOP OF SLAB TO BRIDGE SEAT	BRIDGE SEAT	POINT
А	10+50.00		90.00	5.25	90.15		90.61	501285.739	150932.057	909.88	4.17	905.71	А
В	11+40.00				5.25	90.61		501366.904	150970.945	909.43	4.05	905.38	В
С	10+50.00				90.00	5.25	90.15	501288.008	150927.323	909.80			С
D	11+40.00						5.25	501369.172	150966.210	909.35			D
Е	10+50.00						90.00	501290.276	150922.588	909.72	4.17	905.55	Е
F	11+40.00							501371.441	150961.476	909.27	4.05	905.22	F
										•			

TOP OF ROADWAY TO BRIDGE SEAT										
	DECK	STOOL	BEAM	BEARING	TOTAL					
	THICKNESS	HEIGHT	HEIGHT	HEIGHT	INCHES	FEET				
WEST ABUTMENT	7"	2 3/8"	36"	4 5/8"	50	4.17				
EAST ABUTMENT	7"	2 3/8"	36"	3 1/4"	48 5/8"	4.05				

# DRAFT-WORK IN PROCESS SHEET

DESIGNED BY: BAW CHECKED BY: BLF

DRAWN BY: NAO DATE: 7/27/15

**AECOM** Kimley»Horn

60% SUBMISSION - 09/21/15





# CIVIL EAST - VOLUME 4 MINNEHAHA CREEK TRAIL BRIDGE BRIDGE R0687 BRIDGE LAYOUT

STRUCTURES SHEET NAME: CBRR0687-BRG-SUP-003

OF 34

3

WEST ABUTMENT							
COMPUTED PILE LOAD - TONS/PILE							
FACTORED DEAD LOAD + EARTH PRESSURE	97.7						
FACTORED LIVE LOAD	36.7						
* FACTORED DESIGN LOAD	134.4						

<sup>\*</sup> BASED ON STRENGTH V LOAD COMBINATION.

WEST ABUTMENT REQUIRED NOMINAL PILE BEARING RESISTANCE FOR H-PILES Rn - TONS/PILE									
FIELD CONTROL METHOD	φdyn	* Rn							
MN/DOT PILE FORMULA 2012 (MPF12) $R_n = 20 \sqrt{\frac{ W \times H }{1000}} x log\left(\frac{10}{S}\right)$	0.60	225							
PDA	0.65	207							

<sup>\*</sup> Rn = (FACTORED DESIGN LOAD) / φdyn

#### **GENERAL PILE NOTES**

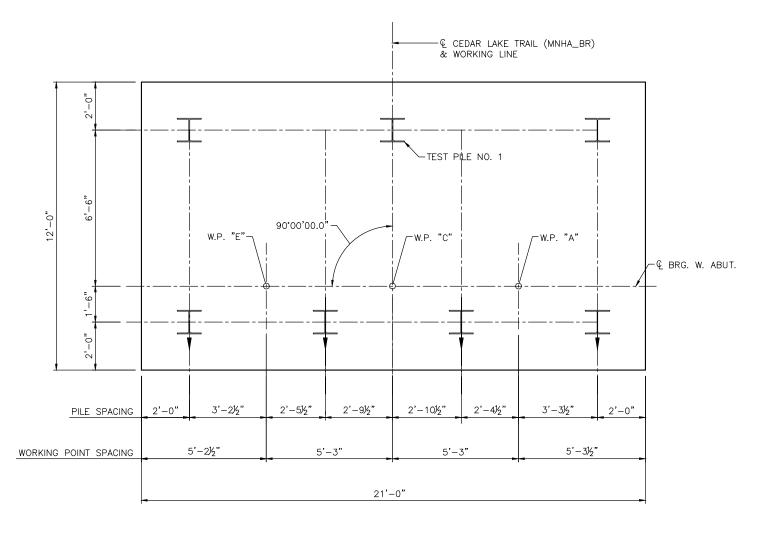
- 1 HP12x53 STEEL TEST PILES 75 FT. LONG
- 6 HP12x53 STEEL PILES EST. 75 FT. LENGTH
- 7 HP12x53 STEEL PILES REQ'D FOR WEST ABUT.

ALL PILES TO BE HP12x53 WITH PILE TIP PROTECTION.

PILE SPACING SHOWN IS AT BOTTOM OF FOOTING.

PILES MARKED THUS  $\dot{\pm}$  TO BE BATTERED 3" PER FOOT IN DIRECTION SHOWN.

FOR PILE SPLICE DETAILS SEE DETAIL B202.

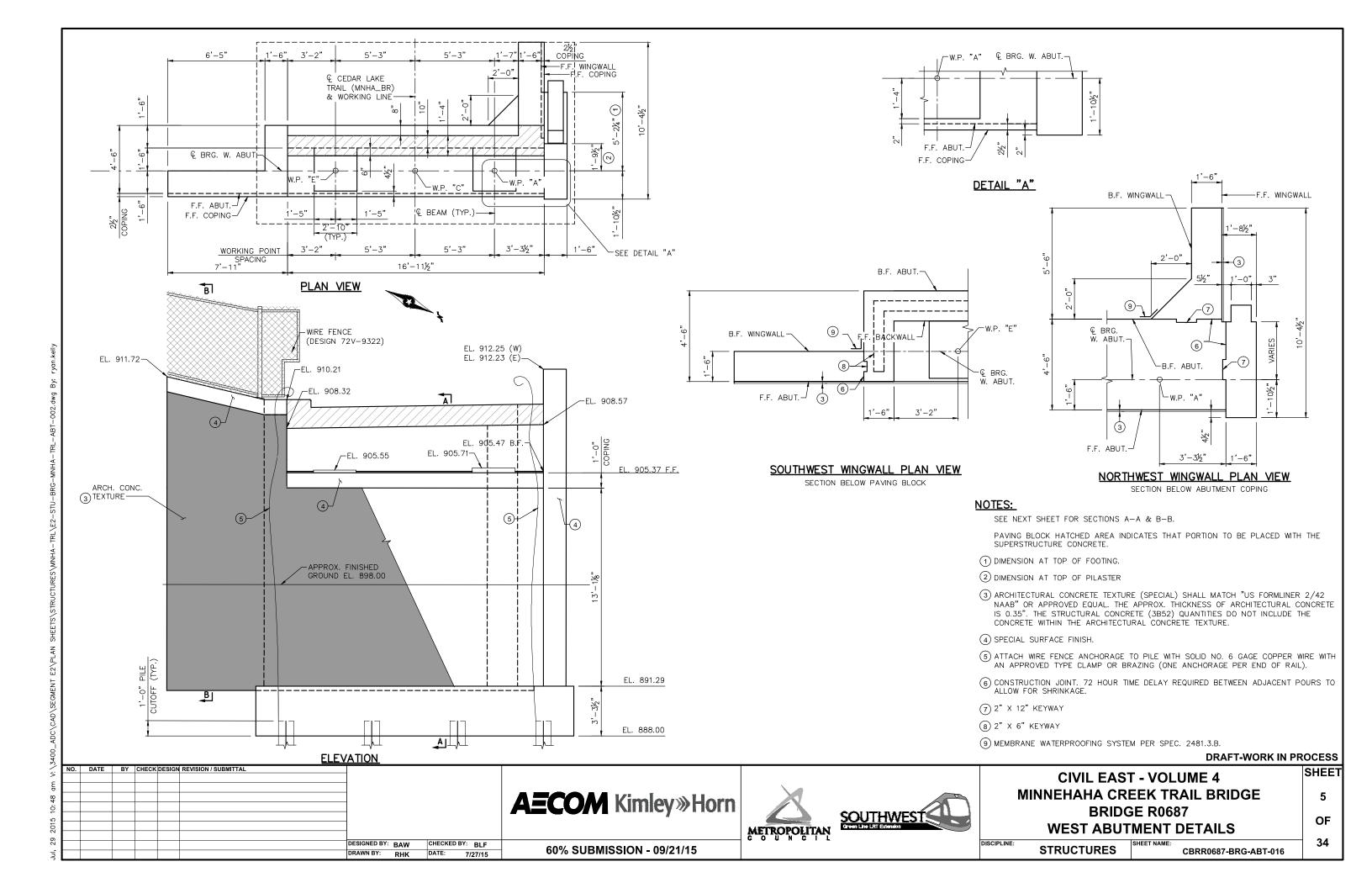


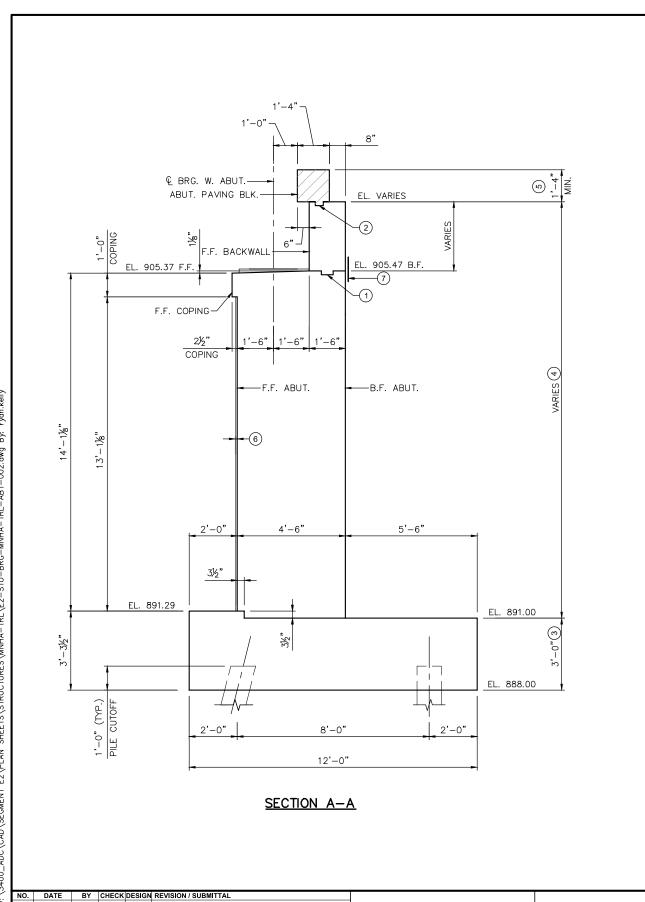


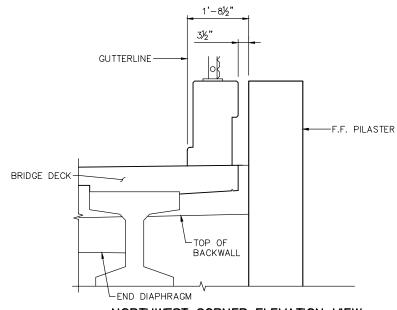
## **DRAFT-WORK IN PROCESS**

NO. DATE BY CHECK DESIGN REVISION / SUBMITTAL SHEET **CIVIL EAST - VOLUME 4** MINNEHAHA CREEK TRAIL BRIDGE **AECOM** Kimley»Horn SOUTHWEST Green Line Little Extension **BRIDGE R0687** OF **WEST ABUTMENT DETAILS** DESIGNED BY: BAW CHECKED BY: BLF DISCIPLINE: 34 **STRUCTURES** 60% SUBMISSION - 09/21/15 CBRR0687-BRG-ABT-019 DRAWN BY: RHK DATE: 7/27/15

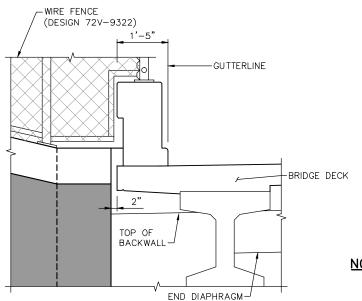
I:12 am V: \54UU\_ADU\\CAD\\SEGMEN! EZ\PLAN SHEE!S\SIRUC!URES\MNHA—IRL\EZ-S!U—BKG-MNHA—IRL-AB!-UUZ.<



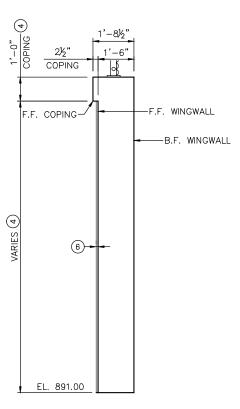




NORTHWEST CORNER ELEVATION VIEW



SOUTHWEST CORNER ELEVATION VIEW



SECTION B-B

#### NOTES:

PAVING BLOCK HATCHED AREA INDICATES THAT PORTION TO BE PLACED WITH THE

- 1) PERMISSIBLE CONSTRUCTION JOINT WITH 2" x 6" KEY CENTERED IN WALL.
- 2 CONSTRUCTION JOINT WITH 2" x 4" KEY
- 3 STRUCTURAL CONCRETE (1G52).
- (4) STRUCTURAL CONCRETE (3B52).
- 5 BRIDGE SLAB CONCRETE (3YHPC-M). SEE SUPERSTRUCTURE DETAILS.
- (6) ARCHITECTURAL CONCRETE TEXTURE (SPECIAL) SHALL MATCH "US FORMLINER 2/42 NAAB" OR APPROVED EQUAL. THE APPROX. THICKNESS OF ARCHITECTURAL CONCRETE IS 0.35". THE STRUCTURAL CONCRETE (3B52) QUANTITIES DO NOT INCLUDE THE CONCRETE WITHIN THE ARCHITECTURAL CONCRETE TEXTURE.
- (7) MEMBRANE WATERPROOFING SYSTEM PER SPEC. 2481.3.B

**DRAFT-WORK IN PROCESS** 

SHEET

OF

**AECOM** Kimley»Horn DESIGNED BY: BAW CHECKED BY: BLF 60% SUBMISSION - 09/21/15 DRAWN BY: RHK DATE: 7/27/15

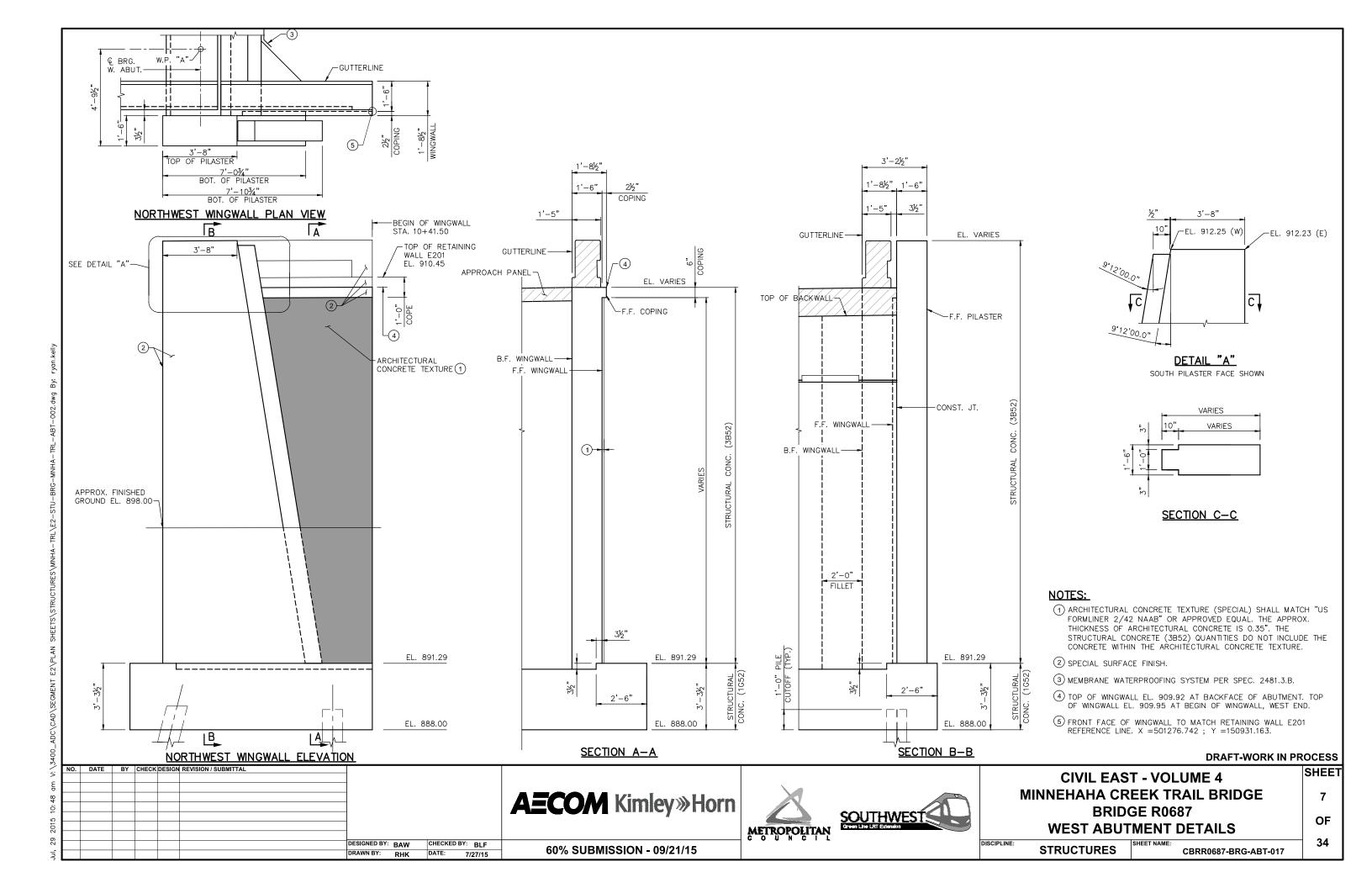




**CIVIL EAST - VOLUME 4** MINNEHAHA CREEK TRAIL BRIDGE **BRIDGE R0687** 

**WEST ABUTMENT DETAILS STRUCTURES** 

CBRR0687-BRG-ABT-018



EAST ABUTMENT COMPUTED PILE LOAD - TONS/PILE						
FACTORED DEAD LOAD + EARTH PRESSURE	79.3					
FACTORED LIVE LOAD	40.8					
* FACTORED DESIGN LOAD	120.1					

\* BASED ON STRENGTH V LOAD COMBINATION.

EAST ABUTI REQUIRED NOMINAL RESISTANCE FOR H-PILI	PILE BEAR	_
FIELD CONTROL METHOD	φdyn	* Rn
MN/DOT PILE FORMULA 2012 (MPF12)		
$R_n = 20 \sqrt{\frac{W \times H}{1000}} \times log\left(\frac{10}{S}\right)$	0.60	201

\* Rn = (FACTORED DESIGN LOAD) / φdyn

185

#### **GENERAL PILE NOTES**

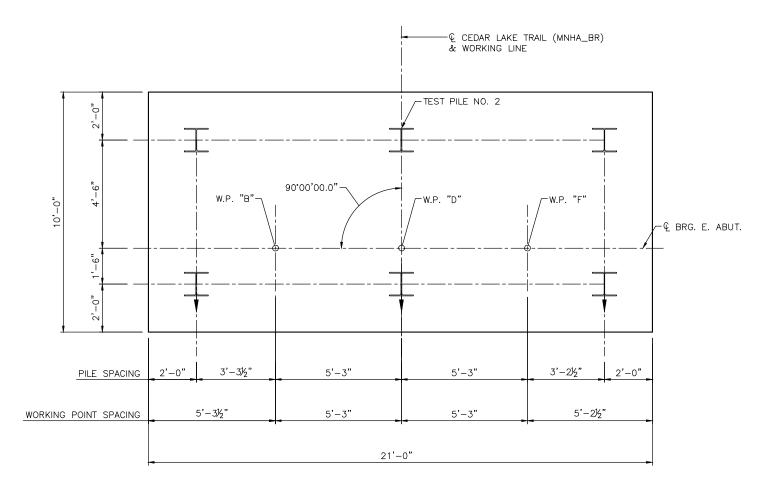
- 1 HP12x53 STEEL TEST PILES 75 FT. LONG
- 5 HP12x53 STEEL PILES EST. 75 FT. LENGTH
- 6 HP12x53 STEEL PILES REQ'D FOR EAST ABUT.

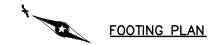
ALL PILES TO BE HP12x53 WITH PILE TIP PROTECTION.

PILE SPACING SHOWN IS AT BOTTOM OF FOOTING.

PILES MARKED THUS  $\stackrel{1}{\pm}$  TO BE BATTERED 3" PER FOOT IN DIRECTION SHOWN.

FOR PILE SPLICE DETAILS SEE DETAIL B202.

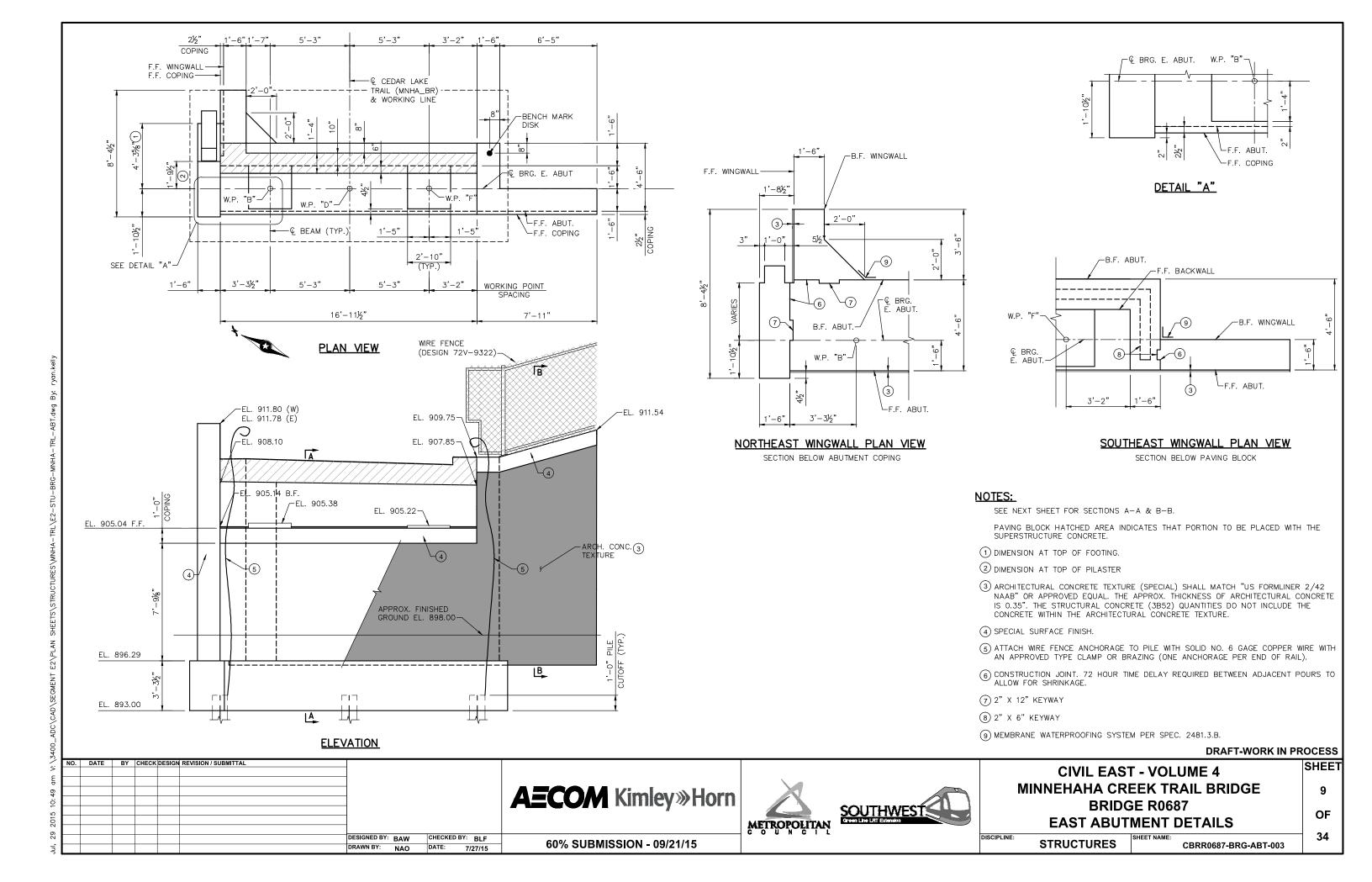


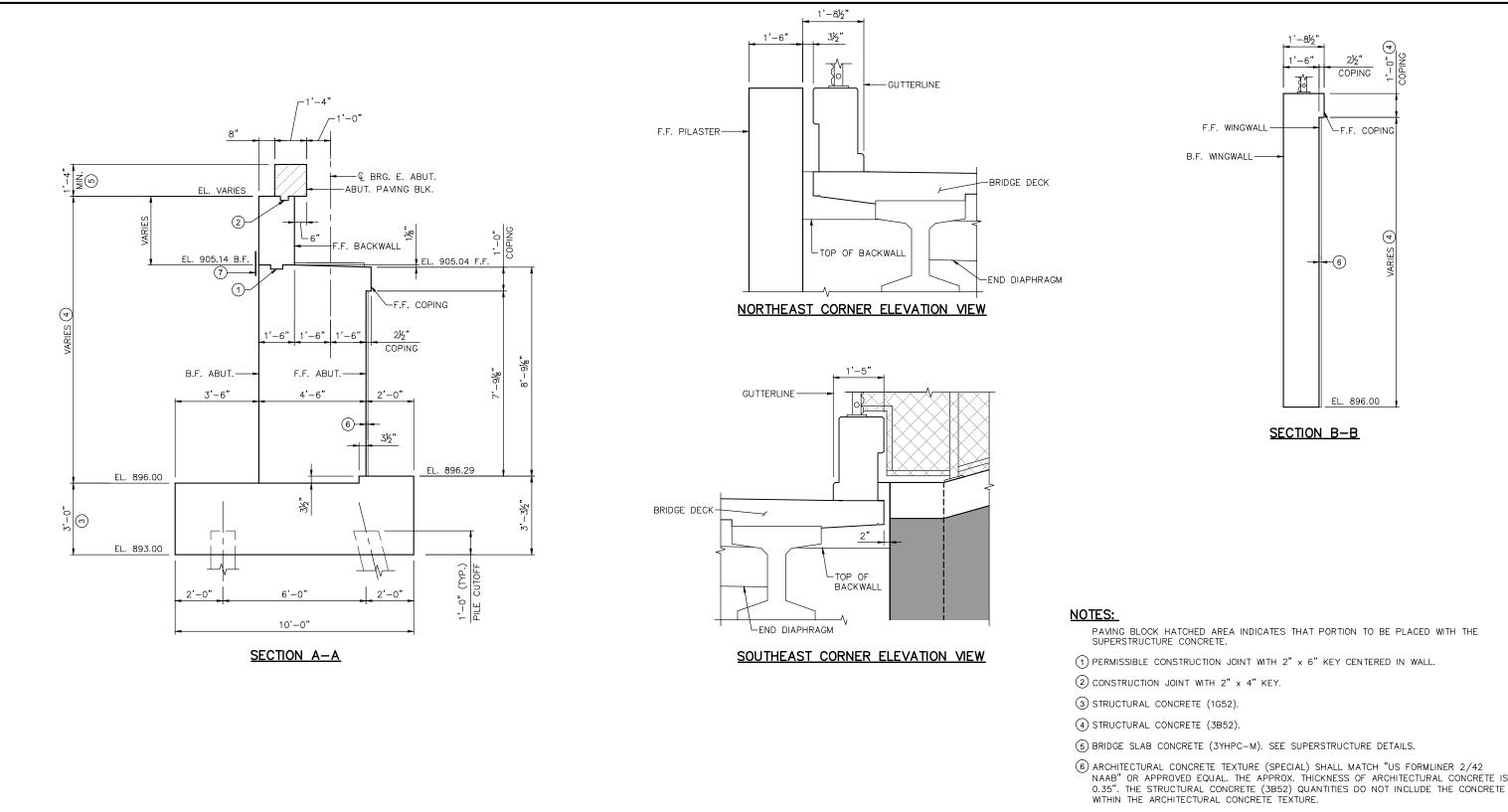


# **DRAFT-WORK IN PROCESS**

NO. DATE BY CHECK DESIGN REVISION / SUBMITTAL SHEET **CIVIL EAST - VOLUME 4** MINNEHAHA CREEK TRAIL BRIDGE **AECOM** Kimley»Horn SOUTHWEST Creen Libro Lett Extension **BRIDGE R0687** OF METROPOLITAN **EAST ABUTMENT DETAILS** DISCIPLINE: 34 DESIGNED BY: BAW CHECKED BY: BLF 60% SUBMISSION - 09/21/15 **STRUCTURES** CBRR0687-BRG-ABT-004 DRAWN BY: NAO DATE: 7/27/15

Y. (UTSULATE VALUENTE LE ( EAN BILLE) STROOTERS (MINTALLE E DIO BILO MINTALLE ABLANGE).





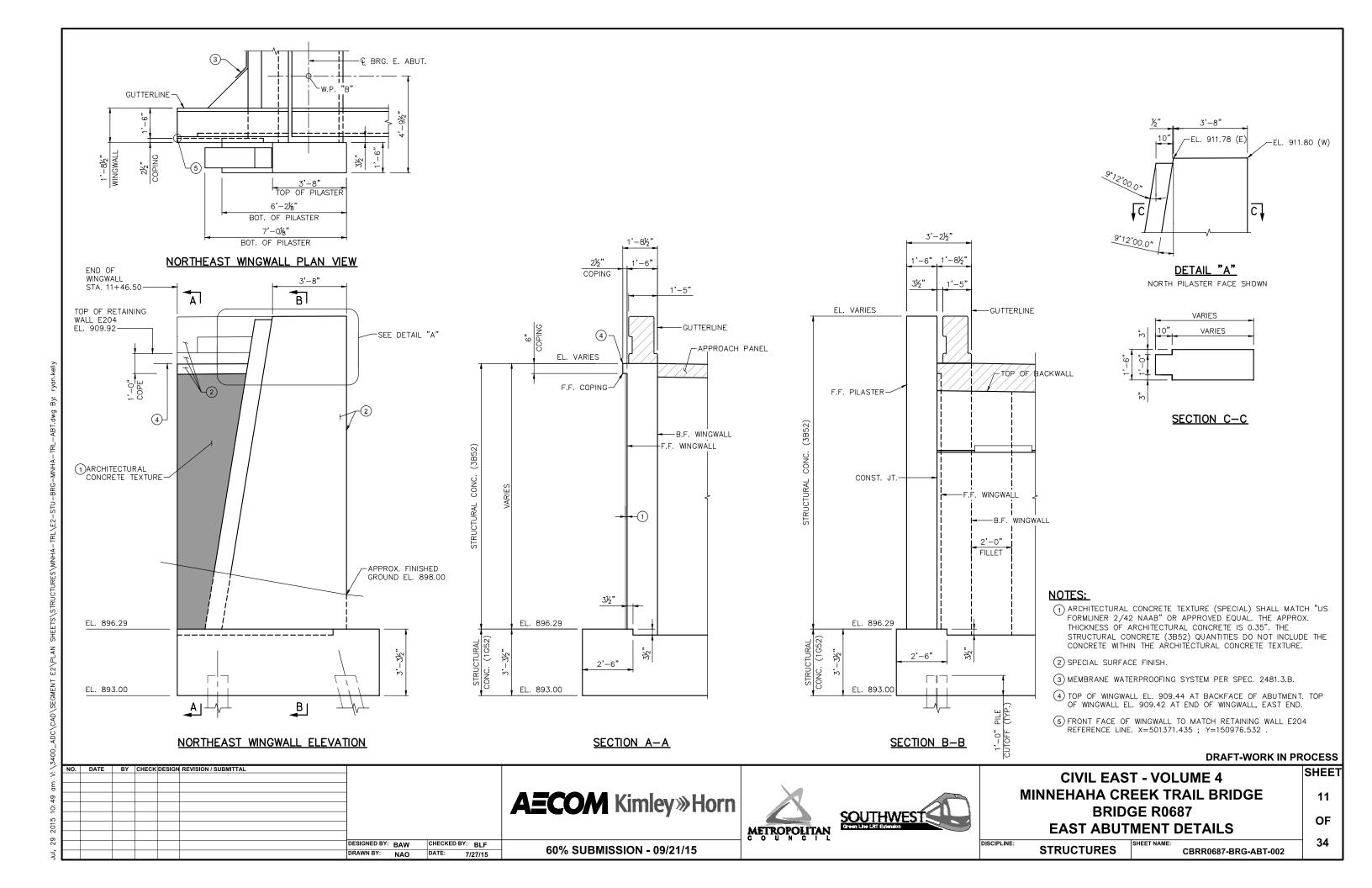
**DRAFT-WORK IN PROCESS** 

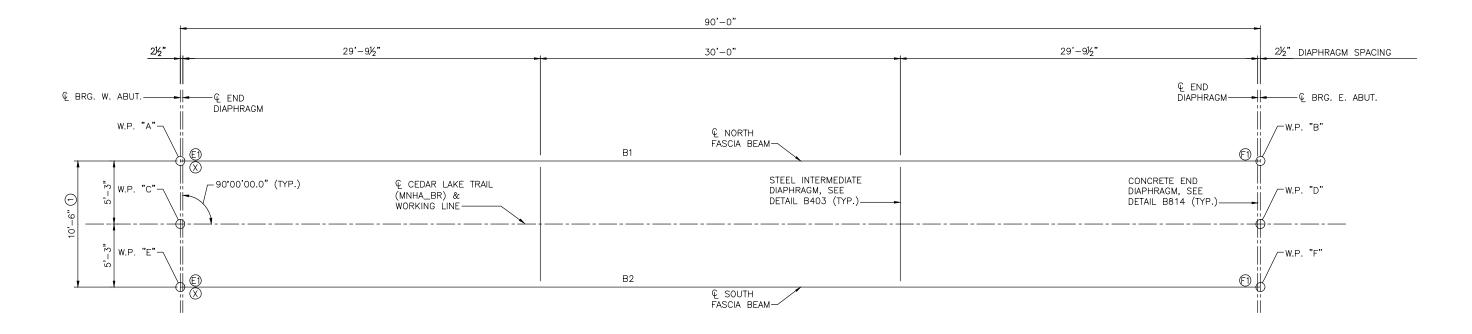
7 MEMBRANE WATERPROOFING SYSTEM PER SPEC. 2481.3.B.

F.F. COPING

EL. 896.00

SHEET **CIVIL EAST - VOLUME 4** MINNEHAHA CREEK TRAIL BRIDGE **AECOM** Kimley»Horn 10 SOUTHWEST **BRIDGE R0687** OF **EAST ABUTMENT DETAILS** DESIGNED BY: BAW CHECKED BY: BLF DISCIPLINE: 60% SUBMISSION - 09/21/15 **STRUCTURES** CBRR0687-BRG-ABT-005 DRAWN BY: NAO DATE: 7/27/15







#### NOTES

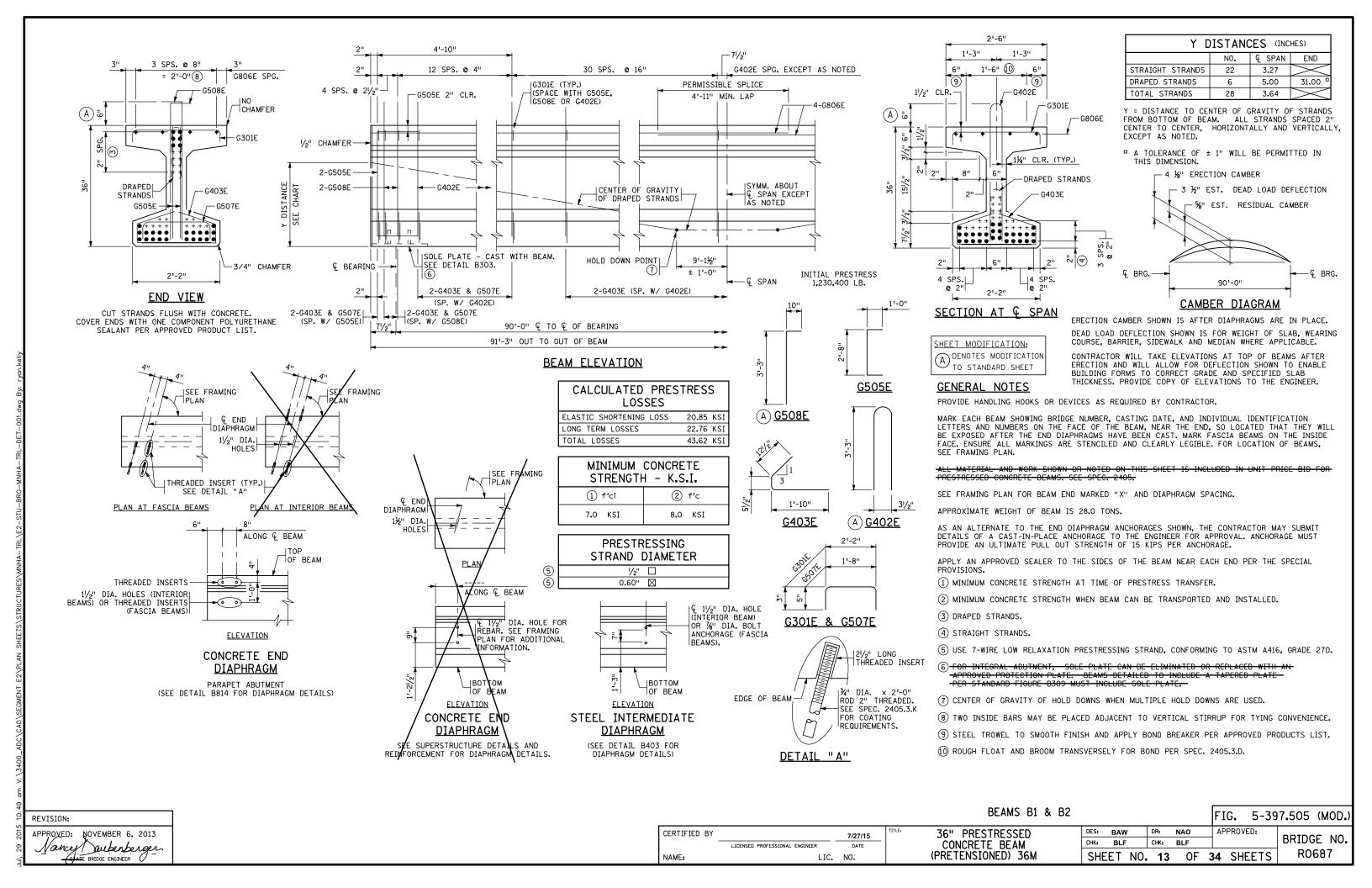
- (F) DENOTES FIXED CURVED PLATE BEARING ASSEMBLY, TYPE F1. SEE DETAIL B310.
- (E1) DENOTES EXPANSION CURVED PLATE BEARING ASSEMBLY, TYPE E1. SEE DETAIL B311.
- X INDICATES END OF BEAM.

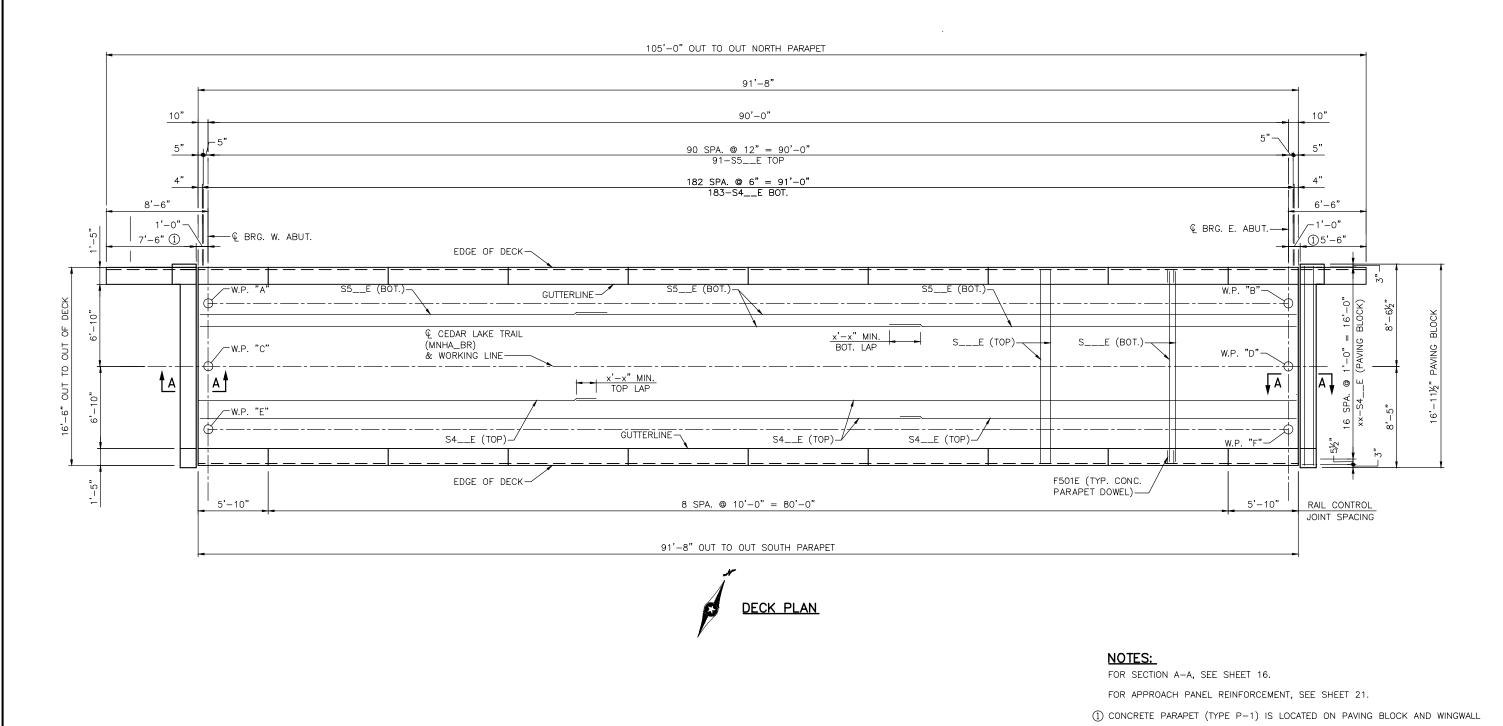
ALL BEAMS SET PARALLEL TO WORKING LINE, ALL DIAPHRAGMS SET PARALLEL TO SUBSTRUCTURES.

1 36M PRESTRESSED CONCRETE BEAMS.

DRAFT-WORK IN PROCESS

34											DIVAL 1-WOLK IN	INOULUU
/ ; E	NO.	DATE	BY	CHECK DESIGN REVISION / SUBMITTAL						CIVIL EAS	T - VOLUME 4	SHEET
: 49 ar							<b>AECOM</b> Kimley»Horn				EEK TRAIL BRIDGE	12
115 10						2001HME21	BRIDGE R0687					
39 20					DESIGNED BY:	CHECKED BY:		METROPOLITAN			ING PLAN SHEET NAME:	34
Jul,					DESIGNED BY: BAW DRAWN BY: NAO	CHECKED BY: BLF DATE: 7/27/15	60% SUBMISSION - 09/21/15			STRUCTURES	CBRR0687-BRG-SUP-001	J -

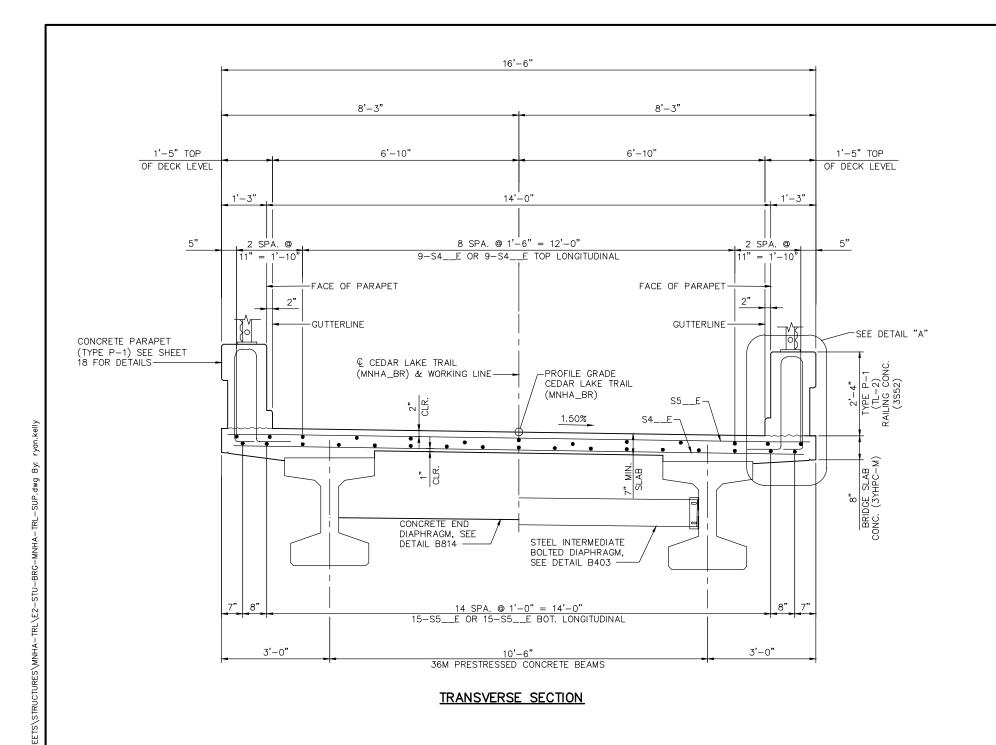


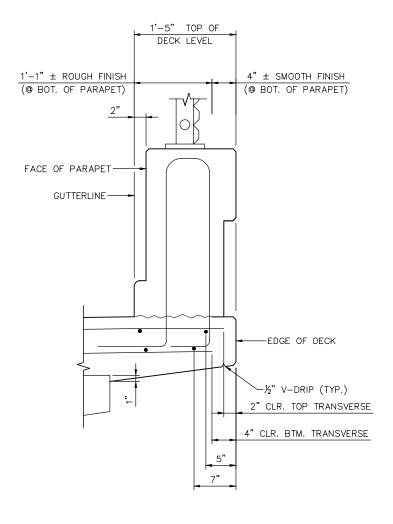


DRAFT-WORK IN PROCESS

NO. DATE BY CHECK DESIGN REVISION / SUBMITTAL SHEET **CIVIL EAST - VOLUME 4** MINNEHAHA CREEK TRAIL BRIDGE **AECOM** Kimley»Horn SOUTHWEST Creen Live Little Extension **BRIDGE R0687** OF SUPERSTRUCTURE DETAILS METROPOLITAN DESIGNED BY: BAW CHECKED BY: BLF DISCIPLINE: 60% SUBMISSION - 09/21/15 **STRUCTURES** CBRR0687-BRG-SUP-004 DRAWN BY: NAO DATE: 7/27/15

Jul, 29 2015 10:49 am V:\3400\_ADC\CAD\SEGMENT E2\PLAN SHEETS\S

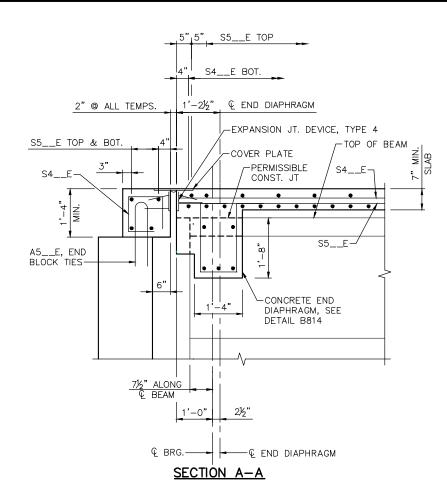




DETAIL "A"

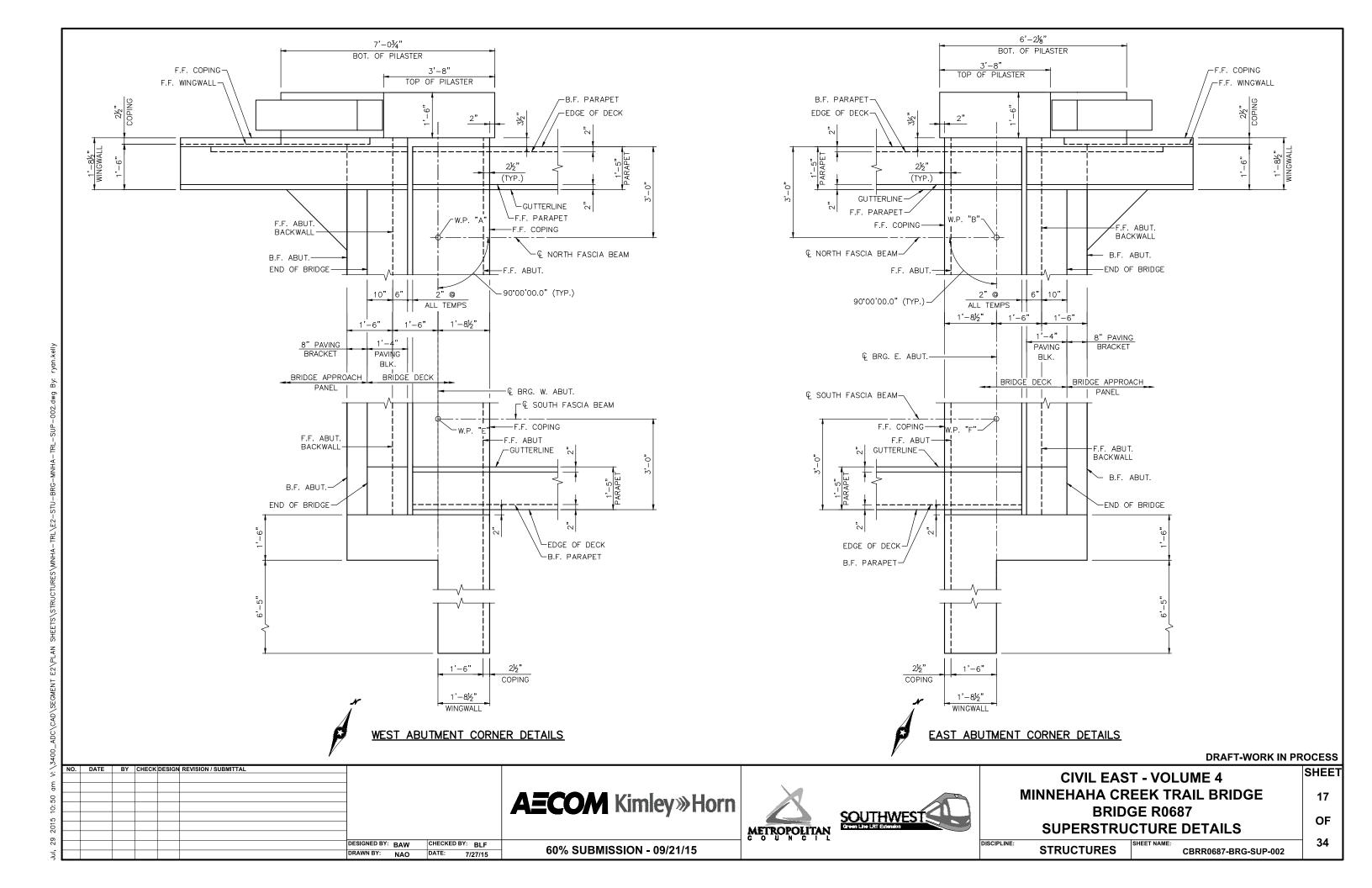
## **DRAFT-WORK IN PROCESS**

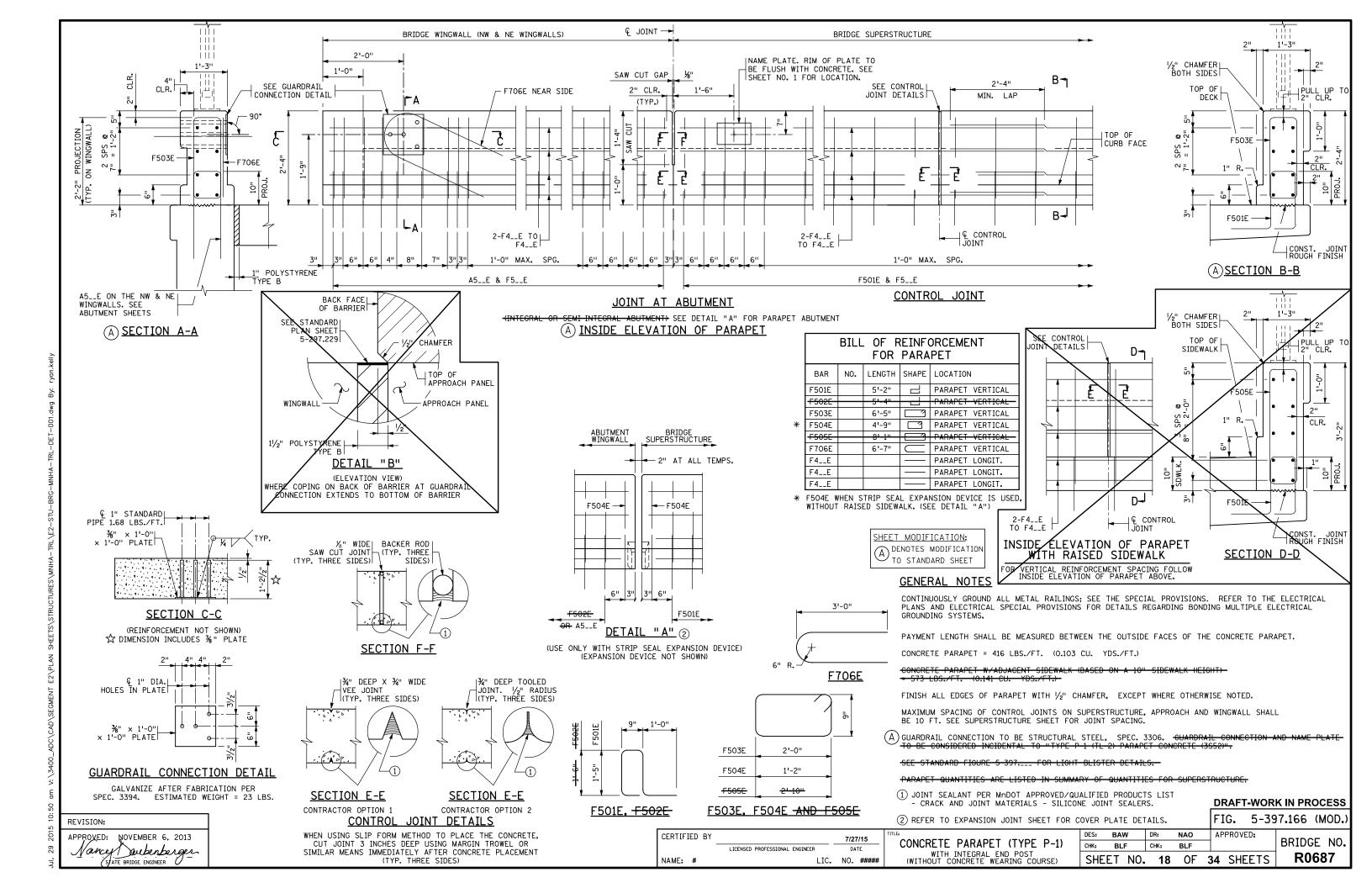
NO. DATE BY CHECK DESIGN REVISION / SUBMITTAL SHEET **CIVIL EAST - VOLUME 4** MINNEHAHA CREEK TRAIL BRIDGE **AECOM** Kimley»Horn 15 SOUTHWEST Green Line LETT Extension **BRIDGE R0687** OF SUPERSTRUCTURE DETAILS METROPOLITAN DISCIPLINE: 34 DESIGNED BY: BAW CHECKED BY: BLF 60% SUBMISSION - 09/21/15 **STRUCTURES** CBRR0687-BRG-SUP-006 DRAWN BY: NAO DATE: 7/27/15

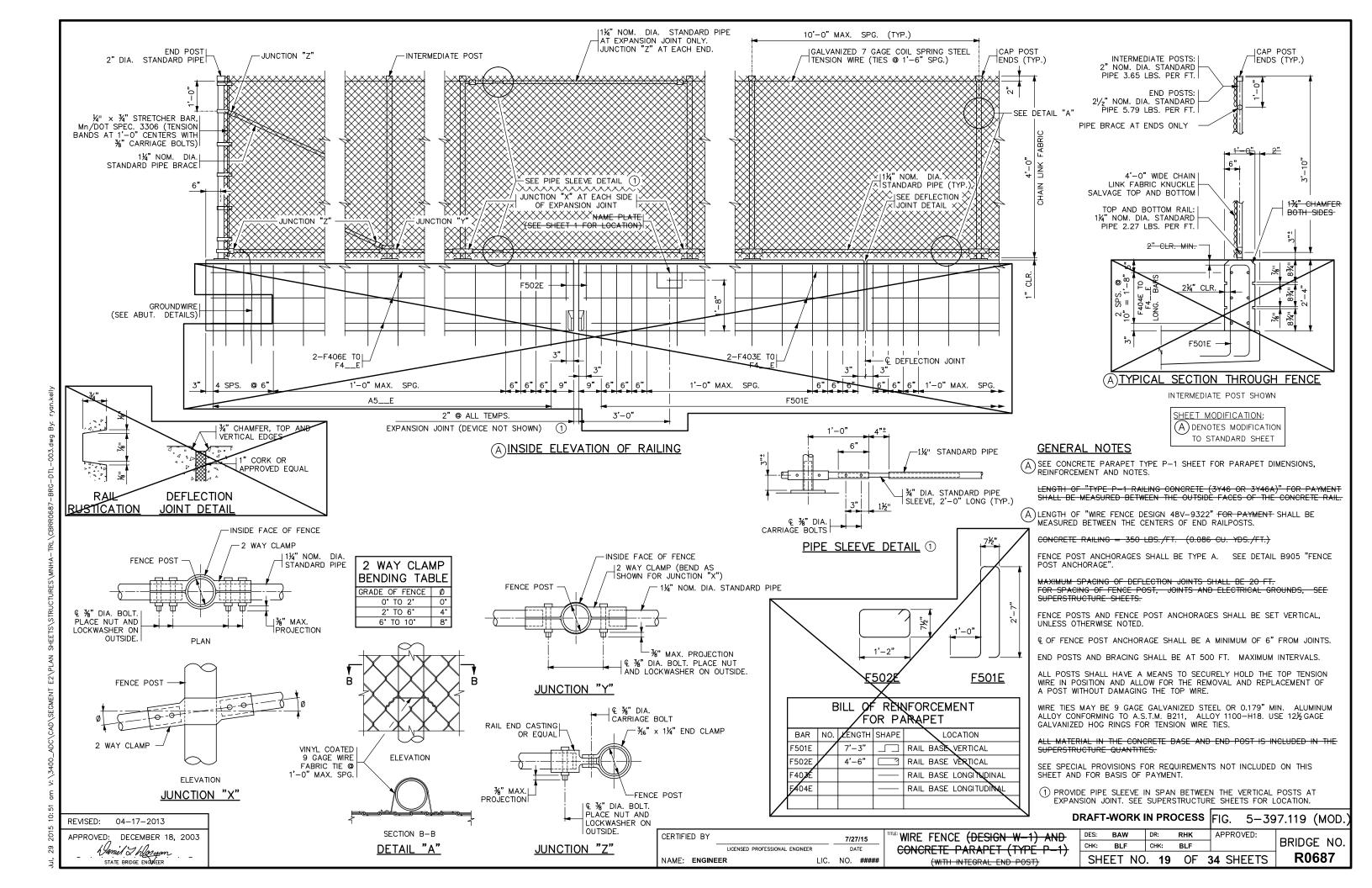


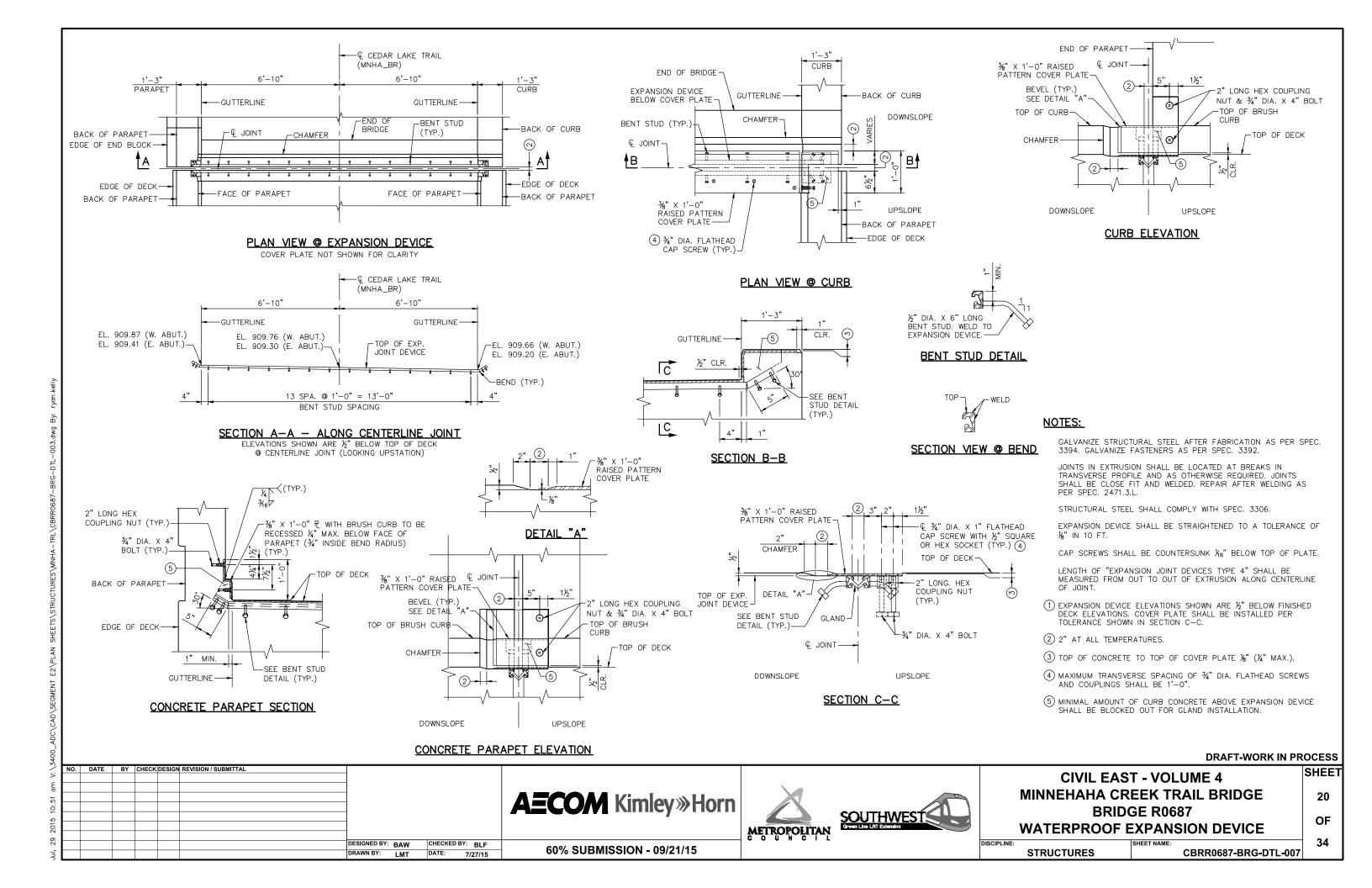
**DRAFT-WORK IN PROCESS** 

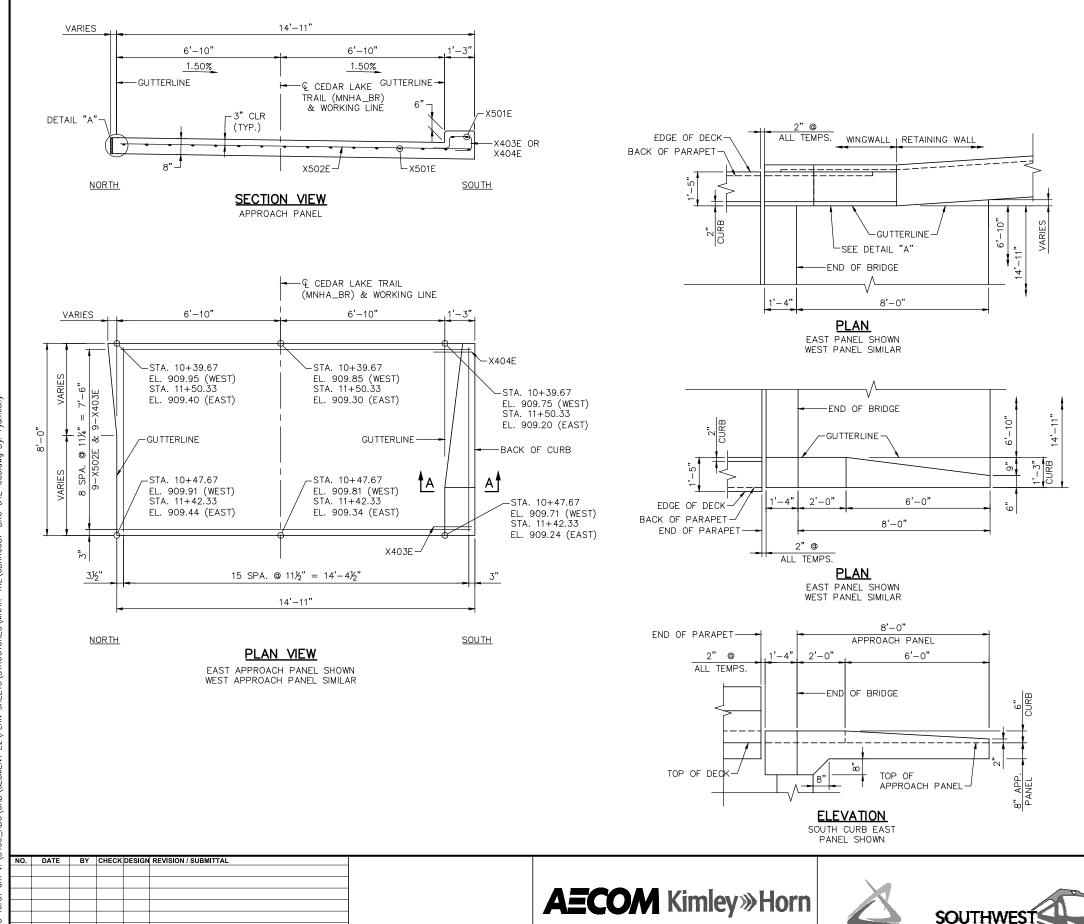
SHEET **CIVIL EAST - VOLUME 4** MINNEHAHA CREEK TRAIL BRIDGE **AECOM** Kimley»Horn 16 **BRIDGE R0687** SOUTHWEST Green Line Little Extension OF SUPERSTRUCTURE DETAILS METROPOLITAN 34 DISCIPLINE: DESIGNED BY: BAW CHECKED BY: BLF 60% SUBMISSION - 09/21/15 **STRUCTURES** CBRR0687-BRG-SUP-005 DRAWN BY: NAO DATE: 7/27/15

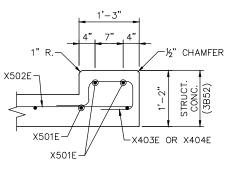




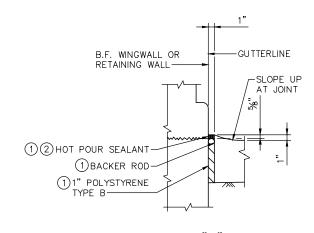








#### SECTION A-A



DETAIL "A"

#### NOTES:

- (1) HOT POUR SEALANT, BACKER ROD, POLYSTYRENE SHALL BE LOCATED BETWEEN WALLS AND APPROACH PANELS.
- (2) HOT POUR SEALANT SPEC. 3725. TOP OF SEALER FLUSH TO  $\mbox{\ensuremath{\%}}{}^{\rm m}$  BELOW TOP OF PAVEMENT SURFACE.

DRAFT-WORK IN PROCESS

SHEET **CIVIL EAST - VOLUME 4** MINNEHAHA CREEK TRAIL BRIDGE 21 SOUTHWEST: **BRIDGE R0687** OF **APPROACH PANEL** METROPOLITAN DESIGNED BY: BAW CHECKED BY: BLF DISCIPLINE: 60% SUBMISSION - 09/21/15 DRAWN BY: LMT DATE: 7/27/15 **STRUCTURES** CBRR0687-BRG-DTL-008

#### NUMBERS FOR NAMEPLATE

### NOTES:

MATERIAL SHALL COMPLY WITH SPEC. 3327.

LETTERS AND NUMBERS SHALL CONFORM TO THOSE SHOWN.

DRAFT ON LETTERS AND NUMBERS SHALL NOT BE MORE THAN 3" IN 12". HORIZONTAL SPACING OF LETTERS AND NUMBERS SHALL PRODUCE A BALANCED LAYOUT IN PROPORTION TO SPACING SHOWN.

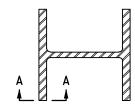
TOP SURFACE OF LETTERS, NUMBERS AND FRAMES SHALL BE BURNISHED. FURNISH 2 STEEL BOLTS % " DIA.  $\times$  3" LONG WITH EACH PLATE.

ALL DIMENSIONS FOR  $\mathscr{V}_4"$  HIGH LETTERS AND NUMBERS SHALL BE IN DIRECT PROPORTION TO THOSE SHOWN FOR THE 1" HIGH LETTERS AND NUMBERS.

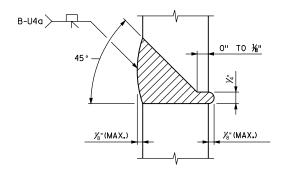
STATE OF MINNESOTA
DEPARTMENT OF TRANSPORTATION APPROVED: NOVEMBER 22, 2002 DETAIL NO. BRIDGE NAMEPLATE Waniel I Waryan B101 (FOR NEW BRIDGES) STATE BRIDGE ENGINEER

DESIGNED BY: BAW CHECKED BY: BLF

DRAWN BY: NAO DATE: 7/27/15



SECTION AT SPLICE



SECTION A-A 100% BUTT WELDED PILE SPLICE

CELLULOSIC TYPE ELECTRODES E-6010 OR E-6011 SHALL BE USED FOR 100% BUTT WELDED SPLICES.

ELECTRODES WHICH HAVE BECOME WET, SOILED OR DAMAGED SHALL NOT BE USED.

WELDING SHALL NOT BE DONE WHEN THE AMBIENT TEMPERATURE IS LOWER THAN O'F, OR WHEN THE PILE IS WET OR EXPOSED TO FALLING RAIN OR SNOW. WHEN THE PILE METAL TEMPERATURE IS BELOW 32°F, THE PILE METAL IN THE AREA OF THE WELD SHALL BE HEATED TO A MINIMUM TEMPERATURE OF 70°F, AND MAINTAINED AT THIS TEMPERATURE DURING WELDING.

APPROVED: NOVEMBER 22, 2002 Hamiel I Waryan STATE BRIDGE ENGINEER

STATE OF MINNESOTA
DEPARTMENT OF TRANSPORTATION

PILE SPLICE (STEEL H BEARING PILES 10" TO 14") DETAIL NO.

B202 DRAFT-WORK IN PROCESS

**AECOM** Kimley»Horn

METROPOLITAN



# **CIVIL EAST - VOLUME 4** MINNEHAHA CREEK TRAIL BRIDGE **BRIDGE R0687 DETAILS**

DISCIPLINE

OF

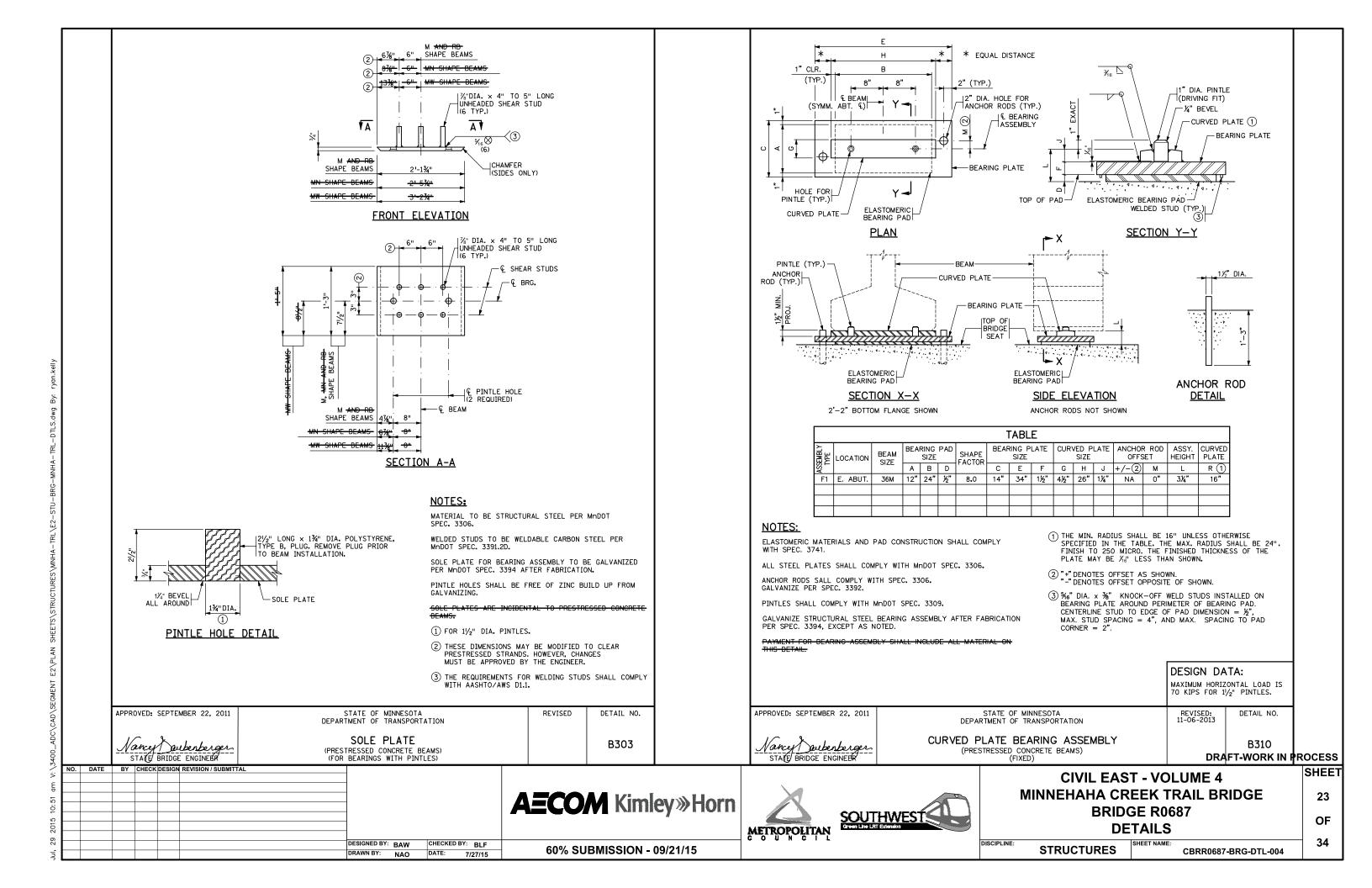
60% SUBMISSION - 09/21/15

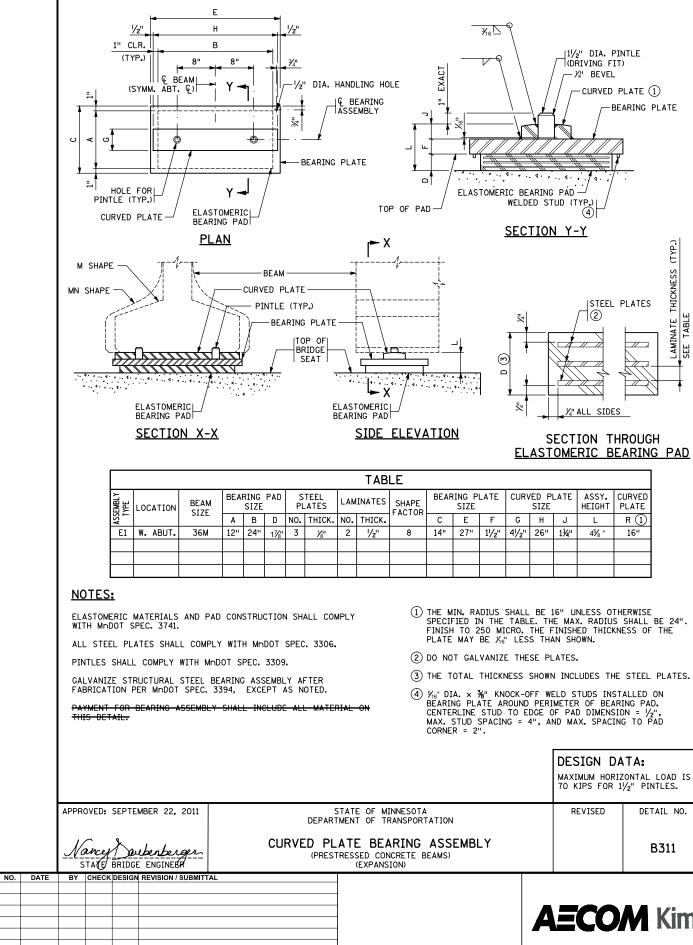
**STRUCTURES** 

CBRR0687-BRG-DTL-003

SHEE

22

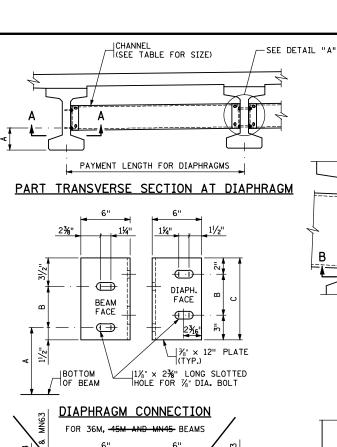




DESIGNED BY: BAW CHECKED BY: BLF

DATE: 7/27/15

DRAWN BY: NAO



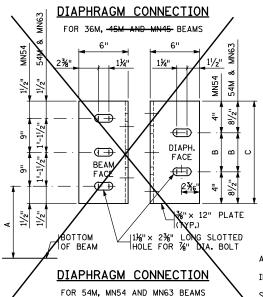


		TABLE										
BEAM		DISTANCE										
HEIGHT	Α	В	С	SIZE								
36M	1'-3"	7"	1'-0"	C12×20.7								
45M	1'-3¾"	1'-1"	1'-6"	MC18×42.7								
54M	1'-214"	11 111	<u> 21 €⊓</u>	MC18×42.7								
MN45	1'-734"	7"	1' 0"	C12×20.7								
MN54	1'-734"	1'-1"	11-911	MC18×42.7								
MN63	1 -734"	1'-1"	21-611	MC18×42.7								

DIA. HOLES IN CHANNEL DETAIL "A" INTERIOR BEAM WITH CONTINUOUS LINE OF DIAPHRAGMS %" DIA, CAST-IN-PLACE BOLT ANCHORAGE 78" × 2¼" H.S. BOLT PER SPEC. 3391.2.B AND 3" SQ. × %6" PLATE WASHER. TORQUE ANCHOR BOLTS TO 80 FT.-LBS. %" x 12" PLATE |¢ DIAPHRAGM (SEE FRAMING PLAN) J€ BOLT TANCHORAGE — 1" MIN. R. SEE FRAMING PLAN FOR & BOLT HOLE & BEAM LOCATIONS SECTION A-A TYPICAL SECTION AT SECTION B-B ALL FASCIA BEAMS TYPICAL SECTION AT INTERIOR BEAM WITH CONTINUOUS OR STAGGERED INTERMEDIATE DIAPHRAGMS ALL STEEL SHALL CONFORM TO SPEC. 3306.

| 1/8" DIA. HIGH STRENGTH BOLTS PER SPEC. 3391.2.B

|%| DIA. A307 BOLTS, PER SPEC. 3391.2.A, WITH TWO HEX NUTS, OR EQUAL, AND TWO HARDENED 3" SQ. ×  $\%_6$ " PLATE WASHERS EACH AT ALL INTERIOR BEAM DIAPHRAGM CONNECTIONS

WITH HEX NUT AND ONE 3" SQ. x 1/6" PLATE WASHER ON SLOTTED SIDE AND HARDENED WASHER

FORM 11/2" DIA. HOLES IN WEB (TYP.)

0

INSTALLATION SHALL CONFORM TO SPEC. 2405.3.K.

SHOP BEND THE LEG OF THE 12" PLATE TO CONFORM TO THE DIAPHRAGM. A %" × 6" × 6" ANGLE MAY BE USED FOR DIAPHRAGMS PERPENDICULAR TO BEAMS.

BENT PLATES MAY BE USED IN PLACE OF CHANNELS. THE BENT PLATES MUST BE THE SAME HEIGHT AS THE CHANNELS THEY REPLACE, BE  $\%_6$ " IN THICKNESS, AND HAVE LEGS 5" LONG.

GALVANIZE STEEL PLATES AND SHAPES IN ACCORDANCE WITH SPEC. 3394.

GALVANIZE BOLTS, NUTS AND WASHERS PER SPEC. 3392.

1) FOR SKEW ANGLES UNDER 20°, USE 90° LESS THE SKEW ANGLE. FOR SKEW ANGLES OVER 20°, USE 90°.

Vaniel I Wargan STATE BRIDGE ENGINEER

APPROVED: OCTOBER 26, 2005

STEEL INTERMEDIATE DIAPHRAGM

(FOR 36M - 54M, MN45 - MN63 PRESTRESSED CONCRETE BEAMS)

STATE OF MINNESOTA
DEPARTMENT OF TRANSPORTATION

DETAIL NO. 06-14-2006 10-22-2009 B403

DRAFT-WORK IN PROCESS

SHEE.

24

OF

**AECOM** Kimley»Horn

60% SUBMISSION - 09/21/15



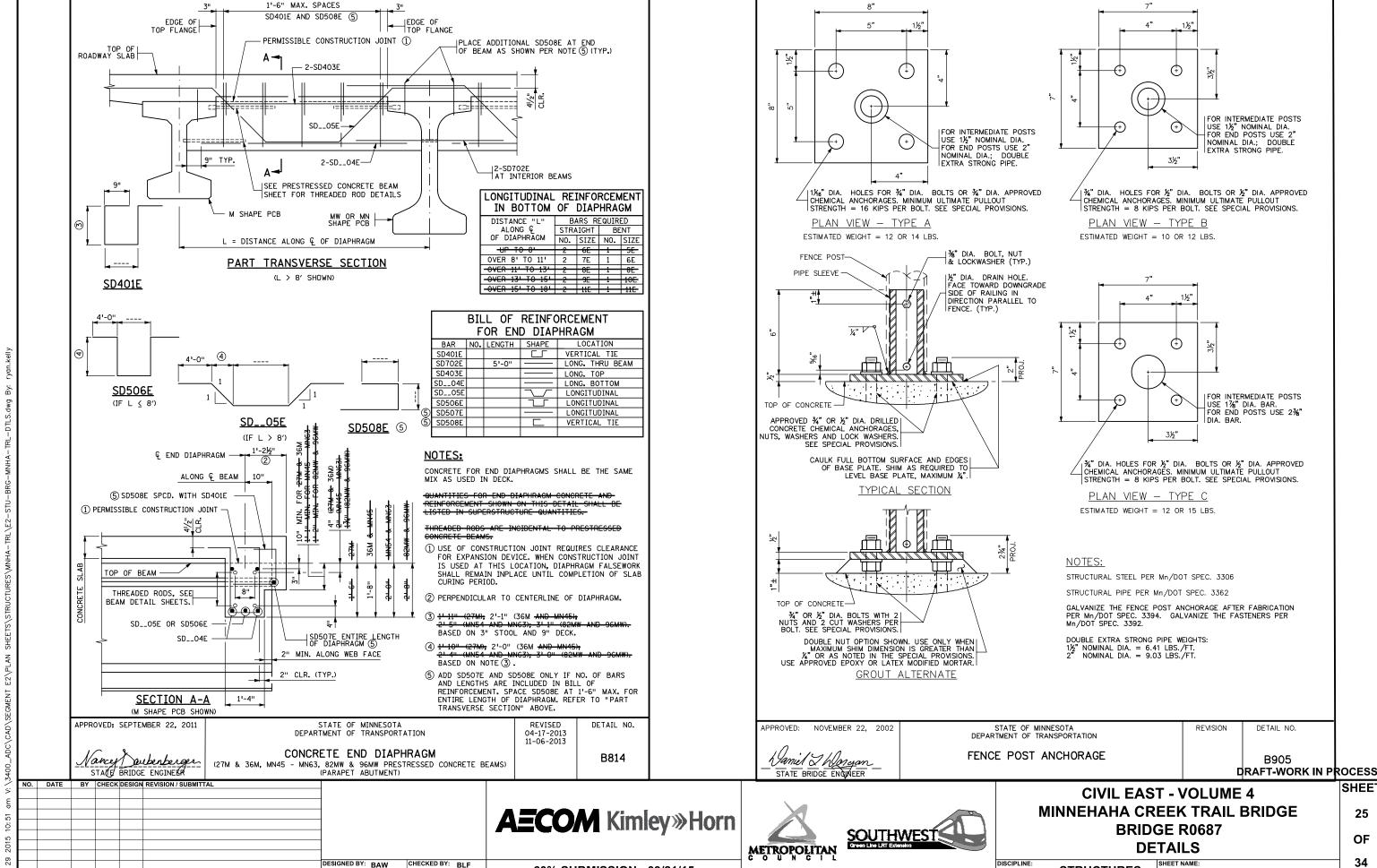


# **CIVIL EAST - VOLUME 4** MINNEHAHA CREEK TRAIL BRIDGE **BRIDGE R0687 DETAILS**

DISCIPLINE **STRUCTURES** 

CBRR0687-BRG-DTL-005

34



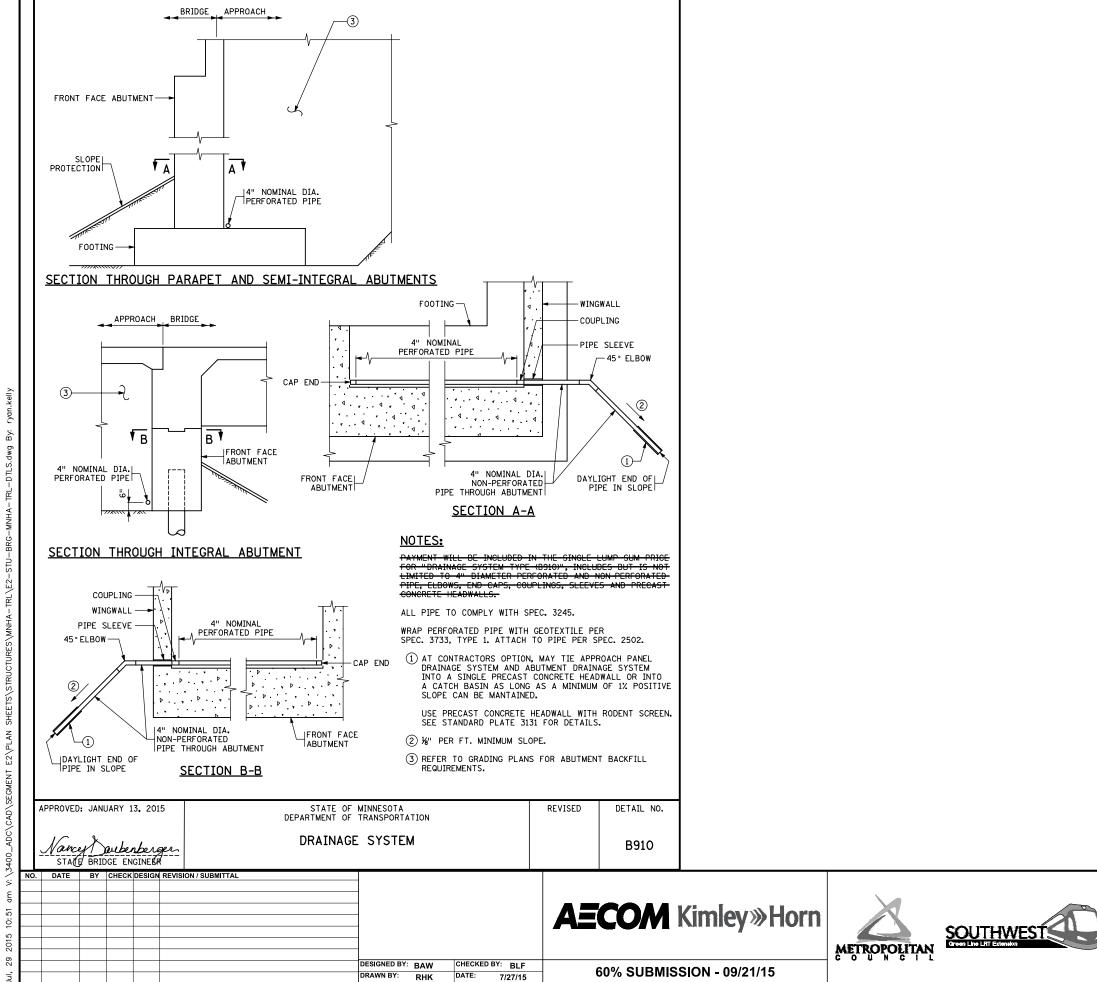
60% SUBMISSION - 09/21/15

DRAWN BY: NAO

DATE: 7/27/15

**STRUCTURES** 

CBRR0687-BRG-DTL-006



**DRAFT-WORK IN PROCESS** SHEET

26

OF

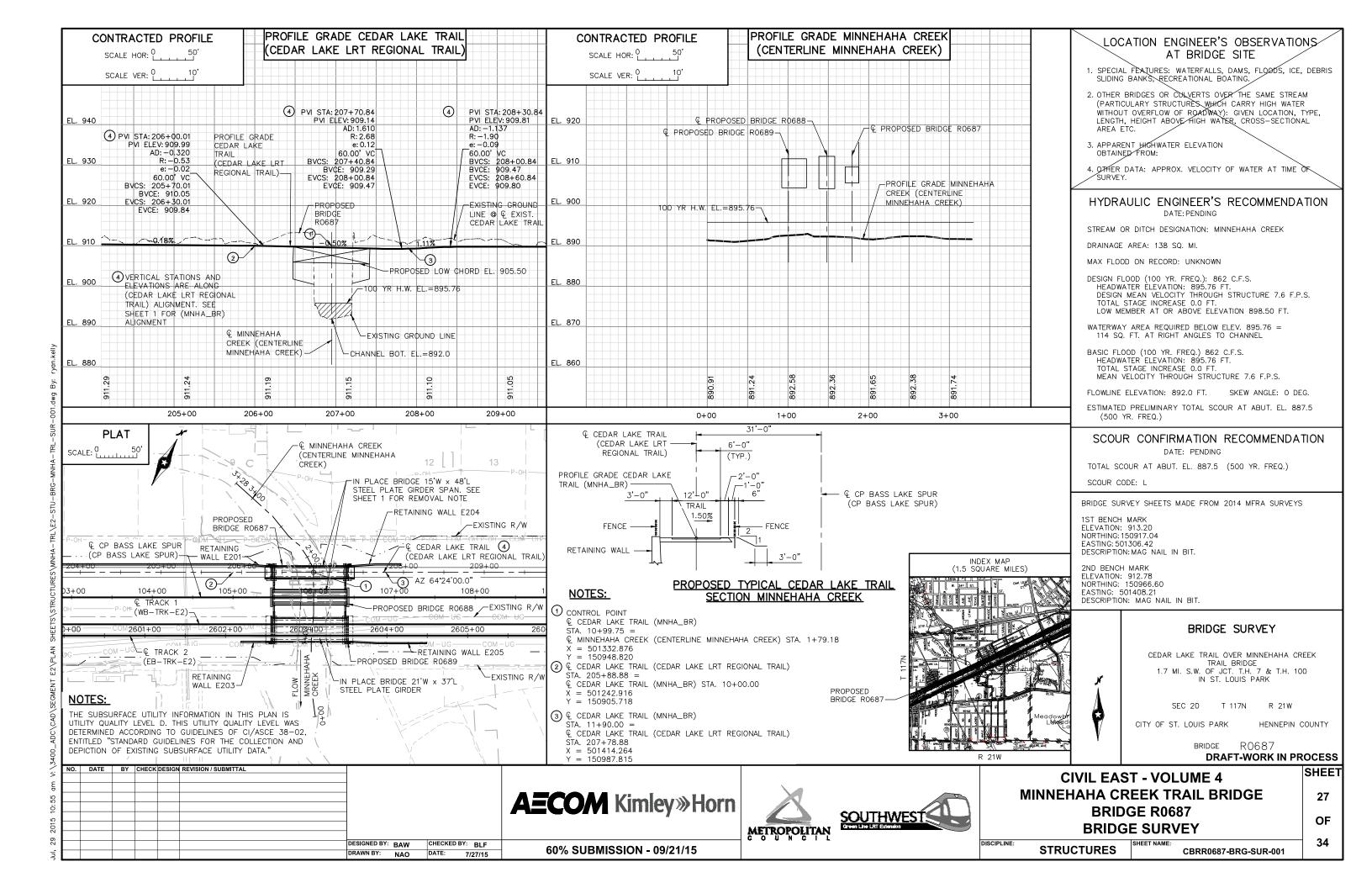
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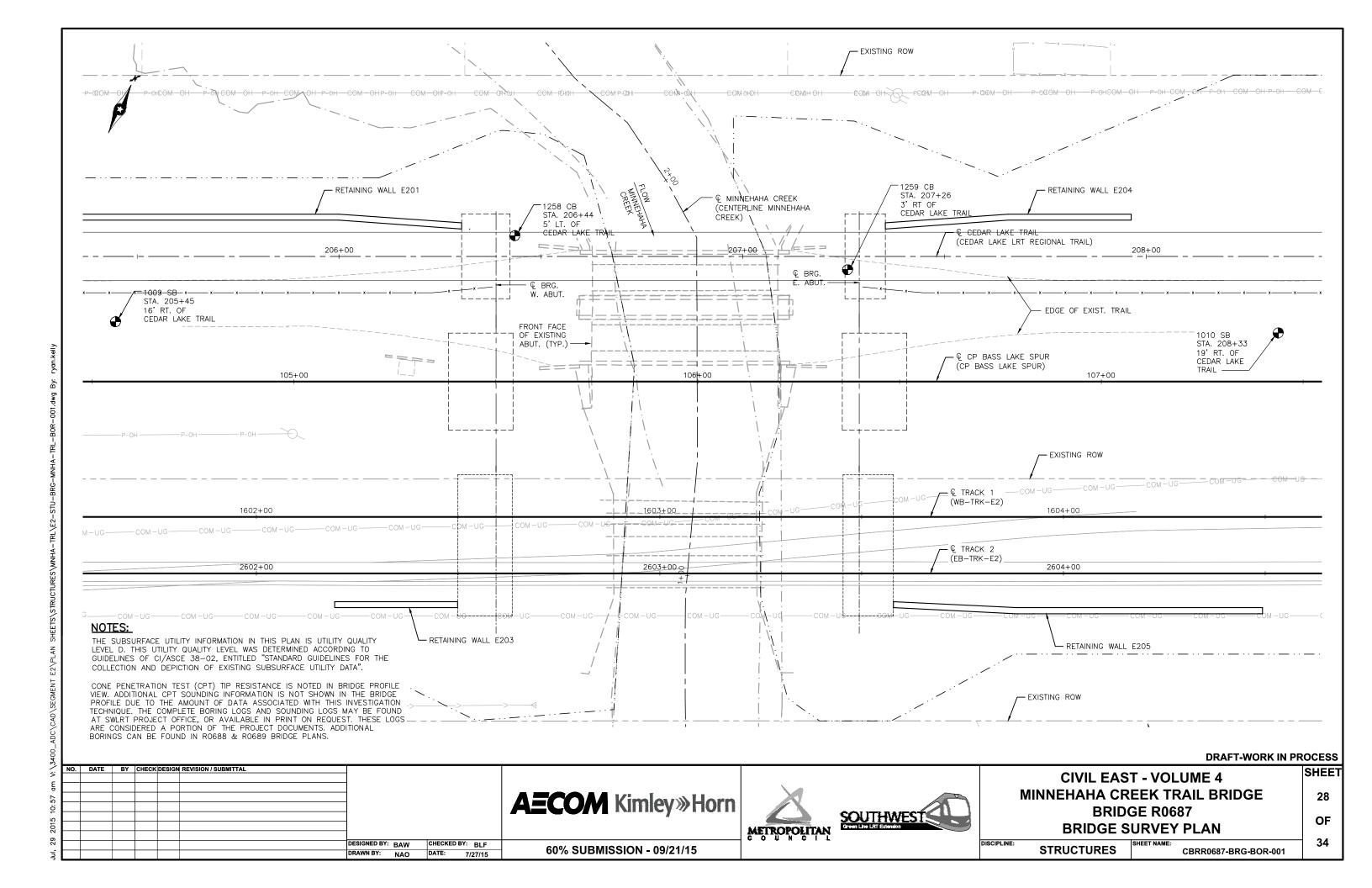
**CIVIL EAST - VOLUME 4** MINNEHAHA CREEK TRAIL BRIDGE **BRIDGE R0687 DETAILS** 

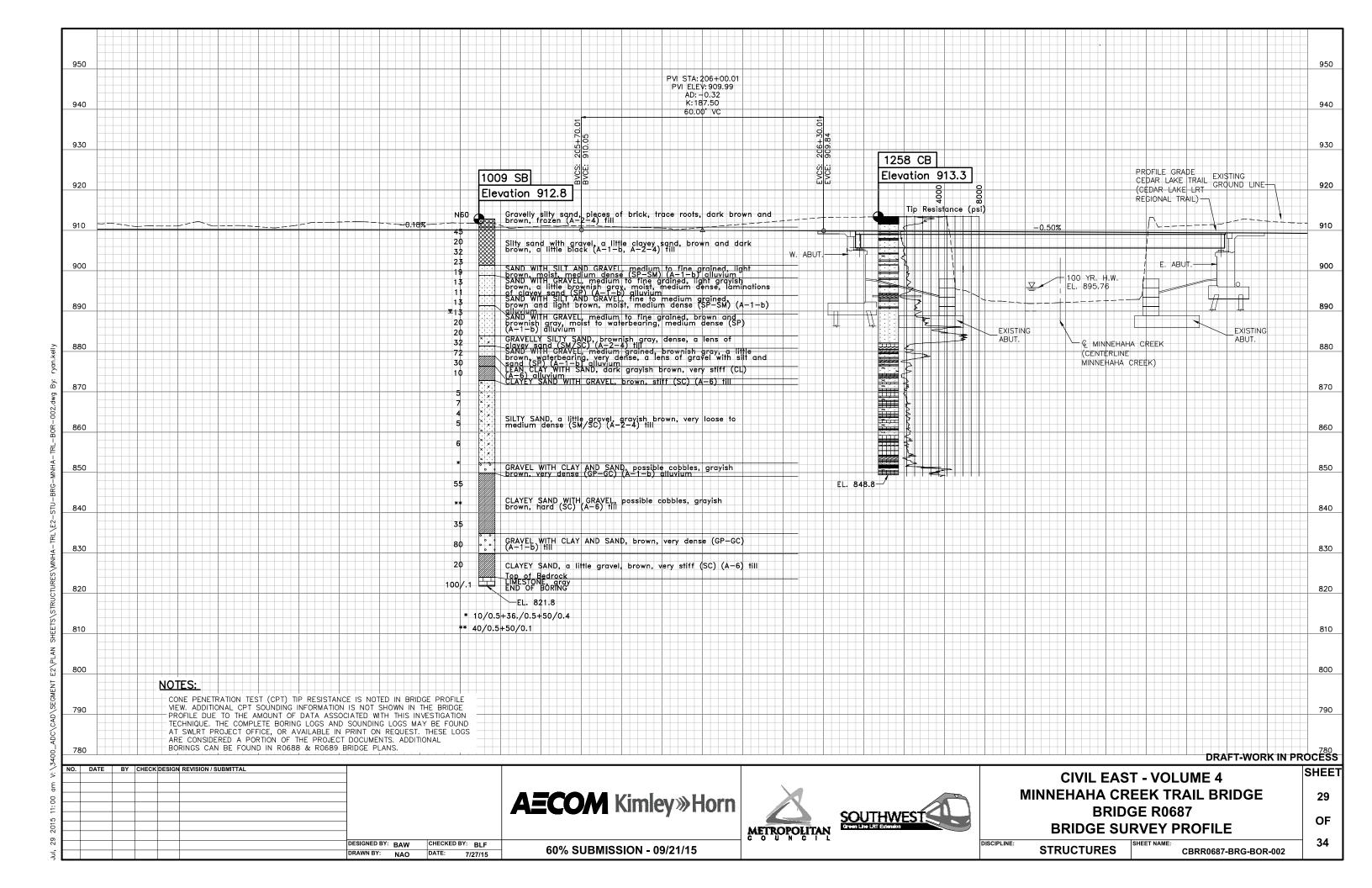
**STRUCTURES** 

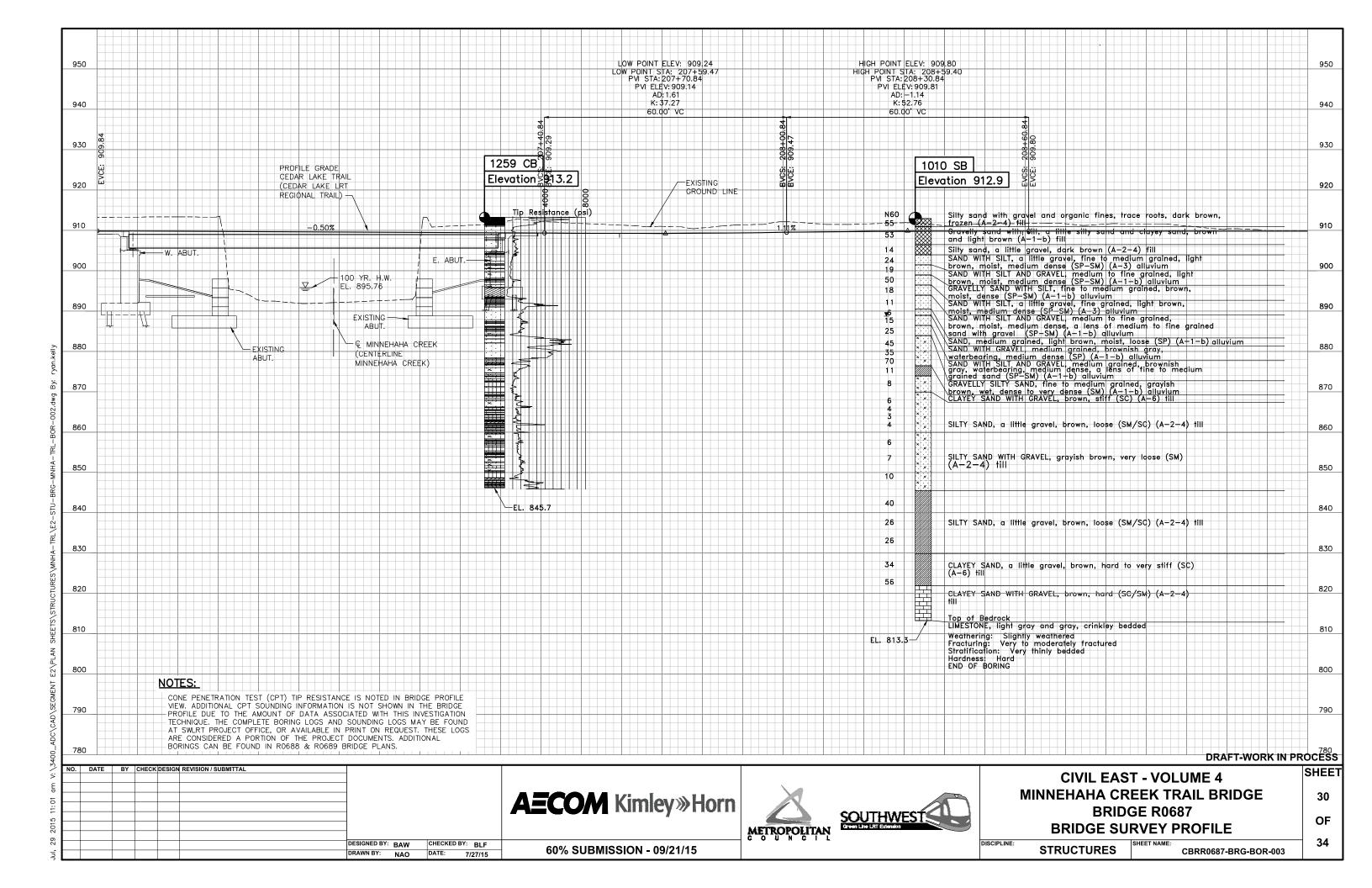
DISCIPLINE:

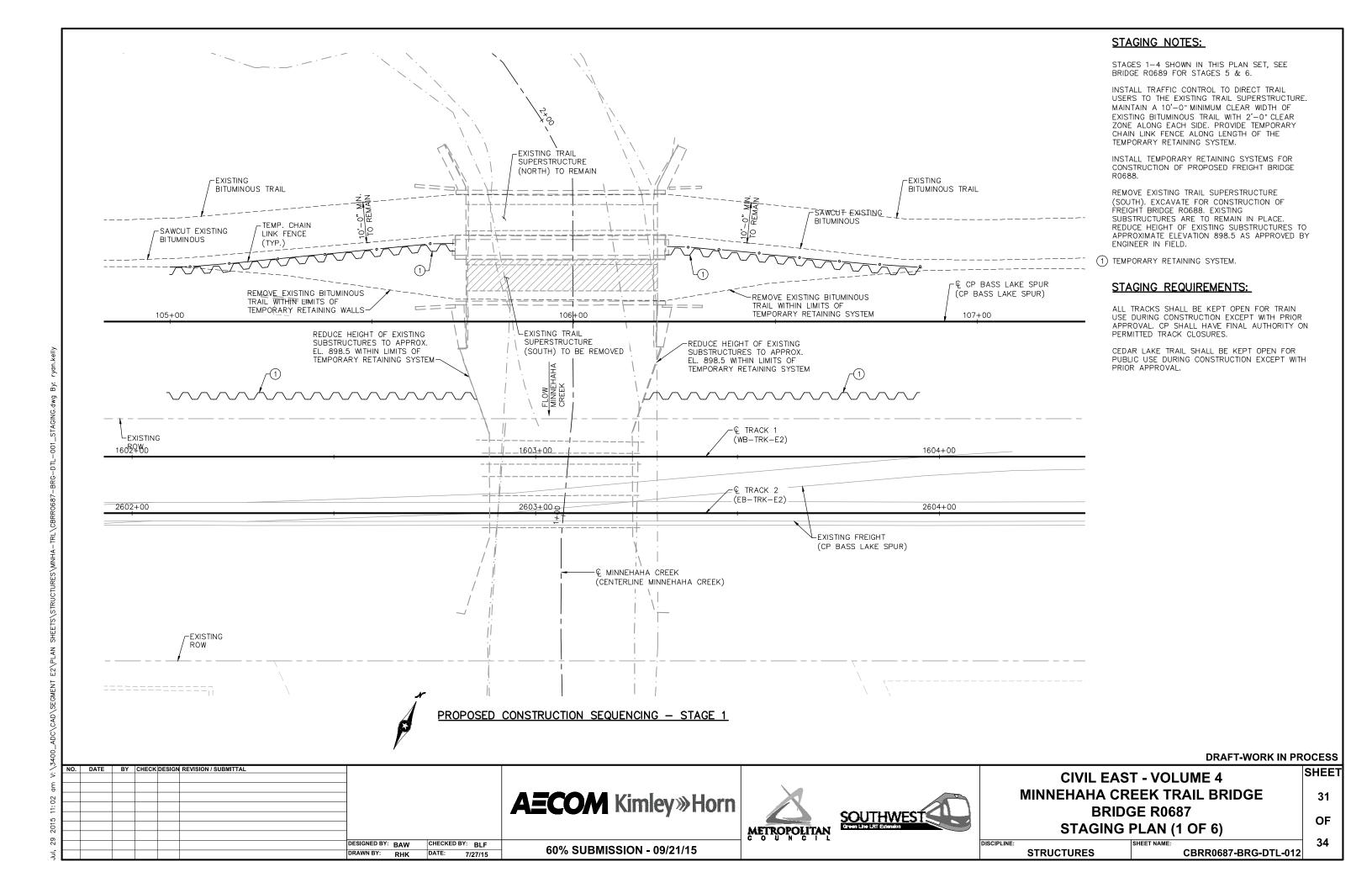
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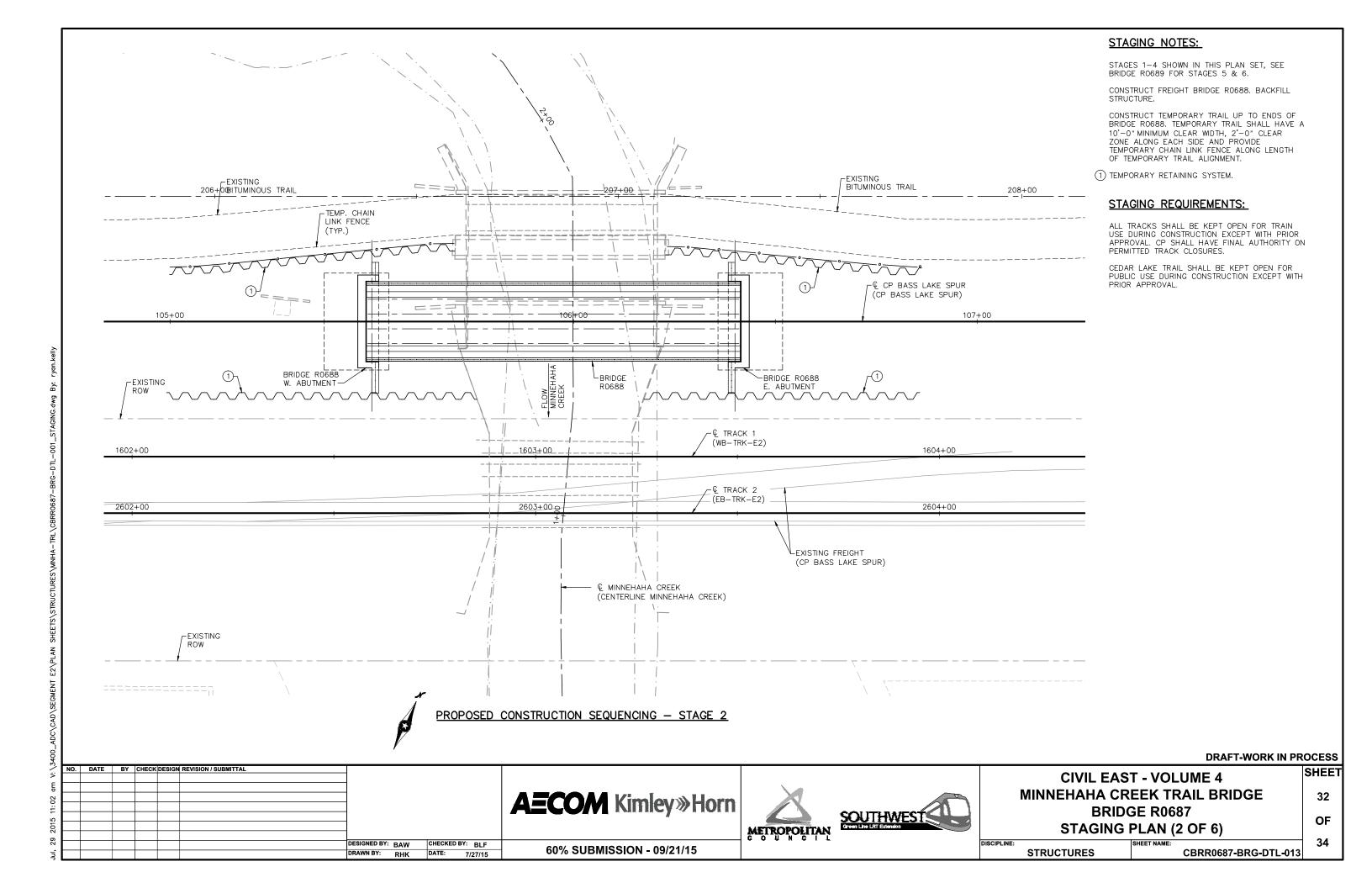


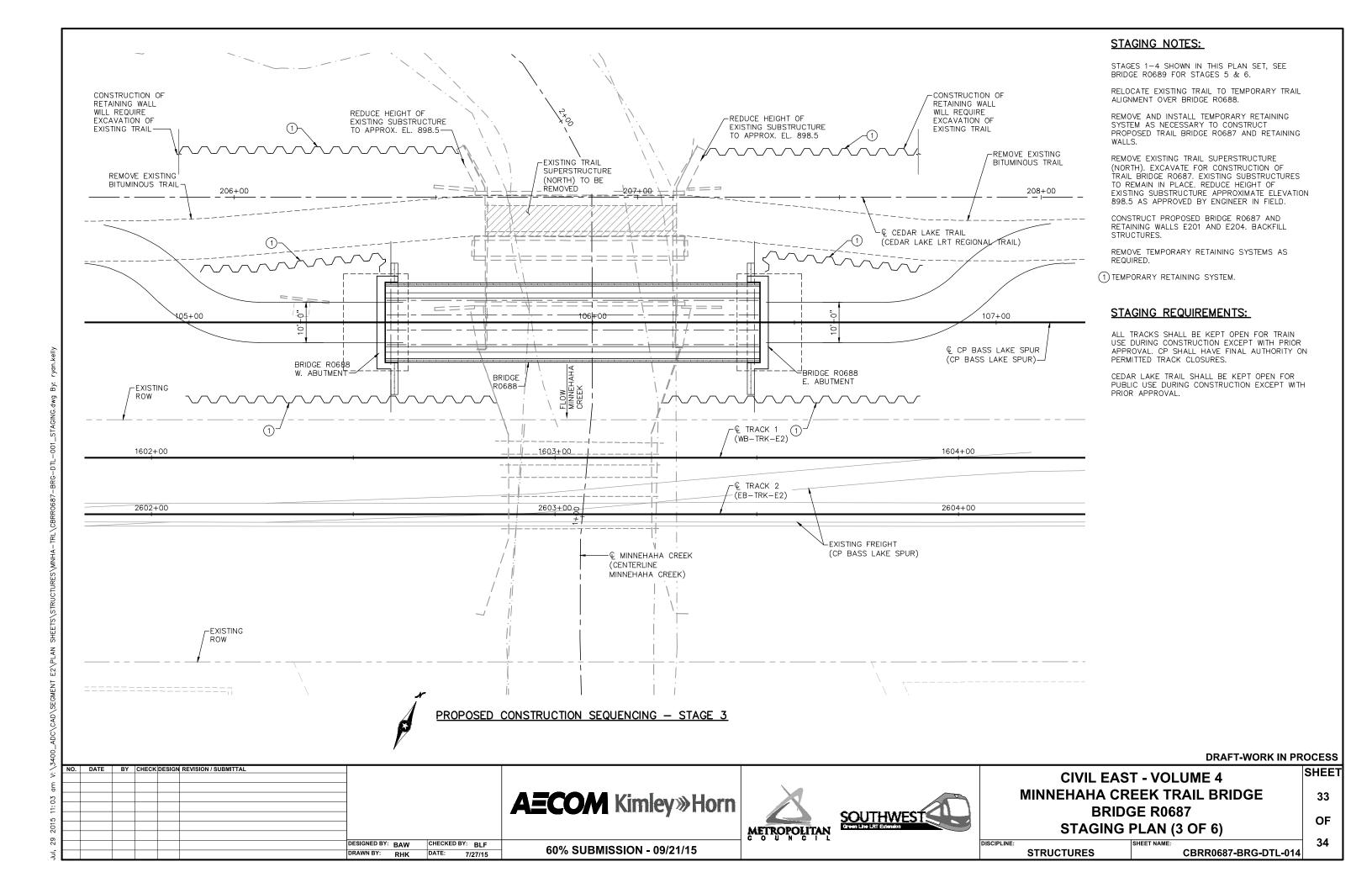


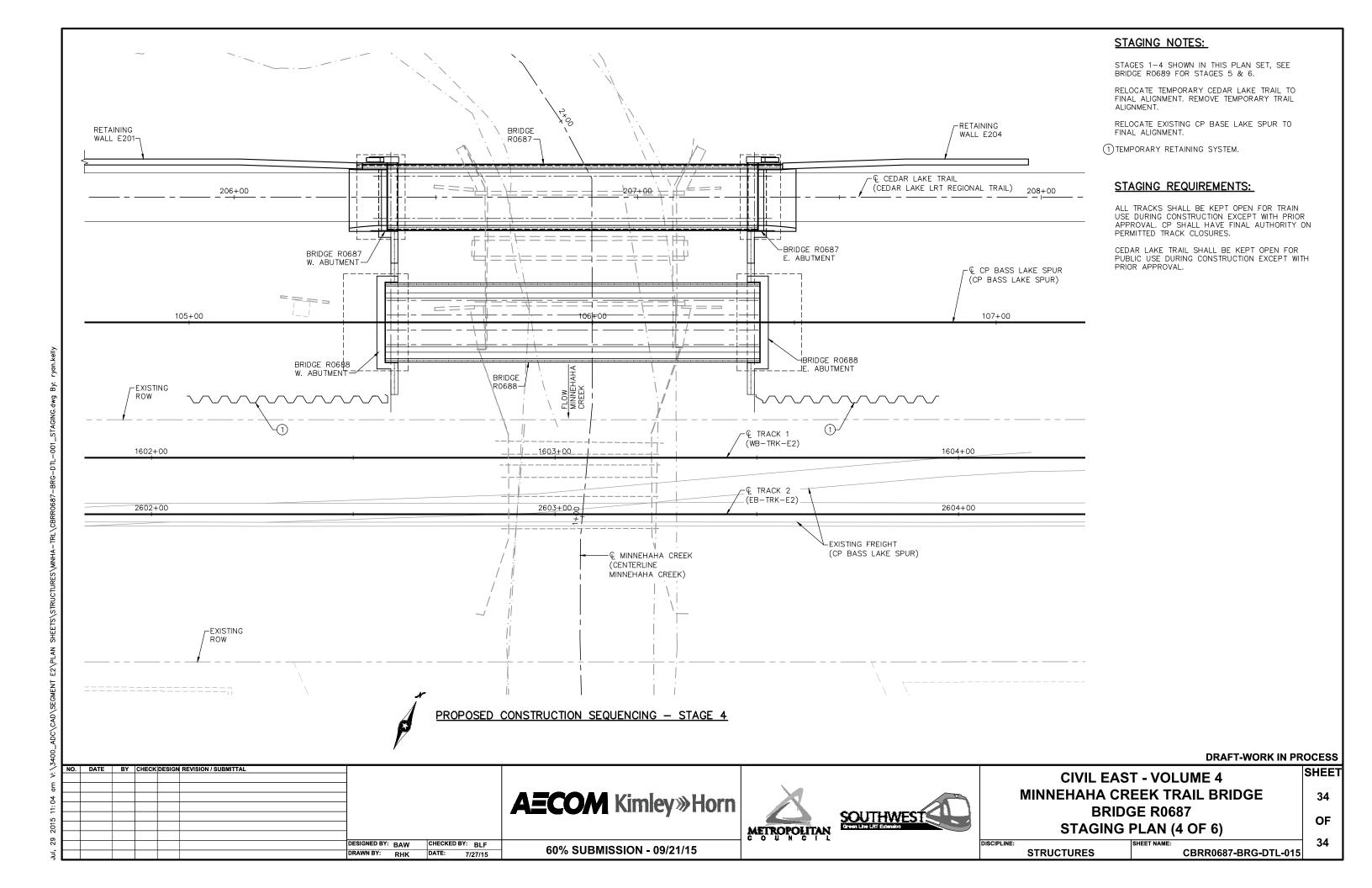


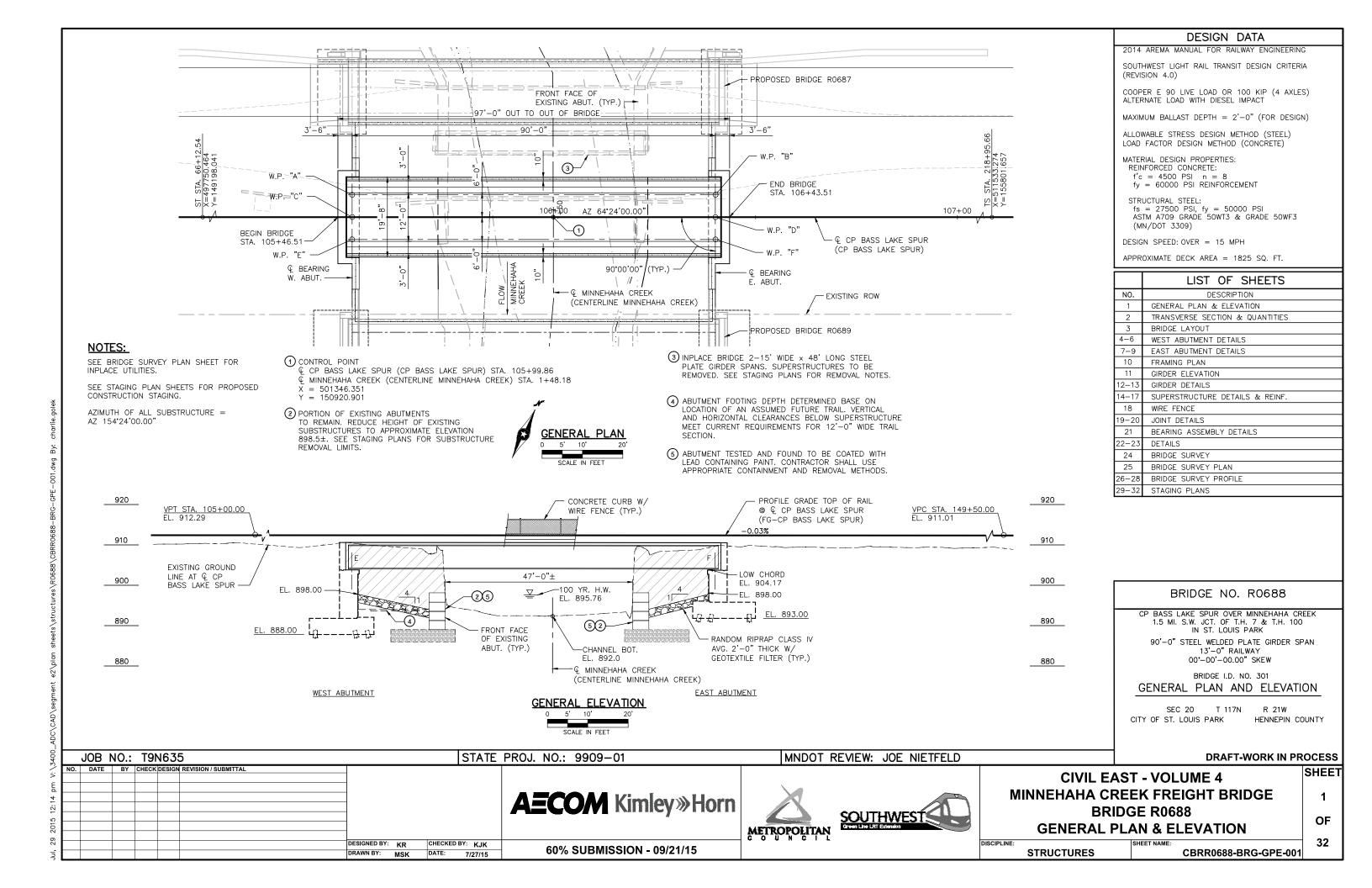


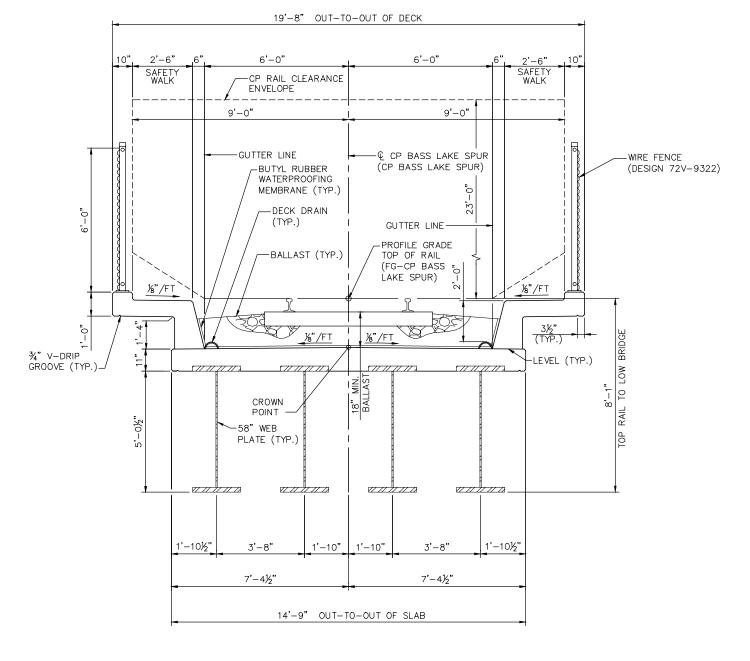












# TRANSVERSE SECTION



	SCHEDULE OF QUANTITIES FOR E	NTIRE BRIDGE	
ITEM NO.	ITEM	UNIT	QUANTITY
2401.501	STRUCTURAL CONCRETE (1G52)	CU. YD.	(P)
2401.501	STRUCTURAL CONCRETE (3B52)	CU. YD.	(P)
2401.501	STRUCTURAL CONCRETE (3S52)	CU. YD.	(P)
2401.541	REINFORCEMENT BARS	POUND	(P)
2401.618	BRIDGE SLAB CONCRETE (3B52)	SQ. FT.	(P)
2402.521	STRUCTURAL STEEL (3306)	POUND	(P)
2402.521	STRUCTURAL STEEL (3309)	POUND	(P)
2402.595	BEARING ASSEMBLY	EACH	(P)
2411.618	ANTI-GRAFFITI COATING	SQ. FT.	(P)
2411.618	ARCHITECTURAL SURFACE FINISH (SPECIAL)	SQ. FT.	(P)
2411.618	ARCHITECTURAL CONC TEXTURE (SPECIAL)	SQ. FT.	(P)
2442.501	REMOVE EXISTING BRIDGE	LUMP SUM	
2452.510	STEEL H-PILING DRIVEN 12"	LIN. FT.	(P)
2452.511	STEEL H-PILING DELIVERED 12"	LIN. FT.	(P)
2452.520	STEEL H-TEST PILE 67 FT LONG 12"	EACH	(P)
2453.520	STEEL H-TEST PILE 71 FT LONG 12"	EACH	(P)
2452.530	PILE TIP PROTECTION 12"	EACH	(P)
2452.601	STEEL SHEET PILING (TEMPORARY)	LUMP SUM	
2481.618	WATERPROOFING	SQ. FT.	(P)
2502.502	DRAINAGE SYSTEM TYPE (B910)	LUMP SUM	
2502.502	DRAINAGE SYSTEM	LUMP SUM	
2502.601	DRAINAGE SYSTEM (BRIDGE DECK)	LUMP SUM	
2511.501	RANDOM RIPRAP CLASS IV	CU. YD.	
2511.515	GEOTEXTILE FILTER TYPE VII	SQ. FT.	(P)
2557.501	WIRE FENCE DESIGN 72V-9322	LIN. FT.	(P)

#### **CONSTRUCTION NOTES:**

THE 2016 EDITION OF THE MINNESOTA DEPARTMENT OF TRANSPORTATION "STANDARD SPECIFICATIONS FOR CONSTRUCTION" SHALL GOVERN.

BRIDGE SEAT REINFORCEMENT SHALL BE CAREFULLY PLACED TO AVOID INTERFERENCE WITH DRILLING HOLES FOR ANCHOR RODS, THE BEAMS SHALL BE ERECTED IN FINAL POSITION PRIOR TO DRILLING HOLES FOR AND PLACING ANCHOR RODS.

THE BAR SIZES SHOWN IN THIS PLAN ARE IN U.S. CUSTOMARY DESIGNATIONS. THE FIRST DIGIT OR THE FIRST TWO DIGITS OF EACH BAR MARK INDICATE THE BAR SIZE.

THE SUBSURFACE UTILITY INFORMATION IN THIS PLAN IS UTILITY QUALITY LEVEL D. THIS UTILITY QUALITY LEVEL WAS DETERMINED ACCORDING TO THE GUIDELINES OF CI/ASCE 38-02, ENTITLED "STANDARD GUIDELINES FOR THE COLLECTION AND DEPICTION OF EXISTING SUBSURFACE UTILITY DATA".

THE PILE LOADS SHOWN IN THE PLANS WERE COMPUTED USING SERVICE LOAD METHODOLOGY. PILE BEARING RESISTANCE DETERMINED IN THE FIELD SHALL INCORPORATE THE METHODS AND/OR FORMULAS DESCRIBED IN THE SPECIAL PROVISIONS.

CONCRETE MATERIALS, MIX DESIGN, TESTING AND CONSTRUCTION SHALL BE IN ACCORDANCE WITH CHAPTER 8, PART 1 OF THE 2013 A.R.E.M.A. MANUAL; MnDOT 2461 AND THE SPECIAL PROVISIONS.

CONCRETE SHALL BE MADE WITH A LOW ALKAKI NORMAL PORTLAND CEMENT (TYPE I OR TYPE I/II) IN ACCORDANCE WITH ASTM C 150, LATEST EDITION, WITH LESS THAN 0.6% SODIUM EQUIVALENTS.

MAXIMUM CONCRETE WATER/CEMENT RATION SHALL BE IN ACCORDANCE WITH CHAPTER 8, SECTION 1.11 OF THE 2013 A.R.E.M.A. MANUAL AND MnDOT 2461.

**DRAFT-WORK IN PROCESS** 

NO. DATE BY CHECK DESIGN REVISION / SUBMITTAL

DESIGNED BY: KR CHECKED BY: KJK
DRAWN BY: MSK DATE: 7/27/15

**AECOM** Kimley»Horn

60% SUBMISSION - 09/21/15





# CIVIL EAST - VOLUME 4 MINNEHAHA CREEK FREIGHT BRIDGE BRIDGE R0688 TRANSVERSE SECTION & QUANTITIES

TRANSVERSE SECTION & QUANTITIES

DISCIPLINE: SHEET NAME:

32

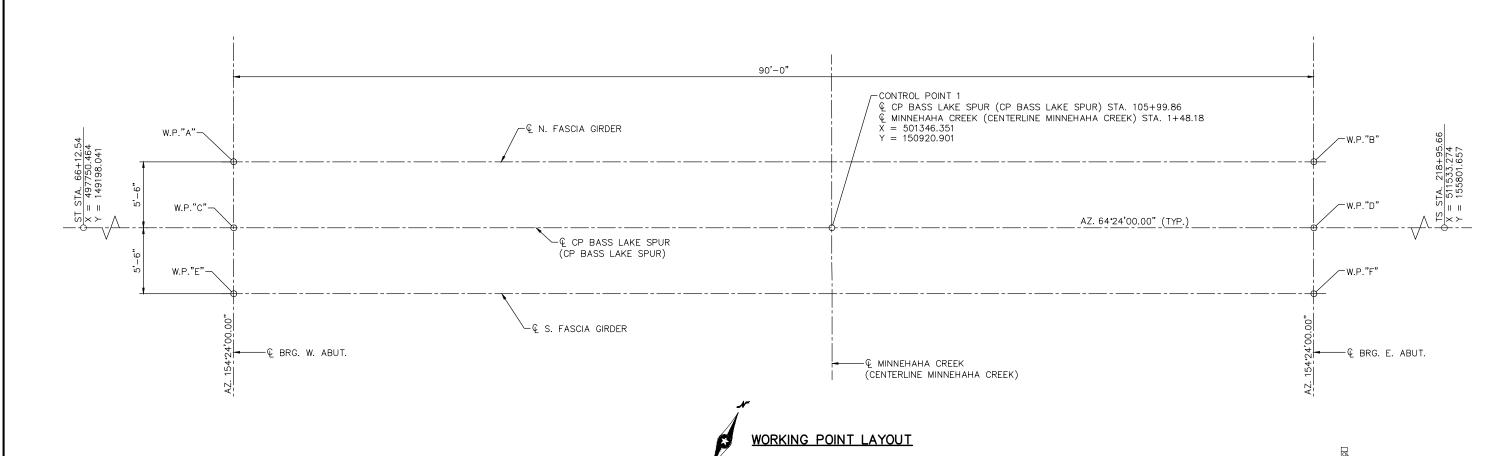
SHEET

2

OF

STRUCTURES

CBRR0688-BRG-SUP-001



	DIME	NSIONS	BETWEE	N WORK	ING POI	NTS		COORD	INATES	ELEVATION						
POINT	STATION	А	В	С	D	Е	F	Х	Υ	TOP OF RAIL	TOP OF DECK	TOP/DECK TO BR. SEAT	BRIDGE SEAT	POINT		
Α	105+50.01	0.00	90.00	5.50		11.00		501299.025	150904.327	912.26	910.16	6.646	903.510	Α		
В	106+40.01		0.00		5.50		11.00	501380.191	150943.214	912.24	910.13	6.646	903.490	В		
С	105+50.01			0.00	90.00	5.50		501301.402	150899.366	912.26	910.21			С		
D	106+40.01				0.00		5.50	501382.567	150938.253	912.24	910.19			D		
Е	105+50.01					0.00	90.00	501303.778	150894.406	912.26	910.16	6.646	903.510	Е		
F	106+40.01						0.00	501384.944	150933.293	912.24	910.13	6.646	903.490	F		

TOP OF B	RIDGE DEC	CK TO BRID	GE SEAT		
	W.P. "A"	W.P. "B"	W.P. "E"	W.P. "F"	
SLAB THICKNESS	11 1/8"	11 1/8"	11 1/8"	11 1/8"	
WEB HEIGHT	58"	58"	58"	58"	
BOTTOM FLANGE HEIGHT	2 1/2"	2 1/2"	2 1/2"	2 1/2"	
BEARING HEIGHT	8 1/8"	8 1/8"	8 1/8"	8 1/8"	
TOTAL	6'-7 3/4"	6'-7 3/4"	6'-7 3/4"	6'-7 3/4"	
TOTAL	0.040	0.040	0.040	0.040	

6.646

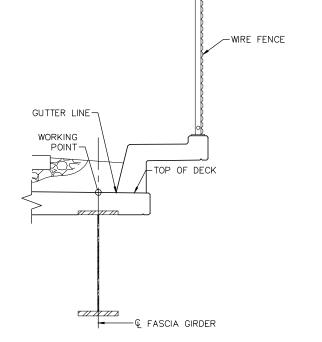
6.646

6.646

6.646

## NOTES:

ALL BEAMS SET PARALLEL TO WORKING LINE, ALL DIAPHRAGMS SET PARALLEL TO SUBSTRUCTURES.



### **DRAFT-WORK IN PROCESS**

	NO. DATE	BY	CHECK DESIGN REVISION / SUBMITTAL							SHEET	
> =								CIVIL EAS	T - VOLUME 4	SIILLI	
ď.								MINNEHAHA CRE	EK FREIGHT BRIDGE		
15				4	<b>AECOM</b> Kimley»Horn			MINITELIALIA SILERI I ILIGITI BRIDGE			
2								BRIDGE R0688			
D						SOUTHWEST				OF	
5						METROPOLITAN Green Line LRT Extension		BRIDG	E LAYOUT	01	
~ [						MEIROPOLIIAN COUNCIL	_	DINIDO	L LATOOT	ĺ	
56				DESIGNED BY: KR CHECKED BY: KJK	000/ CUDMICCION 00/04/45		Ī		SHEET NAME:	32	
ji				DRAWN BY: MSK DATE: 7/27/15	60% SUBMISSION - 09/21/15			STRUCTURES	CBRR0688-BRG-SUP-003	1	

12:15 pm V: \54UU\_ADU\CAD\segment e2\plan sheets\structures\RUb88\CBKKUb88-BKG-SUP-U

WEST ABUT COMPUTED PILE LOA	
DEAD LOAD + EARTH PRESSURE	33
LIVE LOAD	32
DESIGN LOAD	65

\* BASED ON GROUP I LOADING (SERVICE LOAD) PER AREMA CHAPTER 8 SECTION 2.2.4

#### **GENERAL PILE NOTES**

- 1 HP12x53 STEEL TEST PILES 67 FT. LONG 17 HP12x53 STEEL PILES EST. 67 FT. LENGTH
- 18 HP12x53 STEEL PILES REQ'D FOR WEST ABUT.

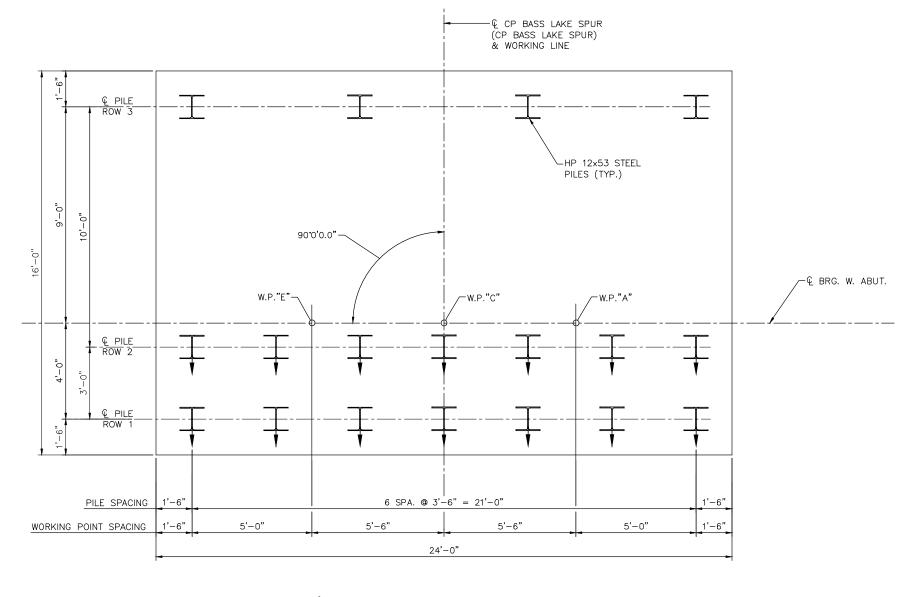
ALL PILES TO BE HP12x53 WITH PILE TIP PROTECTION.

PILE SPACING SHOWN IS AT BOTTOM OF FOOTING.

PILES MARKED THUS I TO BE BATTERED 3" PER FOOT IN DIRECTION SHOWN.

FOR PILE SPLICE DETAILS SEE DETAIL B202.

SEE SURVEY SHEET FOR TEST PILE LOCATIONS.



SOUTH |



FOOTING LAYOUT

<u>NORTH</u>

**DRAFT-WORK IN PROCESS** 

SHEET

OF

32

NO. DATE BY CHECK DESIGN REVISION / SUBMITTAL DESIGNED BY: KR CHECKED BY: KJK DRAWN BY: MSK DATE: 7/27/15

**AECOM** Kimley»Horn

60% SUBMISSION - 09/21/15

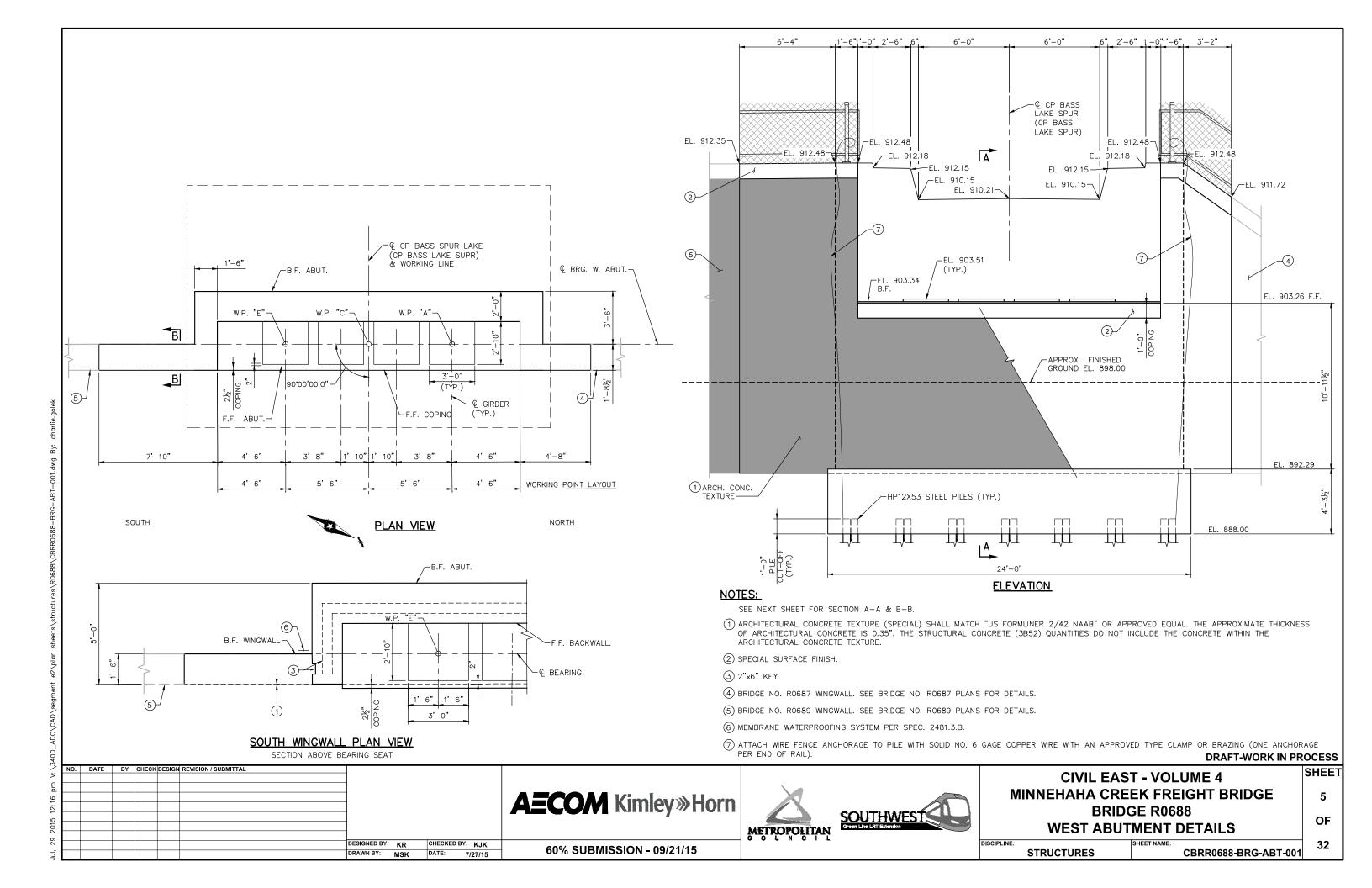


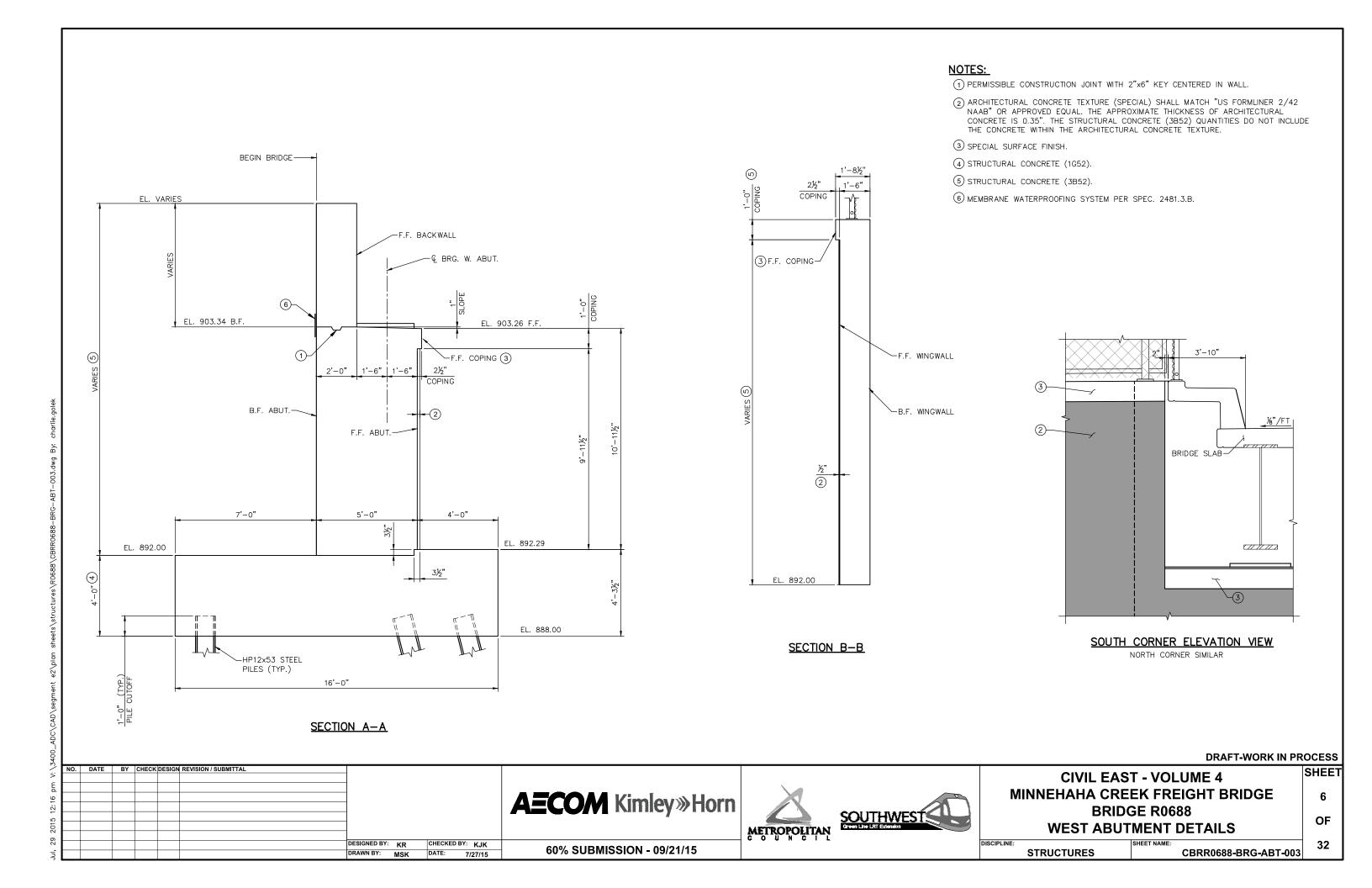


**CIVIL EAST - VOLUME 4** MINNEHAHA CREEK FREIGHT BRIDGE **BRIDGE R0688 WEST ABUTMENT DETAILS** 

DISCIPLINE: **STRUCTURES** 

CBRR0688-BRG-ABT-002





EAST ABUT COMPUTED PILE LOA	
DEAD LOAD + EARTH PRESSURE	34
LIVE LOAD	24
DESIGN LOAD	58

\* BASED ON GROUP I LOADING (SERVICE LOAD) PER AREMA CHAPTER 8 SECTION 2.2.4

#### **GENERAL PILE NOTES**

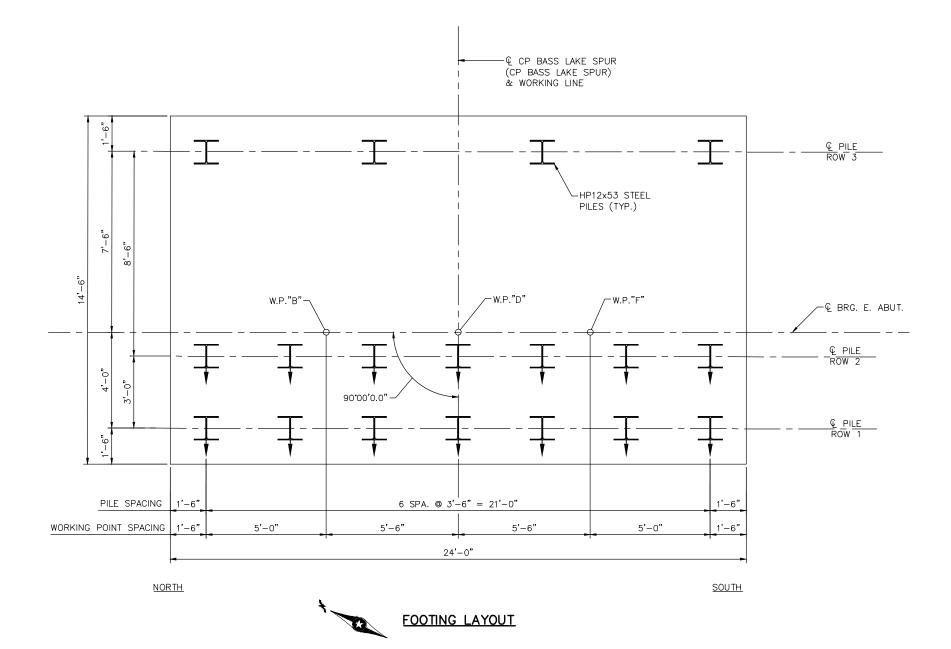
- 1 HP12x53 STEEL TEST PILES 71 FT. LONG 17 HP12x53 STEEL PILES EST. 71 FT. LENGTH
- 18 HP12x53 STEEL PILES REQ'D FOR EAST ABUT. ALL PILES TO BE HP12x53 WITH PILE TIP PROTECTION.

PILE SPACING SHOWN IS AT BOTTOM OF FOOTING.

PILES MARKED THUS I TO BE BATTERED 3" PER FOOT IN DIRECTION SHOWN.

FOR PILE SPLICE DETAILS SEE DETAIL B202.

SEE SURVEY SHEET FOR TEST PILE LOCATIONS.



**DRAFT-WORK IN PROCESS** 

SHEET

7

OF

32

NO. DATE BY CHECK DESIGN REVISION / SUBMITTAL DESIGNED BY: KR CHECKED BY: KJK DRAWN BY: MSK DATE: 7/27/15

**AECOM** Kimley»Horn





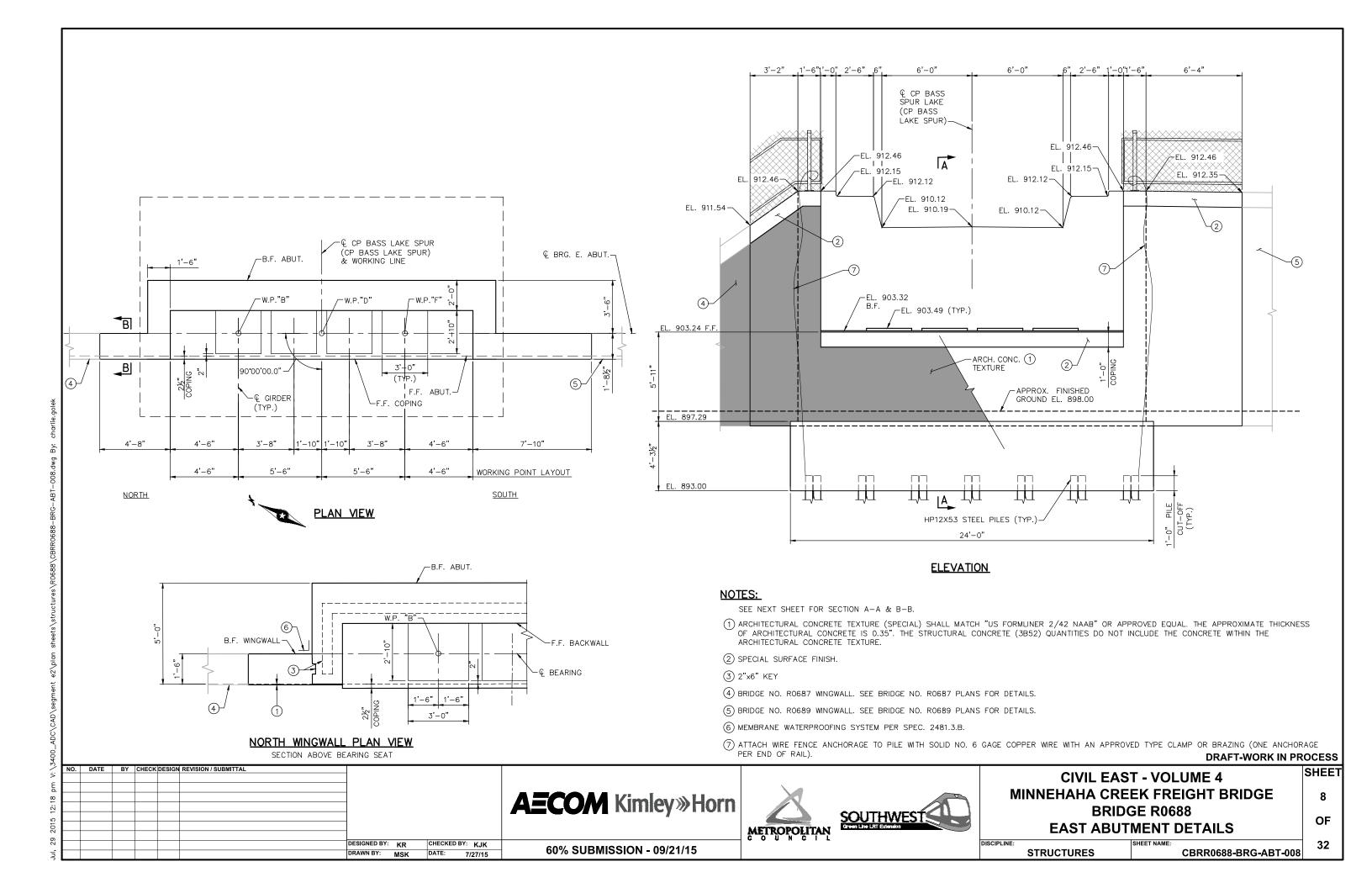
# **CIVIL EAST - VOLUME 4** MINNEHAHA CREEK FREIGHT BRIDGE **BRIDGE R0688 EAST ABUTMENT DETAILS**

DISCIPLINE:

60% SUBMISSION - 09/21/15

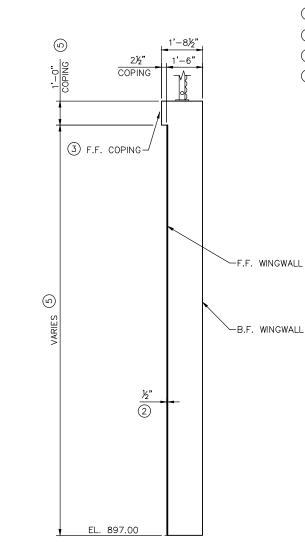
**STRUCTURES** 

CBRR0688-BRG-ABT-009



#### NOTES:

- 1 PERMISSIBLE CONSTRUCTION JOINT WITH 2"x6" KEY CENTERED IN WALL.
- ② ARCHITECTURAL CONCRETE TEXTURE (SPECIAL) SHALL MATCH "US FORMLINER 2/42 NAAB" OR APPROVED EQUAL. THE APPROXIMATE THICKNESS OF ARCHITECTURAL CONCRETE IS 0.35". THE STRUCTURAL CONCRETE (3B52) QUANTITIES DO NOT INCLUDE THE CONCRETE WITHIN THE ARCHITECTURAL CONCRETE TEXTURE.
- 3 SPECIAL SURFACE FINISH.
- (4) STRUCTURAL CONCRETE (1G52).
- 5 STRUCTURAL CONCRETE (3B52).
- 6 MEMBRANE WATERPROOFING SYSTEM PER SPEC. 2481.3.B.



3 BRIDGE SLAB

SECTION B-B

#### NORTH CORNER ELEVATION VIEW

SOUTH CORNER SIMILAR

#### DRAFT-WORK IN PROCESS

SHEET **CIVIL EAST - VOLUME 4** MINNEHAHA CREEK FREIGHT BRIDGE **AECOM** Kimley»Horn SOUTHWEST **BRIDGE R0688** OF **EAST ABUTMENT DETAILS** METROPOLITAN DISCIPLINE: DESIGNED BY: KR CHECKED BY: KJK 32 60% SUBMISSION - 09/21/15 DRAWN BY: MSK DATE: 7/27/15 **CBRR0688-BRG-ABT-016 STRUCTURES** 

END BRIDGE-

F.F. BACKWALL-© BRG. E. ABUT.—

EL. 903.24 F.F.

EL. 897.29

EL. 893.00

3 F.F. COPING-

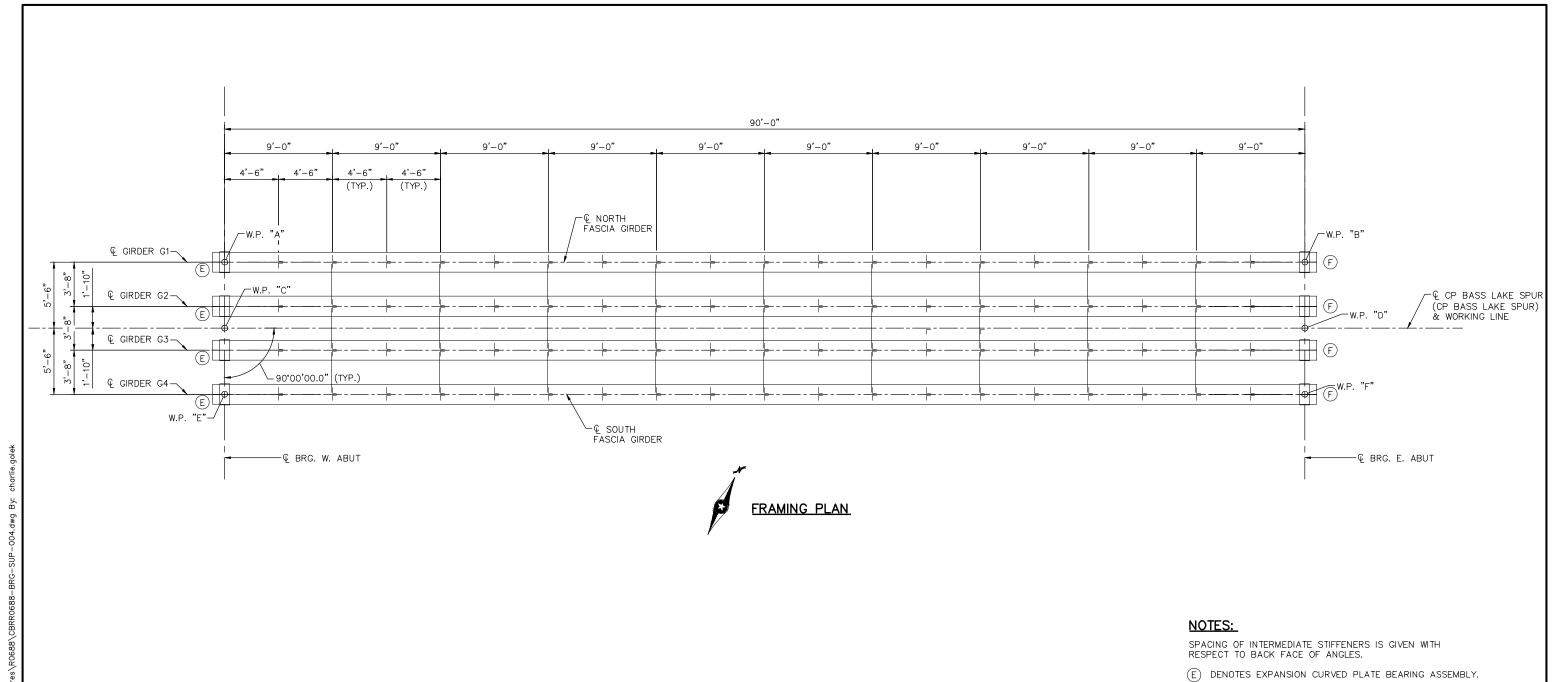
EL. VARIES

. EL. 903.32 B.F.

–B.F. ABUT.

HP12x53 STEEL PILES (TYP.)—

SECTION A-A



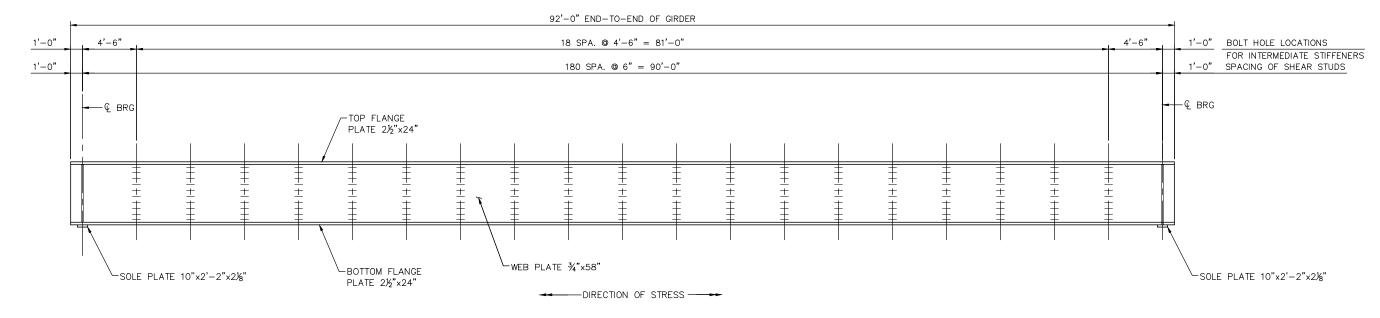
- F DENOTES FIXED CURVED PLATE BEARING ASSEMBLY.

FOR FURTHER INFORMATION ON BEARING ASSEMBLIES, REFER TO GIRDER ELEVATION SHEET AND THE BEARING ASSEMBLY DETAILS SHEETS.

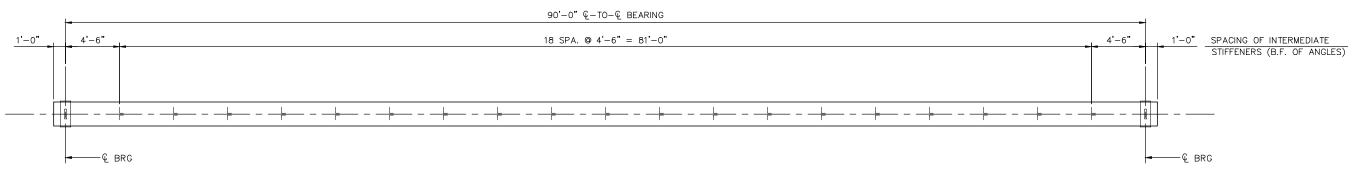
ALL GIRDERS SET PARALLEL TO WORKING LINE.

**DRAFT-WORK IN PROCESS** 

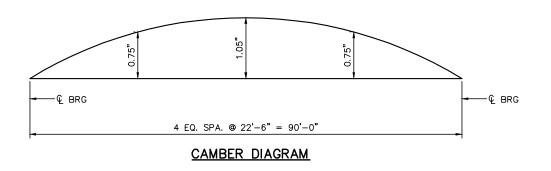
SHEET **CIVIL EAST - VOLUME 4** MINNEHAHA CREEK FREIGHT BRIDGE **AECOM** Kimley»Horn 10 **BRIDGE R0688** SOUTHWEST Green Line Little Extension OF **FRAMING PLAN** DESIGNED BY: KR CHECKED BY: KJK DISCIPLINE: 32 60% SUBMISSION - 09/21/15 DRAWN BY: MSK DATE: 7/27/15 CBRR0688-BRG-SUP-004 **STRUCTURES** 



#### ELEVATION VIEW OF GIRDERS G1 - G4



#### PLAN VIEW OF GIRDERS G1 - G4



#### **GENERAL NOTES:**

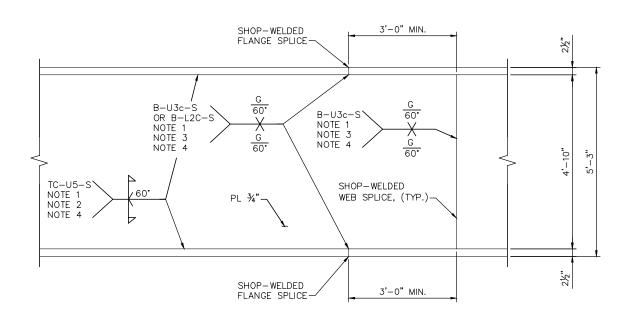
- STRUCTURAL STEEL SHALL CONFORM TO MN/DOT 3309 ASTM GRADE 50WF3.
- 2. BOLTED CONNECTIONS SHALL BE MADE WITH  $\frac{7}{6}$ " DIAMETER A325 TYPE 3 HIGH STRENGTH BOLTS, EXCEPT AS NOTED. HOLES FOR  $\frac{7}{6}$ " DIAMETER BOLTS SHALL BE  $^{15}$ 6", EXCEPT AS NOTED.
- 3. PLACE NUT AND WASHER INSIDE OF GIRDER WEB.
- 4. WEB AND FLANGE PLATES SHALL BE FURNISHED IN AVAILABLE MILL LENGTHS WITH A MINIMUM NUMBER OF SPLICES. LOCATION OF SPLICES SHALL BE APPROVED BY ENGINEER. A SPLICE SHALL BE MINIMUM OF 12" FROM ANY STIFFENER. NO SPLICES WILL BE ALLOWED 12 FEET FROM MIDPOINT OF GIRDER.
- 5. CAMBER DIAGRAM SHOWN IS FOR BEAM IN UNLOADED POSITION AND PROVIDES FOR ALL DEAD LOAD DEFLECTIONS AND RESIDUAL CAMBER. BASE LINE IN CAMBER DIAGRAM IS A STRAIGHT LINE FROM ♀ BRG. AT BOTTOM OF WEB.

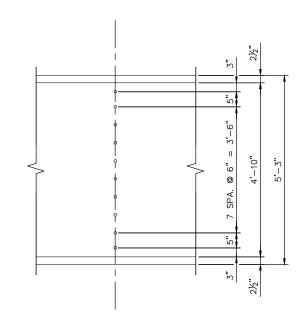
- 6. SOLE PLATES SHALL BE SHOP WELDED TO BOTTOM FLANGE PLATES, FOR WELD DETAILS REFER TO BEARING ASSEMBLY DETAILS SHEET.
- 7. NO WELDING OR DRILLING OF HOLES FOR TEMPORARY ATTACHMENTS
- 8. THE STRUCTURAL STEEL FABRICATOR SHALL BE CERTIFIED UNDER THE A.I.S.C. QUALITY CERTIFICATION PROGRAM, CATEGORY, MAJOR STEEL BRIDGES (Cbr.).

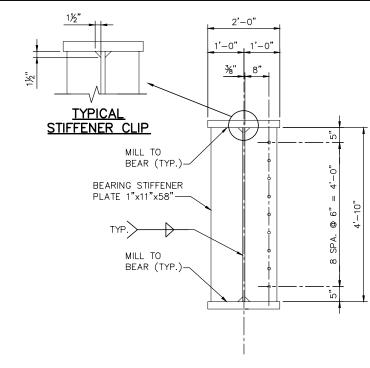
#### **DRAFT-WORK IN PROCESS**

DATE BY CHECK DESIGN REVISION / SUBMITTA SHEET **CIVIL EAST - VOLUME 4** MINNEHAHA CREEK FREIGHT BRIDGE **AECOM** Kimley»Horn 11 **BRIDGE R0688** SOUTHWEST Cross Line Litt Extension OF **GIRDER ELEVATION** METROPOLITAN DESIGNED BY: KR CHECKED BY: KJK DISCIPLINE: 32 60% SUBMISSION - 09/21/15 DRAWN BY: MSK DATE: 7/27/15 **STRUCTURES** CBRR0688-BRG-STL-001

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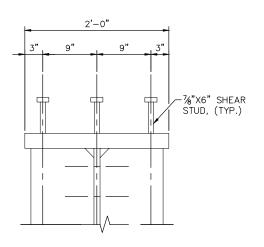




BEARING STIFFENER

**BEAM WELDING DETAILS** 

INTERMEDIATE STIFFENER
BOLT HOLE LAYOUT



#### SHEAR STUD DETAIL

## NOTES:

NOTE 1: BACK GOUGE ROOT TO SOUND METAL BEFORE WELDING SECOND

NOTE 2: WEB TO FLANGE GROOVE WELDS TO BE TESTED PER CURRENT A.W.S. TABLE 6.3 & 6.4.

NOTE 3: WEB AND FLANGE BUTT WELDS SHALL BE TESTED USING RADIOGRAPHIC INSPECTION PER SPEC 2471.3M1d.

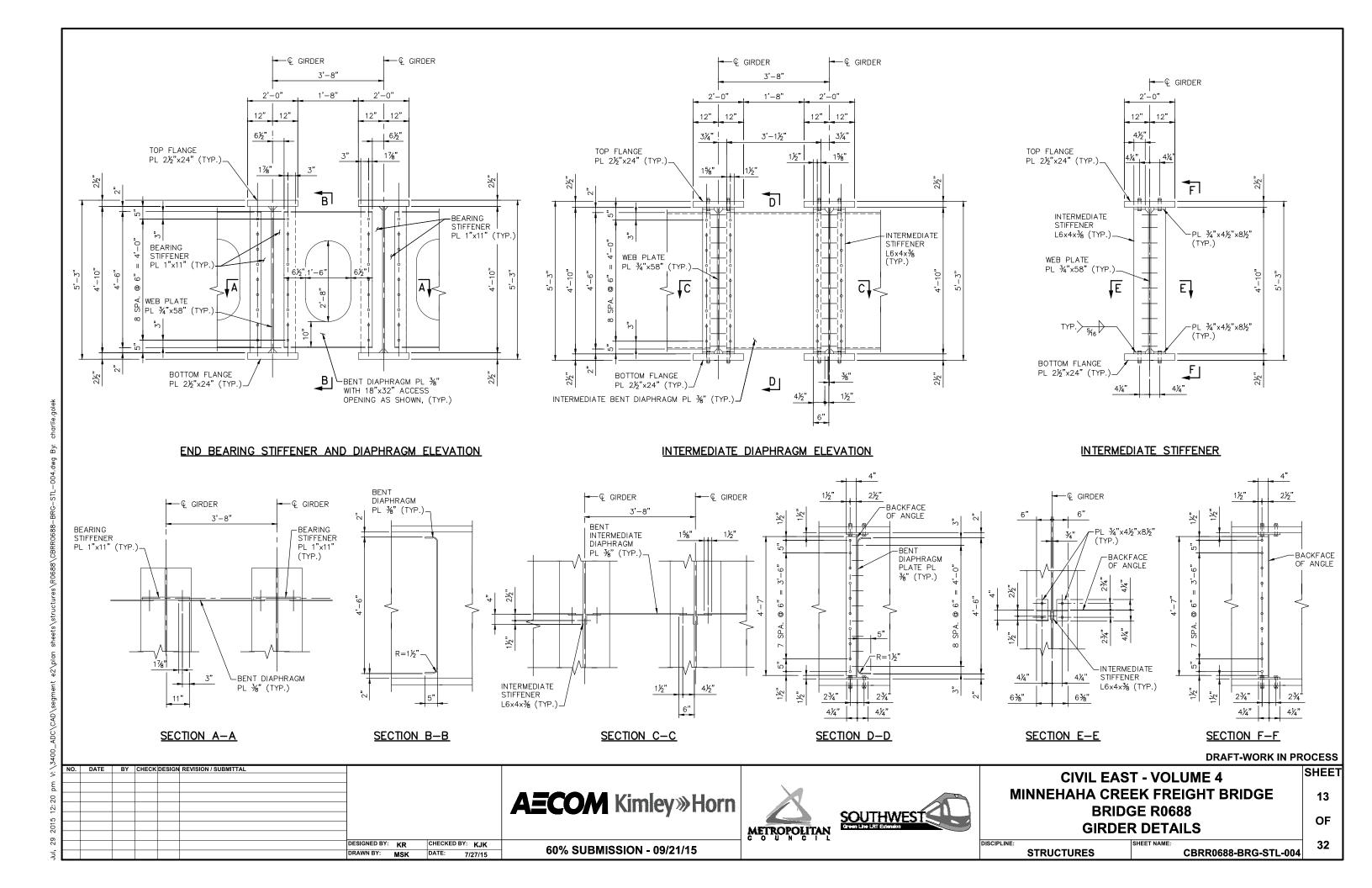
NOTE 4: GRIND FLUSH IN THE DIRECTION OF STRESS ON ALL FOUR SIDES.

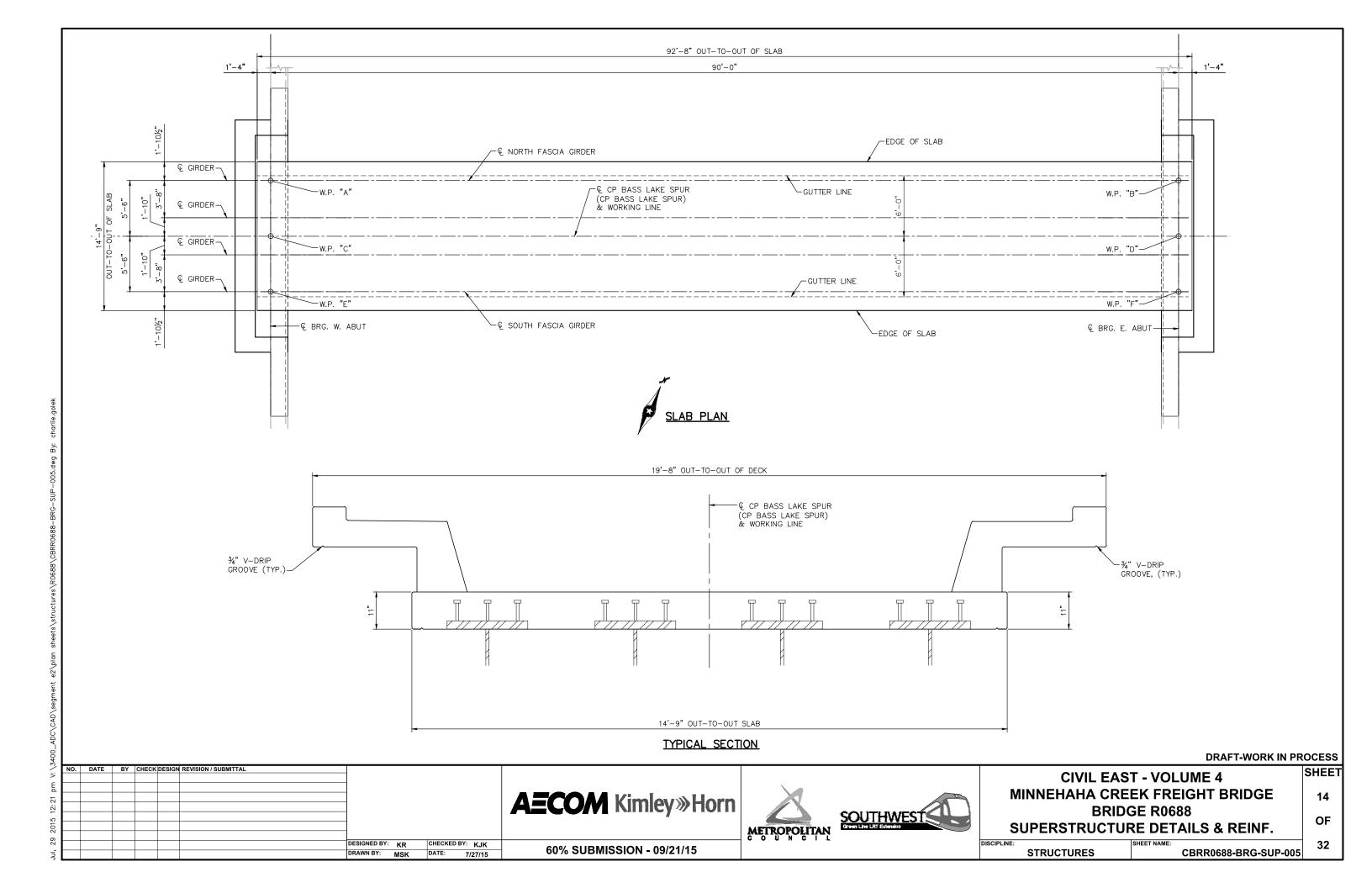
#### **DRAFT-WORK IN PROCESS**

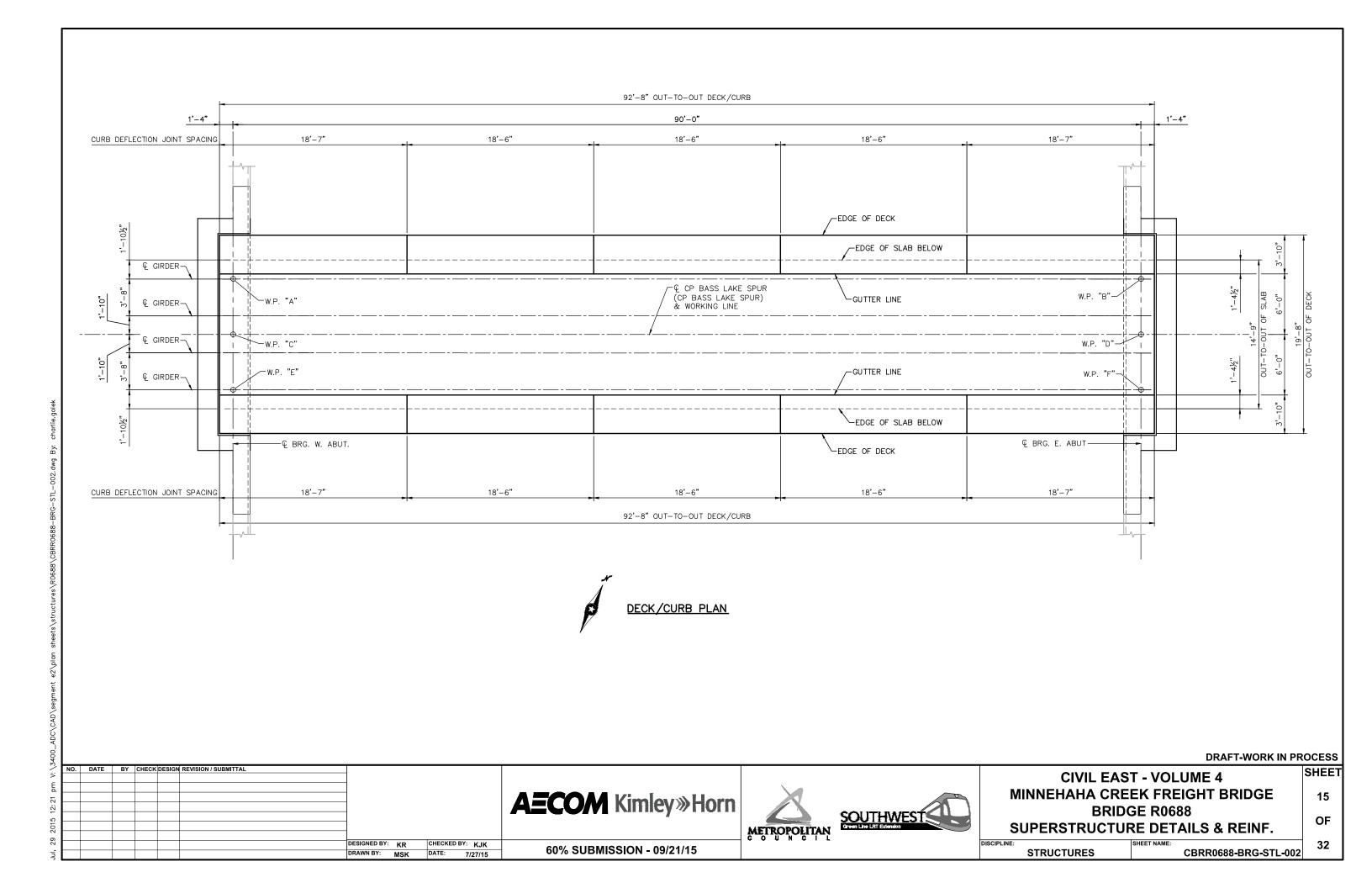
DATE BY CHECK DESIGN REVISION / SUBMITTAL SHEET **CIVIL EAST - VOLUME 4** MINNEHAHA CREEK FREIGHT BRIDGE **AECOM** Kimley»Horn 12 **BRIDGE R0688** SOUTHWEST Green Line LRT Extension OF **GIRDER DETAILS** METROPOLITAN DESIGNED BY: KR CHECKED BY: KJK DISCIPLINE: 32 60% SUBMISSION - 09/21/15 DRAWN BY: MSK DATE: 7/27/15 CBRR0688-BRG-STL-003 **STRUCTURES** 

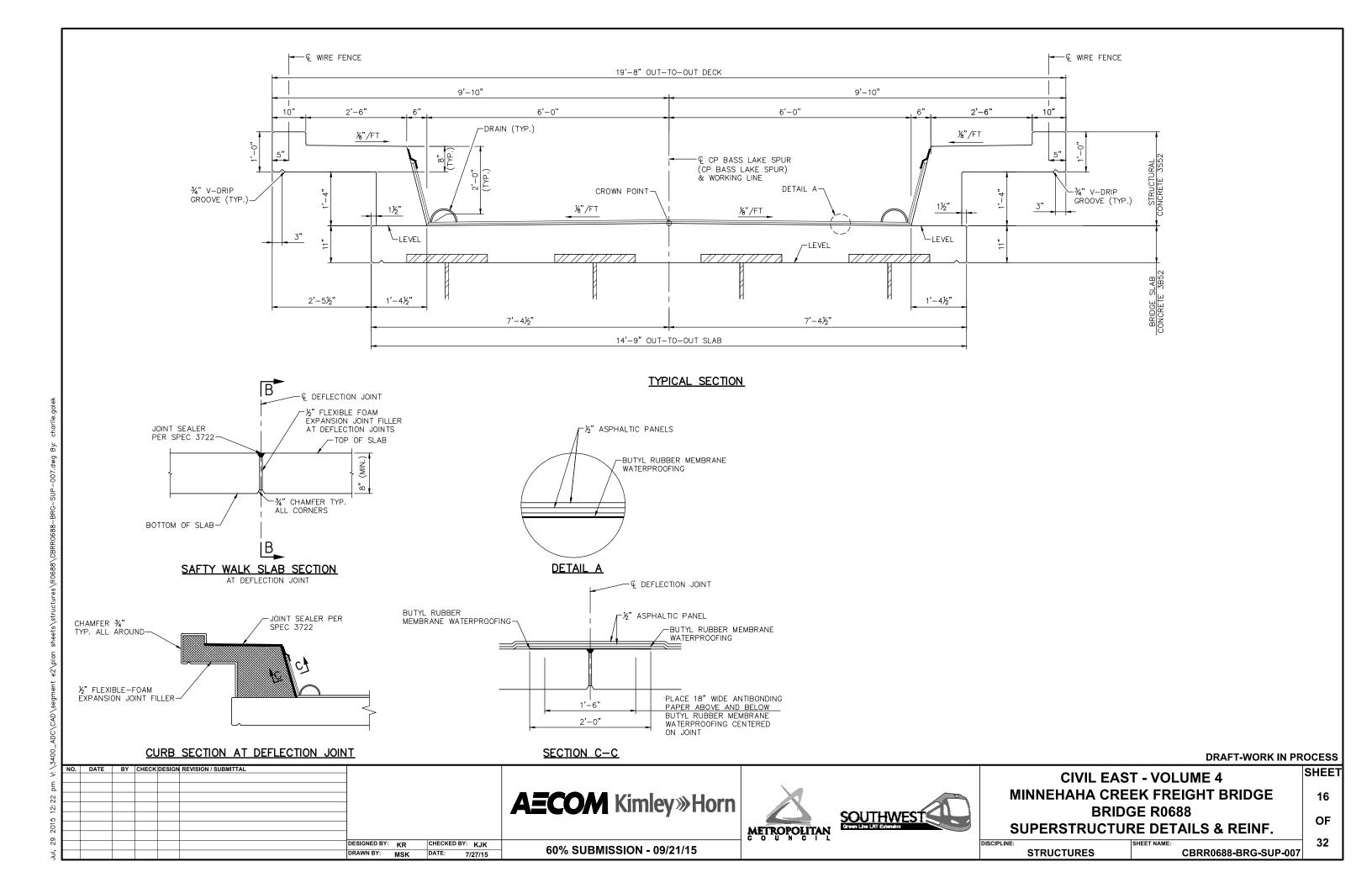
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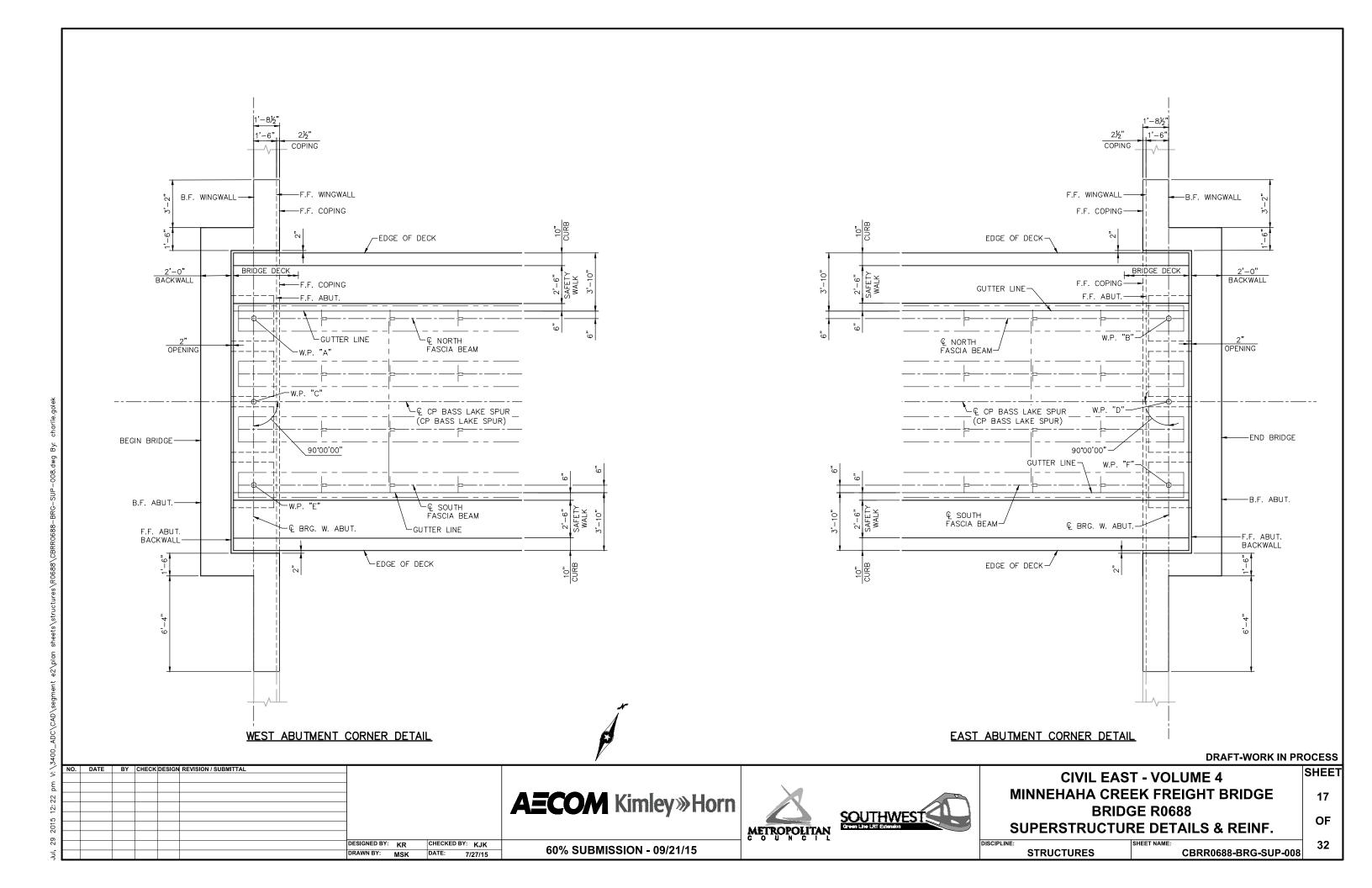
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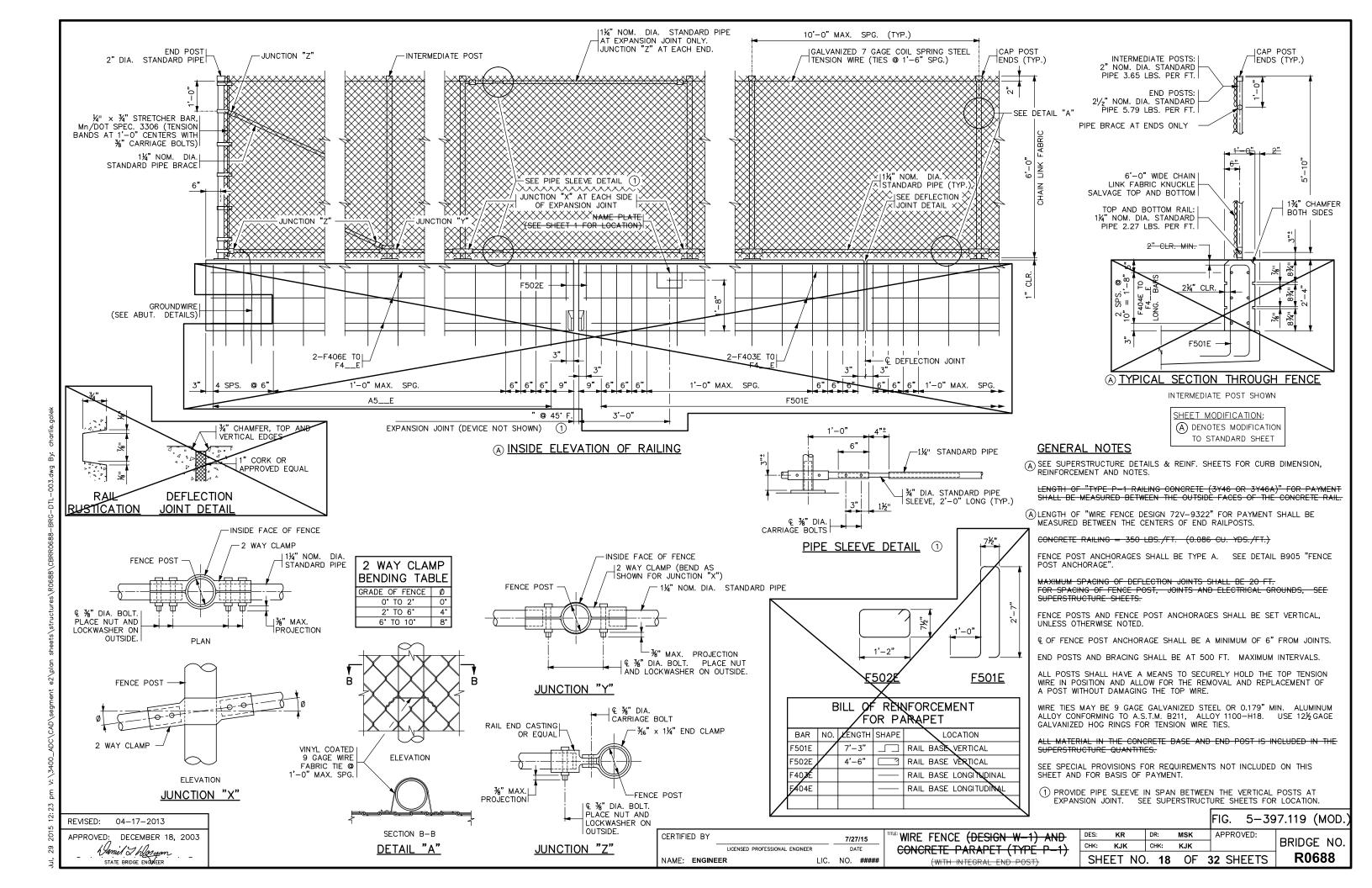


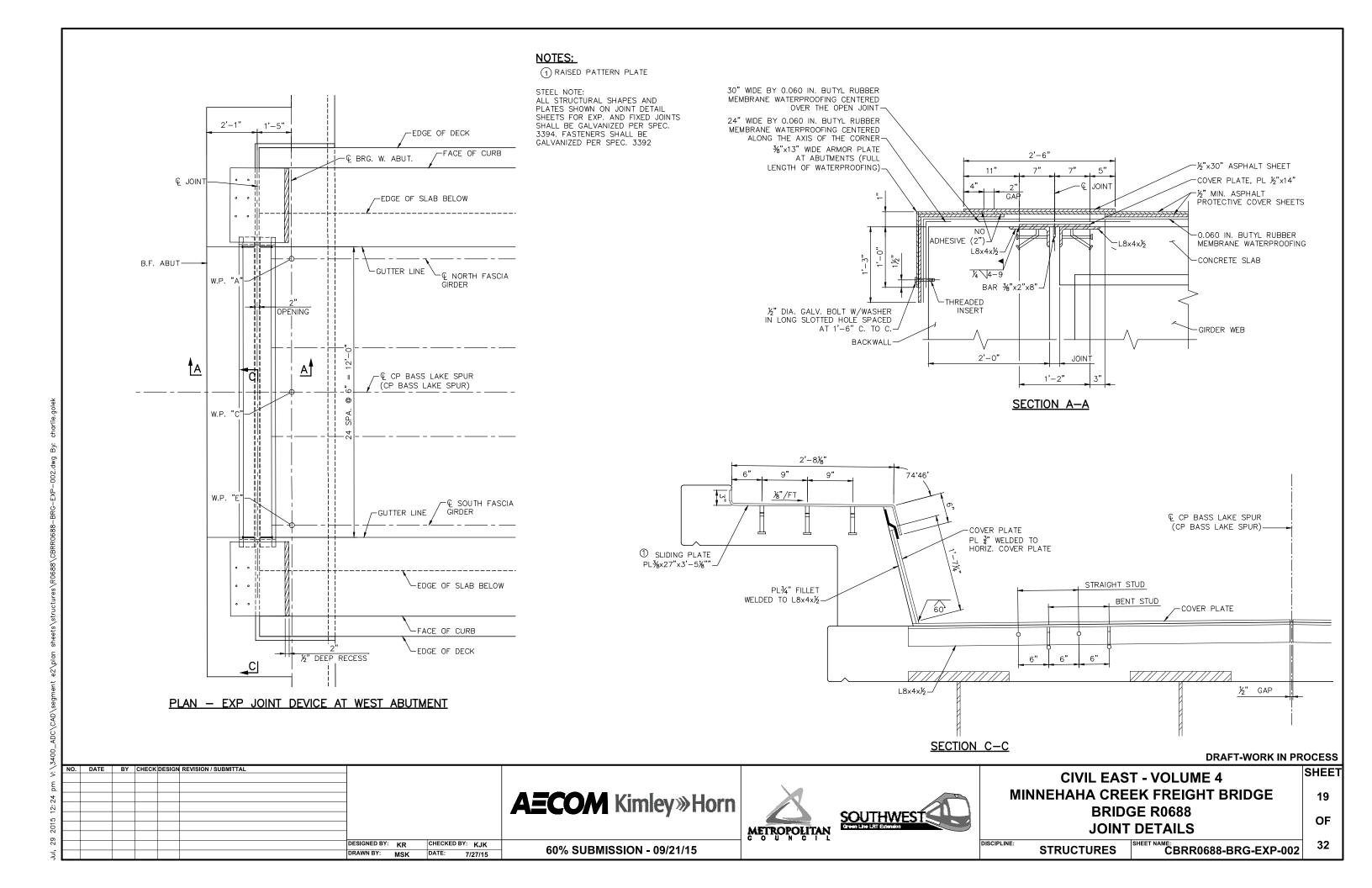


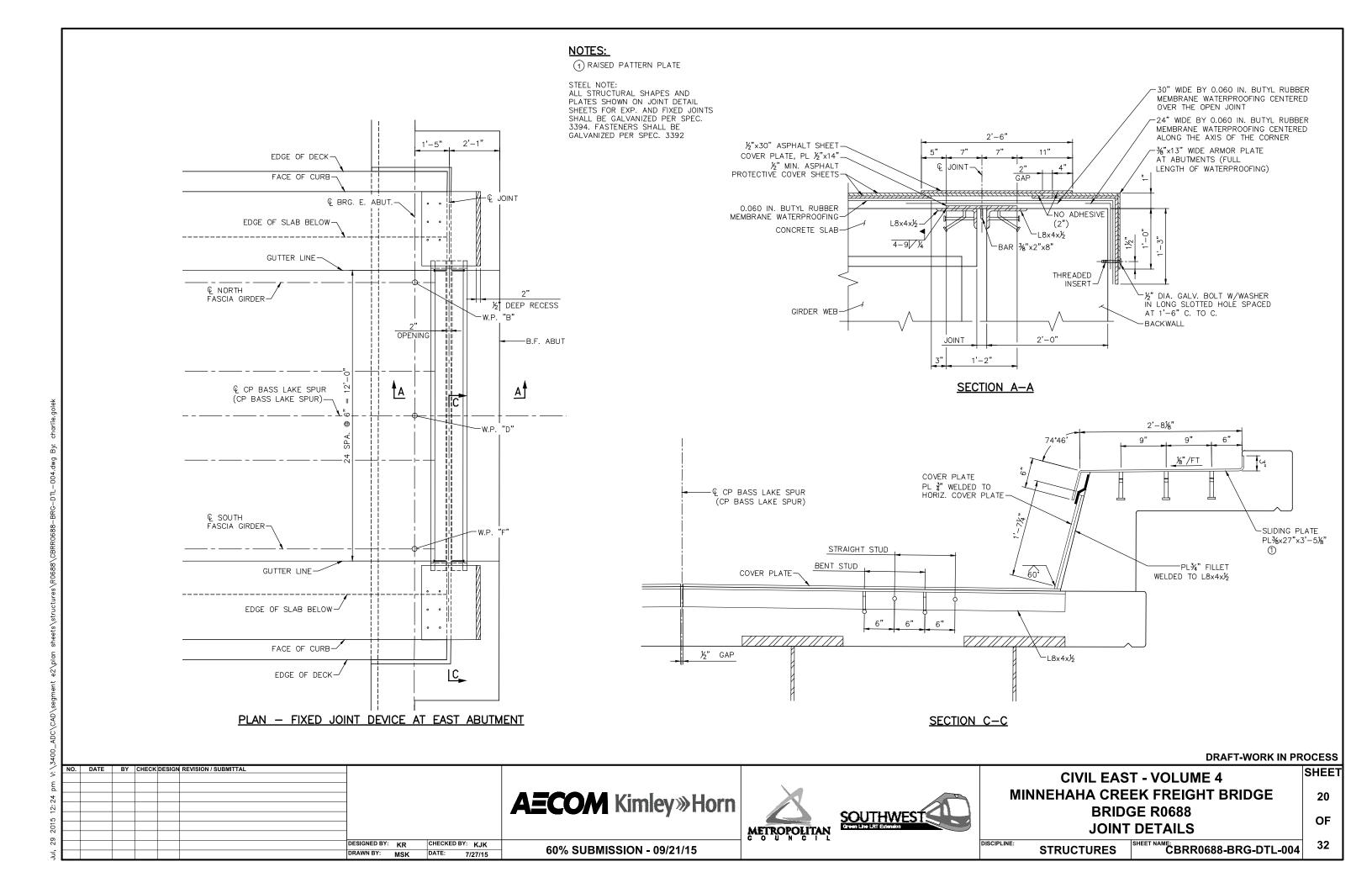


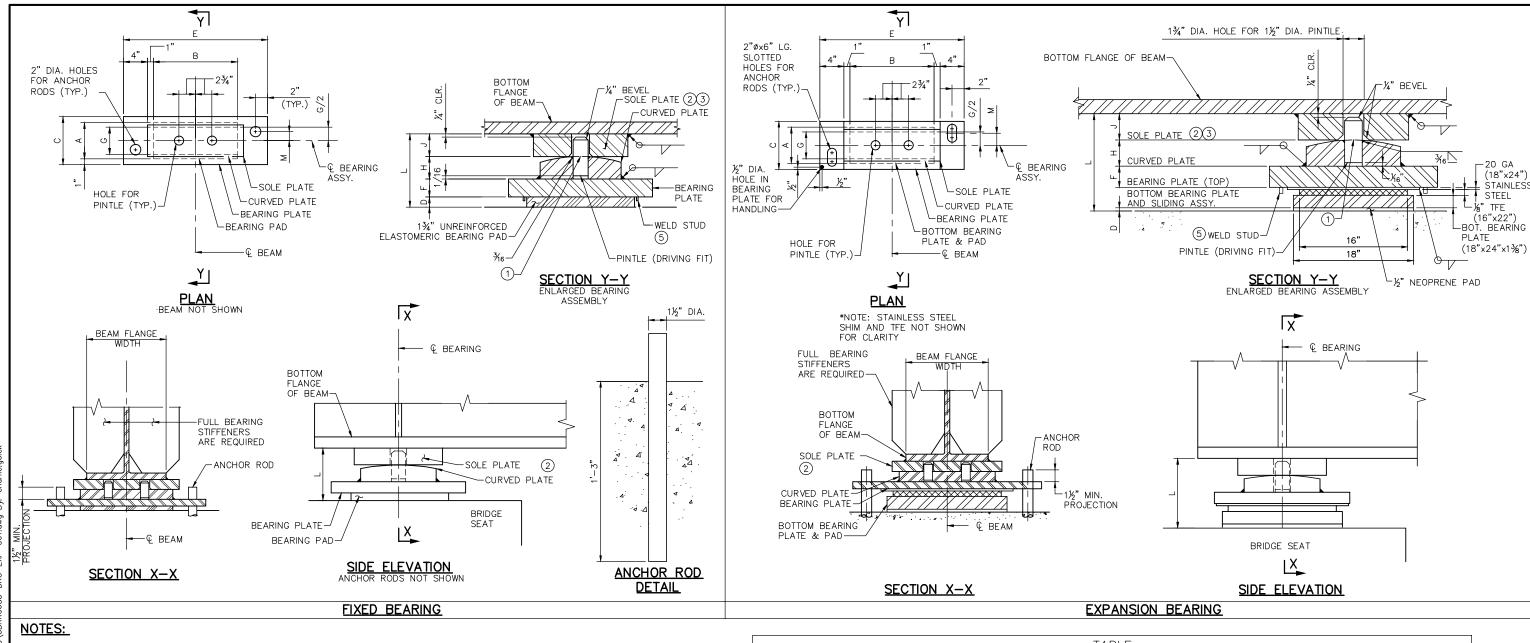












ELASTOMERIC MATERIALS AND PAD CONSTRUCTION SHALL COMPLY

ALL STEEL PLATES SHALL COMPLY WITH SPEC. 3306 EXCEPT THE SOLE PLATE. THE SOLE PLATE SHALL BE THE SAME MATERIAL SPECIFICATION AS THE STEEL BEAMS.

ANCHOR RODS SHALL COMPLY WITH SPEC. 3306. GALVANIZE PER SPEC. 3392.

PINTLES SHALL COMPLY WITH SPEC. 3309.

GALVANIZE STRUCTURAL STEEL BEARING ASSEMBLY AFTER FABRICATION PER SPEC. 3394, EXCEPT AS NOTED.

THE SOLE PLATE IS INCLUDED IN THE WEIGHT OF STRUCTURAL STEEL.

- 1) THE MIN. RADIUS SHALL BE 16" UNLESS OTHERWISE SPECIFIED IN THE TABLE. THE MAX. RADIUS SHALL BE 24". FINISH TO 250 MICRO. THE FINISHED THICKNESS OF THE PLATE MAY BE 1/6" LESS
- 2 WHEN THE SOLE PLATE IS TAPERED, DIMENSIONS "J" AND "L" ARE THICKNESS OF SOLE PLATE AND BEARING ASSEMBLY AT CENTERLINE
- 3 DO NOT GALVANIZE THIS PLATE.
- "+" DENOTES OFFSET AS SHOWN. "-" DENOTES OFFSET OPPOSITE OF SHOWN.
- (5) 5/6" DIA. x 3/8" KNOCK-OFF WELD STUDS INSTALLED ON BEARING PLATE AROUND PERIMETER OF BEARING PAD. CENTERLINE STUD TO EDGE OF PAD DIMENSION = 1/2", MAX. STUD SPACING = 4" AND THE MAX. SPACING TO THE PAD CORNER = 2".
- (6) THE TOTAL THICKNESS SHOWN INCLUDES THE STEEL PLATES.

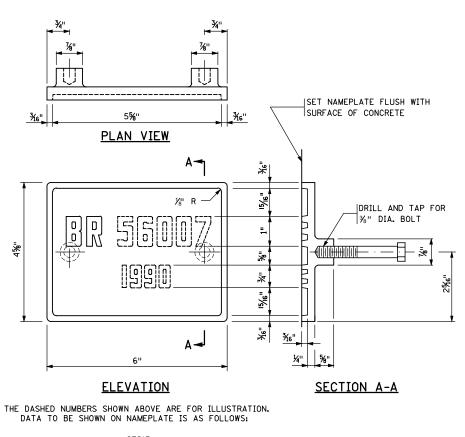
TABLE																						
ASSEMBLY TYPE	LOCATION	BEAM FLANGE		BEARING PAD SIZE SHAPE FACTOR			BEARING PLATE SIZE			CURVED PLATE SIZE		SOLE PLATE SIZE		ATE	PINTLE	ASSY. HEIGHT	ANC RO OFF	DD	LAMIN	NATES		
TYPE	200////	WIDTH	Α	В	D	(INTERNAL)	С	E	F	G	В	Н	R(1)	WID.	LEN.	J (2)	DIA.	L	± (4)	М	NO.	THK.
EXPANSION	ABUT1	24"	18	24	1/2"	-	20	34"	2"	6	24	2"	16	10	26	2½"	1½"	8.125"	+	4"	-	-
FIXED	ABUT2	24"	18	24	1¾"	-	20	34"	21/4"	6	24	2"	16	10	26	21%"	1½"	8.125"	+	4"	-	-

#### **DESIGN DATA:**

MAXIMUM HORIZONTAL LOAD IS 70 KIPS. MINIMUM SOLE PLATE THICKNESS IS  $1\frac{1}{4}$ ".

### **DRAFT-WORK IN PROCESS**

M)															
š	NO. DATE	BY CHE	CK DESIG	N REVISION / SUBMITTAL						CIVIL EAST - VOLUME 4					
.5 pm					-		A = COAA Vineley wy Herry	MINNEHAHA CRE	MINNEHAHA CREEK FREIGHT BRIDGE						
12:2							<b>AECOM</b> Kimley»Horn	COLITEDATECT	SOUTHWEST	BRIDGE R0688					
2015							_	METROPOLITAN	Green Line LRT Extension	BEARING ASSEMBLY DETAILS					
59					DESIGNED BY: KR	CHECKED BY: KJK	COOK CLIDMICCION DOVOMAS	COUNCIL		DISCIPLINE:	SHEET NAME:	32			
Ĭ,					DRAWN BY: MSK	DATE: 7/27/15	60% SUBMISSION - 09/21/15			STRUCTURES	CBRR0688-BRG-EXP-001	4			



BRIDGE 27C13 YEAR 1

#### NUMBERS FOR NAMEPLATE

### NOTES:

MATERIAL SHALL COMPLY WITH SPEC. 3327. LETTERS AND NUMBERS SHALL CONFORM TO THOSE SHOWN. DRAFT ON LETTERS AND NUMBERS SHALL NOT BE MORE THAN 3" IN 12". HORIZONTAL SPACING OF LETTERS AND NUMBERS SHALL PRODUCE A BALANCED LAYOUT IN PROPORTION TO SPACING SHOWN.

TOP SURFACE OF LETTERS, NUMBERS AND FRAMES SHALL BE BURNISHED. FURNISH 2 STEEL BOLTS % " DIA.  $\times$  3" LONG WITH EACH PLATE.

ALL DIMENSIONS FOR ¾" HIGH LETTERS AND NUMBERS SHALL BE IN DIRECT PROPORTION TO THOSE SHOWN FOR THE 1" HIGH LETTERS AND NUMBERS.

CHECKED BY: KJK

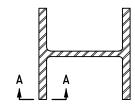
DATE: 7/27/15

1 YEAR OF CONSTRUCTION

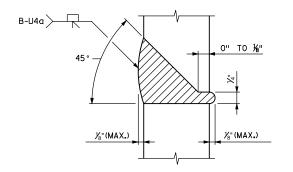
STATE OF MINNESOTA
DEPARTMENT OF TRANSPORTATION APPROVED: NOVEMBER 22, 2002 DETAIL NO. BRIDGE NAMEPLATE Waniel I Waryan B101 (FOR NEW BRIDGES) STATE BRIDGE ENGINEER

DESIGNED BY: KR

DRAWN BY: MSK



SECTION AT SPLICE



SECTION A-A 100% BUTT WELDED PILE SPLICE

CELLULOSIC TYPE ELECTRODES E-6010 OR E-6011 SHALL BE USED FOR 100% BUTT WELDED SPLICES.

ELECTRODES WHICH HAVE BECOME WET, SOILED OR DAMAGED SHALL NOT BE USED.

WELDING SHALL NOT BE DONE WHEN THE AMBIENT TEMPERATURE IS LOWER THAN 0° F. OR WHEN THE PILE IS WET OR EXPOSED TO FALLING RAIN OR SNOW. WHEN THE PILE METAL TEMPERATURE IS BELOW 32° F., THE PILE METAL IN THE AREA OF THE WELD SHALL BE HEATED TO A MINIMUM TEMPERATURE OF 70° F. AND MAINTAINED AT THIS TEMPERATURE DIVISOR WELDING. AT THIS TEMPERATURE DURING WELDING.

APPROVED: NOVEMBER 22, 2002 Hamiel I Waryan

STATE BRIDGE ENGINEER

STATE OF MINNESOTA
DEPARTMENT OF TRANSPORTATION PILE SPLICE

(STEEL H BEARING PILES 10" TO 14")

DETAIL NO.

B202

DRAFT-WORK IN PROCESS SHEE

**AECOM** Kimley»Horn

METROPOLITAN



# **CIVIL EAST - VOLUME 4** MINNEHAHA CREEK FREIGHT BRIDGE **BRIDGE R0688 DETAILS**

DISCIPLINE

32

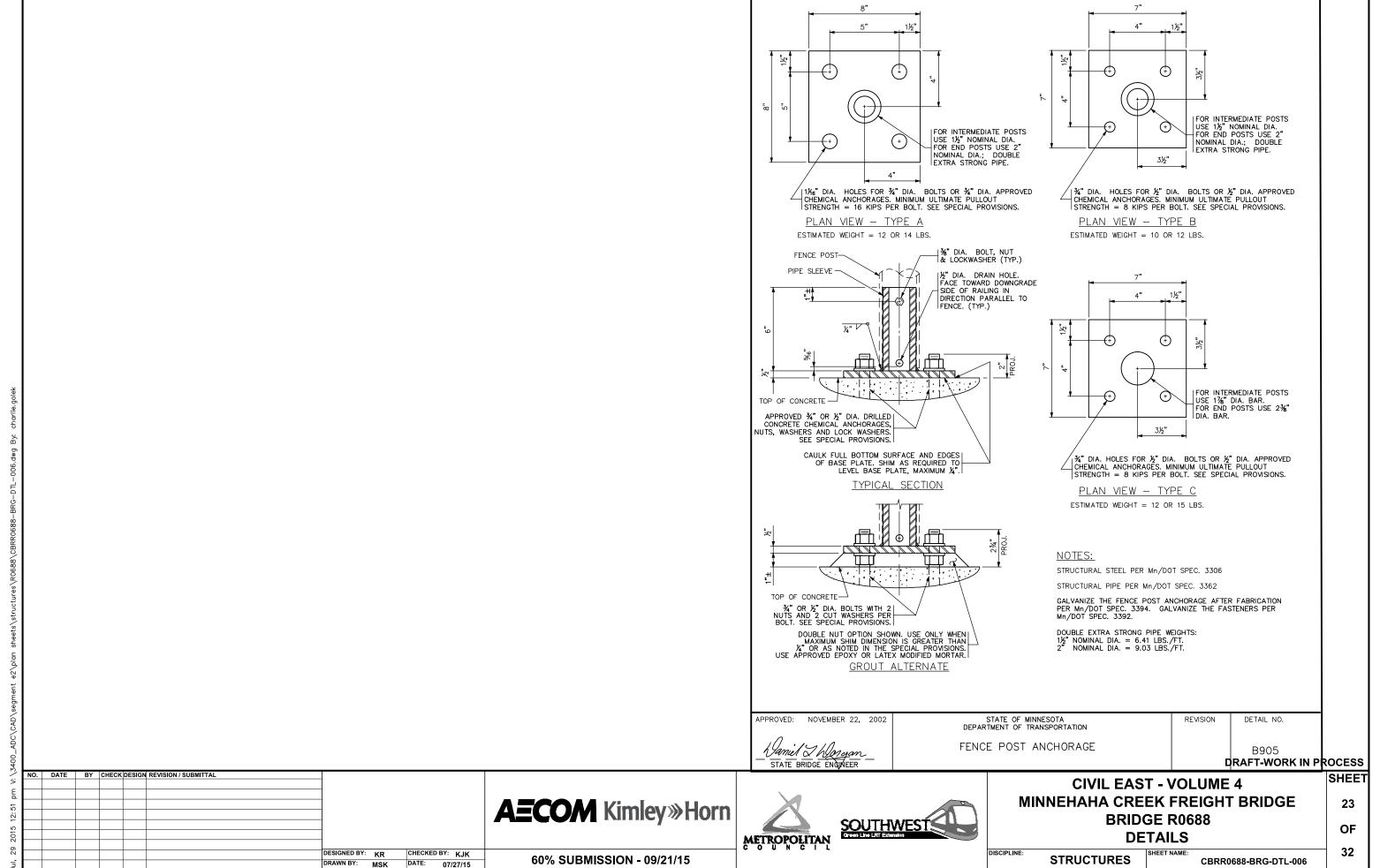
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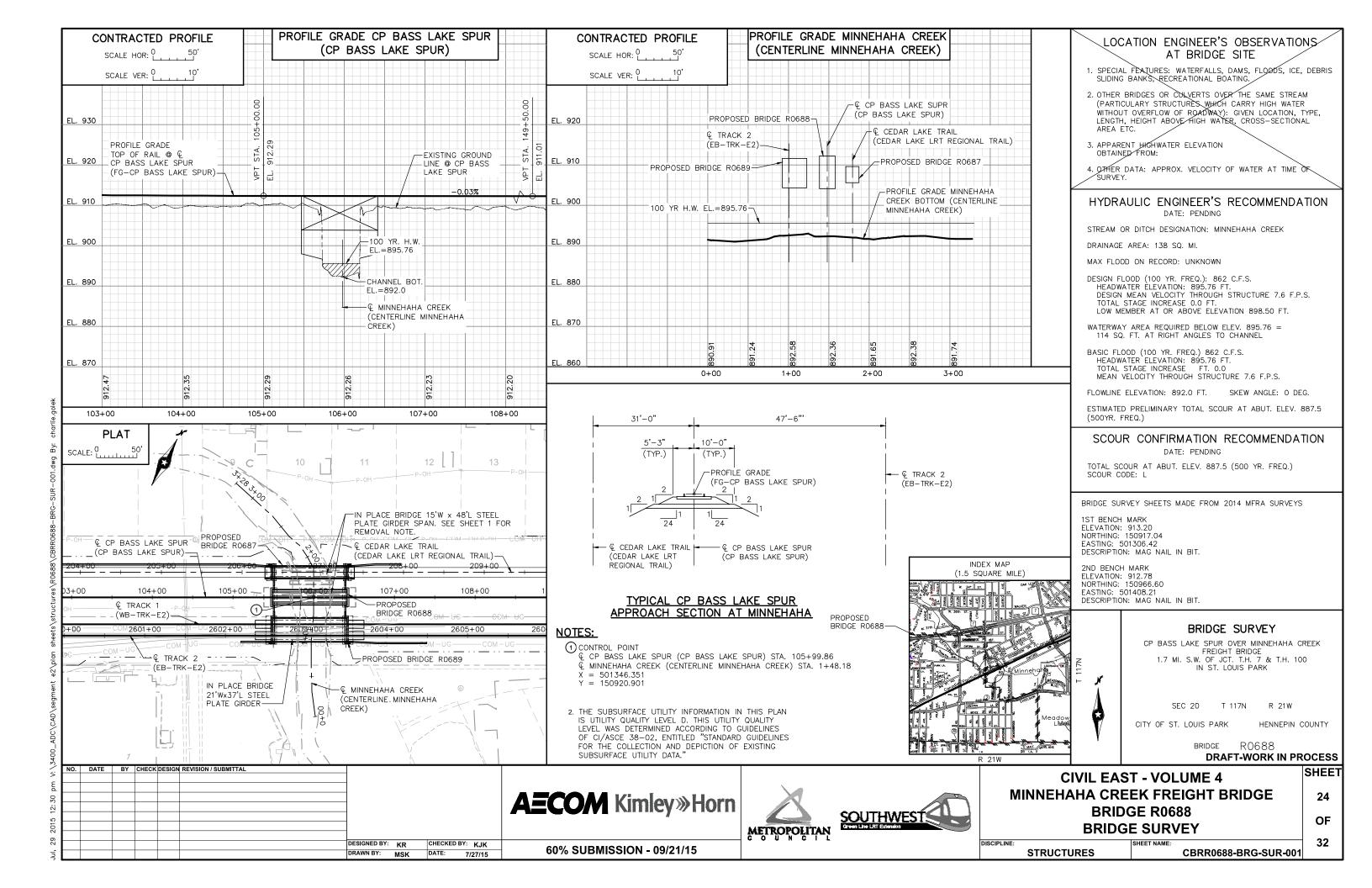
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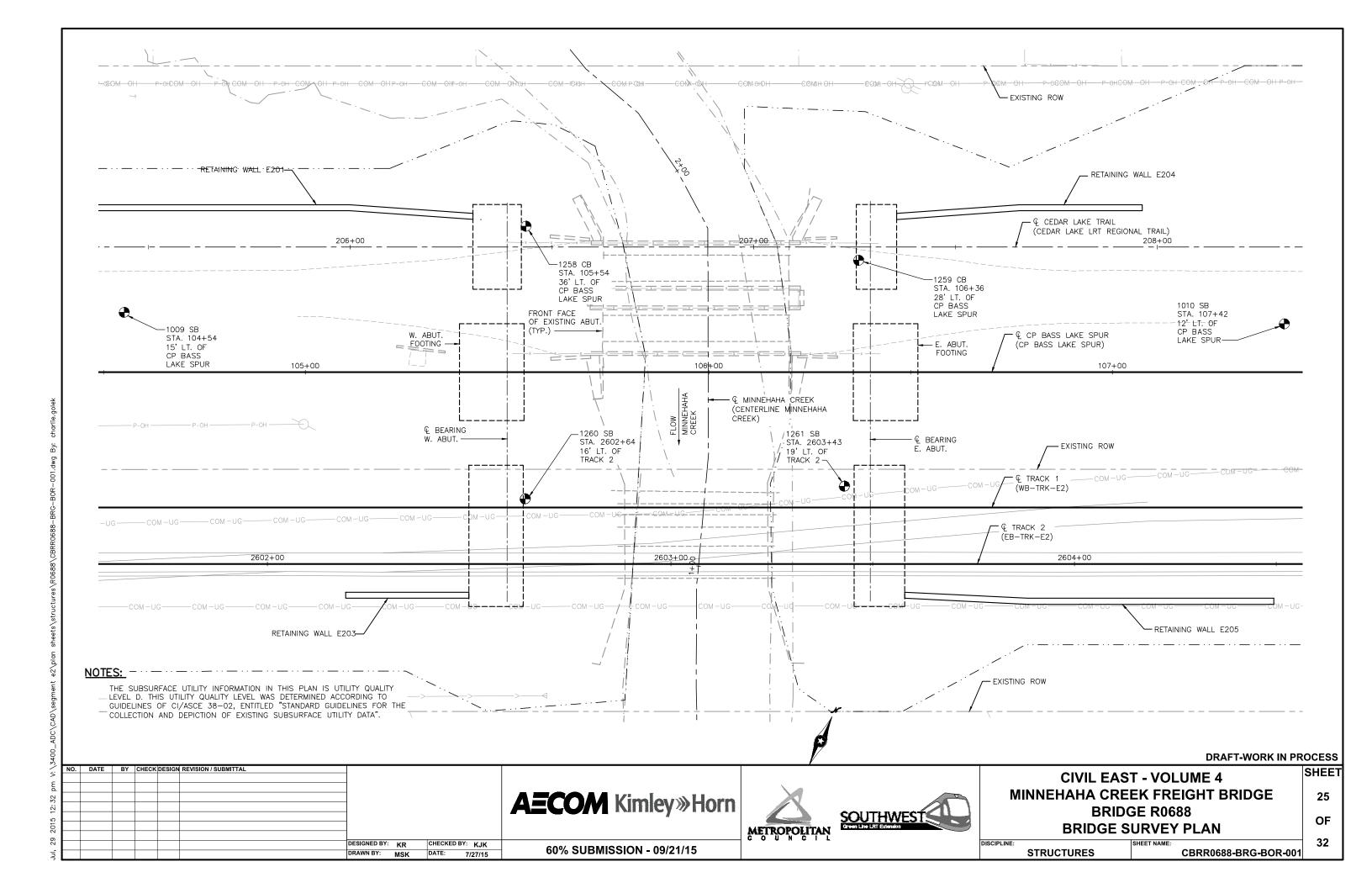
60% SUBMISSION - 09/21/15

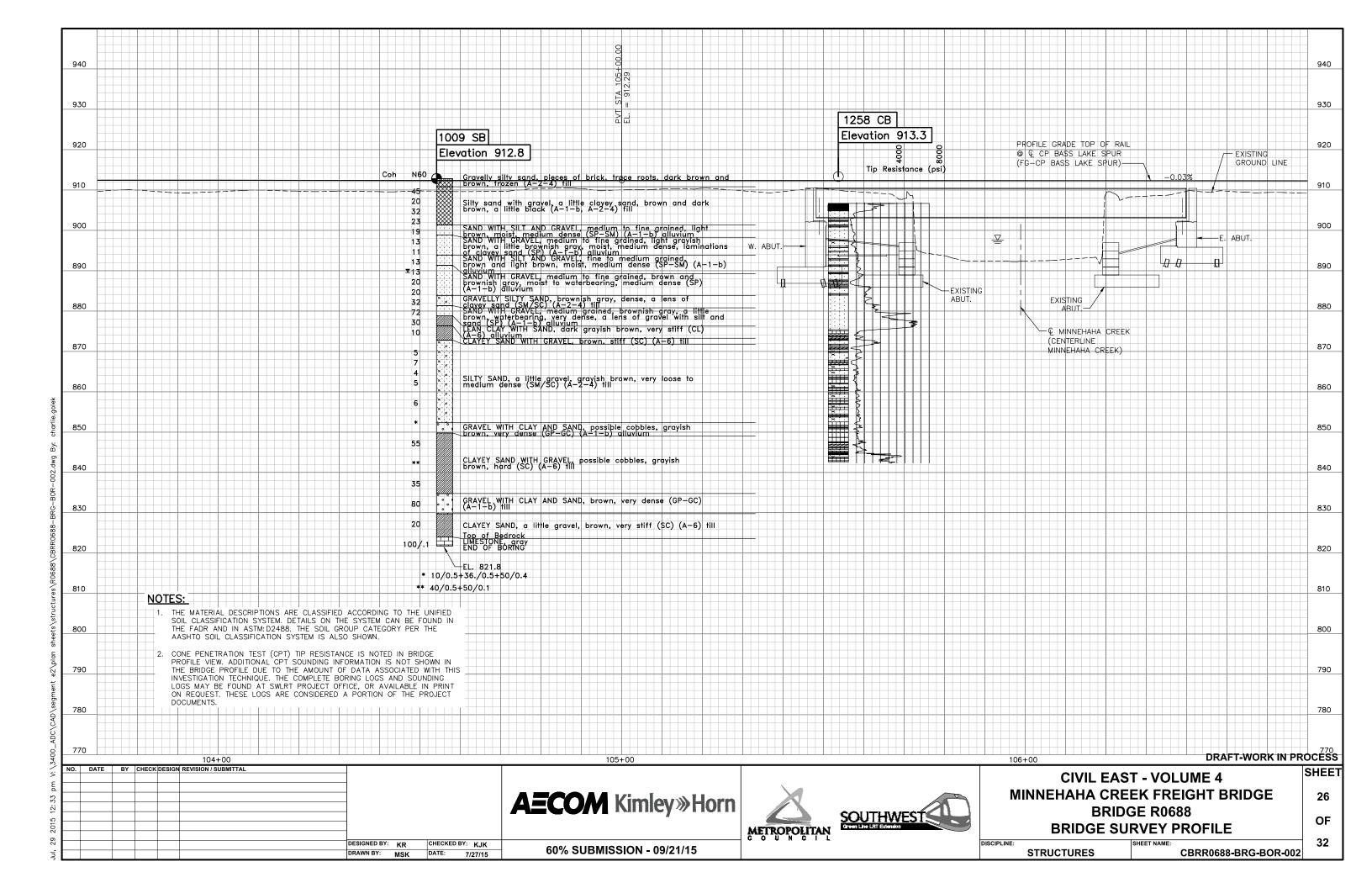
**STRUCTURES** 

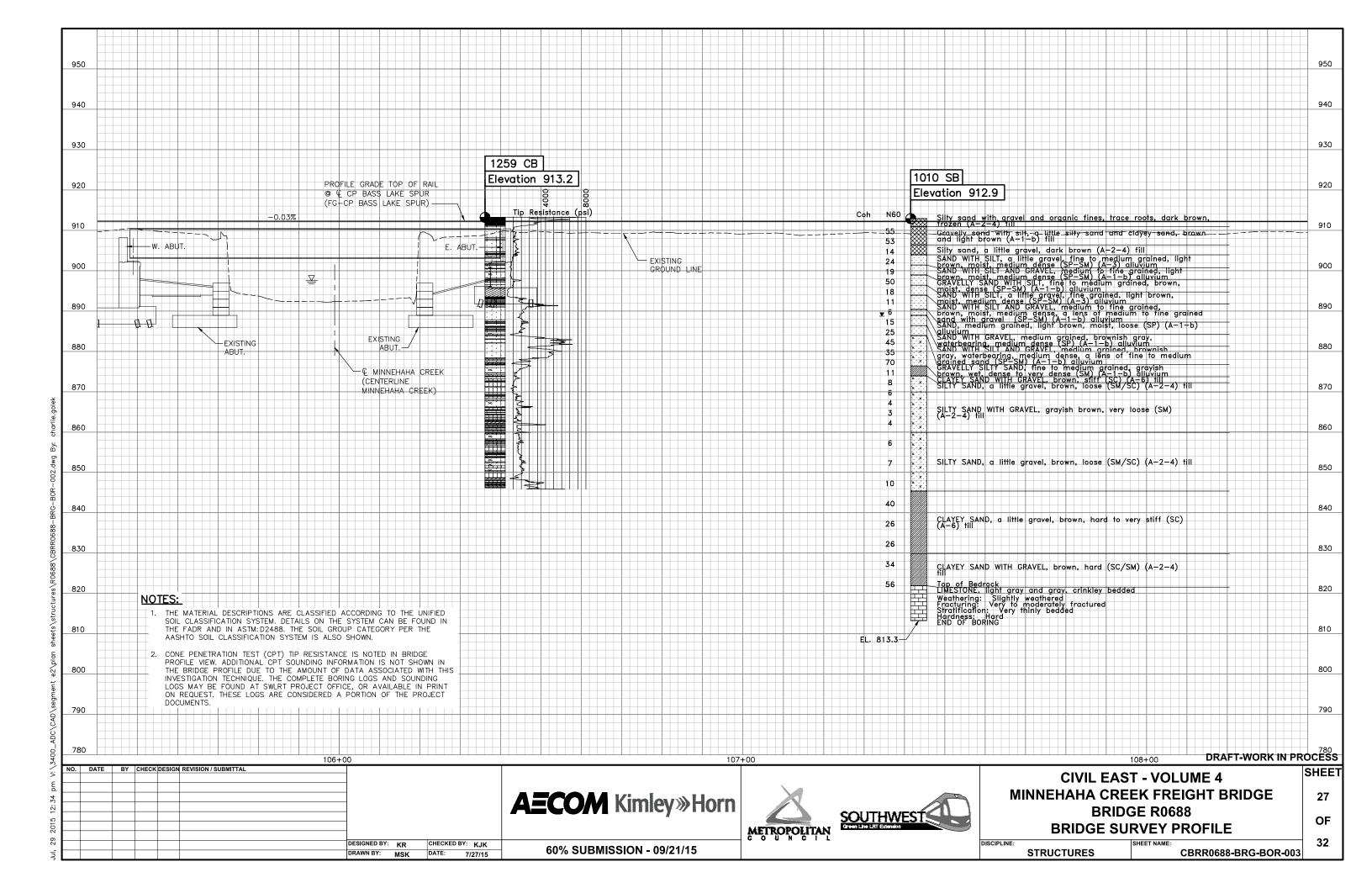
CBRR0688-BRG-DTL-005

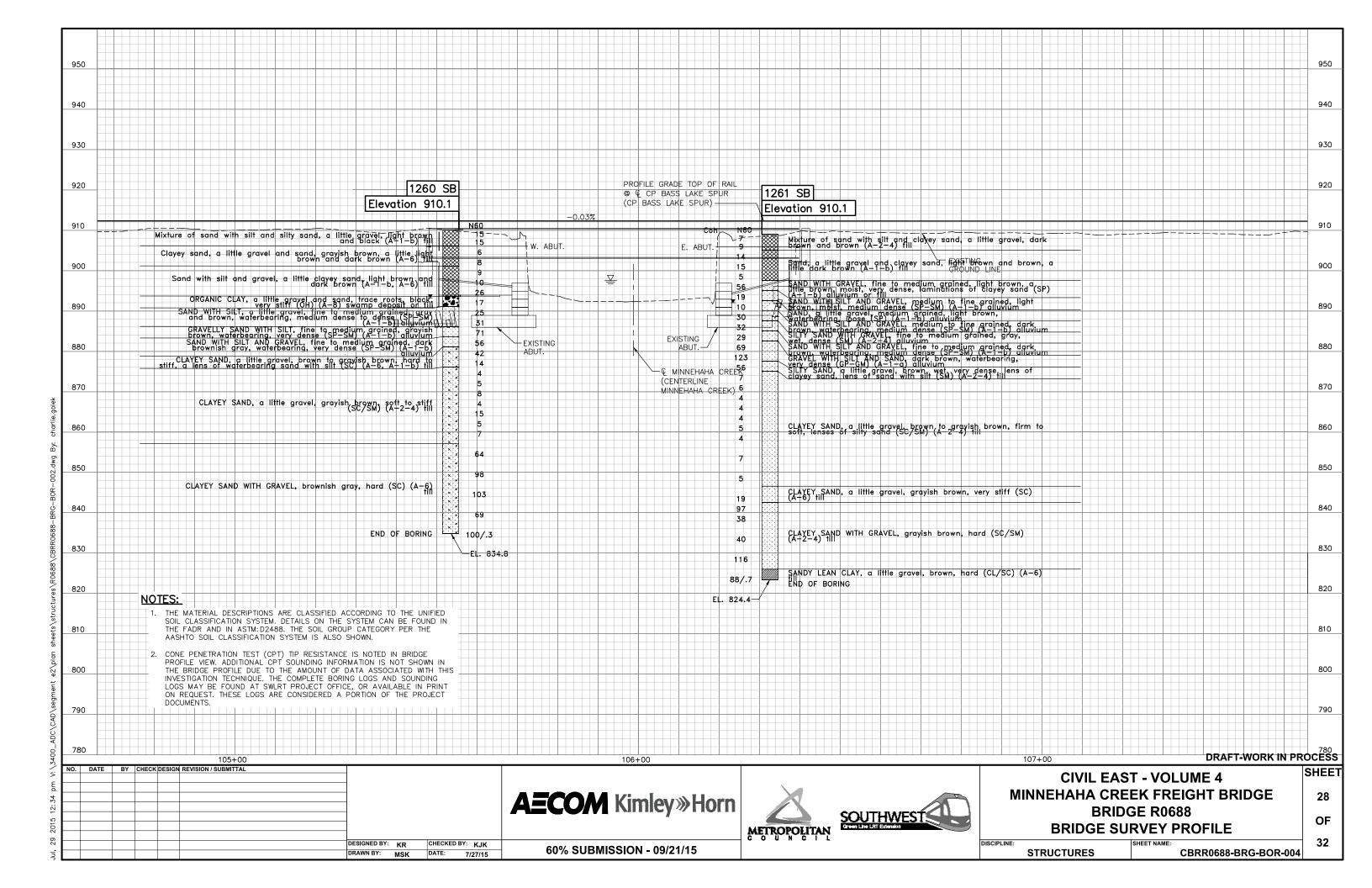


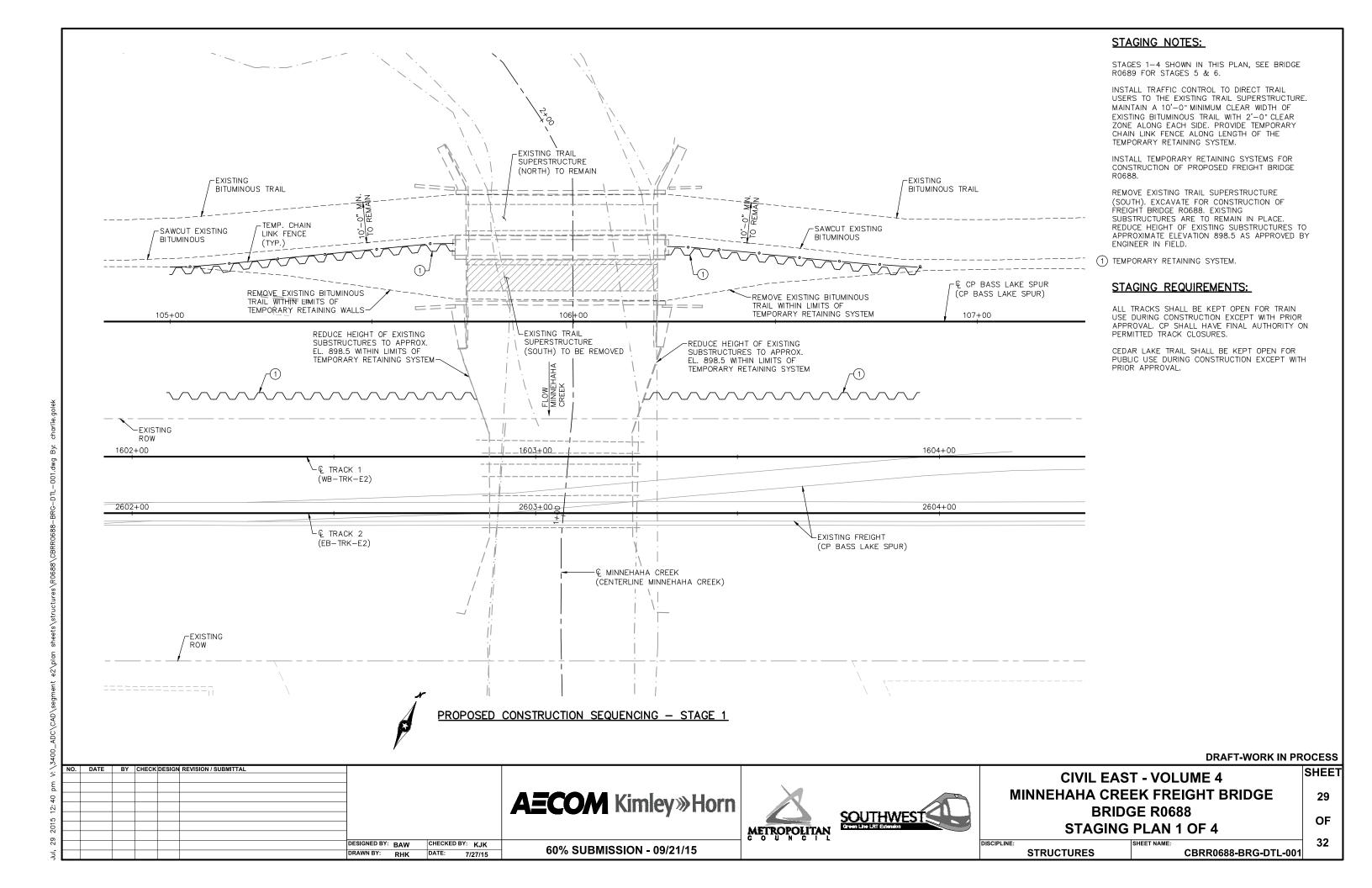


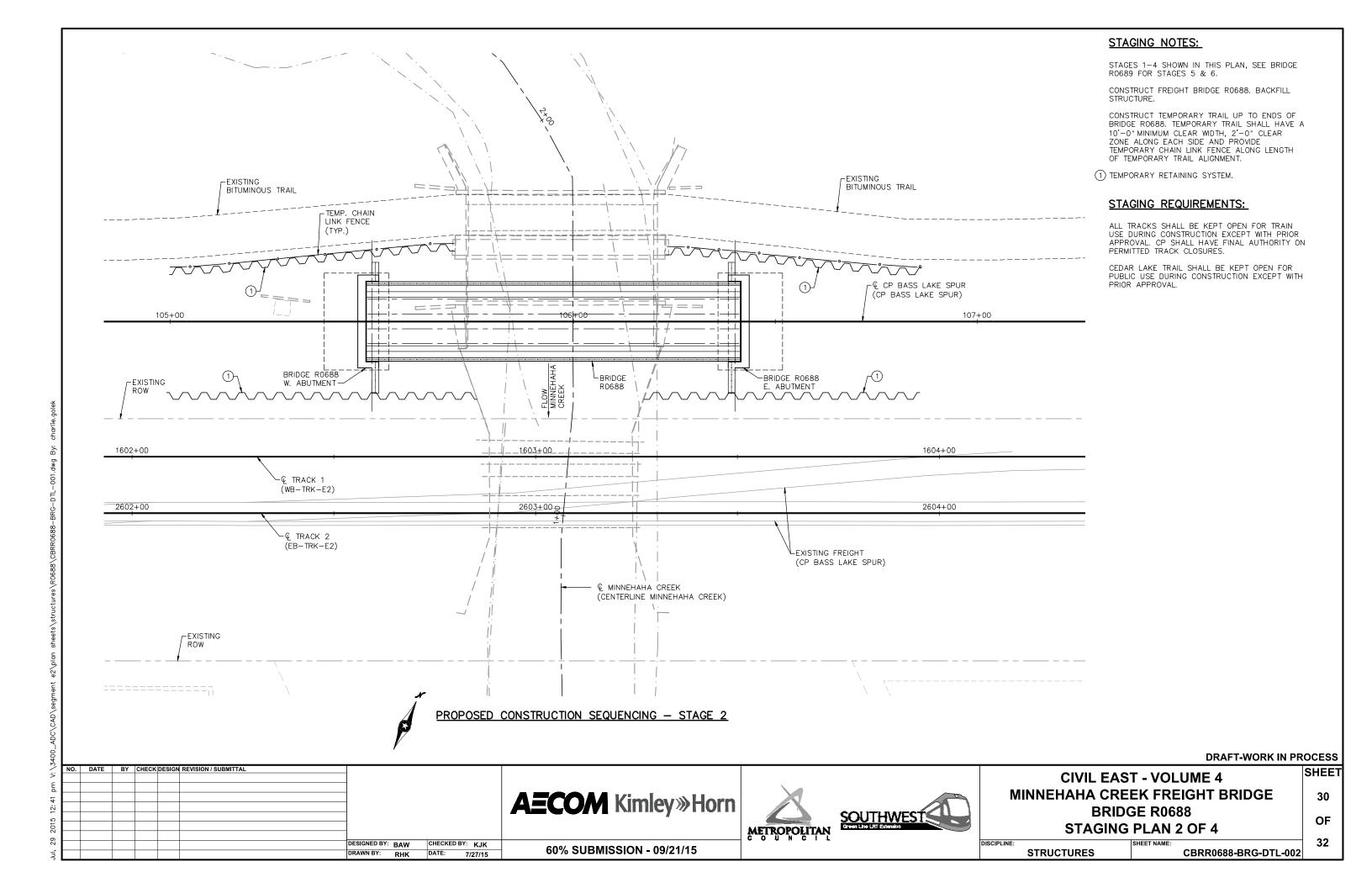


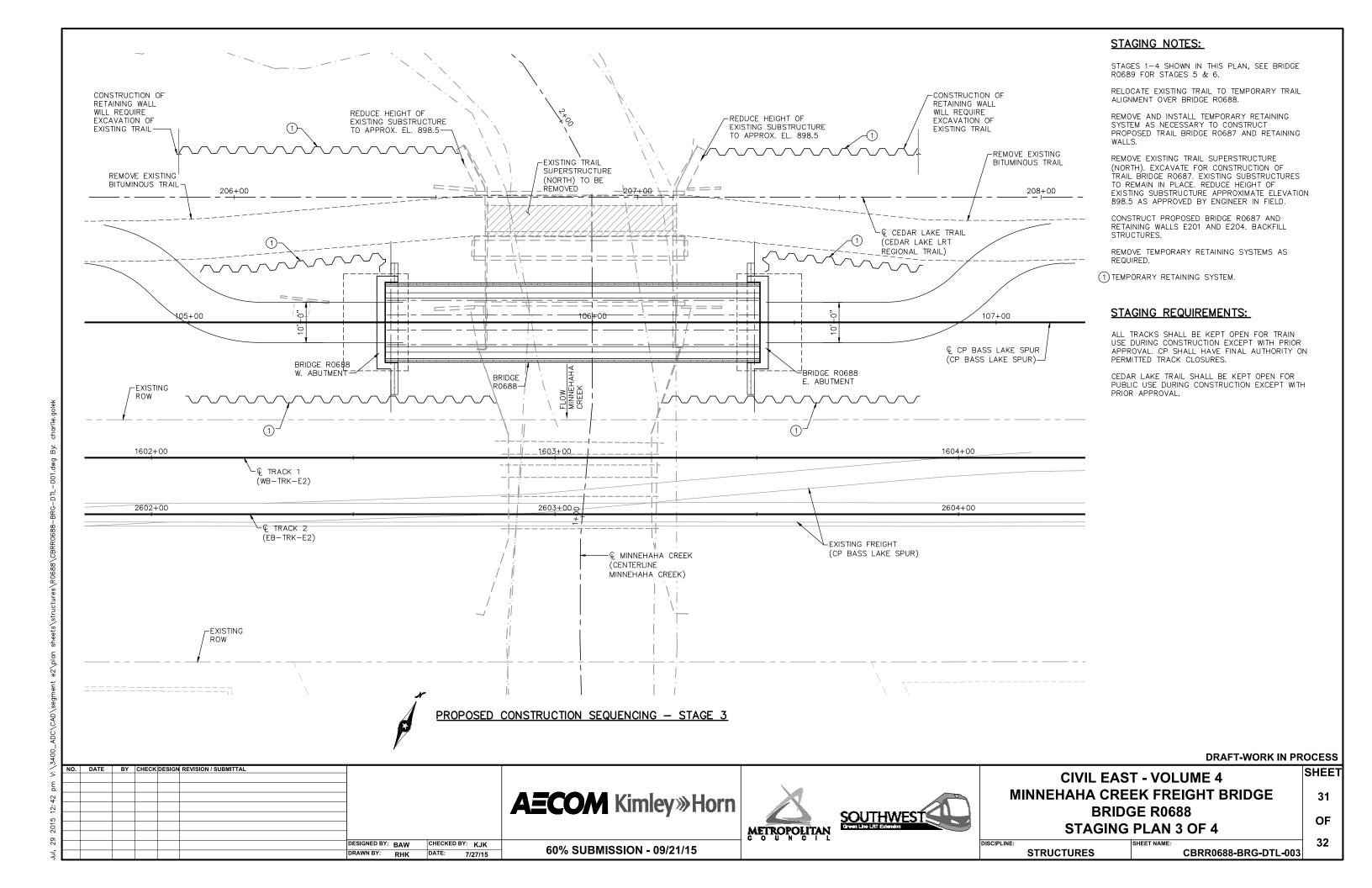


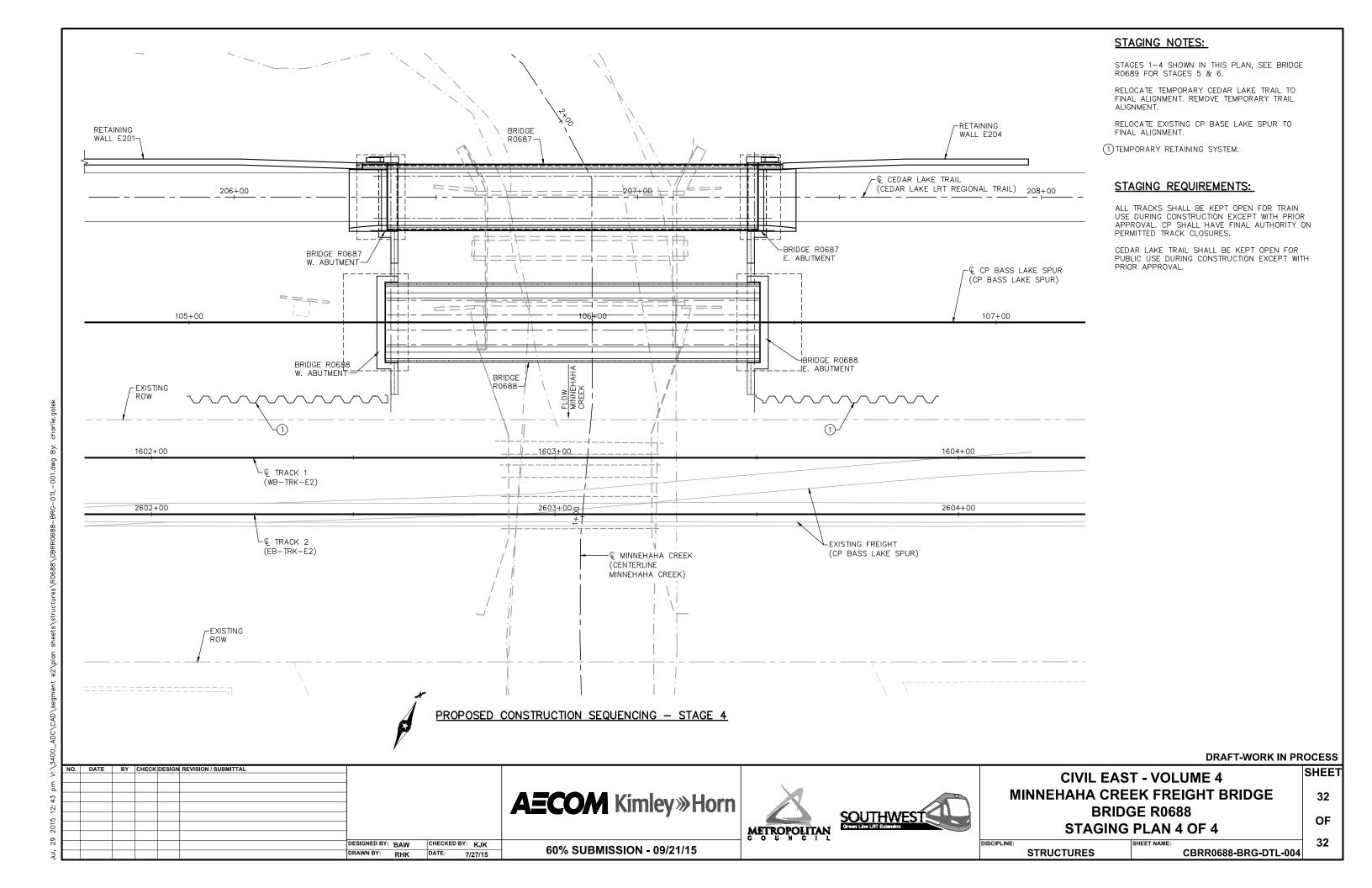


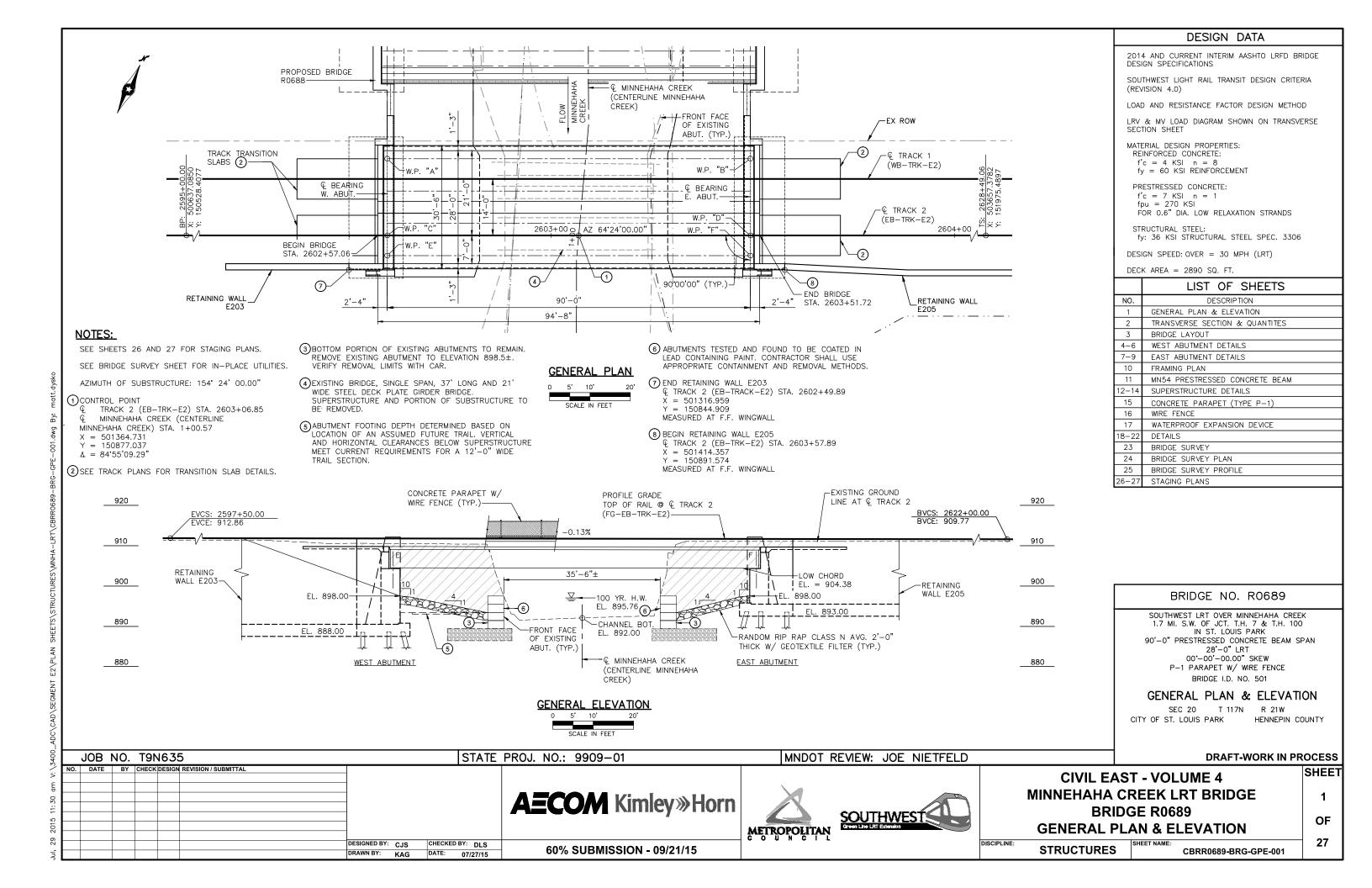


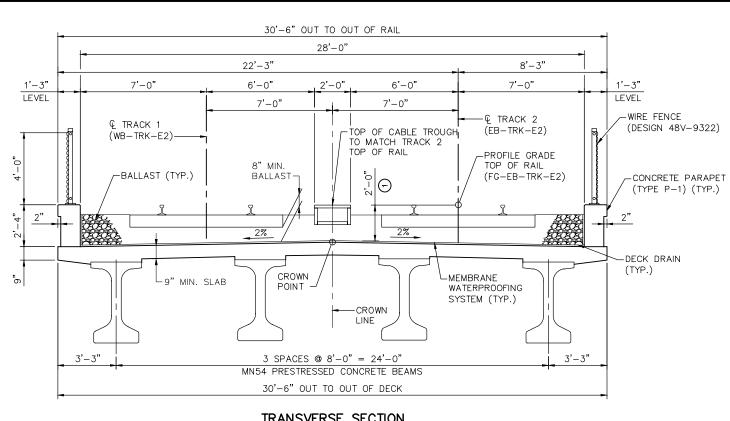












#### **CONSTRUCTION NOTES:**

THE 2016 EDITION OF THE MINNESOTA DEPARTMENT OF TRANSPORTATION "STANDARD SPECIFICATIONS FOR CONSTRUCTION" SHALL GOVERN.

BRIDGE SEAT REINFORCEMENT SHALL BE CAREFULLY PLACED TO AVOID INTERFERENCE WITH DRILLING HOLES FOR ANCHOR RODS. THE BEAMS SHALL BE ERECTED IN FINAL POSITION PRIOR TO DRILLING HOLES FOR AND PLACING ANCHOR RODS.

THE BAR SIZES SHOWN IN THIS PLAN ARE IN U.S. CUSTOMARY DESIGNATIONS. THE FIRST DIGIT OR THE FIRST TWO DIGITS OF EACH BAR MARK INDICATE THE BAR SIZE.

BARS MARKED WITH THE SUFFIX "E" SHALL BE EPOXY COATED IN ACCORDANCE WITH SPEC. 3301.

THE SUBSURFACE UTILITY INFORMATION IN THIS PLAN IS UTILITY QUALITY LEVEL D. THIS UTILITY QUALITY LEVEL WAS DETERMINED ACCORDING TO THE GUIDELINES OF CI/ASCE 38-02, ENTITLED "STANDARD GUIDELINES FOR THE COLLECTION AND DEPICTION OF EXISTING SUBSURFACE UTILITY DATA".

THE PILE LOADS SHOWN IN THE PLANS AND THE CORRESPONDING NOMINAL PILE BEARING RESISTANCE (Rn) WERE COMPUTED USING LRFD METHODOLOGY. PILE BEARING RESISTANCE DETERMINED IN THE FIELD SHALL INCORPORATE THE METHODS AND/OR FORMULAS DESCRIBED IN THE SPECIAL

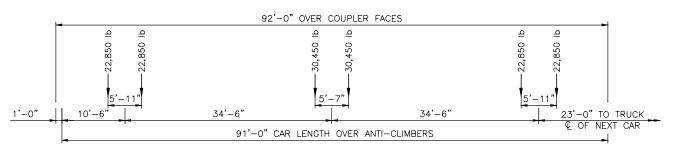
#### NOTES:

1) TOP OF RAIL TO CROWN POINT

		SCHEDULE OF QUANTITIES FOR ENT	IRE BRIDGE	
	ITEM NO.	ITEM	UNIT	QUANTITY
	2401.501	STRUCTURAL CONCRETE (1G52)	CU. YD.	(P)
	2401.501	STRUCTURAL CONCRETE (3B52)	CU. YD.	(P)
	2401.513	TYPE P-1 (TL-2) RAILING CONCRETE (3S52)	LIN. FT.	(P)
	2401.541	REINFORCEMENT BARS	POUND	(P)
	2401.541	REINFORCEMENT BARS (EPOXY COATED)	POUND	(P)
	2401.601	STRUCTURE EXCAVATION	LUMP SUM	
	2401.618	BRIDGE SLAB CONCRETE (3YHPC-M)	SQ. FT.	(P)
	2402.591	EXPANSION JOINT DEVICES TYPE 4	LIN. FT.	(P)
	2402.595	BEARING ASSEMBLY	EACH	(P)
	2405.502	PRESTRESSED CONCRETE BEAMS MN54	LIN. FT.	(P)
	2405.511	DIAPHRAGMS FOR TYPE MN54 PRESTRESSED BEAMS	LIN. FT.	(P)
	2411.618	ANTI-GRAFFITI COATING	SQ. FT.	(P)
	2411.618	ARCHITECTURAL SURFACE FINISH (SPECIAL)	SQ. FT.	(P)
	2411.618	ARCHITECTURAL CONCRETE TEXTURE (SPECIAL)	SQ. FT.	(P)
· ┌	2442.501	REMOVE EXISTING BRIDGE	LUMP SUM	
	2452.510	STEEL H-PILING DRIVEN 12"	LIN. FT.	(P)
	2452.511	STEEL H-PILING DELIVERED 12"	LIN. FT.	(P)
	2452.520	STEEL H-TEST PILE 85 FT LONG 12"	EACH	(P)
	2452.530	PILE TIP PROTECTION 12"	EACH	(P)
	2452.601	STEEL SHEET PILING (TEMPORARY)	LUMP SUM	
	2481.601	MEMBRANE WATERPROOFING SYSTEM	LUMP SUM	
	2502.502	DRAINAGE SYSTEM TYPE (B910)	LUMP SUM	
	2511.501	RANDOM RIPRAP CLASS IV	CU. YD.	
	2511.515	GEOTEXTILE FILTER TYPE VII	SQ. YD.	(P)
	2557.501	WIRE FENCE DESIGN 48V-9322	LIN. FT.	(P)
L	2007.001			

#### TRANSVERSE SECTION

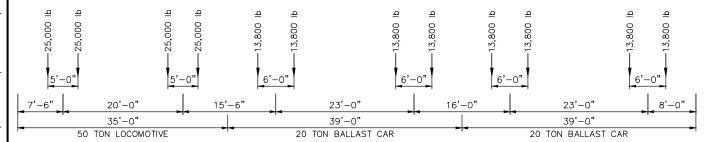




#### NOTES:

- 1. THE LRT TRAIN SHALL CONSIST OF EITHER ONE, TWO, OR THREE CARS, WHICHEVER PRODUCES THE MAXIMUM LOAD FOR THE ELEMENT UNDER CONSIDERATION.
- 2. AXLE LOAD IN POUNDS.
- 3. LOADING DIAGRAM REPRESENTS MAXIMUM LOAD AT EACH TRUCK.

#### LIGHT RAIL VEHICLE LOADING DIAGRAM



- 1. THE MAINTENANCE TRAIN SHALL CONSIST OF ONE LOCOMOTIVE AND ONE, TWO, THREE, OR FOUR BALLAST CARS, WHICHEVER PRODUCES THE MAXIMUM LOAD FOR THE ELEMENT UNDER CONSIDERATION.
- 2. AXLE LOAD IN POUNDS.
- 3. WEIGHT OF EMPTY BALLAST CAR IS 15,000 POUNDS.

MAINTENANCE TRAIN LOADING DIAGRAM

**DRAFT-WORK IN PROCESS** 

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**AECOM** Kimley»Horn

60% SUBMISSION - 09/21/15

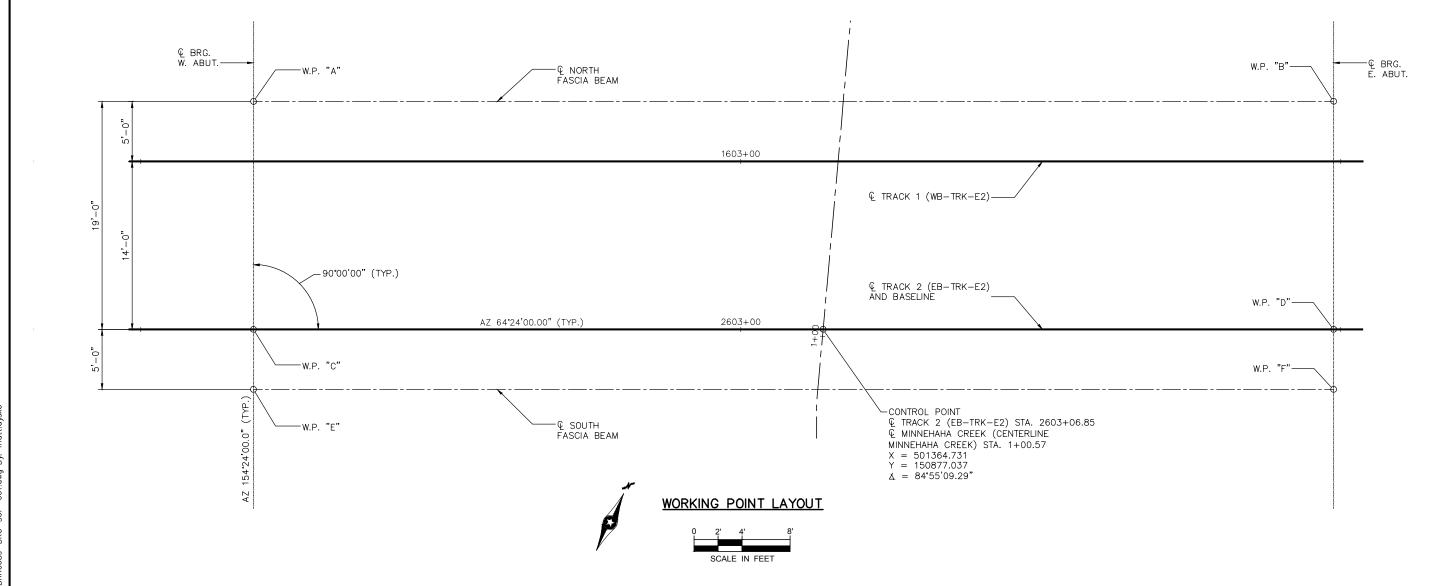




**CIVIL EAST - VOLUME 4** MINNEHAHA CREEK LRT BRIDGE **BRIDGE R0689** 

**TRANSVERSE SECTION & QUANTITIES STRUCTURES** CBRR0689-BRG-TRN-001

27



	DIME	ENSIONS	BETWEE	N WORK	KING POI	NTS		COORD	INATES	ELEVATION			
POINT	STATION	Α	В	С	D	Е	F	х	Y	TOP OF SLAB	TOP OF SLAB TO BRIDGE SEAT	BRIDGE SEAT	POINT
А	2602+59.39	0	90.00	19.00	91.98		93.15	501313.717	150873.663	909.96	5.89	904.07	Α
В	2603+49.39			91.98	19.00	93.15		501394.882	150912.551	909.84	5.77	904.07	В
С	2602+59.39				90.00	5.00	90.14	501321.926	150856.529	910.06			С
D	2603+49.39					90.14	5.00	501403.091	150895.416	909.94			D
E	2602+59.39						90.00	501324.087	150852.02	909.96	5.89	904.07	E
F	2603+49.39							501405.252	150890.907	909.84	5.77	904.07	F

TOP OF ROADWAY TO BRIDGE SEAT											
	DECK	STOOL	BEAM	BEARING	TOTAL						
	THICKNESS	HEIGHT	HEIGHT	HEIGHT	INCHES	FEET					
WEST ABUTMENT	9"	3"	54"	4 ⅓"	70 %"	5.89					
EAST ABUTMENT	9"	3"	54"	3 <i>1</i> /4"	69 <b>¼</b> "	5.77					

## DRAFT-WORK IN PROCESS

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<u> </u>						<b>AECOM</b> Kimley»Horn			DDID	OF DOCOO	
<del></del>								COLITURATE CT	BRID	GE R0689	
5								300 HIVE ST			OF
0							METROPOLITANI	Green Line LRT Extension	│ BRIDG	E LAYOUT	
-							METROPOLITAN		511.50		
53				DESIGNED BY: CJS	CHECKED BY: DLS	COO/ CLIDMICCION DO/24/45			DISCIPLINE: CTDLLCTLIDES	SHEET NAME:	<b>7 27</b>
Jul,				DRAWN BY: KAG	DATE: 07/27/15	60% SUBMISSION - 09/21/15			STRUCTURES	CBRR0689-BRG-SUP-001	

WEST ABUTMENT								
COMPUTED PILE LOAD - TONS/PILE								
FACTORED DEAD LOAD + EARTH PRESSURE	72.4							
FACTORED LIVE LOAD	33.3							
* FACTORED DESIGN LOAD	105.7							

<sup>\*</sup> BASED ON STRENGTH I LOAD COMBINATION.

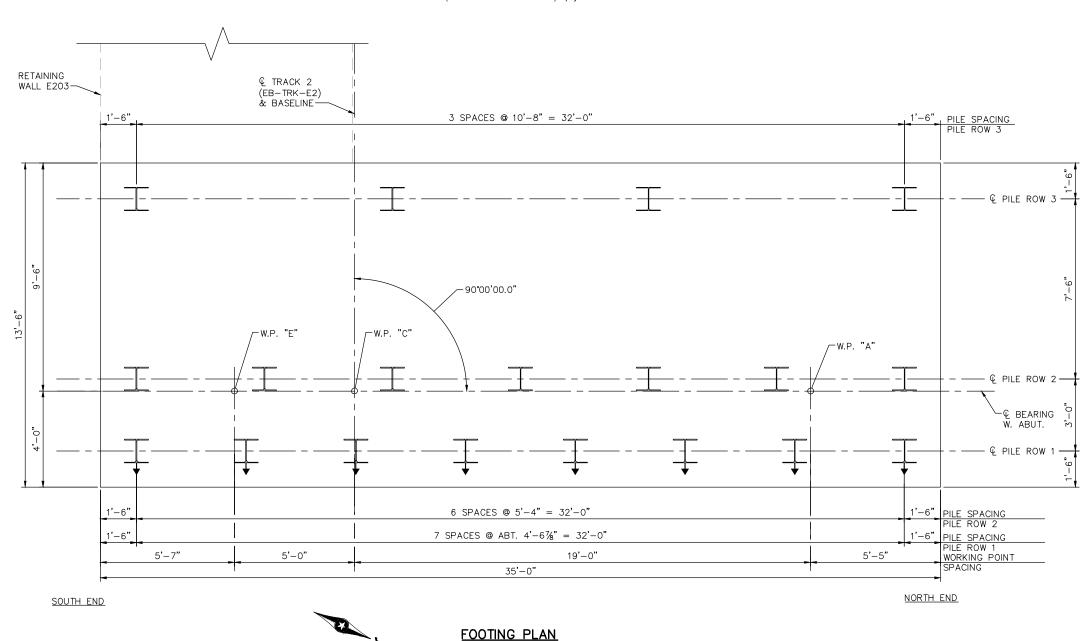
### WEST ABUTMENT REQUIRED NOMINAL PILE BEARING RESISTANCE FOR H-PILES Rn - TONS/PILE

RESISTANCE FOR H-	PILES Rn - TOI	NS/PILE
FIELD CONTROL METHOD	φdyn	* Rn
MN/DOT PILE FORMULA 2012 (MPF12) $R_{n} = 20 \left( \frac{W \times H}{1000} \text{xlog} \left( \frac{10}{S} \right) \right)$	0.60	177
PDA	0.65	163

<sup>\*</sup> Rn = (FACTORED DESIGN LOAD) / φdyn

### **GENERAL PILE NOTES:**

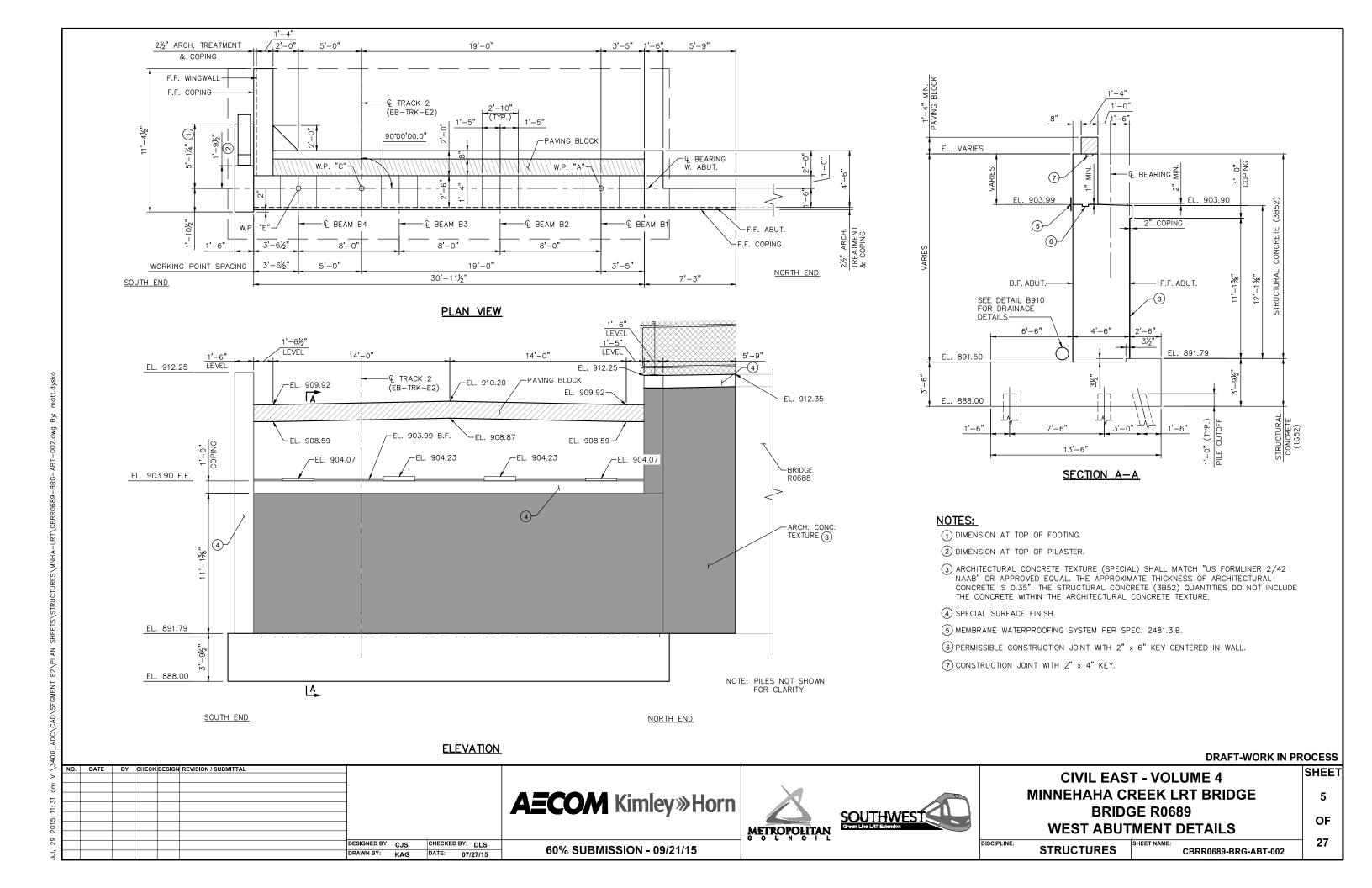
- 1 HP12x53 STEEL TEST PILE 70 FT. LONG
- 18 HP12x53 STEEL PILES EST. 70 FT. LENGTH
- 19 HP12x53 STEEL PILES REQ'D FOR WEST ABUT.
- ALL PILES TO BE HP12x53 WITH PILE TIP PROTECTION.
- PILE SPACING SHOWN IS AT BOTTOM OF FOOTING.
- FOR PILE SPLICE DETAILS SEE DETAIL B202.
- SEE SURVEY SHEET FOR TEST PILE LOCATIONS.

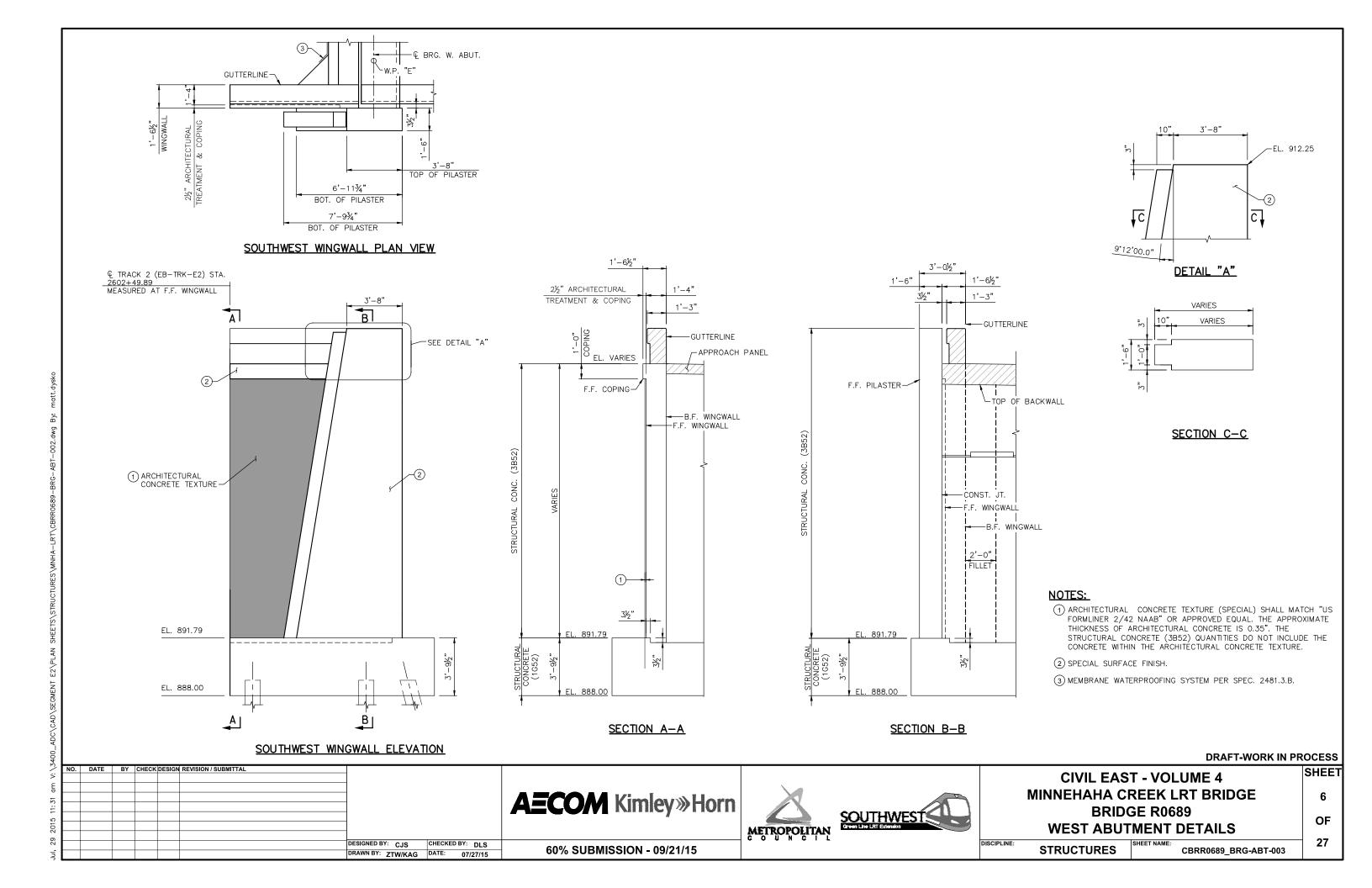


DRAFT-WORK IN PROCESS

34													DIVAL 1-WORKENIT	
·/ :>	NO.	DATE BY	CHECK	DESIGN	REVISION / SUBMITTAL							CIVIL EAS	T - VOLUME 4	SHEET
.31 an								<b>AECOM</b> Kimley»Horn	>0				REEK LRT BRIDGE	4
15 11:								A_COM Killing # Horn		SOUTHWEST			GE R0689	OF
9 20							F		METROPOLITAN	Green Line LRT Extension		WEST ABU	MENT DETAILS	27
Jul, 2						DESIGNED BY: CJS  DRAWN BY: ZTW/KAG	DATE: 07/27/15	60% SUBMISSION - 09/21/15			DISCIPLINE:	STRUCTURES	CBRR0689-BRG-ABT-001	21

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## **EAST ABUTMENT** COMPUTED PILE LOAD - TONS/PILE FACTORED DEAD LOAD + FACTORED LIVE LOAD 40.5 \* FACTORED DESIGN LOAD 123.9

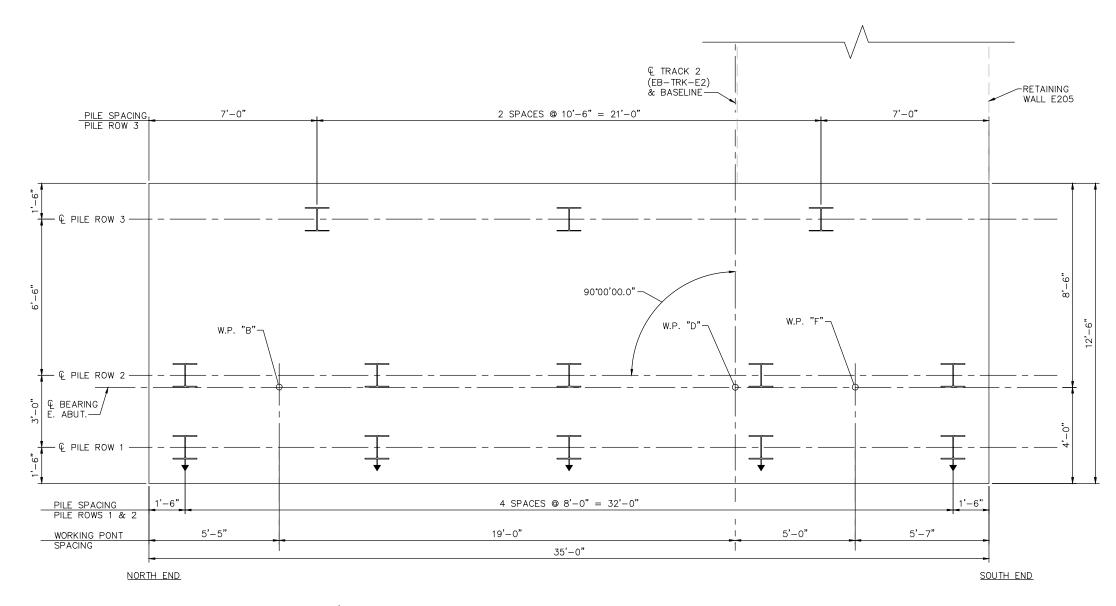
# EAST ABUTMENT REQUIRED NOMINAL PILE BEARING

RESISTANCE FOR H	PILES RII - TOI	NS/PILE
FIELD CONTROL METHOD	φdyn	* Rn
MN/DOT PILE FORMULA 2012 (MPF12) $R_n = 20 \sqrt{\frac{W \times H}{1000} x log} \left(\frac{10}{S}\right)$	0.60	207
PDA	0.65	191

\* Rn = (FACTORED DESIGN LOAD) / φdyn

### **GENERAL PILE NOTES**

- 1 HP12x53 STEEL TEST PILE 75 FT. LONG 12 HP12x53 STEEL PILES EST. 75 FT. LENGTH 13 HP12x53 STEEL PILES REQ'D FOR EAST ABUT.
- ALL PILES TO BE HP12x53 WITH PILE TIP PROTECTION.
- PILE SPACING SHOWN IS AT BOTTOM OF FOOTING.
- PILES MARKED THUS TO BE BATTERED 3" PER FOOT IN
- FOR PILE SPLICE DETAILS SEE DETAIL B202.
- SEE SURVEY SHEET FOR TEST PILE LOCATIONS.





### FOOTING PLAN

#### **DRAFT-WORK IN PROCESS**

SHEET

7

OF

27

				REVISION / SUBMITTAL	DESIGN	CHECK	DI	DATE	NO.
<b>AECOM</b> Kimley»H									
AELUM KIMIEV» F									
CON CURMICCION DO/04/45	CHECKED BY: DLS	CJS	DESIGNED BY:						
60% SUBMISSION - 09/21/15	DATE: 07/27/15	KAG	DRAWN BY:						

**OM** Kimley»Horn

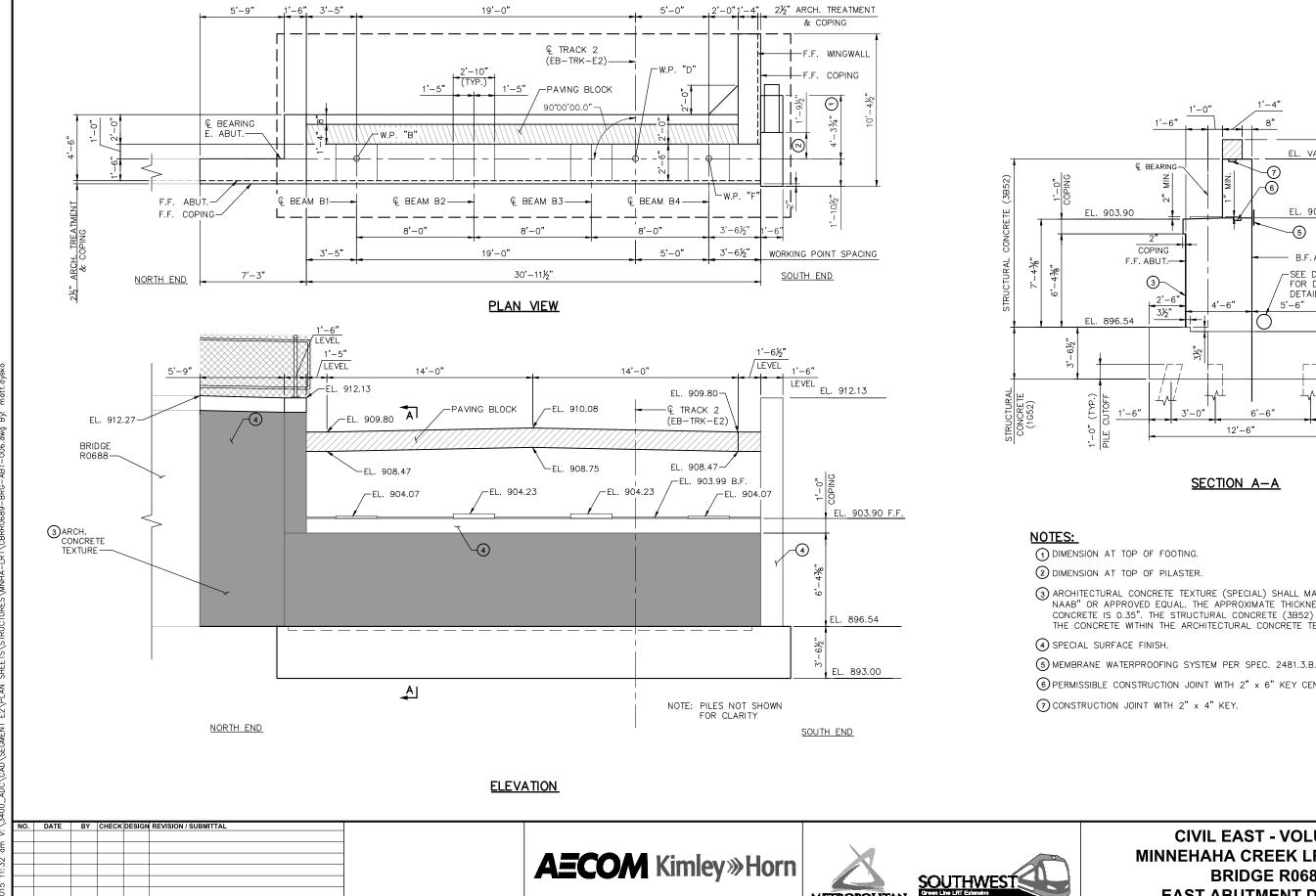




**CIVIL EAST - VOLUME 4** MINNEHAHA CREEK LRT BRIDGE **BRIDGE R0689** 

**EAST ABUTMENT DETAILS** DISCIPLINE: **STRUCTURES** CBRR0689-BRG-ABT-005

<sup>\*</sup> BASED ON STRENGTH I LOAD COMBINATION.



60% SUBMISSION - 09/21/15

DESIGNED BY: CJS CHECKED BY: DLS

DRAWN BY: KAG DATE: 07/27/15

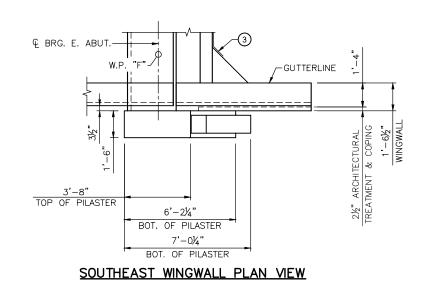
EL. VARIES EL. 903.99 B.F. ABUT. -SEE DETAIL B910 FOR DRAINAGE DETAILS 5'-6" EL. 896.25 EL. 893.00 12'-6"

### SECTION A-A

- 3 ARCHITECTURAL CONCRETE TEXTURE (SPECIAL) SHALL MATCH "US FORMLINER 2/42 NAAB" OR APPROVED EQUAL. THE APPROXIMATE THICKNESS OF ARCHITECTURAL CONCRETE IS 0.35". THE STRUCTURAL CONCRETE (3B52) QUANTITIES DO NOT INCLUDE THE CONCRETE WITHIN THE ARCHITECTURAL CONCRETE TEXTURE.
- 6 PERMISSIBLE CONSTRUCTION JOINT WITH 2" x 6" KEY CENTERED IN WALL.

**DRAFT-WORK IN PROCESS** 

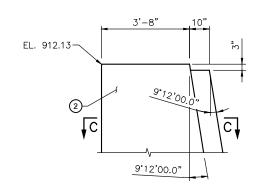
SHEET **CIVIL EAST - VOLUME 4** MINNEHAHA CREEK LRT BRIDGE SOUTHWEST: **BRIDGE R0689** OF **EAST ABUTMENT DETAILS** METROPOLITAN 27 DISCIPLINE: **STRUCTURES** CBRR0689-BRG-ABT-006



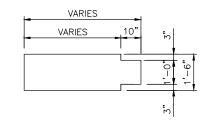
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SEE DETAIL "A"-

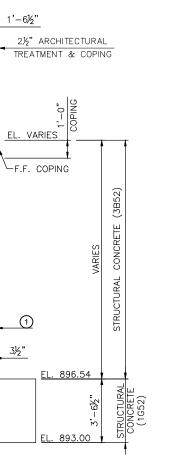
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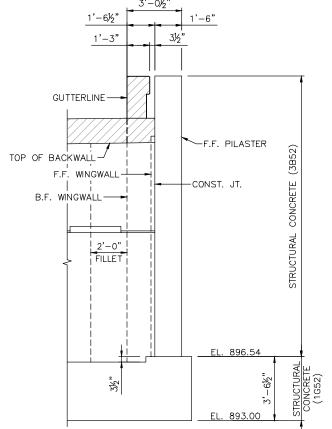


DETAIL "A"



SECTION C-C





## NOTES:

- (1) ARCHITECTURAL CONCRETE TEXTURE (SPECIAL) SHALL MATCH "US FORMLINER 2/42 NAAB" OR APPROVED EQUAL. THE APPROXIMATE THICKNESS OF ARCHITECTURAL CONCRETE IS 0.35". THE STRUCTURAL CONCRETE (3B52) QUANTITIES DO NOT INCLUDE THE CONCRETE WITHIN THE ARCHITECTURAL CONCRETE TEXTURE.
- 2 SPECIAL SURFACE FINISH.
- (3) MEMBRANE WATERPROOFING SYSTEM PER SPEC. 2481.3.B.

SOUTHEAST WINGWALL ELEVATION

© TRACK 2 (EB-TRK-E2) STA. 2603+57.89 MEASURED AT F.F. WINGWALL

- ARCHITECTURAL CONCRETE TEXTURE (1)

EL. 896.54

EL. 893.00

1'-4"

1'-3"

GUTTERLINE -

B.F. WINGWALL —— F.F. WINGWALL –

APPROACH PANEL -

SECTION B-B

DRAFT-WORK IN PROCESS

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								CHECKED BY: DLS
							DRAWN BY: ZTW/KAG	DATE: 07/27/15
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**AECOM** Kimley»Horn

60% SUBMISSION - 09/21/15

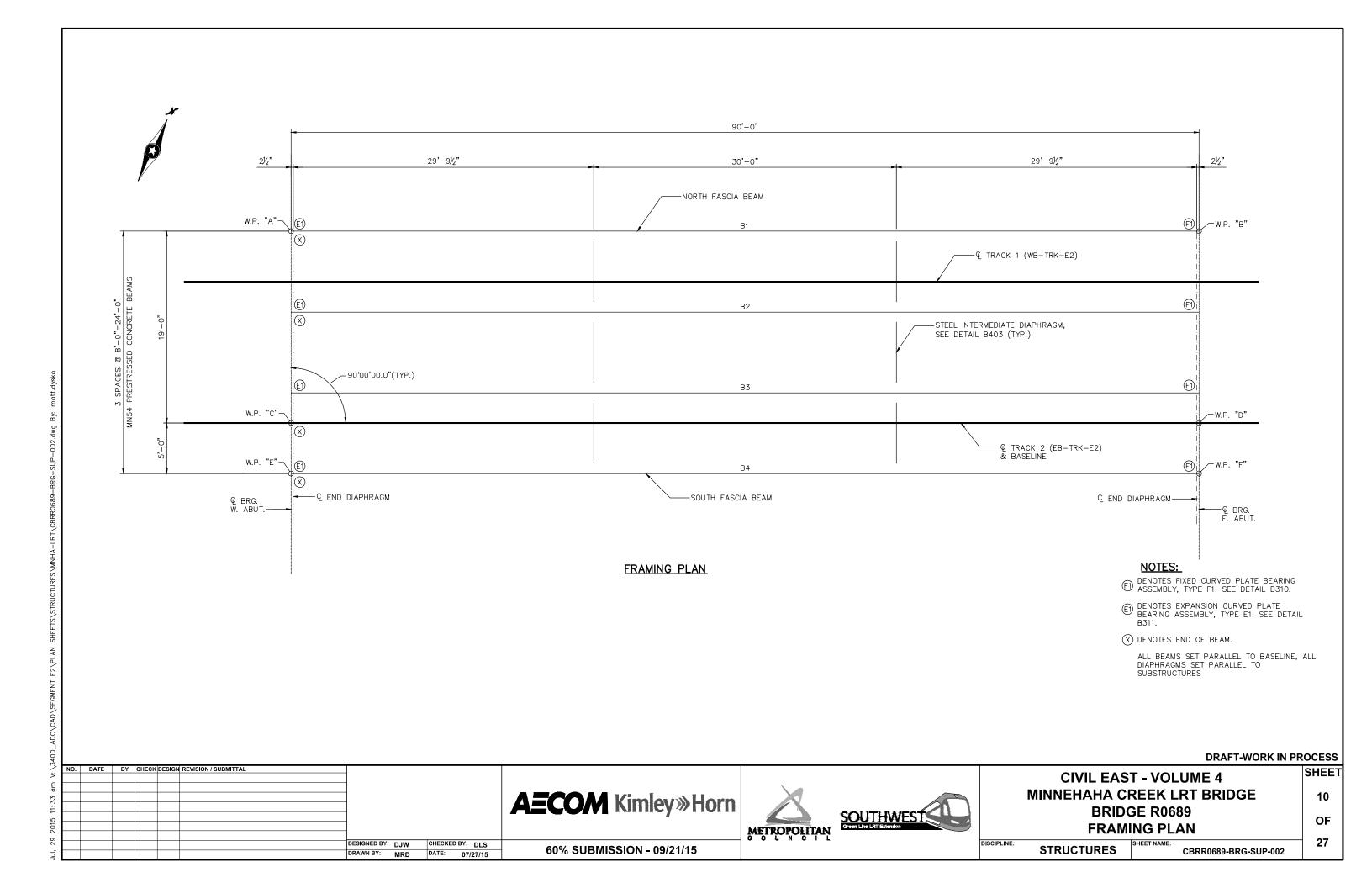
SECTION A-A

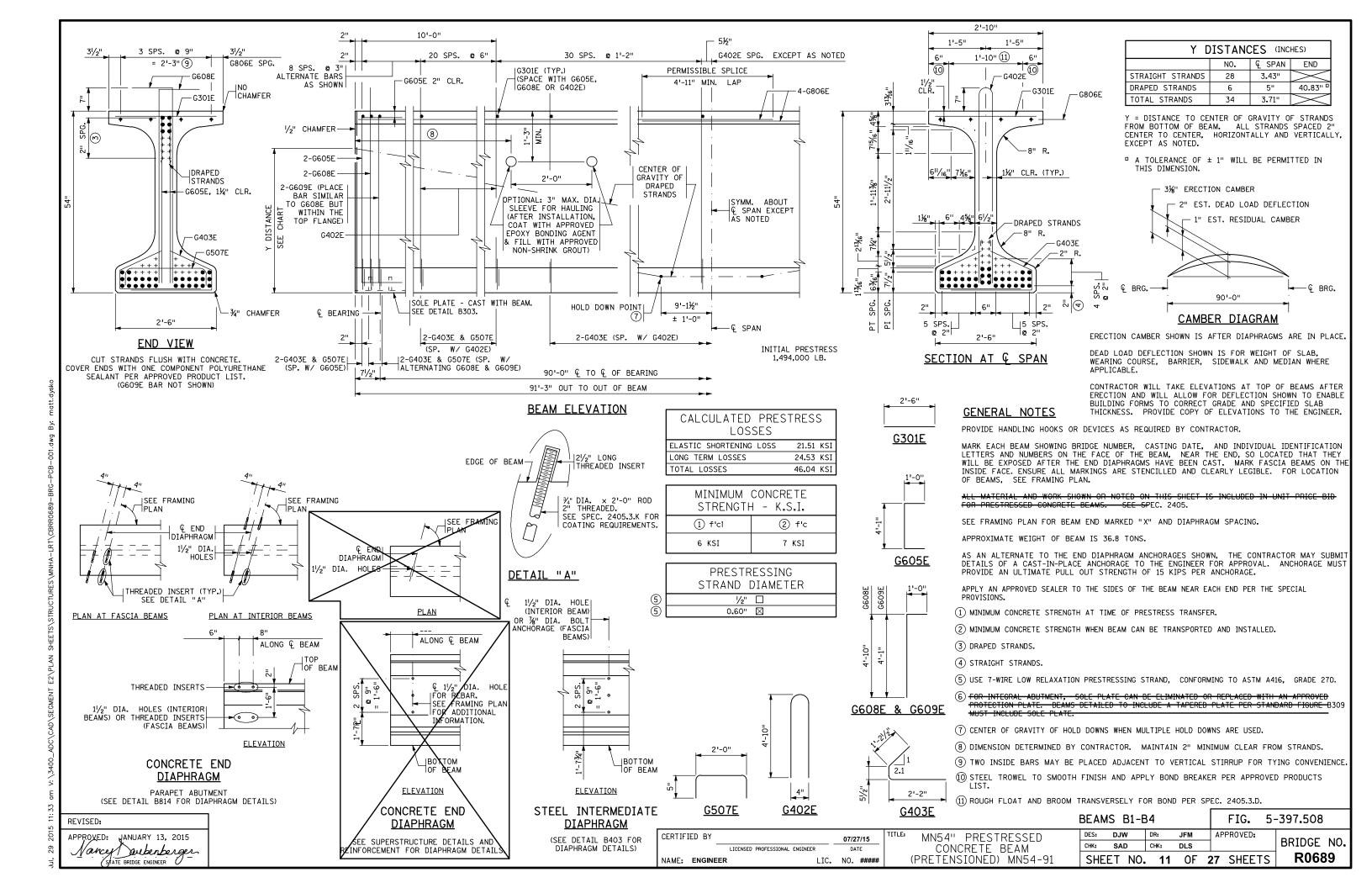


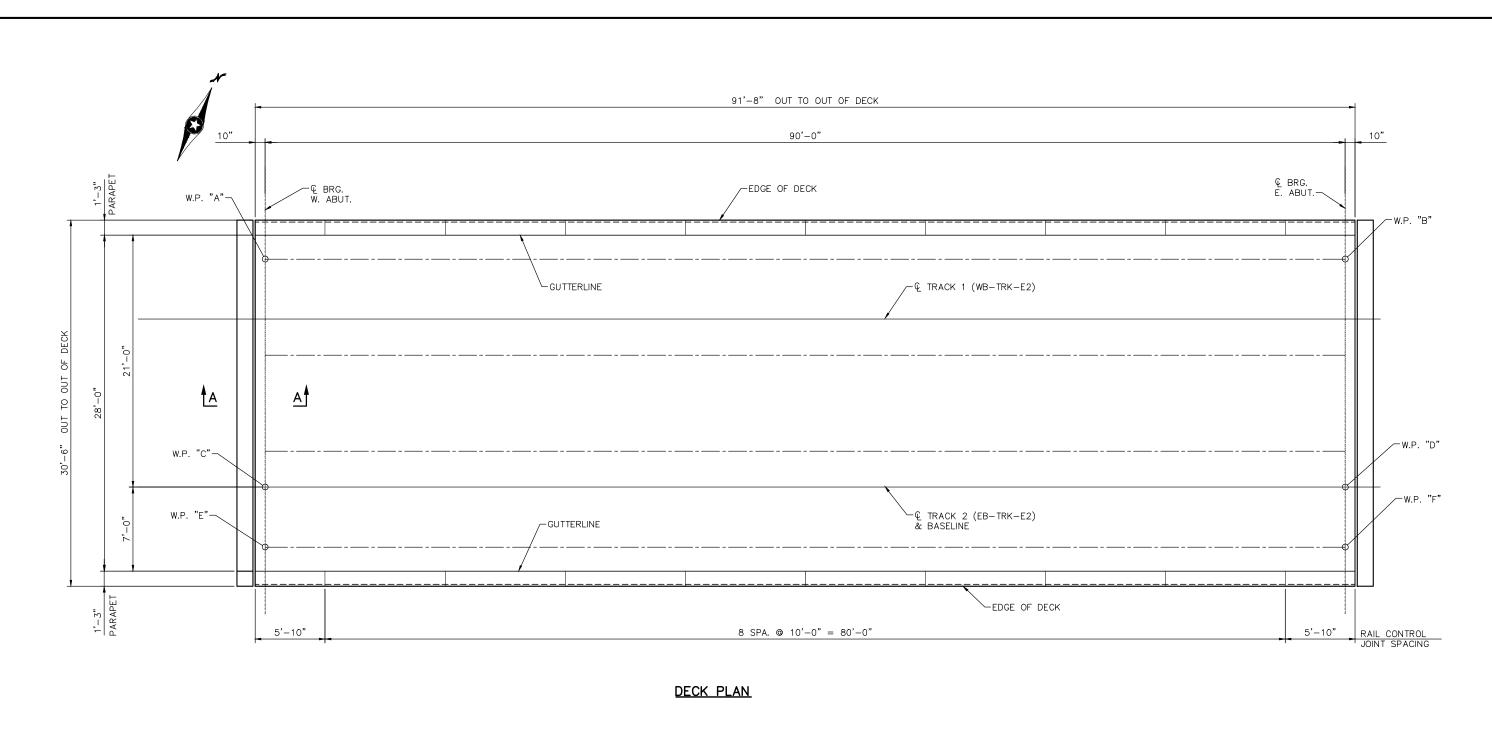


CIVIL EAST - VOLUME 4
MINNEHAHA CREEK LRT BRIDGE
BRIDGE R0689
EAST ABUTMENT DETAILS

DISCIPLINE: STRUCTURES SHEET NAME: CBRR0689-BRG-ABT-007







# NOTES:

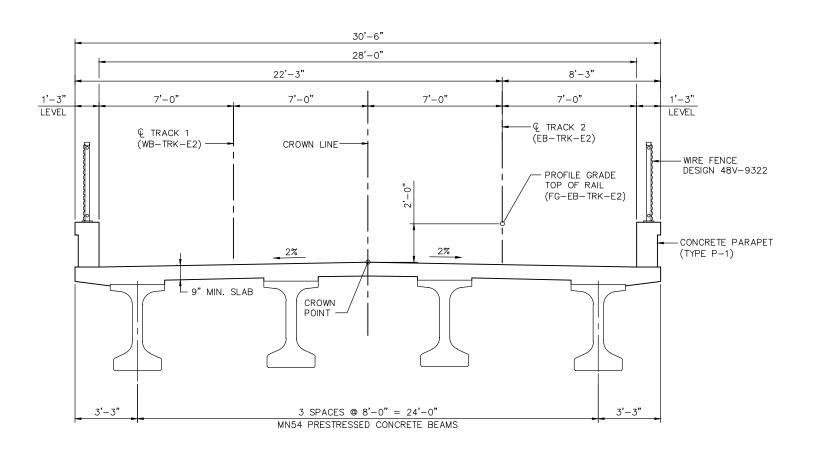
FOR ADDITIONAL PARAPET STEEL TO BE PLACED IN DECK, SEE SHEET XX

FOR SECTION A-A, SEE SHEET 13

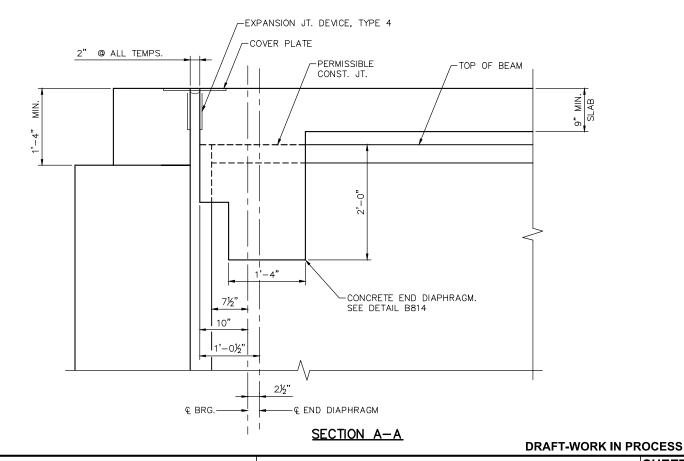
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					_		AECOM KILLINEY # HOLLI		SOUTHWEST		BRID	GE R0689	OF
								METROPOLITAN	Green Line LRT Extension		SUPERSTRU	CTURE DETAILS	0-
					DESIGNED BY: DJW DRAWN BY: MPD	CHECKED BY: DLS	60% SUBMISSION - 09/21/15			DISCIPLINE:	STRUCTURES	SHEET NAME: CBRR0689-BRG-SUP-003	<b>27</b>
	NO.	NO. DATE BY	NO. DATE BY CHECK	NO. DATE BY CHECK DESIGN	NO. DATE BY CHECK DESIGN REVISION / SUBMITTAL			AECOM Kimley»Horn  DESIGNED BY: DJW CHECKED BY: DLS  60% SURMISSION - 09/21/15	AECOM Kimley»Horn  DESIGNED BY: DJW   CHECKED BY: DLS   60% SUBMISSION - 09/21/15	AECOM Kimley Horn  DESIGNED BY: DJW CHECKED BY: DLS  DESIGNED BY: DJW CHECKED BY: DLS  DESIGNED BY: DJW CHECKED BY: DLS  GOV. SLIBMISSION - 09/21/15	AECOM Kimley Horn  DESIGNED BY: DJW CHECKED BY: DLS  DESIGNED BY: DJW CHECKED BY: DLS  DESIGNED BY: DJW CHECKED BY: DLS  DISCIPLINE:  DISCIPLINE:	AECOM Kimley Horn  AECOM Kimley Horn  DESIGNED BY: DJW CHECKED BY: DLS  DE	AECOM Kimley Horn  DESIGNED BY: DJW   CHECKED BY: DLS   60% SUBMISSION = 09/21/15

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TRANSVERSE SECTION







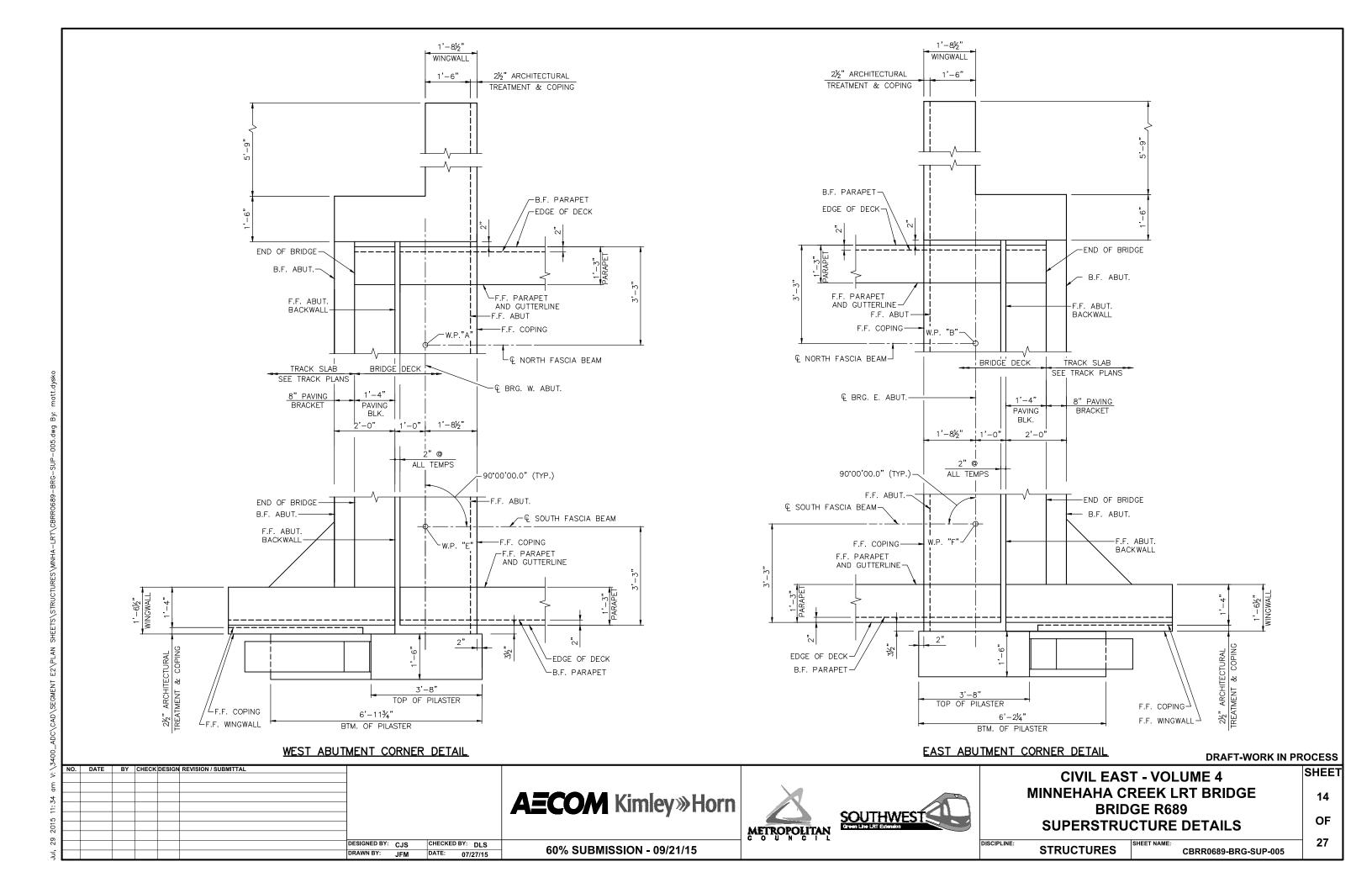
**STRUCTURES** 

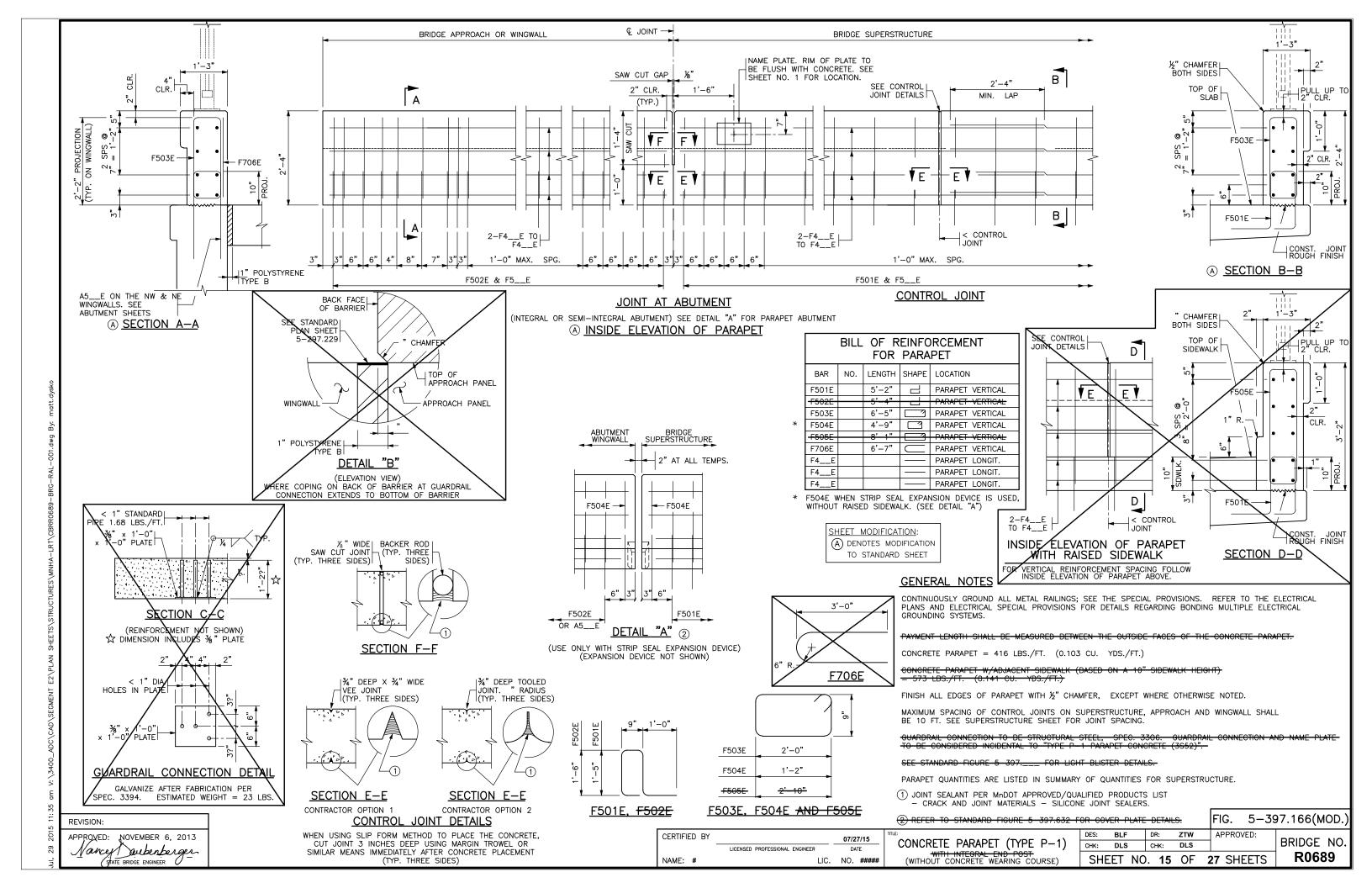
89 DETAILS

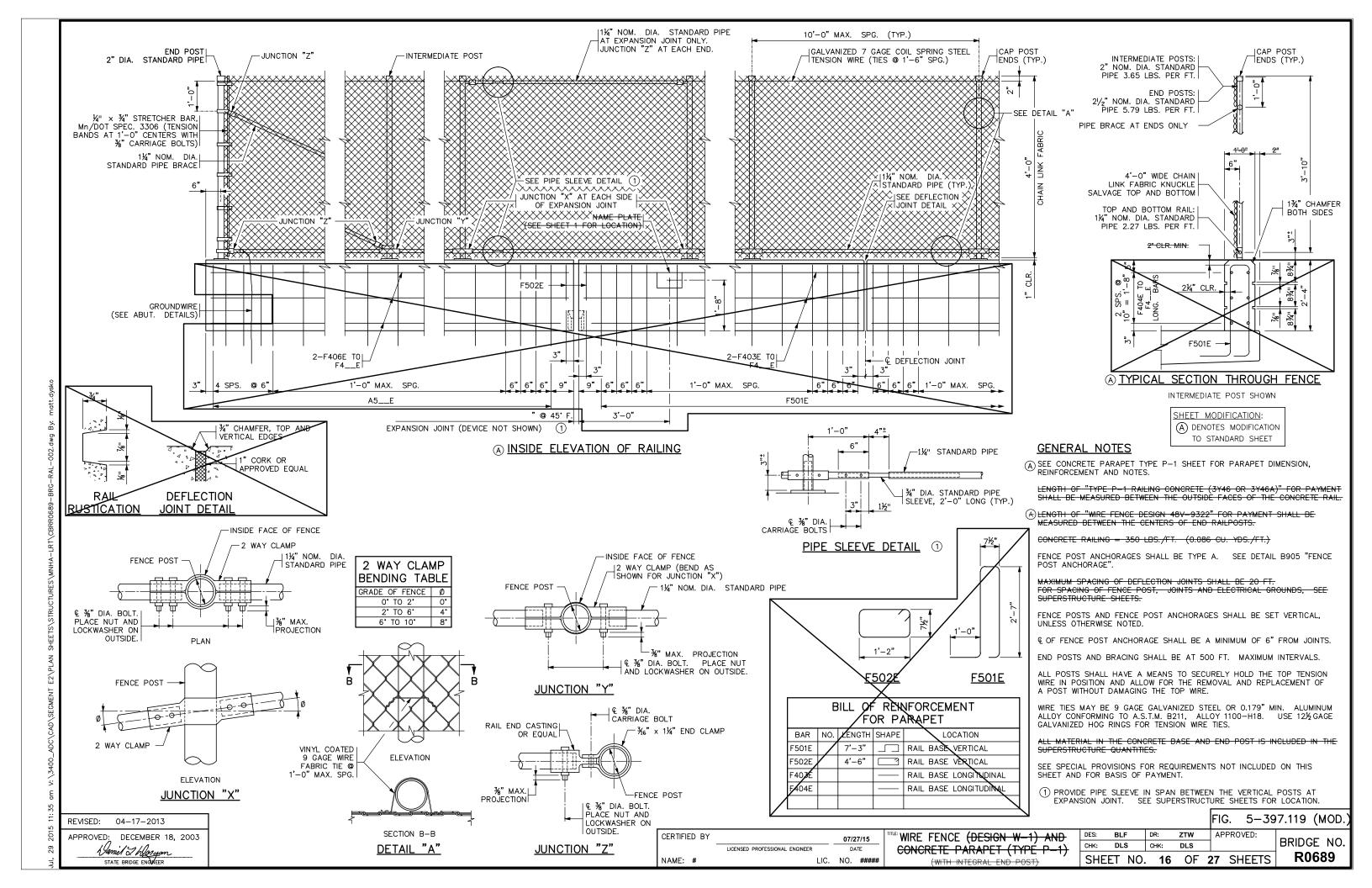
CBRR0689-BRG-SUP-004

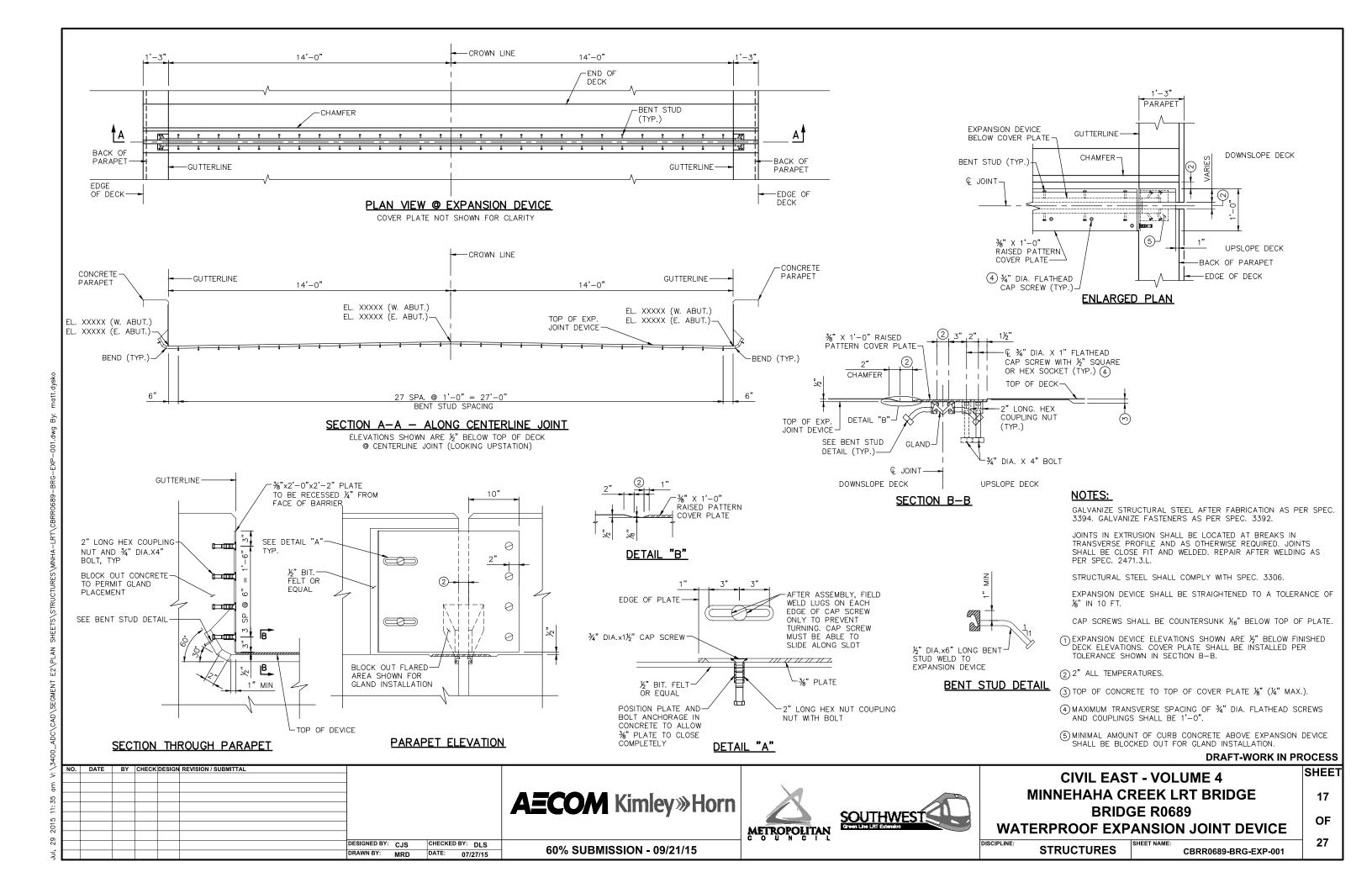
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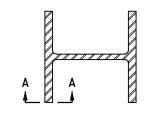
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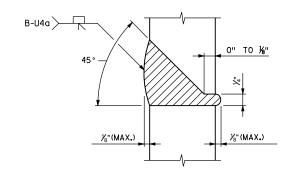








SECTION AT SPLICE



SECTION A-A 100% BUTT WELDED PILE SPLICE

CELLULOSIC TYPE ELECTRODES E-6010 OR E-6011 SHALL BE USED FOR 100% BUTT WELDED SPLICES.

ELECTRODES WHICH HAVE BECOME WET, SOILED OR DAMAGED SHALL NOT BE USED.

WELDING SHALL NOT BE DONE WHEN THE AMBIENT TEMPERATURE IS LOWER THAN O'F. OR WHEN THE PILE IS WET OR EXPOSED TO FALLING RAIN OR SNOW. WHEN THE PILE METAL TEMPERATURE IS BELOW 32°F., THE PILE METAL IN THE AREA OF THE WELD SHALL BE HEATED TO A MINIMUM TEMPERATURE OF 70° F. AND MAINTAINED AT THIS TEMPERATURE DURING WELDING.

APPROVED: NOVEMBER 22, 2002 Waniel I Waryan

STATE BRIDGE ENGINEER

STATE OF MINNESOTA
DEPARTMENT OF TRANSPORTATION PILE SPLICE

(STEEL H BEARING PILES 10" TO 14")

DISCIPLINE:

DETAIL NO.

B202

DRAFT-WORK IN PROCESS SHEET

18

OF

**AECOM** Kimley»Horn

METROPOLITAN



# **CIVIL EAST - VOLUME 4** MINNEHAHA CREEK LRT BRIDGE **BRIDGE R0689 DETAILS**

CBRR0689-BRG-DTL-001

Waniel I Worgan

STATE BRIDGE ENGINEER

DESIGNED BY: CJS CHECKED BY: DLS DATE: 07/27/15 DRAWN BY: JFM

BRIDGE NAMEPLATE

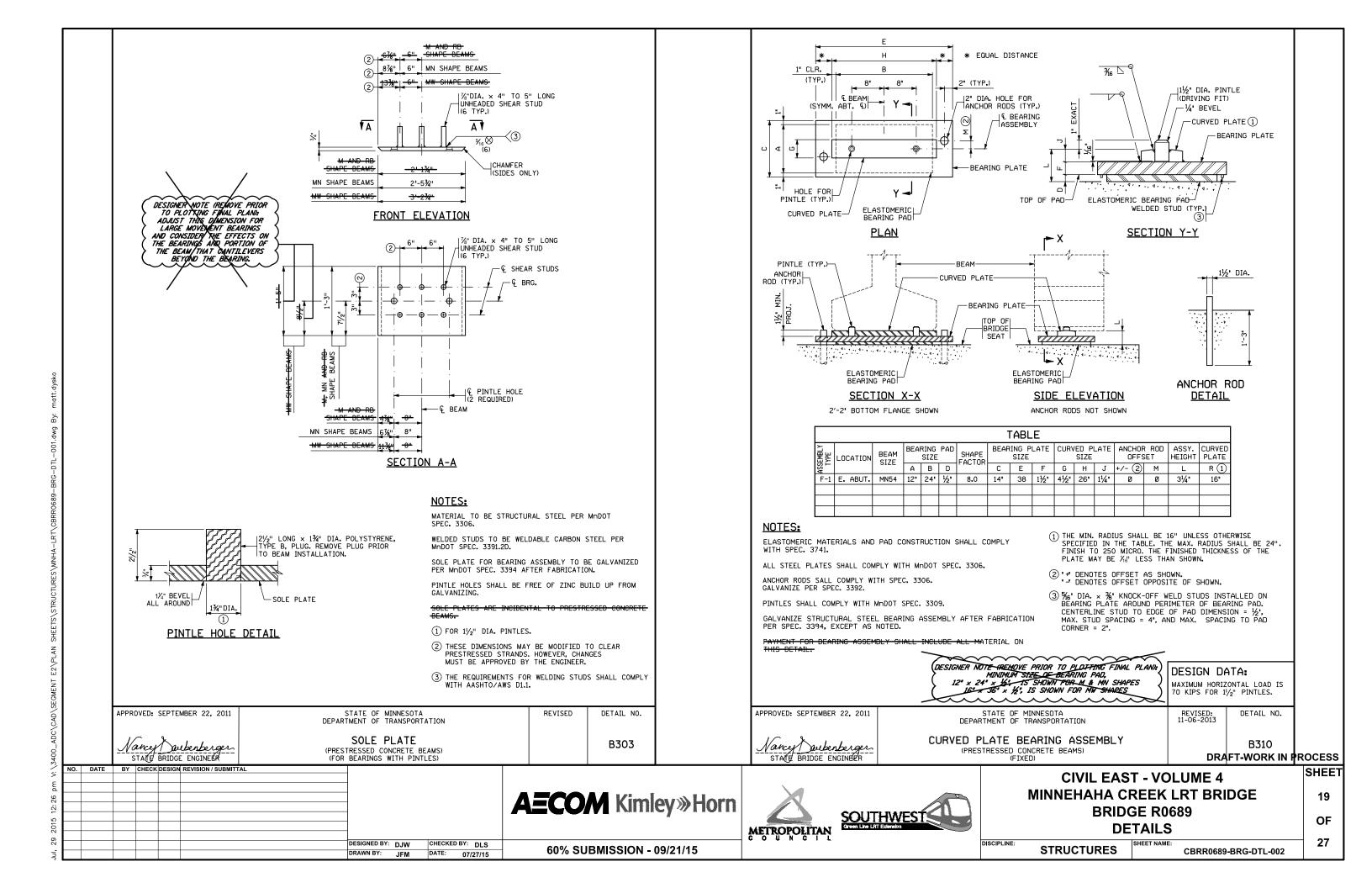
(FOR NEW BRIDGES)

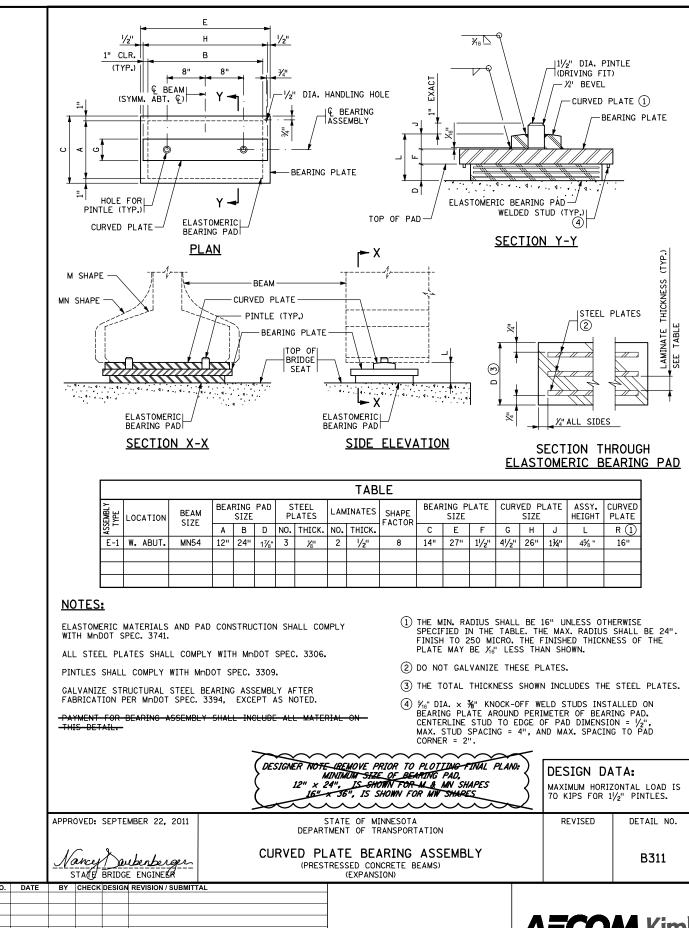
60% SUBMISSION - 09/21/15

DETAIL NO.

B101

**STRUCTURES** 



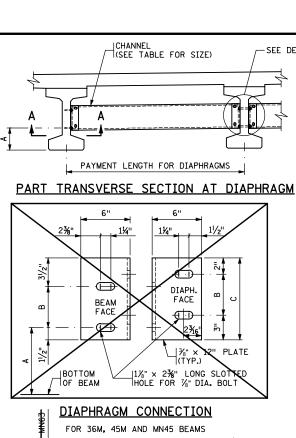


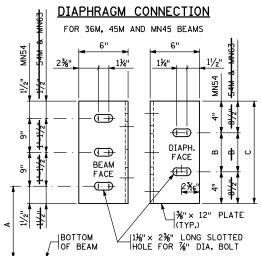
DESIGNED BY: DJW

DRAWN BY: JFM

CHECKED BY: DLS

DATE: 07/27/15

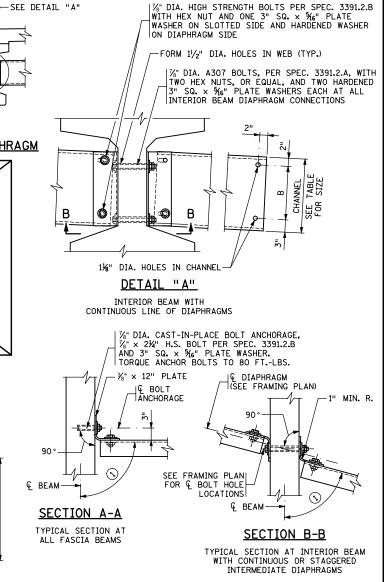




# **DIAPHRAGM CONNECTION**

FOR 54M, MN54 AND MN63 BEAMS

	TABLE					
	BEAM HEIGHT	DISTANCE			CHANNEL	
		Α	В	С	SIZE	
	701	11-3"	711	11 011	01000 7	
П	JOIN	1 -3		1-0	CIZXZO.1	
	4EM	44 73/11	11-111	11 (1	MC10-42 7	
П	HOM	1,-374.	1-1	1-0	MCIOX42.1	
	EAM	44 01/11	11 10	21.61	MC10×42 7	
П	JHWI	1 -274		2 0	MICTOXATC	
	MNME	41 73/11	711	11.00	012420.7	
П	MINTS	1 -174		1 0	CIZAZON	
	MN54	1'-7¾"	1'-1"	1'-9"	MC18×42.7	
	MNCZ	44 73/11	11 111	21.01	M010×40 7	
П	MINOS	1-174	1-1	2 -0	WICTOX 42.1	



ALL STEEL SHALL CONFORM TO SPEC. 3306.

INSTALLATION SHALL CONFORM TO SPEC. 2405.3.K.

SHOP BEND THE LEG OF THE 12" PLATE TO CONFORM TO THE DIAPHRAGM. A %" × 6" × 6" ANGLE MAY BE USED FOR DIAPHRAGMS PERPENDICULAR TO BEAMS.

BENT PLATES MAY BE USED IN PLACE OF CHANNELS. THE BENT PLATES MUST BE THE SAME HEIGHT AS THE CHANNELS THEY REPLACE, BE  $\%_6"$  IN THICKNESS, AND HAVE LEGS 5" LONG.

GALVANIZE STEEL PLATES AND SHAPES IN ACCORDANCE WITH SPEC. 3394.

GALVANIZE BOLTS, NUTS AND WASHERS PER SPEC. 3392.

1) FOR SKEW ANGLES UNDER 20°, USE 90° LESS THE SKEW ANGLE. FOR SKEW ANGLES OVER 20°, USE 90°.



APPROVED: OCTOBER 26, 2005

STEEL INTERMEDIATE DIAPHRAGM

(FOR 36M - 54M, MN45 - MN63 PRESTRESSED CONCRETE BEAMS)

STATE OF MINNESOTA
DEPARTMENT OF TRANSPORTATION

DETAIL NO. 06-14-2006 10-22-2009 B403

> DRAFT-WORK IN PROCESS SHEE.

**AECOM** Kimley»Horn

60% SUBMISSION - 09/21/15





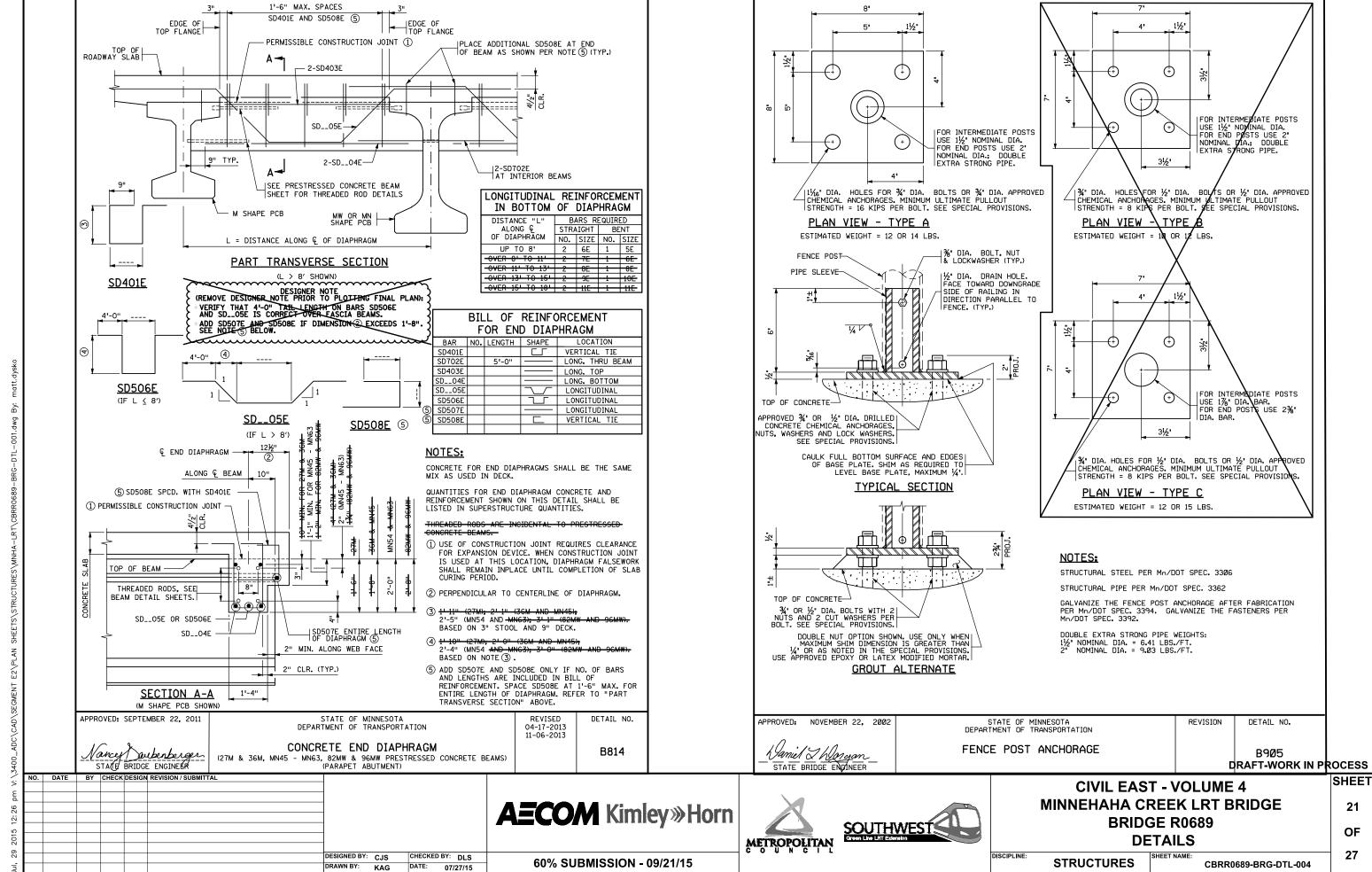
# **CIVIL EAST - VOLUME 4** MINNEHAHA CREEK LRT BRIDGE **BRIDGE R0689 DETAILS**

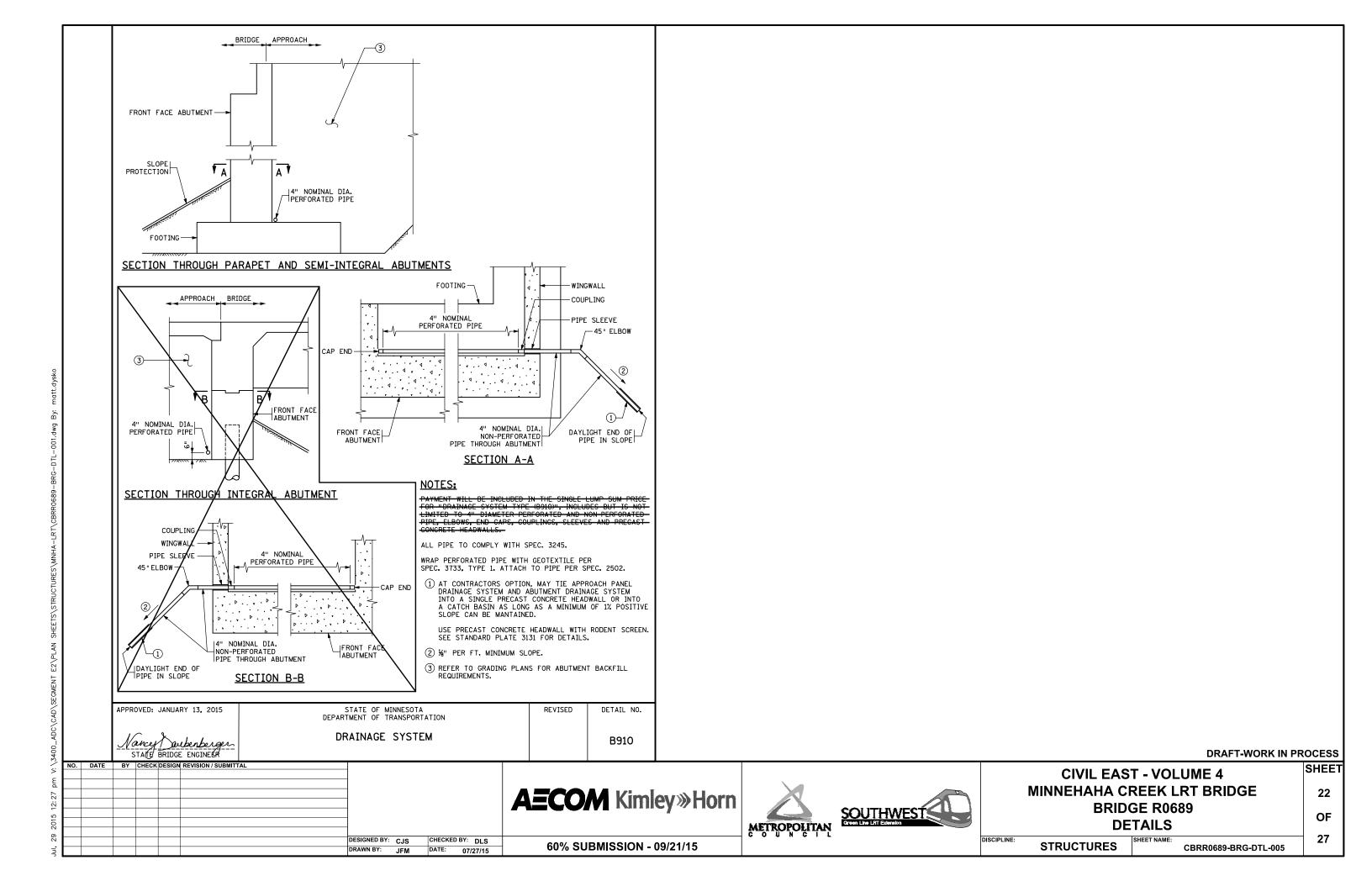
**STRUCTURES** 

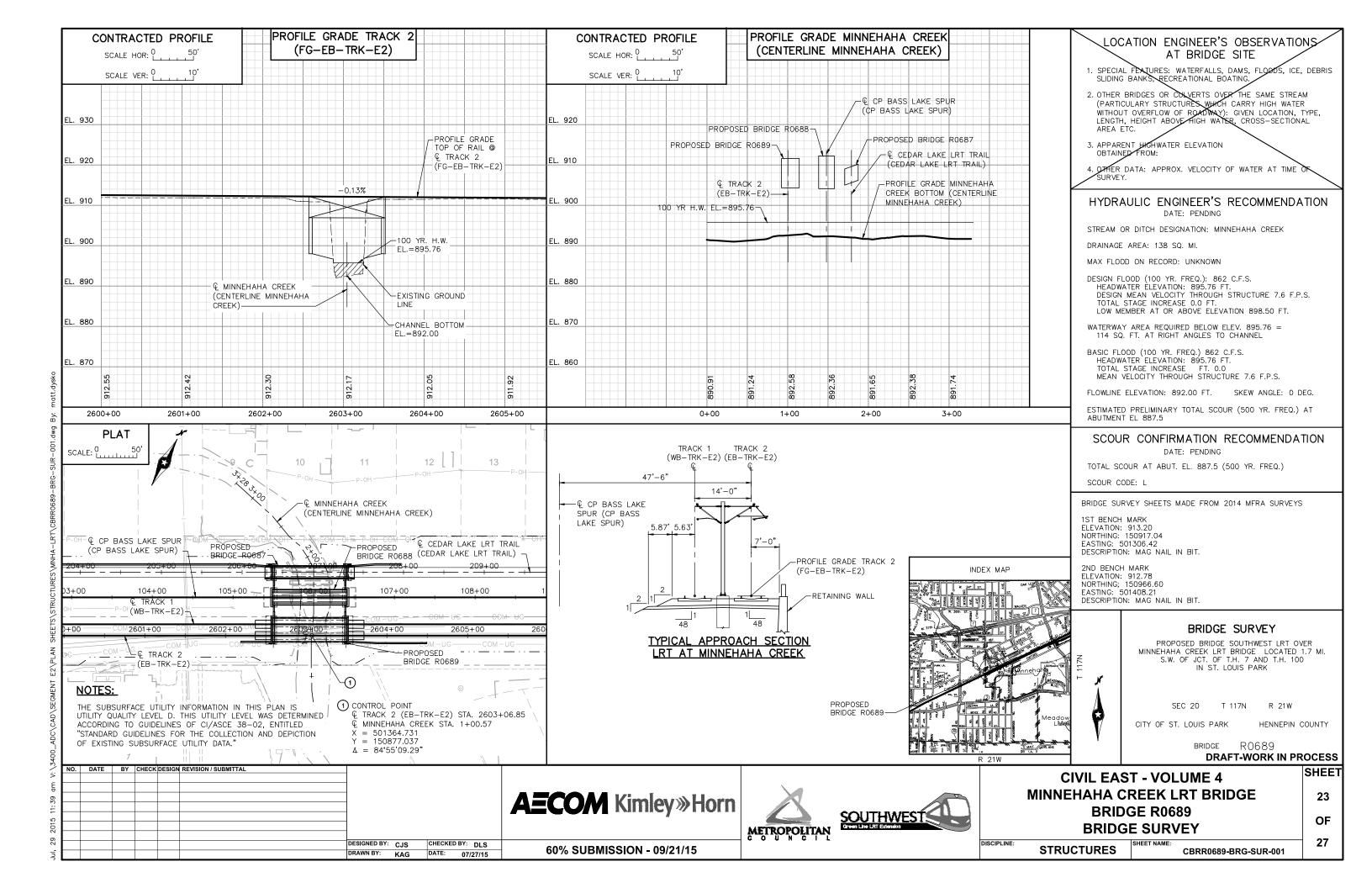
OF

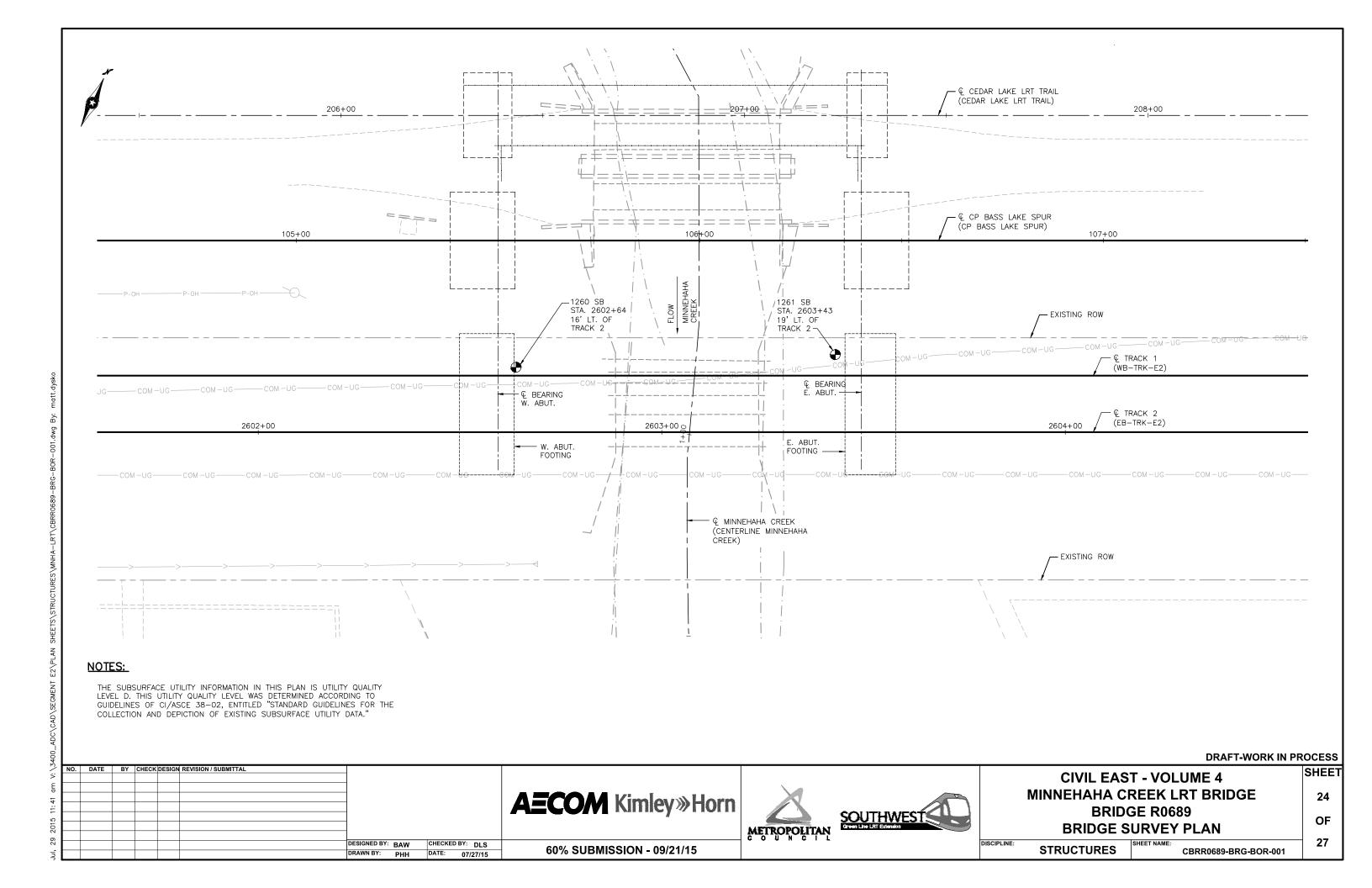
DISCIPLINE

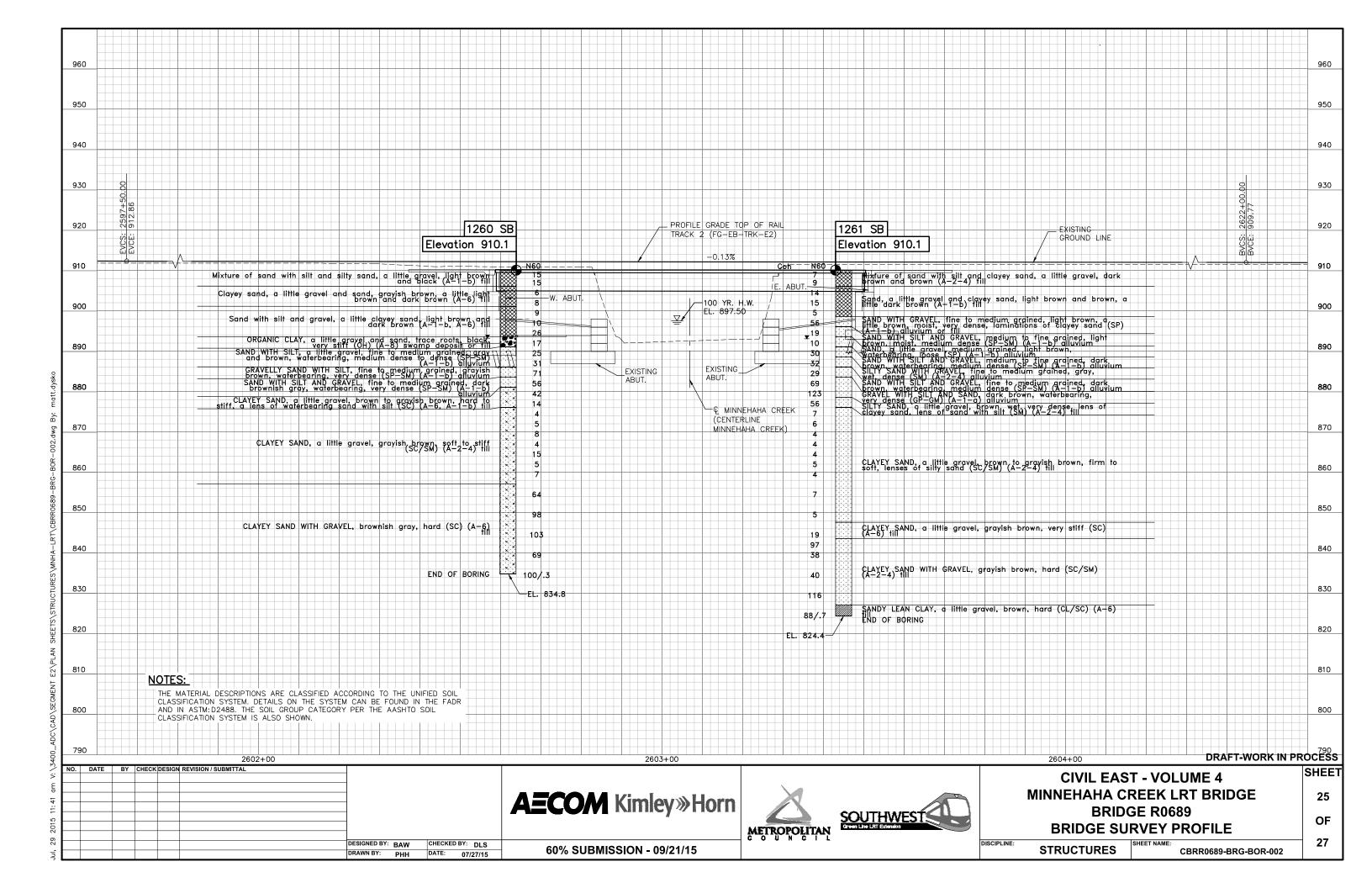
CBRR0689-BRG-DTL-003

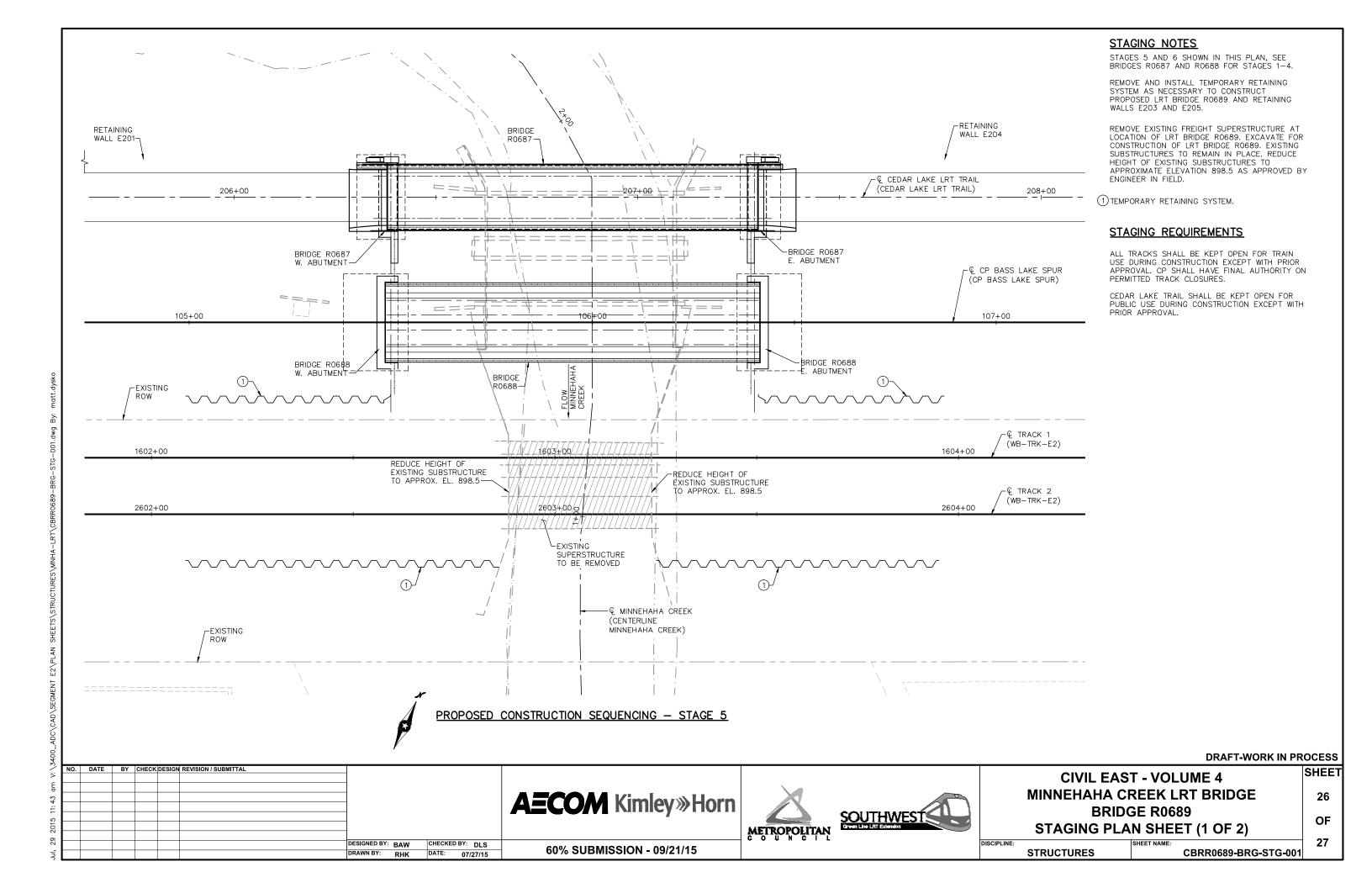


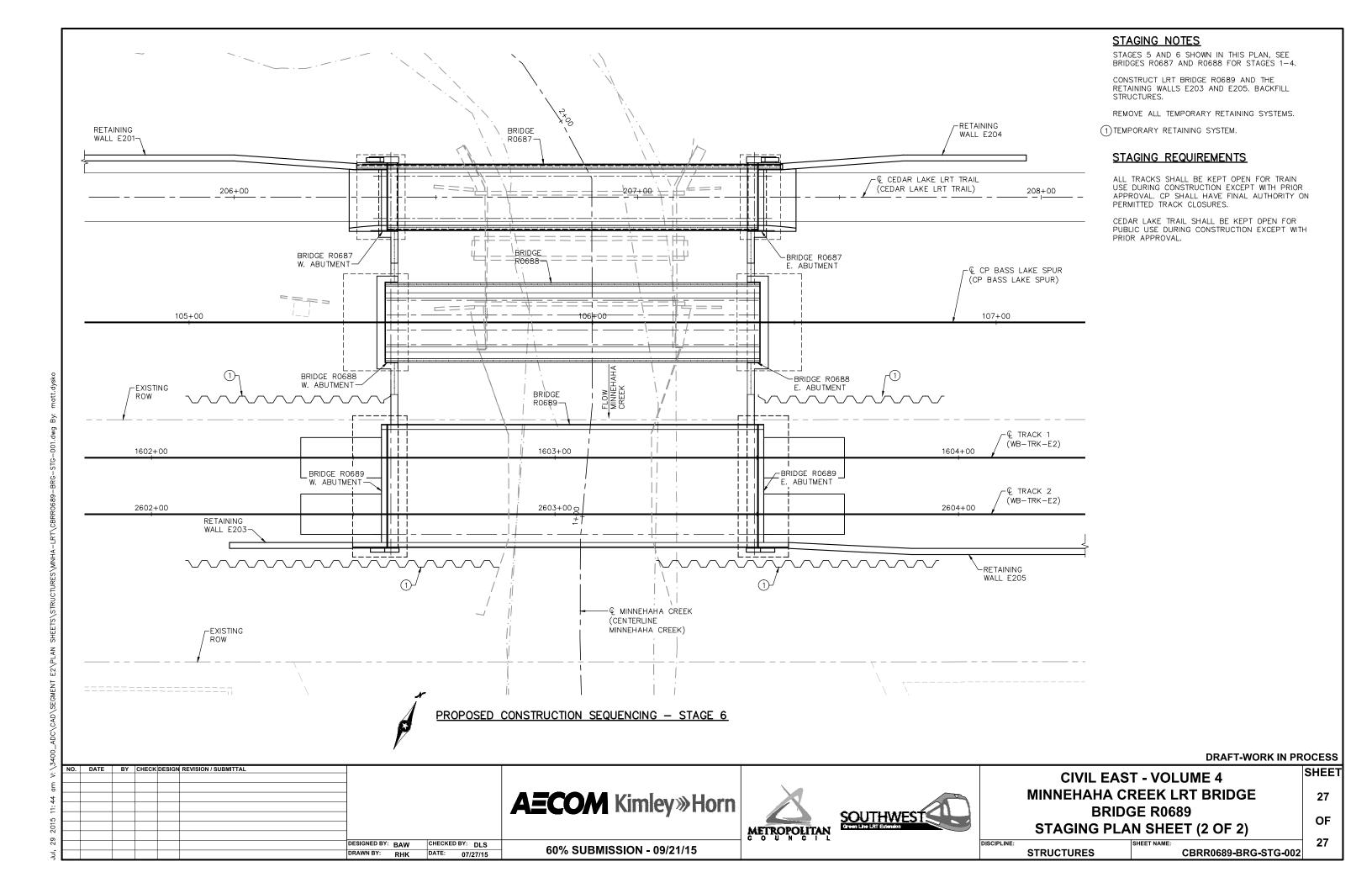


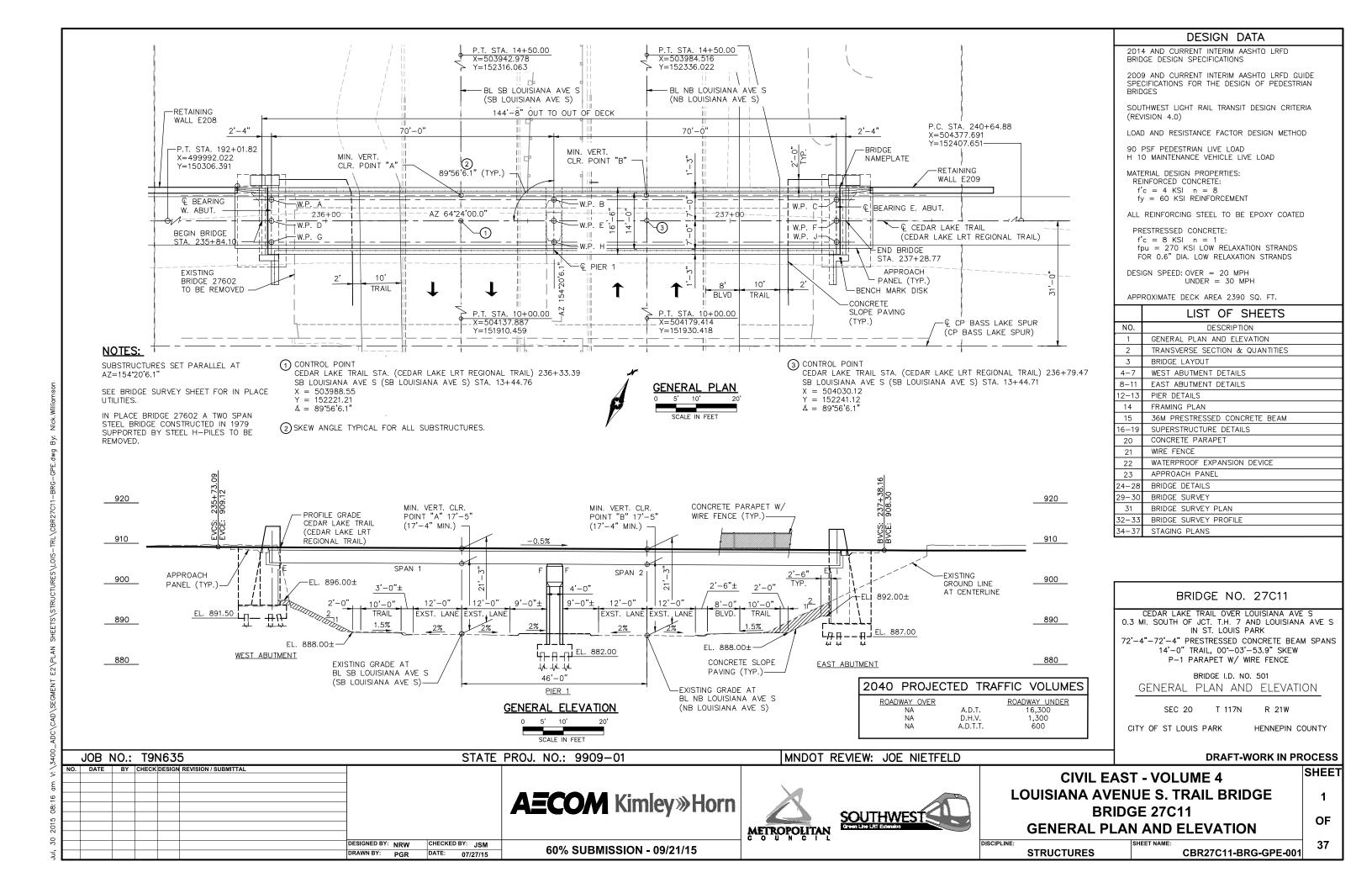


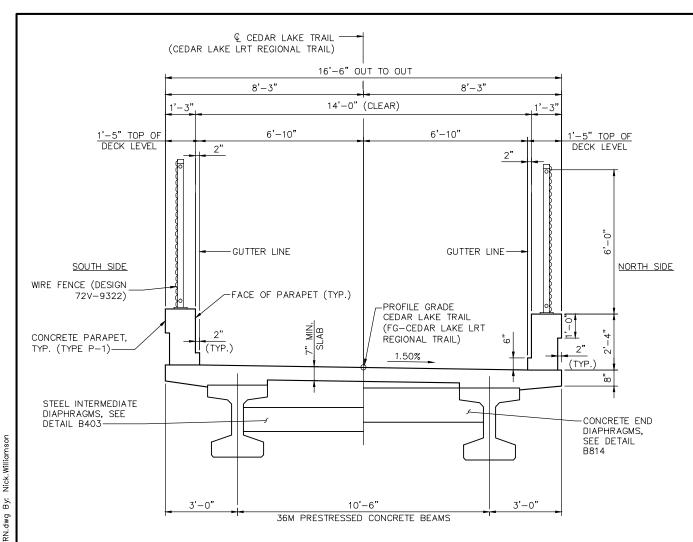












#### CONSTRUCTION NOTES

THE 2016 EDITION OF THE MINNESOTA DEPARTMENT OF TRANSPORTATION "STANDARD SPECIFICATIONS FOR CONSTRUCTION" SHALL GOVERN.

BRIDGE SEAT REINFORCEMENT SHALL BE CAREFULLY PLACED TO AVOID INTERFERENCE WITH DRILLING HOLES FOR ANCHOR RODS, THE BEAMS SHALL BE ERECTED IN FINAL POSITION PRIOR TO DRILLING HOLES FOR AND PLACING ANCHOR RODS.

THE BAR SIZES SHOWN IN THIS PLAN ARE IN U.S. CUSTOMARY DESIGNATIONS. THE FIRST DIGIT OR THE FIRST TWO DIGITS OF EACH BAR MARK INDICATE THE BAR SIZE.

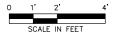
BARS MARKED WITH THE SUFFIX "E" SHALL BE EPOXY COATED IN ACCORDANCE WITH SPEC. 3301.

THE SUBSURFACE UTILITY INFORMATION IN THIS PLAN IS UTILITY QUALITY LEVEL D. THIS UTILITY QUALITY LEVEL WAS DETERMINED ACCORDING TO THE GUIDELINES OF CI/ASCE 38—02, ENTITLED "STANDARD GUIDELINES FOR THE COLLECTION AND DEPICTION OF EXISTING SUBSURFACE UTILITY DATA".

THE PILE LOADS SHOWN IN THE PLANS AND THE CORRESPONDING NOMINAL PILE BEARING RESISTANCE (Rn) WERE COMPUTED USING LRFD METHODOLOGY. PILE BEARING RESISTANCE DETERMINED IN THE FIELD SHALL INCORPORATE THE METHODS AND/OR FORMULAS DESCRIBED IN THE SPECIAL PROVISIONS.

ITEM NO.	ITEM	UNIT	QUANTITY
2401.501	STRUCTURAL CONCRETE (1G52)	CU. YD.	(P
2401.501	STRUCTURAL CONCRETE (3B52)	CU. YD.	(P
2401.513	TYPE P-1 (TL-2) RAILING CONCRETE (3S52)	LIN. FT.	(F
2401.541	REINFORCEMENT BARS	POUND	(F
2401.541	REINFORCEMENT BARS (EPOXY COATED)	POUND	(F
2401.601	STRUCTURE EXCAVATION	LUMP SUM	
2401.618	BRIDGE SLAB CONCRETE (3YHPC-M)	SQ. FT.	(F
2402.591	EXPANSION JOINT DEVICES TYPE 4	LIN. FT.	(F
2402.595	BEARING ASSEMBLY	EACH	(F
2405.502 PRESTRESSED CONCRETE BEAMS 36M		LIN. FT.	(F
2405.511	2405.511 DIAPHRAGMS FOR TYPE 36M PRESTRESSED BEAMS		(F
2411.618	ANTI-GRAFFITI COATING	SQ. FT.	(F
2411.618	ARCHITECTURAL SURFACE FINISH (SPECIAL)	SQ. FT.	(F
2411.618	ARCHITECTURAL CONCRETE TEXTURE (SPECIAL)	SQ. FT.	(F
2442.501	REMOVE EXISTING BRIDGE	LUMP SUM	
2452.510	STEEL H-PILING DRIVEN 12"	LIN. FT.	
2452.511	STEEL H-PILING DELIVERED 12"	LIN. FT.	
2452.520	STEEL H-TEST PILE XX FT LONG 12"	EACH	
2452.530	PILE TIP PROTECTION 12"	EACH	
2452.601	STEEL SHEET PILING (TEMPORARY)	LUMP SUM	
2502.502	DRAINAGE SYSTEM TYPE (B910)	LUMP SUM	
2511.501	RANDOM RIPRAP CLASS IV	CU. YD.	
2511.515	GEOTEXTILE FILTER TYPE VII	SQ. YD.	(F
2557.501	WIRE FENCE DESIGN 72V-9322	LIN. FT.	(F

#### TRANSVERSE SECTION



**DRAFT-WORK IN PROCESS** 

SHEET

NO. DATE BY CHECK DESIGN REVISION / SUBMITTAL

DESIGNED BY: NRW CHECKED BY: JSM
DRAWN BY: PGR DATE: 07/27/15

**AECOM** Kimley»Horn

**METROPOLITAN** 



CIVIL EAST - VOLUME 4
LOUISIANA AVENUE S. TRAIL BRIDGE
BRIDGE 27C11
TRANSVERSE SECTION & QUANTITIES

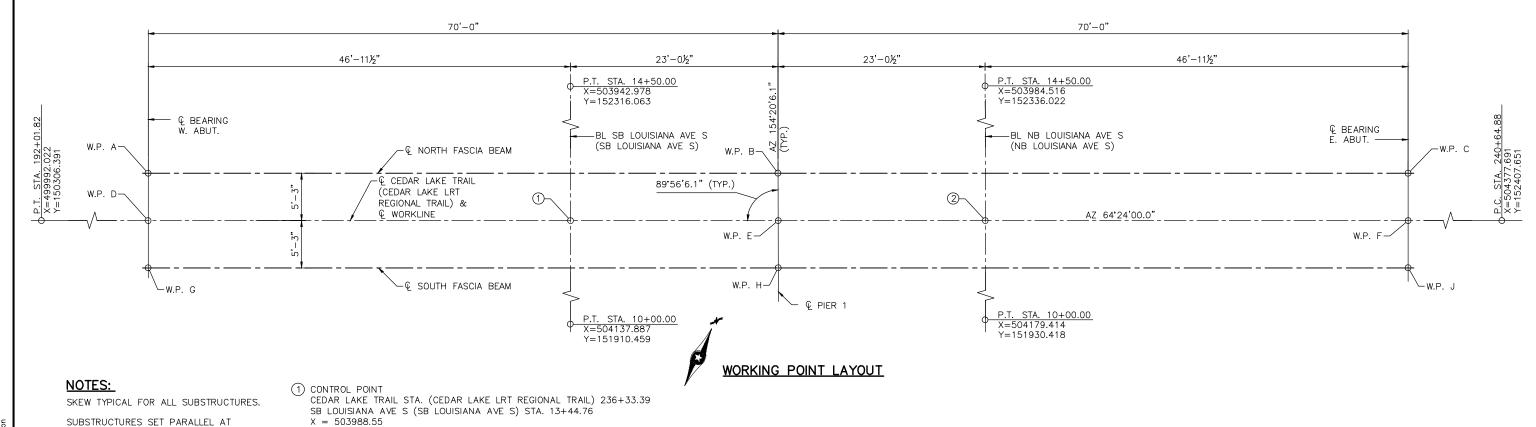
ANTITIES OF

DISCIPLINE: STRUCTURES SHEET

CBR27C11-BRG-TRN-001

Jul, 30 2015 08:16 am V:\3400\_ADC\CAD\SE

60% SUBMISSION - 09/21/15



SUBSTRUCTURES SET PARALLEL AT  $\Delta = 154^{\circ}20'6.1''$ 

Y = 152221.21

 $\Delta = 89^{\circ}56'6.1"$ 

2 CONTROL POINT CEDAR LAKE TRAIL STA. (CEDAR LAKE LRT REGIONAL TRAIL) 236+79.47 SB LOUISIANA AVE S (SB LOUISIANA AVE S) STA. 13+44.71

DATE: 07/27/15

X = 504030.12

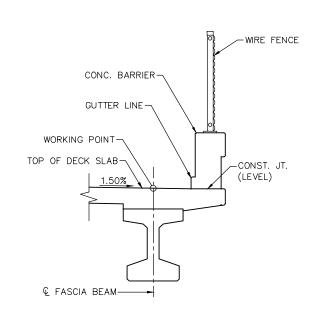
Y = 152241.12 $\Delta = 89^{\circ}56'6.1''$ 

DIMENSIONS BETWEEN WORKING POINTS									COORE	INATES		ELEVATION	S			
POINT	STATION	А	В	С	D	Е	F	G	Н	J	Х	Y	TOP OF SLAB	TOP OF SLAB TO BRIDGE SEAT	BRIDGE SEAT	POINT
Α	235+86.43		70.00		5.25	70.20			70.79	140.41	503943.94	152205.65	909.13	4.23	904.90	Α
В	236+56.43			70.00		5.25	70.20	70.79		70.80	504007.06	152235.90	908.78	4.06	904.72	В
С	237+26.43						5.25	140.38	70.77		504070.19	152266.14	908.43	4.23	904.20	С
D	235+86.43					70.00		5.25	70.20		503946.21	152200.92	909.05			D
Е	236+56.44						70.00		5.25	70.21	504009.34	152231.17	908.70			E
F	237+26.43									5.25	504072.47	152261.41	908.35			F
G	235+86.44								70.00		503948.48	152196.19	908.97	4.23	904.74	G
Н	236+56.44									70.00	504011.61	152226.43	908.62	4.06	904.56	Н
J	237+26.44										504074.74	152256.68	908.27	4.23	904.05	J

TOP OF ROADWAY TO BRIDGE SEAT						
	DECK	STOOL	BEAM HEIGHT	BEARING	TOTAL	
	THICKNESS	HEIGHT		HEIGHT	INCHES	FEET
WEST ABUTMENT	7"	2 1/2"	36"	5 1/4"	50.75"	4.23'
PIER	7"	2 1/2"	36"	3 1/4"	48.75"	4.06'
EAST ABUTMENT	7"	2 1/2"	36"	5 1/4"	50.75"	4.23'

#### NOTES:

ALL BEAMS SET PARALLEL TO WORKING LINE, ALL DIAPHRAGMS SET PARALLEL TO SUBSTRUCTURES.



**WORKING POINT SCHEMATICS** 

**DRAFT-WORK IN PROCESS** 

SHEET

3

OF

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL				
						1			
						DESIGNED BY:	NRW	CHECKED BY:	JSM
						DRAWN BY:	PGR	DATE: 07	/27/15

**AECOM** Kimley»Horn

60% SUBMISSION - 09/21/15





**CIVIL EAST - VOLUME 4** LOUISIANA AVENUE S. TRAIL BRIDGE **BRIDGE 27C11 BRIDGE LAYOUT** 

DISCIPLINE: CBR27C11-BRG-LYT-001 **STRUCTURES** 

WEST ABUTMENT		
COMPUTED PILE LOAD - TONS/PILE		
FACTORED DEAD LOAD + EARTH PRESSURE	71.0	
FACTORED LIVE LOAD	27.4	
*FACTORED DESIGN LOAD	98.4	

 $^{\star}$  BASED ON STRENGTH V LOAD COMBINATION.

WEST ABUT	MENT	
REQUIRED NOMINAL	PILE BEAR	RING
RESISTANCE FOR H-PILI	ES Rn - TOI	NS/PILE
FIELD CONTROL METHOD	φdyn	*Rn
MN/DOT PILE FORMULA 2012 (MPF12) $R_n = 20 \sqrt{\frac{W \times H}{1000}} x log \left(\frac{10}{S}\right)$	0.60	164
PDA	0.65	152

<sup>\*</sup> Rn = (FACTORED DESIGN LOAD) / φdyn

#### **GENERAL PILE NOTES**

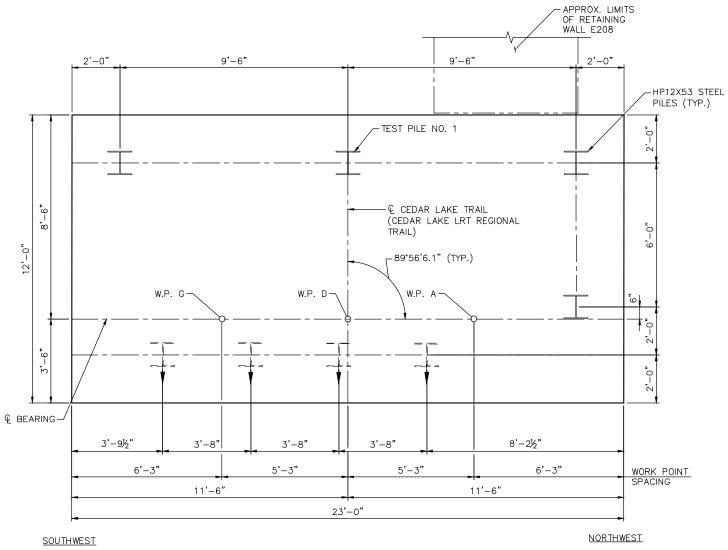
- 1 HP12x53 STEEL TEST PILES 92 FT. LONG
- 7 HP12x53 STEEL PILES EST. 92 FT. LENGTH
- 8 HP12x53 STEEL PILES REQ'D FOR WEST ABUT.

  ALL PILES TO BE HP12x53 WITH PILE TIP PROTECTION.

PILE SPACING SHOWN IS AT BOTTOM OF FOOTING.

PILES MARKED THUS  $\stackrel{1}{\pm}$  TO BE BATTERED 3" PER FOOT IN DIRECTION SHOWN.

FOR PILE SPLICE DETAILS SEE DETAIL B202.

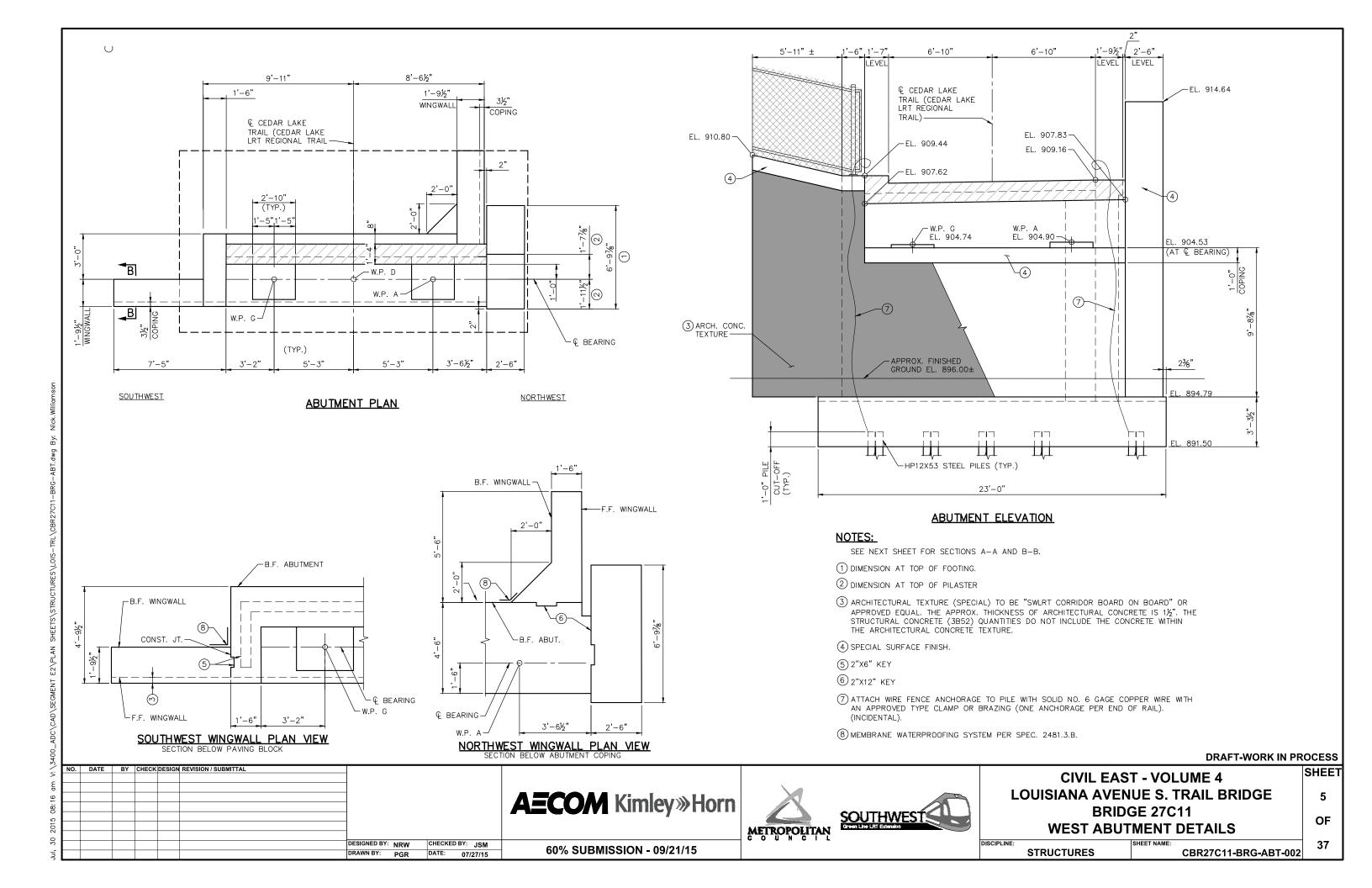


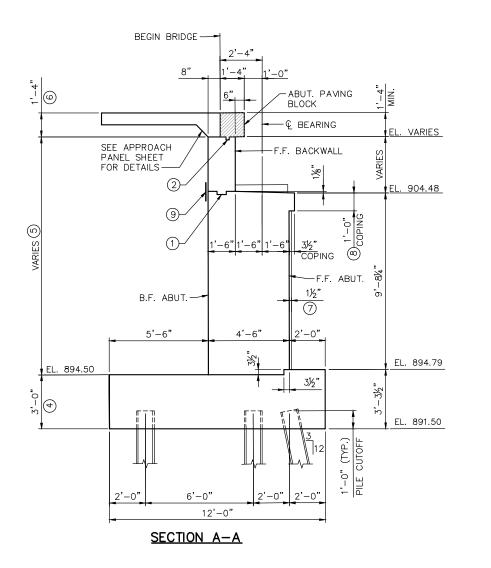
FOOTING PLAN

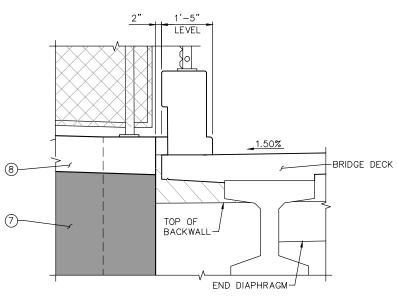
#### **DRAFT-WORK IN PROCESS**

NO. DATE BY CHECK DESIGN REVISION / SUBMITTAL SHEET **CIVIL EAST - VOLUME 4** LOUISIANA AVENUE S. TRAIL BRIDGE **AECOM** Kimley»Horn **BRIDGE 27C11** SOUTHWEST Green Line LRT Extension OF **WEST ABUTMENT DETAILS** DISCIPLINE: DESIGNED BY: NRW CHECKED BY: JSM 37 60% SUBMISSION - 09/21/15 DRAWN BY: PGR DATE: 07/27/15 CBR27C11-BRG-ABT-001 **STRUCTURES** 

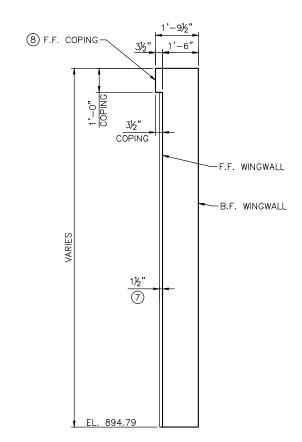
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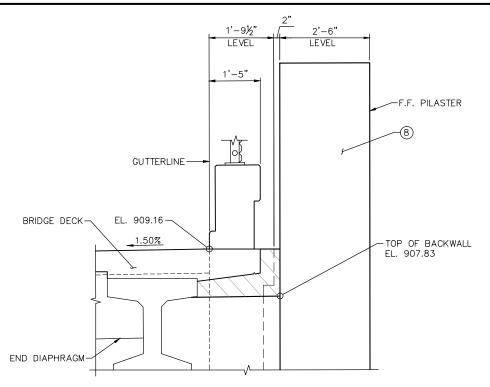






## SOUTHWEST CORNER ELEVATION VIEW





NORTHWEST CORNER ELEVATION VIEW

#### NOTES:

- 1) PERMISSIBLE CONSTRUCTION JOINT WITH 2" x 6" KEY CENTERED IN WALL.
- 2 CONSTRUCTION JOINT WITH 2" x 4" KEY.
- (3) 72 HOUR TIME DELAY REQUIRED BETWEEN ADJACENT POURS TO ALLOW FOR SHRINKAGE.
- (4) STRUCTURAL CONCRETE (1G52).
- (5) STRUCTURAL CONCRETE (3B52).
- 6 BRIDGE SLAB CONCRETE (3YHPC-M). SEE SUPERSTRUCTURE DETAILS.
- 7 ARCHITECTURAL TEXTURE (SPECIAL) TO BE "SWLRT CORRIDOR BOARD ON BOARD" OR APPROVED EQUAL. THE APPROX. THICKNESS OF ARCHITECTURAL CONCRETE IS 1½". THE STRUCTURAL CONCRETE (3B52) QUANTITIES DO NOT INCLUDE THE CONCRETE WITHIN THE ARCHITECTURAL CONCRETE TEXTURE.
- 8 SPECIAL SURFACE FINISH
- 9 MEMBRANE WATERPROOFING SYSTEM PER SPEC. 2481.3.B.

SECTION B-B

**DRAFT-WORK IN PROCESS** 

NO. DATE BY CHECK DESIGN REVISION / SUBMITTAL

DESIGNED BY: NRW CHECKED BY: JSM
DRAWN BY: PGR DATE: 07/27/15

**AECOM** Kimley»Horn

60% SUBMISSION - 09/21/15

METROPOLITAN



# CIVIL EAST - VOLUME 4 LOUISIANA AVENUE S. TRAIL BRIDGE BRIDGE 27C11 WEST ABUTMENT DETAILS

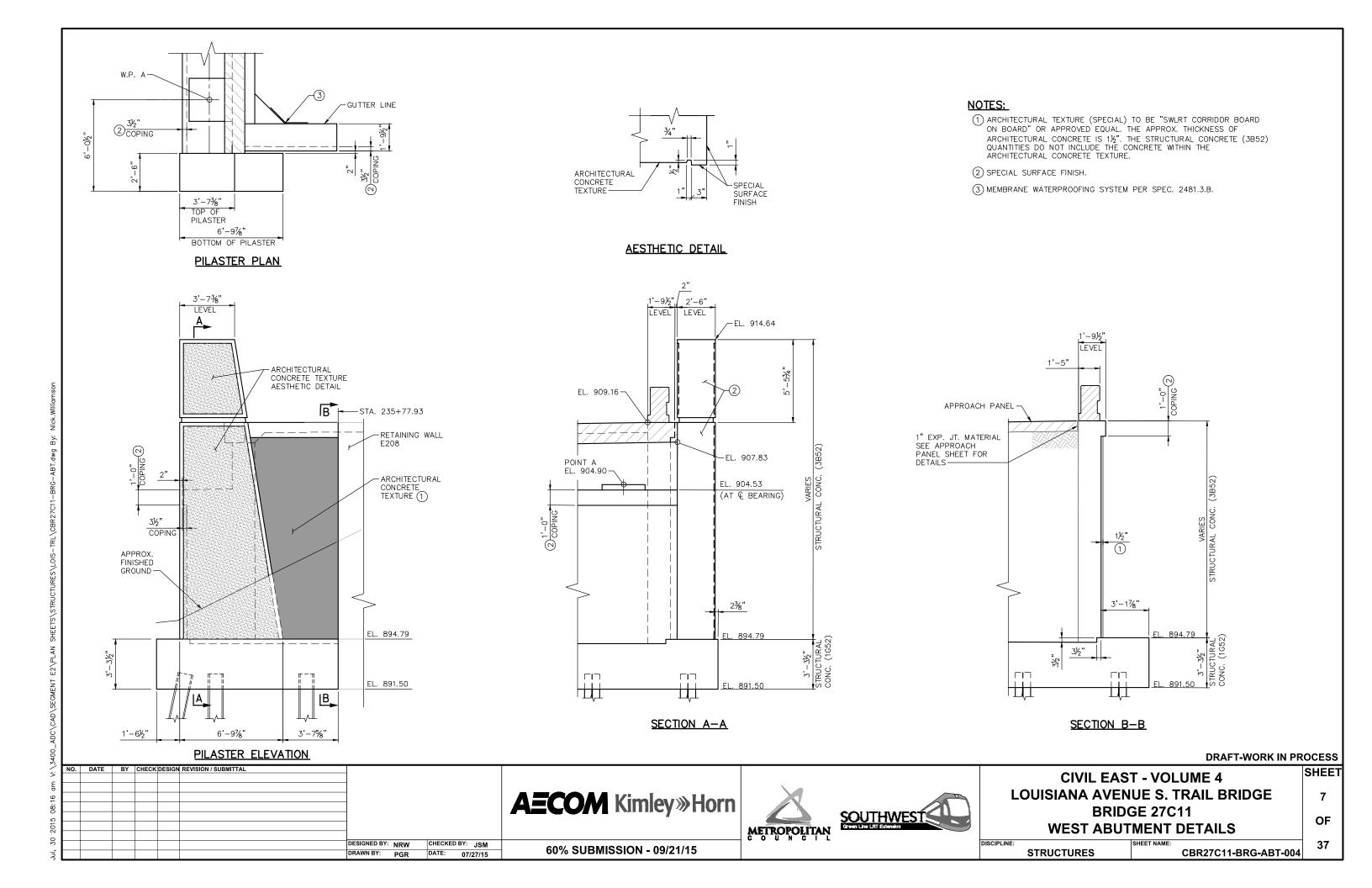
DISCIPLINE: STRUCTURES

SHEET NAME: CBR27C11-BRG-ABT-003

OF 3 37

SHEET

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EAST ABUTMENT				
COMPUTED PILE LOAD - TONS/PILE				
FACTORED DEAD LOAD + EARTH PRESSURE	93.1			
FACTORED LIVE LOAD	36.5			
* FACTORED DESIGN LOAD	129.6			
* PASED ON STRENCTH VI OAD COMPINATION				

EAST ABUTMENT				
REQUIRED NOMINAL PILE BEARING RESISTANCE FOR H-PILES Rn - TONS/PILE				
FIELD CONTROL METHOD	φdyn	*Rn		
MN/DOT PILE FORMULA 2012 (MPF12) $R_n = 20 \sqrt{\frac{W \times H}{1000}} x log \left(\frac{10}{S}\right)$	0.60	216		
PDA	0.65	200		

<sup>\*</sup> Rn = (FACTORED DESIGN LOAD) / φdyn

#### GENERAL PILE NOTES

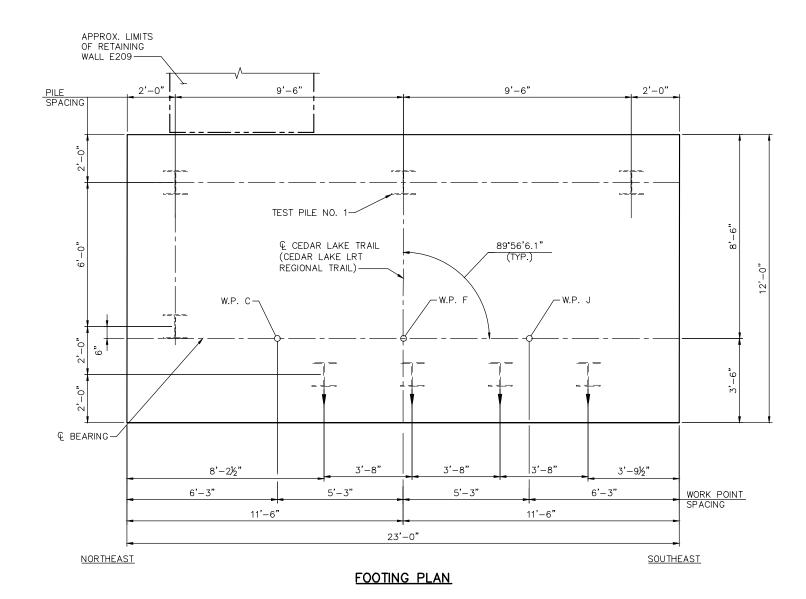
- 1 HP12x53 STEEL TEST PILES 78 FT. LONG
- 7 HP12x53 STEEL PILES EST. 78 FT. LENGTH
- 8 HP12x53 STEEL PILES REQ'D FOR EAST ABUT.

ALL PILES TO BE HP12x53 WITH PILE TIP PROTECTION.

PILE SPACING SHOWN IS AT BOTTOM OF FOOTING.

PILES MARKED THUS TO BE BATTERED 3" PER FOOT

FOR PILE SPLICE DETAILS SEE DETAIL B202.



DESIGNED BY: NRW CHECKED BY: JSM

DRAWN BY: PGR DATE: 07/27/15

**DRAFT-WORK IN PROCESS** 

SHEET

8

OF

37

NO. DATE BY CHECK DESIGN REVISION / SUBMITTAL

**AECOM** Kimley»Horn

60% SUBMISSION - 09/21/15

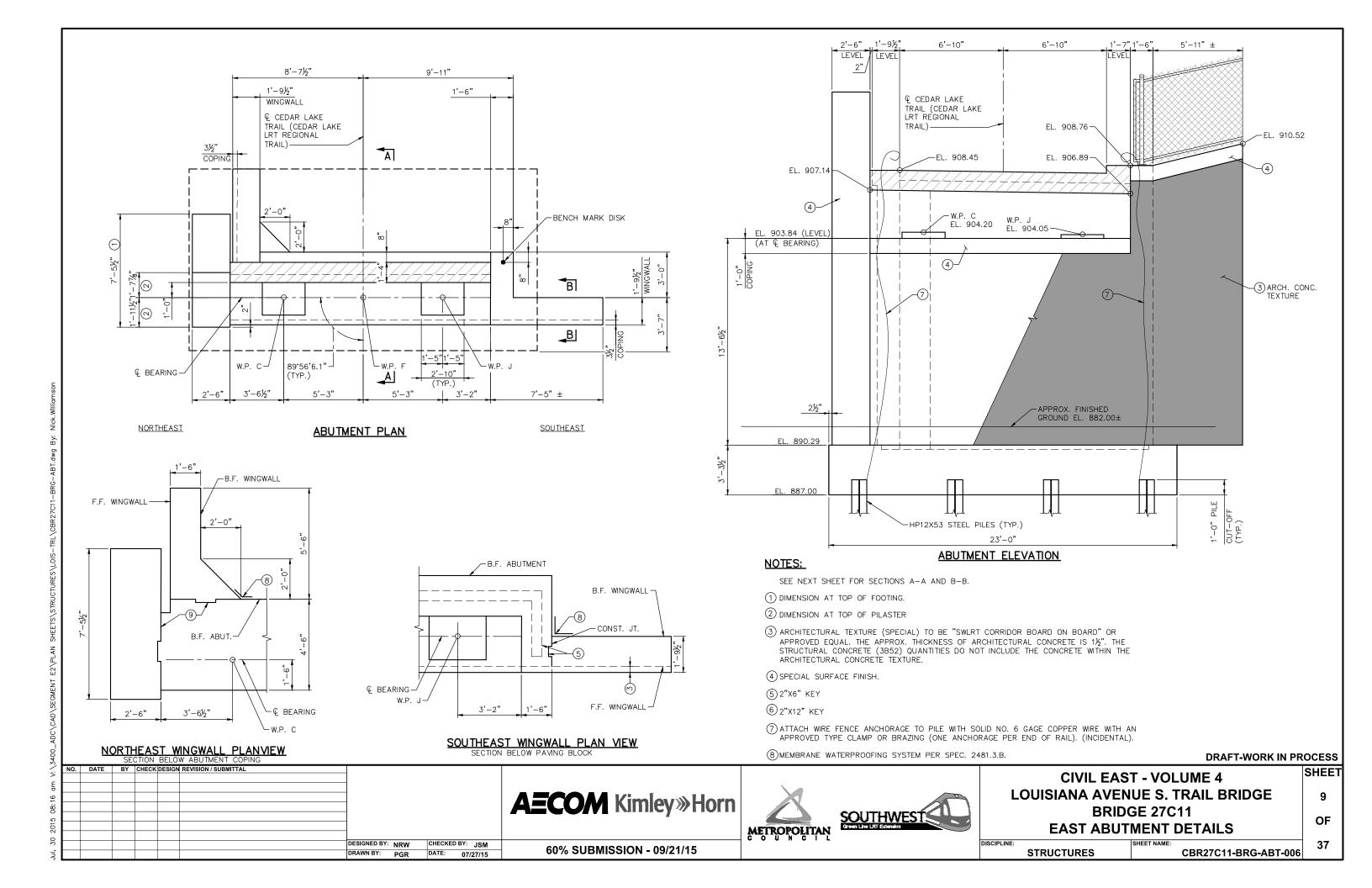


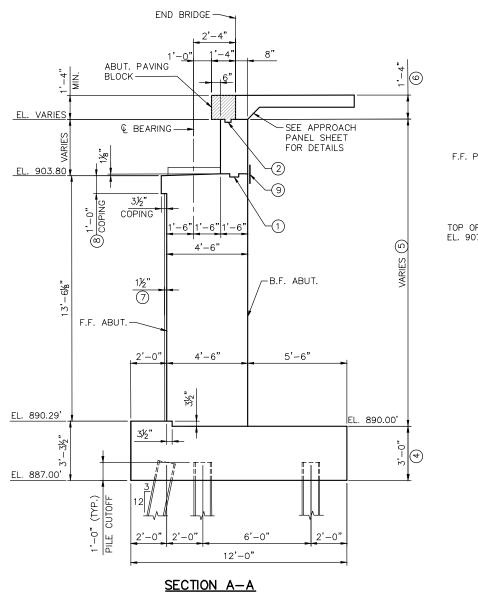


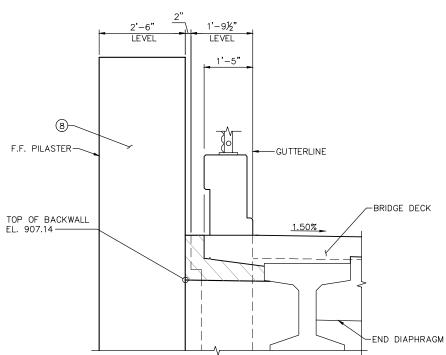
**CIVIL EAST - VOLUME 4** LOUISIANA AVENUE S. TRAIL BRIDGE **BRIDGE 27C11 EAST ABUTMENT DETAILS** 

DISCIPLINE:

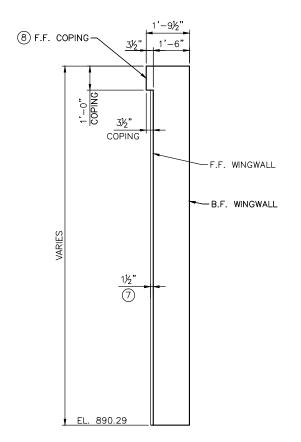
CBR27C11-BRG-ABT-005 **STRUCTURES** 

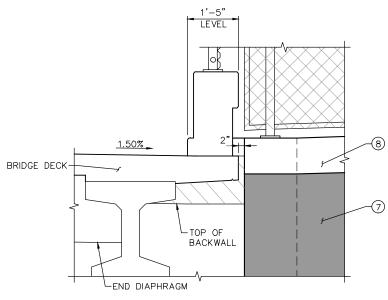






#### NORTHEAST CORNER ELEVATION VIEW





SOUTHEAST CORNER ELEVATION VIEW

#### NOTES:

- (1) PERMISSIBLE CONSTRUCTION JOINT WITH 2" x 6" KEY CENTERED IN WALL.
- 2 CONSTRUCTION JOINT WITH 2" x 4" KEY.
- 3 72 HOUR TIME DELAY REQUIRED BETWEEN ADJACENT POURS TO ALLOW FOR SHRINKAGE.
- (4) STRUCTURAL CONCRETE (1G52).
- (5) STRUCTURAL CONCRETE (3B52).
- 6 BRIDGE SLAB CONCRETE (3YHPC-M). SEE SUPERSTRUCTURE DETAILS.
- 7) ARCHITECTURAL TEXTURE (SPECIAL) TO BE "SWLRT CORRIDOR BOARD ON BOARD" OR APPROVED EQUAL. THE APPROX. THICKNESS OF ARCHITECTURAL CONCRETE IS 11/2". THE STRUCTURAL CONCRETE (3B52) QUANTITIES DO NOT INCLUDE THE CONCRETE WITHIN THE ARCHITECTURAL CONCRETE TEXTURE.
- (8) SPECIAL SURFACE FINISH.
- (9) MEMBRANE WATERPROOFING SYSTEM PER SPEC. 2481.3.B.

SECTION B-B

**DRAFT-WORK IN PROCESS** 

SHEET

10

OF

DESIGNED BY: NRW CHECKED BY: JSM DRAWN BY: PGR DATE: 07/27/15

**AECOM** Kimley»Horn

60% SUBMISSION - 09/21/15

METROPOLITAN



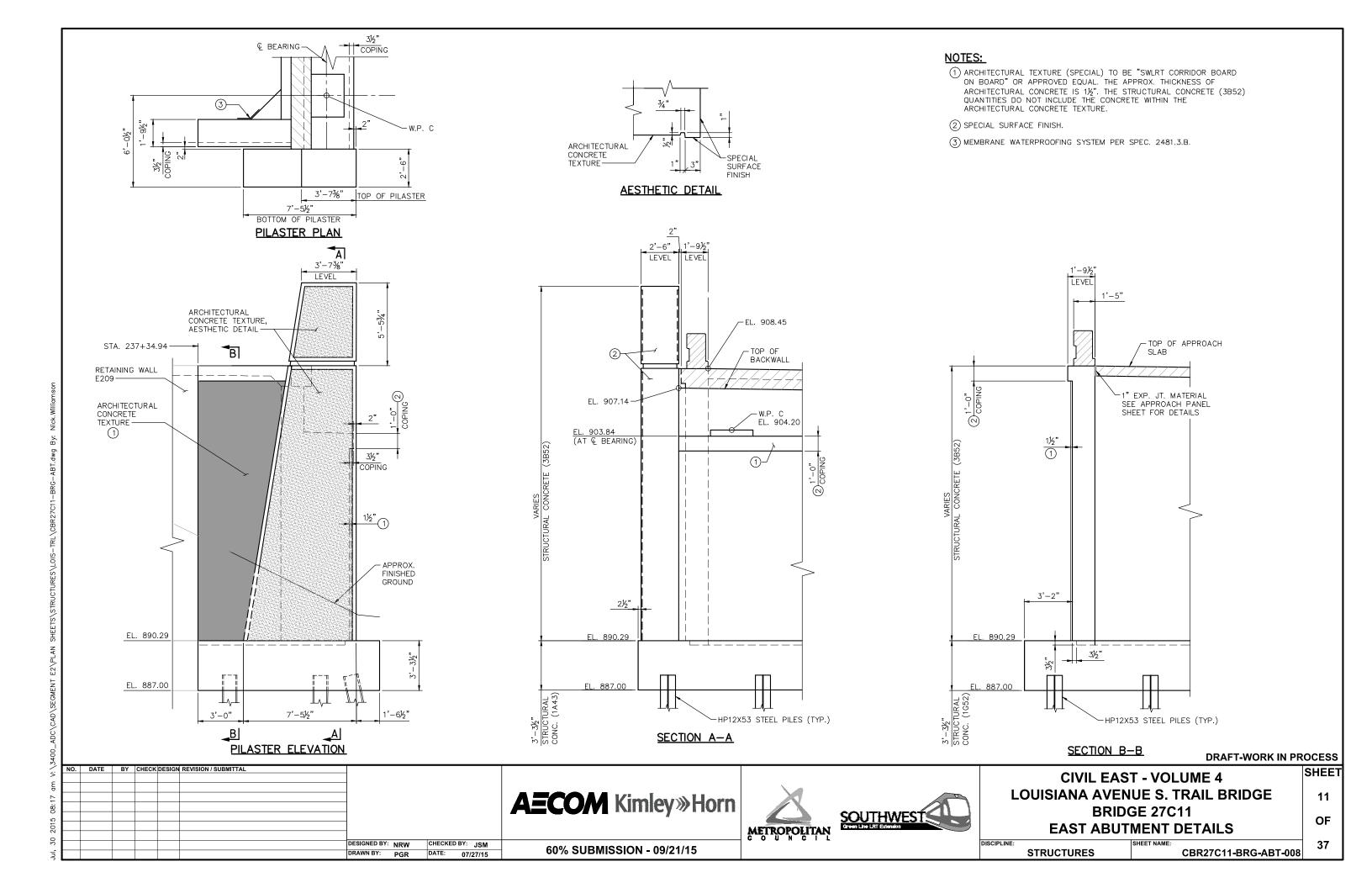
# **CIVIL EAST - VOLUME 4** LOUISIANA AVENUE S. TRAIL BRIDGE **BRIDGE 27C11 EAST ABUTMENT DETAILS**

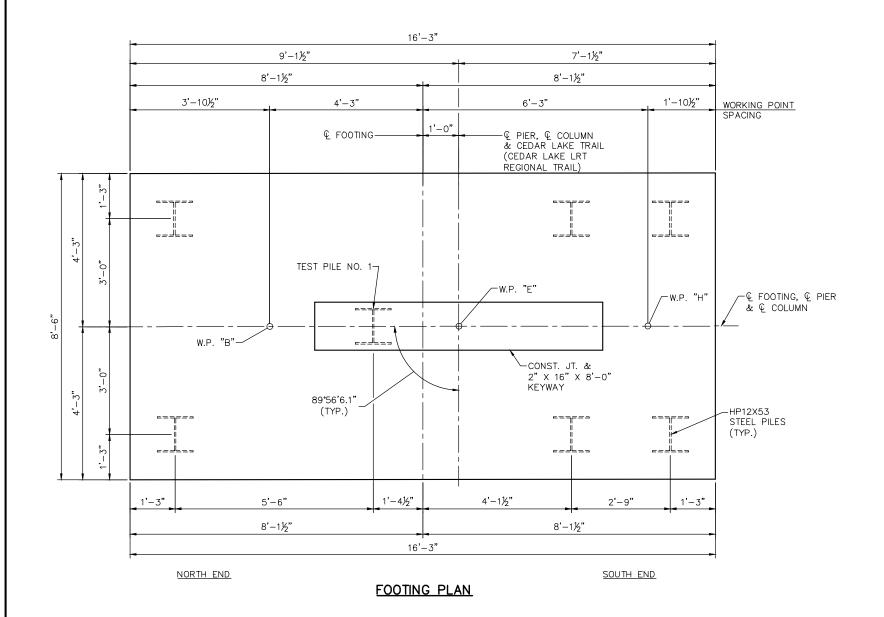
DISCIPLINE:

CBR27C11-BRG-ABT-007

**STRUCTURES** 

37





PIER 1 COMPUTED PILE LOAD - TONS/PILE			
FACTORED DEAD LOAD	41.3		
FACTORED LIVE LOAD	0.0		
FACTORED OVERTURNING	24.3		
* FACTORED DESIGN LOAD	65.6		
* BASED ON STRENGTH III LOAD COMBINATION.			

PIER 1 REQUIRED NOMINAL PILE BEARING RESISTANCE FOR H-PILES Rn - TONS/PILE			
FIELD CONTROL METHOD	φdyn	* Rn	
MN/DOT PILE FORMULA 2012 (MPF12) $R_{\rm H} = 20 \sqrt{\frac{W \times H}{1000}} \times log\left(\frac{10}{S}\right)$	0.60	110	
PDA	0.65	101	
* Rn = (FACTORED DESIGN LOAD) / φdyn			

#### **GENERAL PILE NOTES:**

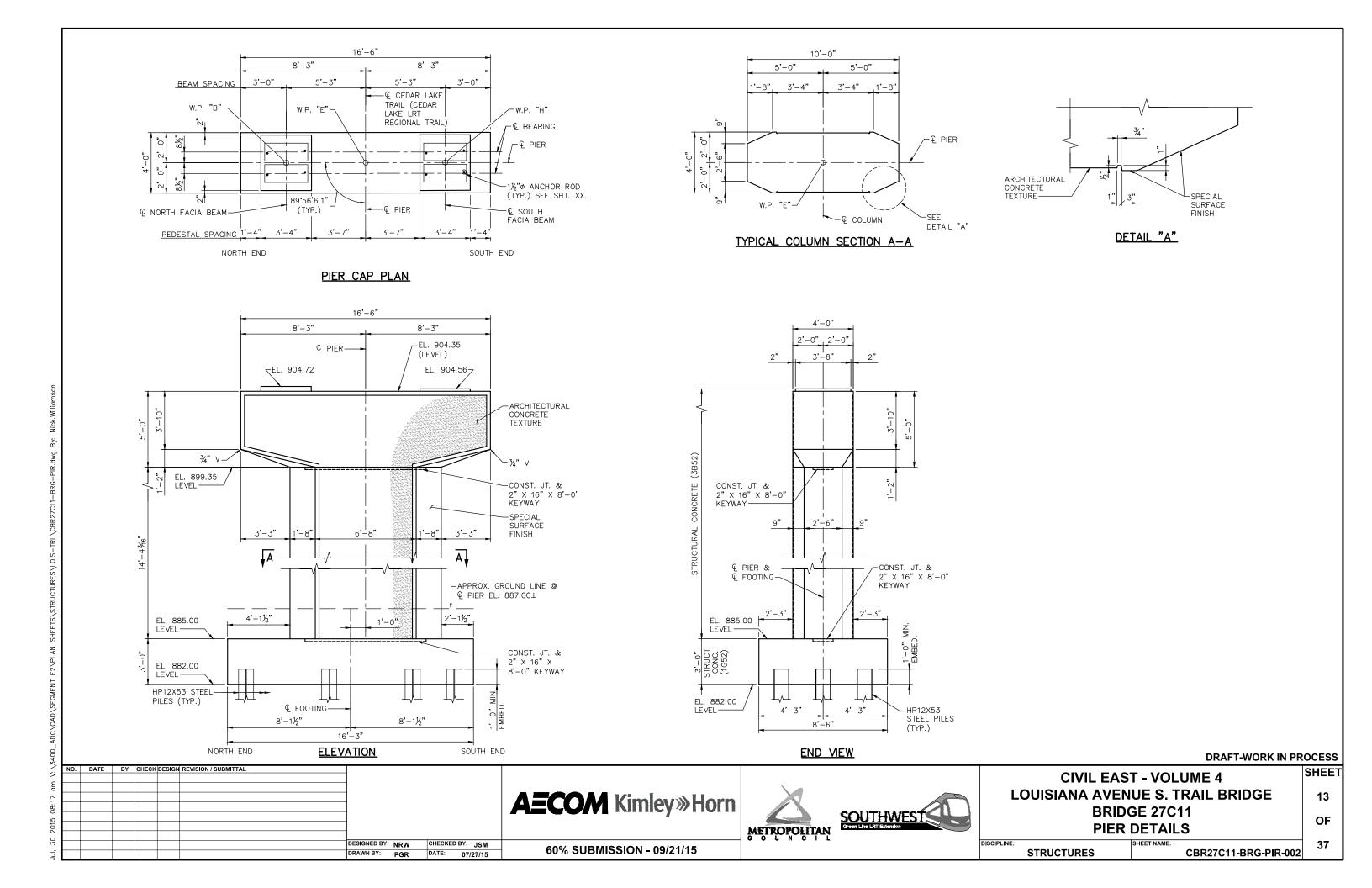
- 1 HP12x53 STEEL TEST PILES 73 FT. LONG 6 HP12x53 STEEL PILES EST. 73 FT. LENGTH
- 7 HP12x53 STEEL PILES REQ'D FOR PIER

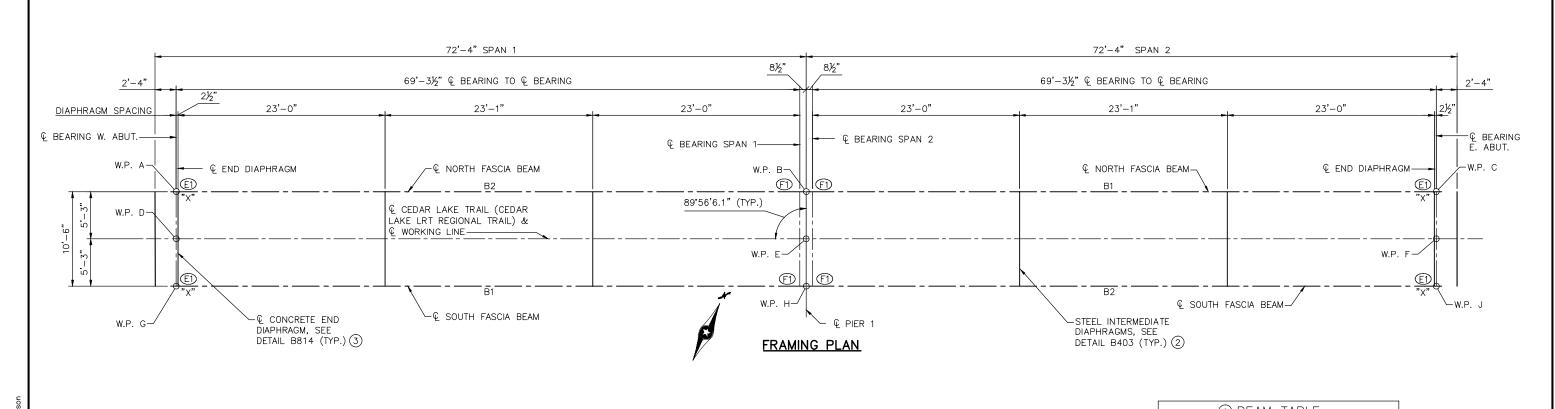
ALL PILES TO BE HP12x53 WITH PILE TIP PROTECTION.

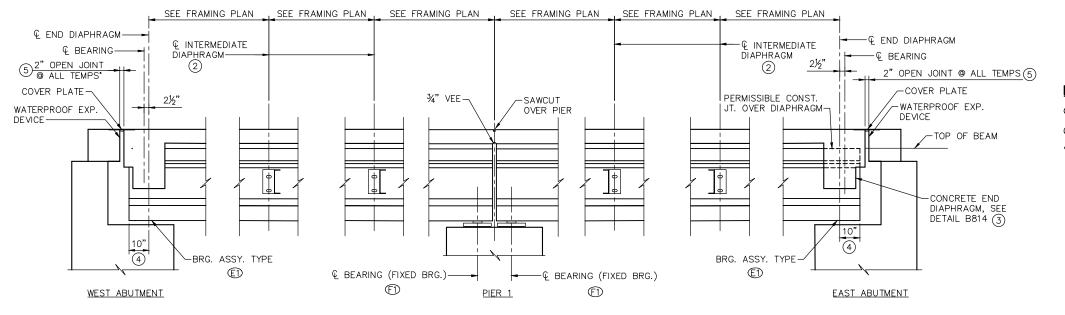
PILE SPACING SHOWN IS AT BOTTOM OF FOOTING.

FOR PILE SPLICE DETAILS SEE DETAIL B202.

NO. DATE BY CHECK DESIGN REVISION / SUBMITTAL SHEET **CIVIL EAST - VOLUME 4** LOUISIANA AVENUE S. TRAIL BRIDGE **AECOM** Kimley»Horn 12 **BRIDGE 27C11** SOUTHWEST Cross Library Extension OF **PIER DETAILS** METROPOLITAN DESIGNED BY: NRW CHECKED BY: JSM DISCIPLINE: 37 60% SUBMISSION - 09/21/15 DRAWN BY: PGR DATE: 07/27/15 CBR27C11-BRG-PIR-001 **STRUCTURES** 







LONGITUDINAL SECTION

① BEAM TABLE					
SPAN	BEAM	LENGTH			
1	B1, B2	70 <b>'</b> −6 <b>½"</b>			
2	B1, B2	70'−6 <b>½"</b>			

#### NOTES:

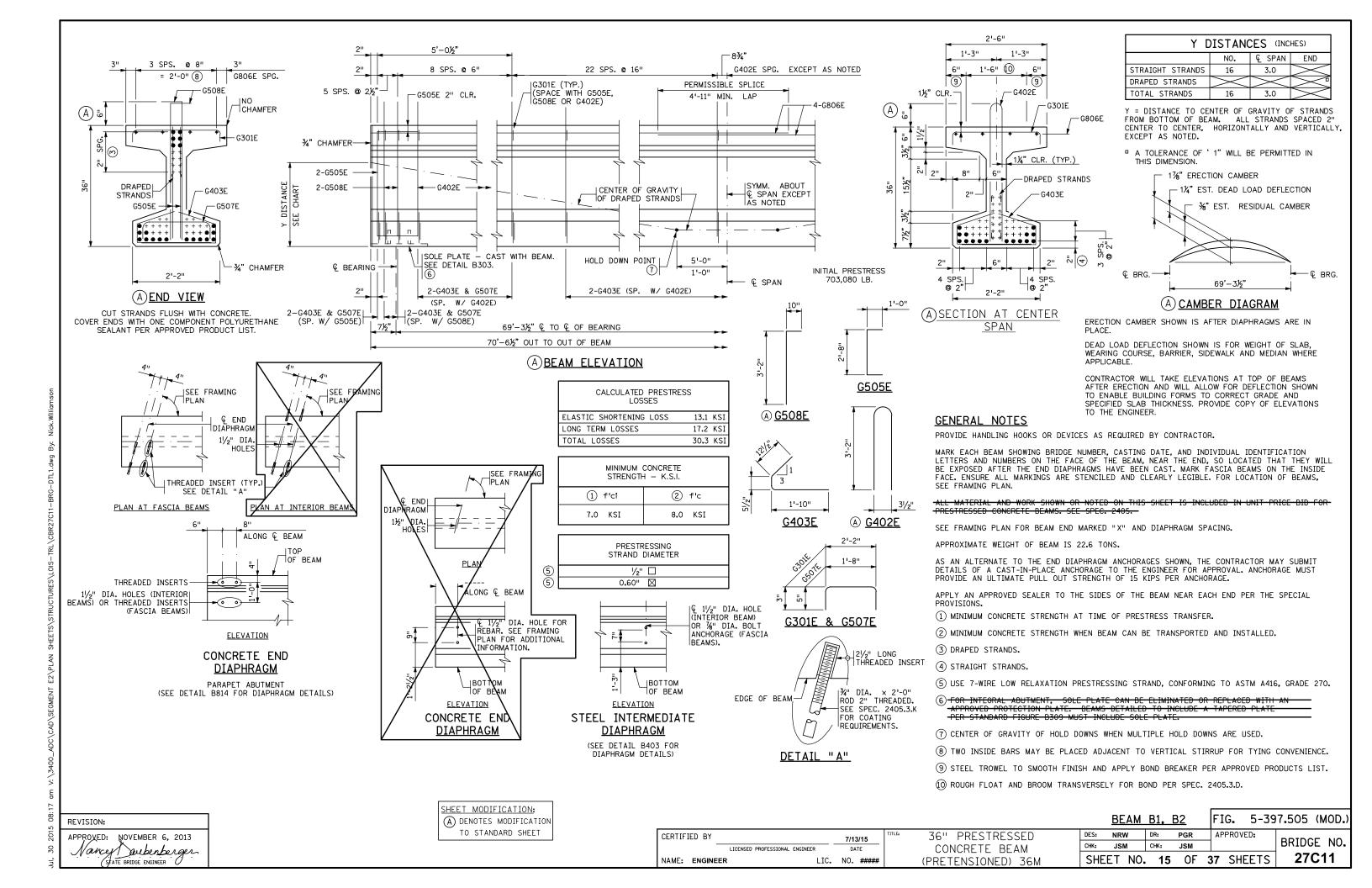
- (F) DENOTES FIXED CURVED PLATE BEARING ASSEMBLY, TYPE F1. SEE DETAIL B310.
- © DENOTES EXPANSION CURVED PLATE BEARING ASSEMBLY TYPE E1. SEE DETAIL B311.
- "X" INDICATES END OF BEAM.

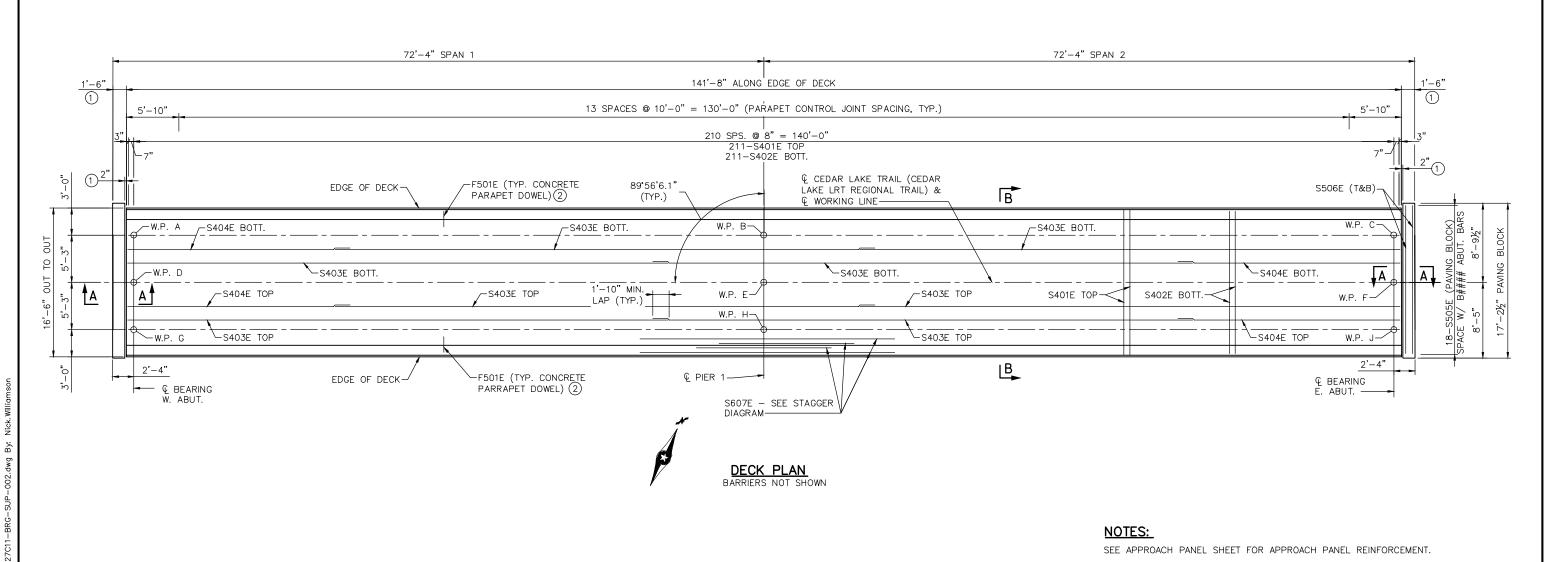
ALL BEAMS SET PARALLEL TO WORKING LINE, ALL DIAPHRAGMS SET PARALLEL TO SUBSTRUCTURES.

- ALL DIMENSIONS SHOWN ARE MEASURED ON A HORIZONTAL PLAN.
- (1) SEE BEAM SHEET FOR DETAILS.
- (2) SEE SHEET 25 FOR INTERMEDIATE DIAPHRAGM DETAIL B403.
- 3 SEE SHEET 27 FOR END DIAPHRAGM DETAIL B814.
- 4 ALONG © OF BEAM.
- (5) PERDENDICULAR TO ABUTMENT.

DRAFT-WORK IN PROCESS

rò L														
ş F	NO.	DATE	BY CHEC	DESIGN	REVISION / SUBMITTAL							CIVIL EAST - VOLUME	4	SHEET
٤	+					-								1
6				A = COAA V:nolouv\ Iloun		D	LOUISIANA AVENUE S. TRAIL BRIDGE			14				
1 28:						<b>AECOM</b> Kimley»Horn			BRIDGE 27C11			1		
2								SOUTHWEST				OF		
201									METROPOLITAN	Green Line LRT Extension		FRAMING PLAN		j 0.
o L									COUNCIL					1
₽						DESIGNED BY: NRW	CHECKED BY: JSM	600/ CLIDMICCIONI 00/24/45			DISCIPLINE:	SHEET NAME:		∣ 37 <i>!</i>
Jul,						DRAWN BY: PGR	DATE: 07/27/15	60% SUBMISSION - 09/21/15				STRUCTURES CBR27	C11-BRG-SUP-001	<u> </u>





# \$607E - Q PIER 1

#### STAGGER DIAGRAM

7'-6" 10'-0"

LONGITUDINAL REINFORCEMENT FOR CONCRETE DECK WITH MAIN REINFORCEMENT PERPENDICULAR TO TRAFFIC WITH ONLY DECK (NOT BEAMS) CONTINUOUS OVER PIER.

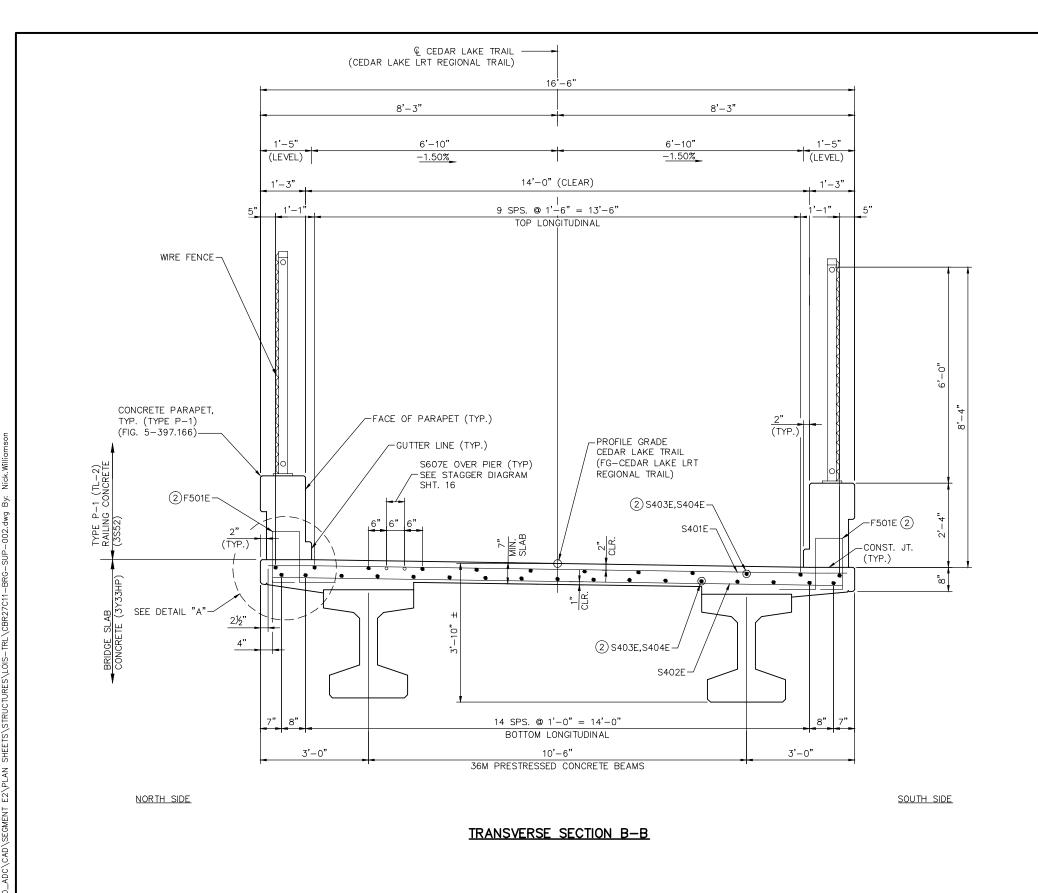
SEE SHEET 18 FOR SECTION A-A

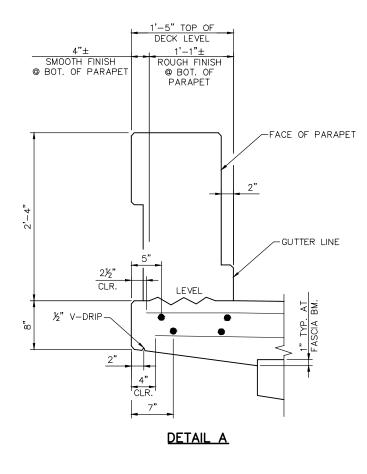
SEE SHEET 17 FOR SECTION B-B

- 1 SUPERSTRUCTURE DIMENSIONS ARE BASED ON A 2" EXPANSION JOINT OPENING.
- (2) FOR PARAPET REINFORCING TO BE PLACED IN SLAB, SEE SHEET 20.

#### DRAFT-WORK IN PROCESS

NO. DATE BY CHECK DESIGN REVISION / SUBMITTAL SHEET **CIVIL EAST - VOLUME 4 AECOM** Kimley»Horn LOUISIANA AVENUE S. TRAIL BRIDGE 16 SOUTHWEST Queen Line LETT Extension **BRIDGE 27C11** OF SUPERSTRUCTURE DETAILS METROPOLITAN DESIGNED BY: NRW CHECKED BY: JSM DISCIPLINE: 60% SUBMISSION - 09/21/15 DRAWN BY: PGR DATE: 07/27/15 CBR27C11-BRG-SUP-002 **STRUCTURES** 



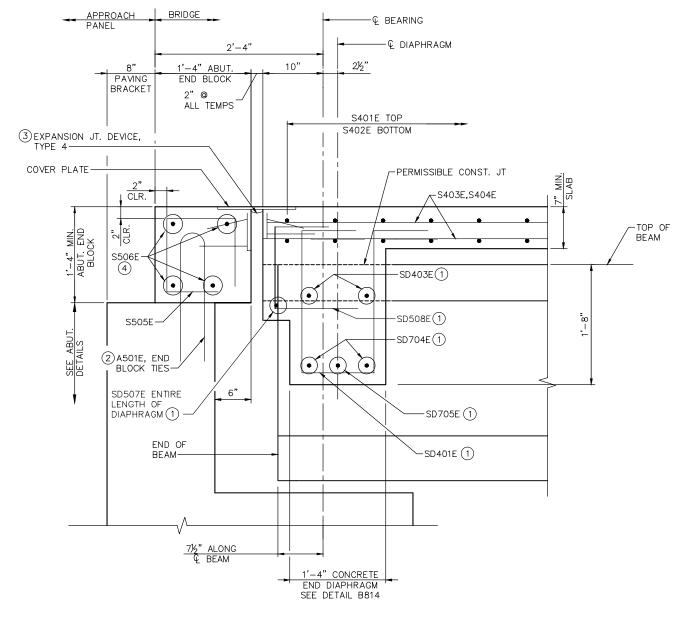


#### NOTES:

- 1) ALTERNATE BARS FROM END TO END TO STAGGER LAPS.
- $\ensuremath{\bigcirc}$  For parapet reinforcing to be placed in slab, see concrete parapet sheet.

#### **DRAFT-WORK IN PROCESS**

SHEET **CIVIL EAST - VOLUME 4** LOUISIANA AVENUE S. TRAIL BRIDGE **AECOM** Kimley»Horn 17 **BRIDGE 27C11** SOUTHWEST Green Line Lett Extension OF SUPERSTRUCTURE DETAILS METROPOLITAN DESIGNED BY: NRW CHECKED BY: JSM 37 60% SUBMISSION - 09/21/15 CBR27C11-BRG-SUP-003 **STRUCTURES** DATE: 07/27/15



#### SECTION A-A AT ABUTMENT SECTION IS TAKEN NORMAL TO JOINT

### GENERAL NOTES

ALL DIMENSIONS SHOWN ARE MEASURED ON A HORIZONTAL PLANE.

SUPERSTRUCTURE DIMENSIONS ARE BASED ON A 2" EXPANSIONS JOINT OPENING.

- ① SEE DETAIL B814 SHT. 27 FOR END DIAPHRAGM DETAILS, END DIAPH. CONCRETE (AT ABUTMENTS), PAID FOR AS "BRIDGE SLAB CONCRETE (3YHPC-M)".
- 2 SEE ABUTMENT SHEETS FOR DETAILS.
- 3 SEE EXPANSION JOINT SHEET FOR DETAILS
- 4 SPACE WITH A501E ABUTMENT BARS.

#### **DRAFT-WORK IN PROCESS**

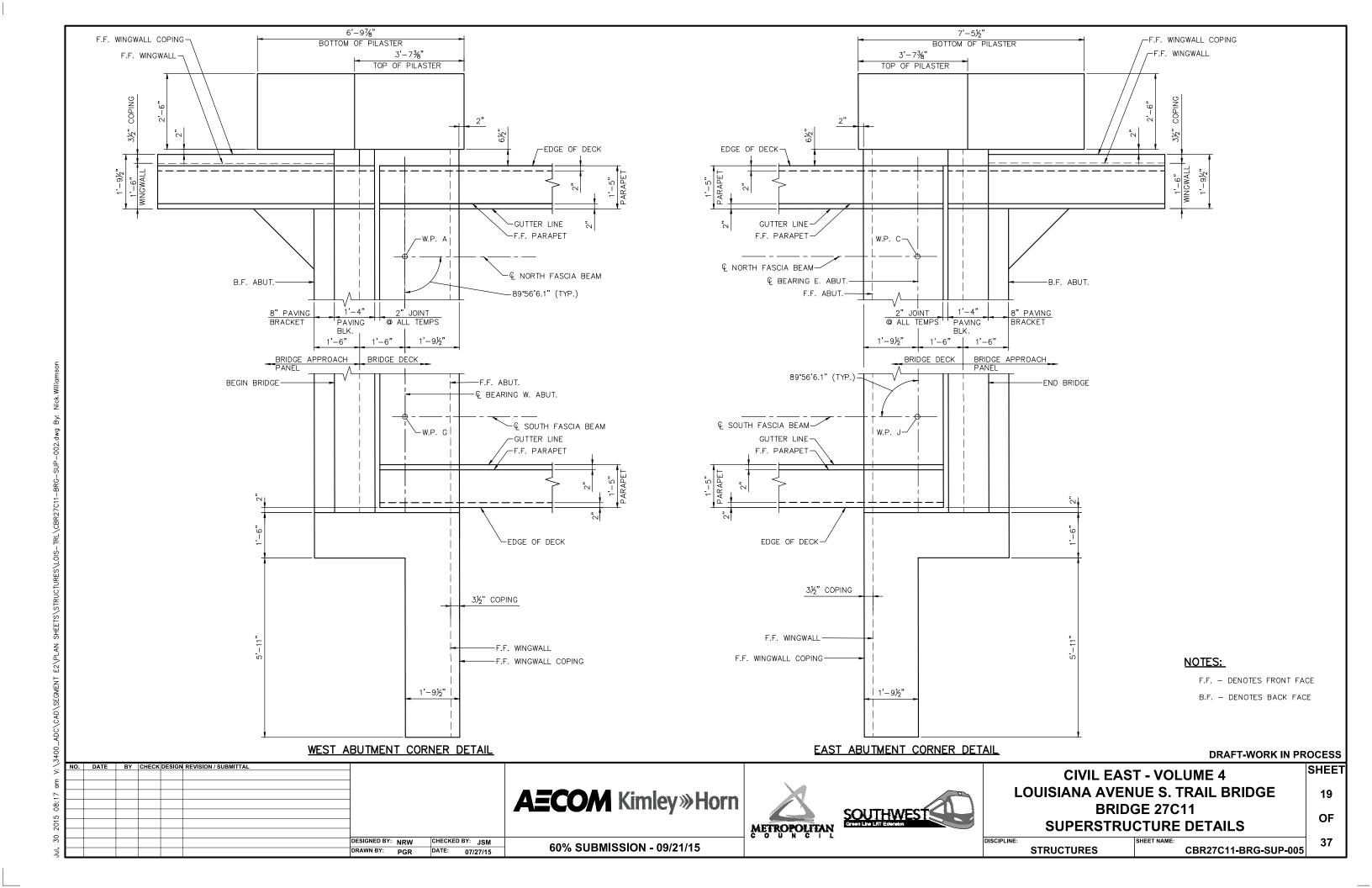
SHEET

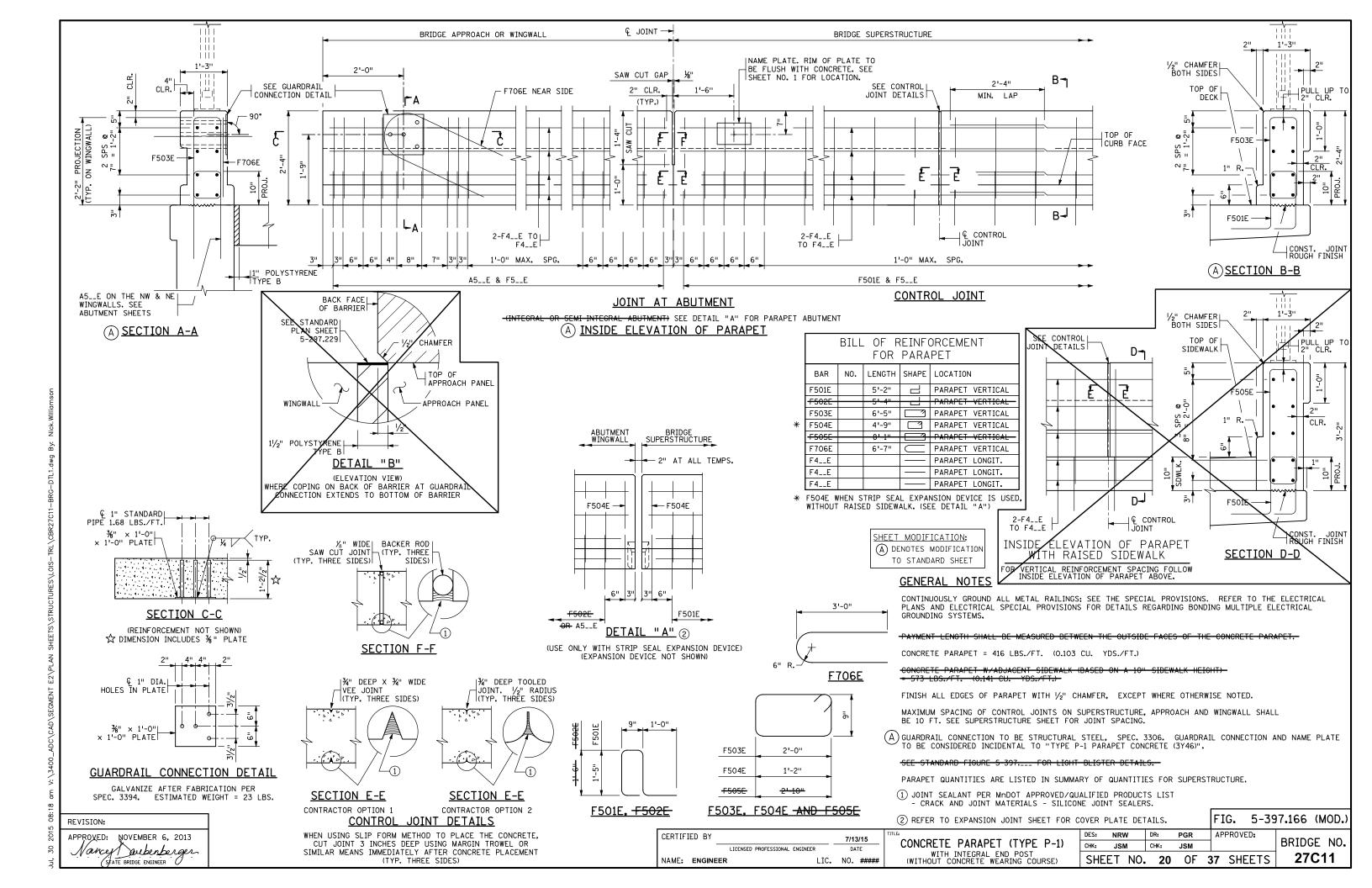
18

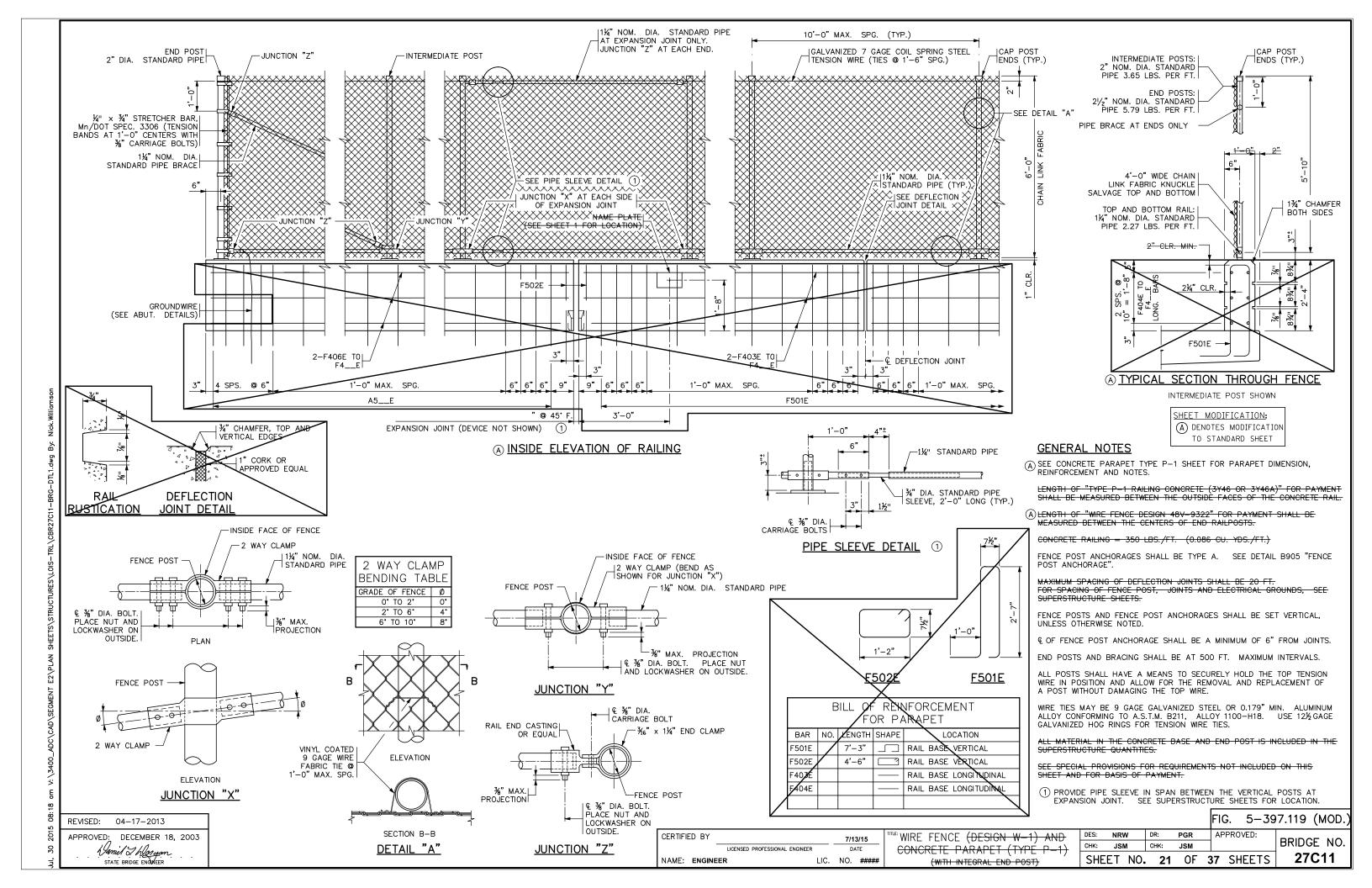
OF

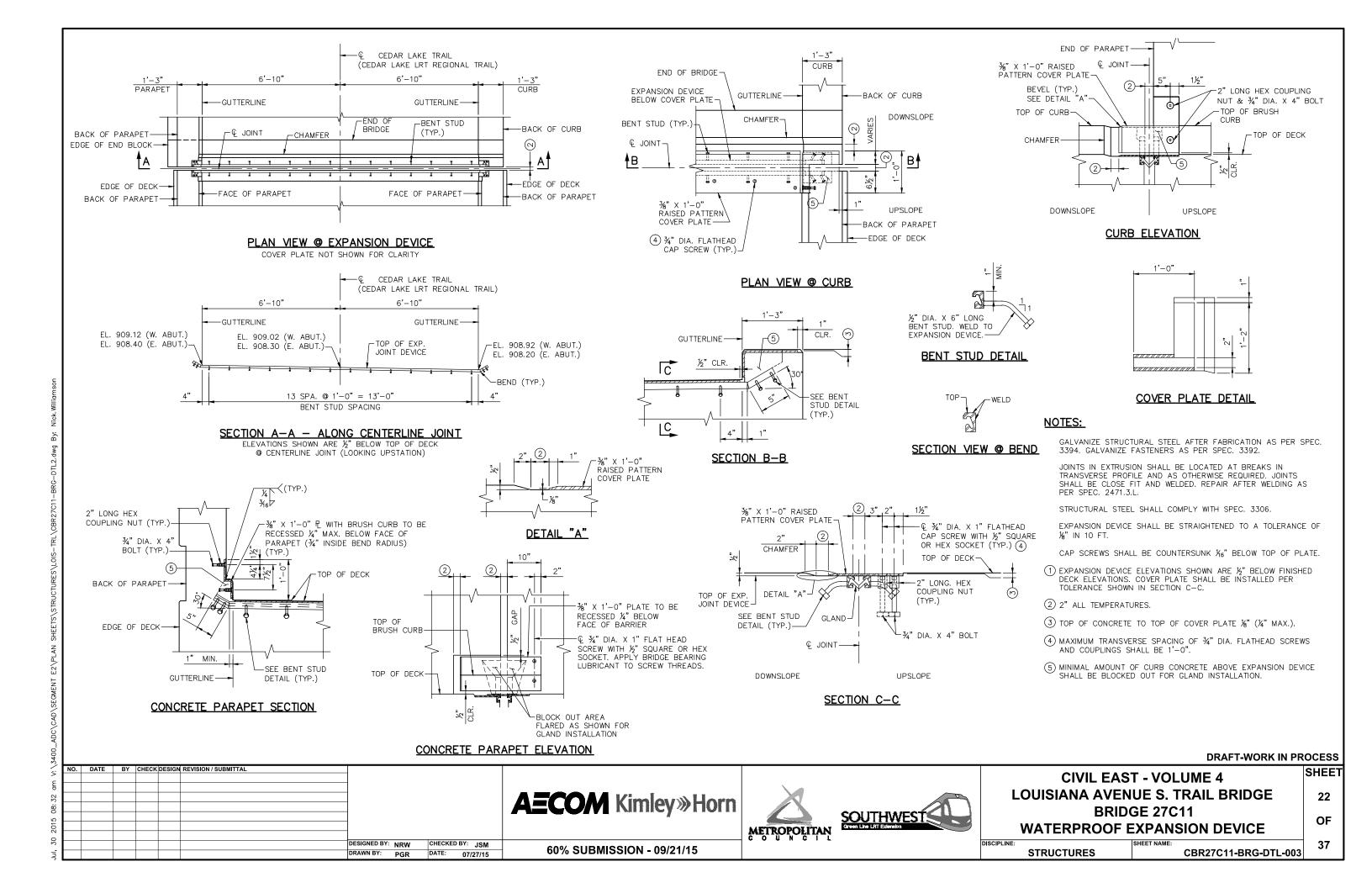
37

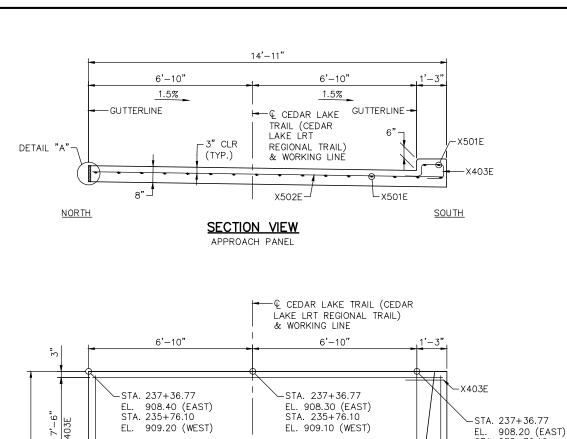
00\_ADC\CAD\SEGMENI E2\PLAN SHEEIS\SIRUCIURES\LOIS—IRL\CBR2/C11—BRG—SUP—002.dwg By. Nic

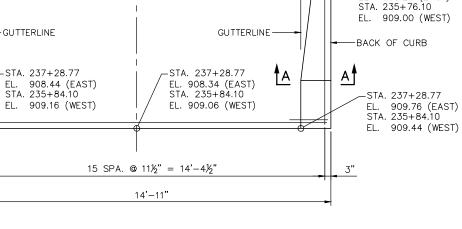




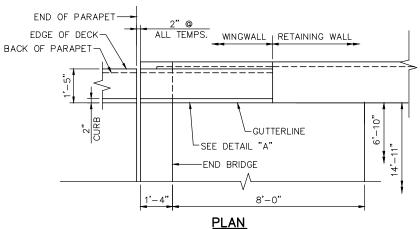




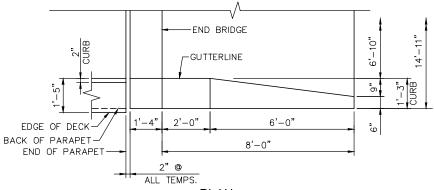




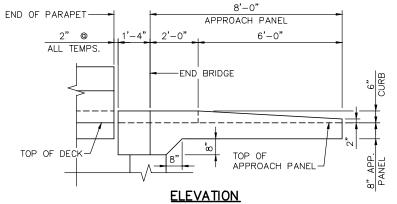




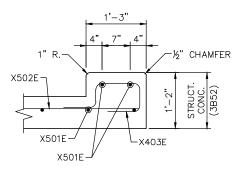
EAST PANEL SHOWN WEST PANEL SIMILAR



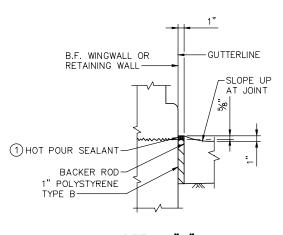
EAST PANEL SHOWN WEST PANEL SIMILAR



SOUTH CURB EAST PANEL SHOWN



#### SECTION A-A



DETAIL "A"

#### NOTES:

1) HOT POUR SEALANT SPEC. 3725. TOP OF SEALER FLUSH TO 1/8" BELOW TOP OF PAVEMENT SURFACE.

#### **DRAFT-WORK IN PROCESS**

SHEET

23

OF

DATE BY CHECK DESIGN REVISION / SUBMITTAL DESIGNED BY: NRW CHECKED BY: JSM DRAWN BY: PGR DATE: 07/27/15

**AECOM** Kimley»Horn

60% SUBMISSION - 09/21/15

METROPOLITAN



# **CIVIL EAST - VOLUME 4** LOUISIANA AVENUE S. TRAIL BRIDGE **BRIDGE 27C11 APPROACH PANEL**

DISCIPLINE:

**STRUCTURES** CBR27C11-BRG-DTL-004

ell e

3½"

37

DRAFT ON LETTERS AND NUMBERS SHALL NOT BE MORE THAN 3" IN 12". HORIZONTAL SPACING OF LETTERS AND NUMBERS SHALL PRODUCE A BALANCED LAYOUT IN PROPORTION TO SPACING SHOWN.

TOP SURFACE OF LETTERS, NUMBERS AND FRAMES SHALL BE BURNISHED. FURNISH 2 STEEL BOLTS % " DIA.  $\times$  3" LONG WITH EACH PLATE.

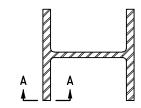
ALL DIMENSIONS FOR f'' HIGH LETTERS AND NUMBERS SHALL BE IN DIRECT PROPORTION TO THOSE SHOWN FOR THE 1" HIGH LETTERS AND NUMBERS.

STATE OF MINNESOTA
DEPARTMENT OF TRANSPORTATION APPROVED: NOVEMBER 22, 2002 DETAIL NO. BRIDGE NAMEPLATE Waniel I Worgan B101 (FOR NEW BRIDGES) STATE BRIDGE ENGINEER

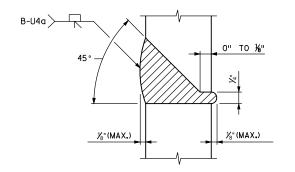
DRAWN BY: PGR

DESIGNED BY: NRW CHECKED BY: JSM

DATE: 07/27/15



SECTION AT SPLICE



SECTION A-A 100% BUTT WELDED PILE SPLICE

CELLULOSIC TYPE ELECTRODES E-6010 OR E-6011 SHALL BE USED FOR 100% BUTT WELDED SPLICES.

ELECTRODES WHICH HAVE BECOME WET, SOILED OR DAMAGED SHALL NOT BE USED.

WELDING SHALL NOT BE DONE WHEN THE AMBIENT TEMPERATURE IS LOWER THAN O'F. OR WHEN THE PILE IS WET OR EXPOSED TO FALLING RAIN OR SNOW. WHEN THE PILE METAL TEMPERATURE IS BELOW 32°F., THE PILE METAL IN THE AREA OF THE WELD SHALL BE HEATED TO A MINIMUM TEMPERATURE OF 70° F. AND MAINTAINED AT THIS TEMPERATURE DURING WELDING.

Waniel I Wargan

STATE OF MINNESOTA
DEPARTMENT OF TRANSPORTATION

PILE SPLICE (STEEL H BEARING PILES 10" TO 14") DETAIL NO.

B202

DRAFT-WORK IN PROCESS

**AECOM** Kimley»Horn

METROPOLITAN



**CIVIL EAST - VOLUME 4** LOUISIANA AVENUE S. TRAIL BRIDGE **BRIDGE 27C11 DETAILS** 

DISCIPLINE: **STRUCTURES** 

CBR27C11-BRG-DTL-005

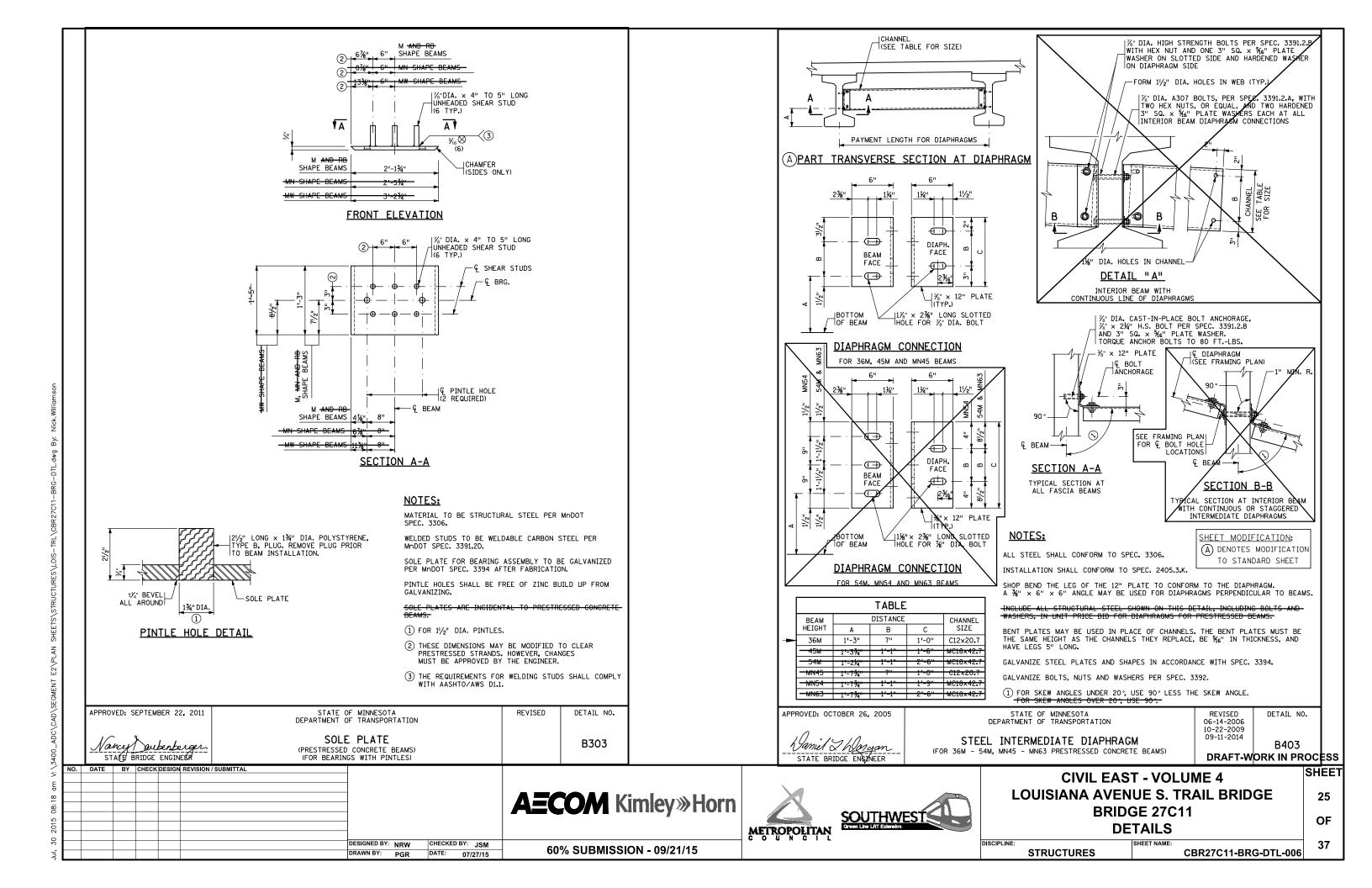
OF

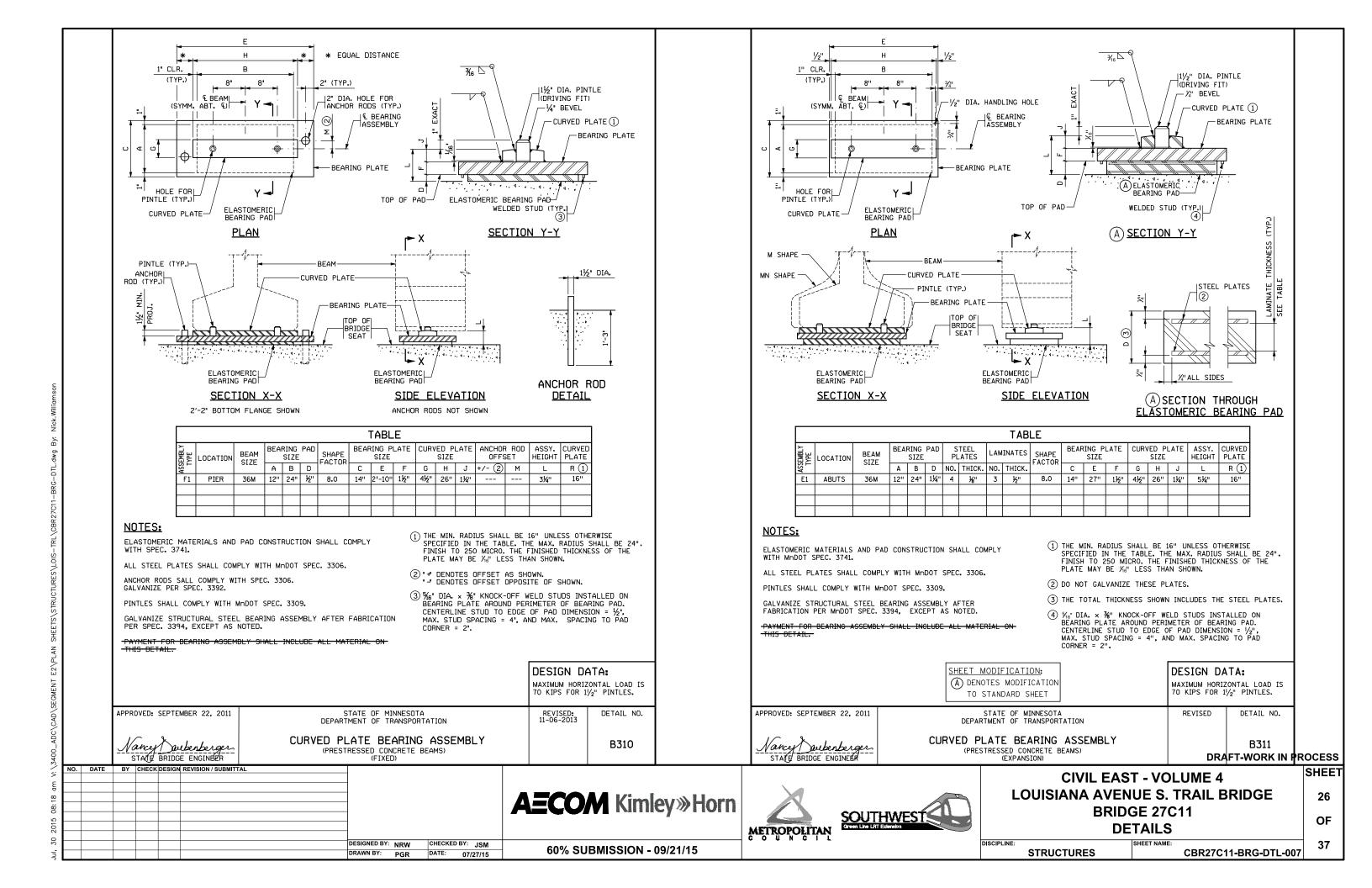
SHEET

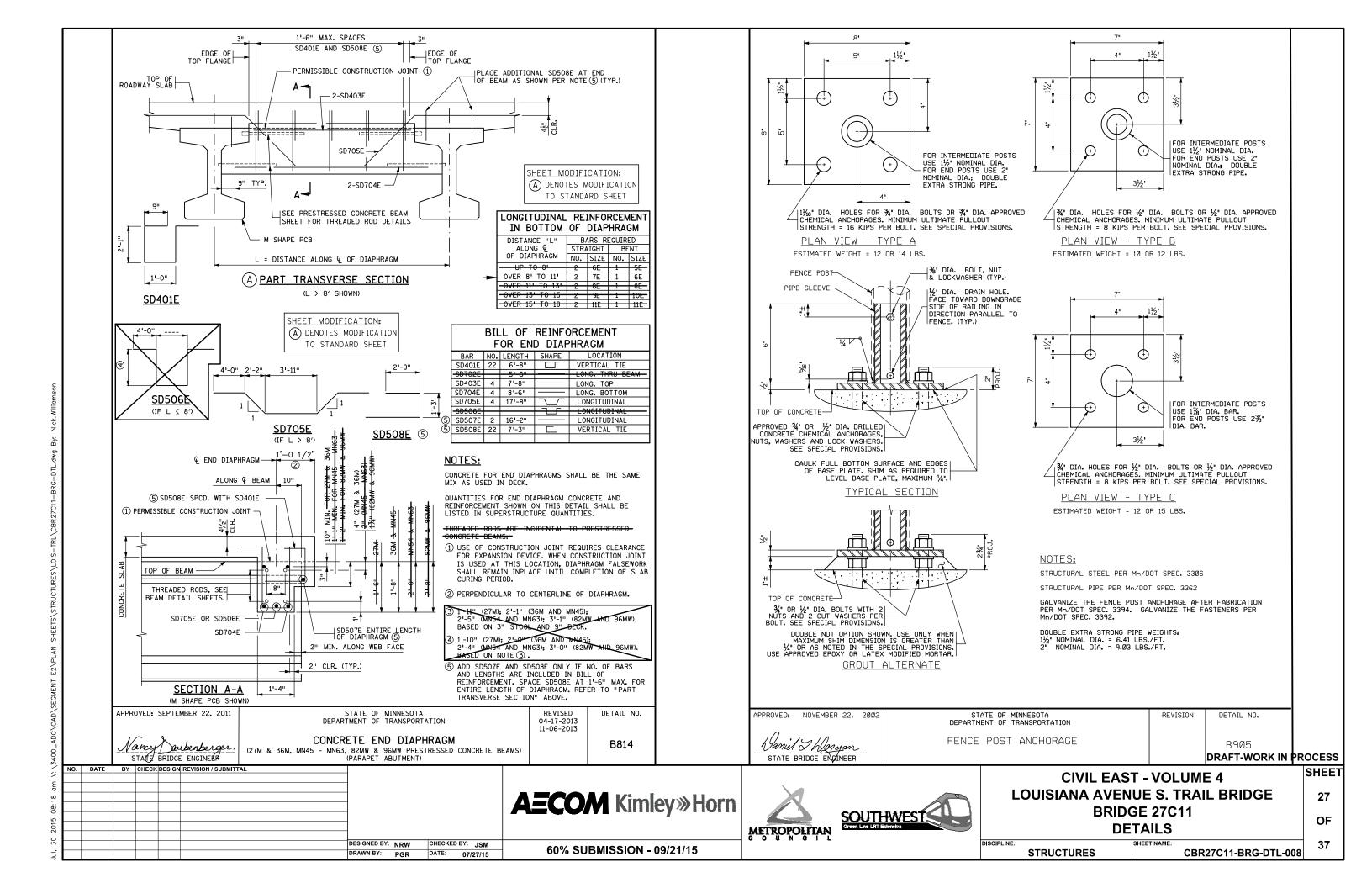
60% SUBMISSION - 09/21/15

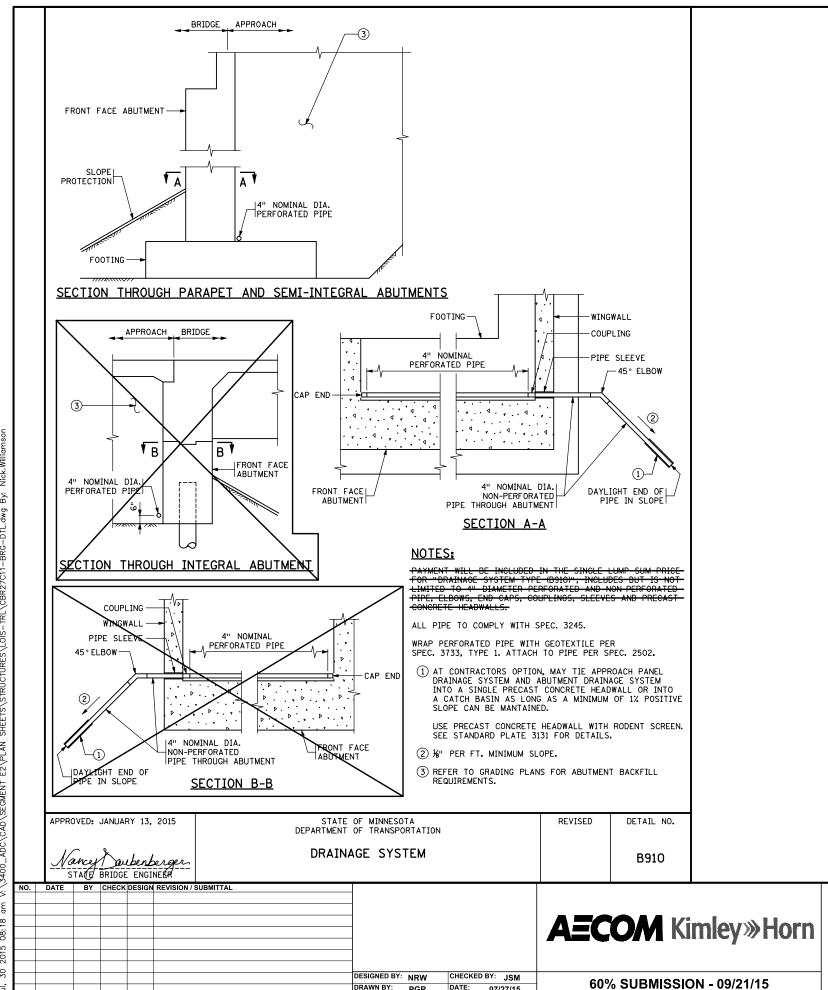
APPROVED: NOVEMBER 22, 2002

STATE BRIDGE ENGINEER









DRAWN BY: PGR

DATE: 07/27/15

**DRAFT-WORK IN PROCESS** SHEET

28

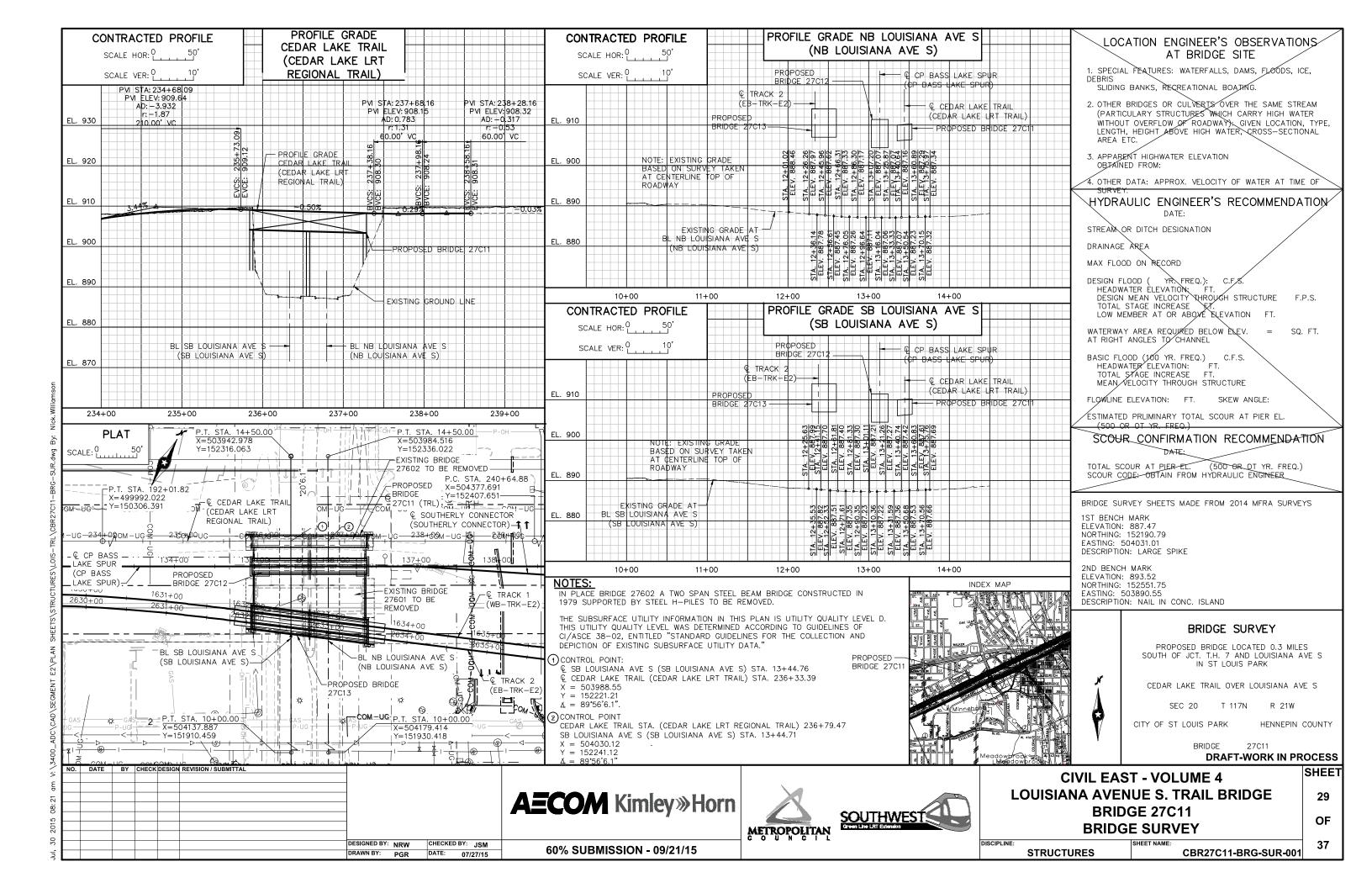
OF

METROPOLITAN

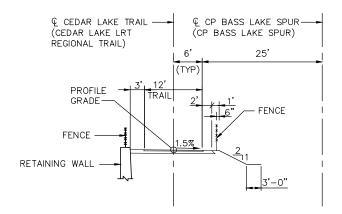


**CIVIL EAST - VOLUME 4** LOUISIANA AVENUE S. TRAIL BRIDGE **BRIDGE 27C11 DETAILS** 

DISCIPLINE: **STRUCTURES** CBR27C11-BRG-DTL-009



#### TYPICAL ROADWAY SECTION LOUISIANA AVE S

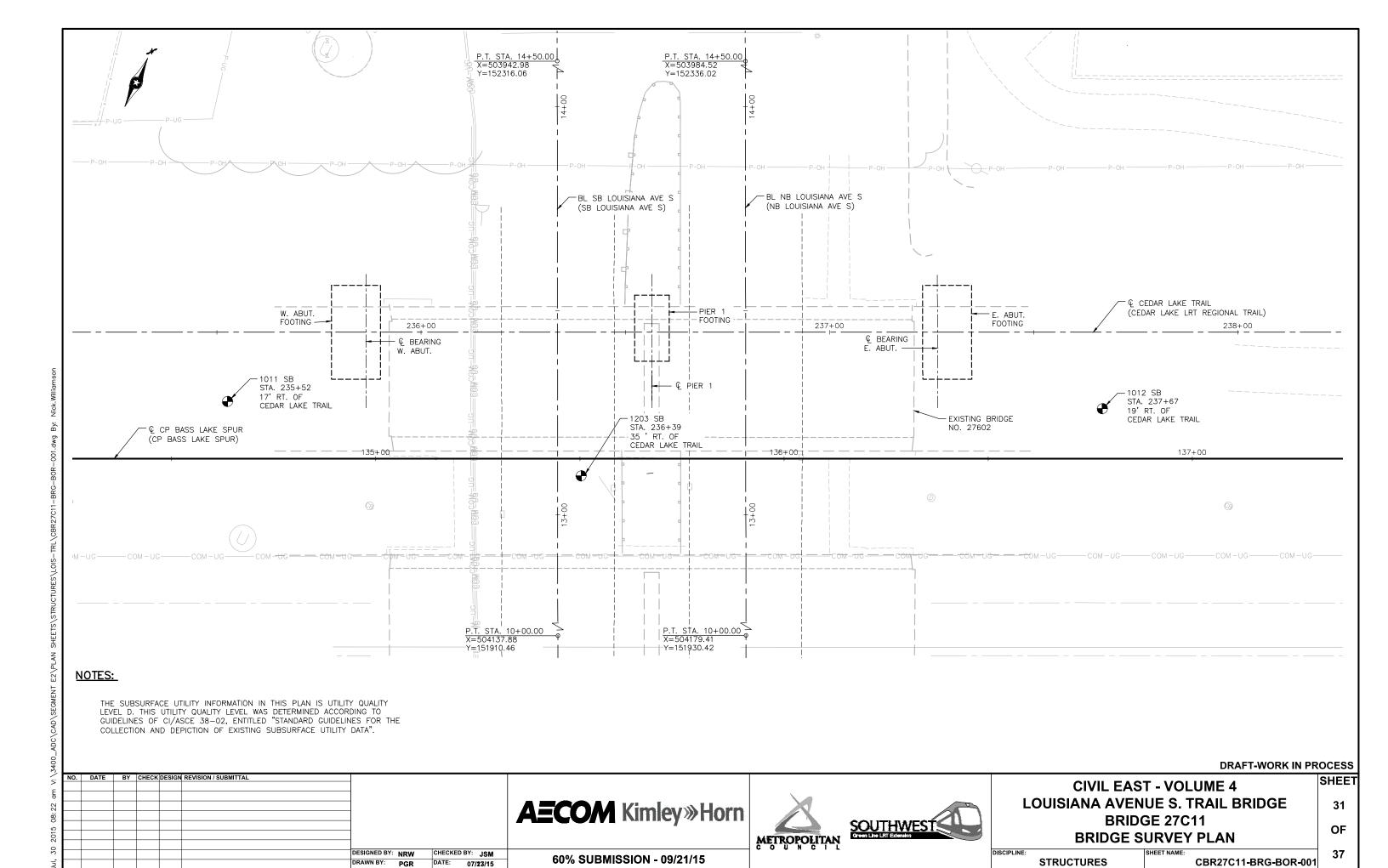


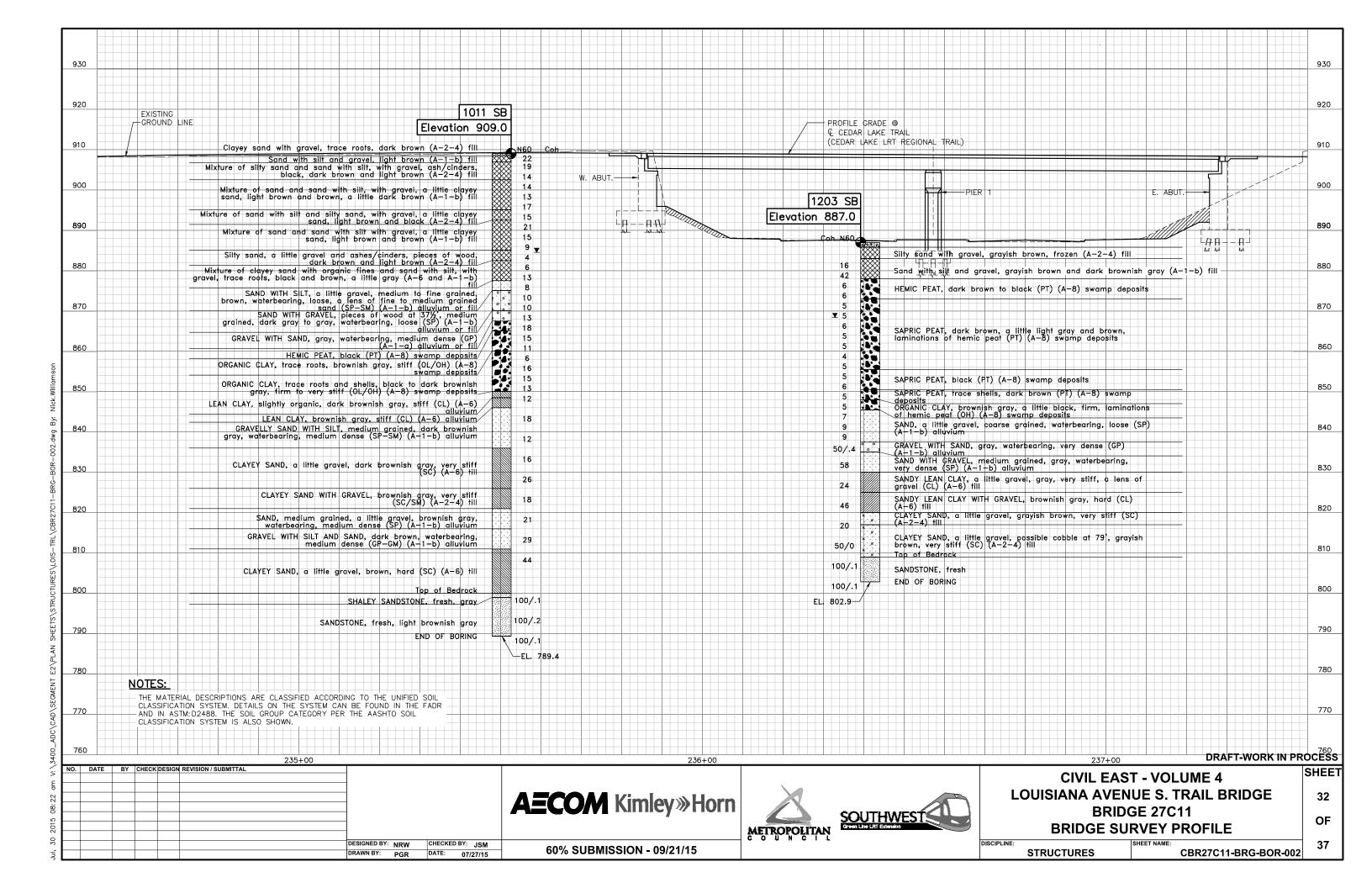
TYPICAL SECTION CEDAR LAKE TRAIL

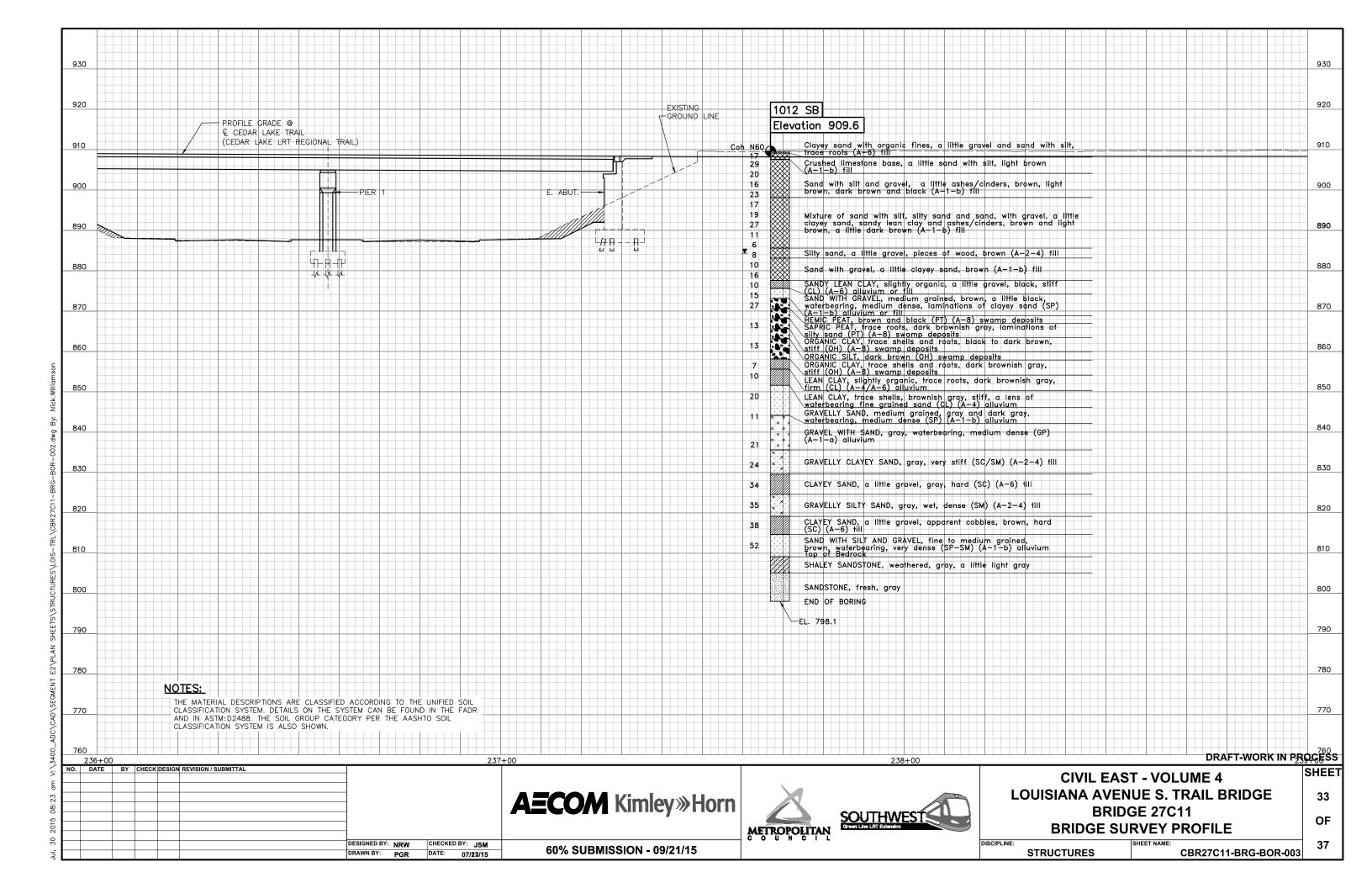
#### **DRAFT-WORK IN PROCESS**

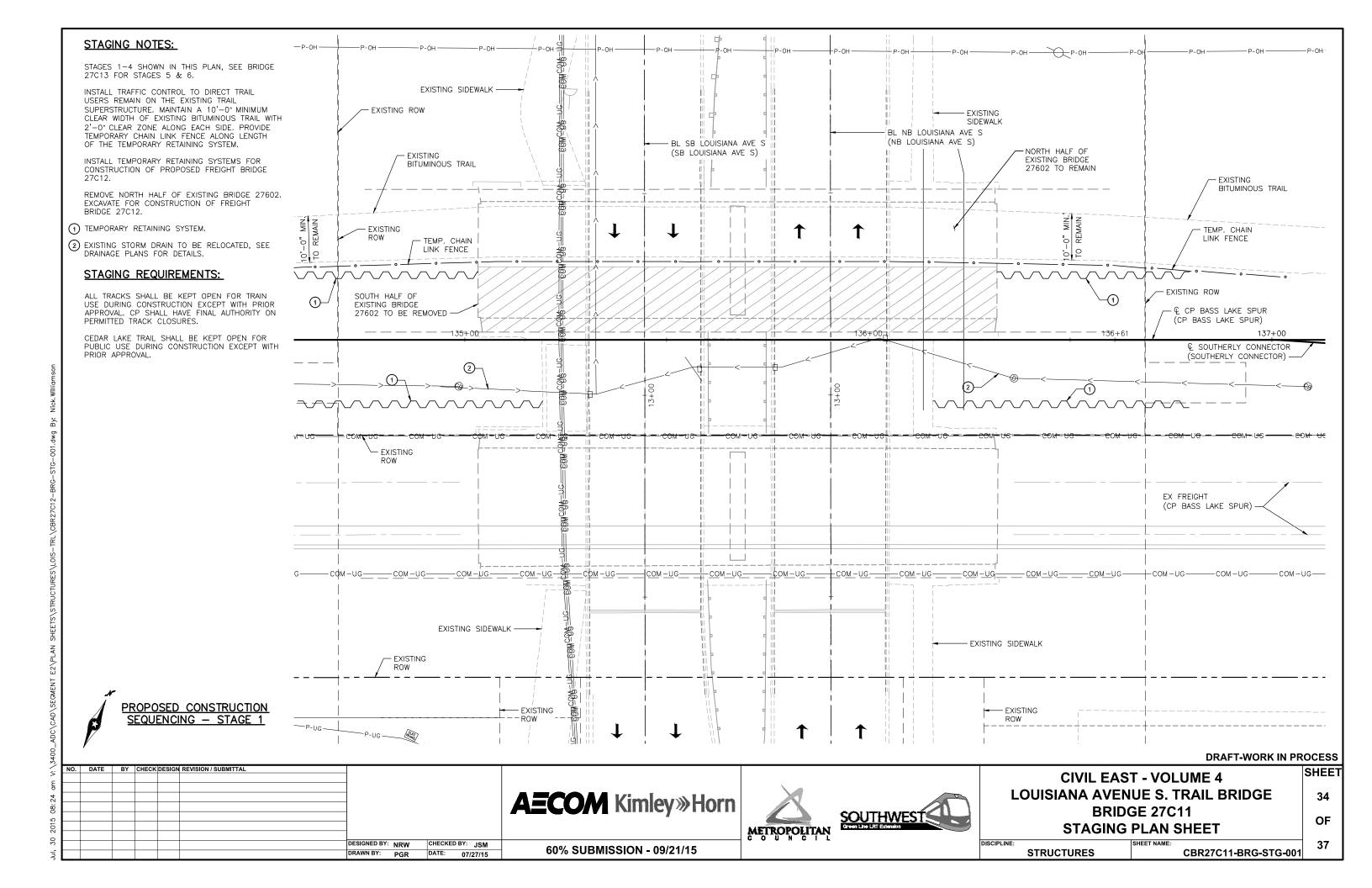
NO. DATE BY CHECK DESIGN REVISION / SUBMITTAL SHEET **CIVIL EAST - VOLUME 4** LOUISIANA AVENUE S. TRAIL BRIDGE **AECOM** Kimley»Horn 30 SOUTHWEST Creen Line Little Extension **BRIDGE 27C11** OF **BRIDGE SURVEY** METROPOLITAN DESIGNED BY: NRW CHECKED BY: JSM DISCIPLINE: 37 60% SUBMISSION - 09/21/15 DRAWN BY: PGR DATE: 07/23/15 CBR27C11-BRG-SUR-002 **STRUCTURES** 

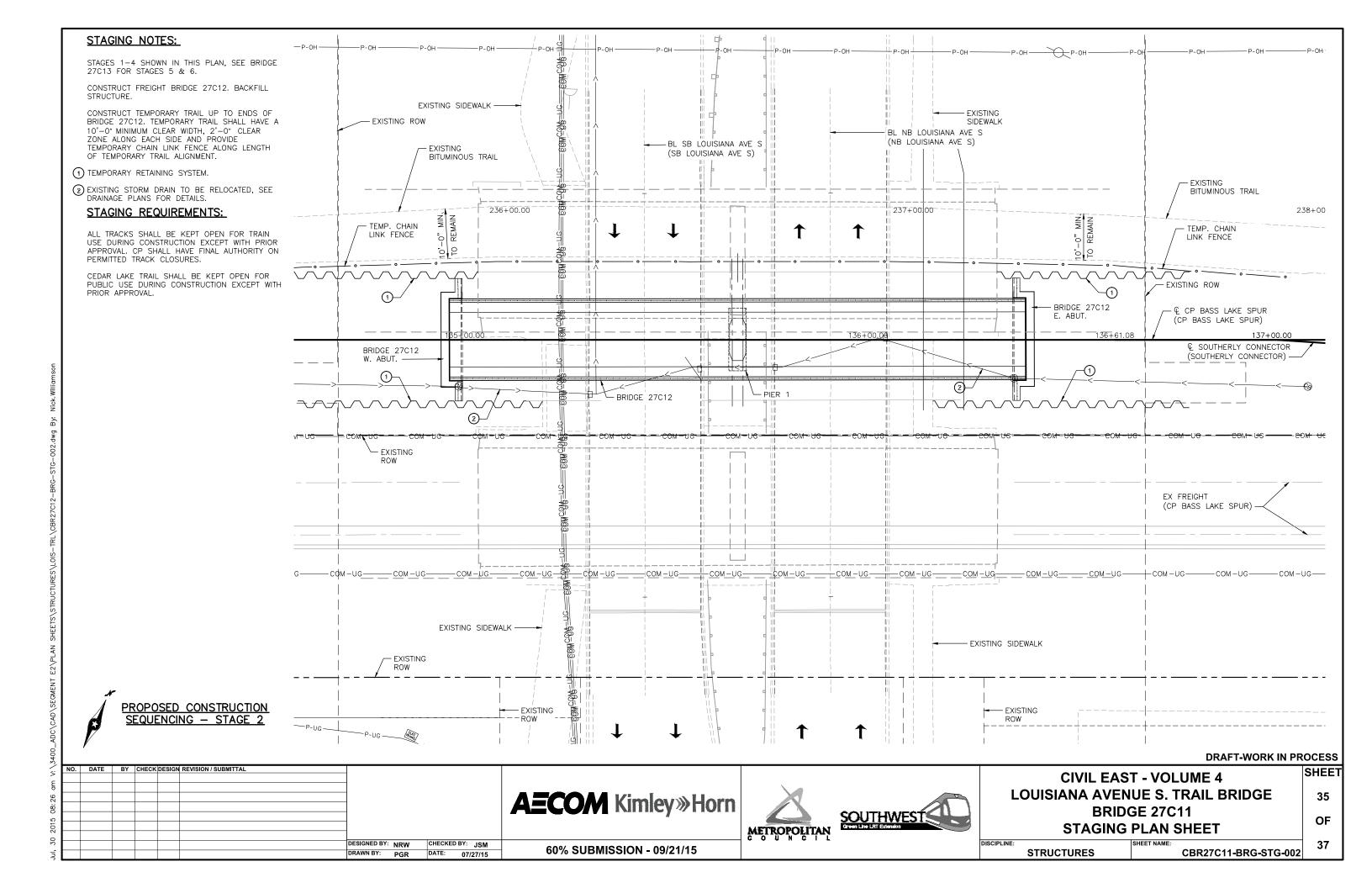
(STOC\_ADD (STOCKER) EX ( FAN STEELS (STOCKES (FOR THE (VERY) OF THE STOCKER)

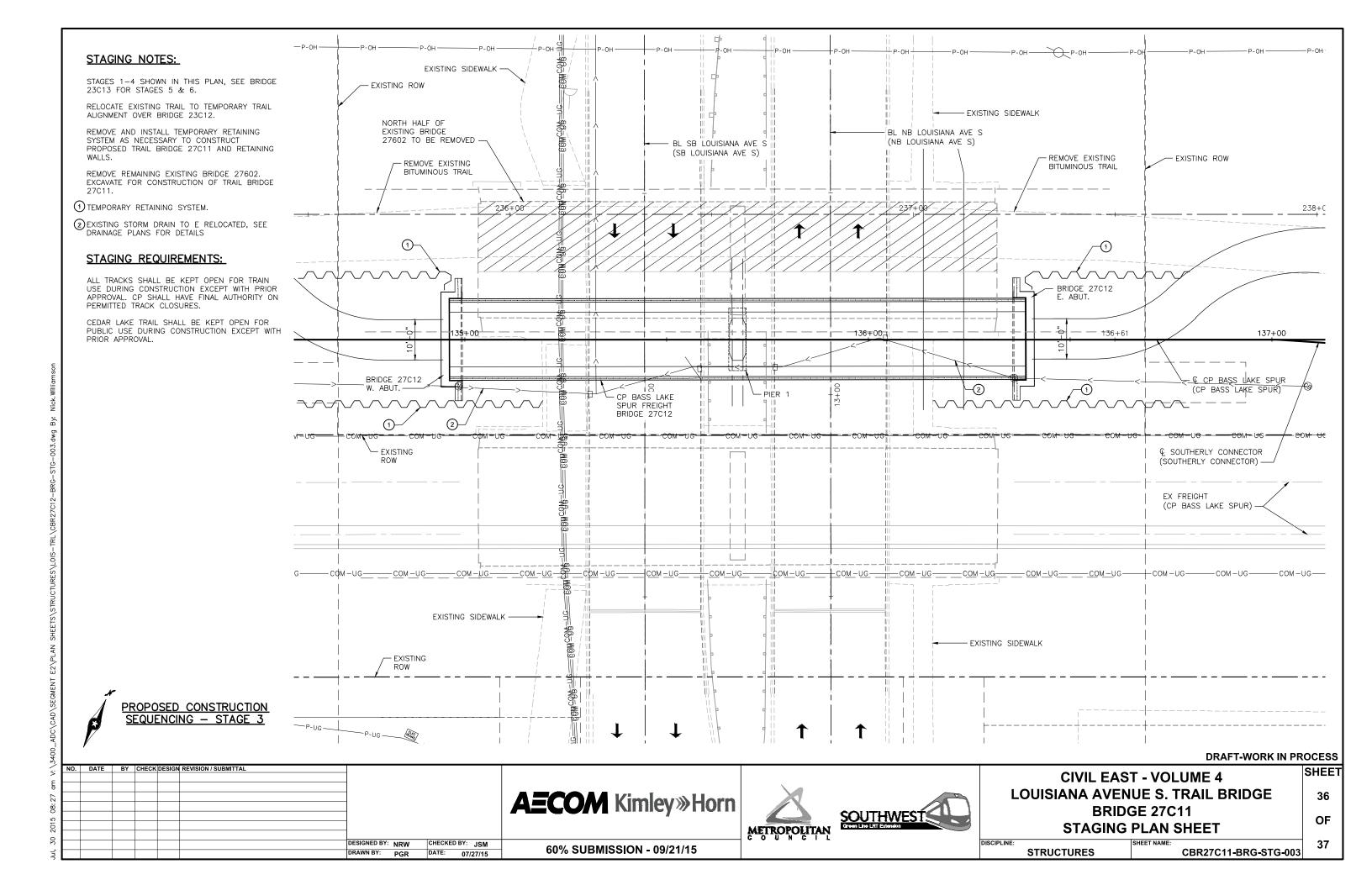


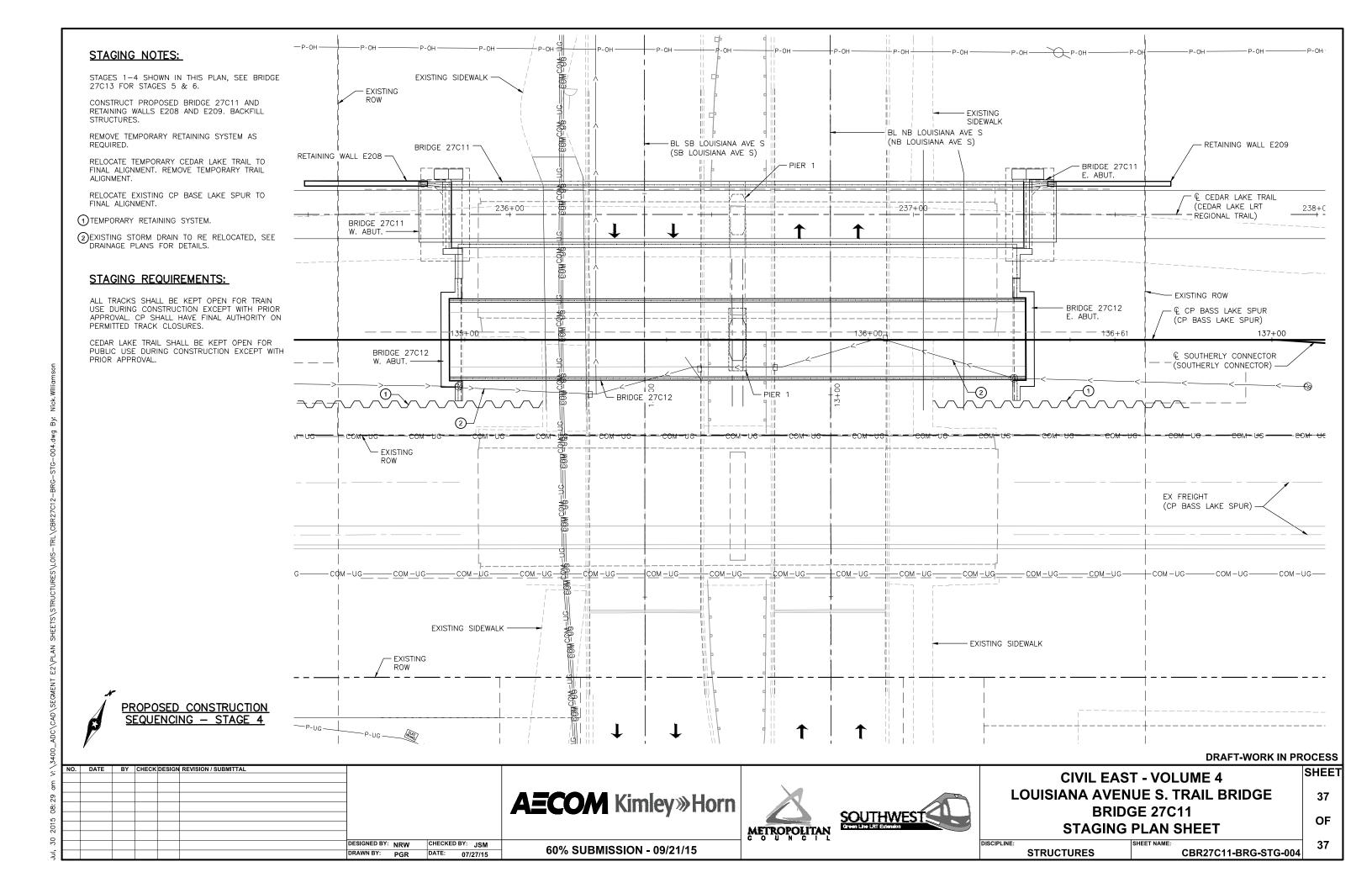


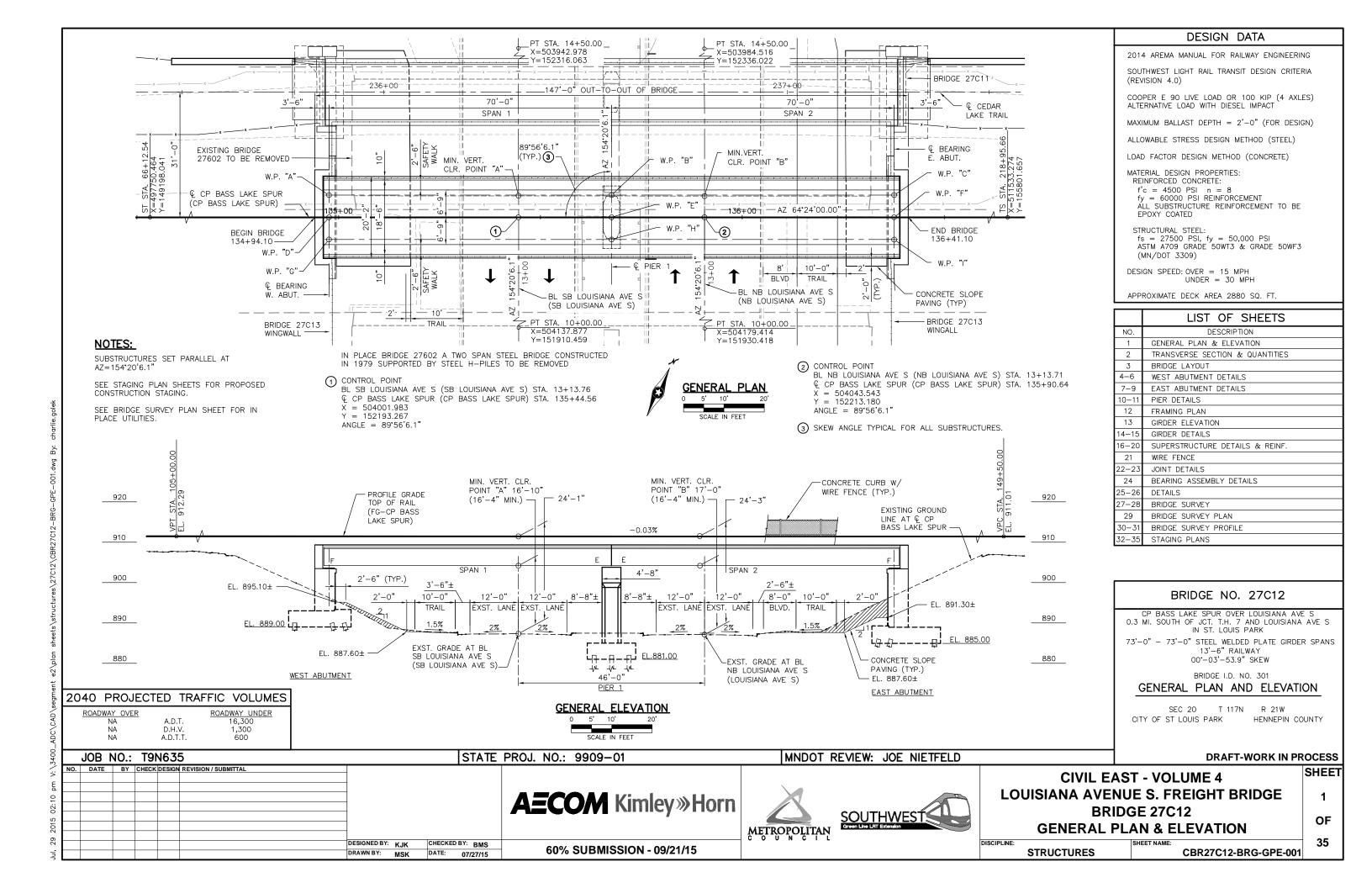


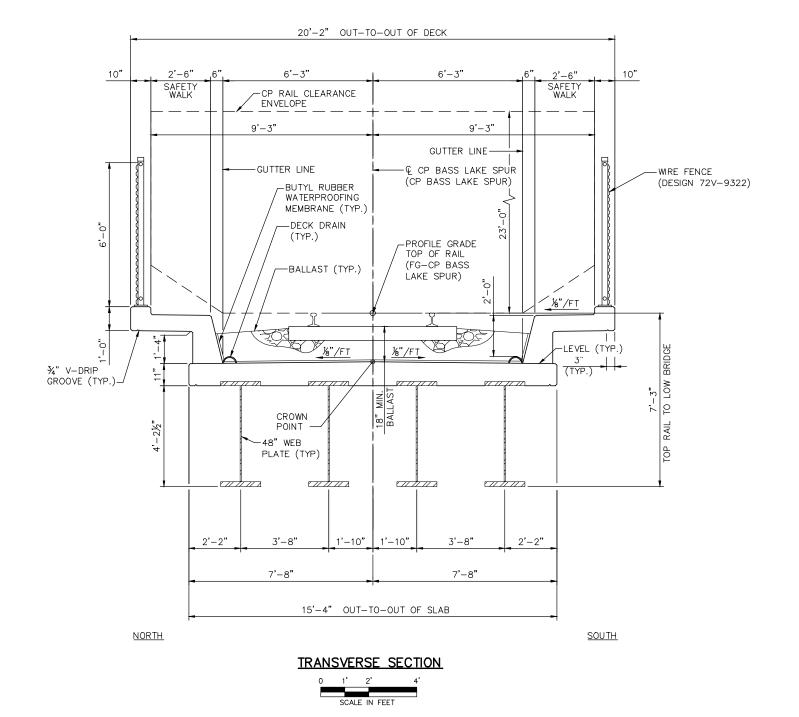












	SCHEDULE OF QUANTITIES FOR EN	TIRE BRIDGE	
ITEM NO.	ITEM	UNIT	QUANTITY
2401.501	STRUCTURAL CONCRETE (1G52)	CU. YD.	(P)
2401.501	STRUCTURAL CONCRETE (3B52)	CU. YD.	(P)
2401.501	STRUCTURAL CONCRETE (3S52)	CU. YD.	(P)
2401.541	REINFORCEMENT BARS	POUND	(P)
2401.541	REINFORCEMENT BARS (EPOXY COATED)	POUND	(P)
2401.618	BRIDGE SLAB CONCRETE (3B52)	SQ. FT.	(P)
2402.521	STRUCTURAL STEEL (3306)	POUND	(P)
2402.521	STRUCTURAL STEEL (3309)	POUND	(P)
2402.595	BEARING ASSEMBLY	EACH	(P)
2411.618	ANTI-GRAFFITI COATING	SQ. FT.	(P)
2411.618	ARCHITECTURAL SURFACE FINISH (SPECIAL)	SQ. FT.	(P)
2411.618	ARCHITECTURAL CONC TEXTURE (SPECIAL)	SQ. FT.	(P)
2442.501	REMOVE EXISTING BRIDGE	LUMP SUM	
2452.510	STEEL H-PILING DRIVEN 12"	LIN. FT.	(P)
2452.511	STEEL H-PILING DELIVERED 12"	LIN. FT.	(P)
2452.520	STEEL H-TEST PILE 91 FT LONG 12"	EACH	(P)
2452.520	STEEL H-TEST PILE 73 FT LONG 12"	EACH	(P)
2452.520	STEEL H-TEST PILE 78 FT LONG 12"	EACH	(P)
2452.530	PILE TIP PROTECTION 12"	EACH	(P)
2452.601	STEEL SHEET PILING (TEMPORARY)	LUMP SUM	
2481.618	WATERPROOFING	SQ. FT.	(P)
2502.502	DRAINAGE SYSTEM TYPE (B910)	LUMP SUM	
2502.502	DRAINAGE SYSTEM	LUMP SUM	
2502.601	DRAINAGE SYSTEM (BRIDGE DECK)	LUMP SUM	
2557.501	WIRE FENCE DESIGN 72V-9322	LIN. FT.	(P)

### **CONSTRUCTION NOTES:**

THE 2016 EDITION OF THE MINNESOTA DEPARTMENT OF TRANSPORTATION "STANDARD SPECIFICATIONS FOR CONSTRUCTION".

BRIDGE SEAT REINFORCEMENT SHALL BE CAREFULLY PLACED TO AVOID INTERFERENCE WITH DRILLING HOLES FOR ANCHOR RODS, THE BEAMS SHALL BE ERECTED IN FINAL POSITION PRIOR TO DRILLING

THE BAR SIZES SHOWN IN THIS PLAN ARE IN U.S. CUSTOMARY DESIGNATIONS. THE FIRST DIGIT OR THE FIRST TWO DIGITS OF EACH BAR MARK INDICATE THE BAR SIZE.

BARS MARKED WITH THE SUFFIX "E" SHALL BE EPOXY COATED IN ACCORDANCE WITH SPEC. 3301.

THE SUBSURFACE UTILITY INFORMATION IN THESE PLANS IS UTILITY QUALITY LEVEL D. THIS UTILITY QUALITY LEVEL WAS DETERMINED ACCORDING TO THE GUIDELINES OF CI/ASCE 38-02, ENTITLED "STANDARD GUIDELINES FOR THE COLLECTION AND DEPICTION OF EXISTING SUBSURFACE UTILITY

THE PILE LOADS SHOWN IN THE PLANS WERE COMPUTED USING SERVICE LOAD METHODOLOGY. PILE BEARING RESISTANCE DETERMINED IN THE FIELD SHALL INCORPORATE THE METHODS AND/OR FORMULAS DESCRIBED IN THE SPECIAL PROVISIONS.

CONCRETE MATERIALS, MIX DESIGN, TESTING AND CONSTRUCTION SHALL BE IN ACCORDANCE WITH CHAPTER 8, PART 1 OF THE 2013 A.R.E.M.A. MANUAL; MnDOT 2461 AND THE SPECIAL PROVISIONS.

CONCRETE SHALL BE MADE WITH A LOW ALKAKI NORMAL PORTLAND CEMENT (TYPE I OR TYPE I/II) IN ACCORDANCE WITH ASTM C 150, LATEST EDITION, WITH LESS THAN 0.6% SODIUM EQUIVALENTS.

MAXIMUM CONCRETE WATER/CEMENT RATION SHALL BE IN ACCORDANCE WITH CHAPTER 8, SECTION 1.11 OF THE 2013 A.R.E.M.A. MANUAL AND MnDOT 2461.

**DRAFT-WORK IN PROCESS** 

NO. DATE BY CHECK DESIGN REVISION / SUBMITTAL DESIGNED BY: KJK CHECKED BY: BMS 60% SUBMISSION - 09/21/15 DRAWN BY: MSK DATE: 07/27/15

**AECOM** Kimley»Horn





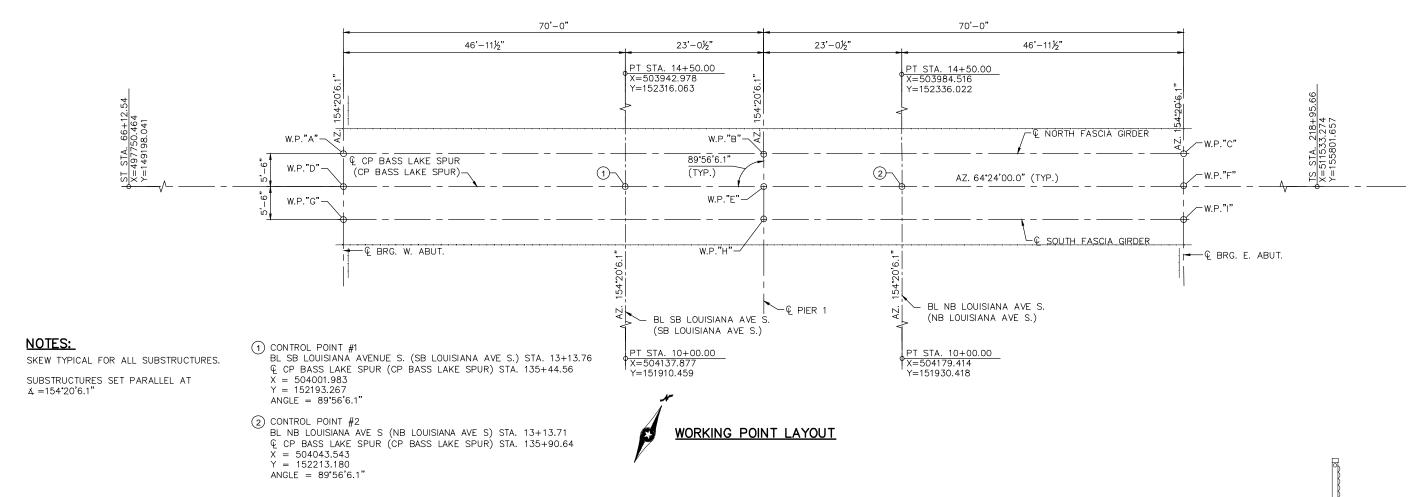
### **CIVIL EAST - VOLUME 4** LOUISIANA AVENUE S. FREIGHT BRIDGE **BRIDGE 27C12 TRANSVERSE SECTION & QUANTITIES**

**STRUCTURES** CBR27C12-BRG-SUP-001

OF 35

SHEET

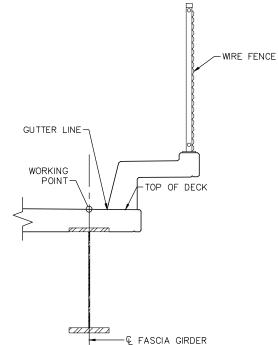
2



	DIMENSIONS BETWEEN WORKING POINTS											INATES	ELEVATION					
POINT	STATION	Α	В	С	D	Е	F	G	Н	ı	Х	Y	TOP OF RAIL	TOP OF DECK	TOP/DECK TO BR. SEAT	BRIDGE SEAT	POINT	
А	134+97.60	0.00	70.00	140.00	5.50			11.00			503957.253	152177.935	911.42	909.31	5.68	903.63	Α	
В	135+67.60		0.00	70.00		5.50			11.00		504020.381	152208.181	911.40	909.29			В	
С	136+37.60			0.00			5.50			11.00	504083.509	152238.427	911.38	909.27	5.68	903.59	С	
D	134+97.60				0.00	70.00	140.00	5.50			503959.635	152172.977	911.42	909.36			D	
Е	135+67.60					0.00	70.00		5.50		504022.763	152203.223	911.40	909.34			Е	
F	136+37.60						0.00			5.50	504085.891	152233.469	911.38	909.32			F	
G	134+97.61							0.00	70.00	140.00	503962.017	152168.020	911.42	909.31	5.68	903.63	G	
Н	135+67.61								0.00	70.00	504025.145	152198.266	911.40	909.29			Н	
Ī	136+37.61	·								0.00	504088.274	152228.512	911.38	909.27	5.68	903.59	I	

	TOP OF B	RIDGE DEC	K TO BRID	GE SEAT		
	W.P. "A"	W.P. "B"	W.P. "C"	W.P. "G"	W.P. "H"	W.P. "I"
SLAB THICKNESS	11 1/8"	11 1/8"	11 1/8"	11 1/8"	11 1/8"	11 1/8"
WEB HEIGHT	48"	48"	48"	48"	48"	48"
BOTTOM FLANGE HEIGHT	2 1/2"	2 1/2"	2 1/2"	2 1/2"	2 1/2"	2 1/2"
BEARING HEIGHT	6.5"	9"	6.5"	6.5"	9"	6.5"
TOTAL	5'-8 1/8"	5'-10 5/8"	5'-8 1/8"	5'-8 1/8"	5'-10 5/8"	5'-8 1/8"
TOTAL	5.677	5.885	5.677	5.677	5.885	5.677

ALL BEAMS SET PARALLEL TO WORKING LINE, ALL DIAPHRAGMS SET PARALLEL TO SUBSTRUCTURES.



DRA	FT_W	<b>IORK</b>	IN PI	ROC	<b>FSS</b>
	1 - V 1		113 1	100	

NO. DATE BY CHECK DESIGN REVISION / SUBMITTAL **CIVIL EAST - VOLUME 4** LOUISIANA AVENUE S. FREIGHT BRIDGE **AECOM** Kimley»Horn SOUTHWEST Creen Line Little Extension METROPOLITAN DESIGNED BY: KJK CHECKED BY: BMS DISCIPLINE: 60% SUBMISSION - 09/21/15 DATE: 07/27/15 DRAWN BY: MSK

SHEET 3 OF

CBR27C12-BRG-SUP-003 **STRUCTURES** 

**BRIDGE 27C12** 

**BRIDGE LAYOUT** 

WEST ABUT	MENT
COMPUTED PILE LOA	AD - TONS/PILE
DEAD LOAD + EARTH PRESSURE	20
LIVE LOAD	30
DESIGN LOAD	50

\* BASED ON GROUP I LOADING (SERVICE LOAD) PER ARENA CHAPTER 8 SECTION 2.2.4

### **GENERAL PILE NOTES**

1 HP12x53 STEEL TEST PILES 91 FT. LONG
17 HP12x53 STEEL PILES EST. 91 FT. LENGTH
18 HP12x53 STEEL PILES REQ'D FOR WEST ABUT.

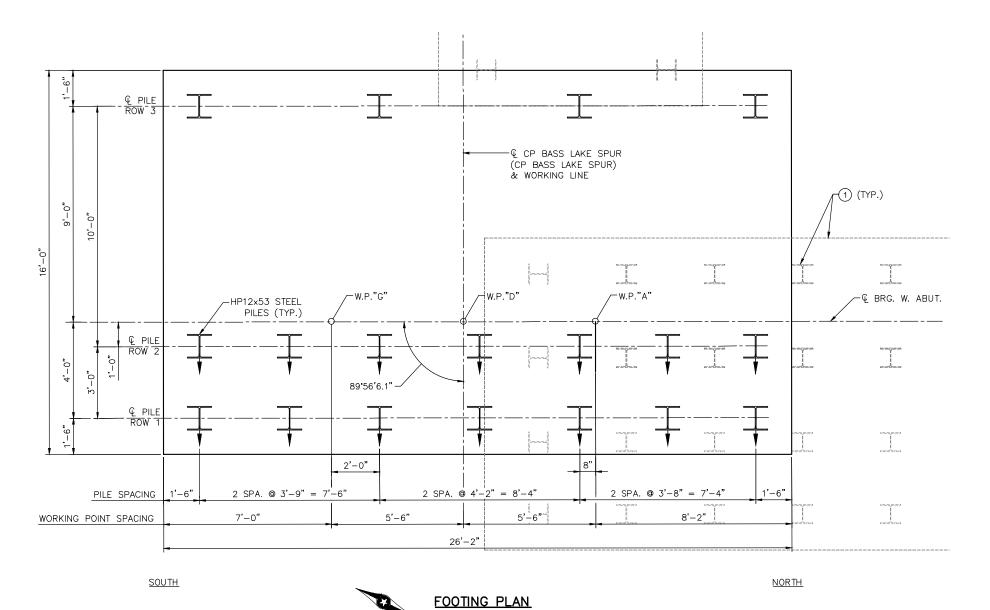
ALL PILES TO BE HP12x53 WITH PILE TIP PROTECTION.

PILE SPACING SHOWN IS AT BOTTOM OF FOOTING.

PILES MARKED THUS  $\overset{1}{\perp}$  TO BE BATTERED 3" PER FOOT IN DIRECTION SHOWN.

FOR PILE SPLICE DETAILS SEE DETAIL B202.

SEE SURVEY SHEET FOR TEST PILE LOCATIONS.



### NOTES:

1 EXISTING BRIDGE 27602 FOOTING. EXISTING FOOTING CONCRETE SHALL BE REMOVED. EXISTING PILES SHALL BE INCORPORATED INTO NEW WORK

**DRAFT-WORK IN PROCESS** 

**AECOM** Kimley»Horn





CIVIL EAST - VOLUME 4 LOUISIANA AVENUE S. FREIGHT BRIDGE BRIDGE 27C12 WEST ABUTMENT DETAILS

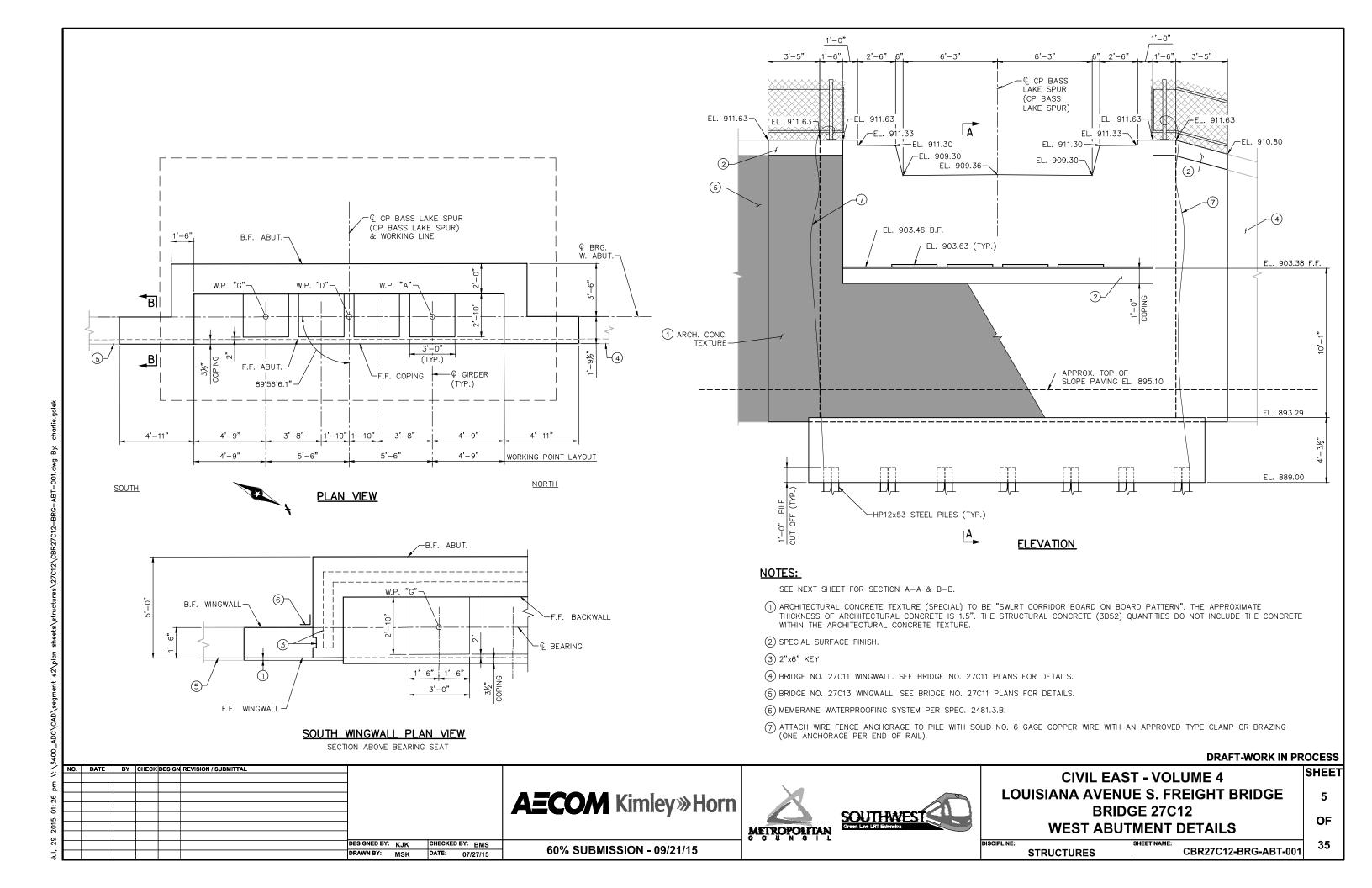
DISCIPLINE:
STRUCTURES
STRUCTURES
SHEET NAME:
CBR27C12-BRG-ABT-002

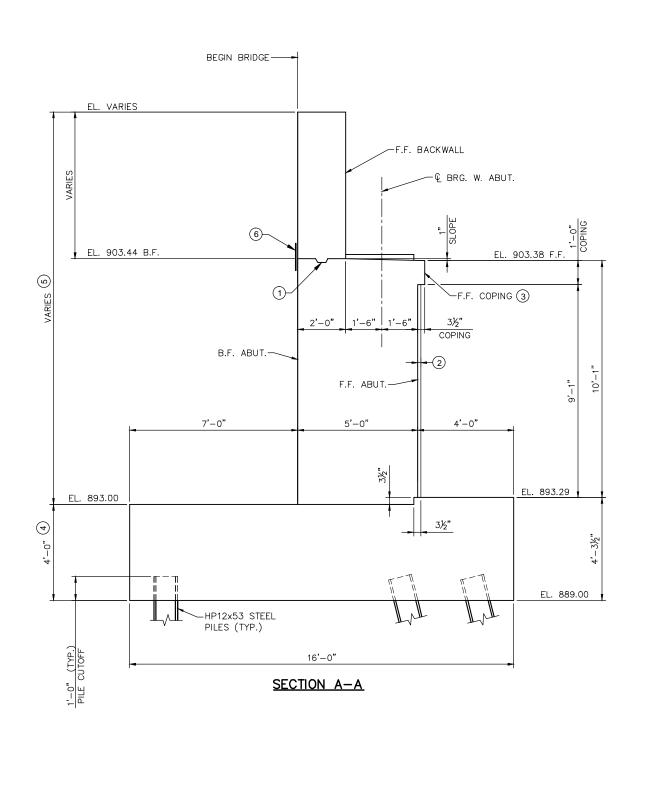
OF 35

SHEET

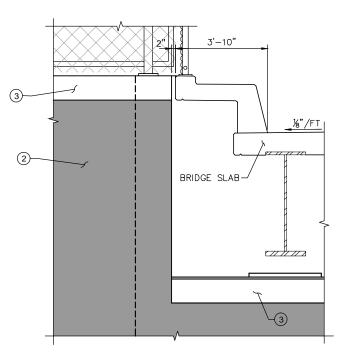
7\\ ma 20:10 2100 90 lill.

60% SUBMISSION - 09/21/15





- 1 PERMISSIBLE CONSTRUCTION JOINT WITH 2"x6" KEY CENTERED IN WALL.
- ② ARCHITECTURAL CONCRETE TEXTURE (SPECIAL) TO BE "SWLRT CORRIDOR BOARD ON BOARD PATTERN". THE APPROXIMATE THICKNESS OF ARCHITECTURAL CONCRETE IS 1.5". THE STRUCTURAL CONCRETE (3B52) QUANTITIES DO NOT INCLUDE THE CONCRETE WITHIN THE ARCHITECTURAL CONCRETE TEXTURE.
- 3 SPECIAL SURFACE FINISH.
- (4) STRUCTURAL CONCRETE (1G52).
- 5 STRUCTURAL CONCRETE (3B52).
- 6 MEMBRANE WATERPROOFING SYSTEM PER SPEC. 2481.3.B.





EL. 893.00

2

F.F. COPING-



### DRAFT-WORK IN PROCESS

DESIGNED BY: KJK CHECKED BY: BMS
DRAWN BY: MSK DATE: 07/27/15

CHECKED BY: BMS
DRAWN BY: MSK DATE: 07/27/15

60% SUBMISSION - 09/21/15





-F.F. WINGWALL

B.F. WINGWALL

## CIVIL EAST - VOLUME 4 LOUISIANA AVENUE S. FREIGHT BRIDGE BRIDGE 27C12 WEST ABUTMENT DETAILS

DISCIPLINE: STRUCTURES SHEET NAME: CBR27C12-BRG-ABT-003

35 35

SHEET

6

OF

## EAST ABUTMENT COMPUTED PILE LOAD - TONS/PILE DEAD LOAD + 25 LIVE LOAD 35 DESIGN LOAD 60

\* BASED ON GROUP I LOADING (SERVICE LOAD) PER ARENA CHAPTER 8 SECTION 2.2.4

### **GENERAL PILE NOTES**

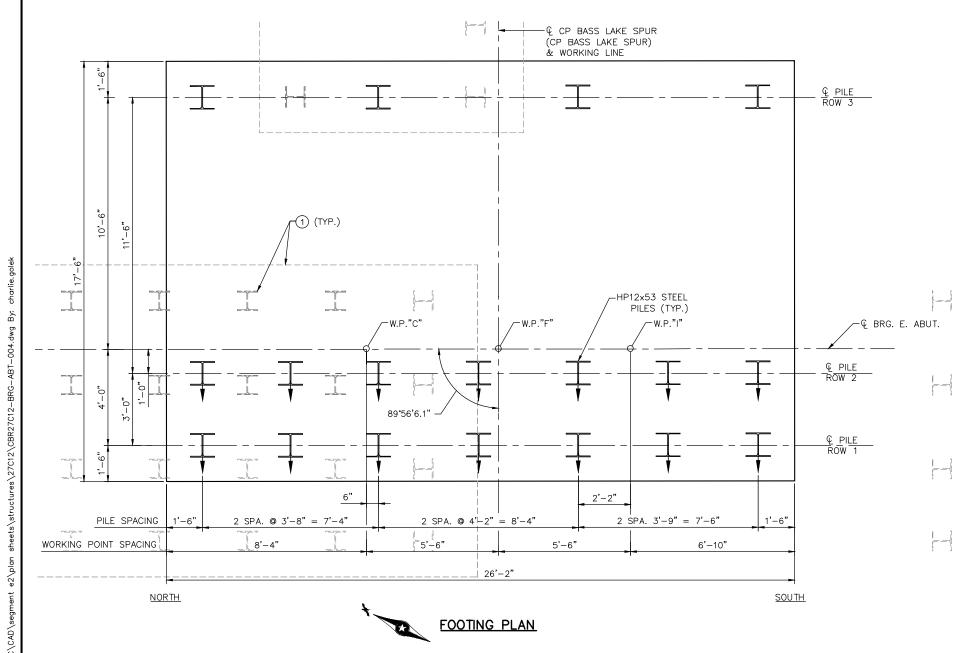
- 1 HP12x53 STEEL TEST PILES 78 FT. LONG 17 HP12x53 STEEL PILES EST. 78 FT. LENGTH
- 18 HP12x53 STEEL PILES REQ'D FOR EAST ABUT.
  ALL PILES TO BE HP12x53 WITH PILE TIP PROTECTION.

PILE SPACING SHOWN IS AT BOTTOM OF FOOTING.

PILES MARKED THUS  $\stackrel{1}{\pm}$  TO BE BATTERED 3" PER FOOT IN DIRECTION SHOWN.

FOR PILE SPLICE DETAILS SEE DETAIL B202.

SEE SURVEY SHEET FOR TEST PILE LOCATIONS.



CHECKED BY: BMS

DATE: 07/27/15

### NOTES

(1) EXISTING BRIDGE 27602 FOOTING. EXISTING FOOTING CONCRETE SHALL BE REMOVED. EXISTING PILES SHALL BE INCORPORATED INTO NEW

**DRAFT-WORK IN PROCESS** 

NO. DATE BY CHECK DESIGN REVISION / SUBMITTAL

DESIGNED BY: KJK

DRAWN BY: MSK

**AECOM** Kimley»Horn

60% SUBMISSION - 09/21/15





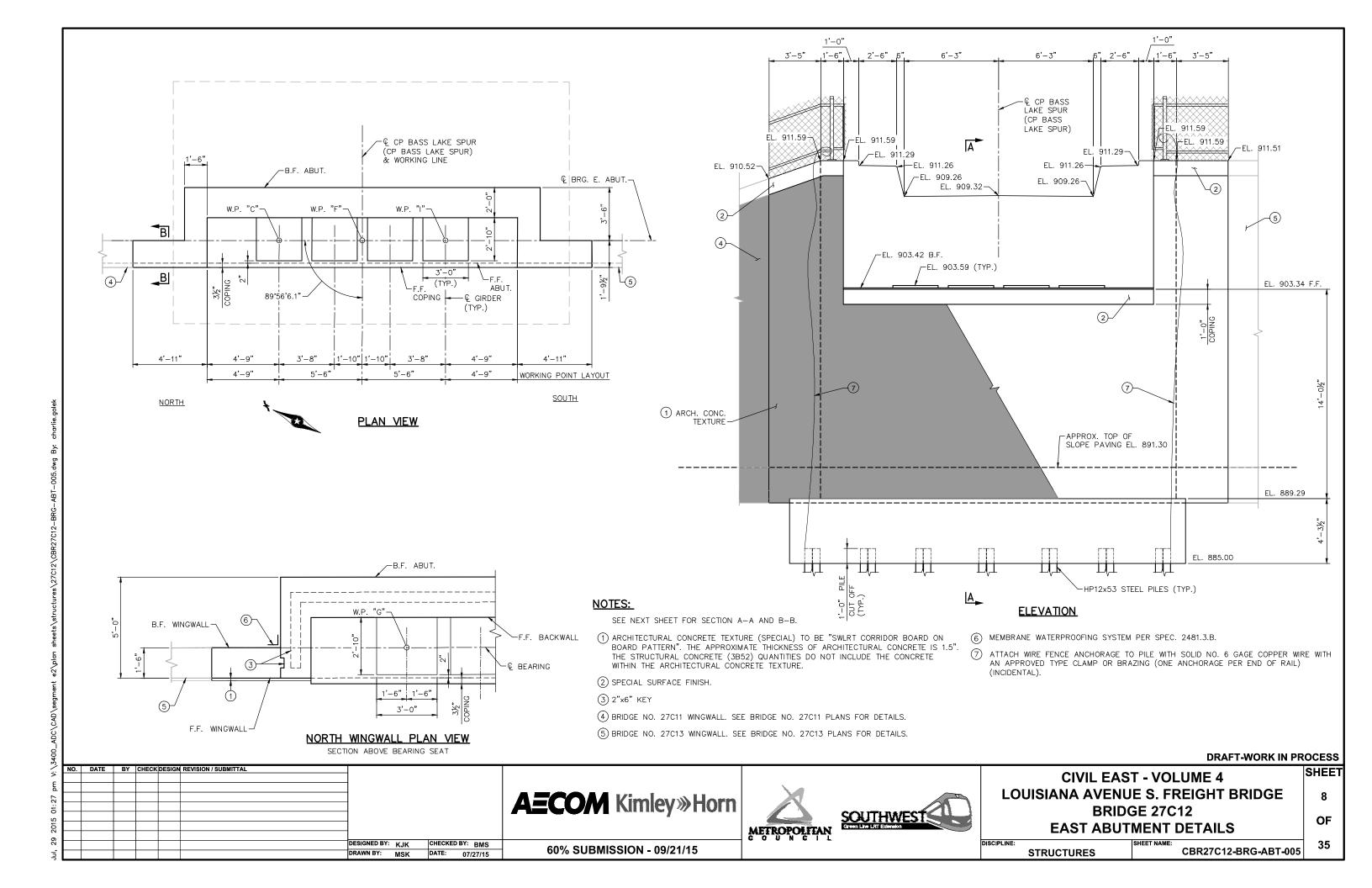
CIVIL EAST - VOLUME 4
LOUISIANA AVENUE S. FREIGHT BRIDGE
BRIDGE 27C12
EAST ABUTMENT DETAILS

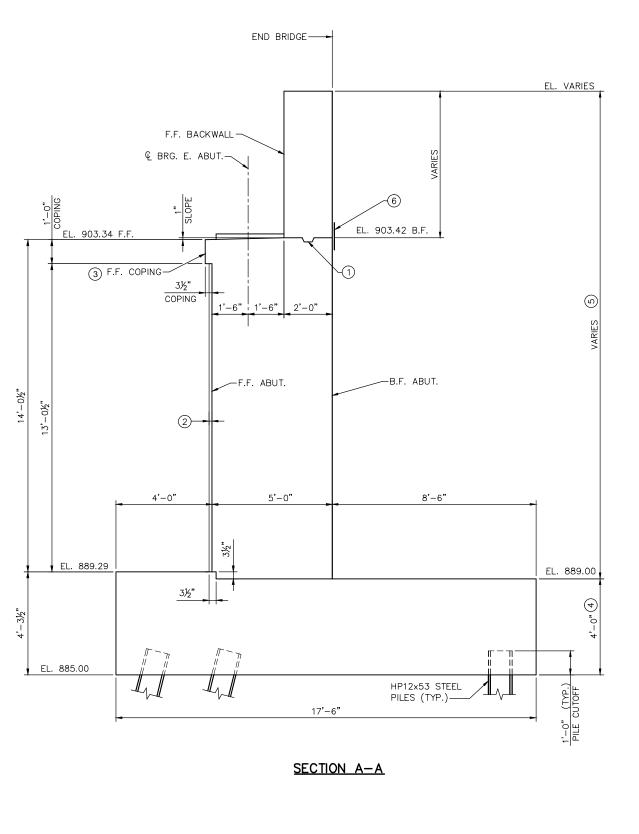
DISCIPLINE:
STRUCTURES
SHEET NAME:
CBR27C12-BRG-ABT-004

OF 35

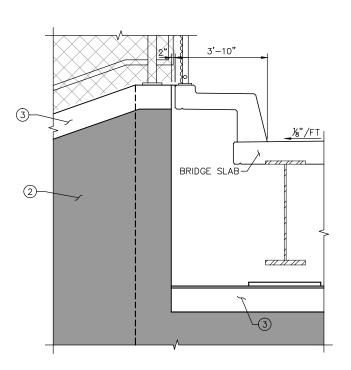
SHEET

7





- 1 PERMISSIBLE CONSTRUCTION JOINT WITH 2"x6" KEY CENTERED IN WALL.
- 2) ARCHITECTURAL CONCRETE TEXTURE (SPECIAL) TO BE "SWLRT CORRIDOR BOARD ON BOARD PATTERN". THE APPROXIMATE THICKNESS OF ARCHITECTURAL CONCRETE IS 1.5". THE STRUCTURAL CONCRETE (3B52) QUANTITIES DO NOT INCLUDE THE CONCRETE WITHIN THE ARCHITECTURAL CONCRETE TEXTURE.
- 3 SPECIAL SURFACE FINISH.
- (4) STRUCTURAL CONCRETE (1G52).
- 5 STRUCTURAL CONCRETE (3B52).
- (6) MEMBRANE WATERPROOFING SYSTEM PER SPEC. 2481.3.B.



SECTION B-B

2

EL. 889.00

-F.F. WINGWALL

─B.F. WINGWALL

F.F. COPING-

(5)

### NORTH CORNER ELEVATION VIEW

SOUTH CORNER SIMILAR

**DRAFT-WORK IN PROCESS** 

NO. DATE BY CHECK/DESIGN REVISION / SUBMITTAL

AECOM Kimley Horn

AECOM Kimley Horn

METROPOLITAN

METROPOLITAN

SUBMITTAL

DESIGNED BY: KJK CHECKED BY: BMS DRAWN BY: MSK DATE: 07/27/15

GOWN BY: MSK DATE: 07/27/15

GOWS SUBMISSION - 09/21/15

CIVIL EAST - VOLUME 4

LOUISIANA AVENUE S. FREIGHT BRIDGE
BRIDGE 27C12

EAST ABUTMENT DETAILS

DISCIPLINE:
STRUCTURES

CBR27C12-BRG-ABT-006

# PIER 1 COMPUTED PILE LOAD - TONS/PILE DEAD LOAD LIVE LOAD OVERTURNING TOTAL LOAD DESIGN LOAD

### **GENERAL PILE NOTES:**

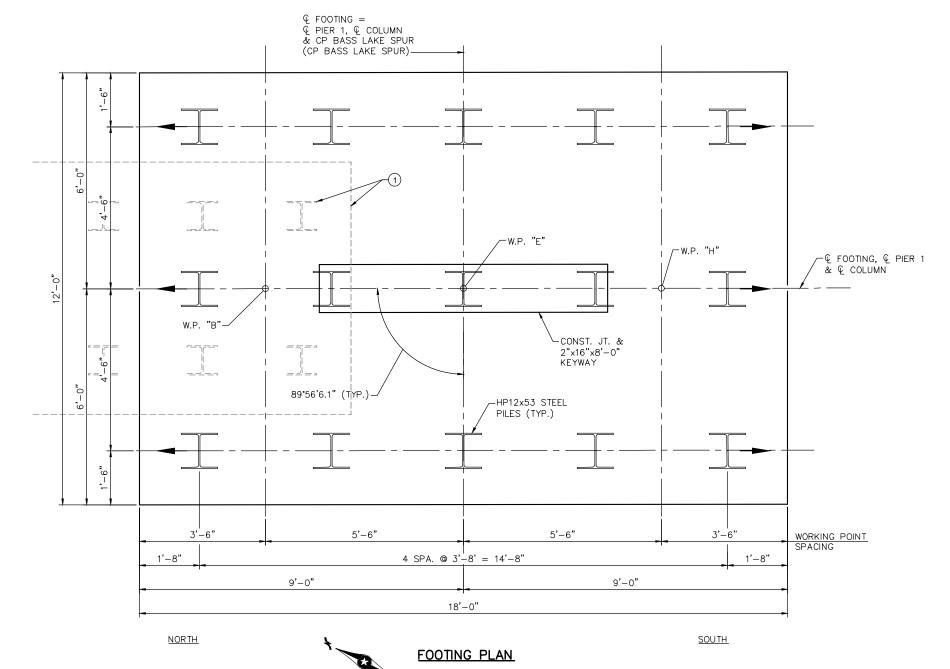
- 1 HP12x53 STEEL TEST PILES 73 FT. LONG
- 14 HP12x53 STEEL PILES EST. 73 FT. LENGTH
  15 HP12x53 STEEL PILES REQ'D FOR PIER 1
- ALL PILES TO BE HP12x53 WITH PILE TIP PROTECTION.

PILE SPACING SHOWN IS AT BOTTOM OF FOOTING.

PILES MARKED THUS  $\dot{\perp}$  TO BE BATTERED 2" PER FOOT IN DIRECTION SHOWN.

FOR PILE SPLICE DETAILS SEE DETAIL B202.

SEE SURVEY SHEET FOR TEST PILE LOCATIONS.



CHECKED BY: BMS

DATE: 07/27/15

### NOTES:

(1) EXISTING BRIDGE 27602 FOOTING. EXISTING FOOTING CONCRETE SHALL BE REMOVED. EXISTING PILES SHALL BE INCORPORATED INTO NEW

**DRAFT-WORK IN PROCESS** 

SHEET

10

OF

35

NO. DATE BY CHECK DESIGN REVISION / SUBMITTAL

DESIGNED BY: KJK
DRAWN BY: MSK

**AECOM** Kimley»Horn

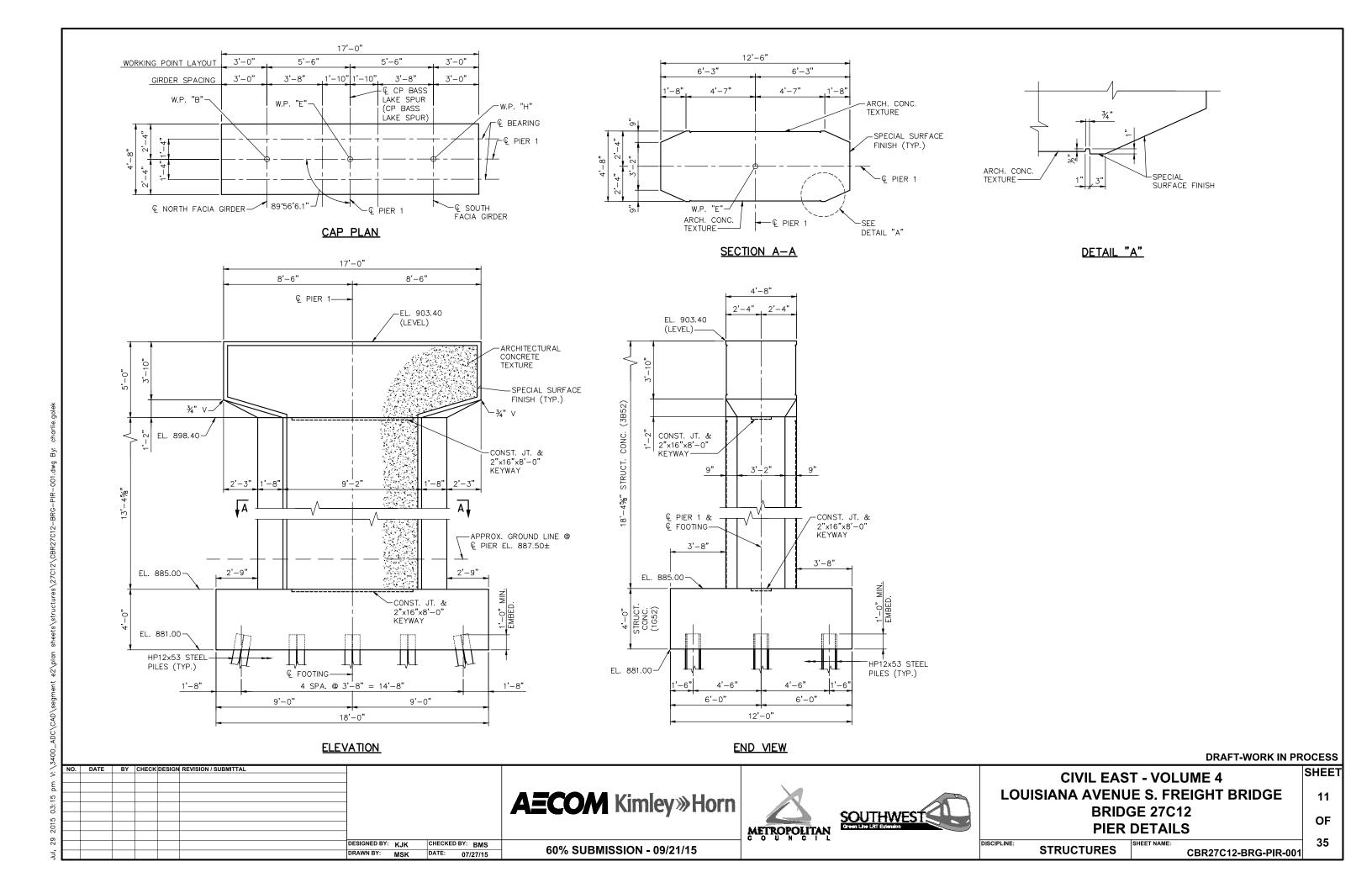
60% SUBMISSION - 09/21/15

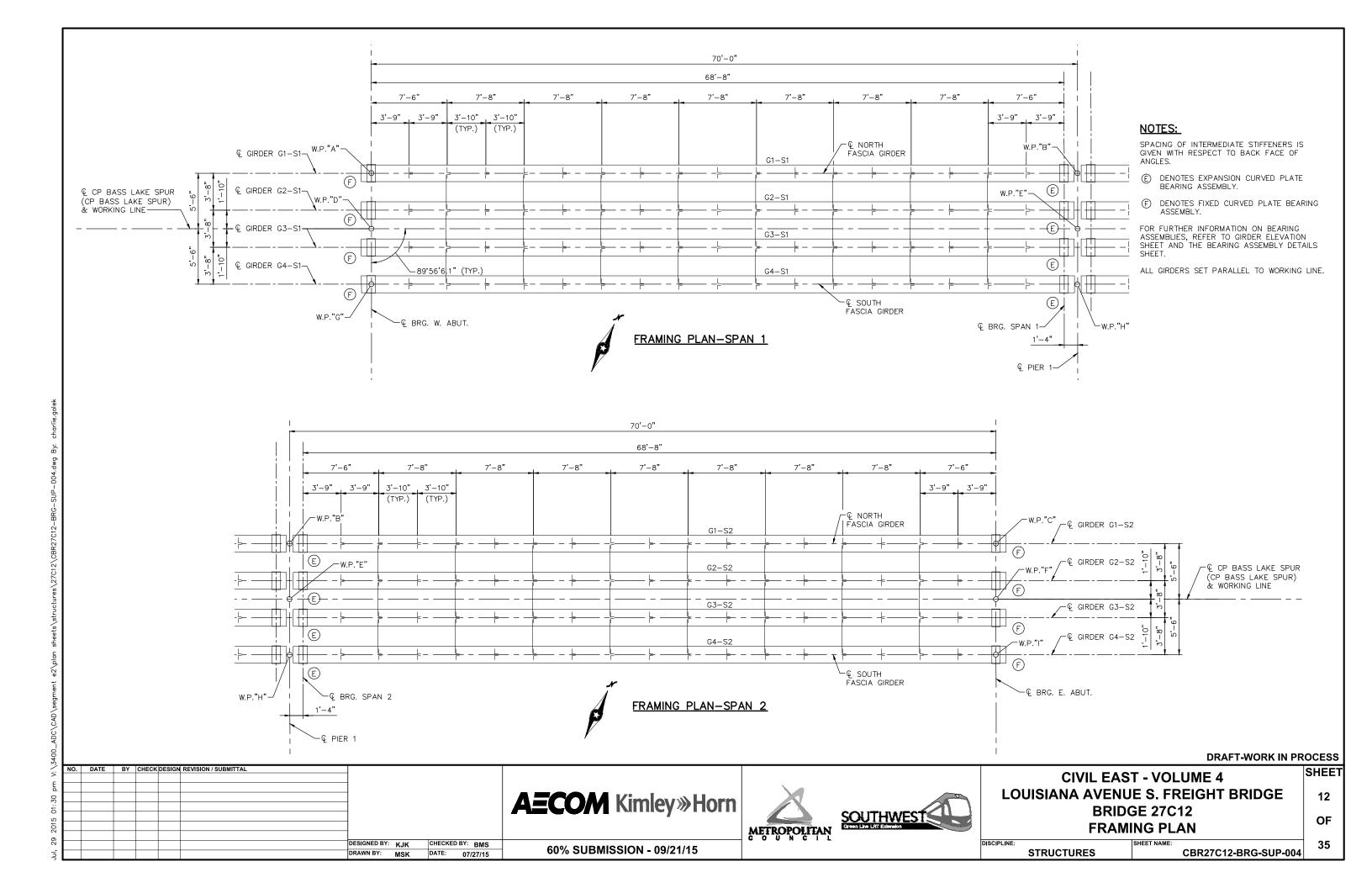


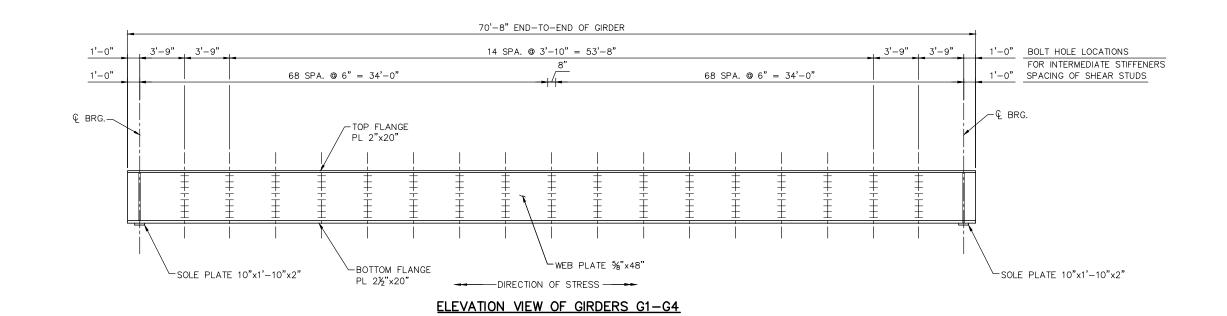


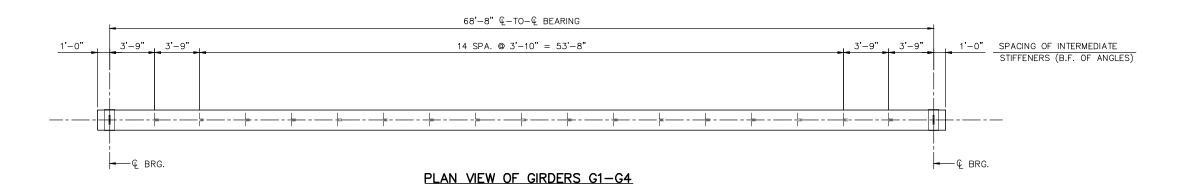
CIVIL EAST - VOLUME 4
LOUISIANA AVENUE S. FREIGHT BRIDGE
BRIDGE 27C12
PIER DETAILS

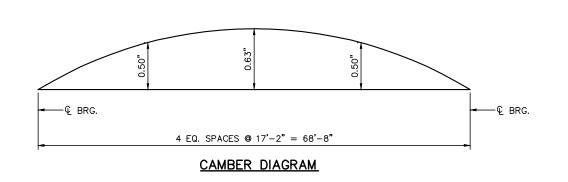
DISCIPLINE: STRUCTURES SHEET NAME: CBR27C12-BRG-PIR-002







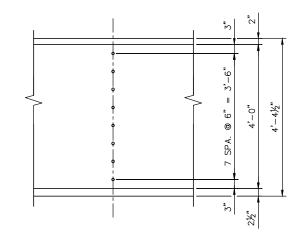


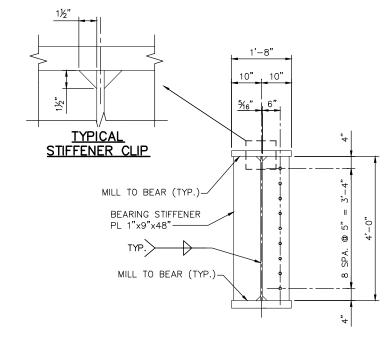


- STRUCTURAL STEEL SHALL CONFORM TO MN/DOT 3309 ASTM A709 GRADE 50WF3 UNLESS OTHERWISE NOTED.
- BOLTED CONNECTIONS SHALL BE MADE WITH %" DIAMETER A325 TYPE 3 HIGH STRENGTH BOLTS, EXCEPT AS NOTED. HOLES FOR %" DIAMETER BOLTS SHALL BE <sup>15</sup>/<sub>6</sub>", EXCEPT AS NOTED.
- 3. PLACE NUT AND WASHER INSIDE OF GIRDER WEB.
- 4. WEB AND FLANGE PLATES SHALL BE FURNISHED IN AVAILABLE MILL LENGTHS WITH A MINIMUM NUMBER OF SPLICES. LOCATION OF SPLICES SHALL BE APPROVED BY ENGINEER. A SPLICE SHALL BE MINIMUM OF 12" FROM ANY STIFFENER. NO SPLICES WILL BE ALLOWED 12 FEET FROM MIDPOINT OF GIRDER.
- 5. CAMBER DIAGRAM SHOWN IS FOR BEAM IN UNLOADED POSITION AND PROVIDES FOR ALL DEAD LOAD DEFLECTIONS AND RESIDUAL CAMBER. BASE LINE IN CAMBER DIAGRAM IS A STRAIGHT LINE FROM & BRG. AT BOTTOM OF WEB.
- 6. SOLE PLATES SHALL BE SHOP WELDED TO BOTTOM FLANGE PLATES, FOR WELD DETAILS REFER TO BEARING ASSEMBLY DETAILS SHEET.
- 7. NO WELDING OR DRILLING OF HOLES FOR TEMPORARY ATTACHMENTS WILL BE PERMITTED.
- 8. THE STRUCTURAL STEEL FABRICATOR SHALL BE CERTIFIED UNDER THE A.I.S.C. QUALITY CERTIFICATION PROGRAM, CATEGORY, MAJOR STEEL BRIDGES (Cbr.).

### **DRAFT-WORK IN PROCESS**

\(\frac{1}{2}\)	D. DATE	BY CHECK DESIGN REVISION / SUBMITTAL						CIVIL EAS	T - VOLUME 4	SHEET
30 pr					<b>A=COM</b> Kimley»Horn	A		LOUISIANA AVENU	E S. FREIGHT BRIDGE	13
01:5					AECOM Kiffley » Hoffi	SOLITHIA/EST		BRIDO	GE 27C12	
2015						METROPOLITAN  Green Line Little Extension		GIRDER	ELEVATION	OF
- 59 			DESIGNED BY: KJK	CHECKED BY: BMS	COO/ CUDMICCION 00/24/45	C O U N C I L	D		SHEET NAME:	⊢ <sub>35</sub>
_ i			DRAWN BY: MSK	DATE: 07/27/15	60% SUBMISSION - 09/21/15			STRUCTURES	CBR27C12-BRG-STL-00 <sup>-</sup>	1





INTERMEDIATE STIFFENER
BOLT HOLE LAYOUT

**BEARING STIFFENER** 

### NOTES:

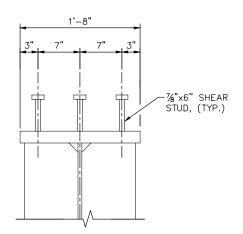
NOTE 1: BACK GOUGE ROOT TO SOUND METAL BEFORE WELDING SECOND SIDE.

NOTE 2: WEB TO FLANGE GROOVE WELDS TO BE TESTED PER CURRENT A.W.S. TABLE 6.3 & 6.4.

NOTE 3: WEB AND FLANGE BUTT WELDS SHALL BE TESTED USING RADIOGRAPHIC INSPECTION PER SPEC 2471.3M1d.

**BEAM WELDING DETAILS** 

NOTE 4: GRIND FLUSH IN THE DIRECTION OF STRESS ON ALL FOUR SIDES.

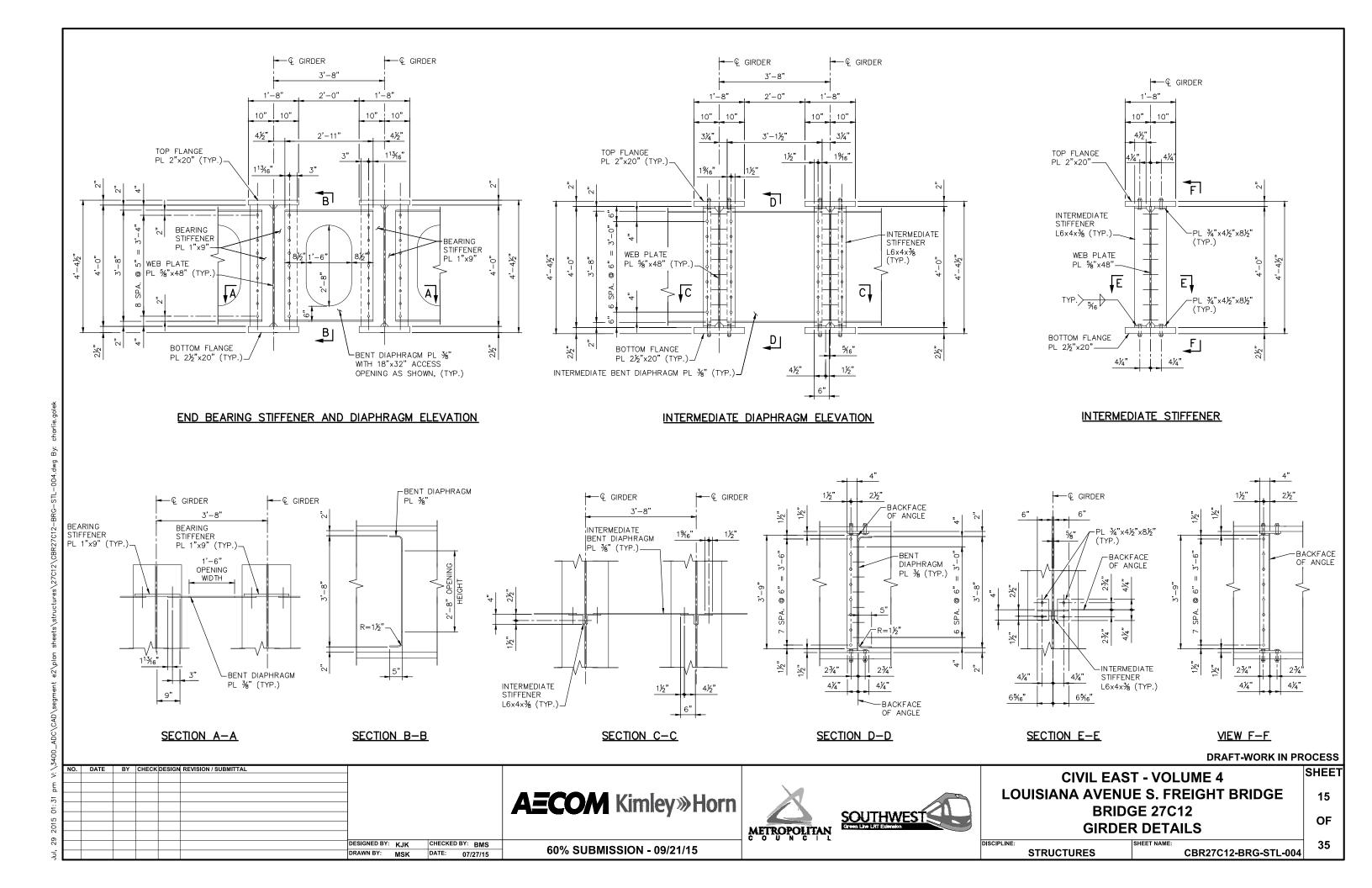


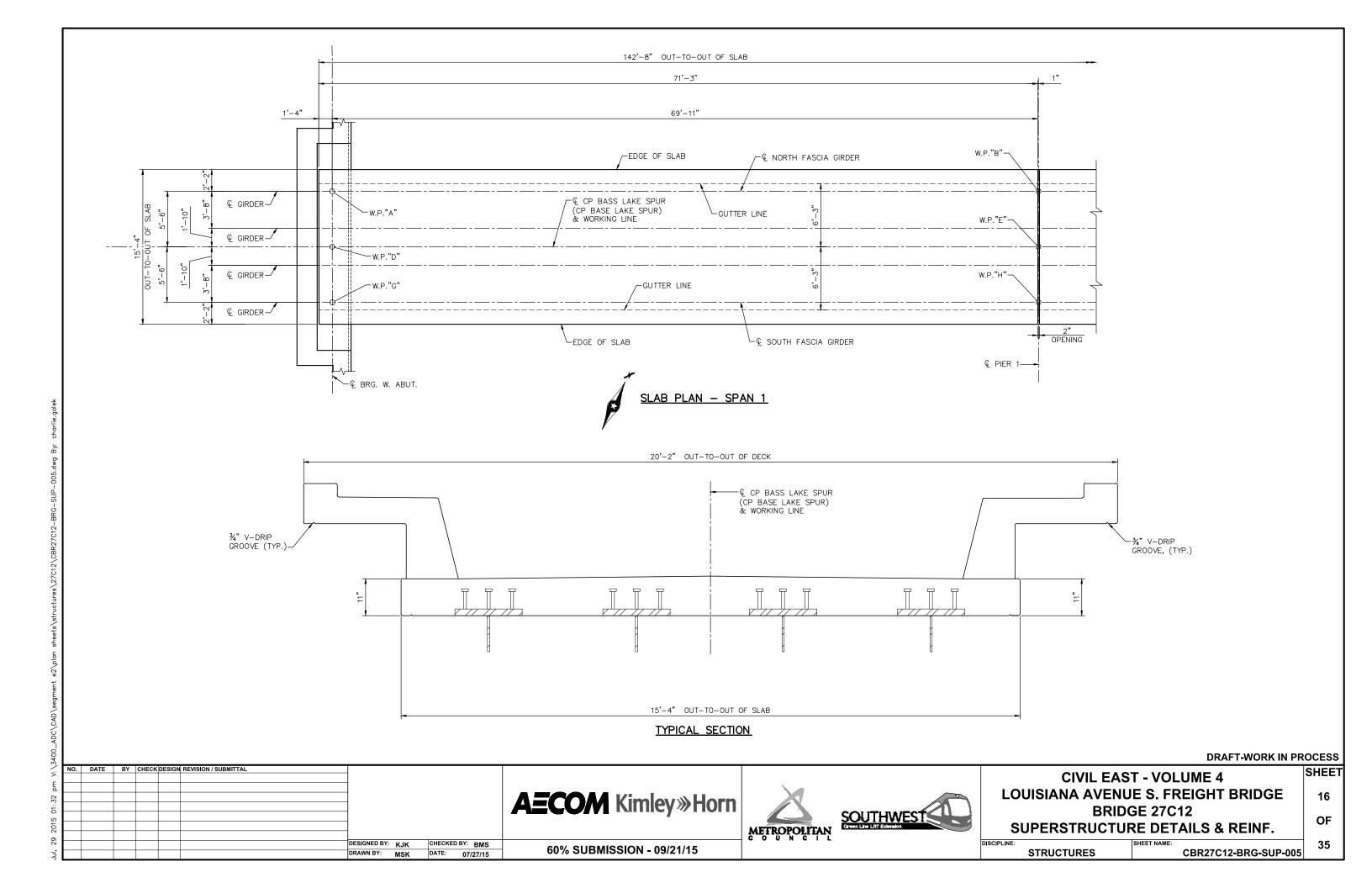
SHEAR STUD DETAIL

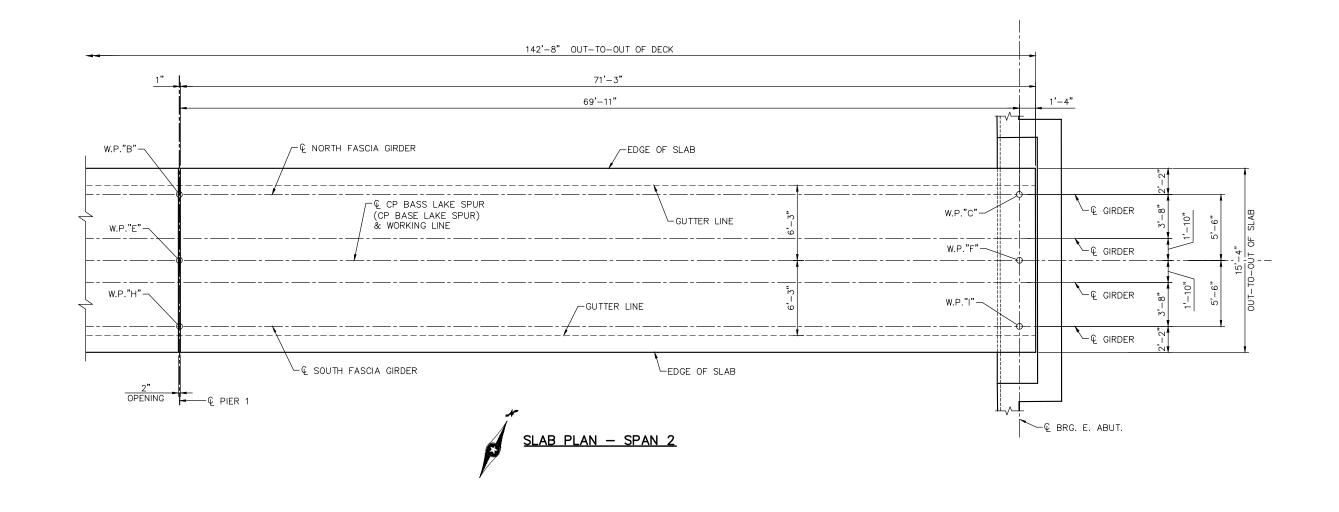
### **DRAFT-WORK IN PROCESS**

NO. DATE BY CHECK DESIGN REVISION / SUBMITTAL SHEET LOUISIANA AVENUE S. FREIGHT BRIDGE **AECOM** Kimley»Horn 14 **BRIDGE 27C12** SOUTHWEST Creen Line Little Extension OF **GIRDER DETAILS** DESIGNED BY: KJK CHECKED BY: BMS 60% SUBMISSION - 09/21/15 DRAWN BY: MSK DATE: 07/27/15 CBR27C12-BRG-STL-003 **STRUCTURES** 

**CIVIL EAST - VOLUME 4** 







**DRAFT-WORK IN PROCESS** 

AECOM Kimley Horn

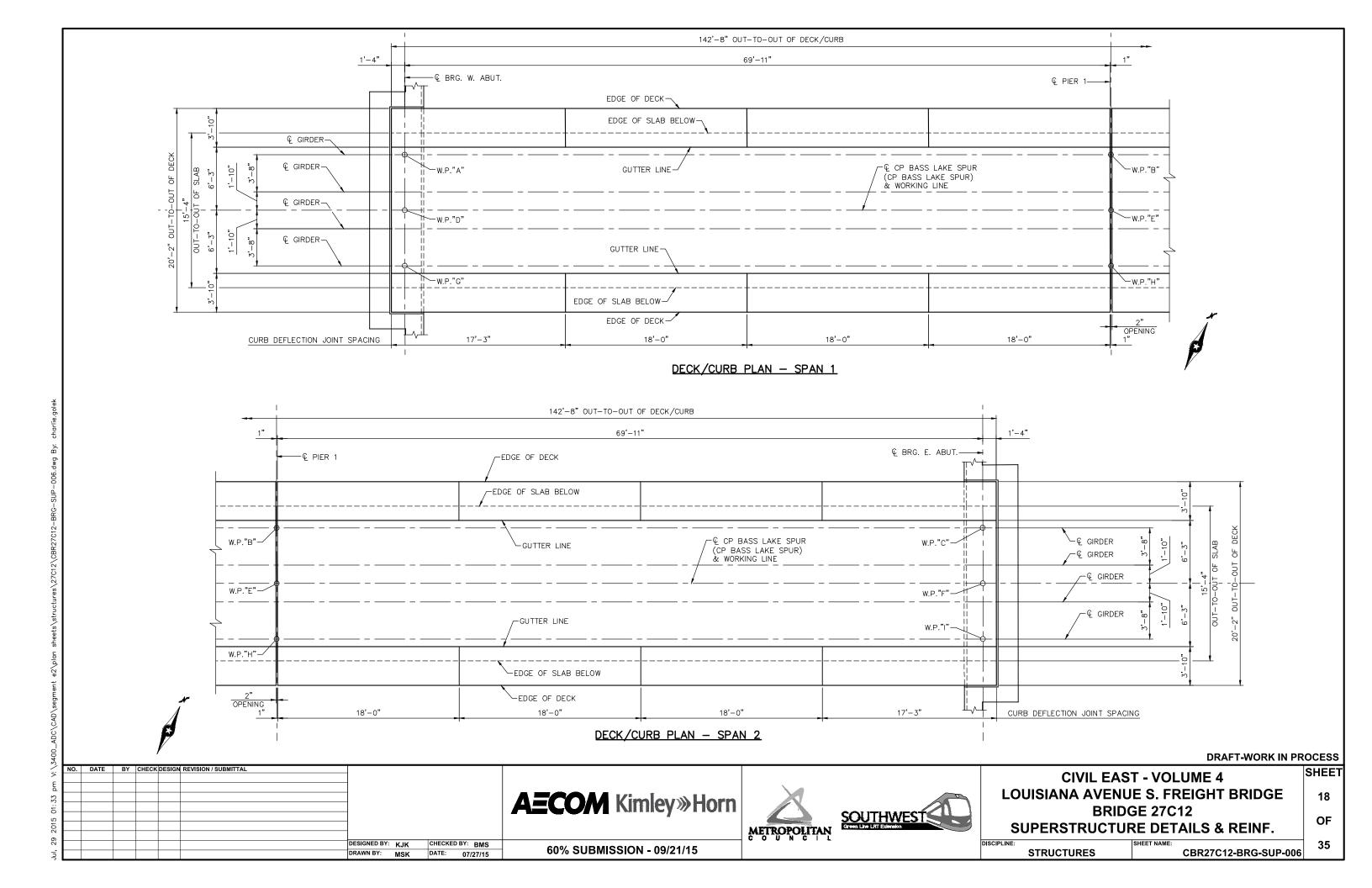
AECOM Kimley Horn

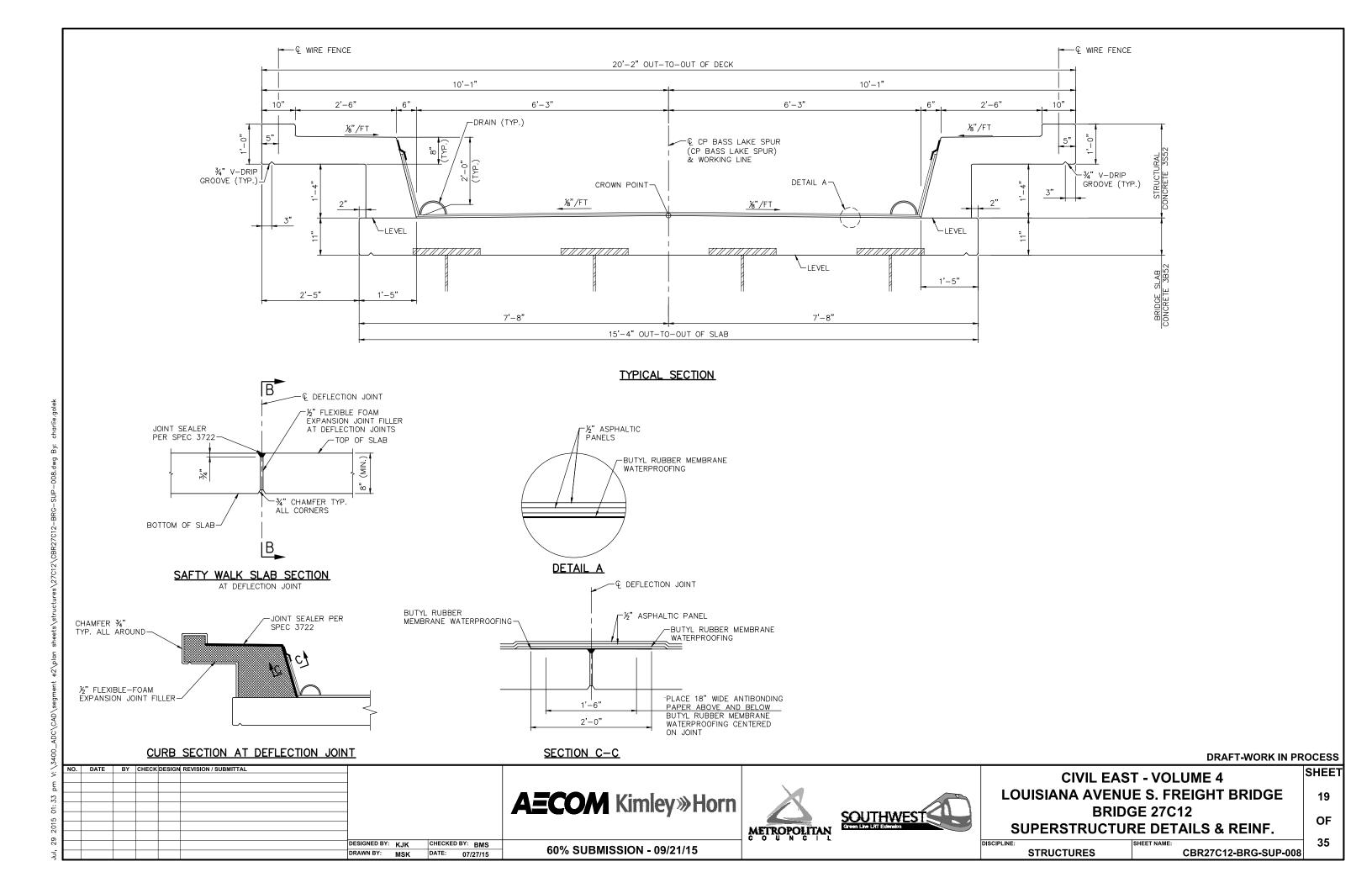
AECOM Kimley Horn

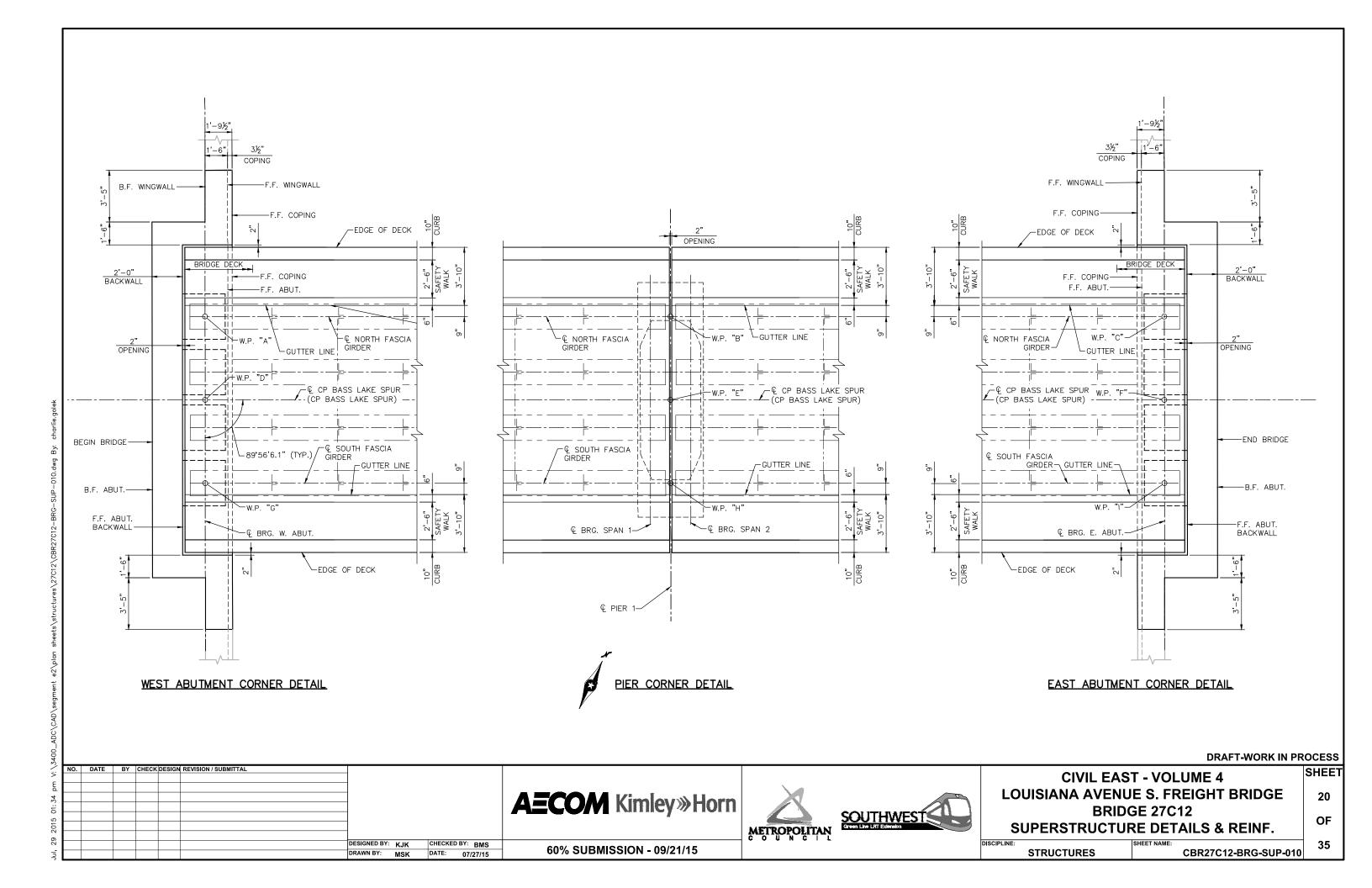
OF SUPERSTRUCTURE DETAILS & REINF.

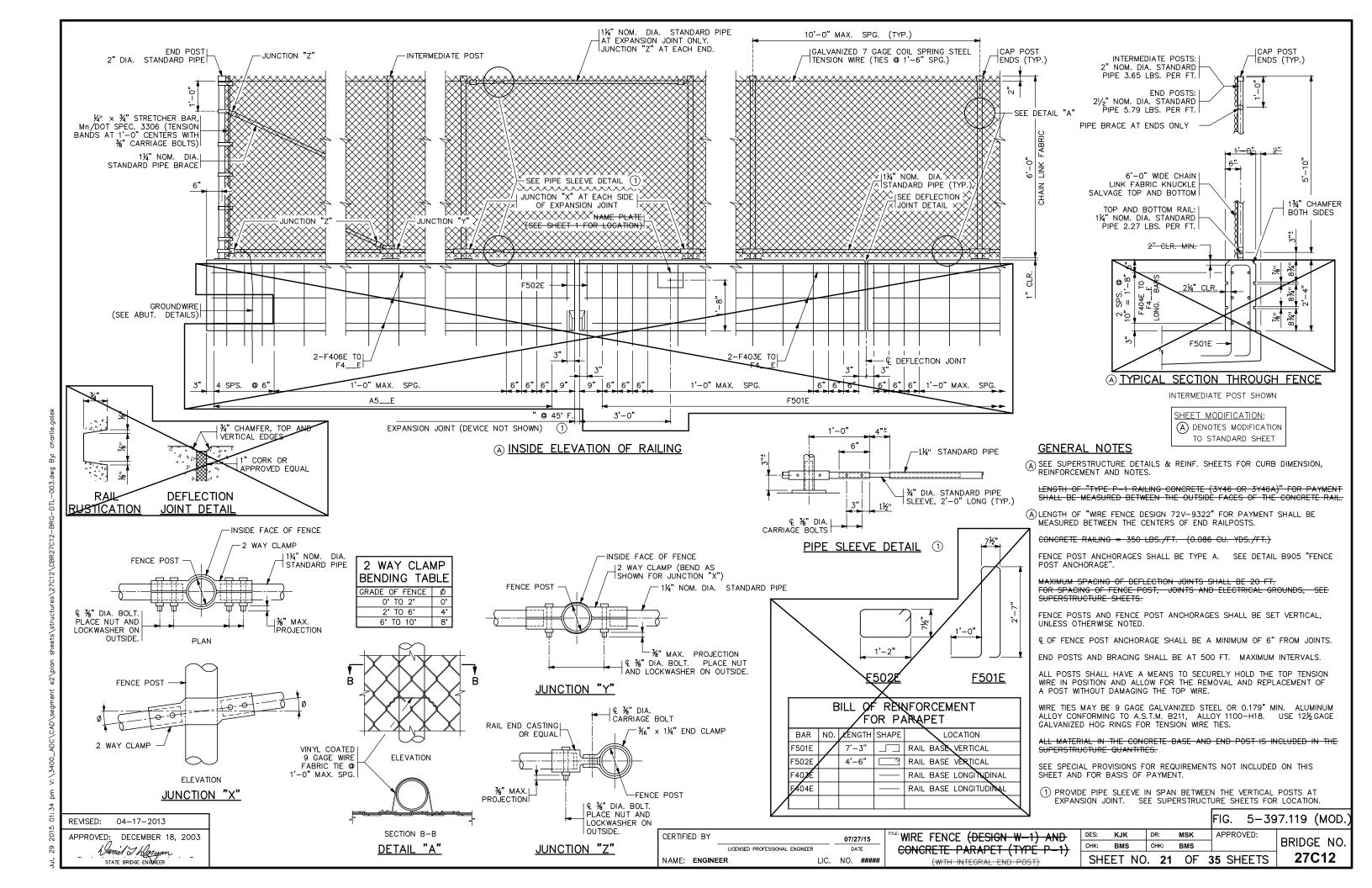
OF STRUCTURES

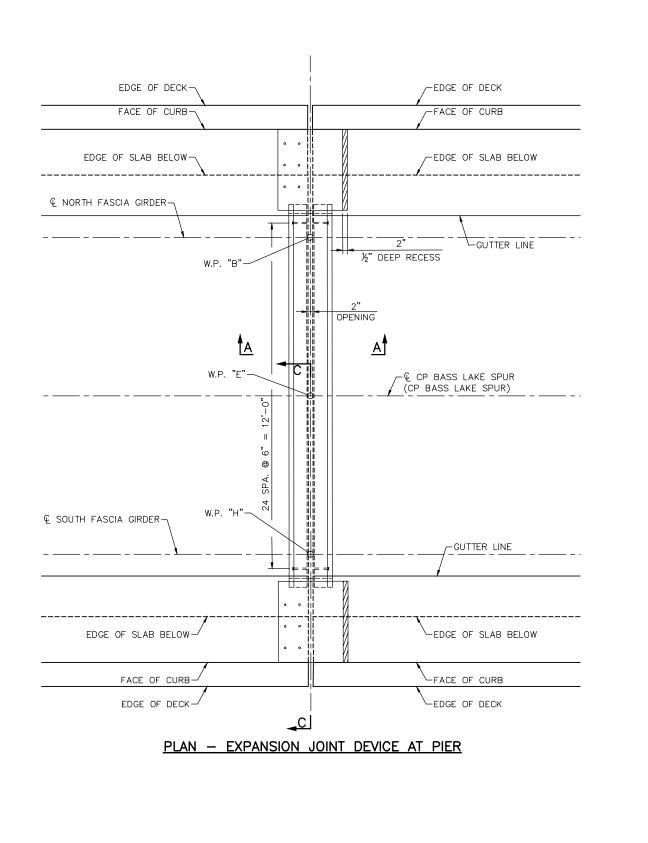
OF

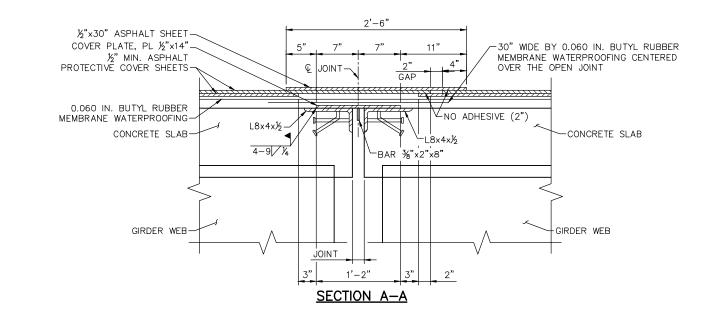


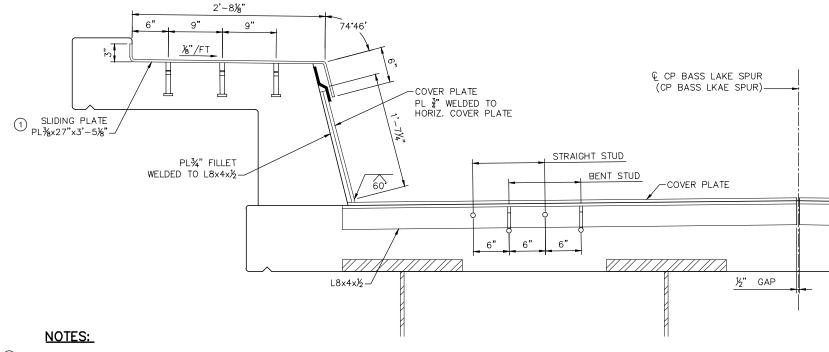












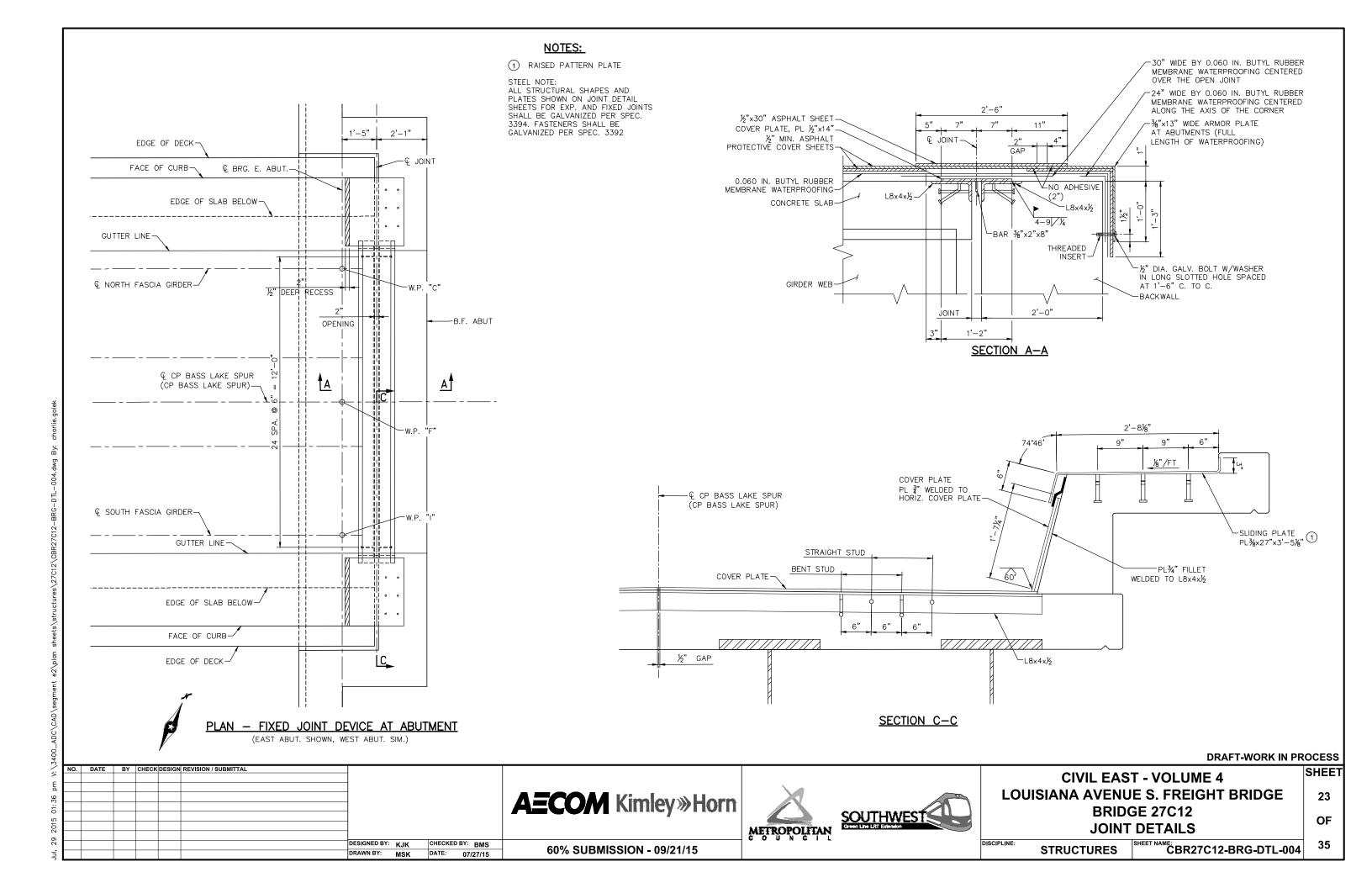
SECTION C-C

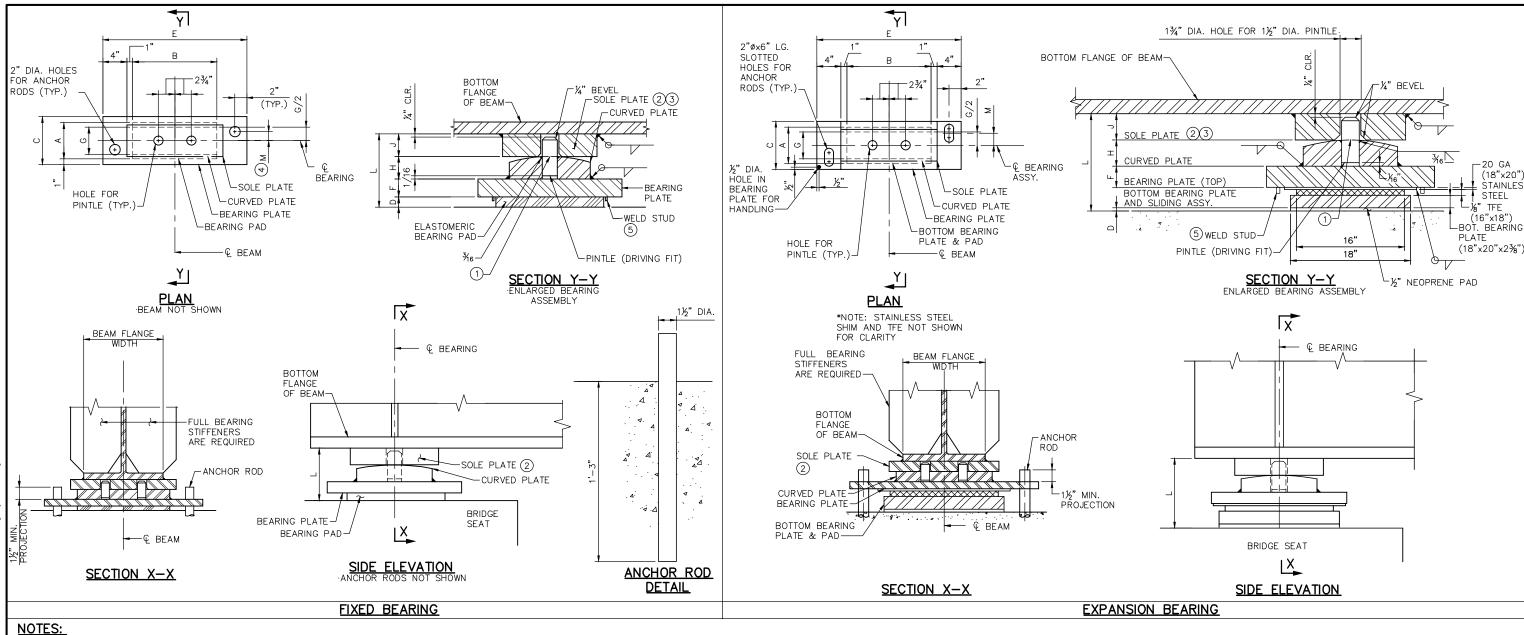
1) RAISED PATTERN PLATE

STEEL NOTE:
ALL STRUCTURAL SHAPES AND
PLATES SHOWN ON JOINT DETAIL
SHEETS FOR EXP. AND FIXED JOINTS
SHALL BE GALVANIZED PER SPEC.
3394. FASTENERS SHALL BE
GALVANIZED PER SPEC. 3392

**DRAFT-WORK IN PROCESS** 

NO. DATE BY CHECK DESIGN REVISION / SUBMITTAL SHEET **CIVIL EAST - VOLUME 4** LOUISIANA AVENUE S. FREIGHT BRIDGE **AECOM** Kimley»Horn 22 **BRIDGE 27C12** SOUTHWEST: OF **JOINT DETAILS** METROPOLITAN DESIGNED BY: KJK CHECKED BY: BMS 60% SUBMISSION - 09/21/15 **STRUCTURES** CBR27C12-BRG-SUP-009 DATE: 07/27/15 DRAWN BY: MSK





ELASTOMERIC MATERIALS AND PAD CONSTRUCTION SHALL COMPLY

ALL STEEL PLATES SHALL COMPLY WITH SPEC. 3306 EXCEPT THE SOLE PLATE. THE SOLE PLATE SHALL BE THE SAME MATERIAL SPECIFICATION AS THE STEEL BEAMS.

ANCHOR RODS SHALL COMPLY WITH SPEC. 3306. GALVANIZE PER SPEC. 3392.

PINTLES SHALL COMPLY WITH SPEC. 3309.

GALVANIZE STRUCTURAL STEEL BEARING ASSEMBLY AFTER FABRICATION PER SPEC. 3394, EXCEPT AS NOTED.

THE SOLE PLATE IS INCLUDED IN THE WEIGHT OF STRUCTURAL STEEL.

- 1) THE MIN. RADIUS SHALL BE 16" UNLESS OTHERWISE SPECIFIED IN THE TABLE. THE MAX. RADIUS SHALL BE 24". FINISH TO 250 MICRO. THE FINISHED THICKNESS OF THE PLATE MAY BE  $\%_6$ " LESS
- 2 WHEN THE SOLE PLATE IS TAPERED, DIMENSIONS "J" AND "L" ARE THICKNESS OF SOLE PLATE AND BEARING ASSEMBLY AT CENTERLINE
- 3 DO NOT GALVANIZE THIS PLATE.
- "+" DENOTES OFFSET AS SHOWN. "-" DENOTES OFFSET OPPOSITE OF SHOWN.
- 5/6" DIA. x 3/8" KNOCK-OFF WELD STUDS INSTALLED ON BEARING PLATE AROUND PERIMETER OF BEARING PAD. CENTERLINE STUD TO EDGE OF PAD DIMENSION = 1/2", MAX. STUD SPACING = 4" AND THE MAX. SPACING TO THE PAD CORNER = 2".
- 6 THE TOTAL THICKNESS SHOWN INCLUDES THE STEEL PLATES.

	TABLE																			
ASSEMBLY TYPE	LOCATION	BEAM FLANGE WIDTH	BEARIN PAD SI			SHAPE FACTOR	BEARING PLATE SIZE			CURVED PLATE SIZE			SOLE PLATE SIZE			PINTLE DIA.	ASSY. HEIGHT	ANC RO OFF	DD	
			WIDTH	WIDTH	WIDTH	А	В	D	(INTERNAL)	С	C E F		G	В	Н	R(1)	WID.	LEN.	LEN. J2	
EXPANSION	PIER 1	20"	16	22	1/2"	-	18	30	21/4"	9	20	1¾"	16	10	22	2"	1½"	9"	+	3"
FIXED	ABUT 1	20"	16	22	<i>1</i> <sub>2</sub> "	-	18	30	21/4"	6	20	1¾"	16	10	22	2"	1½"	6.5"	+	3"
FIXED	ABUT 2	20"	16	22	1/2"	_	18	30	2¼"	6	20	1¾"	16	10	22	2"	1½"	6.5"	+	3"

### **DESIGN DATA:**

MAXIMUM HORIZONTAL LOAD IS 70 KIPS. MINIMUM SOLE PLATE THICKNESS IS 2".

### **DRAFT-WORK IN PROCESS**

-20 GA

STEEL

·½" TFE

(16"x18")

(18"x20")

STAINLES

	NO. DAT	E BY	CHECK DESIGN REVISION / SUBMITTAL						С	IVIL EAST - VOLUME 4	SHEET
16 pm						A =COM Vimlary Harn	X		LOUISIAN	A AVENUE S. FREIGHT BRIDGE	24
. 03:						<b>AECOM</b> Kimley»Horn		SOUTHWEST		BRIDGE 27C12	0.5
2015							METROPOLITAN	Green Line LRT Extension	BEAF	RING ASSEMBLY DETAILS	OF
29				DESIGNED BY: KJK	CHECKED BY: BMS	COOK CLIDMICCION DO/04/45	COOKCIT		DISCIPLINE:	SHEET NAME:	35
Ju,				DRAWN BY: MSK	DATE: 07/27/15	60% SUBMISSION - 09/21/15			STRUCTU	JRES CBR27C12-BRG-EXF	P-001

BRIDGE 27C13
YEAR 1

[23456769<del>0 \*</del>" =

### NUMBERS FOR NAMEPLATE

### NOTES:

MATERIAL SHALL COMPLY WITH SPEC. 3327.

LETTERS AND NUMBERS SHALL CONFORM TO THOSE SHOWN.

DRAFT ON LETTERS AND NUMBERS SHALL NOT BE MORE THAN 3" IN 12".

HORIZONTAL SPACING OF LETTERS AND NUMBERS SHALL PRODUCE A BALANCED LAYOUT IN PROPORTION TO SPACING SHOWN.

TOP SURFACE OF LETTERS, NUMBERS AND FRAMES SHALL BE BURNISHED. FURNISH 2 STEEL BOLTS % DIA.  $\times$  3" LONG WITH EACH PLATE.

ALL DIMENSIONS FOR ¾" HIGH LETTERS AND NUMBERS SHALL BE IN DIRECT PROPORTION TO THOSE SHOWN FOR THE 1" HIGH LETTERS AND NUMBERS.

CHECKED BY: BMS

DATE: 07/27/15

1 YEAR OF CONSTRUCTION

APPROVED: NOVEMBER 22, 2002

STATE OF MINNESOTA
DEPARTMENT OF TRANSPORTATION

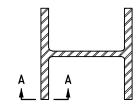
BRIDGE NAMEPLATE
(FOR NEW BRIDGES)

REVISION 09-11-2014

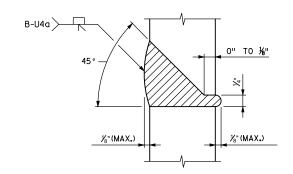
BB101

DESIGNED BY: KJK

DRAWN BY: MSK



SECTION AT SPLICE



SECTION A-A

100% BUTT WELDED PILE SPLICE

### <u>NOTES</u>

CELLULOSIC TYPE ELECTRODES E-6010 OR E-6011 SHALL BE USED FOR 100% BUTT WELDED SPLICES.

ELECTRODES WHICH HAVE BECOME WET, SOILED OR DAMAGED SHALL NOT BE USED.

WELDING SHALL NOT BE DONE WHEN THE AMBIENT TEMPERATURE IS LOWER THAN O'F. OR WHEN THE PILE IS WET OR EXPOSED TO FALLING RAIN OR SNOW. WHEN THE PILE METAL TEMPERATURE IS BELOW 32°F., THE PILE METAL IN THE AREA OF THE WELD SHALL BE HEATED TO A MINIMUM TEMPERATURE OF 70°F. AND MAINTAINED AT THIS TEMPERATURE DURING WELDING.

APPROVED: NOVEMBER 22, 2002

Vaniel & Mongon

STATE BRIDGE ENVINEER

STATE OF MINNESOTA DEPARTMENT OF TRANSPORTATION

PILE SPLICE (STEEL H BEARING PILES 10" TO 14")

REVISION: DETAIL NO. 11-06-2013

B202 DRAFT-WORK IN PROCESS

NO. DATE BY CHECK DESIGN REVISION / SUBMITTAL

**AECOM** Kimley»Horn

METROPOLITAN i



CIVIL EAST - VOLUME 4 LOUISIANA AVENUE S. FREIGHT BRIDGE BRIDGE 27C12 DETAILS

DISCIPLINE: STRUCTURES

IEET NAME: CBR27C12-BRG-DTL-001

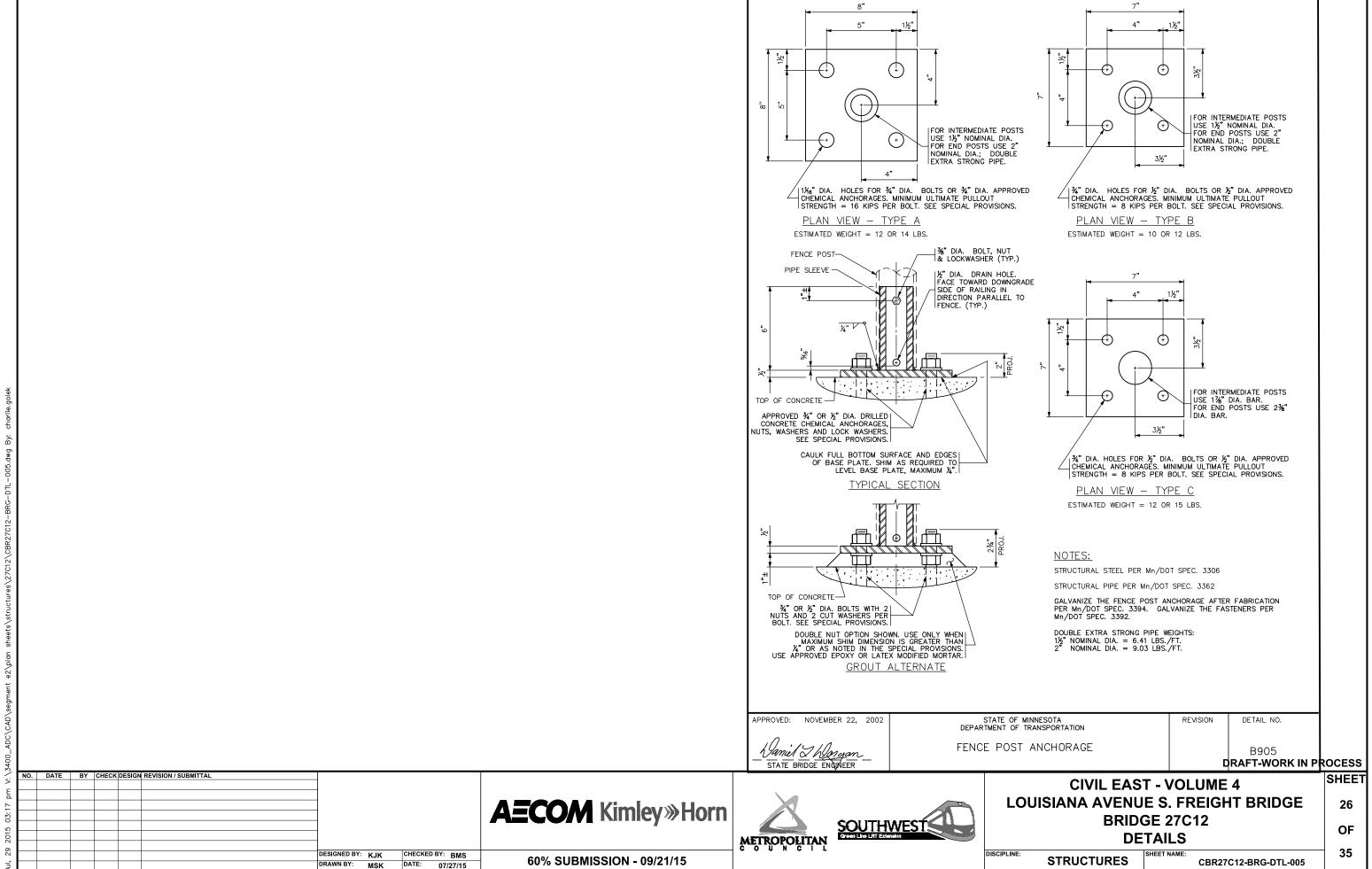
OF 35

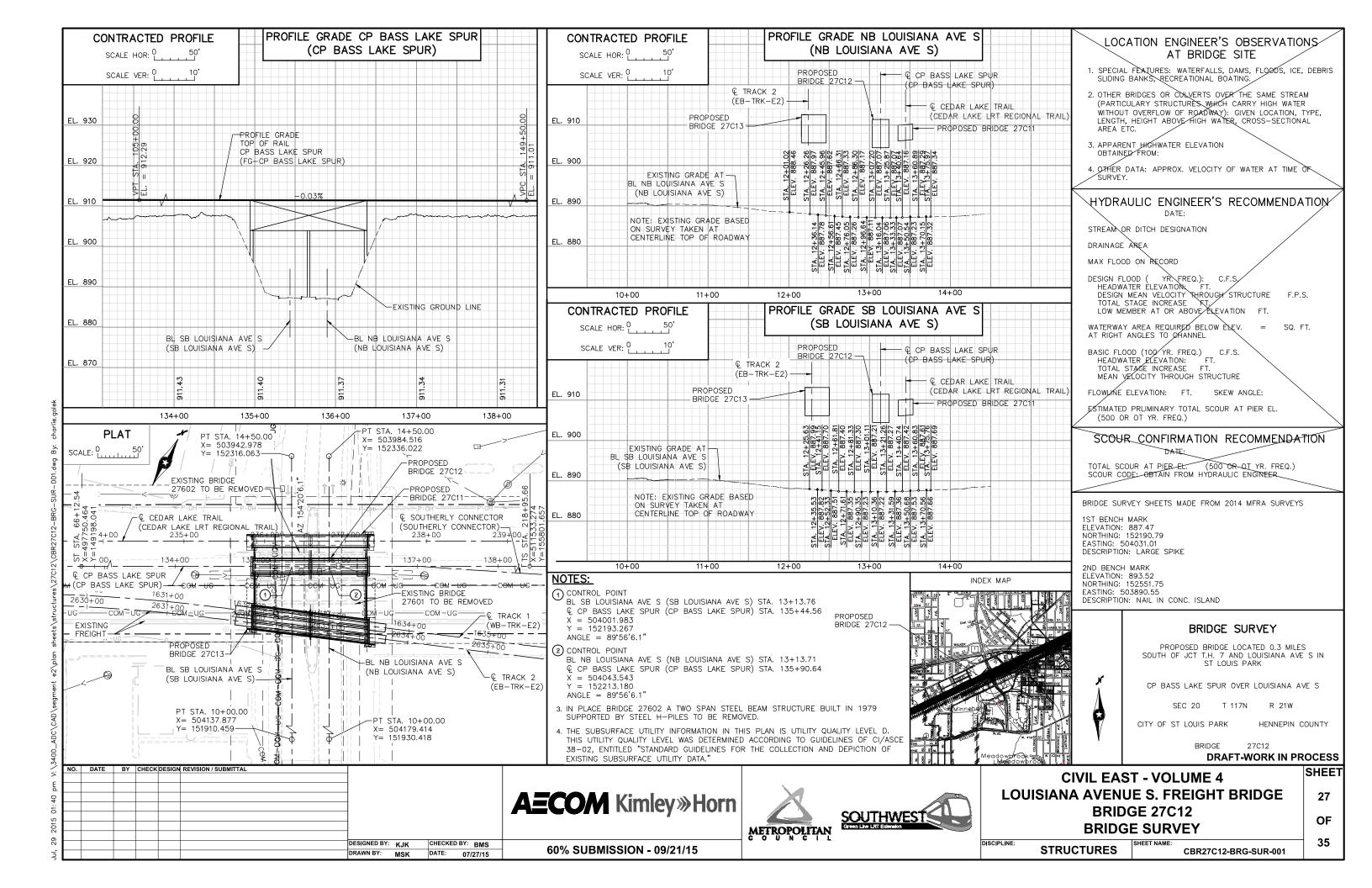
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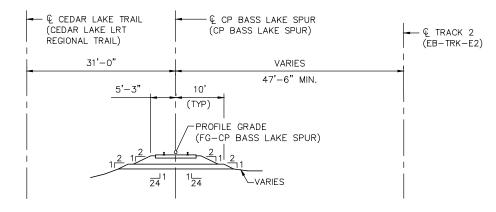
Jul, 29 2015 03:16 pm V:\3400\_ADC\CAD\segment e2\plan sheets`

60% SUBMISSION - 09/21/15





### TYPICAL ROADWAY SECTION LOUISIANA AVE S

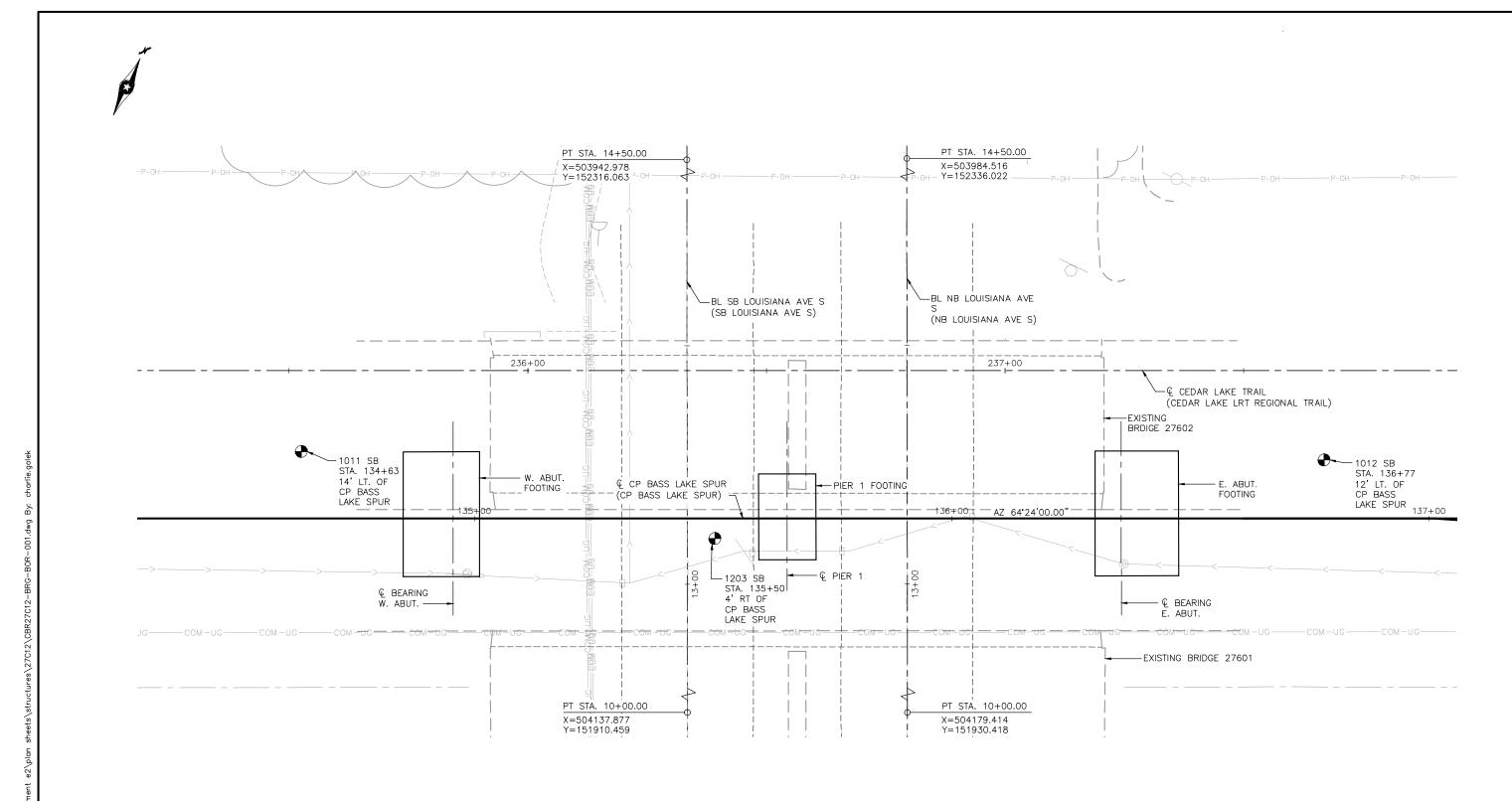


TYPICAL SECTION CP BASS LAKE SPUR APPROACH

**DRAFT-WORK IN PROCESS** 

NO. DATE BY CHECK DESIGN REVISION / SUBMITTAL SHEET **CIVIL EAST - VOLUME 4 AECOM** Kimley»Horn LOUISIANA AVENUE S. FREIGHT BRIDGE 28 SOUTHWEST Creen Line Little Extension **BRIDGE 27C12** OF **BRIDGE SURVEY** METROPOLITAN 35 DESIGNED BY: KJK CHECKED BY: BMS DISCIPLINE: 60% SUBMISSION - 09/21/15 STRUCTURES CBR27C12-BRG-SUR-002 DRAWN BY: MSK DATE: 07/27/15

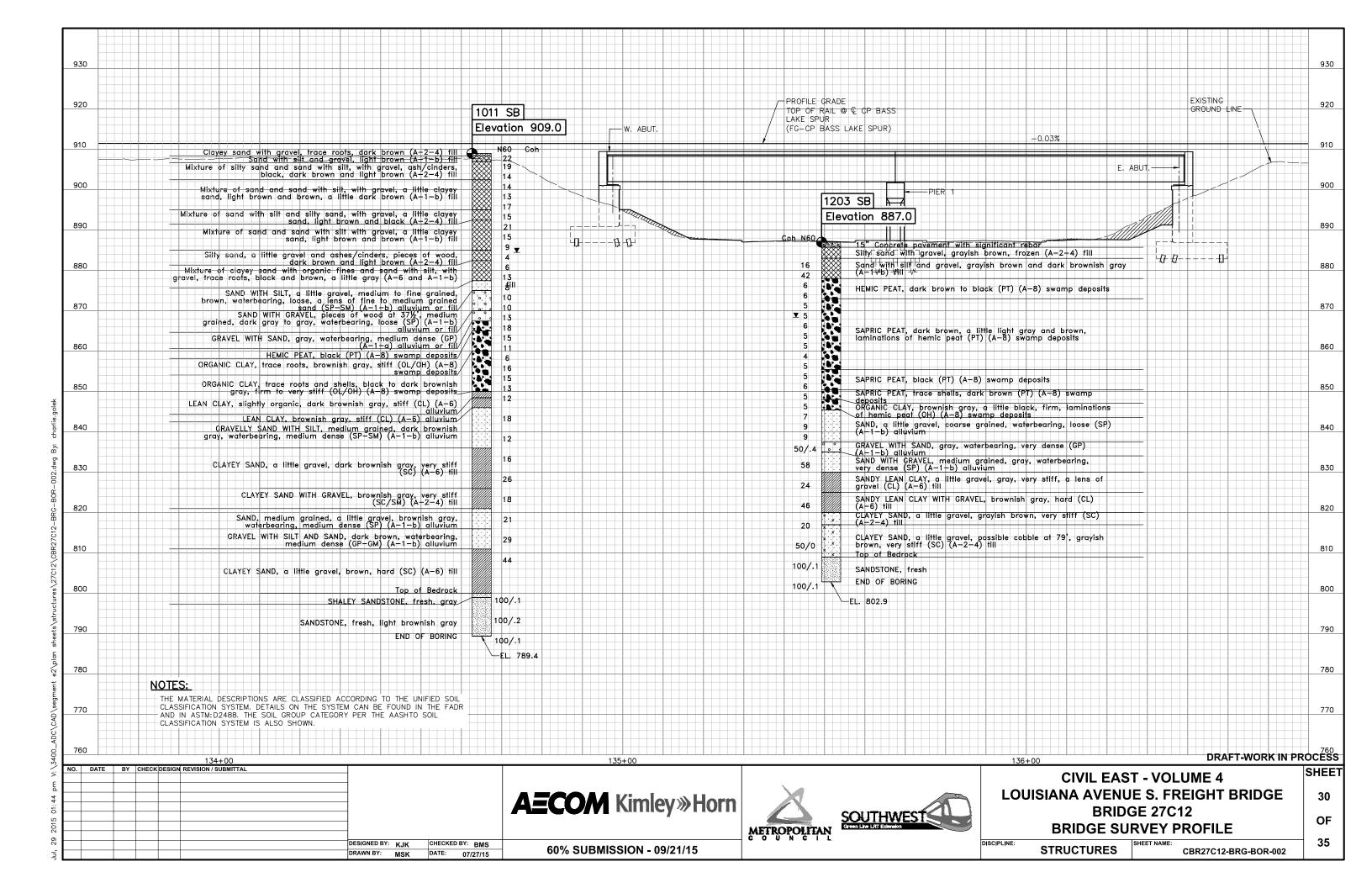
pm V: \54UU\_ADC\CAD\segment eZ\plan sheets\structures\2/C1Z\CBKZ/C1Z-BKG-SUK-UU1.dwg By: char

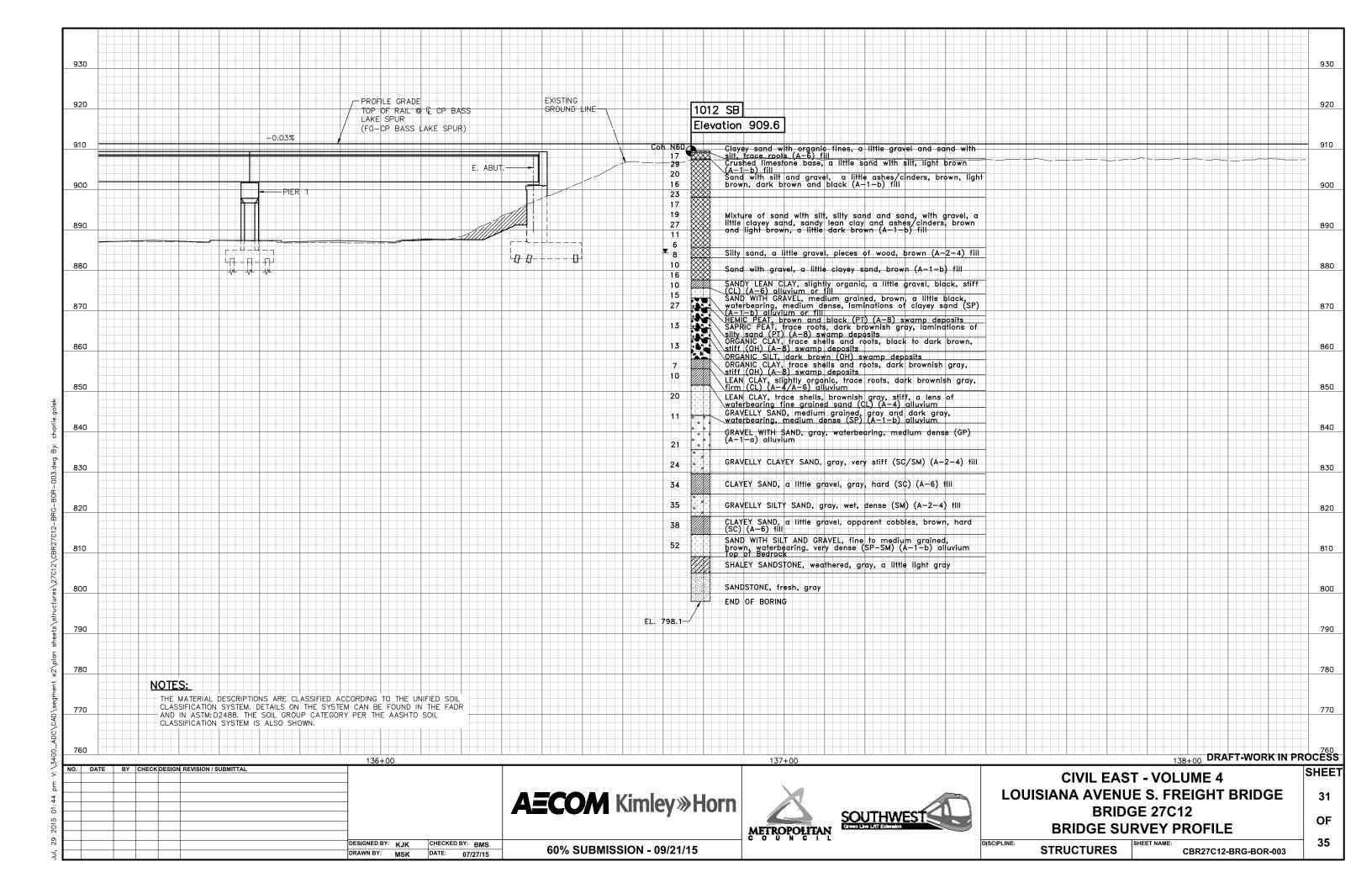


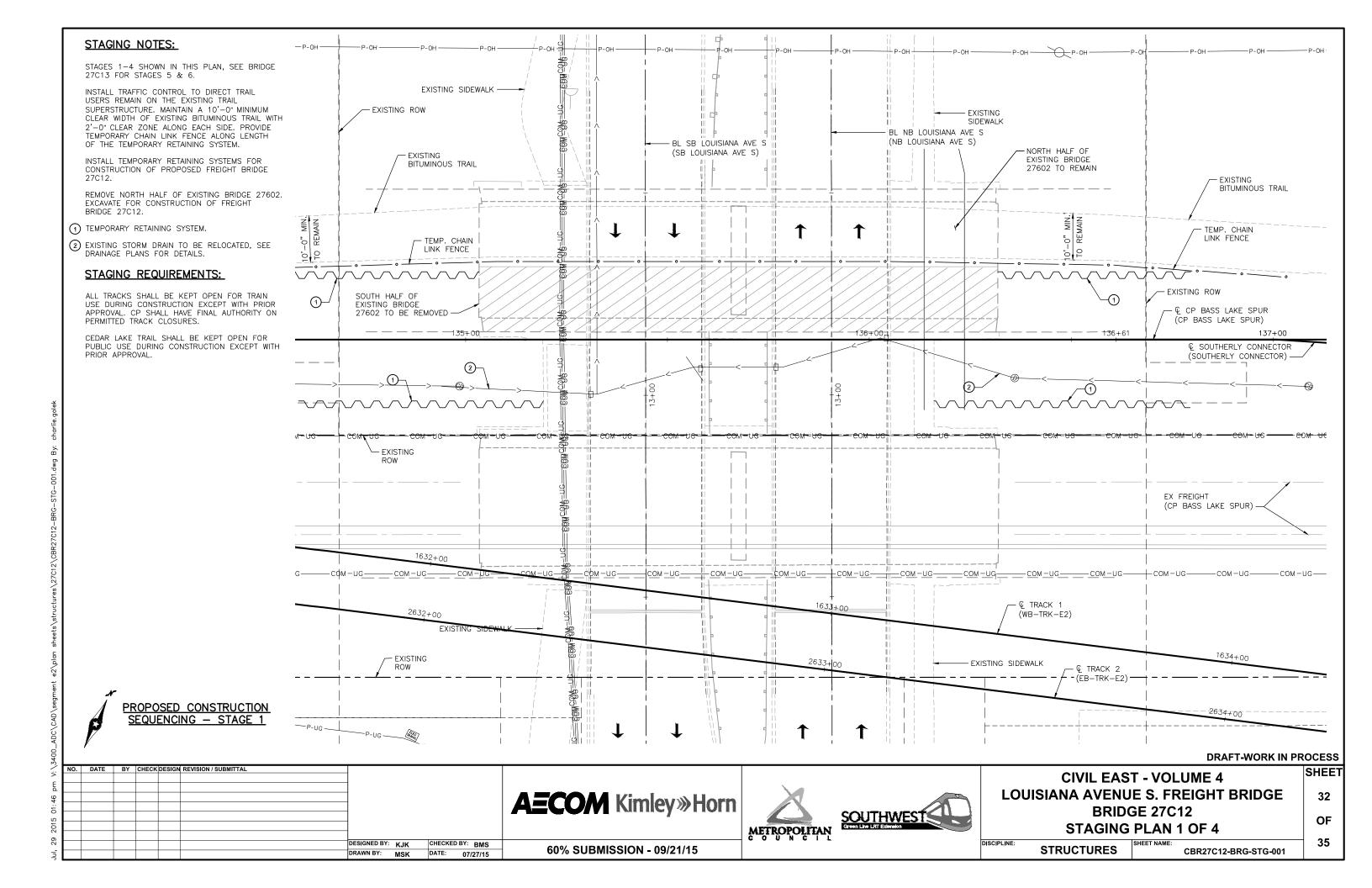
THE SUBSTRUCTURE UTILITY INFORMATION IN THIS PLAN IS UTILITY QUALITY LEVEL D. THIS UTILITY QUALITY LEVEL WAS DETERMINED ACCORDING TO GUIDELINES OF CI/ASCE 38-02, ENTITLED "STANDARD GUIDELINES FOR THE COLLECTION AND DEPICTION OF EXISTING SUBSURFACE UTILITY DATA".

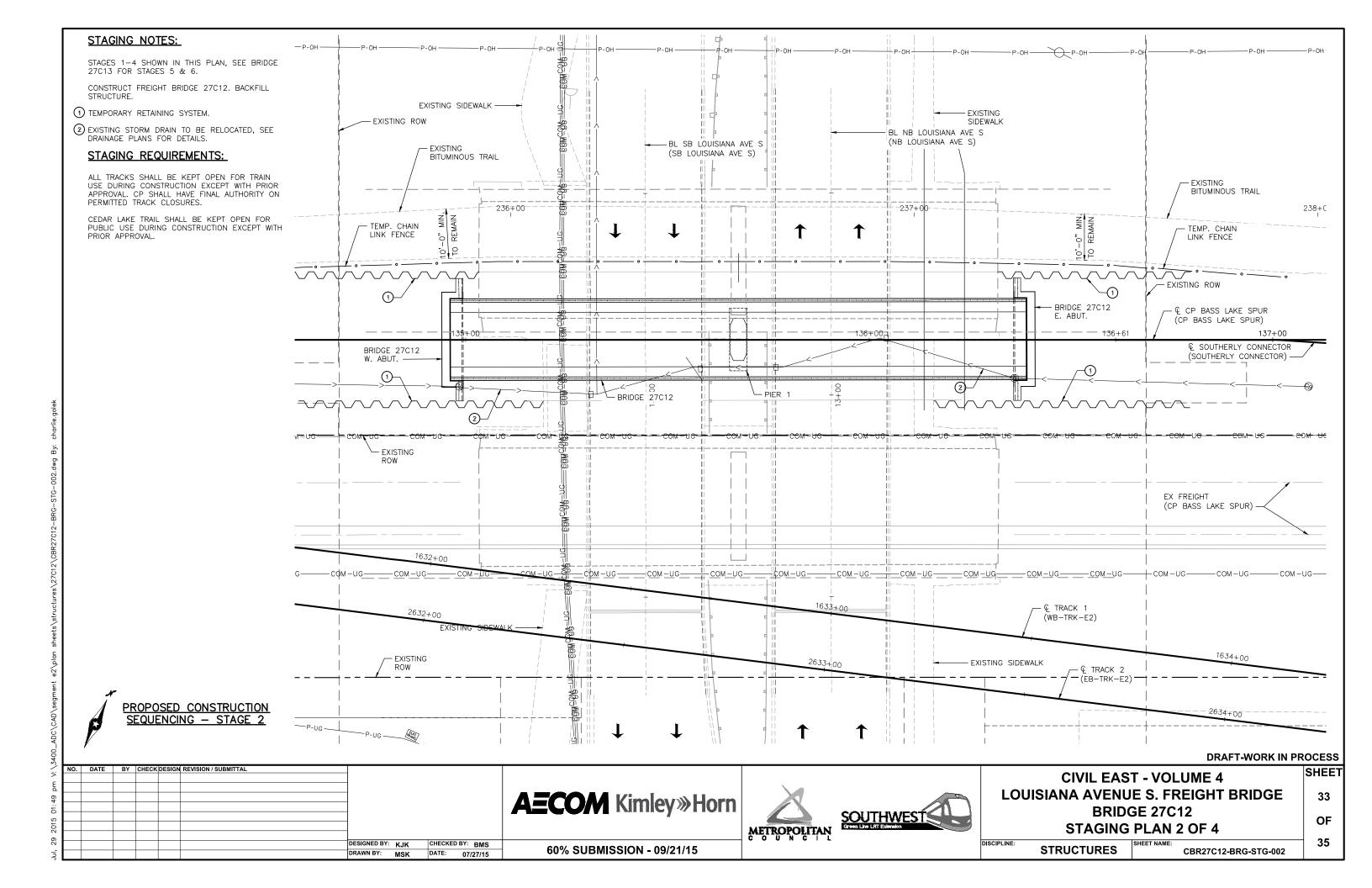
### DRAFT-WORK IN PROCESS

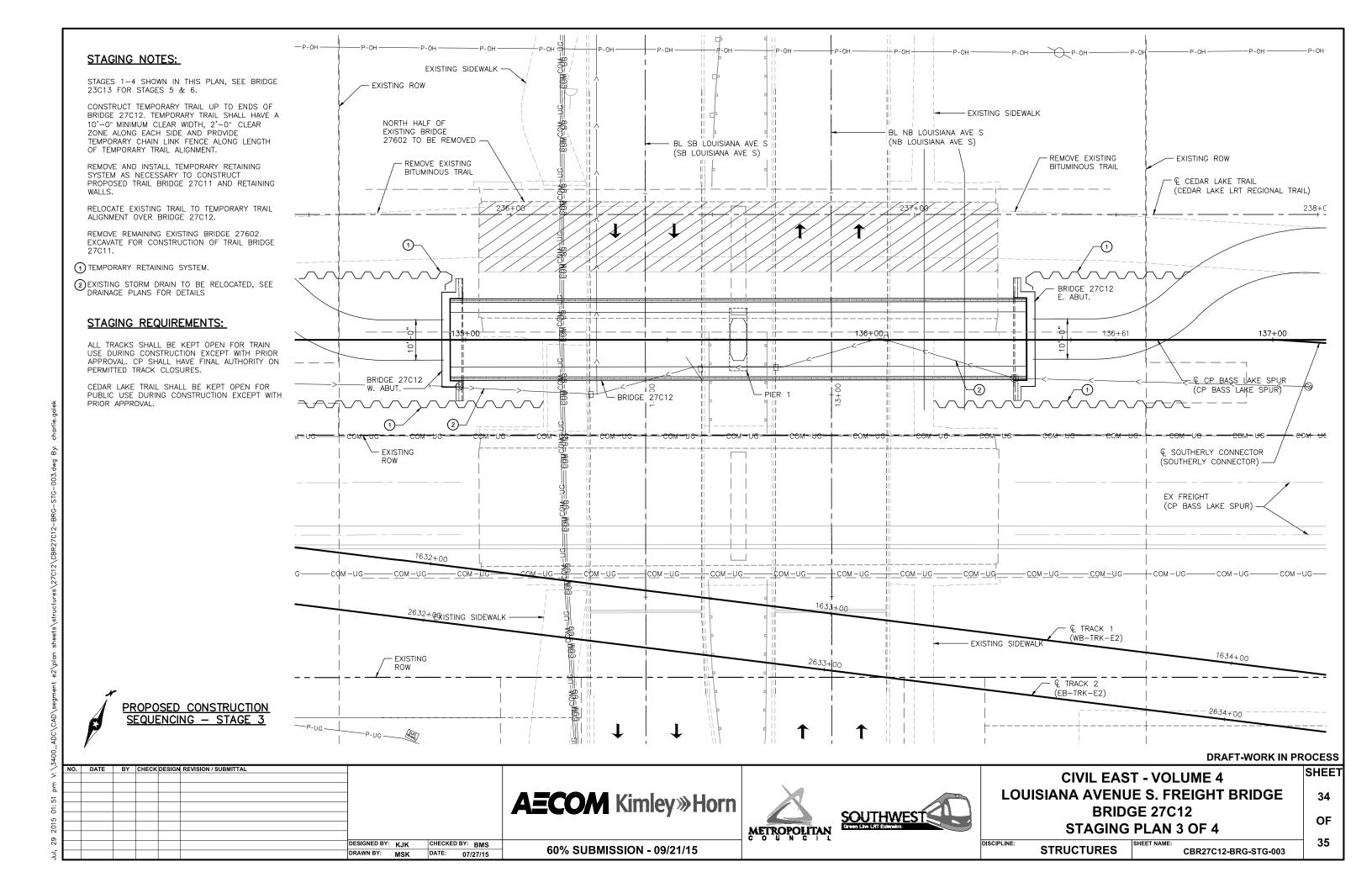
DATE E	BY CHECK DE	ESIGN F	REVISION / SUBMITTAL							CIVIL EAS	T - VOLUME 4	SHEET
						A TOO AA Vine lee wax I lee we	M		LO			29
						A=COM Kimley»Horn		SOLITHWEST		BRID	GE 27C12	
							METROPOLITAN	Green Line LRTT Extension		BRIDGE S	URVEY PLAN	OF
				DESIGNED BY: KJK	CHECKED BY: BMS	60% SUBMISSION - 09/21/15	CORNEIT		DISCIPLINE:	STRUCTURES		<b>│</b> 35
	DATE	DATE BY CHECK DI	DATE BY CHECK DESIGN	DATE BY CHECK DESIGN REVISION / SUBMITTAL		DESIGNED BY: KJK CHECKED BY: BMS	AECOM Kimley» Horn  DESIGNED BY: KJK CHECKED BY: BMS  60% SUBMISSION - 09/21/15	AECOM Kimley Horn  DESIGNED BY: KJK CHECKED BY: BMS  G00/, SUBMISSION - 09/21/15	AECOM Kimley » Horn  DESIGNED BY: KJK CHECKED BY: BMS  DESIGNED BY: KJK CHECKED BY: BWS  DESIGNED BY: BWS  DESIGNED BY: BWS  DESIGNED BY: BWS	AECOM Kimley Horn  DESIGNED BY: KJK CHECKED BY: BMS  DISCIPLINE:	AECOM Kimley Horn    DESIGNED BY: KJK   CHECKED BY: BMS   60% SURMISSION - 09/21/15	AECOM Kimley "Horn  DESIGNED BY: KJK CHECKED BY: BMS  DESIGNED BY: KJK CHE

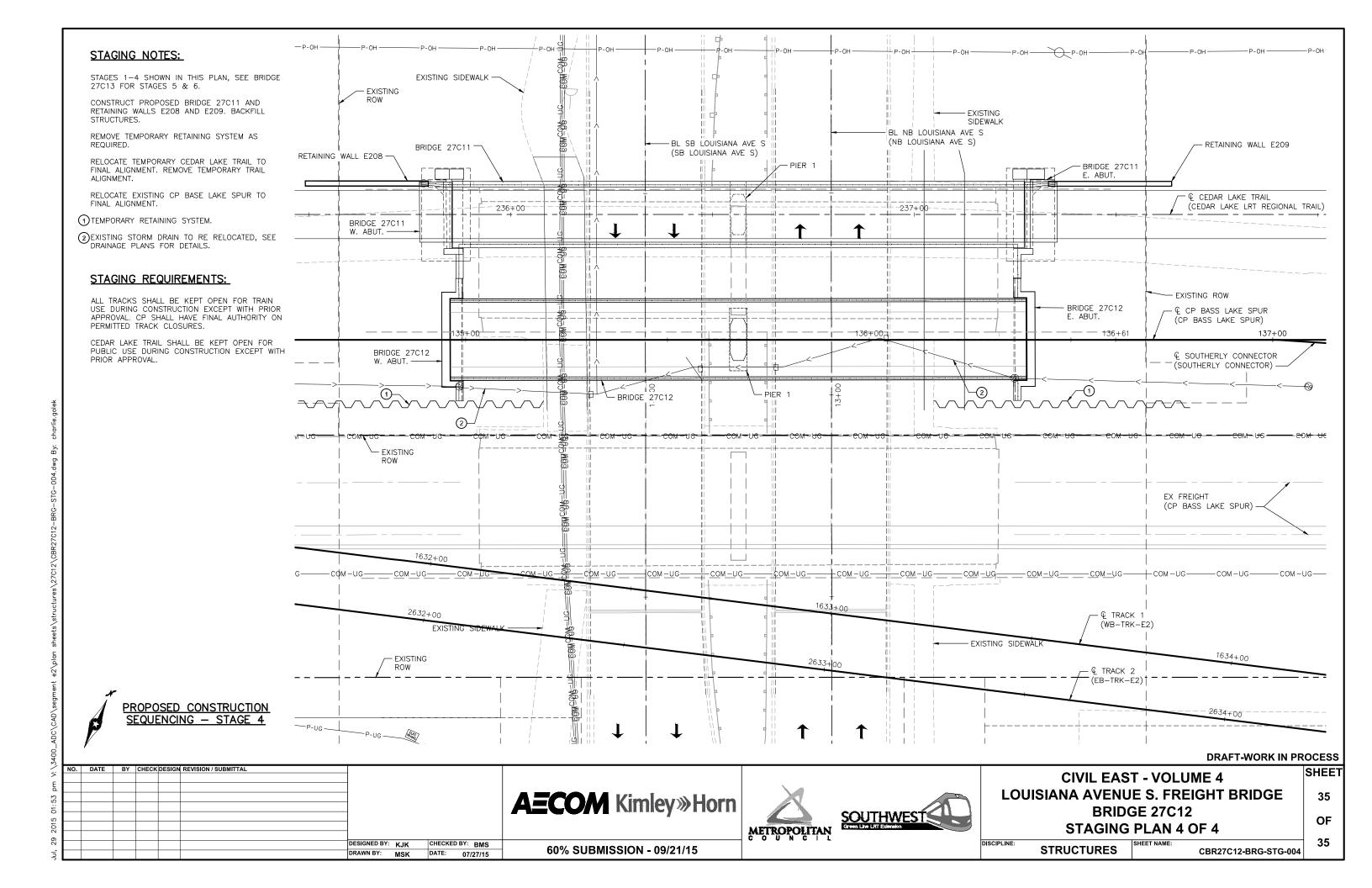


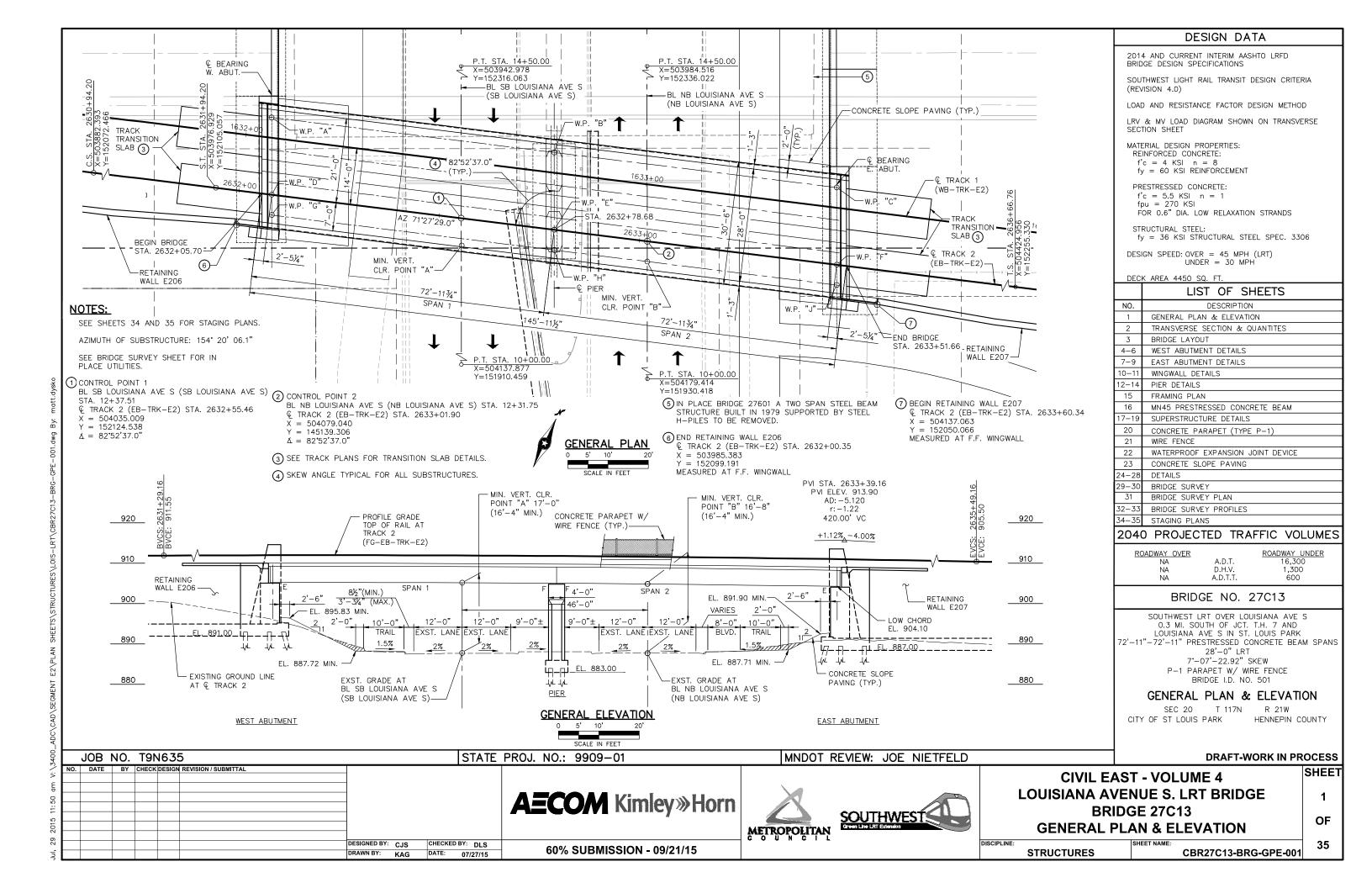












# **CONSTRUCTION NOTES:**

THE 2016 EDITION OF THE MINNESOTA DEPARTMENT OF TRANSPORTATION "STANDARD SPECIFICATIONS FOR CONSTRUCTION" SHALL GOVERN.

BRIDGE SEAT REINFORCEMENT SHALL BE CAREFULLY PLACED TO AVOID INTERFERENCE WITH DRILLING HOLES FOR ANCHOR RODS, THE BEAMS SHALL BE ERECTED IN FINAL POSITION PRIOR TO DRILLING HOLES FOR AND PLACING ANCHOR RODS.

THE BAR SIZES SHOWN IN THIS PLAN ARE IN U.S. CUSTOMARY DESIGNATIONS. THE FIRST DIGIT OR THE -CONCRETE PARAPET FIRST TWO DIGITS OF EACH BAR MARK INDICATE THE BAR SIZE.

> BARS MARKED WITH THE SUFFIX "E" SHALL BE EPOXY COATED IN ACCORDANCE WITH SPEC. 3301.

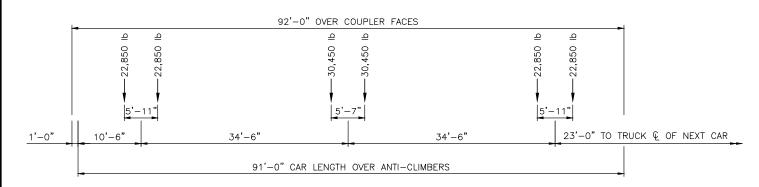
THE SUBSURFACE UTILITY INFORMATION IN THIS PLAN IS UTILITY QUALITY LEVEL D. THIS UTILITY QUALITY LEVEL WAS DETERMINED ACCORDING TO THE GUIDELINES OF CI/ASCE 38-02, ENTITLED "STANDARD GUIDELINES FOR THE COLLECTION AND DEPICTION OF EXISTING SUBSURFACE UTILITY DATA".

THE PILE LOADS SHOWN IN THE PLANS AND THE CORRESPONDING NOMINAL PILE BEARING RESISTANCE (Rn) WERE COMPUTED USING LRFD METHODOLOGY. PILE BEARING RESISTANCE DETERMINED IN THE FIELD SHALL INCORPORATE THE METHODS AND/OR FORMULAS DESCRIBED IN THE SPECIAL PROVISIONS.

# NOTES:

1) TOP OF RAIL TO CROWN POINT

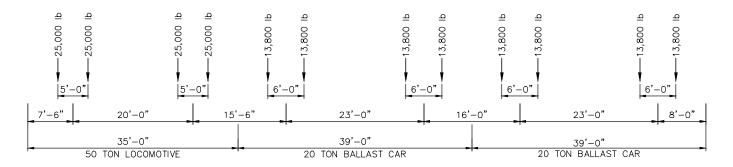
SCHEDULE OF QUANTITIES FOR ENTIRE BRIDGE									
ITEM	UNIT	QUANTITY							
STRUCTURAL CONCRETE (1G52)	CU. YD.	(P)							
STRUCTURAL CONCRETE (3B52)	CU. YD.	(P)							
TYPE P-1 (TL-2) RAILING CONCRETE (3S52)	LIN. FT.	(P)							
REINFORCEMENT BARS	POUND	(P)							
REINFORCEMENT BARS (EPOXY COATED)	POUND	(P)							
STRUCTURE EXCAVATION	LUMP SUM								
BRIDGE SLAB CONCRETE (3YHPC-M)	SQ. FT.	(P)							
EXPANSION JOINT DEVICES TYPE 4	LIN. FT.	(P)							
BEARING ASSEMBLY	EACH	(P)							
PRESTRESSED CONCRETE BEAMS MN45	LIN. FT.	(P)							
DIAPHRAGMS FOR TYPE MN45 PRESTRESSED BEAMS	LIN. FT.	(P)							
ANTI-GRAFFITI COATING	SQ. FT.	(P)							
ARCHITECTURAL SURFACE FINISH (SPECIAL)	SQ. FT.	(P)							
ARCHITECTURAL CONCRETE TEXTURE (SPECIAL)	SQ. FT.	(P)							
REMOVE EXISTING BRIDGE	LUMP SUM								
STEEL H-PILING DRIVEN 12"	LIN. FT.	(P)							
STEEL H-PILING DELIVERED 12"	LIN. FT.	(P)							
STEEL H-TEST PILE 85 FT LONG 12"	EACH	(P)							
PILE TIP PROTECTION 12"	EACH	(P)							
STEEL SHEET PILING (TEMPORARY)	LUMP SUM								
MEMBRANE WATERPROOFING SYSTEM	LUMP SUM								
DRAINAGE SYSTEM TYPE (B910)	LUMP SUM								
RANDOM RIPRAP CLASS IV	CU. YD.								
GEOTEXTILE FILTER TYPE VII	SQ. YD.	(P)							
WIRE FENCE DESIGN 48V-9322	LIN. FT.	(P)							
WIRE FENCE DESIGN 72V-9322	LIN. FT.	(P)							
	ITEM  STRUCTURAL CONCRETE (1G52)  STRUCTURAL CONCRETE (3B52)  TYPE P-1 (TL-2) RAILING CONCRETE (3S52)  REINFORCEMENT BARS REINFORCEMENT BARS (EPOXY COATED)  STRUCTURE EXCAVATION  BRIDGE SLAB CONCRETE (3YHPC-M)  EXPANSION JOINT DEVICES TYPE 4  BEARING ASSEMBLY  PRESTRESSED CONCRETE BEAMS MN45  DIAPHRAGMS FOR TYPE MN45 PRESTRESSED BEAMS  ANTI-GRAFFITI COATING  ARCHITECTURAL SURFACE FINISH (SPECIAL)  ARCHITECTURAL CONCRETE TEXTURE (SPECIAL)  REMOVE EXISTING BRIDGE  STEEL H-PILING DRIVEN 12"  STEEL H-TEST PILE 85 FT LONG 12"  PILE TIP PROTECTION 12"  STEEL SHEET PILING (TEMPORARY)  MEMBRANE WATERPROOFING SYSTEM  DRAINAGE SYSTEM TYPE (B910)  RANDOM RIPRAP CLASS IV  GEOTEXTILE FILTER TYPE VII  WIRE FENCE DESIGN 48V-9322	ITEM UNIT  STRUCTURAL CONCRETE (1G52) CU. YD.  STRUCTURAL CONCRETE (3B52) CU. YD.  TYPE P-1 (TL-2) RAILING CONCRETE (3S52) LIN. FT.  REINFORCEMENT BARS POUND  REINFORCEMENT BARS (EPOXY COATED) POUND  STRUCTURE EXCAVATION LUMP SUM  BRIDGE SLAB CONCRETE (3YHPC-M) SQ. FT.  EXPANSION JOINT DEVICES TYPE 4 LIN. FT.  BEARING ASSEMBLY EACH  PRESTRESSED CONCRETE BEAMS MN45 LIN. FT.  DIAPHRAGMS FOR TYPE MN45 PRESTRESSED BEAMS LIN. FT.  ANTI-GRAFFITI COATING SQ. FT.  ARCHITECTURAL SURFACE FINISH (SPECIAL) SQ. FT.  REMOVE EXISTING BRIDGE LUMP SUM  STEEL H-PILING DRIVEN 12" LIN. FT.  STEEL H-PILING DELIVERED 12" EACH  PILE TIP PROTECTION 12" EACH  STEEL SHEET PILING (TEMPORARY) LUMP SUM  MEMBRANE WATERPROOFING SYSTEM LUMP SUM  DRAINAGE SYSTEM TYPE (B910) LUMP SUM  RANDOM RIPRAP CLASS IV CU. YD.  GEOTEXTILE FILTER TYPE VII SQ. YD.  WIRE FENCE DESIGN 48V-9322 LIN. FT.							



TRANSVERSE SECTION

SCALE IN FEET

0 1.5' 3'



# LIGHT RAIL VEHICLE LOADING DIAGRAM

1. THE LRT TRAIN SHALL CONSIST OF EITHER ONE, TWO OR THREE CARS, WHICHEVER PRODUCES THE MAXIMUM LOAD FOR THE ELEMENT UNDER CONSIDERATION.

DESIGNED BY: CJS

DRAWN BY: KAG

CHECKED BY: DLS

DATE: 07/27/15

- 2. AXLE LOAD IN POUNDS.
- 3. LOADING DIAGRAM REPRESENTS MAXIMUM LOAD AT EACH TRUCK.

1. THE MAINTENANCE TRAIN SHALL CONSIST OF ONE LOCOMOTIVE AND ONE, TWO, THREE OR FOUR BALLAST CARS, WHICHEVER PRODUCES THE MAXIMUM LOAD FOR THE ELEMENT UNDER CONSIDERATION.

MAINTENANCE TRAIN LOADING DIAGRAM

- 2. AXLE LOAD IN POUNDS.
- 3. WEIGHT OF EMPTY BALLAST CAR IS 15,000 POUNDS.

**DRAFT-WORK IN PROCESS** 

SHEET

2

OF

35

DATE BY CHECK DESIGN REVISION / SUBMITTAL

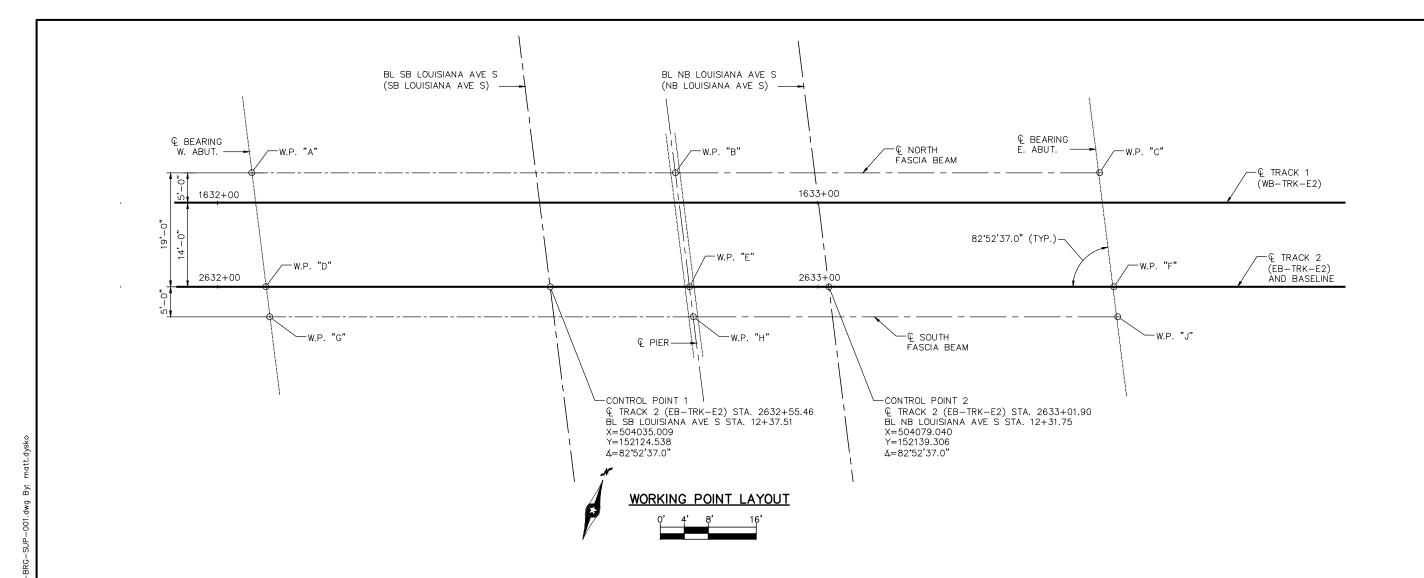
**AECOM** Kimley»Horn

METROPOLITAN



**CIVIL EAST - VOLUME 4** LOUISIANA AVENUE S. LRT BRIDGE **BRIDGE 27C13 TRANSVERSE SECTION & QUANTITIES** 

**STRUCTURES** CBR27C13-BRG-TRN-001



	DIMENSIONS BETWEEN WORKING POINTS									COORDINATES ELEVATION						
POINT	STATION	Α	В	С	D	Е	F	G	Н	J	х	Y	TOP OF SLAB	TOP OF SLAB TO BRIDGE SEAT	BRIDGE SEAT	POINT
Α	2632+05.76'	0	70.54		19.15	75.35	144.72		77.36	146.07	503981.849	152126.748	909.81	5.04	904.77	Α
В	2632+76.31'			70.54	70.77	19.15	75.35	71.68		77.36	504048.731	152149.181	909.64	4.98	904.66	В
С	2633+46.85'				140.01	70.77	19.15	140.16	71.68		504115.614	152171.614	908.86	5.04	903.82	С
D	2632+08.14'					70.54		5.04	71.34	141.80	503990.142	152109.489	909.91			D
E	2632+78.68'						70.54	70.10	5.04	71.34	504057.025	152131.922	909.72			E
F	2633+49.22'							140.55	70.10	5.04	504123.907	152154.355	908.92			F
G	2632+08.76'								70.54		503992.324	152104.947	909.82	5.04	904.78	G
Н	2632+79.31'									70.54	504059.207	152127.380	909.62	4.98	904.64	Н
J	2633+49.85'	·						·			504126.089	152149.813	908.81	5.04	903.77	J

TOP OF ROADWAY TO BRIDGE SEAT										
	BEARING	TO	TAL							
	THICKNESS	HEIGHT	HEIGHT	HEIGHT	INCHES	FEET				
WEST ABUTMENT	9"	21/2"	45"	4"	60 <b>½</b> "	5.04				
PIER	9"	21/2"	45"	31/2"	59¾"	4.98				
EAST ABUTMENT	9"	21/2"	45"	4"	60½"	5.04				

# **DRAFT-WORK IN PROCESS**

> >	NO. DATE	BY CHE	IECK DESIGN REVISION / SUBMITTAL						CIVIL EAS	T - VOLUME 4	SHEET
1 am						A = 60 A A 1/2 to a location with 1 to true	M			NUE S. LRT BRIDGE	3
11:5						<b>AECOM</b> Kimley»Horn		COLITERATECT	BRID	GE 27C13	
2015						_	METROPOLITAN	Green Line LRT Extension		E LAYOUT	OF
6							C O U N C I L				]
5				DESIGNED BY: GAG	CHECKED BY: DLS	CON CLIDMICCION DOISAIAE			DISCIPLINE:	SHEET NAME:	35
Ξ,				DRAWN BY: KAG	DATE: 07/27/15	60% SUBMISSION - 09/21/15			STRUCTURES	CBR27C13-BRG-SUP-001	

# WEST ABUTMENT COMPUTED PILE LOAD - TONS/PILE FACTORED DEAD LOAD + EARTH PRESSURE FACTORED LIVE LOAD 40.4 116.5 \* FACTORED DESIGN LOAD

# WEST ABUTMENT REQUIRED NOMINAL PILE BEARING RESISTANCE FOR H-PILES Rn - TONS/PILE

NEGISTANGET ON TI-FILLS MIT- TONS/FILE									
FIELD CONTROL METHOD	φdyn	* Rn							
MN/DOT PILE FORMULA 2012 (MPF 12) $R_n = 20 \sqrt{\frac{ W \times H}{1000}} x lag \left(\frac{10}{S}\right)$	0.60	195							
PDA	0.65	180							

<sup>\*</sup> Rn = (FACTORED DESIGN LOAD) / φdyn

# **GENERAL PILE NOTES:**

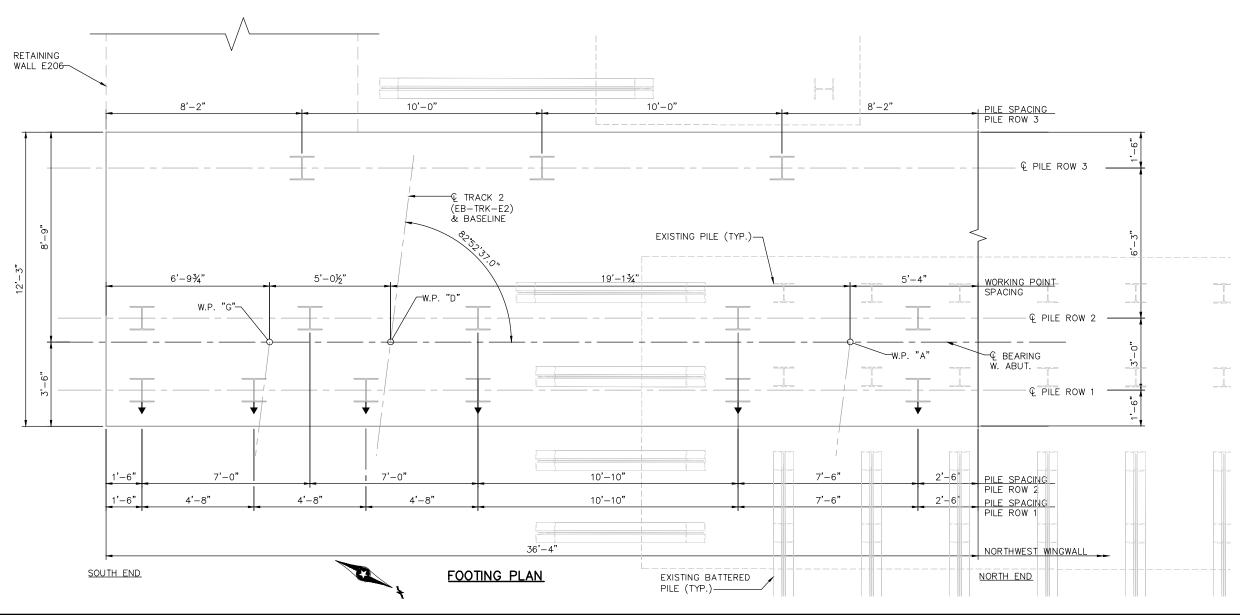
- 1 HP12x53 STEEL TEST PILE 75 FT. LONG
- 13 HP12x53 STEEL PILES EST. 75 FT. LENGTH 14 HP12x53 STEEL PILES REQ'D FOR WEST ABUT.
- ALL PILES TO BE HP12x53 WITH PILE TIP PROTECTION.

PILE SPACING SHOWN IS AT BOTTOM OF FOOTING.

PILES MARKED THUS TO BE BATTERED 3" PER FOOT IN

FOR PILE SPLICE DETAILS SEE DETAIL B202.

SEE SURVEY SHEET FOR TEST PILE LOCATIONS.



**AECOM** Kimley»Horn

60% SUBMISSION - 09/21/15

DESIGNED BY: CJS CHECKED BY: DLS

DRAWN BY: KAG DATE: 07/27/15





**CIVIL EAST - VOLUME 4** LOUISIANA AVENUE S. LRT BRIDGE **BRIDGE 27C13 WEST ABUTMENT DETAILS** 

DISCIPLINE:

CBR27C13\_BRG-ABT-001 **STRUCTURES** 

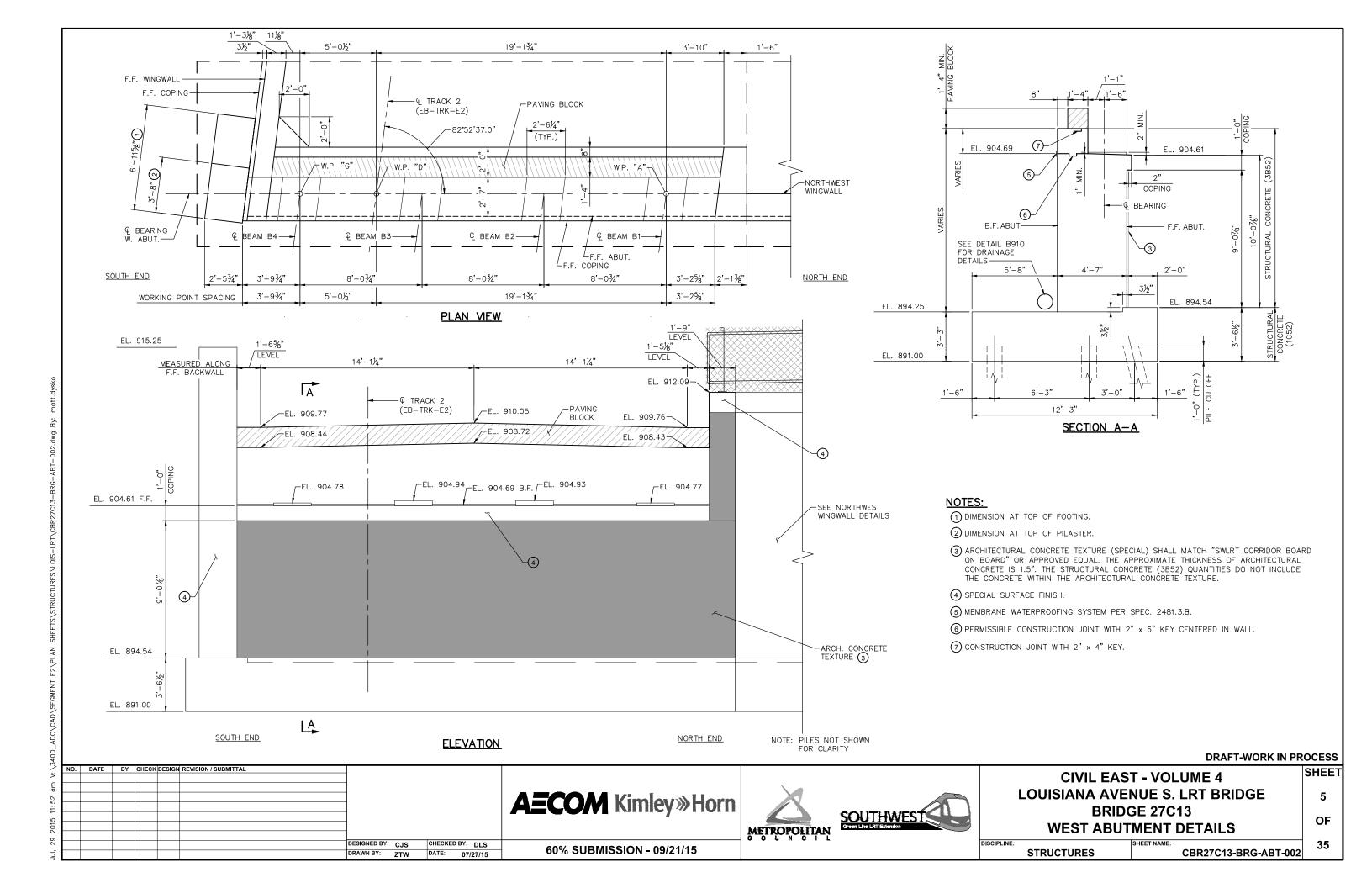
**DRAFT-WORK IN PROCESS** 

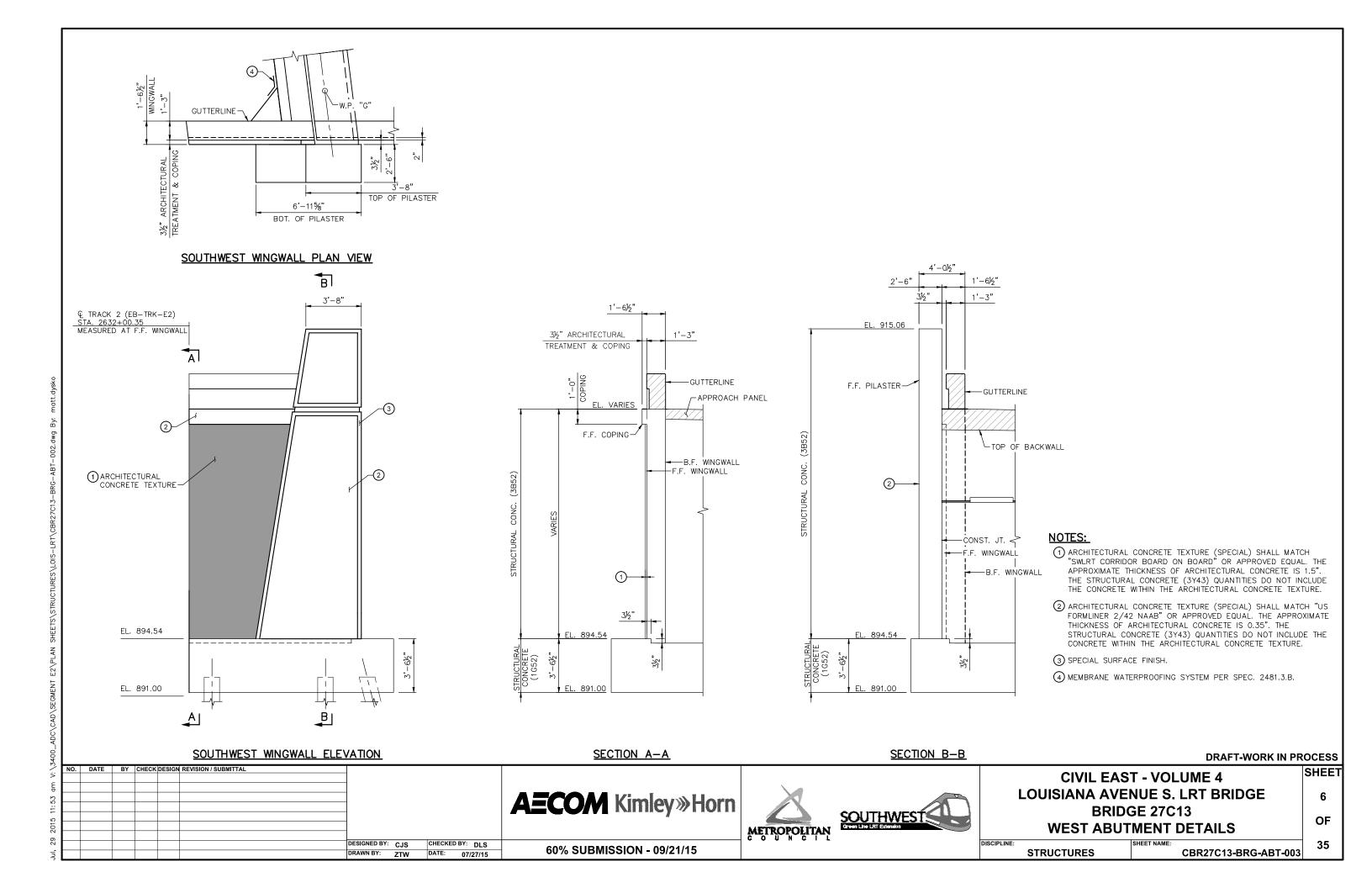
SHEET

OF

35

<sup>\*</sup> BASED ON STRENGTH I LOAD COMBINATION.





# EAST ABUTMENT COMPUTED PILE LOAD - TONS/PILE FACTORED DEAD LOAD + EARTH PRESSURE FACTORED LIVE LOAD 37.4 \* FACTORED DESIGN LOAD 112.7

# EAST ABUTMENT REQUIRED NOMINAL PILE BEARING RESISTANCE FOR H-PILES Rn - TONS/PILE

		10/1 122
FIELD CONTROL METHOD	φdyn	* Rn
MN/DOT PILE FORMULA 2012 (MPF12) $R_n = 20 \sqrt{\frac{W \times H}{1000}} x lag \left(\frac{10}{S}\right)$	0.60	188
PDA	0.65	174

<sup>\*</sup> Rn = (FACTORED DESIGN LOAD) / φdyn

# **GENERAL PILE NOTES:**

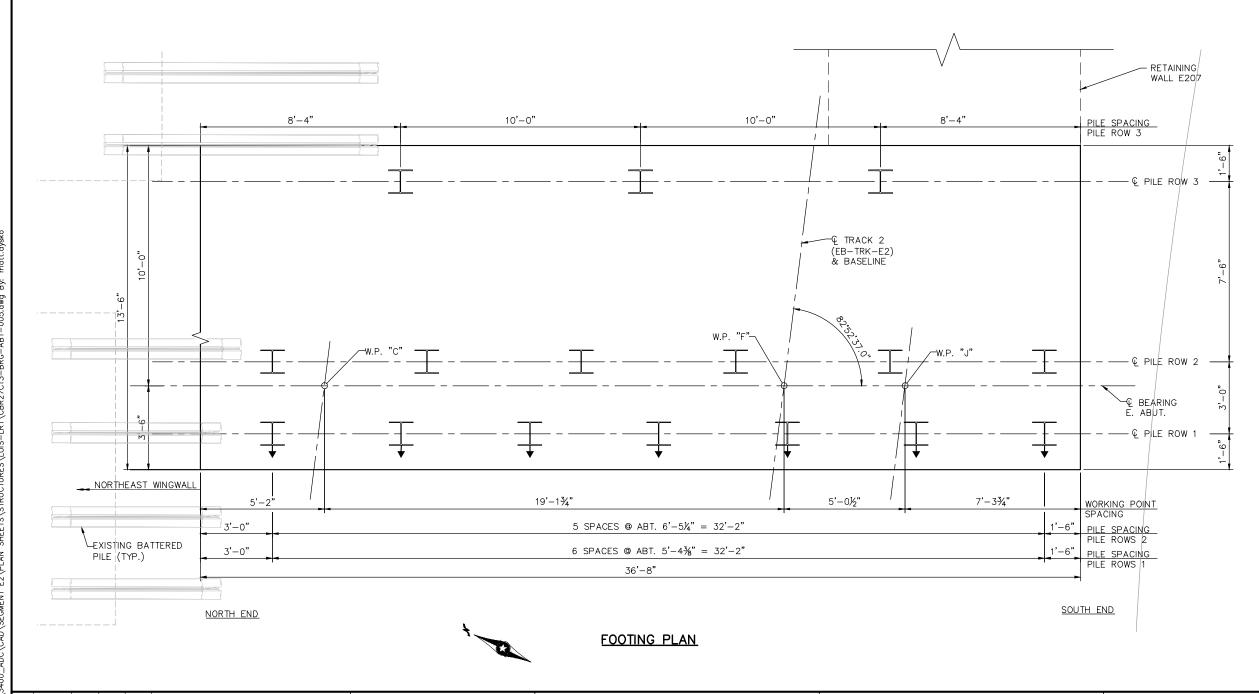
- 1 HP12x53 STEEL TEST PILE 85 FT. LONG
- 15 HP12x53 STEEL PILES EST. 85 FT. LENGTH 16 HP12x53 STEEL PILES REQ'D FOR EAST ABUT.
- ALL PILES TO BE HP12x53 WITH PILE TIP PROTECTION.

PILE SPACING SHOWN IS AT BOTTOM OF FOOTING.

PILES MARKED THUS  $oxed{\mathsf{I}}$  TO BE BATTERED 3" PER FOOT IN

FOR PILE SPLICE DETAILS SEE DETAIL B202.

SEE SURVEY SHEET FOR TEST PILE LOCATIONS.



**DRAFT-WORK IN PROCESS** 

SHEET

7

OF

35

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

**AECOM** Kimley»Horn





**CIVIL EAST - VOLUME 4** LOUISIANA AVENUE S. LRT BRIDGE **BRIDGE 27C13 EAST ABUTMENT DETAILS** 

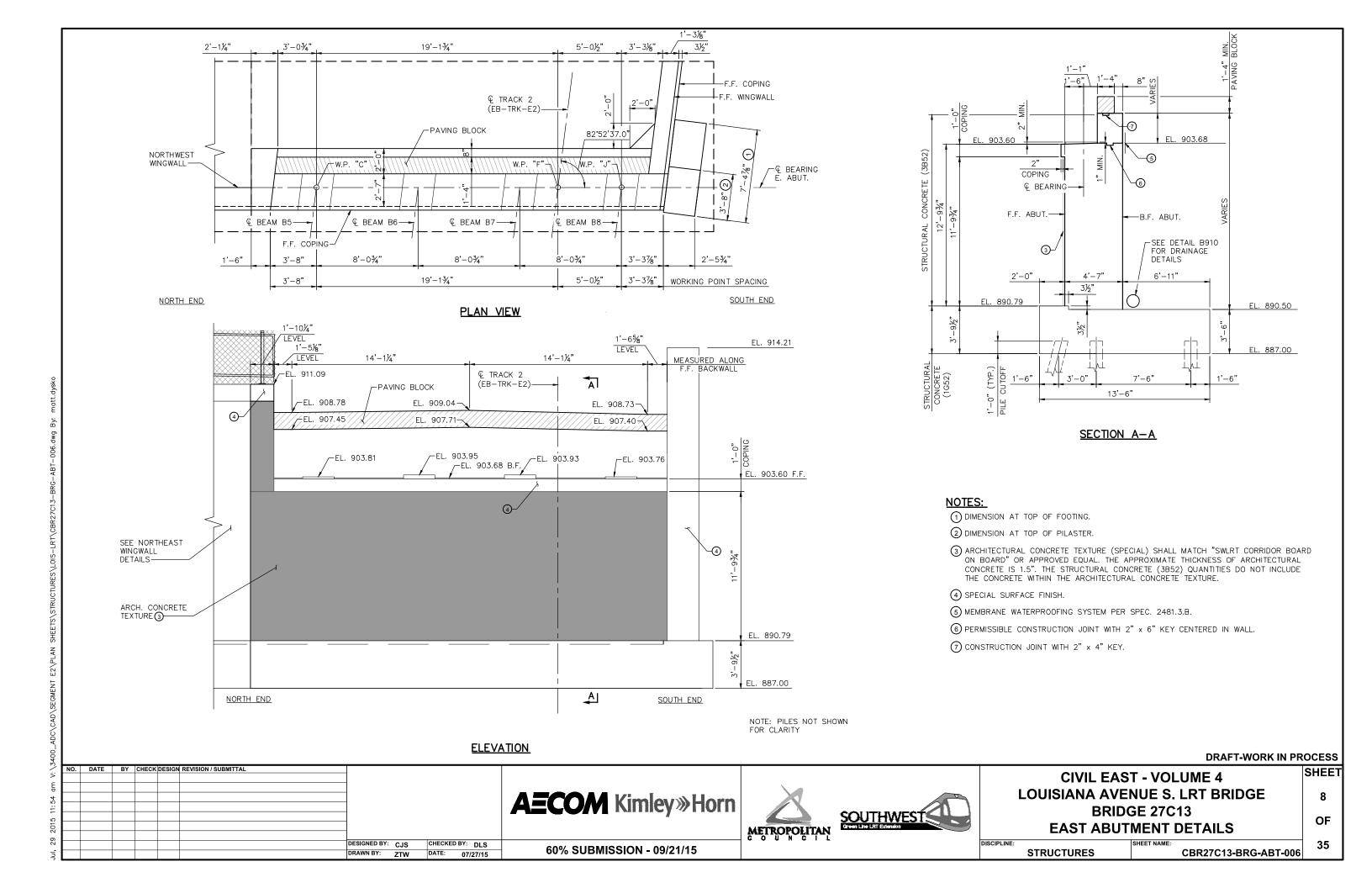
DISCIPLINE: CBR27C13-BRG-ABT-005 **STRUCTURES** 

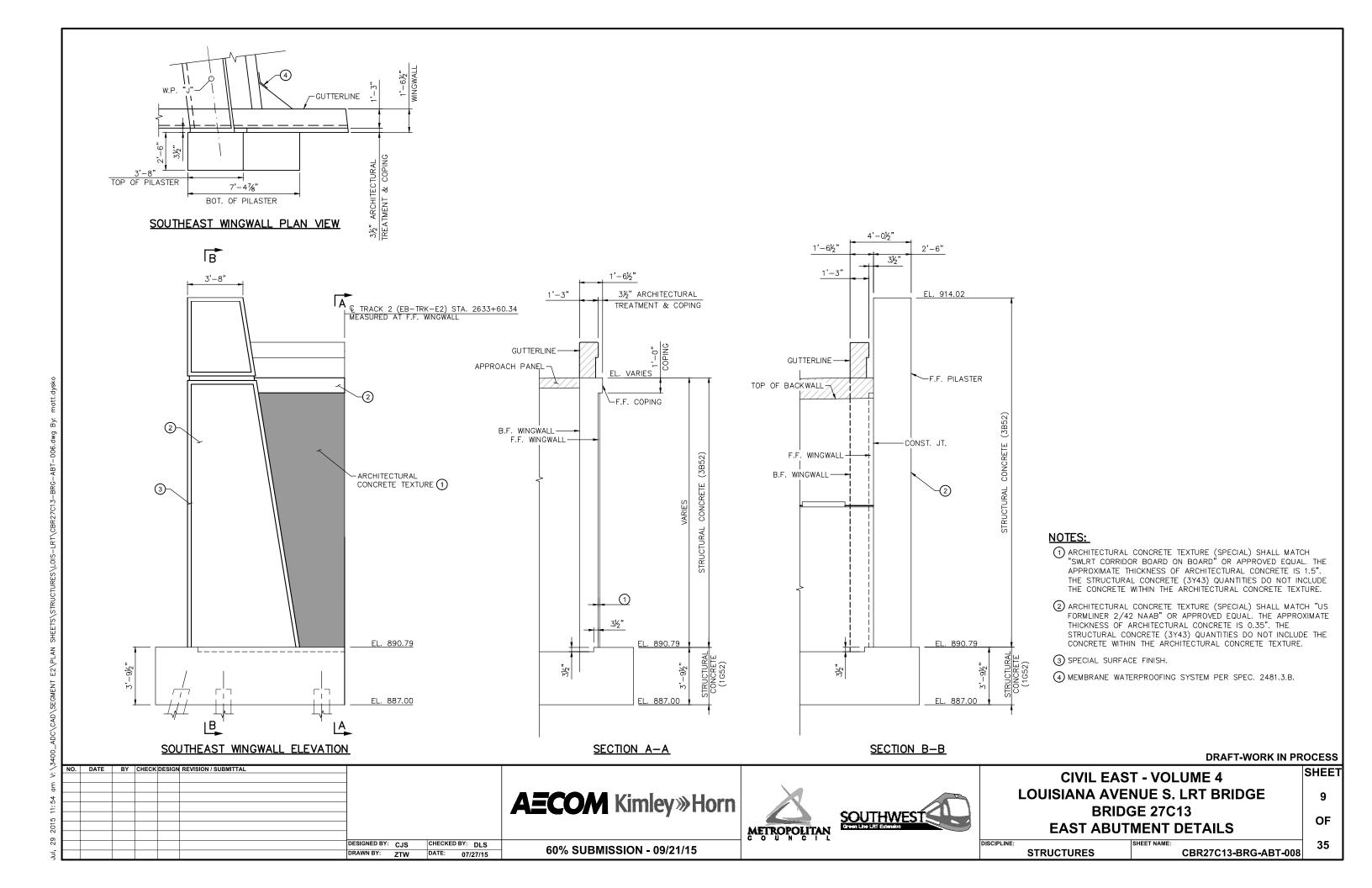
60% SUBMISSION - 09/21/15

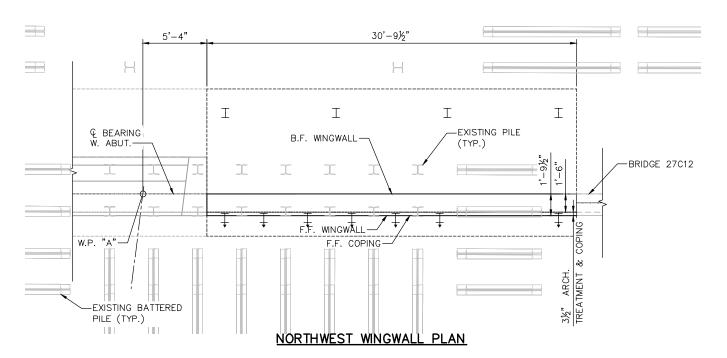
DESIGNED BY: CJS CHECKED BY: DLS

DRAWN BY: ZTW DATE: 07/27/15

<sup>\*</sup> BASED ON STRENGTH I LOAD COMBINATION.







30'-9½"

ΓĀ

# **GENERAL PILE NOTES:**

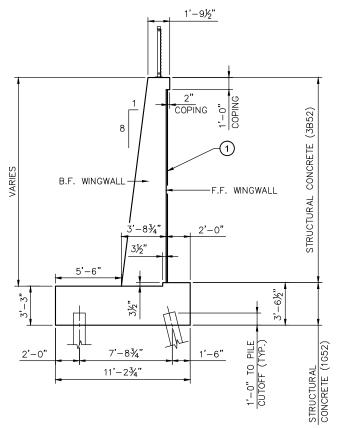
1 HP12x53 STEEL TEST PILE 75 FT. LONG
10 HP12x53 STEEL PILES EST. 75 FT. LENGTH
11 HP12x53 STEEL PILES REQ'D FOR NORTHWEST WING.

ALL PILES TO BE HP12x53 WITH PILE TIP PROTECTION.

PILE SPACING SHOWN IS AT BOTTOM OF FOOTING.

FOR PILE SPLICE DETAILS SEE DETAIL B202.

SEE SURVEY SHEET FOR TEST PILE LOCATIONS.



# SECTION A-A

# NORTHWEST WINGWALL REQUIRED NOMINAL PILE BEARING RESISTANCE FOR H-PILES Rn - TONS/PILE FIELD CONTROL METHOD $\phi$ dyn \*Rn MN/DOT PILE FORMULA 2012 (MPF12) $R_n = 20 \sqrt{\frac{W \times H}{1000} x lag} \left(\frac{10}{S}\right)$ 0.60 138 PDA 0.65 127

NORTHWEST WINGWALL COMPUTED PILE LOAD - TONS/PILE							
FACTORED DEAD LOAD + EARTH PRESSURE	60.3						
FACTORED LIVE LOAD	23.3						
* FACTORED DESIGN LOAD	82.3						
* BASED ON STRENGTH I LOAD COMBINATION.							

# NOTE:

PILES NOT SHOWN FOR CLARITY

-EL. 911.63

NORTHWEST WINGWALL ELEVATION

# NOTES:

- ARCHITECTURAL TEXTURE TO BE "SWLRT CORRIDOR BOARD ON BOARD". THE APPROXIMATE THICKNESS OF ARCHITECTURAL CONCRETE IS 1.5". THE STRUCTURAL CONCRETE (3B52) QUANTITIES DO NOT INCLUDE THE CONCRETE WITHIN THE ARCHITECTURAL CONCRETE TEXTURE.
- 2) SPECIAL SURFACE FINISH

DISCIPLINE:

DRAFT-WORK IN PROCESS

SHEET

10

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL					
						1				
						1				
						1				
						1				
						DESIGNED BY:	CJS	CHECKED BY:	DLS	
						DRAWN BY:	MPD	DATE: 07/3	7/15	

EL. 912.09-

SEE WEST ABUTMENT DETAILS-

EL. 894.54

EL. 891.00

**AECOM** Kimley»Horn

METROPOLITAN I

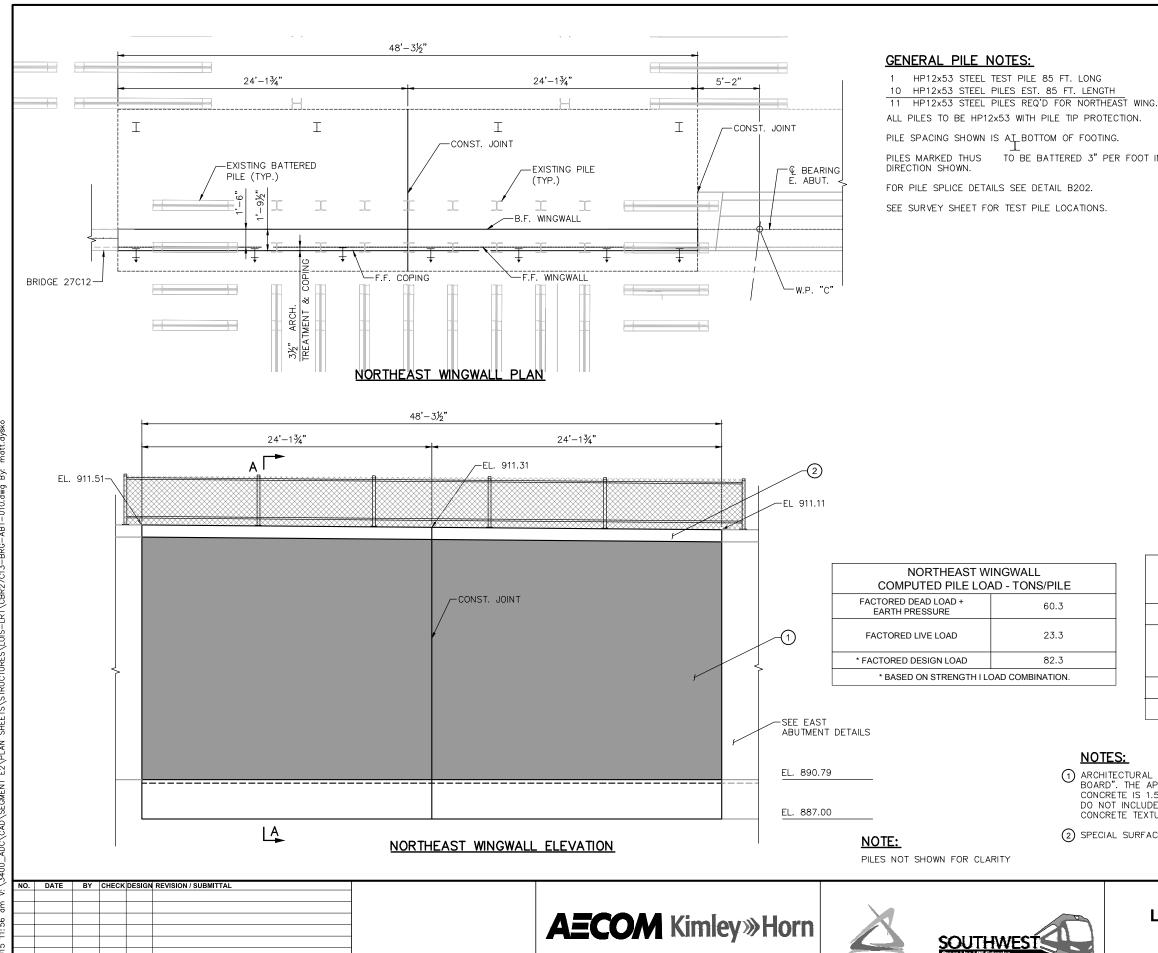


CIVIL EAST - VOLUME 4 LOUISIANA AVENUE S. LRT BRIDGE BRIDGE 27C13 WINGWALL DETAILS

STRUCTURES SHEET NAME:

CBR27C13-BRG-ABT-009 OF

Jul, 29 2015 11:55 am V;



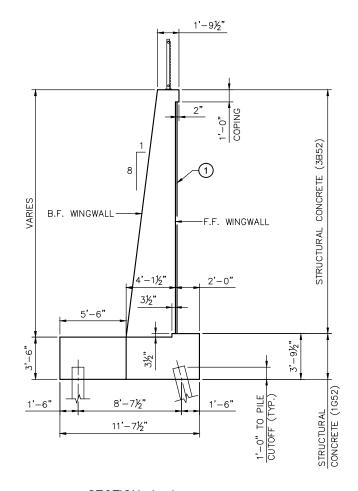
60% SUBMISSION - 09/21/15

DESIGNED BY: CJS CHECKED BY: DLS

DRAWN BY: MRD DATE: 07/27/15

PILE SPACING SHOWN IS AT BOTTOM OF FOOTING.

TO BE BATTERED 3" PER FOOT IN



# SECTION A-A

NORTHEAST WINGWALL REQUIRED NOMINAL PILE BEARING RESISTANCE FOR H-PILES Rn - TONS/PILE									
FIELD CONTROL METHOD	φdyn	* Rn							
MN/DOT PILE FORMULA 2012 (MPF12) $R_n = 20 \sqrt{\frac{W \times H}{1000}} x lag \left(\frac{10}{S}\right)$	0.60	136							
PDA	0.65	127							
* Rn = (FACTORED DESIGN LOAD) / φdyn									

# **NOTES:**

- ① ARCHITECTURAL TEXTURE TO BE "SWLRT CORRIDOR BOARD ON BOARD". THE APPROXIMATE THICKNESS OF ARCHITECTURAL CONCRETE IS 1.5". THE STRUCTURAL CONCRETE (3B52) QUANTITIES DO NOT INCLUDE THE CONCRETE WITHIN THE ARCHITECTURAL CONCRETE TEXTURE.
- 2 SPECIAL SURFACE FINISH

**DRAFT-WORK IN PROCESS** 

SHEET **CIVIL EAST - VOLUME 4** LOUISIANA AVENUE S. LRT BRIDGE 11 **BRIDGE 27C13** SOUTHWEST. OF **WINGWALL DETAILS** METROPOLITAN DISCIPLINE: 35 **STRUCTURES** CBR27C13-BRG-ABT-010

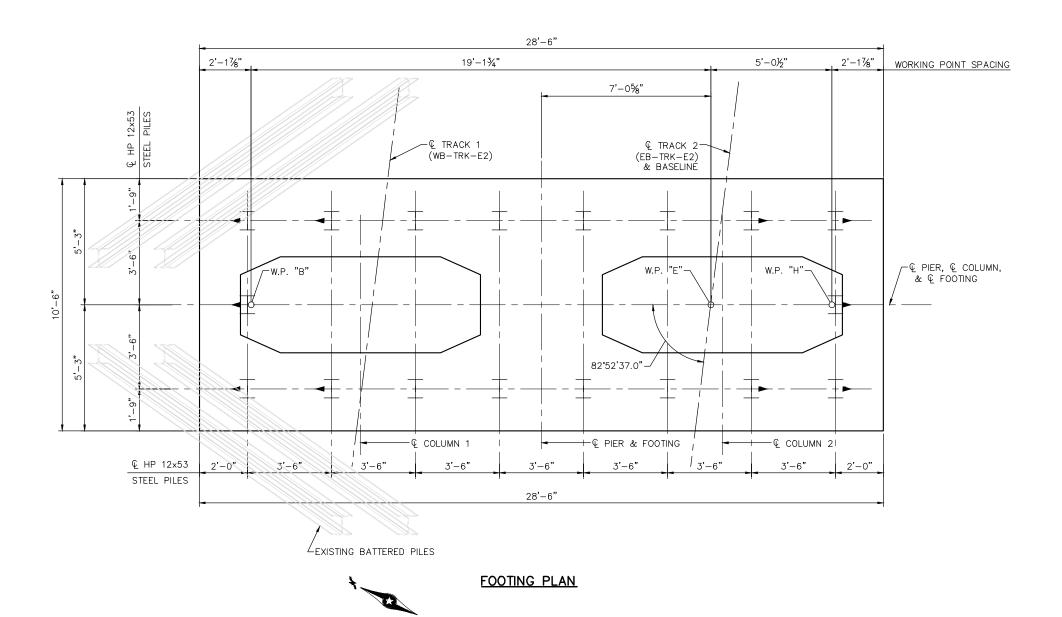
PIER								
COMPUTED PILE LOAD - TONS/PILE								
FACTORED DEAD LOAD	44.9							
FACTORED LIVE LOAD	3.6							
FACTORED OVERTURNING	54.7							
* FACTORED DESIGN LOAD	103.2							
* BASED ON EXTREME EVENT II LOAD COMBINATION.								

PIER REQUIRED NOMINAL PILE BEARING RESISTANCE FOR H-PILES Rn - TONS/PILE									
FIELD CONTROL METHOD	φdyn	* Rn							
MN/DOT PILE FORMULA 2012 (MPF12) $R_n = 20 \sqrt{\frac{W \times H}{1000} x lag} \left(\frac{10}{S}\right)$	0.60	172.0							
PDA	0.65	158.8							

\* Rn = (FACTORED DESIGN LOAD) / φdyn

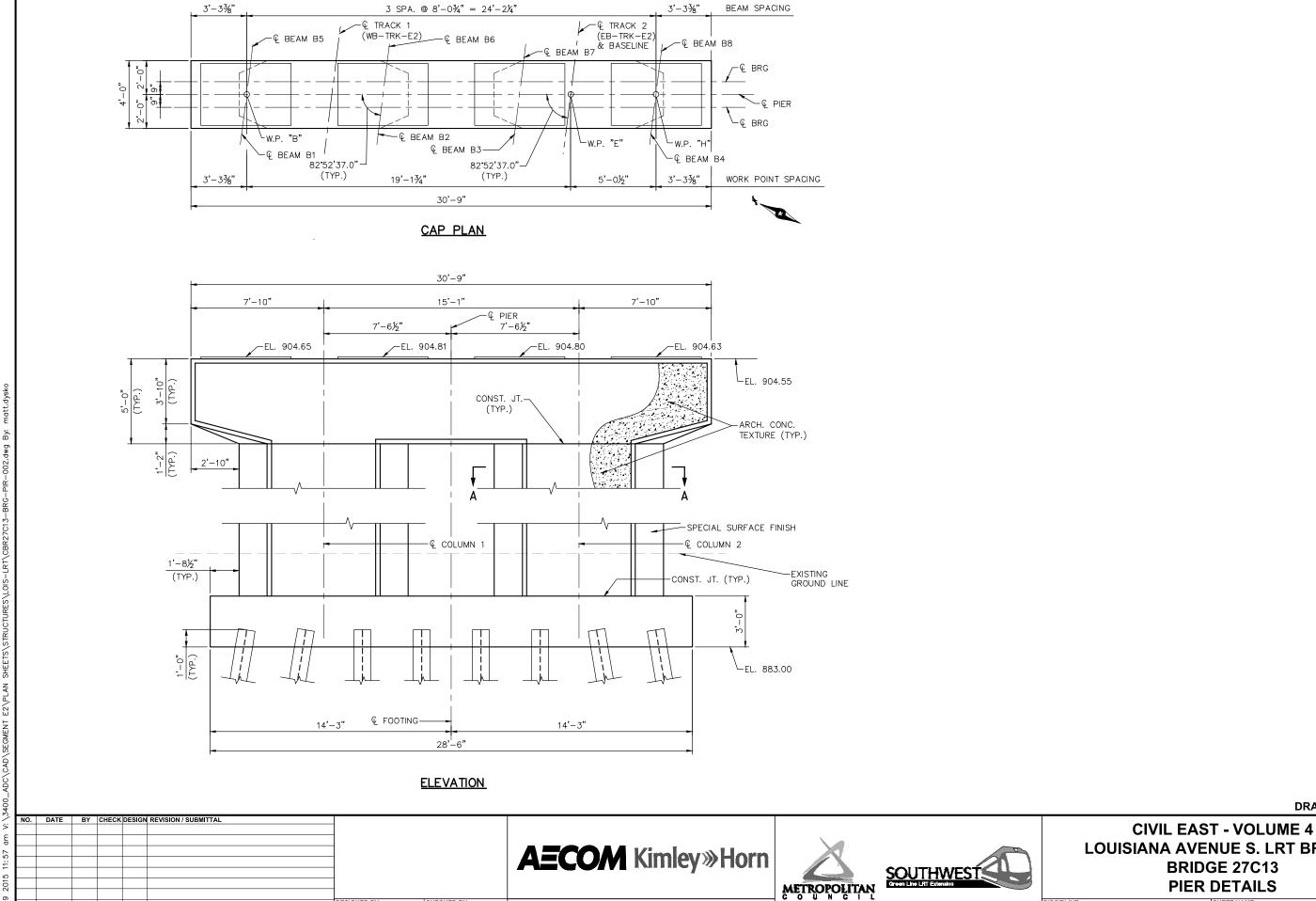
# GENERAL PILE NOTES

- 1 HP12x53 STEEL TEST PILE 75 FT. LONG
  17 HP12x53 STEEL PILES EST. 75 FT. LENGTH
  18 HP12x53 STEEL PILES REO'D FOR WEST ABUT.
- ALL PILES TO BE HP12x53 WITH PILE TIP PROTECTION.
- PILE SPACING SHOWN IS AT BOTTOM OF FOOTING.
- PILES MARKED THUS \$\frac{1}{4}\$ TO BE BATTERED 2" PER FOOT IN DIRECTION SHOWN.
- FOR PILE SPLICE DETAILS SEE DETAIL B202.
- SEE SURVEY SHEET FOR TEST PILE LOCATIONS.



**DRAFT-WORK IN PROCESS** 

SHEET **CIVIL EAST - VOLUME 4** LOUISIANA AVENUE S. LRT BRIDGE **AECOM** Kimley»Horn 12 **BRIDGE 27C13** SOUTHWEST Creen Line Little Extension OF **PIER DETAILS** METROPOLITAN 35 DESIGNED BY: DJW CHECKED BY: DLS DISCIPLINE: 60% SUBMISSION - 09/21/15 **STRUCTURES** CBR27C13-BRG-PIR-001 DRAWN BY: JFM DATE: 07/27/15



60% SUBMISSION - 09/21/15

DESIGNED BY: DJW CHECKED BY: DLS

DRAWN BY: JFM DATE: 07/27/15

LOUISIANA AVENUE S. LRT BRIDGE **BRIDGE 27C13 PIER DETAILS** 

DISCIPLINE: **STRUCTURES** 

CBR27C13-BRG-PIR-002

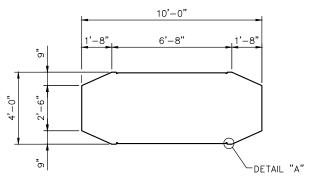
**DRAFT-WORK IN PROCESS** 

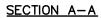
SHEET

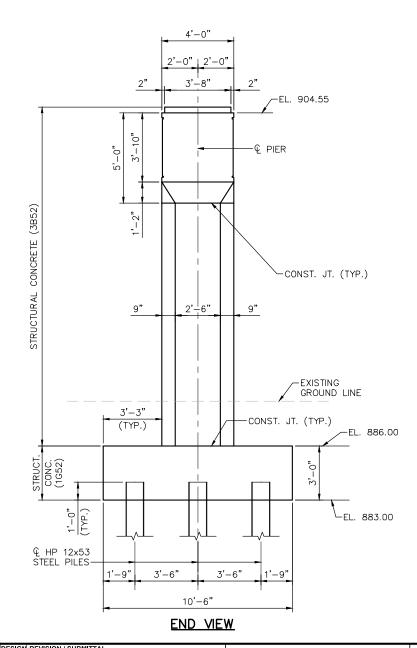
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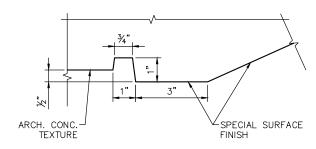
OF

35









DETAIL "A"

**DRAFT-WORK IN PROCESS** 

SHEET

14

OF

DESIGNED BY: DJW CHECKED BY: DLS DATE: 07/27/15

**AECOM** Kimley»Horn

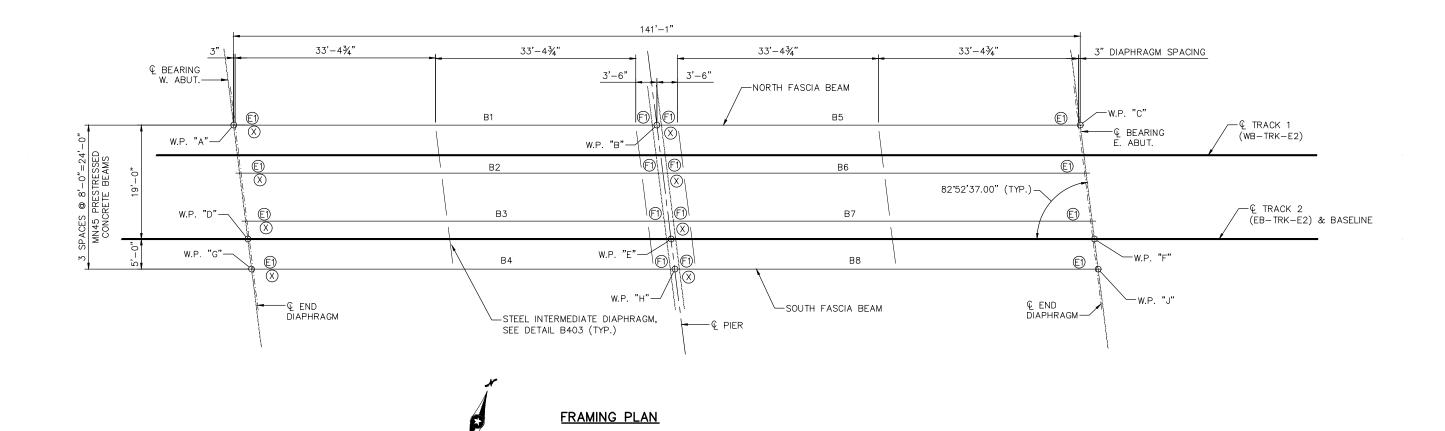




**CIVIL EAST - VOLUME 4** LOUISIANA AVENUE S. LRT BRIDGE **BRIDGE 27C13 PIER DETAILS** 

DISCIPLINE: **STRUCTURES** 

35 CBR27C13-BRG-PIR-003



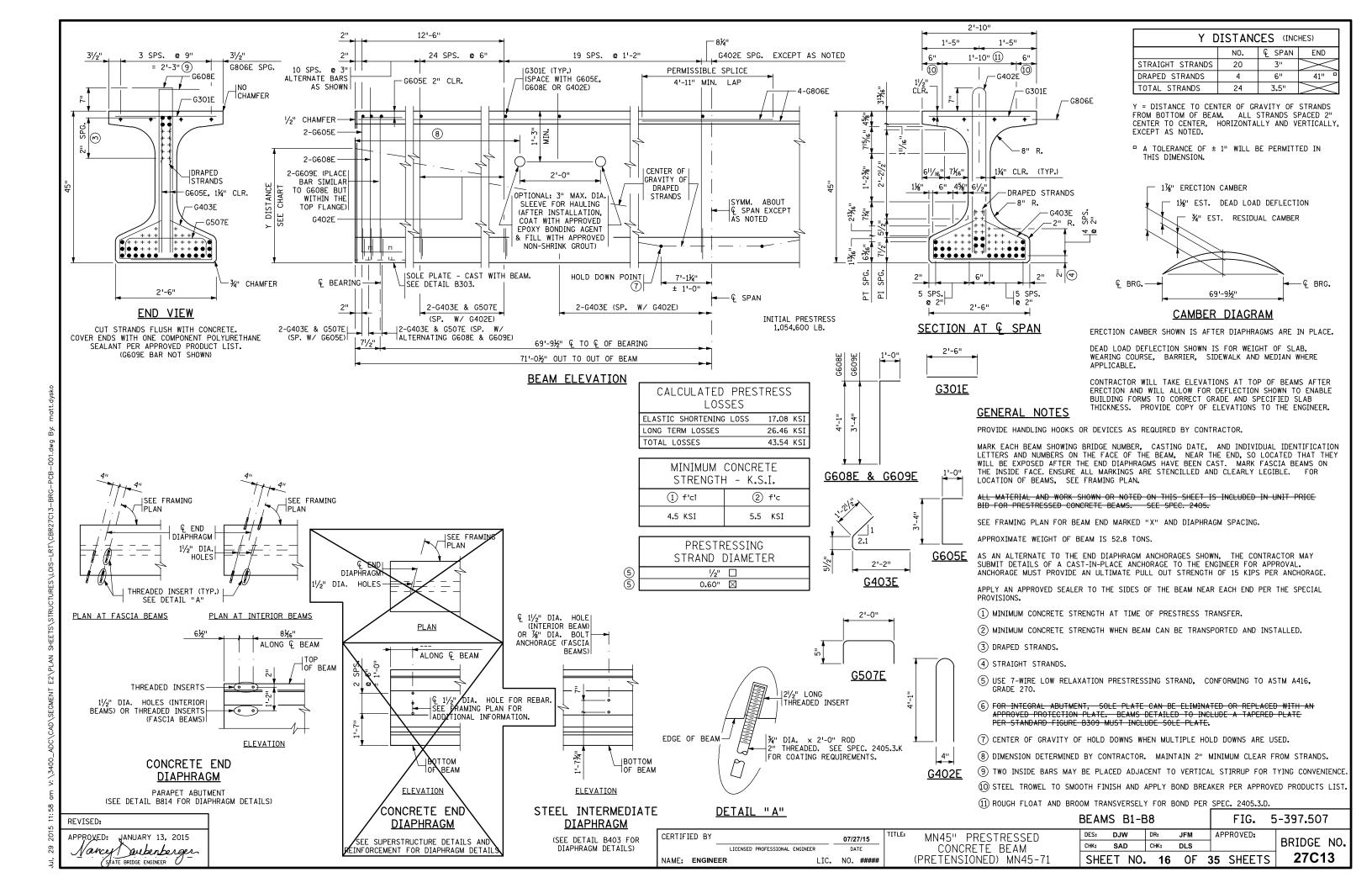
# NOTES:

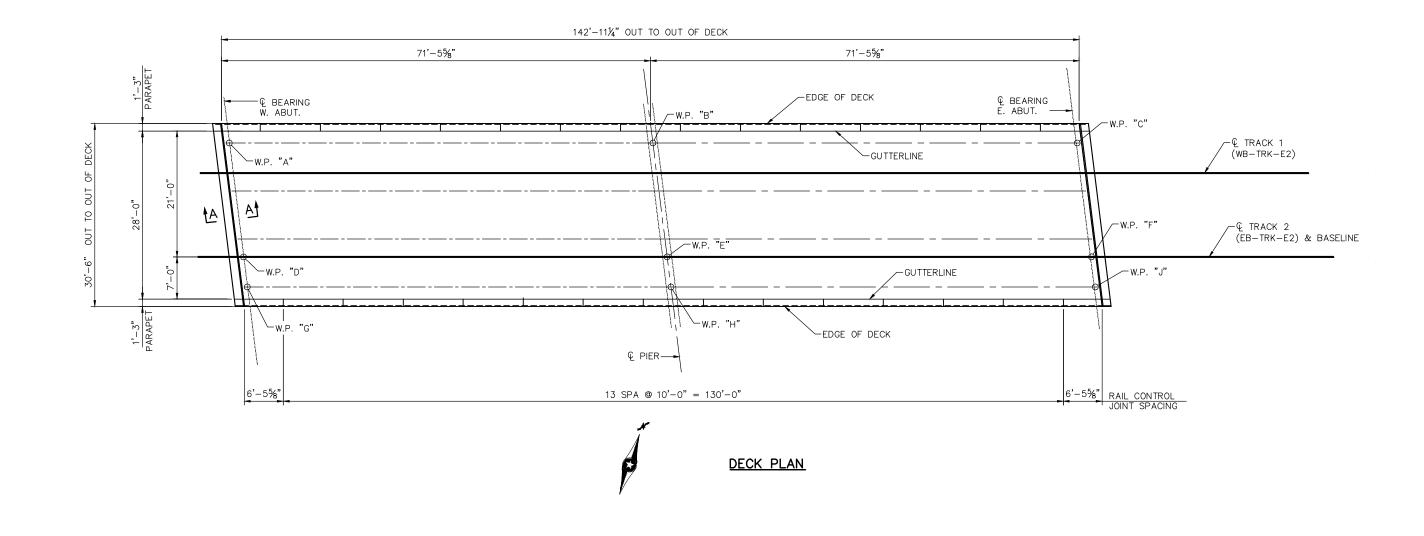
- F) DENOTES FIXED CURVED PLATE BEARING ASSEMBLY TYPE. F1, SEE DETAIL B310
- (E) DENOTES EXPANSION CURVED PLATE BEARING ASSEMBLY TYPE. E1, SEE DETAIL B311
- X DENOTES END OF BEAM

ALL BEAMS SET PARALLEL TO BASELINE. ALL DIAPHRAGMS SET PARALLEL TO SUBSTRUCTURE

# **DRAFT-WORK IN PROCESS**

NO. DATE BY CHECK DESIGN REVISION / SUBMITTAL SHEET **CIVIL EAST - VOLUME 4** LOUISIANA AVENUE S. LRT BRIDGE **AECOM** Kimley»Horn 15 **BRIDGE 27C13** SOUTHWEST Cross Library Extension OF **FRAMING PLAN** METROPOLITAN DESIGNED BY: DJW CHECKED BY: DLS DISCIPLINE: 35 60% SUBMISSION - 09/21/15 CBR27C13-BRG-SUP-002 DRAWN BY: MRD DATE: 07/27/15 **STRUCTURES** 





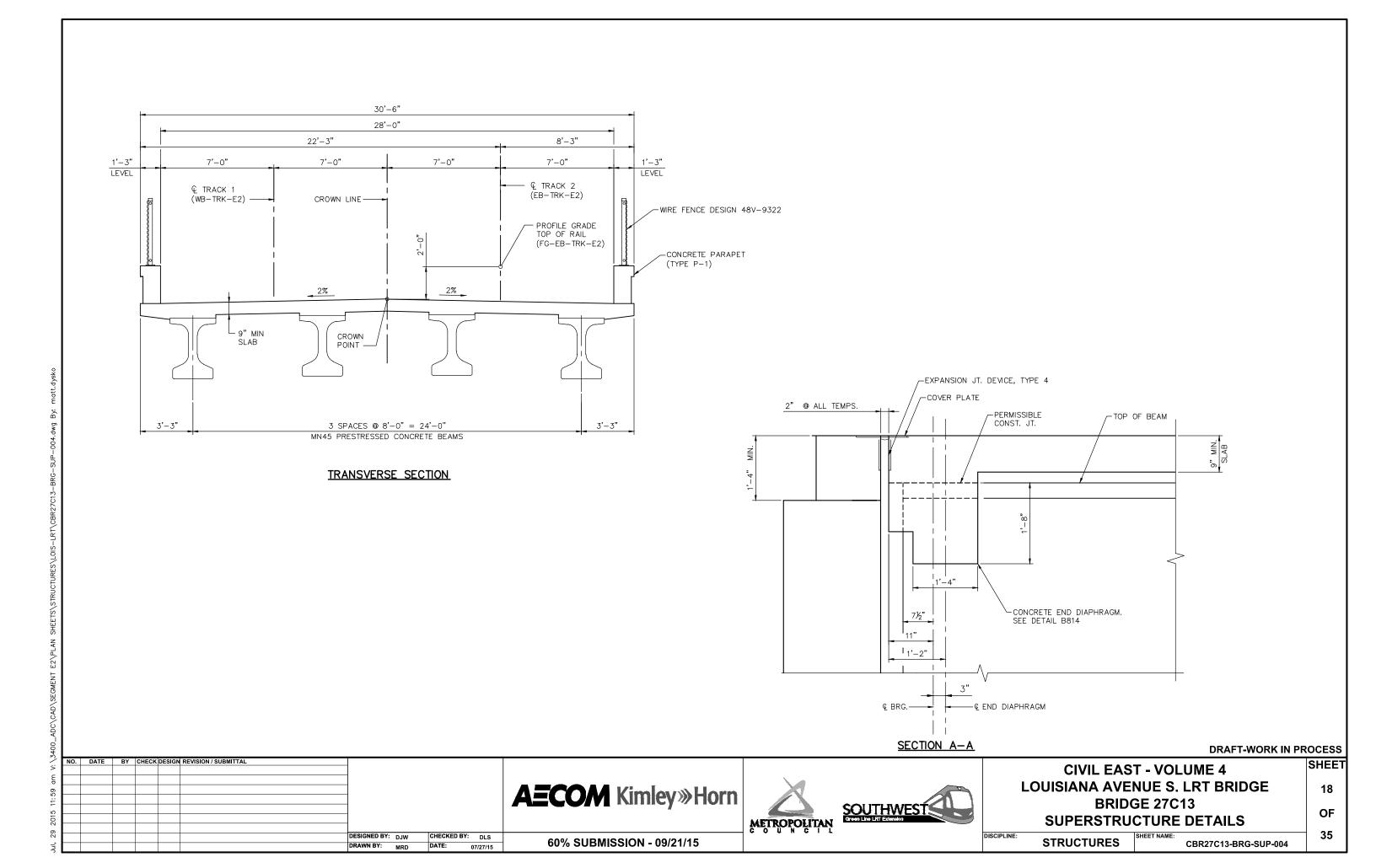
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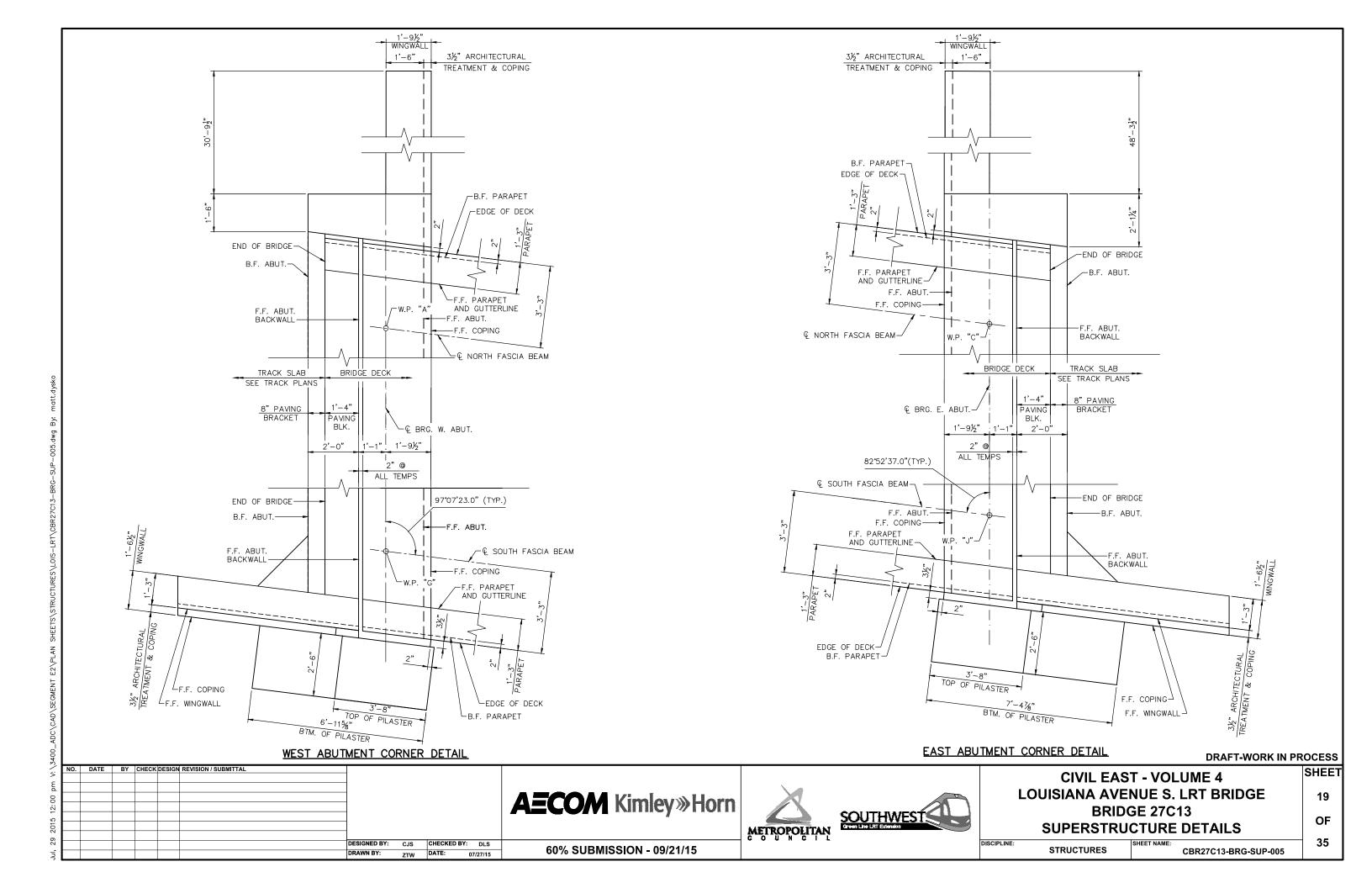
FOR ADDITIONAL PARAPET STEEL TO BE PLACED IN DECK, SEE SHEET XX

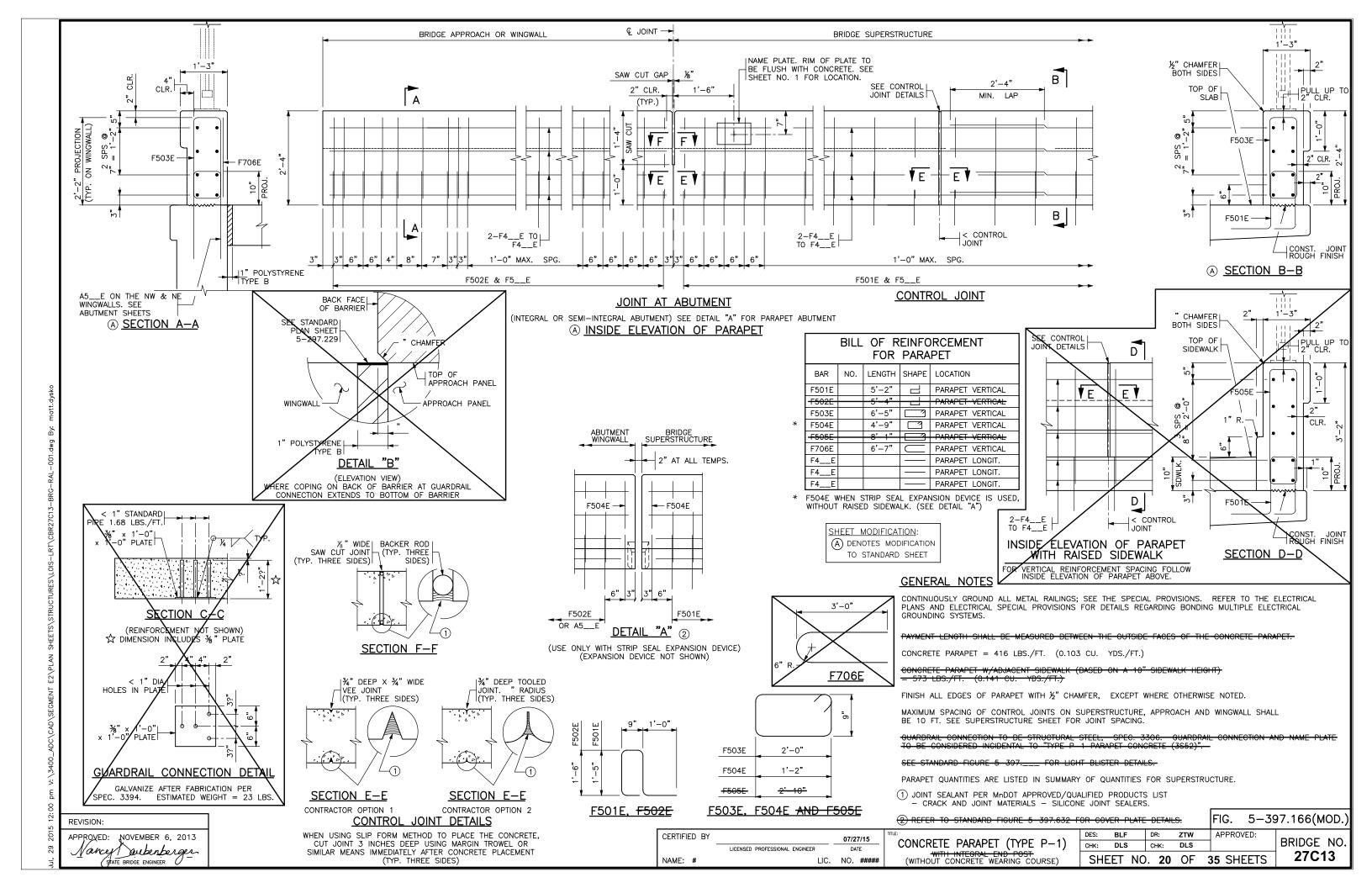
FOR SECTION A-A, SEE SHEET 18

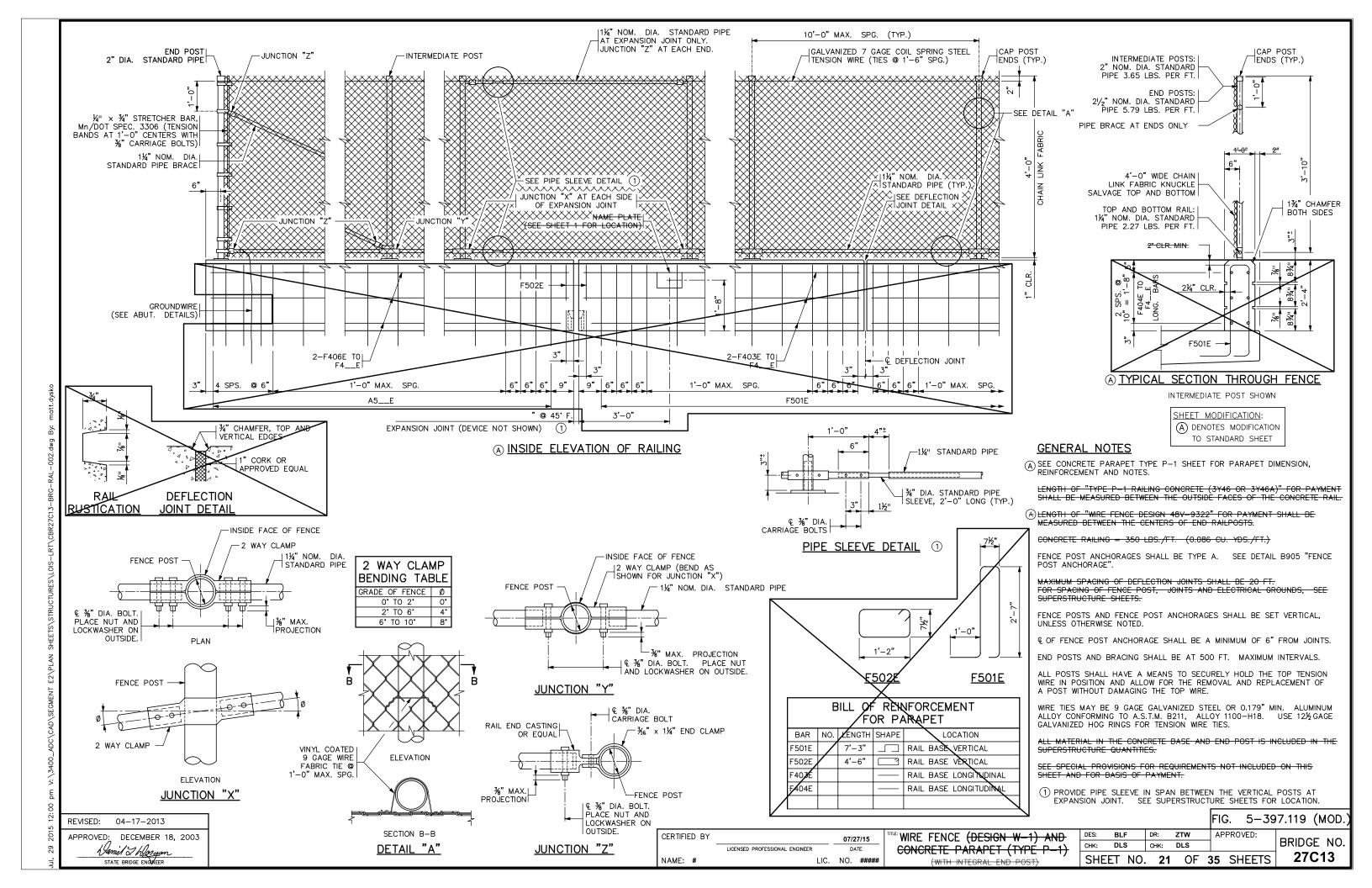
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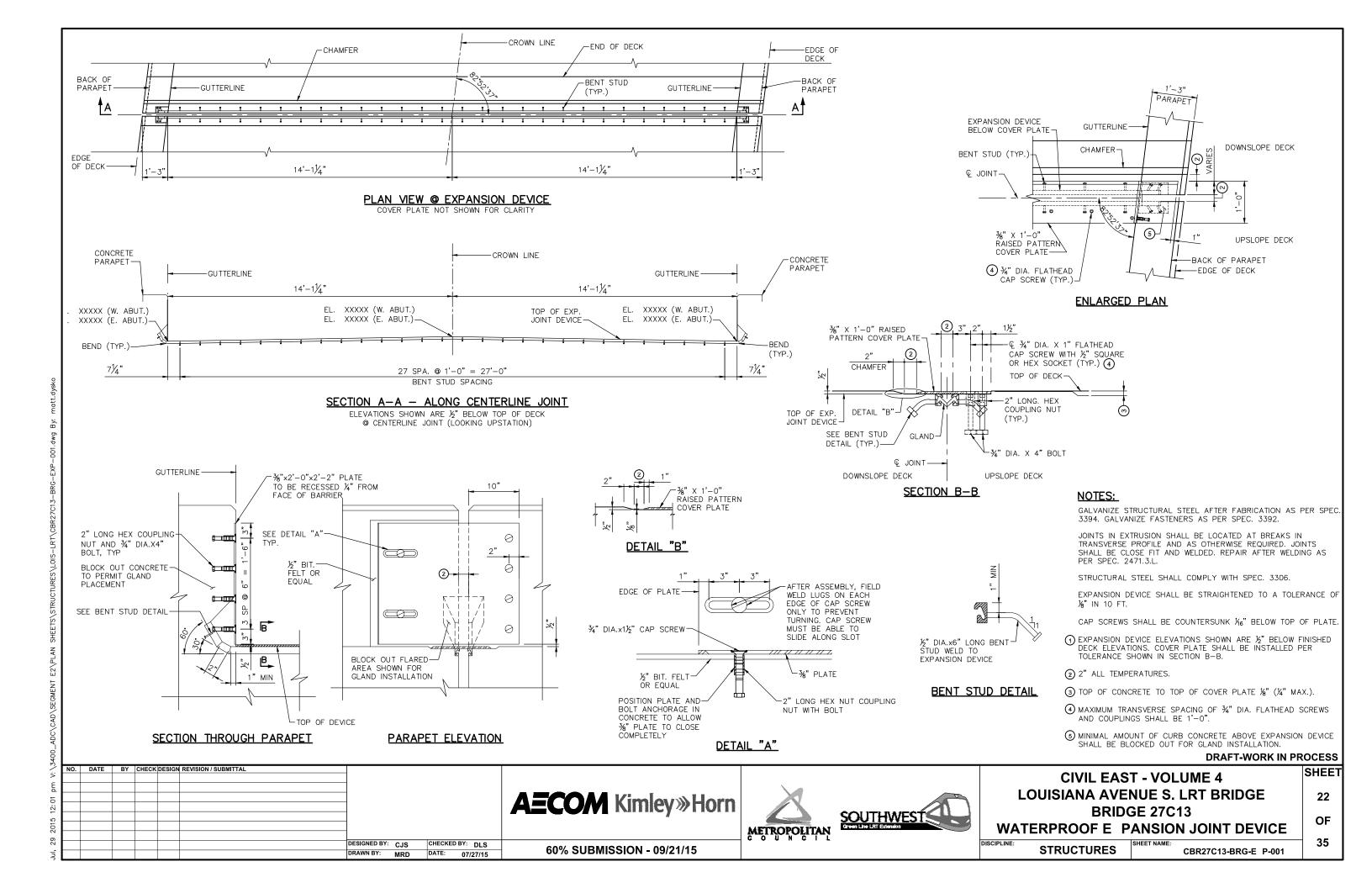
> F	NO.	DATE BY	Y CHECK DESIGN REVISION / SUBMITTAL					CIVIL EAS	T - VOLUME 4	SHEET
29 gr					<b>AECOM</b> Kimley»Horn	A		LOUISIANA AVE	NUE S. LRT BRIDGE	17
<u> </u>					AECOM Killiley » norti		SOUTHWEST	BRIDGE 27C13		
2015						METROPOLITAN	Green Line LRT Extension	SUPERSTRU	CTURE DETAILS	OF
29				DESIGNED BY: DJW CHECKED BY: DLS	600/ SUDMISSION 00/24/45	COUNCIL		DISCIPLINE:	SHEET NAME:	35
j F				DRAWN BY: MRD DATE: 07/27/15	60% SUBMISSION - 09/21/15			STRUCTURES	CBR27C13-BRG-SUP-003	,

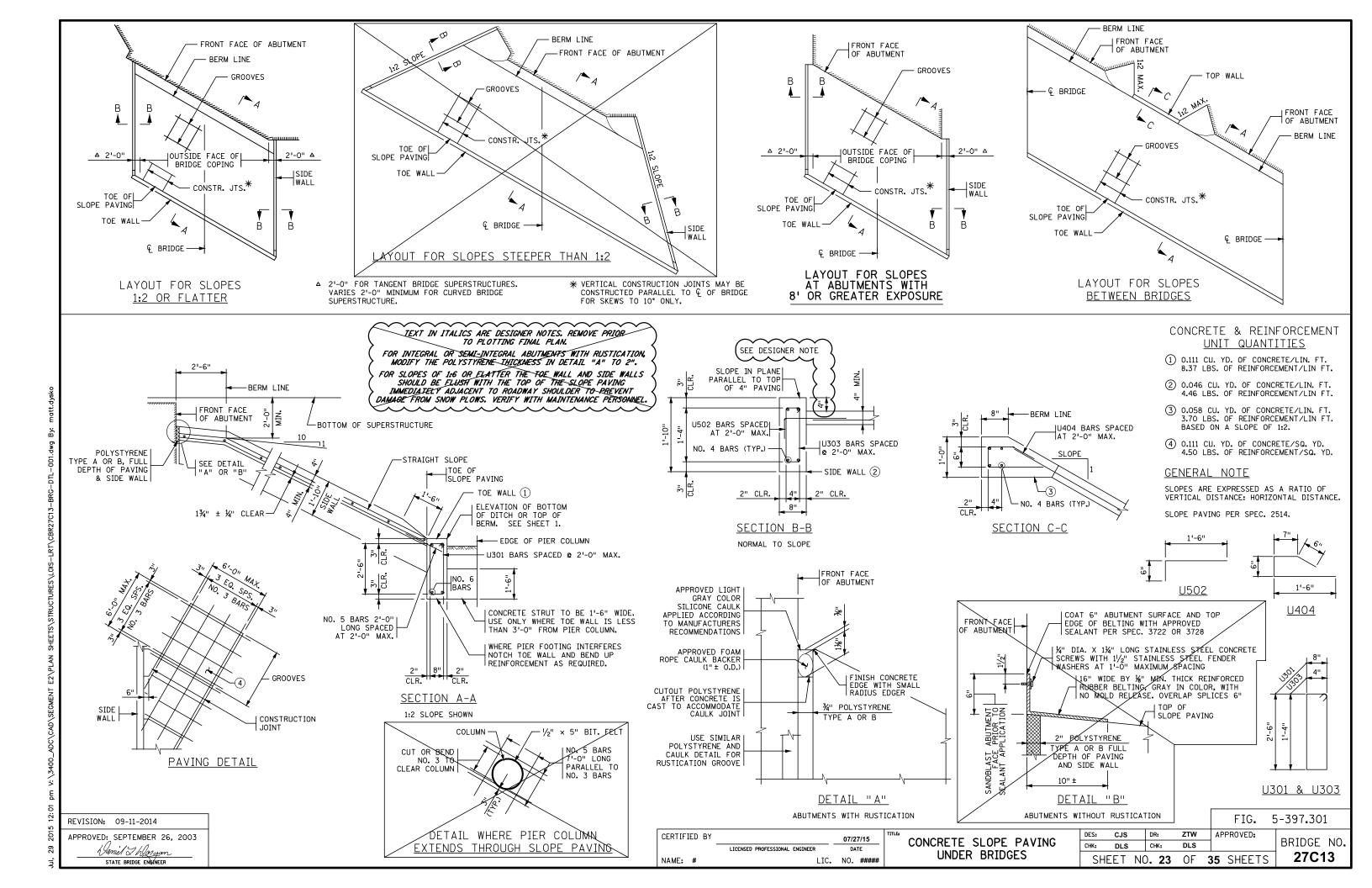












DRAFT ON LETTERS AND NUMBERS SHALL NOT BE MORE THAN 3" IN 12". HORIZONTAL SPACING OF LETTERS AND NUMBERS SHALL PRODUCE A BALANCED LAYOUT IN PROPORTION TO SPACING SHOWN.

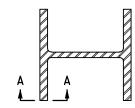
TOP SURFACE OF LETTERS, NUMBERS AND FRAMES SHALL BE BURNISHED.

STATE OF MINNESOTA
DEPARTMENT OF TRANSPORTATION APPROVED: NOVEMBER 22, 2002 DETAIL NO. BRIDGE NAMEPLATE Vaniel I Worgan B101 (FOR NEW BRIDGES) STATE BRIDGE ENGINEER

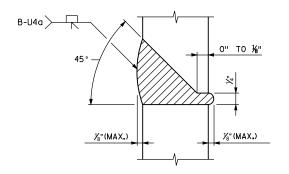
DRAWN BY: JFM

DESIGNED BY: CJS CHECKED BY: DLS

DATE: 07/27/15



SECTION AT SPLICE



SECTION A-A 100% BUTT WELDED PILE SPLICE

CELLULOSIC TYPE ELECTRODES E-6010 OR E-6011 SHALL BE USED FOR 100% BUTT WELDED SPLICES.

ELECTRODES WHICH HAVE BECOME WET, SOILED OR DAMAGED SHALL NOT BE USED.

WELDING SHALL NOT BE DONE WHEN THE AMBIENT TEMPERATURE IS LOWER THAN O'F. OR WHEN THE PILE IS WET OR EXPOSED TO FALLING RAIN OR SNOW. WHEN THE PILE METAL TEMPERATURE IS BELOW 32°F., THE PILE METAL IN THE AREA OF THE WELD SHALL BE HEATED TO A MINIMUM TEMPERATURE OF 70° F. AND MAINTAINED AT THIS TEMPERATURE DURING WELDING.

APPROVED: NOVEMBER 22, 2002 Waniel I Waryan STATE BRIDGE ENGINEER

STATE OF MINNESOTA
DEPARTMENT OF TRANSPORTATION

PILE SPLICE (STEEL H BEARING PILES 10" TO 14") DETAIL NO.

B202

DRAFT-WORK IN PROCESS SHEET

**AECOM** Kimley»Horn

60% SUBMISSION - 09/21/15

METROPOLITAN



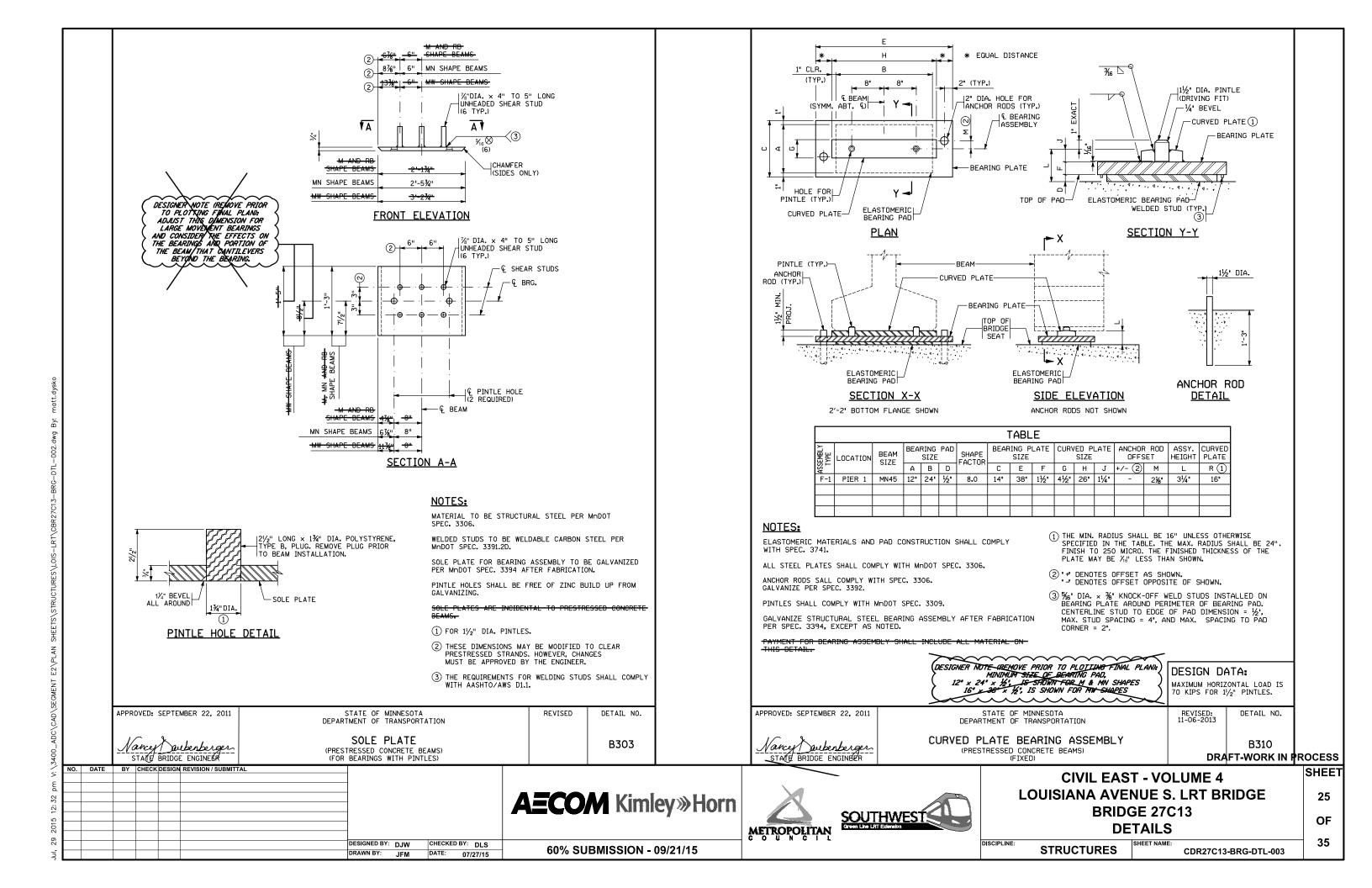
**CIVIL EAST - VOLUME 4** LOUISIANA AVENUE S. LRT BRIDGE **BRIDGE 27C13 DETAILS** 

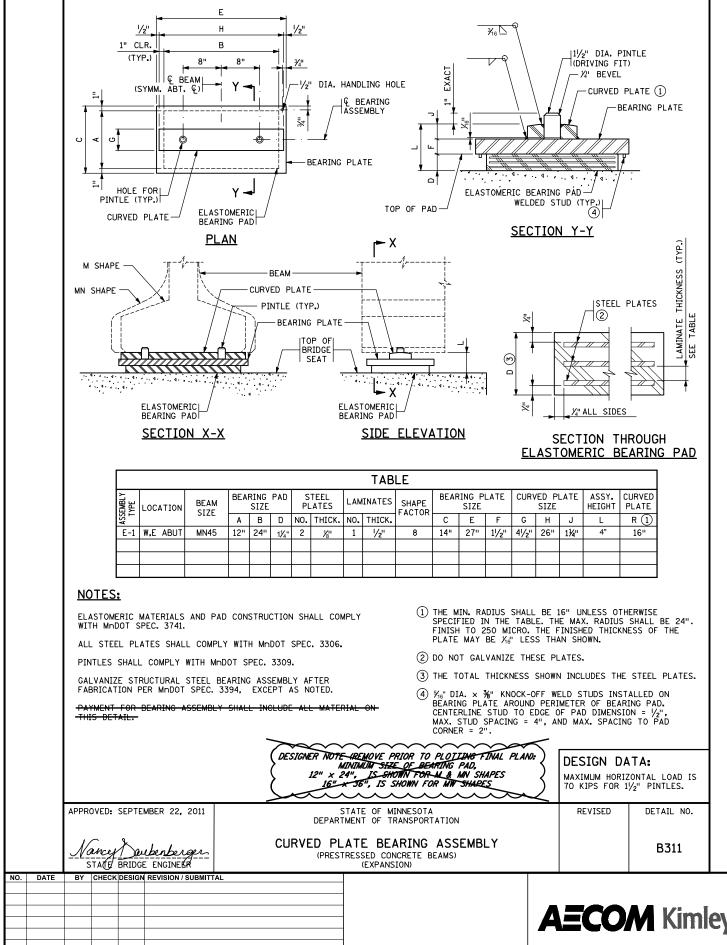
**STRUCTURES** 

CBR27C13-BRG-DTL-002

DISCIPLINE:

OF



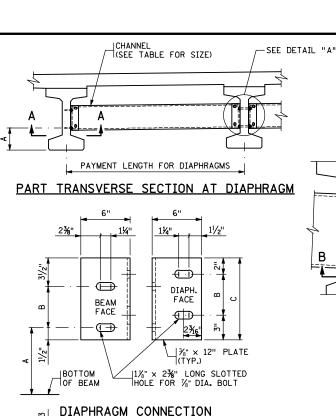


DESIGNED BY: DJW

DRAWN BY: JFM

CHECKED BY: DLS

DATE: 07/27/15



**DIAPHRAGM CONNECTION** 45M AND MN45 BEAMS 11/4"\_ 11/4" (1)⇚ FACE BFAM  $\oplus$ 13%"× 12" PLATE DA. BOLT **DIAPHRAGM CONNECTION** INSTALLATION SHALL CONFORM TO SPEC. 2405.3.K. FOR 54M, MN54 AND MN63 BEAMS SHOP BEND THE LEG OF THE 12" PLATE TO CONFORM TO THE DIAPHRAGM.

TABLE								
BEAM		CHANNEL						
HEIGHT	Α	В	С	SIZE				
701	11 711	711	11 011	01000 7				
JOIN	1-3		1-0	C12 X 20.1				
4EM	44 73/11	11_111	11 (1	MC10-40-7				
45161	1374.	1 -1	1	MICTOX45.1				
EAM	44 01/11	11 10	3	MC10~40.7				
3-1W	1 -274	1 1	þ	MICTOX-15*1				
MN45	1'-7¾"	7"	1'-0"	C12×20.7				
MNE 4	44 73/11	11 10	11 011	MC10-42 7				
MILADA	1 - 174	1 1	1 - 3	MICTOXAC				
MNCZ	44 73/11	11 111	21.61	MC10-42 7				
WINOS	1174	1 1	2 -0	WICTOX-12.1				

APPROVED: OCTOBER 26, 2005 Waniel I Wasyan STATE BRIDGE ENGINEER

STATE OF MINNESOTA
DEPARTMENT OF TRANSPORTATION

STEEL INTERMEDIATE DIAPHRAGM (FOR 36M - 54M, MN45 - MN63 PRESTRESSED CONCRETE BEAMS)

E BEAM-

SECTION A-A

TYPICAL SECTION AT

ALL FASCIA BEAMS

LL STEEL SHALL CONFORM TO SPEC. 3306.

1) FOR SKEW ANGLES UNDER 20°, USE 90° LESS THE SKEW ANGLE. FOR SKEW ANGLES OVER 20°, USE 90°. DETAIL NO. 06-14-2006 10-22-2009 09-11-2014 B403

| 1/8" DIA. HIGH STRENGTH BOLTS PER SPEC. 3391.2.B

|%| DIA. A307 BOLTS, PER SPEC. 3391.2.A, WITH TWO HEX NUTS, OR EQUAL, AND TWO HARDENED 3" SQ. ×  $\%_6$ " PLATE WASHERS EACH AT ALL INTERIOR BEAM DIAPHRAGM CONNECTIONS

| & DIAPHRAGM | (SEE FRAMING PLAN)

SECTION B-B

TYPICAL SECTION AT INTERIOR BEAM WITH CONTINUOUS OR STAGGERED INTERMEDIATE DIAPHRAGMS

-1" MIN. R.

WITH HEX NUT AND ONE 3" SQ. x 16" PLATE WASHER ON SLOTTED SIDE AND HARDENED WASHER

-FORM 11/2" DIA. HOLES IN WEB (TYP.)

ON DIAPHRAGM SIDE

DIA. HOLES IN CHANNEL

%" DIA. CAST-IN-PLACE BOLT ANCHORAGE.  $7_6$ " × 24" H.S. BOLT PER SPEC. 3391.2.B AND 3" SQ. ×  $9_6$ " PLATE WASHER. TORQUE ANCHOR BOLTS TO 80 FT.-LBS.

> SEE FRAMING PLANI FOR & BOLT HOLE

A %" × 6" × 6" ANGLE MAY BE USED FOR DIAPHRAGMS PERPENDICULAR TO BEAMS.

BENT PLATES MAY BE USED IN PLACE OF CHANNELS. THE BENT PLATES MUST BE THE SAME HEIGHT AS THE CHANNELS THEY REPLACE, BE  $\%_6"$  IN THICKNESS, AND HAVE LEGS 5" LONG.

GALVANIZE STEEL PLATES AND SHAPES IN ACCORDANCE WITH SPEC. 3394.

GALVANIZE BOLTS, NUTS AND WASHERS PER SPEC. 3392.

LOCATIONS

DETAIL "A"

INTERIOR BEAM WITH

CONTINUOUS LINE OF DIAPHRAGMS

- ¾" × 12" PLATE

J€ BOLT ANCHORAGE

DRAFT-WORK IN PROCESS

SHEET

METROPOLITAN



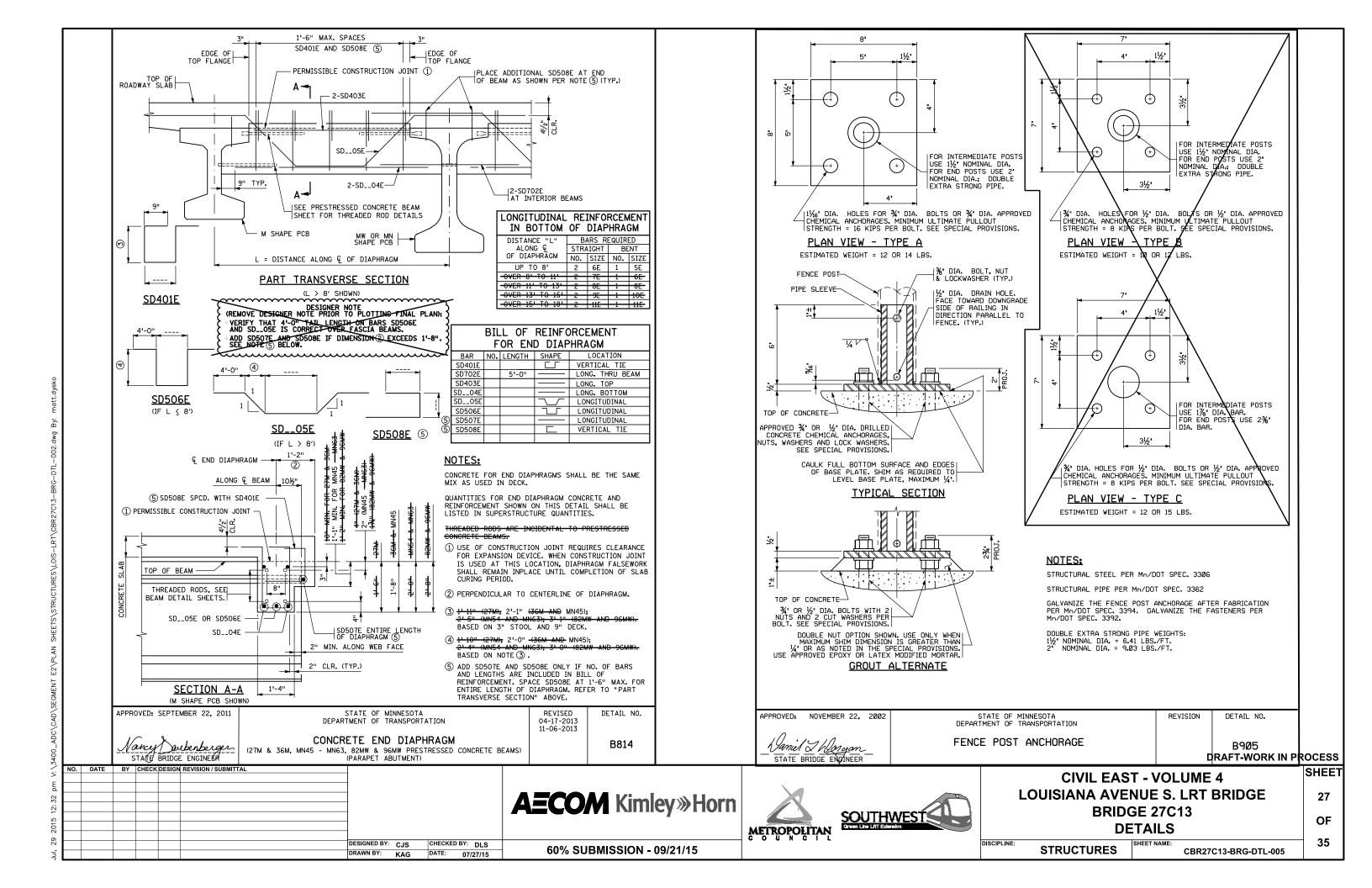
# **CIVIL EAST - VOLUME 4 BRIDGE 27C13**

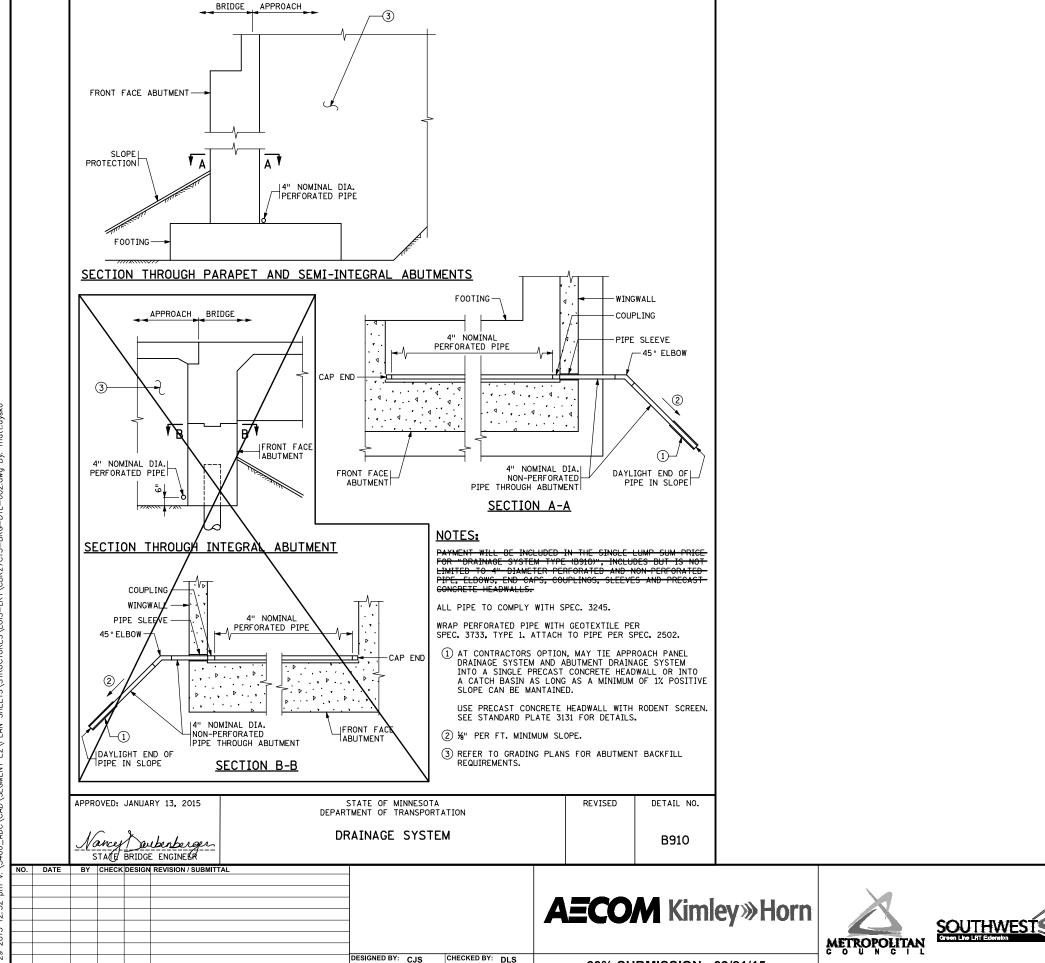
**STRUCTURES** CBR27C13-BRG-DTL-004

LOUISIANA AVENUE S. LRT BRIDGE **DETAILS** DISCIPLINE

OF

**AECOM** Kimley»Horn





DRAWN BY: JFM DATE: 07/27/15

60% SUBMISSION - 09/21/15

**DRAFT-WORK IN PROCESS** 

SHEET

28

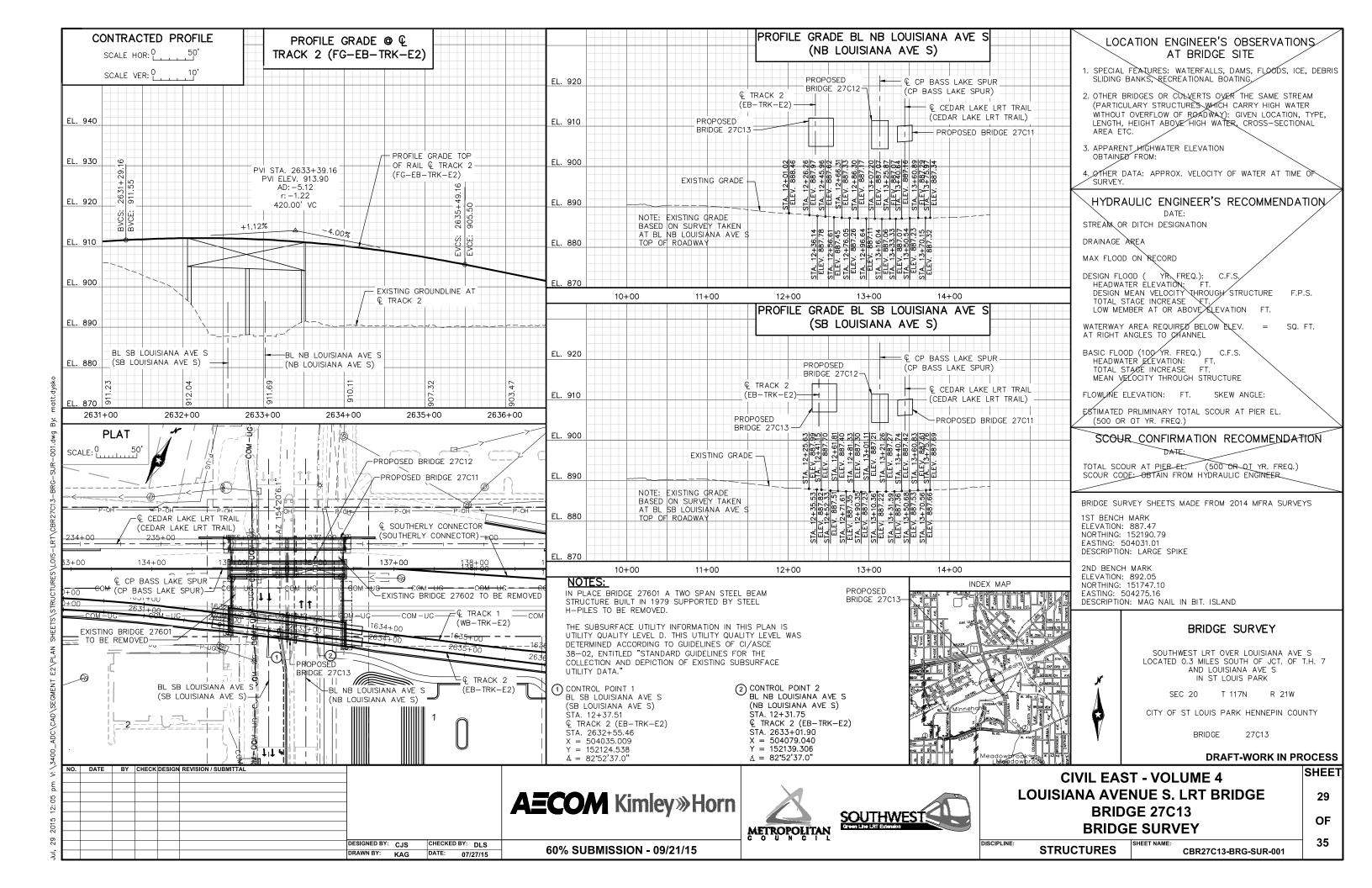
SOUTHWEST Green Line Little Extension

DISCIPLINE:

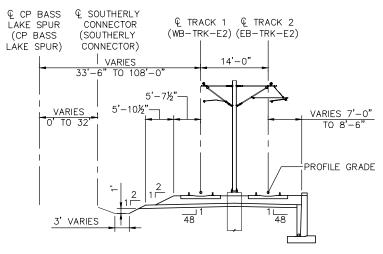
**CIVIL EAST - VOLUME 4** LOUISIANA AVENUE S. LRT BRIDGE **BRIDGE 27C13 DETAILS** 

**STRUCTURES** 

OF 35 CBR27C13-BRG-DTL-006



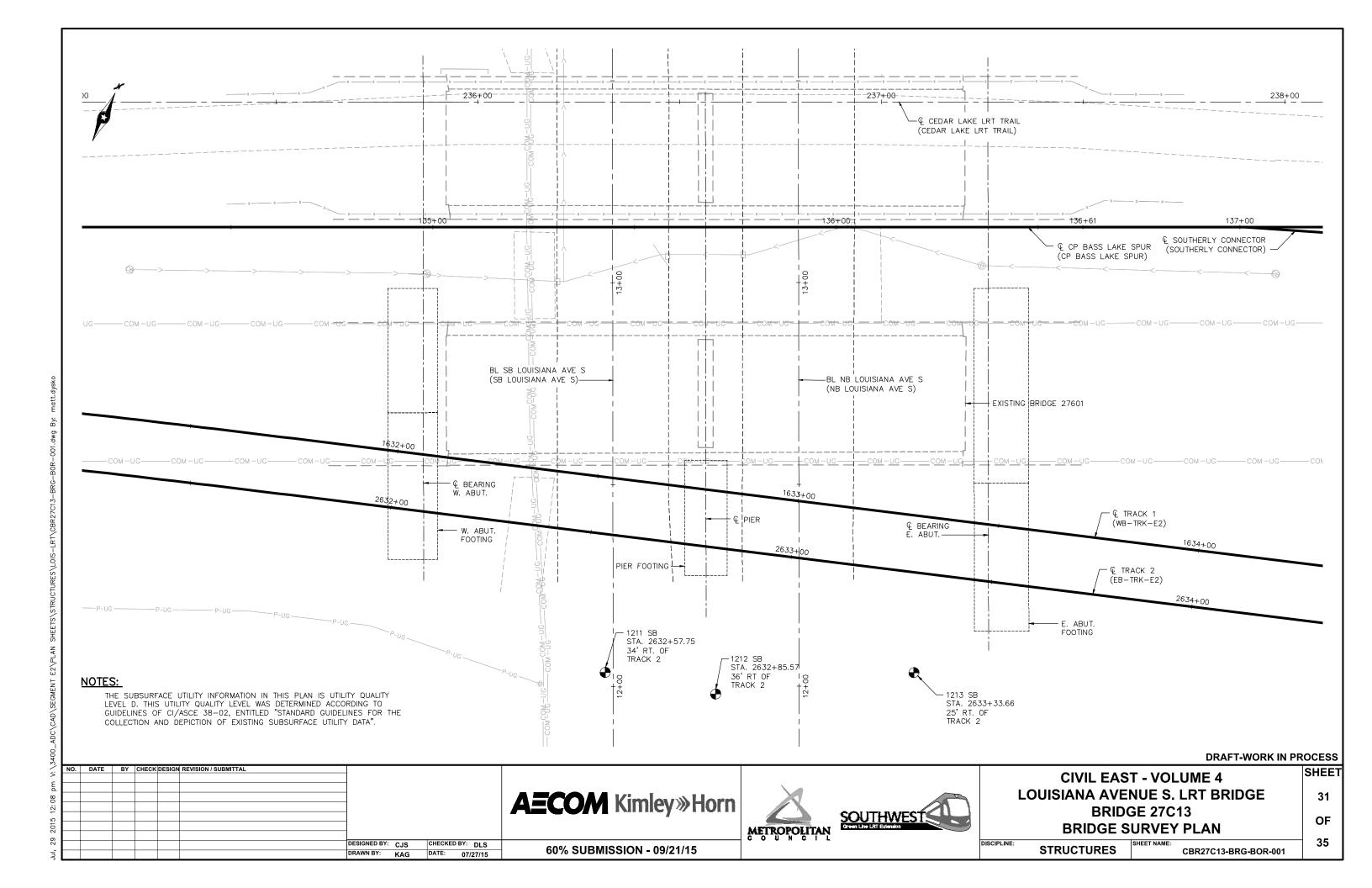
# TYPICAL ROADWAY SECTION LOUISIANA AVE S

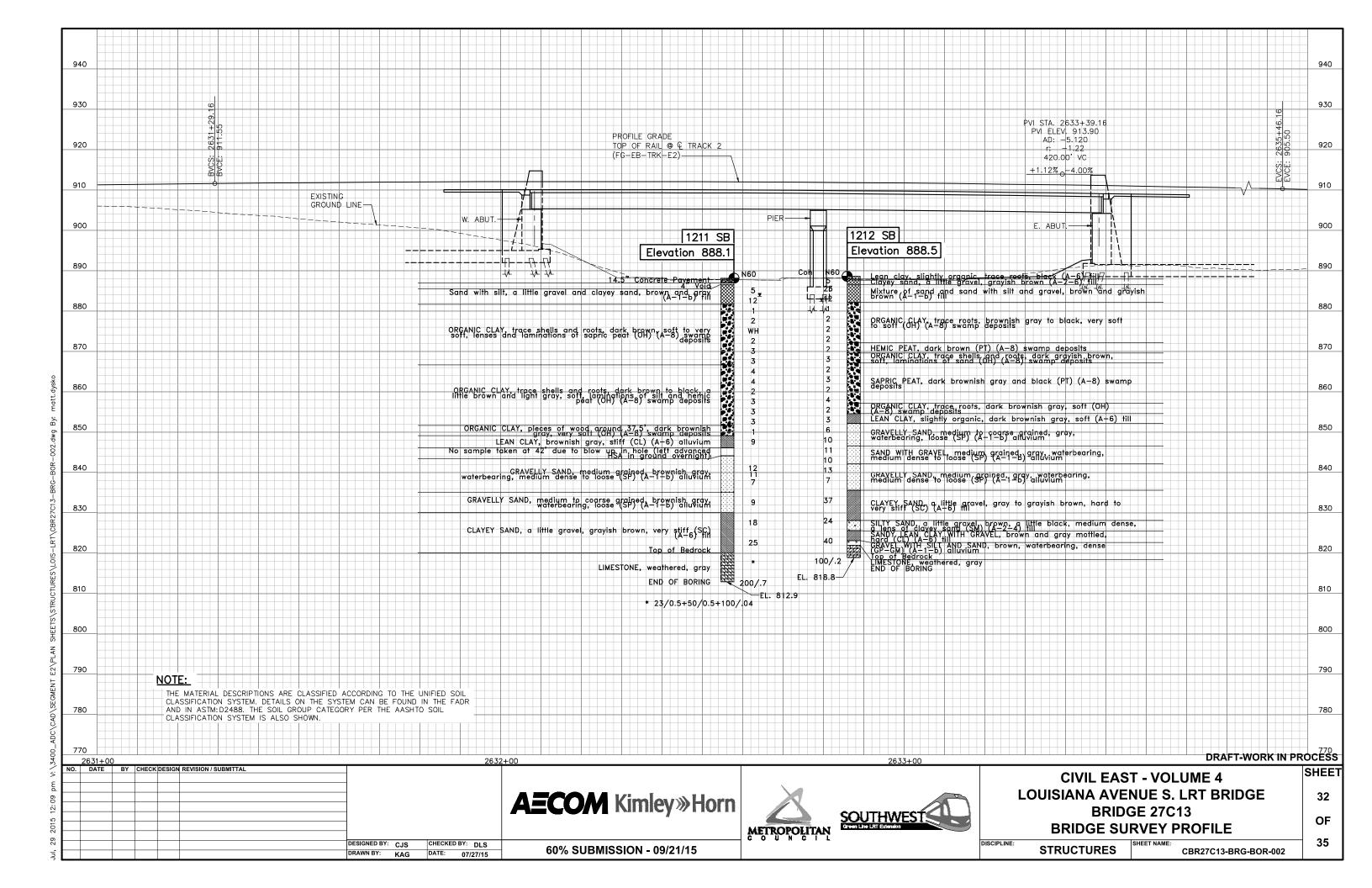


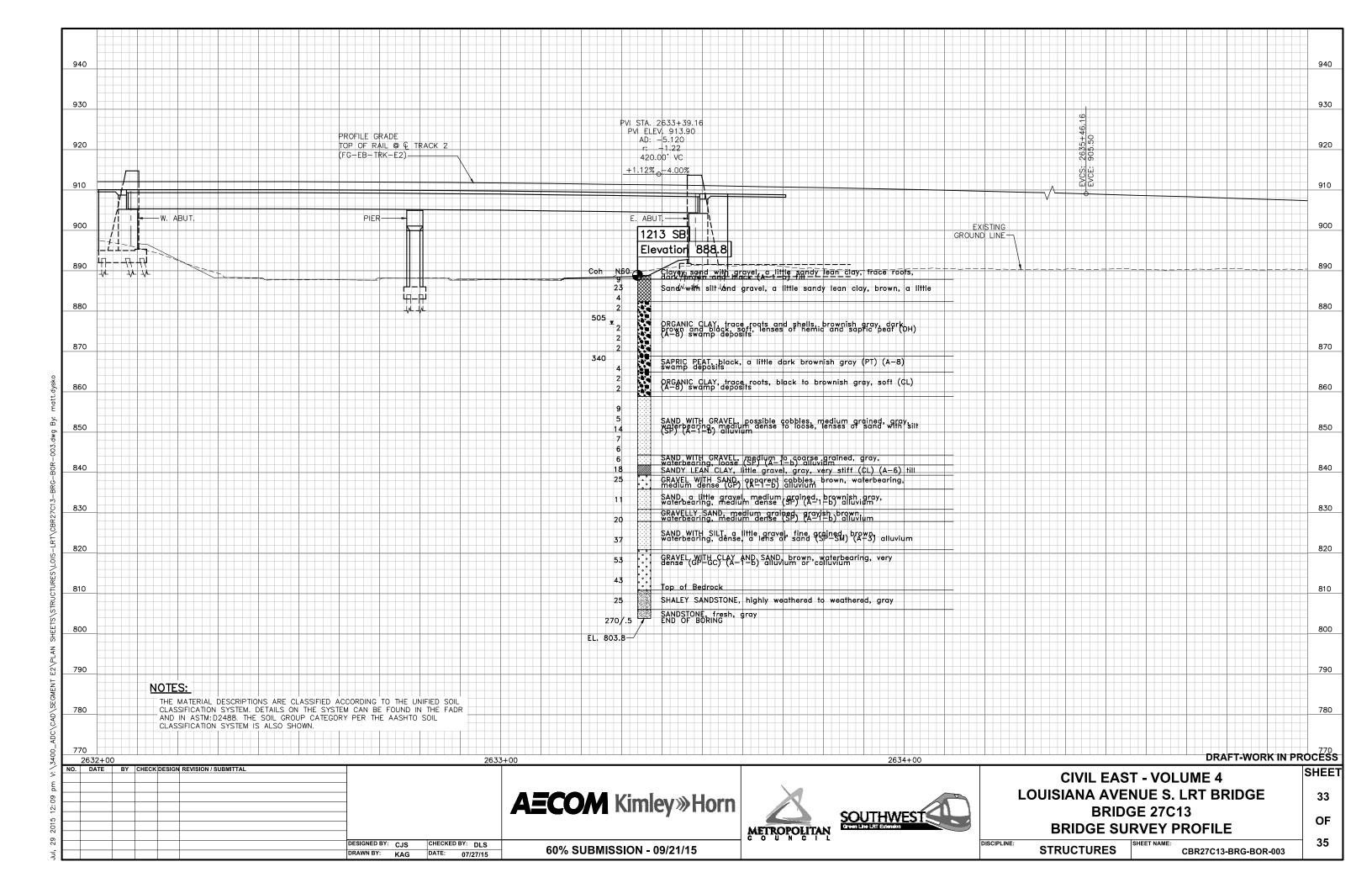
TYPICAL APPROACH SECTION LOUISIANA-LRT

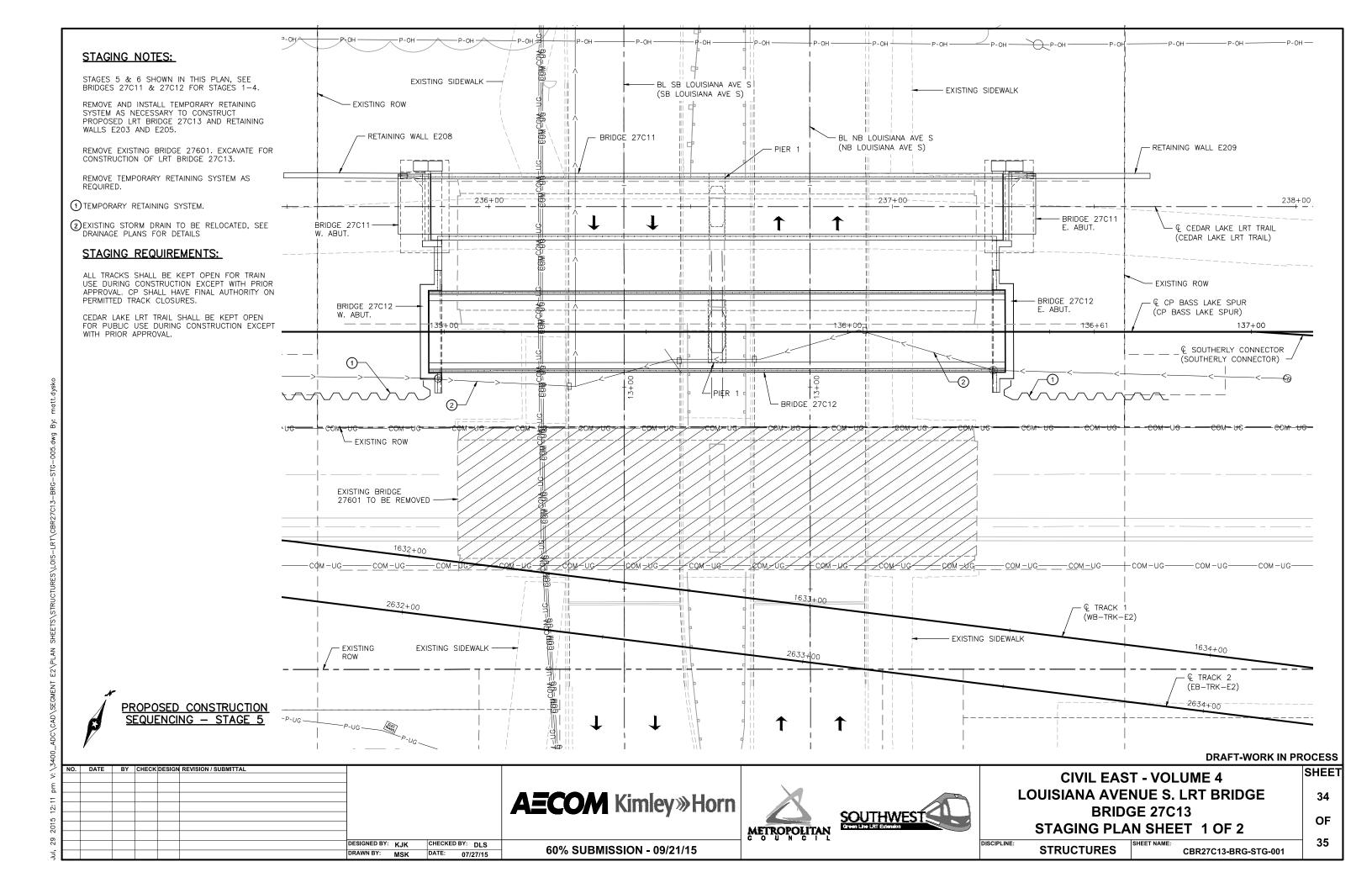
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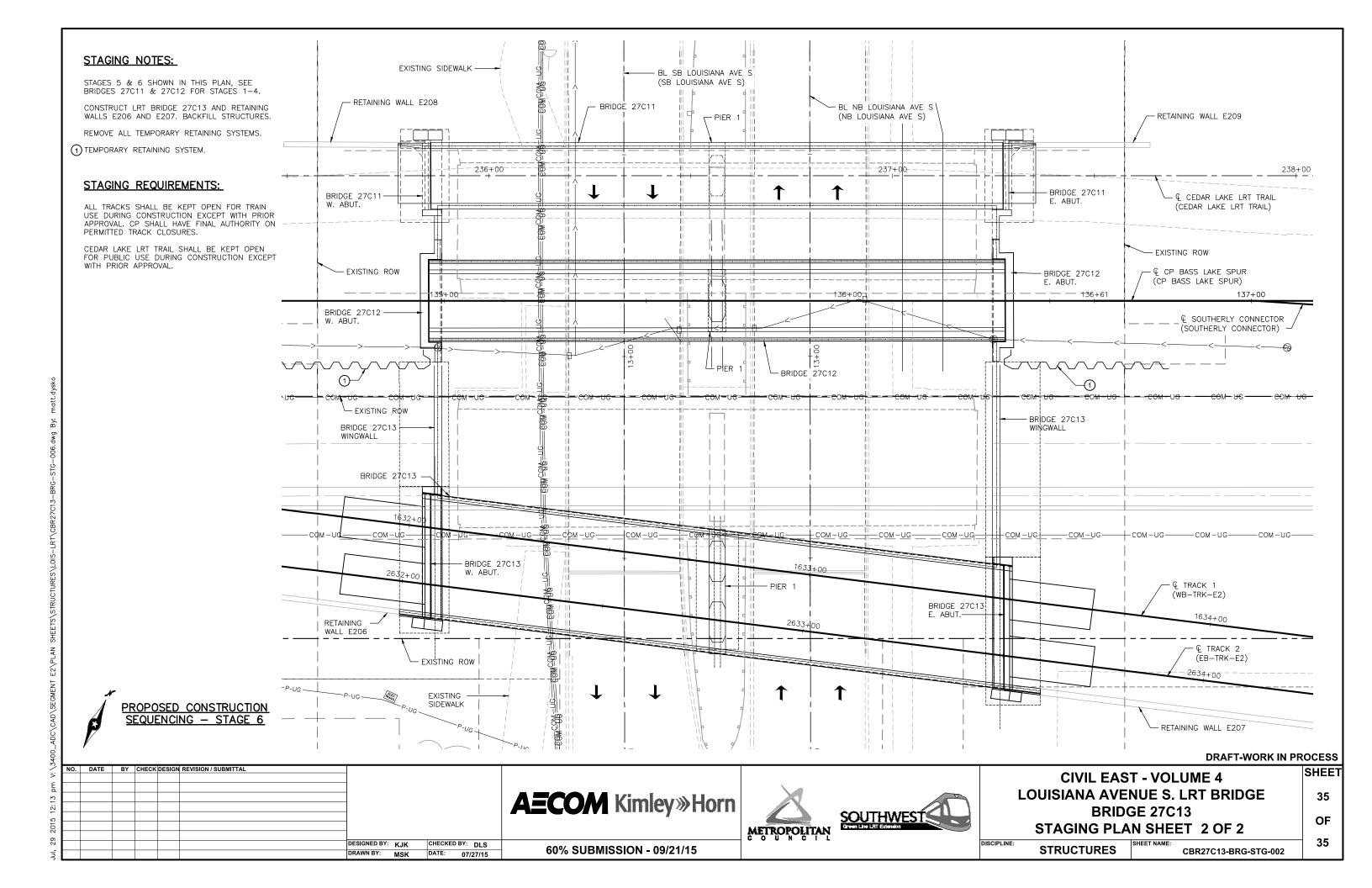
NO. DATE BY CHECK DESIGN REVISION / SUBMITTAL SHEET **CIVIL EAST - VOLUME 4 AECOM** Kimley»Horn LOUISIANA AVENUE S. LRT BRIDGE 30 SOUTHWEST Creen Line Little Extension **BRIDGE 27C13** OF **BRIDGE SURVEY** METROPOLITAN DESIGNED BY: CJS CHECKED BY: DLS 35 DISCIPLINE: 60% SUBMISSION - 09/21/15 **STRUCTURES** CBR27C13-BRG-SUR-002 DRAWN BY: KAG DATE: 07/27/15

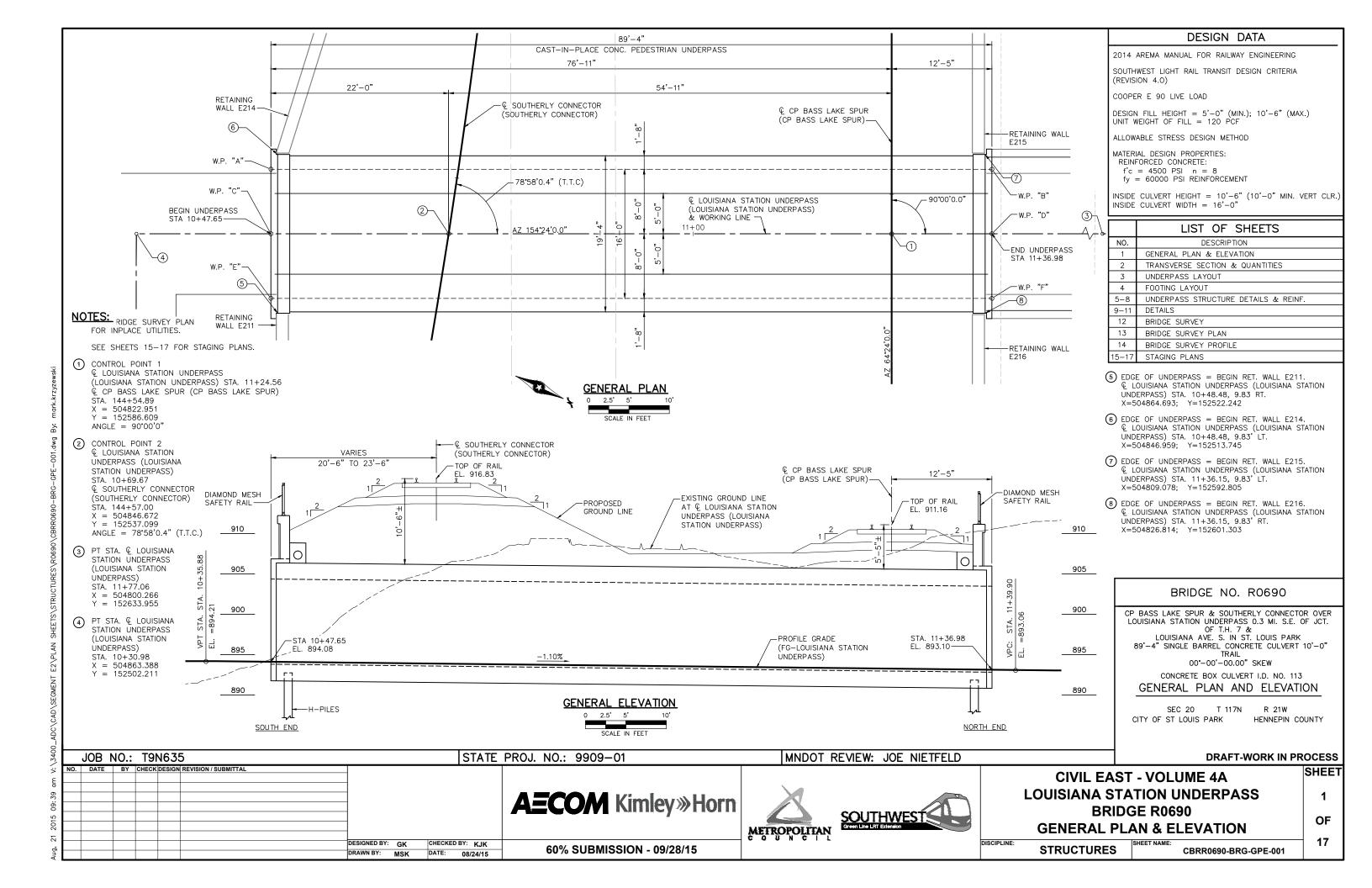


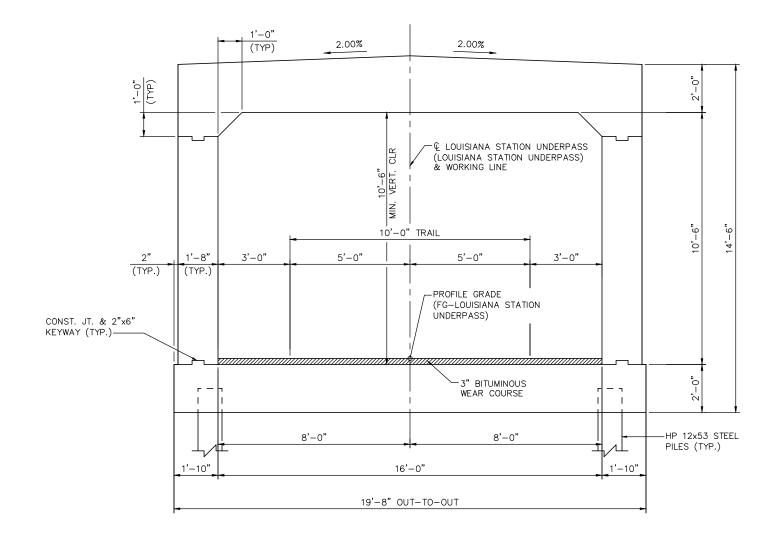














	QUANTITY ESTIMATE FOR ENTIRE U	JNDERPASS	
ITEM NO.	ITEM	UNIT	QUANTITY
2401	STRUCTURAL CONCRETE (1G52)	CU. YD.	
2401	STRUCTURAL CONCRETE (3B52)	CU. YD.	
2401	REINFORCEMENT BARS (EPOXY COATED)	POUND	
2411	ANTI-GRAFFITI COATING	SQ. FT.	
2411	ARCHITECTURAL SURFACE FINISH (SPECIAL)	SQ. FT.	
2452	STEEL H-PILING DRIVEN 12"	LIN. FT.	
2452	STEEL H-PILING DELIVERED 12"	LIN. FT.	
2452	STEEL H-TEST PILE 70 FT LONG 12"	EACH	
2452	PILE TIP PROTECTION 12"	EACH	
2452	STEEL SHEET PILING (TEMPORARY)	LUMP SUM	
2481	WATERPROOFING	SQ. FT.	

#### **CONSTRUCTION NOTES:**

THE 2016 EDITION OF THE MINNESOTA DEPARTMENT OF TRANSPORTATION "STANDARD SPECIFICATIONS FOR CONSTRUCTION" SHALL GOVERN.

THE BAR SIZES SHOWN IN THIS PLAN ARE IN U.S. CUSTOMARY DESIGNATIONS. THE FIRST DIGIT OR THE FIRST TWO DIGITS OF EACH BAR MARK INDICATE THE BAR SIZE.

ALL BARS TO BE EPOXY COATED.

THE SUBSURFACE UTILITY INFORMATION IN THIS PLAN IS UTILITY QUALITY LEVEL D. THIS UTILITY QUALITY LEVEL WAS DETERMINED ACCORDING TO THE GUIDELINES OF CI/ASCE 38-02, ENTITLED "STANDARD GUIDELINES FOR THE COLLECTION AND DEPICTION OF EXISTING SUBSURFACE UTILITY DATA"

THE PILE LOADS SHOWN IN THE PLANS WERE COMPUTED USING SERVICE LOAD METHODOLOGY. PILE BEARING RESISTANCE DETERMINED IN THE FIELD SHALL INCORPORATE THE METHODS AND/OR FORMULAS DESCRIBED IN THE SPECIAL PROVISIONS.

CONCRETE MATERIALS, MIX DESIGN, TESTING AND CONSTRUCTION SHALL BE IN ACCORDANCE WITH CHAPTER 8, PART 1 OF THE 2014 A.R.E.M.A. MANUAL; MnDOT 2461 AND THE SPECIAL PROVISIONS.

CONCRETE SHALL BE MADE WITH A LOW ALKAKI NORMAL PORTLAND CEMENT (TYPE I OR TYPE I/II) IN ACCORDANCE WITH ASTM C 150, LATEST EDITION, WITH LESS THAN 0.6% SODIUM EQUIVALENTS.

MAXIMUM CONCRETE WATER/CEMENT RATION SHALL BE IN ACCORDANCE WITH CHAPTER 8, SECTION 1.11 OF THE 2014 A.R.E.M.A. MANUAL AND MnDOT 2461.

**DRAFT-WORK IN PROCESS** 

SHEET

2

OF

17

DESIGNED BY: GK CHECKED BY: KJK
DRAWN BY: MSK DATE: 08/24/15

**AECOM** Kimley»Horn

60% SUBMISSION - 09/28/15

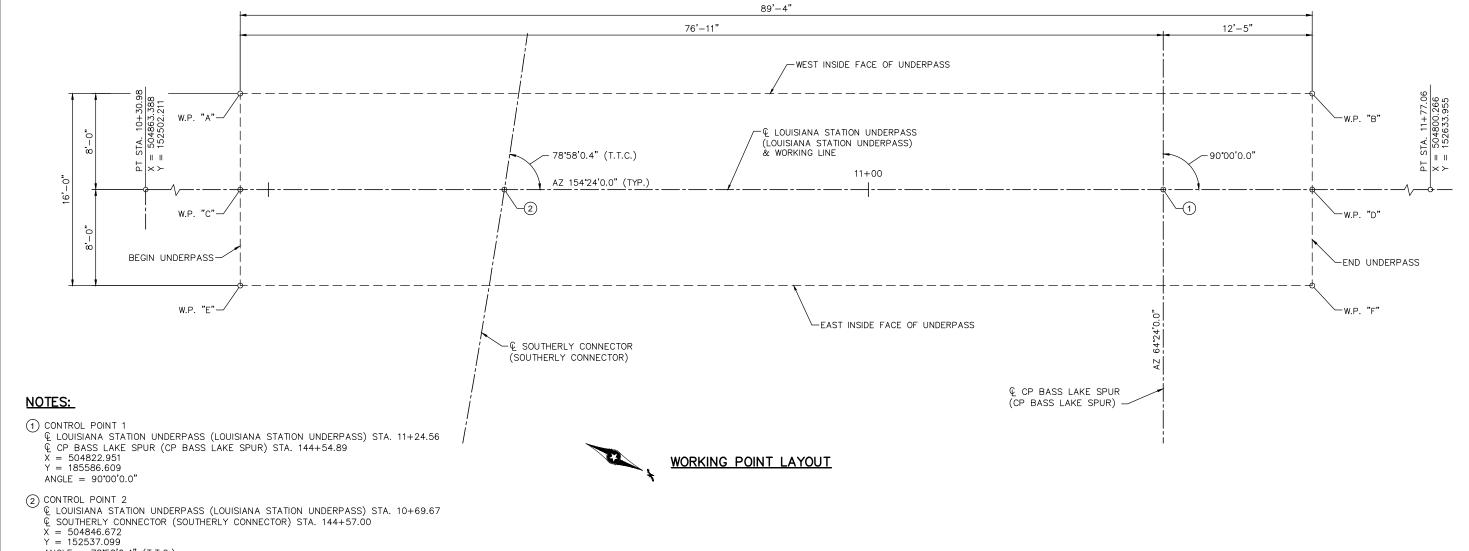




# CIVIL EAST - VOLUME 4A LOUISIANA STATION UNDERPASS BRIDGE R0690 TRANSVERSE SECTION & QUANTITIES

STRUCTURES S

CBRR0690-BRG-SUP-001



	DIME	SNOISN	BETWEE	N WORK	ING POI	NTS		COORD	INATES	ELEVATIC	ELEVATION	
POINT	STATION	А	В	С	D	Е	F	х	Y	TOP OF BOTTOM SLAB	POINT	
А	10+47.65		89.33	8.00		16.00		504848.971	152513.785	893.83	Α	
В	11+36.98				8.00		16.00	504810.372	152594.349	892.85	В	
С	10+47.65				89.33	8.00		504856.186	152517.242	893.83	С	
D	11+36.98						8.00	504817.586	152597.806	892.85	D	
Е	10+47.65						89.33	504863.401	152520.699	893.83	Е	
F	11+36.98							504824.801	152601.262	892.85	F	

DRAFT-WORK IN PROCESS

> NO.	DATE BY CHEC	ECK DESIGI	N REVISION / SUBMITTAL	_						011/11 E407	/OLIBAT /A	SHEET
٤										CIVIL EAS	- VOLUME 4A	0
										LUCIANIA CTA	TION UNDERDACE	
26	ı I I					A = COAA Vinolovy Horn	20		LO	UISIANA STA	TION UNDERPASS	3
070						<b>AECOM</b> Kimley»Horn				DDID/	GE R0690	
2								SOUTHWEST.		BRID	JE KU03U	OF
20.							METROPOLETAN	Green Line LRT Extension		IINDERD	THOVA 1 22	OF
0							WEIKOLOFIYA			ONDER	400 LA 100 I	l
~ _				DESIGNED BY: GK	CHECKED BY: KJK	COOK CURMICOLON, COMOME			DISCIPLINE:	OTPLICTURES	SHEET NAME:	<b>7 17</b>
gu/				DRAWN BY: MSK	DATE: 08/24/15	60% SUBMISSION - 09/28/15			``	STRUCTURES	CBRR0690-BRG-SUP-002	
Aug, 20 2015						60% SUBMISSION - 09/28/15	<b>METROPOLITAN</b>	20011144F21	DISCIPLINE:	UNDERP	ASS LAY	

ZO ZUIO 07:59 am V: \54UU\_AUC\CAU\SEGMEN EZ\FLAN SMEEIS\SIRUCIUKES\KUG9U\CBKKUB9U-BKG-SUF-CUZ.AWg By: Mai

ANGLE =  $78^{\circ}58'0.4"$  (T.T.C.)

COMPUTED PILE LOAD - TONS/PILE							
DEAD LOAD + EARTH PRESSURE	49						
LIVE LOAD	25						
DESIGN LOAD	74						

\* BASED ON GROUP I LOADING (SERVICE LOAD) PER AREMA CHAPTER 8 SECTION 2.2.4

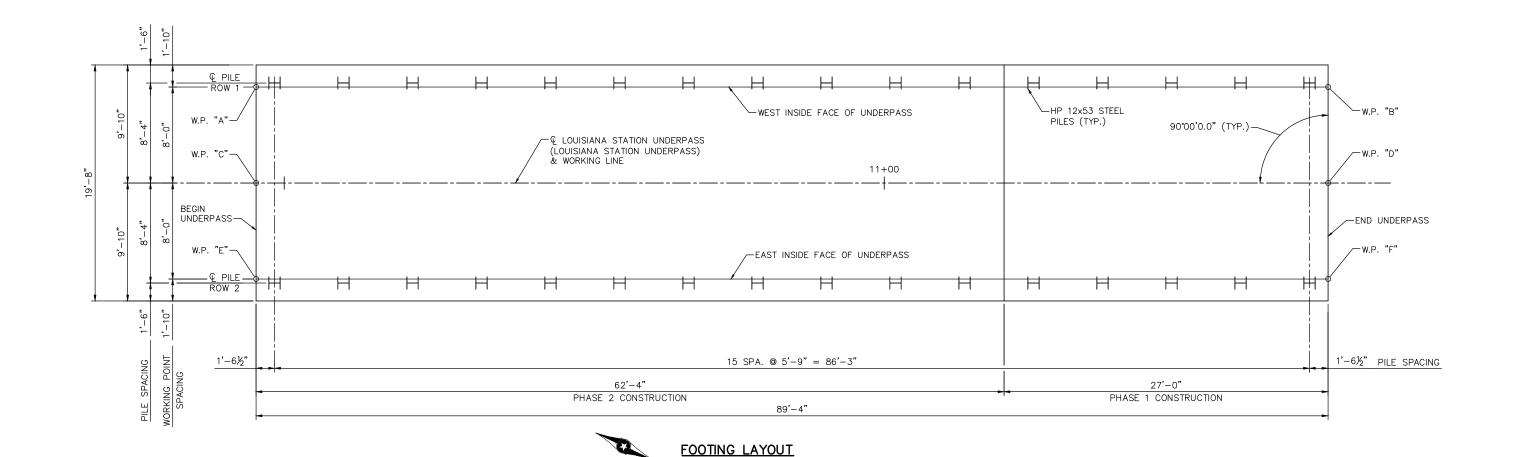
#### **GENERAL PILE NOTES**

- 1 HP12x53 STEEL TEST PILE 70 FT. LONG
- 31 HP12x53 STEEL PILES EST. 70 FT. LENGTH
- 32 HP12x53 STEEL PILES REQ'D FOR UNDERPASS.
  ALL PILES TO BE HP12x53 WITH PILE TIP PROTECTION.

PILE SPACING SHOWN IS AT BOTTOM OF FOOTING.

FOR PILE SPLICE DETAILS SEE DETAIL B202.

SEE SURVEY SHEET FOR TEST PILE LOCATIONS.



SOUTHWEST Green Line LRT Extension

DISCIPLINE:

**AECOM** Kimley»Horn

60% SUBMISSION - 09/28/15

CHECKED BY: KJK

DATE: 08/24/15

**DRAFT-WORK IN PROCESS** 

CBRR0690-BRG-SUP-003

CIVIL EAST - VOLUME 4A LOUISIANA STATION UNDERPASS

**BRIDGE R0690** 

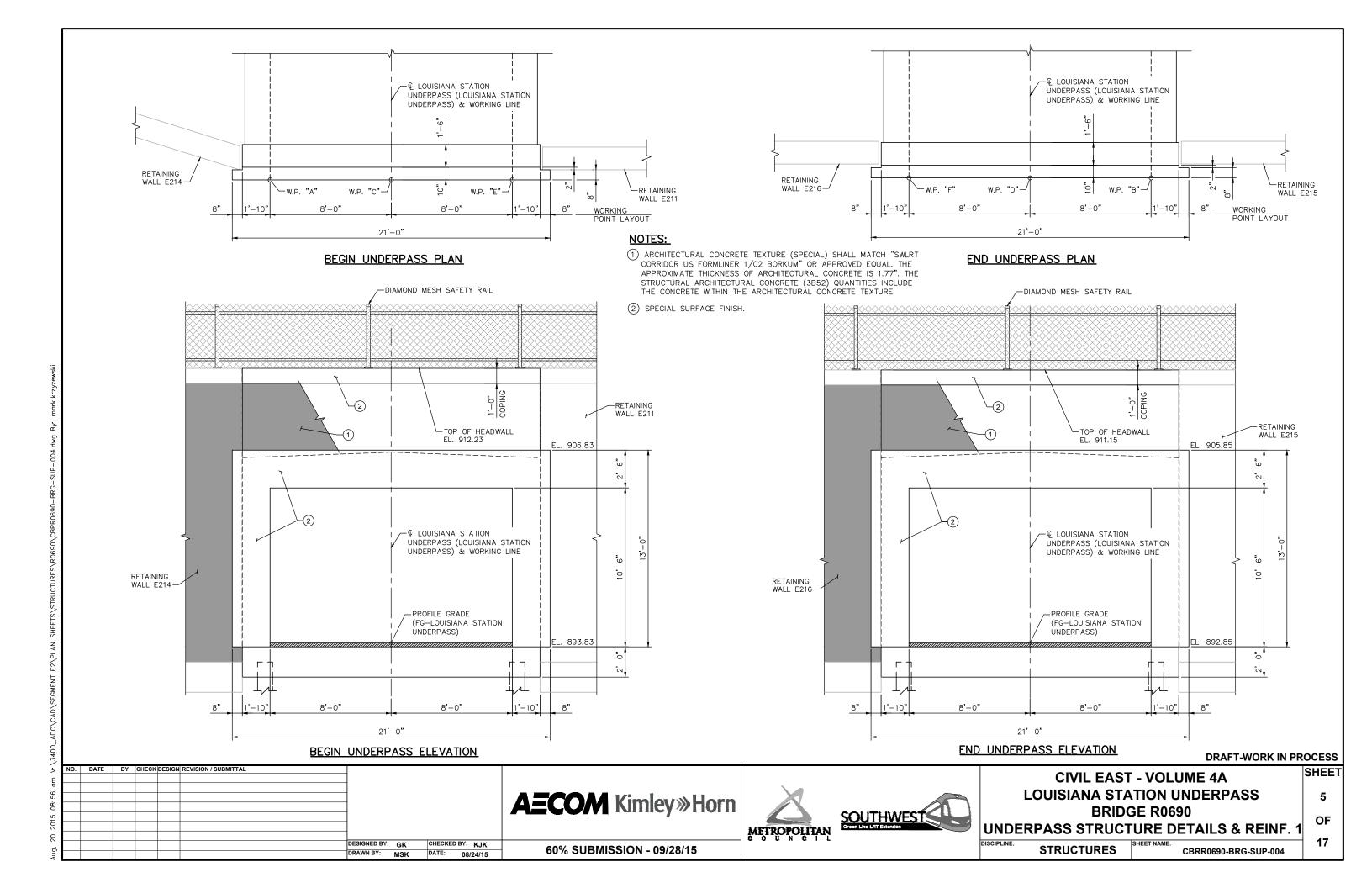
**FOOTING LAYOUT** 

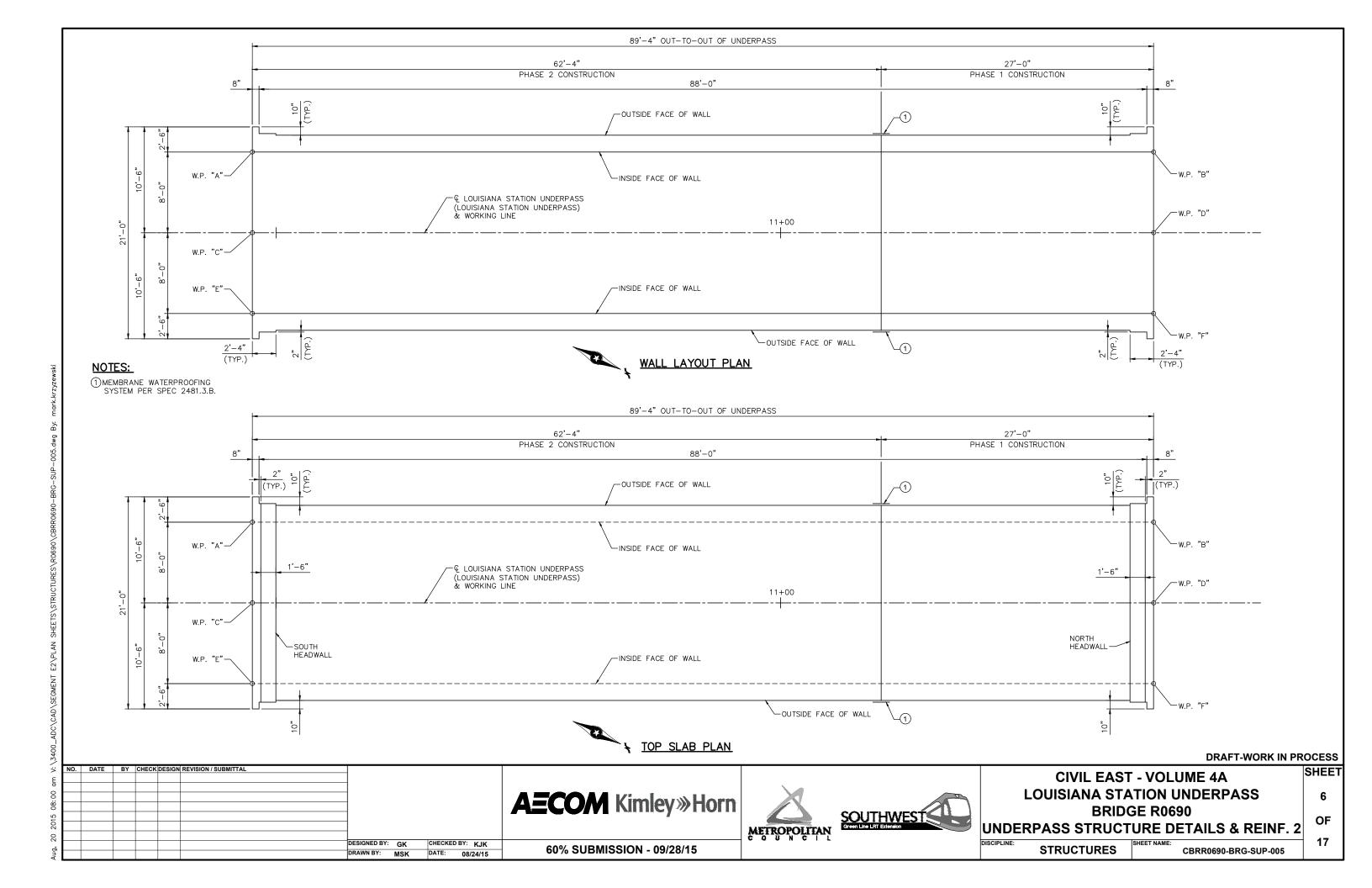
**STRUCTURES** 

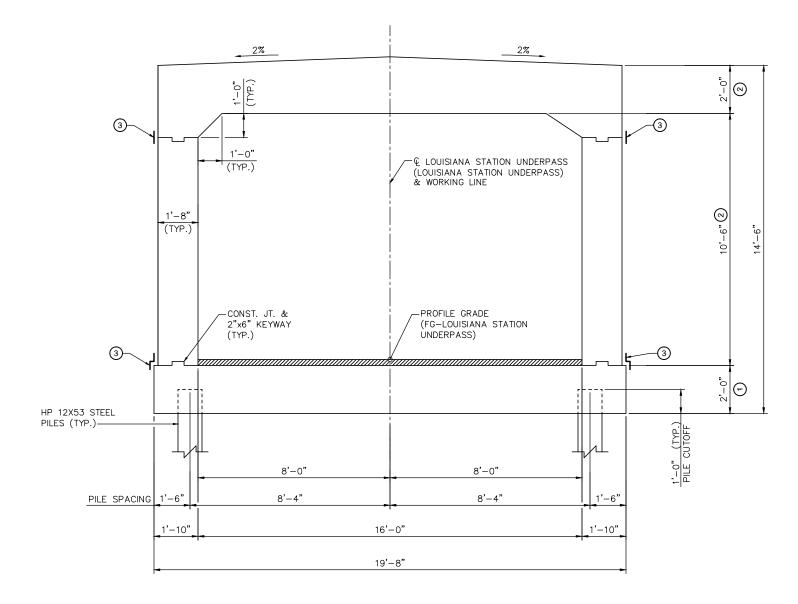
SHEET

OF

17







#### TRANSVERSE SECTION

#### NOTES:

- 1 STRUCTURAL CONCRETE (1G52)
- 2 STRUCTURAL CONCRETE (3B52)
- (3) MEMBRANE WATERPROOFING SYSTEM PER SPEC 2481.3.B.

DRAFT-WORK IN PROCESS

AECOM Kimley Horn

AECOM Kimley Horn

AECOM Kimley Horn

Designed BY: GK CHECKED BY: KJK DRAWN BY: MSK DATE: 08/24/15

Grawn BY: GK CHECKED BY: KJK DRAWN BY: MSK DATE: 08/24/15

CIVIL EAST - VOLUME 4A

LOUISIANA STATION UNDERPASS
BRIDGE R0690

UNDERPASS STRUCTURE DETAILS & REINF. 3

DISCIPLINE: STRUCTURES

CBRR0690-BRG-SUP-006

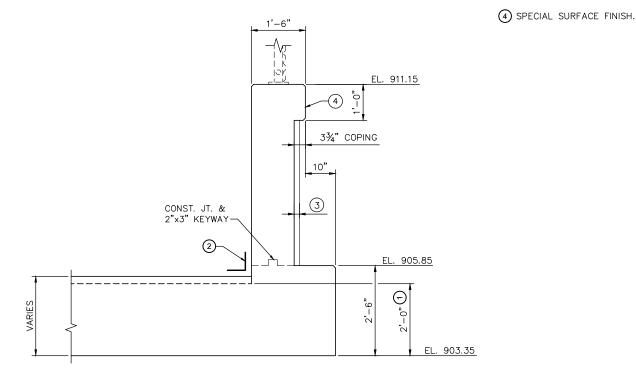
SHEET

7

OF

17

### 1'-6" EL. 912.23 4 3¾" COPING 3 -CONST. JT. & 2"x3" KEYWAY EL. 906.83 EL. 904.33



SECTION @ SOUTH HEADWALL

SECTION @ NORTH HEADWALL

**DRAFT-WORK IN PROCESS** 

SHEET

OF

**AECOM** Kimley»Horn SOUTHWEST Creen Line Little Extendion DESIGNED BY: GK CHECKED BY: KJK 60% SUBMISSION - 09/28/15 **STRUCTURES** DATE: 08/24/15

**CIVIL EAST - VOLUME 4A LOUISIANA STATION UNDERPASS BRIDGE R0690 UNDERPASS STRUCTURE DETAILS & REINF. 4** 

NOTES:

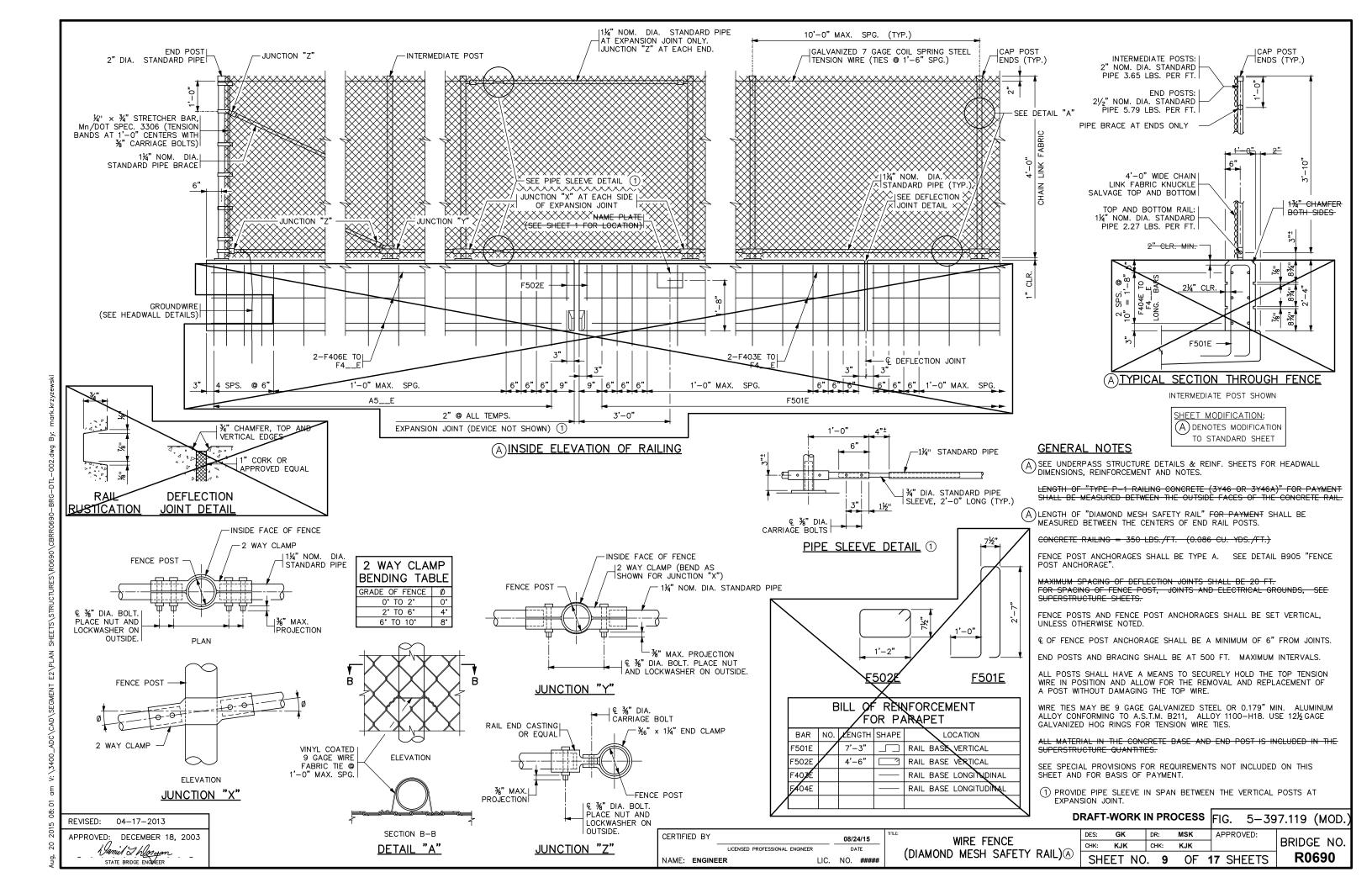
1 TOP SLAB THICKNESS AT EXTERIOR FACE OF WALL. ② MEMBRANE WATERPROOFING SYSTEM PER SPEC 2481.3.B.

3 ARCHITECTURAL CONCRETE TEXTURE (SPECIAL) SHALL MATCH "SWLRT CORRIDOR US FORMLINER 1/02 BORKUM" OR APPROVED EQUAL. THE APPROXIMATE THICKNESS OF ARCHITECTURAL CONCRETE IS 1.77". THE

CONCRETE WITHIN THE ARCHITECTURAL CONCRÉTE TEXTURE.

STRUCTURAL ARCHITECTURAL CONCRETE (3B52) QUANTITIES INCLUDE THE

CBRR0690-BRG-SUP-007



NUMBERS FOR NAMEPLATE

#### NOTES:

MATERIAL SHALL COMPLY WITH SPEC. 3327.

CHECKED BY: KJK

DATE: 08/24/15

LETTERS AND NUMBERS SHALL CONFORM TO THOSE SHOWN.

DRAFT ON LETTERS AND NUMBERS SHALL NOT BE MORE THAN 3" IN 12". HORIZONTAL SPACING OF LETTERS AND NUMBERS SHALL PRODUCE A BALANCED LAYOUT IN PROPORTION TO SPACING SHOWN.

TOP SURFACE OF LETTERS, NUMBERS AND FRAMES SHALL BE BURNISHED. FURNISH 2 STEEL BOLTS % " DIA.  $\times$  3" LONG WITH EACH PLATE.

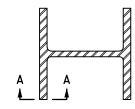
ALL DIMENSIONS FOR  $\frac{1}{2}$ " HIGH LETTERS AND NUMBERS SHALL BE IN DIRECT PROPORTION TO THOSE SHOWN FOR THE 1" HIGH LETTERS AND NUMBERS.

1 YEAR OF CONSTRUCTION

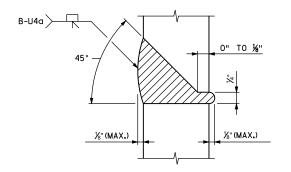
STATE OF MINNESOTA
DEPARTMENT OF TRANSPORTATION APPROVED: NOVEMBER 22, 2002 DETAIL NO. BRIDGE NAMEPLATE Vaniel I Worgan B101 (FOR NEW BRIDGES) STATE BRIDGE ENGINEER

DESIGNED BY: GK

DRAWN BY: MSK



SECTION AT SPLICE



SECTION A-A 100% BUTT WELDED PILE SPLICE

CELLULOSIC TYPE ELECTRODES E-6010 OR E-6011 SHALL BE USED FOR 100% BUTT WELDED SPLICES.

ELECTRODES WHICH HAVE BECOME WET, SOILED OR DAMAGED SHALL NOT BE USED.

WELDING SHALL NOT BE DONE WHEN THE AMBIENT TEMPERATURE IS LOWER THAN O° F. OR WHEN THE PILE IS WET OR EXPOSED TO FALLING RAIN OR SNOW. WHEN THE PILE METAL TEMPERATURE IS BELOW 32° F., THE PILE METAL IN THE AREA OF THE WELD SHALL BE HEATED TO A MINIMUM TEMPERATURE OF 70° F. AND MAINTAINED AT THIS TEMPERATURE DURING WELDING.

APPROVED: NOVEMBER 22, 2002 Waniel I Worgan

STATE BRIDGE ENGINEER

STATE OF MINNESOTA
DEPARTMENT OF TRANSPORTATION

PILE SPLICE (STEEL H BEARING PILES 10" TO 14") DETAIL NO.

B202

DRAFT-WORK IN PROCESS

SHEET

10

OF

17

**AECOM** Kimley»Horn

60% SUBMISSION - 09/28/15

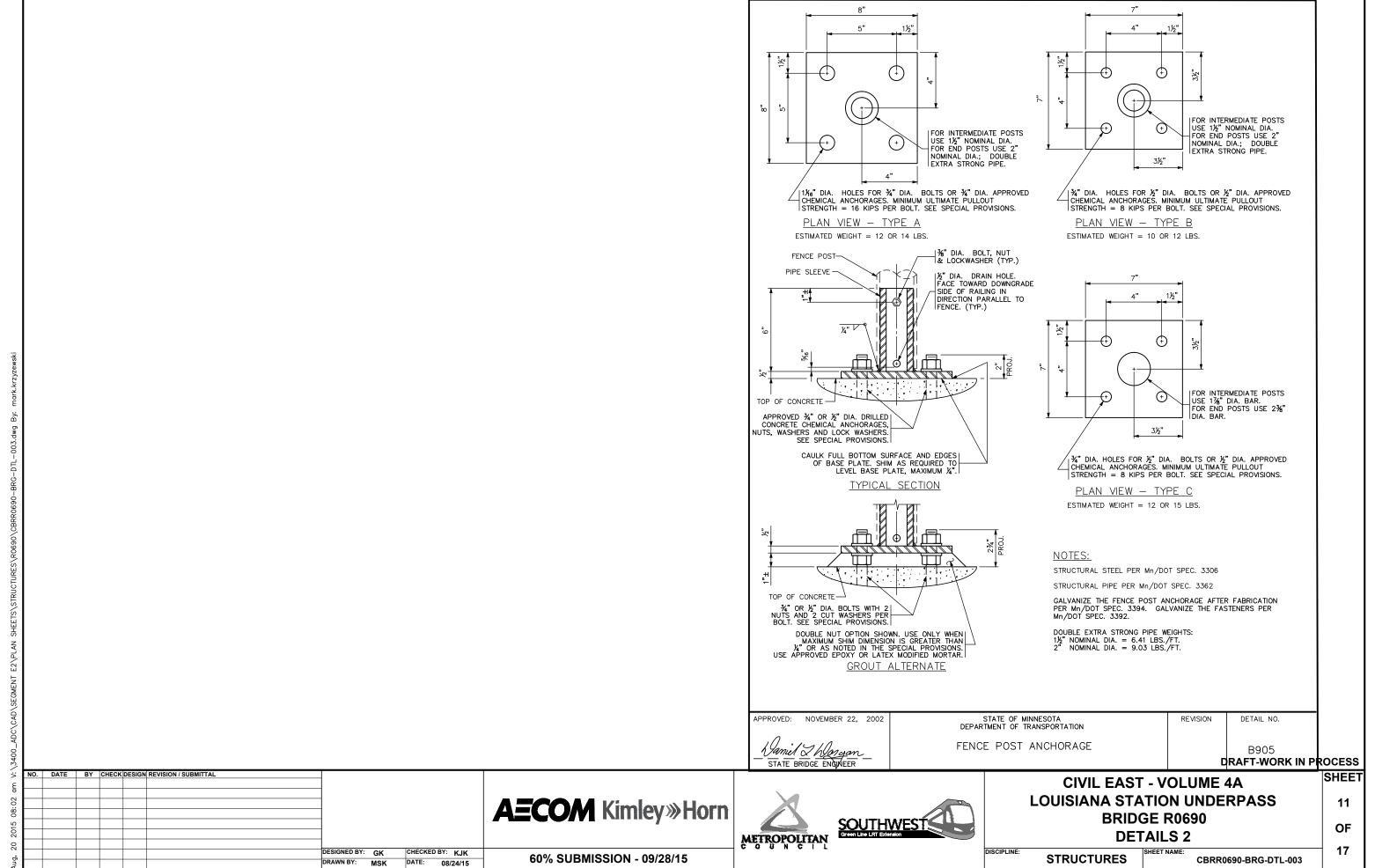


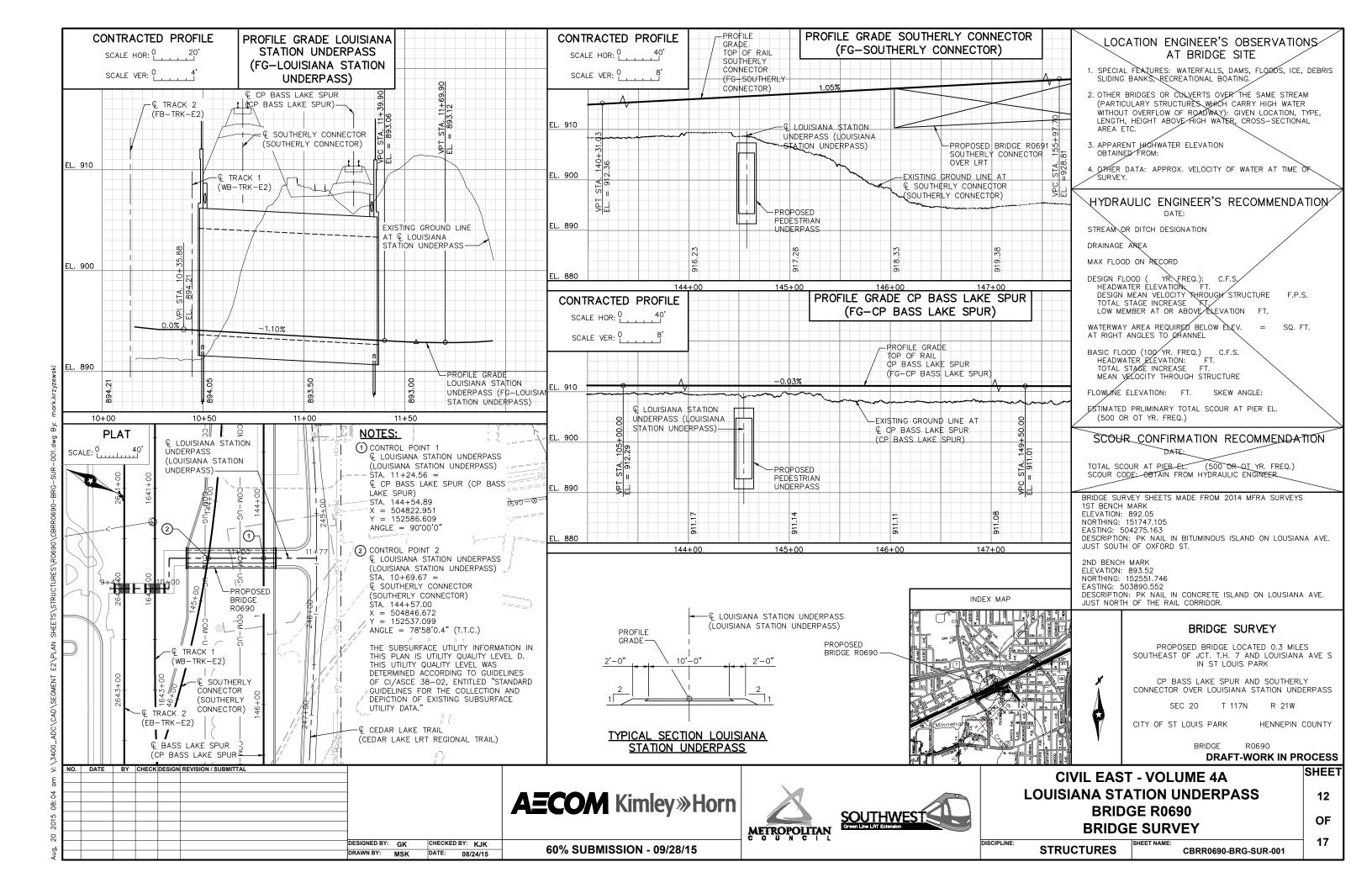


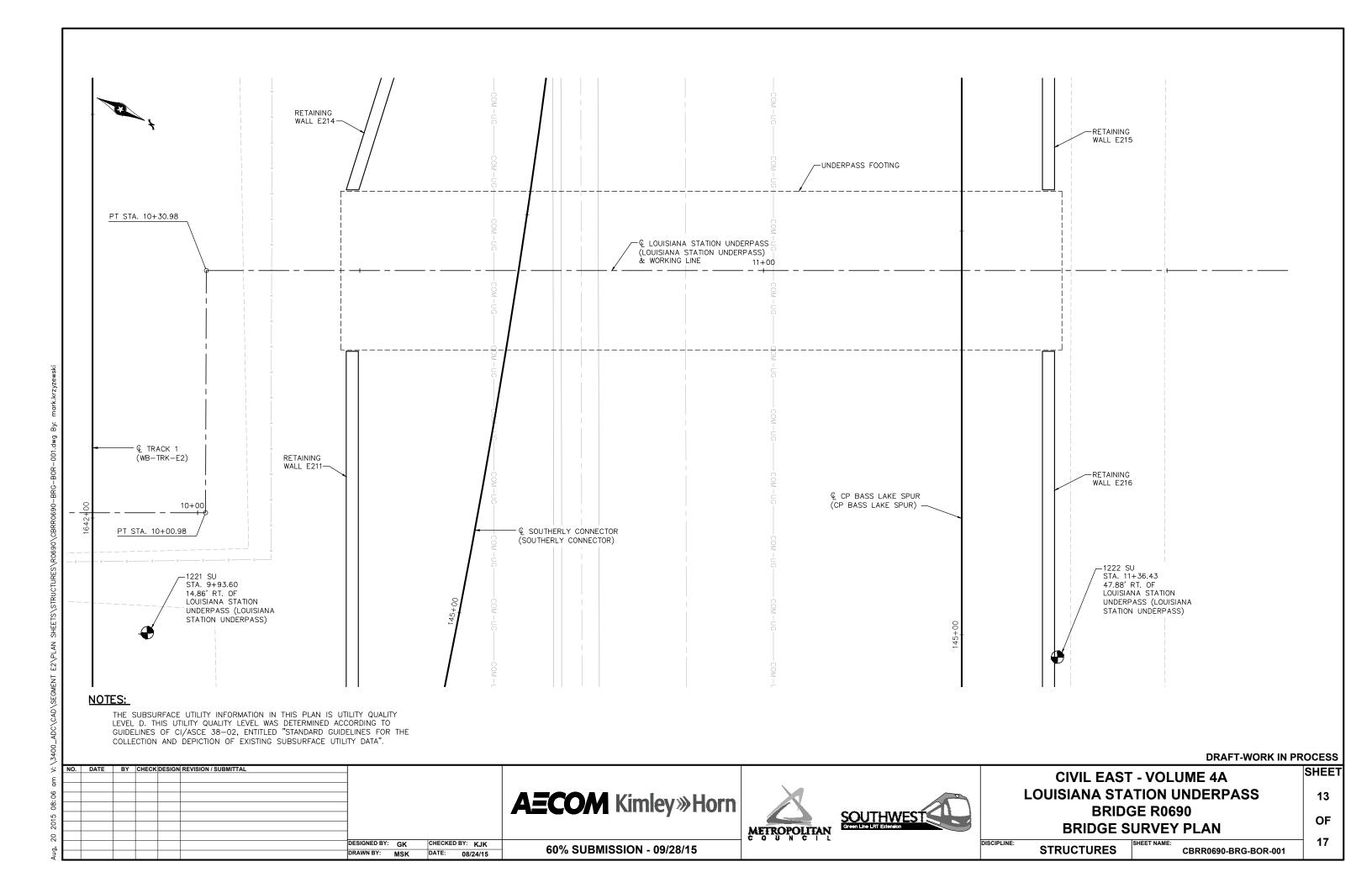
**CIVIL EAST - VOLUME 4A LOUISIANA STATION UNDERPASS BRIDGE R0690 DETAILS 1** 

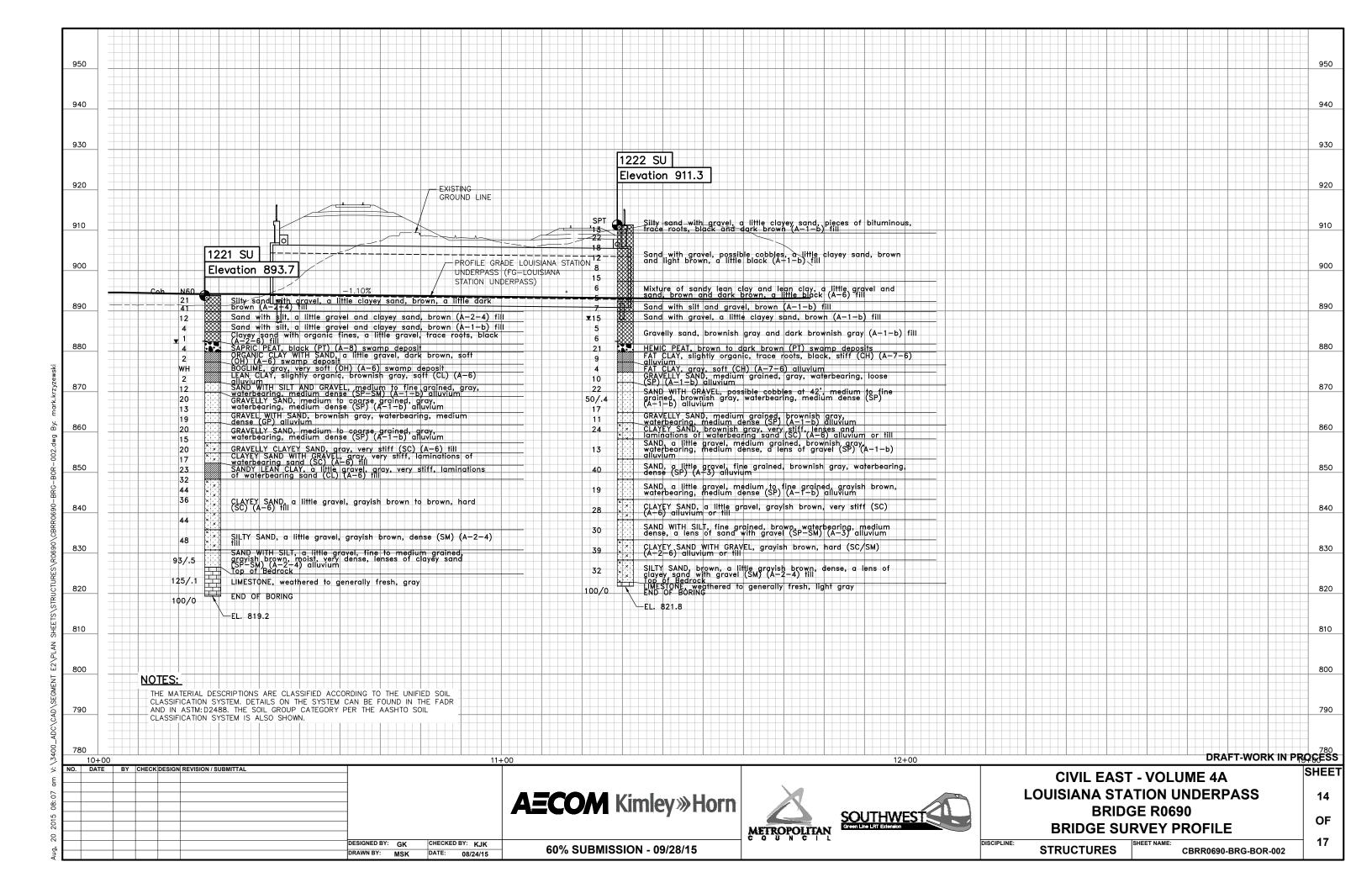
**STRUCTURES** CBRR0690-BRG-DTL-001

DISCIPLINE









#### **STAGING NOTES:**

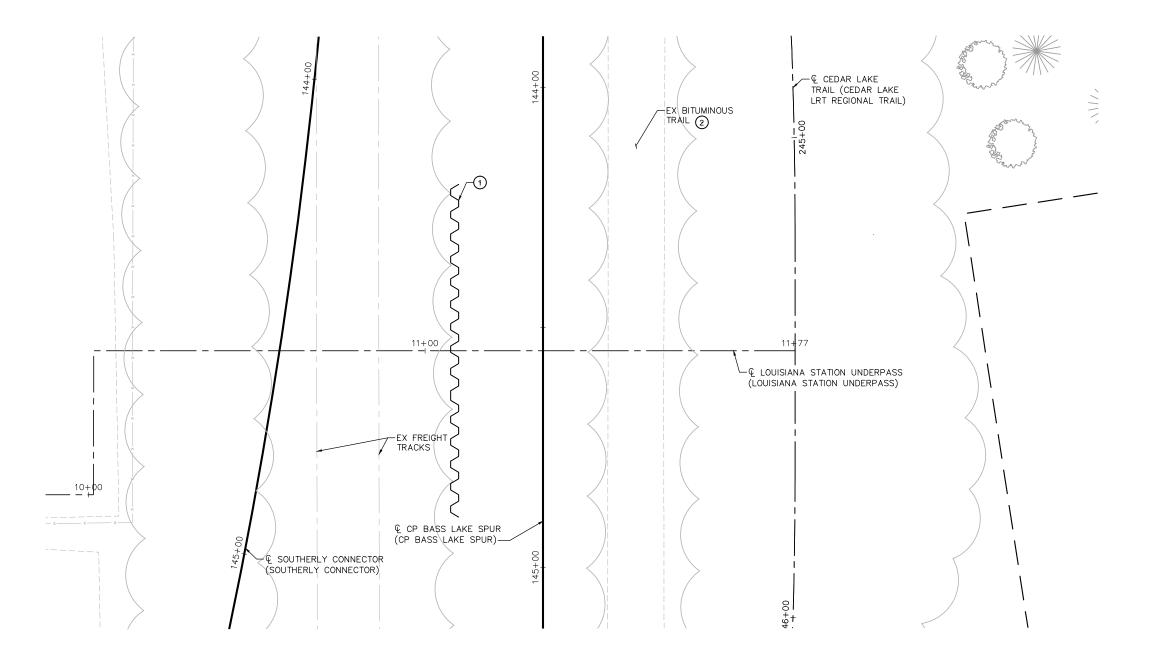
INSTALL TEMPORARY RETAINING SYSTEMS FOR CONSTRUCTION OF NORTH END OF PROPOSED LOUISIANA STATION PEDESTRIAN UNDERPASS. EXCAVATE FOR UNDERPASS CONSTRUCTION.

- 1 TEMPORARY RETAINING SYSTEM
- (2) EXISTING TRAIL SHALL BE SHIFTED TO PROPOSED CEDAR LAKE TRAIL ALIGNMENT PRIOR TO UNDERPASS CONSTRUCTION.

#### STAGING REQUIREMENTS:

ALL TRACKS SHALL BE KEPT OPEN FOR TRAIN USE DURING CONSTRUCTION EXCEPT WITH PRIOR APPROVAL. CP SHALL HAVE FINAL AUTHORITY ON PERMITTED TRACK CLOSURES.

CEDAR LAKE TRAIL SHALL BE KEPT OPEN FOR PUBLIC USE DURING CONSTRUCTION EXCEPT WITH PRIOR APPROVAL.





PROPOSED CONSTRUCTION SEQUENCING - STAGE 1

DRAFT-WORK IN PROCESS

:0 2015 08:09 am V:\	NO. DATE	BY CHECK DESIGN REVISION / SUBMITTAL			<b>AECOM</b> Kimley»Horn	SOUTHWEST Green Und Little Extension		CIVIL EAST - VOLUME 4A LOUISIANA STATION UNDERPASS BRIDGE R0690 STAGING PLAN 1 OF 3	SHEET 15 OF
yng,			DESIGNED BY: GK DRAWN BY: MSK	DATE: 08/24/15	60% SUBMISSION - 09/28/15		DIS	STRUCTURES SHEET NAME: CBRR0690-BRG-STG-	01 17

V. (C+CO\_ADC (CAD (SEGMEN) EZ (TEAN SHEELS (SINGCIONES (NOGSO (CBNNCOSO -BNG-SIG-COLOMY) BY: I

#### **STAGING NOTES:**

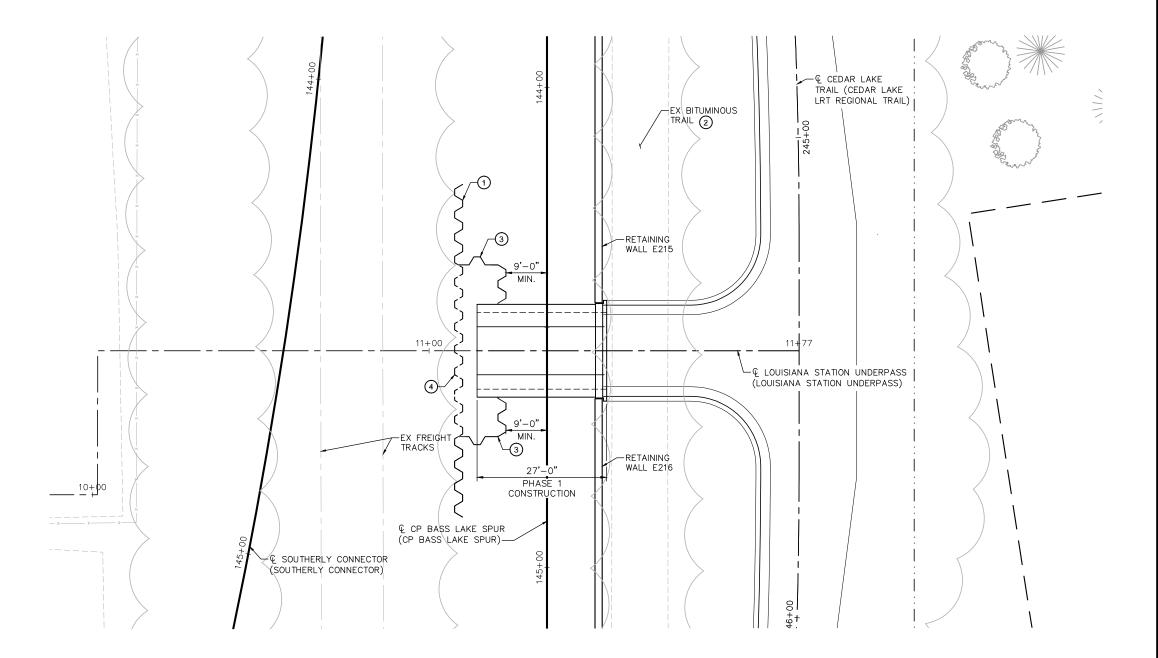
CONSTRUCT NORTH END OF PROPOSED LOUISIANA STATION PEDESTRIAN UNDERPASS AND RETAINING WALLS E215 AND E216.

- 1 TEMPORARY RETAINING SYSTEM
- ② EXISTING TRAIL SHALL BE SHIFTED TO PROPOSED CEDAR LAKE TRAIL ALIGNMENT PRIOR TO UNDERPASS CONSTRUCTION.
- 3 MODIFY TEMPORARY RETAINING SYSTEM AFTER UNDERPASS CONSTRUCTION. BACKFILL STRUCTURE.
- 4 REMOVE TEMPORARY RETAINING SYSTEM.

#### **STAGING REQUIREMENTS:**

ALL TRACKS SHALL BE KEPT OPEN FOR TRAIN USE DURING CONSTRUCTION EXCEPT WITH PRIOR APPROVAL. CP SHALL HAVE FINAL AUTHORITY ON PERMITTED TRACK CLOSURES.

CEDAR LAKE TRAIL SHALL BE KEPT OPEN FOR PUBLIC USE DURING CONSTRUCTION EXCEPT WITH PRIOR APPROVAL





PROPOSED CONSTRUCTION SEQUENCING - STAGE 2

DRAFT-WORK IN PROCESS

SHEET **CIVIL EAST - VOLUME 4A LOUISIANA STATION UNDERPASS AECOM** Kimley»Horn 16 **BRIDGE R0690** SOUTHWEST OF **STAGING PLAN 2 OF 3** METROPOLITAN 17 CHECKED BY: KJK DISCIPLINE: 60% SUBMISSION - 09/28/15 **STRUCTURES** CBRR0690-BRG-STG-002 DATE: 08/24/15

#### **STAGING NOTES:**

RELOCATE EXISTING CP BASS LAKE SPUR TO FINAL ALIGNMENT.

EXCAVATE FOR SOUTH END OF UNDERPASS CONSTRUCTION.

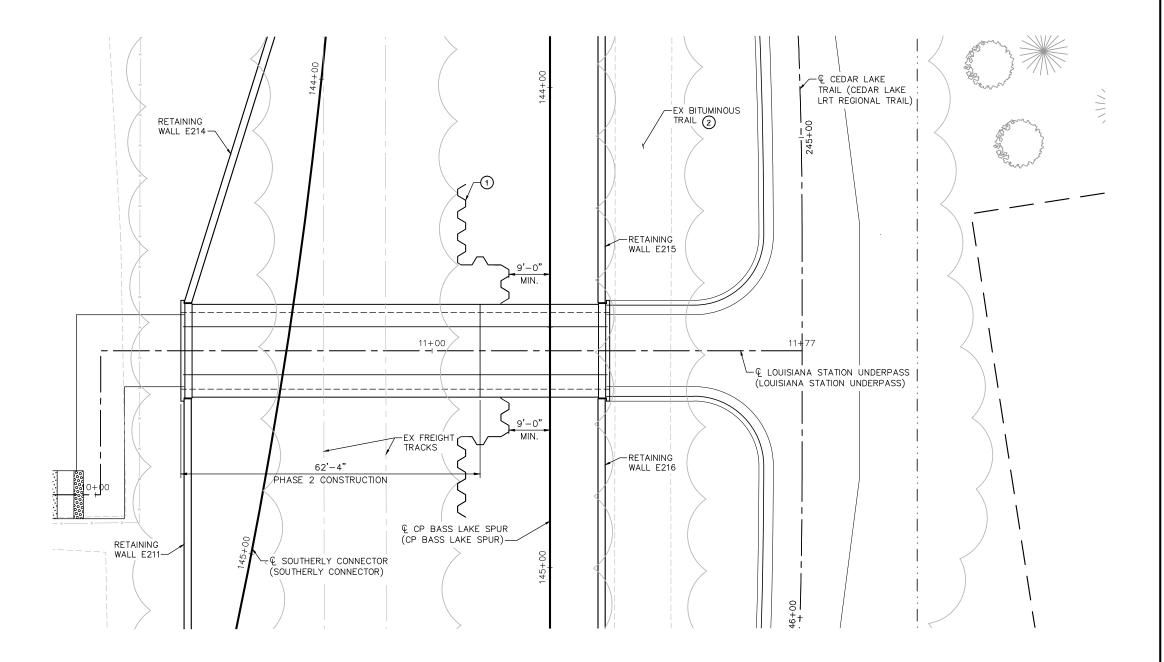
CONSTRUCT REMAINING PROPOSED LOUISIANA STATION PEDESTRIAN UNDERPASS AND RETAINING WALLS E211 AND E214. BACKFILL STRUCTURE.

- 1) TEMPORARY RETAINING SYSTEM
- 2 EXISTING TRAIL SHALL BE SHIFTED TO PROPOSED CEDAR LAKE TRAIL ALIGNMENT PRIOR TO UNDERPASS CONSTRUCTION.

#### **STAGING REQUIREMENTS:**

ALL TRACKS SHALL BE KEPT OPEN FOR TRAIN USE DURING CONSTRUCTION EXCEPT WITH PRIOR APPROVAL. CP SHALL HAVE FINAL AUTHORITY ON PERMITTED TRACK CLOSURES.

CEDAR LAKE TRAIL SHALL BE KEPT OPEN FOR PUBLIC USE DURING CONSTRUCTION EXCEPT WITH PRIOR APPROVAL.

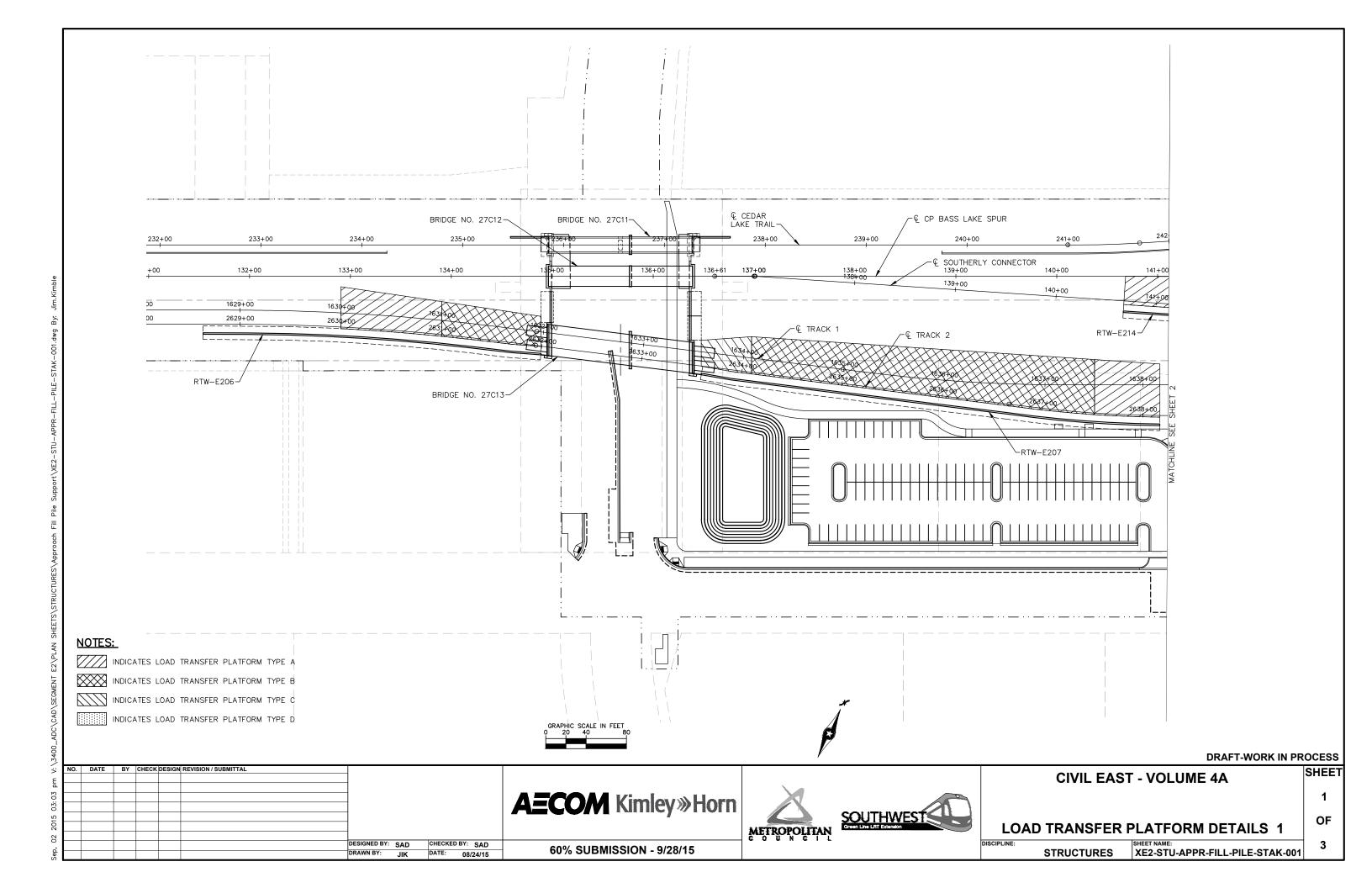


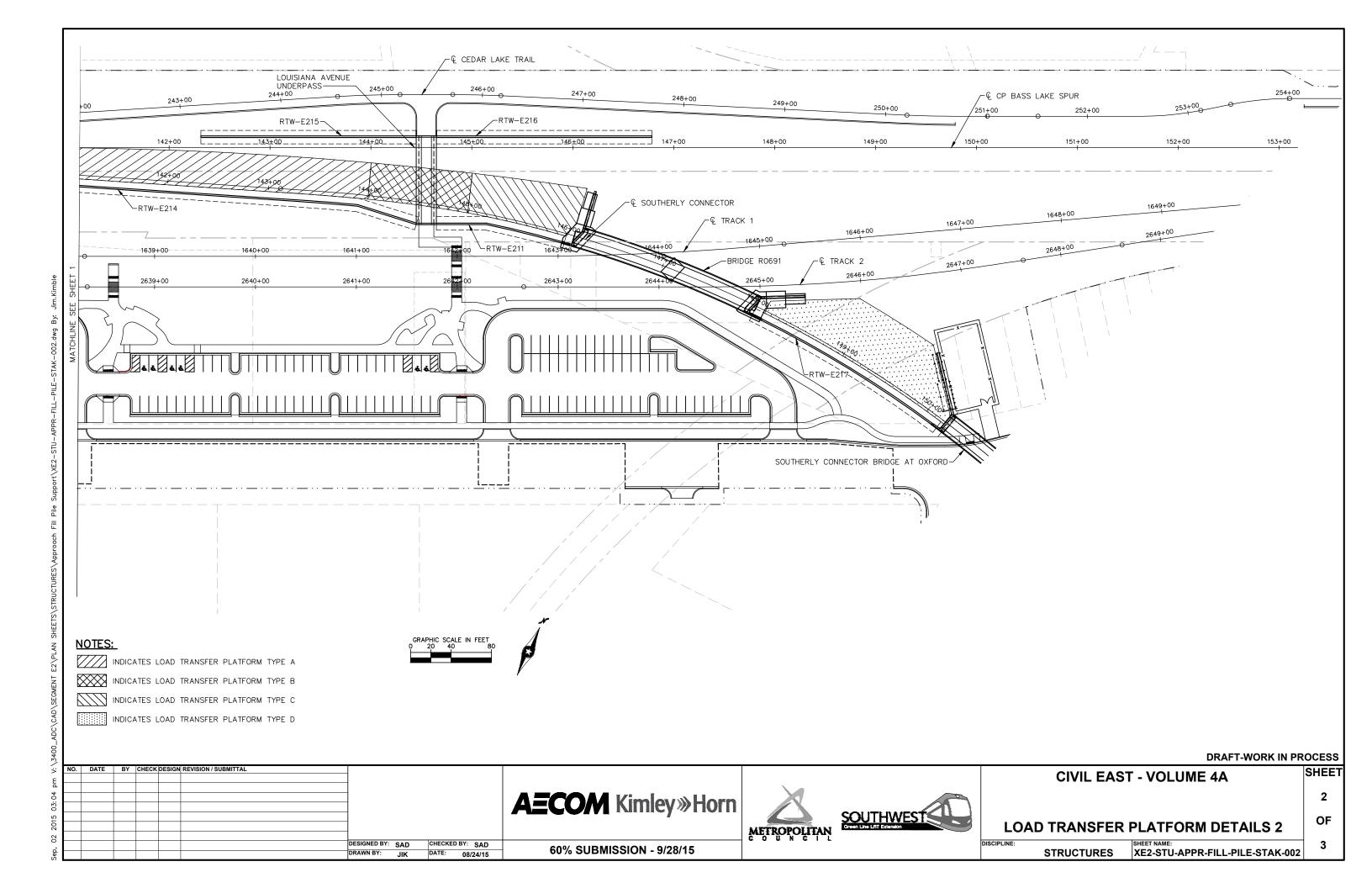


PROPOSED CONSTRUCTION SEQUENCING - STAGE 3

DRAFT-WORK IN PROCESS

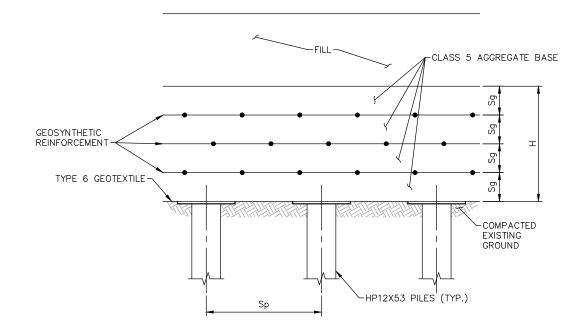
/										
> _	IO. D	DATE E	BY CH	HECK DESIGN REVISION / SUBMITTAL	-				CIVIL FACT VOLUME 4A	SHEET
Ε –									CIVIL EAST - VOLUME 4A	-
° L									LOUISIANA STATION UNDERPASS	4_ '
- ÷ L						A = COA4 Vimlow\\\ Lorn			LOUISIANA STATION UNDERPASS	1/ '
8						<b>AECOM</b> Kimley»Horn			BRIDGE R0690	
15								SOUTHWEST:	DVIDGE V0030	OF
50							METROPOLYTAN	Green Line LRT Extension	STAGING PLAN 3 OF 3	OF
၀.					1		METROPOLITAN		OTACINOT LANGUE	'
~ .					DESIGNED BY: GK CHECKED BY: KJK	COO/ CLIDMICCION DO/00/45			DISCIPLINE: SHEET NAME:	17
6n,					DRAWN BY: MSK DATE: 08/24/15	60% SUBMISSION - 09/28/15			STRUCTURES CBRR0690-BRG-STG-	J3



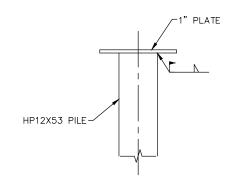


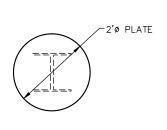
#### **CONSTRUCTION NOTES:**

- PRIOR TO PLACING THE INITIAL AGGREGATE BASE LAYER,
   A TYPE 6 GEOTEXTILE SHALL BE PLACED UPON
   COMPACTED EXISTING GROUND FLUSH WITH THE TOPS OF
   THE PILES.
- 2. FILL SHALL BE SELECT GRANULAR BORROW.



LOAD TRANSFER PLATFORM SECTION

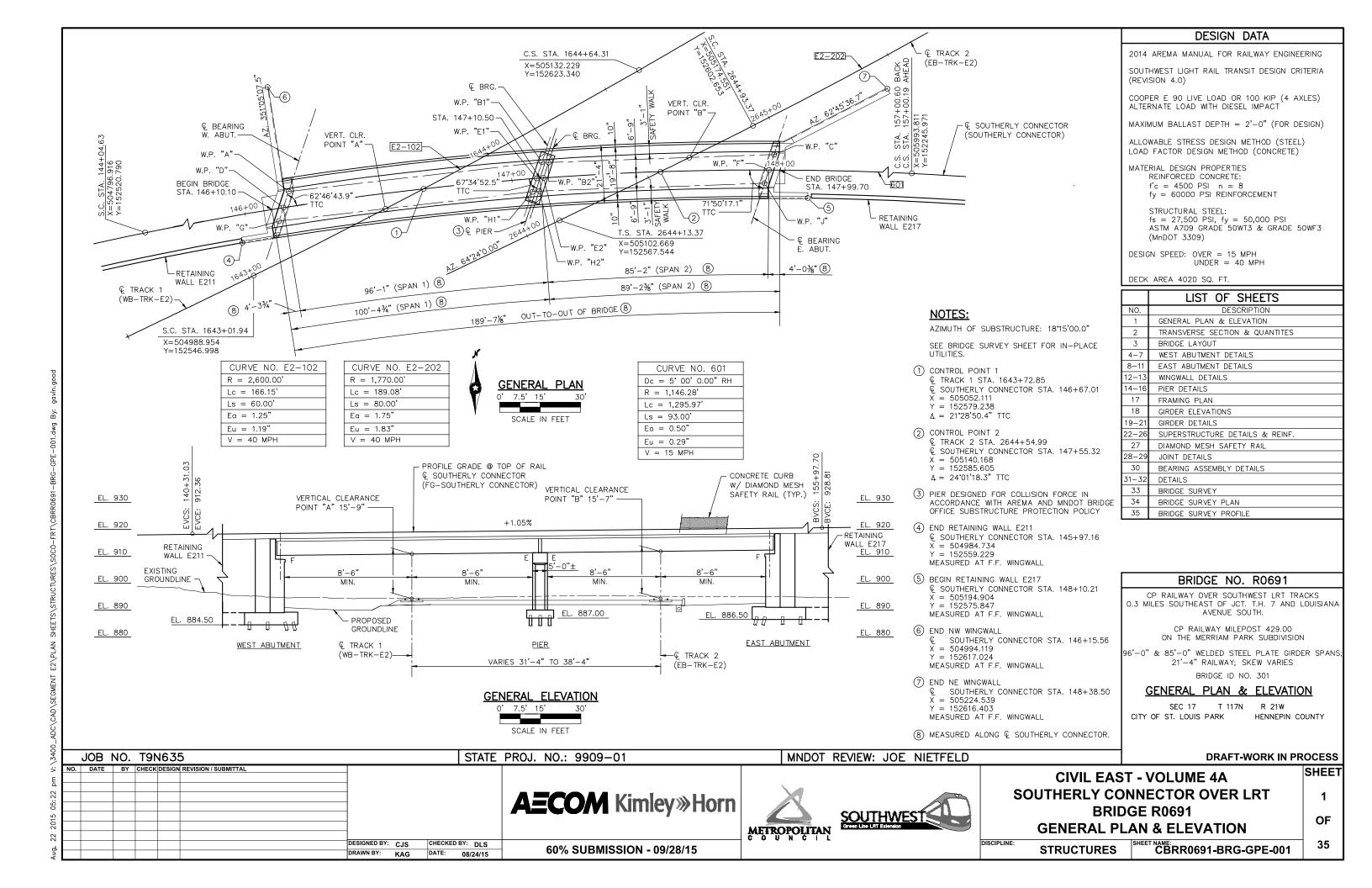


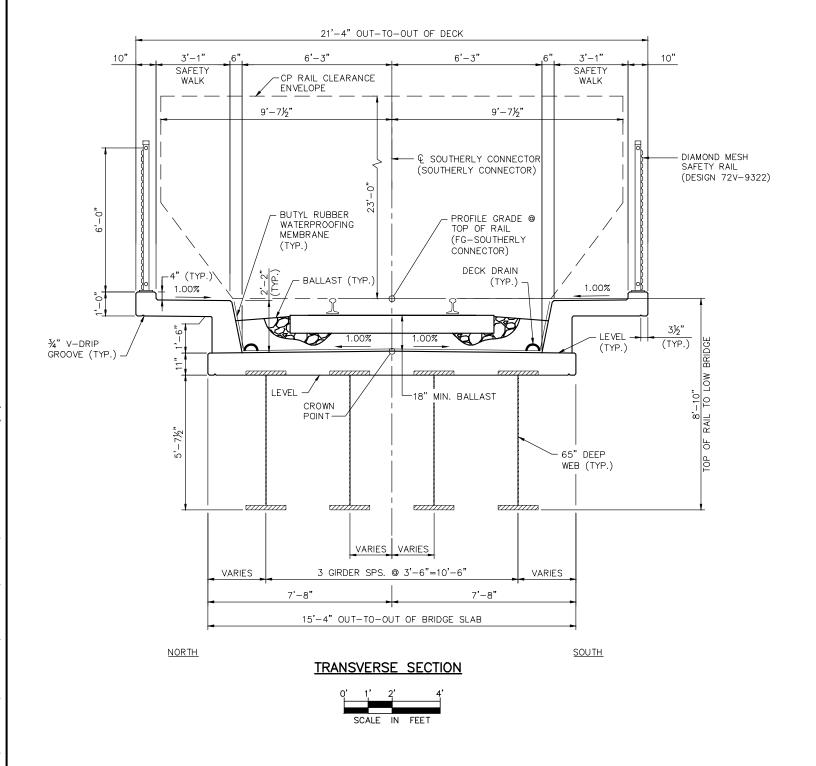


#### PILE PLATE DETAIL

	LOAD TRA	NSFER PLA	ATFORM DA	TA TABLE
TYPE	Sp (FT.)	Sg (FT.)	H (FT.)	REQ'D GEOGRID STRENGTH (pIf)
Α	8'	1.5	6	600
В	7'	1.25	5	417
С	6'	1.0	4	267
D	5.5'	0.875	3.5	205

#### DRAFT-WORK IN PROCESS





	QUANTITY ESTIMATE FOR ENTIRE	BDIDGE	
ITEM NO.	ITEM	UNIT	QUANTITY
2401	STRUCTURAL CONCRETE (1G52)	CU. YD.	
2401	STRUCTURAL CONCRETE (3B52)	CU. YD.	
2401	STRUCTURAL CONCRETE (3S52)	LIN. FT.	
2401	REINFORCEMENT BARS	POUND	
2401	STRUCTURE EXCAVATION	CU. YD.	
2401	BRIDGE SLAB CONCRETE (3B52)	SQ. FT.	
2402	STRUCTURAL STEEL (3306)	CU. YD.	
2402	STRUCTURAL STEEL (3309)	SQ. FT.	
2402	BEARING ASSEMBLY	EACH	
2411	ANTI-GRAFFITI COATING	SQ. FT.	
2411	ARCHITECTURAL SURFACE FINISH (SPECIAL)	SQ. FT.	
2411	ARCHITECTURAL CONCRETE TEXTURE (SPECIAL)	SQ. FT.	
2452	STEEL H-PILING DRIVEN 12"	LIN. FT.	
2452	STEEL H-PILING DELIVERED 12"	LIN. FT.	
2452	STEEL H-TEST PILE 85 FT LONG 12"	EACH	
2452	PILE TIP PROTECTION 12"	EACH	
2481	WATERPROOFING	SQ. FT.	
2502	DRAINAGE SYSTEM TYPE (B910)	LUMP SUM	_
2502	DRAINAGE SYSTEM (BRIDGE DECK)	LUMP SUM	
2557	DIAMOND MESH SAFETY RAIL	LIN. FT.	

#### CONSTRUCTION NOTES:

THE 2016 EDITION OF THE MINNESOTA DEPARTMENT OF TRANSPORTATION "STANDARD SPECIFICATIONS FOR CONSTRUCTION" SHALL GOVERN.

BRIDGE SEAT REINFORCEMENT SHALL BE CAREFULLY PLACED TO AVOID INTERFERENCE WITH DRILLING HOLES FOR ANCHOR RODS, THE BEAMS SHALL BE ERECTED IN FINAL POSITION PRIOR TO DRILLING HOLES FOR AND PLACING ANCHOR RODS.

THE BAR SIZES SHOWN IN THIS PLAN ARE IN U.S. CUSTOMARY DESIGNATIONS. THE FIRST DIGIT OR THE FIRST TWO DIGITS OF EACH BAR MARK INDICATE THE BAR SIZE.

THE SUBSURFACE UTILITY INFORMATION IN THIS PLAN IS UTILITY QUALITY LEVEL D. THIS UTILITY QUALITY LEVEL WAS DETERMINED ACCORDING TO THE GUIDELINES OF CI/ASCE 38-02, ENTITLED "STANDARD GUIDELINES FOR THE COLLECTION AND DEPICTION OF EXISTING SUBSURFACE UTILITY DATA".

THE PILE LOADS SHOWN IN THE PLANS WERE COMPUTED USING SERVICE LOAD METHODOLOGY. PILE BEARING RESISTANCE DETERMINED IN THE FIELD SHALL INCORPORATE THE METHODS AND/OR FORMULAS DESCRIBED IN THE SPECIAL PROVISIONS.

CONCRETE MATERIALS, MIX DESIGN, TESTING AND CONSTRUCTION SHALL BE IN ACCORDANCE WITH CHAPTER 8, PART 1 OF THE 2013 A.R.E.M.A. MANUAL; MnDOT 2461 AND THE SPECIAL PROVISIONS.

CONCRETE SHALL BE MADE WITH A LOW ALKAKI NORMAL PORTLAND CEMENT (TYPE I OR TYPE I/II) IN ACCORDANCE WITH ASTM C 150, LATEST EDITION, WITH LESS THAN 0.6% SODIUM EQUIVALENTS.

MAXIMUM CONCRETE WATER/CEMENT RATION SHALL BE IN ACCORDANCE WITH CHAPTER 8, SECTION 1.11 OF THE 2013 A.R.E.M.A. MANUAL AND MnDOT 2461.

DRAFT-WORK IN PROCESS

NO. DATE BY CHECK DESIGN REVISION / SUBMITTAL

DESIGNED BY: CJS CHECKED BY: DLS

DRAWN BY: KAG DATE: 08/24/15

**AECOM** Kimley»Horn

60% SUBMISSION - 09/28/15

WELL DOOR THAN



## CIVIL EAST - VOLUME 4A SOUTHERLY CONNECTOR OVER LRT BRIDGE R0691 TRANSVERSE SECTION & QUANTITIES

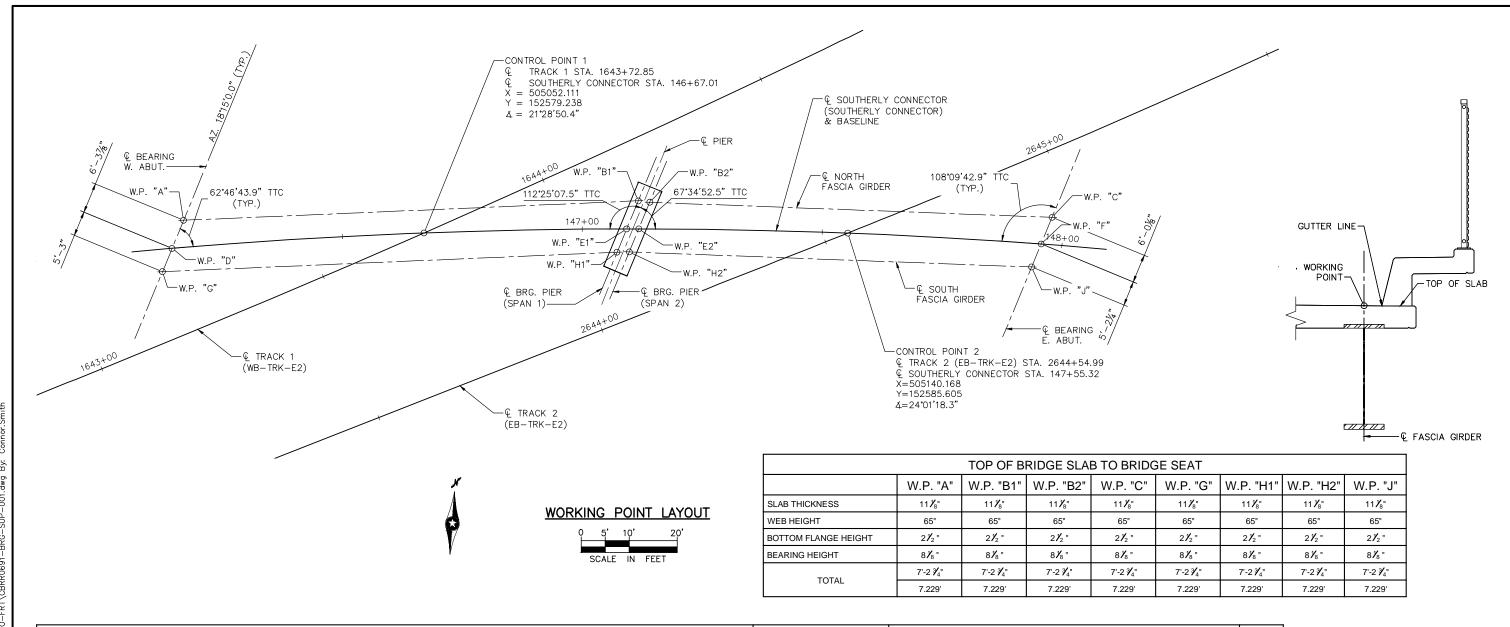
STRUCTURES

T NAME: CBRR0691-BRG-TRN-001

OF 35

SHEET

Aug, 21 2015 05:30 pm V:\3400\_ADC\CAD\SE



				DIME	ENSIONS	BETWEE	N WORK	ING POIN	ITS					COORD	INATES	ELEVATION				
POINT	STATION	А	B1	B2	С	D	E1	E2	F	G	H1	H2	J	х	Y	TOP OF RAIL	TOP OF SLAB	TOP OF SLAB TO BRIDGE SEAT	BRIDGE SEAT	POINT
Α	146+17.30		94.79	97.18	180.93	6.33	92.31	94.83	178.71		90.54	93.07	176.93	505001.982	152578.240	918.513	916.27	7.23'	908.99	А
B1	147+11.64			2.42	86.29	97.62	6.33	5.85	84.42	100.20		10.81	83.11	505096.142	152589.137	919.503	917.26	7.23'	909.99	B1
B2	147+14.03				83.88	99.98	7.35	6.01	82.00	102.54	12.43		80.69	505098.559	152589.016	919.528	917.28	7.23'	909.99	B2
С	147+97.53					183.45	88.67	86.15	6.01	185.68	90.93	88.38		505182.391	152591.956	920.405	918.16	7.23'	910.90	С
D	146+14.42						94.79	97.31	181.05	5.25	92.71	95.25	179.12	505000.001	152572.232					D
E1	147+09.24							2.52	86.41	97.11	5.25	4.83	84.74	505094.161	152583.129					E1
E2	147+11.76								83.88	99.62	6.63	5.19	82.23	505096.679	152583.313					E2
F	147+95.66									183.14	88.36	85.82	5.19	505180.510	152586.253					F
G	146+12.01										94.79	97.34	181.08	504998.358	152567.250	918.457	916.22	7.23'	908.99	G
H1	147+07.22											2.55	86.43	505092.518	152578.147	919.457	917.22	7.23'	909.99	H1
H2	147+09.78												83.88	505095.054	152578.386	919.484	917.25	7.23'	909.99	H2
J	147+94.04													505178.886	152581.327	920.369	918.13	7.23'	910.90	J

**DRAFT-WORK IN PROCESS** 

SHEET

3

OF

DESIGNED BY: CJS CHECKED BY: DLS DRAWN BY: ZTW DATE: 08/24/15

**AECOM** Kimley»Horn

60% SUBMISSION - 09/28/15

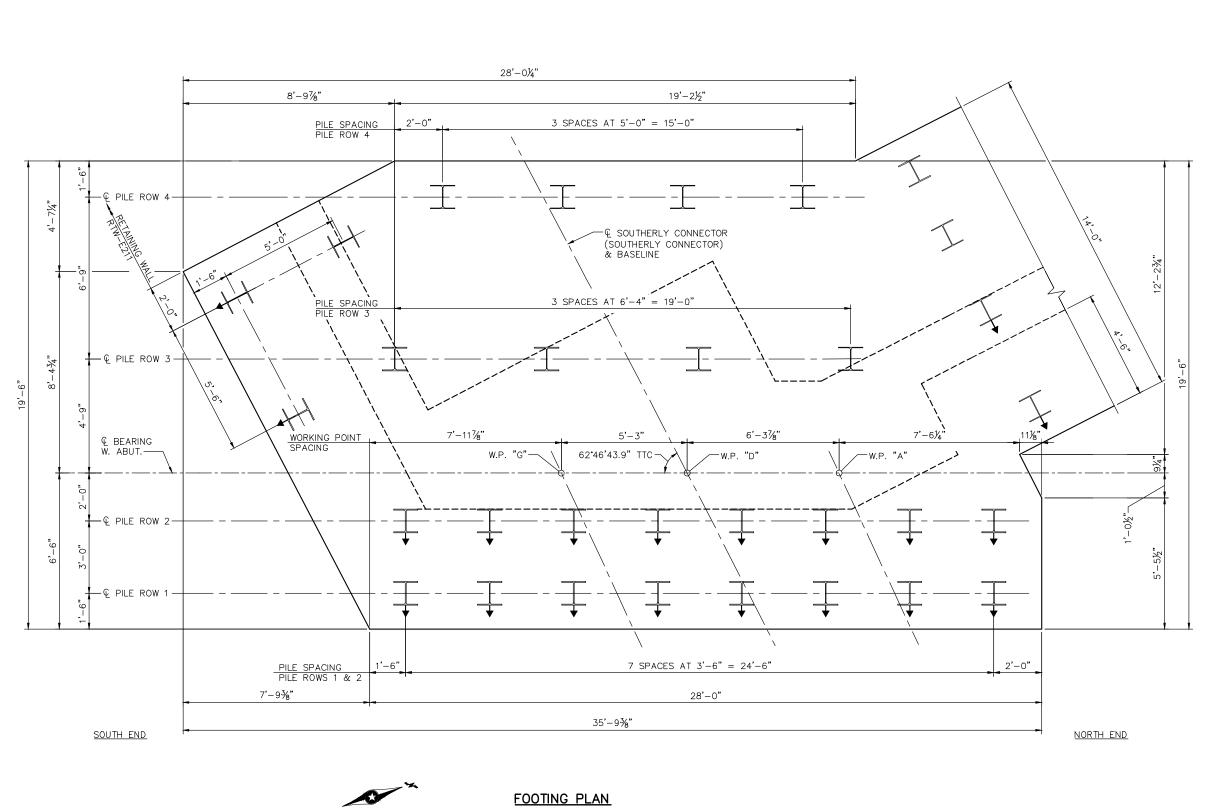




### **CIVIL EAST - VOLUME 4A SOUTHERLY CONNECTOR OVER LRT BRIDGE R0691 BRIDGE LAYOUT**

**STRUCTURES** 

35 CBRR0691-BRG-SUP-001



WEST ABUTMENT
COMPUTED PILE LOAD - TONS/PILE

DEAD LOAD + 43.9

LIVE LOAD 24.0

\* DESIGN LOAD 71.7

\* BASED ON GROUP VI LOADING (SERVICE LOAD) PER AREMA CHAPTER 8 SECTION 2.2.4

#### **GENERAL PILE NOTES:**

- 1 HP12x53 STEEL TEST PILE 63 FT. LONG 30 HP12x53 STEEL PILES EST. 63 FT. LENGTH
- 31 HP12x53 STEEL PILES REQ'D FOR WEST ABUT.
- ALL PILES TO BE HP12x53 WITH PILE TIP PROTECTION.

PILE SPACING SHOWN IS AT BOTTOM OF FOOTING.

PILES MARKED THUS  $\overline{\downarrow}$  TO BE BATTERED 3" PER FOOT IN DIRECTION SHOWN.

FOR PILE SPLICE DETAILS SEE DETAIL B202.

SEE SURVEY SHEET FOR TEST PILE LOCATIONS.

DRAFT-WORK IN PROCESS

SHEET

NO. DATE BY CHECK DESIGN REVISION / SUBMITTAL

DESIGNED BY: GAG CHECKED BY: DLS
DRAWN BY: MRD DATE: 08/24/15

**AECOM** Kimley»Horn

60% SUBMISSION - 09/28/15

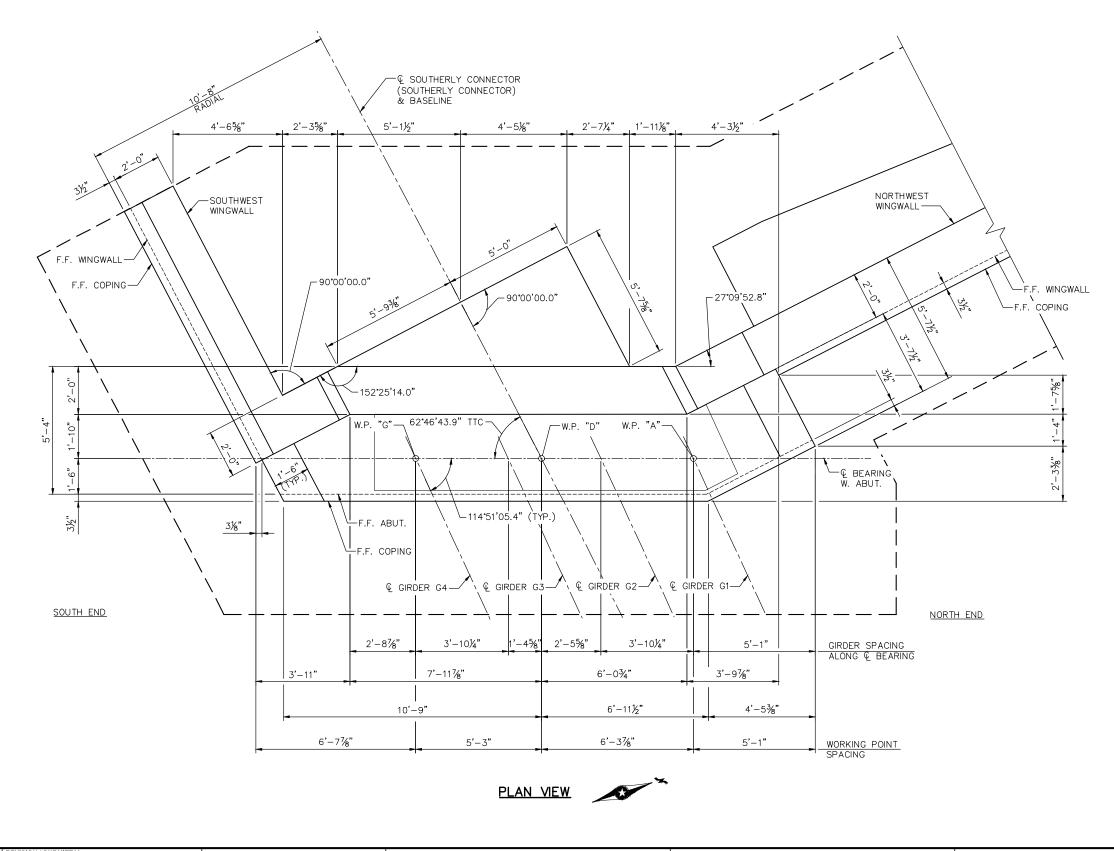
METROPOLITAN E



CIVIL EAST - VOLUME 4A
SOUTHERLY CONNECTOR OVER LRT
BRIDGE R0691
WEST ABUTMENT DETAILS 1

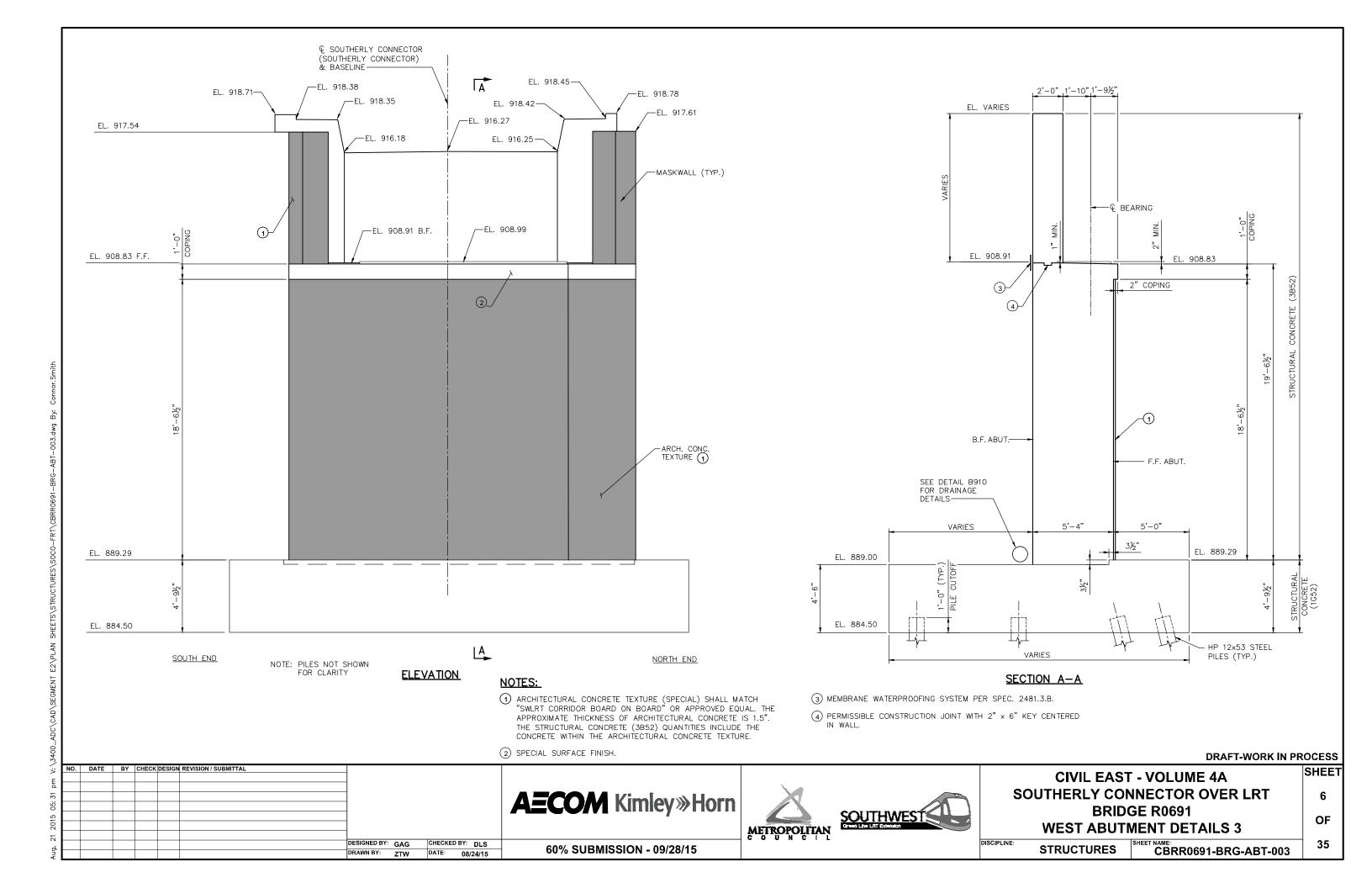
DISCIPLINE: STRUCTURES SHEET NAME: CBRR0691-BRG-ABT-001

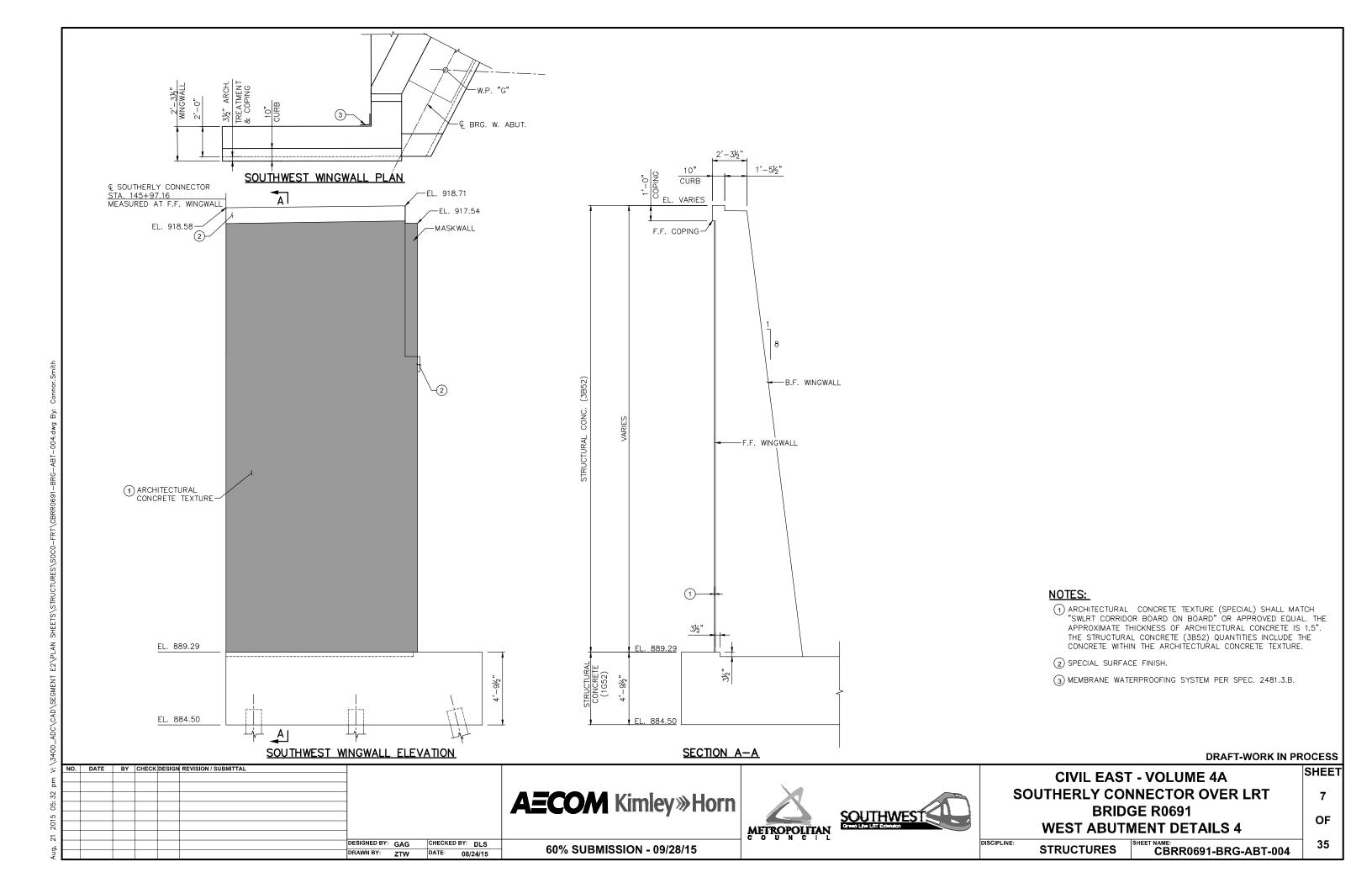
S 1 OF 35

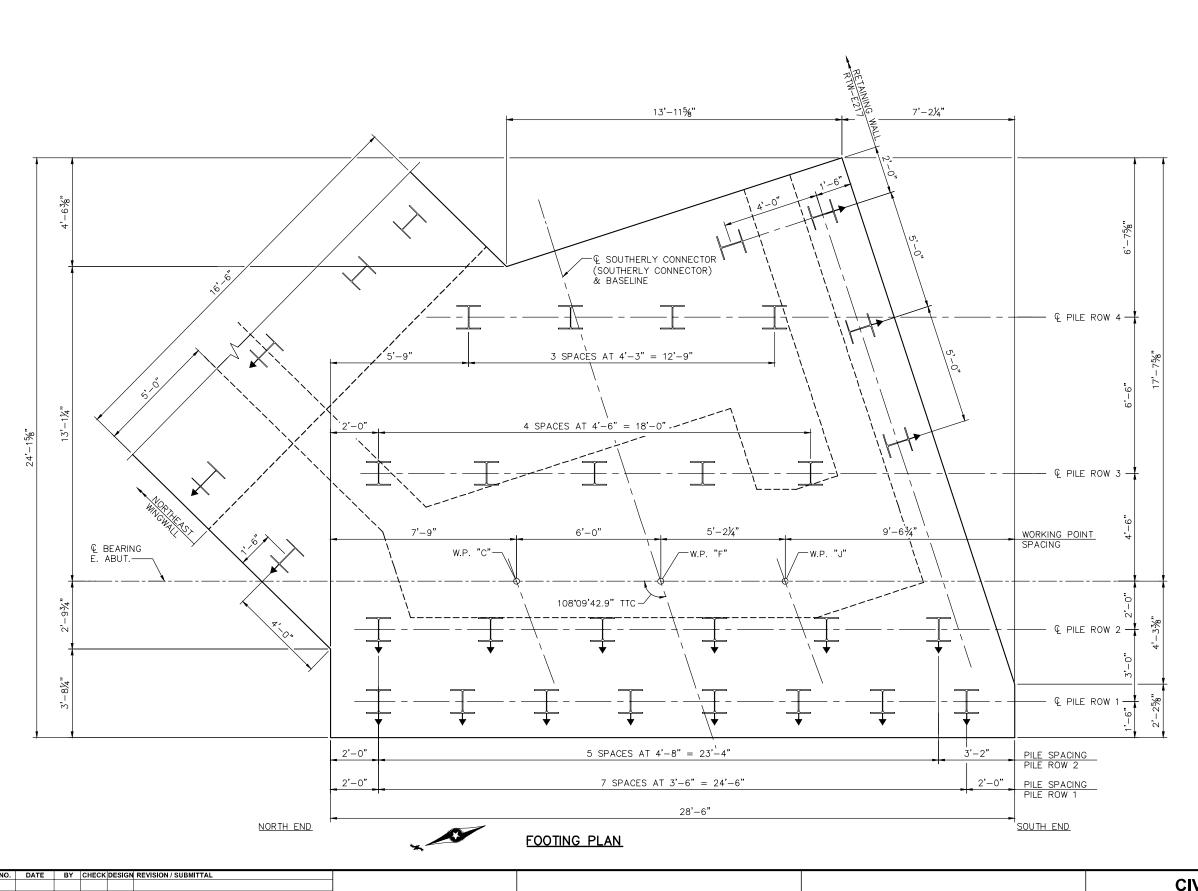


DRAFT-WORK IN PROCESS

; E	NO. DATE BY CHECK DESIGN REVISION / SUBMITTAL	-						CIVIL EAST	- VOLUME 4A	SHEET
:31 p				<b>AECOM</b> Kimley»Horn			S	DUTHERLY CO	NECTOR OVER LRT	5
15 05		-		<b>A=COM</b> Kimley»Horn		SOUTHWEST		BRID	GE R0691	OF
1 201					METROPOLITAN	Green Line LRT Extension		WEST ABUTI	MENT DETAILS 2	0
ug, 2		DESIGNED BY: GAG DRAWN BY: MRD	CHECKED BY: DLS DATE: 08/24/15	60% SUBMISSION - 09/28/15			DISCIPLINE:	STRUCTURES	SHEET NAME: CBRR0691-BRG-ABT-002	35
∢		MIKE	00/24/10		l					







EAST ABUTMENT								
COMPUTED PILE LOAD - TONS/PILE								
DEAD LOAD + EARTH PRESSURE	80.3							
LIVE LOAD	26.8							
* DESIGN LOAD	107.0							

\* BASED ON GROUP VI LOADING (SERVICE LOAD) PER AREMA CHAPTER 8 SECTION 2.2.4

#### **GENERAL PILE NOTES:**

1 HP12x53 STEEL TEST PILE 63 FT. LONG 31 HP12x53 STEEL PILES EST. 63 FT. LENGTH

32 HP12x53 STEEL PILES REQ'D FOR EAST ABUT.

ALL PILES TO BE HP12x53 WITH PILE TIP PROTECTION.

PILE SPACING SHOWN IS AT BOTTOM OF FOOTING.

PILES MARKED THUS \$\frac{1}{4}\$ TO BE BATTERED 3" PER FOOT IN DIRECTION SHOWN.

FOR PILE SPLICE DETAILS SEE DETAIL B202.

SEE SURVEY SHEET FOR TEST PILE LOCATIONS.

**DRAFT-WORK IN PROCESS** 

NO. DATE BY CHECK DESIGN REVISION / SUBMITTAL

DESIGNED BY: GAG CHECKED BY: DLS
DRAWN BY: MRD DATE: 08/24/15

**AECOM** Kimley»Horn

60% SUBMISSION - 09/28/15

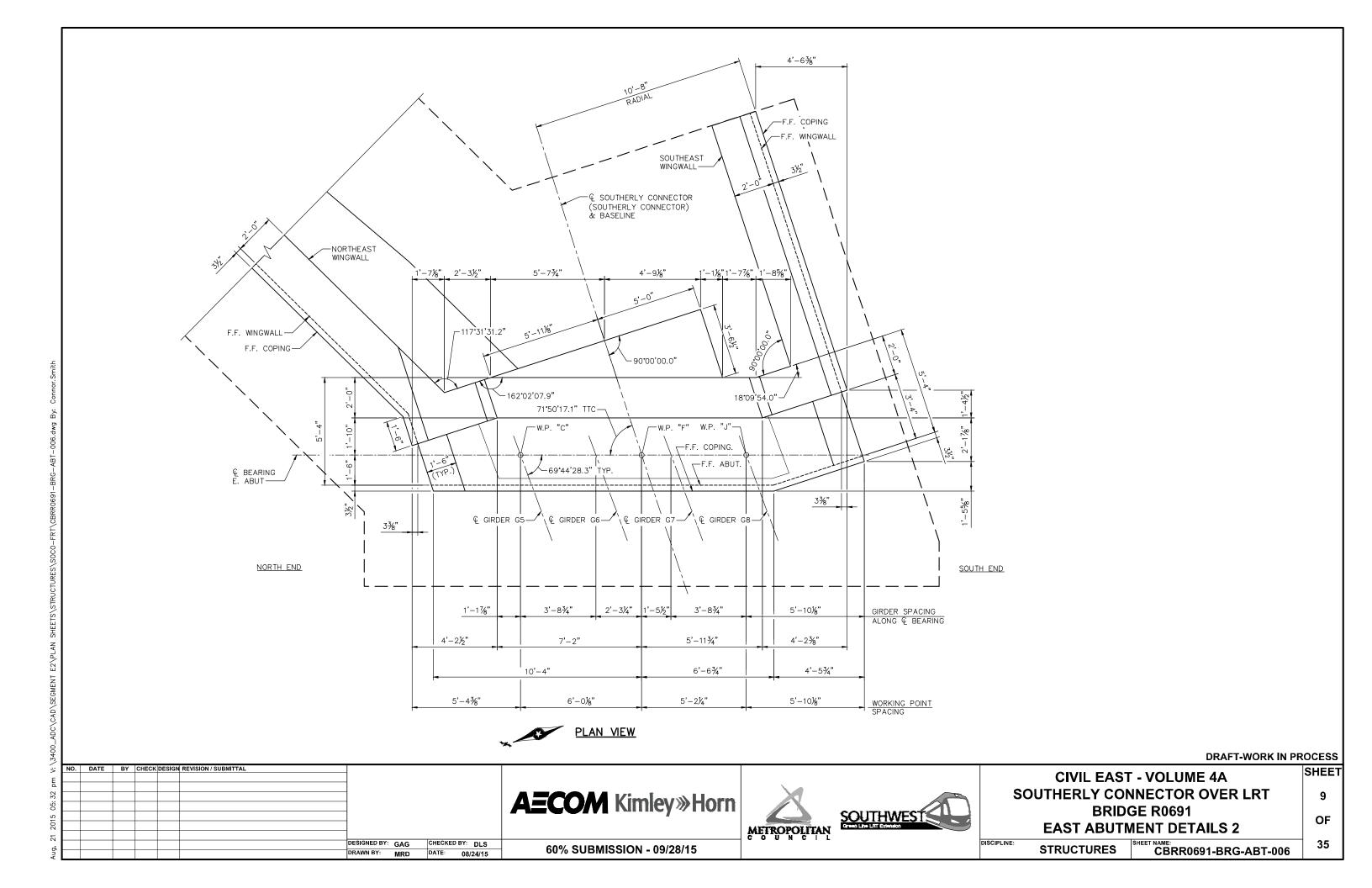


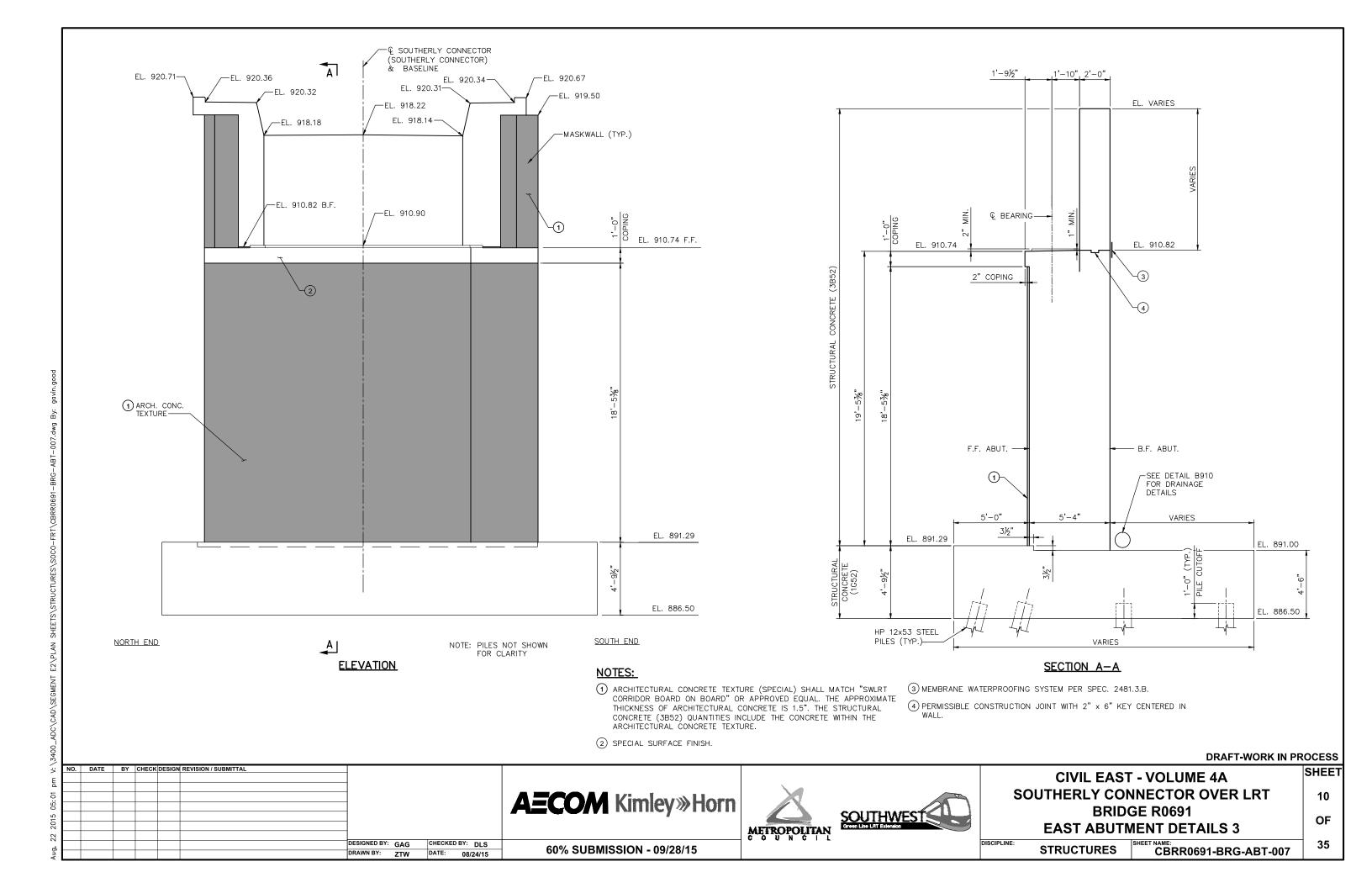


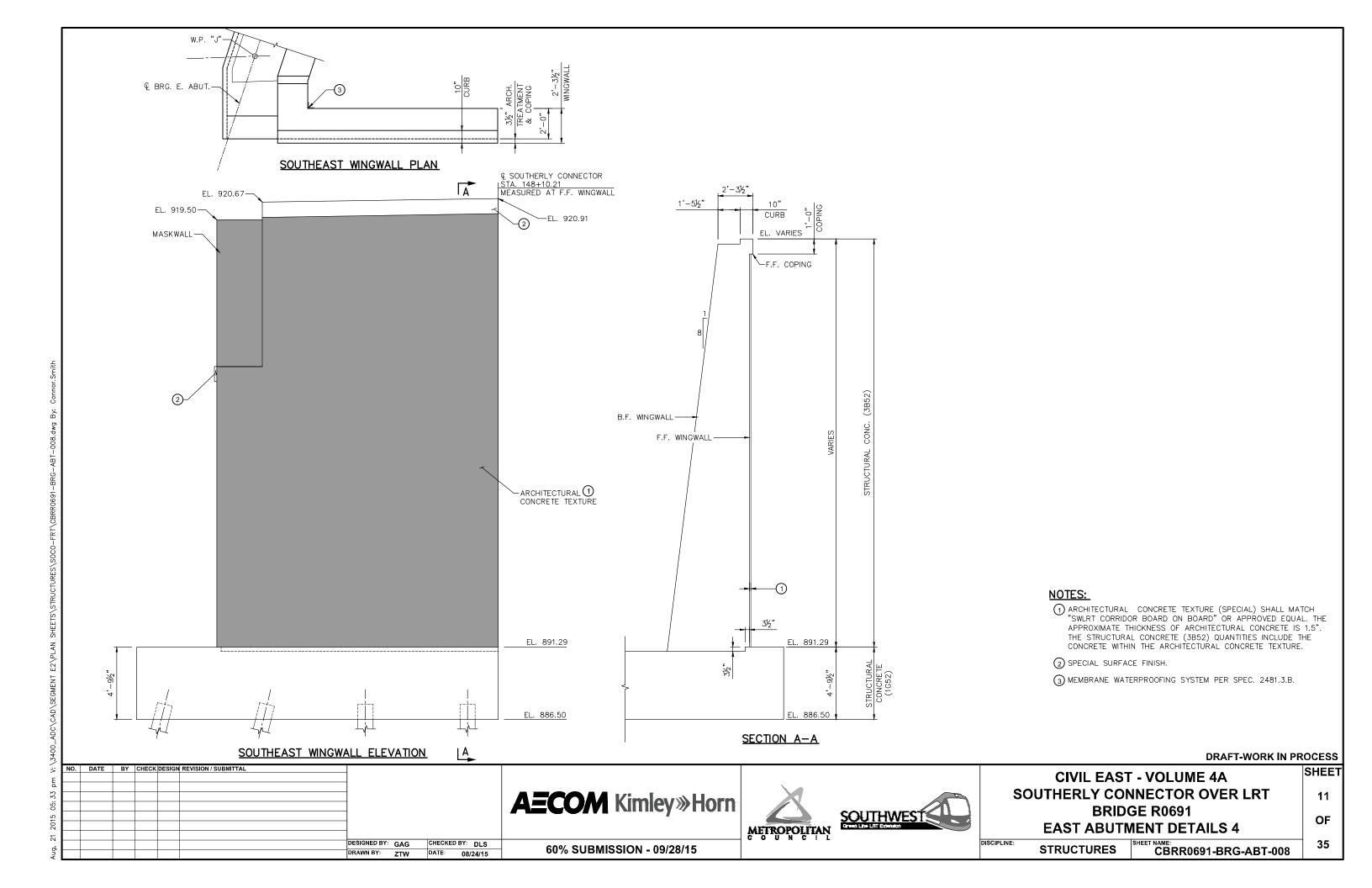
CIVIL EAST - VOLUME 4A
SOUTHERLY CONNECTOR OVER LRT
BRIDGE R0691
EAST ABUTMENT DETAILS 1

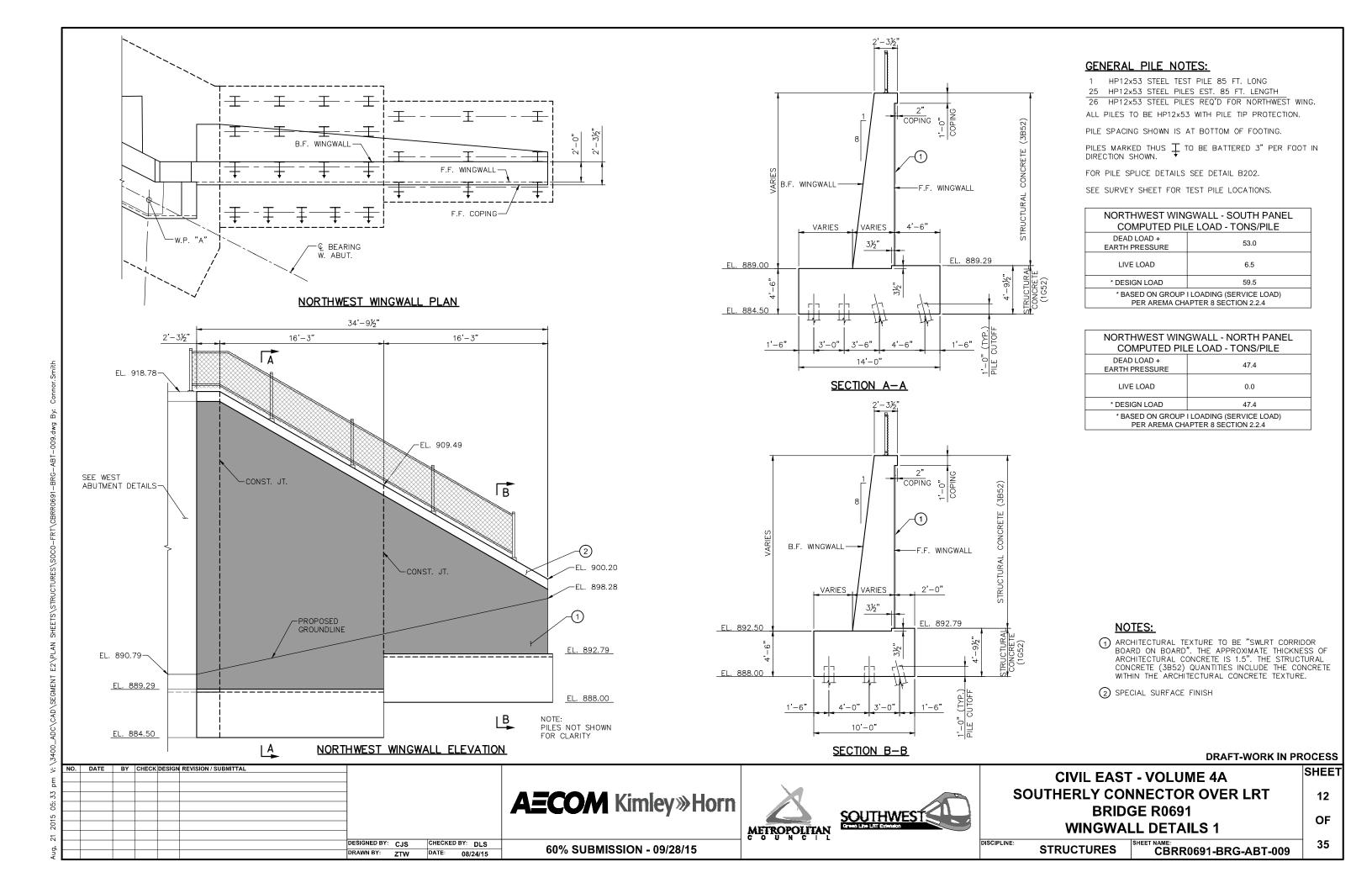
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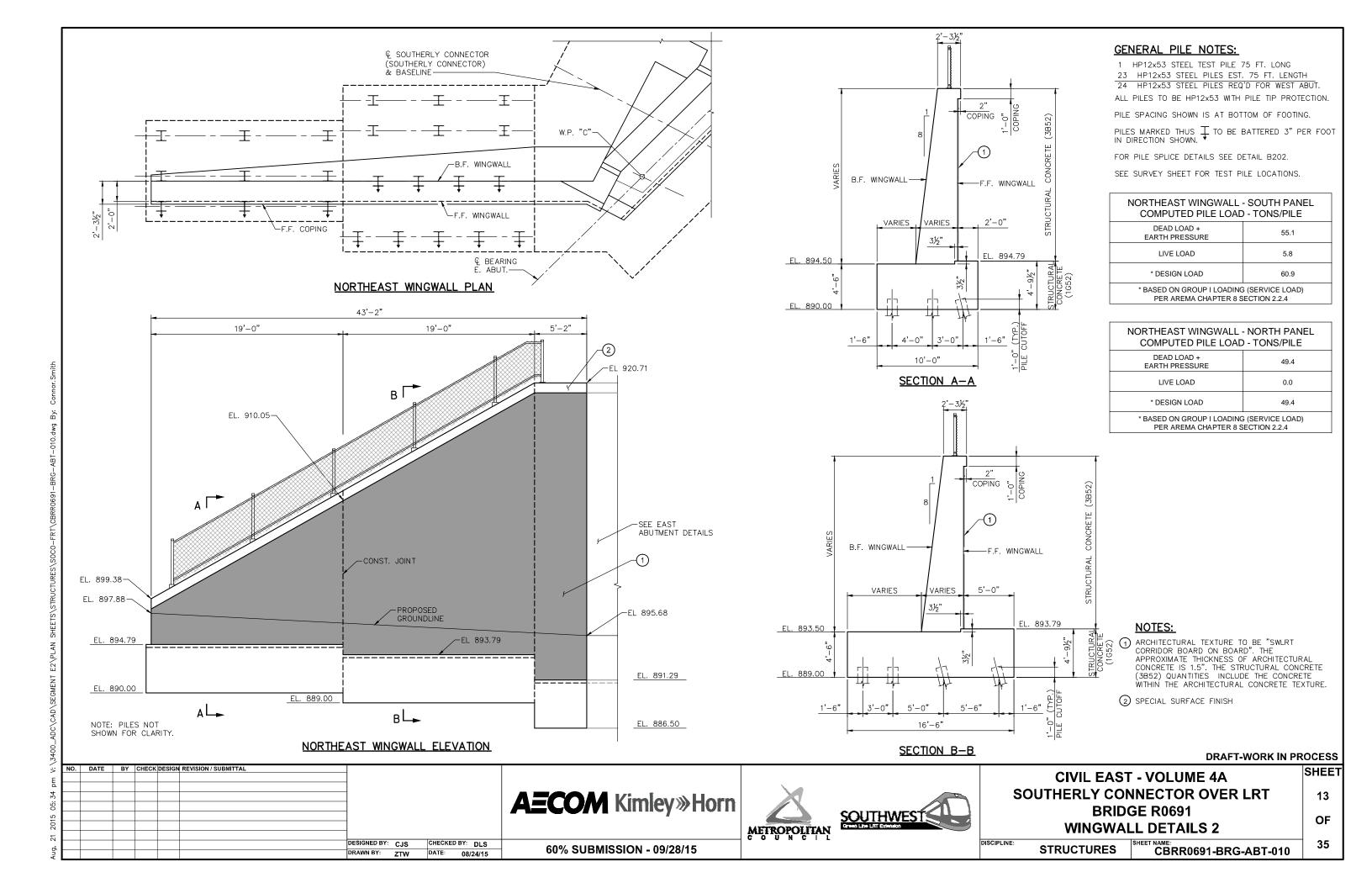
ILS 1 OF 1-BRG-ABT-005

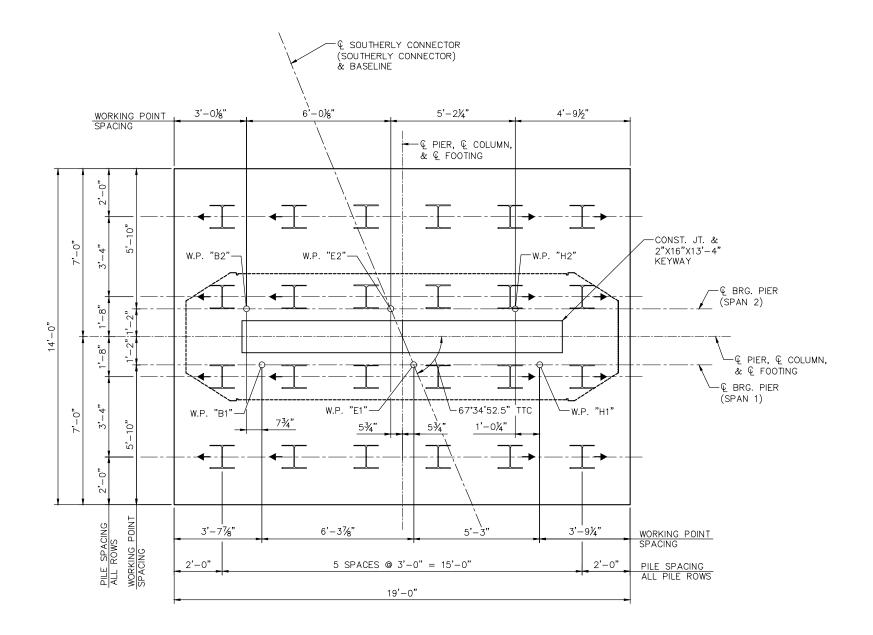












PIER COMPUTED PILE LOAD - TONS/PILE LIVE LOAD OVERTURNING 38.2 TOTAL LOAD 86.1 68.9 DESIGN LOAD

> \* BASED ON GROUP VI LOADING (SERVICE LOAD) PER AREMA CHAPTER 8 SECTION 2.2.4

#### **GENERAL PILE NOTES**

1 HP12x53 STEEL TEST PILE 65 FT. LONG 23 HP12x53 STEEL PILES EST. 65 FT. LENGTH

24 HP12x53 STEEL PILES REQ'D FOR PIER

ALL PILES TO BE HP12x53 WITH PILE TIP PROTECTION.

PILE SPACING SHOWN IS AT BOTTOM OF FOOTING.

PILES MARKED THUS TO BE BATTERED 2" PER FOOT IN DIRECTION SHOWN.

FOR PILE SPLICE DETAILS SEE DETAIL B202.

SEE SURVEY SHEET FOR TEST PILE LOCATIONS.

**FOOTING PLAN** 

**DRAFT-WORK IN PROCESS** 

SHEET

OF

DESIGNED BY: GAG CHECKED BY: DLS DRAWN BY: KAG DATE: 08/24/15

**AECOM** Kimley»Horn

60% SUBMISSION - 09/28/15

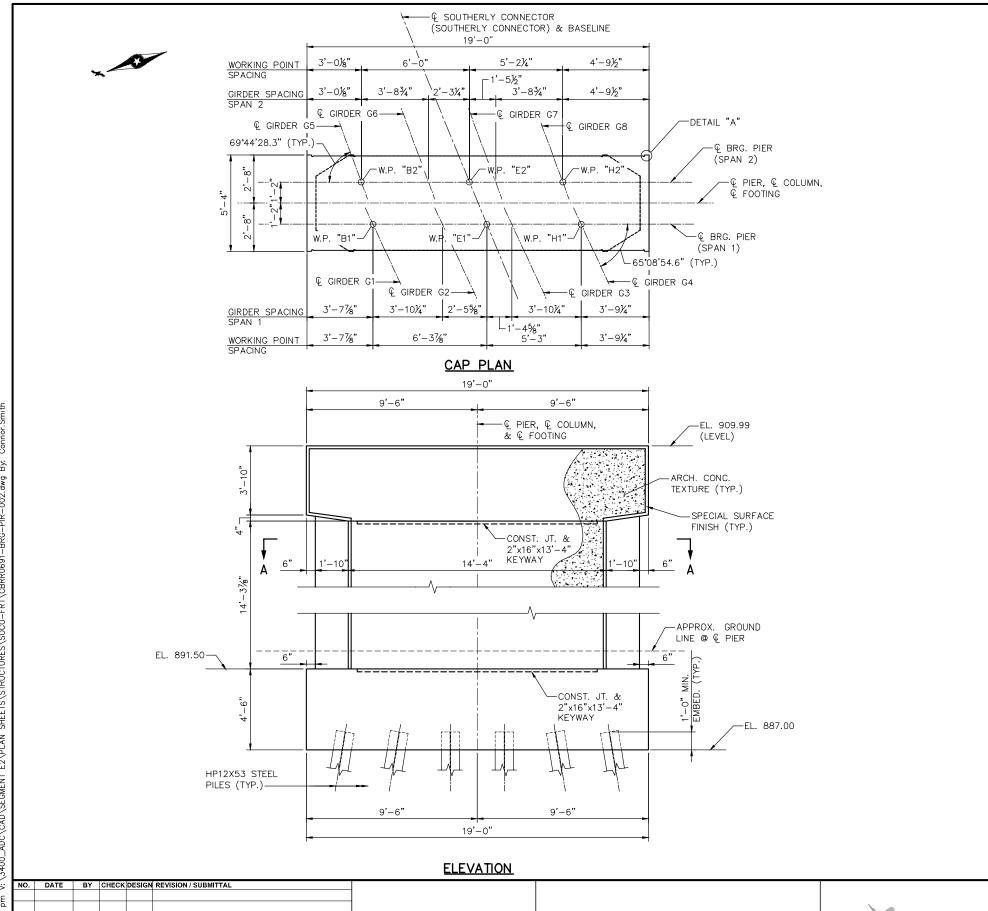


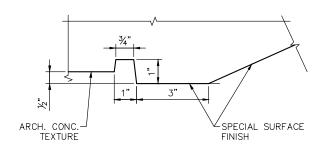


CIVIL EAST - VOLUME 4A
SOUTHERLY CONNECTOR OVER LRT
BRIDGE R0691
PIER DETAILS 1

DISCIPLINE: **STRUCTURES** CBRR0691-BRG-PIR-001

35





**DETAIL A** 

**DRAFT-WORK IN PROCESS** 

SHEET

OF

35

DESIGNED BY: GAG CHECKED BY: DLS DATE: 08/24/15

**AECOM** Kimley»Horn

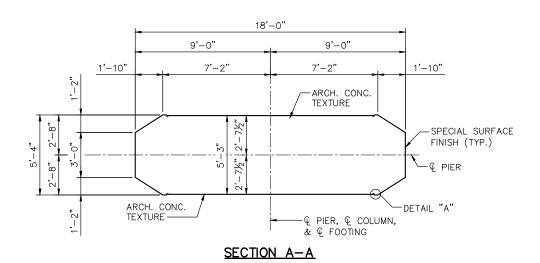
60% SUBMISSION - 09/28/15

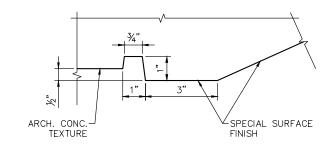




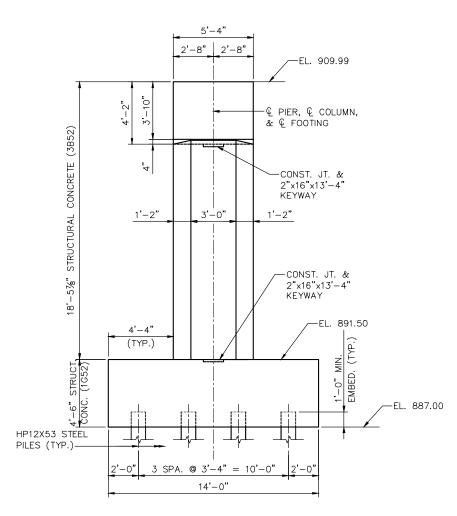
CIVIL EAST - VOLUME 4				
SOUTHERLY CONNECTOR OVER LRT				
BRIDGE R0691				
PIER DETAILS 2				

DISCIPLINE: **STRUCTURES** CBRR0691-BRG-PIR-002





DETAIL A

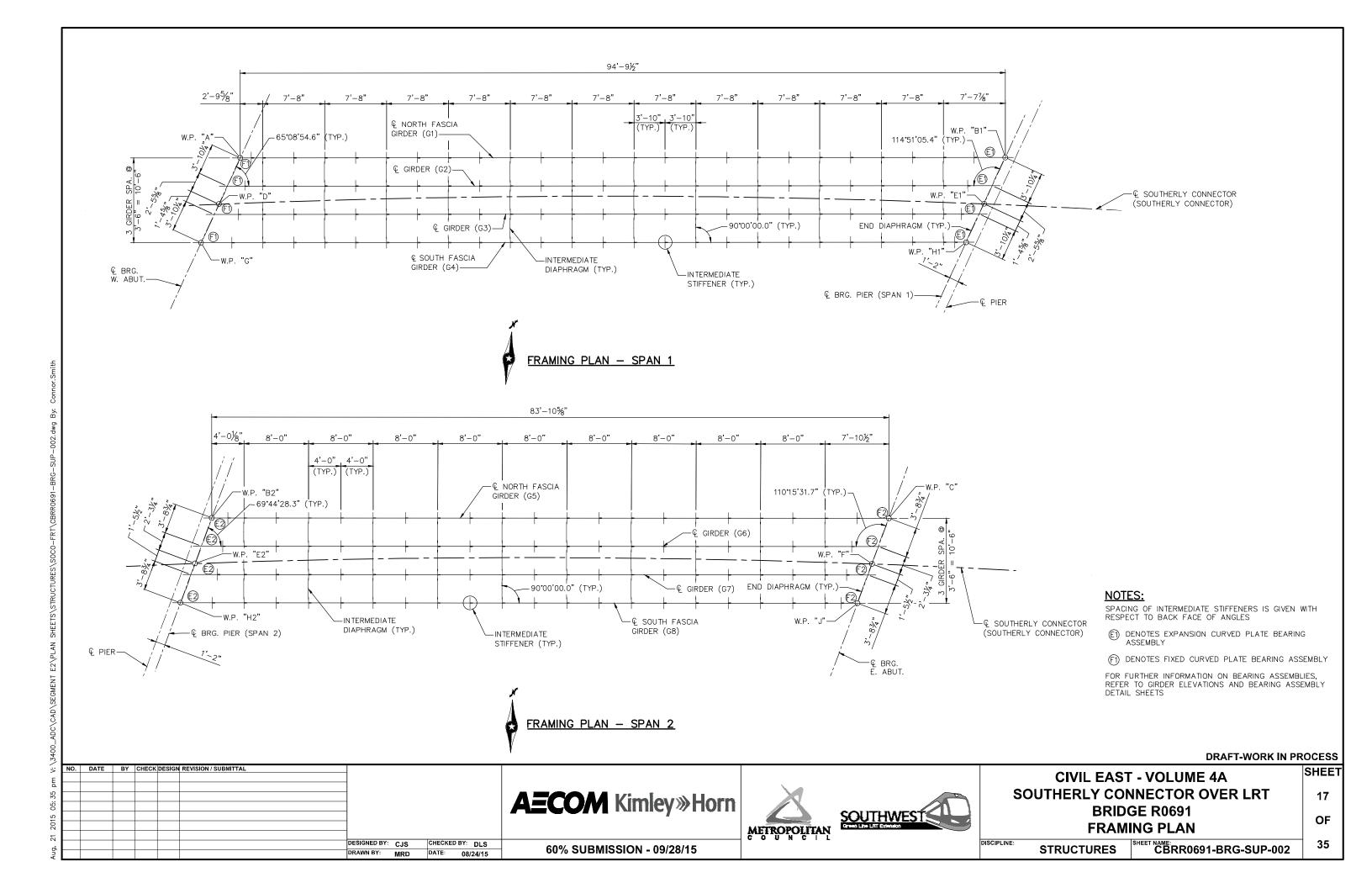


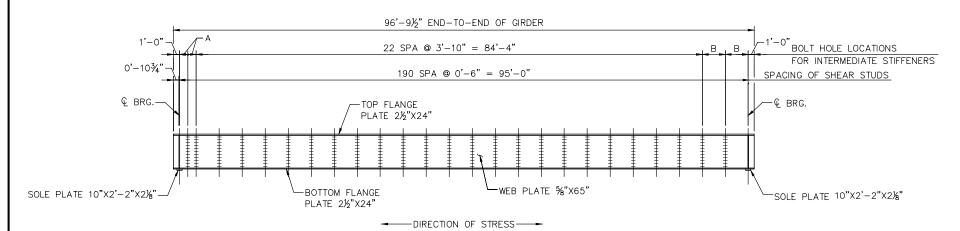
END VIEW

#### **DRAFT-WORK IN PROCESS**

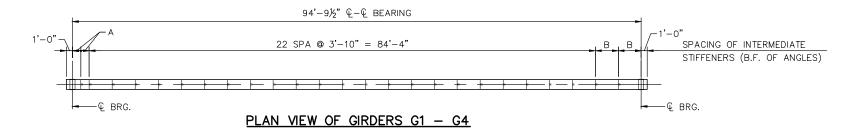
:>	NO. DATE BY CHECK DESIGN REVISION / SUBMITTAL				CIVIL EAST - VOLUME 4A	SHEET
35 р			<b>AECOM</b> Kimley»Horn		SOUTHERLY CONNECTOR OVER LRT	16
5 05			<b>AECOM</b> Kimley»Horn	SOLITHWEST	BRIDGE R0691	
201				METROPOLITAN Green Line Lett Extension	PIER DETAILS 3	OF
ng, 21		DESIGNED BY: GAG CHECKED BY: IDRAWN BY: KAG DATE: 08/2	60% STIRMISSION _ 00/28/15	- COUNCIL	DISCIPLINE: STRUCTURES SHEET NAME: CBRR0691-BRG-PIR-003	35

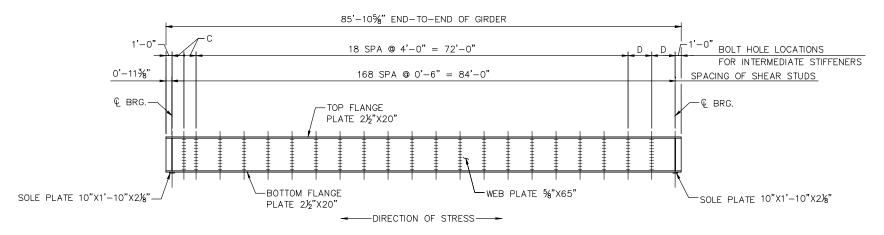
oo pm v: (v4uu\_abc/cab/)sekmeni ez Yrtan sheels(siruclores)(sucuo-fri)(barroogi-bro-frir-uus.awg By:



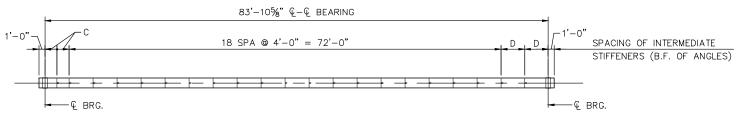


## ELEVATION VIEW OF GIRDERS G1 - G4





# ELEVATION VIEW OF GIRDERS G5 - G8



60% SUBMISSION - 09/28/15

#### PLAN VIEW OF GIRDERS G5 - G8

DATE: 08/24/15

						<b>AECOM</b> Kimley»Horn	М
$\neg$			DESIGNED BY:	JFM	CHECKED BY: DLS	000/ 01/04/00/04/	

DRAWN BY: ZTW





# ₽ BRG. -€ BRG. 4 EQ. SPACES @ 23'-8%" = 94'-9%"

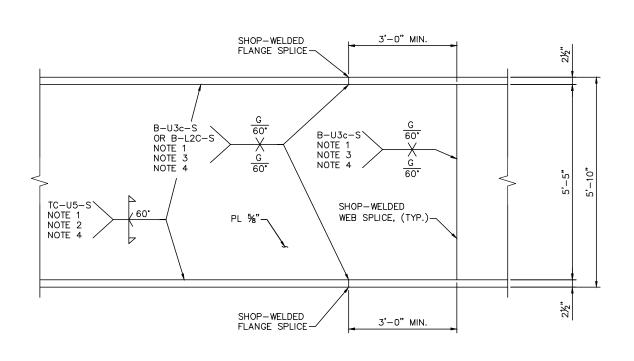
## CAMBER DIAGRAM FOR GIRDERS G1-G4

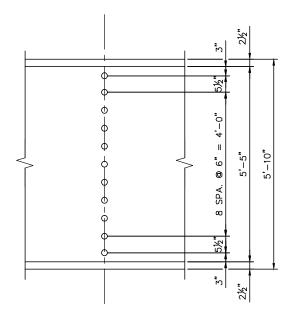
DIMENSION TABLE											
GIRDER	Α	В	С	D							
G1	1'-4¾"	3'-10"									
G2	2'-2½"	3'-0¼"									
G3	3'-0¼"	2'-21/2"									
G4	3'-10"	1'-4¾"									
G5			2'-0"	3'-11¼"							
G6			2'-7¾"	3'-3½"							
G7			3'-3½"	2'-7¾"							
G8			3'-11¼"	2'-0"							

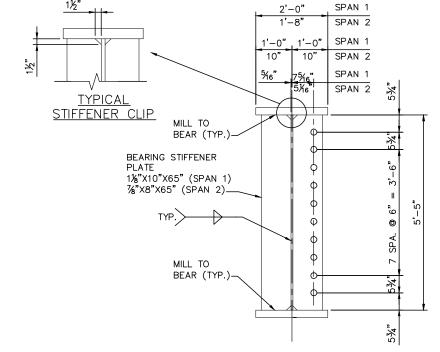
## **GENERAL NOTES:**

- 1. STRUCTURAL STEEL SHALL CONFORM TO Mn/DOT 3309 ASTM A709 GRADE 50WF3 UNLESS OTHERWISE NOTED
- 2. BOLTED CONNECTIONS SHALL BE MADE WITH %" DIAMETER A325 TYPE 3 HIGH STRENGTH BOLTS, EXCEPT AS NOTED. HOLES FOR %" DIAMETER BOLTS SHALL BE 15/6", EXCEPT AS NOTED.
- 3. PLACE NUT AND WASHER INSIDE OF GIRDER WEB.
- 4. WEB AND FLANGE PLATES SHALL BE FURNISHED IN AVAILABLE MILL LENGTHS WITH A MINIMUM NUMBER OF SPLICES. LOCATION OF SPLICES SHALL BE APPROVED BY ENGINEER. A SPLICE SHALL BE MINIMUM OF 12" FROM ANY STIFFENER. NO SPLICES WILL BE ALLOWED 12 FEET FROM MIDPOINT OF GIRDER.
- 5. CAMBER DIAGRAMS SHOWN ARE FOR BEAM IN UNLOADED POSITION AND PROVIDES FOR ALL DEAD LOAD DEFLECTIONS AND RESIDUAL CAMBER. BASE LINE IN CAMBER DIAGRAM IS A STRAIGHT LINE FROM & BRG. AT BOTTOM OF WEB.
- 6. SOLE PLATES SHALL BE SHOP WELDED TO BOTTOM FLANGE PLATES, FOR WELD DETAILS REFER TO BEARING ASSEMBLY DETAILS SHEET.
- 7. NO WELDING OR DRILLING OF HOLES FOR TEMPORARY ATTACHMENTS
- 8. THE STRUCTURAL STEEL FABRICATOR SHALL BE CERTIFIED UNDER THE A.I.S.C. QUALITY CERTIFICATION PROGRAM, CATEGORY, MAJOR STEEL BRIDGES (Cbr.).
- 9. GIRDERS G5-G8 SHALL NOT BE CAMBERED

CIVIL EAST	- VOLUME 4A	SHEET								
SOUTHERLY CONNECTOR OVER LRT										
BRIDO	BRIDGE R0691									
GIRDER	ELEVATION	OF								
STRUCTURES	SHEET NAME: CBRR0691-BRG-STL-001	35								



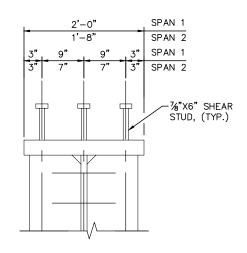




BEAM WELDING DETAILS

INTERMEDIATE STIFFENER
BOLT HOLE LAYOUT

BEARING STIFFENER



SHEAR STUD DESIGN

## NOTES:

NOTE 1. BACK GOUGE ROOT TO SOUND METAL BEFORE WELDING SECOND SIDE.

NOTE 2. WEB TO FLANGE GROOVE WELDS TO BE TESTED PER CURRENT A.W.S. TABLE 6.3 & 6.4.

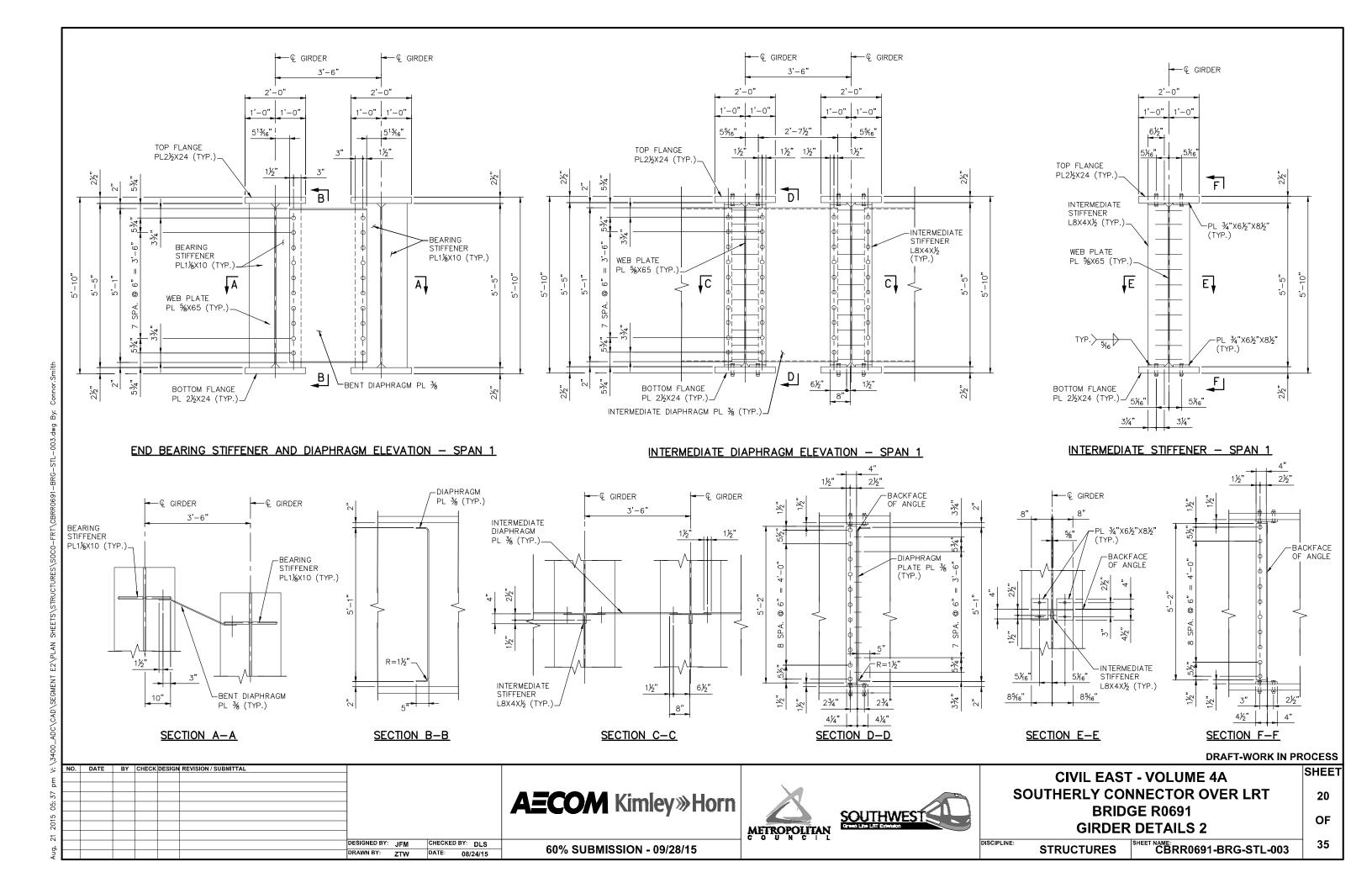
NOTE 3. WEB AND FLANGE BUTT WELDS SHALL BE TESTED USING RADIOGRAPHIC INSPECTION PER SPEC 2471.3M1d.

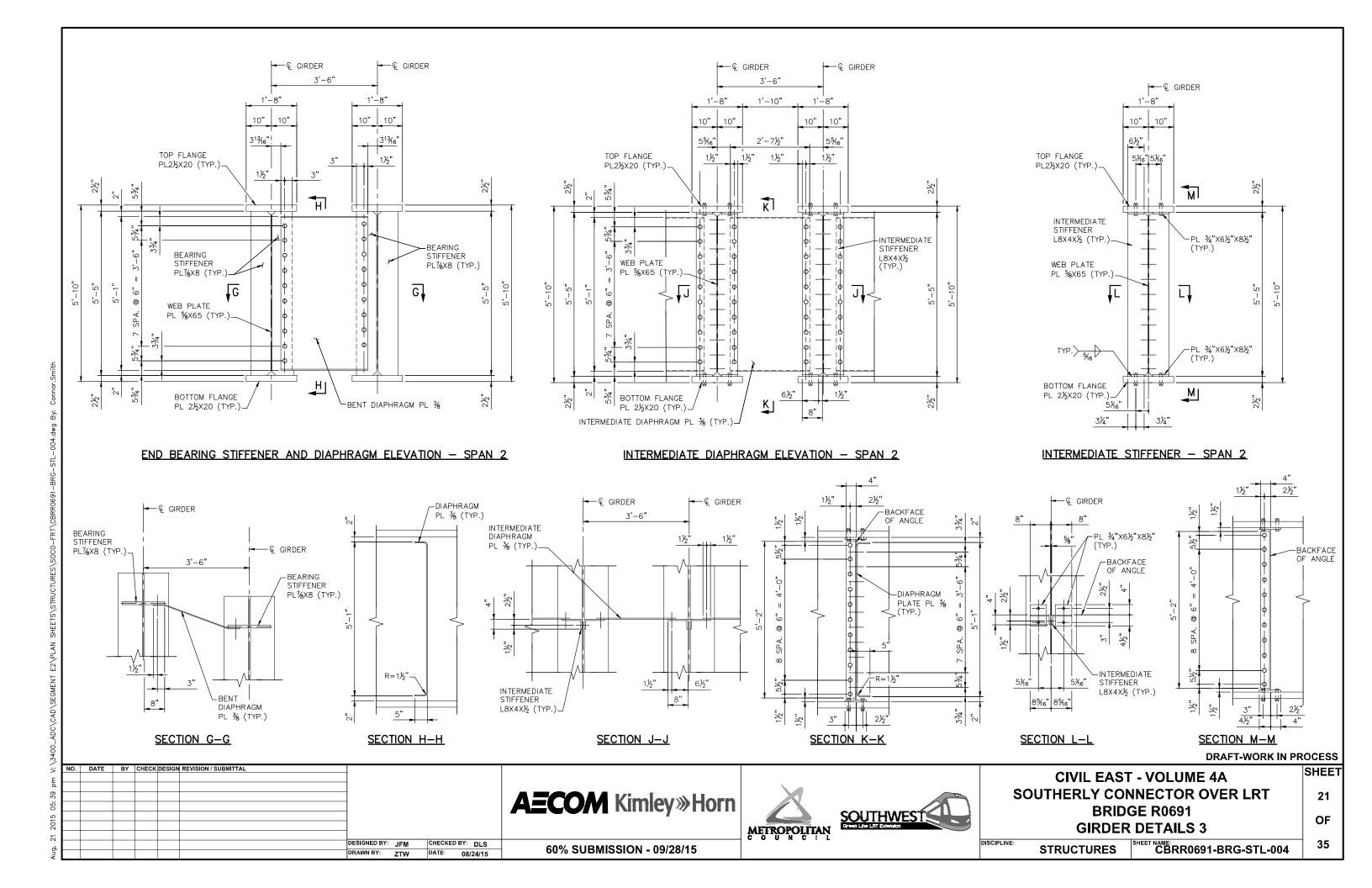
NOTE 4. GRIND FLUSH IN THE DIRECTION OF STRESS ON ALL FOUR SIDES.

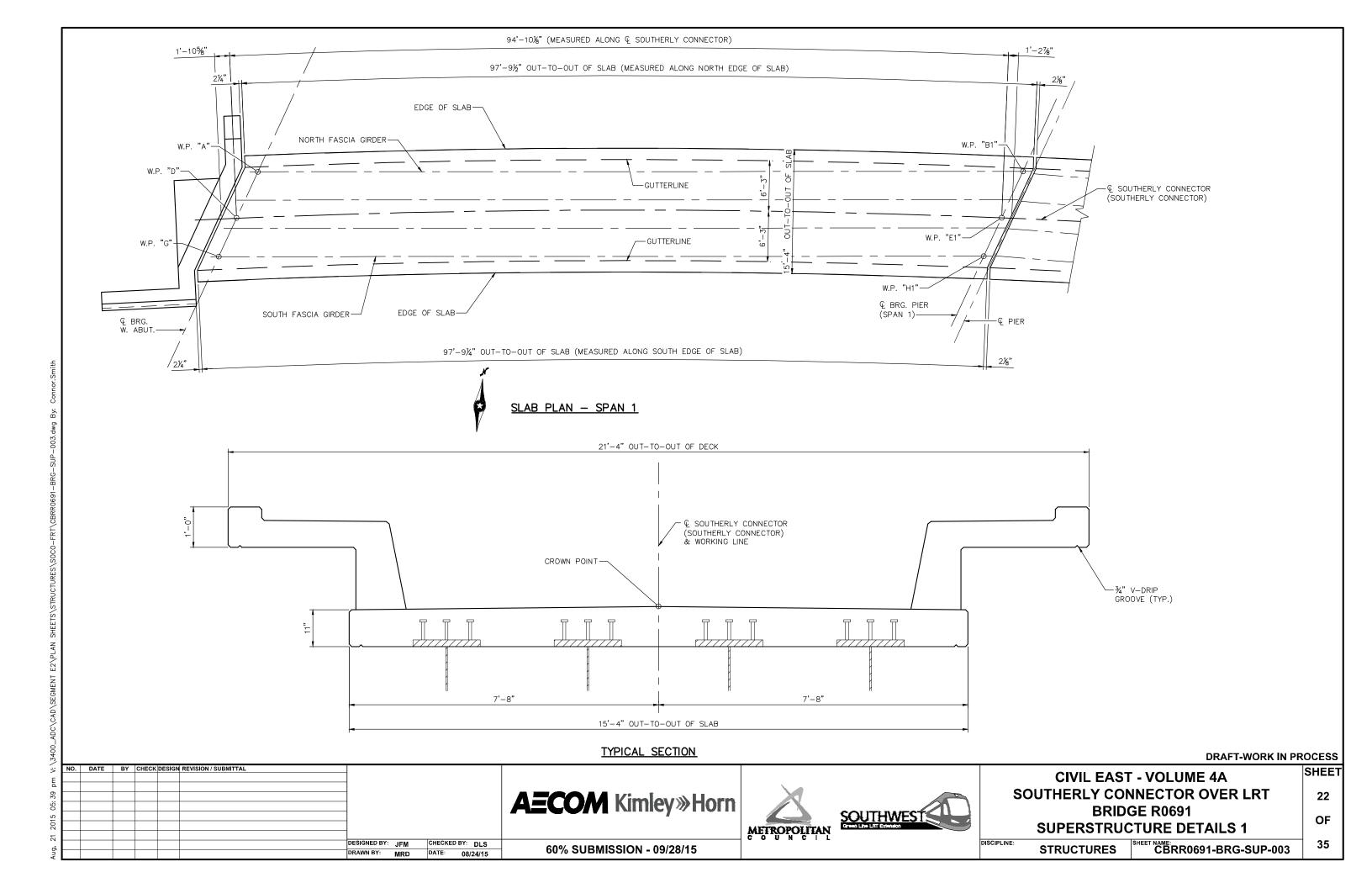
DRAFT-WORK IN PROCESS

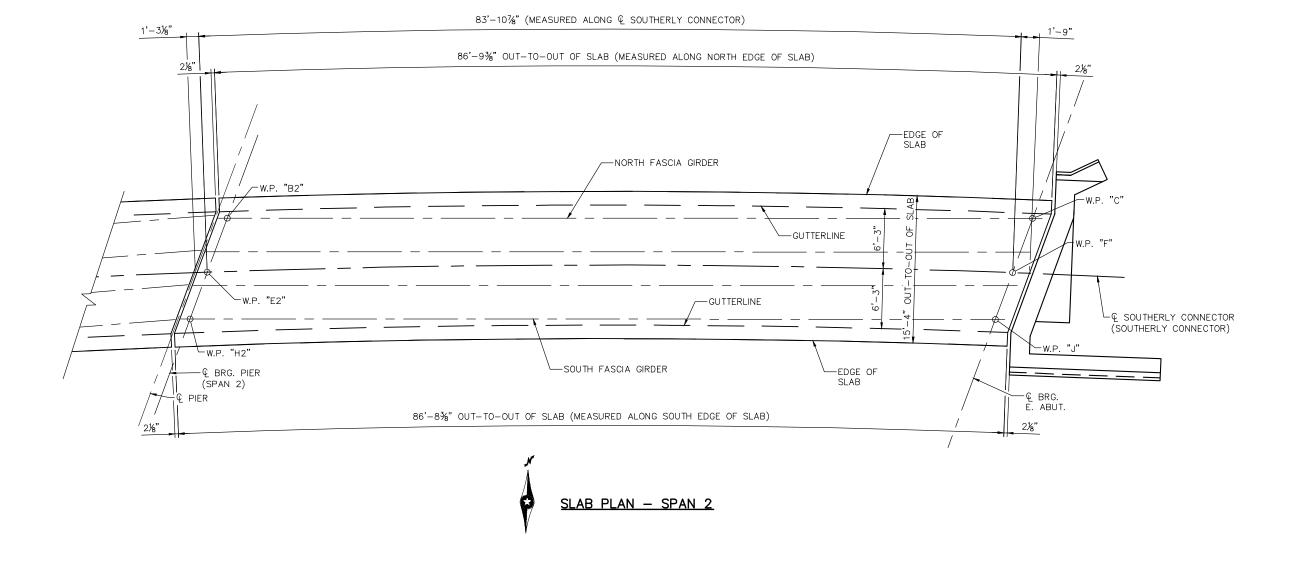
SHEET **CIVIL EAST - VOLUME 4A SOUTHERLY CONNECTOR OVER LRT AECOM** Kimley»Horn **BRIDGE R0691** SOUTHWEST COME LINE LINE EXTENSION OF **GIRDER DETAILS 1** METROPOLITAN DESIGNED BY: JFM CHECKED BY: DLS DISCIPLINE: 35 CBRR0691-BRG-STL-002 **STRUCTURES** 60% SUBMISSION - 09/28/15 DRAWN BY: ZTW DATE: 08/24/15

A... 21 2015 05:36 5m 1/: \3400 ADC\CAP







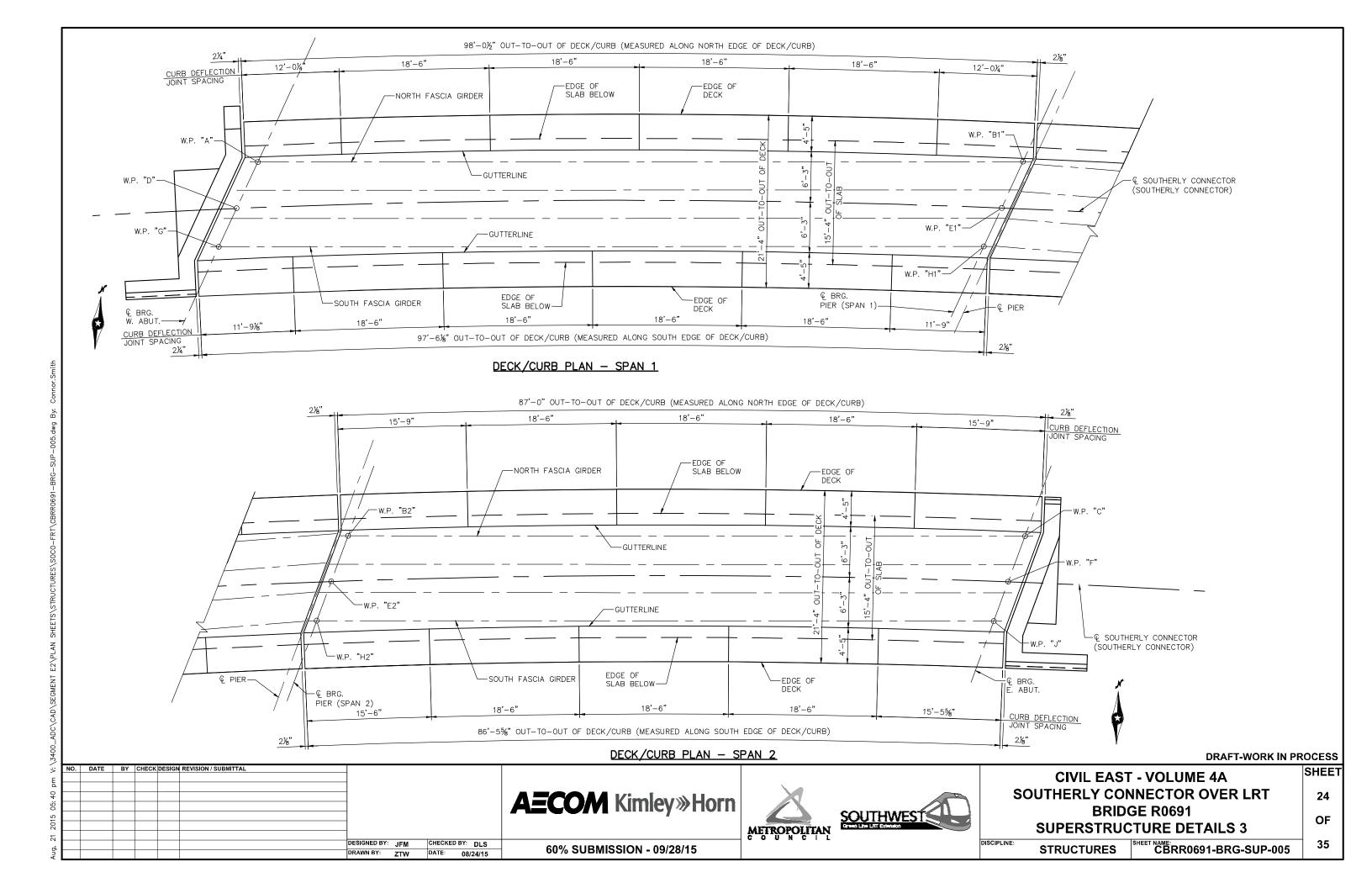


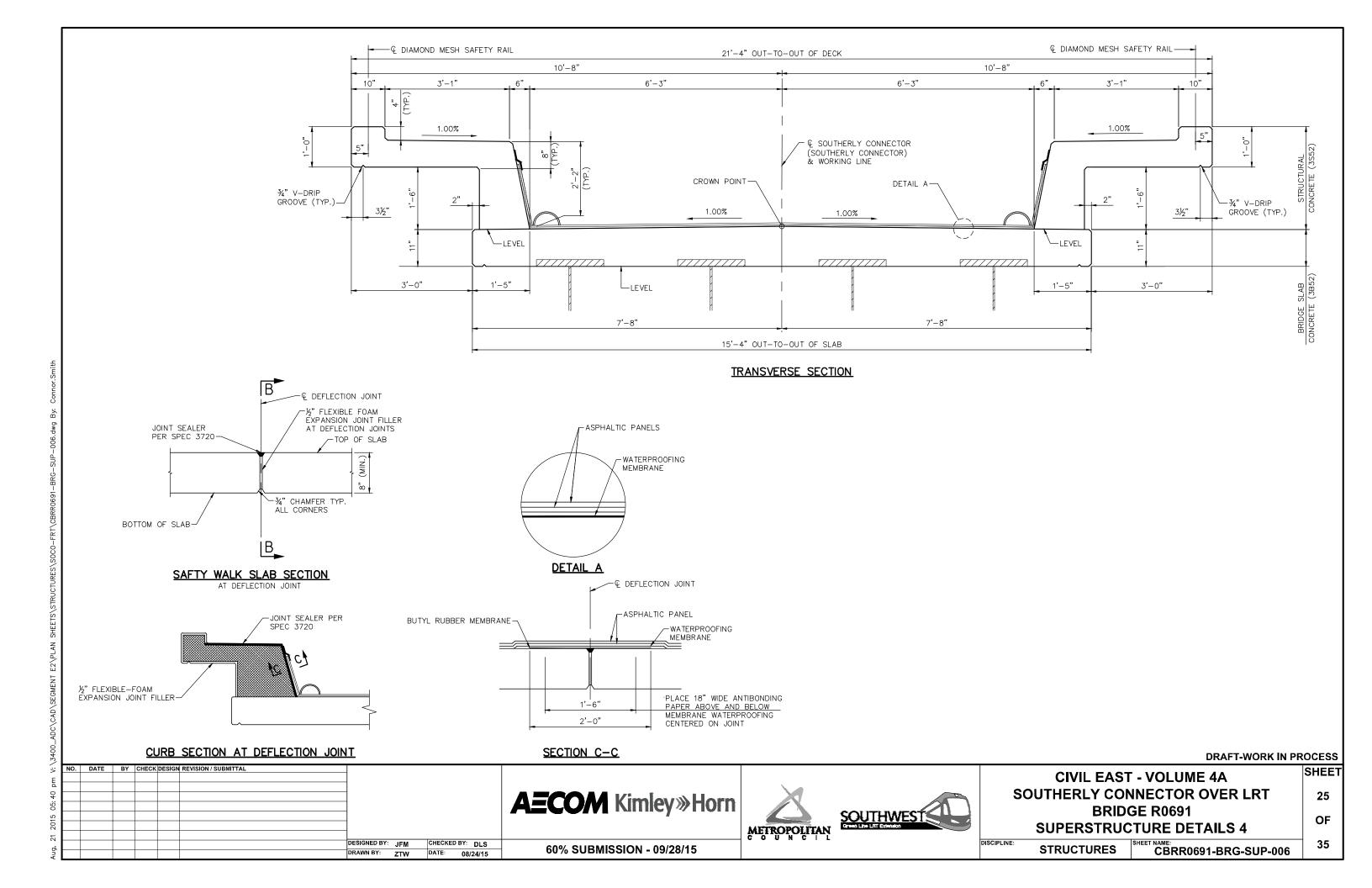
AECOM Kimley Horn

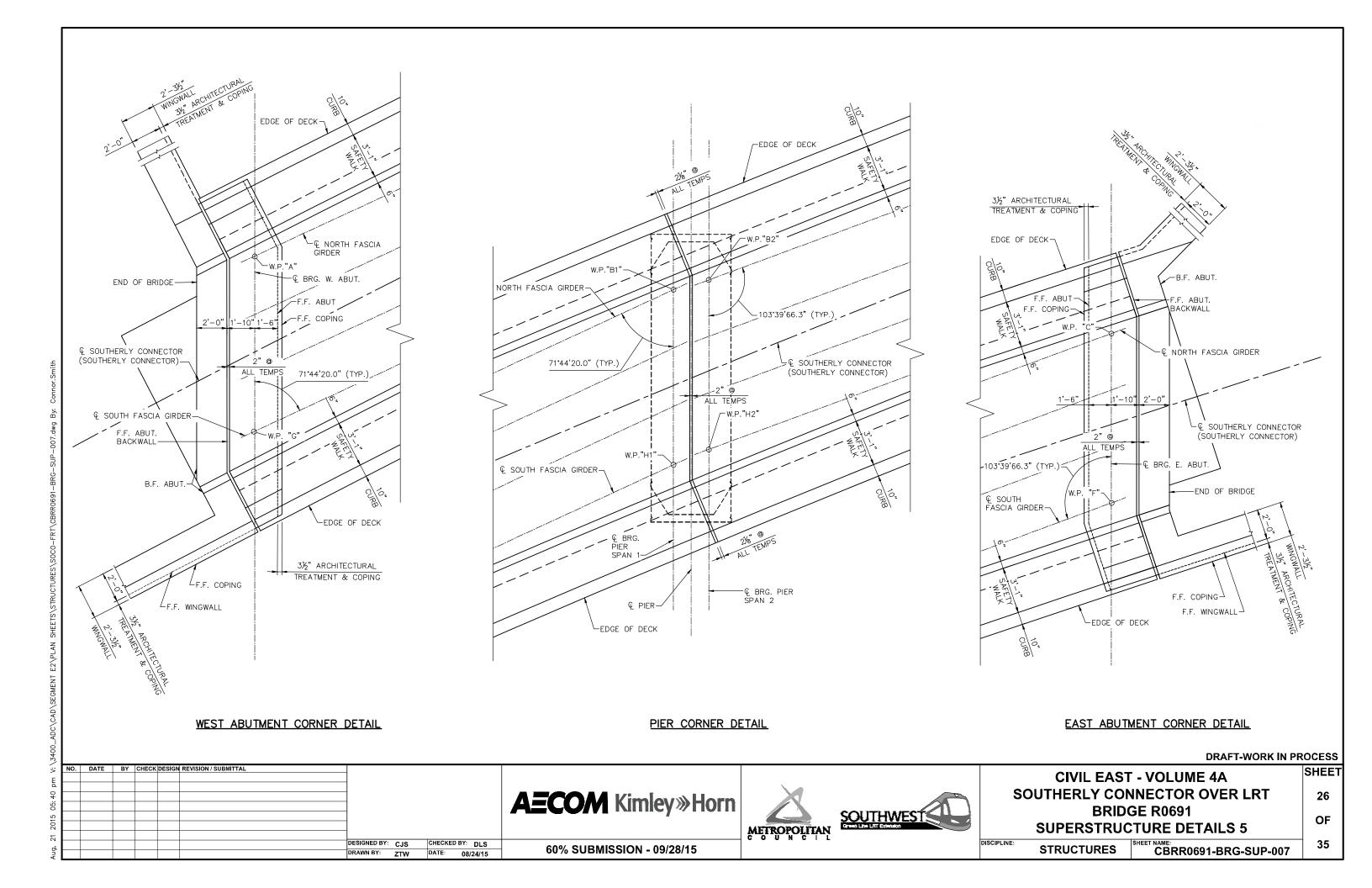
AECOM Kimley Horn

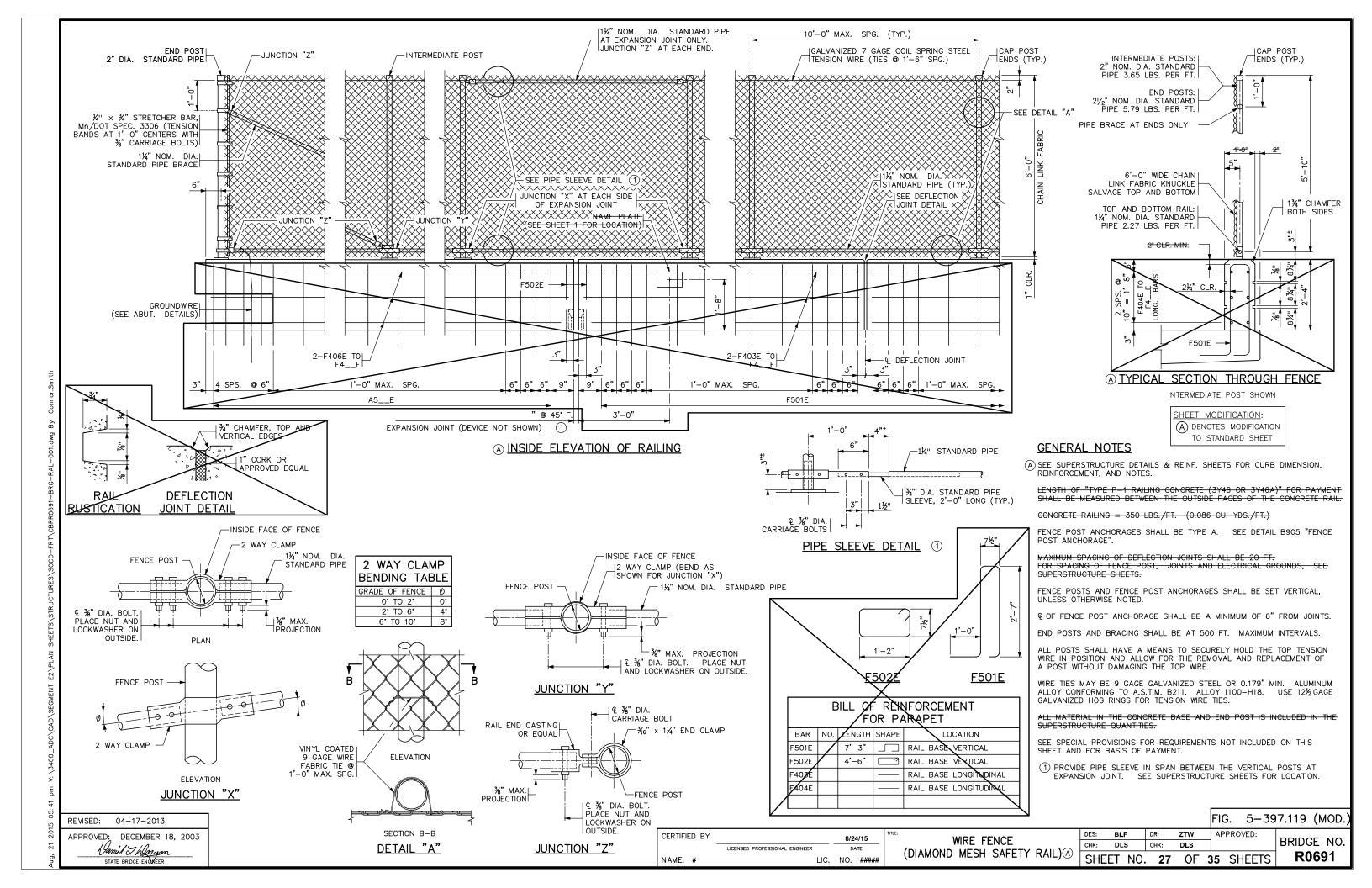
SUPERSTRUCTURE DETAILS 2

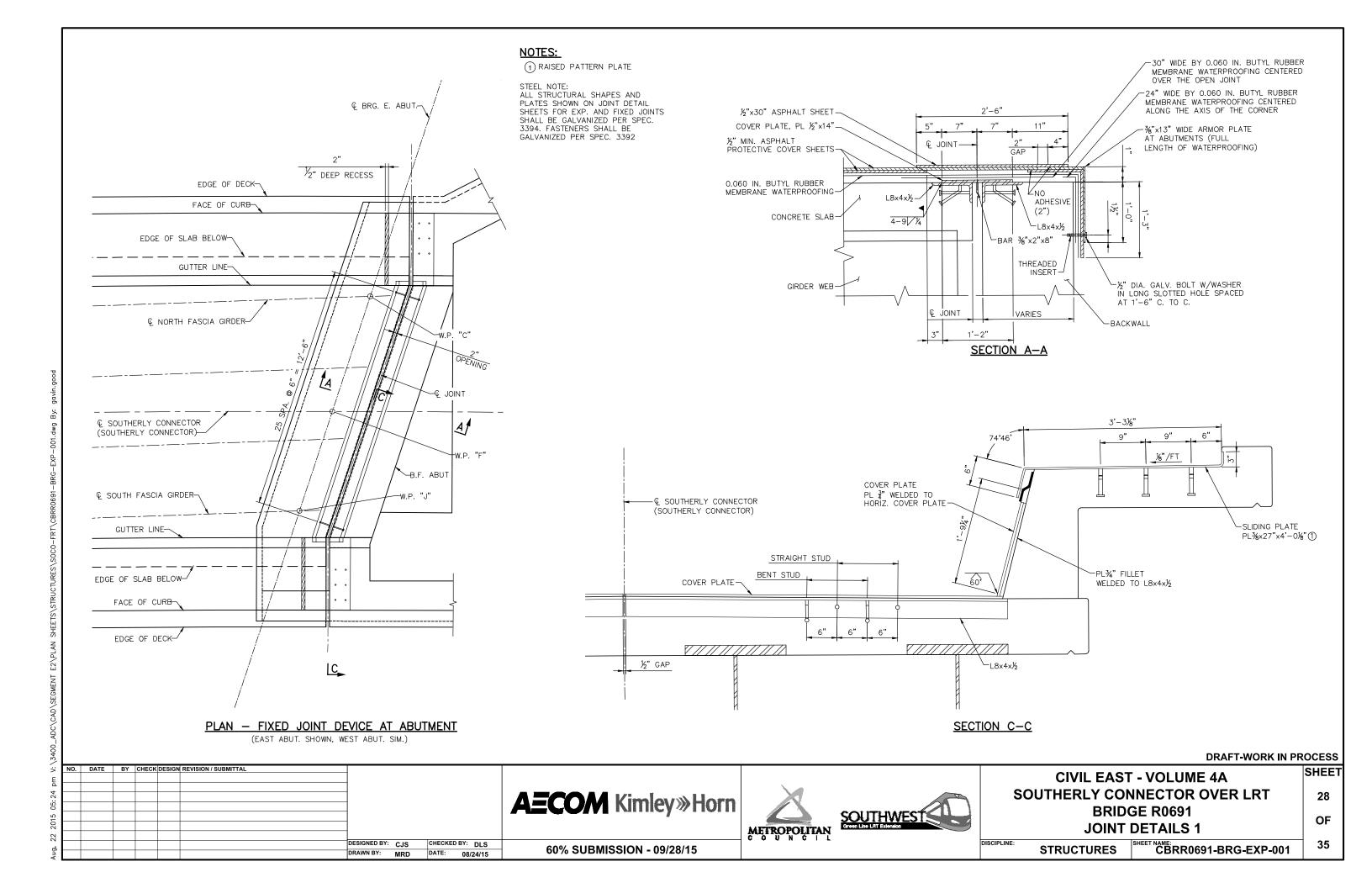
DESIGNED BY: JFM | CHECKED BY: DLS | DRAWN BY: MRD | DATE: 08/24/13 | 08/24/13 | 08/24/13 | 08/24/13 | 08/24/13 | 08/24/13 | 08/24/13 | 08/24/13 | 08/24/13 | 08/24/13 | 08/24/13 | 08/24/13 | 08/24/13 | 08/24/13 | 08/24/13 | 08/24/13 | 08/24/13 | 08/24/13 | 08/24/13 | 08/24/13 | 08/24/13 | 08/24/13 | 08/24/13 | 08/24/13 | 08/24/13 | 08/24/13 | 08/24/13 | 08/24/13 | 08/24/13 | 08/24/13 | 08/24/13 | 08/24/13 | 08/24/13 | 08/24/13 | 08/24/13 | 08/24/13 | 08/24/13 | 08/24/13 | 08/24/13 | 08/24/13 | 08/24/13 | 08/24/13 | 08/24/13 | 08/24/13 | 08/24/13 | 08/24/13 | 08/24/13 | 08/24/13 | 08/24/13 | 08/24/13 | 08/24/13 | 08/24/13 | 08/24/13 | 08/24/13 | 08/24/13 | 08/24/13 | 08/24/13 | 08/24/13 | 08/24/13 | 08/24/13 | 08/24/13 | 08/24/13 | 08/24/13 | 08/24/13 | 08/24/13 | 08/24/13 | 08/24/13 | 08/24/13 | 08/24/13 | 08/24/13 | 08/24/13 | 08/24/13 | 08/24/13 | 08/24/13 | 08/24/13 | 08/24/13 | 08/24/13 | 08/24/13 | 08/24/13 | 08/24/13 | 08/24/13 | 08/24/13 | 08/24/13 | 08/24/13 | 08/24/13 | 08/24/13 | 08/24/13 | 08/24/13 | 08/24/13 | 08/24/13 | 08/24/13 | 08/24/13 | 08/24/13 | 08/24/13 | 08/24/13 | 08/24/13 | 08/24/13 | 08/24/13 | 08/24/13 | 08/24/13 | 08/24/13 | 08/24/13 | 08/24/13 | 08/24/13 | 08/24/13 | 08/24/13 | 08/24/13 | 08/24/13 | 08/24/13 | 08/24/13 | 08/24/13 | 08/24/13 | 08/24/13 | 08/24/13 | 08/24/13 | 08/24/13 | 08/24/13 | 08/24/13 | 08/24/13 | 08/24/13 | 08/24/13 | 08/24/13 | 08/24/13 | 08/24/13 | 08/24/13 | 08/24/13 | 08/24/13 | 08/24/13 | 08/24/13 | 08/24/13 | 08/24/13 | 08/24/13 | 08/24/13 | 08/24/13 | 08/24/13 | 08/24/13 | 08/24/13 | 08/24/13 | 08/24/13 | 08/24/13 | 08/24/13 | 08/24/13 | 08/24/13 | 08/24/13 | 08/24/13 | 08/24/13 | 08/24/13 | 08/24/13 | 08/24/13 | 08/24/13 | 08/24/13 | 08/24/13 | 08/24/13 | 08/24/13 | 08/24/13 | 08/24/13 | 08/24/13 | 08/24/13 | 08/24/13 | 08/24/13 | 08/24/13 | 08/24/13 | 08/24/13 | 08/24/13 | 08/24/13 | 08/24/13 | 08/24/13 | 08/24/13 | 08/24/13 | 08/24/13 | 08/24/13 | 08/24/13 | 08/24/13 | 08/24/13 | 08/24/13

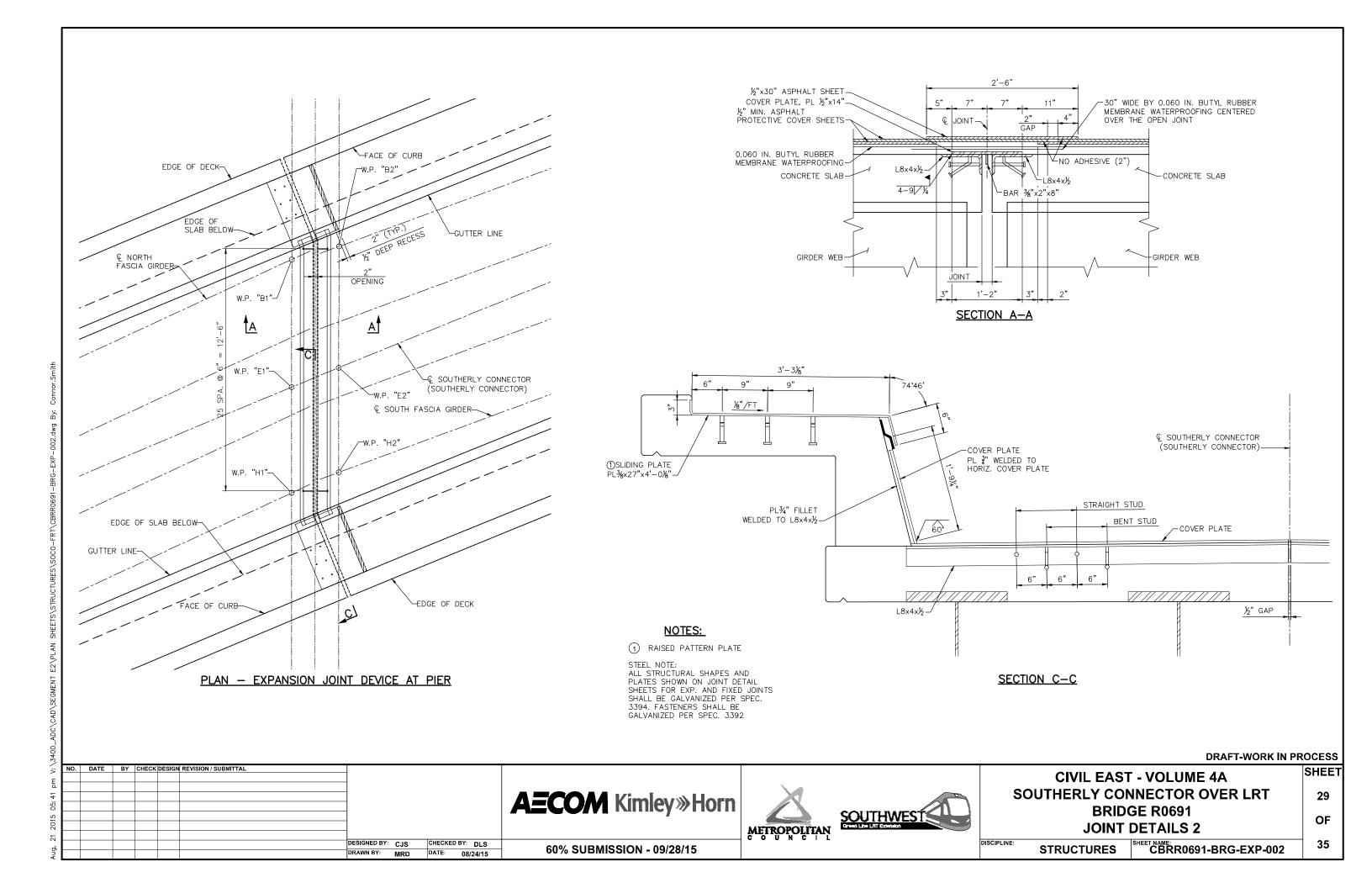


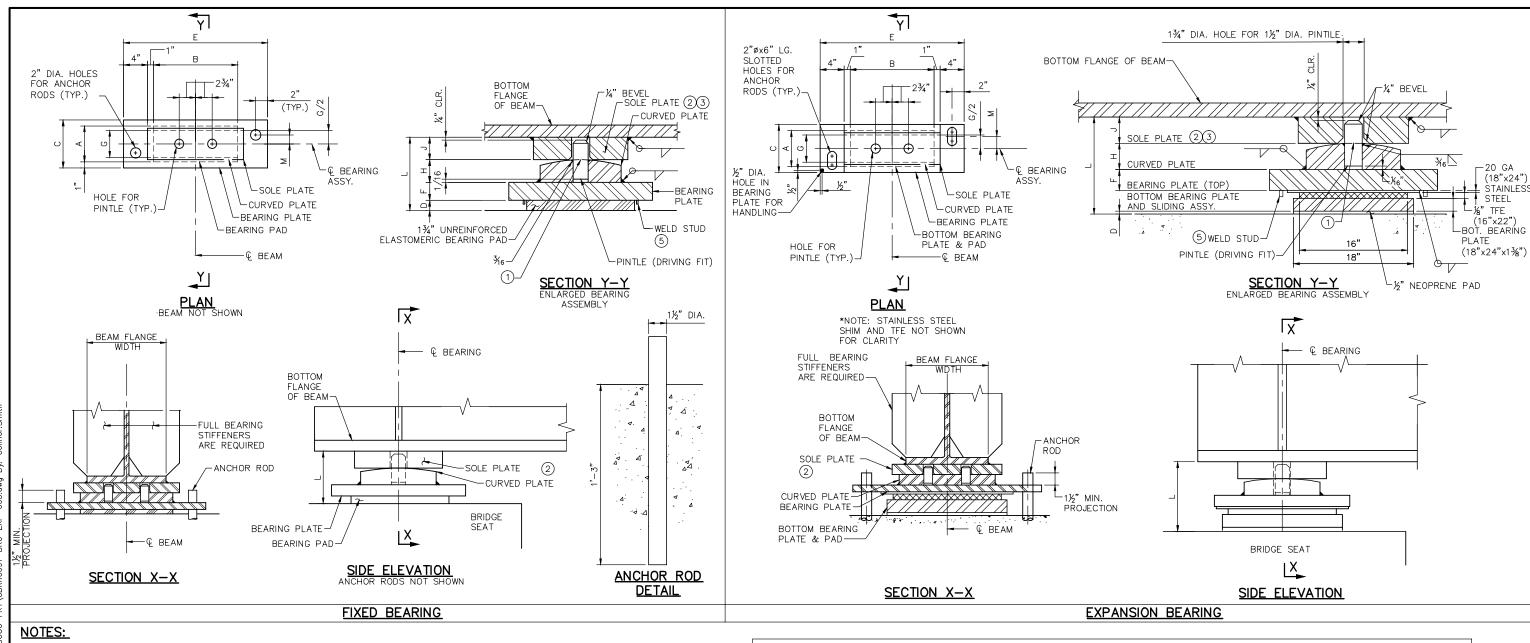












ELASTOMERIC MATERIALS AND PAD CONSTRUCTION SHALL COMPLY

ALL STEEL PLATES SHALL COMPLY WITH SPEC. 3306 EXCEPT THE SOLE PLATE. THE SOLE PLATE SHALL BE THE SAME MATERIAL SPECIFICATION AS THE STEEL BEAMS.

ANCHOR RODS SHALL COMPLY WITH SPEC. 3306. GALVANIZE PER SPEC. 3392.

PINTLES SHALL COMPLY WITH SPEC. 3309.

GALVANIZE STRUCTURAL STEEL BEARING ASSEMBLY AFTER FABRICATION PER SPEC. 3394, EXCEPT AS NOTED.

THE SOLE PLATE IS INCLUDED IN THE WEIGHT OF STRUCTURAL STEEL.

- 1 THE MIN. RADIUS SHALL BE 16" UNLESS OTHERWISE SPECIFIED IN THE TABLE. THE MAX. RADIUS SHALL BE 24". FINISH TO 250 MICRO. THE FINISHED THICKNESS OF THE PLATE MAY BE 1/6" LESS
- 2 WHEN THE SOLE PLATE IS TAPERED, DIMENSIONS "J" AND "L" ARE THICKNESS OF SOLE PLATE AND BEARING ASSEMBLY AT CENTERLINE OF BEARING.
- 3 DO NOT GALVANIZE THIS PLATE.
- "+" DENOTES OFFSET AS SHOWN. "-" DENOTES OFFSET OPPOSITE OF SHOWN.
- $\%_6$ " DIA.  $\times$  %" KNOCK-OFF WELD STUDS INSTALLED ON BEARING PLATE AROUND PERIMETER OF BEARING PAD. CENTERLINE STUD TO EDGE OF PAD DIMENSION =  $\frac{1}{2}$ ", MAX. STUD SPACING = 4" AND THE MAX. SPACING TO THE PAD CORNER = 2".
- (6) THE TOTAL THICKNESS SHOWN INCLUDES THE STEEL PLATES.

TABLE																								
ASSEMBLY TYPE	LOCATION	BEAM FLANGE		BEARING PAD SIZE		SHAPE FACTOR		BEARING PLATE SIZE CURVED PLATE S				SIZE	SOLE PLATE SIZE			PINTLE	ASSY. HEIGHT	ANC RO OFF:	DD	LAMIN	NATES			
TIPE		WIDTH	WIDTH	WIDTH	WIDTH	А	В	D	(INTERNAL)	С	E	F	G	В	Н	R(1)	WID.	LEN.	J2	DIA.	L	± (4)	М	NO.
E1	PIER	24"	18	24	1/2"	-	20	34"	2"	6	24	2"	16	10	26	2½"	1½"	8.125"	+	4"	-	-		
E2	PIER	20"	18	24	1½"	-	20	30"	2"	6	20	2"	16	10	22	2%"	1½"	8.125"	+	4"	-	-		
F1	W. ABUT.	24"	18	24	1¾"	_	20	34"	21/4"	6	24	2"	16	10	26	2½"	1½"	8.125"	+	4"	ı	-		
F2	E. ABUT.	20"	18	20	1¾"	-	20	30"	21/4"	6	20	2"	16	10	22	2½"	1½"	8.125"	+	4"	_	-		

## **DESIGN DATA:**

MAXIMUM HORIZONTAL LOAD IS 70 KIPS. MINIMUM SOLE PLATE THICKNESS IS  $1\frac{1}{4}$ ".

# **DRAFT-WORK IN PROCESS**

SHEET

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OF

=COAA Vinalays IIa
<b>ECOM</b> Kimley»Ho
000/ 01/DMI00ION 00/00/45
60% SUBMISSION - 09/28/15



CIVIL EAST - VOLUME 4A
SOUTHERLY CONNECTOR OVER LRT
BRIDGE R0691
BEARING ASSEMBLY DETAILS

DISCIPLINE: SHEET NAME CBRR0691-BRG-EXP-003 **STRUCTURES** 

35

## NUMBERS FOR NAMEPLATE

#### NOTES:

MATERIAL SHALL COMPLY WITH SPEC. 3327. LETTERS AND NUMBERS SHALL CONFORM TO THOSE SHOWN. DRAFT ON LETTERS AND NUMBERS SHALL NOT BE MORE THAN 3" IN 12". HORIZONTAL SPACING OF LETTERS AND NUMBERS SHALL PRODUCE A BALANCED LAYOUT IN PROPORTION TO SPACING SHOWN. TOP SURFACE OF LETTERS, NUMBERS AND FRAMES SHALL BE BURNISHED. FURNISH 2 STEEL BOLTS  $\%_8$  DIA.  $\times$  3" LONG WITH EACH PLATE. ALL DIMENSIONS FOR  $\frac{3}{4}$ " HIGH LETTERS AND NUMBERS SHALL BE IN DIRECT PROPORTION TO THOSE SHOWN FOR THE 1" HIGH LETTERS AND NUMBERS.

1 YEAR OF CONSTRUCTION

APPROVED: NOVEMBER 22, 2002

STATE OF MINNESOTA
DEPARTMENT OF TRANSPORTATION

BRIDGE NAMEPLATE
(FOR NEW BRIDGES)

REVISION
09-11-2014

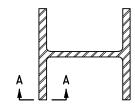
BB101

DESIGNED BY: CJS

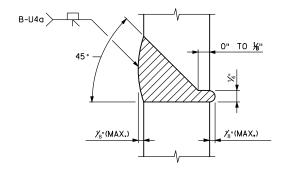
DRAWN BY: ZTW

CHECKED BY: DLS

DATE: 08/24/15



SECTION AT SPLICE



SECTION A-A

100% BUTT WELDED PILE SPLICE

#### NOTES:

CELLULOSIC TYPE ELECTRODES E-6010 OR E-6011 SHALL BE USED FOR 100% BUTT WELDED SPLICES.

ELECTRODES WHICH HAVE BECOME WET, SOILED OR DAMAGED SHALL NOT BE USED.

WELDING SHALL NOT BE DONE WHEN THE AMBIENT TEMPERATURE IS LOWER THAN 0° F. OR WHEN THE PILE IS WET OR EXPOSED TO FALLING RAIN OR SNOW. WHEN THE PILE METAL TEMPERATURE IS BELOW 32° F., THE PILE METAL IN THE AREA OF THE WELD SHALL BE HEATED TO A MINIMUM TEMPERATURE OF 70° F. AND MAINTAINED AT THIS TEMPERATURE DURING WELDING.

Namiel & Manyan

STATE BRIDGE ENGINEER

STATE OF MINNESOTA DEPARTMENT OF TRANSPORTATION

PILE SPLICE
(STEEL H BEARING PILES 10" TO 14")

REVISION: 11-06-2013 DETAIL NO. B202

DRAFT-WORK IN PROCESS

NO. DATE BY CHECK DESIGN REVISION / SUBMITTAL

**AECOM** Kimley»Horn

60% SUBMISSION - 09/28/15





CIVIL EAST - VOLUME 4A
SOUTHERLY CONNECTOR OVER LRT
BRIDGE R0691
DETAILS 1

STRUCTURES

HEET NAME: CBRR0691-BRG-DTL-001

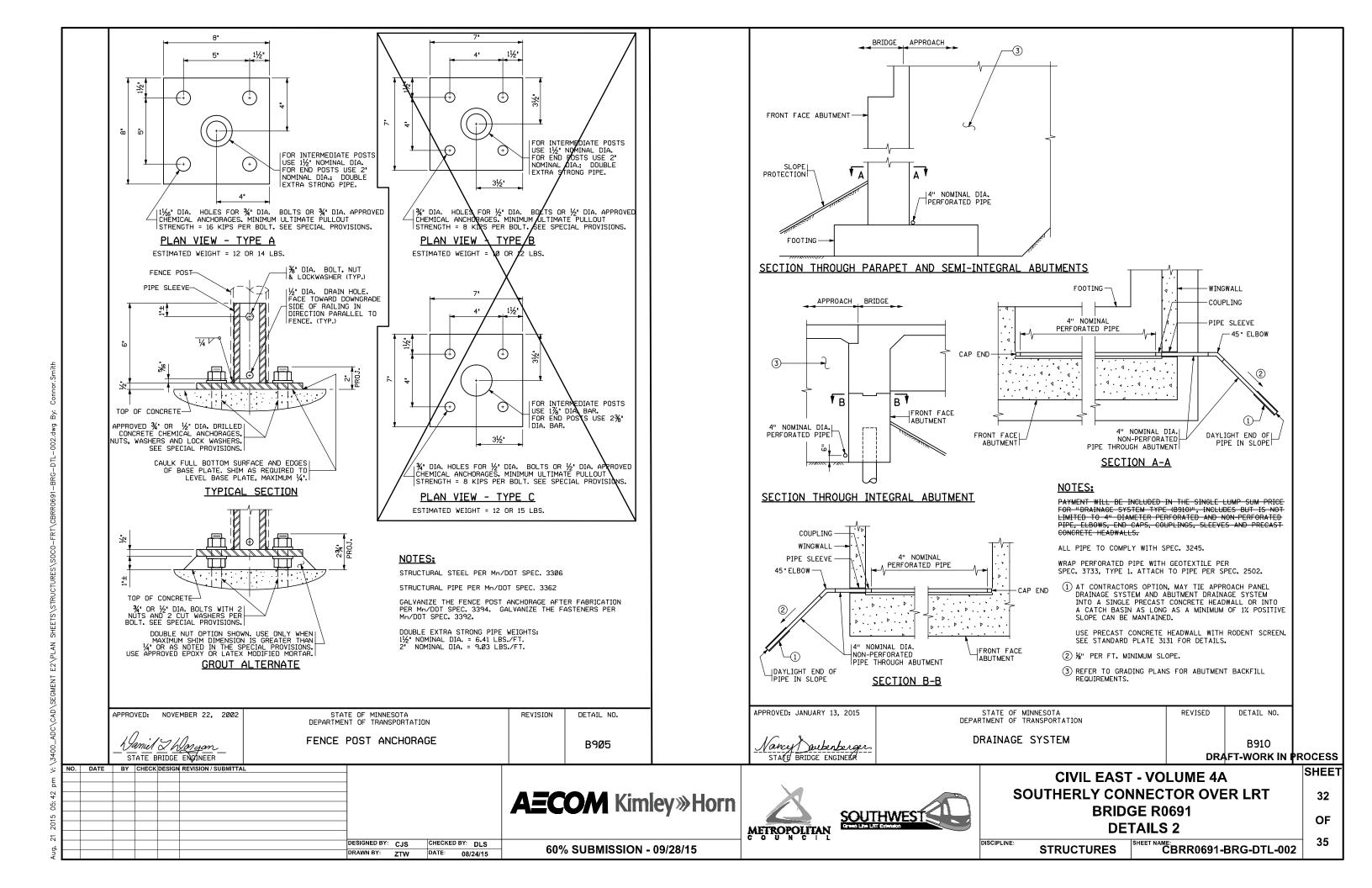
Aug, 21 2015 05:42 pm V:\3400\_ADC\CAD\SEGMENT E

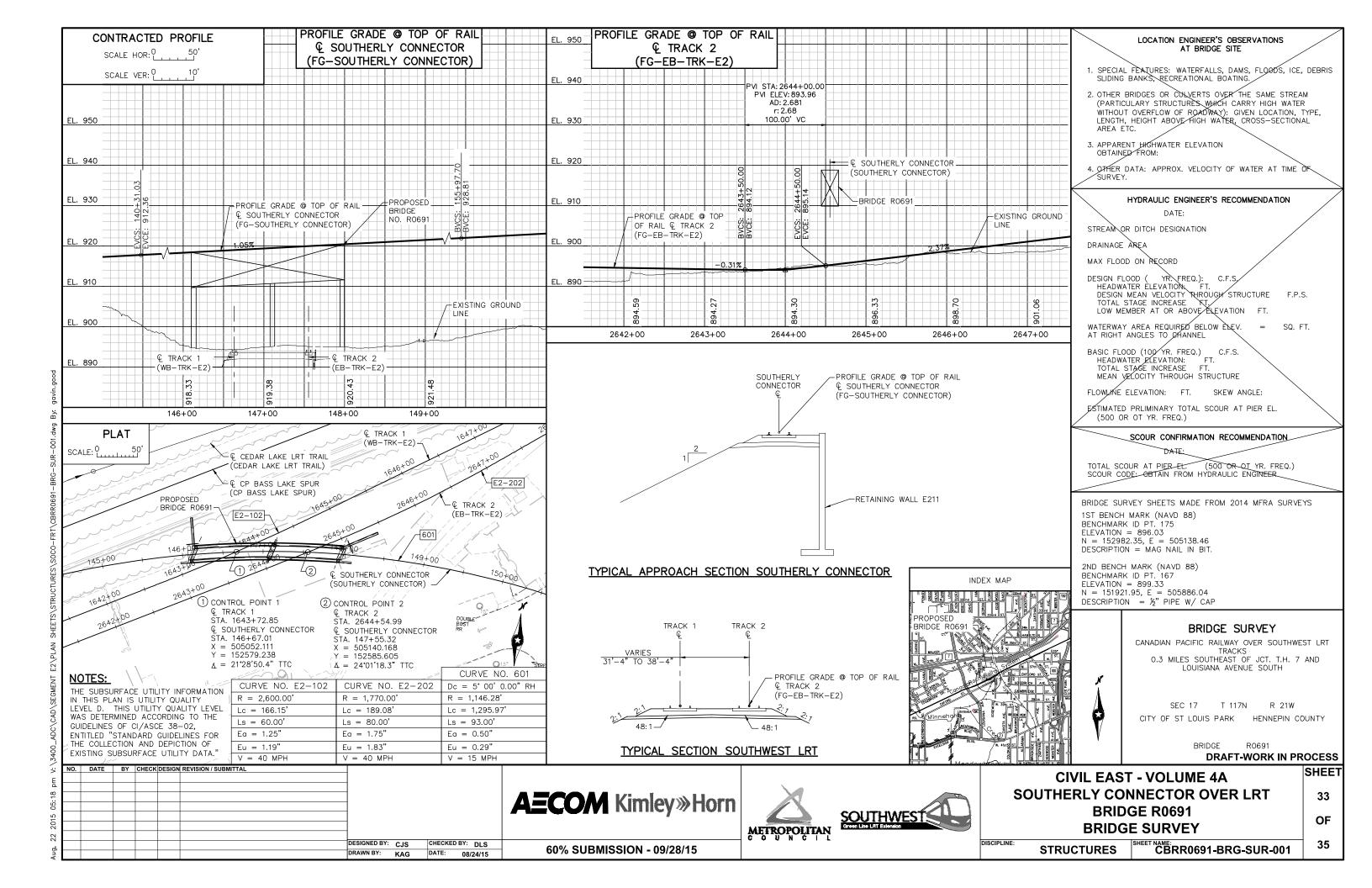
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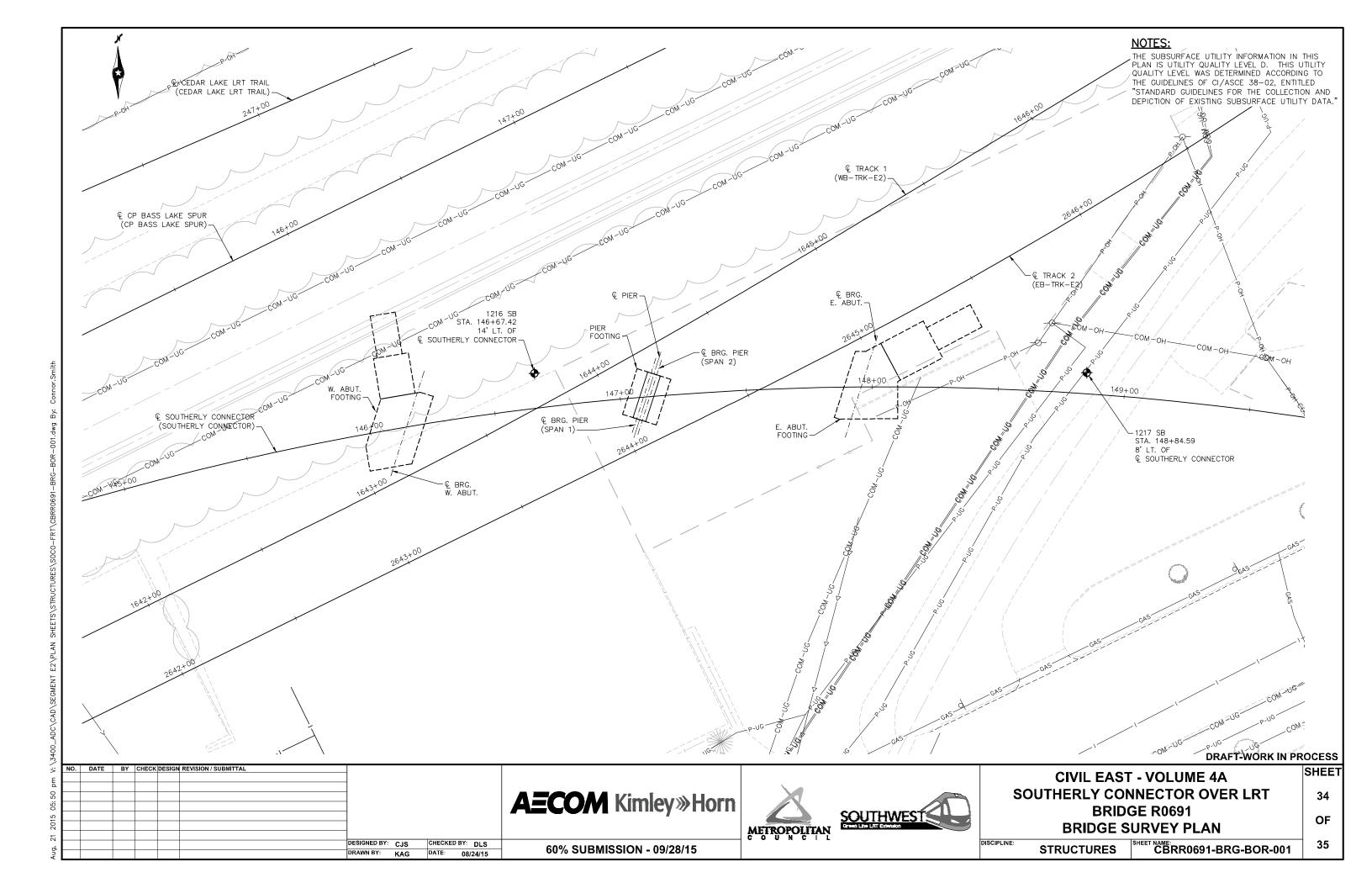
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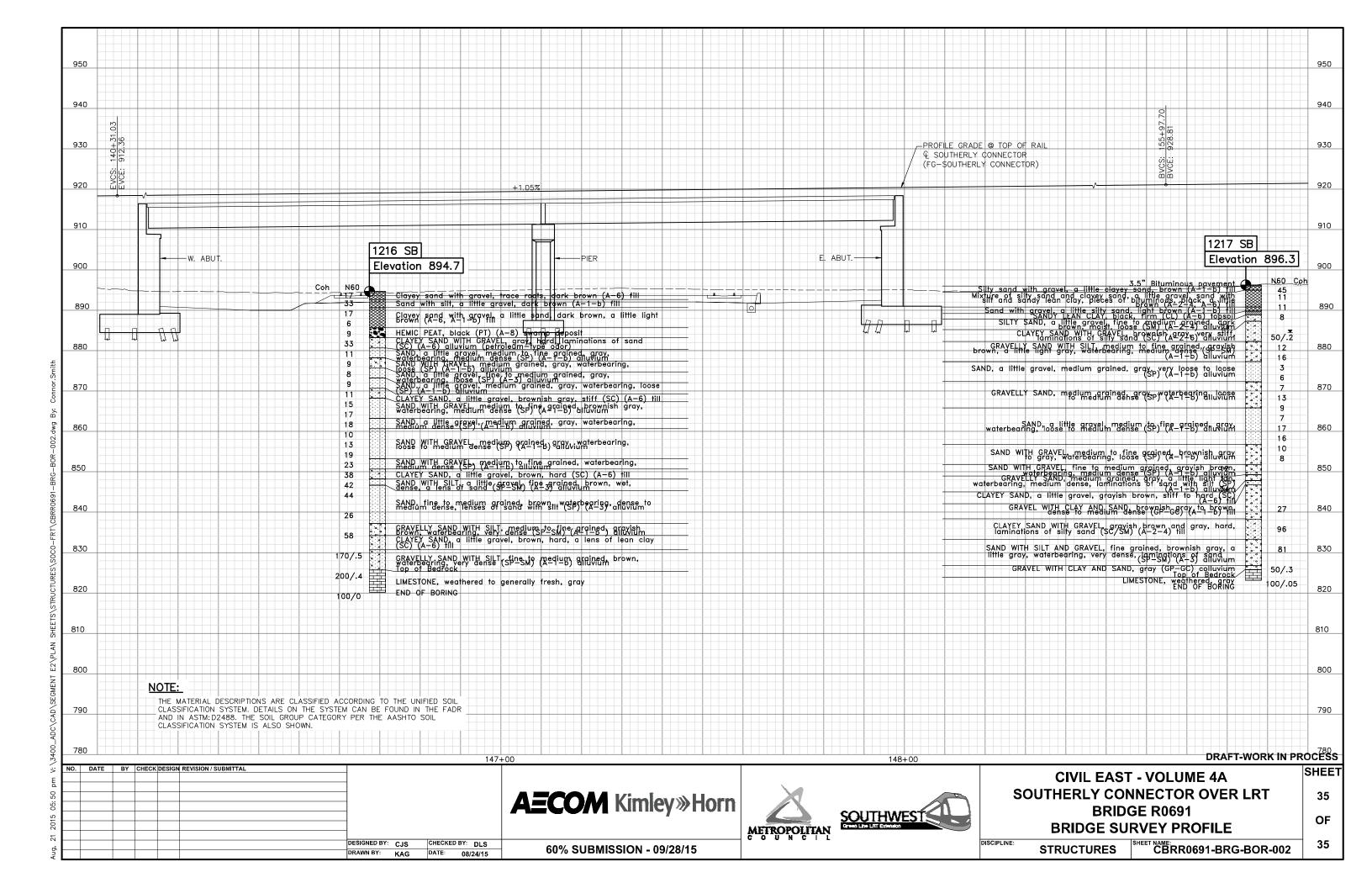
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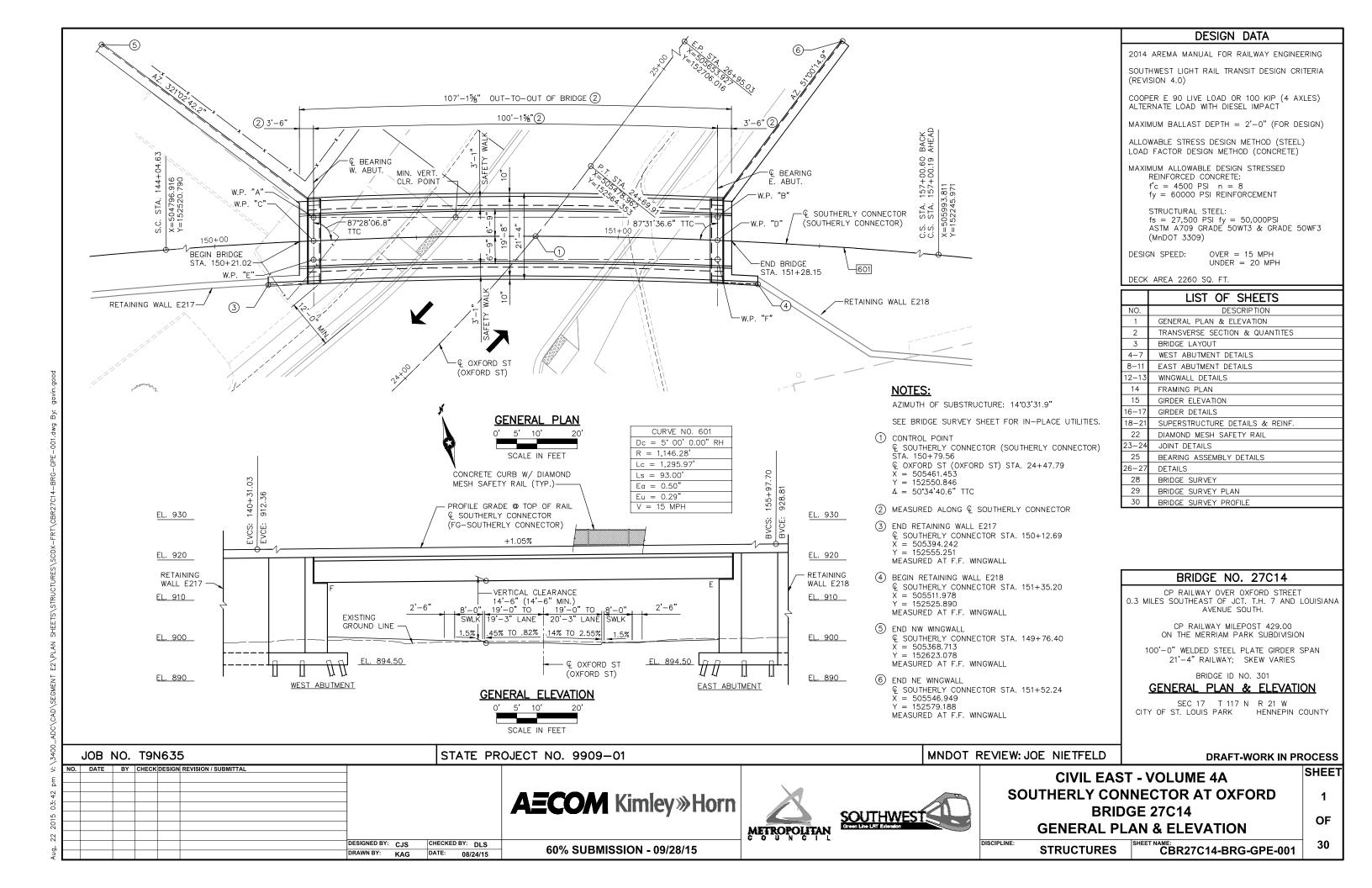
METROPO

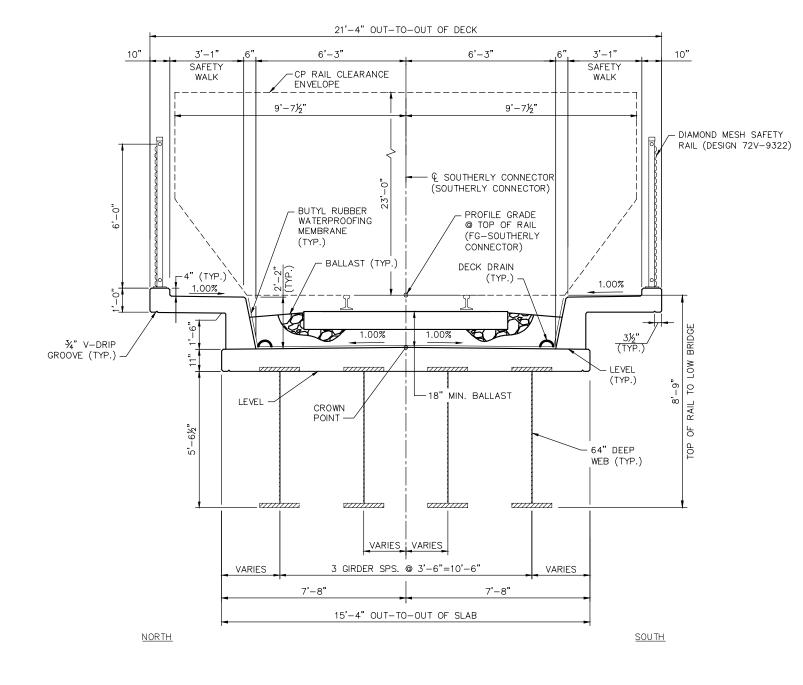




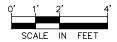








## TRANSVERSE SECTION



	QUANTITY ESTIMATE FOR ENTIRE	BRIDGE	
ITEM NO.	ITEM	UNIT	QUANTITY
2401	STRUCTURAL CONCRETE (1G52)	CU. YD.	
2401	STRUCTURAL CONCRETE (3B52)	CU. YD.	
2401	STRUCTURAL CONCRETE (3S52)	LIN. FT.	
2401	REINFORCEMENT BARS	POUND	
2401	STRUCTURE EXCAVATION	CU. YD.	
2401	BRIDGE SLAB CONCRETE (3B52)	SQ. FT.	
2402	STRUCTURAL STEEL (3306)	CU. YD.	
2402	STRUCTURAL STEEL (3309)	SQ. FT.	
2402	BEARING ASSEMBLY	EACH	
2411	ANTI-GRAFFITI COATING	SQ. FT.	
2411	ARCHITECTURAL SURFACE FINISH (SPECIAL)	SQ. FT.	
2411	ARCHITECTURAL CONCRETE TEXTURE (SPECIAL)	SQ. FT.	
2452	STEEL H-PILING DRIVEN 12"	LIN. FT.	
2452	STEEL H-PILING DELIVERED 12"	LIN. FT.	
2452	STEEL H-TEST PILE 85 FT LONG 12"	EACH	
2452	PILE TIP PROTECTION 12"	EACH	
2481	WATERPROOFING	SQ. FT.	
2502	DRAINAGE SYSTEM TYPE (B910)	LUMP SUM	
2502	DRAINAGE SYSTEM (BRIDGE DECK)	LUMP SUM	
2557	DIAMOND MESH SAFETY RAIL	LIN. FT.	

## **CONSTRUCTION NOTES:**

THE 2016 EDITION OF THE MINNESOTA DEPARTMENT OF TRANSPORTATION "STANDARD SPECIFICATIONS FOR CONSTRUCTION" SHALL GOVERN.

BRIDGE SEAT REINFORCEMENT SHALL BE CAREFULLY PLACED TO AVOID INTERFERENCE WITH DRILLING HOLES FOR ANCHOR RODS, THE BEAMS SHALL BE ERECTED IN FINAL POSITION PRIOR TO DRILLING

THE BAR SIZES SHOWN IN THIS PLAN ARE IN U.S. CUSTOMARY DESIGNATIONS. THE FIRST DIGIT OR THE FIRST TWO DIGITS OF EACH BAR MARK INDICATE THE BAR SIZE.

THE SUBSURFACE UTILITY INFORMATION IN THESE PLANS IS UTILITY QUALITY LEVEL D. THIS UTILITY QUALITY LEVEL WAS DETERMINED ACCORDING TO THE GUIDELINES OF CI/ASCE 38-02, ENTITLED "STANDARD GUIDELINES FOR THE COLLECTION AND DEPICTION OF EXISTING SUBSURFACE UTILITY

THE PILE LOADS SHOWN IN THE PLANS WERE COMPUTED USING SERVICE LOAD METHODOLOGY. PILE BEARING RESISTANCE DETERMINED IN THE FIELD SHALL INCORPORATE THE METHODS AND/OR FORMULAS DESCRIBED IN THE SPECIAL PROVISIONS.

CONCRETE MATERIALS, MIX DESIGN, TESTING AND CONSTRUCTION SHALL BE IN ACCORDANCE WITH CHAPTER 8, PART 1 OF THE 2013 A.R.E.M.A. MANUAL; MnDOT 2461 AND THE SPECIAL PROVISIONS.

CONCRETE SHALL BE MADE WITH A LOW ALKAKI NORMAL PORTLAND CEMENT (TYPE I OR TYPE I/II) IN ACCORDANCE WITH ASTM C 150, LATEST EDITION, WITH LESS THAN 0.6% SODIUM EQUIVALENTS.

MAXIMUM CONCRETE WATER/CEMENT RATION SHALL BE IN ACCORDANCE WITH CHAPTER 8, SECTION 1.11 OF THE 2013 A.R.E.M.A. MANUAL AND MnDOT 2461.

#### **DRAFT-WORK IN PROCESS**

SHEET

2

OF

DESIGNED BY: CJS CHECKED BY: DLS 60% SUBMISSION - 09/28/15 DRAWN BY: KAG DATE: 08/24/15

**AECOM** Kimley»Horn



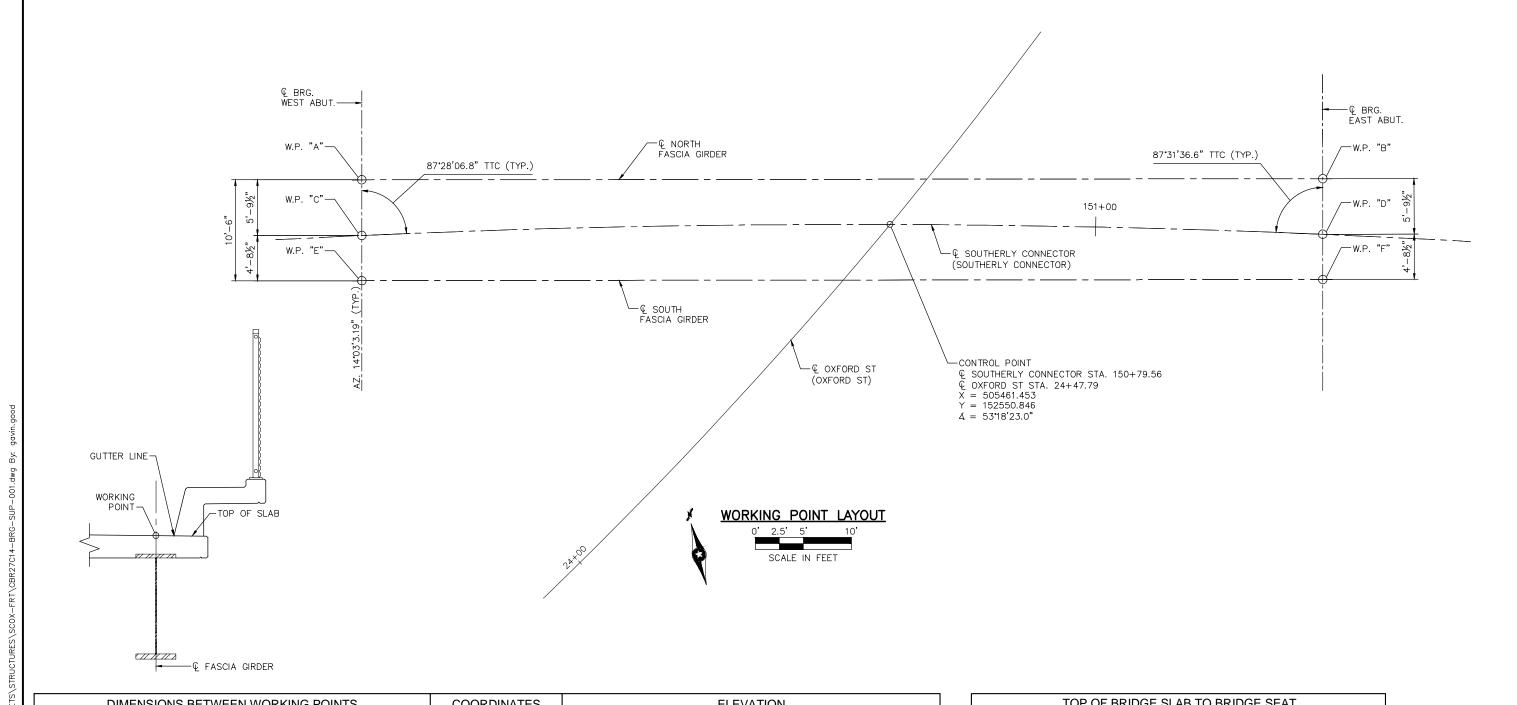


# **CIVIL EAST - VOLUME 4A** SOUTHERLY CONNECTOR AT OXFORD **BRIDGE 27C14 TRANSVERSE SECTION & QUANTITIES**

30

**STRUCTURES** 

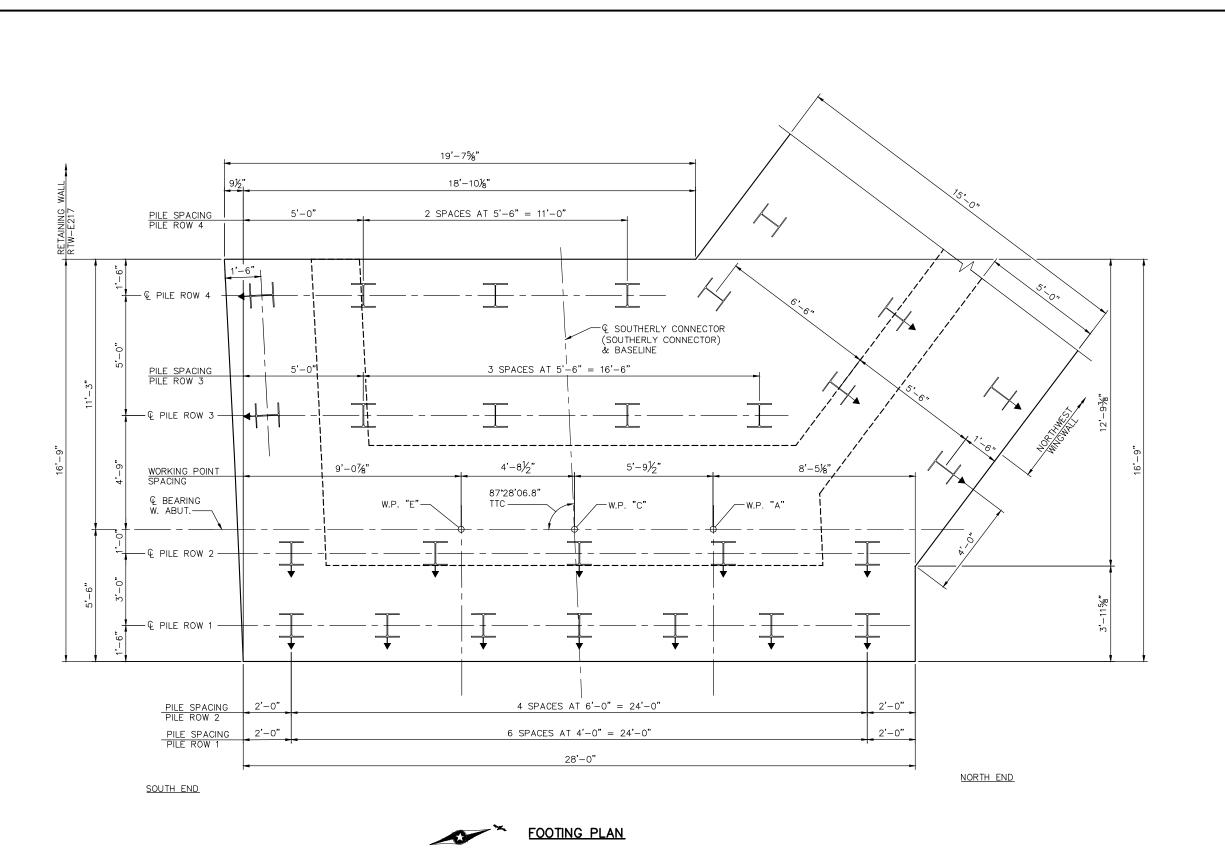
CBR27C14-BRG-TRN-001



	DIMENSIONS BETWEEN WORKING POINTS								INATES	ELEVATION				
POINT	STATION	Α	В	С	D	E F		Х	X Y		TOP OF SLAB	TOP OF SLAB TO BRIDGE SEAT	BRIDGE SEAT	POINT
Α	150+24.78		100.09	5.80	100.26		100.64	505409.225	152568.756	922.79	920.54	7.15'	913.39	Α
В	151+24.40			100.26	5.80	100.65		505506.331	152544.491	923.84	921.59	7.15'	914.44	В
С	150+24.52	.52			100.09	4.70 100.20		505407.817	152563.133					С
D	151+24.65					100.21	4.70	505504.923	152538.868					D
Е	150+24.31						100.09	505406.674	152558.570	922.79	920.55	7.15'	913.39	Е
F	151+24.85							505503.781	152534.306	923.84	920.60	7.15'	914.44	F

TOP OF BRIDGE SLAB TO BRIDGE SEAT										
W.P. "A"	W.P. "B"	W.P. "E"	W.P. "F"							
111/8"	111/8"	111/8"	111/8"							
64"	64"	64"	64"							
21/2"	21/2"	21/2"	21/2"							
8 <b>½</b> "	8 <b>⅓</b> "	8 <b>⅓</b> "	8 <b>½</b> "							
7'-1¾"	7'-1¾"	7'-1¾"	7'-1¾"							
7.146'	7.146'	7.146'	7.146'							
	W.P. "A"  11½"  64"  2½"  8½"  7'-1¾"	W.P. "A" W.P. "B"  11½" 11½" 64" 64" 2½" 2½" 8½" 8½" 7'-1¾" 7'-1¾"	W.P. "A"         W.P. "B"         W.P. "E"           11½"         11½"         11½"           64"         64"         64"           2½"         2½"         2½"           8½"         8½"         8½"           7'-1¾"         7'-1¾"         7'-1¾"							

SHEET **CIVIL EAST - VOLUME 4A SOUTHERLY CONNECTOR AT OXFORD AECOM** Kimley»Horn 3 **BRIDGE 27C14** SOUTHWEST Creen Live Live Extension OF **BRIDGE LAYOUT** METROPOLITAN DISCIPLINE: SHEET NAME: CBR27C14-BRG-SUP-001 DESIGNED BY: CJS CHECKED BY: DLS 30 60% SUBMISSION - 09/28/15 **STRUCTURES** DRAWN BY: ZTW DATE: 08/24/15



WEST ABUTM	ENT			
COMPUTED PILE LOAD	) - TONS/PILE			
DEAD LOAD + EARTH PRESSURE	43.6			
LIVE LOAD	33.6			
* DESIGN LOAD	85.6			

\* BASED ON GROUP VI LOADING (SERVICE LOAD) PER AREMA CHAPTER 8 SECTION 2.2.4

## **GENERAL PILE NOTES:**

1 HP12x53 STEEL TEST PILE 67 FT. LONG 23 HP12x53 STEEL PILES EST. 67 FT. LENGTH 24 HP12x53 STEEL PILES REQ'D FOR WEST ABUT.

ALL PILES TO BE HP12x53 WITH PILE TIP PROTECTION.

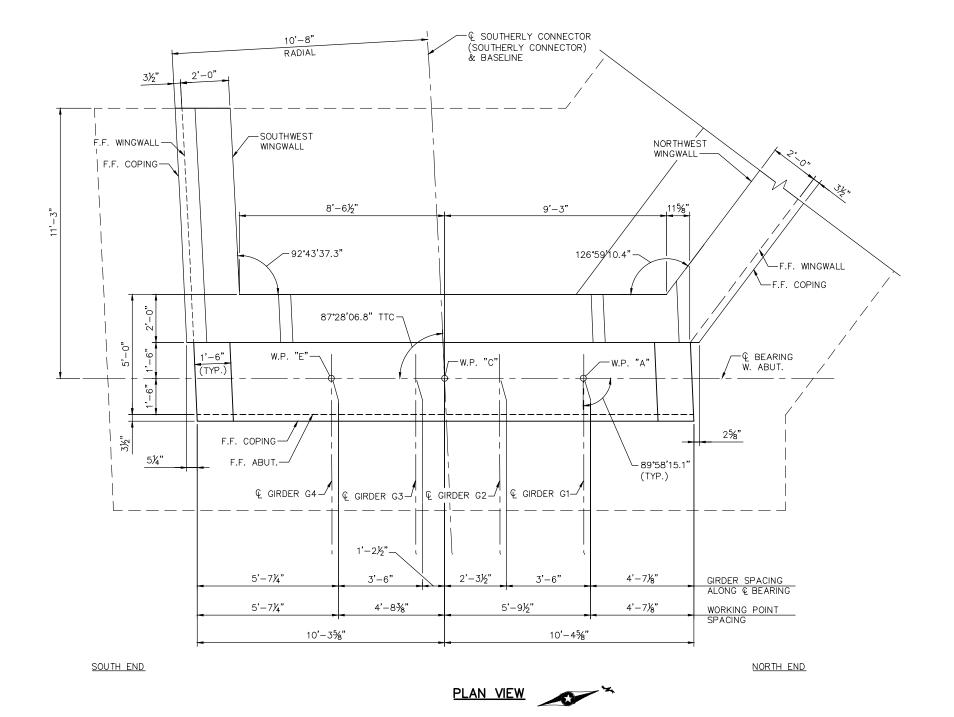
PILE SPACING SHOWN IS AT BOTTOM OF FOOTING.

PILES MARKED THUS  $\overline{\downarrow}$  TO BE BATTERED 3" PER FOOT IN DIRECTION SHOWN.

FOR PILE SPLICE DETAILS SEE DETAIL B202.

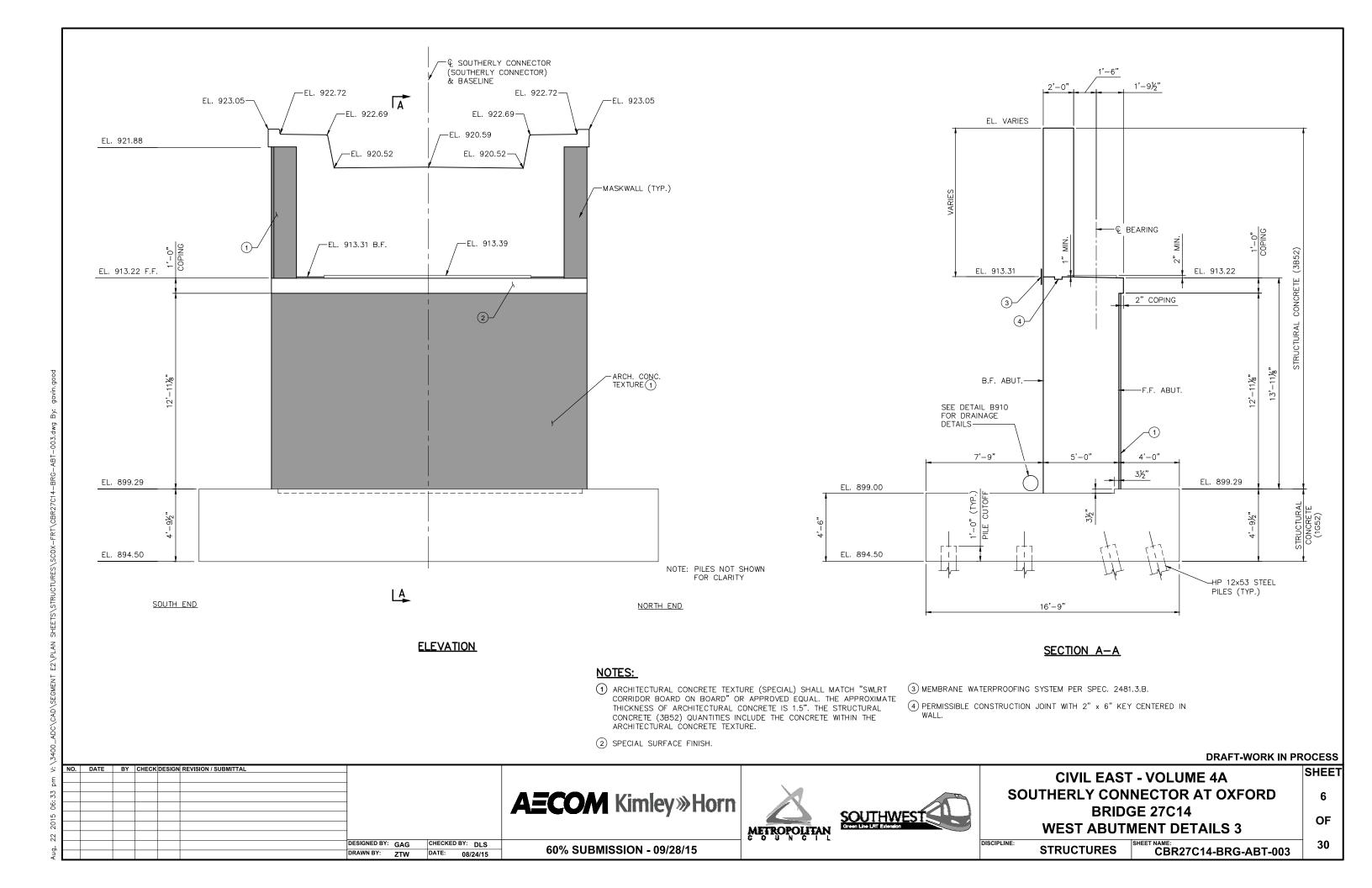
SEE SURVEY SHEET FOR TEST PILE LOCATIONS.

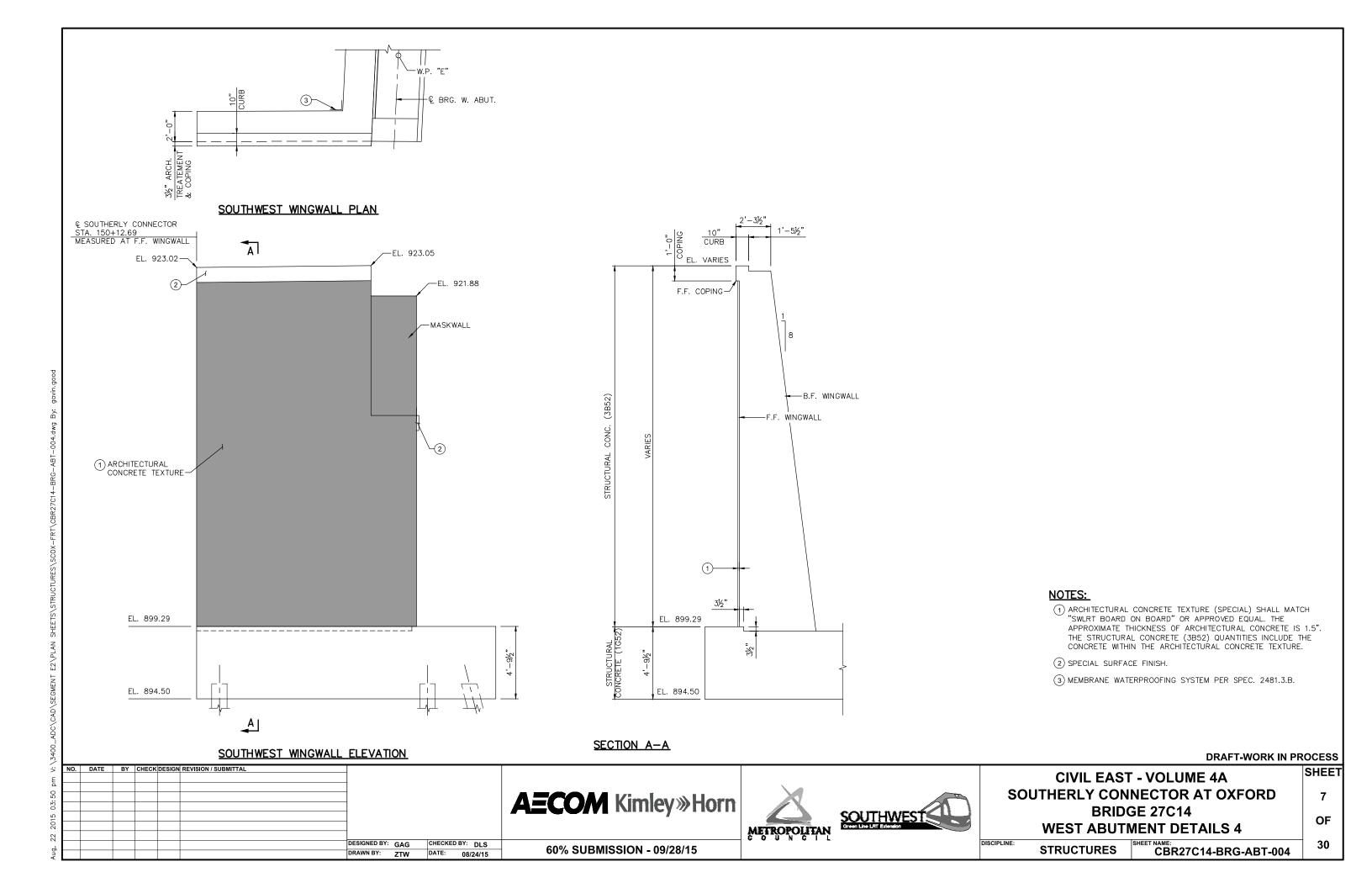
SHEET **CIVIL EAST - VOLUME 4A** SOUTHERLY CONNECTOR AT OXFORD **AECOM** Kimley»Horn SOUTHWEST. **BRIDGE 27C14** OF **WEST ABUTMENT DETAILS 1** METROPOLITAN DISCIPLINE: DESIGNED BY: GAG CHECKED BY: DLS 30 60% SUBMISSION - 09/28/15 **STRUCTURES** CBR27C14-BRG-ABT-001 DATE: 08/24/15

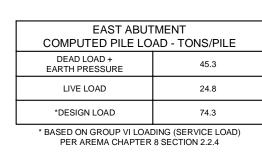


SHEET **CIVIL EAST - VOLUME 4A** SOUTHERLY CONNECTOR AT OXFORD **AECOM** Kimley»Horn 5 **BRIDGE 27C14** SOUTHWEST CONTROL OF THE PROPERTY OF THE PROPE OF **WEST ABUTMENT DETAILS 2** METROPOLITAN DISCIPLINE: DESIGNED BY: GAG CHECKED BY: DLS 30 60% SUBMISSION - 09/28/15 **STRUCTURES** CBR27C14-BRG-ABT-002 DRAWN BY: MRD DATE: 08/24/15

Aug, 22 2015 03:48 pm V:\3400\_ADC\CAD\SEGMENT E2\PLAN SHEETS\STF

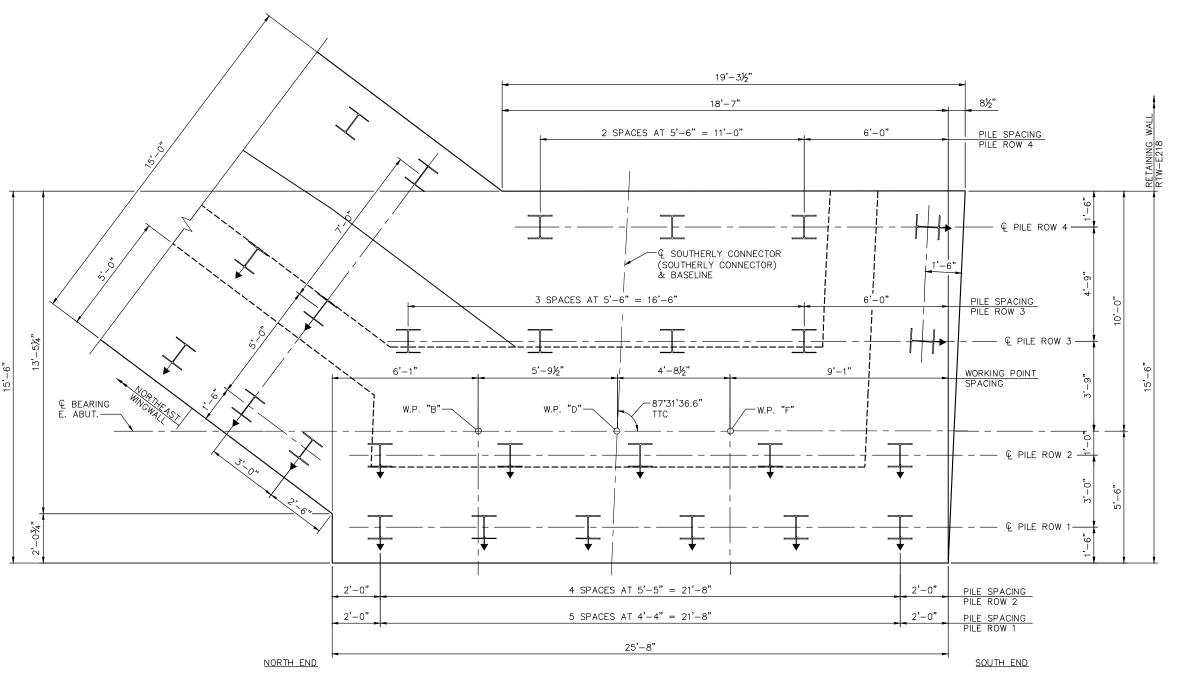






# **GENERAL PILE NOTES:**

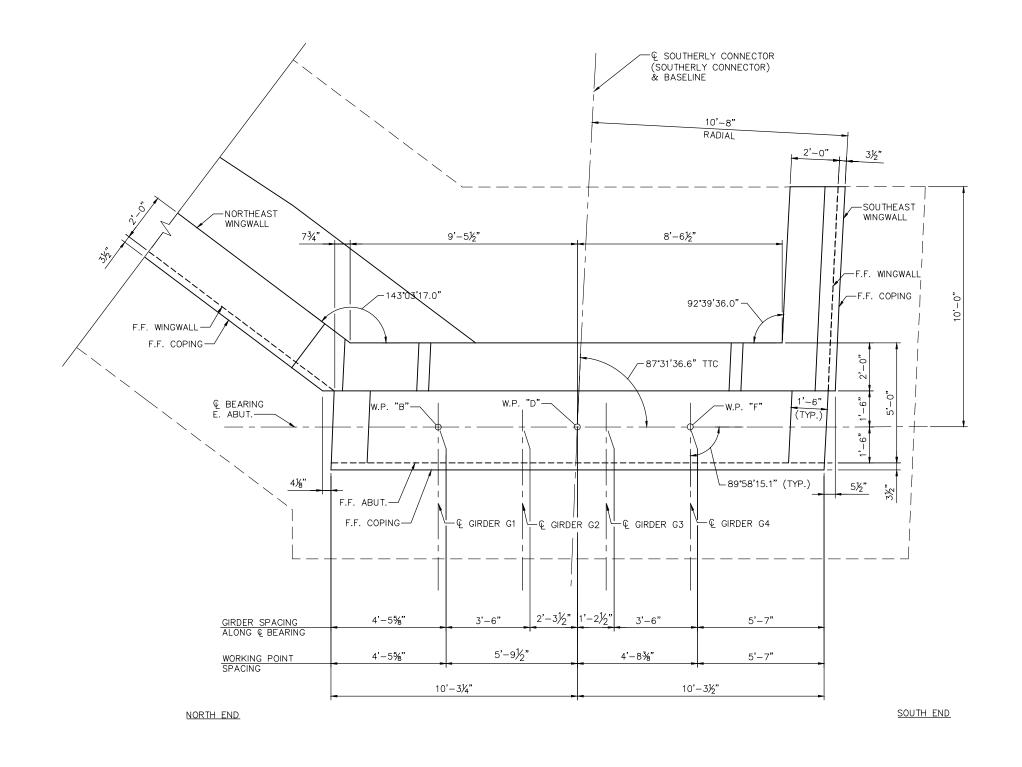
- 1 HP12x53 STEEL TEST PILE 67 FT. LONG 23 HP12x53 STEEL PILES EST. 67 FT. LENGTH 24 HP12x53 STEEL PILES REQ'D FOR EAST ABUT.
- ALL PILES TO BE HP12x53 WITH PILE TIP PROTECTION.
- PILE SPACING SHOWN IS AT BOTTOM OF FOOTING.
- PILES MARKED THUS  $\overline{\downarrow}$  TO BE BATTERED 3" PER FOOT IN DIRECTION SHOWN.
- FOR PILE SPLICE DETAILS SEE DETAIL B202.
- SEE SURVEY SHEET FOR TEST PILE LOCATIONS.



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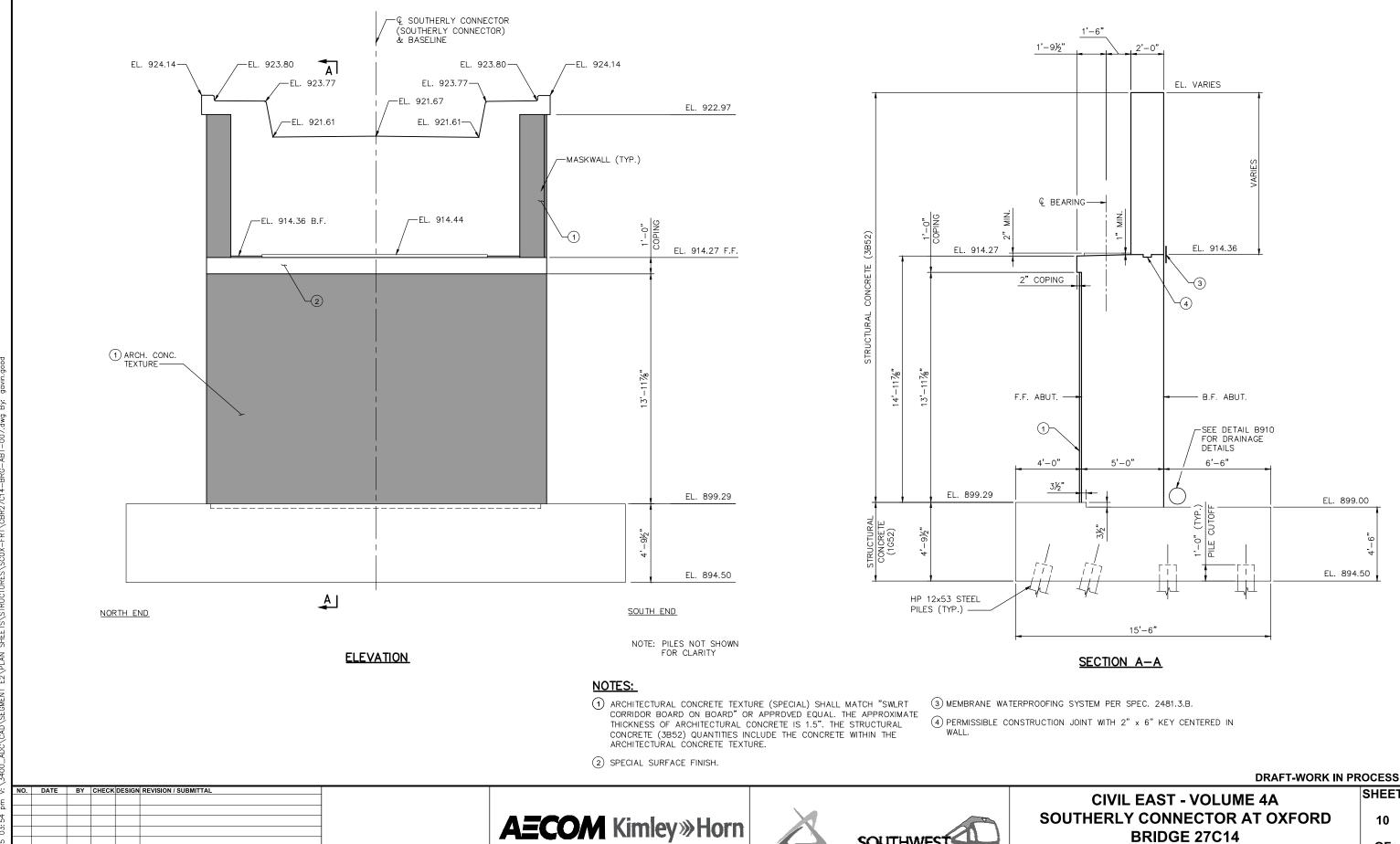
**FOOTING PLAN** 

3									DRAFT-WORK IN P	KUCESS
: E	NO. DAT	TE BY CHECK DESIGN REV	VISION / SUBMITTAL					CIVIL EAS	Γ - VOLUME 4A	SHEET
:52 p					A=COM Vimlav\\\ Harn	A		SOUTHERLY CON	INECTOR AT OXFORD	8
5 03					<b>AECOM</b> Kimley»Horn		SOLITHWEST	BRID	GE 27C14	
2 201						METROPOLITAN	Green Line LRT Extension	EAST ABUT	MENT DETAILS 1	OF
ıg, 2				DESIGNED BY: GAG CHECKED BY: DLS DRAWN BY: MRD DATE: 08/24/15	60% SUBMISSION - 09/28/15	CONCIT		DISCIPLINE: STRUCTURES	SHEET NAME: CBR27C14-BRG-ABT-005	30





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٤									CIVIL EAS	Γ - VOLUME 4A	SILLI
37					1	A=COM Vimilar William	<b>A</b>		SOUTHERLY CON	NECTOR AT OXFORD	9
90						<b>AECOM</b> Kimley»Horn		COLITHIN/ECT	BRID	GE 27C14	
2015					1	_	A STREET OR OTHER AND	Green Line LRT Extension		MENT DETAILS 2	OF
27							METROPOLITAN		LASI ADOII	MENT DETAILS 2	<b> </b>
- 1					DESIGNED BY: GAG CHECKED BY: DLS	COO/ CLIDMICCION DO/20/45			DISCIPLINE: CTDLLCTLIDEC	SHEET NAME:	1 30 l
δηγ					DRAWN BY: MRD DATE: 08/24/15	60% SUBMISSION - 09/28/15			STRUCTURES	CBR27C14-BRG-ABT-006	



60% SUBMISSION - 09/28/15

DESIGNED BY: GAG CHECKED BY: DLS

DATE: 08/24/15

DRAWN BY: ZTW

EL. 899.00

EL. 894.50

SHEET

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OF

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**BRIDGE 27C14** 

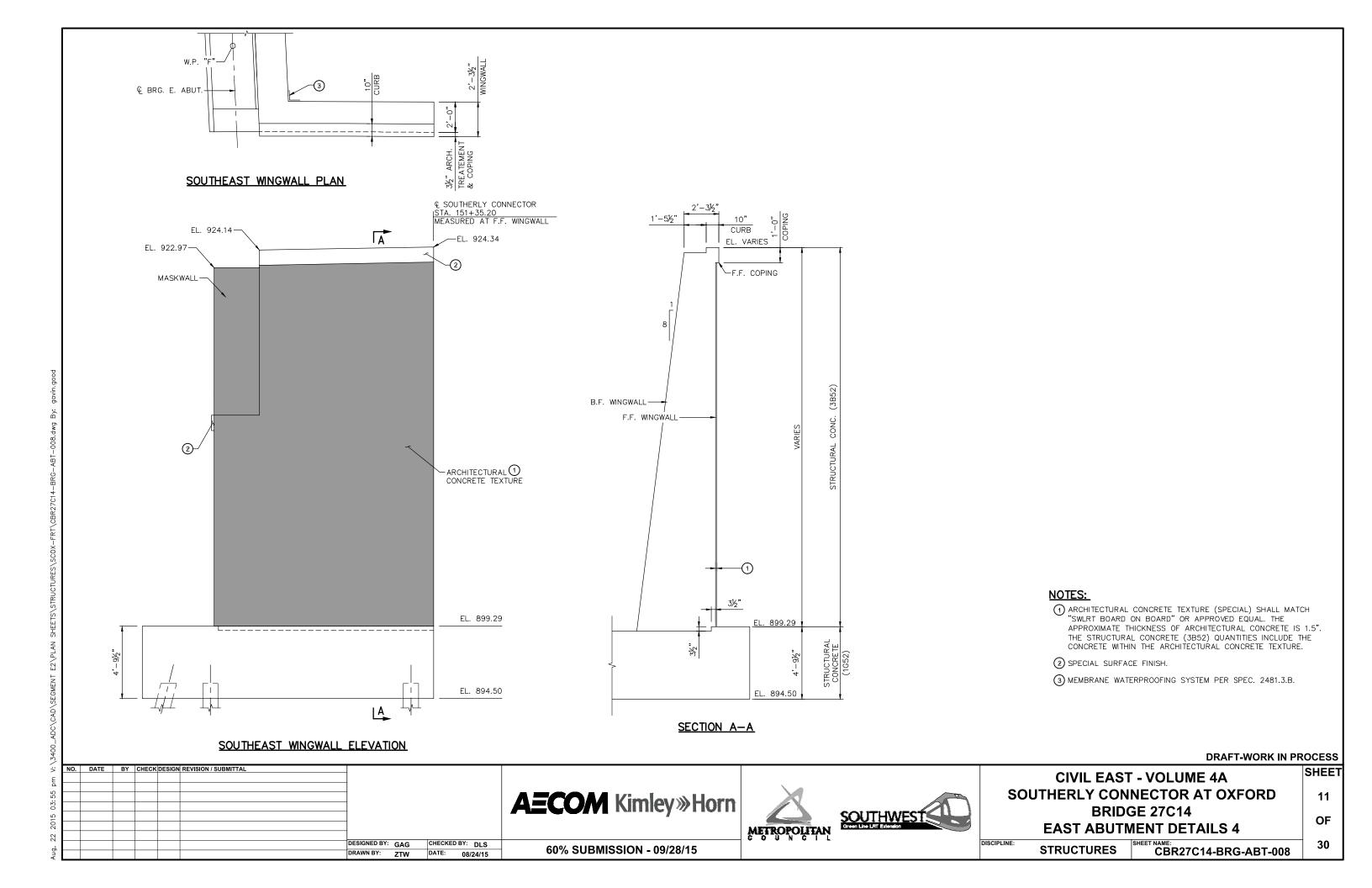
**EAST ABUTMENT DETAILS 3** 

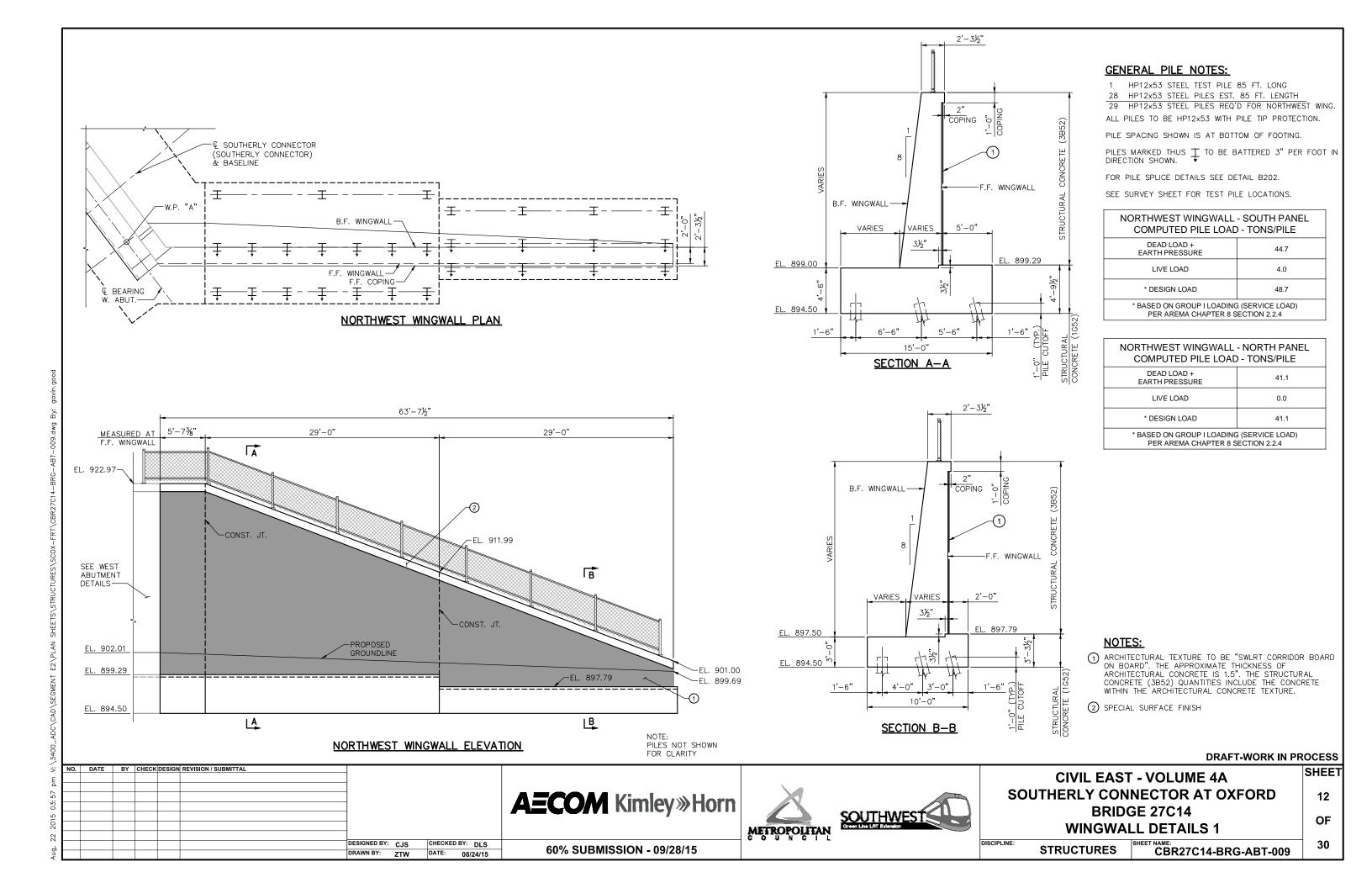
CBR27C14-BRG-ABT-007

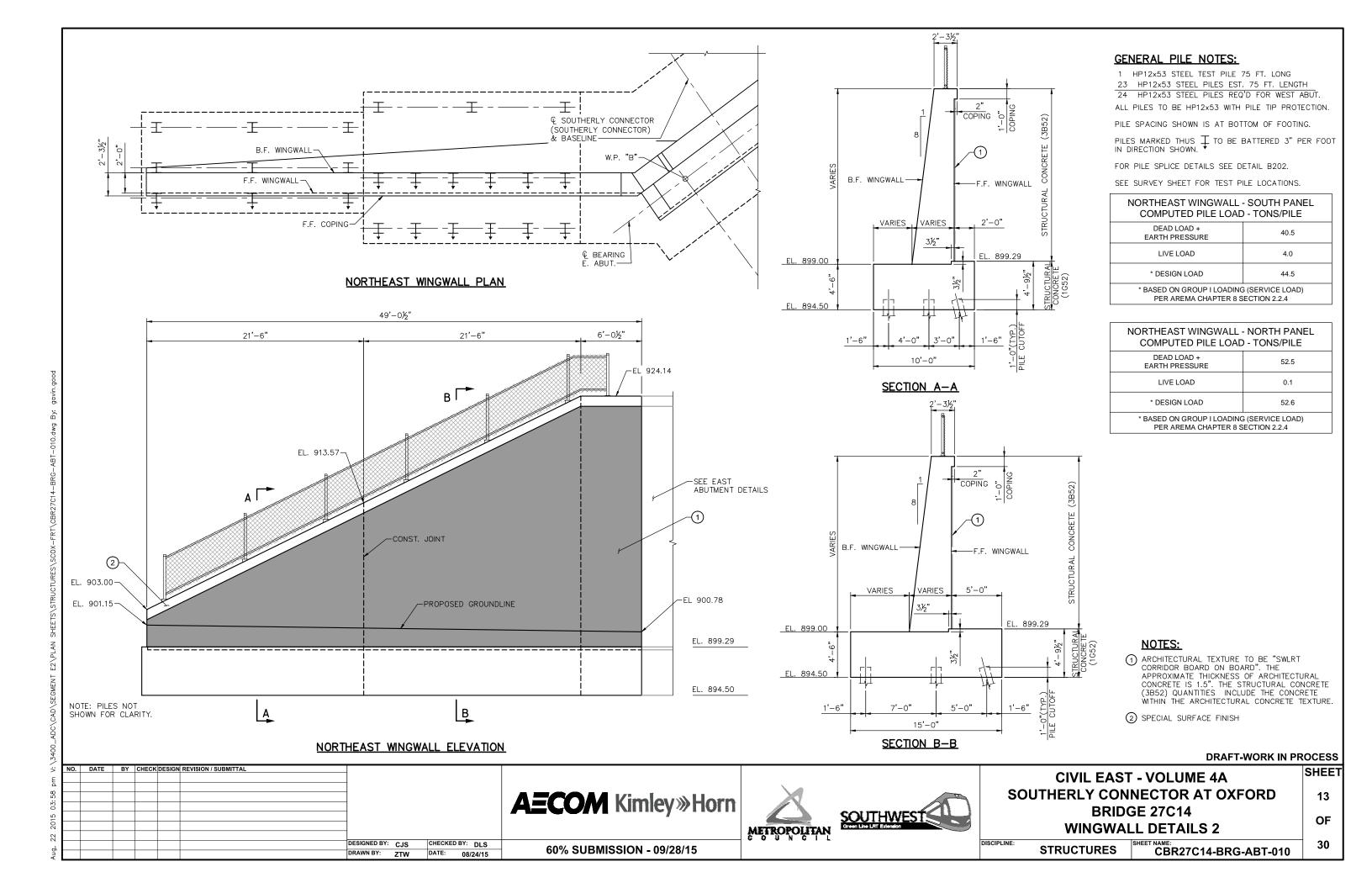
**STRUCTURES** 

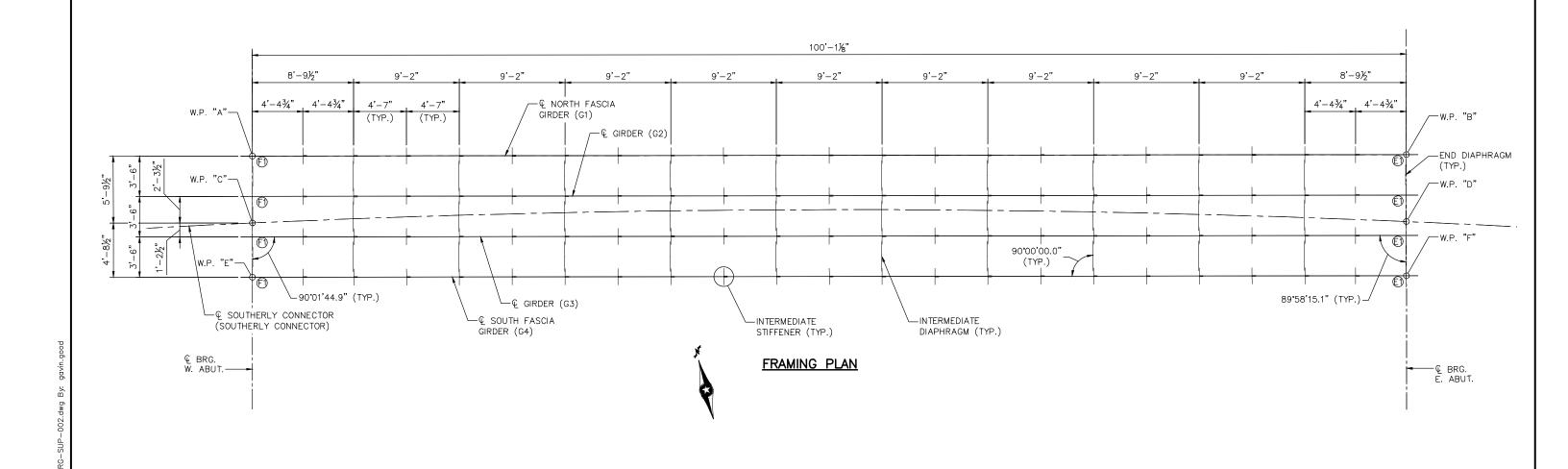
SOUTHWEST Green Line Litt Extension

DISCIPLINE:









# NOTES:

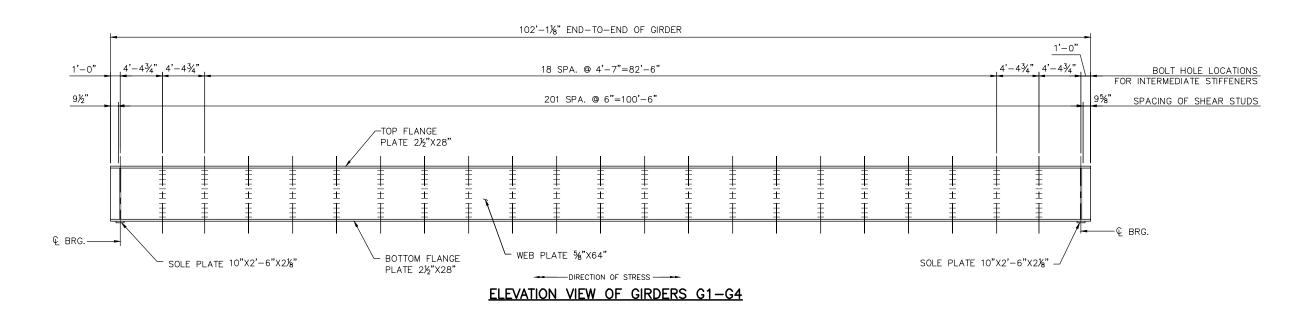
SPACING OF INTERMEDIATE STIFFENERS IS GIVEN WITH RESPECT TO BACK OF FACE OF ANGLES

- © DENOTES EXPANSION CURVED PLATE BEARING ASSEMBLY.
- DENOTES FIXED CURVED PLATE BEARING ASSEMBLY

FOR FURTHER INFORMATION ON BEARING ASSEMBLIES, REFER TO GIRDER ELEVATIONS AND BEARING ASSEMBLY DETAIL SHEETS

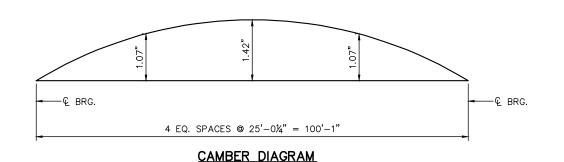
# DRAFT-WORK IN PROCESS

SHEET **CIVIL EAST - VOLUME 4A SOUTHERLY CONNECTOR AT OXFORD AECOM** Kimley»Horn 14 SOUTHWEST Green Line LITT Extension **BRIDGE 27C14** OF **FRAMING PLAN** METROPOLITAN DISCIPLINE: DESIGNED BY: CJS CHECKED BY: DLS 30 60% SUBMISSION - 09/28/15 **STRUCTURES** CBR 27C14-BRG-SUP-002 DATE: 08/24/15



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# PLAN VIEW OF GIRDERS G1-G4



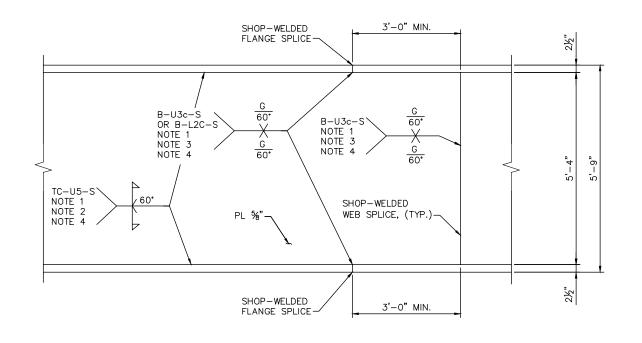
### **GENERAL NOTES:**

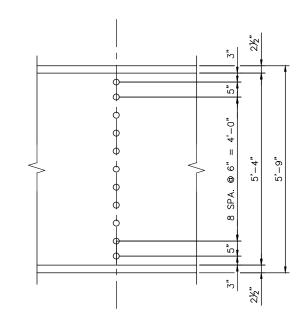
- STRUCTURAL STEEL SHALL CONFORM TO MN/DOT 3309 ASTM A709 GRADE 50WF3 UNLESS OTHERWISE NOTED.
- 2. BOLTED CONNECTIONS SHALL BE MADE WITH %" DIAMETER A325 TYPE 3 HIGH STRENGTH BOLTS, EXCEPT AS NOTED. HOLES FOR %" DIAMETER BOLTS SHALL BE 15/6", EXCEPT AS NOTED.
- 3. PLACE NUT AND WASHER INSIDE OF GIRDER WEB.
- 4. WEB AND FLANGE PLATES SHALL BE FURNISHED IN AVAILABLE MILL LENGTHS WITH A MINIMUM NUMBER OF SPLICES. LOCATION OF SPLICES SHALL BE APPROVED BY ENGINEER. A SPLICE SHALL BE MINIMUM OF 12" FROM ANY STIFFENER. NO SPLICES WILL BE ALLOWED 12 FEET FROM MIDPOINT OF GIRDER.
- 5. CAMBER DIAGRAM SHOWN IS FOR BEAM IN UNLOADED POSITION AND PROVIDES FOR ALL DEAD LOAD DEFLECTIONS AND RESIDUAL CAMBER. BASE LINE IN CAMBER DIAGRAM IS A STRAIGHT LINE FROM & BRG. AT BOTTOM OF WEB.
- 6. SOLE PLATES SHALL BE SHOP WELDED TO BOTTOM FLANGE PLATES, FOR WELD DETAILS REFER TO BEARING ASSEMBLY DETAILS SHEET.
- 7. NO WELDING OR DRILLING OF HOLES FOR TEMPORARY ATTACHMENTS WILL BE PERMITTED.
- 8. THE STRUCTURAL STEEL FABRICATOR SHALL BE CERTIFIED UNDER THE A.I.S.C. QUALITY CERTIFICATION PROGRAM, CATEGORY, MAJOR STEEL BRIDGES (Cbr.).

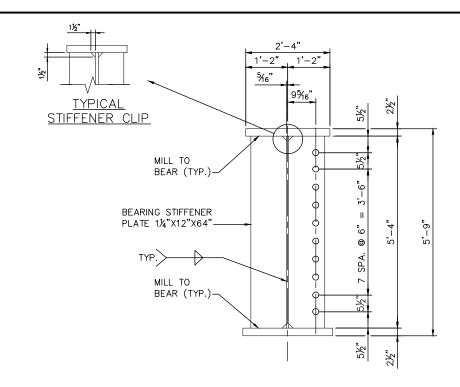
#### **DRAFT-WORK IN PROCESS**

SHEET **CIVIL EAST - VOLUME 4A** SOUTHERLY CONNECTOR AT OXFORD **AECOM** Kimley»Horn 15 SOUTHWEST ST **BRIDGE 27C14** OF **GIRDER ELEVATION** METROPOLITAN DESIGNED BY: JFM CHECKED BY: DLS DISCIPI INF: 30 60% SUBMISSION - 09/28/15 **STRUCTURES** CBR27C14-BRG-STL-001 DRAWN BY: ZTW DATE: 08/24/15

/ PIII V. (3400\_ADC (CAD (3560MEN) EZ (TLAN SPECIS (31ROCIORES (300A-FR) (5582/014-5R6-31L-001.3M)



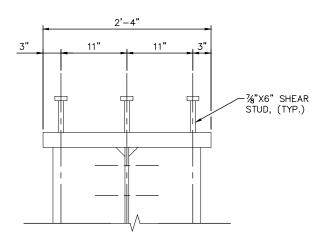




**BEAM WELDING DETAILS** 

INTERMEDIATE STIFFENER
BOLT HOLE LAYOUT

BEARING STIFFENER



SHEAR STUD DETAIL

## NOTES:

NOTE 1. BACK GOUGE ROOT TO SOUND METAL BEFORE WELDING SECOND SIDE.

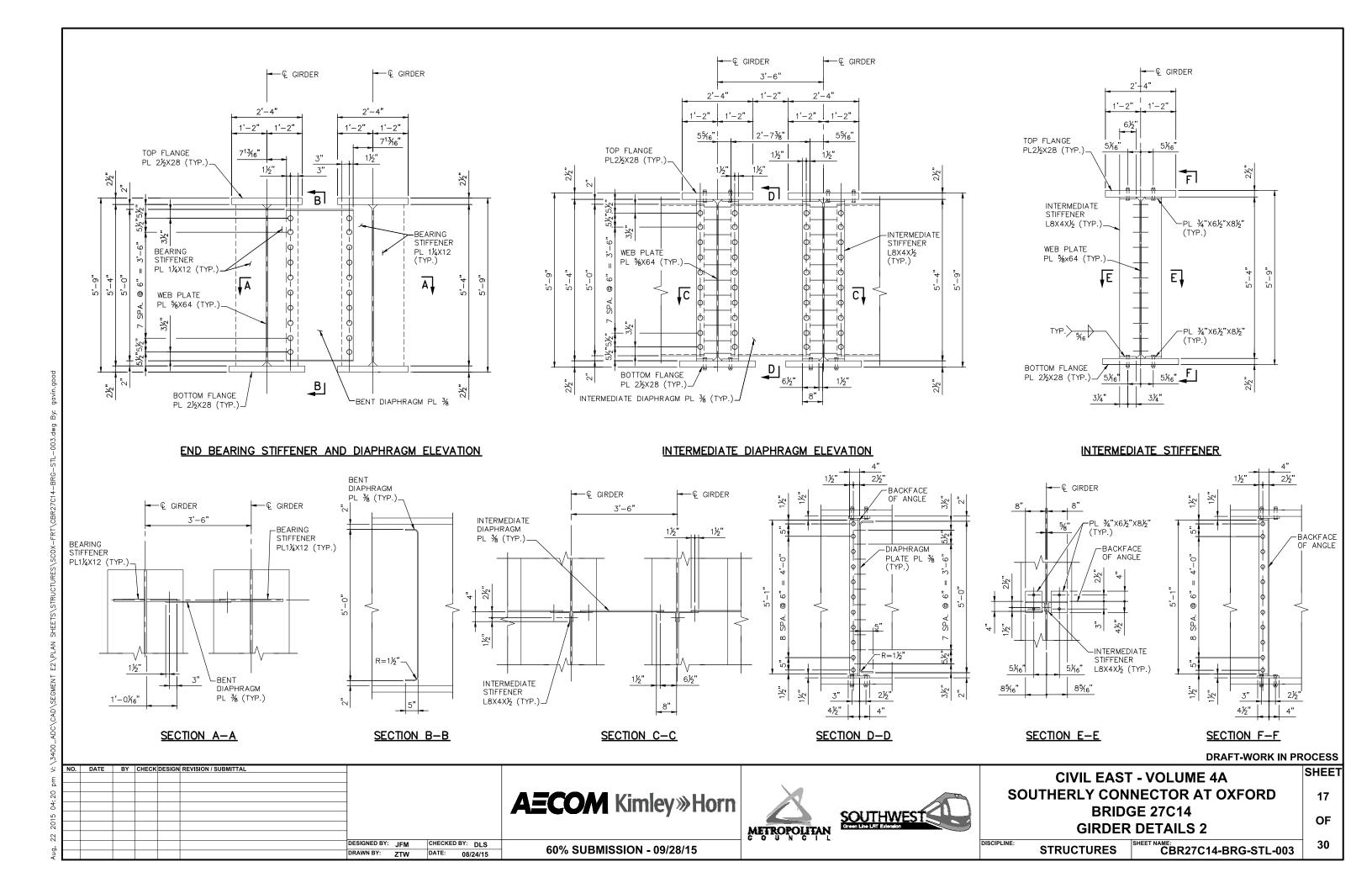
NOTE 2. WEB TO FLANGE GROOVE WELDS TO BE TESTED PER CURRENT A.W.S. TABLE 6.3 & 6.4.

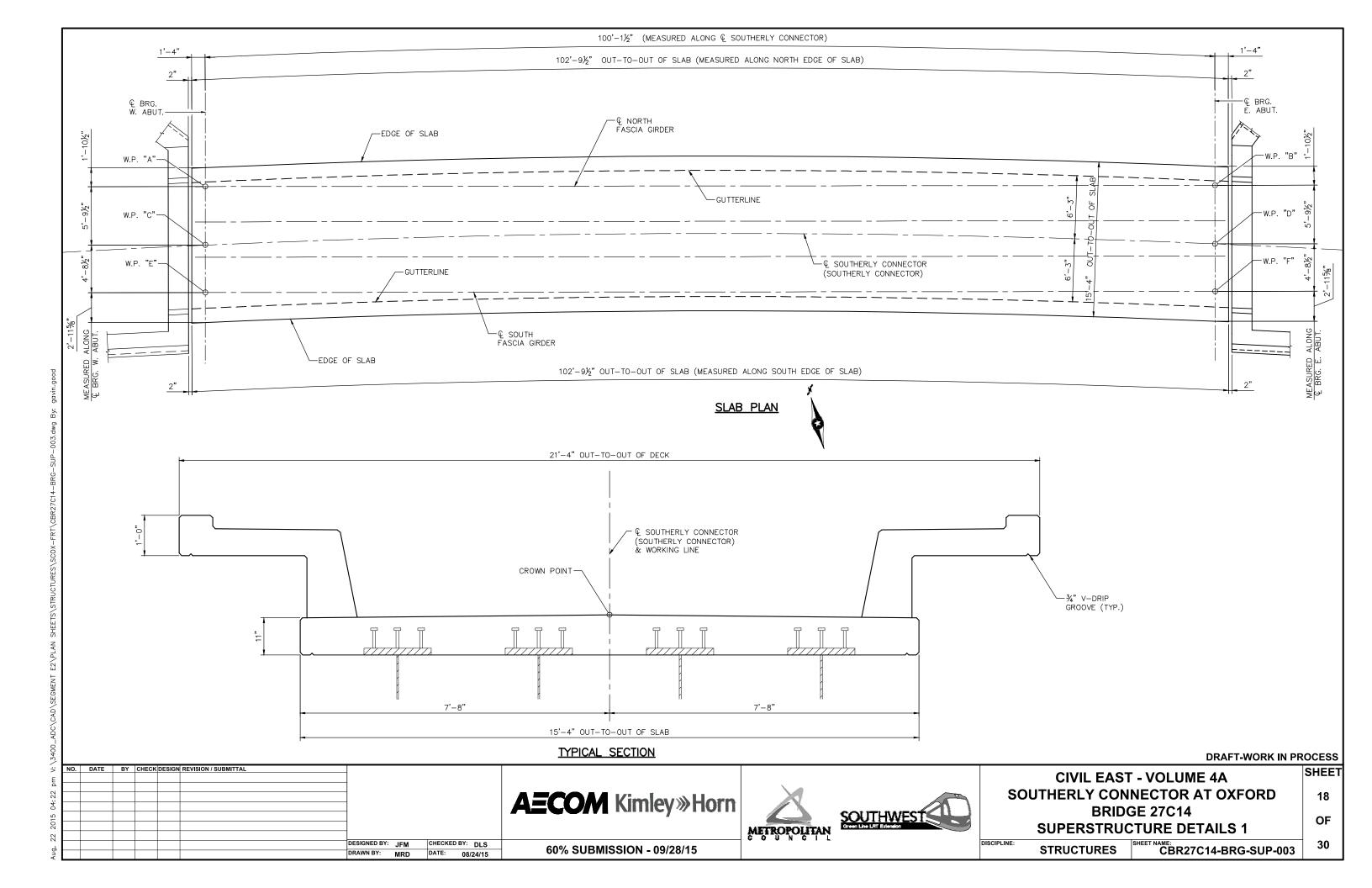
NOTE 3. WEB AND FLANGE BUTT WELDS SHALL BE TESTED USING RADIOGRAPHIC INSPECTION PER SPEC 2471.3M1d.

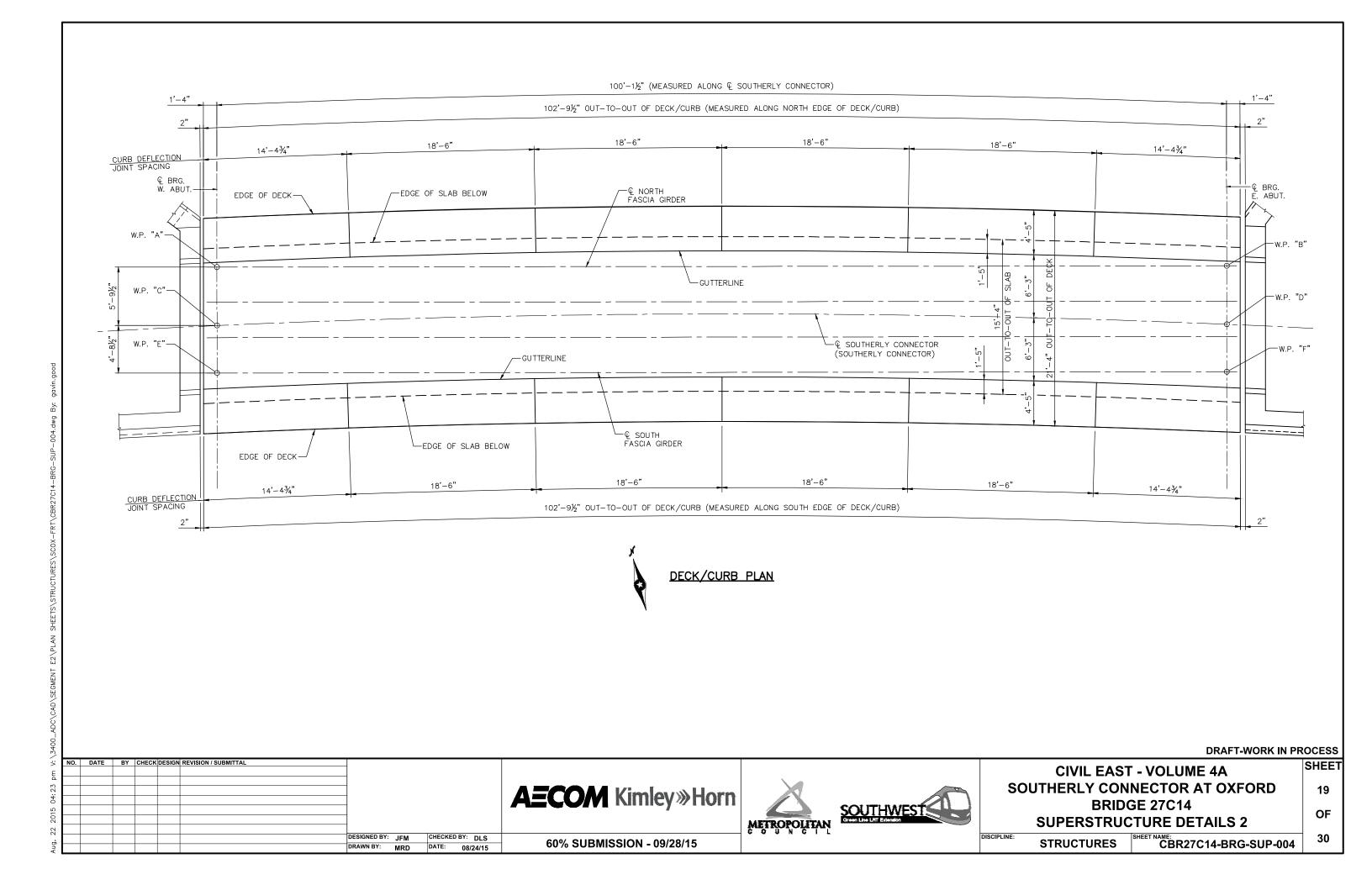
NOTE 4. GRIND FLUSH IN THE DIRECTION OF STRESS ON ALL FOUR SIDES.

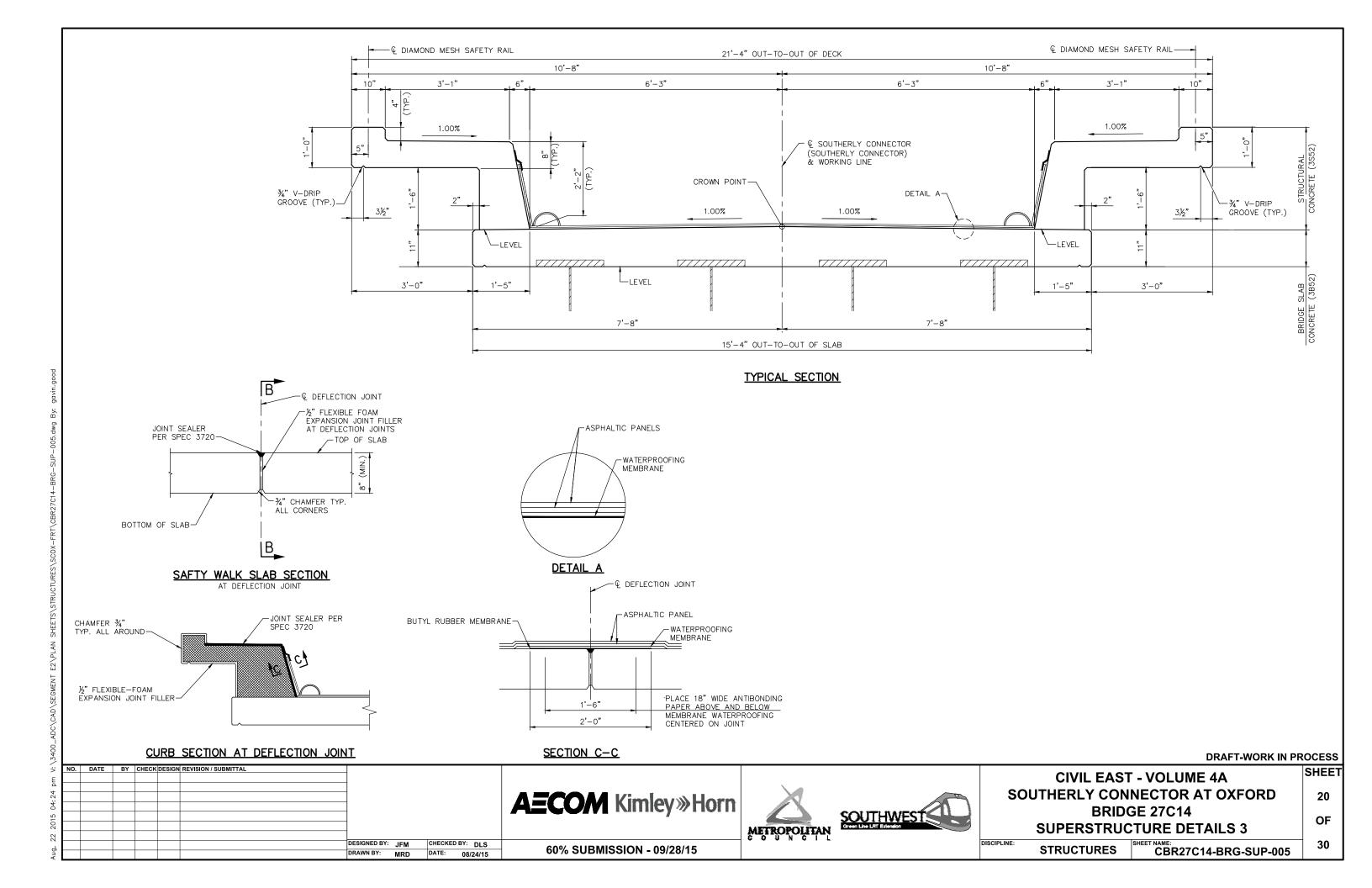
DRAFT-WORK IN PROCESS

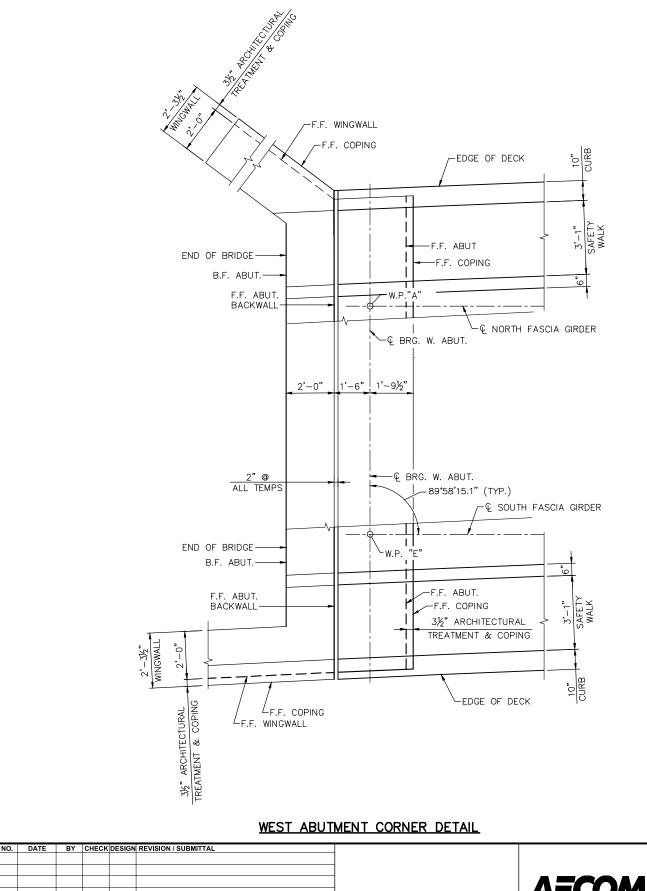
SHEET **CIVIL EAST - VOLUME 4A SOUTHERLY CONNECTOR AT OXFORD AECOM** Kimley»Horn 16 **BRIDGE 27C14** SOUTHWEST OF **GIRDER DETAILS 1** METROPOLITAN DESIGNED BY: JFM CHECKED BY: DLS DISCIPLINE: 30 60% SUBMISSION - 09/28/15 **STRUCTURES** CBR27C14-BRG-STL-002 DRAWN BY: ZTW DATE: 08/24/15

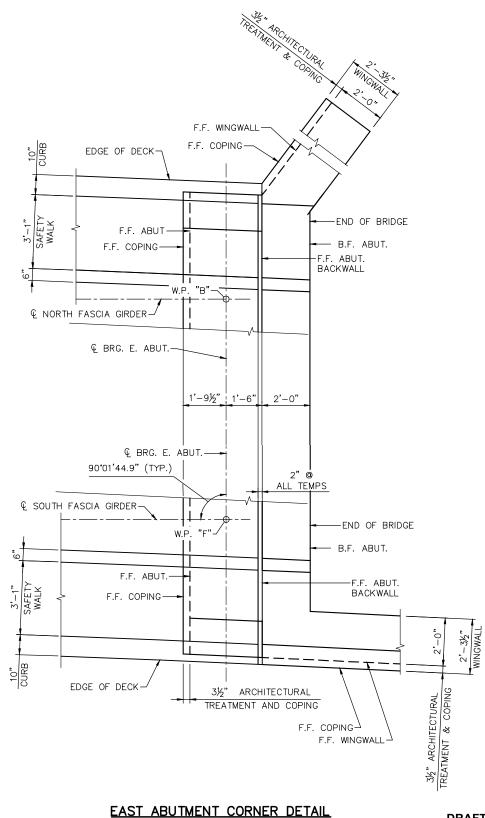












**DRAFT-WORK IN PROCESS** 

SHEET

OF

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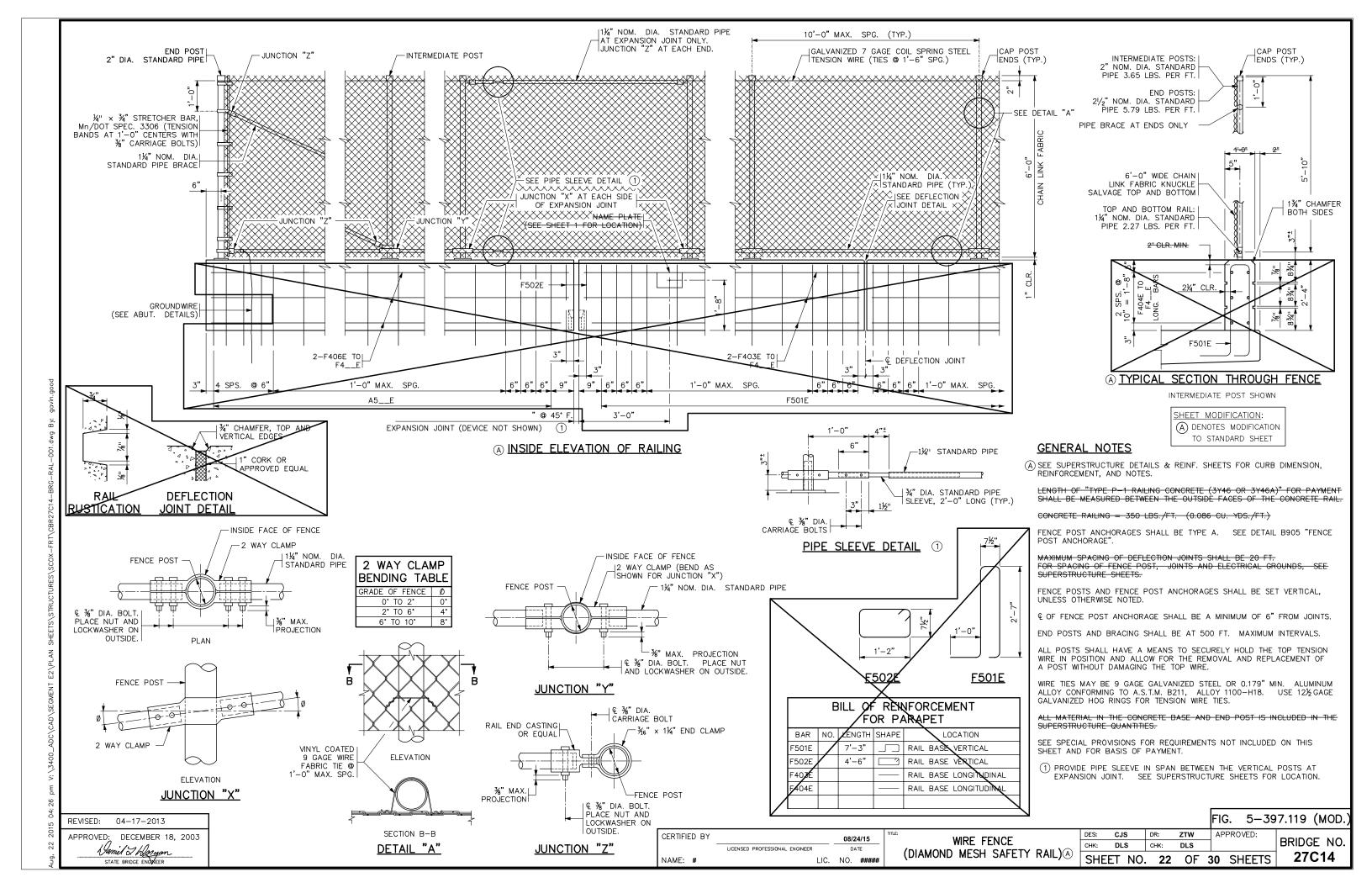
A=COM Kimley >>> Horn

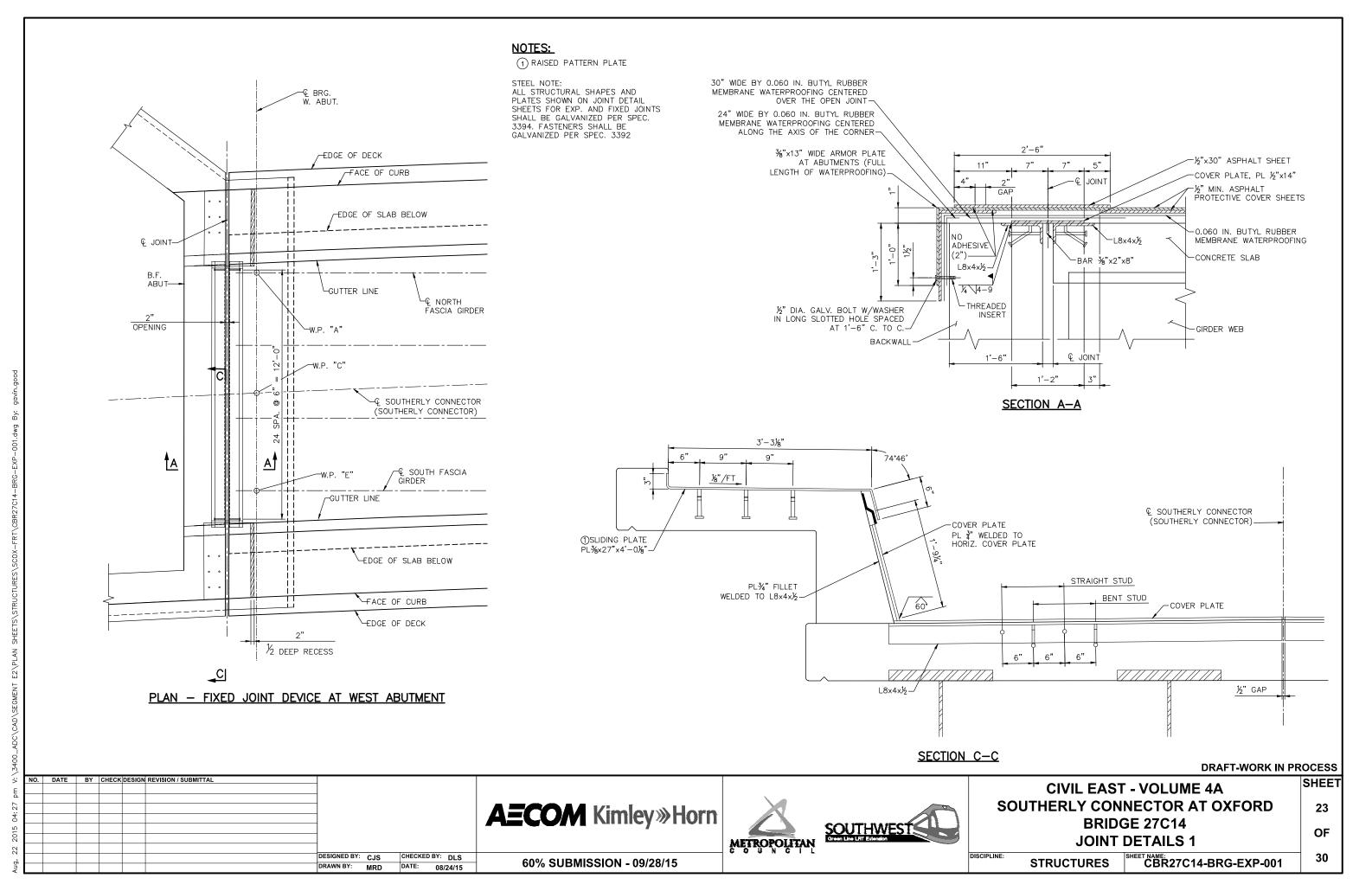
| DESIGNED BY: CJS | CHECKED BY: DLS |
| DRAWN BY: ZTW | DATE: 08/24/15 | 60% SUBMISSION - 09/28/15

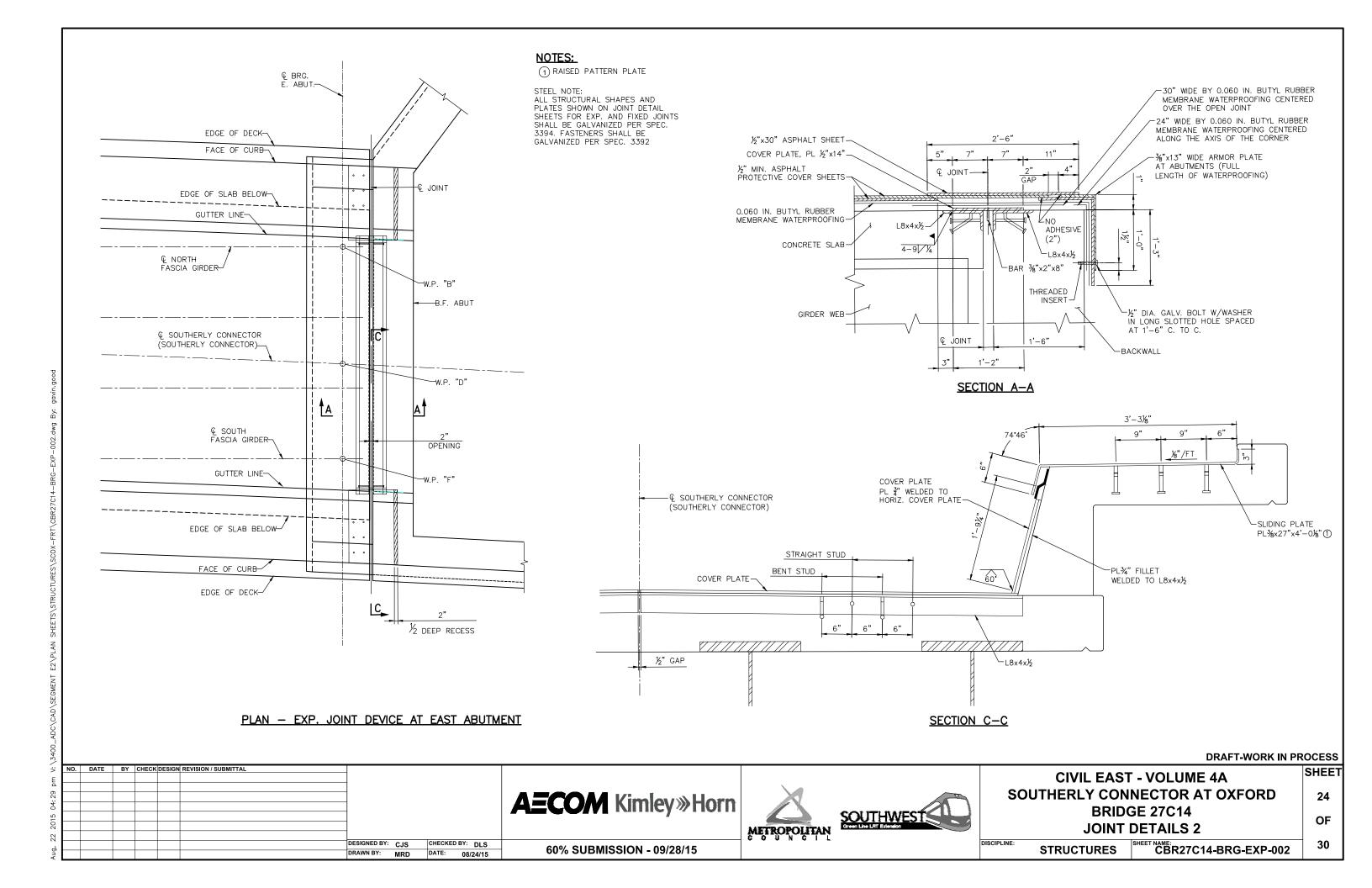


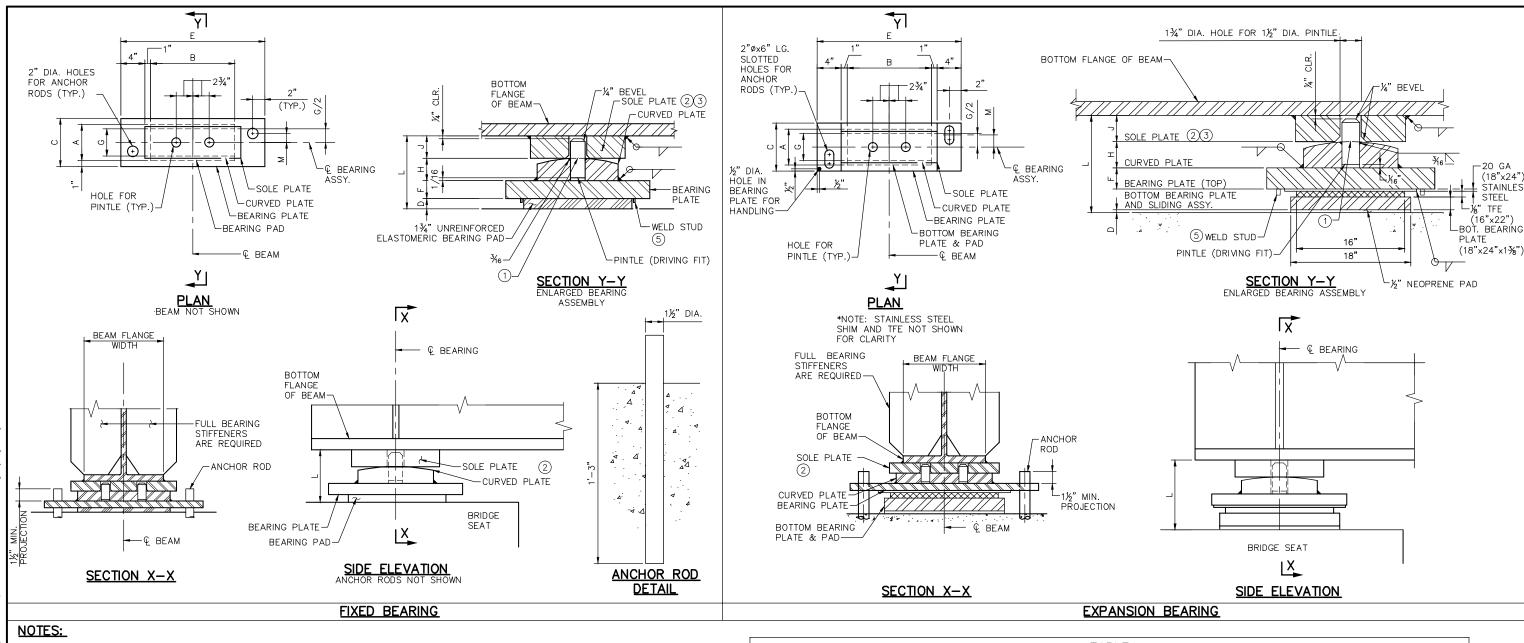


	CIVIL EAST - VOLUME 4A												
	SOUTHERLY CONNECTOR AT OXFORD												
	BRIDGE 27C14 SUPERSTRUCTURE DETAILS 4												
	STRUCTURES SHEET NAME: CBR27C14-BRG-SUP-006												









ELASTOMERIC MATERIALS AND PAD CONSTRUCTION SHALL COMPLY

ALL STEEL PLATES SHALL COMPLY WITH SPEC. 3306 EXCEPT THE SOLE PLATE. THE SOLE PLATE SHALL BE THE SAME MATERIAL SPECIFICATION AS THE STEEL BEAMS.

ANCHOR RODS SHALL COMPLY WITH SPEC. 3306. GALVANIZE PER SPEC. 3392.

PINTLES SHALL COMPLY WITH SPEC. 3309.

GALVANIZE STRUCTURAL STEEL BEARING ASSEMBLY AFTER FABRICATION PER SPEC. 3394, EXCEPT AS NOTED.

THE SOLE PLATE IS INCLUDED IN THE WEIGHT OF STRUCTURAL STEEL.

- 1) THE MIN. RADIUS SHALL BE 16" UNLESS OTHERWISE SPECIFIED IN THE TABLE. THE MAX. RADIUS SHALL BE 24". FINISH TO 250 MICRO. THE FINISHED THICKNESS OF THE PLATE MAY BE 1/6" LESS
- 2 WHEN THE SOLE PLATE IS TAPERED, DIMENSIONS "J" AND "L" ARE THICKNESS OF SOLE PLATE AND BEARING ASSEMBLY AT CENTERLINE
- 3 DO NOT GALVANIZE THIS PLATE.
- 4 "+" DENOTES OFFSET AS SHOWN. "-" DENOTES OFFSET OPPOSITE OF SHOWN.
- (5) 5/6" DIA. x 3/8" KNOCK-OFF WELD STUDS INSTALLED ON BEARING PLATE AROUND PERIMETER OF BEARING PAD. CENTERLINE STUD TO EDGE OF PAD DIMENSION =  $\frac{1}{2}$ ", MAX. STUD SPACING = 4" AND THE MAX. SPACING TO THE PAD CORNER = 2".
- (6) THE TOTAL THICKNESS SHOWN INCLUDES THE STEEL PLATES.

TABLE																						
ASSEMBLY TYPE	LOCATION	BEAM FLANGE WIDTH	BEARING PAD SIZE			SHAPE FACTOR	BEARING PLATE SIZE		CURVED PLATE SIZE			SOLE PLATE SIZE			PINTLE	ASSY. HEIGHT	ANCHOR ROD OFFSET		LAMINATES			
TYPE			А	В	D	(INTERNAL)	С	E	F	G	В	Н	R(1)	WID.	LEN.	J (2)	DIA.	L	± (4)	М	NO.	THK.
E1	E. ABUT.	24"	18	28	½"	-	20	38"	2"	6	28	2"	16	10	30	2%"	1½"	8.125"	+	4"	-	-
F1	W. ABUT.	24"	18	28	1¾"	-	20	38"	21/4"	6	28	2"	16	10	30	21%"	1½"	8.125"	+	4"	-	-

## **DESIGN DATA:**

MAXIMUM HORIZONTAL LOAD IS 70 KIPS. MINIMUM SOLE PLATE THICKNESS IS 14".

**DRAFT-WORK IN PROCESS** 

SHEET

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OF

	10.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL					
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							1				1
Г							1				4
Г							1				
							1				
Г							DESIGNED BY:	CJS	CHECKED BY:	DLS	
							DRAWN BY:	MRD	DATE: 08/	/24/15	1

**AECOM** Kimley»Horn

60% SUBMISSION - 09/28/15





**CIVIL EAST - VOLUME 4A** SOUTHERLY CONNECTOR AT OXFORD **BRIDGE 27C14 BEARING ASSEMBLY DETAILS** 

DISCIPLINE **STRUCTURES** CBR27C14-BRG-EXP-003

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BRIDGE 27C14 YEAR 1

[23455789<del>] \*\*</del>"

## NUMBERS FOR NAMEPLATE

## NOTES:

MATERIAL SHALL COMPLY WITH SPEC. 3327. LETTERS AND NUMBERS SHALL CONFORM TO THOSE SHOWN. DRAFT ON LETTERS AND NUMBERS SHALL NOT BE MORE THAN 3" IN 12". HORIZONTAL SPACING OF LETTERS AND NUMBERS SHALL PRODUCE A BALANCED LAYOUT IN PROPORTION TO SPACING SHOWN.

TOP SURFACE OF LETTERS, NUMBERS AND FRAMES SHALL BE BURNISHED. FURNISH 2 STEEL BOLTS % " DIA.  $\times$  3" LONG WITH EACH PLATE.

ALL DIMENSIONS FOR  $\mbox{\ensuremath{34}}"$  HIGH LETTERS AND NUMBERS SHALL BE IN DIRECT PROPORTION TO THOSE SHOWN FOR THE 1" HIGH LETTERS AND NUMBERS.

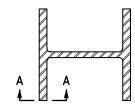
CHECKED BY: DLS

DATE: 08/24/15

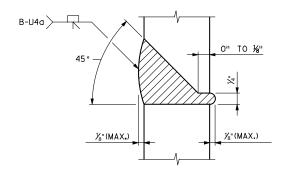
1 YEAR OF CONSTRUCTION

STATE OF MINNESOTA
DEPARTMENT OF TRANSPORTATION APPROVED: NOVEMBER 22, 2002 DETAIL NO. BRIDGE NAMEPLATE Waniel I Worgan B101 (FOR NEW BRIDGES) STATE BRIDGE ENGINEER

DRAWN BY: KAG



SECTION AT SPLICE



SECTION A-A 100% BUTT WELDED PILE SPLICE

CELLULOSIC TYPE ELECTRODES E-6010 OR E-6011 SHALL BE USED FOR 100% BUTT WELDED SPLICES.

ELECTRODES WHICH HAVE BECOME WET, SOILED OR DAMAGED SHALL NOT BE USED.

WELDING SHALL NOT BE DONE WHEN THE AMBIENT TEMPERATURE IS LOWER THAN 0° F. OR WHEN THE PILE IS WET OR EXPOSED TO FALLING RAIN OR SNOW. WHEN THE PILE METAL TEMPERATURE IS BELOW 32° F., THE PILE METAL IN THE AREA OF THE WELD SHALL BE HEATED TO A MINIMUM TEMPERATURE OF 70° F. AND MAINTAINED AT THIS TEMPERATURE DURING WELDING.

APPROVED: NOVEMBER 22, 2002 Waniel I Wargan

STATE BRIDGE ENGINEER

STATE OF MINNESOTA
DEPARTMENT OF TRANSPORTATION PILE SPLICE

(STEEL H BEARING PILES 10" TO 14")

DETAIL NO.

B202

DRAFT-WORK IN PROCESS

SHEET

26

OF

30

DESIGNED BY: CJS

**AECOM** Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN



**CIVIL EAST - VOLUME 4A** SOUTHERLY CONNECTOR AT OXFORD **BRIDGE 27C14 DETAILS 1** 

**STRUCTURES** 

CBR27C14-BRG-DTL-001

DISCIPI INF

