METROPOLITAN COUNCIL

SOUTHWEST
Green Line LRT Extension

CIVIL EAST CONSTRUCTION

VOLUME 4B
BRIDGES

60% SUBMISSION
DATE : 09/28/15

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 6 - RETAINING WALLS
VOLUME 7 - UTILITIES
VOLUME 8 - DRAINAGE
VOLUME 9 - URBAN DESIGN / LANDSCAPE
VOLUME 10 - TRAFFIC / LIGHTING
VOLUME 11A - STATIONS
VOLUME 11B - STATIONS
VOLUME 12 - SYSTEMS

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.

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.

AECOM

CIVIL EAST

SHT #	SHEET NAME	SHEET DESCRIPTION	STATION	STATION	REV
		VOLUME 4B - BRIDGES			
1	E0-BRGB-CVR-001	COVER SHEET			
2	E0-BRG-IDX-001	VOLUME INDEX OF PLAN SHEETS SHEET 1			
3	E0-BRG-IDX-002	VOLUME INDEX OF PLAN SHEETS SHEET 2			
4	E0-BRG-IDX-003	VOLUME INDEX OF PLAN SHEETS SHEET 3			
5	E0-GEN-KEY-001	GENERAL KEY MAP			
6	E0-GEN-NTS-001	GENERAL LEGEND AND ABBREVIATIONS SHEET 1			
7	E0-GEN-NTS-002	GENERAL LEGEND AND ABBREVIATIONS SHEET 2			
		BRIDGE 27303 - TH 100 LRT			
1	CBR27303-BRG-GPE	GENERAL PLAN & ELEVATION			
2	CBR27303-BRG-TRN	TRANSVERSE SECTION & QUANTITIES			
3	CBR27303-BRG-SUP-001	BRIDGE LAYOUT			
4	CBR27303-BRG-ABT-003-1	WEST ABUTMENT REMOVAL PLAN			
5	CBR27303-BRG-ABT-001-1	WEST ABUTMENT DETAILS			
6	CBR27303-BRG-ABT-001-2	WEST ABUTMENT DETAILS			
7	CBR27303-BRG-ABT-001-3	WEST ABUTMENT DETAILS			
8	CBR27303-BRG-ABT-001-4	WEST ABUTMENT DETAILS			
9	CBR27303-BRG-ABT-004-1	EAST ABUTMENT REMOVAL PLAN			
10	CBR27303-BRG-ABT-002-1	EAST ABUTMENT DETAILS			
11	CBR27303-BRG-ABT-002-2	EAST ABUTMENT DETAILS			
12	CBR27303-BRG-ABT-002-3	EAST ABUTMENT DETAILS			
13	CBR27303-BRG-ABT-002-4	EAST ABUTMENT DETAILS			
14	CBR27303-BRG-PIR-001	PIER DETAILS			
15	CBR27303-BRG-SUP-003	FRAMING PLAN			
16	CBR27303-BRG-DTL-003	MN54 PRESTRESSED CONCRETE BEAM			
17	CBR27303-BRG-SUP-004-1	SUPERSTRUCTURE DETAILS			
18	CBR27303-BRG-SUP-004-2	SUPERSTRUCTURE DETAILS			
19	CBR27303-BRG-SUP-004-3	SUPERSTRUCTURE DETAILS			
20	CBR27303-BRG-SUP-002	SUPERSTRUCTURE DETAILS			
21	CBR27303-BRG-DTL-003	CONCRETE PARAPET (TYPE P-1)			
22	CBR27303-BRG-DTL-005-1	WATERPROOF EXPANSION DEVICE			
23	CBR27303-BRG-DTL-004-1	DETAILS			
24	CBR27303-BRG-DTL-004-2	DETAILS			
25	CBR27303-BRG-DTL-004-3	DETAILS			
26	CBR27303-BRG-DTL-002	AS-BUILT BRIDGE DATA			
27	CBR27303-BRG-SUR-001	BRIDGE SURVEY			
28	CBR27303-BRG-BOR-001-1	BRIDGE SURVEY PLAN			
29	CBR27303-BRG-BOR-002-1	BRIDGE SURVEY PROFILE			
30	CBR27303-BRG-BOR-002-2	BRIDGE SURVEY PROFILE			
31	CBR27303-BRG-BOR-002-3	BRIDGE SURVEY PROFILE			
32	CBR27303-BRG-DTL-001-1	STAGING PLAN 1			
33	CBR27303-BRG-DTL-001-2	STAGING PLAN 2			
34	CBR27303-BRG-DTL-001-3	STAGING PLAN 3			
35	CBR27303-BRG-DTL-001-4	STAGING PLAN 4			
36	CBR27303-BRG-DTL-001-5	STAGING PLAN 5			
37	CBR27303-BRG-DTL-001-6	STAGING PLAN 6			
38	CBR27303-BRG-DTL-001-7	STAGING PLAN 7			
39	CBR27303-BRG-DTL-001-8	STAGING PLAN 8			
		BRIDGE 27W34 - TH 100 FREIGHT			
1	CBR27W34-BRG-GPE	GENERAL PLAN & ELEVATION			
2	CBR27W34-BRG-TRN	TRANSVERSE SECTION & QUANTITIES			
3	CBR27W34-BRG-SUP-001	BRIDGE LAYOUT			
4	CBR27W34-BRG-ABT-001-1	WEST ABUTMENT DETAILS			
5	CBR27W34-BRG-ABT-001-2	WEST ABUTMENT DETAILS			
6	CBR27W34-BRG-ABT-001-3	WEST ABUTMENT DETAILS			
7	CBR27W34-BRG-ABT-001-4	WEST ABUTMENT DETAILS			
8	CBR27W34-BRG-ABT-002-1	EAST ABUTMENT DETAILS			
9	CBR27W34-BRG-ABT-002-2	EAST ABUTMENT DETAILS			
10	CBR27W34-BRG-ABT-002-3	EAST ABUTMENT DETAILS			
11	CBR27W34-BRG-ABT-002-4	EAST ABUTMENT DETAILS			
12	CBR27W34-BRG-PIR-001-1	PIER DETAILS			
13	CBR27W34-BRG-PIR-001-2	PIER DETAILS			
14	CBR27W34-BRG-PIR-001-3	PIER DETAILS			
15	CBR27W34-BRG-PIR-002-1	PIER REINFORCEMENT			
16	CBR27W34-BRG-PIR-002-2	PIER REINFORCEMENT			
17	CBR27W34-BRG-SUP-003-1	FRAMING PLAN			
18	CBR27W34-BRG-SUP-003-2	BALLAST PLATE REMOVAL PLAN			
19	CBR27W34-BRG-SUP-002	CORNER DETAILS			
20	CBR27W34-BRG-RAL-002	RAILING DETAILS			
21	CBR27W34-BRG-DTL-003	CONCRETE SLOPE PAVING UNDER BRIDGES			
22	CBR27W34-BRG-DTL-003-2	DETAILS			

CIVIL EAST

SHT #	SHEET NAME	SHEET DESCRIPTION	STATION	STATION	REV
23	CBR27W34-BRG-DTL-002	AS-BUILT BRIDGE DATA			
24	CBR27W34-BRG-SUR-001	BRIDGE SURVEY			
25	CBR27W34-BRG-BOR-001-1	BRIDGE SURVEY PLAN			
26	CBR27W34-BRG-BOR-002-1	BRIDGE SURVEY PROFILE			
27	CBR27W34-BRG-BOR-002-2	BRIDGE SURVEY PROFILE			
28	CBR27W34-BRG-BOR-002-3	BRIDGE SURVEY PROFILE			
29	CBR27W34-BRG-DTL-001-1	STAGING PLAN 1			
30	CBR27W34-BRG-DTL-001-2	STAGING PLAN 2			
31	CBR27W34-BRG-DTL-001-3	STAGING PLAN 3			
32	CBR27W34-BRG-DTL-001-4	STAGING PLAN 4			
33	CBR27W34-BRG-DTL-001-5	STAGING PLAN 5			
34	CBR27W34-BRG-DTL-001-6	STAGING PLAN 6			
35	CBR27W34-BRG-DTL-001-7	STAGING PLAN 7			
36	CBR27W34-BRG-DTL-001-8	STAGING PLAN 8			
		BRIDGE R0692 - CEDAR LAKE TRAIL - BELTLINE STATION			
1	CBRR0692-BASE-BRG-GPE-001	GENERAL PLAN			
2	CBRR0692-BASE-BRG-GPE-002	GENERAL PLAN & ELEVATION 1			
3	CBRR0692-BASE-BRG-GPE-003	GENERAL PLAN & ELEVATION 2			
4	CBRR0692-BASE-BRG-GPE-004	GENERAL PLAN & ELEVATION 3			
5	CBRR0692-BASE-BRG-SUP-001	TRANSVERSE SECTION			
		BRIDGE R0693 - CEDAR LAKE CHANNEL LRT			
1	CBRR0693-BRG-GPE	GENERAL PLAN & ELEVATION			
2	CBRR0693-BRG-TRN	TRANSVERSE SECTION			
		BRIDGE R0694 - CEDAR LAKE CHANNEL FREIGHT			
1	CBRR0694-BRG-GPE	GENERAL PLAN & ELEVATION			
2	CBRR0694-BRG-TRN	TRANSVERSE SECTION			
		BRIDGE R06XX - CEDAR LAKE CHANNEL TRAIL			
1	CBRR06XX-BRG-GPE	GENERAL PLAN & ELEVATION			
2	CBRR06XX-BRG-TRN	TRANSVERSE SECTION			
		BRIDGE R0696 - LUCE LINE TRAIL			
1	CBR0696-BRG-GPE-001	GENERAL PLAN			
2	CBR0696-BRG-GPE-002	GENERAL PLAN & ELEVATION 1			
3	CBR0696-BRG-GPE-003	GENERAL PLAN & ELEVATION 2			
4	CBR0696-BRG-TRN-001	TRANSVERSE SECTION & QUANTITIES			
5	CBR0696-BRG-SUP-001	BRIDGE LAYOUT			
6	CBR0696-BRG-DTL-001	REMOVAL DETAILS			
7	CBR0696-BRG-ABT-001	ABUTMENT RUSTICATION DETAILS			
8	CBR0696-BRG-ABT-002	WEST ABUTMENT FOOTING PLAN AND ELEVATION			
9	CBR0696-BRG-ABT-003	WEST ABUTMENT WINGWALLS			
10	CBR0696-BRG-ABT-004	EAST ABUTMENT FOOTING PLAN AND ELEVATION			
11	CBR0696-BRG-ABT-005	EAST ABUTMENT WINGWALLS			
12	CBR0696-BRG-PIR-001	PIER 1 GEOMETRY			
13	CBR0696-BRG-PIR-002	PIER 2 GEOMETRY			
14	CBR0696-BRG-PIR-003	PIER 3 GEOMETRY			
15	CBR0696-BRG-PIR-004	PIER 4 GEOMETRY			
16	CBR0696-BRG-PIR-005	PIER 5 GEOMETRY 1			
17	CBR0696-BRG-PIR-006	PIER 5 GEOMETRY 2			
18	CBR0696-BRG-PIR-007	PIER 6 GEOMETRY			
19	CBR0696-BRG-SUP-002	CORNER DETAILS			
20	CBR0696-BRG-SUP-003	MAIN SPAN PREFABRICATED TRUSS			
21	CBR0696-BRG-SUP-004	SUPERSTRUCTURE REINF. UNIT 1 & POUR SEQUENCE			
22	CBR0696-BRG-DTL-002	END DIAPHRAGM REINFORCEMENT			
23	CBR0696-BRG-DTL-003	CURB DETAILS 1			
24	CBR0696-BRG-DTL-004	CURB DETAILS 2			
25	CBR0696-BRG-DTL-005	APPROACH PANEL			
26	CBR0696-BRG-DTL-006	LOAD TRANSFER PLATFORM			
27	CBR0696-BRG-DTL-007	WIRE FENCE (DIAMOND MESH SAFETY RAIL)			
28	CBR0696-BRG-DTL-008	CONCRETE CURB FOR USE WITH ORNAMENTAL RAILING			
29	CBR0696-BRG-DTL-009	WATERPROOF EXPANSION DEVICE 1			
30	CBR0696-BRG-DTL-010	WATERPROOF EXPANSION DEVICE 2			
31	CBR0696-BRG-DTL-011	AS-BUILT BRIDGE DATA			
32	CBR0696-BRG-SUR-001	BRIDGE SURVEY 1			
33	CBR0696-BRG-SUR-002	BRIDGE SURVEY 2			
34	CBR0696-BRG-SUR-003	BRIDGE SURVEY 3			
35	CBR0696-BRG-BOR-001	BORINGS 1			
36	CBR0696-BRG-BOR-002	BORINGS 2			
37	CBR0696-BRG-BOR-003	BORINGS 3			

CIVIL EAST

SHT #	SHEET NAME	SHEET DESCRIPTION	STATION	STATION	REV
38	CBR0696-BRG-BOR-004	BORINGS 4			
39	CBR0696-BRG-BOR-005	BORINGS 5			
		BRIDGE 27C16 - GLENWOOD AVE WEST			
1	CBR27C16-BRID-GPE	GENERAL PLAN AND ELEVATION			
2	CBR27C16-BRID-TRN	TRANSVERSE SECTION & QUANTITIES			
3	CBR27C16-BRG-SUP-003	BRIDGE LAYOUT			
4	CBR27C16-BRG-ABT-003	WEST ABUTMENT DETAILS 1			
5	CBR27C16-BRG-ABT-002	WEST ABUTMENT DETAILS 2			
6	CBR27C16-BRG-ABT-001	WEST ABUTMENT DETAILS 3			
7	CBR27C16-BRG-ABT-004	WEST ABUTMENT DETAILS 4			
8	CBR27C16-BRG-PIR-002	PIER FOOTING PLAN			
9	CBR27C16-BRG-PIR-001	PIER PLAN AND ELEVATION			
10	CBR27C16-BRG-PIR-003	PIER DETAILS			
11	CBR27C16-BRG-SUP-002	FRAMING PLAN			
12	CBR27C16-BRG-SUP-005	STRUCTURAL STEEL DETAILS			
13	CBR27C16-BRG-SUP-006	SUPERSTRUCTURE DETAILS 1			
14	CBR27C16-BRG-SUP-007	SUPERSTRUCTURE DETAILS 2			
15	CBR27C16-BRG-SUP-008	SUPERSTRUCTURE DETAILS 3			
16	CBR27C16-BRG-SUP-004	SUPERSTRUCTURE DETAILS 4			
17	CBR27C16-BRG-RAL	STRUCTURAL TUBE RAILING AND CONCRETE PARAPET			
18	CBR27C16-BRG-RAL	CONCRETE CURB			
19	CBR27C16-BRG-RAL	WIRE FENCE DETAILS			
20	CBR27C16-BRG-SYS	CONDUIT SYSTEM			
21	CBR27C16-BRG-EXP-001	WATERPROOF EXPANSION DEVICE 1			
22	CBR27C16-BRG-EXP	WATERPROOF EXPANSION DEVICE 2			
23	CBR27C16-BRG-EXP-003	WATERPROOF EXPANSION DEVICE 3			
24	CBR27C16-BRG-DTL-007	APPROACH PANEL			
25	CBR27C16-BRG-DTL-001	DETAILS 1			
26	CBR27C16-BRG-DTL-002	DETAILS 2			
27	CBR27C16-BRG-DTL003	DETAILS 3			
28	CBR27C16-BRG-DTL-004	DETAILS 4			
29	CBR27C16-BRG-DTL-005	DETAILS 5			
30	CBR27C16-BRG-SUR-001	BRIDGE SURVEY 1			
31	CBR27C16-BRG-SUR-002	BRIDGE SURVEY 2			
32	CBR27C16-BRG-SUR-003	BRIDGE SURVEY 3			
33	CBR27C16-BRG-BOR-001	BRIDGE SURVEY PLAN			
34	CBR27C16-BRG-BOR-002	BRIDGE SURVEY PROFILE 1			
35	CBR27C16-BRG-BOR-003	BRIDGE SURVEY PROFILE 2			
		BRIDGE 27C17 - GLENWOOD AVE EAST			
1	CBR27C17-BRID-GPE	GENERAL PLAN AND ELEVATION			
2	CBR27C17-BRID-TRN-001	TRANSVERSE SECTION & QUANTITIES			
3	CBR27C17-BRG-SUP-001	BRIDGE LAYOUT			
4	CBR27C17-BRG-SUP-001-1	EAST ABUTMENT DETAILS 1			
5	CBR27C17-BRG-ABT-001-1	EAST ABUTMENT DETAILS 2			
6	CBR27C17-BRG-ABT-001-2	EAST ABUTMENT DETAILS 3			
7	CBR27C17-BRG-ABT-001-3	EAST ABUTMENT DETAILS 4			
8	CBR27C17-BRG-ABT-001-4	EAST ABUTMENT DETAILS 5			
9	CBR27C17-BRG-ABT-001-5	EAST ABUTMENT DETAILS 6			
10	CBR27C17-BRG-ABT-001-6	EAST ABUTMENT DETAILS 7			
11	CBR27C17-BRG-PIR-001-1	EAST PIER DETAILS 1			
12	CBR27C17-BRG-PIR-001-2	EAST PIER DETAILS 2			
13	CBR27C17-BRG-PIR-001-3	EAST PIER DETAILS 3			
14	CBR27C17-BRG-SUP-002	FRAMING PLAN			
15	CBR27C17-BRG-PCB	MN45 PRESTRESSED CONCRETE BEAM			
16	CBR27C17-BRG-SUP-003-1	SUPERSTRUCTURE DETAILS 1			
17	CBR27C17-BRG-SUP-006-1	SUPERSTRUCTURE DETAILS 2			
18	CBR27C17-BRG-SUP-006-2	SUPERSTRUCTURE DETAILS 3			
19	CBR27C17-BRG-SUP-004	SUPERSTRUCTURE DETAILS 4			
20	CBR27C17-BRG-RAL	STRUCTURAL TUBE RAILING AND CONCRETE PARAPET			
21	CBR27C17-BRG-RAL	CONCRETE CURB			
22	CBR27C17-BRG-RAL	WIRE FENCE			
23	CBR27C17-BRG-SYS-001	CONDUIT SYSTEM			
24	CBR27C17-BRG-EXP-001	WATERPROOF EXPANSION DEVICE 1			
25	CBR27C17-BRG-EXP	WATERPROOF EXPANSION DEVICE 2			
26	CBR27C17-BRG-EXP-002-2	WATERPROOF EXPANSION DEVICE 3			
27	CBR27C17-BRG-DTL-003	APPROACH PANEL			
28	CBR27C17-BRG-DTL-001-1	DETAILS 1			
29	CBR27C17-BRG-DTL-001-2	DETAILS 2			
30	CBR27C17-BRG-DTL-001-3	DETAILS 3			
31	CBR27C17-BRG-DTL-001-4	DETAILS 4			
32	CBR27C17-BRG-DTL-001-5	DETAILS 5			

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

AECOM

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

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

DISCIPLINE: GENERAL

SHEET NAME: E0-BRG-IDX - 001

SHEET 2 OF 402

Sep. 25 2015 09:06 am V:\3400_ADC\CAD\CAD MANAGEMENT\DRAWING LIST\E1-GEN-IDX.dwg By: V-KriewaMR

CIVIL EAST

SHT #	SHEET NAME	SHEET DESCRIPTION	STATION	STATION	REV
		VOLUME 4B - BRIDGES (cont'd)			
33	CBR27C17-BRG-SUR-001-1	BRIDGE SURVEY 1			
34	CBR27C17-BRG-SUR-001-2	BRIDGE SURVEY 2			
35	CBR27C17-BRG-SUR-001-3	BRIDGE SURVEY 3			
36	CBR27C17-BRG-BOR-001-1	BRIDGE SURVEY PLAN			
37	CBR27C17-BRG-BOR-002-1	BRIDGE SURVEY PROFILE 1			
38	CBR27C17-BRG-BOR-002-2	BRIDGE SURVEY PROFILE 2			
		BRIDGE R0697 - LRT OVER BNSF RAILROAD			
1	CBRR0697-BRG-GPE-001	KEY PLAN & ELEVATION			
2	CBRR0697-BRG-GPE-002-1	GENERAL PLAN & ELEVATION 1			
3	CBRR0697-BRG-GPE-002-2	GENERAL PLAN & ELEVATION 2			
4	CBRR0697-BRG-GPE-001-1	SCHEDULE OF QUANTITIES			
5	CBRR0697-BRG-TRN-001-2	TRANSVERSE SECTION 1			
6	CBRR0697-BRG-TRN-001-3	TRANSVERSE SECTION 2			
7	CBRR0697-BRG-SUP-001-1	BRIDGE LAYOUT 1			
8	CBRR0697-BRG-SUP-001-2	BRIDGE LAYOUT 2			
9	CBRR0697-BRG-SUP-001-3	BRIDGE LAYOUT 3			
10	CBRR0697-BRG-ABT-001-1	SOUTH ABUTMENT DETAILS 1			
11	CBRR0697-BRG-ABT-001-2	SOUTH ABUTMENT DETAILS 2			
12	CBRR0697-BRG-ABT-001-3	SOUTH ABUTMENT DETAILS 3			
13	CBRR0697-BRG-ABT-001-4	SOUTH ABUTMENT DETAILS 4			
14	CBRR0697-BRG-ABT-002-1	NORTH ABUTMENT DETAILS 1			
15	CBRR0697-BRG-ABT-002-2	NORTH ABUTMENT DETAILS 2			
16	CBRR0697-BRG-ABT-002-3	NORTH ABUTMENT DETAILS 3			
17	CBRR0697-BRG-ABT-002-4	NORTH ABUTMENT DETAILS 4			
18	CBRR0697-BRG-ABT-002-5	NORTH ABUTMENT DETAILS 5			
19	CBRR0697-BRG-ABT-002-6	NORTH ABUTMENT DETAILS 6			
20	CBRR0697-BRG-PIR-001-1	PIER 1, 2 & 3 DETAILS 1			
21	CBRR0697-BRG-PIR-001-2	PIER 1, 2 & 3 DETAILS 2			
22	CBRR0697-BRG-PIR-001-6	PIER 4 & 5 DETAILS 1			
23	CBRR0697-BRG-PIR-001-7	PIER 4 & 5 DETAILS 2			
24	CBRR0697-BRG-PIR-001-11	PIER 6 & 7 DETAILS 1			
25	CBRR0697-BRG-PIR-001-12	PIER 6 & 7 DETAILS 2			
26	CBRR0697-BRG-PIR-001-16	PIER 8 DETAILS 1			
27	CBRR0697-BRG-PIR-001-17	PIER 8 DETAILS 2			
28	CBRR0697-BRG-PIR-001-21	PIER 9 DETAILS 1			
29	CBRR0697-BRG-PIR-001-22	PIER 9 DETAILS 2			
30	CBRR0697-BRG-SUP-002-1	FRAMING PLAN 1			
31	CBRR0697-BRG-SUP-002-3	FRAMING PLAN 2			
32	CBRR0697-BRG-SUP-002-3	FRAMING PLAN 3			
33	CBRR0697-BRG-PCB	MN54" PRESTRESSED CONCRETE BEAM 1			
34	CBRR0697-BRG-PCB	MN54" PRESTRESSED CONCRETE BEAM 2			
35	CBRR0697-BRG-PCB	MN54" PRESTRESSED CONCRETE BEAM 3			
36	CBRR0697-BRG-PCB	MN54" PRESTRESSED CONCRETE BEAM 4			
37	CBRR0697-BRG-SUP-003-1	SUPERSTRUCTURE DETAILS 1			
38	CBRR0697-BRG-SUP-003-2	SUPERSTRUCTURE DETAILS 2			
39	CBRR0697-BRG-SUP-003-3	SUPERSTRUCTURE DETAILS 3			
40	CBRR0697-BRG-SUP-003-4	SUPERSTRUCTURE DETAILS 4			
41	CBRR0697-BRG-SUP-003-5	SUPERSTRUCTURE DETAILS 5			
42	CBRR0697-BRG-SUP-003-6	SUPERSTRUCTURE DETAILS 6			
43	CBRR0697-BRG-SUP-003-7	SUPERSTRUCTURE DETAILS 7			
44	CBRR0697-BRG-SUP-003-8	SUPERSTRUCTURE DETAILS 8			
45	CBRR0697-BRG-RAL	CONCRETE BARRIER (TYPE P-4, TL-4)			
46	CBRR0697-BRG-RAL	CONCRETE CURB			
47	CBRR0697-BRG-RAL	WIRE FENCE (DIAMOND MESH SAFETY RAIL)			
48	CBRR0697-BRG-SYS-001	CONDUIT SYSTEM			
49	CBRR0697-BRG-DRN-001-1	DRAINAGE SYSTEM DETAILS 1			
50	CBRR0697-BRG-DRN-001-2	DRAINAGE SYSTEM DETAILS 2			
51	CBRR0697-BRG-EXP-001	WATERPROOF EXPANSION DEVICE			
52	CBRR0697-BRG-DTL-001-1	DETAILS 1			
53	CBRR0697-BRG-DTL-001-2	DETAILS 2			
54	CBRR0697-BRG-DTL-001-3	DETAILS 3			
55	CBRR0697-BRG-DTL-001-4	DETAILS 4			
56	CBRR0697-BRG-DTL-001-5	DETAILS 5			
57	CBRR0697-BRG-SUR-001-1	BRIDGE SURVEY 1			
58	CBRR0697-BRG-SUR-001-2	BRIDGE SURVEY 2			
59	CBRR0697-BRG-BOR-001-1	BRIDGE SURVEY PLAN			
60	CBRR0697-BRG-BOR-002-1	BRIDGE SURVEY PROFILE 1			
61	CBRR0697-BRG-BOR-002-2	BRIDGE SURVEY PROFILE 2			
62	CBRR0697-BRG-BOR-002-3	BRIDGE SURVEY PROFILE 3			
63	CBRR0697-BRG-BOR-002-4	BRIDGE SURVEY PROFILE 4			
64	CBRR0697-BRG-STG-001	STAGING PLAN			

CIVIL EAST

SHT #	SHEET NAME	SHEET DESCRIPTION	STATION	STATION	REV
		5TH AVENUE AND 7TH STREET - BRIDGE 27C18			
1	CBR27C18-BRG-GPE-001	KEY PLAN			
2	CBR27C18-BRG-GPE-002	GENERAL PLAN & ELEVATION 1			
3	CBR27C18-BRG-GPE-003	GENERAL PLAN & ELEVATION 2			
4	CBR27C18-BRG-GPE-004	GENERAL PLAN & ELEVATION 3			
5	CBR27C18-BRG-GPE-005	GENERAL PLAN & ELEVATION 4			
6	CBR27C18-BRG-TRN-001	SCHEDULE OF QUANTITIES			
7	CBR27C18-BRG-TRN-002	TRANSVERSE SECTION 1			
8	CBR27C18-BRG-TRN-003	TRANSVERSE SECTION 2			
9	CBR27C18-BRG-WPL-001	BRIDGE LAYOUT 1			
10	CBR27C18-BRG-WPL-002	BRIDGE LAYOUT 2			
11	CBR27C18-BRG-WPL-003	BRIDGE LAYOUT 3			
12	CBR27C18-BRG-WPL-004	BRIDGE LAYOUT 4			
13	CBR27C18-BRG-WPL-005	BRIDGE LAYOUT 5			
14	CBR27C18-BRG-ABT-001	SOUTH ABUTMENT DETAILS 1			
15	CBR27C18-BRG-ABT-002	SOUTH ABUTMENT DETAILS 2			
16	CBR27C18-BRG-ABT-003	SOUTH ABUTMENT DETAILS 3			
17	CBR27C18-BRG-ABT-004	SOUTH ABUTMENT DETAILS 4			
18	CBR27C18-BRG-PIR-011	PIER 1 DETAILS 1			
19	CBR27C18-BRG-PIR-012	PIER 1 DETAILS 2			
20	CBR27C18-BRG-PIR-015	PIER 2 DETAILS 1			
21	CBR27C18-BRG-PIR-007	PIER 2 DETAILS 2			
22	CBR27C18-BRG-PIR-016	PIER 3 DETAILS 1			
23	CBR27C18-BRG-PIR-008	PIER 3 DETAILS 2			
24	CBR27C18-BRG-PIR-017	PIER 4 DETAILS 1			
25	CBR27C18-BRG-PIR-009	PIER 4 DETAILS 2			
26	CBR27C18-BRG-PIR-018	PIER 5 DETAILS 1			
27	CBR27C18-BRG-PIR-010	PIER 5 DETAILS 2			
28	CBR27C18-BRG-PIR-013	PIER 6 DETAILS 1			
29	CBR27C18-BRG-PIR-014	PIER 6 DETAILS 2			
30	CBR27C18-BRG-PIR-001	PIER 7 & 8 DETAILS 1			
31	CBR27C18-BRG-PIR-003	PIER 7 & 8 DETAILS 2			
32	CBR27C18-BRG-PIR-005	PIER 9 DETAILS 1			
33	CBR27C18-BRG-PIR-006	PIER 9 DETAILS 2			
34	CBR27C18-BRG-PIR-002	PIER 10 DETAILS 1			
35	CBR27C18-BRG-PIR-004	PIER 10 DETAILS 2			
36	CBR27C18-BRG-PEL-001	EXISTING PIER 9 DETAILS 1			
37	CBR27C18-BRG-PEL-002	EXISTING PIER 9 DETAILS 2			
38	CBR27C18-BRG-FRP-001	FRAMING PLAN 1			
39	CBR27C18-BRG-FRP-002	FRAMING PLAN 2			
40	CBR27C18-BRG-FRP-003	FRAMING PLAN 3			
41	CBR27C18-BRG-FRP-004	FRAMING PLAN 4			
42	CBR27C18-BRG-FRP-005	FRAMING PLAN 5			
43	CBR27C18-BRG-FRP-006	FRAMING PLAN 6			
44	CBR27C18-BRG-PCB-001	MN45" PRESTRESSED CONCRETE BEAM (PRETENSIONED) MN45-84			
45	CBR27C18-BRG-PCB-002	MN45" PRESTRESSED CONCRETE BEAM (PRETENSIONED) MN45-82			
46	CBR27C18-BRG-PCB-003	MN45" PRESTRESSED CONCRETE BEAM (PRETENSIONED) MN45-89			
47	CBR27C18-BRG-PCB-004	MN45" PRESTRESSED CONCRETE BEAM (PRETENSIONED) MN45-92			
48	CBR27C18-BRG-PCB-005	MN45" PRESTRESSED CONCRETE BEAM (PRETENSIONED) MN45-62			
49	CBR27C18-BRG-SUP-006	SUPERSTRUCTURE DETAILS 1			
50	CBR27C18-BRG-SUP-007	SUPERSTRUCTURE DETAILS 2			
51	CBR27C18-BRG-SUP-008	SUPERSTRUCTURE DETAILS 3			
52	CBR27C18-BRG-SUP-009	SUPERSTRUCTURE DETAILS 4			
53	CBR27C18-BRG-SUP-010	SUPERSTRUCTURE DETAILS 5			
54	CBR27C18-BRG-SUP-011	SUPERSTRUCTURE DETAILS 6			
55	CBR27C18-BRG-SUP-005	SUPERSTRUCTURE DETAILS 7			
56	CBR27C18-BRG-SUP-012	SUPERSTRUCTURE DETAILS 8			
57	CBR27C18-BRG-SUP-013	SUPERSTRUCTURE DETAILS 9			
58	CBR27C18-BRG-SDT-006	SUPERSTRUCTURE DETAILS 10			
59	CBR27C18-BRG-SDT-005	SUPERSTRUCTURE DETAILS 11			
60	CBR27C18-BRG-RAL-001	WIRE FENCE (DIAMOND MESH SAFETY RAIL)			
61	CBR27C18-BRG-RAL-002	CONCRETE CURB			
62	CBR27C18-BRG-SDT-004	WATERPROOF EXPANSION DEVICE			
63	CBR27C18-BRG-SDT-001	DETAILS 1			
64	CBR27C18-BRG-SDT-002	DETAILS 2			
65	CBR27C18-BRG-SDT-003	DETAILS 3			
66	CBR27C18-BRG-SDT-007	DETAILS 4			

CIVIL EAST

SHT #	SHEET NAME	SHEET DESCRIPTION	STATION	STATION	REV
67	CBR27C18-BRG-SDT-008	DETAILS 5			
68	CBR27C18-BRG-SDT-009	DETAILS 6			
69	CBR27C18-BRG-SUR-001	BRIDGE SURVEY 1			
70	CBR27C18-BRG-SUR-002	BRIDGE SURVEY 2			
71	CBR27C18-BRG-BOR-001	BRIDGE SURVEY PLAN 1			
72	CBR27C18-BRG-BOR-002	BRIDGE SURVEY PLAN 2			
73	CBR27C18-BRG-BOR-003	BRIDGE SURVEY PLAN 3			
74	CBR27C18-BRG-BOR-004	BRIDGE SURVEY PROFILE 1			
75	CBR27C18-BRG-BOR-005	BRIDGE SURVEY PROFILE 2			
76	CBR27C18-BRG-BOR-006	BRIDGE SURVEY PROFILE 3			
77	CBR27C18-BRG-BOR-007	BRIDGE SURVEY PROFILE 4			
78	CBR27C18-BRG-BOR-008	BRIDGE SURVEY PROFILE 5			
79	CBR27C18-BRG-BOR-009	BRIDGE SURVEY PROFILE 6			
80	CBR27C18-BRG-BOR-010	BRIDGE SURVEY PROFILE 7			
		MN&S RR - PIER PROTECTION			
1	E1-STU-PPR-GEN-KEY-001	KEY MAP			
1	EX2-STU-PPR-MNSR-FRT-GPE-001	GENERAL PLAN AND ELEVATION			
2	EX2-STU-PPR-MNSR-FRT-DTL-001	PIER PROTECTION DETAILS			
3	EX2-STU-PPR-MNSR-FRT-PIR-001	VISUAL QUALITY			
		BRIDGE 27037 - PIER PROTECTION			
1	EX3-STU-PPR-WLKS-VEH-GPE-001	GENERAL PLAN AND ELEVATION			
2	EX3-STU-PPR-WLKS-VEH-DTL-001	PIER PROTECTION DETAILS 1			
3	EX3-STU-PPR-WLKS-VEH-DTL-002	PIER PROTECTION DETAILS 2			
4	EX3-STU-PPR-WLKS-VEH-PIR-001	VISUAL QUALITY			
		BRIDGE 27037 - BRIDGE MODIFICATIONS			
1	CBR27037-BRM-GPE-001	EXISTING GENERAL PLAN AND SECTIONS			
2	CBR27037-BRM-TRN-001	SCHEDULE OF QUANTITIES			
3	CBR27037-BRM-DTL-001	REMOVAL DETAILS			
4	CBR27037-BRM-GPE-002	PROPOSED GENERAL PLAN AND SECTIONS			
5	CBR27037-BRM-DTL-002	SIDEWALK DETAILS & REINFORCEMENT WEST ABUT. TO PIER 2			
6	CBR27037-BRM-DTL-003	SIDEWALK DETAILS & REINFORCEMENT PIER 2 TO EAST ABUT.			
7	CBR27037-BRM-DTL-004	ORNAMENTAL METAL RAILING			
8	CBR27037-BRM-DTL-005	STRUCTURAL TUBE RAILING DETAILS			
9	CBR27037-BRM-DTL-006	ORNAMENTAL METAL RAILING ELEVATIONS			
10	CBR27037-BRM-DTL-007	NORTH RAIL ELEVATION			
11	CBR27037-BRM-DTL-008	SOUTH RAIL ELEVATIONS			
12	CBR27037-BRM-DTL-009	SIDEWALK DETAILS			
13	CBR27037-BRM-DTL-010	AS-BUILT BRIDGE DATA			
		BRIDGE 27667 - PIER PROTECTION			
1	EX3-STU-PPR-BRHR-VEH-GPE-001	GENERAL PLAN AND ELEVATION			
2	EX3-STU-PPR-BRHR-VEH-DTL-001	PIER PROTECTION DETAILS 1			
3	EX3-STU-PPR-BRHR-VEH-DTL-002	PIER PROTECTION DETAILS 2			
4	EX3-STU-PPR-BRHR-VEH-PIR-001	VISUAL QUALITY			
		BRIDGE 27758 - BRIDGE MODIFICATIONS			
1	CBR27758-BRM-GPE-001	EXISTING GENERAL PLAN AND SECTIONS			
2	CBR27758-BRM-TRN-001	SCHEDULE OF QUANTITIES			
3	CBR27758-BRM-DTL-001	REMOVAL DETAILS			
4	CBR27758-BRM-GPE-002	PROPOSED GENERAL PLAN AND SECTION			
5	CBR27758-BRM-DTL-002	SIDEWALK DETAILS AND REINFORCEMENT			
6	CBR27758-BRM-DTL-003	WIRE FENCE			
7	CBR27758-BRM-DTL-004	SIDEWALK DETAILS			
8	CBR27758-BRM-SUP-001	FRAMING PLAN			
9	CBR27758-BRM-DTL-005	BOLTED FLANGE TO STIFFENER DETAILS			
10	CBR27758-BRM-DTL-006	SITFFENER DETAILS			
11	CBR27758-BRM-DTL-007	AS-BUILT BRIDGE DATA			
		BRIDGE 27770C - PIER PROTECTION			
1	EX4-STU-PPR-T394-VEH-GPE-001	GENERAL PLAN AND ELEVATION			
2	EX4-STU-PPR-T394-VEH-DTL-001	PIER PROTECTION DETAILS 1			
3	EX4-STU-PPR-T394-VEH-DTL-002	PIER PROTECTION DETAILS 2			
4	EX4-STU-PPR-T394-VEH-DTL-003	PIER PROTECTION DETAILS 3			
5	EX4-STU-PPR-T394-VEH-DTL-004	PIER PROTECTION DETAILS 4			
6	EX4-STU-PPR-T394-VEH-PIR-001	VISUAL QUALITY 1			
7	EX4-STU-PPR-T394-VEH-PIR-002	VISUAL QUALITY 2			

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

AECOM

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4B
BRIDGES
VOLUME INDEX OF PLAN SHEETS
SHEET 2

DISCIPLINE: GENERAL

SHEET NAME: E0-BRG-IDX - 002

SHEET 3 OF 402

Sep. 25 2015 09:07 am V:\3400_ADC\CAD\CAD MANAGEMENT\DRAWING LIST\E1-GEN-IDX.dwg By: V-KriewaMR

CIVIL EAST

SHT #	SHEET NAME	SHEET DESCRIPTION	STATION	STATION	REV
		VOLUME 4B - BRIDGES (cont'd)			
		BRIDGE 27B01 - PIER PROTECTION			
1	EX4-STU-PPR-VWMB-VEH-GPE-001	GENERAL PLAN AND ELEVATION			
2	EX4-STU-PPR-VWMB-VEH-DTL-001	PIER PROTECTION DETAILS			
3	EX4-STU-PPR-VWMB-VEH-PIR-001	VISUAL QUALITY			
		BRIDGES 27725-27729 - PIER PROTECTION			
1	EX4-STU-PPR-ALL94-VEH-GPE-001	GENERAL PLAN			
2	EX4-STU-PPR-ALL94-VEH-GPE-002	GENERAL ELEVATION AND DETAILS			
3	EX4-STU-PPR-ALL94-VEH-DTL-001	BRIDGE 27727 PIER PROTECTION DETAILS			
4	EX4-STU-PPR-ALL94-VEH-DTL-002	BRIDGE 27729 & 27726 PIER PROTECTION DETAILS			
5	NOT USED				
6	EX4-STU-PPR-ALL94-VEH-PIR-002	BRIDGE 27729 & 27726 VISUAL QUALITY			

CIVIL EAST

SHT #	SHEET NAME	SHEET DESCRIPTION	STATION	STATION	REV

CIVIL EAST

SHT #	SHEET NAME	SHEET DESCRIPTION	STATION	STATION	REV

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

AECOM

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

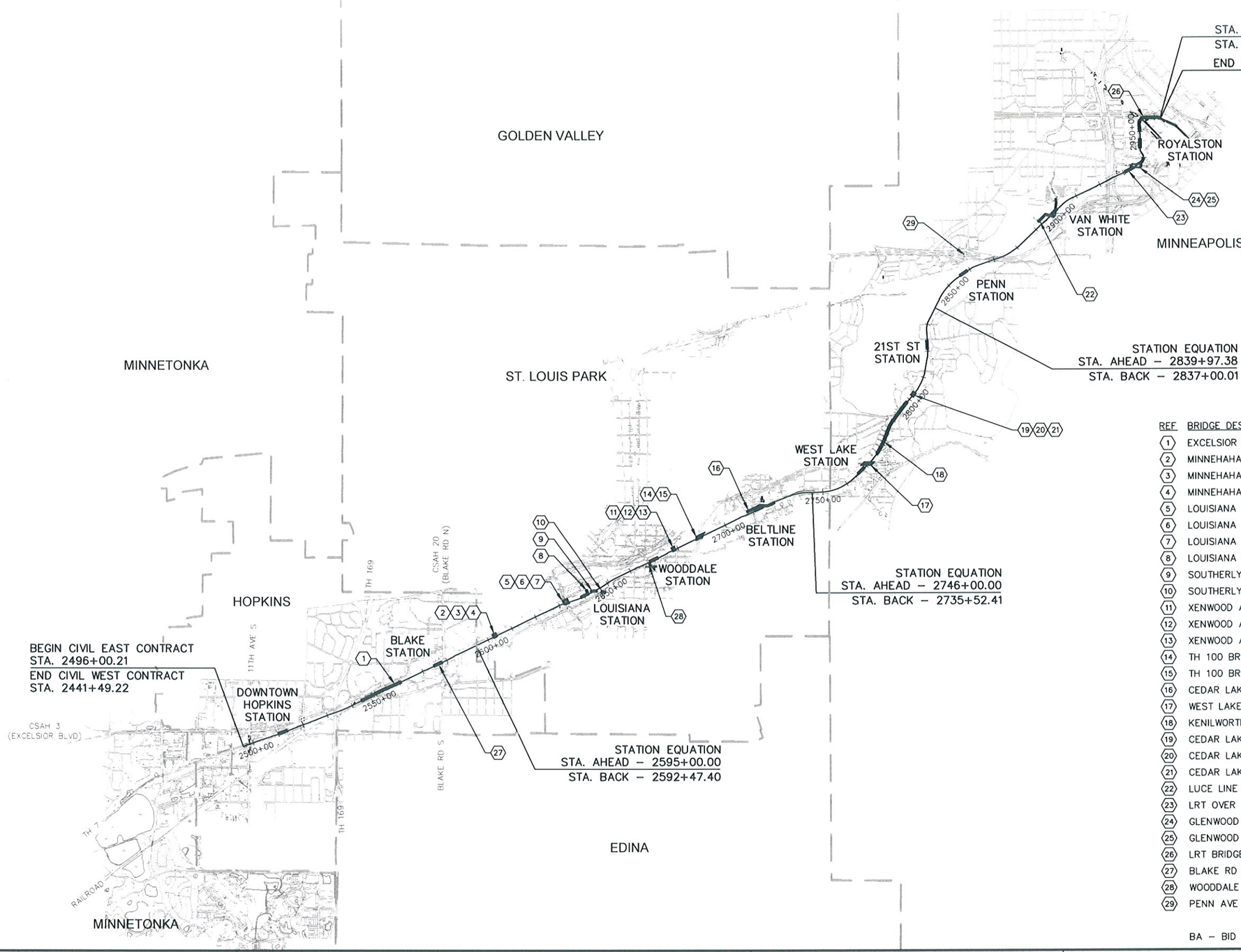
CIVIL EAST - VOLUME 4B
BRIDGES
VOLUME INDEX OF PLAN SHEETS
SHEET 3

DISCIPLINE: GENERAL

SHEET NAME: E0-BRG-IDX - 003

SHEET 4 OF 402

Sep. 25 2015 09:07 am V:\3400_ADC\CAD\CAD MANAGEMENT\DRAWING LIST\E1-GEN-IDX.dwg By: V-KriewaMR



REF	BRIDGE DESCRIPTION	BRIDGE NUMBER
1	EXCELSIOR BLVD BRIDGE	27C10
2	MINNEHAHA CREEK BRIDGE – FREIGHT	R0688
3	MINNEHAHA CREEK BRIDGE – TRAIL	R0687
4	MINNEHAHA CREEK BRIDGE – LRT	R0689
5	LOUISIANA AVE BRIDGE – FREIGHT	27C12
6	LOUISIANA AVE BRIDGE – TRAIL	27C11
7	LOUISIANA AVE BRIDGE – LRT	27C13
8	LOUISIANA STATION UNDERPASS	R0690
9	SOUTHERLY CONNECTOR BRIDGE OVER LRT	R0691
10	SOUTHERLY CONNECTOR BRIDGE OVER OXFORD ST	27C14
11	XENWOOD AVE – FREIGHT	XXXXX BA
12	XENWOOD AVE – TRAIL	XXXXX BA
13	XENWOOD AVE – LRT	XXXXX BA
14	TH 100 BRIDGE RELOCATION – FREIGHT	27W34
15	TH 100 BRIDGE – LRT	27303
16	CEDAR LAKE BRIDGE – TRAIL	R0692
17	WEST LAKE ST BRIDGE MODIFICATIONS	27037
18	KENILWORTH TUNNEL	27C15
19	CEDAR LAKE CHANNEL BRIDGE – FREIGHT	R0694
20	CEDAR LAKE CHANNEL BRIDGE – LRT	R0693
21	CEDAR LAKE CHANNEL BRIDGE – TRAIL	R06xx
22	LUCE LINE BRIDGE – TRAIL	R0696
23	LRT OVER BNSF BRIDGE	R0697
24	GLENWOOD AVE BRIDGE – WEST	27C16
25	GLENWOOD AVE BRIDGE – EAST	27C17
26	LRT BRIDGE OVER 5TH AVE & 7TH ST	27C18
27	BLAKE RD PEDESTRIAN UNDERPASS	27J60 BA
28	WOODDALE TRAIL UNDERPASS	27J61 BA
29	PENN AVE BRIDGE MODIFICATIONS	27758 BA

BA – BID ALTERNATE

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

AECOM

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4B
GENERAL
KEY MAP

DISCIPLINE: GENERAL

SHEET NAME: E0-GEN-KEY - 001

SHEET 5 OF 402

Sep. 21 2015 02:44 pm V:\3400_ADC\CAD\CAD MANAGEMENT\DRAWING LIST\E0-GEN-KEY.dwg By: V-KriewaMR

TRACK LINETYPES

- ROADWAY ℄
- TRACK ℄ (LRT)
- TRACK ℄ (FRT)
- RETAINING WALL
- BALLAST CURB
- TUNNEL WALL
- FENCE
- EX ROW
- PROP ROW
- PROP TCE
- PROP PE
- FENCE / RAILING
- ID ID INTRUSION DETECTION

CIVIL LINETYPES

- ROADWAY ℄
- TRACK ℄ (LRT)
- TRACK ℄ (FRT)
- RETAINING WALL
- BALLAST CURB
- TUNNEL WALL
- CONCRETE CURB AND GUTTER
- TRAIL
- SIDEWALK
- DRIVEWAY
- BRIDGE
- SAWCUT
- FENCE
- DELINEATED WETLAND
- WATER EDGE
- EX ROW
- PROP ROW
- PROP TCE
- PROP PE
- CROSSWALK
- STOP BAR
- MEDIAN NOSE

TRACK SYMBOLS

- PROPOSED DIRECTIONAL LANE USE
- EXISTING DIRECTIONAL LANE USE
- PEDESTRIAN FLASHER
- AUTOMATIC GATE
- RAIL TURNOUT
- RAIL CROSSOVER (DOUBLE)
- RAIL CROSSOVER (SINGLE)
- POINT OF SWITCH (PS)
- OCS POLE FOUNDATION
- RAIL LUBRICATOR
- POINT OF INTERSECTION (PI) OF TURNOUT (TO)
- (W2-200) RAILROAD CURVE NUMBER

NOTE:
ALL TURNOUTS AND CROSSOVERS TO BE EQUIPPED WITH POWER SWITCH MACHINES AND SWITCH HEATERS

CIVIL SYMBOLS

- ACCESSIBLE PEDESTRIAN CURB RAMP (DESIGN VARIES)
- PROPOSED DIRECTIONAL LANE USE
- EXISTING DIRECTIONAL LANE USE
- AUTOMATIC GATE
- HANDICAP PARKING STALL
- TACTILE WARNING STRIP
- TPSS BUILDING (TPSS-SW###)
- SIGNAL OR INTERMEDIATE OR PLATFORM OR XING OR TUNNEL HOUSE OR ANY COMBINATION OF THESE

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 MFRA, INC.
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.

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

AECOM

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4B
GENERAL
LEGEND AND ABBREVIATIONS
SHEET 1

DISCIPLINE: GENERAL

SHEET NAME: E0-GEN-NTS - 001

SHEET 6 OF 402

Sep. 21 2015 02:44 pm V:\3400_ADC\CAD\CAD MANAGEMENT\DRAWING LIST\E0-GEN-NTS.dwg By: V-KriewaMR

ABBREVIATIONS

AD	ALGEBRAIC DIFFERENCE
AVE	AVENUE
BGN	BEGIN
BP	BEGINNING POINT
BVCE	BEGINNING VERTICAL CURVE ELEVATION
BVCS	BEGINNING VERTICAL CURVE STATION
BLVD	BOULEVARD
BNSF	BURLINGTON NORTHERN SANTA FE RAILWAY
C&G	CURB AND GUTTER
℄	CENTERLINE
CIR	CIRCLE
CP	CANADIAN PACIFIC
CPRAIL	CANADIAN PACIFIC RAILWAY
CS	CURVE TO SPIRAL
CSAH	COUNTY STATE AID HIGHWAY
D&U	DRAINAGE AND UTILITY
DF	DIRECT FIXATION
DR	DRIVE
DTL	DETAIL
DWY	DRIVEWAY
E	EAST
Eq	ACTUAL SUPERELEVATION (INCHES)
EB	EAST BOUND
EL or ELEV	ELEVATION
EP	END POINT
ESMT	EASEMENT
Eu	UNBALANCED SUPERELEVATION (INCHES)
EVCE	ENDING VERTICAL CURVE ELEVATION
EVCS	ENDING VERTICAL CURVE STATION
EX	EXISTING
HCRRA	HENNEPIN COUNTY REGIONAL RAILROAD AUTHORITY
LH	LEFT HAND
LN	LANE
LRT	LIGHT RAIL TRANSIT
L_c	CURVE LENGTH (FEET)
L_s	SPIRAL LENGTH (FEET)
MIN	MINIMUM
MPH	MILES PER HOUR
MPLS	CITY OF MINNEAPOLIS
MPRB	MINNEAPOLIS PARK AND RECREATION BOARD
N	NORTH
NB	NORTH BOUND
NIC	NOT IN CONTRACT
NO	NUMBER
OMF	OPERATIONS AND MAINTENANCE FACILITY
OCS	OVERHEAD CONTACT SYSTEM
OH	OVERHEAD
PC	POINT OF CURVE
PE	PERMANENT EASEMENT
PITO	POINT OF INTERSECTION OF TURNOUT
PKWY	PARKWAY
POT	POINT ON TANGENT
PROP	PROPOSED
PS	POINT OF SWITCH
PT	POINT OF TANGENT
PVI	POINT OF VERTICAL INTERSECTION
R	RADIUS (FEET)
RD	ROAD
RL	RAIL LUBRICATOR
r	RATE OF CHANGE VERTICAL CURVE
RH	RIGHT HAND
ROW	RIGHT OF WAY
S	SOUTH
SB	SOUTH BOUND
SC	SPIRAL TO CURVE
SIG-COMM	SIGNAL COMMUNICATION
ST	STREET
ST	SPIRAL TO TANGENT
STA	STATION
TCE	TEMPORARY CONSTRUCTION EASEMENT
TH	TRUNK HIGHWAY
THRU	THROUGH
TOR	TOP OF RAIL
TPSS	TRACTION POWER SUBSTATION
TRK	TRACK
TS	TANGENT TO SPIRAL
TYP	TYPICAL
UG	UNDERGROUND
V	DESIGN VELOCITY (MPH)
VC	VERTICAL CURVE
W	WEST
WB	WEST BOUND

TRAIL INDEX

ABBREVIATED NAME	FULL NAME / LOCATION
TRAIL 1	UNDER RED CIRCLE DR, LRT, AND YELLOW CIRCLE DR
TRAIL 2	FROM TRAIL 1 TO GREEN CIRCLE DR
TRAIL 3	OPUS STATION ACCESS FROM BREN RD E
TRAIL 4	FROM BREN RD W TO TRAIL 5
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 TRAIL FROM CEDAR LAKE LRT REGIONAL TRAIL TO TYLER AVE.
TRAIL D	10' CONNECTOR TRAIL/BELTLINE STATION TO CEDAR LAKE LRT REGIONAL TRAIL
KENILWORTH TRAIL	KENILWORTH TRAIL (MAIN)/W LAKE ST TO PENN STATION
CEDAR LAKE TRAIL	CEDAR LAKE TRAIL (MAIN)/PENN STATION TO TH 394
TRAIL E	KENILWORTH TRAIL (SECONDARY)/EAST OF W LAKE ST
TRAIL F	KENILWORTH TRAIL (SECONDARY)/WEST OF CEDAR LAKE PKWY
TRAIL G	KENILWORTH TRAIL (SECONDARY)/WEST OF PENN STATION
TRAIL G	CEDAR LAKE TRAIL (SECONDARY)/EAST OF PENN STATION
TRAIL H	10' CONNECTOR TRAIL/EAST OF PENN STATION TO KENWOOD PKWY
TRAIL I	NOT USED
CEDAR LAKE TRAIL	CEDAR LAKE TRAIL (MAIN)/AT-GRADE CROSSING AT PENN STATION
TRAIL J	CEDAR LAKE TRAIL (SECONDARY)/NORTHWEST OF PENN STATION
TRAIL K	CEDAR LAKE TRAIL (SECONDARY)/NORTHWEST OF PENN STATION
TRAIL L	CEDAR LAKE TRAIL (SECONDARY)/EAST OF PENN STATION
TRAIL M	NOT USED
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
TRAIL P	8' CONNECTOR TRAIL FROM CEDAR LAKE TRAIL TO LOUISIANA AVE
TRAIL Q	10' CONNECTOR TRAIL FROM CEDAR LAKE TRAIL TO TH 7 SERVICE ROAD
TRAIL R	20' CONNECTOR TRAIL FROM VAN WHITE STATION TO CEDAR LAKE TRAIL
TRAIL S	NOT USED
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
TRAIL V	CONNECTOR TRAIL TO LUCE LINE REGIONAL TRAIL WEST OF LIGHT RAIL
TRAIL W	CONNECTOR TRAIL TO LUCE LINE REGIONAL TRAIL WEST OF LIGHT RAIL

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

AECOM

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

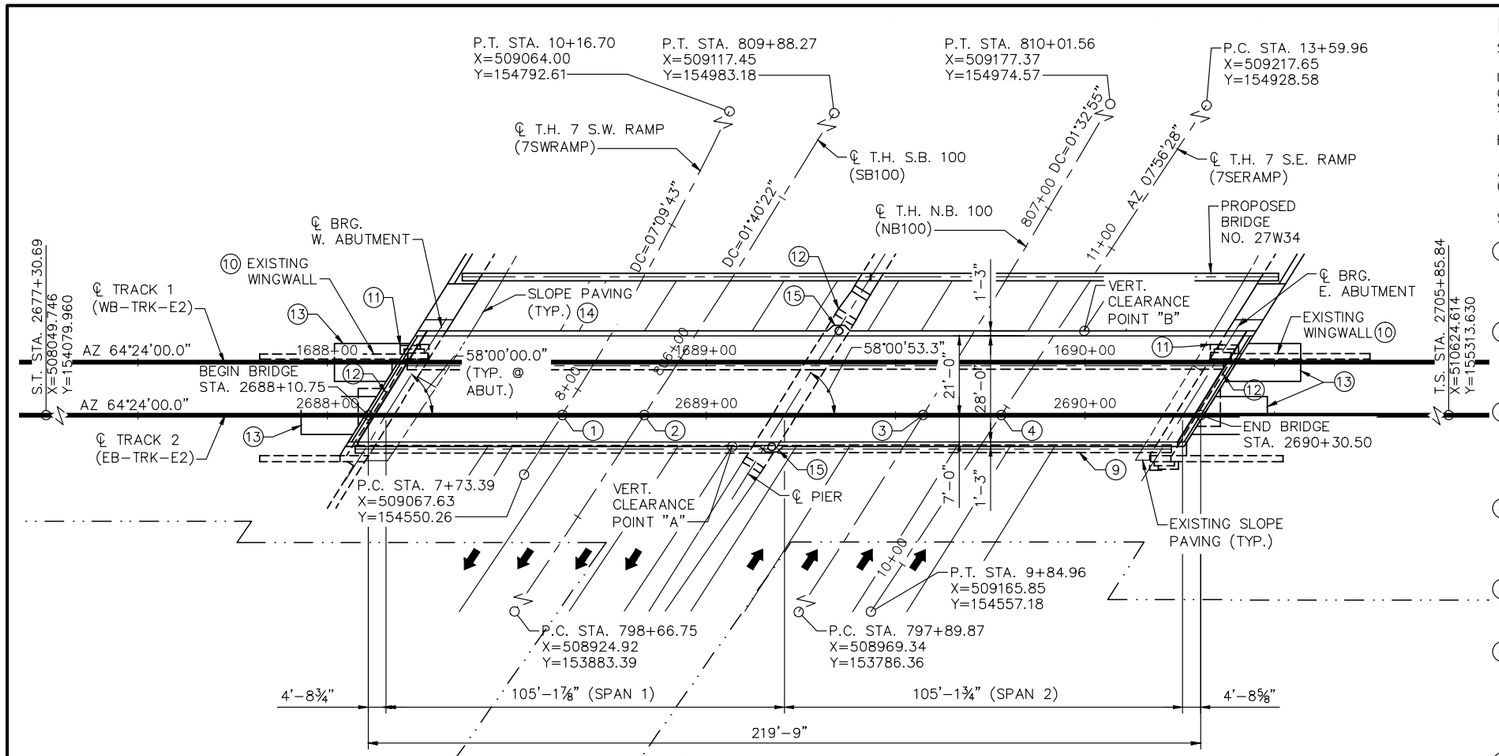
CIVIL EAST - VOLUME 4B
GENERAL
LEGEND AND ABBREVIATIONS
SHEET 2

DISCIPLINE: GENERAL

SHEET NAME: E0-GEN-NTS - 002

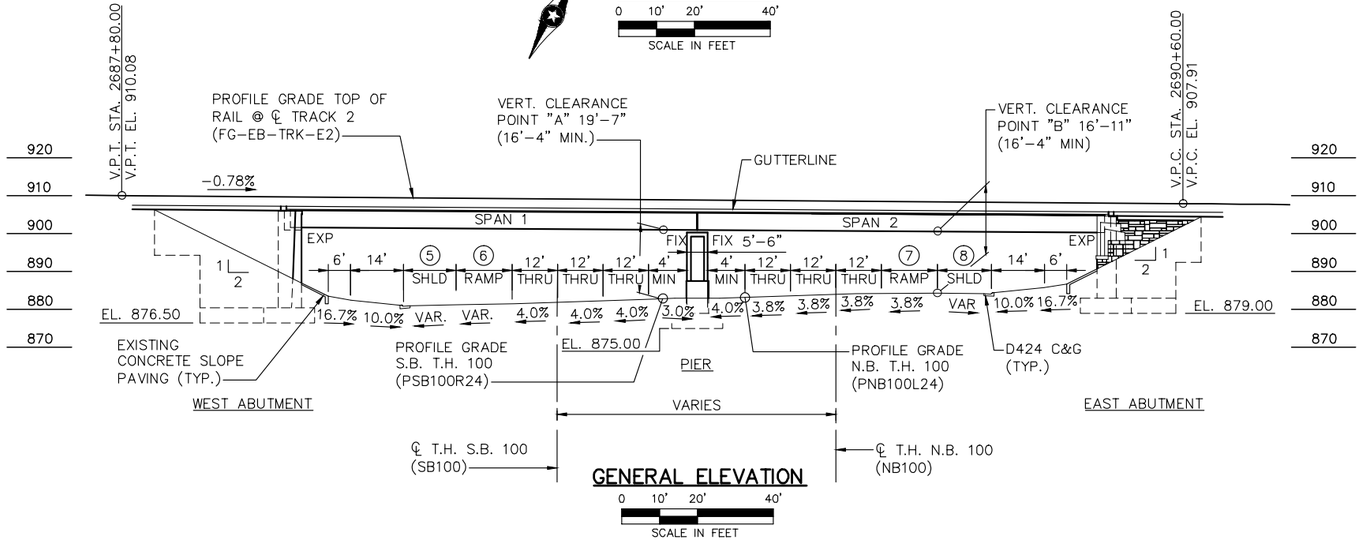
SHEET 7 OF 402

Sep. 21 2015 02:44 pm V:\3400_ADC\CAD\CAD MANAGEMENT\DRAWING LIST\E0-GEN-NTS.dwg By: V-KriewaMR



GENERAL PLAN

0 10' 20' 40'
SCALE IN FEET



GENERAL ELEVATION

0 10' 20' 40'
SCALE IN FEET

NOTES:

SEE BRIDGE SURVEY SHEET FOR INPLACE UTILITIES.

UTILITIES TO BE MOVED OR ADDED DURING THE CONSTRUCTION OF BRIDGE 27303 SHALL BE INCORPORATED INTO THIS PLAN SET DURING FINAL DESIGN.

EXISTING SUBSTRUCTURES SET PARALLEL AT AZ 6°23'06.67"

ABUTMENT EXTENSIONS AZIMUTH SET TO 58°00'0.0" SKEW TO ℄ TRACK 2 TO MATCH EXISTING BRIDGE NO. 27303 SKEW.

SEE SHEET NO. 32–39 FOR PROPOSED STAGING.

1. ℄ TRACK 2 (EB–TRK–E2) P.O.T. 2688+61.96
   ℄ T.H. 7 S.W. RAMP (7SWRAMP) P.O.C. 7+92.04
   X = 509,069.96 Y = 154,568.76
   Δ = 57°52'43.6" (T.T.C.)
2. ℄ TRACK 2 (EB–TRK–E2) P.O.T. 2688+83.63
   ℄ T.H. S.B. 100 (SB100) P.O.C. 805+82.02
   X = 509,089.502 Y = 154,578.128
   Δ = 57°03'17.6" (T.T.C.)
3. CONTROL POINT 1
   ℄ TRACK 2 (EB–TRK–E2) P.O.T. 2689+57.19
   ℄ T.H. N.B. 100 (NB100) P.O.C. 806+36.12
   X = 509,155.844 Y = 154,609.913
   Δ = 58°11'31.4" (T.T.C.)
4. ℄ TRACK 2 (EB–TRK–E2) P.O.T. 2689+77.82
   ℄ T.H. 7 S.E. RAMP (7SERAMP) P.O.T. 10+47.20
   X = 509,174.44 Y = 154,618.83
   Δ = 56°27'31.6"
5. VARIES FROM 6.00' @ ℄ T.H. S.B. 100 (SB100) STA. 804+95.58 TO 2.02' @ STA. 807+00.42. CROSS SLOPE VARIES FROM 4.0% @ STA. 805+42 TO 6.0% @ STA. 806+38.
6. VARIES FROM 12.00' @ ℄ T.H. S.B. 100 (SB100) STA. 804+95.58 TO 26.64' @ STA. 807+00.42. CROSS SLOPE VARIES FROM 4.0% @ STA. 805+42 TO 6.0% @ STA. 806+38. VARYING CROSS SLOPE ONLY APPLIES TO THE 12.00' OF RAMP WIDTH ADJACENT TO THE SHOULDER. THE BALANCE ADJACENT TO THE THRU LANE IS 4.0%.
7. VARIES FROM 12.00' PRIOR TO ℄ T.H. N.B. 100 (NB100) STA. 806+59.82 TO 20.00' @ STA. 808+01.83.
8. VARIES FROM 10.00' PRIOR TO ℄ T.H. N.B. 100 (NB100) STA. 806+59.82 TO 2.00' @ STA. 808+01.83. CROSS SLOPE VARIES FROM 3.2% @ STA. 806+60 TO 2.0% @ STA. 807+18.
9. EXISTING BRIDGE NO. 27303 SUPERSTRUCTURE TO BE RELOCATED (UNDER BRIDGE NO. 27W34)
10. REMOVE EXISTING WINGWALL TO JUST BELOW THE BOTTOM OF THE TRANSITION SLAB FOUNDATION. REMOVE AND RETAIN ORNAMENTAL METAL RAILING FOR INSTALLATION ONTO BRIDGE 27W34 NORTHWEST AND NORTHEAST WINGWALLS.
11. REMOVE EXISTING PILASTER FULL HEIGHT TO ALLOW EXISTING ABUTMENT EXTENSION.
12. EXISTING ABUTMENT & PIER TO BE MODIFIED TO ACCOMODATE LRT SUPERSTRUCTURE. BEAM SEAT DETAILS TO BE COORDINATED DURING FINAL DESIGN TO UTILIZE A STEEL MASONRY PLATE ATOP AN ELASTOMERIC PAD OR A HIGH STRENGTH GROUT PAD SUPPORTING THE EXPANSION BEARING.
13. MODIFY EXISTING ABUTMENT FOR TRANSITION SLAB. SEE TRACK PLANS FOR TRANSITION SLAB DETAILS.
14. SLOPE PAVING PROVIDED UNDER BRIDGE NO. 27W34.
15. OVERHEAD CATENARY SYSTEM POLE SUPPORT BLISTER.

DESIGN DATA

2014 AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS 7TH EDITION AND CURRENT INTERIMS

SOUTHWEST LIGHT RAIL TRANSIT DESIGN CRITERIA (REVISION 4.0)

LOAD AND RESISTANCE FACTOR DESIGN METHOD

LRV & MV LOADING DIAGRAM SHOWN ON SHEET 2

MATERIAL DESIGN PROPERTIES
- REINFORCED CONCRETE (SUBSTRUCTURE):
  f'c = 4 KSI n = 8
  fy = 60 KSI REINFORCEMENT
- REINFORCED CONCRETE (SUPERSTRUCTURE):
  f'c = 4 KSI n = 8
  fy = 60 KSI (EPOXY COATED) REINFORCEMENT
- PRESTRESSED CONCRETE:
  f'c = 9 KSI n = 6
  fpu = 270 KSI
  FOR 0.6" DIA. LOW RELAXATION STRANDS

PROJECTED TRAFFIC VOLUMES:
- 2034 A.D.T. ROADWAY UNDER – 125,000
- 2034 D.H.V. ROADWAY UNDER – 111,000
- 2034 A.D.T.T. ROADWAY UNDER – 3,900

DESIGN SPEED: UNDER = 60 MPH

DECK AREA = 6810 SQ. FT.

LIST OF SHEETS

BRIDGE NO. 27303

SOUTHWEST LRT OVER T.H. 100
0.2 MILES SOUTH OF JCT. T.H. 7
IN ST. LOUIS PARK
(2) 105'–0" PRESTRESSED CONCRETE BEAM SPAN
28'–0" LRT
58°00'00.0" SKEW @ ABUTMENTS
58°00'53.3" SKEW @ PIER
P–1 PARAPET W/ ORNAMENTAL METAL RAILING

BRIDGE I.D. NO. 501

GENERAL PLAN & ELEVATION

SEC 6 T 28N R 24W
CITY OF ST. LOUIS PARK HENNEPIN COUNTY

APPROVED: _____
STATE BRIDGE ENGINEER DATE

DRAFT-WORK IN PROCESS

JOB NO.: T9N635 | STATE PROJ. NO.: 9909–01 | MNDOT REVIEW: JOE NIETFELD

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: KAE | CHECKED BY: MDJ
DRAWN BY: LMT | DATE: 7/27/15

AECOM Kimley»Horn

60% SUBMISSION - 09/21/15

METROPOLITAN COUNCIL

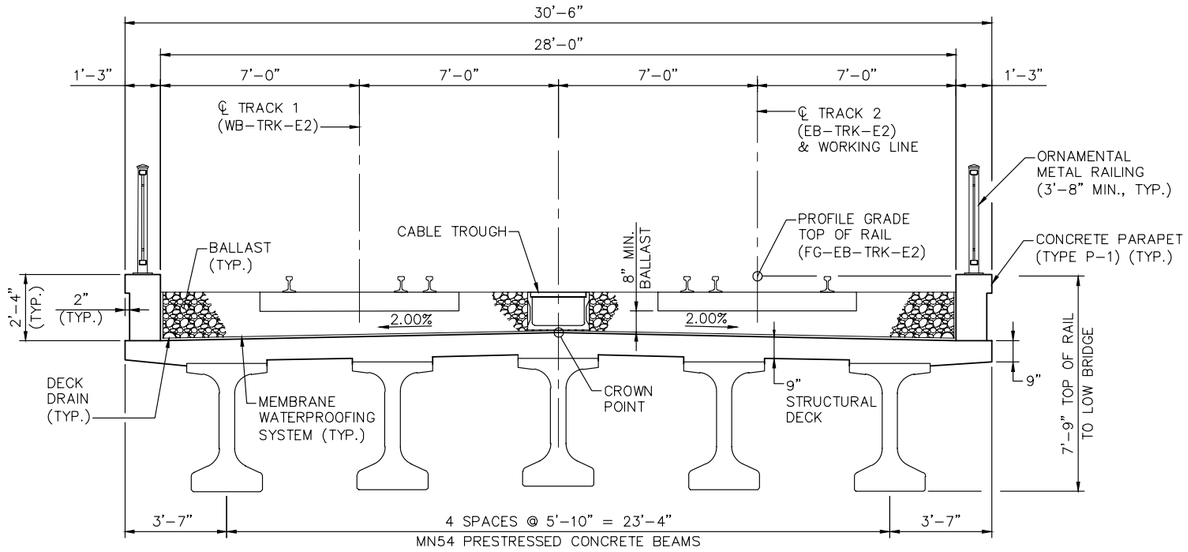
SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4
TH 100 LRT BRIDGE
BRIDGE 27303
GENERAL PLAN & ELEVATION

DISCIPLINE: STRUCTURES
SHEET NAME: CBR27303-BRG-GPE

SHEET 1 OF 39

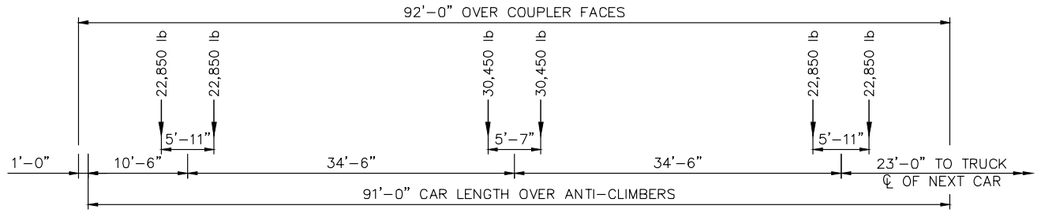
Jul, 29 2015 10:51 am V:\3400_ADC\CAD\SEGMENT E2\PLAN SHEETS\STRUCTURES\T100-LRT\CBR27303-BRG-GPE.dwg By: brad.wodash



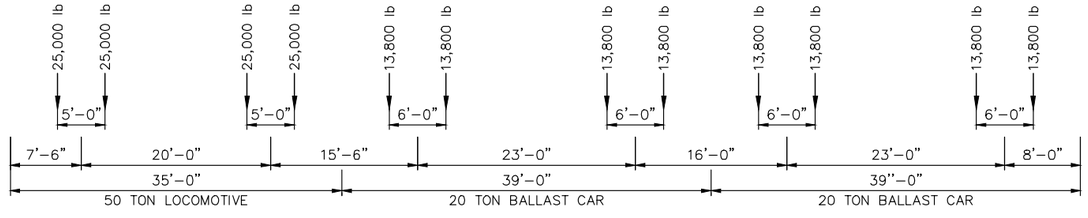
TRANSVERSE SECTION

0 1' 2' 4'

SCALE IN FEET



LIGHT RAIL VEHICLE LOADING DIAGRAM



MAINTENANCE TRAIN LOADING DIAGRAM

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".

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 ALKALI 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 RATIO SHALL BE IN ACCORDANCE WITH CHAPTER 8, SECTION 1.11 OF THE 2013 A.R.E.M.A. MANUAL AND MnDOT 2461.

SCHEDULE OF QUANTITIES FOR ENTIRE BRIDGE

ITEM NO.	ITEM	UNIT	QUANTITY
2105.607	BALLAST (CV)	CU. YD.	(P)
2301.551	BRIDGE APPROACH PANEL	EACH	
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)
2402.583	ORNAMENTAL METAL RAILING TYPE SPECIAL	LIN. FT.	(P)
2402.591	EXPANSION JOINT DEVICES TYPE 4	LIN. FT.	(P)
2402.595	BEARING ASSEMBLY	EACH	(P)
2411.618	ANTI-GRAFFITI COATING	SQ. FT.	(P)
2411.618	ARCH CONC TEXTURE (ASHLAR STONE)	SQ. FT.	(P)
2411.618	ARCH SURFACE FINISH (MULTICOLOR)	SQ. FT.	(P)
2433.501	STRUCTURE REMOVALS	LUMP SUM	
2451.509	AGGREGATE BEDDING (CV)	CU. YD.	(P)
2452.601	STEEL SHEET PILING (TEMPORARY)	LUMP SUM	
2481.618	DAMPROOFING	SQ. FT.	(P)
2481.618	WATERPROOFING	SQ. FT.	(P)
2502.502	DRAINAGE SYSTEM	LUMP SUM	
2502.601	DRAINAGE SYSTEM (BRIDGE DECK)	LUMP SUM	
2545.509	CONDUIT SYSTEM (LIGHTING)	LUMP SUM	

NOTES:

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

AXLE LOAD IN POUNDS.

LOADING DIAGRAM REPRESENTS MAXIMUM LOAD AT EACH TRUCK.

NOTES:

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.

AXLE LOAD IN POUNDS.

WEIGHT OF EMPTY BALLAST CAR IS 15,000 POUNDS.

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: KAE | CHECKED BY: MDJ
DRAWN BY: LMT | DATE: 7/27/15

AECOM Kimley»Horn

60% SUBMISSION - 09/21/15

METROPOLITAN COUNCIL

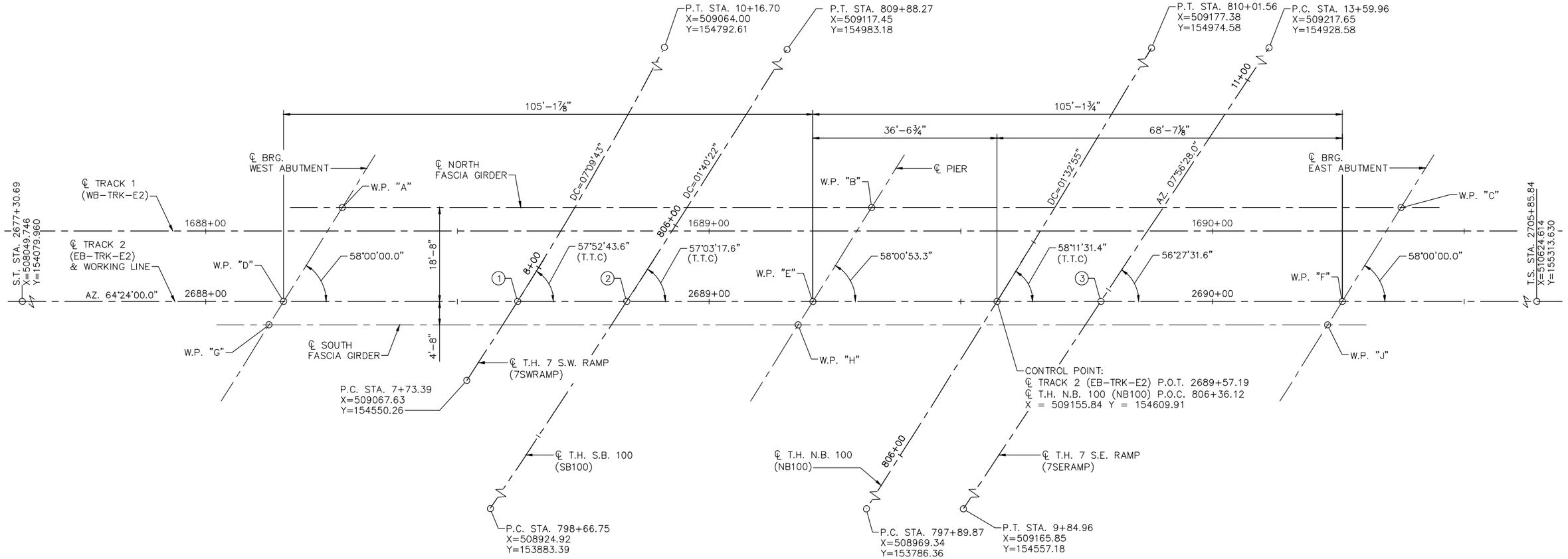
SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4
TH 100 LRT BRIDGE
BRIDGE 27303
TRANSVERSE SECTION & QUANTITIES

DISCIPLINE: STRUCTURES
SHEET NAME: CBR27303-BRG-TRN

SHEET 2 OF 39

Jul, 29 2015 10:51 am V:\3400_ADC\CAD\SEGMENT E2\PLAN SHEETS\STRUCTURES\T100-LRT\CBR27303-BRG-TRN.dwg By: brad.wodash



WORKING POINT LAYOUT

DIMENSIONS BETWEEN WORKING POINTS											COORDINATES		ELEVATION			
POINT	STATION	A	B	C	D	E	F	G	H	J	X	Y	TOP OF SLAB	TOP OF SLAB TO BR. SEAT	BRIDGE SEAT	POINT
A	2688+27.05		105.15		22.01	95.34			93.54	197.12	509030.49	154570.55	907.54	6.00	901.54	A
B	2689+32.05			105.15		22.01	95.34	121.98		93.54	509125.32	154615.99	906.72	5.84	900.88	B
C	2690+37.04						22.01	226.08	121.98		509220.15	154661.42	905.90	6.00	899.90	C
D	2688+15.48					105.15		5.50	102.34		509028.04	154548.68	907.72	--	--	D
E	2689+20.64						105.15		5.50	102.34	509122.87	154594.12	906.90	--	--	E
F	2690+25.78									5.50	509217.70	154639.55	906.09	--	--	F
G	2688+12.47								105.15		509027.43	154543.21	907.65	6.00	901.65	G
H	2689+17.47									105.15	509122.26	154588.65	906.83	5.84	900.99	H
J	2690+22.46										509217.09	154634.08	906.01	6.00	900.01	J

NOTES:

1. ℄ TRACK 2 (EB-TRK-E2) P.O.T. 2688+61.96
   ℄ T.H. 7 S.W. RAMP (7SWRAMP) P.O.C. 7+92.04
   X = 509069.96 Y = 154568.76
2. ℄ TRACK 2 (EB-TRK-E2) P.O.T. 2688+83.63
   ℄ T.H. S.B. 100 (SB100) P.O.C. 805+82.02
   X = 509089.502 Y = 154578.128
3. ℄ TRACK 2 (EB-TRK-E2) P.O.T. 2689+77.82
   ℄ T.H. 7 S.E. RAMP (7SERAMP) P.O.T. 10+47.20
   X = 509174.44 Y = 154618.83

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: KAE | CHECKED BY: MDJ
DRAWN BY: LMT | DATE: 7/27/15

AECOM Kimley»Horn

60% SUBMISSION - 09/21/15

METROPOLITAN COUNCIL

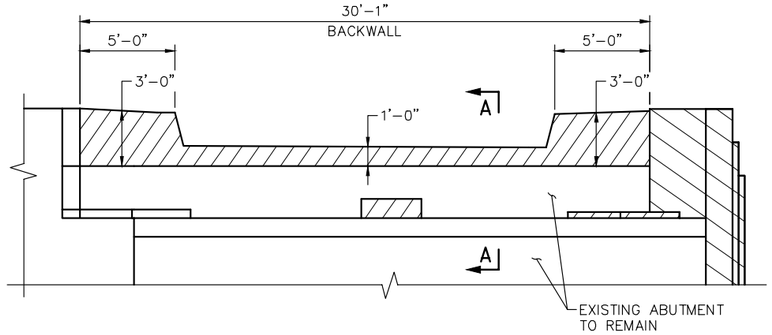
SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4
TH 100 LRT BRIDGE
BRIDGE 27303
BRIDGE LAYOUT

DISCIPLINE: STRUCTURES
SHEET NAME: CBR27303-BRG-SUP-001

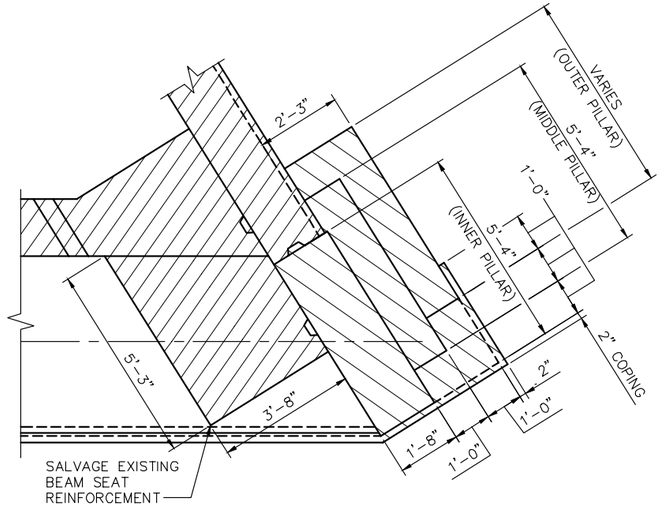
SHEET 3 OF 39

Jul, 29 2015 10:51 am V:\3400_ADC\CAD\SEGMENT E2\PLAN SHEETS\STRUCTURES\T100-LRT\CBR27303-BRG-SUP-001.dwg By: brad.wodash

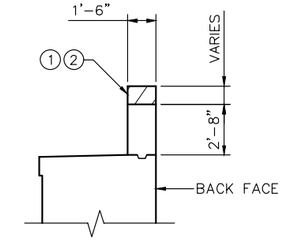


REMOVAL ELEVATION

(WINGWALLS & SOUTH MASK WALL NOT SHOWN FOR CLARITY)

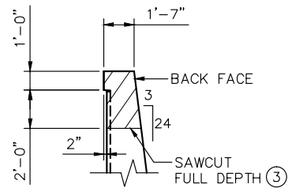


SECTION C-C

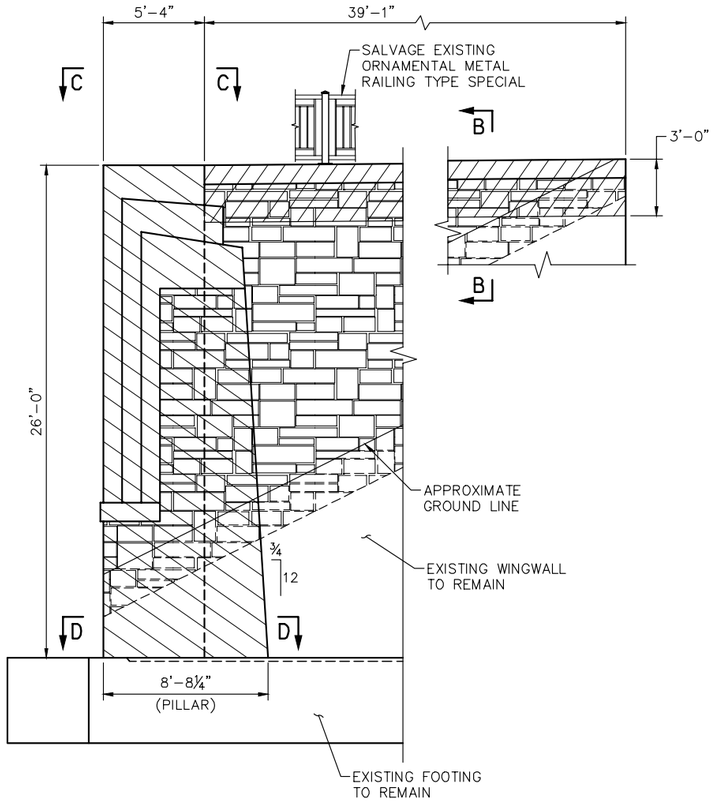


SECTION A-A

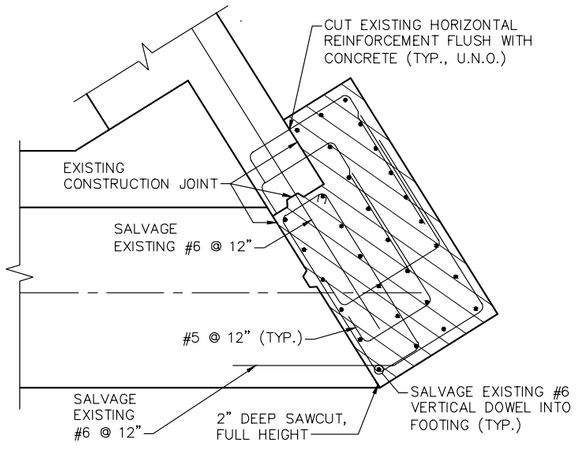
(SECTION THRU ABUTMENT)



SECTION B-B



N.W. WINGWALL REMOVAL ELEVATION



SECTION D-D

(REINFORCEMENT IS SHOWN FOR INFORMATION ONLY)

NOTES:

PHASE 1 REMOVALS TO OCCUR PRIOR TO MOVEMENT OF EXISTING FREIGHT SUPERSTRUCTURE. SEE BRIDGE NO. 27W34 FOR SUPERSTRUCTURE MODIFICATION DETAILS.

PHASE 2 REMOVALS TO OCCUR AFTER MOVEMENT OF EXISTING FREIGHT SUPERSTRUCTURE.

REMOVAL SHALL INCLUDE CONCRETE, REINFORCING STEEL, AND EMBEDS UNLESS NOTED OTHERWISE.

1. REMOVAL INCLUDES EXISTING BACKWALL PROTECTION ANGLES.
2. SALVAGE EXISTING #5 VERTICAL REINFORCEMENT @ 12" SPA.
3. COAT CUT ENDS OF REINFORCING STEEL WITH CORROSION INHIBITOR PER SPECIAL PROVISIONS.

LEGEND

REMOVAL (PHASE 1)

REMOVAL (PHASE 2)

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: KAE | CHECKED BY: MDJ
DRAWN BY: LMT | DATE: 7/27/15

AECOM Kimley»Horn

60% SUBMISSION - 09/21/15

METROPOLITAN COUNCIL

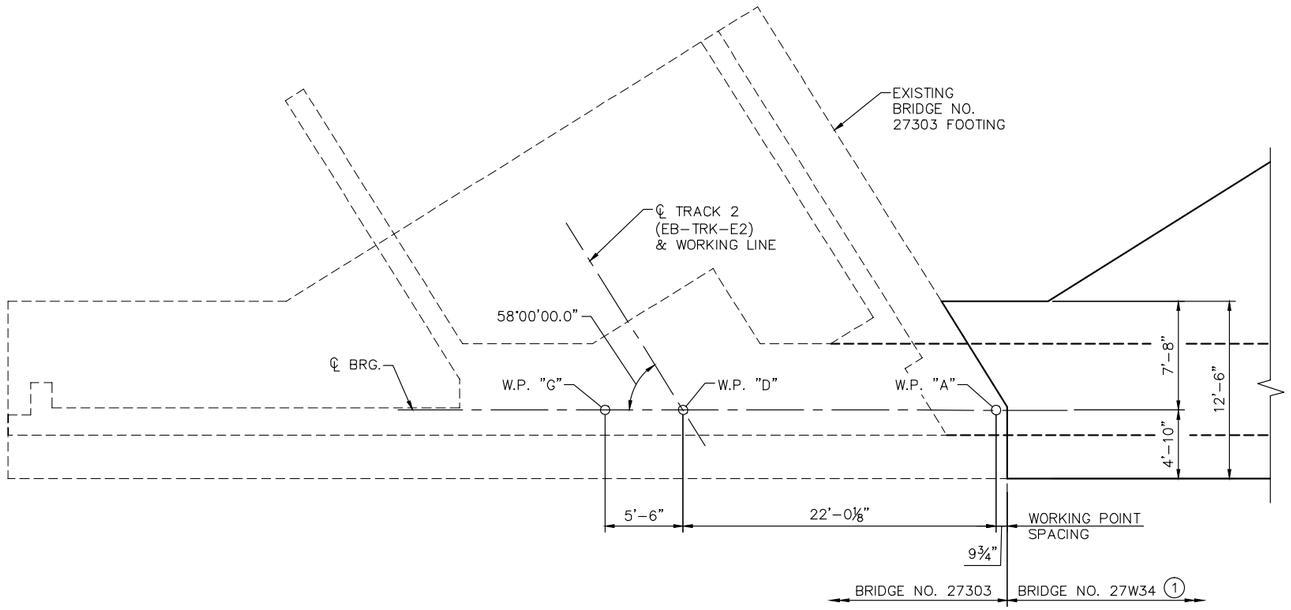
SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4
TH 100 LRT BRIDGE
BRIDGE 27303
WEST ABUTMENT REMOVAL PLAN

DISCIPLINE: STRUCTURES
SHEET NAME: CBR27303-BRG-ABT-003-1

SHEET 4 OF 39

Jul, 29 2015 10:51 am V:\3400_ADC\CAD\SEGMENT E2\PLAN SHEETS\STRUCTURES\T100-LRT\CBR27303-BRG-ABT-003.dwg By: brad.wodash



FOOTING PLAN (1)

SUMMARY OF QUANTITIES - WEST ABUTMENT		
ITEM	UNIT	QUANTITY
STRUCTURE REMOVALS	LUMP SUM	
STRUCTURAL CONCRETE (3B52)	CU. YD.	
REINFORCEMENT BARS	POUND	
REINFORCEMENT BARS (EPOXY COATED)	POUND	
ORNAMENTAL METAL RAILING TYPE SPECIAL	LIN. FT.	
ANTI-GRAFFITI COATING	SQ. FT.	
ARCH CONC TEXTURE (ASHLAR STONE)	SQ. FT.	
ARCH SURFACE FINISH (MULTICOLOR)	SQ. FT.	
DAMPROOFING	SQ. FT.	
MEMBRANE WATERPROOFING	LIN. FT.	

WEST ABUTMENT SPREAD FOOTING LOAD DATA	
* FACTORED DESIGN BEARING PRESSURE	____ TONS/ SQ FT
EFFECTIVE WIDTH B'	____ FT
FACTORED BEARING RESISTANCE $\phi_b q_n$	____ TONS/ SQ FT

* BASED ON _____ LOAD COMBINATION.

NOTES:

(1) FOOTING PLAN PROVIDED TO SHOW GENERAL FOOTING ORIENTATION. FOOTING CONCRETE AND REINFORCEMENT TO BE PROVIDED UNDER BRIDGE NO. 27W34.

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: KAE | CHECKED BY: MDJ
DRAWN BY: LMT | DATE: 7/27/15

AECOM Kimley»Horn

60% SUBMISSION - 09/21/15

METROPOLITAN COUNCIL

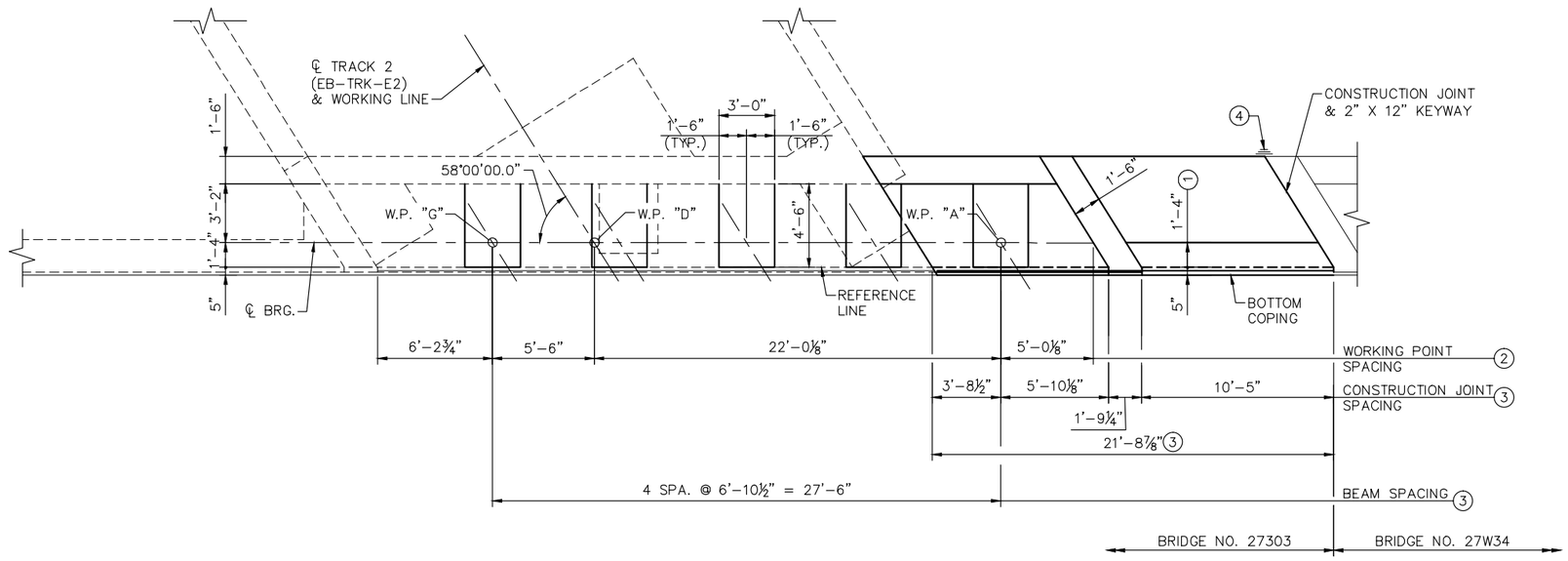
SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4
TH 100 LRT BRIDGE
BRIDGE 27303
WEST ABUTMENT DETAILS

DISCIPLINE: STRUCTURES
SHEET NAME: CBR27303-BRG-ABT-001-1

SHEET 5 OF 39

Aug. 03 2015 08:42 am V:\3400_ADC\CAD\SEGMENT E2\PLAN SHEETS\STRUCTURES\T100-LRT\CBR27303-BRG-ABT-001.dwg By: ryan.kelly



PLAN VIEW

NOTES:

A 72 HOUR DELAY IS REQUIRED BETWEEN ALL ADJACENT POURS OF WALLS AND STEMS.

DAMPROOFING SHALL BE APPLIED TO THE BACK FACE OF THE ABUTMENT, THE NORTHWEST WINGWALL AND SOUTHWEST WINGWALL FROM TOP OF FOOTING TO WITHIN 6" FROM TOP OF ABUTMENT/WINGWALL. DAMPROOFING IS NOT REQUIRED ON SOUTH WINGWALL.

(1) DIMENSIONS SHOWN AT TOP OF WALL.

(2) MEASURED ALONG ℄ BEARING.

(3) MEASURED ALONG REFERENCE LINE.

(4) MEMBRANE WATERPROOFING SYSTEM PER MnDOT SPEC. 2481.3B.

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: KAE | CHECKED BY: MDJ
DRAWN BY: LMT | DATE: 7/27/15

AECOM Kimley»Horn

60% SUBMISSION - 09/21/15

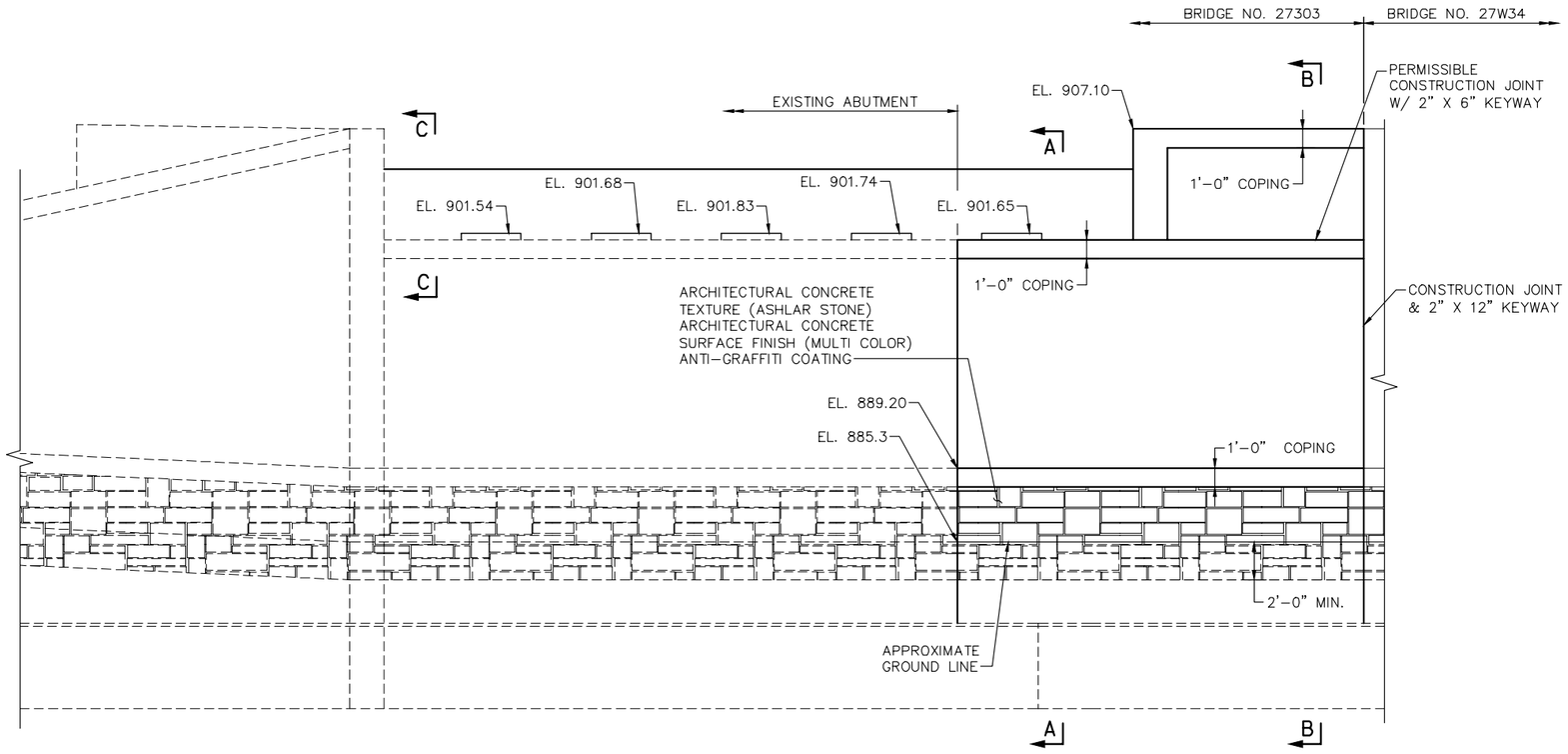
METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4
TH 100 LRT BRIDGE
BRIDGE 27303
WEST ABUTMENT DETAILS

DISCIPLINE: STRUCTURES
SHEET NAME: CBR27303-BRG-ABT-001-2

SHEET 6 OF 39



ELEVATION

NOTES:

FOR SECTIONS A-A, B-B & C-C SEE SHEET 8.

A 72 HOUR DELAY IS REQUIRED BETWEEN ALL ADJACENT POURS OF WALLS AND STEMS.

DAMPROOFING SHALL BE APPLIED TO THE BACK FACE OF THE ABUTMENT, THE NORTHWEST WINGWALL AND SOUTHWEST WINGWALL FROM TOP OF FOOTING TO WITHIN 6" FROM TOP OF ABUTMENT/WINGWALL. DAMPROOFING IS NOT REQUIRED ON SOUTH WINGWALL.

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: KAE | CHECKED BY: MDJ
DRAWN BY: LMT | DATE: 7/27/15

AECOM Kimley»Horn

60% SUBMISSION - 09/21/15

METROPOLITAN COUNCIL

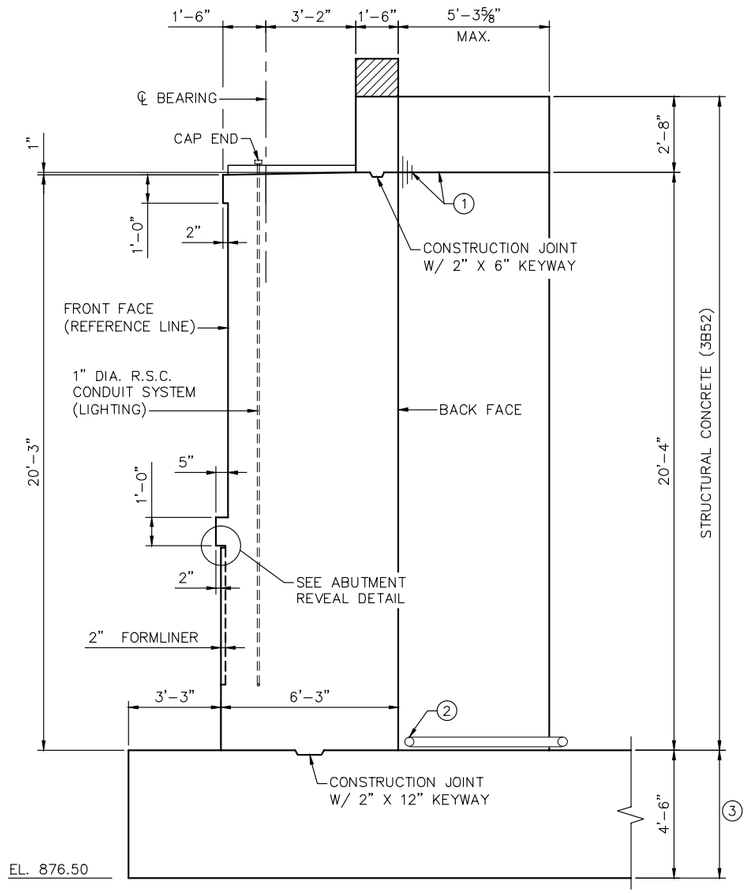
SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4
TH 100 LRT BRIDGE
BRIDGE 27303
WEST ABUTMENT DETAILS

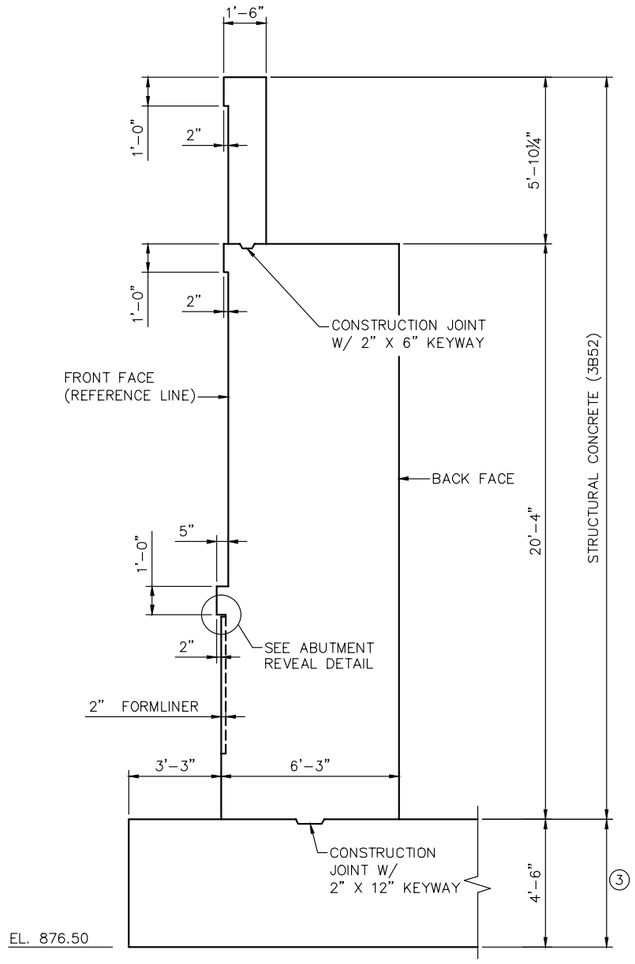
DISCIPLINE: STRUCTURES
SHEET NAME: CBR27303-BRG-ABT-001-3

SHEET 7 OF 39

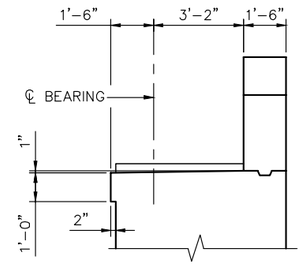
Jul, 29 2015 10:52 am V:\3400_ADC\CAD\SEGMENT E2\PLAN SHEETS\STRUCTURES\T100-LRT\CBR27303-BRG-ABT-001.dwg By: brad.wodash



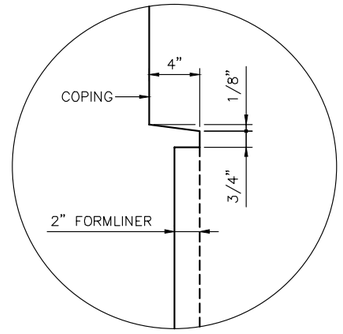
SECTION A–A
(SECTION THRU ABUTMENT)



SECTION B–B
(SECTION THRU WALL)



SECTION C–C
(SECTION THRU EXISTING ABUTMENT)



ABUTMENT REVEAL DETAIL

NOTES:

1. MEMBRANE WATERPROOFING SYSTEM PER MnDOT SPEC. 2481.3B.
2. 4" NOMINAL DIA. PERFORATED PIPE, SEE DETAIL B910.
3. FOOTING PROVIDED BY BRIDGE NO. 27W34,

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: KAE | CHECKED BY: MDJ
DRAWN BY: LMT | DATE: 7/27/15

AECOM Kimley»Horn

60% SUBMISSION - 09/21/15

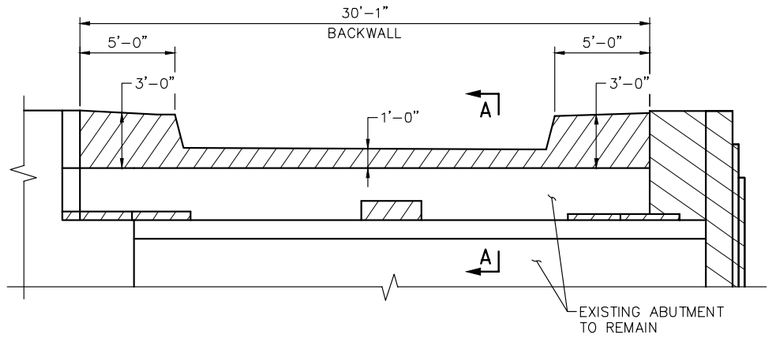
METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4
TH 100 LRT BRIDGE
BRIDGE 27303
WEST ABUTMENT DETAILS

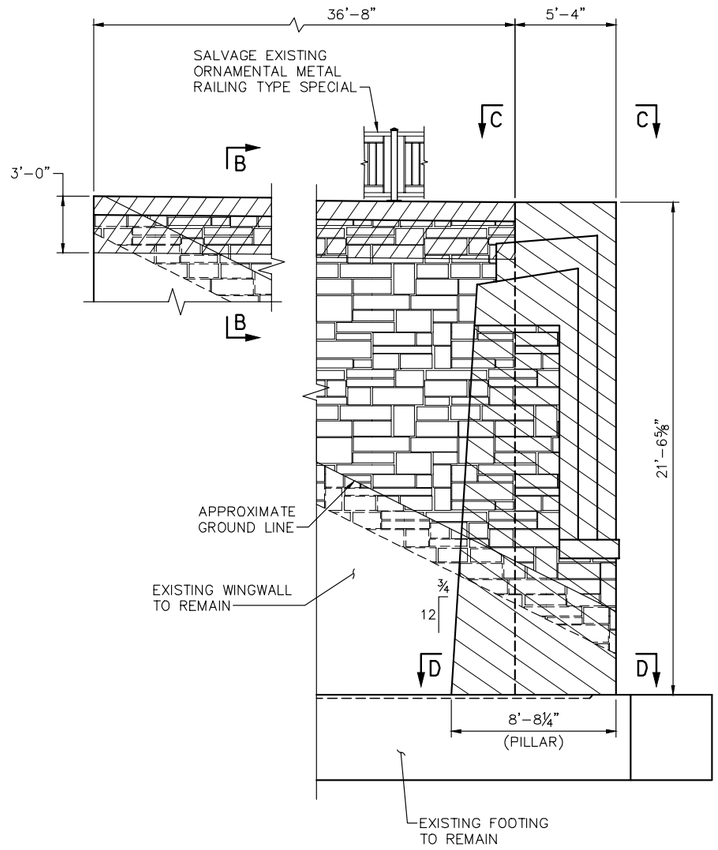
DISCIPLINE: STRUCTURES
SHEET NAME: CBR27303-BRG-ABT-001-4

SHEET 8 OF 39

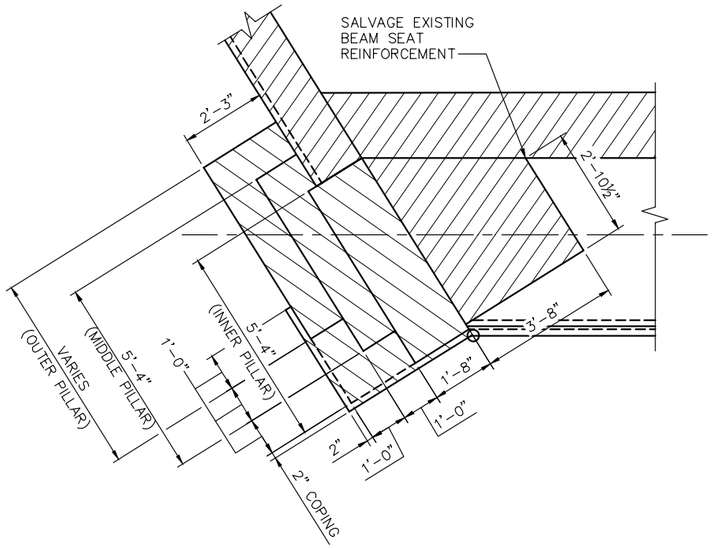


REMOVAL ELEVATION

(WINGWALLS & SOUTH MASK WALL NOT SHOWN FOR CLARITY)



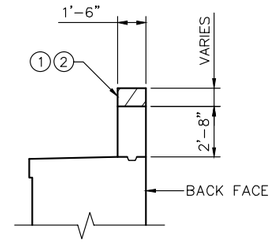
N.E. WINGWALL REMOVAL ELEVATION



SECTION C–C

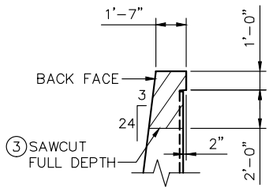
SECTION D–D

(REINFORCEMENT IS SHOWN FOR INFORMATION ONLY)



SECTION A–A

(SECTION THRU ABUTMENT)



SECTION B–B

NOTES:

PHASE 1 REMOVALS TO OCCUR PRIOR TO MOVEMENT OF EXISTING FREIGHT SUPERSTRUCTURE. SEE BRIDGE NO. 27W34 FOR SUPERSTRUCTURE MODIFICATION DETAILS.

PHASE 2 REMOVALS TO OCCUR AFTER MOVEMENT OF EXISTING FREIGHT SUPERSTRUCTURE.

REMOVAL SHALL INCLUDE CONCRETE, REINFORCING STEEL, AND EMBEDS UNLESS NOTED OTHERWISE.

(1) REMOVAL INCLUDES EXISTING BACKWALL PROTECTION ANGLES.

(2) SALVAGE EXISTING #5 VERTICAL REINFORCEMENT @ 12" SPA.

(3) COAT CUT ENDS OF REINFORCING STEEL WITH CORROSION INHIBITOR PER SPECIAL PROVISIONS.

LEGEND

REMOVAL (PHASE 1)

REMOVAL (PHASE 2)

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: KAE | CHECKED BY: MDJ
DRAWN BY: LMT | DATE: 7/27/15

AECOM Kimley»Horn

60% SUBMISSION - 09/21/15

METROPOLITAN COUNCIL

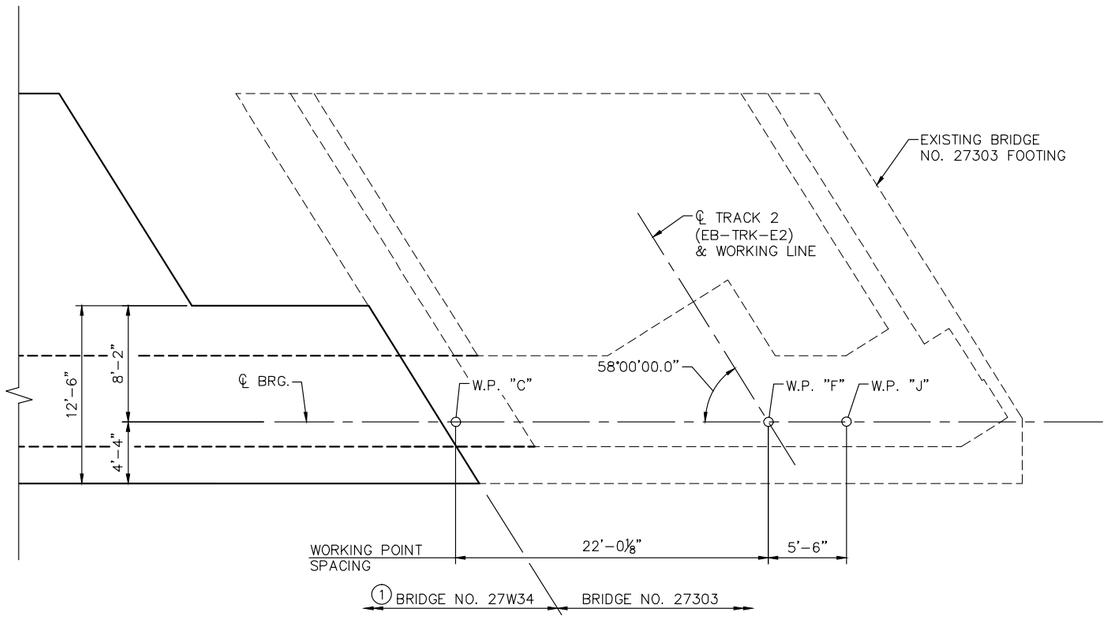
SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4
TH 100 LRT BRIDGE
BRIDGE 27303
EAST ABUTMENT REMOVAL PLAN

DISCIPLINE: STRUCTURES

SHEET NAME: CBR27303-BRG-ABT-004-1

SHEET 9 OF 39



FOOTING PLAN ①

SUMMARY OF QUANTITIES - EAST ABUTMENT		
ITEM	UNIT	QUANTITY
STRUCTURAL CONCRETE (3B52)	CU. YD.	
REINFORCEMENT BARS	POUND	
REINFORCEMENT BARS (EPOXY COATED)	POUND	
ORNAMENTAL METAL RAILING TYPE SPECIAL	LIN. FT.	
ANTI-GRAFFITI COATING	SQ. FT.	
ARCH CONC TEXTURE (ASHLAR STONE)	SQ. FT.	
ARCH SURFACE FINISH (MULTICOLOR)	SQ. FT.	
DAMPROOFING	SQ. FT.	
MEMBRANE WATERPROOFING	LIN. FT.	
BRIDGE NAMEPLATE	EACH	

EAST ABUTMENT SPREAD FOOTING LOAD DATA	
* FACTORED DESIGN BEARING PRESSURE	____ TONS/ SQ FT
EFFECTIVE WIDTH B'	____ FT
FACTORED BEARING RESISTANCE $\phi b \cdot q_n$	____ TONS/ SQ FT

* BASED ON _____ LOAD COMBINATION.

NOTES:

① FOOTING PLAN PROVIDED TO SHOW GENERAL FOOTING ORIENTATION. FOOTING CONCRETE AND REINFORCEMENT TO BE PROVIDED UNDER BRIDGE NO. 27W34.

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: KAE | CHECKED BY: MDJ
DRAWN BY: LMT | DATE: 7/27/15

AECOM Kimley»Horn

60% SUBMISSION - 09/21/15

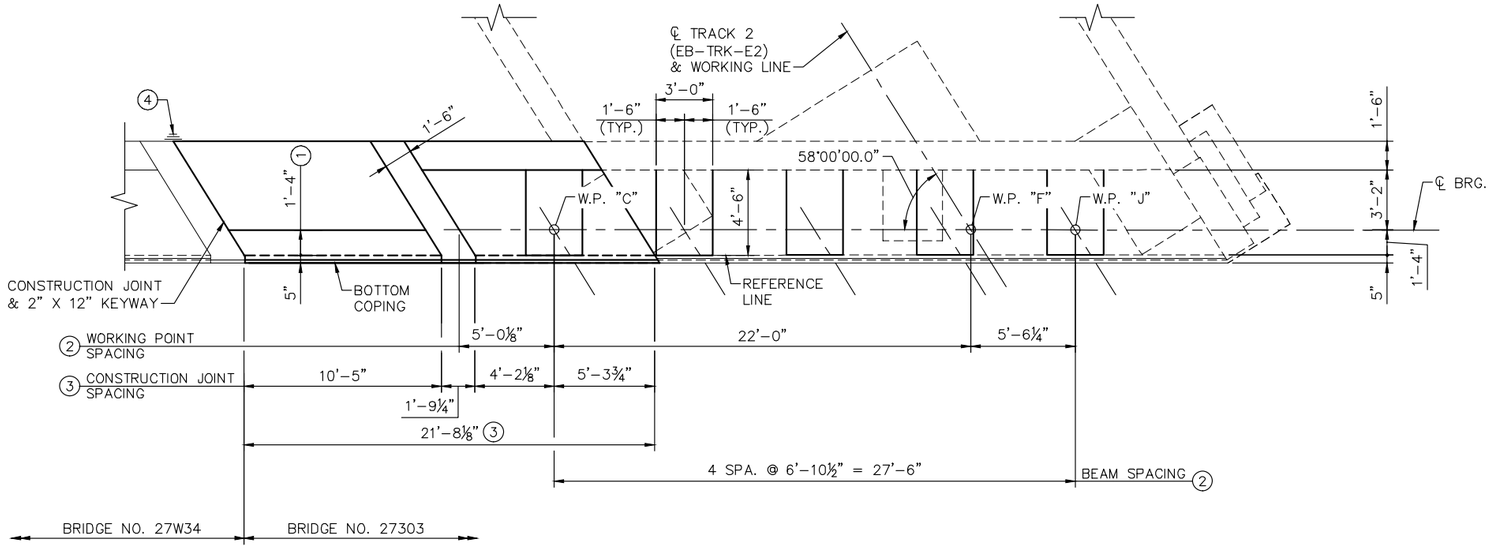
METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4
TH 100 LRT BRIDGE
BRIDGE 27303
EAST ABUTMENT DETAILS

DISCIPLINE: STRUCTURES
SHEET NAME: CBR27303-BRG-ABT-002-1

SHEET 10 OF 39



PLAN VIEW

NOTES:

A 72 HOUR DELAY IS REQUIRED BETWEEN ALL ADJACENT POURS OF WALLS AND STEMS.

DAMPROOFING SHALL BE APPLIED TO THE BACK FACE OF THE ABUTMENT, THE NORTHWEST WINGWALL AND SOUTHWEST WINGWALL FROM TOP OF FOOTING TO WITHIN 6" FROM TOP OF ABUTMENT/WINGWALL. DAMPROOFING IS NOT REQUIRED ON SOUTH WINGWALL.

(1) DIMENSIONS SHOWN AT TOP OF WALL.

(2) MEASURED ALONG ℄ BEARING.

(3) MEASURED ALONG REFERENCE LINE.

(4) MEMBRANE WATERPROOFING SYSTEM PER MnDOT SPEC. 2481.3B.

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: KAE | CHECKED BY: MDJ
DRAWN BY: LMT | DATE: 7/27/15

AECOM Kimley»Horn

60% SUBMISSION - 09/21/15

METROPOLITAN COUNCIL

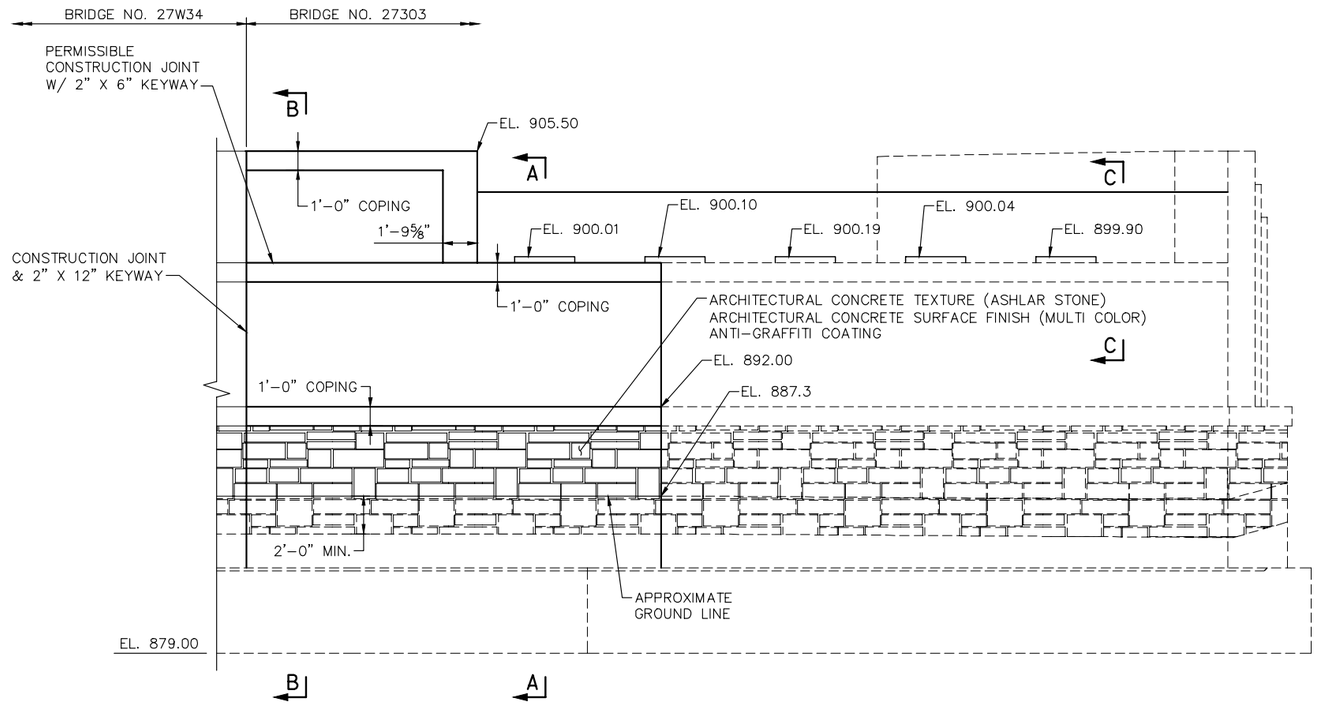
SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4
TH 100 LRT BRIDGE
BRIDGE 27303
EAST ABUTMENT DETAILS

DISCIPLINE: STRUCTURES
SHEET NAME: CBR27303-BRG-ABT-002-2

SHEET 11 OF 39

Jul, 29 2015 10:52 am V:\3400_ADC\CAD\SEGMENT E2\PLAN SHEETS\STRUCTURES\T100-LRT\CBR27303-BRG-ABT-002.dwg By: brad.wodash



ELEVATION

NOTES:

FOR SECTIONS A–A, B–B AND C–C SEE SHEET 13.

A 72 HOUR DELAY IS REQUIRED BETWEEN ALL ADJACENT POURS OF WALLS AND STEMS.

DAMPROOFING SHALL BE APPLIED TO THE BACK FACE OF THE ABUTMENT, THE NORTHWEST WINGWALL AND SOUTHWEST WINGWALL FROM TOP OF FOOTING TO WITHIN 6" FROM TOP OF ABUTMENT/WINGWALL. DAMPROOFING IS NOT REQUIRED ON SOUTH WINGWALL.

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: KAE | CHECKED BY: MDJ
DRAWN BY: LMT | DATE: 7/27/15

AECOM Kimley»Horn

60% SUBMISSION - 09/21/15

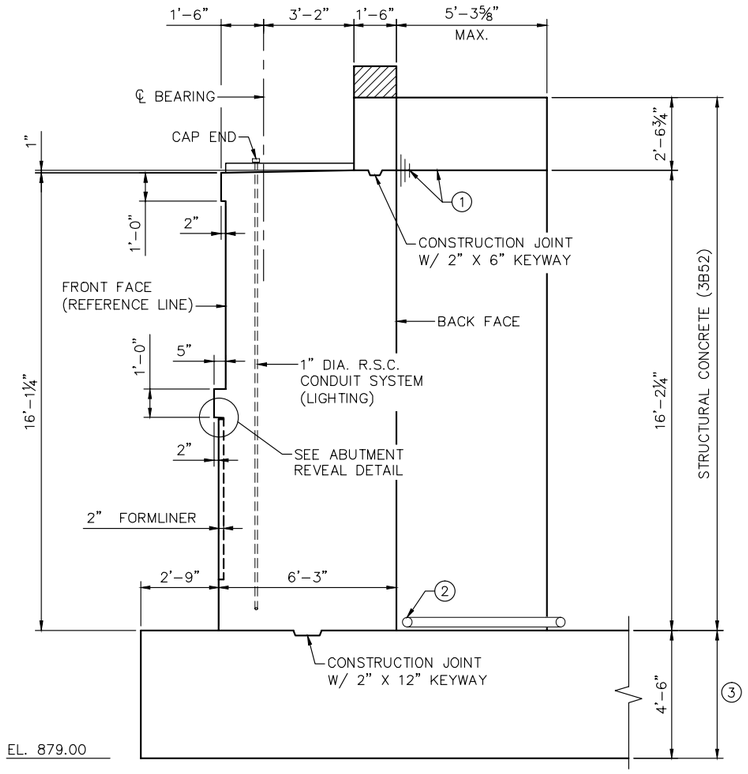
METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

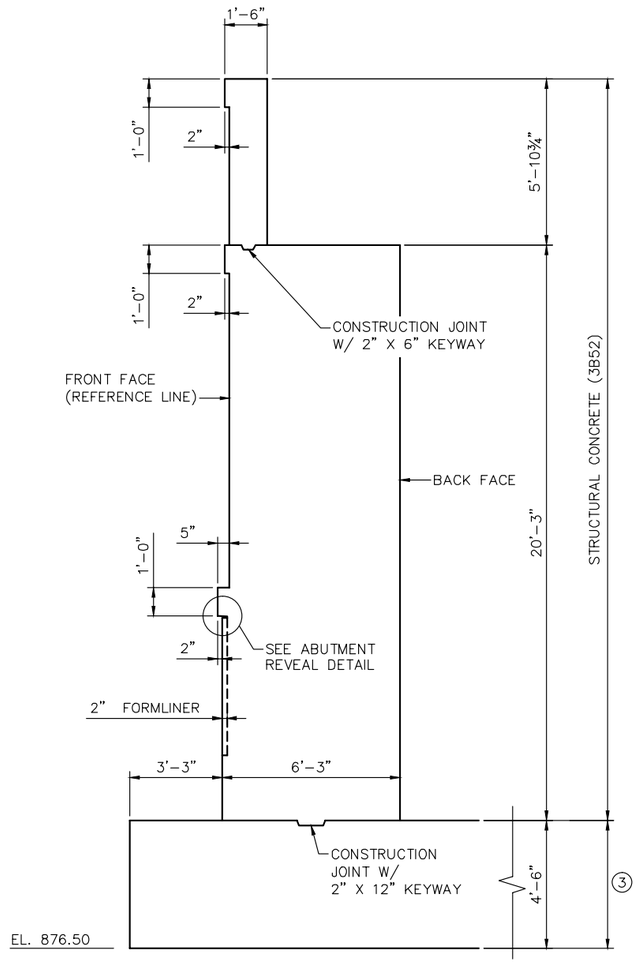
CIVIL EAST - VOLUME 4
TH 100 LRT BRIDGE
BRIDGE 27303
EAST ABUTMENT DETAILS

DISCIPLINE: STRUCTURES
SHEET NAME: CBR27303-BRG-ABT-002-3

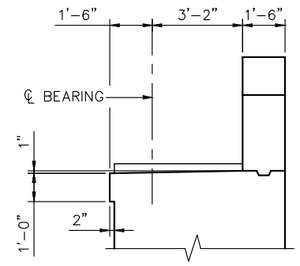
SHEET 12 OF 39



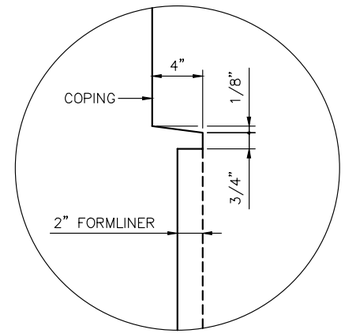
SECTION A–A
(SECTION THRU ABUTMENT)



SECTION B–B
(SECTION THRU WALL)



SECTION C–C
(SECTION THRU EXISTING ABUTMENT)



ABUTMENT REVEAL DETAIL

NOTES:

1. MEMBRANE WATERPROOFING SYSTEM PER MnDOT SPEC. 2481.3B.
2. 4" NOMINAL DIA. PERFORATED PIPE, SEE DETAIL B910.
3. FOOTING PROVIDED BY BRIDGE NO. 27W34.

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: KAE | CHECKED BY: MDJ
DRAWN BY: LMT | DATE: 7/27/15

AECOM Kimley»Horn

60% SUBMISSION - 09/21/15

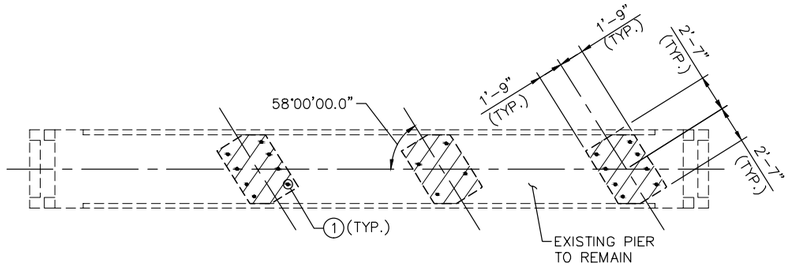
METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

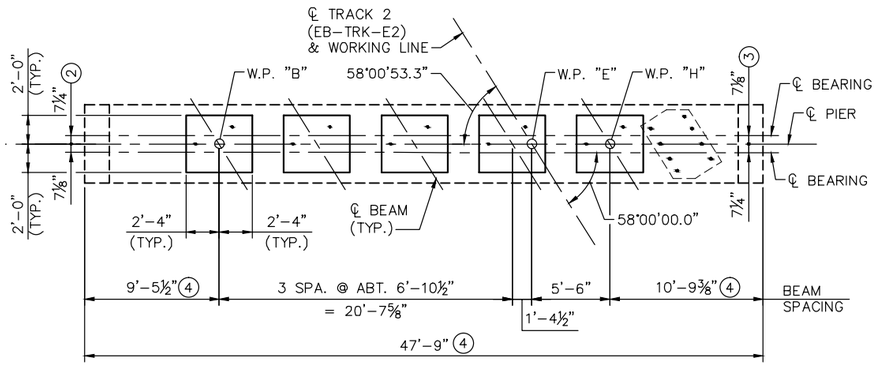
CIVIL EAST - VOLUME 4
TH 100 LRT BRIDGE
BRIDGE 27303
EAST ABUTMENT DETAILS

DISCIPLINE: STRUCTURES
SHEET NAME: CBR27303-BRG-ABT-002-4

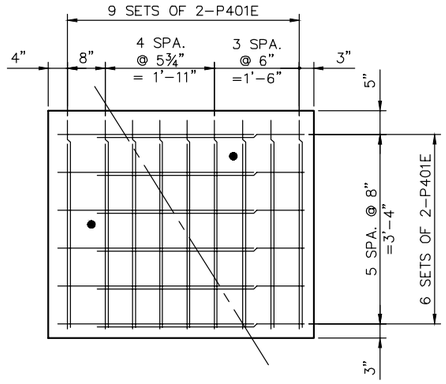
SHEET 13 OF 39



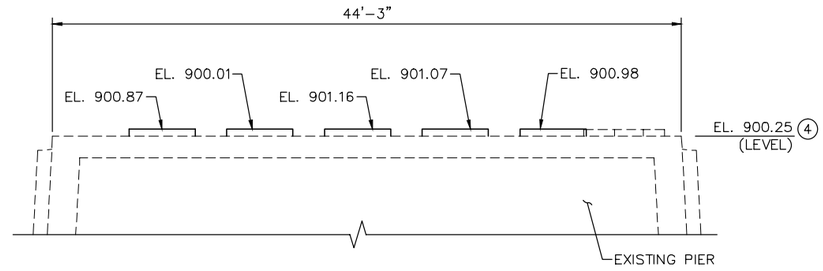
REMOVAL PLAN (4)



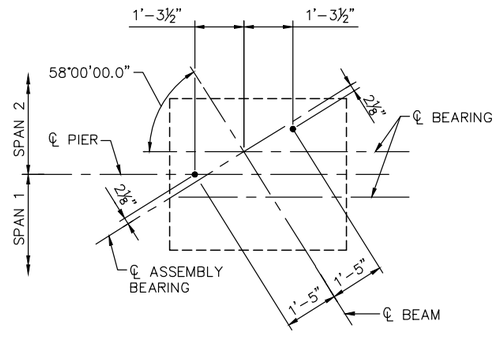
PLAN VIEW



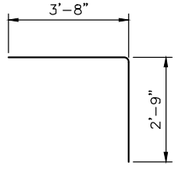
PEDESTAL DETAIL



PARTIAL ELEVATION



ANCHOR BOLT LAYOUT



P401E

SUMMARY OF QUANTITIES - PIER		
ITEM	UNIT	QUANTITY
STRUCTURAL CONCRETE (3B52)	CU. YD.	
REINFORCEMENT BARS (EPOXY COATED)	POUND	
STRUCTURE REMOVALS	LUMP SUM	

PIER SPREAD FOOTING LOAD DATA	
* FACTORED DESIGN BEARING PRESSURE	____ TONS/ SQ FT
EFFECTIVE WIDTH B' (PERPENDICULAR TO PIER)	____ FT
EFFECTIVE WIDTH L' (PARALLEL TO PIER)	____ FT
FACTORED BEARING RESISTANCE $\phi_b q_n$	____ TONS/ SQ FT

* BASED ON _____ LOAD COMBINATION.

NOTES:

DRILL AND EPOXY P401E BARS INTO EXISTING PIER WALL. HOLES FOR P401E INTO PIER WALL MAY ENCOUNTER #5 TRANSVERSE TOP TIES. CONTRACTOR TO MAKE PROVISIONS TO DRILL THROUGH #5 BARS TO PLACE P401E AS REQUIRED.

HOLES FOR ANCHOR ROD MAY ENCOUNTER #5 TRANSVERSE TOP TIES. CONTRACTOR TO MAKE PROVISIONS TO DRILL THROUGH #5 BARS TO PLACE P401E AS REQUIRED.

(1) CUT ANCHOR BOLTS FLUSH WITH CONCRETE SURFACE AND COAT WITH CORROSION INHIBITOR. TYPICAL 20 LOCATIONS.

(2) MEASURED AT W.P. "B"

(3) MEASURED AT W.P. "H"

(4) DIMENSIONS BASED ON EXISTING BRIDGE NO. 27303 PLANS. CONTRACTOR TO FIELD VERIFY PRIOR TO CONSTRUCTION. ANY DISCREPANCIES SHALL BE COMMUNICATED TO THE ENGINEER.

LEGEND

REMOVE EXISTING BEAM SEAT CONCRETE AND REINFORCING STEEL. CUT REINFORCING STEEL FLUSH WITH FINISHED CONCRETE AND COAT WITH CORROSION INHIBITOR.

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: KAE | CHECKED BY: MDJ
DRAWN BY: LMT | DATE: 7/27/15

AECOM Kimley»Horn

60% SUBMISSION - 09/21/15

METROPOLITAN COUNCIL

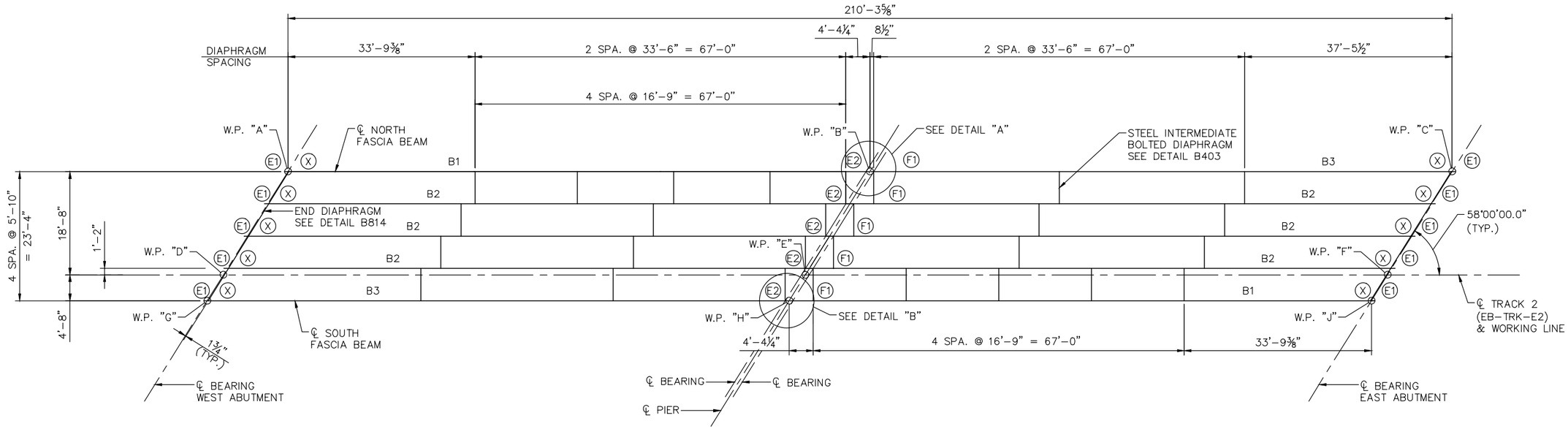
SOUTHWEST Green Line LRT Extension

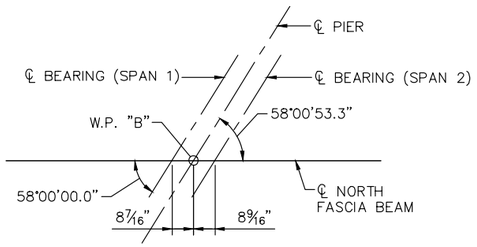
CIVIL EAST - VOLUME 4
TH 100 LRT BRIDGE
BRIDGE 27303
PIER DETAILS

DISCIPLINE: STRUCTURES
SHEET NAME: CBR27303-BRG-PIR-001

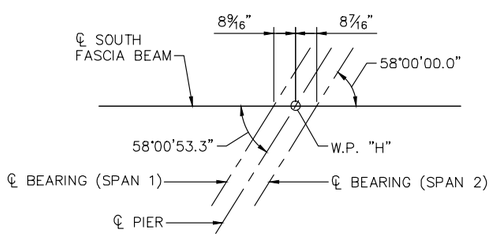
SHEET 14 OF 39

Aug, 03 2015 09:44 am V:\3400_ADC\CAD\SEGMENT E2\PLAN SHEETS\STRUCTURES\T100-LRT\CBR27303-BRG-PIR-001.dwg By: ryan.kelly





DETAIL "A"



DETAIL "B"

FRAMING PLAN

SUMMARY OF QUANTITIES - SUPERSTRUCTURE		
ITEM	UNIT	QUANTITY
BRIDGE SLAB CONCRETE (3Y42)	SQ. FT.	
RAILING CONCRETE	LIN. FT.	
RAISED MEDIAN	SQ. FT.	
REINFORCEMENT BARS (EPOXY COATED)	POUND	
ORNAMENTAL METAL RAILING	LIN. FT.	
FIXED CURVED PLATE ASSEMBLY TYPE 1	EACH	
EXPANSION CURVED PLATE BEARING ASSEMBLY TYPE 1	EACH	
EXPANSION CURVED PLATE BEARING ASSEMBLY TYPE 2	EACH	
DRAINAGE SYSTEM BRIDGE DECK	LUMP SUM	
PRESTRESSED CONCRETE BEAMS MN54	LIN. FT.	
MEMBRANE WATERPROOFING	SQ. FT.	
BALLAST (CV)	CU. YD.	

NOTES:

SEE SHEET NO. 16 FOR PRECAST BEAM ELEVATION.

(E1) DENOTES EXPANSION CURVED PLATE BEARING ASSEMBLY TYPE 1. SEE DETAIL B311.

(E2) DENOTES EXPANSION CURVED PLATE BEARING ASSEMBLY TYPE 2. SEE DETAIL B311.

(F1) DENOTES FIXED CURVED PLATE ASSEMBLY TYPE 1. SEE DETAIL B310.

(X) INDICATES END OF BEAM.

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: KAE | CHECKED BY: MDJ
DRAWN BY: LMT | DATE: 7/27/15

AECOM Kimley»Horn

60% SUBMISSION - 09/21/15

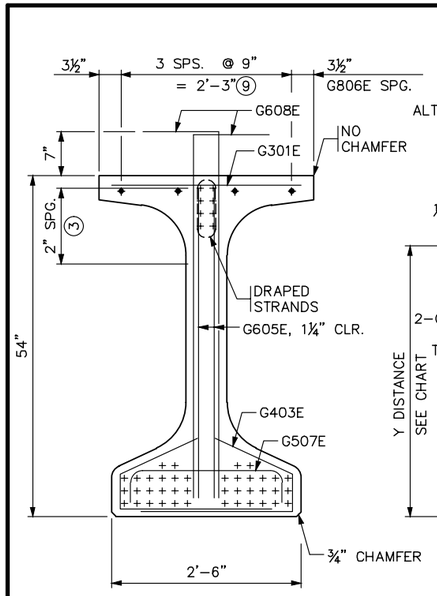
METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4
TH 100 LRT BRIDGE
BRIDGE 27303
FRAMING PLAN

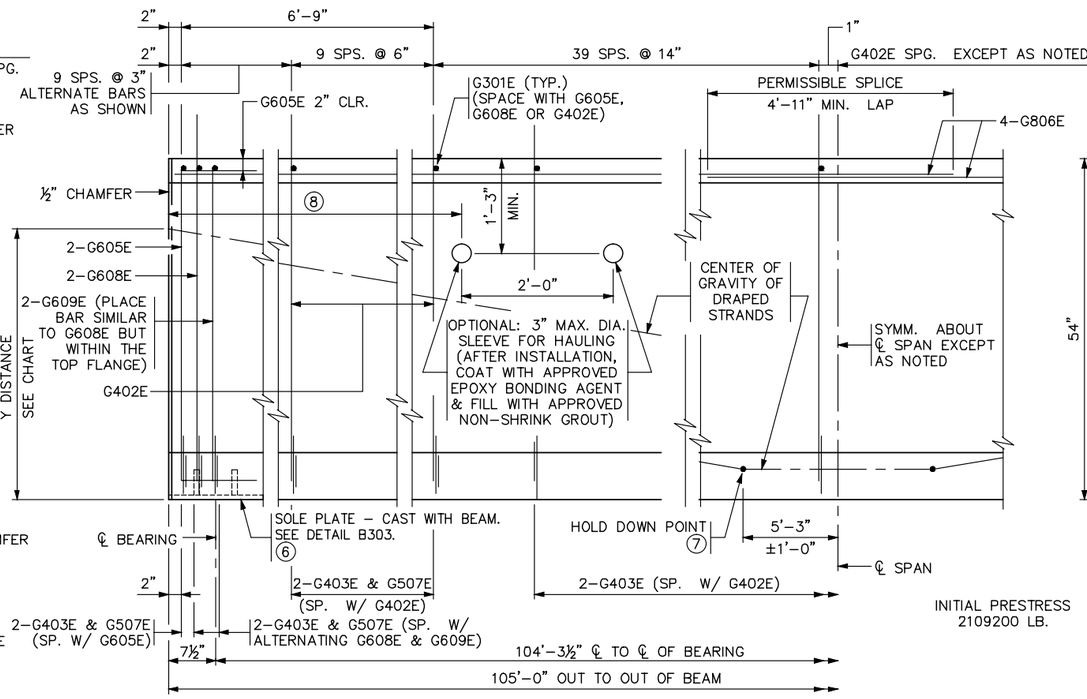
DISCIPLINE: STRUCTURES
SHEET NAME: CBR27303-BRG-SUP-003

SHEET 15 OF 39



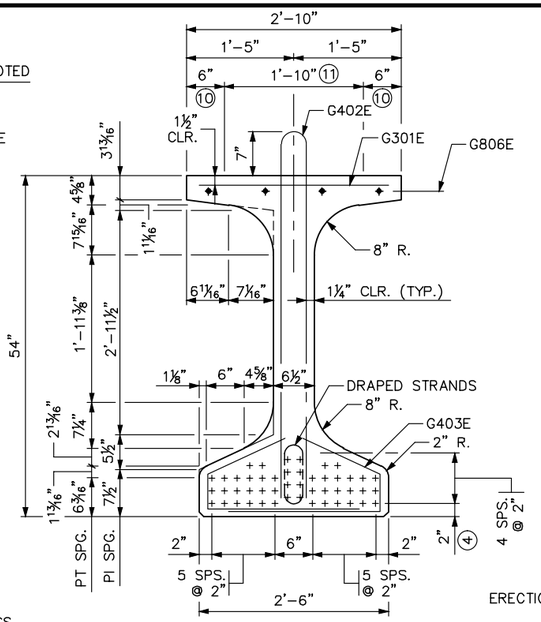
END VIEW

CUT STRANDS FLUSH WITH CONCRETE. COVER ENDS WITH ONE COMPONENT POLYURETHANE SEALANT PER APPROVED PRODUCT LIST. (G609E BAR NOT SHOWN)



BEAM ELEVATION

INITIAL PRESTRESS 2109200 LB.

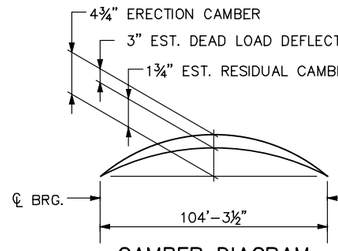


SECTION AT ℄ SPAN

Y DISTANCES (INCHES)	NO.	℄ SPAN	END
STRAIGHT STRANDS	40	4.4	
DRAPED STRANDS	8	6.0	48.0 □
TOTAL STRANDS	48	4.67	

Y = DISTANCE TO CENTER OF GRAVITY OF STRANDS FROM BOTTOM OF BEAM. ALL STRANDS SPACED 2" CENTER TO CENTER, HORIZONTALLY AND VERTICALLY, EXCEPT AS NOTED.

□ A TOLERANCE OF ±1" WILL BE PERMITTED IN THIS DIMENSION.

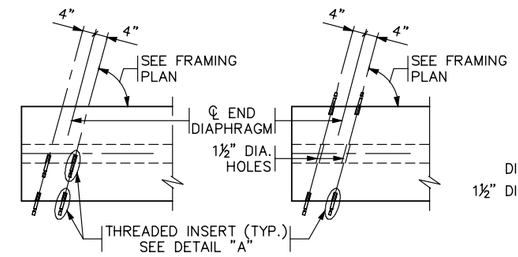


CAMBER DIAGRAM

ERECTION CAMBER SHOWN IS AFTER DIAPHRAGMS ARE IN PLACE.

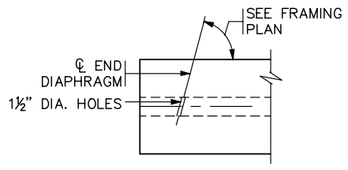
DEAD LOAD DEFLECTION SHOWN IS FOR WEIGHT OF SLAB, WEARING COURSE, BARRIER, SIDEWALK AND MEDIAN WHERE APPLICABLE.

CONTRACTOR WILL TAKE ELEVATIONS AT TOP OF BEAMS AFTER ERECTION AND WILL ALLOW FOR DEFLECTION SHOWN TO ENABLE BUILDING FORMS TO CORRECT GRADE AND SPECIFIED SLAB THICKNESS. PROVIDE COPY OF ELEVATIONS TO THE ENGINEER.

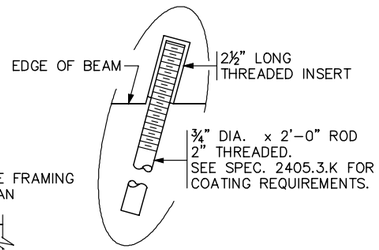


PLAN AT FASCIA BEAMS

PLAN AT INTERIOR BEAMS



PLAN

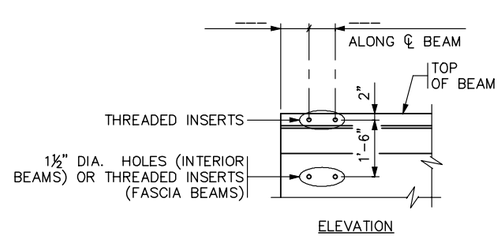


DETAIL "A"

CALCULATED PRESTRESS LOSSES	
ELASTIC SHORTENING LOSS	26.09 KSI
LONG TERM LOSSES	25.32 KSI
TOTAL LOSSES	51.40 KSI

MINIMUM CONCRETE STRENGTH – K.S.I.	
① f'ci	② f'c
7.5 KSI	8.0 KSI

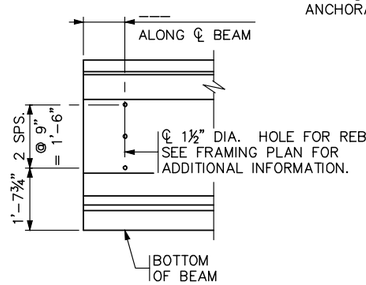
PRESTRESSING STRAND DIAMETER	
½" □	⑤
0.60" ☒	⑤



ELEVATION

CONCRETE END DIAPHRAGM

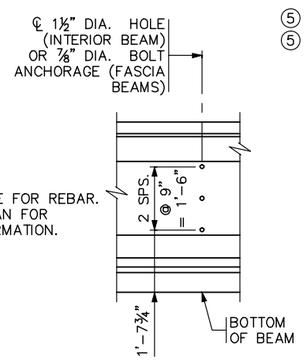
PARAPET ABUTMENT
(SEE DETAIL B814 FOR DIAPHRAGM DETAILS)



ELEVATION

CONCRETE END DIAPHRAGM

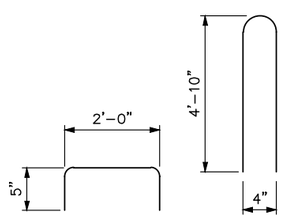
SEE SUPERSTRUCTURE DETAILS AND REINFORCEMENT FOR DIAPHRAGM DETAILS.



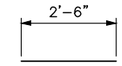
ELEVATION

STEEL INTERMEDIATE DIAPHRAGM

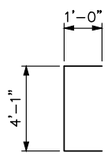
(SEE DETAIL B403 FOR DIAPHRAGM DETAILS)



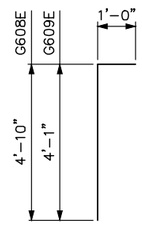
G507E G402E



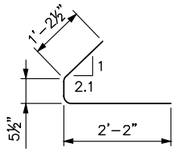
G301E



G605E



G608E & G609E



G403E

GENERAL NOTES

PROVIDE HANDLING HOOKS OR DEVICES AS REQUIRED BY CONTRACTOR.

MARK EACH BEAM SHOWING BRIDGE NUMBER, CASTING DATE, AND INDIVIDUAL IDENTIFICATION LETTERS AND NUMBERS ON THE FACE OF THE BEAM, NEAR THE END, SO LOCATED THAT THEY WILL BE EXPOSED AFTER THE END DIAPHRAGMS HAVE BEEN CAST. MARK FASCIA BEAMS ON THE INSIDE FACE. ENSURE ALL MARKINGS ARE STENCILLED AND CLEARLY LEGIBLE. FOR LOCATION OF BEAMS, SEE FRAMING PLAN.

ALL MATERIAL AND WORK SHOWN OR NOTED ON THIS SHEET IS INCLUDED IN UNIT PRICE BID FOR PRESTRESSED CONCRETE BEAMS. SEE SPEC. 2405.

SEE FRAMING PLAN FOR BEAM END MARKED "X" AND DIAPHRAGM SPACING.

APPROXIMATE WEIGHT OF BEAM IS 42 TONS.

AS AN ALTERNATE TO THE END DIAPHRAGM ANCHORAGES SHOWN, THE CONTRACTOR MAY SUBMIT DETAILS OF A CAST-IN-PLACE ANCHORAGE TO THE ENGINEER FOR APPROVAL. ANCHORAGE MUST PROVIDE AN ULTIMATE PULL OUT STRENGTH OF 15 KIPS PER ANCHORAGE.

APPLY AN APPROVED SEALER TO THE SIDES OF THE BEAM NEAR EACH END PER THE SPECIAL PROVISIONS.

① MINIMUM CONCRETE STRENGTH AT TIME OF PRESTRESS TRANSFER.

② MINIMUM CONCRETE STRENGTH WHEN BEAM CAN BE TRANSPORTED AND INSTALLED.

③ DRAPED STRANDS.

④ STRAIGHT STRANDS.

⑤ USE 7-WIRE LOW RELAXATION PRESTRESSING STRAND, CONFORMING TO ASTM A416, GRADE 270.

⑥ FOR INTEGRAL ABUTMENT, SOLE PLATE CAN BE ELIMINATED OR REPLACED WITH AN APPROVED PROTECTION PLATE. BEAMS DETAILED TO INCLUDE A TAPERED PLATE PER STANDARD FIGURE B309 MUST INCLUDE SOLE PLATE.

⑦ CENTER OF GRAVITY OF HOLD DOWNS WHEN MULTIPLE HOLD DOWNS ARE USED.

⑧ DIMENSION DETERMINED BY CONTRACTOR. MAINTAIN 2" MINIMUM CLEAR FROM STRANDS.

⑨ TWO INSIDE BARS MAY BE PLACED ADJACENT TO VERTICAL STIRRUP FOR TYING CONVENIENCE.

⑩ STEEL TROWEL TO SMOOTH FINISH AND APPLY BOND BREAKER PER APPROVED PRODUCTS LIST.

⑪ ROUGH FLOAT AND BROOM TRANSVERSELY FOR BOND PER SPEC. 2405.3.D.

DRAFT-WORK IN PROCESS

REVISED:

APPROVED: JANUARY 13, 2015
Nancy Daubenberger
STATE BRIDGE ENGINEER

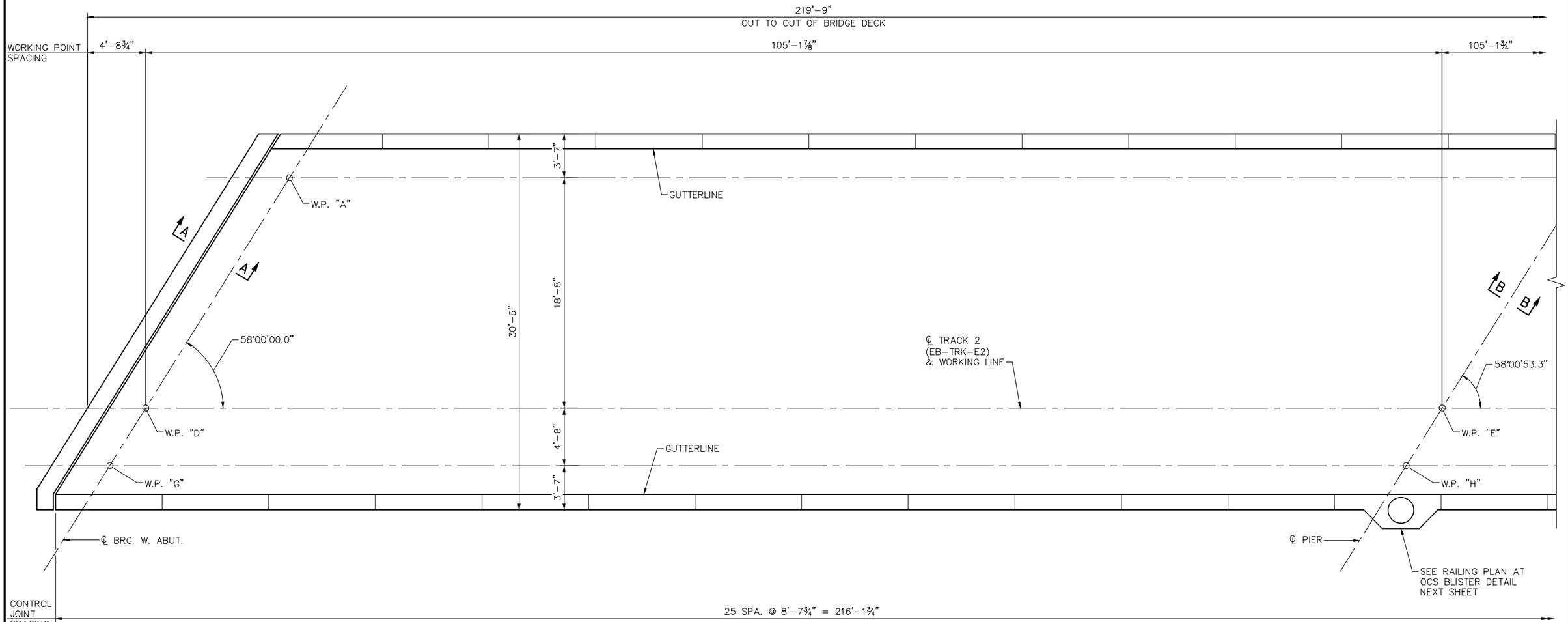
CERTIFIED BY _____ LICENSED PROFESSIONAL ENGINEER 7/27/15 DATE
NAME: ENGINEER _____ LIC. NO. #####

TITLE: MN54" PRESTRESSED CONCRETE BEAM (PRETENSIONED) MN54-105

BEAMS B1-B3

FIG. 5-397.508

DES: KAE	DR: LMT	APPROVED:	BRIDGE NO. 27303
CHK: MDJ	CHK: MDJ		
SHEET NO. 16 OF 34 SHEETS			



DECK PLAN

NOTES:

SEE SHEET 19 FOR SECTION A-A & B-B.

SEE SHEET 19 FOR TRANSVERSE SECTION THRU DECK.

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: KAE | CHECKED BY: MDJ
DRAWN BY: LMT | DATE: 7/27/15

AECOM Kimley»Horn

60% SUBMISSION - 09/21/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

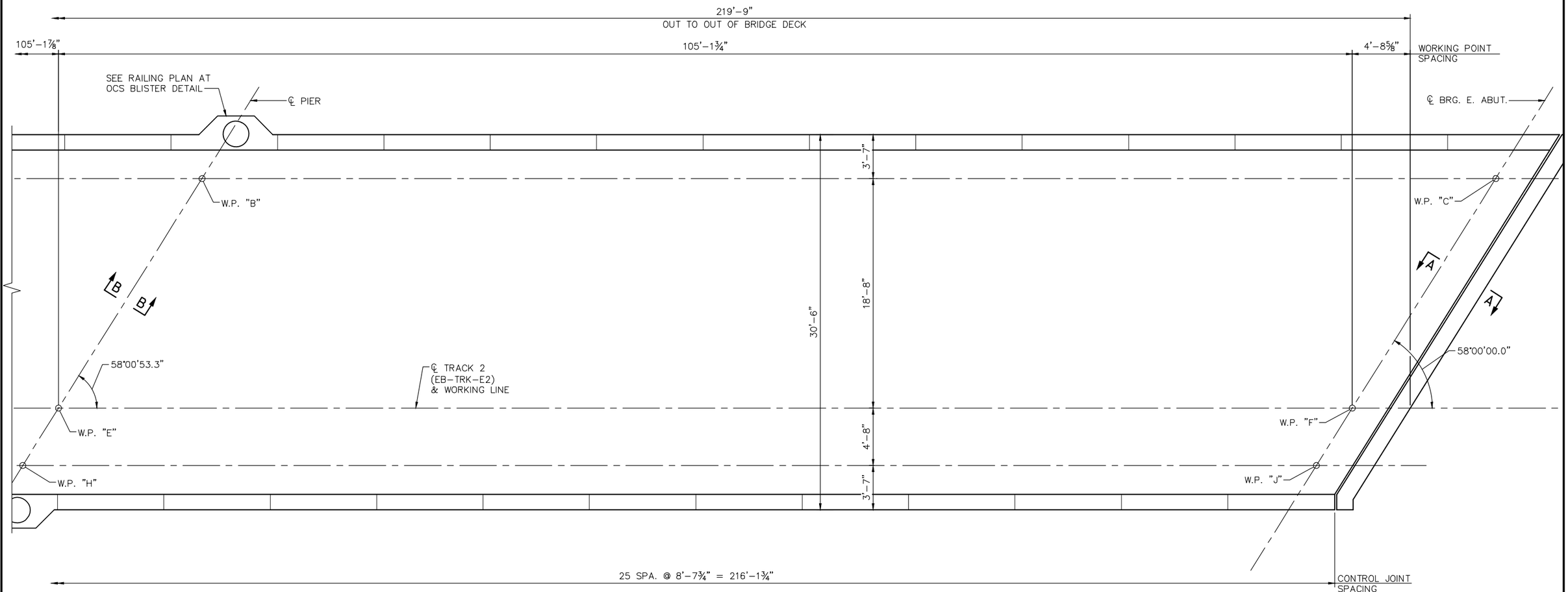
CIVIL EAST - VOLUME 4
TH 100 LRT BRIDGE
BRIDGE 27303
SUPERSTRUCTURE DETAILS

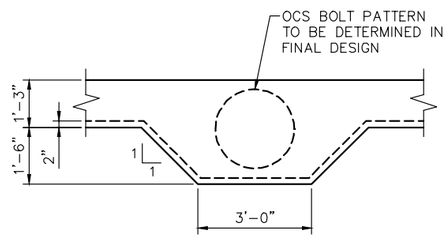
DISCIPLINE: STRUCTURES

SHEET NAME: CBR27303-BRG-SUP-004-1

SHEET 17 OF 39

Jul, 29 2015 10:53 am V:\3400_ADC\CAD\SEGMENT E2\PLAN SHEETS\STRUCTURES\T100-LRT\CBR27303-BRG-SUP-004.dwg By: brad.wodash





RAILING PLAN AT OCS BLISTER

DECK PLAN

NOTES:

SEE SHEET 19 FOR SECTION A-A & B-B.

SEE SHEET 19 FOR TRANSVERSE SECTION THRU DECK.

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: KAE | CHECKED BY: MDJ
DRAWN BY: LMT | DATE: 7/27/15

AECOM Kimley»Horn

60% SUBMISSION - 09/21/15

METROPOLITAN COUNCIL

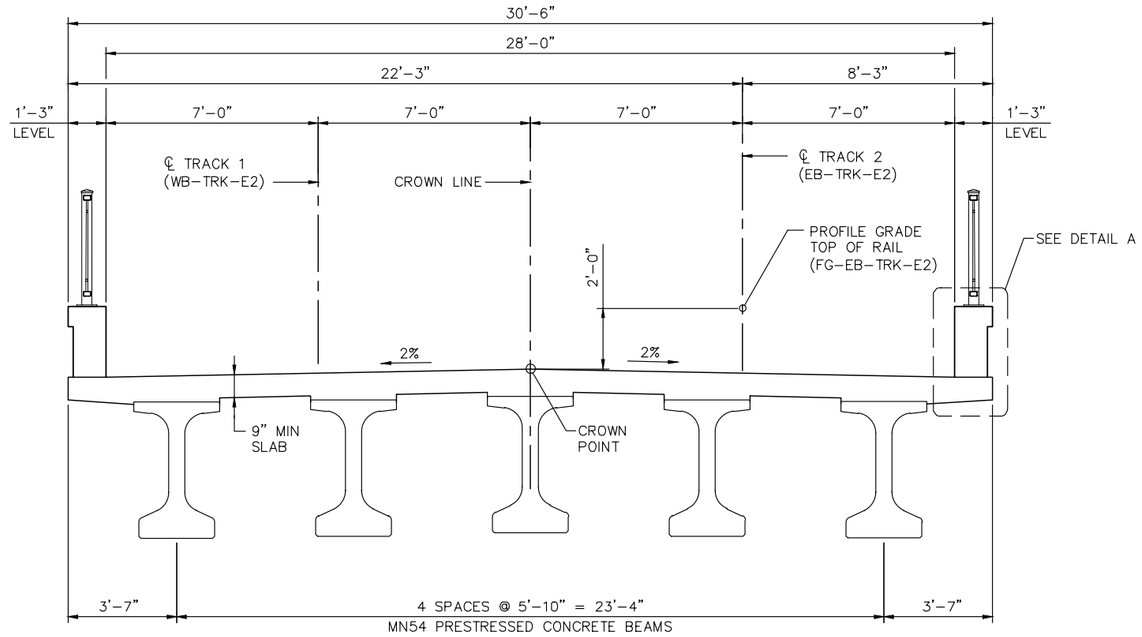
SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4
TH 100 LRT BRIDGE
BRIDGE 27303
SUPERSTRUCTURE DETAILS

DISCIPLINE: STRUCTURES

SHEET NAME: CBR27303-BRG-SUP-004-2

SHEET 18 OF 39

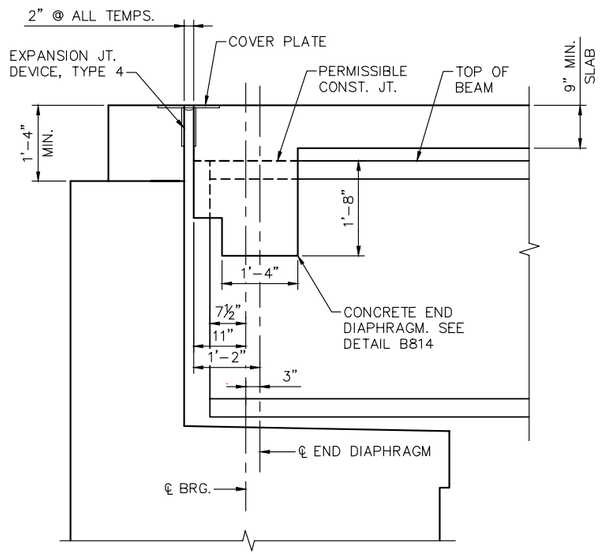


TRANSVERSE SECTION

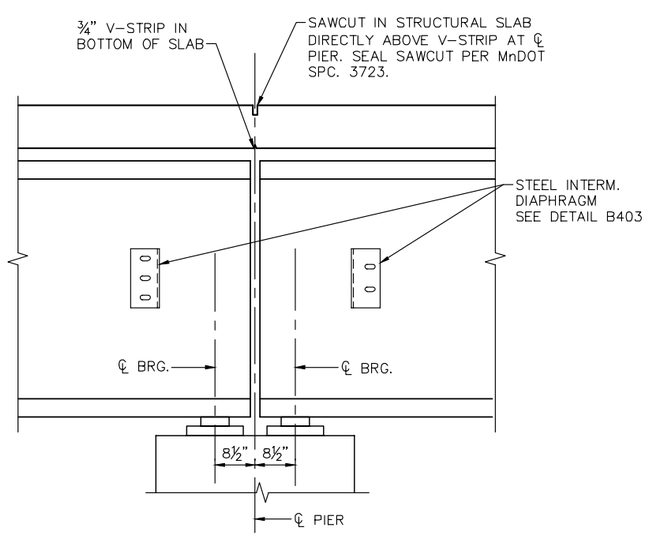
SUMMARY OF QUANTITIES - SUPERSTRUCTURE		
ITEM	UNIT	QUANTITY
BRIDGE SLAB CONCRETE (3Y42)	SQ. FT.	
(1) RAILING CONCRETE	LIN. FT.	
RAISED MEDIAN	SQ. FT.	
REINFORCEMENT BARS (EPOXY COATED)	POUND	
ORNAMENTAL METAL RAILING	LIN. FT.	
FIXED CURVED PLATE ASSEMBLY TYPE 1	EACH	
EXPANSION CURVED PLATE BEARING ASSEMBLY TYPE 1	EACH	
EXPANSION CURVED PLATE BEARING ASSEMBLY TYPE 2	EACH	
DRAINAGE SYSTEM BRIDGE DECK	LUMP SUM	
PRESTRESSED CONCRETE BEAMS MN54	LIN. FT.	
MEMBRANE WATERPROOFING	SQ. FT.	
BALLAST (CV)	CU. YD.	

NOTES:

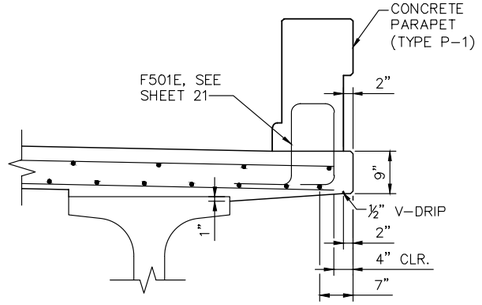
(1) INCLUDES REINFORCEMENT FOR DECK, END DIAPHRAGM, PARAPET TYPE (P-1)



SECTION A-A



SECTION B-B



DETAIL A

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: KAE | CHECKED BY: MDJ
DRAWN BY: LMT | DATE: 7/27/15

AECOM Kimley»Horn

60% SUBMISSION - 09/21/15

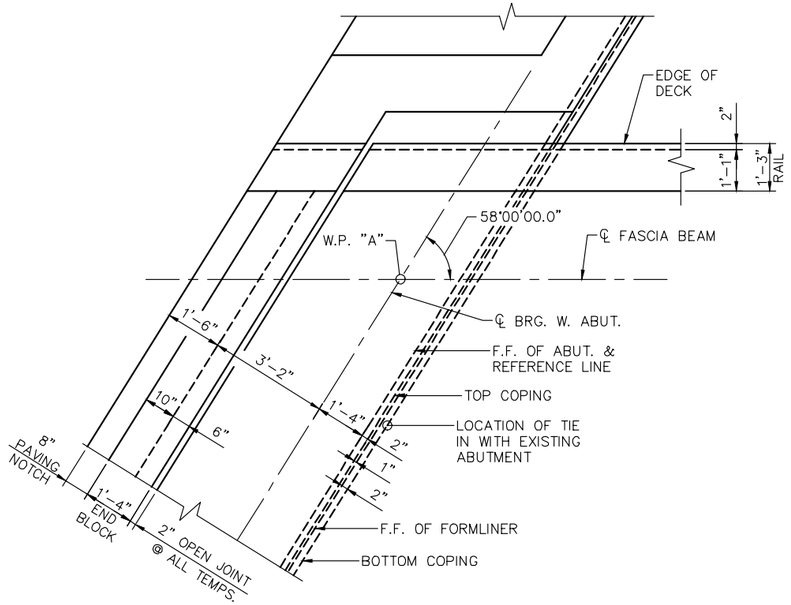
METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

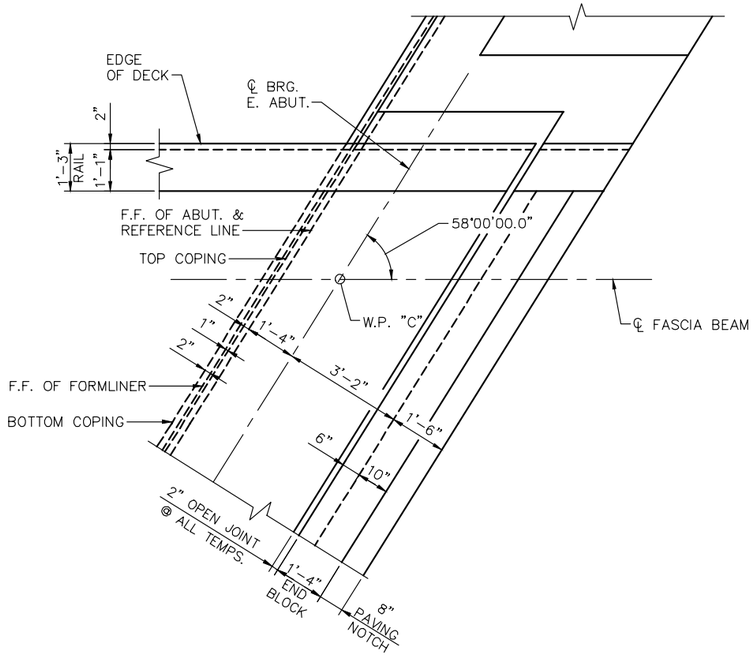
CIVIL EAST - VOLUME 4
TH 100 LRT BRIDGE
BRIDGE 27303
SUPERSTRUCTURE DETAILS

DISCIPLINE: STRUCTURES
SHEET NAME: CBR27303-BRG-SUP-004-3

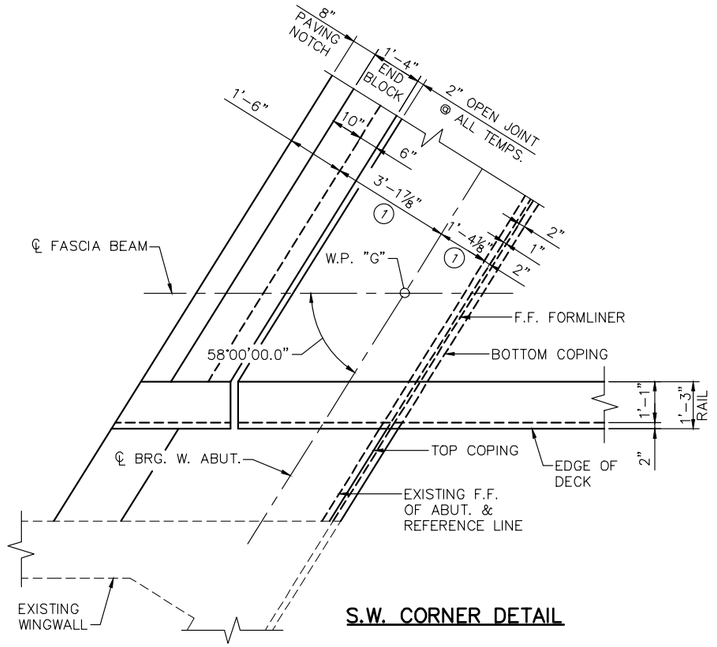
SHEET 19 OF 39



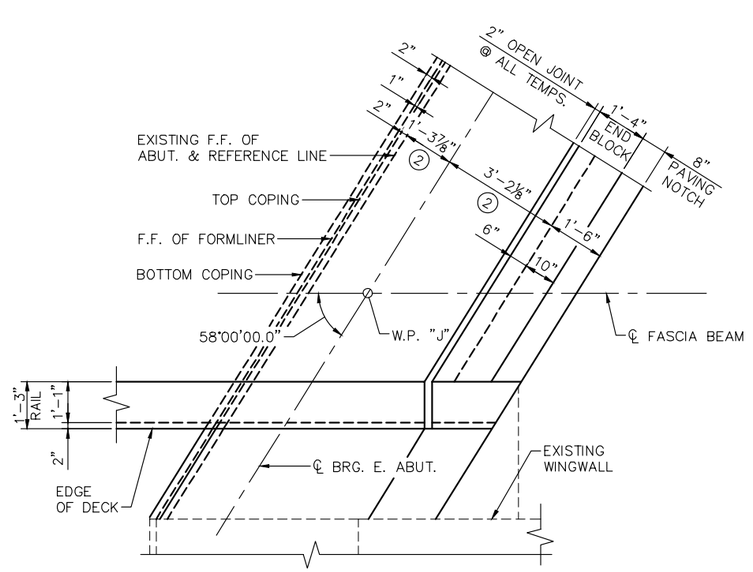
N.W. CORNER DETAIL



N.E. CORNER DETAIL



S.W. CORNER DETAIL



S.E. CORNER DETAIL

NOTES:

① DIMENSION PROVIDED AT W.P. "G"

② DIMENSION PROVIDED AT W.P. "J"

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: KAE | CHECKED BY: MDJ

DRAWN BY: LMT | DATE: 7/27/15

AECOM Kimley»Horn

60% SUBMISSION - 09/21/15

METROPOLITAN COUNCIL

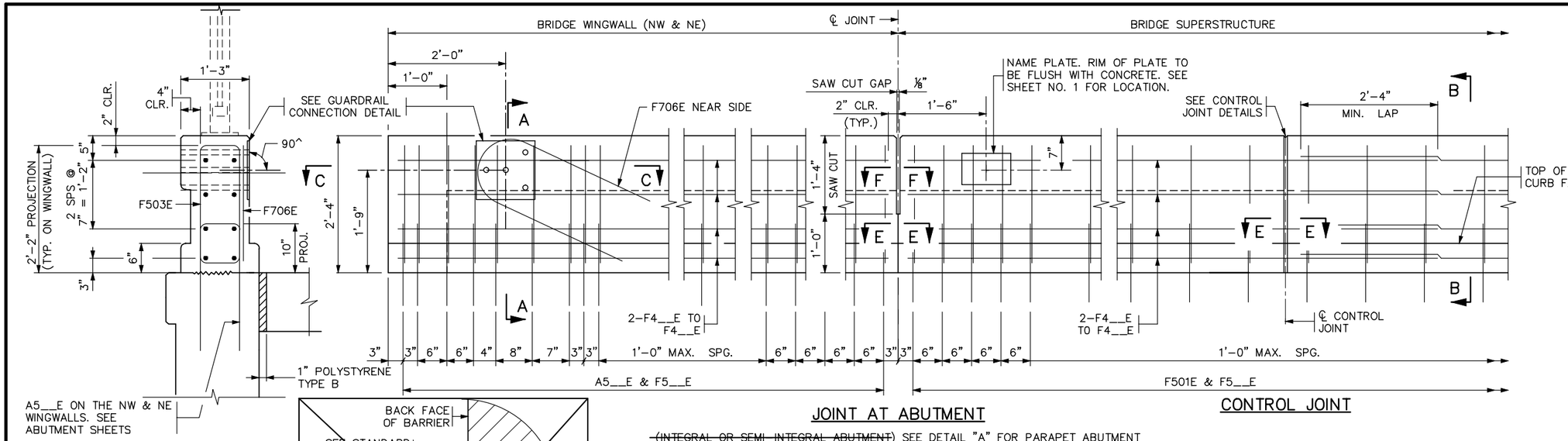
SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4
TH 100 LRT BRIDGE
BRIDGE 27303
SUPERSTRUCTURE DETAILS

DISCIPLINE: STRUCTURES

SHEET NAME: CBR27303-BRG-SUP-002

SHEET 20 OF 32

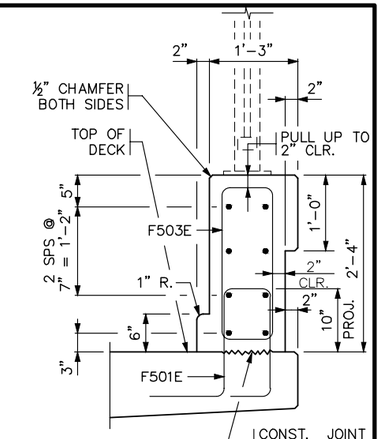


Ⓐ SECTION A–A

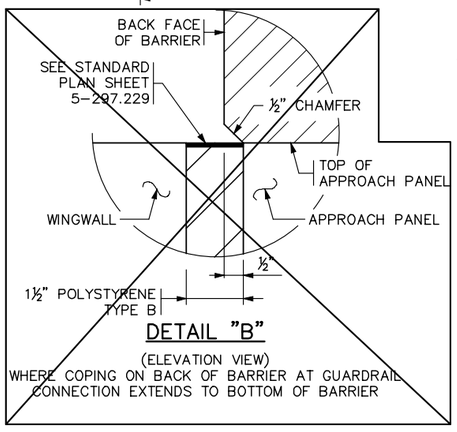
JOINT AT ABUTMENT

~~(INTEGRAL OR SEMI INTEGRAL ABUTMENT)~~ SEE DETAIL "A" FOR PARAPET ABUTMENT

CONTROL JOINT



Ⓐ SECTION B–B



DETAIL "B"

(ELEVATION VIEW)
WHERE COPING ON BACK OF BARRIER AT GUARDRAIL CONNECTION EXTENDS TO BOTTOM OF BARRIER

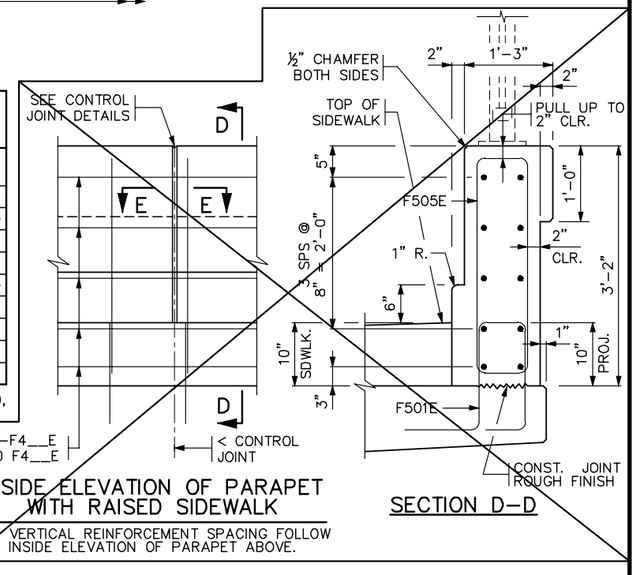
DETAIL "A" ②

(USE ONLY WITH STRIP SEAL EXPANSION DEVICE)
(EXPANSION DEVICE NOT SHOWN)

BILL OF REINFORCEMENT FOR PARAPET

	BAR	NO.	LENGTH	SHAPE	LOCATION
	F501E		5'-2"		PARAPET VERTICAL
	~~F502E~~		~~5'-4"~~		~~PARAPET VERTICAL~~
	F503E		6'-5"		PARAPET VERTICAL
*	F504E		4'-9"		PARAPET VERTICAL
	~~F505E~~		~~8'-1"~~		~~PARAPET VERTICAL~~
	F706E		6'-7"		PARAPET VERTICAL
	F4__E				PARAPET LONGIT.
	F4__E				PARAPET LONGIT.
	F4__E				PARAPET LONGIT.

* F504E WHEN STRIP SEAL EXPANSION DEVICE IS USED, WITHOUT RAISED SIDEWALK. (SEE DETAIL "A")

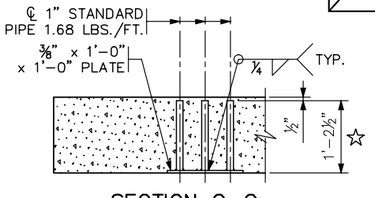


INSIDE ELEVATION OF PARAPET WITH RAISED SIDEWALK

FOR VERTICAL REINFORCEMENT SPACING FOLLOW INSIDE ELEVATION OF PARAPET ABOVE.

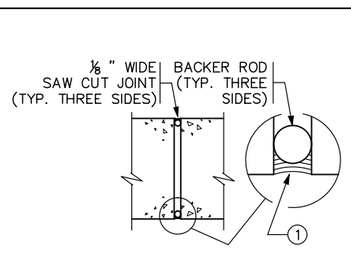
SECTION D–D

SHEET MODIFICATION:
Ⓐ DENOTES MODIFICATION TO STANDARD SHEET

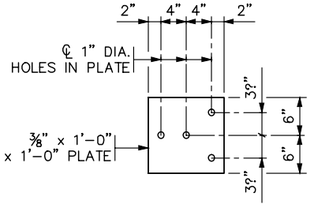


SECTION C–C

(REINFORCEMENT NOT SHOWN)
☆ DIMENSION INCLUDES ⅜" PLATE

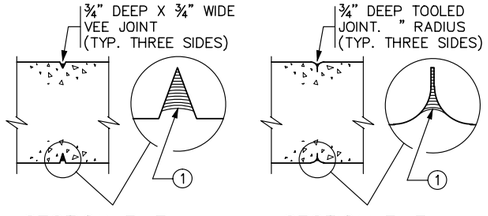


SECTION F–F



GUARDRAIL CONNECTION DETAIL

GALVANIZE AFTER FABRICATION PER SPEC. 3394. ESTIMATED WEIGHT = 23 LBS.

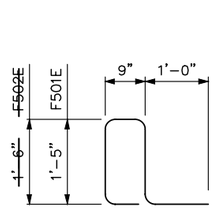


SECTION E–E
CONTRACTOR OPTION 1

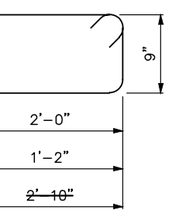
SECTION E–E
CONTRACTOR OPTION 2

CONTROL JOINT DETAILS

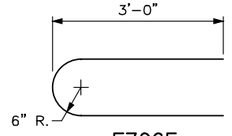
WHEN USING SLIP FORM METHOD TO PLACE THE CONCRETE, CUT JOINT 3 INCHES DEEP USING MARGIN TROWEL OR SIMILAR MEANS IMMEDIATELY AFTER CONCRETE PLACEMENT (TYP. THREE SIDES)



F501E, ~~F502E~~



F503E, F504E ~~AND F505E~~



F706E

GENERAL NOTES

CONTINUOUSLY GROUND ALL METAL RAILINGS; SEE THE SPECIAL PROVISIONS. REFER TO THE ELECTRICAL PLANS AND ELECTRICAL SPECIAL PROVISIONS FOR DETAILS REGARDING BONDING MULTIPLE ELECTRICAL GROUNDING SYSTEMS.

~~PAYMENT LENGTH SHALL BE MEASURED BETWEEN THE OUTSIDE FACES OF THE CONCRETE PARAPET.~~

CONCRETE PARAPET = 416 LBS./FT. (0.103 CU. YDS./FT.)

~~CONCRETE PARAPET W/ADJACENT SIDEWALK (BASED ON A 10" SIDEWALK HEIGHT) = 573 LBS./FT. (0.141 CU. YDS./FT.)~~

FINISH ALL EDGES OF PARAPET WITH " CHAMFER, EXCEPT WHERE OTHERWISE NOTED.

MAXIMUM SPACING OF CONTROL JOINTS ON SUPERSTRUCTURE, APPROACH AND WINGWALL SHALL BE 10 FT. SEE SUPERSTRUCTURE SHEET FOR JOINT SPACING.

Ⓐ GUARDRAIL CONNECTION TO BE STRUCTURAL STEEL, SPEC. 3306. ~~GUARDRAIL CONNECTION AND NAME PLATE TO BE CONSIDERED INCIDENTAL TO "TYPE P-1 PARAPET CONCRETE (3S52)".~~

~~SEE STANDARD FIGURE 5-397.___ FOR LIGHT BLISTER DETAILS.~~

PARAPET QUANTITIES ARE LISTED IN SUMMARY OF QUANTITIES FOR SUPERSTRUCTURE.

① JOINT SEALANT PER MnDOT APPROVED/QUALIFIED PRODUCTS LIST – CRACK AND JOINT MATERIALS – SILICONE JOINT SEALERS.

② REFER TO EXPANSION JOINT SHEET FOR COVER PLATE DETAILS.

DRAFT-WORK IN PROCESS

FIG. 5–397.166 (MOD.)

REVISION:

APPROVED: NOVEMBER 6, 2013
STATE BRIDGE ENGINEER

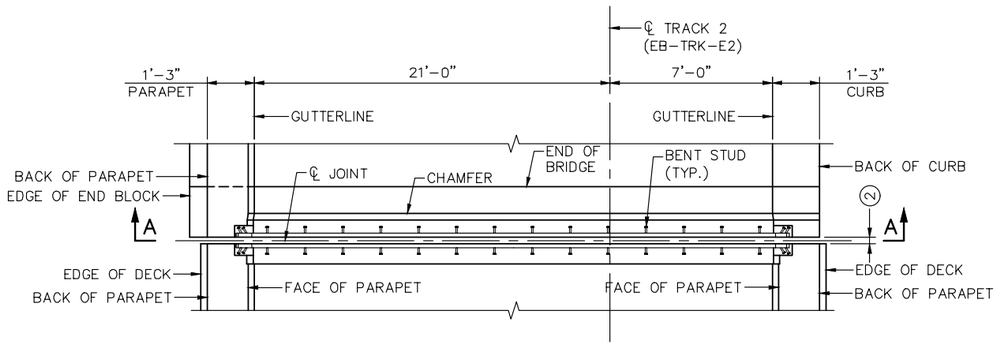
CERTIFIED BY _____ LICENSED PROFESSIONAL ENGINEER 7/27/15 DATE
NAME: ENGINEER LIC. NO. #####

TITLE: CONCRETE PARAPET (TYPE P-1)
WITH INTEGRAL END POST
(WITHOUT CONCRETE WEARING COURSE)

DES: KAE	DR: LMT	APPROVED:
CHK: MDJ	CHK: MDJ	

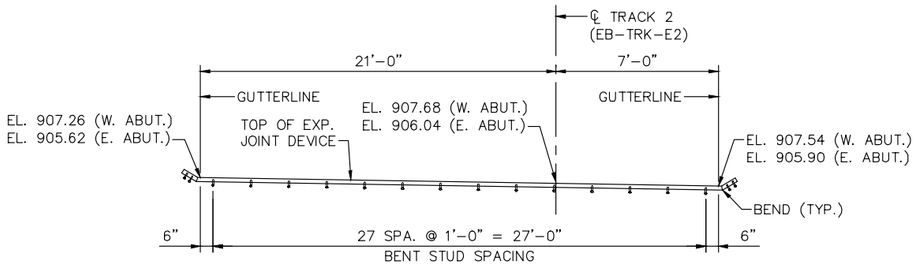
SHEET NO. 21 OF 39 SHEETS

BRIDGE NO. 27303



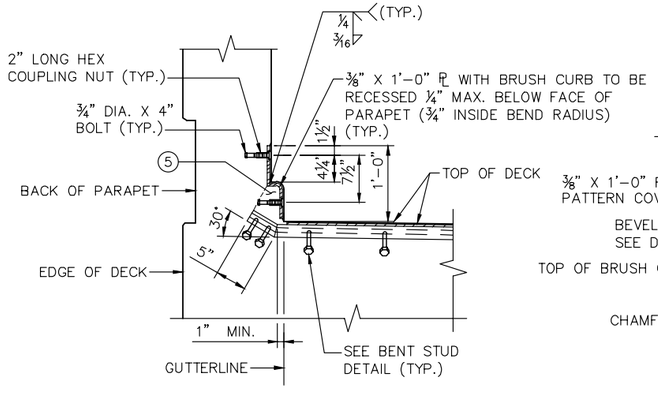
PLAN VIEW @ EXPANSION DEVICE

COVER PLATE NOT SHOWN FOR CLARITY

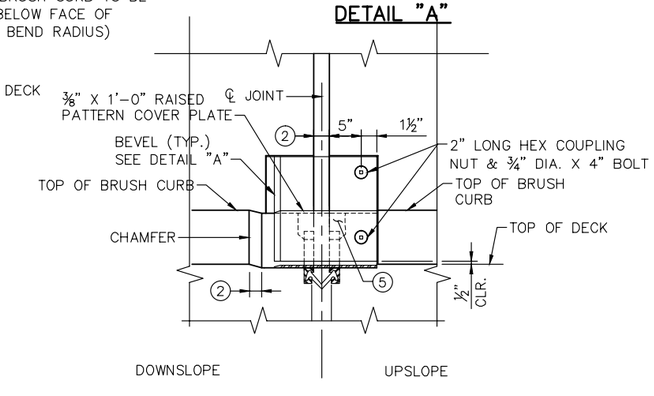


SECTION A–A – ALONG CENTERLINE JOINT

ELEVATIONS SHOWN ARE ½" BELOW TOP OF DECK
@ CENTERLINE JOINT (LOOKING UPSTATION)

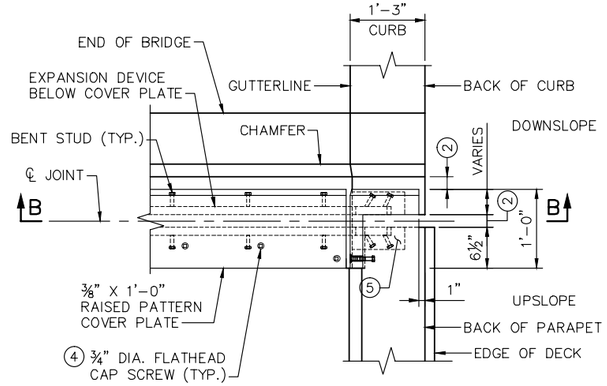


CONCRETE PARAPET SECTION

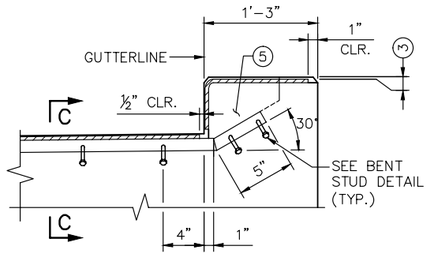


DETAIL "A"

CONCRETE PARAPET ELEVATION

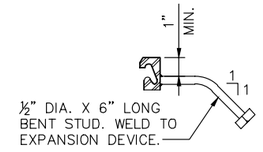


PLAN VIEW @ CURB

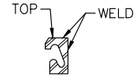


SECTION B–B

SECTION C–C



BENT STUD DETAIL



SECTION VIEW @ BEND

NOTES:

GALVANIZE STRUCTURAL STEEL AFTER FABRICATION AS PER SPEC. 3394. GALVANIZE FASTENERS AS PER SPEC. 3392.

JOINTS IN EXTRUSION SHALL BE LOCATED AT BREAKS IN TRANSVERSE PROFILE AND AS OTHERWISE REQUIRED. JOINTS SHALL BE CLOSE FIT AND WELDED. REPAIR AFTER WELDING AS PER SPEC. 2471.3.L.

STRUCTURAL STEEL SHALL COMPLY WITH SPEC. 3306.

EXPANSION DEVICE SHALL BE STRAIGHTENED TO A TOLERANCE OF ⅛" IN 10 FT.

CAP SCREWS SHALL BE COUNTERSUNK 1⁄16" BELOW TOP OF PLATE.

LENGTH OF PAYMENT FOR DEVICE IS FROM OUT TO OUT OF EXTRUSION ALONG CENTERLINE OF JOINT.

~~THE BID ITEM "EXPANSION JOINT DEVICES TYPE 4" INCLUDES ALL MATERIALS, LABOR, FABRICATION, FORMWORK, AND INSTALLATION REQUIRED FOR THE EXPANSION JOINT DEVICES AND COVER PLATES.~~

(1) EXPANSION DEVICE ELEVATIONS SHOWN ARE ½" BELOW FINISHED DECK ELEVATIONS. COVER PLATE SHALL BE INSTALLED PER TOLERANCE SHOWN IN SECTION C–C.

(2) 2" AT ALL TEMPERATURES.

(3) TOP OF CONCRETE TO TOP OF COVER PLATE ⅛" (¼" MAX.).

(4) MAXIMUM TRANSVERSE SPACING OF ¾" DIA. FLATHEAD SCREWS AND COUPLINGS SHALL BE 1'–0".

(5) MINIMAL AMOUNT OF CURB CONCRETE ABOVE EXPANSION DEVICE SHALL BE BLOCKED OUT FOR GLAND INSTALLATION.

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: KAE | CHECKED BY: MDJ
DRAWN BY: LMT | DATE: 7/27/15

AECOM Kimley»Horn

60% SUBMISSION - 09/21/15

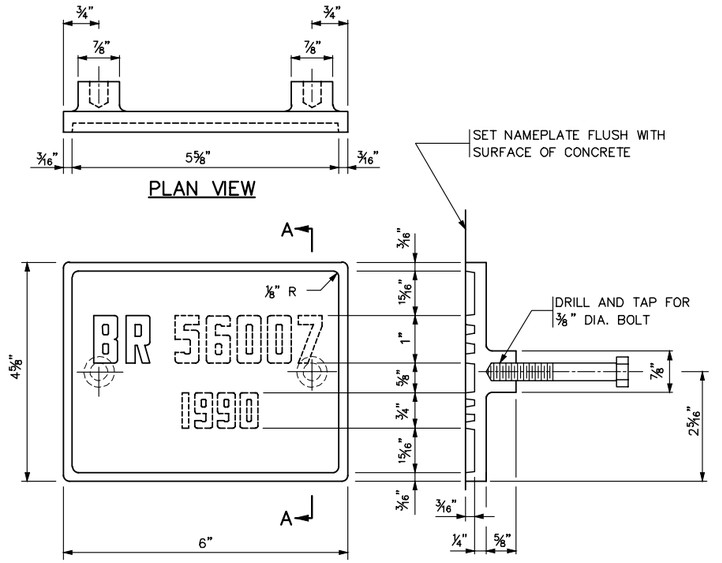
METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4
TH 100 LRT BRIDGE
BRIDGE 27303
WATERPROOF EXPANSION DEVICE

DISCIPLINE: STRUCTURES
SHEET NAME: CBR27303-BRG-DTL-005-1

SHEET 22 OF 36



THE DASHED NUMBERS SHOWN ABOVE ARE FOR ILLUSTRATION.
DATA TO BE SHOWN ON NAMEPLATE IS AS FOLLOWS:

BRIDGE 27303

YEAR 2016

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".

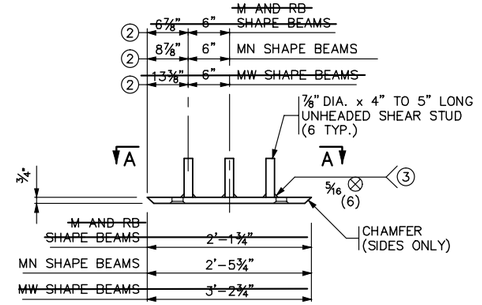
HORIZONTAL SPACING OF LETTERS AND NUMBERS SHALL PRODUCE A BALANCED LAYOUT IN PROPORTION TO SPACING SHOWN.

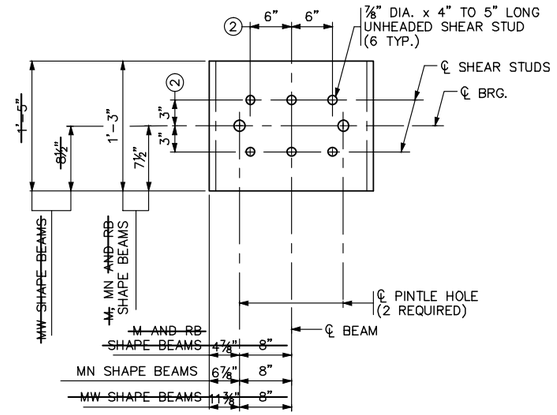
TOP SURFACE OF LETTERS, NUMBERS AND FRAMES SHALL BE BURNISHED.

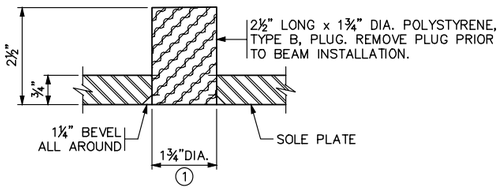
FURNISH 2 STEEL BOLTS ⅜ " DIA. x 3" LONG WITH EACH PLATE.

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

APPROVED: NOVEMBER 22, 2002	STATE OF MINNESOTA DEPARTMENT OF TRANSPORTATION	REVISION 09–11–2014	DETAIL NO.
Daniel L Worgan STATE BRIDGE ENGINEER	BRIDGE NAMEPLATE (FOR NEW BRIDGES)		B101







PINTLE HOLE DETAIL

NOTES:

MATERIAL TO BE STRUCTURAL STEEL PER MnDOT SPEC. 3306.

WELDED STUDS TO BE WELDABLE CARBON STEEL PER MnDOT SPEC. 3391.2D.

SOLE PLATE FOR BEARING ASSEMBLY TO BE GALVANIZED PER MnDOT SPEC. 3394 AFTER FABRICATION.

PINTLE HOLES SHALL BE FREE OF ZINC BUILD UP FROM GALVANIZING.

~~SOLE PLATES ARE INCIDENTAL TO PRESTRESSED CONCRETE BEAMS.~~

(1) FOR 1½" DIA. PINTLES.

(2) THESE DIMENSIONS MAY BE MODIFIED TO CLEAR PRESTRESSED STRANDS. HOWEVER, CHANGES MUST BE APPROVED BY THE ENGINEER.

(3) THE REQUIREMENTS FOR WELDING STUDS SHALL COMPLY WITH AASHTO/AWS D1.1.

APPROVED: SEPTEMBER 22, 2011	STATE OF MINNESOTA DEPARTMENT OF TRANSPORTATION	REVISED	DETAIL NO.
Nancy Daubenberger STATE BRIDGE ENGINEER	SOLE PLATE (PRESTRESSED CONCRETE BEAMS) (FOR BEARINGS WITH PINTLES)		B303

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: KAE | CHECKED BY: MDJ
DRAWN BY: LMT | DATE: 7/27/15

AECOM Kimley»Horn

60% SUBMISSION - 09/21/15

METROPOLITAN COUNCIL

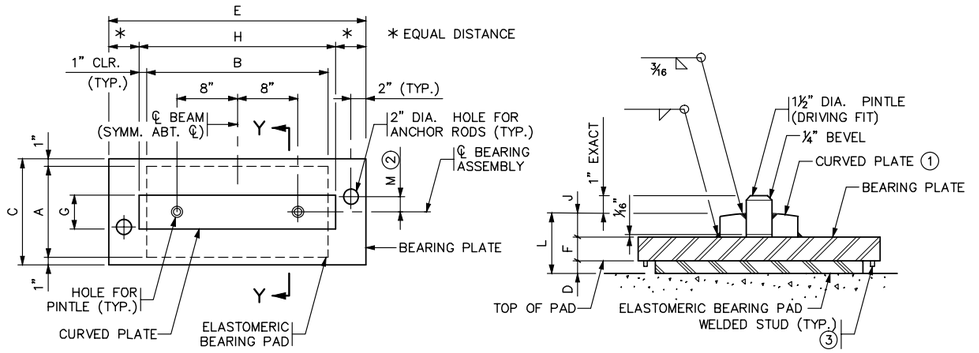
SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4
TH 100 LRT BRIDGE
BRIDGE 27303
DETAILS

DISCIPLINE: STRUCTURES
SHEET NAME: CBR27303-BRG-DTL-004-1

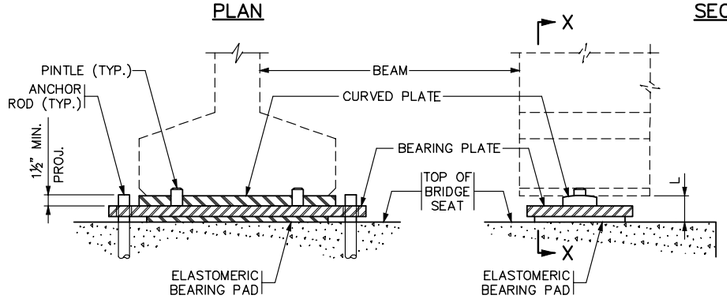
SHEET 23 OF 36

Jul, 29 2015 10:54 am V:\3400_ADC\CAD\SEGMENT E2\PLAN SHEETS\STRUCTURES\T100-LRT\CBR27303-BRG-DTL-004.dwg By: brad.wodash



PLAN

SECTION Y–Y

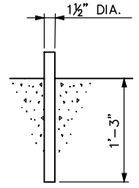


SECTION X–X

2'–2" BOTTOM FLANGE SHOWN

SIDE ELEVATION

ANCHOR RODS NOT SHOWN



ANCHOR ROD DETAIL

TABLE																
ASSEMBLY TYPE	LOCATION	BEAM SIZE	BEARING PAD SIZE			SHAPE FACTOR	BEARING PLATE SIZE			CURVED PLATE SIZE			ANCHOR ROD OFFSET		ASSY. HEIGHT	CURVED PLATE
			A	B	D		C	E	F	G	H	J	+/–②	M	L	R ①
		M & MN	12"	24"	½"	8.0	14"		1½"	4½"	26"	1¼"			3¼"	
~~——~~	~~——~~	~~MW~~	~~16"~~	~~36"~~	~~½"~~	~~11.1~~	~~18"~~	~~——~~	~~1½"~~	~~4½"~~	~~38"~~	~~1¼"~~	~~——~~	~~——~~	~~3¼"~~	~~——~~

NOTES:

ELASTOMERIC MATERIALS AND PAD CONSTRUCTION SHALL COMPLY WITH SPEC. 3741.

ALL STEEL PLATES SHALL COMPLY WITH SPEC. 3306.

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.

~~PAYMENT FOR BEARING ASSEMBLY SHALL INCLUDE ALL MATERIAL ON THIS DETAIL.~~

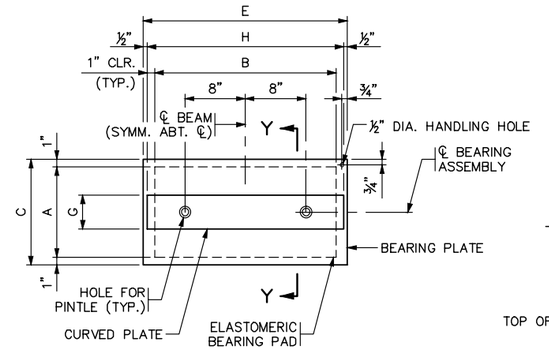
① THE MIN. RADIUS SHALL BE 16" UNLESS OTHERWISE SPECIFIED IN THE TABLE. THE MAX. RADIUS SHALL BE 24". FINISH TO 250 MICRO. THE FINISHED THICKNESS OF THE PLATE MAY BE 1⁄16" LESS THAN SHOWN.

② "+" DENOTES OFFSET AS SHOWN.
"–" DENOTES OFFSET OPPOSITE OF SHOWN.

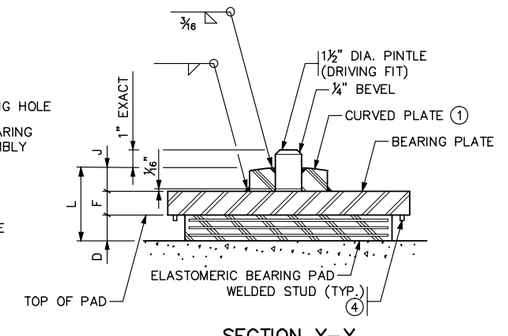
③ 5⁄16" DIA. x 3⁄8" KNOCK–OFF WELD STUDS INSTALLED ON BEARING PLATE AROUND PERIMETER OF BEARING PAD. CENTERLINE STUD TO EDGE OF PAD DIMENSION = ½", MAX. STUD SPACING = 4", AND MAX. SPACING TO PAD CORNER = 2".

DESIGN DATA:
MAXIMUM HORIZONTAL LOAD IS 70 KIPS FOR 1" PINTLES.

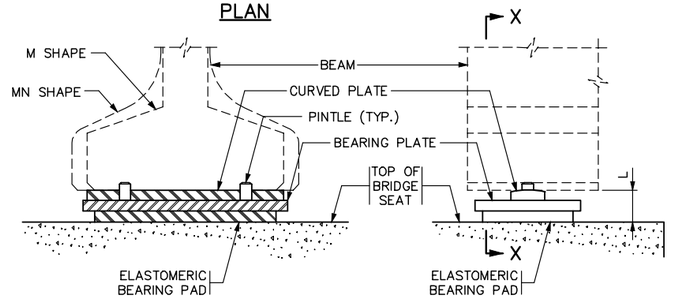
APPROVED: SEPTEMBER 22, 2011	STATE OF MINNESOTA DEPARTMENT OF TRANSPORTATION	REVISED	DETAIL NO.
Nancy Daubenberger STATE BRIDGE ENGINEER	CURVED PLATE BEARING ASSEMBLY (PRESTRESSED CONCRETE BEAMS) (FIXED)	11–06–2013	B310



PLAN

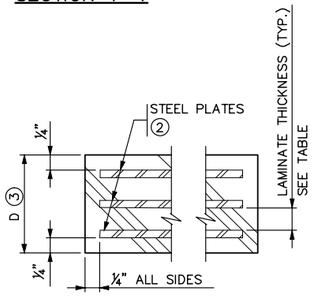


SECTION Y–Y



SECTION X–X

SIDE ELEVATION



SECTION THROUGH ELASTOMERIC BEARING PAD

TABLE																				
ASSEMBLY TYPE	LOCATION	BEAM SIZE	BEARING PAD SIZE			STEEL PLATES		LAMINATES		SHAPE FACTOR	BEARING PLATE SIZE			CURVED PLATE SIZE			ASSY. HEIGHT	CURVED PLATE
			A	B	D	NO.	THICK.	NO.	THICK.		C	E	F	G	H	J	L	R ①
		M & MN	12"	24"			⅛"		½"		14"	27"	1½"	4½"	26"	1¼"		
~~——~~	~~——~~	~~MW~~	~~16"~~	~~36"~~	~~——~~	~~——~~	~~⅛"~~	~~——~~	~~½"~~	~~——~~	~~18"~~	~~39"~~	~~1½"~~	~~4½"~~	~~38"~~	~~1¼"~~	~~——~~	~~——~~

NOTES:

ELASTOMERIC MATERIALS AND PAD CONSTRUCTION SHALL COMPLY WITH MnDOT SPEC. 3741.

ALL STEEL PLATES SHALL COMPLY WITH MnDOT SPEC. 3306.

PINTLES SHALL COMPLY WITH MnDOT SPEC. 3309.

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

~~PAYMENT FOR BEARING ASSEMBLY SHALL INCLUDE ALL MATERIAL ON THIS DETAIL.~~

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 1⁄16" LESS THAN SHOWN.

② DO NOT GALVANIZE THESE PLATES.

③ THE TOTAL THICKNESS SHOWN INCLUDES THE STEEL PLATES.

④ 5⁄16" DIA. x 3⁄8" KNOCK–OFF WELD STUDS INSTALLED ON BEARING PLATE AROUND PERIMETER OF BEARING PAD. CENTERLINE STUD TO EDGE OF PAD DIMENSION = ½", MAX. STUD SPACING = 4", AND MAX. SPACING TO PAD CORNER = 2".

DESIGN DATA:
MAXIMUM HORIZONTAL LOAD IS 70 KIPS FOR 1" PINTLES.

APPROVED: SEPTEMBER 22, 2011	STATE OF MINNESOTA DEPARTMENT OF TRANSPORTATION	REVISED	DETAIL NO.
Nancy Daubenberger STATE BRIDGE ENGINEER	CURVED PLATE BEARING ASSEMBLY (PRESTRESSED CONCRETE BEAMS) (EXPANSION)		B311

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: KAE | CHECKED BY: MDJ
DRAWN BY: LMT | DATE: 7/27/15

AECOM Kimley»Horn

60% SUBMISSION - 09/21/15

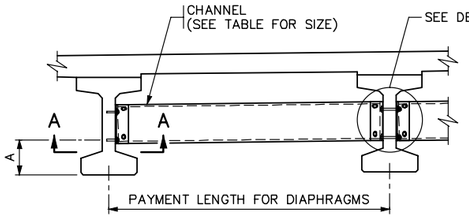
METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

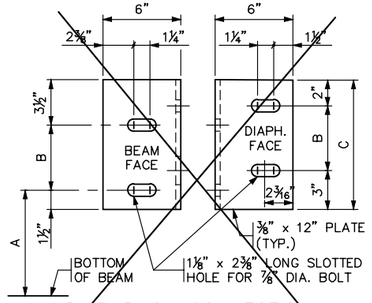
CIVIL EAST - VOLUME 4
TH 100 LRT BRIDGE
BRIDGE 27303
DETAILS

DISCIPLINE: STRUCTURES
SHEET NAME: CBR27303-BRG-DTL-004-2

SHEET 24 OF 36

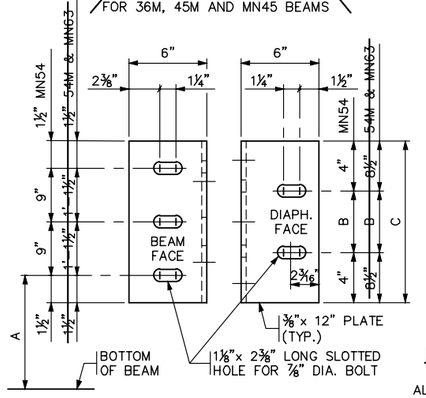


PART TRANSVERSE SECTION AT DIAPHRAGM



DIAPHRAGM CONNECTION

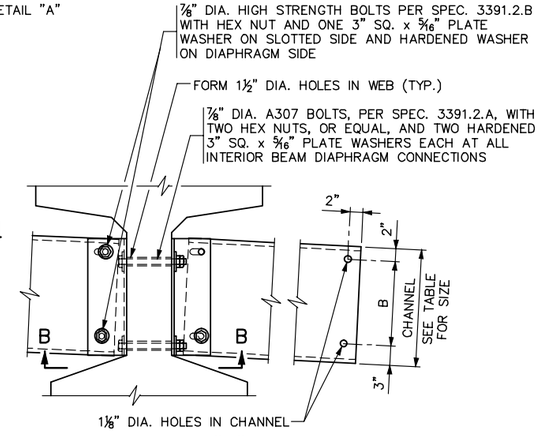
FOR 36M, 45M AND MN45 BEAMS



DIAPHRAGM CONNECTION

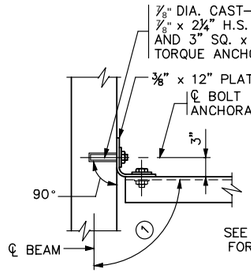
FOR 54M, MN54 AND MN63 BEAMS

TABLE				
BEAM HEIGHT	DISTANCE			CHANNEL SIZE
	A	B	C	
~~36M~~	~~1' 3"~~	~~7"~~	~~1' 0"~~	~~C12x20.7~~
~~45M~~	~~1'-3¾"~~	~~1' 1"~~	~~1' 6"~~	~~MC18x42.7~~
~~54M~~	~~1'-2¼"~~	~~1' 1"~~	~~2' 6"~~	~~MC18x42.7~~
~~MN45~~	~~1'-7¾"~~	~~7"~~	~~1' 0"~~	~~C12x20.7~~
MN54	1'-7¾"	1'-1"	1'-9"	MC18x42.7
~~MN63~~	~~1'-7¾"~~	~~1' 1"~~	~~2' 6"~~	~~MC18x42.7~~



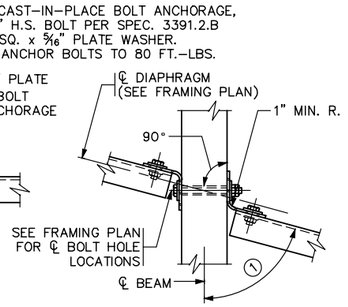
DETAIL "A"

INTERIOR BEAM WITH
CONTINUOUS LINE OF DIAPHRAGMS



SECTION A-A

TYPICAL SECTION AT
ALL FASCIA BEAMS



SECTION B-B

TYPICAL SECTION AT INTERIOR BEAM
WITH CONTINUOUS OR STAGGERED
INTERMEDIATE DIAPHRAGMS

NOTES:

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 ⅜" x 6" x 6" ANGLE MAY BE USED FOR DIAPHRAGMS PERPENDICULAR TO BEAMS.

~~INCLUDE ALL STRUCTURAL STEEL SHOWN ON THIS DETAIL, INCLUDING BOLTS AND WASHERS, IN UNIT PRICE BID FOR DIAPHRAGMS FOR PRESTRESSED BEAMS.~~

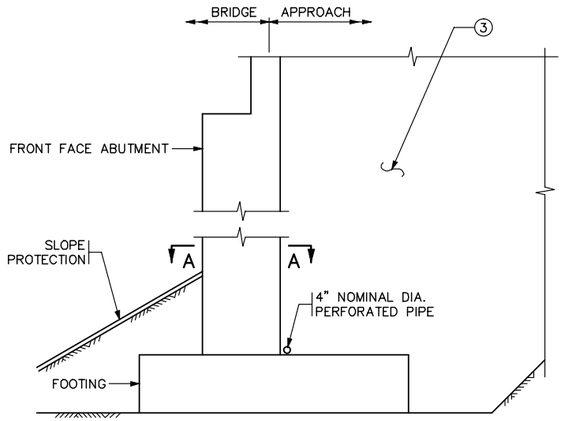
BENT PLATES MAY BE USED IN PLACE OF CHANNELS. THE BENT PLATES MUST BE THE SAME HEIGHT AS THE CHANNELS THEY REPLACE, BE 5/16" IN THICKNESS, AND HAVE LEGS 5" LONG.

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

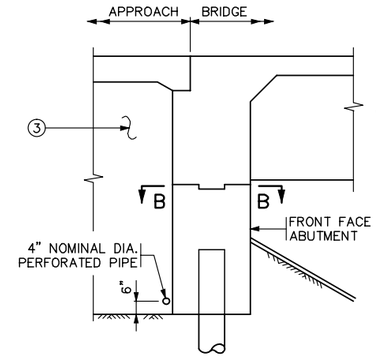
GALVANIZE BOLTS, NUTS AND WASHERS PER SPEC. 3392.

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

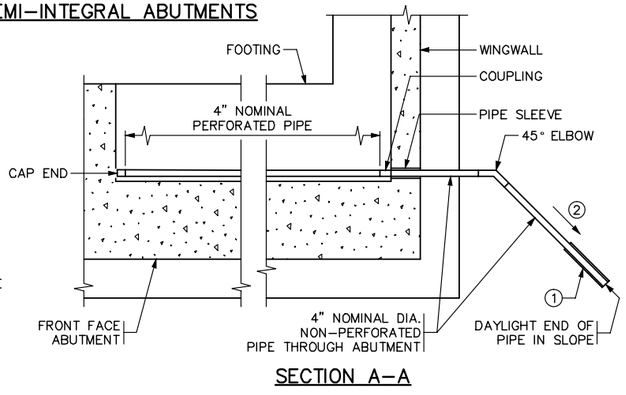
APPROVED: OCTOBER 26, 2005	STATE OF MINNESOTA DEPARTMENT OF TRANSPORTATION	REVISED	DETAIL NO.
Daniel D. Worgan STATE BRIDGE ENGINEER	STEEL INTERMEDIATE DIAPHRAGM (FOR 36M – 54M, MN45 – MN63 PRESTRESSED CONCRETE BEAMS)	06-14-2006 10-22-2009 09-11-2014	B403



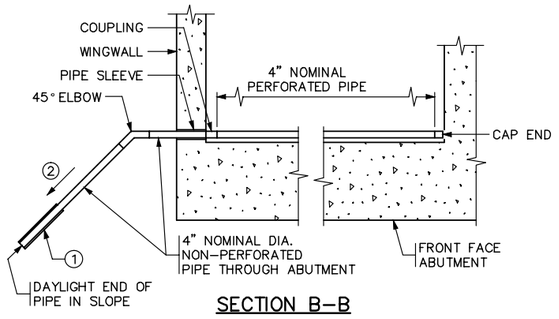
SECTION THROUGH PARAPET AND SEMI-INTEGRAL ABUTMENTS



SECTION THROUGH INTEGRAL ABUTMENT



SECTION A-A



SECTION B-B

NOTES:

~~PAYMENT WILL BE INCLUDED IN THE SINGLE LUMP SUM PRICE FOR "DRAINAGE SYSTEM TYPE (B910)", INCLUDES BUT IS NOT LIMITED TO 4" DIAMETER PERFORATED AND NON-PERFORATED PIPE, ELBOWS, END CAPS, COUPLINGS, SLEEVES AND PRECAST CONCRETE HEADWALLS.~~

ALL PIPE TO COMPLY WITH SPEC. 3245.

WRAP PERFORATED PIPE WITH GEOTEXTILE PER SPEC. 3733, TYPE 1. ATTACH TO PIPE PER SPEC. 2502.

① AT CONTRACTORS OPTION, MAY TIE APPROACH PANEL DRAINAGE SYSTEM AND ABUTMENT DRAINAGE SYSTEM INTO A SINGLE PRECAST CONCRETE HEADWALL OR INTO A CATCH BASIN AS LONG AS A MINIMUM OF 1% POSITIVE SLOPE CAN BE MANTAINED.

USE PRECAST CONCRETE HEADWALL WITH RODENT SCREEN. SEE STANDARD PLATE 3131 FOR DETAILS.

② ⅛" PER FT. MINIMUM SLOPE.

③ REFER TO GRADING PLANS FOR ABUTMENT BACKFILL REQUIREMENTS.

APPROVED: JANUARY 13, 2015	STATE OF MINNESOTA DEPARTMENT OF TRANSPORTATION	REVISED	DETAIL NO.
Nancy J. Daubenberger STATE BRIDGE ENGINEER	DRAINAGE SYSTEM		B910 DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: KAE CHECKED BY: MDJ
DRAWN BY: LMT DATE: 7/27/15

AECOM Kimley»Horn

60% SUBMISSION - 09/21/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4
TH 100 LRT BRIDGE
BRIDGE 27303
DETAILS

DISCIPLINE: STRUCTURES

SHEET NAME: CBR27303-BRG-DTL-004-3

SHEET 25 OF 36

CONCRETE WEARING COURSE

☐ LOW SLUMP

☐ OTHER _____
TYPE OR MANUFACTURER

EXPANSION JOINTS

JOINT MANUFACTURER

MANUFACTURER'S IDENTIFICATION _____
MFR'S No. AND/OR LETTER DESIGNATION FOR JOINT USED

GLAND MANUFACTURER _____
NAME AND ADDRESS (CITY, STATE)

SIZE OF GLAND _____

MANUFACTURER'S IDENTIFICATION _____
MFR'S No. AND/OR LETTER DESIGNATION FOR GLAND USED

ELASTOMERIC BEARING PADS

PAD MANUFACTURER _____
NAME AND ADDRESS (CITY, STATE)

SPECIAL SURFACE FINISH

SYSTEM: _____ COLOR: _____

FINISHING ROADWAY FACES OF BARRIER RAILING

TYPE: _____ COLOR: _____

ANTI–GRAFFITI COATING

MANUFACTURER _____
NAME AND ADDRESS (CITY, STATE)

PRODUCT NAME: _____ LOCATION: _____

PAINT SYSTEM

Mn/DOT SPECIFICATION NUMBER _____
2478 OR 2479 OR OTHER

MANUFACTURER _____
NAME AND ADDRESS (CITY, STATE)

PRIME COAT _____
Mn/DOT MATERIAL SPECIFICATION NUMBER

INTERMEDIATE COAT _____
Mn/DOT MATERIAL SPECIFICATION NUMBER

FINISH COAT _____ _____
Mn/DOT MATERIAL SPECIFICATION NUMBER COLOR

PLAN QUALITY

RATE 1 (AGREE), 2 (NEUTRAL), OR 3 (DISAGREE, PLEASE COMMENT BELOW)

DIMENSIONING AND DETAILING ADEQUATELY DESCRIBED REQUIRED CONSTRUCTION. _____
BAR LISTS AND QUANTITIES WERE TYPICALLY COMPLETE AND FREE OF ERRORS. _____
SCALE OF DRAWINGS AND OVERALL LEGIBILITY OF LINES AND TEXT WAS GOOD. _____
(SB) SPECIAL PROVISIONS ADEQUATELY DESCRIBED SPECIAL WORK AND PAYMENT. _____

COMMENTS: _____

NUMBER OF BRIDGE SUPPLEMENTAL AGREEMENTS: _____ COST: $ _____

LIST SIGNIFICANT ERRORS OR OMISSIONS IN PLAN DETAILS OR PAY QUANTITIES IN THE SPACE PROVIDED AT RIGHT.

BRIDGE REMOVAL / BRIDGE OPENING

NUMBER OF AND DATE OLD BRIDGE WAS REMOVED (IF APPLICABLE):

BRIDGE NUMBER _____ DATE REMOVED _____

DATE NEW BRIDGE WAS OPENED TO TRAFFIC _____

NOTIFY THE BRIDGE OFFICE BRIDGE MANAGEMENT UNIT WITH THIS INFORMATION AS SOON AS POSSIBLE. (651) 366–4557

OTHER ITEMS ①

① UTILITIES ADDED DURING CONSTRUCTION AND SPECIALTY ITEMS.

FINAL QUANTITIES ENTERED ON SCHEDULE OF QUANTITIES: YES ☐ NO ☐

SUMMARY OF SIGNIFICANT AS–BUILT CHANGES

THE AS–BUILT INFORMATION WAS ADDED TO THE PLAN BY:

_____ _____
INSPECTOR(S) SIGNATURE DATE

CHECKED BY: _____ _____
PROJECT ENGINEER/SUPERVISOR SIGNATURE DATE

AT THE TIME OF THE FINAL, THIS COMPLETED AS–BUILT BRIDGE DATA SHEET MUST BE SUBMITTED TO THE BRIDGE OFFICE – ATTN: REGIONAL CONSTRUCTION ENGINEER (MS610).

REVISION: 10–28–2008

APPROVED: SEPTEMBER 26, 2003
Daniel T. Hegeman
STATE BRIDGE ENGINEER

AS–BUILT DETAILS
(AS NEEDED)

DRAFT-WORK IN PROCESS FIG. 5–397.900

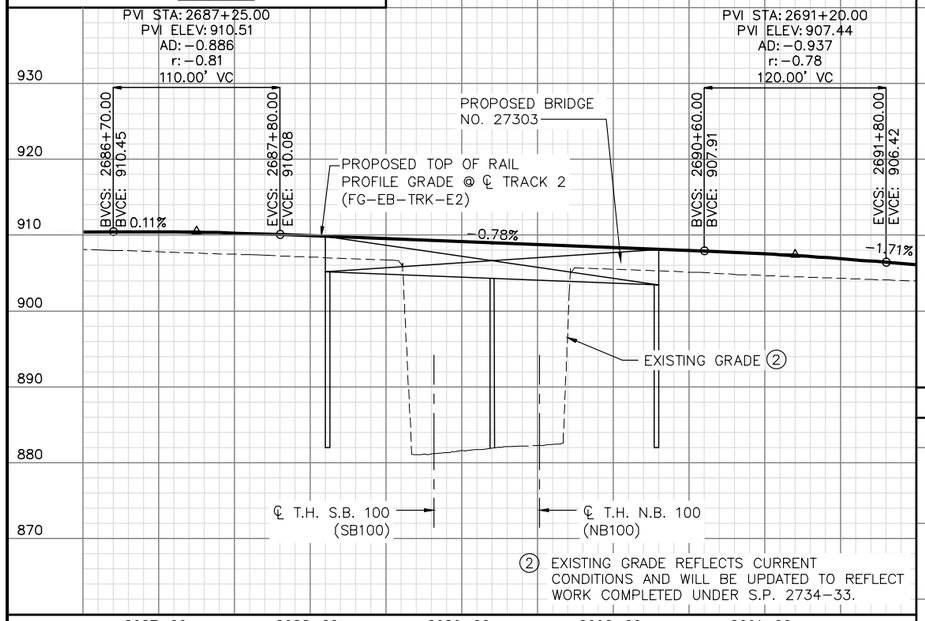
TITLE: AS–BUILT BRIDGE DATA

DES: KAE	DR: LMT	APPROVED:	BRIDGE NO. 27303
CHK: MDJ	CHK: MDJ		
SHEET NO. 26 OF 39 SHEETS			

CONTRACTED PROFILE

SCALE HOR: 0 50'

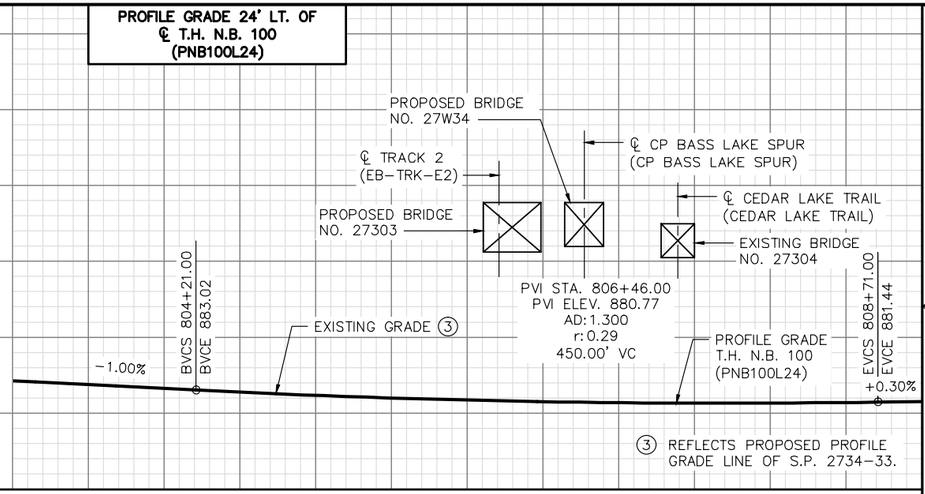
SCALE VER: 0 10'



② EXISTING GRADE REFLECTS CURRENT CONDITIONS AND WILL BE UPDATED TO REFLECT WORK COMPLETED UNDER S.P. 2734−33.

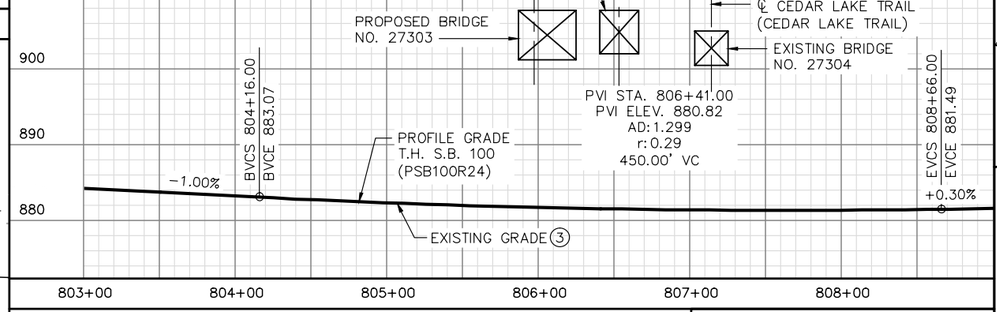
PROFILE GRADE TOP OF RAIL @ ℄ TRACK 2 (FG−EB−TRK−E2)

PROFILE GRADE 24' LT. OF ℄ T.H. N.B. 100 (PNB100L24)



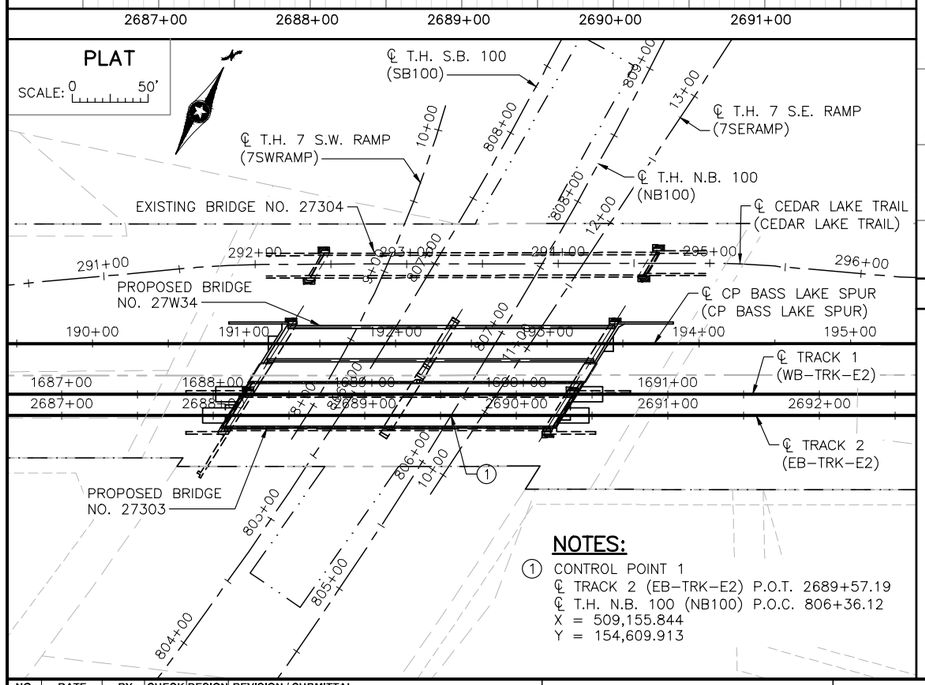
③ REFLECTS PROPOSED PROFILE GRADE LINE OF S.P. 2734−33.

PROFILE GRADE 24' RT. OF ℄ T.H. S.B. 100 (PSB100R24)



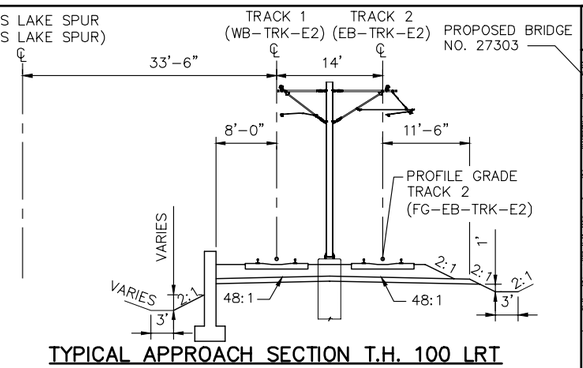
PLAT

SCALE: 0 50'



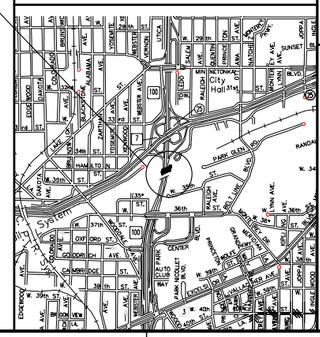
NOTES:

1. CONTROL POINT 1
   ℄ TRACK 2 (EB−TRK−E2) P.O.T. 2689+57.19
   ℄ T.H. N.B. 100 (NB100) P.O.C. 806+36.12
   X = 509,155.844
   Y = 154,609.913



TYPICAL APPROACH SECTION T.H. 100 LRT

INDEX MAP



LOCATION ENGINEER'S OBSERVATIONS AT BRIDGE SITE

1. SPECIAL FEATURES: WATERFALLS, DAMS, FLOODS, ICE, DEBRIS SLIDING BANKS, RECREATIONAL BOATING.
2. OTHER BRIDGES OR CULVERTS OVER THE SAME STREAM (PARTICULARY STRUCTURES WHICH CARRY HIGH WATER WITHOUT OVERFLOW OF ROADWAY): GIVEN LOCATION, TYPE, LENGTH, HEIGHT ABOVE HIGH WATER, CROSS−SECTIONAL AREA ETC.
3. APPARENT HIGHWATER ELEVATION OBTAINED FROM:
4. OTHER DATA: APPROX. VELOCITY OF WATER AT TIME OF SURVEY.

HYDRAULIC ENGINEER'S RECOMMENDATION

DATE:

STREAM OR DITCH DESIGNATION

DRAINAGE AREA

MAX FLOOD ON RECORD

DESIGN FLOOD (YR. FREQ.): C.F.S.
HEADWATER ELEVATION: FT.
DESIGN MEAN VELOCITY THROUGH STRUCTURE F.P.S.
TOTAL STAGE INCREASE FT.
LOW MEMBER AT OR ABOVE ELEVATION FT.

WATERWAY AREA REQUIRED BELOW ELEV. = SQ. FT.
AT RIGHT ANGLES TO CHANNEL

BASIC FLOOD (100 YR. FREQ.) C.F.S.
HEADWATER ELEVATION: FT.
TOTAL STAGE INCREASE FT.
MEAN VELOCITY THROUGH STRUCTURE

FLOWLINE ELEVATION: FT. SKEW ANGLE:

ESTIMATED PRLIMINARY TOTAL SCOUR AT PIER EL.
(500 OR OT YR. FREQ.)

SCOUR CONFIRMATION RECOMMENDATION

DATE:

TOTAL SCOUR AT PIER EL. (500 OR OT YR. FREQ.)
SCOUR CODE: OBTAIN FROM HYDRAULIC ENGINEER

BRIDGE SURVEY SHEETS MADE FROM 2014 MFRA SURVEYS AND PROPOSED PLANS FOR S.P. 2734−33

1ST BENCH MARK (NAVD 88)
BENCHMARK ID PT. 61
ELEVATION = 914.44
X = 507459.25, Y = 153987.80
DESCRIPTION = TOP NUT HYDRANT

2ND BENCH MARK (NAVD 88)
BENCHMARK ID PT. 63
ELEVATION = 888.82
X = 511126.66, Y = 155735.94
DESCRIPTION = MAG NAIL IN BIT. ISLAND

BRIDGE SURVEY

PROPOSED BRIDGE LOCATED:
0.2 MILES SOUTH OF JCT. T.H. 7
IN ST. LOUIS PARK

SEC 6 T 28N R 24W

CITY OF ST LOUIS PARK HENNEPIN COUNTY

BRIDGE NO. 27303

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: KAE CHECKED BY: MDJ
DRAWN BY: LMT DATE: 7/27/15

AECOM Kimley»Horn

60% SUBMISSION - 09/21/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4
TH 100 LRT BRIDGE
BRIDGE 27303
BRIDGE SURVEY

DISCIPLINE: STRUCTURES

SHEET NAME: CBR27303-BRG-SUR-001

SHEET 27 OF 39

Jul, 29 2015 10:56 am V:\3400_ADC\CAD\SEGMENT E2\PLAN SHEETS\STRUCTURES\T100-LRT\CBR27303-BRG-SUR-001.dwg By: brad.wodash

℄ T.H. 7 S.W. RAMP
(7SWRAMP)

℄ T.H. S.B. 100
(SB100)

℄ T.H. N.B. 100
(NB100)

℄ T.H. 7 S.E. RAMP
(7SERAMP)

℄ CEDAR LAKE TRAIL
(CEDAR LAKE TRAIL)

℄ BRG. W. ABUT.

℄ PIER

℄ BRG. E. ABUT.

℄ CP BASS LAKE SPUR
(CP BASS LAKE SPUR)

℄ TRACK 1
(WB–TRK–E2)

℄ TRACK 2
(EB–TRK–E2)

CB–01
STA. 2688+33.59
28' LT. OF ℄ TRACK 2

B–01
STA. 2688+12.67
13' RT. OF ℄ TRACK 2

B–02
STA. 2688+92.11
55' RT. OF ℄ TRACK 2

B–03
STA. 2689+54.14
33' LT. OF ℄ TRACK 2

B–04
STA. 2690+38.42
21' LT. OF ℄ TRACK 2

CB–02A
STA. 2690+21.68
21' RT. OF ℄ TRACK 2

NOTES:

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."

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: KAE | CHECKED BY: MDJ
DRAWN BY: LMT | DATE: 7/27/15

AECOM Kimley»Horn

60% SUBMISSION - 09/21/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

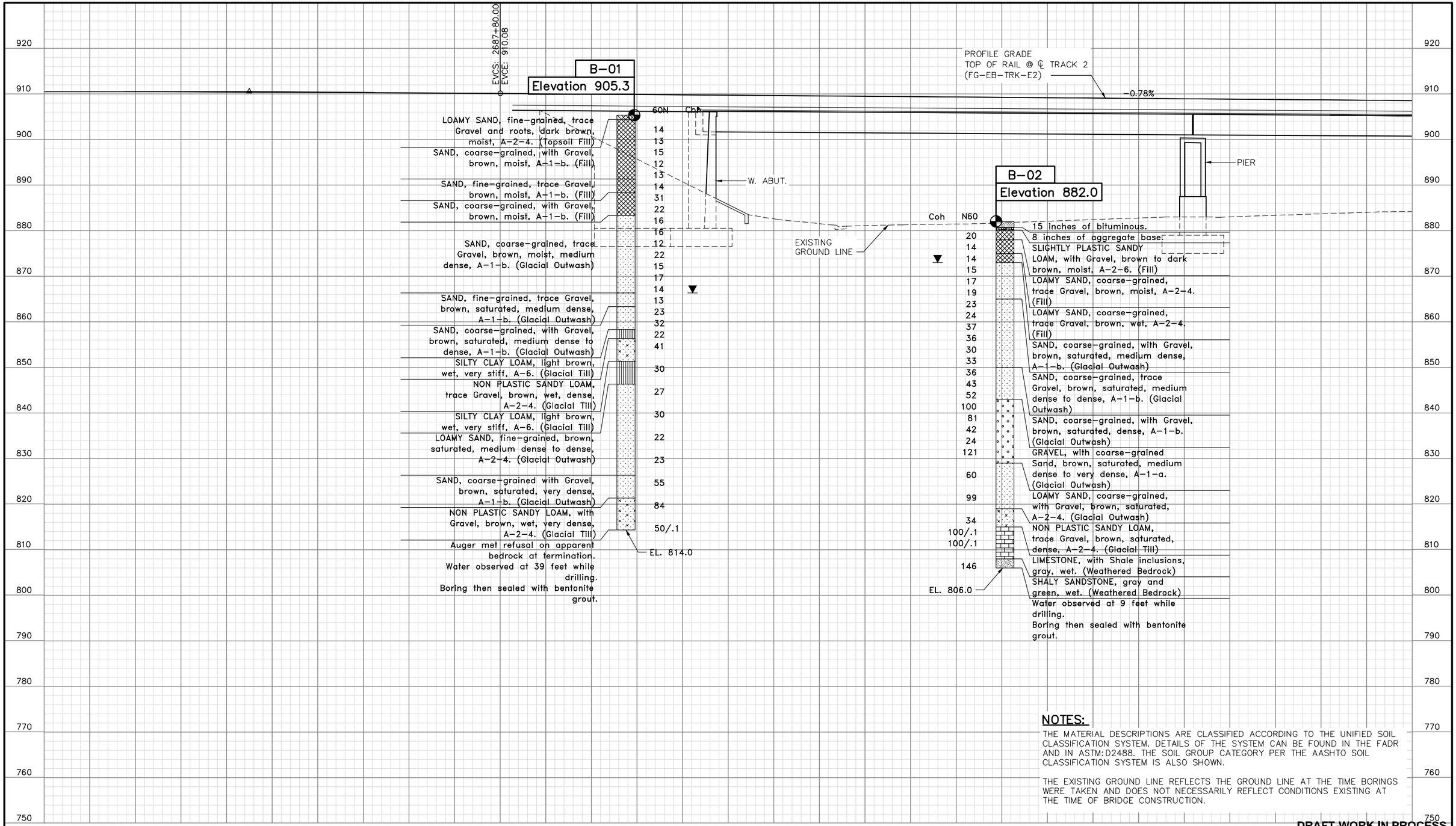
CIVIL EAST - VOLUME 4
TH 100 LRT BRIDGE
BRIDGE 27303
BRIDGE SURVEY PLAN

DISCIPLINE: STRUCTURES

SHEET NAME: CBR27303-BRG-BOR-001-1

SHEET 28 OF 39

Jul, 29 2015 10:56 am V:\3400_ADC\CAD\SEGMENT E2\PLAN SHEETS\STRUCTURES\T100-LRT\CBR27303-BRG-BOR-001.dwg By: brad.wodash



N60	
14	
13	
15	
12	
13	
14	
31	
22	
16	
16	
12	
22	
15	
17	
14	
13	
23	
32	
22	
41	
30	
27	
30	
22	
23	
55	
84	
50/.1	

Coh N60	
20	
14	
14	
15	
17	
19	
23	
24	
37	
36	
30	
33	
36	
43	
52	
100	
81	
42	
24	
121	
60	
99	
34	
100/.1	
100/.1	
146	

NOTES:

THE MATERIAL DESCRIPTIONS ARE CLASSIFIED ACCORDING TO THE UNIFIED SOIL CLASSIFICATION SYSTEM. DETAILS OF THE SYSTEM CAN BE FOUND IN THE FADR AND IN ASTM:D2488. THE SOIL GROUP CATEGORY PER THE AASHTO SOIL CLASSIFICATION SYSTEM IS ALSO SHOWN.

THE EXISTING GROUND LINE REFLECTS THE GROUND LINE AT THE TIME BORINGS WERE TAKEN AND DOES NOT NECESSARILY REFLECT CONDITIONS EXISTING AT THE TIME OF BRIDGE CONSTRUCTION.

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: KAE | CHECKED BY: MDJ
DRAWN BY: LMT | DATE: 7/27/15

AECOM Kimley»Horn

60% SUBMISSION - 09/21/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

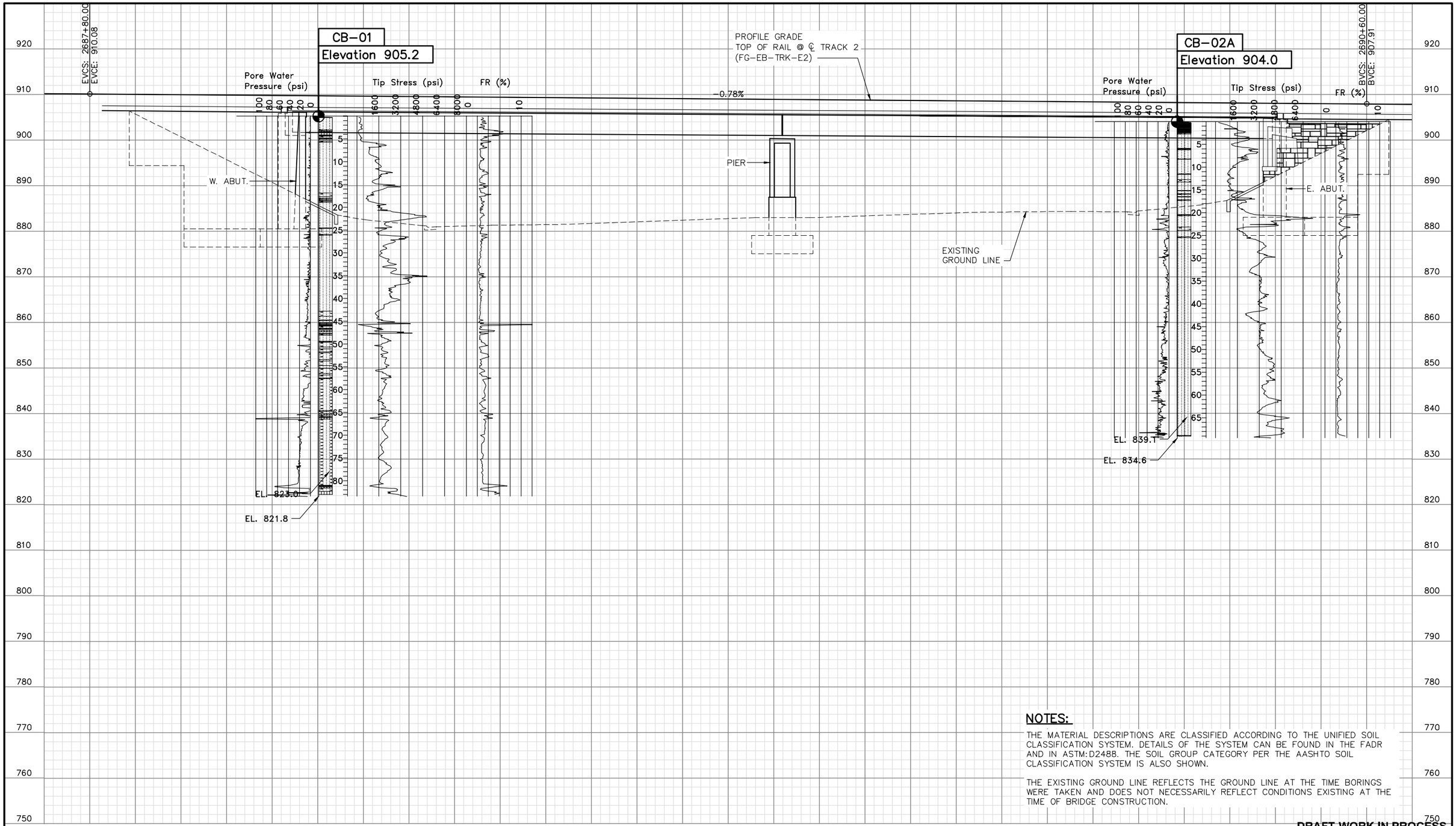
CIVIL EAST - VOLUME 4
TH 100 LRT BRIDGE
BRIDGE 27303
BRIDGE SURVEY PROFILE

DISCIPLINE: STRUCTURES

SHEET NAME: CBR27303-BRG-BOR-002-1

SHEET 29 OF 39

Jul, 29 2015 10:58 am V:\3400_ADC\CAD\SEGMENT E2\PLAN SHEETS\STRUCTURES\T100-LRT\CBR27303-BRG-BOR-002.dwg By: brad.wodash



NOTES:

THE MATERIAL DESCRIPTIONS ARE CLASSIFIED ACCORDING TO THE UNIFIED SOIL CLASSIFICATION SYSTEM. DETAILS OF THE SYSTEM CAN BE FOUND IN THE FADR AND IN ASTM:D2488. THE SOIL GROUP CATEGORY PER THE AASHTO SOIL CLASSIFICATION SYSTEM IS ALSO SHOWN.

THE EXISTING GROUND LINE REFLECTS THE GROUND LINE AT THE TIME BORINGS WERE TAKEN AND DOES NOT NECESSARILY REFLECT CONDITIONS EXISTING AT THE TIME OF BRIDGE CONSTRUCTION.

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: KAE | CHECKED BY: MDJ
DRAWN BY: LMT | DATE: 7/27/15

AECOM Kimley»Horn

60% SUBMISSION - 09/21/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

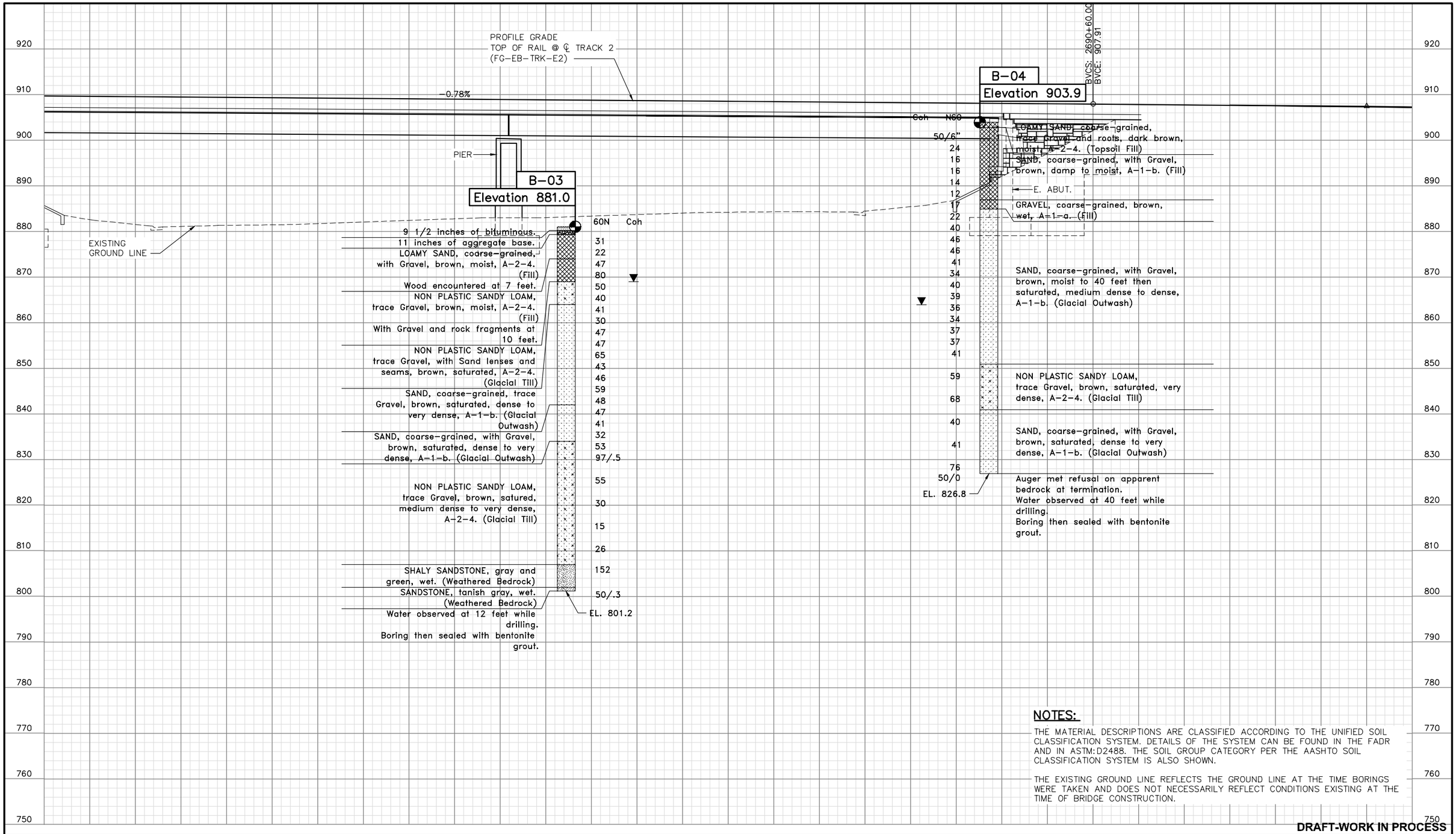
CIVIL EAST - VOLUME 4
TH 100 LRT BRIDGE
BRIDGE 27303
BRIDGE SURVEY PROFILE

DISCIPLINE: STRUCTURES

SHEET NAME: CBR27303-BRG-BOR-002-2

SHEET 30 OF 39

Jul. 29 2015 10:59 am V:\3400_ADC\CAD\SEGMENT E2\PLAN SHEETS\STRUCTURES\T100-LRT\CBR27303-BRG-BOR-002.dwg By: brad.wodash



NOTES:

THE MATERIAL DESCRIPTIONS ARE CLASSIFIED ACCORDING TO THE UNIFIED SOIL CLASSIFICATION SYSTEM. DETAILS OF THE SYSTEM CAN BE FOUND IN THE FADR AND IN ASTM:D2488. THE SOIL GROUP CATEGORY PER THE AASHTO SOIL CLASSIFICATION SYSTEM IS ALSO SHOWN.

THE EXISTING GROUND LINE REFLECTS THE GROUND LINE AT THE TIME BORINGS WERE TAKEN AND DOES NOT NECESSARILY REFLECT CONDITIONS EXISTING AT THE TIME OF BRIDGE CONSTRUCTION.

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: KAE | CHECKED BY: MDJ
DRAWN BY: LMT | DATE: 7/27/15

AECOM Kimley»Horn

60% SUBMISSION - 09/21/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4
TH 100 LRT BRIDGE
BRIDGE 27303
BRIDGE SURVEY PROFILE

DISCIPLINE: STRUCTURES

SHEET NAME: CBR27303-BRG-BOR-002-3

SHEET 31 OF 39

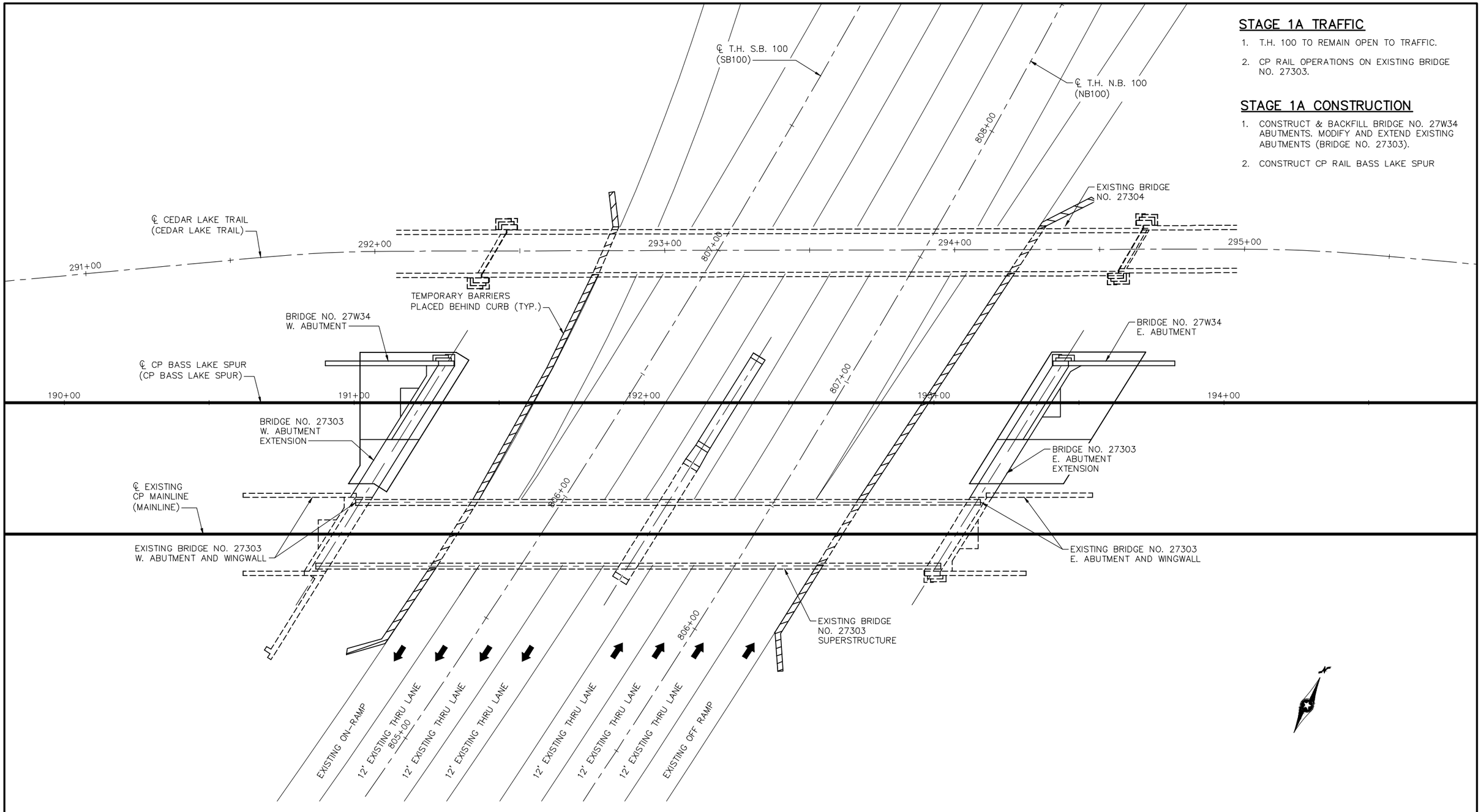
Jul, 29 2015 11:00 am V:\3400_ADC\CAD\SEGMENT E2\PLAN SHEETS\STRUCTURES\T100-LRT\CBR27303-BRG-BOR-002.dwg By: brad.wodash

STAGE 1A TRAFFIC

1. T.H. 100 TO REMAIN OPEN TO TRAFFIC.
2. CP RAIL OPERATIONS ON EXISTING BRIDGE NO. 27303.

STAGE 1A CONSTRUCTION

1. CONSTRUCT & BACKFILL BRIDGE NO. 27W34 ABUTMENTS. MODIFY AND EXTEND EXISTING ABUTMENTS (BRIDGE NO. 27303).
2. CONSTRUCT CP RAIL BASS LAKE SPUR



DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: KAE | CHECKED BY: MDJ
DRAWN BY: LMT | DATE: 7/27/15

AECOM Kimley»Horn

60% SUBMISSION - 09/21/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4
TH 100 LRT BRIDGE
BRIDGE 27303
STAGING PLAN (1 OF 8)

DISCIPLINE: STRUCTURES

SHEET NAME: CBR27303-BRG-DTL-001-1

SHEET 32 OF 39

Jul, 29 2015 11:02 am V:\3400_ADC\CAD\SEGMENT E2\PLAN SHEETS\STRUCTURES\T100-LRT\CBR27303-BRG-DTL-001.dwg By: brad.wodash

STAGE 1B TRAFFIC

1. T.H. 100 INSIDE LANE TEMPORARY CLOSURE.
2. CP RAIL OPERATIONS ON EXISTING BRIDGE NO. 27303.

STAGE 1B CONSTRUCTION

1. CONSTRUCT REMAINING PORTIONS OF BRIDGE NO. 27W34 PIER.
2. CONSTRUCT CP RAIL BASS LAKE SPUR.

℄ T.H. S.B. 100 (SB100)

℄ T.H. N.B. 100 (NB100)

TEMPORARY BARRIER PLACED IN TRAFFIC LANES

EXISTING BRIDGE NO. 27304

℄ CEDAR LAKE TRAIL (CEDAR LAKE TRAIL)

291+00 292+00 293+00 294+00 295+00

807+00 808+00

TEMPORARY BARRIERS PLACED BEHIND CURB (TYP.)

2'-0" (TYP.)

℄ CP BASS LAKE SPUR (CP BASS LAKE SPUR)

190+00 191+00 192+00 193+00 194+00

807+00

BRIDGE NO. 27W34 PIER

℄ EXISTING CP MAINLINE (MAINLINE)

806+00

EXISTING BRIDGE NO. 27303 PIER

EXISTING BRIDGE NO. 27303 SUPERSTRUCTURE

806+00

805+00

EXISTING ON-RAMP

12' EXISTING THRU LANE

12' EXISTING THRU LANE

12' EXISTING THRU LANE

12' EXISTING THRU LANE

12' EXISTING THRU LANE

12' EXISTING THRU LANE

EXISTING OFF RAMP

N

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: KAE | CHECKED BY: MDJ
DRAWN BY: LMT | DATE: 7/27/15

AECOM Kimley»Horn

60% SUBMISSION - 09/21/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

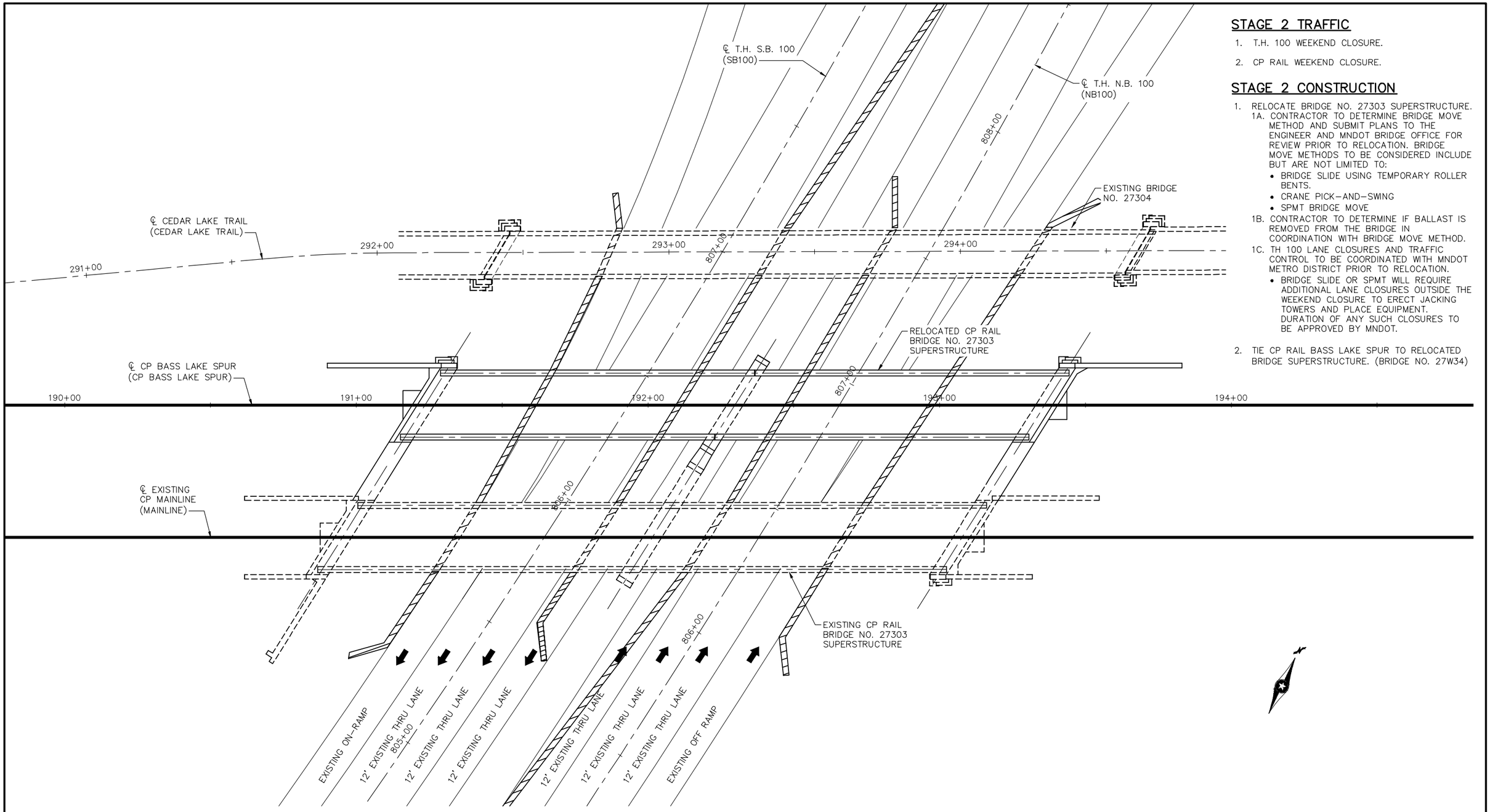
CIVIL EAST - VOLUME 4
TH 100 LRT BRIDGE
BRIDGE 27303
STAGING PLAN (2 OF 8)

DISCIPLINE: STRUCTURES

SHEET NAME: CBR27303-BRG-DTL-001-2

SHEET 33 OF 39

Jul, 29 2015 11:02 am V:\3400_ADC\CAD\SEGMENT E2\PLAN SHEETS\STRUCTURES\T100-LRT\CBR27303-BRG-DTL-001.dwg By: brad.wodash



STAGE 2 TRAFFIC

1. T.H. 100 WEEKEND CLOSURE.
2. CP RAIL WEEKEND CLOSURE.

STAGE 2 CONSTRUCTION

1. RELOCATE BRIDGE NO. 27303 SUPERSTRUCTURE.
   - 1A. CONTRACTOR TO DETERMINE BRIDGE MOVE METHOD AND SUBMIT PLANS TO THE ENGINEER AND MNDOT BRIDGE OFFICE FOR REVIEW PRIOR TO RELOCATION. BRIDGE MOVE METHODS TO BE CONSIDERED INCLUDE BUT ARE NOT LIMITED TO:
     - BRIDGE SLIDE USING TEMPORARY ROLLER BENTS.
     - CRANE PICK-AND-SWING
     - SPMT BRIDGE MOVE
   - 1B. CONTRACTOR TO DETERMINE IF BALLAST IS REMOVED FROM THE BRIDGE IN COORDINATION WITH BRIDGE MOVE METHOD.
   - 1C. TH 100 LANE CLOSURES AND TRAFFIC CONTROL TO BE COORDINATED WITH MNDOT METRO DISTRICT PRIOR TO RELOCATION.
     - BRIDGE SLIDE OR SPMT WILL REQUIRE ADDITIONAL LANE CLOSURES OUTSIDE THE WEEKEND CLOSURE TO ERECT JACKING TOWERS AND PLACE EQUIPMENT. DURATION OF ANY SUCH CLOSURES TO BE APPROVED BY MNDOT.
2. TIE CP RAIL BASS LAKE SPUR TO RELOCATED BRIDGE SUPERSTRUCTURE. (BRIDGE NO. 27W34)

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: KAE | CHECKED BY: MDJ
DRAWN BY: LMT | DATE: 7/27/15

AECOM Kimley»Horn

60% SUBMISSION - 09/21/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4
TH 100 LRT BRIDGE
BRIDGE 27303
STAGING PLAN (3 OF 8)

DISCIPLINE: STRUCTURES
SHEET NAME: CBR27303-BRG-DTL-001-3

SHEET 34 OF 39

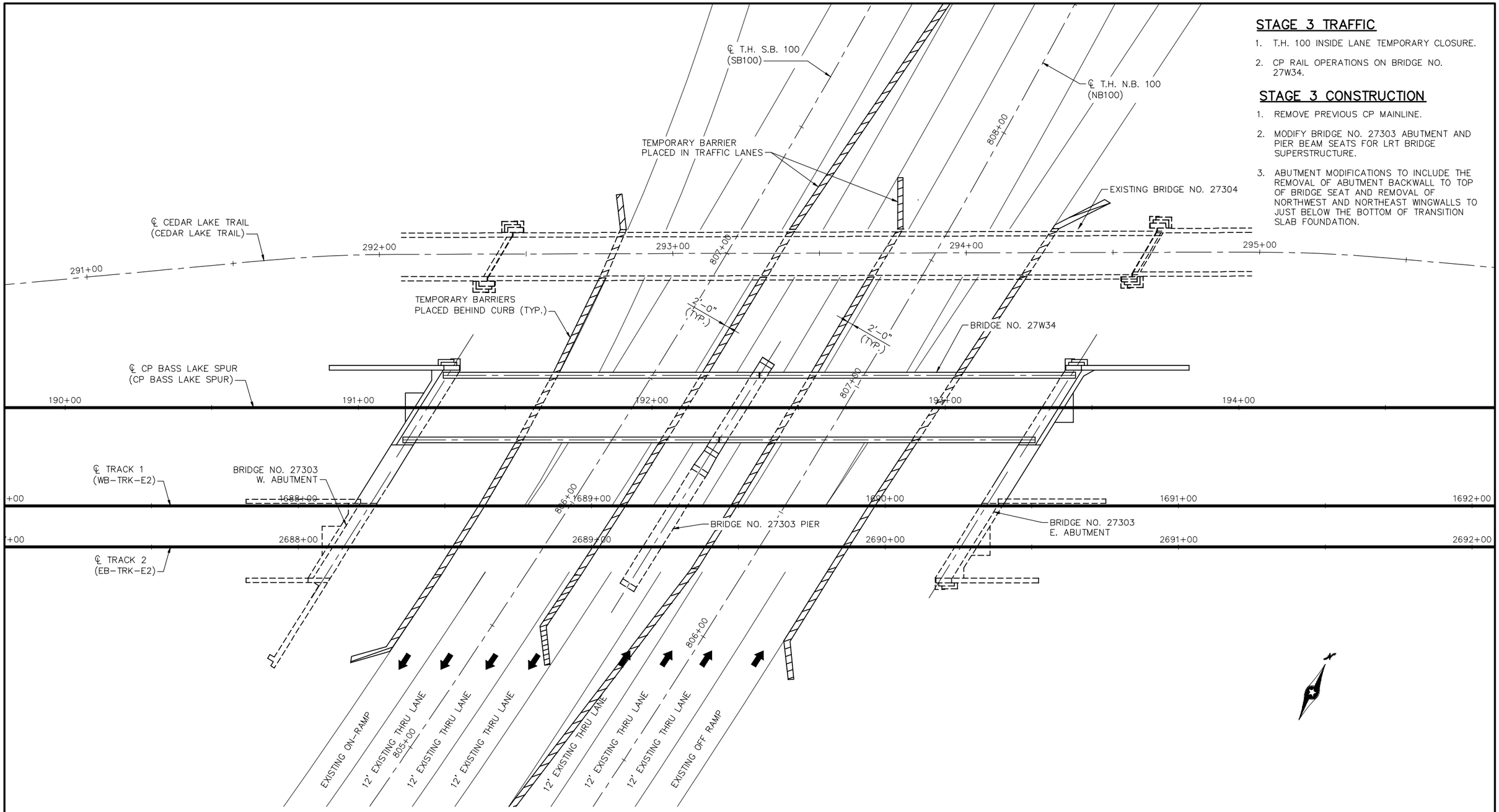
Jul, 29 2015 11:02 am V:\3400_ADC\CAD\SEGMENT E2\PLAN SHEETS\STRUCTURES\T100-LRT\CBR27303-BRG-DTL-001.dwg By: brad.wodash

STAGE 3 TRAFFIC

1. T.H. 100 INSIDE LANE TEMPORARY CLOSURE.
2. CP RAIL OPERATIONS ON BRIDGE NO. 27W34.

STAGE 3 CONSTRUCTION

1. REMOVE PREVIOUS CP MAINLINE.
2. MODIFY BRIDGE NO. 27303 ABUTMENT AND PIER BEAM SEATS FOR LRT BRIDGE SUPERSTRUCTURE.
3. ABUTMENT MODIFICATIONS TO INCLUDE THE REMOVAL OF ABUTMENT BACKWALL TO TOP OF BRIDGE SEAT AND REMOVAL OF NORTHWEST AND NORTHEAST WINGWALLS TO JUST BELOW THE BOTTOM OF TRANSITION SLAB FOUNDATION.



DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: KAE | CHECKED BY: MDJ
DRAWN BY: LMT | DATE: 7/27/15

AECOM Kimley»Horn

60% SUBMISSION - 09/21/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4
TH 100 LRT BRIDGE
BRIDGE 27303
STAGING PLAN (4 OF 8)

DISCIPLINE: STRUCTURES

SHEET NAME: CBR27303-BRG-DTL-001-4

SHEET 35 OF 39

Jul, 29 2015 11:02 am V:\3400_ADC\CAD\SEGMENT E2\PLAN SHEETS\STRUCTURES\T100-LRT\CBR27303-BRG-DTL-001.dwg By: brad.wodash

STAGE 4 TRAFFIC

1. T.H. 100 WEEKEND CLOSURE.
2. CP RAIL OPERATIONS ON BRIDGE NO. 27W34.

STAGE 4 CONSTRUCTION

1. ERECT BRIDGE NO. 27303 BEAMS.

℄ T.H. S.B. 100 (SB100)

℄ T.H. N.B. 100 (NB100)

808+00

EXISTING BRIDGE NO. 27304

℄ CEDAR LAKE TRAIL (CEDAR LAKE TRAIL)

291+00 292+00 293+00 807+00 294+00 295+00

BRIDGE NO. 27W34

℄ CP BASS LAKE SPUR (CP BASS LAKE SPUR)

190+00 191+00 192+00 807+00 193+00 194+00

℄ TRACK 1 (WB-TRK-E2)

+00 1688+00 806+00 1689+00 1690+00 1691+00 1692+00

+00 2688+00 2689+00 2690+00 2691+00 2692+00

℄ TRACK 2 (EB-TRK-E2)

BRIDGE NO. 27303 BEAM (TYP.)

806+00

805+00

EXISTING ON-RAMP

12' EXISTING THRU LANE

12' EXISTING THRU LANE

12' EXISTING THRU LANE

12' EXISTING THRU LANE

12' EXISTING THRU LANE

12' EXISTING THRU LANE

12' EXISTING THRU LANE

EXISTING OFF RAMP

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: KAE | CHECKED BY: MDJ

DRAWN BY: LMT | DATE: 7/27/15

AECOM Kimley»Horn

60% SUBMISSION - 09/21/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4
TH 100 LRT BRIDGE
BRIDGE 27303
STAGING PLAN (5 OF 8)

DISCIPLINE: STRUCTURES

SHEET NAME: CBR27303-BRG-DTL-001-5

SHEET 36 OF 39

Jul, 29 2015 11:02 am V:\3400_ADC\CAD\SEGMENT E2\PLAN SHEETS\STRUCTURES\T100-LRT\CBR27303-BRG-DTL-001.dwg By: brad.wodash

STAGE 5 TRAFFIC

1. T.H. 100 LANES REOPENED; TEMPORARY LANE CLOSURES FOR CONSTRUCTION ACTIVITIES.
2. TEMPORARY CLOSURE OF T.H. 100 REQUIRED FOR CONCRETE PLACEMENT OVER ROADWAY.

STAGE 5 CONSTRUCTION

1. CONSTRUCT BRIDGE NO. 27303 SUPERSTRUCTURE.
2. BRIDGE NO. 27303 AND BRIDGE NO. 27W34 COMPLETED

℄ T.H. S.B. 100 (SB100)
℄ T.H. N.B. 100 (NB100)
808+00
EXISTING BRIDGE NO. 27304
℄ CEDAR LAKE TRAIL (CEDAR LAKE TRAIL)
291+00
292+00
293+00
807+00
294+00
295+00
BRIDGE NO. 27W34
℄ CP BASS LAKE SPUR (CP BASS LAKE SPUR)
190+00
191+00
192+00
807+00
193+00
194+00
℄ TRACK 1 (WB–TRK–E2)
+00
1688+00
806+00
1689+00
1690+00
1691+00
1692+00
+00
2688+00
2689+00
2690+00
2691+00
2692+00
℄ TRACK 2 (EB–TRK–E2)
BRIDGE NO. 27303
806+00
805+00
EXISTING ON–RAMP
12' EXISTING THRU LANE
12' EXISTING THRU LANE
12' EXISTING THRU LANE
12' EXISTING THRU LANE
12' EXISTING THRU LANE
12' EXISTING THRU LANE
12' EXISTING THRU LANE
EXISTING OFF RAMP

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: KAE | CHECKED BY: MDJ
DRAWN BY: LMT | DATE: 7/27/15

AECOM Kimley»Horn

60% SUBMISSION - 09/21/15

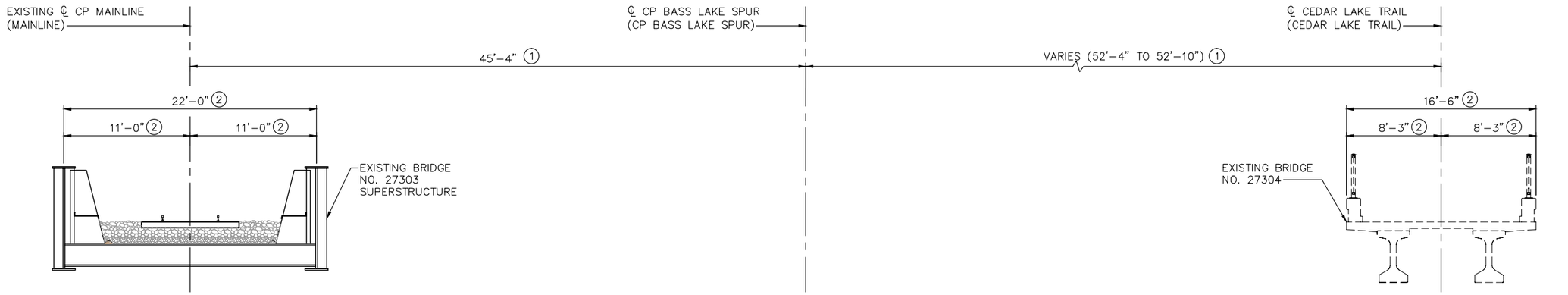
METROPOLITAN COUNCIL
SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4
TH 100 LRT BRIDGE
BRIDGE 27303
STAGING PLAN (6 OF 8)

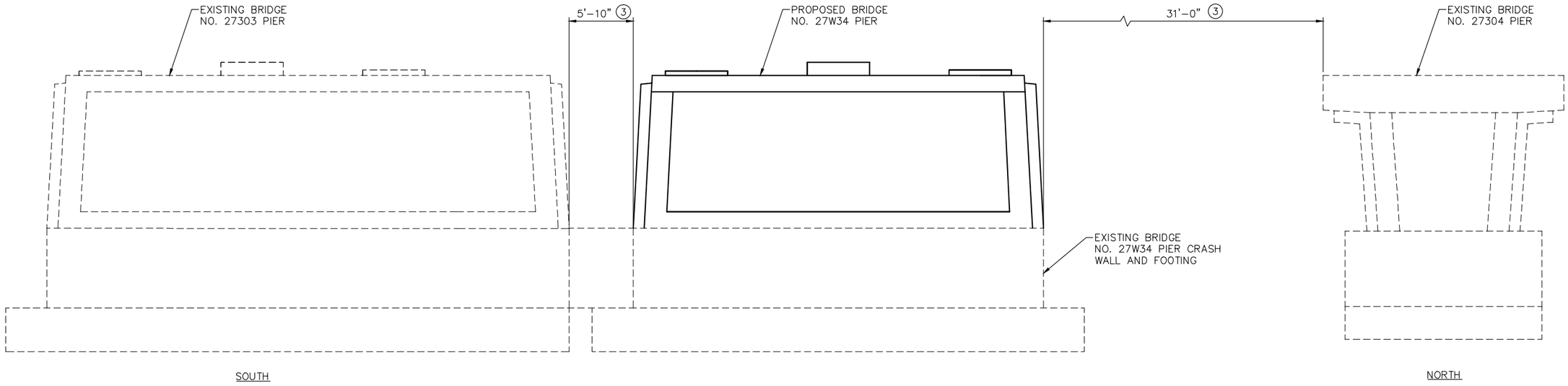
DISCIPLINE: STRUCTURES
SHEET NAME: CBR27303-BRG-DTL-001-6

SHEET 37 OF 39

Jul, 29 2015 11:02 am V:\3400_ADC\CAD\SEGMENT E2\PLAN SHEETS\STRUCTURES\T100-LRT\CBR27303-BRG-DTL-001.dwg By: brad.wodash



STAGE 1 CROSS SECTION



STAGE 1B CROSS SECTION

NOTES:

(1) DIMENSION MEASURED PERPENDICULAR TO ℄ CP BASS LAKE SPUR.

(2) DIMENSION MEASURED PERPENDICULAR TO SUPERSTRUCTURE ALIGNMENT.

(3) DIMENSION MEASURED ALONG MEDIAN T.H. 100.

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: KAE | CHECKED BY: MDJ
DRAWN BY: LMT | DATE: 7/27/15

AECOM Kimley»Horn

60% SUBMISSION - 09/21/15

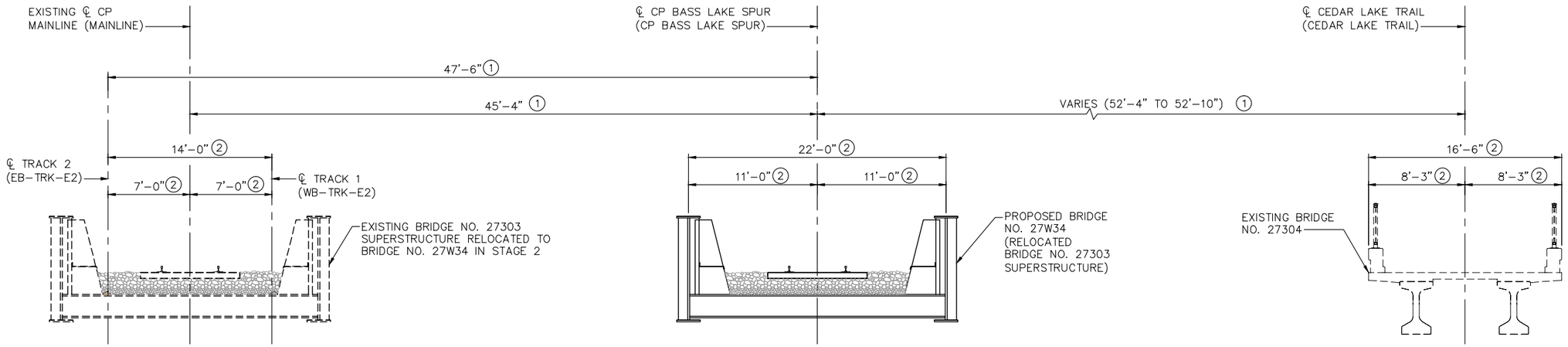
METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

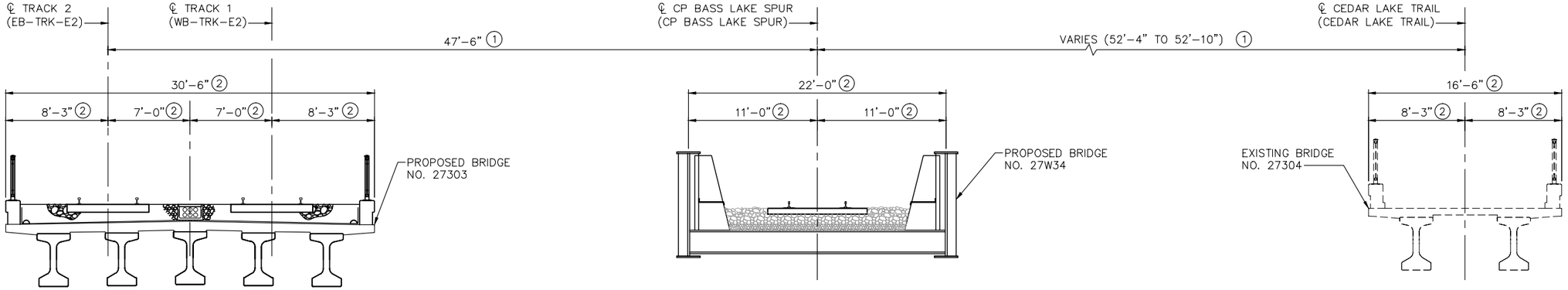
CIVIL EAST - VOLUME 4
TH 100 LRT BRIDGE
BRIDGE 27303
STAGING PLAN (7 OF 8)

DISCIPLINE: STRUCTURES
SHEET NAME: CBR27303-BRG-DTL-001-7

SHEET 38 OF 39



STAGE 2 CROSS SECTION



TYPICAL SECTION – FINAL CONDITION

NOTES:

(1) DIMENSION MEASURED PERPENDICULAR TO ℄ CP BASS LAKE SPUR.

(2) DIMENSION MEASURED PERPENDICULAR TO SUPERSTRUCTURE ALIGNMENT.

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: KAE | CHECKED BY: MDJ
DRAWN BY: LMT | DATE: 7/27/15

AECOM Kimley»Horn

60% SUBMISSION - 09/21/15

METROPOLITAN COUNCIL

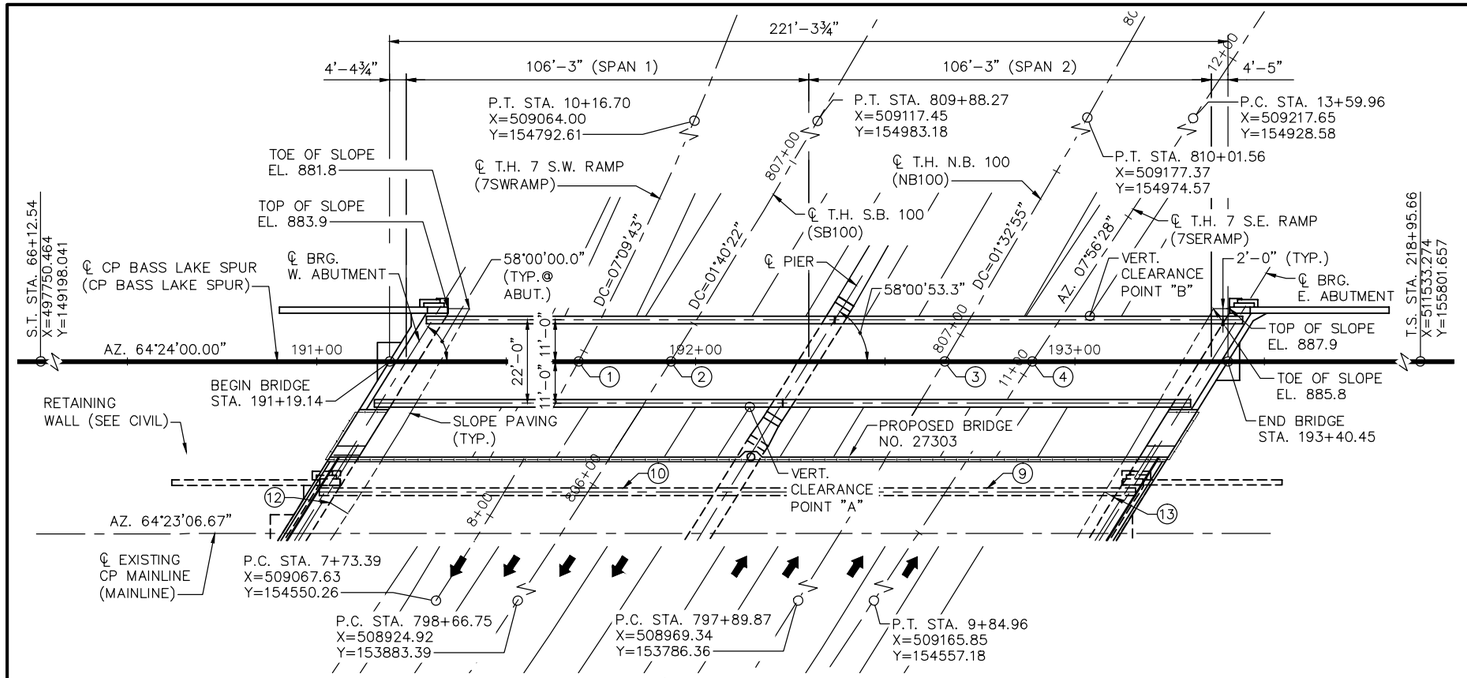
SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4
TH 100 LRT BRIDGE
BRIDGE 27303
STAGING PLAN (8 OF 8)

DISCIPLINE: STRUCTURES

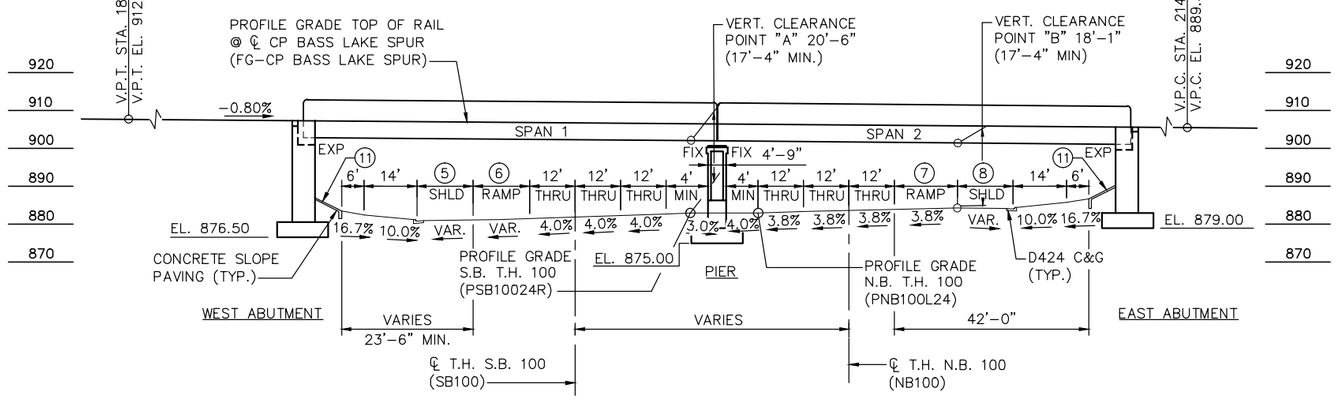
SHEET NAME: CBR27303-BRG-DTL-001-8

SHEET 39 OF 39



GENERAL PLAN

0 10' 20' 40'
SCALE IN FEET



GENERAL ELEVATION

0 10' 20' 40'
SCALE IN FEET

NOTES:

SEE BRIDGE SURVEY SHEET FOR INPLACE UTILITIES.

PIER AZIMUTH SET TO MATCH EXISTING BRIDGE NO. 27303 AT AZ 6°23'06.67".

ABUTMENT AZIMUTH SET TO A 58°00'00.0" SKEW TO ℄ CP BASS LAKE SPUR TO MATCH EXISTING BRIDGE NO. 27303 SKEW.

ALLOW FOR 2" FORMLINER IN THE ABUTMENT FACE AND WINGWALLS.

SEE SHEET NO. 29–36 FOR PROPOSED STAGING.

(1) ℄ CP BASS LAKE SPUR (CP BASS LAKE SPUR)
P.O.T. 191+69.04
℄ T.H. 7 S.W. RAMP (7SWRAMP) P.O.C. 8+46.98
X = 509,074.32 Y = 154,623.52
Δ = 61°48'50.0"

(2) ℄ CP BASS LAKE SPUR (CP BASS LAKE SPUR)
P.O.T 191+93.35
℄ T.H. S.B. 100 (SB100) P.O.C. 806+38.32
X = 509,096.24 Y = 154,634.03
Δ = 57°59'48.5"

(3) CONTROL POINT 1
℄ CP BASS LAKE SPUR (CP BASS LAKE SPUR)
P.O.T. 192+65.65
℄ T.H. N.B. 100 (NB100) P.O.C. 806+91.76
X = 509,161.44 Y = 154,665.27
Δ = 59°03'11.3"

(4) ℄ CP BASS LAKE SPUR (CP BASS LAKE SPUR)
P.O.T. 192+88.79
℄ T.H. 7 S.E. RAMP (7SERAMP) P.O.T. 11+04.19
X = 509,182.32 Y = 154,675.27
Δ = 56°27'31.6"

(5) VARIES FROM 6.00' @ ℄ T.H. S.B. 100 (SB100) STA. 804+95.58 TO 2.02' @ STA. 807+00.42. CROSS SLOPE VARIES FROM 4.0% @ STA. 805+42 TO 6.0% @ STA. 806+38.

(6) VARIES FROM 12.00' @ ℄ T.H. S.B. 100 (SB100) STA. 804+95.58 TO 26.64' @ STA. 807+00.42. CROSS SLOPE VARIES FROM 4.0% @ STA. 805+42 TO 6.0% @ STA. 806+38. VARYING CROSS SLOPE ONLY APPLIES TO THE 12.00' OF RAMP WIDTH ADJACENT TO THE SHOULDER. THE BALANCE ADJACENT TO THE THRU LANE IS 4.0%.

(7) VARIES FROM 12.00' PRIOR TO ℄ T.H. N.B. 100 (NB100) STA. 806+59.82 TO 20.00' @ STA. 808+01.83.

(8) VARIES FROM 10.00' PRIOR TO ℄ T.H. N.B. 100 (NB100) STA. 806+59.82 TO 2.00' @ STA. 808+01.83. CROSS SLOPE VARIES FROM 3.2% @ STA. 806+60 TO 2.0% @ STA. 807+18.

(9) EXISTING BRIDGE NO. 27303 SUPERSTRUCTURE TO BE RELOCATED.

(10) EXISTING FIBER-OPTIC LINE ATTACHED TO THRU-PLATE GIRDER. RELOCATION OF UTILITY LINE TO BE COORDINATED WITH THE RELOCATION OF EXISTING BRIDGE NO. 27303 SUPERSTRUCTURE.

(11) PROVIDE MAXIMUM SLOPE OF 2H:1V AT CONCRETE SLOPE PAVING AND ALONG NW AND NE WINGWALLS.

(12) REMOVE 10' OF CONCRETE SLOPE PAVING. TOE OF SLOPE EL. 882.4. TOP OF SLOPE EL. 885.1.

(13) REMOVE 10' OF CONCRETE SLOPE PAVING. TOE OF SLOPE EL. 885.6. TOP OF SLOPE EL. 887.0.

DESIGN DATA

2014 A.R.E.M.A. MANUAL FOR RAILWAY ENGINEERING

SOUTHWEST LIGHT RAIL TRANSIT DESIGN CRITERIA (REVISION 4.0)

COOPER E90 LIVE LOAD OR 100 KIP (4 AXLES) ALTERNATE LOAD WITH DIESEL IMPACT

MAXIMUM BALLAST DEPTH = 2'-0" (FOR DESIGN)

WORKING STRESS DESIGN METHOD (STEEL)

LOAD FACTOR DESIGN METHOD (CONCRETE)

MAXIMUM ALLOWABLE DESIGN STRESSES
REINFORCED CONCRETE:
f'c = 4500 PSI n = 8
fy = 60000 PSI REINFORCEMENT

STRUCTURAL STEEL:
fs = 27500 PSI, fy = 50,000 PSI
ASTM A709 GRADE 50WT3 & GRADE 50WF3
(MN/DOT 3309)

PROJECTED TRAFFIC VOLUMES:
2034 A.D.T. ROADWAY UNDER – 125,000
2034 D.H.V. ROADWAY UNDER – 111,000
2034 A.D.T.T. ROADWAY UNDER – 3,900

DESIGN SPEED: UNDER = 60 MPH

DECK AREA = 4870 SQ. FT.

LIST OF SHEETS

BRIDGE NO. 27W34

CP RAILWAY OVER T.H. 100
0.2 MILES SOUTH OF JCT. T.H. 7 IN ST. LOUIS PARK
CP RAILWAY MILEPOST 429.00
ON THE MERRIAM PARK SUBDIVSION

BRIDGE ID NO. 305

GENERAL PLAN & ELEVATION

SEC 6 T 28N R 24W
CITY OF ST. LOUIS PARK HENNEPIN COUNTY

APPROVED: _____ DATE: _____
STATE BRIDGE ENGINEER

DRAFT WORK IN PROCESS

JOB NO.: T9N635 | STATE PROJ. NO.: 9909–01 | MNDOT REVIEW: JOE NIETFELD

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: KAE | CHECKED BY: MDJ
DRAWN BY: LMT | DATE: 7/27/15

AECOM Kimley»Horn

60% SUBMISSION - 09/21/15

METROPOLITAN COUNCIL

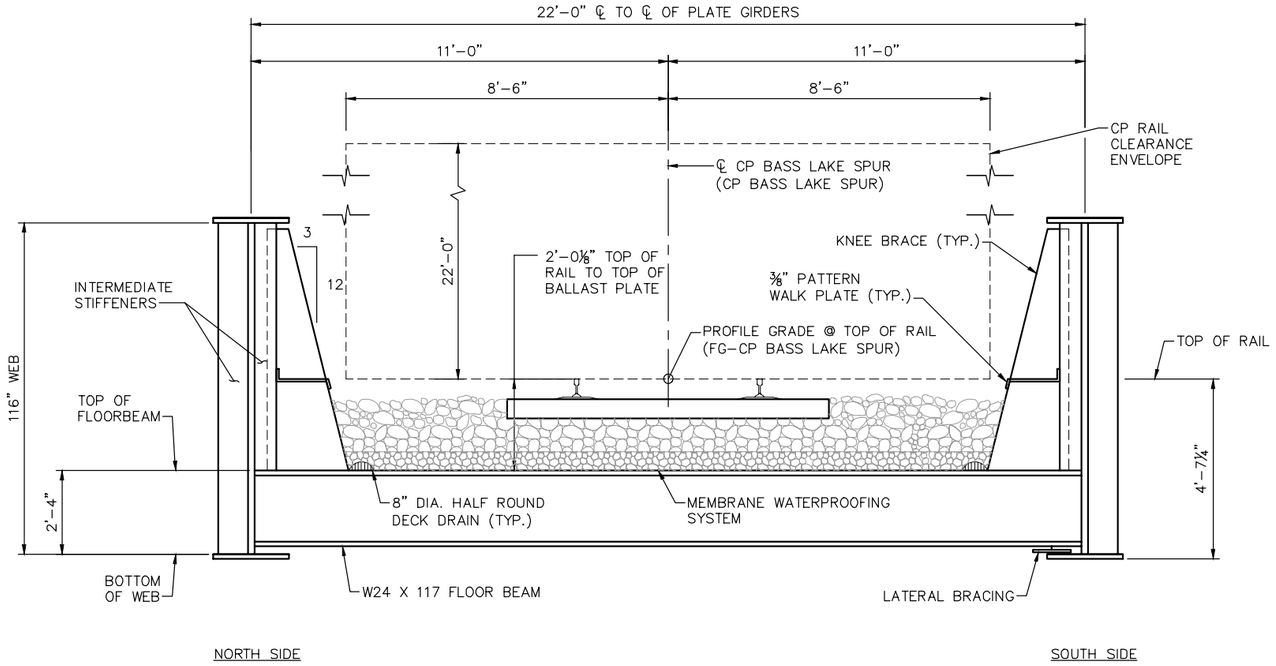
SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4
TH 100 FREIGHT RAIL BRIDGE
BRIDGE 27W34
GENERAL PLAN & ELEVATION

DISCIPLINE: STRUCTURES
SHEET NAME: CBR27W34-BRG-GPE

SHEET 1 OF 36

Jul, 29 2015 11:30 am V:\3400_ADC\CAD\SEGMENT E2\PLAN SHEETS\STRUCTURES\T100-FRT\CBR27W34-BRG-GPE.dwg By: brad.wodash



TRANSVERSE SECTION ①

0 1' 2' 4'

SCALE IN FEET

SCHEDULE OF QUANTITIES FOR ENTIRE BRIDGE			
ITEM NO.	ITEM	UNIT	QUANTITY
2105.607	RAILROAD TRACK BALLAST (CV)	CU. YD.	(P)
2401.501	STRUCTURAL CONCRETE (1G52)	CU. YD.	(P)
2401.541	REINFORCEMENT BARS	POUND	(P)
2401.541	REINFORCEMENT BARS (EPOXY COATED)	POUND	(P)
2401.601	STRUCTURE EXCAVATION	LUMP SUM	
2401.607	STRUCTURAL CONCRETE (3B52)	CU. YD.	(P)
2402.583	ORNAMENTAL METAL RAILING TYPE SPECIAL	LIN. FT.	(P)
2402.595	BEARING ASSEMBLY	EACH	(P)
2411.618	ANTI-GRAFFITI COATING	SQ. FT.	(P)
2411.618	ARCH CONC TEXTURE (ASHLAR STONE)	SQ. FT.	(P)
2411.618	ARCH SURFACE FINISH (MULTICOLOR)	SQ. FT.	(P)
2442.501	REMOVE EXISTING BRIDGE	LUMP SUM	
2451.509	AGGREGATE BEDDING (CV)	CU. YD.	(P)
2452.601	STEEL SHEET PILING (TEMPORARY)	LUMP SUM	
2481.618	DAMPROOFING	SQ. FT.	(P)
2481.618	WATERPROOFING	SQ. FT.	(P)
2502.502	DRAINAGE SYSTEM	LUMP SUM	
2502.601	DRAINAGE SYSTEM (BRIDGE DECK)	LUMP SUM	
2545.509	CONDUIT SYSTEM (LIGHTING)	LUMP SUM	

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".

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 ALKALI 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 RATIO SHALL BE IN ACCORDANCE WITH CHAPTER 8, SECTION 1.11 OF THE 2013 A.R.E.M.A. MANUAL AND MnDOT 2461.

NOTES:

① EXISTING BRIDGE 27303 SUPERSTRUCTURE TO BE RELOCATED TO NEW ALIGNMENT. DIMENSIONS ARE BASED ON CONSTRUCTION PLANS FOR S.P. NO. 2734-27303.

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: KAE | CHECKED BY: MDJ
DRAWN BY: LMT | DATE: 7/27/15

AECOM Kimley»Horn

60% SUBMISSION - 09/21/15

METROPOLITAN COUNCIL

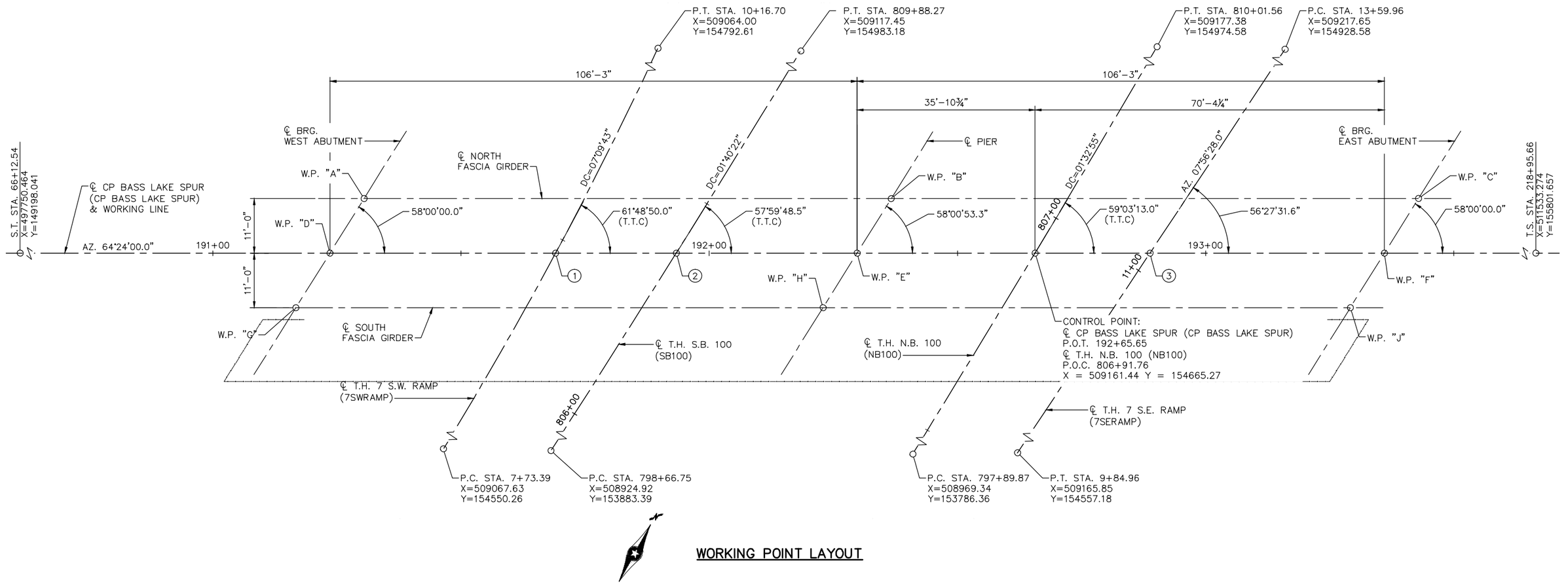
SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4
TH 100 FREIGHT RAIL BRIDGE
BRIDGE 27W34
TRANSVERSE SECTION & QUANTITIES

DISCIPLINE: STRUCTURES
SHEET NAME: CBR27W34-BRG-TRN

SHEET 2 OF 36

Jul, 29 2015 11:30 am V:\3400_ADC\CAD\SEGMENT E2\PLAN SHEETS\STRUCTURES\T100-FRT\CBR27W34-BRG-TRN.dwg By: brad.wodash



WORKING POINT LAYOUT

DIMENSIONS BETWEEN WORKING POINTS											COORDINATES		ELEVATION				
POINT	STATION	A	B	C	D	E	F	G	H	J	X	Y	TOP OF RAIL	TOP OF BALLAST PLATE	TOP OF BALLAST PLATE TO BR. SEAT	BRIDGE SEAT	POINT
A	191+30.44		106.22		12.97	99.96			95.06	199.93	509034.75	154616.76	907.36	905.35	3.42	901.93	A
B	192+36.66			106.25		12.97	99.98	121.97		95.08	509130.54	154662.66	906.51	904.50	3.54	900.96	B
C	193+42.90						12.97	227.28	121.99		509226.36	154708.57	905.67	903.66	3.42	900.24	C
D	191+23.56					106.22		12.97	99.96		509033.31	154603.87	907.41	905.40	2.80	902.60	D
E	192+29.78						106.25		12.97	99.98	509129.10	154649.77	906.57	904.56	2.80	901.76	E
F	193+36.03									12.97	509224.92	154695.68	905.72	903.71	2.80	900.91	F
G	191+16.69								106.23		509031.86	154590.98	907.47	905.46	3.42	902.04	G
H	192+22.92									106.24	509127.66	154636.88	906.62	904.61	3.54	901.07	H
J	193+29.16										509223.47	154682.79	905.78	903.77	3.42	900.35	J

NOTES:

1. ℄ CP BASS LAKE SPUR (CP BASS LAKE SPUR) P.O.T. 191+69.04
   ℄ T.H. 7 S.W. RAMP (7SWRAMP) P.O.C. 8+46.98
   X = 509074.32 Y = 154623.52
2. ℄ CP BASS LAKE SPUR (CP BASS LAKE SPUR) P.O.T 191+93.35
   ℄ T.H. S.B. 100 (SB100) P.O.C. 806+38.32
   X = 509096.24 Y = 154634.03
3. ℄ CP BASS LAKE SPUR (CP BASS LAKE SPUR) P.O.T. 192+88.79
   ℄ T.H. 7 S.E. RAMP (7SERAMP) P.O.T. 11+04.19
   X = 509182.32 Y = 154675.27

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: KAE | CHECKED BY: MDJ
DRAWN BY: LMT | DATE: 7/27/15

AECOM Kimley»Horn

60% SUBMISSION - 09/21/15

METROPOLITAN COUNCIL

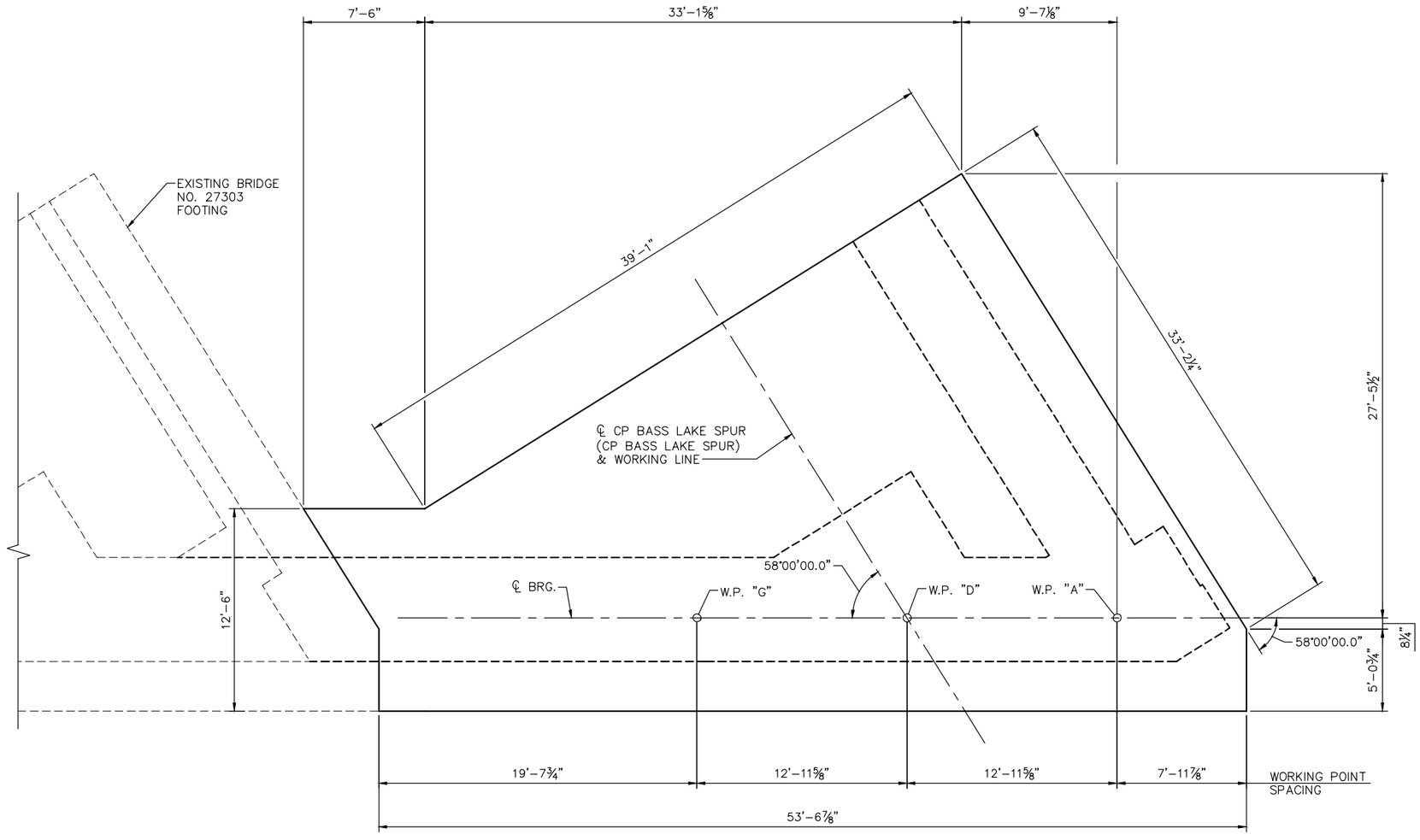
SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4
TH 100 FREIGHT RAIL BRIDGE
BRIDGE 27W34
BRIDGE LAYOUT

DISCIPLINE: STRUCTURES
SHEET NAME: CBR27W34-BRG-SUP-001

SHEET 3 OF 36

Jul, 29 2015 11:30 am V:\3400_ADC\CAD\SEGMENT E2\PLAN SHEETS\STRUCTURES\T100-FRT\CBR27W34-BRG-SUP-001.dwg By: brad.wodash



FOOTING PLAN

SUMMARY OF QUANTITIES - WEST ABUTMENT

ITEM	UNIT	QUANTITY
STRUCTURAL CONCRETE (1G52)	CU. YD.	
STRUCTURAL CONCRETE (3B52)	CU. YD.	
REINFORCEMENT BARS	POUND	
REINFORCEMENT BARS (EPOXY COATED)	POUND	
ORNAMENTAL METAL RAILING TYPE SPECIAL	LIN. FT.	
ANTI-GRAFFITI COATING	SQ. FT.	
ARCH CONC TEXTURE (ASHLAR STONE)	SQ. FT.	
ARCH SURFACE FINISH (MULTICOLOR)	SQ. FT.	
DAMPROOFING	SQ. FT.	
MEMBRANE WATERPROOFING	LIN. FT.	
1" RIGID STEEL CONDUIT	LIN. FT.	
1" END CAPS	EACH	

WEST ABUTMENT SPREAD FOOTING LOAD DATA	
* ALLOWABLE DESIGN BEARING PRESSURE	____ TONS/ SQ FT
EFFECTIVE WIDTH B'	____ FT
ALLOWABLE BEARING RESISTANCE $\phi b\, q_n$	____ TONS/ SQ FT

* BASED ON _____ LOAD COMBINATION.

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: KAE | CHECKED BY: MDJ
DRAWN BY: LMT | DATE: 7/27/15

AECOM Kimley»Horn

60% SUBMISSION - 09/21/15

METROPOLITAN COUNCIL

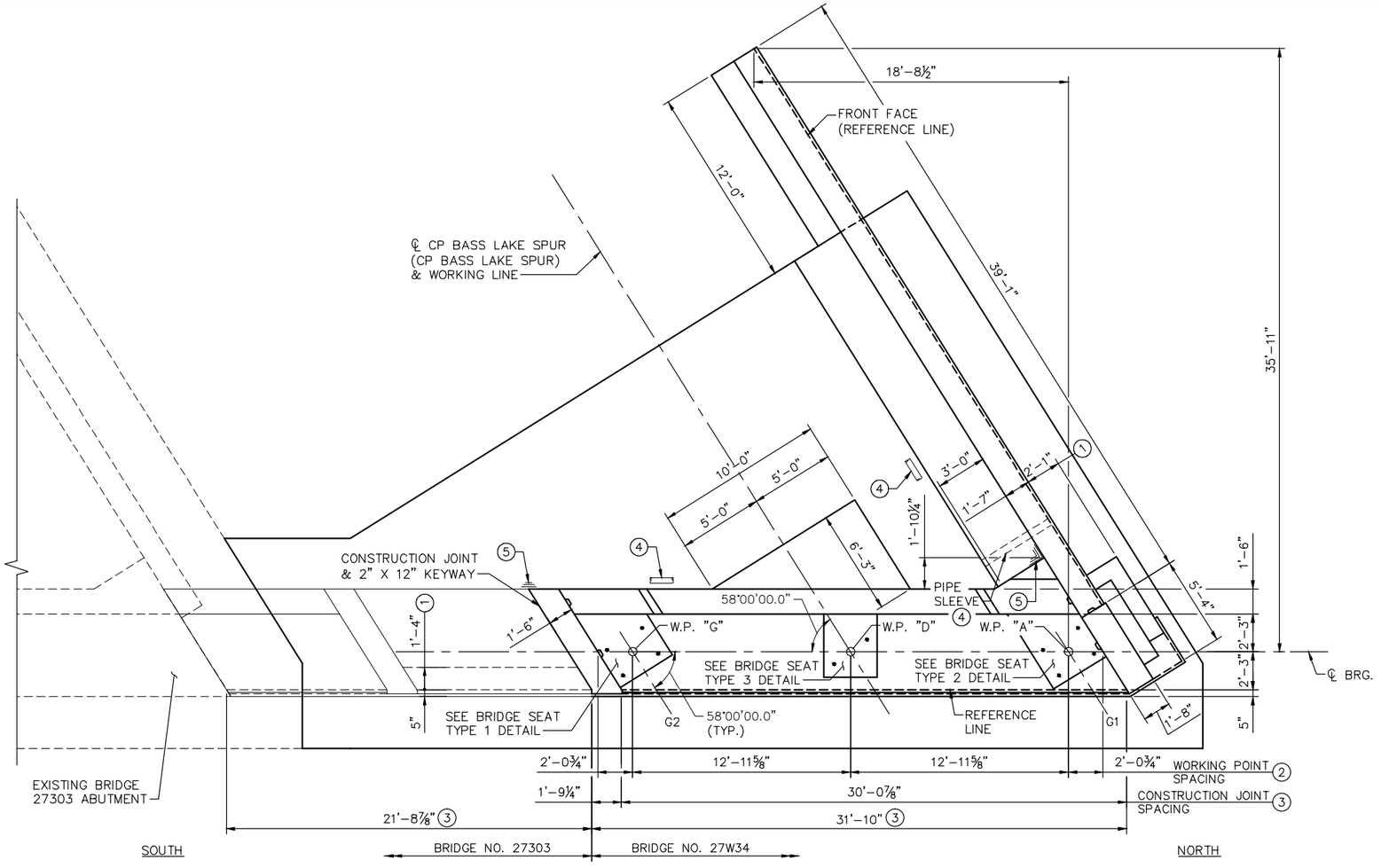
SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4
TH 100 FREIGHT RAIL BRIDGE
BRIDGE 27W34
WEST ABUTMENT DETAILS

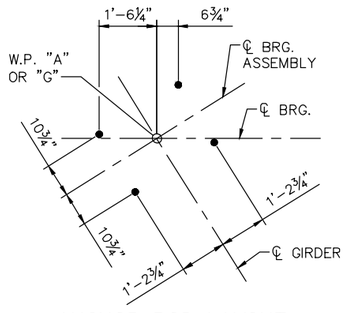
DISCIPLINE: STRUCTURES

SHEET NAME: CBR27W34-BRG-ABT-001-1

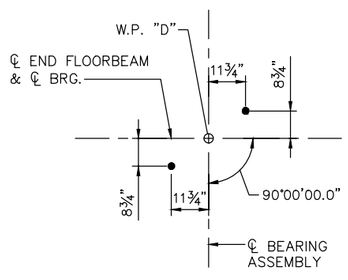
SHEET 4 OF 36



PLAN



ANCHOR ROD LAYOUT
(BEARING E1)



ANCHOR ROD LAYOUT
(BEARING E2)

NOTES:

A 72 HOUR DELAY IS REQUIRED BETWEEN ALL ADJACENT POURS OF WALLS AND STEMS.

DAMPROOFING SHALL BE APPLIED TO THE BACK FACE OF THE ABUTMENT, THE NORTHWEST WINGWALL FROM TOP OF FOOTING TO WITHIN 6" FROM TOP OF ABUTMENT/WINGWALL. DAMPROOFING IS NOT REQUIRED ON SOUTH WINGWALL.

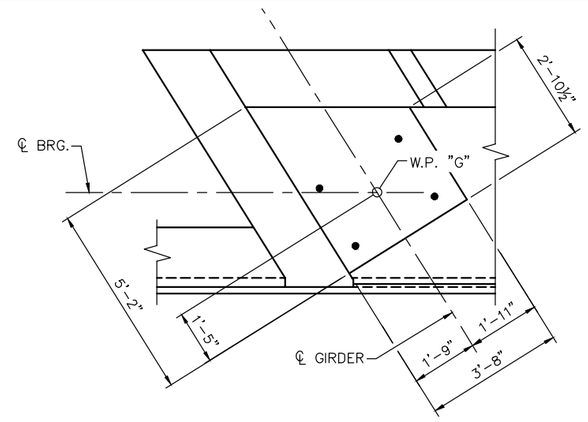
(1) DIMENSIONS SHOWN AT TOP OF WALL.

(2) MEASURED ALONG ℄ BEARING.

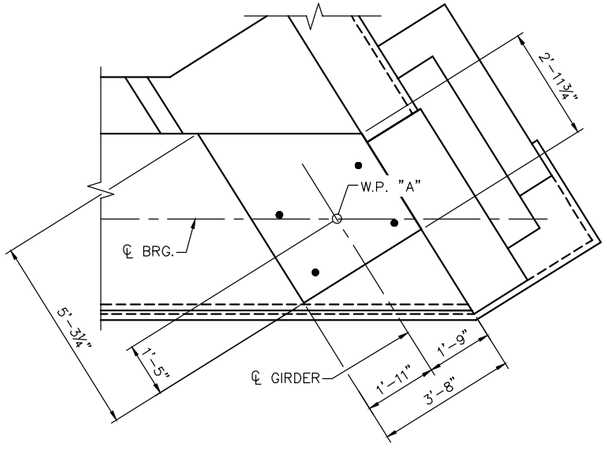
(3) MEASURED ALONG REFERENCE LINE.

(4) DRAINAGE SYSTEM. SEE DETAIL B910.

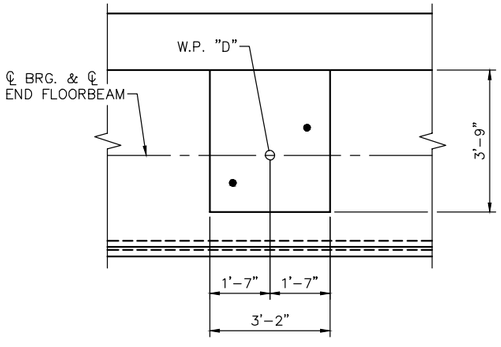
(5) MEMBRANE WATERPROOFING SYSTEM PER MnDOT SPEC. 2481.3B.



BRIDGE SEAT TYPE 1



BRIDGE SEAT TYPE 2



BRIDGE SEAT TYPE 3

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: KAE | CHECKED BY: MDJ
DRAWN BY: LMT | DATE: 7/27/15

AECOM Kimley»Horn

60% SUBMISSION - 09/21/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

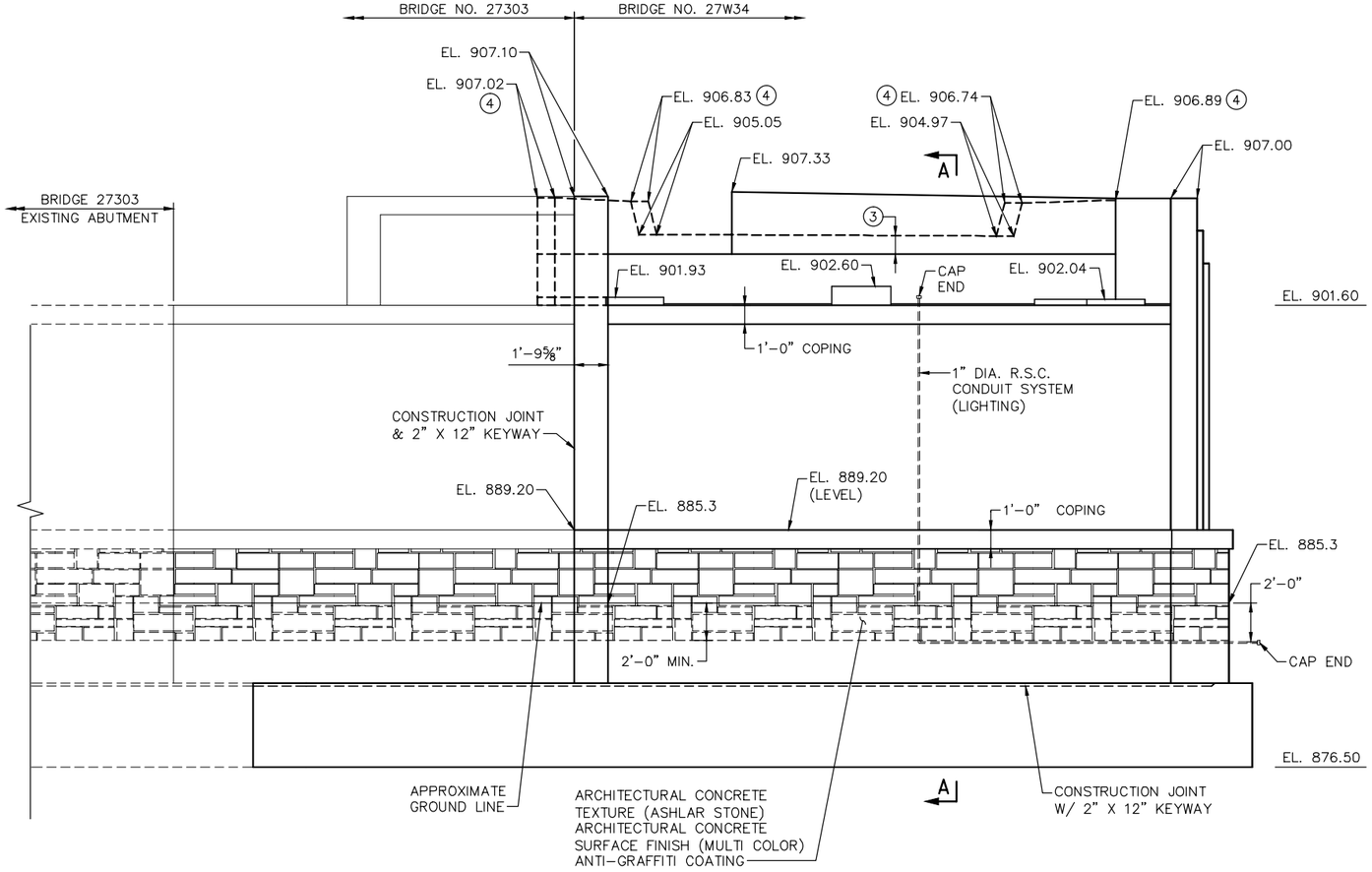
CIVIL EAST - VOLUME 4
TH 100 FREIGHT RAIL BRIDGE
BRIDGE 27W34
WEST ABUTMENT DETAILS

SHEET 5 OF 36

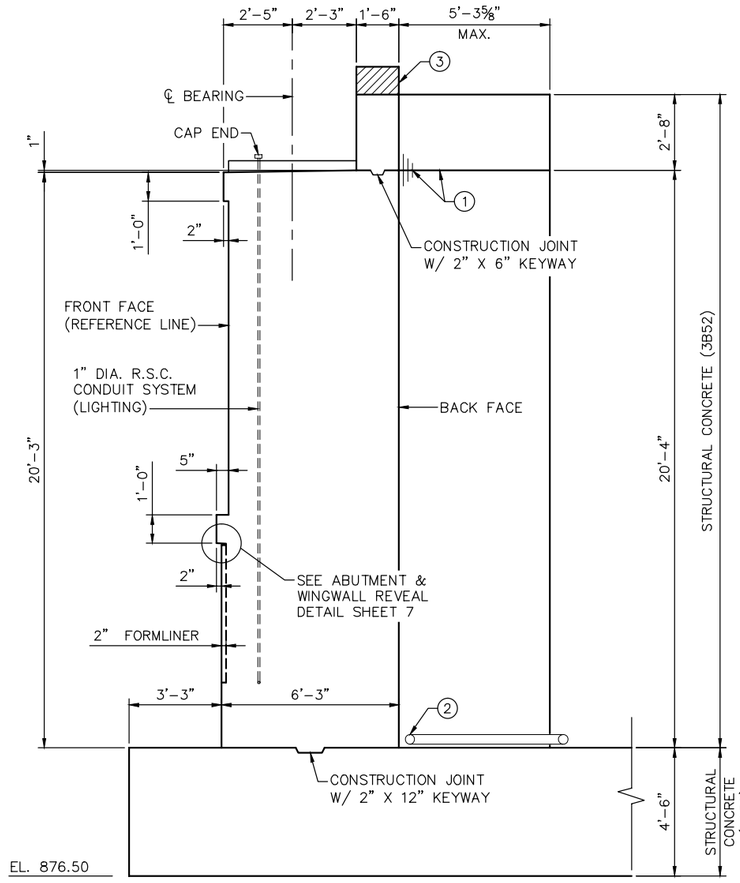
DISCIPLINE: STRUCTURES

SHEET NAME: CBR27W34-BRG-ABT-001-2

Jul, 29 2015 11:30 am V:\3400_ADC\CAD\SEGMENT E2\PLAN SHEETS\STRUCTURES\T100-FRT\CBR27W34-BRG-ABT-001.dwg By: brad.wodash



ELEVATION



SECTION A–A
(SECTION THRU ABUTMENT)

NOTES:

1. MEMBRANE WATERPROOFING SYSTEM PER MnDOT SPEC. 2481.3B.
2. 4" NOMINAL DIA. PERFORATED PIPE, SEE DETAIL B910.
3. CONCRETE TO BE POURED AFTER BACKWALL PROTECTION ANGLES HAVE BEEN INSTALLED (SEE BALLAST AND WATERPROOFING DETAILS).
4. ELEVATIONS SHOWN AT BOTTOM OF WALK PLATE.

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: KAE | CHECKED BY: MDJ
DRAWN BY: LMT | DATE: 7/27/15

AECOM Kimley»Horn

60% SUBMISSION - 09/21/15

METROPOLITAN COUNCIL

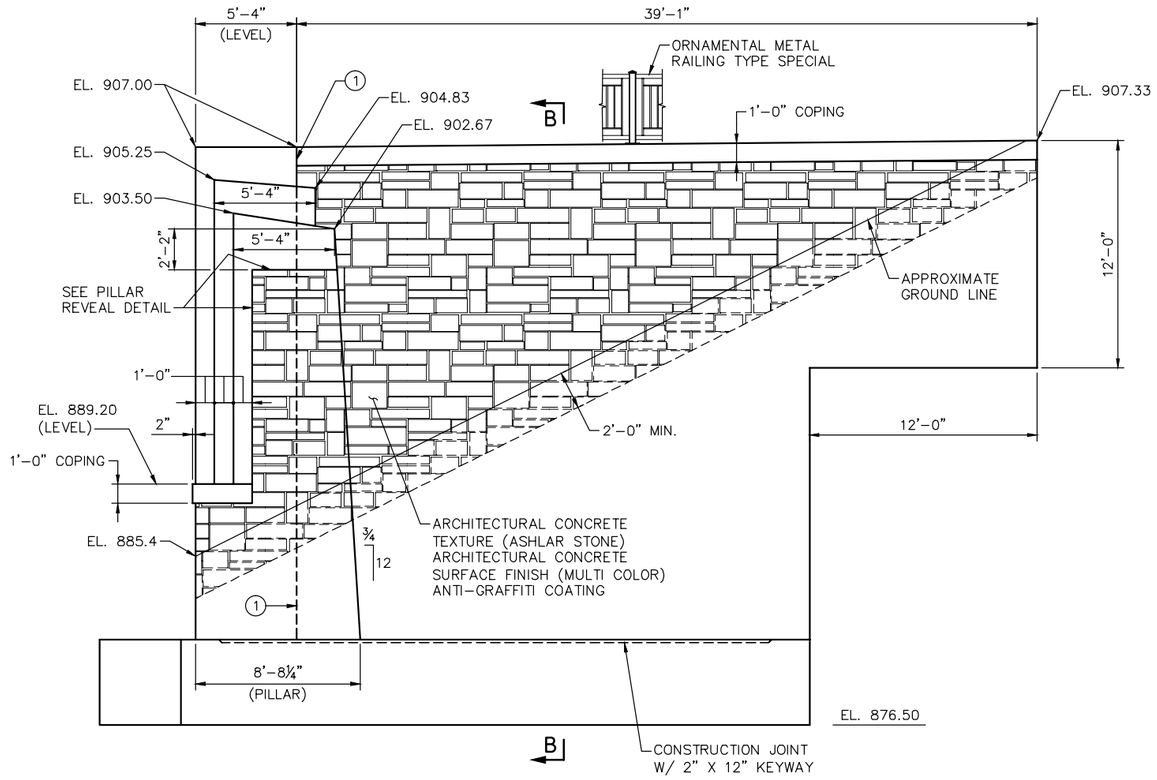
SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4
TH 100 FREIGHT RAIL BRIDGE
BRIDGE 27W34
WEST ABUTMENT DETAILS

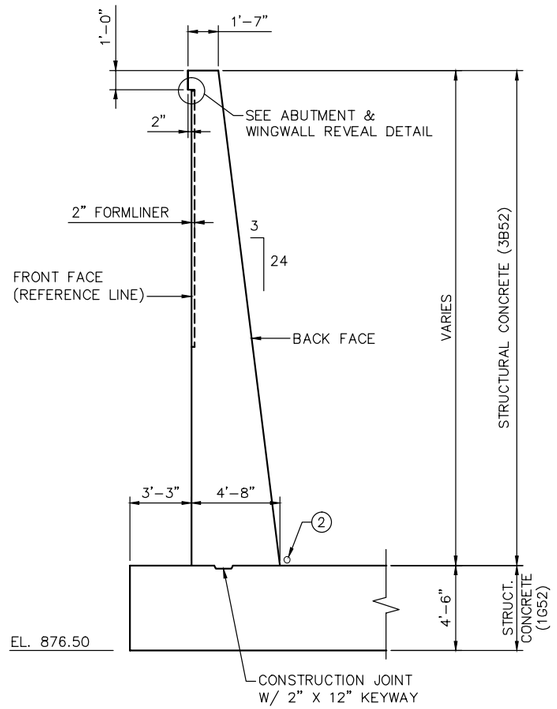
DISCIPLINE: STRUCTURES
SHEET NAME: CBR27W34-BRG-ABT-001-3

SHEET 6 OF 36

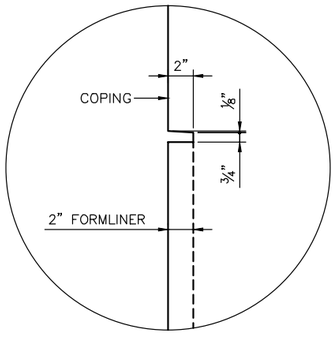
Jul, 29 2015 11:30 am V:\3400_ADC\CAD\SEGMENT E2\PLAN SHEETS\STRUCTURES\T100-FRT\CBR27W34-BRG-ABT-001.dwg By: brad.wodash



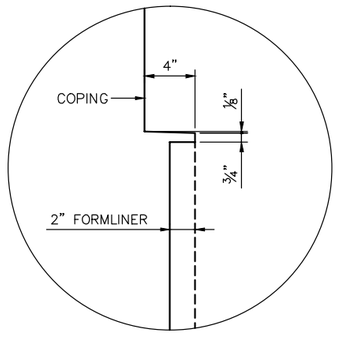
N.W. WINGWALL ELEVATION



SECTION B–B
(SECTION THRU WINGWALL)



PILLAR REVEAL DETAIL



ABUTMENT & WINGWALL REVEAL DETAIL

NOTES:

1. CONSTRUCTION JOINT W/ 2" X 6" KEYWAY.
2. 4" NOMINAL DIA. PERFORATED PIPE, SEE DETAIL B910.

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: KAE | CHECKED BY: MDJ
DRAWN BY: LMT | DATE: 7/27/15

AECOM Kimley»Horn

60% SUBMISSION - 09/21/15

METROPOLITAN COUNCIL

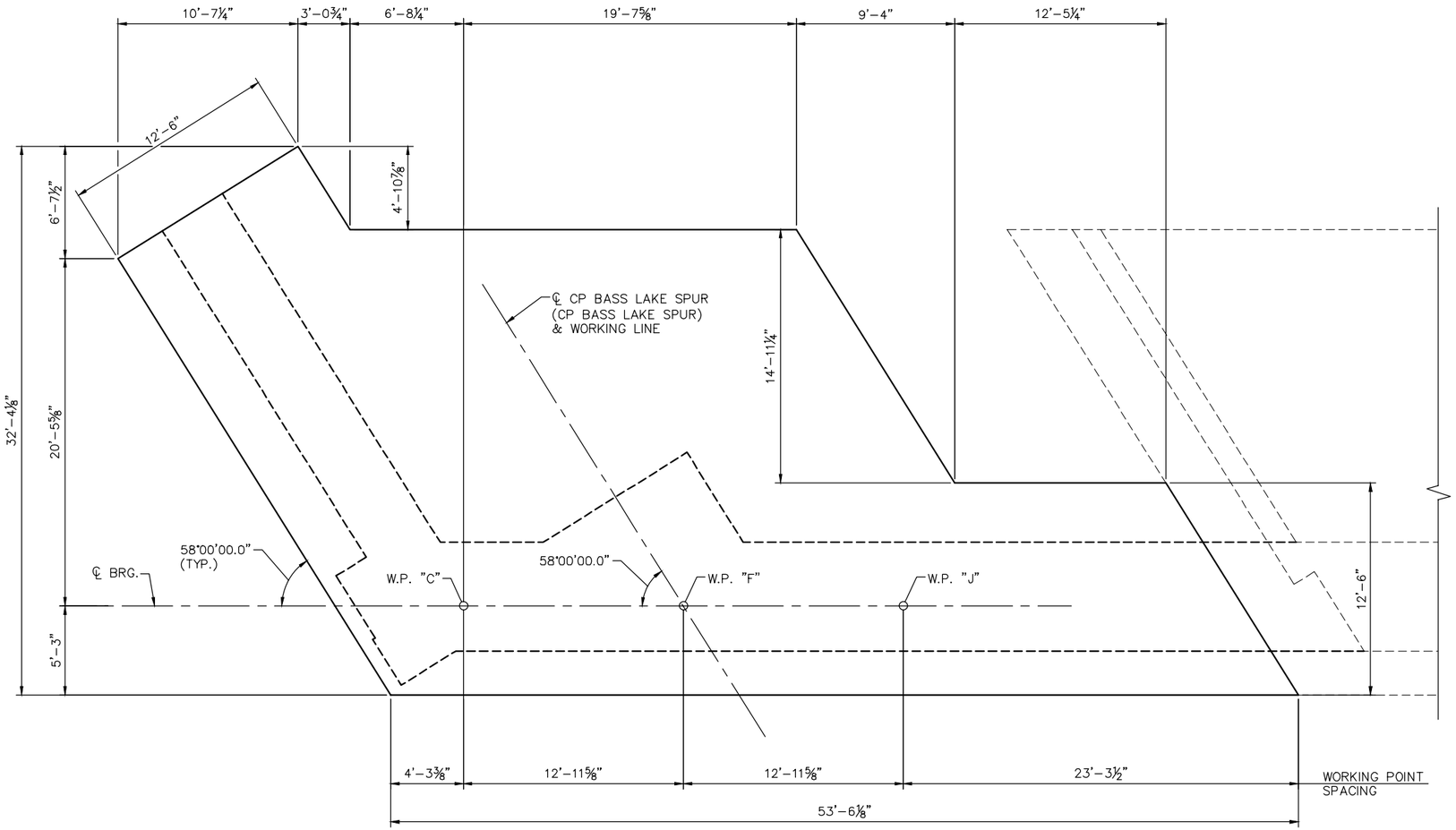
SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4
TH 100 FREIGHT RAIL BRIDGE
BRIDGE 27W34
WEST ABUTMENT DETAILS

DISCIPLINE: STRUCTURES
SHEET NAME: CBR27W34-BRG-ABT-001-4

SHEET 7 OF 36

Jul, 29 2015 11:30 am V:\3400_ADC\CAD\SEGMENT E2\PLAN SHEETS\STRUCTURES\T100-FRT\CBR27W34-BRG-ABT-001.dwg By: brad.wodash



FOOTING PLAN

SUMMARY OF QUANTITIES - EAST ABUTMENT

ITEM	UNIT	QUANTITY
STRUCTURAL CONCRETE (1G52)	CU. YD.	
STRUCTURAL CONCRETE (3B52)	CU. YD.	
REINFORCEMENT BARS	POUND	
REINFORCEMENT BARS (EPOXY COATED)	POUND	
ORNAMENTAL METAL RAILING TYPE SPECIAL	LIN. FT.	
ANTI-GRAFFITI COATING	SQ. FT.	
ARCH CONC TEXTURE (ASHLAR STONE)	SQ. FT.	
ARCH SURFACE FINISH (MULTICOLOR)	SQ. FT.	
DAMPROOFING	SQ. FT.	
MEMBRANE WATERPROOFING	LIN. FT.	
BRIDGE NAMEPLATE	EACH	
B.M. DISK	EACH	
1" RIGID STEEL CONDUIT	LIN. FT.	
1" END CAPS	EACH	

EAST ABUTMENT
SPREAD FOOTING LOAD DATA

* ALLOWABLE DESIGN BEARING PRESSURE	____ TONS/ SQ FT
EFFECTIVE WIDTH B'	____ FT
ALLOWABLE BEARING RESISTANCE $\phi b \cdot qn$	____ TONS/ SQ FT

* BASED ON _____ LOAD COMBINATION.

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: KAE | CHECKED BY: MDJ
DRAWN BY: LMT | DATE: 7/27/15

AECOM Kimley»Horn

60% SUBMISSION - 09/21/15

METROPOLITAN COUNCIL

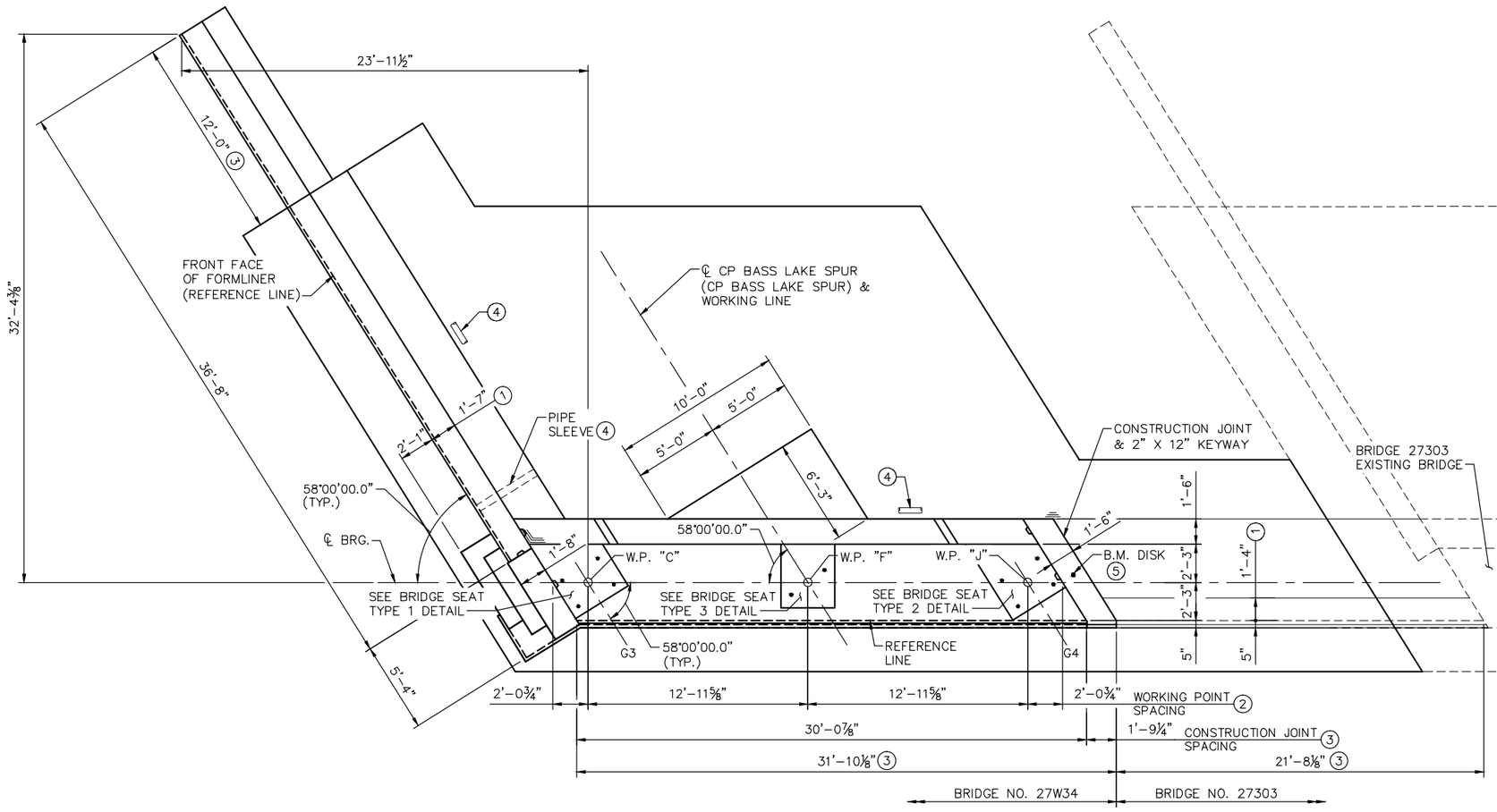
SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4
TH 100 FREIGHT RAIL BRIDGE
BRIDGE 27W34
EAST ABUTMENT DETAILS

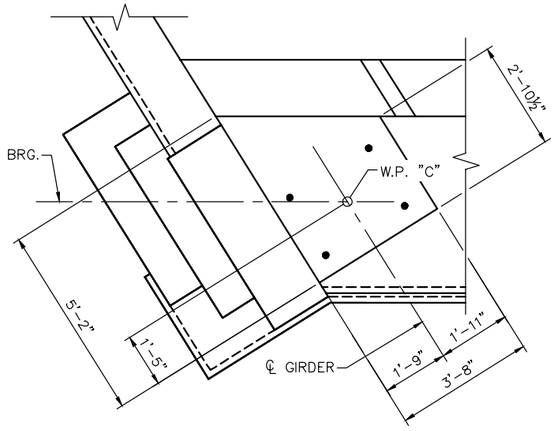
DISCIPLINE: STRUCTURES
SHEET NAME: CBR27W34-BRG-ABT-002-1

SHEET 8 OF 36

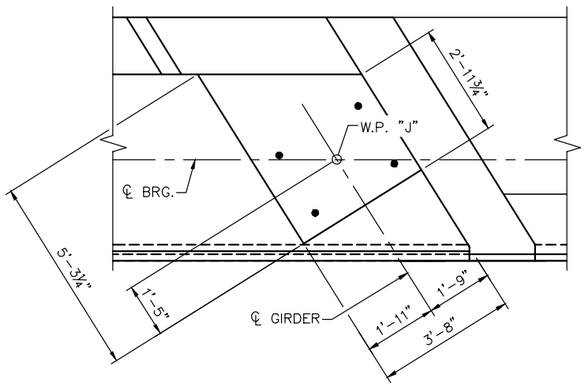
Jul, 29 2015 11:31 am V:\3400_ADC\CAD\SEGMENT E2\PLAN SHEETS\STRUCTURES\T100-FRT\CBR27W34-BRG-ABT-002.dwg By: brad.wodash



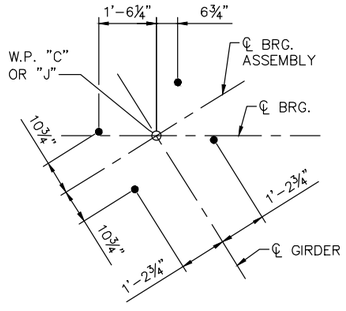
PLAN



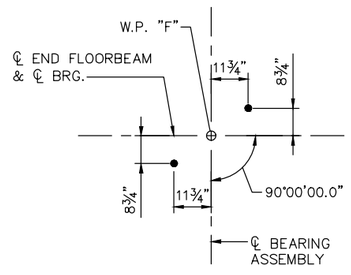
BRIDGE SEAT TYPE 1



BRIDGE SEAT TYPE 2



ANCHOR ROD LAYOUT
(BEARING E1)



ANCHOR ROD LAYOUT
(BEARING E2)

NOTES:

A 72 HOUR DELAY IS REQUIRED BETWEEN ALL ADJACENT POURS OF WALLS AND STEMS.

DAMPROOFING SHALL BE APPLIED TO THE BACK FACE OF THE ABUTMENT AND WINGWALLS FROM TOP OF FOOTING TO WITHIN 6" FROM TOP OF ABUTMENTS/WINGWALL.

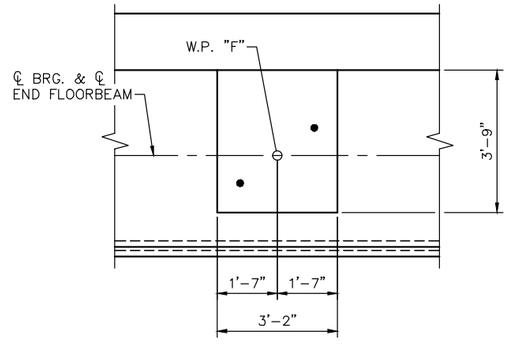
(1) DIMENSIONS SHOWN AT TOP OF WALL.

(2) MEASURED ALONG ℄ BEARING.

(3) MEASURED ALONG REFERENCE LINE.

(4) DRAINAGE SYSTEM. SEE DETAIL B910.

(5) STATE WILL FURNISH DISK. BEND PRONGS OUTWARD TO ANCHOR IN CONCRETE.



BRIDGE SEAT TYPE 3

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: KAE | CHECKED BY: MDJ
DRAWN BY: LMT | DATE: 7/27/15

AECOM Kimley»Horn

60% SUBMISSION - 09/21/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

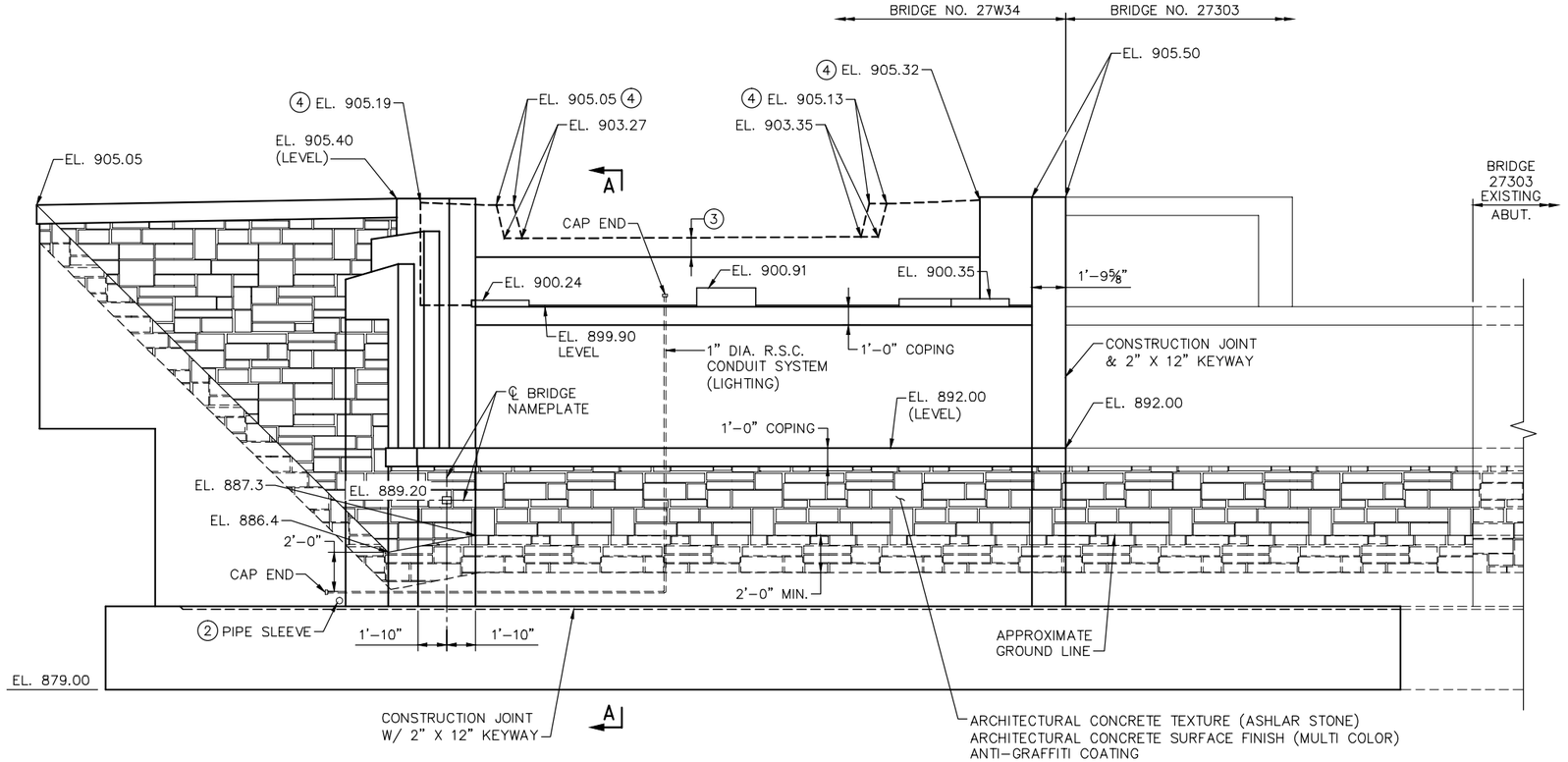
CIVIL EAST - VOLUME 4
TH 100 FREIGHT RAIL BRIDGE
BRIDGE 27W34
EAST ABUTMENT DETAILS

DISCIPLINE: STRUCTURES

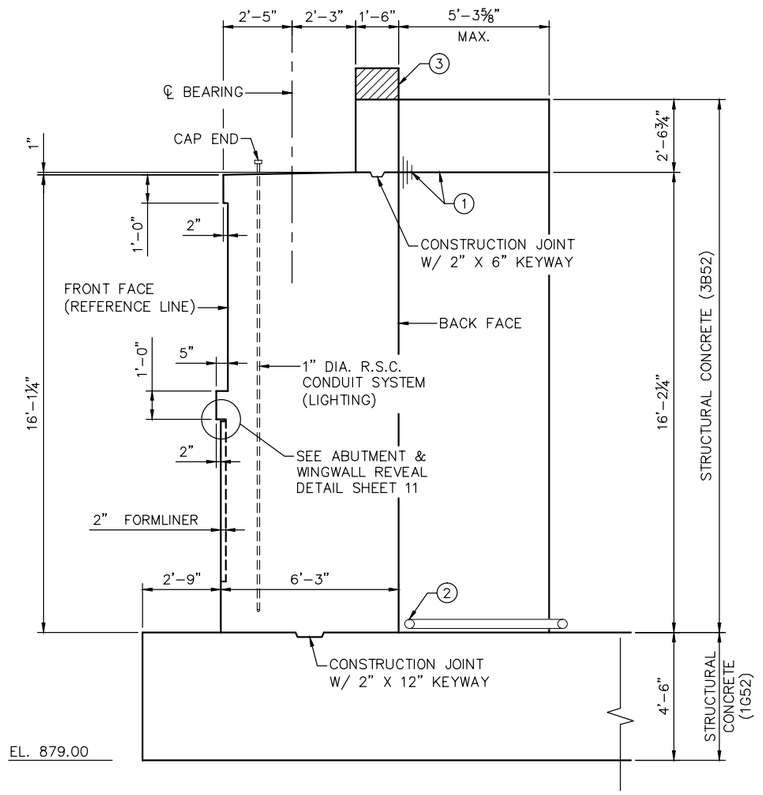
SHEET NAME: CBR27W34-BRG-ABT-002-2

SHEET 9 OF 36

Jul, 29 2015 11:31 am V:\3400_ADC\CAD\SEGMENT E2\PLAN SHEETS\STRUCTURES\T100-FRT\CBR27W34-BRG-ABT-002.dwg By: brad.wodash



ELEVATION



SECTION A–A
(SECTION THRU ABUTMENT)

NOTES:

① MEMBRANE WATERPROOFING SYSTEM PER MnDOT SPEC. 2481.3B. PAYMENT SHALL INCIDENTAL TO "STRUCTURAL CONCRETE (3B52)".

② SEE DRAINAGE SYSTEM (BRIDGE DECK) DETAILS.

③ CONCRETE TO BE POURED AFTER BACKWALL PROTECTION ANGLES HAVE BEEN INSTALLED (SEE BALLAST AND WATERPROOFING DETAILS).

④ ELEVATIONS SHOWN AT BOTTOM OF WALK PLATE.

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: KAE | CHECKED BY: MDJ
DRAWN BY: LMT | DATE: 7/27/15

AECOM Kimley»Horn

60% SUBMISSION - 09/21/15

METROPOLITAN COUNCIL

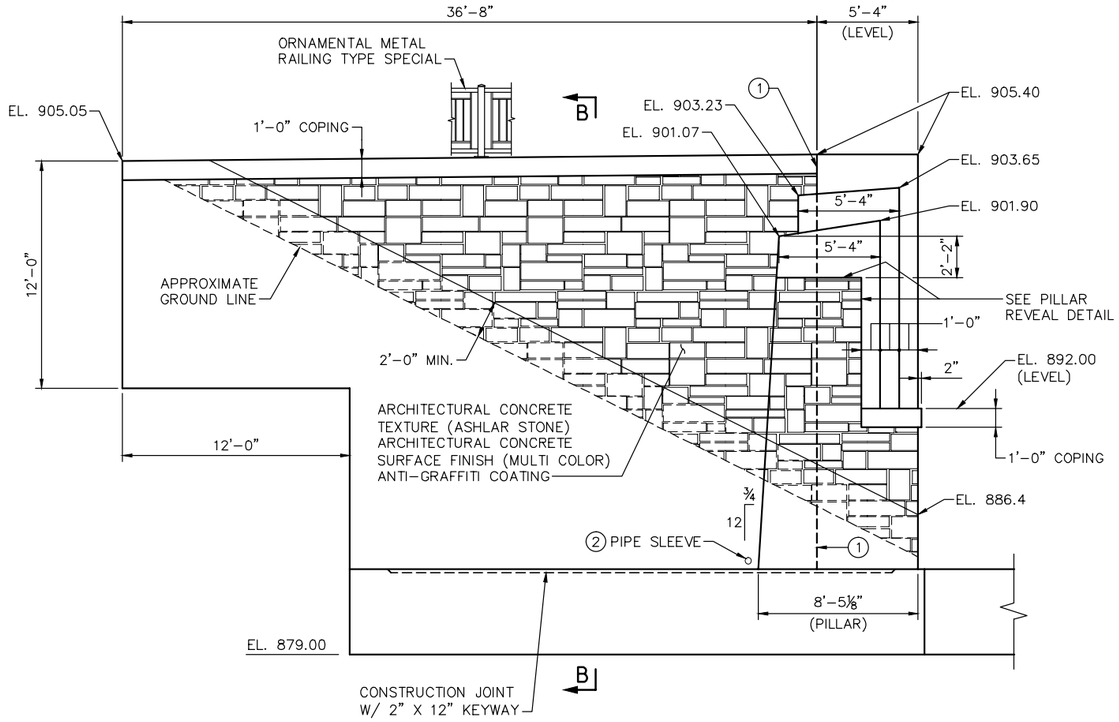
SOUTHWEST Green Line LRT Extension

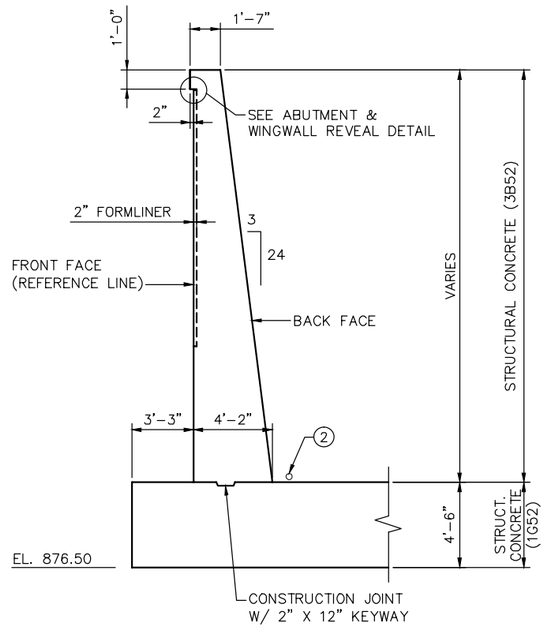
CIVIL EAST - VOLUME 4
TH 100 FREIGHT RAIL BRIDGE
BRIDGE 27W34
EAST ABUTMENT DETAILS

DISCIPLINE: STRUCTURES
SHEET NAME: CBR27W34-BRG-ABT-002-3

SHEET 10 OF 36

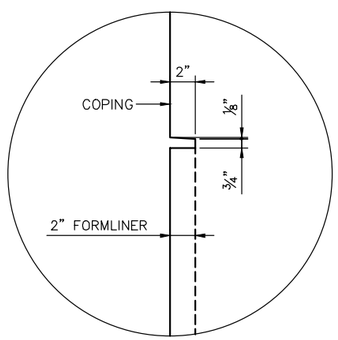
Jul, 29 2015 11:31 am V:\3400_ADC\CAD\SEGMENT E2\PLAN SHEETS\STRUCTURES\T100-FRT\CBR27W34-BRG-ABT-002.dwg By: brad.wodash



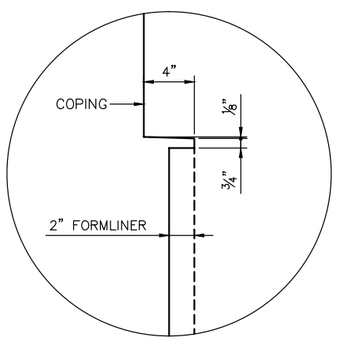


N.E. WINGWALL ELEVATION

SECTION B–B
(SECTION THRU WINGWALL)



PILLAR REVEAL DETAIL



ABUTMENT & WINGWALL REVEAL DETAIL

NOTES:

1. CONSTRUCTION JOINT W/ 2" X 6" KEYWAY.
2. SEE DRAINAGE SYSTEM (BRIDGE DECK) DETAILS.

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: KAE | CHECKED BY: MDJ
DRAWN BY: LMT | DATE: 7/27/15

AECOM Kimley»Horn

60% SUBMISSION - 09/21/15

METROPOLITAN COUNCIL

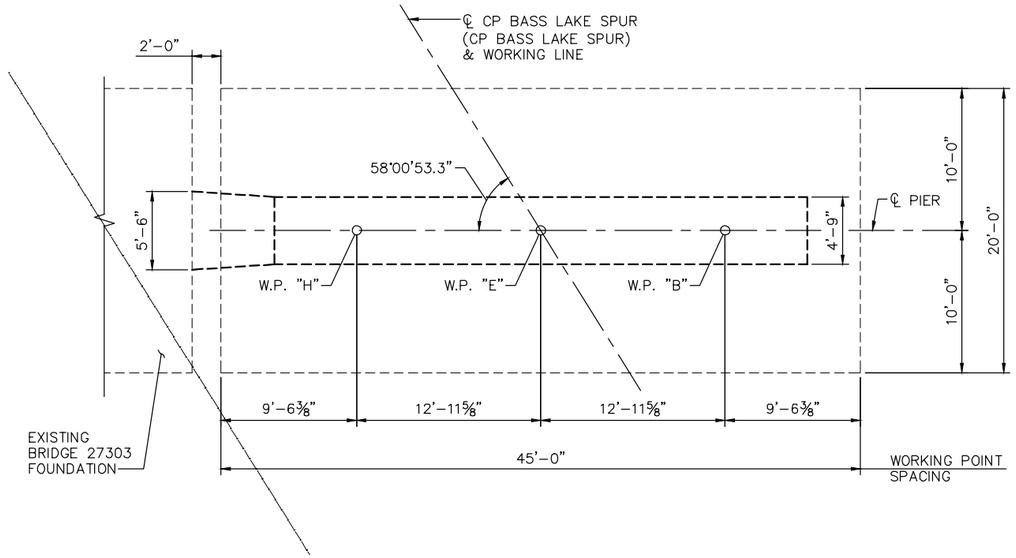
SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4
TH 100 FREIGHT RAIL BRIDGE
BRIDGE 27W34
EAST ABUTMENT DETAILS

DISCIPLINE: STRUCTURES
SHEET NAME: CBR27W34-BRG-ABT-002-4

SHEET 11 OF 36

Jul, 29 2015 11:31 am V:\3400_ADC\CAD\SEGMENT E2\PLAN SHEETS\STRUCTURES\T100-FRT\CBR27W34-BRG-ABT-002.dwg By: brad.wodash



EXISTING FOOTING PLAN

SUMMARY OF QUANTITIES - PIER		
ITEM	UNIT	QUANTITY
STRUCTURAL CONCRETE (3B52)	CU. YD.	
REINFORCEMENT BARS	POUND	
REINFORCEMENT BARS (EPOXY COATED)	POUND	

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: KAE | CHECKED BY: MDJ
DRAWN BY: LMT | DATE: 7/27/15

AECOM Kimley»Horn

60% SUBMISSION - 09/21/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

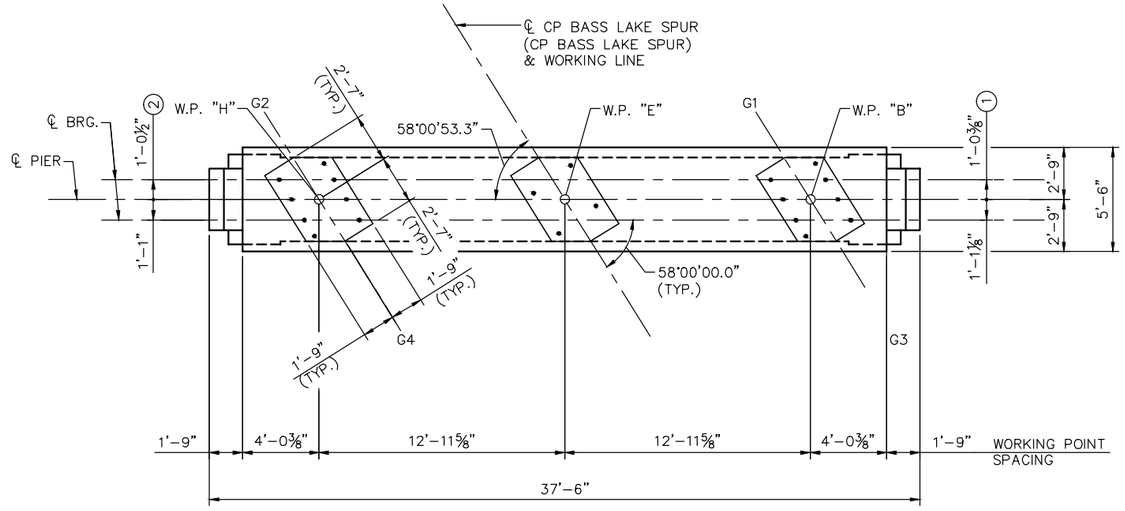
CIVIL EAST - VOLUME 4
TH 100 FREIGHT RAIL BRIDGE
BRIDGE 27W34
PIER DETAILS

DISCIPLINE: STRUCTURES

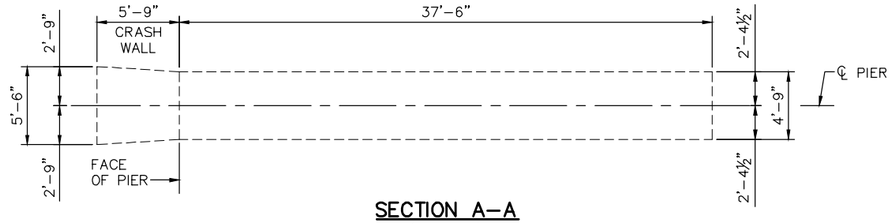
SHEET NAME: CBR27W34-BRG-PIR-001-1

SHEET 12 OF 36

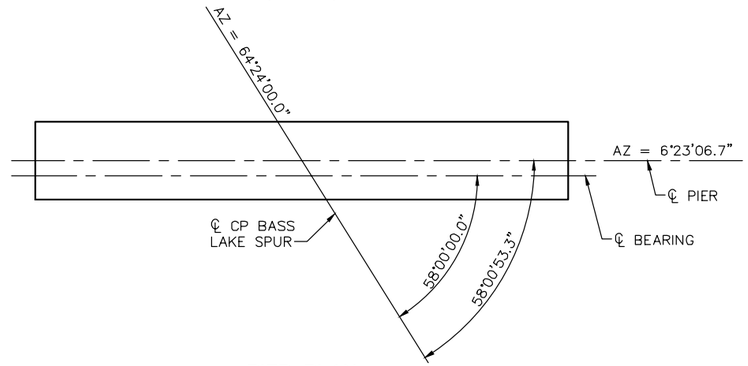
Jul, 29 2015 11:31 am V:\3400_ADC\CAD\SEGMENT E2\PLAN SHEETS\STRUCTURES\T100-FRT\CBR27W34-BRG-PIR-001.dwg By: brad.wodash



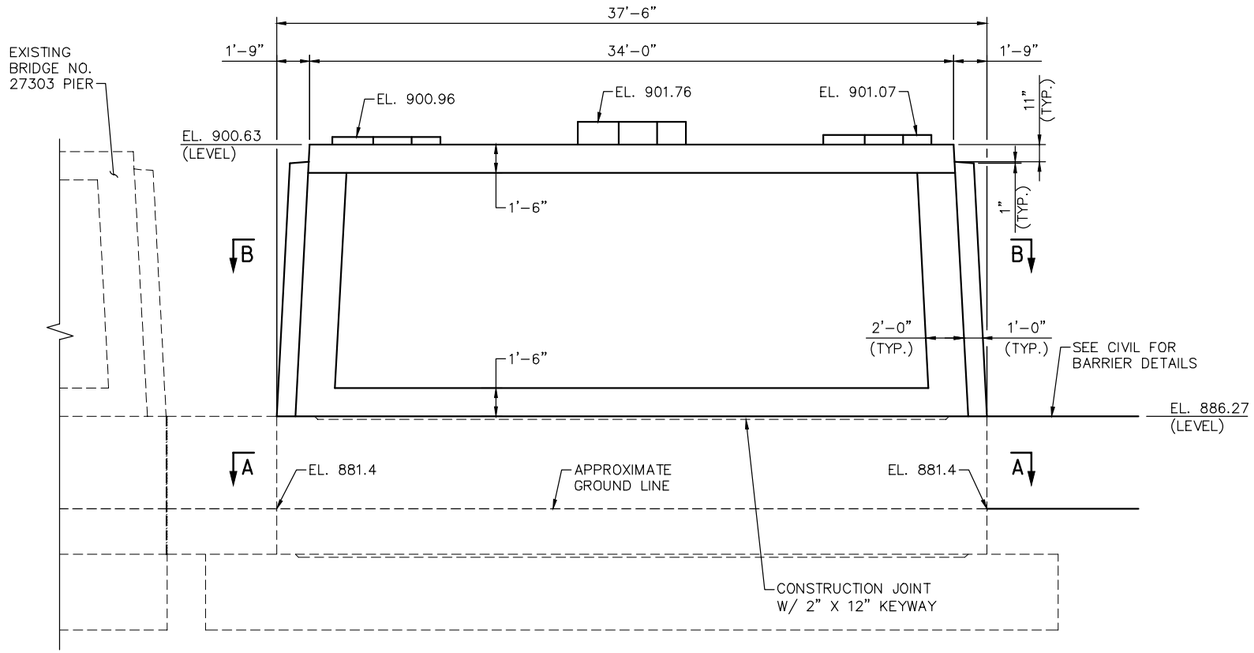
PLAN



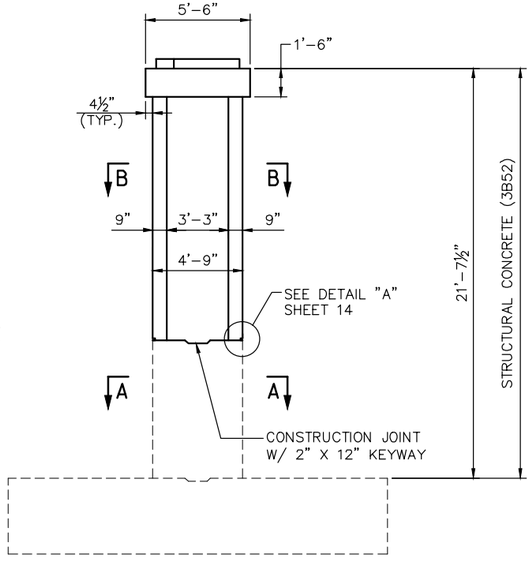
SECTION A–A
(EXISTING)



PIER PLAN
℄ BEARING IS NOT PARALLEL TO THE ℄ OF PIER



ELEVATION



END VIEW

NOTES:

1. MEASURED AT W.P. "B"
2. MEASURED AT W.P. "H"
3. TAPER AS REQUIRED TO MATCH EXISTING.

SEE SHEET 14 FOR SECTION B–B AND ANCHOR BOLT LAYOUT.

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: KAE | CHECKED BY: MDJ
DRAWN BY: LMT | DATE: 7/27/15

AECOM Kimley»Horn

60% SUBMISSION - 09/21/15

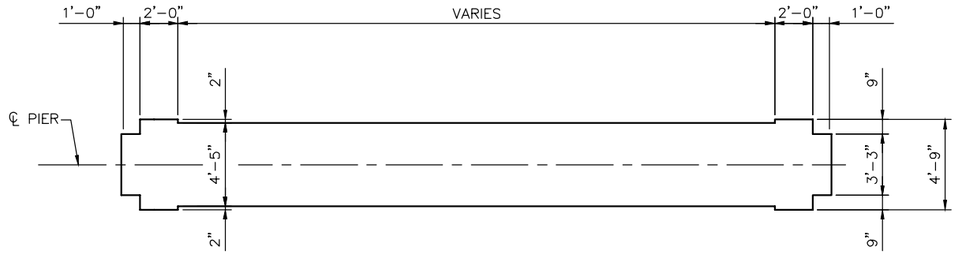
METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

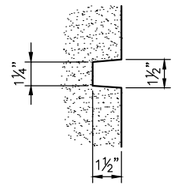
CIVIL EAST - VOLUME 4
TH 100 FREIGHT RAIL BRIDGE
BRIDGE 27W34
PIER DETAILS

DISCIPLINE: STRUCTURES
SHEET NAME: CBR27W34-BRG-PIR-001-2

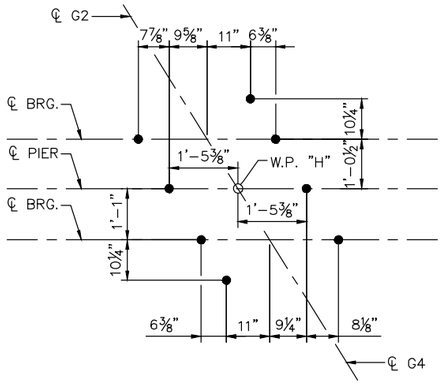
SHEET 13 OF 36



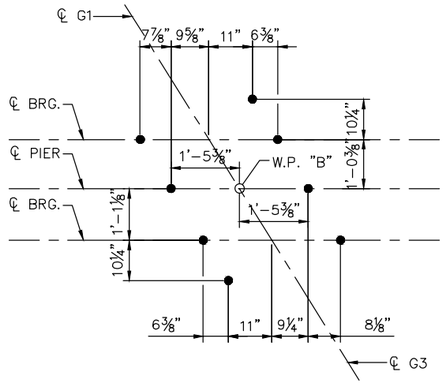
SECTION B-B



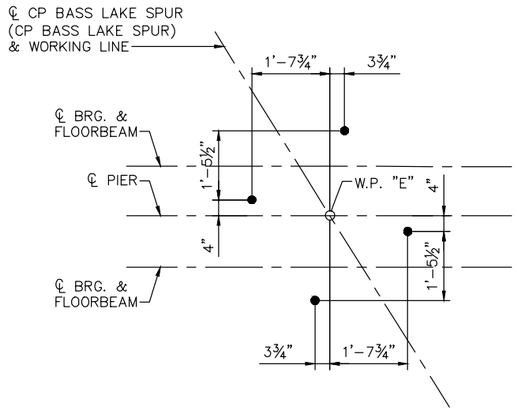
DETAIL "A"



ANCHOR BOLT LAYOUT
(BEARING F1)



ANCHOR BOLT LAYOUT
(BEARING F2)



ANCHOR BOLT LAYOUT
(BEARING E2)

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: KAE | CHECKED BY: MDJ
DRAWN BY: LMT | DATE: 7/27/15

AECOM Kimley»Horn

60% SUBMISSION - 09/21/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

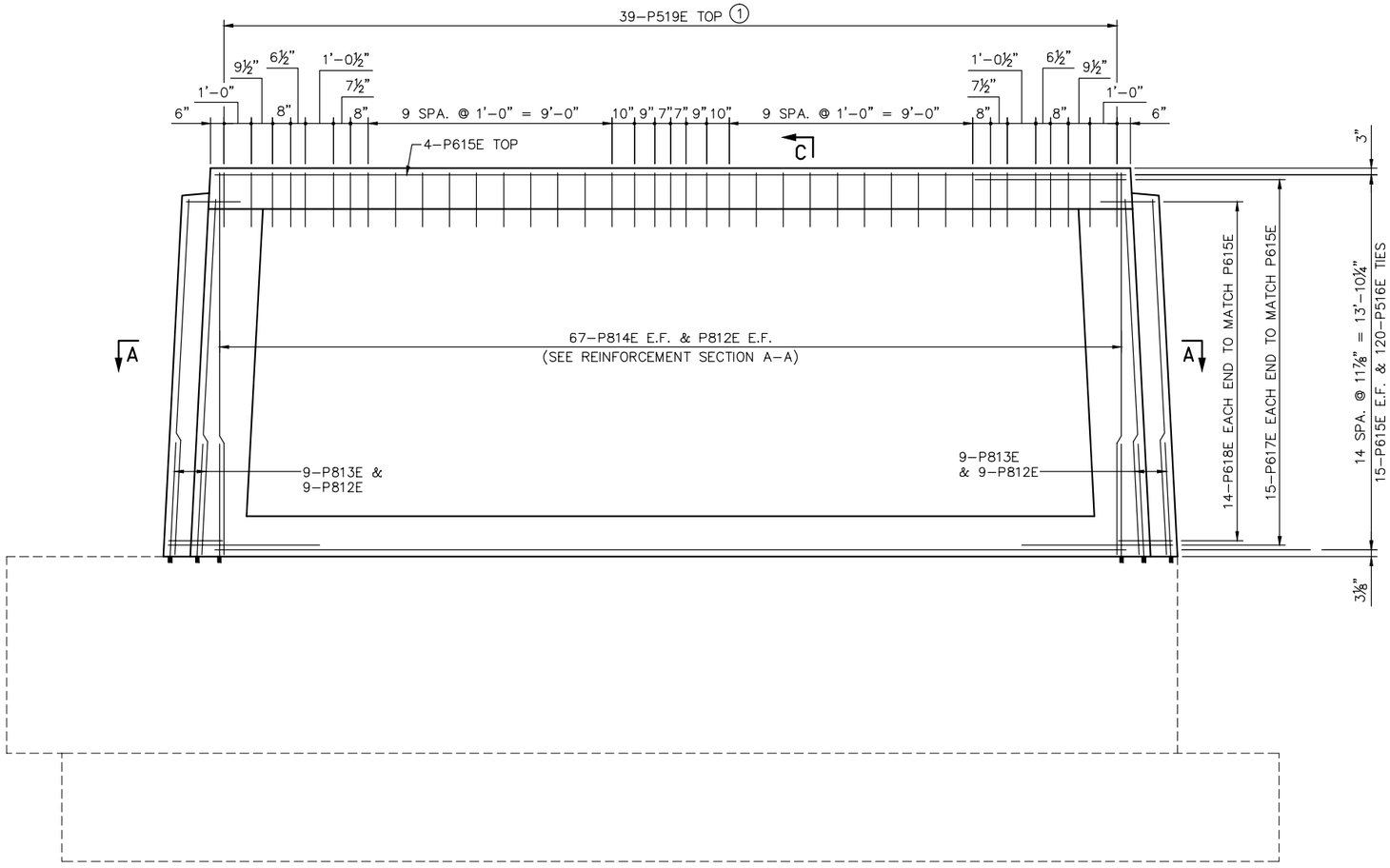
CIVIL EAST - VOLUME 4
TH 100 FREIGHT RAIL BRIDGE
BRIDGE 27W34
PIER DETAILS

DISCIPLINE: STRUCTURES

SHEET NAME: CBR27W34-BRG-PIR-001-3

SHEET 14 OF 36

Jul. 29 2015 11:31 am V:\3400_ADC\CAD\SEGMENT E2\PLAN SHEETS\STRUCTURES\T100-FRT\CBR27W34-BRG-PIR-001.dwg By: brad.wodash

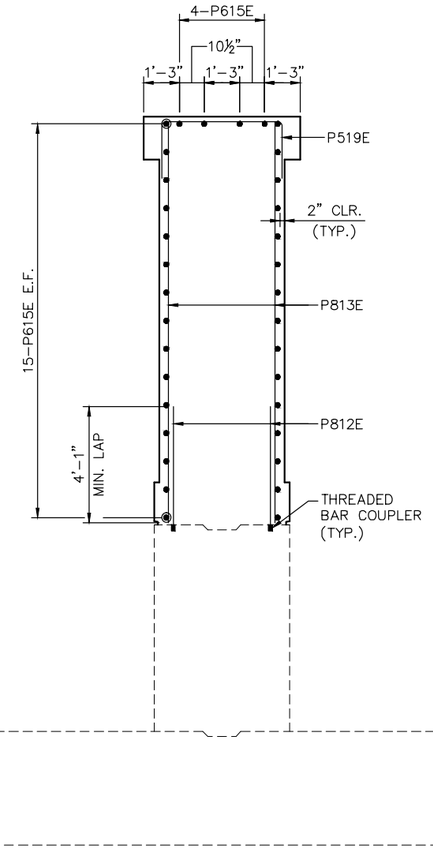


SOUTH END

NORTH END

REINFORCEMENT ELEVATION

(LOOKING WEST)



REINFORCEMENT SECTION C–C

NOTES:

SEE SHEET 16 FOR SECTION A–A.

(1) CAREFULLY PLACE REINFORCEMENT TO AVOID INTERFERENCE WITH DRILLING HOLES FOR ANCHOR BOLTS.

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: KAE | CHECKED BY: MDJ
DRAWN BY: LMT | DATE: 7/27/15

AECOM Kimley»Horn

60% SUBMISSION - 09/21/15

METROPOLITAN COUNCIL

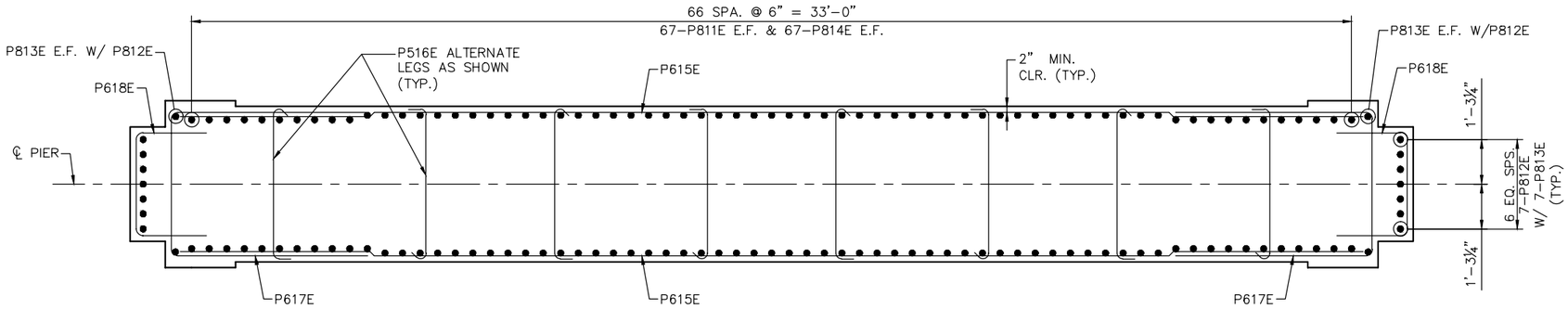
SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4
TH 100 FREIGHT RAIL BRIDGE
BRIDGE 27W34
PIER REINFORCEMENT

DISCIPLINE: STRUCTURES

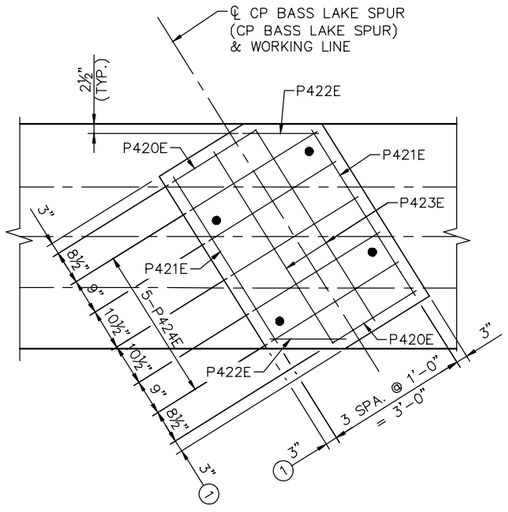
SHEET NAME: CBR27W34-BRG-PIR-002-1

SHEET 15 OF 36

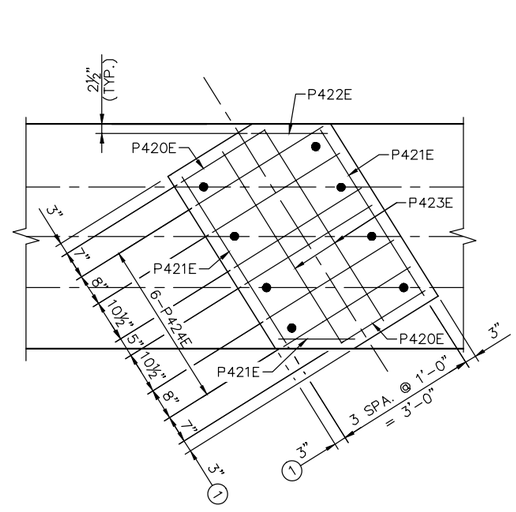


REINFORCEMENT SECTION A-A

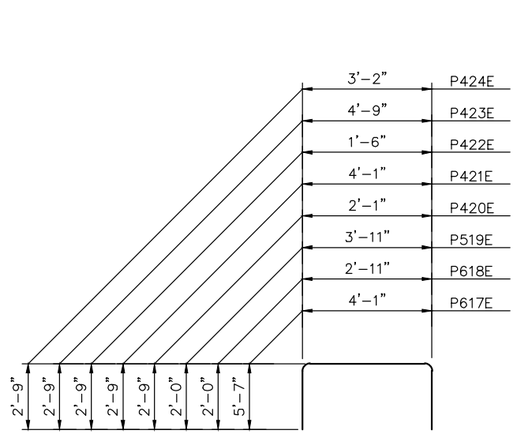
BILL OF REINFORCEMENT - PIER				
BAR	NO.	LENGTH	SHAPE	LOCATION
P812E	152	4'-2"	STRT.	STEM - VERTICAL
P813E	18	13'-2"	STRT.	STEM - VERTICAL
P814E	134	14'-2"	STRT.	STEM - VERTICAL
P615E	30	33'-8"	STRT.	STEM - HORIZONTAL
P516E	120	4'-7"	BENT	STEM - STIRRUP
P617E	30	15'-3"	BENT	STEM - END TIE
P618E	28	6'-11"	BENT	STEM - END TIE
P519E	39	7'-11"	BENT	STEM - TOP TIE
P420E	6	7'-7"	BENT	PEDESTAL - TIE
P421E	6	9'-7"	BENT	PEDESTAL - TIE
P422E	6	7'-0"	BENT	PEDESTAL - TIE
P423E	6	10'-3"	BENT	PEDESTAL - TIE
P424E	17	8'-8"	BENT	PEDESTAL - TIE



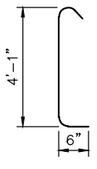
BRIDGE SEAT REINFORCEMENT
(BEARING E2)



BRIDGE SEAT REINFORCEMENT
(BEARING F1 & F2)



P617E, P618E, P519E, P420E, P421E, P422E, P423E P424E



P516E

NOTES:

1. CAREFULLY PLACE REINFORCEMENT TO AVOID INTERFERENCE WITH DRILLING HOLES FOR ANCHOR BOLTS.

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: KAE | CHECKED BY: MDJ
DRAWN BY: LMT | DATE: 7/27/15

AECOM Kimley»Horn

60% SUBMISSION - 09/21/15

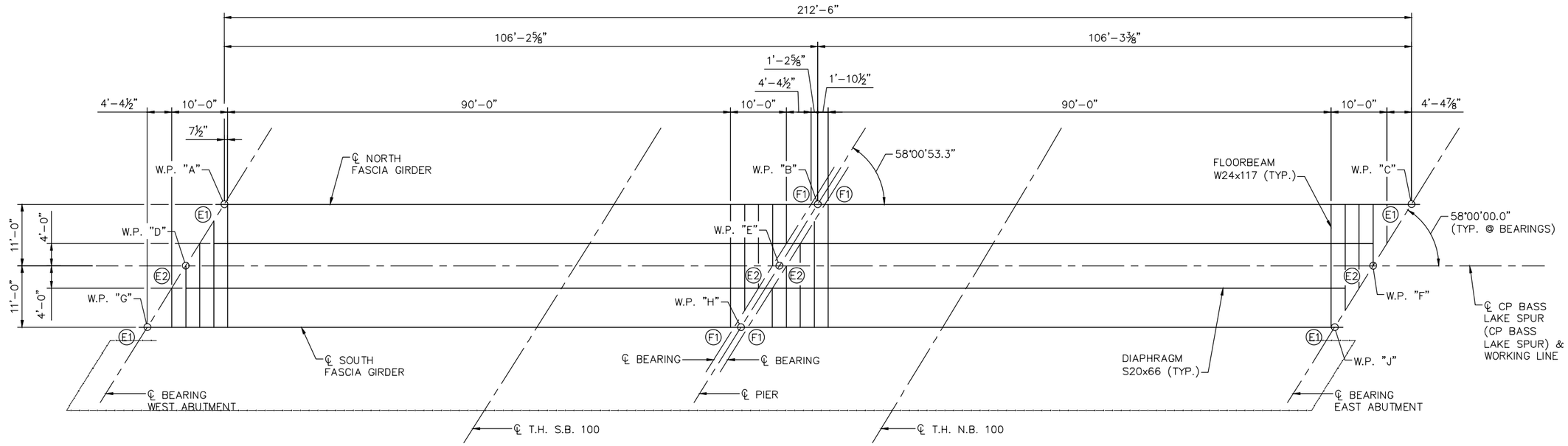
METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4
TH 100 FREIGHT RAIL BRIDGE
BRIDGE 27W34
PIER REINFORCEMENT

DISCIPLINE: STRUCTURES
SHEET NAME: CBR27W34-BRG-PIR-002-2

SHEET 16 OF 36



FRAMING PLAN (1)

SUMMARY OF QUANTITIES - SUPERSTRUCTURE			
	ITEM	UNIT	QUANTITY
(1)	RELOCATE BRIDGE SUPER STRUCTURE	LUMP SUM	
	FIXED BEARING ASSEMBLY TYPE 1	EACH	
	EXPANSION BEARING ASSEMBLY TYPE 1	EACH	
	EXPANSION BEARING ASSEMBLY TYPE 1	EACH	
	DRAINAGE SYSTEM BRIDGE DECK	LUMP SUM	
	RAILROAD TRACK BALLAST (CV)	CU. YD.	
	WATERPROOFING	SQ. FT.	

NOTES:

(E1) DENOTES EXPANSION BEARING ASSEMBLY TYPE 1. RELOCATE EXISTING BEARING.

(E2) DENOTES EXPANSION BEARING ASSEMBLY TYPE 2. RELOCATE EXISTING BEARING.

(F1) DENOTES FIXED BEARING ASSEMBLY TYPE 1. RELOCATE EXISTING BEARING.

(1) FRAMING PLAN IS FOR INFORMATION ONLY. THE CONTRACTOR SHALL VERIFY STRUCTURAL DETAILS AND MEMBER CAPACITIES PRIOR TO RELOCATING EXISTING BRIDGE NO. 27303 SUPERSTRUCTURE AND BEARINGS.

THE WALK PLATE AND SUPPORT PLATES EMBEDDED INTO THE ABUTMENT SHALL MEET MnDOT 3306 AND SHALL BE GALVANIZED PER MnDOT 3394.

ALL BOLTED CONNECTIONS SHALL BE MADE WITH ⅞" DIAMETER A325 BOLTS, EXCEPT AS NOTED.

THE MINIMUM EDGE DISTANCE TO THE ℄ OF ALL FASTENERS WILL BE 1½" UNLESS NOTED OTHERWISE.

NO WELDING OR DRILLED HOLES FOR TEMPORARY ATTACHMENTS TO THE GIRDERS WILL BE PERMITTED.

PLACE NUT AND WASHER ON INSIDE OF GIRDER FOR ALL BOLTS THROUGH GIRDER WEB.

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: KAE | CHECKED BY: MDJ
DRAWN BY: LMT | DATE: 7/27/15

AECOM Kimley»Horn

60% SUBMISSION - 09/21/15

METROPOLITAN COUNCIL

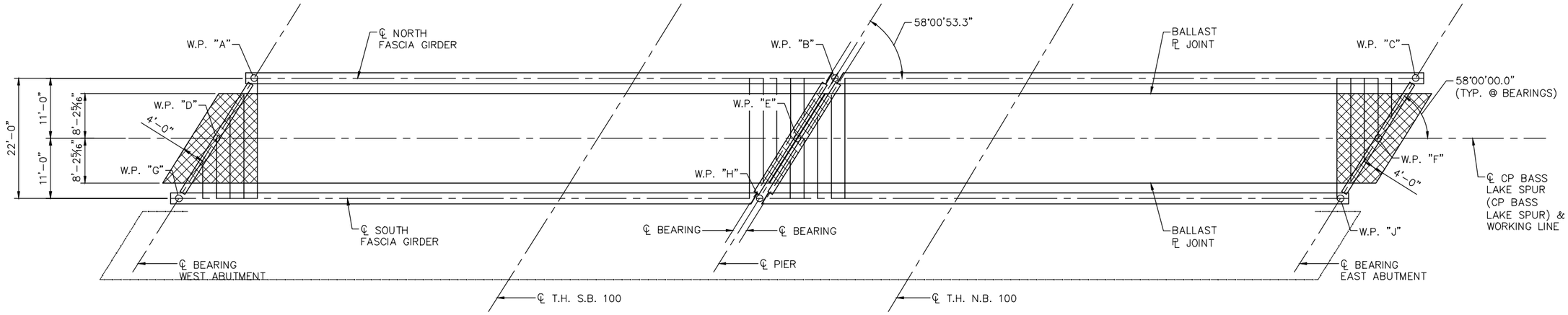
SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4
TH 100 FREIGHT RAIL BRIDGE
BRIDGE 27W34
FRAMING PLAN

DISCIPLINE: STRUCTURES
SHEET NAME: CBR27W34-BRG-SUP-003-1

SHEET 17 OF 36

Jul, 29 2015 11:32 am V:\3400_ADC\CAD\SEGMENT E2\PLAN SHEETS\STRUCTURES\T100-FRT\CBR27W34-BRG-SUP-003.dwg By: brad.wodash



BALLAST PLATE REMOVAL PLAN

LEGEND

- REMOVE AND REINSTALL EXISTING BALLAST PLATE AND WATERPROOFING
- REMOVE AND REINSTALL WATERPROOFING OVER PIER

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: KAE | CHECKED BY: MDJ
DRAWN BY: LMT | DATE: 7/27/15

AECOM Kimley»Horn

60% SUBMISSION - 09/21/15

METROPOLITAN COUNCIL

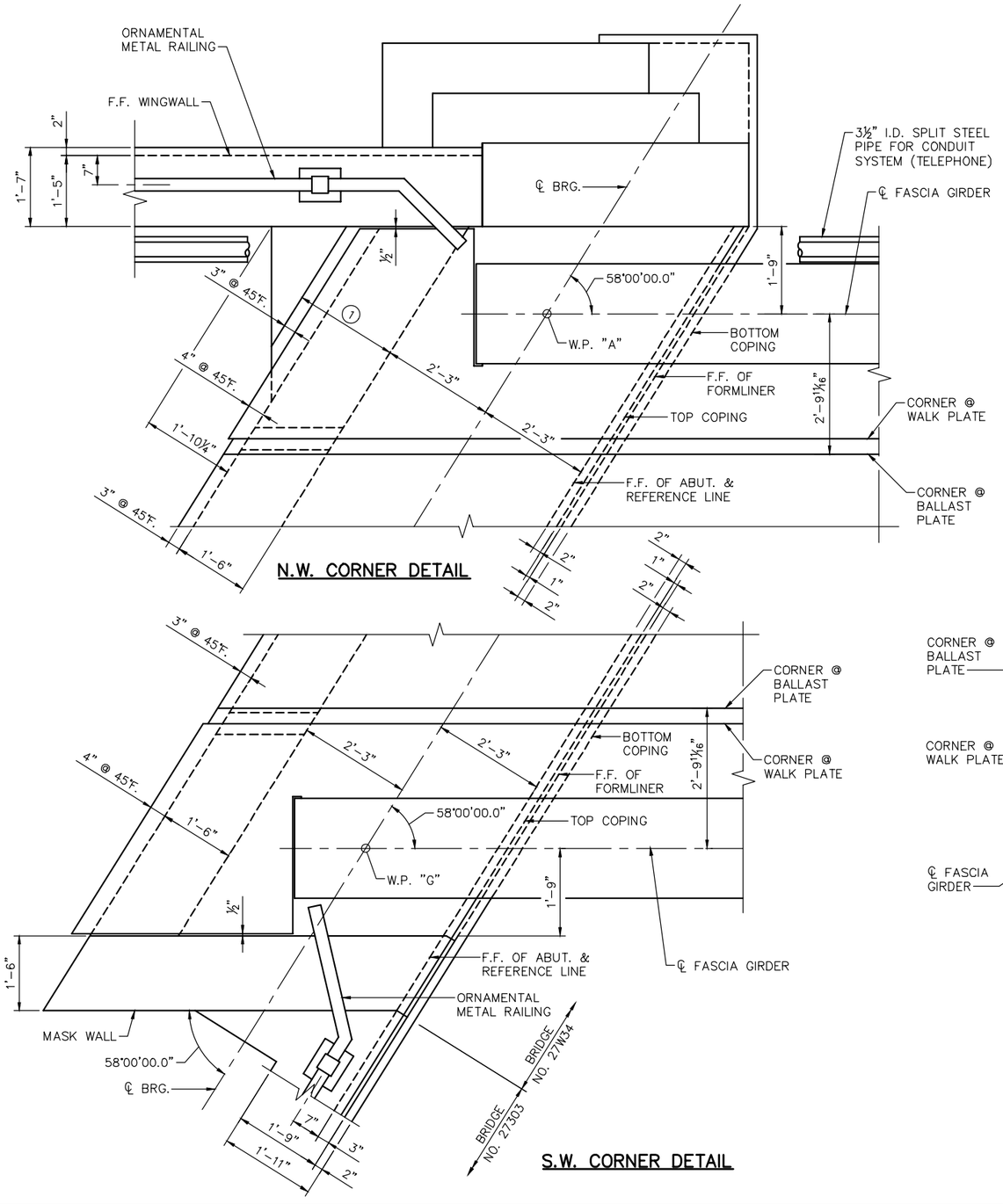
SOUTHWEST Green Line LRT Extension

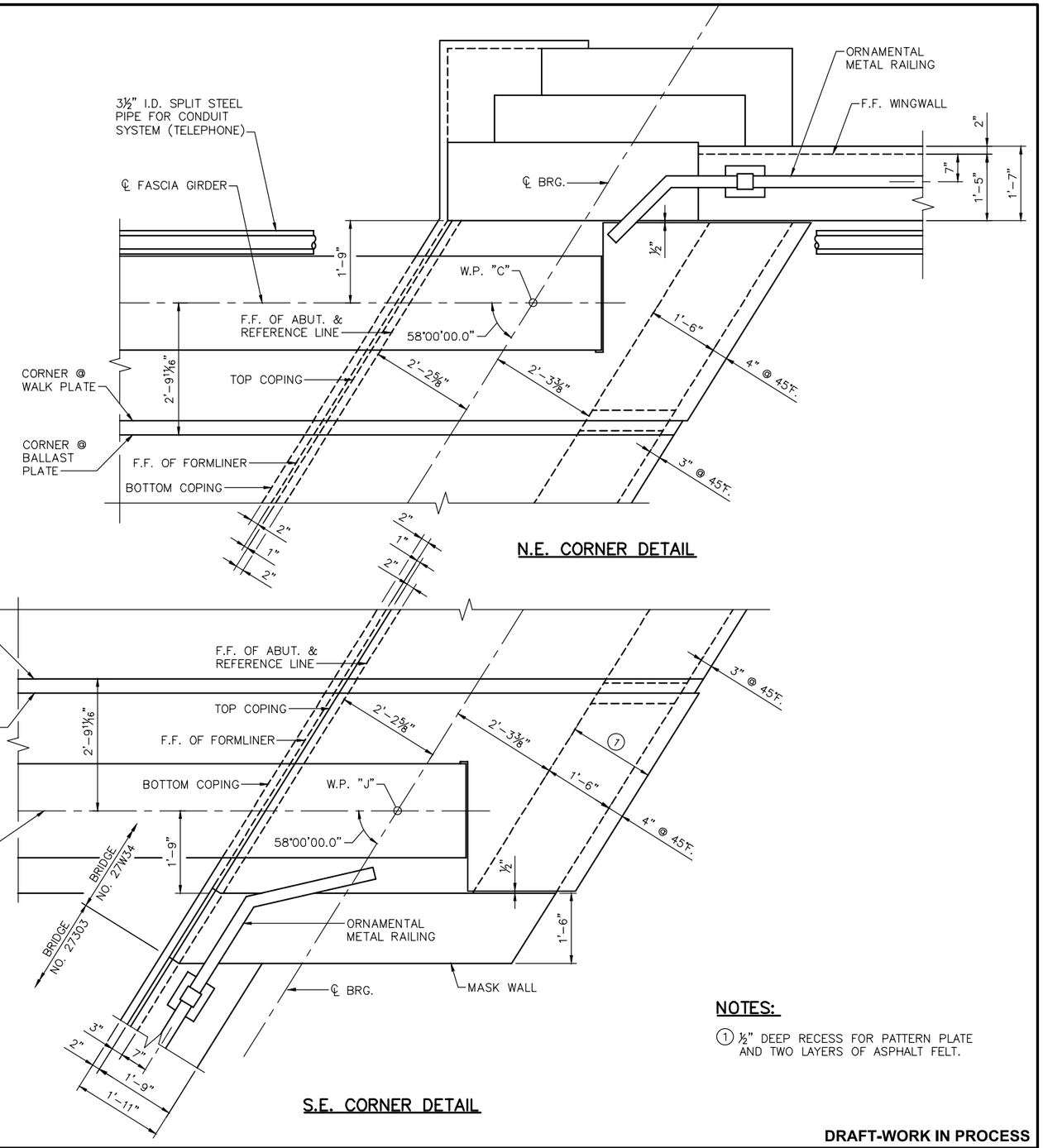
CIVIL EAST - VOLUME 4
TH 100 FREIGHT RAIL BRIDGE
BRIDGE 27W34
BALLAST PLATE REMOVAL PLAN

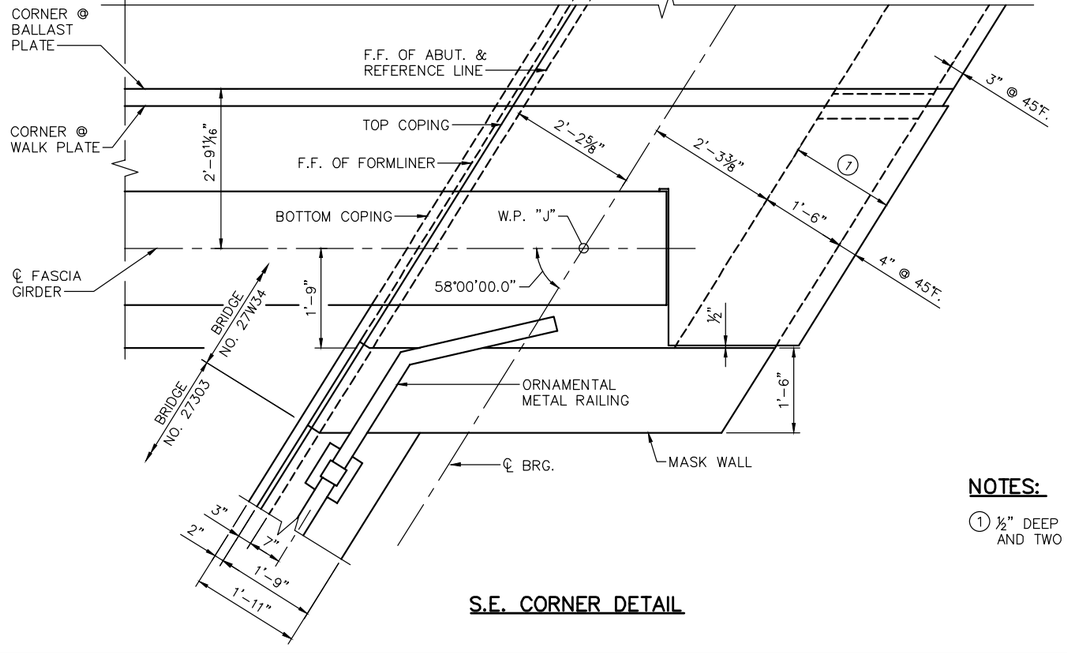
DISCIPLINE: STRUCTURES
SHEET NAME: CBR27W34-BRG-SUP-003-2

SHEET 18 OF 36

Jul, 29 2015 11:32 am V:\3400_ADC\CAD\SEGMENT E2\PLAN SHEETS\STRUCTURES\T100-FRT\CBR27W34-BRG-SUP-003.dwg By: brad.wodash







NOTES:

① ½" DEEP RECESS FOR PATTERN PLATE AND TWO LAYERS OF ASPHALT FELT.

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: KAE | CHECKED BY: MDJ
DRAWN BY: LMT | DATE: 7/27/15

AECOM Kimley»Horn

60% SUBMISSION - 09/21/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

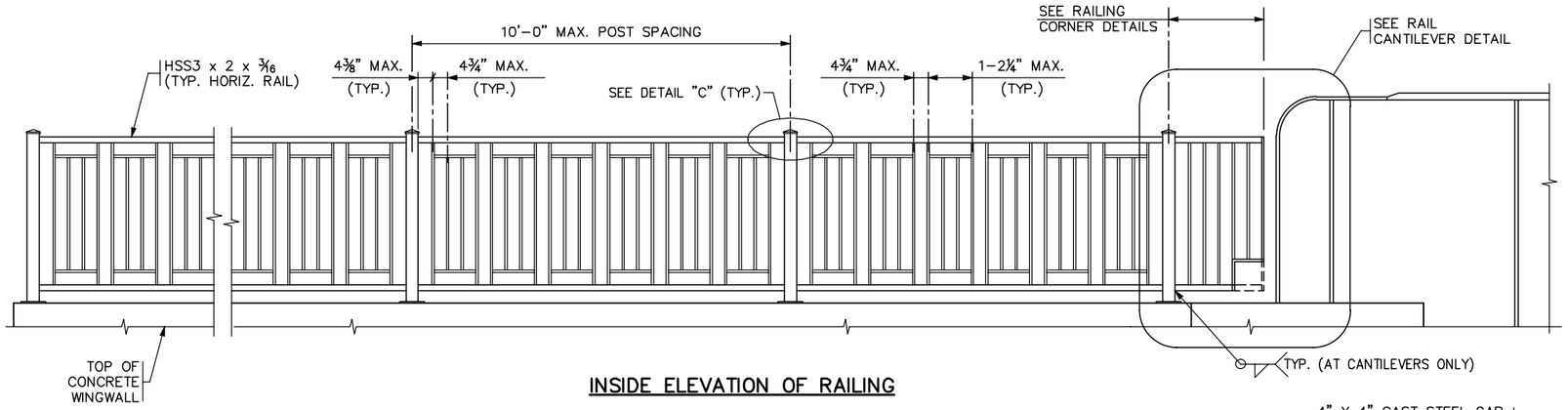
CIVIL EAST - VOLUME 4
TH 100 FREIGHT RAIL BRIDGE
BRIDGE 27W34
CORNER DETAILS

DISCIPLINE: STRUCTURES

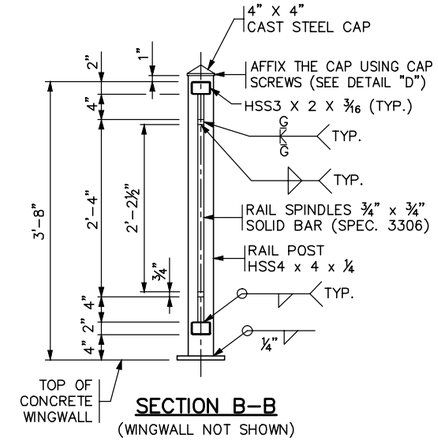
SHEET NAME: CBR27W34-BRG-SUP-002

SHEET 19 OF 32

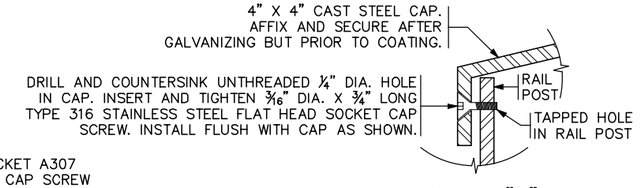
Jul, 29 2015 11:32 am V:\3400_ADC\CAD\SEGMENT E2\PLAN SHEETS\STRUCTURES\T100-FRT\CBR27W34-BRG-SUP-002.dwg By: brad.wodash



INSIDE ELEVATION OF RAILING



SECTION B–B
(WINGWALL NOT SHOWN)

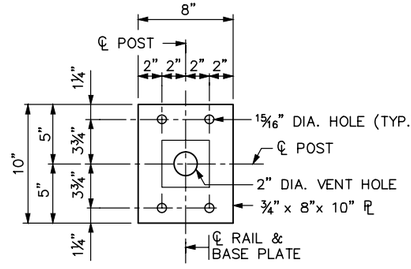


DETAIL "D"

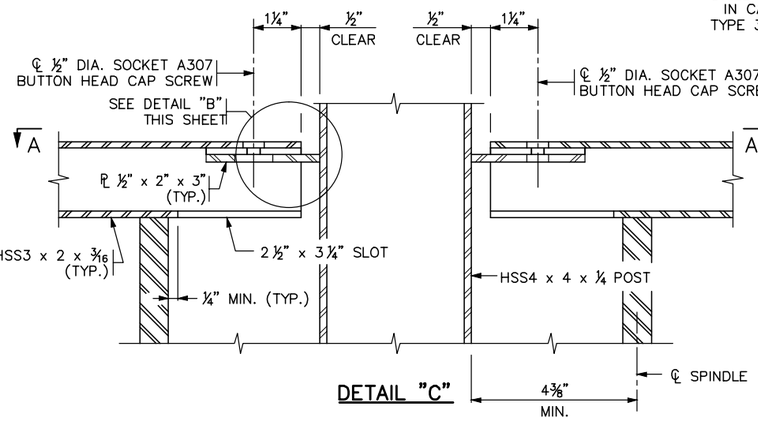
NOTES:

FOR RAILING GENERAL NOTES SEE SHEET NO. __.

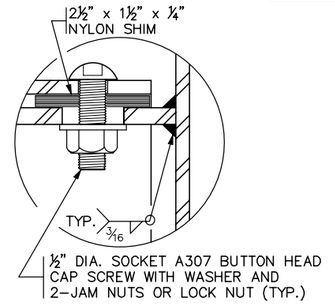
1. ADHESIVE ANCHORAGE WITH 5/8" DIA. ANCHOR ROD PER SPEC. 3385, TYPE A WITH HEX NUT AND WASHER. PROVIDE AN ADHESIVE WITH A MINIMUM CHARACTERISTIC BOND STRENGTH IN UNCRACKED CONCRETE OF 1.5 KSI. EMBED THE ANCHORAGE NO LESS THAN 5" REGARDLESS OF CHARACTERISTIC BOND STRENGTH. DRILL THROUGH REINFORCEMENT (IF ENCOUNTERED) TO ACHIEVE MINIMUM EMBEDMENT. ENSURE HEX NUT IS IN CONTACT WITH THE ADJACENT SURFACE AND TORQUE TO 60 FT–LBS UNLESS A HIGHER TORQUE IS RECOMMENDED BY THE MANUFACTURER. PROOF LOAD TO 6.9 KIPS. SEE SPECIAL PROVISIONS FOR ADDITIONAL REQUIREMENTS.
2. OPENING IN RAILING FOR CONDUIT SYSTEM (MCI); NORTH SIDE OF BRIDGE ONLY.
3. SHOP INSTALL CAST STEEL CAP FIRMLY SEATED TO TOP OF POST SUCH THAT THE CAP DOES NOT ROCK OR WOBBLE.



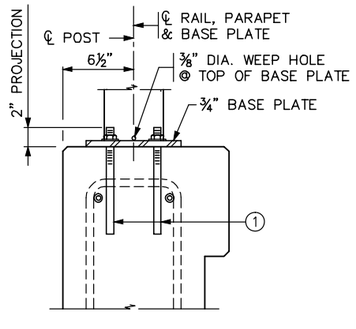
BASE PLATE



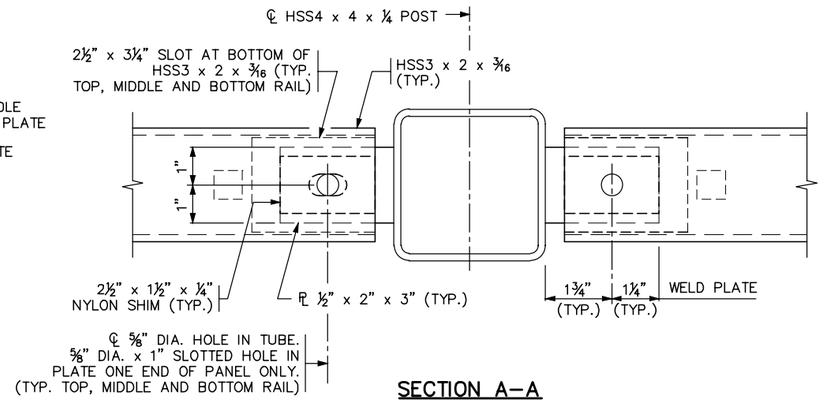
DETAIL "C"



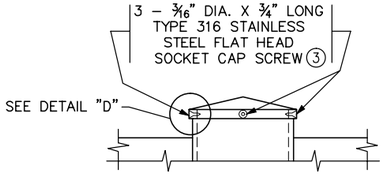
DETAIL "B"



ANCHOR DETAIL

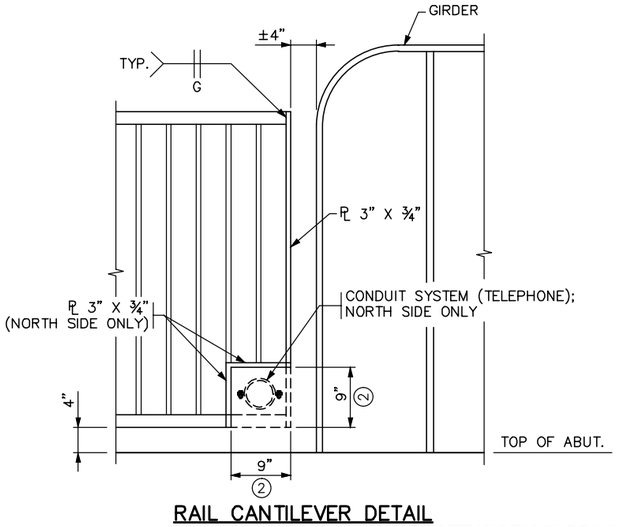


SECTION A–A



RAILPOST CAP MACHINE BOLT DETAIL

PLACE 3 CAP SCREWS, TWO PARALLEL TO RAILING AS SHOWN, AND ONE ON OUTSIDE FACE. (3)



RAIL CANTILEVER DETAIL

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: KAE | CHECKED BY: MDJ
DRAWN BY: LMT | DATE: 7/27/15

AECOM Kimley»Horn

60% SUBMISSION - 09/21/15

METROPOLITAN COUNCIL

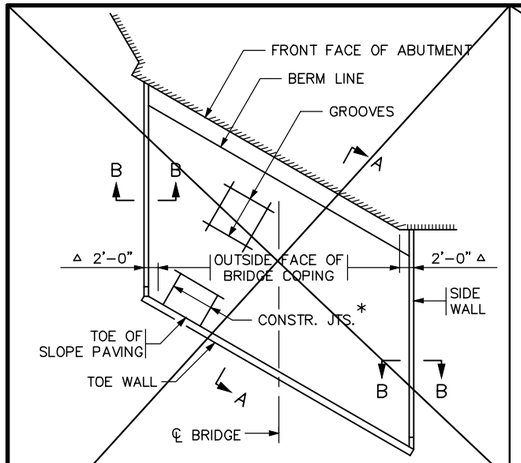
SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4
TH 100 FREIGHT RAIL BRIDGE
BRIDGE 27W34
RAILING DETAILS

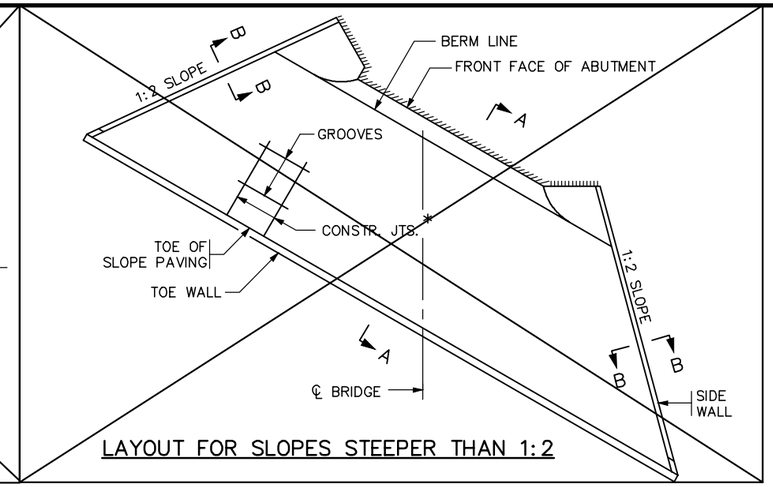
DISCIPLINE: STRUCTURES
SHEET NAME: CBR27W34-BRG-RAL-002

SHEET 20 OF 36

Jul, 29 2015 11:32 am V:\3400_ADC\CAD\SEGMENT E2\PLAN SHEETS\STRUCTURES\T100-FRT\CBR27W34-BRG-RAL-002.dwg By: brad.wodash



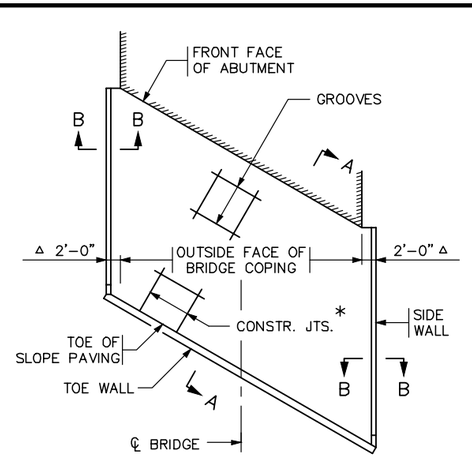
LAYOUT FOR SLOPES
1:2 OR FLATTER



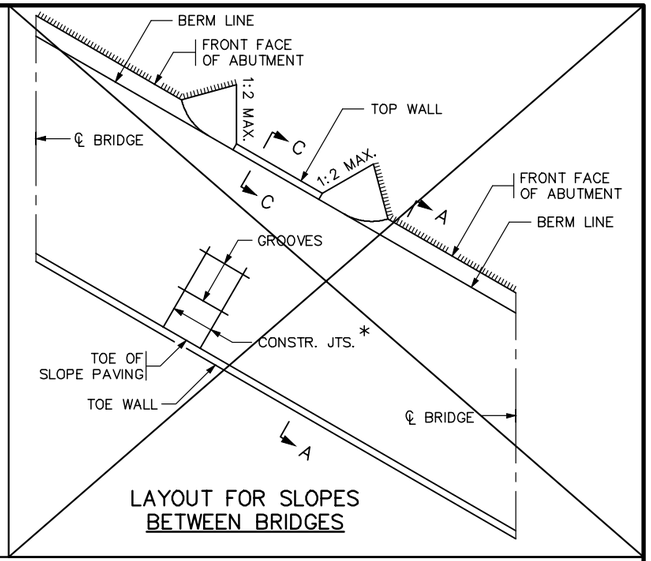
LAYOUT FOR SLOPES STEEPER THAN 1:2

△ 2'–0" FOR TANGENT BRIDGE SUPERSTRUCTURES. VARIES 2'–0" MINIMUM FOR CURVED BRIDGE SUPERSTRUCTURE.

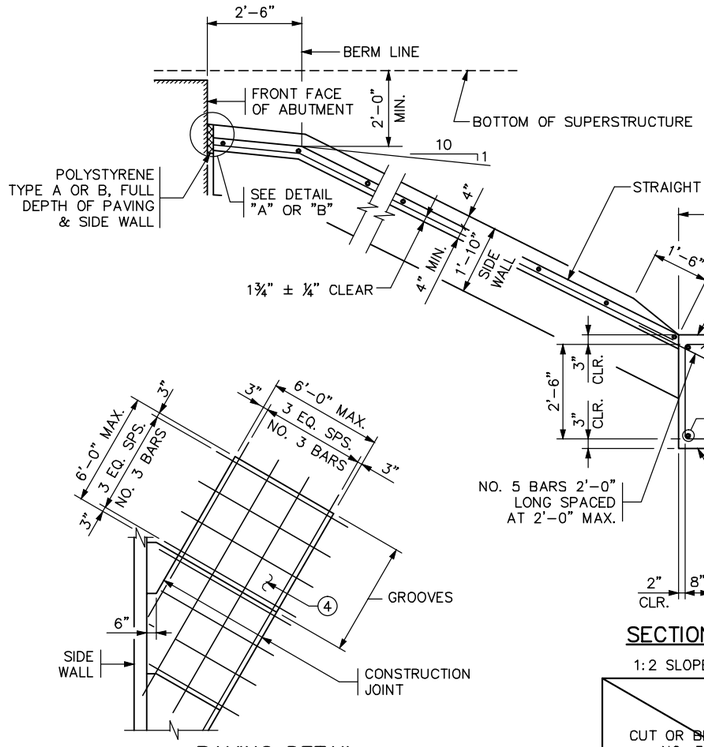
* VERTICAL CONSTRUCTION JOINTS MAY BE CONSTRUCTED PARALLEL TO ℄ OF BRIDGE FOR SKEWS TO 10° ONLY.



LAYOUT FOR SLOPES
AT ABUTMENTS WITH
8' OR GREATER EXPOSURE



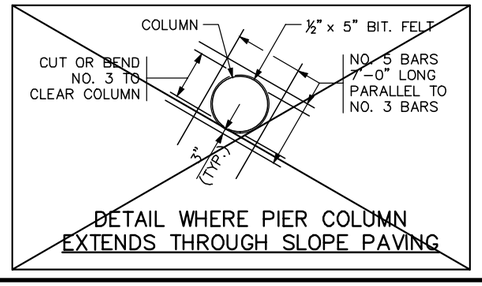
LAYOUT FOR SLOPES
BETWEEN BRIDGES



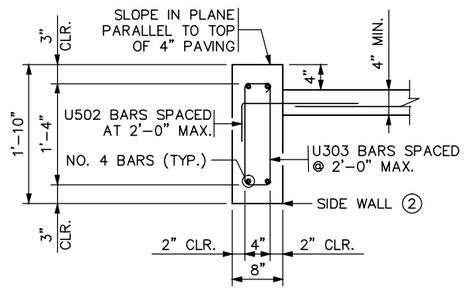
SECTION A–A

1:2 SLOPE SHOWN

PAVING DETAIL

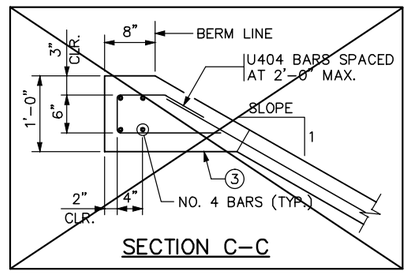


DETAIL WHERE PIER COLUMN EXTENDS THROUGH SLOPE PAVING

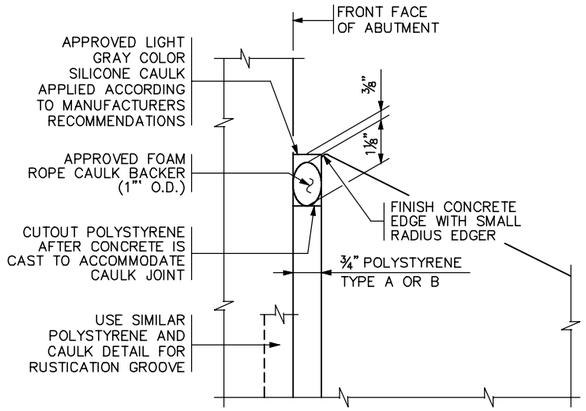


SECTION B–B

NORMAL TO SLOPE

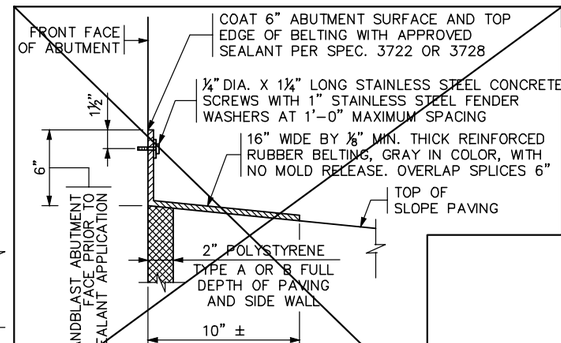


SECTION C–C



DETAIL "A"

ABUTMENTS WITH RUSTICATION



DETAIL "B"

ABUTMENTS WITHOUT RUSTICATION

CONCRETE & REINFORCEMENT UNIT QUANTITIES

① 0.111 CU. YD. OF CONCRETE/LIN. FT.
8.37 LBS. OF REINFORCEMENT/LIN FT.

② 0.046 CU. YD. OF CONCRETE/LIN. FT.
4.46 LBS. OF REINFORCEMENT/LIN FT.

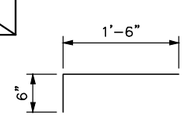
③ 0.058 CU. YD. OF CONCRETE/LIN. FT.
3.70 LBS. OF REINFORCEMENT/LIN FT.
BASED ON A SLOPE OF 1:2.

④ 0.111 CU. YD. OF CONCRETE/SQ. YD.
4.50 LBS. OF REINFORCEMENT/SQ. YD.

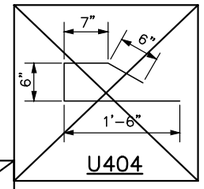
GENERAL NOTE

SLOPES ARE EXPRESSED AS A RATIO OF VERTICAL DISTANCE: HORIZONTAL DISTANCE.

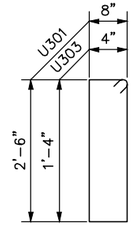
SLOPE PAVING PER SPEC. 2514.



U502



U404



U301 & U303

DRAFT-WORK IN PROCESS

FIG. 5–397.301

REVISION:	09–11–2014
APPROVED:	SEPTEMBER 26, 2003

Daniel Z. Hagen
STATE BRIDGE ENGINEER

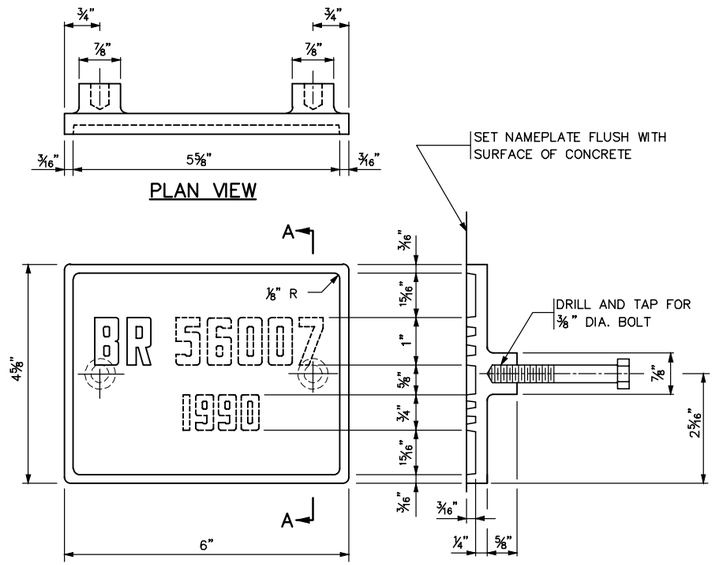
CERTIFIED BY _____ 7/27/15
LICENSED PROFESSIONAL ENGINEER — DATE

NAME: ENGINEER LIC. NO. #####

TITLE: CONCRETE SLOPE PAVING UNDER BRIDGES

DES: KAE	DR: LMT	APPROVED:	BRIDGE NO. 27W34
CHK: MDJ	CHK: MDJ		
SHEET NO. 21 OF 36 SHEETS			

Jul, 29 2015 11:32 am V:\3400_ADC\CAD\SEGMENT E2\PLAN SHEETS\STRUCTURES\T100-FRT\CBR27W34-BRG-DTL-003.dwg By: brad.wodash



THE DASHED NUMBERS SHOWN ABOVE ARE FOR ILLUSTRATION.
DATA TO BE SHOWN ON NAMEPLATE IS AS FOLLOWS:

BRIDGE 27W34

YEAR 2016

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".

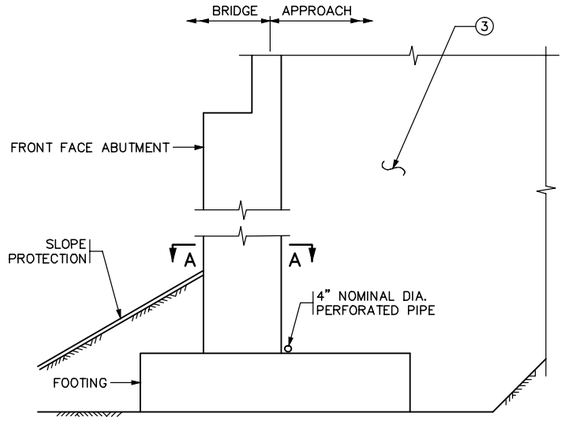
HORIZONTAL SPACING OF LETTERS AND NUMBERS SHALL PRODUCE A BALANCED LAYOUT IN PROPORTION TO SPACING SHOWN.

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

FURNISH 2 STEEL BOLTS ⅜ " DIA. x 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.

APPROVED: NOVEMBER 22, 2002	STATE OF MINNESOTA DEPARTMENT OF TRANSPORTATION	REVISION 09–11–2014	DETAIL NO.
STATE BRIDGE ENGINEER	BRIDGE NAMEPLATE (FOR NEW BRIDGES)		B101



SECTION THROUGH PARAPET AND SEMI–INTEGRAL ABUTMENTS

NOTES:

~~PAYMENT WILL BE INCLUDED IN THE SINGLE LUMP SUM PRICE FOR "DRAINAGE SYSTEM TYPE (B910)", INCLUDES BUT IS NOT LIMITED TO 4" DIAMETER PERFORATED AND NON–PERFORATED PIPE, ELBOWS, END CAPS, COUPLINGS, SLEEVES AND PRECAST CONCRETE HEADWALLS.~~

ALL PIPE TO COMPLY WITH SPEC. 3245.

WRAP PERFORATED PIPE WITH GEOTEXTILE PER SPEC. 3733, TYPE 1. ATTACH TO PIPE PER SPEC. 2502.

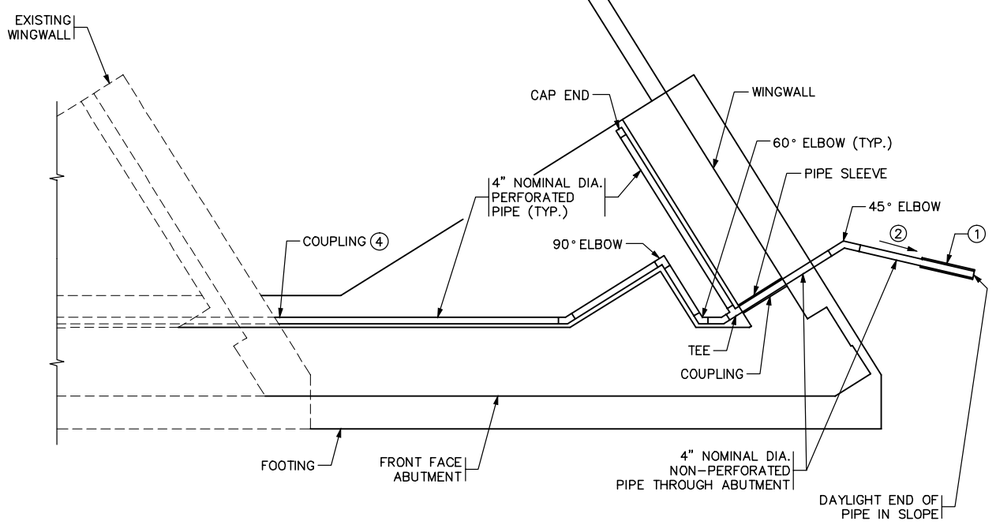
(1) AT CONTRACTORS OPTION, MAY TIE APPROACH PANEL DRAINAGE SYSTEM AND ABUTMENT DRAINAGE SYSTEM INTO A SINGLE PRECAST CONCRETE HEADWALL OR INTO A CATCH BASIN AS LONG AS A MINIMUM OF 1% POSITIVE SLOPE CAN BE MANTAINED.

INSTALL SALVAGED PRECAST CONCRETE HEADWALL WITH RODENT SCREEN. SEE STANDARD PLATE 3131 FOR DETAILS.

(2) ⅛" PER FT. MINIMUM SLOPE.

(3) MATERIAL SHALL COMPLY WITH Mn/DOT SPEC. 3149.2B SELECT GRANULAR BORROW, MODIFIED SO THAT NO MORE THAN 10% PASSES A NO. 200 SIEVE. (UNDER GRADING PORTION OF CONTRACT)

(4) REMOVE EXISTING 4" NON–PERFORATED PIPE TO 1'–0" FROM FACE OF EXISTING WINGWALL. SALVAGE EXISTING CONCRETE HEADWALL WITH RODENT SCREEN FOR REINSTALLATION.



SECTION A–A

SHEET MODIFICATION:
(A) DENOTES MODIFICATION TO STANDARD SHEET

APPROVED: JANUARY 13, 2015	STATE OF MINNESOTA DEPARTMENT OF TRANSPORTATION	REVISED	DETAIL NO.
STATE BRIDGE ENGINEER	DRAINAGE SYSTEM		B910 MOD.

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: KAE | CHECKED BY: MDJ
DRAWN BY: LMT | DATE: 7/27/15

AECOM Kimley»Horn

60% SUBMISSION - 09/21/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4
TH 100 FREIGHT BRIDGE
BRIDGE 27W34
DETAILS

DISCIPLINE: STRUCTURES
SHEET NAME: CBR27W34-BRG-DTL-003-2

SHEET 22 OF 36

Jul, 29 2015 11:32 am V:\3400_ADC\CAD\SEGMENT E2\PLAN SHEETS\STRUCTURES\T100-FRT\CBR27W34-BRG-DTL-003.dwg By: brad.wodash

CONCRETE WEARING COURSE

☐ LOW SLUMP

☐ OTHER _____
TYPE OR MANUFACTURER

EXPANSION JOINTS

JOINT MANUFACTURER

MANUFACTURER'S IDENTIFICATION _____
MFR'S No. AND/OR LETTER DESIGNATION FOR JOINT USED

GLAND MANUFACTURER _____
NAME AND ADDRESS (CITY, STATE)

SIZE OF GLAND _____

MANUFACTURER'S IDENTIFICATION _____
MFR'S No. AND/OR LETTER DESIGNATION FOR GLAND USED

ELASTOMERIC BEARING PADS

PAD MANUFACTURER _____
NAME AND ADDRESS (CITY, STATE)

SPECIAL SURFACE FINISH

SYSTEM: _____ COLOR: _____

FINISHING ROADWAY FACES OF BARRIER RAILING

TYPE: _____ COLOR: _____

ANTI–GRAFFITI COATING

MANUFACTURER _____
NAME AND ADDRESS (CITY, STATE)

PRODUCT NAME: _____ LOCATION: _____

PAINT SYSTEM

Mn/DOT SPECIFICATION NUMBER _____
2478 OR 2479 OR OTHER

MANUFACTURER _____
NAME AND ADDRESS (CITY, STATE)

PRIME COAT _____
Mn/DOT MATERIAL SPECIFICATION NUMBER

INTERMEDIATE COAT _____
Mn/DOT MATERIAL SPECIFICATION NUMBER

FINISH COAT _____ _____
Mn/DOT MATERIAL SPECIFICATION NUMBER COLOR

PLAN QUALITY

RATE 1 (AGREE), 2 (NEUTRAL), OR 3 (DISAGREE, PLEASE COMMENT BELOW)

DIMENSIONING AND DETAILING ADEQUATELY DESCRIBED REQUIRED CONSTRUCTION. _____
BAR LISTS AND QUANTITIES WERE TYPICALLY COMPLETE AND FREE OF ERRORS. _____
SCALE OF DRAWINGS AND OVERALL LEGIBILITY OF LINES AND TEXT WAS GOOD. _____
(SB) SPECIAL PROVISIONS ADEQUATELY DESCRIBED SPECIAL WORK AND PAYMENT. _____

COMMENTS: _____

NUMBER OF BRIDGE
SUPPLEMENTAL AGREEMENTS: _____ COST: $ _____

LIST SIGNIFICANT ERRORS OR OMISSIONS IN PLAN DETAILS OR PAY QUANTITIES IN THE SPACE PROVIDED AT RIGHT.

BRIDGE REMOVAL / BRIDGE OPENING

NUMBER OF AND DATE OLD BRIDGE WAS REMOVED (IF APPLICABLE):

BRIDGE NUMBER _____ DATE REMOVED _____

DATE NEW BRIDGE WAS OPENED TO TRAFFIC _____

NOTIFY THE BRIDGE OFFICE BRIDGE MANAGEMENT UNIT WITH THIS INFORMATION AS SOON AS POSSIBLE. (651) 366–4557

OTHER ITEMS ①

① UTILITIES ADDED DURING CONSTRUCTION AND SPECIALTY ITEMS.

FINAL QUANTITIES ENTERED ON SCHEDULE OF QUANTITIES: YES ☐ NO ☐

SUMMARY OF SIGNIFICANT AS–BUILT CHANGES

THE AS–BUILT INFORMATION WAS ADDED TO THE PLAN BY:

_____ _____
INSPECTOR(S) SIGNATURE DATE

CHECKED BY: _____ _____
PROJECT ENGINEER/SUPERVISOR SIGNATURE DATE

AT THE TIME OF THE FINAL, THIS COMPLETED AS–BUILT BRIDGE DATA SHEET MUST BE SUBMITTED TO THE BRIDGE OFFICE – ATTN: REGIONAL CONSTRUCTION ENGINEER (MS610).

REVISION: 10–28–2008

APPROVED: SEPTEMBER 26, 2003
Daniel T. Hegeman
STATE BRIDGE ENGINEER

AS–BUILT DETAILS
(AS NEEDED)

DRAFT-WORK IN PROCESS

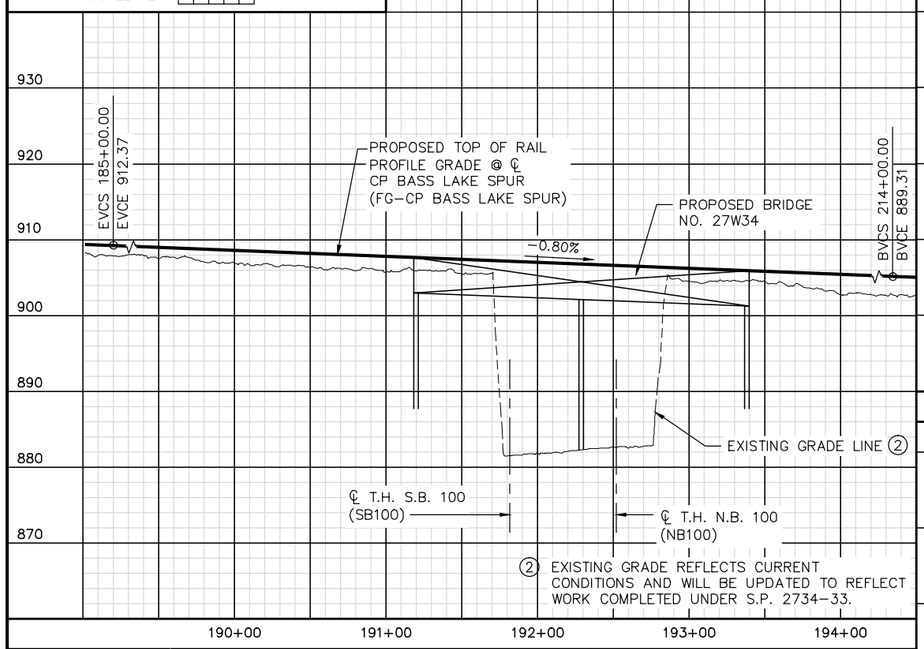
FIG. 5–397.900

TITLE:	DES: KAE	DR: LMT	APPROVED:	BRIDGE NO.
AS–BUILT BRIDGE DATA	CHK: MDJ	CHK: MDJ		27W34
	SHEET NO. 23 OF 36 SHEETS			

CONTRACTED PROFILE

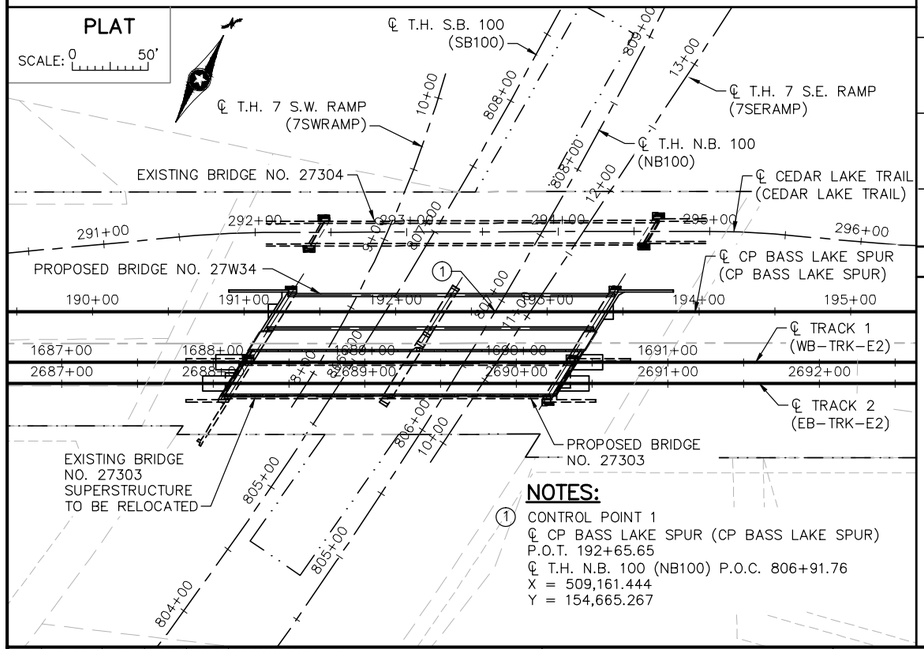
SCALE HOR: 0 50'

SCALE VER: 0 10'



PLAT

SCALE: 0 50'

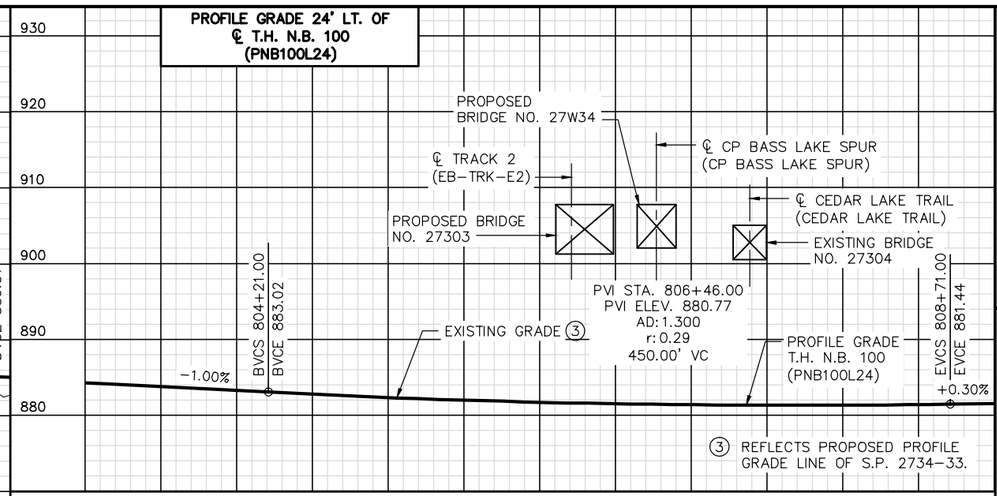


NOTES:

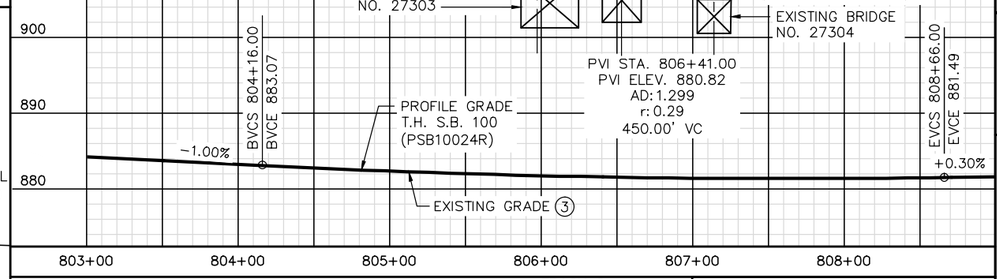
(1) CONTROL POINT 1
℄ CP BASS LAKE SPUR (CP BASS LAKE SPUR)
P.O.T. 192+65.65
℄ T.H. N.B. 100 (NB100) P.O.C. 806+91.76
X = 509,161.444
Y = 154,665.267

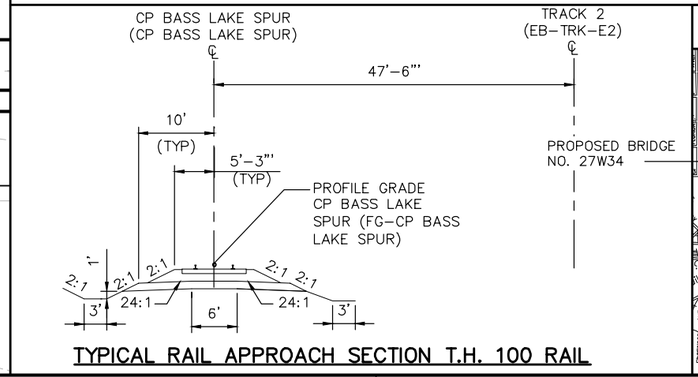
PROFILE GRADE TOP OF RAIL @ ℄ CP BASS LAKE SPUR (FG–CP BASS LAKE SPUR)

PROFILE GRADE 24' LT. OF ℄ T.H. N.B. 100 (PNB100L24)



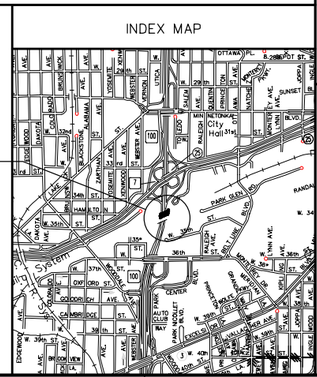
PROFILE GRADE 24' RT. OF ℄ T.H. S.B. 100 (PSB100R24)





TYPICAL RAIL APPROACH SECTION T.H. 100 RAIL

INDEX MAP



LOCATION ENGINEER'S OBSERVATIONS AT BRIDGE SITE

1. SPECIAL FEATURES: WATERFALLS, DAMS, FLOODS, ICE, DEBRIS SLIDING BANKS, RECREATIONAL BOATING.
2. OTHER BRIDGES OR CULVERTS OVER THE SAME STREAM (PARTICULARY STRUCTURES WHICH CARRY HIGH WATER WITHOUT OVERFLOW OF ROADWAY): GIVEN LOCATION, TYPE, LENGTH, HEIGHT ABOVE HIGH WATER, CROSS–SECTIONAL AREA ETC.
3. APPARENT HIGHWATER ELEVATION OBTAINED FROM:
4. OTHER DATA: APPROX. VELOCITY OF WATER AT TIME OF SURVEY.

HYDRAULIC ENGINEER'S RECOMMENDATION

DATE:

STREAM OR DITCH DESIGNATION

DRAINAGE AREA

MAX FLOOD ON RECORD

DESIGN FLOOD (YR. FREQ.): C.F.S.
HEADWATER ELEVATION: FT.
DESIGN MEAN VELOCITY THROUGH STRUCTURE F.P.S.
TOTAL STAGE INCREASE FT.
LOW MEMBER AT OR ABOVE ELEVATION FT.

WATERWAY AREA REQUIRED BELOW ELEV. = SQ. FT.
AT RIGHT ANGLES TO CHANNEL

BASIC FLOOD (100 YR. FREQ.) C.F.S.
HEADWATER ELEVATION: FT.
TOTAL STAGE INCREASE FT.
MEAN VELOCITY THROUGH STRUCTURE

FLOWLINE ELEVATION: FT. SKEW ANGLE:

ESTIMATED PRLIMINARY TOTAL SCOUR AT PIER EL.
(500 OR OT YR. FREQ.)

SCOUR CONFIRMATION RECOMMENDATION

DATE:

TOTAL SCOUR AT PIER EL. (500 OR OT YR. FREQ.)
SCOUR CODE: OBTAIN FROM HYDRAULIC ENGINEER

BRIDGE SURVEY SHEETS MADE FROM 2014 MFRA SURVEYS AND PROPOSED PLANS FOR S.P. 2734–33

1ST BENCH MARK (NAVD 88)
BENCHMARK ID PT. 61
ELEVATION = 914.44
X = 507459.25, Y = 153987.80
DESCRIPTION = TOP NUT HYDRANT

2ND BENCH MARK (NAVD 88)
BENCHMARK ID PT. 63
ELEVATION = 888.82
X = 511126.66, Y = 155735.94
DESCRIPTION = MAG NAIL IN BIT. ISLAND

BRIDGE SURVEY

PROPOSED BRIDGE LOCATED:
0.2 MILES SOUTH OF JCT. T.H. 7
IN ST. LOUIS PARK

SEC 6 T 28N R 24W

CITY OF ST LOUIS PARK HENNEPIN COUNTY

BRIDGE NO. 27W34

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: KAE CHECKED BY: MDJ
DRAWN BY: LMT DATE: 7/27/15

AECOM Kimley»Horn

60% SUBMISSION - 09/21/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

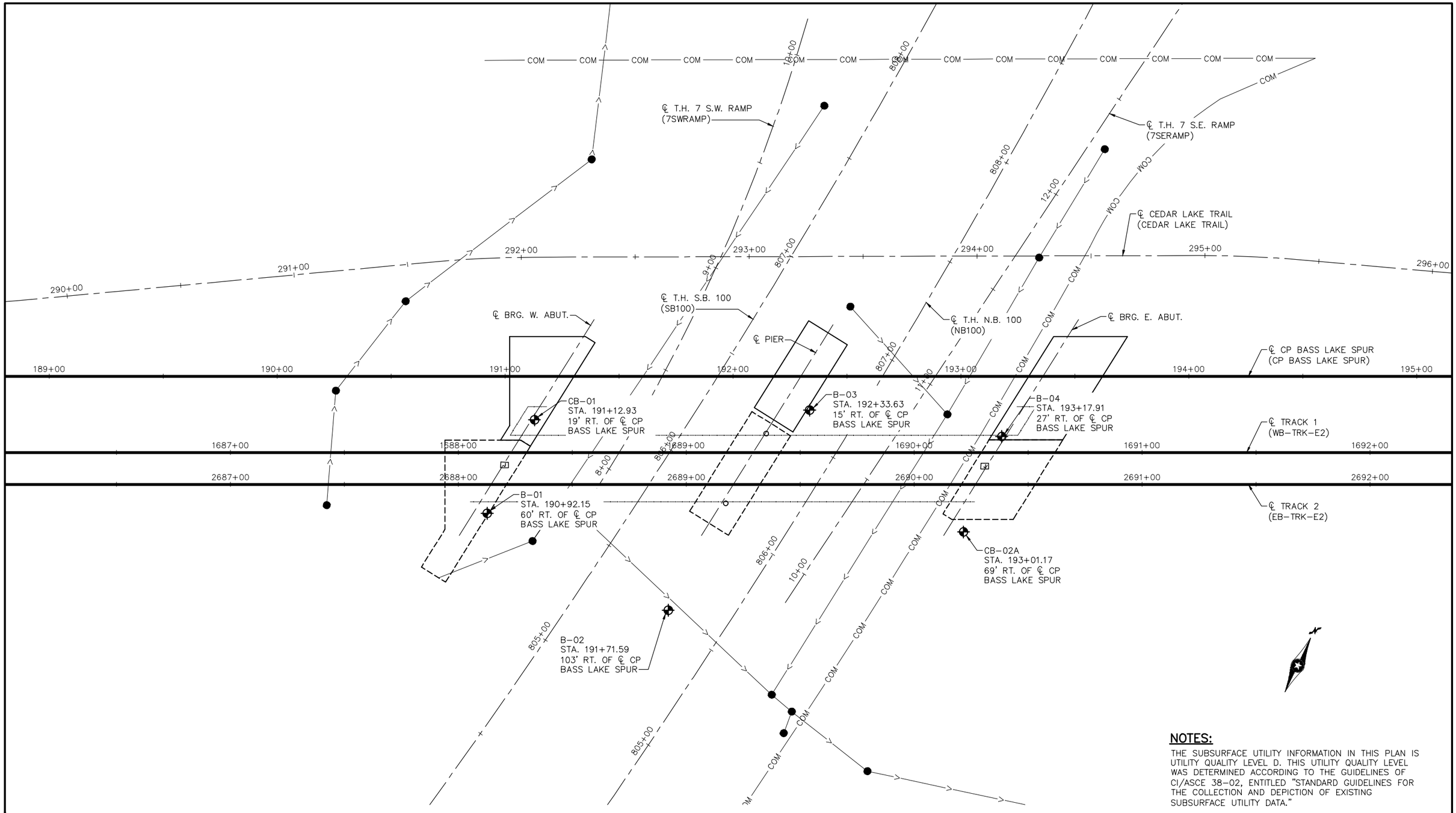
CIVIL EAST - VOLUME 4
TH 100 FREIGHT RAIL BRIDGE
BRIDGE 27W34
BRIDGE SURVEY

DISCIPLINE: STRUCTURES

SHEET NAME: CBR27W34-BRG-SUR-001

SHEET 24 OF 36

Jul, 29 2015 11:34 am V:\3400_ADC\CAD\SEGMENT E2\PLAN SHEETS\STRUCTURES\T100-FRT\CBR27W34-BRG-SUR-001.dwg By: brad.wodash



NOTES:

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."

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: KAE | CHECKED BY: MDJ
DRAWN BY: LMT | DATE: 7/27/15

AECOM Kimley»Horn

60% SUBMISSION - 09/21/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

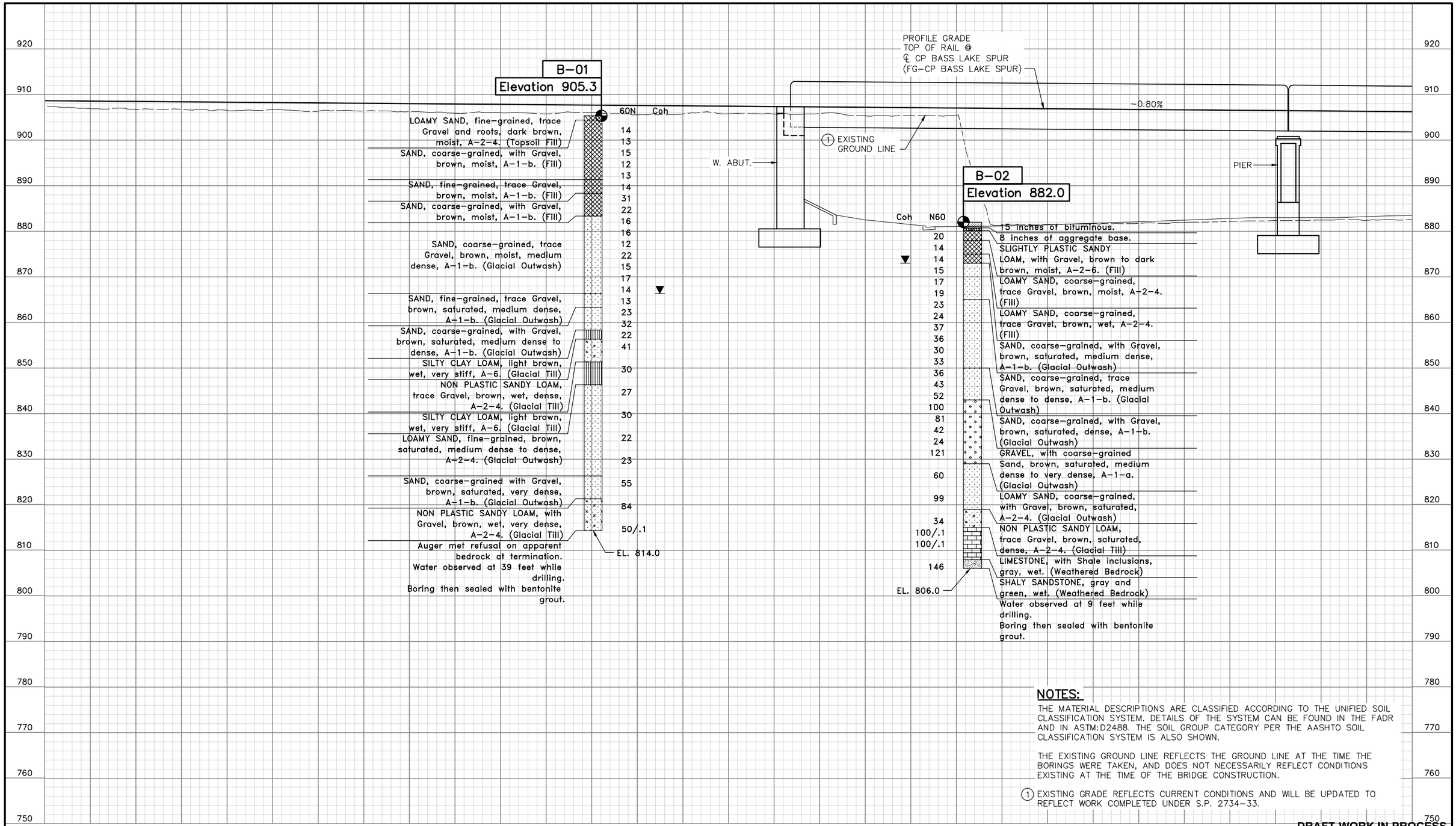
CIVIL EAST - VOLUME 4
TH 100 FREIGHT RAIL BRIDGE
BRIDGE 27W34
BRIDGE SURVEY PLAN

DISCIPLINE: STRUCTURES

SHEET NAME: CBR27W34-BRG-BOR-001-1

SHEET 25 OF 36

Jul, 29 2015 11:34 am V:\3400_ADC\CAD\SEGMENT E2\PLAN SHEETS\STRUCTURES\T100-FRT\CBR27W34-BRG-BOR-001.dwg By: brad.wodash



NOTES:

THE MATERIAL DESCRIPTIONS ARE CLASSIFIED ACCORDING TO THE UNIFIED SOIL CLASSIFICATION SYSTEM. DETAILS OF THE SYSTEM CAN BE FOUND IN THE FADR AND IN ASTM:D2488. THE SOIL GROUP CATEGORY PER THE AASHTO SOIL CLASSIFICATION SYSTEM IS ALSO SHOWN.

THE EXISTING GROUND LINE REFLECTS THE GROUND LINE AT THE TIME THE BORINGS WERE TAKEN, AND DOES NOT NECESSARILY REFLECT CONDITIONS EXISTING AT THE TIME OF THE BRIDGE CONSTRUCTION.

(1) EXISTING GRADE REFLECTS CURRENT CONDITIONS AND WILL BE UPDATED TO REFLECT WORK COMPLETED UNDER S.P. 2734-33.

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: KAE | CHECKED BY: MDJ
DRAWN BY: LMT | DATE: 7/27/15

AECOM Kimley»Horn

60% SUBMISSION - 09/21/15

METROPOLITAN COUNCIL

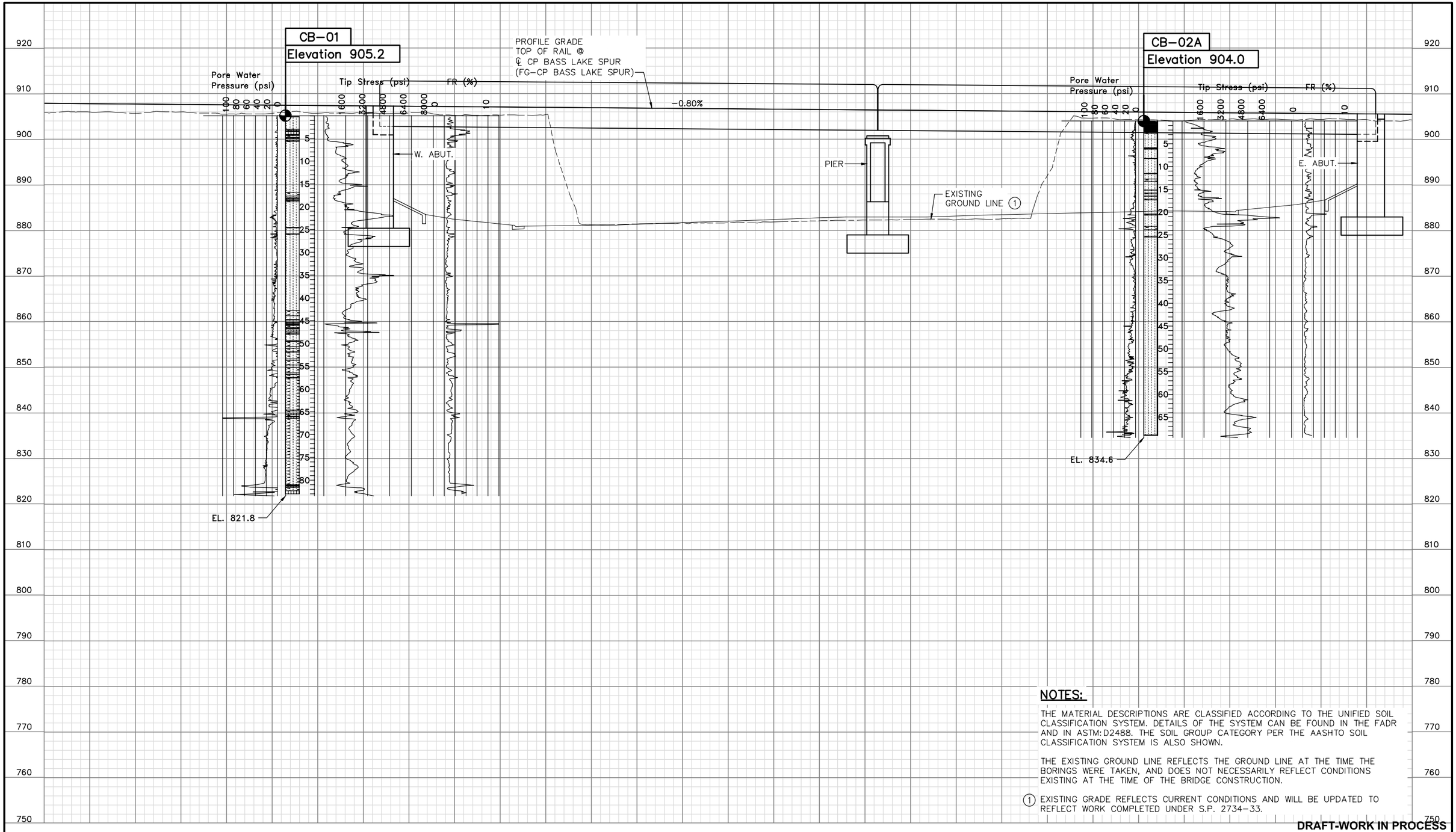
SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4
TH 100 FREIGHT BRIDGE
BRIDGE 27W34
BRIDGE SURVEY PROFILE

DISCIPLINE: STRUCTURES

SHEET NAME: CBR27W34-BRG-BOR-002-1

SHEET 26 OF 36



NOTES:

THE MATERIAL DESCRIPTIONS ARE CLASSIFIED ACCORDING TO THE UNIFIED SOIL CLASSIFICATION SYSTEM. DETAILS OF THE SYSTEM CAN BE FOUND IN THE FADR AND IN ASTM:D2488. THE SOIL GROUP CATEGORY PER THE AASHTO SOIL CLASSIFICATION SYSTEM IS ALSO SHOWN.

THE EXISTING GROUND LINE REFLECTS THE GROUND LINE AT THE TIME THE BORINGS WERE TAKEN, AND DOES NOT NECESSARILY REFLECT CONDITIONS EXISTING AT THE TIME OF THE BRIDGE CONSTRUCTION.

(1) EXISTING GRADE REFLECTS CURRENT CONDITIONS AND WILL BE UPDATED TO REFLECT WORK COMPLETED UNDER S.P. 2734–33.

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: KAE | CHECKED BY: MDJ
DRAWN BY: LMT | DATE: 7/27/15

AECOM Kimley»Horn

60% SUBMISSION - 09/21/15

METROPOLITAN COUNCIL

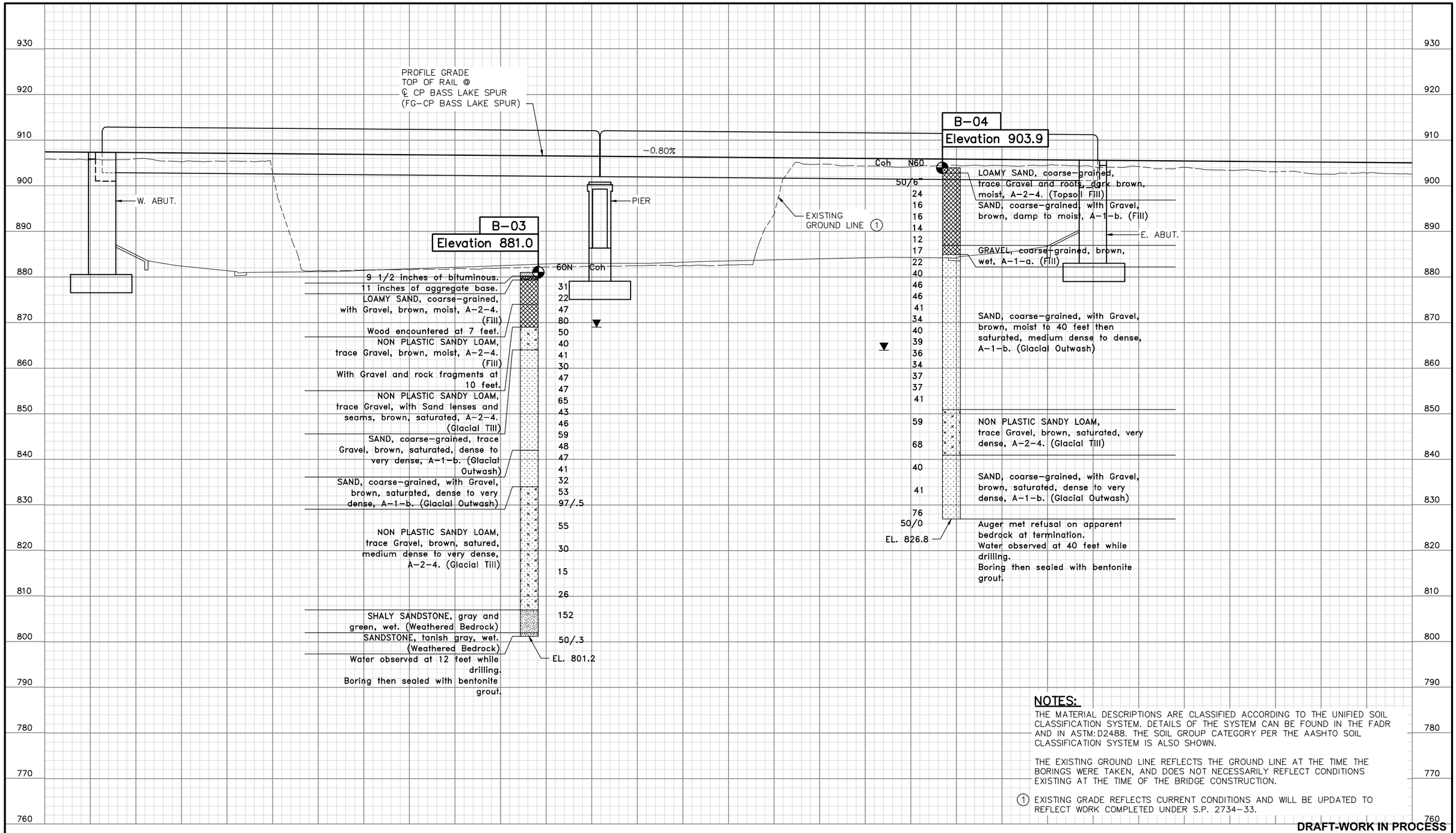
SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4
TH 100 FREIGHT RAIL BRIDGE
BRIDGE 27W34
BRIDGE SURVEY PROFILE

DISCIPLINE: STRUCTURES
SHEET NAME: CBR27W34-BRG-BOR-002-2

SHEET 27 OF 36

Jul, 29 2015 11:35 am V:\3400_ADC\CAD\SEGMENT E2\PLAN SHEETS\STRUCTURES\T100-FRT\CBR27W34-BRG-BOR-002.dwg By: brad.wodash



NOTES:

THE MATERIAL DESCRIPTIONS ARE CLASSIFIED ACCORDING TO THE UNIFIED SOIL CLASSIFICATION SYSTEM. DETAILS OF THE SYSTEM CAN BE FOUND IN THE FADR AND IN ASTM: D2488. THE SOIL GROUP CATEGORY PER THE AASHTO SOIL CLASSIFICATION SYSTEM IS ALSO SHOWN.

THE EXISTING GROUND LINE REFLECTS THE GROUND LINE AT THE TIME THE BORINGS WERE TAKEN, AND DOES NOT NECESSARILY REFLECT CONDITIONS EXISTING AT THE TIME OF THE BRIDGE CONSTRUCTION.

(1) EXISTING GRADE REFLECTS CURRENT CONDITIONS AND WILL BE UPDATED TO REFLECT WORK COMPLETED UNDER S.P. 2734-33.

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: KAE | CHECKED BY: MDJ
DRAWN BY: LMT | DATE: 7/27/15

AECOM Kimley»Horn

60% SUBMISSION - 09/21/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4
TH 100 FREIGHT RAIL BRIDGE
BRIDGE 27W34
BRIDGE SURVEY PROFILE

DISCIPLINE: STRUCTURES

SHEET NAME: CBR27W34-BRG-BOR-002-3

SHEET 28 OF 36

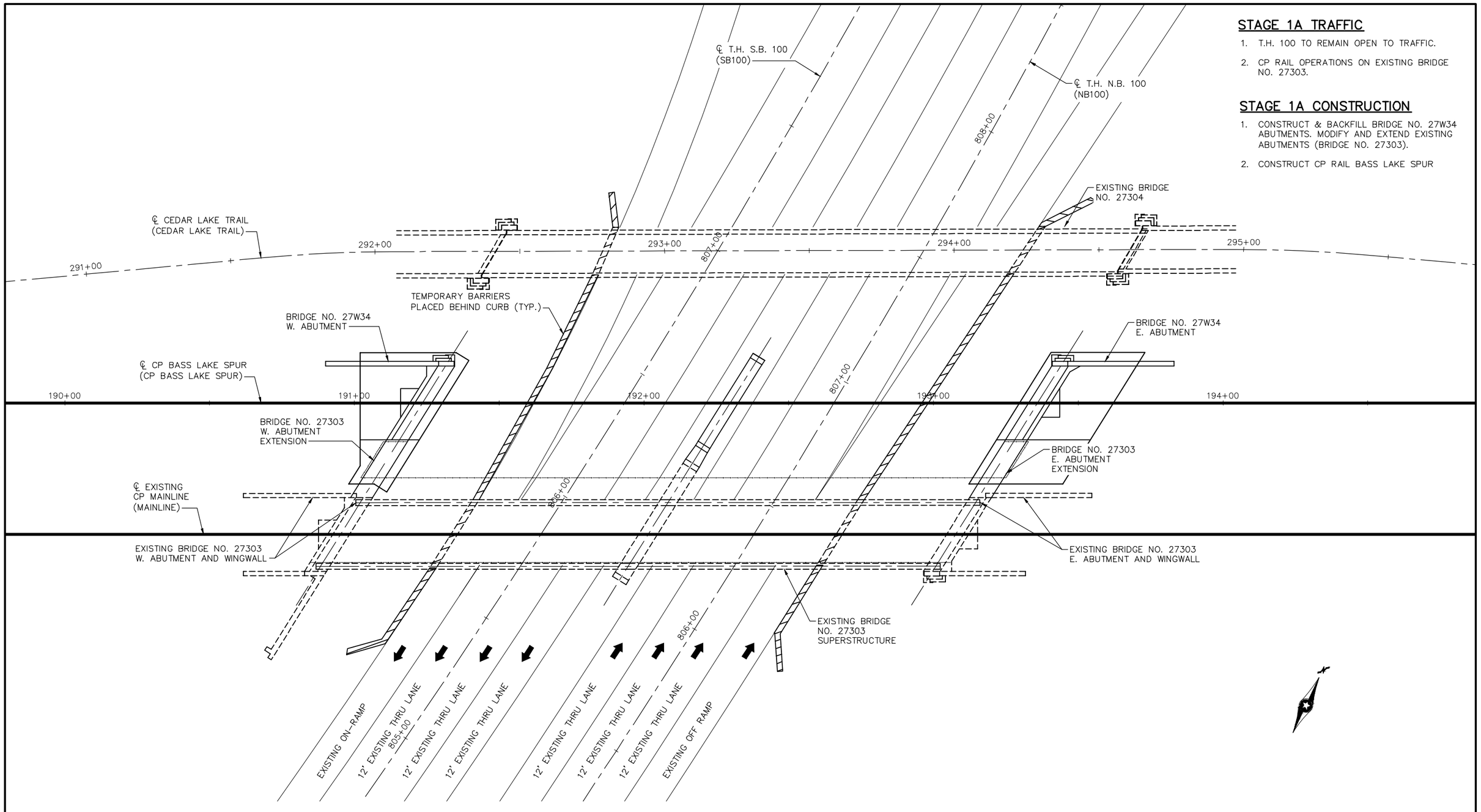
Jul, 29 2015 11:35 am V:\3400_ADC\CAD\SEGMENT E2\PLAN SHEETS\STRUCTURES\T100-FRT\CBR27W34-BRG-BOR-002.dwg By: brad.wodash

STAGE 1A TRAFFIC

1. T.H. 100 TO REMAIN OPEN TO TRAFFIC.
2. CP RAIL OPERATIONS ON EXISTING BRIDGE NO. 27303.

STAGE 1A CONSTRUCTION

1. CONSTRUCT & BACKFILL BRIDGE NO. 27W34 ABUTMENTS. MODIFY AND EXTEND EXISTING ABUTMENTS (BRIDGE NO. 27303).
2. CONSTRUCT CP RAIL BASS LAKE SPUR



DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: KAE | CHECKED BY: MDJ
DRAWN BY: LMT | DATE: 7/27/15

AECOM Kimley»Horn

60% SUBMISSION - 09/21/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4
TH 100 FREIGHT RAIL BRIDGE
BRIDGE 27W34
STAGING PLAN (1 OF 8)

DISCIPLINE: STRUCTURES

SHEET NAME: CBR27W34-BRG-DTL-001-1

SHEET 29 OF 36

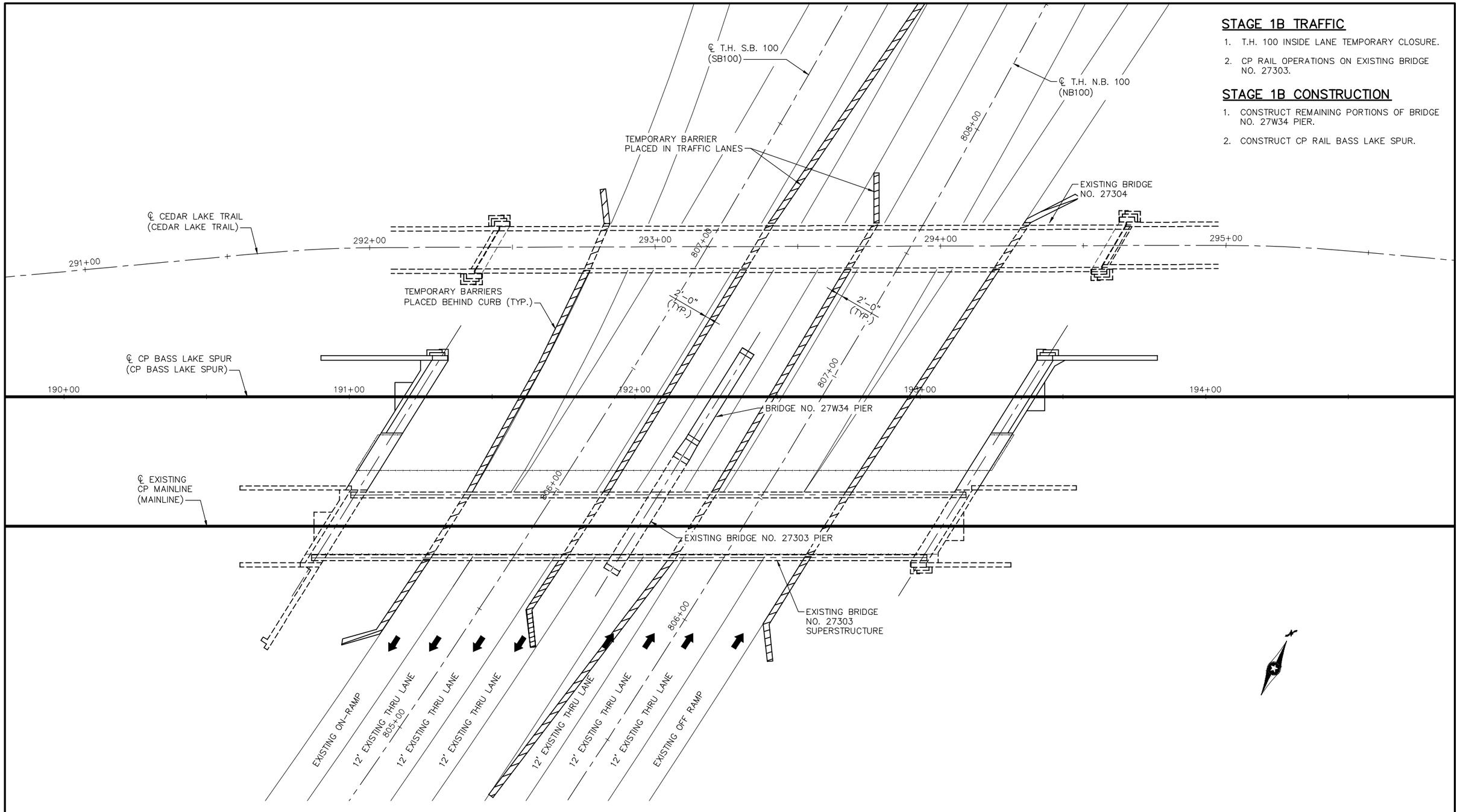
Jul, 29 2015 11:35 am v:\3400_ADC\CAD\SEGMENT E2\PLAN SHEETS\STRUCTURES\T100-FRT\CBR27W34-BRG-DTL-001.dwg By: brad.wodash

STAGE 1B TRAFFIC

1. T.H. 100 INSIDE LANE TEMPORARY CLOSURE.
2. CP RAIL OPERATIONS ON EXISTING BRIDGE NO. 27303.

STAGE 1B CONSTRUCTION

1. CONSTRUCT REMAINING PORTIONS OF BRIDGE NO. 27W34 PIER.
2. CONSTRUCT CP RAIL BASS LAKE SPUR.



DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: KAE | CHECKED BY: MDJ
DRAWN BY: LMT | DATE: 7/27/15

AECOM Kimley»Horn

60% SUBMISSION - 09/21/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

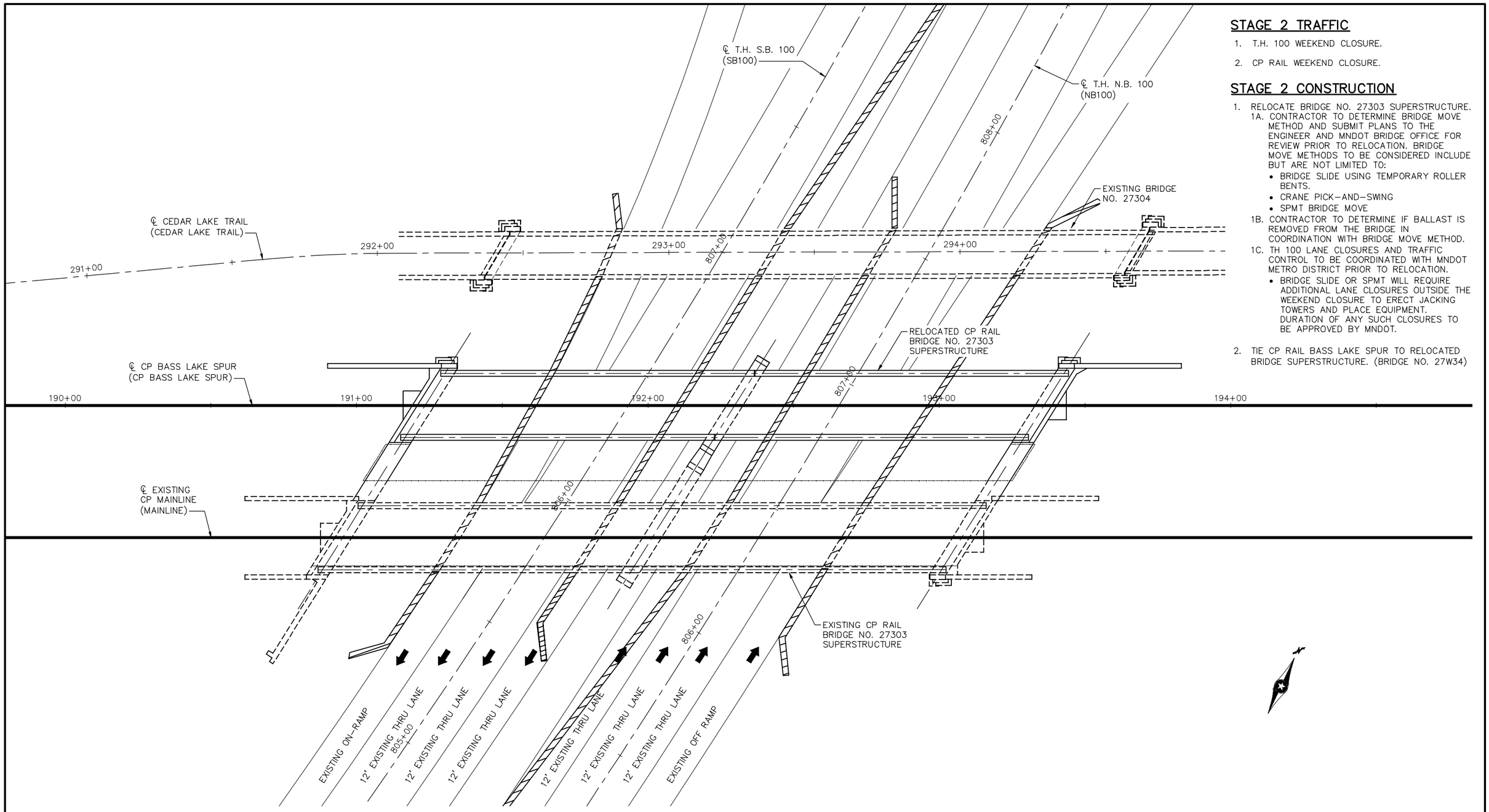
CIVIL EAST - VOLUME 4
TH 100 FREIGHT RAIL BRIDGE
BRIDGE 27W34
STAGING PLAN (2 OF 8)

DISCIPLINE: STRUCTURES

SHEET NAME: CBR27W34-BRG-DTL-001-2

SHEET 30 OF 36

Jul, 29 2015 11:35 am v:\3400_ADC\CAD\SEGMENT E2\PLAN SHEETS\STRUCTURES\T100-FRT\CBR27W34-BRG-DTL-001.dwg By: brad.wodash



STAGE 2 TRAFFIC

1. T.H. 100 WEEKEND CLOSURE.
2. CP RAIL WEEKEND CLOSURE.

STAGE 2 CONSTRUCTION

1. RELOCATE BRIDGE NO. 27303 SUPERSTRUCTURE.
   1A. CONTRACTOR TO DETERMINE BRIDGE MOVE METHOD AND SUBMIT PLANS TO THE ENGINEER AND MNDOT BRIDGE OFFICE FOR REVIEW PRIOR TO RELOCATION. BRIDGE MOVE METHODS TO BE CONSIDERED INCLUDE BUT ARE NOT LIMITED TO:
   - BRIDGE SLIDE USING TEMPORARY ROLLER BENTS.
   - CRANE PICK-AND-SWING
   - SPMT BRIDGE MOVE

   1B. CONTRACTOR TO DETERMINE IF BALLAST IS REMOVED FROM THE BRIDGE IN COORDINATION WITH BRIDGE MOVE METHOD.
   1C. TH 100 LANE CLOSURES AND TRAFFIC CONTROL TO BE COORDINATED WITH MNDOT METRO DISTRICT PRIOR TO RELOCATION.
   - BRIDGE SLIDE OR SPMT WILL REQUIRE ADDITIONAL LANE CLOSURES OUTSIDE THE WEEKEND CLOSURE TO ERECT JACKING TOWERS AND PLACE EQUIPMENT. DURATION OF ANY SUCH CLOSURES TO BE APPROVED BY MNDOT.

2. TIE CP RAIL BASS LAKE SPUR TO RELOCATED BRIDGE SUPERSTRUCTURE. (BRIDGE NO. 27W34)

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: KAE | CHECKED BY: MDJ
DRAWN BY: LMT | DATE: 7/27/15

AECOM Kimley»Horn

60% SUBMISSION - 09/21/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4
TH 100 FREIGHT RAIL BRIDGE
BRIDGE 27W34
STAGING PLAN (3 OF 8)

DISCIPLINE: STRUCTURES
SHEET NAME: CBR27W34-BRG-DTL-001-3

SHEET 31 OF 36

Jul, 29 2015 11:35 am v:\3400_ADC\CAD\SEGMENT E2\PLAN SHEETS\STRUCTURES\T100-FRT\CBR27W34-BRG-DTL-001.dwg By: brad.wodash

STAGE 3 TRAFFIC

1. T.H. 100 INSIDE LANE TEMPORARY CLOSURE.
2. CP RAIL OPERATIONS ON BRIDGE NO. 27W34.

STAGE 3 CONSTRUCTION

1. REMOVE PREVIOUS CP MAINLINE.
2. MODIFY BRIDGE NO. 27303 ABUTMENT AND PIER BEAM SEATS FOR LRT BRIDGE SUPERSTRUCTURE.
3. ABUTMENT MODIFICATIONS TO INCLUDE THE REMOVAL OF ABUTMENT BACKWALL TO TOP OF BRIDGE SEAT AND REMOVAL OF NORTHWEST AND NORTHEAST WINGWALLS TO JUST BELOW THE BOTTOM OF TRANSITION SLAB FOUNDATION.

℄ T.H. S.B. 100 (SB100)
℄ T.H. N.B. 100 (NB100)
TEMPORARY BARRIER PLACED IN TRAFFIC LANES
EXISTING BRIDGE NO. 27304
℄ CEDAR LAKE TRAIL (CEDAR LAKE TRAIL)
TEMPORARY BARRIERS PLACED BEHIND CURB (TYP.)
2'-0" (TYP.)
BRIDGE NO. 27W34
℄ CP BASS LAKE SPUR (CP BASS LAKE SPUR)
℄ TRACK 1 (WB-TRK-E2)
BRIDGE NO. 27303 W. ABUTMENT
BRIDGE NO. 27303 PIER
BRIDGE NO. 27303 E. ABUTMENT
℄ TRACK 2 (EB-TRK-E2)
EXISTING ON-RAMP
12' EXISTING THRU LANE
EXISTING OFF RAMP

291+00 292+00 293+00 294+00 295+00
807+00 808+00 806+00 805+00
190+00 191+00 192+00 193+00 194+00
1688+00 1689+00 1690+00 1691+00 1692+00

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: KAE | CHECKED BY: MDJ
DRAWN BY: LMT | DATE: 7/27/15

AECOM Kimley»Horn

60% SUBMISSION - 09/21/15

METROPOLITAN COUNCIL
SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4
TH 100 FREIGHT RAIL BRIDGE
BRIDGE 27W34
STAGING PLAN (4 OF 8)

DISCIPLINE: STRUCTURES
SHEET NAME: CBR27W34-BRG-DTL-001-4

SHEET 32 OF 36

Jul, 29 2015 11:35 am V:\3400_ADC\CAD\SEGMENT E2\PLAN SHEETS\STRUCTURES\T100-FRT\CBR27W34-BRG-DTL-001.dwg By: brad.wodash

STAGE 4 TRAFFIC

1. T.H. 100 WEEKEND CLOSURE.
2. CP RAIL OPERATIONS ON BRIDGE NO. 27W34.

STAGE 4 CONSTRUCTION

1. ERECT BRIDGE NO. 27303 BEAMS.

℄ T.H. S.B. 100 (SB100)

℄ T.H. N.B. 100 (NB100)

EXISTING BRIDGE NO. 27304

℄ CEDAR LAKE TRAIL (CEDAR LAKE TRAIL)

291+00 292+00 293+00 294+00 295+00

807+00 808+00

BRIDGE NO. 27W34

℄ CP BASS LAKE SPUR (CP BASS LAKE SPUR)

190+00 191+00 192+00 193+00 194+00

807+00

℄ TRACK 1 (WB-TRK-E2)

1688+00 1689+00 1690+00 1691+00 1692+00

806+00

℄ TRACK 2 (EB-TRK-E2)

BRIDGE NO. 27303 BEAM (TYP.)

805+00 806+00

EXISTING ON-RAMP

12' EXISTING THRU LANE

12' EXISTING THRU LANE

12' EXISTING THRU LANE

12' EXISTING THRU LANE

12' EXISTING THRU LANE

12' EXISTING THRU LANE

12' EXISTING THRU LANE

EXISTING OFF RAMP

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: KAE | CHECKED BY: MDJ

DRAWN BY: LMT | DATE: 7/27/15

AECOM Kimley»Horn

60% SUBMISSION - 09/21/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4
TH 100 FREIGHT RAIL BRIDGE
BRIDGE 27W34
STAGING PLAN (5 OF 8)

DISCIPLINE: STRUCTURES

SHEET NAME: CBR27W34-BRG-DTL-001-5

SHEET 33 OF 36

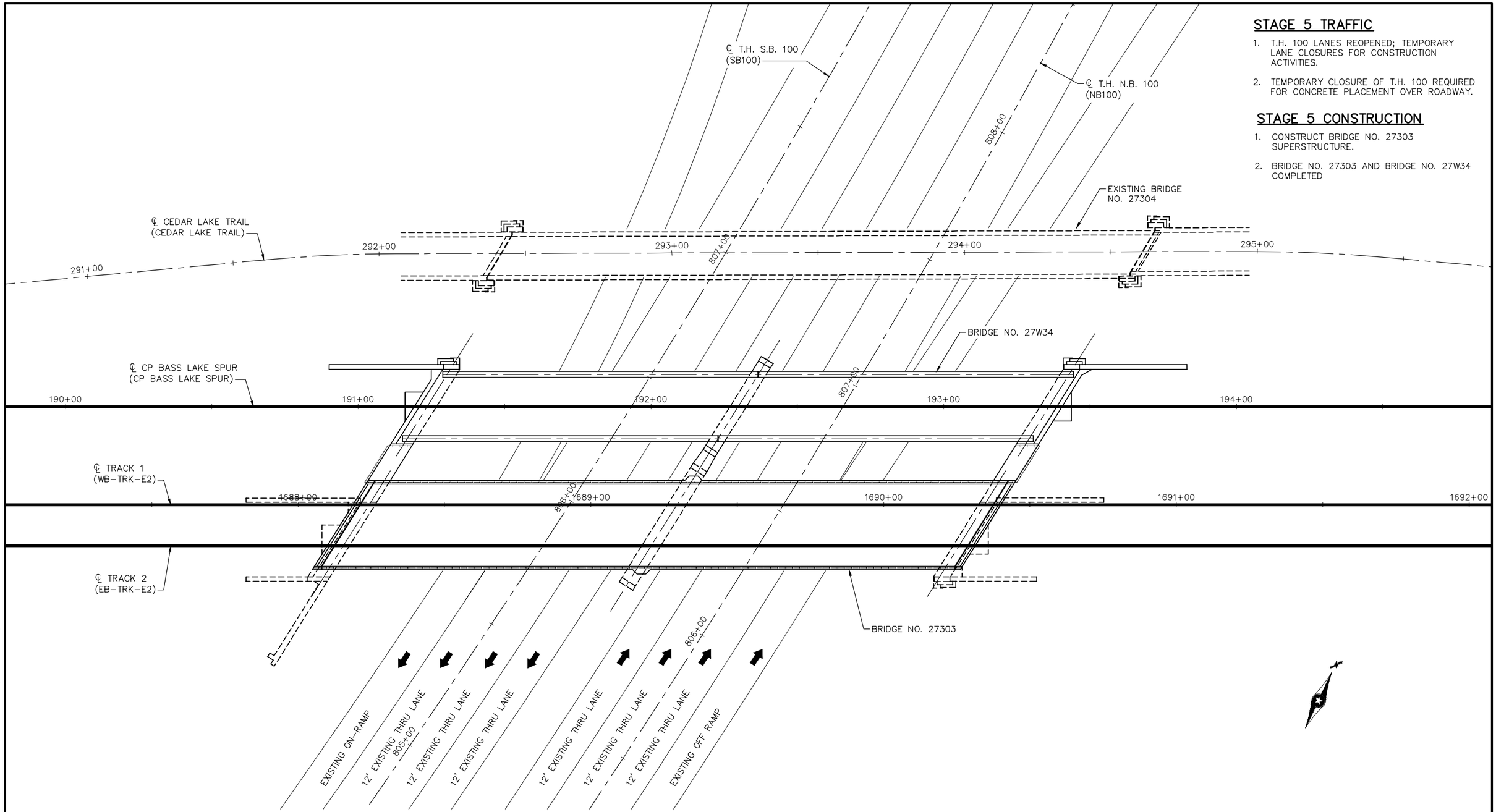
Jul, 29 2015 11:36 am V:\3400_ADC\CAD\SEGMENT E2\PLAN SHEETS\STRUCTURES\T100-FRT\CBR27W34-BRG-DTL-001.dwg By: brad.wodash

STAGE 5 TRAFFIC

1. T.H. 100 LANES REOPENED; TEMPORARY LANE CLOSURES FOR CONSTRUCTION ACTIVITIES.
2. TEMPORARY CLOSURE OF T.H. 100 REQUIRED FOR CONCRETE PLACEMENT OVER ROADWAY.

STAGE 5 CONSTRUCTION

1. CONSTRUCT BRIDGE NO. 27303 SUPERSTRUCTURE.
2. BRIDGE NO. 27303 AND BRIDGE NO. 27W34 COMPLETED



DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: KAE | CHECKED BY: MDJ
DRAWN BY: LMT | DATE: 7/27/15

AECOM Kimley»Horn

60% SUBMISSION - 09/21/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

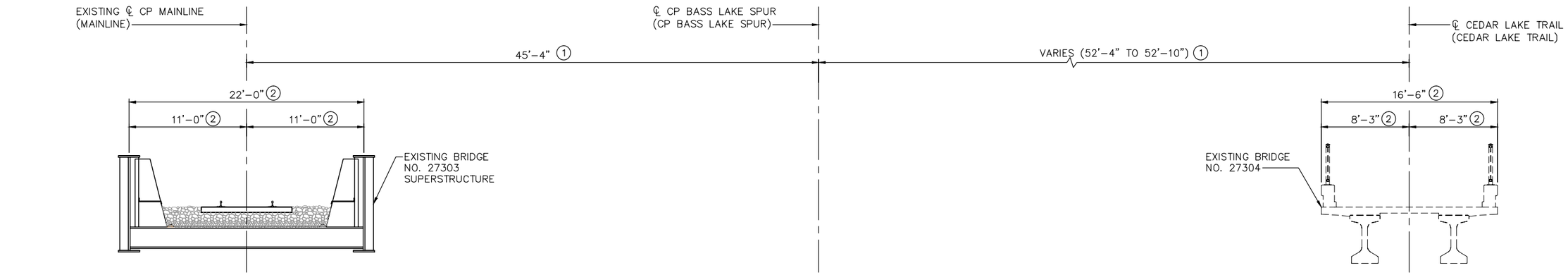
CIVIL EAST - VOLUME 4
TH 100 FREIGHT RAIL BRIDGE
BRIDGE 27W34
STAGING PLAN (6 OF 8)

DISCIPLINE: STRUCTURES

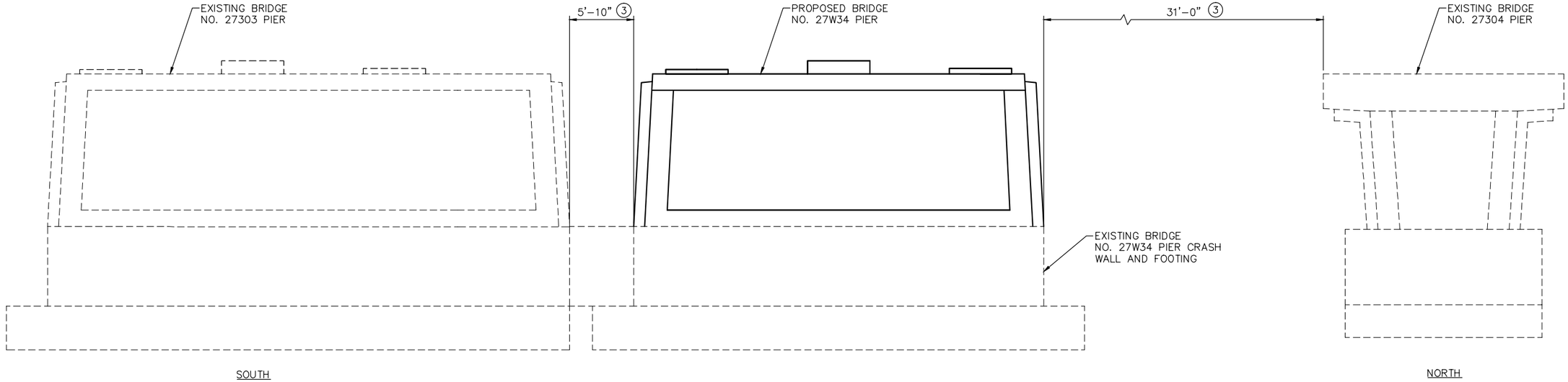
SHEET NAME: CBR27W34-BRG-DTL-001-6

SHEET 34 OF 36

Jul, 29 2015 11:36 am V:\3400_ADC\CAD\SEGMENT E2\PLAN SHEETS\STRUCTURES\T100-FRT\CBR27W34-BRG-DTL-001.dwg By: brad.wodash



STAGE 1 CROSS SECTION



STAGE 1B CROSS SECTION

NOTES:

(1) DIMENSION MEASURED PERPENDICULAR TO ℄ CP BASS LAKE SPUR.

(2) DIMENSION MEASURED PERPENDICULAR TO SUPERSTRUCTURE ALIGNMENT.

(3) DIMENSION MEASURED ALONG MEDIAN T.H. 100.

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: KAE | CHECKED BY: MDJ
DRAWN BY: LMT | DATE: 7/27/15

AECOM Kimley»Horn

60% SUBMISSION - 09/21/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

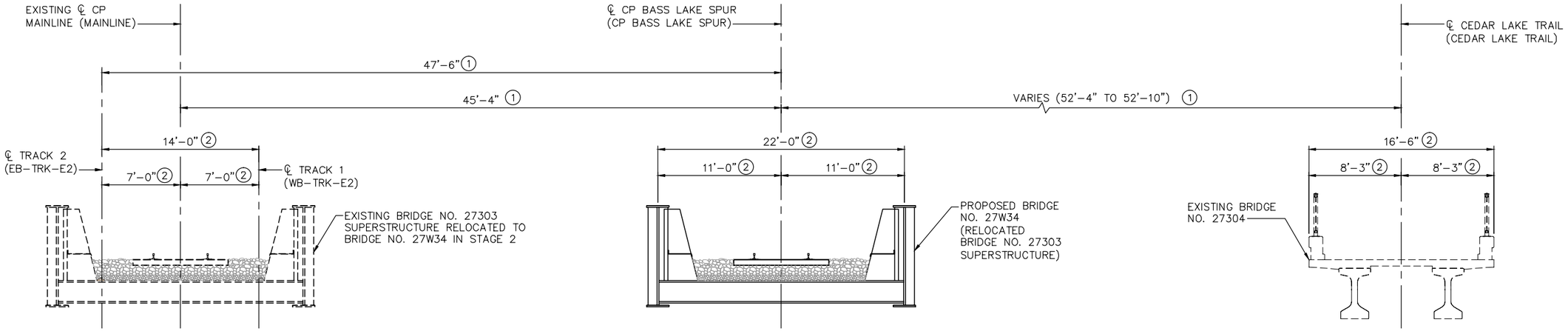
CIVIL EAST - VOLUME 4
TH 100 FREIGHT RAIL BRIDGE
BRIDGE 27W34
STAGING PLAN (7 OF 8)

DISCIPLINE: STRUCTURES

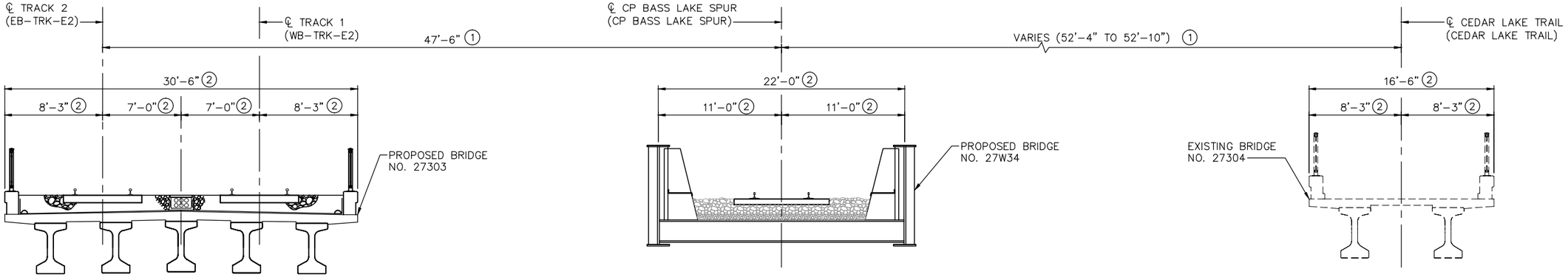
SHEET NAME: CBR27W34-BRG-DTL-001-7

SHEET 35 OF 36

Jul, 29 2015 11:36 am V:\3400_ADC\CAD\SEGMENT E2\PLAN SHEETS\STRUCTURES\T100-FRT\CBR27W34-BRG-DTL-001.dwg By: brad.wodash



STAGE 2 CROSS SECTION



TYPICAL SECTION – FINAL CONDITION

NOTES:

1. DIMENSION MEASURED PERPENDICULAR TO ℄ CP BASS LAKE SPUR.
2. DIMENSION MEASURED PERPENDICULAR TO SUPERSTRUCTURE ALIGNMENT.

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: KAE | CHECKED BY: MDJ
DRAWN BY: LMT | DATE: 7/27/15

AECOM Kimley»Horn

60% SUBMISSION - 09/21/15

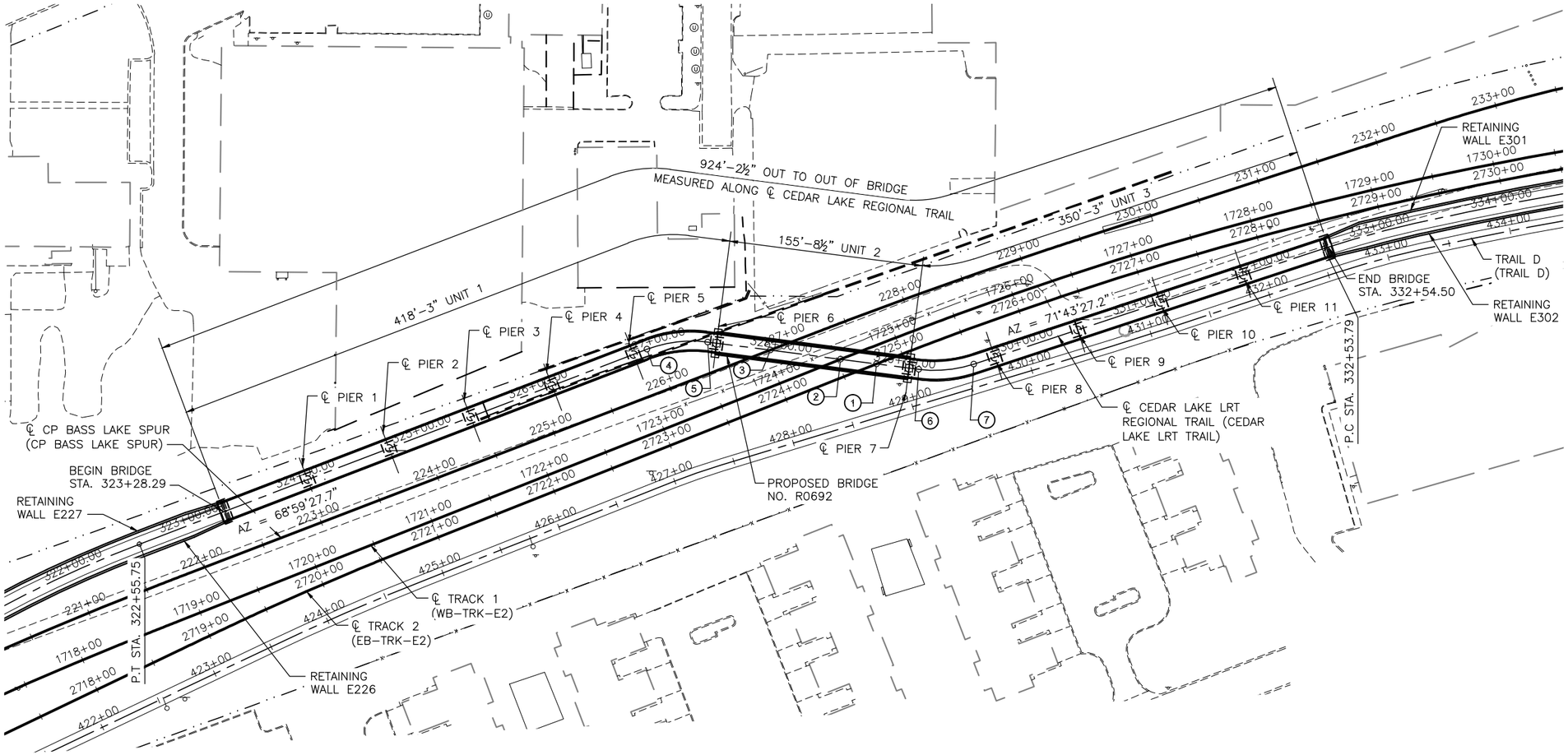
METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4
TH 100 FREIGHT RAIL BRIDGE
BRIDGE 27W34
STAGING PLAN (8 OF 8)

DISCIPLINE: STRUCTURES
SHEET NAME: CBR27W34-BRG-DTL-001-8

SHEET 36 OF 36



NOTES:

1. CONTROL POINT
   ℄ CEDAR LAKE LRT REGIONAL TRAIL (CEDAR LAKE LRT TRAIL) STA. 328+78.04
   ℄ TRACK 2 (EB–TRK–E2) STA 2724+78.00
   X = 512351.670
   Y = 156084.656
2. CONTROL POINT
   ℄ CEDAR LAKE LRT REGIONAL TRAIL (CEDAR LAKE LRT TRAIL) STA. 328+48.96
   ℄ TRACK 1 (WB–TRK–E2) STA 1724+52.26
   X = 51232.829
   Y = 156088.393
3. CONTROL POINT
   ℄ CEDAR LAKE LRT REGIONAL TRAIL (CEDAR LAKE LRT TRAIL) STA. 327+91.88
   ℄ CP BASS LAKE SPUR (CP BASS LAKE SPUR) STA 226+85.64
   X = 512266.226
   Y = 156095.726
4. P.C. STA. 326+91.91
   X = 512167.527
   Y = 156096.384
5. P.T. STA. 327+41.46
   X = 512216.226
   Y = 156102.203
6. P.C. STA. 329+12.16
   X = 512385.507
   Y = 156080.273
7. P.T. STA. 329+56.94
   X = 512429.714
   Y = 156084.488

GENERAL PLAN
0 25' 50' 100'
SCALE IN FEET

DESIGN DATA

2014 AND CURRENT INTERIM AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS

2009 AND CURRENT INTERIM AASHTO LRFD GUIDE SPECIFICATIONS FOR THE DESIGN OF PEDESTRIAN BRIDGES

SOUTHWEST LIGHT RAIL TRANSIT DESIGN CRITERIA (REVISION 4.0)

LOAD AND RESISTANCE FACTOR DESIGN METHOD

90 PSF PEDESTRIAN LIVE LOAD
H 10 MAINTENANCE VEHICLE LIVE LOAD

MATERIAL DESIGN PROPERTIES:
REINFORCED CONCRETE:
f'c = 4 KSI n = 8
fy = 60 KSI REINFORCEMENT

STRUCTURAL STEEL:
fy = 50 KSI

DESIGN SPEED: OVER = 20 MPH

APPROXIMATE DECK AREA: 15,250 SQ. FT.

LIST OF SHEETS

BRIDGE NO. R0692

CEDAR LAKE LRT REGIONAL TRAIL OVER CANADIAN PACIFIC RAILWAY & SOUTHWEST LRT 0.3 MI. SOUTH OF JCT. CSAH 5 AND BELTLINE BLVD. IN ST. LOUIS PARK

PREFABRICATED STEEL TRUSS MAIN SPAN WITH C.I.P. CONCRETE DECK GIRDER APPROACH SPANS
14'–0" TRAIL
00°–00'–00.00" SKEW
BRIDGE I.D. NO. 302 (MAIN SPAN)
NO. 206 (APPROACH SPANS)

GENERAL PLAN

SEC 6 T 28N R 24W
CITY OF ST LOUIS PARK HENNEPIN COUNTY

DRAFT-WORK IN PROCESS

JOB NO. T9N635 | STATE PRO. NO. 9909–01 | MNDOT REVIEW: JOE NIETFELD

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: KAE CHECKED BY: CPE
DRAWN BY: NAO DATE: 8/24/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

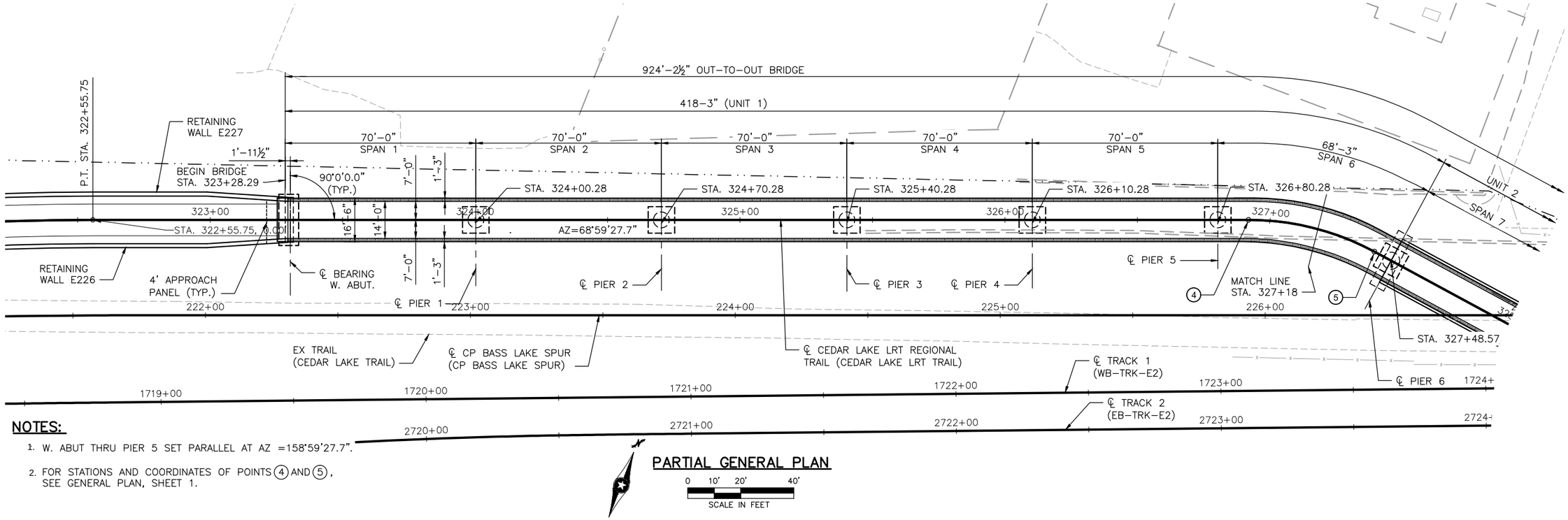
SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4
CEDAR LAKE TRAIL - BELTLINE STATION
BRIDGE R0692
GENERAL PLAN

DISCIPLINE: STRUCTURES
SHEET NAME: CBRR0692-BASE-BRG-GPE-001

SHEET 1 OF 5

Aug. 21 2015 04:02 pm V:\3400_ADC\CAD\SEGMENT E2\PLAN SHEETS\STRUCTURES\CLRT-TRL-BASE\CBRR0692-BASE-BRG-GPE-001.dwg By: Katie.Ellis

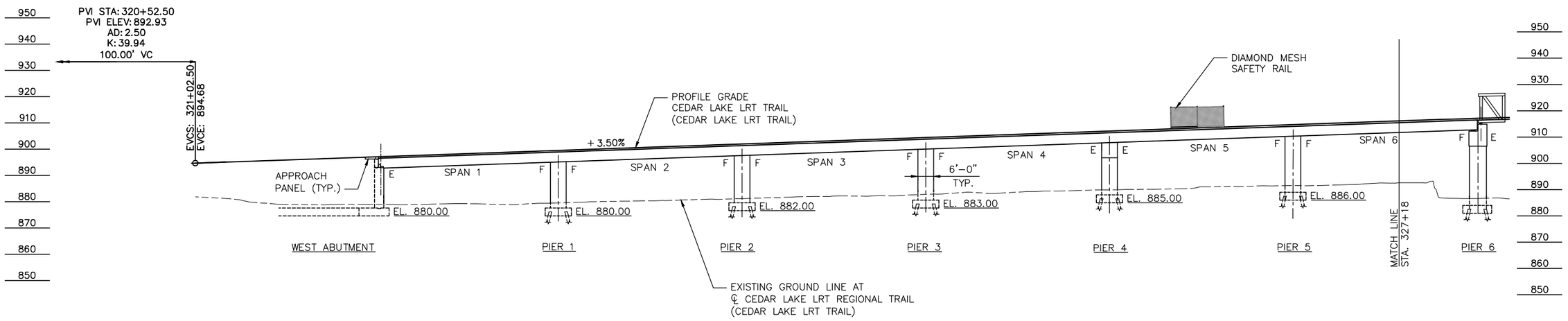


NOTES:

1. W. ABUT THRU PIER 5 SET PARALLEL AT AZ =158°59'27.7".
2. FOR STATIONS AND COORDINATES OF POINTS (4) AND (5), SEE GENERAL PLAN, SHEET 1.

PARTIAL GENERAL PLAN

0 10' 20' 40'
SCALE IN FEET



PARTIAL GENERAL ELEVATION

0 10' 20' 40'
SCALE IN FEET

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: KAE | CHECKED BY: CPE
DRAWN BY: NAO | DATE: 8/24/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

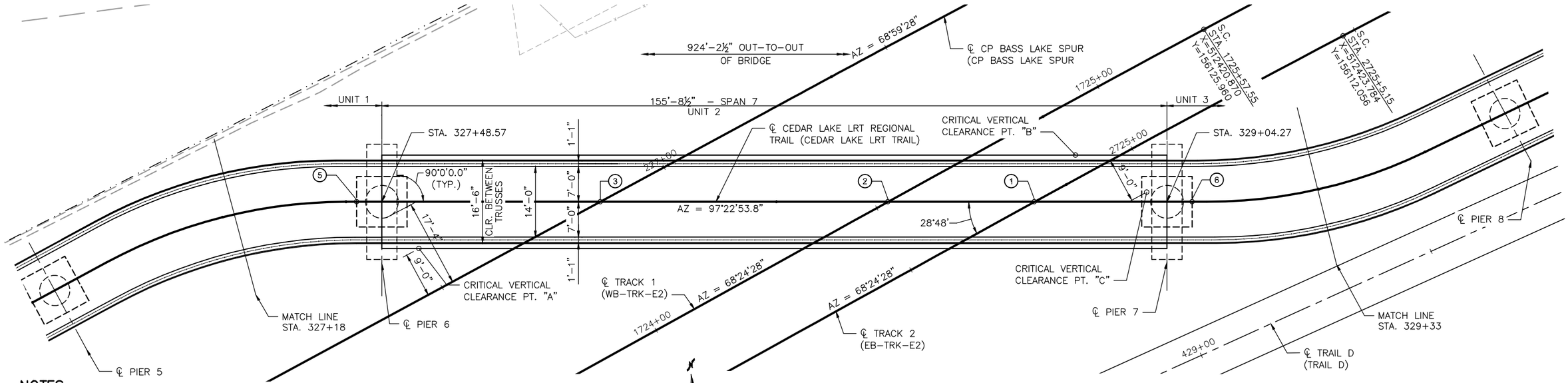
SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4
CEDAR LAKE TRAIL - BELTLINE STATION
BRIDGE R0692
GENERAL PLAN & ELEVATION 1

DISCIPLINE: STRUCTURES
SHEET NAME: CBRR0692-BASE-BRG-GPE-002

SHEET 2 OF 5

Aug. 21 2015 04:11 pm V:\3400_ADC\CAD\SEGMENT E2\PLAN SHEETS\STRUCTURES\CLRT-TRL-BASE\CBRR0692-BASE-BRG-GPE-002.dwg By: Katie.Ellis



NOTES:

1. PIERS 6 AND 7 SET PARALLEL TO AZIMUTH 7°22'53.8".
2. DESIGN COLUMNS FOR PIERS 8 AND 9 FOR THE COLLISION FORCE IN ACCORDANCE WITH AREMA AND MNDOT BRIDGE OFFICE SUBSTRUCTURE PROTECTION POLICY.
3. FOR STATIONS AND COORDINATES OF POINTS (1) THRU (3) AND (5) THRU (6), SEE GENERAL PLAN, SHEET 1.

PARTIAL GENERAL PLAN

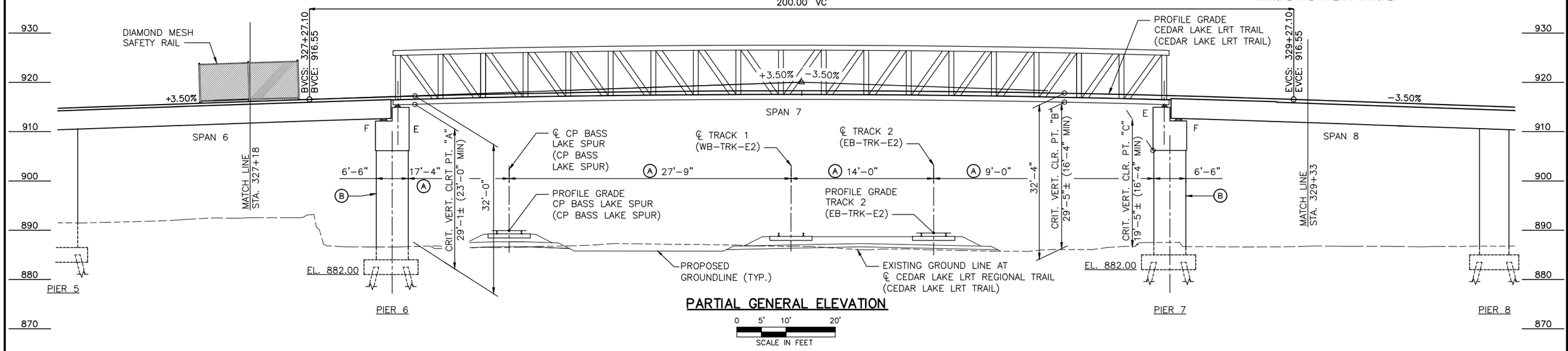
0 5' 10' 20'
SCALE IN FEET

HIGH POINT ELEV: 918.30
HIGH POINT STA: 328+27.13
PVI STA: 328+27.10
PVI ELEV: 920.05
AD: -7.00
K: 28.57
200.00' VC

NOTES:

(A) MEASURED PERPENDICULAR TO TRACKS.

(B) PIER OF HEAVY CONSTRUCTION DESIGNED IN ACCORDANCE WITH MNDOT LRFD BRIDGE DESIGN MANUAL AND AREMA MANUAL.



PARTIAL GENERAL ELEVATION

0 5' 10' 20'
SCALE IN FEET

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: KAE | CHECKED BY: CPE
DRAWN BY: NAO | DATE: 8/24/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

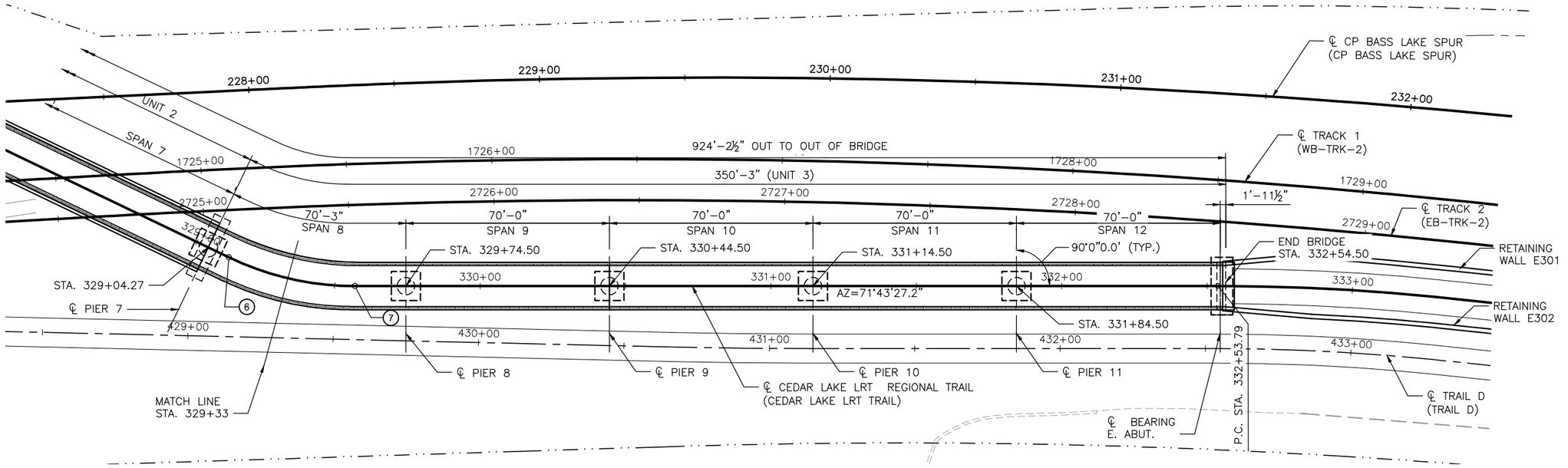
SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4
CEDAR LAKE TRAIL - BELTLINE STATION
BRIDGE R0692
GENERAL PLAN & ELEVATION 2

DISCIPLINE: STRUCTURES
SHEET NAME: CBRR0692-BASE-BRG-GPE-003

SHEET 3 OF 5

Aug. 21 2015 04:19 pm V:\3400_ADC\CAD\SEGMENT E2\PLAN SHEETS\STRUCTURES\CLRT-TRL-BASE\CBRR0692-BASE-BRG-GPE-003.dwg By: Katie.Ellis

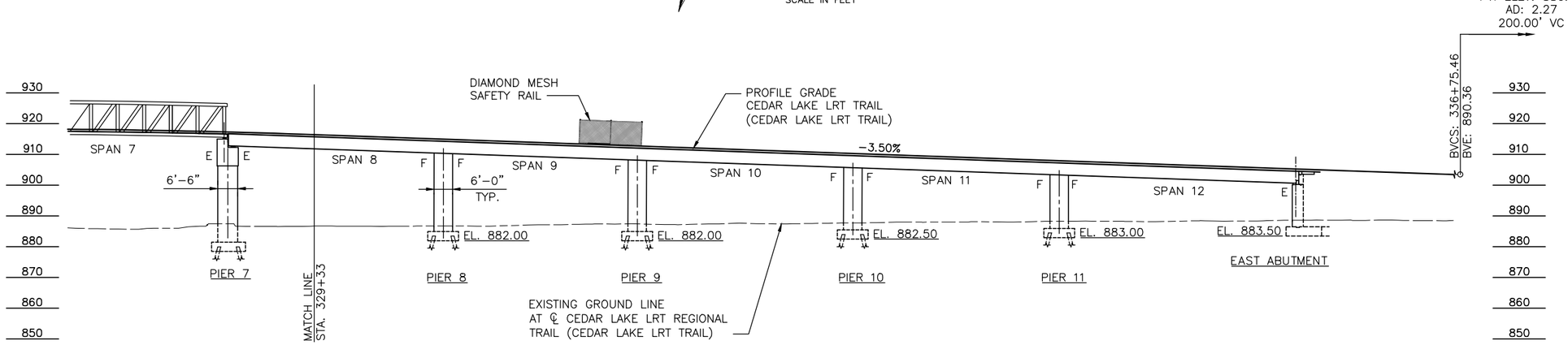


NOTES:

1. PIERS 8 THRU 11 AND EAST ABUTMENT SET PARALLEL TO AZIMUTH 161°43'27.2".
2. FOR STATIONS AND COORDINATES OF POINTS (6) AND (7), SEE GENERAL PLAN, SHEET 1.

PARTIAL GENERAL PLAN

0 10' 20' 40'
SCALE IN FEET



PARTIAL GENERAL ELEVATION

0 10' 20' 40'
SCALE IN FEET

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: KAE | CHECKED BY: CPE
DRAWN BY: NAO | DATE: 8/24/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

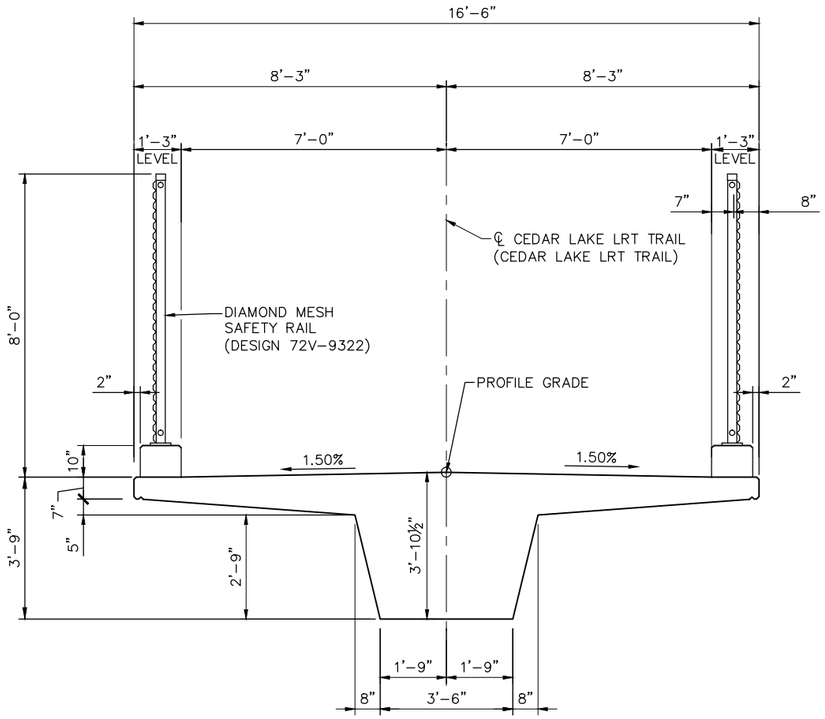
SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4
CEDAR LAKE TRAIL - BELTLINE STATION
BRIDGE R0692
GENERAL PLAN & ELEVATION 3

DISCIPLINE: STRUCTURES
SHEET NAME: CBRR0692-BASE-BRG-GPE-004

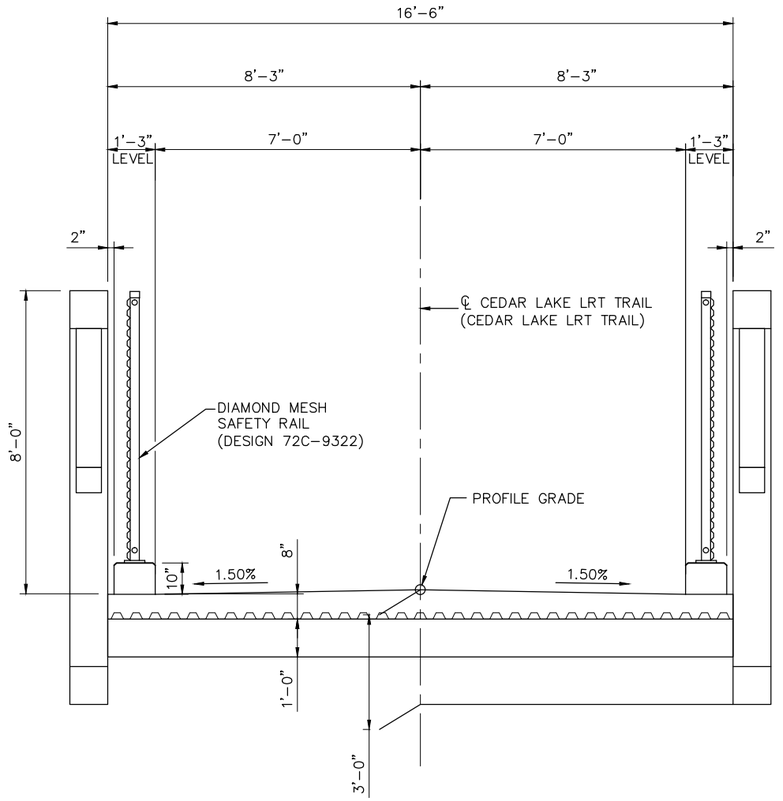
SHEET 4 OF 5

Aug, 21 2015 04:40 pm v:\3400_ADC\CAD\SEGMENT E2\PLAN SHEETS\STRUCTURES\CLRT-TRL-BASE\CBRR0692-BASE-BRG-GPE-004.dwg By: Katie.Ellis



TRANSVERSE SECTION– UNIT 1 & 3

0 1' 2' 4'
SCALE IN FEET



TRANSVERSE SECTION– UNIT 2

0 1' 2' 4'
SCALE IN FEET

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: KAE | CHECKED BY: CPE
DRAWN BY: NAO | DATE: 8/24/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

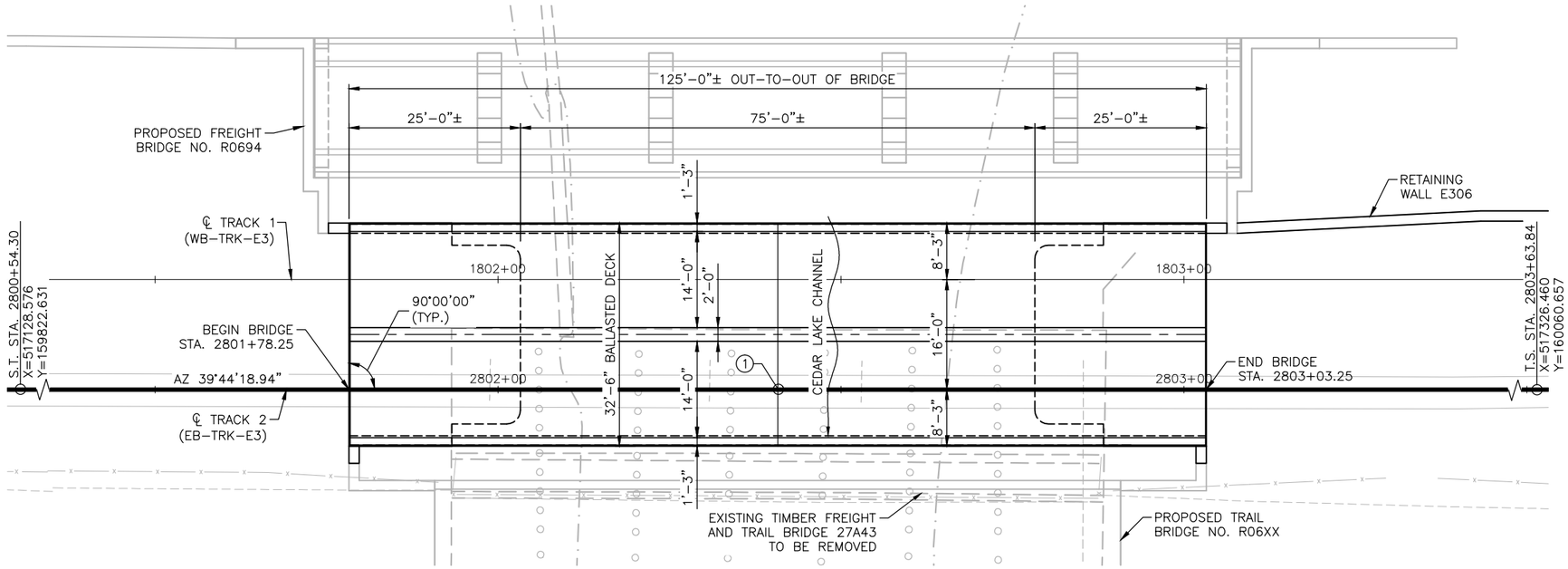
SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4
CEDAR LAKE TRAIL - BELTLINE STATION
BRIDGE R0692
TRANSVERSE SECTION

DISCIPLINE: STRUCTURES
SHEET NAME: CBRR0692-BASE-BRG-SUP-001

SHEET 5 OF 5

Aug. 21 2015 04:43 pm V:\3400_ADC\CAD\SEGMENT E2\PLAN SHEETS\STRUCTURES\CLRT-TRL-BASE\CBRR0692-BASE-BRG-SUP-001.dwg By: Katie.Ellis



GENERAL PLAN

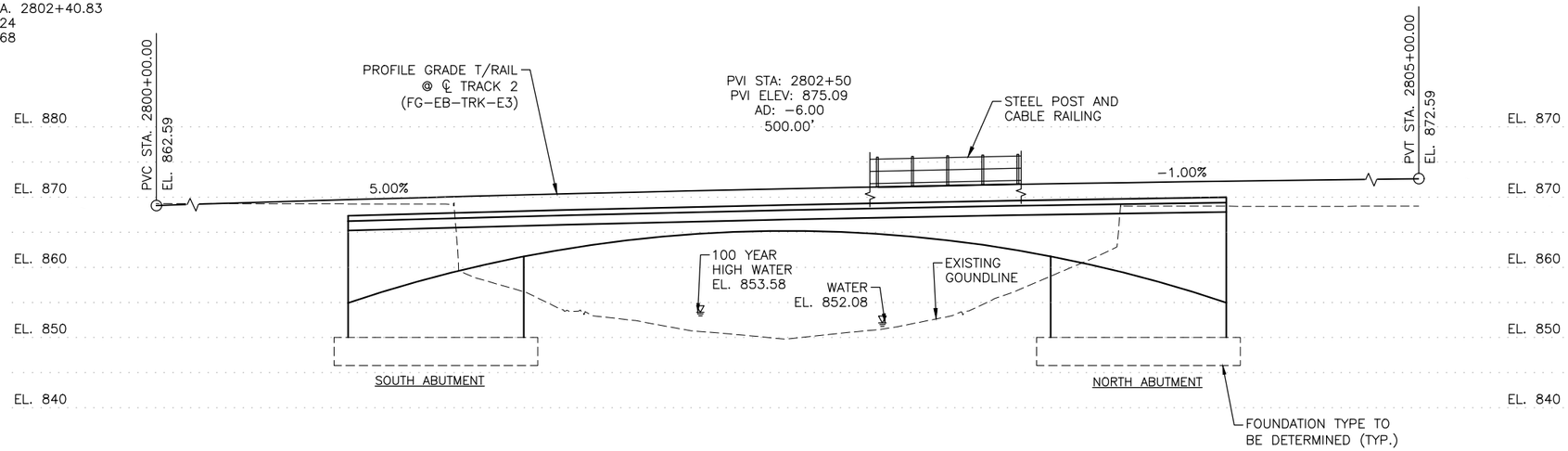
0 5' 10' 20'

SCALE IN FEET

NOTES:

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."

(1) CONTROL POINT 1
℄ TRACK 2 STA. 2802+40.83
X = 517247.824
Y = 159966.068



GENERAL ELEVATION

0 5' 10' 20'

SCALE IN FEET

DESIGN DATA

2014 AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS 6TH EDITION AND CURRENT INTERIMS

SOUTHWEST LIGHT RAIL TRANSIT DESIGN CRITERIA (REVISION 4.0)

LOAD AND RESISTANCE FACTOR DESIGN METHOD

LRV & MV LOADING DIAGRAM SHOWN ON SHEET 2

MATERIAL DESIGN PROPERTIES
REINFORCED CONCRETE:
f'c = 4000 PSI n = 8
fy = 60000 PSI REINFORCEMENT

DESIGN SPEED: OVER = 30 MPH (LRT)
UNDER = N/A

APPROXIMATE DECK AREA 4063 SQ. FT.

LIST OF SHEETS

PROPOSED TYPE OF STRUCTURE

DECK:
SINGLE SPAN - RIGID FRAME C.I.P. CONCRETE ARCH

SUBSTRUCTURE:
ABUTMENTS - FOUNDATION TYPE TO BE DETERMINED

DEPTH OF STRUCTURE:
±6-0" TOP OF RAIL TO LOW BRIDGE AT MIDSPAN

BRIDGE NO. R0693

SOUTHWEST LRT OVER CEDAR LAKE CHANNEL BETWEEN LAKE OF THE ISLES AND CEDAR LAKE IN MINNEAPOLIS

125'-0" CONTINUOUS CONCRETE SLAB
32'-6" RAILWAY
0°00'00.00" SKEW

BRIDGE ID NO. 209

GENERAL PLAN & ELEVATION

SEC 32 T 29N R 24W
CITY OF MINNEAPOLIS HENNEPIN COUNTY

DRAFT-WORK IN PROCESS

JOB NO.: T9N635 | STATE PROJ. NO.: 9909-01 | MNDOT REVIEW: JOE NIETFELD

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: DESI | CHECKED BY: CPE
DRAWN BY: KAG | DATE: 08/24/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

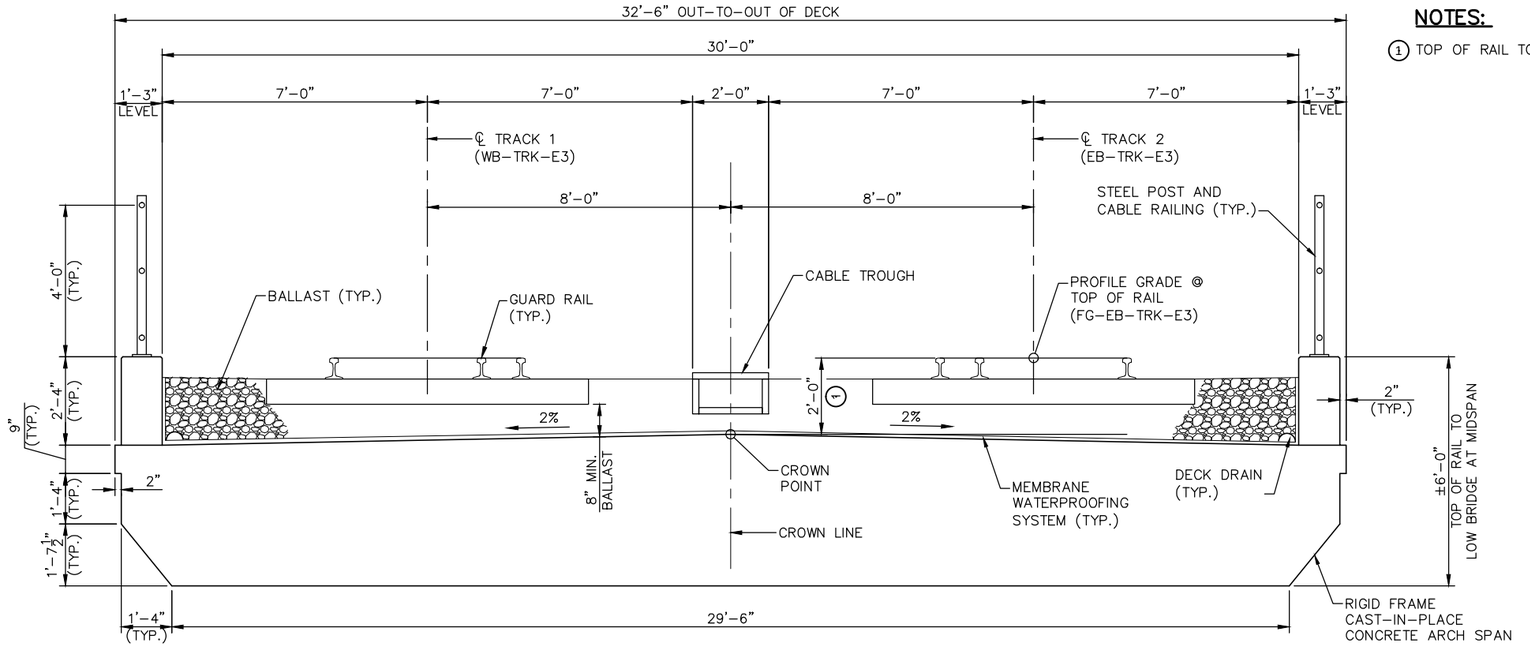
SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4
CEDAR LAKE CHANNEL LRT BRIDGE
BRIDGE R0693
GENERAL PLAN & ELEVATION

DISCIPLINE: STRUCTURES | SHEET NAME: CBRR0693-BRG-GPE

SHEET 1 OF 2

Sep. 21 2015 10:55 am V:\3400_ADC\CAD\SEGMENT E3\PLAN SHEETS\STRUCTURES\R0693 CLCH-LRT\CBRR0693-BRG-GPE.dwg By: kelley.glynn



TRANSVERSE SECTION
(AT MIDSPAN)

0' 1' 2' 4'
SCALE IN FEET

NOTES:

(1) TOP OF RAIL TO CROWN POINT

CONSTRUCTION NOTES:

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

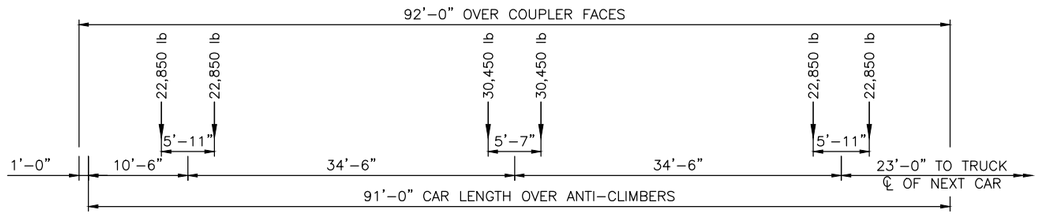
BRIDGE SEAT REINFORCEMENT SHALL BE CAREFULLY PLACED TO AVOID INTERFERENCE WITH DRILLING HOLES FOR ANCHOR RODS, THE BEAMS SHALL BE ERECTED IN FINAL POSITION PRIOR TO DRILLING HOLES FOR AND PLACING ANCHOR RODS.

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".

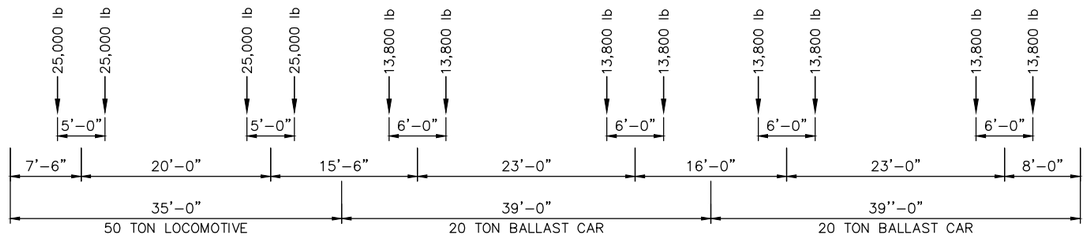
THE PILE LOADS SHOWN IN THE PLANS AND THE CORRESPONDING NOMINAL PILE BEARING RESISTANCE (Rn) WERE COMPUTED USING LRFD METHODOLOGY. PILE BEARING RESISTANCE DETERMINED IN THE FIELD SHALL INCORPORATE THE METHODS AND/OR FORMULAS DESCRIBED IN THE SPECIAL PROVISIONS.



LIGHT RAIL VEHICLE LOADING DIAGRAM

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.



MAINTENANCE TRAIN LOADING DIAGRAM

NOTES:

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.

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: DESI | CHECKED BY: CPE
DRAWN BY: KAG | DATE: 08/24/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

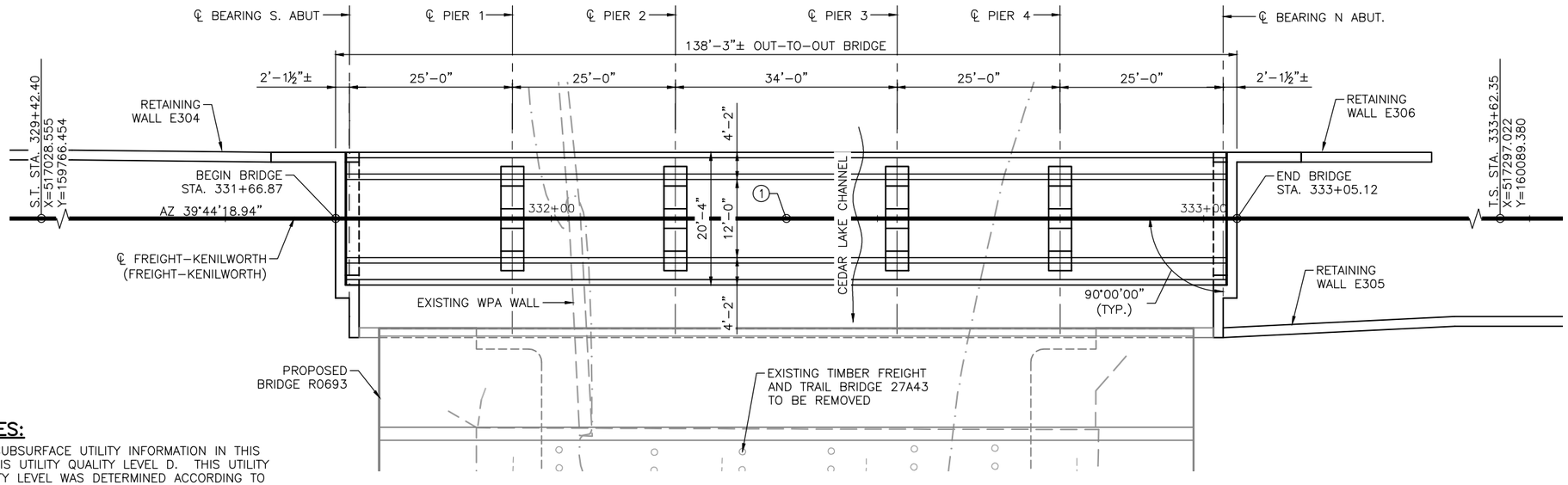
METROPOLITAN COUNCIL
SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4
CEDAR LAKE CHANNEL LRT BRIDGE
BRIDGE R0693
TRANSVERSE SECTION

DISCIPLINE: STRUCTURES
SHEET NAME: CBRR0693-BRG-TRN

SHEET 2 OF 2

Sep. 21 2015 09:30 am V:\3400_ADC\CAD\SEGMENT E3\PLAN SHEETS\STRUCTURES\R0693 CLCH-LRT\CBRR0693-BRG-TRN.dwg By: kelley.glynn



NOTES:

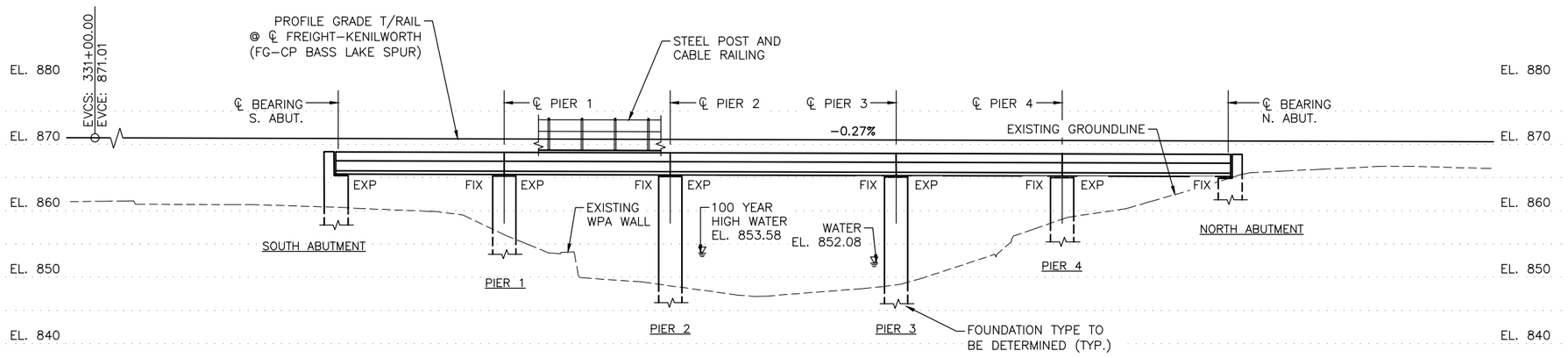
THE SUBSURFACE UTILITY INFORMATION IN THIS PLAN IS UTILITY QUALITY LEVEL D. THIS UTILITY QUALITY LEVEL WAS DETERMINED ACCORDING TO THE GUIDELINES OF CI/ASCE 38–02, ENTITLED "STANDARD GUIDELINES FOR THE COLLECTION AND DEPICTION OF EXISTING SUBSURFACE UTILITY DATA."

(1) CONTROL POINT 1
℄ FREIGHT–KENILWORTH STA. 332+36.00
X = 517216.247
Y = 159992.220

GENERAL PLAN

0 5' 10' 20'

SCALE IN FEET



GENERAL ELEVATION

0 5' 10' 20'

SCALE IN FEET

DESIGN DATA

2014 AREMA MANUAL FOR RAILWAY ENGINEERING

SOUTHWEST LIGHT RAIL TRANSIT DESIGN CRITERIA (REVISION 4.0)

COOPER E90 LIVE LOAD OR 100 KIP (4 AXLES) ALTERNATE LOAD WITH DIESEL IMPACT

MAXIMUM BALLAST DEPTH: 2'–0" (FOR DESIGN)

LOAD FACTOR DESIGN METHOD

MATERIAL DESIGN PROPERTIES
REINFORCED CONCRETE:
f'c = 4500 PSI n = 8
fy = 60000 PSI REINFORCEMENT

PRESTRESSED CONCRETE:
f'c = 6000 PSI n = 6
fpu = 270 KSI LOW RELAXATION STRANDS
0.75 x fpu FOR INITIAL PRESTRESS

DESIGN SPEED: OVER = 30 MPH (FRT)
UNDER = N. A.

APPROXIMATE DECK AREA = 2811 SQ. FT.

LIST OF SHEETS

PROPOSED TYPE OF STRUCTURE

DECK:
5 SPANS – PRECAST PRESTRESSED CONCRETE SLABS

SUBSTRUCTURE:
PARAPET ABUTMENTS – FOUNDATION TYPE TO BE DETERMINED

PIER – FOUNDATION TYPE TO BE DETERMINED

DEPTH OF STRUCTURE:
5'–0"± TOP OF RAIL TO LOW BRIDGE

BRIDGE NO. R0694

CP FREIGHT RAIL OVER CEDAR LAKE CHANNEL BETWEEN LAKE OF THE ISLES AND CEDAR LAKE IN MINNEAPOLIS

25'– 25'– 34'– 25'– 25' PRESTRESSED CONCRETE SLAB SPANS. 20'–4" RAILWAY 0°00'00.00" SKEW

BRIDGE ID NO. 509

GENERAL PLAN & ELEVATION

SEC 32 T 29 N R 24 W
CITY OF MINNEAPOLIS HENNEPIN COUNTY

DRAFT-WORK IN PROCESS

JOB NO.: T9N635 | STATE PROJ. NO.: 9909–01 | MNDOT REVIEW: JOE NIETFELD

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: DESI | CHECKED BY: CPE
DRAWN BY: KAG | DATE: 08/24/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

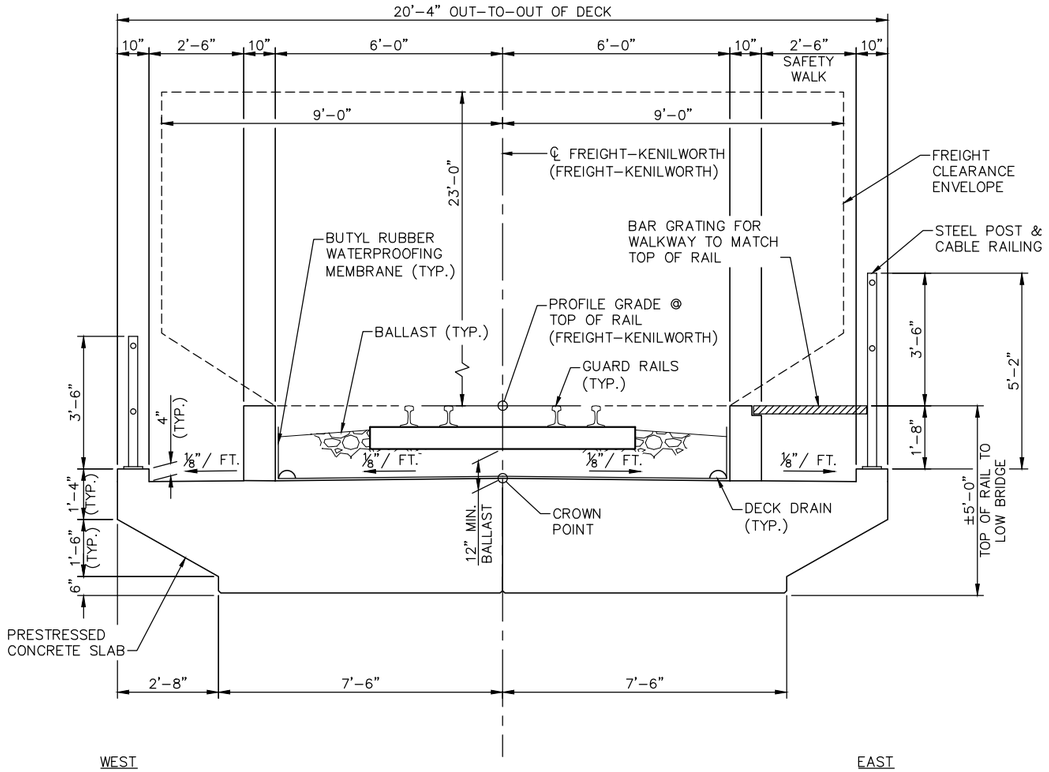
SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4
CEDAR LAKE CHANNEL FREIGHT BRIDGE
BRIDGE R0694
GENERAL PLAN & ELEVATION

DISCIPLINE: STRUCTURES | SHEET NAME: CBRR0694-BRG-GPE

SHEET 1 OF 2

Sep. 21 2015 10:06 am V:\3400_ADC\CAD\SEGMENT E3\PLAN SHEETS\STRUCTURES\R0694 CLCH-FRT\CBRR0694-BRG-GPE.dwg By: kelley,glynn



TRANSVERSE SECTION

0' 1' 2' 4'

SCALE IN FEET

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 2014 AREMA MANUAL AND MnDOT 2461.

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: DESI | CHECKED BY: CPE
DRAWN BY: KAG | DATE: 08/24/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

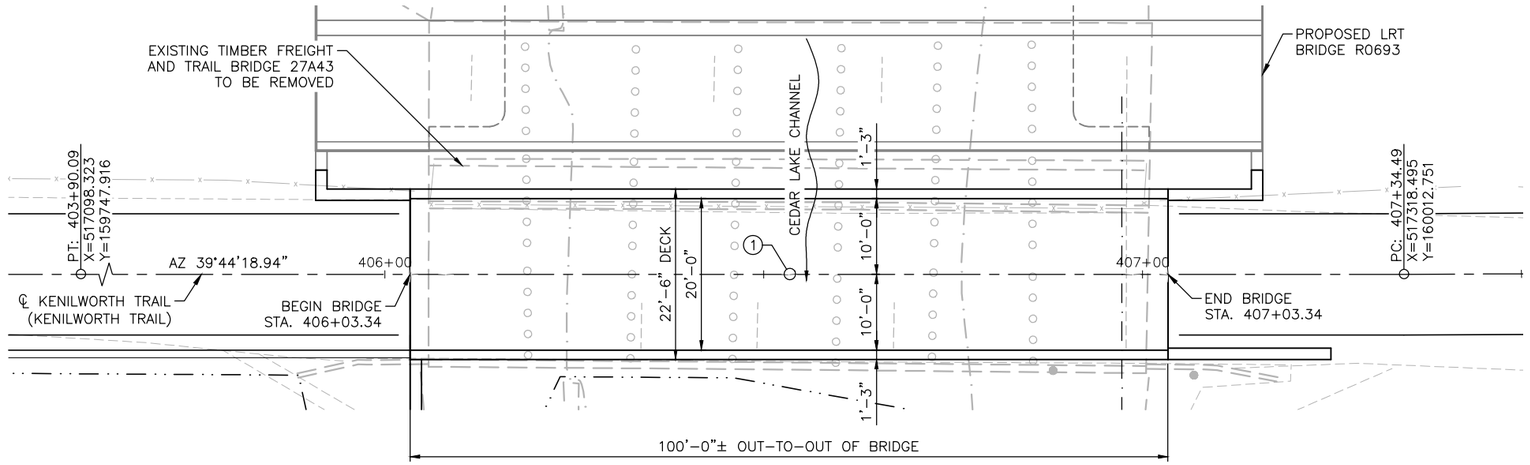
SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4
CEDAR LAKE CHANNEL FREIGHT BRIDGE
BRIDGE R0694
TRANSVERSE SECTION

DISCIPLINE: STRUCTURES
SHEET NAME: CBRR0694-BRG-TRN

SHEET 2 OF 2

Sep. 21 2015 10:09 am V:\3400_ADC\CAD\SEGMENT E3\PLAN SHEETS\STRUCTURES\R0694 CLCH-FRT\CBRR0694-BRG-TRN.dwg By: kelley.glynn



GENERAL PLAN

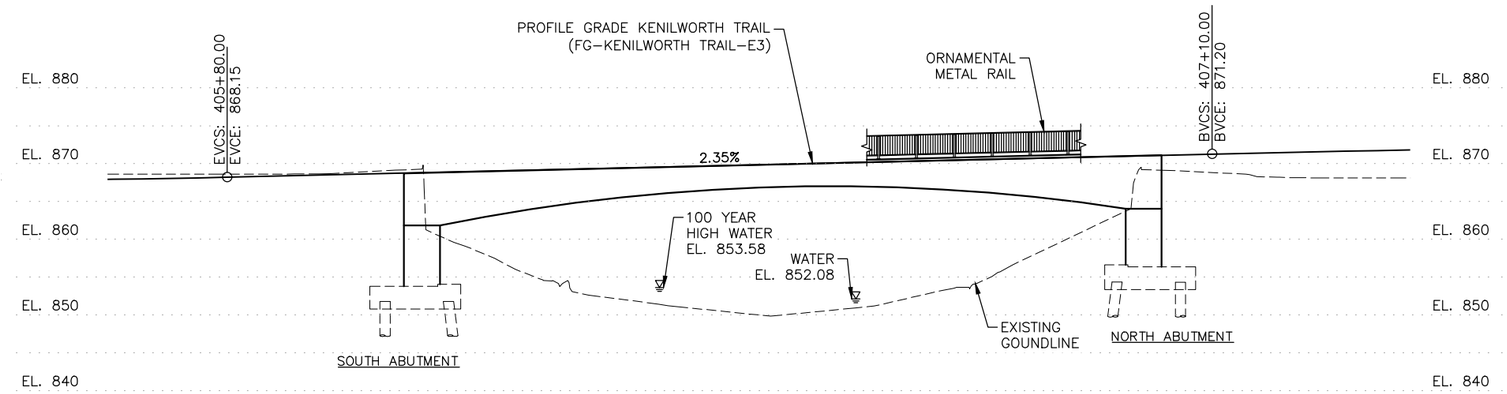
0 5' 10' 20'

SCALE IN FEET

NOTES:

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."

(1) CONTROL POINT 1
℄ KENILWORTH TRAIL STA. 406+53.34
X = 517266.614
Y = 159950.346



GENERAL ELEVATION

0 5' 10' 20'

SCALE IN FEET

DESIGN DATA

2014 AND CURRENT INTERIM AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS

2009 AND CURRENT INTERIM AASHTO LRFD GUIDE SPECIFICATIONS FOR THE DESIGN OF PEDESTRIAN BRIDGES

SOUTHWEST LIGHT RAIL TRANSIT DESIGN CRITERIA (REVISION 4.0)

LOAD AND RESISTANCE FACTOR DESIGN METHOD

90 PSF PEDESTRIAN LIVE LOAD
H 10 MAINTENANCE VEHICLE LIVE LOAD

MATERIAL DESIGN PROPERTIES:
REINFORCED CONCRETE:
f'c = 4 KSI n = 8
fy = 60 KSI REINFORCEMENT

PRESTRESSED CONCRETE:
f'c = 8 KSI n = 1
fpu = 270 KSI
FOR 0.6" DIA. LOW RELAXATION STRANDS

DESIGN SPEED: OVER = 30 MPH

DECK AREA = 2250 SQ. FT.

LIST OF SHEETS

NO.	DESCRIPTION
1	GENERAL PLAN & ELEVATION
2	TRANSVERSE SECTION

PROPOSED TYPE OF STRUCTURE

DECK:
SINGLE SPAN – RIGID FRAME C.I.P. CONCRETE ARCH

SUBSTRUCTURE:
ABUTMENTS – FOUNDATION TYPE TO BE DETERMINED

DEPTH OF STRUCTURE:
±3'-0" TOP OF DECK TO LOW BRIDGE AT MIDSPAN

BRIDGE NO. R06XX

KENILWORTH TRAIL OVER CEDAR LAKE CHANNEL BETWEEN LAKE OF THE ISLES AND CEDAR LAKE IN MINNEAPOLIS

100'-0" CONCRETE RIGID FRAME
20'-0" CLEAR TRAIL, 00°-00'-00.0" SKEW

BRIDGE I.D. NO. XXX

GENERAL PLAN & ELEVATION

SEC 32 T 29N R 24W
CITY OF MINNEAPOLIS HENNEPIN COUNTY

DRAFT-WORK IN PROCESS

JOB NO.: T9N635 | STATE PROJ. NO.: 9909-01 | MNDOT REVIEW: JOE NIETFELD

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: DESI | CHECKED BY: CPE
DRAWN BY: KAG | DATE: 08/24/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

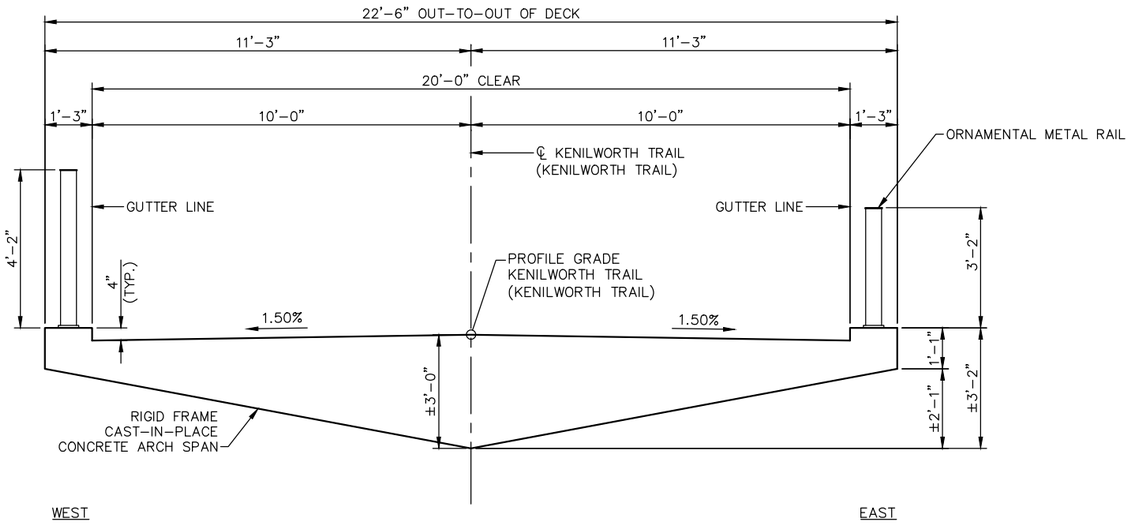
METROPOLITAN COUNCIL | SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4
CEDAR LAKE CHANNEL TRAIL BRIDGE
BRIDGE R06XX
GENERAL PLAN & ELEVATION

DISCIPLINE: STRUCTURES
SHEET NAME: CBRR06XX-BRG-GPE

SHEET 1 OF 2

Sep. 21 2015 01:19 pm V:\3400_ADC\CAD\SEGMENT E3\PLAN SHEETS\STRUCTURES\R06XX CLCH-TRL\CBRR06XX-BRG-GPE.dwg By: kelley.glynn



TRANSVERSE SECTION

(AT MIDSPAN)

0' 1' 2' 4'

SCALE IN FEET

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.

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: DESI | CHECKED BY: CPE
DRAWN BY: KAG | DATE: 08/24/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

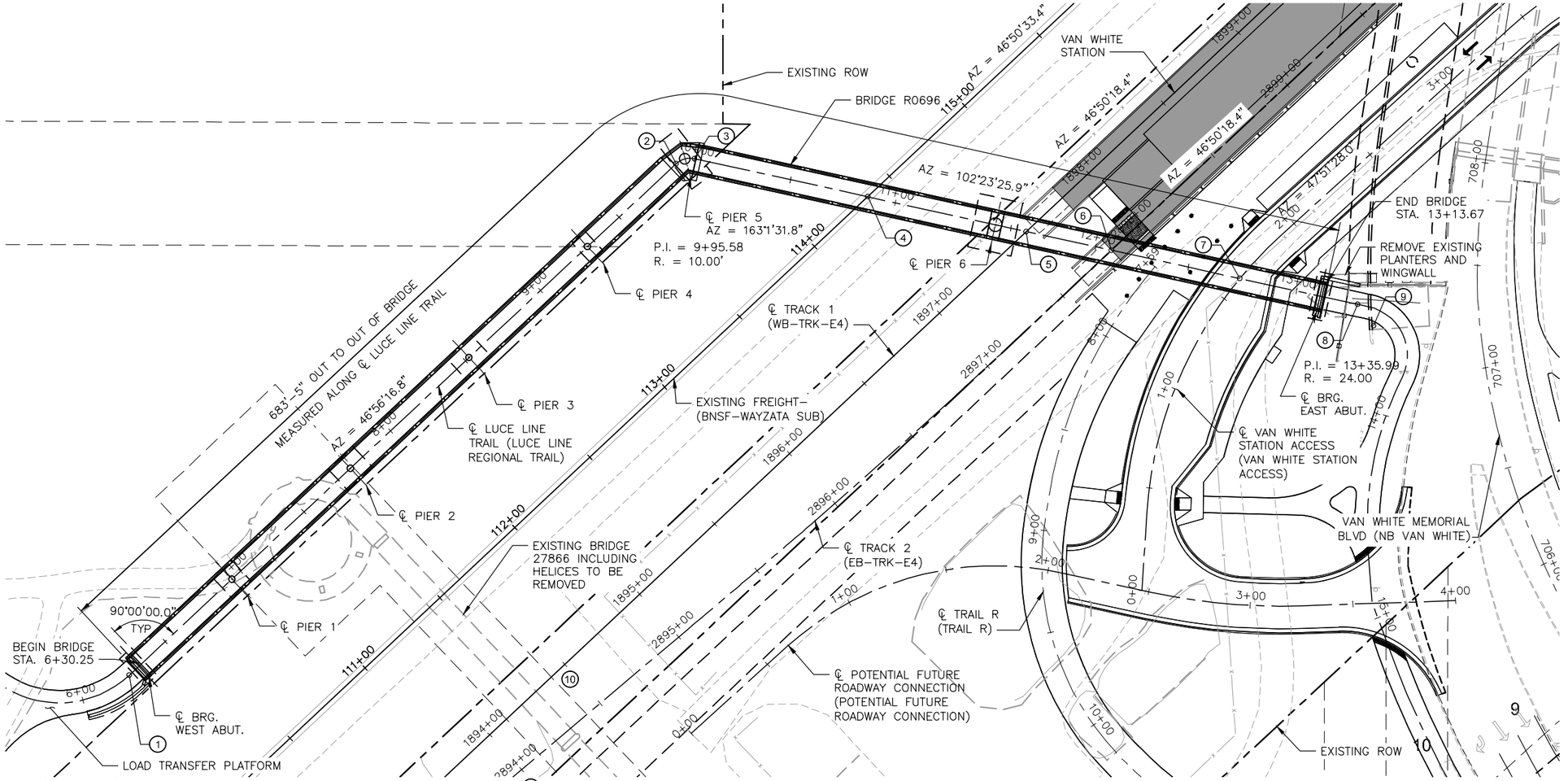
SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4
CEDAR LAKE CHANNEL TRAIL BRIDGE
BRIDGE R06XX
TRANSVERSE SECTION

DISCIPLINE: STRUCTURES
SHEET NAME: CBRR06XX-BRG-TRN

SHEET 2 OF 2

Sep. 18 2015 08:47 am V:\3400_ADC\CAD\SEGMENT E3\PLAN SHEETS\STRUCTURES\R06XX CLCH-TRL\CBRR06XX-BRG-TRN.dwg By: kelley.glynn



1. P.T. STA. 6+25.85
   X=522084.923
   Y=166471.469

2. P.C. STA. 9+90.32
   X=522351.209
   Y=166720.324

3. P.T. STA. 10+00.00
   X=522360.182
   Y=166722.785

4. ℄ LUCE LINE TRAIL BRIDGE (LUCE LINE REGIONAL TRAIL) STA. 10+86.15
   ℄ EXISTING FREIGHT (BNSF WAYZATA SUB) STA. 114+35.32
   X=522444.327
   Y=166704.299
   ∠=55°32'52.4"

5. ℄ LUCE LINE TRAIL BRIDGE (LUCE LINE REGIONAL TRAIL) STA. 11+65.29
   ℄ TRACK 1 (WB–TRK–E4) STA. 1897+58.47
   X=522521.624
   Y=166687.317
   ∠=55°33'7.5"

6. CONTROL POINT
   ℄ LUCE LINE TRAIL BRIDGE (LUCE LINE REGIONAL TRAIL) STA. 12+07.73
   ℄ TRACK 2 (EB–TRK–E4) STA. 2897+82.48
   X=522563.078
   Y=166678.210
   ∠=55°33'7.5"

7. ℄ LUCE LINE TRAIL BRIDGE (LUCE LINE REGIONAL TRAIL) STA. 12+71.74
   ℄ VAN WHITE STATION ACCESS (VAN WHITE STATION ACCESS) STA. 1+62.43
   X=522625.591
   Y=166664.477
   ∠=62°47'21.8"

8. P.C. STA. 13+30.50
   X=522682.984
   Y=166651.868

9. P.T. STA. 13+44.59
   X=522690.824
   Y=166641.560

10. THREE SPAN STEEL BEAM BRIDGE WITH CONCRETE HELICES AT EACH END TO BE REMOVED.

DESIGN DATA

2014 AND CURRENT INTERIM AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS

2009 AASHTO LRFD GUIDE SPECIFICATIONS FOR THE DESIGN OF PEDESTRIAN BRIDGES

SOUTHWEST LIGHT RAIL TRANSIT DESIGN CRITERIA (REVISION 4.0)

LOAD AND RESISTANCE FACTOR DESIGN METHOD

90 PSF PEDESTRIAN LIVE LOAD
H 10 MAINTENANCE VEHICLE LIVE LOAD

MATERIAL DESIGN PROPERTIES:
REINFORCED CONCRETE:
f'c = 4000 PSI n = 8
fy = 60000 PSI REINFORCEMENT

STRUCTURAL STEEL:
fy = 50000 PSI

DESIGN SPEED: OVER = 10 MPH

APPROXIMATE DECK AREA: 11,620 SQ. FT.

LIST OF SHEETS

BRIDGE NO. R0696

LUCE LINE TRAIL BRIDGE OVER BNSF RAILWAY & SOUTHWEST LRT 0.5 MI. SOUTHWEST OF JCT. OF I–94 & TH–394 IN MINNEAPOLIS

PREFABRICATED STEEL TRUSS MAIN SPANS WITH C–I–P CONCRETE DECK GIRDER APPROACH SPANS
14'–0" TRAIL
00°–00'–00.00" SKEW

BRIDGE I.D. NO. 302 (MAIN SPAN)
206 (APPROACH SPANS)

GENERAL PLAN

SEC 28 T 29N R 24W

CITY OF MINNEAPOLIS HENNEPIN COUNTY

DRAFT-WORK IN PROCESS

JOB NO. T9N635 STATE PROJECT NO. 9909–01 MNDOT REVIEW: JOE NIETFELD

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: PDC CHECKED BY: SAD
DRAWN BY: JIK DATE: 08/24/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

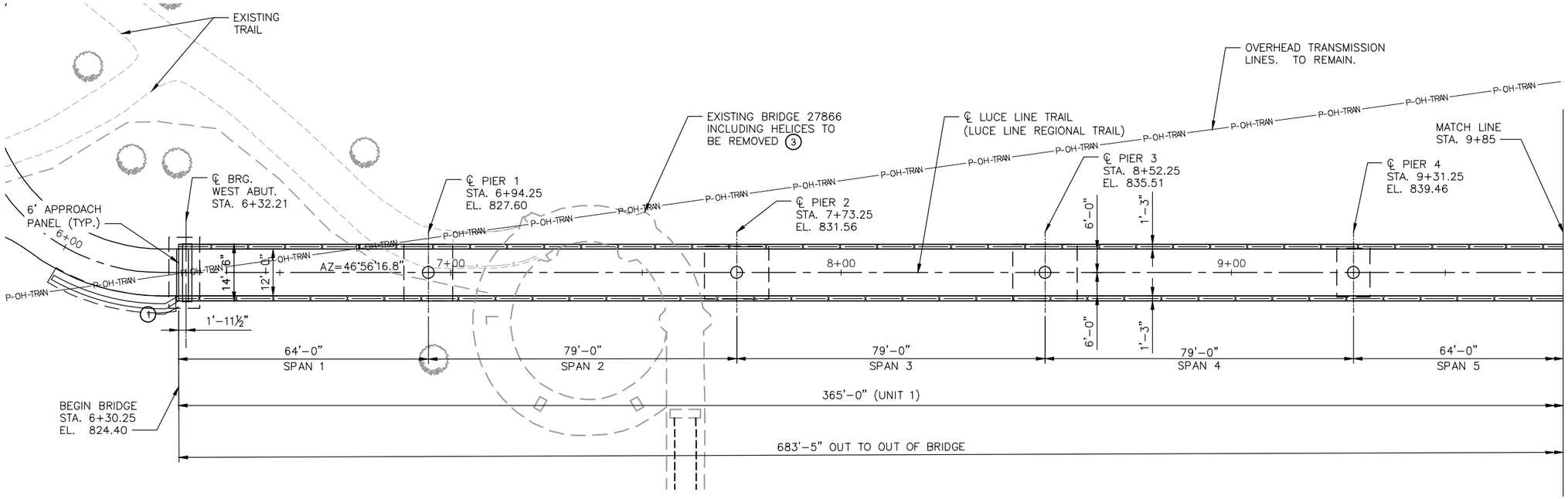
CIVIL EAST - VOLUME 4B
LUCE LINE TRAIL BRIDGE
BRIDGE R0696
GENERAL PLAN

DISCIPLINE: STRUCTURES

SHEET NAME: CBR0696-BRG-GPE-001

SHEET 1 OF 39

Sep. 04 2015 12:14 pm V:\3400_ADC\CAD\SEGMENT E4\PLAN SHEETS\STRUCTURES\VNWHT-TRL\CBR0696-BRG-GPE-001.dwg By: Jim.Kimble



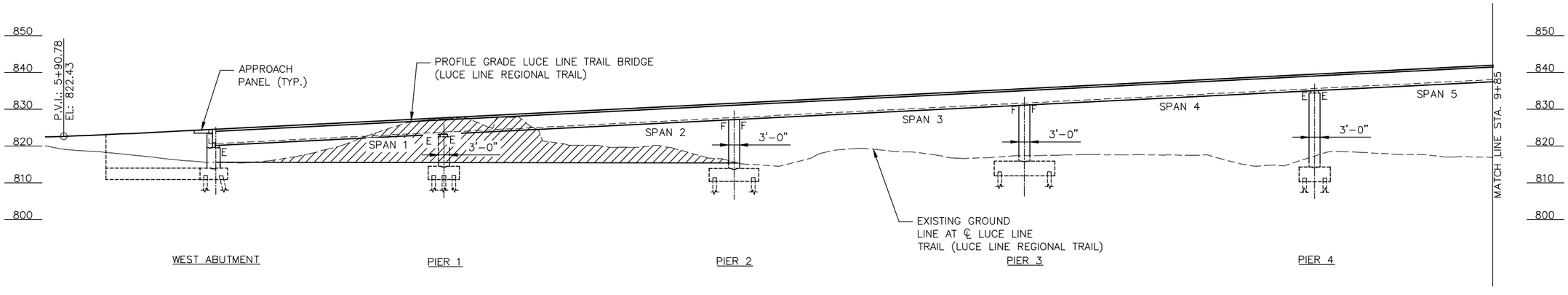
NOTES:

1. (1) END OF BRIDGE SUBSTRUCTURE WINGWALL TO BE DETERMINED IN ADVANCED DESIGN. STATION 6+30.25, 522094.137/166468.046
2. SUBSTRUCTURES SET TO THE FOLLOWING AZIMUTHS:
   W. ABUTMENT AZ = 136°56'16.7"
3. (3) BRIDGE 27866 IS A THREE SPAN STEEL BEAM BRIDGE WITH A CONCRETE HELIX AT EACH END.
4. SEE BORING SHEET FOR IN PLACE UTILITIES.

HATCHED AREA TO BE REMOVED UNDER GRADING PORTION OF CONTRACT.

GENERAL PLAN

0 7.5' 15' 30'
SCALE IN FEET



GENERAL ELEVATION

0 7.5' 15' 30'
SCALE IN FEET

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: PDC | CHECKED BY: SAD
DRAWN BY: JIK | DATE: 08/24/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

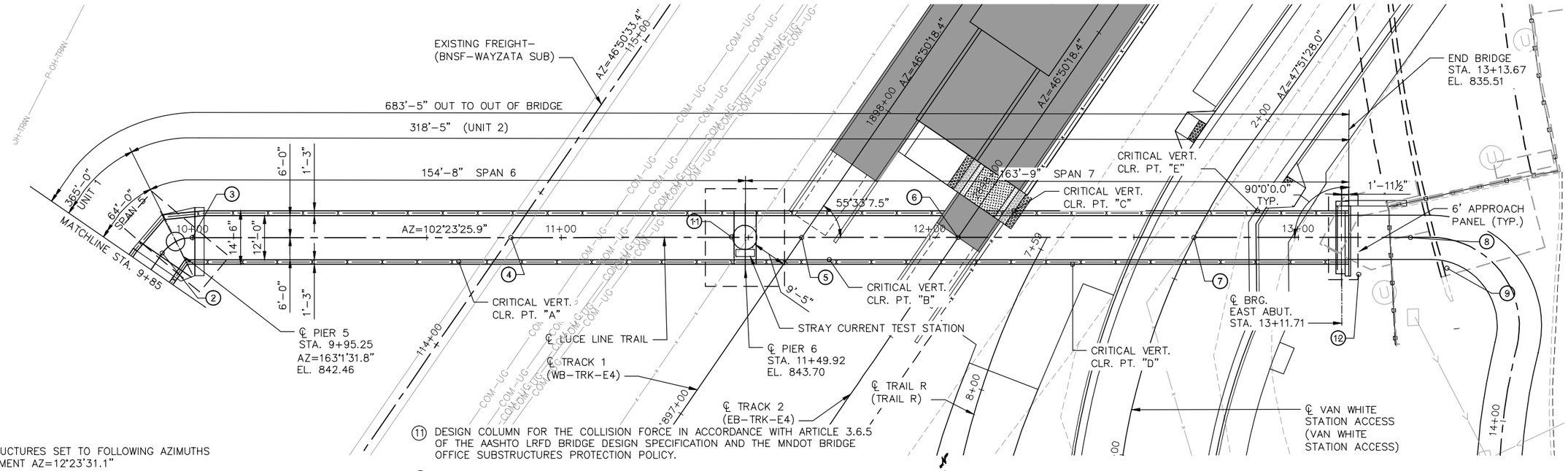
SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4B
LUCE LINE TRAIL BRIDGE
BRIDGE R0696
GENERAL PLAN & ELEVATION 1

DISCIPLINE: STRUCTURES
SHEET NAME: CBR0696-BRG-GPE-002

SHEET 2 OF 39

Sep. 04 2015 12:16 pm V:\3400_ADC\CAD\SEGMENT E4\PLAN SHEETS\STRUCTURES\VNWHT-TRL\CBR0696-BRG-GPE-002.dwg By: Jim.Kimble



NOTES:

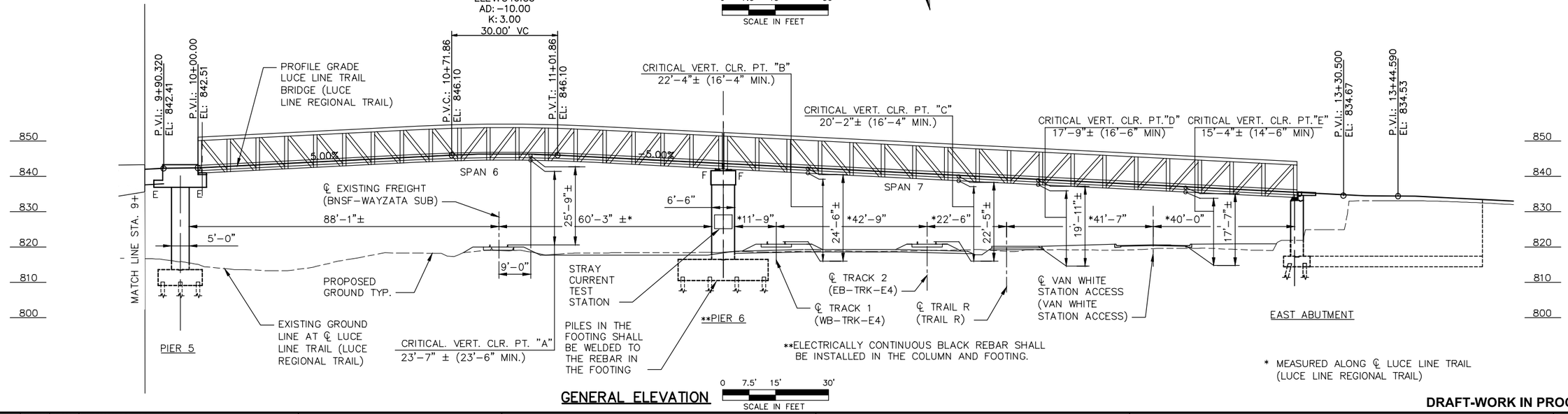
1. SUBSTRUCTURES SET TO FOLLOWING AZIMUTHS
   E ABUTMENT AZ=12°23'31.1"
2. SEE BORING SHEET FOR INPLACE UTILITIES
3. FOR STATION AND COORDINATES OF POINT (2) THRU (9) SEE SHEET 1.

(11) DESIGN COLUMN FOR THE COLLISION FORCE IN ACCORDANCE WITH ARTICLE 3.6.5 OF THE AASHTO LRFD BRIDGE DESIGN SPECIFICATION AND THE MNDOT BRIDGE OFFICE SUBSTRUCTURES PROTECTION POLICY.

(12) END OF BRIDGE SUBSTRUCTURE WINGWALL TO BE DETERMINED IN ADVANCED DESIGN. STATION 13+16.67, 522664.671/166646.937.

GENERAL PLAN

0 7.5' 15' 30'
SCALE IN FEET



**ELECTRICALLY CONTINUOUS BLACK REBAR SHALL BE INSTALLED IN THE COLUMN AND FOOTING.

* MEASURED ALONG ℄ LUCE LINE TRAIL (LUCE LINE REGIONAL TRAIL)

GENERAL ELEVATION

0 7.5' 15' 30'
SCALE IN FEET

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: PDC | CHECKED BY: SAD
DRAWN BY: JIK | DATE: 08/24/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

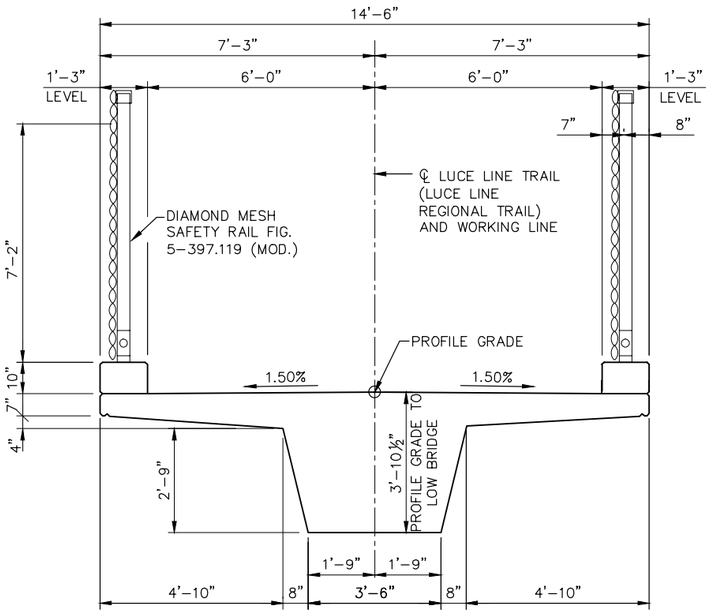
SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4B
LUCE LINE TRAIL BRIDGE
BRIDGE R0696
GENERAL PLAN & ELEVATION 2

DISCIPLINE: STRUCTURES
SHEET NAME: CBR0696-BRG-GPE-003

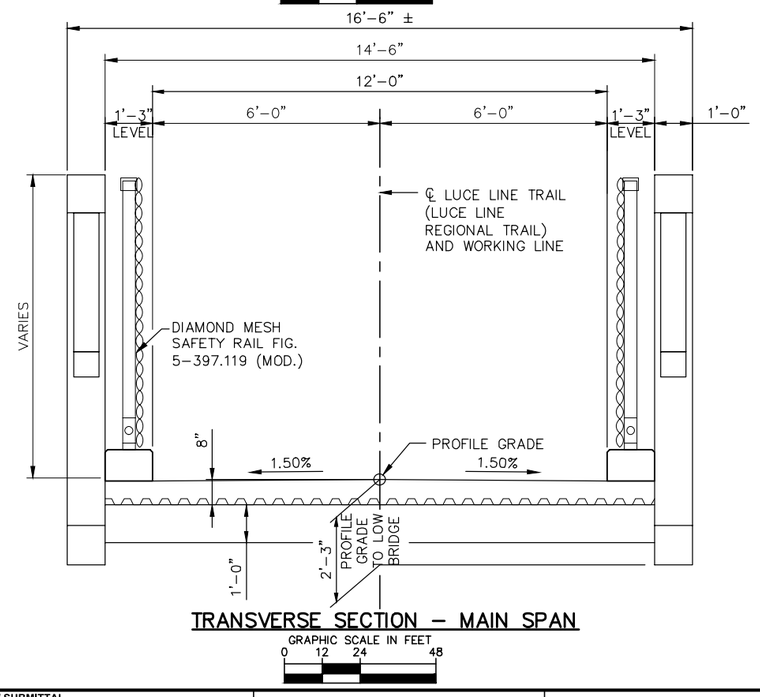
SHEET 3 OF 39

Sep. 04 2015 12:18 pm v:\3400_ADC\CAD\SEGMENT E4\PLAN SHEETS\STRUCTURES\VNWHT-TRL\CBR0696-BRG-GPE-003.dwg By: Jim.Kimble



TRANSVERSE SECTION – APPROACH SPAN

GRAPHIC SCALE IN FEET
0 12 24 48



TRANSVERSE SECTION – MAIN SPAN

GRAPHIC SCALE IN FEET
0 12 24 48

CONSTRUCTION NOTES

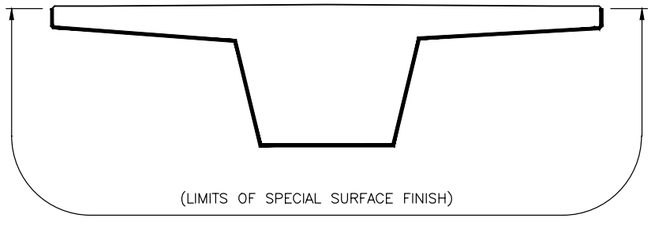
THE 2016 EDITION OF THE MINNESOTA DEPARTMENT OF TRANSPORTATION "STANDARD SPECIFICATIONS FOR CONSTRUCTION" SHALL GOVERN.

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

THE FIRST TWO DIGITS OF EACH BAR MARK INDICATES THE BAR SIZE. BARS MARKED WITH THE SUFFIX "E" SHALL BE EPOXY COATED IN ACCORDANCE WITH SPEC. 3301.

QUANTITY ESTIMATE FOR ENTIRE BRIDGE

ITEM NO.	ITEM	UNIT	QUANTITY
2401	STRUCTURAL CONCRETE (3B52)	CU. YD.	
2401	STRUCTURAL CONCRETE (1G52)	CU. YD.	
2401	BRIDGE SLAB CONCRETE (3Y42)	CU. YD.	
2401	REINFORCEMENT BARS	POUNDS	
2401	REINFORCEMENT BARS (EPOXY COATED)	POUNDS	
2401	SPECIAL SURFACE FINISH (COLOR SYSTEM)	SQ. FT.	
2402	DIAMOND MESH SAFETY RAIL	LIN. FT.	
2402	EXPANSION JOINT DEVICES TYPE 4	LIN. FT.	
2402	ELASTOMERIC BEARING PAD	EACH	
2402	PEDESTRIAN BRIDGE (SUPERSTRUCTURE)	EACH	
2411	ANTI-GRAFFITI COATING	SQ. FT.	
2451	AGGREGATE BACKFILL (CV)	CU. YD.	
2452	C-I-P CONCRETE PILING DELIVERED, 12"	LIN. FT.	
2452	C-I-P CONCRETE PILING DRIVEN, 12"	LIN. FT.	
2452	C-I-P CONCRETE TEST PILE 102' LONG, 12"	EACH	
2452	C-I-P CONCRETE TEST PILE 106' LONG, 12"	EACH	
2452	C-I-P CONCRETE TEST PILE 102' LONG, 12"	EACH	
2452	C-I-P CONCRETE TEST PILE 104' LONG, 12"	EACH	
2452	C-I-P CONCRETE TEST PILE 108' LONG, 12"	EACH	
2452	C-I-P CONCRETE TEST PILE 112' LONG, 12"	EACH	
2452	C-I-P CONCRETE TEST PILE 98' LONG, 12"	EACH	
2452	C-I-P CONCRETE TEST PILE 102' LONG, 12"	EACH	



NOTES

DENOTES SURFACES RECEIVING SPECIAL SURFACE FINISH (COLOR SYSTEM) TYPE 2.

LIMITS OF SPECIAL SURFACE FINISH (COLOR SYSTEM), TYPE 2

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: PDC | CHECKED BY: SAD
DRAWN BY: JIK | DATE: 08/24/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

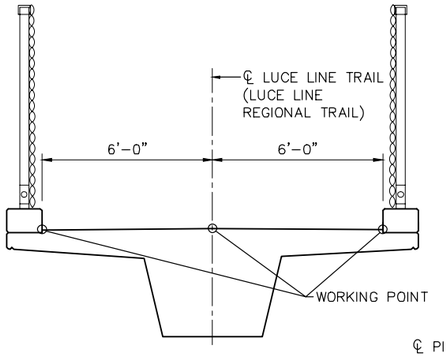
SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4B
LUCE LINE TRAIL BRIDGE
BRIDGE R0696
TRANSVERSE SECTION AND QUANTITIES

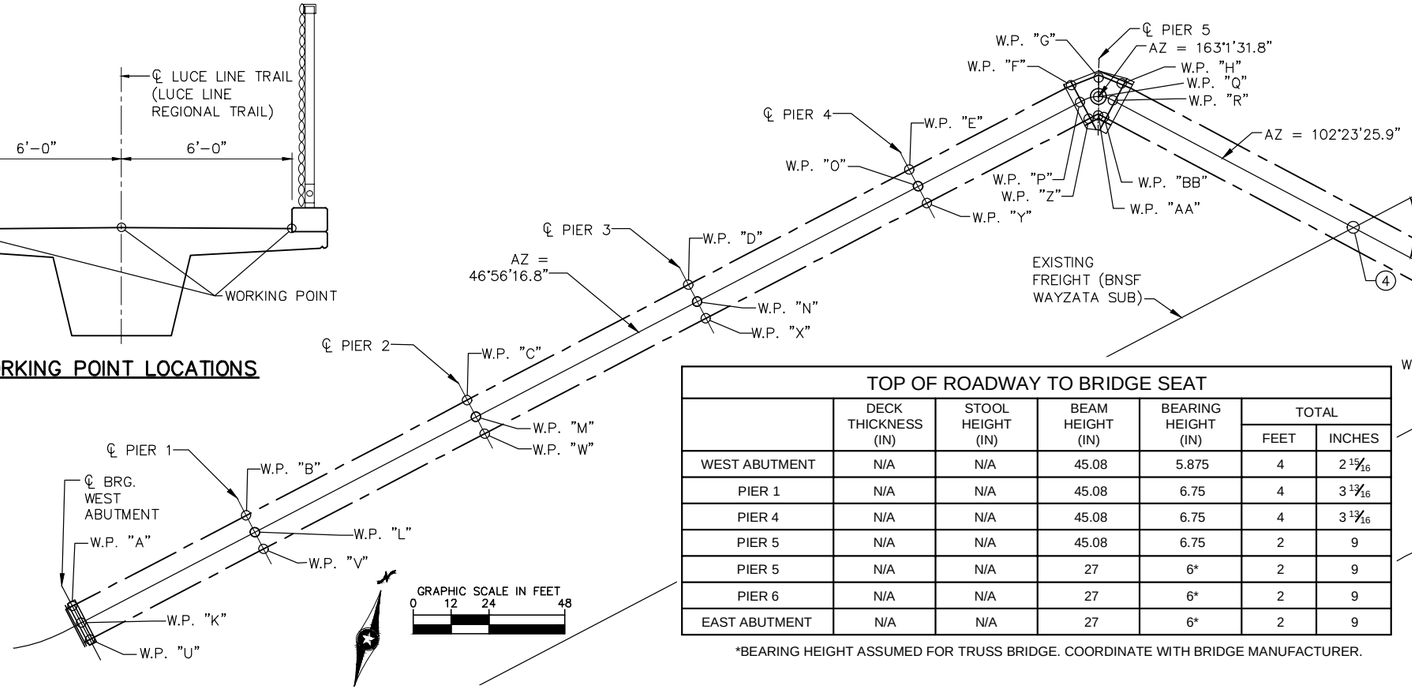
DISCIPLINE: STRUCTURES
SHEET NAME: CBR0696-BRG-TRN-001

SHEET 4 OF 39

Sep. 04 2015 12:18 pm V:\3400_ADC\CAD\SEGMENT E4\PLAN SHEETS\STRUCTURES\VNWHT-TRL\CBR0696-BRG-TRN-001.dwg By: Jim.Kimble



WORKING POINT LOCATIONS



TOP OF ROADWAY TO BRIDGE SEAT						
	DECK THICKNESS (IN)	STOOL HEIGHT (IN)	BEAM HEIGHT (IN)	BEARING HEIGHT (IN)	TOTAL FEET	TOTAL INCHES
WEST ABUTMENT	N/A	N/A	45.08	5.875	4	2 15/16
PIER 1	N/A	N/A	45.08	6.75	4	3 13/16
PIER 4	N/A	N/A	45.08	6.75	4	3 13/16
PIER 5	N/A	N/A	45.08	6.75	2	9
PIER 5	N/A	N/A	27	6*	2	9
PIER 6	N/A	N/A	27	6*	2	9
EAST ABUTMENT	N/A	N/A	27	6*	2	9

*BEARING HEIGHT ASSUMED FOR TRUSS BRIDGE. COORDINATE WITH BRIDGE MANUFACTURER.

NOTES

FOR STATION AND COORDINATES OF CONTROL POINTS (4) THRU (7) SEE SHEET 1.

DIMENSIONS BETWEEN WORKING POINTS (FEET)

Point	STATION	X-COORD.	Y-COORD	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	BB	CC	DD	Point
A	6+32.21	522085.470	166480.193		62.04									6.00	62.33									12.00	63.19									A
B	6+94.25	522130.796	166522.551			79.00									6.00	79.23									12.00	79.91								B
C	7+73.25	522188.515	166576.492				79.00									6.00	79.23									12.00	79.91							C
D	8+52.25	522246.234	166630.432					79.00									6.00	79.23									12.00	79.91						D
E	9+31.25	522303.952	166684.372						57.79									6.00	58.10									12.00	59.03					E
F	9+89.04	522346.177	166723.833							9.05									6.00	9.37									12.00	12.87				F
G	9+95.25	522353.939	166728.484								7.53									6.00	8.45									12.00	12.58			G
H	10+10.00	522361.470	166728.645									149.92									6.00	150.04									12.00	150.40		H
I	11+49.92	522507.894	166696.477										161.79									6.00	161.91									12.00	162.24	I
J	13+11.71	522665.918	166661.760																				6.00										12.00	J
K	6+32.21	522089.567	166475.809												62.04										62.34									K
L	6+94.25	522134.893	166518.168													79.00										79.23								L
M	7+73.25	522192.612	166572.108														79.00										79.23							M
N	8+52.25	522250.330	166626.049															79.00										79.00						N
O	9+31.25	522308.049	166679.989																57.79										58.10					O
P	9+89.04	522350.274	166719.450																	6.13										7.21				P
Q	9+95.25	522355.476	166722.684																		4.71										6.70			Q
R	10+00.00	522360.182	166722.785																			149.92										150.04		R
S	11+49.92	522506.607	166690.616																				161.79										161.91	S
T	13+11.71	522664.631	166655.900																														6.00	T
U	6+32.21	522093.664	166471.425																						62.04									U
V	6+94.25	522138.990	166513.784																								79.00							V
W	7+73.25	522196.708	166567.725																									79.00						W
X	8+52.25	522254.432	166621.669																										79.00					X
Y	9+31.25	522312.146	166675.605																											57.79				Y
Z	9+89.04	522354.370	166715.066																												3.21			Z
AA	9+95.25	522357.012	166716.883																													1.88		AA
BB	10+00.00	522358.895	166716.924																														149.92	BB
CC	11+49.92	522505.320	166684.756																															CC
DD	13+11.71	522663.347	166650.039																															DD

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: PDC | CHECKED BY: SAD
DRAWN BY: JIK | DATE: 08/24/15

60% SUBMISSION - 09/28/15

AECOM Kimley»Horn

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

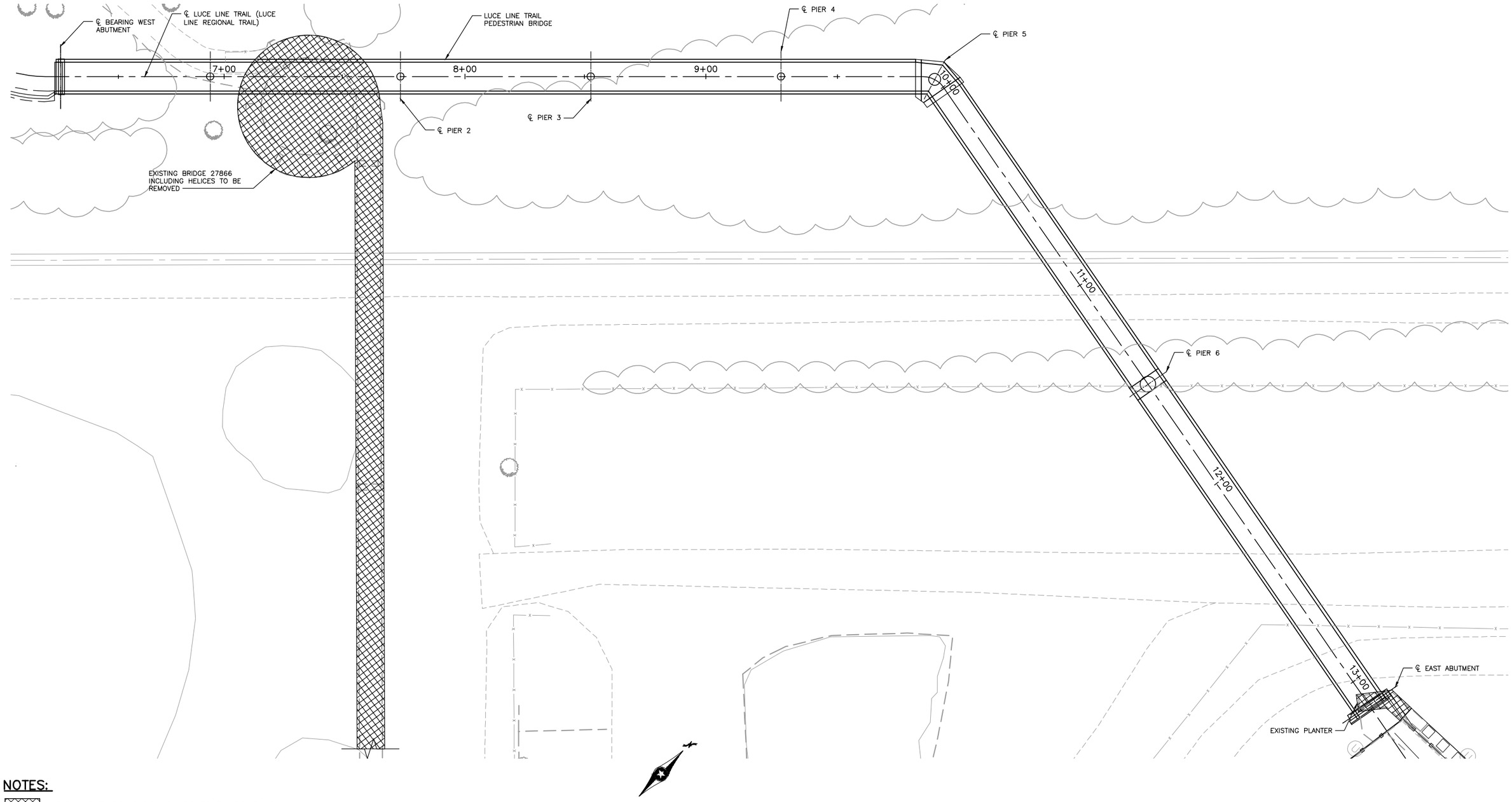
CIVIL EAST - VOLUME 4B
LUCE LINE TRAIL BRIDGE
BRIDGE R0696
BRIDGE LAYOUT

DISCIPLINE: STRUCTURES

SHEET NAME: CBR0696-BRG-SUP-001

SHEET 5 OF 39

Sep. 04 2015 12:19 pm v:\3400_ADC\CAD\SEGMENT E4\PLAN SHEETS\STRUCTURES\VNWHT-TRL\CBR0696-BRG-SUP-001.dwg By: Jim.Kimble



NOTES:

INDICATES EXISTING STRUCTURE TO BE REMOVED.

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: PDC | CHECKED BY: SAD
DRAWN BY: JIK | DATE: 08/24/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

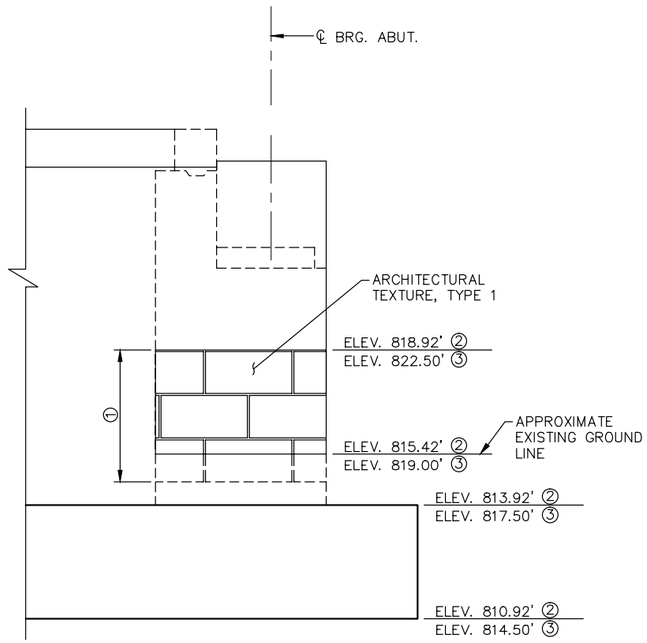
CIVIL EAST - VOLUME 4B
LUCE LINE TRAIL BRIDGE
BRIDGE R0696
REMOVAL DETAILS

DISCIPLINE: STRUCTURES

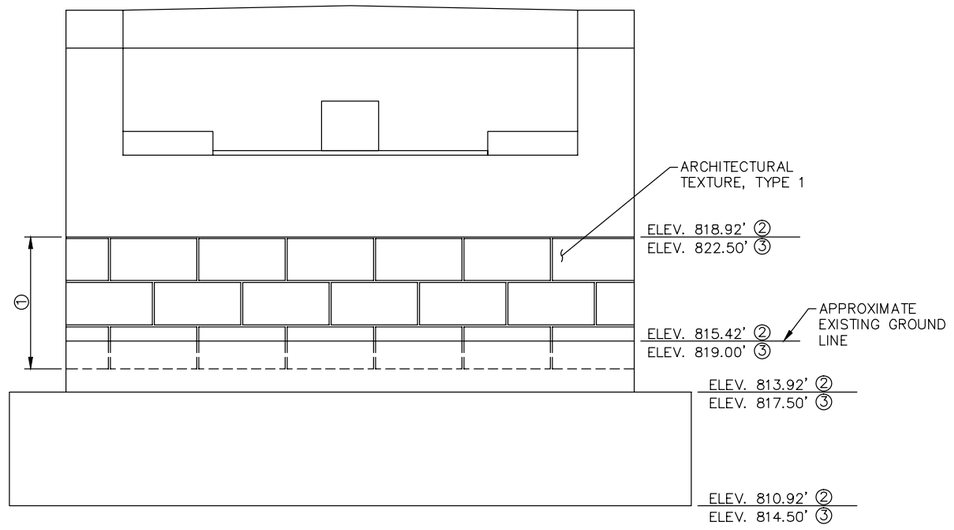
SHEET NAME: CBR0696-BRG-DTL-001

SHEET 6 OF 39

Sep. 04 2015 12:20 pm V:\3400_ADC\CAD\SEGMENT E4\PLAN SHEETS\STRUCTURES\VNWHT-TRL\CBR0696-BRG-DTL-001.dwg By: Jim.Kimble



ELEVATION OF WINGWALL

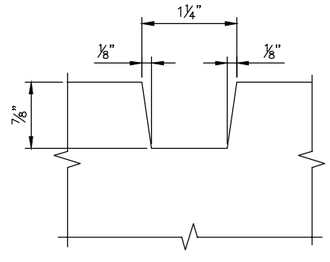


ELEVATION OF ABUTMENT

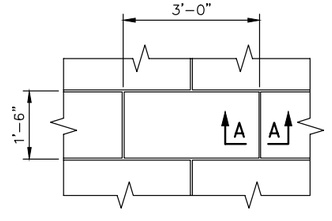
① LIMITS OF ARCHITECTURAL TEXTURE, TYPE 1 AND SPECIAL SURFACE FINISH (COLOR SYSTEM), TYPE 1 (FEDERAL COLOR 32648). ALL OTHER EXPOSED ABUTMENT, RETAINING WALL AND WINGWALL SURFACES SHALL RECEIVE SPECIAL SURFACE FINISH (COLOR SYSTEM), TYPE 2 (FEDERAL COLOR 33717).

② WEST ABUTMENT.

③ EAST ABUTMENT.



TYPICAL SECTION A–A



ARCHITECTURAL TEXTURE, TYPE 1

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: PDC | CHECKED BY: SAD
DRAWN BY: JIK | DATE: 08/24/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

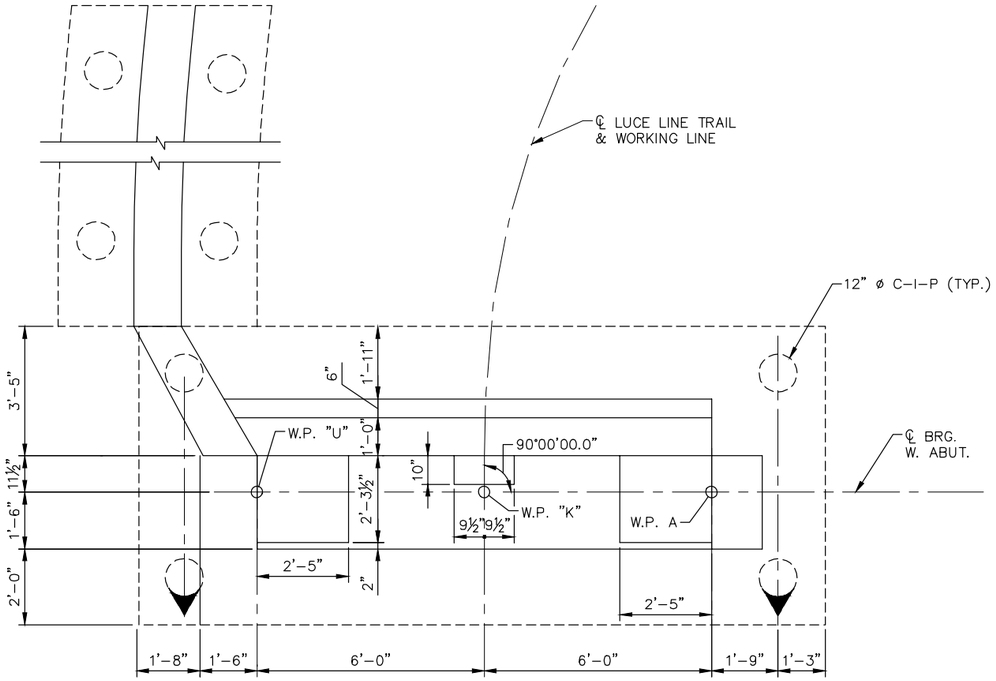
SOUTHWEST Green Line LRT Extension

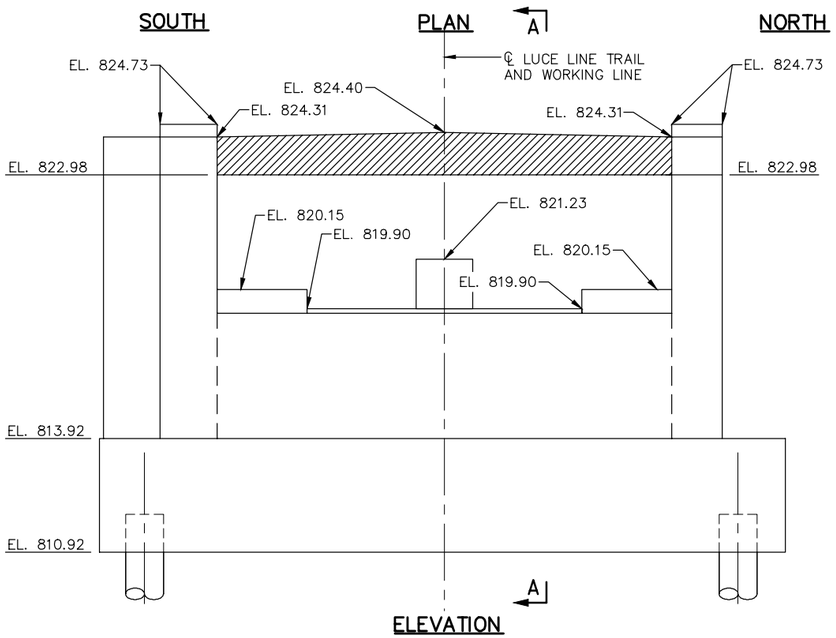
CIVIL EAST - VOLUME 4B
LUCE LINE TRAIL BRIDGE
BRIDGE R0696
ABUTMENT RUSTICATION DETAILS

DISCIPLINE: STRUCTURES
SHEET NAME: CBR0696-BRG-ABT-001

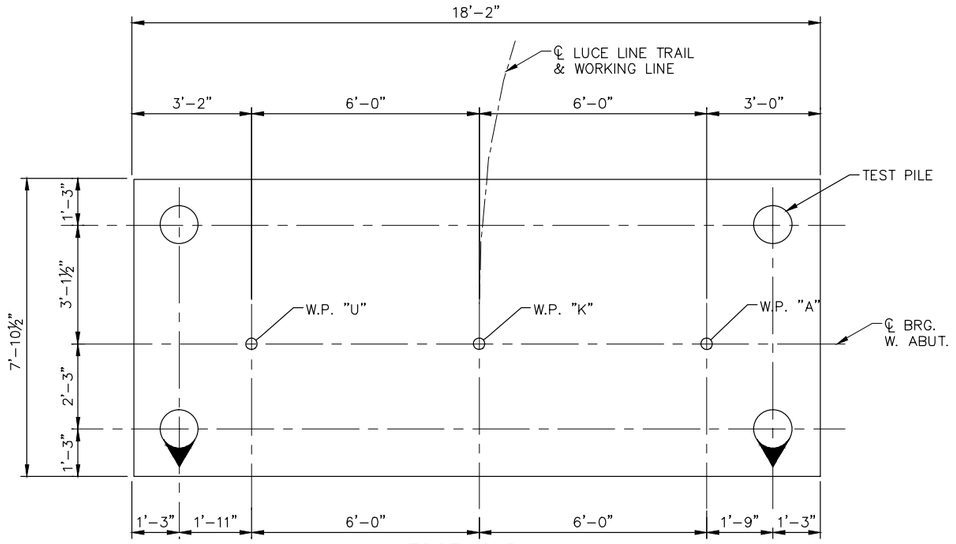
SHEET 7 OF 39

Sep. 04 2015 12:20 pm V:\3400_ADC\CAD\SEGMENT E4\PLAN SHEETS\STRUCTURES\VNWHT-TRL\CBR0696-BRG-ABT-001.dwg By: Jim.Kimble

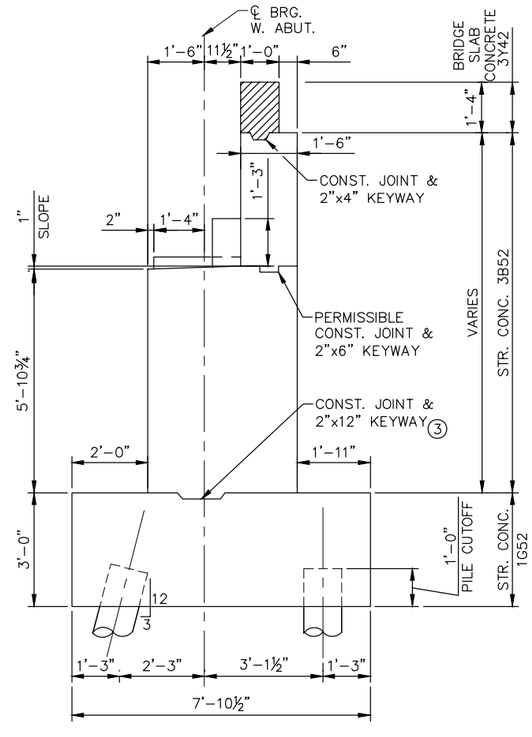




ELEVATION



FOOTING PLAN



SECTION A–A

COMPUTED PILE LOADS WEST ABUTMENT – (TONS PER PILE)	
DEAD LOAD + EARTH PRESSURE	
LIVE LOAD	
TOTAL LOAD	80
* DESIGN LOAD	100

WEST ABUTMENT
REQUIRED NOMINAL PILE BEARINGS
RESISTANCE FOR C–I–P Rn–Tons/Pile

FIELD CONTROL METHOD	φdyn	*Rn
MnDOT Pile Formula 2012 (MPF12) $Rn=20\sqrt{\frac{WxH}{1000}}\times\log(\frac{10}{S})$	0.50	160
PDA	0.65	123

*Rn = (Factored Design Load)/φdyn

PILE NOTES

PILE SPACING SHOWN IS AT BOTTOM OF FOOTING.

PILES MARKED THUS ○ TO BE BATTERED 3 INCHES PER FOOT IN DIRECTION SHOWN.

ALL PILES 12" DIA. CAST–IN–PLACE CONCRETE.

PILES TO HAVE A NOMINAL DIAMETER OF 12" AND A MINIMUM WALL THICKNESS OF ¼"

1–12" ø C–I–P TEST PILE 102 FEET LONG
3–12" ø C–I–P PILES EST. LENGTH 92 FEET LONG
4–12" ø C–I–P PILES REQ'D FOR WEST ABUTMENT

NOTES

① 3Y42 MIX TO BE INCLUDED IN SUPERSTRUCTURE QUANTITIES.

② SIDES OF SHEAR KEY TO BE VERTICAL AND TOP OF SHEAR KEY TO BE LEVEL IN BOTH DIRECTIONS.

③ 3–PLY JOINT WATERPROOFING IF CONSTRUCTION JOINTS ARE USED.

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: PDC | CHECKED BY: SAD
DRAWN BY: JIK | DATE: 08/24/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

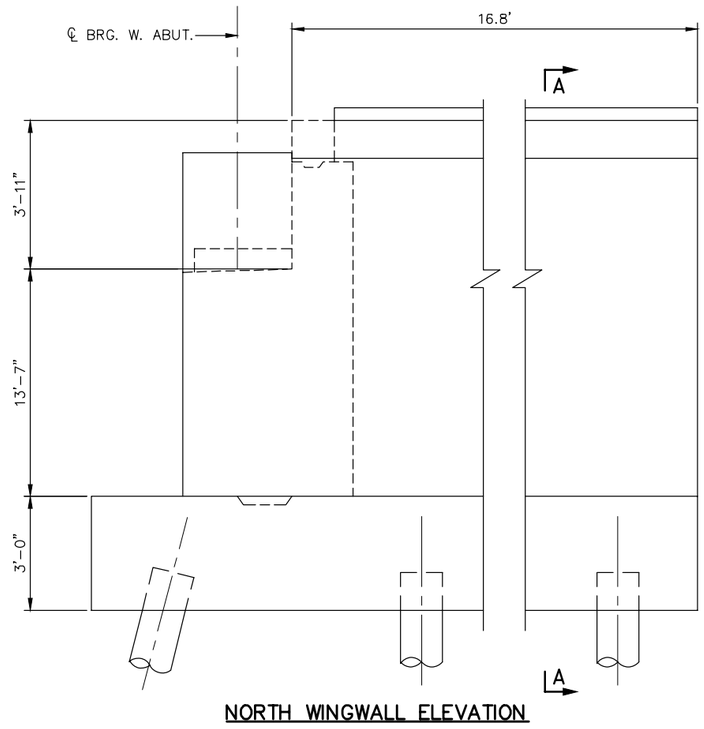
SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4B
LUCE LINE TRAIL BRIDGE
BRIDGE R0696
W. ABUT. FOOTING PLAN AND ELEVATION

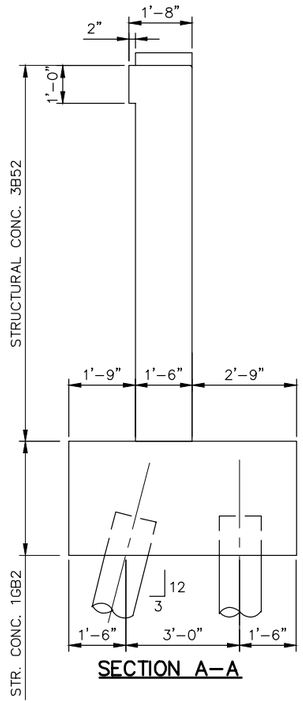
DISCIPLINE: STRUCTURES
SHEET NAME: CBR0696-BRG-ABT-002

SHEET 8 OF 39

Sep. 04 2015 12:20 pm V:\3400_ADC\CAD\SEGMENT E4\PLAN SHEETS\STRUCTURES\VNWHT-TRL\CBR0696-BRG-ABT-002.dwg By: Jim.Kimble



NORTH WINGWALL ELEVATION



SECTION A-A

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: PDC | CHECKED BY: SAD
DRAWN BY: JIK | DATE: 08/24/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

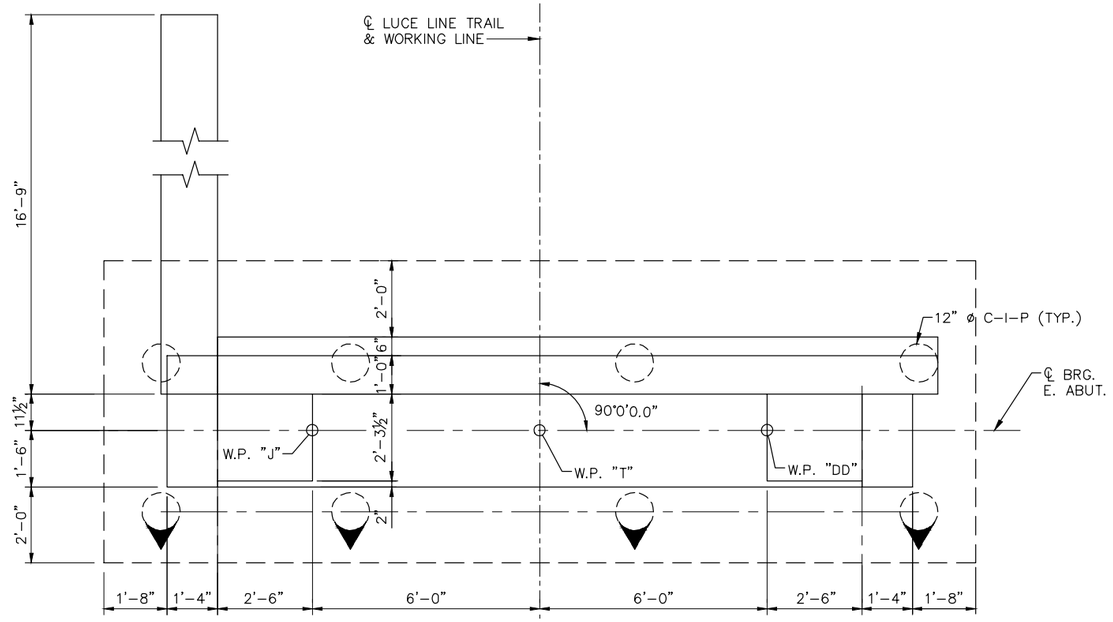
SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4B
LUCE LINE TRAIL BRIDGE
BRIDGE R0696
WEST ABUTMENT WINGWALLS

DISCIPLINE: STRUCTURES
SHEET NAME: CBR0696-BRG-ABT-003

SHEET 9 OF 39

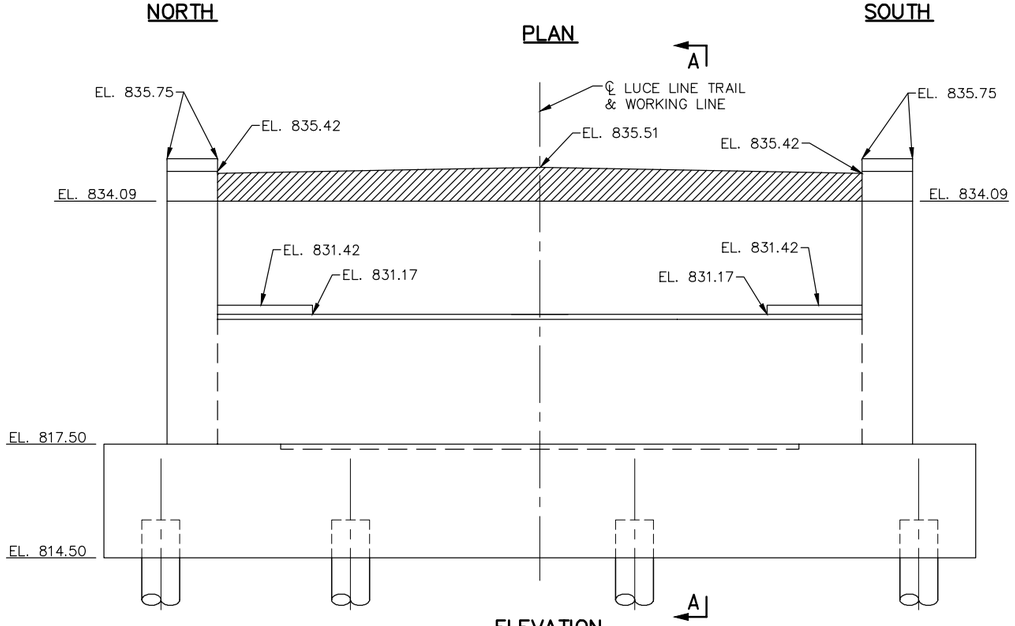
Sep, 04 2015 12:21 pm V:\3400_ADC\CAD\SEGMENT E4\PLAN SHEETS\STRUCTURES\VNWHT-TRL\CBR0696-BRG-ABT-003.dwg By: Jim.Kimble



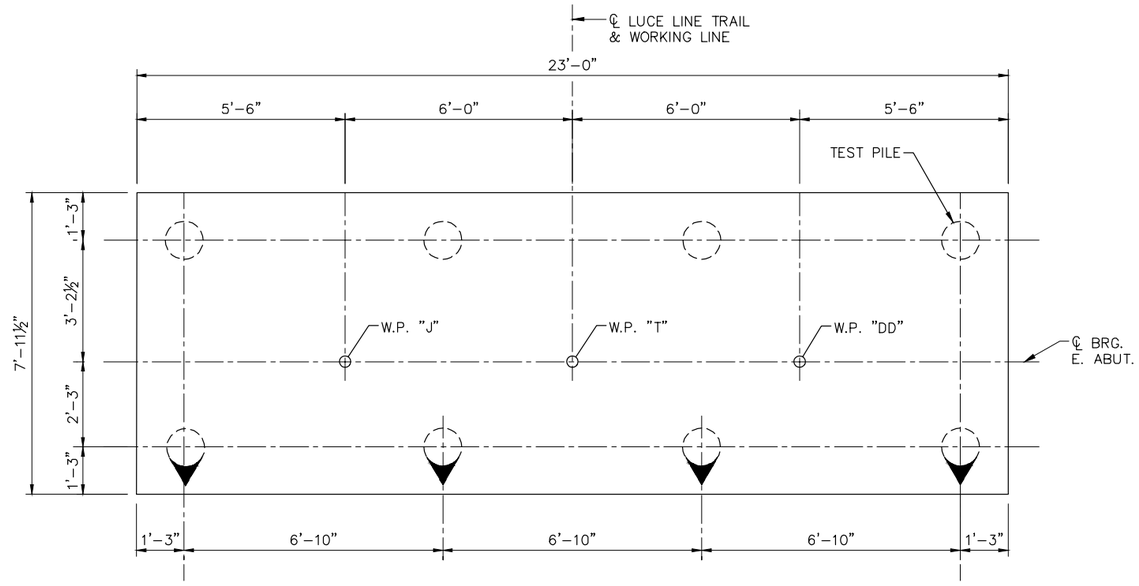
NORTH

PLAN

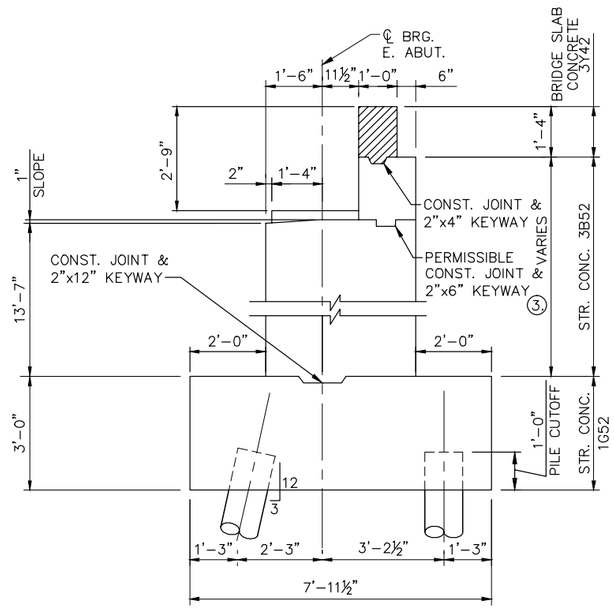
SOUTH



ELEVATION



FOOTING PLAN



SECTION A-A

COMPUTED PILE LOADS
WEST ABUTMENT - (TONS PER PILE)

DEAD LOAD + EARTH PRESSURE	
LIVE LOAD	
TOTAL LOAD	79
* DESIGN LOAD	100

EAST ABUTMENT
REQUIRED NOMINAL PILE BEARINGS
RESISTANCE FOR C-I-P Rn-Tons/Pile

FIELD CONTROL METHOD	φdyn	*Rn
MnDOT Pile Formula 2012 (MPF12) $Rn=20\sqrt{\frac{WxH}{1000}}\times\log(\frac{10}{S})$	0.50	158
PDA	0.65	122

*Rn = (Factored Design Load)/φdyn

PILE NOTES

PILES MARKED THUS ○ TO BE BATTERED 3 INCHES PER FOOT IN DIRECTION SHOWN.

PILES TO HAVE A NOMINAL DIAMETER OF 12" AND MINIMUM WALL THICKNESS OF ¼".

ALL PILES 12" DIA. CAST-IN-PLACE CONCRETE.

PILE SPACING SHOWN IS AT BOTTOM OF FOOTING.

1-12" CAST-IN-PLACE TEST PILE 102 FEET LONG.

7-12" CAST-IN-PLACE PILES ESTIMATED LENGTH 92 FEET.

8-12" CAST-IN-PLACE PILES REQ'D FOR EAST ABUTMENT.

NOTES

1. 3Y42 MIX TO BE INCLUDED IN SUPERSTRUCTURE QUANTITIES.
2. SIDES OF SHEAR KEY TO BE VERTICAL AND TOP OF SHEAR KEY TO BE LEVEL IN BOTH DIRECTIONS.
3. 3-PLY JOINT WATERPROOFING IF CONST. JOINT IS USED.

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: PDC | CHECKED BY: SAD
DRAWN BY: JJD | DATE: 08/24/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

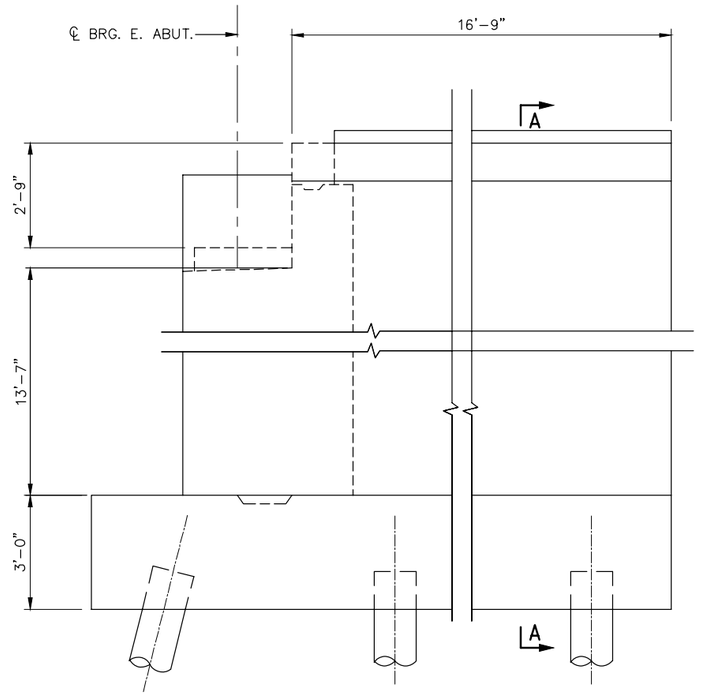
CIVIL EAST - VOLUME 4B
LUCE LINE TRAIL BRIDGE
BRIDGE R0696
E. ABUT. FOOTING PLAN AND ELEVATION

DISCIPLINE: STRUCTURES

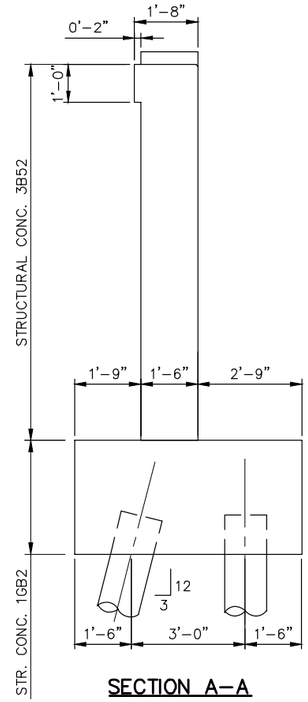
SHEET NAME: CBR0696-BRG-ABT-004

SHEET 10 OF 39

Sep, 04 2015 12:21 pm V:\3400_ADC\CAD\SEGMENT E4\PLAN SHEETS\STRUCTURES\WWHT-TRL\CBR0696-BRG-ABT-004.dwg By: Jim.Kimble



SOUTH WINGWALL ELEVATION



SECTION A-A

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: PDC | CHECKED BY: SAD
DRAWN BY: JIK | DATE: 08/24/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

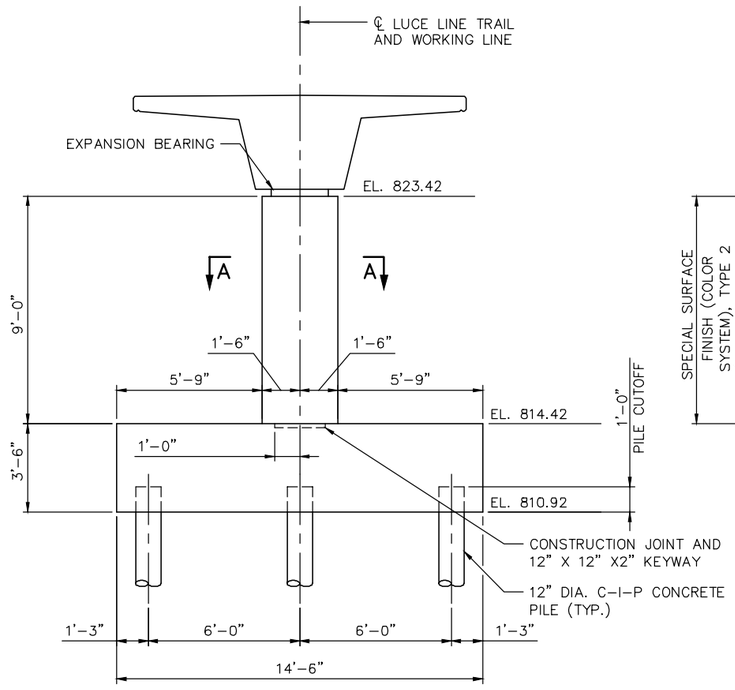
CIVIL EAST - VOLUME 4B
LUCE LINE TRAIL BRIDGE
BRIDGE R0696
EAST ABUTMENT WINGWALLS

DISCIPLINE: STRUCTURES

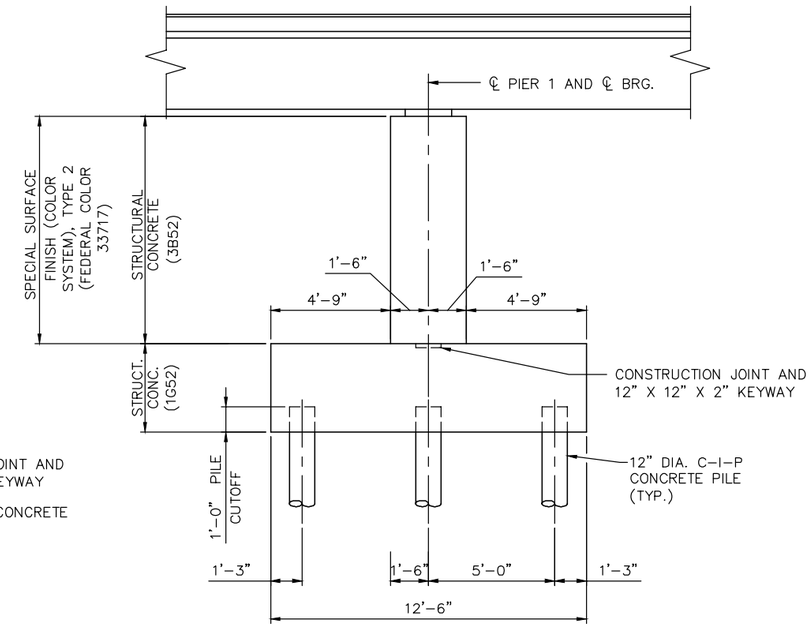
SHEET NAME: CBR0696-BRG-ABT-005

SHEET 11 OF 39

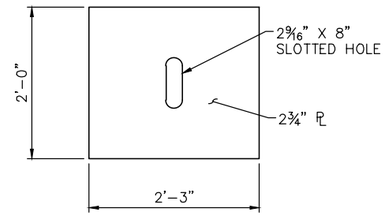
Sep. 04 2015 12:21 pm V:\3400_ADC\CAD\SEGMENT E4\PLAN SHEETS\STRUCTURES\VNWHT-TRL\CBR0696-BRG-ABT-005.dwg By: Jim.Kimble



ELEVATION



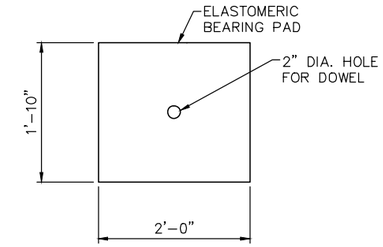
END VIEW



BEARING PLATE DETAIL

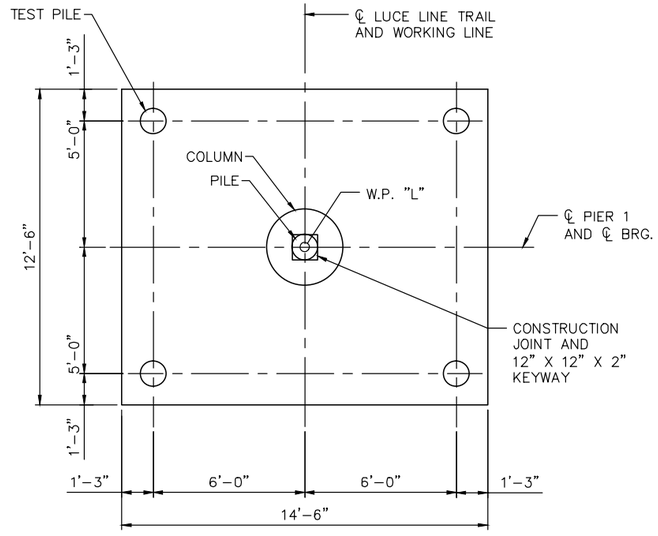
PIER 1 REQUIRED NOMINAL PILE BEARINGS RESISTANCE FOR C-I-P Rn-Tons/Pile		
FIELD CONTROL METHOD	φdyn	*Rn
MnDOT Pile Formula 2012 (MPF12) $Rn=20\sqrt{\frac{WxH}{1000}}\times\log(\frac{10}{S})$	0.50	165.2
PDA	0.65	127.1

*Rn = (Factored Design Load)/φdyn

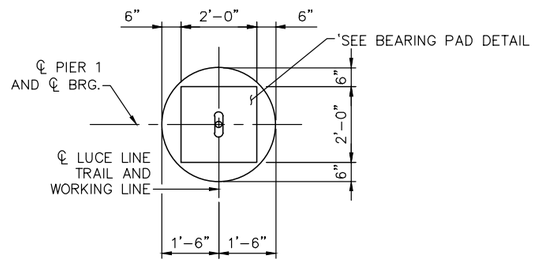


BEARING PAD DETAIL

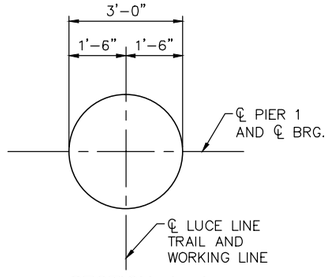
PIER 1 COMPUTED PILE LOAD - TONS/PILE	
FACTORED DEAD LOAD	15
FACTORED LIVE LOAD	10.7
FACTORED OVERTURNING	56.9
* FACTORED DESIGN LOAD = PILE BEARING RESISTANCE	82.6



FOOTING PLAN



EXPANSION BEARING PLAN VIEW



SECTION A-A

PIER 1 PILE NOTES:

ALL PILES 12" DIA. CAST-IN-PLACE CONCRETE.

PILE SPACING SHOWN IS AT BOTTOM OF FOOTING.

PILES TO HAVE A NOMINAL DIAMETER OF 12" AND A MINIMUM WALL THICKNESS OF ¼"

1 - 12" CAST-IN-PLACE TEST PILE, 106 FEET LONG.

4 - 12" CAST-IN-PLACE PILES, ESTIMATED LENGTH 96 FEET LONG.

5 - 12" CAST-IN-PLACE PILES REQUIRED AT PIER 1.

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: PDC | CHECKED BY: SAD
DRAWN BY: JIK | DATE: 08/24/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

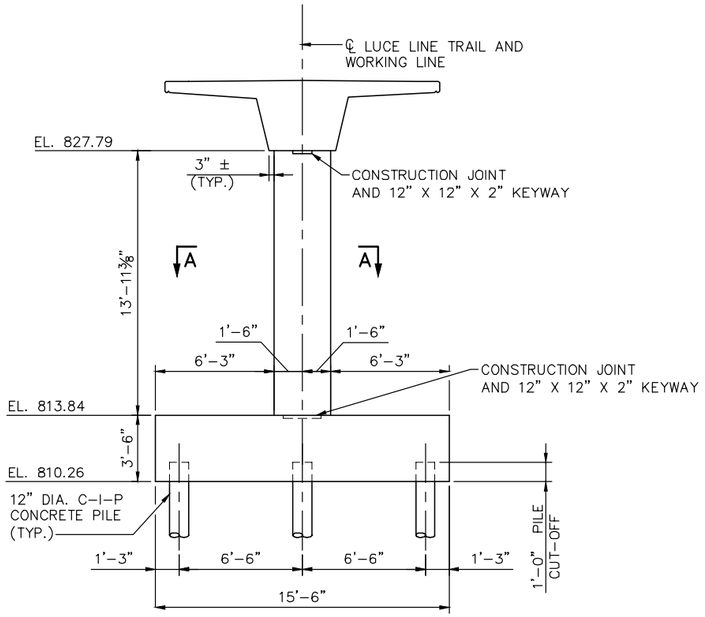
SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4B
LUCE LINE TRAIL BRIDGE
BRIDGE R0696
PIER 1 GEOMETRY

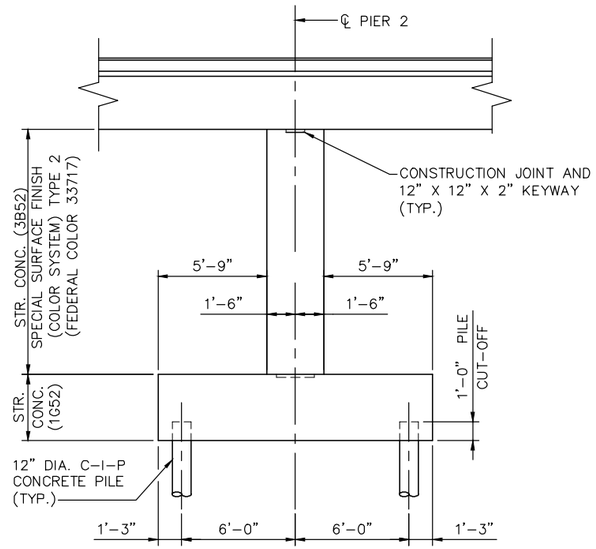
DISCIPLINE: STRUCTURES
SHEET NAME: CBR0696-BRG-PIR-001

SHEET 12 OF 39

Sep. 04 2015 12:21 pm v:\3400_ADC\CAD\SEGMENT E4\PLAN SHEETS\STRUCTURES\VNWHT-TRL\CBR0696-BRG-PIR-001.dwg By: Jim.Kimble



ELEVATION

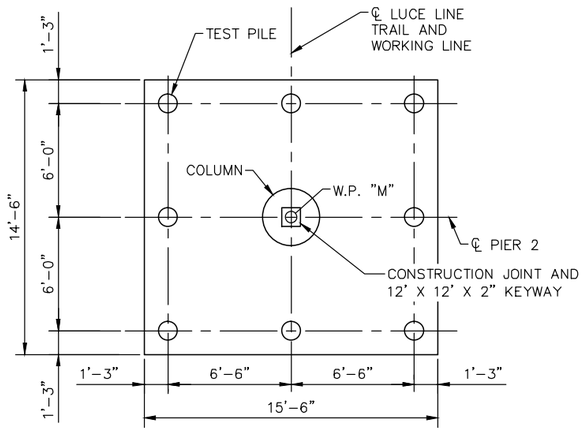


END VIEW

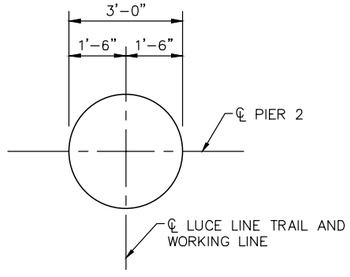
PIER 2 REQUIRED NOMINAL PILE BEARINGS RESISTANCE FOR C-I-P Rn-Tons/Pile		
FIELD CONTROL METHOD	φdyn	*Rn
MnDOT Pile Formula 2012 (MPF12) $Rn=20\sqrt{\frac{WxH}{1000}}\times\log(\frac{10}{S})$	0.50	166.8
PDA	0.65	128.3

*Rn = (Factored Design Load)/φdyn

PIER 2	
COMPUTED PILE LOAD - TONS/PILE	
FACTORED DEAD LOAD	36.8
FACTORED LIVE LOAD	19.6
FACTORED OVERTURNING	27.0
* FACTORED DESIGN LOAD = PILE BEARING RESISTANCE	83.4



FOOTING PLAN



SECTION A-A

PIER 2 PILE NOTES:

ALL PILES 12" DIA. CAST-IN-PLACE CONCRETE PILES.

PILE SPACING SHOWN IS AT BOTTOM OF FOOTING.

PILES TO HAVE A NOMINAL DIAMETER OF 12" AND A MINIMUM WALL THICKNESS OF ¼"

1 - 12" CAST-IN-PLACE TEST PILE, 102 FEET LONG.

7 - 12" CAST-IN-PLACE PILES, ESTIMATED LENGTH 92 FEET LONG.

8 - 12" CAST-IN-PLACE PILES REQUIRED AT PIER 2.

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: PDC | CHECKED BY: SAD
DRAWN BY: JIK | DATE: 08/24/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

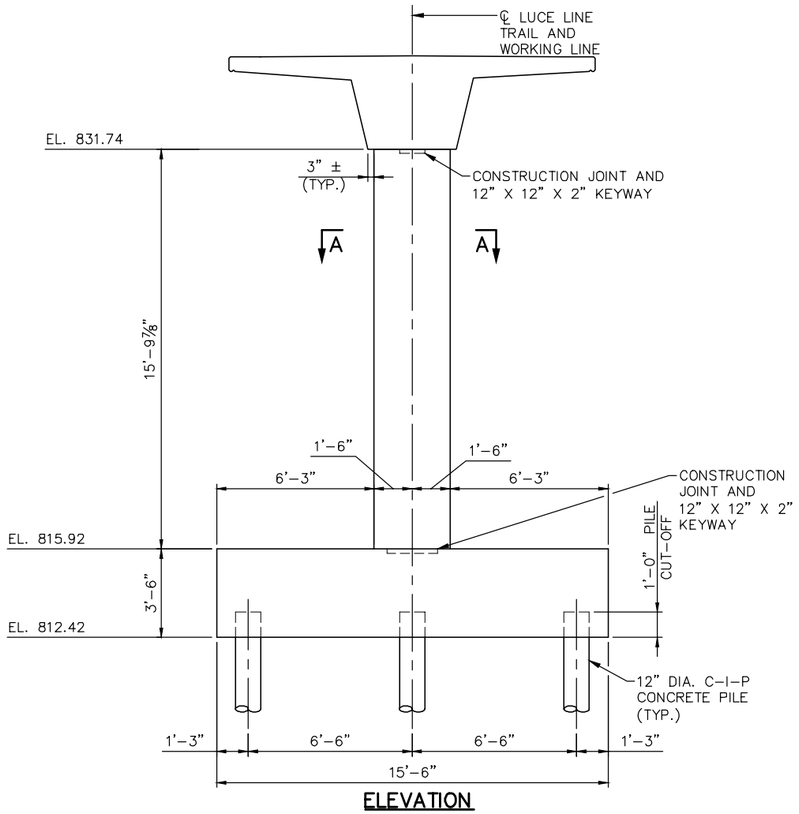
SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4B
LUCE LINE TRAIL BRIDGE
BRIDGE R0696
PIER 2 GEOMETRY

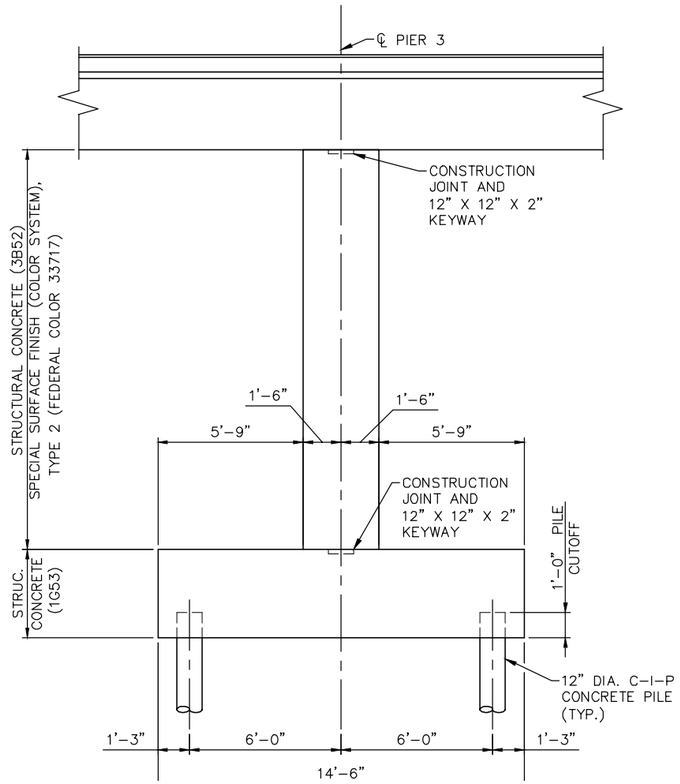
DISCIPLINE: STRUCTURES
SHEET NAME: CBR0696-BRG-PIR-002

SHEET 13 OF 39

Sep. 04 2015 12:22 pm V:\3400_ADC\CAD\SEGMENT E4\PLAN SHEETS\STRUCTURES\VN\WHT-TRL\CBR0696-BRG-PIR-002.dwg By: Jim.Kimble



ELEVATION

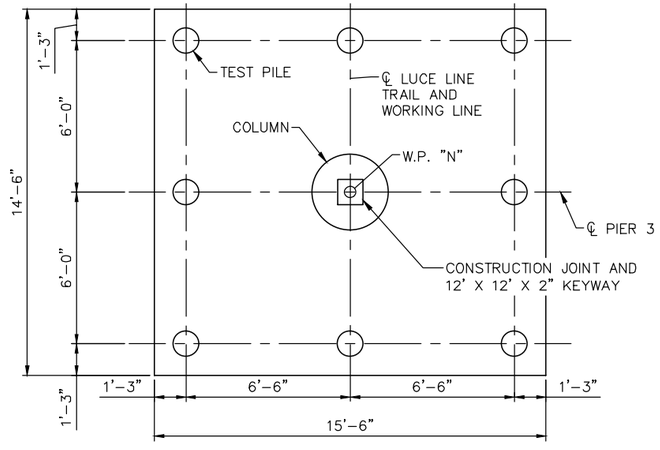


END VIEW

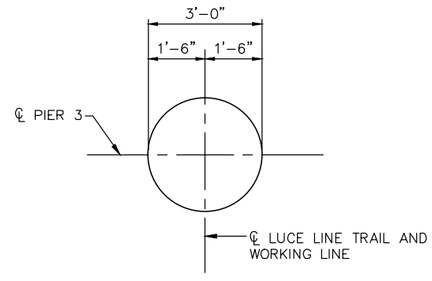
PIER 3 REQUIRED NOMINAL PILE BEARINGS RESISTANCE FOR C-I-P Rn-Tons/Pile		
FIELD CONTROL METHOD	φdyn	*Rn
MnDOT Pile Formula 2012 (MPF12) $Rn=20\sqrt{\frac{WxH}{1000}}\times\log(\frac{10}{S})$	0.50	193.9
PDA	0.65	149.1

*Rn = (Factored Design Load)/φdyn

PIER 3	
COMPUTED PILE LOAD - TONS/PILE	
FACTORED DEAD LOAD	36.7
FACTORED LIVE LOAD	12.5
FACTORED OVERTURNING	47.7
* FACTORED DESIGN LOAD = PILE BEARING RESISTANCE	96.9



FOOTING PLAN



SECTION A-A

PIER 3 PILE NOTES:

ALL PILES 12" DIA. CAST-IN-PLACE CONCRETE.

PILE SPACING SHOWN IS AT BOTTOM OF FOOTING.

PILES TO HAVE A NOMINAL DIAMETER OF 12" AND A MINIMUM WALL THICKNESS OF ¼"

1 - 12" CAST-IN-PLACE TEST PILE, 104 FEET LONG.

7 - 12" CAST-IN-PLACE PILES, ESTIMATED LENGTH 94 FEET LONG.

8 - 12" CAST-IN-PLACE PILES REQUIRED AT PIER 3.

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: PDC | CHECKED BY: SAD
DRAWN BY: JIK | DATE: 08/24/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

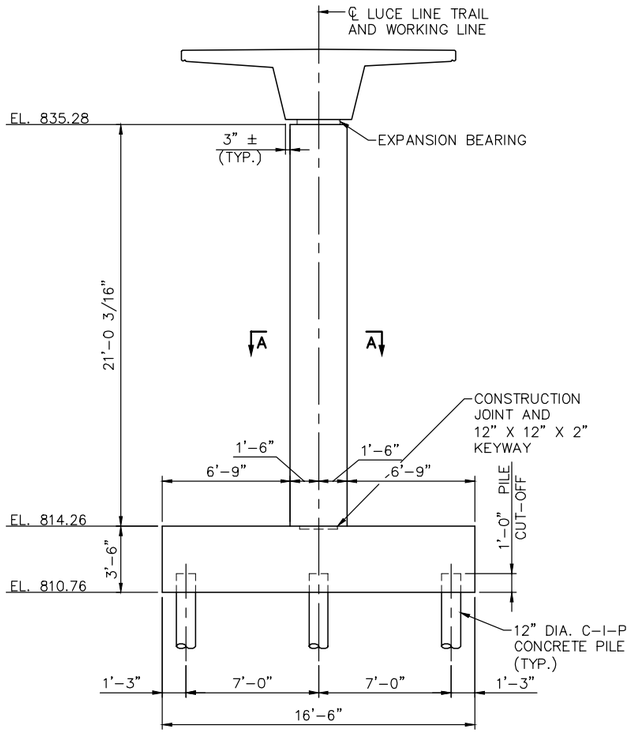
SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4B
LUCE LINE TRAIL BRIDGE
BRIDGE R0696
PIER 3 GEOMETRY

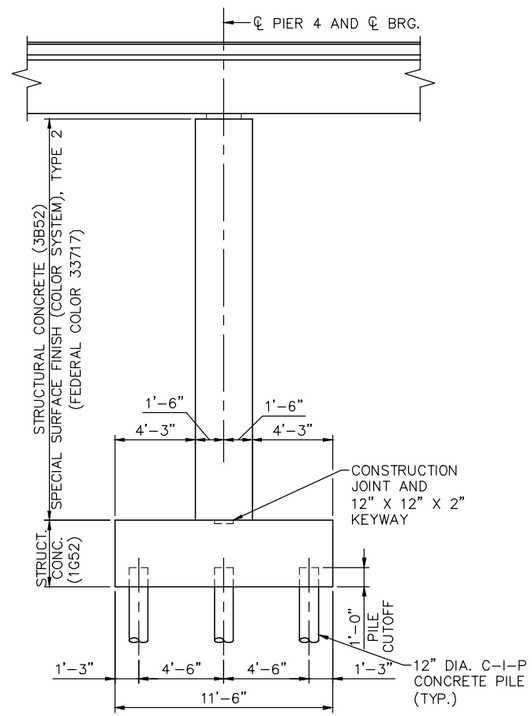
DISCIPLINE: STRUCTURES

SHEET NAME: CBR0696-BRG-PIR-003

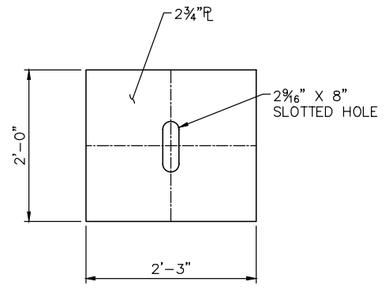
SHEET 14 OF 39



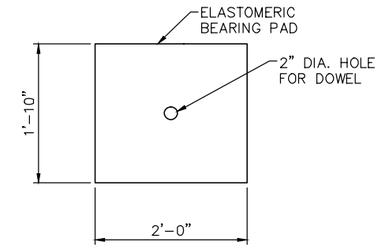
ELEVATION



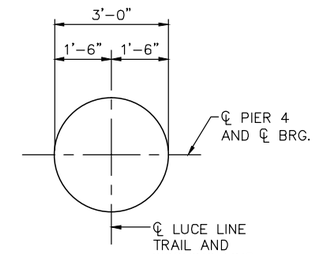
END VIEW



BEARING PLATE DETAIL



BEARING PAD DETAIL

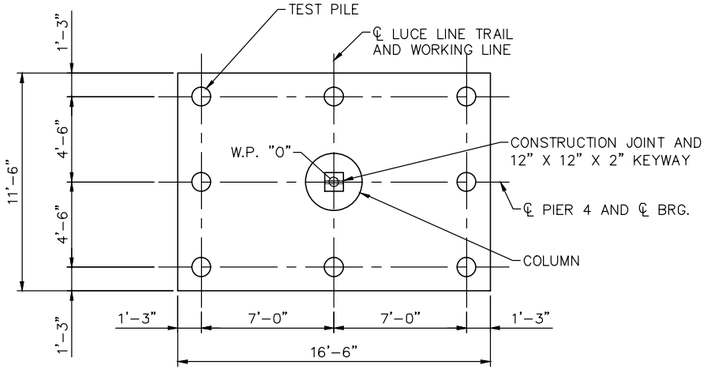


SECTION A–A

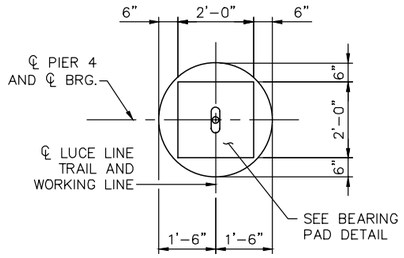
PIER 4 REQUIRED NOMINAL PILE BEARINGS RESISTANCE FOR C–I–P Rn–Tons/Pile		
FIELD CONTROL METHOD	φdyn	*Rn
MnDOT Pile Formula 2012 (MPF12) $Rn=20\sqrt{\frac{WxH}{1000}}\times\log(\frac{10}{s})$	0.50	178.9
PDA	0.65	136.7

*Rn = (Factored Design Load)/φdyn

PIER 4	
COMPUTED PILE LOAD - TONS/PILE	
FACTORED DEAD LOAD	44.9
FACTORED LIVE LOAD	0
FACTORED OVERTURNING	44.5
* FACTORED DESIGN LOAD = PILE BEARING RESISTANCE	89.4



FOOTING PLAN



EXPANSION BEARING PLAN VIEW

PIER 4 PILE NOTES:

ALL PILES 12" DIA. CAST–IN–PLACE CONCRETE.

PILE SPACING SHOWN IS AT BOTTOM OF FOOTING.

PILES TO HAVE A NOMINAL DIAMETER OF 12" AND A MINIMUM WALL THICKNESS OF ¼".

1–CAST–IN–PLACE TEST PILE, 108 FEET LONG.

7–CAST–IN–PLACE PILES, ESTIMATED LENGTH 98 FEET.

8–CAST–IN–PLACE PILES REQUIRED FOR PIER 4.

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: PDC | CHECKED BY: SAD
DRAWN BY: JIK | DATE: 08/24/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

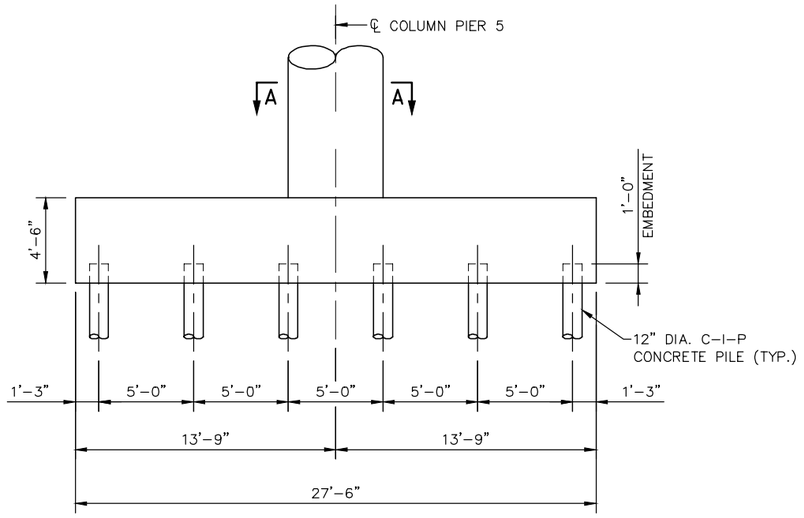
SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4B
LUCE LINE TRAIL BRIDGE
BRIDGE R0696
PIER 4 GEOMETRY

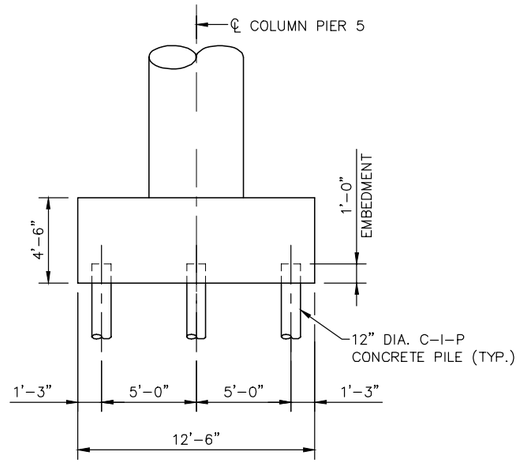
DISCIPLINE: STRUCTURES
SHEET NAME: CBR0696-BRG-PIR-004

SHEET 15 OF 39

Sep. 04 2015 12:22 pm V:\3400_ADC\CAD\SEGMENT E4\PLAN SHEETS\STRUCTURES\VNWHT-TRL\CBR0696-BRG-PIR-004.dwg By: Jim.Kimble



ELEVATION B–B



ELEVATION C–C

PIER 5 REQUIRED NOMINAL PILE BEARINGS RESISTANCE FOR C-I-P PILES Rn-Tons/Pile		
FIELD CONTROL METHOD	φdyn	*Rn
MnDOT Pile Formula 2012 (MPF12) $Rn=20\sqrt{\frac{WxH}{1000}}\times\log(\frac{10}{s})$	0.50	151.0
PDA	0.65	116.2

*Rn = (Factored Design Load)/φdyn

PIER 5	
COMPUTED PILE LOAD – TONS/PILE	
FACTORED DEAD LOAD	18.0
FACTORED LIVE LOAD	0
FACTORED OVERTURNING	57.5
* FACTORED DESIGN LOAD = PILE BEARING RESISTANCE	75.5

PIER 5 PILE NOTES:

ALL PILES 12" DIA. CAST-IN-PLACE CONCRETE.

PILE SPACING SHOWN IS AT BOTTOM OF FOOTING.

PILES HAVE A NOMINAL DIAMETER OF 12" AND A MINIMUM WALL THICKNESS OF ¼"

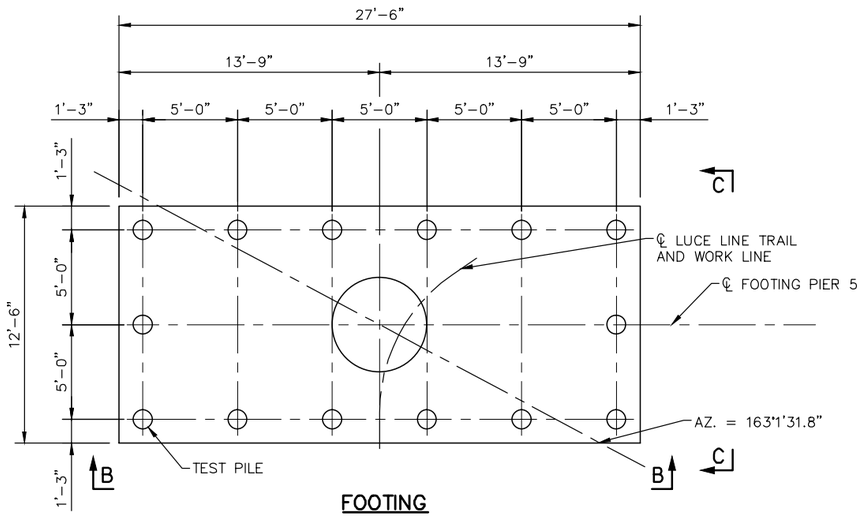
1 - 12" CAST-IN-PLACE TEST PILE, 112 FEET LONG.

13 - 12" CAST-IN-PLACE PILES, ESTIMATED LENGTH 102 FEET LONG.

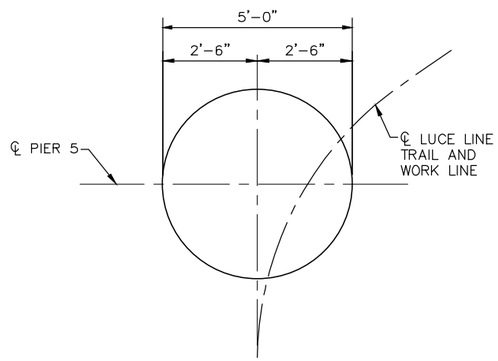
14 - 12" CAST-IN-PLACE PILES REQUIRED AT PIER 3.

(1) ELEVATIONS SHOWN ARE ESTIMATED ONLY. CONTRACTOR SHALL VERIFY ELEVATIONS BASED ON PREMANUFACTURED TRUSS GEOMETRY AND TRUSS BEARING ASSEMBLIES.

(2) ℄ BEARING FOR PREMANUFACTURED TRUSS SHALL BE VERIFIED BY CONTRACTOR.



FOOTING



SECTION A–A

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: PDC | CHECKED BY: SAD
DRAWN BY: JIK | DATE: 08/24/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

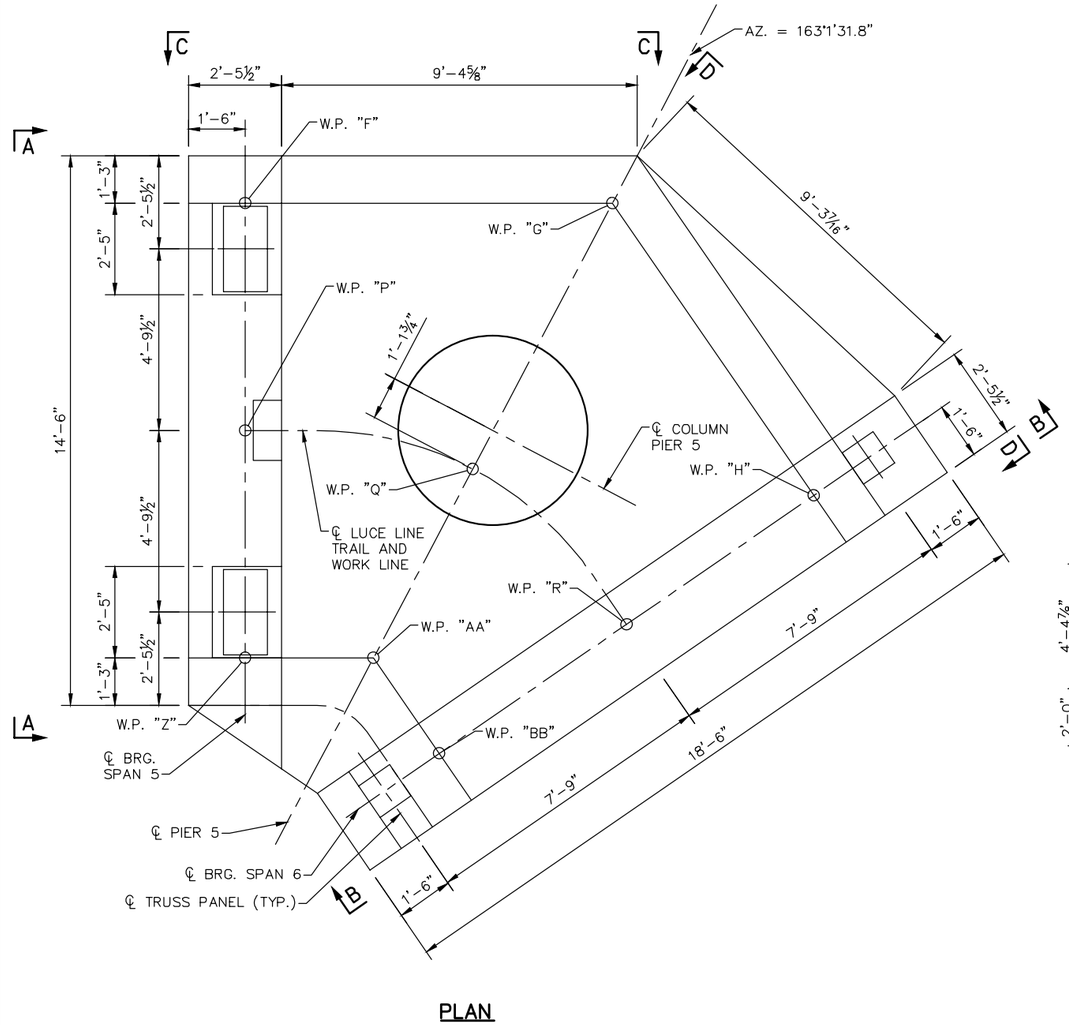
CIVIL EAST - VOLUME 4B
LUCE LINE TRAIL BRIDGE
BRIDGE 0696
PIER 5 GEOMETRY 1

DISCIPLINE: STRUCTURES

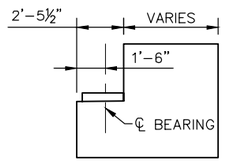
SHEET NAME: CBR0696-BRG-PIR-005

SHEET 16 OF 39

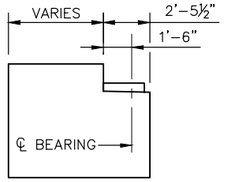
Sep. 04 2015 12:22 pm V:\3400_ADC\CAD\SEGMENT E4\PLAN SHEETS\STRUCTURES\VNWHT-TRL\CBR0696-BRG-PIR-005.dwg By: Jim.Kimble



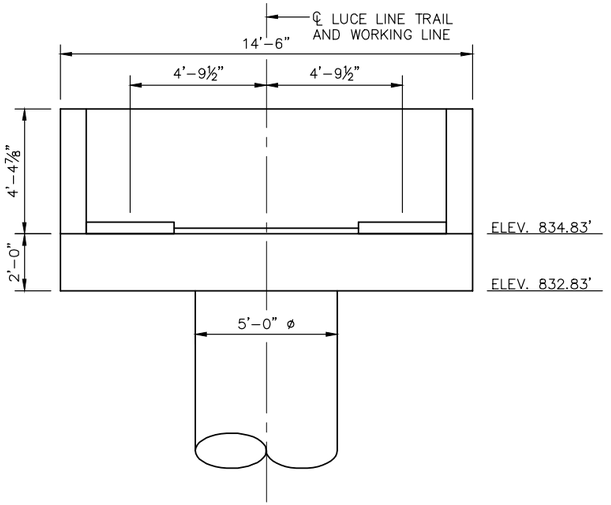
PLAN



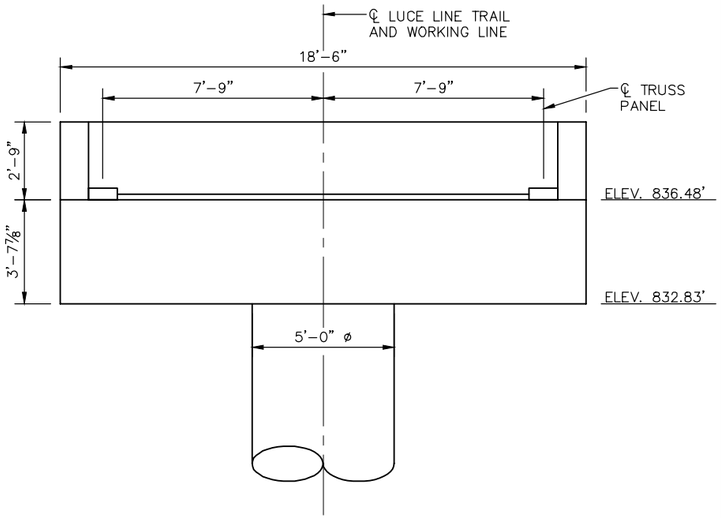
SECTION C–C



SECTION D–D



VIEW A–A



VIEW B–B

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: PDC | CHECKED BY: SAD
DRAWN BY: JIK | DATE: 08/24/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

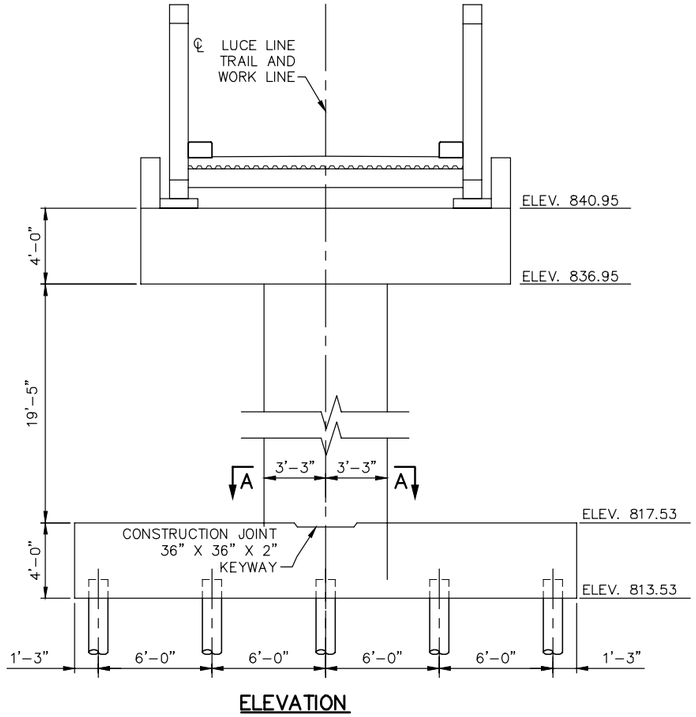
SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4B
LUCE LINE TRAIL BRIDGE
BRIDGE R0696
PIER 5 GEOMETRY 2

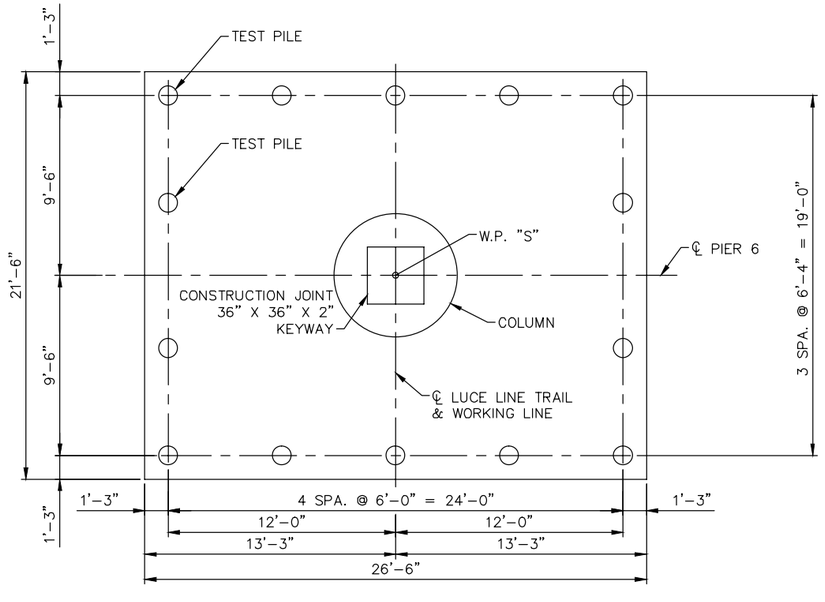
DISCIPLINE: STRUCTURES
SHEET NAME: CBR0696-BRG-PIR-006

SHEET 17 OF 39

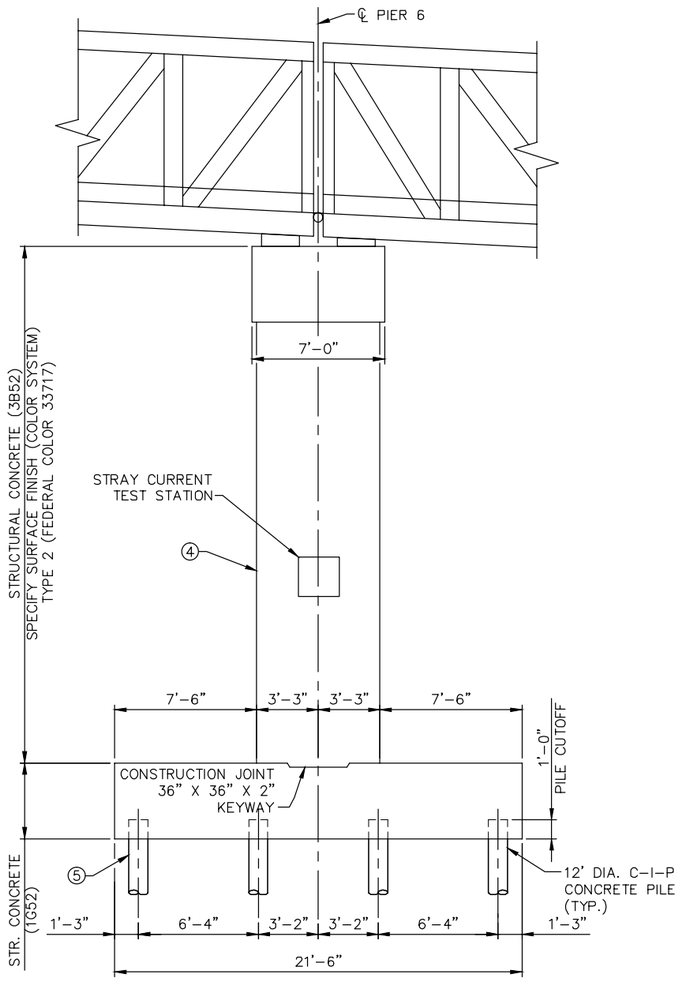
Sep. 04 2015 12:23 pm v:\3400_ADC\CAD\SEGMENT E4\PLAN SHEETS\STRUCTURES\VAIWHT-TRL\CBR0696-BRG-PIR-006.dwg By: Jim.Kimble



ELEVATION



FOOTING PLAN

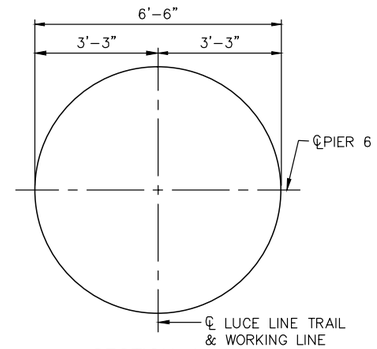


END VIEW

PIER 6 REQUIRED NOMINAL PILE BEARINGS RESISTANCE FOR C-I-P Rn-Tons/Pile		
FIELD CONTROL METHOD	φdyn	*Rn
MnDOT Pile Formula 2012 (MPF12) $Rn=20\sqrt{\frac{WxH}{1000}}\times\log(\frac{10}{S})$	0.50	141
PDA	0.65	108.4

*Rn = (Factored Design Load)/φdyn

PIER 6	
COMPUTED PILE LOAD – TONS/PILE	
FACTORED DEAD LOAD	24.5
FACTORED LIVE LOAD	4.2
FACTORED OVERTURNING	41.8
* FACTORED DESIGN LOAD = PILE BEARING RESISTANCE	70.5



SECTION A-A

NOTES:

1. ELEVATIONS SHOWN ARE ESTIMATED ONLY. CONTRACTOR SHALL VERIFY ELEVATIONS BASED ON PREMANUFACTURED TRUSS GEOMETRY AND TRUSS BEARING ASSEMBLIES.
2. ℄ BEARING FOR PREMANUFACTURED TRUSS SHALL BE VERIFIED BY CONTRACTOR.
3. EPOXY COATED REBAR BEING USED. NO SPECIAL STRAY CURRENT CORROSION CONTROL MEASURES REQUIRED.
4. AT PIER 6 ELECTRICALLY CONTINUOUS BLACK REBAR SHALL BE INSTALLED IN THE COLUMN AND FOOTING.
5. AT PIER 6 THE PILES IN THE FOOTING SHALL BE WELDED TO THE REBAR IN THE FOOTING.

PIER 6 PILE NOTES:

ALL PILES 12" DIA. CAST-IN-PLACE CONCRETE.

PILE SPACING SHOWN IS AT BOTTOM OF FOOTING.

PILES TO HAVE A NOMINAL DIAMETER OF 12" AND A MINIMAL WALL THICKNESS OF 4"

1-12" CAST-IN-PLACE TEST PILE, 98 FEET LONG.

13-12" CAST-IN-PLACE PILES, ESTIMATED LENGTH 88 FEET.

14-CAST-IN-PLACE PILES REQUIRED FOR PIER 6.

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: PDC | CHECKED BY: SAD
DRAWN BY: JIK | DATE: 08/24/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

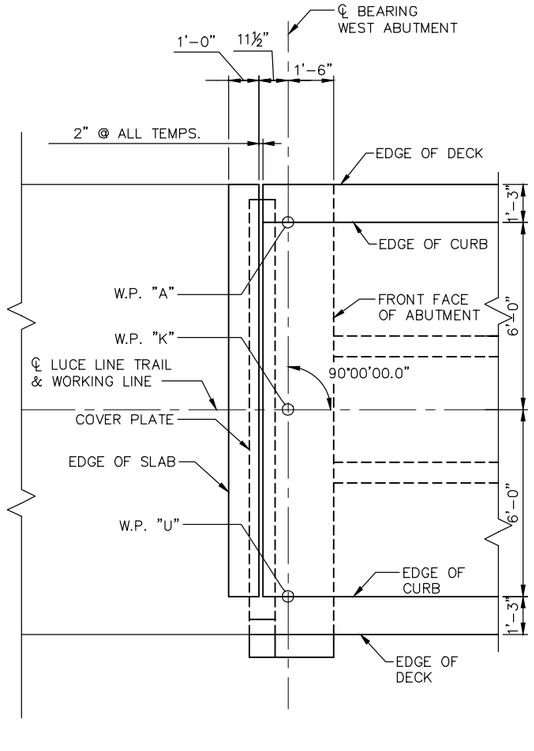
SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4B
LUCE LINE TRAIL BRIDGE
BRIDGE R0696
PIER 6 GEOMETRY

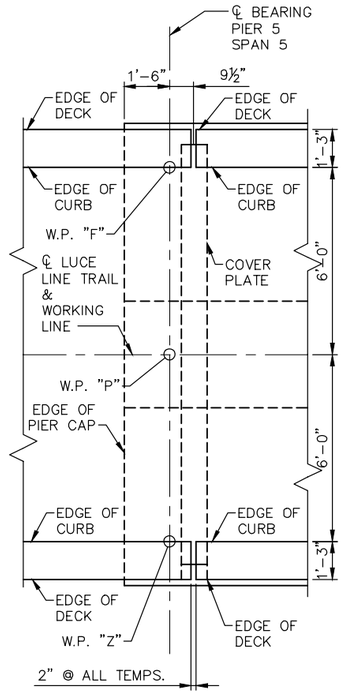
DISCIPLINE: STRUCTURES
SHEET NAME: CBR0696-BRG-PIR-007

SHEET 18 OF 39

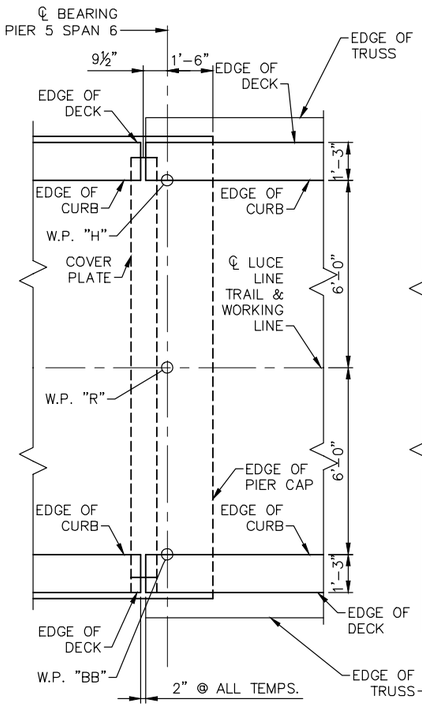
Sep. 04 2015 12:23 pm V:\3400_ADC\CAD\SEGMENT E4\PLAN SHEETS\STRUCTURES\VNWHT-TRL\CBR0696-BRG-PIR-007.dwg By: Jim.Kimble



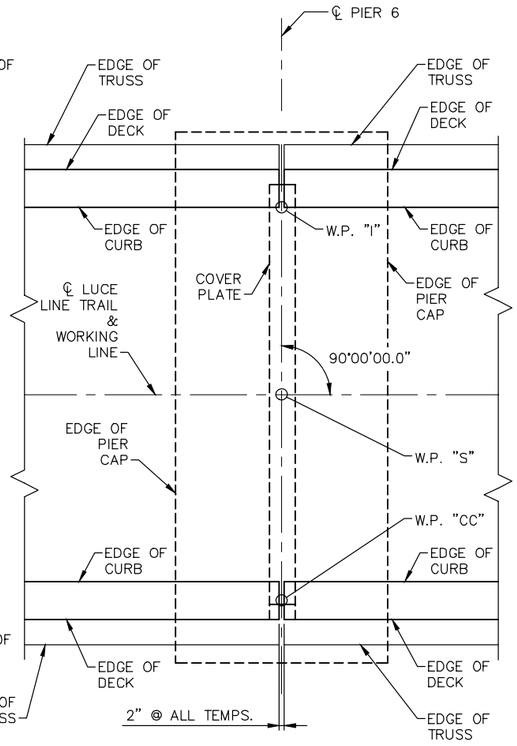
WEST ABUTMENT DETAIL

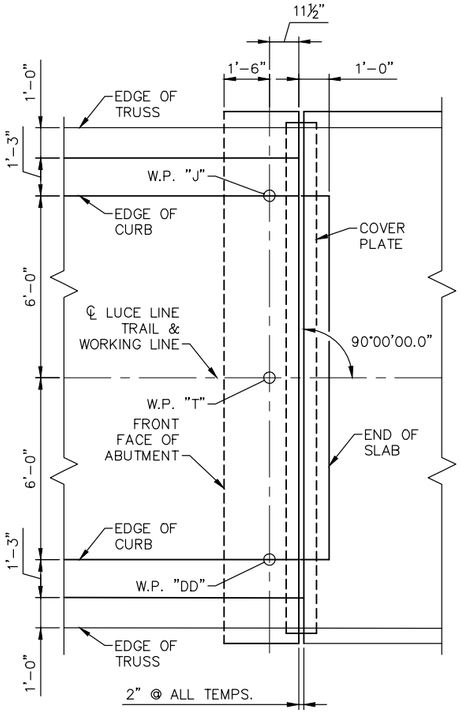


PIER 5 DETAIL



PIER 6 DETAIL





EAST ABUTMENT DETAIL

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: PDC | CHECKED BY: SAD
DRAWN BY: JIK | DATE: 08/24/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

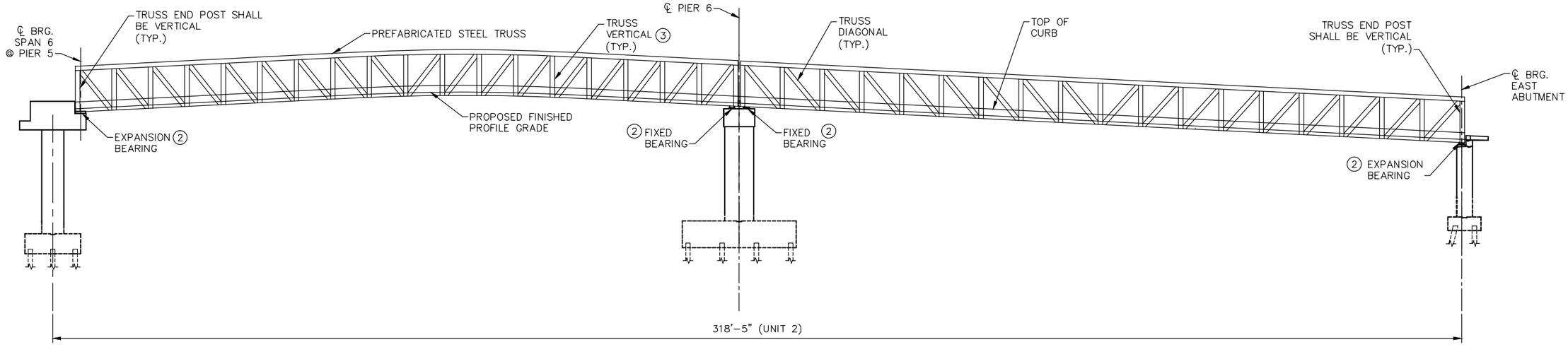
CIVIL EAST - VOLUME 4B
LUCE LINE TRAIL BRIDGE
BRIDGE R0696
CORNER DETAILS

DISCIPLINE: STRUCTURES

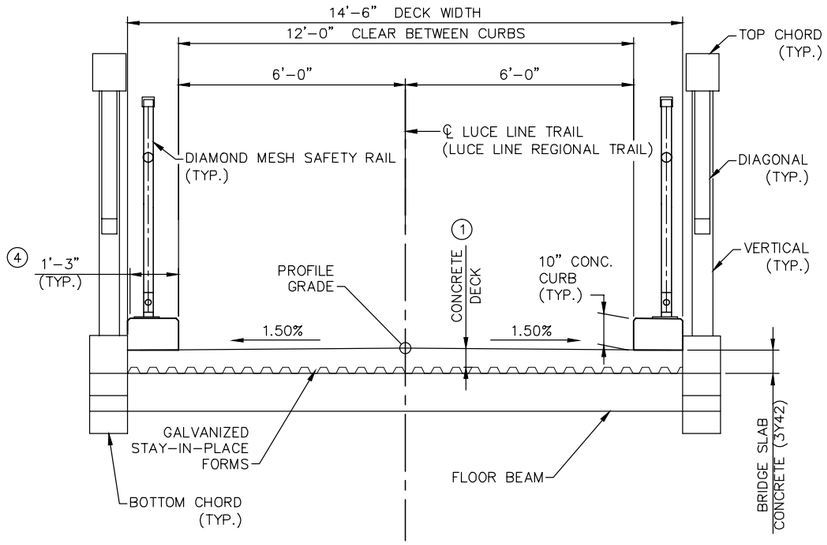
SHEET NAME: CBR0696-BRG-SUP-002

SHEET 19 OF 39

Sep. 04 2015 12:23 pm V:\3400_ADC\CAD\SEGMENT E4\PLAN SHEETS\STRUCTURES\VNWHT-TRL\CBR0696-BRG-SUP-002.dwg By: Jim.Kimble



PREFABRICATED TRUSS ELEVATION



NOTES:

TRUSS MEMBERS AND RAILING SHALL BE FABRICATED FROM HIGH STRENGTH, LOW ALLOY, ENHANCED ATMOSPHERIC CORROSION RESISTANT ASTM A847 COLD-FORMED WELDED SQUARE AND RECTANGULAR TUBING AND MISCELLANEOUS PARTS SHALL BE FABRICATED FROM ASTM A588, ASTM A606, OR ASTM A242 PLATE, BAR AND STRUCTURAL SHAPES (Fy=50,000 PSI).

MAXIMUM TRUSS BEARING LOADS SHOWN IN THE TABLE WERE ASSUMED BASED ON PRE-BID COORDINATION WITH PREFABRICATED STEEL TRUSS MANUFACTURES. UNFACTORED LOADS ARE SHOWN.

DESIGN SHALL BE IN ACCORDANCE WITH 2014 AND CURRENT INTERIM AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS AND 2009 LRFD GUIDE SPECIFICATIONS FOR THE DESIGN OF PEDESTRIAN BRIDGES.

THE BID ITEM "PEDESTRIAN BRIDGE (SUPERSTRUCTURE)" INCLUDES ALL DESIGN MATERIALS, FABRICATION, STRUCTURAL STEEL INSPECTION, DELIVERY, LABOR AND INSTALLATION FOR THE PREFABRICATED STEEL TRUSS INCLUDING THE ORNAMENTAL METAL RAIL, HANDRAIL, BEARINGS, GALVANIZED FORM DECKING, CONCRETE DECK WITH REINFORCEMENT AND CURB REINFORCEMENT COMPLETE IN PLACE.

BRIDGE REACTIONS USED FOR SUBSTRUCTURE DESIGN

COMBINE REACTIONS AS PER 2014 AND CURRENT INTERIM AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS AND 2009 LRFD GUIDE SPECIFICATIONS FOR THE DESIGN OF PEDESTRIAN BRIDGES.

REACTIONS ARE NOT TO BE EXCEEDED WITHOUT APPROVAL BY THE ENGINEER SEALING THESE BRIDGE PLANS. LOADS ARE UNFACTORED.

SPAN 6			
LOAD	P (LBS)	H (LBS)	L (LBS)
DEAD	65,825		
UNIFORM LIVE	48,725		
VEHICLE LIVE	10,000		
WIND UPLIFT (20 psf)	-18,565		
WIND +/- 19.195	± 17,975	35,190	
THERMAL			9,875

SPAN 7			
LOAD	P (LBS)	H (LBS)	L (LBS)
DEAD	83,075		
UNIFORM LIVE	51,585		
VEHICLE LIVE	10,000		
WIND UPLIFT (20 psf)	19,650		
WIND +/- 19.195	± 19,195	37,255	
THERMAL			6,255

"P" – VERTICAL LOAD EACH BASE PLATE (4 PER SPANS 5&6) "H" – + DOWNWARD LOAD
HORIZONTAL LOAD EACH BASE PLATE (2 PER SPANS 5&6) "L" – – UPWARD LOAD
LONGITUDINAL LOAD EACH BASE PLATE (4 PER SPAN 5&6)

ALL STRUCTURAL TUBING SHALL BE EITHER WATER TIGHT OR DESIGNED SO THAT MOISTURE IS NOT TRAPPED IN TUBES, SUCH AS MIN. ⅜" WEEP HOLES AT BOTH ENDS OF TUBES.

ANCHOR ROD DESIGN & DETERMINATION OF LOCATIONS AT THE PIERS WILL BE DETERMINED BY THE PREFABRICATED STEEL TRUSS MANUFACTURER AND CONTRACTOR SHALL COORDINATE REINFORCEMENT PLACEMENT/ADJUSTMENT IN PIER CAPS AS APPROVED BY ENGINEER IN FIELD.

BEARINGS AT PIER 6 SHALL BE FIXED AND BEARINGS AT PIER 5 AND EAST ABUTMENT SHALL BE EXPANSION.

ANCHOR RODS FOR THE TRUSS SHALL COMPLY WITH SPEC. 3385 TYPE C, AND GALVANIZED PER SPEC. 3392.

HARDWARE SHALL BE GALVANIZED PER SPEC 3392, AND STRUCTURAL BOLTS SHALL MEET ASTM A325, TYPE 1, MECHANICALLY GALVANIZED.

(1) PREFABRICATED STEEL TRUSS MANUFACTURER SHALL DESIGN THE CONCRETE DECK ON THE PREFABRICATED STEEL TRUSS AND TRANSVERSE AND LONGITUDINAL DECK REINFORCEMENT. THE DECK REINFORCING, (5) NO. 4 LONGITUDINAL CURB REINFORCEMENT BAR PER CURB, AND NO. 4 BENT TIES IN EACH CURB TO MATCH TRANSVERSE DECK BAR SPACING FOR THE CONCRETE DECK ON THE PREFABRICATED STEEL TRUSS SHALL BE FURNISHED AND INSTALLED BY THE CONTRACTOR.

(2) SEE ABUTMENT AND PIER DETAILS SHEETS FOR BEARING SEAT ELEVATIONS.

(3) TRUSS VERTICALS SHALL BE UNIFORMLY SPACED ALONG LENGTH OF BRIDGE WITH A MAXIMUM SPACING OF 8'-0".

(4) MAINTAIN 1'-3" WIDE CONCRETE CURB FULL LENGTH OF TRUSS INCLUDING AT END POSTS.

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: PDC | CHECKED BY: SAD
DRAWN BY: JIK | DATE: 08/24/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

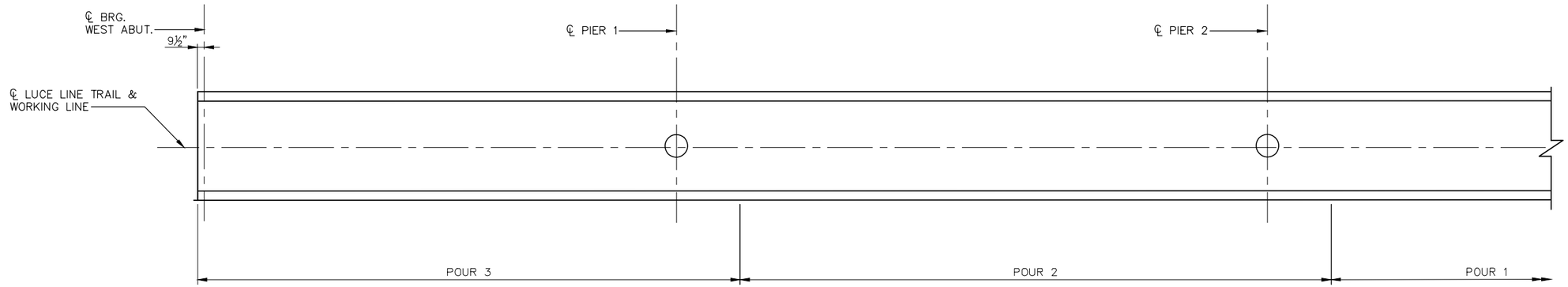
SOUTHWEST Green Line LRT Extension

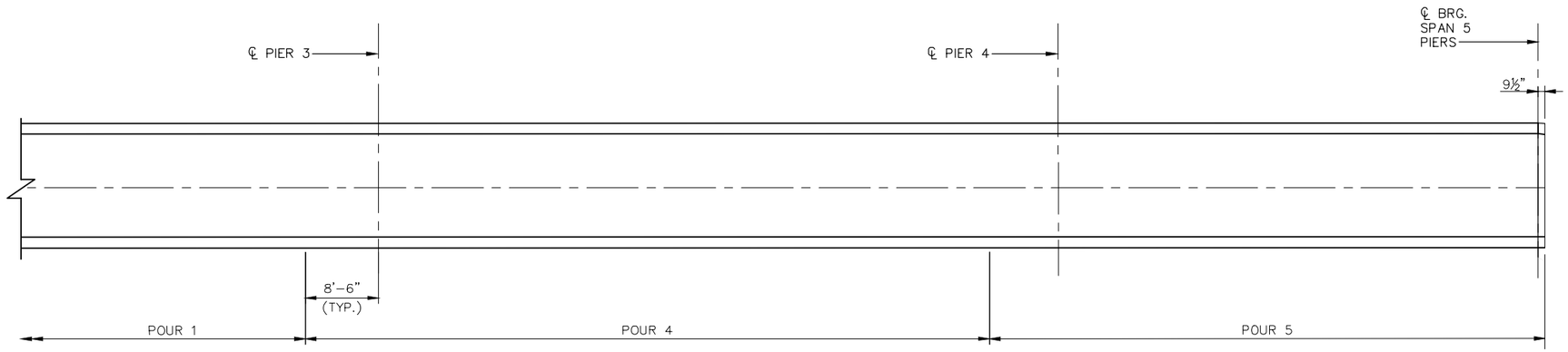
CIVIL EAST - VOLUME 4B
LUCE LINE TRAIL BRIDGE
BRIDGE R0696
MAIN SPAN PREFABRICATED TRUSS

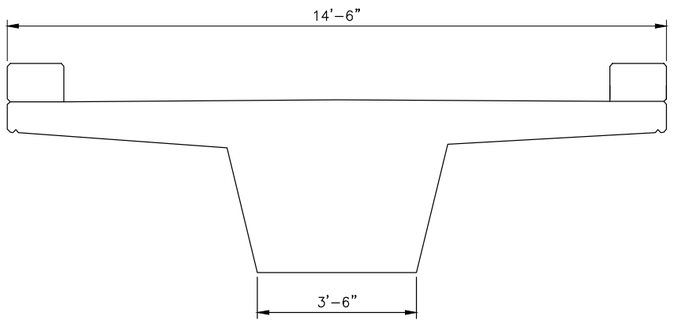
DISCIPLINE: STRUCTURES
SHEET NAME: CBR0696-BRG-SUP-003

SHEET 20 OF 39

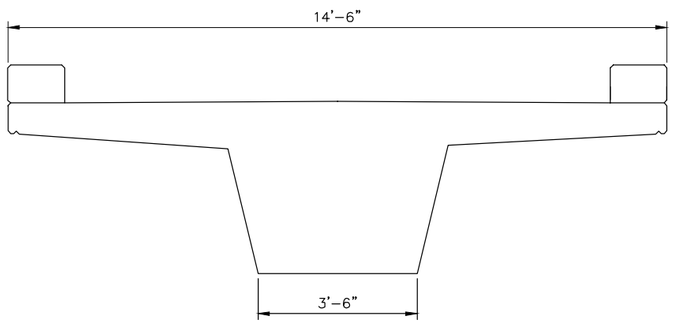
Sep, 04 2015 12:23 pm v:\3400_ADC\CAD\SEGMENT E4\PLAN SHEETS\STRUCTURES\NWHT-TRL\CBR0696-BRG-SUP-003.dwg By: Jim.Kimble







TYPICAL MIDSPAN SECTION



TYPICAL PIER SECTION

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: PDC | CHECKED BY: SAD
DRAWN BY: JIK | DATE: 08/24/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

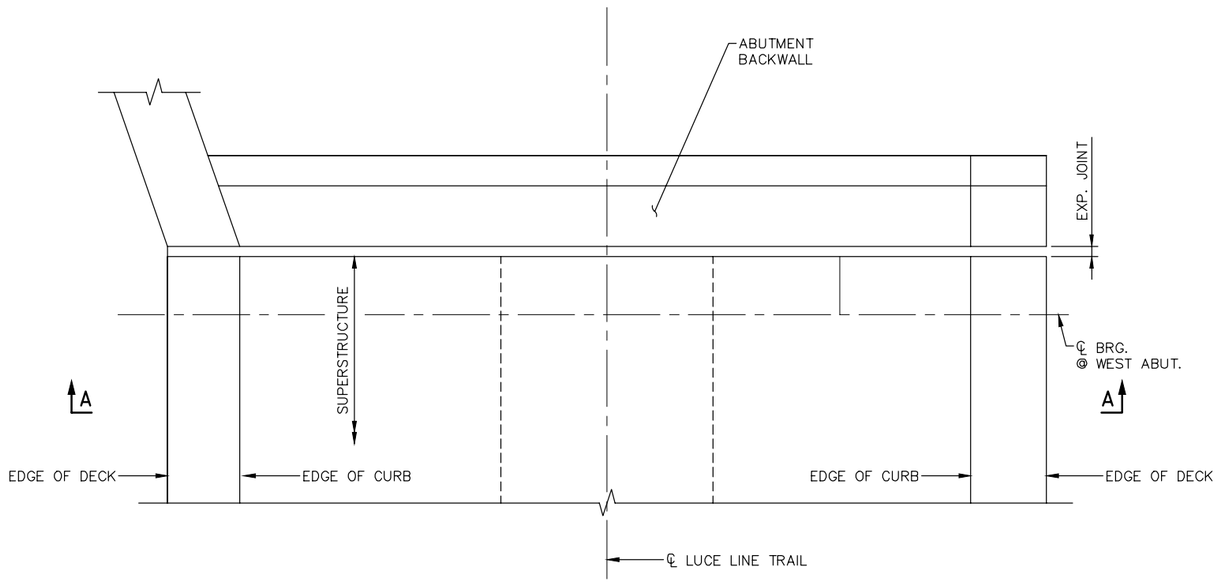
SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4B
LUCE LINE TRAIL BRIDGE
BRIDGE R0696
SUPERST. REINF. UNIT 1 & POUR SEQUENCE

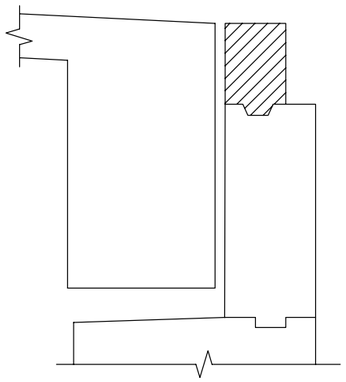
DISCIPLINE: STRUCTURES
SHEET NAME: CBR0696-BRG-SUP-004

SHEET 21 OF 39

Sep. 04 2015 12:24 pm V:\3400_ADC\CAD\SEGMENT E4\PLAN SHEETS\STRUCTURES\VNWHT-TRL\CBR0696-BRG-SUP-004.dwg By: Jim.Kimble

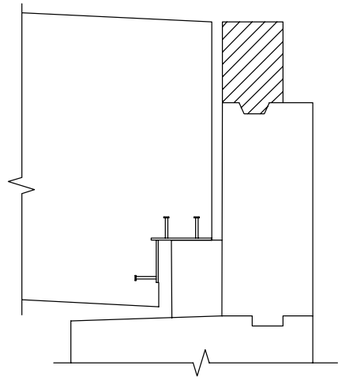


PLAN



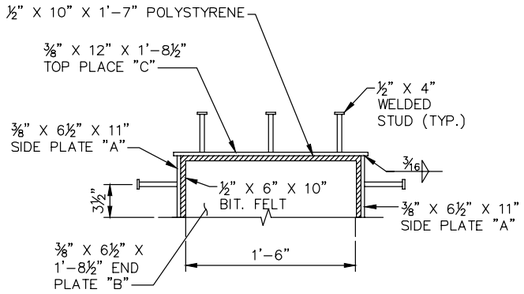
SECTION B–B

(BEARING ASSEMBLY AND PEDESTAL NOT SHOWN FOR CLARITY)

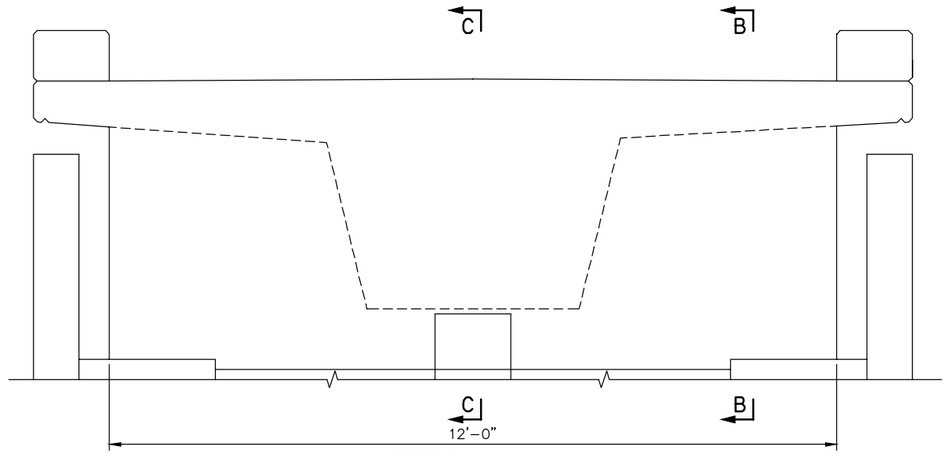


SECTION C–C

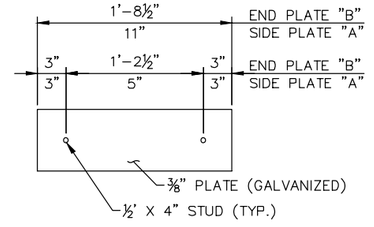
(BEARING ASSEMBLY AND PEDESTAL NOT SHOWN FOR CLARITY)



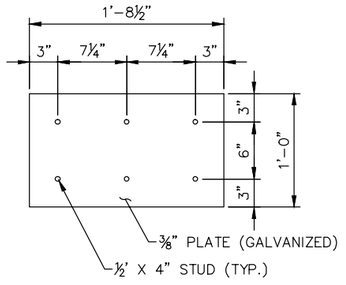
TRANSVERSE SECTION



SECTION A–A



SIDE PLATE "A" & END PLATE "B"



TOP PLATE "C"

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: PDC | CHECKED BY: SAD
DRAWN BY: JIK | DATE: 08/24/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

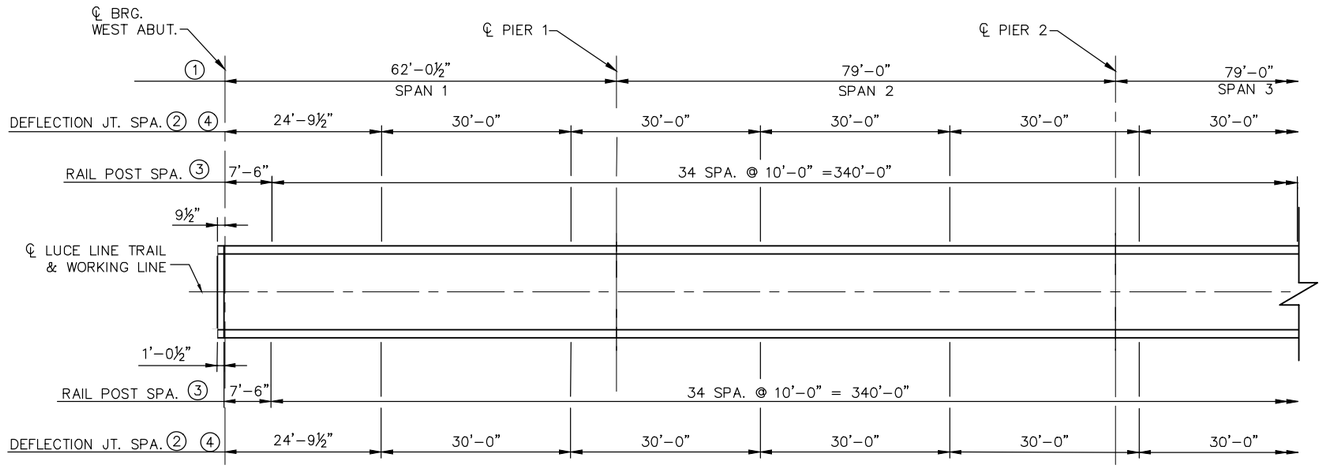
CIVIL EAST - VOLUME 4B
LUCE LINE TRAIL BRIDGE
BRIDGE R0696
END DIAPHRAGM REINFORCEMENT

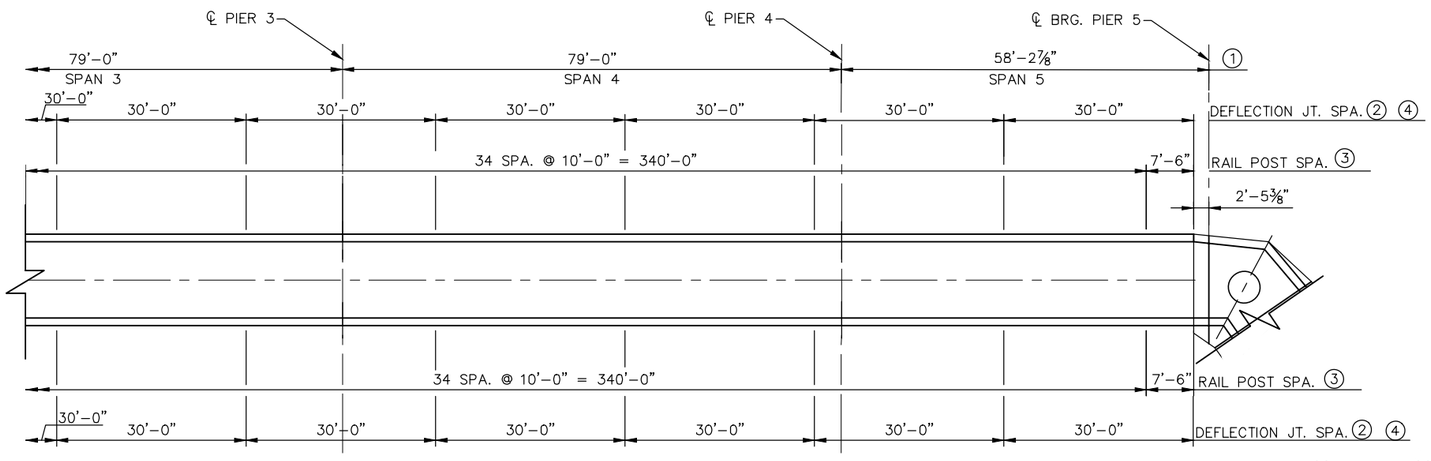
DISCIPLINE: STRUCTURES

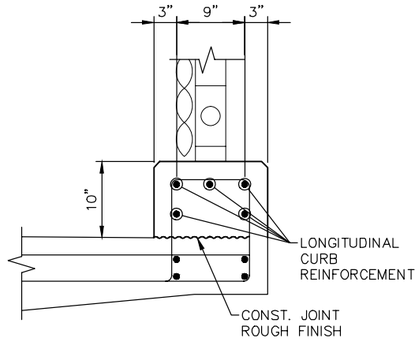
SHEET NAME: CBR0696-BRG-DTL-002

SHEET 22 OF 39

Sep. 04 2015 12:24 pm V:\3400_ADC\CAD\SEGMENT E4\PLAN SHEETS\STRUCTURES\VNWHT-TRL\CBR0696-BRG-DTL-002.dwg By: Jim.Kimble







TYPICAL CURB SECTION
(APPROACH SPAN)

NOTES:

1. MEASURED ALONG CENTERLINE OF LUCE LINE TRAIL.
2. MEASURED ALONG INSIDE FACE OF CURB.
3. MEASURED ALONG CENTERLINE OF RAILING.
4. BREAK BOND AT JOINT IN CURB BY APPROVED METHOD. NO REINFORCEMENT THROUGH JOINT.
5. FINISH TOP OF ALL CURB JOINTS WITH ¼" EDGE AND VERTICAL EDGES WITH ½" V STRIPS.

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: PDC | CHECKED BY: SAD
DRAWN BY: JIK | DATE: 08/24/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

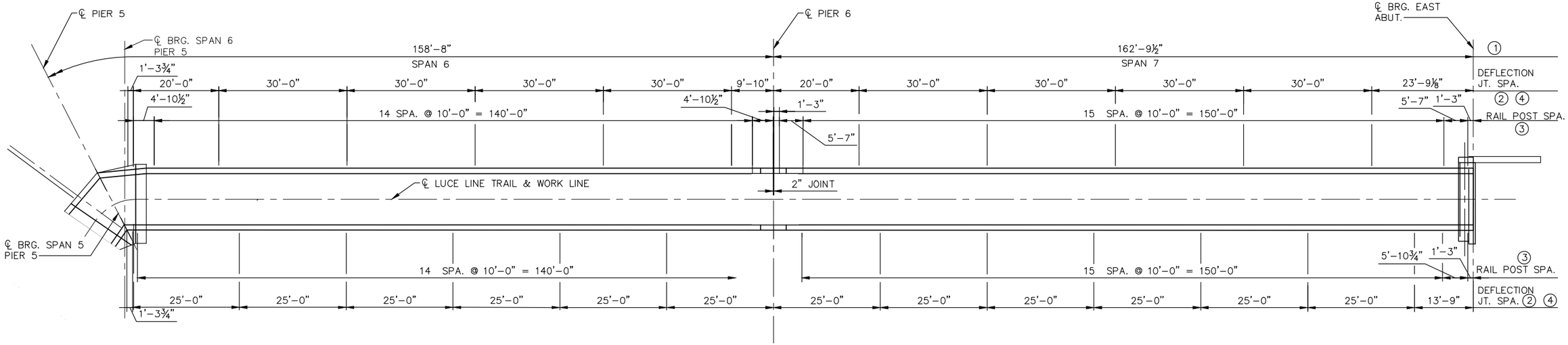
CIVIL EAST - VOLUME 4B
LUCE LINE TRAIL BRIDGE
BRIDGE R0696
CURB DETAILS 1

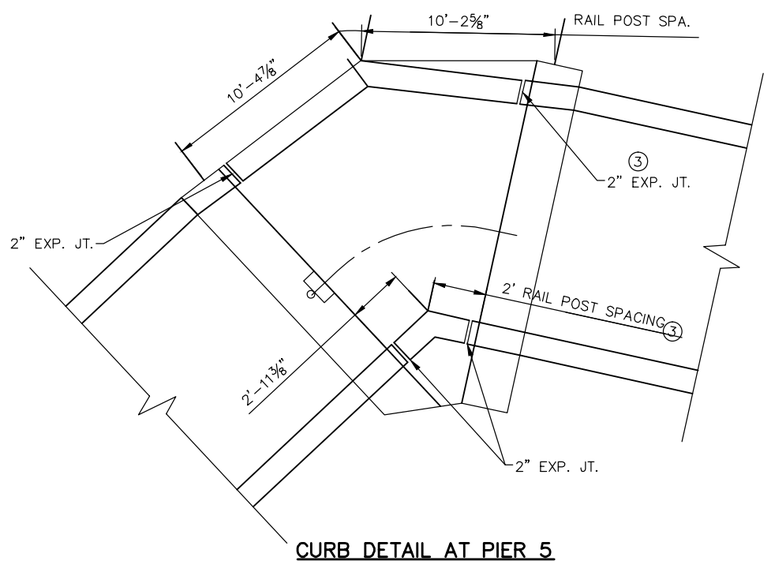
DISCIPLINE: STRUCTURES

SHEET NAME: CBR0696-BRG-DTL-003

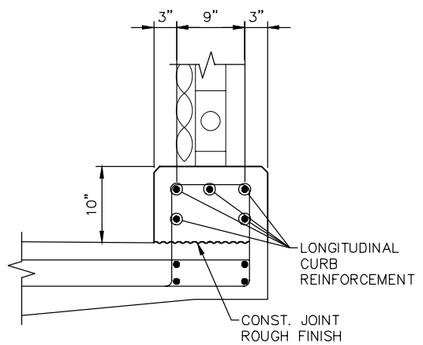
SHEET 23 OF 39

Sep, 04 2015 12:24 pm v:\3400_ADC\CAD\SEGMENT E4\PLAN SHEETS\STRUCTURES\WNWHT-TRL\CBR0696-BRG-DTL-003.dwg By: Jim.Kimble





CURB DETAIL AT PIER 5



TYPICAL CURB SECTION
(APPROACH SPAN)

NOTES:

1. MEASURED ALONG CENTERLINE OF LUCE LINE TRAIL.
2. MEASURED ALONG INSIDE FACE OF CURB.
3. MEASURED ALONG CENTERLINE OF RAILING.
4. BREAK BOND AT JOINT IN CURB BY APPROVED METHOD. NO REINFORCEMENT THROUGH JOINT.
5. FINISH TOP OF ALL CURB JOINTS WITH ¼" EDGE AND VERTICAL EDGES WITH ½" V STRIPS.

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: PDC | CHECKED BY: SAD
DRAWN BY: JIK | DATE: 08/24/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

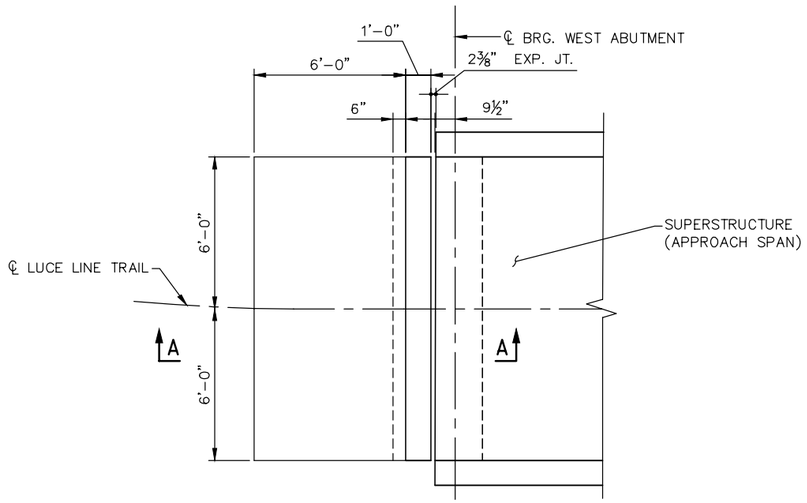
SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4B
LUCE LINE TRAIL BRIDGE
BRIDGE R0696
CURB DETAILS 2

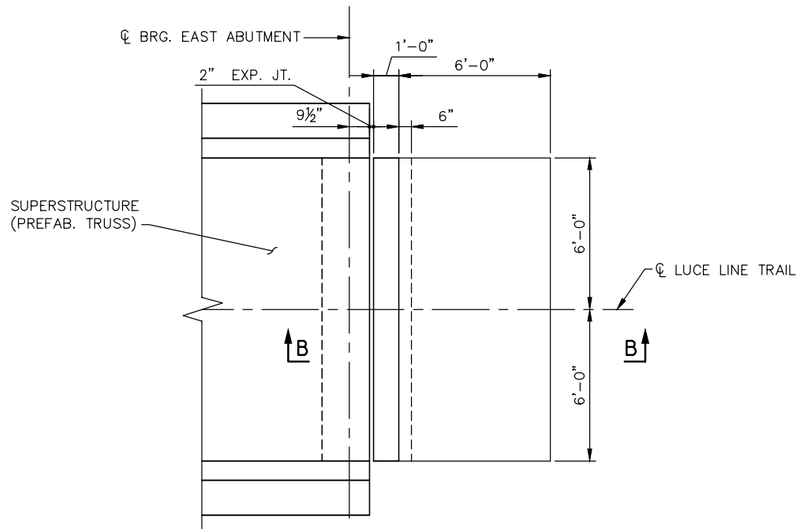
DISCIPLINE: STRUCTURES
SHEET NAME: CBR0696-BRG-DTL-004

SHEET 24 OF 39

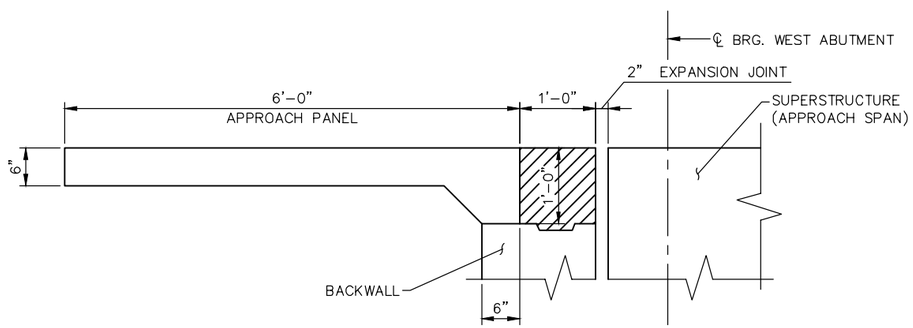
Sep, 04 2015 12:24 pm v:\3400_ADC\CAD\SEGMENT E4\PLAN SHEETS\STRUCTURES\NWHT-TRL\CBR0696-BRG-DTL-004.dwg By: Jim.Kimble



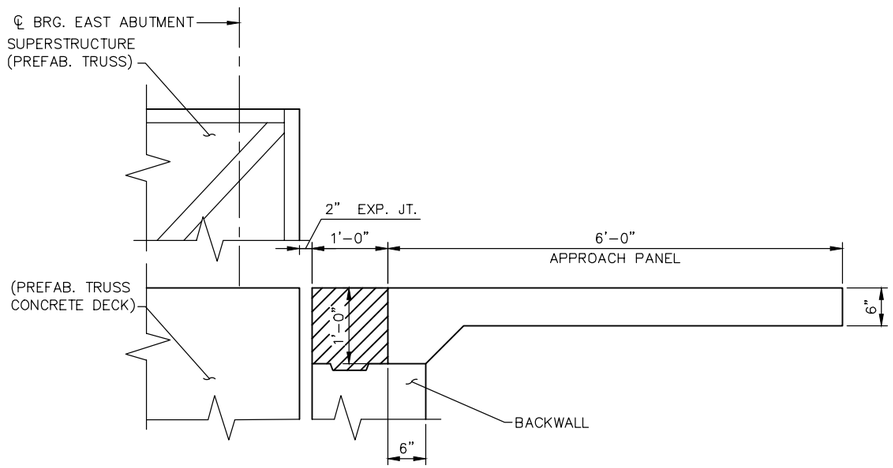
WEST APPROACH PANEL



EAST APPROACH PANEL



SECTION A–A



SECTION B–B

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: PDC | CHECKED BY: SAD
DRAWN BY: JIK | DATE: 08/24/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

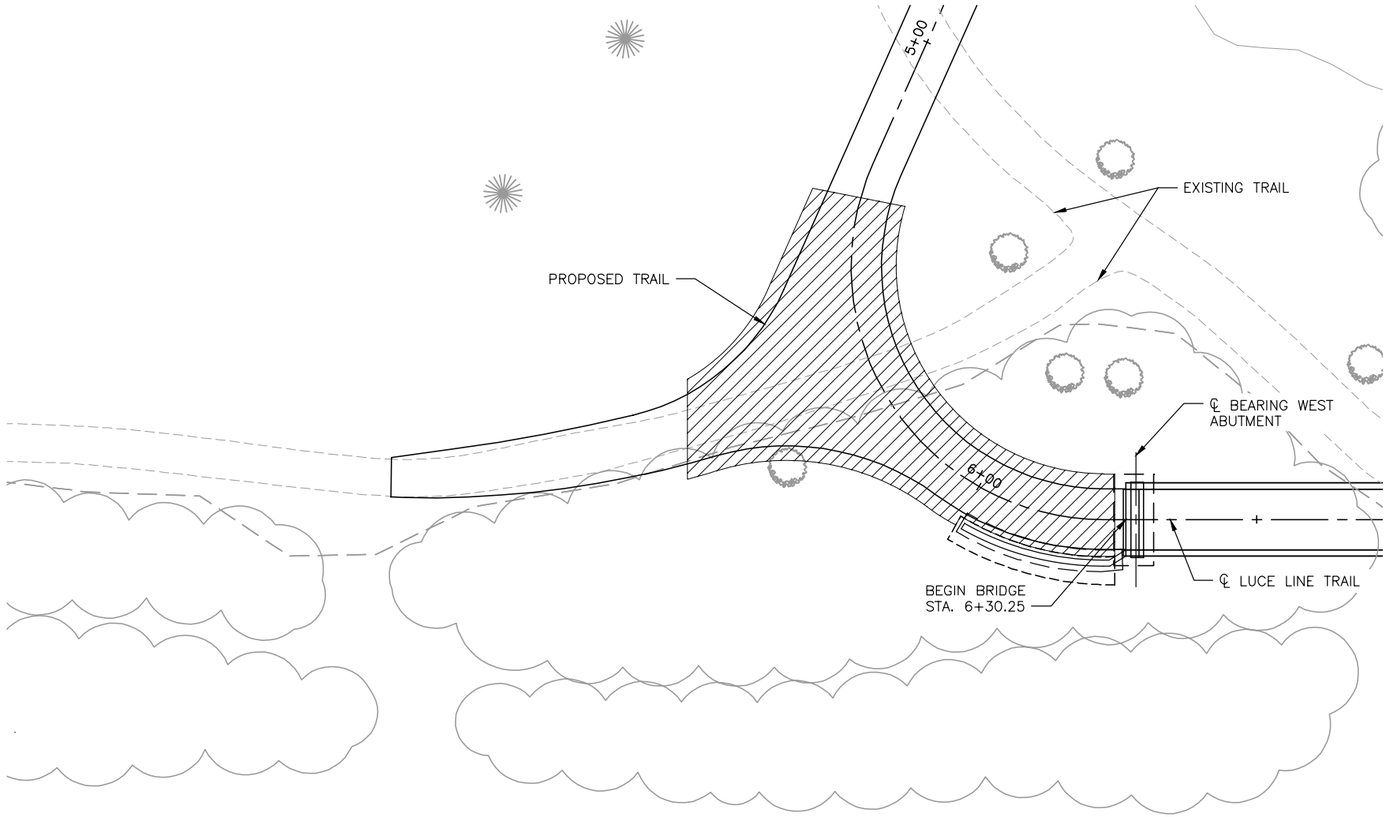
CIVIL EAST - VOLUME 4B
LUCE LINE TRAIL BRIDGE
BRIDGE R0696
APPROACH PANEL

DISCIPLINE: STRUCTURES

SHEET NAME: CBR0696-BRG-DTL-005

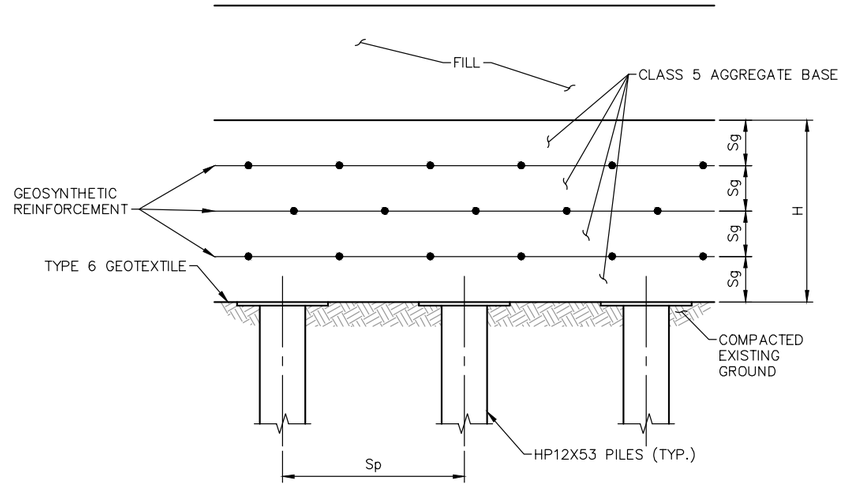
SHEET 25 OF 39

Sep, 04 2015 12:24 pm v:\3400_ADC\CAD\SEGMENT E4\PLAN SHEETS\STRUCTURES\NWHT-TRL\CBR0696-BRG-DTL-005.dwg By: Jim.Kimble



LOAD TRANSFER PLATFORM PLAN

GRAPHIC SCALE IN FEET
0 7.5 15 30



LOAD TRANSFER PLATFORM SECTION

NOTES:

INDICATES LOAD TRANSFER PLATFORM

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: PGC | CHECKED BY: SAD
DRAWN BY: JIK | DATE: 08/24/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

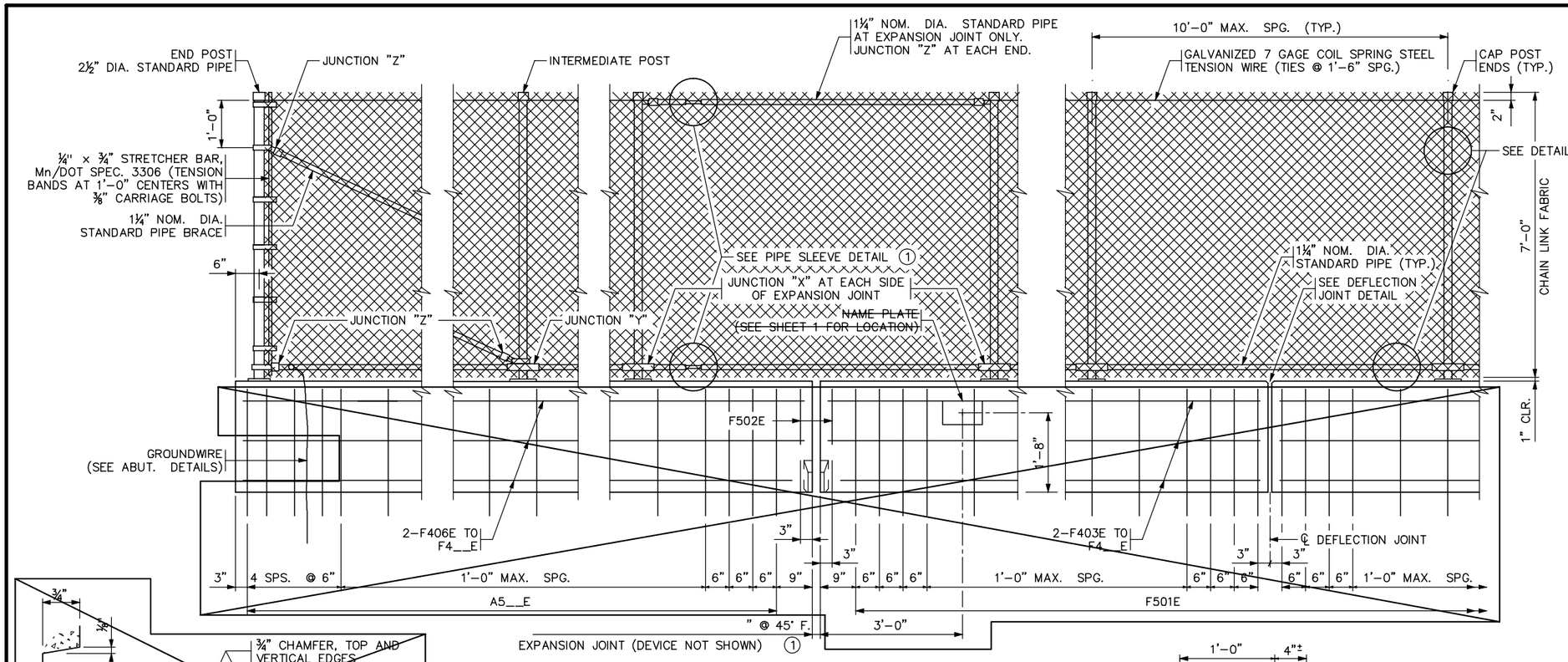
SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4B
LUCE LINE TRAIL BRIDGE
BRIDGE 0696
LOAD TRANSFER PLATFORM

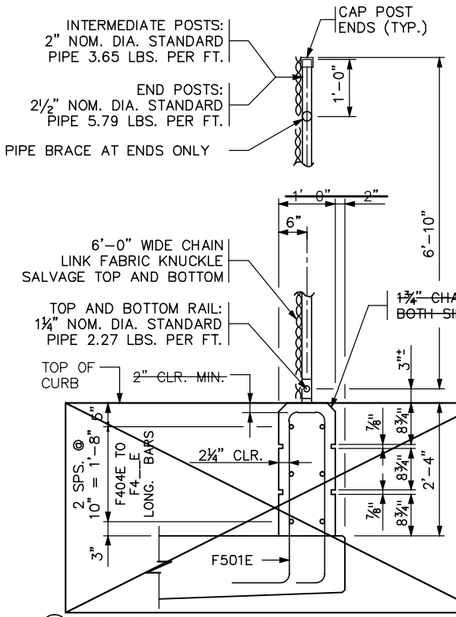
DISCIPLINE: STRUCTURES
SHEET NAME: CBR0696-BRG-DTL-006

SHEET 26 OF 39

Sep, 04 2015 12:26 pm v:\3400_ADC\CAD\SEGMENT E4\PLAN SHEETS\STRUCTURES\WNWHT-TRL\CBR0696-BRG-DTL-006.dwg By: Jim.Kimble



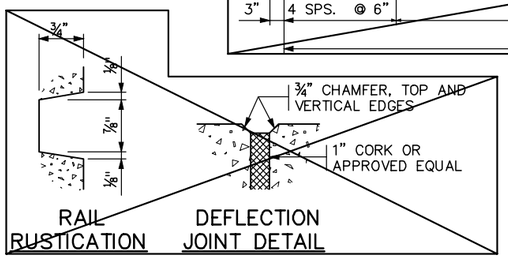
(A) INSIDE ELEVATION OF RAILING

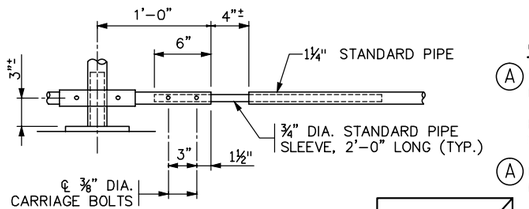


(A) TYPICAL SECTION THROUGH FENCE

INTERMEDIATE POST SHOWN

SHEET MODIFICATION:
(A) DENOTES MODIFICATION TO STANDARD SHEET





PIPE SLEEVE DETAIL (1)

GENERAL NOTES

(A) SEE CONCRETE PARAPET TYPE P-2 FOR DIMENSIONS, REINFORCEMENT AND NOTES.

~~LENGTH OF "TYPE P-1 RAILING CONCRETE (3Y46 OR 3Y46A)" FOR PAYMENT SHALL BE MEASURED BETWEEN THE OUTSIDE FACES OF THE CONCRETE RAIL.~~

(A) LENGTH OF "WIRE FENCE DESIGN 72V-9322" FOR PAYMENT SHALL BE MEASURED BETWEEN THE CENTERS OF END RAILPOSTS.

~~CONCRETE RAILING = 350 LBS./FT. (0.086 CU. YDS./FT.)~~

FENCE POST ANCHORAGES SHALL BE TYPE A. SEE DETAIL B905 "FENCE POST ANCHORAGE".

~~MAXIMUM SPACING OF DEFLECTION JOINTS SHALL BE 20 FT. FOR SPACING OF FENCE POST, JOINTS AND ELECTRICAL GROUNDS, SEE SUPERSTRUCTURE SHEETS.~~

FENCE POSTS AND FENCE POST ANCHORAGES SHALL BE SET VERTICAL, UNLESS OTHERWISE NOTED.

℄ OF FENCE POST ANCHORAGE SHALL BE A MINIMUM OF 6" FROM JOINTS.

END POSTS AND BRACING SHALL BE AT 500 FT. MAXIMUM INTERVALS.

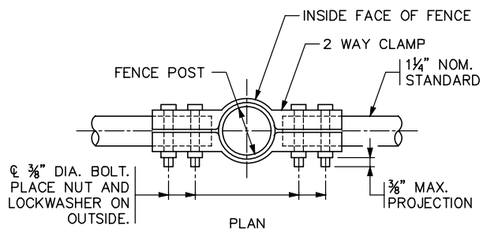
ALL POSTS SHALL HAVE A MEANS TO SECURELY HOLD THE TOP TENSION WIRE IN POSITION AND ALLOW FOR THE REMOVAL AND REPLACEMENT OF A POST WITHOUT DAMAGING THE TOP WIRE.

WIRE TIES MAY BE 9 GAGE GALVANIZED STEEL OR 0.179" MIN. ALUMINUM ALLOY CONFORMING TO A.S.T.M. B211, ALLOY 1100-H18. USE 12½ GAGE GALVANIZED HOG RINGS FOR TENSION WIRE TIES.

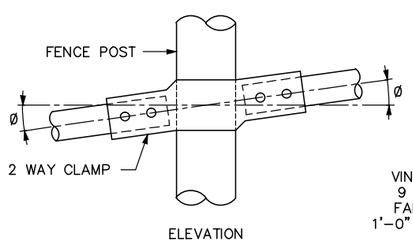
~~ALL MATERIAL IN THE CONCRETE BASE AND END POST IS INCLUDED IN THE SUPERSTRUCTURE QUANTITIES.~~

SEE SPECIAL PROVISIONS FOR REQUIREMENTS NOT INCLUDED ON THIS SHEET ~~AND FOR BASIS OF PAYMENT.~~

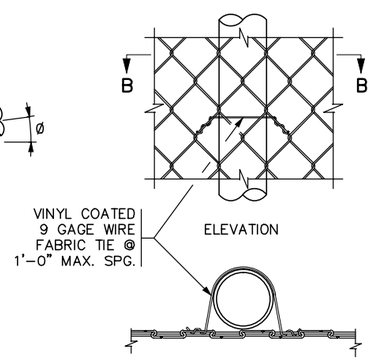
(1) PROVIDE PIPE SLEEVE IN SPAN BETWEEN THE VERTICAL POSTS AT EXPANSION JOINT. SEE SUPERSTRUCTURE SHEETS FOR LOCATION.



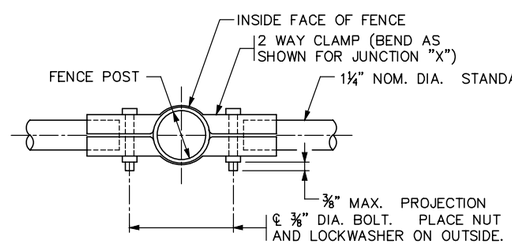
2 WAY CLAMP BENDING TABLE	
GRADE OF FENCE	Ø
0° TO 2°	0°
2° TO 6°	4°
6° TO 10°	8°



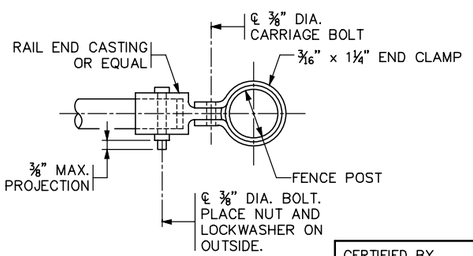
JUNCTION "X"



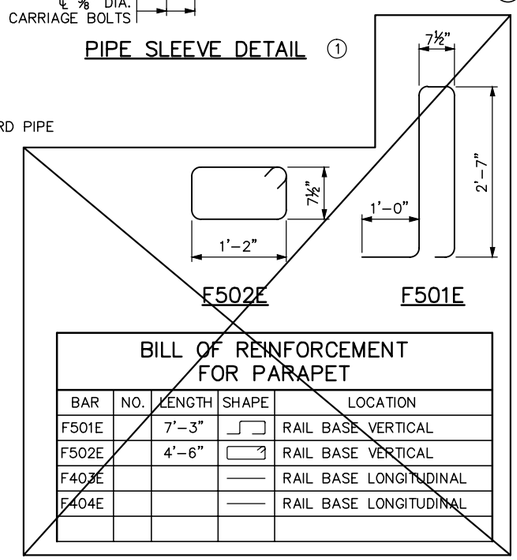
DETAIL "A"



JUNCTION "Y"



JUNCTION "Z"



BILL OF REINFORCEMENT FOR PARAPET				
BAR	NO.	LENGTH	SHAPE	LOCATION
F501E		7'-3"		RAIL BASE VERTICAL
F502E		4'-6"		RAIL BASE VERTICAL
F403E				RAIL BASE LONGITUDINAL
F404E				RAIL BASE LONGITUDINAL

REVISED: 04-17-2013

APPROVED: DECEMBER 18, 2003

Daniel L Morgan

STATE BRIDGE ENGINEER

CERTIFIED BY _____ LICENSED PROFESSIONAL ENGINEER _____ DATE

NAME: LIC. NO.

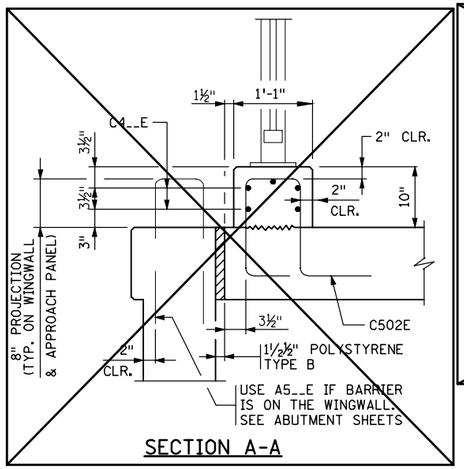
TITLE: WIRE FENCE (A) (DIAMOND MESH SAFETY RAIL)

DRAFT-WORK IN PROCESS

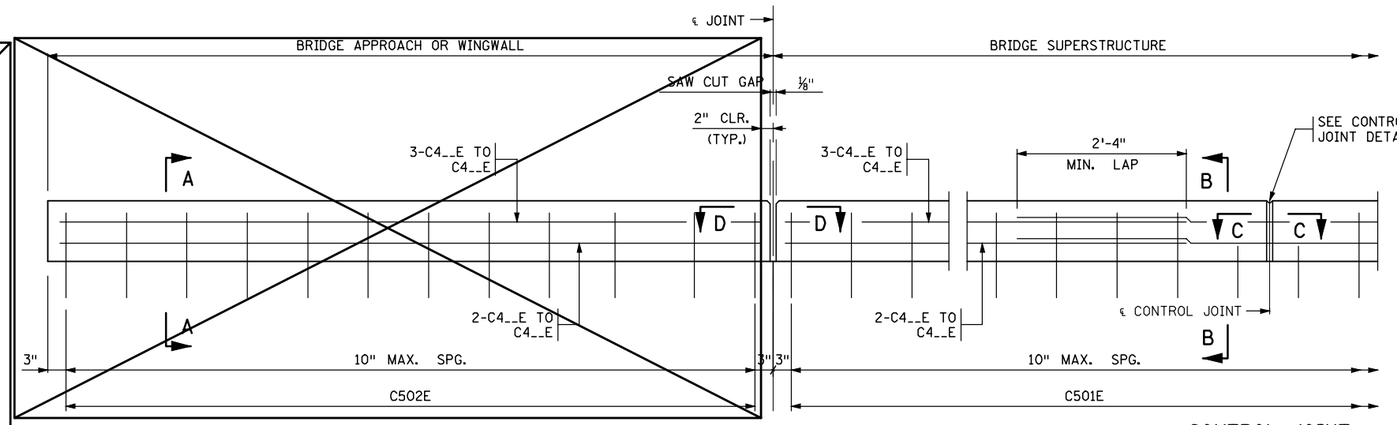
FIG. 5-397.119 (MOD.)

DES:	DR:	APPROVED:	BRIDGE NO.
CHK:	CHK:		R0696

SHEET NO. 27 OF 39 SHEETS



SECTION A-A



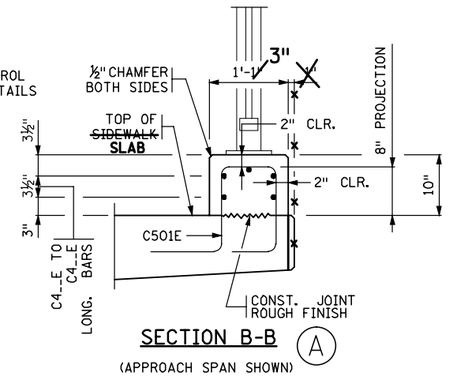
JOINT AT ABUTMENT

CONTROL JOINT

INTEGRAL OR SEMI-INTEGRAL ABUTMENT SEE DETAIL "A" FOR PARAPET ABUTMENT

INSIDE ELEVATION OF CONCRETE CURB

CURB DOES NOT MEET CRASH TEST REQUIREMENTS OF NCHRP REPORT 350



SECTION B-B Ⓐ

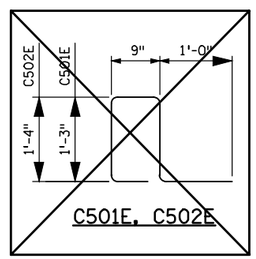
(APPROACH SPAN SHOWN)

SHEET MODIFICATION:

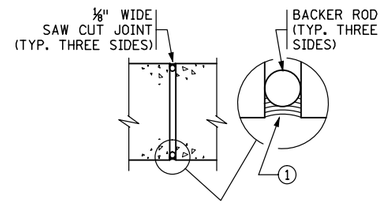
Ⓐ DENOTES MODIFICATION TO STANDARD SHEET

BILL OF REINFORCEMENT FOR CURB

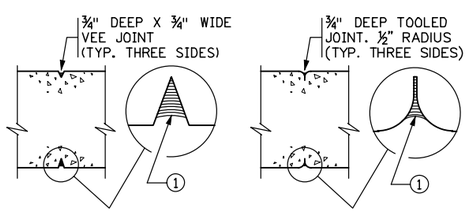
BAR	NO.	LENGTH	SHAPE	LOCATION
C501E	--	4'-10"	⌐¬	CURB BASE VERTICAL
C502E	--	5'-0"	⌐¬	CURB BASE VERTICAL
C4__E	--	-----	——	CURB BASE LONGIT.
C4__E	--	-----	——	CURB BASE LONGIT.
C4__E	--	-----	——	CURB BASE LONGIT.



C501E, C502E



SECTION D-D



SECTION C-C

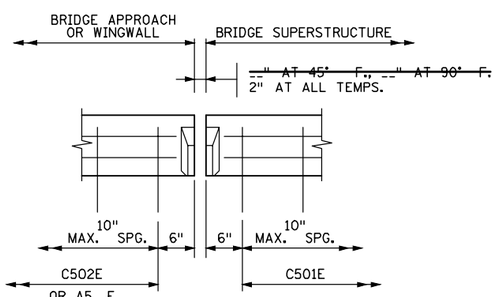
CONTRACTOR OPTION 1

SECTION C-C

CONTRACTOR OPTION 2

CONTROL JOINT DETAILS

WHEN USING SLIP FORM METHOD TO PLACE THE CONCRETE, CUT JOINT 3 INCHES DEEP USING MARGIN TROWEL OR SIMILAR MEANS IMMEDIATELY AFTER CONCRETE PLACEMENT (TYP. THREE SIDES)



DETAIL "A" ②

(USE ONLY WITH STRIP SEAL EXPANSION DEVICE)
(EXPANSION DEVICE NOT SHOWN)

GENERAL NOTES

CONTINUOUSLY GROUND ALL METAL RAILINGS; SEE THE SPECIAL PROVISIONS. REFER TO THE ELECTRICAL PLANS AND ELECTRICAL SPECIAL PROVISIONS FOR DETAILS REGARDING BONDING MULTIPLE ELECTRICAL GROUNDING SYSTEMS.

PAYMENT LENGTH SHALL BE MEASURED BETWEEN THE OUTSIDE FACES OF THE CONCRETE CURB.

CONCRETE CURB = 125 LBS./FT. (0.031 CU. YDS./FT.)

FINISH ALL EDGES OF CURB WITH ½" CHAMFER, EXCEPT WHERE OTHERWISE NOTED.

MAXIMUM SPACING OF CONTROL JOINTS ON SUPERSTRUCTURE, APPROACH AND WINGWALL SHALL BE 10 FT. SEE SUPERSTRUCTURE SHEET FOR JOINT SPACING.

CONCRETE CURB QUANTITIES ARE LISTED IN SUMMARY OF QUANTITIES FOR SUPERSTRUCTURE.

① JOINT SEALANT PER MnDOT APPROVED/QUALIFIED PRODUCTS LIST - CRACK AND JOINT MATERIALS - SILICONE JOINT SEALERS.

② REFER TO STANDARD FIGURE 5-397.632 FOR COVER PLATE DETAILS.

REVISION:

APPROVED: NOVEMBER 6, 2013

Nancy Daubenberger

STATE BRIDGE ENGINEER

DRAFT-WORK IN PROCESS

FIG. 5-397.167 (MOD.)

CERTIFIED BY _____ LICENSED PROFESSIONAL ENGINEER _____ DATE

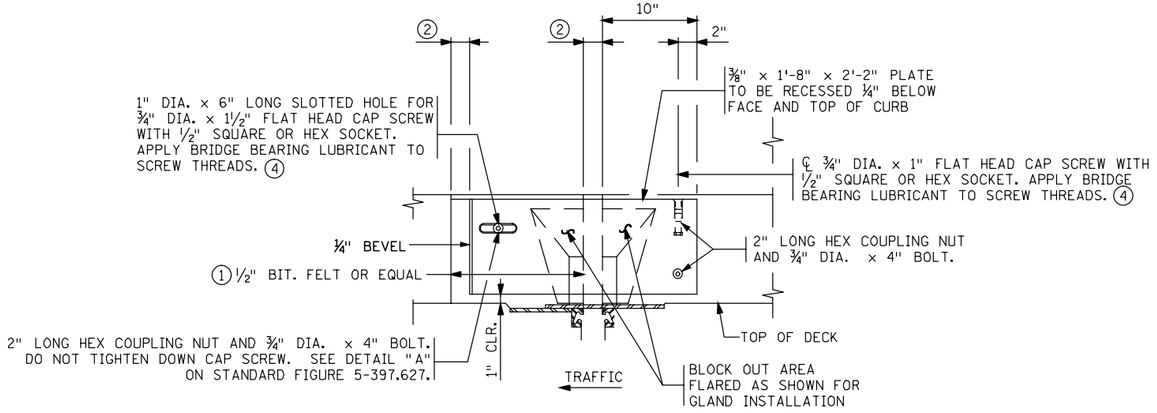
NAME: LIC. NO.

TITLE: CONCRETE CURB FOR USE WITH ORNAMENTAL RAILING

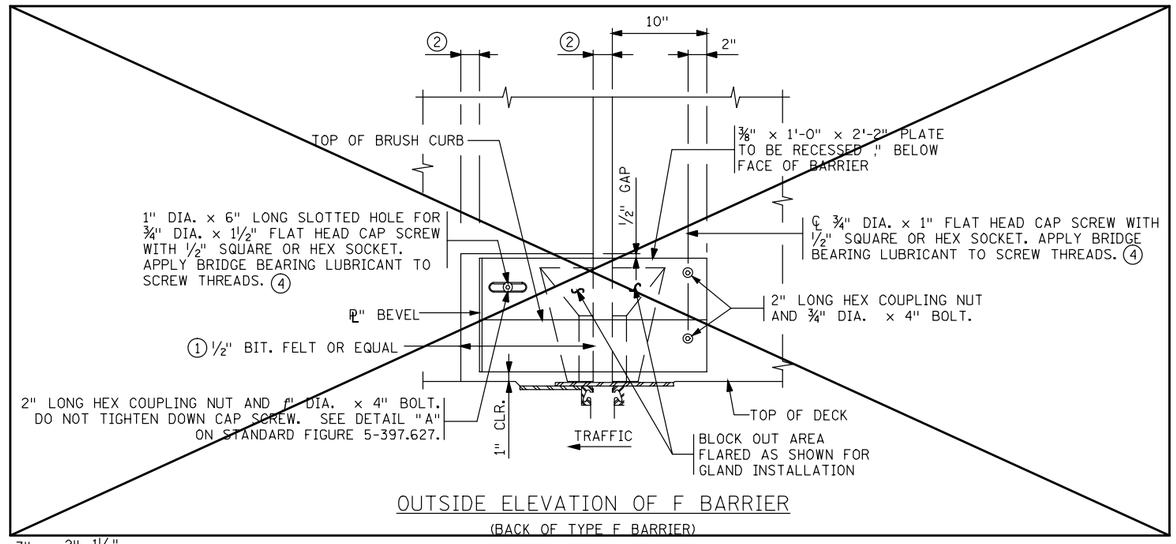
DES: DR: CHK: CHK: APPROVED:

SHEET NO. 28 OF 39 SHEETS

BRIDGE NO. R0696



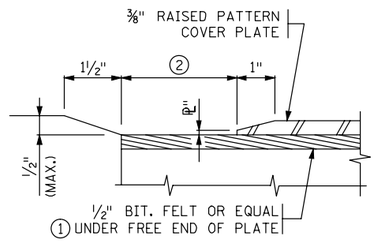
INSIDE ELEVATION OF CONCRETE CURB



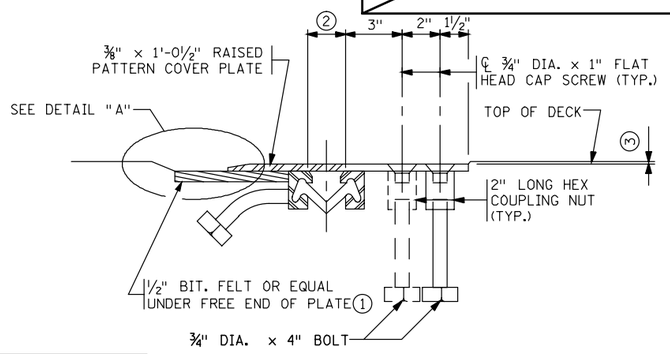
OUTSIDE ELEVATION OF F BARRIER

(BACK OF TYPE F BARRIER)

NOTE:
TRANSVERSE DECK REINFORCEMENT MAY BE SHIFTED THE MINIMUM DISTANCE REQUIRED FOR EXPANSION DEVICE PLACEMENT



DETAIL "A"



SECTION D-D

GENERAL NOTES

SEE STANDARD FIGURE 5-397.627 FOR ADDITIONAL DETAILS AND NOTES.

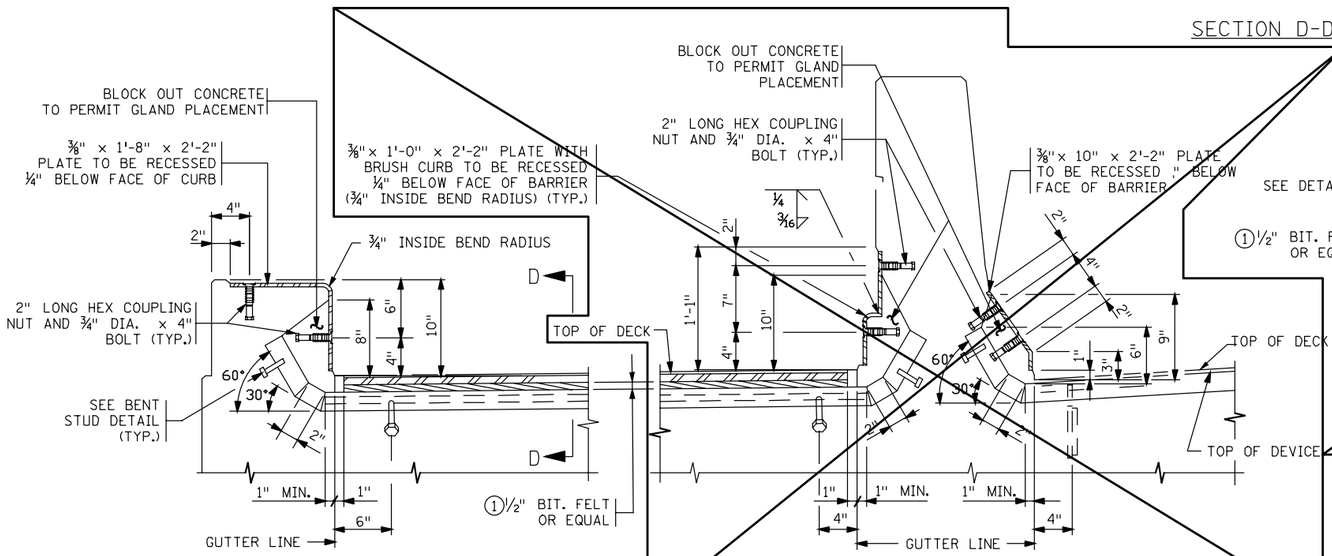
3/4" DIA. X 1" FLAT HEAD CAP SCREW WITH 1/2" SQUARE OR HEX SOCKET PER SPEC 3391. CAP SCREWS SHALL BE COUNTERSUNK 1/16" BELOW TOP OF PLATE. APPLY BRIDGE BEARING LUBRICANT TO SCREW THREADS. (4)

(1) USE LARGEST SINGLE PIECE POSSIBLE. USE OF SMALL PIECES OR SCRAPS SECURED TOGETHER IS PROHIBITED.

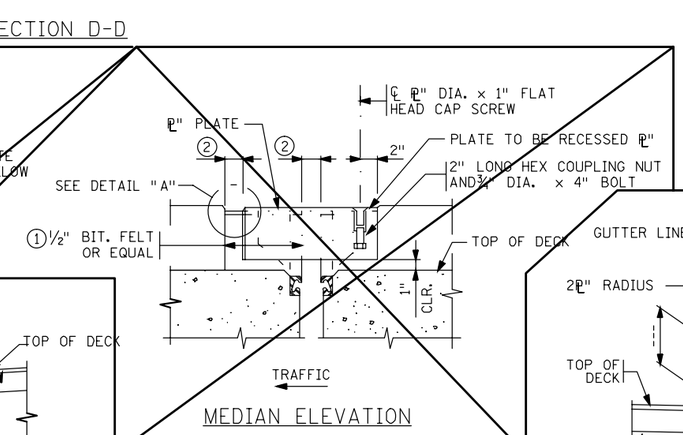
(2) SEE NOTE (2) ON STANDARD FIGURE 5-397.627.

(3) 1/8" (1/4" MAX.) .

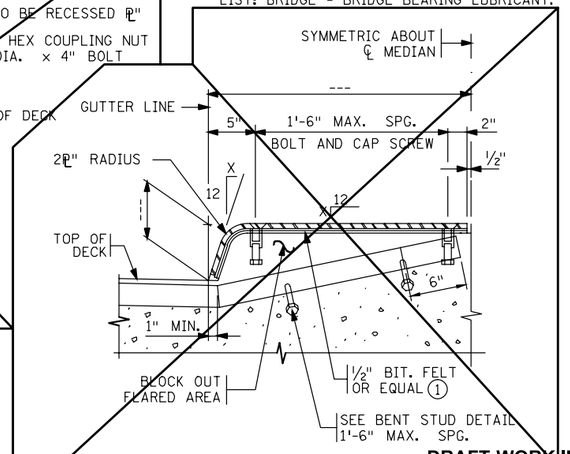
(4) LUBRICANT PER MnDOT APPROVED/QUALIFIED PRODUCTS LIST: BRIDGE - BRIDGE BEARING LUBRICANT.



SECTION THROUGH BARRIER AND CURB - INTEGRAL SIDEWALK



MEDIAN ELEVATION



MEDIAN SECTION

DRAFT-WORK IN PROCESS

REVISION:

APPROVED: NOVEMBER 6, 2013
Nancy Daubenberger
STATE BRIDGE ENGINEER

CERTIFIED BY _____ LICENSED PROFESSIONAL ENGINEER _____ DATE
NAME: LIC. NO.

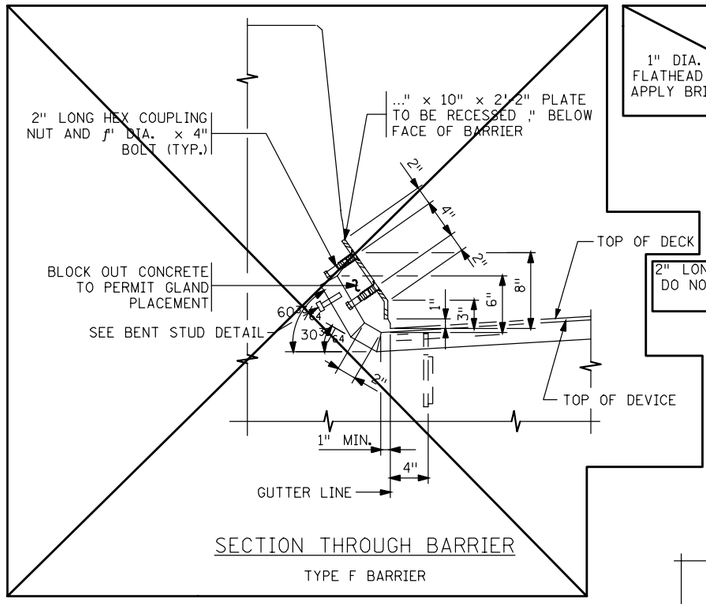
TITLE: WATERPROOF EXPANSION DEVICE 1 (RAISED MEDIAN OR INTEGRAL SIDEWALK WITH CURB)

DES: DR: APPROVED:
CHK: CHK:

FIG. 5-397.632 (MOD.)

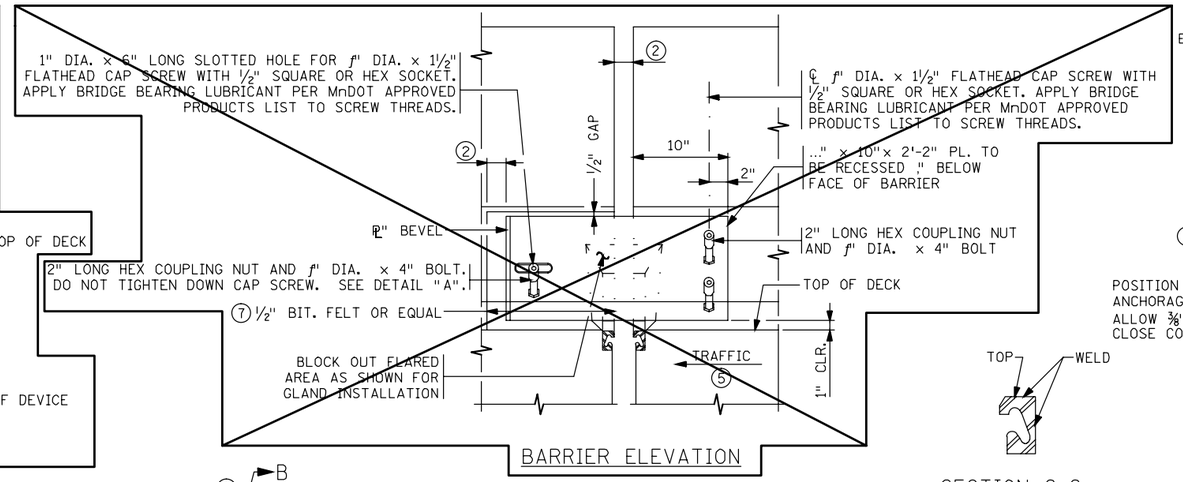
SHEET NO. 29 OF 39 SHEETS

BRIDGE NO. R0696

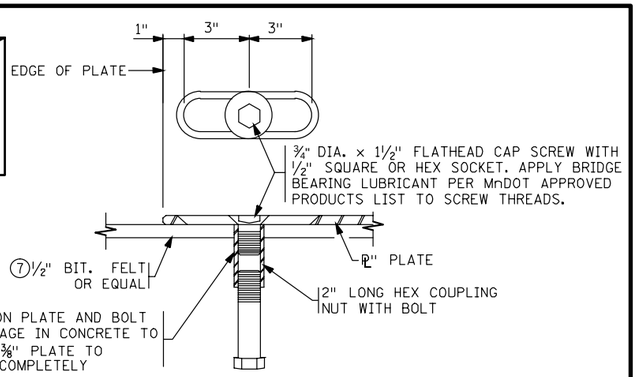


SECTION THROUGH BARRIER

TYPE F BARRIER

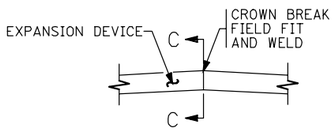


BARRIER ELEVATION

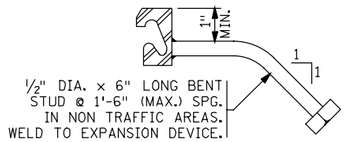


DETAIL "A"

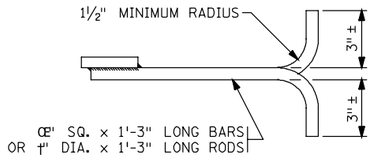
SECTION C-C



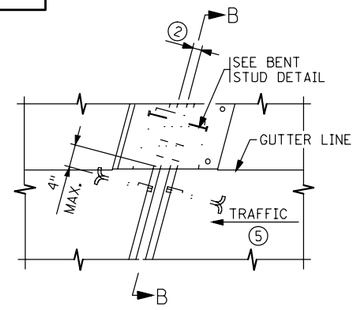
DETAIL "B"



BENT STUD DETAIL

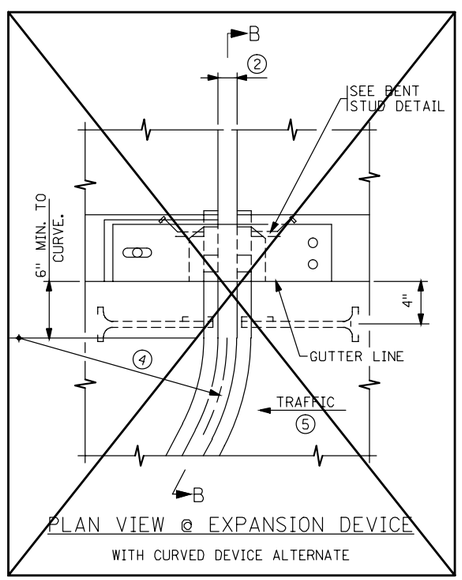


BAR-ROD DETAIL



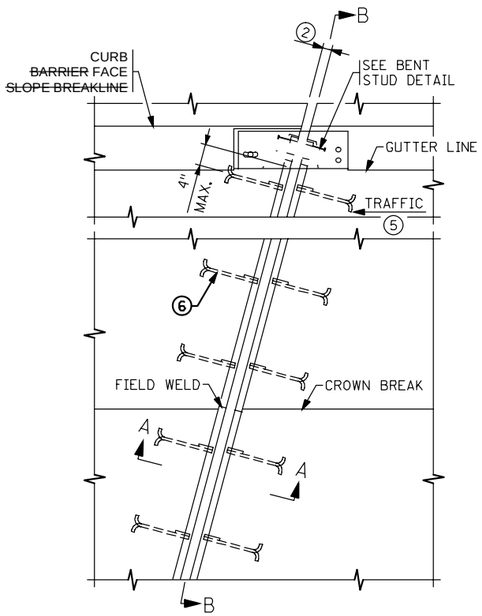
PLAN VIEW @ EXPANSION DEVICE

MEDIAN OR SIDEWALK ALTERNATE



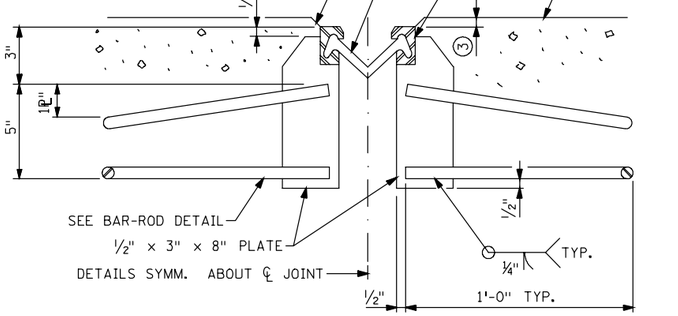
PLAN VIEW @ EXPANSION DEVICE

WITH CURVED DEVICE ALTERNATE

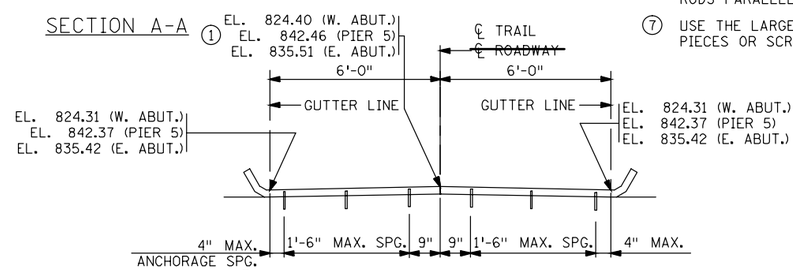


PLAN VIEW @ EXPANSION DEVICE

WITH STRAIGHT DEVICE



SECTION A-A



① SECTION B-B ~ ALONG ℄ JOINT

ELEVATIONS SHOWN ARE ℄" BELOW TOP OF SLAB @ ℄ JOINT
ELEVATIONS SHOWN ARE ½" BELOW TOP OF SLAB @ ℄ JOINT

GENERAL NOTES

GALVANIZE STRUCTURAL STEEL AFTER FABRICATION AS PER SPEC. 3394. GALVANIZE FASTENERS AS PER SPEC. 3392.

JOINTS IN EXTRUSION SHALL BE LOCATED AT BREAKS IN TRANSVERSE PROFILE AND AS OTHERWISE REQUIRED. JOINTS SHALL BE CLOSE FIT AND WELDED. REPAIR AFTER WELDING AS PER SPEC. 2471.3L.

STRUCTURAL STEEL SHALL COMPLY WITH SPEC. 3306 OR SPEC. 3309.

EXPANSION DEVICE SHALL BE STRAIGHTENED TO A TOLERANCE OF ⅛" IN 10 FT.

¾" DIA. X 1½" FLATHEAD CAP SCREW WITH ½" SQUARE OR HEX SOCKET PER SPEC 3391. CAP SCREWS SHALL BE COUNTERSUNK 1/16" BELOW TOP OF PLATE. APPLY BRIDGE BEARING LUBRICANT PER MnDOT APPROVED PRODUCTS LIST TO SCREW THREADS

LENGTH OF PAYMENT FOR DEVICE IS FROM OUTER END TO OUTER END OF EXTRUSION ALONG CENTERLINE OF JOINT. REFER TO THE SPECIAL PROVISIONS FOR MORE SPECIFIC PAYMENT INFORMATION.

① DIMENSIONS ARE ALONG CENTERLINE OF JOINT.

② ~~__AT 45° F; __ AT 90° F. 2" AT ALL TEMPS.~~

③ ⅛" (¼" MAX.) . ~~½" (⅝" MAX.) WHEN SNOWPLOW FINGERS ARE USED. SNOWPLOW FINGERS ARE REQUIRED FOR SKEWS OVER 15° AND LESS THAN 50°.~~

④ ~~SEE SUPERSTRUCTURE DETAILS FOR RADIUS.~~

⑤ ~~SEE SHEET NO. __ FOR DIRECTION OF TRAFFIC.~~

⑥ PLACE BAR-ROD NORMAL TO JOINT ON NEW BRIDGES AND JOINT REPLACEMENTS. ~~ON JOINT REPLACEMENTS WHEN SKEW IS OVER 15° AND LESS THAN 50° BEND RODS PARALLEL TO ℄ ROADWAY.~~

⑦ USE THE LARGEST SINGLE PIECE POSSIBLE. USE OF SMALL PIECES OR SCRAPS SECURED TOGETHER IS PROHIBITED.

DRAFT-WORK IN PROCESS

REVISION: 09-11-2014	FIG. 5-397.627 (MOD.)
APPROVED: NOVEMBER 6, 1995	
Donald J. Flemming	
STATE BRIDGE ENGINEER	

CERTIFIED BY _____ LICENSED PROFESSIONAL ENGINEER _____ DATE

NAME: _____ LIC. NO._____

TITLE: WATERPROOF EXPANSION DEVICE 2

DES: ------	DR: ------	APPROVED:	BRIDGE NO.
CHK: ------	CHK: ------		R0696
SHEET NO. 30 OF 39 SHEETS			

CONCRETE WEARING COURSE

☐ LOW SLUMP

☐ OTHER _____
TYPE OR MANUFACTURER

EXPANSION JOINTS

JOINT MANUFACTURER

MANUFACTURER'S IDENTIFICATION _____
MFR'S No. AND/OR LETTER DESIGNATION FOR JOINT USED

GLAND MANUFACTURER _____
NAME AND ADDRESS (CITY, STATE)

SIZE OF GLAND _____

MANUFACTURER'S IDENTIFICATION _____
MFR'S No. AND/OR LETTER DESIGNATION FOR GLAND USED

ELASTOMERIC BEARING PADS

PAD MANUFACTURER _____
NAME AND ADDRESS (CITY, STATE)

SPECIAL SURFACE FINISH

SYSTEM: _____ COLOR: _____

FINISHING ROADWAY FACES OF BARRIER RAILING

TYPE: _____ COLOR: _____

ANTI-GRAFFITI COATING

MANUFACTURER _____
NAME AND ADDRESS (CITY, STATE)

PRODUCT NAME: _____ LOCATION: _____

PAINT SYSTEM

Mn/DOT SPECIFICATION NUMBER _____
2478 OR 2479 OR OTHER

MANUFACTURER _____
NAME AND ADDRESS (CITY, STATE)

PRIME COAT _____
Mn/DOT MATERIAL SPECIFICATION NUMBER

INTERMEDIATE COAT _____
Mn/DOT MATERIAL SPECIFICATION NUMBER

FINISH COAT _____ _____
Mn/DOT MATERIAL SPECIFICATION NUMBER COLOR

PLAN QUALITY

RATE 1 (AGREE), 2 (NEUTRAL), OR 3 (DISAGREE), PLEASE COMMENT BELOW)

DIMENSIONING AND DETAILING ADEQUATELY DESCRIBED REQUIRED CONSTRUCTION. _____
BAR LISTS AND QUANTITIES WERE TYPICALLY COMPLETE AND FREE OF ERRORS. _____
SCALE OF DRAWINGS AND OVERALL LEGIBILITY OF LINES AND TEXT WAS GOOD. _____
(SB) SPECIAL PROVISIONS ADEQUATELY DESCRIBED SPECIAL WORK AND PAYMENT. _____

COMMENTS: _____

NUMBER OF BRIDGE
SUPPLEMENTAL AGREEMENTS: _____ COST: $ _____

LIST SIGNIFICANT ERRORS OR OMISSIONS IN PLAN DETAILS OR PAY QUANTITIES IN THE SPACE PROVIDED AT RIGHT.

BRIDGE REMOVAL / BRIDGE OPENING

NUMBER OF AND DATE OLD BRIDGE WAS REMOVED (IF APPLICABLE):

BRIDGE NUMBER _____ DATE REMOVED _____

DATE NEW BRIDGE WAS OPENED TO TRAFFIC _____

NOTIFY THE BRIDGE OFFICE BRIDGE MANAGEMENT UNIT WITH THIS INFORMATION AS SOON AS POSSIBLE. (651) 366-4557

OTHER ITEMS ①

① UTILITIES ADDED DURING CONSTRUCTION AND SPECIALTY ITEMS.

FINAL QUANTITIES ENTERED ON SCHEDULE OF QUANTITIES: YES ☐ NO ☐

SUMMARY OF SIGNIFICANT AS-BUILT CHANGES

THE AS-BUILT INFORMATION WAS ADDED TO THE PLAN BY:

_____ _____
INSPECTOR(S) SIGNATURE DATE

CHECKED BY: _____ _____
PROJECT ENGINEER/SUPERVISOR SIGNATURE DATE

AT THE TIME OF THE FINAL, THIS COMPLETED AS-BUILT BRIDGE DATA SHEET MUST BE SUBMITTED TO THE BRIDGE OFFICE - ATTN: REGIONAL CONSTRUCTION ENGINEER (MS610).

DRAFT-WORK IN PROCESS

REVISION: 10-28-2008

APPROVED: SEPTEMBER 26, 2003
Daniel L Hagen
STATE BRIDGE ENGINEER

AS-BUILT DETAILS
(AS NEEDED)

FIG. 5-397.900

TITLE: AS-BUILT BRIDGE DATA

DES: ------	DR: ------	APPROVED:	BRIDGE NO.
CHK: ------	CHK: ------		R0696

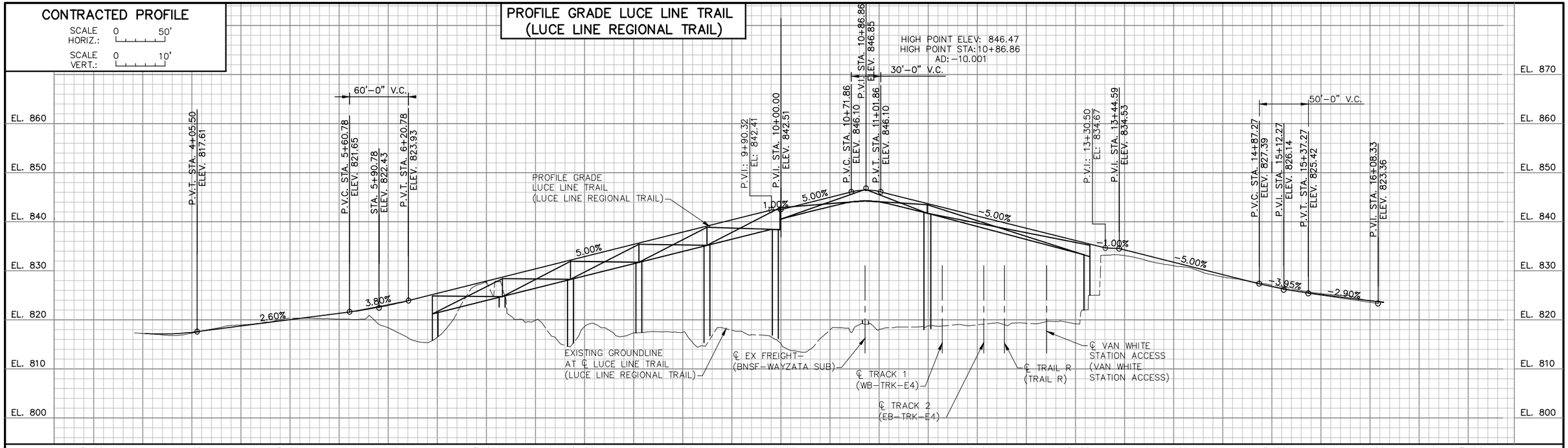
SHEET NO. 31 OF 39 SHEETS

CONTRACTED PROFILE

SCALE HORIZ.: 0 50'

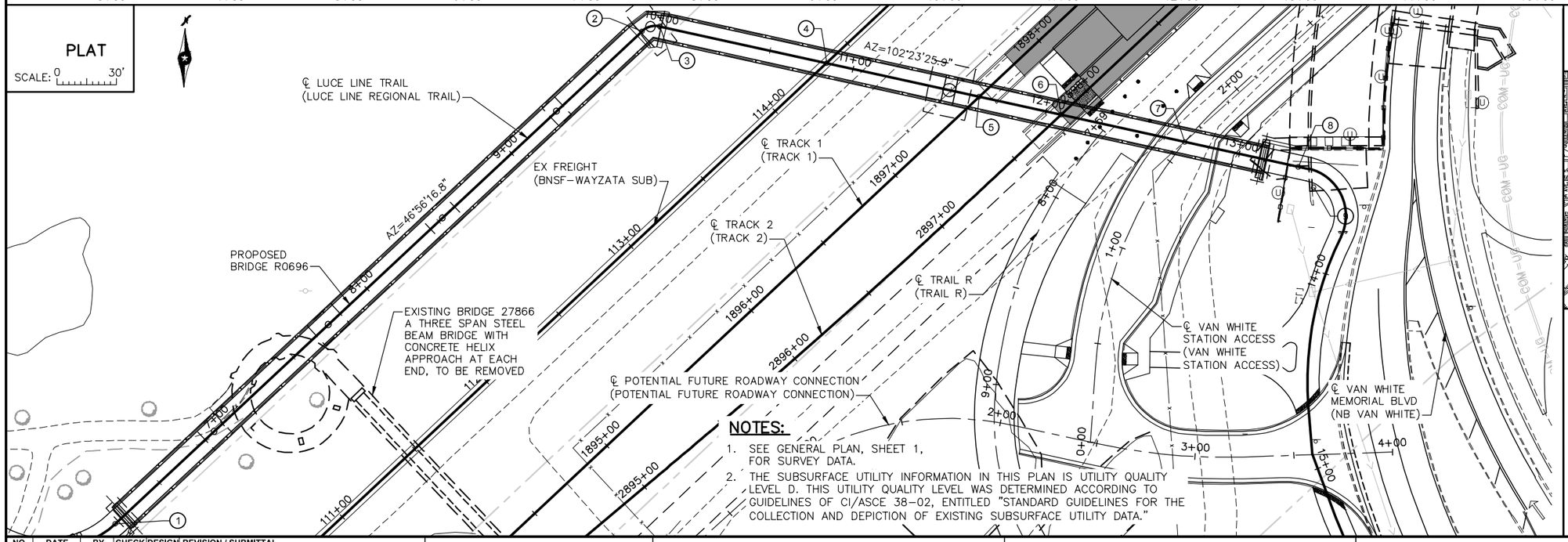
SCALE VERT.: 0 10'

PROFILE GRADE LUCE LINE TRAIL (LUCE LINE REGIONAL TRAIL)



PLAT

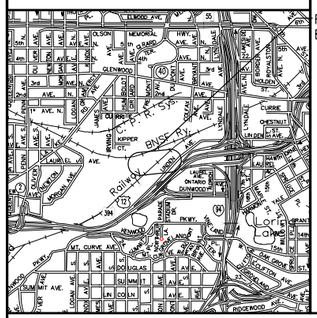
SCALE: 0 30'



NOTES:

1. SEE GENERAL PLAN, SHEET 1, FOR SURVEY DATA.
2. THE SUBSURFACE 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."

INDEX MAP



BRIDGE SURVEY

PROPOSED BRIDGE LOCATED 0.5 MILES SOUTHWEST OF JCT. I-94 AND TH-394 IN MINNEAPOLIS

LUCE LINE TRAIL OVER BNSF RAILWAY AND SOUTHWEST LRT

SEC 28 T 29N R 24W

CITY OF MINNEAPOLIS HENNEPIN COUNTY

BRIDGE R0696

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: PDC CHECKED BY: SAD

DRAWN BY: JIK DATE: 08/24/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4B
LUCE LINE TRAIL BRIDGE
BRIDGE R0696
BRIDGE SURVEY 1

DISCIPLINE: STRUCTURES

SHEET NAME: CBR0696-BRG-SUR-001

SHEET 32 OF 39

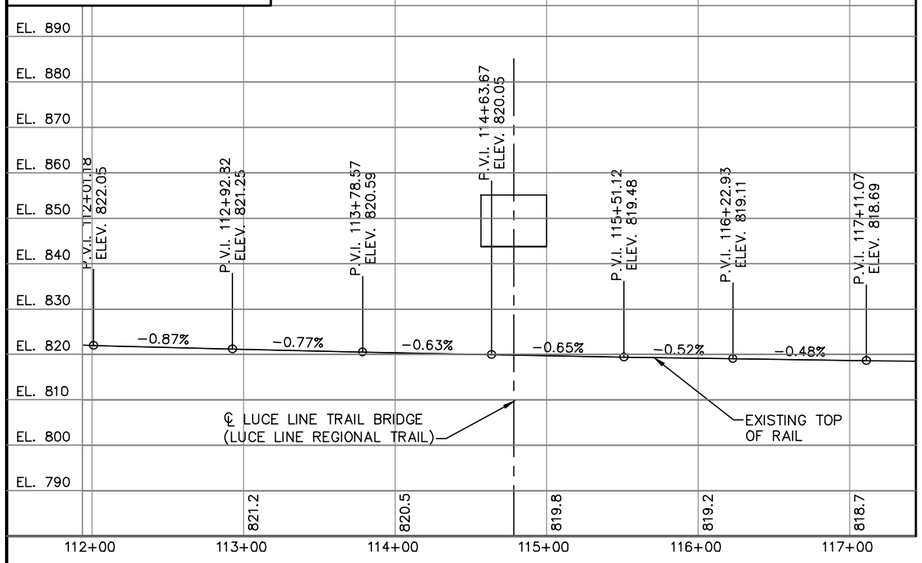
Sep. 04 2015 12:29 pm V:\3400_ADC\CAD\SEGMENT E4\PLAN SHEETS\STRUCTURES\VNWHT-TRL\CBR0696-BRG-SUR-001.dwg By: Jim.Kimble

CONTRACTED PROFILE

SCALE HORIZ.: 0 50'

SCALE VERT.: 0 10'

PROFILE GRADE EX. FREIGHT– (BNSF–WAYZATA SUB)

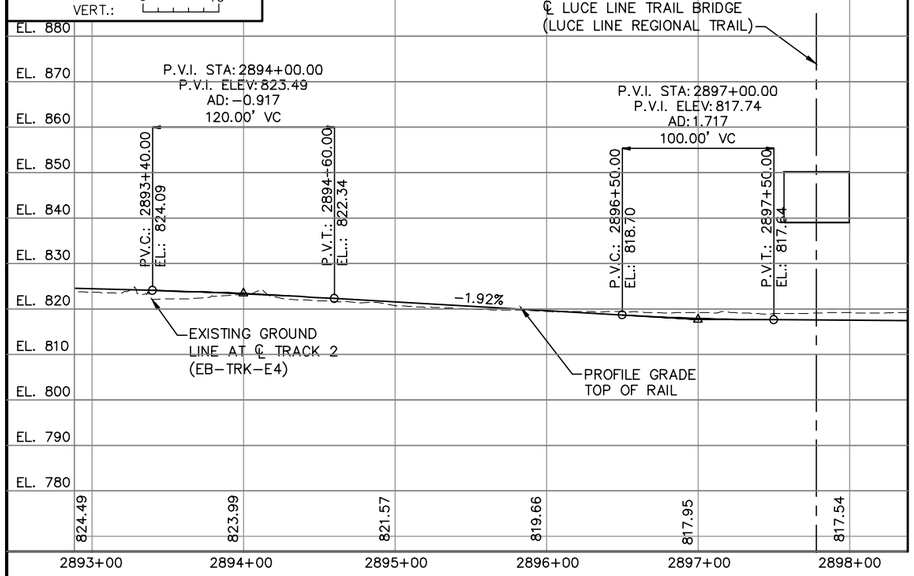


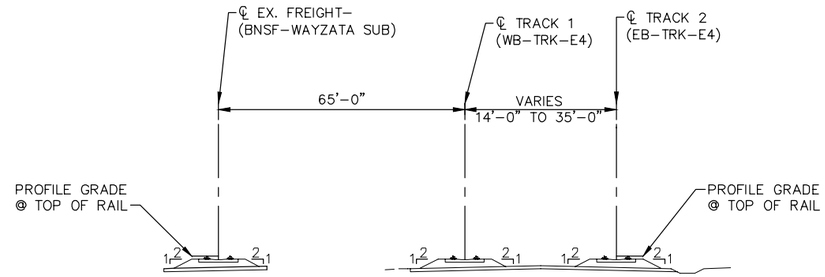
CONTRACTED PROFILE

SCALE HORIZ.: 0 50'

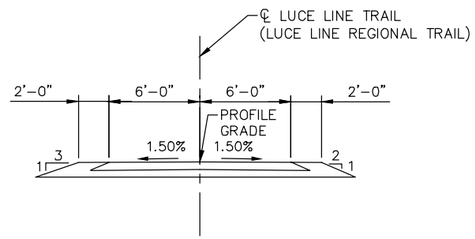
SCALE VERT.: 0 10'

PROFILE GRADE TRACK 2 (EB–TRK–E4)





TYPICAL SECTIONS EX. FREIGHT AND TRACK 1 AND TRACK 2



TYPICAL SECTIONS LUCE LINE TRAIL

LOCATION ENGINEER'S OBSERVATIONS AT BRIDGE SITE

1. SPECIAL FEATURES: WATERFALLS, DAMS, FLOODS, ICE, DEBRIS SLIDING BANKS, RECREATIONAL BOATING.
2. OTHER BRIDGES OR CULVERTS OVER THE SAME STREAM (PARTICULARLY STRUCTURES WHICH CARRY HIGH WATER WITHOUT OVERFLOW OF ROADWAY): GIVEN LOCATION, TYPE, LENGTH, HEIGHT ABOVE HIGH WATER, CROSS–SECTIONAL AREA ETC.
3. APPARENT HIGHWATER ELEVATION OBTAINED FROM:
4. OTHER DATA: APPROX. VELOCITY OF WATER AT TIME OF SURVEY.

HYDRAULIC ENGINEER'S RECOMMENDATION

DATE:

STREAM OR DITCH DESIGNATION

DRAINAGE AREA

MAX FLOOD ON RECORD

DESIGN FLOOD (YR. FREQ.): C.F.S.
HEADWATER ELEVATION: FT.
DESIGN MEAN VELOCITY THROUGH STRUCTURE F.P.S.
TOTAL STAGE INCREASE FT.
LOW MEMBER AT OR ABOVE ELEVATION FT.

WATERWAY AREA REQUIRED BELOW ELEV. = SQ. FT.
AT RIGHT ANGLES TO CHANNEL

BASIC FLOOD (100 YR. FREQ.) C.F.S.
HEADWATER ELEVATION: FT.
TOTAL STAGE INCREASE FT.
MEAN VELOCITY THROUGH STRUCTURE

FLOWLINE ELEVATION: FT. SKEW ANGLE:

ESTIMATED PRELIMINARY TOTAL SCOUR AT PIER EL.
(500 OR OT YR. FREQ.)

SCOUR CONFIRMATION RECOMMENDATION

DATE:

TOTAL SCOUR AT PIER EL. (500 OR OT YR. FREQ.)
SCOUR CODE: OBTAIN FROM HYDRAULIC ENGINEER

BRIDGE SURVEY = SHEETS MADE FROM 2014 MFRA SURVEYS

1ST BENCH MARK
ELEVATION: 838.49
NORTHING: 166512.10
EASTING: 522182.52
DESCRIPTION: DRILL HOLE IN CONCRETE

2ND BENCH MARK
ELEVATION: 841.33
NORTHING: 166200.34
EASTING: 522480.63
DESCRIPTION: DRILL HOLE IN CONCRETE

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: PDC CHECKED BY: SAD
DRAWN BY: JIK DATE: 08/24/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

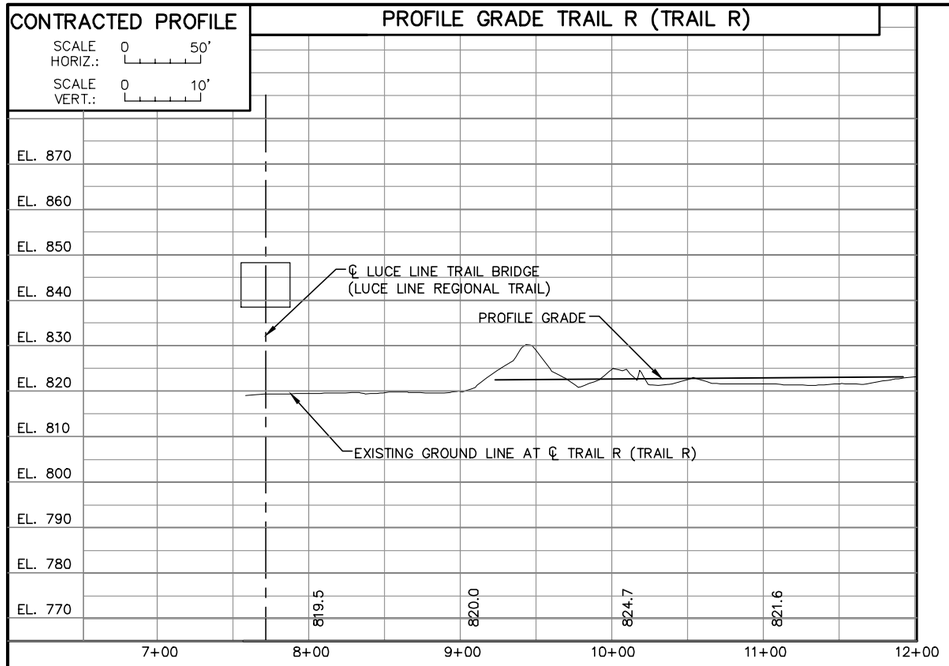
CIVIL EAST - VOLUME 4B
LUCE LINE TRAIL BRIDGE
BRIDGE R0696
BRIDGE SURVEY 2

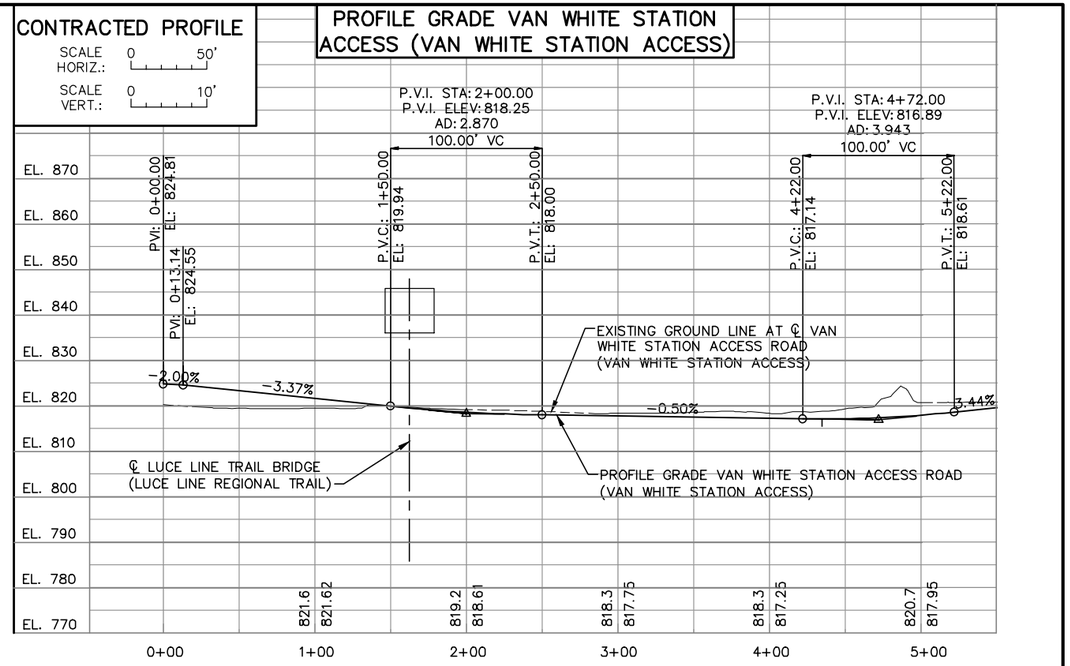
DISCIPLINE: STRUCTURES

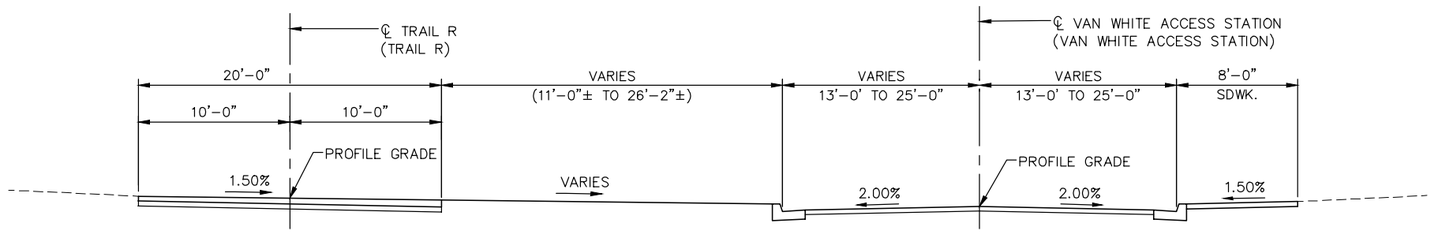
SHEET NAME: CBR0696-BRG-SUR-002

SHEET 33 OF 39

Sep, 04 2015 12:30 pm v:\3400_ADC\CAD\SEGMENT E4\PLAN SHEETS\STRUCTURES\WWHT-TRL\CBR0696-BRG-SUR-002.dwg By: Jim.Kimble







TYPICAL SECTIONS TRAIL R AND
VAN WHITE ACCESS STATION

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: PDC | CHECKED BY: SAD
DRAWN BY: JIK | DATE: 08/24/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

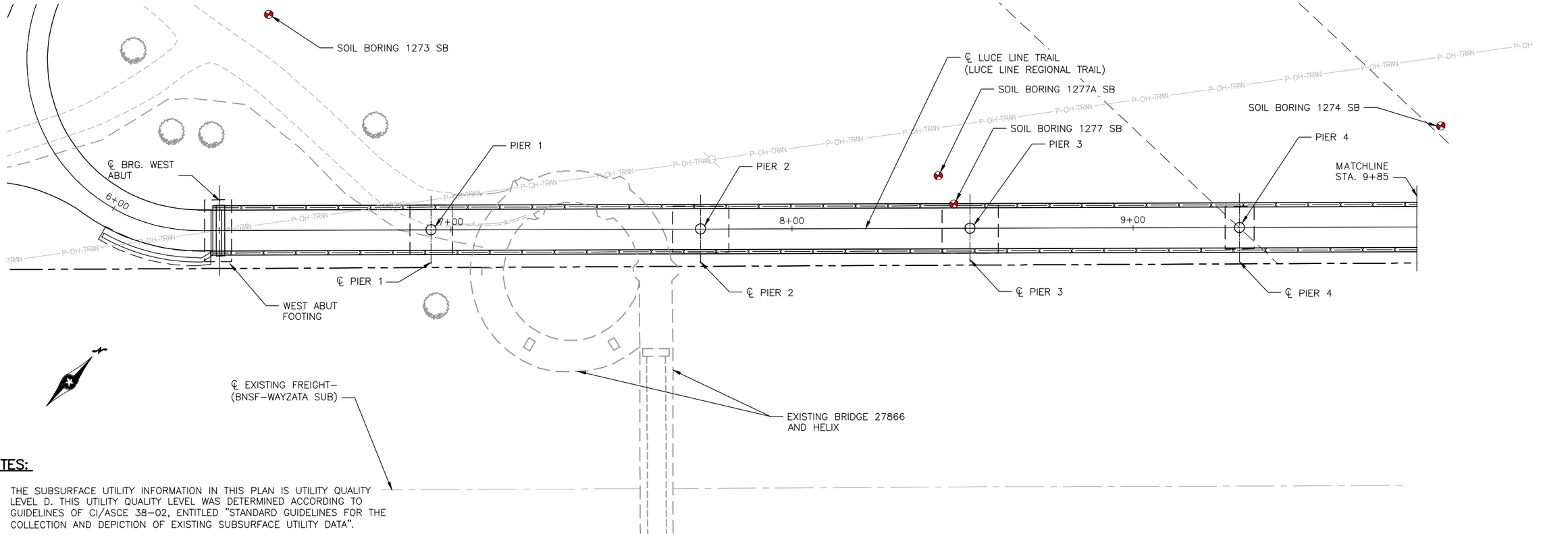
CIVIL EAST - VOLUME 4B
LUCE LINE TRAIL BRIDGE
BRIDGE R0696
BRIDGE SURVEY 3

DISCIPLINE: STRUCTURES

SHEET NAME: CBR0696-BRG-SUR-003

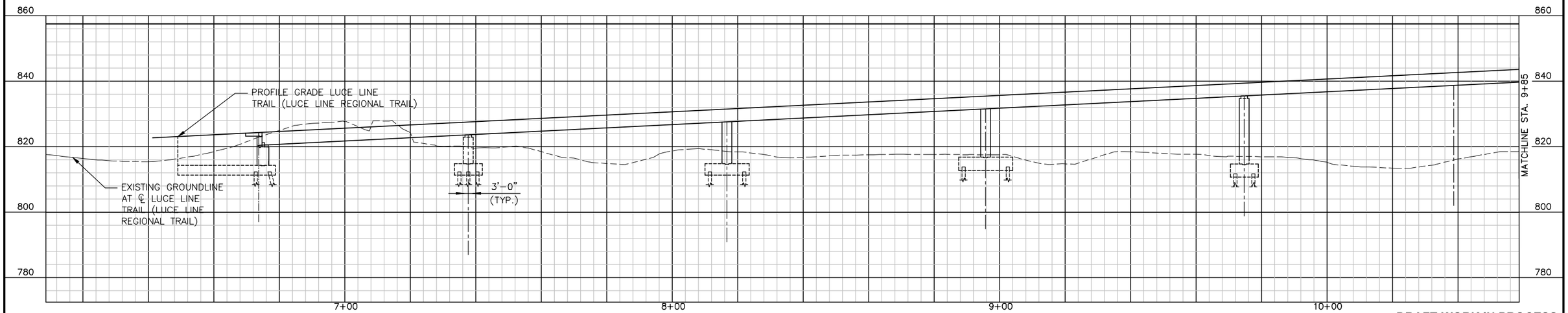
SHEET 34 OF 39

Sep. 04 2015 12:30 pm V:\3400_ADC\CAD\SEGMENT E4\PLAN SHEETS\STRUCTURES\VNWHT-TRL\CBR0696-BRG-SUR-003.dwg By: Jim.Kimble



NOTES:

1. THE SUBSURFACE 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".
2. FOR P.C. AND P.T., COORDINATES SEE GENERAL PLAN, SHEET 1.



DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: PDC | CHECKED BY: SAD
DRAWN BY: JIK | DATE: 08/24/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

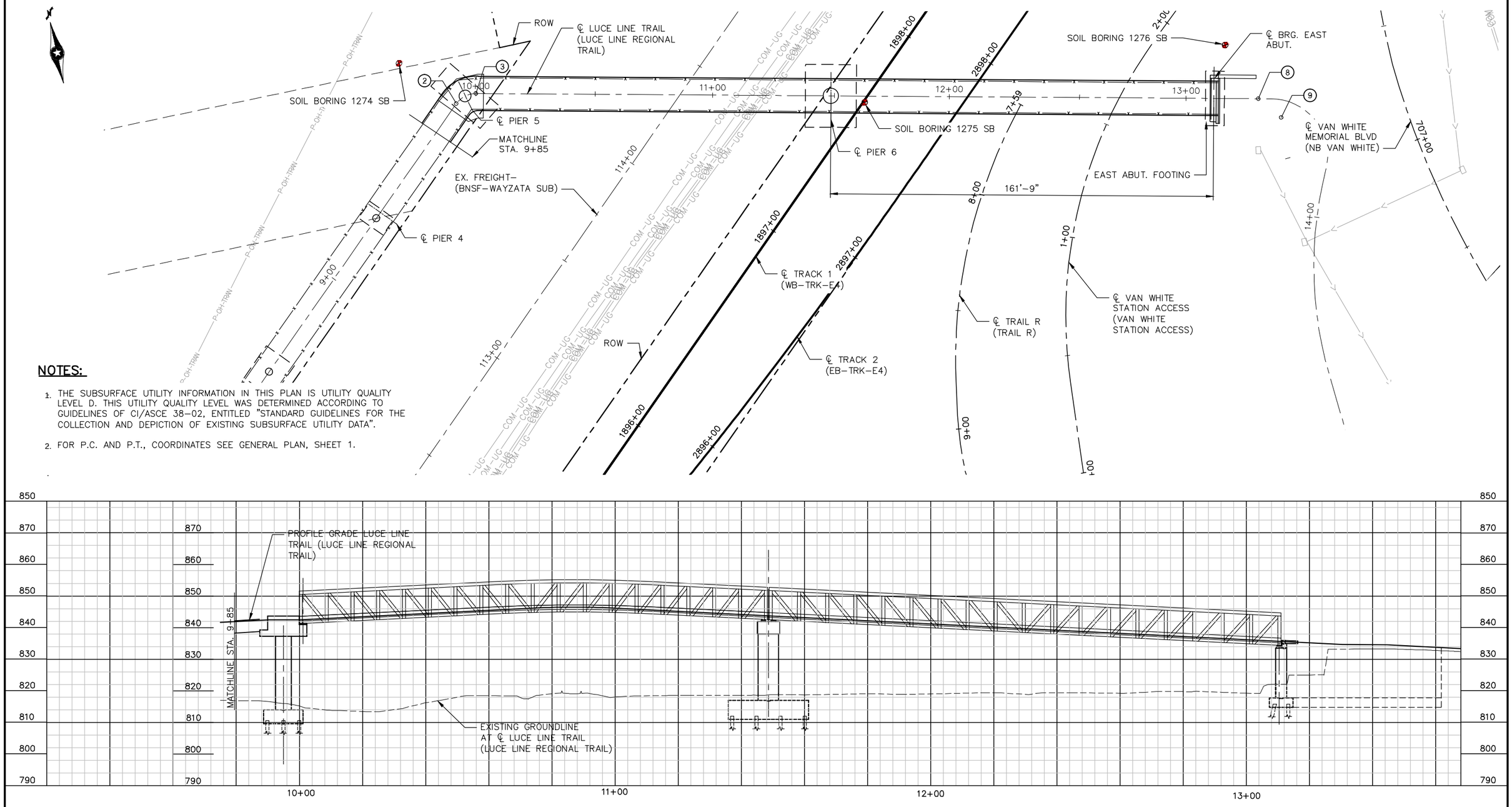
CIVIL EAST - VOLUME 4B
LUCE LINE TRAIL BRIDGE
BRIDGE R0696
BORINGS 1

DISCIPLINE: STRUCTURES

SHEET NAME: CBR0696-BRG-BOR-001

SHEET 35 OF 39

Sep, 04 2015 12:32 pm v:\3400_ADC\CAD\SEGMENT E4\PLAN SHEETS\STRUCTURES\VNWHT-TRL\CBR0696-BRG-BOR-001.dwg By: Jim.Kimble



NOTES:

1. THE SUBSURFACE 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".
2. FOR P.C. AND P.T., COORDINATES SEE GENERAL PLAN, SHEET 1.

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: PDC | CHECKED BY: SAD
DRAWN BY: JIK | DATE: 08/24/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4B
LUCE LINE TRAIL BRIDGE
BRIDGE R0696
BORINGS 2

DISCIPLINE: STRUCTURES
SHEET NAME: CBR0696-BRG-BOR-002

SHEET 36 OF 39

Sep. 04 2015 12:33 pm v:\3400_ADC\CAD\SEGMENT E4\PLAN SHEETS\STRUCTURES\VNWHT-TRL\CBR0696-BRG-BOR-002.dwg By: Jim.Kimble

1273 SB | Elevation 834.7

Coh	N60			
			830	
	12			SILTY SAND, a little gravel and clayey sand, pieces of bituminous and plastic, trace roots, dark grayish brown, a little black (A-2-4) (slight petroleum-type odor below 2') fill
	11			
	4			
	4			
	3			SILTY SAND, a little gravel, pieces of wood, dark gray (A-2-4) (slight petroleum-type odor) fill
	44		820	
	17			SILTY SAND, a little gravel, black, a little light brown (A-2-4) (petroleum-type odor) fill
	8			GRAVELLY SAND WITH SILT, pieces of concrete, trace roots, dark gray, a little light brown (A-1-b) fill
	3		810	
	7			HEMIC PEAT, black (PT) A-8, swamp deposit
	8			ORGANIC CLAY, trace roots and shells, brownish gray, soft (OH), A-8, swamp deposit
	5			SAND, a little gravel, fine to medium grained, gray, waterbearing, loose (SP) A-1-b, alluvium
	3		800	
	1			SAND, a little gravel, fine to medium grained, gray, waterbearing, loose, lenses of clayey sand (SP) A-1-b, alluvium
	1			
	2			SILTY SAND, a little gravel, fine to medium grained, dark gray, waterbearing, very loose (SM) A-2-4, alluvium
			790	
285	7			SILTY SAND, fine grained, dark brownish gray, waterbearing, very loose, lenses and laminations of lean clay (SM) A-2-4, alluvium
1335				
	10			FAT CLAY, dark brownish gray, very soft to soft (CH) A-7-6, alluvium
				LEAN CLAY, brownish gray, lenses and laminations of silty sand (CL) A-6, alluvium
	1		780	
				SANDY LEAN CLAY, dark brownish gray, stiff, lenses and laminations of silty sand (CL) A-6, till
	15			FAT CLAY, dark brownish gray, stiff to very soft, lenses and laminations of sand with silt (CH) A-7-6, alluvium
	25		770	
	4			SILTY SAND, fine to medium grained, dark brownish gray, waterbearing, medium dense to loose to medium dense, lenses and laminations of clayey sand and fat clay (SM) A-2-4, alluvium
	25			
	50		760	
	16			FAT CLAY, dark brownish gray, very stiff to stiff (CH) A-7-6, alluvium
	14			
			750	
	13			SILTY SAND, a little gravel, fine to medium grained, dark brownish gray, waterbearing, medium dense, lenses and laminations of clayey sand (SM) A-2-4, alluvium
	17			SILTY SAND, a little gravel, fine to medium grained, dark grayish brown, waterbearing, medium dense (@M) A-1-b, alluvium
	23		740	
	24			FAT CLAY, dark brownish gray, very stiff (CH) A-7-6, alluvium
	27			CLAYEY SAND, a little gravel, dark brownish gray, very stiff (SC) A-6, till
	34		730	
	23			SANDY LEAN CLAY, a little gravel, dark brownish gray, hard to very stiff to hard (CL) A-7-6, till
	31			
	28		720	
	41			CLAYEY SAND, a little gravel, dark brownish gray, very stiff to hard (SC) A-6, till
	48			
	24		710	
	60			
	43			LEAN CLAY, a little gravel, dark brownish gray, hard, lenses and laminations of silty sand (CL) A-6, alluvium
			700	Bottom of Hole - 161.5'

1274 SB | Elevation 831.4

Coh	N60			
	16		830	CLAYEY SAND, a little gravel, pieces of concrete, wood and bituminous, trace roots, dark brown, A-6, fill
	7			
	7			
	13			SILTY SAND WITH GRAVEL, a little clayey sand, pieces of glass, dark brown, A-1-b, fill
	2		820	
	3			PIECES OF CONCRETE, a little silty sand, trace roots, dark brown, A-1-b, fill
	WH			HEMIC PEAT, black (PT) A-8, swamp deposit
	3			ORGANIC CLAY, trace shells and roots, brownish gray to dark brownish gray, very soft to soft (OH) A-8, swamp deposit
	6		810	FAT CLAY, trace roots, dark gray, a little gray, soft, a lense of organic clay, laminations of sand (CH) A-7-6, alluvium
	11			
	9			SAND, fine to medium grained, gray, waterbearing, loose (SP) A-3, alluvium
	8			
	12			SAND, a little gravel, fine to medium grained, gray, waterbearing, medium dense to loose (SP) A-1-b, alluvium
	8		800	
	10			
	4			LEAN CLAY WITH SAND, dark gray, soft, lenses and laminations of clayey sand (CL) A-6, alluvium
695				
	11			LEAN CLAY, dark brownish gray, soft to stiff, lenses and laminations of fat clay and sandy silt (CL/CH) A-7-6, alluvium
1620			790	
	2			SILTY SAND, fine grained, brownish gray, wet, very loose (SP-SM) A-2-4, alluvium
	15			SANDY LEAN CLAY, a little gravel, brownish gray, stiff (CL) A-6, till
	21		780	SILTY SAND, a little gravel, fine to medium grained, brownish gray, wet, medium dense (SM) A-2-4, alluvium
	22			SAND WITH SILT, a little gravel, fine grained, brownish gray, waterbearing, medium dense (SP-SM) A-3, alluvium
	19			SILTY SAND, a little gravel, fine to medium grained, dark brownish gray, wet, medium dense (SM) A-2-4, alluvium
	11		770	FAT CLAY, grayish brown, stiff (CH) A-7-6, alluvium
	12			
	7			CLAYEY SAND, a little gravel, brownish gray, firm to soft (SC) A-6, till
	3		760	
	11			SANDY LEAN CLAY, a little gravel, dark brownish gray, stiff to very stiff (CL) A-6, till
	19			
	21		750	
	13			CLAYEY SAND, a little gravel, dark brownish gray, stiff to hard (SC) A-6, till
	17			
	29		740	
	29			
	33			
	31		730	
	35			
	36			SILTY SAND, a little gravel, dark brownish gray, very dense (SM) A-2-4, till
	*		720	
	**			CLAYEY SAND, a little gravel, dark brownish gray, hard, laminations of silt and sand (SC) A-6, till
	***		710	Bottom of Hole - 160.3'

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: PDC | CHECKED BY: SAD
DRAWN BY: JIK | DATE: 08/24/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4B
LUCE LINE TRAIL BRIDGE
BRIDGE R0696
BORINGS 3

DISCIPLINE: STRUCTURES
SHEET NAME: CBR0696-BRG-BOR-003

SHEET 37 OF 39

Sep. 04 2015 12:33 pm V:\3400_ADC\CAD\SEGMENT E4\PLAN SHEETS\STRUCTURES\VNWHT-TRL\CBR0696-BRG-BOR-003.dwg By: Jim.Kimble

1275 SB

Elevation XXX.X

1275 SB

Coh	N60	
	13	MIXTURE OF SILTY SAND AND SANDY LEAN CLAY, a little gravel, ashes/cinders, dark brown and black, A-2-4/A-6, fill
	12	SANDY LEAN CLAY, a little gravel, brown and dark brown, A-6, fill
	▼50/.2	
	50/.1	MIXTURE OF SANDY LEAN CLAY AND SILTY SAND, a little gravel, pieces of metal, brown and dark brown, A-6, fill
	36	MOSTLY PIECES OF CONCRETE, gray, fill
	4	
	2	MOSTLY PIECES OF WOOD, dark brown and brown, fill
	*	
	3	ORGANIC CLAY, trace shells and roots, gray, soft (OH) A-7-6, alluvium
165	3	
	25	SAND, a little gravel, pieces of wood, fine to medium grained, dark gray, a little brownish gray, waterbearing, a lens of organic clay (SP) alluvium
	43	
	47	SILTY SAND, trace roots, fine grained, gray, wet, medium dense (SM) A-2-4, alluvium
	46	
	28	SAND, fine grained, gray, waterbearing, medium dense (SP) A-3, alluvium
	31	
	16	
980		
	10	
1440		
	11	FAT CLAY, gray to dark gray, a little light gray, stiff, laminations of silt and lean clay (CH) A-7-6, alluvium
	13	
	11	
	16	
	38	SAND, a little gravel, fine to medium grained, brown, waterbearing, dense (SP) A-1-b, alluvium
	24	FAT CLAY, gray, very stiff (CH) A-7-6, alluvium
	26	CLAYEY SAND, a little gravel, gray, very stiff to hard (SC) A-6, till
	34	
	35	
	33	
	33	
	52	
	48	
	48	
	48	

Bottom of Hole – 131'

1276 SB

Elevation XXX.X

Coh	N60	
	9	CLAYEY SAND, a little gravel and silty sand, pieces of concrete, brick, glass and fabric, trace roots, dark brown, A-6, fill
	9	
	6	
	▼15	SAND WITH SILT AND GRAVEL, brown and gray, A-1-b, fill
	10	
	2	ORGANIC CLAY, trace shells and roots, black, a little light gray, soft, lens of boglime (OH) A-7-6, alluvium
	1	
830		ORGANIC CLAY, trace shells and roots, brownish gray, very soft (OH) A-7-6, alluvium
	14	
	3	FAT CLAY WITH SAND, slightly organic, trace shells, gray, stiff (CH) A-7-6, alluvium
	30	
	31	SILTY SAND, with organic fines, fine grained, dark gray, wet, medium dense to very loose, a lens of fat clay around 23' (SM) A-2-4, alluvium
	36	
	32	
	38	SAND, fine grained, gray, waterbearing, medium dense (SP) A-3, alluvium
	18	
	6	SAND, fine to medium grained, grayish brown, waterbearing, dense (SP) A-3, alluvium
1025		
	9	SAND, fine grained, brown to gray, waterbearing, dense (SP) A-3, alluvium
965		
	11	SAND, fine to medium grained, gray, waterbearing, dense to medium dense (SP) A-3, alluvium
885		FAT CLAY, gray to dark gray, a little light gray, very stiff to firm, laminations of silt (CH) A-7-6, alluvium
	10	
	14	
	21	FAT CLAY WITH SAND, a little gravel, gray, stiff to very stiff (CH) A-7-6, till
	16	
	19	SANDY LEAN CLAY, a little gravel, gray, very stiff (CL) A-7-6, till
	21	
	22	CLAYEY SAND, a little gravel, gray, very stiff to hard (SC) A-6, till
	22	
	25	
	32	
	23	LEAN CLAY WITH SAND, gray, very stiff (CL) A-7-6, till
	24	FAT CLAY, gray, a little light gray, very stiff, laminations of silt (CH) A-7-6, alluvium
	18	CLAYEY SAND, a little gravel, gray, very stiff (SC) A-6, till
	38	SANDY LEAN CLAY, a little gravel, gray, hard (CL) A-7-6, till
	53	
	48	CLAYEY SAND, a little gravel, gray, hard (SC) A-6, till
	72	
	65	SANDY LEAN CLAY, a little gravel, gray, hard, lenses and laminations of fat clay (CL) A-6, till

Bottom of Hole – 151'

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: PDC | CHECKED BY: SAD
DRAWN BY: JIK | DATE: 08/24/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4B
LUCE LINE TRAIL BRIDGE
BRIDGE R0696
BORINGS 4

DISCIPLINE: STRUCTURES

SHEET NAME: CBR0696-BRG-BOR-004

SHEET 38 OF 39

Sep. 04 2015 12:34 pm V:\3400_ADC\CAD\SEGMENT E4\PLAN SHEETS\STRUCTURES\VNWHT-TRL\CBR0696-BRG-BOR-004.dwg By: Jim.Kimble

1277 SB | Elevation 831.4

Coh N60

Coh N60	Description
8 17 32 8	MIXTURE OF CLAYEY SAND AND LEAN CLAY WITH SAND, a little gravel and silty sand, pieces of concrete and bituminous, dark brown, A–6, fill
13 8	LEAN CLAY WITH SAND, slightly organic, a little gravel, pieces of wood and concrete, trace roots, black, A–7–6, fill
1 WH 1	SILTY SAND WITH GRAVEL, apparent cobbles, pieces of concrete and plastic, trace roots, dark brownish gray, A–2–4, fill
	ORGANIC CLAY, a little gravel, pieces of wood, trace roots, black, firm (OH) A–8, swamp deposit
	SAPRIC PEAT, black, a lense of organic clay, laminations of sand (PT) A–8, swamp deposit
	ORGANIC CLAY, trace shells and roots, brownish gray, very soft (OH) A–8, swamp deposit
	Bottom of Hole – 23.5'

1277A SB | Elevation 831.6

Coh N60

Coh N60	Description
	No sampling to 24.5' (see Boring 1277 SB)
	ORGANIC CLAY, trace shells, grayish brown (OH) A–8, swamp deposit
3 8	SAND, fine to medium grained, gray, waterbearing, very loose (SP) A–3, alluvium
7 8 8	SAND, a little gravel, medium grained, brownish gray, waterbearing, loose, lenses and laminations of clayey sand (SP) A–1–b, alluvium
6 8	SILTY SAND, a little gravel, fine grained, dark gray, waterbearing, loose (SM) A–2–4, alluvium
6 8 5 19 14	SILTY SAND, a little gravel, fine grained, dary gray, waterbearing, loose to medium dense, lenses and laminations of lean clay (SM) A–2–4, alluvium
15	SILTY SAND, fine grained, dark gray, waterbearing, medium dense, lenses and laminations of sandy silt and lean clay (SM) A–2–4, alluvium
12	FAT CLAY, dark gray, stiff (CH) A–7–6, alluvium
20	SILTY SAND, fine to medium grained, dark brownish gray, waterbearing, medium dense (SM) A–2–4, alluvium
19 17	FAT CLAY, dark brownish gray, very stiff, lenses of silty sand (CH) A–7–6, alluvium
16 14	CLAYEY SAND, a little gravel, dark brownish gray, very stiff to stiff (SC) A–6, till
30 52	SILTY SAND, a little gravel, fine to medium grained, dark brownish gray, waterbearing, medium dense to very dense, lense and laminations of fat clay (SM) A–2–4, alluvium
28 19 28 25	CLAYEY SAND, a little gravel, dark brownish gray, very stiff (SC) A–6, till
36	SANDY LEAN CLAY, a little gravel, dark brownish gray, hard (CL) A–6, till
22	FAT CLAY, dark gray, very stiff (CH) A–7–6, alluvium
48 46	CLAYEY SAND, a little gravel, dark brownish gray, hard (SC) A–6, till
65 43	SAND LEAN CLAY, a little gravel, dark brownish gray, hard (CL) A–6, till
51	LEAN CLAY, a little gravel, dark brownish gray, a little gray, hard, laminations of silt (CL) A–6, alluvium
	Bottom of Hole – 161'

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: PDC | CHECKED BY: SAD
DRAWN BY: JIK | DATE: 08/24/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

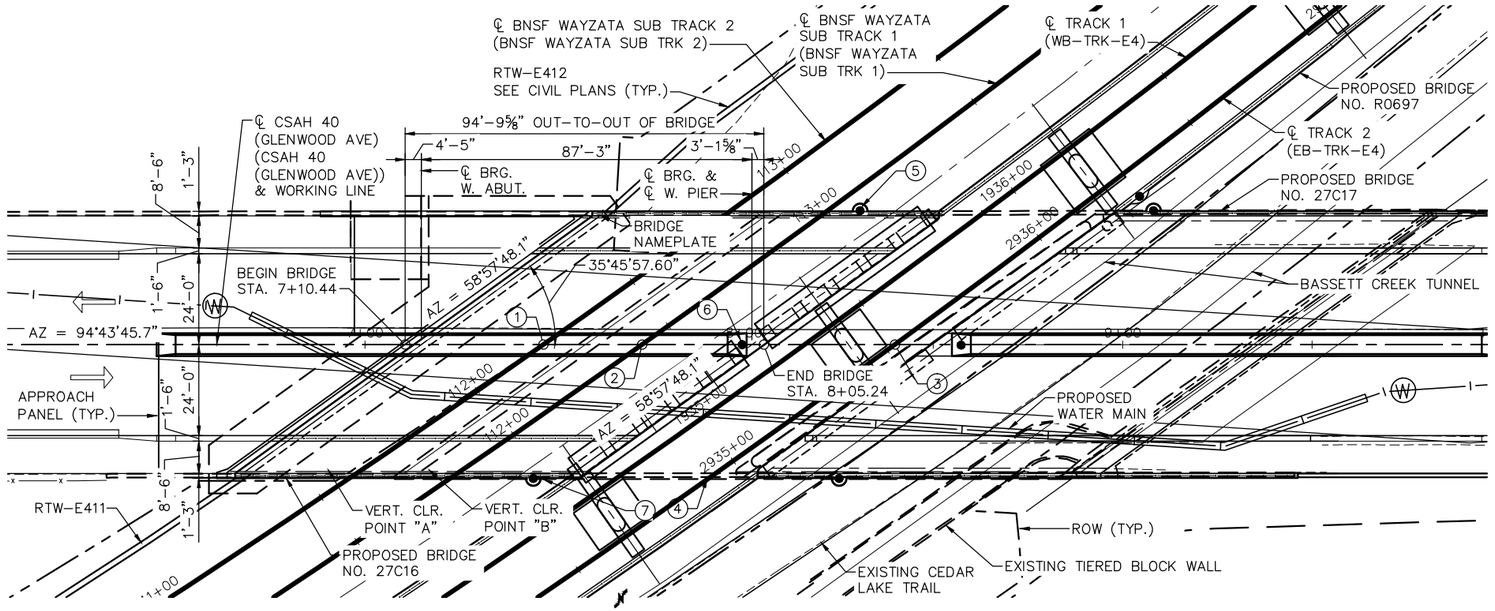
SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4B
LUCE LINE TRAIL BRIDGE
BRIDGE R0696
BORINGS 5

DISCIPLINE: STRUCTURES
SHEET NAME: CBR0696-BRG-BOR-005

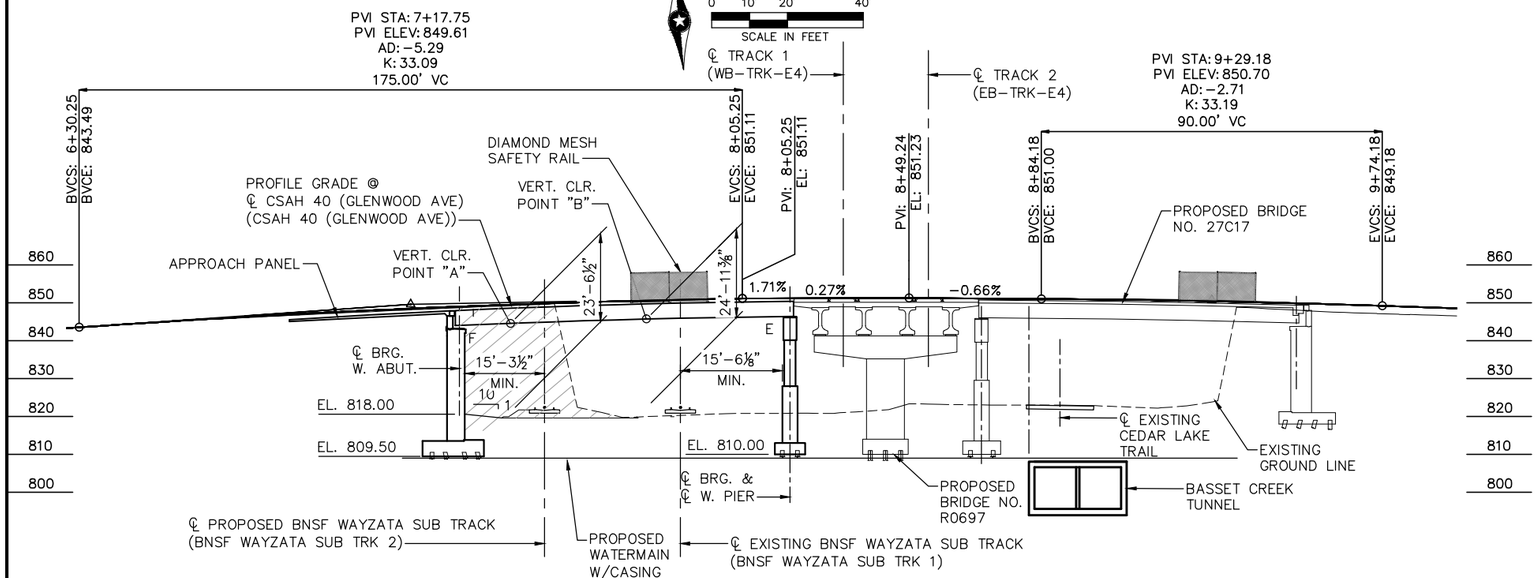
SHEET 39 OF 39

Sep, 04 2015 12:34 pm v:\3400_ADC\CAD\SEGMENT E4\PLAN SHEETS\STRUCTURES\VNWHT-TRL\CBR0696-BRG-BOR-005.dwg By: Jim.Kimble



GENERAL PLAN

0 10' 20' 40'
SCALE IN FEET



WEST ABUTMENT WEST PIER

GENERAL ELEVATION

0 10' 20' 40'
SCALE IN FEET

LIST OF SHEETS

NO.	DESCRIPTION
1	GENERAL PLAN & ELEVATION
2	TRANSVERSE SECTION & QUANTITIES
3	BRIDGE LAYOUT
4–7	WEST ABUTMENT DETAILS
8–10	WEST PIER DETAILS
11	FRAMING PLAN
12	STRUCTURAL STEEL DETAILS
13–16	SUPERSTRUCTURE DETAILS
17	STRUCTURAL TUBE RAILING AND CONCRETE PARAPET
18	CONCRETE CURB
19	WIRE FENCE (DIAMOND MESH SAFETY RAIL
20	CONDUIT SYSTEM
21–23	WATERPROOF EXPANSION DEVICE
24	APPROACH PANEL
25–29	BRIDGE DETAILS
30–32	BRIDGE SURVEY
33	BRIDGE SURVEY PLAN
34–35	BRIDGE SURVEY PROFILE

DESIGN DATA

2014 AND CURRENT INTERIM AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS

SOUTHWEST LIGHT RAIL TRANSIT DESIGN CRITERIA (REVISION 4.0)

LOAD AND RESISTANCE FACTOR DESIGN METHOD
HL–93 LIVE LOAD

DEAD LOAD INCLUDES 20SF ALLOWANCE FOR FUTURE WEARING COURSE MODIFICATIONS

MATERIAL DESIGN PROPERTIES:
REINFORCED CONCRETE:
f'c = 4 KSI n = 8
fy = 60 KSI REINFORCEMENT

STRUCTURAL STEEL:
fy = 36 KSI STRUCTURAL STEEL SPEC. 3306
fy = 50 KSI STRUCTURAL STEEL SPEC. 3309

DESIGN SPEED: OVER = 30 MPH
UNDER = PER BNSF RAIL

7800 PROJECTED AADT FOR YEAR 2040

APPROXIMATE DECK AREA 6684 SQ. FT.

BRIDGE OPERATING RATING:

NOTES:

SEE BRIDGE SURVEY PLAN FOR INPLACE UTILITIES.

1. ℄ CSAH 40 (GLENWOOD AVE)
(CSAH 40 (GLENWOOD AVE)) P.O.C. 7+47.08
℄ BNSF WAYZATA SUB TRACK 2
(BNSF WAYZATA SUB TRK 2) P.O.T. 112+21.20
X = 525722.907 Y = 168541.154
Δ = 35°02'00.5"
2. ℄ CSAH 40 (GLENWOOD AVE)
(CSAH 40 (GLENWOOD AVE)) P.O.C. 7+73.11
℄ BNSF WAYZATA SUB TRACK 1
(BNSF WAYZATA SUB TRK 1) P.O.T. 112+41.42
X = 525748.844 Y = 168539.008
Δ = 35°21'28.2"
3. ℄ CSAH 40 (GLENWOOD AVE)
(CSAH 40 (GLENWOOD AVE)) P.O.C. 8+39.83
℄ TRACK 2 (EB–TRK–E4) P.O.T. 2935+52.51
X = 525815.344 Y = 168533.506
Δ = 36°10'39.1"
4. EXISTING BRIDGE NO. 27569 TO BE REMOVED, TWO SPAN CONT. STEEL BUILT IN 1989. 181.9' LONG AND 70.4' WIDE.
5. PEDESTRIAN FLASHER
6. OCS POLE
7. GATE ARM

BRIDGE NO. 27C16

CSAH 40 (GLENWOOD AVENUE) OVER BNSF WAYZATA SUB R.R. TRACKS.
0.2 MI. EAST OF JCT. CSAH 40 (GLENWOOD AVENUE) & INTERSTATE 94

88' STEEL BEAM SPAN, 54°14'02.4" SKEW, 2–21' RDWY., 6'–0" RAISED CONCRETE MEDIAN, TYPE P–2 CONC. PARAPETS & STRUCTURAL TUBE RAILINGS, 8'–6" SIDEWALKS WITH CONCRETE CURBS & SAFETY RAILS.

BRIDGE I.D. NO. 301

GENERAL PLAN & ELEVATION

SEC 22 T 29 N R 24 W
CITY OF MINNEAPOLIS HENNEPIN COUNTY

APPROVED: _____
STATE BRIDGE ENGINEER DATE

DRAFT-WORK IN PROCESS

JOB NO.: T9N635 | STATE PROJ. NO.: 9909–01 | MNDOT REVIEW: JOE NIETFELD

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: EJT CHECKED BY: LNI
DRAWN BY: NAO DATE: 8/24/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

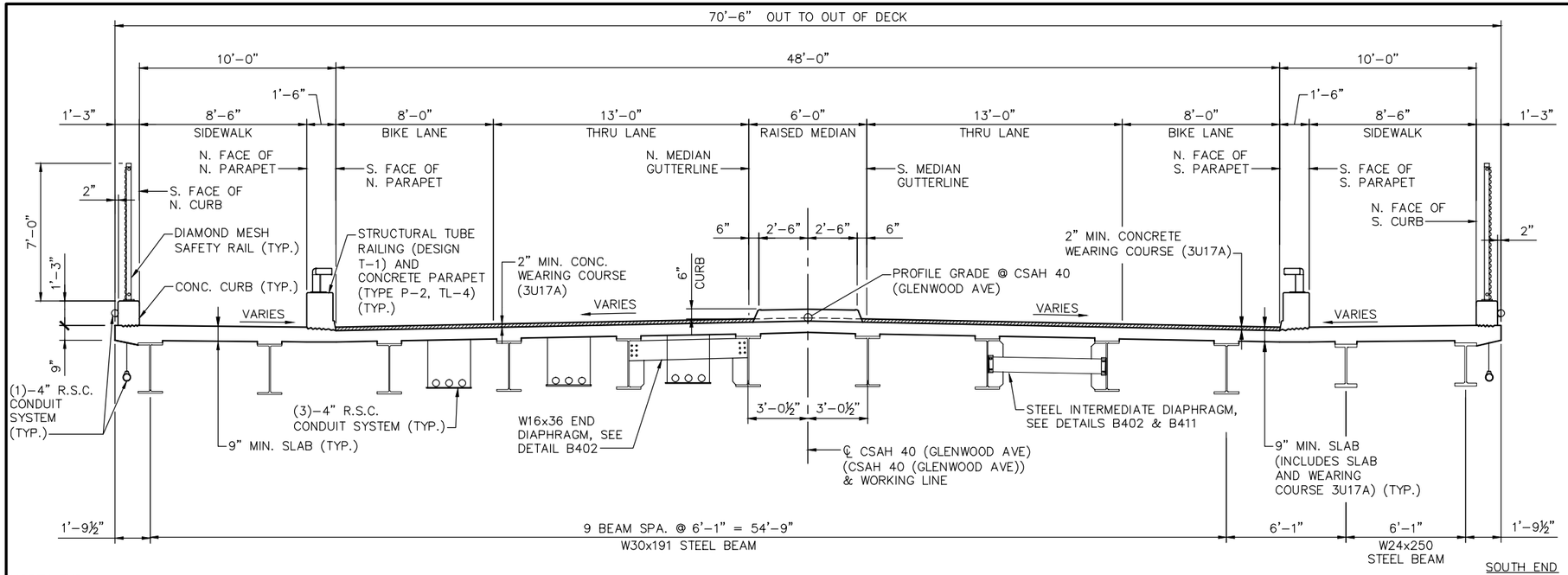
SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4B
CSAH 40 (GLENWOOD AVENUE) - WEST
BRIDGE 27C16
GENERAL PLAN & ELEVATION

DISCIPLINE: STRUCTURES
SHEET NAME: CBR27C16-BRG-GPE

SHEET 1 OF 35

Aug, 24 2015 09:36 am V:\3400_ADC\CAD\SEGMENT E4\PLAN SHEETS\STRUCTURES\27C16\CBR27C16-BRG-GPE.dwg By: Neal.Oleson



TRANSVERSE SECTION

0 10' 20' 40'

SCALE IN FEET

QUANTITY ESTIMATE FOR ENTIRE BRIDGE

ITEM NO.	ITEM	UNIT	QUANTITY
2401	STRUCTURAL CONCRETE (1G52)	CU. YD.	
2401	STRUCTURAL CONCRETE (3B52)	CU. YD.	
2401	TYPE CURB RAILING CONCRETE (3S52)	LIN. FT.	
2401	TYPE P-2 (TL-4) RAILING CONCRETE (3S52)	LIN. FT.	
2401	RAISED MEDIAN CONCRETE (3S52)	SQ. FT.	
2401	REINFORCEMENT BARS	POUND	
2401	REINFORCEMENT BARS (EPOXY COATED)	POUND	
2401	REINFORCEMENT BARS (STAINLESS-60 KSI)	POUND	
2401	STRUCTURE EXCAVATION	CU. YD.	
2401	BRIDGE SLAB CONCRETE (3YHPC-S)	SQ. FT.	
2402	EXPANSION JOINT DEVICES TYPE 5	LIN. FT.	
2402	BEARING ASSEMBLY	EACH	
2402	STRUCTURAL STEEL (3309)	POUND	
2406	BRIDGE APPROACH PANELS	SQ. YD.	
2411	ANTI-GRAFFITI COATING	SQ. FT.	
2411	REVERSE BATTEN SURFACE TREATMENT	SQ. YD.	
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	STEEL H-TEST PILE 95 FT LONG 12"	EACH	
2452	PILE TIP PROTECTION 12"	EACH	
2502	DRAINAGE SYSTEM TYPE (B910)	EACH	
2545	CONDUIT SYSTEM	EACH	
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.

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

BARS MARKED WITH THE SUFFIX "S" SHALL BE STAINLESS STEEL IN ACCORDANCE WITH THE SPECIAL PROVISIONS.

ALL REINFORCEMENT SHALL BE 2 INCHES CLEAR, UNLESS SHOWN OR NOTED OTHERWISE.

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.

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".

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: EJT | CHECKED BY: LNI

DRAWN BY: NAO | DATE: 8/24/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

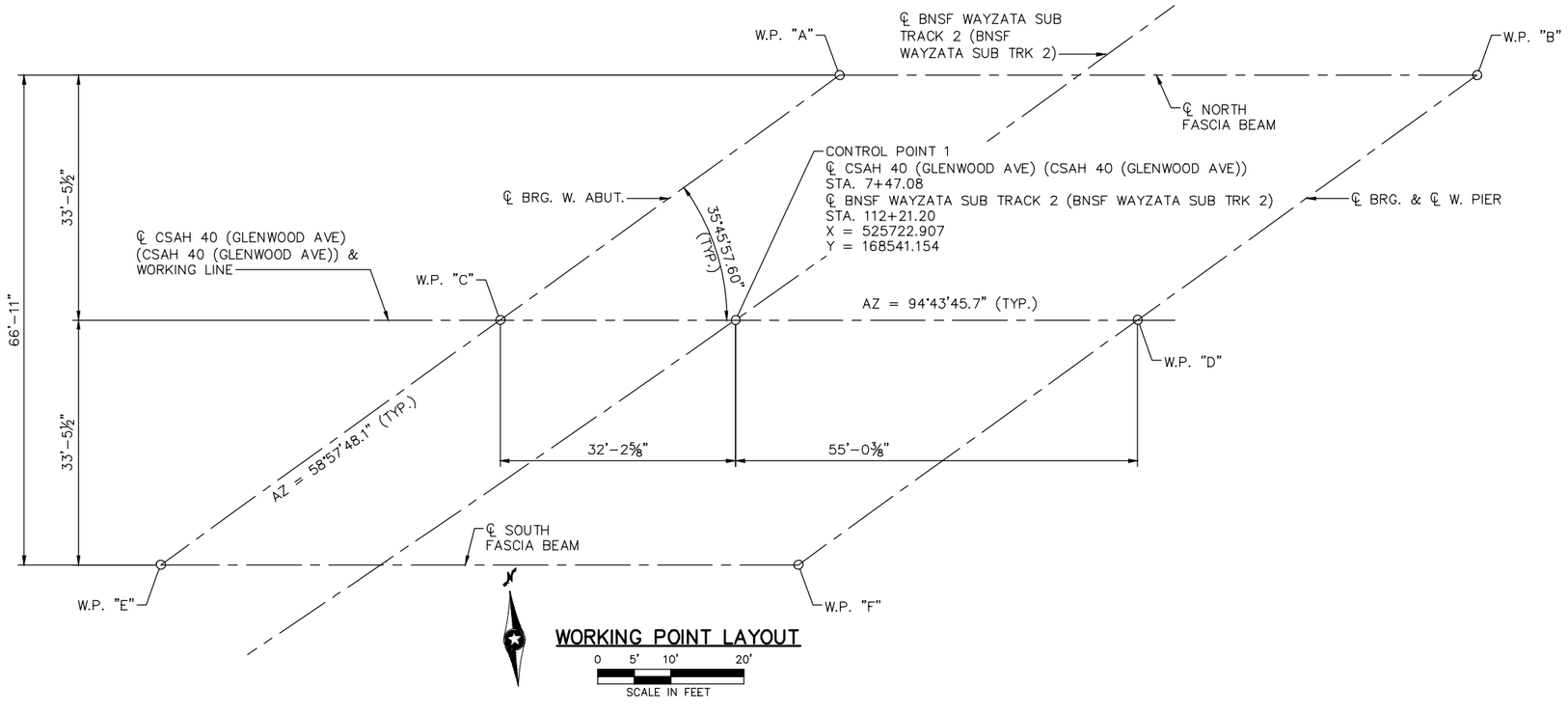
CIVIL EAST - VOLUME 4B
CSAH 40 (GLENWOOD AVENUE) - WEST
BRIDGE 27C16
TRANSVERSE SECTION & QUANTITIES

DISCIPLINE: STRUCTURES

SHEET NAME: CBR27C16-BRG-TRN

SHEET 2 OF 35

Aug, 24 2015 09:11 am V:\3400_ADC\CAD\SEGMENT E4\PLAN SHEETS\STRUCTURES\27C16\CBR27C16-BRG-TRN-001.dwg By: Neal.Oleson



WORKING POINT LOCATIONS

DIMENSIONS BETWEEN WORKING POINTS								COORDINATES		ELEVATIONS			
POINT	STATION	A	B	C	D	E	F	X	Y	TOP OF SLAB	TOP OF SLAB TO BRIDGE SEAT	BRIDGE SEAT	POINT
A	7+61.31		87.25	57.24	52.76		67.15	525739.851	168573.325	850.46	3.87	846.59	A
B	8+48.56				57.24	192.17		525826.796	168566.131	851.43	3.97	847.46	B
C	7+14.86				87.25	57.24	52.76	525690.802	168543.810	848.51			C
D	8+02.11						57.24	525777.748	168536.617	851.08			D
E	6+68.42						87.25	525641.753	168514.296	846.56	3.50	843.06	E
F	7+55.66							525728.698	168507.103	850.73	3.61	847.12	F

TOP OF ROADWAY TO BRIDGE SEAT					
		WEST ABUT.	WEST ABUT.	WEST PIER	WEST PIER
BEAMS		B1	B12	B1	B12
DECK THICKNESS		9"	9"	9"	9"
STOOL HEIGHT		1 7/8"	1 7/8"	1 3/4"	1 7/8"
BEAM HEIGHT		30 5/8"	26 3/8"	30 5/8"	26 3/8"
BEARING HEIGHT		4 7/8"	4 7/8"	6 1/8"	6 1/8"
TOTAL	INCHES	46 3/8"	42 1/8"	47 1/2"	43 3/8"
	FEET	3.87	3.5	3.97	3.61

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: EJT | CHECKED BY: LNI
DRAWN BY: NAO | DATE: 8/24/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4B
CSAH 40 (GLENWOOD AVENUE) - WEST
BRIDGE 27C16
BRIDGE LAYOUT

DISCIPLINE: STRUCTURES
SHEET NAME: CBR27C16-BRG-SUP-003

SHEET 3 OF 35

WEST ABUTMENT COMPUTED PILE LOAD - TONS/PILE	
FACTORED DEAD LOAD + EARTH PRESSURE	83.0
FACTORED LIVE LOAD	4.9
* FACTORED DESIGN LOAD	87.9

* BASED ON STRENGTH I LOAD COMBINATION.

NORTHWEST WINGWALL COMPUTED PILE LOAD - TONS/PILE	
FACTORED DEAD LOAD + EARTH PRESSURE	105.5
FACTORED LIVE LOAD	13.4
* FACTORED DESIGN LOAD	118.9

* BASED ON STRENGTH I 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) $R_n = 20\sqrt{\frac{W \times H}{1000}} \times log\left(\frac{10}{S}\right)$	0.60	147
PDA	0.65	136

* Rn = (FACTORED DESIGN LOAD) / φdyn

NORTHWEST WINGWALL REQUIRED NOMINAL PILE BEARING RESISTANCE FOR H-PILES Rn - TONS/PILE		
FIELD CONTROL METHOD	φdyn	* Rn
MN/DOT PILE FORMULA 2012 (MPF12) $R_n = 20\sqrt{\frac{W \times H}{1000}} \times log\left(\frac{10}{S}\right)$	0.60	199
PDA	0.65	183

* Rn = (FACTORED DESIGN LOAD) / φdyn

GENERAL PILE NOTES

3 HP12x53 STEEL TEST PILES 95 FT. LONG
97 HP12x53 STEEL PILES EST. 85 FT. LENGTH
100 HP12x53 STEEL PILES REQ'D FOR WEST ABUTMENT

1 HP12x53 STEEL TEST PILES 95 FT. LONG
30 HP12x53 STEEL PILES EST. 85 FT. LENGTH
31 HP12x53 STEEL PILES REQ'D FOR WINGWALL

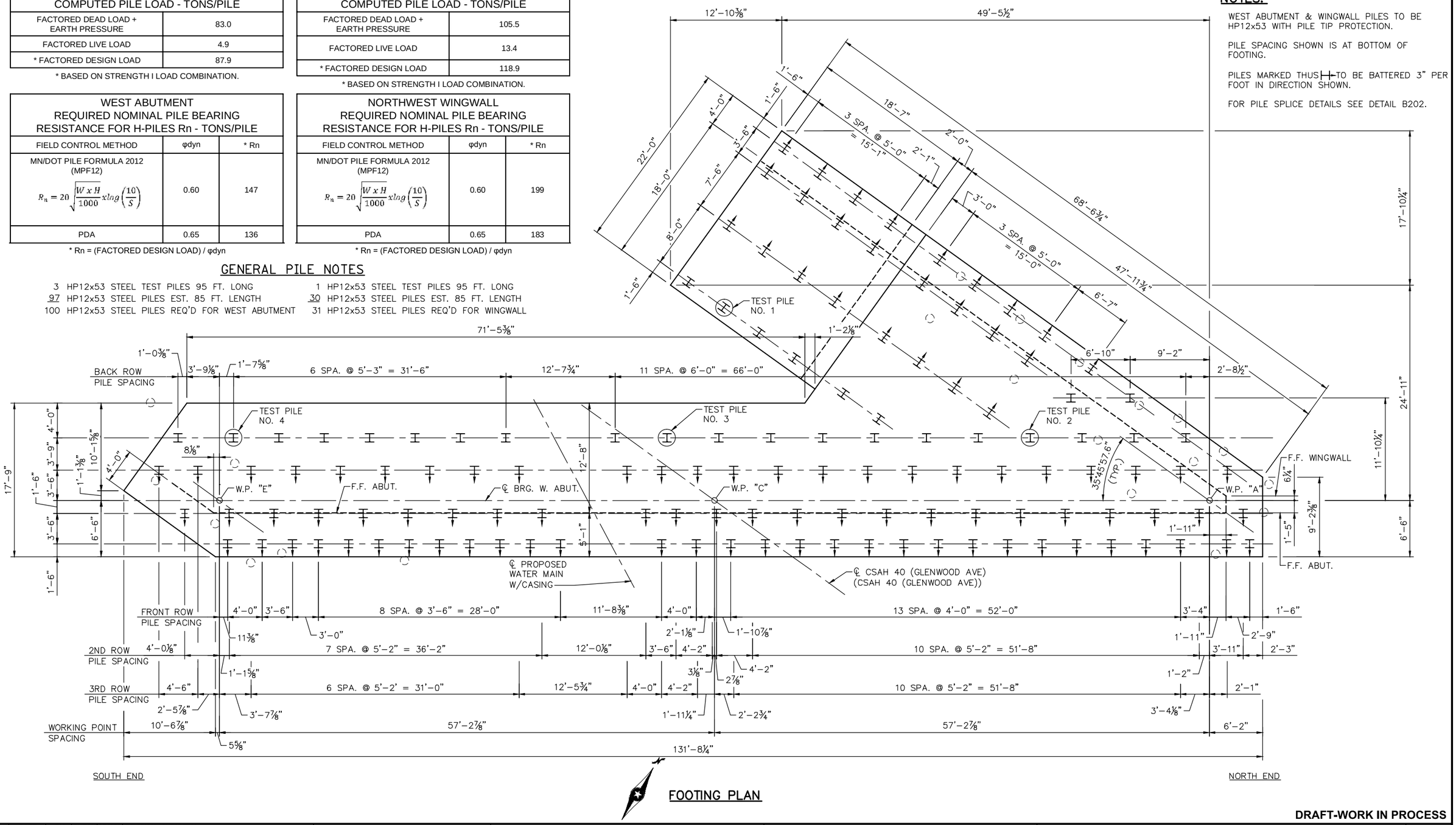
NOTES:

WEST ABUTMENT & WINGWALL 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 DIRECTION SHOWN.

FOR PILE SPLICE DETAILS SEE DETAIL B202.



FOOTING PLAN

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: EJT | CHECKED BY: LNI
DRAWN BY: NAO | DATE: 8/24/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

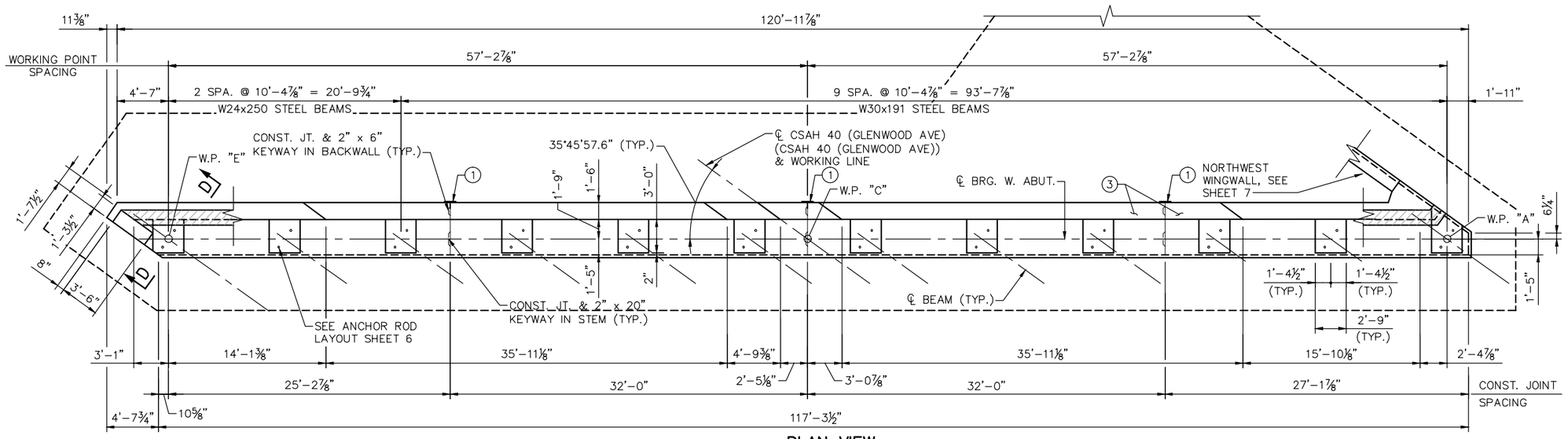
SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4B
CSAH 40 (GLENWOOD AVENUE) - WEST
BRIDGE 27C16
WEST ABUTMENT DETAILS 1

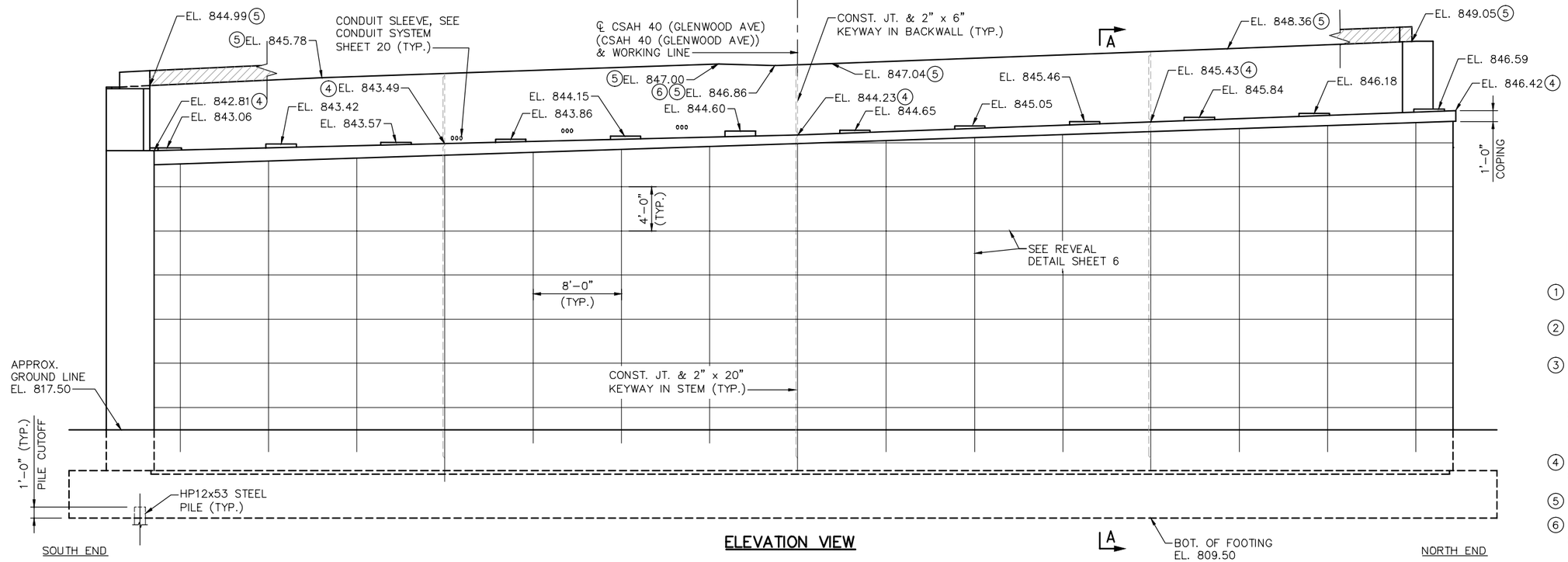
DISCIPLINE: STRUCTURES
SHEET NAME: CBR27C16-BRG-ABT-003

SHEET 4 OF 35

Aug, 24 2015 09:12 am V:\3400_ADC\CAD\SEGMENT E4\PLAN SHEETS\STRUCTURES\27C16\CBR27C16-BRG-ABT-001.dwg By: Neal.Oleson



PLAN VIEW



NOTES:

FOR SECTIONS A–A & D–D, SEE SHEET 6.

1. MEMBRANE WATERPROOFING SYSTEM PER MnDOT 2481.3.B.
2. PERFORATED PIPE, SEE DETAIL B910 FOR DRAINAGE DETAILS.
3. THERE SHALL BE A 72 HOUR MINIMUM TIME DELAY BETWEEN CONCRETE POURS OF ADJACENT ABUTMENT SECTIONS THAT HAVE VERTICAL CONSTRUCTION JOINTS. CONTRACTOR MAY PROPOSED TO REDUCE THE WAITING PERIOD IF THE CURE IS MAINTAINED. SEE SPECIAL PROVISIONS.
4. ELEVATION AT FRONT FACE OF ABUTMENT COPING.
5. ELEVATION AT FRONT FACE OF BACKWALL.
6. ℄ CSAH 40 (GLENWOOD AVE)(CSAH 40 (GLENWOOD AVE)) & WORKING LINE.

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: EJT | CHECKED BY: LNI
DRAWN BY: NAO | DATE: 8/24/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

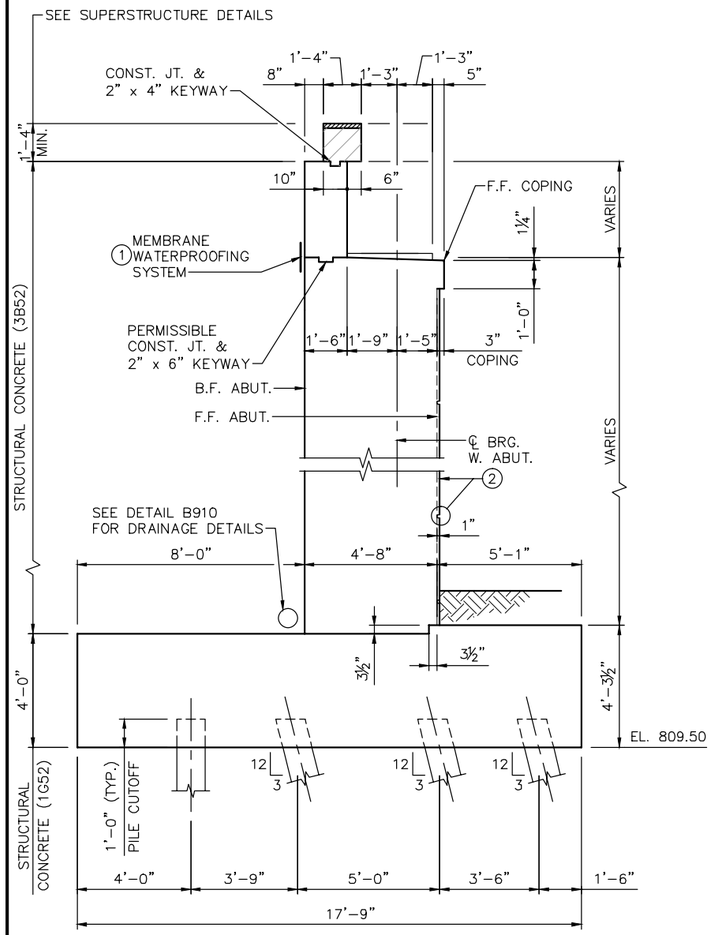
METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

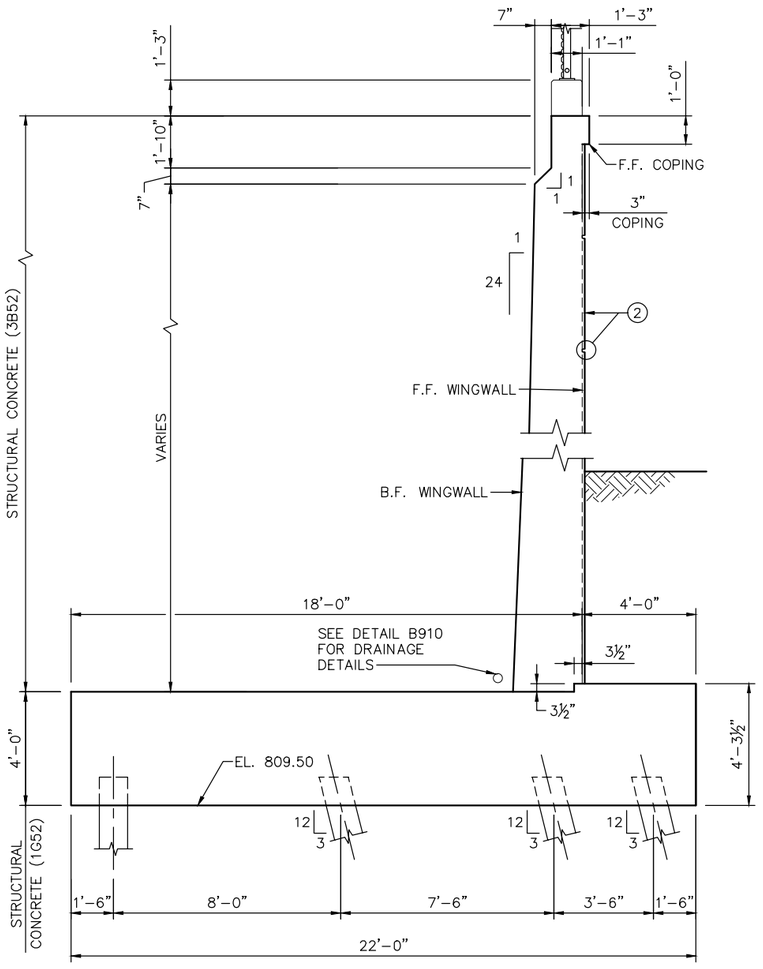
CIVIL EAST - VOLUME 4B
CSAH 40 (GLENWOOD AVENUE) - WEST
BRIDGE 27C16
WEST ABUTMENT DETAILS 2

DISCIPLINE: STRUCTURES
SHEET NAME: CBR27C16-BRG-ABT-002

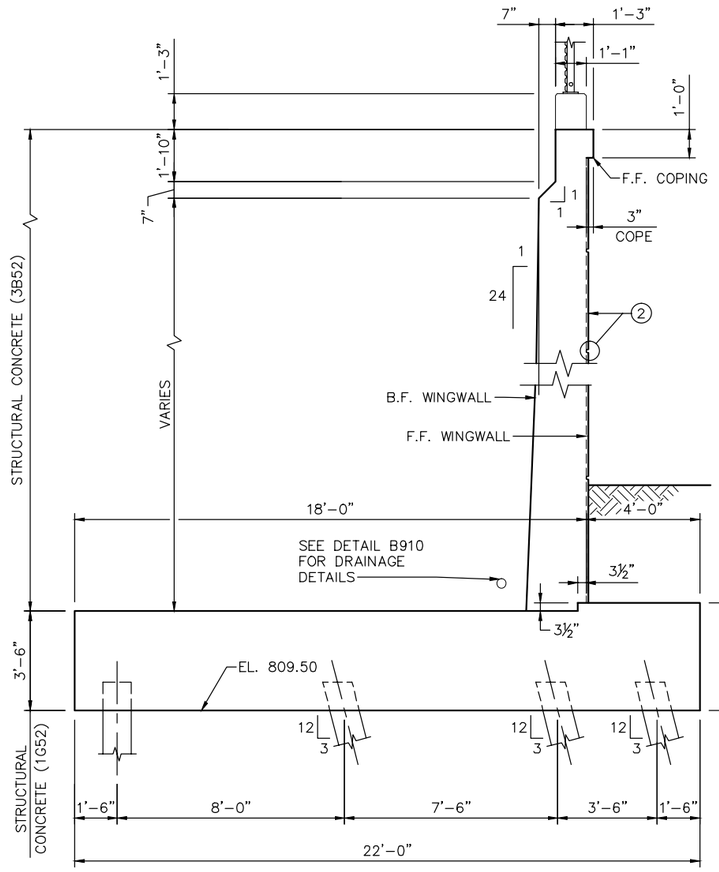
SHEET 5 OF 35



SECTION A–A



SECTION B–B



SECTION C–C

NOTES:

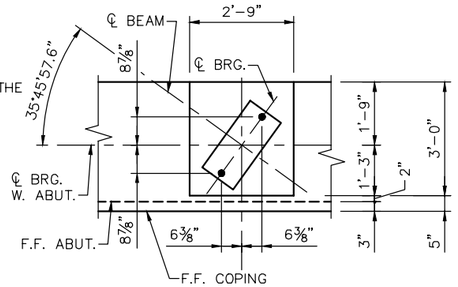
PAVING BLOCK HATCHED AREA INDICATES THAT PORTION TO BE PLACED WITH THE SUPERSTRUCTURE CONCRETE.

FOR LOCATION OF SECTION A–A, SEE SHEET 5.

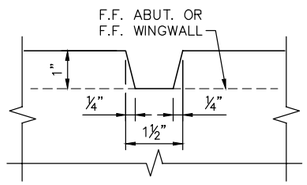
FOR LOCATION OF SECTIONS B–B, & C–C, SEE SHEET 7.

(1) MEMBRANE WATERPROOFING SYSTEM PER MnDOT SPEC. 2481.3.B.

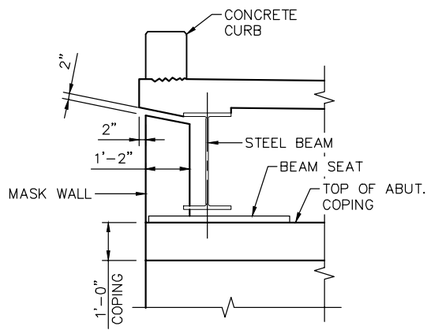
(2) SEE REVEAL DETAIL THIS SHEET.



ANCHOR ROD LAYOUT



REVEAL DETAIL



SECTION D–D

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: EJT | CHECKED BY: LNI
DRAWN BY: NAO | DATE: 8/24/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

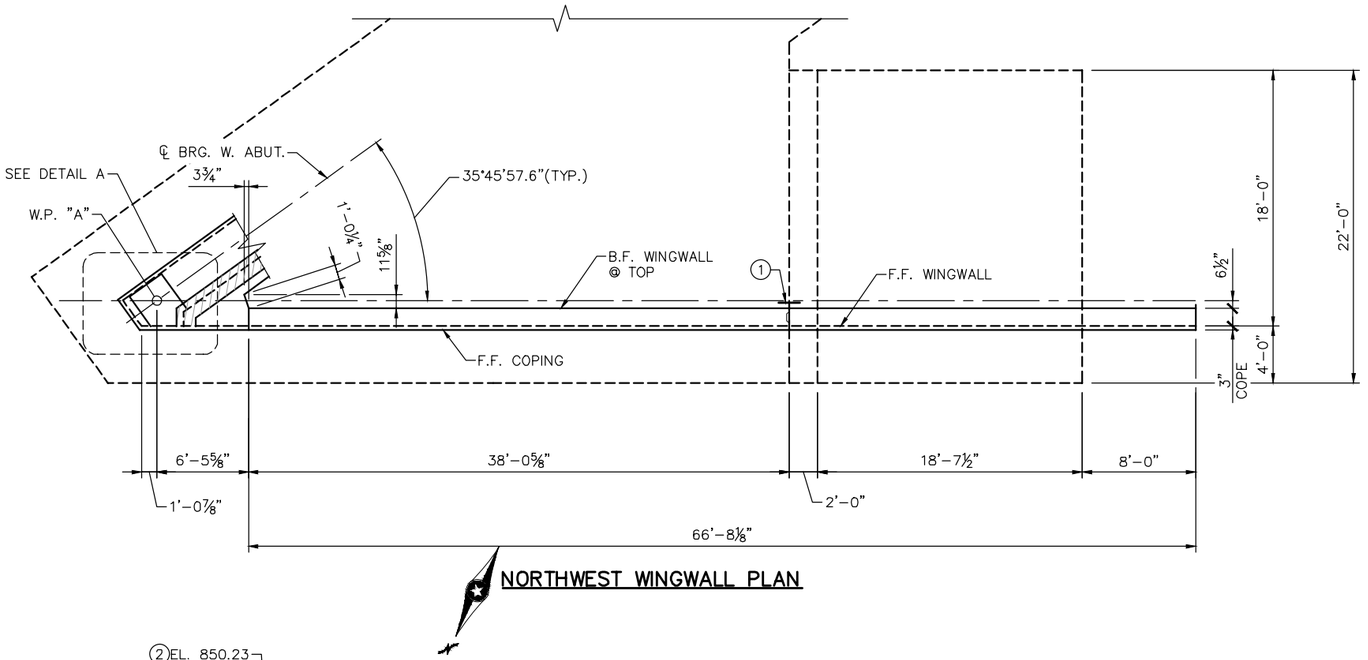
SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4B
CSAH 40 (GLENWOOD AVENUE) - WEST
BRIDGE 27C16
WEST ABUTMENT DETAILS 3

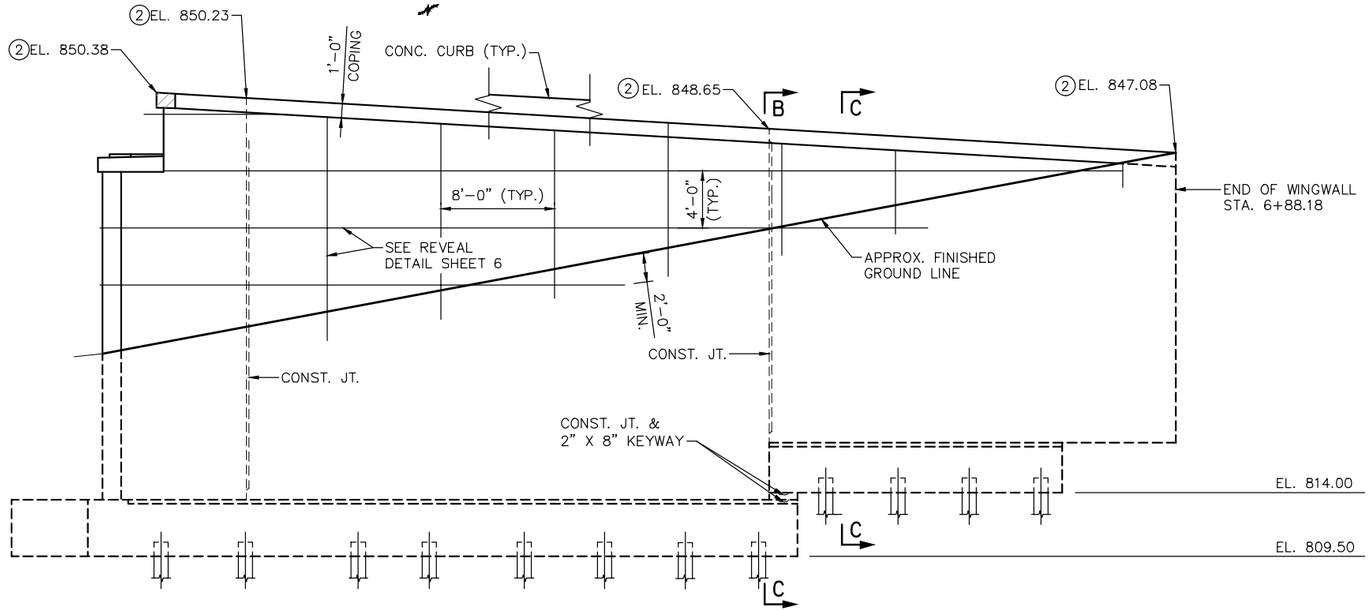
DISCIPLINE: STRUCTURES
SHEET NAME: CBR27C16-BRG-ABT-001

SHEET 6 OF 35

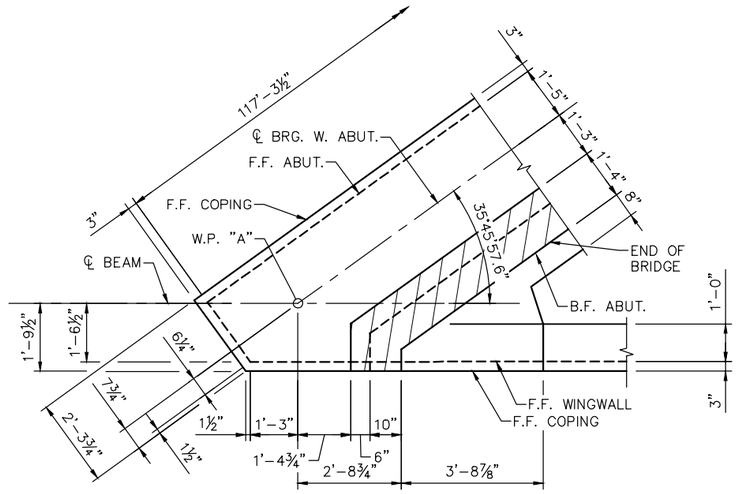
Aug, 24 2015 09:12 am V:\3400_ADC\CAD\SEGMENT E4\PLAN SHEETS\STRUCTURES\27C16\CBR27C16-BRG-ABT-001.dwg By: Neal.Oleson



NORTHWEST WINGWALL PLAN



NORTHWEST WINGWALL ELEVATION



DETAIL A

NOTES:

FOR SECTIONS B–B & C–C, SEE SHEET 6.

(1) MEMBRANE WATERPROOFING SYSTEM PER MnDOT 2481.3.B.

(2) ELEVATION AT TOP OF WINGWALL COPING.

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: EJT | CHECKED BY: LNI
DRAWN BY: NAO | DATE: 8/24/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4B
CSAH 40 (GLENWOOD AVENUE) - WEST
BRIDGE 27C16
WEST ABUTMENT DETAILS 4

DISCIPLINE: STRUCTURES
SHEET NAME: CBR27C16-BRG-ABT-004

SHEET 7 OF 35

WEST PIER COMPUTED PILE LOAD - TONS/PILE	
FACTORED DEAD LOAD	59.3
FACTORED LIVE LOAD	2.5
FACTORED OVERTURNING	48.2
* FACTORED DESIGN LOAD	110
* BASED ON STRENGTH I LOAD COMBINATION.	

WEST PIER REQUIRED NOMINAL PILE BEARING RESISTANCE FOR H-PILES Rn - TONS/PILE		
FIELD CONTROL METHOD	φdyn	* Rn
MN/DOT PILE FORMULA 2012 (MPF12) $R_n = 20\sqrt{\frac{W\,x\,H}{1000}}\,x\log\left(\frac{10}{S}\right)$	0.60	183.2
PDA	0.65	169.2
* Rn = (FACTORED DESIGN LOAD) / φdyn		

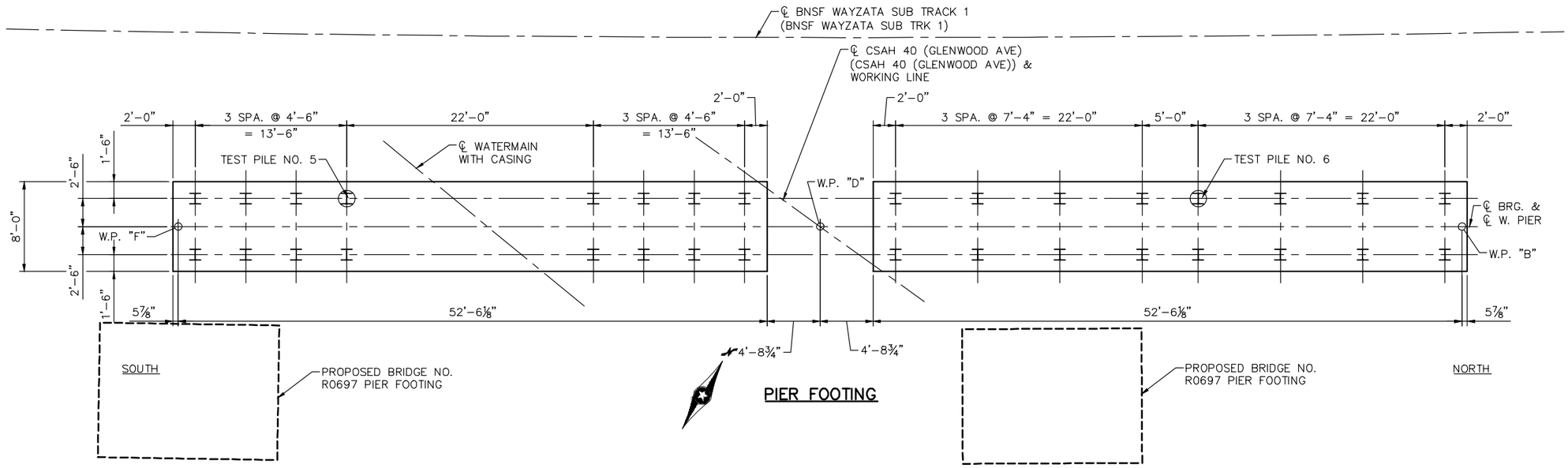
GENERAL PILE NOTES

2 HP12x53 STEEL TEST PILES 70 FT. LONG
30 HP12x53 STEEL PILES EST. 60 FT. LENGTH
32 HP12x53 STEEL PILES REQ'D FOR WEST 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.



DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: EJT | CHECKED BY: LNI
DRAWN BY: NAO | DATE: 8/24/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

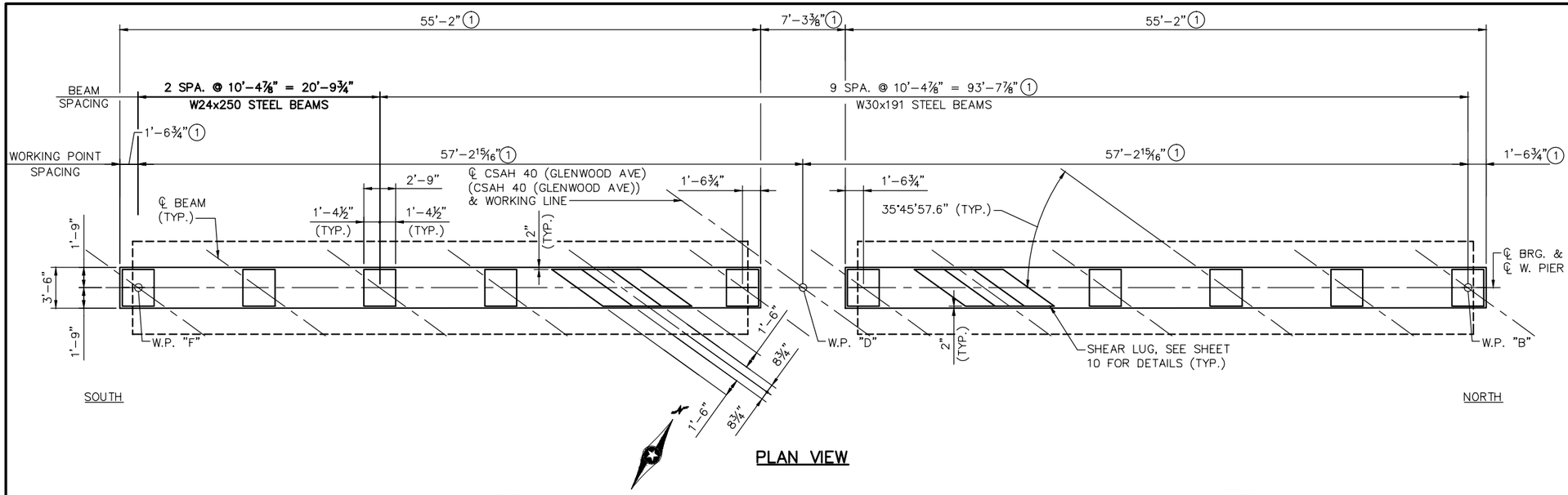
SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4B
CSAH 40 (GLENWOOD AVENUE) - WEST
BRIDGE 27C16
PIER FOOTING PLAN

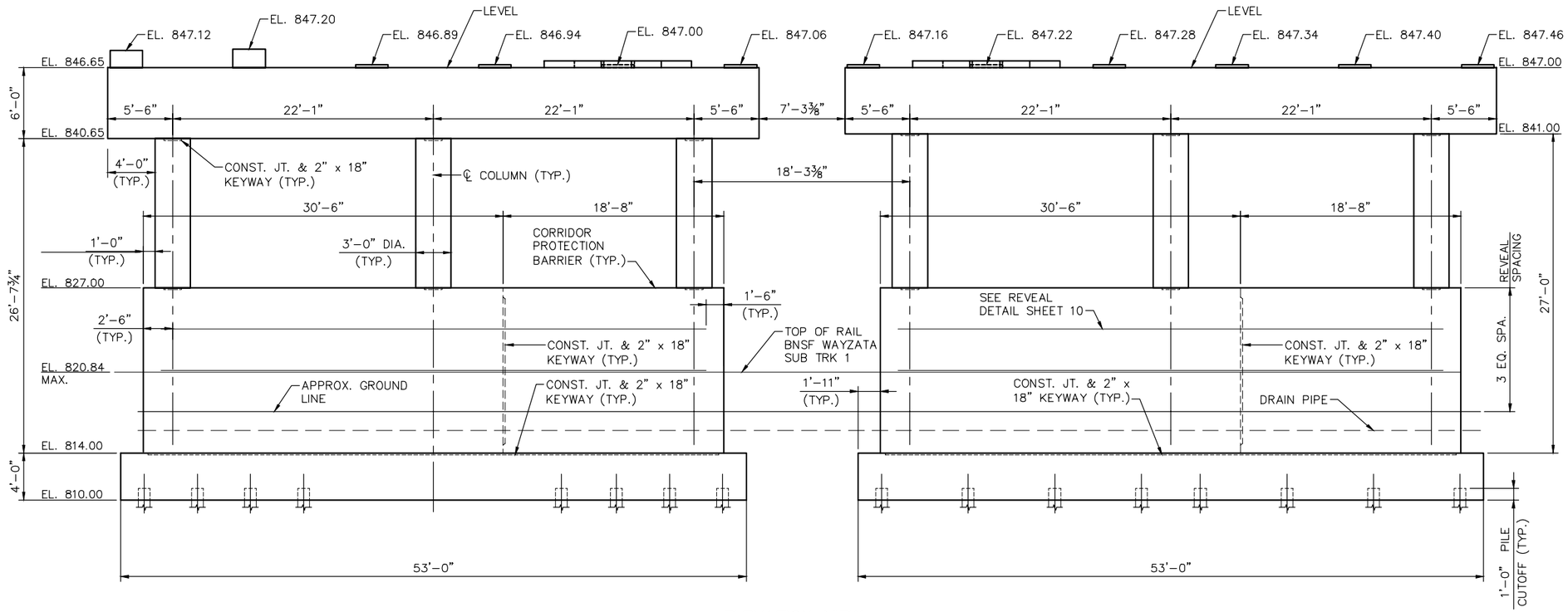
DISCIPLINE: STRUCTURES
SHEET NAME: CBR27C16-BRG-PIR-002

SHEET 8 OF 35

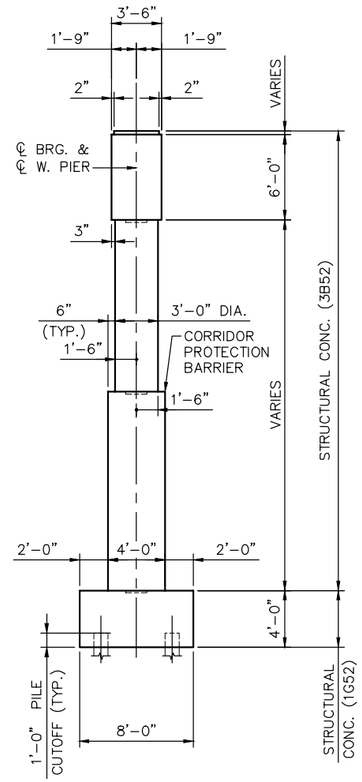
Aug. 24 2015 09:12 am V:\3400_ADC\CAD\SEGMENT E4\PLAN SHEETS\STRUCTURES\27C16\CBR27C16-BRG-PIR-001.dwg By: Neal.Oleson



PLAN VIEW



ELEVATION VIEW



END ELEVATION

NOTES:

(1) DIMENSIONS MEASURED ALONG ℄ W. PIER

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: EJT | CHECKED BY: LNI
DRAWN BY: NAO | DATE: 8/24/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

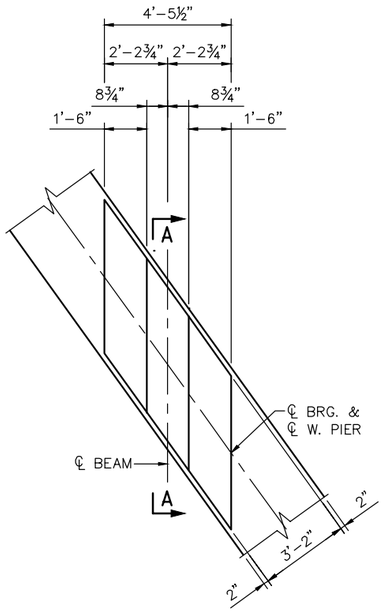
CIVIL EAST - VOLUME 4B
CSAH 40 (GLENWOOD AVENUE) - WEST
BRIDGE 27C16
PIER PLAN & ELEVATION

DISCIPLINE: STRUCTURES

SHEET NAME: CBR27C16-BRG-PIR-001

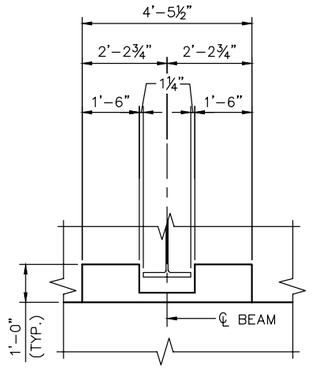
SHEET 9 OF 35

Aug. 24 2015 09:12 am V:\3400_ADC\CAD\SEGMENT E4\PLAN SHEETS\STRUCTURES\27C16\CBR27C16-BRG-PIR-001.dwg By: Neal.Oleson



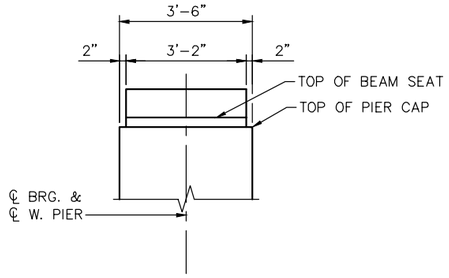
SHEAR LUG PLAN

DIMENSIONS MEASURED PERPENDICULAR TO ℄ BEAM

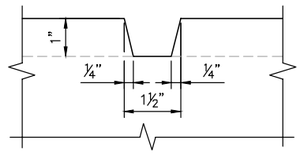


SHEAR LUG ELEVATION

DIMENSIONS MEASURED PERPENDICULAR TO ℄ BEAM



SECTION A-A



REVEAL DETAIL

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: EJT | CHECKED BY: LNI
DRAWN BY: NAO | DATE: 8/24/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

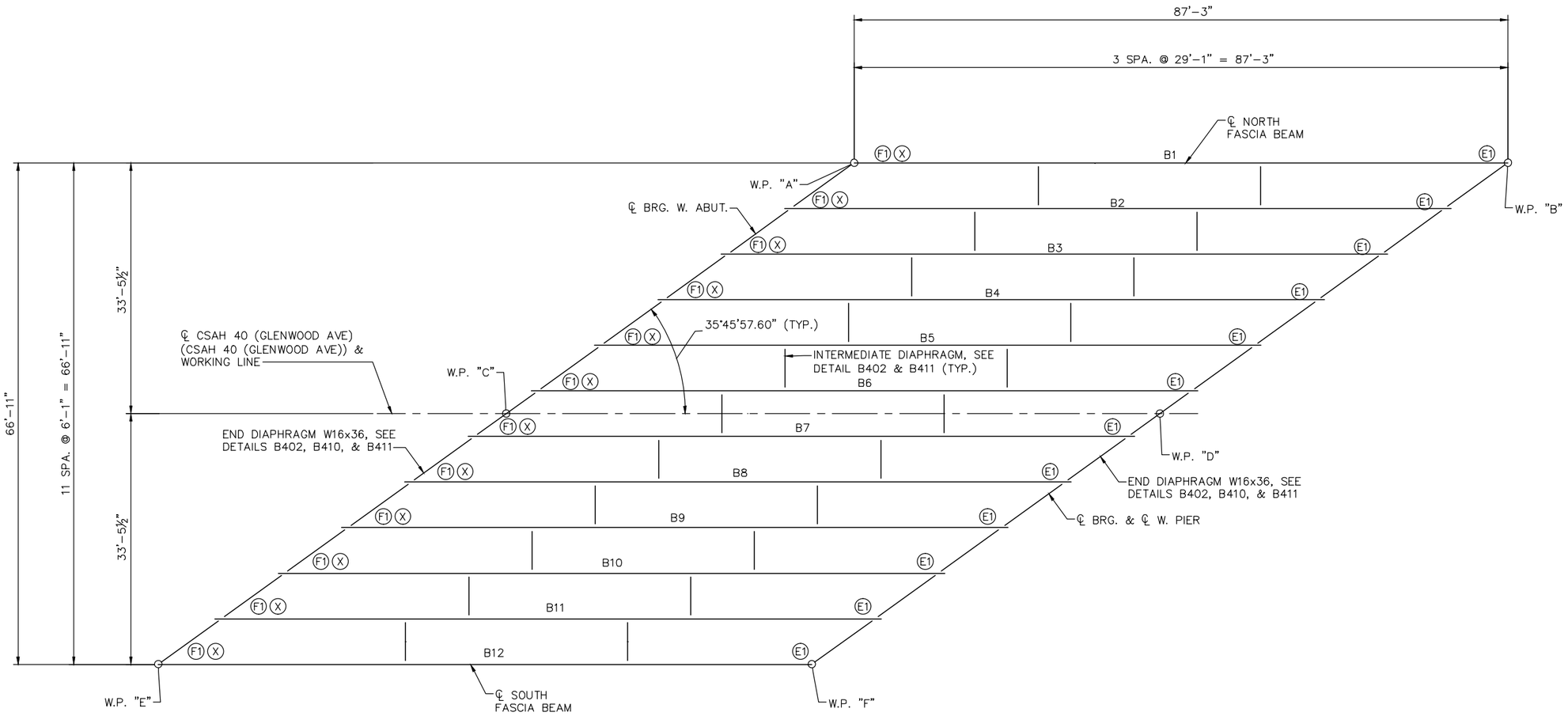
SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4B
CSAH 40 (GLENWOOD AVENUE) - WEST
BRIDGE 27C16
PIER DETAILS

DISCIPLINE: STRUCTURES
SHEET NAME: CBR27C16-BRG-PIR-003

SHEET 10 OF 35

Aug, 24 2015 09:12 am V:\3400_ADC\CAD\SEGMENT E4\PLAN SHEETS\STRUCTURES\27C16\CBR27C16-BRG-PIR-001.dwg By: Neal.Oleson



FRAMING PLAN

NOTES:

(E1) DENOTES EXPANSION CURVED PLATE BEARING ASSEMBLY TYPE E1. SEE DETAIL B355.

(F1) DENOTES FIXED CURVED PLATE BEARING ASSEMBLY, TYPE F1. SEE DETAIL B354.

(X) INDICATES END OF BEAM.

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: EJT | CHECKED BY: EJT
DRAWN BY: NAO | DATE: 8/24/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

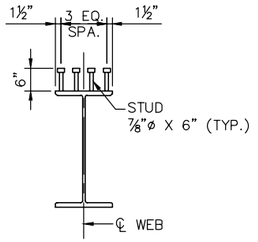
CIVIL EAST - VOLUME 4B
CSAH 40 (GLENWOOD AVENUE) - WEST
BRIDGE 27C16
FRAMING PLAN

DISCIPLINE: STRUCTURES

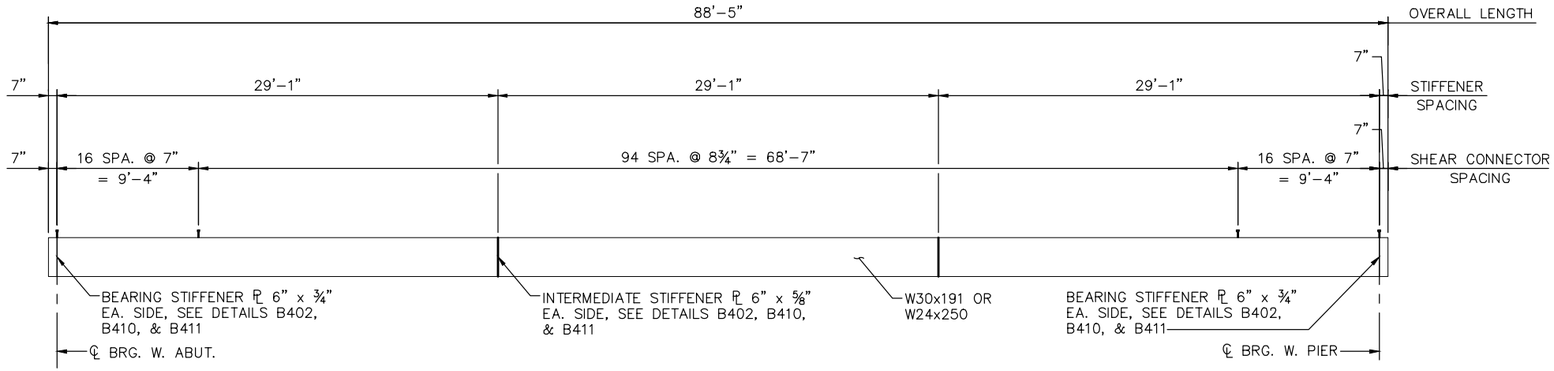
SHEET NAME: CBR27C16-BRG-SUP-002

SHEET 11 OF 35

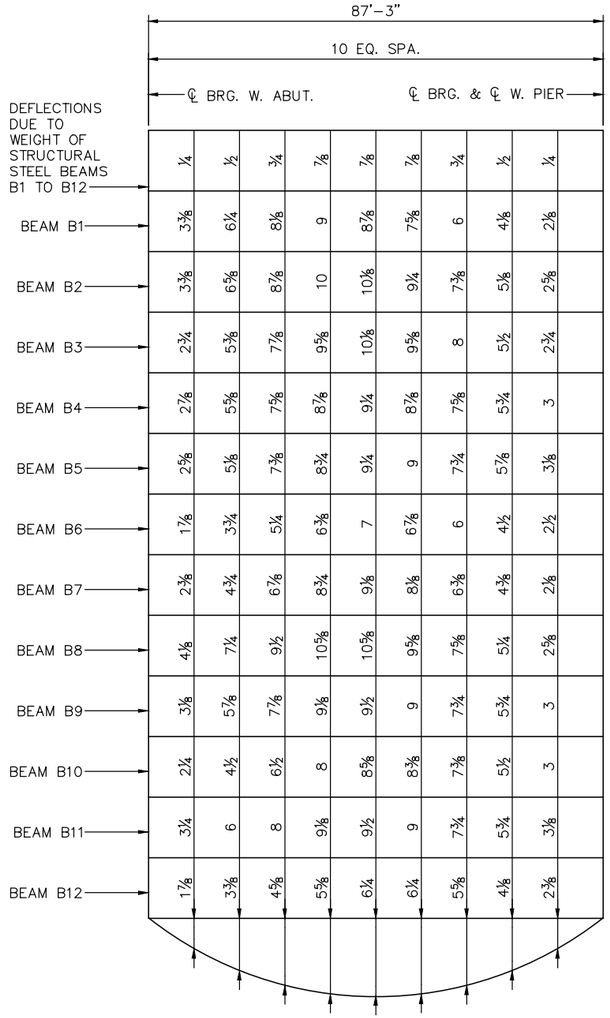
Aug, 24 2015 09:13 am V:\3400_ADC\CAD\SEGMENT E4\PLAN SHEETS\STRUCTURES\27C16\CBR27C16-BRG-SUP-002.dwg By: Neal.Oleson



SHEAR CONNECTOR DETAIL

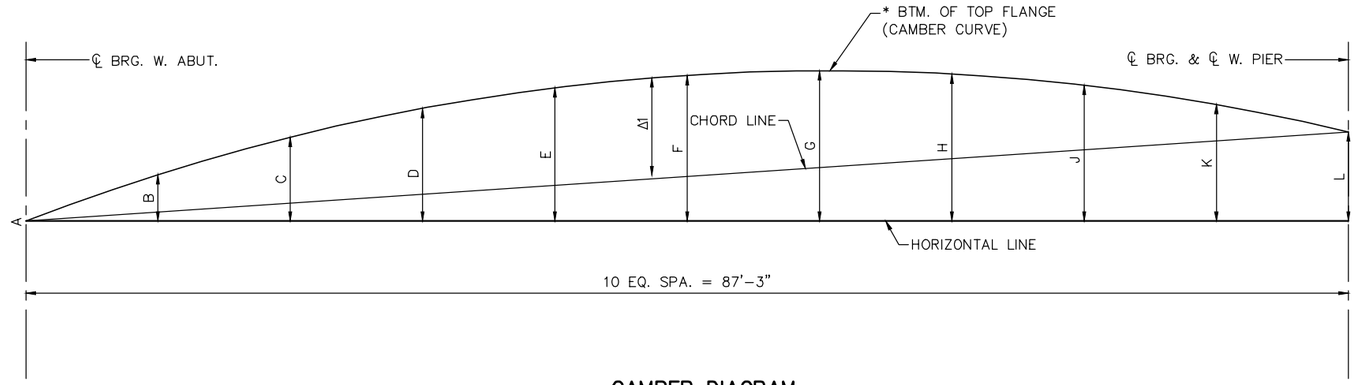


BEAM ELEVATION



DEFLECTION DIAGRAM

* DEFECTION DUE TO SLAB, WEARING COURSE, AND RAILINGS. DOES NOT INCLUDE FUTURE WEARING COURSE.



CAMBER DIAGRAM

DIMENSIONS (SHOWN IN INCHES)											
BEAM	A	B	C	D	E	F	G	H	J	K	L
B1	0	4 1/4	8 1/8	11	12 7/8	13 5/8	13 3/8	12 5/8	11 3/4	10 5/8	9 1/2
B2	0	4 3/4	9 3/8	12 7/8	15 1/2	17	17 1/2	16 7/8	16	15	13 3/4
B3	0	4 1/2	8 7/8	13	16 1/2	18 3/4	20	20 1/8	19 1/4	18 1/4	17 1/4
B4	0	5 1/8	10	14 1/4	17 5/8	20 1/4	22	23	23 1/4	22 3/4	21 7/8
B5	0	5 1/8	10 1/8	14 7/8	18 3/4	21 7/8	24	25 3/8	25 7/8	25 3/4	25 1/8
B6	0	4 7/8	9 1/2	14 1/8	18 1/8	21 5/8	24 3/8	26 1/2	28	28 7/8	29 3/8
B7	0	5 1/4	10 1/2	15 1/2	20 1/4	23 1/2	25 3/8	26 1/2	27 3/8	28	28 5/8
B8	0	7 3/8	13 7/8	19 3/8	23 7/8	27 1/4	29 1/2	30 3/4	31 5/8	32 3/8	33 1/8
B9	0	6 3/4	13 1/8	18 3/4	23 1/2	27 5/8	30 3/4	33 1/8	34 3/4	35 5/8	36 1/8
B10	0	6 1/4	12 3/8	18 1/4	23 5/8	28 1/8	31 7/8	34 3/4	36 3/4	38 1/8	39
B11	0	7 3/4	14 7/8	21 3/8	27	31 3/4	35 3/4	39	41 3/8	43 1/8	44 1/2
B12	0	6 3/4	13	19 1/8	25	30 3/8	35 1/8	39 3/8	42 7/8	45 3/4	48 1/4

MAXIMUM CAMBER IN SEGMENT	
BEAM	Δ 1
B1	10
B2	11 1/8
B3	11 1/8
B4	10 1/4
B5	10 1/4
B6	7 7/8
B7	10 1/8
B8	11 5/8
B9	10 3/8
B10	9 5/8
B11	10 3/8
B12	7 1/4

NOTES:

1. CONTRACTOR SHALL BE ALLOWED TO SUBSTITUTE A BUILT–UP PLATE GIRDER WITH SIMILAR PROPERTIES AS THE ROLLED SECTION, SUBJECT TO APPROVAL OF THE ENGINEER.
2. ALL STRUCTURAL STEEL SHALL CONFORM TO 3309 UNLESS OTHERWISE NOTED.
3. BEARING STIFFENERS SHALL BE VERTICAL.
4. END OF BEAMS SHALL BE VERTICAL.
5. ROWS OF SHEAR CONNECTORS SHALL BE ALIGNED PARALLEL TO THE TRANSVERSE SLAB REINFORCEMENT BARS.
6. SHEAR CONNECTORS SHALL CONFORM TO 3391.
7. CAMBER DIAGRAM SHOWN IS FOR BEAMS IN UNLOADED POSITION AND PROVIDES FOR ALL DEAD LOAD DEFLECTIONS AND RESIDUAL CAMBER.
8. CAMBER DIAGRAM CHORD LINES ARE STRAIGHT LINES FROM END TO END OF BEAM SEGMENTS AT TOP OF WEB. *
9. CAMBER DIAGRAM HORIZONTAL DIMENSIONS ARE SHOWN IN FEET. VERTICAL DIMENSIONS ARE SHOWN IN INCHES AND FRACTION OF INCHES.
10. DEFLECTION DIAGRAM VALUES GIVEN ARE IN INCHES AND FRACTIONS OF INCHES.

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: EJT | CHECKED BY: LNI
DRAWN BY: NAO | DATE: 8/24/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

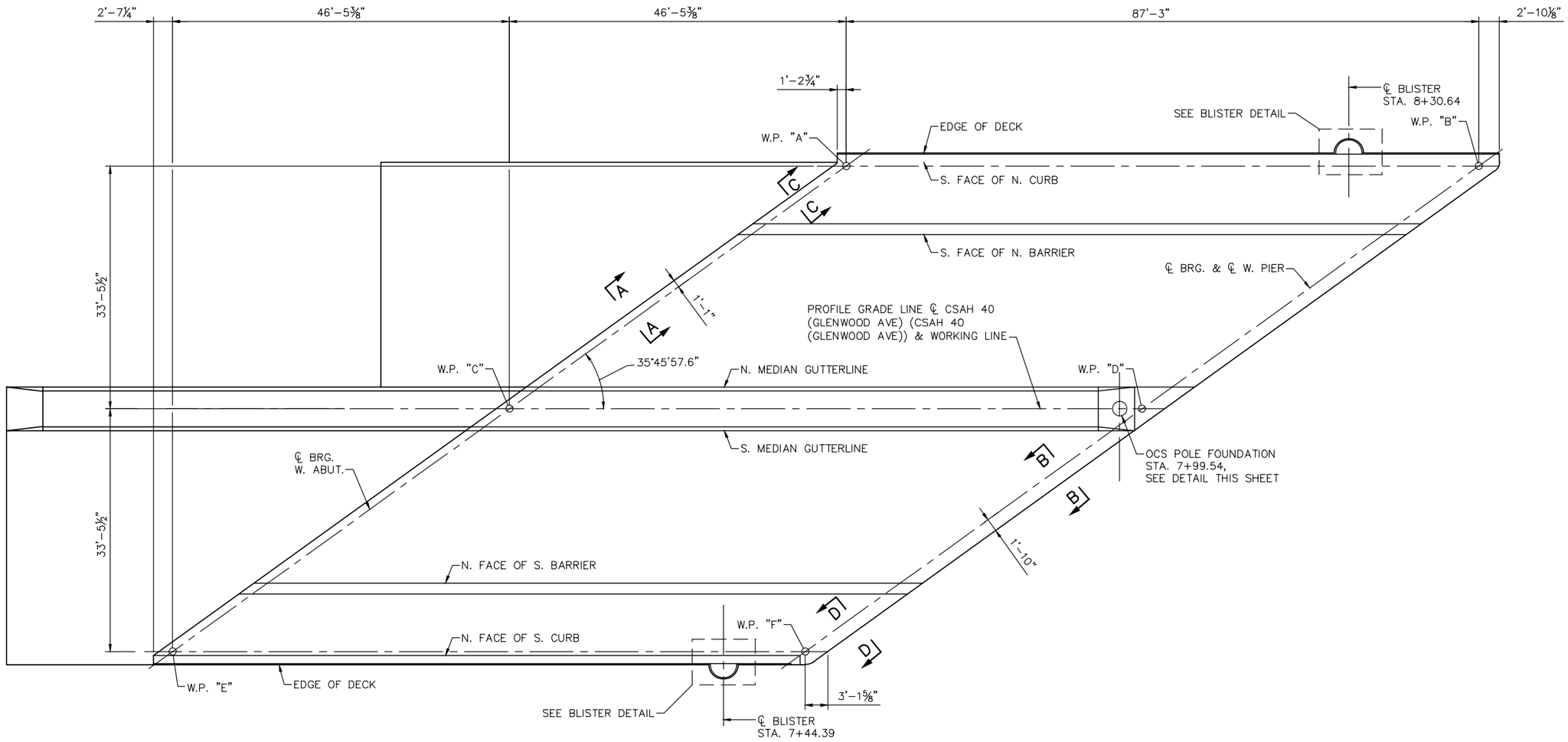
SOUTHWEST Green Line LRT Extension

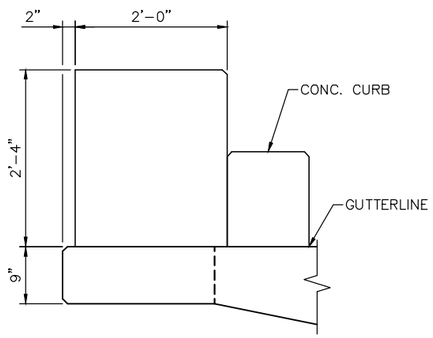
CIVIL EAST - VOLUME 4B
CSAH 40 (GLENWOOD AVENUE) - WEST
BRIDGE 27C16
STRUCTURAL STEEL DETAILS

DISCIPLINE: STRUCTURES
SHEET NAME: CBR27C16-BRG-SUP-005

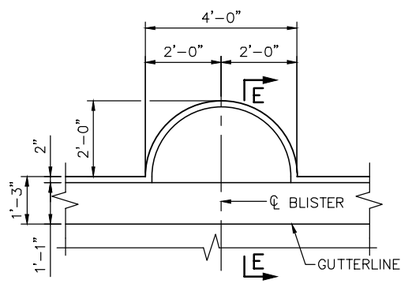
SHEET 12 OF 35

Aug, 24 2015 09:13 am V:\3400_ADC\CAD\SEGMENT E4\PLAN SHEETS\STRUCTURES\27C16\CBR27C16-BRG-SUP-005.dwg By: Neal.Oleson



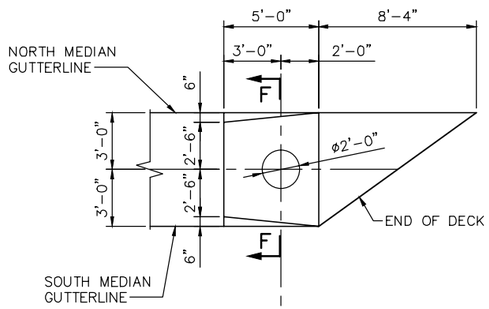


SECTION E–E



BLISTER DETAIL

DECK PLAN



OCS POLE FOUNDATION

NOTES:

SEE SHEET 14 FOR SECTION F–F.

SEE SHEET 15 FOR SECTIONS A–A, B–B, C–C, & D–D.

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: HLR | CHECKED BY: EJT
DRAWN BY: NAO | DATE: 8/24/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

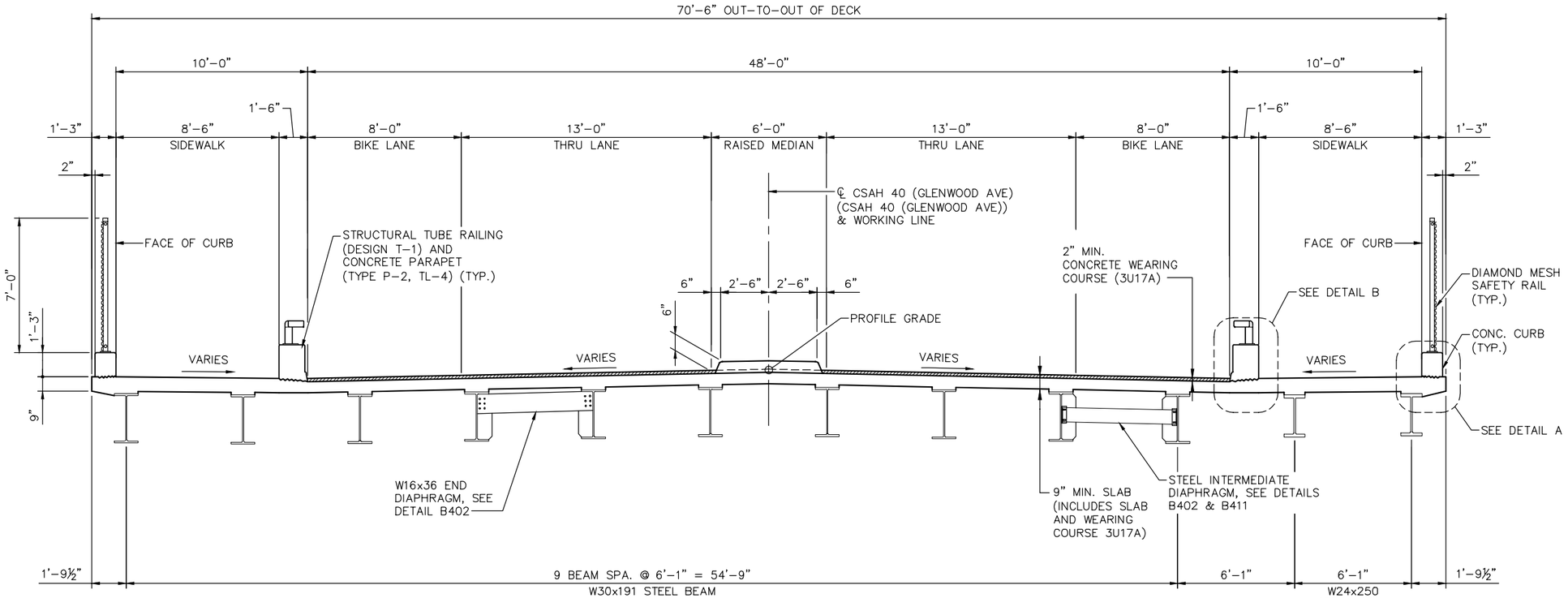
CIVIL EAST - VOLUME 4B
CSAH 40 (GLENWOOD AVENUE) - WEST
BRIDGE 27C16
SUPERSTRUCTURE DETAILS 1

DISCIPLINE: STRUCTURES

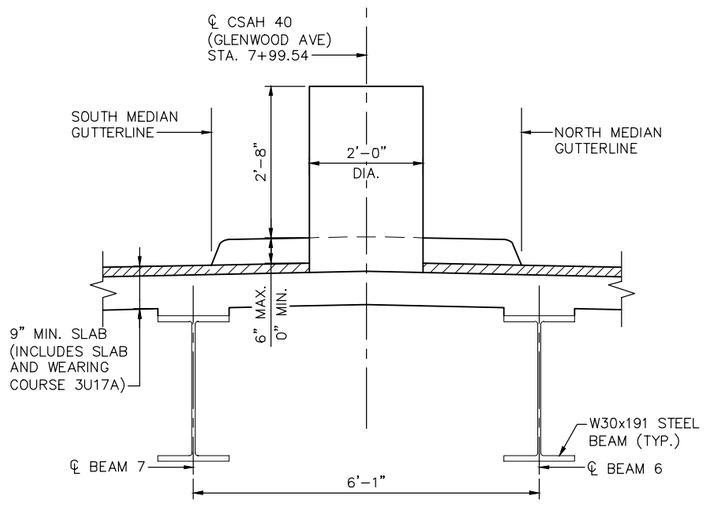
SHEET NAME: CBR27C16-BRG-SUP-006

SHEET 13 OF 35

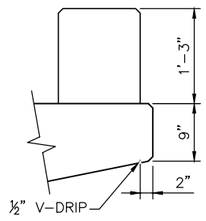
Aug, 24 2015 09:13 am V:\3400_ADC\CAD\SEGMENT E4\PLAN SHEETS\STRUCTURES\27C16\CBR27C16-BRG-SUP-007.dwg By: Neal.Oleson



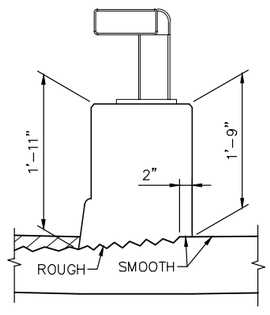
TRANSVERSE SECTION THRU DECK



SECTION F-F



DETAIL A



DETAIL B

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: EJT | CHECKED BY: LNI
DRAWN BY: NAO | DATE: 8/24/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

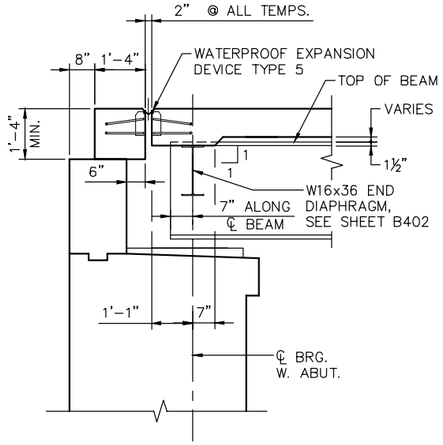
SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4B
CSAH 40 (GLENWOOD AVENUE) - WEST
BRIDGE 27C16
SUPERSTRUCTURE DETAILS 2

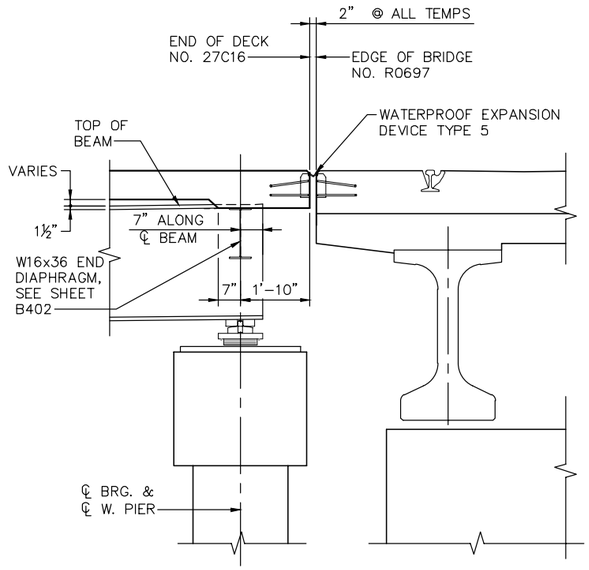
DISCIPLINE: STRUCTURES
SHEET NAME: CBR27C16-BRG-SUP-007

SHEET 14 OF 35

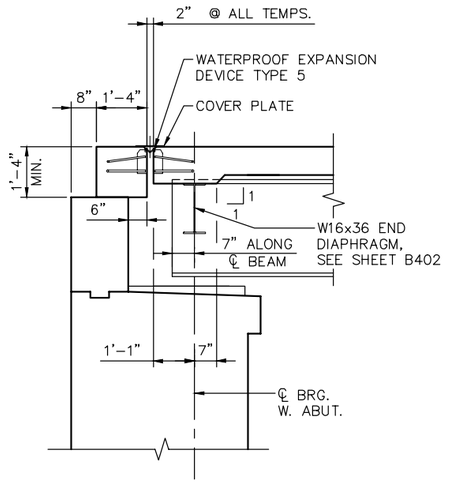
Aug, 24 2015 09:13 am V:\3400_ADC\CAD\SEGMENT E4\PLAN SHEETS\STRUCTURES\27C16\CBR27C16-BRG-SUP-007.dwg By: Neal.Olseon



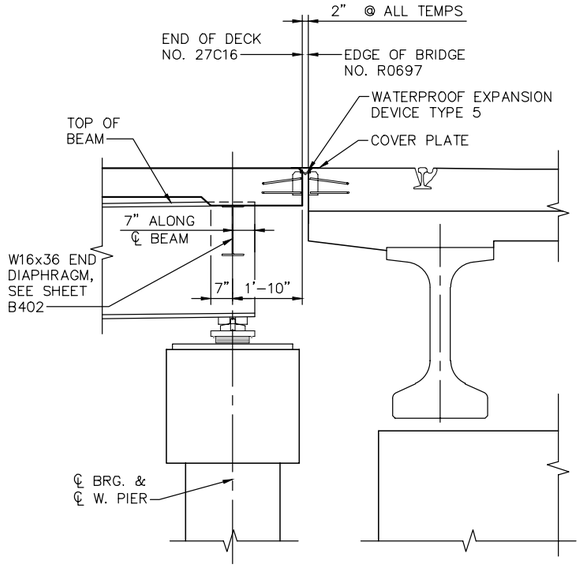
SECTION A–A



SECTION B–B



SECTION C–C



SECTION D–D

NOTES:

DIMENSIONS ARE PERPENDICULAR TO ℄ OF BEARING, UNLESS NOTED OTHERWISE.

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: EJT | CHECKED BY: LNI
DRAWN BY: NAO | DATE: 8/24/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

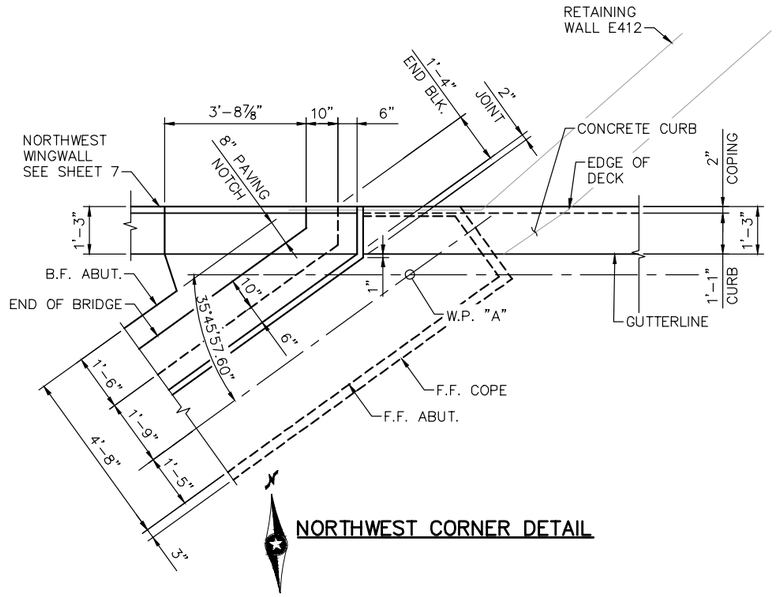
SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4B
CSAH 40 (GLENWOOD AVENUE) - WEST
BRIDGE 27C16
SUPERSTRUCTURE DETAILS 3

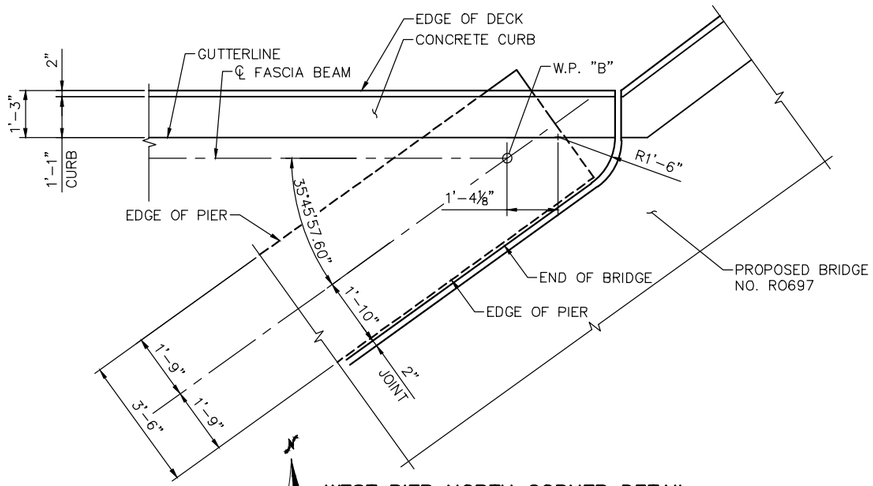
DISCIPLINE: STRUCTURES
SHEET NAME: CBR27C16-BRG-SUP-008

SHEET 15 OF 35

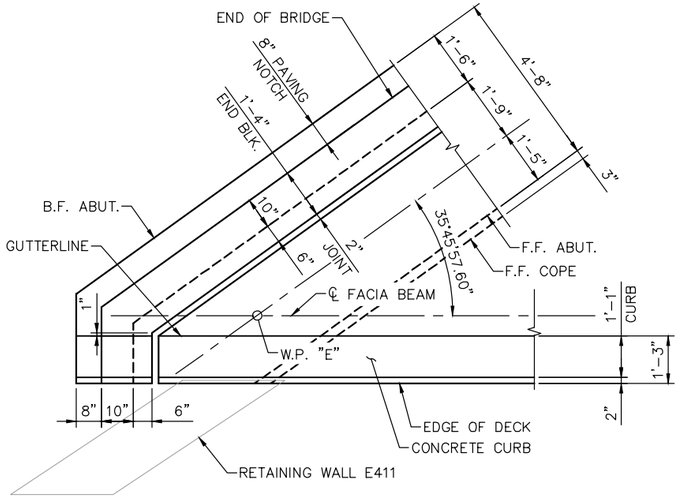
Aug. 24 2015 09:14 am V:\3400_ADC\CAD\SEGMENT E4\PLAN SHEETS\STRUCTURES\27C16\CBR27C16-BRG-SUP-004.dwg By: Neal.Olson



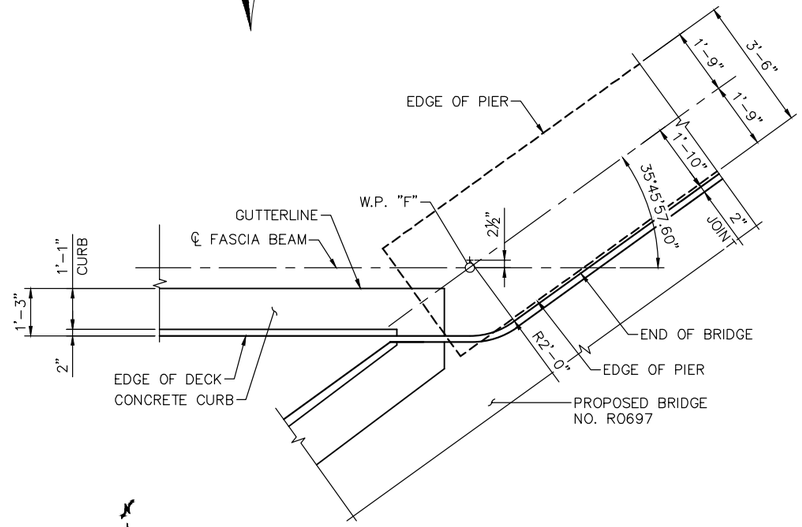
NORTHWEST CORNER DETAIL



WEST PIER NORTH CORNER DETAIL



SOUTHWEST CORNER DETAIL



WEST PIER SOUTH CORNER DETAIL

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: EJT | CHECKED BY: LNI
DRAWN BY: NAO | DATE: 8/24/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

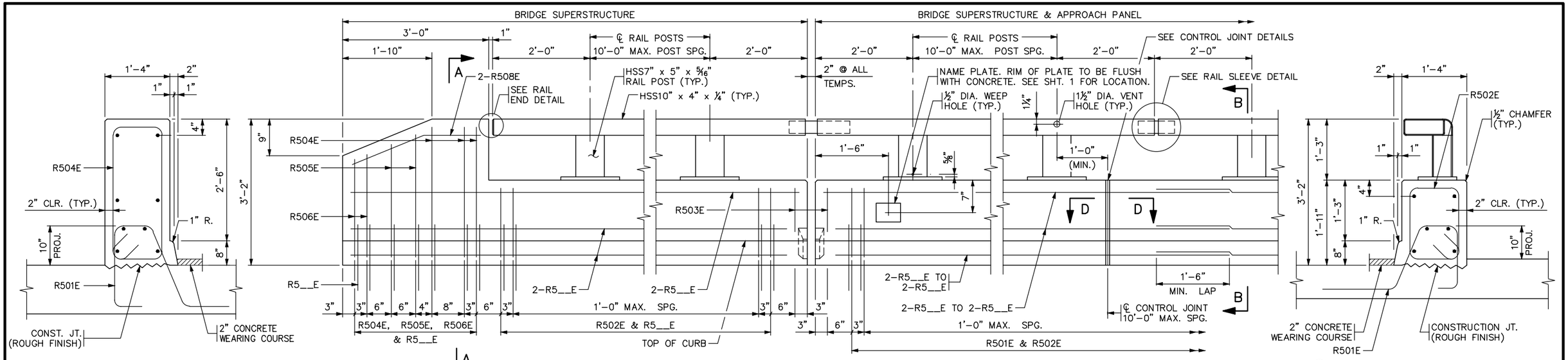
CIVIL EAST - VOLUME 4B
CSAH 40 (GLENWOOD AVENUE) - WEST
BRIDGE 27C16
SUPERSTRUCTURE DETAILS 4

DISCIPLINE: STRUCTURES

SHEET NAME: CBR27C16-BRG-SUP-004

SHEET 16 OF 35

Aug, 24 2015 09:14 am V:\3400_ADC\CAD\SEGMENT E4\PLAN SHEETS\STRUCTURES\27C16\CBR27C16-BRG-SUP-004.dwg By: Neal.Olesen



(A) SECTION A–A

(A) SECTION B–B

EXPANSION JOINT

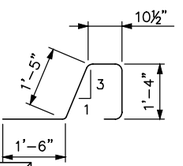
DEVICE NOT SHOWN

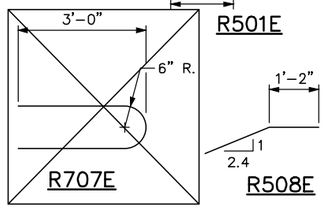
(A) INSIDE ELEVATION OF RAILING

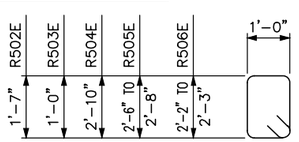
CONCRETE WEARING COURSE NOT SHOWN

RAIL MEETS TEST LEVEL 4 REQUIREMENTS OF NCHRP REPORT 350

CONTROL JOINT







R502E, R503E, R504E, R505E & R506E

GENERAL NOTES

FOR PAYMENT OF "TYPE P-2 (TL-4) BARRIER CONCRETE (3S52)" MEASURE LENGTH OF CONCRETE BARRIER BETWEEN END FACES. CONCRETE PARAPET = 396 LBS./FT. (0.098 CU. YDS./FT.)

FOR PAYMENT OF "STRUCTURAL TUBE RAILING DESIGN T-1" MEASURE LENGTH OF RAIL FROM END TO END OF TUBING. DO NOT DEDUCT FOR JOINTS.

FINISH ALL EDGES OF RAIL WITH ½" CHAMFER, EXCEPT WHERE OTHERWISE NOTED.

MAX. SPACING OF CONCRETE CONTROL JOINTS SHALL BE 10 FT.

PROVIDE CORRECT ALIGNMENT FOR ANCHORAGES BY PLACING THEM ACCURATELY AND NORMAL TO GRADE. SEE SPECIAL PROVISIONS.

PROVIDE STRUCTURAL STEEL AND PLATE WASHERS PER Mn/DOT SPEC. 3310. PROVIDE STRUCTURAL TUBES PER A.S.T.M. A500, GRADE B AS SPECIFIED IN Mn/DOT SPEC. 3361.

GALVANIZE BOLTS, NUTS, AND WASHERS PER Mn/DOT SPEC. 3392.

GALVANIZE ALL OTHER STRUCTURAL STEEL PER Mn/DOT SPEC. 3394, AFTER FABRICATION.

~~PROVIDE GUARDRAIL CONNECTION STRUCTURAL STEEL PER Mn/DOT SPEC. 3306.~~

~~GUARDRAIL CONNECTION AND NAME PLATE IS INCIDENTAL TO "TYPE P-2 (TL-4) BARRIER CONCRETE (3Y46 OR 3Y46A)".~~

~~PRICE BID FOR "STRUCTURAL TUBE RAILING DESIGN T-1" INCLUDES ANCHORAGES AND ALL MATERIAL ABOVE TOP OF CONCRETE BARRIER.~~

~~ALL MATERIAL IN THE CONCRETE BARRIER IS LISTED IN SUMMARY OF QUANTITIES FOR SUPERSTRUCTURE.~~

SEE SPECIAL PROVISIONS FOR PAINT REQUIREMENTS.

CONTINUOUSLY GROUND THE METAL RAILING AS DIRECTED IN THE SPECIAL PROVISIONS. REFER TO THE ELECTRICAL PLANS AND ELECTRICAL SPECIAL PROVISIONS FOR DETAILS REGARDING BONDING MULTIPLE ELECTRICAL GROUNDING SYSTEMS.

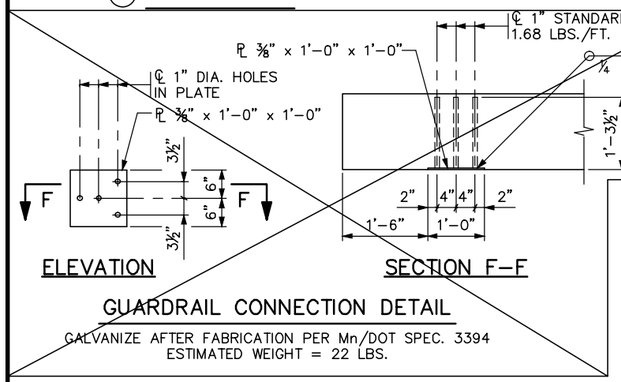
(1) MAKE THICKNESS THE SAME AS SLAB IN SECTION B–B.

(2) 1" AT RAILING JOINTS. AT EXPANSION JOINTS, MAKE 1" LARGER THAN GAP IN EXPANSION JOINTS.

(3) 5" AT RAILING JOINTS AND 8" AT EXPANSION JOINTS.

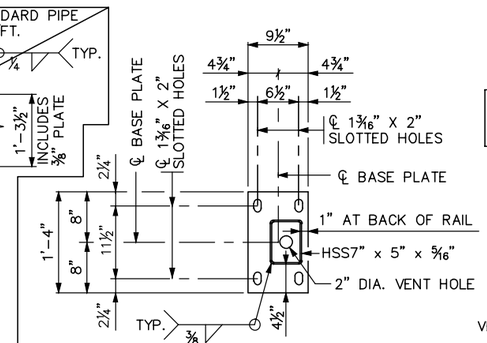
(4) SUBSTITUTION OF CHEMICAL ANCHOR RODS FOR CAST-IN-PLACE ANCHORAGE IS NOT PERMITTED.

(5) SEE SPECIAL PROVISIONS FOR JOINT SEALING REQUIREMENTS.

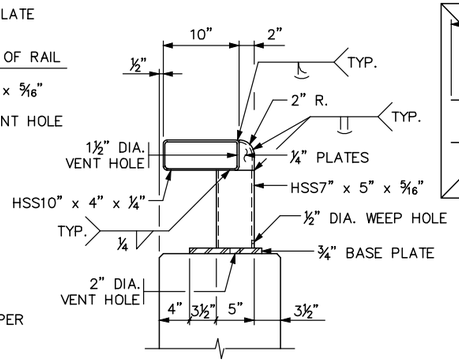


GUARDRAIL CONNECTION DETAIL

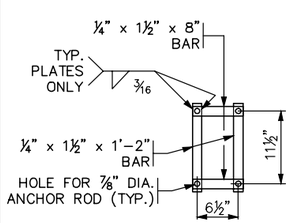
GALVANIZE AFTER FABRICATION PER Mn/DOT SPEC. 3394
ESTIMATED WEIGHT = 22 LBS.



BASE PLATE

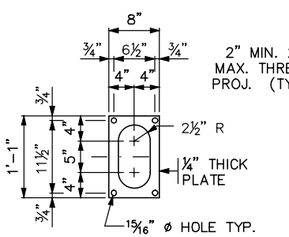


STRUCTURAL TUBE RAIL DETAIL



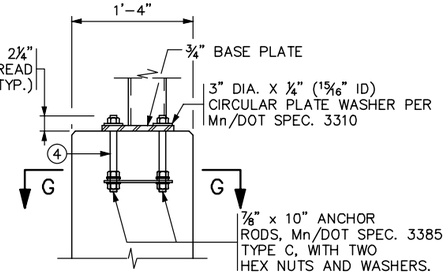
SECTION G–G

ANCHOR BAR ALTERNATE

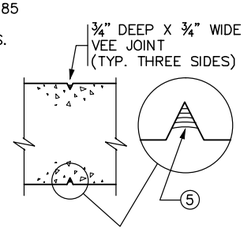


SECTION G–G

ANCHOR PLATE ALTERNATE

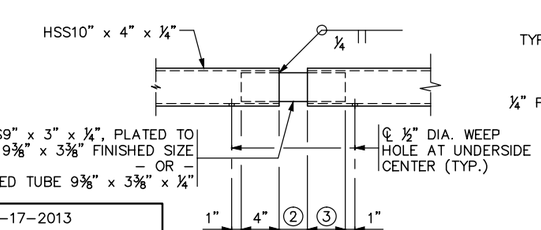


ANCHOR DETAIL

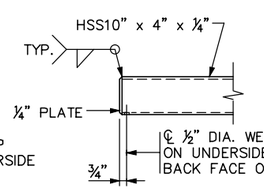


SECTION D–D

CONTROL JOINT DETAILS



RAIL SLEEVE DETAIL



RAIL END DETAIL

BILL OF REINFORCEMENT FOR PARAPET				
BAR	NO.	LENGTH	SHAPE	LOCATION
R501E	___	5'-7"	BENT	PARAPET VERTICAL
R502E	___	6'-1"	BENT	PARAPET VERTICAL
R503E	___	4'-11"	BENT	PARAPET VERTICAL
R504E	___	8'-7"	BENT	PARAPET VERTICAL
R505E	– SER. OF 2	7'-11" TO 8'-3"	BENT	PARAPET VERTICAL
R506E	– SER. OF 2	7'-3" TO 7'-5"	BENT	PARAPET VERTICAL
~~R707E~~	~~___~~	~~6' 7"~~	~~BENT~~	~~PARAPET END~~
R508E	___	2'-9"	BENT	PARAPET END LONGIT.
R509E	___	___	———	PARAPET LONGITUDINAL
R510E	___	___	———	PARAPET LONGITUDINAL
R511E	___	___	———	PARAPET LONGITUDINAL
R512E	___	___	———	PARAPET LONGITUDINAL

DRAFT-WORK IN PROCESS

FIG. 5–397.157 (MOD.)

REVISED: 04–17–2013

APPROVED: MARCH 30, 2010

STATE BRIDGE ENGINEER

SHEET MODIFICATION:
(A) DENOTES MODIFICATION TO STANDARD SHEET

CERTIFIED BY _____ LICENSED PROFESSIONAL ENGINEER 8/24/15 DATE

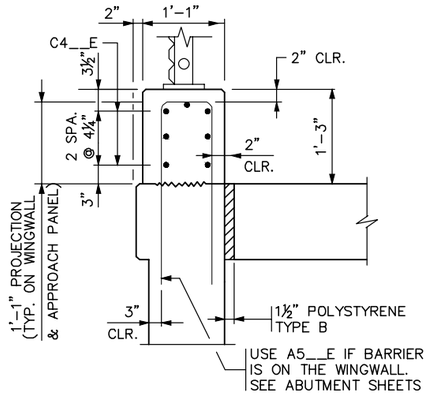
NAME: **ENGINEER** LIC. NO. #####

TITLE: STRUCTURAL TUBE RAILING (DESIGN T-1) AND CONCRETE PARAPET (TYPE P-2, TL-4) (WITH INTEGRAL END POST)

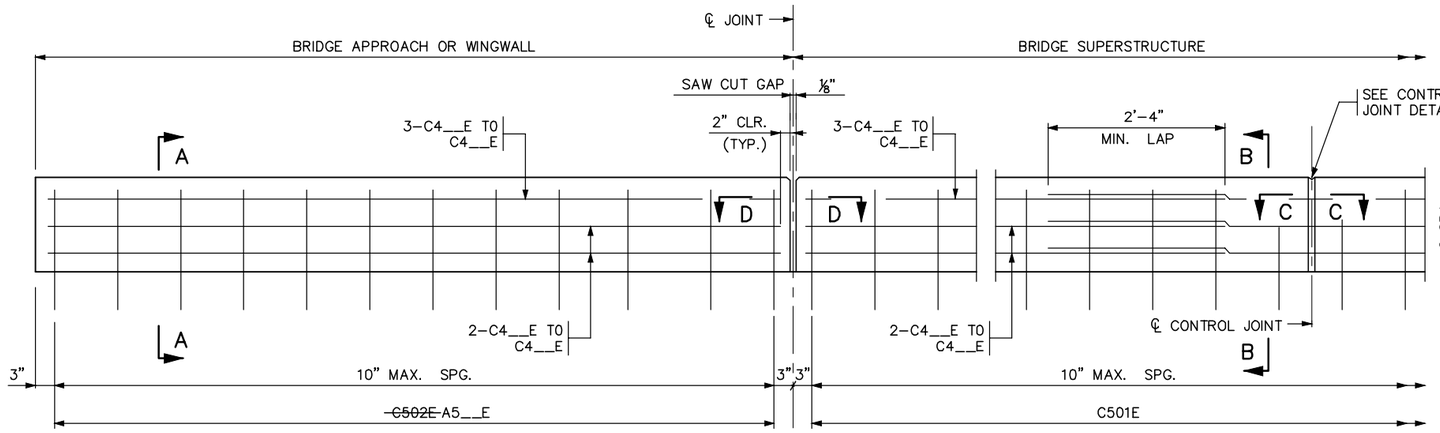
DES: EJT	DR: NAO	APPROVED:
CHK: LNI	CHK: EJT	

SHEET NO. 17 OF 35 SHEETS

BRIDGE NO. 27C16



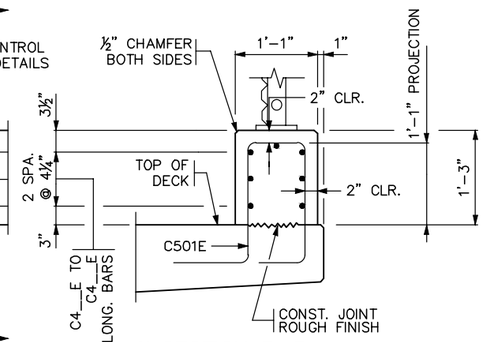
SECTION A–A Ⓐ



JOINT AT ABUTMENT Ⓐ

CONTROL JOINT

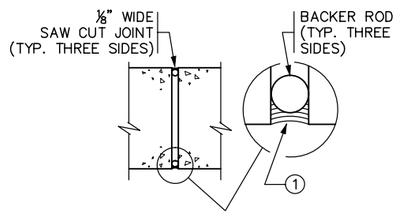
INTEGRAL OR SEMI–INTEGRAL ABUTMENT SEE DETAIL "A" FOR PARAPET ABUTMENT



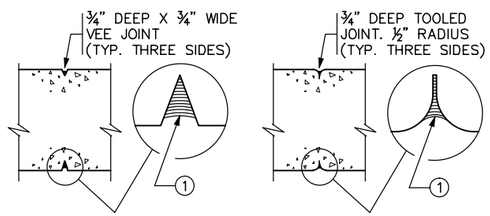
Ⓐ SECTION B–B

INSIDE ELEVATION OF CONCRETE CURB

CURB DOES NOT MEET CRASH TEST REQUIREMENTS OF NCHRP REPORT 350



SECTION D–D

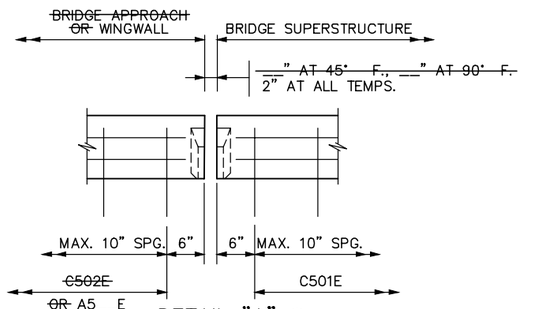


SECTION C–C
CONTRACTOR OPTION 1

SECTION C–C
CONTRACTOR OPTION 2

CONTROL JOINT DETAILS

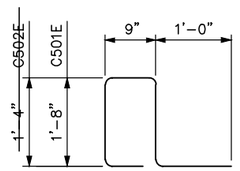
WHEN USING SLIP FORM METHOD TO PLACE THE CONCRETE, CUT JOINT 3 INCHES DEEP USING MARGIN TROWEL OR SIMILAR MEANS IMMEDIATELY AFTER CONCRETE PLACEMENT (TYP. THREE SIDES)



DETAIL "A" ②

(USE ONLY WITH STRIP SEAL EXPANSION DEVICE) (EXPANSION DEVICE NOT SHOWN)

BILL OF REINFORCEMENT FOR CURB				
BAR	NO.	LENGTH	SHAPE	LOCATION
Ⓐ C501E	__	5'–8"	⊔	CURB BASE VERTICAL
~~C502E~~	~~__~~	~~5'–0"~~	⊔	~~CURB BASE VERTICAL~~
C4__E	__	_____	——	CURB BASE LONGIT.
C4__E	__	_____	——	CURB BASE LONGIT.
C4__E	__	_____	——	CURB BASE LONGIT.



Ⓐ C501E, ~~C502E~~

GENERAL NOTES

CONTINUOUSLY GROUND ALL METAL RAILINGS; SEE THE SPECIAL PROVISIONS. REFER TO THE ELECTRICAL PLANS AND ELECTRICAL SPECIAL PROVISIONS FOR DETAILS REGARDING BONDING MULTIPLE ELECTRICAL GROUNDING SYSTEMS.

~~PAYMENT LENGTH SHALL BE MEASURED BETWEEN THE OUTSIDE FACES OF THE CONCRETE CURB.~~

Ⓐ CONCRETE CURB = 204 LBS./FT. (0.050 CU. YDS./FT.)

FINISH ALL EDGES OF CURB WITH ½" CHAMFER, EXCEPT WHERE OTHERWISE NOTED.

MAXIMUM SPACING OF CONTROL JOINTS ON SUPERSTRUCTURE, APPROACH AND WINGWALL SHALL BE 10 FT. SEE SUPERSTRUCTURE SHEET FOR JOINT SPACING.

~~CONCRETE CURB QUANTITIES ARE LISTED IN SUMMARY OF QUANTITIES FOR SUPERSTRUCTURE.~~

① JOINT SEALANT PER MnDOT APPROVED/QUALIFIED PRODUCTS LIST – CRACK AND JOINT MATERIALS – SILICONE JOINT SEALERS.

② REFER TO STANDARD FIGURE 5–397.632 FOR COVER PLATE DETAILS.

REVISION:

APPROVED: NOVEMBER 6, 2013
Nancy Daubenberger
STATE BRIDGE ENGINEER

SHEET MODIFICATION:
Ⓐ DENOTES MODIFICATION TO STANDARD SHEET

CERTIFIED BY _____ 8/24/15
LICENSED PROFESSIONAL ENGINEER — DATE
NAME: **ENGINEER** LIC. NO. #####

TITLE: CONCRETE CURB ~~FOR USE WITH ORNAMENTAL RAILING~~

DRAFT-WORK IN PROCESS

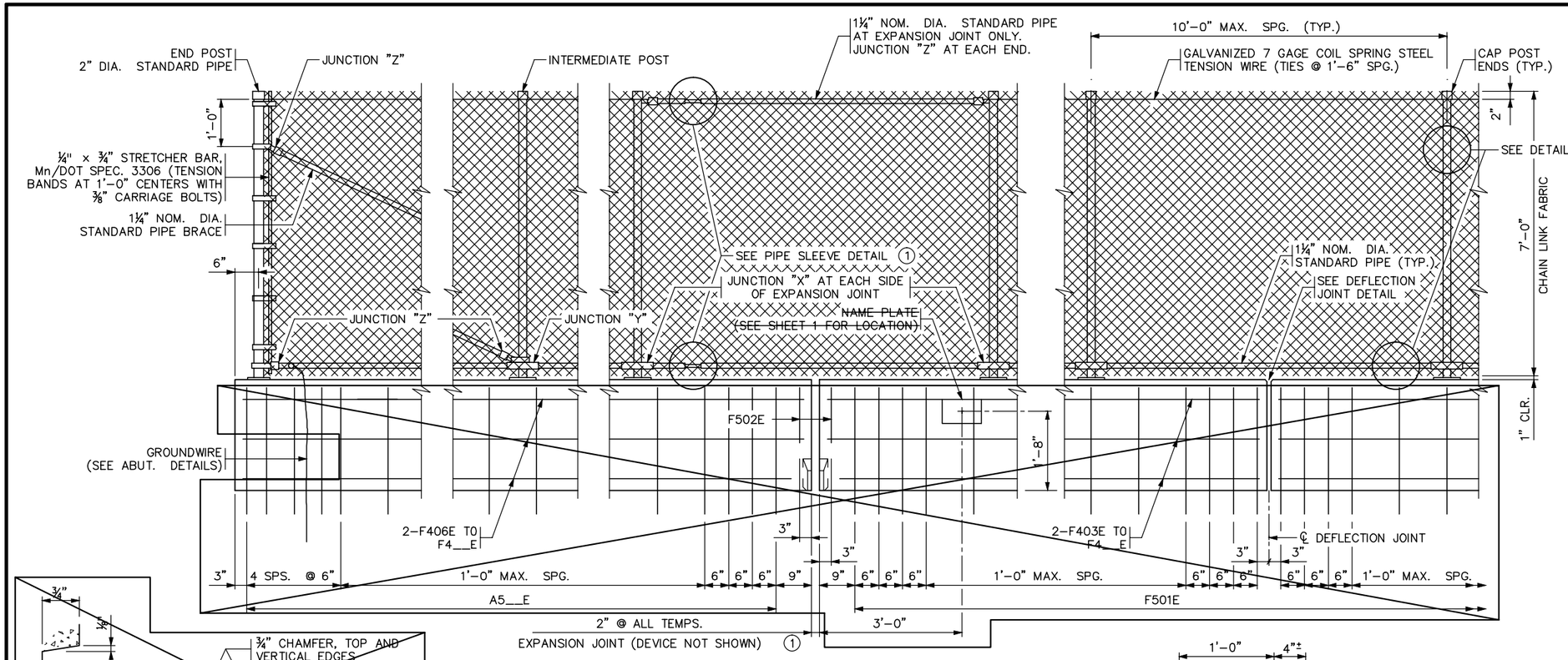
FIG. 5–397.167 (MOD.)

DES: EJT	DR: NAO	APPROVED:
CHK: LNI	CHK: EJT	

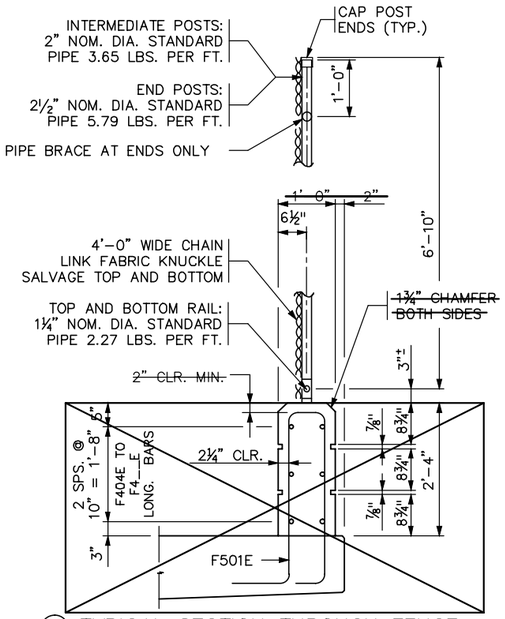
SHEET NO. **18** OF **35** SHEETS

BRIDGE NO. **27C16**

Aug, 24 2015 09:14 am V:\3400_ADC\CAD\SEGMENT E4\PLAN SHEETS\STRUCTURES\27C16\CBR27C16-BRG-RAL-001.dwg By: Neal.Oleson



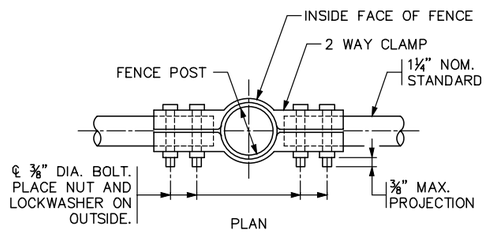
Ⓐ INSIDE ELEVATION OF RAILING



Ⓐ TYPICAL SECTION THROUGH FENCE

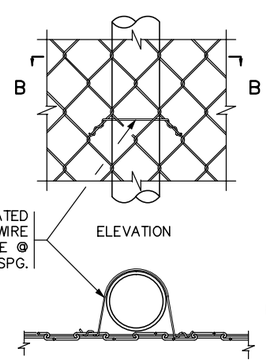
INTERMEDIATE POST SHOWN

SHEET MODIFICATION:
Ⓐ DENOTES MODIFICATION TO STANDARD SHEET

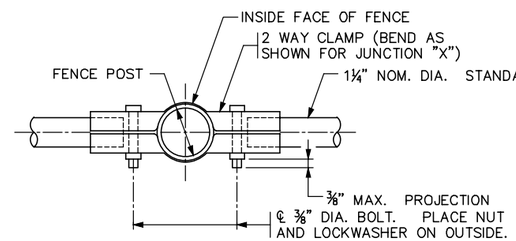


JUNCTION "X"

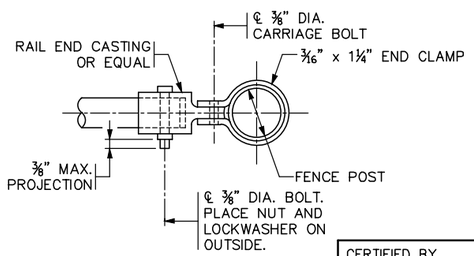
2 WAY CLAMP BENDING TABLE	
GRADE OF FENCE	Ø
0° TO 2°	0°
2° TO 6°	4°
6° TO 10°	8°



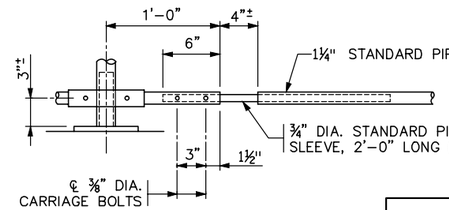
DETAIL "A"



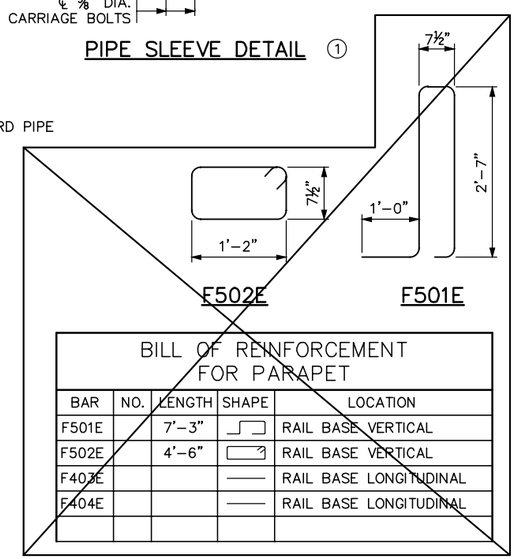
JUNCTION "Y"



JUNCTION "Z"



PIPE SLEEVE DETAIL (1)



BILL OF REINFORCEMENT FOR PARAPET				
BAR	NO.	LENGTH	SHAPE	LOCATION
F501E		7'-3"		RAIL BASE VERTICAL
F502E		4'-6"		RAIL BASE VERTICAL
F403E				RAIL BASE LONGITUDINAL
F404E				RAIL BASE LONGITUDINAL

GENERAL NOTES

Ⓐ SEE CONCRETE CURB SHEET FOR DIMENSIONS, REINFORCEMENT AND NOTES.

~~LENGTH OF "TYPE P-1 RAILING CONCRETE (3Y46 OR 3Y46A)" FOR PAYMENT SHALL BE MEASURED BETWEEN THE OUTSIDE FACES OF THE CONCRETE RAIL.~~

Ⓐ LENGTH OF "WIRE FENCE DESIGN 84V-9322" FOR PAYMENT SHALL BE MEASURED BETWEEN THE CENTERS OF END RAILPOSTS.

~~CONCRETE RAILING = 350 LBS./FT. (0.086 CU. YDS./FT.)~~

FENCE POST ANCHORAGES SHALL BE TYPE A. SEE DETAIL B905 "FENCE POST ANCHORAGE".

~~MAXIMUM SPACING OF DEFLECTION JOINTS SHALL BE 20 FT. FOR SPACING OF FENCE POST, JOINTS AND ELECTRICAL GROUNDS, SEE SUPERSTRUCTURE SHEETS.~~

FENCE POSTS AND FENCE POST ANCHORAGES SHALL BE SET VERTICAL, UNLESS OTHERWISE NOTED.

℄ OF FENCE POST ANCHORAGE SHALL BE A MINIMUM OF 6" FROM JOINTS.

END POSTS AND BRACING SHALL BE AT 500 FT. MAXIMUM INTERVALS.

ALL POSTS SHALL HAVE A MEANS TO SECURELY HOLD THE TOP TENSION WIRE IN POSITION AND ALLOW FOR THE REMOVAL AND REPLACEMENT OF A POST WITHOUT DAMAGING THE TOP WIRE.

WIRE TIES MAY BE 9 GAGE GALVANIZED STEEL OR 0.179" MIN. ALUMINUM ALLOY CONFORMING TO A.S.T.M. B211, ALLOY 1100-H18. USE 12½ GAGE GALVANIZED HOG RINGS FOR TENSION WIRE TIES.

~~ALL MATERIAL IN THE CONCRETE BASE AND END POST IS INCLUDED IN THE SUPERSTRUCTURE QUANTITIES.~~

SEE SPECIAL PROVISIONS FOR REQUIREMENTS NOT INCLUDED ON THIS SHEET ~~AND FOR BASIS OF PAYMENT.~~

(1) PROVIDE PIPE SLEEVE IN SPAN BETWEEN THE VERTICAL POSTS AT EXPANSION JOINT. SEE SUPERSTRUCTURE SHEETS FOR LOCATION.

REVISED: 04-17-2013

APPROVED: DECEMBER 18, 2003

STATE BRIDGE ENGINEER

DRAFT-WORK IN PROCESS

FIG. 5-397.119 (MOD.)

CERTIFIED BY _____ LICENSED PROFESSIONAL ENGINEER 8/24/15 DATE

NAME: **ENGINEER** LIC. NO. #####

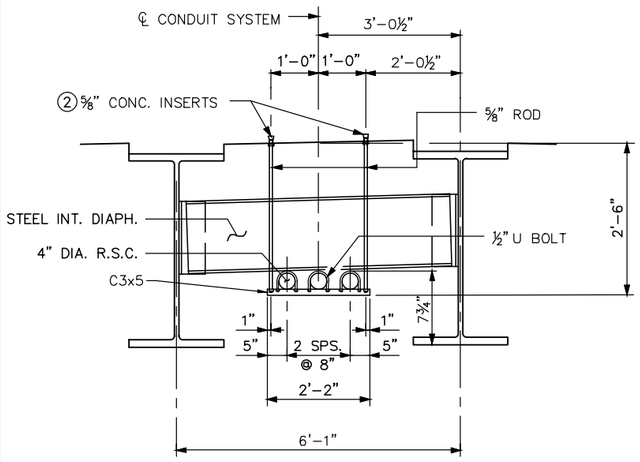
TITLE: Ⓐ WIRE FENCE (DIAMOND MESH SAFETY RAIL) ~~(WITH INTEGRAL END POST)~~

DES: EJT	DR: NAO	APPROVED:
CHK: LNI	CHK: EJT	

SHEET NO. 19 OF 35 SHEETS

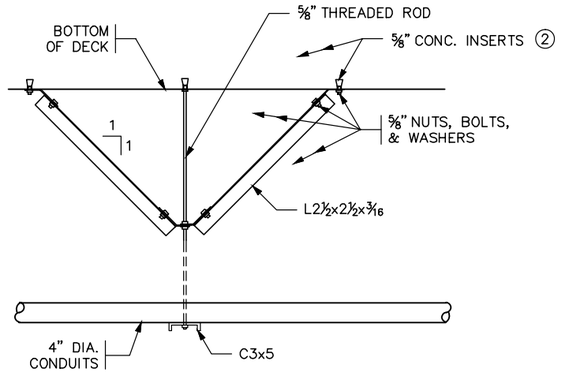
BRIDGE NO. 27C16

Aug. 24 2015 09:14 am V:\3400_ADC\CAD\SEGMENT E4\PLAN SHEETS\STRUCTURES\27C16\CBR27C16-BRG-RAL-001.dwg By: Neal.Oleson



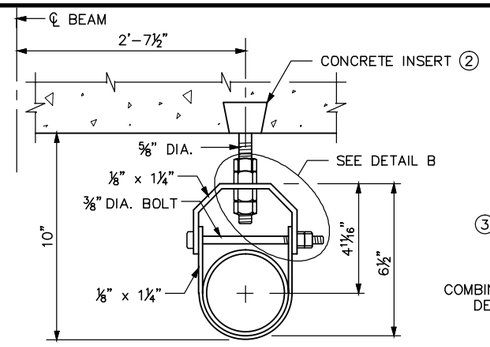
Ⓐ TRANSVERSE SECTION

(FOR SYSTEMWIDE ELECTRICAL CONDUIT SYSTEM)



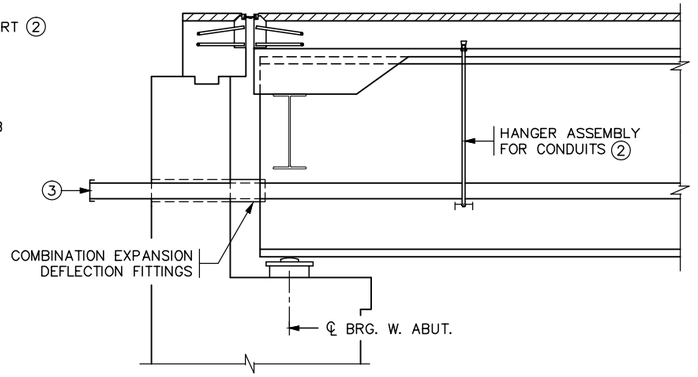
Ⓐ CENTERING DEVICE DETAIL – SIDE VIEW

(LOCATED ONLY ON A HANGER ADJACENT TO PIER)



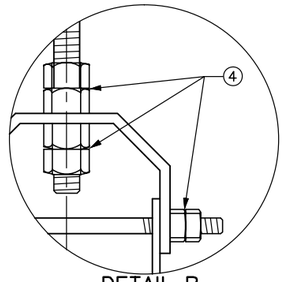
CONDUIT HANGER DETAIL

(FOR SYSTEMWIDE ELECTRICAL CONDUIT SYSTEM)

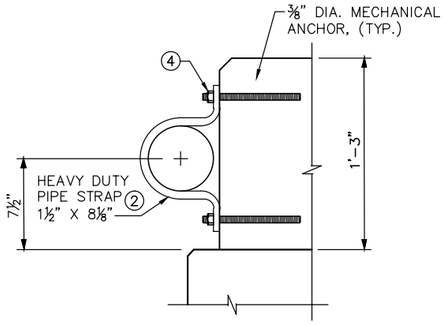


Ⓐ LONGITUDINAL SECTION

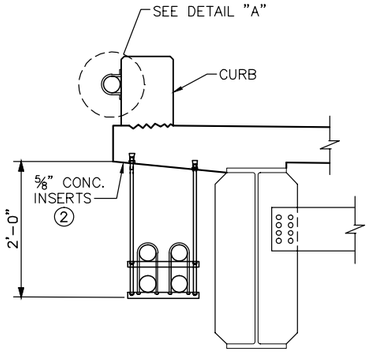
(FOR SYSTEMWIDE ELECTRICAL CONDUIT SYSTEM)



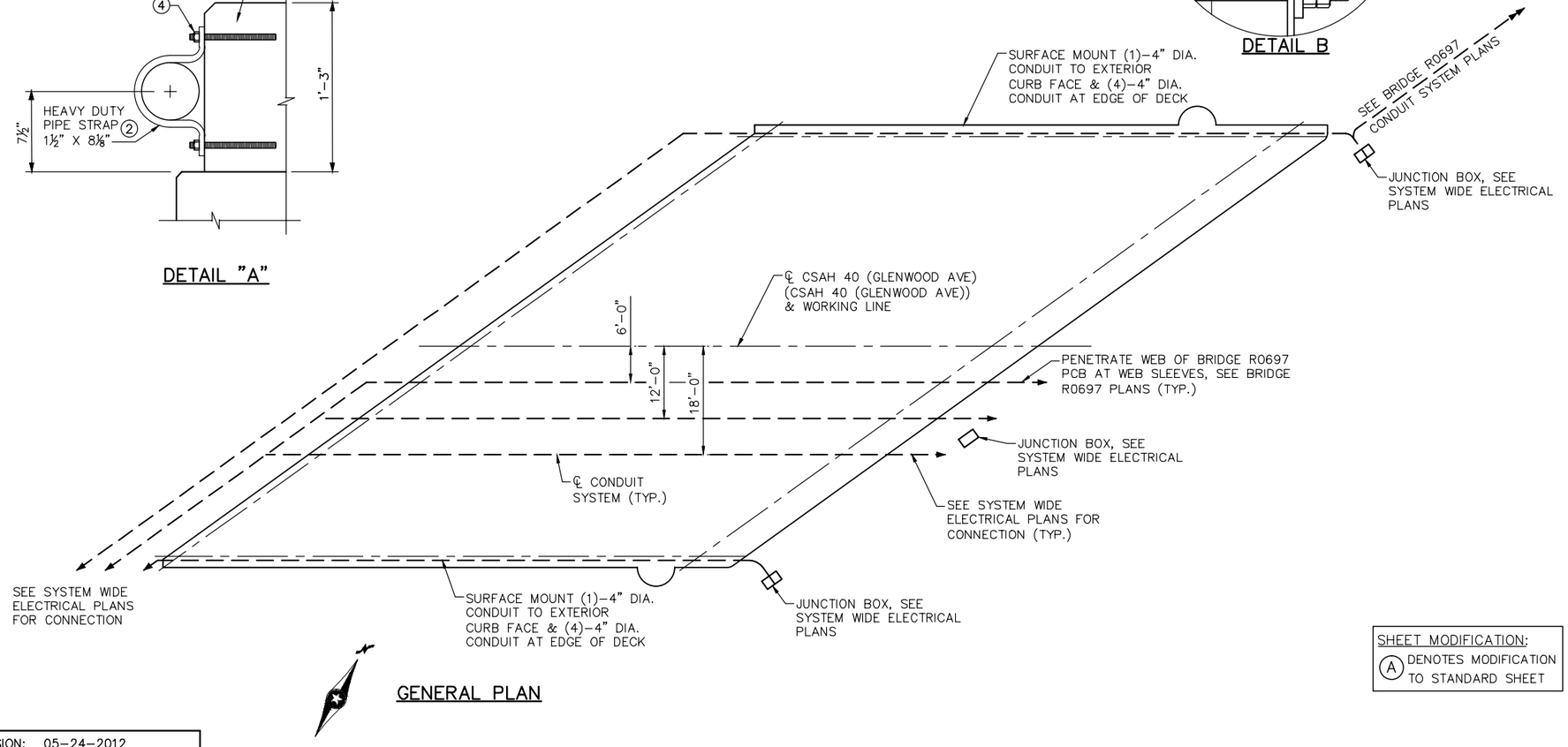
DETAIL B



DETAIL "A"



OVERHANG CONDUIT DETIAL



GENERAL PLAN

GENERAL NOTES

RODS, EYE BOLTS AND PIPE CLAMPS SHALL COMPLY WITH MnDOT SPEC. 3313, TYPE I.

TURNBUCKLES AND EYE BOLTS SHALL COMPLY WITH A.S.T.M. A235 CLASS A MINIMUM REQUIREMENTS.

FLAT BARS AND ANCHORAGES SHALL COMPLY WITH SPEC. 3306.

CONCRETE INSERTS SHALL BE APPROVED TYPE MALLEABLE IRON. MATERIAL AS PER SPEC. 3324, GRADE 35018. TAP AFTER GALVANIZING.

GALVANIZE BOLTS, NUTS, WASHERS, TURNBUCKLES, RODS, EYE BOLTS, AND INSERTS AS PER SPEC. 3392. GALVANIZE OTHER MATERIAL AS PER SPEC. 3394 AFTER FABRICATION.

PIPE SLEEVES SHALL COMPLY WITH SPEC. 3362.

Ⓐ ② SPACE PIPE STRAPS OR INSERTS AT 10'–0" MAXIMUM CENTERS.

③ SEE SYSTEM WIDE ELECTRICAL PLANS.

④ DOUBLE NUTS OR JAM NUTS OR LOCK NUT.

SHEET MODIFICATION:
Ⓐ DENOTES MODIFICATION TO STANDARD SHEET

REVISION: 05–24–2012

APPROVED: SEPTEMBER 26, 2003
Daniel T. Hergott
STATE BRIDGE ENGINEER

DRAFT-WORK IN PROCESS

FIG. 5–397.402 (MOD.)

CERTIFIED BY _____ 8/24/15
LICENSED PROFESSIONAL ENGINEER — DATE
NAME: **ENGINEER** LIC. NO. #####

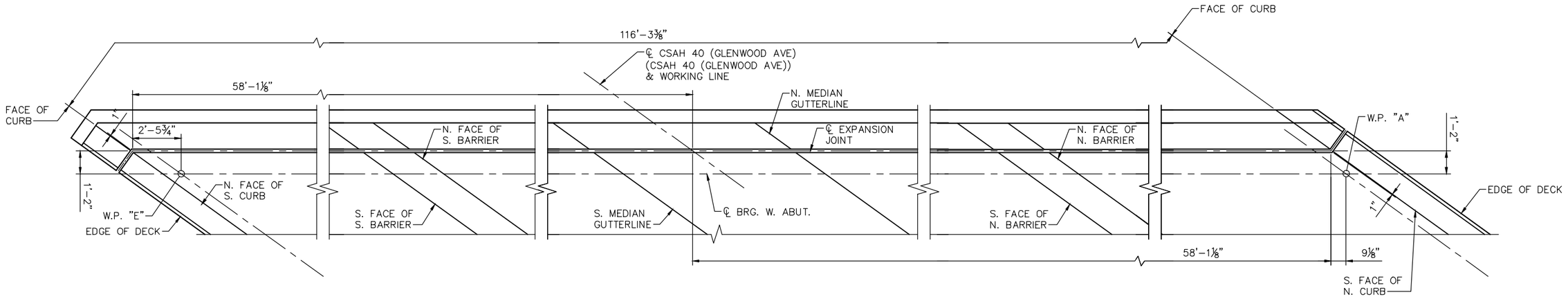
TITLE: CONDUIT SYSTEM FOR SYSTEM WIDE ELECTRICAL

DES: EJT	DR: NAO	APPROVED:	BRIDGE NO.
CHK: LNI	CHK: EJT		27C16
SHEET NO. 20 OF 35 SHEETS			

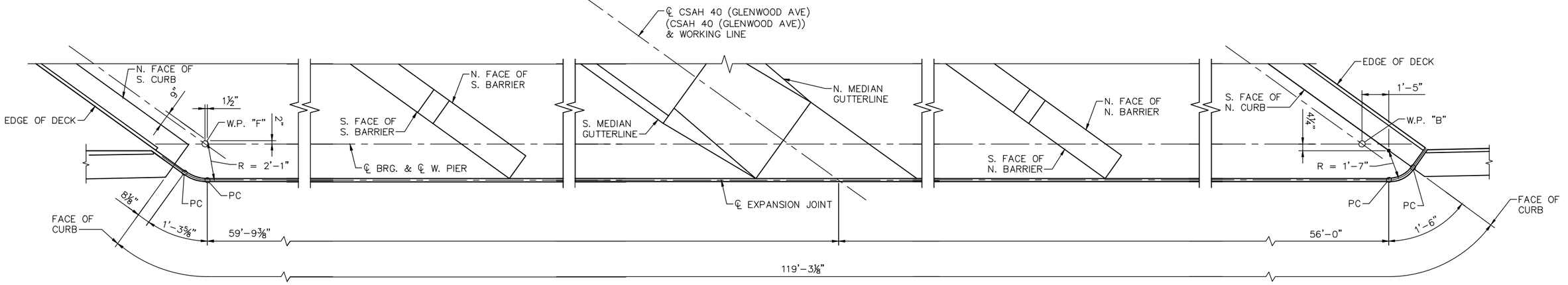
Aug, 24 2015 09:14 am V:\3400_ADC\CAD\SEGMENT E4\PLAN SHEETS\STRUCTURES\27C16\CBR27C16-BRG-SYS-001.dwg By: Neal.Oleson

NOTES:

ALL DIMENSIONS MEASURED ALONG ℄ OF EXPANSION JOINT.



PLAN



PLAN

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: HLR | CHECKED BY: EJT
DRAWN BY: NAO | DATE: 8/24/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

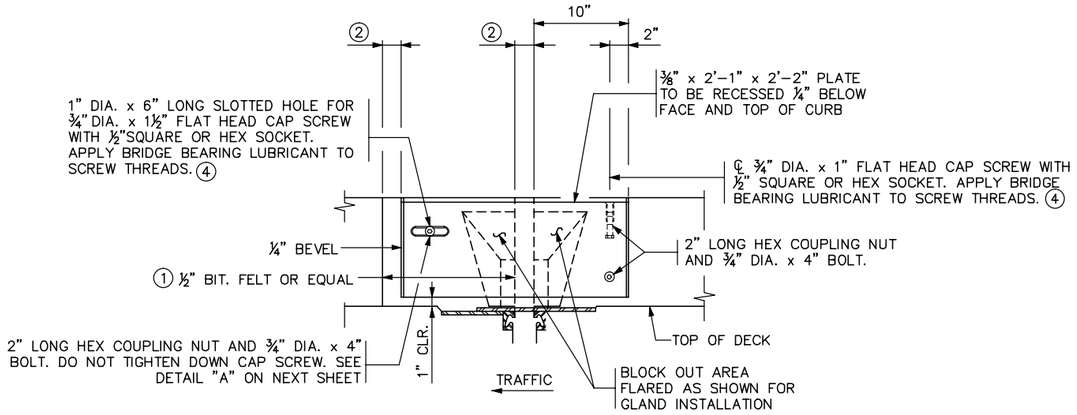
CIVIL EAST - VOLUME 4B
CSAH 40 (GLENWOOD AVENUE) - WEST
BRIDGE 27C16
WATERPROOF EXPANSION DEVICE 1

DISCIPLINE: STRUCTURES

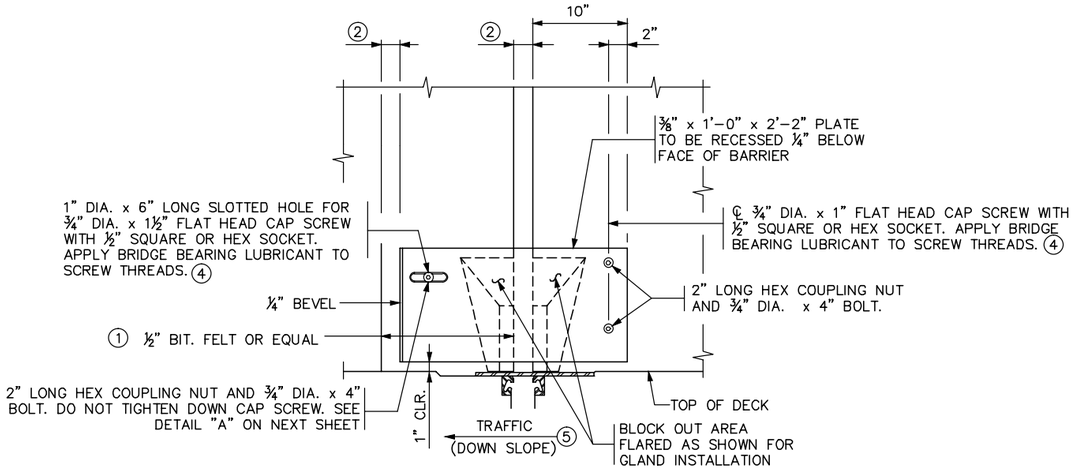
SHEET NAME: CBR27C16-BRG-EXP-001

SHEET 21 OF 35

Aug, 24 2015 09:14 am V:\3400_ADC\CAD\SEGMENT E4\PLAN SHEETS\STRUCTURES\27C16\CBR27C16-BRG-EXP-001.dwg By: Neal.Oleson



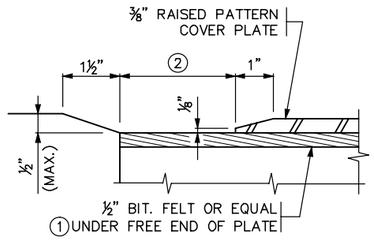
INSIDE ELEVATION OF CONCRETE CURB



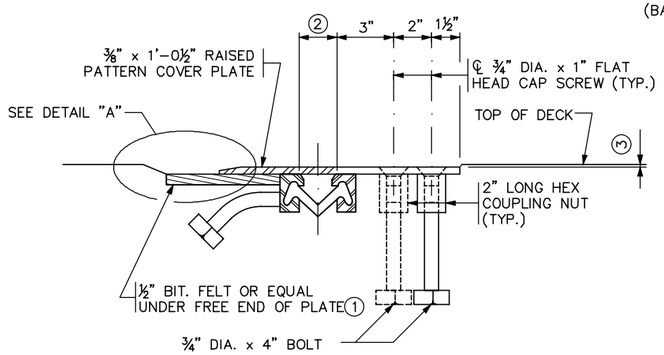
Ⓐ OUTSIDE ELEVATION OF P2 BARRIER

(BACK OF TYPE P2 BARRIER, FRONT FACE PLATE SIM., ELEV @ SDWK. SHOWN)

NOTE:
TRANSVERSE DECK REINFORCEMENT MAY BE SHIFTED THE MINIMUM DISTANCE REQUIRED FOR EXPANSION DEVICE PLACEMENT



DETAIL "A"



SECTION D–D

GENERAL NOTES

Ⓐ SEE NEXT SHEET FOR ADDITIONAL DETAILS AND NOTES.

¾" DIA. X 1" FLAT HEAD CAP SCREW WITH ½" SQUARE OR HEX SOCKET PER SPEC 3391. CAP SCREWS SHALL BE COUNTERSUNK 1/16" BELOW TOP OF PLATE. APPLY BRIDGE BEARING LUBRICANT TO SCREW THREADS. ④

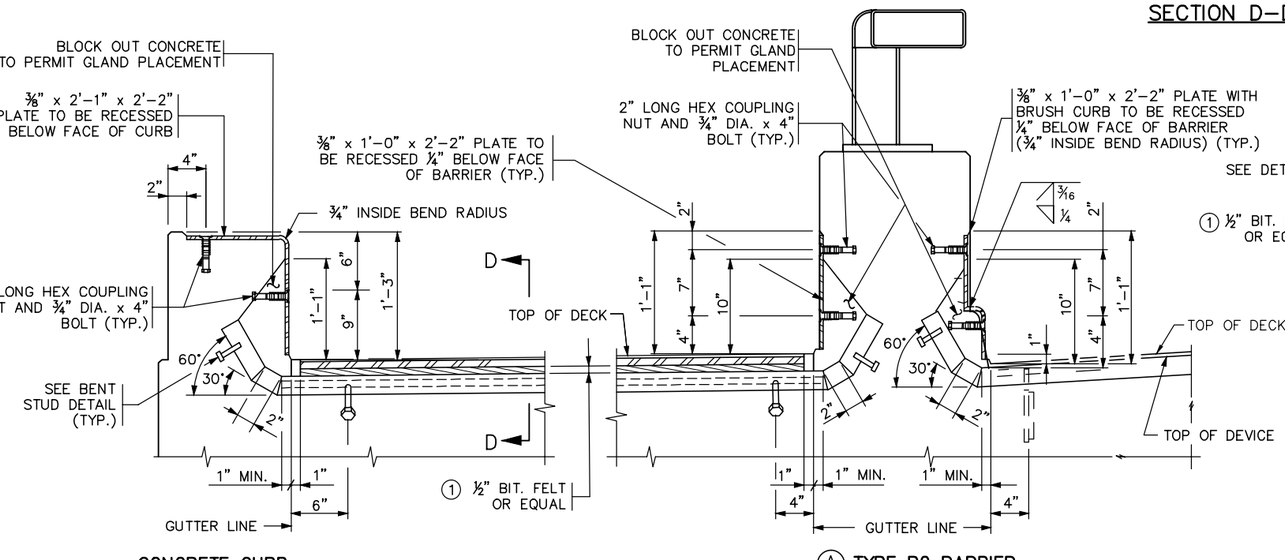
① USE LARGEST SINGLE PIECE POSSIBLE. USE OF SMALL PIECES OR SCRAPS SECURED TOGETHER IS PROHIBITED.

Ⓐ ② 2" @ ALL TEMPS

③ ⅛" (¼" MAX.).

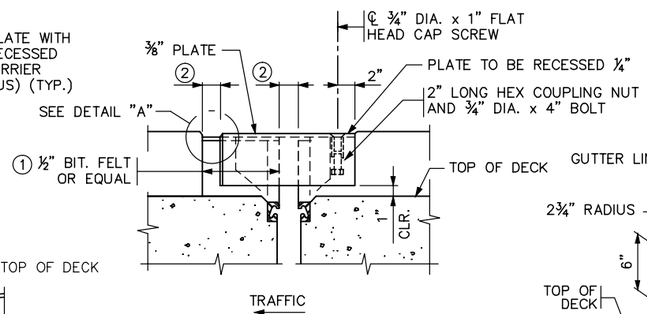
④ LUBRICANT PER MnDOT APPROVED/QUALIFIED PRODUCTS LIST: BRIDGE – BRIDGE BEARING LUBRICANT.

Ⓐ ⑤ DOWN SLOPE DIRECTION APPLIES TO ⅜" x 1'-0½" RAISED COVER PLATE

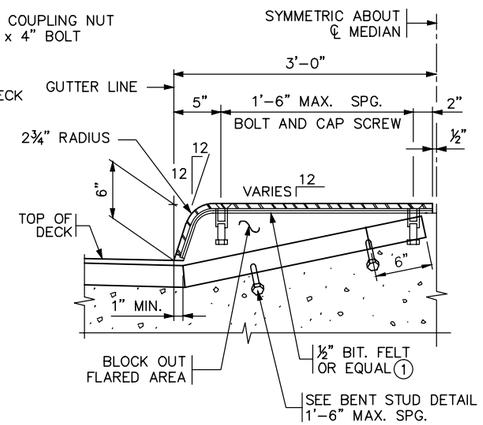


CONCRETE CURB

Ⓐ TYPE P2 BARRIER



MEDIAN ELEVATION



Ⓐ MEDIAN SECTION

SHEET MODIFICATION:
Ⓐ DENOTES MODIFICATION TO STANDARD SHEET

SECTION THROUGH BARRIER AND CURB – INTEGRAL SIDEWALK

(BENT STUD MAY BE USED ON WEST ABUTMENT EXPANSION JOINT IN SIDEWALK AREA.)
(ALL OTHER LOCATIONS SHALL BE BAR–RODS.)

REVISION:

APPROVED: NOVEMBER 6, 2013
Nancy Daubenberger
STATE BRIDGE ENGINEER

DRAFT-WORK IN PROCESS

CERTIFIED BY _____ 8/24/15
LICENSED PROFESSIONAL ENGINEER — DATE
NAME: ENGINEER LIC. NO. #####

TITLE: WATERPROOF EXPANSION DEVICE (RAISED MEDIAN OR INTEGRAL SIDEWALK WITH CURB)

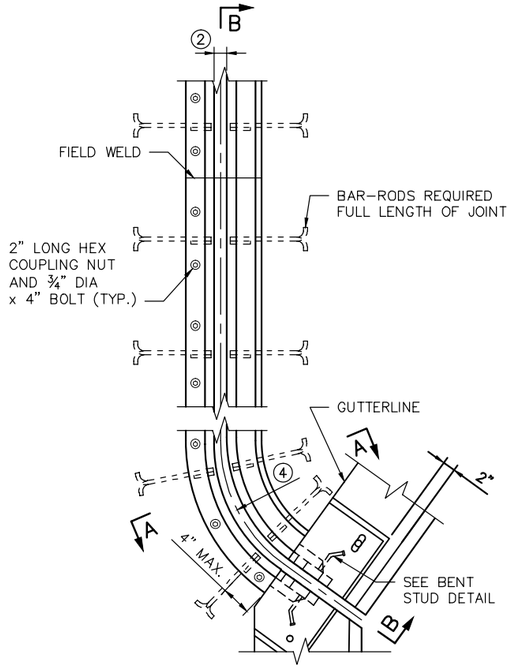
DES: HLR	DR: NAO	APPROVED:
CHK: EJT	CHK: EJT	

SHEET NO. 22 OF 35 SHEETS

FIG. 5–397.632 (MOD.)

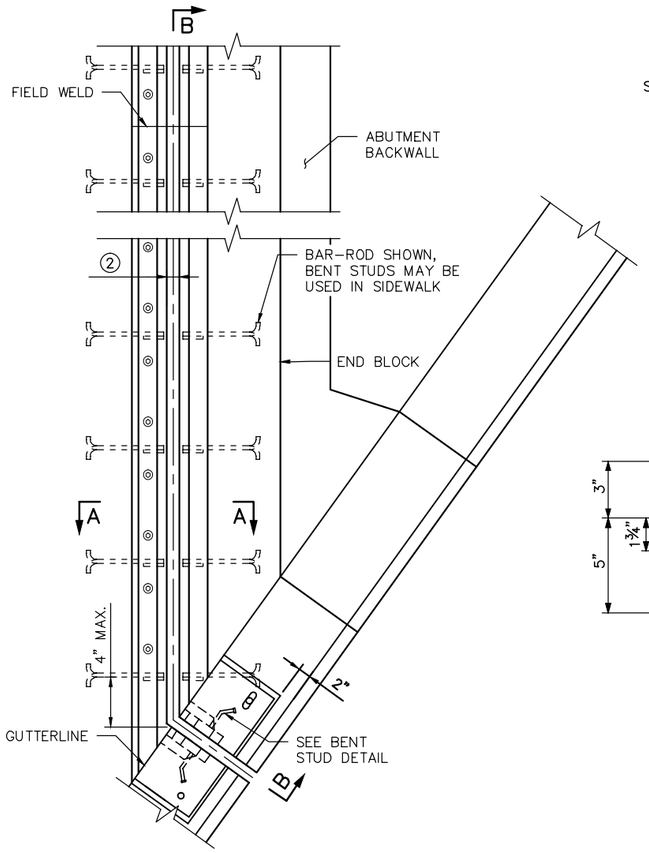
BRIDGE NO. 27C16

Aug, 24 2015 09:15 am V:\3400_ADC\CAD\SEGMENT E4\PLAN SHEETS\STRUCTURES\27C16\CBR27C16-BRG-EXP-002.dwg By: Neal.Oleson



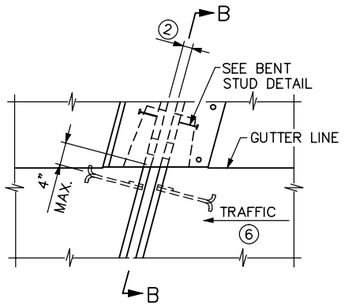
PLAN VIEW @ EXPANSION DEVICE

(WEST PIER, NORTH CORNER SHOWN, SOUTH CORNER SIMILAR)



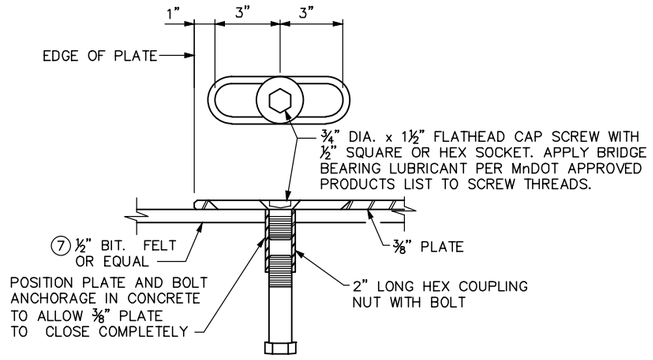
PLAN VIEW @ EXPANSION DEVICE

(WEST ABUTMENT, NORTH CORNER SHOWN, SOUTH CORNER SIMILAR)

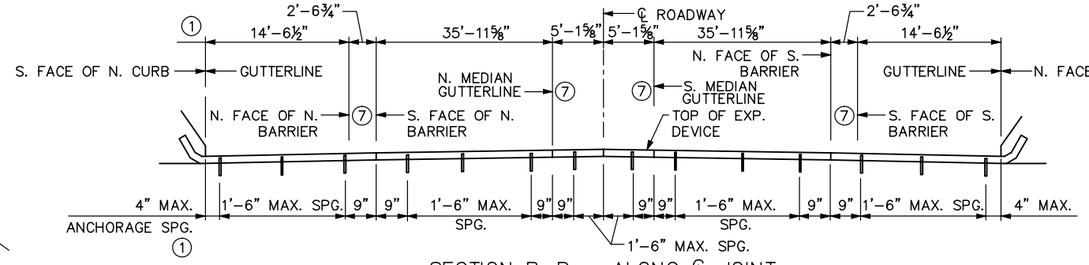


PLAN VIEW @ EXPANSION DEVICE

MEDIAN OR SIDEWALK ALTERNATE

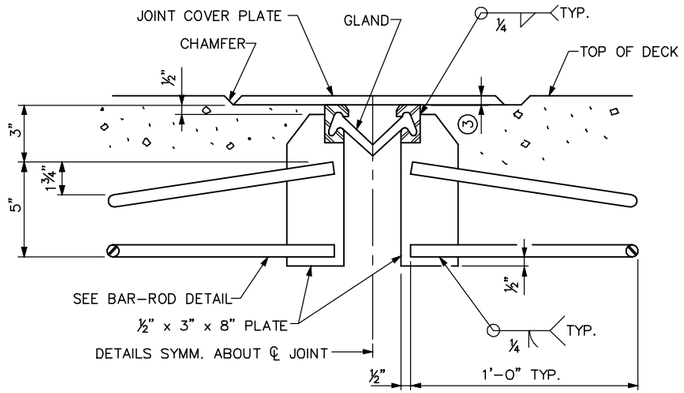


DETAIL "A"



SECTION B–B ~ ALONG ℄ JOINT

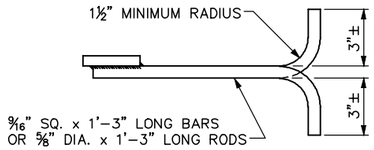
ELEVATIONS SHOWN AT ROADWAY ARE ⅛" BELOW TOP OF SLAB @ ℄ JOINT
ELEVATIONS SHOWN AT SIDEWALKS ARE ½" BELOW TOP OF SLAB @ ℄ JOINT



SECTION A–A

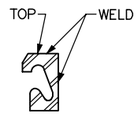
(SECTION @ SIDEWALK SHOWN W/COVER PLATE. OMIT COVER PLATE IN ROADWAY)

ELEVATIONS		
LOCATION	WEST ABUT.	WEST PIER
SOUTH FACE OF NORTH CURB	850.41	851.43
NORTH FACE OF NORTH BARRIER	849.86	851.36
SOUTH FACE OF NORTH BARRIER	849.73	851.33
NORTH MEDIAN GUTTERLINE	848.42	851.14
CL ROADWAY		851.11
SOUTH MEDIAN GUTTERLINE	848.38	851.09
NORTH FACE OF SOUTH BARRIER	847.18	850.89
SOUTH FACE OFSOUTH BARRIER	846.89	850.87
NORTH FACE OF SOUTH CURB	846.40	850.80

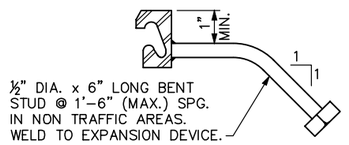


BAR–ROD DETAIL ⑤

(SEE SECTION D–D ON PREVIOUS SHEET FOR COVER PLATE SCREW DETAIL)



SECTION C–C



BENT STUD DETAIL

NOTES:

GALVANIZE STRUCTURAL STEEL AFTER FABRICATION AS PER MnDOT SPEC. 3394. GALVANIZE FASTENERS AS PER MnDOT SPEC. 3392.

JOINTS IN EXTRUSION SHALL BE LOCATED AT BREAKS IN TRANSVERSE PROFILE AND AS OTHERWISE REQUIRED. JOINTS SHALL BE CLOSE FIT AND WELDED. REPAIR AFTER WELDING AS PER MnDOT SPEC. 2471.3.L.

STRUCTURAL STEEL SHALL COMPLY WITH MnDOT SPEC. 3306 OR MnDOT SPEC. 3309.

EXPANSION DEVICE SHALL BE STRAIGHTENED TO A TOLERANCE OF ⅛" IN 10 FT.

¾" DIA. X 1½" FLATHEAD CAP SCREW WITH ½" SQUARE OR HEX SOCKET PER MnDOT SPEC 3391. CAP SCREWS SHALL BE COUNTERSUNK 1/16" BELOW TOP OF PLATE. APPLY BRIDGE BEARING LUBRICANT PER MnDOT APPROVED PRODUCTS LIST TO SCREW THREADS.

① DIMENSIONS ARE ALONG CENTERLINE OF JOINT.

② 2" AT ALL TEMPERATURES.

③ ⅛" (¼" MAX.).

④ SEE SHEET 21 FOR RADIUS.

⑤ PLACE BAR–ROD NORMAL TO JOINT.

⑥ SEE SHEET 1 FOR DIRECTION OF TRAFFIC.

⑦ SEE SHEET 13 FOR WEST ABUTMENT DETAILS.

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: HLR | CHECKED BY: EJT
DRAWN BY: NAO | DATE: 8/24/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

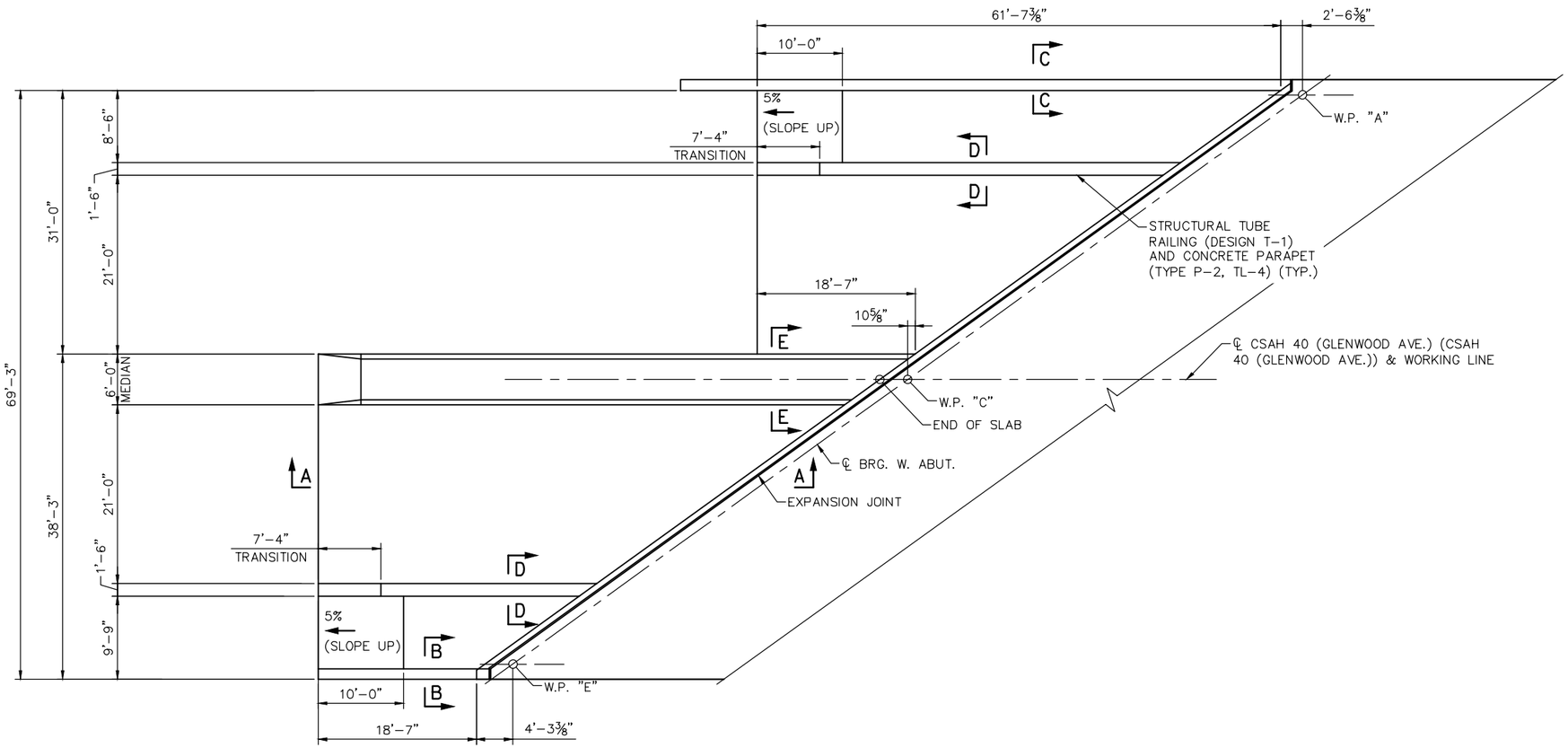
METROPOLITAN COUNCIL

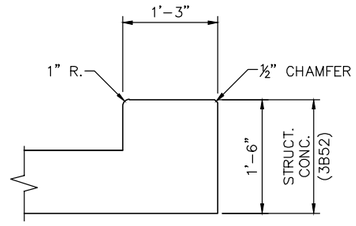
SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4B
CSAH 40 (GLENWOOD AVENUE) - WEST
BRIDGE 27C16
WATERPROOF EXPANSION DEVICE 3

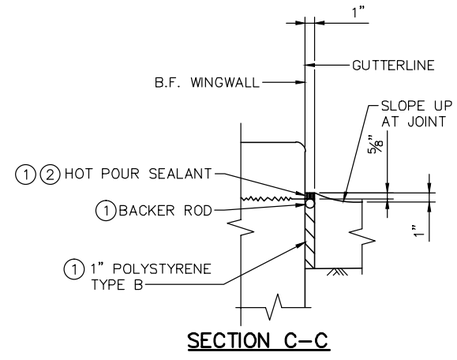
DISCIPLINE: STRUCTURES
SHEET NAME: CBR27C16-BRG-EXP-003

SHEET 23 OF 35





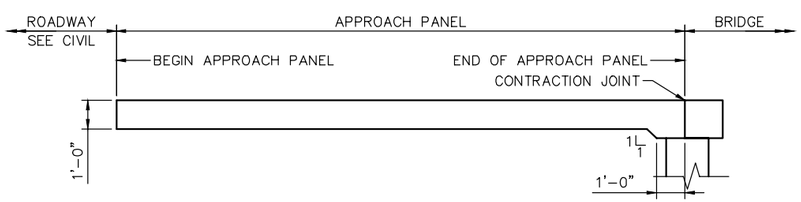
SECTION B–B



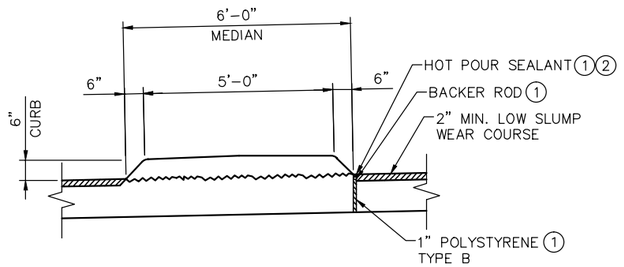
SECTION C–C

NOTES:

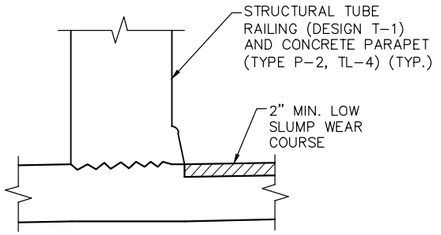
1. HOT POUR SEALANT, BACKER ROD, POLYSTYRENE SHALL BE LOCATED BETWEEN WALLS AND APPROACH PANELS.
2. HOT POUR SEALANT SPEC. 3725. TOP OF SEALER FLUSH TO ⅛" BELOW TOP OF PAVEMENT SURFACE.



SECTION A–A



SECTION E–E



SECTION D–D

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: HLR | CHECKED BY: EJT
DRAWN BY: NAO | DATE: 8/24/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

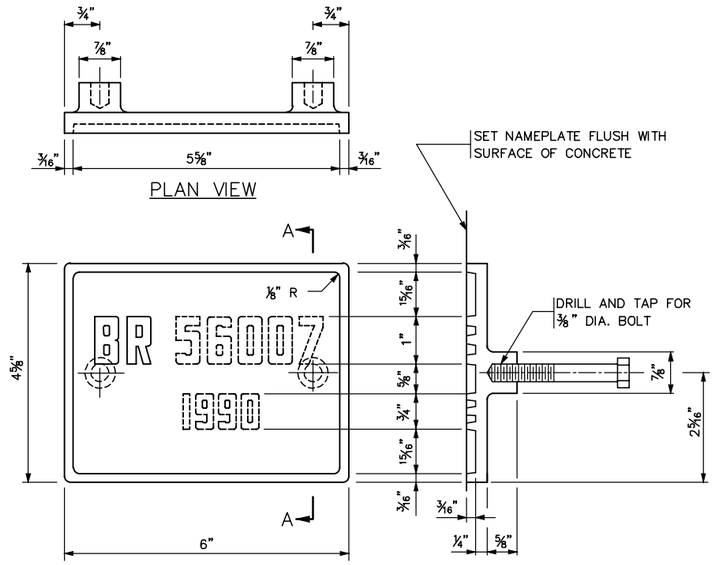
SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4B
CSAH 40 (GLENWOOD AVENUE) - WEST
BRIDGE 27C16
APPROACH PANEL

DISCIPLINE: STRUCTURES
SHEET NAME: CBR27C16-BRG-DTL-007

SHEET 24 OF 35

Aug. 24 2015 09:15 am V:\3400_ADC\CAD\SEGMENT E4\PLAN SHEETS\STRUCTURES\27C16\CBR27C16-BRG-DTL-003.dwg By: Neal.Oleson



THE DASHED NUMBERS SHOWN ABOVE ARE FOR ILLUSTRATION.
DATA TO BE SHOWN ON NAMEPLATE IS AS FOLLOWS:

BRIDGE 27C16

YEAR 2016

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".

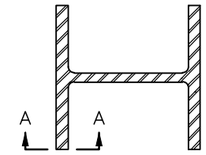
HORIZONTAL SPACING OF LETTERS AND NUMBERS SHALL PRODUCE A BALANCED LAYOUT IN PROPORTION TO SPACING SHOWN.

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

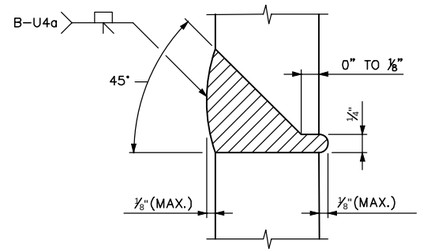
FURNISH 2 STEEL BOLTS ⅜ " DIA. x 3" LONG WITH EACH PLATE.

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

APPROVED: NOVEMBER 22, 2002	STATE OF MINNESOTA DEPARTMENT OF TRANSPORTATION	REVISION 09–11–2014	DETAIL NO.
STATE BRIDGE ENGINEER	BRIDGE NAMEPLATE (FOR NEW BRIDGES)		B101



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.

APPROVED: NOVEMBER 22, 2002	STATE OF MINNESOTA DEPARTMENT OF TRANSPORTATION	REVISION: 11–06–2013	DETAIL NO.
STATE BRIDGE ENGINEER	PILE SPLICE (STEEL H BEARING PILES 10" TO 14")		B202

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: HLR | CHECKED BY: EJT
DRAWN BY: NAO | DATE: 8/24/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

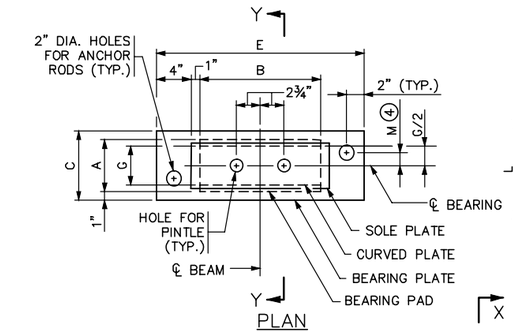
SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4B
CSAH 40 (GLENWOOD AVENUE) - WEST
BRIDGE 27C16
DETAILS 1

DISCIPLINE: STRUCTURES
SHEET NAME: CBR27C16-BRG-DTL-001

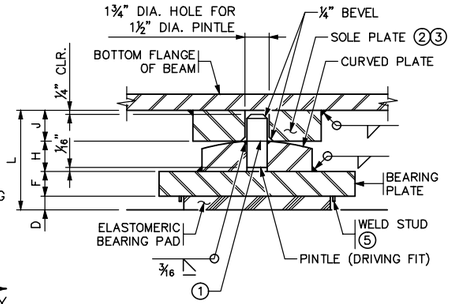
SHEET 25 OF 35

Aug. 24 2015 09:15 am V:\3400_ADC\CAD\SEGMENT E4\PLAN SHEETS\STRUCTURES\27C16\CBR27C16-BRG-DTL-001.dwg By: Neal.Oleson



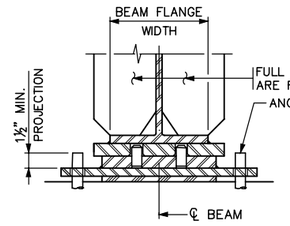
PLAN

BEAM NOT SHOWN

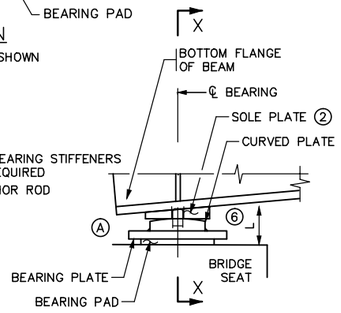


SECTION Y–Y

ENLARGED

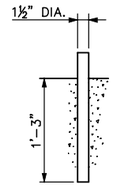


SECTION X–X



SIDE ELEVATION

ANCHOR RODS NOT SHOWN



ANCHOR ROD DETAIL

TABLE

ASSEMBLY TYPE	LOCATION	BEAM FLANGE WIDTH	BEARING PAD SIZE			SHAPE FACTOR	BEARING PLATE SIZE			CURVED PLATE SIZE				SOLE PLATE SIZE					PINTLE DIA.	ASSY. HEIGHT	ANCHOR ROD OFFSET	
			A	B	D		C	E	F	G	B	H	R (1)	WID.	LEN.	J1 (2)	J2 (2)	J (2)		L	+/– (4)	M
F1	W. ABUT.	15"/13⅛"	12"	16"	½"	6.9	14"	26"	1½"	4½"	16"	1¼"	16"	6"	18"	1¼"	1⅞"	1⅝"	1½"	4⅞"	___	___

NOTES:

ELASTOMERIC MATERIALS AND PAD CONSTRUCTION SHALL COMPLY WITH SPEC. 3741.

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.

FOR SPANS UP TO 150 FEET, USE 1½" DIAMETER ANCHOR RODS. ABOVE 150 FOOT SPANS, DESIGN ANCHOR RODS PER AASHTO DESIGN CRITERIA.

PINTLES SHALL COMPLY WITH SPEC. 3309.

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

~~PAYMENT FOR BEARING ASSEMBLY SHALL INCLUDE ALL MATERIAL ON THIS DETAIL EXCEPT THE SOLE PLATE. 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 1/16" LESS THAN SHOWN.

(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.

(4) "+" DENOTES OFFSET AS SHOWN.
"–" DENOTES OFFSET OPPOSITE OF SHOWN.

(5) 5/16" DIA. x ⅜" KNOCK–OFF WELD STUDS INSTALLED ON BEARING PLATE AROUND PERIMETER OF BEARING PAD. CENTERLINE STUD TO EDGE OF PAD DIMENSION = ½" MAX. STUD SPACING = 4" AND THE MAX. SPACING TO THE PAD CORNER = 2".

(6) MARK THICKER SIDE OF SLOPPED PLATES WITH AN "H" FOR PLACEMENT. SEE FRAMING PLAN SHEET NO. 11.

SHEET MODIFICATION:
(A) DENOTES MODIFICATION TO STANDARD SHEET

DESIGN DATA:
MAXIMUM HORIZONTAL LOAD IS 70 KIPS. MINIMUM SOLE PLATE THICKNESS IS 1¼".

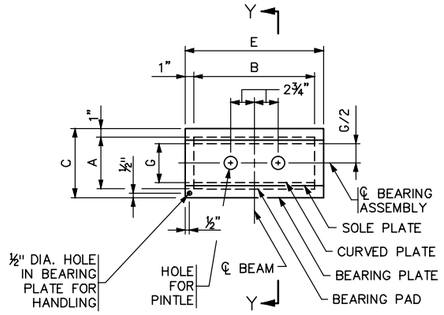
APPROVED: NOVEMBER 22, 2002
Daniel J. Hougen
STATE BRIDGE ENGINEER

STATE OF MINNESOTA
DEPARTMENT OF TRANSPORTATION

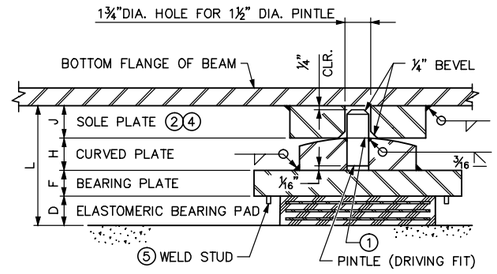
CURVED PLATE BEARING ASSEMBLY
(STEEL BEAMS)
(FIXED)

REVISED
08–10–2006
12–17–2008
11–06–2013

DETAIL NO.
B354
(MOD.)

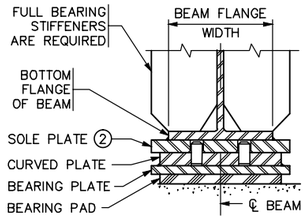


PLAN

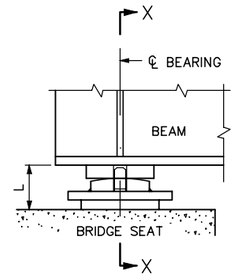


SECTION Y–Y

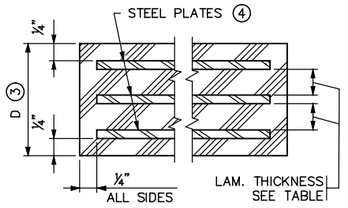
ENLARGED BEARING ASSEMBLY



SECTION X–X



SIDE ELEVATION



SECTION THROUGH BEARING PAD

TABLE

ASSEMBLY TYPE	LOCATION	BEAM FLANGE WIDTH	BEARING PAD SIZE			STEEL PLATES		LAMINATES		SHAPE FACTOR	BEARING PLATE SIZE			CURVED PLATE SIZE				SOLE PLATE SIZE			PINTLE DIA.	ASSY. HEIGHT
			A	B	D	NO.	THICK.	NO.	THICK.		C	E	F	G	B	H	R (1)	WID.	LEN.	J (2)		L
E1	W. PIER	15"/13⅛"	10"	16"	2⅛"	4	⅛"	3	⅜"	8.2	12"	18"	1½"	4½"	16"	16"	16"	18"	6"	1¼"	1½"	6⅛"

NOTES:

ELASTOMERIC MATERIALS AND PAD CONSTRUCTION SHALL COMPLY WITH Mn/DOT SPEC. 3741.

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

PINTLES SHALL COMPLY WITH Mn/DOT SPEC. 3309.

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

~~PAYMENT FOR BEARING ASSEMBLY SHALL INCLUDE ALL MATERIAL ON THIS DETAIL EXCEPT THE SOLE PLATE. 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 1/16" LESS THAN SHOWN.

(2) WHEN THE SOLE PLATE IS TAPERED, DIMENSIONS "J" AND "L" ARE THICKNESS OF SOLE PLATE AND BEARING ASSEMBLY AT CENTERLINE OF BEARING.

(3) THE TOTAL THICKNESS SHOWN INCLUDES THE STEEL PLATES.

(4) DO NOT GALVANIZE THIS PLATE.

(5) 5/16" DIA. x ¾" KNOCK–OFF WELD STUDS INSTALLED ON BEARING PLATE AROUND PERIMETER OF BEARING PAD. CENTERLINE STUD TO EDGE OF PAD DIMENSION = ½", MAX. STUD SPACING = 4" AND THE MAX. SPACING TO THE PAD CORNER = 2".

DESIGN DATA:
MAXIMUM HORIZONTAL LOAD IS 70 KIPS. MINIMUM SOLE PLATE THICKNESS IS 1¼".

APPROVED: NOVEMBER 22, 2002
Daniel J. Hougen
STATE BRIDGE ENGINEER

STATE OF MINNESOTA
DEPARTMENT OF TRANSPORTATION

CURVED PLATE BEARING ASSEMBLY
(STEEL BEAMS)
(EXPANSION)

REVISED
08–10–2006
12–17–2008

DETAIL NO.
B355

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: HLR | CHECKED BY: EJT
DRAWN BY: NAO | DATE: 8/24/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

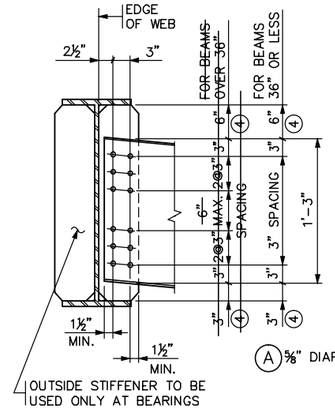
SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4B
CSAH 40 (GLENWOOD AVENUE) - WEST
BRIDGE 27C16
DETAILS 2

DISCIPLINE: STRUCTURES
SHEET NAME: CBR27C16-BRG-DTL-002

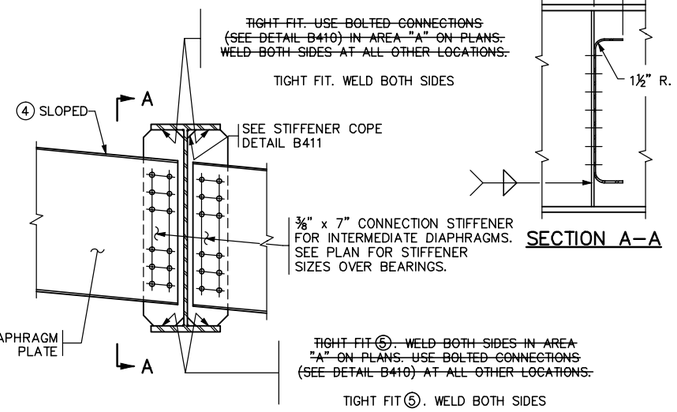
SHEET 26 OF 35

Aug, 24 2015 09:15 am V:\3400_ADC\CAD\SEGMENT E4\PLAN SHEETS\STRUCTURES\27C16\CBR27C16-BRG-DTL-001.dwg By: Neal.Oleson



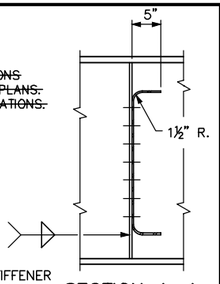
FASCIA BEAM

AT PIER AND INTERMEDIATE DIAPHRAGMS

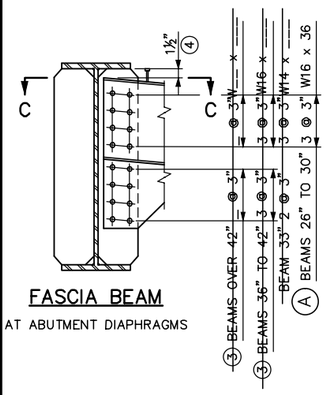


INTERIOR BEAM

AT PIER AND INTERMEDIATE DIAPHRAGMS

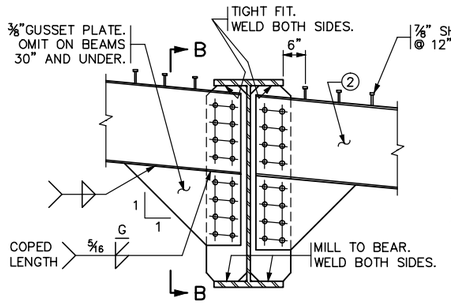


SECTION A–A



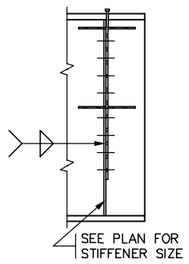
FASCIA BEAM

AT ABUTMENT DIAPHRAGMS

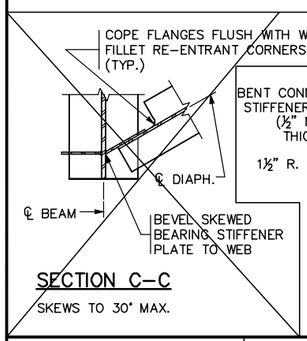


INTERIOR BEAM

AT ABUTMENT DIAPHRAGMS

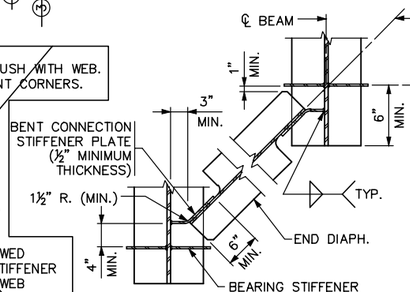


SECTION B–B



SECTION C–C

SKEWS TO 30° MAX.



SECTION C–C

SKEWS OVER 30° TO 60°

SHEET MODIFICATION:
Ⓐ DENOTES MODIFICATION TO STANDARD SHEET

NOTES:

ALL STEEL SHALL CONFORM TO Mn/DOT SPEC. 3309.

① USE SAME SHEAR STUD HEIGHT AS USED ON THE BEAMS.

② SEE FRAMING PLAN FOR SIZE OF DIAPHRAGM.

③ FOR PLATE GIRDERS, END DIAPHRAGMS SHALL BE AT LEAST THE BEAM HEIGHT.

④ DIAPHRAGMS MAY BE PLACED LEVEL, PROVIDED MINIMUM CLEARANCES ARE MET.

⑤ MILL TO BEAR FOR BEARING STIFFENERS.

APPROVED: MARCH 26, 2009	STATE OF MINNESOTA DEPARTMENT OF TRANSPORTATION	REVISED	DETAIL NO.
Daniel L. Worgan STATE BRIDGE ENGINEER	BOLTED DIAPHRAGMS (FOR STEEL BEAMS)		B402

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: HLR | CHECKED BY: EJT
DRAWN BY: NAO | DATE: 8/24/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

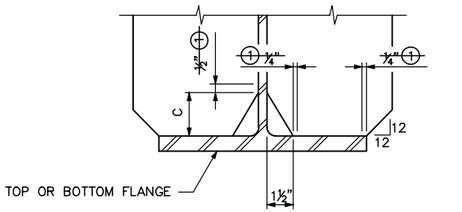
SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4B
CSAH 40 (GLENWOOD AVENUE) - WEST
BRIDGE 27C16
DETAILS 3

DISCIPLINE: STRUCTURES
SHEET NAME: CBR27C16-BRG-DTL-003

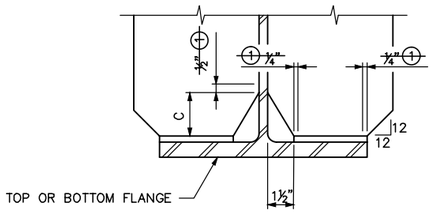
SHEET 27 OF 35

Aug, 24 2015 09:15 am V:\3400_ADC\CAD\SEGMENT E4\PLAN SHEETS\STRUCTURES\27C16\CBR27C16-BRG-DTL-001.dwg By: Neal.Oleson



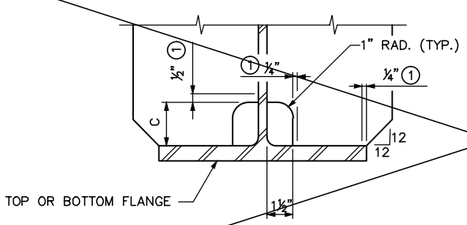
STIFFENER TO FLANGE CONNECTION

OPTION 1



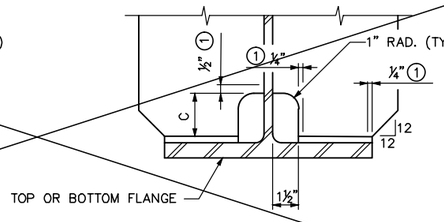
STIFFENER TO TAB PLATE CONNECTION

OPTION 1



STIFFENER TO FLANGE CONNECTION

OPTION 2

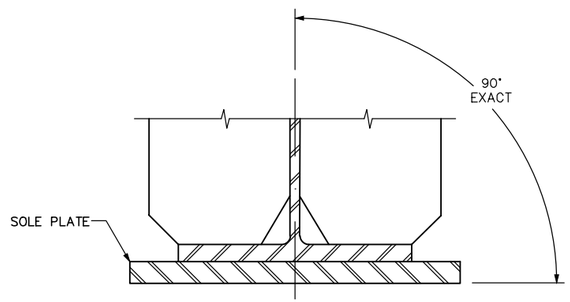


STIFFENER TO TAB PLATE CONNECTION

OPTION 2

STIFFENER COPE DETAIL

~~PLATE GIRDER OR~~ ROLLED BEAM



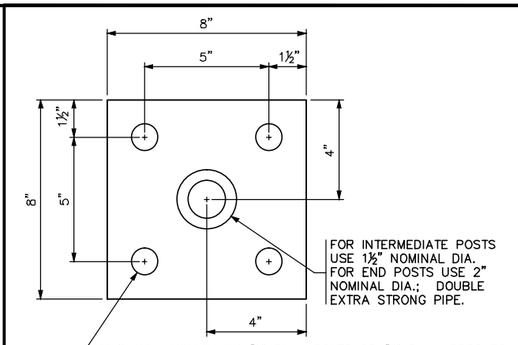
SOLE PLATE AT BEARING

WEB THICKNESS	DIMENSION C
½", 9/16", 5/8"	2½"
1/16", ¾"	3"

NOTES:

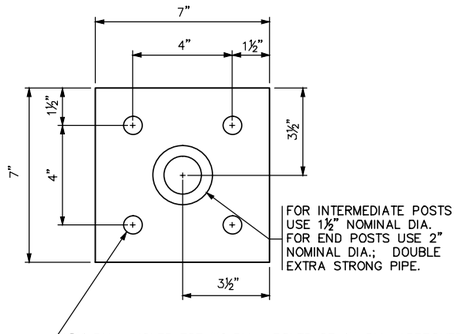
① ~~DO NOT WELD IN THIS AREA. SEE B410 FOR CONNECTION DETAILS.~~

APPROVED: OCTOBER 22, 2008	STATE OF MINNESOTA DEPARTMENT OF TRANSPORTATION	REVISION	DETAIL NO.
Daniel L Wangen STATE BRIDGE ENGINEER	STIFFENER DETAILS (FOR STEEL BEAMS)		B411



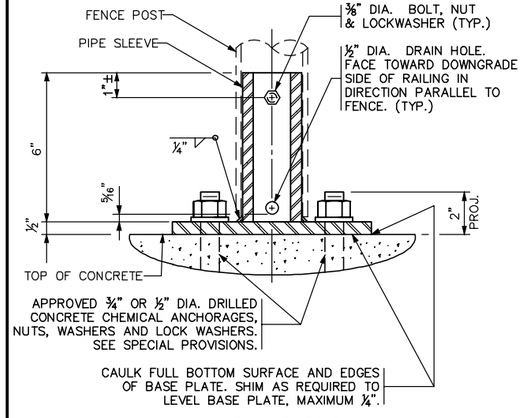
PLAN VIEW – TYPE A

ESTIMATED WEIGHT = 12 OR 14 LBS.

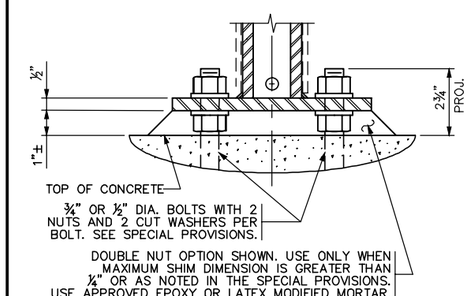


PLAN VIEW – TYPE B

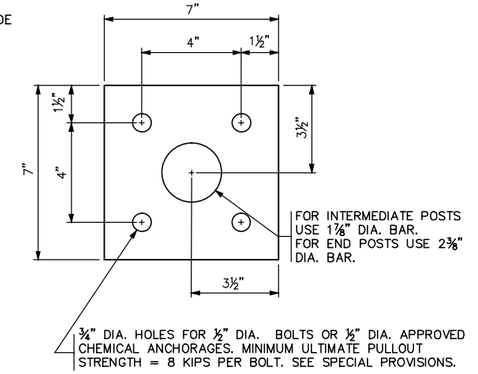
ESTIMATED WEIGHT = 10 OR 12 LBS.



TYPICAL SECTION



GROUT ALTERNATE



PLAN VIEW – TYPE C

ESTIMATED WEIGHT = 12 OR 15 LBS.

NOTES:

STRUCTURAL STEEL PER Mn/DOT SPEC. 3306

STRUCTURAL PIPE PER Mn/DOT SPEC. 3362

GALVANIZE THE FENCE POST ANCHORAGE AFTER FABRICATION PER Mn/DOT SPEC. 3394. GALVANIZE THE FASTENERS PER Mn/DOT SPEC. 3392.

DOUBLE EXTRA STRONG PIPE WEIGHTS:
1½" NOMINAL DIA. = 6.41 LBS./FT.
2" NOMINAL DIA. = 9.03 LBS./FT.

APPROVED: NOVEMBER 22, 2002	STATE OF MINNESOTA DEPARTMENT OF TRANSPORTATION	REVISION	DETAIL NO.
Daniel L Wangen STATE BRIDGE ENGINEER	FENCE POST ANCHORAGE		B905 DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: HLR | CHECKED BY: EJT

DRAWN BY: NAO | DATE: 8/24/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

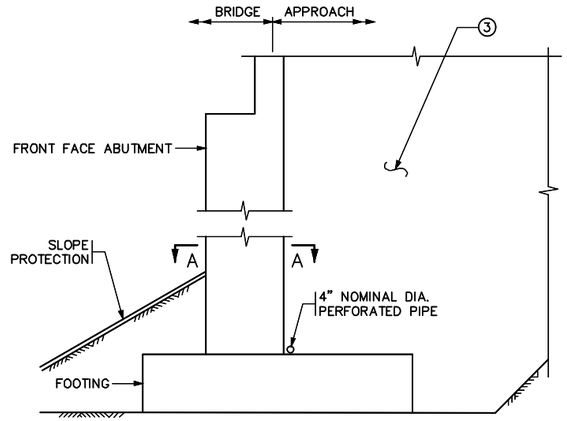
CIVIL EAST - VOLUME 4B
CSAH 40 (GLENWOOD AVENUE) - WEST
BRIDGE 27C16
DETAILS 4

DISCIPLINE: STRUCTURES

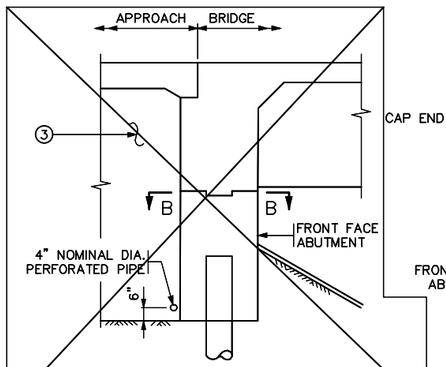
SHEET NAME: CBR27C16-BRG-DTL-004

SHEET 28 OF 35

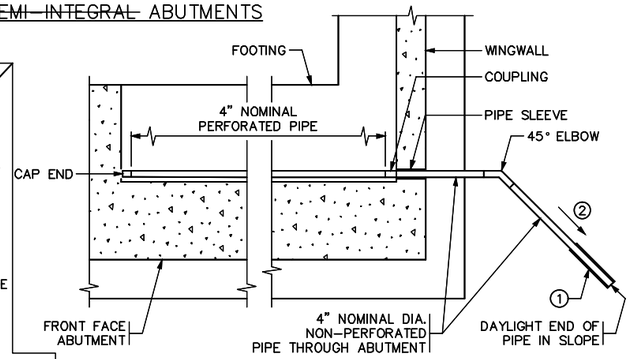
Aug. 24 2015 09:15 am V:\3400_ADC\CAD\SEGMENT E4\PLAN SHEETS\STRUCTURES\27C16\CBR27C16-BRG-DTL-001.dwg By: Neal.Oleson



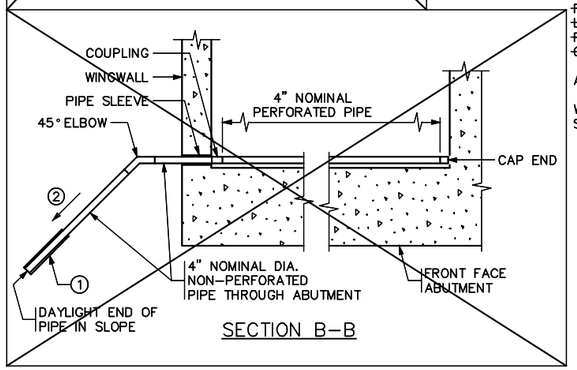
SECTION THROUGH PARAPET ~~AND SEMI-INTEGRAL~~ ABUTMENTS



SECTION THROUGH INTEGRAL ABUTMENT



SECTION A–A



SECTION B–B

NOTES:

~~PAYMENT WILL BE INCLUDED IN THE SINGLE LUMP SUM PRICE FOR "DRAINAGE SYSTEM TYPE (B910)", INCLUDES BUT IS NOT LIMITED TO 4" DIAMETER PERFORATED AND NON-PERFORATED PIPE, ELBOWS, END CAPS, COUPLINGS, SLEEVES AND PRECAST CONCRETE HEADWALLS.~~

ALL PIPE TO COMPLY WITH SPEC. 3245.

WRAP PERFORATED PIPE WITH GEOTEXTILE PER SPEC. 3733, TYPE 1. ATTACH TO PIPE PER SPEC. 2502.

① AT CONTRACTORS OPTION, MAY TIE APPROACH PANEL DRAINAGE SYSTEM AND ABUTMENT DRAINAGE SYSTEM INTO A SINGLE PRECAST CONCRETE HEADWALL OR INTO A CATCH BASIN AS LONG AS A MINIMUM OF 1% POSITIVE SLOPE CAN BE MANTAINED.

USE PRECAST CONCRETE HEADWALL WITH RODENT SCREEN. SEE STANDARD PLATE 3131 FOR DETAILS.

② ⅛" PER FT. MINIMUM SLOPE.

③ REFER TO GRADING PLANS FOR ABUTMENT BACKFILL REQUIREMENTS.

APPROVED: JANUARY 13, 2015	STATE OF MINNESOTA DEPARTMENT OF TRANSPORTATION	REVISED	DETAIL NO.
Nancy Daubenberger STATE BRIDGE ENGINEER	DRAINAGE SYSTEM		B910

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: HLR | CHECKED BY: EJT
DRAWN BY: NAO | DATE: 8/24/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4B
CSAH 40 (GLENWOOD AVENUE) - WEST
BRIDGE 27C16
DETAILS 5

DISCIPLINE: STRUCTURES
SHEET NAME: CBR27C16-BRG-DTL-005

SHEET 29 OF 35

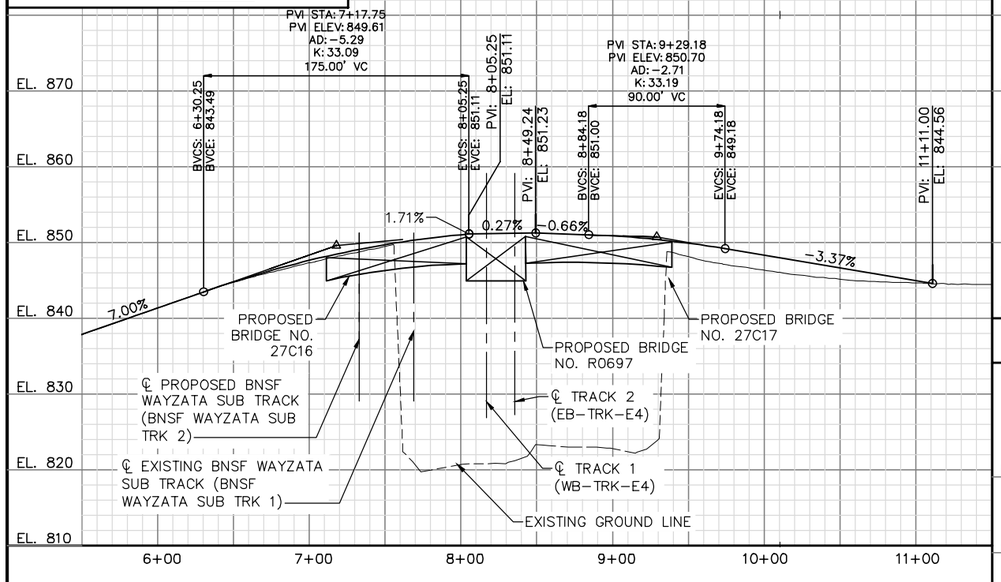
Aug, 24 2015 09:15 am V:\3400_ADC\CAD\SEGMENT E4\PLAN SHEETS\STRUCTURES\27C16\CBR27C16-BRG-DTL-001.dwg By: Neal.Oleson

CONTRACTED PROFILE

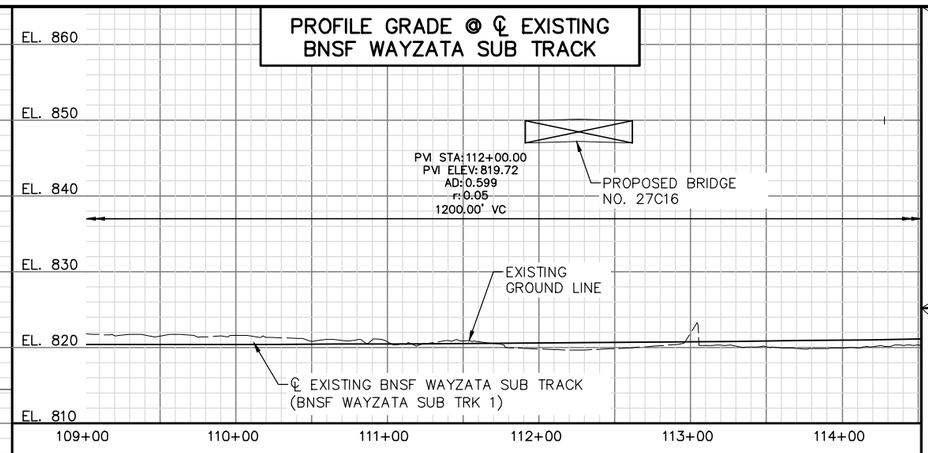
SCALE HOR: 0 50'

SCALE VER: 0 10'

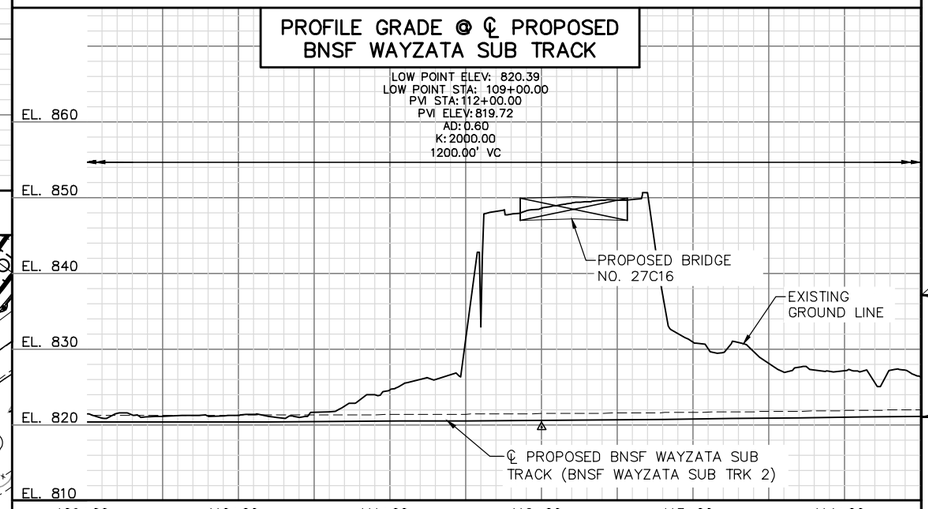
PROFILE GRADE @ ℄ CSAH 40 (GLENWOOD AVENUE)



PROFILE GRADE @ ℄ EXISTING BNSF WAYZATA SUB TRACK

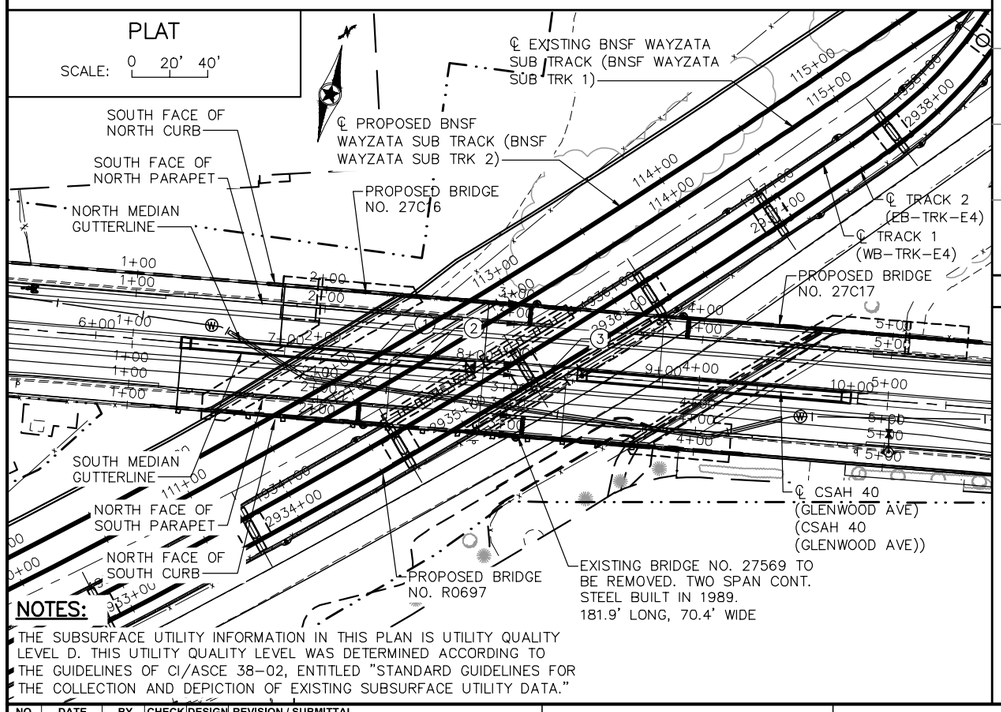


PROFILE GRADE @ ℄ PROPOSED BNSF WAYZATA SUB TRACK



PLAT

SCALE: 0 20' 40'



NOTES:

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."

NOTES:

1. CONTROL POINT
   ℄ CSAH 40 (GLENWOOD AVE)
   (CSAH 40 (GLENWOOD AVE)) P.O.C. 7+47.08
   ℄ PROPOSED BNSF WAYZATA SUB TRACK
   (BNSF WAYZATA SUB TRK 2) P.O.T. 112+21.20
   X = 525722.907 Y = 168541.154
   Δ = 35°02'00.5"
2. ℄ CSAH 40 (GLENWOOD AVE)
   (CSAH 40 (GLENWOOD AVE)) P.O.C. 7+73.11
   ℄ EXISTING BNSF WAYZATA SUB TRACK
   (BNSF WAYZATA SUB TRK 1) P.O.T. 212+39.14
   X = 525748.844 Y = 168539.008
   Δ = 35°21'28.2"
3. ℄ CSAH 40 (GLENWOOD AVE)
   (CSAH 40 (GLENWOOD AVE)) P.O.C. 8+39.83
   ℄ TRACK 2 (EB−TRK−E4) P.O.T. 2935+52.51
   X = 525815.344 Y = 168533.506
   Δ = 36°10'39.1"

PROPOSED BRIDGE NO. 27C16

INDEX MAP

T 29N

LOCATION ENGINEER'S OBSERVATIONS AT BRIDGE SITE

1. SPECIAL FEATURES: WATERFALLS, DAMS, FLOODS, ICE, DEBRIS SLIDING BANKS, RECREATIONAL BOATING.
2. OTHER BRIDGES OR CULVERTS OVER THE SAME STREAM (PARTICULARY STRUCTURES WHICH CARRY HIGH WATER WITHOUT OVERFLOW OF ROADWAY): GIVEN LOCATION, TYPE, LENGTH, HEIGHT ABOVE HIGH WATER, CROSS−SECTIONAL AREA ETC.
3. APPARENT HIGHWATER ELEVATION OBTAINED FROM:
4. OTHER DATA: APPROX. VELOCITY OF WATER AT TIME OF SURVEY.

HYDRAULIC ENGINEER'S RECOMMENDATION

DATE:

STREAM OR DITCH DESIGNATION:

DRAINAGE AREA: SQ. MI.

MAX FLOOD ON RECORD:

DESIGN FLOOD (YR. FREQ.): C.F.S.
HEADWATER ELEVATION: FT.
DESIGN MEAN VELOCITY THROUGH STRUCTURE F.P.S.
TOTAL STAGE INCREASE FT.
LOW MEMBER AT OR ABOVE ELEVATION FT.

WATERWAY AREA REQUIRED BELOW ELEV. = SQ. FT.
AT RIGHT ANGLES TO CHANNEL

BASIC FLOOD (YR. FREQ.) C.F.S.
HEADWATER ELEVATION: FT.
TOTAL STAGE INCREASE FT.
MEAN VELOCITY THROUGH STRUCTURE F.P.S.

FLOWLINE ELEVATION: FT. SKEW ANGLE:

ESTIMATED PRELIMINARY TOTAL SCOUR AT PIER EL. (500 YR. FREQ.)

SCOUR CONFIRMATION RECOMMENDATION

DATE:

TOTAL SCOUR AT PIER EL. (500 OR OT YR. FREQ.)
SCOUR CODE: OBTAIN FROM HYDRAULIC ENGINEER

BRIDGE SURVEY SHEETS MADE FROM 2014 MFRA SURVEYS

1ST BENCH MARK (NAVD 88)
BENCHMARK ID PT. 163
ELEVATION = 822.94
N = 168527.62, E = 525863.31
DESCRIPTION = MAG NAIL IN BIT. PATH

2ND BENCH MARK (NAVD 88)
BENCHMARK ID PT. 162
ELEVATION = 822.47
N = 168430.42, E = 525688.95
DESCRIPTION = MAG NAIL IN BIT. PATH

BRIDGE SURVEY 1

PROPOSED BRIDGE LOCATED:
0.2 MILES NORTHEAST OF JCT. CSAH 40
(GLENWOOD AVENUE) AND INTERSTATE 94

SEC 22 T 29 N R 24 W

CITY OF MINNEAPOLIS HENNEPIN COUNTY

BRIDGE NO. 27C16

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: HLR CHECKED BY: EJT
DRAWN BY: NAO DATE: 8/24/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4B
CSAH 40 (GLENWOOD AVENUE) - WEST
BRIDGE 27C16
BRIDGE SURVEY 1

DISCIPLINE: STRUCTURES

SHEET NAME: CBR27C16-BRG-SUR-001

SHEET 30 OF 35

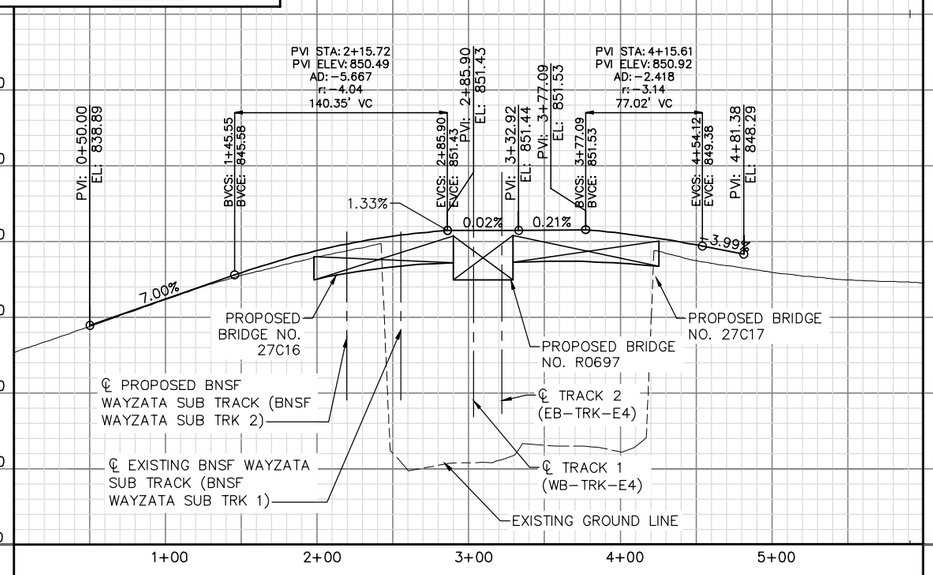
Aug. 24 2015 09:16 am V:\3400_ADC\CAD\SEGMENT E4\PLAN SHEETS\STRUCTURES\27C16\CBR27C16-BRG-SUR-001.dwg By: Neal.Olson

CONTRACTED PROFILE

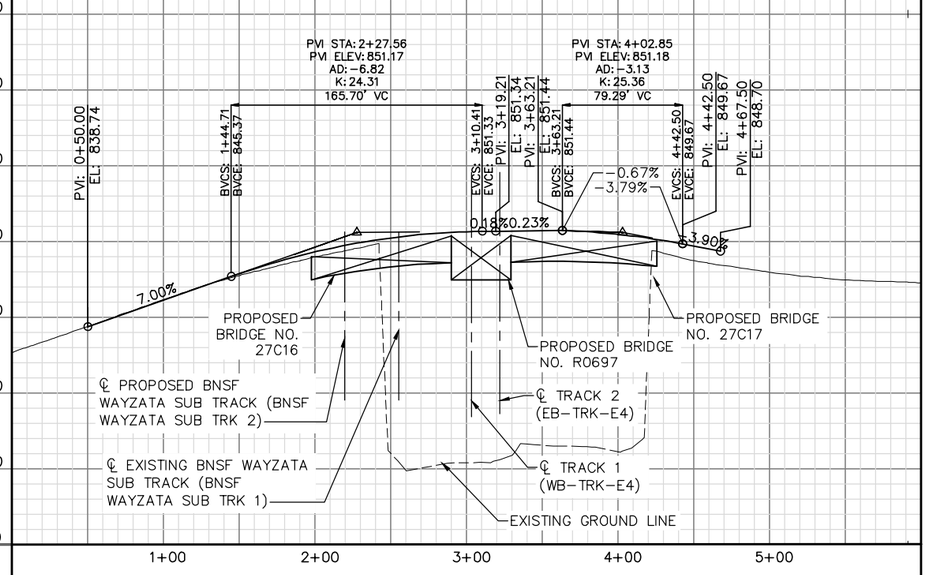
SCALE HOR: 0 50'

SCALE VER: 0 10'

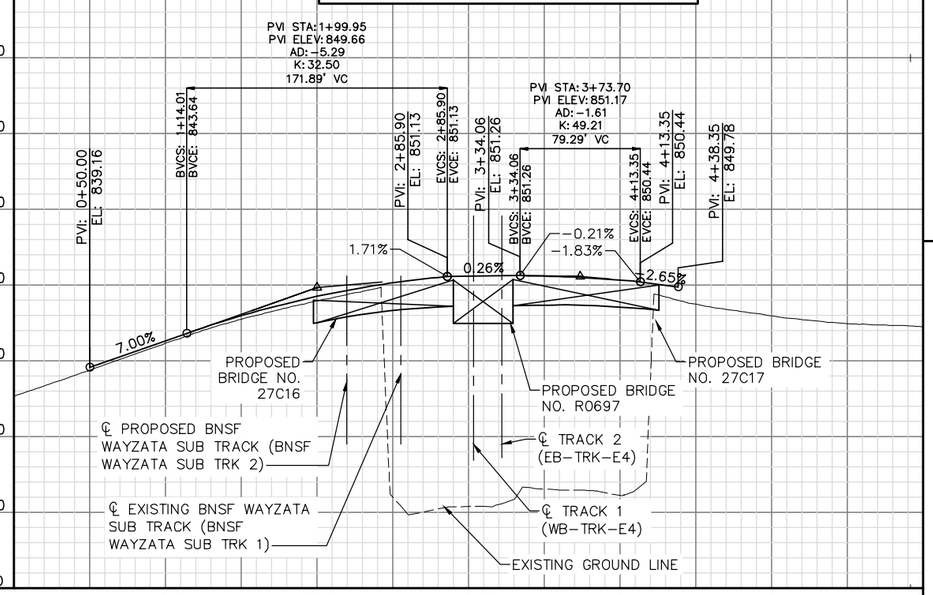
PROFILE GRADE @ SOUTH FACE OF NORTH CURB



PROFILE GRADE @ SOUTH FACE OF NORTH PARAPET



PROFILE GRADE @ NORTH MEDIAN GUTTERLINE

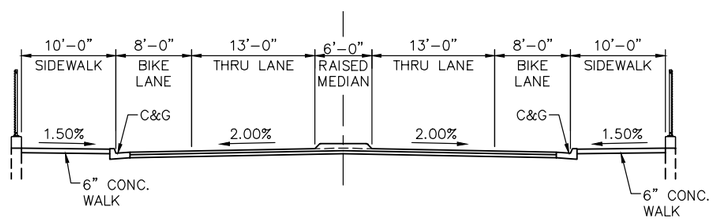


NOTES:

℄ CSAH 40 (GLENWOOD AVE) (CSAH 40 (GLENWOOD AVE) STA. 5+69.35 = SOUTH FACE OF NORTH CURB STA. 0+50.00.

℄ CSAH 40 (GLENWOOD AVE) (CSAH 40 (GLENWOOD AVE)) STA. 5+69.35 = SOUTH FACE OF NORTH BARRIER STA. 0+50.00.

℄ CSAH 40 (GLENWOOD AVE) (CSAH 40 (GLENWOOD AVE)) STA. 5+69.35 = NORTH MEDIAN GUTTERLINE STA. 0+50.00.



PROPOSED TYPICAL GLENWOOD AVENUE SECTION

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: HLR | CHECKED BY: EJT

DRAWN BY: NAO | DATE: 8/24/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4B
CSAH 40 (GLENWOOD AVENUE) - WEST
BRIDGE 27C16
BRIDGE SURVEY 2

DISCIPLINE: STRUCTURES

SHEET NAME: CBR27C16-BRG-SUR-002

SHEET 31 OF 35

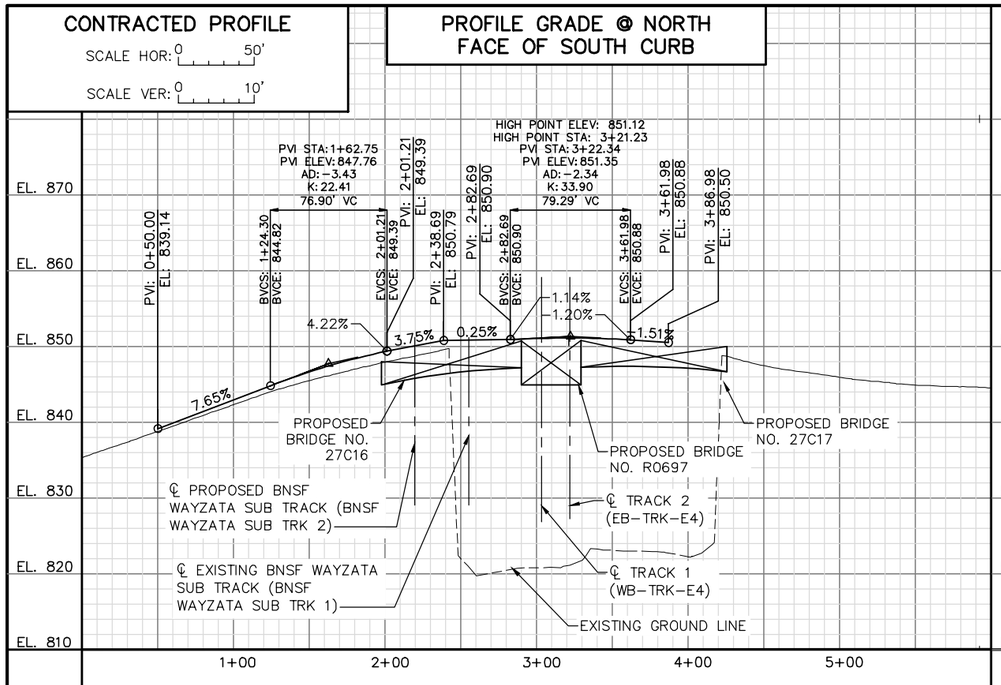
Aug. 24 2015 09:18 am V:\3400_ADC\CAD\SEGMENT E4\PLAN SHEETS\STRUCTURES\27C16\CBR27C16-BRG-SUR-001.dwg By: Neal.Oleson

CONTRACTED PROFILE

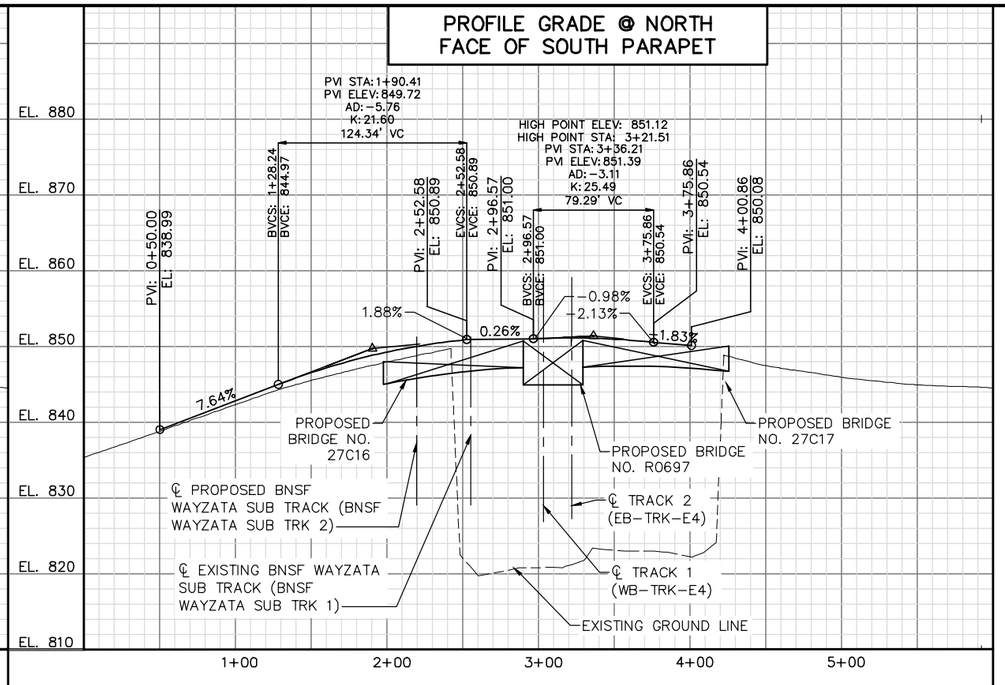
SCALE HOR: 0 50'

SCALE VER: 0 10'

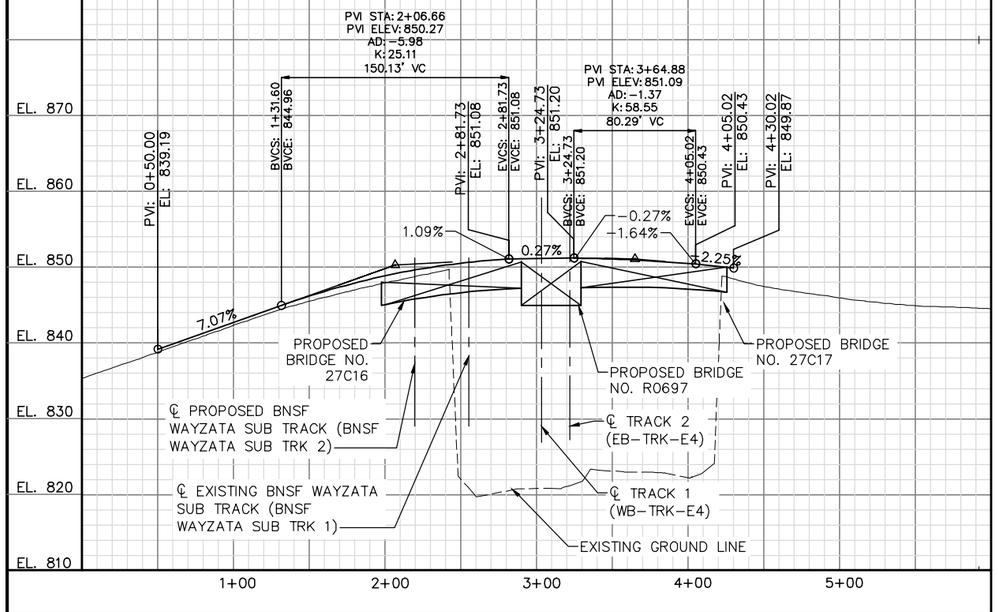
PROFILE GRADE @ NORTH FACE OF SOUTH CURB



PROFILE GRADE @ NORTH FACE OF SOUTH PARAPET



PROFILE GRADE @ SOUTH MEDIAN GUTTERLINE



NOTES:

℄ CSAH 40 (GLENWOOD AVE) (CSAH 40 (GLENWOOD AVE)) STA. 5+69.35 = NORTH FACE OF SOUTH CURB STA. 0+50.00

℄ CSAH 40 (GLENWOOD AVE) (CSAH 40 (GLENWOOD AVE)) STA. 5+69.35 = NORTH FACE OF SOUTH BARRIER STA. 0+50.00.

℄ CSAH 40 (GLENWOOD AVE) (CSAH 40 (GLENWOOD AVE)) STA. 5+69.35 = SOUTH MEDIAN GUTTERLINE STA. 0+50.00

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: HLR | CHECKED BY: EJT

DRAWN BY: NAO | DATE: 8/24/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4B
CSAH 40 (GLENWOOD AVENUE) - WEST
BRIDGE 27C16
BRIDGE SURVEY 3

DISCIPLINE: STRUCTURES

SHEET NAME: CBR27C16-BRG-SUR-003

SHEET 32 OF 35

Aug. 24 2015 09:19 am V:\3400_ADC\CAD\SEGMENT E4\PLAN SHEETS\STRUCTURES\27C16\CBR27C16-BRG-SUR-001.dwg By: Neal.Oleson

℄ CSAH 40 (GLENWOOD AVE)
(CSAH 40 (GLENWOOD AVE))

1158 SB
STA. 2934+20.00
67' LT. OF ℄ TRACK 2

℄ BRG. W. ABUT.

℄ BRG. & ℄ W. PIER

℄ TRACK 1
(WB–TRK–E4)

℄ TRACK 2
(EB–TRK–E4)

1021 SB
STA. 2936+86.00
74' RT. OF ℄ TRACK 2

℄ PROPOSED BNSF WAYZATA SUB TRACK
(BNSF WAYZATA SUB TRK 2)

1159 SB
STA. 2936+21.27
77' RT. OF ℄ TRACK 2

℄ EXISTING BNSF WAYZATA SUB TRACK
(BNSF WAYZATA SUB TRK 1)

1136 SW
STA. 2934+01.93
11' LT. OF ℄ TRACK 2

NOTES:

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."

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: HLR | CHECKED BY: EJT
DRAWN BY: NAO | DATE: 8/24/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

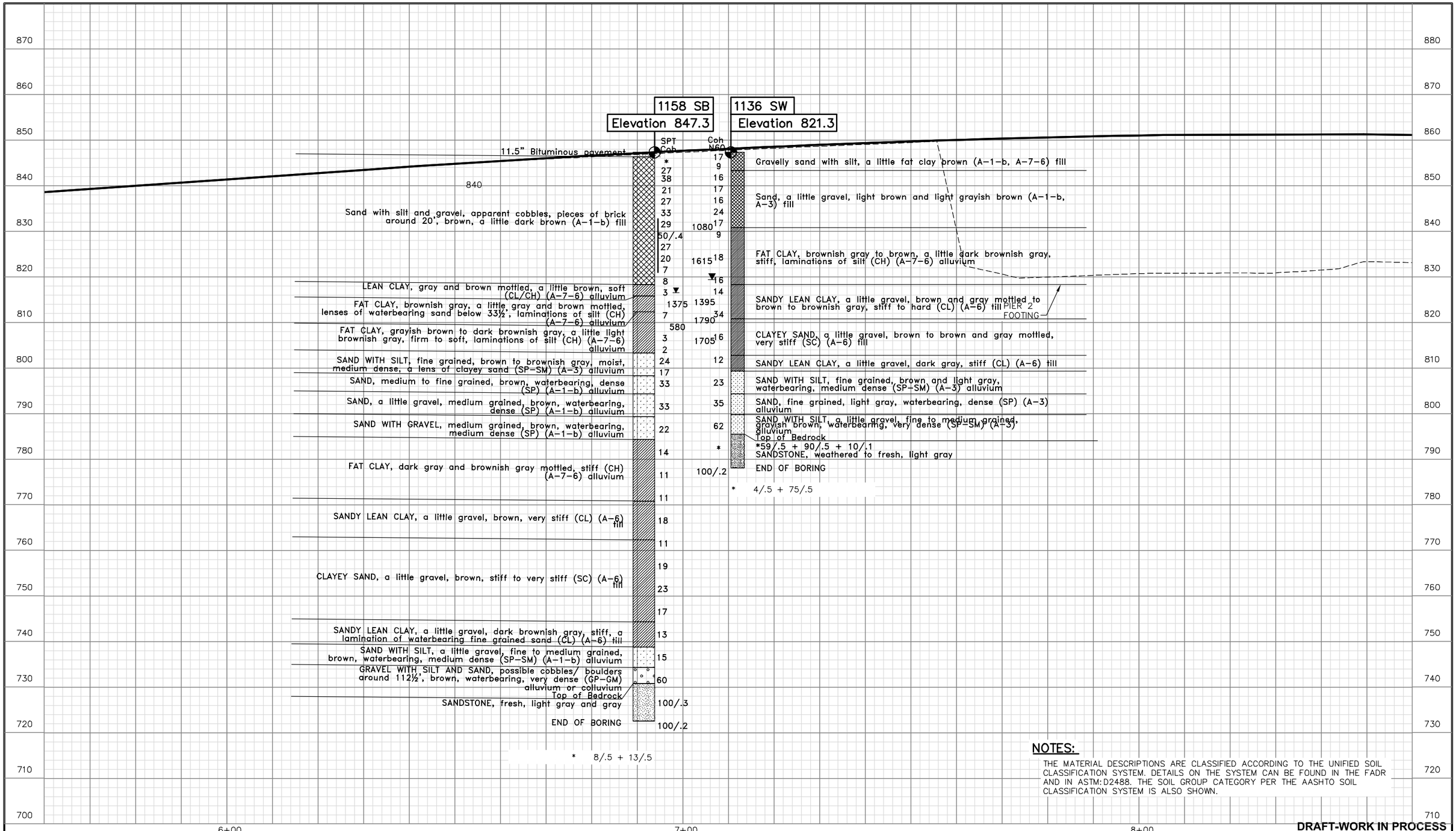
CIVIL EAST - VOLUME 4B
CSAH 40 (GLENWOOD AVENUE) - WEST
BRIDGE 27C16
BRIDGE SURVEY PLAN

DISCIPLINE: STRUCTURES

SHEET NAME: CBR27C16-BRG-BOR-001

SHEET 33 OF 35

Aug, 24 2015 09:19 am V:\3400_ADC\CAD\SEGMENT E4\PLAN SHEETS\STRUCTURES\27C16\CBR27C16-BRG-BOR-001.dwg By: Neal.Oleson



NOTES:

THE MATERIAL DESCRIPTIONS ARE CLASSIFIED ACCORDING TO THE UNIFIED SOIL CLASSIFICATION SYSTEM. DETAILS ON THE SYSTEM CAN BE FOUND IN THE FADR AND IN ASTM:D2488. THE SOIL GROUP CATEGORY PER THE AASHTO SOIL CLASSIFICATION SYSTEM IS ALSO SHOWN.

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: HLR | CHECKED BY: EJT
DRAWN BY: NAO | DATE: 8/24/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

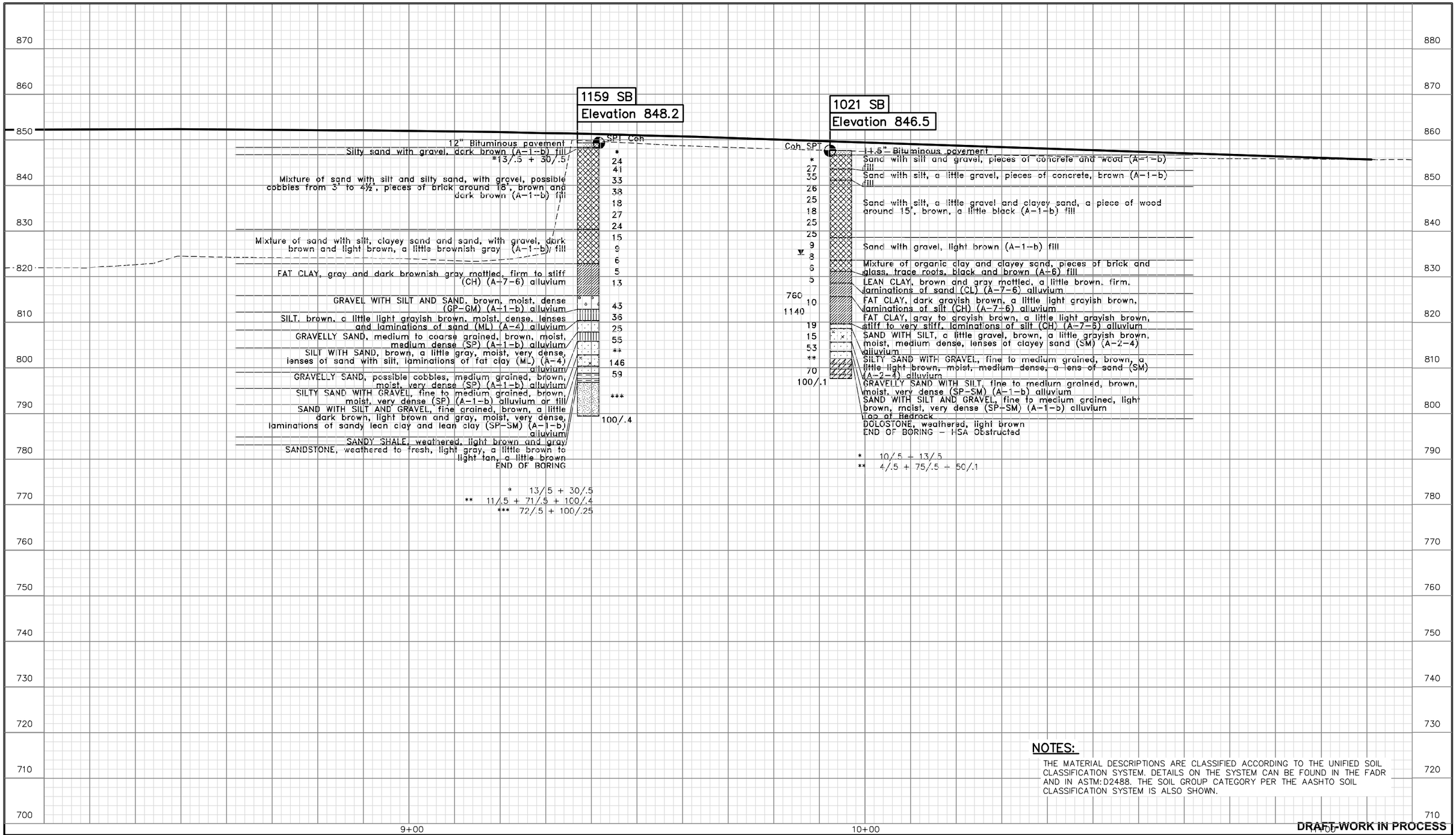
SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4B
CSAH 40 (GLENWOOD AVENUE) - WEST
BRIDGE 27C16
BRIDGE SURVEY PROFILE 1

DISCIPLINE: STRUCTURES
SHEET NAME: CBR27C16-BRG-BOR-002

SHEET 34 OF 35

Aug. 24 2015 09:20 am V:\3400_ADC\CAD\SEGMENT E4\PLAN SHEETS\STRUCTURES\27C16\CBR27C16-BRG-BOR-002.dwg By: Neal.Oleson



NOTES:

THE MATERIAL DESCRIPTIONS ARE CLASSIFIED ACCORDING TO THE UNIFIED SOIL CLASSIFICATION SYSTEM. DETAILS ON THE SYSTEM CAN BE FOUND IN THE FADR AND IN ASTM:D2488. THE SOIL GROUP CATEGORY PER THE AASHTO SOIL CLASSIFICATION SYSTEM IS ALSO SHOWN.

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: HLR | CHECKED BY: EJT
DRAWN BY: NAO | DATE: 8/24/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

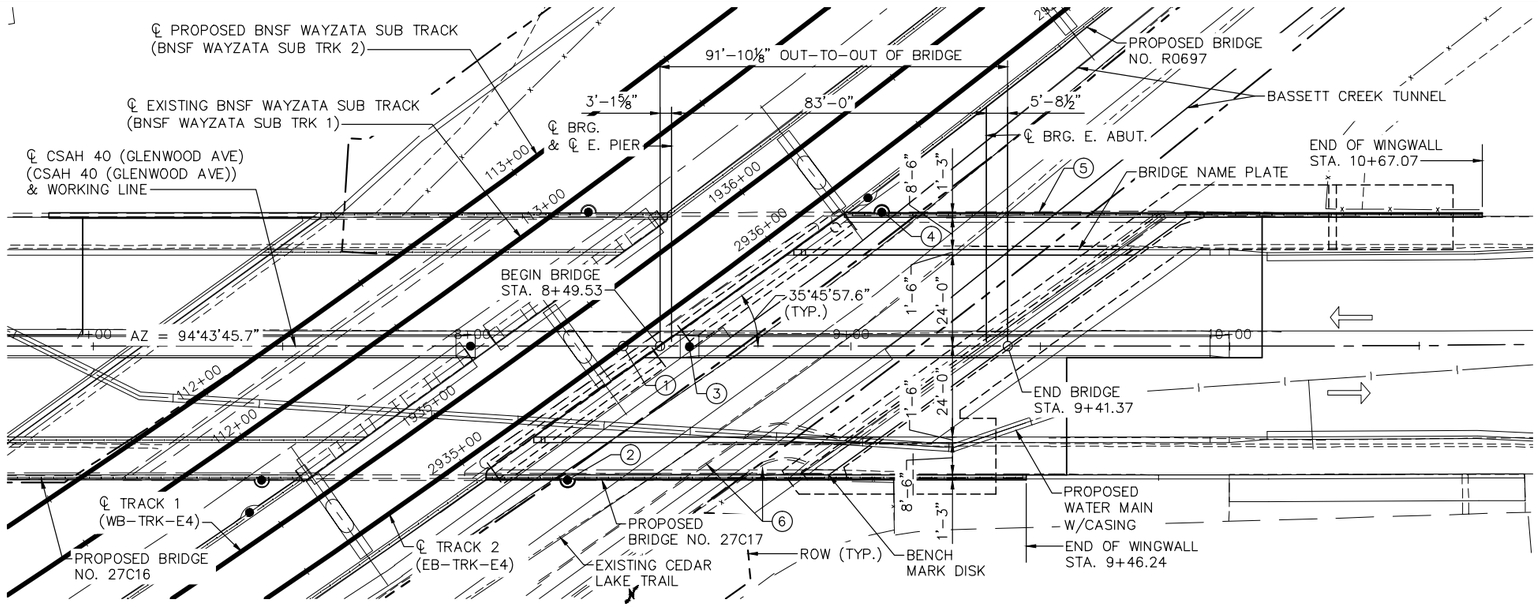
SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4B
CSAH 40 (GLENWOOD AVENUE) - WEST
BRIDGE 27C16
BRIDGE SURVEY PROFILE 2

DISCIPLINE: STRUCTURES
SHEET NAME: CBR27C16-BRG-BOR-003

SHEET 35 OF 35

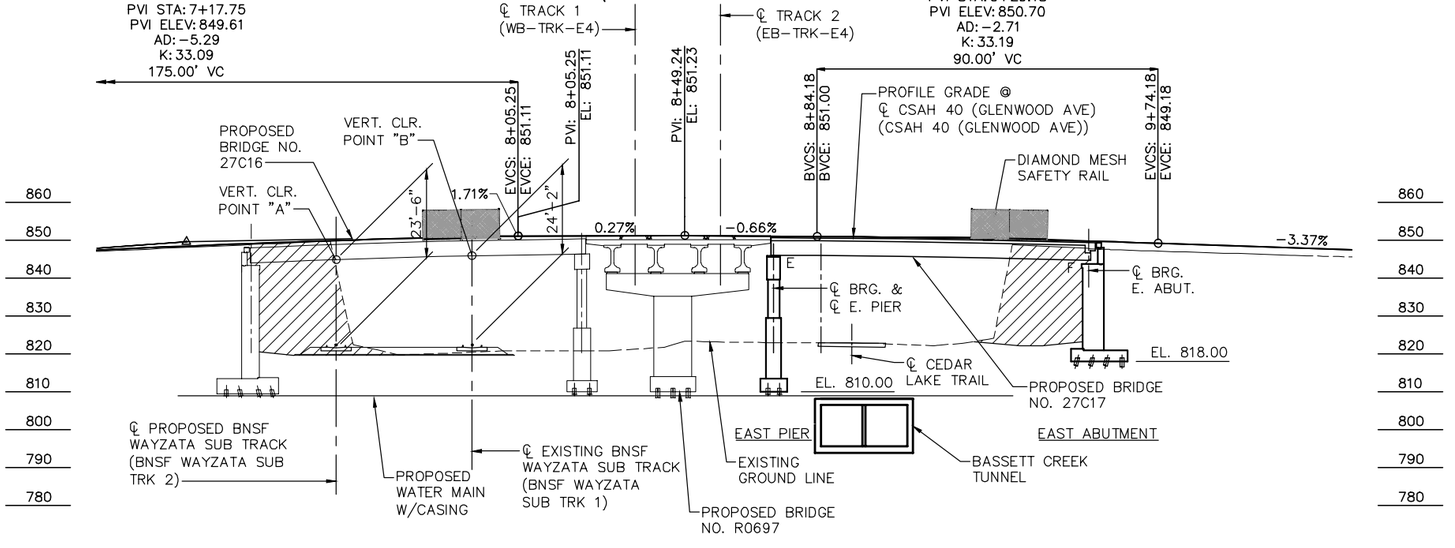
Aug, 24 2015 09:20 am V:\3400_ADC\CAD\SEGMENT E4\PLAN SHEETS\STRUCTURES\27C16\CBR27C16-BRG-BOR-002.dwg By: Neal.Oleson



GENERAL PLAN

0 10' 20' 40'

SCALE IN FEET



GENERAL ELEVATION

0 10' 20' 40'

SCALE IN FEET

LIST OF SHEETS

NO.	DESCRIPTION
1	GENERAL PLAN & ELEVATION
2	TRANSVERSE SECTION & QUANTITIES
3	BRIDGE LAYOUT
4–10	EAST ABUTMENT DETAILS
11–13	EAST PIER DETAILS
14	FRAMING PLAN
15	MN45" PRESTRESSED CONCRETE BEAM
16–19	SUPERSTRUCTURE DETAILS
20	STRUCTURAL TUBE RAILING AND CONCRETE PARAPET
21	CONCRETE CURB
22	WIRE FENCE (DIAMOND MESH SAFETY RAIL)
23	CONDUIT SYSTEM
24–26	WATERPROOF EXPANSION DEVICE
27	APPROACH PANEL
28–32	DETAILS
33–35	BRIDGE SURVEY
36	BRIDGE SURVEY PLAN
37–38	BRIDGE SURVEY PROFILE

DESIGN DATA

2014 AND CURRENT INTERIM AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS

SOUTHWEST LIGHT RAIL TRANSIT DESIGN CRITERIA (REVISION 4.0)

LOAD AND RESISTANCE FACTOR DESIGN METHOD
HL-93 LIVE LOAD

DEAD LOAD INCLUDES 20 PSF ALLOWANCE FOR FUTURE WEARING COURSE MODIFICATIONS

MATERIAL DESIGN PROPERTIES:
REINFORCED CONCRETE:
f'c = 4 KSI n = 8
fy = 60 KSI REINFORCEMENT

PRESTRESSED CONCRETE:
f'c = 7 KSI n = 1
fpu = 270 KSI
FOR 0.6" DIA. LOW RELAXATION STRANDS

STRUCTURAL STEEL:
fy = 36 KSI STRUCTURAL STEEL SPEC. 3306

DESIGN SPEED: OVER = 30 MPH

7800 PROJECTED AADT FOR YEAR 2040

DECK AREA = 6483 SQ. FT.

BRIDGE OPERATING RATING:

NOTES:

SEE BRIDGE SURVEY PLAN FOR INPLACE UTILITIES.

1. ℄ CSAH 40 (GLENWOOD AVE)
(CSAH 40 (GLENWOOD AVE)) P.O.C. 8+39.83
℄ TRACK 2 (EB-TRK-E4) P.O.T. 2935+52.52
X = 525815.344 Y = 168533.506
Δ = 36°10'39.1"
2. PEDESTRIAN FLASHER AT STA. 8+25.13
3. OCS POLE AT STA. 8+57.33
4. GATE ARM AT STA. 9+08.16
5. EXISTING BRIDGE 27569 TO BE REMOVED.
6. EXISTING TERRACED BLOCK WALL TO BE SALVAGED AND REINSTALLED.

BRIDGE NO. 27C17

CSAH 40 (GLENWOOD AVENUE)
OVER CEDAR LAKE TRAIL
0.2 MI. EAST OF JCT. CSAH 40 (GLENWOOD AVENUE) & INTERSTATE 94

86' P.C.B. SPAN, 54°14'02.4" SKEW,
2-21' RDWY., 6'-0" RAISED CONC. MEDIAN,
TYPE P-2 CONC. PARAPETS & STRUC. TUBE RAILINGS, 8'-6" SIDEWALKS WITH CONC. CURBS W/ SAFETY RAILS

BRIDGE I.D. NO. 501

GENERAL PLAN & ELEVATION

SEC 22 T 29 N R 24 W
CITY OF MINNEAPOLIS HENNEPIN COUNTY

APPROVED: _____
STATE BRIDGE ENGINEER DATE

DRAFT-WORK IN PROCESS

JOB NO.: T9N635 | STATE PROJ. NO.: 9909-01 | MNDOT REVIEW: JOE NIETFELD

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: BAW CHECKED BY: BLF
DRAWN BY: LMT DATE: 8/24/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

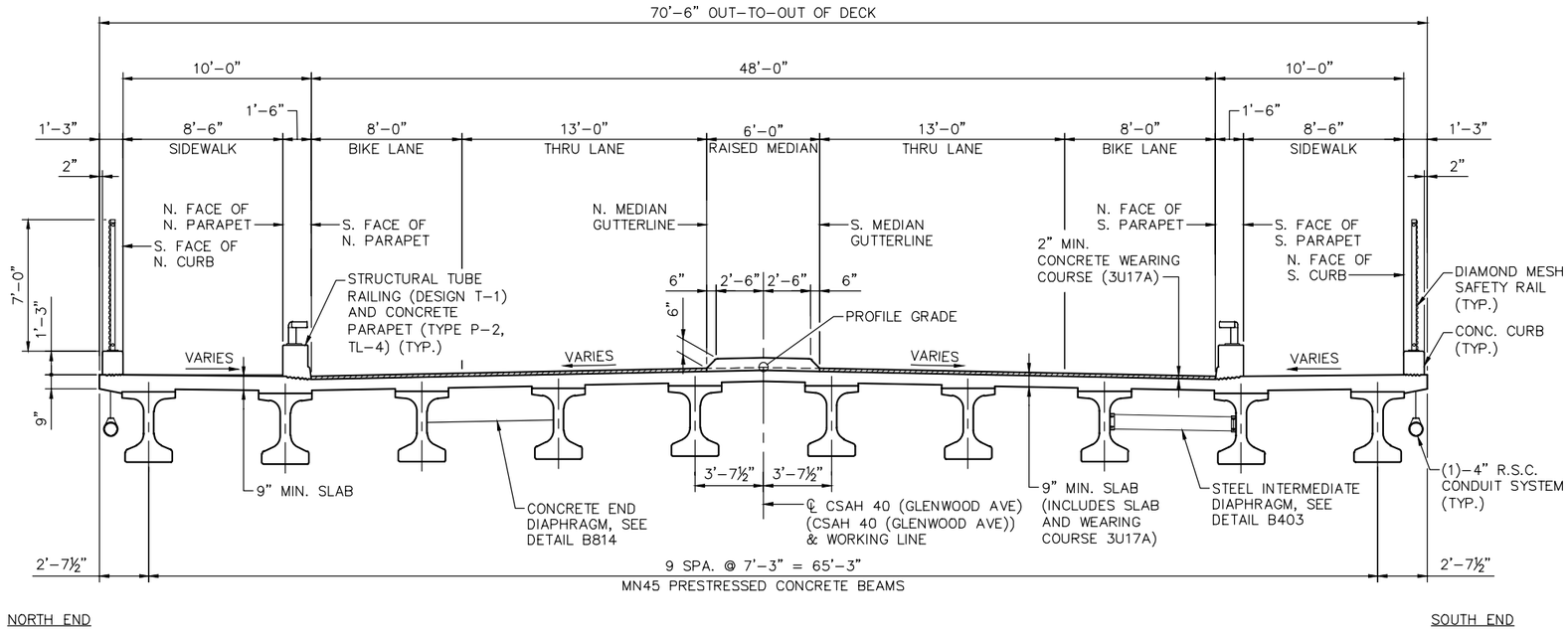
SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4B
CSAH 40 (GLENWOOD AVENUE) - EAST
BRIDGE 27C17
GENERAL PLAN & ELEVATION

DISCIPLINE: STRUCTURES
SHEET NAME: CBR27C17-BRG-GPE

SHEET 1 OF 38

Aug, 24 2015 09:04 am V:\3400_ADC\CAD\SEGMENT E4\PLAN SHEETS\STRUCTURES\27C17\CBR27C17-BRG-GPE.dwg By: ryan.kelly



TRANSVERSE SECTION

0 2' 4' 8'

SCALE IN FEET

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 MNDOT SPEC. 3301.

BARS MARKED WITH THE SUFFIX "S" SHALL BE STAINLESS STEEL IN ACCORDANCE WITH THE SPECIAL PROVISIONS.

ALL REINFORCEMENT SHALL BE 2 INCHES CLEAR, UNLESS SHOWN OR NOTED OTHERWISE.

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.

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".

QUANTITY ESTIMATE FOR ENTIRE BRIDGE

ITEM NO.	ITEM	UNIT	QUANTITY
2401	STRUCTURAL CONCRETE (1G52)	CU. YD.	
2401	STRUCTURAL CONCRETE (3B52)	CU. YD.	
2401	TYPE CURB RAILING CONCRETE (3S52)	LIN. FT.	
2401	TYPE P-2 (TL-4) RAILING CONCRETE (3S52)	LIN. FT.	
2401	RAISED MEDIAN CONCRETE (3S52)	SQ. FT.	
2401	REINFORCEMENT BARS	POUND	
2401	REINFORCEMENT BARS (EPOXY COATED)	POUND	
2401	REINFORCEMENT BARS (STAINLESS-60KSI)	POUND	
2401	STRUCTURE EXCAVATION	CU. YD.	
2401	BRIDGE SLAB CONCRETE (3YHPC-S)	SQ. FT.	
2402	EXPANSION JOINT DEVICES TYPE 5	LIN. FT.	
2402	BEARING ASSEMBLY	EACH	
2402	PRESTRESSED CONCRETE BEAMS MN45	LIN. FT.	
2404	CONCRETE WEARING COURSE (3U17A)	SQ. FT.	
2405	DIAPHRAGMS FOR TYPE MN45 PRESTRESSED BEAMS	LIN. FT.	
2406	BRIDGE APPROACH PANELS	SQ. YD.	
2411	REVERSE BATTEN SURFACE TREATMENT	SQ. YD.	
2411	ANTI-GRAFFITI COATING	SQ. FT.	
2452	STEEL H-PILING DRIVEN 12"	LIN. FT.	
2452	STEEL H-PILING DELIVERED 12"	LIN. FT.	
2452	STEEL H-TEST PILE 30 FT LONG 12"	EACH	
2452	STEEL H-TEST PILE 60 FT LONG 12"	EACH	
2452	PILE TIP PROTECTION 12"	EACH	
2502	DRAINAGE SYSTEM (B910)	EACH	
2545	CONDUIT SYSTEM (LIGHTING)	EACH	
2557	DIAMOND MESH SAFETY RAIL	LIN. FT.	

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: BAW | CHECKED BY: BLF
DRAWN BY: LMT | DATE: 8/24/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

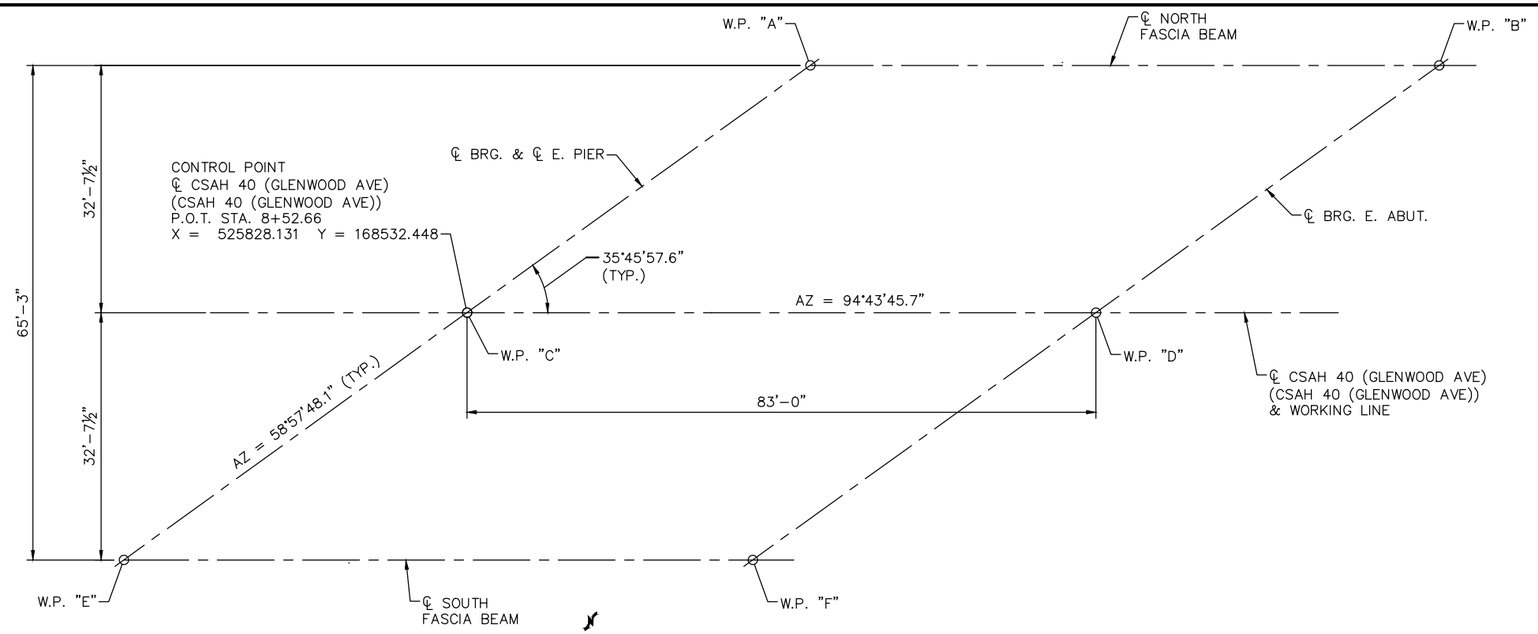
SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4B
CSAH 40 (GLENWOOD AVENUE) - EAST
BRIDGE 27C17
TRANSVERSE SECTION & QUANTITIES

DISCIPLINE: STRUCTURES
SHEET NAME: CBR27C17-BRG-TRN-001

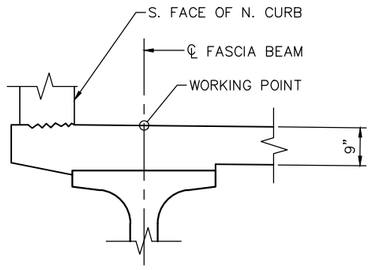
SHEET 2 OF 38

Aug, 24 2015 09:04 am V:\3400_ADC\CAD\SEGMENT E4\PLAN SHEETS\STRUCTURES\27C17\CBR27C17-BRG-TRN-001.dwg By: ryan.kelly

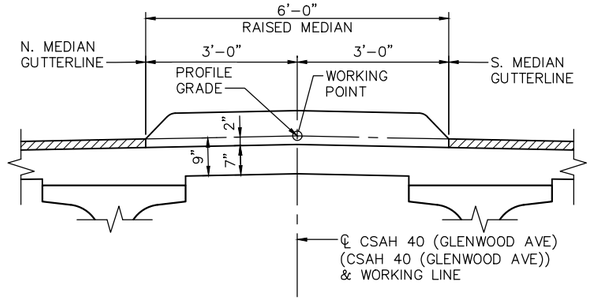


WORKING POINT LAYOUT

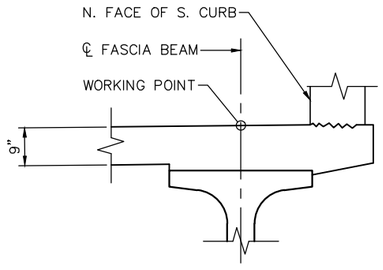
0 5' 10' 20'
SCALE IN FEET



NORTH



CENTERLINE



SOUTH

WORKING POINT LOCATIONS

DIMENSIONS BETWEEN WORKING POINTS								COORDINATES		ELEVATIONS			
POINT	STATION	A	B	C	D	E	F	X	Y	TOP OF SLAB	TOP OF SLAB TO BRIDGE SEAT	BRIDGE SEAT	POINT
A	8+97.96		83.00	55.82	49.86		65.69	525875.959	168561.228	851.50	5.04	846.46	A
B	9+80.96				55.82	185.44		525958.677	168554.385	849.05	4.92	844.13	B
C	8+52.66				83.00	55.82	49.86	525828.131	168532.448	851.21			C
D	9+35.66						55.82	525910.849	168525.605	850.26			D
E	8+07.36						83.00	525780.303	168503.669	850.92	5.05	845.87	E
F	8+90.37							525863.021	168496.826	850.76	4.95	845.81	F

TOP OF ROADWAY TO BRIDGE SEAT					
		EAST PIER	EAST PIER	EAST ABUTMENT	EAST ABUTMENT
BEAMS		N. FASCIA	S. FASCIA	N. FASCIA	S. FASCIA
DECK THICKNESS		9"	9"	9"	9"
STOOL HEIGHT		1 7/8"	2"	1 3/4"	2 1/8"
BEAM HEIGHT		45"	45"	45"	45"
BEARING HEIGHT		4 5/8"	4 5/8"	3 1/4"	3 1/4"
TOTAL	INCHES	60 1/2	60 5/8	59	59 3/8
	FEET	5.04	5.05	4.92	4.95

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: BAW | CHECKED BY: BLF
DRAWN BY: LMT | DATE: 8/24/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4B
CSAH 40 (GLENWOOD AVENUE) - EAST
BRIDGE 27C17
BRIDGE LAYOUT

DISCIPLINE: STRUCTURES
SHEET NAME: CBR27C17-BRG-SUP-001

SHEET 3 OF 38

Aug. 24 2015 09:37 am V:\3400_ADC\CAD\SEGMENT E4\PLAN SHEETS\STRUCTURES\27C17\CBR27C17-BRG-SUP-001.dwg By: ryan.kelly

EAST ABUTMENT AND WINGWALLS COMPUTED PILE LOAD - TONS/PILE	
FACTORED DEAD LOAD + EARTH PRESSURE	114.1
FACTORED LIVE LOAD	8.6
* FACTORED DESIGN LOAD	122.7

* BASED ON STRENGTH I LOAD COMBINATION.

EAST ABUTMENT AND WINGWALLS 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	205
PDA	0.65	189

* Rn = (FACTORED DESIGN LOAD) / φdyn

GENERAL PILE NOTES

3 STEEL H-TEST PILES 30 FT. LONG
108 STEEL H-PILES EST. LENGTH 30 FT.
111 STEEL H-PILES REQ'D FOR EAST ABUTMENT AND WINGWALLS

EAST ABUTMENT & WINGWALL PILES ARE TO BE HP12x53 WITH PILE TIP PROTECTION.

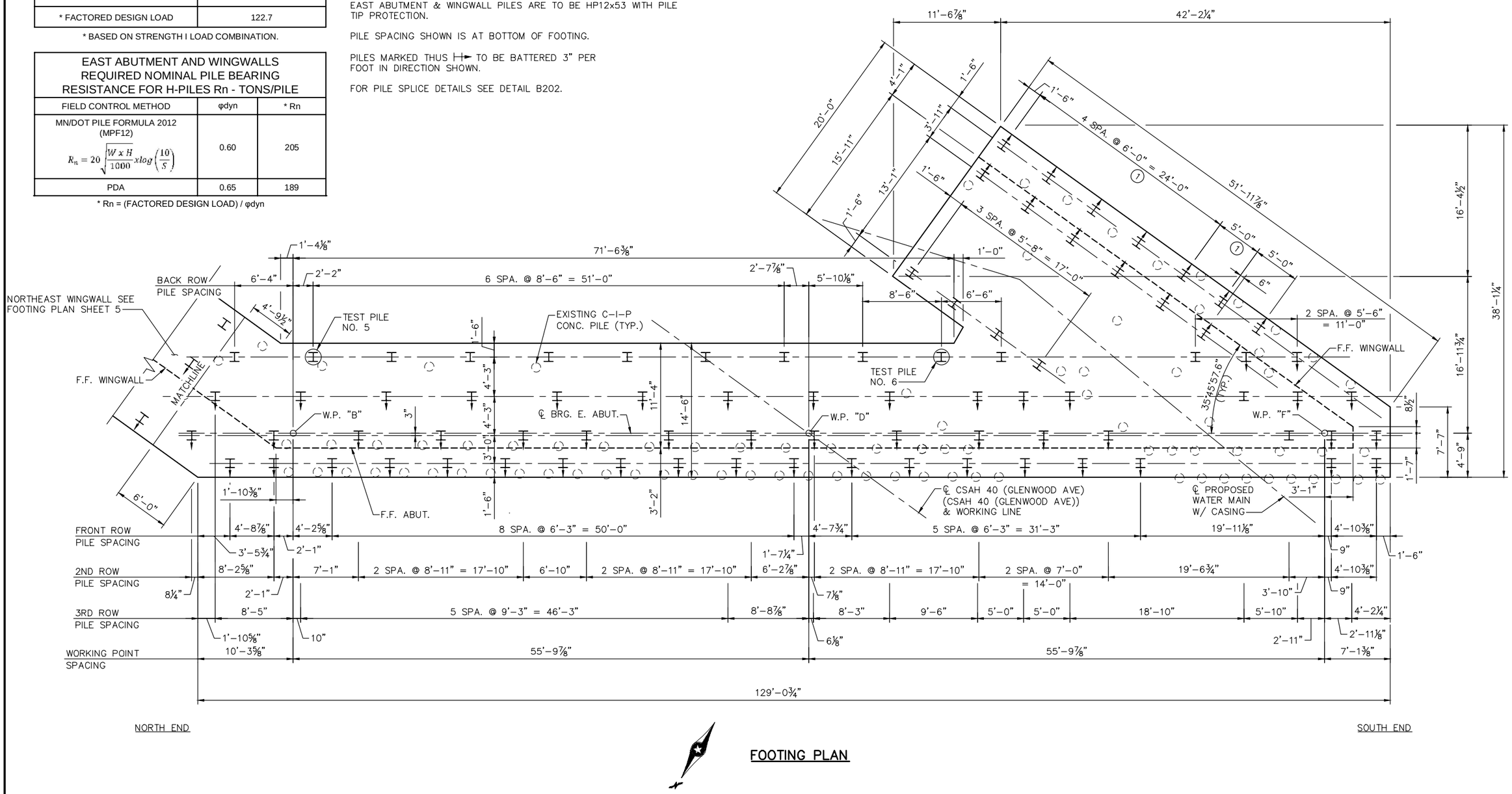
PILE SPACING SHOWN IS AT BOTTOM OF FOOTING.

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

FOR PILE SPLICE DETAILS SEE DETAIL B202.

NOTES:

① FRONT ROW AND 2ND ROW PILE SPACING.



FOOTING PLAN

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: BAW | CHECKED BY: BLF
DRAWN BY: LMT | DATE: 8/24/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

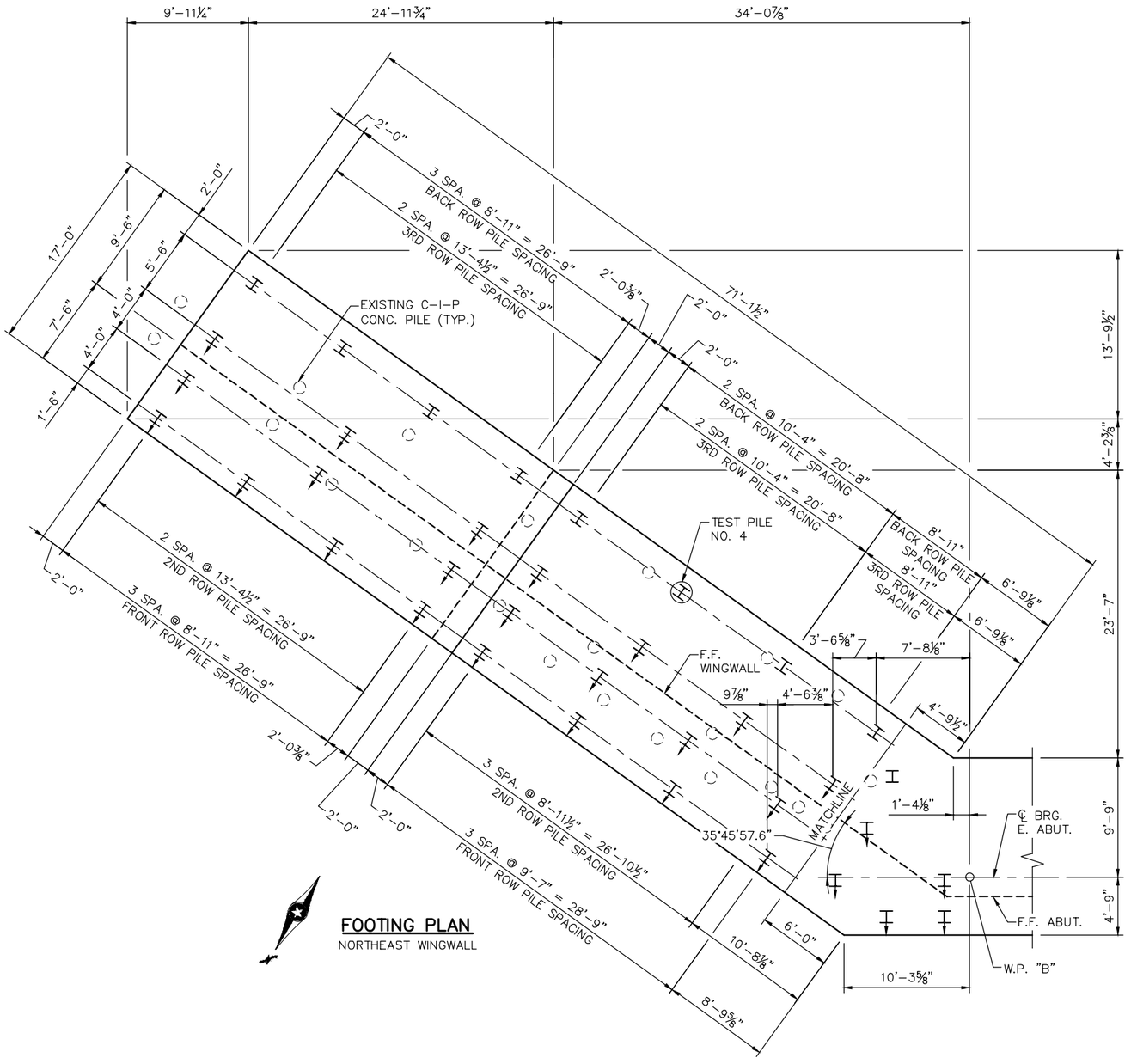
SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4B
CSAH 40 (GLENWOOD AVENUE) - EAST
BRIDGE 27C17
EAST ABUTMENT DETAILS 1

DISCIPLINE: STRUCTURES
SHEET NAME: CBR27C17-BRG-ABT-001-1

SHEET 4 OF 38

Aug, 24 2015 09:05 am V:\3400_ADC\CAD\SEGMENT E4\PLAN SHEETS\STRUCTURES\27C17\CBR27C17-BRG-ABT-001.dwg By: ryan.kelly



FOOTING PLAN
NORTHEAST WINGWALL

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: BAW | CHECKED BY: BLF
DRAWN BY: LMT | DATE: 8/24/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

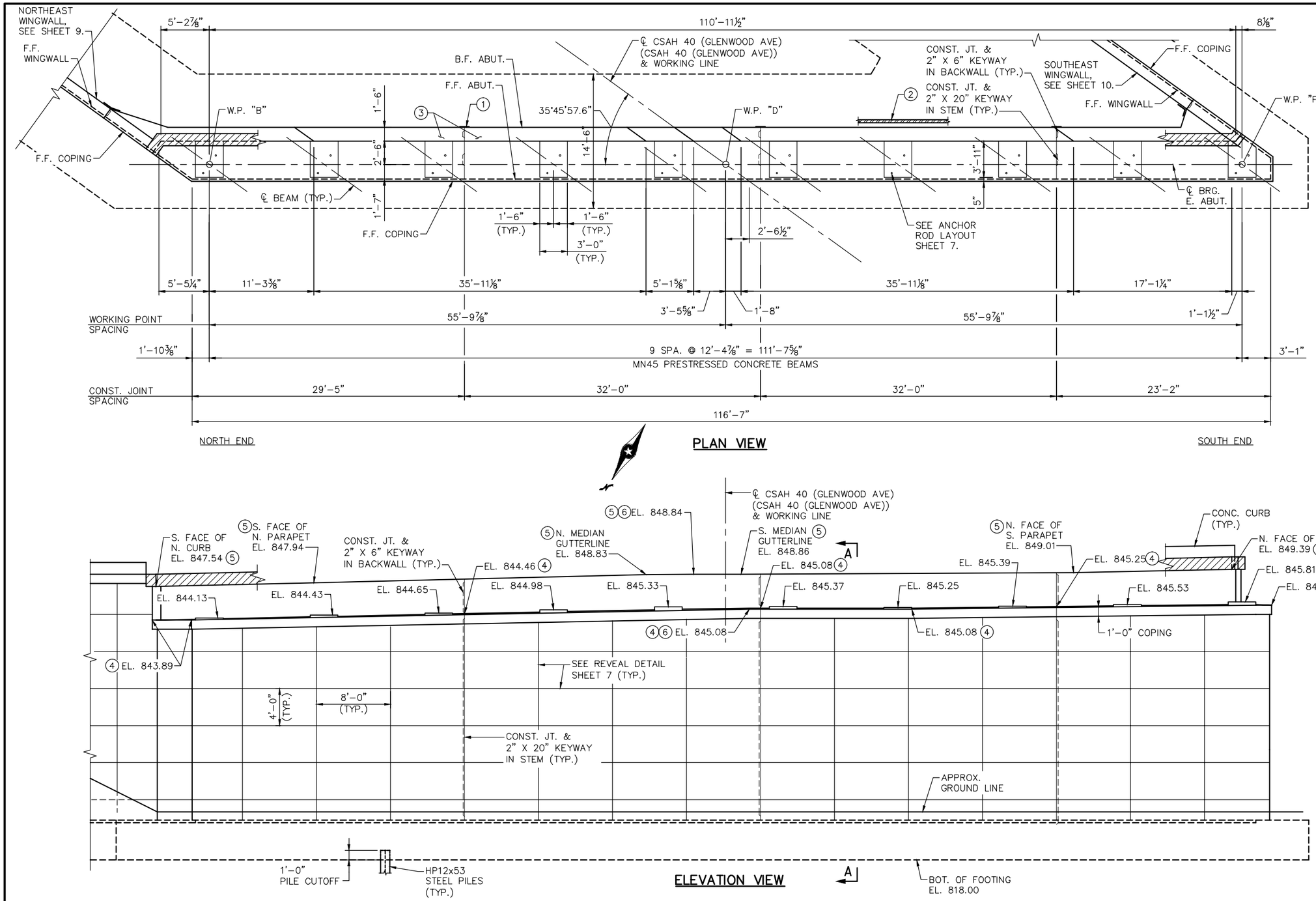
SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4B
CSAH 40 (GLENWOOD AVENUE) - EAST
BRIDGE 27C17
EAST ABUTMENT DETAILS 2

DISCIPLINE: STRUCTURES
SHEET NAME: CBR27C17-BRG-ABT-001-1

SHEET 5 OF 38

Aug, 24 2015 09:05 am V:\3400_ADC\CAD\SEGMENT E4\PLAN SHEETS\STRUCTURES\27C17\CBR27C17-BRG-ABT-001.dwg By: ryan.kelly



PLAN VIEW

ELEVATION VIEW

NOTES:

FOR SECTION A–A, SEE SHEET 7.

1. MEMBRANE WATERPROOFING SYSTEM PER MnDOT 2481.3.B.
2. PERFORATED PIPE, SEE DETAIL B910 FOR DRAINAGE DETAILS.
3. THERE SHALL BE A 72 HOUR MINIMUM TIME DELAY BETWEEN CONCRETE POURS OF ADJACENT ABUTMENT SECTIONS THAT HAVE VERTICAL CONSTRUCTION JOINTS. CONTRACTOR MAY PROPOSED TO REDUCE THE WAITING PERIOD IF THE CURE IS MAINTAINED. SEE SPECIAL PROVISIONS.
4. ELEVATION AT FRONT FACE OF ABUTMENT COPING.
5. ELEVATION AT FRONT FACE OF BACKWALL.
6. ℄ CSAH 40 (GLENWOOD AVE)(CSAH 40 (GLENWOOD AVE)) & WORKING LINE.

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: BAW | CHECKED BY: BLF
DRAWN BY: LMT | DATE: 8/24/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

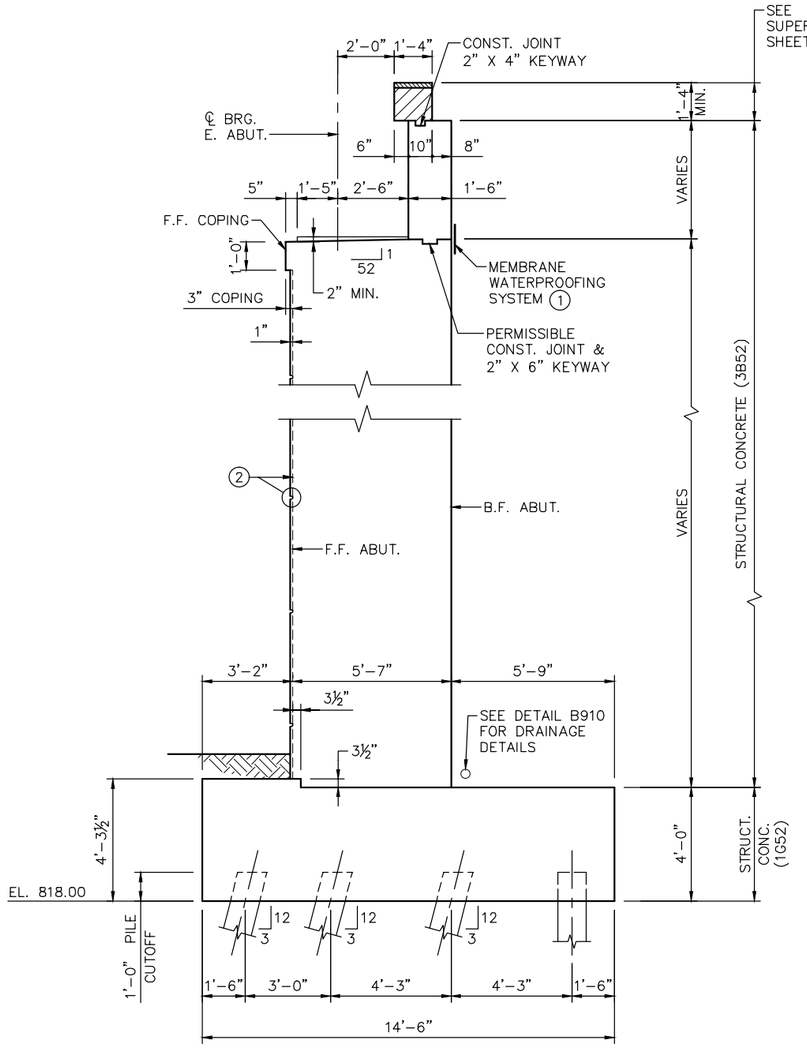
CIVIL EAST - VOLUME 4B
CSAH 40 (GLENWOOD AVENUE) - EAST
BRIDGE 27C17
EAST ABUTMENT DETAILS 3

DISCIPLINE: STRUCTURES

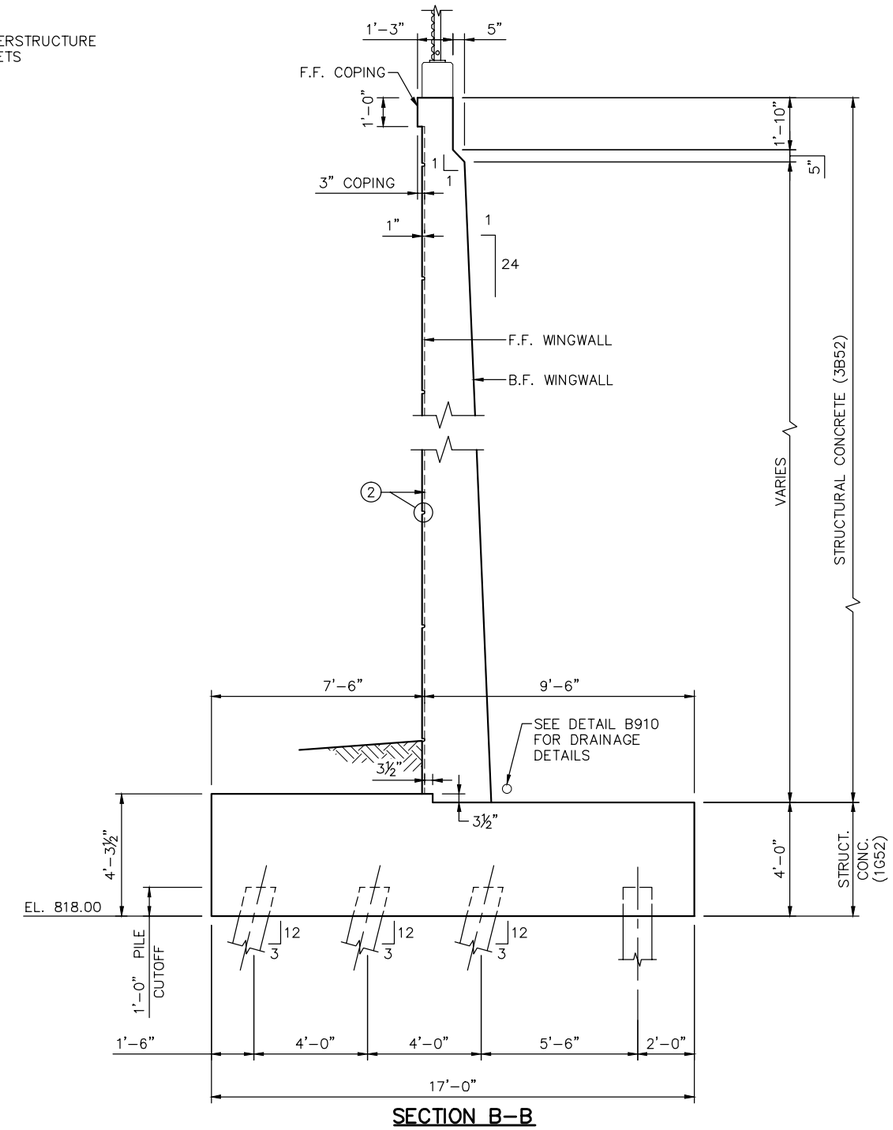
SHEET NAME: CBR27C17-BRG-ABT-001-2

SHEET 6 OF 38

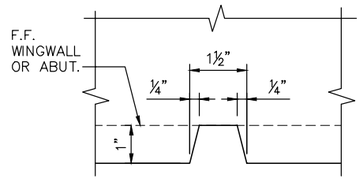
Aug, 24 2015 09:05 am V:\3400_ADC\CAD\SEGMENT E4\PLAN SHEETS\STRUCTURES\27C17\CBR27C17-BRG-ABT-001.dwg By: ryan.kelly



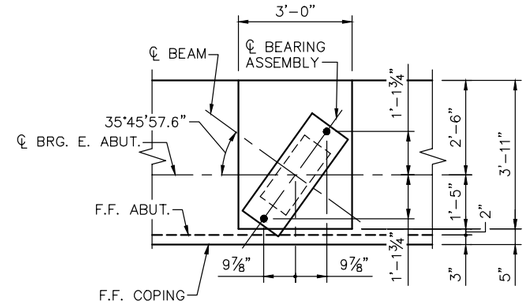
SECTION A–A



SECTION B–B



REVEAL DETAIL



ANCHOR ROD LAYOUT

NOTES:

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

SEE SHEET 6 FOR LOCATION OF SECTION A–A.

SEE SHEET 9 FOR LOCATION OF SECTION B–B.

(1) MEMBRANE WATERPROOFING SYSTEM PER MnDOT SPEC. 2481.3.B.

(2) SEE REVEAL DETAIL THIS SHEET.

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: BAW | CHECKED BY: BLF
DRAWN BY: LMT | DATE: 8/24/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

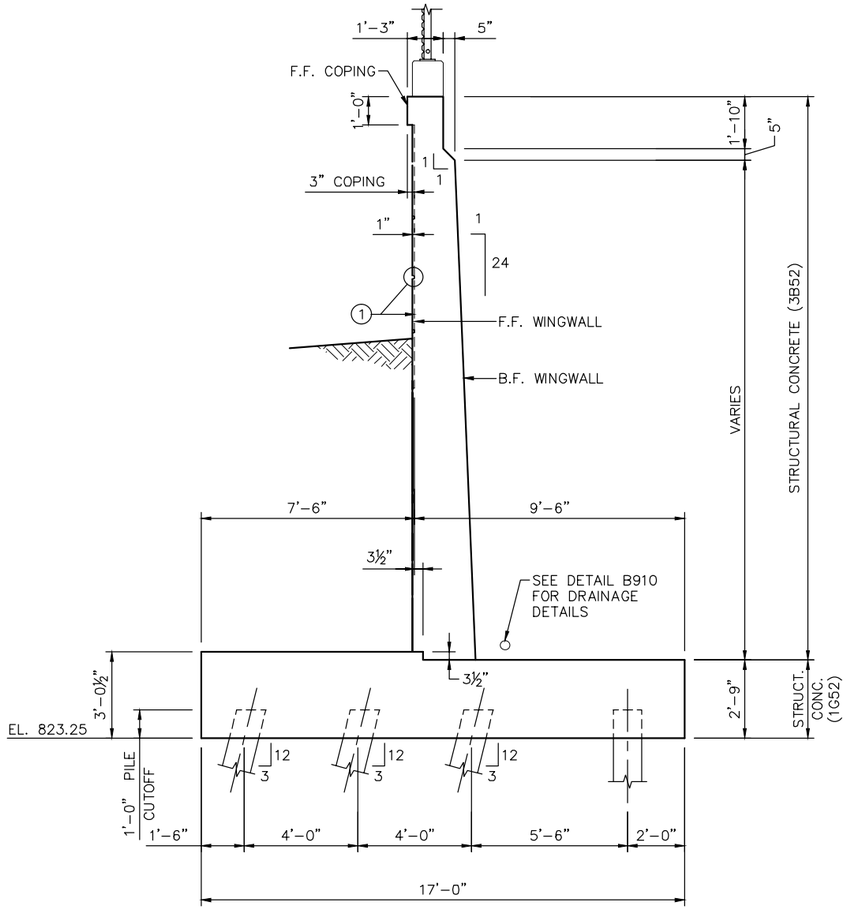
METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

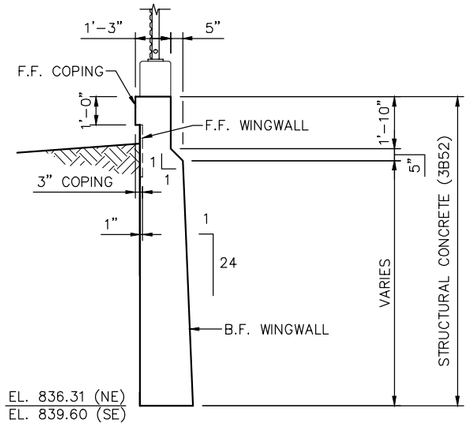
CIVIL EAST - VOLUME 4B
CSAH 40 (GLENWOOD AVENUE) - EAST
BRIDGE 27C17
EAST ABUTMENT DETAILS 4

DISCIPLINE: STRUCTURES
SHEET NAME: CBR27C17-BRG-ABT-001-3

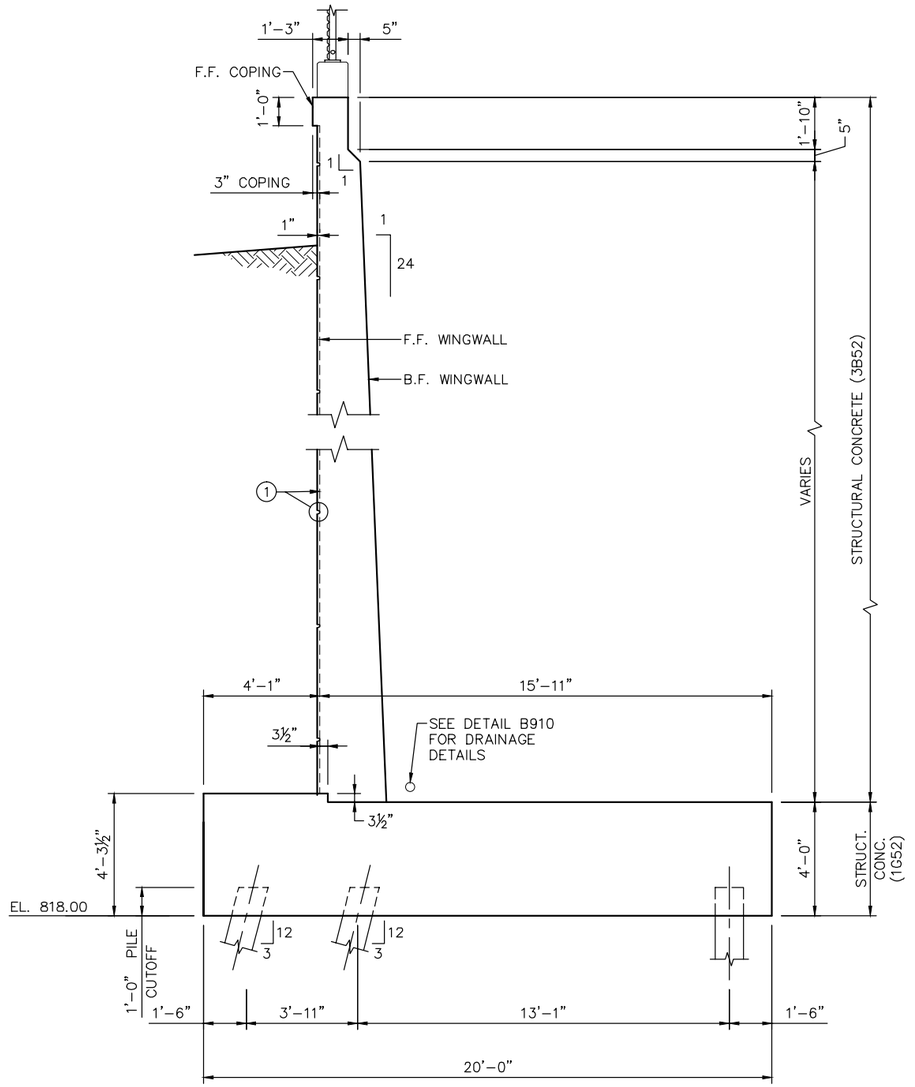
SHEET 7 OF 38



SECTION C–C



SECTION D–D



SECTION E–E

NOTES:

FOR LOCATION OF SECTION C–C, D–D, E–E, SEE SHEETS 10.

(1) SEE REVEAL DETAIL ON SHEET 7.

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: BAW | CHECKED BY: BLF
DRAWN BY: LMT | DATE: 8/24/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

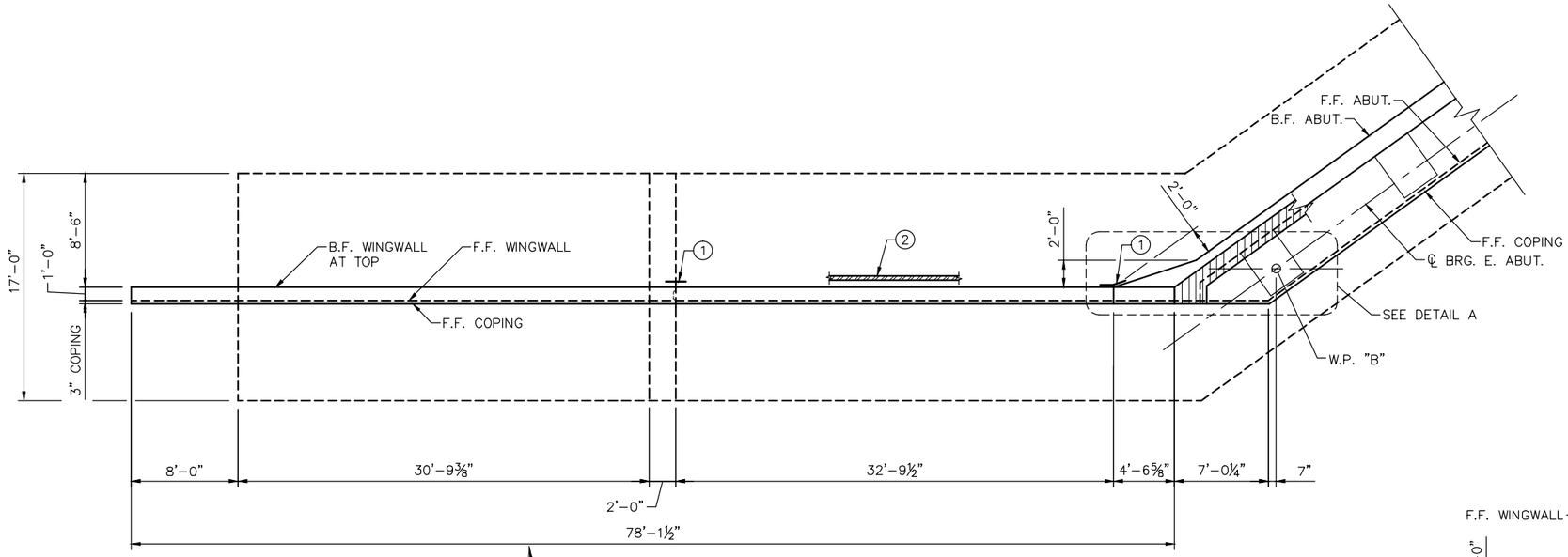
SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4B
CSAH 40 (GLENWOOD AVENUE) - EAST
BRIDGE 27C17
EAST ABUTMENT DETAILS 5

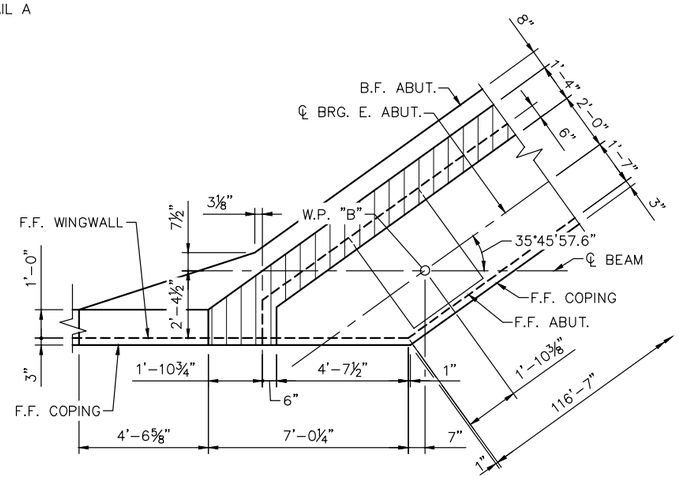
DISCIPLINE: STRUCTURES
SHEET NAME: CBR27C17-BRG-ABT-001-4

SHEET 8 OF 38

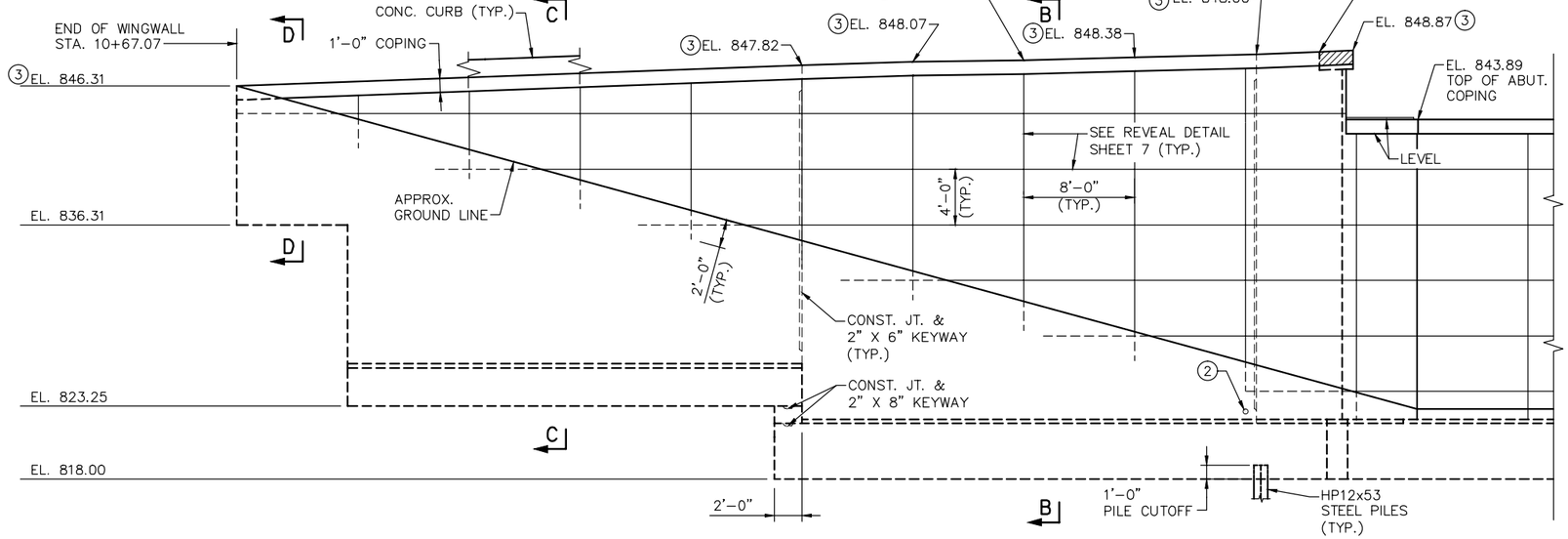
Aug. 24 2015 09:05 am V:\3400_ADC\CAD\SEGMENT E4\PLAN SHEETS\STRUCTURES\27C17\CBR27C17-BRG-ABT-001.dwg By: ryan.kelly



NORTHEAST WINGWALL PLAN



DETAIL A



NORTHEAST WINGWALL ELEVATION

NOTES:

FOR SECTION B–B, SEE SHEET 7.

FOR SECTIONS C–C, & D–D, SEE SHEET 8.

(1) MEMBRANE WATERPROOFING SYSTEM PER MnDOT 2481.3.B.

(2) PERFORATED PIPE, SEE DETAIL B910 FOR DRAINAGE DETAILS.

(3) ELEVATION AT TOP OF WINGWALL COPING.

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: BAW | CHECKED BY: BLF
DRAWN BY: LMT | DATE: 8/24/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

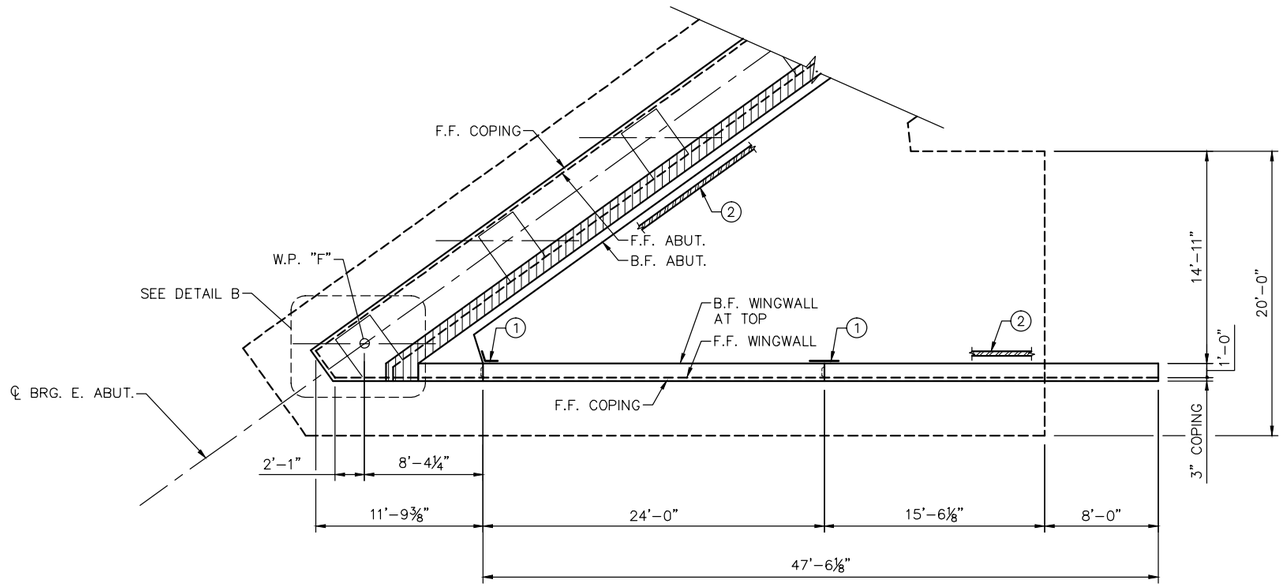
SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4B
CSAH 40 (GLENWOOD AVENUE) - EAST
BRIDGE 27C17
EAST ABUTMENT DETAILS 6

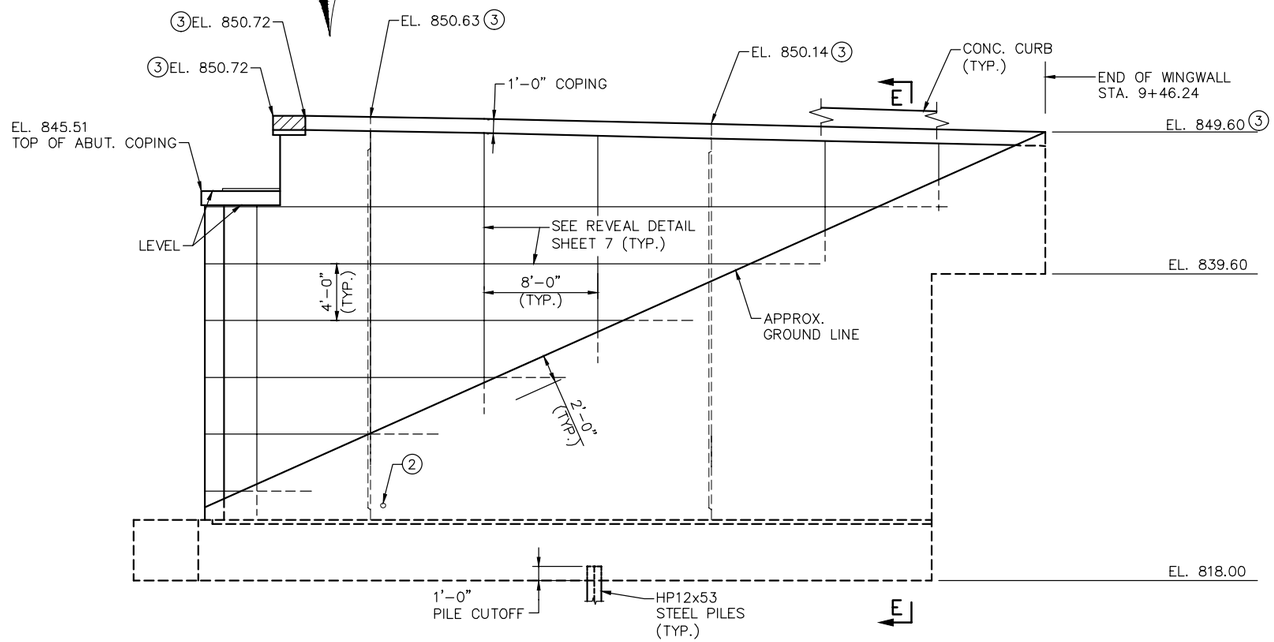
DISCIPLINE: STRUCTURES
SHEET NAME: CBR27C17-BRG-ABT-001-5

SHEET 9 OF 38

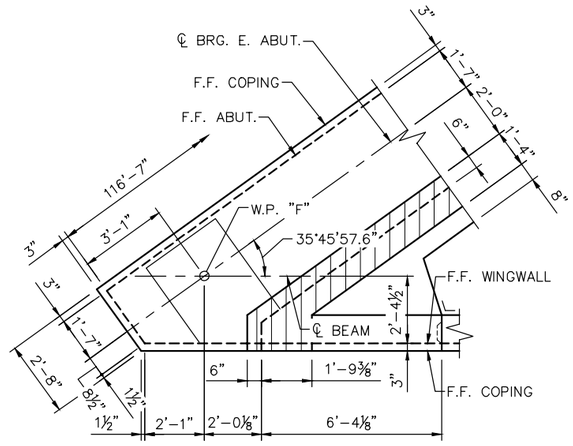
Aug. 24 2015 09:05 am V:\3400_ADC\CAD\SEGMENT E4\PLAN SHEETS\STRUCTURES\27C17\CBR27C17-BRG-ABT-001.dwg By: ryan.kelly



SOUTHEAST WINGWALL PLAN



SOUTHEAST WINGWALL ELEVATION



DETAIL B

NOTES:

FOR SECTION E-E, SEE SHEET 8.

(1) MEMBRANE WATERPROOFING SYSTEM PER MnDOT 2481.3.B.

(2) PERFORATED PIPE, SEE DETAIL B910 FOR DRAINAGE DETAILS.

(3) ELEVATION AT TOP OF WINGWALL COPING.

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: BAW | CHECKED BY: BLF
DRAWN BY: LMT | DATE: 8/24/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

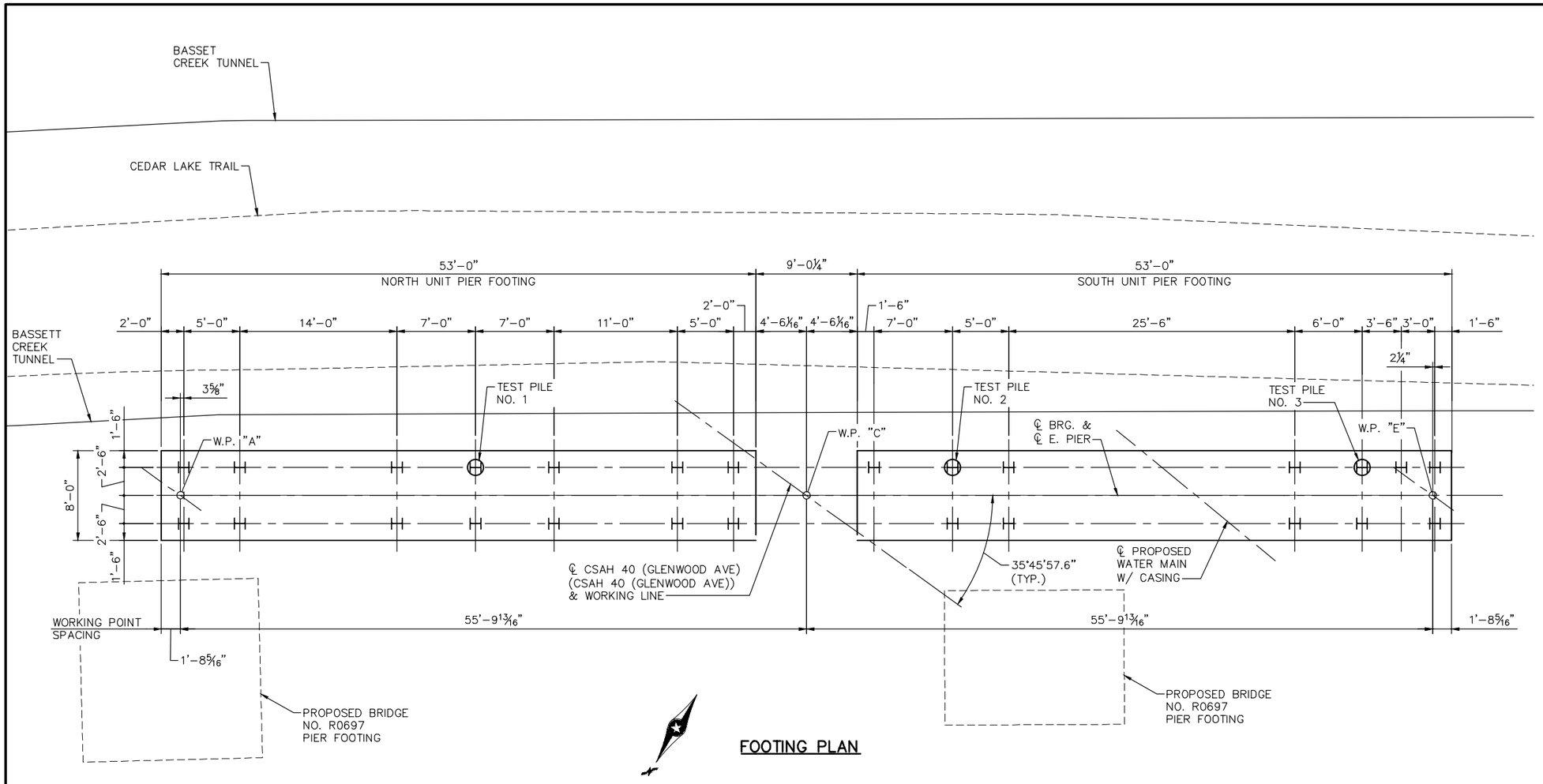
METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4B
CSAH 40 (GLENWOOD AVENUE) - EAST
BRIDGE 27C17
EAST ABUTMENT DETAILS 7

DISCIPLINE: STRUCTURES
SHEET NAME: CBR27C17-BRG-ABT-001-6

SHEET 10 OF 38



FOOTING PLAN

EAST PIER COMPUTED PILE LOAD - TONS/PILE	
FACTORED DEAD LOAD	62.6
FACTORED LIVE LOAD	5.7
FACTORED OVERTURNING	57.8
* FACTORED DESIGN LOAD	126.1

* BASED ON STRENGTH I LOAD COMBINATION.

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

FIELD CONTROL METHOD	φdyn	* Rn
MN/DOT PILE FORMULA 2012 (MPF12) $R_n = 20\sqrt{\frac{W\,x\,H}{1000}}\,x log\left(\frac{10}{S}\right)$	0.60	210.1
PDA	0.65	193.9

* Rn = (FACTORED DESIGN LOAD) / φdyn

GENERAL PILE NOTES

3 STEEL H–TEST PILES 60 FT. LONG
23 STEEL H–PILES EST. LENGTH 50 FT.
26 STEEL H–PILES REQ'D FOR EAST PIER

PIER PILES ARE TO BE HP12x53 WITH PILE TIP PROTECTION.

PILE SPACING SHOWN IS AT BOTTOM OF FOOTING.

FOR PILE SPLICE DETAILS SEE DETAIL B202.

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: BAW | CHECKED BY: BLF
DRAWN BY: LMT | DATE: 8/24/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

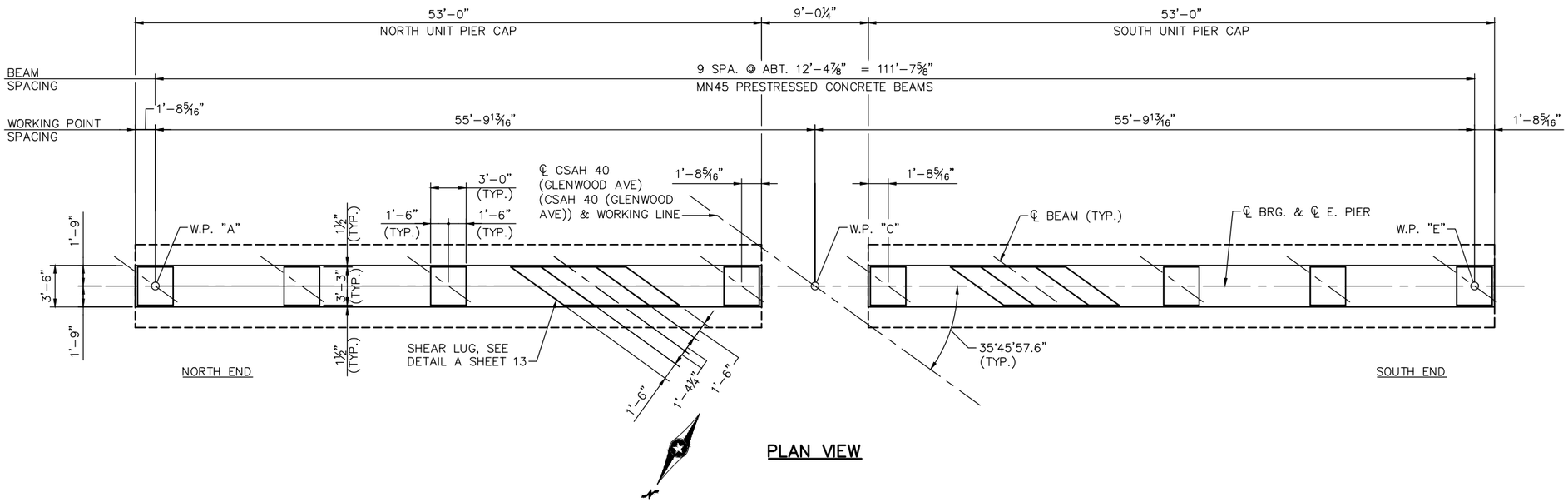
SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4B
CSAH 40 (GLENWOOD AVENUE) - EAST
BRIDGE 27C17
EAST PIER DETAILS 1

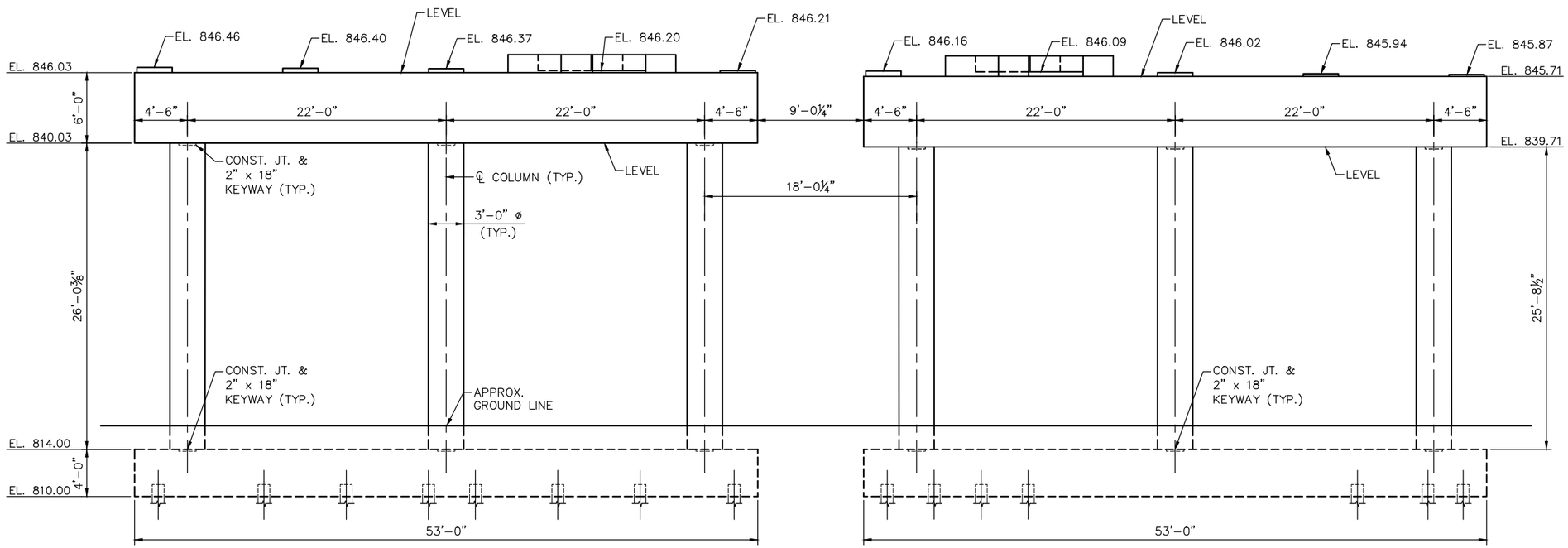
DISCIPLINE: STRUCTURES
SHEET NAME: CBR27C17-BRG-PIR-001-1

SHEET 11 OF 38

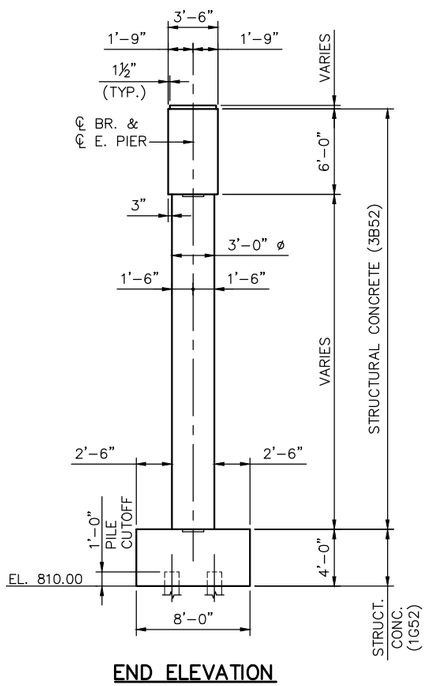
Aug. 24 2015 09:06 am V:\3400_ADC\CAD\SEGMENT E4\PLAN SHEETS\STRUCTURES\27C17\CBR27C17-BRG-PIR-001.dwg By: ryan.kelly



PLAN VIEW



ELEVATION VIEW



END ELEVATION

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: BAW | CHECKED BY: BLF
DRAWN BY: LMT | DATE: 8/24/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

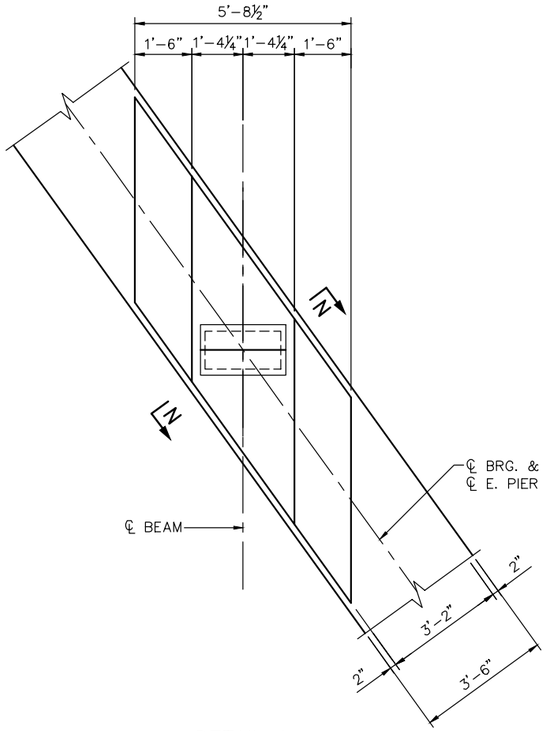
SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4B
CSAH 40 (GLENWOOD AVENUE) - EAST
BRIDGE 27C17
EAST PIER DETAILS 2

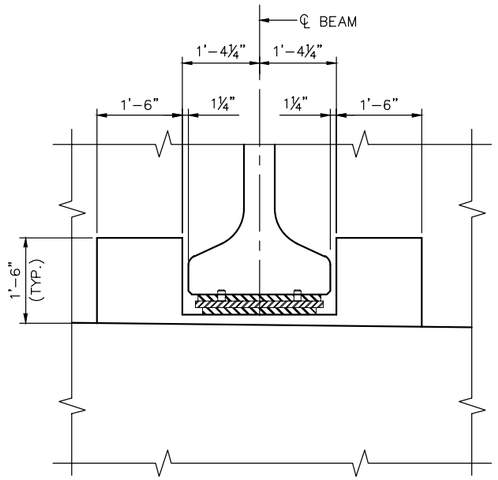
DISCIPLINE: STRUCTURES
SHEET NAME: CBR27C17-BRG-PIR-001-2

SHEET 12 OF 38

Aug. 24 2015 09:37 am V:\3400_ADC\CAD\SEGMENT E4\PLAN SHEETS\STRUCTURES\27C17\CBR27C17-BRG-PIR-001.dwg By: ryan.kelly

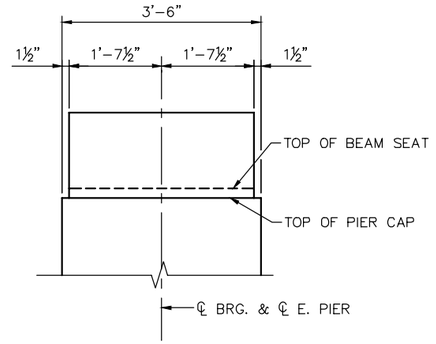


DETAIL A



SHEAR LUG ELEVATION

DIMENSIONS ARE PERPENDICULAR TO ℄ BEAM



SECTION N-N

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: BAW | CHECKED BY: BLF
DRAWN BY: LMT | DATE: 8/24/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

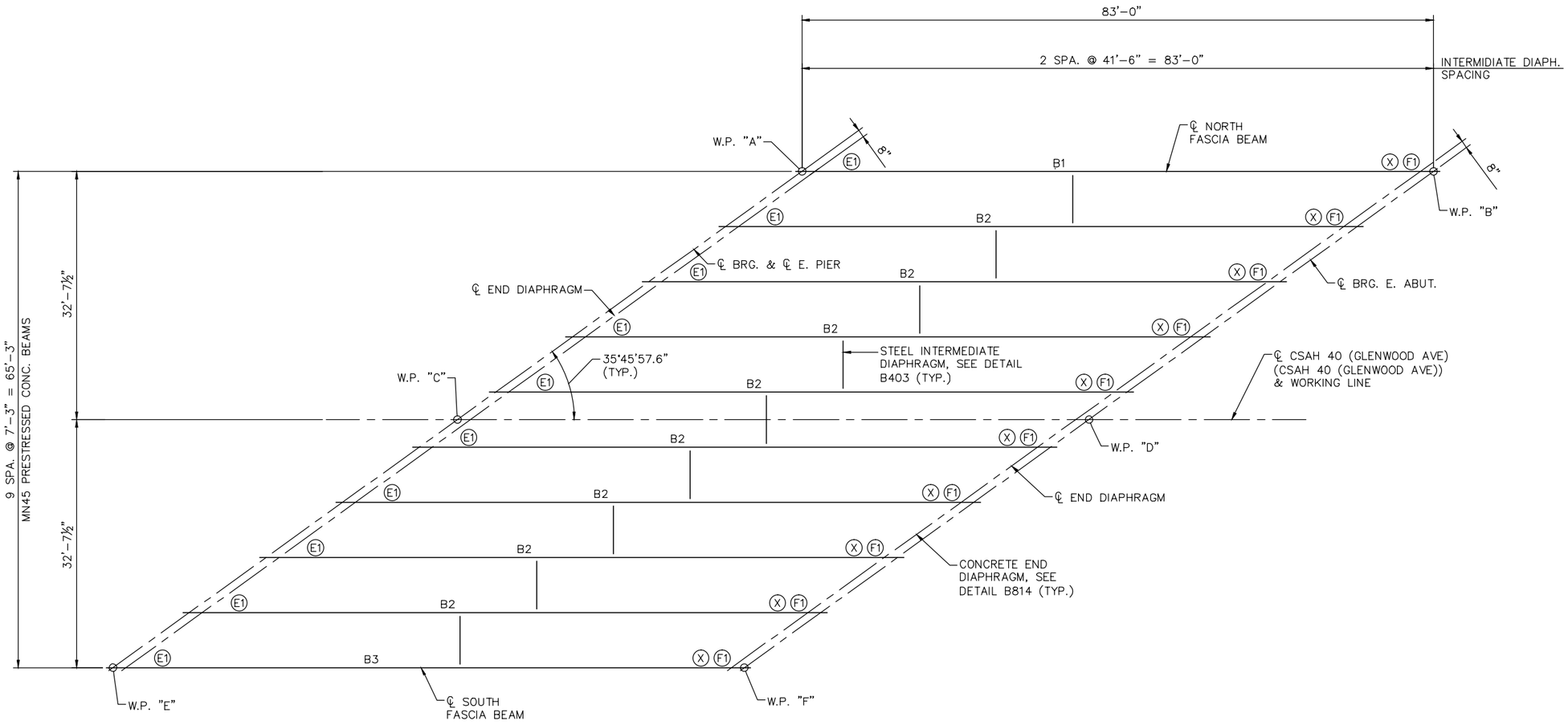
SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4B
CSAH 40 (GLENWOOD AVENUE) - EAST
BRIDGE 27C17
EAST PIER DETAILS 3

DISCIPLINE: STRUCTURES
SHEET NAME: CBR27C17-BRG-PIR-001-3

SHEET 13 OF 38

Aug. 24 2015 09:06 am V:\3400_ADC\CAD\SEGMENT E4\PLAN SHEETS\STRUCTURES\27C17\CBR27C17-BRG-PIR-001.dwg By: ryan.kelly



FRAMING PLAN

NOTES:

(E1) DENOTES EXPANSION CURVED PLATE BEARING ASSEMBLY TYPE E1. SEE DETAIL B311.

(F1) DENOTES FIXED CURVED PLATE BEARING ASSEMBLY, TYPE F1. SEE DETAIL B310.

(X) INDICATES END OF BEAM.

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: BAW | CHECKED BY: BLF
DRAWN BY: LMT | DATE: 8/24/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

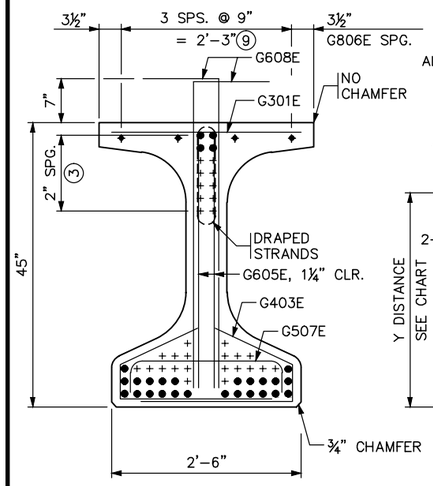
CIVIL EAST - VOLUME 4B
CSAH 40 (GLENWOOD AVENUE) - EAST
BRIDGE 27C17
FRAMING PLAN

DISCIPLINE: STRUCTURES

SHEET NAME: CBR27C17-BRG-SUP-002

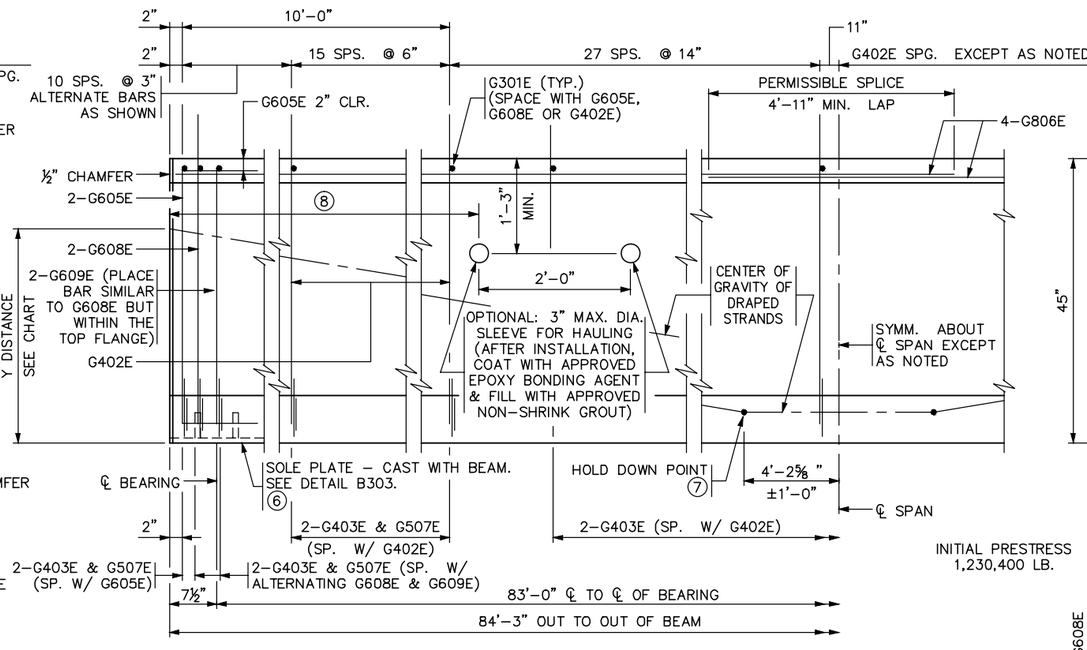
SHEET 14 OF 38

Aug, 24 2015 09:06 am V:\3400_ADC\CAD\SEGMENT E4\PLAN SHEETS\STRUCTURES\27C17\CBR27C17-BRG-SUP-002.dwg By: ryan.kelly



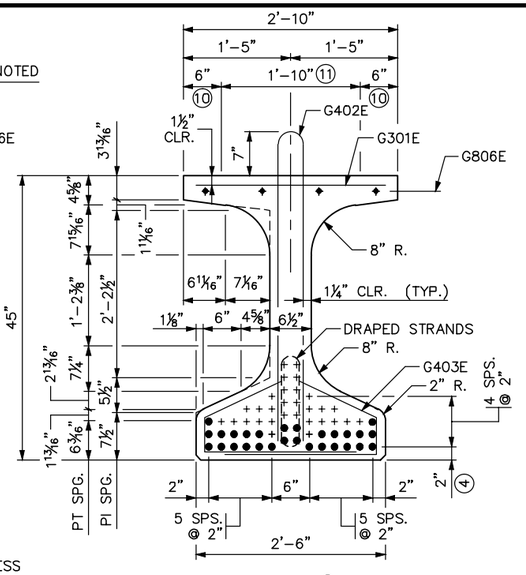
END VIEW

CUT STRANDS FLUSH WITH CONCRETE. COVER ENDS WITH ONE COMPONENT POLYURETHANE SEALANT PER APPROVED PRODUCT LIST. (G609E BAR NOT SHOWN)



BEAM ELEVATION

INITIAL PRESTRESS 1,230,400 LB.

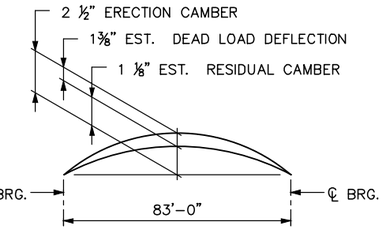


SECTION AT ℄ SPAN

Y DISTANCES (INCHES)			
	NO.	℄ SPAN	END
STRAIGHT STRANDS	24	3.17	
DRAPED STRANDS	4	4.00	41.00 □
TOTAL STRANDS	28	3.29	

Y = DISTANCE TO CENTER OF GRAVITY OF STRANDS FROM BOTTOM OF BEAM. ALL STRANDS SPACED 2" CENTER TO CENTER, HORIZONTALLY AND VERTICALLY, EXCEPT AS NOTED.

□ A TOLERANCE OF ±1" WILL BE PERMITTED IN THIS DIMENSION.



CAMBER DIAGRAM

ERECTION CAMBER SHOWN IS AFTER DIAPHRAGMS ARE IN PLACE.

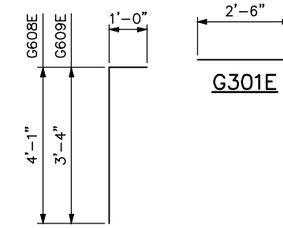
DEAD LOAD DEFLECTION SHOWN IS FOR WEIGHT OF SLAB, WEARING COURSE, BARRIER, SIDEWALK AND MEDIAN WHERE APPLICABLE.

CONTRACTOR WILL TAKE ELEVATIONS AT TOP OF BEAMS AFTER ERECTION AND WILL ALLOW FOR DEFLECTION SHOWN TO ENABLE BUILDING FORMS TO CORRECT GRADE AND SPECIFIED SLAB THICKNESS. PROVIDE COPY OF ELEVATIONS TO THE ENGINEER.

CALCULATED PRESTRESS LOSSES	
ELASTIC SHORTENING LOSS	15.39 KSI
LONG TERM LOSSES	30.67 KSI
TOTAL LOSSES	46.06 KSI

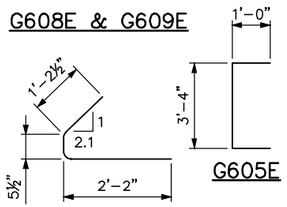
MINIMUM CONCRETE STRENGTH – K.S.I.	
① f'ci	② f'c
6.0 KSI	7.0 KSI

PRESTRESSING STRAND DIAMETER	
⑤	½" □
⑤	0.60" ☒



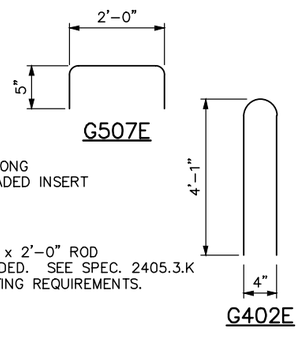
G608E & G609E

G301E



G403E

G605E



G507E

G402E

DETAIL "A"

GENERAL NOTES

PROVIDE HANDLING HOOKS OR DEVICES AS REQUIRED BY CONTRACTOR.

MARK EACH BEAM SHOWING BRIDGE NUMBER, CASTING DATE, AND INDIVIDUAL IDENTIFICATION LETTERS AND NUMBERS ON THE FACE OF THE BEAM, NEAR THE END, SO LOCATED THAT THEY WILL BE EXPOSED AFTER THE END DIAPHRAGMS HAVE BEEN CAST. MARK FASCIA BEAMS ON THE INSIDE FACE. ENSURE ALL MARKINGS ARE STENCILED AND CLEARLY LEGIBLE. FOR LOCATION OF BEAMS, SEE FRAMING PLAN.

~~ALL MATERIAL AND WORK SHOWN OR NOTED ON THIS SHEET IS INCLUDED IN UNIT PRICE BID FOR PRESTRESSED CONCRETE BEAMS. SEE SPEC. 2405~~

SEE FRAMING PLAN FOR BEAM END MARKED "X" AND DIAPHRAGM SPACING.

APPROXIMATE WEIGHT OF BEAM IS 31.3 TONS.

AS AN ALTERNATE TO THE END DIAPHRAGM ANCHORAGES SHOWN, THE CONTRACTOR MAY SUBMIT DETAILS OF A CAST-IN-PLACE ANCHORAGE TO THE ENGINEER FOR APPROVAL. ANCHORAGE MUST PROVIDE AN ULTIMATE PULL OUT STRENGTH OF 15 KIPS PER ANCHORAGE.

APPLY AN APPROVED SEALER TO THE SIDES OF THE BEAM NEAR EACH END PER THE SPECIAL PROVISIONS.

① MINIMUM CONCRETE STRENGTH AT TIME OF PRESTRESS TRANSFER.

② MINIMUM CONCRETE STRENGTH WHEN BEAM CAN BE TRANSPORTED AND INSTALLED.

③ DRAPED STRANDS.

④ STRAIGHT STRANDS.

⑤ USE 7-WIRE LOW RELAXATION PRESTRESSING STRAND, CONFORMING TO ASTM A416, GRADE 270.

⑥ ~~FOR INTEGRAL ABUTMENT, SOLE PLATE CAN BE ELIMINATED OR REPLACED WITH AN APPROVED PROTECTION PLATE. BEAMS DETAILED TO INCLUDE A TAPERED PLATE PER STANDARD FIGURE B309 MUST INCLUDE SOLE PLATE.~~

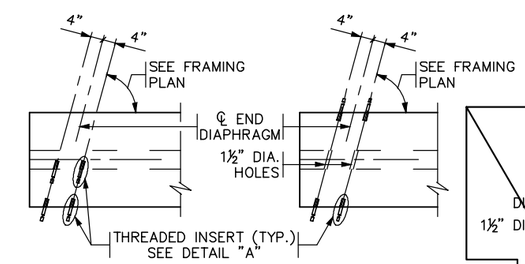
⑦ CENTER OF GRAVITY OF HOLD DOWNS WHEN MULTIPLE HOLD DOWNS ARE USED.

⑧ DIMENSION DETERMINED BY CONTRACTOR. MAINTAIN 2" MINIMUM CLEAR FROM STRANDS.

⑨ TWO INSIDE BARS MAY BE PLACED ADJACENT TO VERTICAL STIRRUP FOR TYING CONVENIENCE.

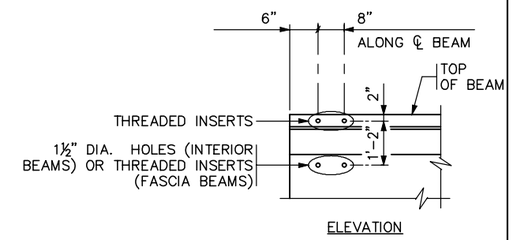
⑩ STEEL TROWEL TO SMOOTH FINISH AND APPLY BOND BREAKER PER APPROVED PRODUCTS LIST.

⑪ ROUGH FLOAT AND BROOM TRANSVERSELY FOR BOND PER SPEC. 2405.3.D.



PLAN AT FASCIA BEAMS

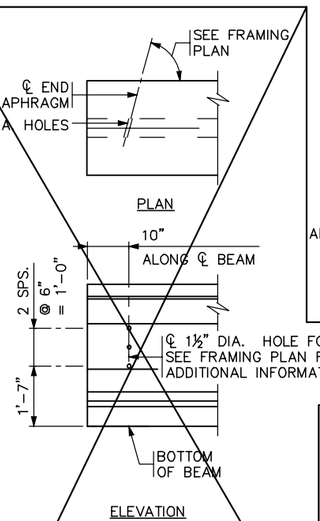
PLAN AT INTERIOR BEAMS



ELEVATION

CONCRETE END DIAPHRAGM

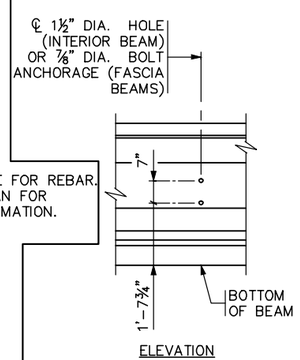
PARAPET ABUTMENT
(SEE DETAIL B814 FOR DIAPHRAGM DETAILS)



ELEVATION

CONCRETE END DIAPHRAGM

SEE SUPERSTRUCTURE DETAILS AND REINFORCEMENT FOR DIAPHRAGM DETAILS.



ELEVATION

STEEL INTERMEDIATE DIAPHRAGM

(SEE DETAIL B403 FOR DIAPHRAGM DETAILS)

REVISED:

APPROVED: JANUARY 13, 2015
Nancy Dorbenberger
STATE BRIDGE ENGINEER

DRAFT-WORK IN PROCESS

CERTIFIED BY _____ LICENSED PROFESSIONAL ENGINEER 8/24/15 DATE

NAME: **ENGINEER** LIC. NO. #####

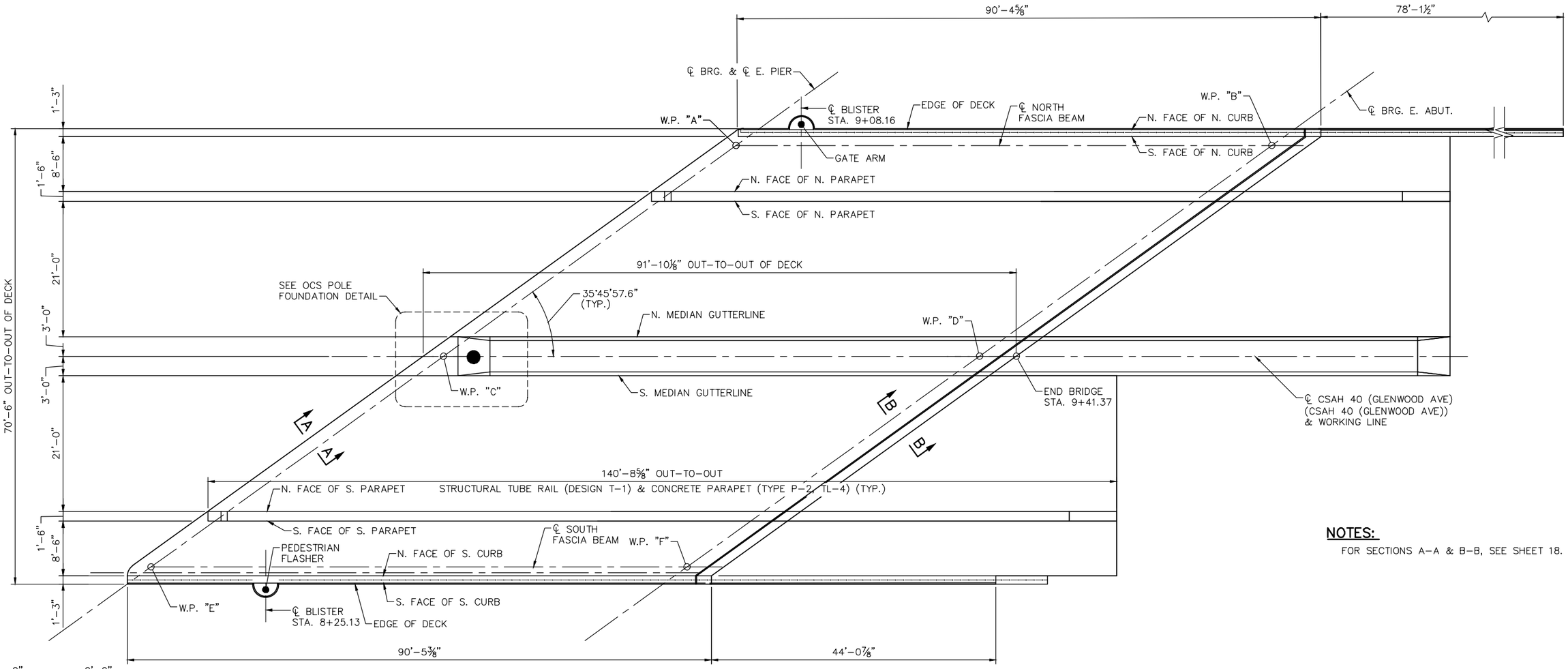
TITLE: MN45" PRESTRESSED CONCRETE BEAM (PRETENSIONED) MN45-86

BEAMS B1-B3

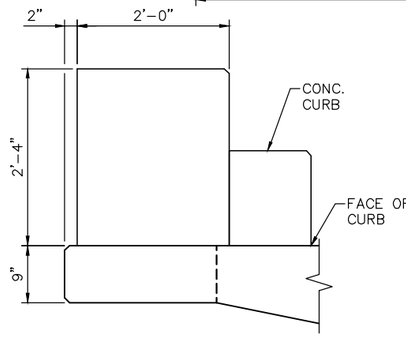
FIG. 5-397.507

DES: BAW	DR: LMT	APPROVED:	BRIDGE NO. 27C17
CHK: BLF	CHK: BLF		
SHEET NO. 15 OF 38 SHEETS			

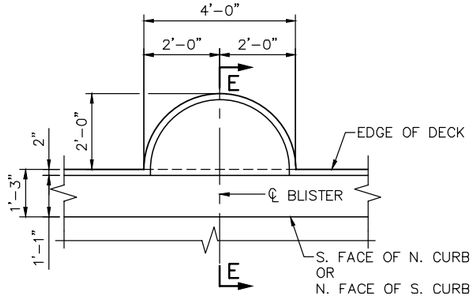
Aug. 24 2015 09:06 am V:\3400_ADC\CAD\SEGMENT E4\PLAN SHEETS\STRUCTURES\27C17\CBR27C17-BRG-PCB-001.dwg By: ryan.kelly



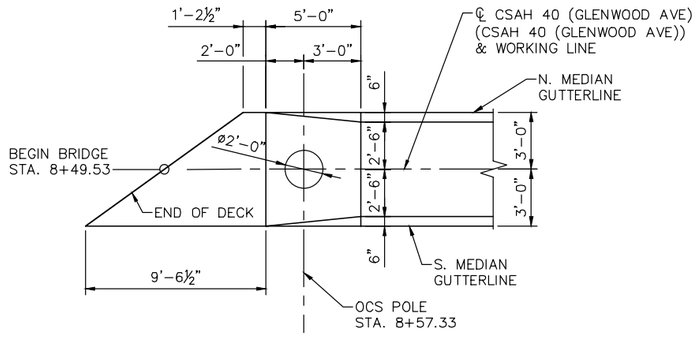
DECK PLAN



SECTION E-E



BLISTER DETAIL



OCS POLE FOUNDATION

NOTES:

FOR SECTIONS A-A & B-B, SEE SHEET 18.

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: BAW | CHECKED BY: BLF
DRAWN BY: LMT | DATE: 8/24/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

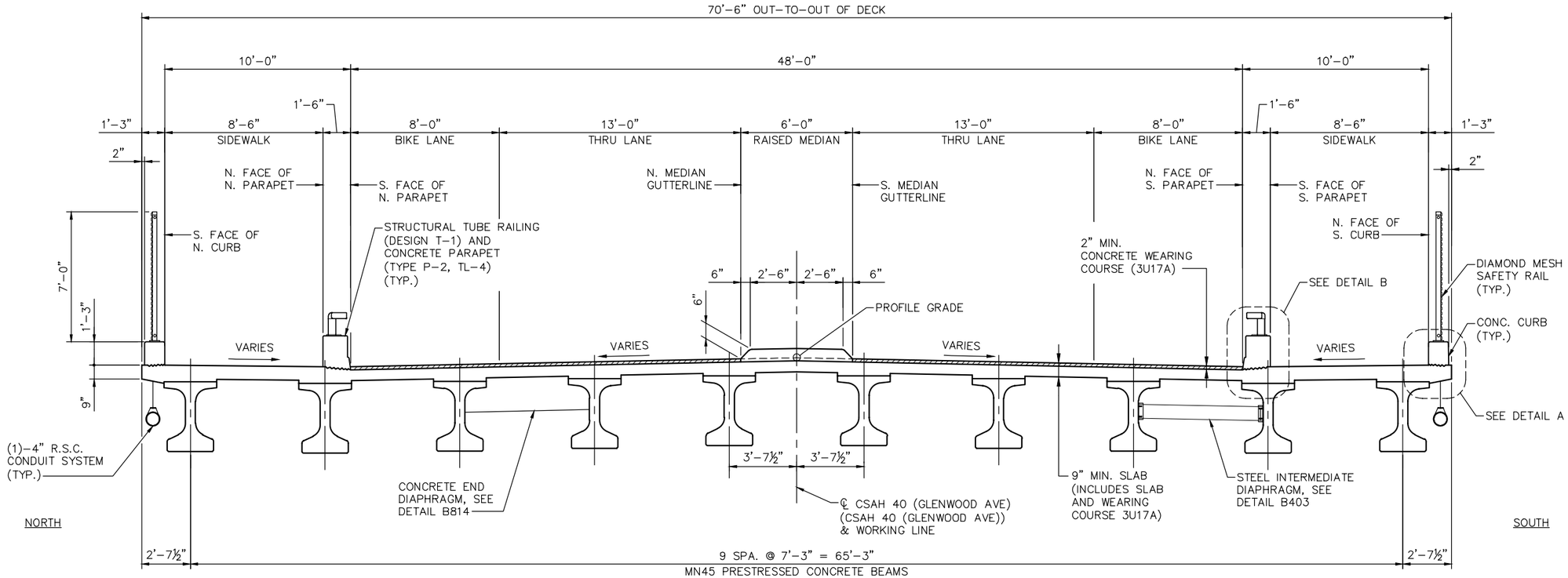
SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4B
CSAH 40 (GLENWOOD AVENUE) - EAST
BRIDGE 27C17
SUPERSTRUCTURE DETAILS 1

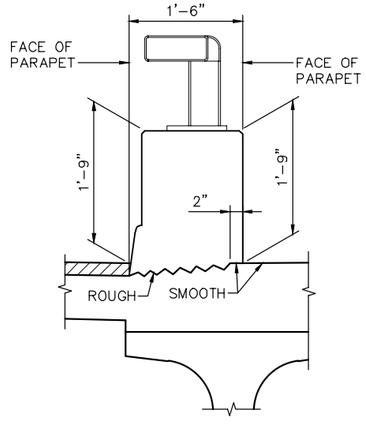
DISCIPLINE: STRUCTURES

SHEET NAME: CBR27C17-BRG-SUP-003-1

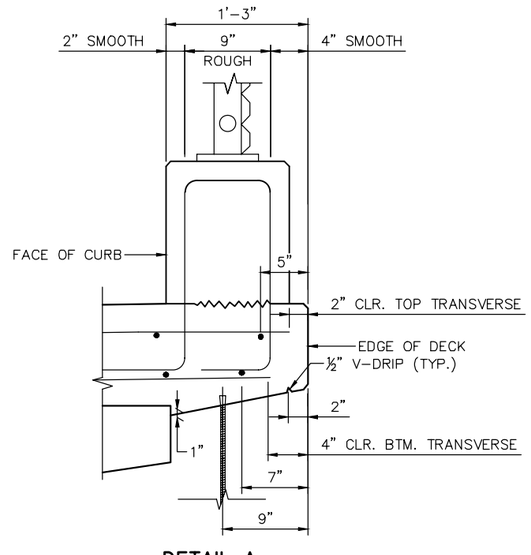
SHEET 16 OF 38



TRANSVERSE SECTION THRU DECK



DETAIL B



DETAIL A

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: BAW | CHECKED BY: BLF
DRAWN BY: LMT | DATE: 8/24/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

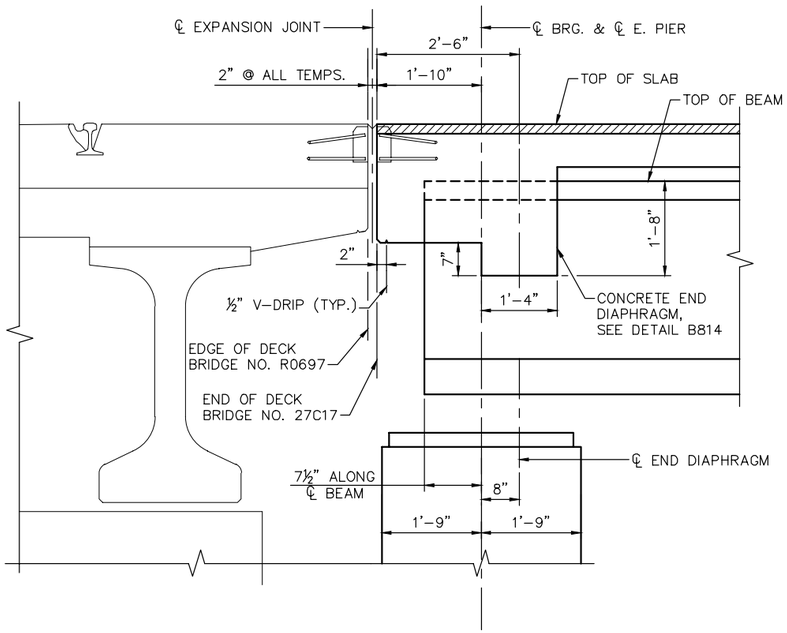
SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4B
CSAH 40 (GLENWOOD AVENUE) - EAST
BRIDGE 27C17
SUPERSTRUCTURE DETAILS 2

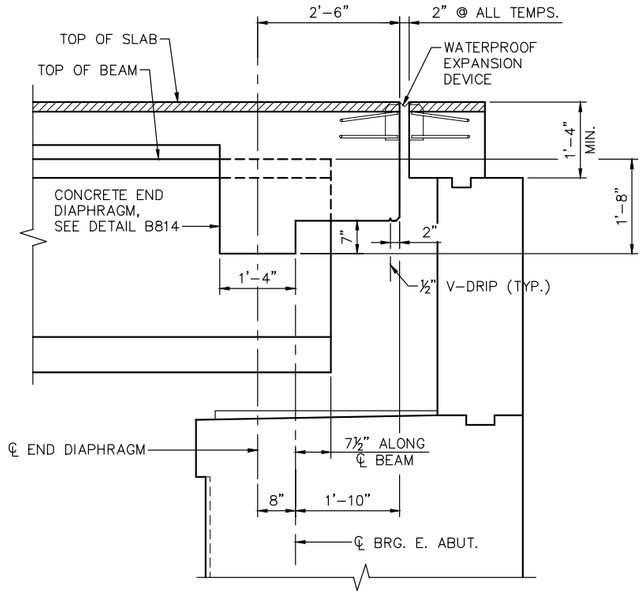
DISCIPLINE: STRUCTURES
SHEET NAME: CBR27C17-BRG-SUP-006-1

SHEET 17 OF 38

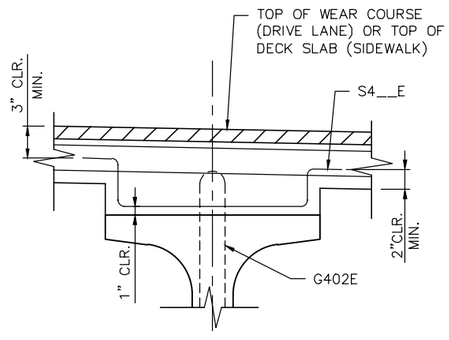
Aug, 24 2015 09:07 am V:\3400_ADC\CAD\SEGMENT E4\PLAN SHEETS\STRUCTURES\27C17\CBR27C17-BRG-SUP-006.dwg By: ryan.kelly



SECTION A-A



SECTION B-B



STOOL TIE DETAIL

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: BAW | CHECKED BY: BLF
DRAWN BY: LMT | DATE: 8/24/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

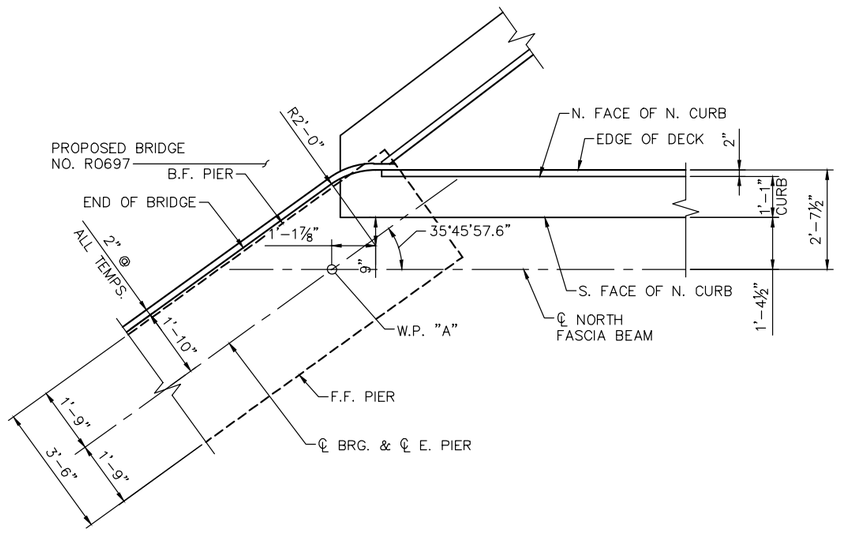
CIVIL EAST - VOLUME 4B
CSAH 40 (GLENWOOD AVENUE) - EAST
BRIDGE 27C17
SUPERSTRUCTURE DETAILS 3

DISCIPLINE: STRUCTURES

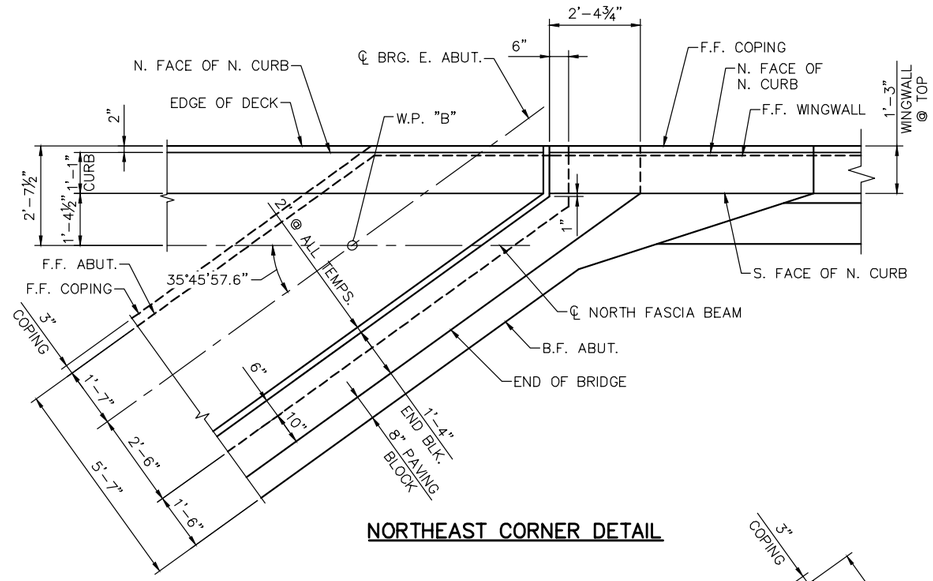
SHEET NAME: CBR27C17-BRG-SUP-006-2

SHEET 18 OF 38

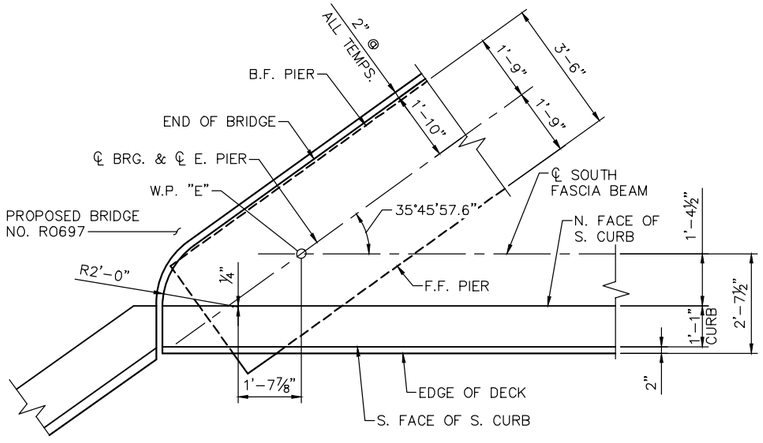
Aug, 24 2015 09:07 am V:\3400_ADC\CAD\SEGMENT E4\PLAN SHEETS\STRUCTURES\27C17\CBR27C17-BRG-SUP-006.dwg By: ryan.kelly



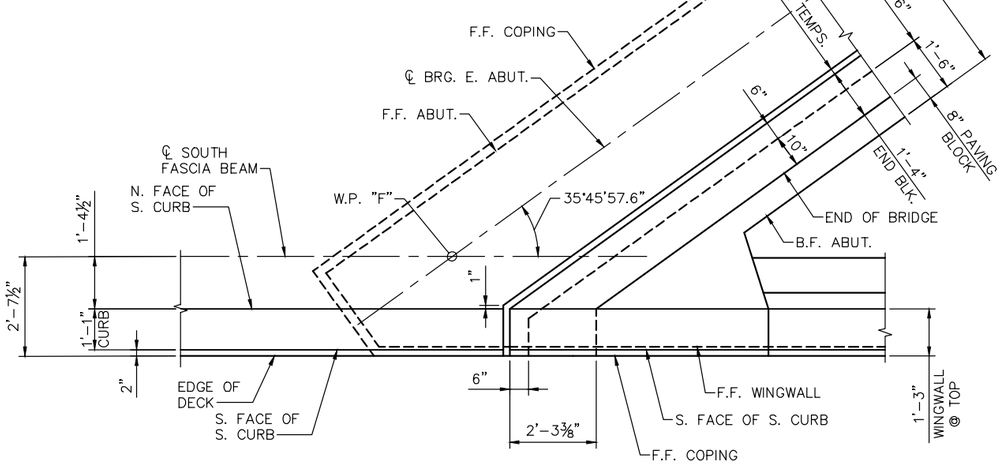
NORTHWEST CORNER DETAIL



NORTHEAST CORNER DETAIL



SOUTHWEST CORNER DETAIL



SOUTHEAST CORNER DETAIL

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: BAW | CHECKED BY: BLF
DRAWN BY: LMT | DATE: 8/24/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

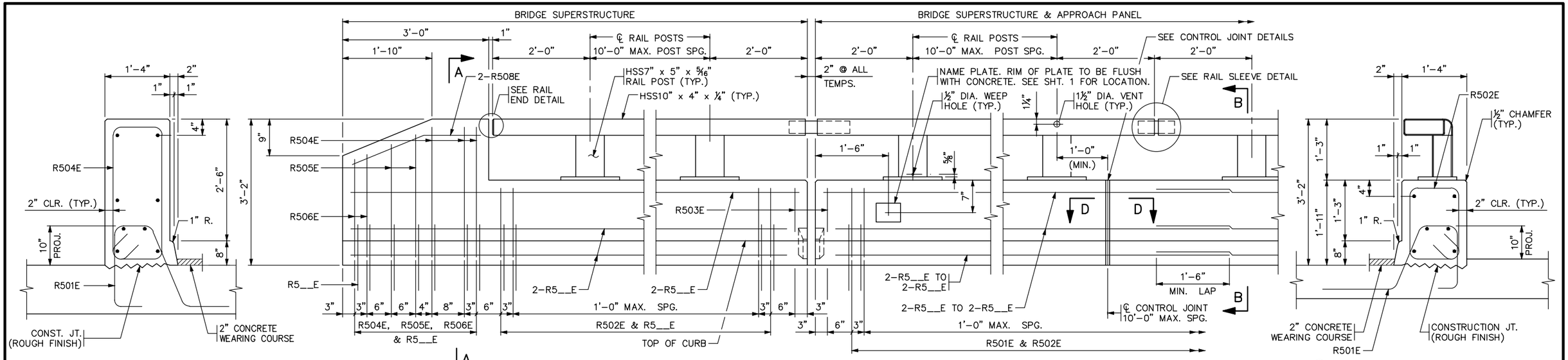
SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4B
CSAH 40 (GLENWOOD AVENUE) - EAST
BRIDGE 27C17
SUPERSTRUCTURE DETAILS 4

DISCIPLINE: STRUCTURES
SHEET NAME: CBR27C17-BRG-SUP-004

SHEET 19 OF 38

Aug. 24 2015 09:07 am V:\3400_ADC\CAD\SEGMENT E4\PLAN SHEETS\STRUCTURES\27C17\CBR27C17-BRG-SUP-004.dwg By: ryan.kelly



Ⓐ SECTION A–A

Ⓐ SECTION B–B

EXPANSION JOINT

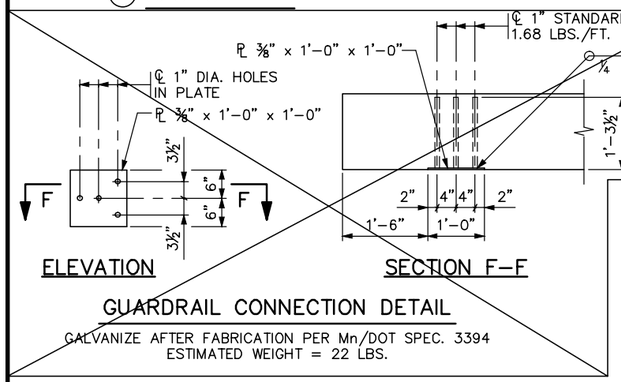
DEVICE NOT SHOWN

CONTROL JOINT

Ⓐ INSIDE ELEVATION OF RAILING

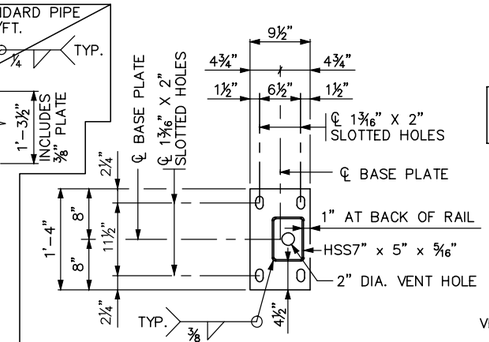
CONCRETE WEARING COURSE NOT SHOWN

RAIL MEETS TEST LEVEL 4 REQUIREMENTS OF NCHRP REPORT 350

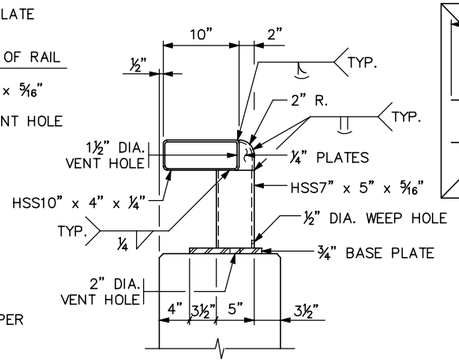


GUARDRAIL CONNECTION DETAIL

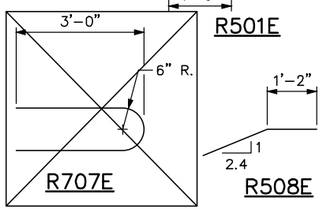
GALVANIZE AFTER FABRICATION PER Mn/DOT SPEC. 3394
ESTIMATED WEIGHT = 22 LBS.



BASE PLATE



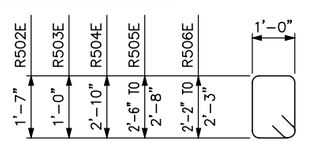
STRUCTURAL TUBE RAIL DETAIL



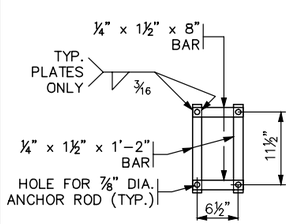
R501E

R707E

R508E

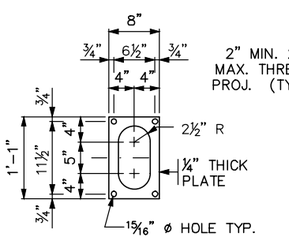


R502E, R503E, R504E, R505E & R506E



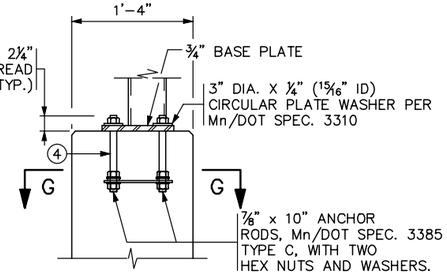
SECTION G–G

ANCHOR BAR ALTERNATE

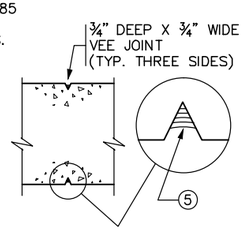


SECTION G–G

ANCHOR PLATE ALTERNATE

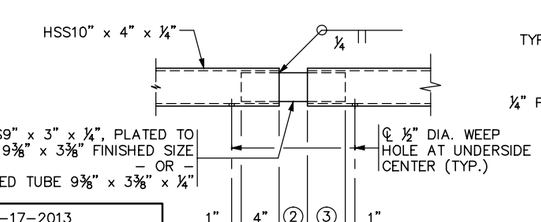


ANCHOR DETAIL

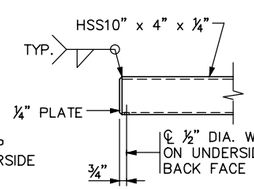


SECTION D–D

CONTROL JOINT DETAILS



RAIL SLEEVE DETAIL



RAIL END DETAIL

BILL OF REINFORCEMENT FOR PARAPET

BAR	NO.	LENGTH	SHAPE	LOCATION
R501E	____	5'–7"	BENT	PARAPET VERTICAL
R502E	____	6'–1"	BENT	PARAPET VERTICAL
R503E	____	4'–11"	BENT	PARAPET VERTICAL
R504E	____	8'–7"	BENT	PARAPET VERTICAL
R505E	– SER. OF 2	7'–11" TO 8'–3"	BENT	PARAPET VERTICAL
R506E	– SER. OF 2	7'–3" TO 7'–5"	BENT	PARAPET VERTICAL
~~R707E~~	~~____~~	~~6' 7"~~	~~BENT~~	~~PARAPET END~~
R508E	____	2'–9"	BENT	PARAPET END LONGIT.
R509E	____	____	———	PARAPET LONGITUDINAL
R510E	____	____	———	PARAPET LONGITUDINAL
R511E	____	____	———	PARAPET LONGITUDINAL
R512E	____	____	———	PARAPET LONGITUDINAL

GENERAL NOTES

FOR PAYMENT OF "TYPE P–2 (TL–4) BARRIER CONCRETE (3S52)" MEASURE LENGTH OF CONCRETE BARRIER BETWEEN END FACES. CONCRETE PARAPET = 396 LBS./FT. (0.098 CU. YDS./FT.)

FOR PAYMENT OF "STRUCTURAL TUBE RAILING DESIGN T–1" MEASURE LENGTH OF RAIL FROM END TO END OF TUBING. DO NOT DEDUCT FOR JOINTS.

FINISH ALL EDGES OF RAIL WITH 1/2" CHAMFER, EXCEPT WHERE OTHERWISE NOTED.

MAX. SPACING OF CONCRETE CONTROL JOINTS SHALL BE 10 FT.

PROVIDE CORRECT ALIGNMENT FOR ANCHORAGES BY PLACING THEM ACCURATELY AND NORMAL TO GRADE. SEE SPECIAL PROVISIONS.

PROVIDE STRUCTURAL STEEL AND PLATE WASHERS PER Mn/DOT SPEC. 3310. PROVIDE STRUCTURAL TUBES PER A.S.T.M. A500, GRADE B AS SPECIFIED IN Mn/DOT SPEC. 3361.

GALVANIZE BOLTS, NUTS, AND WASHERS PER Mn/DOT SPEC. 3392.

GALVANIZE ALL OTHER STRUCTURAL STEEL PER Mn/DOT SPEC. 3394, AFTER FABRICATION.

~~PROVIDE GUARDRAIL CONNECTION STRUCTURAL STEEL PER Mn/DOT SPEC. 3306.~~

~~GUARDRAIL CONNECTION AND NAME PLATE IS INCIDENTAL TO "TYPE P–2 (TL–4) BARRIER CONCRETE (3Y46 OR 3Y46A)".~~

~~PRICE BID FOR "STRUCTURAL TUBE RAILING DESIGN T–1" INCLUDES ANCHORAGES AND ALL MATERIAL ABOVE TOP OF CONCRETE BARRIER.~~

~~ALL MATERIAL IN THE CONCRETE BARRIER IS LISTED IN SUMMARY OF QUANTITIES FOR SUPERSTRUCTURE.~~

SEE SPECIAL PROVISIONS FOR PAINT REQUIREMENTS.

CONTINUOUSLY GROUND THE METAL RAILING AS DIRECTED IN THE SPECIAL PROVISIONS. REFER TO THE ELECTRICAL PLANS AND ELECTRICAL SPECIAL PROVISIONS FOR DETAILS REGARDING BONDING MULTIPLE ELECTRICAL GROUNDING SYSTEMS.

(1) MAKE THICKNESS THE SAME AS SLAB IN SECTION B–B.

(2) 1" AT RAILING JOINTS. AT EXPANSION JOINTS, MAKE 1" LARGER THAN GAP IN EXPANSION JOINTS.

(3) 5" AT RAILING JOINTS AND 8" AT EXPANSION JOINTS.

(4) SUBSTITUTION OF CHEMICAL ANCHOR RODS FOR CAST–IN–PLACE ANCHORAGE IS NOT PERMITTED.

(5) SEE SPECIAL PROVISIONS FOR JOINT SEALING REQUIREMENTS.

DRAFT-WORK IN PROCESS

FIG. 5–397.157 (MOD.)

REVISED: 04–17–2013

APPROVED: MARCH 30, 2010

STATE BRIDGE ENGINEER

SHEET MODIFICATION:
Ⓐ DENOTES MODIFICATION TO STANDARD SHEET

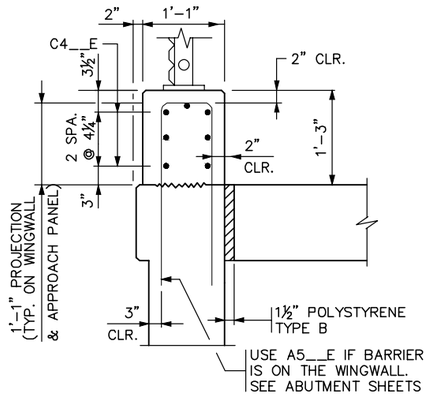
CERTIFIED BY _____ 8/24/15
LICENSED PROFESSIONAL ENGINEER — DATE
NAME: **ENGINEER** LIC. NO. #####

TITLE: STRUCTURAL TUBE RAILING (DESIGN T–1) AND CONCRETE PARAPET (TYPE P–2, TL–4) (WITH INTEGRAL END POST)

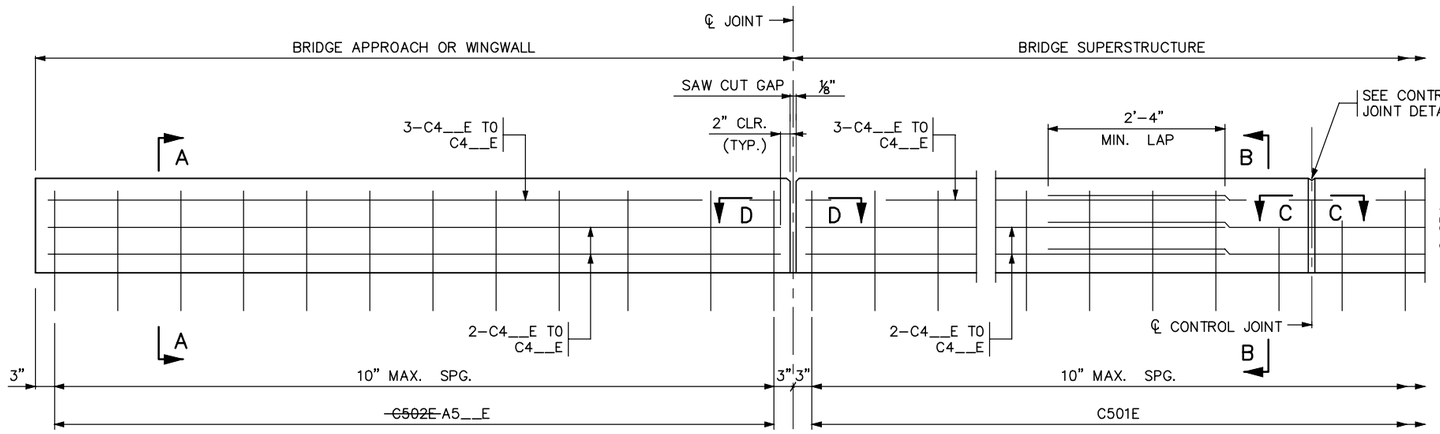
DES: BAW	DR: LMT	APPROVED:	BRIDGE NO. 27C17
CHK: BLF	CHK: BLF		

SHEET NO. 20 OF 38 SHEETS

Aug. 24 2015 09:07 am V:\3400_ADC\CAD\SEGMENT E4\PLAN SHEETS\STRUCTURES\27C17\CBR27C17-BRG-RAL-001.dwg By: ryan.kelly



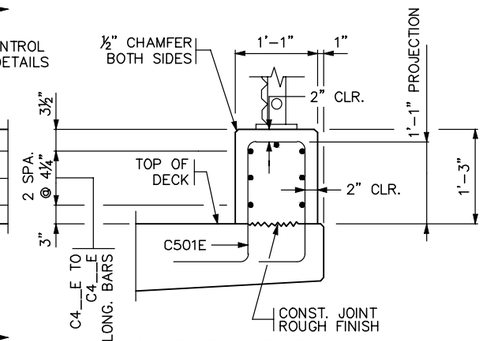
SECTION A–A Ⓐ



JOINT AT ABUTMENT Ⓐ

CONTROL JOINT

INTEGRAL OR SEMI–INTEGRAL ABUTMENT SEE DETAIL "A" FOR PARAPET ABUTMENT

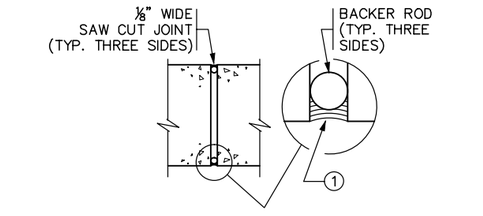


Ⓐ SECTION B–B

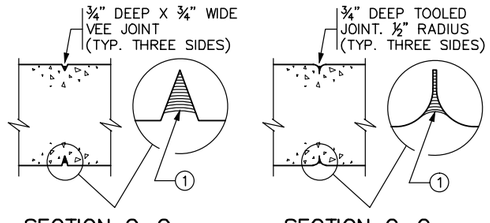
INSIDE ELEVATION OF CONCRETE CURB

CURB DOES NOT MEET CRASH TEST REQUIREMENTS OF NCHRP REPORT 350

BILL OF REINFORCEMENT FOR CURB				
BAR	NO.	LENGTH	SHAPE	LOCATION
Ⓐ C501E	__	5'–8"		CURB BASE VERTICAL
~~C502E~~	~~__~~	~~5'–0"~~		~~CURB BASE VERTICAL~~
C4__E	__	_____	——	CURB BASE LONGIT.
C4__E	__	_____	——	CURB BASE LONGIT.
C4__E	__	_____	——	CURB BASE LONGIT.



SECTION D–D

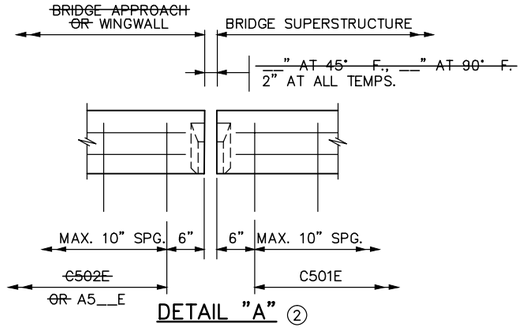


SECTION C–C
CONTRACTOR OPTION 1

SECTION C–C
CONTRACTOR OPTION 2

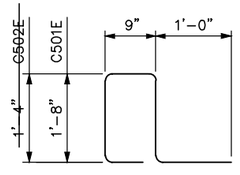
CONTROL JOINT DETAILS

WHEN USING SLIP FORM METHOD TO PLACE THE CONCRETE, CUT JOINT 3 INCHES DEEP USING MARGIN TROWEL OR SIMILAR MEANS IMMEDIATELY AFTER CONCRETE PLACEMENT (TYP. THREE SIDES)



DETAIL "A" ②

(USE ONLY WITH STRIP SEAL EXPANSION DEVICE) (EXPANSION DEVICE NOT SHOWN)



Ⓐ ~~C501E, C502E~~

GENERAL NOTES

CONTINUOUSLY GROUND ALL METAL RAILINGS; SEE THE SPECIAL PROVISIONS. REFER TO THE ELECTRICAL PLANS AND ELECTRICAL SPECIAL PROVISIONS FOR DETAILS REGARDING BONDING MULTIPLE ELECTRICAL GROUNDING SYSTEMS.

PAYMENT LENGTH SHALL BE MEASURED BETWEEN THE OUTSIDE FACES OF THE CONCRETE CURB.

Ⓐ CONCRETE CURB = 204 LBS./FT. (0.050 CU. YDS./FT.)

FINISH ALL EDGES OF CURB WITH ½" CHAMFER, EXCEPT WHERE OTHERWISE NOTED.

MAXIMUM SPACING OF CONTROL JOINTS ON SUPERSTRUCTURE, APPROACH AND WINGWALL SHALL BE 10 FT. SEE SUPERSTRUCTURE SHEET FOR JOINT SPACING.

~~CONCRETE CURB QUANTITIES ARE LISTED IN SUMMARY OF QUANTITIES FOR SUPERSTRUCTURE.~~

① JOINT SEALANT PER MnDOT APPROVED/QUALIFIED PRODUCTS LIST – CRACK AND JOINT MATERIALS – SILICONE JOINT SEALERS.

② REFER TO STANDARD FIGURE 5–397.632 FOR COVER PLATE DETAILS.

REVISION:

APPROVED: NOVEMBER 6, 2013
Nancy Daubenberger
STATE BRIDGE ENGINEER

SHEET MODIFICATION:
Ⓐ DENOTES MODIFICATION TO STANDARD SHEET

CERTIFIED BY _____ 8/24/15
LICENSED PROFESSIONAL ENGINEER — DATE
NAME: **ENGINEER** LIC. NO. #####

TITLE: CONCRETE CURB ~~FOR USE WITH ORNAMENTAL RAILING~~

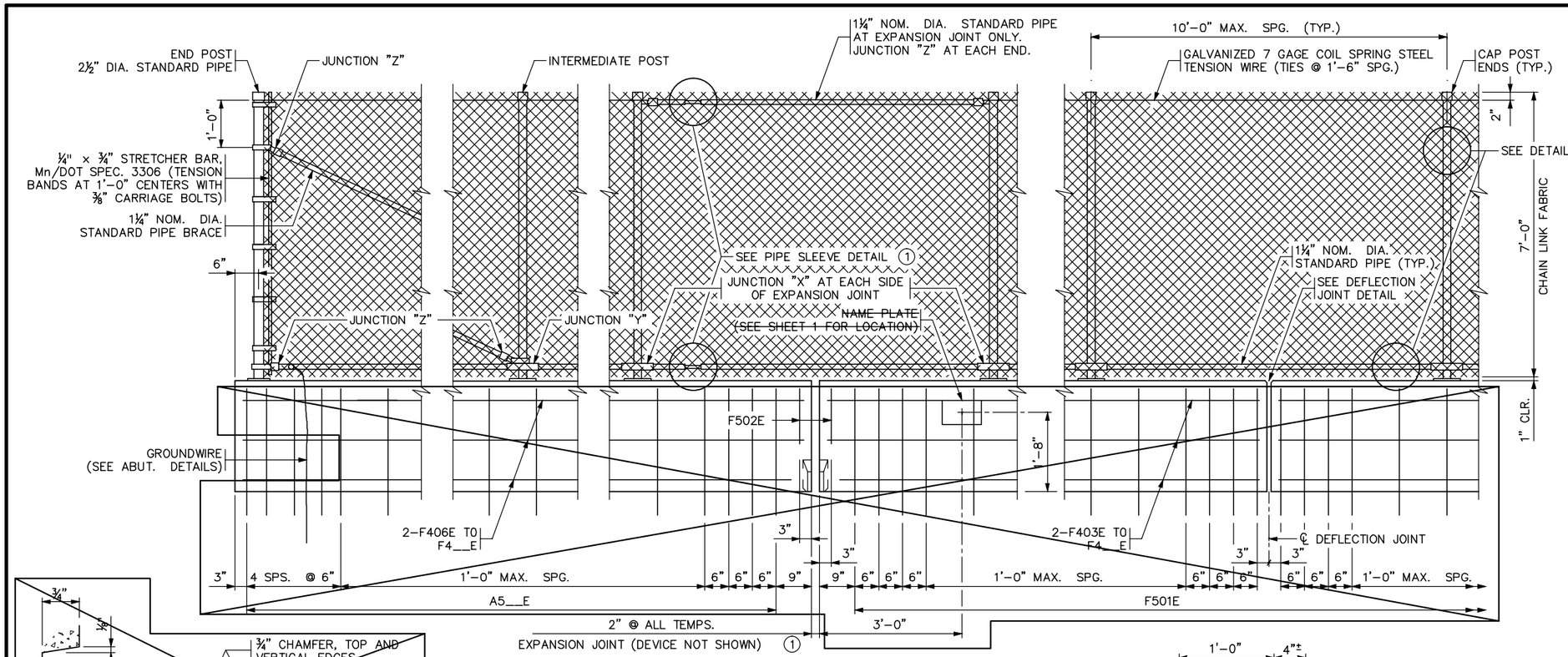
DRAFT-WORK IN PROCESS

FIG. 5–397.167 (MOD.)

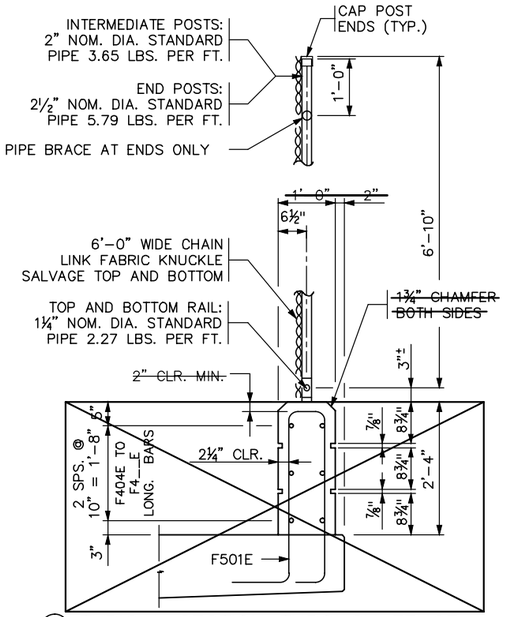
DES: BAW	DR: LMT	APPROVED:
CHK: BLF	CHK: BLF	

SHEET NO. **21** OF **38** SHEETS

BRIDGE NO. **27C17**



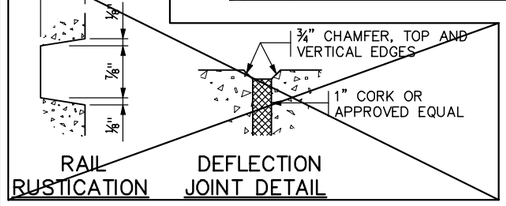
Ⓐ INSIDE ELEVATION OF RAILING

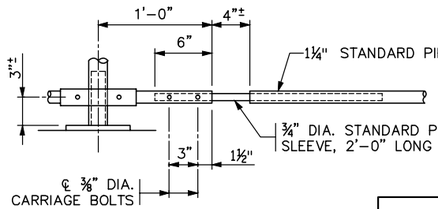


Ⓐ TYPICAL SECTION THROUGH FENCE

INTERMEDIATE POST SHOWN

SHEET MODIFICATION:
Ⓐ DENOTES MODIFICATION TO STANDARD SHEET





PIPE SLEEVE DETAIL (1)

GENERAL NOTES

Ⓐ SEE CONCRETE CURB SHEET FOR DIMENSIONS, REINFORCEMENT AND NOTES.

~~LENGTH OF "TYPE P-1 RAILING CONCRETE (3Y46 OR 3Y46A)" FOR PAYMENT SHALL BE MEASURED BETWEEN THE OUTSIDE FACES OF THE CONCRETE RAIL.~~

Ⓐ LENGTH OF "WIRE FENCE DESIGN 84V-9322" FOR PAYMENT SHALL BE MEASURED BETWEEN THE CENTERS OF END RAILPOSTS.

~~CONCRETE RAILING = 350 LBS./FT. (0.086 CU. YDS./FT.)~~

FENCE POST ANCHORAGES SHALL BE TYPE A. SEE DETAIL B905 "FENCE POST ANCHORAGE".

~~MAXIMUM SPACING OF DEFLECTION JOINTS SHALL BE 20 FT. FOR SPACING OF FENCE POST, JOINTS AND ELECTRICAL GROUNDS, SEE SUPERSTRUCTURE SHEETS.~~

FENCE POSTS AND FENCE POST ANCHORAGES SHALL BE SET VERTICAL, UNLESS OTHERWISE NOTED.

℄ OF FENCE POST ANCHORAGE SHALL BE A MINIMUM OF 6" FROM JOINTS.

END POSTS AND BRACING SHALL BE AT 500 FT. MAXIMUM INTERVALS.

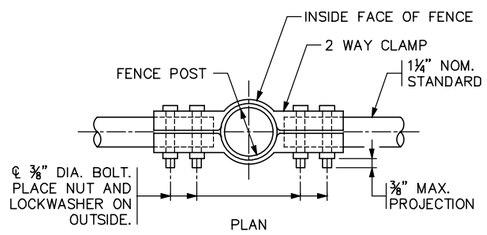
ALL POSTS SHALL HAVE A MEANS TO SECURELY HOLD THE TOP TENSION WIRE IN POSITION AND ALLOW FOR THE REMOVAL AND REPLACEMENT OF A POST WITHOUT DAMAGING THE TOP WIRE.

WIRE TIES MAY BE 9 GAGE GALVANIZED STEEL OR 0.179" MIN. ALUMINUM ALLOY CONFORMING TO A.S.T.M. B211, ALLOY 1100-H18. USE 12½ GAGE GALVANIZED HOG RINGS FOR TENSION WIRE TIES.

~~ALL MATERIAL IN THE CONCRETE BASE AND END POST IS INCLUDED IN THE SUPERSTRUCTURE QUANTITIES.~~

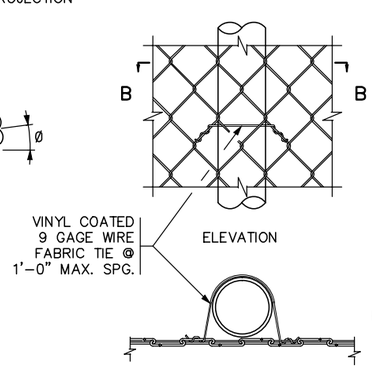
SEE SPECIAL PROVISIONS FOR REQUIREMENTS NOT INCLUDED ON THIS SHEET ~~AND FOR BASIS OF PAYMENT.~~

(1) PROVIDE PIPE SLEEVE IN SPAN BETWEEN THE VERTICAL POSTS AT EXPANSION JOINT. SEE SUPERSTRUCTURE SHEETS FOR LOCATION.

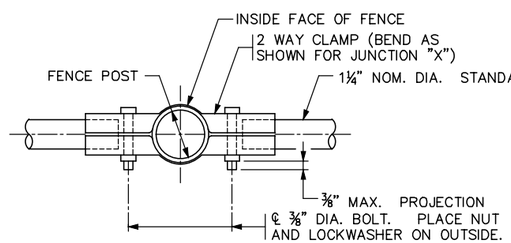


JUNCTION "X"

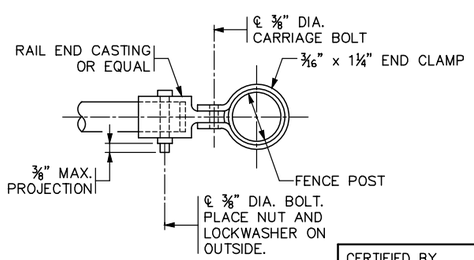
2 WAY CLAMP BENDING TABLE	
GRADE OF FENCE	Ø
0° TO 2°	0°
2° TO 6°	4°
6° TO 10°	8°



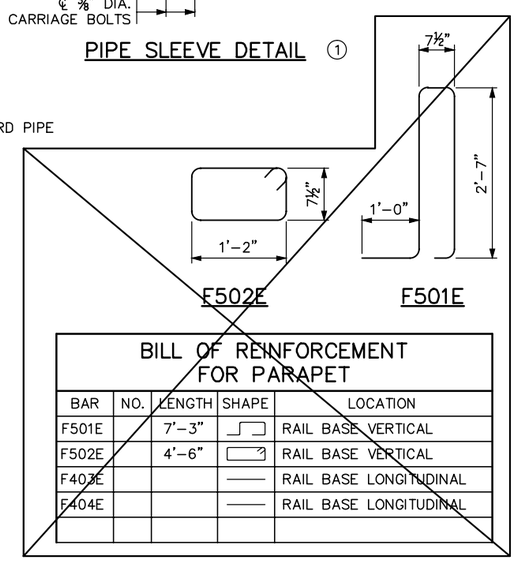
DETAIL "A"



JUNCTION "Y"



JUNCTION "Z"



BILL OF REINFORCEMENT FOR PARAPET				
BAR	NO.	LENGTH	SHAPE	LOCATION
F501E		7'-3"		RAIL BASE VERTICAL
F502E		4'-6"		RAIL BASE VERTICAL
F403E			——	RAIL BASE LONGITUDINAL
F404E			——	RAIL BASE LONGITUDINAL

REVISED: 04-17-2013

APPROVED: DECEMBER 18, 2003

STATE BRIDGE ENGINEER

CERTIFIED BY _____ LICENSED PROFESSIONAL ENGINEER 8/24/15 DATE

NAME: ENGINEER LIC. NO. #####

TITLE: WIRE FENCE Ⓐ (DIAMOND MESH SAFETY RAIL)

DRAFT-WORK IN PROCESS

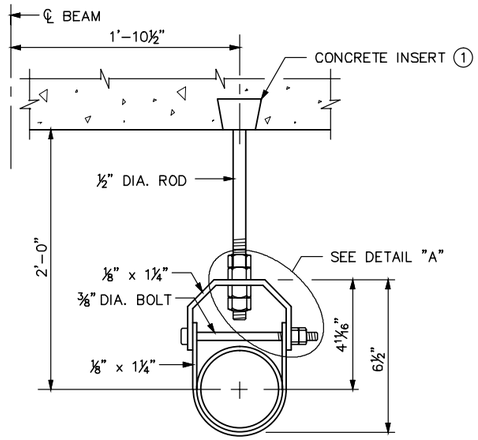
FIG. 5-397.119 (MOD.)

DES: BAW	DR: LMT	APPROVED:
CHK: BLF	CHK: BLF	

SHEET NO. 22 OF 38 SHEETS

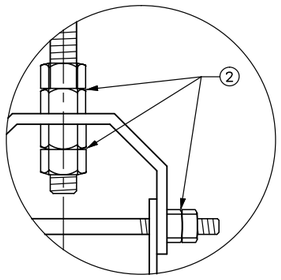
BRIDGE NO. 27C17

Aug. 24 2015 09:08 am V:\3400_ADC\CAD\SEGMENT E4\PLAN SHEETS\STRUCTURES\27C17\CBR27C17-BRG-RAL-001.dwg By: ryan.kelly

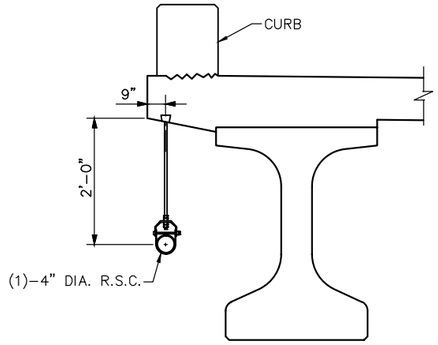


CONDUIT HANGER DETAIL

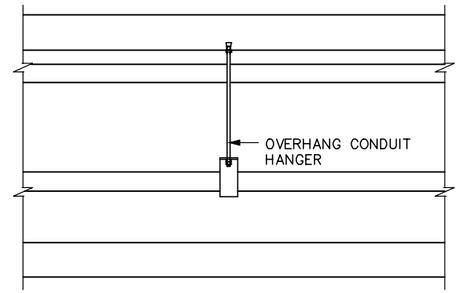
(FOR SYSTEM WIDE ELECTRICAL CONDUIT SYSTEM)



DETAIL "A"

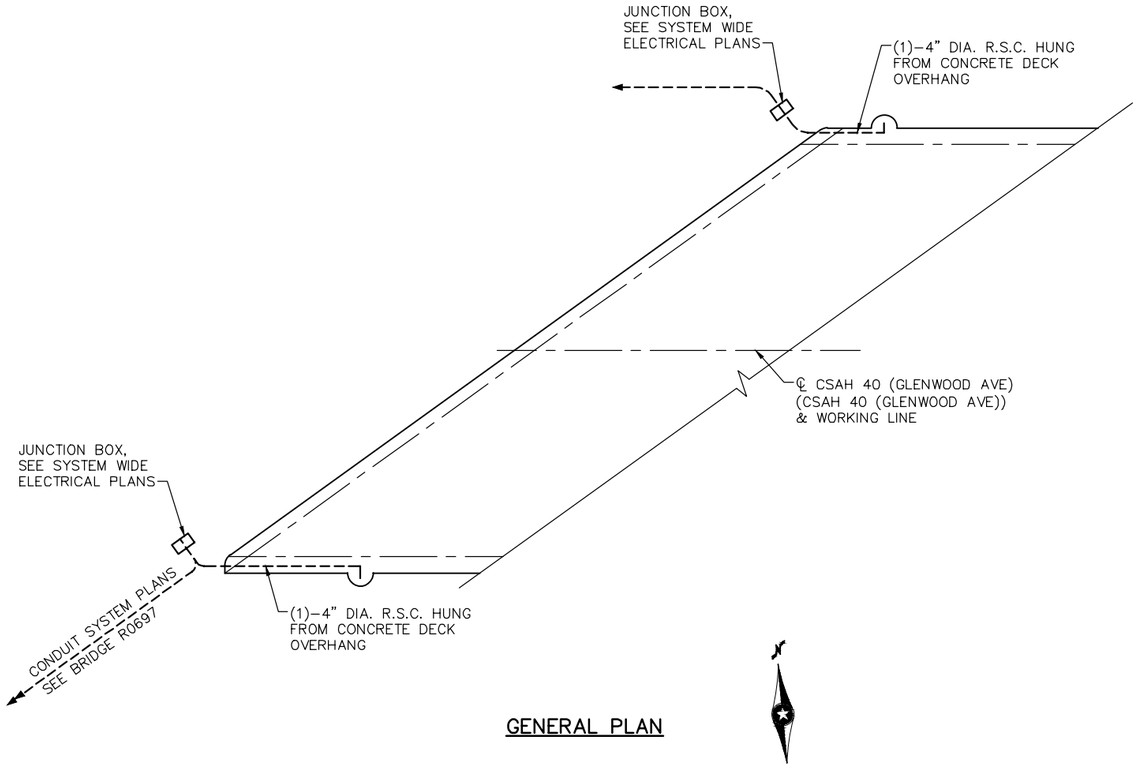


OVERHANG CONDUIT DETIAL



LONGITUDINAL SECTION

(FOR SYSTEMWIDE ELECTRICAL CONDUIT SYSTEM)



GENERAL PLAN

NOTES:

RODS SHALL COMPLY WITH MnDOT SPEC. 3313, TYPE I.

FLAT BARS AND ANCHORAGES SHALL COMPLY WITH SPEC. 3306.

CONCRETE INSERTS SHALL BE APPROVED TYPE MALLEABLE IRON. MATERIAL AS PER SPEC. 3324, GRADE 35018. TAP AFTER GALVANIZING.

GALVANIZE BOLTS, NUTS, WASHERS, RODS AND INSERTS AS PER SPEC. 3392. GALVANIZE OTHER MATERIAL AS PER SPEC. 3394 AFTER FABRICATION.

① SPACE INSERTS AT 10'-0" MAXIMUM CENTERS.

② DOUBLE NUTS OR JAM NUTS OR LOCK NUT.

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: BAW | CHECKED BY: BLF
DRAWN BY: LMT | DATE: 8/24/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

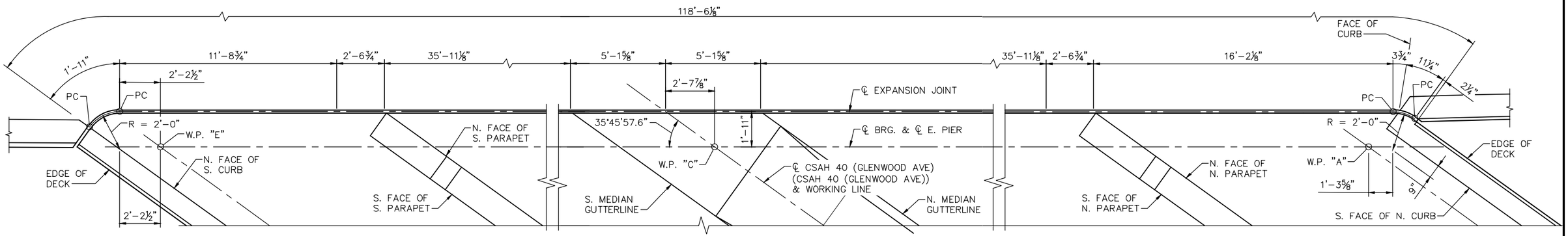
SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4B
CSAH 40 (GLENWOOD AVENUE) - EAST
BRIDGE 27C17
CONDUIT SYSTEM

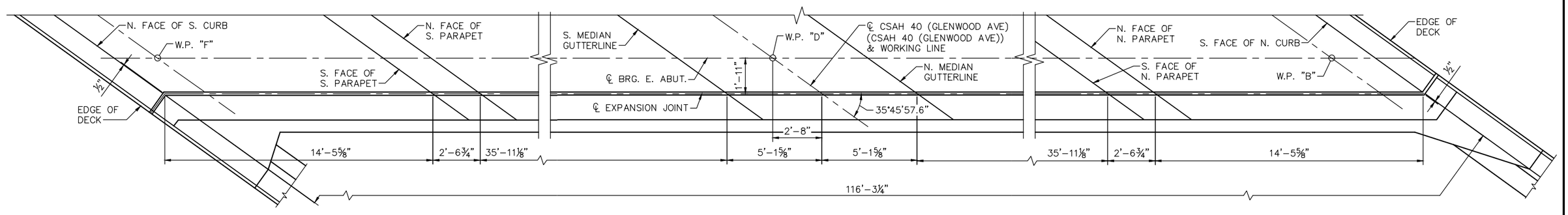
DISCIPLINE: STRUCTURES
SHEET NAME: CBR27C17-BRG-SYS-001

SHEET 23 OF 38

Aug, 24 2015 09:08 am V:\3400_ADC\CAD\SEGMENT E4\PLAN SHEETS\STRUCTURES\27C17\CBR27C17-BRG-SYS-001.dwg By: ryan.kelly



PLAN VIEW
EXPANSION JOINT AT EAST PIER



PLAN VIEW
EXPANSION JOINT AT EAST ABUTMENT

NOTES:
ALL DIMENSIONS ALONG ℄ OF EXPANSION JOINT.

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: BAW | CHECKED BY: BLF
DRAWN BY: LMT | DATE: 8/24/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

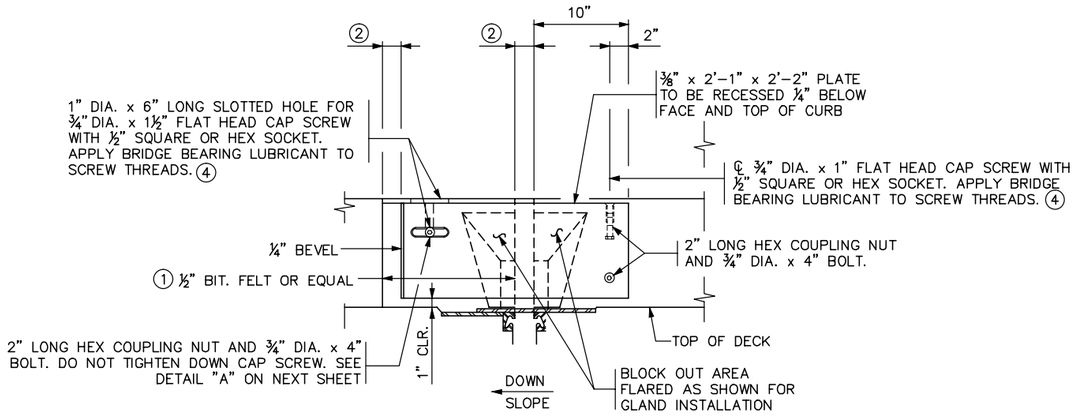
SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4B
CSAH 40 (GLENWOOD AVENUE) - EAST
BRIDGE 27C17
WATERPROOF EXPANSION DEVICE 1

DISCIPLINE: STRUCTURES
SHEET NAME: CBR27C17-BRG-EXP-001

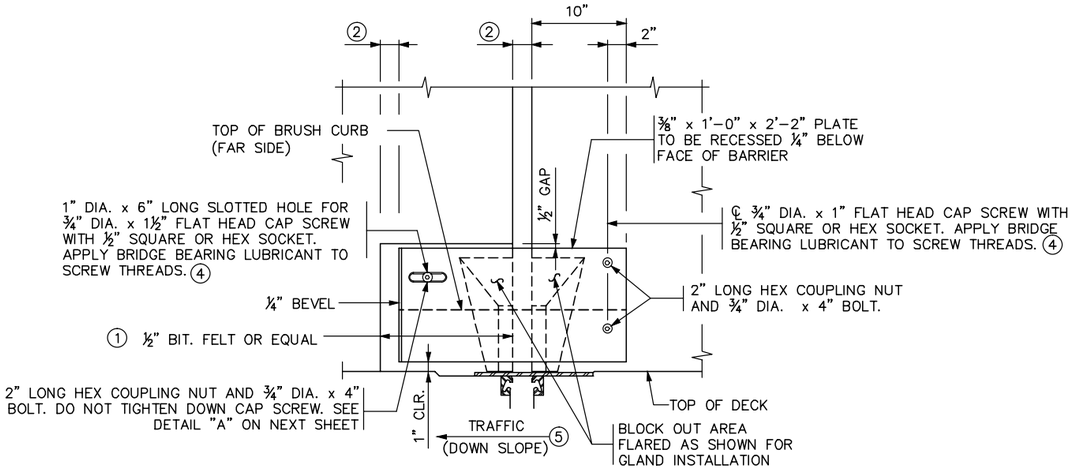
SHEET 24 OF 38

Aug, 24 2015 09:08 am V:\3400_ADC\CAD\SEGMENT E4\PLAN SHEETS\STRUCTURES\27C17\CBR27C17-BRG-EXP-001.dwg By: ryan.kelly



(A) INSIDE ELEVATION OF CONCRETE CURB

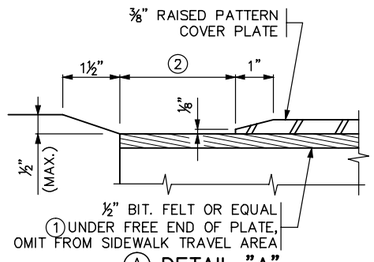
(ELEVATION @ SIDEWALK SHOWN)



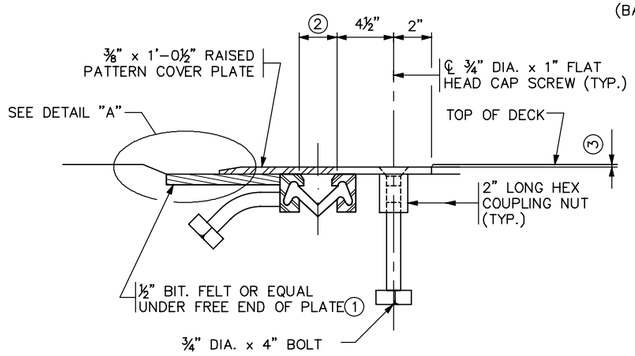
(A) OUTSIDE ELEVATION OF P-2 PARAPET

(BACK OF TYPE P-2 PARAPET, FRONT FACE SIMILAR, ELEVATION @ SIDEWALK SHOWN)

NOTE:
TRANSVERSE DECK REINFORCEMENT MAY BE SHIFTED THE MINIMUM DISTANCE REQUIRED FOR EXPANSION DEVICE PLACEMENT



(A) DETAIL "A"



SECTION D-D

GENERAL NOTES

(A) SEE NEXT SHEET FOR ADDITIONAL DETAILS AND NOTES.

3/4" DIA. X 1" FLAT HEAD CAP SCREW WITH 1/2" SQUARE OR HEX SOCKET PER SPEC 3391. CAP SCREWS SHALL BE COUNTERSUNK 1/16" BELOW TOP OF PLATE. APPLY BRIDGE BEARING LUBRICANT TO SCREW THREADS. (4)

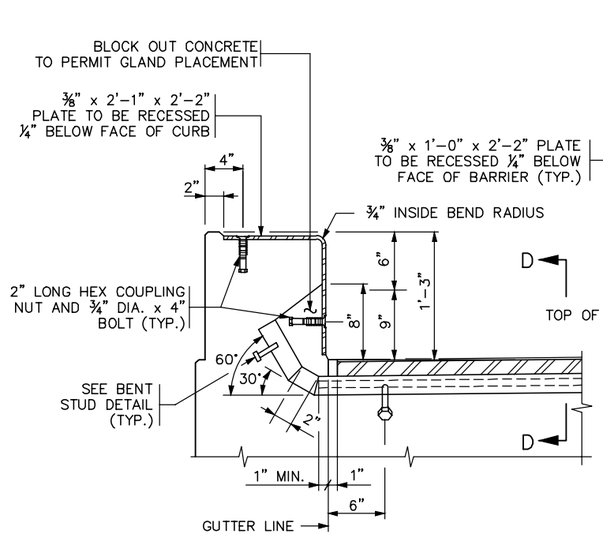
(1) USE LARGEST SINGLE PIECE POSSIBLE. USE OF SMALL PIECES OR SCRAPS SECURED TOGETHER IS PROHIBITED.

(A) (2) 2" @ ALL TEMPS.

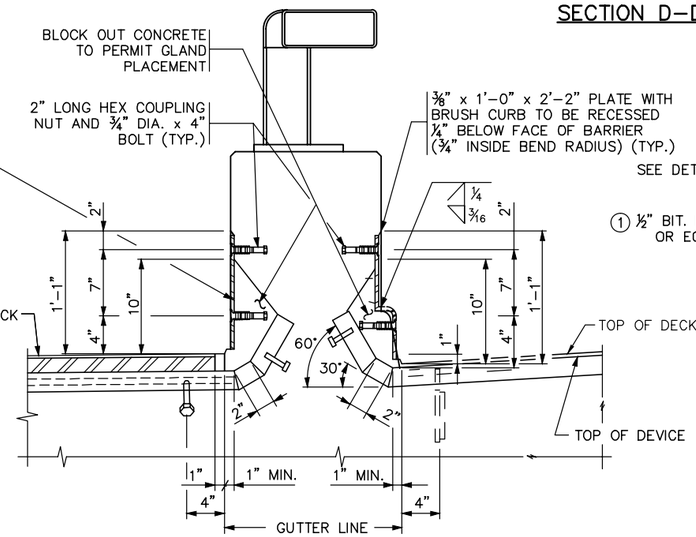
(3) 1/8" (1/4" MAX.).

(4) LUBRICANT PER MnDOT APPROVED/QUALIFIED PRODUCTS LIST: BRIDGE - BRIDGE BEARING LUBRICANT.

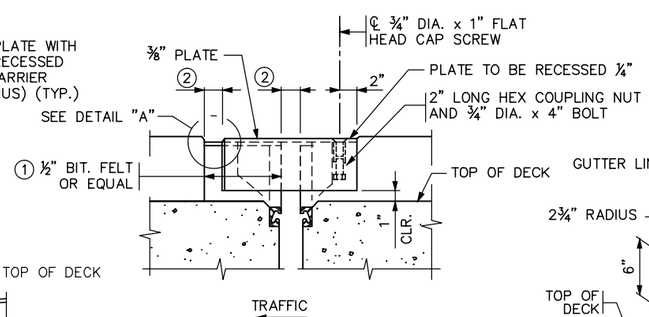
(A) (5) DOWN SLOPE DIRECTION APPLIES TO 3/8" x 1'-0 1/2" RAISED COVER PLATE



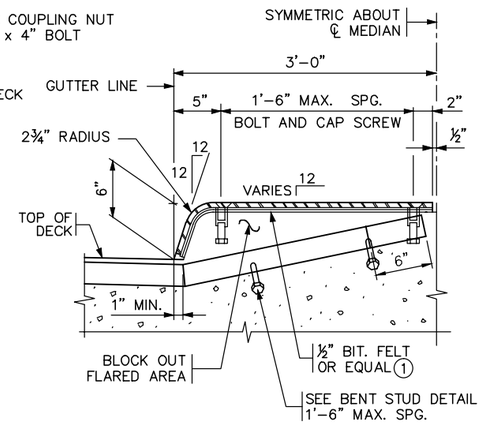
CONCRETE CURB



TYPE P-2 PARAPET



MEDIAN ELEVATION



(A) MEDIAN SECTION

SHEET MODIFICATION:
(A) DENOTES MODIFICATION TO STANDARD SHEET

SECTION THROUGH PARAPET AND CURB - INTEGRAL SIDEWALK (A)

(BENT STUDS MAY BE USED ON EAST ABUTMENT EXPANSION JOINT IN SIDEWALK AREA.)
(ALL OTHER LOCATIONS SHALL BE BAR-RODS.)

REVISION:

APPROVED: NOVEMBER 6, 2013
Nancy Daubenberger
STATE BRIDGE ENGINEER

DRAFT-WORK IN PROCESS

CERTIFIED BY _____ 8/24/15
LICENSED PROFESSIONAL ENGINEER — DATE
NAME: **ENGINEER** LIC. NO. #####

TITLE: WATERPROOF EXPANSION DEVICE (RAISED MEDIAN OR INTEGRAL SIDEWALK WITH CURB)

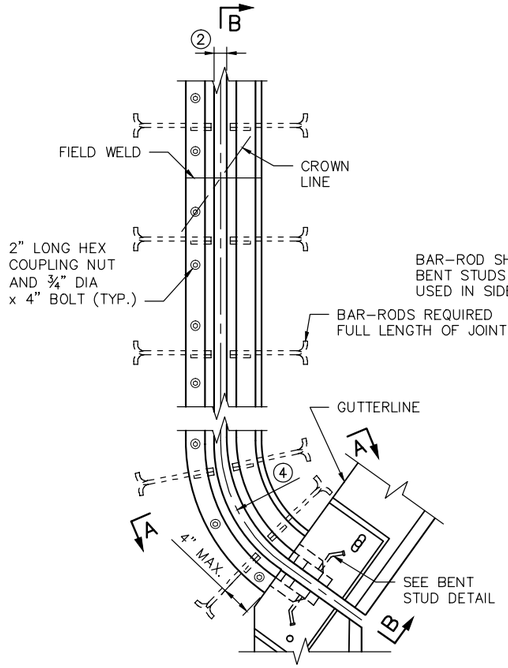
DES: BAW	DR: LMT	APPROVED:
CHK: BLF	CHK: BLF	

SHEET NO. **25** OF **38** SHEETS

FIG. 5-397.632 (MOD.)

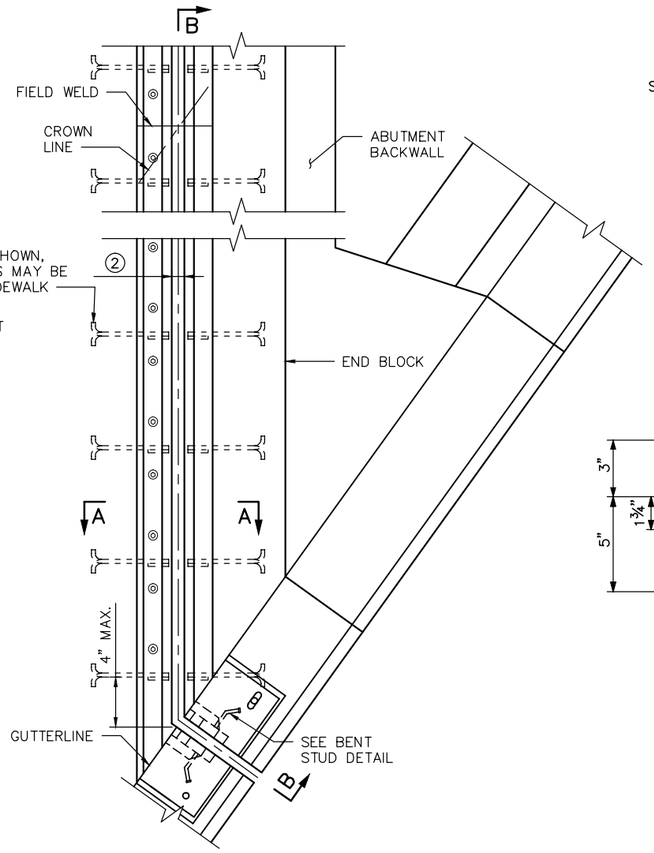
BRIDGE NO. **27C17**

Aug, 24 2015 09:08 am V:\3400_ADC\CAD\SEGMENT E4\PLAN SHEETS\STRUCTURES\27C17\CBR27C17-BRG-EXP-002.dwg By: ryan.kelly



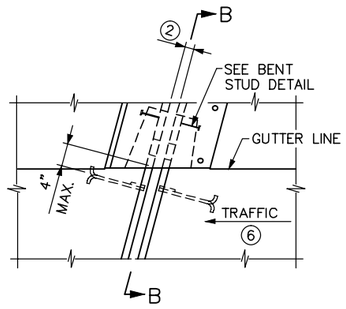
PLAN VIEW @ EXPANSION DEVICE

(EAST PIER, SOUTH SHOWN NORTH SIMILAR)



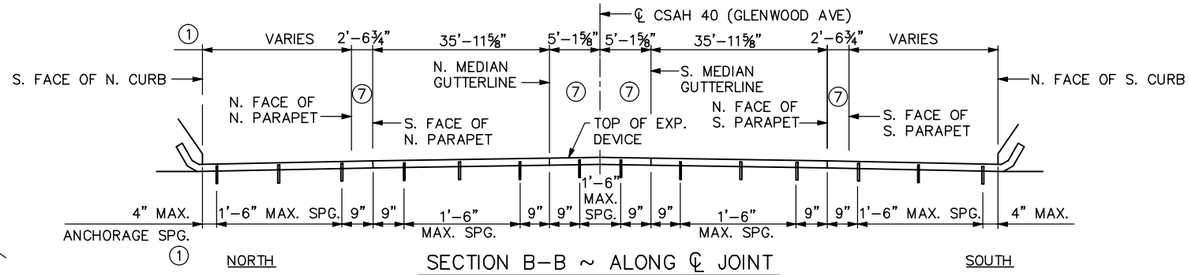
PLAN VIEW @ EXPANSION DEVICE

(EAST ABUTMENT, SOUTH SHOWN NORTH SIMILAR)



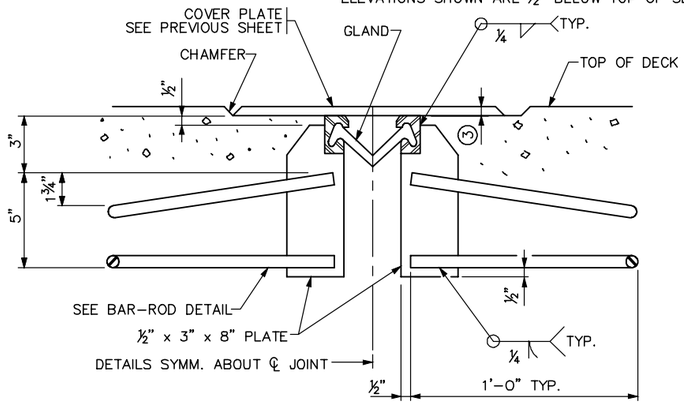
PLAN VIEW @ EXPANSION DEVICE

(MEDIAN OR SIDEWALK ALTERNATE)



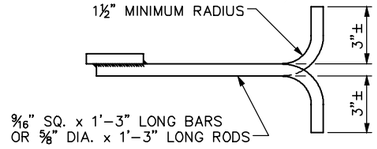
SECTION B–B ~ ALONG ℄ JOINT

⑧ (ELEVATIONS SHOWN ARE ⅛" BELOW TOP OF SLAB @ ℄ JOINT
ELEVATIONS SHOWN ARE ½" BELOW TOP OF SLAB @ ℄ JOINT WITH COVER PLATE)



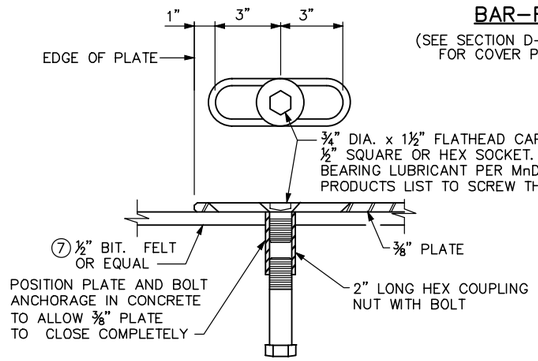
SECTION A–A

(SECTION @ SIDEWALK SHOWN W/COVER PLATE. OMIT COVER PLATE IN ROADWAY)

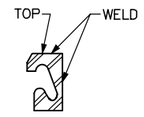


BAR–ROD DETAIL ⑤

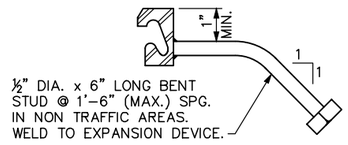
(SEE SECTION D–D ON PREVIOUS SHEET FOR COVER PLATE SCREW DETAIL)



DETAIL "A"



SECTION C–C



BENT STUD DETAIL

⑧ ELEVATIONS

LOCATION	EAST PIER	EAST ABUT.
S. FACE OF N. CURB	851.49	848.84
N. FACE OF N. PARAPET	851.41	849.18
S. FACE OF N. PARAPET	851.43	849.27
N. MEDIAN GUTTERLINE	851.25	850.25
CL CSAH 40 (GLENWOOD AVE)	851.22	
S. MEDIAN GUTTERLINE	851.19	850.25
N. FACE OF S. PARAPET	850.99	850.31
S. FACE OF S. PARAPET	850.94	850.38
N. FACE OF S. CURB	850.86	850.71

NOTES:

GALVANIZE STRUCTURAL STEEL AFTER FABRICATION AS PER MnDOT SPEC. 3394. GALVANIZE FASTENERS AS PER MnDOT SPEC. 3392.

JOINTS IN EXTRUSION SHALL BE LOCATED AT BREAKS IN TRANSVERSE PROFILE AND AS OTHERWISE REQUIRED. JOINTS SHALL BE CLOSE FIT AND WELDED. REPAIR AFTER WELDING AS PER MnDOT SPEC. 2471.3.L.

STRUCTURAL STEEL SHALL COMPLY WITH MnDOT SPEC. 3306 OR MnDOT SPEC. 3309.

EXPANSION DEVICE SHALL BE STRAIGHTENED TO A TOLERANCE OF ⅛" IN 10 FT.

¾" DIA. X 1½" FLATHEAD CAP SCREW WITH ½" SQUARE OR HEX SOCKET PER MnDOT SPEC 3391. CAP SCREWS SHALL BE COUNTERSUNK ⅛" BELOW TOP OF PLATE. APPLY BRIDGE BEARING LUBRICANT PER MnDOT APPROVED PRODUCTS LIST TO SCREW THREADS.

LENGTH OF PAYMENT FOR DEVICE IS FROM OUT TO OUT OF EXTRUSION ALONG CENTERLINE OF JOINT.

① DIMENSIONS ARE ALONG CENTERLINE OF JOINT. SEE SHEET 24 FOR ADDITIONAL DIMENSIONS.

② 2" AT ALL TEMPERATURES.

③ ⅛" (¼" MAX.).

④ SEE SHEET 24 FOR RADIUS.

⑤ PLACE BAR–ROD NORMAL TO JOINT.

⑥ SEE SHEET 1 FOR DIRECTION OF TRAFFIC.

⑦ EAST ABUTMENT, EXTRUSION NON–CONTINUOUS AND ANGLED UP, SEE DETAILS ON PREVIOUS SHEET.

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: BAW | CHECKED BY: BLF
DRAWN BY: LMT | DATE: 8/24/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

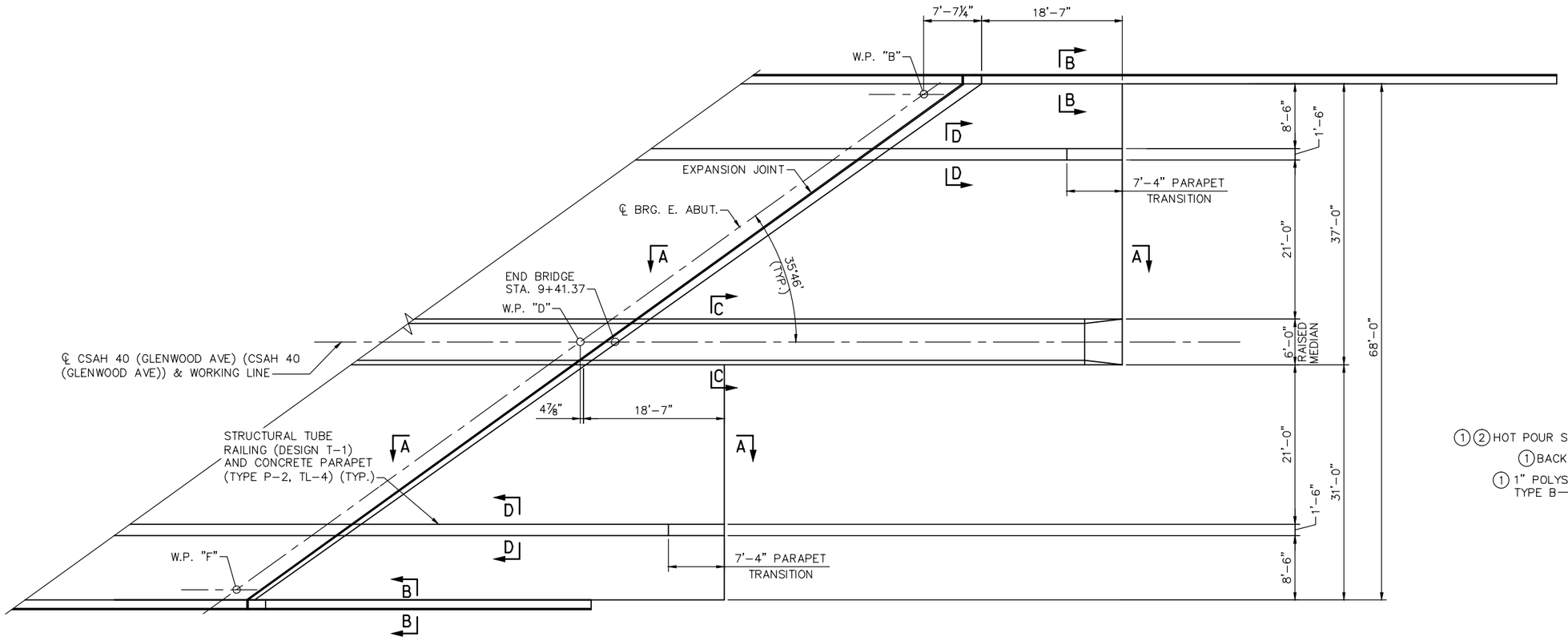
SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4B
CSAH 40 (GLENWOOD AVENUE) - EAST
BRIDGE 27C17
WATERPROOF EXPANSION DEVICE 3

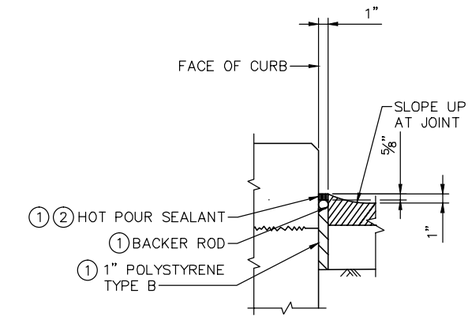
DISCIPLINE: STRUCTURES
SHEET NAME: CBR27C17-BRG-EXP-002-2

SHEET 26 OF 38

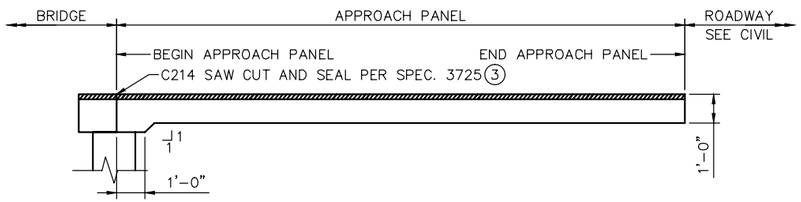
Aug, 24 2015 09:08 am V:\3400_ADC\CAD\SEGMENT E4\PLAN SHEETS\STRUCTURES\27C17\CBR27C17-BRG-EXP-002.dwg By: ryan.kelly



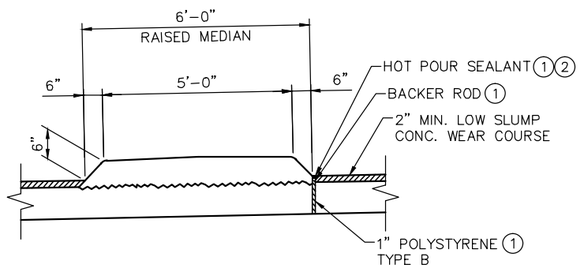
PLAN VIEW



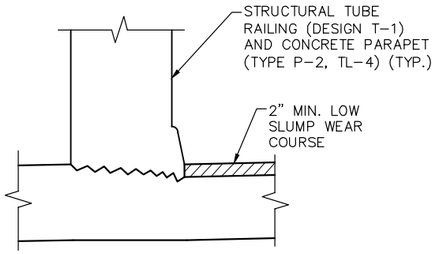
SECTION B-B



SECTION A-A



SECTION C-C



SECTION D-D

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 ⅛" BELOW TOP OF PAVEMENT SURFACE.
3. ALL JOINTS SHALL BE SAWCUT. SAWCUTS SHALL BE MADE WHILE THE CONCRETE IS STILL GREEN. WHEN A CONCRETE WEARING COURSE IS SPECIFIED, THE JOINTS SHALL BE SAWN THROUGH BOTH THE WEARING COURSE AND THE UNDERLYING APPROACH PANEL IN A SINGLE OPERATION.

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: BAW | CHECKED BY: BLF
DRAWN BY: LMT | DATE: 8/24/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

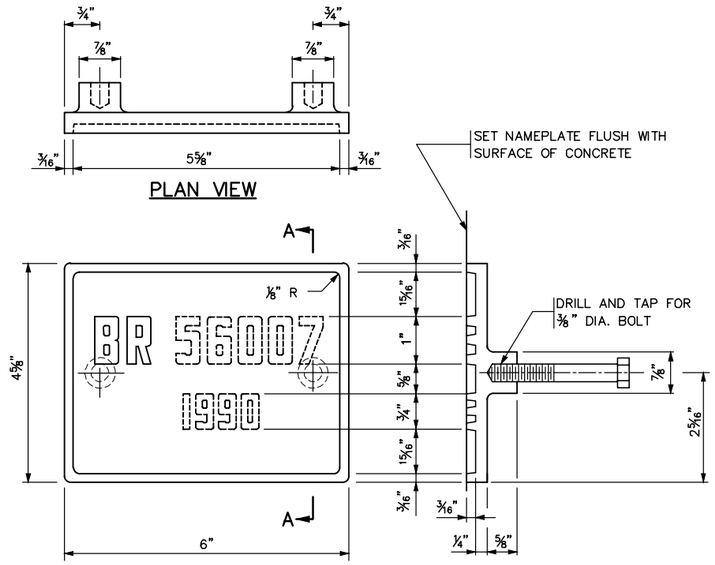
SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4B
CSAH 40 (GLENWOOD AVENUE) - EAST
BRIDGE 27C17
APPROACH PANEL

DISCIPLINE: STRUCTURES
SHEET NAME: CBR27C17-BRG-DTL-003

SHEET 27 OF 38

Aug, 24 2015 09:08 arn V:\3400_ADC\CAD\SEGMENT E4\PLAN SHEETS\STRUCTURES\27C17\CBR27C17-BRG-DTL-003.dwg By: ryan.kelly



THE DASHED NUMBERS SHOWN ABOVE ARE FOR ILLUSTRATION.
DATA TO BE SHOWN ON NAMEPLATE IS AS FOLLOWS:

BRIDGE 27C17

YEAR 2016

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".

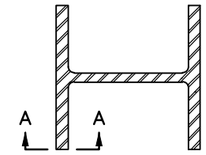
HORIZONTAL SPACING OF LETTERS AND NUMBERS SHALL PRODUCE A BALANCED LAYOUT IN PROPORTION TO SPACING SHOWN.

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

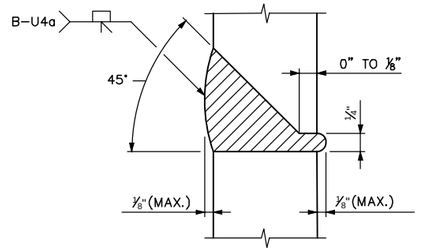
FURNISH 2 STEEL BOLTS ⅜ " DIA. x 3" LONG WITH EACH PLATE.

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

APPROVED: NOVEMBER 22, 2002	STATE OF MINNESOTA DEPARTMENT OF TRANSPORTATION	REVISION 09–11–2014	DETAIL NO.
STATE BRIDGE ENGINEER	BRIDGE NAMEPLATE (FOR NEW BRIDGES)		B101



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.

APPROVED: NOVEMBER 22, 2002	STATE OF MINNESOTA DEPARTMENT OF TRANSPORTATION	REVISION: 11–06–2013	DETAIL NO.
STATE BRIDGE ENGINEER	PILE SPLICE (STEEL H BEARING PILES 10" TO 14")		B202

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: BAW | CHECKED BY: BLF
DRAWN BY: LMT | DATE: 8/24/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

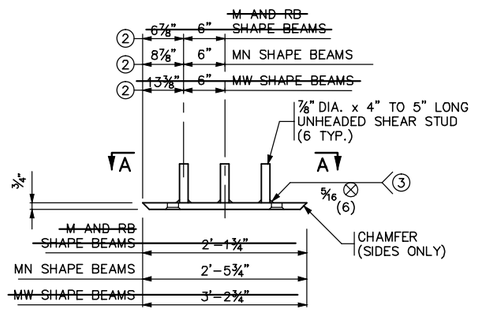
METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

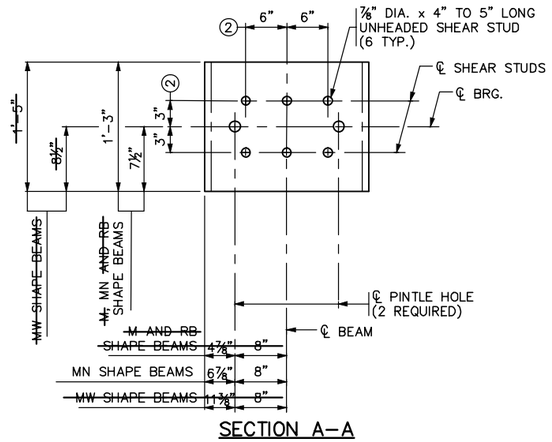
CIVIL EAST - VOLUME 4B
CSAH 40 (GLENWOOD AVENUE) - EAST
BRIDGE 27C17
DETAILS 1

DISCIPLINE: STRUCTURES
SHEET NAME: CBR27C17-BRG-DTL-001-1

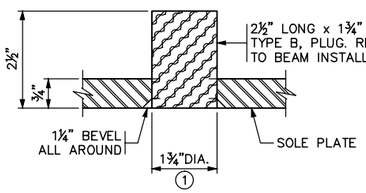
SHEET 28 OF 38



FRONT ELEVATION



SECTION A–A



PINTLE HOLE DETAIL

NOTES:

MATERIAL TO BE STRUCTURAL STEEL PER MnDOT SPEC. 3306.

WELDED STUDS TO BE WELDABLE CARBON STEEL PER MnDOT SPEC. 3391.2D.

SOLE PLATE FOR BEARING ASSEMBLY TO BE GALVANIZED PER MnDOT SPEC. 3394 AFTER FABRICATION.

PINTLE HOLES SHALL BE FREE OF ZINC BUILD UP FROM GALVANIZING.

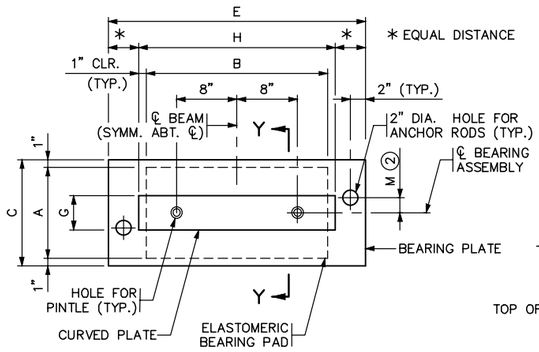
SOLE PLATES ARE INCIDENTAL TO PRESTRESSED CONCRETE BEAMS.

① FOR 1½" DIA. PINTLES.

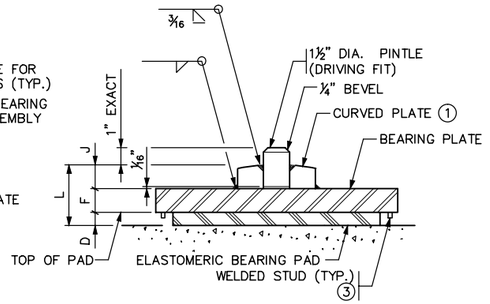
② THESE DIMENSIONS MAY BE MODIFIED TO CLEAR PRESTRESSED STRANDS. HOWEVER, CHANGES MUST BE APPROVED BY THE ENGINEER.

③ THE REQUIREMENTS FOR WELDING STUDS SHALL COMPLY WITH AASHTO/AWS D1.1.

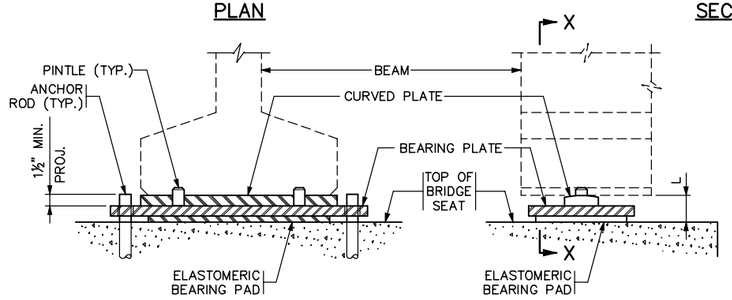
APPROVED: SEPTEMBER 22, 2011	STATE OF MINNESOTA DEPARTMENT OF TRANSPORTATION	REVISED	DETAIL NO.
Nancy Daubenberger STATE BRIDGE ENGINEER	SOLE PLATE (PRESTRESSED CONCRETE BEAMS) (FOR BEARINGS WITH PINTLES)		B303



PLAN



SECTION Y–Y

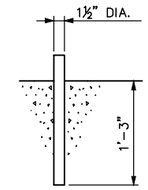


SECTION X–X

2'–2" BOTTOM FLANGE SHOWN

SIDE ELEVATION

ANCHOR RODS NOT SHOWN



ANCHOR ROD DETAIL

TABLE

ASSEMBLY TYPE	LOCATION	BEAM SIZE	BEARING PAD SIZE A	BEARING PAD SIZE B	BEARING PAD SIZE D	SHAPE FACTOR	BEARING PLATE SIZE C	BEARING PLATE SIZE E	BEARING PLATE SIZE F	CURVED PLATE SIZE G	CURVED PLATE SIZE H	CURVED PLATE SIZE J	ANCHOR ROD OFFSET +/-②	ANCHOR ROD OFFSET M	ASSY. HEIGHT L	CURVED PLATE R ①
F1	E. ABUT	MN45	12"	24"	½"	8.0	14"	38"	1½"	4½"	26"	1¼"	NA	0"	3¼"	16"

NOTES:

ELASTOMERIC MATERIALS AND PAD CONSTRUCTION SHALL COMPLY WITH SPEC. 3741.

ALL STEEL PLATES SHALL COMPLY WITH SPEC. 3306.

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.

~~PAYMENT FOR BEARING ASSEMBLY SHALL INCLUDE ALL MATERIAL ON THIS DETAIL.~~

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 1/16" LESS THAN SHOWN.

② "+" DENOTES OFFSET AS SHOWN.
"-" DENOTES OFFSET OPPOSITE OF SHOWN.

③ 5/16" DIA. x 3/8" KNOCK–OFF WELD STUDS INSTALLED ON BEARING PLATE AROUND PERIMETER OF BEARING PAD. CENTERLINE STUD TO EDGE OF PAD DIMENSION = ½", MAX. STUD SPACING = 4", AND MAX. SPACING TO PAD CORNER = 2".

DESIGN DATA:
MAXIMUM HORIZONTAL LOAD IS 70 KIPS FOR 1" PINTLES.

APPROVED: SEPTEMBER 22, 2011	STATE OF MINNESOTA DEPARTMENT OF TRANSPORTATION	REVISED 11–06–2013	DETAIL NO.
Nancy Daubenberger STATE BRIDGE ENGINEER	CURVED PLATE BEARING ASSEMBLY (PRESTRESSED CONCRETE BEAMS) (FIXED)		B310

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: BAW | CHECKED BY: BLF
DRAWN BY: LMT | DATE: 8/24/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

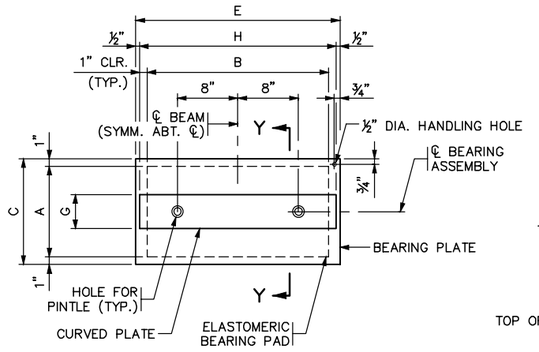
METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

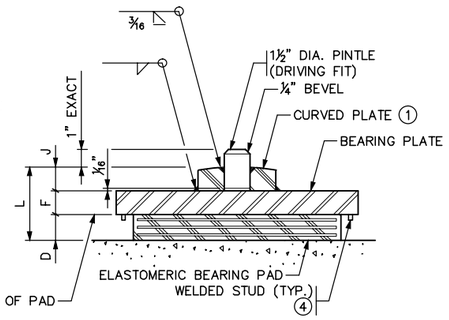
CIVIL EAST - VOLUME 4B
CSAH 40 (GLENWOOD AVENUE) - EAST
BRIDGE 27C17
DETAILS 2

DISCIPLINE: STRUCTURES
SHEET NAME: CBR27C17-BRG-DTL-001-2

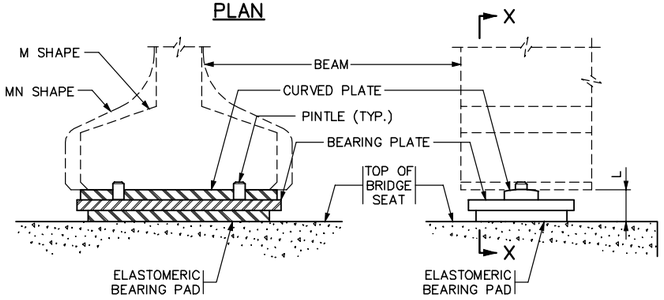
SHEET 29 OF 38



PLAN

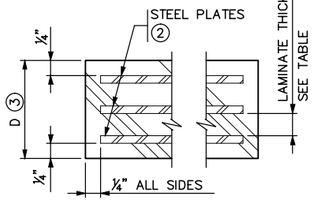


SECTION Y–Y



SECTION X–X

SIDE ELEVATION



SECTION THROUGH ELASTOMERIC BEARING PAD

TABLE

ASSEMBLY TYPE	LOCATION	BEAM SIZE	BEARING PAD SIZE A	B	D	STEEL PLATES NO.	THICK.	LAMINATES NO.	THICK.	SHAPE FACTOR	BEARING PLATE SIZE C	E	F	CURVED PLATE SIZE G	H	J	ASSY. HEIGHT L	CURVED PLATE R ①
E1	E. PIER	MN45	12"	24"	1⅞"	3	⅛"	2	½"	8.0	14"	27"	1½"	4½"	26"	1¼"	4⅝"	16"

NOTES:

ELASTOMERIC MATERIALS AND PAD CONSTRUCTION SHALL COMPLY WITH MnDOT SPEC. 3741.

ALL STEEL PLATES SHALL COMPLY WITH MnDOT SPEC. 3306.

PINTLES SHALL COMPLY WITH MnDOT SPEC. 3309.

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

~~PAYMENT FOR BEARING ASSEMBLY SHALL INCLUDE ALL MATERIAL ON THIS DETAIL.~~

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 1/16" LESS THAN SHOWN.

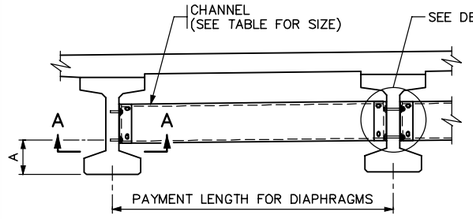
② DO NOT GALVANIZE THESE PLATES.

③ THE TOTAL THICKNESS SHOWN INCLUDES THE STEEL PLATES.

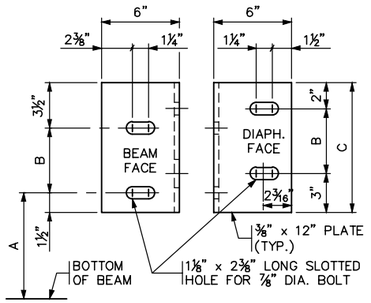
④ 5/16" DIA. x 3/8" KNOCK–OFF WELD STUDS INSTALLED ON BEARING PLATE AROUND PERIMETER OF BEARING PAD. CENTERLINE STUD TO EDGE OF PAD DIMENSION = ½", MAX. STUD SPACING = 4", AND MAX. SPACING TO PAD CORNER = 2".

DESIGN DATA:
MAXIMUM HORIZONTAL LOAD IS 70 KIPS FOR 1" PINTLES.

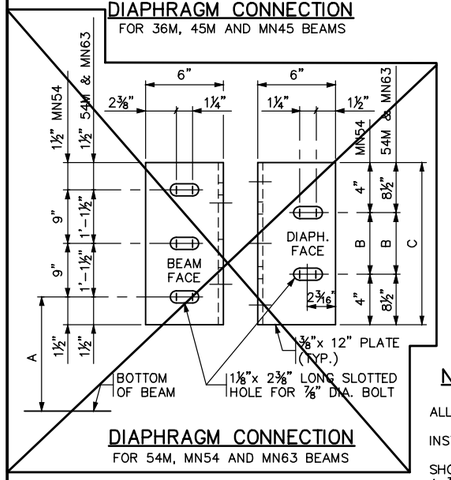
APPROVED: SEPTEMBER 22, 2011	STATE OF MINNESOTA DEPARTMENT OF TRANSPORTATION	REVISED	DETAIL NO.
Nancy Daubenberger STATE BRIDGE ENGINEER	CURVED PLATE BEARING ASSEMBLY (PRESTRESSED CONCRETE BEAMS) (EXPANSION)		B311



PART TRANSVERSE SECTION AT DIAPHRAGM

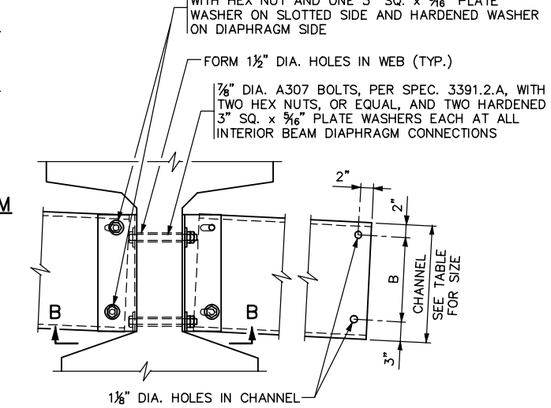


DIAPHRAGM CONNECTION
FOR 36M, 45M AND MN45 BEAMS



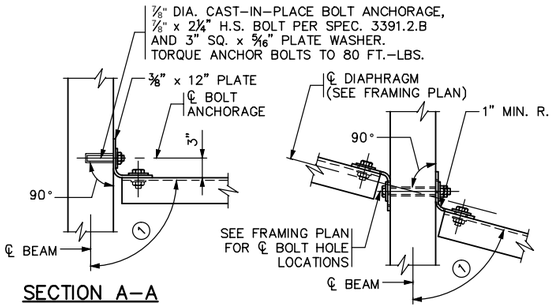
DIAPHRAGM CONNECTION
FOR 54M, MN54 AND MN63 BEAMS

BEAM HEIGHT	DISTANCE A	B	C	CHANNEL SIZE
~~36M~~	~~1'-3"~~	~~7"~~	~~1'-0"~~	~~C12x20.7~~
~~45M~~	~~1'-3¾"~~	~~1'-1"~~	~~1'-6"~~	~~MC18x42.7~~
~~54M~~	~~1'-2¾"~~	~~1'-1"~~	~~2'-6"~~	~~MC18x42.7~~
MN45	1'-7¾"	7"	1'-0"	C12x20.7
~~MN54~~	~~1'-7¾"~~	~~1'-1"~~	~~1'-9"~~	~~MC18x42.7~~
~~MN63~~	~~1'-7¾"~~	~~1'-1"~~	~~2'-6"~~	~~MC18x42.7~~



DETAIL "A"

INTERIOR BEAM WITH CONTINUOUS LINE OF DIAPHRAGMS



SECTION A–A

TYPICAL SECTION AT ALL FASCIA BEAMS

SECTION B–B

TYPICAL SECTION AT INTERIOR BEAM WITH CONTINUOUS OR STAGGERED INTERMEDIATE DIAPHRAGMS

NOTES:

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 ⅜" x 6" x 6" ANGLE MAY BE USED FOR DIAPHRAGMS PERPENDICULAR TO BEAMS.

~~INCLUDE ALL STRUCTURAL STEEL SHOWN ON THIS DETAIL, INCLUDING BOLTS AND WASHERS, IN UNIT PRICE BID FOR DIAPHRAGMS FOR PRESTRESSED BEAMS.~~

BENT PLATES MAY BE USED IN PLACE OF CHANNELS. THE BENT PLATES MUST BE THE SAME HEIGHT AS THE CHANNELS THEY REPLACE, BE 5/16" 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	STATE OF MINNESOTA DEPARTMENT OF TRANSPORTATION	REVISED	DETAIL NO.
Daniel T. Morgan STATE BRIDGE ENGINEER	STEEL INTERMEDIATE DIAPHRAGM (FOR 36M – 54M, MN45 – MN63 PRESTRESSED CONCRETE BEAMS)	06–14–2006 10–22–2009 09–11–2014	B403

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: BAW | CHECKED BY: BLF
DRAWN BY: LMT | DATE: 8/24/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

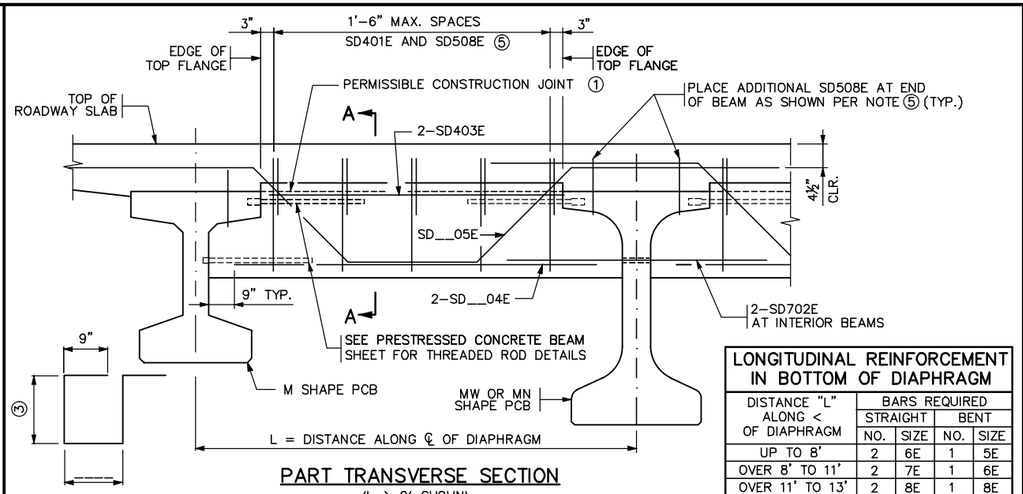
METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4B
CSAH 40 (GLENWOOD AVENUE) - EAST
BRIDGE 27C17
DETAILS 3

DISCIPLINE: STRUCTURES
SHEET NAME: CBR27C17-BRG-DTL-001-3

SHEET 30 OF 38

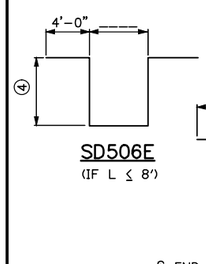


PART TRANSVERSE SECTION

(L > 8′ SHOWN)

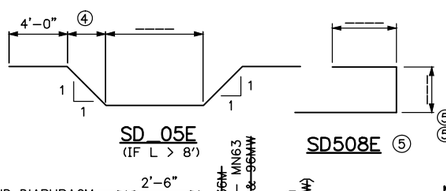
SD401E

LONGITUDINAL REINFORCEMENT IN BOTTOM OF DIAPHRAGM				
DISTANCE "L" ALONG < OF DIAPHRAGM	BARS REQUIRED			
	STRAIGHT		BENT	
	NO.	SIZE	NO.	SIZE
UP TO 8′	2	6E	1	5E
OVER 8′ TO 11′	2	7E	1	6E
OVER 11′ TO 13′	2	8E	1	8E
OVER 13′ TO 15′	2	9E	1	10E
OVER 15′ TO 18′	2	11E	1	11E



SD506E

(IF L ≤ 8′)

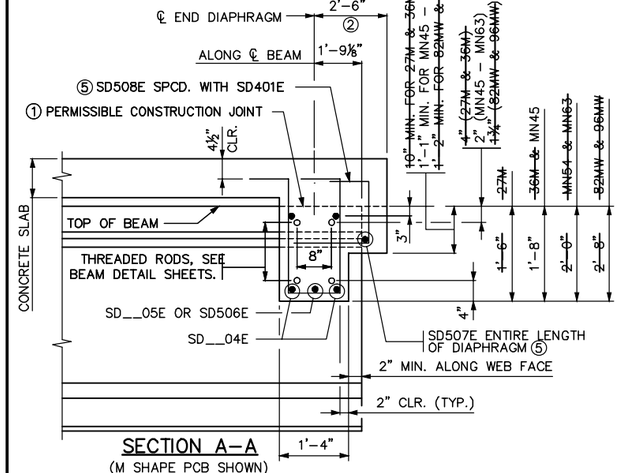


SD_05E

(IF L > 8′)

SD508E ⑤

BILL OF REINFORCEMENT FOR END DIAPHRAGM				
BAR	NO.	LENGTH	SHAPE	LOCATION
SD401E				VERTICAL TIE
SD702E		5′–0"		LONG. THRU BEAM
SD403E				LONG. TOP
SD__04E				LONG. BOTTOM
SD__05E				LONGITUDINAL
SD506E				LONGITUDINAL
⑤ SD507E				LONGITUDINAL
⑤ SD508E				VERTICAL TIE



SECTION A–A

(M SHAPE PCB SHOWN)

NOTES:

CONCRETE FOR END DIAPHRAGMS SHALL BE THE SAME MIX AS USED IN DECK.

~~QUANTITIES FOR END DIAPHRAGM CONCRETE AND REINFORCEMENT SHOWN ON THIS DETAIL SHALL BE LISTED IN SUPERSTRUCTURE QUANTITIES.~~

~~THREADED RODS ARE INCIDENTAL TO PRESTRESSED CONCRETE BEAMS.~~

① USE OF CONSTRUCTION JOINT REQUIRES CLEARANCE FOR EXPANSION DEVICE. WHEN CONSTRUCTION JOINT IS USED AT THIS LOCATION, DIAPHRAGM FALSEWORK SHALL REMAIN INPLACE UNTIL COMPLETION OF SLAB CURING PERIOD.

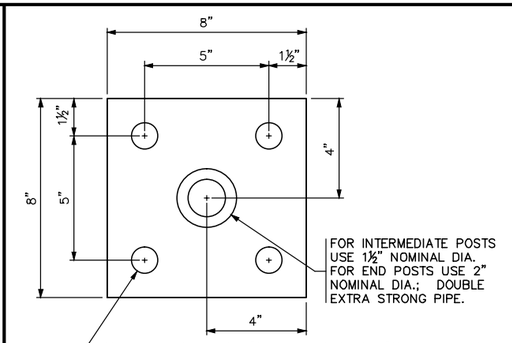
② PERPENDICULAR TO CENTERLINE OF DIAPHRAGM.

③ ~~1′–11" (27M),~~ 2′–1" (~~36M AND~~ MN45); ~~2′–5" (MN54 AND MN63); 3′–1" (82MW AND 96MW).~~ BASED ON 3" STOOL AND 9" DECK.

④ ~~1′–10" (27M),~~ 2′–0" (~~36M AND~~ MN45); ~~2′–4" (MN54 AND MN63); 3′–0" (82MW AND 96MW).~~ BASED ON NOTE ③.

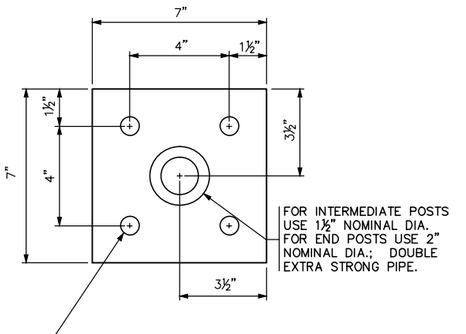
⑤ ADD SD507E AND SD508E ONLY IF NO. OF BARS AND LENGTHS ARE INCLUDED IN BILL OF REINFORCEMENT. SPACE SD508E AT 1′–6" MAX. FOR ENTIRE LENGTH OF DIAPHRAGM. REFER TO "PART TRANSVERSE SECTION" ABOVE.

APPROVED: SEPTEMBER 22, 2011	STATE OF MINNESOTA DEPARTMENT OF TRANSPORTATION	REVISED 04–17–2013 11–06–2013	DETAIL NO.
Nancy Daubenberger STATE BRIDGE ENGINEER	CONCRETE END DIAPHRAGM (27M & 36M, MN45 – MN63, 82MW & 96MW PRESTRESSED CONCRETE BEAMS) (PARAPET ABUTMENT)		B814



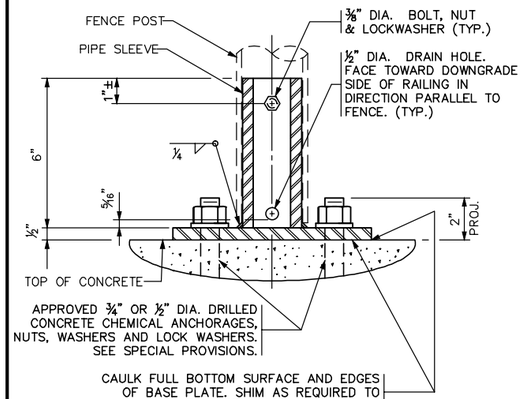
PLAN VIEW – TYPE A

ESTIMATED WEIGHT = 12 OR 14 LBS.

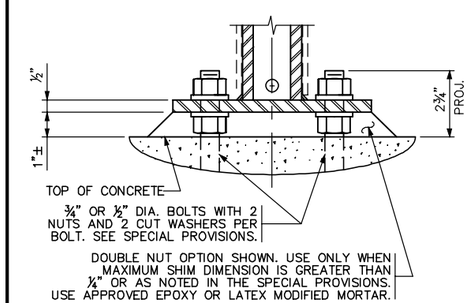


PLAN VIEW – TYPE B

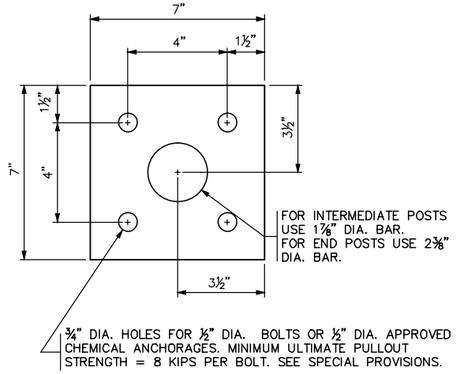
ESTIMATED WEIGHT = 10 OR 12 LBS.



TYPICAL SECTION



GROUT ALTERNATE



PLAN VIEW – TYPE C

ESTIMATED WEIGHT = 12 OR 15 LBS.

NOTES:

STRUCTURAL STEEL PER Mn/DOT SPEC. 3306

STRUCTURAL PIPE PER Mn/DOT SPEC. 3362

GALVANIZE THE FENCE POST ANCHORAGE AFTER FABRICATION PER Mn/DOT SPEC. 3394. GALVANIZE THE FASTENERS PER Mn/DOT SPEC. 3392.

DOUBLE EXTRA STRONG PIPE WEIGHTS:
1½" NOMINAL DIA. = 6.41 LBS./FT.
2" NOMINAL DIA. = 9.03 LBS./FT.

APPROVED: NOVEMBER 22, 2002	STATE OF MINNESOTA DEPARTMENT OF TRANSPORTATION	REVISION	DETAIL NO.
Daniel D. Morgan STATE BRIDGE ENGINEER	FENCE POST ANCHORAGE		B905

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: BAW | CHECKED BY: BLF

DRAWN BY: LMT | DATE: 8/24/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

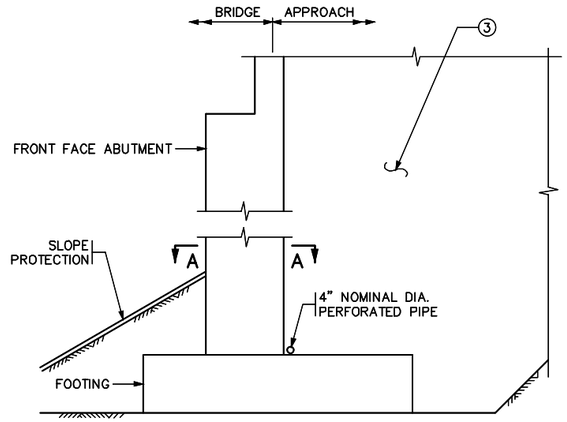
SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4B
CSAH 40 (GLENWOOD AVENUE) - EAST
BRIDGE 27C17
DETAILS 4

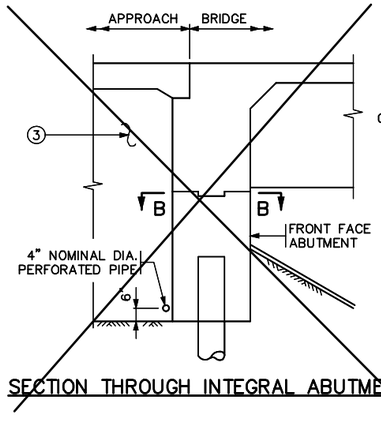
DISCIPLINE: STRUCTURES

SHEET NAME: CBR27C17-BRG-DTL-001-4

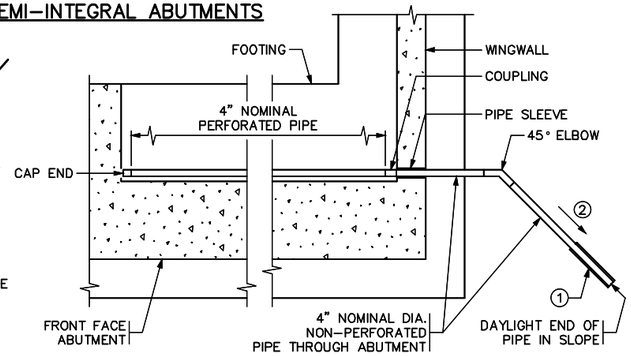
SHEET 31 OF 38



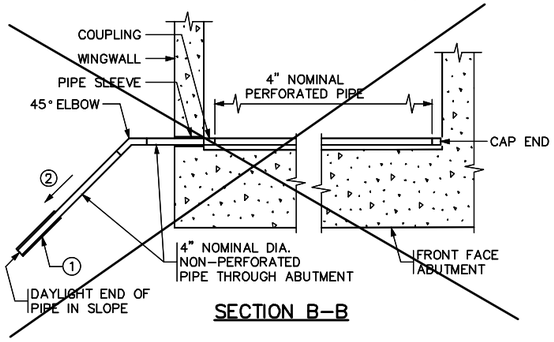
SECTION THROUGH PARAPET AND SEMI-INTEGRAL ABUTMENTS



SECTION THROUGH INTEGRAL ABUTMENT



SECTION A-A



SECTION B-B

NOTES:

~~PAYMENT WILL BE INCLUDED IN THE SINGLE LUMP SUM PRICE FOR "DRAINAGE SYSTEM TYPE (B910)", INCLUDES BUT IS NOT LIMITED TO 4" DIAMETER PERFORATED AND NON-PERFORATED PIPE, ELBOWS, END CAPS, COUPLINGS, SLEEVES AND PRECAST CONCRETE HEADWALLS.~~

ALL PIPE TO COMPLY WITH SPEC. 3245.

WRAP PERFORATED PIPE WITH GEOTEXTILE PER SPEC. 3733, TYPE 1. ATTACH TO PIPE PER SPEC. 2502.

① AT CONTRACTORS OPTION, MAY TIE APPROACH PANEL DRAINAGE SYSTEM AND ABUTMENT DRAINAGE SYSTEM INTO A SINGLE PRECAST CONCRETE HEADWALL OR INTO A CATCH BASIN AS LONG AS A MINIMUM OF 1% POSITIVE SLOPE CAN BE MANTAINED.

USE PRECAST CONCRETE HEADWALL WITH RODENT SCREEN. SEE STANDARD PLATE 3131 FOR DETAILS.

② ⅛" PER FT. MINIMUM SLOPE.

③ REFER TO GRADING PLANS FOR ABUTMENT BACKFILL REQUIREMENTS.

APPROVED: JANUARY 13, 2015	STATE OF MINNESOTA DEPARTMENT OF TRANSPORTATION	REVISED	DETAIL NO.
Nancy Daubenberger STATE BRIDGE ENGINEER	DRAINAGE SYSTEM		B910

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: BAW | CHECKED BY: BLF
DRAWN BY: LMT | DATE: 8/24/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4B
CSAH 40 (GLENWOOD AVENUE) - EAST
BRIDGE 27C17
DETAILS 5

DISCIPLINE: STRUCTURES
SHEET NAME: CBR27C17-BRG-DTL-001-5

SHEET 32 OF 38

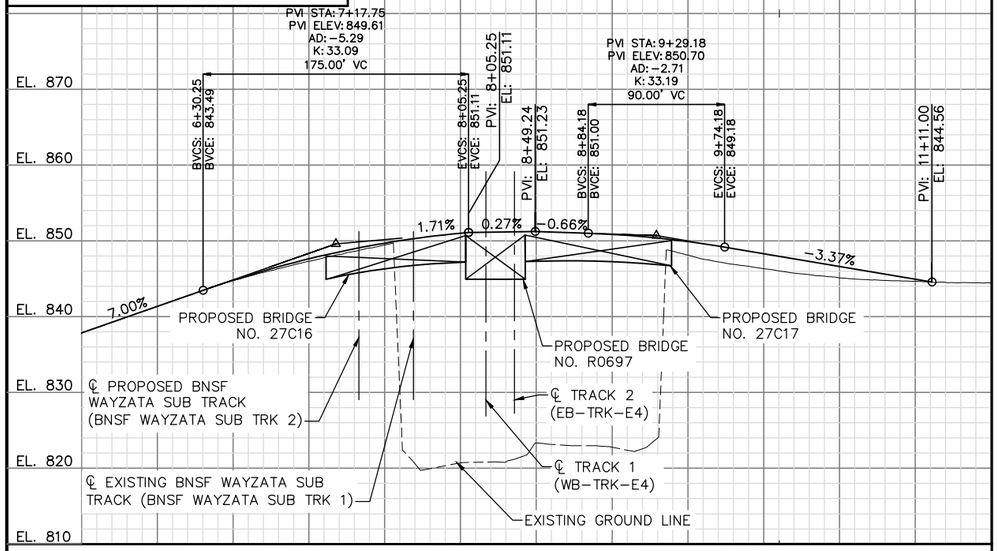
Aug. 24 2015 09:09 am V:\3400_ADC\CAD\SEGMENT E4\PLAN SHEETS\STRUCTURES\27C17\CBR27C17-BRG-DTL-001.dwg By: ryan.kelly

CONTRACTED PROFILE

SCALE HOR: 0 50'

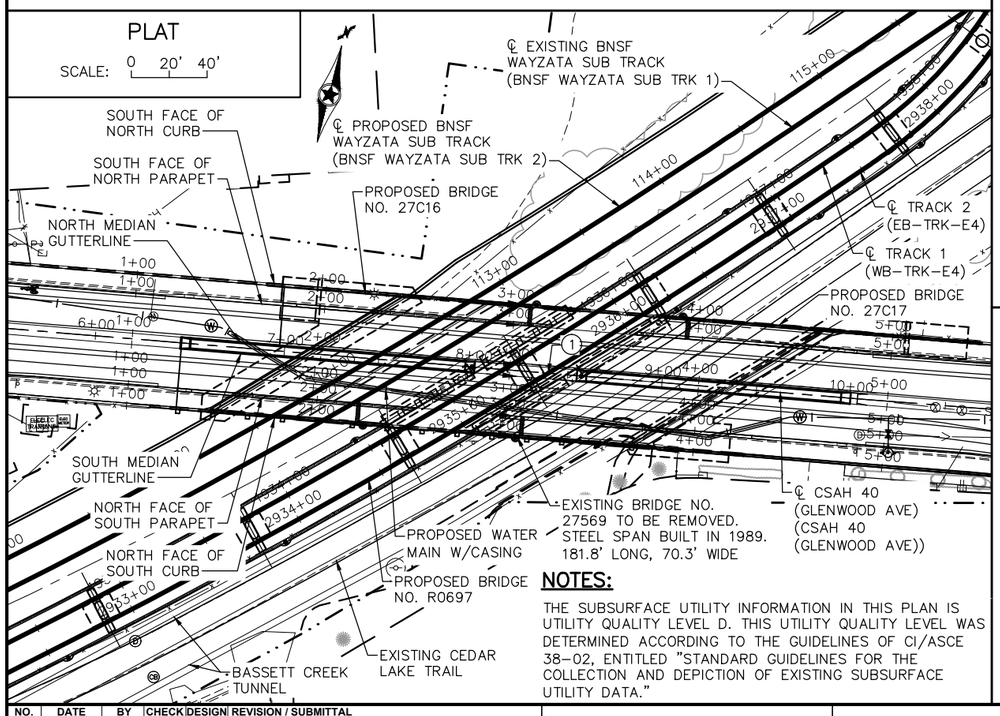
SCALE VER: 0 10'

PROFILE GRADE
℄ CSAH 40 (GLENWOOD AVE)
(CSAH 40 (GLENWOOD AVE))



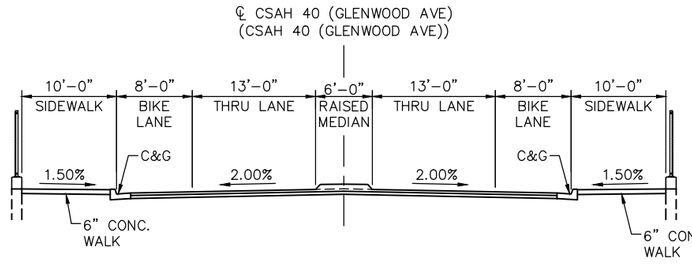
PLAT

SCALE: 0 20' 40'



NOTES:

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."



TYPICAL SECTION

NOTES:

(1) ℄ CSAH 40 (GLENWOOD AVE)
(CSAH 40 (GLENWOOD AVE)) P.O.C. 8+39.83
℄ TRACK 2 (EB−TRK−E4) P.O.T. 2935+52.52
X = 525815.344 Y = 168533.506
Δ = 36°10'39.1"

INDEX MAP

LOCATION ENGINEER'S OBSERVATIONS AT BRIDGE SITE

1. SPECIAL FEATURES: WATERFALLS, DAMS, FLOODS, ICE, DEBRIS SLIDING BANKS, RECREATIONAL BOATING.
2. OTHER BRIDGES OR CULVERTS OVER THE SAME STREAM (PARTICULARY STRUCTURES WHICH CARRY HIGH WATER WITHOUT OVERFLOW OF ROADWAY): GIVEN LOCATION, TYPE, LENGTH, HEIGHT ABOVE HIGH WATER, CROSS−SECTIONAL AREA ETC.
3. APPARENT HIGHWATER ELEVATION OBTAINED FROM:
4. OTHER DATA: APPROX. VELOCITY OF WATER AT TIME OF SURVEY.

HYDRAULIC ENGINEER'S RECOMMENDATION

DATE:

STREAM OR DITCH DESIGNATION:

DRAINAGE AREA: SQ. MI.

MAX FLOOD ON RECORD:

DESIGN FLOOD (YR. FREQ.): C.F.S.
HEADWATER ELEVATION: FT.
DESIGN MEAN VELOCITY THROUGH STRUCTURE F.P.S.
TOTAL STAGE INCREASE FT.
LOW MEMBER AT OR ABOVE ELEVATION FT.

WATERWAY AREA REQUIRED BELOW ELEV. = SQ. FT.
AT RIGHT ANGLES TO CHANNEL

BASIC FLOOD (YR. FREQ.) C.F.S.
HEADWATER ELEVATION: FT.
TOTAL STAGE INCREASE FT.
MEAN VELOCITY THROUGH STRUCTURE F.P.S.

FLOWLINE ELEVATION: FT. SKEW ANGLE:

ESTIMATED PRELIMINARY TOTAL SCOUR AT PIER EL. (500 YR. FREQ.)

SCOUR CONFIRMATION RECOMMENDATION

DATE:

TOTAL SCOUR AT PIER EL. (500 OR QT YR. FREQ.)
SCOUR CODE: OBTAIN FROM HYDRAULIC ENGINEER

BRIDGE SURVEY SHEETS MADE FROM 2014 MFRA SURVEYS

1ST BENCH MARK (NAVD 88)
BENCHMARK ID PT. 163
ELEVATION = 822.94
N = 168527.62, E = 525863.31
DESCRIPTION = MAG NAIL IN BIT. PATH

2ND BENCH MARK (NAVD 88)
BENCHMARK ID PT. 162
ELEVATION = 822.47
N = 168430.42, E = 525688.95
DESCRIPTION = MAG NAIL IN BIT. PATH

BRIDGE SURVEY 1

PROPOSED BRIDGE LOCATED:
0.25 MILES NORTHEAST OF JCT. CSAH 40
(GLENWOOD AVENUE) AND INTERSTATE 94

SEC 22 T 29 N R 24 W

CITY OF MINNEAPOLIS HENNEPIN COUNTY

BRIDGE NO. 27C17

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: BAW CHECKED BY: BLF
DRAWN BY: LMT DATE: 8/24/15

AECOM Kimley»Horn

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

60% SUBMISSION - 09/28/15

CIVIL EAST - VOLUME 4B
CSAH 40 (GLENWOOD AVENUE) - EAST
BRIDGE 27C17
BRIDGE SURVEY 1

DISCIPLINE: STRUCTURES

SHEET NAME: CBR27C17-BRG-SUR-001-1

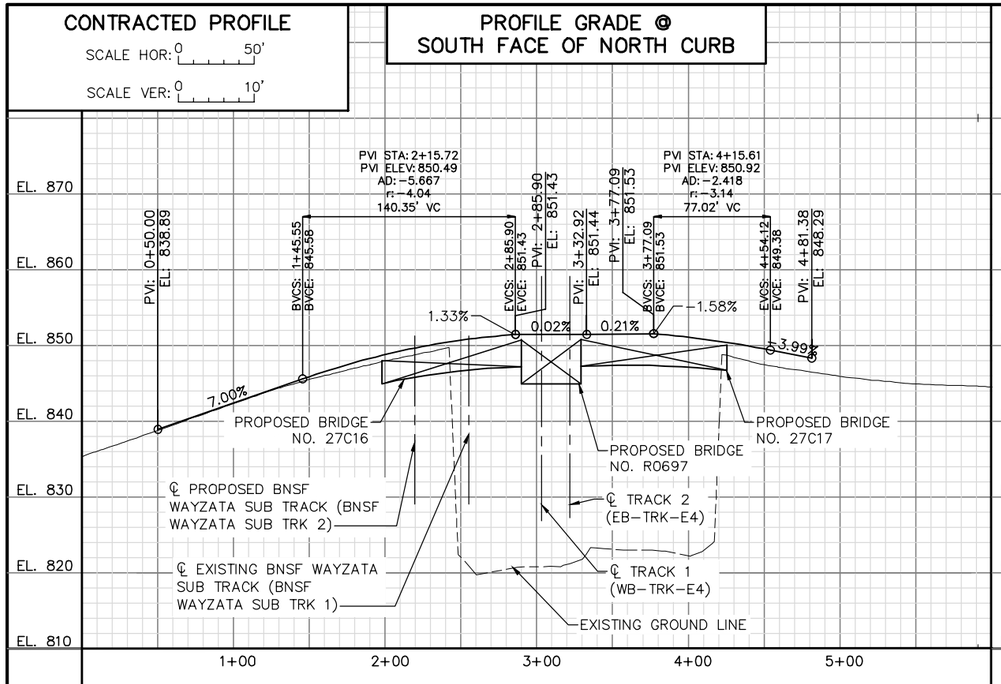
SHEET 33 OF 38

CONTRACTED PROFILE

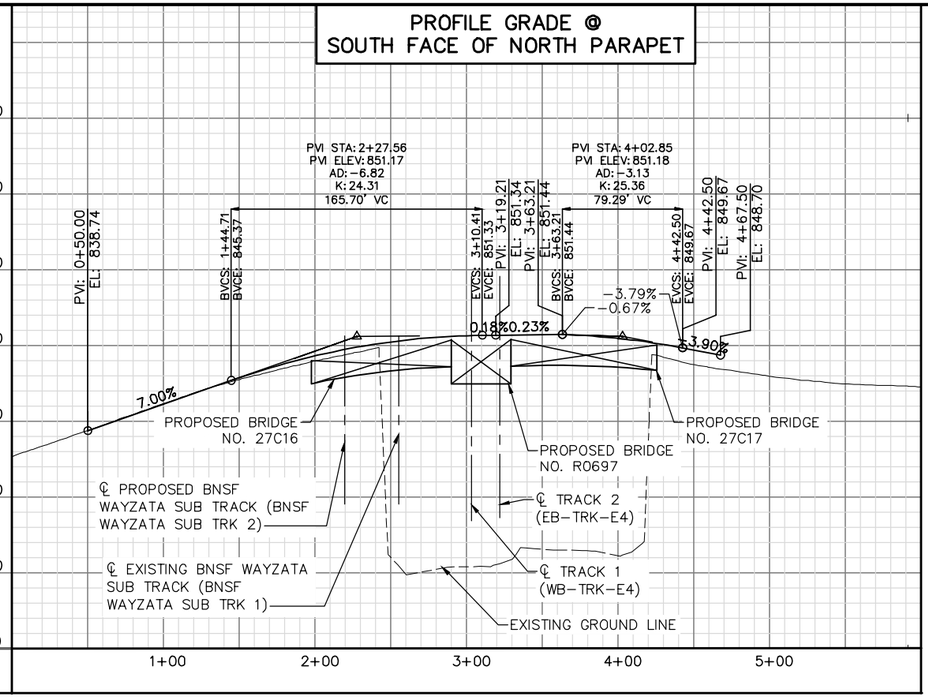
SCALE HOR: 0 50'

SCALE VER: 0 10'

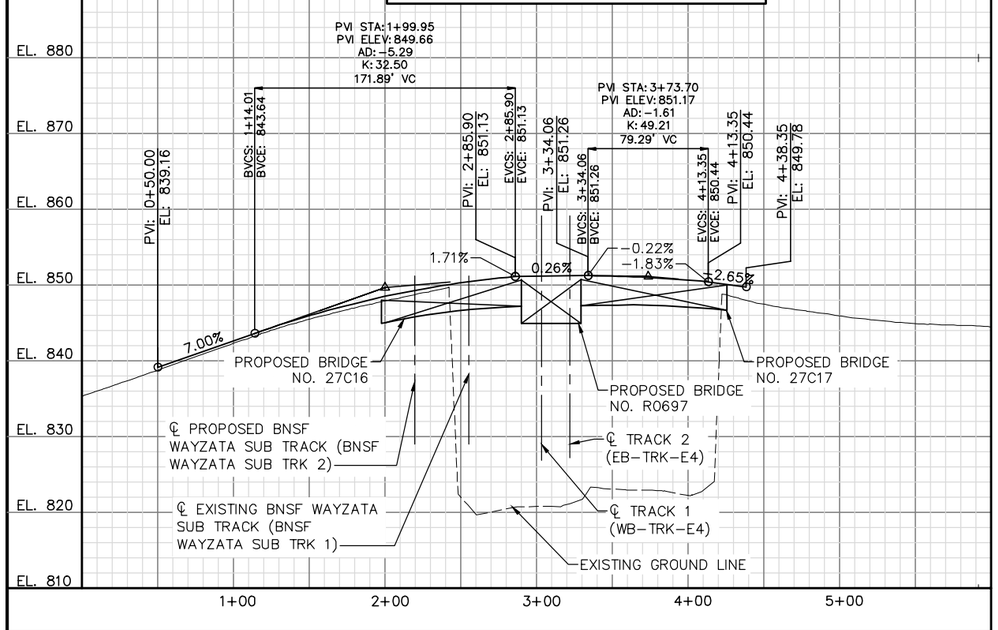
PROFILE GRADE @ SOUTH FACE OF NORTH CURB



PROFILE GRADE @ SOUTH FACE OF NORTH PARAPET



PROFILE GRADE @ NORTH MEDIAN GUTTERLINE



NOTES:

℄ CSAH 40 (GLENWOOD AVE) (CSAH 40 (GLENWOOD AVE)) STA. 5+69.35 = SOUTH FACE OF NORTH CURB STA. 0+50.00.

℄ CSAH 40 (GLENWOOD AVE) (CSAH 40 (GLENWOOD AVE)) STA. 5+69.35 = SOUTH FACE OF NORTH PARAPET STA. 0+50.00.

℄ CSAH 40 (GLENWOOD AVE) (CSAH 40 (GLENWOOD AVE)) STA. 5+69.35 = NORTH MEDIAN GUTTERLINE STA. 0+50.00.

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: BAW | CHECKED BY: BLF

DRAWN BY: LMT | DATE: 8/24/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4B
CSAH 40 (GLENWOOD AVENUE) - EAST
BRIDGE 27C17
BRIDGE SURVEY 2

DISCIPLINE: STRUCTURES

SHEET NAME: CBR27C17-BRG-SUR-001-2

SHEET 34 OF 38

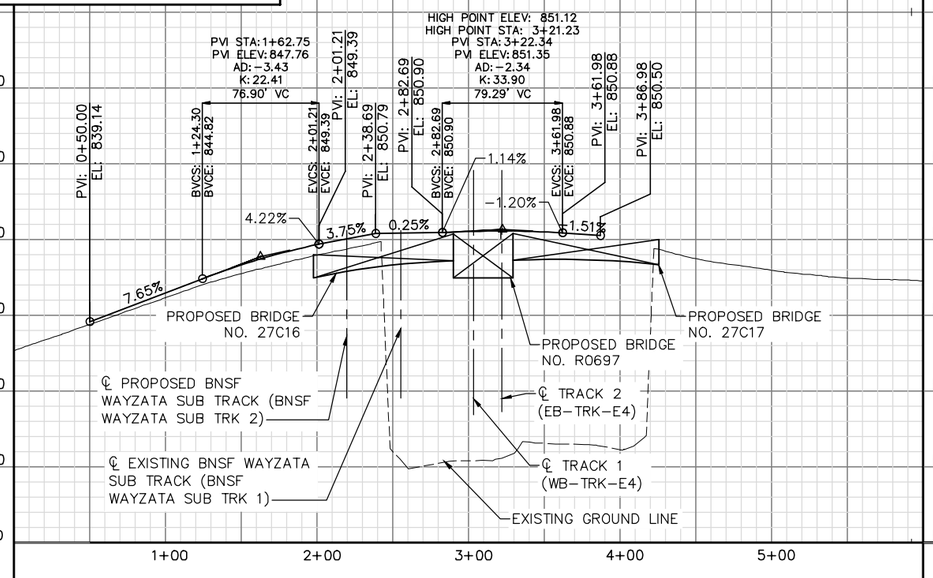
Aug. 24 2015 09:10 am V:\3400_ADC\CAD\SEGMENT E4\PLAN SHEETS\STRUCTURES\27C17\CBR27C17-BRG-SUR-001.dwg By: ryan.kelly

CONTRACTED PROFILE

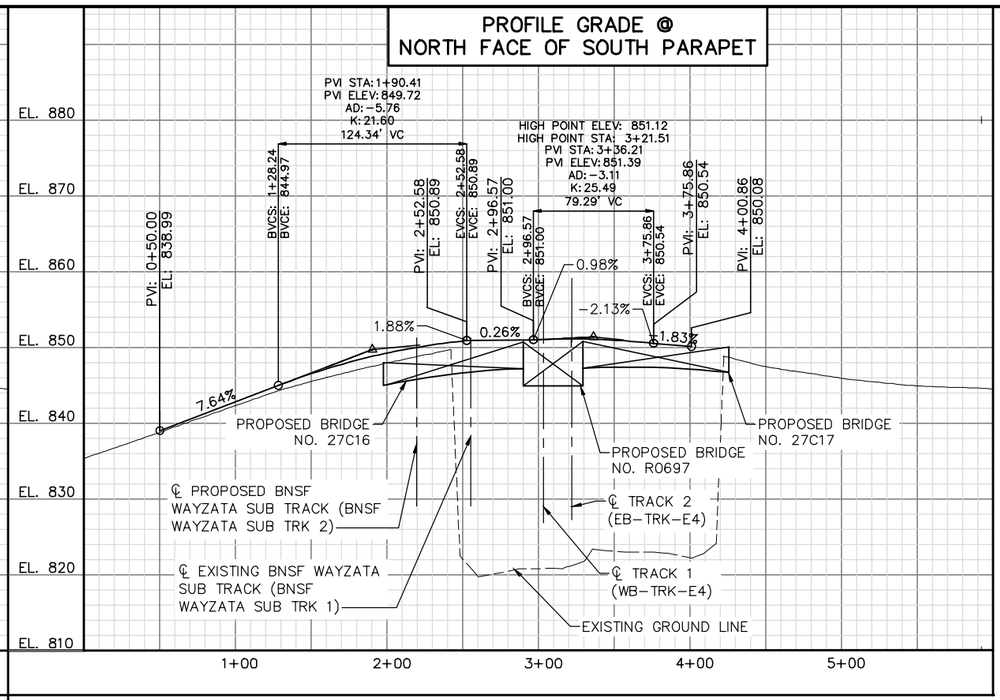
SCALE HOR: 0 50'

SCALE VER: 0 10'

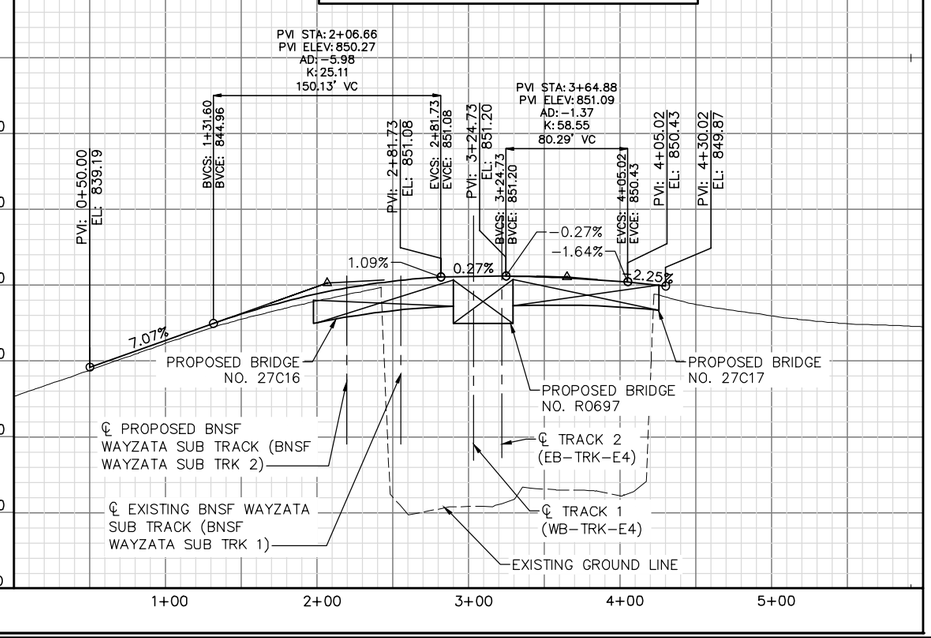
PROFILE GRADE @ NORTH FACE OF SOUTH CURB



PROFILE GRADE @ NORTH FACE OF SOUTH PARAPET



PROFILE GRADE @ SOUTH MEDIAN GUTTERLINE



NOTES:

℄ CSAH 40 (GLENWOOD AVE) (CSAH 40 (GLENWOOD AVE)) STA. 5+69.35 = NORTH FACE OF SOUTH CURB STA. 0+50.00

℄ CSAH 40 (GLENWOOD AVE) (CSAH 40 (GLENWOOD AVE)) STA. 5+69.35 = NORTH FACE OF SOUTH PARAPET STA. 0+50.00.

℄ CSAH 40 (GLENWOOD AVE) (CSAH 40 (GLENWOOD AVE)) STA. 5+69.35 = SOUTH MEDIAN GUTTERLINE STA. 0+50.00

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: BAW | CHECKED BY: BLF

DRAWN BY: LMT | DATE: 8/24/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4B
CSAH 40 (GLENWOOD AVENUE) - EAST
BRIDGE 27C17
BRIDGE SURVEY 3

DISCIPLINE: STRUCTURES

SHEET NAME: CBR27C17-BRG-SUR-001-3

SHEET 35 OF 38

Aug. 24 2015 09:10 am V:\3400_ADC\CAD\SEGMENT E4\PLAN SHEETS\STRUCTURES\27C17\CBR27C17-BRG-SUR-001.dwg By: ryan.kelly

℄ TRACK 1
(WB–TRK–E4)

℄ TRACK 2
(EB–TRK–E4)

℄ CSAH 40 (GLENWOOD AVE)
(CSAH 40 (GLENWOOD AVE))

1158 SB
STA. 6+93.69
21' RT. OF ℄ CSAH 40
(GLENWOOD AVE)

1021 SB
STA. 9+92.18
22' LT. OF ℄ CSAH 40
(GLENWOOD AVE)

℄ PROPOSED BNSF WAYZATA SUB TRACK
(BNSF WAYZATA SUB TRK 2)

℄ EXISTING BNSF WAYZATA SUB TRACK
(BNSF WAYZATA SUB TRK 1)

℄ BRG.
E. ABUT.

℄ BRG. &
℄ E. PIER

1159 SB
STA. 9+41.50
21' RT. OF ℄ CSAH 40
(GLENWOOD AVE)

PROPOSED WATER
MAIN W/CASING

1136 SW
STA. 7+10.43
78' RT. OF ℄ CSAH 40
(GLENWOOD AVE)

EXISTING CEDAR
LAKE TRAIL

BASSETT CREEK
TUNNEL

℄ CEDAR LAKE LRT TRAIL
(CEDAR LAKE LRT TRAIL (2))

CEM 10 PVC

6 VCP

12 VCP

NOTES:

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."

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: BAW | CHECKED BY: BLF
DRAWN BY: LMT | DATE: 8/24/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

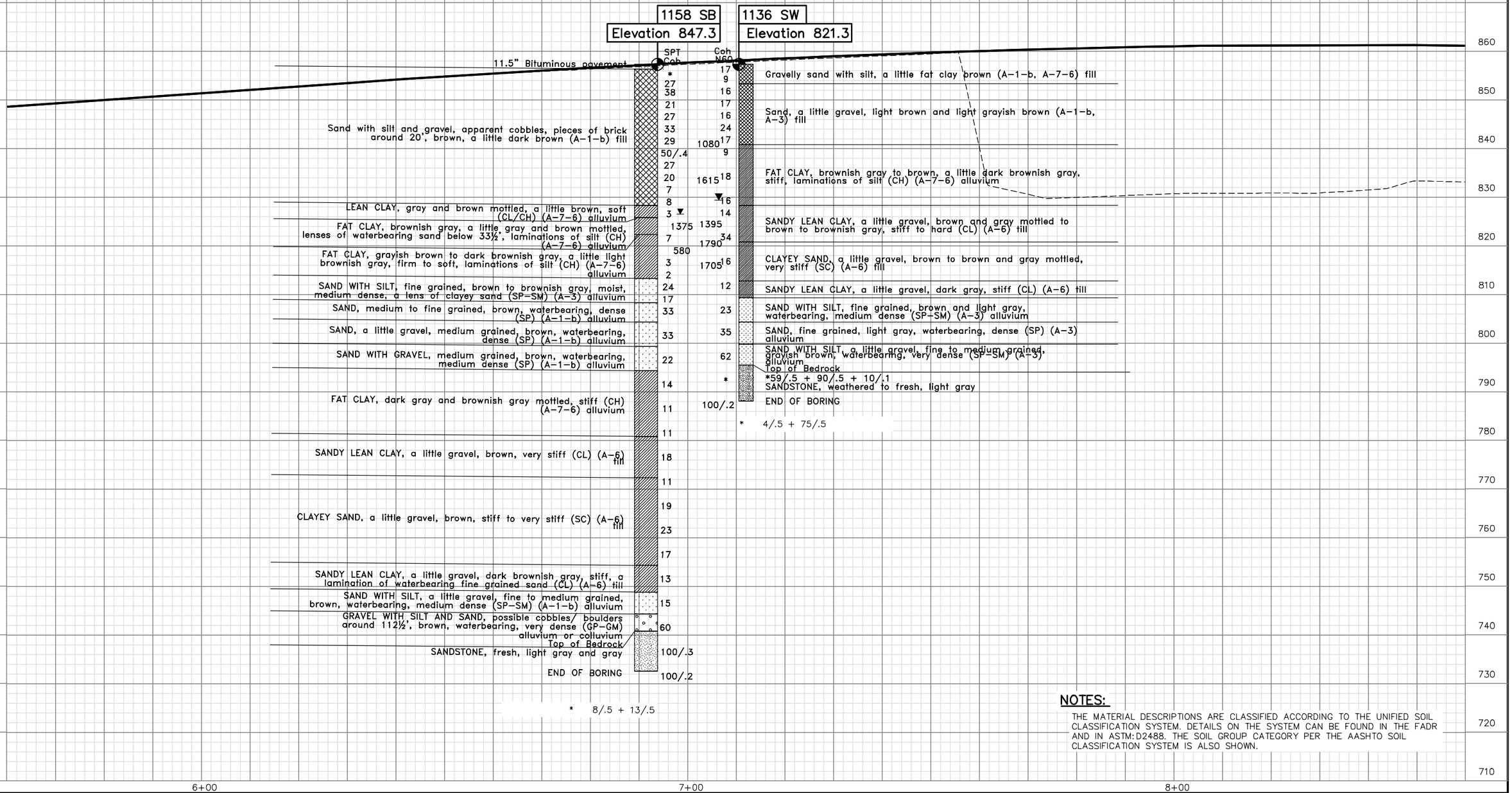
CIVIL EAST - VOLUME 4B
CSAH 40 (GLENWOOD AVENUE) - EAST
BRIDGE 27C17
BRIDGE SURVEY PLAN

DISCIPLINE: STRUCTURES

SHEET NAME: CBR27C17-BRG-BOR-001-1

SHEET 36 OF 38

Aug, 24 2015 09:11 am V:\3400_ADC\CAD\SEGMENT E4\PLAN SHEETS\STRUCTURES\27C17\CBR27C17-BRG-BOR-001.dwg By: ryan.kelly



NOTES:

THE MATERIAL DESCRIPTIONS ARE CLASSIFIED ACCORDING TO THE UNIFIED SOIL CLASSIFICATION SYSTEM. DETAILS ON THE SYSTEM CAN BE FOUND IN THE FADR AND IN ASTM:D2488. THE SOIL GROUP CATEGORY PER THE AASHTO SOIL CLASSIFICATION SYSTEM IS ALSO SHOWN.

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: BAW | CHECKED BY: BLF
DRAWN BY: LMT | DATE: 8/24/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

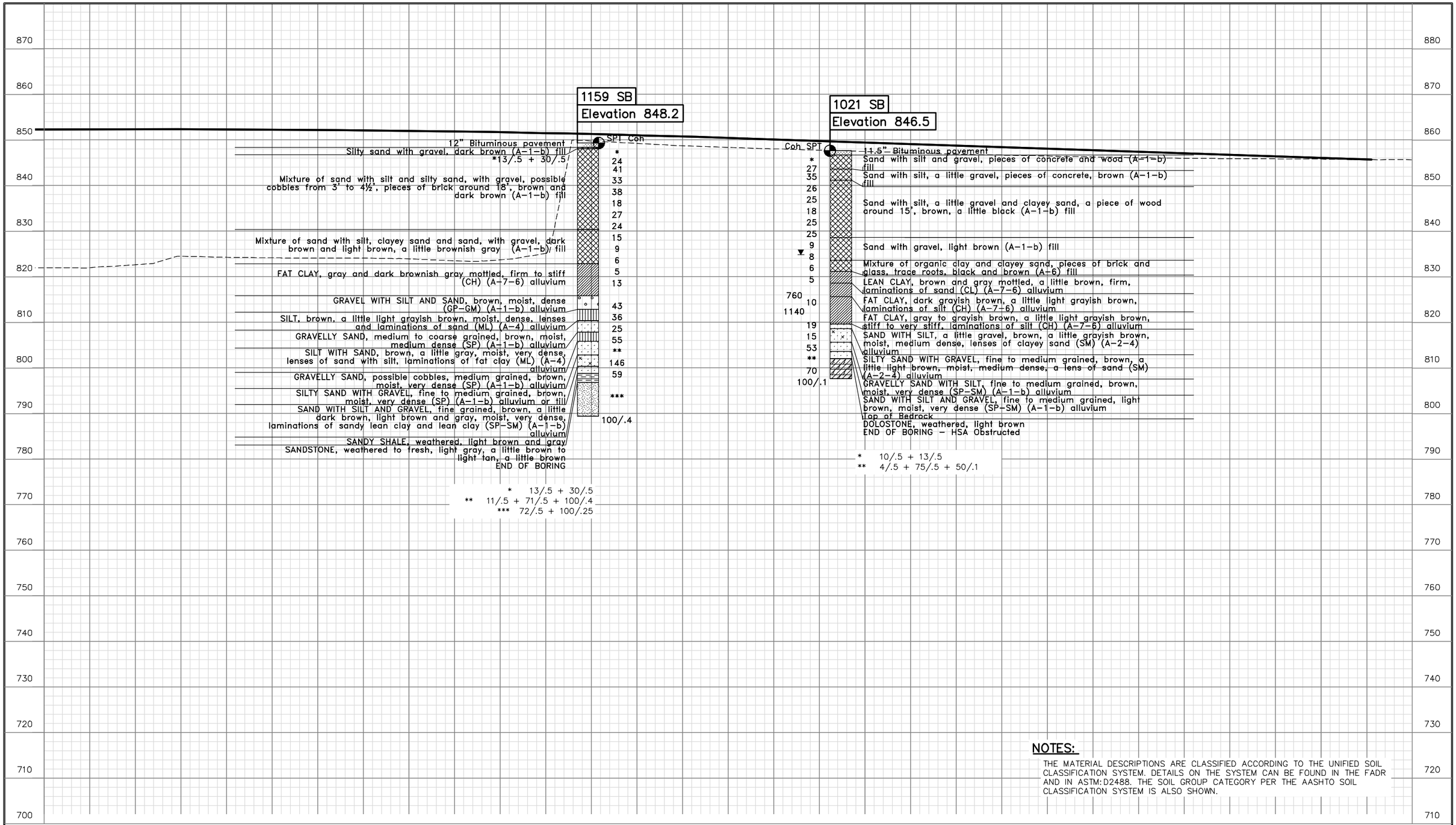
SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4B
CSAH 40 (GLENWOOD AVENUE) - EAST
BRIDGE 27C17
BRIDGE SURVEY PROFILE 1

DISCIPLINE: STRUCTURES
SHEET NAME: CBR27C17-BRG-BOR-002-1

SHEET 37 OF 38

Aug. 24 2015 09:11 am V:\3400_ADC\CAD\SEGMENT E4\PLAN SHEETS\STRUCTURES\27C17\CBR27C17-BRG-BOR-002.dwg By: ryan.kelly



NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: BAW | CHECKED BY: BLF
DRAWN BY: LMT | DATE: 8/24/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

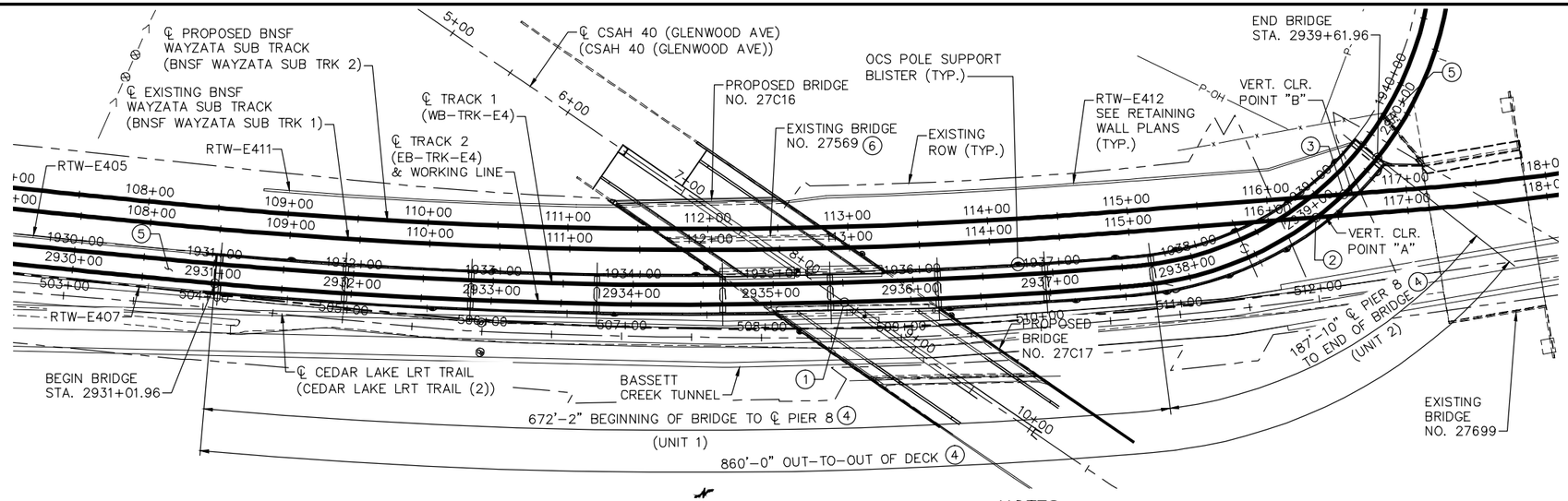
SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4B
CSAH 40 (GLENWOOD AVENUE) - EAST
BRIDGE 27C17
BRIDGE SURVEY PROFILE 2

DISCIPLINE: STRUCTURES
SHEET NAME: CBR27C17-BRG-BOR-002-2

SHEET 38 OF 38

Aug, 24 2015 09:12 am V:\3400_ADC\CAD\SEGMENT E4\PLAN SHEETS\STRUCTURES\27C17\CBR27C17-BRG-BOR-002.dwg By: ryan.kelly



GENERAL PLAN

0 25' 50' 100'

SCALE IN FEET

CONSTRUCTION SEQUENCE

1. DETOUR VEHICLE TRAFFIC ON GLENWOOD AVENUE.
2. CONSTRUCT PROPOSED BRIDGE NO. R0697 SUBSTRUCTURES.
3. CONSTRUCT PROPOSED BRIDGE NO. R0697 UNIT 2 GIRDERS & SUPERSTRUCTURE.
4. CONSTRUCT PROPOSED BRIDGE NO. R0697 UNIT 1 BEAMS & SUPERSTRUCTURE IN CONJUNCTION WITH PROPOSED BRIDGES NO. 27C16 & NO. 27C17.
5. MAINTAIN FREIGHT TRAFFIC ON EXISTING BNSF TRACK, AND MAINTAIN TRAIL TRAFFIC ON THE CEDAR LAKE TRAIL AT ALL TIMES DURING CONSTRUCTION.
6. COORDINATE CONSTRUCTION ACTIVITIES WITH CONSTRUCTION OF ADJACENT PROPOSED BRIDGES & WALLS.

NOTES:

FINISHED GROUND TO BE SEEDED, SEE LANDSCAPE PLANS.

SEE BRIDGE SURVEY SHEET FOR INPLACE UTILITIES.

(1) CONTROL POINT
℄ TRACK 2 (EB–TRK–E4) P.O.C. 2935+52.51
℄ CSAH 40 (GLENWOOD AVE)
(CSAH 40 (GLENWOOD AVE)) P.O.T. 8+39.83
X = 525815.344 Y = 168533.506
Δ = 36°17'28.1" (T.T.C.)

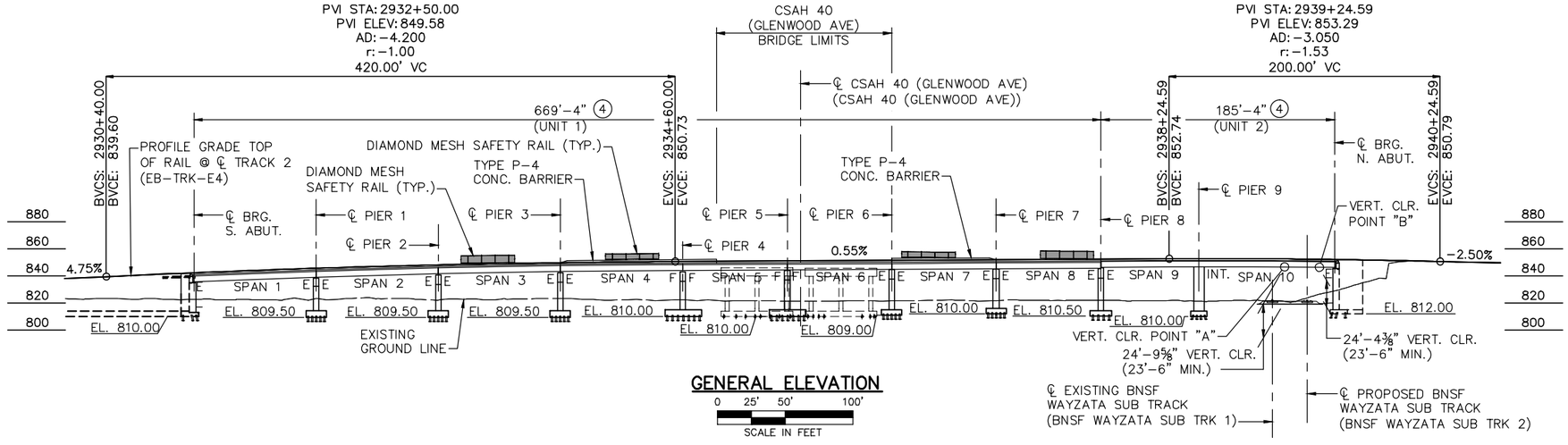
(2) ℄ TRACK 2 (EB–TRK–E4) P.O.C. 2939+00.72
℄ EXISTING BNSF WAYZATA SUB TRACK
(BNSF WAYZATA SUB TRK 1) P.O.T. 116+34.22
X = 526077.848 Y = 168753.465
Δ = 32°40'49.9" (T.T.C.)

(3) ℄ TRACK 2 (EB–TRK–E4) P.O.C. 2939+26.44
℄ PROPOSED BNSF WAYZATA SUB TRACK
(BNSF WAYZATA SUB TRK 2) P.O.T. 116+55.17
X = 526086.701 Y = 168777.597
Δ = 38°43'10.1" (T.T.C.)

(4) DIMENSIONS MEASURED ALONG ℄ TRACK 2. SEE SHEETS 2–3 FOR SPAN LENGTHS.

(5) SEE TRACK PLANS FOR TRANSITION SLAB DETAILS.

(6) EXISTING BRIDGE NO. 27569 TO BE REMOVED, 181.9' LONG AND 70.4' WIDE, TWO STEEL CONT. BEAM SPANS BUILT IN 1988.



GENERAL ELEVATION

0 25' 50' 100'

SCALE IN FEET

DESIGN DATA

2014 AND CURRENT INTERIM AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS

SOUTHWEST LIGHT RAIL TRANSIT DESIGN CRITERIA (REVISION 4.0)

2014 AREMA MANUAL FOR RAILWAY ENGINEERING

LOAD AND RESISTANCE FACTOR DESIGN METHOD

LRV & MV LOAD DIAGRAM SHOWN ON SHEET 4

MATERIAL DESIGN PROPERTIES:
REINFORCED CONCRETE:
ABUTMENTS, PIERS, & UNIT 1 SUPERSTRUCTURE
f'c = 4 KSI n = 8
fy = 60 KSI REINFORCEMENT
UNIT 2 GIRDERS
f'c = 6 KSI n = 6
fy = 60 KSI REINFORCEMENT

PRESTRESSED CONCRETE:
f'c = 8 KSI n = 1
fpu = 270 KSI
FOR 0.6" DIA. LOW RELAXATION STRANDS

DESIGN SPEED: UNDER = PER BNSF RAIL
OVER = 10 MPH

DECK AREA = 24609 SQ. FT.

LIST OF SHEETS

2040 PROJECTED TRAFFIC VOLUMES

	CSAH 40
A.A.D.T.	690
D.H.V.	955
A.D.T.T.	7800

BRIDGE NO. R0697

SOUTHWEST LRT OVER BNSF WAYZATA SUB RR TRACKS.
0.1 MI. S.E. OF JCT. CSAH 40 (GLENWOOD AVENUE) AND INTERSTATE 94 IN MINNEAPOLIS.

BRIDGE I.D. NO. 501 & 206

KEY PLAN & ELEVATION

SEC 22 T 29 N R 24 W
CITY OF MINNEAPOLIS HENNEPIN COUNTY

DRAFT-WORK IN PROCESS

JOB NO.: T9N635 | STATE PROJ. NO.: 9909–01 | MNDOT REVIEW: JOE NIETFELD

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: KAE | CHECKED BY: EJT
DRAWN BY: LMT | DATE: 9/14/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

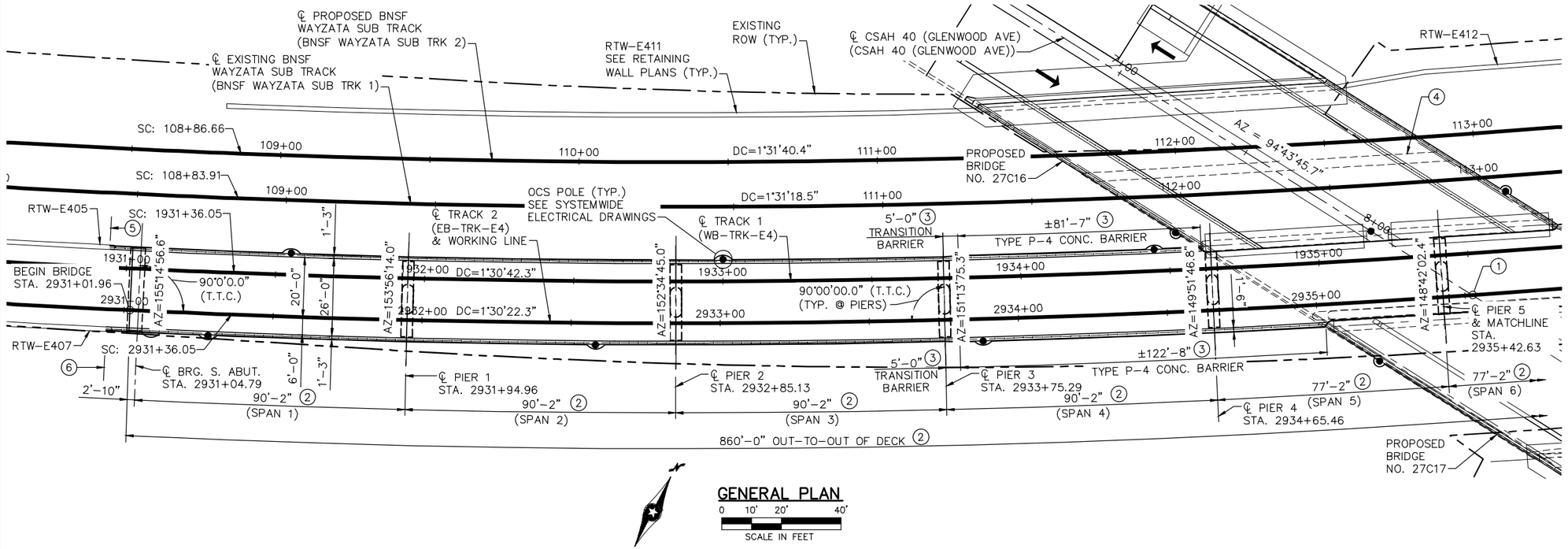
CIVIL EAST - VOLUME 4B
LRT OVER BNSF
BRIDGE R0697
KEY PLAN & ELEVATION

DISCIPLINE: STRUCTURES

SHEET NAME: CBRR0697-BRG-GPE-001

SHEET 1 OF 64

Sep. 10 2015 11:27 am V:\3400_ADC\CAD\segment e4\plan sheets\structures\R0697\CBRR0697-BRG-GPE-001.dwg By: lisa.thompson

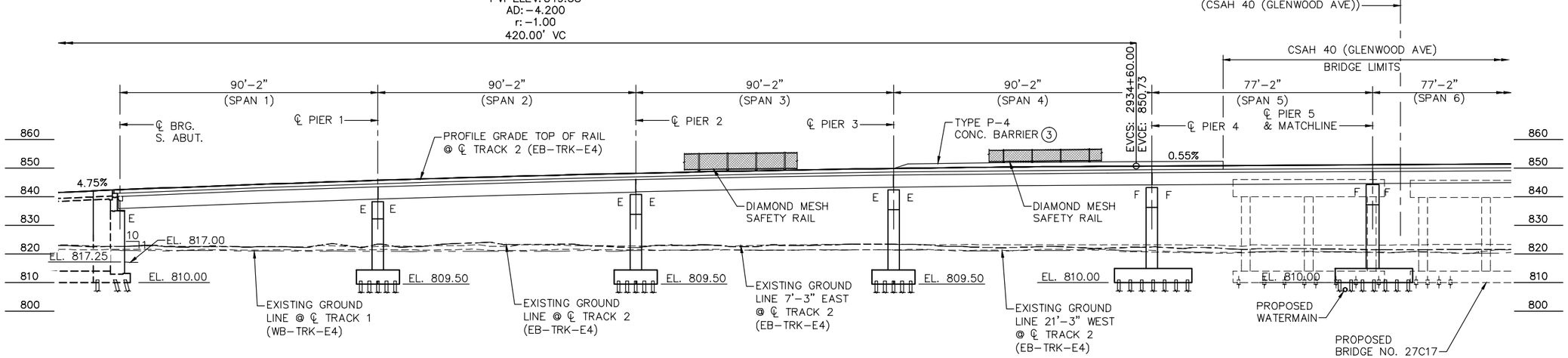


GENERAL PLAN

0 10' 20' 40'
SCALE IN FEET

NOTES:

1. CONTROL POINT
   ℄ TRACK 2 (EB–TRK–E4) P.O.C. 2935+52.51
   ℄ CSAH 40 (GLENWOOD AVE)
   (CSAH 40 (GLENWOOD AVE)) P.O.T. 8+39.83
   X = 525815.344 Y = 168533.506
   Δ = 36°17'28.1" (T.T.C.)
2. DIMENSIONS MEASURED ALONG ℄ TRACK 2.
3. SEE TYPE P–4 BARRIER (MOD.) DETAILS ON SHEET 45.
4. EXISTING BRIDGE NO. 27569 TO BE REMOVED, 181.9' LONG AND 70.4' WIDE, TWO STEEL CONT. BEAM SPANS BUILT IN 1988.
5. END OF RETAINING WALL E405 AND BEGIN OF SW WINGWALL. ℄ TRACK 2 (EB–TRK–E4) STA. 2930+94.30.
6. END OF RETAINING WALL E407 AND BEGIN OF SE WINGWALL. ℄ TRACK 2 (EB–TRK–E4) STA. 2930+94.30.



GENERAL ELEVATION

0 10' 20' 40'
SCALE IN FEET

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: KAE | CHECKED BY: EJT
DRAWN BY: LMT | DATE: 9/14/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

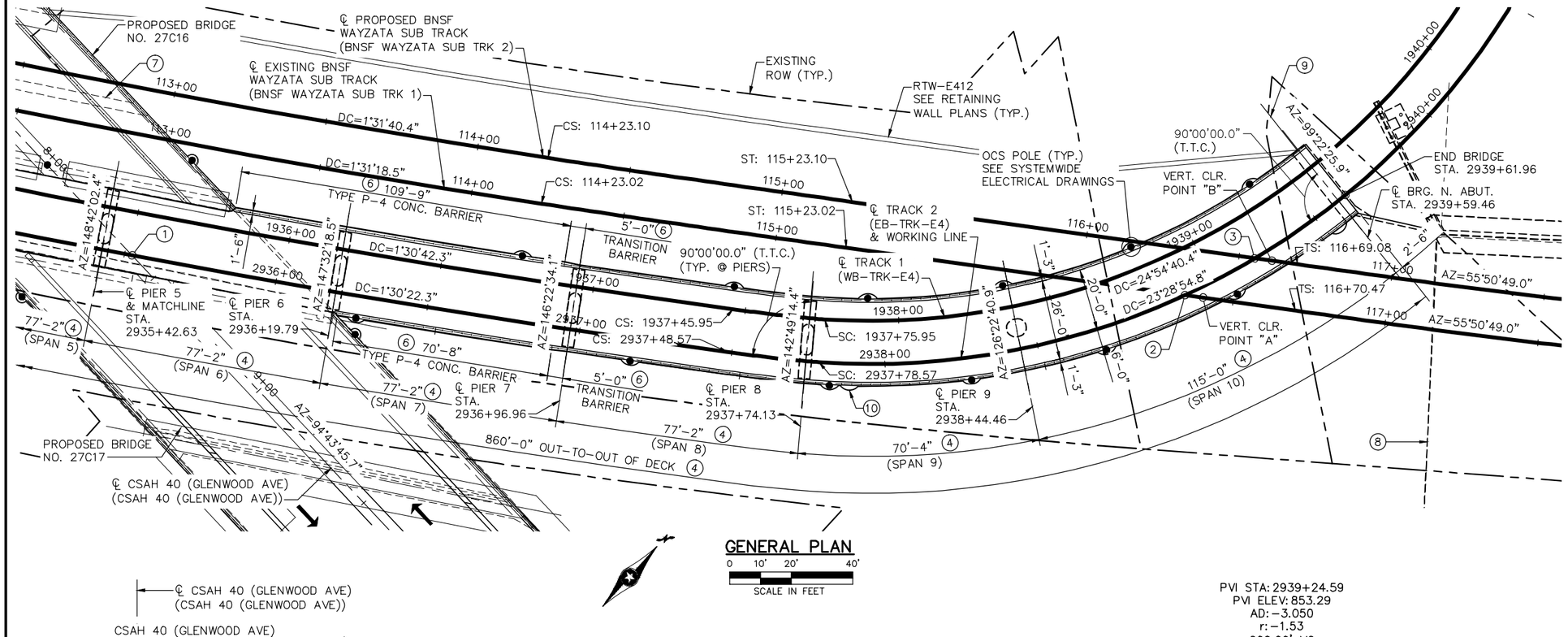
CIVIL EAST - VOLUME 4B
LRT OVER BNSF
BRIDGE R0697
GENERAL PLAN & ELEVATION 1

DISCIPLINE: STRUCTURES

SHEET NAME: CBRR0697-BRG-GPE-002-1

SHEET 2 OF 64

Sep. 10 2015 11:28 am V:\3400_ADC\CAD\segment e4\plan sheets\structures\R0697\CBRR0697-BRG-GPE-002.dwg By: lisa.thompson

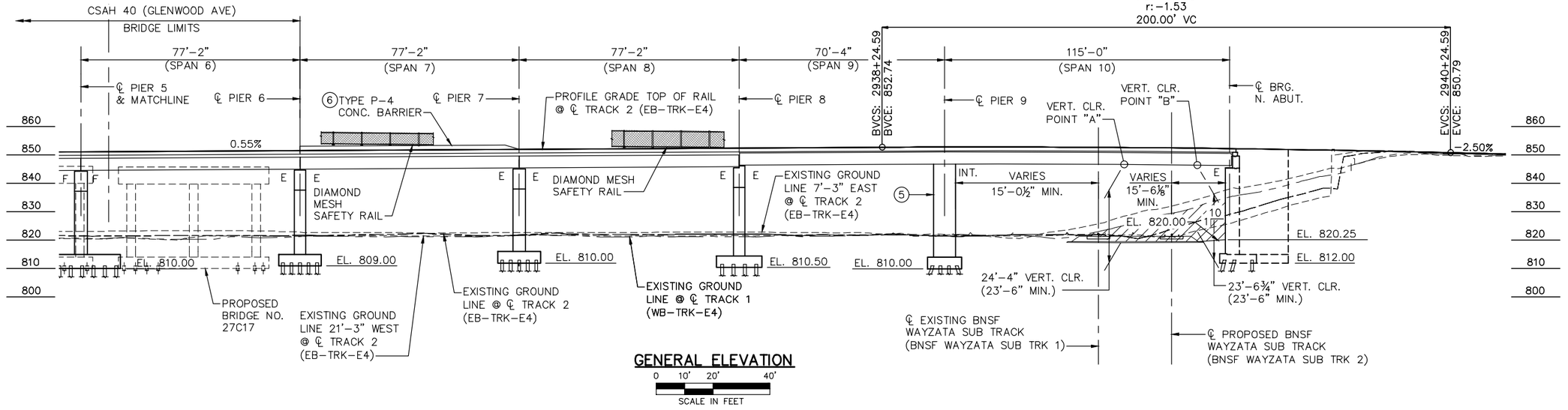


GENERAL PLAN

0 10' 20' 40'
SCALE IN FEET

NOTES:

1. CONTROL POINT
   ℄ TRACK 2 (EB-TRK-E4) P.O.C. 2935+52.51
   ℄ CSAH 40 (GLENWOOD AVE)
   (CSAH 40 (GLENWOOD AVE)) P.O.T. 8+39.83
   X = 525815.344 Y = 168533.506
   Δ = 36°17'28.1" (T.T.C.)
2. ℄ TRACK 2 (EB-TRK-E4) P.O.C. 2939+00.72
   ℄ EXISTING BNSF WAYZATA SUB TRACK
   (BNSF WAYZATA SUB TRK 1) P.O.T. 116+34.22
   X = 526077.848 Y = 168753.465
   Δ = 32°40'49.9" (T.T.C.)
3. ℄ TRACK 2 (EB-TRK-E4) P.O.C. 2939+26.44
   ℄ PROPOSED BNSF WAYZATA SUB TRACK
   (BNSF WAYZATA SUB TRK 2) P.O.T. 116+55.17
   X = 526086.701 Y = 168777.597
   Δ = 38°43'10.1" (T.T.C.)
4. DIMENSIONS MEASURED ALONG ℄ TRACK 2.
5. PIER IS CONSIDERED TO BE OF HEAVY CONSTRUCTION IN ACCORDANCE WITH MnDOT LRFD BRIDGE DESIGN MANUAL AND AREMA MANUAL FOR RAILWAY ENGINEERING.
6. SEE TYPE P-4 CONC. BARRIER (MOD.) DETAILS ON SHEET 45.
7. EXISTING BRIDGE NO. 27569 TO BE REMOVED, 181.9' LONG AND 70.4' WIDE, TWO STEEL CONT. BEAM SPANS BUILT IN 1988.
8. EXISTING BRIDGE NO. 27699 TO REMAIN, 116.7' LONG AND 70.4' WIDE, ONE PCB SPAN BUILT IN 2000.
9. END OF RETAINING WALL E412 AND BEGIN NORTH ABUTMENT. ℄ TRACK 2 (EB-TRK-E4) STA. 2939+56.40.
10. RAIL LUBRICATOR EQUIPMENT BLISTER TO BE COORDINATED DURING ADVANCED DESIGN.



GENERAL ELEVATION

0 10' 20' 40'
SCALE IN FEET

PVI STA: 2939+24.59
PVI ELEV: 853.29
AD: -3.050
r: -1.53
200.00' VC

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: KAE | CHECKED BY: EJT
DRAWN BY: LMT | DATE: 9/14/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

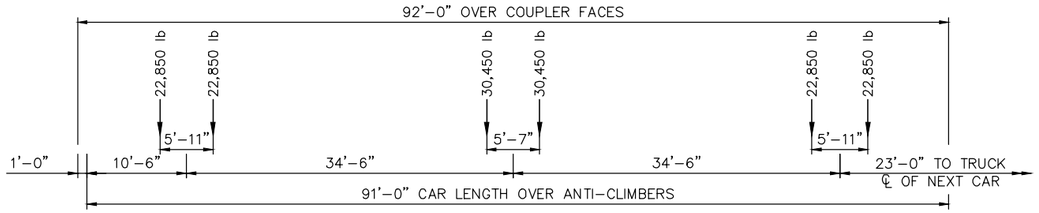
SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4B
LRT OVER BNSF
BRIDGE R0697
GENERAL PLAN & ELEVATION 2

DISCIPLINE: STRUCTURES
SHEET NAME: CBRR0697-BRG-GPE-002-2

SHEET 3 OF 64

Sep. 10 2015 11:28 am V:\3400_ADC\CAD\segment e4\plan sheets\structures\R0697\CBRR0697-BRG-GPE-002.dwg By: lisa.thompson



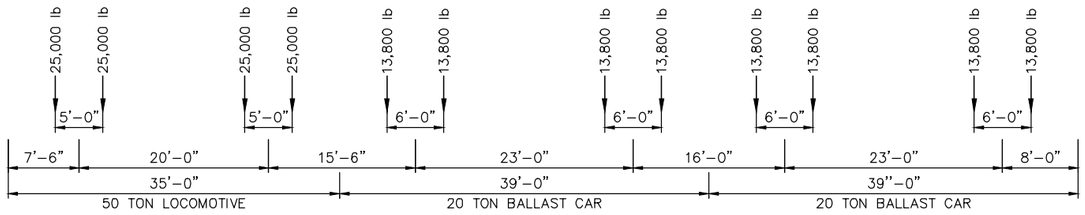
LIGHT RAIL VEHICLE LOADING DIAGRAM

NOTES:

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

AXLE LOAD IN POUNDS.

LOADING DIAGRAM REPRESENTS MAXIMUM LOAD AT EACH TRUCK.



MAINTENANCE TRAIN LOADING DIAGRAM

NOTES:

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.

AXLE LOAD IN POUNDS.

WEIGHT OF EMPTY BALLAST CAR IS 15,000 POUNDS.

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 (3JM)	CU. YD.	
2401	BRIDGE SLAB CONCRETE (3Y42)	SQ. FT.	
2401	EMBEDDED TRACK SLAB CONCRETE (3YHPC-S)	CU. YD.	
2401	TYPE CURB RAILING CONCRETE (3S52)	LIN. FT.	
2401	TYPE MOD P-4 (TL-4) RAILING CONCRETE (3S52)	LIN. FT.	
2401	REINFORCEMENT BARS	POUND	
2401	REINFORCEMENT BARS (EPOXY COATED)	POUND	
2401	STRUCTURE EXCAVATION	CU. YD.	
2402	EXPANSION JOINT DEVICES TYPE SPECIAL	LIN. FT.	
2402	BEARING ASSEMBLY	EACH	
2402	PRESTRESSED CONCRETE BEAMS MN54	LIN. FT.	
2405	DIAPHRAGMS FOR TYPE MN54 PRESTRESSED BEAMS	LIN. FT.	
2433	CEMENT GROUT	CU. YD.	
2452	C-I-P CONCRETE PILING DELIVERED 12"	LIN. FT.	
2452	C-I-P CONCRETE PILING DRIVEN 12"	LIN. FT.	
2452	STEEL H-PILING DRIVEN 12"	LIN. FT.	
2452	STEEL H-PILING DRIVEN 14"	LIN. FT.	
2452	STEEL H-PILING DELIVERED 12"	LIN. FT.	
2452	STEEL H-PILING DELIVERED 14"	LIN. FT.	
2452	C-I-P CONCRETE TEST PILE 95 LONG 12"	EACH	
2452	STEEL H-TEST PILE 45 LONG 12"	EACH	
2452	STEEL H-TEST PILE 50 LONG 12"	EACH	
2452	STEEL H-TEST PILE 60 LONG 12"	EACH	
2452	STEEL H-TEST PILE 70 LONG 12"	EACH	
2452	STEEL H-TEST PILE 75 LONG 12"	EACH	
2452	STEEL H-TEST PILE 80 LONG 12"	EACH	
2452	STEEL H-TEST PILE 55 LONG 14"	EACH	
2452	PILE TIP PROTECTION 12"	EACH	
2452	PILE TIP PROTECTION 14"	EACH	
2481	MEMBRANE WATERPROOFING SYSTEM	SQ. YD.	
2502	DRAINAGE SYSTEM	EACH	
2545	CONDUIT SYSTEM	EACH	
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.

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

ALL REINFORCEMENT SHALL BE 2 INCHES CLEAR, UNLESS SHOWN OR NOTED OTHERWISE.

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.

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".

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: KAE | CHECKED BY: EJT
DRAWN BY: LMT | DATE: 9/14/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

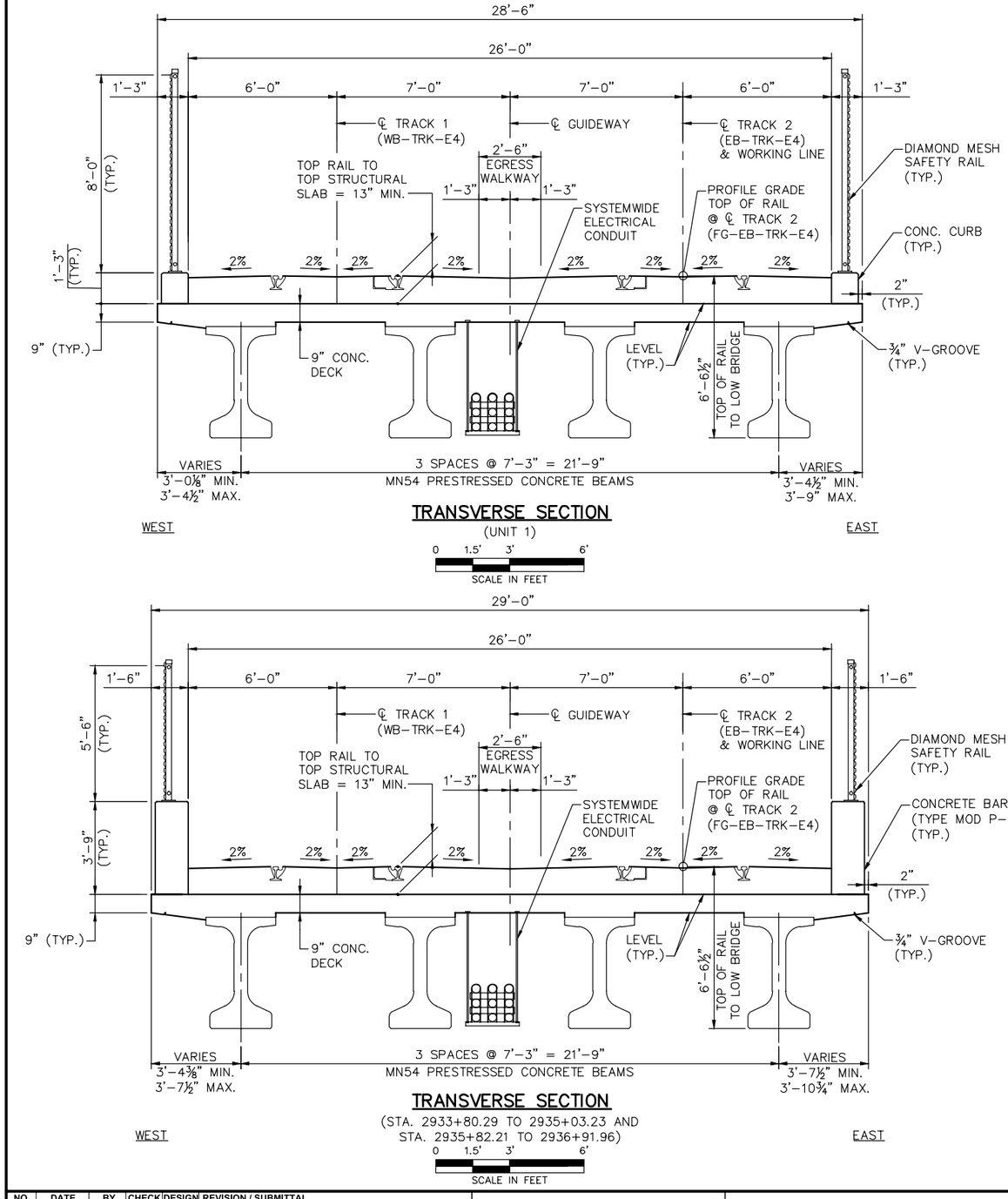
METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4B
LRT OVER BNSF
BRIDGE R0697
SCHEDULE OF QUANTITIES

DISCIPLINE: STRUCTURES
SHEET NAME: CBRR0697-BRG-TRN-001-1

SHEET 4 OF 64

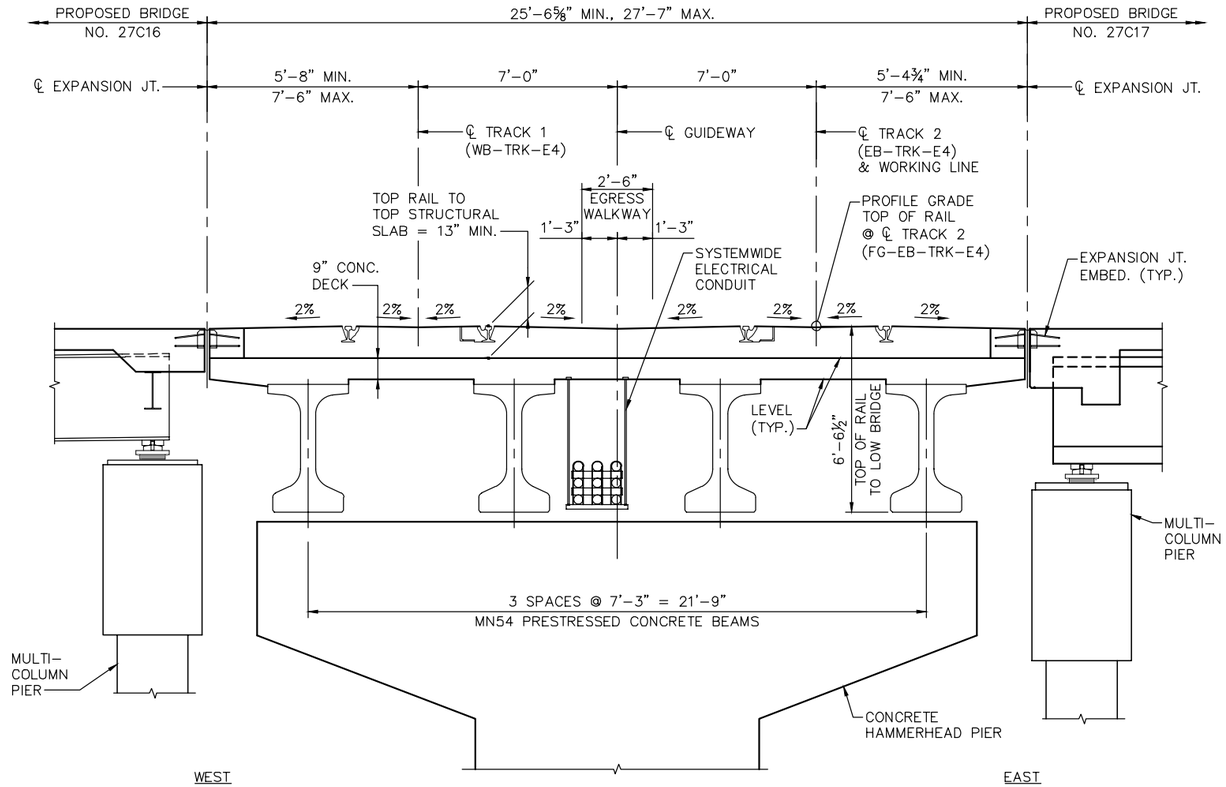


TRANSVERSE SECTION
(UNIT 1)

0 1.5' 3' 6'
SCALE IN FEET

TRANSVERSE SECTION
(STA. 2933+80.29 TO 2935+03.23 AND
STA. 2935+82.21 TO 2936+91.96)

0 1.5' 3' 6'
SCALE IN FEET



TRANSVERSE SECTION
CSAH 40 (GLENWOOD AVE)

0 1.5' 3' 6'
SCALE IN FEET

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: KAE | CHECKED BY: EJT
DRAWN BY: LMT | DATE: 9/14/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

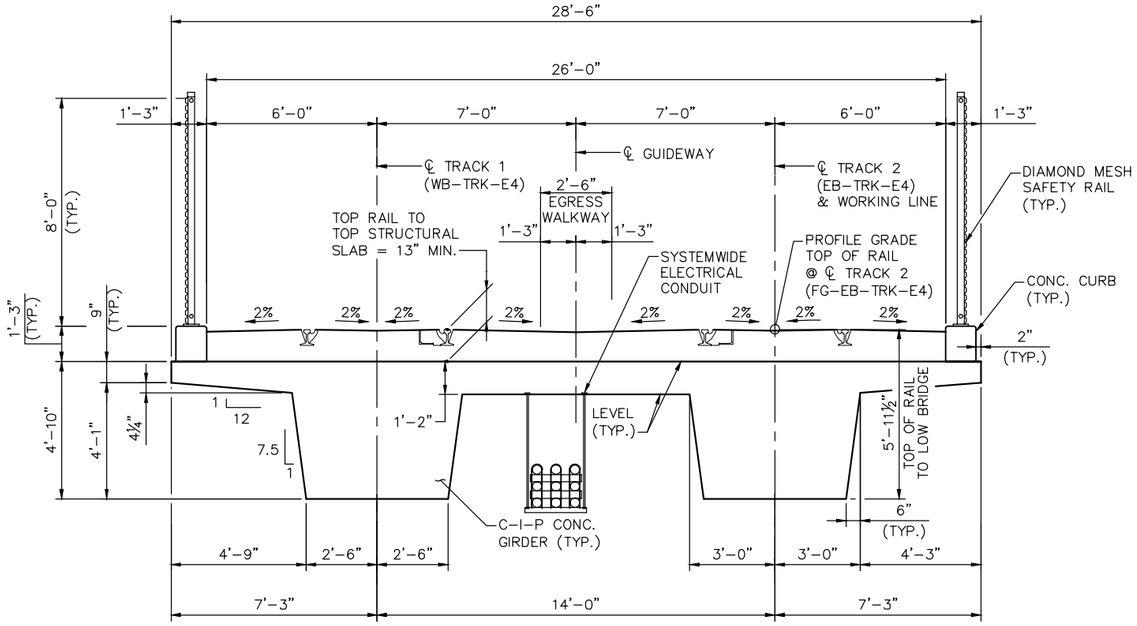
SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4B
LRT OVER BNSF
BRIDGE R0697
TRANSVERSE SECTION 1

DISCIPLINE: STRUCTURES
SHEET NAME: CBRR0697-BRG-TRN-001-2

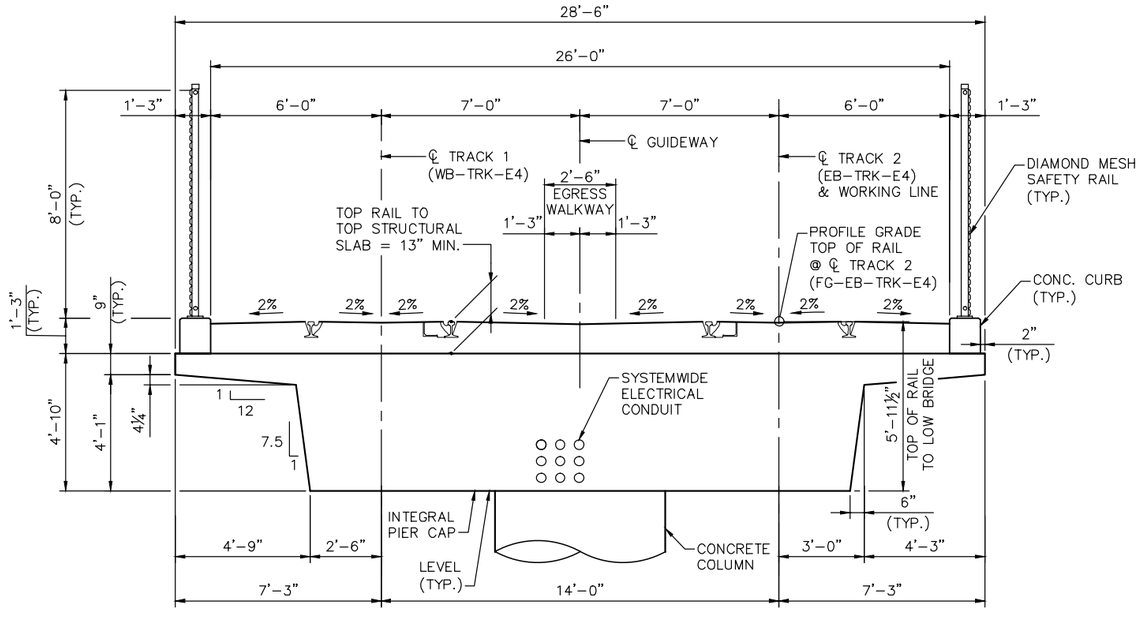
SHEET 5 OF 64

Sep. 10 2015 11:29 am V:\3400_ADC\CAD\segment e4\plan sheets\structures\R0697\CBRR0697-BRG-TRN.dwg By: lisa.thompson



TRANSVERSE SECTION
(UNIT 2)

0 1.5' 3' 6'
SCALE IN FEET



TRANSVERSE SECTION
(UNIT 2 AT PIER 9)

0 1.5' 3' 6'
SCALE IN FEET

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: KAE | CHECKED BY: EJT
DRAWN BY: LMT | DATE: 9/14/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

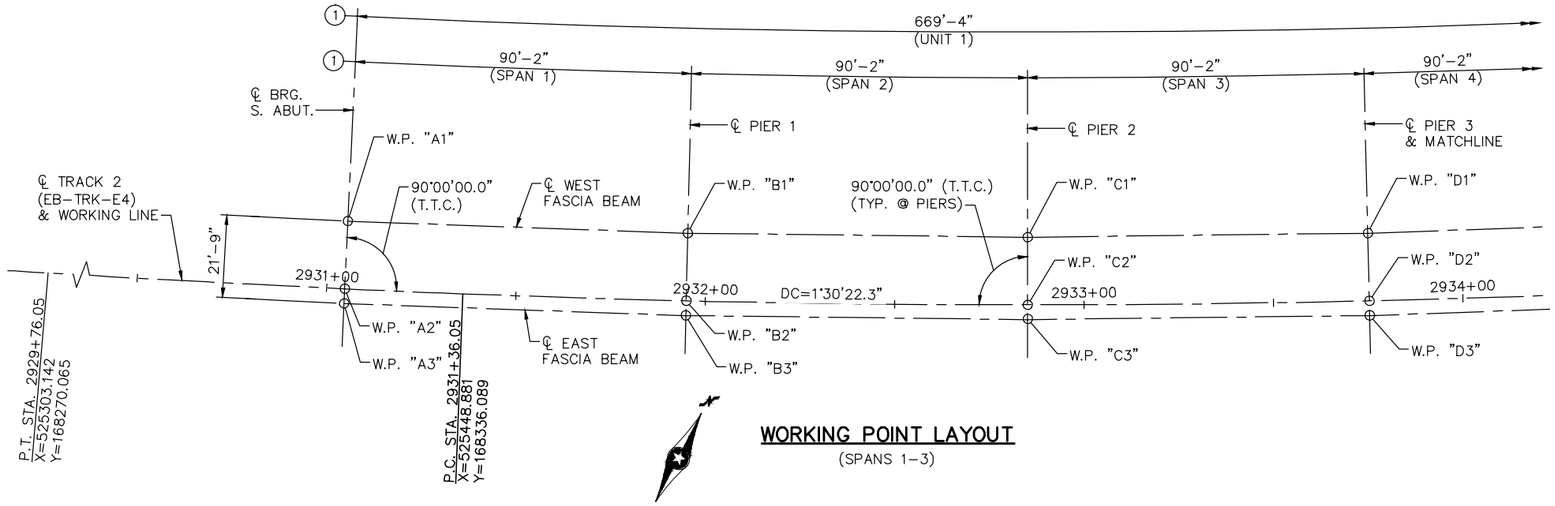
METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4B
LRT OVER BNSF
BRIDGE R0697
TRANSVERSE SECTION 2

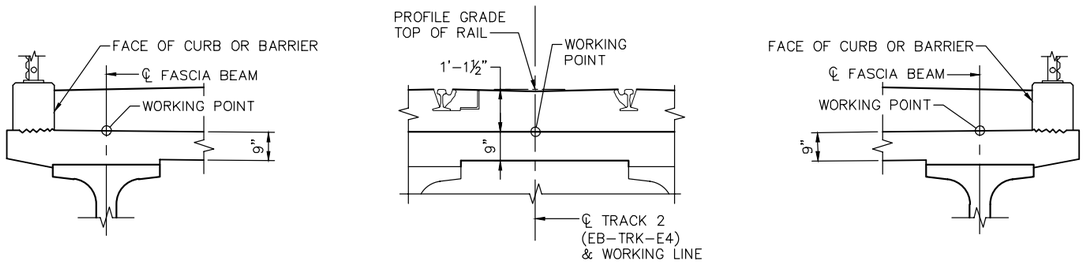
DISCIPLINE: STRUCTURES
SHEET NAME: CBRR0697-BRG-TRN-001-3

SHEET 6 OF 64



WORKING POINT LAYOUT

(SPANS 1-3)



WEST

EAST

WORKING POINT LOCATIONS

(UNIT 1)

DIMENSIONS BETWEEN WORKING POINTS - UNIT 1														COORDINATES		ELEVATION				
POINT	STATION	A1	A2	A3	B1	B2	B3	C1	C2	C3	D1	D2	D3	X	Y	TOP OF RAIL	TOP OF SLAB	TOP OF SLAB TO BRIDGE SEAT	BRIDGE SEAT	POINT
A1	2931+04.79	---	17.88	---	89.76	91.73	92.61	---	---	181.31	---	---	---	525413.059	168339.135		841.35	6.32	835.03	A1
A2	2931+04.79	---	---	3.88	---	90.17	90.30	---	---	---	---	---	---	525420.543	168322.902	842.47	841.35			A2
A3	2931+04.79	---	---	---	92.59	---	90.26	181.30	---	---	---	---	---	525422.165	168319.382		841.35	6.32	835.03	A3
B1	2931+94.96	---	---	---	---	17.88	---	89.74	91.71	92.59	---	---	181.29	525494.150	168377.620		844.64	6.10	838.54	B1
B2	2931+94.96	---	---	---	---	---	3.88	---	90.16	90.29	---	---	---	525502.004	168361.563	845.76	844.64			B2
B3	2931+94.96	---	---	---	---	---	---	92.59	---	90.26	181.29	---	---	525503.707	168358.082		844.64	6.10	838.54	B3
C1	2932+85.13	---	---	---	---	---	---	---	17.87	---	89.74	91.71	92.59	525574.292	168418.001		847.12	5.99	841.13	C1
C2	2932+85.13	---	---	---	---	---	---	---	---	3.88	---	90.16	90.29	525582.524	168402.134	848.24	847.12			C2
C3	2932.85.13	---	---	---	---	---	---	---	---	---	92.59	---	90.26	525584.309	168398.695		847.12	5.99	841.13	C3
D1	2933+75.29	---	---	---	---	---	---	---	---	---	---	17.87	---	525653.455	168460.269		848.79	5.84	842.95	D1
D2	2933+75.29	---	---	---	---	---	---	---	---	---	---	---	3.88	525662.060	168444.602	849.91	848.79			D2
D3	2933+75.29	---	---	---	---	---	---	---	---	---	---	---	---	525663.926	168441.206		848.79	5.84	842.95	D3

NOTES:

1. DIMENSIONS MEASURED ALONG ℄ TRACK 2.

TOP OF DECK TO BRIDGE SEAT						
	DECK THICKNESS	STOOL HEIGHT	BEAM HEIGHT	BEARING HEIGHT	TOTAL	
					INCHES	FEET
S. ABUT.	9"	2 1/2"	54"	10 1/4"	75 3/4	6.31
PIER 1	9"	2 1/2"	54"	7 3/4"	73 1/4	6.10
PIER 2	9"	2 3/8"	54"	6 1/2"	71 7/8	5.99
PIER 3	9"	2 1/2"	54"	4 5/8"	70 1/8	5.84

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: KAE | CHECKED BY: EJT
DRAWN BY: LMT | DATE: 9/14/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

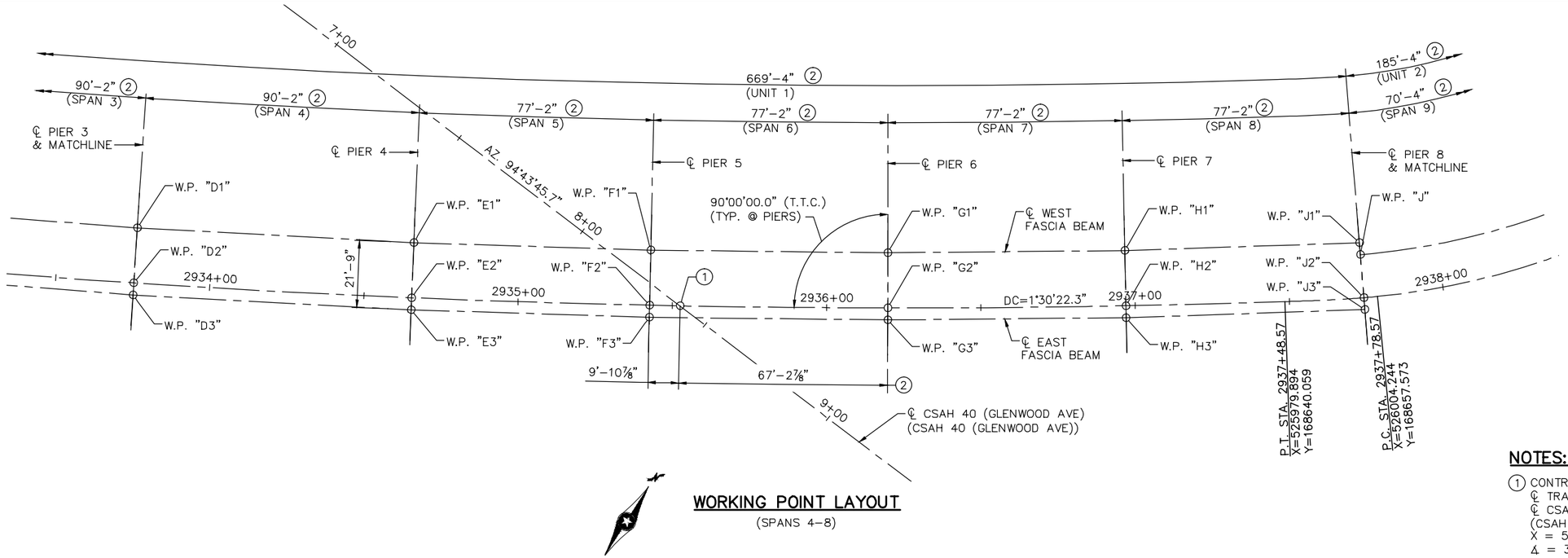
SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4B
LRT OVER BNSF
BRIDGE R0697
BRIDGE LAYOUT 1

DISCIPLINE: STRUCTURES
SHEET NAME: CBRR0697-BRG-SUP-001-1

SHEET 7 OF 64

Sep. 10 2015 11:29 am V:\3400_ADC\CAD\segment e4\plan sheets\structures\R0697\CBRR0697-BRG-SUP-001.dwg By: lisa.thompson



WORKING POINT LAYOUT

(SPANS 4–8)

NOTES:

1. CONTROL POINT 1
   ℄ TRACK 2 (EB–TRK–E4) P.O.C. 2935+52.51
   ℄ CSAH 40 (GLENWOOD AVE)
   (CSAH 40 (GLENWOOD AVE)) P.O.T. 8+39.83
   X = 525815.344 Y = 168533.506
   Δ = 36°17'28.1" (T.T.C.)
2. DIMENSIONS MEASURED ALONG ℄ TRACK 2.

DIMENSIONS BETWEEN WORKING POINTS - UNIT 1 (CONTINUED)

POINT	STATION	D1	D2	D3	E1	E2	E3	F1	F2	F3	G1	G2	G3	H1	H2	H3	J1	J2	J3	COORDINATES X	COORDINATES Y	ELEVATION TOP OF RAIL	ELEVATION TOP OF SLAB	TOP OF SLAB TO BRIDGE SEAT	ELEVATION BRIDGE SEAT	POINT
D1	2933+75.29	---	17.87	---	89.74	91.71	92.59	---	---	168.42	---	---	---	---	---	---	---	---	---	525653.455	168460.269		848.79	5.84	842.95	D1
D2	2933+75.29	---	---	3.88	---	90.16	90.29	---	---	---	---	---	---	---	---	---	---	---	---	525662.060	168444.602	849.91	848.79			D2
D3	2933+75.29	---	---	---	92.59	---	90.26	168.42	---	---	---	---	---	---	---	---	---	---	---	525663.926	168441.206		848.79	5.84	842.95	D3
E1	2934+65.46	---	---	---	---	17.87	---	76.81	79.04	80.04	---	---	155.56	---	---	---	---	---	---	525731.593	168504.402		849.64	5.72	843.92	E1
E2	2934+65.46	---	---	---	---	---	3.88	---	77.17	77.31	---	---	---	---	---	---	---	---	---	525740.567	168488.943	850.76	849.64			E2
E3	2934+65.46	---	---	---	---	---	---	80.04	---	77.25	155.56	---	---	---	---	---	---	---	---	525742.513	168485.592		849.64	5.72	843.92	E3
F1	2935+42.63	---	---	---	---	---	---	---	17.87	---	76.80	79.03	80.03	---	---	155.56	---	---	---	525797.622	168543.636		850.06	5.75	844.31	F1
F2	2935+42.63	---	---	---	---	---	---	---	---	3.88	---	77.16	77.30	---	---	---	---	---	---	525806.909	168528.362	851.18	850.06			F2
F3	2935+42.63	---	---	---	---	---	---	---	---	---	80.03	---	77.24	155.56	---	---	---	---	---	525808.922	168525.051		850.06	5.75	844.31	F3
G1	2936+19.79	---	---	---	---	---	---	---	---	---	---	17.88	---	76.81	79.04	80.04	---	---	155.67	525862.834	168584.196		850.49	5.95	844.54	G1
G2	2936+19.79	---	---	---	---	---	---	---	---	---	---	---	3.87	---	77.17	77.31	---	---	---	525872.428	168569.114	851.61	850.49			G2
G3	2936+19.79	---	---	---	---	---	---	---	---	---	---	---	---	80.04	---	77.25	---	---	---	525874.508	168565.844		850.49	5.95	844.54	G3
H1	2936+96.96	---	---	---	---	---	---	---	---	---	---	---	---	---	17.87	---	76.05	78.95	80.09	525927.218	168626.075		850.91	6.07	844.84	H1
H2	2936+96.96	---	---	---	---	---	---	---	---	---	---	---	---	---	---	3.87	---	77.16	77.44	525937.116	168611.191	852.03	850.91			H2
H3	2936+96.96	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	79.41	---	77.40	525939.262	168607.964		850.91	6.07	844.84	H3
J1	2937+74.13	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	17.87	---	525989.928	168669.104		851.34	6.21	845.13	J1
J2	2937+74.13	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	3.87	526000.730	168654.862	852.46	851.34			J2
J3	2937+74.13	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	526003.072	168651.774		851.34	6.21	845.13	J3

TOP OF DECK TO BRIDGE SEAT

	DECK THICKNESS	STOOL HEIGHT	BEAM HEIGHT	BEARING HEIGHT	TOTAL INCHES	TOTAL FEET
PIER 3	9"	2 1/2"	54"	4 5/8"	70 1/8	5.84
PIER 4	9"	2 3/8"	54"	3 1/4"	68 5/8	5.72
PIER 5	9"	2 3/4"	54"	3 1/4"	69 3/8	5.75
PIER 6	9"	2 1/2"	54"	5 7/8"	71 3/8	5.95
PIER 7	9"	2 3/4"	54"	7 1/8"	72 7/8	6.07
PIER 8	9"	2 5/8"	54"	8 7/8"	74 1/2	6.21

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: KAE | CHECKED BY: EJT
DRAWN BY: LMT | DATE: 9/14/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

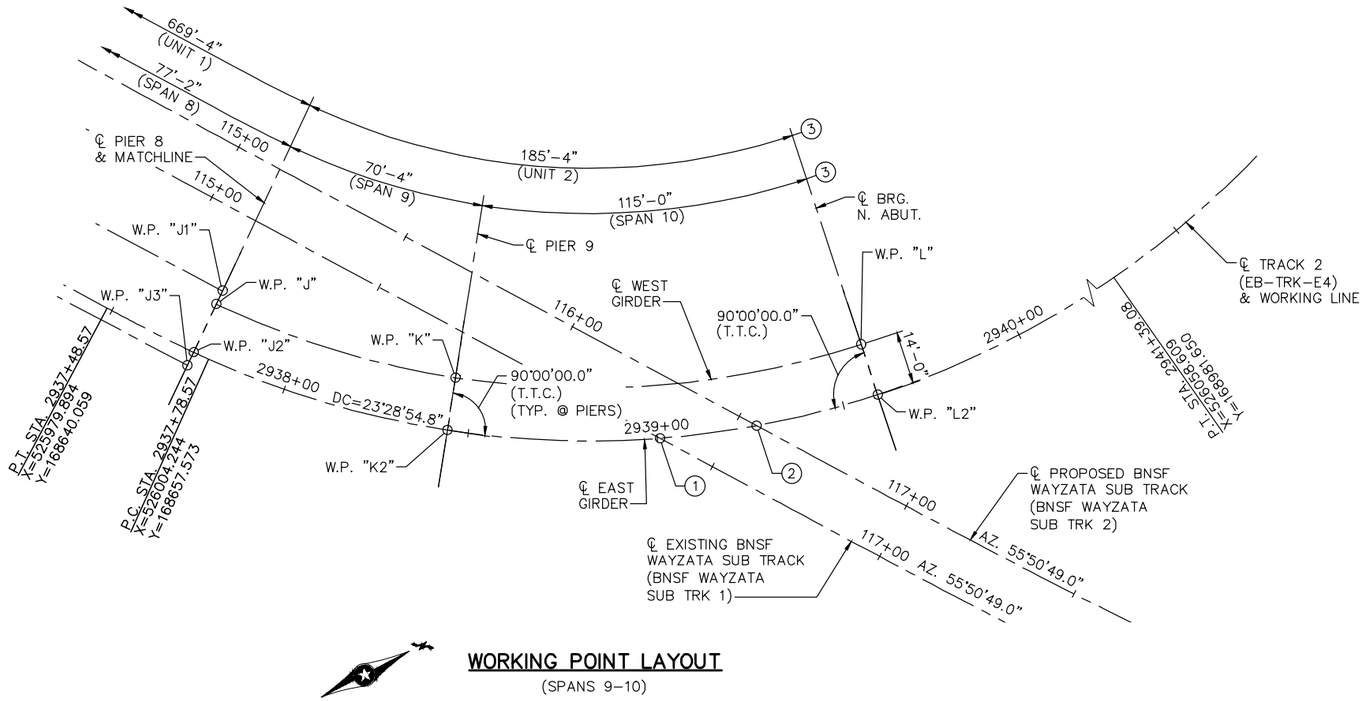
SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4B
LRT OVER BNSF
BRIDGE R0697
BRIDGE LAYOUT 2

DISCIPLINE: STRUCTURES
SHEET NAME: CBRR0697-BRG-SUP-001-2

SHEET 8 OF 64

Sep. 10 2015 11:29 am V:\3400_ADC\CAD\segment e4\plan sheets\structures\R0697\CBRR0697-BRG-SUP-001.dwg By: lisa.thompson



WORKING POINT LAYOUT

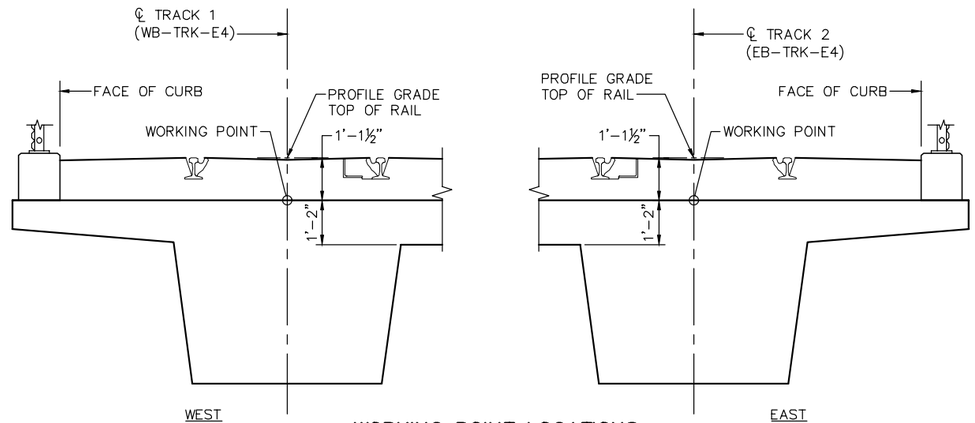
(SPANS 9–10)

NOTES:

1. ℄ TRACK 2 (EB–TRK–E4) P.O.C. 2939+00.72
   ℄ EXISTING BNSF WAYZATA SUB TRACK
   (BNSF WAYZATA SUB TRK 1) P.O.T. 116+34.22
   X = 526077.848 Y = 168753.465
   Δ = 32°40'49.9" (T.T.C.)
2. ℄ TRACK 2 (EB–TRK–E4) P.O.C. 2939+26.44
   ℄ PROPOSED BNSF WAYZATA SUB TRACK
   (BNSF WAYZATA SUB TRK 2) P.O.T. 116+55.17
   X = 526086.701 Y = 168777.597
   Δ = 38°43'10.1" (T.T.C.)
3. DIMENSIONS MEASURED ALONG ℄ TRACK 2.

DIMENSIONS BETWEEN WORKING POINTS - UNIT 2								COORDINATES		ELEVATION				
POINT	STATION	J	J2	K	K2	L	L2	X	Y	TOP OF RAIL	TOP OF SLAB	TOP OF SLAB TO BRIDGE SEAT	BRIDGE SEAT	POINT
J	2937+74.13	---	14.00	66.08	69.49	170.54	176.22	525992.270	168666.016	852.55	851.34	5.47	845.87	J
J2	2937+74.13	---	---	69.47	70.09	176.20	180.91	526000.730	168654.862	852.46	851.34	5.47	845.87	J2
K	2938+44.46	---	---	---	14.00	107.40	111.50	526038.700	168713.040	852.81	851.69			K
K2	2938+44.46	---	---	---	---	111.50	113.94	526049.972	168704.736	852.82	851.69			K2
L	2939+59.46	---	---	---	---	---	14.00	526080.451	168811.994	851.91	850.79	5.52	845.27	L
L2	2939+59.46	---	---	---	---	---	---	526094.264	168809.714	852.09	850.79	5.52	845.27	L2

TOP OF DECK TO BRIDGE SEAT					
	DECK THICKNESS	BEAM HEIGHT	BEARING HEIGHT	TOTAL	
				INCHES	FEET
PIER 8	9"	49"	7 5/8"	65 5/8	5.47
N. ABUT.	9"	49"	8 1/4"	66 1/4	5.52



WORKING POINT LOCATIONS

(UNIT 2)

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: KAE | CHECKED BY: EJT
DRAWN BY: LMT | DATE: 9/14/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

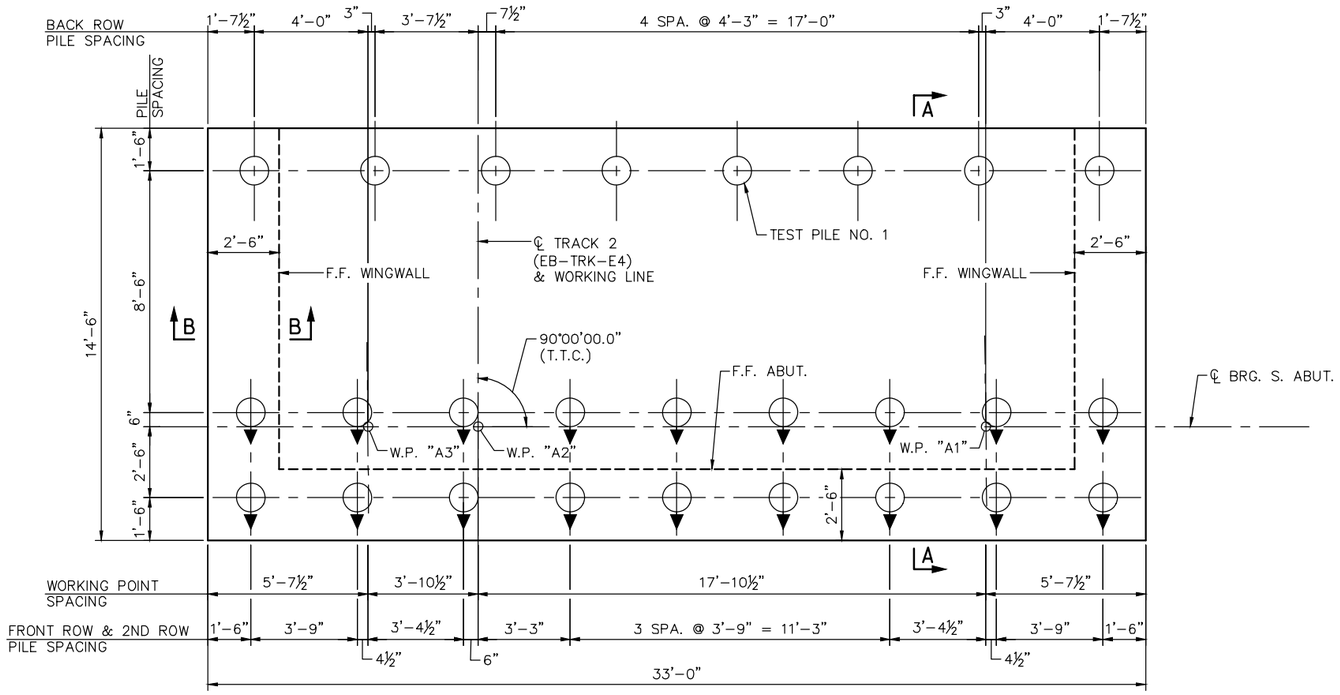
SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4B
LRT OVER BNSF
BRIDGE R0697
BRIDGE LAYOUT 3

DISCIPLINE: STRUCTURES
SHEET NAME: CBRR0697-BRG-SUP-001-3

SHEET 9 OF 64

Sep. 10 2015 11:29 am V:\3400_ADC\CAD\segment e4\plan sheets\structures\R0697\CBRR0697-BRG-SUP-001.dwg By: lisa.thompson



EAST

WEST

FOOTING PLAN

SOUTH ABUTMENT COMPUTED PILE LOAD - TONS/PILE	
FACTORED DEAD LOAD + EARTH PRESSURE	64.9
FACTORED LIVE LOAD	29.5
* FACTORED DESIGN LOAD	94.4

* BASED ON STRENGTH I LOAD COMBINATION.

SOUTH ABUTMENT REQUIRED NOMINAL PILE BEARING RESISTANCE FOR CIP PILES Rn - TONS/PILE		
FIELD CONTROL METHOD	φdyn	* Rn
MN/DOT PILE FORMULA 2012 (MPF12) $R_n = 20\sqrt{\frac{W \times H}{1000}} x log\left(\frac{10}{S}\right)$	0.50	189
PDA	0.65	146

* Rn = (FACTORED DESIGN LOAD) / φdyn

GENERAL PILE NOTES

1 C-I-P CONCRETE TEST PILES 95 FT. LONG
25 C-I-P CONCRETE PILES EST. LENGTH 85 FT.
26 C-I-P CONCRETE PILES REQ'D FOR SOUTH ABUTMENT.

PILE SPACING SHOWN IS AT BOTTOM OF FOOTING.

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

PILES TO HAVE A NOMINAL DIAMETER OF 12".

FOR PILE SPLICE DETAILS SEE DETAIL B201.

NOTES:

FOR SECTIONS A-A AND B-B, SEE SHEET 13.

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: KAE | CHECKED BY: EJT
DRAWN BY: LMT | DATE: 9/14/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

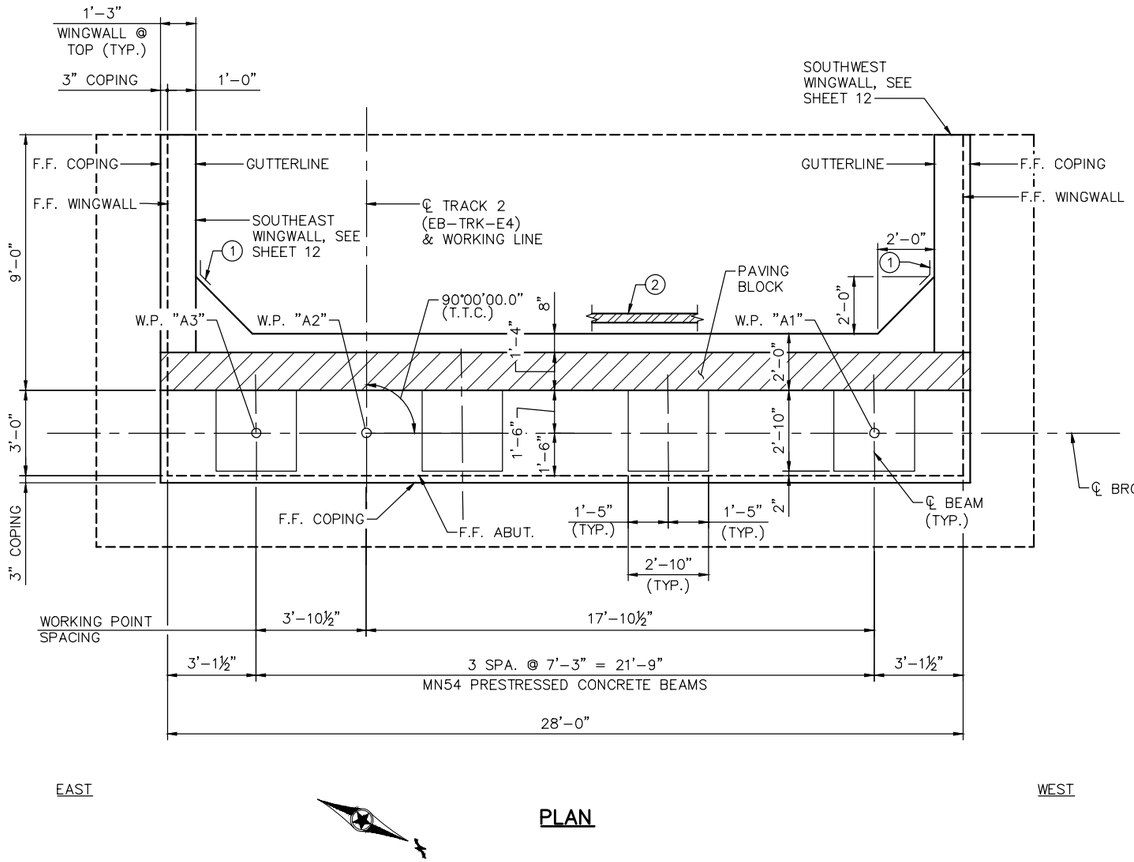
SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4B
LRT OVER BNSF
BRIDGE R0697
SOUTH ABUTMENT DETAILS 1

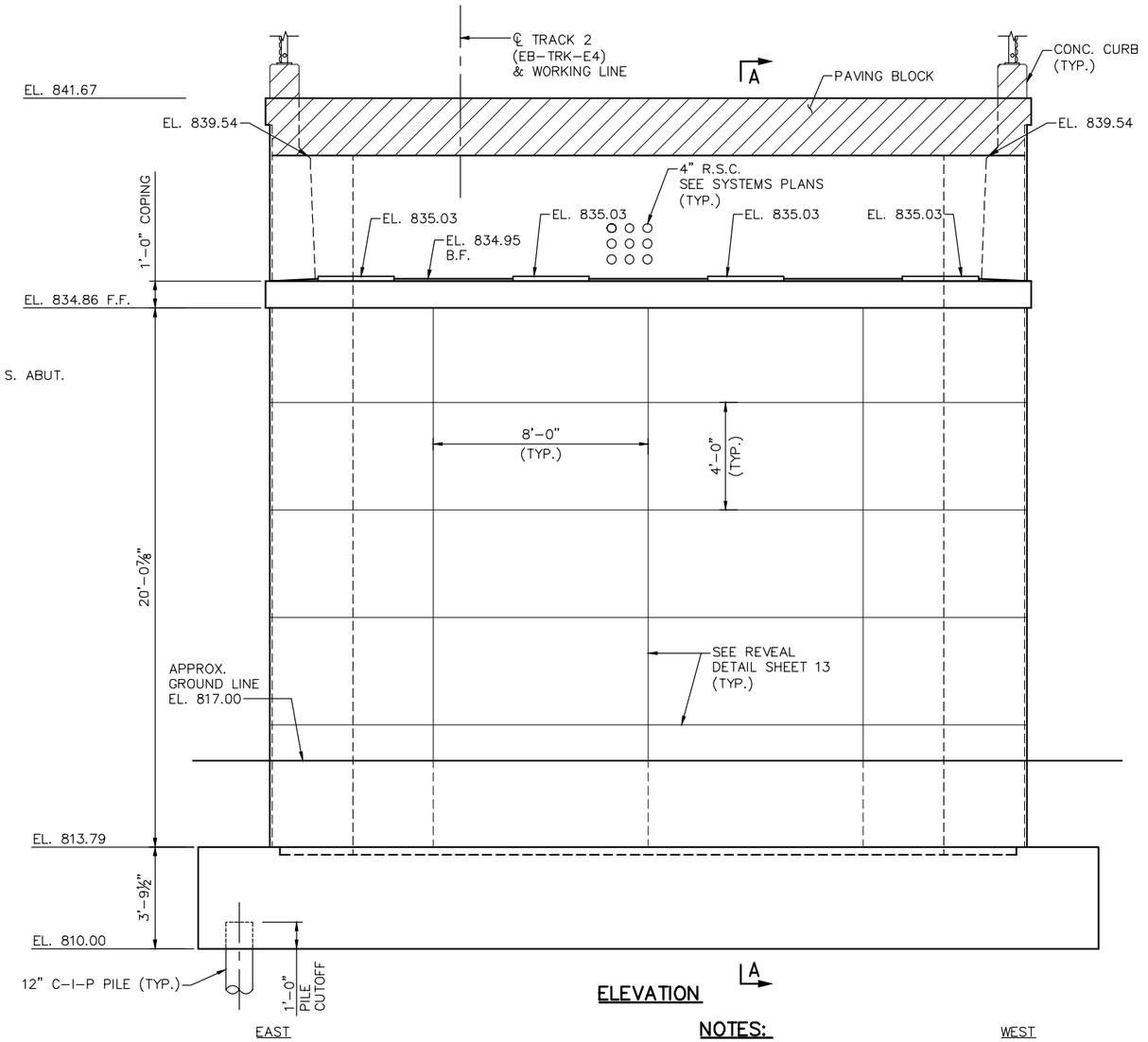
DISCIPLINE: STRUCTURES
SHEET NAME: CBRR0697-BRG-ABT-001-1

SHEET 10 OF 64

Sep. 10 2015 12:06 pm V:\3400_ADC\CAD\SEGMENT E4\PLAN SHEETS\STRUCTURES\R0697\CBRR0697-BRG-ABT-001.dwg By: lisa.thompson



PLAN



ELEVATION

NOTES:

FOR SECTION A-A, SEE SHEET 13.

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

(1) MEMBRANE WATERPROOFING SYSTEM PER MnDOT 2481.3.B.

(2) PERFORATED PIPE, SEE DETAIL B910 FOR DRAINAGE DETAILS.

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: KAE | CHECKED BY: EJT
DRAWN BY: LMT | DATE: 9/14/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

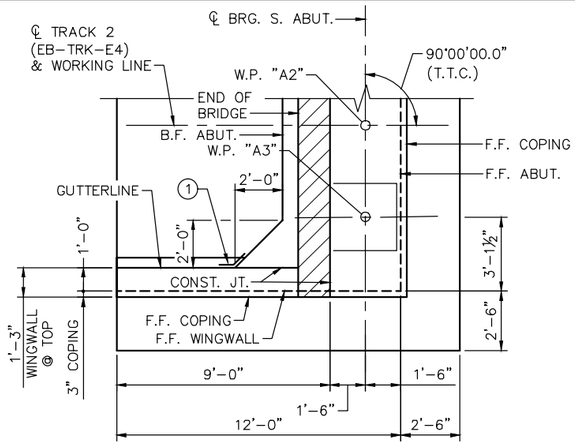
SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4B
LRT OVER BNSF
BRIDGE R0697
SOUTH ABUTMENT DETAILS 2

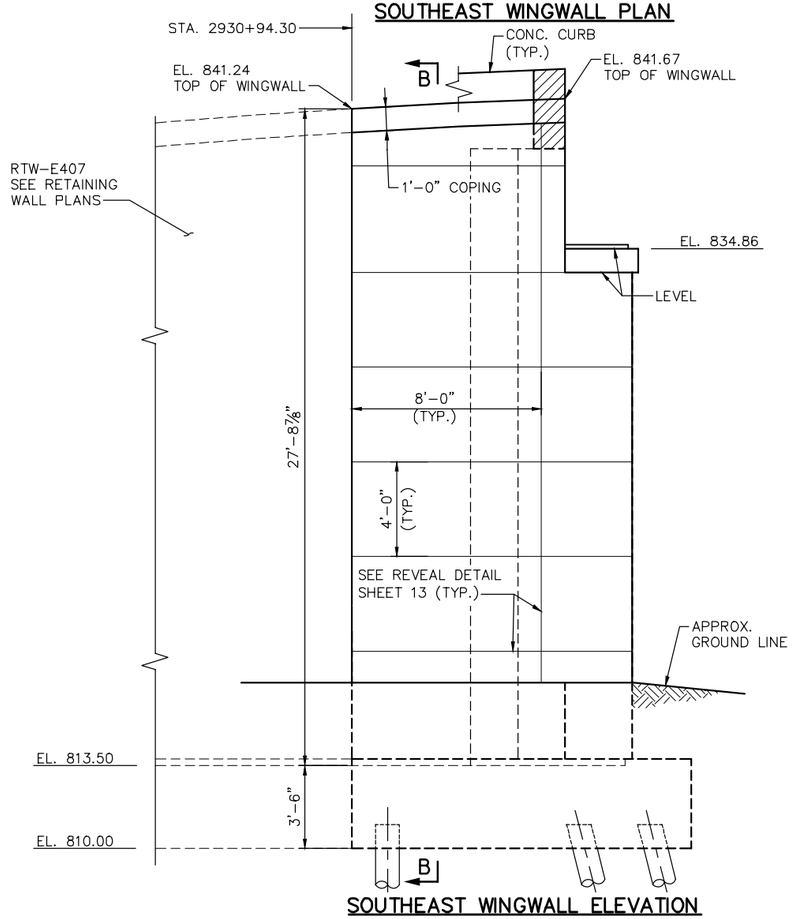
SHEET 11 OF 64

DISCIPLINE: STRUCTURES

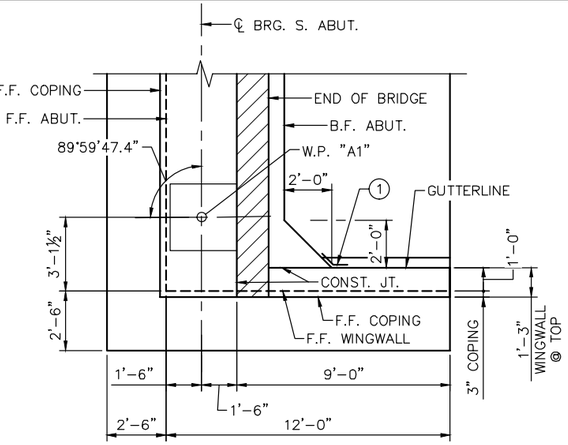
SHEET NAME: CBRR0697-BRG-ABT-001-2



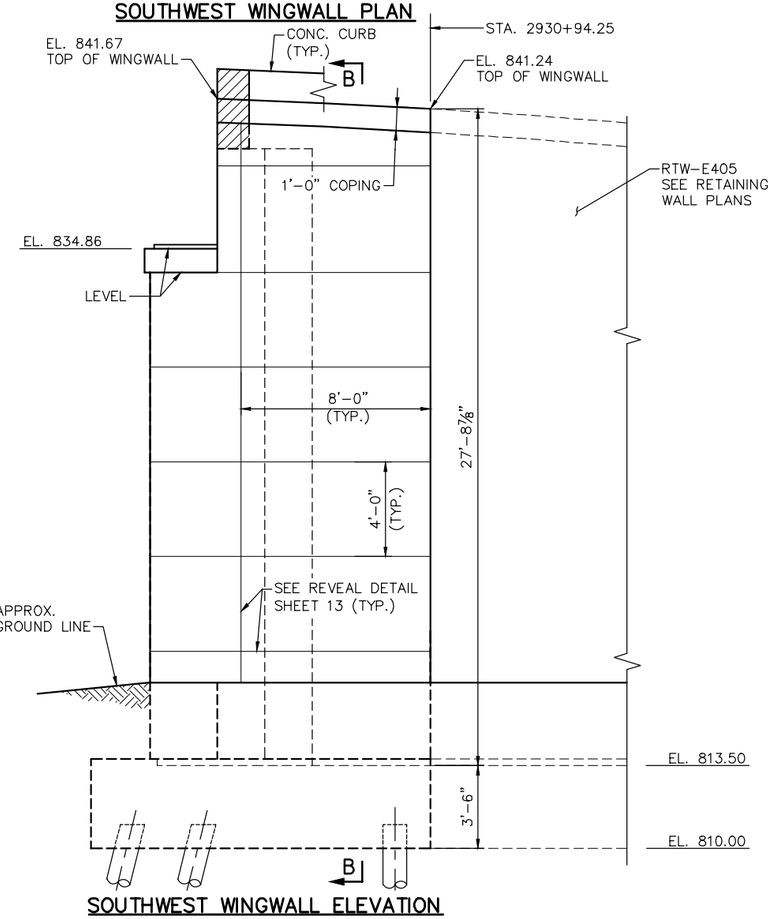
SOUTHEAST WINGWALL PLAN



SOUTHEAST WINGWALL ELEVATION



SOUTHWEST WINGWALL PLAN



SOUTHWEST WINGWALL ELEVATION

NOTES:

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

FOR SECTION B-B, SEE SHEET 13.

(1) MEMBRANE WATERPROOFING SYSTEM PER MnDOT SPEC. 2481.3.B.

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: KAE | CHECKED BY: EJT
DRAWN BY: LMT | DATE: 9/14/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

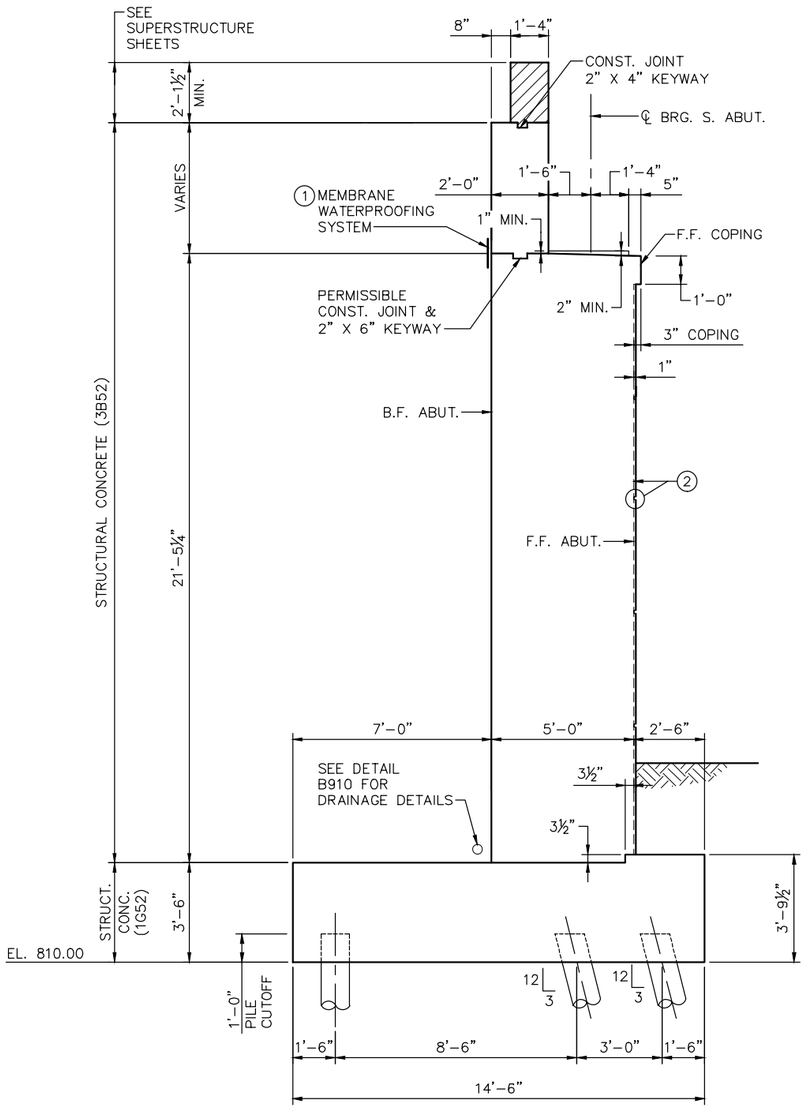
CIVIL EAST - VOLUME 4B
LRT OVER BNSF
BRIDGE R0697
SOUTH ABUTMENT DETAILS 3

SHEET 12 OF 64

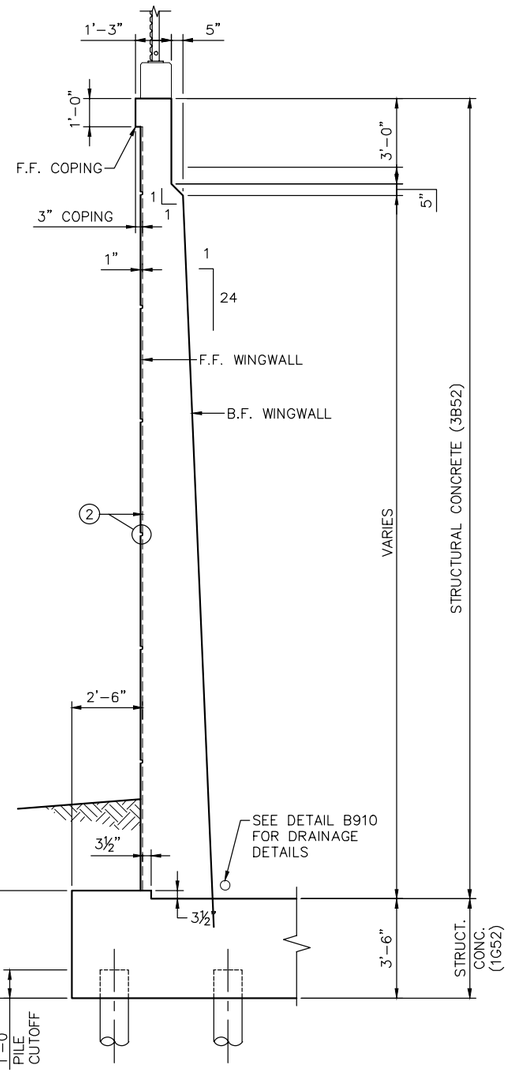
DISCIPLINE: STRUCTURES

SHEET NAME: CBRR0697-BRG-ABT-001-3

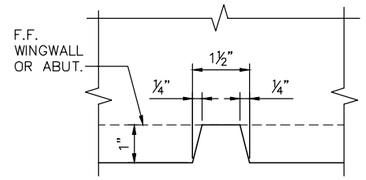
Sep. 10 2015 11:30 am V:\3400_ADC\CAD\segment e4\plan sheets\structures\R0697\CBRR0697-BRG-ABT-001.dwg By: lisa.thompson



SECTION A–A



SECTION B–B



REVEAL DETAIL

NOTES:

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

SEE SHEET 11 FOR LOCATION OF SECTION A–A.

SEE SHEET 12 FOR LOCATION OF SECTION B–B.

(1) MEMBRANE WATERPROOFING SYSTEM PER MnDOT SPEC. 2481.3.B.

(2) SEE REVEAL DETAIL THIS SHEET.

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: KAE | CHECKED BY: EJT
DRAWN BY: LMT | DATE: 9/14/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

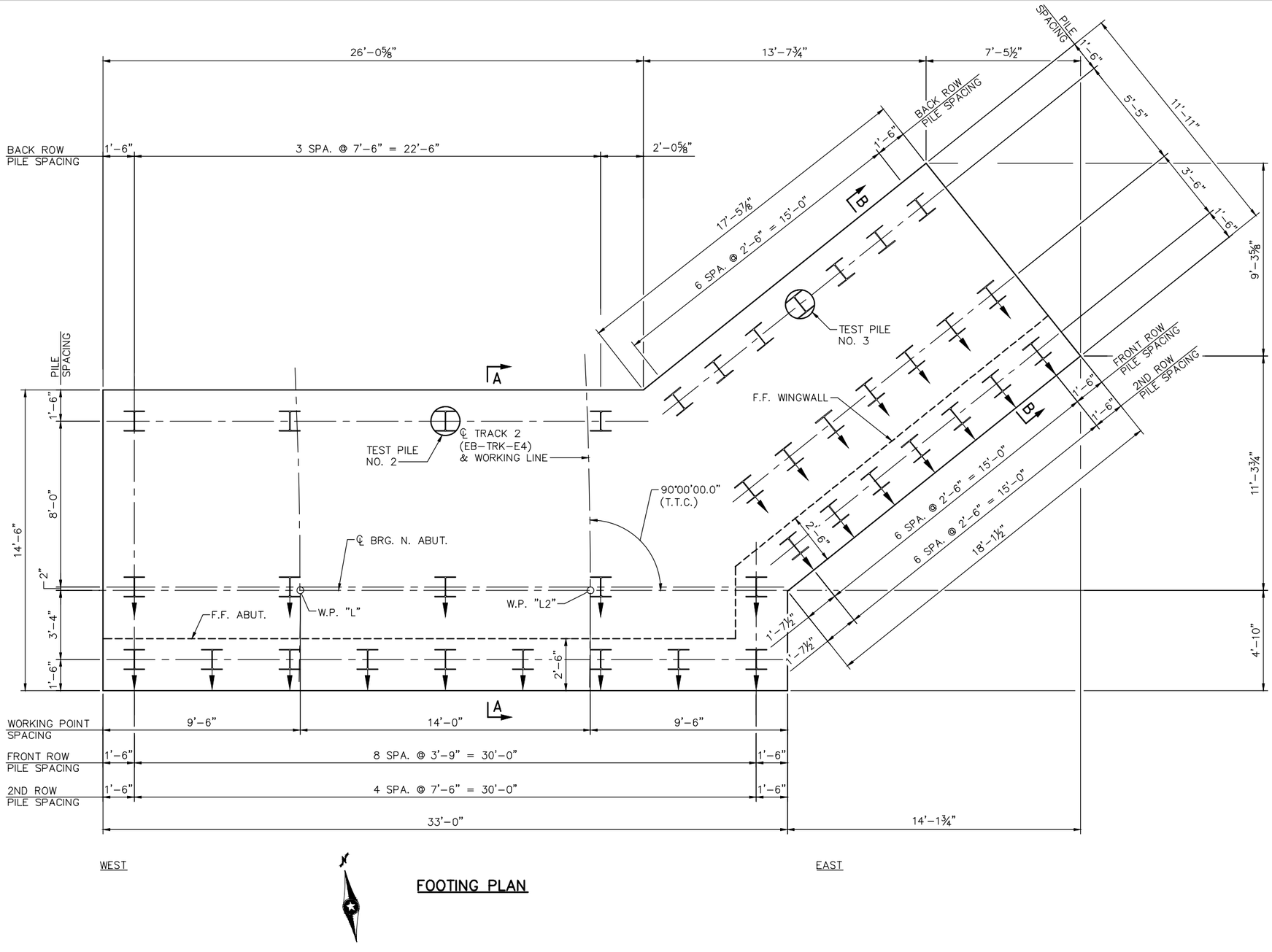
SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4B
LRT OVER BNSF
BRIDGE R0697
SOUTH ABUTMENT DETAILS 4

SHEET 13 OF 64

DISCIPLINE: STRUCTURES

SHEET NAME: CBRR0697-BRG-ABT-001-4



FOOTING PLAN

NORTH ABUTMENT COMPUTED PILE LOAD - TONS/PILE	
FACTORED DEAD LOAD	98.6
FACTORED LIVE LOAD	30.0
* FACTORED DESIGN LOAD	128.6

* BASED ON STRENGTH I LOAD COMBINATION.

NORTH ABUTMENT REQUIRED NOMINAL PILE BEARING RESISTANCE FOR H-PILES Rn - TONS/PILE		
FIELD CONTROL METHOD	φdyn	* Rn
MN/DOT PILE FORMULA 2012 (MPF12) $R_n = 20\sqrt{\frac{W \times H}{1000}} \times log\left(\frac{10}{S}\right)$	0.60	215
PDA	0.65	198

* Rn = (FACTORED DESIGN LOAD) / φdyn

GENERAL PILE NOTES

1 STEEL HP 12x53 TEST PILES 75 FT. LONG
17 STEEL HP 12x53 PILES EST. LENGTH 65 FT.
18 STEEL HP 12x53 PILES REQ'D FOR NORTH ABUTMENT

NORTHEAST WINGWALL COMPUTED PILE LOAD - TONS/PILE	
FACTORED DEAD LOAD	59.5
FACTORED LIVE LOAD	14.2
* FACTORED DESIGN LOAD	73.7

* BASED ON STRENGTH I LOAD COMBINATION.

NORTHWEST WINGWALL REQUIRED NOMINAL PILE BEARING RESISTANCE FOR H-PILES Rn - TONS/PILE		
FIELD CONTROL METHOD	φdyn	* Rn
MN/DOT PILE FORMULA 2012 (MPF12) $R_n = 20\sqrt{\frac{W \times H}{1000}} \times log\left(\frac{10}{S}\right)$	0.60	123
PDA	0.65	114

* Rn = (FACTORED DESIGN LOAD) / φdyn

GENERAL PILE NOTES

1 STEEL HP 12x53 TEST PILES 75 FT. LONG
20 STEEL HP 12x53 PILES EST. LENGTH 65 FT.
21 STEEL HP 12x53 PILES REQ'D FOR WINGWALL

NOTES:

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 DIRECTION SHOWN.

FOR PILE SPLICE DETAILS SEE DETAIL B202.

FOR SECTIONS A-A & B-B, SEE SHEET 18.

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: BAW | CHECKED BY: EJT
DRAWN BY: LMT | DATE: 9/14/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

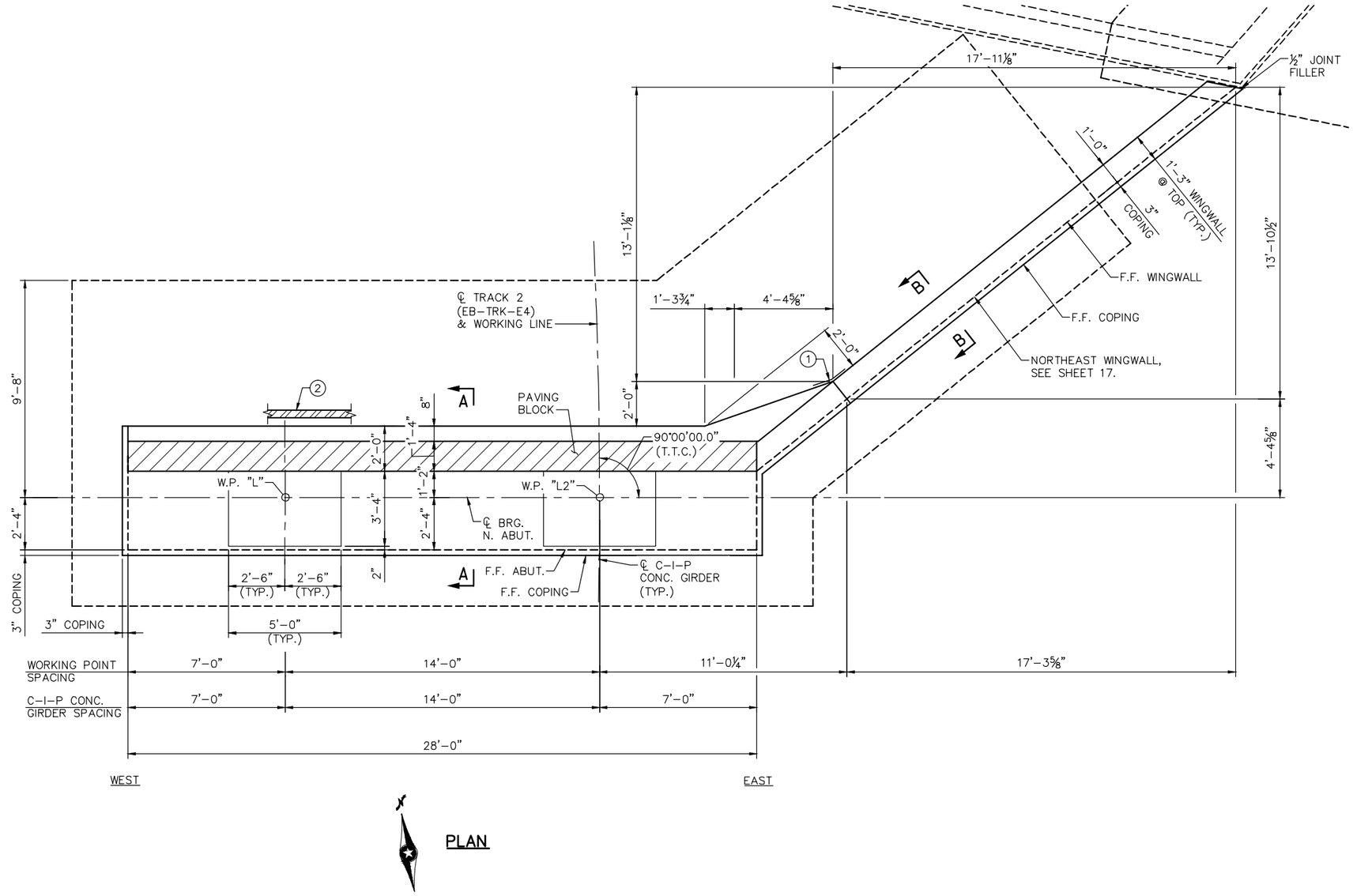
METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4B
LRT OVER BNSF
BRIDGE R0697
NORTH ABUTMENT DETAILS 1

DISCIPLINE: STRUCTURES
SHEET NAME: CBRR0697-BRG-ABT-002-1

SHEET 14 OF 64



PLAN

NOTES:

FOR SECTION A-A & B-B, SEE SHEET 18.

CONTRACTOR TO FIELD VERIFY NORTHEAST WINGWALL DIMENSIONS WITH RESPECT TO EXISTING BRIDGE AND MODIFY REINFORCEMENT AND DIMENSIONS AS NECESSARY.

(1) MEMBRANE WATERPROOFING SYSTEM PER MnDOT 2481.3.B.

(2) PERFORATED PIPE, SEE DETAIL B910 FOR DRAINAGE DETAILS.

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: BAW | CHECKED BY: EJT
DRAWN BY: LMT | DATE: 9/14/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

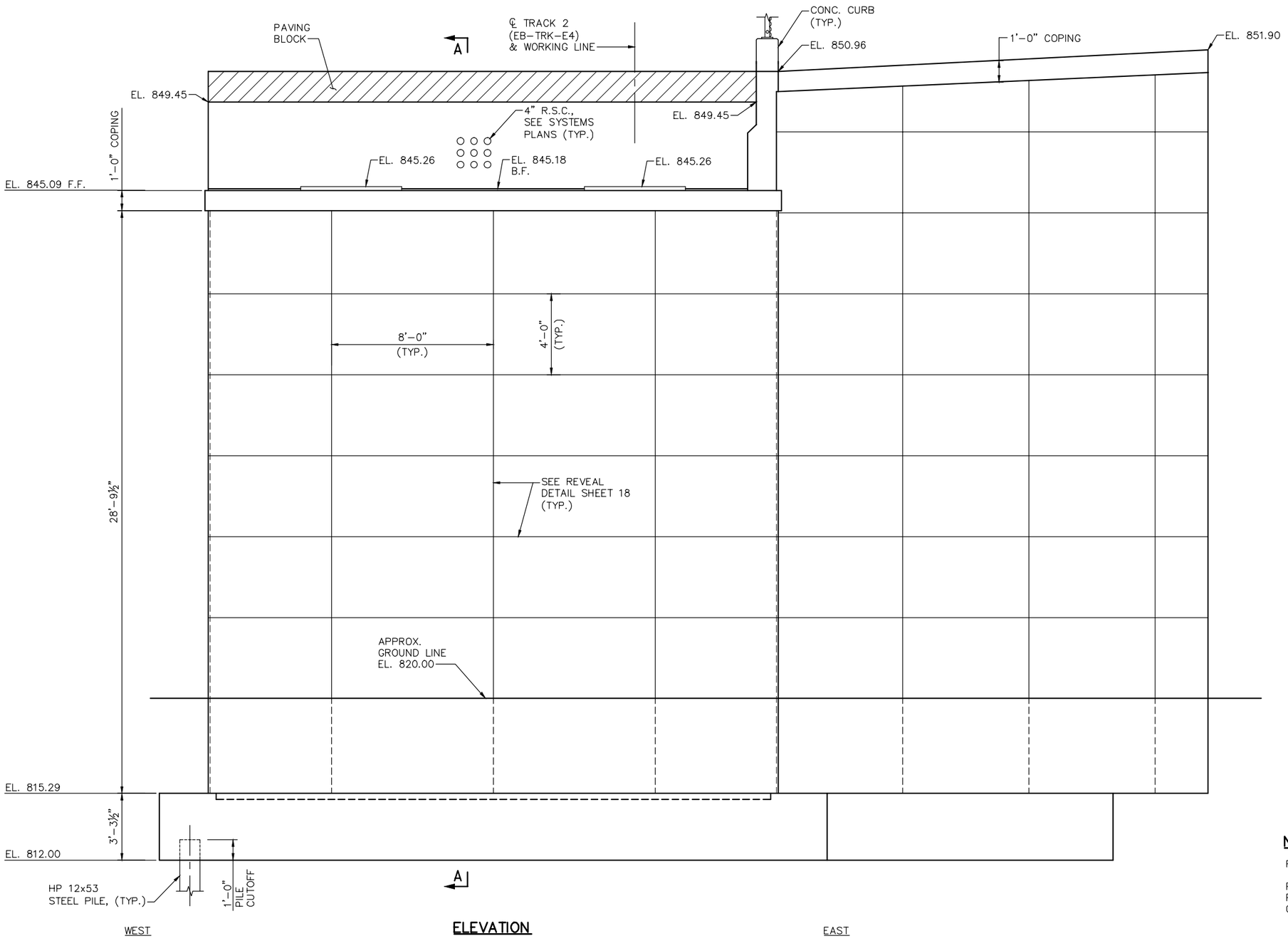
SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4B
LRT OVER BNSF
BRIDGE R0697
NORTH ABUTMENT DETAILS 2

DISCIPLINE: STRUCTURES
SHEET NAME: CBRR0697-BRG-ABT-002-2

SHEET 15 OF 64

Sep. 10 2015 11:30 am V:\3400_ADC\CAD\segment e4\plan sheets\structures\R0697\CBRR0697-BRG-ABT-002.dwg By: lisa.thompson



NOTES:

FOR SECTION A-A, SEE SHEET 18.

PAVING BLOCK HATCHED AREA INDICATES THAT PORTION TO BE PLACED WITH SUPERSTRUCTURE CONCRETE.

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: BAW | CHECKED BY: EJT
DRAWN BY: LMT | DATE: 9/14/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

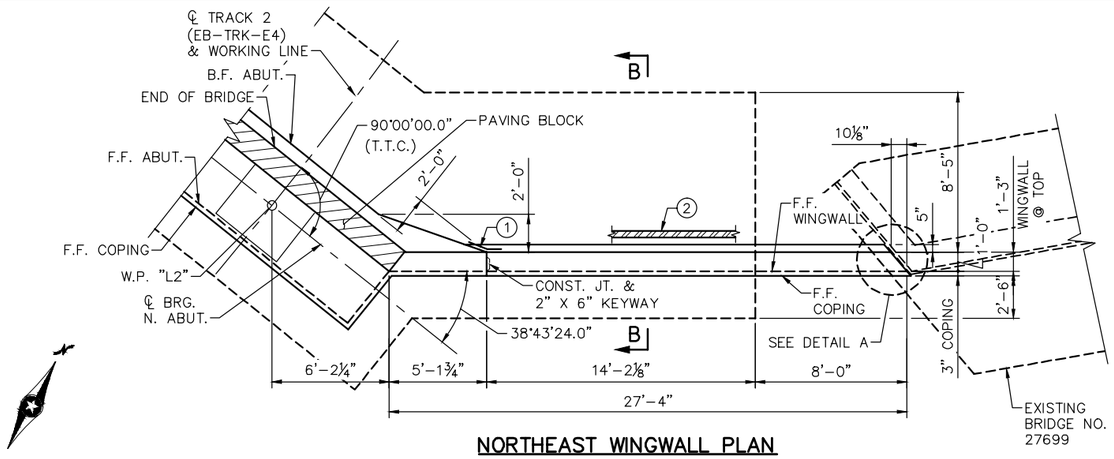
CIVIL EAST - VOLUME 4B
LRT OVER BNSF
BRIDGE R0697
NORTH ABUTMENT DETAILS 3

DISCIPLINE: STRUCTURES

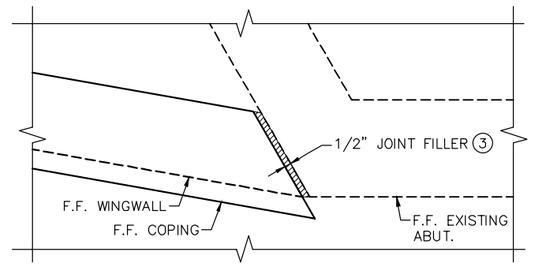
SHEET NAME: CBRR0697-BRG-ABT-002-3

SHEET 16 OF 64

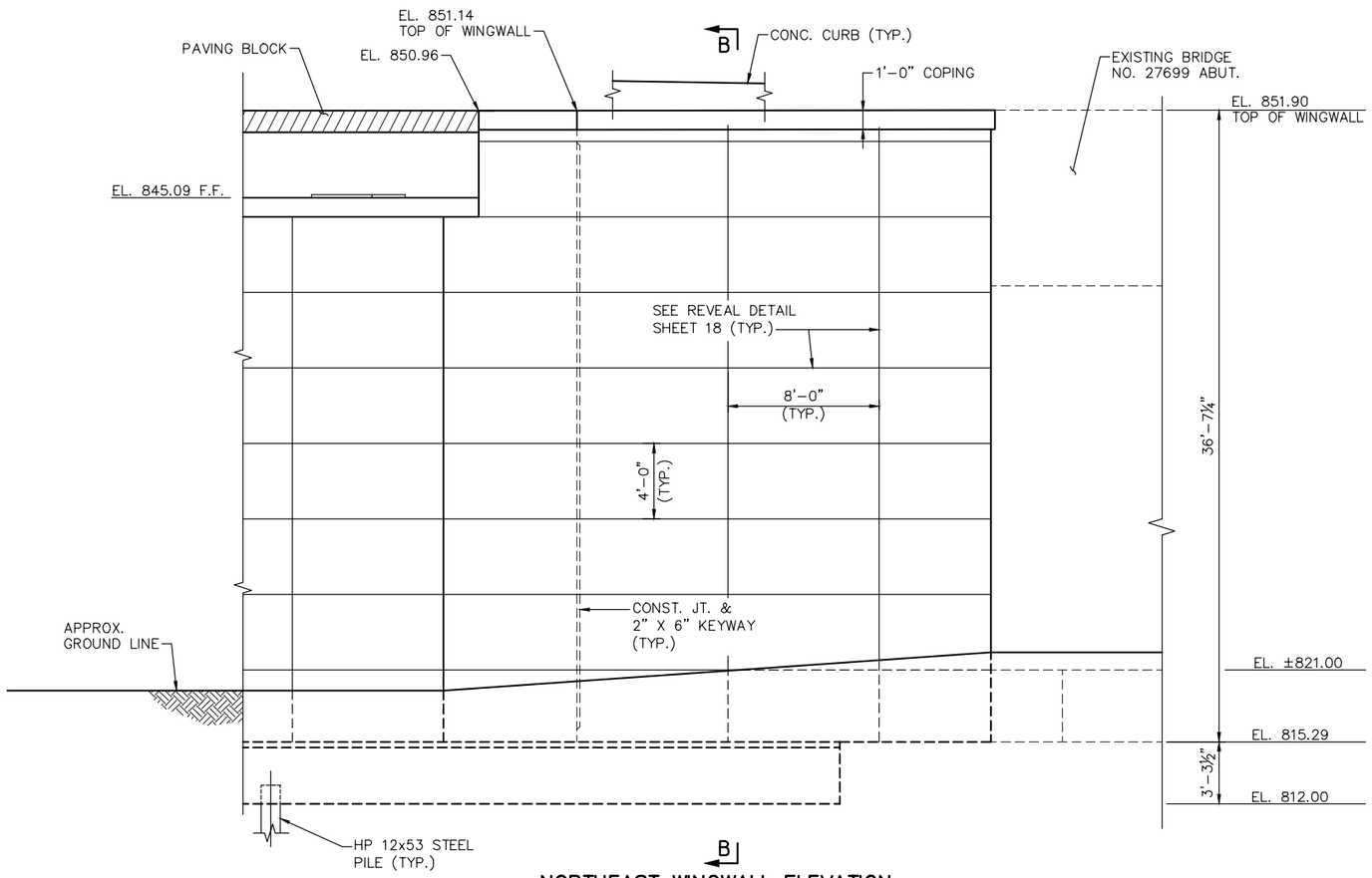
Sep. 10 2015 11:30 am V:\3400_ADC\CAD\segment e4\plan sheets\structures\R0697\CBRR0697-BRG-ABT-002.dwg By: lisa.thompson



NORTHEAST WINGWALL PLAN



DETAIL A



NORTHEAST WINGWALL ELEVATION

NOTES:

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

FOR SECTION B–B, SEE SHEET 18.

1. MEMBRANE WATERPROOFING SYSTEM PER MnDOT 2481.3.B.
2. PERFORATED PIPE, SEE DETAIL B910 FOR DRAINAGE DETAILS.
3. JOINT FILLER SHALL BE CORK PER MnDOT SPEC. 2401.3E3.

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: BAW | CHECKED BY: EJT
DRAWN BY: LMT | DATE: 9/14/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

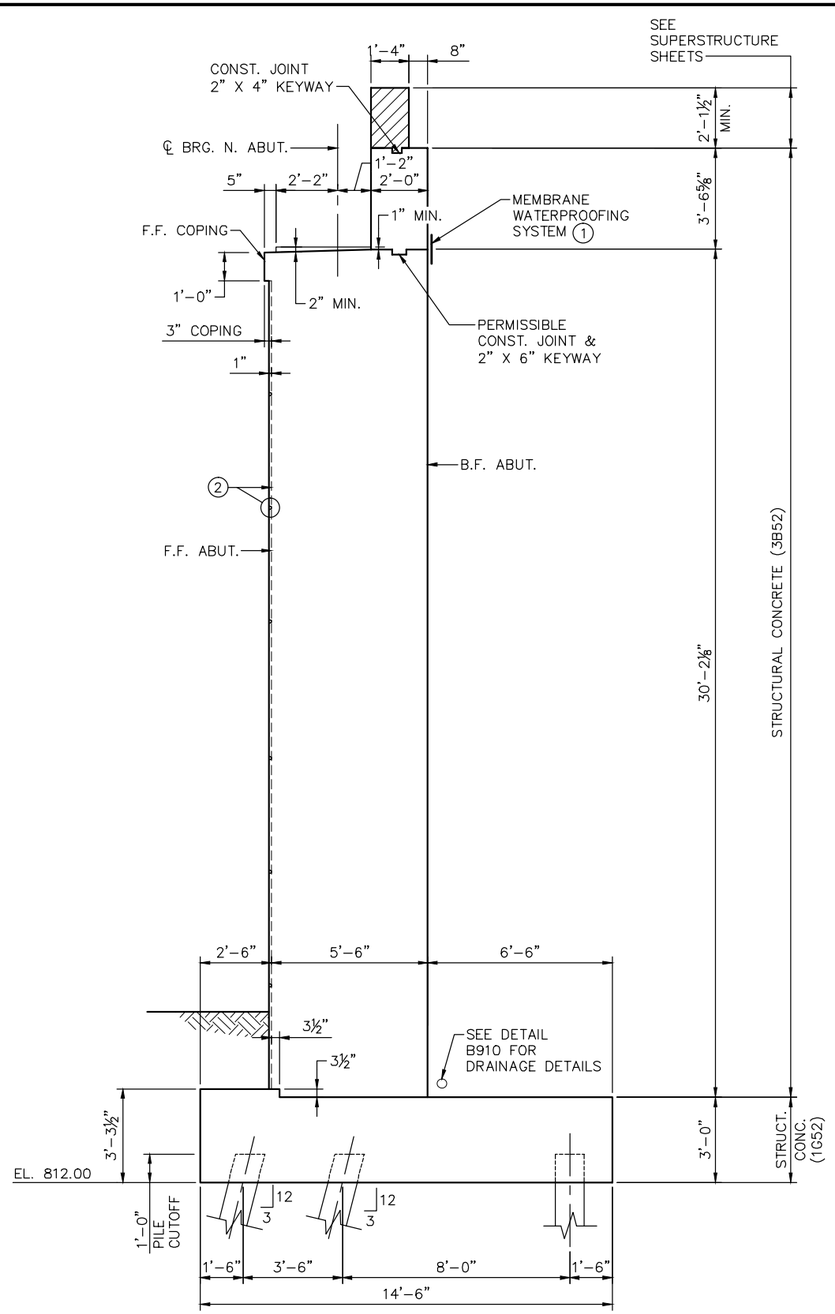
CIVIL EAST - VOLUME 4B
LRT OVER BNSF
BRIDGE R0697
NORTH ABUTMENT DETAILS 4

DISCIPLINE: STRUCTURES

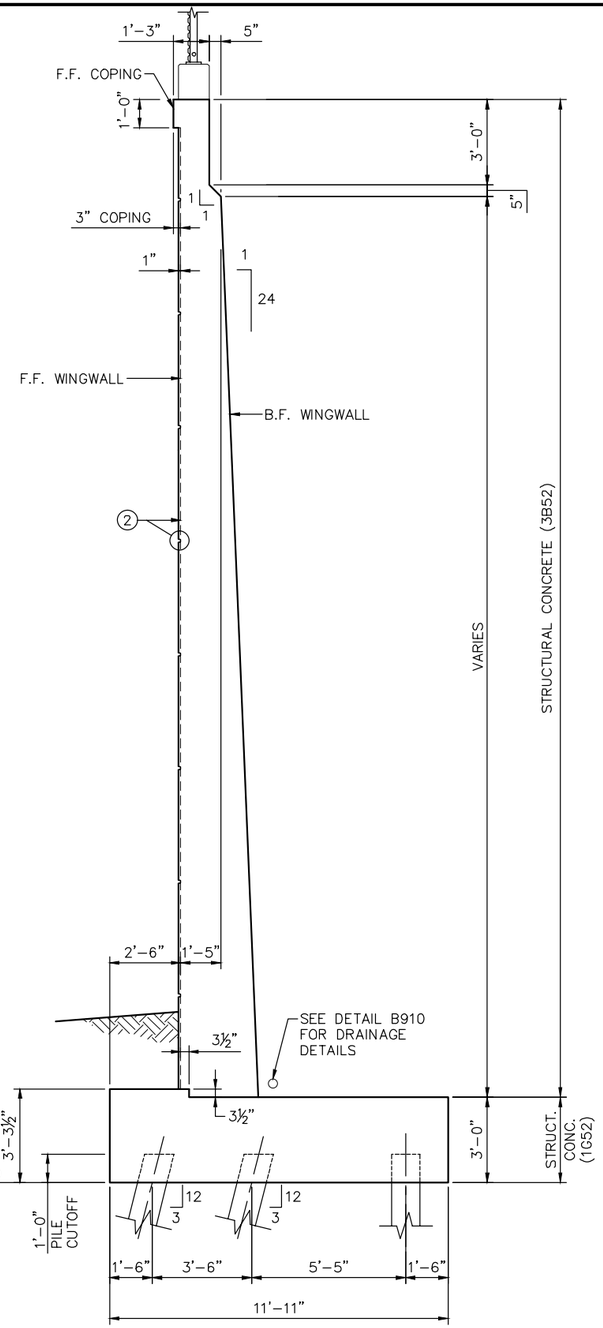
SHEET NAME: CBRR0697-BRG-ABT-002-4

SHEET 17 OF 64

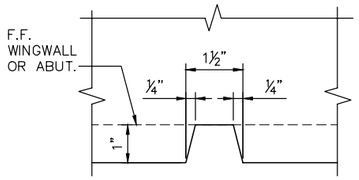
Sep. 10 2015 11:30 am V:\3400_ADC\CAD\segment e4\plan sheets\structures\R0697\CBRR0697-BRG-ABT-002.dwg By: lisa.thompson



SECTION A–A



SECTION B–B



REVEAL DETAIL

NOTES:

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

SEE SHEETS 15–17 FOR LOCATION OF SECTION A–A & B–B.

(1) MEMBRANE WATERPROOFING SYSTEM PER MnDOT SPEC. 2481.3.B.

(2) SEE REVEAL DETAIL THIS SHEET.

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: BAW | CHECKED BY: EJT
DRAWN BY: LMT | DATE: 9/14/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

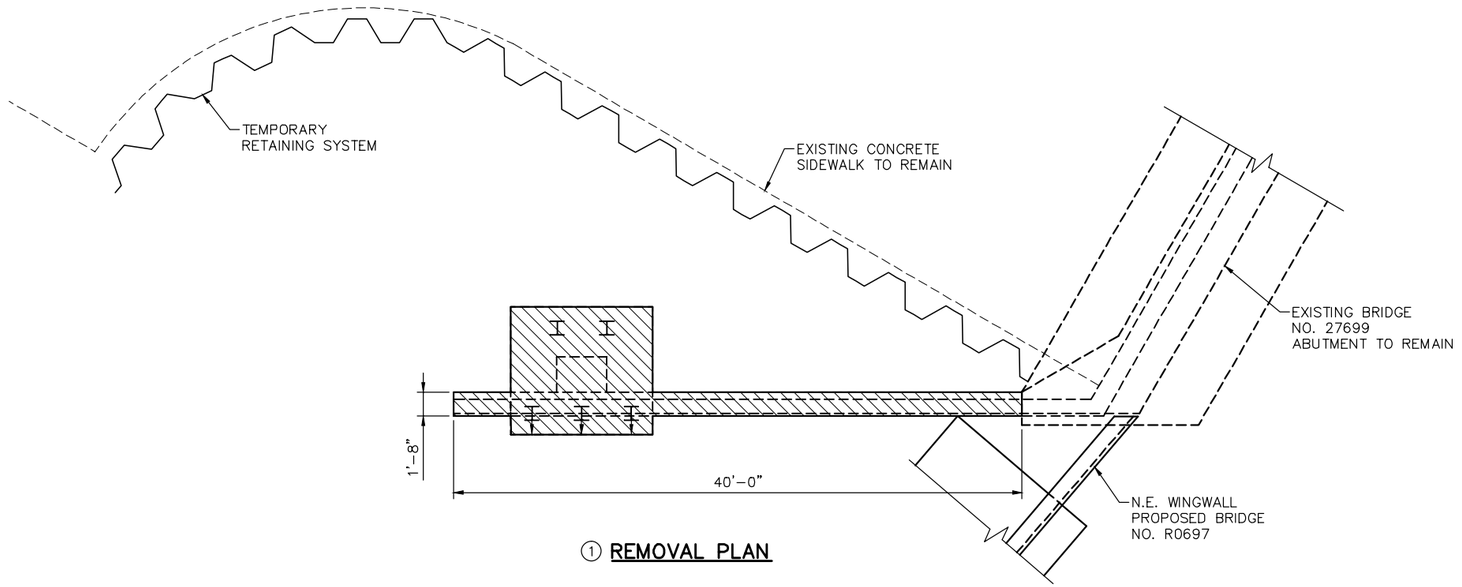
SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4B
LRT OVER BNSF
BRIDGE R0697
NORTH ABUTMENT DETAILS 5

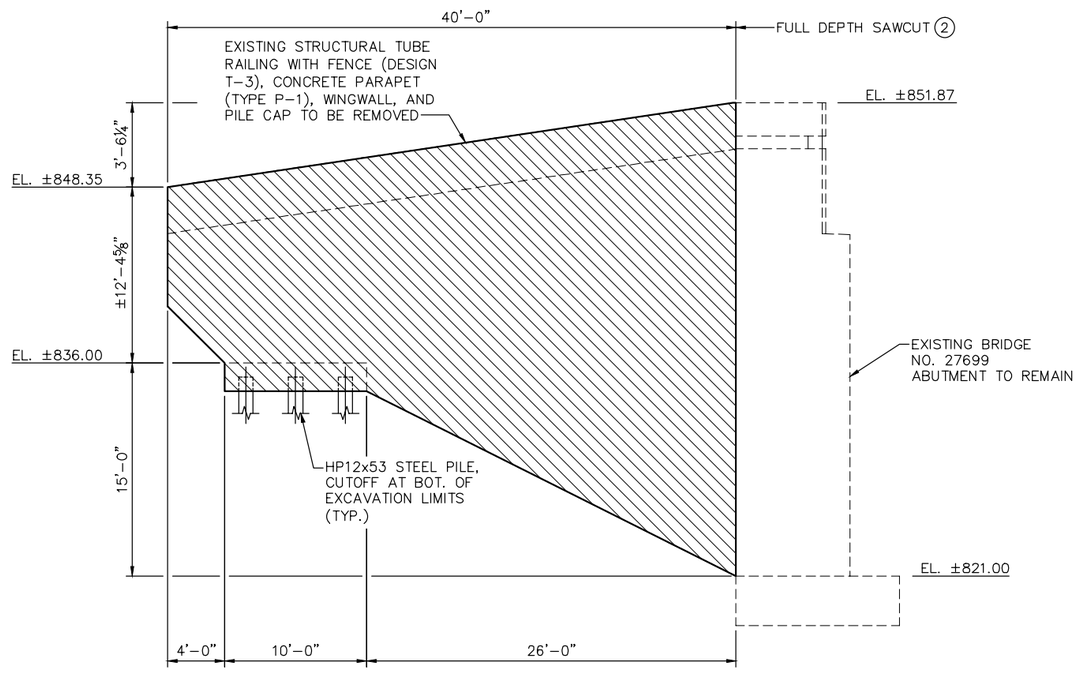
DISCIPLINE: STRUCTURES
SHEET NAME: CBRR0697-BRG-ABT-002-5

SHEET 18 OF 64

Sep. 10 2015 11:30 am V:\3400_ADC\CAD\segment e4\plan sheets\structures\R0697\CBRR0697-BRG-ABT-002.dwg By: lisa.thompson



① REMOVAL PLAN



① REMOVAL ELEVATION

NOTES:

CONTRACTOR TO FIELD VERIFY REMOVAL LIMITS.

① EXISTING BRIDGE NO. 27699 REMOVAL DETAILS

② CONTRACTOR TO GRIND TOP OF SAWED CONCRETE SURFACE SMOOTH, AND SHALL APPLY CORROSION INHIBITOR TO ALL EXPOSED REINFORCEMENT ENDS.

LEGEND

REMOVAL LIMITS

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: BAW | CHECKED BY: EJT
DRAWN BY: LMT | DATE: 9/14/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

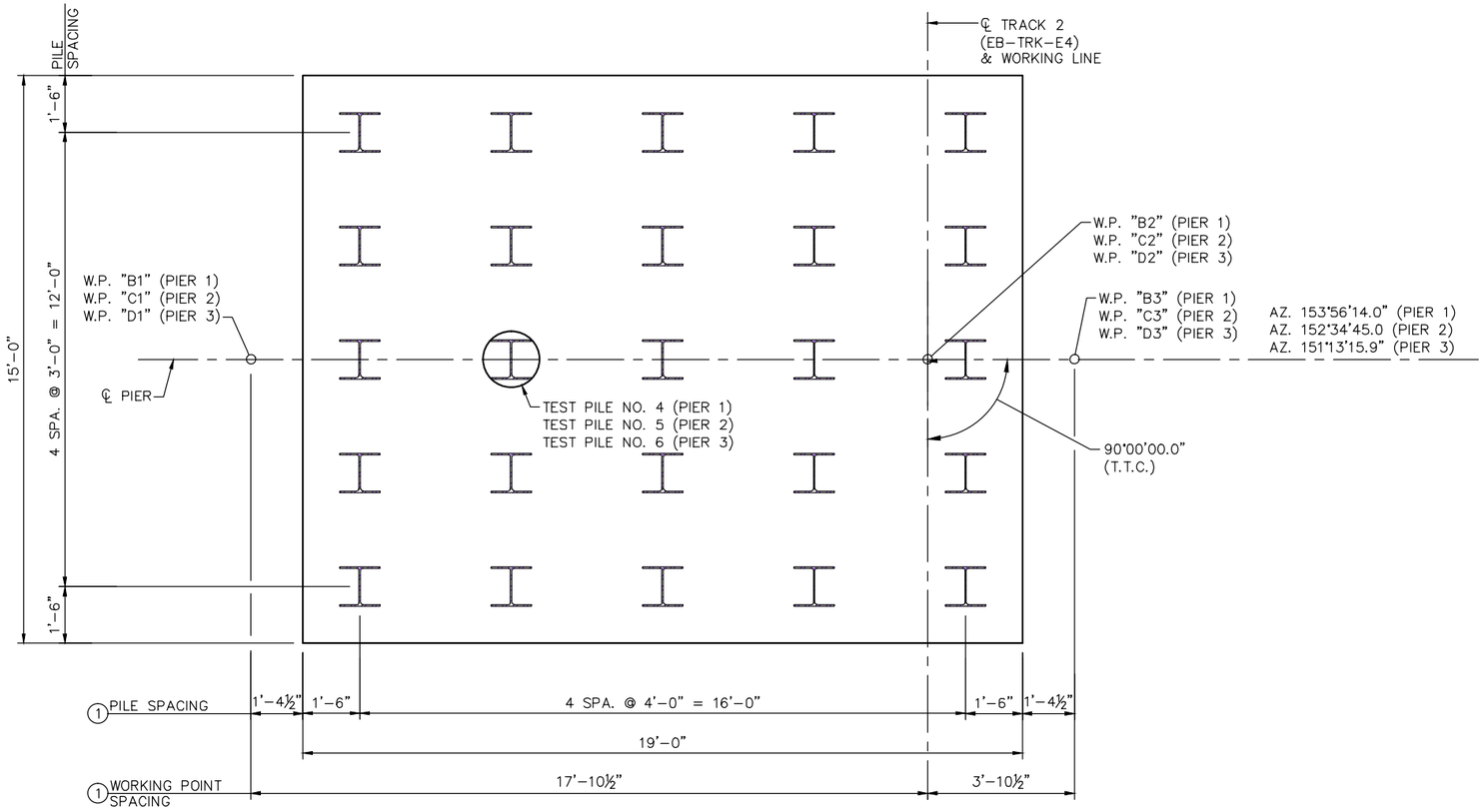
SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4B
LRT OVER BNSF
BRIDGE R0697
NORTH ABUTMENT DETAILS 6

DISCIPLINE: STRUCTURES

SHEET NAME: CBRR0697-BRG-ABT-002-6

SHEET 19 OF 64



FOOTING PLAN
(PIER 1, 2, & 3)

PIER 1, 2, & 3 COMPUTED PILE LOAD - TONS/PILE	
FACTORED DEAD LOAD	51.9
FACTORED LIVE LOAD	-1.8
FACTORED OVERTURNING	50.4
* FACTORED DESIGN LOAD	100.4

* BASED ON STRENGTH V LOAD COMBINATION.

PIER 1, 2 & 3 REQUIRED NOMINAL PILE BEARING RESISTANCE FOR H-PILES Rn - TONS/PILE		
FIELD CONTROL METHOD	φdyn	* Rn
MN/DOT PILE FORMULA 2012 (MPF12) $R_n = 20\sqrt{\frac{W\,x\,H}{1000}\,x log\left(\frac{10}{S}\right)}$	0.60	167.3
PDA	0.65	154.5

* Rn = (FACTORED DESIGN LOAD) / φdyn

GENERAL PILE NOTES (PIER 1)

1 STEEL HP 12 X 53–TEST PILES 80 FT. LONG
24 STEEL HP 12 X 53–PILES EST. LENGTH 80 FT.
25 STEEL HP 12 X 53–PILES REQ'D FOR PIER 1

GENERAL PILE NOTES (PIER 2)

1 STEEL HP 12 X 53–TEST PILES 65 FT. LONG
24 STEEL HP 12 X 53–PILES EST. LENGTH 65 FT.
25 STEEL HP 12 X 53–PILES REQ'D FOR PIER 2

GENERAL PILE NOTES (PIER 3)

1 STEEL HP 12 X 53–TEST PILES 55 FT. LONG
24 STEEL HP 12 X 53–PILES EST. LENGTH 55 FT.
25 STEEL HP 12 X 53–PILES REQ'D FOR PIER 3

NOTES:

(1) DIMENSIONS MEASURED ALONG ℄ OF PIER.
PIER PILES ARE TO BE HP12x53 WITH PILE TIP PROTECTION.
PILE SPACING SHOWN IS AT BOTTOM OF FOOTING.
FOR PILE SPLICE DETAILS SEE DETAIL B202.

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: RHK | CHECKED BY: EJT
DRAWN BY: LMT | DATE: 9/14/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

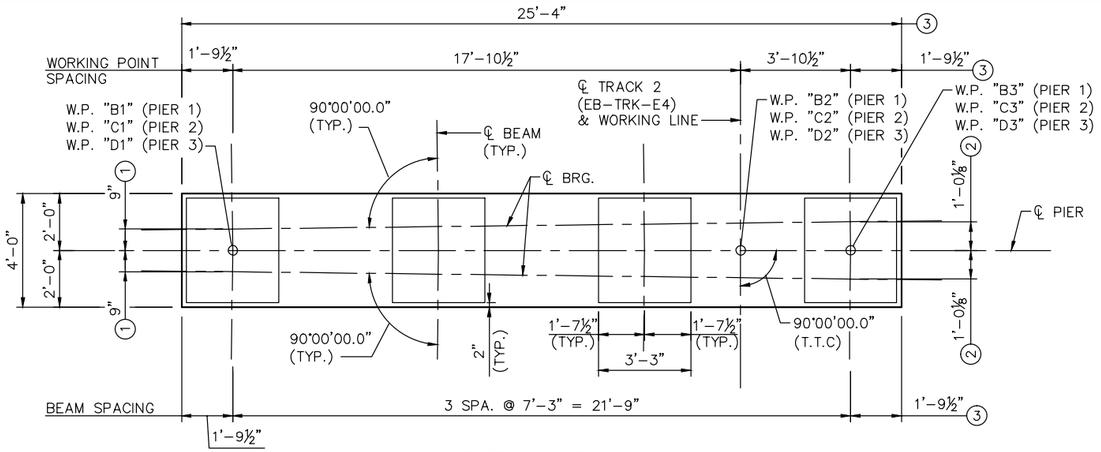
SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4B
LRT OVER BNSF
BRIDGE R0697
PIER 1, 2, & 3 DETAILS 1

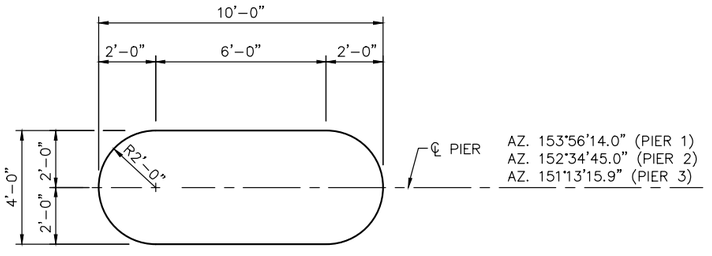
DISCIPLINE: STRUCTURES
SHEET NAME: CBRR0697-BRG-PIR-001-1

SHEET 20 OF 64

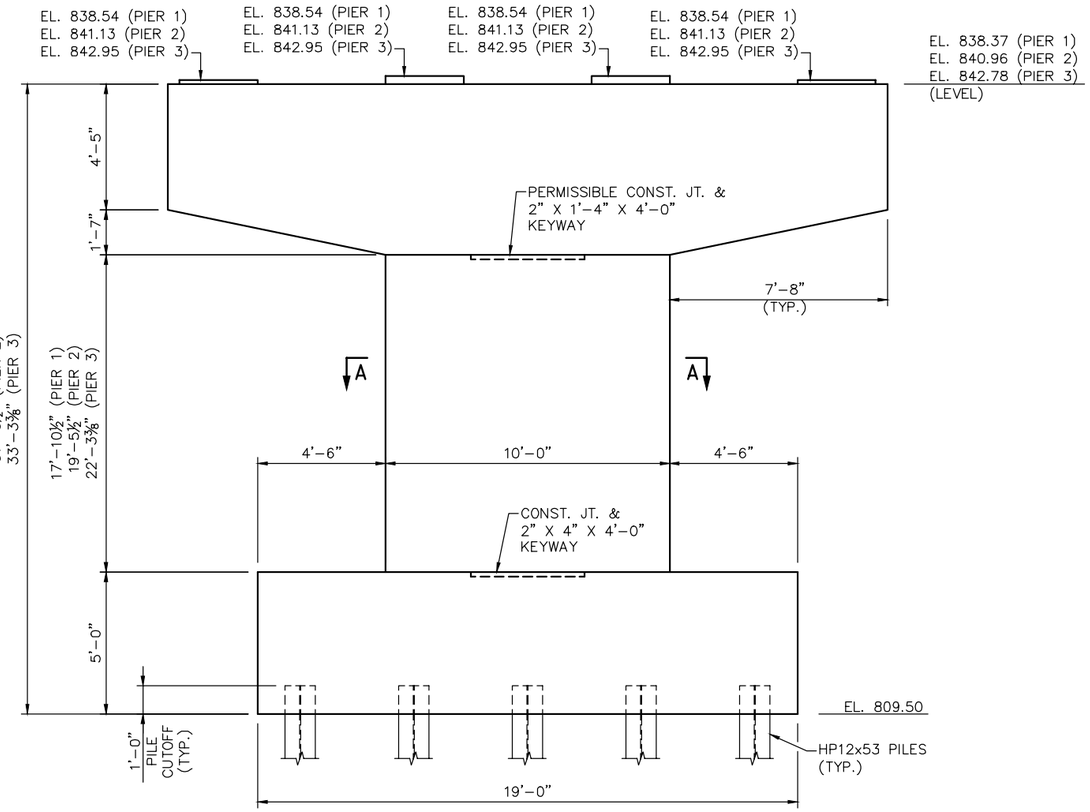
Sep. 10 2015 11:31 am V:\3400_ADC\CAD\segment e4\plan sheets\structures\R0697\CBRR0697-BRG-PIR-001.dwg By: lisa.thompson



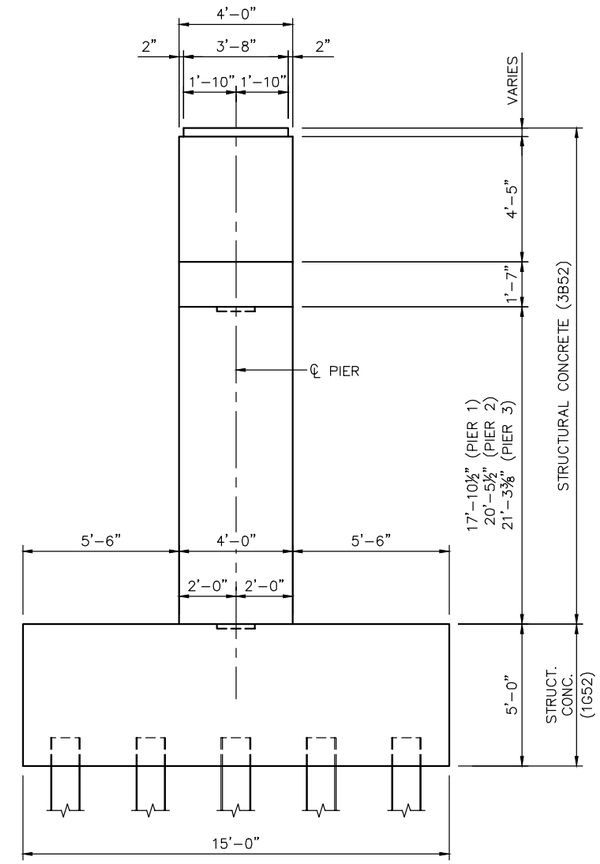
PIER CAP PLAN
(PIER 1, 2, & 3)



SECTION A-A
(PIER 1, 2, & 3)



ELEVATION
(PIER 1, 2, & 3)



END ELEVATION
(PIER 1, 2, & 3)

NOTES:

1. DIMENSIONS MEASURED ALONG ℄ OF BEAM @ W.P."B1" (PIER 1), W.P. "C1" (PIER 2) AND W.P. "D1" (PIER 3).
2. DIMENSIONS MEASURED ALONG ℄ OF BEAM @ W.P. "B3" (PIER 1), W.P. "C3" (PIER 2) AND W.P. "D3" (PIER 3).
3. DIMENSIONS MEASURED ALONG ℄ OF PIER.

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: RHK | CHECKED BY: EJT
DRAWN BY: LMT | DATE: 9/14/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

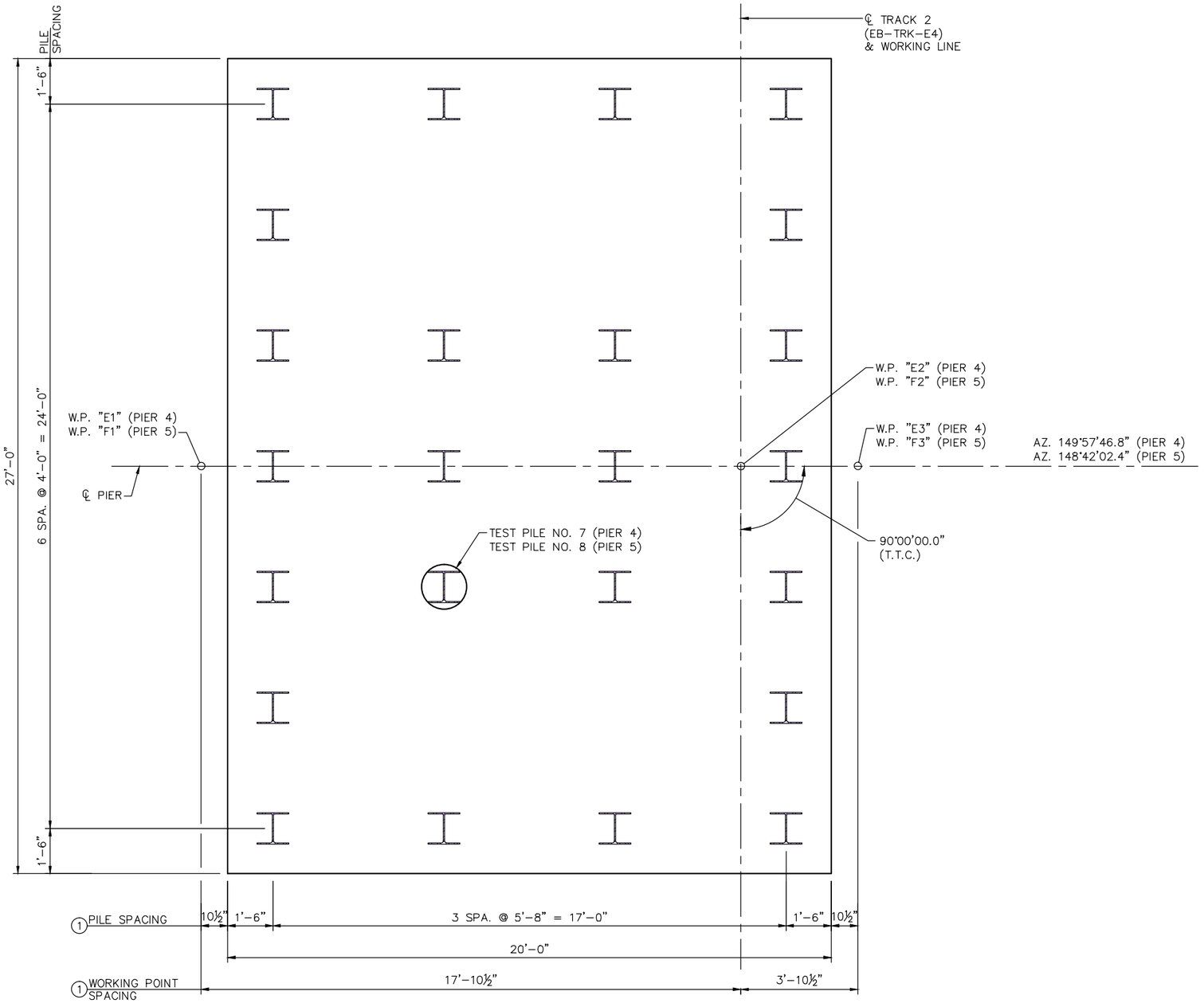
METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4B
LRT OVER BNSF
BRIDGE R0697
PIER 1, 2, & 3 DETAILS 2

DISCIPLINE: STRUCTURES
SHEET NAME: CBRR0697-BRG-PIR-001-2

SHEET 21 OF 64



FOOTING PLAN
(PIER 4 & 5)

PIER 4 & 5 COMPUTED PILE LOAD - TONS/PILE	
FACTORED DEAD LOAD	
FACTORED LIVE LOAD	
FACTORED OVERTURNING	
* FACTORED DESIGN LOAD	

* BASED ON STRENGTH I LOAD COMBINATION.

PIER 4 & 5 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	
PDA	0.65	

* Rn = (FACTORED DESIGN LOAD) / φdyn

GENERAL PILE NOTES (PIER 4)

1 STEEL HP 12 X 53–TEST PILES 50 FT. LONG
23 STEEL HP 12 X 53–PILES EST. LENGTH 50 FT.
24 STEEL HP 12 X 53–PILES REQ'D FOR PIER 4

GENERAL PILE NOTES (PIER 5)

1 STEEL HP 12 X 53–TEST PILES 50 FT. LONG
23 STEEL HP 12 X 53–PILES EST. LENGTH 50 FT.
24 STEEL HP 12 X 53–PILES REQ'D FOR PIER 5

NOTES:

① DIMENSIONS MEASURED ALONG ℄ OF PIER.
PIER PILES ARE TO BE HP12x53 WITH PILE TIP PROTECTION.
PILE SPACING SHOWN IS AT BOTTOM OF FOOTING.
FOR PILE SPLICE DETAILS SEE DETAIL B202.

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: RHK | CHECKED BY: EJT
DRAWN BY: LMT | DATE: 9/14/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

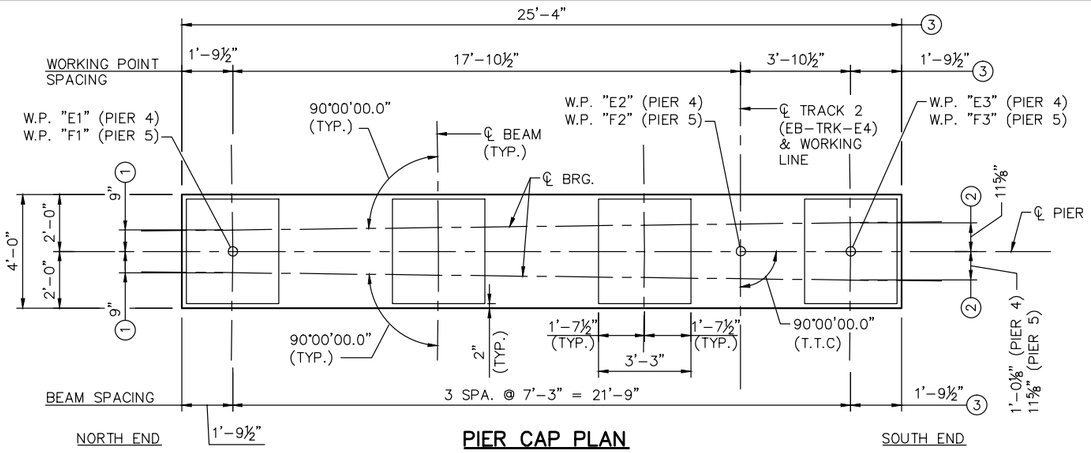
SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4B
LRT OVER BNSF
BRIDGE R0697
PIER 4 & 5 DETAILS 1

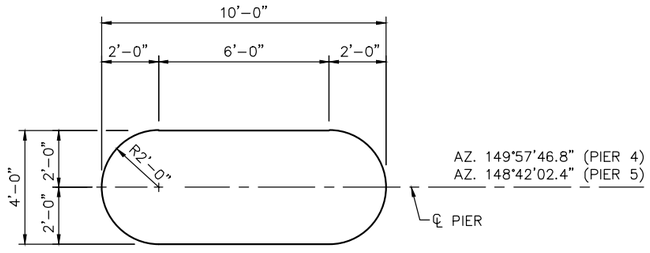
DISCIPLINE: STRUCTURES
SHEET NAME: CBRR0697-BRG-PIR-001-6

SHEET 22 OF 64

Sep. 10 2015 11:31 am V:\3400_ADC\CAD\segment e4\plan sheets\structures\R0697\CBRR0697-BRG-PIR-001.dwg By: lisa.thompson



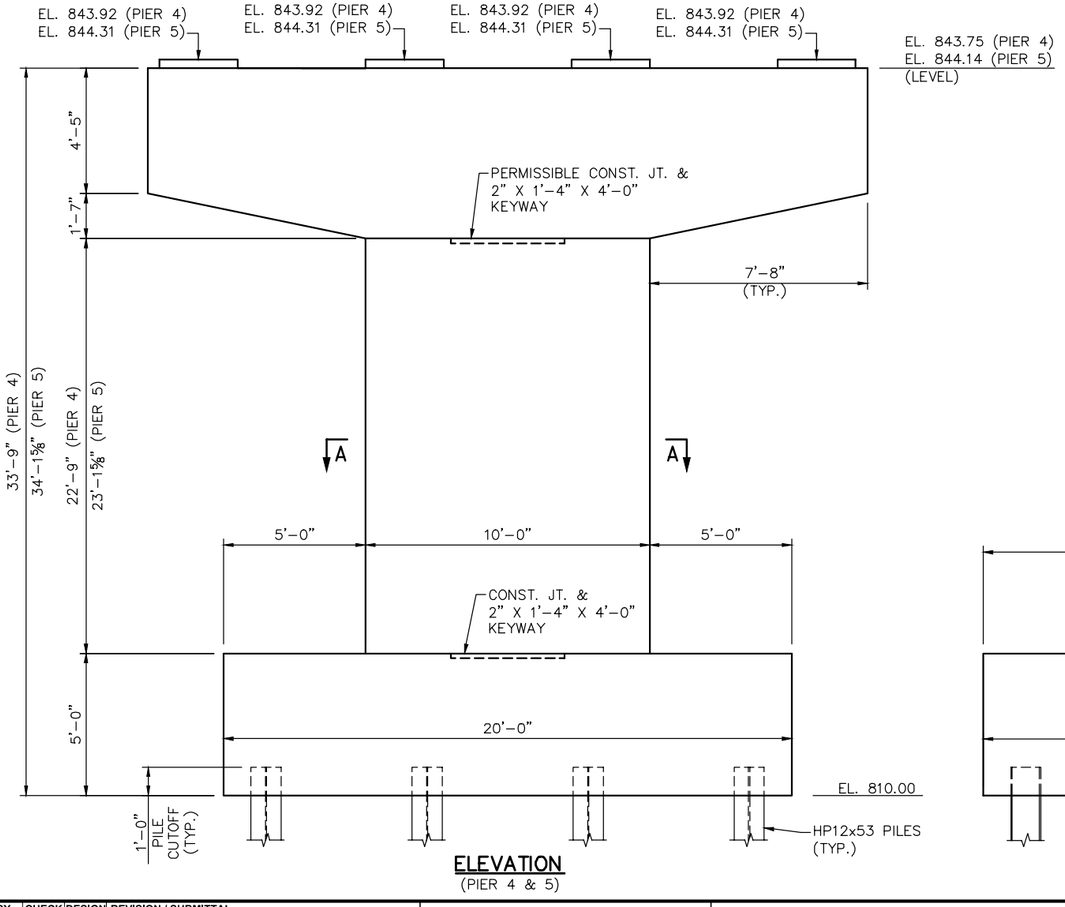
PIER CAP PLAN
(PIER 4 & 5)



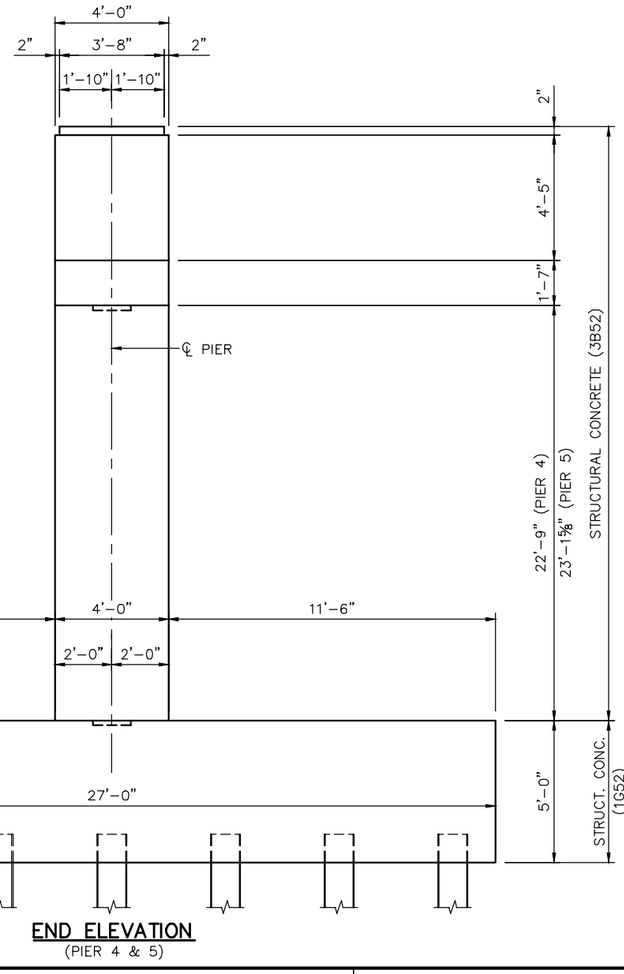
SECTION A-A
(PIER 4 & 5)

NOTES:

1. DIMENSIONS MEASURED ALONG ℄ OF BEAM @ W.P. "E1" (PIER 4) AND W.P. "F1" (PIER 5).
2. DIMENSIONS MEASURED ALONG ℄ OF BEAM @ W.P. "E3" (PIER 4) AND W.P. "F3" (PIER 5).
3. DIMENSIONS MEASURED ALONG ℄ OF PIER.



ELEVATION
(PIER 4 & 5)



END ELEVATION
(PIER 4 & 5)

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: RHK | CHECKED BY: EJT
DRAWN BY: LMT | DATE: 9/14/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

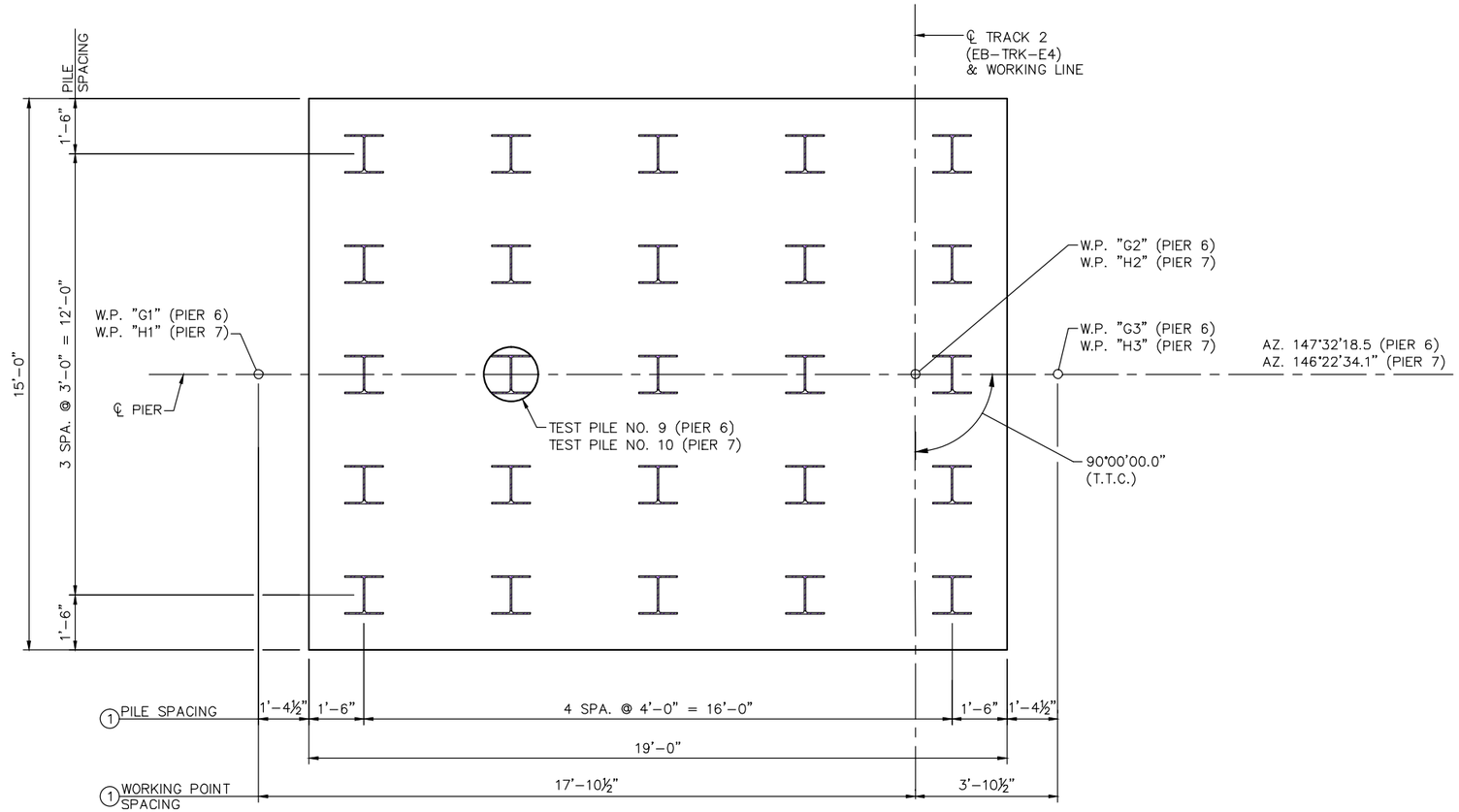
SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4B
LRT OVER BNSF
BRIDGE R0697
PIER 4 & 5 DETAILS 2

DISCIPLINE: STRUCTURES
SHEET NAME: CBRR0697-BRG-PIR-001-7

SHEET 23 OF 64

Sep. 10 2015 11:31 am V:\3400_ADC\CAD\segment e4\plan sheets\structures\R0697\CBRR0697-BRG-PIR-001.dwg By: lisa.thompson



FOOTING PLAN
(PIER 6 & 7)

PIER 6 &7 COMPUTED PILE LOAD - TONS/PILE	
FACTORED DEAD LOAD	
FACTORED LIVE LOAD	
FACTORED OVERTURNING	
* FACTORED DESIGN LOAD	

* BASED ON STRENGTH I LOAD COMBINATION.

PIER 6 & 7 REQUIRED NOMINAL PILE BEARING RESISTANCE FOR H-PILES Rn - TONS/PILE		
FIELD CONTROL METHOD	φdyn	* Rn
MN/DOT PILE FORMULA 2012 (MPF12) $R_n = 20\sqrt{\frac{W\,x\,H}{1000}}\,x\log\left(\frac{10}{S}\right)$	0.60	
PDA	0.65	

* Rn = (FACTORED DESIGN LOAD) / φdyn

GENERAL PILE NOTES (PIER 6)

1 STEEL HP 12 X 53–TEST PILES 45 FT. LONG
23 STEEL HP 12 X 53–PILES EST. LENGTH 45 FT.
24 STEEL HP 12 X 53–PILES REQ'D FOR PIER 4

GENERAL PILE NOTES (PIER 7)

1 STEEL HP 12 X 53–TEST PILES 45 FT. LONG
23 STEEL HP 12 X 53–PILES EST. LENGTH 45 FT.
24 STEEL HP 12 X 53–PILES REQ'D FOR PIER 5

NOTES:

PIER PILES ARE TO BE HP12x53 WITH PILE TIP PROTECTION.
PILE SPACING SHOWN IS AT BOTTOM OF FOOTING.
FOR PILE SPLICE DETAILS SEE DETAIL B202.

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: RHK | CHECKED BY: EJT
DRAWN BY: LMT | DATE: 9/14/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

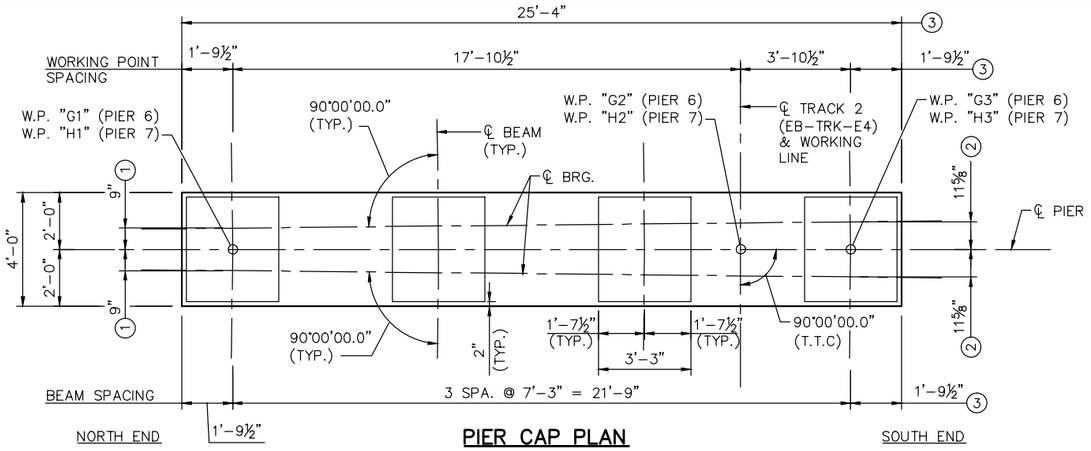
METROPOLITAN COUNCIL
SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4B
LRT OVER BNSF
BRIDGE R0697
PIER 6 & 7 DETAILS 1

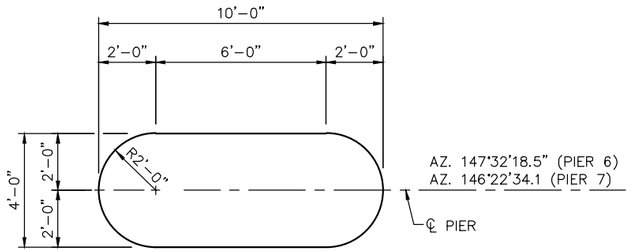
DISCIPLINE: STRUCTURES
SHEET NAME: CBRR0697-BRG-PIR-001-11

SHEET 24 OF 64

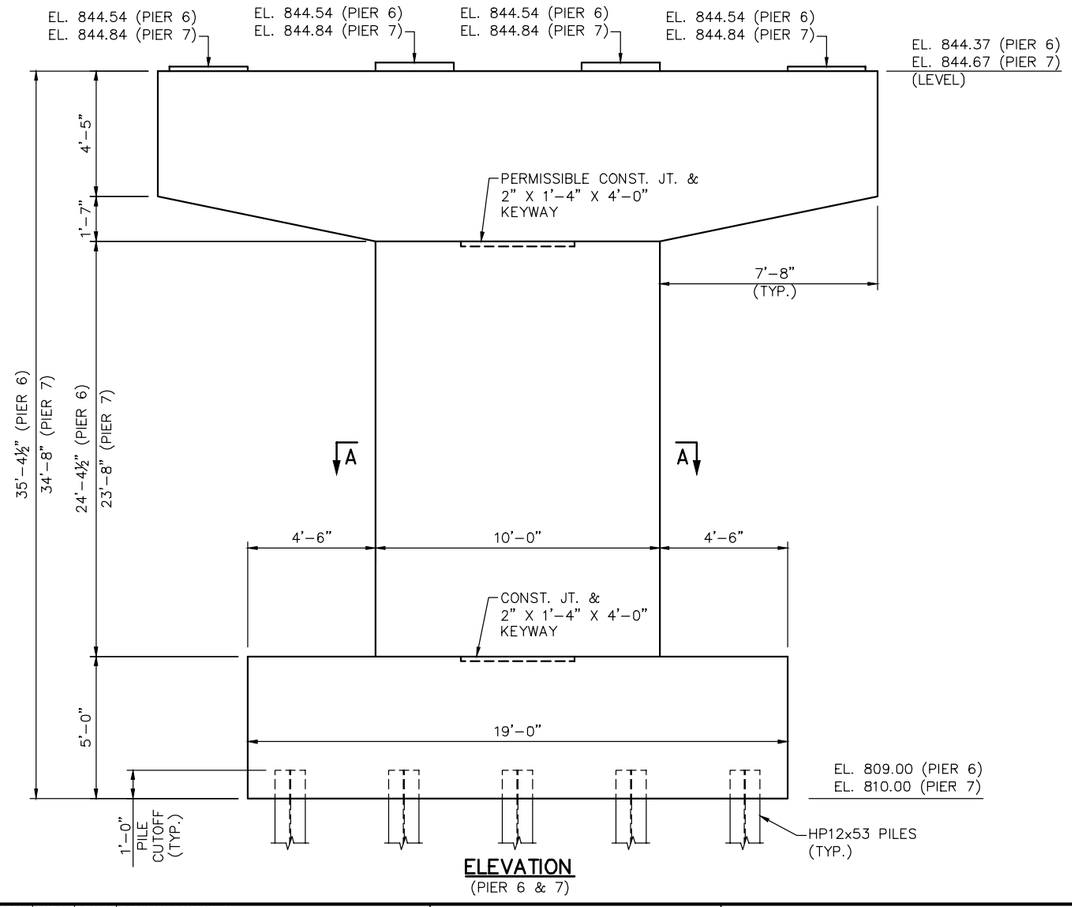
Sep. 10 2015 11:31 am V:\3400_ADC\CAD\segment e4\plan sheets\structures\R0697\CBRR0697-BRG-PIR-001.dwg By: lisa.thompson



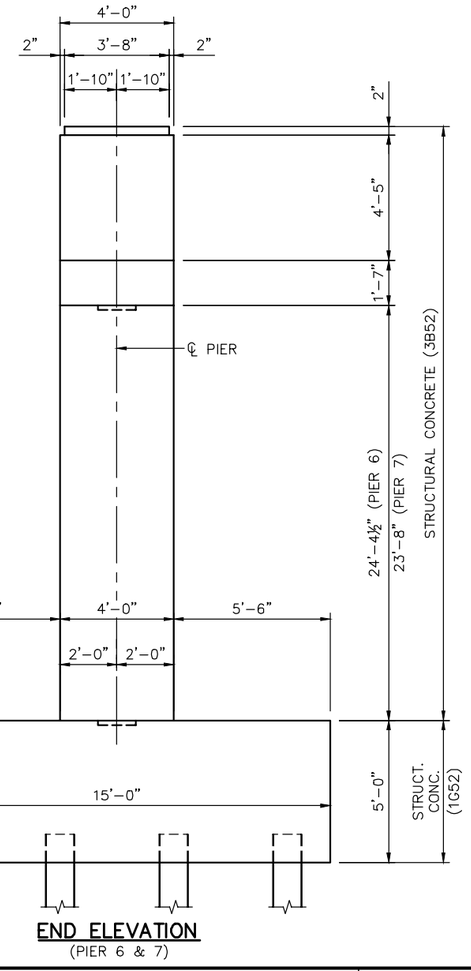
PIER CAP PLAN
(PIER 6 & 7)



SECTION A-A
(PIER 6 & 7)



ELEVATION
(PIER 6 & 7)



END ELEVATION
(PIER 6 & 7)

NOTES:

1. DIMENSIONS MEASURED ALONG ℄ OF BEAM @ W.P. "G1" (PIER 6) AND W.P. "H1" (PIER 7).
2. DIMENSIONS MEASURED ALONG ℄ OF BEAM @ W.P. "G3" (PIER 6) AND W.P. "H3" (PIER 7).
3. DIMENSIONS MEASURED ALONG ℄ OF PIER.

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: RHK | CHECKED BY: EJT
DRAWN BY: LMT | DATE: 9/14/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

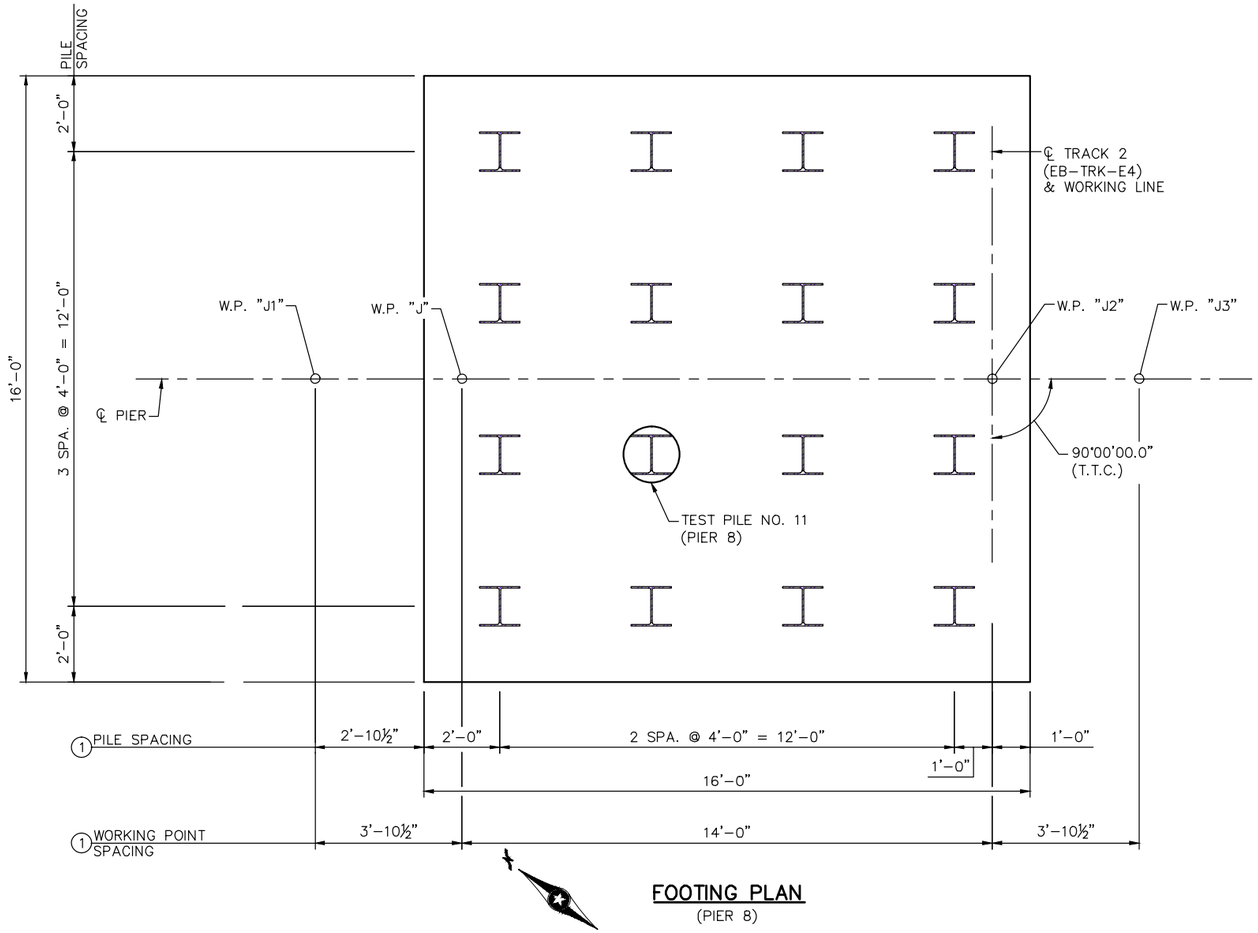
SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4B
LRT OVER BNSF
BRIDGE R0697
PIER 6 & 7 DETAILS 2

DISCIPLINE: STRUCTURES
SHEET NAME: CBRR0697-BRG-PIR-001-12

SHEET 25 OF 64

Sep. 10 2015 11:31 am V:\3400_ADC\CAD\segment e4\plan sheets\structures\R0697\CBRR0697-BRG-PIR-001.dwg By: lisa.thompson



FOOTING PLAN
(PIER 8)

PIER 8 COMPUTED PILE LOAD - TONS/PILE	
FACTORED DEAD LOAD	
FACTORED LIVE LOAD	
FACTORED OVERTURNING	
* FACTORED DESIGN LOAD	

* BASED ON STRENGTH I LOAD COMBINATION.

PIER 8 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	
PDA	0.65	

* Rn = (FACTORED DESIGN LOAD) / φdyn

GENERAL PILE NOTES

1 STEEL HP 12 X 53–TEST PILES 55 FT. LONG
15 STEEL HP 12 X 53–PILES EST. LENGTH 55 FT.
16 STEEL HP 12 X 53–PILES REQ'D FOR PIER 8

NOTES:

1. DIMENSIONS MEASURED ALONG ℄ OF PIER.
   PIER PILES ARE TO BE HP12x53 WITH PILE TIP PROTECTION.
   PILE SPACING SHOWN IS AT BOTTOM OF FOOTING.
   FOR PILE SPLICE DETAILS SEE DETAIL B202.

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: RHK | CHECKED BY: EJT
DRAWN BY: LMT | DATE: 9/14/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

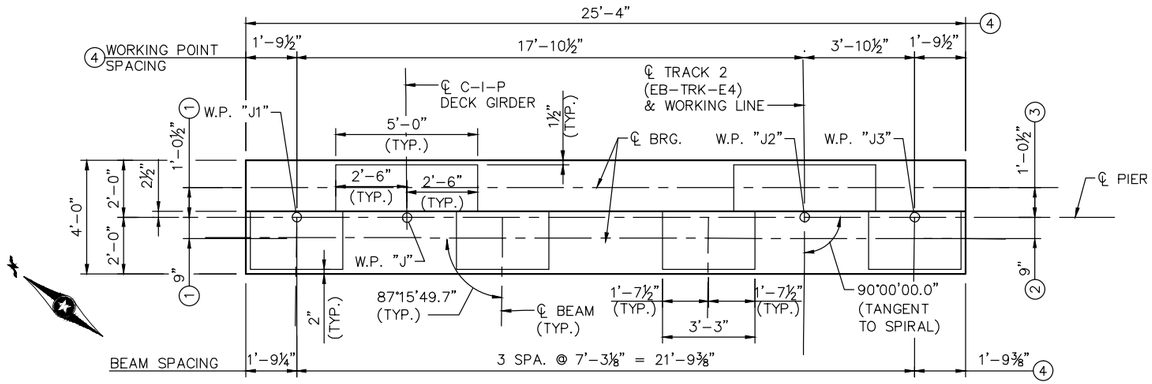
METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

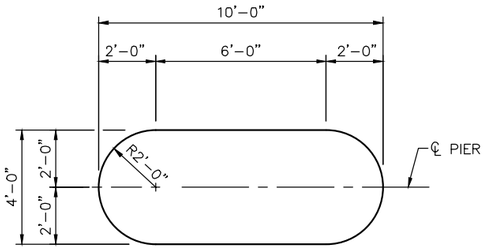
CIVIL EAST - VOLUME 4B
LRT OVER BNSF
BRIDGE R0697
PIER 8 DETAILS 1

DISCIPLINE: STRUCTURES
SHEET NAME: CBRR0697-BRG-PIR-001-16

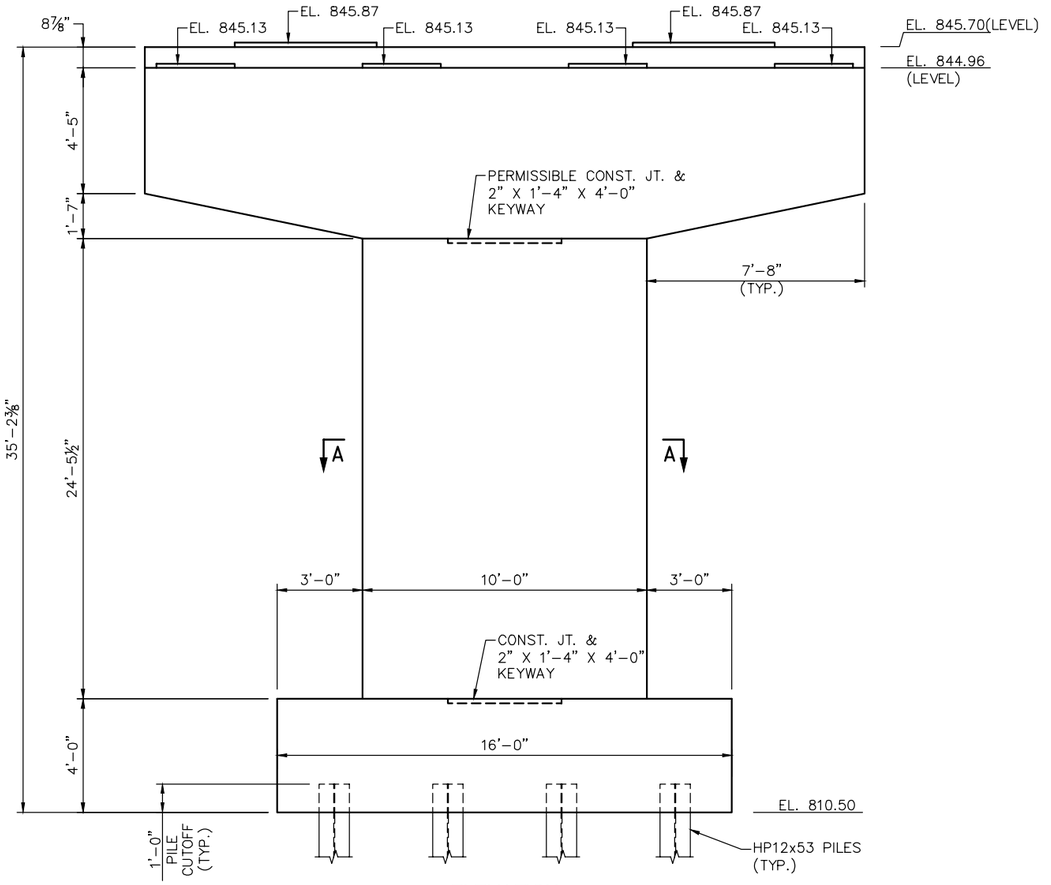
SHEET 26 OF 64



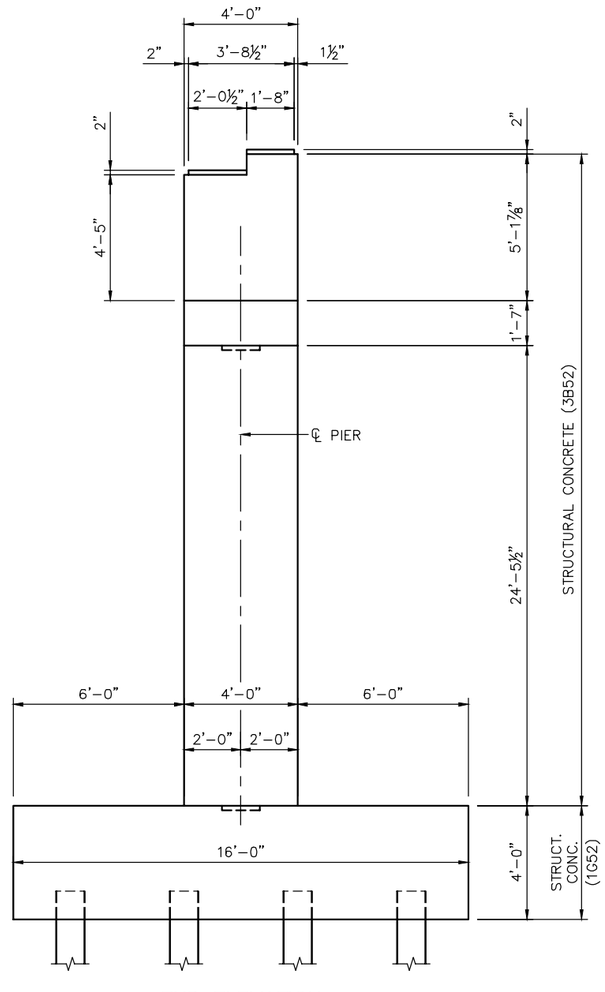
PIER CAP PLAN
(PIER 8)



SECTION A-A
(PIER 8)



ELEVATION
(PIER 8)



END ELEVATION
(PIER 8)

NOTES:

1. DIMENSIONS MEASURED ALONG ℄ OF BEAM @ W.P. "J1".
2. DIMENSIONS MEASURED ALONG ℄ OF BEAM @ W.P. "J3".
3. DIMENSIONS MEASURED ALONG C OF BEAM @ W.P. "J2".
4. DIMENSIONS MEASURED ALONG ℄ OF PIER.

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: RHK | CHECKED BY: EJT
DRAWN BY: LMT | DATE: 9/14/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

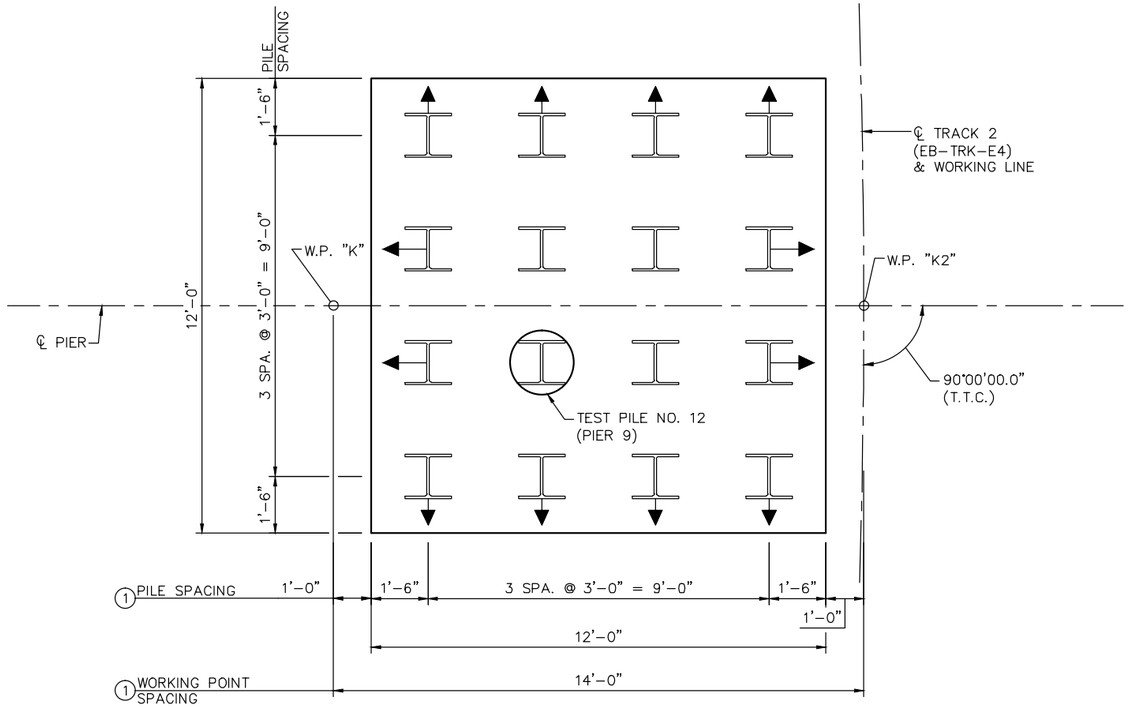
SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4B
LRT OVER BNSF
BRIDGE R0697
PIER 8 DETAILS 2

DISCIPLINE: STRUCTURES

SHEET NAME: CBRR0697-BRG-PIR-001-17

SHEET 27 OF 64



FOOTING PLAN
(PIER 9)

PIER 9 COMPUTED PILE LOAD - TONS/PILE	
FACTORED DEAD LOAD	
FACTORED LIVE LOAD	
FACTORED OVERTURNING	
* FACTORED DESIGN LOAD	

* BASED ON STRENGTH I LOAD COMBINATION.

PIER 9 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	
PDA	0.65	

* Rn = (FACTORED DESIGN LOAD) / φdyn

GENERAL PILE NOTES

1 STEEL HP 14 X 117-TEST PILES 55 FT. LONG
15 STEEL HP 14 X 117-PILES EST. LENGTH 55 FT.
16 STEEL HP 14 X 117-PILES REQ'D FOR PIER 9

NOTES:

PIER PILES ARE TO BE HP14x117 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.

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: RHK | CHECKED BY: EJT
DRAWN BY: LMT | DATE: 9/14/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

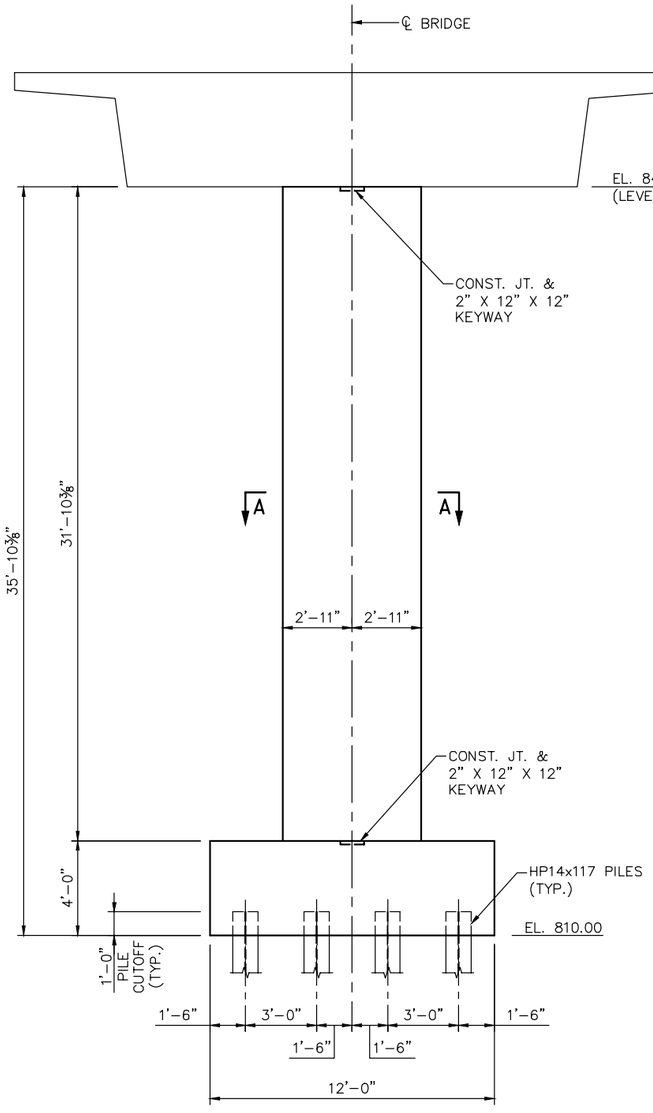
SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4B
LRT OVER BNSF
BRIDGE R0697
PIER 9 DETAILS 1

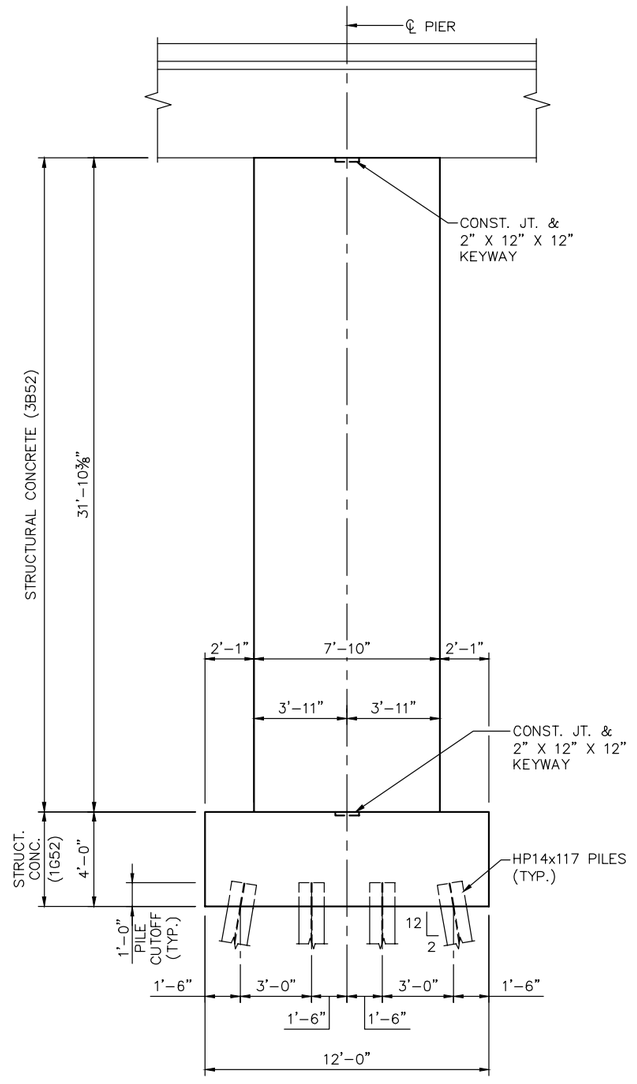
DISCIPLINE: STRUCTURES
SHEET NAME: CBRR0697-BRG-PIR-001-21

SHEET 28 OF 64

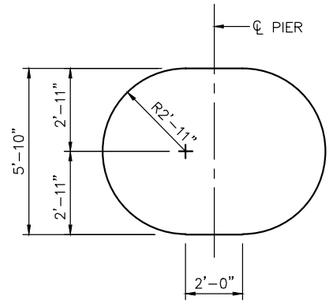
Sep. 10 2015 11:31 am V:\3400_ADC\CAD\segment e4\plan sheets\structures\R0697\CBRR0697-BRG-PIR-001.dwg By: lisa.thompson



ELEVATION
(PIER 9)



END ELEVATION
(PIER 9)



SECTION A-A
(PIER 9)

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: RHK | CHECKED BY: EJT
DRAWN BY: LMT | DATE: 9/14/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

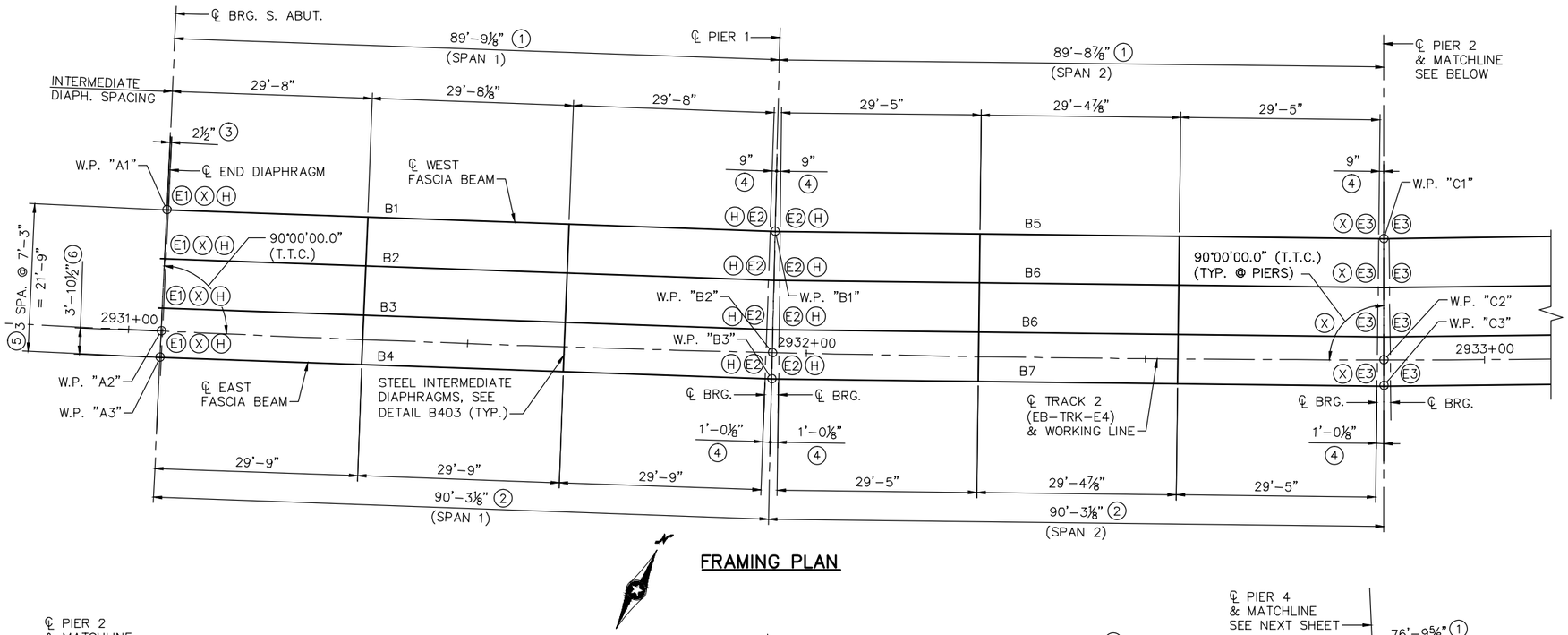
CIVIL EAST - VOLUME 4B
LRT OVER BNSF
BRIDGE R0697
PIER 9 DETAILS 2

DISCIPLINE: STRUCTURES

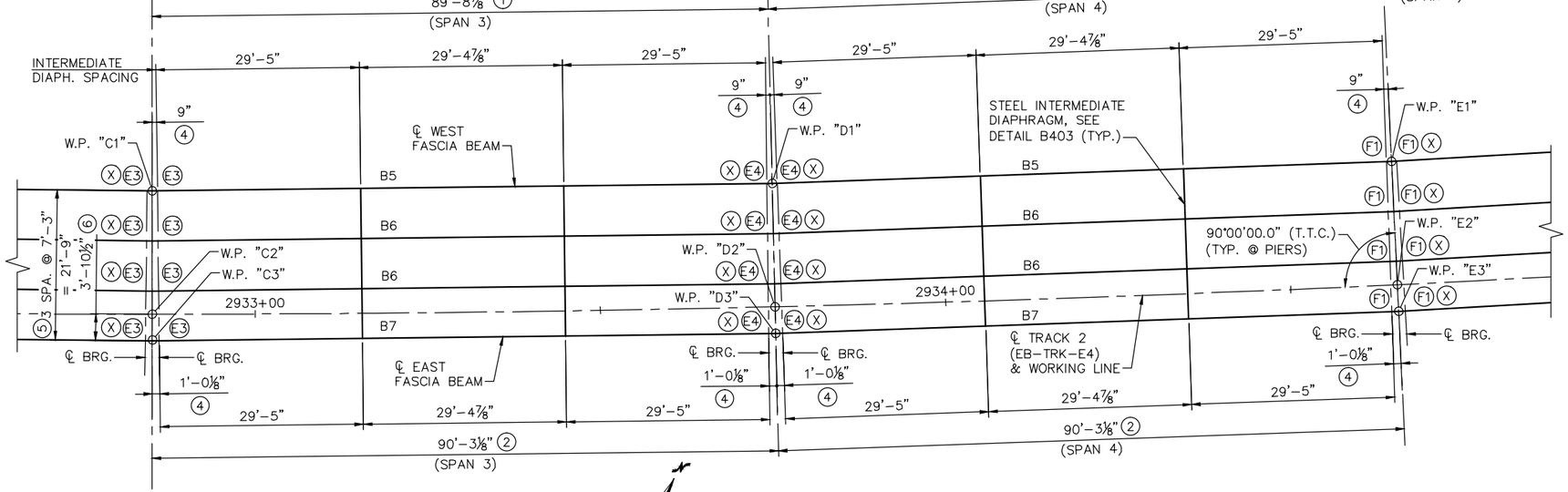
SHEET NAME: CBRR0697-BRG-PIR-001-22

SHEET 29 OF 64

Sep. 10 2015 11:31 am V:\3400_ADC\CAD\segment e4\plan sheets\structures\R0697\CBRR0697-BRG-PIR-001.dwg By: lisa.thompson



FRAMING PLAN



FRAMING PLAN

NOTES:

SEE SHEETS NO. 33 & 34 FOR PRESTRESSED CONCRETE BEAM DETAILS.

(E1) DENOTES EXPANSION CURVED PLATE BEARING ASSEMBLY TYPE 1. SEE DETAIL B311.

(E2) DENOTES EXPANSION CURVED PLATE BEARING ASSEMBLY TYPE 2. SEE DETAIL B311.

(E3) DENOTES EXPANSION CURVED PLATE BEARING ASSEMBLY TYPE 3. SEE DETAIL B311.

(E4) DENOTES EXPANSION CURVED PLATE BEARING ASSEMBLY TYPE 4. SEE DETAIL B311.

(F1) DENOTES FIXED CURVED PLATE ASSEMBLY TYPE 1. SEE DETAIL B310.

(H) DENOTES TAPERED BEARING PLATE. INSTALL THICKER SIDE OF BEARING PLATE ON UPHILL SIDE OF CENTERLINE BEARING. SEE DETAIL B311.

(X) INDICATES END OF BEAM.

(1) WORKING POINT DIMENSIONS MEASURED ALONG WEST FASCIA BEAM.

(2) WORKING POINT DIMENSIONS MEASURED ALONG EAST FASCIA BEAM.

(3) CONCRETE END DIAPHRAGM SHALL BE PARALLEL TO CENTERLINE BEARING. SEE DETAIL B814.

(4) INTERMEDIATE DIAPHRAGM SPACING ALONG CENTERLINE OF FASCIA BEAM.

(5) MN54 PRESTRESSED CONCRETE BEAMS.

(6) DIMENSION MEASURED BETWEEN WORKING POINTS AT SUBSTRUCTURE.

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: BAW | CHECKED BY: EJT
DRAWN BY: LMT | DATE: 9/14/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

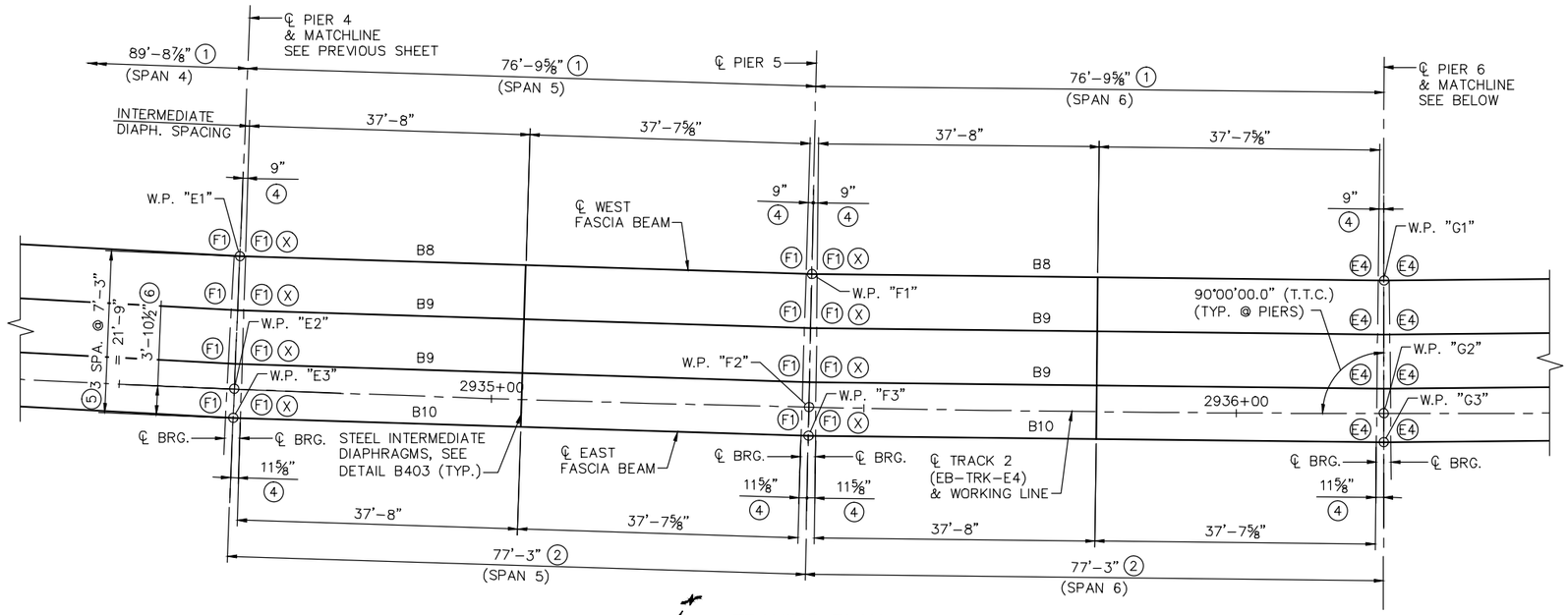
CIVIL EAST - VOLUME 4B
LRT OVER BNSF
BRIDGE R0697
FRAMING PLAN 1

DISCIPLINE: STRUCTURES

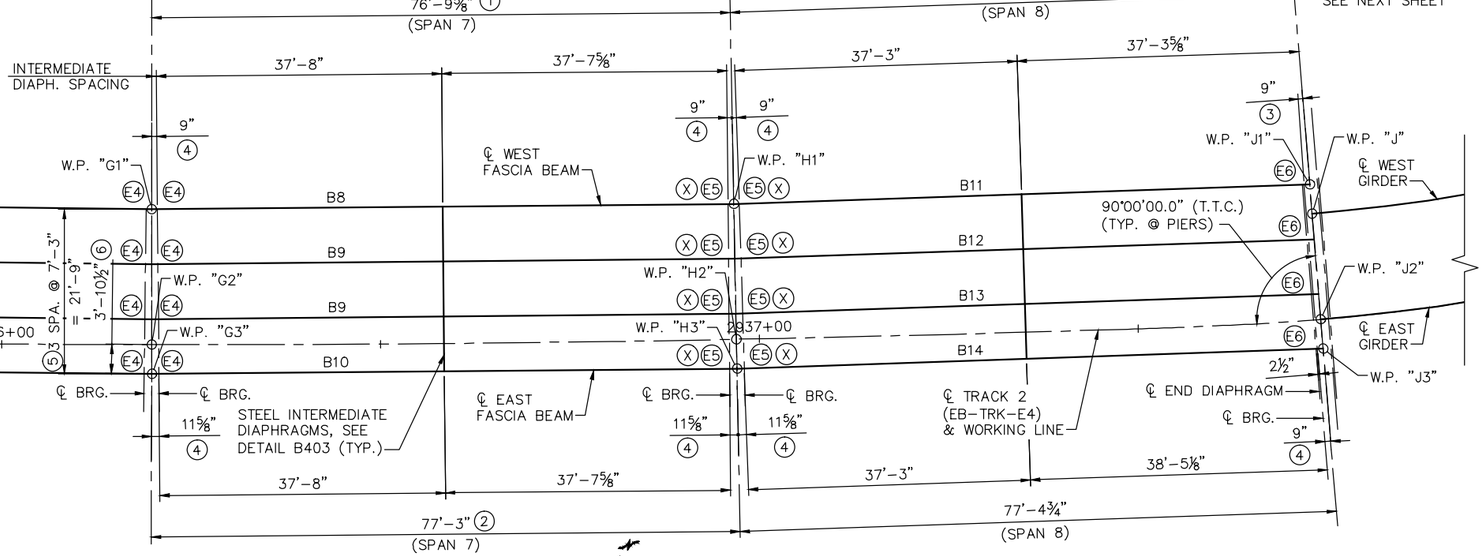
SHEET NAME: CBRR0697-BRG-SUP-002-1

SHEET 30 OF 64

Sep. 10 2015 11:32 am V:\3400_ADC\CAD\segment e4\plan sheets\structures\R0697\CBRR0697-BRG-SUP-002.dwg By: lisa.thompson



FRAMING PLAN



FRAMING PLAN

NOTES:

SEE SHEETS NO. 33 & 34 FOR PRESTRESSED CONCRETE BEAM DETAILS.

(E4) DENOTES EXPANSION CURVED PLATE BEARING ASSEMBLY TYPE 4. SEE DETAIL B311.

(E5) DENOTES EXPANSION CURVED PLATE BEARING ASSEMBLY TYPE 5. SEE DETAIL B311.

(E6) DENOTES EXPANSION CURVED PLATE BEARING ASSEMBLY TYPE 6. SEE DETAIL B311.

(F1) DENOTES FIXED CURVED PLATE ASSEMBLY TYPE 1. SEE DETAIL B310.

(X) INDICATES END OF BEAM.

(1) WORKING POINT DIMENSIONS MEASURED ALONG WEST FASCIA BEAM.

(2) WORKING POINT DIMENSIONS MEASURED ALONG EAST FASCIA BEAM.

(3) CONCRETE END DIAPHRAGM SHALL BE PARALLEL TO CENTERLINE BEARING. SEE DETAIL B814.

(4) INTERMEDIATE DIAPHRAGM SPACING ALONG CENTERLINE OF FASCIA BEAM.

(5) MN54 PRESTRESSED CONCRETE BEAMS.

(6) DIMENSION MEASURED BETWEEN WORKING POINTS AT SUBSTRUCTURE.

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: BAW | CHECKED BY: EJT
DRAWN BY: LMT | DATE: 9/14/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

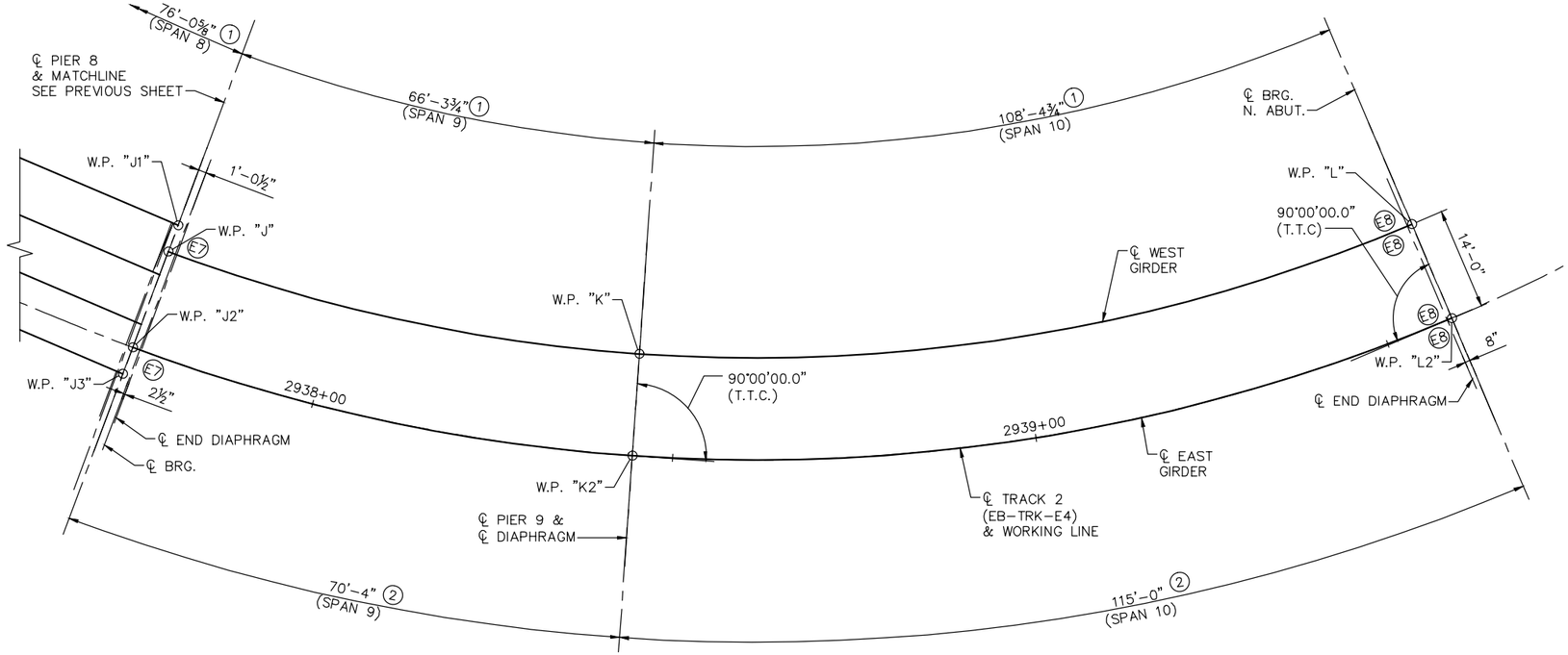
SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4B
LRT OVER BNSF
BRIDGE R0697
FRAMING PLAN 2

DISCIPLINE: STRUCTURES

SHEET NAME: CBRR0697-BRG-SUP-002-3

SHEET 31 OF 64



FRAMING PLAN

NOTES:

E7 DENOTES EXPANSION CURVED PLATE BEARING ASSEMBLY TYPE 7. SEE DETAIL B311.

E8 DENOTES EXPANSION CURVED PLATE BEARING ASSEMBLY TYPE 8. SEE DETAIL B311.

① DIMENSIONS MEASURED ALONG ℄ WEST GIRDER.

② DIMENSIONS MEASURED ALONG ℄ EAST GIRDER.

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: BAW | CHECKED BY: EJT
DRAWN BY: LMT | DATE: 9/14/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

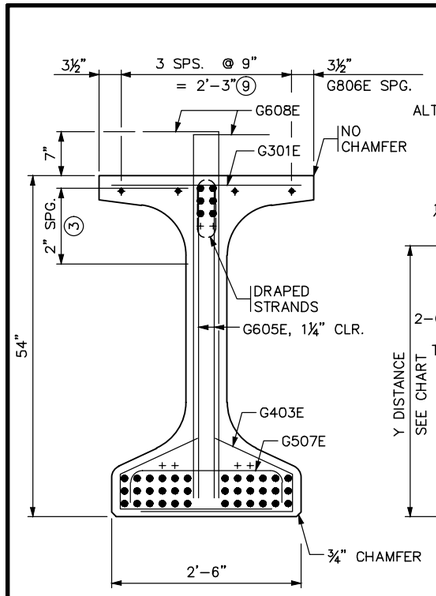
CIVIL EAST - VOLUME 4B
LRT OVER BNSF
BRIDGE R0697
FRAMING PLAN 3

DISCIPLINE: STRUCTURES

SHEET NAME: CBRR0697-BRG-SUP-002-3

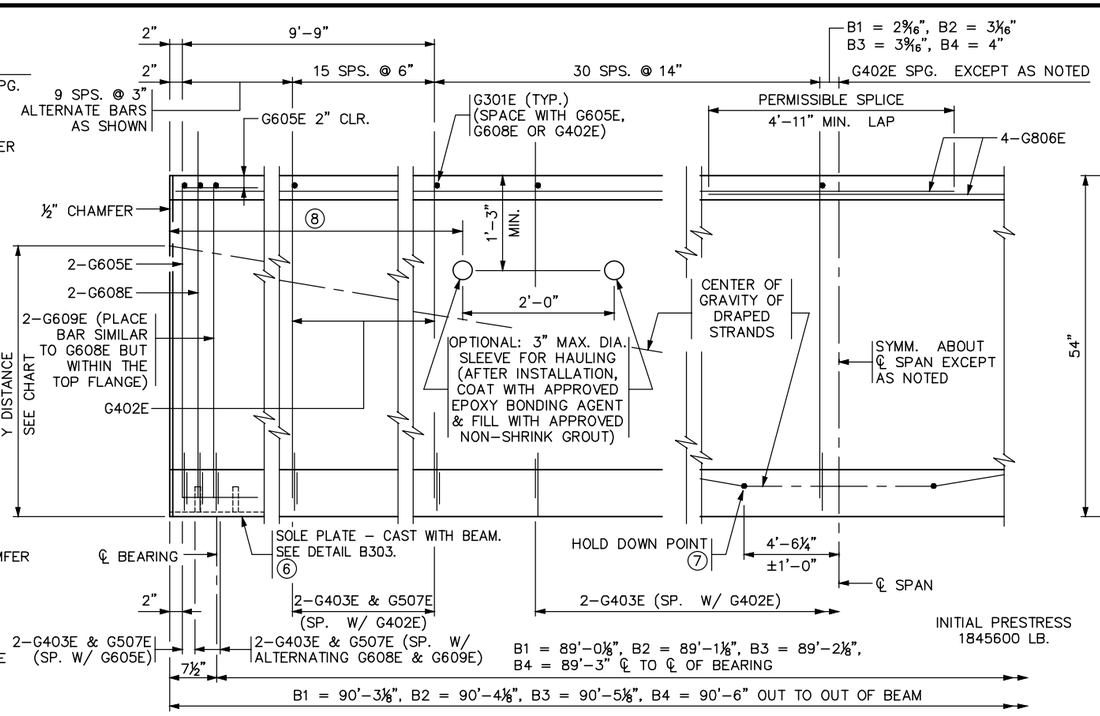
SHEET 32 OF 64

Sep. 10 2015 11:32 am V:\3400_ADC\CAD\segment e4\plan sheets\structures\R0697\CBRR0697-BRG-SUP-002.dwg By: lisa.thompson



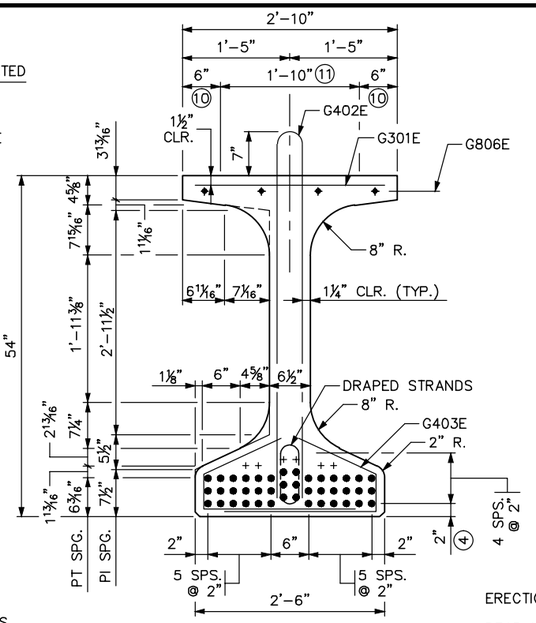
END VIEW

CUT STRANDS FLUSH WITH CONCRETE. COVER ENDS WITH ONE COMPONENT POLYURETHANE SEALANT PER APPROVED PRODUCT LIST. (G609E BAR NOT SHOWN)



INITIAL PRESTRESS 1845600 LB.

BEAM ELEVATION

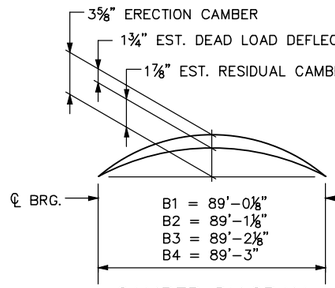


SECTION AT ℄ SPAN

Y DISTANCES (INCHES)	NO.	℄ SPAN	END
STRAIGHT STRANDS	36	4	⊠
DRAPED STRANDS	6	5	49.00 □
TOTAL STRANDS	42	4.14	⊠

Y = DISTANCE TO CENTER OF GRAVITY OF STRANDS FROM BOTTOM OF BEAM. ALL STRANDS SPACED 2" CENTER TO CENTER, HORIZONTALLY AND VERTICALLY, EXCEPT AS NOTED.

□ A TOLERANCE OF ±1" WILL BE PERMITTED IN THIS DIMENSION.

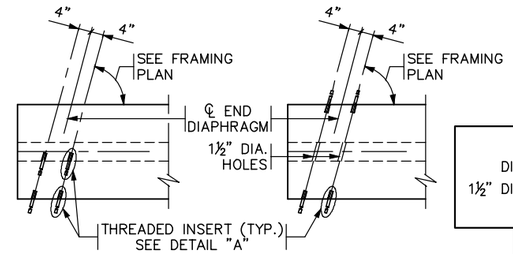


CAMBER DIAGRAM

ERECTION CAMBER SHOWN IS AFTER DIAPHRAGMS ARE IN PLACE.

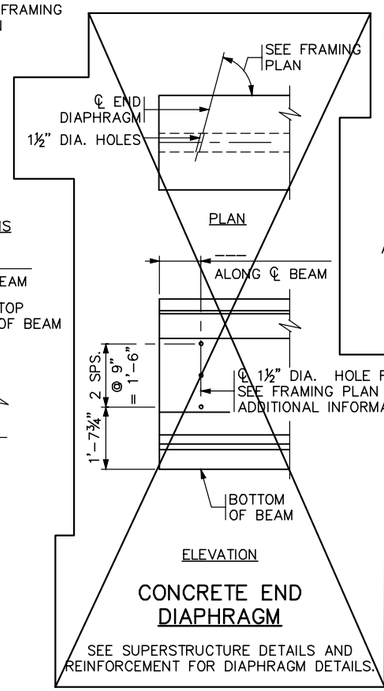
DEAD LOAD DEFLECTION SHOWN IS FOR WEIGHT OF SLAB, WEARING COURSE, BARRIER, SIDEWALK AND MEDIAN WHERE APPLICABLE.

CONTRACTOR WILL TAKE ELEVATIONS AT TOP OF BEAMS AFTER ERECTION AND WILL ALLOW FOR DEFLECTION SHOWN TO ENABLE BUILDING FORMS TO CORRECT GRADE AND SPECIFIED SLAB THICKNESS. PROVIDE COPY OF ELEVATIONS TO THE ENGINEER.



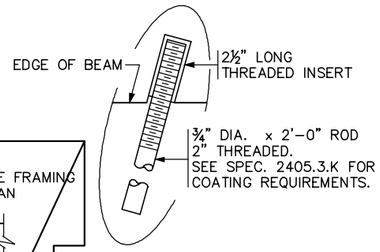
CONCRETE END DIAPHRAGM

PARAPET ABUTMENT
(SEE DETAIL B814 FOR DIAPHRAGM DETAILS)

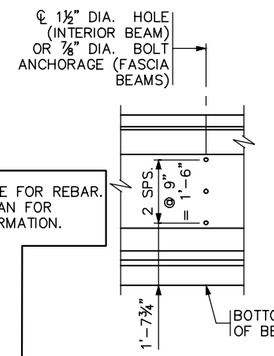


CONCRETE END DIAPHRAGM

SEE SUPERSTRUCTURE DETAILS AND REINFORCEMENT FOR DIAPHRAGM DETAILS.



DETAIL "A"



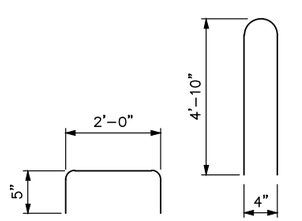
STEEL INTERMEDIATE DIAPHRAGM

(SEE DETAIL B403 FOR DIAPHRAGM DETAILS)

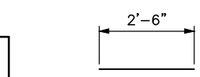
CALCULATED PRESTRESS LOSSES	
ELASTIC SHORTENING LOSS	25.12 KSI
LONG TERM LOSSES	24.62 KSI
TOTAL LOSSES	49.74 KSI

MINIMUM CONCRETE STRENGTH – K.S.I.	
① f'ci	② f'c
7.0 KSI	8.0 KSI

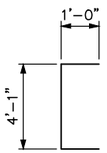
PRESTRESSING STRAND DIAMETER	
⑤	½" □
⑤	0.60" ⊠



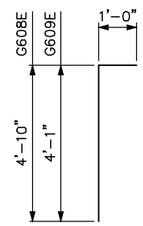
G507E G402E



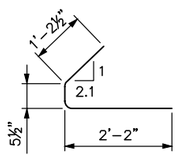
G301E



G605E



G608E & G609E



G403E

GENERAL NOTES

PROVIDE HANDLING HOOKS OR DEVICES AS REQUIRED BY CONTRACTOR.

MARK EACH BEAM SHOWING BRIDGE NUMBER, CASTING DATE, AND INDIVIDUAL IDENTIFICATION LETTERS AND NUMBERS ON THE FACE OF THE BEAM, NEAR THE END, SO LOCATED THAT THEY WILL BE EXPOSED AFTER THE END DIAPHRAGMS HAVE BEEN CAST. MARK FASCIA BEAMS ON THE INSIDE FACE. ENSURE ALL MARKINGS ARE STENCILLED AND CLEARLY LEGIBLE. FOR LOCATION OF BEAMS, SEE FRAMING PLAN.

~~ALL MATERIAL AND WORK SHOWN OR NOTED ON THIS SHEET IS INCLUDED IN UNIT PRICE BID FOR PRESTRESSED CONCRETE BEAMS. SEE SPEC. 2405.~~

SEE FRAMING PLAN FOR BEAM END MARKED "X" AND DIAPHRAGM SPACING.

APPROXIMATE WEIGHT OF BEAM IS 36.5 TONS.

AS AN ALTERNATE TO THE END DIAPHRAGM ANCHORAGES SHOWN, THE CONTRACTOR MAY SUBMIT DETAILS OF A CAST-IN-PLACE ANCHORAGE TO THE ENGINEER FOR APPROVAL. ANCHORAGE MUST PROVIDE AN ULTIMATE PULL OUT STRENGTH OF 15 KIPS PER ANCHORAGE.

APPLY AN APPROVED SEALER TO THE SIDES OF THE BEAM NEAR EACH END PER THE SPECIAL PROVISIONS.

① MINIMUM CONCRETE STRENGTH AT TIME OF PRESTRESS TRANSFER.

② MINIMUM CONCRETE STRENGTH WHEN BEAM CAN BE TRANSPORTED AND INSTALLED.

③ DRAPED STRANDS.

④ STRAIGHT STRANDS.

⑤ USE 7-WIRE LOW RELAXATION PRESTRESSING STRAND, CONFORMING TO ASTM A416, GRADE 270.

⑥ ~~FOR INTEGRAL ABUTMENT, SOLE PLATE CAN BE ELIMINATED OR REPLACED WITH AN APPROVED PROTECTION PLATE. BEAMS DETAILED TO INCLUDE A TAPERED PLATE PER STANDARD FIGURE B309 MUST INCLUDE SOLE PLATE.~~

⑦ CENTER OF GRAVITY OF HOLD DOWNS WHEN MULTIPLE HOLD DOWNS ARE USED.

⑧ DIMENSION DETERMINED BY CONTRACTOR. MAINTAIN 2" MINIMUM CLEAR FROM STRANDS.

⑨ TWO INSIDE BARS MAY BE PLACED ADJACENT TO VERTICAL STIRRUP FOR TYING CONVENIENCE.

⑩ STEEL TROWEL TO SMOOTH FINISH AND APPLY BOND BREAKER PER APPROVED PRODUCTS LIST.

⑪ ROUGH FLOAT AND BROOM TRANSVERSELY FOR BOND PER SPEC. 2405.3.D.

DRAFT-WORK IN PROCESS

REVISED:

APPROVED: JANUARY 13, 2015
Nancy Daubenberger
STATE BRIDGE ENGINEER

CERTIFIED BY _____ LICENSED PROFESSIONAL ENGINEER 9/14/15 DATE
NAME: ENGINEER _____ LIC. NO. #####

TITLE: MN54" PRESTRESSED CONCRETE BEAM (PRETENSIONED) MN54-91

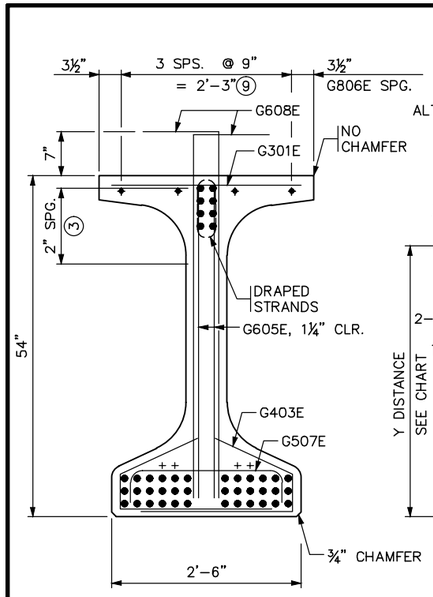
BEAM B1-B4

FIG. 5-397.508

DES: BAW	DR: LMT	APPROVED:
CHK: EJT	CHK: EJT	

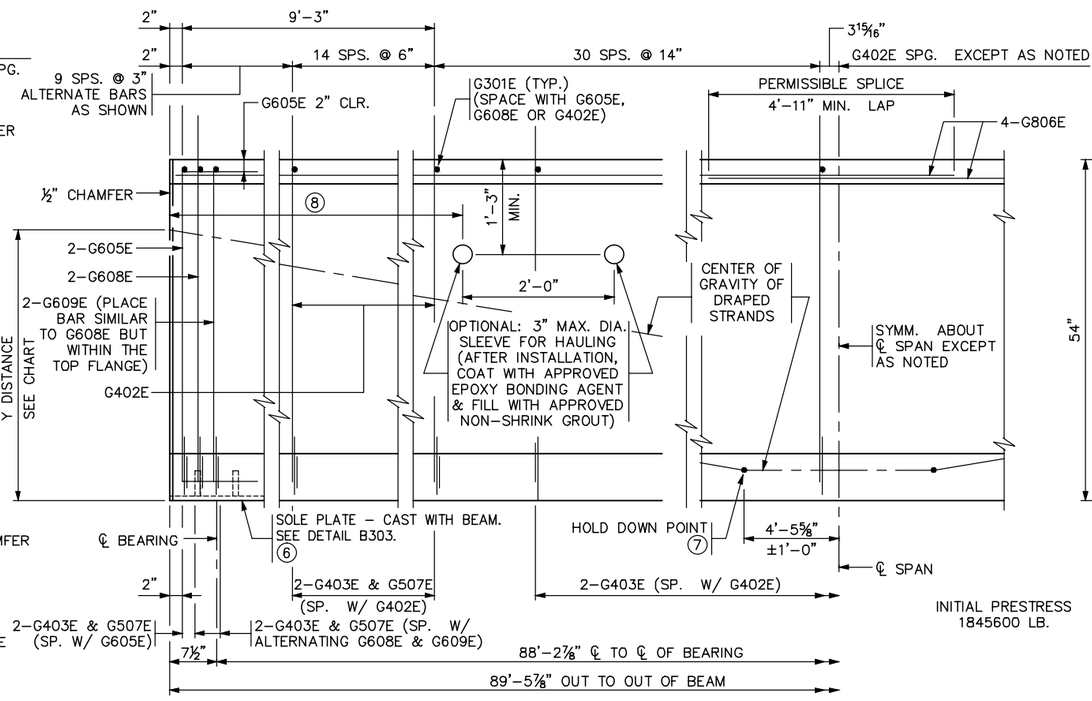
SHEET NO. 33 OF 64 SHEETS

BRIDGE NO. R0697



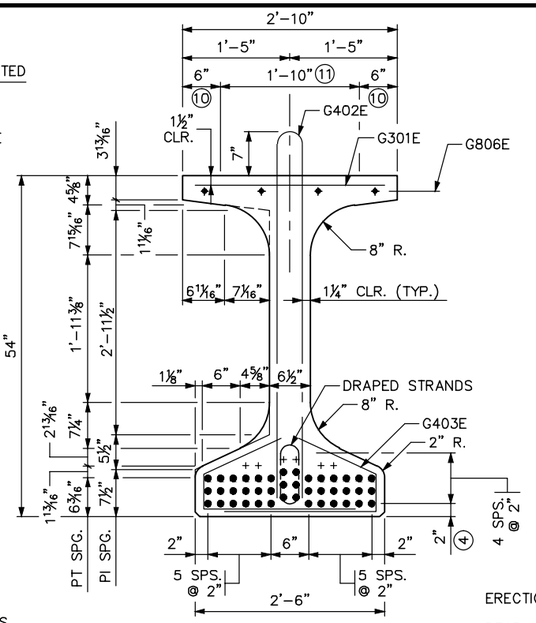
END VIEW

CUT STRANDS FLUSH WITH CONCRETE. COVER ENDS WITH ONE COMPONENT POLYURETHANE SEALANT PER APPROVED PRODUCT LIST. (G609E BAR NOT SHOWN)



BEAM ELEVATION

INITIAL PRESTRESS 1845600 LB.

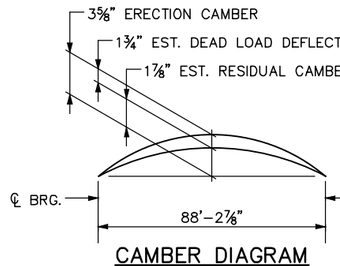


SECTION AT ℄ SPAN

Y DISTANCES (INCHES)	NO.	℄ SPAN	END
STRAIGHT STRANDS	36	4	
DRAPED STRANDS	6	5	49.00 ▫
TOTAL STRANDS	42	4.14	

Y = DISTANCE TO CENTER OF GRAVITY OF STRANDS FROM BOTTOM OF BEAM. ALL STRANDS SPACED 2" CENTER TO CENTER, HORIZONTALLY AND VERTICALLY, EXCEPT AS NOTED.

▫ A TOLERANCE OF ±1" WILL BE PERMITTED IN THIS DIMENSION.

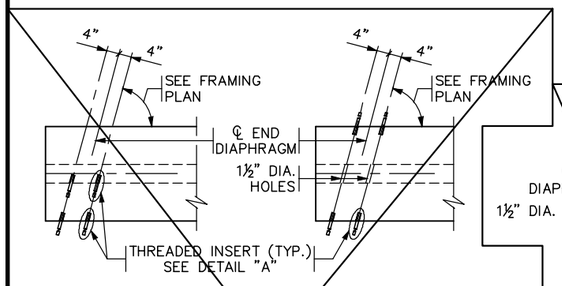


CAMBER DIAGRAM

ERECTION CAMBER SHOWN IS AFTER DIAPHRAGMS ARE IN PLACE.

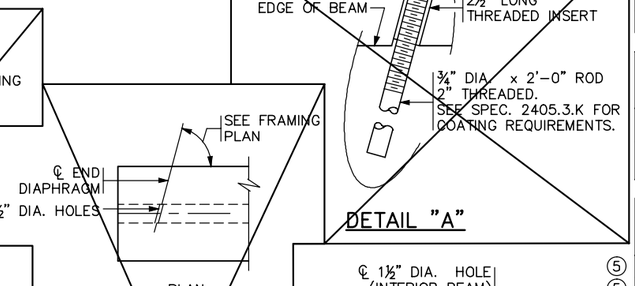
DEAD LOAD DEFLECTION SHOWN IS FOR WEIGHT OF SLAB, WEARING COURSE, BARRIER, SIDEWALK AND MEDIAN WHERE APPLICABLE.

CONTRACTOR WILL TAKE ELEVATIONS AT TOP OF BEAMS AFTER ERECTION AND WILL ALLOW FOR DEFLECTION SHOWN TO ENABLE BUILDING FORMS TO CORRECT GRADE AND SPECIFIED SLAB THICKNESS. PROVIDE COPY OF ELEVATIONS TO THE ENGINEER.



CONCRETE END DIAPHRAGM

PARAPET ABUTMENT
(SEE DETAIL B814 FOR DIAPHRAGM DETAILS)



CONCRETE END DIAPHRAGM

SEE SUPERSTRUCTURE DETAILS AND REINFORCEMENT FOR DIAPHRAGM DETAILS

STEEL INTERMEDIATE DIAPHRAGM

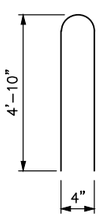
(SEE DETAIL B403 FOR DIAPHRAGM DETAILS)

CALCULATED PRESTRESS LOSSES	
ELASTIC SHORTENING LOSS	25.12 KSI
LONG TERM LOSSES	24.62 KSI
TOTAL LOSSES	49.74 KSI

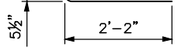
MINIMUM CONCRETE STRENGTH – K.S.I.	
① f'ci	② f'c
7.0 KSI	8.0 KSI

PRESTRESSING STRAND DIAMETER	
⑤	½" ☐
⑤	0.60" ☒

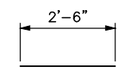
G507E



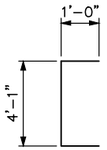
G402E



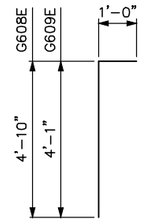
G403E



G301E



G605E



G608E & G609E

GENERAL NOTES

PROVIDE HANDLING HOOKS OR DEVICES AS REQUIRED BY CONTRACTOR.

MARK EACH BEAM SHOWING BRIDGE NUMBER, CASTING DATE, AND INDIVIDUAL IDENTIFICATION LETTERS AND NUMBERS ON THE FACE OF THE BEAM, NEAR THE END, SO LOCATED THAT THEY WILL BE EXPOSED AFTER THE END DIAPHRAGMS HAVE BEEN CAST. MARK FASCIA BEAMS ON THE INSIDE FACE. ENSURE ALL MARKINGS ARE STENCILLED AND CLEARLY LEGIBLE. FOR LOCATION OF BEAMS, SEE FRAMING PLAN.

~~ALL MATERIAL AND WORK SHOWN OR NOTED ON THIS SHEET IS INCLUDED IN UNIT PRICE BID FOR PRESTRESSED CONCRETE BEAMS. SEE SPEC. 2405.~~

SEE FRAMING PLAN FOR BEAM END MARKED "X" AND DIAPHRAGM SPACING.

APPROXIMATE WEIGHT OF BEAM IS 36.1 TONS.

AS AN ALTERNATE TO THE END DIAPHRAGM ANCHORAGES SHOWN, THE CONTRACTOR MAY SUBMIT DETAILS OF A CAST-IN-PLACE ANCHORAGE TO THE ENGINEER FOR APPROVAL. ANCHORAGE MUST PROVIDE AN ULTIMATE PULL OUT STRENGTH OF 15 KIPS PER ANCHORAGE.

APPLY AN APPROVED SEALER TO THE SIDES OF THE BEAM NEAR EACH END PER THE SPECIAL PROVISIONS.

① MINIMUM CONCRETE STRENGTH AT TIME OF PRESTRESS TRANSFER.

② MINIMUM CONCRETE STRENGTH WHEN BEAM CAN BE TRANSPORTED AND INSTALLED.

③ DRAPED STRANDS.

④ STRAIGHT STRANDS.

⑤ USE 7-WIRE LOW RELAXATION PRESTRESSING STRAND, CONFORMING TO ASTM A416, GRADE 270.

⑥ ~~FOR INTEGRAL ABUTMENT, SOLE PLATE CAN BE ELIMINATED OR REPLACED WITH AN APPROVED PROTECTION PLATE. BEAMS DETAILED TO INCLUDE A TAPERED PLATE PER STANDARD FIGURE B309 MUST INCLUDE SOLE PLATE.~~

⑦ CENTER OF GRAVITY OF HOLD DOWNS WHEN MULTIPLE HOLD DOWNS ARE USED.

⑧ DIMENSION DETERMINED BY CONTRACTOR. MAINTAIN 2" MINIMUM CLEAR FROM STRANDS.

⑨ TWO INSIDE BARS MAY BE PLACED ADJACENT TO VERTICAL STIRRUP FOR TYING CONVENIENCE.

⑩ STEEL TROWEL TO SMOOTH FINISH AND APPLY BOND BREAKER PER APPROVED PRODUCTS LIST.

⑪ ROUGH FLOAT AND BROOM TRANSVERSELY FOR BOND PER SPEC. 2405.3.D.

DRAFT-WORK IN PROCESS

REVISED:

APPROVED: JANUARY 13, 2015
Nancy Dorbenberger
STATE BRIDGE ENGINEER

CERTIFIED BY _____ LICENSED PROFESSIONAL ENGINEER 9/14/15 DATE
NAME: ENGINEER _____ LIC. NO. #####

TITLE: MN54" PRESTRESSED CONCRETE BEAM (PRETENSIONED) MN54-90

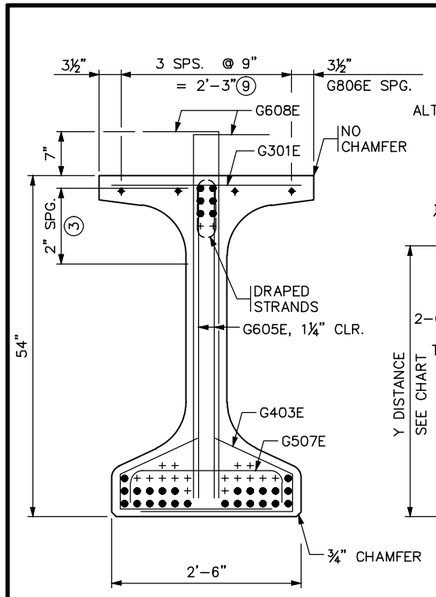
BEAM B5-B7

FIG. 5-397.508

DES: BAW	DR: LMT	APPROVED:
CHK: EJT	CHK: EJT	

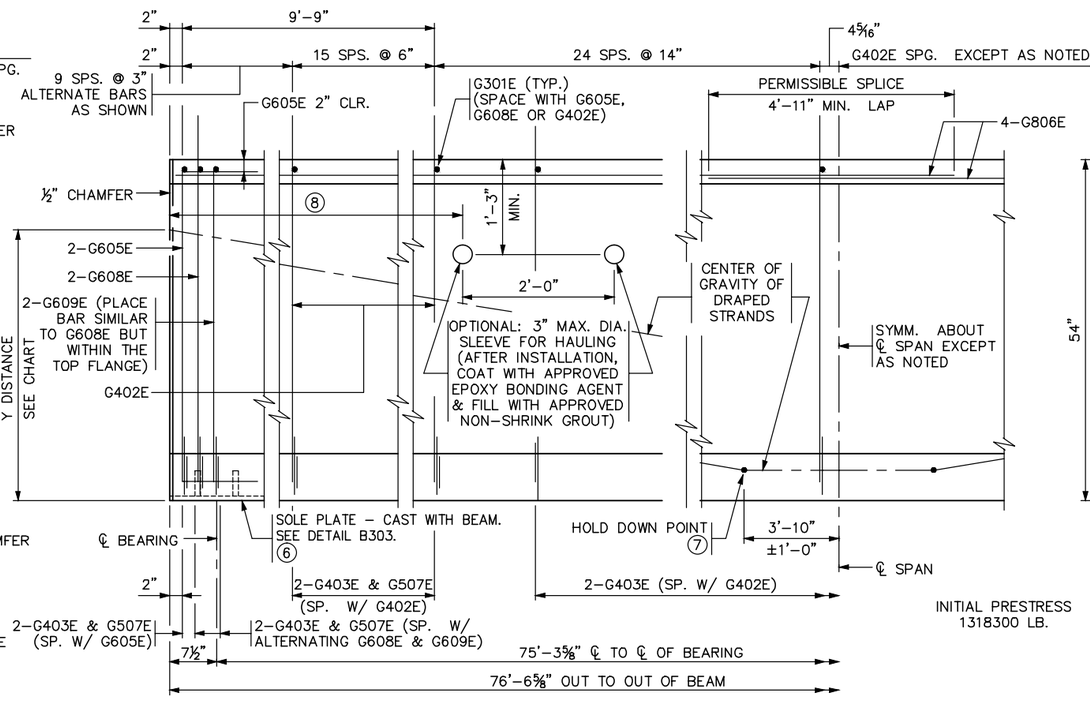
SHEET NO. 34 OF 64 SHEETS

BRIDGE NO. R0697



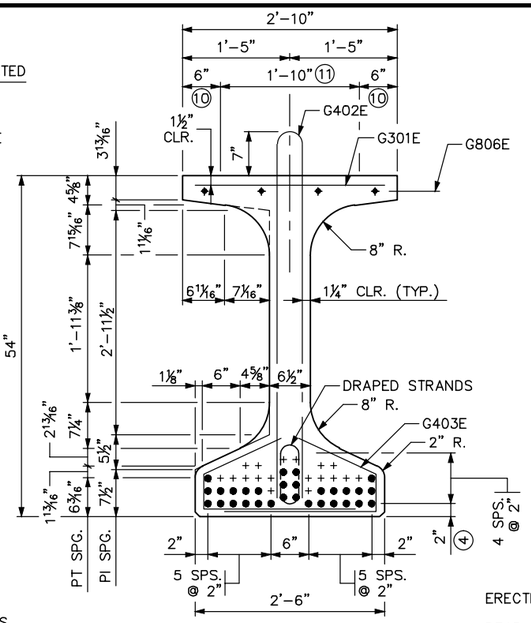
END VIEW

CUT STRANDS FLUSH WITH CONCRETE. COVER ENDS WITH ONE COMPONENT POLYURETHANE SEALANT PER APPROVED PRODUCT LIST. (G609E BAR NOT SHOWN)



BEAM ELEVATION

INITIAL PRESTRESS 1318300 LB.

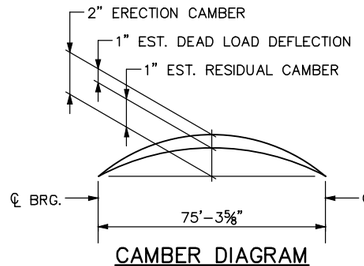


SECTION AT ℄ SPAN

Y DISTANCES (INCHES)	NO.	℄ SPAN	END
STRAIGHT STRANDS	24	3.17	
DRAPED STRANDS	6	5	49.00 ▫
TOTAL STRANDS	30	3.53	

Y = DISTANCE TO CENTER OF GRAVITY OF STRANDS FROM BOTTOM OF BEAM. ALL STRANDS SPACED 2" CENTER TO CENTER, HORIZONTALLY AND VERTICALLY, EXCEPT AS NOTED.

▫ A TOLERANCE OF ±1" WILL BE PERMITTED IN THIS DIMENSION.

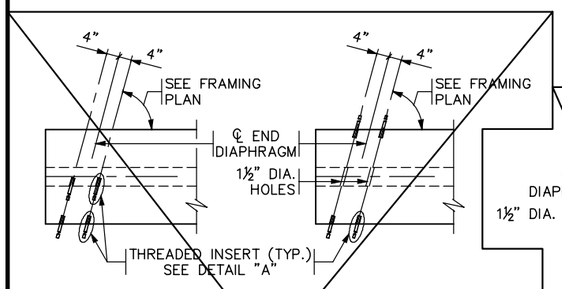


CAMBER DIAGRAM

ERECTION CAMBER SHOWN IS AFTER DIAPHRAGMS ARE IN PLACE.

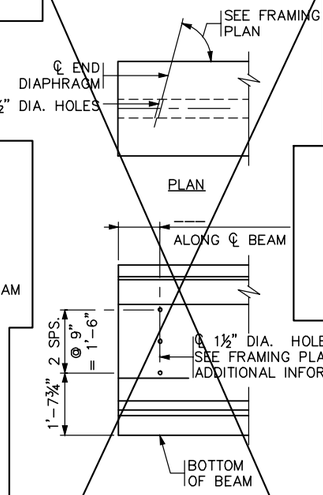
DEAD LOAD DEFLECTION SHOWN IS FOR WEIGHT OF SLAB, WEARING COURSE, BARRIER, SIDEWALK AND MEDIAN WHERE APPLICABLE.

CONTRACTOR WILL TAKE ELEVATIONS AT TOP OF BEAMS AFTER ERECTION AND WILL ALLOW FOR DEFLECTION SHOWN TO ENABLE BUILDING FORMS TO CORRECT GRADE AND SPECIFIED SLAB THICKNESS. PROVIDE COPY OF ELEVATIONS TO THE ENGINEER.



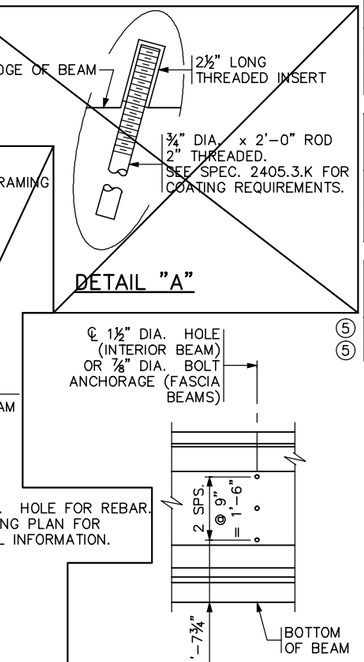
CONCRETE END DIAPHRAGM

PARAPET ABUTMENT
(SEE DETAIL B814 FOR DIAPHRAGM DETAILS)



CONCRETE END DIAPHRAGM

SEE SUPERSTRUCTURE DETAILS AND REINFORCEMENT FOR DIAPHRAGM DETAILS



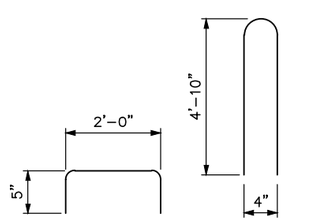
STEEL INTERMEDIATE DIAPHRAGM

(SEE DETAIL B403 FOR DIAPHRAGM DETAILS)

CALCULATED PRESTRESS LOSSES	
ELASTIC SHORTENING LOSS	19.21 KSI
LONG TERM LOSSES	20.35 KSI
TOTAL LOSSES	39.56 KSI

MINIMUM CONCRETE STRENGTH – K.S.I.	
(1) f'ci	(2) f'c
7.0 KSI	8.0 KSI

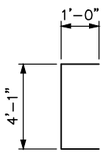
PRESTRESSING STRAND DIAMETER	
(5)	½" ☐
(5)	0.60" ☒



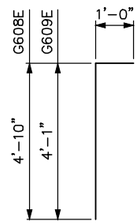
G507E G402E

2'-6"

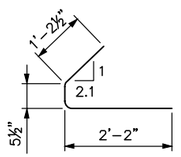
G301E



G605E



G608E & G609E



G403E

GENERAL NOTES

PROVIDE HANDLING HOOKS OR DEVICES AS REQUIRED BY CONTRACTOR.

MARK EACH BEAM SHOWING BRIDGE NUMBER, CASTING DATE, AND INDIVIDUAL IDENTIFICATION LETTERS AND NUMBERS ON THE FACE OF THE BEAM, NEAR THE END, SO LOCATED THAT THEY WILL BE EXPOSED AFTER THE END DIAPHRAGMS HAVE BEEN CAST. MARK FASCIA BEAMS ON THE INSIDE FACE. ENSURE ALL MARKINGS ARE STENCILLED AND CLEARLY LEGIBLE. FOR LOCATION OF BEAMS, SEE FRAMING PLAN.

~~ALL MATERIAL AND WORK SHOWN OR NOTED ON THIS SHEET IS INCLUDED IN UNIT PRICE BID FOR PRESTRESSED CONCRETE BEAMS. SEE SPEC. 2405.~~

SEE FRAMING PLAN FOR BEAM END MARKED "X" AND DIAPHRAGM SPACING.

APPROXIMATE WEIGHT OF BEAM IS 30.9 TONS.

AS AN ALTERNATE TO THE END DIAPHRAGM ANCHORAGES SHOWN, THE CONTRACTOR MAY SUBMIT DETAILS OF A CAST-IN-PLACE ANCHORAGE TO THE ENGINEER FOR APPROVAL. ANCHORAGE MUST PROVIDE AN ULTIMATE PULL OUT STRENGTH OF 15 KIPS PER ANCHORAGE.

APPLY AN APPROVED SEALER TO THE SIDES OF THE BEAM NEAR EACH END PER THE SPECIAL PROVISIONS.

(1) MINIMUM CONCRETE STRENGTH AT TIME OF PRESTRESS TRANSFER.

(2) MINIMUM CONCRETE STRENGTH WHEN BEAM CAN BE TRANSPORTED AND INSTALLED.

(3) DRAPED STRANDS.

(4) STRAIGHT STRANDS.

(5) USE 7-WIRE LOW RELAXATION PRESTRESSING STRAND, CONFORMING TO ASTM A416, GRADE 270.

(6) ~~FOR INTEGRAL ABUTMENT, SOLE PLATE CAN BE ELIMINATED OR REPLACED WITH AN APPROVED PROTECTION PLATE. BEAMS DETAILED TO INCLUDE A TAPERED PLATE PER STANDARD FIGURE B309 MUST INCLUDE SOLE PLATE.~~

(7) CENTER OF GRAVITY OF HOLD DOWNS WHEN MULTIPLE HOLD DOWNS ARE USED.

(8) DIMENSION DETERMINED BY CONTRACTOR. MAINTAIN 2" MINIMUM CLEAR FROM STRANDS.

(9) TWO INSIDE BARS MAY BE PLACED ADJACENT TO VERTICAL STIRRUP FOR TYING CONVENIENCE.

(10) STEEL TROWEL TO SMOOTH FINISH AND APPLY BOND BREAKER PER APPROVED PRODUCTS LIST.

(11) ROUGH FLOAT AND BROOM TRANSVERSELY FOR BOND PER SPEC. 2405.3.D.

DRAFT-WORK IN PROCESS

REVISED:

APPROVED: JANUARY 13, 2015
NANCY DOEBENBERGER
STATE BRIDGE ENGINEER

CERTIFIED BY _____ LICENSED PROFESSIONAL ENGINEER 9/14/15 DATE
NAME: ENGINEER _____ LIC. NO. #####

TITLE: MN54" PRESTRESSED CONCRETE BEAM (PRETENSIONED) MN54-77

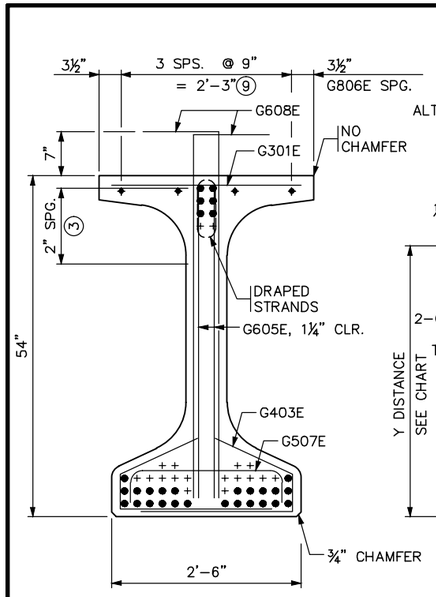
BEAM B8-B10

FIG. 5-397.508

DES: BAW	DR: LMT	APPROVED:
CHK: EJT	CHK: EJT	

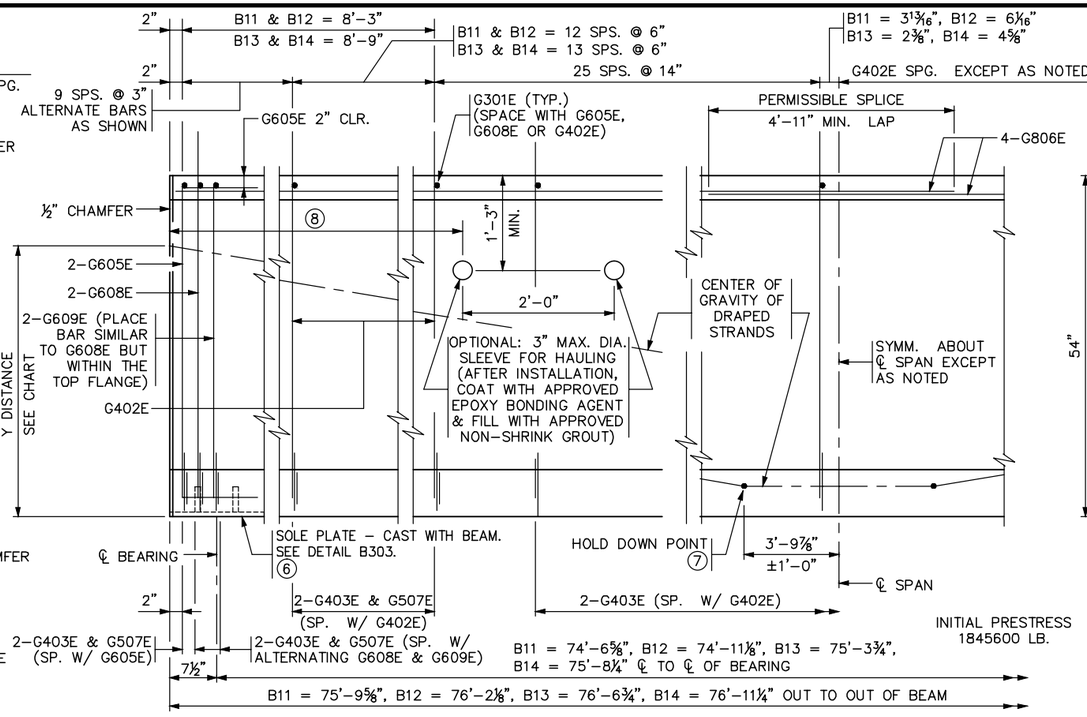
SHEET NO. 35 OF 64 SHEETS

BRIDGE NO. R0697

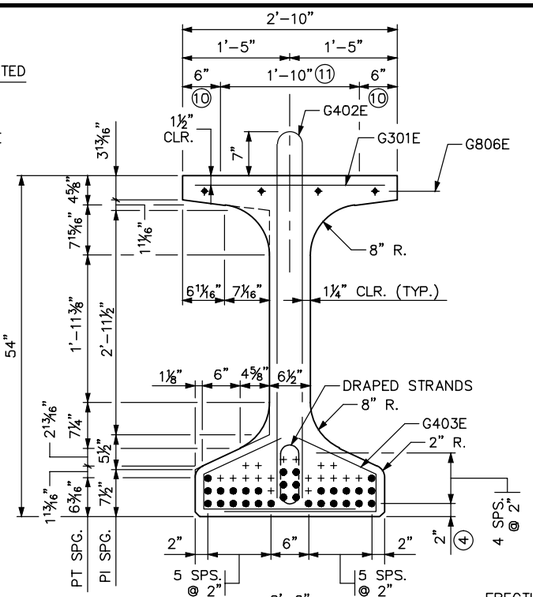


END VIEW

CUT STRANDS FLUSH WITH CONCRETE. COVER ENDS WITH ONE COMPONENT POLYURETHANE SEALANT PER APPROVED PRODUCT LIST. (G609E BAR NOT SHOWN)



BEAM ELEVATION

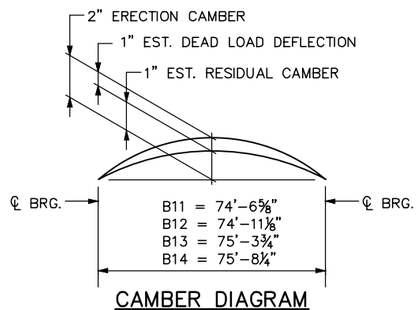


SECTION AT ℄ SPAN

Y DISTANCES (INCHES)	NO.	℄ SPAN	END
STRAIGHT STRANDS	24	3.17	☒
DRAPED STRANDS	6	5	49.00 ▫
TOTAL STRANDS	30	3.53	☒

Y = DISTANCE TO CENTER OF GRAVITY OF STRANDS FROM BOTTOM OF BEAM. ALL STRANDS SPACED 2" CENTER TO CENTER, HORIZONTALLY AND VERTICALLY, EXCEPT AS NOTED.

▫ A TOLERANCE OF ±1" WILL BE PERMITTED IN THIS DIMENSION.

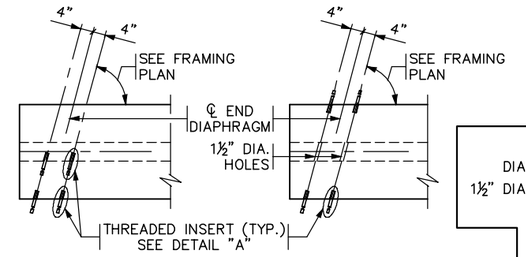


CAMBER DIAGRAM

ERECTION CAMBER SHOWN IS AFTER DIAPHRAGMS ARE IN PLACE.

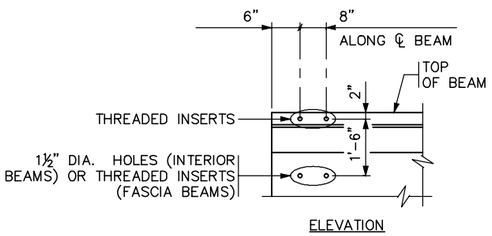
DEAD LOAD DEFLECTION SHOWN IS FOR WEIGHT OF SLAB, WEARING COURSE, BARRIER, SIDEWALK AND MEDIAN WHERE APPLICABLE.

CONTRACTOR WILL TAKE ELEVATIONS AT TOP OF BEAMS AFTER ERECTION AND WILL ALLOW FOR DEFLECTION SHOWN TO ENABLE BUILDING FORMS TO CORRECT GRADE AND SPECIFIED SLAB THICKNESS. PROVIDE COPY OF ELEVATIONS TO THE ENGINEER.



PLAN AT FASCIA BEAMS

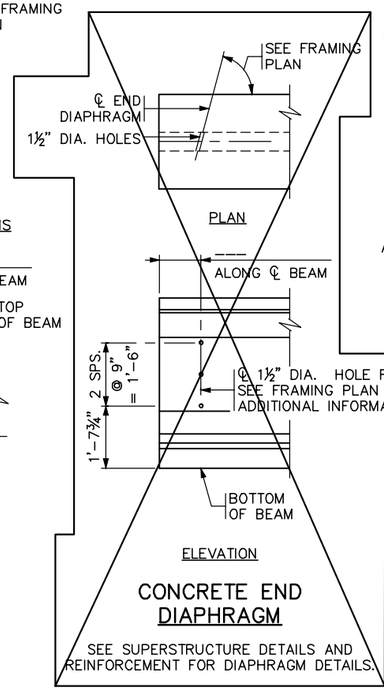
PLAN AT INTERIOR BEAMS



ELEVATION

CONCRETE END DIAPHRAGM

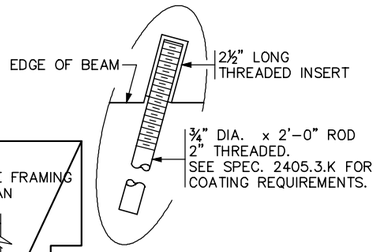
PARAPET ABUTMENT
(SEE DETAIL B814 FOR DIAPHRAGM DETAILS)



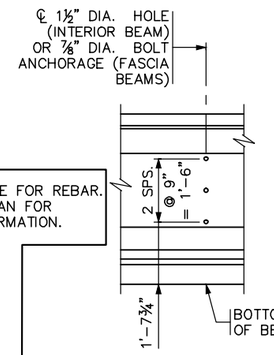
ELEVATION

CONCRETE END DIAPHRAGM

SEE SUPERSTRUCTURE DETAILS AND REINFORCEMENT FOR DIAPHRAGM DETAILS.



DETAIL "A"



ELEVATION

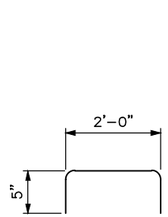
STEEL INTERMEDIATE DIAPHRAGM

(SEE DETAIL B403 FOR DIAPHRAGM DETAILS)

CALCULATED PRESTRESS LOSSES	
ELASTIC SHORTENING LOSS	19.21 KSI
LONG TERM LOSSES	20.35 KSI
TOTAL LOSSES	39.56 KSI

MINIMUM CONCRETE STRENGTH – K.S.I.	
① f'ci	② f'c
7.0 KSI	8.0 KSI

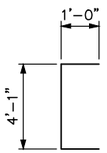
PRESTRESSING STRAND DIAMETER	
⑤	½" ☐
⑤	0.60" ☒



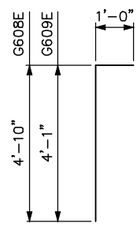
G507E

G402E

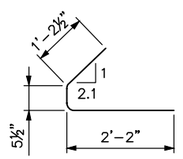
G301E



G605E



G608E & G609E



G403E

GENERAL NOTES

PROVIDE HANDLING HOOKS OR DEVICES AS REQUIRED BY CONTRACTOR.

MARK EACH BEAM SHOWING BRIDGE NUMBER, CASTING DATE, AND INDIVIDUAL IDENTIFICATION LETTERS AND NUMBERS ON THE FACE OF THE BEAM, NEAR THE END, SO LOCATED THAT THEY WILL BE EXPOSED AFTER THE END DIAPHRAGMS HAVE BEEN CAST. MARK FASCIA BEAMS ON THE INSIDE FACE. ENSURE ALL MARKINGS ARE STENCILLED AND CLEARLY LEGIBLE. FOR LOCATION OF BEAMS, SEE FRAMING PLAN.

~~ALL MATERIAL AND WORK SHOWN OR NOTED ON THIS SHEET IS INCLUDED IN UNIT PRICE BID FOR PRESTRESSED CONCRETE BEAMS. SEE SPEC. 2405.~~

SEE FRAMING PLAN FOR BEAM END MARKED "X" AND DIAPHRAGM SPACING.

APPROXIMATE WEIGHT OF BEAM IS 31.0 TONS.

AS AN ALTERNATE TO THE END DIAPHRAGM ANCHORAGES SHOWN, THE CONTRACTOR MAY SUBMIT DETAILS OF A CAST-IN-PLACE ANCHORAGE TO THE ENGINEER FOR APPROVAL. ANCHORAGE MUST PROVIDE AN ULTIMATE PULL OUT STRENGTH OF 15 KIPS PER ANCHORAGE.

APPLY AN APPROVED SEALER TO THE SIDES OF THE BEAM NEAR EACH END PER THE SPECIAL PROVISIONS.

① MINIMUM CONCRETE STRENGTH AT TIME OF PRESTRESS TRANSFER.

② MINIMUM CONCRETE STRENGTH WHEN BEAM CAN BE TRANSPORTED AND INSTALLED.

③ DRAPED STRANDS.

④ STRAIGHT STRANDS.

⑤ USE 7-WIRE LOW RELAXATION PRESTRESSING STRAND, CONFORMING TO ASTM A416, GRADE 270.

⑥ ~~FOR INTEGRAL ABUTMENT, SOLE PLATE CAN BE ELIMINATED OR REPLACED WITH AN APPROVED PROTECTION PLATE. BEAMS DETAILED TO INCLUDE A TAPERED PLATE PER STANDARD FIGURE B309 MUST INCLUDE SOLE PLATE.~~

⑦ CENTER OF GRAVITY OF HOLD DOWNS WHEN MULTIPLE HOLD DOWNS ARE USED.

⑧ DIMENSION DETERMINED BY CONTRACTOR. MAINTAIN 2" MINIMUM CLEAR FROM STRANDS.

⑨ TWO INSIDE BARS MAY BE PLACED ADJACENT TO VERTICAL STIRRUP FOR TYING CONVENIENCE.

⑩ STEEL TROWEL TO SMOOTH FINISH AND APPLY BOND BREAKER PER APPROVED PRODUCTS LIST.

⑪ ROUGH FLOAT AND BROOM TRANSVERSELY FOR BOND PER SPEC. 2405.3.D.

DRAFT-WORK IN PROCESS

REVISED:

APPROVED: JANUARY 13, 2015
Nancy Dorbenberger
STATE BRIDGE ENGINEER

CERTIFIED BY _____ LICENSED PROFESSIONAL ENGINEER 9/14/15 DATE
NAME: ENGINEER LIC. NO. #####

TITLE: MN54" PRESTRESSED CONCRETE BEAM (PRETENSIONED) MN54-91

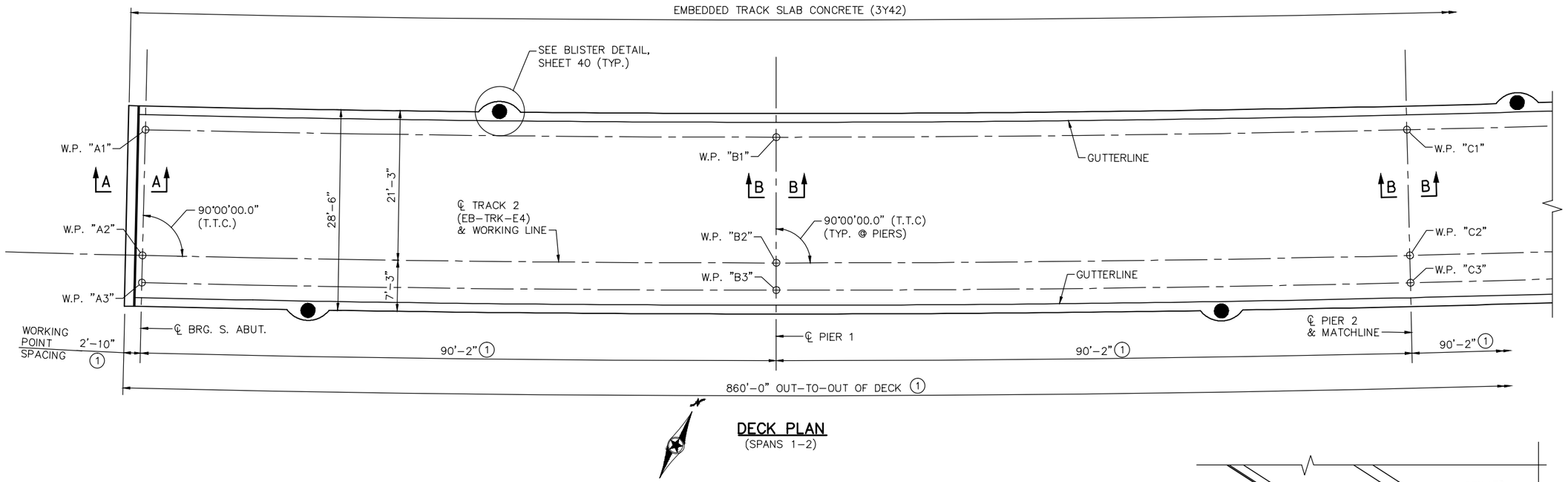
BEAM B11-B14

FIG. 5-397.508

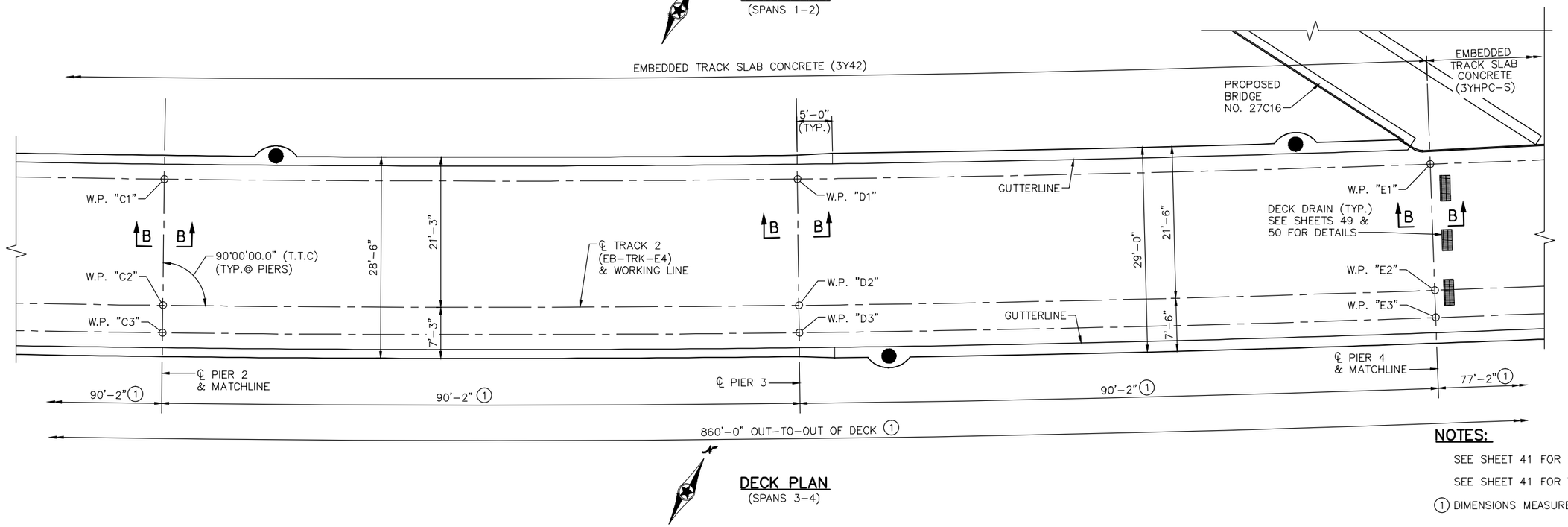
DES: BAW	DR: LMT	APPROVED:
CHK: EJT	CHK: EJT	

SHEET NO. 36 OF 64 SHEETS

BRIDGE NO. R0697



DECK PLAN
(SPANS 1–2)



DECK PLAN
(SPANS 3–4)

NOTES:

SEE SHEET 41 FOR SECTION A–A & B–B.

SEE SHEET 41 FOR TRANSVERSE SECTION THRU DECK.

(1) DIMENSIONS MEASURED ALONG ℄ TRACK 2.

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: BAW | CHECKED BY: EJT
DRAWN BY: LMT | DATE: 9/14/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

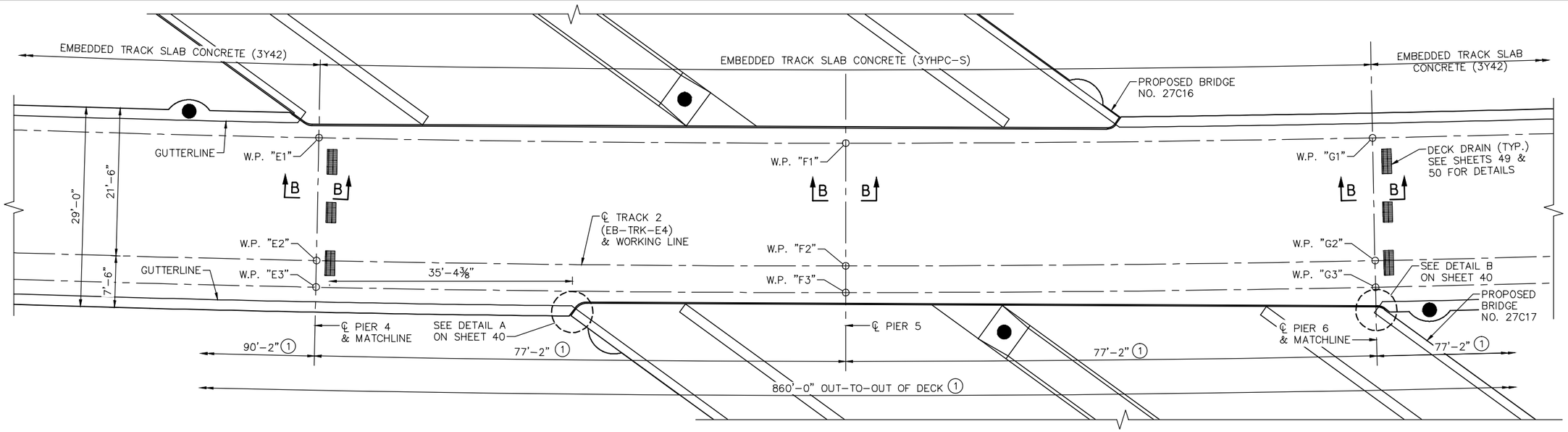
METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

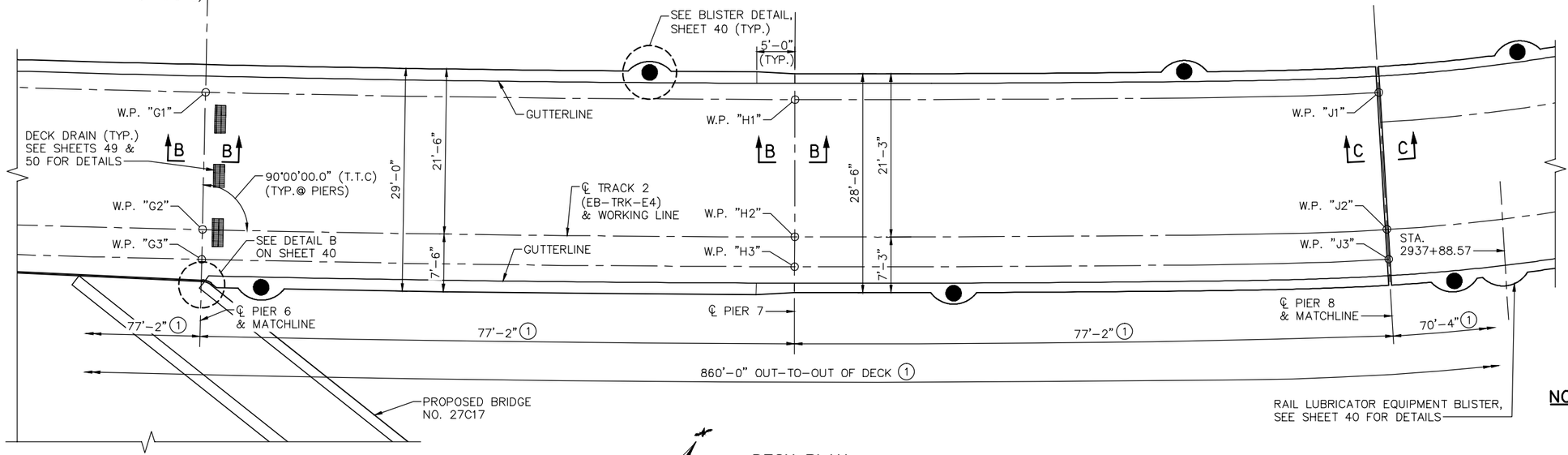
CIVIL EAST - VOLUME 4B
LRT OVER BNSF
BRIDGE R0697
SUPERSTRUCTURE DETAILS 1

DISCIPLINE: STRUCTURES
SHEET NAME: CBRR0697-BRG-SUP-003-1

SHEET 37 OF 64



DECK PLAN
(SPANS 5-6)



DECK PLAN
(SPANS 7-8)

NOTES:

SEE SHEET 41 FOR SECTIONS B-B & C-C.

SEE SHEET 41 FOR TRANSVERSE SECTION THRU DECK.

(1) DIMENSIONS MEASURED ALONG ℄ TRACK 2.

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: BAW | CHECKED BY: EJT
DRAWN BY: LMT | DATE: 9/14/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

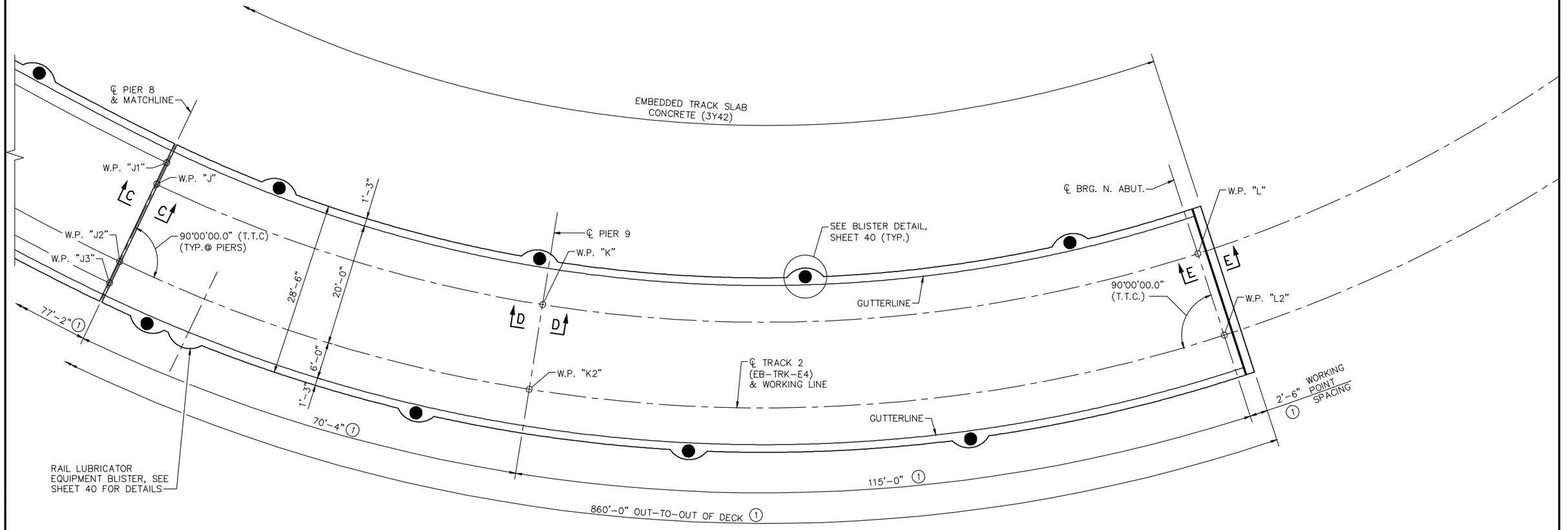
METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4B
LRT OVER BNSF
BRIDGE R0697
SUPERSTRUCTURE DETAILS 2

DISCIPLINE: STRUCTURES
SHEET NAME: CBRR0697-BRG-SUP-003-2

SHEET 38 OF 64



DECK PLAN
(SPANS 9-10)

NOTES:

SEE SHEET 43 FOR SECTIONS C-C, D-D, & E-E.

SEE SHEET 42 FOR TRANSVERSE SECTION THRU DECK.

(1) DIMENSIONS MEASURED ALONG ℄ TRACK 2.

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: BAW | CHECKED BY: EJT
DRAWN BY: LMT | DATE: 9/14/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

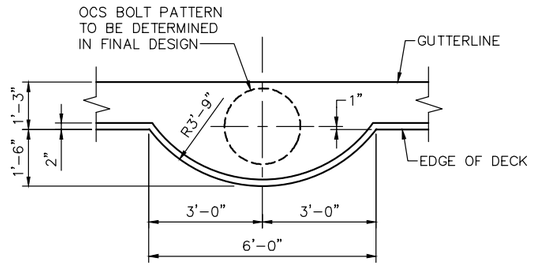
CIVIL EAST - VOLUME 4B
LRT OVER BNSF
BRIDGE R0697
SUPERSTRUCTURE DETAILS 3

DISCIPLINE: STRUCTURES

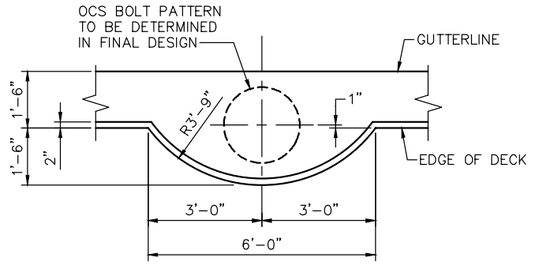
SHEET NAME: CBRR0697-BRG-SUP-003-3

SHEET 39 OF 64

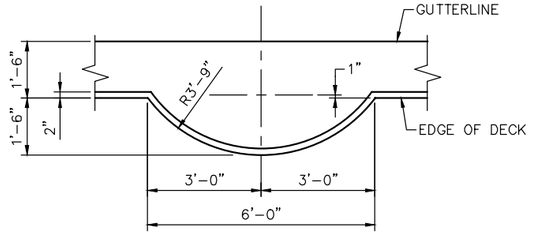
Sep. 10 2015 11:32 am V:\3400_ADC\CAD\segment e4\plan sheets\structures\R0697\CBRR0697-BRG-SUP-003.dwg By: lisa.thompson



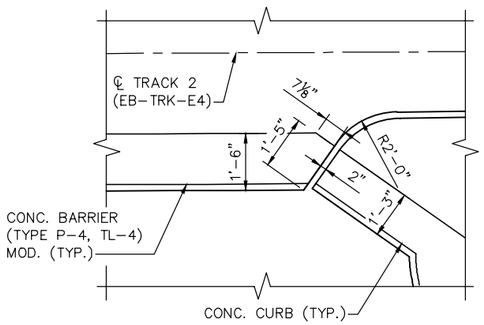
OCS BLISTER AT CURB



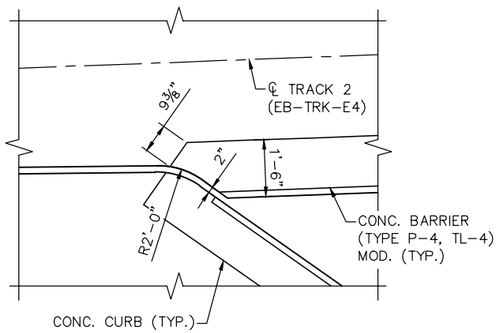
OCS BLISTER AT TYPE P-4 BLISTER



RAIL LUBRICATOR BLISTER



DETAIL A



DETAIL B

SUPERSTRUCTURE POUR SEQUENCE:

1. POUR C-I-P CONCRETE GIRDERS.
2. POURS SPANS 1, 2, AND 3. TRANSVERSE CONSTRUCTION JOINT PERMITTED AT ℄ PIER 3.
3. POUR SPANS 4 THRU 8.
4. SEE TRACK PLANS FOR EMBEDDED TRACK INFILL SLAB POUR SEQUENCE.

NOTES:

A MINIMUM OF 72 HOURS MUST BE PROVIDED BETWEEN ADJACENT DECK POURS.

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: BAW | CHECKED BY: EJT
DRAWN BY: LMT | DATE: 9/14/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

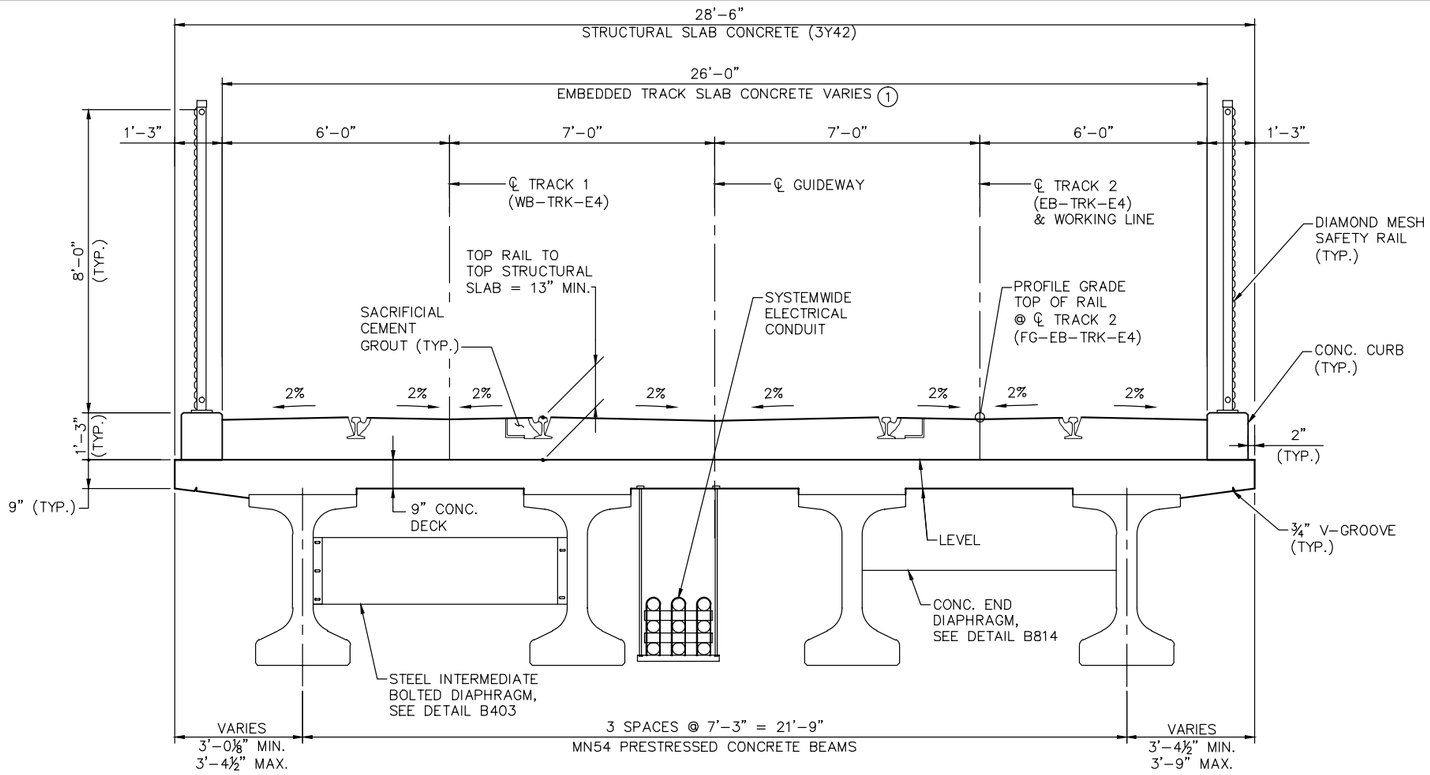
METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4B
LRT OVER BNSF
BRIDGE R0697
SUPERSTRUCTURE DETAILS 4

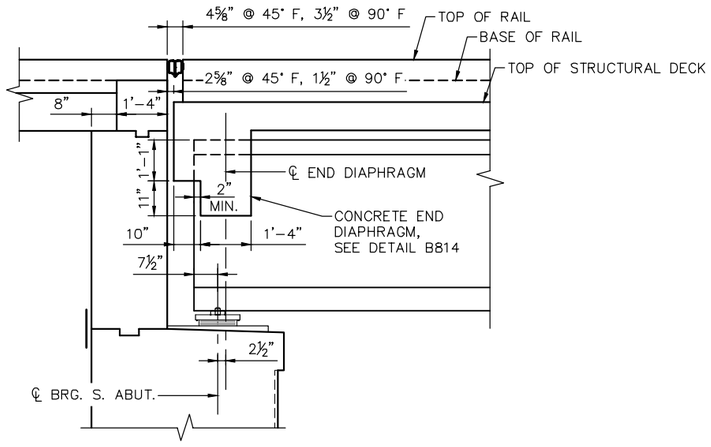
DISCIPLINE: STRUCTURES
SHEET NAME: CBRR0697-BRG-SUP-003-4

SHEET 40 OF 64



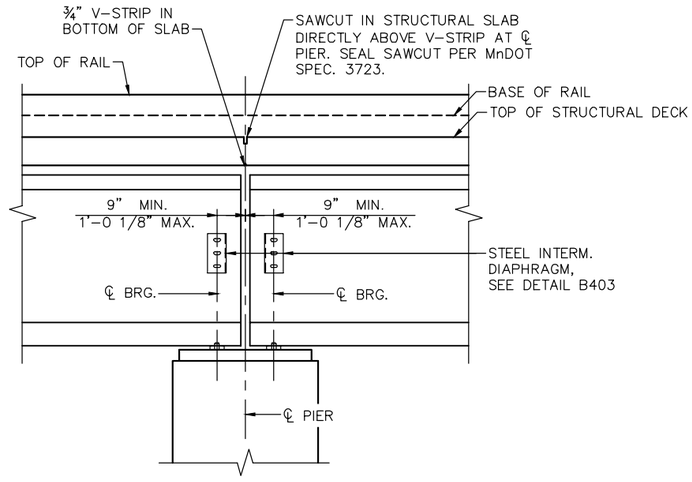
TRANSVERSE SECTION THRU DECK
(UNIT 1)

WEST

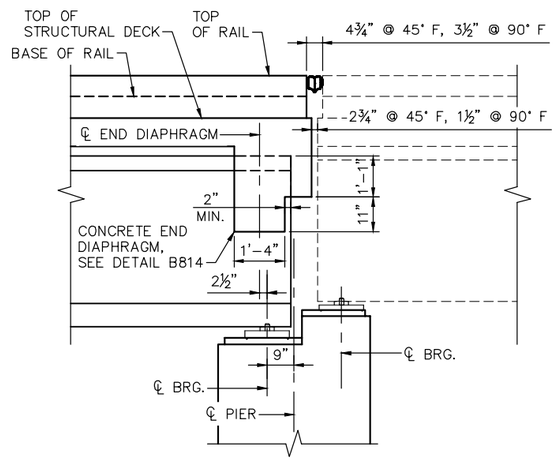


SECTION A-A

EAST



SECTION B-B



SECTION C-C

NOTES:

1. SEE SHEET 37-39 FOR EMBEDDED TRACK SLAB CONCRETE.

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: BAW | CHECKED BY: EJT
DRAWN BY: LMT | DATE: 9/14/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

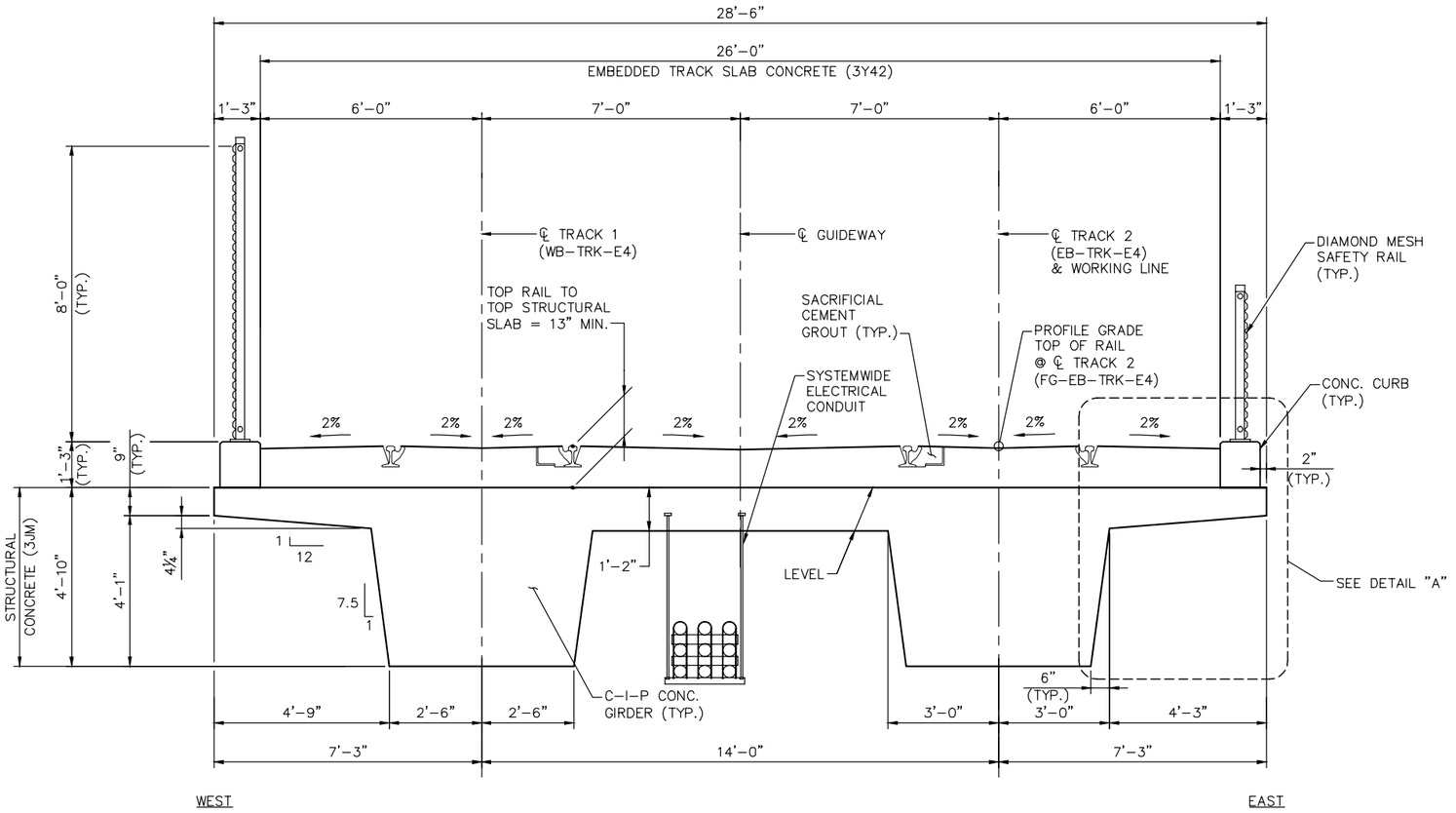
METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

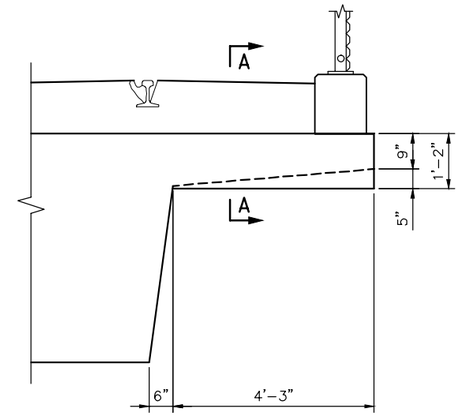
CIVIL EAST - VOLUME 4B
LRT OVER BNSF
BRIDGE R0697
SUPERSTRUCTURE DETAILS 5

DISCIPLINE: STRUCTURES
SHEET NAME: CBRR0697-BRG-SUP-003-5

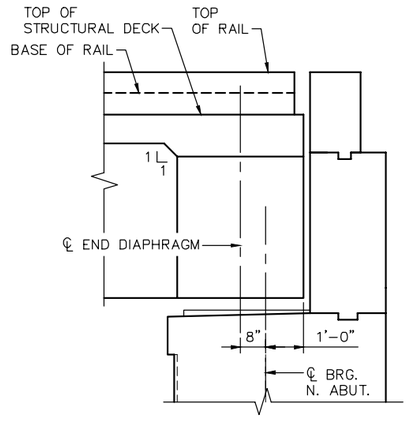
SHEET 41 OF 64



TYPICAL MIDSPAN SECTION



DETAIL A (1)



SECTION A-A
(NORTH ABUTMENT SHOWN, PIER 8 SIMILAR)

NOTES:

(1) LIMITS OF THICKENED SLAB SHALL MATCH END DIAPHRAGM LIMITS AT PIER 8 AND NORTH ABUTMENT.

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: TDR | CHECKED BY: EJT
DRAWN BY: LMT | DATE: 9/14/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

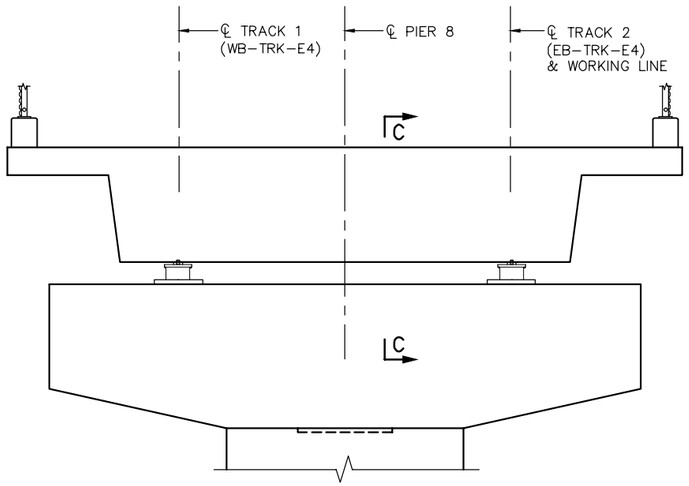
CIVIL EAST - VOLUME 4B
LRT OVER BNSF
BRIDGE R0697
SUPERSTRUCTURE DETAILS 6

DISCIPLINE: STRUCTURES

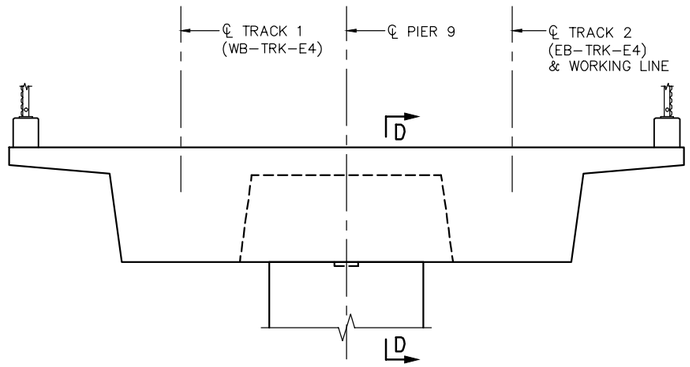
SHEET NAME: CBRR0697-BRG-SUP-003-6

SHEET 42 OF 64

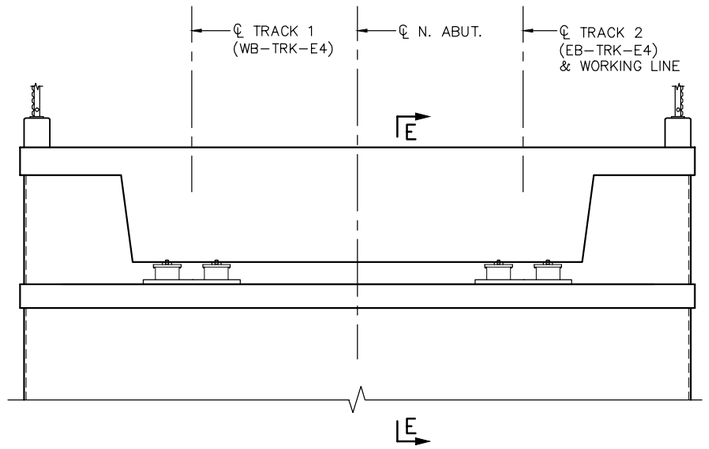
Sep. 10 2015 11:32 am V:\3400_ADC\CAD\segment e4\plan sheets\structures\R0697\CBRR0697-BRG-SUP-003.dwg By: lisa.thompson



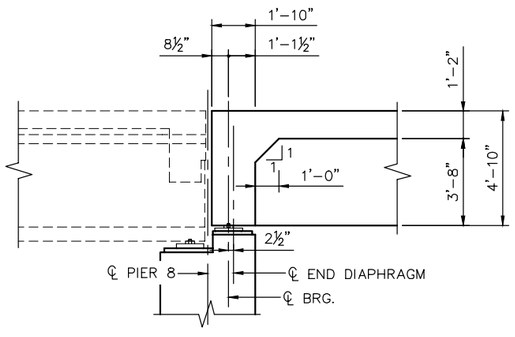
PIER 8 ELEVATION



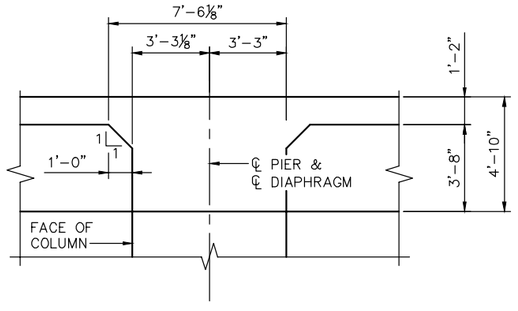
PIER 9 ELEVATION



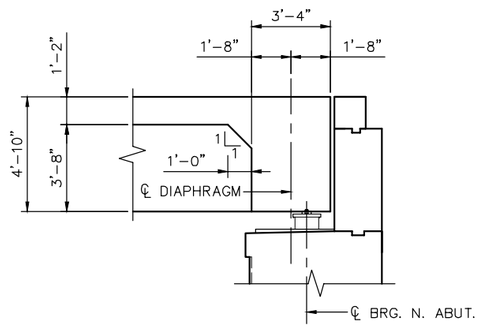
N. ABUT. ELEVATION



SECTION C–C



SECTION D–D



SECTION E–E

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: TDR | CHECKED BY: EJT
DRAWN BY: LMT | DATE: 9/14/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

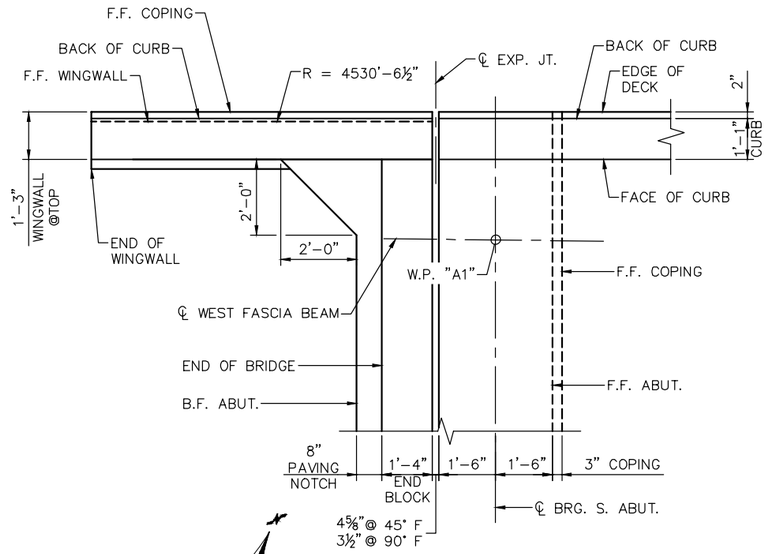
CIVIL EAST - VOLUME 4B
LRT OVER BNSF
BRIDGE R0697
SUPERSTRUCTURE DETAILS 7

DISCIPLINE: STRUCTURES

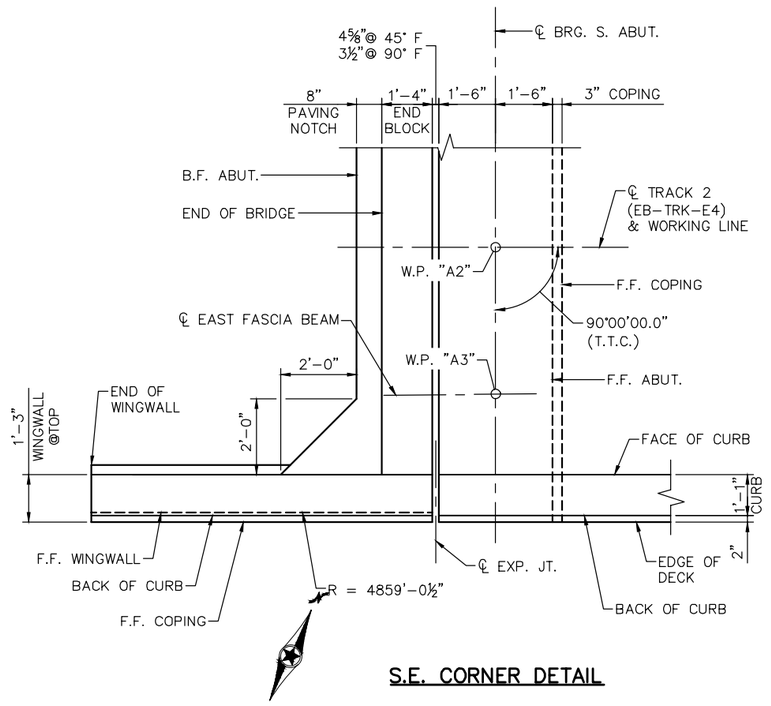
SHEET NAME: CBRR0697-BRG-SUP-003-7

SHEET 43 OF 64

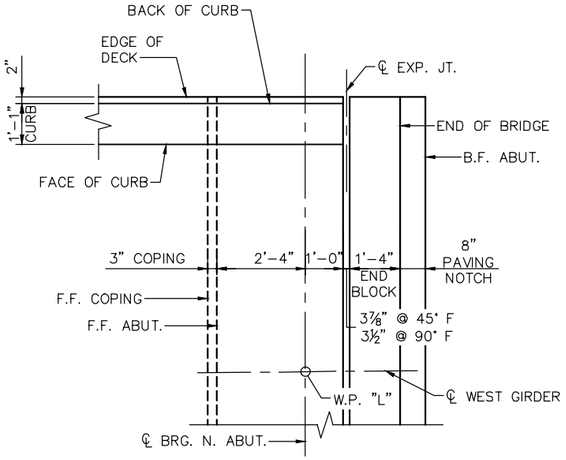
Sep. 10 2015 11:33 am V:\3400_ADC\CAD\segment e4\plan sheets\structures\R0697\CBRR0697-BRG-SUP-003.dwg By: lisa.thompson



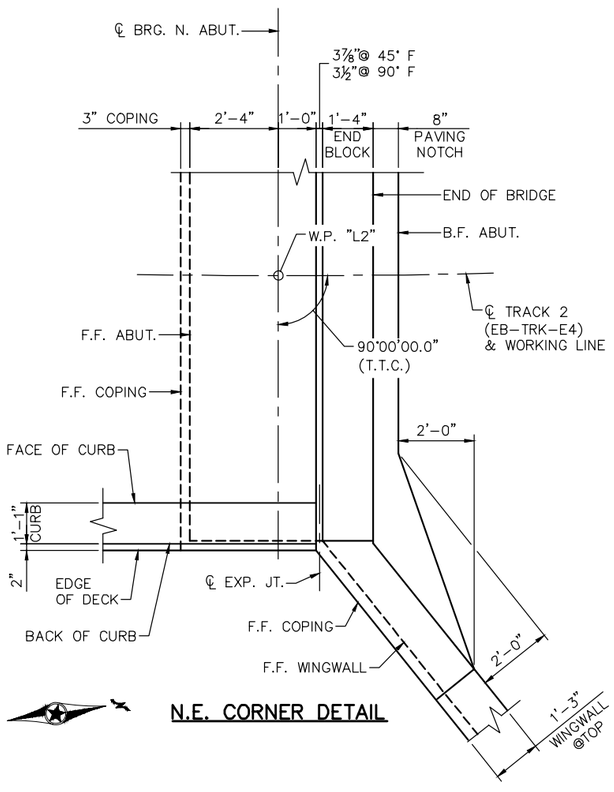
S.W. CORNER DETAIL



S.E. CORNER DETAIL



N.W. CORNER DETAIL



N.E. CORNER DETAIL

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: BAW | CHECKED BY: EJT
DRAWN BY: LMT | DATE: 9/14/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

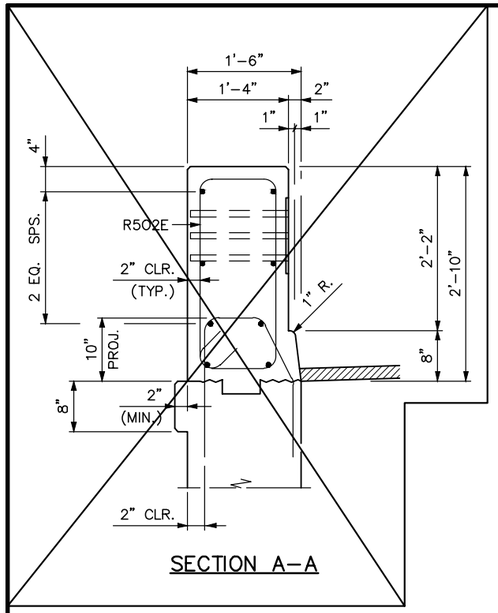
SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4B
LRT OVER BNSF
BRIDGE R0697
SUPERSTRUCTURE DETAILS 8

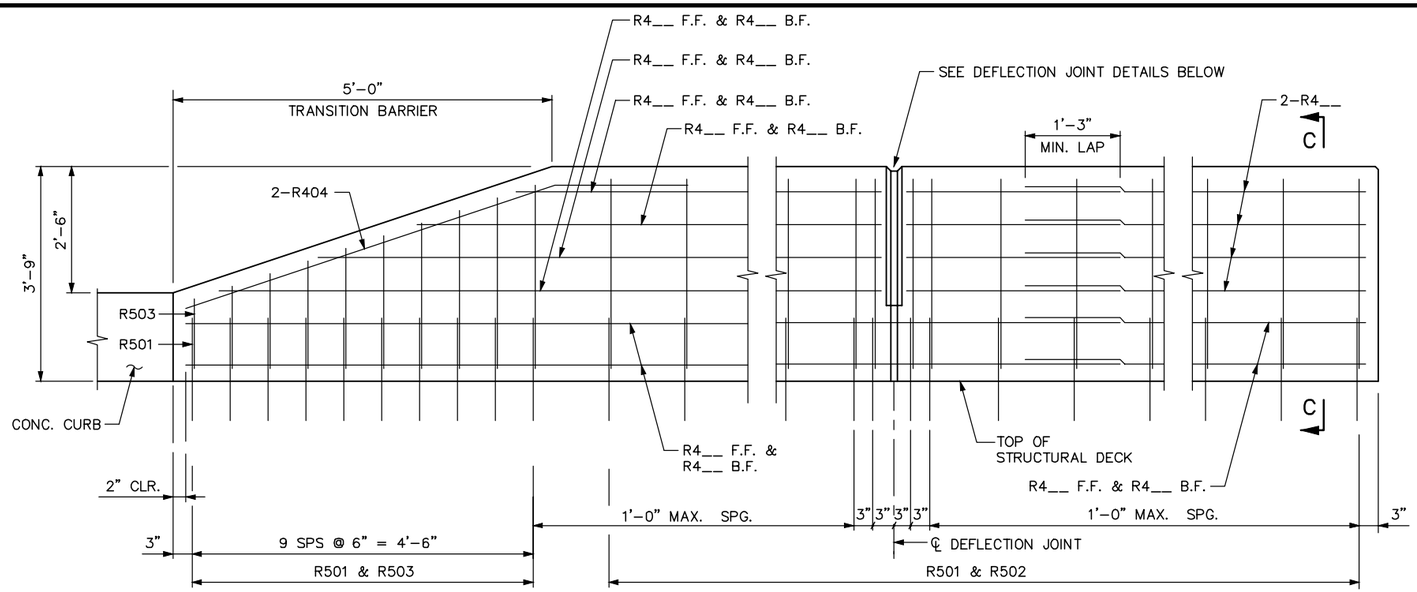
DISCIPLINE: STRUCTURES

SHEET NAME: CBRR0697-BRG-SUP-003-8

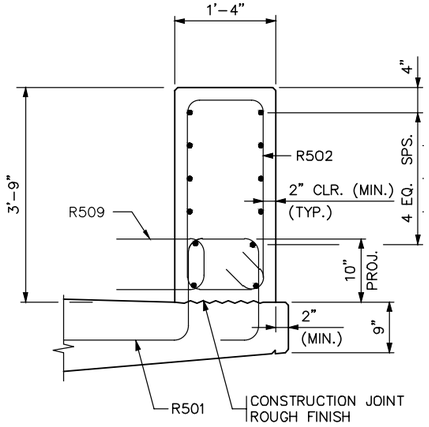
SHEET 44 OF 64



SECTION A–A



DEFLECTION JOINT

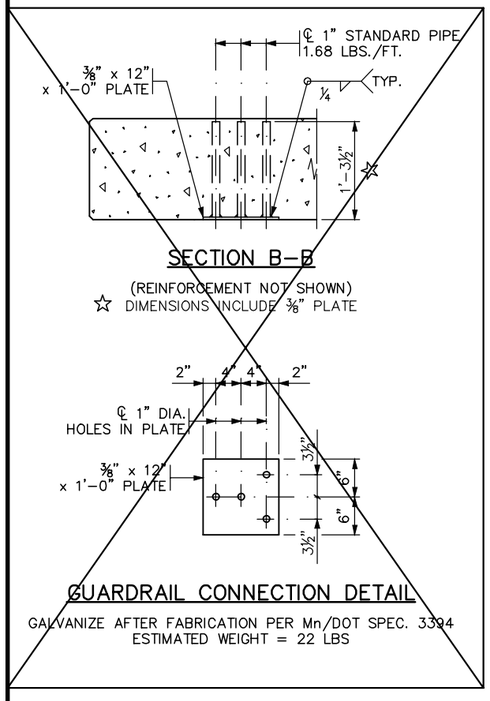


Ⓐ SECTION C–C

Ⓐ INSIDE ELEVATION OF BARRIER

BARRIER MEETS TEST LEVEL 4 REQUIREMENTS OF NCHRP REPORT 350

SHEET MODIFICATION:
Ⓐ DENOTES MODIFICATION TO STANDARD SHEET

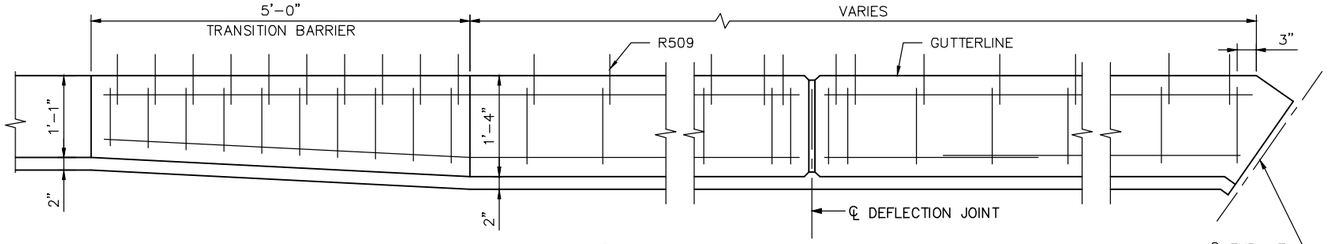


SECTION B–B

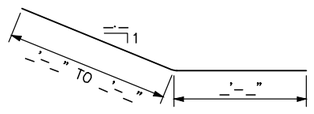
(REINFORCEMENT NOT SHOWN)
☆ DIMENSIONS INCLUDE ⅜" PLATE

GUARDRAIL CONNECTION DETAIL

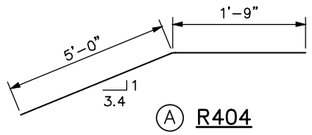
GALVANIZE AFTER FABRICATION PER Mn/DOT SPEC. 3394
ESTIMATED WEIGHT = 22 LBS



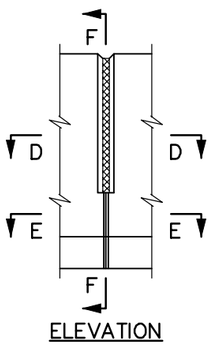
Ⓐ PLAN VIEW
(SOUTHEAST CORNER SHOWN)



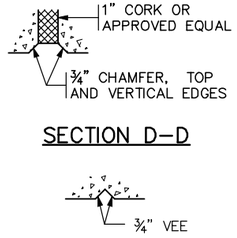
Ⓐ R4__E



Ⓐ R404

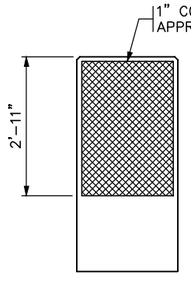


ELEVATION

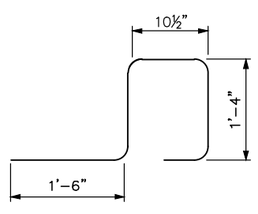


SECTION D–D

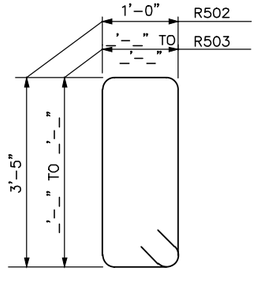
SECTION E–E



Ⓐ SECTION F–F



Ⓐ R501



Ⓐ R502 & R503

DEFLECTION JOINT DETAILS

ESTIMATED QUANTITY OF CORK PER JOINT = 2.15 SQ. FT.

BILL OF REINFORCEMENT FOR BARRIER

BAR	NO.	LENGTH	SHAPE	LOCATION
R501	___	_'-_"	BENT	BARRIER VERTICAL
R502	___	_'-_"	BENT	BARRIER VERTICAL
R503	___	_'-_"	BENT	BARRIER VERTICAL
R404	___	_'-_"	BENT	BARRIER END LONGIT.
R405	___	___	———	BARRIER LONGITUDINAL
R406	___	___	———	BARRIER LONGITUDINAL
R407	___	___	———	BARRIER LONGITUDINAL
R408	___	___	———	BARRIER LONGITUDINAL
R509				

GENERAL NOTES

~~LENGTH OF "TYPE P-4 (TL-4) RAILING CONCRETE (3Y46 OR 3Y46A)" FOR PAYMENT SHALL BE MEASURED BETWEEN THE OUTSIDE FACES OF THE CONCRETE BARRIER.~~

CONCRETE BARRIER = 579 LBS./FT. (0.143 CU. YDS./FT.)

FINISH ALL EDGES OF BARRIER WITH ½" VEE, EXCEPT WHERE OTHERWISE NOTED.

MAXIMUM SPACING OF CONCRETE DEFLECTION JOINTS SHALL BE 20 FT.

SEE SUPERSTRUCTURE SHEET FOR JOINT SPACING.

~~GUARDRAIL CONNECTION TO BE STRUCTURAL STEEL, Mn/DOT SPEC. 3306.~~

GALVANIZE STRUCTURAL STEEL PER Mn/DOT SPEC. 3394 AFTER FABRICATION.

~~GUARDRAIL CONNECTION, CORK, AND NAME PLATE TO BE CONSIDERED INCIDENTAL TO "TYPE P-4 (TL-4) RAILING CONCRETE (3Y46 OR 3Y46A)".~~

~~BARRIER QUANTITIES ARE LISTED IN SUMMARY OF QUANTITIES FOR SUPERSTRUCTURE.~~

REVISED: 04-17-2013

APPROVED: JULY 25, 2005

Daniel L. Thompson
STATE BRIDGE ENGINEER

DRAFT-WORK IN PROCESS

FIG. 5-397.173 (MOD.)

CERTIFIED BY _____ 9/14/15
LICENSED PROFESSIONAL ENGINEER — DATE
NAME: ENGINEER LIC. NO. #####

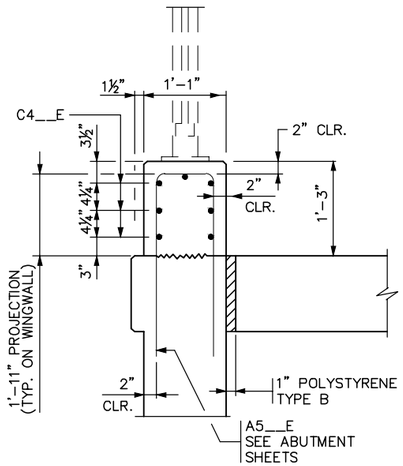
TITLE: CONCRETE BARRIER (TYPE P-4, TL-4)
WITH INTEGRAL END POST
(WITH CONC. WEARING COURSE)

DES: KAE	DR: LMT	APPROVED:
CHK: EJT	CHK: EJT	

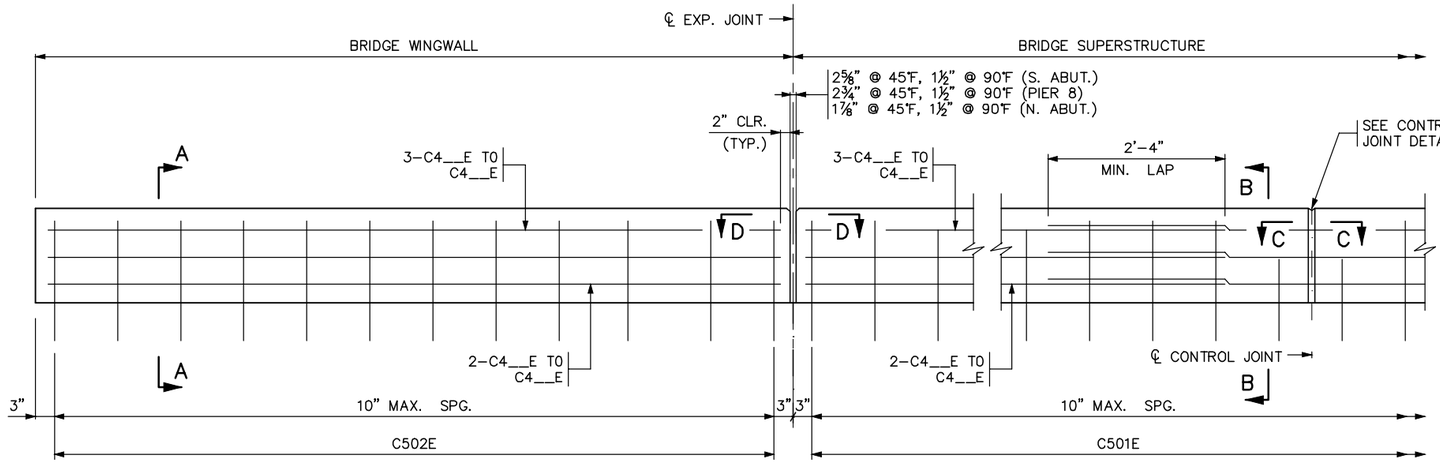
SHEET NO. 45 OF 64 SHEETS

BRIDGE NO. R0697

Sep. 10 2015 11:33 am V:\3400_ADC\CAD\segment e4\plan sheets\structures\R0697\CBRR0697-BRG-RAL-001.dwg By: lisa.thompson



Ⓐ SECTION A–A



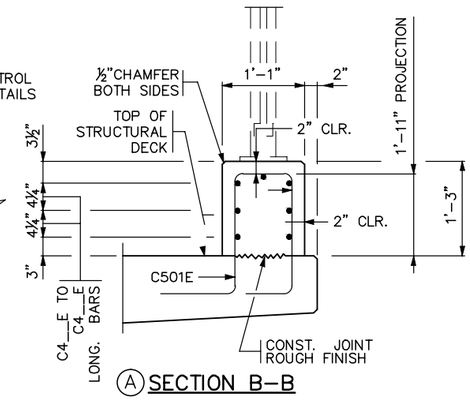
JOINT AT ABUTMENT

CONTROL JOINT

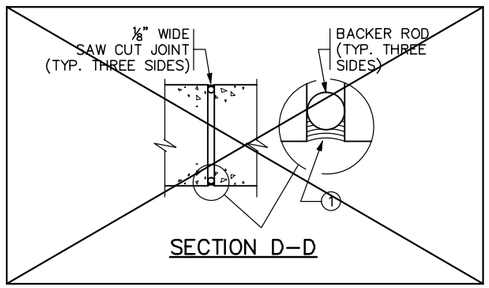
~~INTEGRAL OR SEMI-INTEGRAL ABUTMENT~~ SEE DETAIL "A" FOR PARAPET ABUTMENT

Ⓐ INSIDE ELEVATION OF CONCRETE CURB

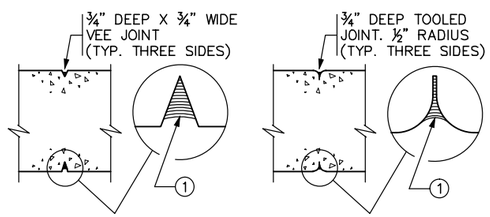
CURB DOES NOT MEET CRASH TEST REQUIREMENTS OF NCHRP REPORT 350



Ⓐ SECTION B–B



SECTION D–D

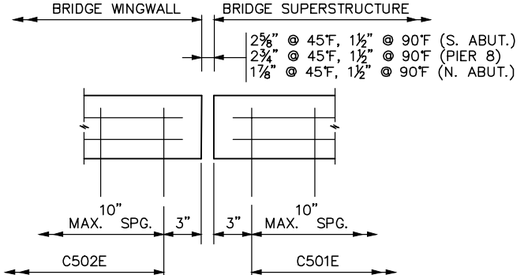


SECTION C–C
CONTRACTOR OPTION 1

SECTION C–C
CONTRACTOR OPTION 2

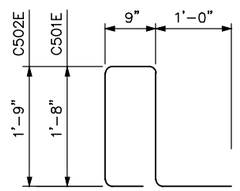
CONTROL JOINT DETAILS

WHEN USING SLIP FORM METHOD TO PLACE THE CONCRETE, CUT JOINT 3 INCHES DEEP USING MARGIN TROWEL OR SIMILAR MEANS IMMEDIATELY AFTER CONCRETE PLACEMENT (TYP. THREE SIDES)



DETAIL "A" ②Ⓐ

~~(USE ONLY WITH STRIP SEAL EXPANSION DEVICE) (EXPANSION DEVICE NOT SHOWN)~~



Ⓐ C501E, C502E

BILL OF REINFORCEMENT FOR CURB				
BAR	NO.	LENGTH	SHAPE	LOCATION
C501E	__	5'–3"	⊔	CURB BASE VERTICAL
C502E	__	5'–5"	⊔	CURB BASE VERTICAL
C4__E	__	_____	——	CURB BASE LONGIT.
C4__E	__	_____	——	CURB BASE LONGIT.
C4__E	__	_____	——	CURB BASE LONGIT.

GENERAL NOTES

CONTINUOUSLY GROUND ALL METAL RAILINGS; SEE THE SPECIAL PROVISIONS. REFER TO THE ELECTRICAL PLANS AND ELECTRICAL SPECIAL PROVISIONS FOR DETAILS REGARDING BONDING MULTIPLE ELECTRICAL GROUNDING SYSTEMS.

~~PAYMENT LENGTH SHALL BE MEASURED BETWEEN THE OUTSIDE FACES OF THE CONCRETE CURB.~~

Ⓐ CONCRETE CURB = 204 LBS./FT. (0.050 CU. YDS./FT.)

FINISH ALL EDGES OF CURB WITH ½" CHAMFER, EXCEPT WHERE OTHERWISE NOTED.

MAXIMUM SPACING OF CONTROL JOINTS ON SUPERSTRUCTURE, APPROACH AND WINGWALL SHALL BE 10 FT. SEE SUPERSTRUCTURE SHEET FOR JOINT SPACING.

~~CONCRETE CURB QUANTITIES ARE LISTED IN SUMMARY OF QUANTITIES FOR SUPERSTRUCTURE.~~

① JOINT SEALANT PER MnDOT APPROVED/QUALIFIED PRODUCTS LIST – CRACK AND JOINT MATERIALS – SILICONE JOINT SEALERS.

② REFER TO STANDARD FIGURE 5–397.632 FOR COVER PLATE DETAILS.

SHEET MODIFICATION:
Ⓐ DENOTES MODIFICATION TO STANDARD SHEET

REVISION:

APPROVED: NOVEMBER 6, 2013
STATE BRIDGE ENGINEER

CERTIFIED BY _____ LICENSED PROFESSIONAL ENGINEER 9/14/15 DATE
NAME: ENGINEER LIC. NO. #####

TITLE: CONCRETE CURB ~~FOR USE WITH ORNAMENTAL RAILING~~

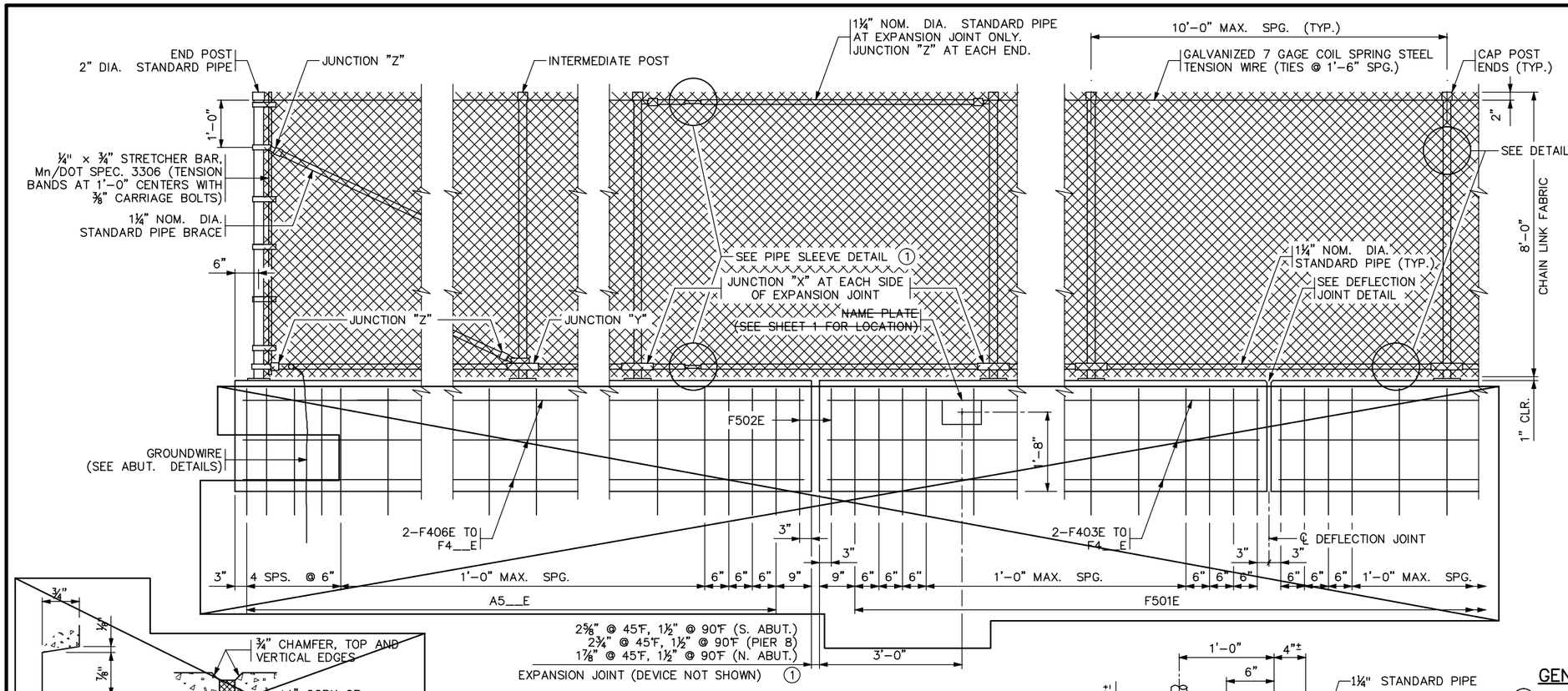
DRAFT-WORK IN PROCESS

FIG. 5–397.167 (MOD.)

DES: KAE	DR: LMT	APPROVED:
CHK: EJT	CHK: EJT	

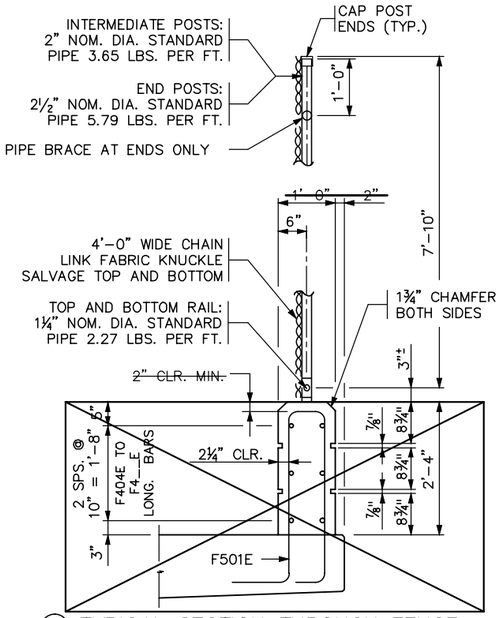
SHEET NO. 46 OF 64 SHEETS

BRIDGE NO. R0697

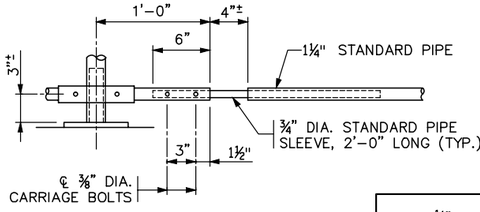


Ⓐ TYPICAL SECTION THROUGH FENCE

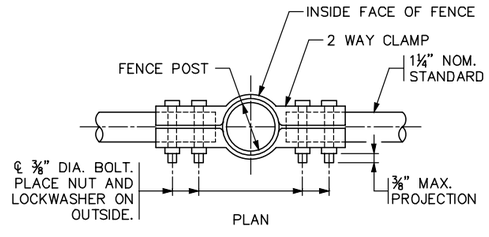
INTERMEDIATE POST SHOWN



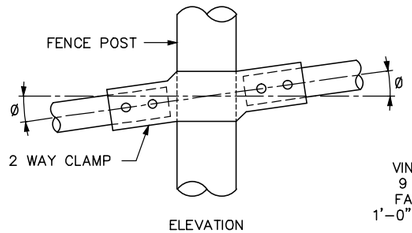
Ⓐ INSIDE ELEVATION OF RAILING



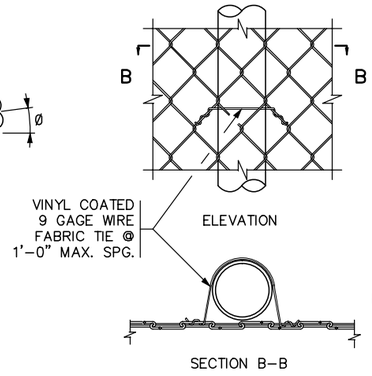
PIPE SLEEVE DETAIL (1)



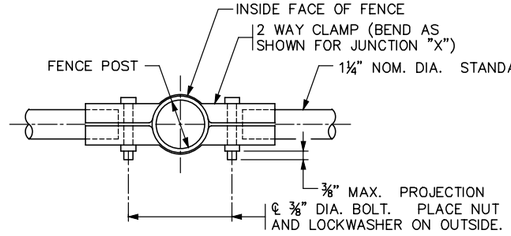
2 WAY CLAMP BENDING TABLE	
GRADE OF FENCE	Ø
0° TO 2°	0°
2° TO 6°	4°
6° TO 10°	8°



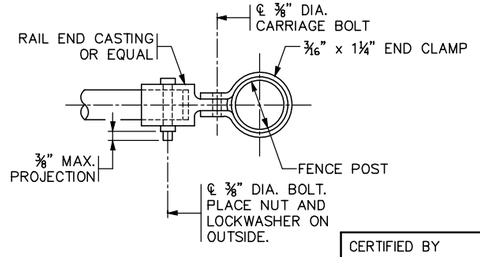
JUNCTION "X"



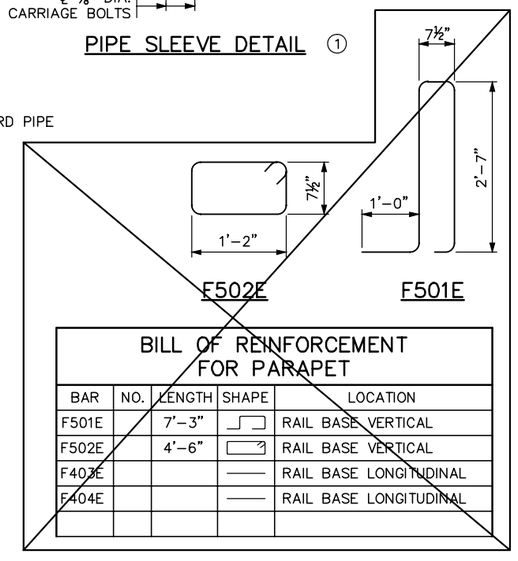
DETAIL "A"



JUNCTION "Y"



JUNCTION "Z"



BILL OF REINFORCEMENT FOR PARAPET				
BAR	NO.	LENGTH	SHAPE	LOCATION
F501E		7'-3"		RAIL BASE VERTICAL
F502E		4'-6"		RAIL BASE VERTICAL
F403E				RAIL BASE LONGITUDINAL
F404E				RAIL BASE LONGITUDINAL

SHEET MODIFICATION:
Ⓐ DENOTES MODIFICATION TO STANDARD SHEET

GENERAL NOTES

Ⓐ SEE CONCRETE BARRIER (TYPE P-4, TL-4) AND CONCRETE CURB SHEETS FOR DIMENSIONS, REINFORCEMENT, AND NOTES.

~~LENGTH OF "TYPE P-1 RAILING CONCRETE (3Y46 OR 3Y46A)" FOR PAYMENT SHALL BE MEASURED BETWEEN THE OUTSIDE FACES OF THE CONCRETE RAIL.~~

Ⓐ ~~LENGTH OF "WIRE FENCE DESIGN 48V-9322" FOR PAYMENT SHALL BE MEASURED BETWEEN THE CENTERS OF END RAILPOSTS.~~

~~CONCRETE RAILING = 350 LBS./FT. (0.086 CU. YDS./FT.)~~

FENCE POST ANCHORAGES SHALL BE TYPE A. SEE DETAIL B905 "FENCE POST ANCHORAGE".

~~MAXIMUM SPACING OF DEFLECTION JOINTS SHALL BE 20 FT. FOR SPACING OF FENCE POST, JOINTS AND ELECTRICAL GROUNDS, SEE SUPERSTRUCTURE SHEETS.~~

FENCE POSTS AND FENCE POST ANCHORAGES SHALL BE SET VERTICAL, UNLESS OTHERWISE NOTED.

℄ OF FENCE POST ANCHORAGE SHALL BE A MINIMUM OF 6" FROM JOINTS.

END POSTS AND BRACING SHALL BE AT 500 FT. MAXIMUM INTERVALS.

ALL POSTS SHALL HAVE A MEANS TO SECURELY HOLD THE TOP TENSION WIRE IN POSITION AND ALLOW FOR THE REMOVAL AND REPLACEMENT OF A POST WITHOUT DAMAGING THE TOP WIRE.

WIRE TIES MAY BE 9 GAGE GALVANIZED STEEL OR 0.179" MIN. ALUMINUM ALLOY CONFORMING TO A.S.T.M. B211, ALLOY 1100-H18. USE 12½ GAGE GALVANIZED HOG RINGS FOR TENSION WIRE TIES.

~~ALL MATERIAL IN THE CONCRETE BASE AND END POST IS INCLUDED IN THE SUPERSTRUCTURE QUANTITIES.~~

SEE SPECIAL PROVISIONS FOR REQUIREMENTS NOT INCLUDED ON THIS SHEET AND FOR BASIS OF PAYMENT.

(1) PROVIDE PIPE SLEEVE IN SPAN BETWEEN THE VERTICAL POSTS AT EXPANSION JOINT. SEE SUPERSTRUCTURE SHEETS FOR LOCATION.

REVISED: 04-17-2013

APPROVED: DECEMBER 18, 2003

STATE BRIDGE ENGINEER

DRAFT-WORK IN PROCESS

FIG. 5-397.119 (MOD.)

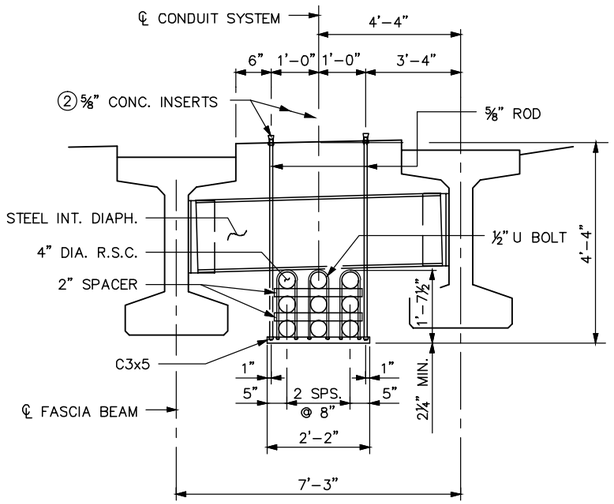
CERTIFIED BY _____ LICENSED PROFESSIONAL ENGINEER 9/14/15 DATE

NAME: ENGINEER LIC. NO. #####

TITLE: WIRE FENCE Ⓐ (DIAMOND MESH SAFETY RAIL)

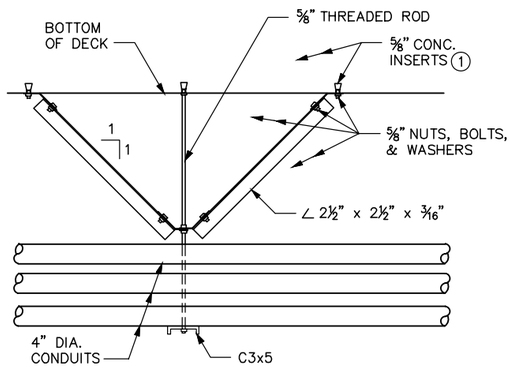
DES: KAE	DR: LMT	APPROVED:	BRIDGE NO.
CHK: EJT	CHK: EJT		R0697

SHEET NO. 47 OF 64 SHEETS



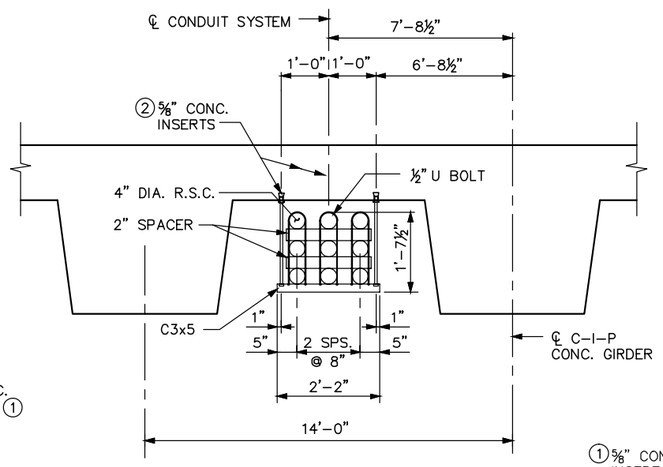
UNIT 1 TRANSVERSE SECTION

(LENGTH SHOWN BETWEEN PIER 4 & N. ABUT. LENGTH BETWEEN S. ABUT. & PIER 4 HAS (6)–4" DIA. R.S.C.)

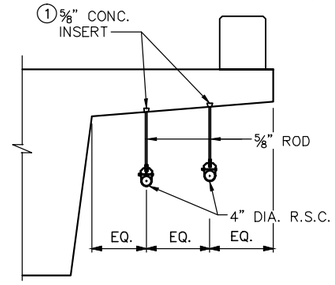


CENTERING DEVICE DETAIL – SIDE VIEW

(LOCATED ONLY ON A HANGER ADJACENT TO PIER)

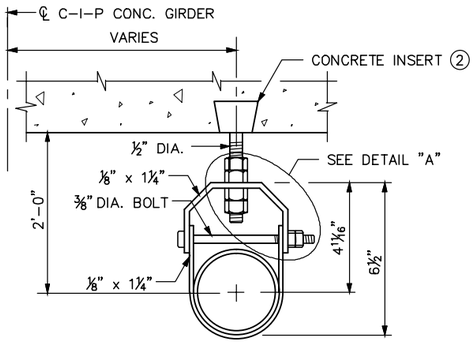


UNIT 2 TRANSVERSE SECTION



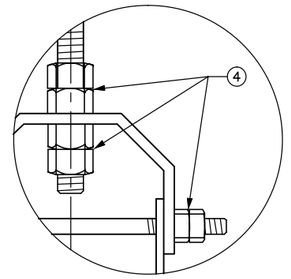
UNIT 2 CONDUIT HANGER DETAIL

(EAST END SHOWN, WEST END SIMILAR)

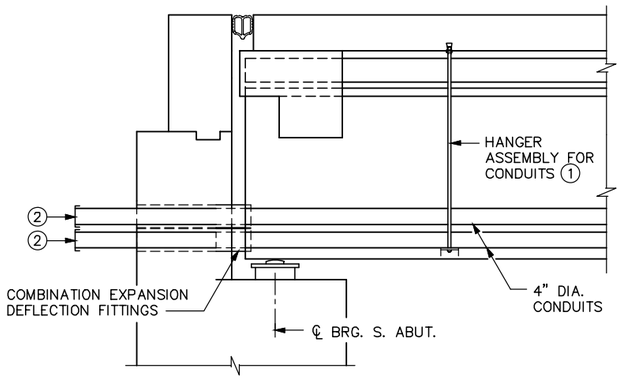


CONDUIT HANGER DETAIL

(FOR SYSTEMWIDE ELECTRICAL CONDUIT SYSTEM)

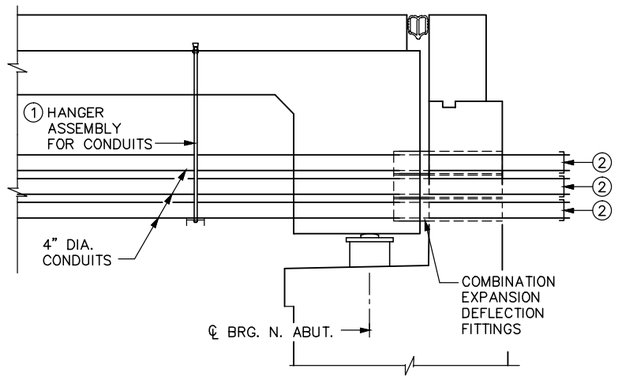


DETAIL "A"



LONGITUDINAL SECTION @ S. ABUT.

(FOR SYSTEMWIDE ELECTRICAL CONDUIT SYSTEM)



LONGITUDINAL SECTION @ N. ABUT.

(FOR SYSTEMWIDE ELECTRICAL CONDUIT SYSTEM)

NOTES:

RODS, EYE BOLTS AND PIPE CLAMPS SHALL COMPLY WITH MnDOT SPEC. 3313, TYPE I.

TURNBUCKLES AND EYE BOLTS SHALL COMPLY WITH A.S.T.M. A235 CLASS A MINIMUM REQUIREMENTS.

FLAT BARS AND ANCHORAGES SHALL COMPLY WITH SPEC. 3306.

CONCRETE INSERTS SHALL BE APPROVED TYPE MALLEABLE IRON. MATERIAL AS PER SPEC. 3324, GRADE 35018. TAP AFTER GALVANIZING.

GALVANIZE BOLTS, NUTS, WASHERS, TURNBUCKLES, RODS, EYE BOLTS, AND INSERTS AS PER SPEC. 3392. GALVANIZE OTHER MATERIAL AS PER SPEC. 3394 AFTER FABRICATION.

PIPE SLEEVES SHALL COMPLY WITH SPEC. 3362.

① SPACE INSERTS AT 10'–0" MAXIMUM CENTERS.

② CAP ENDS.

③ DOUBLE NUTS OR JAM NUTS OR LOCK NUT.

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: KAE | CHECKED BY: EJT
DRAWN BY: LMT | DATE: 9/14/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

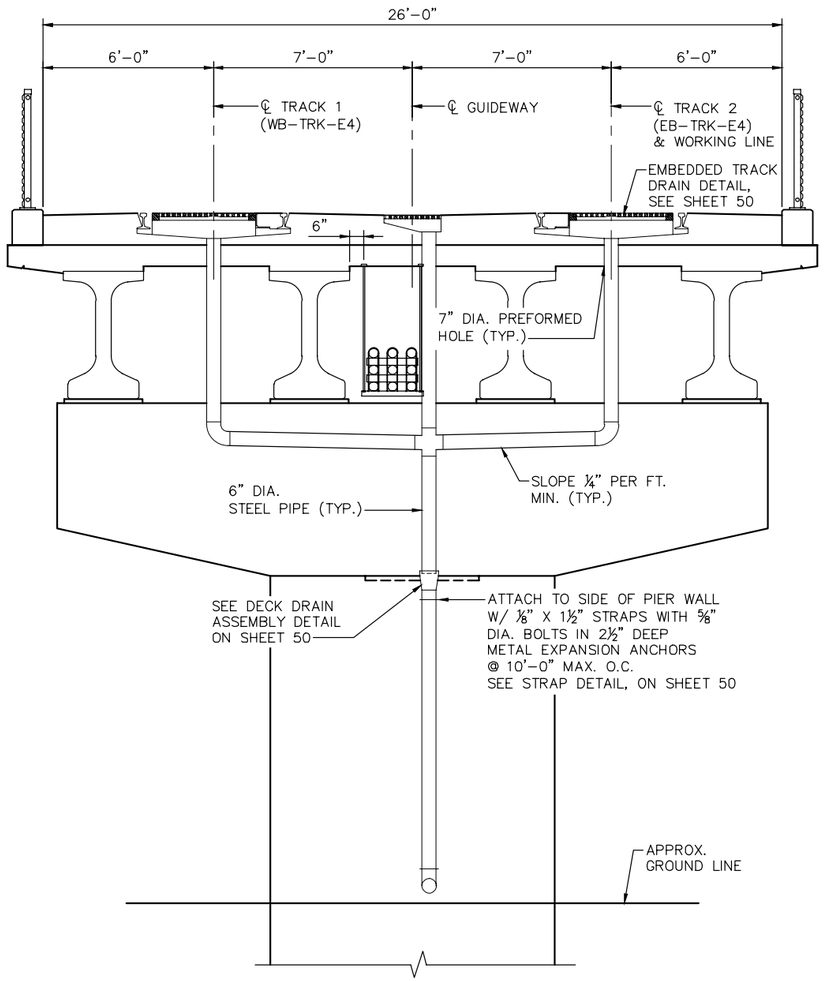
METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4B
LRT OVER BNSF
BRIDGE R0697
CONDUIT SYSTEM

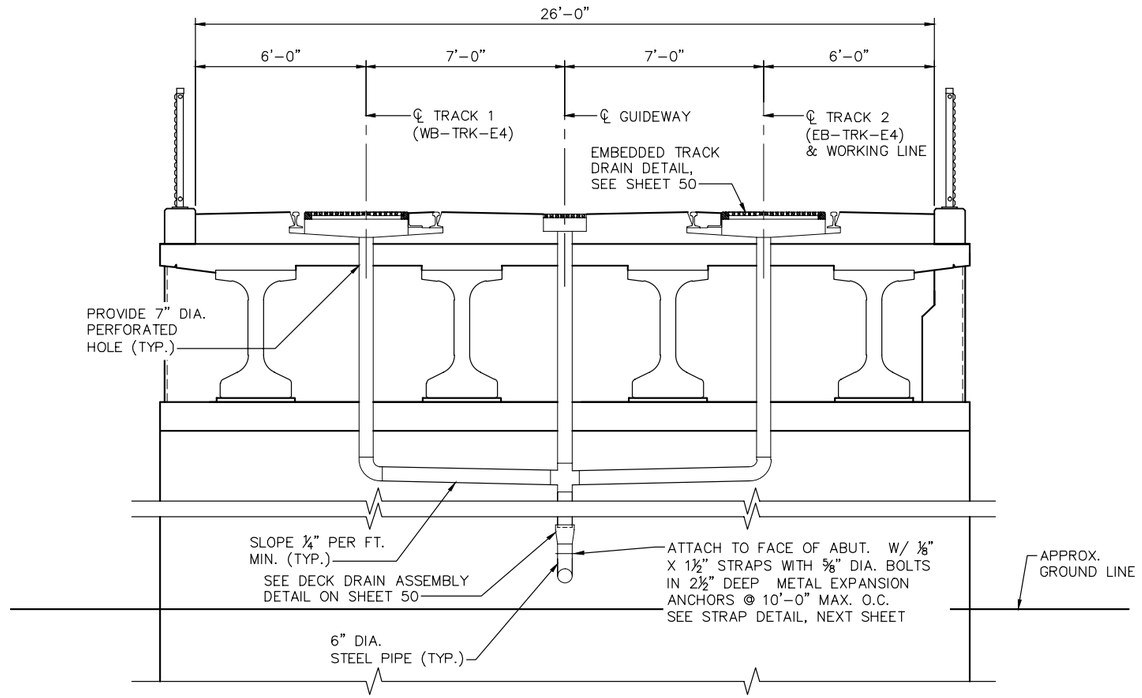
DISCIPLINE: STRUCTURES
SHEET NAME: CBRR0697-BRG-SYS-001

SHEET 48 OF 64



DRAIN AT PIERS

(NORTH FACE OF PIER 4 SHOWN, NORTH FACE OF PIER 6 SIMILAR)



DRAIN AT SOUTH ABUTMENT

NOTES:

PAINT LEADER TO MATCH BRIDGE FINISH.

ALL PIPES TO BE 6"x0.135" WELDED STEEL PIPE & GALV. FITTINGS & BENDS SHALL HAVE A MIN. WALL THICKNESS OF ⅛". ALL JOINTS OR CONNECTIONS TO BE BUTT WELDED OR CONNECTED BY A STEEL PIPE SLEEVE @ TO BE SMOOTH THROUGHOUT INSIDE OF PIPE EXCEPT AS NOTES. ALL BENDS TO BE ON A 1'-6" MIN. RAD. MEASURED ALONG ℄ PIPE . ALL BENDS TO BE SMOOTH. PIPES SHALL BE SUPPORTED BY SUITABLE GALV. HANGERS & 10'-0" MAX. SPACING THROUGHOUT. GALVANIZED DECK DRAIN ASSEMBLY AFTER FABRICATION. MIN PIPE SLOPE = 0.02.

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: KAE | CHECKED BY: EJT
DRAWN BY: LMT | DATE: 9/14/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

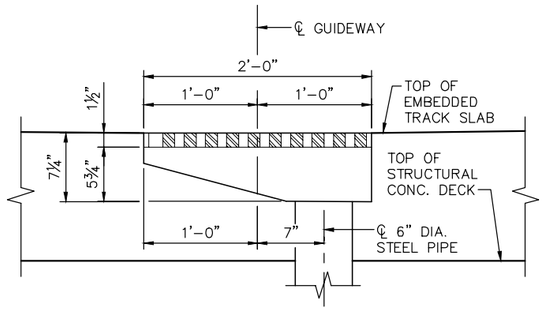
CIVIL EAST - VOLUME 4B
LRT OVER BNSF
BRIDGE R0697
DRAINAGE SYSTEM DETAILS 1

DISCIPLINE: STRUCTURES

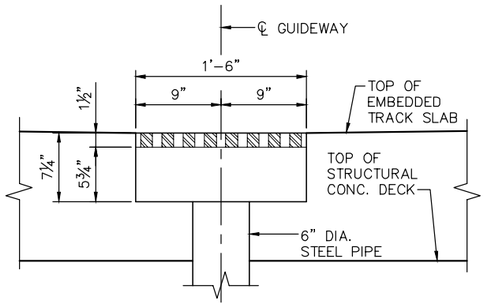
SHEET NAME: CBRR0697-BRG-DRN-001-1

SHEET 49 OF 64

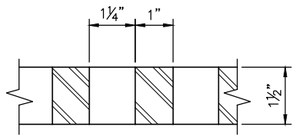
Sep. 10 2015 11:33 am V:\3400_ADC\CAD\segment e4\plan sheets\structures\R0697\CBRR0697-BRG-DRN-001.dwg By: lisa.thompson



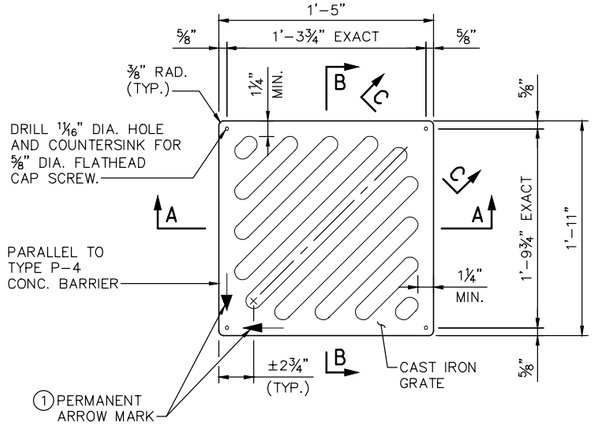
SECTION A–A



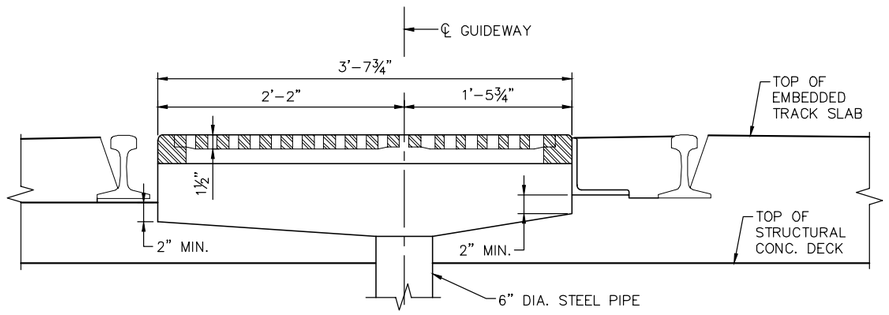
SECTION B–B



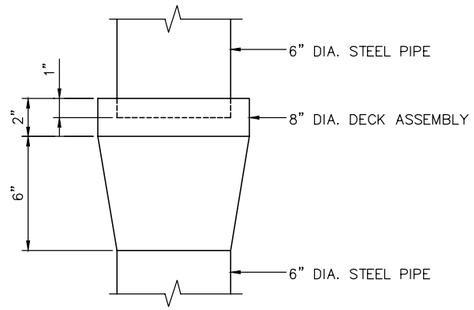
SECTION C–C



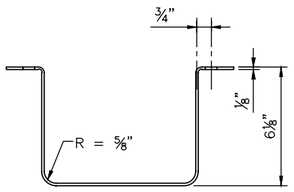
TOP VIEW
(GRATE)

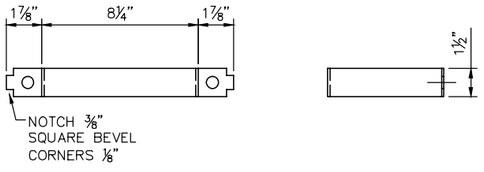


EMBEDDED TRACK DRAIN DETAIL



DECK DRAIN ASSEMBLY DETAIL





STRAP DETAIL

NOTES:

PAINT LEADER TO MATCH BRIDGE FINISH.

ALL PIPES TO BE 6"x0.135" WELDED STEEL PIPE & GALV. FITTINGS & BENDS SHALL HAVE A MIN. WALL THICKNESS OF ⅛". ALL JOINTS OR CONNECTIONS TO BE BUTT WELDED OR CONNECTED BY A STEEL PIPE SLEEVE @ TO BE SMOOTH THROUGHOUT INSIDE OF PIPE EXCEPT AS NOTES. ALL BENDS TO BE ON A 1'–6" MIN. RAD. MEASURED ALONG ℄ PIPE . ALL BENDS TO BE SMOOTH. PIPES SHALL BE SUPPORTED BY SUITABLE GALV. HANGERS & 10'–0" MAX. SPACING THROUGHOUT. GALVANIZED DECK DRAIN ASSEMBLY AFTER FABRICATION. MIN PIPE SLOPE = 0.02.

(1) INSTALL GRATE WITH ARROW ON CURB SIDE AND IN DIRECTION OF FLOW.

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: KAE | CHECKED BY: EJT
DRAWN BY: LMT | DATE: 9/14/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

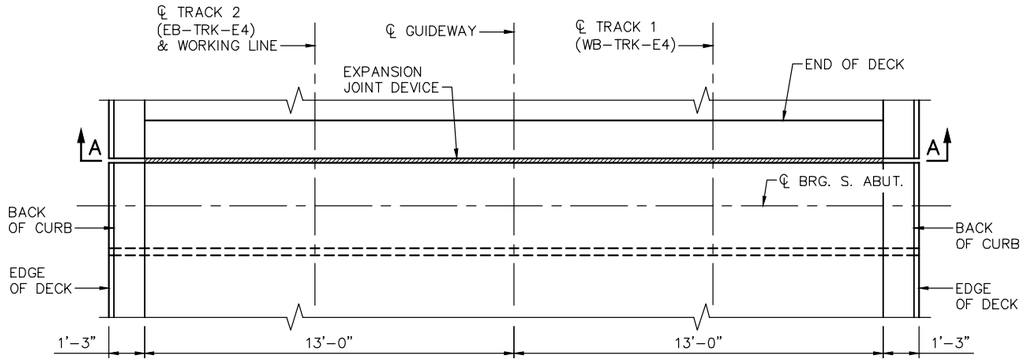
SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4B
LRT OVER BNSF
BRIDGE R0697
DRAINAGE SYSTEM DETAILS 2

DISCIPLINE: STRUCTURES
SHEET NAME: CBRR0697-BRG-DRN-001-2

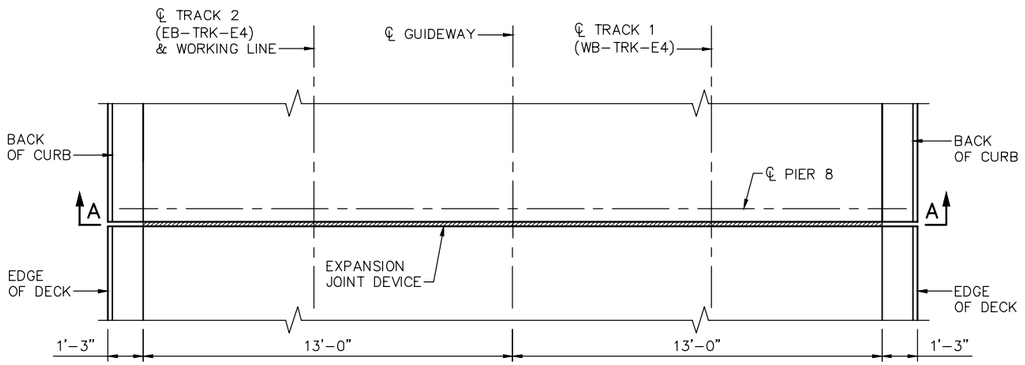
SHEET 50 OF 64

Sep. 10 2015 11:33 am V:\3400_ADC\CAD\segment e4\plan sheets\structures\R0697\CBRR0697-BRG-DRN-001.dwg By: lisa.thompson



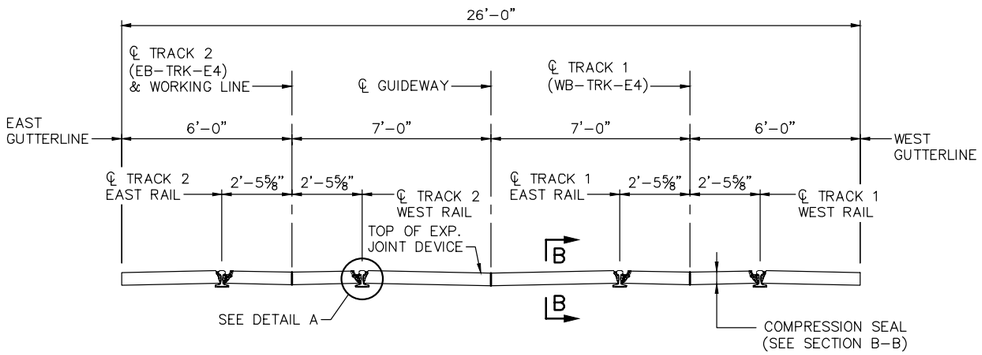
PLAN VIEW @ EXPANSION DEVICE

(SOUTH ABUTMENT SHOWN, NORTH ABUTMENT SIMILAR)



PLAN VIEW @ EXPANSION DEVICE

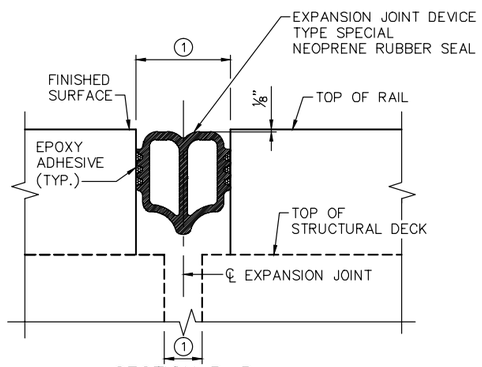
(PIER 8 SHOWN)



SECTION A–A

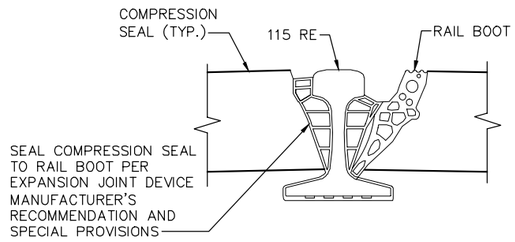
EXPANSION JOINT ELEVATIONS				
SUBSTRUCTURE		SOUTH ABUTMENT	PIER 8	NORTH ABUTMENT
EAST GUTTERLINE		842.40	852.39	851.84
TRACK 2	EAST RAIL	842.47	852.46	851.91
	CENTERLINE	842.42	852.41	851.86
	WEST RAIL	842.47	852.46	851.91
GUIDEWAY		842.38	852.37	851.82
TRACK 1	EAST RAIL	842.48	852.55	852.09
	CENTERLINE	842.43	852.50	852.04
	WEST RAIL	842.48	852.55	852.09
WEST GUTTERLINE		842.41	852.48	852.02

EXPANSION JOINT OPENING DIMENSIONS						
	SOUTH ABUTMENT		PIER 8		NORTH ABUTMENT	
SLAB	STRUCTURAL	EMBEDDED TRACK	STRUCTURAL	EMBEDDED TRACK	STRUCTURAL	EMBEDDED TRACK
45° F	2 5/8"	4 5/8"	2 3/4"	4 3/4"	1 7/8"	3 7/8"
90° F	1 1/2"	3 1/2"	1 1/2"	3 1/2"	1 1/2"	3 1/2"



SECTION B–B

(PIER 8 SHOWN)
(SEE SPECIAL PROVISIONS)



DETAIL A

NOTES:

① SEE EXPANSION JOINT OPENING TABLE.

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: KAE | CHECKED BY: EJT
DRAWN BY: LMT | DATE: 9/14/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

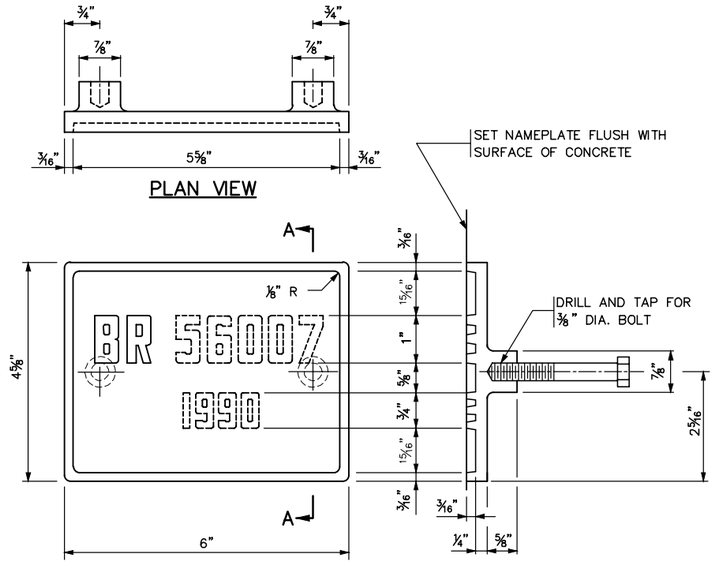
SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4B
LRT OVER BNSF
BRIDGE R0697
WATERPROOF EXPANSION DEVICE

DISCIPLINE: STRUCTURES

SHEET NAME: CBRR0697-BRG-EXP-001

SHEET 51 OF 64



THE DASHED NUMBERS SHOWN ABOVE ARE FOR ILLUSTRATION.
DATA TO BE SHOWN ON NAMEPLATE IS AS FOLLOWS:

BRIDGE R0697

YEAR 2016

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".

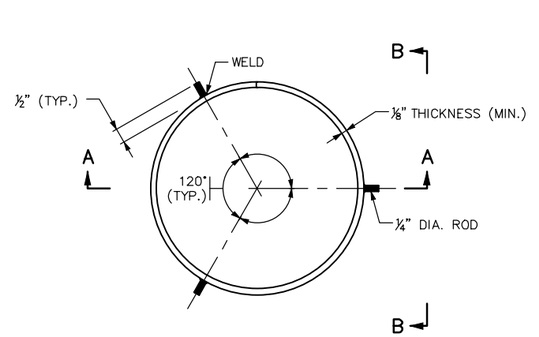
HORIZONTAL SPACING OF LETTERS AND NUMBERS SHALL PRODUCE A BALANCED LAYOUT IN PROPORTION TO SPACING SHOWN.

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

FURNISH 2 STEEL BOLTS ⅜ " DIA. x 3" LONG WITH EACH PLATE.

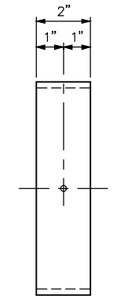
ALL DIMENSIONS FOR ¾" HIGH LETTERS AND NUMBERS SHALL BE IN DIRECT PROPORTION TO THOSE SHOWN FOR THE 1" HIGH LETTERS AND NUMBERS.

APPROVED: NOVEMBER 22, 2002	STATE OF MINNESOTA DEPARTMENT OF TRANSPORTATION	REVISION 09–11–2014	DETAIL NO.
Daniel D Hengen STATE BRIDGE ENGINEER	BRIDGE NAMEPLATE (FOR NEW BRIDGES)		B101



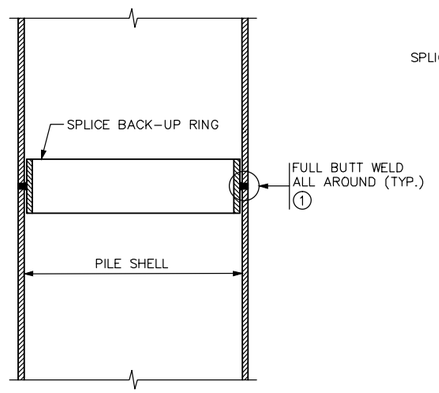
PLAN VIEW – SPLICE BACK–UP RING

PILE NOT SHOWN

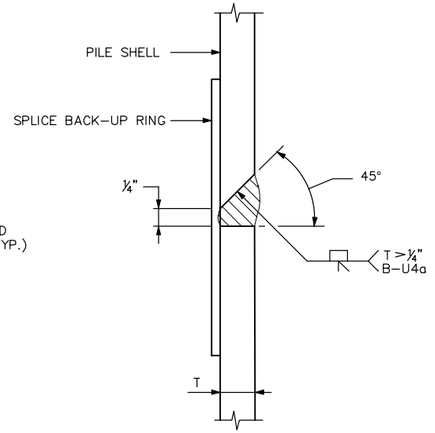


SECTION B–B

PILE NOT SHOWN



SECTION A–A



DETAIL "A" ①

NOTES:

APPROVED COMMERCIAL PILE SPLICE BACK–UP RING MAY BE USED IN LIEU OF THE TYPE DETAILED, PROVIDED THAT ¼" ROOT IS MAINTAINED. BACK–UP RING SHALL HAVE A TIGHT FIT.

WELDING ELECTRODES SHALL BE CELLULOSIC TYPE ELECTRODES E–6010 OR E–6011.

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.

① FOR PILE SHELL THICKNESSES GREATER THAN ¼", USE A B–U4a WELD CONFIGURATION. SEE DETAIL "A".

APPROVED: NOVEMBER 22, 2002	STATE OF MINNESOTA DEPARTMENT OF TRANSPORTATION	REVISION: 11–06–2013	DETAIL NO.
Daniel D Hengen STATE BRIDGE ENGINEER	PILE SPLICE (CAST–IN–PLACE CONCRETE PILES)		B201

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: KAE | CHECKED BY: EJT
DRAWN BY: LMT | DATE: 9/14/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

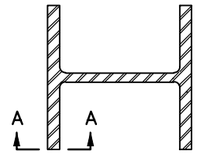
SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4B
LRT OVER BNSF
BRIDGE R0697
DETAILS 1

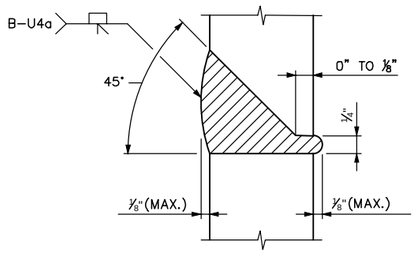
DISCIPLINE: STRUCTURES

SHEET NAME: CBRR0697-BRG-DTL-001-1

SHEET 52 OF 64



SECTION AT SPLICE



SECTION A–A

100% BUTT WELDED PILE SPLICE

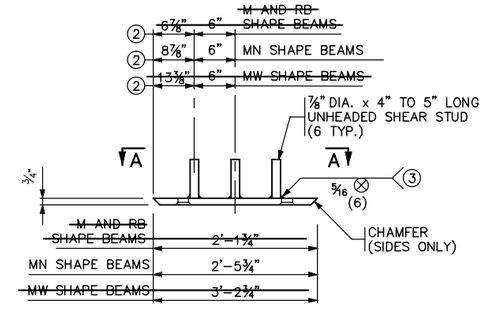
NOTES:

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

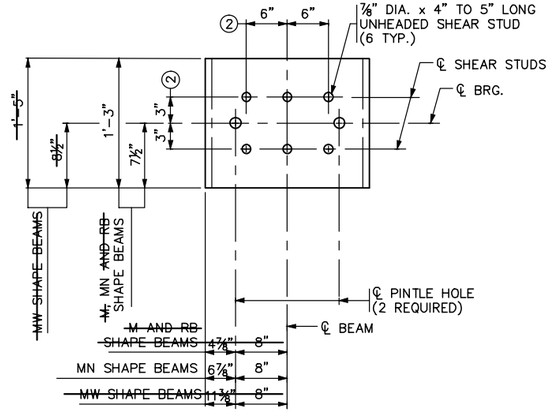
ELECTRODES WHICH HAVE BECOME WET, SOILED OR DAMAGED SHALL NOT BE USED.

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.

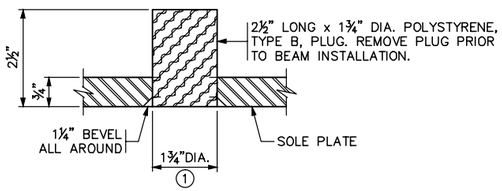
APPROVED: NOVEMBER 22, 2002	STATE OF MINNESOTA DEPARTMENT OF TRANSPORTATION	REVISION: 11–06–2013	DETAIL NO.
Daniel L Worgan STATE BRIDGE ENGINEER	PILE SPLICE (STEEL H BEARING PILES 10" TO 14")		B202



FRONT ELEVATION



SECTION A–A



PINTLE HOLE DETAIL

NOTES:

MATERIAL TO BE STRUCTURAL STEEL PER MnDOT SPEC. 3306.

WELDED STUDS TO BE WELDABLE CARBON STEEL PER MnDOT SPEC. 3391.2D.

SOLE PLATE FOR BEARING ASSEMBLY TO BE GALVANIZED PER MnDOT SPEC. 3394 AFTER FABRICATION.

PINTLE HOLES SHALL BE FREE OF ZINC BUILD UP FROM GALVANIZING.

SOLE PLATES ARE INCIDENTAL TO PRESTRESSED CONCRETE BEAMS.

① FOR 1½" DIA. PINTLES.

② THESE DIMENSIONS MAY BE MODIFIED TO CLEAR PRESTRESSED STRANDS. HOWEVER, CHANGES MUST BE APPROVED BY THE ENGINEER.

③ THE REQUIREMENTS FOR WELDING STUDS SHALL COMPLY WITH AASHTO/AWS D1.1.

APPROVED: SEPTEMBER 22, 2011	STATE OF MINNESOTA DEPARTMENT OF TRANSPORTATION	REVISED	DETAIL NO.
Nancy Daubenberger STATE BRIDGE ENGINEER	SOLE PLATE (PRESTRESSED CONCRETE BEAMS) (FOR BEARINGS WITH PINTLES)		B303

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: KAE | CHECKED BY: EJT
DRAWN BY: LMT | DATE: 9/14/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

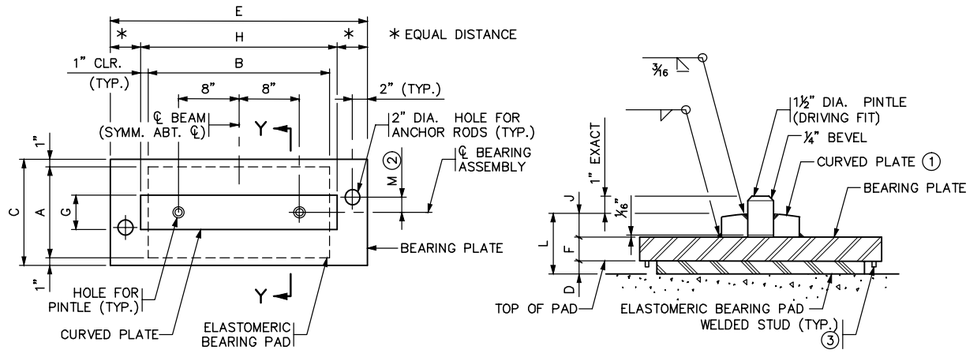
SOUTHWEST Green Line LRT Extension

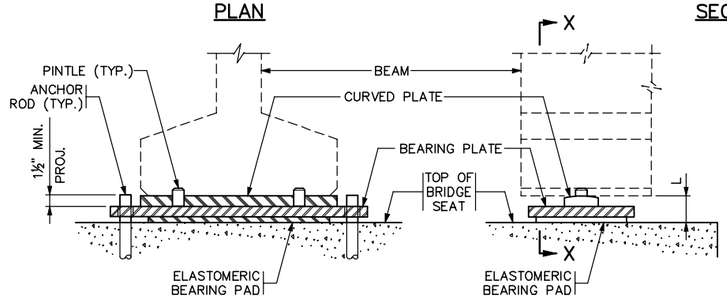
CIVIL EAST - VOLUME 4B
LRT OVER BNSF
BRIDGE R0697
DETAILS 2

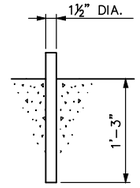
DISCIPLINE: STRUCTURES
SHEET NAME: CBRR0697-BRG-DTL-001-2

SHEET 53 OF 64

Sep. 10 2015 11:34 am V:\3400_ADC\CAD\segment e4\plan sheets\structures\R0697\CBRR0697-BRG-DTL-001.dwg By: lisa.thompson







TABLE

ASSEMBLY TYPE	LOCATION	BEAM SIZE	BEARING PAD SIZE A	B	D	SHAPE FACTOR	BEARING PLATE SIZE C	E	F	CURVED PLATE SIZE G	H	J	ANCHOR ROD OFFSET +/–②	M	ASSY. HEIGHT L	CURVED PLATE R ①
F1	PIER 4 & PIER 5	MN54	12"	24"	½"	8.0	14"	38"	1½"	4½"	26"	1¼"	—	⅞"	3¼"	16"
~~—~~	~~—~~	~~MW~~	~~16"~~	~~36"~~	~~½"~~	~~11.1~~	~~18"~~	~~—~~	~~1½"~~	~~4½"~~	~~38"~~	~~1¼"~~	~~—~~	~~—~~	~~3¼"~~	~~—~~

NOTES:

ELASTOMERIC MATERIALS AND PAD CONSTRUCTION SHALL COMPLY WITH SPEC. 3741.

ALL STEEL PLATES SHALL COMPLY WITH SPEC. 3306.

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.

PAYMENT FOR BEARING ASSEMBLY SHALL INCLUDE ALL MATERIAL ON THIS DETAIL.

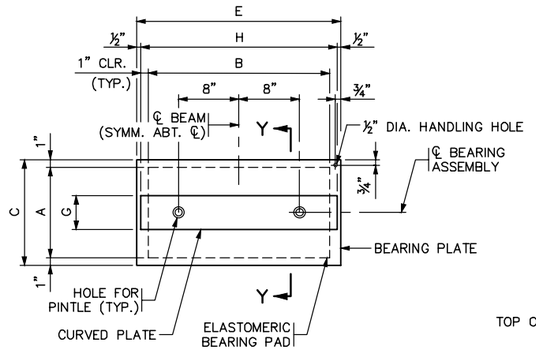
① THE MIN. RADIUS SHALL BE 16" UNLESS OTHERWISE SPECIFIED IN THE TABLE. THE MAX. RADIUS SHALL BE 24". FINISH TO 250 MICRO. THE FINISHED THICKNESS OF THE PLATE MAY BE 1/16" LESS THAN SHOWN.

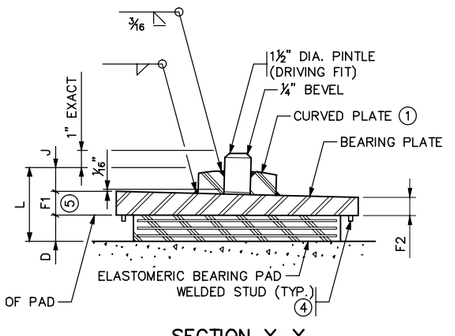
② "+" DENOTES OFFSET AS SHOWN.
"–" DENOTES OFFSET OPPOSITE OF SHOWN.

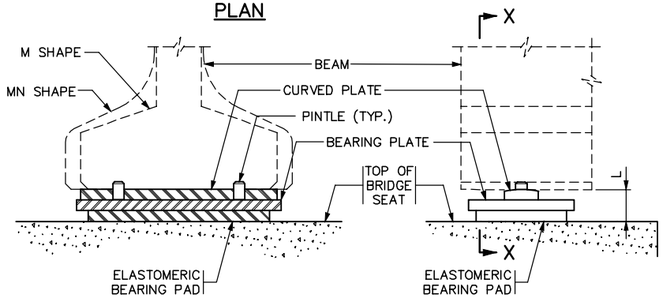
③ 5/16" DIA. x 3/8" KNOCK–OFF WELD STUDS INSTALLED ON BEARING PLATE AROUND PERIMETER OF BEARING PAD. CENTERLINE STUD TO EDGE OF PAD DIMENSION = ½", MAX. STUD SPACING = 4", AND MAX. SPACING TO PAD CORNER = 2".

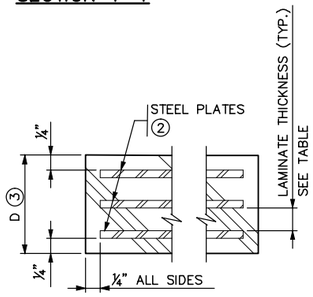
DESIGN DATA:
MAXIMUM HORIZONTAL LOAD IS 70 KIPS FOR 1" PINTLES.

APPROVED: SEPTEMBER 22, 2011	STATE OF MINNESOTA DEPARTMENT OF TRANSPORTATION	REVISED	DETAIL NO.
STATE BRIDGE ENGINEER	CURVED PLATE BEARING ASSEMBLY (PRESTRESSED CONCRETE BEAMS) (FIXED)	11–06–2013	B310









TABLE

ASSEMBLY TYPE	LOCATION	BEAM SIZE	BEARING PAD SIZE A	B	D	STEEL PLATES NO.	THICK.	LAMINATES NO.	THICK.	SHAPE FACTOR	BEARING PLATE SIZE C	E	F1	F ⑥	F2	CURVED PLATE SIZE G	H	J	ASSY. HEIGHT L ⑥	CURVED PLATE R ①
E1	S. ABUT.	MN54	20"	24"	6¾"	8	⅛"	7	¾"	7.3	22"	27"	2¾"	2¼"	1¾"	8"	26"	1¼"	10¼"	18"
E2	PIER 1	MN54	12"	24"	5"	8	⅛"	7	½"	8.0	14"	27"	1¾"	1½"	1¼"	4½"	26"	1¼"	7¾"	16"
E3	PIER 2	MN54	12"	24"	3¾"	6	⅛"	5	½"	8.0	14"	27"	—	1½"	—	4½"	26"	1¼"	6½"	16"
E4	PIER 3	MN54	12"	24"	1⅞"	3	⅛"	2	½"	8.0	14"	27"	—	1½"	—	4½"	26"	1¼"	4⅝"	16"
E5	PIER 6	MN54	12"	24"	3⅛"	5	⅛"	4	½"	8.0	14"	27"	—	1½"	—	4½"	26"	1¼"	5⅞"	16"
E6	PIER 7	MN54	12"	24"	4⅜"	7	⅛"	6	½"	8.0	14"	27"	—	1½"	—	4½"	26"	1¼"	7⅛"	16"
E7	PIER 8	MN54	16"	24"	5⅝"	9	⅛"	8	½"	9.6	18"	27"	—	2"	—	6"	26"	1¼"	8⅝"	16"
E7	PIER 8	GIRDER	14"	24"	4⅜"	7	⅛"	6	½"	8.0	14"	27"	—	1½"	—	4½"	26"	1¼"	7⅝"	16"
E8	N. ABUT.	GIRDER	16"	24"	5"	8	⅛"	7	½"	9.6	18"	27"	—	2"	—	6"	26"	1¼"	8¼"	16"

NOTES:

ELASTOMERIC MATERIALS AND PAD CONSTRUCTION SHALL COMPLY WITH MnDOT SPEC. 3741.

ALL STEEL PLATES SHALL COMPLY WITH MnDOT SPEC. 3306.

PINTLES SHALL COMPLY WITH MnDOT SPEC. 3309.

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

PAYMENT FOR BEARING ASSEMBLY SHALL INCLUDE ALL MATERIAL ON THIS DETAIL.

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 1/16" LESS THAN SHOWN.

② DO NOT GALVANIZE THESE PLATES.

③ THE TOTAL THICKNESS SHOWN INCLUDES THE STEEL PLATES.

④ 5/16" DIA. x 3/8" KNOCK–OFF WELD STUDS INSTALLED ON BEARING PLATE AROUND PERIMETER OF BEARING PAD. CENTERLINE STUD TO EDGE OF PAD DIMENSION = ½", MAX. STUD SPACING = 4", AND MAX. SPACING TO PADCORNER = 2".

⑤ MARK THICKER SIDE OF SLOPED PLATES WITH AN "H" FOR PLACEMENT. SEE FRAMING PLAN SHEET NO. 30.

⑥ THICKNESS AT ℄ BEARING.

DESIGN DATA:
MAXIMUM HORIZONTAL LOAD IS 70 KIPS FOR 1" PINTLES.

APPROVED: SEPTEMBER 22, 2011	STATE OF MINNESOTA DEPARTMENT OF TRANSPORTATION	REVISED	DETAIL NO.
STATE BRIDGE ENGINEER	CURVED PLATE BEARING ASSEMBLY (PRESTRESSED CONCRETE BEAMS) (EXPANSION)		B311 MOD.

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: KAE | CHECKED BY: EJT
DRAWN BY: LMT | DATE: 9/14/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

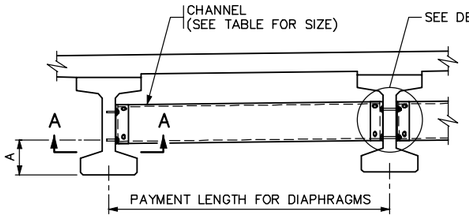
METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

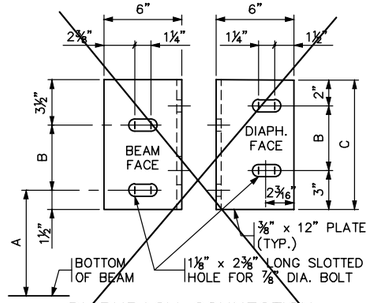
CIVIL EAST - VOLUME 4B
LRT OVER BNSF
BRIDGE R0697
DETAILS 3

DISCIPLINE: STRUCTURES
SHEET NAME: CBRR0697-BRG-DTL-001-3

SHEET 54 OF 64

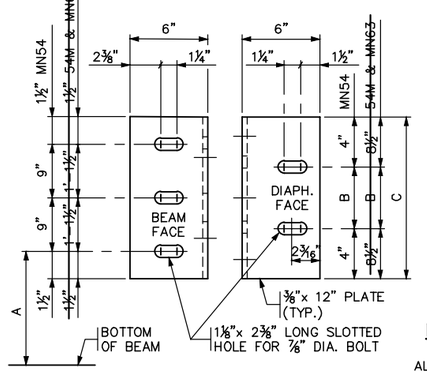


PART TRANSVERSE SECTION AT DIAPHRAGM



DIAPHRAGM CONNECTION

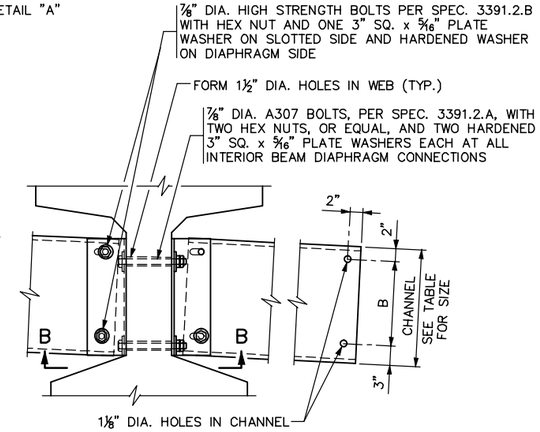
FOR 36M, 45M AND MN45 BEAMS



DIAPHRAGM CONNECTION

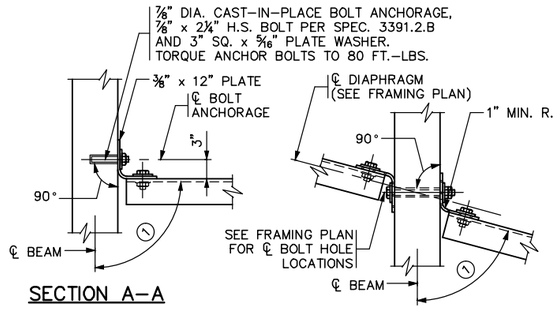
FOR 54M, MN54 AND MN63 BEAMS

TABLE				
BEAM HEIGHT	DISTANCE			CHANNEL SIZE
	A	B	C	
~~36M~~	~~1' 3"~~	~~7"~~	~~1' 0"~~	~~C12x20.7~~
~~45M~~	~~1'-3¾"~~	~~1' 1"~~	~~1' 6"~~	~~MC18x42.7~~
~~54M~~	~~1'-2¼"~~	~~1' 1"~~	~~2' 6"~~	~~MC18x42.7~~
~~MN45~~	~~1'-7¾"~~	~~7"~~	~~1' 0"~~	~~C12x20.7~~
MN54	1'-7¾"	1'-1"	1'-9"	MC18x42.7
~~MN63~~	~~1'-7¾"~~	~~1' 1"~~	~~2' 6"~~	~~MC18x42.7~~



DETAIL "A"

INTERIOR BEAM WITH CONTINUOUS LINE OF DIAPHRAGMS



SECTION A–A

TYPICAL SECTION AT ALL FASCIA BEAMS

SECTION B–B

TYPICAL SECTION AT INTERIOR BEAM WITH CONTINUOUS OR STAGGERED INTERMEDIATE DIAPHRAGMS

NOTES:

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 ⅜" x 6" x 6" ANGLE MAY BE USED FOR DIAPHRAGMS PERPENDICULAR TO BEAMS.

~~INCLUDE ALL STRUCTURAL STEEL SHOWN ON THIS DETAIL, INCLUDING BOLTS AND WASHERS, IN UNIT PRICE BID FOR DIAPHRAGMS FOR PRESTRESSED BEAMS.~~

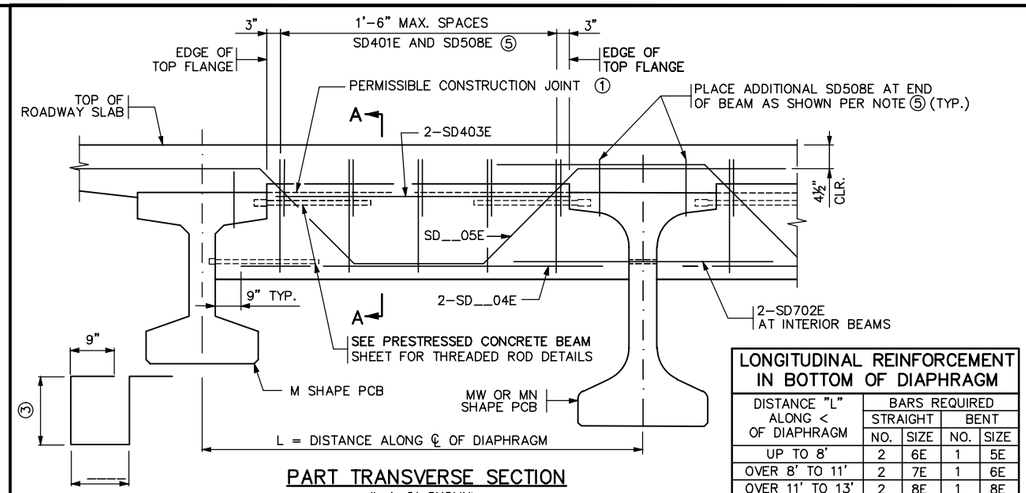
BENT PLATES MAY BE USED IN PLACE OF CHANNELS. THE BENT PLATES MUST BE THE SAME HEIGHT AS THE CHANNELS THEY REPLACE, BE 5⁄16" IN THICKNESS, AND HAVE LEGS 5" LONG.

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	STATE OF MINNESOTA DEPARTMENT OF TRANSPORTATION	REVISED	DETAIL NO.
Daniel L Wogsan STATE BRIDGE ENGINEER	STEEL INTERMEDIATE DIAPHRAGM (FOR 36M – 54M, MN45 – MN63 PRESTRESSED CONCRETE BEAMS)	06-14-2006 10-22-2009 09-11-2014	B403

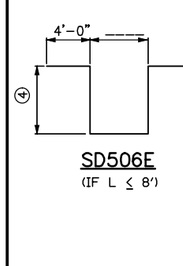


PART TRANSVERSE SECTION

(L > 8' SHOWN)

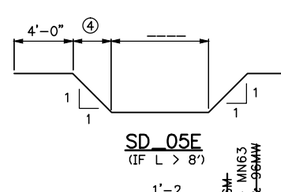
SD401E

LONGITUDINAL REINFORCEMENT IN BOTTOM OF DIAPHRAGM				
DISTANCE "L" ALONG < OF DIAPHRAGM	BARS REQUIRED			
	STRAIGHT		BENT	
	NO.	SIZE	NO.	SIZE
UP TO 8'	2	6E	1	5E
OVER 8' TO 11'	2	7E	1	6E
OVER 11' TO 13'	2	8E	1	8E
OVER 13' TO 15'	2	9E	1	10E
OVER 15' TO 18'	2	11E	1	11E



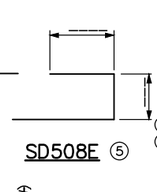
SD506E

(IF L ≤ 8')



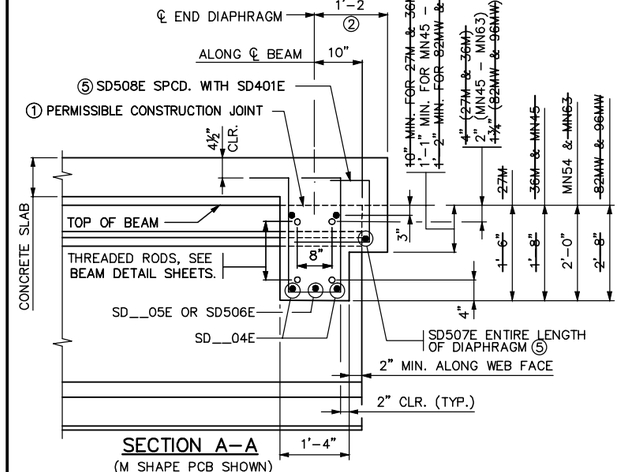
SD_05E

(IF L > 8')



SD508E ⑤

BILL OF REINFORCEMENT FOR END DIAPHRAGM				
BAR	NO.	LENGTH	SHAPE	LOCATION
SD401E				VERTICAL TIE
SD702E		5'-0"		LONG. THRU BEAM
SD403E				LONG. TOP
SD_04E				LONG. BOTTOM
SD_05E				LONGITUDINAL
SD506E				LONGITUDINAL
⑤ SD507E				LONGITUDINAL
⑤ SD508E				VERTICAL TIE



SECTION A–A

(M SHAPE PCB SHOWN)

NOTES:

CONCRETE FOR END DIAPHRAGMS SHALL BE THE SAME MIX AS USED IN DECK.

~~QUANTITIES FOR END DIAPHRAGM CONCRETE AND REINFORCEMENT SHOWN ON THIS DETAIL SHALL BE LISTED IN SUPERSTRUCTURE QUANTITIES.~~

THREADED RODS ARE INCIDENTAL TO PRESTRESSED CONCRETE BEAMS.

① USE OF CONSTRUCTION JOINT REQUIRES CLEARANCE FOR EXPANSION DEVICE. WHEN CONSTRUCTION JOINT IS USED AT THIS LOCATION, DIAPHRAGM FALSEWORK SHALL REMAIN INPLACE UNTIL COMPLETION OF SLAB CURING PERIOD.

② PERPENDICULAR TO CENTERLINE OF DIAPHRAGM.

③ 1'-11" (27M); 2'-1" (36M AND MN45); 2'-5" (MN54 AND MN63); 3'-1" (82MW AND 96MW). BASED ON 3" STOOL AND 9" DECK.

④ 1'-10" (27M); 2'-0" (36M AND MN45); 2'-4" (MN54 AND MN63); 3'-0" (82MW AND 96MW). BASED ON NOTE ③.

⑤ ADD SD507E AND SD508E ONLY IF NO. OF BARS AND LENGTHS ARE INCLUDED IN BILL OF REINFORCEMENT. SPACE SD508E AT 1'-6" MAX. FOR ENTIRE LENGTH OF DIAPHRAGM. REFER TO "PART TRANSVERSE SECTION" ABOVE.

APPROVED: SEPTEMBER 22, 2011	STATE OF MINNESOTA DEPARTMENT OF TRANSPORTATION	REVISED	DETAIL NO.
Nancy Daubenberger STATE BRIDGE ENGINEER	CONCRETE END DIAPHRAGM (27M & 36M, MN45 – MN63, 82MW & 96MW PRESTRESSED CONCRETE BEAMS) (PARAPET ABUTMENT)	04-17-2013 11-06-2013	B814 DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: KAE | CHECKED BY: EJT
DRAWN BY: LMT | DATE: 9/14/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

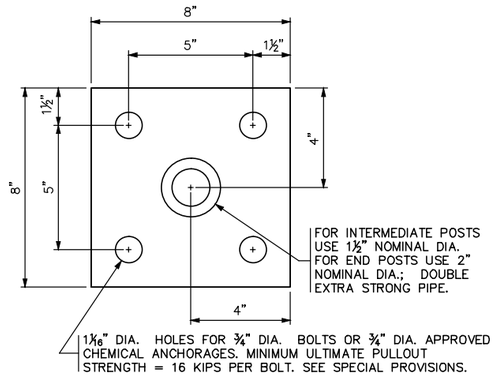
SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4B
LRT OVER BNSF
BRIDGE R0697
DETAILS 4

DISCIPLINE: STRUCTURES
SHEET NAME: CBRR0697-BRG-DTL-001-4

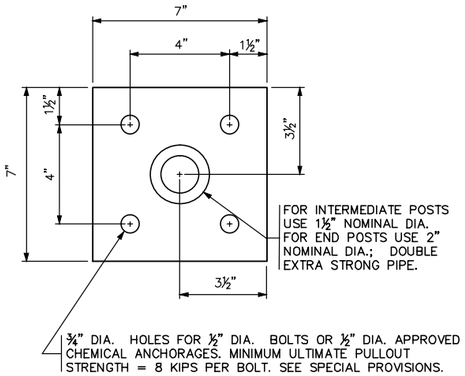
SHEET 55 OF 64

Sep. 10 2015 11:34 am V:\3400_ADC\CAD\segment e4\plan sheets\structures\R0697\CBRR0697-BRG-DTL-001.dwg By: lisa.thompson



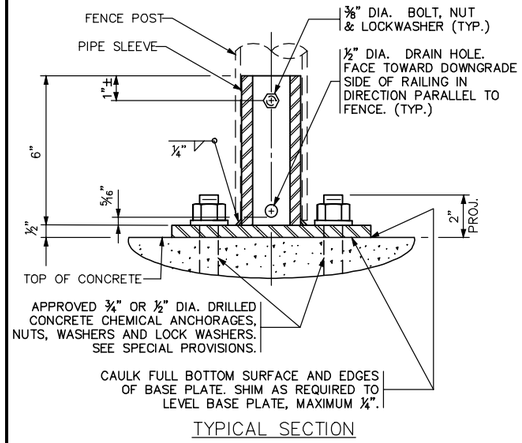
PLAN VIEW – TYPE A

ESTIMATED WEIGHT = 12 OR 14 LBS.

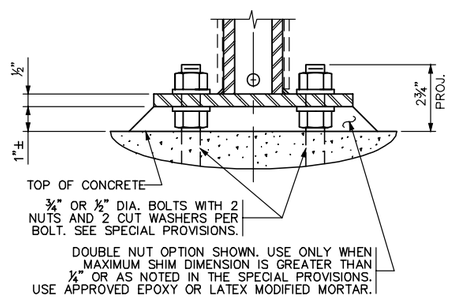


PLAN VIEW – TYPE B

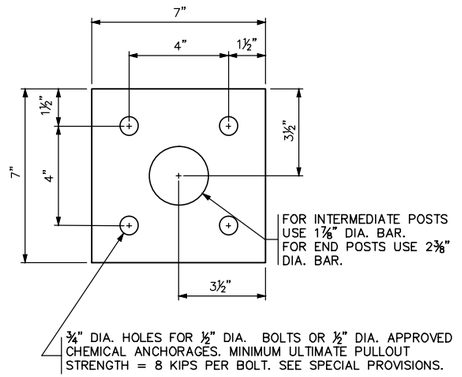
ESTIMATED WEIGHT = 10 OR 12 LBS.



TYPICAL SECTION



GROUT ALTERNATE



PLAN VIEW – TYPE C

ESTIMATED WEIGHT = 12 OR 15 LBS.

NOTES:

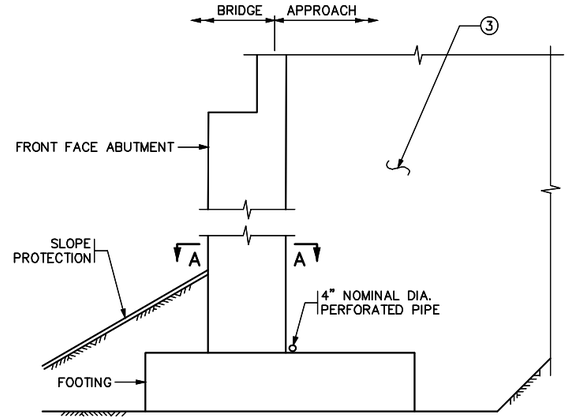
STRUCTURAL STEEL PER Mn/DOT SPEC. 3306

STRUCTURAL PIPE PER Mn/DOT SPEC. 3362

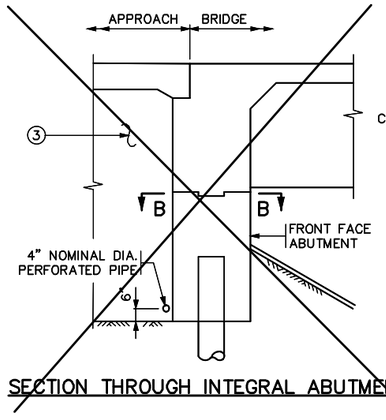
GALVANIZE THE FENCE POST ANCHORAGE AFTER FABRICATION PER Mn/DOT SPEC. 3394. GALVANIZE THE FASTENERS PER Mn/DOT SPEC. 3392.

DOUBLE EXTRA STRONG PIPE WEIGHTS:
1½" NOMINAL DIA. = 6.41 LBS./FT.
2" NOMINAL DIA. = 9.03 LBS./FT.

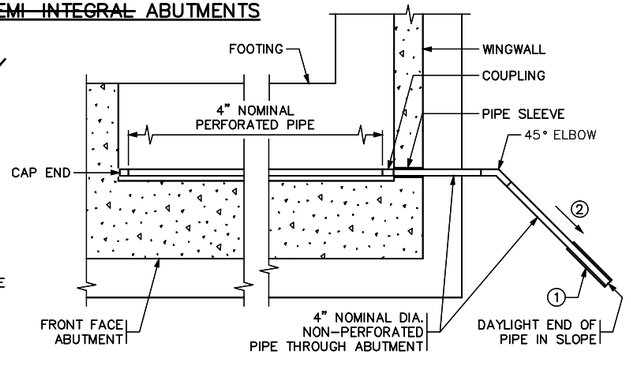
APPROVED: NOVEMBER 22, 2002	STATE OF MINNESOTA DEPARTMENT OF TRANSPORTATION	REVISION	DETAIL NO.
Daniel L Worgan STATE BRIDGE ENGINEER	FENCE POST ANCHORAGE		B905



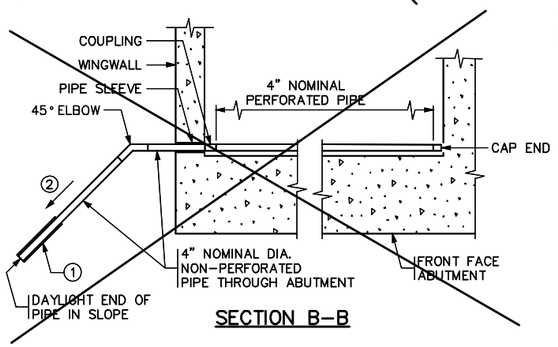
SECTION THROUGH PARAPET AND ~~SEMI INTEGRAL~~ ABUTMENTS



SECTION THROUGH INTEGRAL ABUTMENT



SECTION A–A



SECTION B–B

NOTES:

~~PAYMENT WILL BE INCLUDED IN THE SINGLE LUMP SUM PRICE FOR "DRAINAGE SYSTEM TYPE (B910)", INCLUDES BUT IS NOT LIMITED TO 4" DIAMETER PERFORATED AND NON PERFORATED PIPE, ELBOWS, END CAPS, COUPLINGS, SLEEVES AND PRECAST CONCRETE HEADWALLS.~~

ALL PIPE TO COMPLY WITH SPEC. 3245.

WRAP PERFORATED PIPE WITH GEOTEXTILE PER SPEC. 3733, TYPE 1. ATTACH TO PIPE PER SPEC. 2502.

① AT CONTRACTORS OPTION, MAY TIE APPROACH PANEL DRAINAGE SYSTEM AND ABUTMENT DRAINAGE SYSTEM INTO A SINGLE PRECAST CONCRETE HEADWALL OR INTO A CATCH BASIN AS LONG AS A MINIMUM OF 1% POSITIVE SLOPE CAN BE MANTAINED.

USE PRECAST CONCRETE HEADWALL WITH RODENT SCREEN. SEE STANDARD PLATE 3131 FOR DETAILS.

② ⅛" PER FT. MINIMUM SLOPE.

③ REFER TO GRADING PLANS FOR ABUTMENT BACKFILL REQUIREMENTS.

APPROVED: JANUARY 13, 2015	STATE OF MINNESOTA DEPARTMENT OF TRANSPORTATION	REVISED	DETAIL NO.
Nancy Daubenberger STATE BRIDGE ENGINEER	DRAINAGE SYSTEM		B910

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: KAE | CHECKED BY: EJT
DRAWN BY: LMT | DATE: 9/14/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4B
LRT OVER BNSF
BRIDGE R0697
DETAILS 5

DISCIPLINE: STRUCTURES
SHEET NAME: CBRR0697-BRG-DTL-001-5

SHEET 56 OF 64

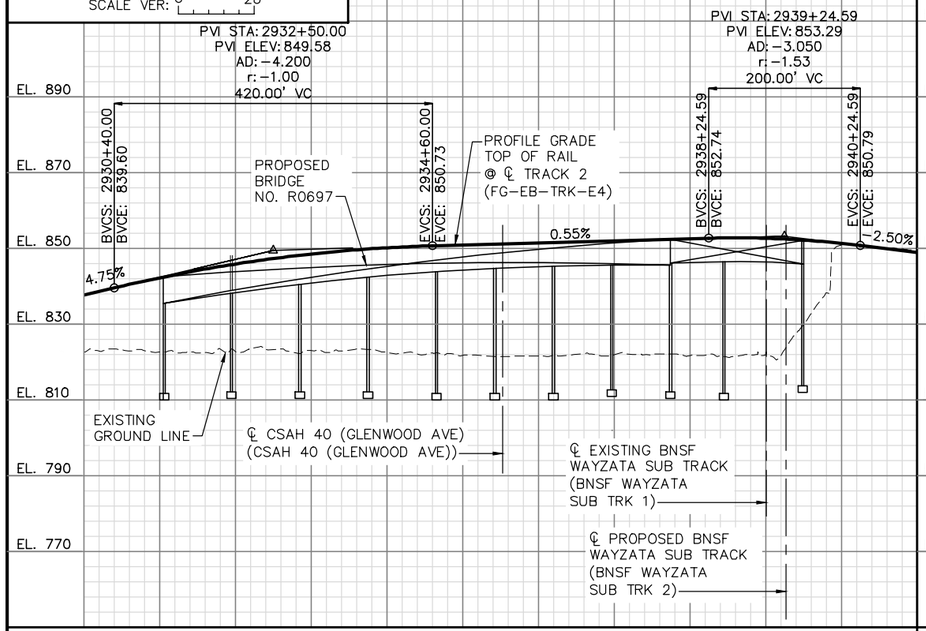
Sep. 10 2015 11:34 am V:\3400_ADC\CAD\segment e4\plan sheets\structures\R0697\CBRR0697-BRG-DTL-001.dwg By: lisa.thornpson

CONTRACTED PROFILE

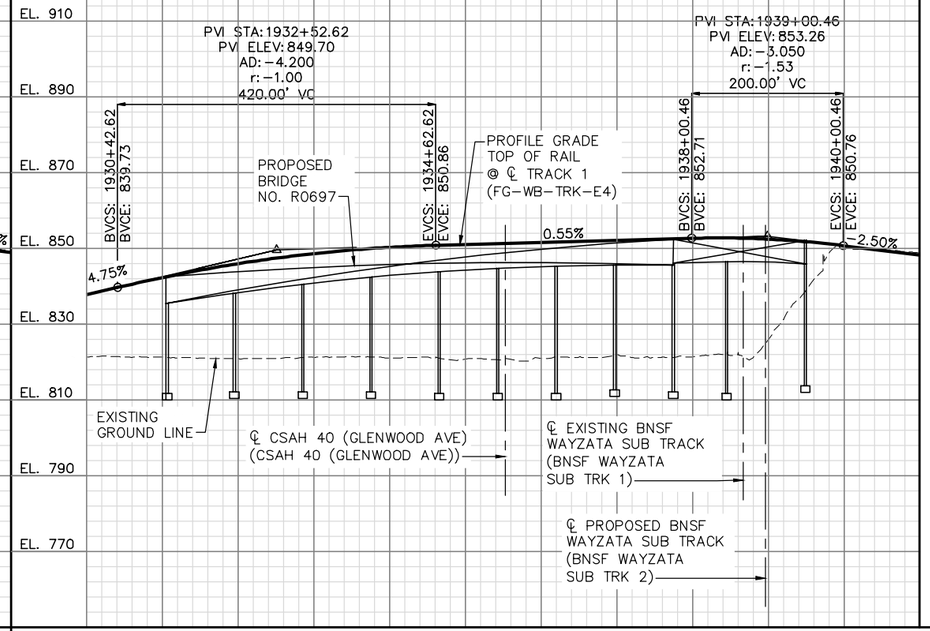
SCALE HOR: 0 100'

SCALE VER: 0 20'

PROFILE GRADE TOP OF RAIL @ ℄ TRACK 2 (FG-EB-TRK-E4)

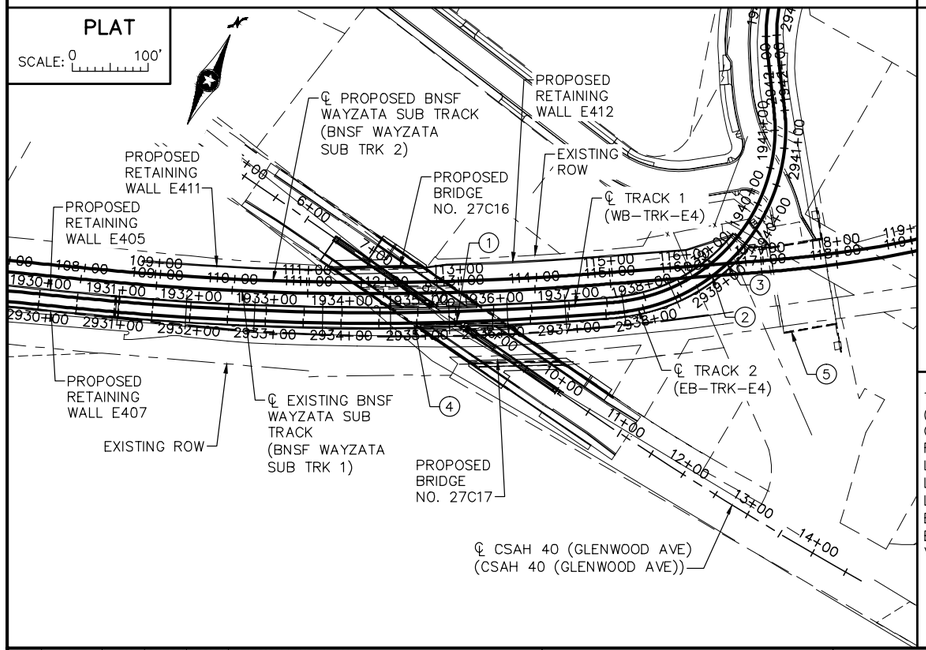


PROFILE GRADE TOP OF RAIL @ ℄ TRACK 1 (FG-WB-TRK-E4)



PLAT

SCALE: 0 100'



NOTES:

1. ℄ CONTROL POINT
   ℄ TRACK 2 (EB-TRK-E4) P.O.C. 2935+52.51
   ℄ CSAH 40 (GLENWOOD AVE)
   (CSAH 40 (GLENWOOD AVE)) P.O.T. 8+39.83
   X = 525815.344 Y = 168533.506
   Δ = 36°17'28.1" (T.T.C.)

2. ℄ TRACK 2 (EB-TRK-E4) P.O.C. 2939+00.72
   ℄ EXISTING BNSF WAYZATA SUB TRACK
   (BNSF WAYZATA SUB TRK 1) P.O.T. 116+34.22
   X = 526077.848 Y = 168753.465
   Δ = 32°40'49.9" (T.T.C.)

3. ℄ TRACK 2 (EB-TRK-E4) P.O.C. 2939+26.44
   ℄ PROPOSED BNSF WAYZATA SUB TRACK
   (BNSF WAYZATA SUB TRK 2) P.O.T. 116+55.17
   X = 526086.701 Y = 168777.597
   Δ = 38°43'10.1" (T.T.C.)

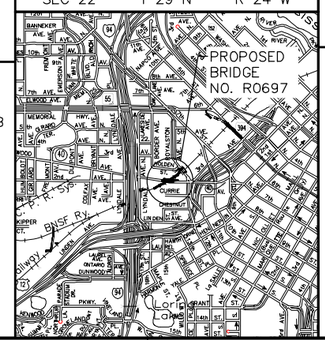
4. EXISTING BRIDGE NO. 27569 TO BE REMOVED, 181.9' LONG AND 70.4' WIDE, TWO STEEL CONT. BEAM SPANS BUILT IN 1988.

5. EXISTING BRIDGE NO. 27699 TO REMAIN, 116.7' LONG & 70.4' WIDE, ONE PCB SPAN BUILT IN 2000.

TRACK 2 (FG-EB-TRK-E4) CURVE NO. E4-209A	TRACK 2 (FG-EB-TRK-E4) CURVE NO. E4-209B	TRACK 1 (FG-WB-TRK-E4) CURVE NO. E4-109A	TRACK 1 (FG-WB-TRK-E4) CURVE NO. E4-109B
R = 3804.00'	R = 244.00'	R = 3790.00'	R = 230.00'
Lc = 612.52'	Lc = 360.51'	Lc = 609.91'	Lc = 338.11'
Ls1 = 160.00'	Ls = 30.00'	Ls1 = 160.00'	Ls = 30.00'
Ls2 = 30.00'	Ea = 0.00"	Ls2 = 30.00'	Ea = 0.00"
Ea = 0.00"	Eu = 1.62"	Ea = 0.00"	Eu = 1.72"
Eu = 2.60"-0.10"	V = 10 MPH	Eu = 2.61"-0.10"	V = 10 MPH
V = 50-10 MPH		V = 50-10 MPH	

INDEX MAP

SEC 22 T 29 N R 24 W



LOCATION ENGINEER'S OBSERVATIONS AT BRIDGE SITE

1. SPECIAL FEATURES: WATERFALLS, DAMS, FLOODS, ICE, DEBRIS SLIDING BANKS, RECREATIONAL BOATING.
2. OTHER BRIDGES OR CULVERTS OVER THE SAME STREAM (PARTICULARY STRUCTURES WHICH CARRY HIGH WATER WITHOUT OVERFLOW OF ROADWAY): GIVEN LOCATION, TYPE, LENGTH, HEIGHT ABOVE HIGH WATER, CROSS-SECTIONAL AREA ETC.
3. APPARENT HIGHWATER ELEVATION OBTAINED FROM:
4. OTHER DATA: APPROX. VELOCITY OF WATER AT TIME OF SURVEY.

HYDRAULIC ENGINEER'S RECOMMENDATION

DATE:

STREAM OR DITCH DESIGNATION:

DRAINAGE AREA: SQ. MI.

MAX FLOOD ON RECORD:

DESIGN FLOOD (YR. FREQ.): C.F.S.
HEADWATER ELEVATION: FT.
DESIGN MEAN VELOCITY THROUGH STRUCTURE F.P.S.
TOTAL STAGE INCREASE FT.
LOW MEMBER AT OR ABOVE ELEVATION FT.

WATERWAY AREA REQUIRED BELOW ELEV. = SQ. FT.
AT RIGHT ANGLES TO CHANNEL

BASIC FLOOD (100 YR. FREQ.) C.F.S.
HEADWATER ELEVATION: FT.
TOTAL STAGE INCREASE FT.
MEAN VELOCITY THROUGH STRUCTURE F.P.S.

FLOWLINE ELEVATION: FT. SKEW ANGLE:

ESTIMATED PRELIMINARY TOTAL SCOUR AT PIER EL.
(500 YR. FREQ.)

SCOUR CONFIRMATION RECOMMENDATION

DATE:

TOTAL SCOUR AT PIER EL. (500 OR OT YR. FREQ.)
SCOUR CODE: OBTAIN FROM HYDRAULIC ENGINEER

BRIDGE SURVEY SHEETS MADE FROM 2014 MFRA SURVEYS

1ST BENCH MARK (NAVD 88)
BENCHMARK ID PT. 78
ELEVATION = 851.67
X = 526108.98, Y = 168845.25
DESCRIPTION = ½" PIPE W/ CAP

2ND BENCH MARK (NAVD 88)
BENCHMARK ID PT. 77
ELEVATION = 849.53
X = 526300.32, Y = 168719.56
DESCRIPTION = ½" PIPE W/ CAP

BRIDGE SURVEY 1

PROPOSED BRIDGE LOCATED:
0.1 MI. S.E. OF JCT. CSAH 40 (GLENWOOD AVENUE) AND INTERSTATE 94 IN MINNEAPOLIS.

SEC 22 T 29 N R 24 W

CITY OF MINNEAPOLIS HENNEPIN COUNTY

BRIDGE NO. R0697

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: KAE CHECKED BY: EJT
DRAWN BY: LMT DATE: 9/14/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4B
LRT OVER BNSF
BRIDGE R0697
BRIDGE SURVEY 1

DISCIPLINE: STRUCTURES

SHEET NAME: CBRR0697-BRG-SUR-001-1

SHEET 57 OF 64

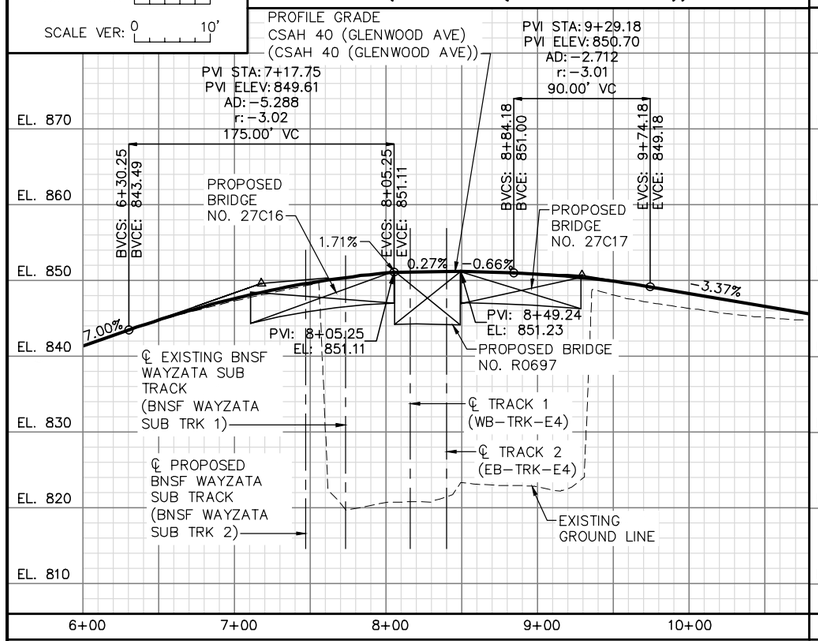
Sep. 10 2015 11:35 am V:\3400_ADC\CAD\segment e4\plan sheets\structures\R0697\CBRR0697-BRG-SUR-001.dwg By: lisa.thompson

CONTRACTED PROFILE

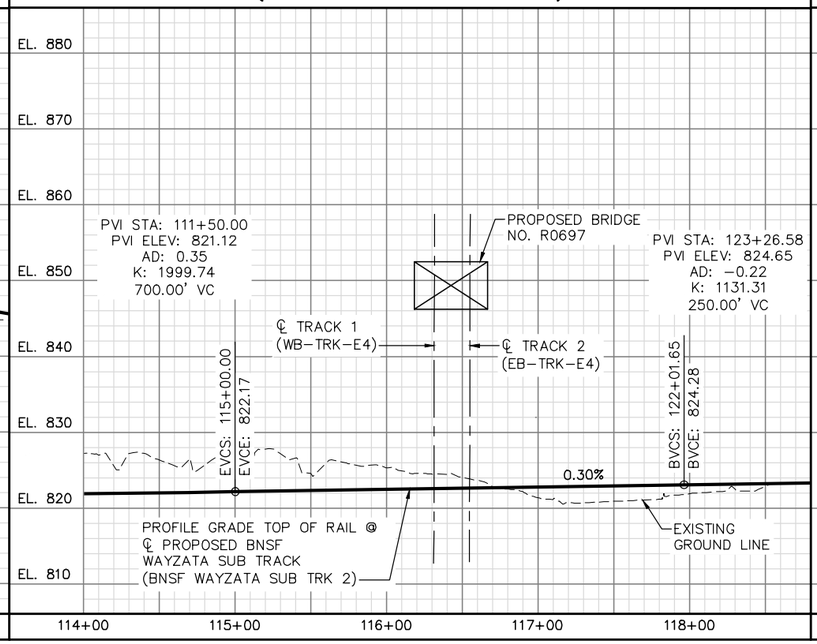
SCALE HOR: 0 50'

SCALE VER: 0 10'

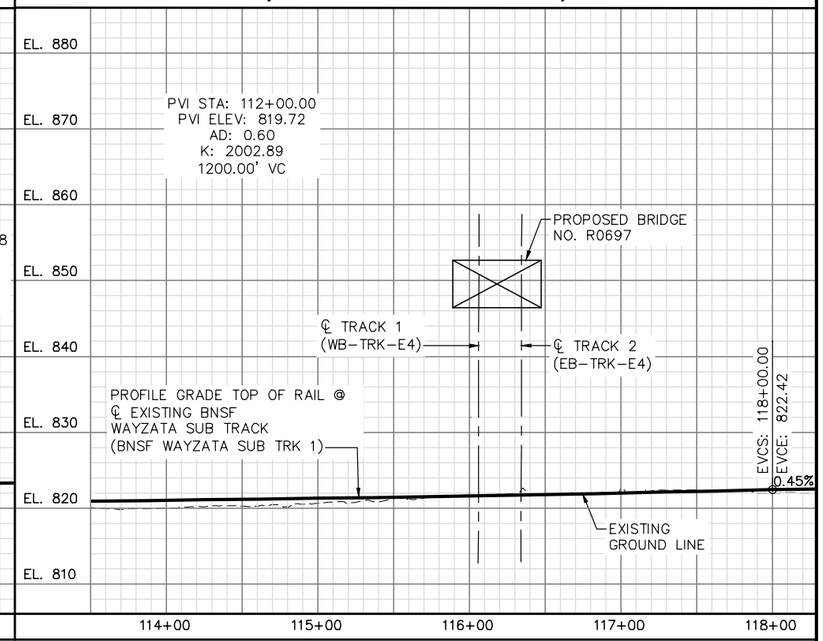
PROFILE GRADE ℄ CSAH 40 (GLENWOOD AVE) (CSAH 40 (GLENWOOD AVE))

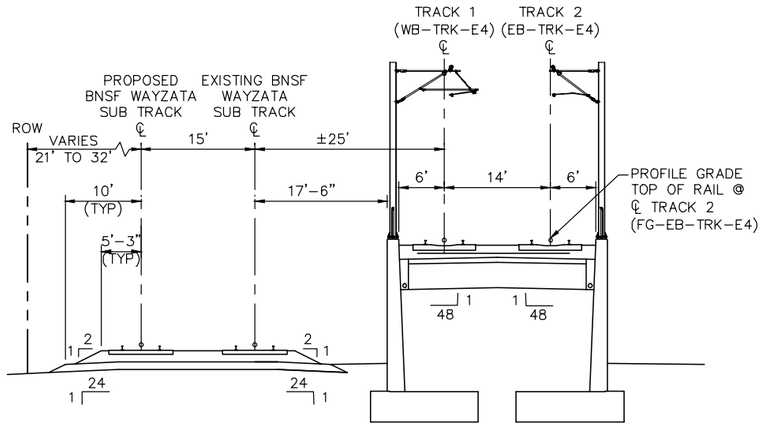


PROFILE GRADE ℄ PROPOSED BNSF WAYZATA SUB TRACK (BNSF WAYZATA SUB TRK 2)

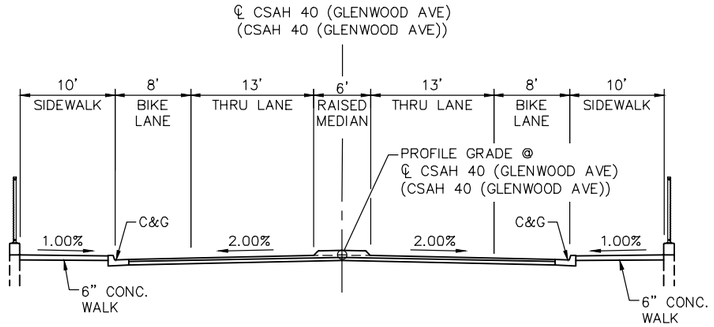


PROFILE GRADE ℄ EXISTING BNSF WAYZATA SUB TRACK (BNSF WAYZATA SUB TRK 1)





TYPICAL APPROACH SECTION



TYPICAL SECTION
CSAH 40 (GLENWOOD AVE)

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: KAE | CHECKED BY: EJT
DRAWN BY: LMT | DATE: 9/14/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4B
LRT OVER BNSF
BRIDGE R0697
BRIDGE SURVEY 2

DISCIPLINE: STRUCTURES

SHEET NAME: CBRR0697-BRG-SUR-001-2

SHEET 58 OF 64

Sep. 10 2015 11:35 am V:\3400_ADC\CAD\segment e4\plan sheets\structures\R0697\CBRR0697-BRG-SUR-001.dwg By: lisa.thompson

℄ CSAH 40 (GLENWOOD AVE)
(CSAH 40 (GLENWOOD AVE))

℄ PROPOSED BNSF
WAYZATA SUB TRACK
(BNSF WAYZATA SUB TRK 2)

℄ EXISTING BNSF
WAYZATA SUB TRACK
(BNSF WAYZATA SUB TRK 1)

1158 SB
STA. 2934+20.00
67' LT. OF ℄ TRACK 2

1008 SB
STA. 2940+00.01
34' LT. OF ℄ TRACK 2

℄ BRG.
N. ABUT.

℄ TRACK 2
(EB-TRK-E4)
& WORKING LINE

℄ TRACK 1
(WB-TRK-E4)

1204 SB
STA. 2938+42.29
3' LT. OF ℄ TRACK 2

℄ BRG.
S. ABUT.

℄ PIER 1

℄ PIER 2

℄ PIER 3

℄ PIER 4

℄ PIER 5

℄ PIER 6

℄ PIER 7

℄ PIER 8

℄ PIER 9

BASSETT
CREEK TUNNEL

1163 CW
STA. 2931+02.36
20' LT. OF ℄ TRACK 2

1164 CW
STA. 2932+01.73
18' LT. OF ℄ TRACK 2

1165 CW
STA. 2933+03.26
16' LT. OF ℄ TRACK 2

1136 SW
STA. 2934+01.93
11' LT. OF ℄ TRACK 2

1021 SB
STA. 2936+86.00
74' RT. OF ℄ TRACK 2

1159 SB
STA. 2936+21.27
77' RT. OF ℄ TRACK 2

NOTES:

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."

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: KAE | CHECKED BY: EJT
DRAWN BY: LMT | DATE: 9/14/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4B
LRT OVER BNSF
BRIDGE R0697
BRIDGE SURVEY PLAN

DISCIPLINE: STRUCTURES

SHEET NAME: CBRR0697-BRG-BOR-001-1

SHEET 59 OF 64

Sep. 10 2015 11:36 am V:\3400_ADC\CAD\segment e4\plan sheets\structures\R0697\CBRR0697-BRG-BOR-001.dwg By: lisa.thompson

PVI STA: 2932+50.00
PVI ELEV: 849.58
AD: −4.200
r: −1.00
420.00' VC

PROFILE GRADE
TOP OF RAIL @
℄ TRACK 2
(FG−EB−TRK−E4)

℄ BRG.
S. ABUT.

℄ PIER 1

℄ PIER 2

EXISTING
GROUND LINE

1163 CW
Elevation 821.2

1164 CW
Elevation 821.0

1165 CW
Elevation 821.5

Pore Pressure (psi) 0 40 80 120 160
Tip Resistance (psi) 0 1600 3200 4800 6400 8000
Friction Ratio (%) 0 2 4 6 8 10

EL. 721.2

EL. 738.5

EL. 748.4

870 860 850 840 830 820 810 800 790 780 770 760 750 740 730 720 710 700

5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95

2931+00 2932+00 2933+00

NOTES:

THE MATERIAL DESCRIPTIONS ARE CLASSIFIED ACCORDING TO THE UNIFIED SOIL CLASSIFICATION SYSTEM. DETAILS ON THE SYSTEM CAN BE FOUND IN THE FADR AND IN ASTM: D2488. THE SOIL GROUP CATEGORY PER THE AASHTO SOIL CLASSIFICATION SYSTEM IS ALSO SHOWN.

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: KAE | CHECKED BY: EJT
DRAWN BY: LMT | DATE: 9/14/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4B
LRT OVER BNSF
BRIDGE R0697
BRIDGE SURVEY PROFILE 1

DISCIPLINE: STRUCTURES

SHEET NAME: CBRR0697-BRG-BOR-002-1

SHEET 60 OF 64

Sep. 10 2015 11:37 am V:\3400_ADC\CAD\segment e4\plan sheets\structures\R0697\CBRR0697-BRG-BOR-002.dwg By: lisa.thompson

PVI STA: 2932+50.00
PVI ELEV: 849.58
AD: −4.200
r: −1.00
420.00' VC

PROFILE GRADE
TOP OF RAIL @
℄ TRACK 2
(FG−EB−TRK−E4)

EVCS: 2934+60.00
EVCE: 850.73

0.55%

℄ PIER 2 | ℄ PIER 3 | ℄ PIER 4 | ℄ PIER 5

EXISTING
GROUND LINE

1158 SB
Elevation 847.3

1136 SW
Elevation 821.3

Coh N60		
	*	11.5" Bituminous pavement
	27	
	38	
	21	
	27	
	33	Sand with silt and gravel, apparent cobbles, pieces of brick around 20', brown, a little dark brown (A−1−b) fill
	29	
	50/.4	
	27	
	20	
N60 Coh	7	
17	8	Gravelly sand with silt, a little fat clay brown (A−1−b, A−7−6) fill
9	▼ 3	
16		LEAN CLAY, gray and brown mottled, a little brown, soft (CL/CH) (A−7−6) alluvium
17	1375	FAT CLAY, brownish gray, a little gray and brown mottled, lenses of waterbearing sand below 33½', laminations of silt (CH) (A−7−6) alluvium
16	7	
24	580	
17 1080	3	FAT CLAY, grayish brown to dark brownish gray, a little light brownish gray, firm to soft, laminations of silt (CH) (A−7−6) alluvium
9	2	
	24	SAND WITH SILT, fine grained, brown to brownish gray, moist, medium dense, a lens of clayey sand (SP−SM) (A−3) alluvium
18 1615	17	
	33	SAND, medium to fine grained, brown, waterbearing, dense (SP) (A−1−b) alluvium
16 ▼		
14 1395	33	SAND, a little gravel, medium grained, brown, waterbearing, dense (SP) (A−1−b) alluvium
34 1790	22	SAND WITH GRAVEL, medium grained, brown, waterbearing, medium dense (SP) (A−1−b) alluvium
16 1705	14	
12	11	FAT CLAY, dark gray and brownish gray mottled, stiff (CH) (A−7−6) alluvium
23	11	
35	18	SANDY LEAN CLAY, a little gravel, brown, very stiff (CL) (A−6) till
62	11	
Top of Bedrock		
*	19	
100/.2	23	CLAYEY SAND, a little gravel, brown, stiff to very stiff (SC) (A−6) till
	17	
	13	SANDY LEAN CLAY, a little gravel, dark brownish gray, stiff, a lamination of waterbearing fine grained sand (CL) (A−6) till
	15	SAND WITH SILT, a little gravel, fine to medium grained, brown, waterbearing, medium dense (SP−SM) (A−1−b) alluvium
	60	GRAVEL WITH SILT AND SAND, possible cobbles/ boulders around 112½', brown, waterbearing, very dense (GP−GM) alluvium or colluvium
		Top of Bedrock
	100/.3	SANDSTONE, fresh, light gray and gray
	100/.2	END OF BORING

Sand, a little gravel, light brown and light grayish brown (A−1−b, A−3) fill

FAT CLAY, brownish gray to brown, a little dark brownish gray, stiff, laminations of silt (CH) (A−7−6) alluvium

SANDY LEAN CLAY, a little gravel, brown and gray mottled to brown to brownish gray, stiff to hard (CL) (A−6) till

CLAYEY SAND, a little gravel, brown to brown and gray mottled, very stiff (SC) (A−6) till

SANDY LEAN CLAY, a little gravel, dark gray, stiff (CL) (A−6) till

SAND WITH SILT, fine grained, brown and light gray, waterbearing, medium dense (SP−SM) (A−3) alluvium

SAND, fine grained, light gray, waterbearing, dense (SP) (A−3) alluvium

SAND WITH SILT, a little gravel, fine to medium grained, grayish brown, waterbearing, very dense (SP−SM) (A−3) alluvium

*59/.5 + 90/.5 + 10/.1
SANDSTONE, weathered to fresh, light gray

END OF BORING

EL. 752.1

* 4/.5 + 75/.5

EL. 722.6

* 8/.5 + 13/.5

880 870 860 850 840 830 820 810 800 790 780 770 760 750 740 730 720 710

2933+00 | 2934+00 | 2935+00

NOTES:

THE MATERIAL DESCRIPTIONS ARE CLASSIFIED ACCORDING TO THE UNIFIED SOIL CLASSIFICATION SYSTEM. DETAILS ON THE SYSTEM CAN BE FOUND IN THE FADR AND IN ASTM: D2488. THE SOIL GROUP CATEGORY PER THE AASHTO SOIL CLASSIFICATION SYSTEM IS ALSO SHOWN.

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: KAE | CHECKED BY: EJT
DRAWN BY: LMT | DATE: 9/14/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4B
LRT OVER BNSF
BRIDGE R0697
BRIDGE SURVEY PROFILE 2

DISCIPLINE: STRUCTURES
SHEET NAME: CBRR0697-BRG-BOR-002-2

SHEET 61 OF 64

Sep. 10 2015 11:37 am V:\3400_ADC\CAD\segment e4\plan sheets\structures\R0697\CBRR0697-BRG-BOR-002.dwg By: lisa.thompson

PROFILE GRADE
TOP OF RAIL @
℄ TRACK 2
(FG-EB-TRK-E4)

EXISTING
GROUND LINE

℄ PIER 5

℄ PIER 6

1159 SB
Elevation 848.2

0.55%

12" Bituminous pavement
Silty sand with gravel, dark brown (A-1-b) fill
*13/.5 + 30/.5

Mixture of sand with silt and silty sand, with gravel, possible cobbles from 3' to 4½', pieces of brick around 18', brown and dark brown (A-1-b) fill

Mixture of sand with silt, clayey sand and sand, with gravel, dark brown and light brown, a little brownish gray (A-1-b) fill

FAT CLAY, gray and dark brownish gray mottled, firm to stiff (CH) (A-7-6) alluvium

GRAVEL WITH SILT AND SAND, brown, moist, dense (GP-GM) (A-1-b) alluvium

SILT, brown, a little light grayish brown, moist, dense, lenses and laminations of sand (ML) (A-4) alluvium

GRAVELLY SAND, medium to coarse grained, brown, moist, medium dense (SP) (A-1-b) alluvium

SILT WITH SAND, brown, a little gray, moist, very dense, lenses of sand with silt, laminations of fat clay (ML) (A-4) alluvium

GRAVELLY SAND, possible cobbles, medium grained, brown, moist, very dense (SP) (A-1-b) alluvium

SILTY SAND WITH GRAVEL, fine to medium grained, brown, moist, very dense (SP) (A-1-b) alluvium or fill

SAND WITH SILT AND GRAVEL, fine grained, brown, a little dark brown, light brown and gray, moist, very dense, laminations of sandy lean clay and lean clay (SP-SM) (A-1-b) alluvium

SANDY SHALE, weathered, light brown and gray

SANDSTONE, weathered to fresh, light gray, a little brown to light tan, a little brown
END OF BORING

N60	Coh
*	
24	
41	
33	
38	
18	
27	
24	
15	
9	
6	
5	
13	
43	
36	
25	
55	
**	
146	
59	
***	
100/.4	

EL. 788.3

* 13/.5 + 30/.5
** 11/.5 + 71/.5 + 100/.4
*** 72/.5 + 100/.25

℄ PIER 7

1021 SB
Elevation 846.5

N60	Coh	
*		11.5" Bituminous pavement
27		Sand with silt and gravel, pieces of concrete and wood (A-1-b) fill
35		Sand with silt, a little gravel, pieces of concrete, brown (A-1-b) fill
26		
25		Sand with silt, a little gravel and clayey sand, a piece of wood around 15', brown, a little black (A-1-b) fill
18		
25		
25		Sand with gravel, light brown (A-1-b) fill
9		
8		Mixture of organic clay and clayey sand, pieces of brick and glass, trace roots, black and brown (A-6) fill
6		
5	760	LEAN CLAY, brown and gray mottled, a little brown, firm, laminations of sand (CL) (A-7-6) alluvium
10	1140	FAT CLAY, dark grayish brown, a little light grayish brown, laminations of silt (CH) (A-7-6) alluvium
		FAT CLAY, gray to grayish brown, a little light grayish brown, stiff to very stiff, laminations of silt (CH) (A-7-6) alluvium
19		SAND WITH SILT, a little gravel, brown, a little grayish brown, moist, medium dense, lenses of clayey sand (SM) (A-2-4) alluvium
15		
53		
**		SILTY SAND WITH GRAVEL, fine to medium grained, brown, a little light brown, moist, medium dense, a lens of sand (SM) (A-2-4) alluvium
70		
100/.1		GRAVELLY SAND WITH SILT, fine to medium grained, brown, moist, very dense (SP-SM) (A-1-b) alluvium
		SAND WITH SILT AND GRAVEL, fine to medium grained, light brown, moist, very dense (SP-SM) (A-1-b) alluvium

EL. 796.5

Top of Bedrock
DOLOSTONE, weathered, light brown
END OF BORING - HSA Obstructed

* 10/.5 + 13/.5
** 4/.5 + 75/.5 + 50/.1

℄ PIER 8

NOTES:

THE MATERIAL DESCRIPTIONS ARE CLASSIFIED ACCORDING TO THE UNIFIED SOIL CLASSIFICATION SYSTEM. DETAILS ON THE SYSTEM CAN BE FOUND IN THE FADR AND IN ASTM:D2488. THE SOIL GROUP CATEGORY PER THE AASHTO SOIL CLASSIFICATION SYSTEM IS ALSO SHOWN.

880 870 860 850 840 830 820 810 800 790 780 770 760 750 740 730 720 710

2935+00 2936+00 2937+00

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: KAE CHECKED BY: EJT
DRAWN BY: LMT DATE: 9/14/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4B
LRT OVER BNSF
BRIDGE R0697
BRIDGE SURVEY PROFILE 3

DISCIPLINE: STRUCTURES
SHEET NAME: CBRR0697-BRG-BOR-002-3

SHEET 62 OF 64

Sep. 10 2015 11:37 am V:\3400_ADC\CAD\segment e4\plan sheets\structures\R0697\CBRR0697-BRG-BOR-002.dwg By: lisa.thompson

PVI STA: 2939+24.59
PVI ELEV: 853.29
AD: −3.050
r: −1.53
200.00' VC

PROFILE GRADE
TOP OF RAIL @
℄ TRACK 2
(FG-EB-TRK-E4)

℄ PIER 9

℄ BRG.
N. ABUT.

EXISTING
GROUND LINE

0.55%

−2.50%

BVCS: 2938+24.59
BVCE: 852.74

EVCS: 2940+24.59
EVCE: 850.79

1204 SB
Elevation 821.5

Coh	N60	
	21	Gravel with clay and sand, dark brown (A-1-b) fill
	9	
	11	
980	11	
1830	9	
1295	13	FAT CLAY, grayish brown, a little light grayish brown, brown and gray, mottled and brownish gray, stiff, laminations of silt (CH) (A-7-6) alluvium
1730	9	
	11	
1380 ▼	14	
1850	15	
	16	LEAN CLAY, grayish brown, a little brown and light grayish brown, very stiff, laminations of sand and silt (CL/CH) (A-7-6) alluvium
	20	CLAYEY SAND, grayish brown, very stiff (SC) (A-2-6) alluvium
	25	GRAVELLY SAND, medium to coarse grained, brown, waterbearing, medium dense (SP) (A-1-b) alluvium
	24	SAND WITH GRAVEL, medium to fine grained, brown, waterbearing, medium dense (SP) (A-1-b) alluvium
	89	SANDY LEAN CLAY, a little gravel, brownish gray, hard (CL) (A-6) till
		GRAVELLY SAND, medium to fine grained, brown, waterbearing, very dense, lenses of clayey sand (SP) (A-1-b) alluvium
	100	Top of Bedrock
	100/.4	SANDSTONE, weathered to fresh, light gray to light brown END OF BORING

EL. 756.6

1008 SB
Elevation 849.8

Coh	N60	
	5	
	9	Clayey sand, a little gravel, sandy lean clay, silty sand and sand, pieces of concrete, brick, bituminous and mortar, trace roots, dark brown, a little black, brown and light gray (A-6) fill
	21	
	13	
	14	
	16	
	9	Mixture of sand with silt and sand, a little gravel, brown and grayish brown (A-3, A-1-b) fill
	7	
	8	SAND WITH SILT, fine to medium grained, grayish brown, a little brown, moist, loose (SP-SM) (A-3) alluvium or fill
	15	SAND, a little gravel, medium to fine grained, light brown, a little brown, moist, medium dense (SP) (A-1-b) alluvium or fill
	11	
	12	
1670	11	LEAN CLAY, brownish gray, a little grayish brown and gray, stiff (CL) (A-7-6) alluvium
1950		
1840	10	LEAN CLAY, brownish gray, lenses and laminations of silty sand (CL) (A-7-6) alluvium
2560	12	LEAN CLAY, dark brownish gray, a little brownish gray and brown, stiff, laminations of silt and silty sand (CL) (A-7-6) alluvium
1200	15	FAT CLAY, brownish gray, a little light brown (CH/CL) (A-7-6) alluvium
	14	
	13	FAT CLAY, dark brownish gray to dark grayish brown, a little light tan and gray, stiff, laminations of silt (CH) (A-7-6) alluvium
	15	
	18	SANDY LEAN CLAY, a little gravel, brownish gray, stiff (CL) (A-6) till
	19	LEAN CLAY WITH SAND, brownish gray, very stiff (CL) (A-6) till
	23	CLAYEY SAND WITH GRAVEL, grayish brown, very stiff (SC) (A-6) till
▼	14	
	16	SANDY LEAN CLAY, grayish brown, very stiff (CL) (A-6) till
	44	LEAN CLAY, grayish brown, stiff to very stiff (CL) (A-6) alluvium
	25	
		SILTY SAND, possible cobbles, fine to medium grained, grayish brown, wet, dense (SM) (A-2-4) alluvium
		GRAVEL WITH SAND, gray, waterbearing (GP) (A-1-b) till or colluvium
	50/.4	CLAYEY SAND, a little gravel, apparent cobbles, grayish brown, very stiff (SC) (A-6) till and colluvium Top of Bedrock
	60/.1	SANDSTONE, weathered to fresh, light gray
		END OF BORING

EL. 730.2

NOTES:

THE MATERIAL DESCRIPTIONS ARE CLASSIFIED ACCORDING TO THE UNIFIED SOIL CLASSIFICATION SYSTEM. DETAILS ON THE SYSTEM CAN BE FOUND IN THE FADR AND IN ASTM:D2488. THE SOIL GROUP CATEGORY PER THE AASHTO SOIL CLASSIFICATION SYSTEM IS ALSO SHOWN.

880 870 860 850 840 830 820 810 800 790 780 770 760 750 740 730 720 710

2938+00 2939+00 2940+00

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: KAE | CHECKED BY: EJT
DRAWN BY: LMT | DATE: 9/14/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4B
LRT OVER BNSF
BRIDGE R0697
BRIDGE SURVEY PROFILE 4

DISCIPLINE: STRUCTURES
SHEET NAME: CBRR0697-BRG-BOR-002-4

SHEET 63 OF 64

Sep. 10 2015 11:37 am V:\3400_ADC\CAD\segment e4\plan sheets\structures\R0697\CBRR0697-BRG-BOR-002.dwg By: lisa.thompson

℄ CSAH 40 (GLENWOOD AVE)
(CSAH 40 (GLENWOOD AVE))

℄ PROPOSED BNSF
WAYZATA SUB TRACK
(BNSF WAYZATA SUB TRK 2)

℄ EXISTING BNSF
WAYZATA SUB TRACK
(BNSF WAYZATA SUB TRK 1)

SOE (TYP.)

PROPOSED BRIDGE NO. 27C16

℄ TRACK 1
(WB–TRK–E4)

℄ TRACK 2
(EB–TRK–E4)
& WORKING LINE

℄ BRG.
S. ABUT.

℄ BRG.
N. ABUT.

℄ PIER 1

℄ PIER 2

℄ PIER 3

℄ PIER 4

℄ PIER 5

℄ PIER 6

℄ PIER 7

℄ PIER 8

℄ PIER 9

PROPOSED
BRIDGE NO. 27C17

BASSETT
CREEK TUNNEL

NOTES:

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."

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: RHK | CHECKED BY: EJT
DRAWN BY: LMT | DATE: 9/14/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

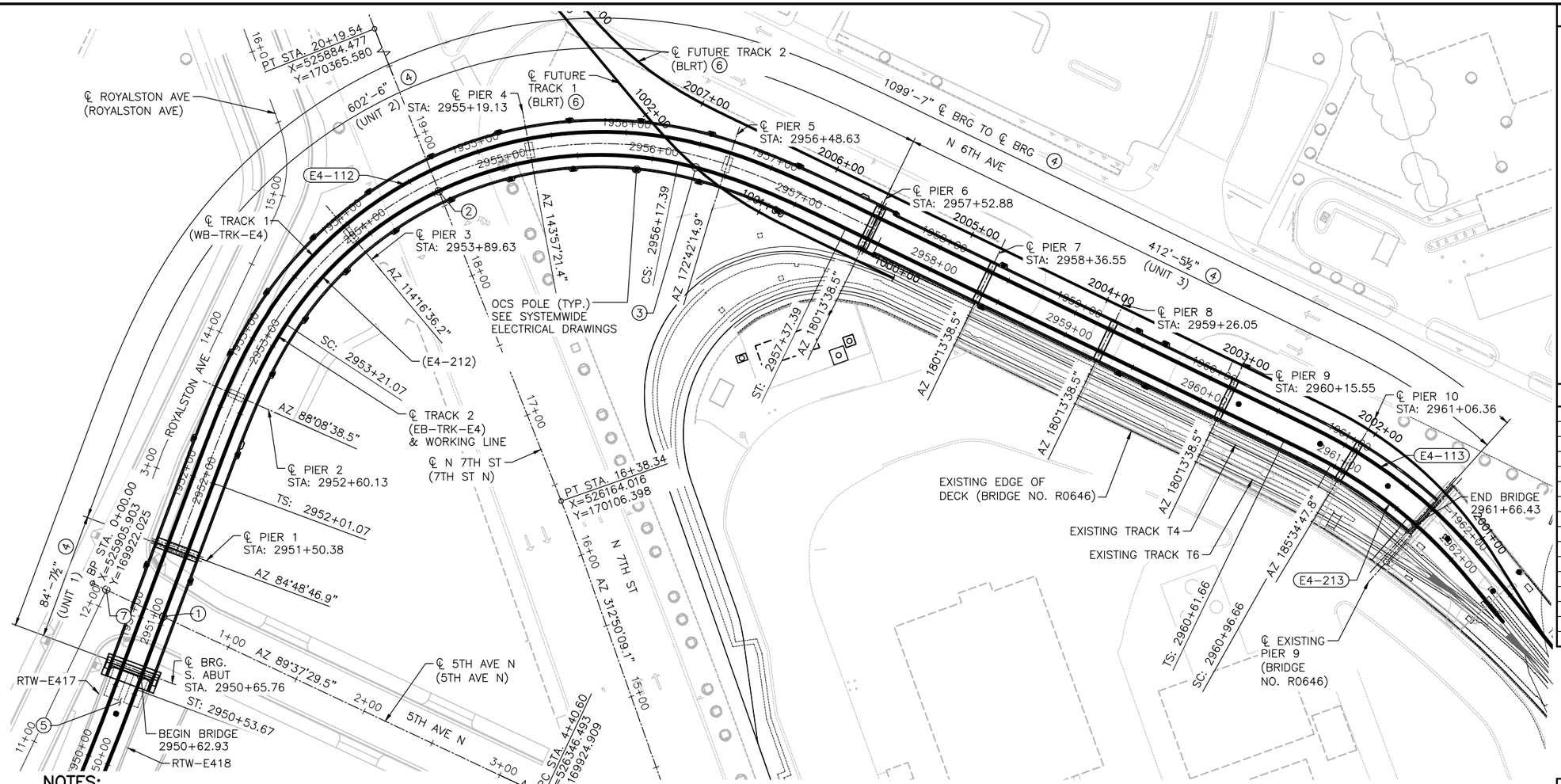
CIVIL EAST - VOLUME 4B
LRT OVER BNSF
BRIDGE R0697
STAGING PLAN

DISCIPLINE: STRUCTURES

SHEET NAME: CBRR0697-BRG-STG-001

SHEET 64 OF 64

Sep. 10 2015 01:05 pm V:\3400_ADC\CAD\SEGMENT E4\PLAN SHEETS\STRUCTURES\R0697\CBRR0697-BRG-STG-001.dwg By: lisa.thompson



NOTES:

SEE BRIDGE SURVEY SHEET FOR IN PLACE UTILITIES.

SEE SHEET 69 FOR TRACK CURVE DETAILS. SEE SHEETS 2–5 FOR ADDITIONAL TRACK LAYOUT INFORMATION.

① CONTROL POINT 1
℄ TRACK 2 (EB–TRK–E4) STA. 2951+05.41
℄ 5TH AVE N (5TH AVE N) STA. 0+52.25
X = 525958.153
Y = 169922.367
ANGLE = 94°48'42.6"

② CONTROL POINT 2
℄ TRACK 2 (EB–TRK–E4) STA. 2954+53.85
℄ N 7TH ST (7TH ST N) STA. 18+60.43
X = 526001.151
Y = 170257.402
ANGLE = 93°50'28.0" (T.T.C.)

③ CONTROL POINT 3
℄ TRACK 2 (EB–TRK–E4) STA. 2956+29.51
℄ FUTURE TRACK 1 STA. 1001+51.41
X = 526148.834
Y = 170345.712
ANGLE = 26°26'28.0" (T.T.C.)

④ DIMENSIONS MEASURED ALONG ℄ TRACK 2. SEE SHEETS 2–5 FOR SPAN LENGTHS.

⑤ SEE TRACK PLANS FOR TRANSITION SLAB DETAILS.

⑥ BLRT ALIGNMENT SHOWN IS BASED ON PRELIMINARY INFORMATION WILL BE UPDATED AS ADDITIONAL INFORMATION IS AVAILABLE.

⑦ ℄ 5TH AVE N (5TH AVE N) STA. 0+10.20 =
℄ ROYALSTON AVE (ROYALSTON AVE) STA. 12+11.99
X = 525916.107
Y = 169922.091
ANGLE = 90°16'01.31" (T.T.C.)

KEY PLAN
0 20' 40' 80'
SCALE IN FEET

DESIGN DATA

2014 AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS
7TH EDITION AND CURRENT INTERIMS

SOUTHWEST LIGHT RAIL TRANSIT DESIGN CRITERIA
(REVISION 4.0)

LOAD AND RESISTANCE FACTOR DESIGN METHOD

LRV & MV LOADING DIAGRAM SHOWN ON SHEET 6

MATERIAL DESIGN PROPERTIES
REINFORCED CONCRETE:
f'c = 4,000 PSI n = 8
fy = 60,000 PSI REINFORCEMENT

PRESTRESSED CONCRETE:
f'c = 8,000 PSI n = 1
fpu = 270 KSI LOW RELAXATION STRANDS
0.75 x fpu FOR INITIAL PRESTRESS

REINFORCED CONCRETE BOX GIRDER:
f'c = 5500 PSI n = 6

DESIGN SPEED: OVER = 15 MPH (LRT)
UNDER = 30 MPH (VEH)

APPROXIMATE DECK AREA 34640 SQ. FT.

LIST OF SHEETS

2040 PROJECTED TRAFFIC VOLUMES

	5TH AVE N	7TH ST N
A.D.T.	1,700	11,500
D.H.V.	120	990
A.D.T.T.	230	1,590

BRIDGE NO. 27C18

SOUTHWEST LRT TRACKS OVER 5TH AVENUE NORTH AND 7TH STREET. LOCATED 0.3 MILES EAST OF JCT. T.H. 55 (OLSON MEMORIAL HIGHWAY) AND INTERSTATE 94.

BRIDGE ID NOS. 501, 607 & 501

KEY PLAN

SEC 22 T 29N R 24W
CITY OF MINNEAPOLIS HENNEPIN COUNTY

DRAFT-WORK IN PROCESS

JOB NO.: T9N635 | STATE PROJ. NO.: 9909–01 | MNDOT REVIEW: JOE NIETFIELD

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: KR | CHECKED BY: KJK
DRAWN BY: MSK | DATE: 09/18/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

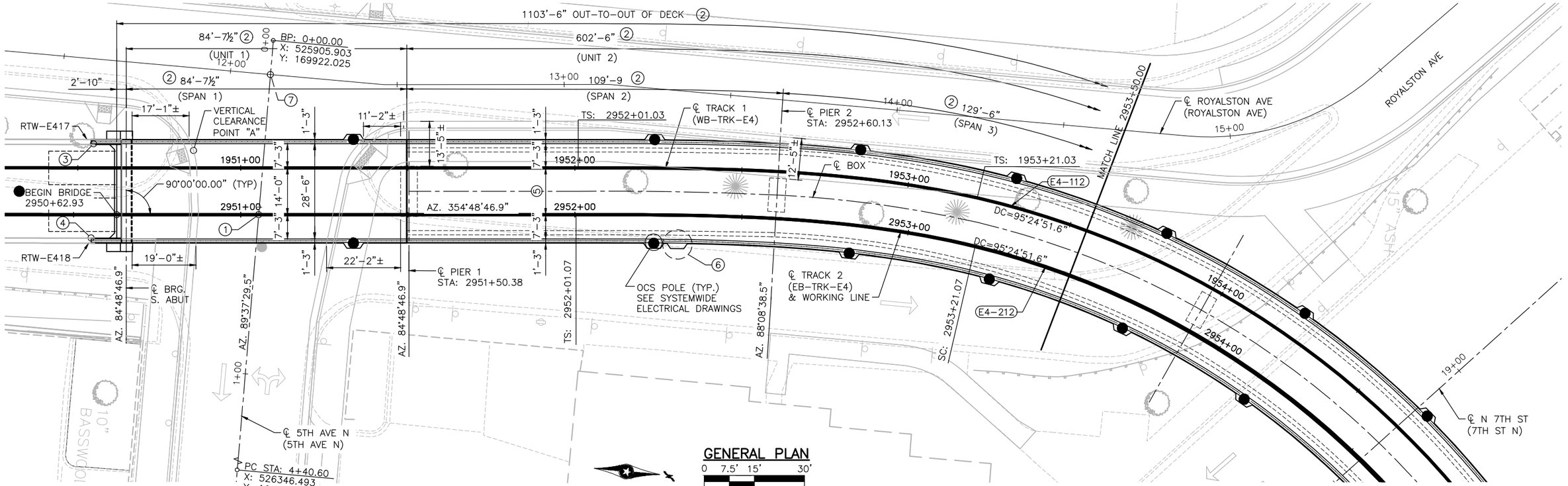
SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4B
5TH AVENUE AND 7TH STREET
BRIDGE 27C18
KEY PLAN

DISCIPLINE: STRUCTURES
SHEET NAME: CBR27C18-BRG-GPE-001

SHEET 1 OF 80

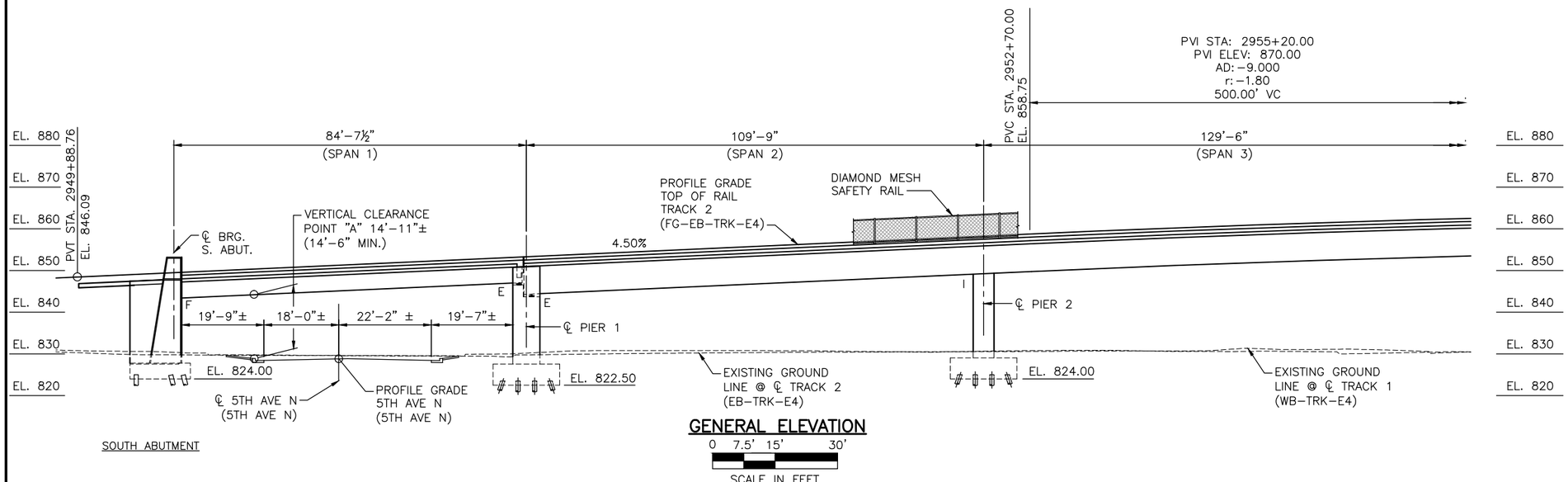
Sep. 18 2015 07:18 am V:\3400_ADC\CAD\SEGMENT E4\PLAN SHEETS\STRUCTURES\27C18\CBR27C18-BRG-GPE-001.dwg By: mark.krzyzewski



GENERAL PLAN

0 7.5' 15' 30'

SCALE IN FEET



GENERAL ELEVATION

0 7.5' 15' 30'

SCALE IN FEET

NOTES:

1. CONTROL POINT 1
   ℄ TRACK 2 (EB-TRK-E4) STA. 2951+05.41
   ℄ 5TH AVE N (5TH AVE N) STA. 0+52.25
   X = 525958.153
   Y = 169922.367
   ANGLE = 94°48'42.6"
2. DIMENSIONS MEASURED ALONG ℄ TRACK 2.
3. END OF WINGWALL = BEGIN RET. WALL E417 ℄ TRACK 2 (EB-TRK-E4) STA. 2950+55.26, 22.50 LT.
   X=525940.279; Y=169870.384
4. END OF WINGWALL = BEGIN RET. WALL E418 ℄ TRACK 2 (EB-TRK-E4) STA. 2950+55.26, 8.50 RT.
   X=525971.152; Y=169873.187
5. 14'-0": STA. 2951+50.38 TO STA. 2952+01.07

   TRANSITION 14'-0" TO 16'-0": STA. 2952+01.07 TO STA. 2957+37.39

   16'-0": STA. 2957+37.39 TO 2957+52.88
6. RAIL LUBRICATOR EQUIPMENT BLISTER TO BE COORDINATED DURING ADVANCE DESIGN.
7. ℄ 5TH AVE N (5TH AVE N) STA. 0+10.20 = ℄ ROYALSTON AVE (ROYALSTON AVE) STA. 12+11.99
   X = 525916.107
   Y = 169922.091
   ANGLE = 90°16'01.31"

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: KR | CHECKED BY: KJK
DRAWN BY: MSK | DATE: 09/18/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

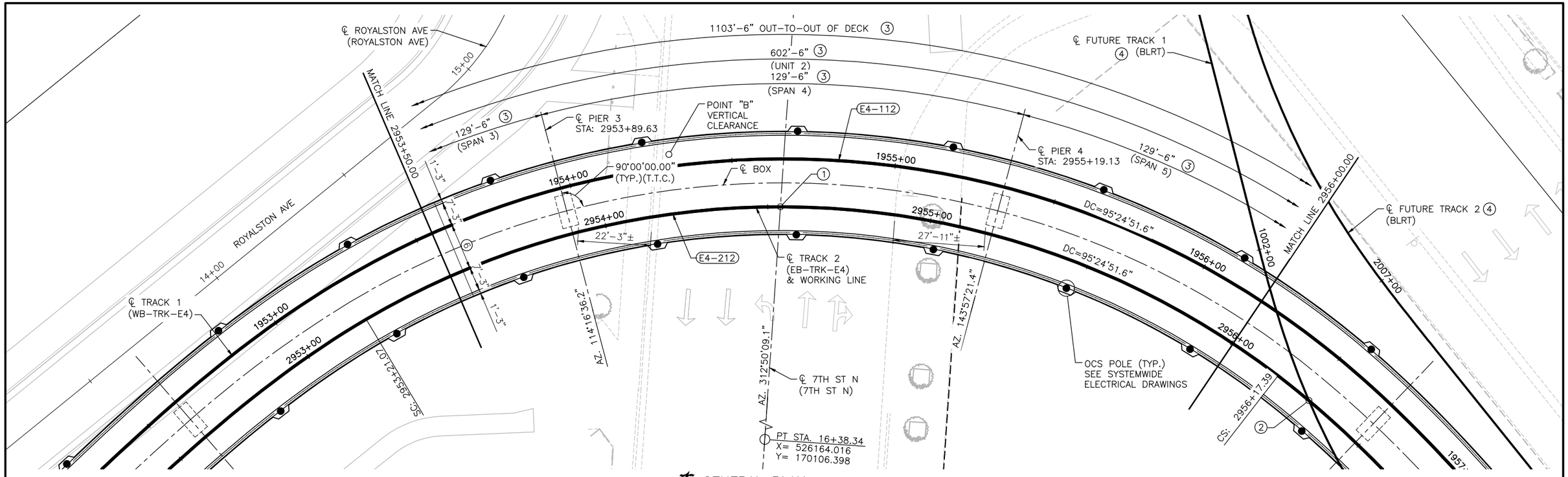
CIVIL EAST - VOLUME 4B
5TH AVENUE AND 7TH STREET BRIDGE 27C18
GENERAL PLAN & ELEVATION 1

DISCIPLINE: STRUCTURES

SHEET NAME: CBR27C18-BRG-GPE-002

SHEET 2 OF 80

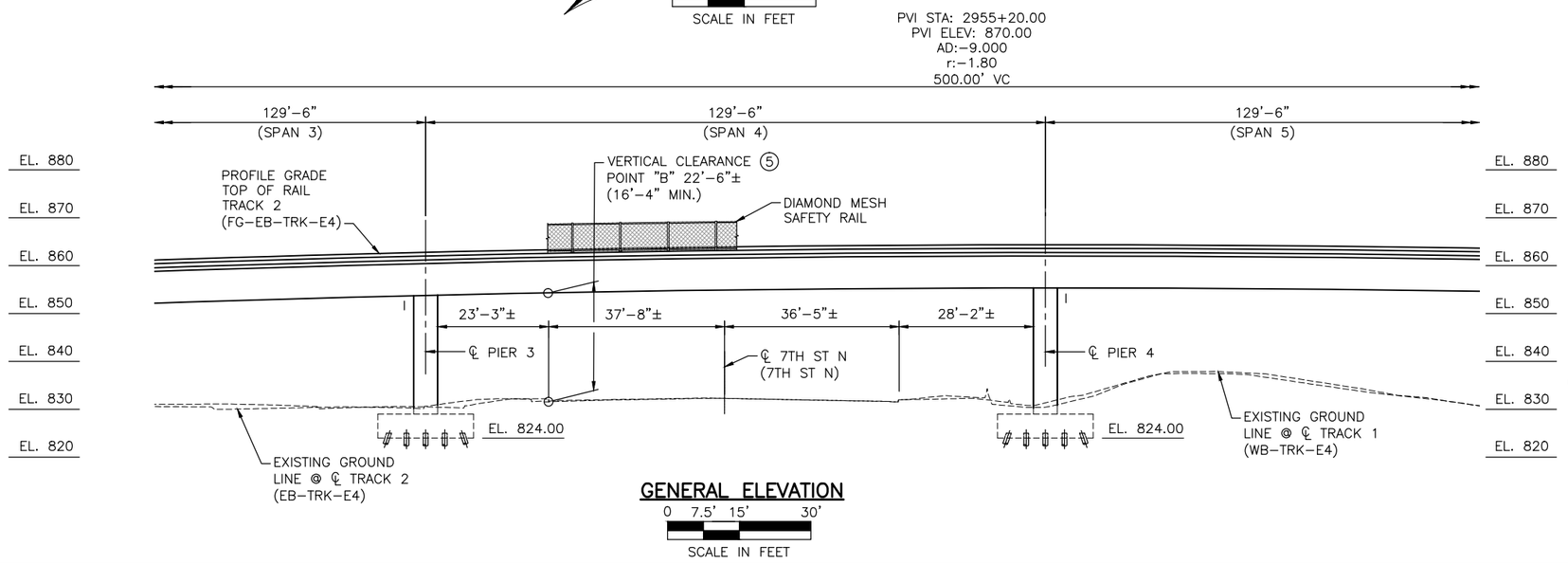
Sep. 17 2015 02:43 pm v:\3400_ADC\CAD\SEGMENT E4\PLAN SHEETS\STRUCTURES\27C18\CBR27C18-BRG-GPE-002.dwg By: mark.krzyzewski



GENERAL PLAN

0 7.5' 15' 30'

SCALE IN FEET



GENERAL ELEVATION

0 7.5' 15' 30'

SCALE IN FEET

NOTES:

1. CONTROL POINT 2
   ℄ TRACK 2 (EB-TRK-E4) STA. 2954+53.85
   ℄ 7TH ST N (7TH ST N) STA. 18+60.43
   X = 526001.151
   Y = 170257.402
   ANGLE = 93°50'28.0" (T.T.C.)
2. CONTROL POINT 3
   ℄ TRACK 2 (EB-TRK-E4) STA. 2956+29.51
   ℄ FUTURE TRACK 1 STA. 1001+51.41
   X = 526148.834
   Y = 170345.712
   ANGLE = 26°26'28.0" (T.T.C.)
3. DIMENSIONS MEASURED ALONG ℄ TRACK 2.
4. BLRT ALIGNMENT AND PROFILE SHOWN IS BASED ON PRELIMINARY INFORMATION AND WILL BE UPDATED AS ADDITIONAL INFORMATION IS AVAILABLE.
5. CRITICAL CLEARANCE DATA BASED ON SURVEY TAKEN AT TOP OF ROADWAY.
6. 14'-0": STA. 2951+50.38 TO STA. 2952+01.07

   TRANSITION 14'-0" TO 16'-0": STA. 2952+01.07 TO STA. 2957+37.39

   16'-0": STA 2957+37.39 TO 2957+52.88

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: KR | CHECKED BY: KJK
DRAWN BY: MSK | DATE: 09/18/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

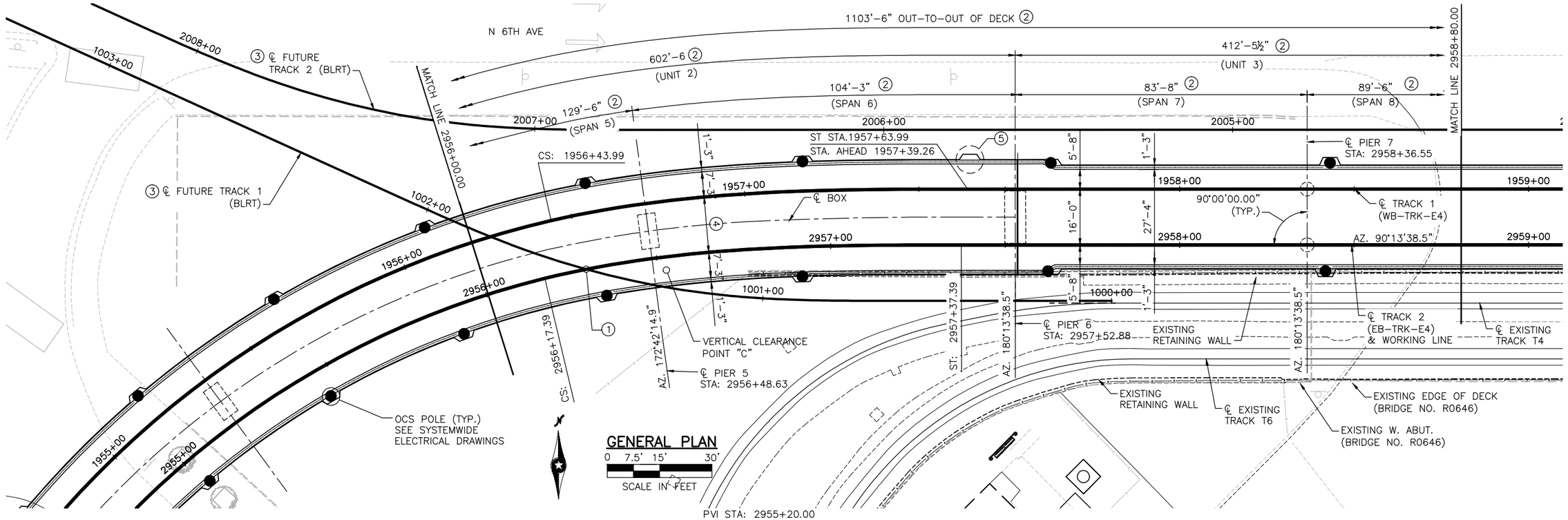
SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4B
5TH AVENUE AND 7TH STREET
BRIDGE 27C18
GENERAL PLAN & ELEVATION 2

DISCIPLINE: STRUCTURES

SHEET NAME: CBR27C18-BRG-GPE-003

SHEET 3 OF 80



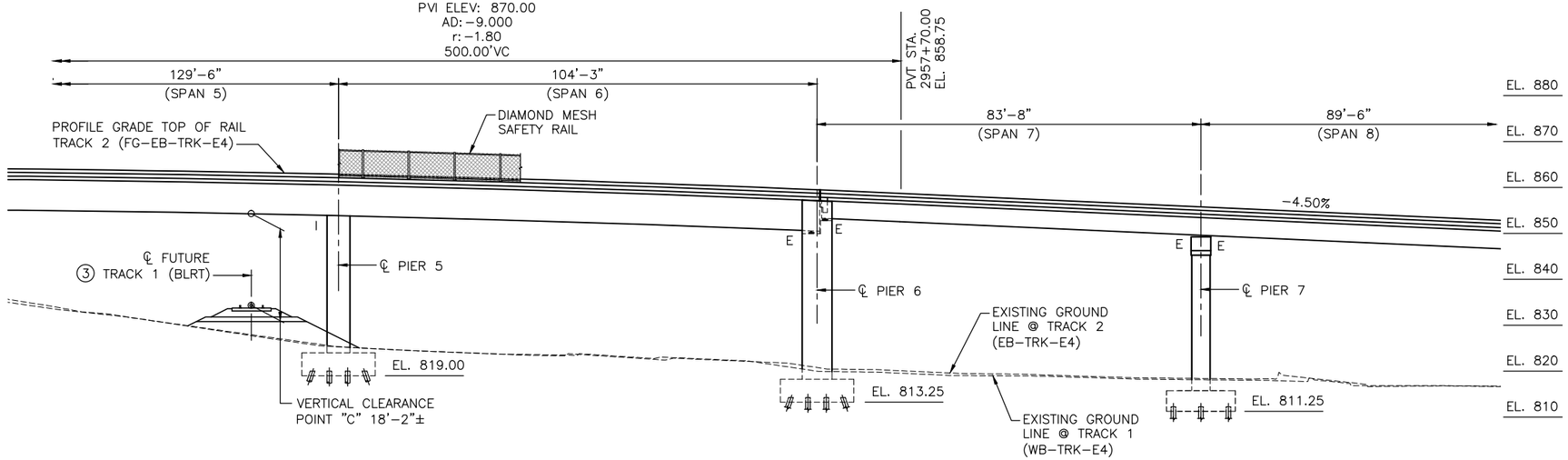
GENERAL PLAN

0 7.5' 15' 30'

SCALE IN FEET

PVI STA: 2955+20.00
PVI ELEV: 870.00
AD: −9.000
r: −1.80
500.00'VC

PVT STA. 2957+70.00
EL. 858.75



GENERAL ELEVATION

0 7.5' 15' 30'

SCALE IN FEET

NOTES:

1. CONTROL POINT 3
   ℄ TRACK 2 (EB-TRK-E4) STA. 2956+29.51
   ℄ FUTURE TRACK 1 STA. 1001+51.41
   X = 526148.834
   Y = 170345.712
   ANGLE = 26°26'28.0" (T.T.C.)
2. DIMENSIONS MEASURED ALONG ℄ TRACK 2.
3. BLRT ALIGNMENT SHOWN IS BASED ON PRELIMINARY INFORMATION AND WILL BE UPDATED AS ADDITIONAL INFORMATION IS AVAILABLE.
4. 14'-0": STA. 2951+50.38 TO STA. 2952+01.07

   TRANSITION 14'-0" TO 16'-0": STA. 2952+01.07 TO STA. 2957+37.39

   16'-0": STA 2957+37.39 TO 2957+52.88
5. RAIL LUBRICATOR EQUIPMENT BLISTER TO BE COORDINATED DURING ADVANCE DESIGN.

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: KR | CHECKED BY: KJK
DRAWN BY: MSK | DATE: 09/18/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

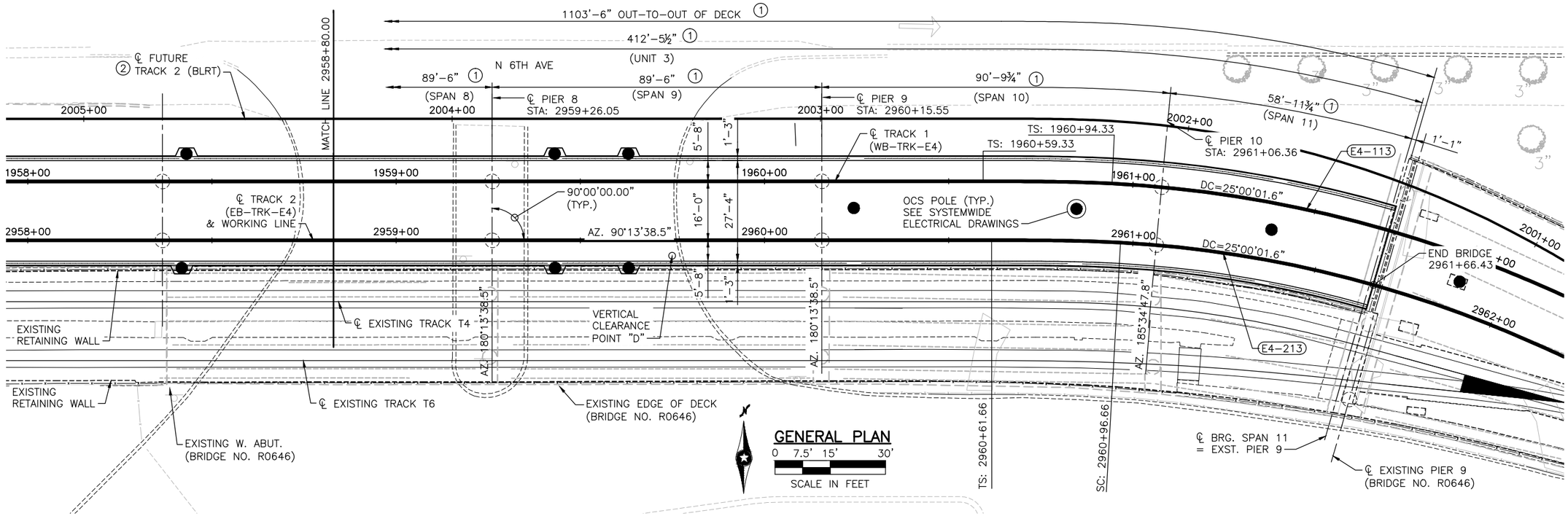
SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4B
5TH AVENUE AND 7TH STREET
BRIDGE 27C18
GENERAL PLAN & ELEVATION 3

DISCIPLINE: STRUCTURES
SHEET NAME: CBR27C18-BRG-GPE-004

SHEET 4 OF 80

Sep, 18 2015 07:22 am v:\3400_ADC\CAD\SEGMENT E4\PLAN SHEETS\STRUCTURES\27C18\CBR27C18-BRG-GPE-004.dwg By: mark.krzyzewski



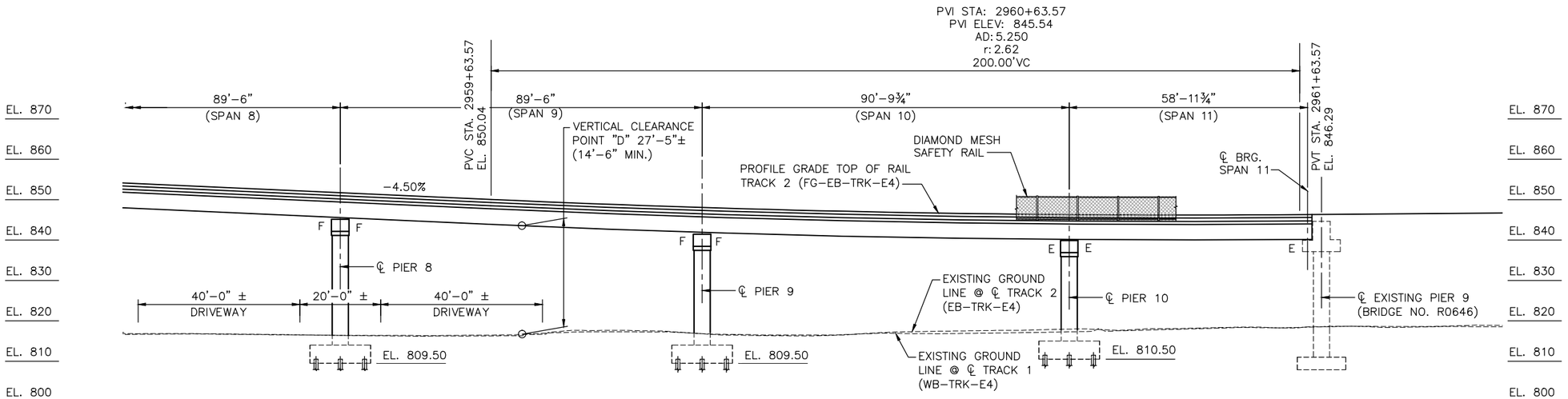
GENERAL PLAN

0 7.5' 15' 30'

SCALE IN FEET

NOTES:

1. DIMENSIONS MEASURED ALONG ℄ TRACK 2.
2. BLRT ALIGNMENT AND PROFILE SHOWN IS BASED ON PRELIMINARY INFORMATION AND WILL BE UPDATED AS ADDITIONAL INFORMATION IS AVAILABLE.



GENERAL ELEVATION

0 7.5' 15' 30'

SCALE IN FEET

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: KR | CHECKED BY: KJK
DRAWN BY: MSK | DATE: 09/18/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

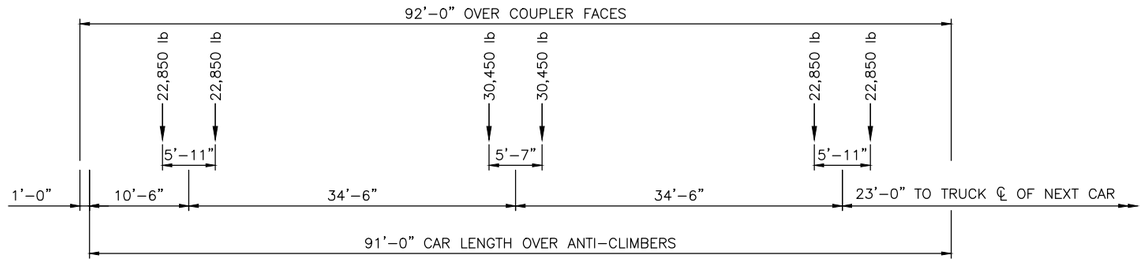
CIVIL EAST - VOLUME 4B
5TH AVENUE AND 7TH STREET
BRIDGE 27C18
GENERAL PLAN & ELEVATION 4

DISCIPLINE: STRUCTURES

SHEET NAME: CBR27C18-BRG-GPE-005

SHEET 5 OF 80

Sep. 17 2015 02:55 pm V:\3400_ADC\CAD\SEGMENT E4\PLAN SHEETS\STRUCTURES\27C18\CBR27C18-BRG-GPE-005.dwg By: mark.krzyzewski



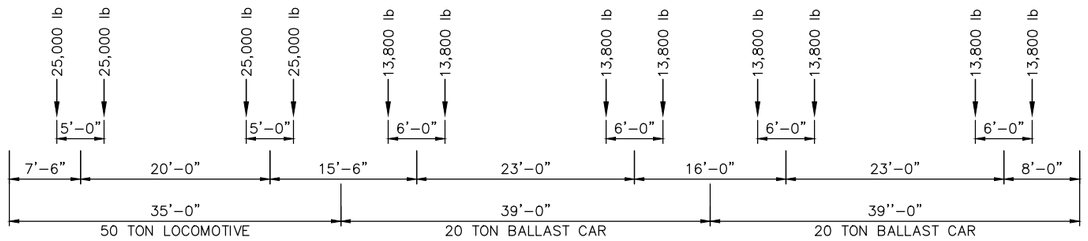
LIGHT RAIL VEHICLE LOADING DIAGRAM

NOTES:

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

AXLE LOAD IN POUNDS.

LOADING DIAGRAM REPRESENTS MAXIMUM LOAD AT EACH TRUCK.



MAINTENANCE TRAIN LOADING DIAGRAM

NOTES:

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.

AXLE LOAD IN POUNDS.

WEIGHT OF EMPTY BALLAST CAR IS 15,000 POUNDS.

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.

ALL REINFORCEMENT SHALL BE 2 INCHES CLEAR, UNLESS SHOWN OR NOTED OTHERWISE.

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.

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".

QUANTITY ESTIMATE FOR ENTIRE BRIDGE

ITEM NO.	ITEM	UNIT	QUANTITY
2401	STRUCTURAL CONCRETE (3B52)	CU. YD.	
2401	STRUCTURAL CONCRETE (1G52)	CU. YD.	
2401	STRUCTURAL CONCRETE (3JM)	CU. YD.	
2401	BRIDGE SLAB CONCRETE (3Y42)	SQ. FT.	
2401	TYPE CURB RAILING CONCRETE	LIN. FT.	
2401	REINFORCEMENT BARS	POUND	
2401	REINFORCEMENT BARS (EPOXY COATED)	POUND	
2402	EXPANSION JOINT DEVICES TYPE 4	LIN. FT.	
2402	EXPANSION JOINT DEVICES TYPE 5	LIN. FT.	
2402	BEARING ASSEMBLY	EACH	
2402	PRESTRESSED CONCRETE BEAMS MN45	LIN. FT.	
2405	DIAPHRAGMS FOR TYPE MN45 PRESTRESSED BEAMS	LIN. FT.	
2452	C-I-P CONCRETE PILING DELIVERED 12"	LIN. FT.	
2452	C-I-P CONCRETE PILING DRIVEN 12"	LIN. FT.	
2452	STEEL H-PILING DRIVEN 12"	LIN. FT.	
2452	STEEL H-PILING DELIVERED 12"	LIN. FT.	
2452	C-I-P CONCRETE TEST PILE 100-FT LONG 12"	EACH	
2452	C-I-P CONCRETE TEST PILE 98-FT LONG 12"	EACH	
2452	C-I-P CONCRETE TEST PILE 99-FT LONG 12"	EACH	
2452	C-I-P CONCRETE TEST PILE 97-FT LONG 12"	EACH	
2452	C-I-P CONCRETE TEST PILE 90-FT LONG 12"	EACH	
2452	STEEL H-TEST PILE 95-FT LONG 12"	EACH	
2452	STEEL H-TEST PILE 100-FT LONG 12"	EACH	
2452	STEEL H-TEST PILE 126-FT LONG 12"	EACH	
2452	STEEL H-TEST PILE 141-FT LONG 12"	EACH	
2452	STEEL H-TEST PILE 140-FT LONG 12"	EACH	
2452	PILE TIP PROTECTION 12"	EACH	
2481	MEMBRANE WATERPROOFING SYSTEM	SQ. YD.	
2502	DRAINAGE SYSTEM	EACH	
2545	CONDUIT SYSTEM	EACH	

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: KR | CHECKED BY: KJK
DRAWN BY: MSK | DATE: 09/18/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

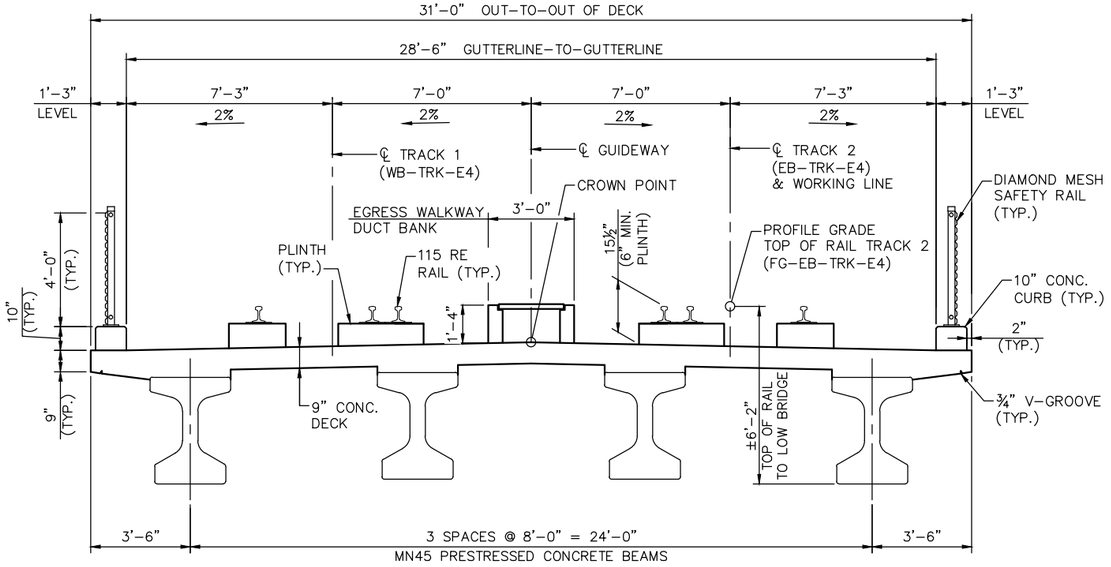
METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4B
5TH AVENUE AND 7TH STREET
BRIDGE 27C18
SCHEDULE OF QUANTITIES

DISCIPLINE: STRUCTURES
SHEET NAME: CBR27C18-BRG-TRN-001

SHEET 6 OF 80

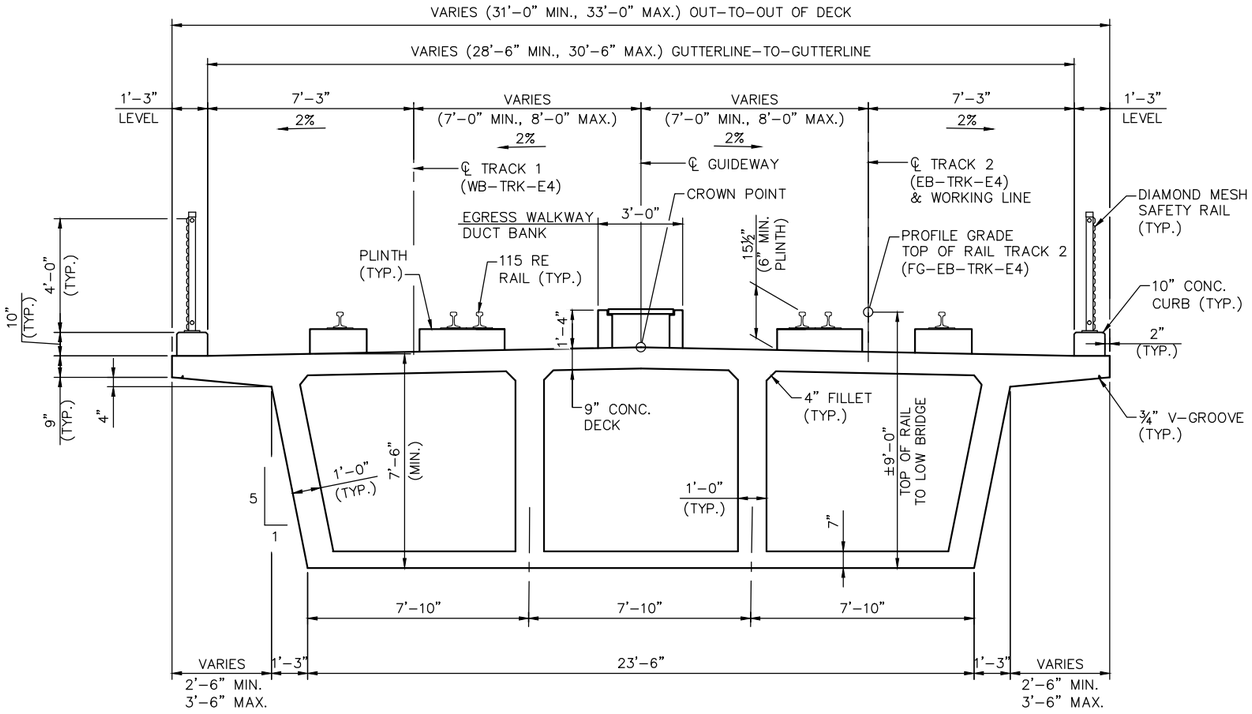


WEST

TRANSVERSE SECTION
(UNIT 1)

0 1.5' 3' 6'
SCALE IN FEET

EAST



WEST/NORTH

TRANSVERSE SECTION
(UNIT 2)

0 1.5' 3' 6'
SCALE IN FEET

EAST/SOUTH

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: KR | CHECKED BY: KJK
DRAWN BY: MSK | DATE: 09/18/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

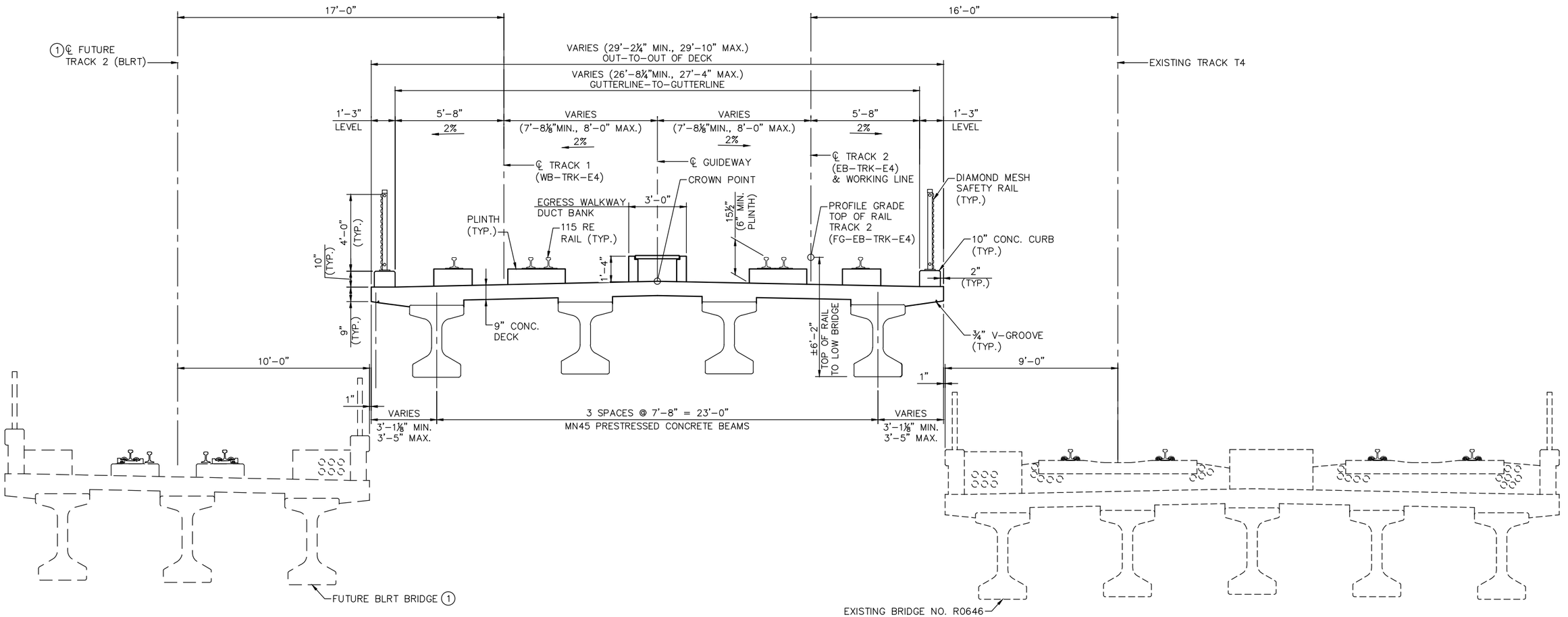
SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4B
5TH AVENUE AND 7TH STREET
BRIDGE 27C18
TRANSVERSE SECTION 1

DISCIPLINE: STRUCTURES
SHEET NAME: CBR27C18-BRG-TRN-002

SHEET 7 OF 80

Sep, 17 2015 02:56 pm v:\3400_ADC\CAD\SEGMENT E4\PLAN SHEETS\STRUCTURES\27C18\CBR27C18-BRG-TRN-002.dwg By: mark.krzyzewski



NORTH

SOUTH

TRANSVERSE SECTION

(UNIT 3)

0 1.5' 3' 6'

SCALE IN FEET

NOTES:

1. BLRT ALIGNMENT SHOWN IS BASED ON PRELIMINARY INFORMATION AND IS TO BE UPDATED AS ADDITIONAL INFORMATION IS AVAILABLE

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: KR | CHECKED BY: KJK
DRAWN BY: MSK | DATE: 09/18/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4 B
5TH AVENUE AND 7TH STREET
BRIDGE 27C18
TRANSVERSE SECTION 2

DISCIPLINE: STRUCTURES

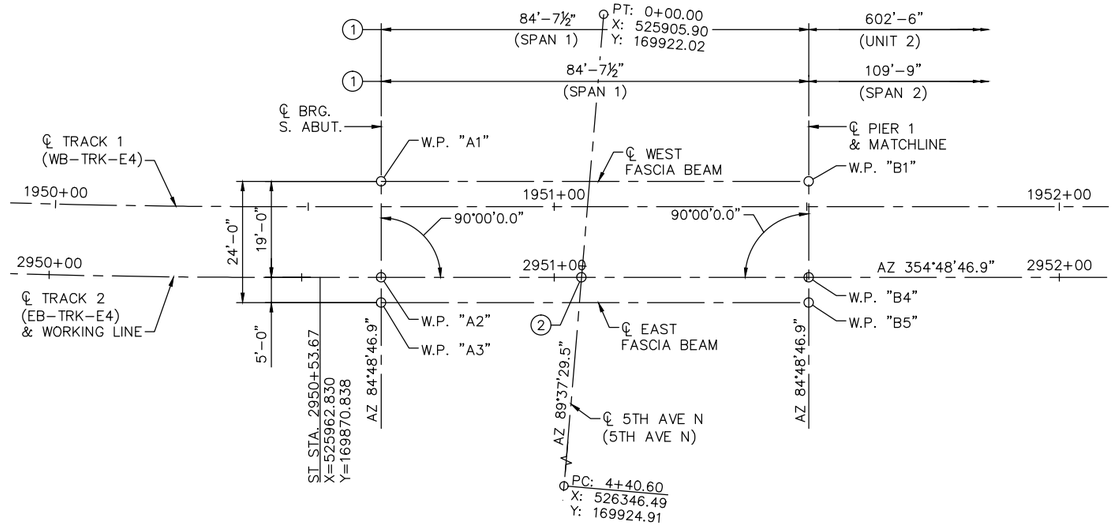
SHEET NAME: CBR27C18-BRG-TRN-003

SHEET 8 OF 80

Sep, 17 2015 02:56 pm v:\3400_ADC\CAD\SEGMENT E4\PLAN SHEETS\STRUCTURES\27C18\CBR27C18-BRG-TRN-003.dwg By: mark.krzyzewski

NOTES:

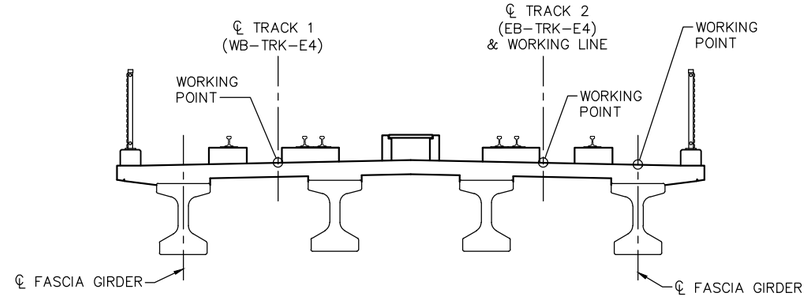
1. DIMENSIONS MEASURED ALONG ℄ TRACK 2.
2. CONTROL POINT 1
   ℄ TRACK 2 (EB–TRK–E4) STA. 2951+05.41
   ℄ 5TH AVE N (5TH AVE N) STA. 0+52.25
   X = 525958.153
   Y = 169922.367
   ANGLE = 94°48'42.6" (T.T.C.)



WORKING POINT LAYOUT
(SPAN 1)

DIMENSIONS BETWEEN WORKING POINTS								COORDINATES		ELEVATION				
POINT	STATION	A1	A2	A3	B1	B4	B5	X	Y	TOP OF RAIL	TOP OF DECK	TOP/DECK TO BR. SEAT	BRIDGE SEAT	POINT
A1	2950+65.76	--	19.00	24.00	84.62	--	--	525942.815	169881.158	--	848.03	4.979	843.05	A1
A2	2950+65.76	--	--	5.00	--	84.62	--	525961.738	169882.876	849.57	848.13	--	--	A2
A3	2950+65.76	--	--	--	--	--	84.63	525966.717	169883.328	--	848.03	4.979	843.05	A3
B1	2951+50.38	--	--	--	--	19.00	24.00	525935.165	169965.436	--	851.84	--	--	B1
B4	2951+50.38	--	--	--	--	--	5.00	525954.087	169967.154	853.37	851.94	--	--	B4
B5	2951+50.38	--	--	--	--	--	--	525959.066	169967.606	--	851.84	--	--	B5

TOP OF DECK TO BRIDGE SEAT						
	DECK THICKNESS	STOOL HEIGHT	BEAM HEIGHT	BEARING HEIGHT	TOTAL	
					INCHES	FEET
SOUTH ABUT.	9"	2 1/2"	45"	3 1/4"	59 3/4"	4.979
PIER 1	9"	2 1/2"	45"	4"	60 1/2"	5.042



WORKING POINT LOCATIONS
(UNITS 1 & 3)

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: KR | CHECKED BY: KJK
DRAWN BY: MSK | DATE: 09/18/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

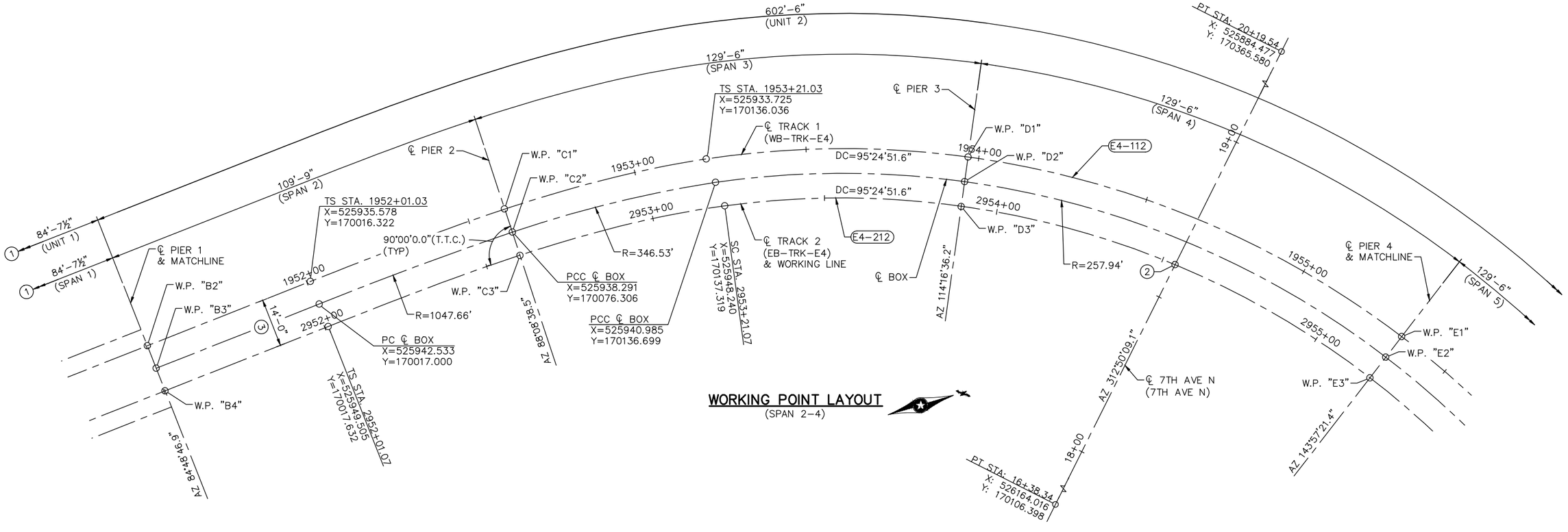
METROPOLITAN COUNCIL
SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4B
5TH AVENUE AND 7TH STREET
BRIDGE 27C18
BRIDGE LAYOUT 1

DISCIPLINE: STRUCTURES
SHEET NAME: CBR27C18-BRG-WPL-001

SHEET 9 OF 80

Sep, 17 2015 02:57 pm v:\3400_ADC\CAD\SEGMENT E4\PLAN SHEETS\STRUCTURES\27C18\CBR27C18-BRG-WPL-001.dwg By: mark.krzyzewski



WORKING POINT LAYOUT
(SPAN 2-4)

DIMENSIONS BETWEEN WORKING POINTS														COORDINATES		ELEVATION				
POINT	STATION	B2	B3	B4	C1	C2	C3	D1	D2	D3	E1	E2	E3	X	Y	TOP OF RAIL	TOP OF DECK	TOP/DECK TO BR. SEAT	BRIDGE SEAT	POINT
B2	2951+50.38	--	7.00	14.00	110.55	--	--	243.32	--	--	362.38	--	--	525940.144	169965.888	--	851.92	--	--	B2
B3	2951+50.38	--	--	7.00	--	110.14	--	--	239.71	--	--	355.23	--	525947.116	169966.521	--	852.08	--	--	B3
B4	2951+50.38	--	--	--	--		109.73	--	--	236.11	--	--	348.08	525954.087	169967.154	853.37	851.92	--	--	B4
C1	2952+60.13	--	--	--	--	7.06	14.05	134.72	--	--	261.73	--	--	525931.270	170076.079	--	856.86	--	--	C1
C2	2952+60.13	--	--	--	--	--	6.99	--	131.49	--	--	254.90	--	525938.327	170076.307	--	857.02	--	--	C2
C3	2952+60.13	--	--	--	--	--	--	--	--	128.29	--	--	248.11	525945.309	170076.534	858.31	856.86	--	--	C3
D1	2953+89.63	--	--	--	--	--	--	--	7.18	14.37	135.58	--	--	525954.464	170208.782	--	861.39	--	--	D1
D2	2953+89.63	--	--	--	--	--	--	--	--	7.18	--	131.82	--	525961.012	170205.829	--	861.55	--	--	D2
D3	2953+89.63	--	--	--	--	--	--	--	--	--	--	--	128.06	525967.560	170202.876	862.85	861.39	--	--	D3
E1	2955+19.13	--	--	--	--	--	--	--	--	--	--	7.51	15.02	526039.515	170314.373	--	862.92	--	--	E1
E2	2955+19.13	--	--	--	--	--	--	--	--	--	--	--	7.50	526043.934	170308.300	--	863.08	--	--	E2
E3	2955+19.13	--	--	--	--	--	--	--	--	--	--	--	--	526048.350	170302.231	864.37	862.92	--	--	E3

TOP OF DECK TO BRIDGE SEAT				
	STRUCTURE DEPTH	BEARING HEIGHT	TOTAL	
			INCHES	FEET
PIER 1	90 1/4"	6"	96 1/4"	8.021

NOTES:

SEE SHEET 69 FOR TRACK CURVE DATA.

SEE SHEET 11 FOR WORKING POINT LAYOUT INFORMATION.

(1) DIMENSIONS MEASURED ALONG ℄ TRACK 2.

(2) CONTROL POINT 2
℄ TRACK 2 (EB-TRK-E4) STA. 2954+53.85
℄ 7TH ST N (7TH ST N) STA. 18+60.43
X = 526001.151
Y = 170257.402
ANGLE = 93°50'28.0" (T.T.C.)

(3) 14'-0": STA. 2951+50.38 TO STA. 2952+01.07

TRANSITION 14'-0" TO 16'-0": STA. 2952+01.07 TO STA. 2957+37.39

16'-0": STA 2957+37.39 TO 2957+52.88

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: KR | CHECKED BY: KJK
DRAWN BY: MSK | DATE: 09/18/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

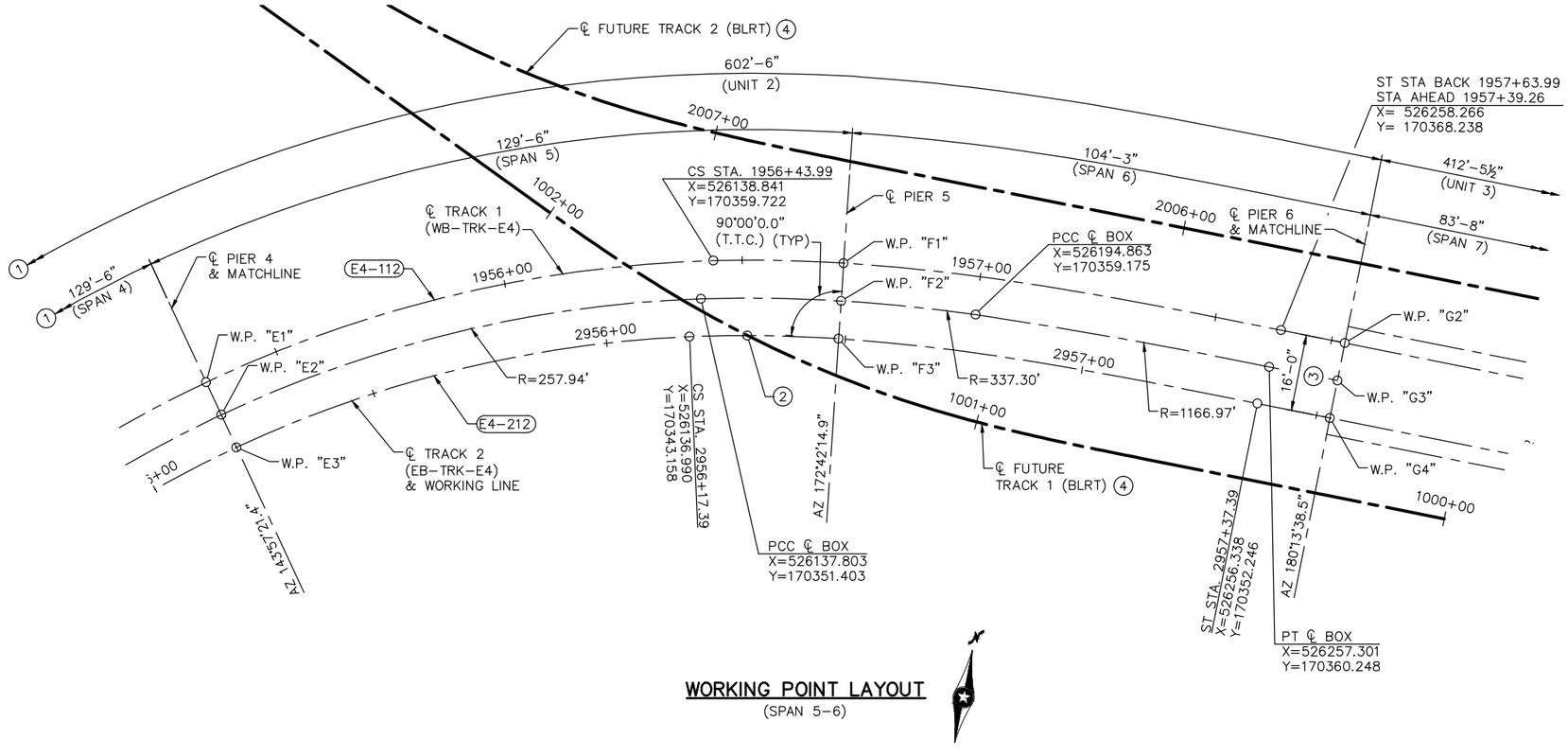
CIVIL EAST - VOLUME 4B
5TH AVENUE AND 7TH STREET
BRIDGE 27C18
BRIDGE LAYOUT 2

DISCIPLINE: STRUCTURES

SHEET NAME: CBR27C18-BRG-WPL-002

SHEET 10 OF 80

Sep. 18 2015 07:22 am v:\3400_ADC\CAD\SEGMENT E4\PLAN SHEETS\STRUCTURES\27C18\CBR27C18-BRG-WPL-002.dwg By: mark.krzyzewski



WORKING POINT LAYOUT
(SPAN 5-6)

NOTES:

SEE SHEET 69 FOR TRACK CURVE DATA.

(1) DIMENSIONS MEASURED ALONG ℄ TRACK 2.

(2) CONTROL POINT 3
℄ TRACK 2 (EB-TRK-E4) STA. 2956+29.51
℄ FUTURE TRACK 1 STA. 1001+51.41
X = 526148.834
Y = 170345.712
ANGLE = 26°26'28.0" (T.T.C.)

(3) 14'-0": STA. 2951+50.38 TO STA. 2952+01.07

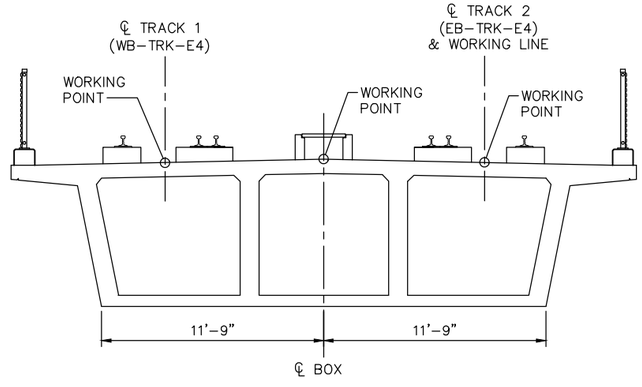
TRANSITION 14'-0" TO 16'-0": STA. 2952+01.07 TO STA. 2957+37.39

16'-0": STA 2957+37.39 TO 2957+52.88

(4) BLRT ALIGNMENT SHOWN IS BASED ON PRELIMINARY INFORMATION AND WILL BE UPDATED AS ADDITIONAL INFORMATION IS AVAILABLE.

DIMENSIONS BETWEEN WORKING POINTS											COORDINATES		ELEVATION				
POINT	STATION	E1	E2	E3	F1	F2	F3	G2	G3	G4	X	Y	TOP OF RAIL	TOP OF DECK	TOP/DECK TO BR. SEAT	BRIDGE SEAT	POINT
E1	2955+19.13	--	7.51	15.02	135.76	--	--	238.52	--	--	526039.515	170314.373	--	862.92	--	--	E1
E2	2955+19.13	--	--	7.50	--	131.92	--	--	233.75	--	526043.934	170308.300	--	863.08	--	--	E2
E3	2955+19.13	--	--	--	--	--	128.09	--	--	228.99	526048.350	170302.231	864.37	862.92	--	--	E3
F1	2956+48.63	--	--	--	--	7.93	15.86	106.25	--	--	526165.697	170364.450	--	861.43	--	--	F1
F2	2956+48.63	--	--	--	--	--	7.93	--	105.21	--	526166.704	170356.584	--	861.59	--	--	F2
F3	2956+48.63	--	--	--	--	--	--	--	--	104.17	526167.713	170348.715	862.89	861.43	--	--	F3
G2	2957+52.88	--	--	--	--	--	--	--	8.00	16.00	526271.886	170368.187	--	858.04	--	--	G2
G3	2957+52.88	--	--	--	--	--	--	--	--	8.00	526271.855	170360.187	--	858.20	--	--	G3
G4	2957+52.88	--	--	--	--	--	--	--	--	--	526271.824	170352.184	859.49	858.04	--	--	G4

TOP OF DECK TO BRIDGE SEAT				
	STRUCTURE DEPTH	BEARING HEIGHT	TOTAL	
			INCHES	FEET
PIER 6	90 1/4"	6"	96 1/4"	8.021



WORKING POINT LOCATIONS
(UNITS 2)

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: KR | CHECKED BY: KJK
DRAWN BY: MSK | DATE: 09/18/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

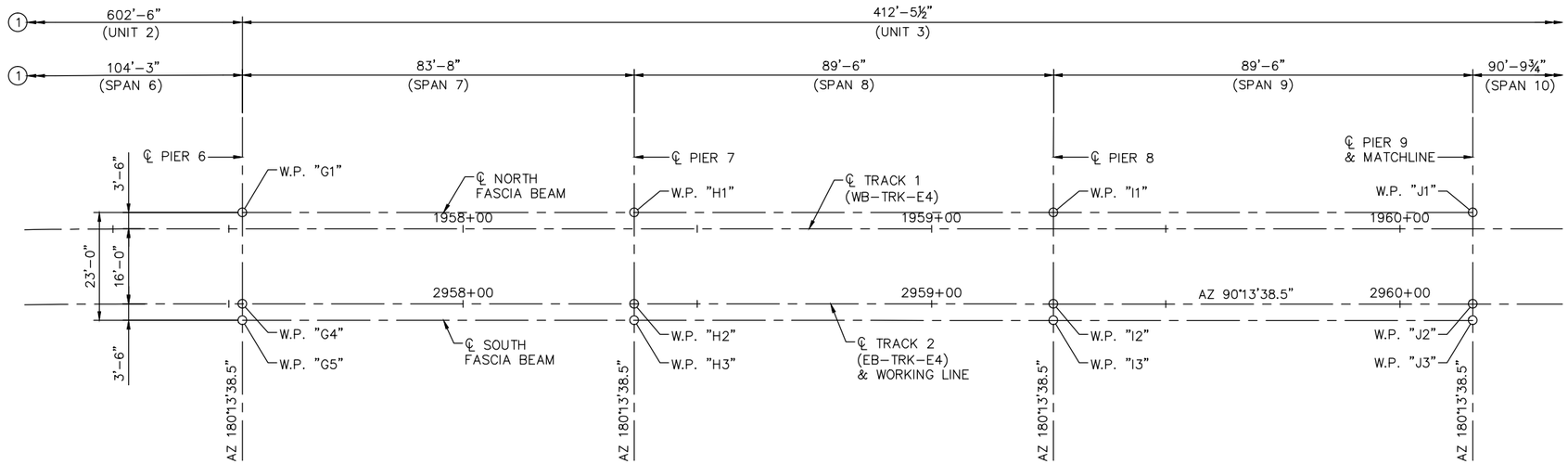
SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4B
5TH AVENUE AND 7TH STREET
BRIDGE 27C18
BRIDGE LAYOUT 3

DISCIPLINE: STRUCTURES
SHEET NAME: CBR27C18-BRG-WPL-003

SHEET 11 OF 80

Sep. 17 2015 02:58 pm V:\3400_ADC\CAD\SEGMENT E4\PLAN SHEETS\STRUCTURES\27C18\CBR27C18-BRG-WPL-003.dwg By: mark.krzyzewski



WORKING POINT LAYOUT
(SPAN 7-9)

DIMENSIONS BETWEEN WORKING POINTS														COORDINATES		ELEVATION				
POINT	STATION	G1	G4	G5	H1	H2	H3	I1	I2	I3	J1	J2	J3	X	Y	TOP OF RAIL	TOP OF DECK	TOP/DECK TO BR. SEAT	BRIDGE SEAT	POINT
G1	2957+52.88	--	19.50	23.00	83.67	--	--	173.17	--	--	262.67	--	--	526271.902	170371.684	--	857.97	--	--	G1
G4	2957+52.88	--	--	3.50	--	83.67	--	--	173.17	--	--	262.67	--	526271.824	170352.184	859.49	858.04	--	--	G4
G5	2957+52.88	--	--	--	--		83.67	--	--	173.17	--	--	262.67	526271.810	170348.684	--	857.97	--	--	G5
H1	2958+36.55	--	--	--	--	19.50	23.00	89.50	--	--	179.00	--	--	526355.566	170371.352	--	854.23	5.198	849.03	H1
H2	2958+36.55	--	--	--	--	--	3.50	--	89.50	--	--	179.00	--	526355.489	170351.852	855.76	854.30	--	--	H2
H3	2958+36.54	--	--	--	--	--	--	--		89.50	--	--	179.00	526355.475	170348.352	--	854.23	5.198	849.03	H3
I1	2959+26.05	--	--	--	--	--	--	--	19.50	23.00	89.50	--	--	526445.066	170370.997	--	850.21	4.979	845.23	I1
I2	2959+26.05	--	--	--	--	--	--	--	--	3.50	--	89.50	--	526444.988	170351.497	851.73	850.28	--	--	I2
I3	2959+26.05	--	--	--	--	--	--	--	--	--	--	--	89.50	526444.975	170347.997	--	850.21	4.979	845.23	I3
J1	2960+15.55	--	--	--	--	--	--	--	--	--	--	19.50	23.00	526534.565	170370.642	--	846.53	4.979	841.55	J1
J2	2960+15.55	--	--	--	--	--	--	--	--	--	--	--	3.50	526534.488	170351.142	848.06	846.60	--	--	J2
J3	2960+15.55	--	--	--	--	--	--	--	--	--	--	--	--	526534.474	170347.642	--	846.53	4.979	841.55	J3

TOP OF DECK TO BRIDGE SEAT						
	DECK THICKNESS	STOOL HEIGHT	BEAM HEIGHT	BEARING HEIGHT	TOTAL	
					INCHES	FEET
PIER 6	9"	2 1/2"	45"	7 3/4"	64 1/4"	5.354
PIER 7	9"	2 1/2"	45"	5 7/8"	62 3/8"	5.198
PIER 8	9"	2 1/2"	45"	3 1/4"	59 3/4"	4.979
PIER 9	9"	2 1/2"	45"	3 1/4"	59 3/4"	4.979

NOTES:

SEE SHEET 9 FOR WORKING POINT LAYOUT INFORMATION.

(1) DIMENSIONS MEASURED ALONG ℄ TRACK 2.

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: KR | CHECKED BY: KJK
DRAWN BY: MSK | DATE: 09/18/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

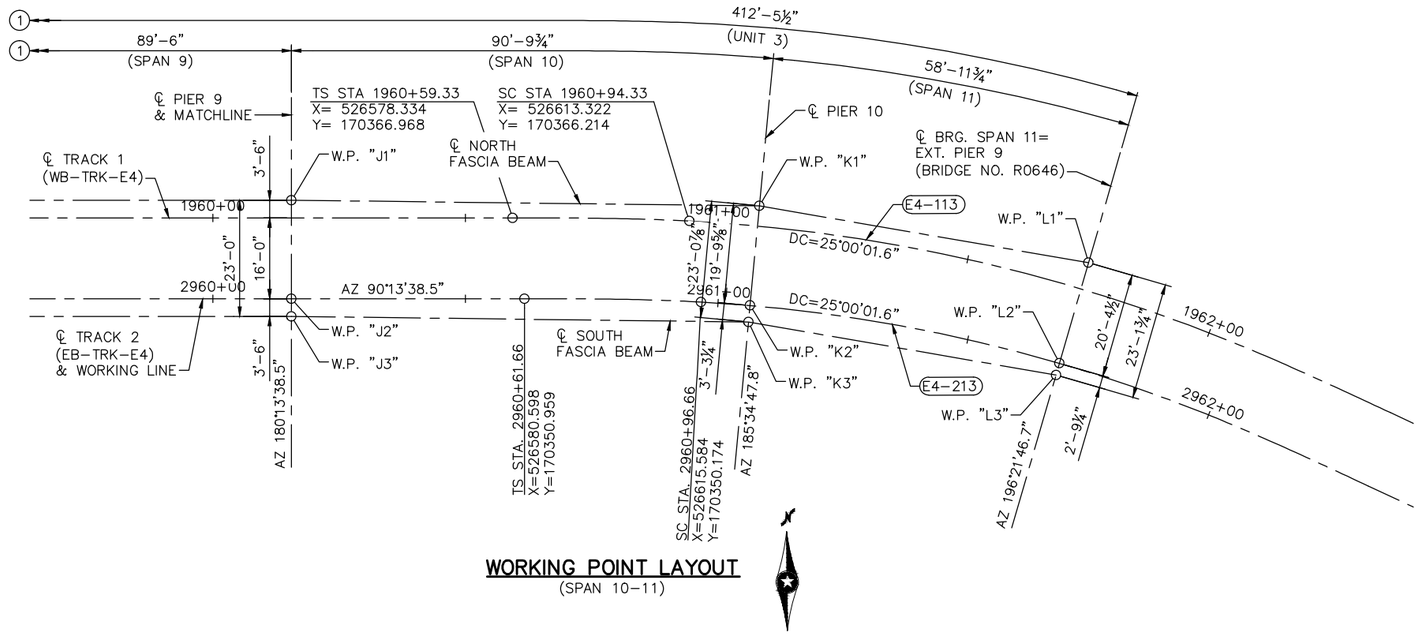
METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4B
5TH AVENUE AND 7TH STREET
BRIDGE 27C18
BRIDGE LAYOUT 4

DISCIPLINE: STRUCTURES
SHEET NAME: CBR27C18-BRG-WPL-004

SHEET 12 OF 80



WORKING POINT LAYOUT
(SPAN 10-11)

DIMENSIONS BETWEEN WORKING POINTS											COORDINATES		ELEVATION				
POINT	STATION	J1	J2	J3	K1	K2	K3	L1	L2	L3	X	Y	TOP OF RAIL	TOP OF DECK	TOP/DECK TO BR. SEAT	BRIDGE SEAT	POINT
J1	2960+15.55	--	19.50	23.00	92.63	--	--	154.84	--	--	526534.565	170370.642	--	846.53	4.979	841.55	J1
J2	2960+15.55	--	--	3.50	--	90.79	--	--	149.20	--	526534.488	170351.142	848.06	846.60	--	--	J2
J3	2960+15.55	--	--	--	--		90.48	--	--	148.37	526534.474	170347.642	--	846.53	4.979	841.55	J3
K1	2961+06.50	--	--	--	--	19.80	23.07	62.68	--	--	526627.185	170369.156	--	844.77	5.250	839.52	K1
K2	2961+06.36	--	--	--	--	--	3.27	--	58.90	--	526625.260	170349.450	846.29	844.84	--	--	K2
K3	2961+06.34	--	--	--	--	--	--	--	--	58.34	526624.942	170346.191	--	844.77	5.250	839.52	K3
L1	2961+65.51	--	--	--	--	--	--	--	20.37	23.15	526688.912	170358.258	--	844.78	5.354	839.43	L1
L2	2961+65.34	--	--	--	--	--	--	--	--	2.77	526683.172	170338.709	846.30	844.80	--	--	L2
L3	2961+65.32	--	--	--	--	--	--	--	--	--	526682.390	170336.047	--	844.78	5.354	839.43	L3

TOP OF DECK TO BRIDGE SEAT						
	DECK THICKNESS	STOOL HEIGHT	BEAM HEIGHT	BEARING HEIGHT	TOTAL	
					INCHES	FEET
PIER 9	9"	2 1/2"	45"	3 1/4"	59 3/4"	4.979
PIER 10	9"	2 1/2"	45"	6 1/2"	63"	5.250
EXST PIER 9	9"	2 1/2"	45"	7 3/4"	64 1/4"	5.354

NOTES:

SEE SHEET 9 FOR WORKING POINT LAYOUT INFORMATION.

SEE SHEET 69 FOR TRACK CURVE DATA.

(1) DIMENSIONS MEASURED ALONG ℄ TRACK 2.

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: KR | CHECKED BY: KJK
DRAWN BY: MSK | DATE: 09/18/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

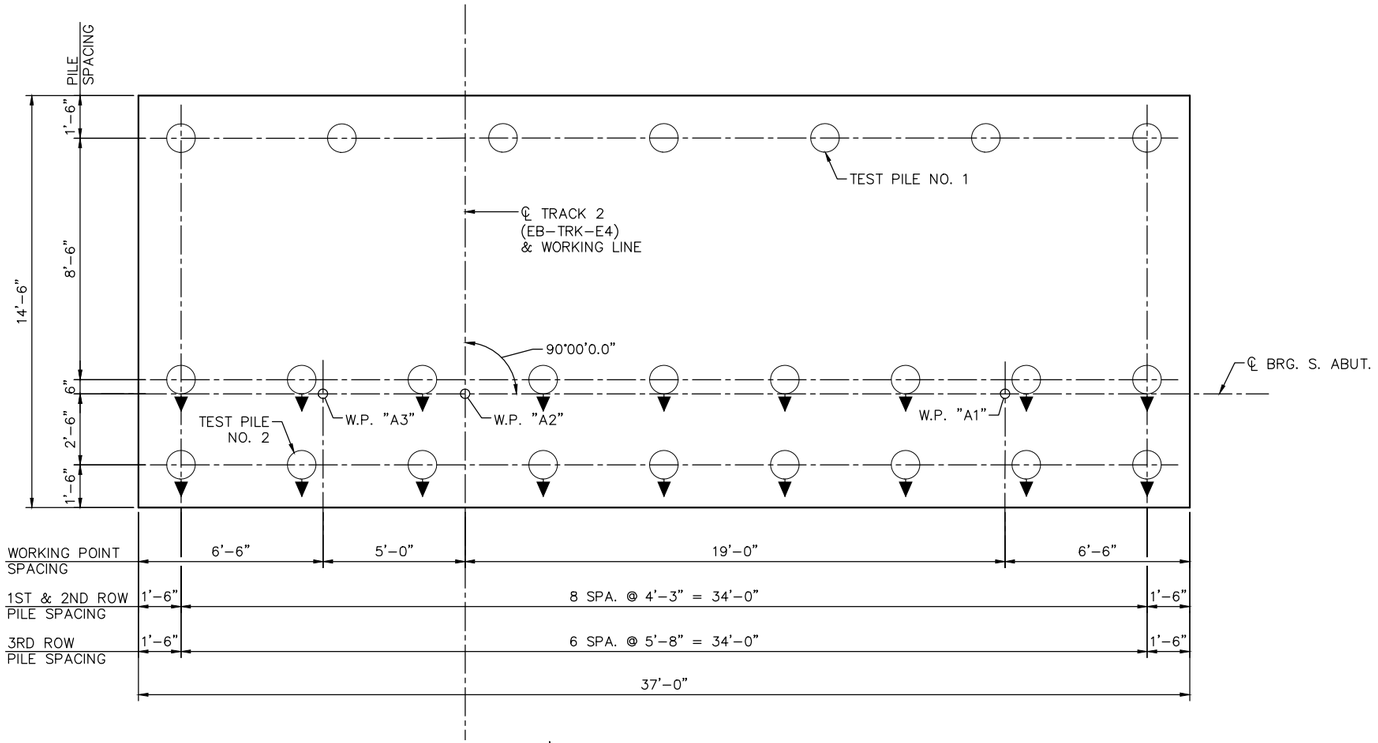
CIVIL EAST - VOLUME 4B
5TH AVENUE AND 7TH STREET
BRIDGE 27C18
BRIDGE LAYOUT 5

DISCIPLINE: STRUCTURES

SHEET NAME: CBR27C18-BRG-WPL-005

SHEET 13 OF 80

Sep. 17 2015 02:59 pm V:\3400_ADC\CAD\SEGMENT E4\PLAN SHEETS\STRUCTURES\27C18\CBR27C18-BRG-WPL-005.dwg By: mark.krzyzewski



EAST

FOOTING PLAN

WEST

SOUTH ABUTMENT COMPUTED PILE LOAD - TONS/PILE	
FACTORED DEAD LOAD + EARTH PRESSURE	56.4
FACTORED LIVE LOAD	30.2
* FACTORED DESIGN LOAD	86.6
* BASED ON STRENGTH I LOAD COMBINATION.	

SOUTH ABUTMENT REQUIRED NOMINAL PILE BEARING RESISTANCE FOR CIP PILES Rn - TONS/PILE		
FIELD CONTROL METHOD	φdyn	* Rn
PDA	0.65	134
* Rn = (FACTORED DESIGN LOAD) / φdyn		

GENERAL PILE NOTES

2 C-I-P CONCRETE TEST PILES 100 FT. LONG
23 C-I-P CONCRETE PILES EST. LENGTH 90 FT.
25 C-I-P CONCRETE PILES REQ'D FOR SOUTH ABUTMENT.

NOTES

PILE SPACING SHOWN IS AT BOTTOM OF FOOTING.

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

PILES TO HAVE A NOMINAL DIAMETER OF 12".

FOR PILE SPLICE DETAILS SEE DETAIL B201.

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: KR | CHECKED BY: KJK
DRAWN BY: MSK | DATE: 09/18/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

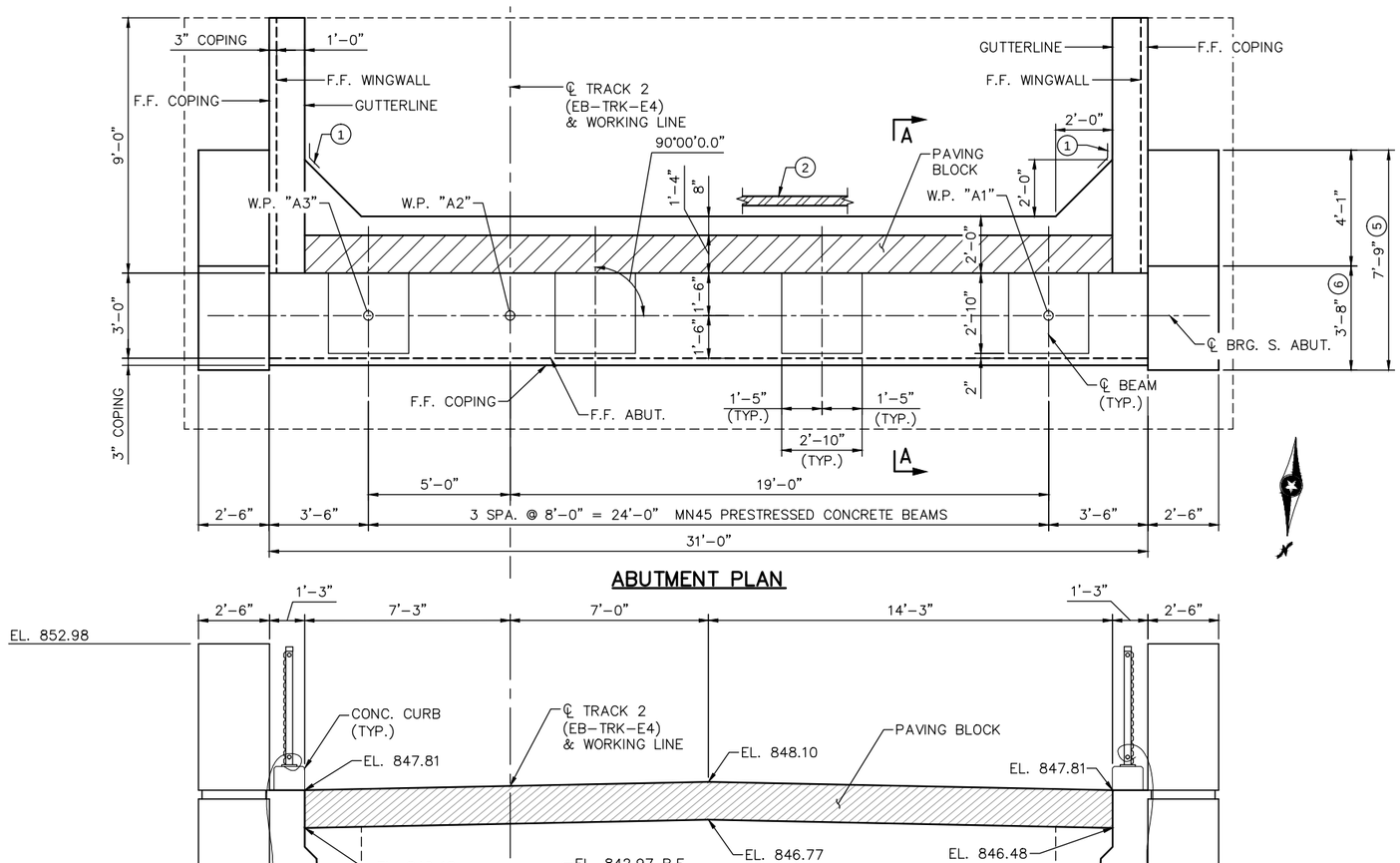
SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4B
5TH AVENUE AND 7TH STREET
BRIDGE 27C18
SOUTH ABUTMENT DETAILS 1

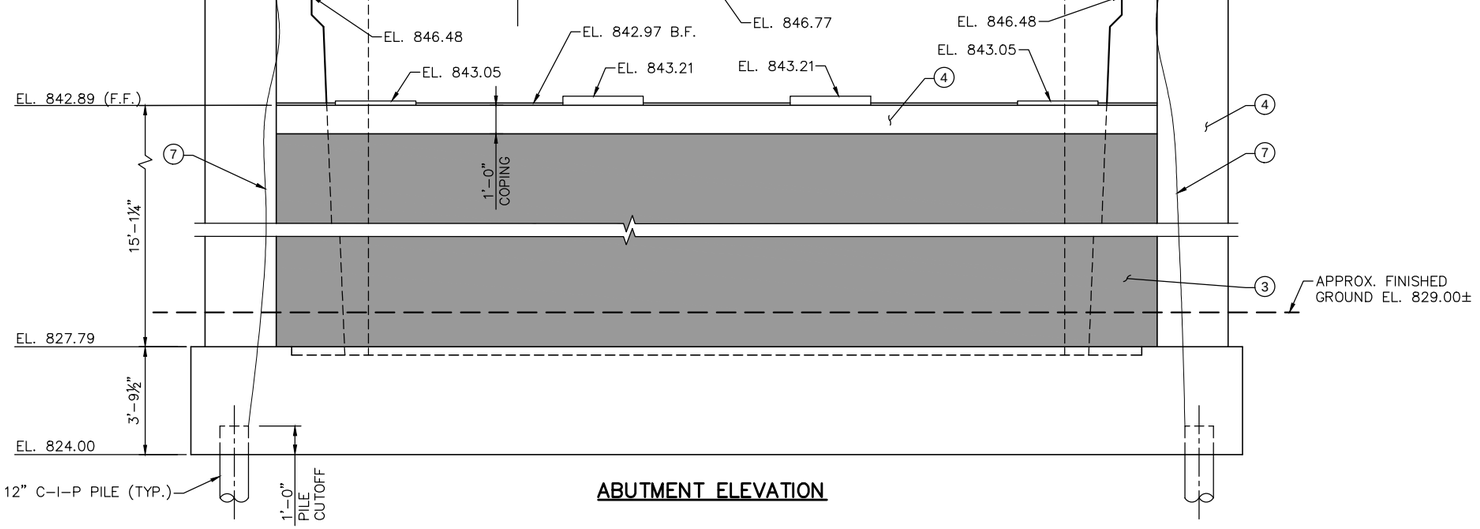
DISCIPLINE: STRUCTURES
SHEET NAME: CBR27C18-BRG-ABT-001

SHEET 14 OF 80

Sep. 18 2015 07:23 am V:\3400_ADC\CAD\SEGMENT E4\PLAN SHEETS\STRUCTURES\27C18\CBR27C18-BRG-ABT-001.dwg By: mark.krzyzewski



ABUTMENT PLAN



ABUTMENT ELEVATION

NOTES

FOR SECTION A-A, SEE SHEET 17.

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

(1) MEMBRANE WATERPROOFING SYSTEM PER SPEC. 2481.3.B.

(2) PERFORATED PIPE, SEE DETAIL B910 FOR DRAINAGE DETAILS.

(3) ARCHITECTURAL CONCRETE TEXTURE (SPECIAL) TO BE DETERMINED. THE APPROX. THICKNESS OF ARCHITECTURAL CONCRETE ASSUMED TO BE 1". THE STRUCTURAL CONCRETE (3B52) QUANTITIES INCLUDE THE CONCRETE WITHIN THE ARCHITECTURAL CONCRETE TEXTURE.

(4) SPECIAL SURFACE FINISH.

(5) DIMENSION AT TOP OF FOOTING.

(6) DIMENSION AT TOP OF PILASTER.

(7) ATTACH DIAMOND MESH SAFETY RAIL ANCHORAGE TO PILE WITH SOLID NO. 6 GAGE COPPER WIRE WITH AN APPROVED TYPE CLAMP OR BRAZING (ONE ANCHORAGE PER END OF RAIL).

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: KR | CHECKED BY: KJK
DRAWN BY: MSK | DATE: 09/18/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

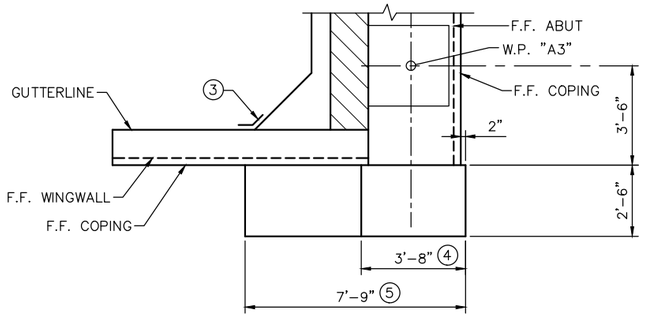
SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4B
5TH AVENUE AND 7TH STREET
BRIDGE 27C18
SOUTH ABUTMENT DETAILS 2

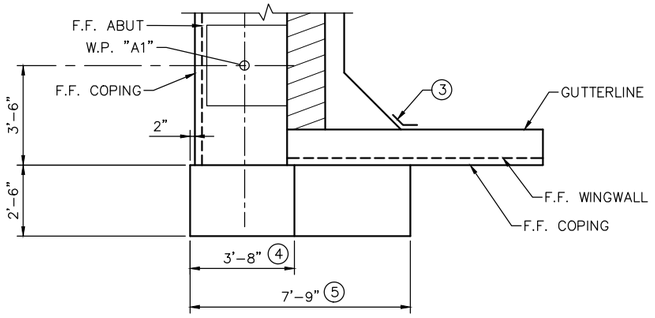
DISCIPLINE: STRUCTURES
SHEET NAME: CBR27C18-BRG-ABT-002

SHEET 15 OF 80

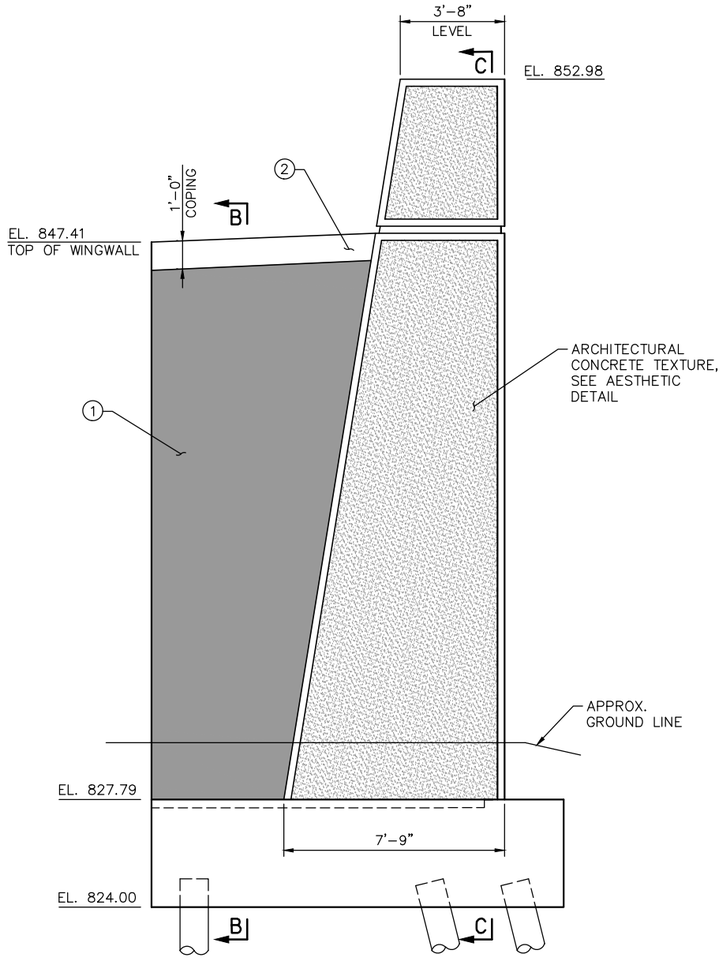
Sep. 17 2015 03:00 pm v:\3400_ADC\CAD\SEGMENT E4\PLAN SHEETS\STRUCTURES\27C18\CBR27C18-BRG-ABT-002.dwg By: mark.krzyzewski



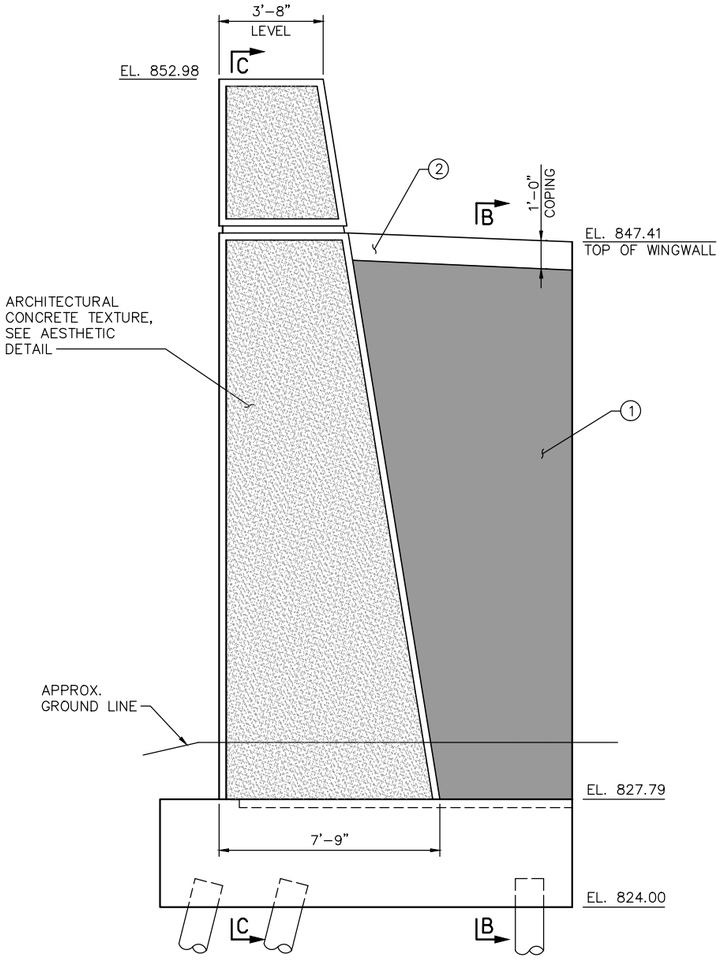
EAST PILASTER PLAN



WEST PILASTER PLAN



EAST PILASTER ELEVATION

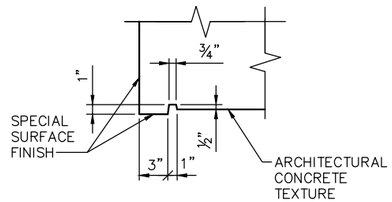


WEST PILASTER ELEVATION

NOTES:

FOR SECTION B–B AND C–C SEE SHEET 17.

1. ARCHITECTURAL CONCRETE TEXTURE (SPECIAL) TO BE DETERMINED. THE APPROX. THICKNESS OF ARCHITECTURAL CONCRETE ASSUMED TO BE 1". THE STRUCTURAL CONCRETE (3B52) QUANTITIES INCLUDE THE CONCRETE WITHIN THE ARCHITECTURAL CONCRETE TEXTURE.
2. SPECIAL SURFACE FINISH.
3. MEMBRANE WATERPROOFING SYSTEM PER SPEC. 2481.3.B.
4. TOP OF PILASTER
5. BOTTOM OF PILASTER



AESTHETIC DETAIL

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: KR | CHECKED BY: KJK
DRAWN BY: MSK | DATE: 09/18/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4B
5TH AVENUE AND 7TH STREET
BRIDGE 27C18
SOUTH ABUTMENT DETAILS 3

DISCIPLINE: STRUCTURES
SHEET NAME: CBR27C18-BRG-ABT-003

SHEET 16 OF 80

Sep. 17 2015 03:00 pm v:\3400_ADC\CAD\SEGMENT E4\PLAN SHEETS\STRUCTURES\27C18\CBR27C18-BRG-ABT-003.dwg By: mark.krzyzewski

NOTES:

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

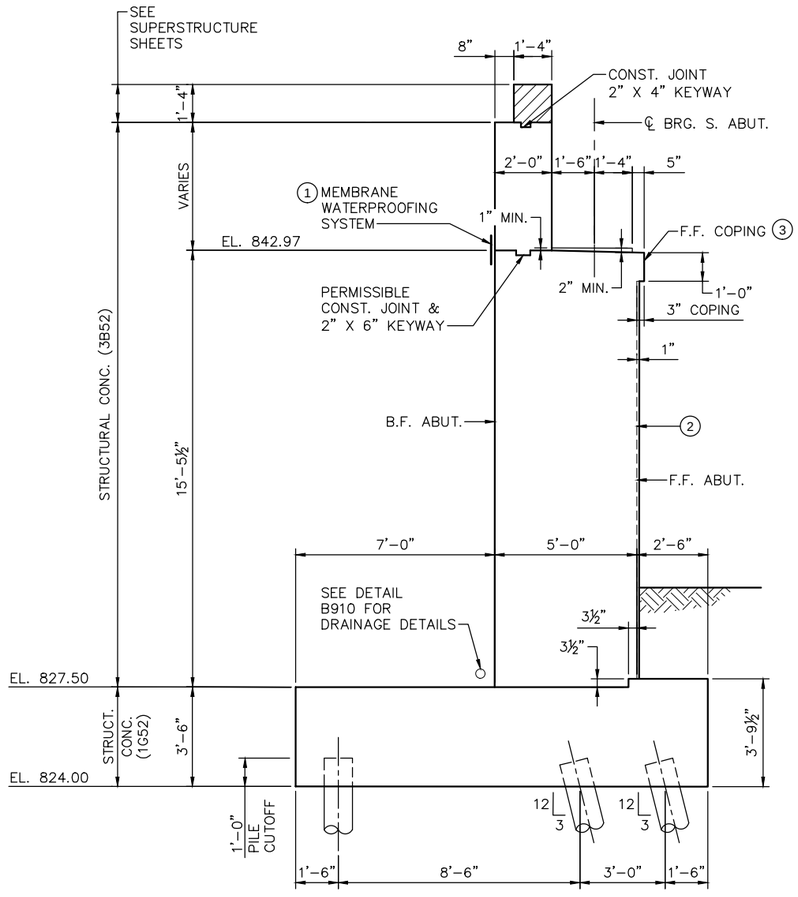
SEE SHEET 15 FOR LOCATION OF SECTION A–A.

SEE SHEET 16 FOR LOCATION OF SECTION B–B AND SECTION C–C.

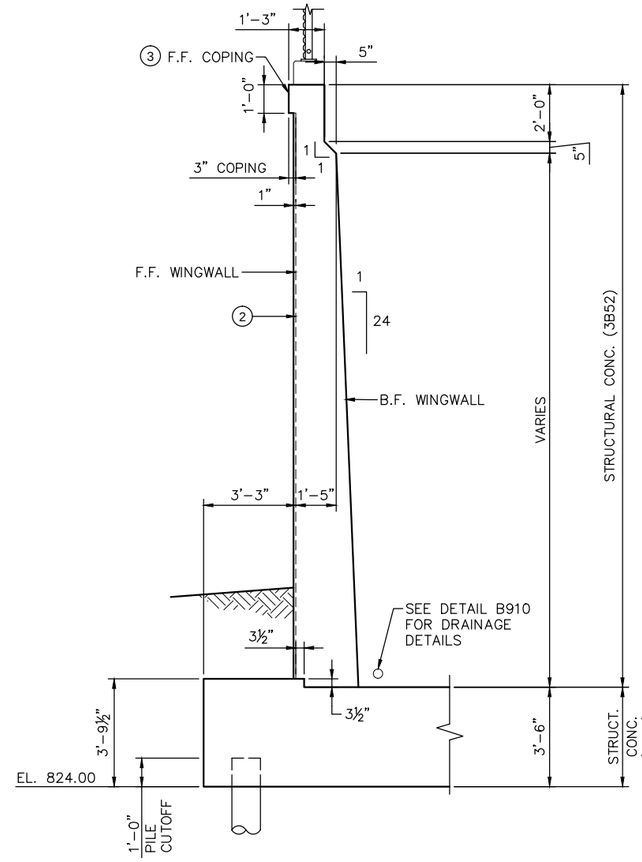
(1) MEMBRANE WATERPROOFING SYSTEM PER SPEC. 2481.3.B.

(2) ARCHITECTURAL CONCRETE TEXTURE (SPECIAL) TO BE DETERMINED. THE APPROX. THICKNESS OF ARCHITECTURAL CONCRETE ASSUMED TO BE 1". THE STRUCTURAL CONCRETE (3B52) QUANTITIES INCLUDE THE CONCRETE WITHIN THE ARCHITECTURAL CONCRETE TEXTURE.

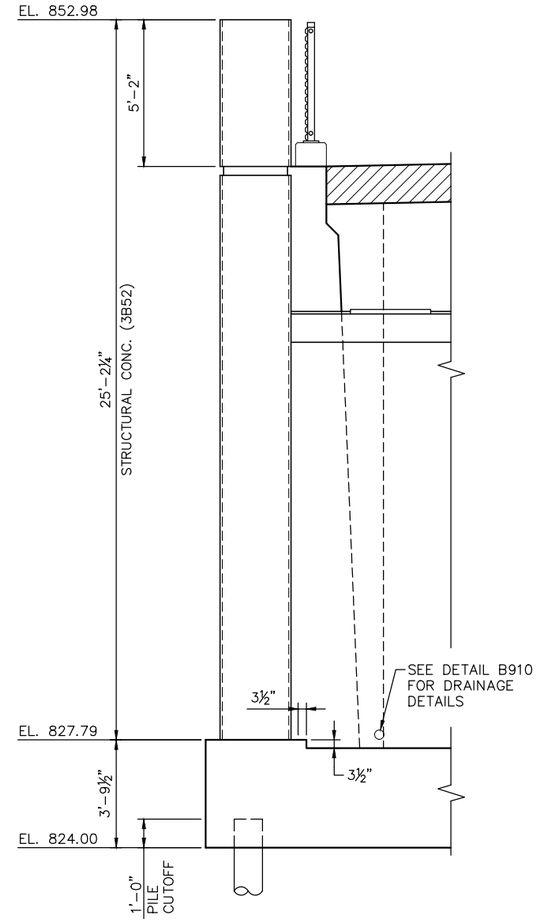
(3) SPECIAL SURFACE FINISH.



SECTION A–A



SECTION B–B



SECTION C–C

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: KR | CHECKED BY: KJK
DRAWN BY: MSK | DATE: 09/18/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

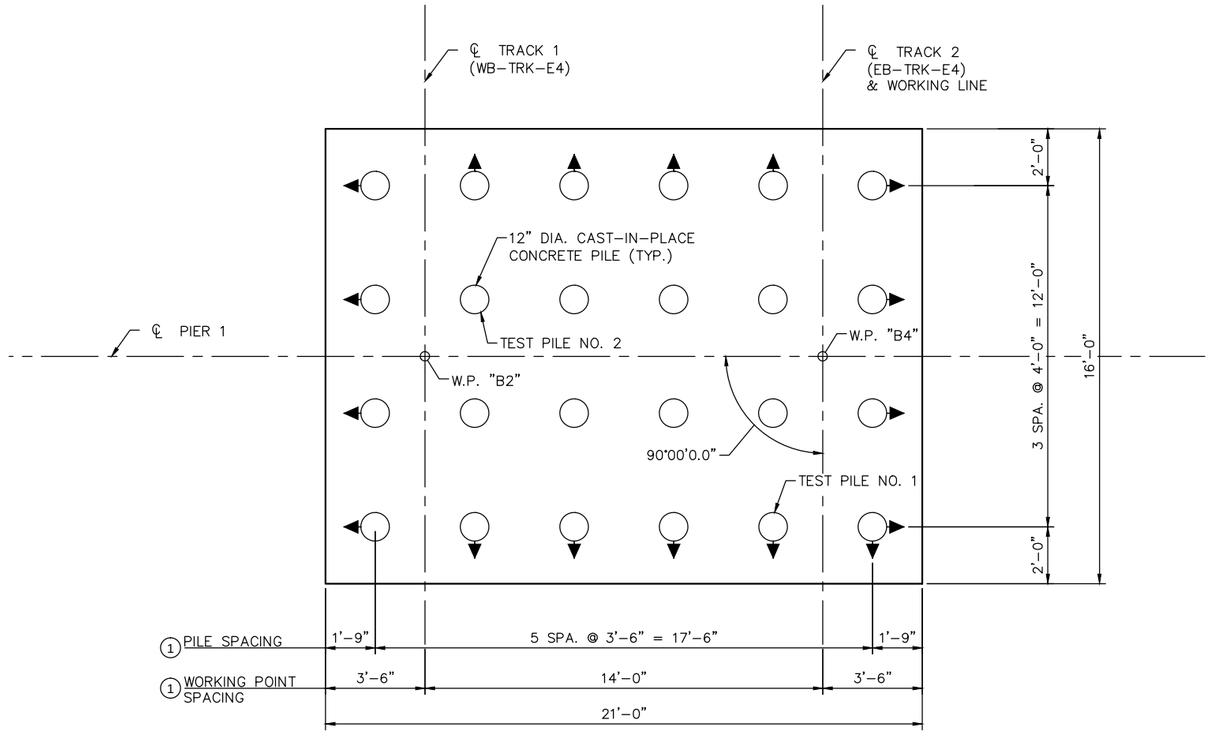
SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4B
5TH AVENUE AND 7TH STREET
BRIDGE 27C18
SOUTH ABUTMENT DETAILS 4

DISCIPLINE: STRUCTURES
SHEET NAME: CBR27C18-BRG-ABT-004

SHEET 17 OF 80

Sep. 17 2015 03:01 pm V:\3400_ADC\CAD\SEGMENT E4\PLAN SHEETS\STRUCTURES\27C18\CBR27C18-BRG-ABT-004.dwg By: mark.krzyzewski



FOOTING PLAN

PIER 1 COMPUTED PILE LOAD - TONS/PILE	
FACTORED DEAD LOAD	
FACTORED LIVE LOAD	
FACTORED OVERTURNING	
* FACTORED DESIGN LOAD	90
* BASED ON STRENGTH V LOAD COMBINATION.	

PIER 1 REQUIRED NOMINAL PILE BEARING RESISTANCE FOR CIP PILES Rn - TONS/PILE		
FIELD CONTROL METHOD	φdyn	* Rn
PDA	0.65	138
* Rn = (FACTORED DESIGN LOAD) / φdyn		

GENERAL PILE NOTES

2 CAST–IN–PLACE CONCRETE TEST PILES 98 FT. LONG
22 CAST–IN–PLACE CONCRETE PILES EST. 88 FT. LENGTH
24 CAST–IN–PLACE CONCRETE PILES REQ'D FOR WEST ABUT.

PILE SPACING SHOWN IS AT BOTTOM OF FOOTING.

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

PILES TO HAVE A NOMINAL DIAMETER OF 12" AND 5/16" WALL THICKNESS.

FOR PILE SPLICE DETAILS SEE DETAIL B201.

NOTES:

(1) DIMENSIONS MEASURED ALONG ℄ PIER

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: KR | CHECKED BY: KJK
DRAWN BY: MSK | DATE: 09/18/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

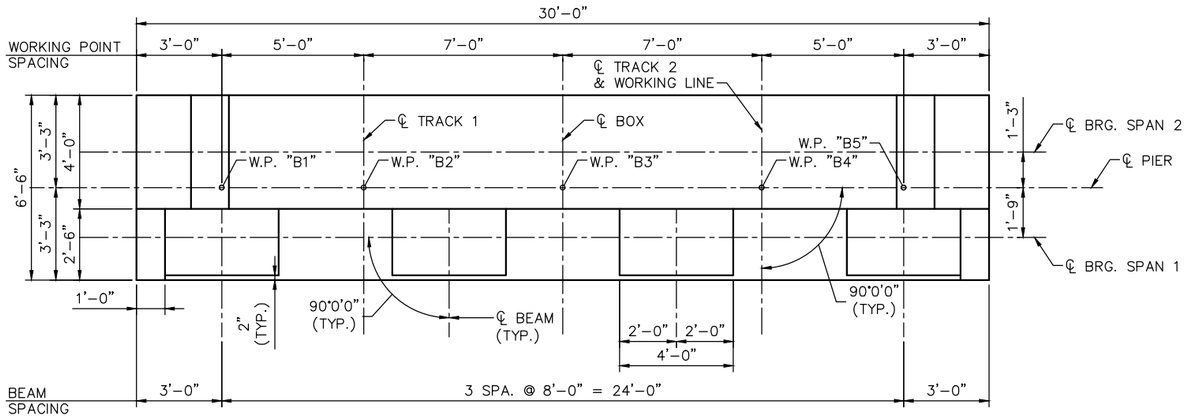
SOUTHWEST Green Line LRT Extension

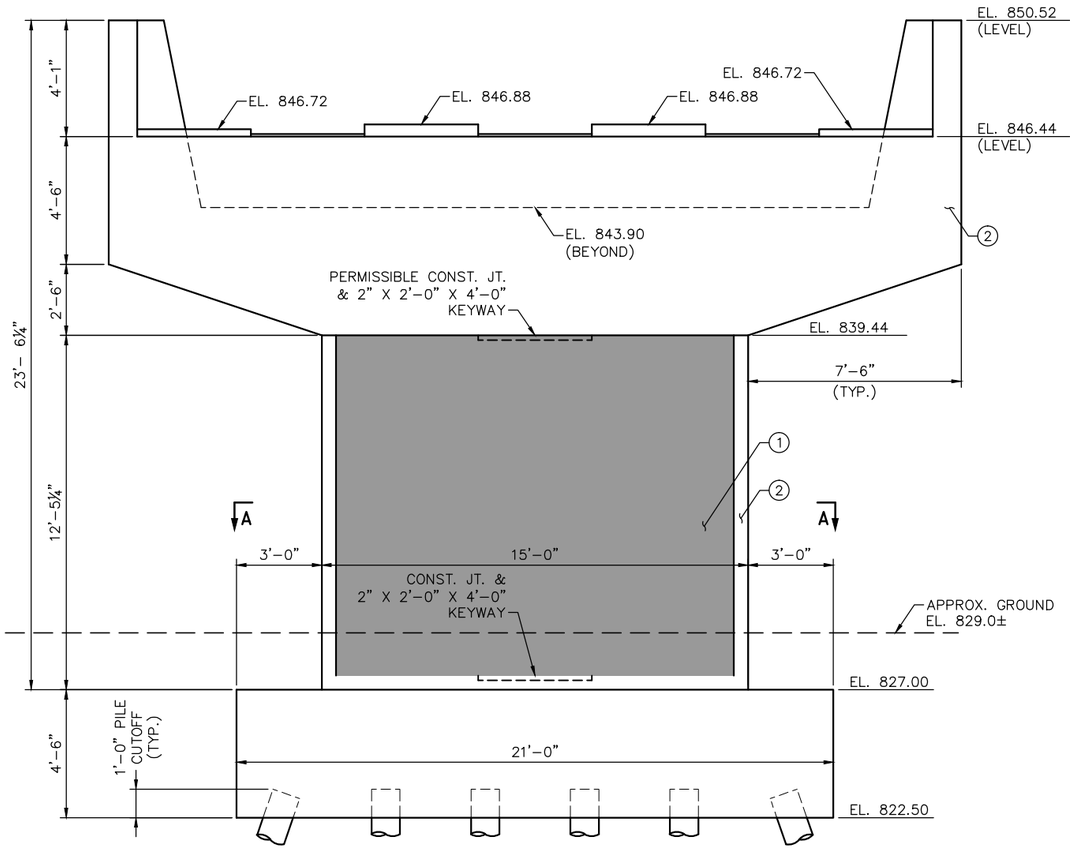
CIVIL EAST - VOLUME 4B
5TH AVENUE AND 7TH STREET
BRIDGE 27C18
PIER 1 DETAILS 1

DISCIPLINE: STRUCTURES
SHEET NAME: CBR27C18-BRG-PIR-011

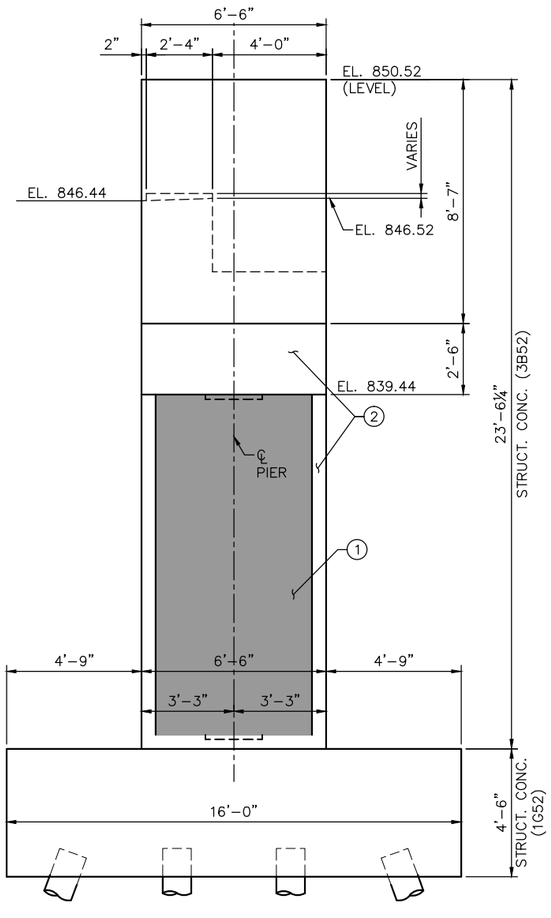
SHEET 18 OF 80

Sep. 18 2015 07:23 am v:\3400_ADC\CAD\SEGMENT E4\PLAN SHEETS\STRUCTURES\27C18\CBR27C18-BRG-PIR-011.dwg By: mark.krzyzewski

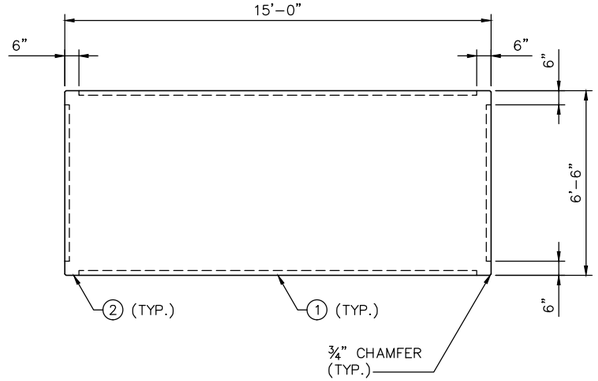




ELEVATION
LOOKING UP STATION



END ELEVATION – PIER 1



SECTION A–A

NOTES:

① ARCHITECTURAL CONCRETE TEXTURE (SPECIAL) TO BE DETERMINED. THE APPROX. THICKNESS OF ARCHITECTURAL CONCRETE ASSUMED TO BE 1". THE STRUCTURAL CONCRETE (3B52) QUANTITIES INCLUDE THE CONCRETE WITHIN THE ARCHITECTURAL CONCRETE TEXTURE.

② SPECIAL SURFACE FINISH.

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: KR | CHECKED BY: KJK
DRAWN BY: MSK | DATE: 09/18/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

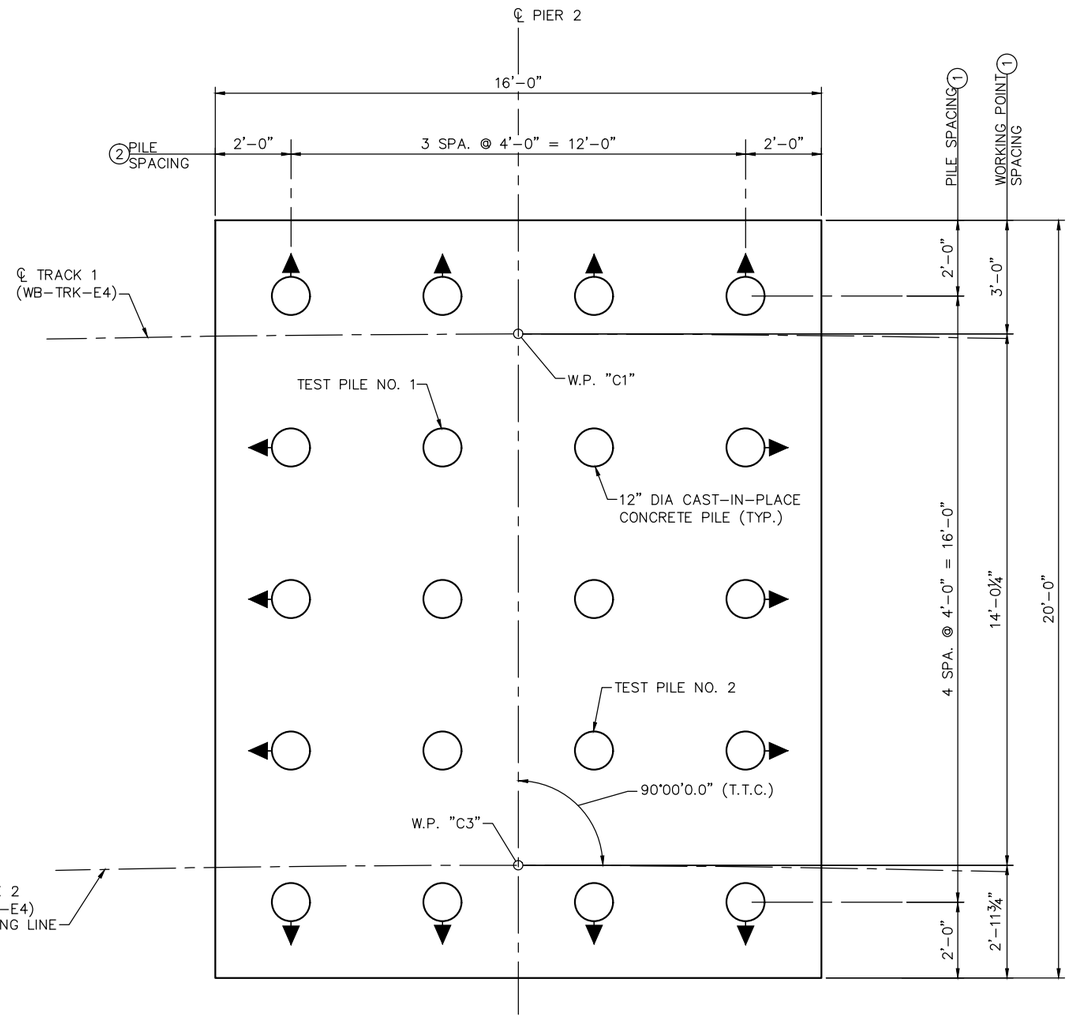
METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4B
5TH AVENUE AND 7TH STREET BRIDGE 27C18
PIER 1 DETAILS 2

DISCIPLINE: STRUCTURES
SHEET NAME: CBR27C18-BRG-PIR-012

SHEET 19 OF 80



FOOTING PLAN

PIER 2 COMPUTED PILE LOAD - TONS/PILE	
FACTORED DEAD LOAD	
FACTORED LIVE LOAD	
FACTORED OVERTURNING	
* FACTORED DESIGN LOAD	
* BASED ON STRENGTH V LOAD COMBINATION.	

PIER 2 REQUIRED NOMINAL PILE BEARING RESISTANCE FOR CIP PILES Rn - TONS/PILE		
FIELD CONTROL METHOD	φdyn	* Rn
PDA	0.65	
* Rn = (FACTORED DESIGN LOAD) / φdyn		

GENERAL PILE NOTES

2 CAST–IN–PLACE CONCRETE TEST PILES 99 FT. LONG
18 CAST–IN–PLACE CONCRETE PILES EST. 89 FT. LENGTH
20 CAST–IN–PLACE CONCRETE PILES REQ'D FOR PIER 2
PILE SPACING SHOWN IS AT BOTTOM OF FOOTING.

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

PILES TO HAVE A NOMINAL DIAMETER OF 12" AND 5/16" WALL THICKNESS.

FOR PILE SPLICE DETAILS SEE DETAIL B201.

NOTES:

(1) DIMENSIONS MEASURED ALONG ℄ PIER.

(2) DIMENSIONS MEASURED NORMAL TO ℄ PIER.

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: KR | CHECKED BY: KJK
DRAWN BY: MSK | DATE: 09/18/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

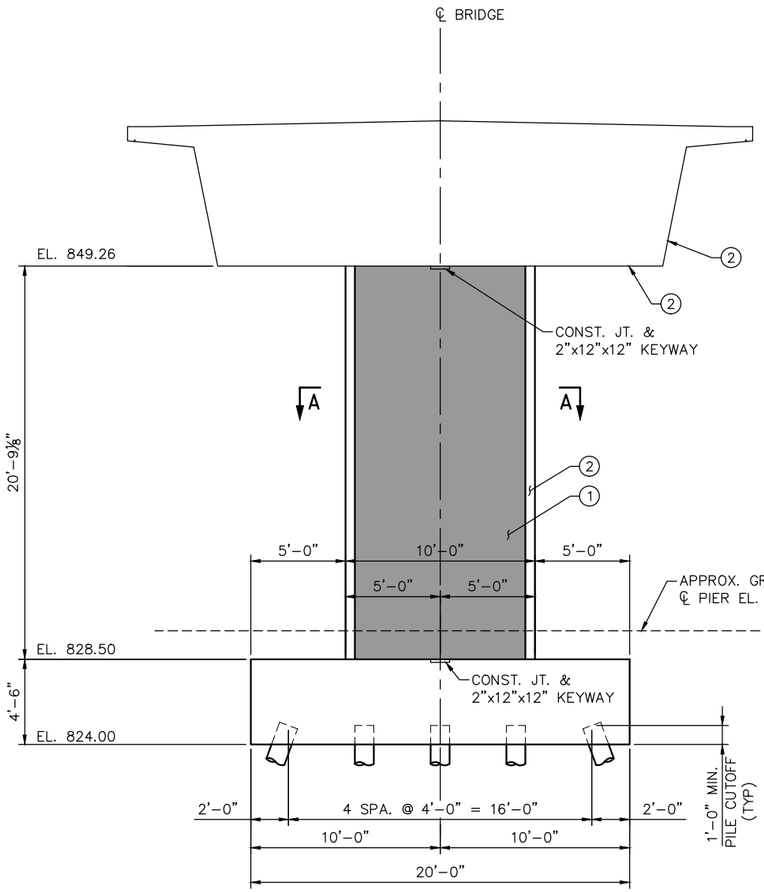
SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4B
5TH AVENUE AND 7TH STREET
BRIDGE 27C18
PIER 2 DETAILS 1

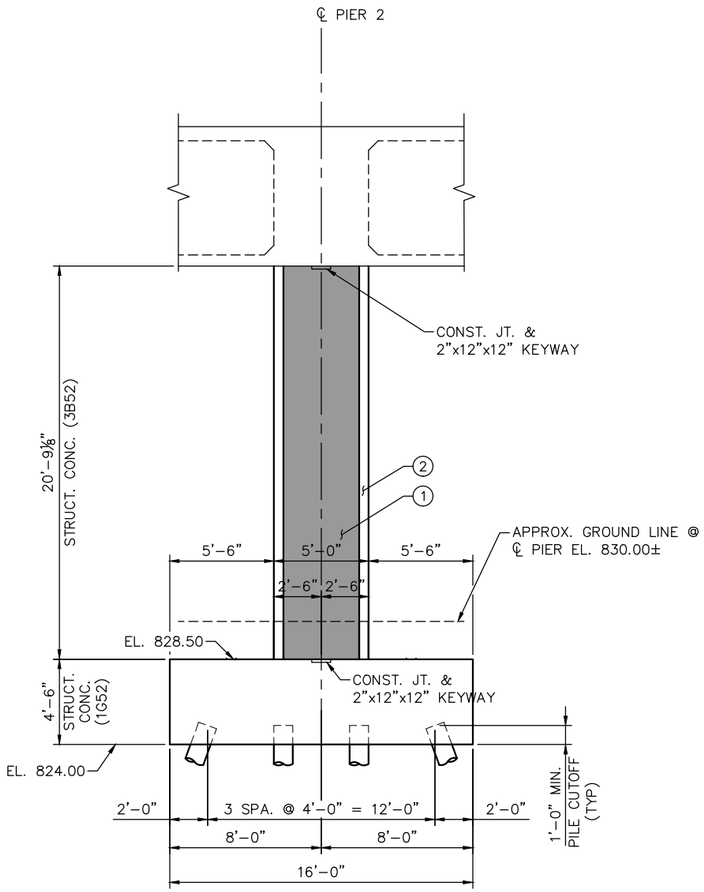
DISCIPLINE: STRUCTURES
SHEET NAME: CBR27C18-BRG-PIR-015

SHEET 20 OF 80

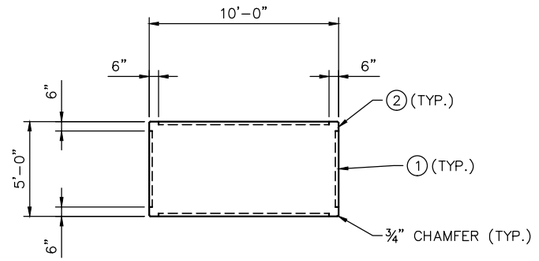
Sep. 18 2015 07:23 am v:\3400_ADC\CAD\SEGMENT E4\PLAN SHEETS\STRUCTURES\27C18\CBR27C18-BRG-PIR-015.dwg By: mark.krzyzewski



ELEVATION



END ELEVATION



SECTION A–A

NOTES:

1. ARCHITECTURAL CONCRETE TEXTURE (SPECIAL) TO BE DETERMINED. THE APPROX. THICKNESS OF ARCHITECTURAL CONCRETE ASSUMED TO BE 1". THE STRUCTURAL CONCRETE (3B52) QUANTITIES INCLUDE THE CONCRETE WITHIN THE ARCHITECTURAL CONCRETE TEXTURE.
2. SPECIAL SURFACE FINISH.

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: KR | CHECKED BY: KJK
DRAWN BY: MSK | DATE: 09/18/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

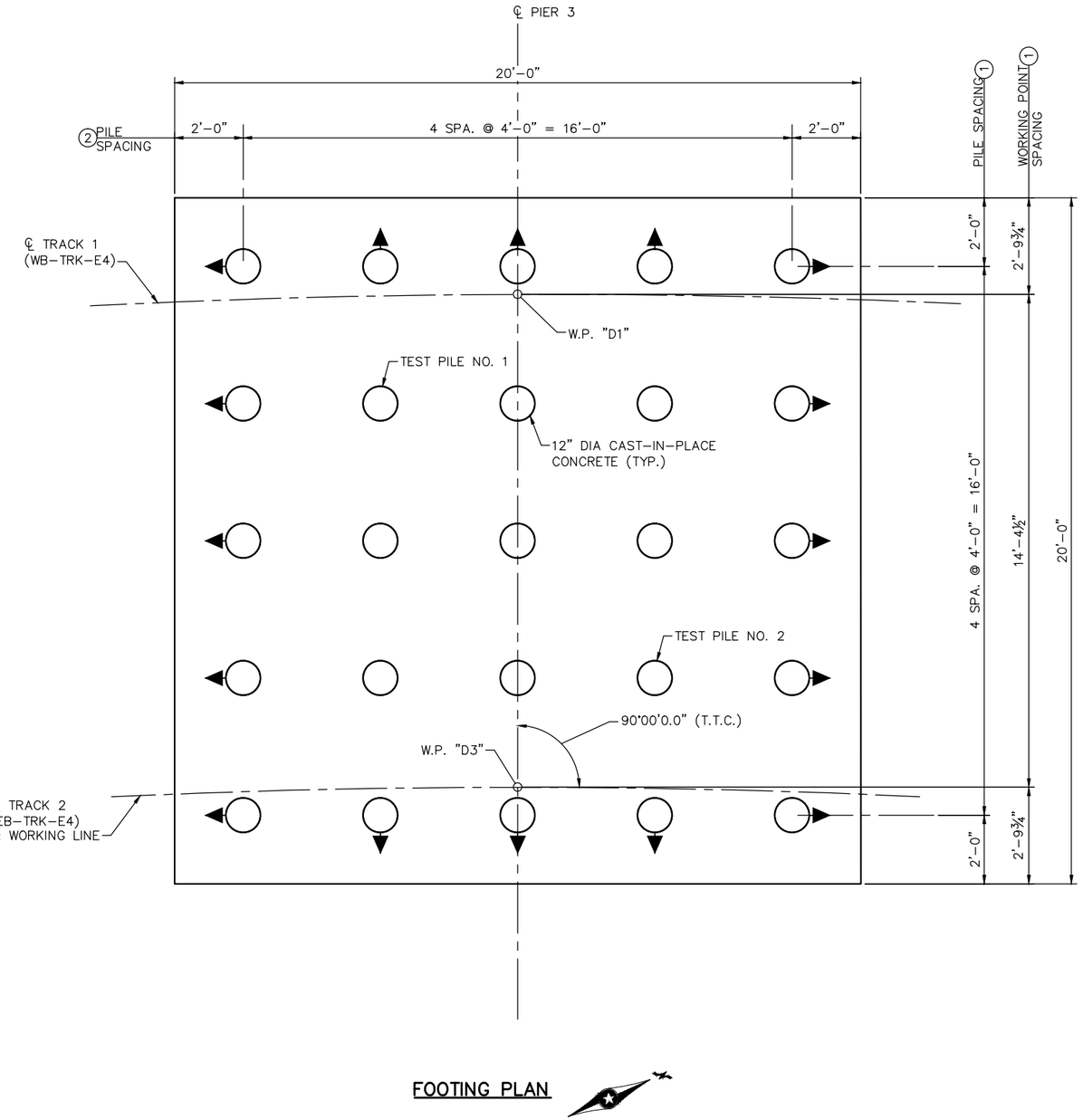
SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4B
5TH AVENUE AND 7TH STREET
BRIDGE 27C18
PIER 2 DETAILS 2

DISCIPLINE: STRUCTURES
SHEET NAME: CBR27C18-BRG-PIR-007

SHEET 21 OF 80

Sep. 17 2015 03:02 pm v:\3400_ADC\CAD\SEGMENT E4\PLAN SHEETS\STRUCTURES\27C18\CBR27C18-BRG-PIR-007.dwg By: mark.krzyzewski



FOOTING PLAN

PIER 3 COMPUTED PILE LOAD - TONS/PILE	
FACTORED DEAD LOAD	
FACTORED LIVE LOAD	
FACTORED OVERTURNING	
* FACTORED DESIGN LOAD	
* BASED ON STRENGTH V LOAD COMBINATION.	

PIER 3 REQUIRED NOMINAL PILE BEARING RESISTANCE FOR CIP PILES Rn - TONS/PILE		
FIELD CONTROL METHOD	φdyn	* Rn
PDA	0.65	
* Rn = (FACTORED DESIGN LOAD) / φdyn		

GENERAL PILE NOTES

2 CAST–IN–PLACE CONCRETE TEST PILES 98 FT. LONG
23 CAST–IN–PLACE CONCRETE PILES EST. 88 FT. LENGTH
25 CAST–IN–PLACE CONCRETE PILES REQ'D FOR PIER 3.

PILE SPACING SHOWN IS AT BOTTOM OF FOOTING.

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

PILES TO HAVE A NOMINAL DIAMETER OF 12" AND 5/16" WALL THICKNESS.

FOR PILE SPLICE DETAILS SEE DETAIL B201.

NOTES:

① DIMENSIONS MEASURED ALONG ℄ PIER.

② DIMENSIONS MEASURED NORMAL TO ℄ PIER.

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: KR CHECKED BY: KJK
DRAWN BY: MSK DATE: 09/18/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

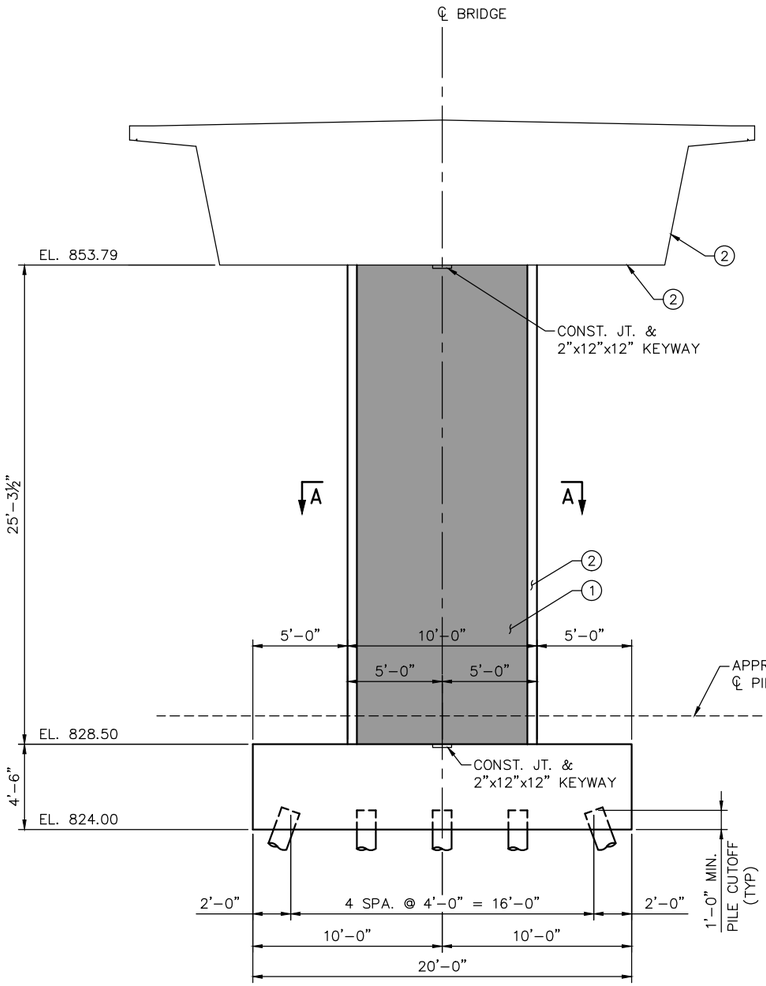
SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4B
5TH AVENUE AND 7TH STREET
BRIDGE 27C18
PIER 3 DETAILS 1

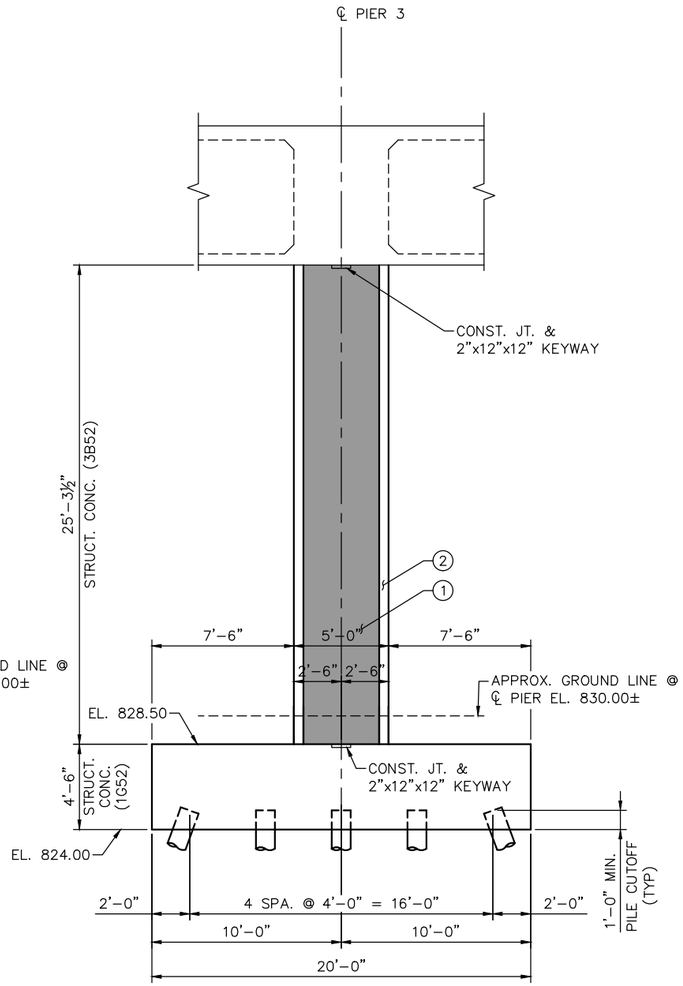
DISCIPLINE: STRUCTURES
SHEET NAME: CBR27C18-BRG-PIR-016

SHEET 22 OF 80

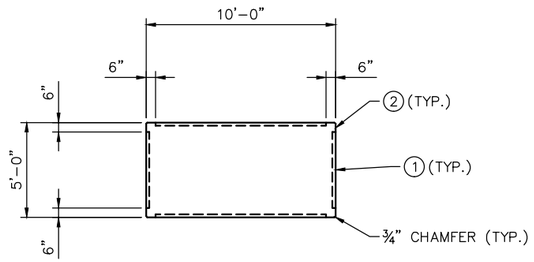
Sep. 18 2015 07:24 am V:\3400_ADC\CAD\SEGMENT E4\PLAN SHEETS\STRUCTURES\27C18\CBR27C18-BRG-PIR-016.dwg By: mark.krzyzewski



ELEVATION



END ELEVATION



SECTION A–A

NOTES:

1. ARCHITECTURAL CONCRETE TEXTURE (SPECIAL) TO BE DETERMINED. THE APPROX. THICKNESS OF ARCHITECTURAL CONCRETE ASSUMED TO BE 1". THE STRUCTURAL CONCRETE (3B52) QUANTITIES INCLUDE THE CONCRETE WITHIN THE ARCHITECTURAL CONCRETE TEXTURE.
2. SPECIAL SURFACE FINISH.

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: KR | CHECKED BY: KJK
DRAWN BY: MSK | DATE: 09/18/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

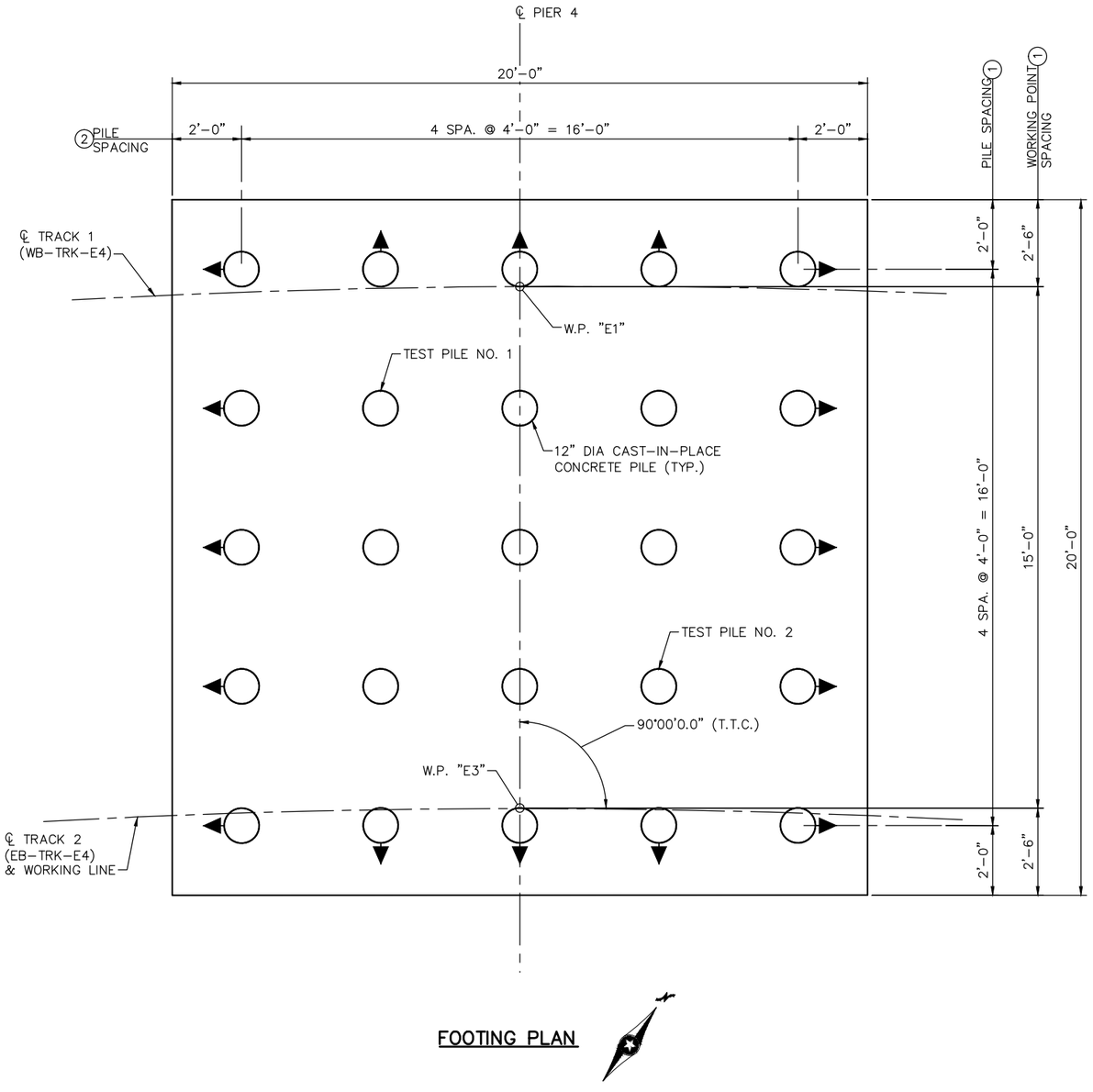
CIVIL EAST - VOLUME 4B
5TH AVENUE AND 7TH STREET
BRIDGE 27C18
PIER 3 DETAILS 2

DISCIPLINE: STRUCTURES

SHEET NAME: CBR27C18-BRG-PIR-008

SHEET 23 OF 80

Sep. 17 2015 03:03 pm V:\3400_ADC\CAD\SEGMENT E4\PLAN SHEETS\STRUCTURES\27C18\CBR27C18-BRG-PIR-008.dwg By: mark.krzyzewski



FOOTING PLAN

PIER 4 COMPUTED PILE LOAD - TONS/PILE	
FACTORED DEAD LOAD	
FACTORED LIVE LOAD	
FACTORED OVERTURNING	
* FACTORED DESIGN LOAD	
* BASED ON STRENGTH V LOAD COMBINATION.	

PIER 4 REQUIRED NOMINAL PILE BEARING RESISTANCE FOR CIP PILES Rn - TONS/PILE		
FIELD CONTROL METHOD	φdyn	* Rn
PDA	0.65	
* Rn = (FACTORED DESIGN LOAD) / φdyn		

GENERAL PILE NOTES

2 CAST–IN–PLACE CONCRETE TEST PILES 97 FT. LONG
23 CAST–IN–PLACE CONCRETE PILES EST. 87 FT. LENGTH
25 CAST–IN–PLACE CONCRETE PILES REQ'D FOR PIER 4.

PILE SPACING SHOWN IS AT BOTTOM OF FOOTING.

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

PILES TO HAVE A NOMINAL DIAMETER OF 12" AND 5/16" WALL THICKNESS.

FOR PILE SPLICE DETAILS SEE DETAIL B201.

NOTES:

(1) DIMENSIONS MEASURED ALONG ℄ PIER.

(2) DIMENSIONS MEASURED NORMAL TO ℄ PIER.

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: KR | CHECKED BY: KJK
DRAWN BY: MSK | DATE: 09/18/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

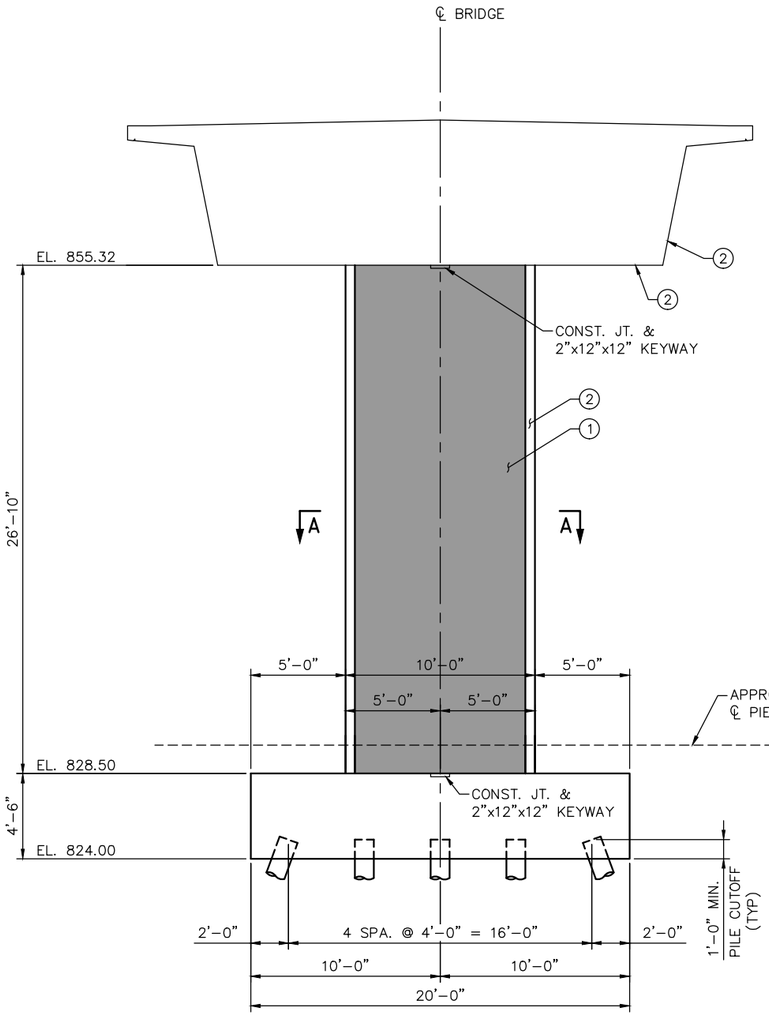
SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4B
5TH AVENUE AND 7TH STREET
BRIDGE 27C18
PIER 4 DETAILS 1

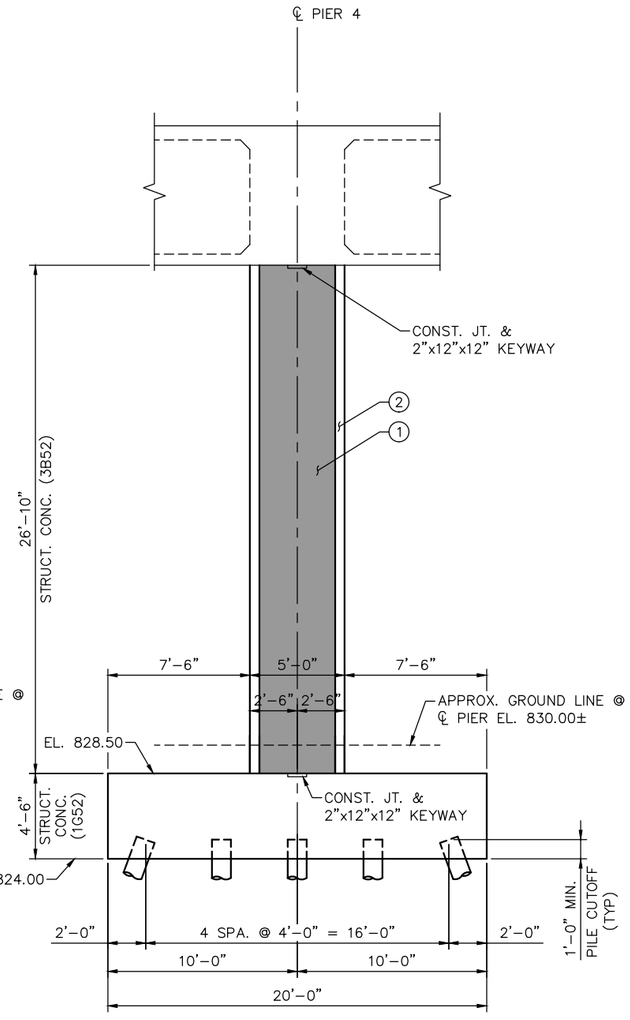
DISCIPLINE: STRUCTURES
SHEET NAME: CBR27C18-BRG-PIR-017

SHEET 24 OF 80

Sep. 18 2015 07:24 am V:\3400_ADC\CAD\SEGMENT E4\PLAN SHEETS\STRUCTURES\27C18\CBR27C18-BRG-PIR-017.dwg By: mark.krzyzewski



ELEVATION



END ELEVATION

SECTION A–A

NOTES:

1. ARCHITECTURAL CONCRETE TEXTURE (SPECIAL) TO BE DETERMINED. THE APPROX. THICKNESS OF ARCHITECTURAL CONCRETE ASSUMED TO BE 1". THE STRUCTURAL CONCRETE (3B52) QUANTITIES INCLUDE THE CONCRETE WITHIN THE ARCHITECTURAL CONCRETE TEXTURE.
2. SPECIAL SURFACE FINISH.

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: KR | CHECKED BY: KJK
DRAWN BY: MSK | DATE: 09/18/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

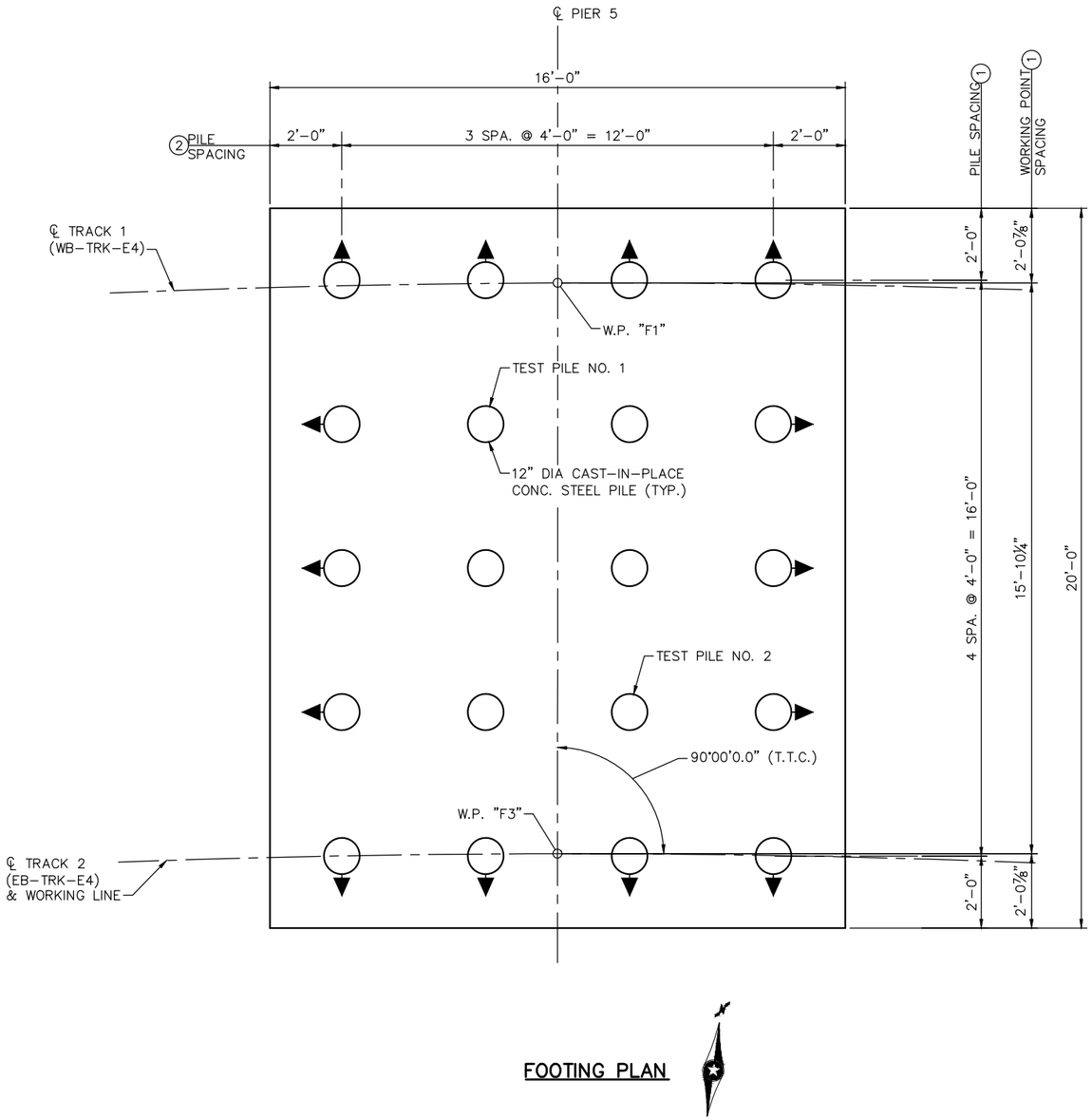
CIVIL EAST - VOLUME 4B
5TH AVENUE AND 7TH STREET BRIDGE 27C18
PIER 4 DETAILS 2

DISCIPLINE: STRUCTURES

SHEET NAME: CBR27C18-BRG-PIR-009

SHEET 25 OF 80

Sep, 17 2015 03:04 pm v:\3400_ADC\CAD\SEGMENT E4\PLAN SHEETS\STRUCTURES\27C18\CBR27C18-BRG-PIR-009.dwg By: mark.krzyzewski



FOOTING PLAN

PIER 5 COMPUTED PILE LOAD - TONS/PILE	
FACTORED DEAD LOAD	
FACTORED LIVE LOAD	
FACTORED OVERTURNING	
* FACTORED DESIGN LOAD	
* BASED ON STRENGTH V LOAD COMBINATION.	

PIER 5 REQUIRED NOMINAL PILE BEARING RESISTANCE FOR CIP PILES Rn - TONS/PILE		
FIELD CONTROL METHOD	φdyn	* Rn
PDA	0.65	
* Rn = (FACTORED DESIGN LOAD) / φdyn		

GENERAL PILE NOTES

2 CAST–IN–PLACE CONCRETE TEST PILES 90 FT. LONG
18 CAST–IN–PLACE CONCRETE PILES EST. 80 FT. LENGTH
20 CAST–IN–PLACE CONCRETE PILES REQ'D FOR PIER 5.

PILE SPACING SHOWN IS AT BOTTOM OF FOOTING.

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

PILES TO HAVE A NOMINAL DIAMETER OF 12" AND 5/16" WALL THICKNESS.

FOR PILE SPLICE DETAILS SEE DETAIL B201.

NOTES:

(1) DIMENSIONS MEASURED ALONG ℄ PIER.

(2) DIMENSIONS MEASURED NORMAL TO ℄ PIER.

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: KR | CHECKED BY: KJK
DRAWN BY: MSK | DATE: 09/18/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

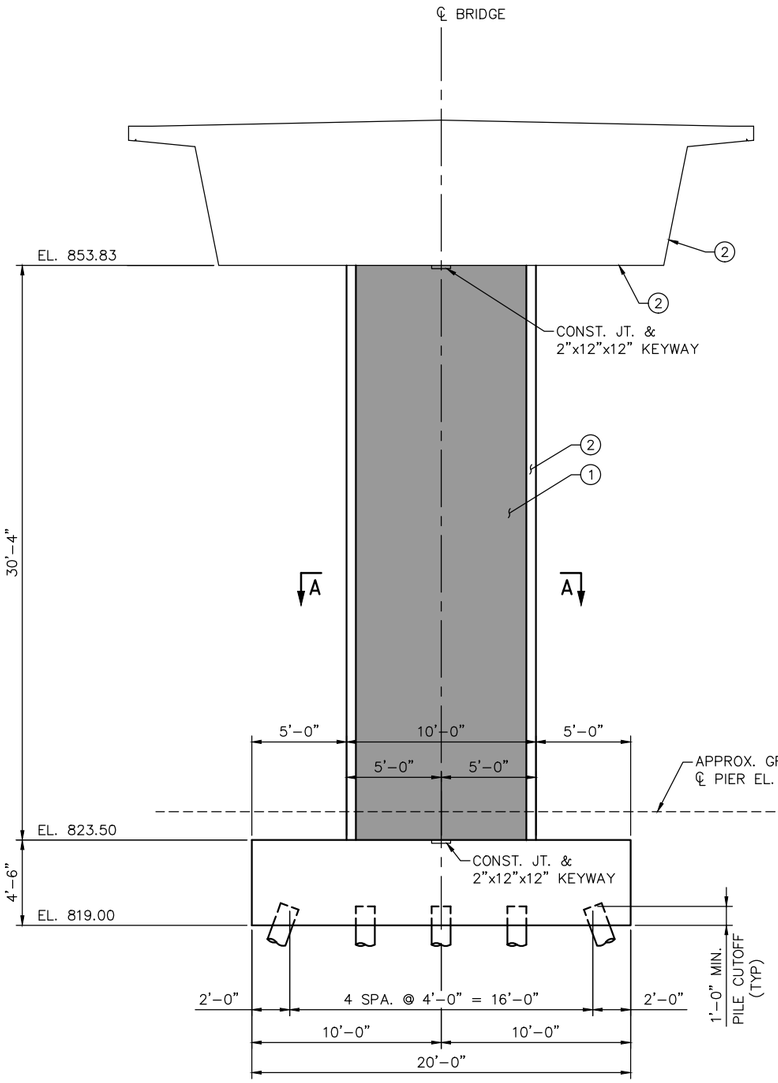
SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4B
5TH AVENUE AND 7TH STREET
BRIDGE 27C18
PIER 5 DETAILS 1

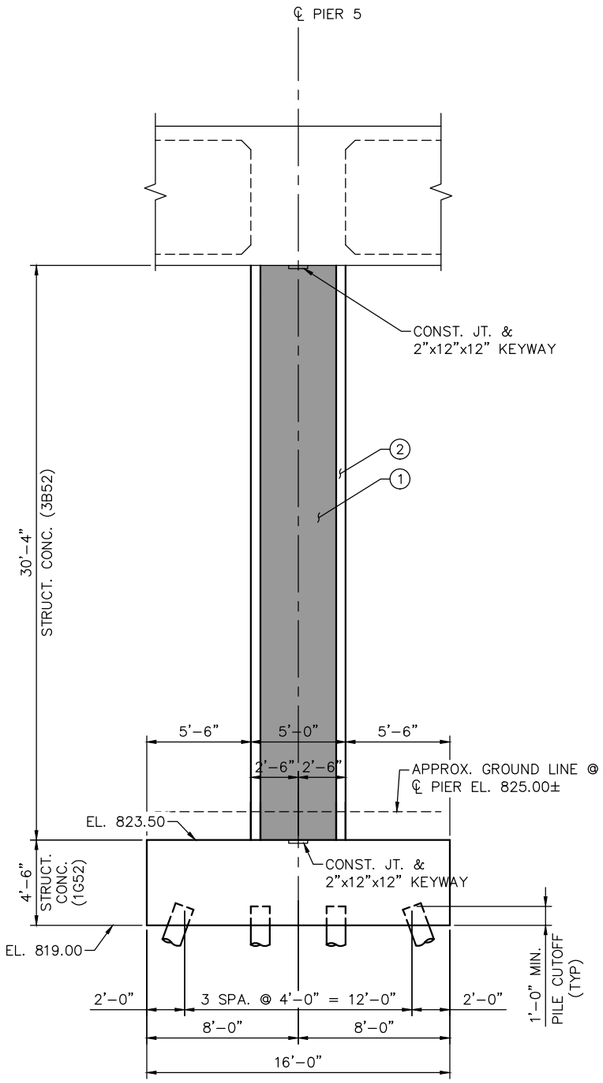
DISCIPLINE: STRUCTURES
SHEET NAME: CBR27C18-BRG-PIR-018

SHEET 26 OF 80

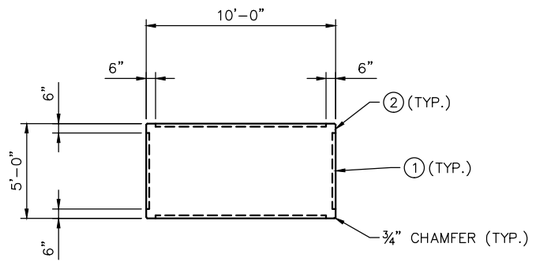
Sep. 18 2015 07:25 am v:\3400_ADC\CAD\SEGMENT E4\PLAN SHEETS\STRUCTURES\27C18\CBR27C18–BRG–PIR–018.dwg By: mark.krzyzewski



ELEVATION



END ELEVATION



SECTION A–A

NOTES:

1. ARCHITECTURAL CONCRETE TEXTURE (SPECIAL) TO BE DETERMINED. THE APPROX. THICKNESS OF ARCHITECTURAL CONCRETE ASSUMED TO BE 1". THE STRUCTURAL CONCRETE (3B52) QUANTITIES INCLUDE THE CONCRETE WITHIN THE ARCHITECTURAL CONCRETE TEXTURE.
2. SPECIAL SURFACE FINISH.

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: KR | CHECKED BY: KJK
DRAWN BY: MSK | DATE: 09/18/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

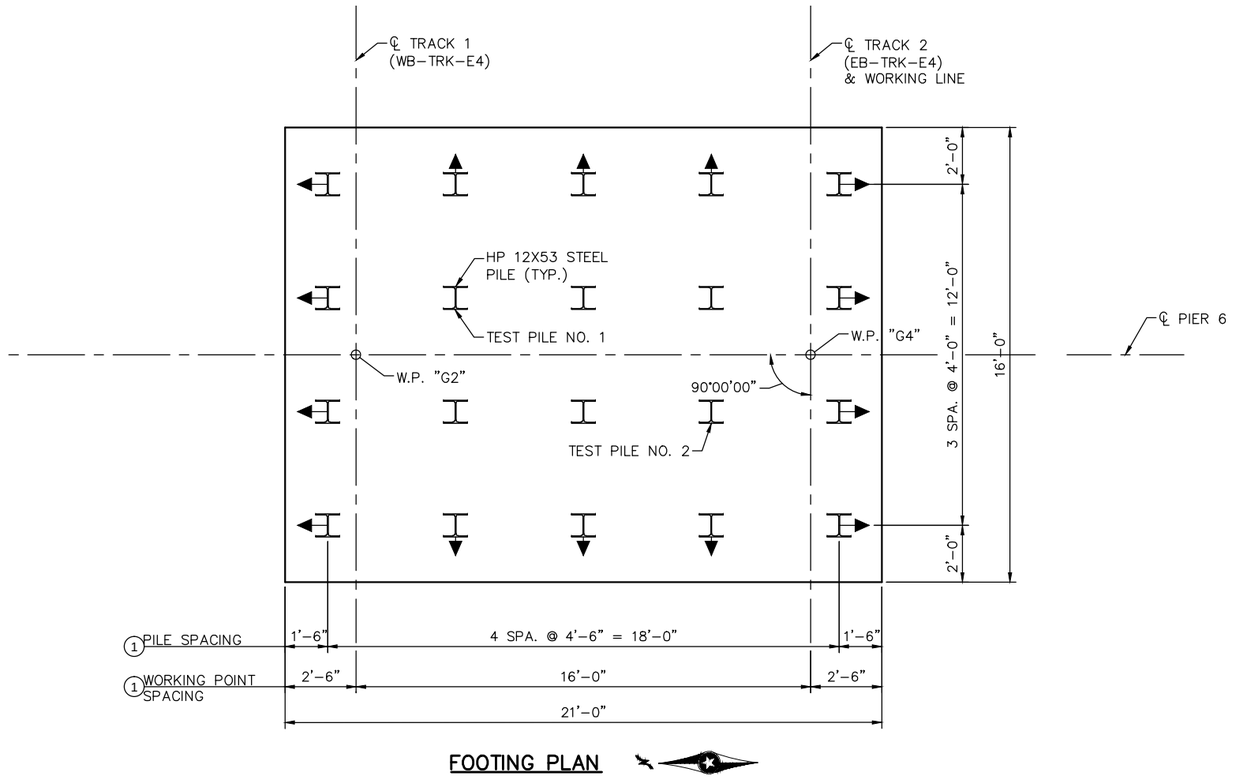
CIVIL EAST - VOLUME 4B
5TH AVENUE AND 7TH STREET
BRIDGE 27C18
PIER 5 DETAILS 2

DISCIPLINE: STRUCTURES

SHEET NAME: CBR27C18-BRG-PIR-010

SHEET 27 OF 80

Sep. 17 2015 03:05 pm v:\3400_ADC\CAD\SEGMENT E4\PLAN SHEETS\STRUCTURES\27C18\CBR27C18-BRG-PIR-010.dwg By: mark.krzyzewski



FOOTING PLAN

PIER 6 COMPUTED PILE LOAD - TONS/PILE	
FACTORED DEAD LOAD	
FACTORED LIVE LOAD	
FACTORED OVERTURNING	
* FACTORED DESIGN LOAD	134
* BASED ON STRENGTH V LOAD COMBINATION.	

PIER 6 REQUIRED NOMINAL PILE BEARING RESISTANCE FOR H-PILES Rn - TONS/PILE		
FIELD CONTROL METHOD	φdyn	* Rn
PDA	0.65	206
* Rn = (FACTORED DESIGN LOAD) / φdyn		

GENERAL PILE NOTES

2 STEEL H–TEST PILES 95 FT. LONG
18 STEEL H–PILES EST. 85 FT. LENGTH
20 STEEL H–PILES REQ'D FOR PEIR 6

PILE SPACING SHOWN IS AT BOTTOM OF FOOTING.

ALL PILES TO BE HP12x53 WITH PILE TIP PROTECTION.

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

FOR PILE SPLICE DETAILS SEE DETAIL B202.

NOTES:

(1) DIMENSIONS MEASURED ALONG ℄ PIER

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: KR | CHECKED BY: KJK
DRAWN BY: MSK | DATE: 09/18/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

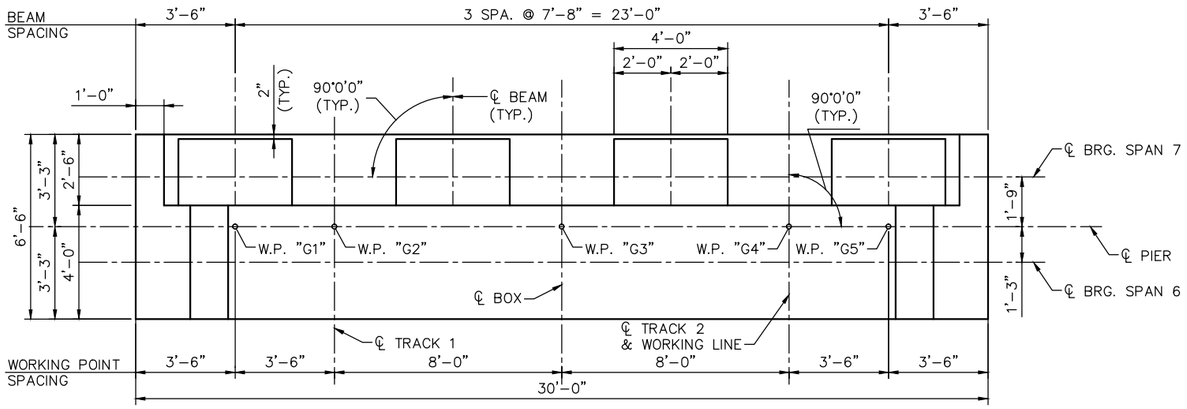
SOUTHWEST Green Line LRT Extension

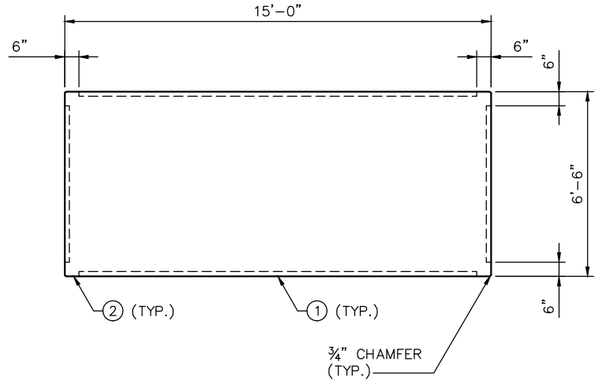
CIVIL EAST - VOLUME 4B
5TH AVENUE AND 7TH STREET
BRIDGE 27C18
PIER 6 DETAILS 1

DISCIPLINE: STRUCTURES
SHEET NAME: CBR27C18-BRG-PIR-013

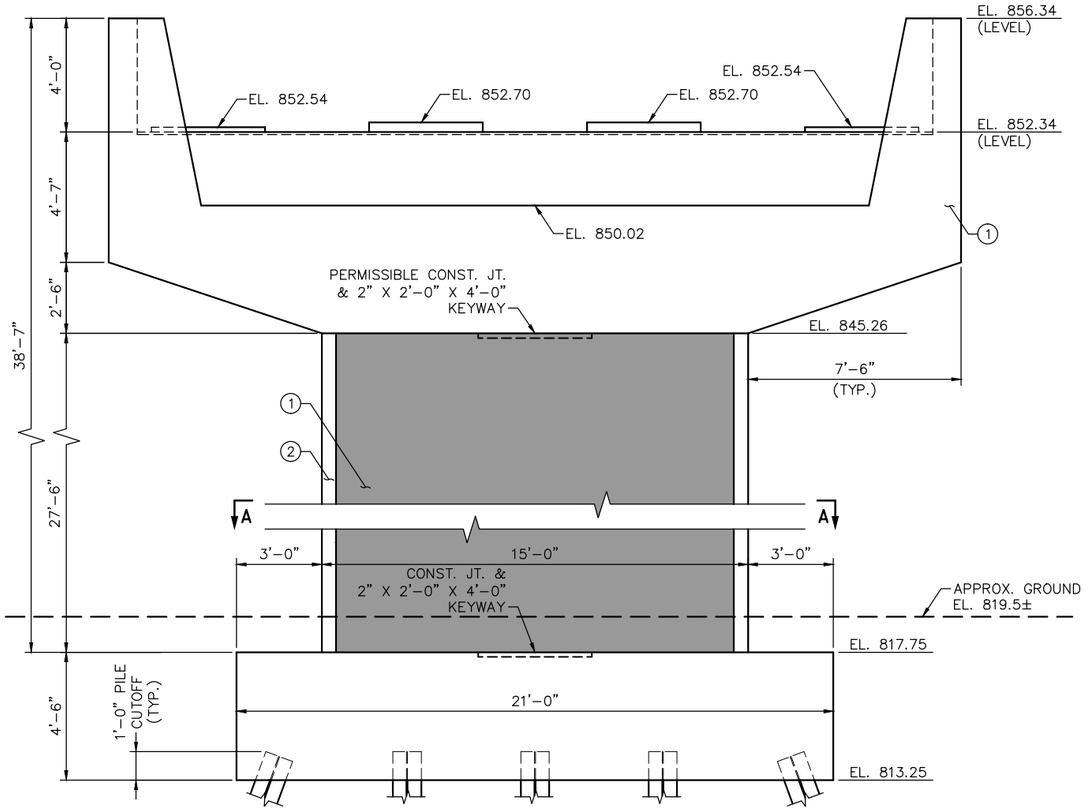
SHEET 28 OF 80

Sep. 18 2015 07:25 am v:\3400_ADC\CAD\SEGMENT E4\PLAN SHEETS\STRUCTURES\27C18\CBR27C18-BRG-PIR-013.dwg By: mark.krzyzewski



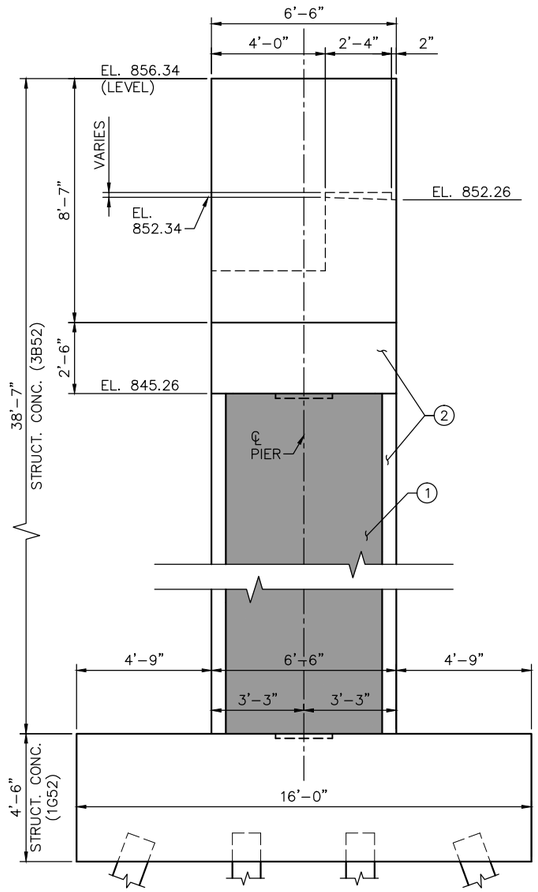


SECTION A–A



ELEVATION

LOOKING UP STATION



END ELEVATION – PIER 6

NOTES:

1. ARCHITECTURAL CONCRETE TEXTURE (SPECIAL) TO BE DETERMINED. THE APPROX. THICKNESS OF ARCHITECTURAL CONCRETE ASSUMED TO BE 1". THE STRUCTURAL CONCRETE (3B52) QUANTITIES INCLUDE THE CONCRETE WITHIN THE ARCHITECTURAL CONCRETE TEXTURE.
2. SPECIAL SURFACE FINISH.

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: KR | CHECKED BY: KJK
DRAWN BY: MSK | DATE: 09/18/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

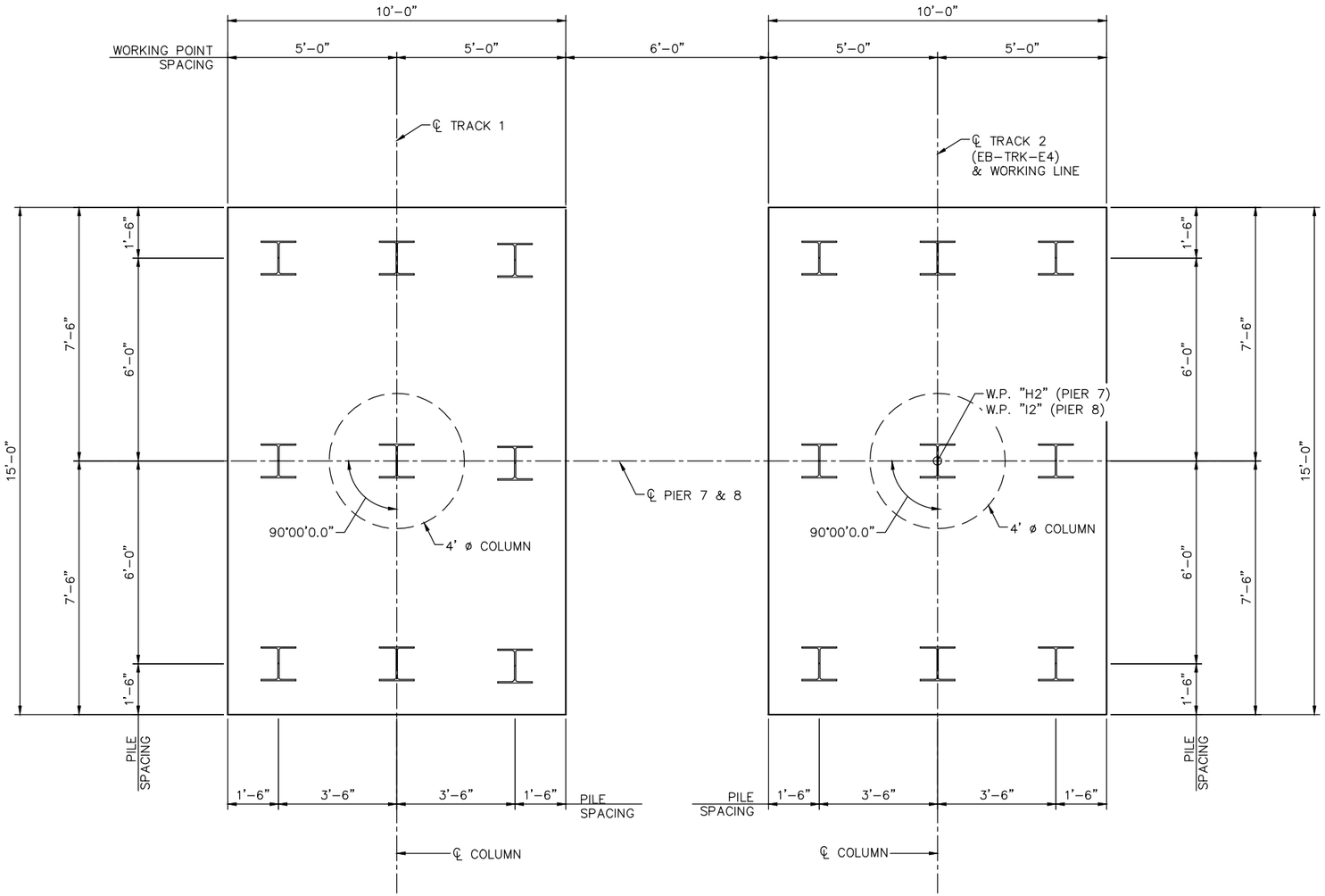
METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4B
5TH AVENUE AND 7TH STREET
BRIDGE 27C18
PIER 6 DETAILS 2

DISCIPLINE: STRUCTURES
SHEET NAME: CBR27C18-BRG-PIR-014

SHEET 29 OF 80



FOOTING PLAN

PIER 7 COMPUTED PILE LOAD - TONS/PILE	
FACTORED DEAD LOAD	
FACTORED LIVE LOAD	
FACTORED OVERTURNING	
* FACTORED DESIGN LOAD	94
* BASED ON STRENGTH III LOAD COMBINATION.	

PIER 7 REQUIRED NOMINAL PILE BEARING RESISTANCE FOR H-PILES Rn - TONS/PILE		
FIELD CONTROL METHOD	φdyn	* Rn
PDA	0.65	145
* Rn = (FACTORED DESIGN LOAD) / φdyn		

GENERAL PILE NOTES

2 STEEL H–TEST PILE 108 FT. LONG
16 STEEL H–PILES EST. LENGTH 98 FT.
18 STELL H–PILES REQ'D FOR PIER 7

PIER 8 COMPUTED PILE LOAD - TONS/PILE	
FACTORED DEAD LOAD	
FACTORED LIVE LOAD	
FACTORED OVERTURNING	
* FACTORED DESIGN LOAD	115
* BASED ON STRENGTH V LOAD COMBINATION.	

PIER 8 REQUIRED NOMINAL PILE BEARING RESISTANCE FOR H-PILES Rn - TONS/PILE		
FIELD CONTROL METHOD	φdyn	* Rn
PDA	0.65	178
* Rn = (FACTORED DESIGN LOAD) / φdyn		

GENERAL PILE NOTES

2 STEEL H–TEST PILE 126 FT. LONG
16 STEEL H–PILES EST. LENGTH 116 FT.
18 STELL H–PILES REQ'D FOR PIER 8

NOTES:

PIER PILES TO BE HP 12x53 WITH PILE TIP PROTECTION.

PILE SPACING SHOWN IS AT BOTTOM OF FOOTING.

FOR PILE SPLICE DETAILS, SEE DETAIL B202.

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: KR | CHECKED BY: KJK
DRAWN BY: MSK | DATE: 09/18/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

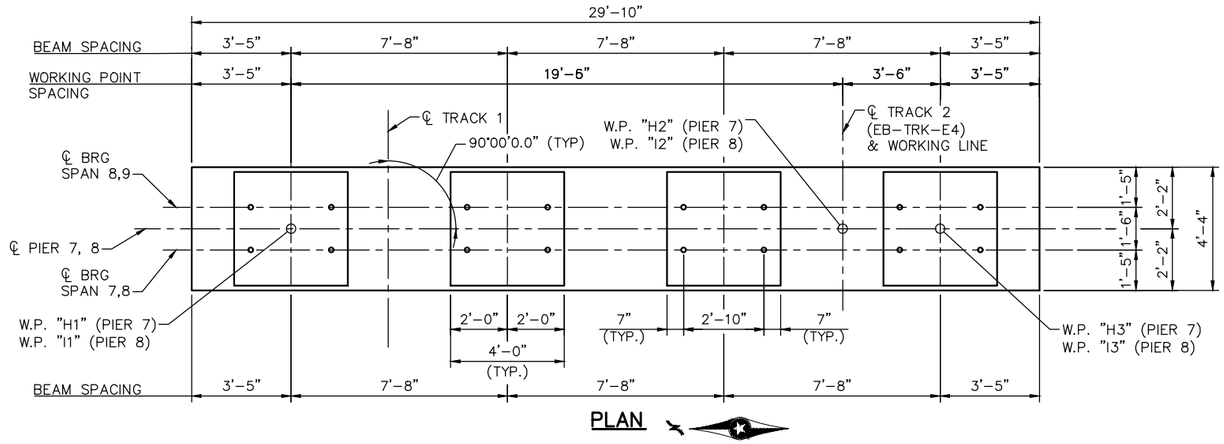
SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4B
5TH AVENUE AND 7TH STREET
BRIDGE 27C18
PIER 7 & 8 DETAILS 1

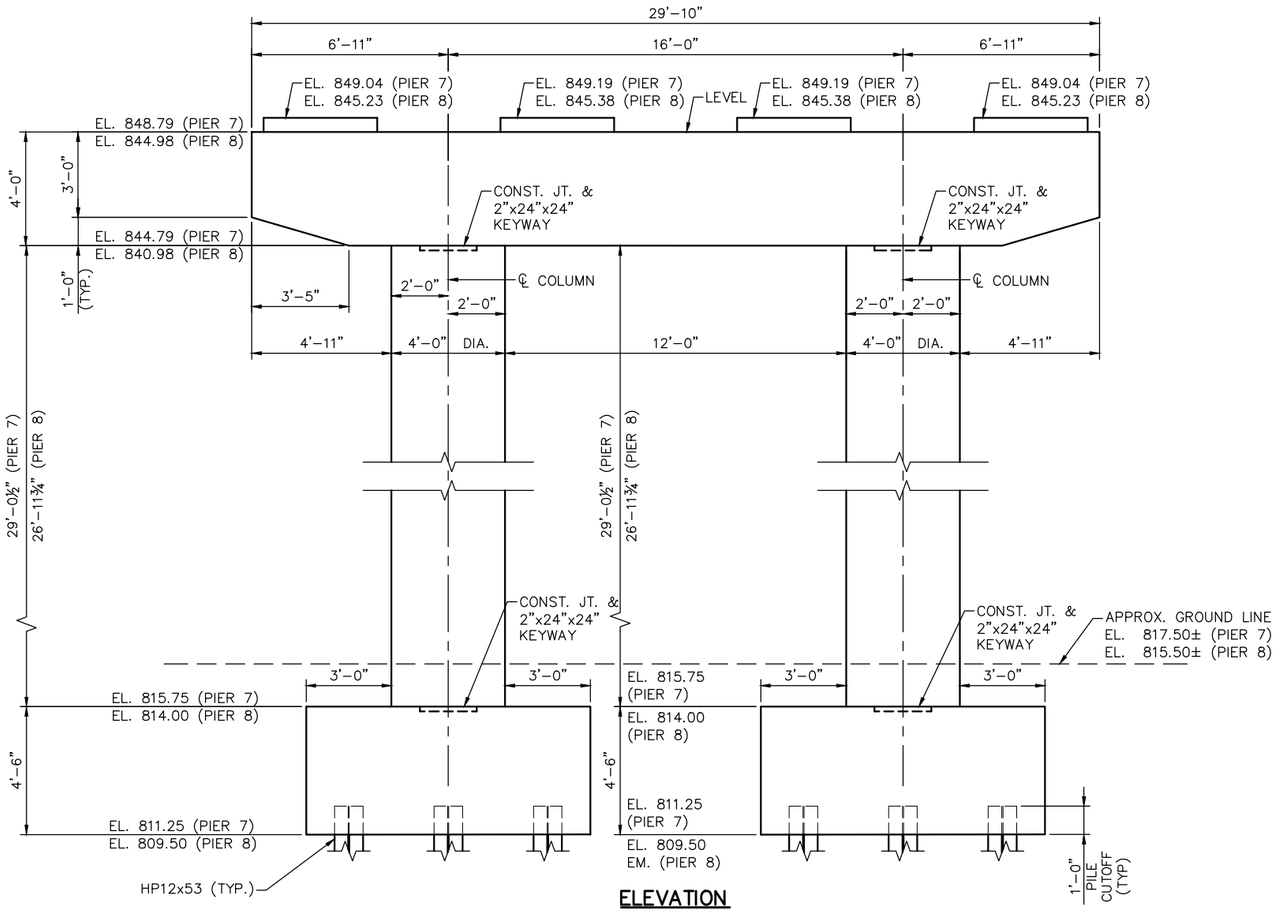
DISCIPLINE: STRUCTURES
SHEET NAME: CBR27C18-BRG-PIR-001

SHEET 30 OF 80

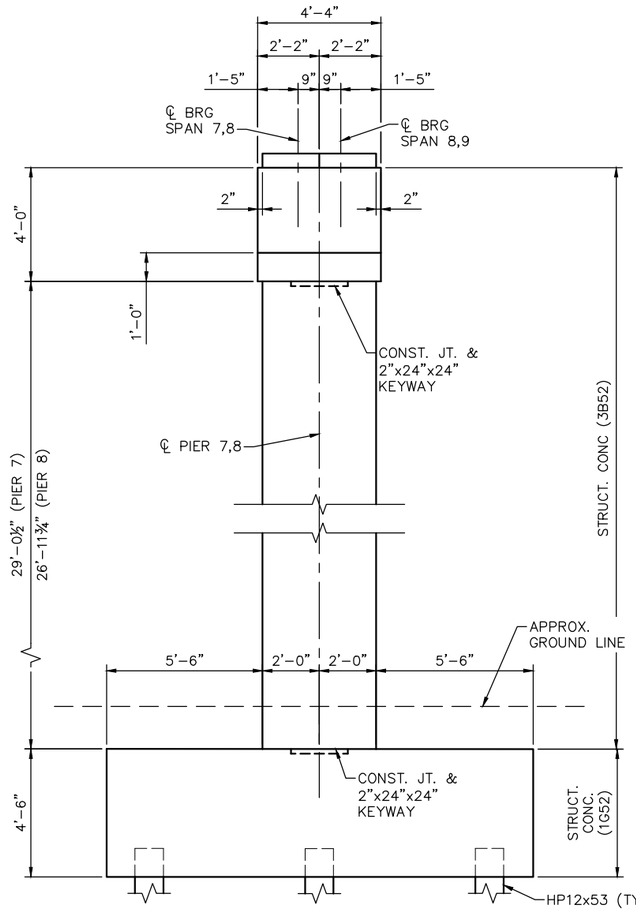
Sep, 18 2015 07:26 am v:\3400_ADC\CAD\SEGMENT E4\PLAN SHEETS\STRUCTURES\27C18\CBR27C18-BRG-PIR-001.dwg By: mark.krzyzewski



PLAN



ELEVATION



END VIEW

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: KR | CHECKED BY: KJK
DRAWN BY: MSK | DATE: 09/18/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

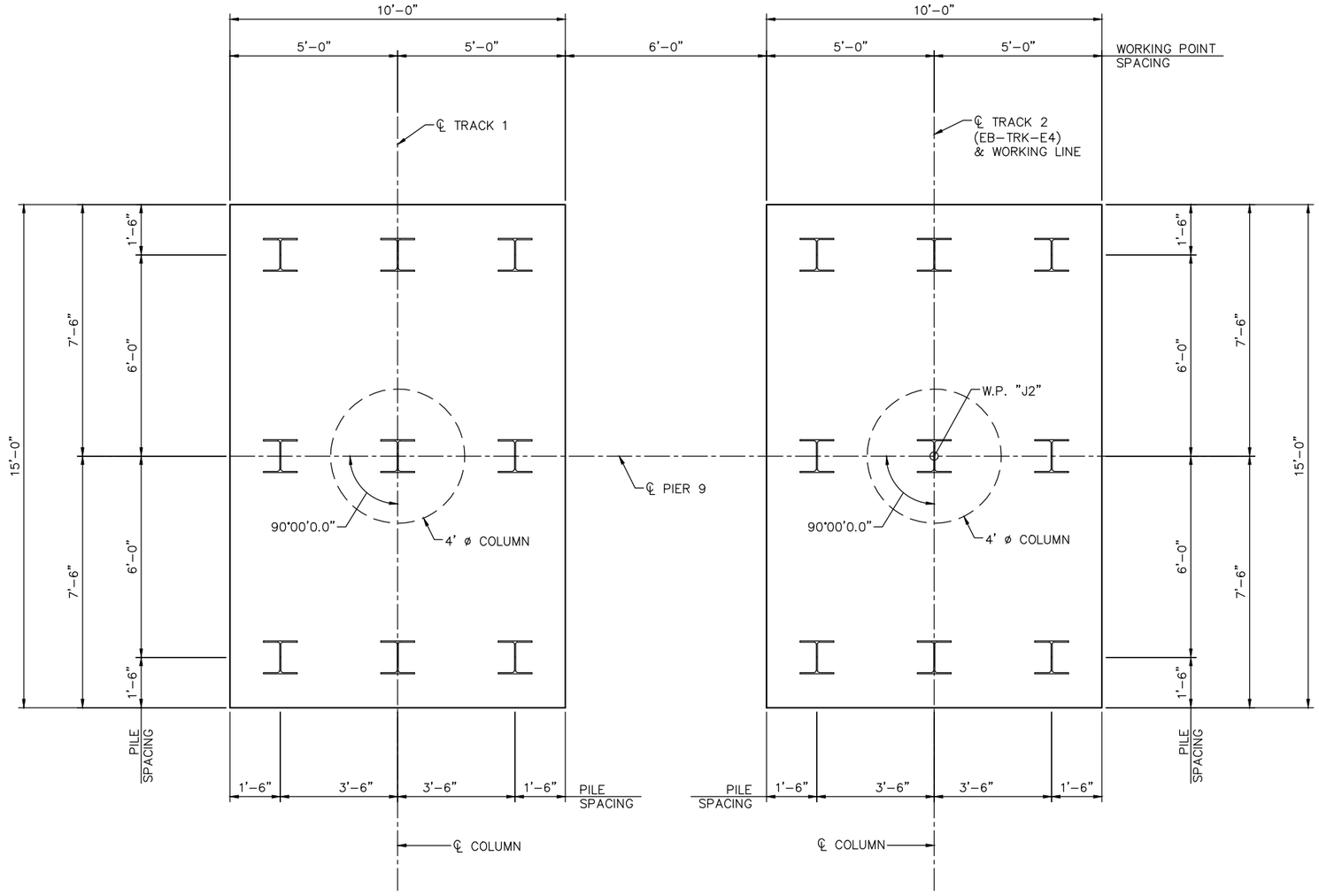
SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4B
5TH AVENUE AND 7TH STREET BRIDGE 27C18
PIER 7 & 8 DETAILS 2

DISCIPLINE: STRUCTURES

SHEET NAME: CBR27C18-BRG-PIR-003

SHEET 31 OF 80



FOOTING PLAN

PIER 9 COMPUTED PILE LOAD - TONS/PILE	
FACTORED DEAD LOAD	
FACTORED LIVE LOAD	
FACTORED OVERTURNING	
* FACTORED DESIGN LOAD	115
* BASED ON STRENGTH V LOAD COMBINATION.	

PIER 9 REQUIRED NOMINAL PILE BEARING RESISTANCE FOR H-PILES Rn - TONS/PILE		
FIELD CONTROL METHOD	φdyn	* Rn
PDA	0.65	178
* Rn = (FACTORED DESIGN LOAD) / φdyn		

GENERAL PILE NOTES

2 STEEL H–TEST PILE 141 FT. LONG
16 STEEL H–PILES EST. LENGTH 131 FT
18 STEEL H–PILES REQ'D FOR PIER 9

PIER PILES TO BE HP 12x53 WITH PILE TIP PROTECTION.

PILE SPACING SHOWN IS AT BOTTOM OF FOOTING

FOR PILE SPLICE DETAILS, SEE DETAIL B202.

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: KR | CHECKED BY: KJK
DRAWN BY: MSK | DATE: 09/18/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

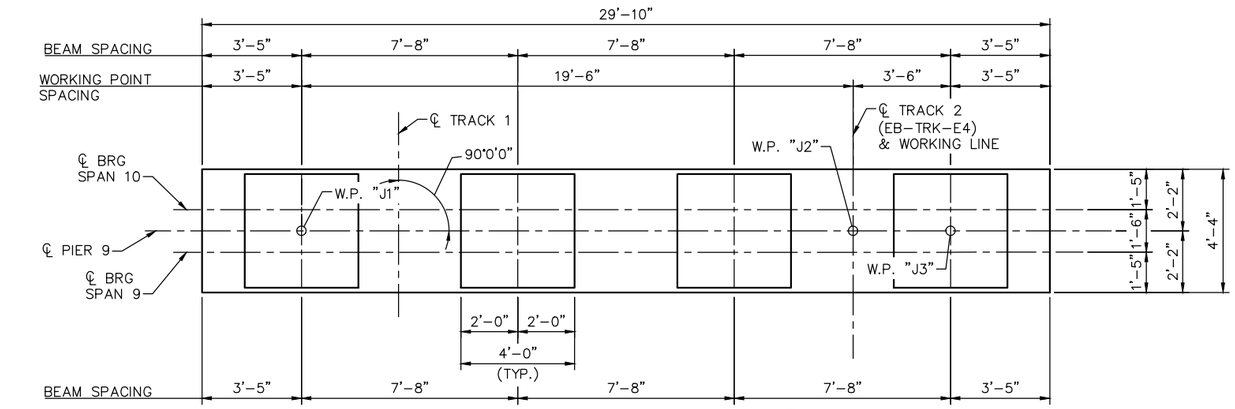
SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4B
5TH AVENUE AND 7TH STREET
BRIDGE 27C18
PIER 9 DETAILS 1

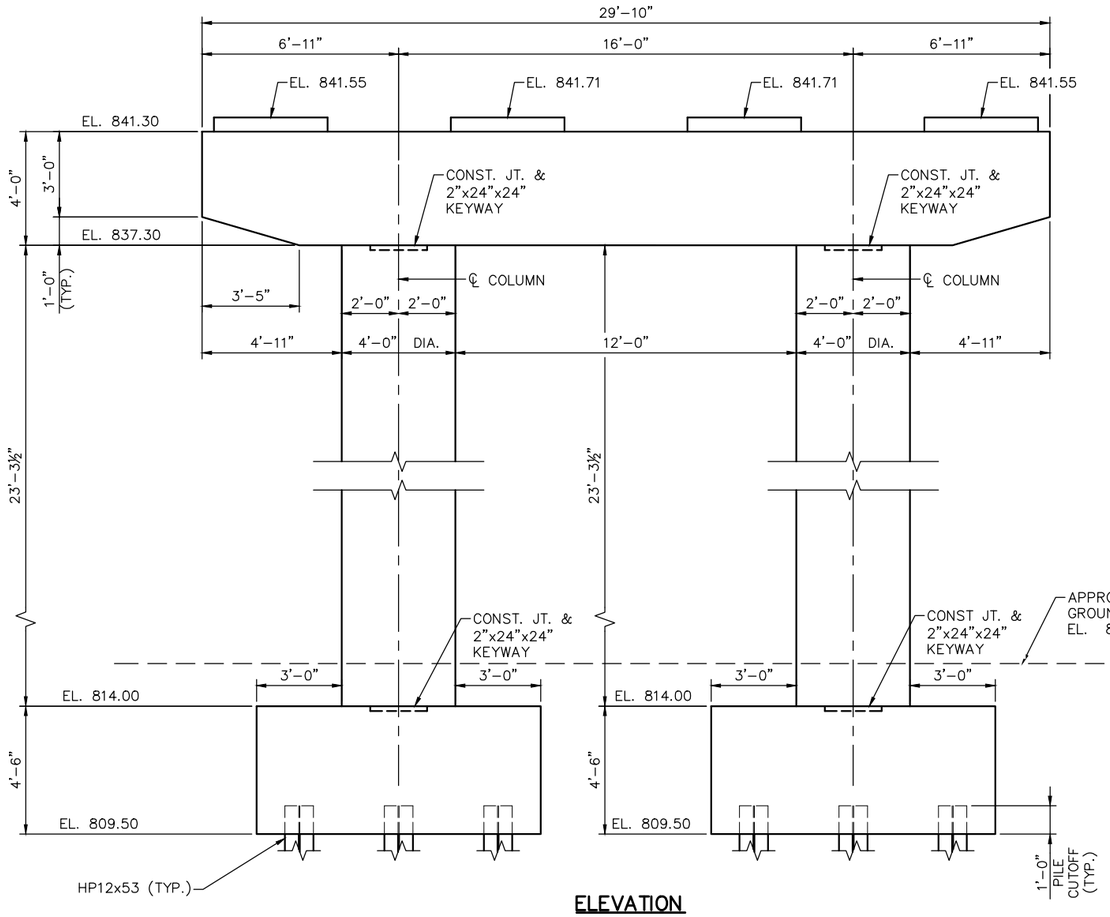
DISCIPLINE: STRUCTURES
SHEET NAME: CBR27C18-BRG-PIR-005

SHEET 32 OF 80

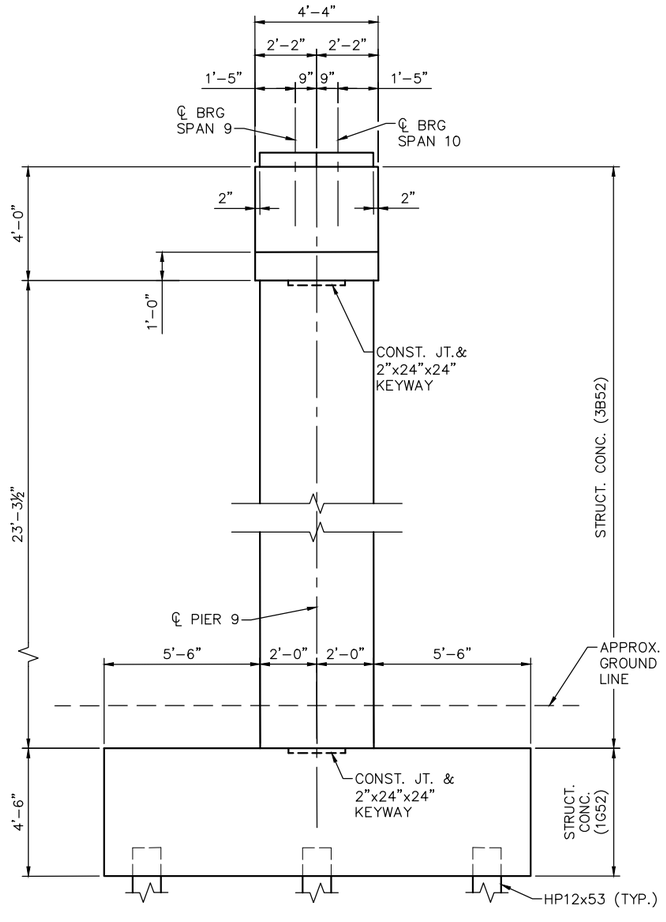
Sep, 18 2015 07:27 am v:\3400_ADC\CAD\SEGMENT E4\PLAN SHEETS\STRUCTURES\27C18\CBR27C18-BRG-PIR-005.dwg By: mark.krzyzewski



PLAN



ELEVATION



END VIEW

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: KR | CHECKED BY: KJK
DRAWN BY: MSK | DATE: 09/18/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

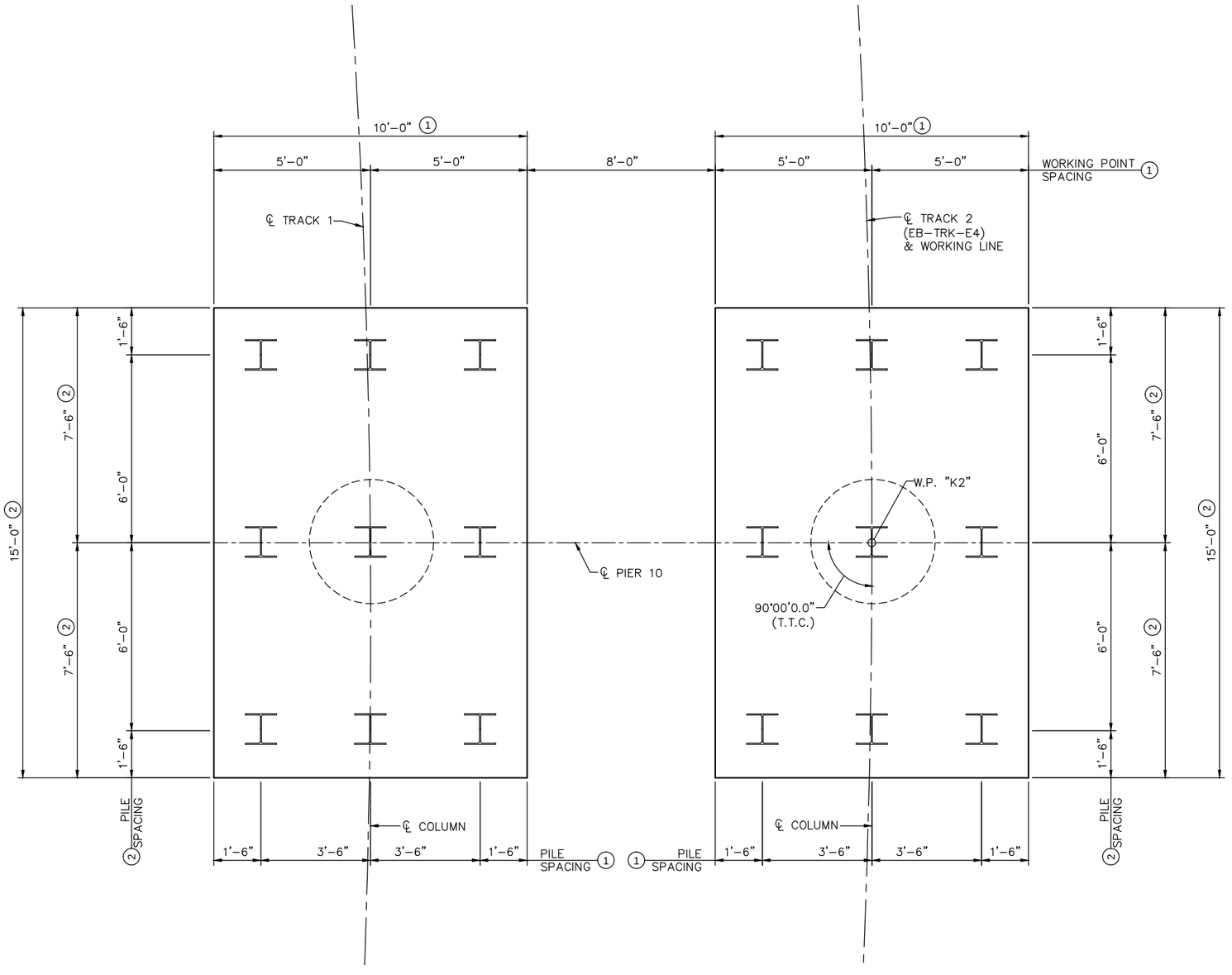
CIVIL EAST - VOLUME 4B
5TH AVENUE AND 7TH STREET
BRIDGE 27C18
PIER 9 DETAILS 2

DISCIPLINE: STRUCTURES

SHEET NAME: CBR27C18-BRG-PIR-006

SHEET 33 OF 80

Sep. 18 2015 07:27 am V:\3400_ADC\CAD\SEGMENT E4\PLAN SHEETS\STRUCTURES\27C18\CBR27C18-BRG-PIR-006.dwg By: mark.krzyzewski



FOOTING PLAN

PIER 10 COMPUTED PILE LOAD - TONS/PILE	
FACTORED DEAD LOAD	
FACTORED LIVE LOAD	
FACTORED OVERTURNING	
* FACTORED DESIGN LOAD	94
* BASED ON STRENGTH III LOAD COMBINATION.	

PIER 10 REQUIRED NOMINAL PILE BEARING RESISTANCE FOR H-PILES Rn - TONS/PILE		
FIELD CONTROL METHOD	φdyn	* Rn
PDA	0.65	145
* Rn = (FACTORED DESIGN LOAD) / φdyn		

GENERAL PILE NOTES

2 STEEL H-TEST PILE 140 FT. LONG
16 STEEL H-PILES EST. LENGTH 130 FT.
18 STEEL H-PILES REQ'D FOR PIER 10

PILE SPACING IS SHOWN AT BOTTOM OF FOOTING.

ALL PILES TO BE HP12X53 WITH A PILE TIP PROTECTION

FOR PILE SPLICE DETAILS SEE B-DETAIL B202

NOTES:

(1) DIMENSIONS MEASURED ALONG ℄ PIER

(2) DIMENSIONS MEASURED NORMAL TO ℄ PIER

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: KR | CHECKED BY: KJK
DRAWN BY: MSK | DATE: 09/18/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

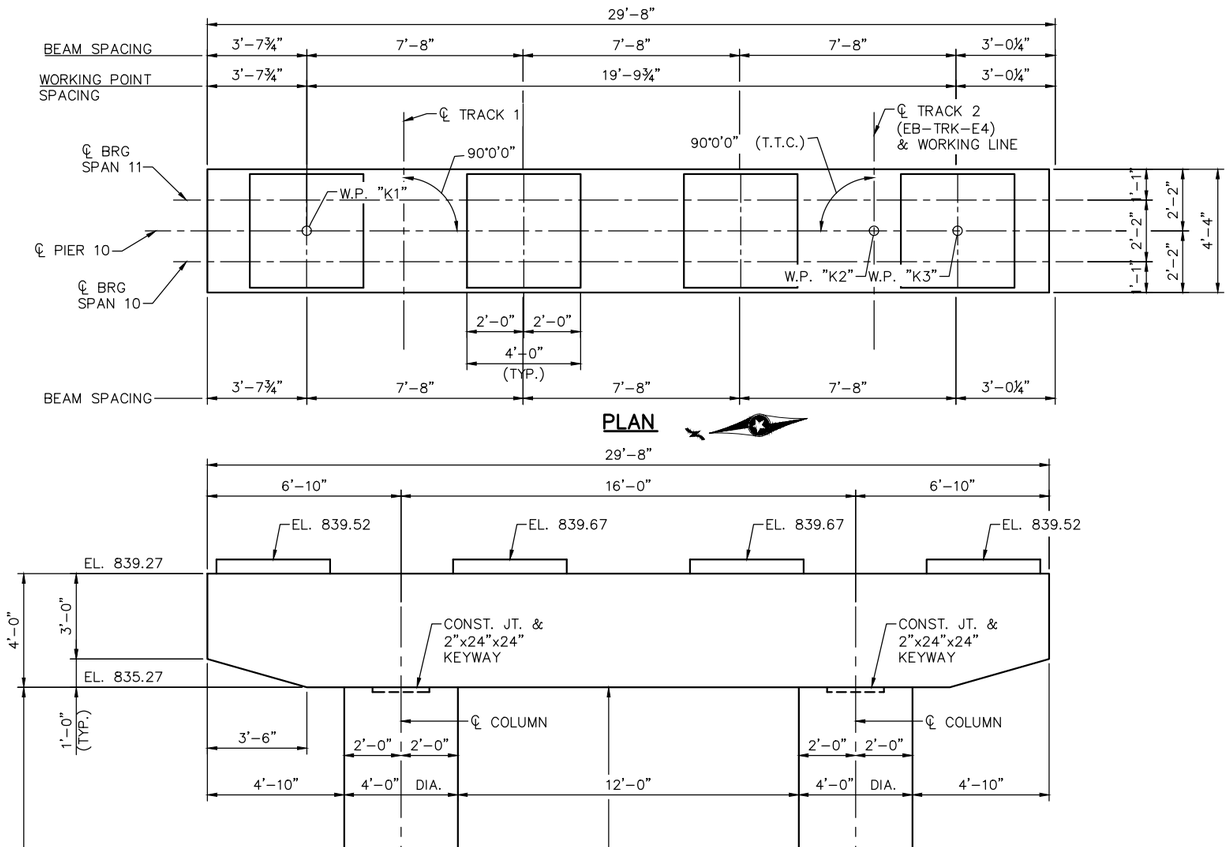
CIVIL EAST - VOLUME 4B
5TH AVENUE AND 7TH STREET BRIDGE 27C18
PIER 10 DETAILS 1

DISCIPLINE: STRUCTURES

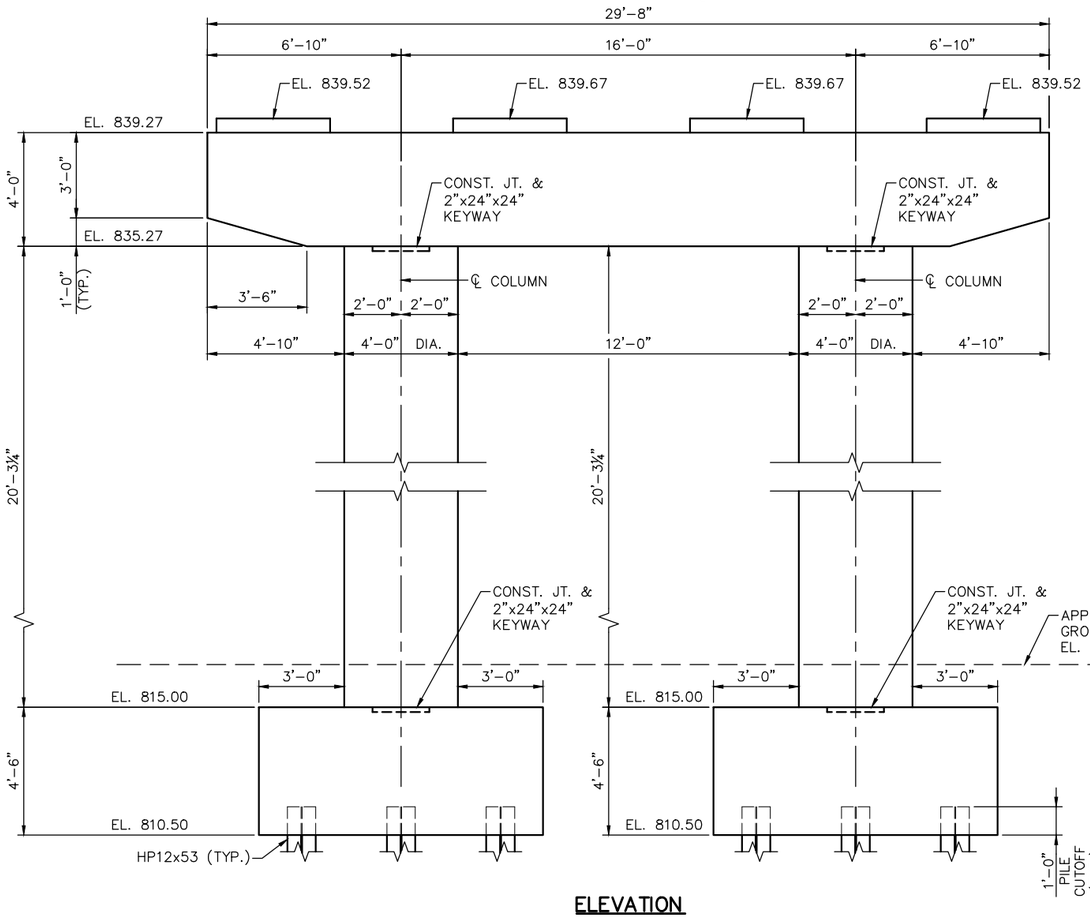
SHEET NAME: CBR27C18-BRG-PIR-002

SHEET 34 OF 80

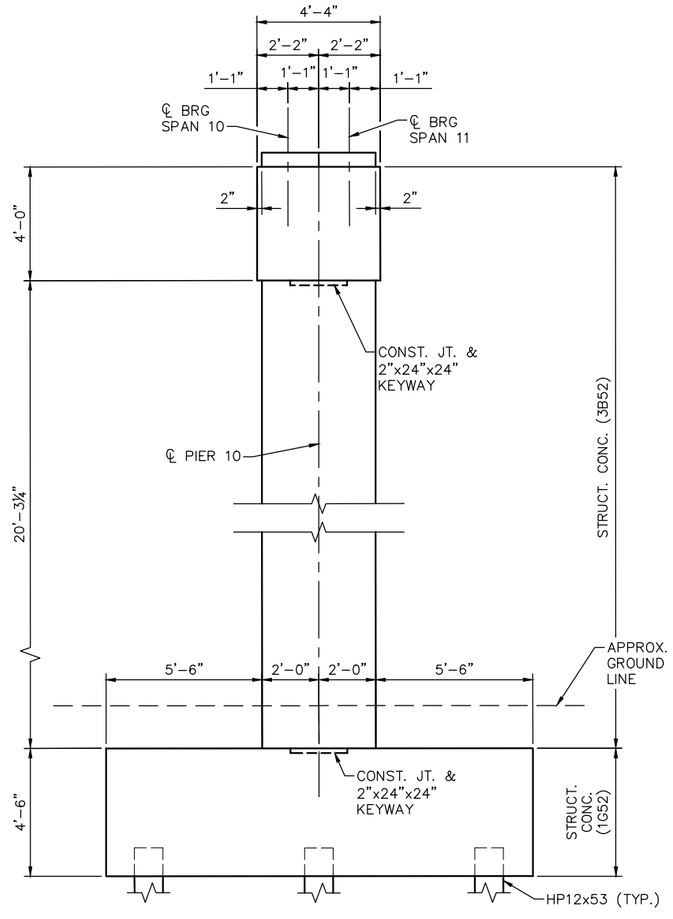
Sep. 18 2015 07:28 am V:\3400_ADC\CAD\SEGMENT E4\PLAN SHEETS\STRUCTURES\27C18\CBR27C18-BRG-PIR-002.dwg By: mark.krzyzewski



PLAN



ELEVATION



END VIEW

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: KR | CHECKED BY: KJK
DRAWN BY: MSK | DATE: 09/18/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

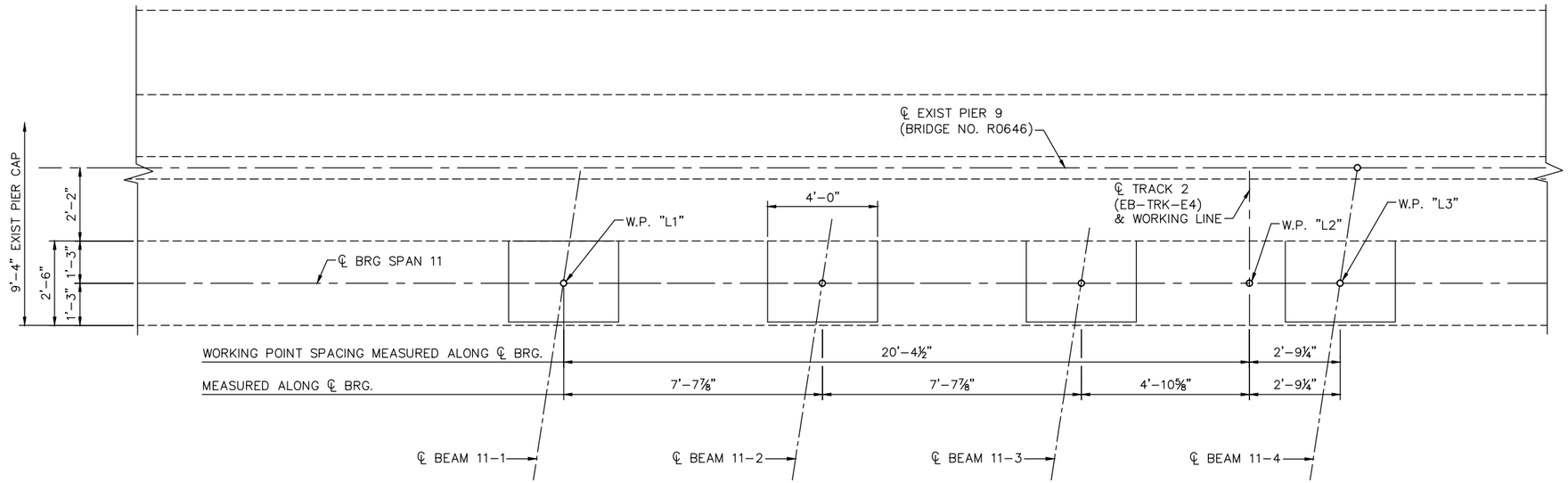
CIVIL EAST - VOLUME 4B
5TH AVENUE AND 7TH STREET BRIDGE 27C18
PIER 10 DETAILS 2

DISCIPLINE: STRUCTURES

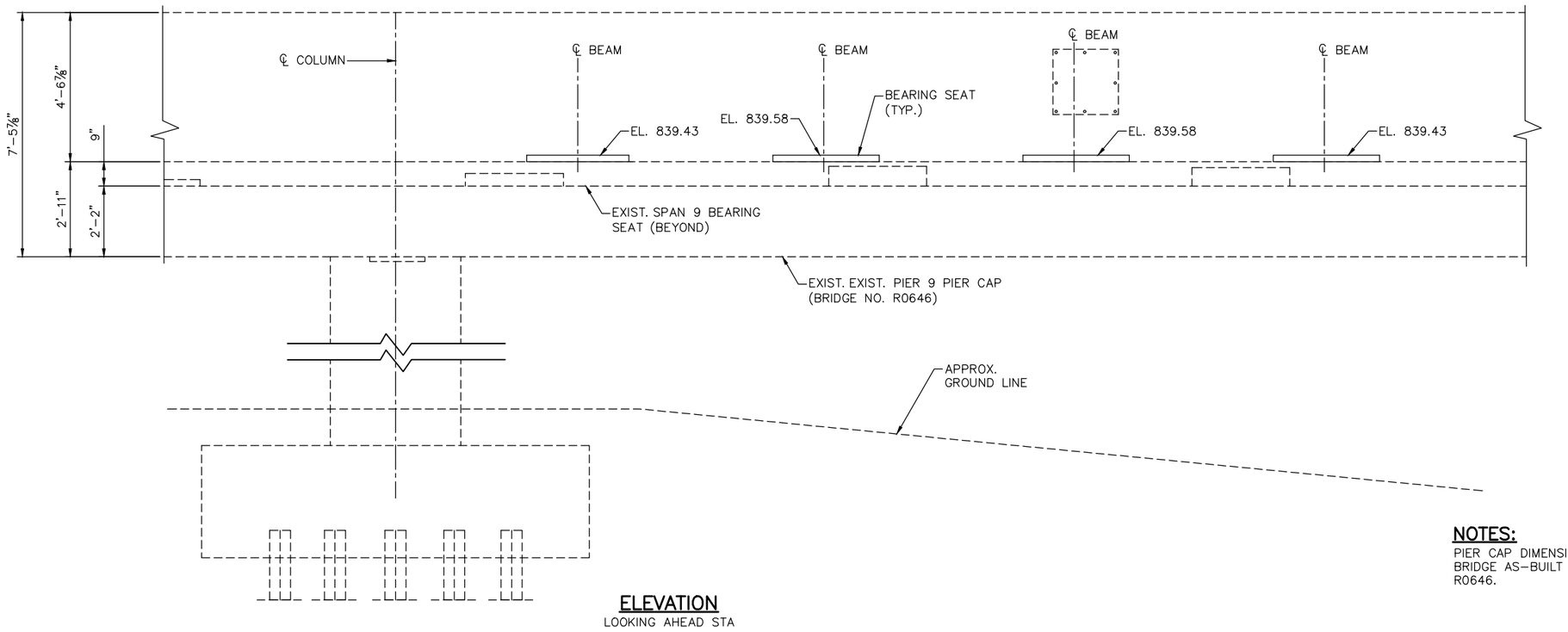
SHEET NAME: CBR27C18-BRG-PIR-004

SHEET 35 OF 80

Sep. 18 2015 07:28 am v:\3400_ADC\CAD\SEGMENT E4\PLAN SHEETS\STRUCTURES\27C18\CBR27C18-BRG-PIR-004.dwg By: mark.krzyzewski



PLAN



ELEVATION
LOOKING AHEAD STA

NOTES:
PIER CAP DIMENSIONS SHOWN BASED ON EXISTING BRIDGE AS-BUILT DRAWINGS FOR BRIDGE NO. R0646.

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: KR | CHECKED BY: KJK
DRAWN BY: MSK | DATE: 09/18/15

AECOM Kimley»Horn

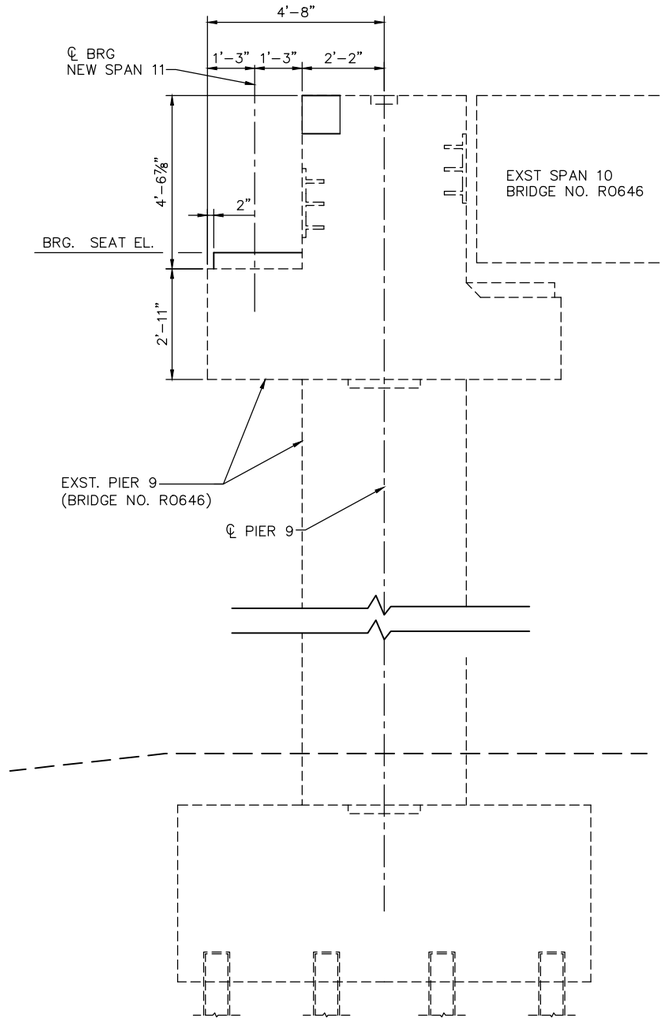
60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL
SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4B
5TH AVENUE AND 7TH STREET
BRIDGE 27C18
EXISTING PIER 9 DETAILS 1

DISCIPLINE: STRUCTURES
SHEET NAME: CBR27C18-BRG-PEL-001

SHEET 36 OF 80



END ELEVATION

NOTES:

PIER CAP DIMENSIONS SHOWN BASED ON EXISTING BRIDGE AS-BUILT DRAWINGS FOR BRIDGE NO. R0646.

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: KR | CHECKED BY: KJK
DRAWN BY: MSK | DATE: 09/18/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

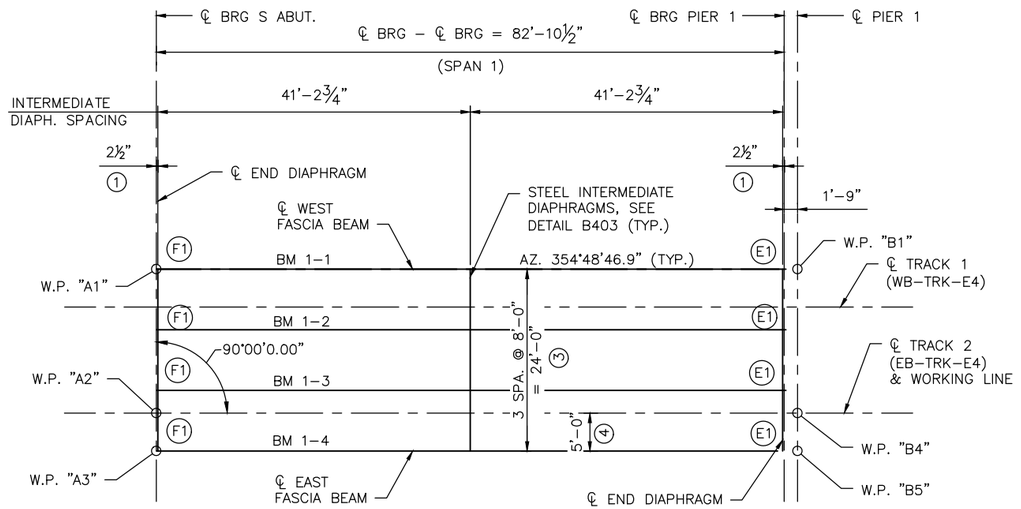
CIVIL EAST - VOLUME 4B
5TH AVENUE AND 7TH STREET BRIDGE 27C18
EXISTING PIER 9 DETAILS 2

DISCIPLINE: STRUCTURES

SHEET NAME: CBR27C18-BRG-PEL-002

SHEET 37 OF 80

Sep. 17 2015 03:09 pm v:\3400_ADC\CAD\SEGMENT E4\PLAN SHEETS\STRUCTURES\27C18\CBR27C18-BRG-PEL-002.dwg By: mark.krzyzewski



SPAN 1

FRAMING PLAN – UNIT 1

LEGEND:

BM 1–1
- 1 — DENOTES BEAM I.D. NUMBER IN SPAN
- 1 — DENOTES SPAN NUMBER

NOTES:

BEAM AZIMUTHS SHOWN FOR EACH SPAN ARE TYPICAL UNLESS NOTED OTHERWISE

(1) CONCRETE END DIAPHRAGM SHALL BE PARALLEL TO CENTERLINE BEARING. SEE DETAIL B814.

(2) INTERMEDIATE DIAPHRAGM SPACING ALONG CENTERLINE OF FASCIA BEAM.

(3) MN45 PRESTRESSED CONCRETE BEAMS.

(4) DIMENSION MEASURED BETWEEN WORKING POINTS AT SUBSTRUCTURE.

(E1) DENOTES EXPANSION CURVED PLATE BEARING ASSEMBLY, TYPE 1. SEE DETAIL B311.

(F1) DENOTES FIXED CURVED PLATE BRG. ASSEMBLY, TYPE 1. SEE DETAIL B310.

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: KR | CHECKED BY: KJK
DRAWN BY: MSK | DATE: 09/18/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

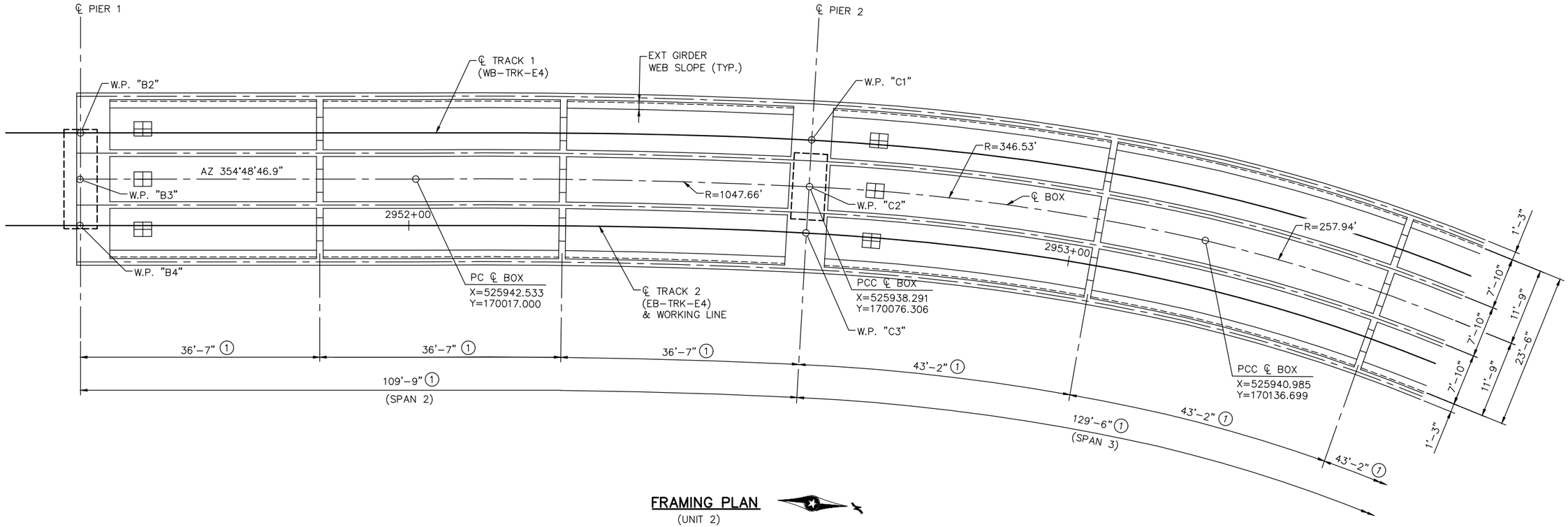
SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4B
5TH AVENUE AND 7TH STREET
BRIDGE 27C18
FRAMING PLAN 1

DISCIPLINE: STRUCTURES

SHEET NAME: CBR27C18-BRG-FRP-001

SHEET 38 OF 80



FRAMING PLAN
(UNIT 2)

NOTES:

⊞ ACCESS OPENING IN BOTTOM OF BOX GIRDER CELL. SEE DETAIL B942.

(1) DIMENSIONS MEASURED ALONG ℄ TRACK 2.

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: KR | CHECKED BY: KJK
DRAWN BY: MSK | DATE: 09/18/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

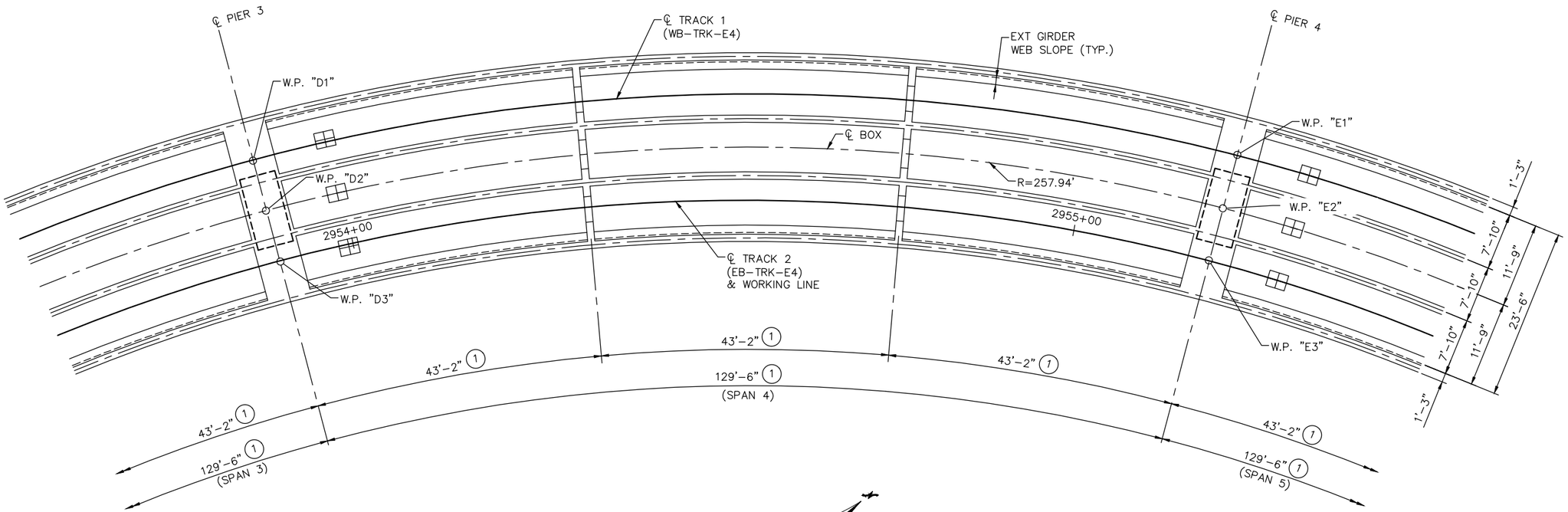
SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4B
5TH AVENUE AND 7TH STREET
BRIDGE 27C18
FRAMING PLAN 2

DISCIPLINE: STRUCTURES
SHEET NAME: CBR27C18-BRG-FRP-002

SHEET 39 OF 80

Sep, 18 2015 07:29 am v:\3400_ADC\CAD\SEGMENT E4\PLAN SHEETS\STRUCTURES\27C18\CBR27C18-BRG-FRP-002.dwg By: mark.krzyzewski



FRAMING PLAN
(UNIT 2)

NOTES:

ACCESS OPENING IN BOTTOM OF BOX GIRDER CELL. SEE DETAIL B942.

(1) DIMENSIONS MEASURED ALONG ℄ TRACK 2.

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: KR | CHECKED BY: KJK
DRAWN BY: MSK | DATE: 09/18/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

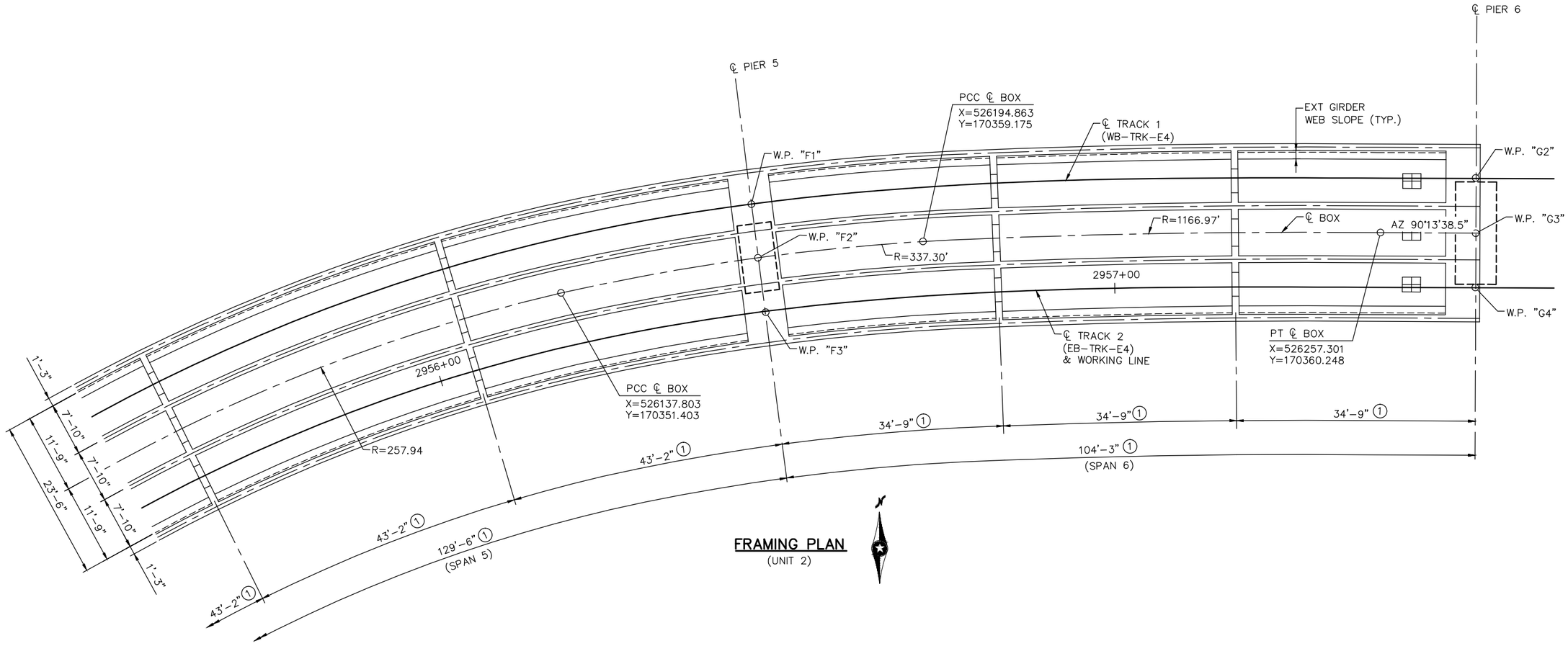
SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4B
5TH AVENUE AND 7TH STREET
BRIDGE 27C18
FRAMING PLAN 3

DISCIPLINE: STRUCTURES
SHEET NAME: CBR27C18-BRG-FRP-003

SHEET 40 OF 80

Sep. 18 2015 07:30 am V:\3400_ADC\CAD\SEGMENT E4\PLAN SHEETS\STRUCTURES\27C18\CBR27C18-BRG-FRP-003.dwg By: mark.krzyzewski



FRAMING PLAN
(UNIT 2)

NOTES:

⊞ ACCESS OPENING IN BOTTOM OF BOX GIRDER CELL. SEE DETAIL B942.

(1) DIMENSIONS MEASURED ALONG ℄ TRACK 2.

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: KR | CHECKED BY: KJK
DRAWN BY: MSK | DATE: 09/18/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

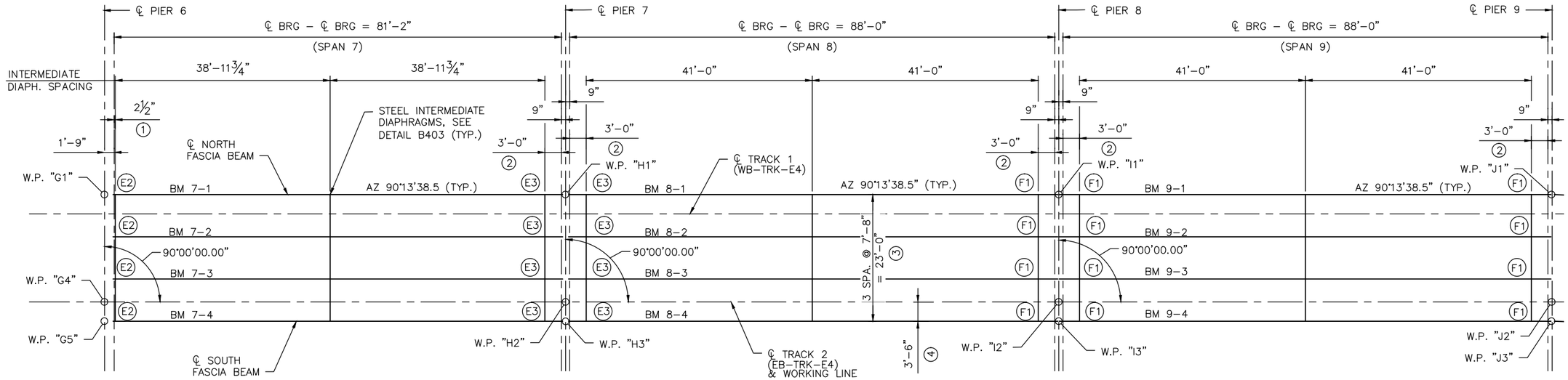
CIVIL EAST - VOLUME 4B
5TH AVENUE AND 7TH STREET
BRIDGE 27C18
FRAMING PLAN 4

DISCIPLINE: STRUCTURES

SHEET NAME: CBR27C18-BRG-FRP-004

SHEET 41 OF 80

Sep. 18 2015 07:31 am v:\3400_ADC\CAD\SEGMENT E4\PLAN SHEETS\STRUCTURES\27C18\CBR27C18-BRG-FRP-004.dwg By: mark.krzyzewski



SPAN 7

SPAN 8

SPAN 9

FRAMING PLAN – UNIT 3

LEGEND:

BM 1–1
- 1 — DENOTES BEAM I.D. NUMBER IN SPAN
- 2 — DENOTES SPAN NUMBER

NOTES:

BEAM AZIMUTHS SHOWN FOR EACH SPAN ARE TYPICAL UNLESS NOTED OTHERWISE

1. CONCRETE END DIAPHRAGM SHALL BE PARALLEL TO CENTERLINE BEARING. SEE DETAIL B814.
2. INTERMEDIATE DIAPHRAGM SPACING ALONG CENTERLINE OF FASCIA BEAM.
3. MN45 PRESTRESSED CONCRETE BEAMS.
4. DIMENSION MEASURED BETWEEN WORKING POINTS AT SUBSTRUCTURE.

E2 DENOTES EXPANSION CURVED PLATE BEARING ASSEMBLY, TYPE 2. SEE DETAIL B311.

E3 DENOTES EXPANSION CURVED PLATE BEARING ASSEMBLY, TYPE 3. SEE DETAIL B311.

F1 DENOTES FIXED CURVED PLATE BRG. ASSEMBLY, TYPE 1. SEE DETAIL B310.

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: KR | CHECKED BY: KJK
DRAWN BY: MSK | DATE: 09/18/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

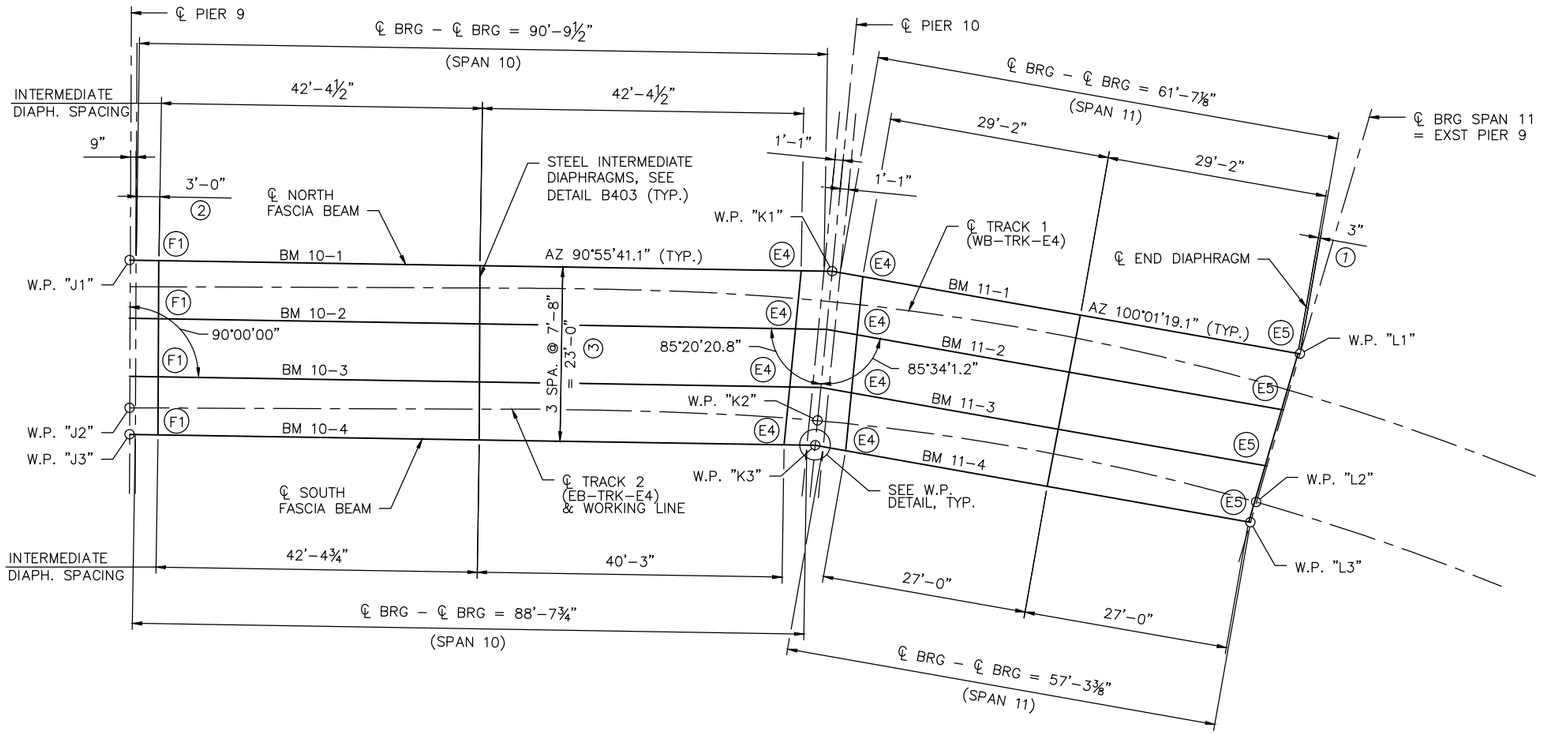
CIVIL EAST - VOLUME 4B
5TH AVENUE AND 7TH STREET
BRIDGE 27C18
FRAMING PLAN 5

DISCIPLINE: STRUCTURES

SHEET NAME: CBR27C18-BRG-FRP-005

SHEET 42 OF 80

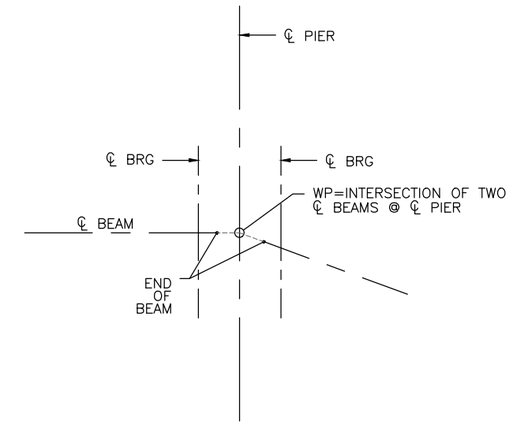
Sep. 18 2015 07:31 am V:\3400_ADC\CAD\SEGMENT E4\PLAN SHEETS\STRUCTURES\27C18\CBR27C18-BRG-FRP-005.dwg By: mark.krzyzewski



SPAN 10

SPAN 11

FRAMING PLAN – UNIT 3



W.P. DETAIL

LEGEND:

BM 1–1

- DENOTES BEAM I.D. NUMBER IN SPAN
- DENOTES SPAN NUMBER

NOTES:

BEAM AZIMUTHS SHOWN FOR EACH SPAN ARE TYPICAL UNLESS NOTED OTHERWISE

(1) CONCRETE END DIAPHRAGM SHALL BE PARALLEL TO CENTERLINE BEARING. SEE DETAIL B814.

(2) INTERMEDIATE DIAPHRAGM SPACING ALONG CENTERLINE OF FASCIA BEAM.

(3) MN45 PRESTRESSED CONCRETE BEAMS.

(4) DIMENSION MEASURED BETWEEN WORKING POINTS AT SUBSTRUCTURE.

(E4) DENOTES EXPANSION CURVED PLATE BEARING ASSEMBLY, TYPE 4. SEE DETAIL B311.

(E5) DENOTES EXPANSION CURVED PLATE BEARING ASSEMBLY, TYPE 5. SEE DETAIL B311.

(F1) DENOTES FIXED CURVED PLATE BRG. ASSEMBLY, TYPE 1. SEE DETAIL B310.

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: KR | CHECKED BY: KJK
DRAWN BY: MSK | DATE: 09/18/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

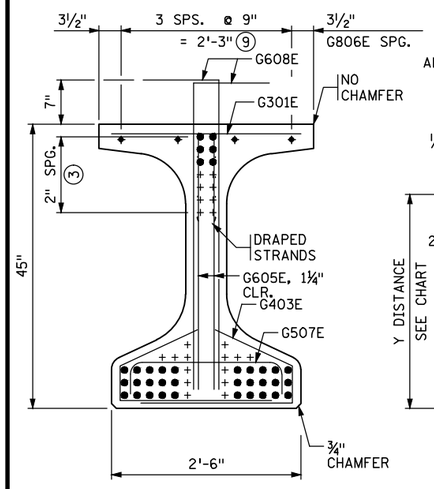
SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4B
5TH AVENUE AND 7TH STREET
BRIDGE 27C18
FRAMING PLAN 6

DISCIPLINE: STRUCTURES
SHEET NAME: CBR27C18-BRG-FRP-006

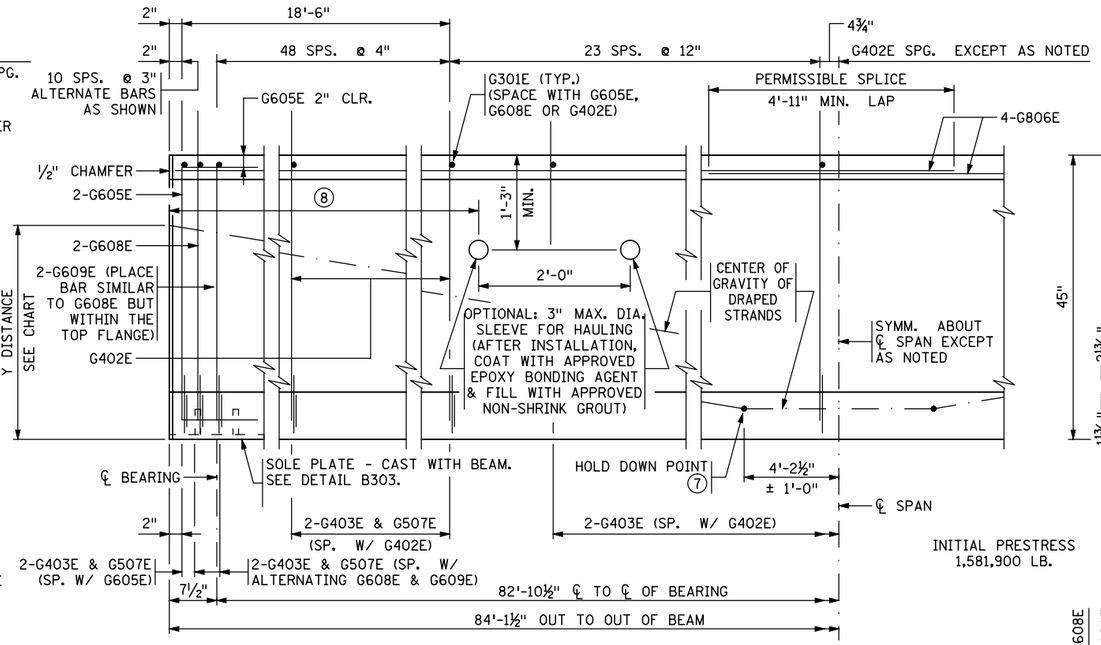
SHEET 43 OF 80

Sep. 18 2015 07:32 am v:\3400_ADC\CAD\SEGMENT E4\PLAN SHEETS\STRUCTURES\27C18\CBR27C18-BRG-FRP-006.dwg By: mark.krzyzewski



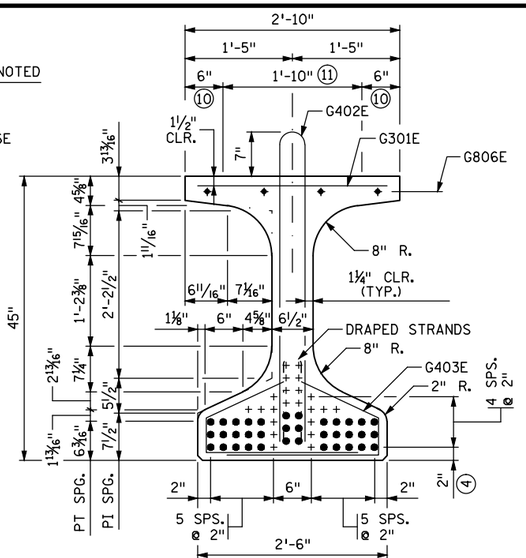
END VIEW

CUT STRANDS FLUSH WITH CONCRETE.
COVER ENDS WITH ONE COMPONENT POLYURETHANE SEALANT PER APPROVED PRODUCT LIST.
(G609E BAR NOT SHOWN)



BEAM ELEVATION

INITIAL PRESTRESS
1,581,900 LB.

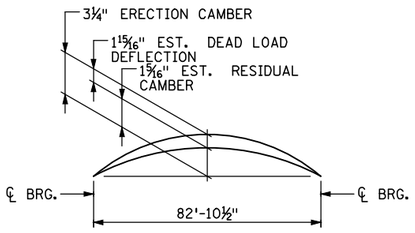


SECTION AT ℄ SPAN

Y DISTANCES (INCHES)			
	NO.	℄ SPAN	END
STRAIGHT STRANDS	30	4.0	
DRAPED STRANDS	6	5.0	40.00 □
TOTAL STRANDS	36	4.17	

Y = DISTANCE TO CENTER OF GRAVITY OF STRANDS FROM BOTTOM OF BEAM. ALL STRANDS SPACED 2" CENTER TO CENTER, HORIZONTALLY AND VERTICALLY, EXCEPT AS NOTED.

□ A TOLERANCE OF ± 1" WILL BE PERMITTED IN THIS DIMENSION.



CAMBER DIAGRAM

ERECTION CAMBER SHOWN IS AFTER DIAPHRAGMS ARE IN PLACE.

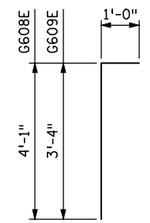
DEAD LOAD DEFLECTION SHOWN IS FOR WEIGHT OF SLAB, WEARING COURSE, BARRIER, SIDEWALK AND MEDIAN WHERE APPLICABLE.

CONTRACTOR WILL TAKE ELEVATIONS AT TOP OF BEAMS AFTER ERECTION AND WILL ALLOW FOR DEFLECTION SHOWN TO ENABLE BUILDING FORMS TO CORRECT GRADE AND SPECIFIED SLAB THICKNESS. PROVIDE COPY OF ELEVATIONS TO THE ENGINEER.

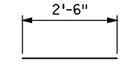
CALCULATED PRESTRESS LOSSES	
ELASTIC SHORTENING LOSS	22.50 KSI
LONG TERM LOSSES	23.58 KSI
TOTAL LOSSES	46.08 KSI

MINIMUM CONCRETE STRENGTH - K.S.I.	
(1) f'ci	(2) f'c
7.0 KSI	8.0 KSI

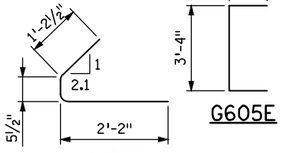
PRESTRESSING STRAND DIAMETER	
(5)	½" □
(5)	0.60" ☒



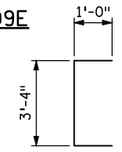
G608E & G609E



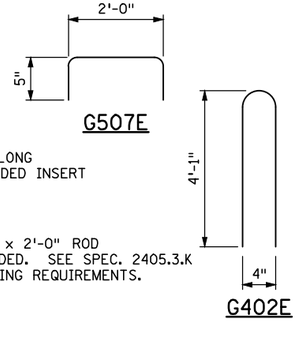
G301E



G403E



G605E



G507E

G402E

GENERAL NOTES

PROVIDE HANDLING HOOKS OR DEVICES AS REQUIRED BY CONTRACTOR.

MARK EACH BEAM SHOWING BRIDGE NUMBER, CASTING DATE, AND INDIVIDUAL IDENTIFICATION LETTERS AND NUMBERS ON THE FACE OF THE BEAM, NEAR THE END, SO LOCATED THAT THEY WILL BE EXPOSED AFTER THE END DIAPHRAGMS HAVE BEEN CAST. MARK FASCIA BEAMS ON THE INSIDE FACE. ENSURE ALL MARKINGS ARE STENCILLED AND CLEARLY LEGIBLE. FOR LOCATION OF BEAMS, SEE FRAMING PLAN.

~~ALL MATERIAL AND WORK SHOWN OR NOTED ON THIS SHEET IS INCLUDED IN UNIT PRICE BID FOR PRESTRESSED CONCRETE BEAMS. SEE SPEC. 2405.~~

SEE FRAMING PLAN FOR BEAM END MARKED "X" AND DIAPHRAGM SPACING.

APPROXIMATE WEIGHT OF BEAM IS 30.0 TONS.

AS AN ALTERNATE TO THE END DIAPHRAGM ANCHORAGES SHOWN, THE CONTRACTOR MAY SUBMIT DETAILS OF A CAST-IN-PLACE ANCHORAGE TO THE ENGINEER FOR APPROVAL. ANCHORAGE MUST PROVIDE AN ULTIMATE PULL OUT STRENGTH OF 15 KIPS PER ANCHORAGE.

APPLY AN APPROVED SEALER TO THE SIDES OF THE BEAM NEAR EACH END PER THE SPECIAL PROVISIONS.

(1) MINIMUM CONCRETE STRENGTH AT TIME OF PRESTRESS TRANSFER.

(2) MINIMUM CONCRETE STRENGTH WHEN BEAM CAN BE TRANSPORTED AND INSTALLED.

(3) DRAPED STRANDS.

(4) STRAIGHT STRANDS.

(5) USE 7-WIRE LOW RELAXATION PRESTRESSING STRAND, CONFORMING TO ASTM A416, GRADE 270.

(6) ~~FOR INTEGRAL ABUTMENT, SOLE PLATE CAN BE ELIMINATED OR REPLACED WITH AN APPROVED PROTECTION PLATE. BEAMS DETAILED TO INCLUDE A TAPERED PLATE PER STANDARD FIGURE B309 MUST INCLUDE SOLE PLATE.~~

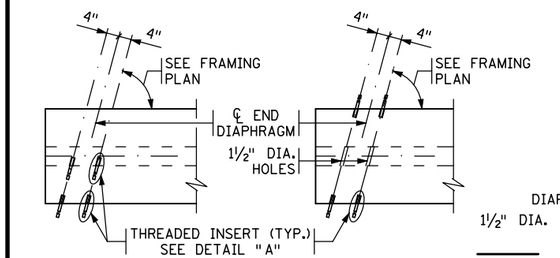
(7) CENTER OF GRAVITY OF HOLD DOWNS WHEN MULTIPLE HOLD DOWNS ARE USED.

(8) DIMENSION DETERMINED BY CONTRACTOR. MAINTAIN 2" MINIMUM CLEAR FROM STRANDS.

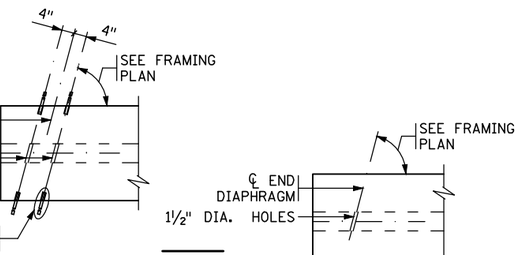
(9) TWO INSIDE BARS MAY BE PLACED ADJACENT TO VERTICAL STIRRUP FOR TYING CONVENIENCE.

(10) STEEL TROWEL TO SMOOTH FINISH AND APPLY BOND BREAKER PER APPROVED PRODUCTS LIST.

(11) ROUGH FLOAT AND BROOM TRANSVERSELY FOR BOND PER SPEC. 2405.3.D.

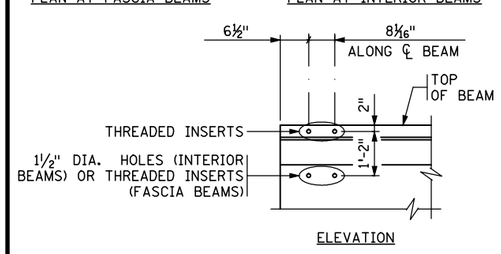


PLAN AT FASCIA BEAMS



PLAN AT INTERIOR BEAMS

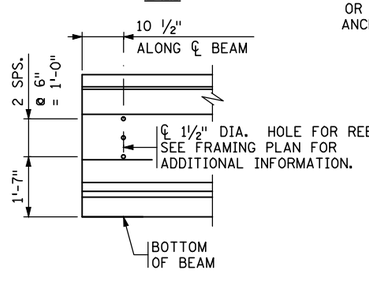
PLAN



ELEVATION

CONCRETE END DIAPHRAGM

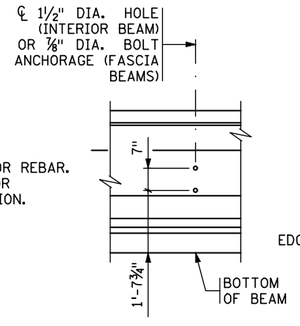
PARAPET ABUTMENT
(SEE DETAIL B814 FOR DIAPHRAGM DETAILS)



ELEVATION

CONCRETE END DIAPHRAGM

SEE SUPERSTRUCTURE DETAILS AND REINFORCEMENT FOR DIAPHRAGM DETAILS.



ELEVATION

STEEL INTERMEDIATE DIAPHRAGM

(SEE DETAIL B403 FOR DIAPHRAGM DETAILS)

DETAIL "A"

DRAFT-WORK IN PROCESS BEAMS 1-1 TO 1-4

FIG. 5-397.507

REVISED:

APPROVED: JANUARY 13, 2015
Nancy Daubenberger
STATE BRIDGE ENGINEER

CERTIFIED BY _____ 09/18/15
LICENSED PROFESSIONAL ENGINEER — DATE
NAME: ENGINEER LIC. NO. #####

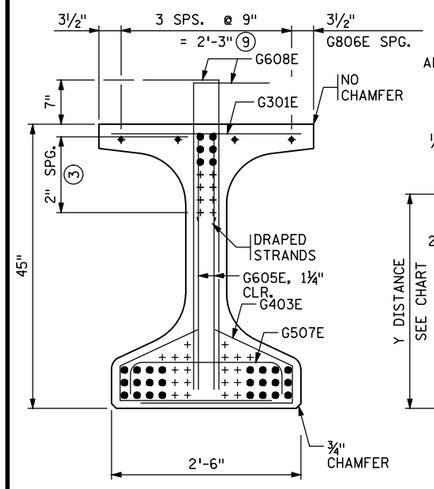
TITLE: MN45" PRESTRESSED CONCRETE BEAM (PRETENSIONED) MN45-84

DES: KR	DR: MSK
CHK: KJK	CHK: KJK

APPROVED:

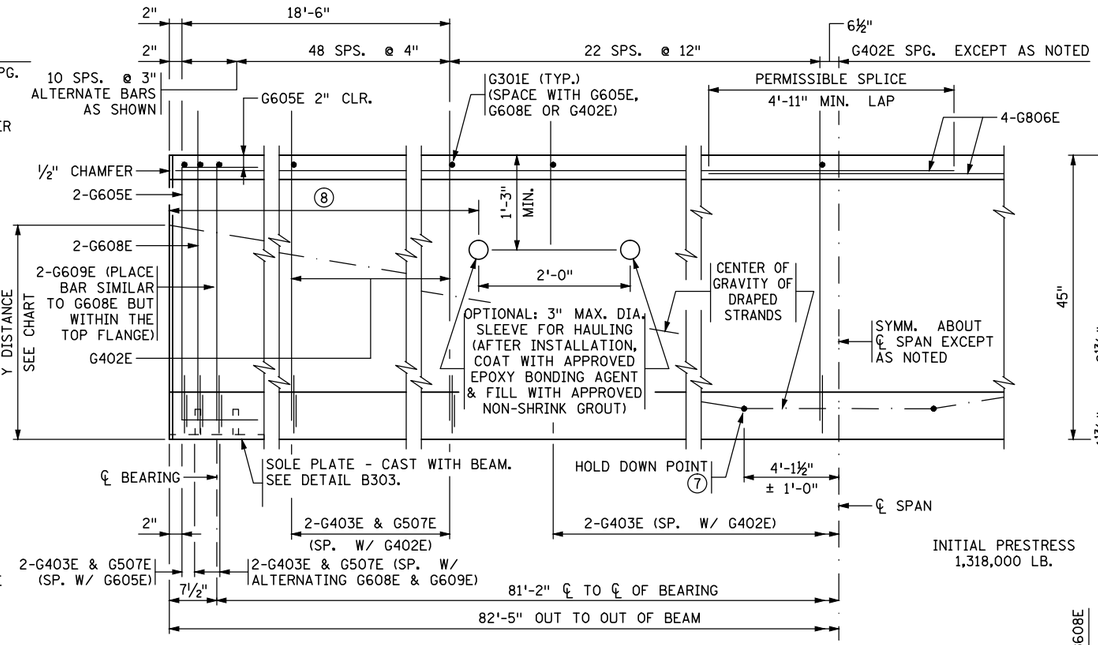
SHEET NO. 44 OF 80 SHEETS

BRIDGE NO. 27C18



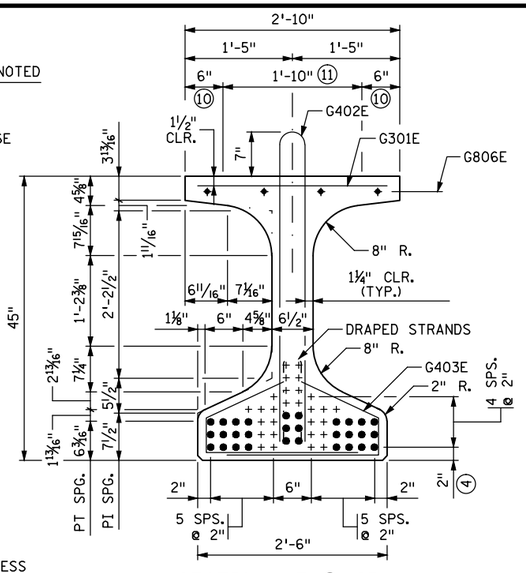
END VIEW

CUT STRANDS FLUSH WITH CONCRETE.
COVER ENDS WITH ONE COMPONENT POLYURETHANE SEALANT PER APPROVED PRODUCT LIST.
(G609E BAR NOT SHOWN)



BEAM ELEVATION

INITIAL PRESTRESS
1,318,000 LB.

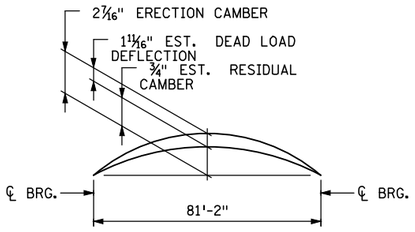


SECTION AT ℄ SPAN

Y DISTANCES (INCHES)			
	NO.	℄ SPAN	END
STRAIGHT STRANDS	24	4.0	
DRAPED STRANDS	6	5.0	40.00 □
TOTAL STRANDS	30	4.20	

Y = DISTANCE TO CENTER OF GRAVITY OF STRANDS FROM BOTTOM OF BEAM. ALL STRANDS SPACED 2" CENTER TO CENTER, HORIZONTALLY AND VERTICALLY, EXCEPT AS NOTED.

□ A TOLERANCE OF ± 1" WILL BE PERMITTED IN THIS DIMENSION.



CAMBER DIAGRAM

ERECTION CAMBER SHOWN IS AFTER DIAPHRAGMS ARE IN PLACE.

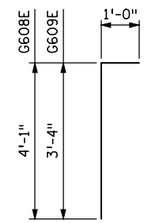
DEAD LOAD DEFLECTION SHOWN IS FOR WEIGHT OF SLAB, WEARING COURSE, BARRIER, SIDEWALK AND MEDIAN WHERE APPLICABLE.

CONTRACTOR WILL TAKE ELEVATIONS AT TOP OF BEAMS AFTER ERECTION AND WILL ALLOW FOR DEFLECTION SHOWN TO ENABLE BUILDING FORMS TO CORRECT GRADE AND SPECIFIED SLAB THICKNESS. PROVIDE COPY OF ELEVATIONS TO THE ENGINEER.

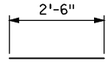
CALCULATED PRESTRESS LOSSES	
ELASTIC SHORTENING LOSS	18.60 KSI
LONG TERM LOSSES	21.26 KSI
TOTAL LOSSES	39.86 KSI

MINIMUM CONCRETE STRENGTH - K.S.I.	
(1) f'ci	(2) f'c
7.0 KSI	8.0 KSI

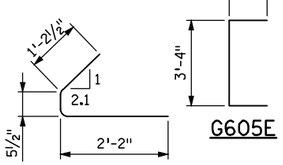
PRESTRESSING STRAND DIAMETER	
(5)	½" □
(5)	0.60" ☒



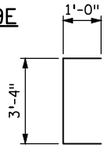
G608E & G609E



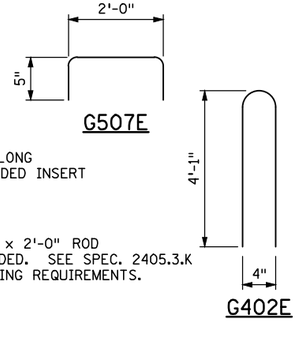
G301E



G403E

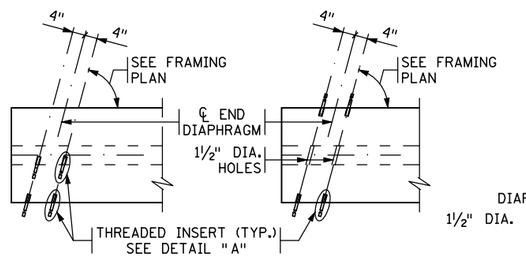


G605E

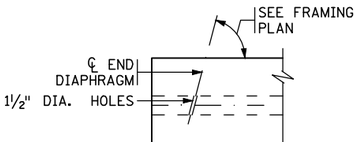


G507E

DETAIL "A"

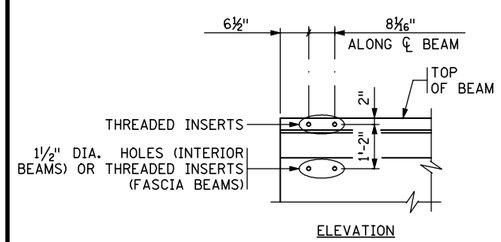


PLAN AT FASCIA BEAMS



PLAN AT INTERIOR BEAMS

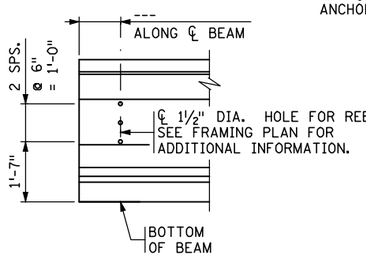
PLAN



ELEVATION

CONCRETE END DIAPHRAGM

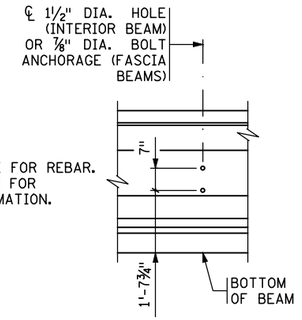
PARAPET ABUTMENT
(SEE DETAIL B814 FOR DIAPHRAGM DETAILS)



ELEVATION

CONCRETE END DIAPHRAGM

SEE SUPERSTRUCTURE DETAILS AND REINFORCEMENT FOR DIAPHRAGM DETAILS.



ELEVATION

STEEL INTERMEDIATE DIAPHRAGM

(SEE DETAIL B403 FOR DIAPHRAGM DETAILS)

GENERAL NOTES

PROVIDE HANDLING HOOKS OR DEVICES AS REQUIRED BY CONTRACTOR.

MARK EACH BEAM SHOWING BRIDGE NUMBER, CASTING DATE, AND INDIVIDUAL IDENTIFICATION LETTERS AND NUMBERS ON THE FACE OF THE BEAM, NEAR THE END, SO LOCATED THAT THEY WILL BE EXPOSED AFTER THE END DIAPHRAGMS HAVE BEEN CAST. MARK FASCIA BEAMS ON THE INSIDE FACE. ENSURE ALL MARKINGS ARE STENCILLED AND CLEARLY LEGIBLE. FOR LOCATION OF BEAMS, SEE FRAMING PLAN.

~~ALL MATERIAL AND WORK SHOWN OR NOTED ON THIS SHEET IS INCLUDED IN UNIT PRICE BID FOR PRESTRESSED CONCRETE BEAMS. SEE SPEC. 2405.~~

SEE FRAMING PLAN FOR BEAM END MARKED "X" AND DIAPHRAGM SPACING.

APPROXIMATE WEIGHT OF BEAM IS 30.0 TONS.

AS AN ALTERNATE TO THE END DIAPHRAGM ANCHORAGES SHOWN, THE CONTRACTOR MAY SUBMIT DETAILS OF A CAST-IN-PLACE ANCHORAGE TO THE ENGINEER FOR APPROVAL. ANCHORAGE MUST PROVIDE AN ULTIMATE PULL OUT STRENGTH OF 15 KIPS PER ANCHORAGE.

APPLY AN APPROVED SEALER TO THE SIDES OF THE BEAM NEAR EACH END PER THE SPECIAL PROVISIONS.

(1) MINIMUM CONCRETE STRENGTH AT TIME OF PRESTRESS TRANSFER.

(2) MINIMUM CONCRETE STRENGTH WHEN BEAM CAN BE TRANSPORTED AND INSTALLED.

(3) DRAPED STRANDS.

(4) STRAIGHT STRANDS.

(5) USE 7-WIRE LOW RELAXATION PRESTRESSING STRAND, CONFORMING TO ASTM A416, GRADE 270.

(6) ~~FOR INTEGRAL ABUTMENT, SOLE PLATE CAN BE ELIMINATED OR REPLACED WITH AN APPROVED PROTECTION PLATE. BEAMS DETAILED TO INCLUDE A TAPERED PLATE PER STANDARD FIGURE B309 MUST INCLUDE SOLE PLATE.~~

(7) CENTER OF GRAVITY OF HOLD DOWNS WHEN MULTIPLE HOLD DOWNS ARE USED.

(8) DIMENSION DETERMINED BY CONTRACTOR. MAINTAIN 2" MINIMUM CLEAR FROM STRANDS.

(9) TWO INSIDE BARS MAY BE PLACED ADJACENT TO VERTICAL STIRRUP FOR TYING CONVENIENCE.

(10) STEEL TROWEL TO SMOOTH FINISH AND APPLY BOND BREAKER PER APPROVED PRODUCTS LIST.

(11) ROUGH FLOAT AND BROOM TRANSVERSELY FOR BOND PER SPEC. 2405.3.D.

REVISED:

APPROVED: JANUARY 13, 2015
Nancy Daubenberger
STATE BRIDGE ENGINEER

DRAFT-WORK IN PROCESS BEAMS 7-1 TO 7-4

FIG. 5-397.507

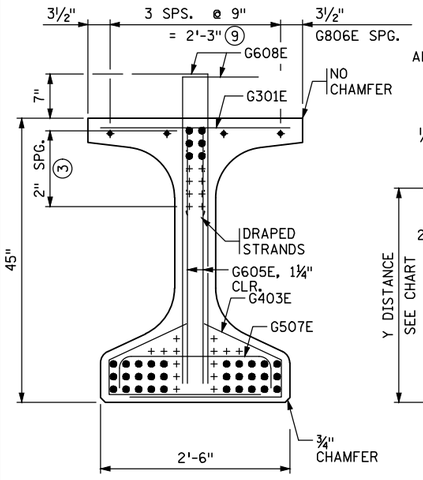
CERTIFIED BY _____ 09/18/15
LICENSED PROFESSIONAL ENGINEER — DATE
NAME: ENGINEER LIC. NO. #####

TITLE: MN45" PRESTRESSED CONCRETE BEAM (PRETENSIONED) MN45-82

DES: KR	DR: MSK	APPROVED:
CHK: KJK	CHK: KJK	

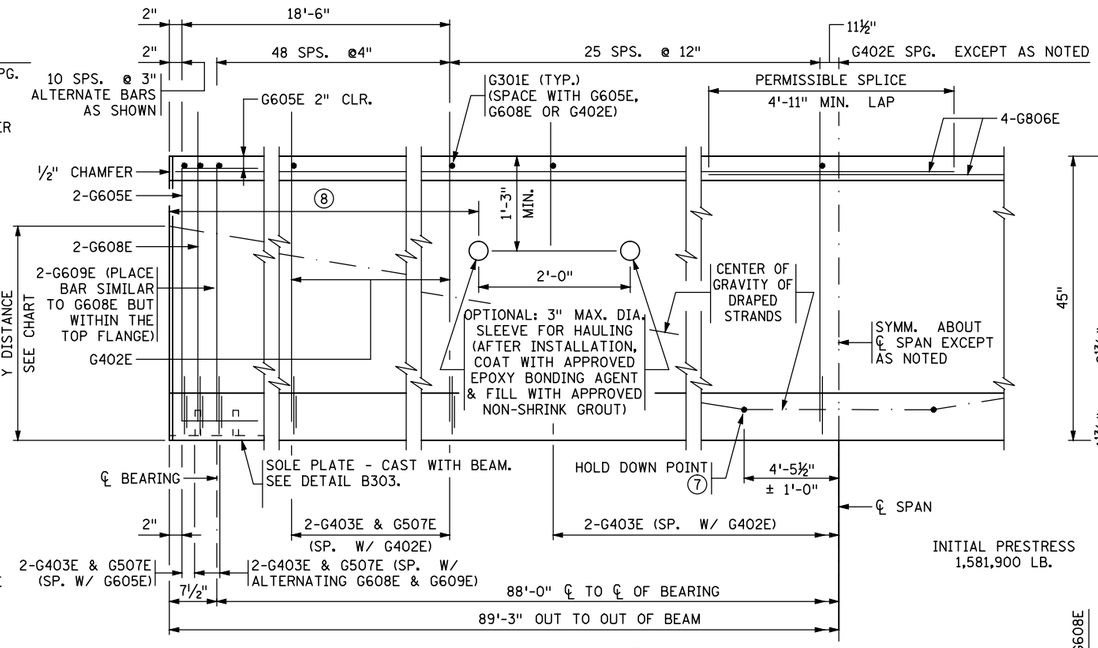
SHEET NO. 45 OF 80 SHEETS

BRIDGE NO. 27C18



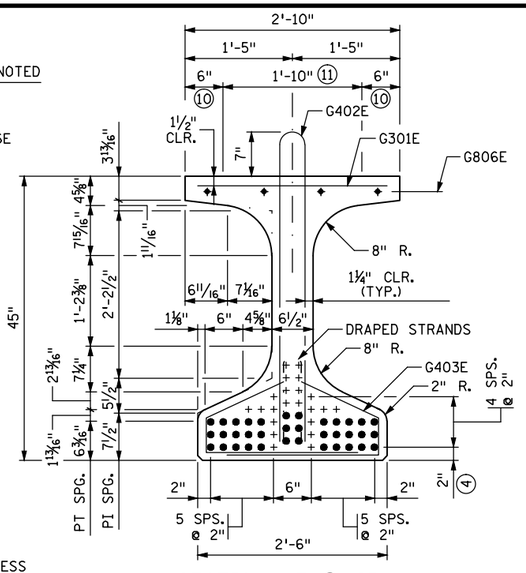
END VIEW

CUT STRANDS FLUSH WITH CONCRETE.
COVER ENDS WITH ONE COMPONENT POLYURETHANE SEALANT PER APPROVED PRODUCT LIST.
(G609E BAR NOT SHOWN)



BEAM ELEVATION

INITIAL PRESTRESS
1,581,900 LB.

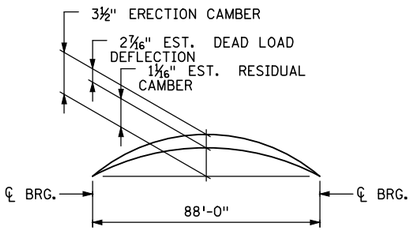


SECTION AT ℄ SPAN

Y DISTANCES (INCHES)			
	NO.	℄ SPAN	END
STRAIGHT STRANDS	30	4.0	
DRAPED STRANDS	6	5.0	40.00 □
TOTAL STRANDS	36	4.17	

Y = DISTANCE TO CENTER OF GRAVITY OF STRANDS FROM BOTTOM OF BEAM. ALL STRANDS SPACED 2" CENTER TO CENTER, HORIZONTALLY AND VERTICALLY, EXCEPT AS NOTED.

□ A TOLERANCE OF ± 1" WILL BE PERMITTED IN THIS DIMENSION.



CAMBER DIAGRAM

ERECTION CAMBER SHOWN IS AFTER DIAPHRAGMS ARE IN PLACE.

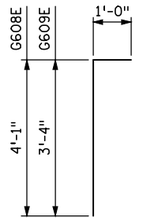
DEAD LOAD DEFLECTION SHOWN IS FOR WEIGHT OF SLAB, WEARING COURSE, BARRIER, SIDEWALK AND MEDIAN WHERE APPLICABLE.

CONTRACTOR WILL TAKE ELEVATIONS AT TOP OF BEAMS AFTER ERECTION AND WILL ALLOW FOR DEFLECTION SHOWN TO ENABLE BUILDING FORMS TO CORRECT GRADE AND SPECIFIED SLAB THICKNESS. PROVIDE COPY OF ELEVATIONS TO THE ENGINEER.

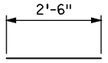
CALCULATED PRESTRESS LOSSES	
ELASTIC SHORTENING LOSS	21.96 KSI
LONG TERM LOSSES	23.57 KSI
TOTAL LOSSES	45.53 KSI

MINIMUM CONCRETE STRENGTH - K.S.I.	
(1) f'ci	(2) f'c
7.0 KSI	8.0 KSI

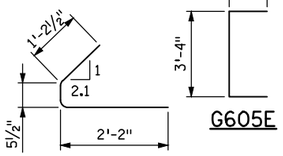
PRESTRESSING STRAND DIAMETER	
(5)	½" □
(5)	0.60" ☒



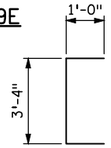
G608E & G609E



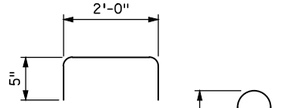
G301E



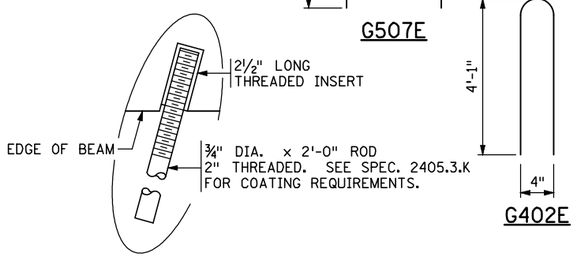
G403E



G605E



G507E



DETAIL "A"

G402E

GENERAL NOTES

PROVIDE HANDLING HOOKS OR DEVICES AS REQUIRED BY CONTRACTOR.

MARK EACH BEAM SHOWING BRIDGE NUMBER, CASTING DATE, AND INDIVIDUAL IDENTIFICATION LETTERS AND NUMBERS ON THE FACE OF THE BEAM, NEAR THE END, SO LOCATED THAT THEY WILL BE EXPOSED AFTER THE END DIAPHRAGMS HAVE BEEN CAST. MARK FASCIA BEAMS ON THE INSIDE FACE. ENSURE ALL MARKINGS ARE STENCILLED AND CLEARLY LEGIBLE. FOR LOCATION OF BEAMS, SEE FRAMING PLAN.

~~ALL MATERIAL AND WORK SHOWN OR NOTED ON THIS SHEET IS INCLUDED IN UNIT PRICE BID FOR PRESTRESSED CONCRETE BEAMS. SEE SPEC. 2405.~~

SEE FRAMING PLAN FOR BEAM END MARKED "X" AND DIAPHRAGM SPACING.

APPROXIMATE WEIGHT OF BEAM IS 32.0 TONS.

AS AN ALTERNATE TO THE END DIAPHRAGM ANCHORAGES SHOWN, THE CONTRACTOR MAY SUBMIT DETAILS OF A CAST-IN-PLACE ANCHORAGE TO THE ENGINEER FOR APPROVAL. ANCHORAGE MUST PROVIDE AN ULTIMATE PULL OUT STRENGTH OF 15 KIPS PER ANCHORAGE.

APPLY AN APPROVED SEALER TO THE SIDES OF THE BEAM NEAR EACH END PER THE SPECIAL PROVISIONS.

(1) MINIMUM CONCRETE STRENGTH AT TIME OF PRESTRESS TRANSFER.

(2) MINIMUM CONCRETE STRENGTH WHEN BEAM CAN BE TRANSPORTED AND INSTALLED.

(3) DRAPED STRANDS.

(4) STRAIGHT STRANDS.

(5) USE 7-WIRE LOW RELAXATION PRESTRESSING STRAND, CONFORMING TO ASTM A416, GRADE 270.

(6) ~~FOR INTEGRAL ABUTMENT, SOLE PLATE CAN BE ELIMINATED OR REPLACED WITH AN APPROVED PROTECTION PLATE. BEAMS DETAILED TO INCLUDE A TAPERED PLATE PER STANDARD FIGURE B309 MUST INCLUDE SOLE PLATE.~~

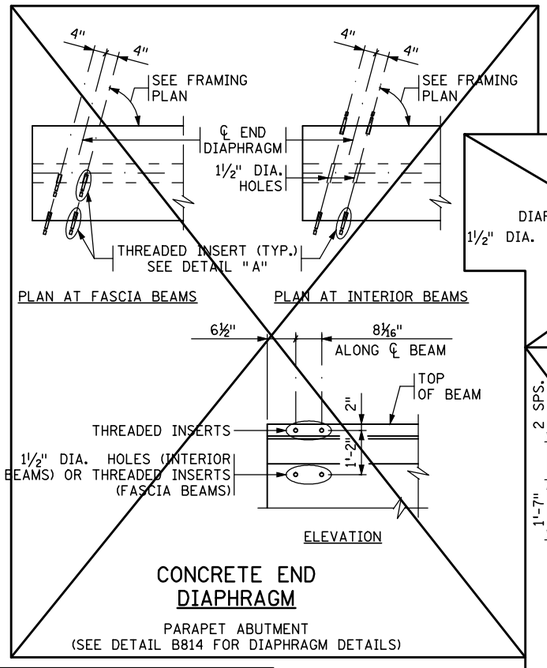
(7) CENTER OF GRAVITY OF HOLD DOWNS WHEN MULTIPLE HOLD DOWNS ARE USED.

(8) DIMENSION DETERMINED BY CONTRACTOR. MAINTAIN 2" MINIMUM CLEAR FROM STRANDS.

(9) TWO INSIDE BARS MAY BE PLACED ADJACENT TO VERTICAL STIRRUP FOR TYING CONVENIENCE.

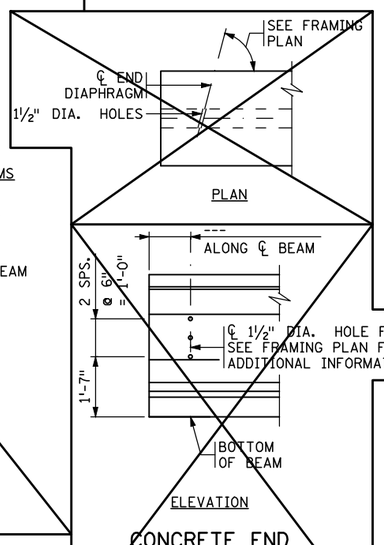
(10) STEEL TROWEL TO SMOOTH FINISH AND APPLY BOND BREAKER PER APPROVED PRODUCTS LIST.

(11) ROUGH FLOAT AND BROOM TRANSVERSELY FOR BOND PER SPEC. 2405.3.D.



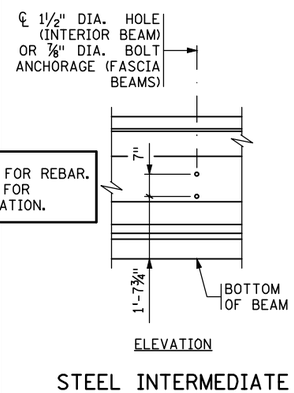
CONCRETE END DIAPHRAGM

PARAPET ABUTMENT
(SEE DETAIL B814 FOR DIAPHRAGM DETAILS)



CONCRETE END DIAPHRAGM

SEE SUPERSTRUCTURE DETAILS AND REINFORCEMENT FOR DIAPHRAGM DETAILS.



STEEL INTERMEDIATE DIAPHRAGM

(SEE DETAIL B403 FOR DIAPHRAGM DETAILS)

REVISED:

APPROVED: JANUARY 13, 2015
Nancy Dorbenberger
STATE BRIDGE ENGINEER

DRAFT-WORK IN PROCESS BEAM S 8-1 TO 8-4 & BEAMS 9-1 TO 9-4

FIG. 5-397.507

CERTIFIED BY _____ 09/18/15
LICENSED PROFESSIONAL ENGINEER — DATE
NAME: ENGINEER LIC. NO. #####

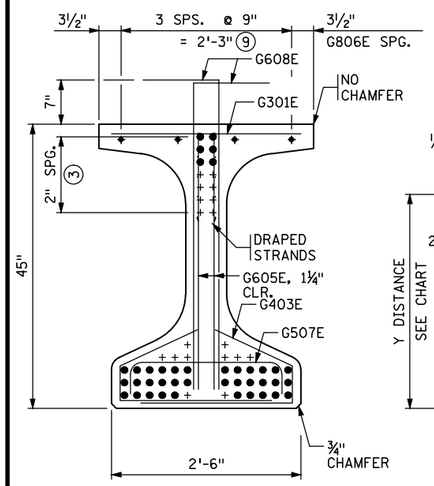
TITLE: MN45" PRESTRESSED CONCRETE BEAM (PRETENSIONED) MN45-89

DES: KR	DR: MSK
CHK: KJK	CHK: KJK

APPROVED:

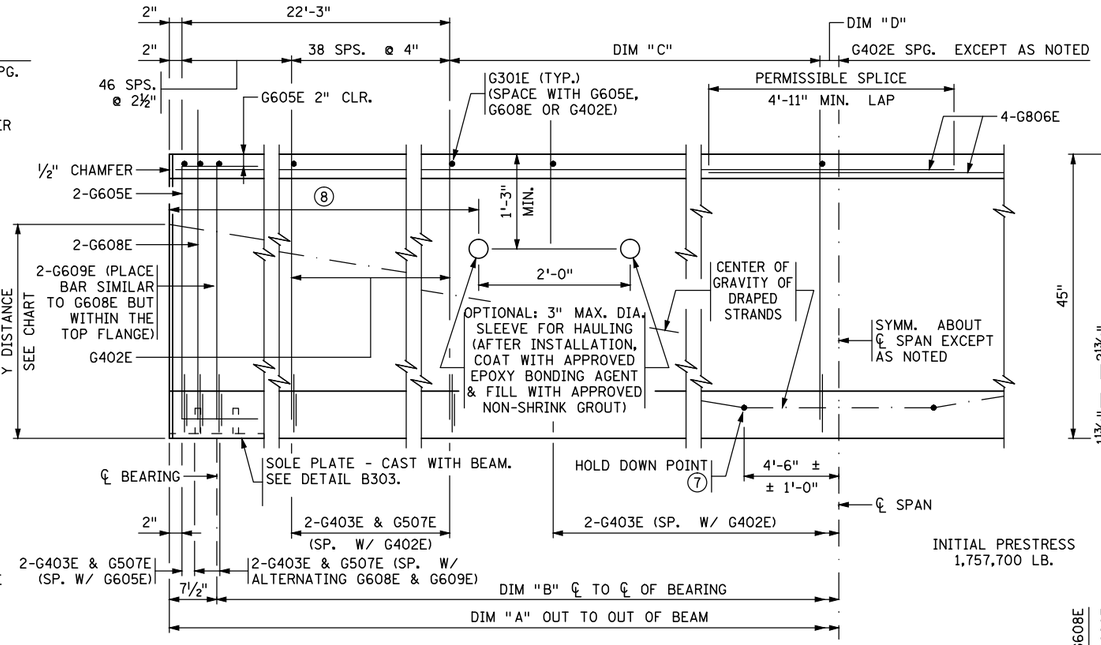
SHEET NO. 46 OF 80 SHEETS

BRIDGE NO. 27C18



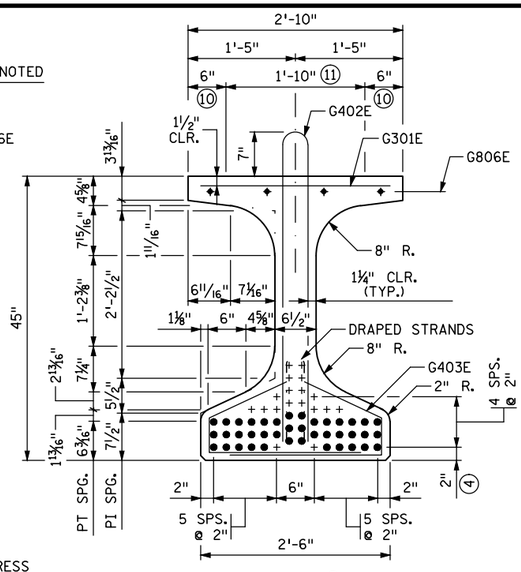
END VIEW

CUT STRANDS FLUSH WITH CONCRETE.
COVER ENDS WITH ONE COMPONENT POLYURETHANE SEALANT PER APPROVED PRODUCT LIST.
(G609E BAR NOT SHOWN)



BEAM ELEVATION

INITIAL PRESTRESS
1,757,700 LB.

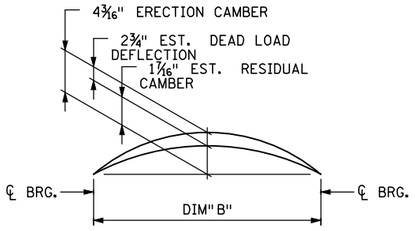


SECTION AT ℄ SPAN

Y DISTANCES (INCHES)			
	NO.	℄ SPAN	END
STRAIGHT STRANDS	34	4.12	
DRAPED STRANDS	6	5.0	
TOTAL STRANDS	40	4.25	

Y = DISTANCE TO CENTER OF GRAVITY OF STRANDS FROM BOTTOM OF BEAM. ALL STRANDS SPACED 2" CENTER TO CENTER, HORIZONTALLY AND VERTICALLY, EXCEPT AS NOTED.

□ A TOLERANCE OF ± 1" WILL BE PERMITTED IN THIS DIMENSION.



CAMBER DIAGRAM

ERECTION CAMBER SHOWN IS AFTER DIAPHRAGMS ARE IN PLACE.

DEAD LOAD DEFLECTION SHOWN IS FOR WEIGHT OF SLAB, WEARING COURSE, BARRIER, SIDEWALK AND MEDIAN WHERE APPLICABLE.

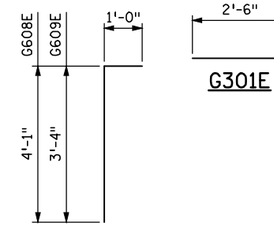
CONTRACTOR WILL TAKE ELEVATIONS AT TOP OF BEAMS AFTER ERECTION AND WILL ALLOW FOR DEFLECTION SHOWN TO ENABLE BUILDING FORMS TO CORRECT GRADE AND SPECIFIED SLAB THICKNESS. PROVIDE COPY OF ELEVATIONS TO THE ENGINEER.

BEAM ID	DIM "A"	DIM "B"	DIM "C"	DIM "D"
BM 10-1	92'-0½"	90'-9½"	23 SPA @ 12" =23'-0"	7¼"
BM 10-2	91'-3¹⁵⁄₁₆"	90'-0¹⁵⁄₁₆"	23 SPA @ 12" =23'-0"	3"
BM 10-3	90'-7⁵⁄₁₆"	89'-4⁵⁄₁₆"	22 SPA @ 12" =22'-0"	10⅝"
BM 10-4	89'-10¾"	88'-7¾"	22 SPA @ 12" =22'-0"	6⅜"

CALCULATED PRESTRESS LOSSES	
ELASTIC SHORTENING LOSS	24.18 KSI
LONG TERM LOSSES	25.12 KSI
TOTAL LOSSES	49.30 KSI

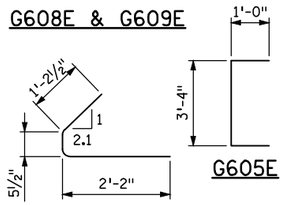
MINIMUM CONCRETE STRENGTH - K.S.I.	
(1) f'ci	(2) f'c
7.0 KSI	8.0 KSI

PRESTRESSING STRAND DIAMETER	
(5)	½" □
(5)	0.60" ☒



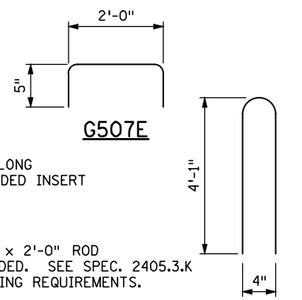
G608E & G609E

G301E



G403E

G605E



G507E

G402E

GENERAL NOTES

PROVIDE HANDLING HOOKS OR DEVICES AS REQUIRED BY CONTRACTOR.

MARK EACH BEAM SHOWING BRIDGE NUMBER, CASTING DATE, AND INDIVIDUAL IDENTIFICATION LETTERS AND NUMBERS ON THE FACE OF THE BEAM, NEAR THE END, SO LOCATED THAT THEY WILL BE EXPOSED AFTER THE END DIAPHRAGMS HAVE BEEN CAST. MARK FASCIA BEAMS ON THE INSIDE FACE. ENSURE ALL MARKINGS ARE STENCILLED AND CLEARLY LEGIBLE. FOR LOCATION OF BEAMS, SEE FRAMING PLAN.

~~ALL MATERIAL AND WORK SHOWN OR NOTED ON THIS SHEET IS INCLUDED IN UNIT PRICE BID FOR PRESTRESSED CONCRETE BEAMS. SEE SPEC. 2405.~~

SEE FRAMING PLAN FOR BEAM END MARKED "X" AND DIAPHRAGM SPACING.

APPROXIMATE WEIGHT OF BEAM IS 33.0 TONS.

AS AN ALTERNATE TO THE END DIAPHRAGM ANCHORAGES SHOWN, THE CONTRACTOR MAY SUBMIT DETAILS OF A CAST-IN-PLACE ANCHORAGE TO THE ENGINEER FOR APPROVAL. ANCHORAGE MUST PROVIDE AN ULTIMATE PULL OUT STRENGTH OF 15 KIPS PER ANCHORAGE.

APPLY AN APPROVED SEALER TO THE SIDES OF THE BEAM NEAR EACH END PER THE SPECIAL PROVISIONS.

(1) MINIMUM CONCRETE STRENGTH AT TIME OF PRESTRESS TRANSFER.

(2) MINIMUM CONCRETE STRENGTH WHEN BEAM CAN BE TRANSPORTED AND INSTALLED.

(3) DRAPED STRANDS.

(4) STRAIGHT STRANDS.

(5) USE 7-WIRE LOW RELAXATION PRESTRESSING STRAND, CONFORMING TO ASTM A416, GRADE 270.

(6) ~~FOR INTEGRAL ABUTMENT, SOLE PLATE CAN BE ELIMINATED OR REPLACED WITH AN APPROVED PROTECTION PLATE. BEAMS DETAILED TO INCLUDE A TAPERED PLATE PER STANDARD FIGURE B309 MUST INCLUDE SOLE PLATE.~~

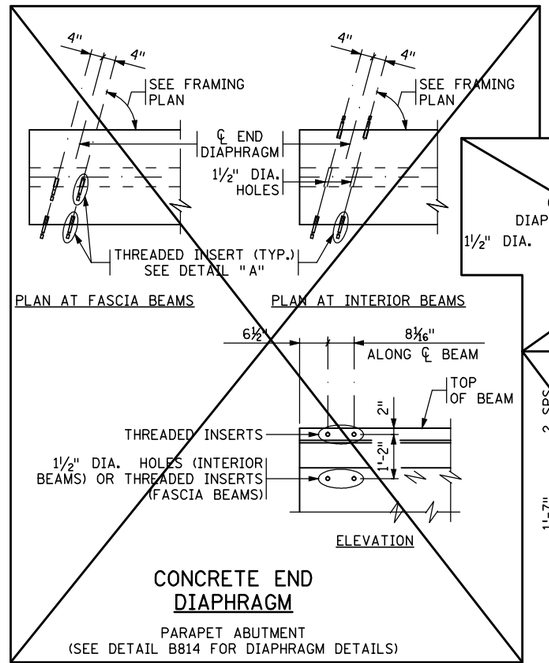
(7) CENTER OF GRAVITY OF HOLD DOWNS WHEN MULTIPLE HOLD DOWNS ARE USED.

(8) DIMENSION DETERMINED BY CONTRACTOR. MAINTAIN 2" MINIMUM CLEAR FROM STRANDS.

(9) TWO INSIDE BARS MAY BE PLACED ADJACENT TO VERTICAL STIRRUP FOR TYING CONVENIENCE.

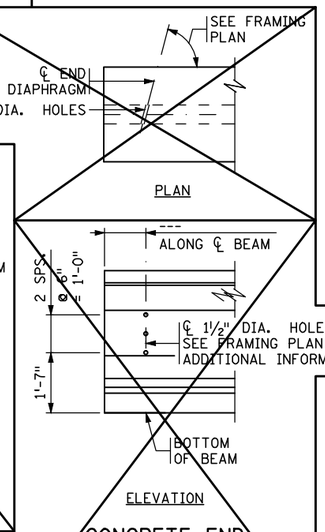
(10) STEEL TROWEL TO SMOOTH FINISH AND APPLY BOND BREAKER PER APPROVED PRODUCTS LIST.

(11) ROUGH FLOAT AND BROOM TRANSVERSELY FOR BOND PER SPEC. 2405.3.D.



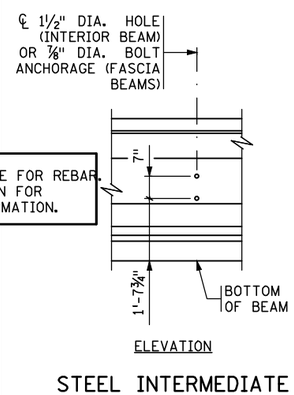
CONCRETE END DIAPHRAGM

PARAPET ABUTMENT
(SEE DETAIL B814 FOR DIAPHRAGM DETAILS)



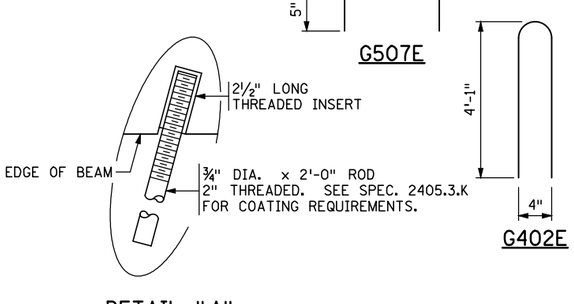
CONCRETE END DIAPHRAGM

SEE SUPERSTRUCTURE DETAILS AND REINFORCEMENT FOR DIAPHRAGM DETAILS.



STEEL INTERMEDIATE DIAPHRAGM

(SEE DETAIL B403 FOR DIAPHRAGM DETAILS)



DETAIL "A"

REVISED:

APPROVED: JANUARY 13, 2015
Nancy Daubenberger
STATE BRIDGE ENGINEER

DRAFT-WORK IN PROCESS BEAMS 10-1 TO 10-4

FIG. 5-397.507

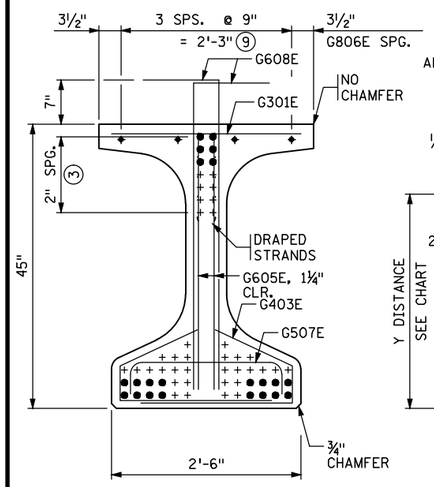
CERTIFIED BY _____ 09/18/15
LICENSED PROFESSIONAL ENGINEER — DATE
NAME: ENGINEER LIC. NO. #####

TITLE: MN45" PRESTRESSED CONCRETE BEAM (PRETENSIONED) MN45-92

DES: KR	DR: MSK	APPROVED:
CHK: KJK	CHK: KJK	

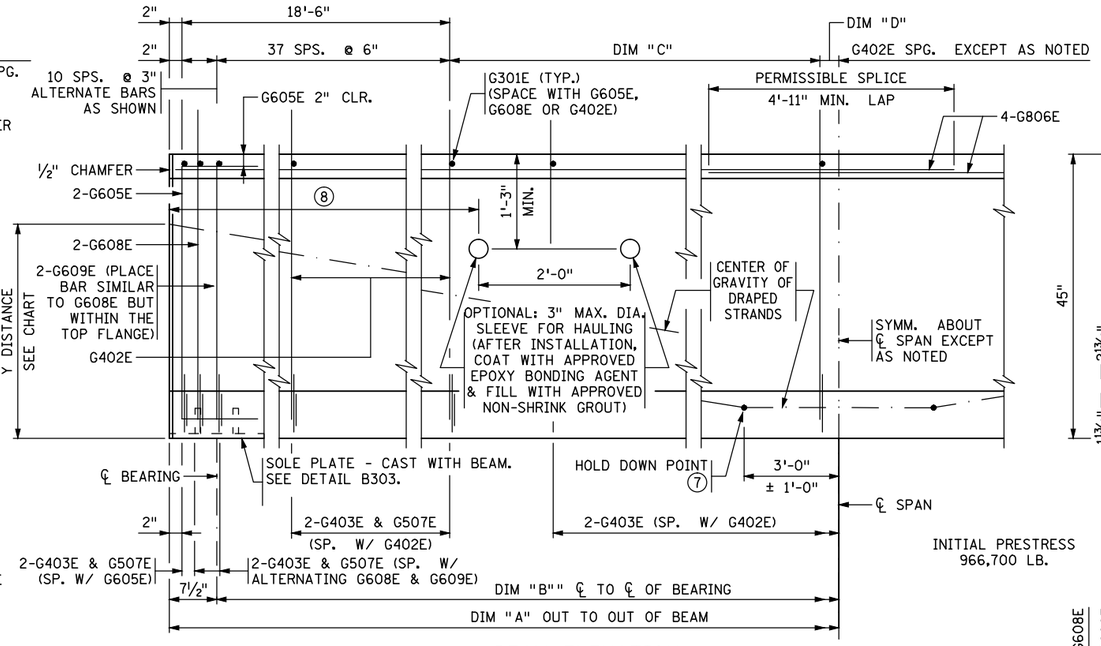
SHEET NO. 47 OF 80 SHEETS

BRIDGE NO. 27C18



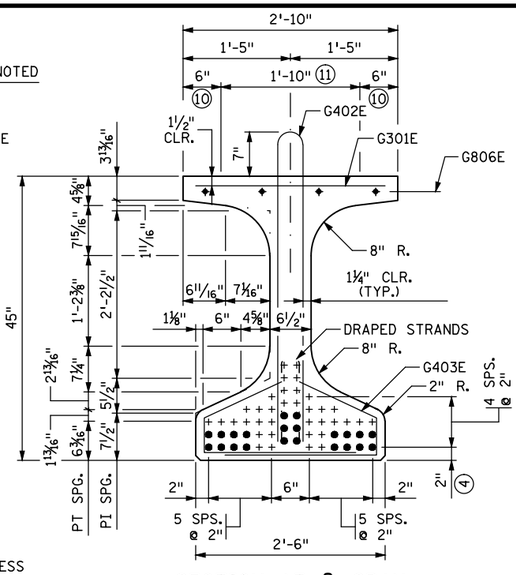
END VIEW

CUT STRANDS FLUSH WITH CONCRETE.
COVER ENDS WITH ONE COMPONENT POLYURETHANE SEALANT PER APPROVED PRODUCT LIST.
(G609E BAR NOT SHOWN)



BEAM ELEVATION

INITIAL PRESTRESS
966,700 LB.

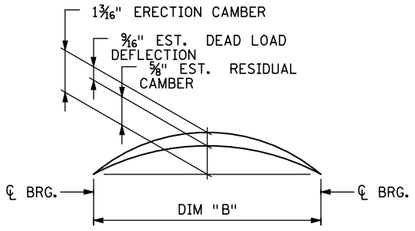


SECTION AT ℄ SPAN

Y DISTANCES (INCHES)			
	NO.	℄ SPAN	END
STRAIGHT STRANDS	16	3.0	
DRAPED STRANDS	6	5.0	40.00 □
TOTAL STRANDS	22	3.55	

Y = DISTANCE TO CENTER OF GRAVITY OF STRANDS FROM BOTTOM OF BEAM. ALL STRANDS SPACED 2" CENTER TO CENTER, HORIZONTALLY AND VERTICALLY, EXCEPT AS NOTED.

□ A TOLERANCE OF ± 1" WILL BE PERMITTED IN THIS DIMENSION.



CAMBER DIAGRAM

ERECTION CAMBER SHOWN IS AFTER DIAPHRAGMS ARE IN PLACE.

DEAD LOAD DEFLECTION SHOWN IS FOR WEIGHT OF SLAB, WEARING COURSE, BARRIER, SIDEWALK AND MEDIAN WHERE APPLICABLE.

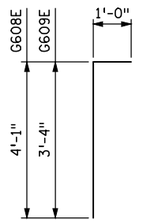
CONTRACTOR WILL TAKE ELEVATIONS AT TOP OF BEAMS AFTER ERECTION AND WILL ALLOW FOR DEFLECTION SHOWN TO ENABLE BUILDING FORMS TO CORRECT GRADE AND SPECIFIED SLAB THICKNESS. PROVIDE COPY OF ELEVATIONS TO THE ENGINEER.

BEAM ID	DIM "A"	DIM "B"	DIM "C"	DIM "D"
BM 11-1	62'-10⅛"	61'-7⅛"	12 SPA @ 12"=12'-0"	9"
BM 11-2	61'-4¾"	60'-1¾"	11 SPA @ 12"=11'-0"	12⅜"
BM 11-3	59'-11⅜"	58'-8⅜"	11 SPA @ 12"=11'-0"	3¾"
BM 11-4	58'-6"	57'-3⅜"	10 SPA @ 12"=10'-0"	7"

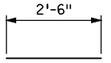
CALCULATED PRESTRESS LOSSES	
ELASTIC SHORTENING LOSS	15.25 KSI
LONG TERM LOSSES	18.17 KSI
TOTAL LOSSES	33.42 KSI

MINIMUM CONCRETE STRENGTH - K.S.I.	
(1) f'ci	(2) f'c
7.0 KSI	8.0 KSI

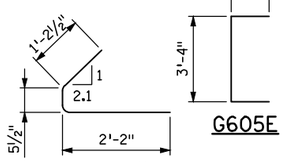
PRESTRESSING STRAND DIAMETER	
(5)	½" □
(5)	0.60" ☒



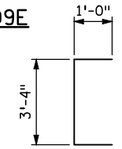
G608E & G609E



G301E



G403E



G605E

G507E

G402E

GENERAL NOTES

PROVIDE HANDLING HOOKS OR DEVICES AS REQUIRED BY CONTRACTOR.

MARK EACH BEAM SHOWING BRIDGE NUMBER, CASTING DATE, AND INDIVIDUAL IDENTIFICATION LETTERS AND NUMBERS ON THE FACE OF THE BEAM, NEAR THE END, SO LOCATED THAT THEY WILL BE EXPOSED AFTER THE END DIAPHRAGMS HAVE BEEN CAST. MARK FASCIA BEAMS ON THE INSIDE FACE. ENSURE ALL MARKINGS ARE STENCILLED AND CLEARLY LEGIBLE. FOR LOCATION OF BEAMS, SEE FRAMING PLAN.

~~ALL MATERIAL AND WORK SHOWN OR NOTED ON THIS SHEET IS INCLUDED IN UNIT PRICE BID FOR PRESTRESSED CONCRETE BEAMS. SEE SPEC. 2405.~~

SEE FRAMING PLAN FOR BEAM END MARKED "X" AND DIAPHRAGM SPACING.

APPROXIMATE WEIGHT OF BEAM IS 23.0 TONS.

AS AN ALTERNATE TO THE END DIAPHRAGM ANCHORAGES SHOWN, THE CONTRACTOR MAY SUBMIT DETAILS OF A CAST-IN-PLACE ANCHORAGE TO THE ENGINEER FOR APPROVAL. ANCHORAGE MUST PROVIDE AN UNLIMITED PULL OUT STRENGTH OF 15 KIPS PER ANCHORAGE.

APPLY AN APPROVED SEALER TO THE SIDES OF THE BEAM NEAR EACH END PER THE SPECIAL PROVISIONS.

(1) MINIMUM CONCRETE STRENGTH AT TIME OF PRESTRESS TRANSFER.

(2) MINIMUM CONCRETE STRENGTH WHEN BEAM CAN BE TRANSPORTED AND INSTALLED.

(3) DRAPED STRANDS.

(4) STRAIGHT STRANDS.

(5) USE 7-WIRE LOW RELAXATION PRESTRESSING STRAND, CONFORMING TO ASTM A416, GRADE 270.

(6) ~~FOR INTEGRAL ABUTMENT, SOLE PLATE CAN BE ELIMINATED OR REPLACED WITH AN APPROVED PROTECTION PLATE. BEAMS DETAILED TO INCLUDE A TAPERED PLATE PER STANDARD FIGURE B309 MUST INCLUDE SOLE PLATE.~~

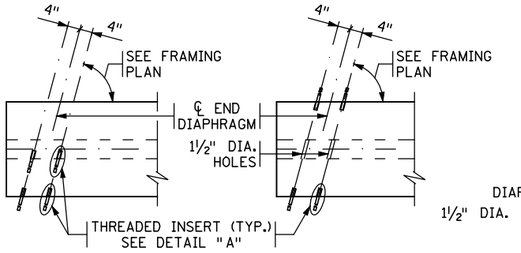
(7) CENTER OF GRAVITY OF HOLD DOWNS WHEN MULTIPLE HOLD DOWNS ARE USED.

(8) DIMENSION DETERMINED BY CONTRACTOR. MAINTAIN 2" MINIMUM CLEAR FROM STRANDS.

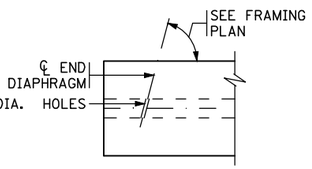
(9) TWO INSIDE BARS MAY BE PLACED ADJACENT TO VERTICAL STIRRUP FOR TYING CONVENIENCE.

(10) STEEL TROWEL TO SMOOTH FINISH AND APPLY BOND BREAKER PER APPROVED PRODUCTS LIST.

(11) ROUGH FLOAT AND BROOM TRANSVERSELY FOR BOND PER SPEC. 2405.3.D.

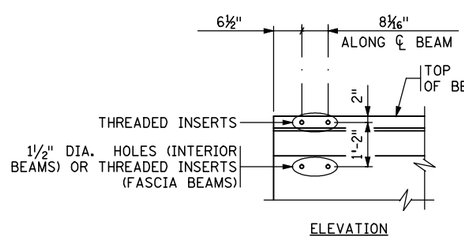


PLAN AT FASCIA BEAMS



PLAN AT INTERIOR BEAMS

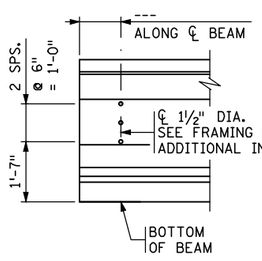
PLAN



ELEVATION

CONCRETE END DIAPHRAGM

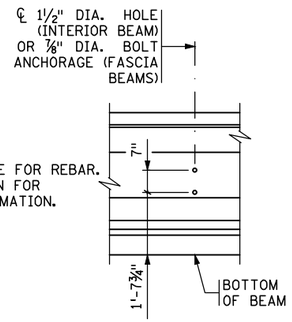
PARAPET ABUTMENT
(SEE DETAIL B814 FOR DIAPHRAGM DETAILS)



ELEVATION

CONCRETE END DIAPHRAGM

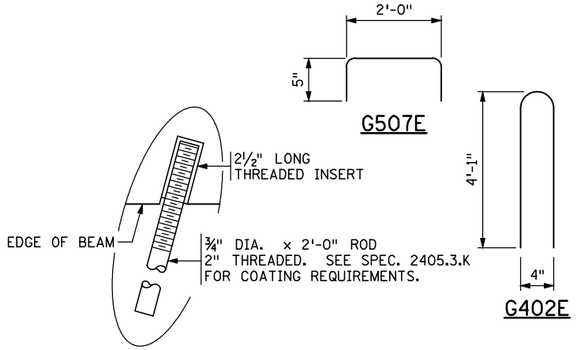
SEE SUPERSTRUCTURE DETAILS AND REINFORCEMENT FOR DIAPHRAGM DETAILS.



ELEVATION

STEEL INTERMEDIATE DIAPHRAGM

(SEE DETAIL B403 FOR DIAPHRAGM DETAILS)



DETAIL "A"

DRAFT-WORK IN PROCESS BEAMS 11-1 TO 11-4 | FIG. 5-397.507

REVISED:

APPROVED: JANUARY 13, 2015
Nancy Daubenberger
STATE BRIDGE ENGINEER

CERTIFIED BY _____ 09/18/15
LICENSED PROFESSIONAL ENGINEER — DATE
NAME: ENGINEER LIC. NO. #####

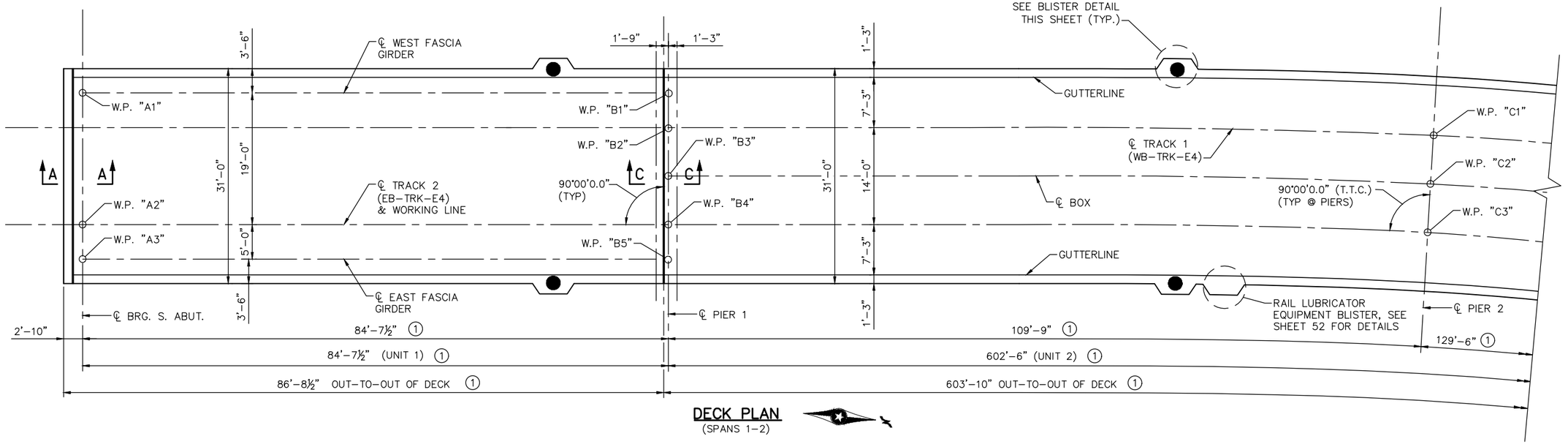
TITLE: MN45" PRESTRESSED CONCRETE BEAM (PRETENSIONED) MN45-62

DES: KR	DR: MSK	APPROVED:
CHK: KJK	CHK: KJK	

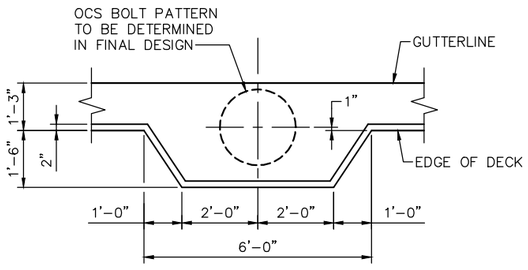
SHEET NO. 48 OF 35 SHEETS

BRIDGE NO. 27C18

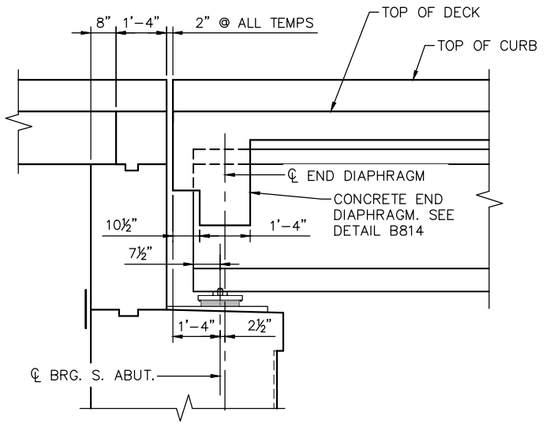
Sep. 17 2015 03:14 pm V:\3400_ADC\CAD\SEGMENT E4\PLAN SHEETS\STRUCTURES\27C18\CBR27C18-BRG-PCB-005.dwg By: mark.krzyzewski



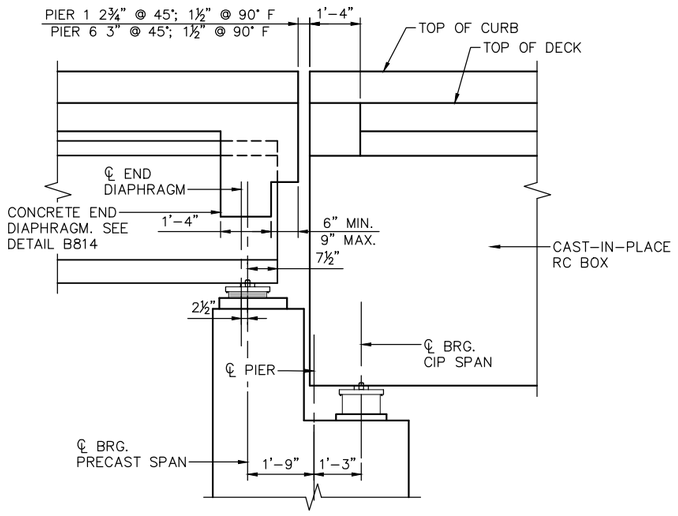
DECK PLAN
(SPANS 1-2)



OCS BLISTER AT CURB
(UNITS 1 & 2)



SECTION A-A



SECTION C-C

NOTES:

(1) DIMENSIONS MEASURED ALONG ℄ TRACK 2.

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: KR | CHECKED BY: KJK
DRAWN BY: MSK | DATE: 09/18/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

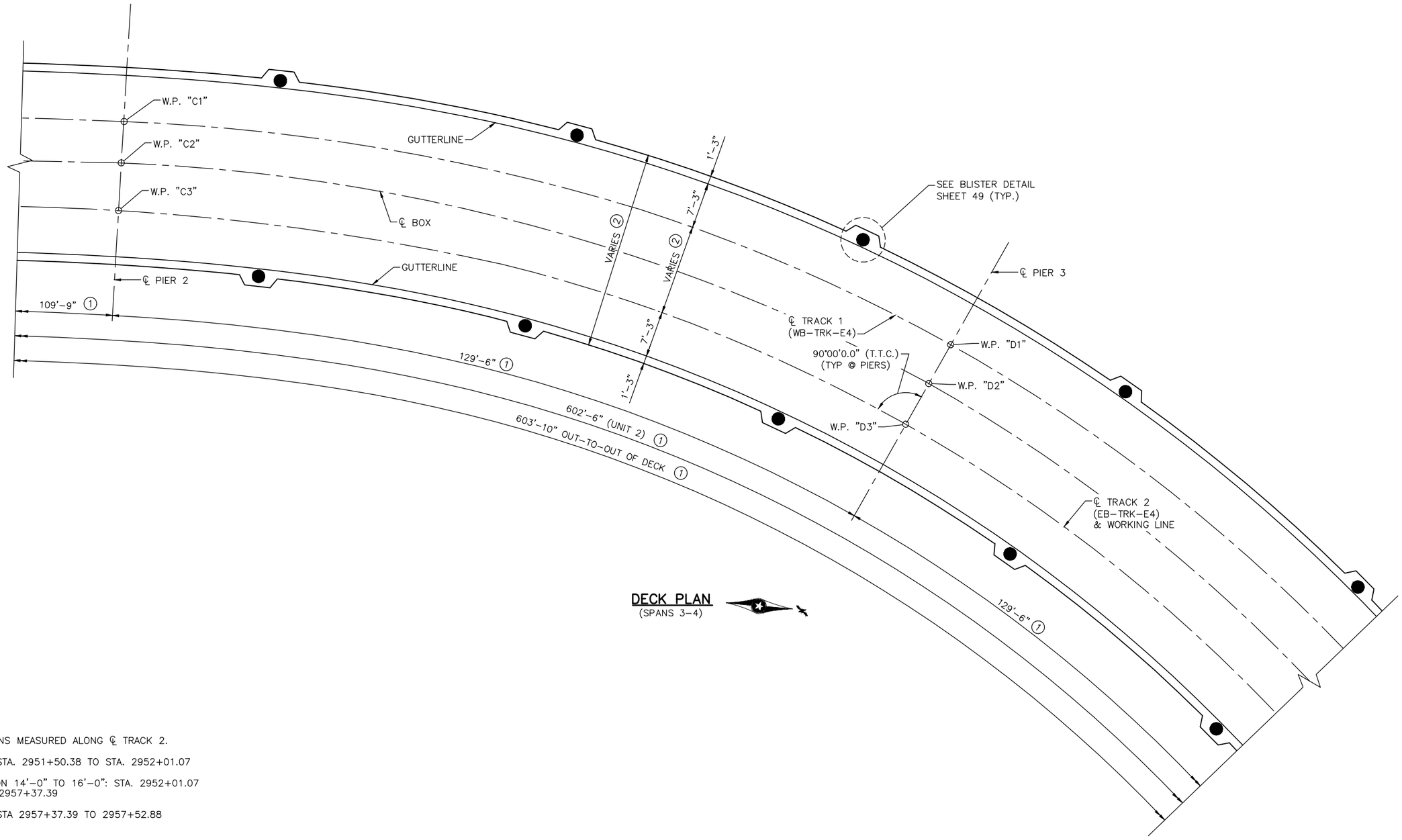
METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4B
5TH AVENUE AND 7TH STREET
BRIDGE 27C18
SUPERSTRUCTURE DETAILS 1

DISCIPLINE: STRUCTURES
SHEET NAME: CBR27C18-BRG-SUP-006

SHEET 49 OF 80



DECK PLAN
(SPANS 3-4)

NOTES:

① DIMENSIONS MEASURED ALONG ℄ TRACK 2.

② 14'-0": STA. 2951+50.38 TO STA. 2952+01.07

TRANSITION 14'-0" TO 16'-0": STA. 2952+01.07 TO STA. 2957+37.39

16'-0": STA 2957+37.39 TO 2957+52.88

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: KR | CHECKED BY: KJK
DRAWN BY: MSK | DATE: 09/18/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

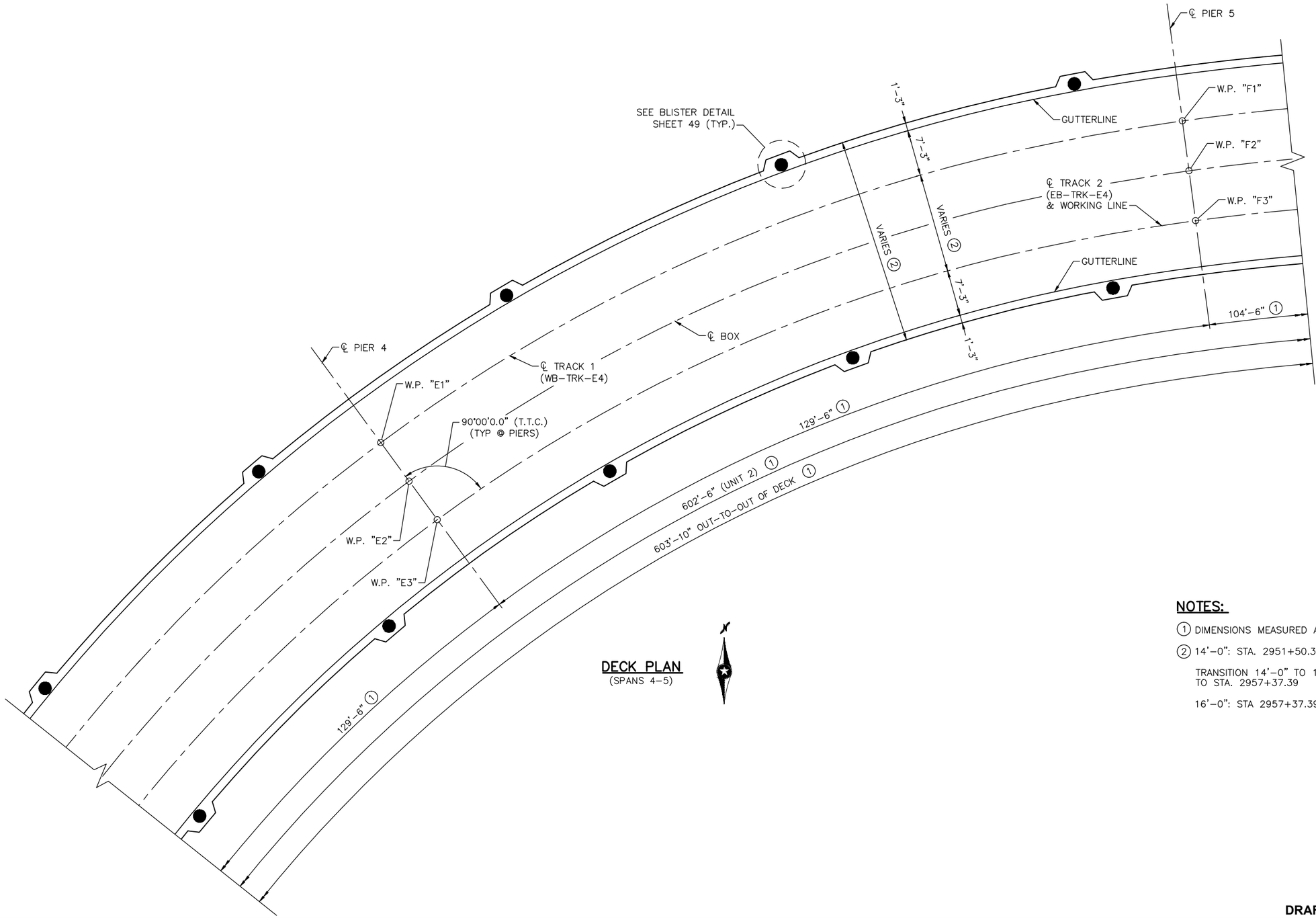
CIVIL EAST - VOLUME 4B
5TH AVENUE AND 7TH STREET BRIDGE 27C18
SUPERSTRUCTURE DETAILS 2

DISCIPLINE: STRUCTURES

SHEET NAME: CBR27C18-BRG-SUP-007

SHEET 50 OF 80

Sep. 17 2015 03:14 pm V:\3400_ADC\CAD\SEGMENT E4\PLAN SHEETS\STRUCTURES\27C18\CBR27C18-BRG-SUP-007.dwg By: mark.krzyzewski



DECK PLAN
(SPANS 4-5)

NOTES:

(1) DIMENSIONS MEASURED ALONG ℄ TRACK 2.

(2) 14'-0": STA. 2951+50.38 TO STA. 2952+01.07

TRANSITION 14'-0" TO 16'-0": STA. 2952+01.07 TO STA. 2957+37.39

16'-0": STA 2957+37.39 TO 2957+52.88

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: KR | CHECKED BY: KJK
DRAWN BY: MSK | DATE: 09/18/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

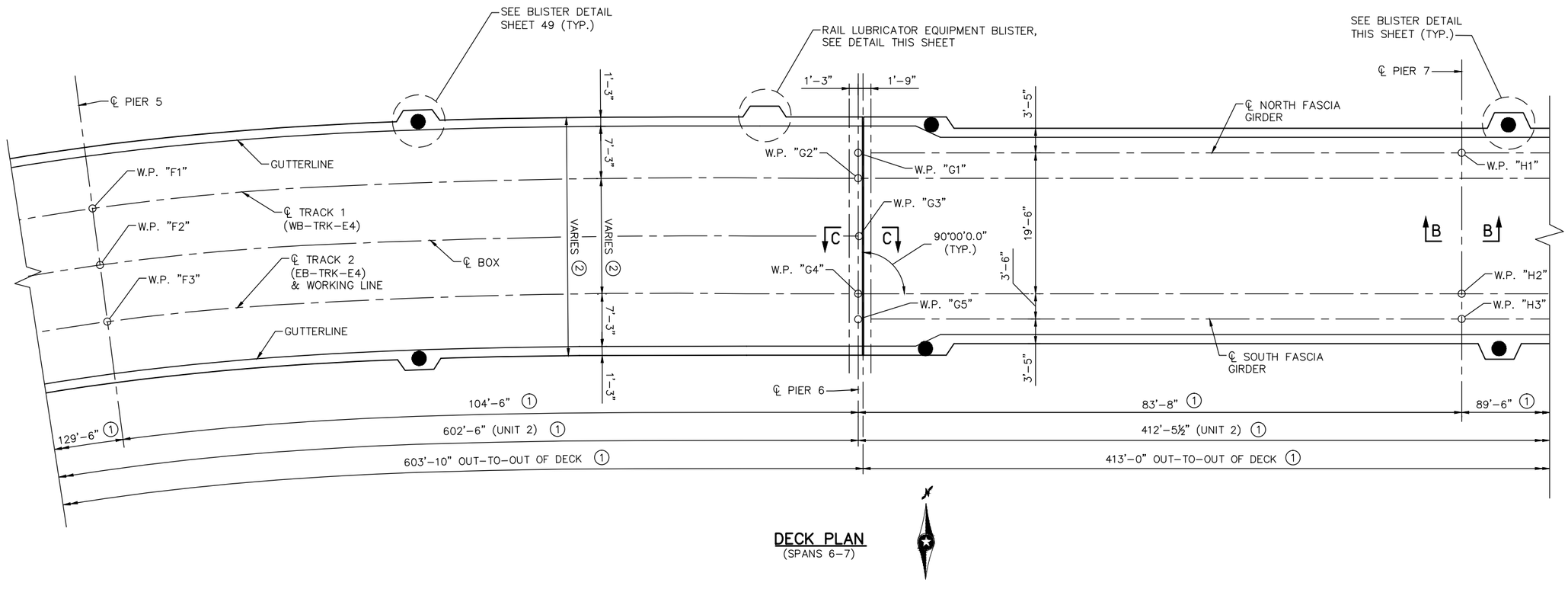
CIVIL EAST - VOLUME 4B
5TH AVENUE AND 7TH STREET
BRIDGE 27C18
SUPERSTRUCTURE DETAILS 3

DISCIPLINE: STRUCTURES

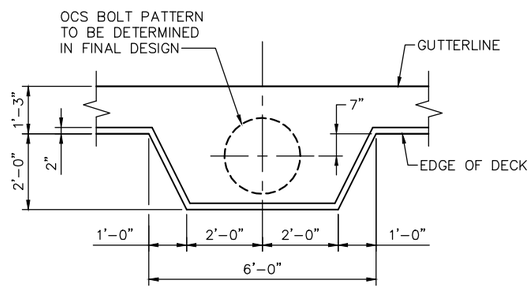
SHEET NAME: CBR27C18-BRG-SUP-008

SHEET 51 OF 80

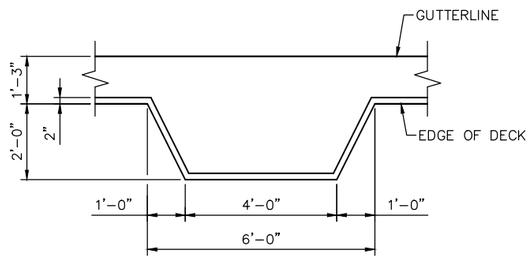
Sep. 17 2015 03:15 pm V:\3400_ADC\CAD\SEGMENT E4\PLAN SHEETS\STRUCTURES\27C18\CBR27C18-BRG-SUP-008.dwg By: mark.krzyzewski



DECK PLAN
(SPANS 6–7)



OCS BLISTER AT CURB
(UNIT 3)



RAIL LUBRICATOR BLISTER AT CURB

NOTES:

SEE SHEET 49 FOR SECTION C–C.

SEE SHEET 53 FOR SECTION B–B.

(1) DIMENSIONS MEASURED ALONG ℄ TRACK 2.

(2) 14'–0": STA. 2951+50.38 TO STA. 2952+01.07

TRANSITION 14'–0" TO 16'–0": STA. 2952+01.07 TO STA. 2957+37.39

16'–0": STA 2957+37.39 TO 2957+52.88

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: KR | CHECKED BY: KJK
DRAWN BY: MSK | DATE: 09/18/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

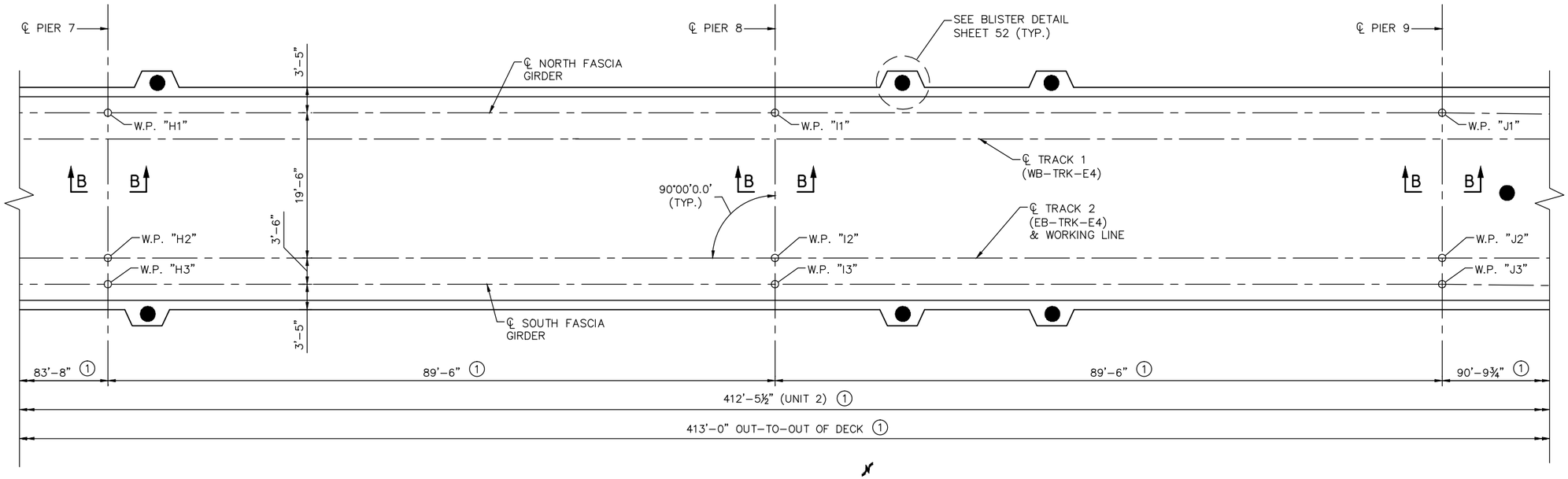
SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4B
5TH AVENUE AND 7TH STREET
BRIDGE 27C18
SUPERSTRUCTURE DETAILS 4

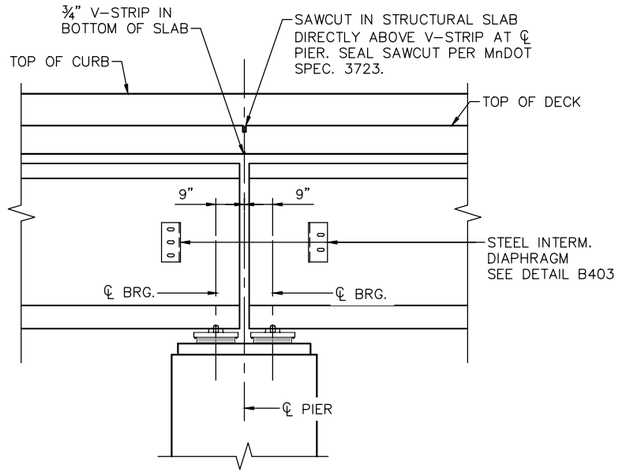
DISCIPLINE: STRUCTURES
SHEET NAME: CBR27C18-BRG-SUP-009

SHEET 52 OF 80

Sep. 18 2015 10:47 am V:\3400_ADC\CAD\SEGMENT E4\PLAN SHEETS\STRUCTURES\27C18\CBR27C18-BRG-SUP-009.dwg By: mark.krzyzewski



DECK PLAN
(SPANS 8-9)



SECTION B-B

NOTES:

(1) DIMENSIONS MEASURED ALONG ℄ TRACK 2.

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: KR | CHECKED BY: KJK
DRAWN BY: MSK | DATE: 09/18/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

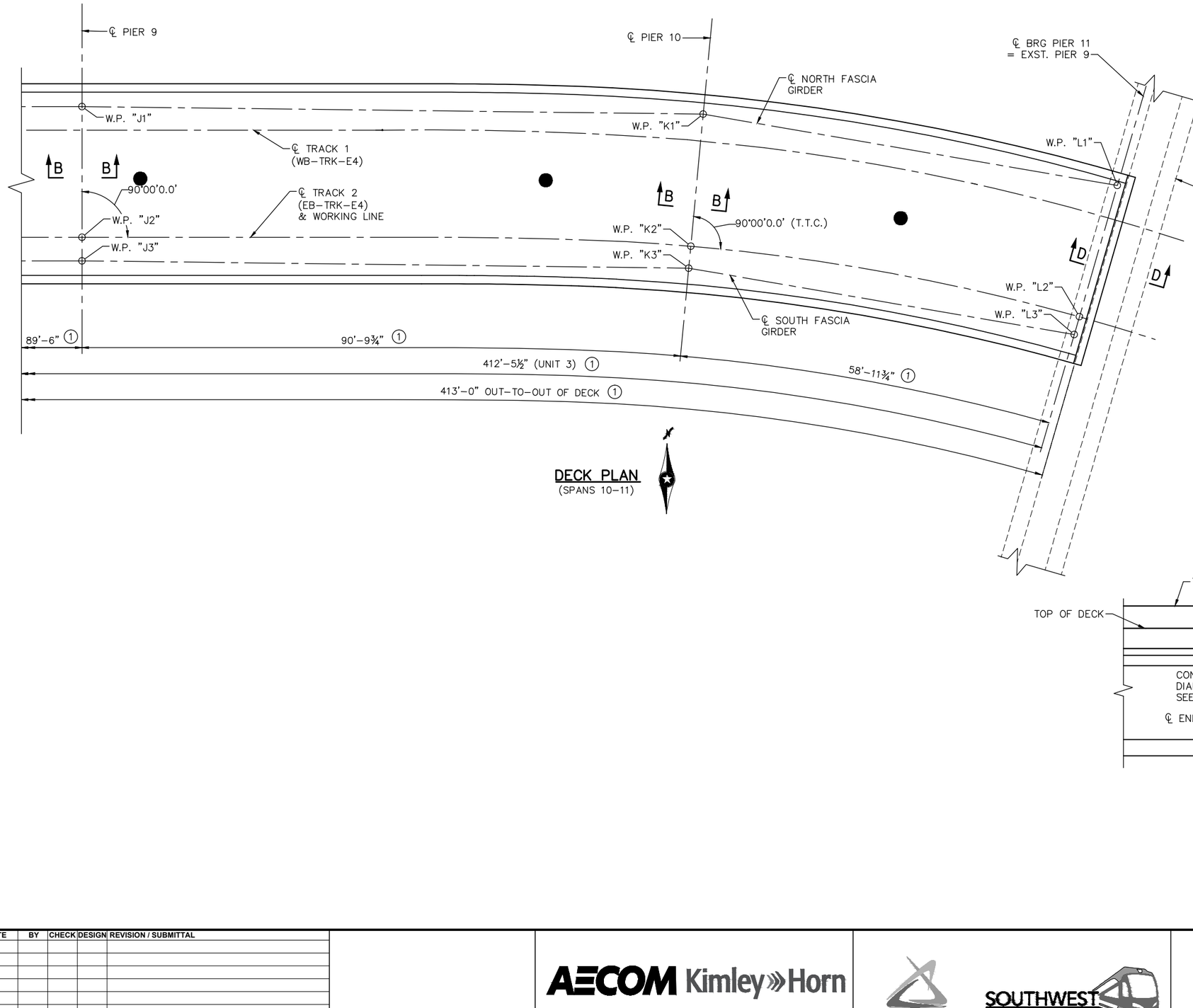
SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4B
5TH AVENUE AND 7TH STREET
BRIDGE 27C18
SUPERSTRUCTURE DETAILS 5

DISCIPLINE: STRUCTURES
SHEET NAME: CBR27C18-BRG-SUP-010

SHEET 53 OF 80

Sep. 17 2015 03:16 pm V:\3400_ADC\CAD\SEGMENT E4\PLAN SHEETS\STRUCTURES\27C18\CBR27C18-BRG-SUP-010.dwg By: mark.krzyzewski

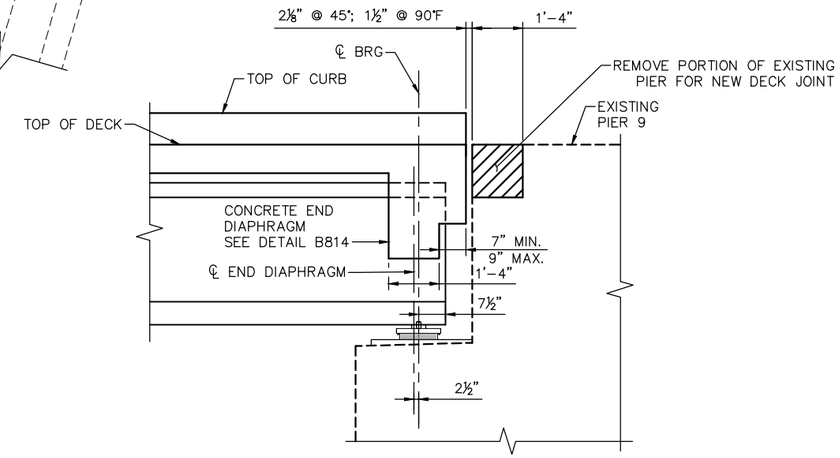


DECK PLAN
(SPANS 10–11)

NOTES:

SEE SHEET 53 FOR SECTION B–B.

(1) DIMENSIONS MEASURED ALONG ℄ TRACK 2.



SECTION D–D

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: KR | CHECKED BY: KJK
DRAWN BY: MSK | DATE: 09/18/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

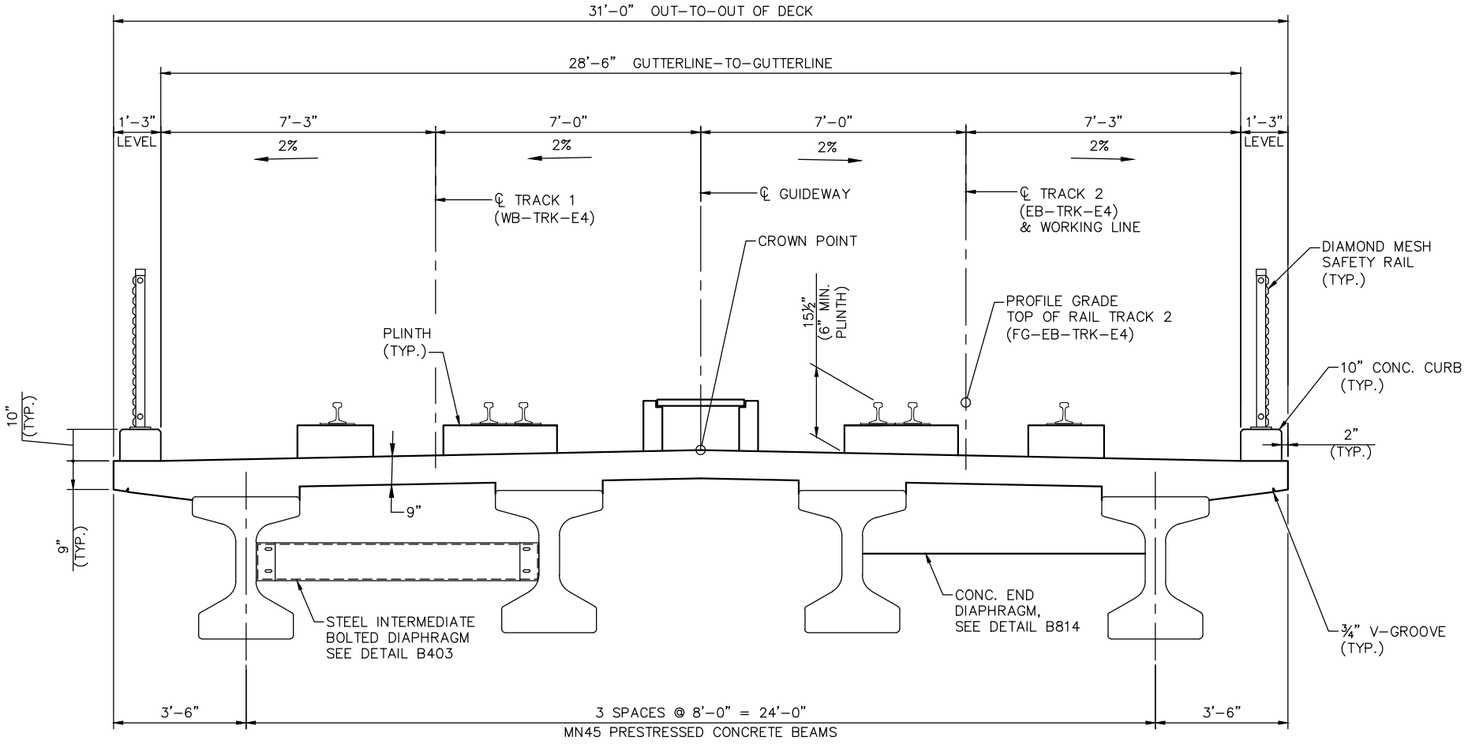
CIVIL EAST - VOLUME 4B
5TH AVENUE AND 7TH STREET
BRIDGE 27C18
SUPERSTRUCTURE DETAILS 6

DISCIPLINE: STRUCTURES

SHEET NAME: CBR27C18-BRG-SUP-011

SHEET 54 OF 80

Sep. 18 2015 10:47 am V:\3400_ADC\CAD\SEGMENT E4\PLAN SHEETS\STRUCTURES\27C18\CBR27C18-BRG-SUP-011.dwg By: mark.krzyzewski



TRANSVERSE SECTION
(UNIT 1)

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: KR | CHECKED BY: KJK
DRAWN BY: MSK | DATE: 09/18/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

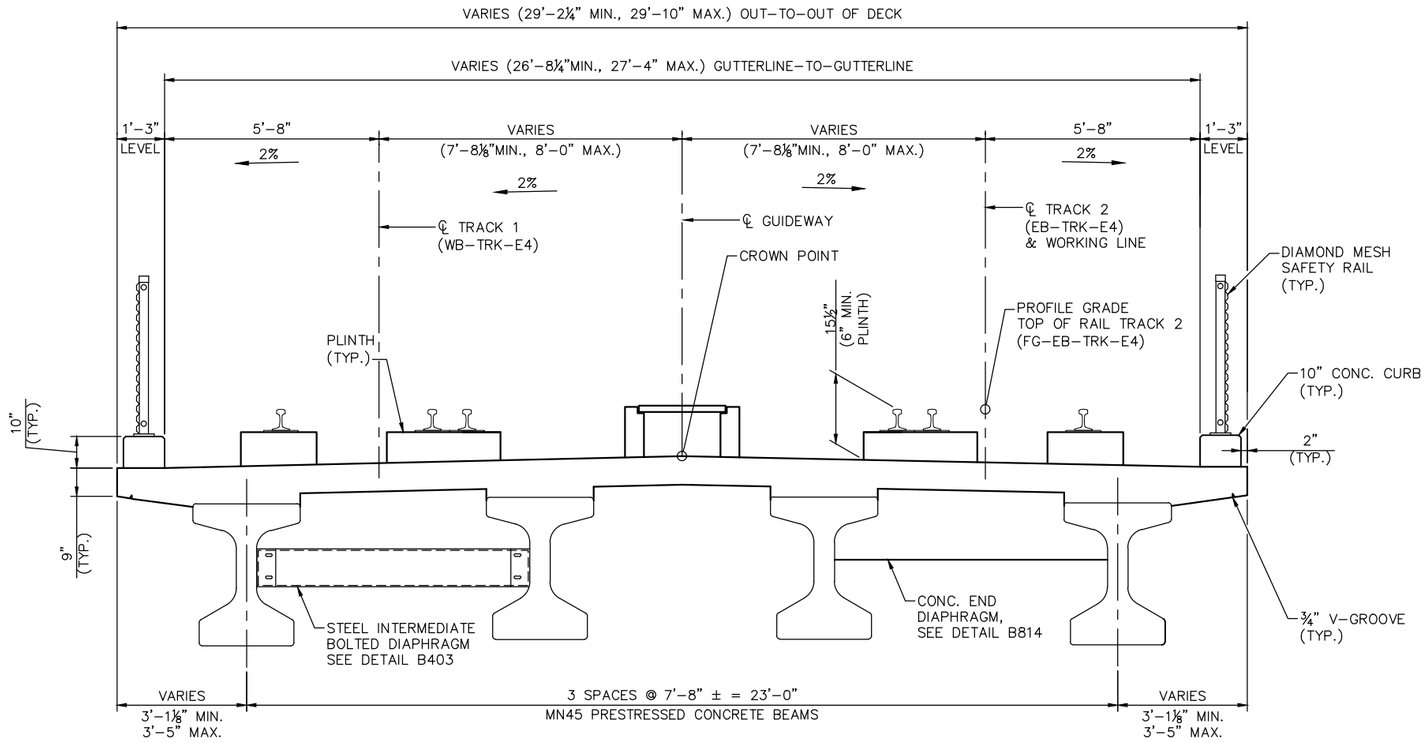
SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4B
5TH AVENUE AND 7TH STREET
BRIDGE 27C18
SUPERSTRUCTURE DETAILS 7

DISCIPLINE: STRUCTURES
SHEET NAME: CBR27C18-BRG-SUP-005

SHEET 55 OF 80

Sep, 17 2015 03:17 pm v:\3400_ADC\CAD\SEGMENT E4\PLAN SHEETS\STRUCTURES\27C18\CBR27C18-BRG-SUP-005.dwg By: mark.krzyzewski



TRANSVERSE SECTION
(UNIT 3)

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: KR | CHECKED BY: KJK
DRAWN BY: MSK | DATE: 09/18/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

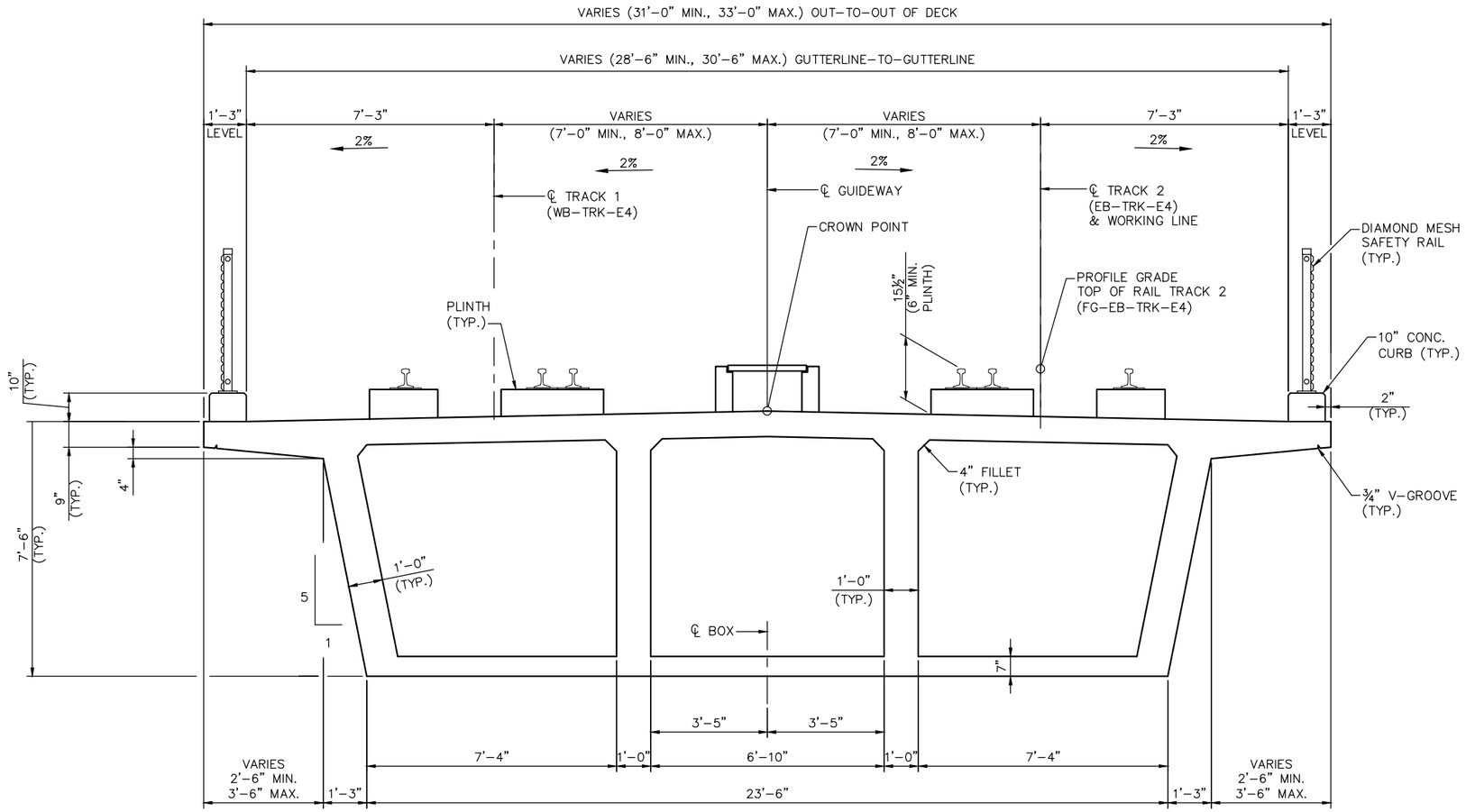
CIVIL EAST - VOLUME 4B
5TH AVENUE AND 7TH STREET
BRIDGE 27C18
SUPERSTRUCTURE DETAILS 8

DISCIPLINE: STRUCTURES

SHEET NAME: CBR27C18-BRG-SUP-012

SHEET 56 OF 80

Sep, 17 2015 03:17 pm v:\3400_ADC\CAD\SEGMENT E4\PLAN SHEETS\STRUCTURES\27C18\CBR27C18-BRG-SUP-012.dwg By: mark.krzyzewski



TRANSVERSE SECTION
(UNIT 2)

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: KR | CHECKED BY: KJK
DRAWN BY: MSK | DATE: 09/18/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

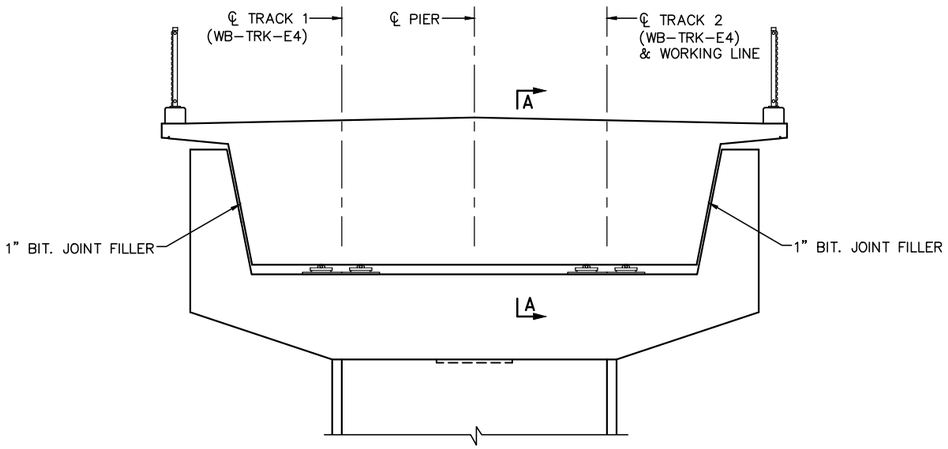
SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4B
5TH AVENUE AND 7TH STREET
BRIDGE 27C18
SUPERSTRUCTURE DETAILS 9

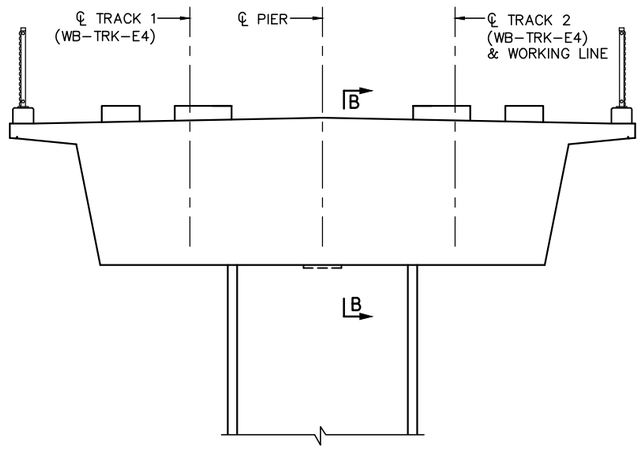
DISCIPLINE: STRUCTURES
SHEET NAME: CBR27C18-BRG-SUP-013

SHEET 57 OF 80

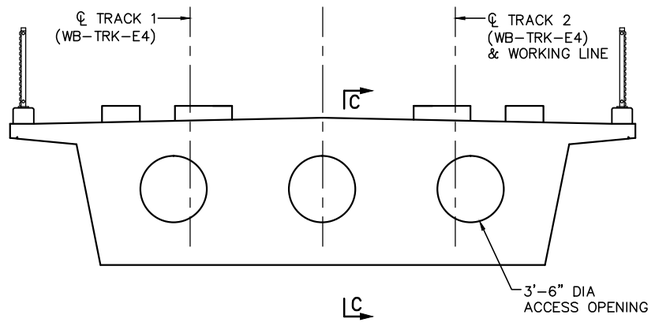
Sep, 17 2015 03:17 pm v:\3400_ADC\CAD\SEGMENT E4\PLAN SHEETS\STRUCTURES\27C18\CBR27C18-BRG-SUP-013.dwg By: mark.krzyzewski



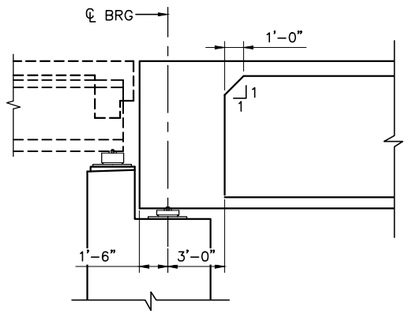
END PIER ELEVATION



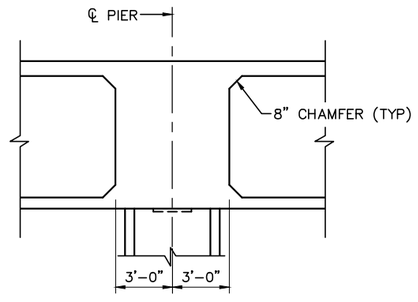
INTERMEDIATE PIER ELEVATION



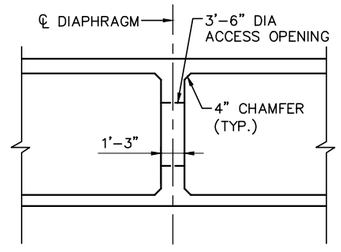
INTERMEDIATE DIAPHRAGM ELEVATION



SECTION A–A



SECTION B–B



SECTION C–C

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: KR | CHECKED BY: KJK
DRAWN BY: MSK | DATE: 09/18/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

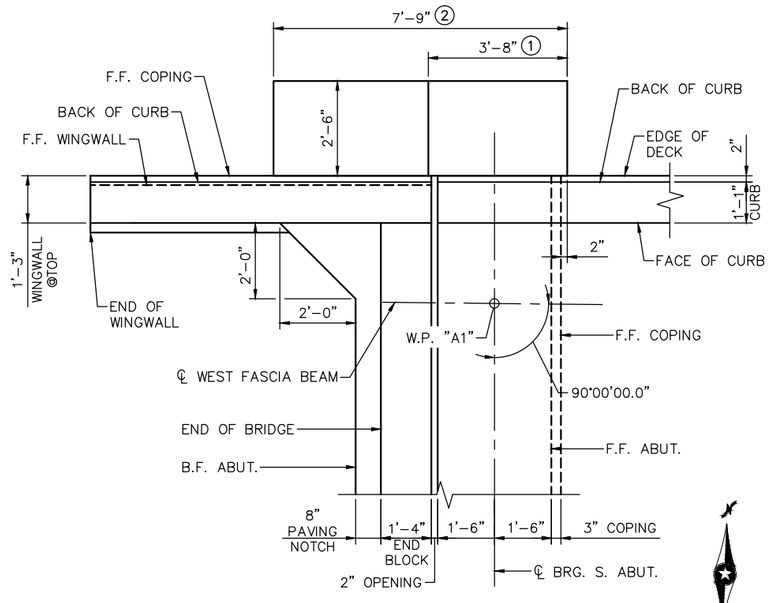
CIVIL EAST - VOLUME 4B
5TH AVENUE AND 7TH STREET
BRIDGE 27C18
SUPERSTRUCTURE DETAILS 10

DISCIPLINE: STRUCTURES

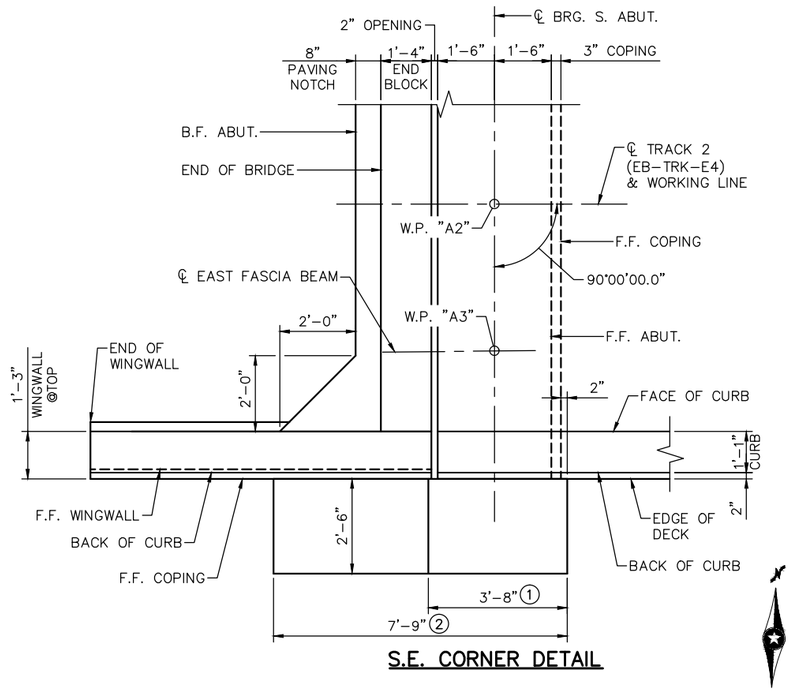
SHEET NAME: CBR27C18-BRG-SDT-006

SHEET 58 OF 80

Sep, 18 2015 10:48 am V:\3400_ADC\CAD\SEGMENT E4\PLAN SHEETS\STRUCTURES\27C18\CBR27C18-BRG-SDT-006.dwg By: mark.krzyzewski



S.W. CORNER DETAIL



S.E. CORNER DETAIL

NOTES:

(1) MEASURED AT TOP OF PILASTER.

(2) MEASURED AT BOTTOM OF PILASTER.

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: KR | CHECKED BY: KJK
DRAWN BY: MSK | DATE: 09/18/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

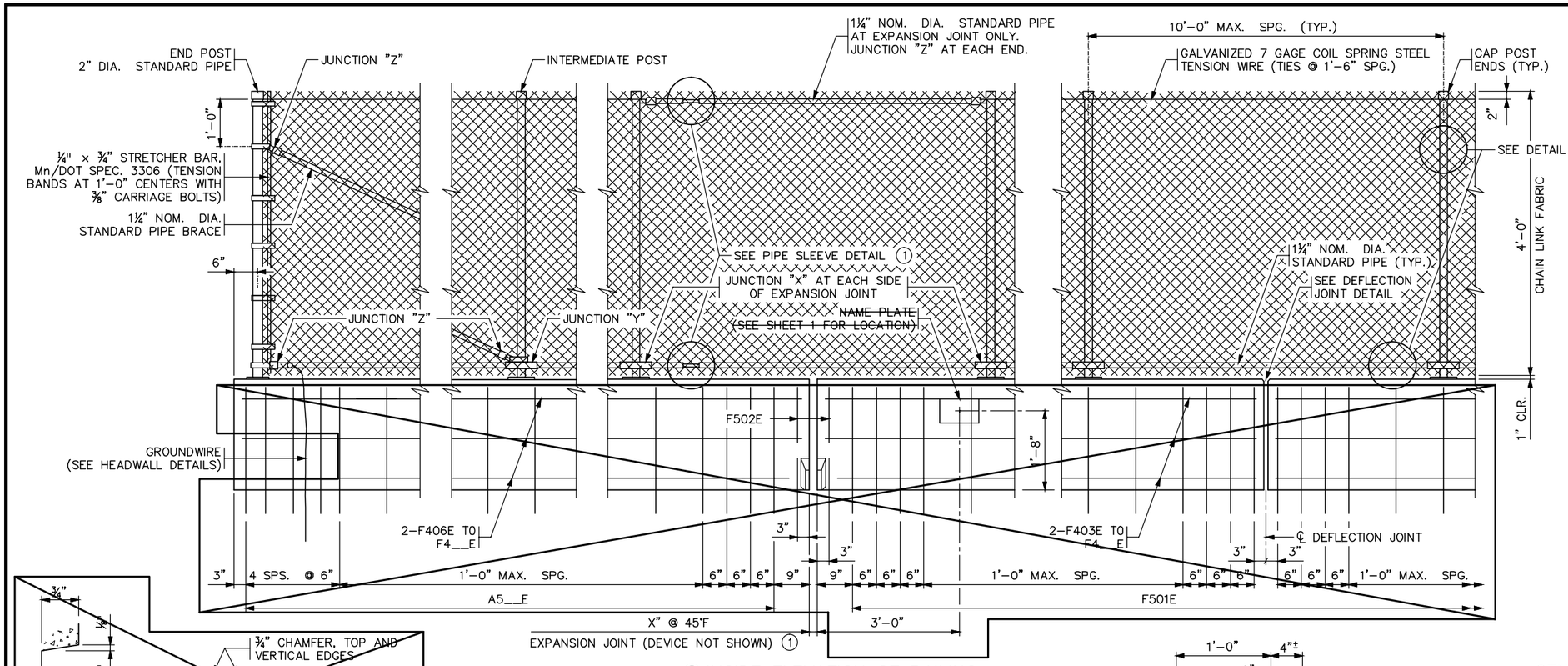
CIVIL EAST - VOLUME 4B
5TH AVENUE AND 7TH STREET
BRIDGE 27C18
SUPERSTRUCTURE DETAILS 11

DISCIPLINE: STRUCTURES

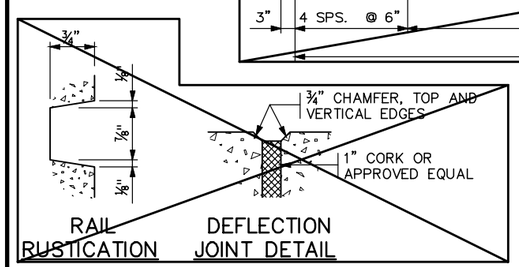
SHEET NAME: CBR27C18-BRG-SDT-005

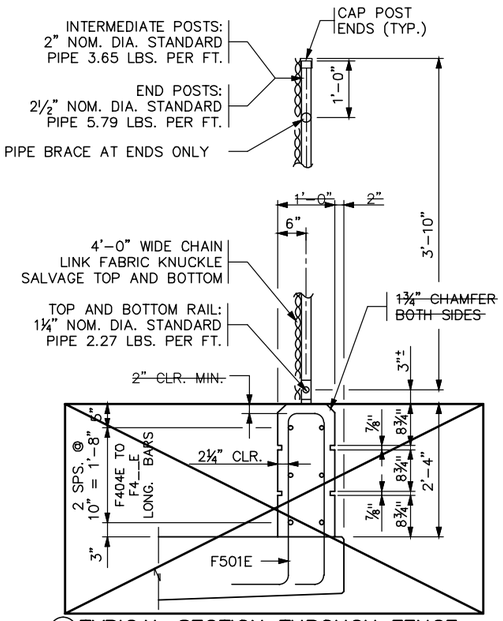
SHEET 59 OF 80

Sep. 17 2015 03:18 pm v:\3400_ADC\CAD\SEGMENT E4\PLAN SHEETS\STRUCTURES\27C18\CBR27C18-BRG-SDT-005.dwg By: mark.krzyzewski



Ⓐ INSIDE ELEVATION OF RAILING

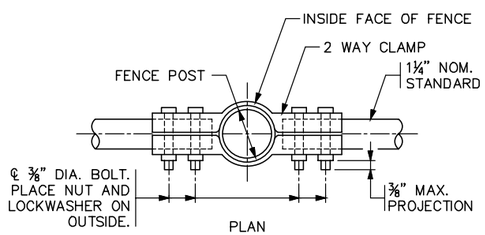




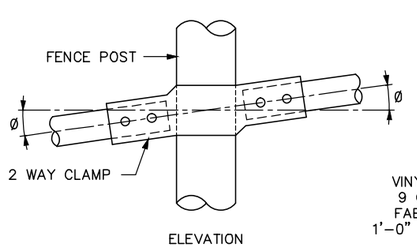
Ⓐ TYPICAL SECTION THROUGH FENCE

INTERMEDIATE POST SHOWN

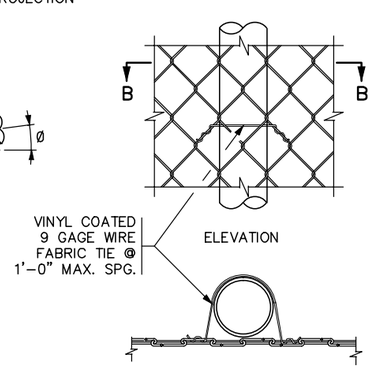
SHEET MODIFICATION:
Ⓐ DENOTES MODIFICATION TO STANDARD SHEET



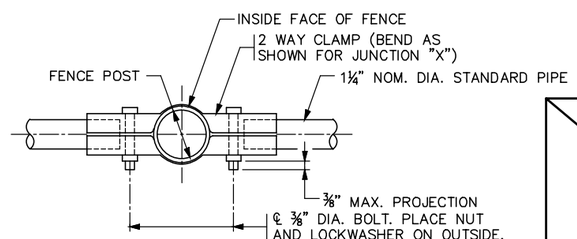
2 WAY CLAMP BENDING TABLE	
GRADE OF FENCE	Ø
0° TO 2°	0°
2° TO 6°	4°
6° TO 10°	8°



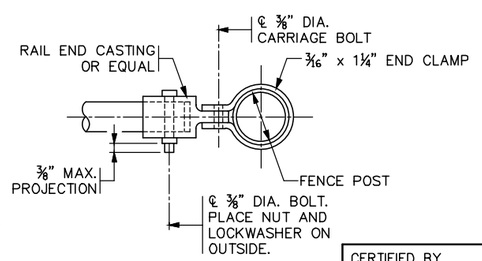
JUNCTION "X"



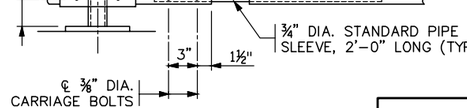
DETAIL "A"



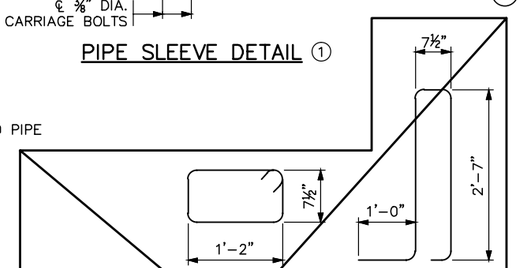
JUNCTION "Y"



JUNCTION "Z"



PIPE SLEEVE DETAIL (1)



F502E F501E

BILL OF REINFORCEMENT FOR PARAPET

BAR	NO.	LENGTH	SHAPE	LOCATION
F501E		7'-3"		RAIL BASE VERTICAL
F502E		4'-6"		RAIL BASE VERTICAL
F403E				RAIL BASE LONGITUDINAL
F404E				RAIL BASE LONGITUDINAL

GENERAL NOTES

Ⓐ SEE SUPERSTRUCTURE DETAIL SHEETS FOR CURB DIMENSIONS, REINFORCEMENT AND NOTES.

~~LENGTH OF "TYPE P-1 RAILING CONCRETE (3Y46 OR 3Y46A)" FOR PAYMENT SHALL BE MEASURED BETWEEN THE OUTSIDE FACES OF THE CONCRETE RAIL.~~

Ⓐ ~~LENGTH OF "DIAMOND MESH SAFETY RAIL" FOR PAYMENT SHALL BE MEASURED BETWEEN THE CENTERS OF END RAILPOSTS.~~

~~CONCRETE RAILING = 350 LBS./FT. (0.086 CU. YDS./FT.)~~

FENCE POST ANCHORAGES SHALL BE TYPE A. SEE DETAIL B905 "FENCE POST ANCHORAGE".

~~MAXIMUM SPACING OF DEFLECTION JOINTS SHALL BE 20 FT. FOR SPACING OF FENCE POST, JOINTS AND ELECTRICAL GROUNDS, SEE SUPERSTRUCTURE SHEETS.~~

FENCE POSTS AND FENCE POST ANCHORAGES SHALL BE SET VERTICAL, UNLESS OTHERWISE NOTED.

℄ OF FENCE POST ANCHORAGE SHALL BE A MINIMUM OF 6" FROM JOINTS.

END POSTS AND BRACING SHALL BE AT 500 FT. MAXIMUM INTERVALS.

ALL POSTS SHALL HAVE A MEANS TO SECURELY HOLD THE TOP TENSION WIRE IN POSITION AND ALLOW FOR THE REMOVAL AND REPLACEMENT OF A POST WITHOUT DAMAGING THE TOP WIRE.

WIRE TIES MAY BE 9 GAGE GALVANIZED STEEL OR 0.179" MIN. ALUMINUM ALLOY CONFORMING TO A.S.T.M. B211, ALLOY 1100-H18. USE 12½ GAGE GALVANIZED HOG RINGS FOR TENSION WIRE TIES.

~~ALL MATERIAL IN THE CONCRETE BASE AND END POST IS INCLUDED IN THE SUPERSTRUCTURE QUANTITIES.~~

SEE SPECIAL PROVISIONS FOR REQUIREMENTS NOT INCLUDED ON THIS SHEET AND FOR BASIS OF PAYMENT.

(1) PROVIDE PIPE SLEEVE IN SPAN BETWEEN THE VERTICAL POSTS AT EXPANSION JOINT.

REVISED: 04-17-2013

APPROVED: DECEMBER 18, 2003

Daniel L. Morgan
STATE BRIDGE ENGINEER

DRAFT-WORK IN PROCESS

FIG. 5-397.119 (MOD.)

CERTIFIED BY _____ 08/24/15
LICENSED PROFESSIONAL ENGINEER — DATE

NAME: **ENGINEER** LIC. NO. #####

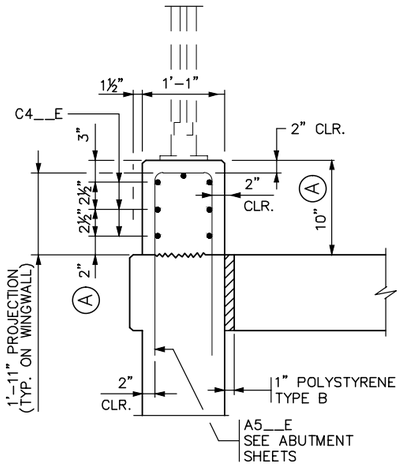
TITLE: WIRE FENCE (DIAMOND MESH SAFETY RAIL)Ⓐ

DES: KR	DR: MSK	APPROVED:
CHK: KJK	CHK: KJK	

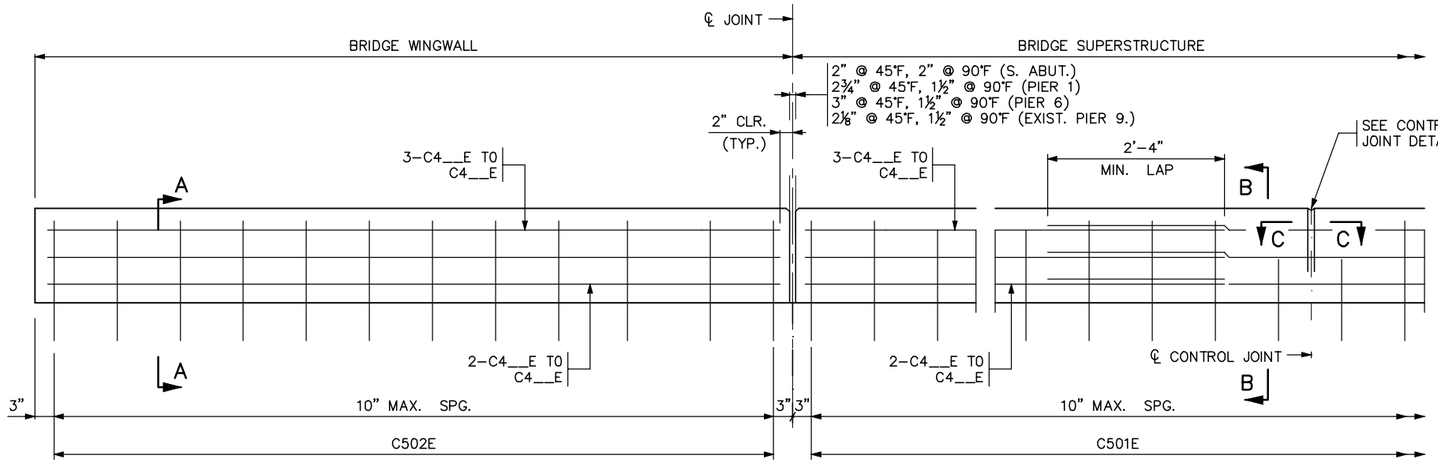
SHEET NO. **60** OF **80** SHEETS

BRIDGE NO. **27C18**

Sep. 17 2015 03:19 pm V:\3400_ADC\CAD\SEGMENT E4\PLAN SHEETS\STRUCTURES\27C18\CBR27C18-BRG-RAL-001.dwg By: mark.krzyzewski



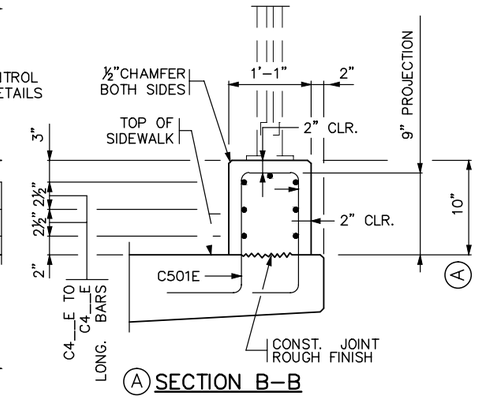
Ⓐ SECTION A–A



JOINT AT ABUTMENT

CONTROL JOINT

~~INTEGRAL OR SEMI-INTEGRAL ABUTMENT~~ SEE DETAIL "A" FOR PARAPET ABUTMENT

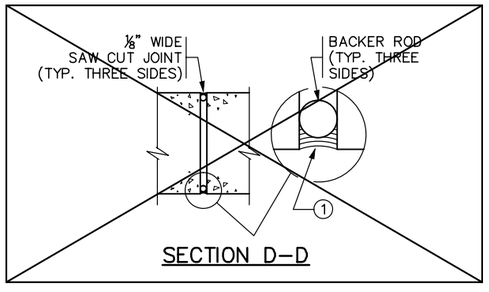


Ⓐ SECTION B–B

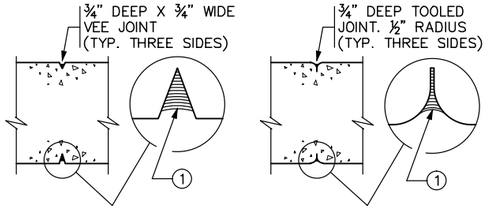
Ⓐ INSIDE ELEVATION OF CONCRETE CURB

CURB DOES NOT MEET CRASH TEST REQUIREMENTS OF NCHRP REPORT 350

BILL OF REINFORCEMENT FOR CURB				
BAR	NO.	LENGTH	SHAPE	LOCATION
C501E	__	4'-7"	⌐	CURB BASE VERTICAL
C502E	__	4'-9"	⌐	CURB BASE VERTICAL
C4__E	__	_____	——	CURB BASE LONGIT.
C4__E	__	_____	——	CURB BASE LONGIT.
C4__E	__	_____	——	CURB BASE LONGIT.



SECTION D–D

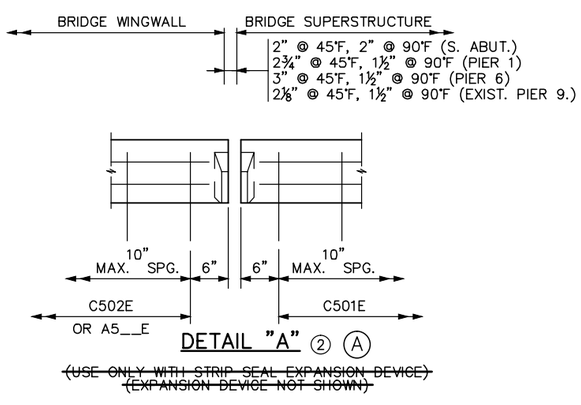


SECTION C–C
CONTRACTOR OPTION 1

SECTION C–C
CONTRACTOR OPTION 2

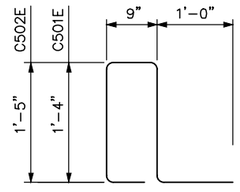
CONTROL JOINT DETAILS

WHEN USING SLIP FORM METHOD TO PLACE THE CONCRETE, CUT JOINT 3 INCHES DEEP USING MARGIN TROWEL OR SIMILAR MEANS IMMEDIATELY AFTER CONCRETE PLACEMENT (TYP. THREE SIDES)



DETAIL "A" ② Ⓐ

~~(USE ONLY WITH STRIP SEAL EXPANSION DEVICE)~~
~~(EXPANSION DEVICE NOT SHOWN)~~



Ⓐ C501E, C502E

GENERAL NOTES

CONTINUOUSLY GROUND ALL METAL RAILINGS; SEE THE SPECIAL PROVISIONS. REFER TO THE ELECTRICAL PLANS AND ELECTRICAL SPECIAL PROVISIONS FOR DETAILS REGARDING BONDING MULTIPLE ELECTRICAL GROUNDING SYSTEMS.

~~PAYMENT LENGTH SHALL BE MEASURED BETWEEN THE OUTSIDE FACES~~ OF ~~THE CONCRETE CURB.~~

Ⓐ CONCRETE CURB = 204 LBS./FT. (0.050 CU. YDS./FT.)

FINISH ALL EDGES OF CURB WITH ½" CHAMFER, EXCEPT WHERE OTHERWISE NOTED.

MAXIMUM SPACING OF CONTROL JOINTS ON SUPERSTRUCTURE, APPROACH AND WINGWALL SHALL BE 10 FT. SEE SUPERSTRUCTURE SHEET FOR JOINT SPACING.

~~CONCRETE CURB QUANTITIES ARE LISTED IN SUMMARY OF QUANTITIES FOR SUPERSTRUCTURE.~~

① JOINT SEALANT PER MnDOT APPROVED/QUALIFIED PRODUCTS LIST – CRACK AND JOINT MATERIALS – SILICONE JOINT SEALERS.

② REFER TO STANDARD FIGURE 5–397.632 FOR COVER PLATE DETAILS.

SHEET MODIFICATION:
Ⓐ DENOTES MODIFICATION TO STANDARD SHEET

REVISION:

APPROVED: NOVEMBER 6, 2013
Nancy Daubenberger
STATE BRIDGE ENGINEER

CERTIFIED BY _____ 09/18/15
LICENSED PROFESSIONAL ENGINEER — DATE
NAME: **ENGINEER** LIC. NO. #####

TITLE: CONCRETE CURB ~~FOR USE WITH ORNAMENTAL RAILING~~

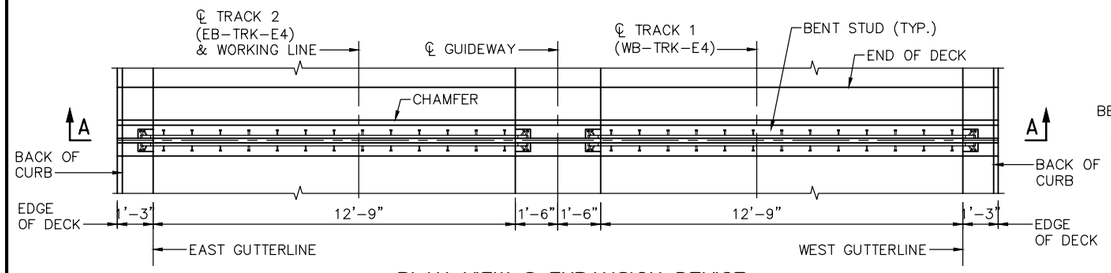
DRAFT-WORK IN PROCESS

FIG. 5–397.167 (MOD.)

DES: KR	DR: MSK	APPROVED:
CHK: KJK	CHK: CHEK2	

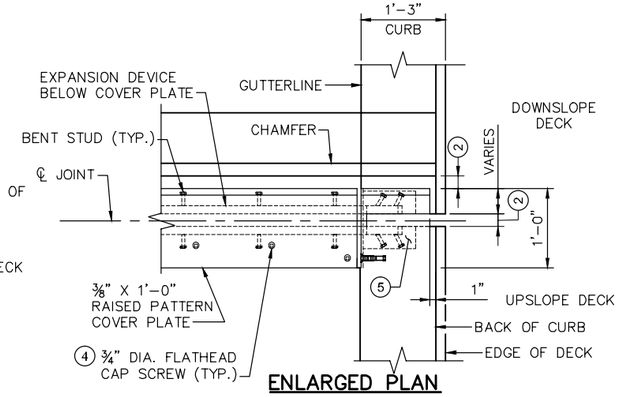
SHEET NO. **61** OF **80** SHEETS

BRIDGE NO. **27C18**

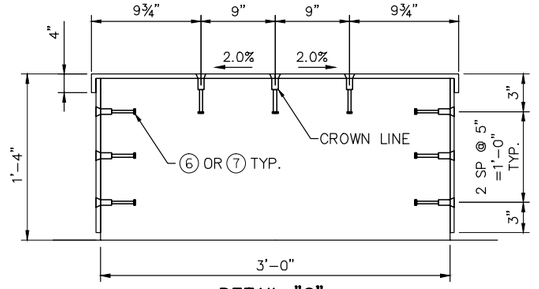


PLAN VIEW @ EXPANSION DEVICE

COVER PLATE NOT SHOWN FOR CLARITY
(SOUTH ABUTMENT SHOWN LOOKING BACK STATION)

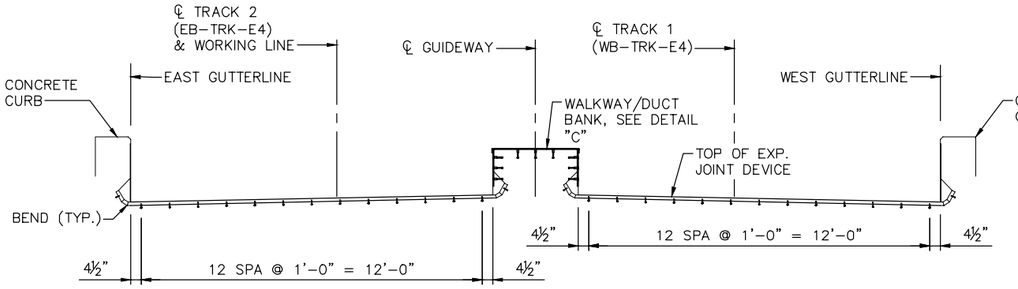


ENLARGED PLAN



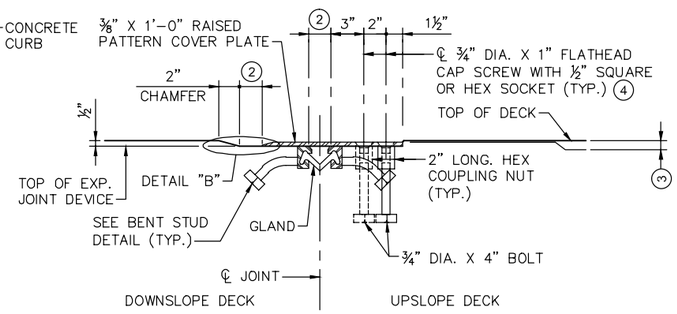
DETAIL "C"

WALKWAY/DUCT BANK

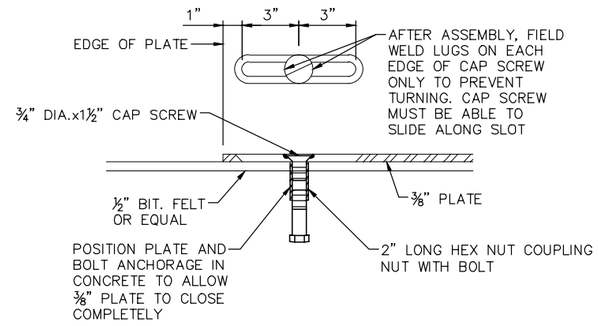


SECTION A–A – ALONG CENTERLINE JOINT

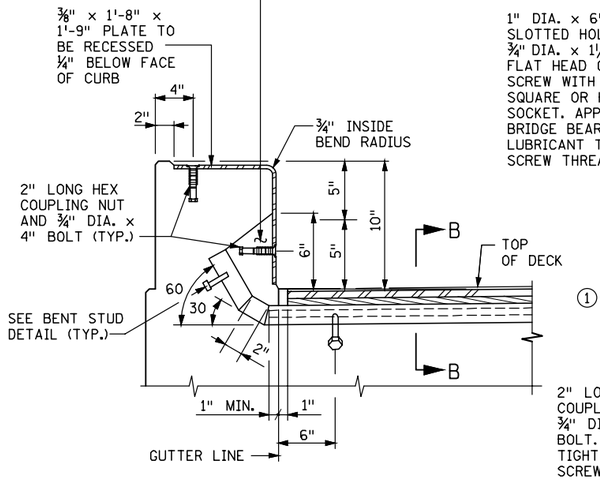
ELEVATIONS SHOWN ARE ½" BELOW TOP OF DECK
@ CENTERLINE JOINT (LOOKING BACK STATION)



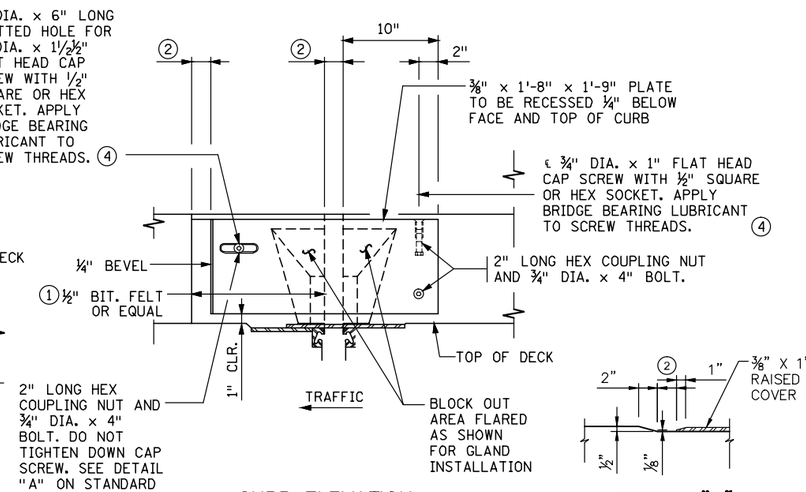
SECTION B–B



DETAIL "A"

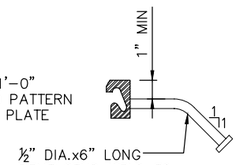


CONCRETE CURB



CURB ELEVATION

DETAIL "B"



BENT STUD DETAIL

NOTES:

GALVANIZE STRUCTURAL STEEL AFTER FABRICATION AS PER SPEC. 3394. GALVANIZE FASTENERS AS PER SPEC. 3392.

JOINTS IN EXTRUSION SHALL BE LOCATED AT BREAKS IN TRANSVERSE PROFILE AND AS OTHERWISE REQUIRED. JOINTS SHALL BE CLOSE FIT AND WELDED. REPAIR AFTER WELDING AS PER SPEC. 2471.3.L.

STRUCTURAL STEEL SHALL COMPLY WITH SPEC. 3306.

EXPANSION DEVICE SHALL BE STRAIGHTENED TO A TOLERANCE OF ⅛" IN 10 FT.

CAP SCREWS SHALL BE COUNTERSUNK 1/16" BELOW TOP OF PLATE.

1. EXPANSION DEVICE ELEVATIONS SHOWN ARE ½" BELOW FINISHED DECK ELEVATIONS. COVER PLATE SHALL BE INSTALLED PER TOLERANCE SHOWN IN SECTION B–B.
2. SEE EXPANSION JOINT OPENING TABLE
3. TOP OF CONCRETE TO TOP OF COVER PLATE ⅛" (¼" MAX.).
4. MAXIMUM TRANSVERSE SPACING OF ¾" DIA. FLATHEAD SCREWS AND COUPLINGS SHALL BE 1'–0".
5. MINIMAL AMOUNT OF CURB CONCRETE ABOVE EXPANSION DEVICE SHALL BE BLOCKED OUT FOR GLAND INSTALLATION.
6. ℄ ¾" DIA. x 6" LONG SLOTTED HOLES FOR ½" DIA. x 1½" FLAT HEAD SCREW WITH 2" LONG HEX COUPLING NUT AND ½" DIA x 4" BOLT. DO NOT TIGHTEN DOWN SCREW.
7. ℄ ½" DIA. HOLE FOR ½" DIA. x 1" FLAT HEAD SCREW WITH 2" LONG HEX COUPLING NUT AND ½" DIA. x 4" BOLT.

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: KR | CHECKED BY: KJK
DRAWN BY: MSK | DATE: 09/18/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

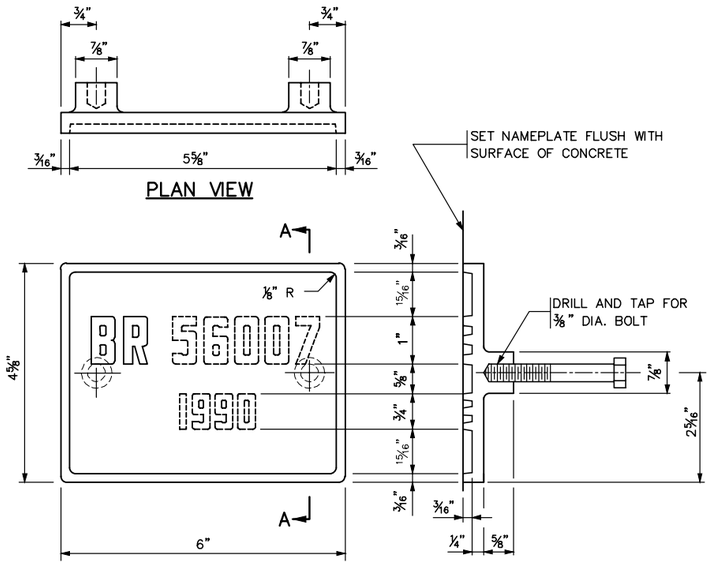
SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4B
5TH AVENUE AND 7TH STREET
BRIDGE 27C18
WATERPROOF EXPANSION DEVICE

DISCIPLINE: STRUCTURES
SHEET NAME: CBR27C18-BRG-SDT-004

SHEET 62 OF 80

Sep. 18 2015 08:40 am V:\3400_ADC\CAD\SEGMENT E4\PLAN SHEETS\STRUCTURES\27C18\CBR27C18-BRG-SDT-004.dwg By: mark.krzyzewski



THE DASHED NUMBERS SHOWN ABOVE ARE FOR ILLUSTRATION.
DATA TO BE SHOWN ON NAMEPLATE IS AS FOLLOWS:

BRIDGE 27C18

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.

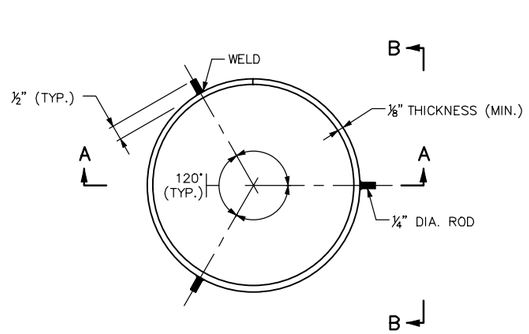
TOP SURFACE OF LETTERS, NUMBERS AND FRAMES SHALL BE BURNISHED.

FURNISH 2 STEEL BOLTS ⅜ " DIA. x 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.

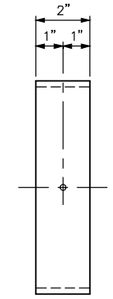
① YEAR OF CONSTRUCTION.

APPROVED: NOVEMBER 22, 2002	STATE OF MINNESOTA DEPARTMENT OF TRANSPORTATION	REVISION 09–11–2014	DETAIL NO.
STATE BRIDGE ENGINEER	BRIDGE NAMEPLATE (FOR NEW BRIDGES)		B101



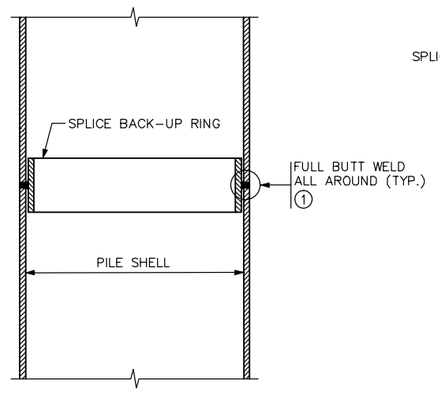
PLAN VIEW – SPLICE BACK–UP RING

PILE NOT SHOWN

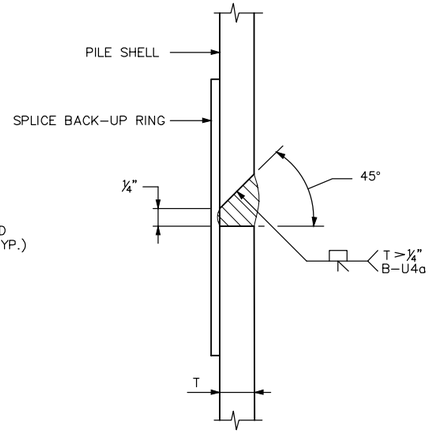


SECTION B–B

PILE NOT SHOWN



SECTION A–A



DETAIL "A" ①

NOTES:

APPROVED COMMERCIAL PILE SPLICE BACK–UP RING MAY BE USED IN LIEU OF THE TYPE DETAILED, PROVIDED THAT ¼" ROOT IS MAINTAINED. BACK–UP RING SHALL HAVE A TIGHT FIT.

WELDING ELECTRODES SHALL BE CELLULOSIC TYPE ELECTRODES E–6010 OR E–6011.

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.

① FOR PILE SHELL THICKNESSES GREATER THAN ½", USE A B–U4a WELD CONFIGURATION. SEE DETAIL "A".

APPROVED: NOVEMBER 22, 2002	STATE OF MINNESOTA DEPARTMENT OF TRANSPORTATION	REVISION: 11–06–2013	DETAIL NO.
STATE BRIDGE ENGINEER	PILE SPLICE (CAST–IN–PLACE CONCRETE PILES)		B201

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: KR | CHECKED BY: KJK
DRAWN BY: MSK | DATE: 09/18/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

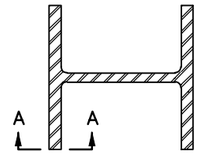
SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4B
5TH AVENUE AND 7TH STREET
BRIDGE 27C18
DETAILS 1

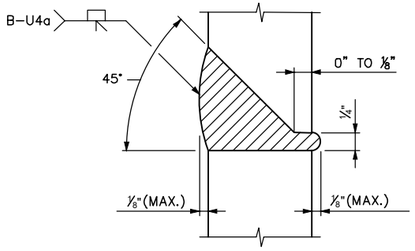
DISCIPLINE: STRUCTURES
SHEET NAME: CBR27C18-BRG-SDT-001

SHEET 63 OF 80

Sep. 17 2015 03:20 pm V:\3400_ADC\CAD\SEGMENT E4\PLAN SHEETS\STRUCTURES\27C18\CBR27C18-BRG-SDT-001.dwg By: mark.krzyzewski



SECTION AT SPLICE



SECTION A-A

100% BUTT WELDED PILE SPLICE

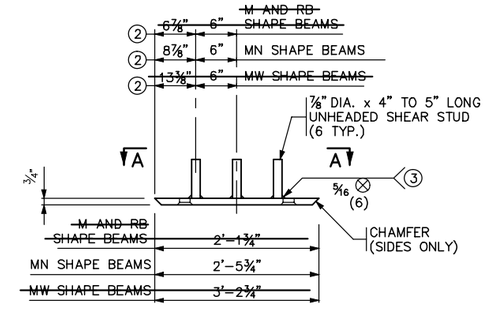
NOTES:

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

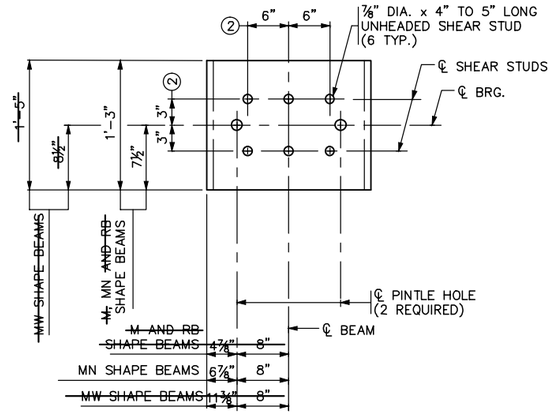
ELECTRODES WHICH HAVE BECOME WET, SOILED OR DAMAGED SHALL NOT BE USED.

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.

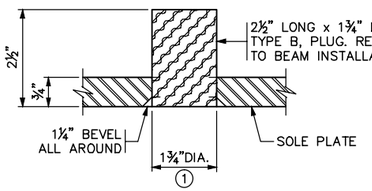
APPROVED: NOVEMBER 22, 2002	STATE OF MINNESOTA DEPARTMENT OF TRANSPORTATION	REVISION: 11-06-2013	DETAIL NO.
Daniel L Worzyan STATE BRIDGE ENGINEER	PILE SPLICE (STEEL H BEARING PILES 10" TO 14")		B202



FRONT ELEVATION



SECTION A-A



PINTLE HOLE DETAIL

NOTES:

MATERIAL TO BE STRUCTURAL STEEL PER MnDOT SPEC. 3306.

WELDED STUDS TO BE WELDABLE CARBON STEEL PER MnDOT SPEC. 3391.2D.

SOLE PLATE FOR BEARING ASSEMBLY TO BE GALVANIZED PER MnDOT SPEC. 3394 AFTER FABRICATION.

PINTLE HOLES SHALL BE FREE OF ZINC BUILD UP FROM GALVANIZING.

SOLE PLATES ARE INCIDENTAL TO PRESTRESSED CONCRETE BEAMS.

① FOR 1½" DIA. PINTLES.

② THESE DIMENSIONS MAY BE MODIFIED TO CLEAR PRESTRESSED STRANDS. HOWEVER, CHANGES MUST BE APPROVED BY THE ENGINEER.

③ THE REQUIREMENTS FOR WELDING STUDS SHALL COMPLY WITH AASHTO/AWS D1.1.

APPROVED: SEPTEMBER 22, 2011	STATE OF MINNESOTA DEPARTMENT OF TRANSPORTATION	REVISED	DETAIL NO.
Nancy Daubenberger STATE BRIDGE ENGINEER	SOLE PLATE (PRESTRESSED CONCRETE BEAMS) (FOR BEARINGS WITH PINTLES)		B303

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: KR | CHECKED BY: KJK
DRAWN BY: MSK | DATE: 09/18/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

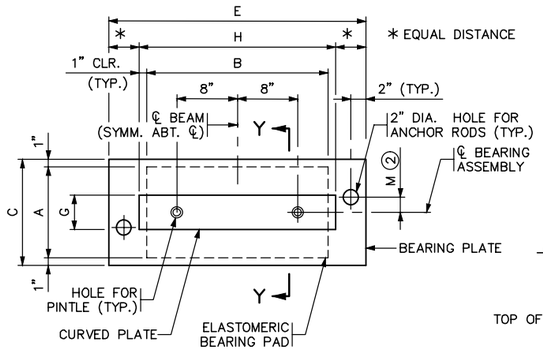
CIVIL EAST - VOLUME 4B
5TH AVENUE AND 7TH STREET
BRIDGE 27C18
DETAILS 2

DISCIPLINE: STRUCTURES

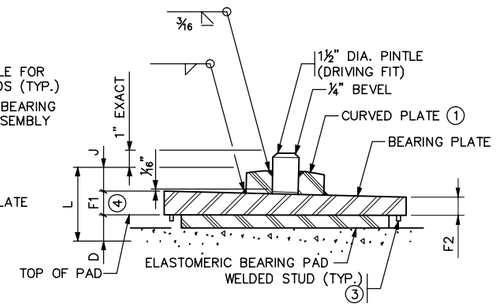
SHEET NAME: CBR27C18-BRG-SDT-002

SHEET 64 OF 80

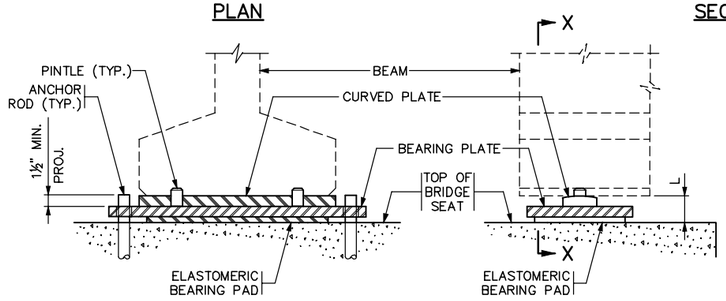
Sep. 17 2015 03:20 pm v:\3400_ADC\CAD\SEGMENT E4\PLAN SHEETS\STRUCTURES\27C18\CBR27C18-BRG-SDT-002.dwg By: mark.krzyzewski



PLAN



SECTION Y–Y

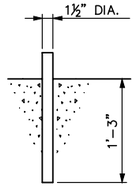


SECTION X–X

2'–2" BOTTOM FLANGE SHOWN

SIDE ELEVATION

ANCHOR RODS NOT SHOWN



ANCHOR ROD DETAIL

TABLE																		
ASSEMBLY TYPE	LOCATION	BEAM SIZE	BEARING PAD SIZE			SHAPE FACTOR	BEARING PLATE SIZE					CURVED PLATE SIZE			ANCHOR ROD OFFSET		ASSY. HEIGHT	CURVED PLATE
			A	B	D		C	E	F1	F ⑤	F2	G	H	J	+/–②	M	L ⑤	R ①
F1	S. ABUT., P8, P9	MN45	12"	24"	½"	8.0	14"	38"	1⅞"	1½"	1⅛"	4½"	26"	1¼"			3¼"	16"
~~——~~	~~——~~	~~MW~~	~~16"~~	~~36"~~	~~½"~~	~~11.1~~	~~18"~~		~~1⅞"~~	~~1½"~~	~~1⅛"~~	~~4½"~~	~~38"~~	~~1¼"~~			~~3¼"~~	~~——~~

NOTES:

ELASTOMERIC MATERIALS AND PAD CONSTRUCTION SHALL COMPLY WITH SPEC. 3741.

ALL STEEL PLATES SHALL COMPLY WITH SPEC. 3306.

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.

~~PAYMENT FOR BEARING ASSEMBLY SHALL INCLUDE ALL MATERIAL ON THIS DETAIL.~~

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 1/16" LESS THAN SHOWN.

② "+" DENOTES OFFSET AS SHOWN.
"–" DENOTES OFFSET OPPOSITE OF SHOWN.

③ 5/16" DIA. x 3/8" KNOCK–OFF WELD STUDS INSTALLED ON BEARING PLATE AROUND PERIMETER OF BEARING PAD. CENTERLINE STUD TO EDGE OF PAD DIMENSION = ½", MAX. STUD SPACING = 4", AND MAX. SPACING TO PAD CORNER = 2".

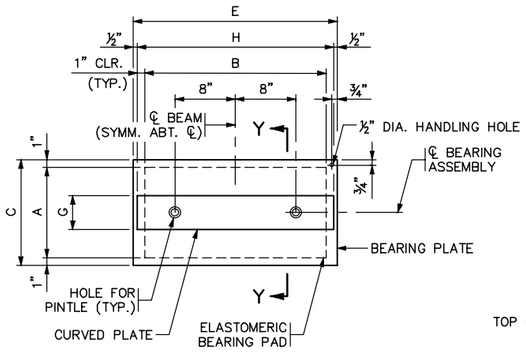
④ MARK THICKER SIDE OF SLOPED PLATES WITH AN "H" FOR PLACEMENT. SEE FRAMING PLAN SHEET NO. 30.

⑤ THICKNESS AT ℄ BEARING.

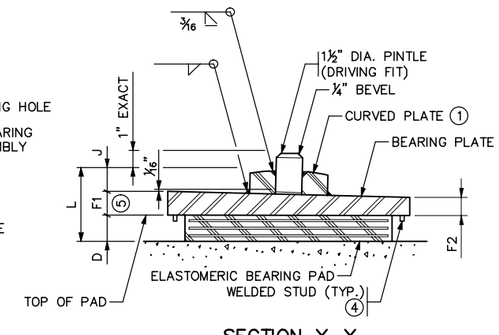
DESIGN DATA:

MAXIMUM HORIZONTAL LOAD IS 70 KIPS FOR 1" PINTLES.

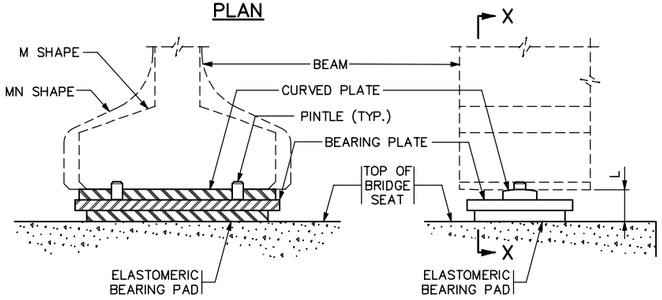
APPROVED: SEPTEMBER 22, 2011	STATE OF MINNESOTA DEPARTMENT OF TRANSPORTATION	REVISED	DETAIL NO.
Nancy Daubenberger STATE BRIDGE ENGINEER	CURVED PLATE BEARING ASSEMBLY (PRESTRESSED CONCRETE BEAMS) (FIXED)	11–06–2013	B310



PLAN

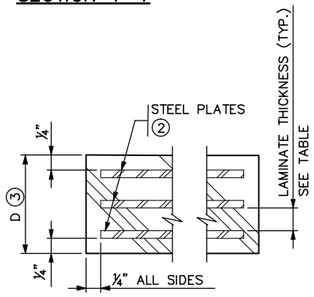


SECTION Y–Y



SECTION X–X

SIDE ELEVATION



SECTION THROUGH ELASTOMERIC BEARING PAD

TABLE																							
ASSEMBLY TYPE	LOCATION	BEAM SIZE	BEARING PAD SIZE			STEEL PLATES		LAMINATES		SHAPE FACTOR	BEARING PLATE SIZE					CURVED PLATE SIZE			ASSY. HEIGHT	CURVED PLATE
			A	B	D	NO.	THICK.	NO.	THICK.		C	E	F1	F ⑥	F2	G	H	J	L ⑥	R ①
E1	PIER 1	MN45	14"	24"	1¼"	2	⅛"	1	½"	8.8	16"	27"	1⅞"	1½"	1⅛"	4½"	26"	1¼"	4"	16"
E2	PIER 6	MN45	14"	24"	5"	8	⅛"	7	½"	8.8	16"	27"	1⅞"	1½"	1⅛"	4½"	26"	1¼"	7¾"	16"
E3	PIER 7	MN45	14"	24"	3⅛"	5	⅛"	4	½"	8.8	16"	27"	1⅞"	1½"	1⅛"	4½"	26"	1¼"	5⅞"	16"
E4	PIER 10	MN45	12"	24"	3¾"	6	⅛"	5	½"	8.0	14"	27"	1⅞"	1½"	1⅛"	4½"	26"	1¼"	6½"	16"
E5	PIER 11	MN45	12"	24"	5"	8	⅛"	7	½"	8.0	14"	27"	1⅞"	1½"	1⅛"	4½"	26"	1¼"	7¾"	16"

NOTES:

ELASTOMERIC MATERIALS AND PAD CONSTRUCTION SHALL COMPLY WITH MnDOT SPEC. 3741.

ALL STEEL PLATES SHALL COMPLY WITH MnDOT SPEC. 3306.

PINTLES SHALL COMPLY WITH MnDOT SPEC. 3309.

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

~~PAYMENT FOR BEARING ASSEMBLY SHALL INCLUDE ALL MATERIAL ON THIS DETAIL.~~

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 1/16" LESS THAN SHOWN.

② DO NOT GALVANIZE THESE PLATES.

③ THE TOTAL THICKNESS SHOWN INCLUDES THE STEEL PLATES.

④ 5/16" DIA. x 3/8" KNOCK–OFF WELD STUDS INSTALLED ON BEARING PLATE AROUND PERIMETER OF BEARING PAD. CENTERLINE STUD TO EDGE OF PAD DIMENSION = ½", MAX. STUD SPACING = 4", AND MAX. SPACING TO PADCORNER = 2".

⑤ MARK THICKER SIDE OF SLOPED PLATES WITH AN "H" FOR PLACEMENT. SEE FRAMING PLAN SHEET NO. 30.

⑥ THICKNESS AT ℄ BEARING.

DESIGN DATA:

MAXIMUM HORIZONTAL LOAD IS 70 KIPS FOR 1" PINTLES.

APPROVED: SEPTEMBER 22, 2011	STATE OF MINNESOTA DEPARTMENT OF TRANSPORTATION	REVISED	DETAIL NO.
Nancy Daubenberger STATE BRIDGE ENGINEER	CURVED PLATE BEARING ASSEMBLY (PRESTRESSED CONCRETE BEAMS) (EXPANSION)		B311

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: KR CHECKED BY: KJK
DRAWN BY: MSK DATE: 09/18/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

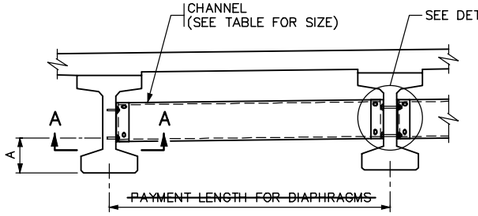
METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

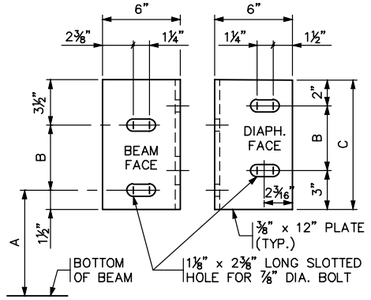
CIVIL EAST - VOLUME 4B
5TH AVENUE AND 7TH STREET
BRIDGE 27C18
DETAILS 3

DISCIPLINE: STRUCTURES
SHEET NAME: CBR27C18-BRG-SDT-003

SHEET 65 OF 80

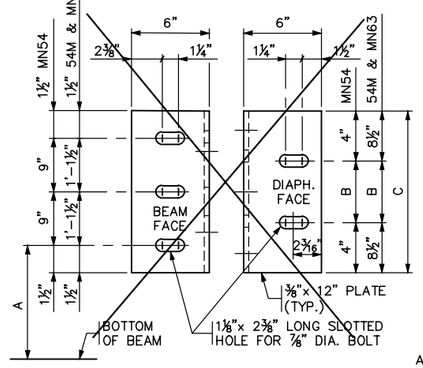


PART TRANSVERSE SECTION AT DIAPHRAGM



DIAPHRAGM CONNECTION

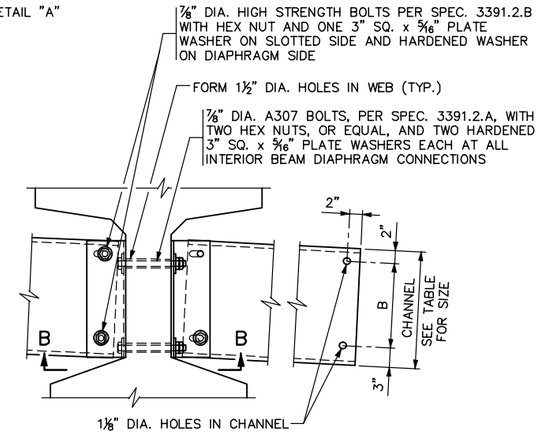
FOR 36M, 45M AND MN45 BEAMS



DIAPHRAGM CONNECTION

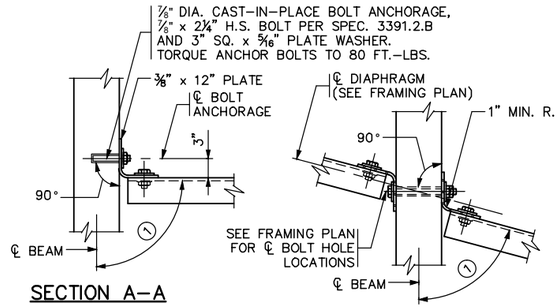
FOR 54M, MN54 AND MN63 BEAMS

TABLE				
BEAM HEIGHT	DISTANCE			CHANNEL SIZE
	A	B	C	
~~36M~~	~~1' 3"~~	~~7"~~	~~1' 0"~~	~~C12x20.7~~
~~45M~~	~~1'-3¾"~~	~~1' 1"~~	~~1' 6"~~	~~MC18x42.7~~
~~54M~~	~~1'-2¼"~~	~~1' 1"~~	~~2' 6"~~	~~MC18x42.7~~
MN45	1'-7¾"	7"	1'-0"	C12x20.7
~~MN54~~	~~1'-7¾"~~	~~1' 1"~~	~~1' 9"~~	~~MC18x42.7~~
~~MN63~~	~~1'-7¾"~~	~~1' 1"~~	~~2' 6"~~	~~MC18x42.7~~



DETAIL "A"

INTERIOR BEAM WITH CONTINUOUS LINE OF DIAPHRAGMS



SECTION A–A

TYPICAL SECTION AT ALL FASCIA BEAMS

SECTION B–B

TYPICAL SECTION AT INTERIOR BEAM WITH CONTINUOUS OR STAGGERED INTERMEDIATE DIAPHRAGMS

NOTES:

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 ⅜" x 6" x 6" ANGLE MAY BE USED FOR DIAPHRAGMS PERPENDICULAR TO BEAMS.

~~INCLUDE ALL STRUCTURAL STEEL SHOWN ON THIS DETAIL, INCLUDING BOLTS AND WASHERS, IN UNIT PRICE BID FOR DIAPHRAGMS FOR PRESTRESSED BEAMS.~~

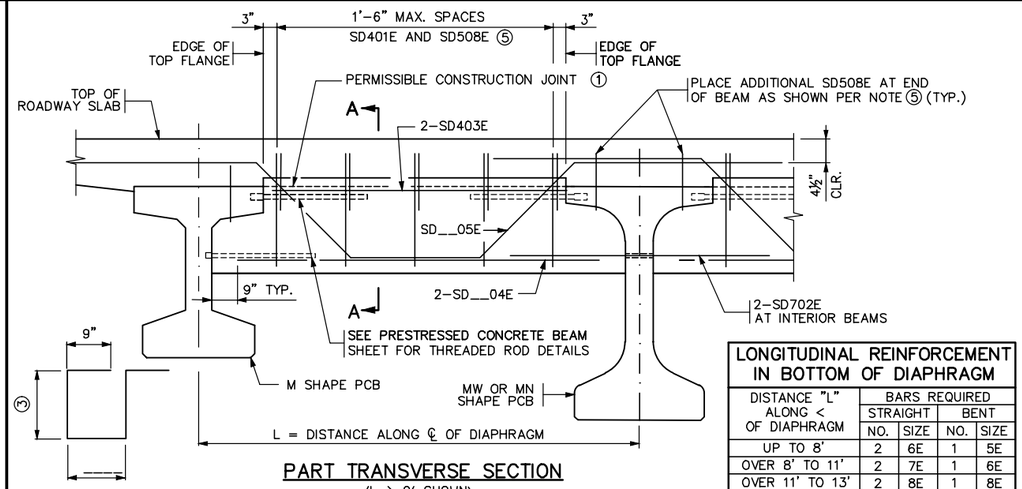
BENT PLATES MAY BE USED IN PLACE OF CHANNELS. THE BENT PLATES MUST BE THE SAME HEIGHT AS THE CHANNELS THEY REPLACE, BE 5⁄16" IN THICKNESS, AND HAVE LEGS 5" LONG.

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°.

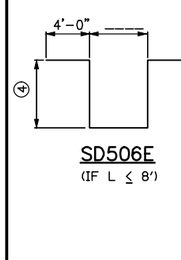
APPROVED: OCTOBER 26, 2005	STATE OF MINNESOTA DEPARTMENT OF TRANSPORTATION	REVISED	DETAIL NO.
Daniel L. Hogan STATE BRIDGE ENGINEER	STEEL INTERMEDIATE DIAPHRAGM (FOR 36M – 54M, MN45 – MN63 PRESTRESSED CONCRETE BEAMS)	06–14–2006 10–22–2009 09–11–2014	B403



PART TRANSVERSE SECTION

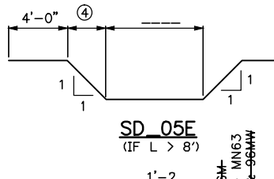
(L > 8' SHOWN)

LONGITUDINAL REINFORCEMENT IN BOTTOM OF DIAPHRAGM				
DISTANCE "L" ALONG < OF DIAPHRAGM	BARS REQUIRED			
	STRAIGHT		BENT	
	NO.	SIZE	NO.	SIZE
UP TO 8'	2	6E	1	5E
OVER 8' TO 11'	2	7E	1	6E
OVER 11' TO 13'	2	8E	1	8E
OVER 13' TO 15'	2	9E	1	10E
OVER 15' TO 18'	2	11E	1	11E



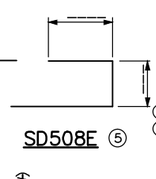
SD506E

(IF L ≤ 8')



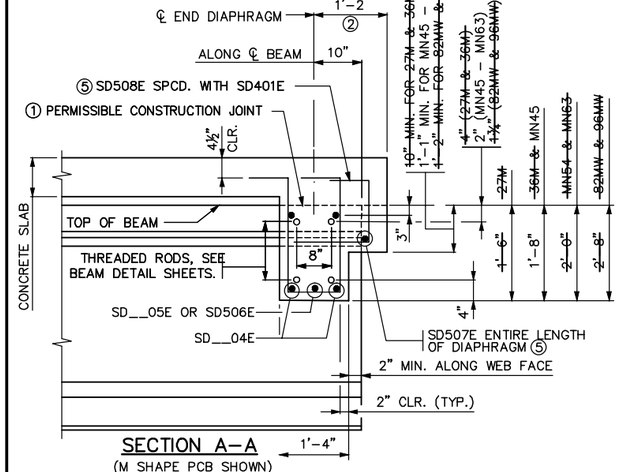
SD_05E

(IF L > 8')



SD508E ⑤

BILL OF REINFORCEMENT FOR END DIAPHRAGM				
BAR	NO.	LENGTH	SHAPE	LOCATION
SD401E				VERTICAL TIE
SD702E		5'-0"		LONG. THRU BEAM
SD403E				LONG. TOP
SD_04E				LONG. BOTTOM
SD_05E				LONGITUDINAL
SD506E				LONGITUDINAL
⑤ SD507E				LONGITUDINAL
⑤ SD508E				VERTICAL TIE



SECTION A–A

(M SHAPE PCB SHOWN)

NOTES:

CONCRETE FOR END DIAPHRAGMS SHALL BE THE SAME MIX AS USED IN DECK.

~~QUANTITIES FOR END DIAPHRAGM CONCRETE AND REINFORCEMENT SHOWN ON THIS DETAIL SHALL BE LISTED IN SUPERSTRUCTURE QUANTITIES.~~

THREADED RODS ARE INCIDENTAL TO PRESTRESSED CONCRETE BEAMS.

① USE OF CONSTRUCTION JOINT REQUIRES CLEARANCE FOR EXPANSION DEVICE. WHEN CONSTRUCTION JOINT IS USED AT THIS LOCATION, DIAPHRAGM FALSEWORK SHALL REMAIN INPLACE UNTIL COMPLETION OF SLAB CURING PERIOD.

② PERPENDICULAR TO CENTERLINE OF DIAPHRAGM.

③ 1'–11" (27M); 2'–1" (36M AND MN45); 2'–5" (MN54 AND MN63); 3'–1" (82MW AND 96MW). BASED ON 3" STOOL AND 9" DECK.

④ 1'–10" (27M); 2'–0" (36M AND MN45); 2'–4" (MN54 AND MN63); 3'–0" (82MW AND 96MW). BASED ON NOTE ③.

⑤ ADD SD507E AND SD508E ONLY IF NO. OF BARS AND LENGTHS ARE INCLUDED IN BILL OF REINFORCEMENT. SPACE SD508E AT 1'–6" MAX. FOR ENTIRE LENGTH OF DIAPHRAGM. REFER TO "PART TRANSVERSE SECTION" ABOVE.

APPROVED: SEPTEMBER 22, 2011	STATE OF MINNESOTA DEPARTMENT OF TRANSPORTATION	REVISED	DETAIL NO.
Nancy Daubenberger STATE BRIDGE ENGINEER	CONCRETE END DIAPHRAGM (27M & 36M, MN45 – MN63, 82MW & 96MW PRESTRESSED CONCRETE BEAMS) (PARAPET ABUTMENT)	04–17–2013 11–06–2013	B814

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: KR | CHECKED BY: KJK
DRAWN BY: MSK | DATE: 09/18/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

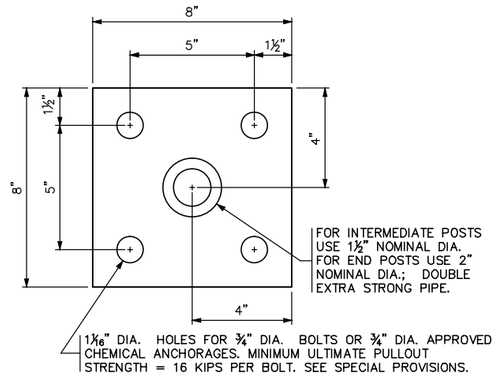
SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4B
5TH AVENUE AND 7TH STREET
BRIDGE 27C18
DETAILS 4

DISCIPLINE: STRUCTURES
SHEET NAME: CBR27C18-BRG-SDT-007

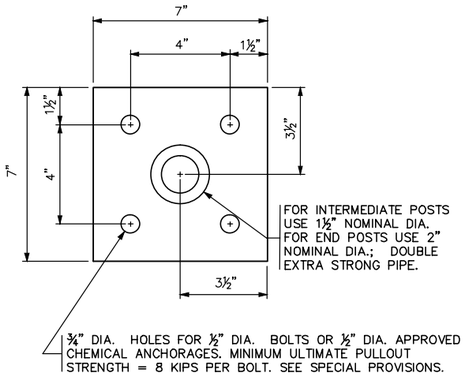
SHEET 66 OF 80

Sep. 17 2015 03:21 pm v:\3400_ADC\CAD\SEGMENT E4\PLAN SHEETS\STRUCTURES\27C18\CBR27C18-BRG-SDT-007.dwg By: mark.krzyzewski



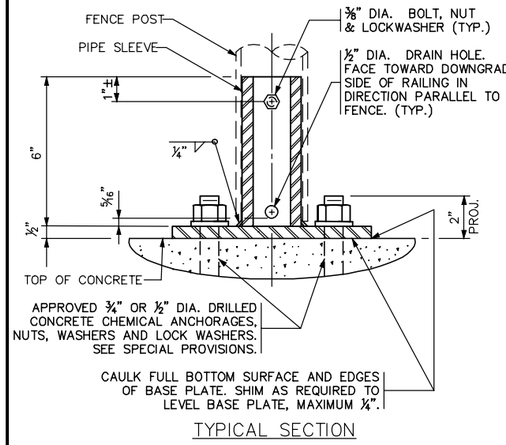
PLAN VIEW – TYPE A

ESTIMATED WEIGHT = 12 OR 14 LBS.

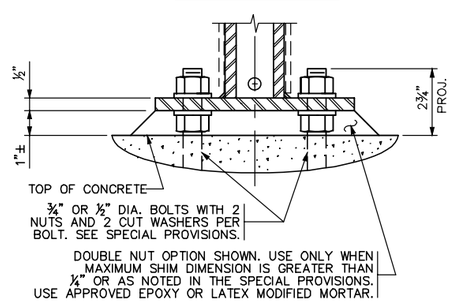


PLAN VIEW – TYPE B

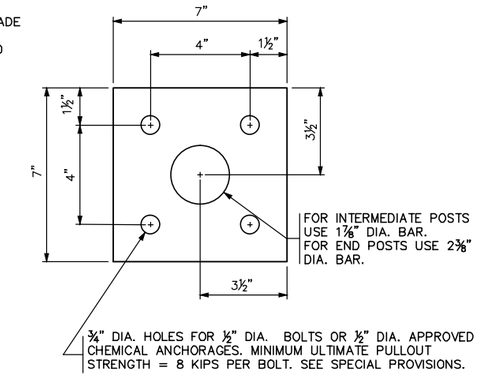
ESTIMATED WEIGHT = 10 OR 12 LBS.



TYPICAL SECTION



GROUT ALTERNATE



PLAN VIEW – TYPE C

ESTIMATED WEIGHT = 12 OR 15 LBS.

NOTES:

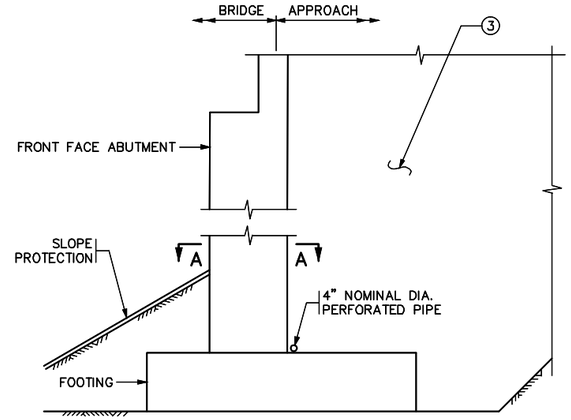
STRUCTURAL STEEL PER Mn/DOT SPEC. 3306

STRUCTURAL PIPE PER Mn/DOT SPEC. 3362

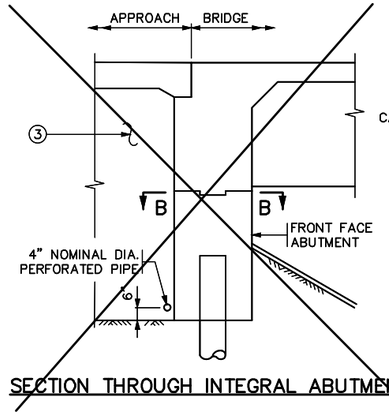
GALVANIZE THE FENCE POST ANCHORAGE AFTER FABRICATION PER Mn/DOT SPEC. 3394. GALVANIZE THE FASTENERS PER Mn/DOT SPEC. 3392.

DOUBLE EXTRA STRONG PIPE WEIGHTS:
1½" NOMINAL DIA. = 6.41 LBS./FT.
2" NOMINAL DIA. = 9.03 LBS./FT.

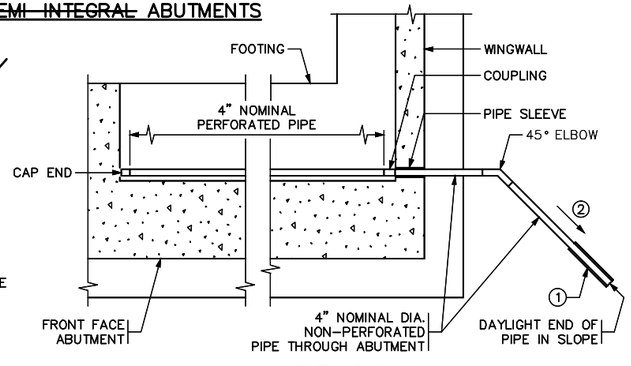
APPROVED: NOVEMBER 22, 2002	STATE OF MINNESOTA DEPARTMENT OF TRANSPORTATION	REVISION	DETAIL NO.
Daniel L. Worgan STATE BRIDGE ENGINEER	FENCE POST ANCHORAGE		B905



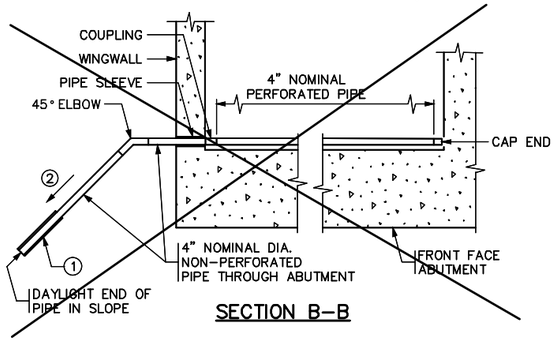
SECTION THROUGH PARAPET AND ~~SEMI INTEGRAL~~ ABUTMENTS



SECTION THROUGH INTEGRAL ABUTMENT



SECTION A–A



SECTION B–B

NOTES:

~~PAYMENT WILL BE INCLUDED IN THE SINGLE LUMP SUM PRICE FOR "DRAINAGE SYSTEM TYPE (B910)", INCLUDES BUT IS NOT LIMITED TO 4" DIAMETER PERFORATED AND NON PERFORATED PIPE, ELBOWS, END CAPS, COUPLINGS, SLEEVES AND PRECAST CONCRETE HEADWALLS.~~

ALL PIPE TO COMPLY WITH SPEC. 3245.

WRAP PERFORATED PIPE WITH GEOTEXTILE PER SPEC. 3733, TYPE 1. ATTACH TO PIPE PER SPEC. 2502.

(1) AT CONTRACTORS OPTION, MAY TIE APPROACH PANEL DRAINAGE SYSTEM AND ABUTMENT DRAINAGE SYSTEM INTO A SINGLE PRECAST CONCRETE HEADWALL OR INTO A CATCH BASIN AS LONG AS A MINIMUM OF 1% POSITIVE SLOPE CAN BE MANTAINED.

USE PRECAST CONCRETE HEADWALL WITH RODENT SCREEN. SEE STANDARD PLATE 3131 FOR DETAILS.

(2) ⅛" PER FT. MINIMUM SLOPE.

(3) REFER TO GRADING PLANS FOR ABUTMENT BACKFILL REQUIREMENTS.

APPROVED: JANUARY 13, 2015	STATE OF MINNESOTA DEPARTMENT OF TRANSPORTATION	REVISED	DETAIL NO.
Nancy Daubenberger STATE BRIDGE ENGINEER	DRAINAGE SYSTEM		B910

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: KR | CHECKED BY: KJK
DRAWN BY: MSK | DATE: 09/18/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

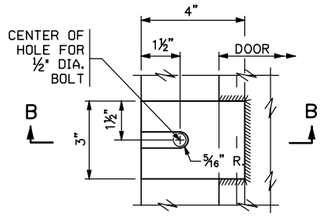
METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

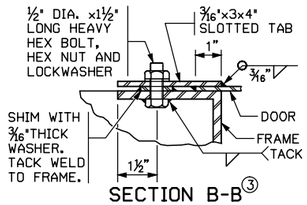
CIVIL EAST - VOLUME 4B
5TH AVENUE AND 7TH STREET
BRIDGE 27C18
DETAILS 5

DISCIPLINE: STRUCTURES
SHEET NAME: CBR27C18-BRG-SDT-008

SHEET 67 OF 80

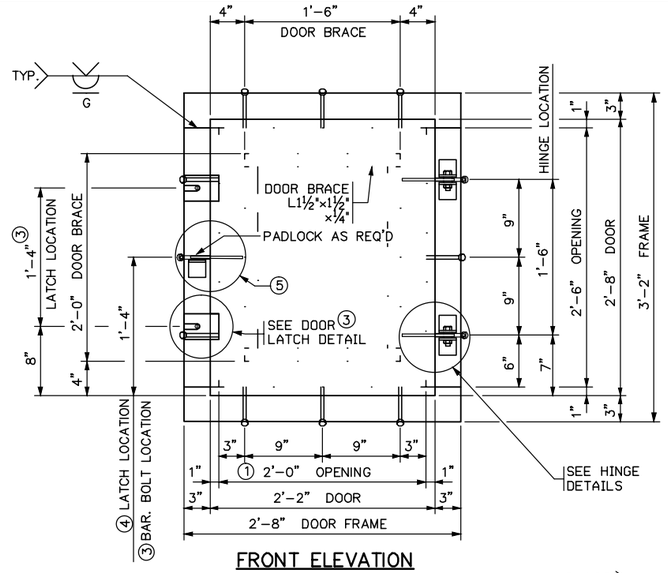


PLAN VIEW



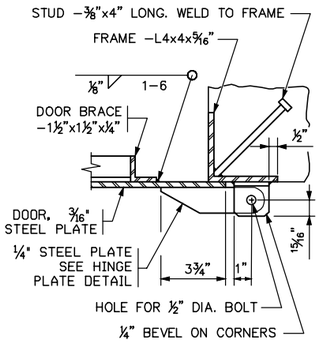
SECTION B-B ③

DOOR LATCH DETAIL

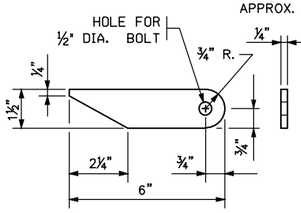


FRONT ELEVATION

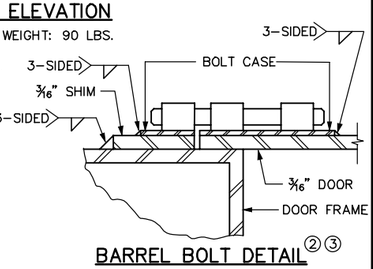
APPROX. WEIGHT: 90 LBS.



SECTION A-A



HINGE PLATE DETAIL



BARREL BOLT DETAIL ②③

NOTES:

WELDING PER Mn/DOT SPEC. 2471.

DOOR AND FRAME TO BE FLAT AFTER FABRICATION.

GALVANIZE STRUCTURAL SHAPES AFTER FABRICATION PER Mn/DOT SPEC. 3394.

GALVANIZE HARDWARE PER Mn/DOT SPEC. 3392.

ALL MATERIAL ON THIS DETAIL TO BE INCLUDED IN THE PRICE BID FOR OTHER ITEMS.

ALL STEEL TO BE 3306, UNLESS OTHERWISE NOTED.

DOOR TO BE LOCATED AWAY FROM TRAFFIC LANES.

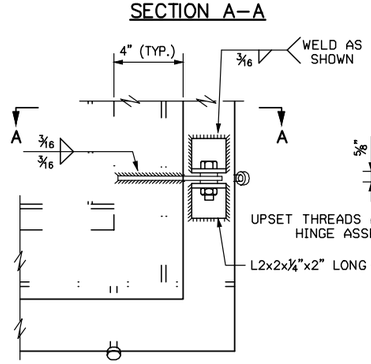
① DIMENSION TRANSVERSE TO ℄ BRIDGE WHEN IN HORIZONTAL POSITION TO MINIMIZE EFFECT ON THE BOTTOM SLAB REINFORCEMENT.

② 4" BARREL BOLT (STANLEY NO. 1084 OR EQUAL)

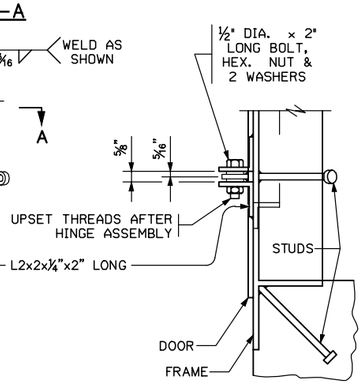
③ HORIZONTAL POSITION ONLY

④ VERTICAL POSITION ONLY

⑤ BARREL BOLT - HORIZONTAL POSITION
LATCH PLATE & ANGLE - VERTICAL POSITION



FRONT VIEW



HINGE DETAILS

SIDE VIEW

APPROVED: NOVEMBER 22, 2002	STATE OF MINNESOTA DEPARTMENT OF TRANSPORTATION	REVISION	DETAIL NO.
Daniel L Hogan STATE BRIDGE ENGINEER	INSPECTION DOOR (IN VERTICAL OR HORIZONTAL POSITION)		B942

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: KR | CHECKED BY: KJK
DRAWN BY: MSK | DATE: 09/18/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4B
5TH AVENUE AND 7TH STREET
BRIDGE 27C18
DETAILS 6

DISCIPLINE: STRUCTURES

SHEET NAME: CBR27C18-BRG-SDT-009

SHEET 68 OF 80

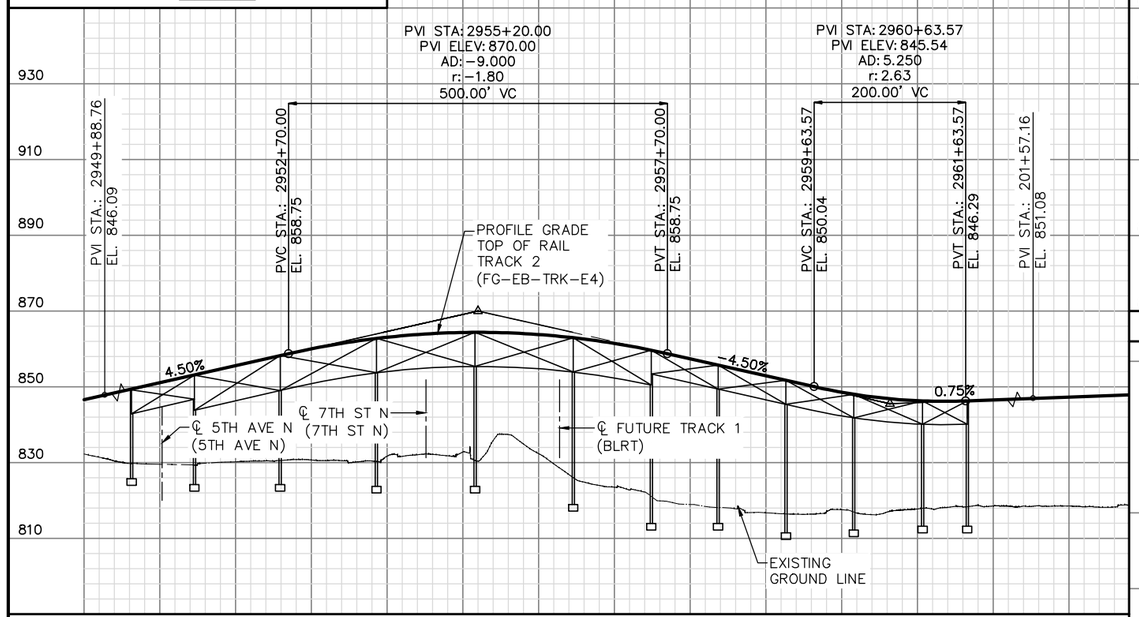
Sep. 17 2015 03:22 pm V:\3400_ADC\CAD\SEGMENT E4\PLAN SHEETS\STRUCTURES\27C18\CBR27C18-BRG-SDT-009.dwg By: mark.krzyzewski

CONTRACTED PROFILE

SCALE HOR: 0 100'

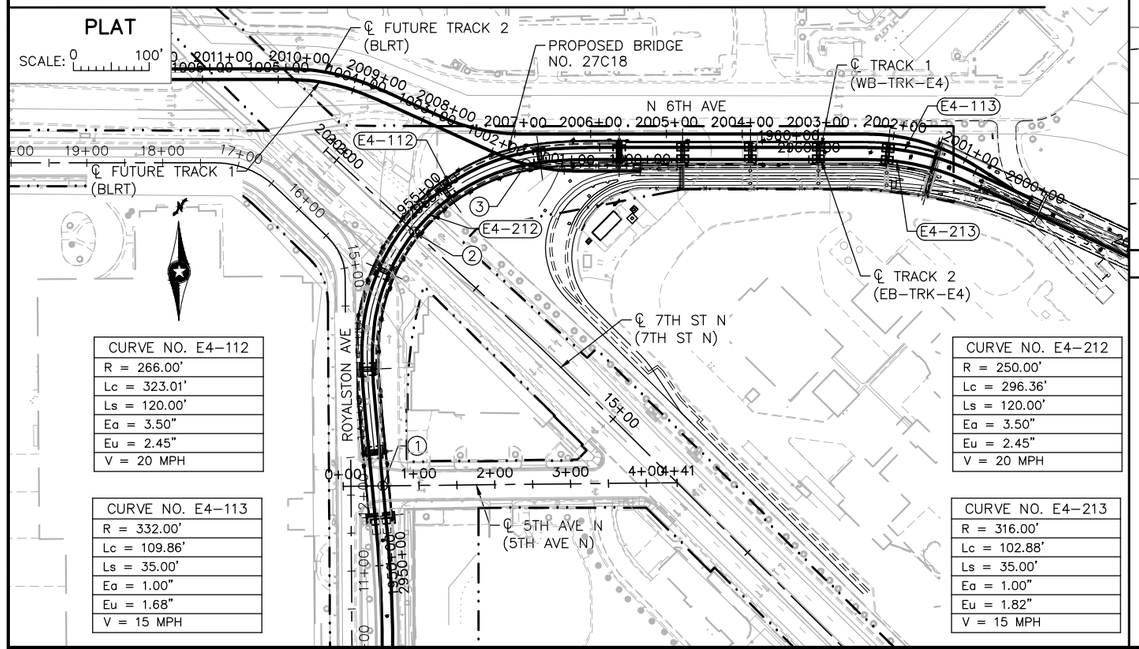
SCALE VER: 0 20'

PROFILE GRADE T/RAIL TRACK 2 (FG-EB-TRK-E4)



PLAT

SCALE: 0 100'



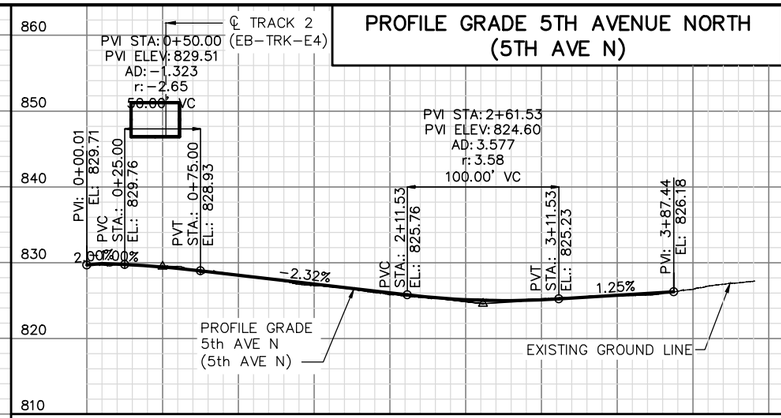
CURVE NO. E4-112
R = 266.00'
Lc = 323.01'
Ls = 120.00'
Eq = 3.50"
Eu = 2.45"
V = 20 MPH

CURVE NO. E4-113
R = 332.00'
Lc = 109.86'
Ls = 35.00'
Eq = 1.00"
Eu = 1.68"
V = 15 MPH

CURVE NO. E4-212
R = 250.00'
Lc = 296.36'
Ls = 120.00'
Eq = 3.50"
Eu = 2.45"
V = 20 MPH

CURVE NO. E4-213
R = 316.00'
Lc = 102.88'
Ls = 35.00'
Eq = 1.00"
Eu = 1.82"
V = 15 MPH

PROFILE GRADE 5TH AVENUE NORTH (5TH AVE N)

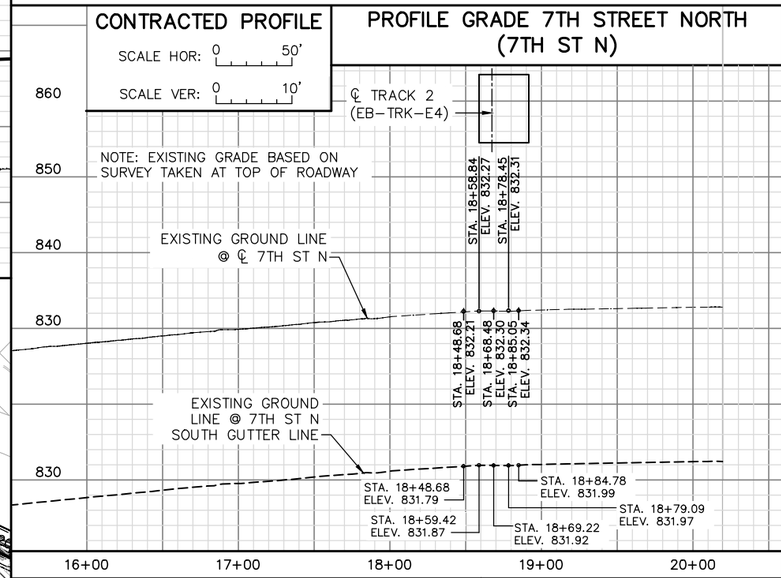


CONTRACTED PROFILE

SCALE HOR: 0 50'

SCALE VER: 0 10'

PROFILE GRADE 7TH STREET NORTH (7TH ST N)

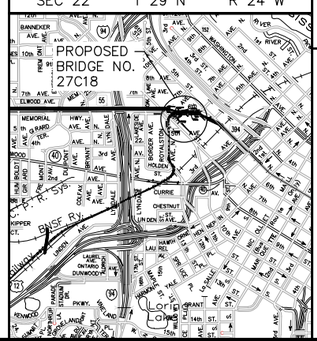


NOTES:

1. CONTROL POINT 1
   ℄ TRACK 2 (EB-TRK-E4) STA. 2951+05.41
   ℄ 5TH AVE (5TH AVE N) STA. 0+52.25
   X = 525958.153
   Y = 169922.367
   ANGLE = 94°48'42.6" (T.T.C)
2. CONTROL POINT 2
   ℄ TRACK 2 (EB-TRK-E4) STA. 2954+53.85
   ℄ 7TH ST N (7TH ST N) STA. 18+60.43
   X = 526001.151
   Y = 170257.402
   ANGLE = 93°50'28.0" (T.T.C.)
3. CONTROL POINT 3
   ℄ TRACK 2 (EB-TRK-E4) STA. 2956+29.51
   ℄ FUTURE TRACK 1 STA. 1001+51.41
   X = 526148.834
   Y = 170345.712
   ANGLE = 26°26'28.0" (T.T.C.)

INDEX MAP

SEC 22 T 29 N R 24 W



LOCATION ENGINEER'S OBSERVATIONS AT BRIDGE SITE

1. SPECIAL FEATURES: WATERFALLS, DAMS, FLOODS, ICE, DEBRIS SLIDING BANKS, RECREATIONAL BOATING.
2. OTHER BRIDGES OR CULVERTS OVER THE SAME STREAM (PARTICULARY STRUCTURES WHICH CARRY HIGH WATER WITHOUT OVERFLOW OF ROADWAY): GIVEN LOCATION, TYPE, LENGTH, HEIGHT ABOVE HIGH WATER, CROSS-SECTIONAL AREA ETC.
3. APPARENT HIGHWATER ELEVATION OBTAINED FROM:
4. OTHER DATA: APPROX. VELOCITY OF WATER AT TIME OF SURVEY.

HYDRAULIC ENGINEER'S RECOMMENDATION

DATE:

STREAM OR DITCH DESIGNATION

DRAINAGE AREA

MAX FLOOD ON RECORD

DESIGN FLOOD (YR. FREQ.): C.F.S.
HEADWATER ELEVATION: FT.
DESIGN MEAN VELOCITY THROUGH STRUCTURE F.P.S.
TOTAL STAGE INCREASE FT.
LOW MEMBER AT OR ABOVE ELEVATION FT.

WATERWAY AREA REQUIRED BELOW ELEV. = SQ. FT.
AT RIGHT ANGLES TO CHANNEL

BASIC FLOOD (100 YR. FREQ.) C.F.S.
HEADWATER ELEVATION: FT.
TOTAL STAGE INCREASE FT.
MEAN VELOCITY THROUGH STRUCTURE

FLOWLINE ELEVATION: FT. SKEW ANGLE:

ESTIMATED PRLIMINARY TOTAL SCOUR AT PIER EL.
(500 OR OT YR. FREQ.)

SCOUR CONFIRMATION RECOMMENDATION

DATE:

TOTAL SCOUR AT PIER EL. (500 OR OT YR. FREQ.)
SCOUR CODE: OBTAIN FROM HYDRAULIC ENGINEER

BRIDGE SURVEY SHEETS MADE FROM 2014 MFRA SURVEYS

1ST BENCH MARK (NAVD 88)
BENCHMARK ID PT. 82
ELEVATION = 832.55
N = 170339.14, E = 525851.45
DESCRIPTION = MAG NAIL IN WALK

2ND BENCH MARK (NAVD 88)
BENCHMARK ID PT. 83
ELEVATION = 828.36
N = 170329.54, E = 525453.40
DESCRIPTION = SPIKE IN BACK OF CURB

BRIDGE SURVEY 1

PROPOSED BRIDGE
LOCATED 0.3 MILES EAST OF JCT. T.H. 55
(OLSON MEMORIAL HIGHWAY) AND INTERSTATE 94.

SOUTHWEST LRT CONNECTION TO INTERCHANGE
BRIDGE NO. R0646

SEC 22 T 29N R 24W

CITY OF MINNEAPOLIS HENNEPIN COUNTY

BRIDGE NO. 27C18

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: KR CHECKED BY: KJK
DRAWN BY: MSK DATE: 09/18/15

AECOM Kimley»Horn

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

PRELIMINARY PLAN

CIVIL EAST - VOLUME 4B
5TH AVENUE AND 7TH STREET
BRIDGE 27C18
BRIDGE SURVEY 1

DISCIPLINE: STRUCTURES

SHEET NAME: CBR27C18-BRG-SUR-001

SHEET 69 OF 80

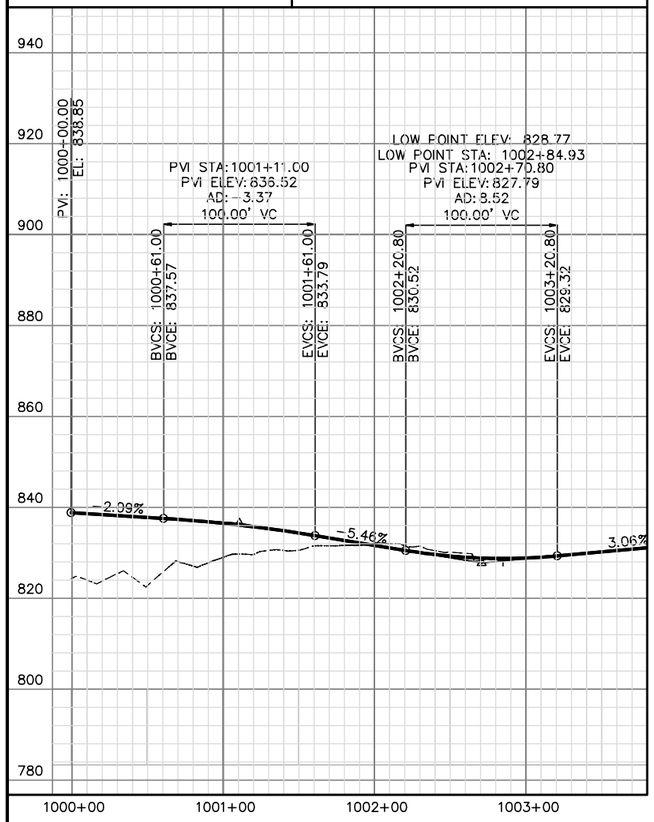
Sep. 17 2015 03:27 pm V:\3400_ADC\CAD\SEGMENT E4\PLAN SHEETS\STRUCTURES\27C18\CBR27C18-BRG-SUR-001.dwg By: mark.krzyzewski

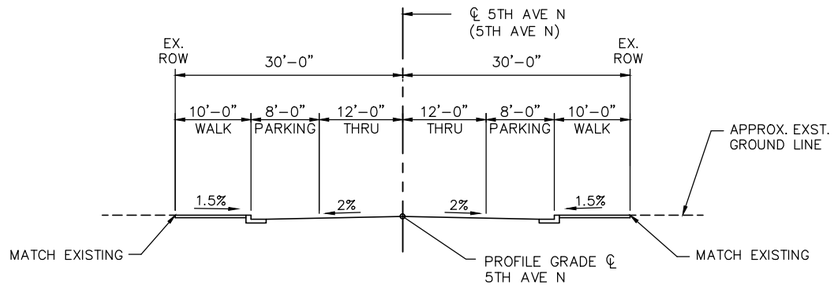
CONTRACTED PROFILE

SCALE HOR: 0 50'

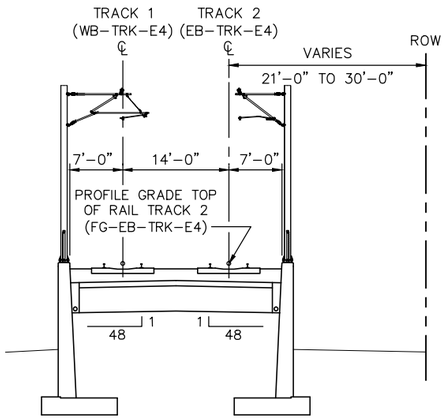
SCALE VER: 0 15'

PROFILE GRADE
FUTURE TRACK 1 (BLRT)

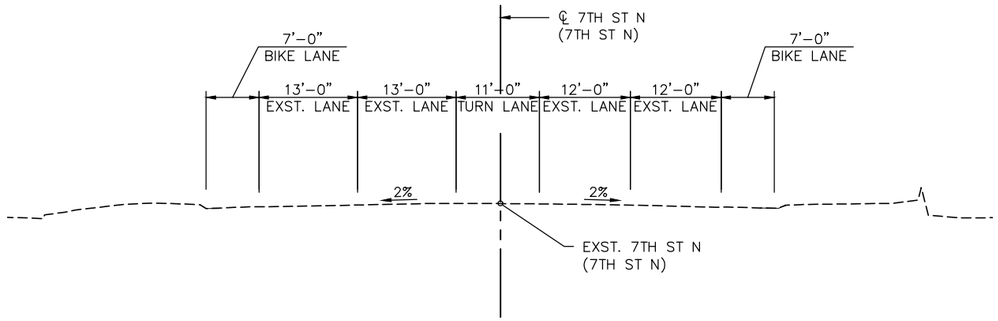




TYPICAL ROADWAY SECTION 5TH AVE N



TYPICAL APPROACH SECTION



TYPICAL EXISTING ROADWAY SECTION 7TH ST N

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: KR | CHECKED BY: KJK

DRAWN BY: MSK | DATE: 09/18/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

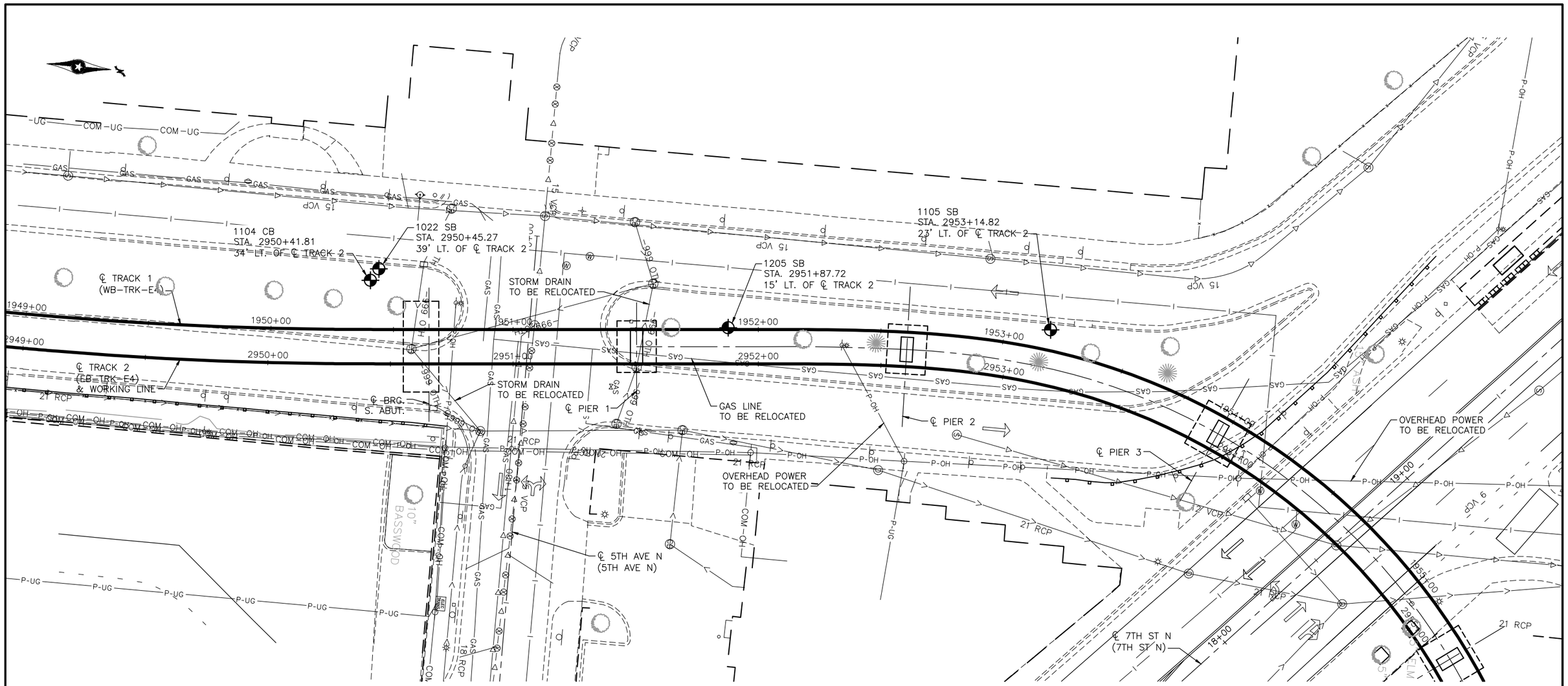
CIVIL EAST - VOLUME 4B
5TH AVENUE AND 7TH STREET
BRIDGE 27C18
BRIDGE SURVEY 2

DISCIPLINE: STRUCTURES

SHEET NAME: CBR27C18-BRG-SUR-002

SHEET 70 OF 80

Sep. 17 2015 03:33 pm v:\3400_ADC\CAD\SEGMENT E4\PLAN SHEETS\STRUCTURES\27C18\CBR27C18-BRG-SUR-002.dwg By: mark.krzyzewski



NOTES:

1. 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."

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: KR | CHECKED BY: KJK
DRAWN BY: MSK | DATE: 09/18/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

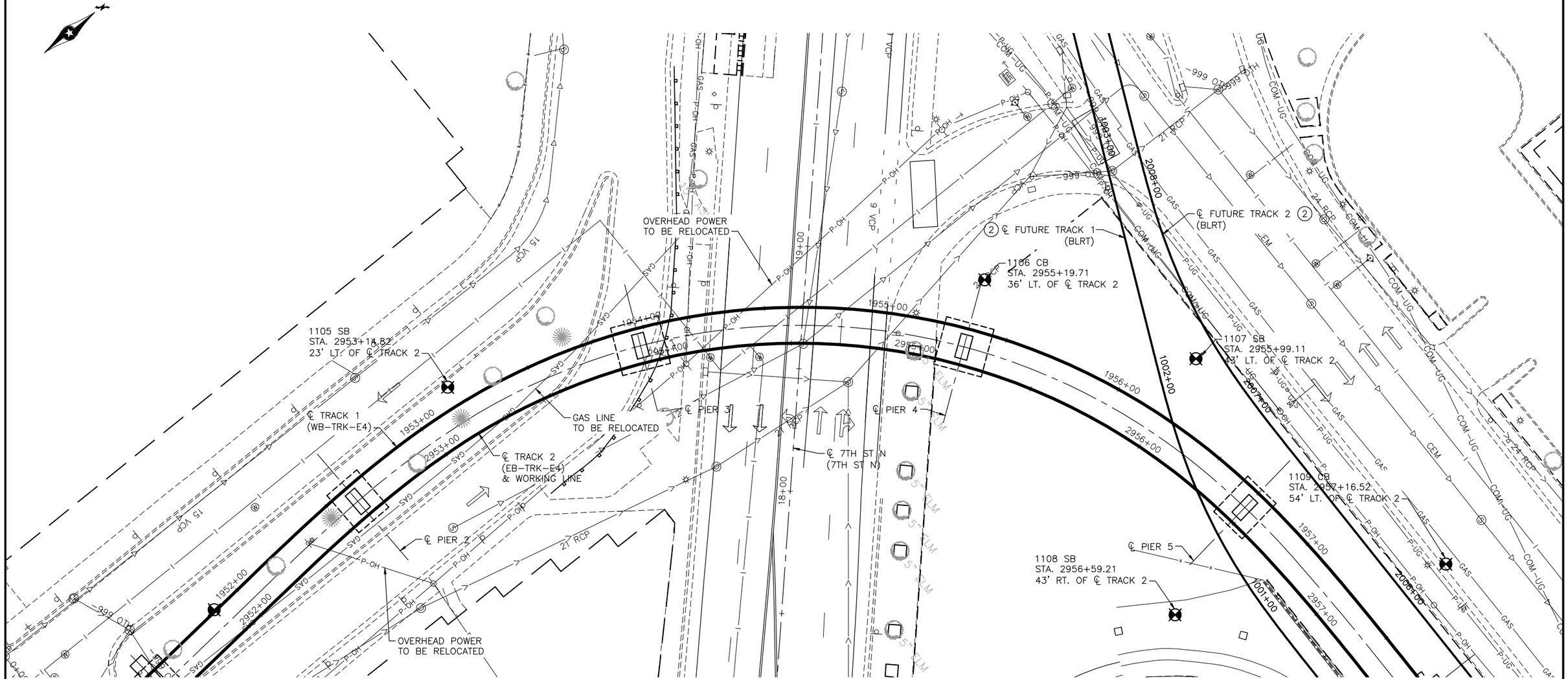
CIVIL EAST - VOLUME 4B
5TH AVENUE AND 7TH STREET BRIDGE 27C18
BRIDGE SURVEY PLAN 1

DISCIPLINE: STRUCTURES

SHEET NAME: CBR27C18-BRG-BOR-001

SHEET 71 OF 80

Sep. 17 2015 03:35 pm v:\3400_ADC\CAD\SEGMENT E4\PLAN SHEETS\STRUCTURES\27C18\CBR27C18-BRG-BOR-001.dwg By: mark.krzyzewski



NOTES:

1. 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."

(2) BLRT ALIGNMENT SHOWN IS BASED ON PRELIMINARY INFORMATION AND WILL BE UPDATED AS ADDITIONAL INFORMATION IS AVAILABLE.

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: KR | CHECKED BY: KJK
DRAWN BY: MSK | DATE: 09/18/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

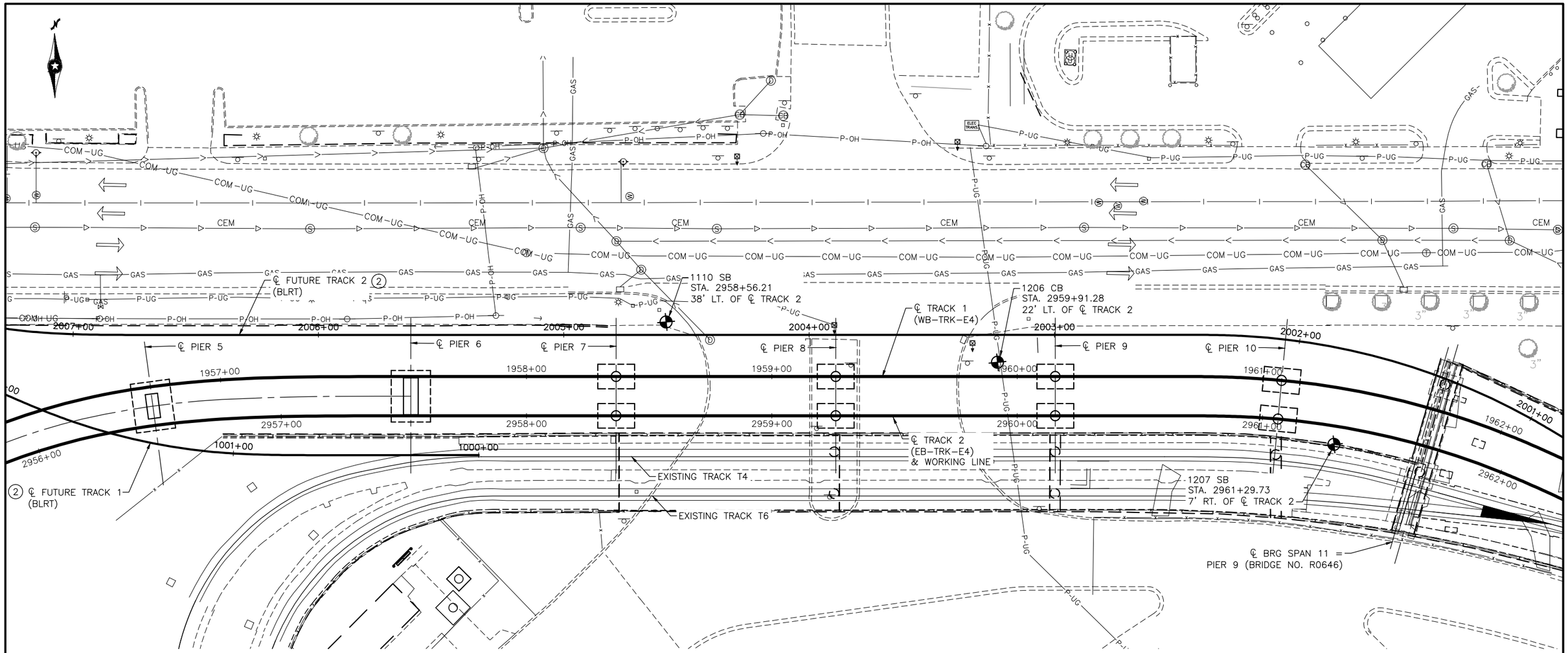
METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4B
5TH AVENUE AND 7TH STREET
BRIDGE 27C18
BRIDGE SURVEY PLAN 2

DISCIPLINE: STRUCTURES
SHEET NAME: CBR27C18-BRG-BOR-002

SHEET 72 OF 80



NOTES:

1. 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."

(2) BLRT ALIGNMENT SHOWN IS BASED ON PRELIMINARY INFORMATION AND WILL BE UPDATED AS ADDITIONAL INFORMATION IS AVAILABLE.

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: KR | CHECKED BY: KJK
DRAWN BY: MSK | DATE: 09/18/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

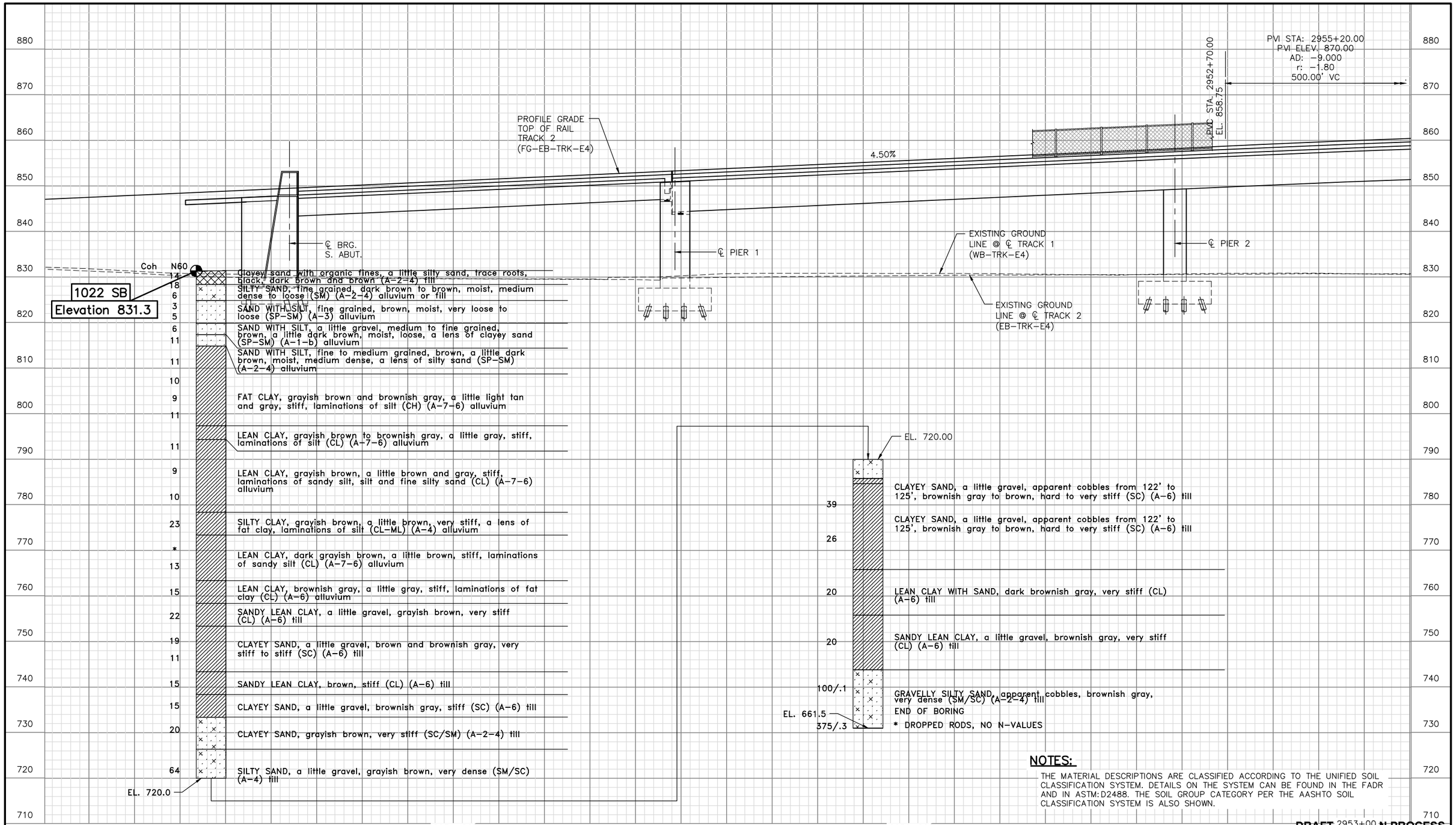
SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4B
5TH AVENUE AND 7TH STREET
BRIDGE 27C18
BRIDGE SURVEY PLAN 3

DISCIPLINE: STRUCTURES
SHEET NAME: CBR27C18-BRG-BOR-003

SHEET 73 OF 80

Sep. 17 2015 03:39 pm V:\3400_ADC\CAD\SEGMENT E4\PLAN SHEETS\STRUCTURES\27C18\CBR27C18-BRG-BOR-003.dwg By: mark.krzyzewski



NOTES:

THE MATERIAL DESCRIPTIONS ARE CLASSIFIED ACCORDING TO THE UNIFIED SOIL CLASSIFICATION SYSTEM. DETAILS ON THE SYSTEM CAN BE FOUND IN THE FADR AND IN ASTM:D2488. THE SOIL GROUP CATEGORY PER THE AASHTO SOIL CLASSIFICATION SYSTEM IS ALSO SHOWN.

DRAFT N PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: KR | CHECKED BY: KJK
DRAWN BY: MSK | DATE: 09/18/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

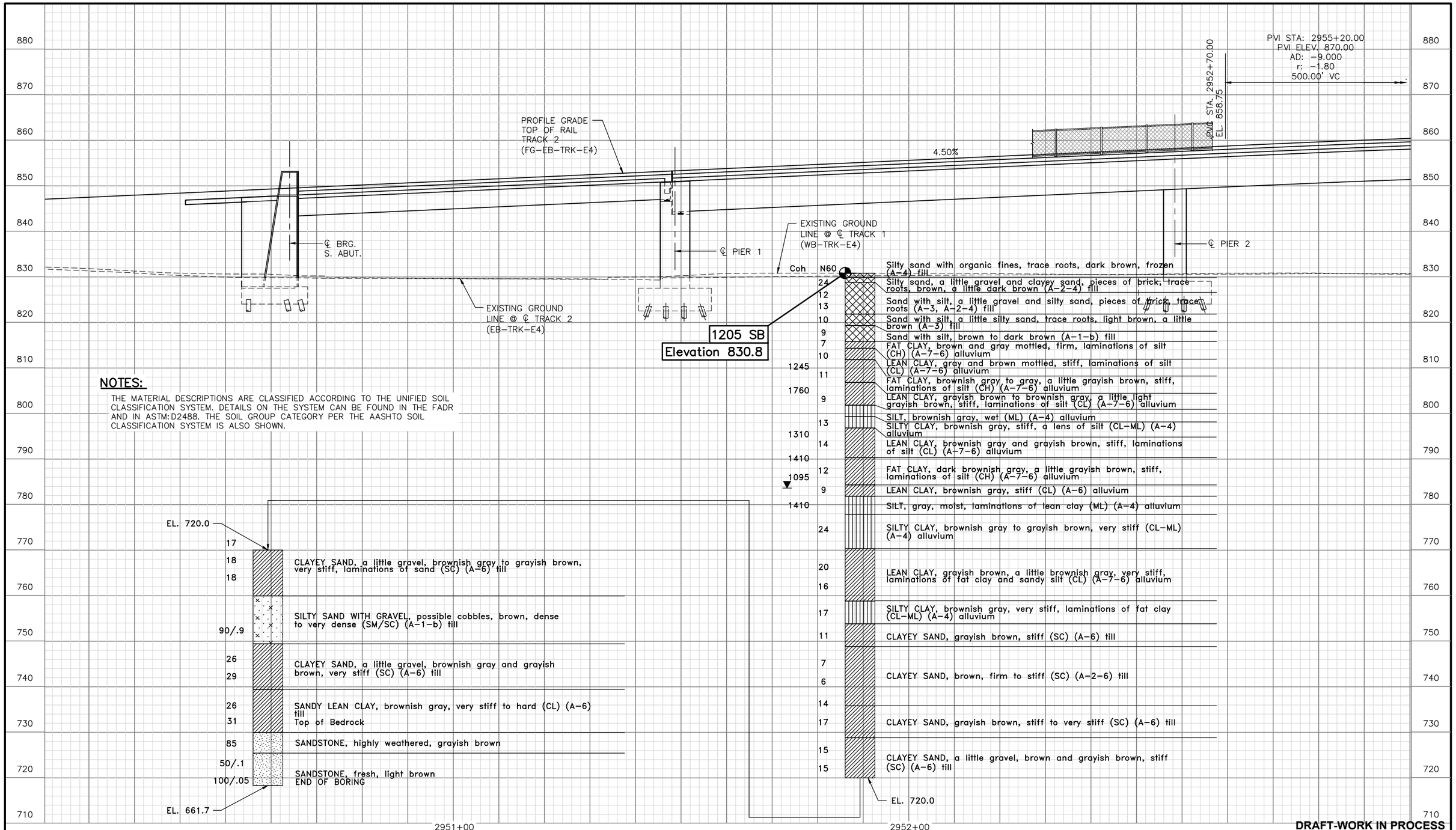
CIVIL EAST - VOLUME 4B
5TH AVENUE AND 7TH STREET
BRIDGE 27C18
BRIDGE SURVEY PROFILE 1

DISCIPLINE: STRUCTURES

SHEET NAME: CBR27C18-BRG-BOR-004

SHEET 74 OF 80

Sep. 17 2015 03:40 pm v:\3400_ADC\CAD\SEGMENT E4\PLAN SHEETS\STRUCTURES\27C18\CBR27C18-BRG-BOR-004.dwg By: mark.krzyzewski



NOTES:

THE MATERIAL DESCRIPTIONS ARE CLASSIFIED ACCORDING TO THE UNIFIED SOIL CLASSIFICATION SYSTEM. DETAILS ON THE SYSTEM CAN BE FOUND IN THE FADR AND IN ASTM:D2488. THE SOIL GROUP CATEGORY PER THE AASHTO SOIL CLASSIFICATION SYSTEM IS ALSO SHOWN.

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: KR | CHECKED BY: KJK
DRAWN BY: MSK | DATE: 09/18/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

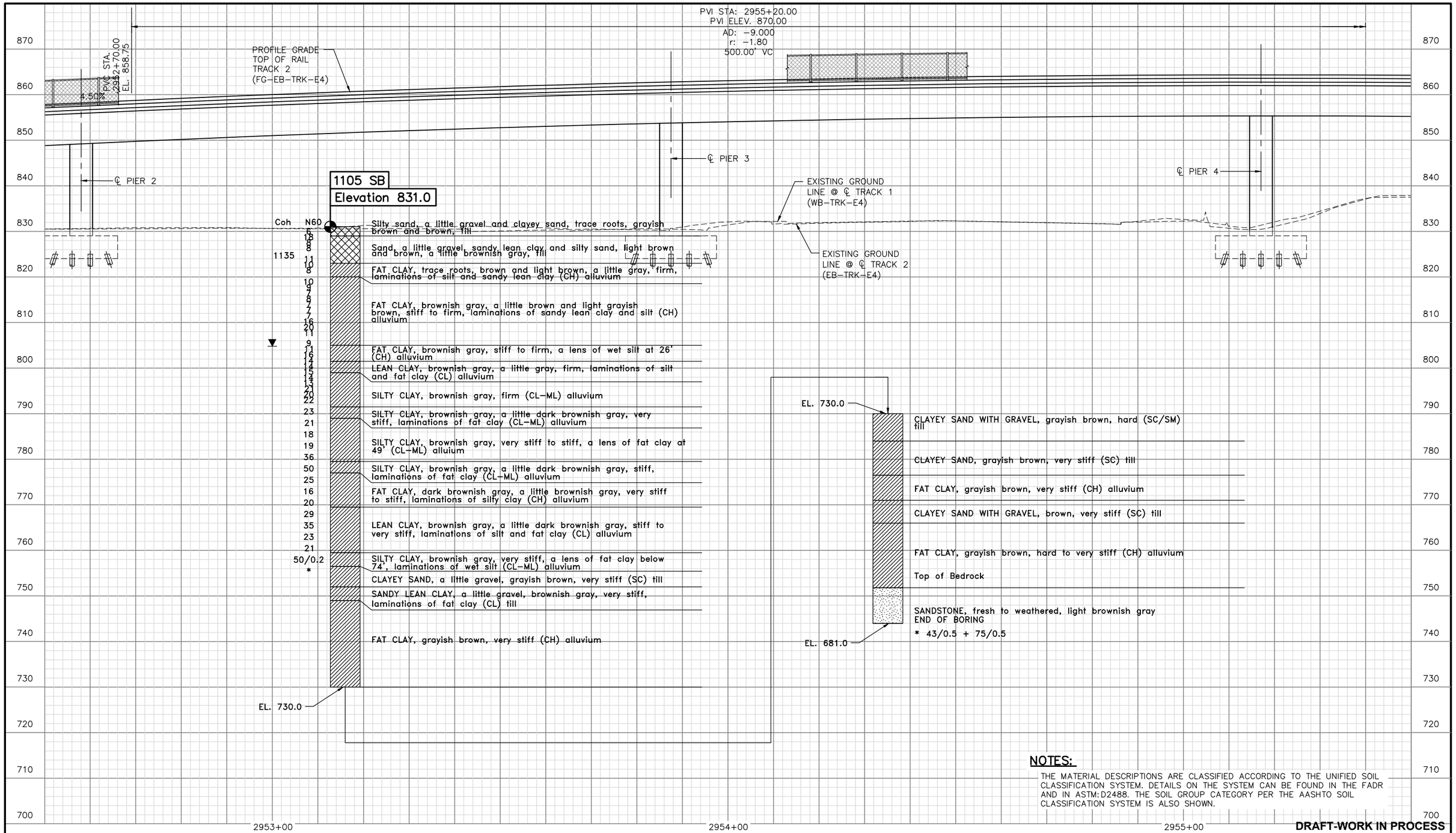
CIVIL EAST - VOLUME 4B
5TH AVENUE AND 7TH STREET
BRIDGE 27C18
BRIDGE SURVEY PROFILE 2

DISCIPLINE: STRUCTURES

SHEET NAME: CBR27C18-BRG-BOR-005

SHEET 75 OF 80

Sep. 17 2015 03:40 pm v:\3400_ADC\CAD\SEGMENT E4\PLAN SHEETS\STRUCTURES\27C18\CBR27C18-BRG-BOR-004.dwg By: mark.krzyzewski



NOTES:

THE MATERIAL DESCRIPTIONS ARE CLASSIFIED ACCORDING TO THE UNIFIED SOIL CLASSIFICATION SYSTEM. DETAILS ON THE SYSTEM CAN BE FOUND IN THE FADR AND IN ASTM:D2488. THE SOIL GROUP CATEGORY PER THE AASHTO SOIL CLASSIFICATION SYSTEM IS ALSO SHOWN.

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: KR | CHECKED BY: KJK
DRAWN BY: MSK | DATE: 09/18/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

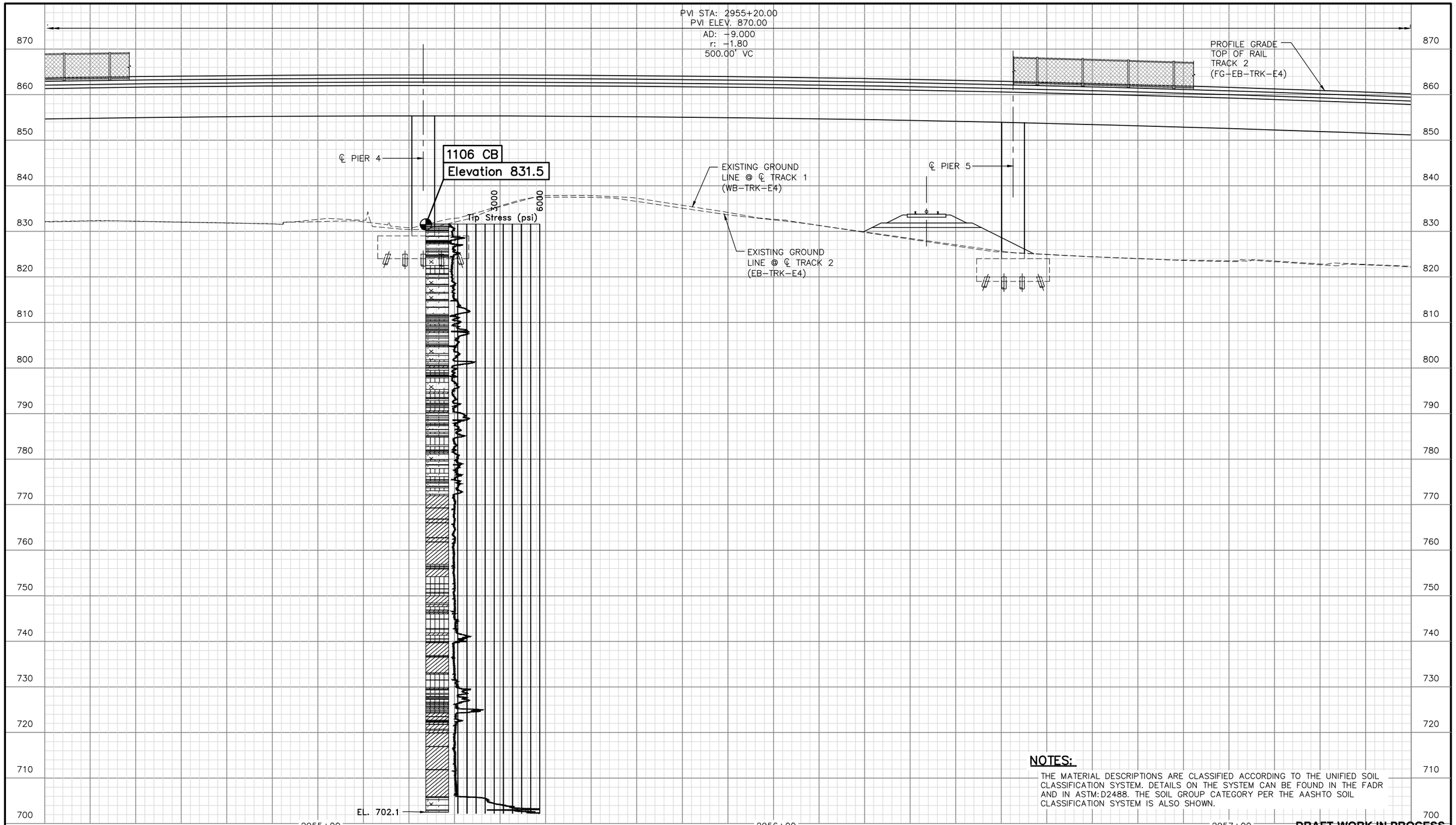
CIVIL EAST - VOLUME 4B
5TH AVENUE AND 7TH STREET
BRIDGE 27C18
BRIDGE SURVEY PROFILE 3

DISCIPLINE: STRUCTURES

SHEET NAME: CBR27C18-BRG-BOR-006

SHEET 76 OF 80

Sep. 17 2015 03:41 pm V:\3400_ADC\CAD\SEGMENT E4\PLAN SHEETS\STRUCTURES\27C18\CBR27C18-BRG-BOR-006.dwg By: mark.krzyzewski



NOTES:

THE MATERIAL DESCRIPTIONS ARE CLASSIFIED ACCORDING TO THE UNIFIED SOIL CLASSIFICATION SYSTEM. DETAILS ON THE SYSTEM CAN BE FOUND IN THE FADR AND IN ASTM:D2488. THE SOIL GROUP CATEGORY PER THE AASHTO SOIL CLASSIFICATION SYSTEM IS ALSO SHOWN.

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: KR | CHECKED BY: KJK
DRAWN BY: MSK | DATE: 09/18/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

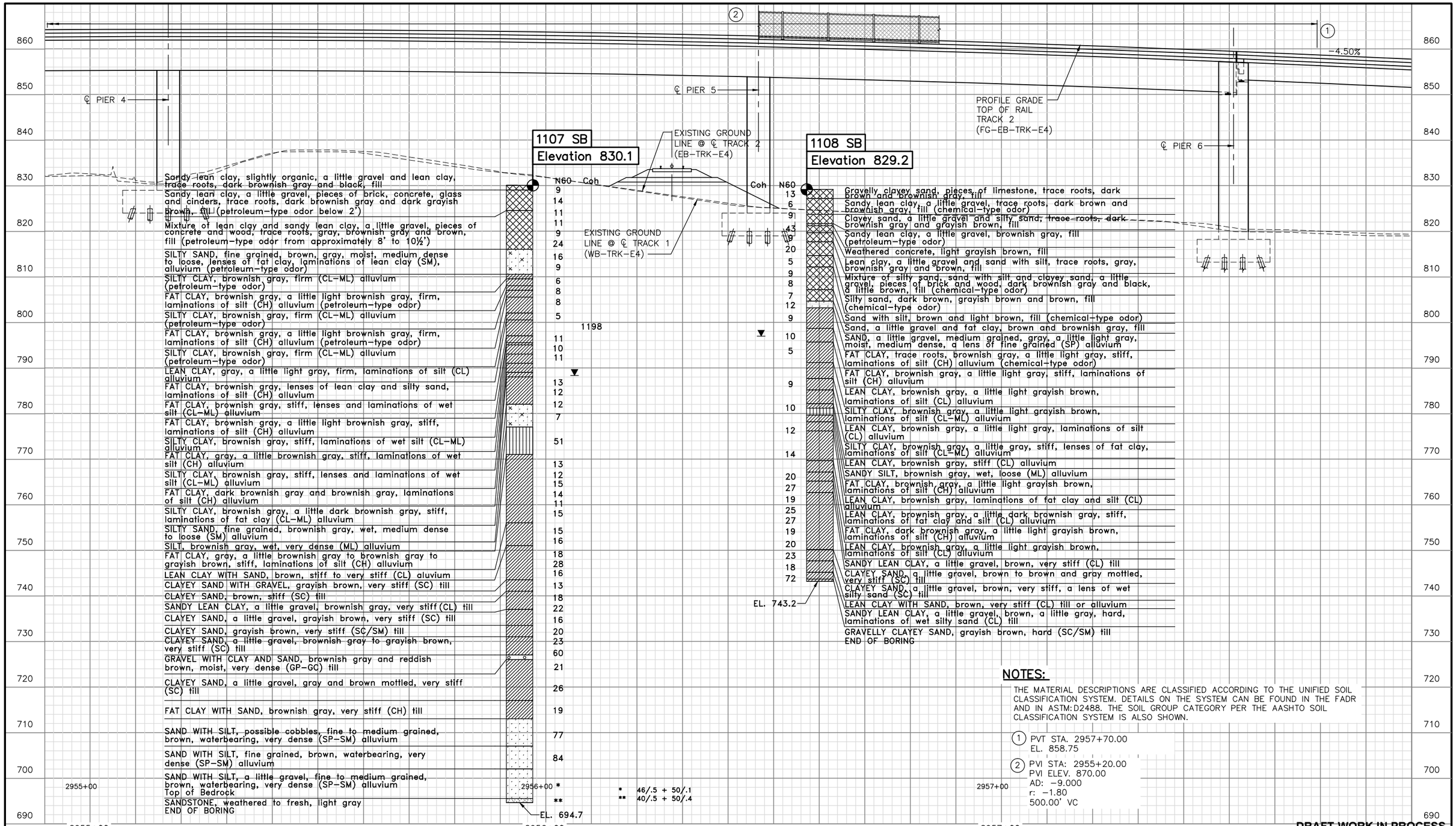
CIVIL EAST - VOLUME 4B
5TH AVENUE AND 7TH STREET
BRIDGE 27C18
BRIDGE SURVEY PROFILE 4

DISCIPLINE: STRUCTURES

SHEET NAME: CBR27C18-BRG-BOR-007

SHEET 77 OF 80

Sep. 17 2015 03:41 pm v:\3400_ADC\CAD\SEGMENT E4\PLAN SHEETS\STRUCTURES\27C18\CBR27C18-BRG-BOR-004.dwg By: mark.krzyzewski



NOTES:

THE MATERIAL DESCRIPTIONS ARE CLASSIFIED ACCORDING TO THE UNIFIED SOIL CLASSIFICATION SYSTEM. DETAILS ON THE SYSTEM CAN BE FOUND IN THE FADR AND IN ASTM:D2488. THE SOIL GROUP CATEGORY PER THE AASHTO SOIL CLASSIFICATION SYSTEM IS ALSO SHOWN.

(1) PVT STA. 2957+70.00
EL. 858.75

(2) PVI STA: 2955+20.00
PVI ELEV. 870.00
AD: -9.000
r: -1.80
500.00' VC

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: KR | CHECKED BY: KJK
DRAWN BY: MSK | DATE: 09/18/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4B
5TH AVENUE AND 7TH STREET
BRIDGE 27C18
BRIDGE SURVEY PROFILE 5

DISCIPLINE: STRUCTURES
SHEET NAME: CBR27C18-BRG-BOR-008

SHEET 78 OF 80

Sep. 17 2015 03:41 pm V:\3400_ADC\CAD\SEGMENT E4\PLAN SHEETS\STRUCTURES\27C18\CBR27C18-BRG-BOR-004.dwg By: mark.krzyzewski

PVI STA: 2955+20.00
PVI ELEV. 870.00
AD: −9.000
r: −1.80
500.00' VC

PVT STA: 2957+70.00
EL. 858.75

−4.50%

PROFILE GRADE
TOP OF RAIL
TRACK 2
(FG−EB−TRK−E4)

℄ PIER 6

℄ PIER 7

℄ PIER 8

EXISTING GROUND
LINE @ ℄ TRACK 2
(EB−TRK−E4)

EXISTING GROUND
LINE @ ℄ TRACK 1
(WB−TRK−E4)

1109 CB
Elevation 820.4

Tip Stress (psi) 3000 6000

EL. 751.8

EL. 730.0

27	CLAYEY SAND, a little gravel, brownish gray, very stiff (SC) till
18	No sample recovery − driller note: possible cobbles/boulders, possible colluvium
100/.4	REDEPOSITED SANDSTONE, brownish gray, [Textural classification: Sand, a little gravel, fine grained, waterbearing, very dense (SP)] colluvium or alluvium
	Top of Bedrock
100/.5	SANDSTONE, fresh, a lens of shaly sandstone, gray, a little light brown
	END OF BORING

EL. 709.0

1110 SB
Elevation 817.9

Coh

N60	
18	Mixture of clayey sand and lean clay, a little gravel, dark brownish gray and gray, fill
19	
8	Sand with silt, a little gravel, pieces of brick and wood, grayish brown and black, fill (petroleum−type odor below about 7')
5	
3	
5	Silty sand, black, a little gray, fill
7	Sand with silt, a little silty sand, gray, a little brownish gray, fill
9	
▼ 9	Sand, brown and gray, fill
2	Sand with silt, trace roots, dark gray, fill
6	Sand, a little gravel, a nail, dark gray and gray, fill
7	SAND, a little gravel, medium to fine grained, dark gray, waterbearing, loose (SP) alluvium or fill
11	SAND, a little gravel, medium to fine grained, gray, waterbearing, medium dense, lenses of fine grained (SP) alluvium
15	LEAN CLAY, brownish gray, stiff, laminations of fat clay (CL) alluvium
16	SILT, brownish gray, wet, medium dense (ML) alluvium
17	FAT CLAY, brownish gray, a little gray, very stiff, laminations of silt (CH) alluvium
15	LEAN CLAY, brownish gray, stiff (CL) alluvium
13	FAT CLAY, brownish gray, a little gray, stiff, laminations of lean clay (CH) alluvium
15	
26	CLAYEY SAND, a little gravel, brown, very stiff, laminations of waterbearing sand below 77' (SC) till
22	
23	

EL. 730.0

880 870 860 850 840 830 820 810 800 790 780 770 760 750 740 730 720 710

2957+00 2958+00 2959+00

NOTES:

THE MATERIAL DESCRIPTIONS ARE CLASSIFIED ACCORDING TO THE UNIFIED SOIL CLASSIFICATION SYSTEM. DETAILS ON THE SYSTEM CAN BE FOUND IN THE FADR AND IN ASTM:D2488. THE SOIL GROUP CATEGORY PER THE AASHTO SOIL CLASSIFICATION SYSTEM IS ALSO SHOWN.

2959+00

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: KR CHECKED BY: KJK
DRAWN BY: MSK DATE: 09/18/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4B
5TH AVENUE AND 7TH STREET
BRIDGE 27C18
BRIDGE SURVEY PROFILE 6

DISCIPLINE: STRUCTURES
SHEET NAME: CBR27C18-BRG-BOR-009

SHEET 79 OF 80

Sep. 17 2015 03:41 pm v:\3400_ADC\CAD\SEGMENT E4\PLAN SHEETS\STRUCTURES\27C18\CBR27C18-BRG-BOR-004.dwg By: mark.krzyzewski

PVC STA. 2959+63.57
EL. 850.04

PVI STA: 2960+63.57
PVI ELEV. 845.54
AD: 5.250
r: 2.63
200.00' VC

PVT STA. 2961+63.57
EL. 846.29

PROFILE GRADE
TOP OF RAIL
TRACK 2
(FG-EB-TRK-E4)

0.75%

℄ PIER 9

℄ PIER 10

℄ EXISTING PIER 9
(BRIDGE NO. R0646)

EXISTING GROUND
LINE @ ℄ TRACK 2
(EB-TRK-E4)

EXISTING GROUND
LINE @ ℄ TRACK 1
(WB-TRK-E4)

1206 CB
Elevation 817.5

1207 SB
Elevation 817.9

3000 6000
Tip Stress (psi)

Coh N60

Coh	N60	
	17	Mixture of clayey sand, sandy lean clay and silty sand, with gravel, pieces of brick, trace roots, dark brown and brown, fill
	25	
	14	
	23	Silty sand, pieces of concrete and wood, brownish gray and black, fill (petroleum-type odor)
	9	
	7	Silty sand, a little gravel and clayey sand, pieces of bituminous and wood, cinders, clinkers and ash, dark brown and gray, fill (petroleum-type odor)
	4	
	4	
	6	Silty sand, a little gravel and organic silt, pieces of bituminous, trace roots, gray and dark gray, fill (petroleum-type odor)
	8	ORGANIC CLAY, trace roots, grayish brown, firm (OL/OH) swamp deposit
	5	
	4	ORGANIC CLAY, grayish brown, soft (OL/OH) swamp deposit
	4	
	4	
	3	ORGANIC CLAY, trace roots, brownish gray, soft (OL/OH) swamp deposit
	3	ORGANIC CLAY, dark gray, a little gray, soft (OL/OH) swamp deposit
890		LEAN CLAY, trace roots, gray, a little light gray, laminations of silt (CL) alluvium (petroleum-type odor)
	7	SAND WITH SILT, fine grained, gray, wet (SP-SM) alluvium (petroleum-type odor)
	22	SAND, a little gravel, fine to medium grained, gray, waterbearing, loose (SP) alluvium (petroleum-type odor)
	36	SAND, fine grained, gray, waterbearing, medium dense to dense (SP) alluvium
	20	SAND WITH SILT, a little gravel, fine to medium grained, gray, a little black, waterbearing, medium dense (SP-SM) alluvium (petroleum-type odor)
	31	SAND, a little gravel, medium grained, gray, waterbearing, dense (SP) alluvium
	19	SILTY CLAY, brownish gray, stiff (CL-ML) alluvium (petroleum-type odor)
	19	FAT CLAY, brownish gray, very stiff, laminations of wet silt (CH) alluvium (petroleum-type odor)
	23	SILTY CLAY, brownish gray, very stiff (CL-ML) alluvium
	14	LEAN CLAY, a little dark gray, very stiff, laminations of fat clay (CL) alluvium
	20	FAT CLAY, gray, a little brownish gray, stiff, laminations of wet silt (CH) alluvium
	13	LEAN CLAY, brownish gray, very stiff (CL) alluvium
	24	FAT CLAY, gray, a little brownish gray mottled, stiff (CH) alluvium
	22	SILTY CLAY, brownish gray, very stiff, laminations of wet silt (CL-ML) alluvium
	20	SILTY CLAY, brownish gray, a little gray, very stiff, laminations of fat clay (CL-ML) alluvium
	16	SANDY LEAN CLAY, a little gravel, brown and gray mottled to brown, very stiff (CL) till
	28	
	57	CLAYEY SAND, a little gravel, brown, hard, laminations of waterbearing sand (SC) till
	41	

EL. 700.00
23 SANDY LEAN CLAY, a little gravel, brown and gray mottled, very stiff (CL) till
23 CLAYEY SAND, a little gravel, brown and gray mottled, very stiff, (SC) till
24
59 SANDSTONE SAND [Textural Classification: Sand with silt a little gravel, fine grained, brown, very dense (SP-SM) colluvium or residual soil
100/0.1 Top of Bedrock
Apparent Fresh SANDSTONE, based on drilling action (no samples retrieved)
100/0.1
END OF BORING
EL. 673.3

EL. 700.00

EL. 697.8

2960+00 2961+00 2962+00

NOTES:

THE MATERIAL DESCRIPTIONS ARE CLASSIFIED ACCORDING TO THE UNIFIED SOIL CLASSIFICATION SYSTEM. DETAILS ON THE SYSTEM CAN BE FOUND IN THE FADR AND IN ASTM:D2488. THE SOIL GROUP CATEGORY PER THE AASHTO SOIL CLASSIFICATION SYSTEM IS ALSO SHOWN.

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: KR CHECKED BY: KJK
DRAWN BY: MSK DATE: 09/18/15

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

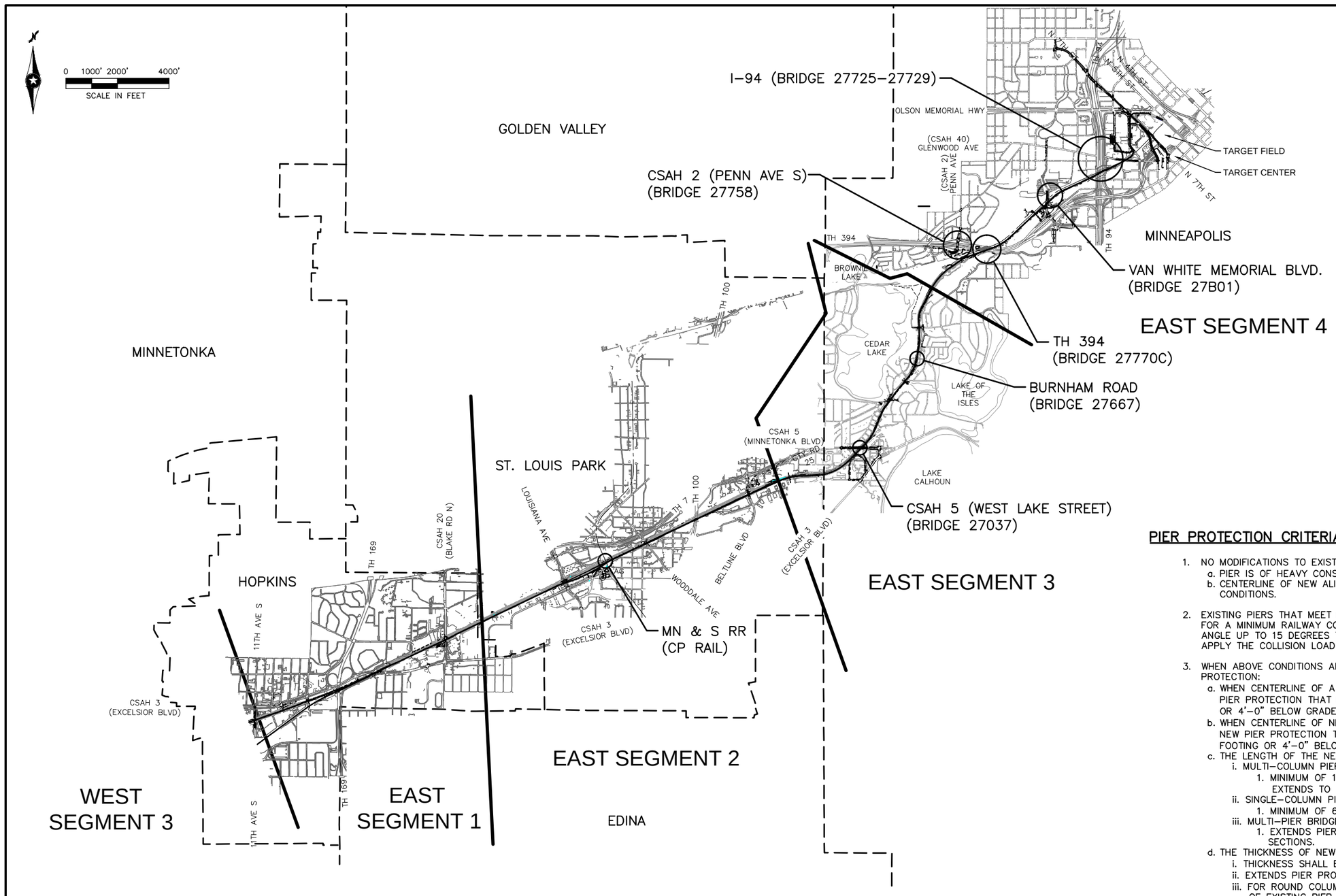
SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4B
5TH AVENUE AND 7TH STREET
BRIDGE 27C18
BRIDGE SURVEY PROFILE 7

DISCIPLINE: STRUCTURES
SHEET NAME: CBR27C18-BRG-BOR-010

SHEET 80 OF 80

Sep. 17 2015 03:41 pm V:\3400_ADC\CAD\SEGMENT E4\PLAN SHEETS\STRUCTURES\27C18\CBR27C18-BRG-BOR-004.dwg By: mark.krzyzewski



PIER PROTECTION CRITERIA NOTES:

1. NO MODIFICATIONS TO EXISTING PIER IF ANY OF THE FOLLOWING ARE MET:
   a. PIER IS OF HEAVY CONSTRUCTION. (SEE NOTE 2.)
   b. CENTERLINE OF NEW ALIGNMENT IS THE SAME OR IMPROVED OVER THE EXISTING CONDITIONS.
2. EXISTING PIERS THAT MEET HEAVY CONSTRUCTION GUIDELINES SHOULD BE ANALYZED FOR A MINIMUM RAILWAY COLLISION LOAD OF 600 KIPS APPLIED DIRECTLY AT AN ANGLE UP TO 15 DEGREES TANGENT TO THE RAILWAY IN ADVANCE TO DESIGN. APPLY THE COLLISION LOAD AT 5 FEET ABOVE TOP OF RAIL ELEVATION.
3. WHEN ABOVE CONDITIONS ARE NOT MET, THE FOLLOWING ARE USED FOR NEW PIER PROTECTION:
   a. WHEN CENTERLINE OF A NEW ALIGNMENT IS 12'-0" TO 25'-0", PROVIDE NEW PIER PROTECTION THAT IS 6'-0" ABOVE RAIL AND EXTENDS TO TOP OF FOOTING OR 4'-0" BELOW GRADE BETWEEN FOOTINGS.
   b. WHEN CENTERLINE OF NEW ALIGNMENT IS LESS THAN 12'-0" FROM PIER, PROVIDE NEW PIER PROTECTION THAT IS 12'-0" ABOVE RAIL AND EXTENDS TO TOP OF FOOTING OR 4'-0" BELOW GRADE BETWEEN FOOTINGS.
   c. THE LENGTH OF THE NEW PIER PROTECTION SHALL MEET THE FOLLOWING:
      i. MULTI-COLUMN PIERS:
         1. MINIMUM OF 1'-0" EXTENSION BEYOND THE PIER COLUMN FACE OR EXTENDS TO EDGE OF FOOTING (WHICHEVER IS GREATER).
      ii. SINGLE-COLUMN PIERS:
         1. MINIMUM OF 6'-0" EXTENSION BEYOND THE PIER COLUMN FACE.
      iii. MULTI-PIER BRIDGES:
         1. EXTENDS PIER PROTECTION TO BE CONTINUOUS BETWEEN PIER SECTIONS.
   d. THE THICKNESS OF NEW PIER PROTECTION SHALL MEET THE FOLLOWING:
      i. THICKNESS SHALL BE MINIMUM 2'-6" THICK.
      ii. EXTENDS PIER PROTECTION 6" PAST EXISTING FACE OF PIER COLUMN.
      iii. FOR ROUND COLUMN PIERS, EXTEND PIER PROTECTION 6" ON BOTH FACES OF EXISTING PIER.

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AMC | CHECKED BY: LKZ
DRAWN BY: CAD | DATE: 8/6/2015

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

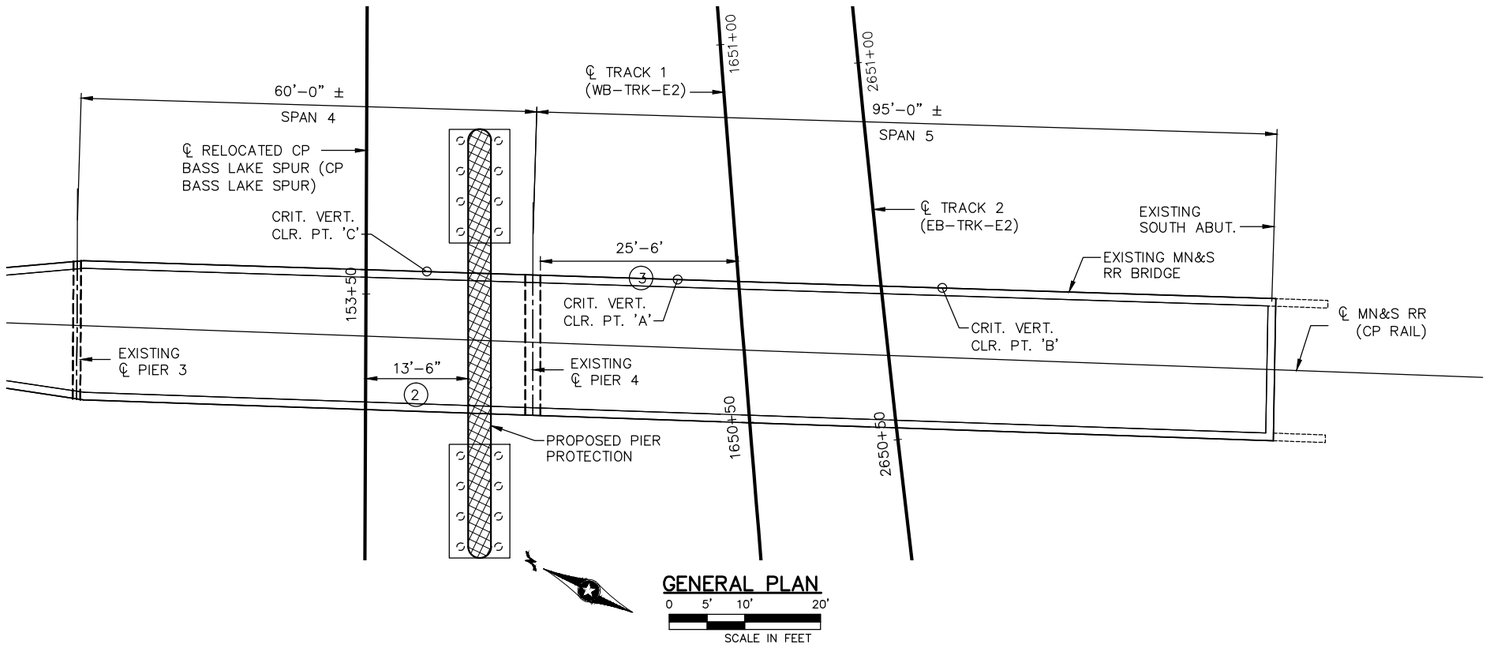
SOUTHWEST Green Line LRT Extension

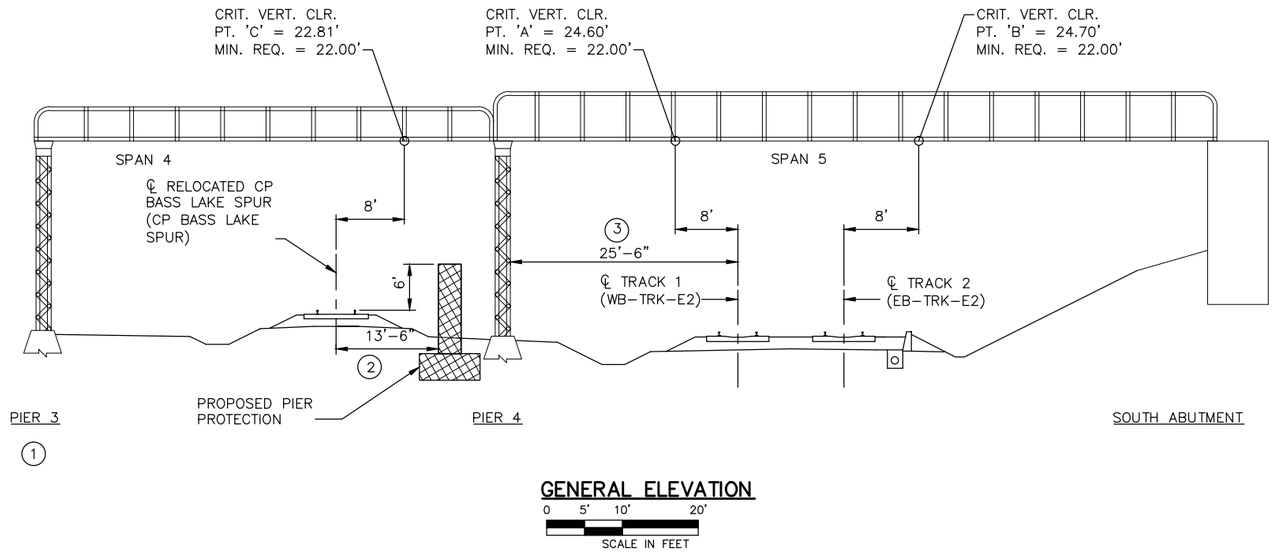
CIVIL EAST - VOLUME 4
EXISTING BRIDGE
PIER PROTECTION & MODIFICATIONS
KEY MAP

DISCIPLINE: STRUCTURES
SHEET NAME: E1-STU-PPR-GEN-KEY-001

SHEET 1 OF 1

Aug. 10 2015 05:10 pm V:\3400_ADC\CAD\SEGMENT E1\PLAN SHEETS\STRUCTURES\PIER PROTECTION\E1-STU-PPR-GEN-KEY.dwg By: Anne.Cesnik





DESIGN DATA

2014 AND CURRENT INTERIM AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS

2014 AREMA MANUAL FOR RAILWAY ENGINEERING

MNDOT DRAFT PIER PROTECTION POLICY (MARCH 15, 2015)

LOAD AND RESISTANCE FACTOR DESIGN METHOD

SOUTHWEST LIGHT RAIL TRANSIT DESIGN CRITERIA (REVISION 4.0)

MATERIAL DESIGN PROPERTIES:
REINFORCED CONCRETE:
f'c = 4000 PSI n = 8
fy = 60000 PSI REINFORCEMENT

RAILWAY COLLISION LOAD = 600 K

NO.	DESCRIPTION
1	GENERAL PLAN AND ELEVATION
2	PIER PROTECTION DETAILS
3	VISUAL QUALITY

SCHEDULE OF QUANTITIES FOR PIER PROTECTION

ITEM NO.	DESCRIPTION	UNIT	QUANTITY
2401	STRUCTURAL CONCRETE (3Y43)	CU. YD.	
2401	REINFORCEMENT BARS	POUND	
2433	ANCHORAGES TYPE REINF. BARS	EACH	
2452	CIP CONCRETE PILING DELIVERED, 12"	LIN. FT.	
2452	CIP CONCRETE PILING DRIVEN, 12"	LIN. FT.	
2452	CIP CONCRETE TEST PILE, 12"	EACH	
2452	PILE REDRIVING	EACH	

NOTES:

1. PIER PROTECTION NOT REQUIRED ON PIER 3
2. HORIZONTAL OFFSET SHOWN IS MEASURED PERPENDICULAR FROM CENTERLINE OF TRACK TO FACE OF PIER PROTECTION AT CLOSEST POINT
3. HORIZONTAL OFFSET SHOWN IS MEASURED PERPENDICULAR FROM CENTERLINE OF TRACK TO FACE OF PIER AT CLOSEST POINT PLANS BASED ON LIMITED FIELD SURVEY

PROPOSED PIER PROTECTION

FOR VISUAL QUALITY REQUIREMENTS REFER TO SHEET 3

MN&S RR (CP RAIL)

CP RAIL OVER CP RR, SOUTHWEST LRT, AND CEDAR LAKE TRAIL

GENERAL PLAN AND ELEVATION

CITY OF ST. LOUIS PARK HENNEPIN COUNTY

APPROVED: _____ STATE BRIDGE ENGINEER DATE

DRAFT-WORK IN PROCESS

JOB NO. T9N635 STATE PROJECT NO. 9909–01 MNDOT REVIEW: JOE NIETFELD

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AMC CHECKED BY: LKZ
DRAWN BY: AES DATE: 8/6/2015

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

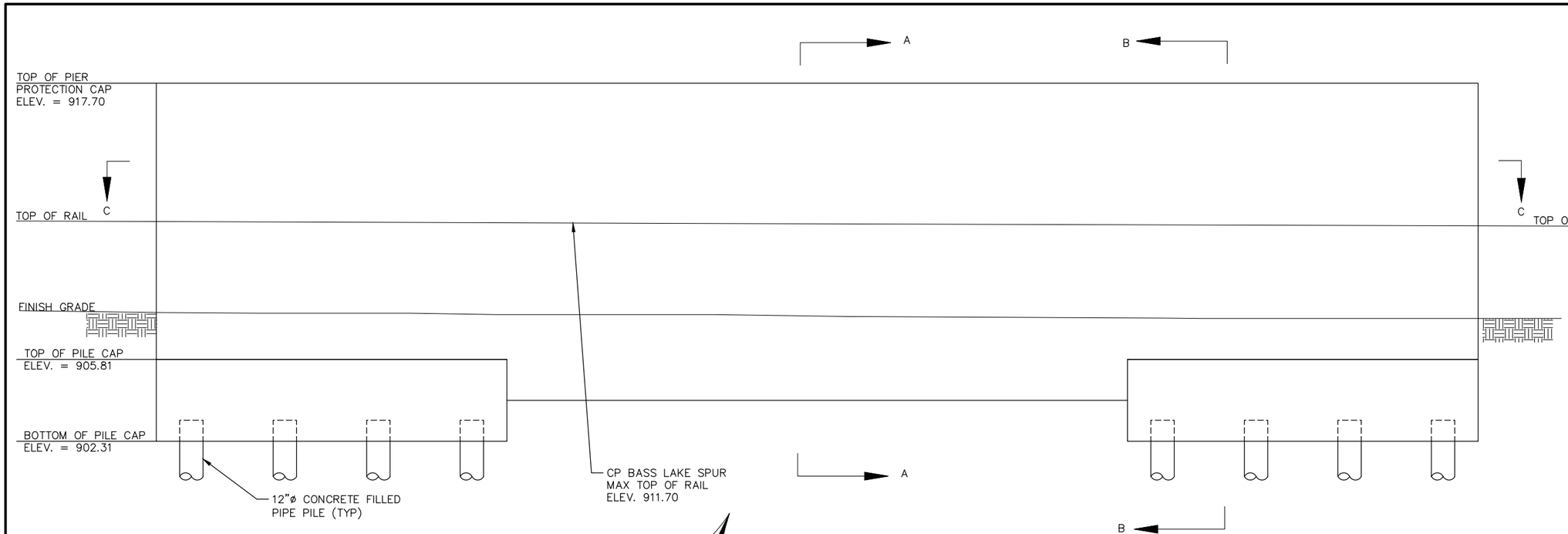
SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4
MN&S RR (CP RAIL)
PIER PROTECTION
GENERAL PLAN AND ELEVATION

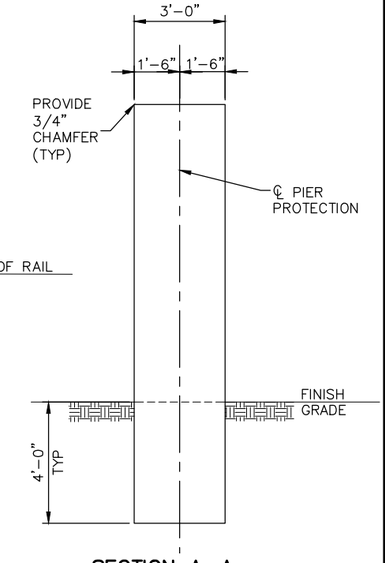
DISCIPLINE: STRUCTURES
SHEET NAME: EX2-STU-PPR-MNSR-FRT-GPE-001

SHEET 1 OF 3

Aug. 10 2015 05:10 pm V:\3400_ADC\CAD\SEGMENT E2\PLAN SHEETS\STRUCTURES\PIER PROTECTION\EX2-STU-PPR-MNSR-FRT-DTL.dwg By: Anne.Cesnik



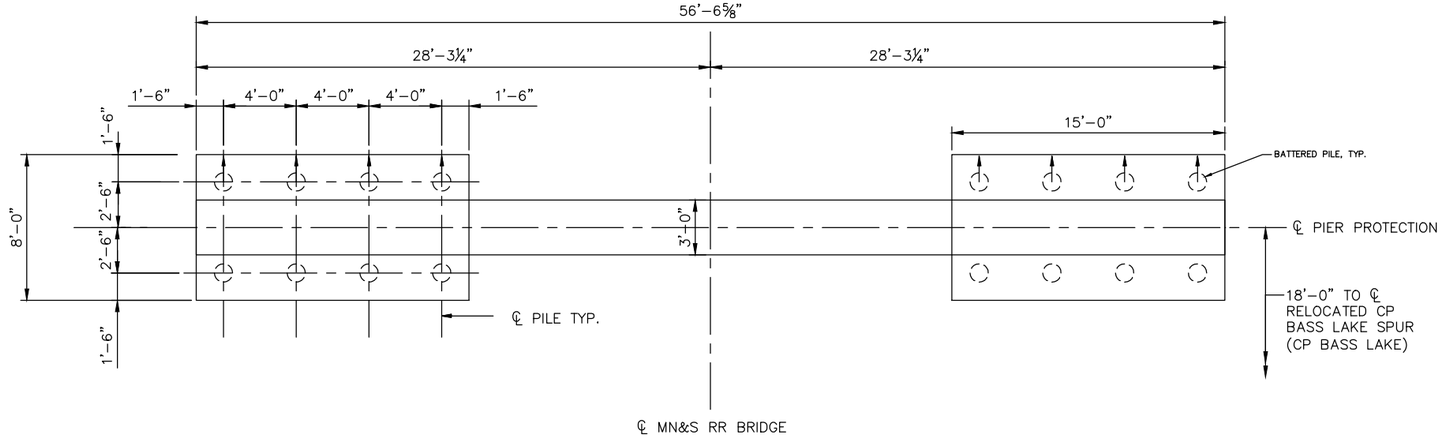
ELEVATION – PIER 4



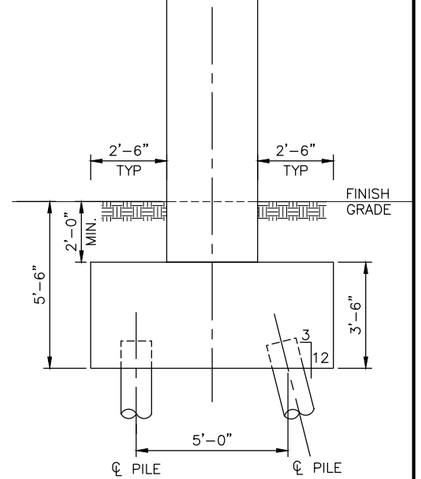
SECTION A–A

NOTES:

FOR VISUAL QUALITY REQUIREMENTS
REFER TO SHEET 3



SECTION C–C



SECTION B–B

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AMC | CHECKED BY: LKZ
DRAWN BY: AES | DATE: 8/6/2015

AECOM Kimley»Horn

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

60% SUBMISSION - 09/28/15

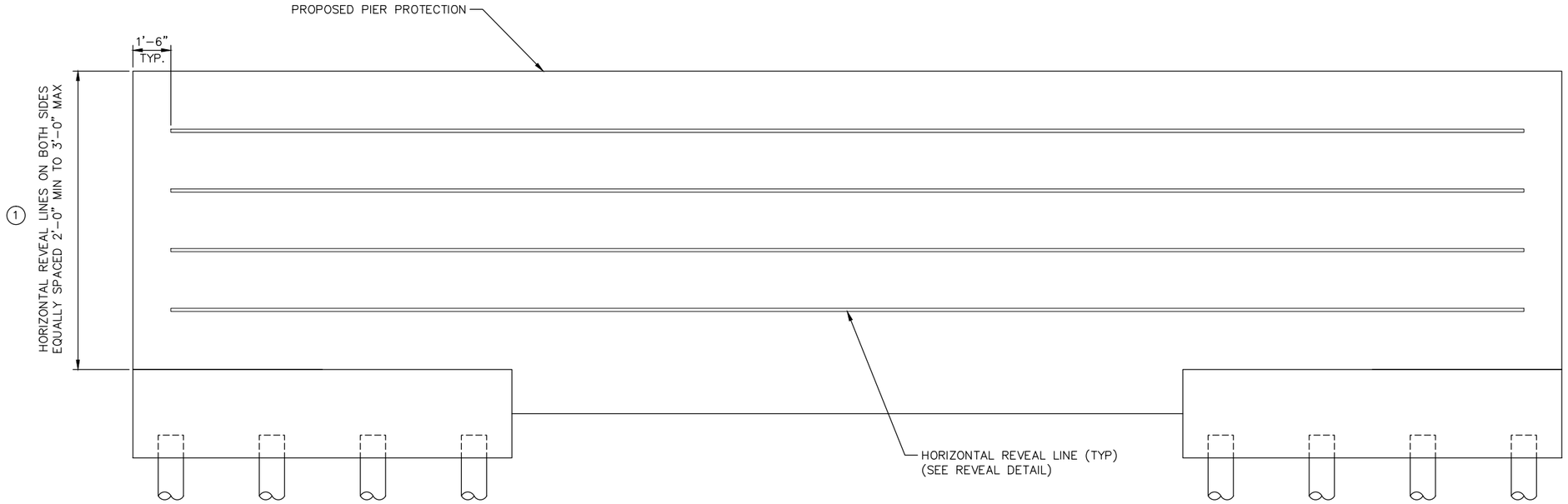
CIVIL EAST - VOLUME 4
MN&S RR (CP RAIL)
PIER PROTECTION
DETAILS

DISCIPLINE: STRUCTURES

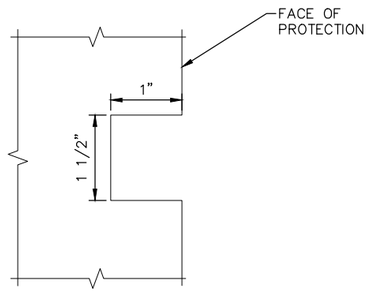
SHEET NAME: EX2-STU-PPR-MNSR-FRT-DTL-001

SHEET 2 OF 3

Aug. 10 2015 05:10 pm v:\3400_ADC\CAD\SEGMENT E2\PLAN SHEETS\STRUCTURES\PIER PROTECTION\EX2-STU-PPR-MNSR-FRT-DTL.dwg By: Anne.Cesnik



ELEVATION – PIER 4



REVEAL DETAIL

NOTES:

1. PROVIDE HORIZONTAL REVEAL LINES EQUALLY SPACED AS SHOWN ON FRONT AND BACK FACE OF PIER PROTECTION.

   PROVIDE ¾" CHAMFER AT TOP OF PIER PROTECTION

   APPLY ANTI-GRAFFITI COATING TO VISIBLE SURFACES

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AMC | CHECKED BY: LKZ
DRAWN BY: CAD | DATE: 8/6/2015

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

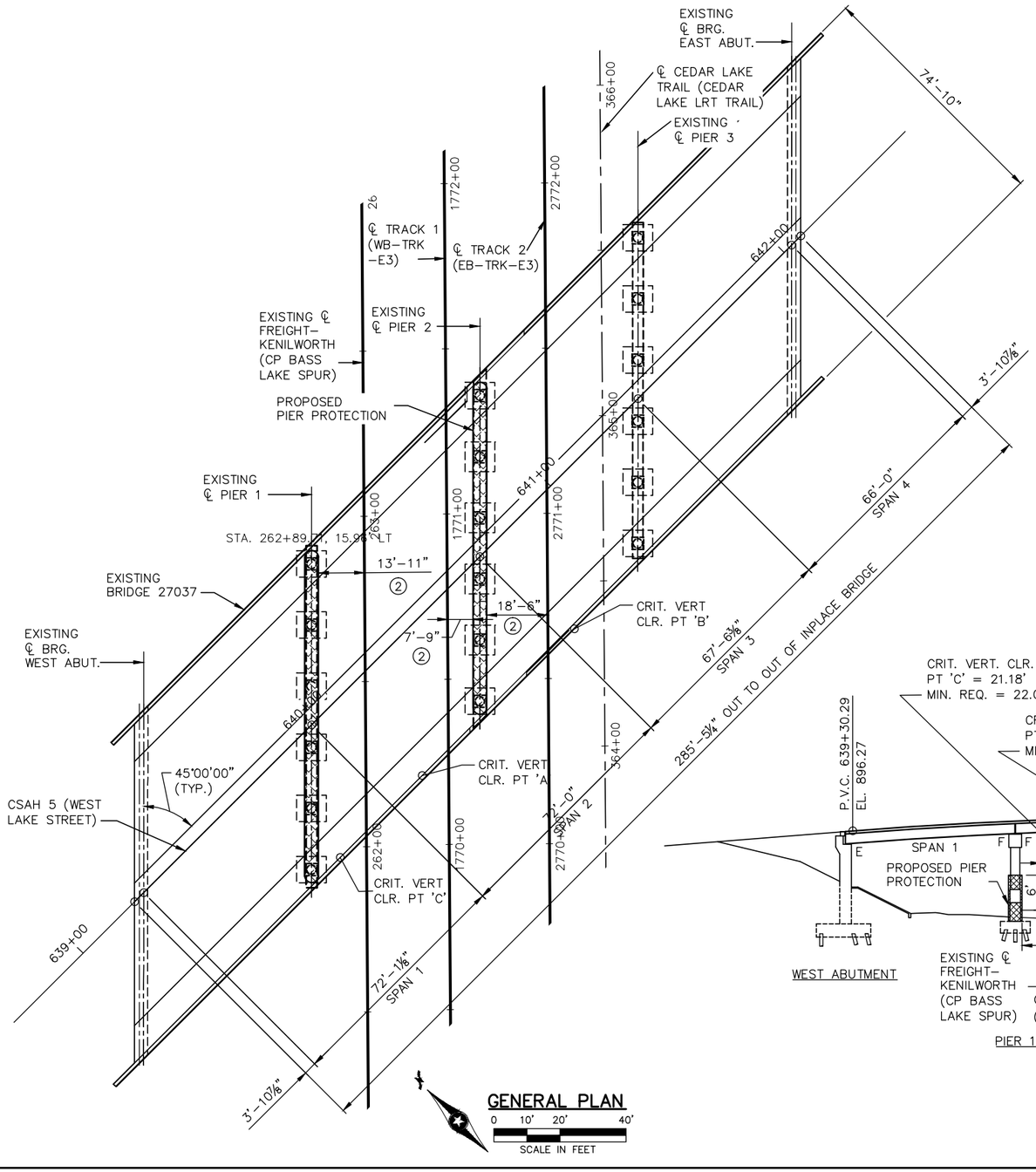
METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4
MN&S RR (CP RAIL)
PIER PROTECTION
VISUAL QUALITY

DISCIPLINE: STRUCTURES
SHEET NAME: EX2-STU-PPR-MNSR-FRT-PIR-001

SHEET 3 OF 3



DESIGN DATA

2014 AND CURRENT INTERIM AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS

2014 AREMA MANUAL FOR RAILWAY ENGINEERING

MNDOT DRAFT PIER PROTECTION POLICY (MARCH 15, 2015)

LOAD AND RESISTANCE FACTOR DESIGN METHOD

SOUTHWEST LIGHT RAIL TRANSIT DESIGN CRITERIA (REVISION 4.0)

RAILWAY COLLISION LOAD = 600 KIPS

MATERIAL DESIGN PROPERTIES:
REINFORCED CONCRETE:
f'c = 4000 PSI n = 8
fy = 60000 PSI REINFORCEMENT

LIST OF SHEETS

SCHEDULE OF QUANTITIES FOR PIER PROTECTION

ITEM NO.	DESCRIPTION	UNIT	QUANTITY
2401.501	STRUCTURAL CONCRETE (3Y43)	CU. YD.	
2401.541	REINFORCEMENT BARS	POUND	
2433.516	ANCHORAGES TYPE REINF. BARS	EACH	
2451.601	STRUCTURE EXCAVATION	LUMP SUM	

NOTES:

① PIER PROTECTION NOT REQUIRED ON PIER 3

② HORIZONTAL OFFSET SHOWN IS MEASURED PERPENDICULAR FROM CENTERLINE OF TRACK TO FACE OF PIER PROTECTION AT CLOSEST POINT

PROPOSED PIER PROTECTION

FOR VISUAL QUALITY REQUIREMENTS REFER TO SHEET 4

BRIDGE NO. 27037

CSAH 5 (WEST LAKE STREET) OVER CP RR, SOUTHWEST LRT, AND CEDAR LAKE TRAIL–ABT. 1.2 MI. E. OF JCT. T.H. 100 AND T.H. 7.

BRIDGE I.D. NO. 501

GENERAL PLAN AND ELEVATION

SEC 32/5 T 29N/28N R 24W
CITY OF MINNEAPOLIS HENNEPIN COUNTY

APPROVED: _____ STATE BRIDGE ENGINEER DATE

DRAFT-WORK IN PROCESS

JOB NO. T9N635 STATE PROJECT NO. 9909–01 MNDOT REVIEW: JOE NIETFELD

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AMC CHECKED BY: LKZ
DRAWN BY: CAD DATE: 8/6/2015

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

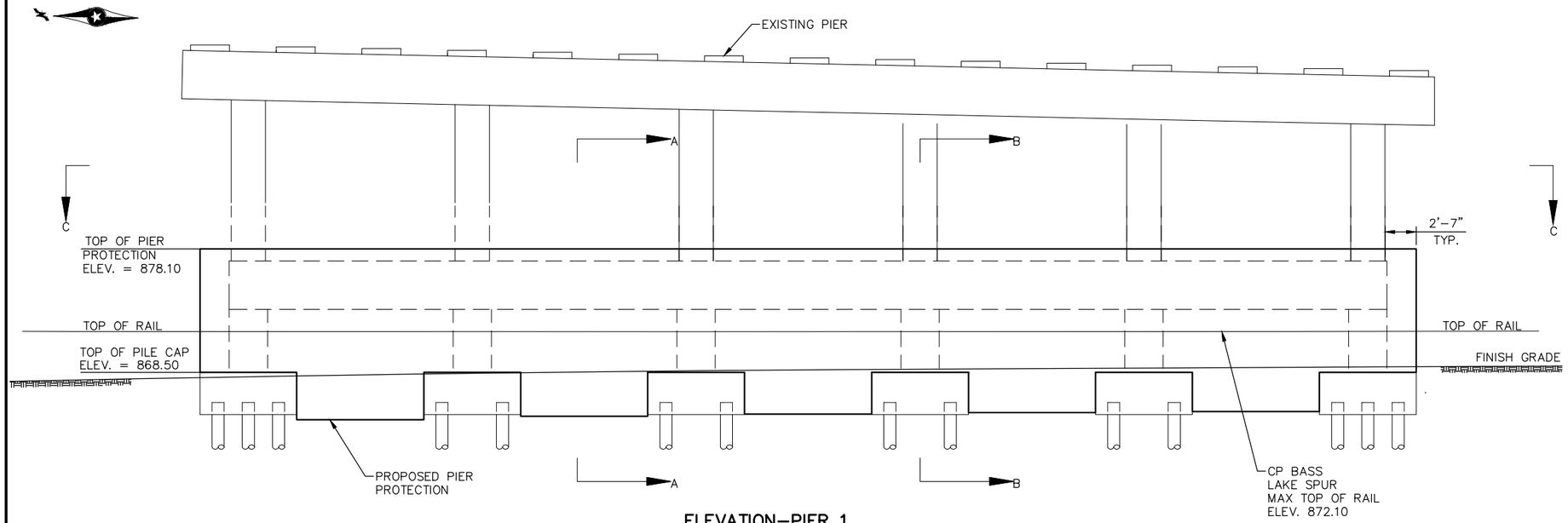
SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4
CSAH 25 (WEST LAKE ST.) (BRIDGE 27037)
PIER PROTECTION
GENERAL PLAN AND ELEVATION

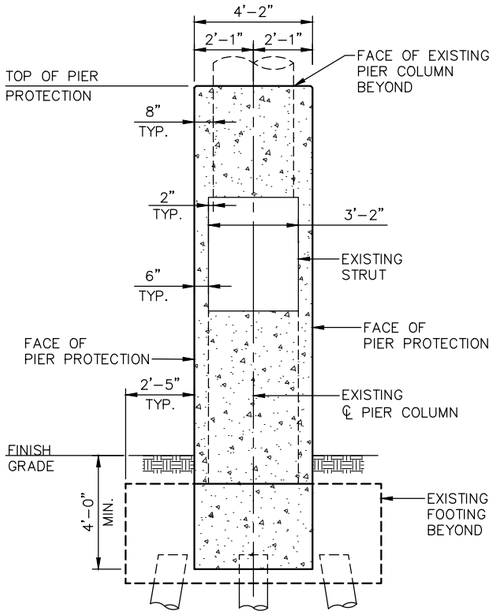
DISCIPLINE: STRUCTURES
SHEET NAME: EX3-STU-PPR-WLKS-VEH-GPE-001

SHEET 1 OF 4

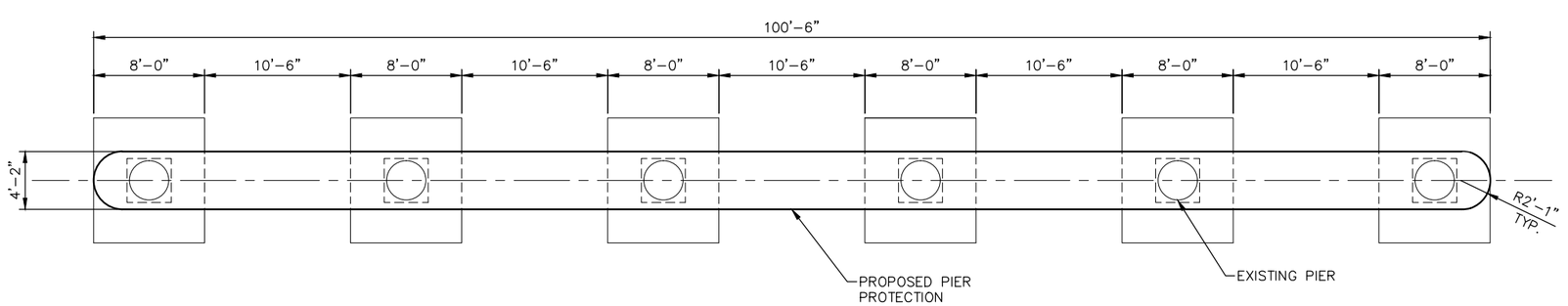
Aug. 10 2015 05:11 pm V:\3400_ADC\CAD\SEGMENT E3\PLAN SHEETS\STRUCTURES\PIER PROTECTION\EX3-STU-PPR-WLKS-VEH-DTL.dwg By: Anne.Cesnik



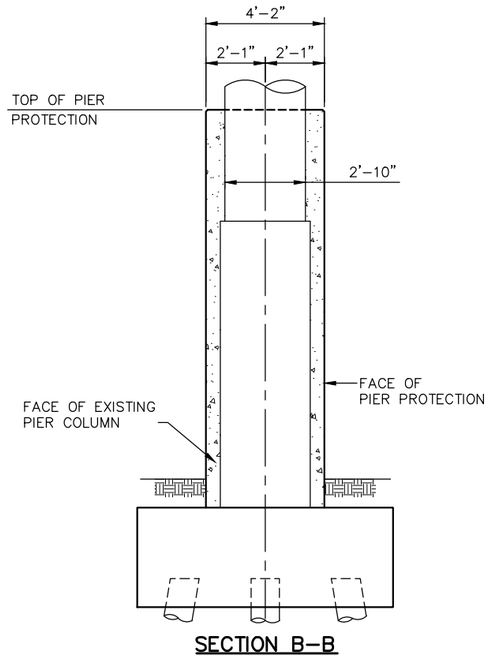
ELEVATION–PIER 1



SECTION A–A



SECTION C–C



SECTION B–B

NOTES:

FOR VISUAL QUALITY REQUIREMENTS REFER TO SHEET 4

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AMC | CHECKED BY: LKZ
DRAWN BY: CAD | DATE: 8/6/2015

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

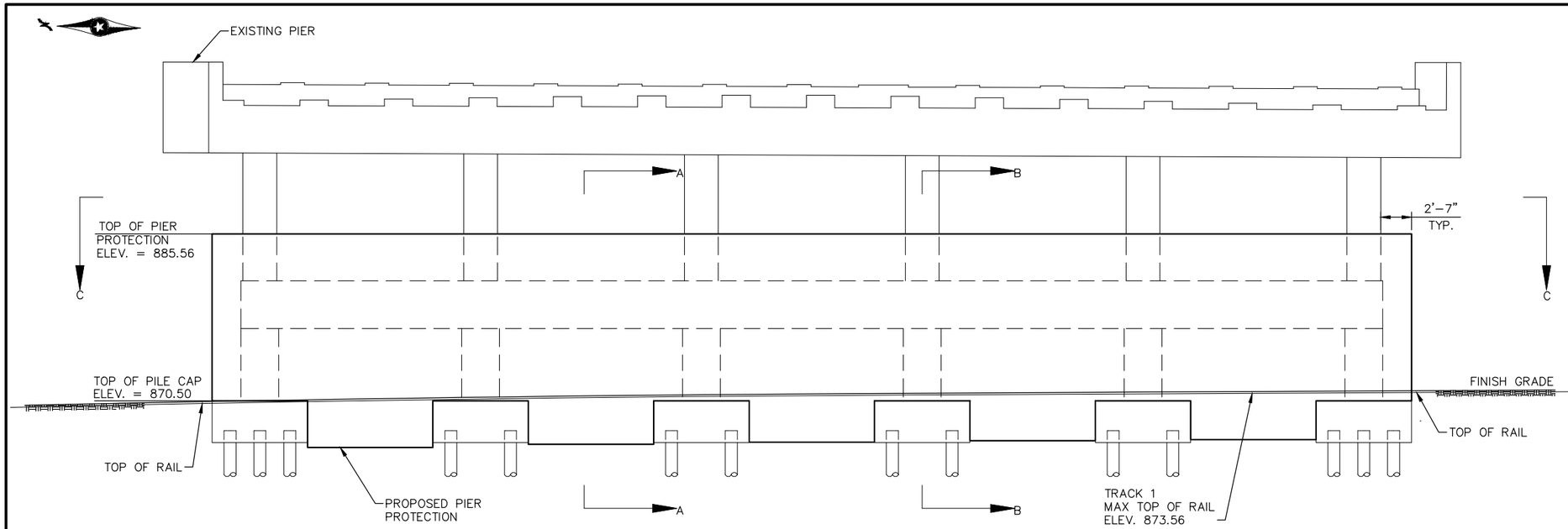
CIVIL EAST - VOLUME 4
CSAH 25 (WEST LAKE ST.) (BRIDGE 27037)
PIER PROTECTION
DETAILS (1 OF 2)

DISCIPLINE: STRUCTURES

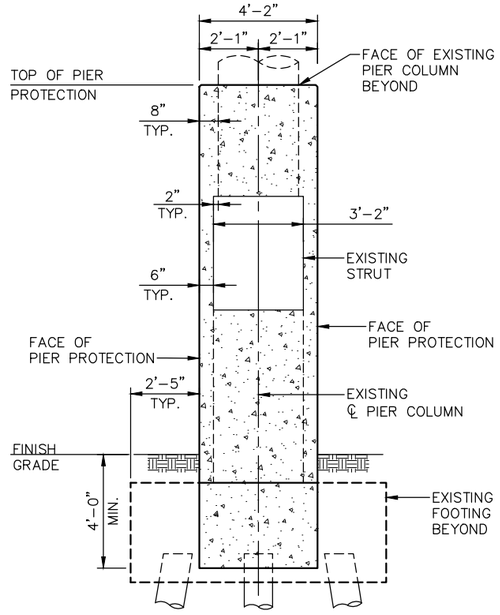
SHEET NAME: EX3-STU-PPR-WLKS-VEH-DTL-001

SHEET 2 OF 4

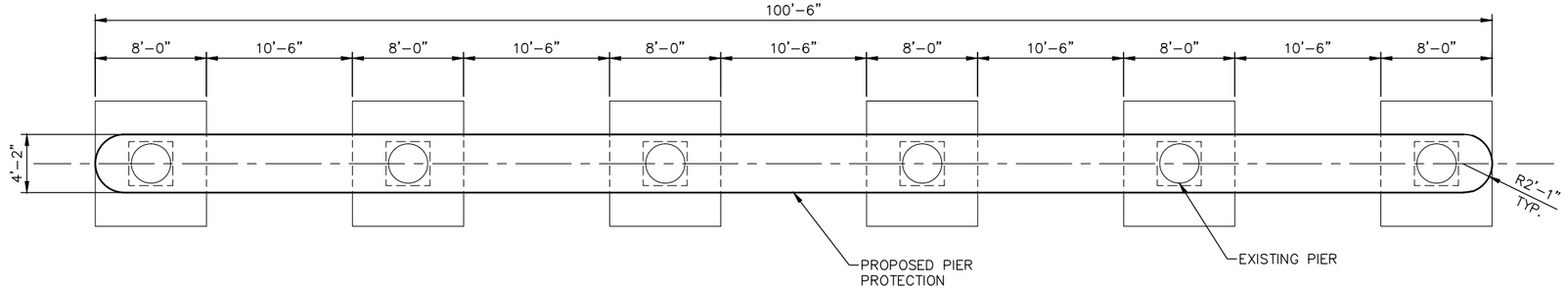
Aug, 10 2015 05:11 pm V:\3400_ADC\CAD\SEGMENT E3\PLAN SHEETS\STRUCTURES\PIER PROTECTION\EX3-STU-PPR-WLKS-VEH-DTL.dwg By: Anne.Cesnik



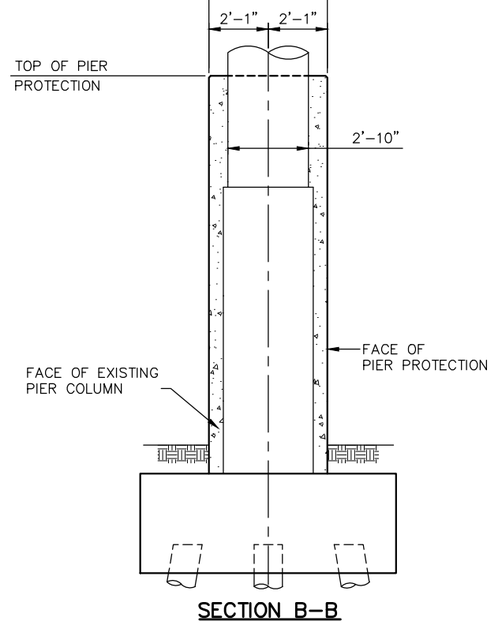
ELEVATION–PIER 2



SECTION A–A



SECTION C–C



SECTION B–B

NOTES:

FOR VISUAL QUALITY REQUIREMENTS REFER TO SHEET 4

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AMC | CHECKED BY: LKZ
DRAWN BY: CAD | DATE: 8/6/2015

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

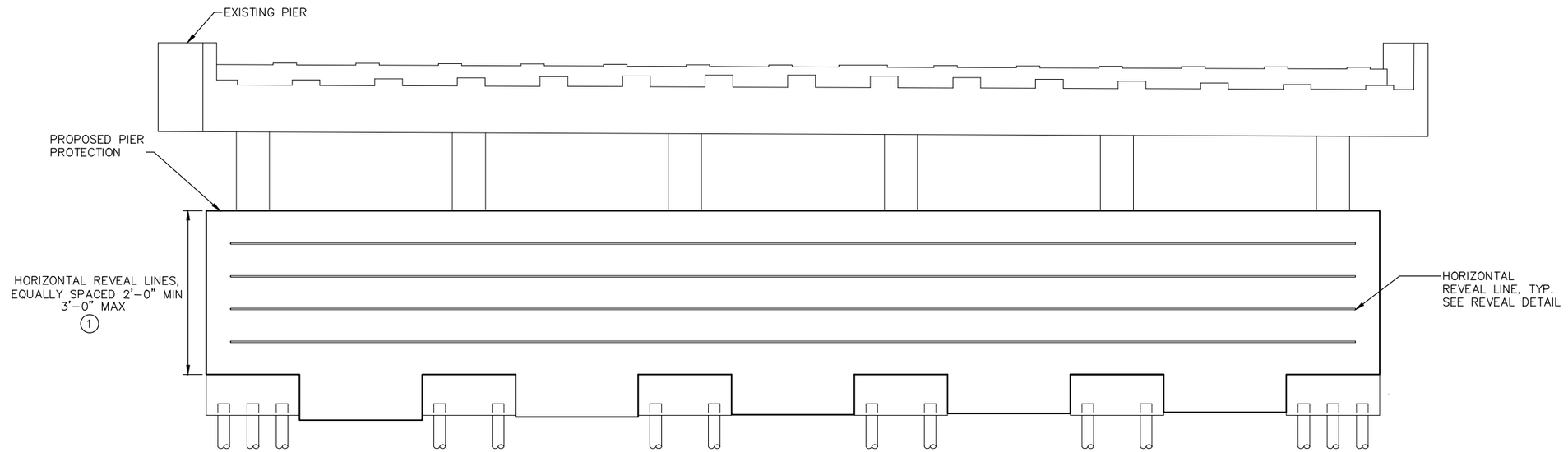
SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4
CSAH 25 (WEST LAKE ST.)(BRIDGE 27037)
PIER PROTECTION
DETAILS (2 OF 2)

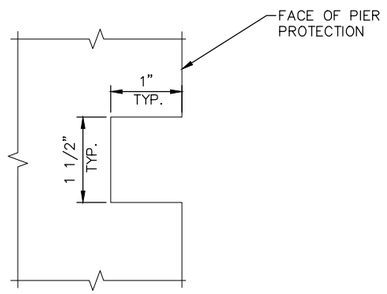
DISCIPLINE: STRUCTURES
SHEET NAME: EX3-STU-PPR-WLKS-VEH-DTL-002

SHEET 3 OF 4

Aug, 10 2015 05:11 pm V:\3400_ADC\CAD\SEGMENT E3\PLAN SHEETS\STRUCTURES\PIER PROTECTION\EX3-STU-PPR-WLKS-VEH-DTL.dwg By: Anne.Cesnik



ELEVATION–PIER



REVEAL DETAIL

NOTES:

1. PROVIDE HORIZONTAL REVEAL LINES EQUALLY SPACED AS SHOWN ON FRONT AND BACK FACE OF PIER PROTECTION. DISCONTINUE REVEAL LINES AT BEGINNING OF RADIUS AT END OF WALL

   PROVIDE ¾" CHAMFER AT TOP OF PIER PROTECTION

   APPLY ANTI–GRAFFITI COATING TO VISIBLE SURFACES

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AMC | CHECKED BY: LKZ
DRAWN BY: CAD | DATE: 8/6/2015

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

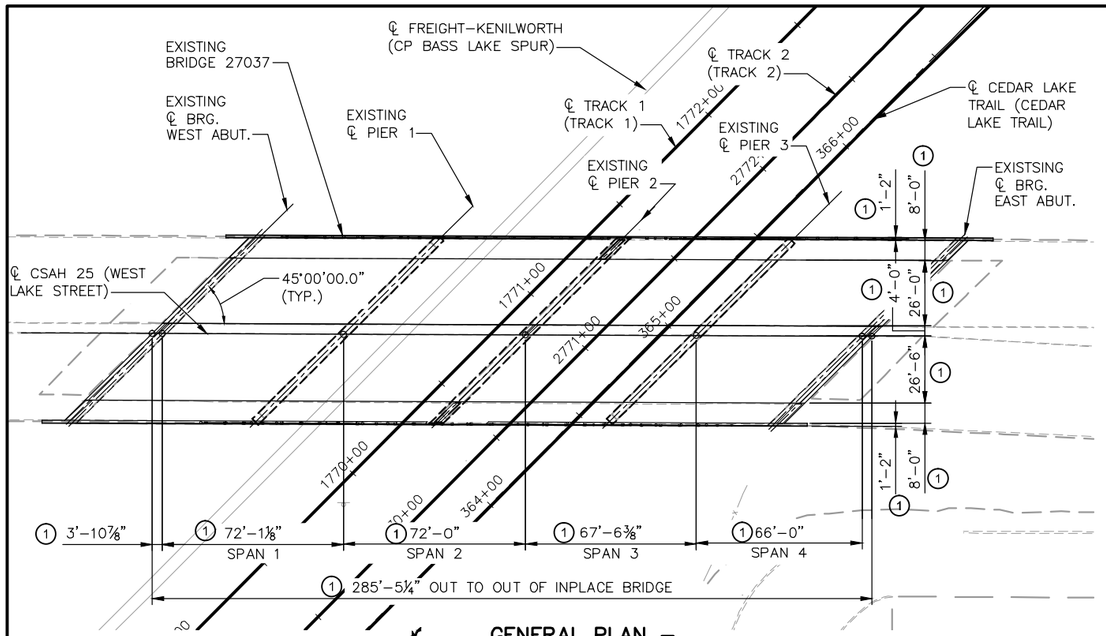
CIVIL EAST - VOLUME 4
CSAH 25 (WEST LAKE ST.)(BRIDGE 27037)
PIER PROTECTION
VISUAL QUALITY

DISCIPLINE: STRUCTURES

SHEET NAME: EX3-STU-PPR-WLKS-VEH-PIR-001

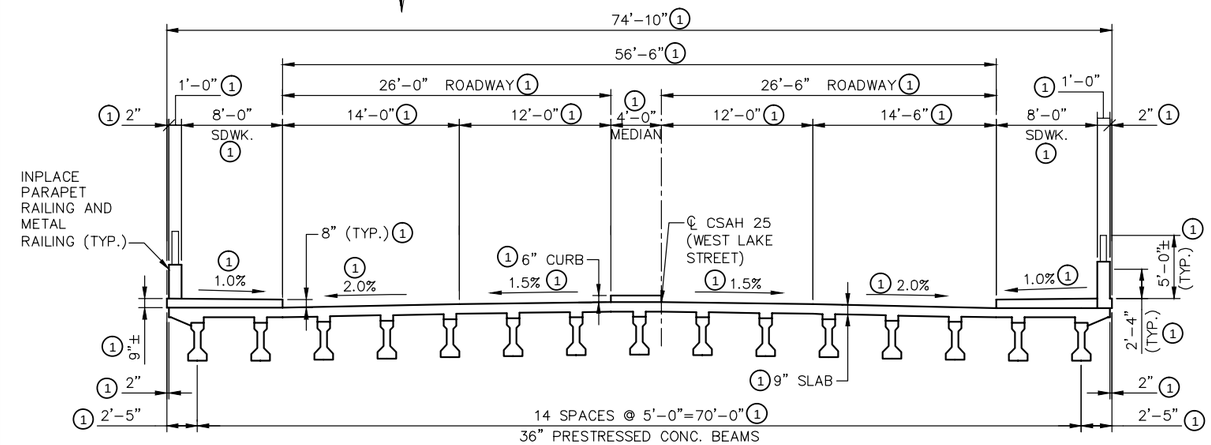
SHEET 4 OF 4

Aug, 10 2015 05:11 pm V:\3400_ADC\CAD\SEGMENT E3\PLAN SHEETS\STRUCTURES\PIER PROTECTION\EX3-STU-PPR-WLKS-VEH-DTL.dwg By: Anne.Cesnik



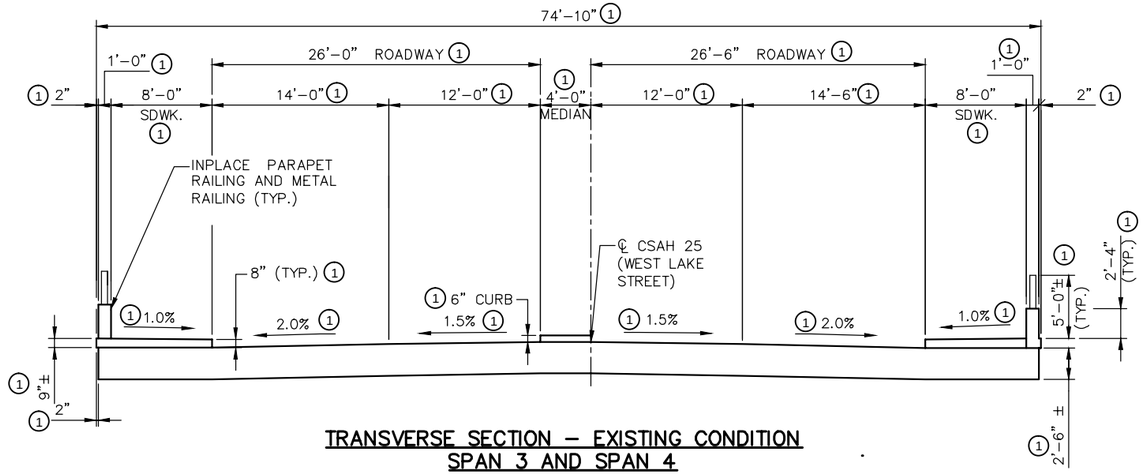
GENERAL PLAN – EXISTING CONDITION

0 15' 30' 60'
SCALE IN FEET



TRANSVERSE SECTION – EXISTING CONDITION SPAN 1 AND SPAN 2

0 3' 6' 12'
SCALE IN FEET



TRANSVERSE SECTION – EXISTING CONDITION SPAN 3 AND SPAN 4

0 3' 6' 12'
SCALE IN FEET

(1) PER ORIGINAL BRIDGE PLAN DATED 12–13–90.

(2) THE FINAL LOAD RATINGS WILL BE DETERMINED ONCE CONCRETE CORING RESULTS ARE AVAILABLE.

DESIGN DATA

2014 AND CURRENT INTERIMS AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS

SOUTHWEST LIGHT RAIL TRANSIT DESIGN CRITERIA (REVISION 4.0)

LOAD AND RESISTANCE FACTOR DESIGN METHOD

MATERIAL DESIGN PROPERTIES:
REINFORCED CONCRETE:
f'c = 4000 PSI n = 8
fy = 60000 PSI REINFORCEMENT

PRESTRESSED CONCRETE:
f'c = 6000 PSI n = 8
fpu = 270 KSI LOW RELAXATION STRANDS
0.75 x fpu FOR INITAL PRESTRESS

DESIGN SPEED: OVER = 35 MPH
UNDER = N.A.

DECK AREA 21360 SQ. FT.

(2) HL93 LRFR INVENTORY RATING RF TBD
HL93 LRFR OPERATING RATING RF TBD

BRIDGE NO. 20737

CSAH 25 (WEST LAKE STREET) OVER CP RR, SOUTHWEST LRT, AND CEDAR LAKE TRAIL. LOCATED 1.2 MILES EAST OF JCT. OF CSAH 25 (WEST LAKE STREET) AND TH 100

BRIDGE I.D. NO. 501/209

GENERAL PLAN

SEC 32/5 T 29N/28N R 24W
CITY OF MINNEAPOLIS HENNEPIN COUNTY

APPROVED: _____
STATE BRIDGE ENGINEER DATE

DRAFT-WORK IN PROCESS

LIST OF SHEETS

JOB NO. T9N635 STATE PROJECT NO. 9909–01 MNDOT REVIEW: JOE NIETFELD

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: JCW CHECKED BY: SAD
DRAWN BY: JIK DATE: 08/10/15

AECOM Kimley»Horn

60% SUBMISSION - 9/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4
CSAH 25 (WEST LAKE STREET) (BRIDGE 27037)
BRIDGE MODIFICATIONS
EXISTING GENERAL PLAN & SECTIONS

DISCIPLINE: STRUCTURES
SHEET NAME: CBR27037-BRM-GPE-001

SHEET 1 OF 13

Aug. 10 2015 11:35 am V:\3400_ADC\CAD\SEGMENT E3\PLAN SHEETS\STRUCTURES\BR27037 MODS\CBR27037-BRM-GPE-001.dwg By: Jim.Kimble

CONSTRUCTION NOTES:

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

NO CUTTING WILL BE PERMITTED UNTIL THE CUTTING LIMITS HAVE BEEN OUTLINED BY THE CONTRACTOR AND APPROVED BY THE ENGINEER. REMOVAL AND RECONSTRUCTION SHALL CONFORM TO SPEC. 2433.

THE FIRST TWO DIGITS OF EACH BAR MARK INDICATES THE BAR SIZE. BARS MARKED WITH THE SUFFIX "E" SHALL BE EPOXY COATED IN ACCORDANCE WITH SPEC. 3301.

HATCHED AREAS INDICATE AREAS TO BE REMOVED.

THE CONTRACTOR SHALL FIELD VERIFY INPLACE BRIDGE ELEVATIONS AND DIMENSIONS.

INPLACE CONDUIT IN SIDEWALK TO REMAIN. CARE SHALL BE TAKEN NOT TO DAMAGE THE CONDUIT OR ITS CONTENTS.

THE CONTRACTOR SHALL MAKE FIELD MEASUREMENTS, AS NECESSARY, PRIOR TO FABRICATION OF COVER PLATES TO ASSURE PROPER FIT IN THE FINAL WORK.

INPLACE EXPANSION DEVICE TO REMAIN. CARE SHALL BE TAKEN NOT TO DAMAGE THE EXPANSION DEVICE.

QUANTITY ESTIMATE FOR ENTIRE BRIDGE

	ITEM NO.	ITEM	UNIT	QUANTITY
(4)	2401	TYPE P–2, TL–4 BARRIER CONCRETE (3S52)	LIN. FT.	
(1)	2401	SIDEWALK CONCRETE (3F52)	SQ. FT.	
	2401	REINFORCING BARS (EPOXY COATED)	POUND	
	2401	RESURFACE EXISTING PARAPET RAILING EXTERIOR	SQ. FT.	
	2402	ACRYLIC PAINT	SQ. FT.	
	2402	ORNAMENTAL METAL RAILING	LIN. FT.	
	2402	STRUCTURAL TUBE RAILING DESIGN T–1 (MOD.)	LIN. FT.	
	2402	STRUCTURAL STEEL	POUND	
	2404	CHIP SEAL WEARING COURSE	SQ. FT.	
(2)	2433	REMOVE CONCRETE SIDEWALK	SQ. FT.	
(3)	2433	REMOVE METAL RAILING	LIN. FT.	
(5)	2433	REMOVE CONCRETE PARAPET	LIN. FT.	
	2433	EPOXY SEALER	SQ. YD.	
	2545	CONDUIT SYSTEM	LUMP SUM	

(1) SIDEWALK CONCRETE (3F52) VOLUME IS APPROXIMATELY XX CUBIC YARDS.

(2) INCLUDES REMOVAL OF 2'–0" OF INPLACE SIDEWALK ON EACH SIDE OF THE BRIDGE.

(3) INCLUDES REMOVAL OF ALL METAL RAILING ON EACH SIDE OF THE BRIDGE.

(4) TYPE P–2, TL–4 PARAPET WITH MODIFIED T–1 RAILING. TYPE P–2, TL–4 BARRIER CONCRETE (3S52) VOLUME IS APPROXIMATELY XX CUBIC YARDS.

(5) INCLUDES REMOVAL OF SPECIFIED SECTIONS OF INPLACE CONCRETE PARAPET.

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: JCW | CHECKED BY: SAD
DRAWN BY: JIK | DATE: 08/10/15

AECOM Kimley»Horn

60% SUBMISSION - 9/28/15

METROPOLITAN COUNCIL

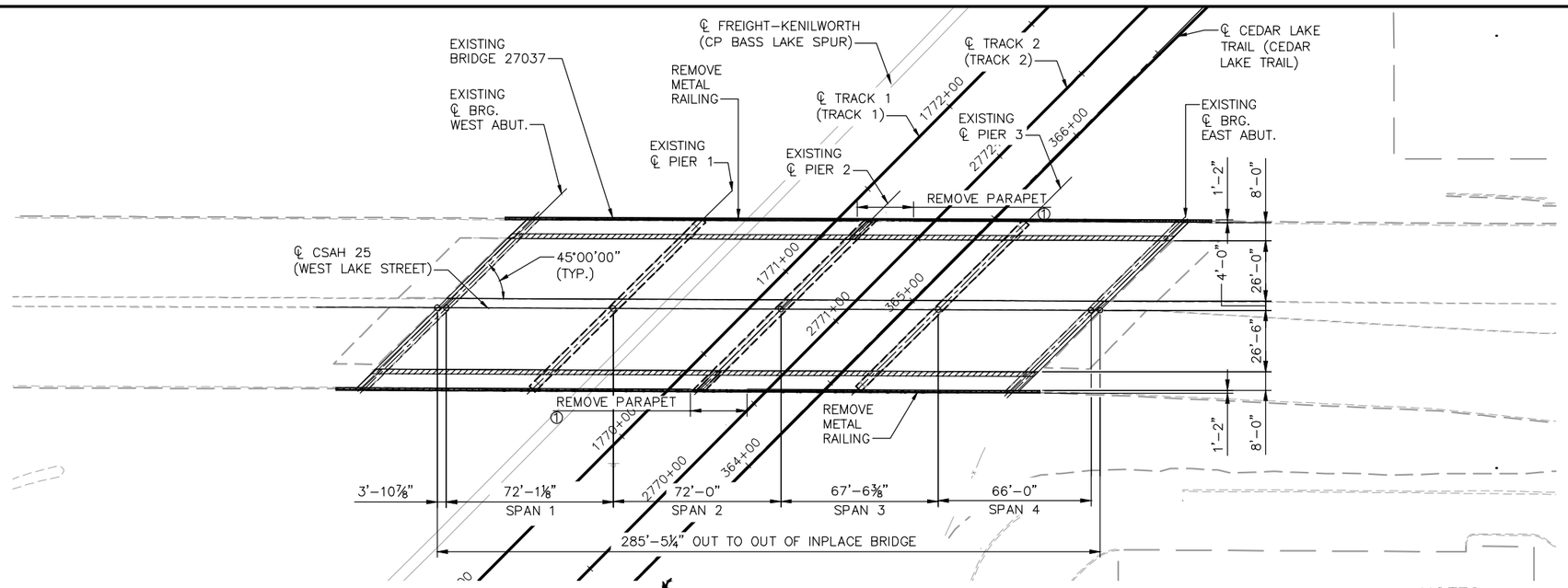
SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4
CSAH 25 (WEST LAKE STREET) (BRIDGE 27037)
BRIDGE MODIFICATIONS
SCHEDULE OF QUANTITIES

DISCIPLINE: STRUCTURES
SHEET NAME: CBR27037-BRM-TRN-001

SHEET 2 OF 13

Aug, 10 2015 11:35 am V:\3400_ADC\CAD\SEGMENT E3\PLAN SHEETS\STRUCTURES\BR27037 MODS\CBR27037-BRM-TRN-001.dwg By: Jim.Kimble



GENERAL PLAN – REMOVALS

0 15' 30' 60'
SCALE IN FEET

STAGING NOTES:

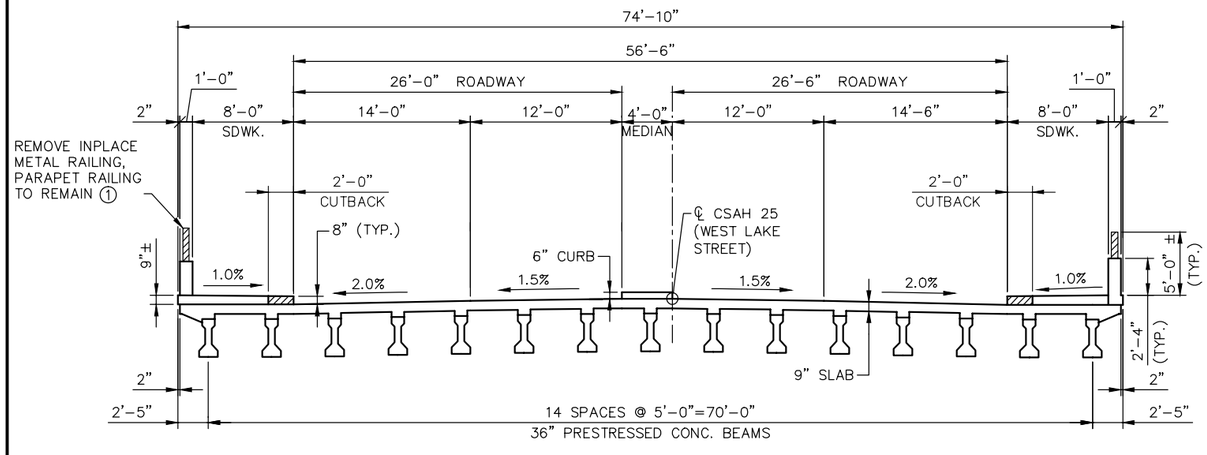
MOVE TRAFFIC TO ADJACENT LANES DURING CONSTRUCTION ACTIVITY IN OUTER LANES.

SIDEWALK TO BE CLOSED DURING REMOVAL AND CONSTRUCTION.

NOTES:

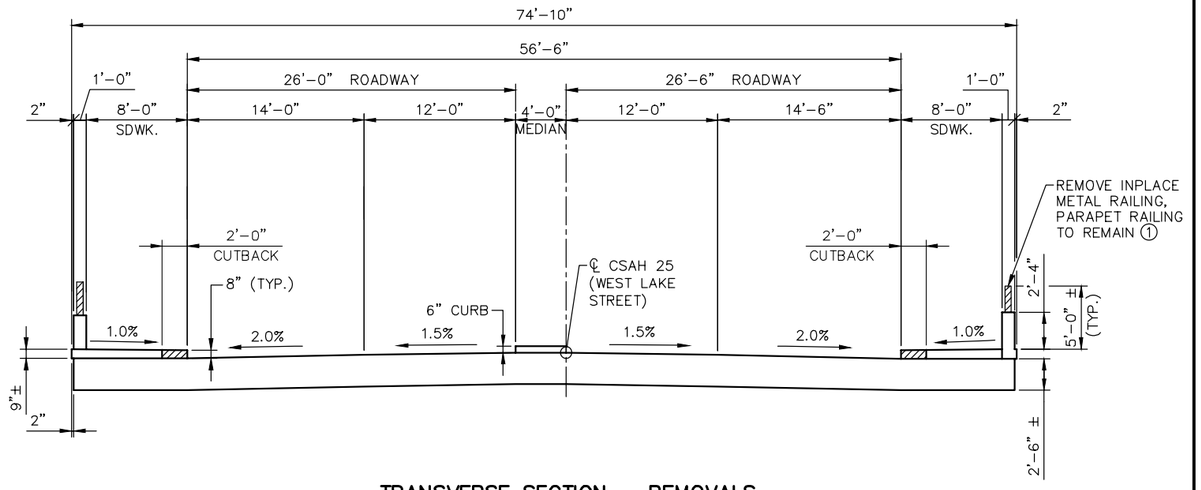
▨ DENOTES AREAS TO BE REMOVED.

ALL INPLACE ANCHOR BOLTS FOR FENCE AND LIGHT POLES THAT ARE REMOVED SHALL BE CUT FLUSH WITH TOP OF INPLACE PARAPET.



TRANSVERSE SECTION – REMOVALS SPAN 1 AND SPAN 2

0 3' 6' 12'
SCALE IN FEET



TRANSVERSE SECTION – REMOVALS SPAN 3 AND SPAN 4

0 3' 6' 12'
SCALE IN FEET

① SEE PROPOSED GENERAL PLAN & SECTIONS FOR LENGTH OF PARAPET REMOVAL.

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: JCW | CHECKED BY: SAD
DRAWN BY: JIK | DATE: 08/10/15

AECOM Kimley»Horn

60% SUBMISSION - 9/28/15

METROPOLITAN COUNCIL

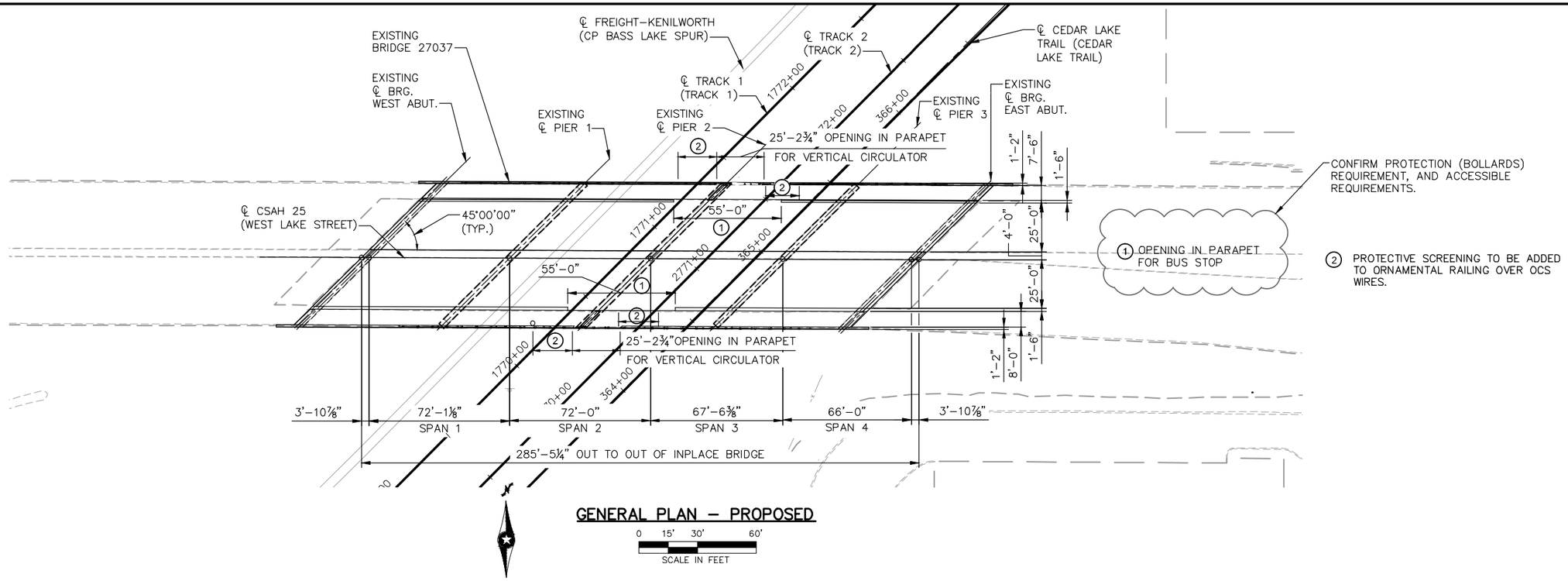
SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4
CSAH 25 (WEST LAKE STREET) (BRIDGE 27037)
BRIDGE MODIFICATIONS
REMOVAL DETAILS

DISCIPLINE: STRUCTURES
SHEET NAME: CBR27037-BRM-DTL-001

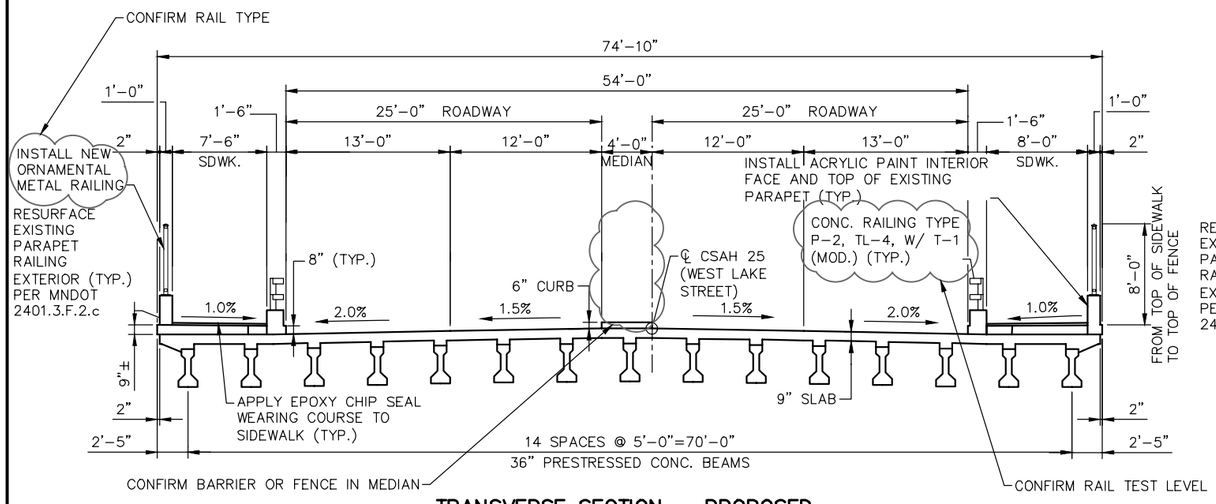
SHEET 3 OF 13

Aug, 10 2015 11:36 am V:\3400_ADC\CAD\SEGMENT E3\PLAN SHEETS\STRUCTURES\BR27037 MODS\CBR27037-BRM-DTL-001.dwg By: Jim.Kimble



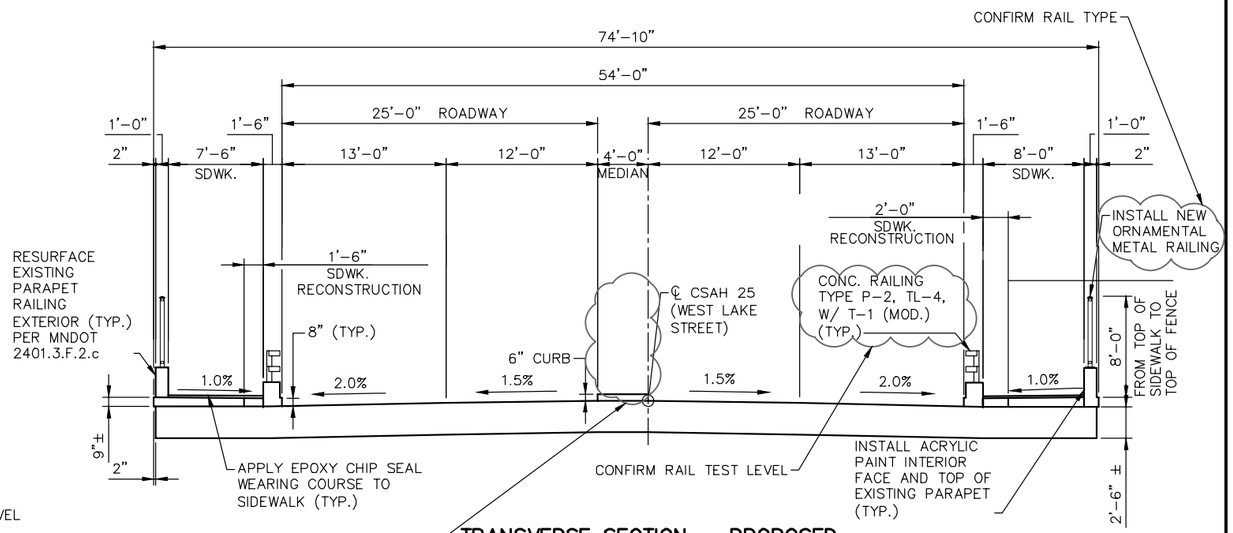
GENERAL PLAN – PROPOSED

0 15' 30' 60'
SCALE IN FEET



TRANSVERSE SECTION – PROPOSED SPAN 1 AND SPAN 2

0 3' 6' 12'
SCALE IN FEET



TRANSVERSE SECTION – PROPOSED SPAN 3 AND SPAN 4

0 3' 6' 12'
SCALE IN FEET

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: JCW | CHECKED BY: SAD
DRAWN BY: JIK | DATE: 08/10/15

AECOM Kimley»Horn

60% SUBMISSION - 9/28/15

METROPOLITAN COUNCIL

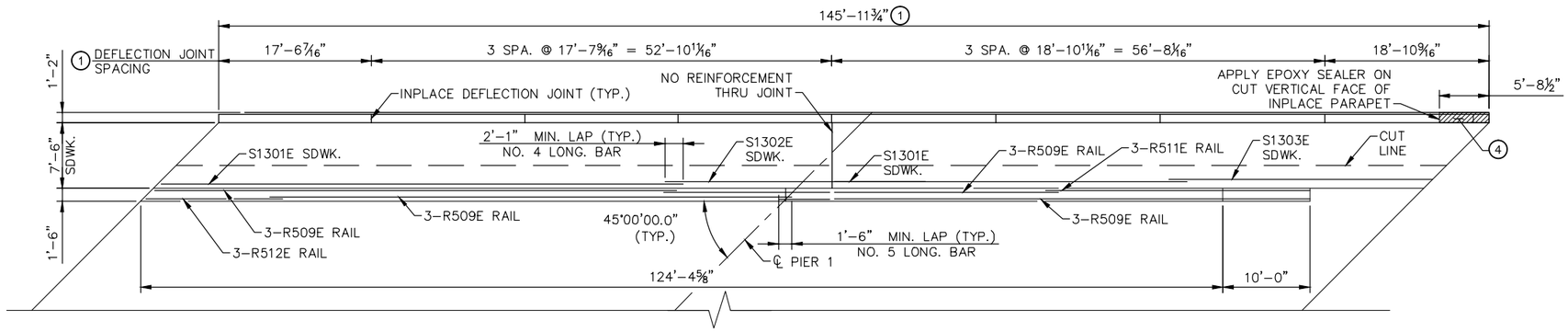
SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4
CSAH 25 (WEST LAKE STREET) (BRIDGE 27037)
BRIDGE MODIFICATIONS
PROPOSED GENERAL PLAN & SECTIONS

DISCIPLINE: STRUCTURES
SHEET NAME: CBR27037-BRM-GPE-002

SHEET 4 OF 13

Aug. 10 2015 11:37 am V:\3400_ADC\CAD\SEGMENT E3\PLAN SHEETS\STRUCTURES\BR27037 MODS\CBR27037-BRM-GPE-002.dwg By: Jim.Kimble



NORTH SIDEWALK PLAN
(WEST ABUTMENT TO PIER 2)

NOTE:
INPLACE TRANSVERSE, LONGITUDINAL, AND TIE SIDEWALK BARS NOT COMPLETELY EXPOSED TO REMAIN IN PLACE. CLEAN, STRAIGHTEN AND ADJUST AS REQUIRED. COMPLETELY EXPOSED BARS TO BE REMOVED AND DISPOSED OF.

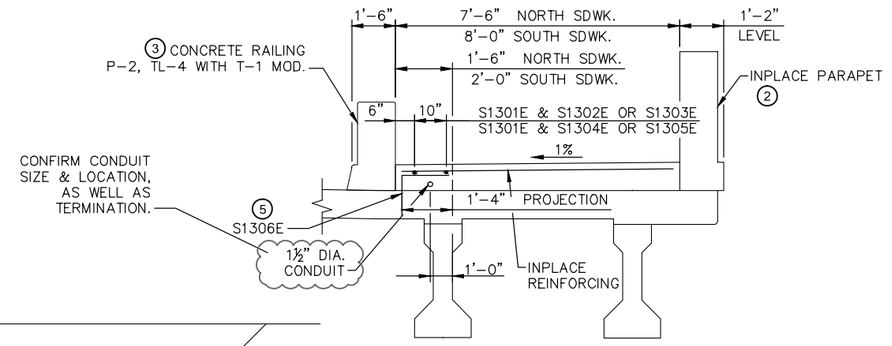
(1) PER ORIGINAL BRIDGE PLAN DATED 12-13-90.

(2) PROPOSED ORNAMENTAL METAL RAILING NOT SHOWN FOR CLARITY SEE SHEET 9.

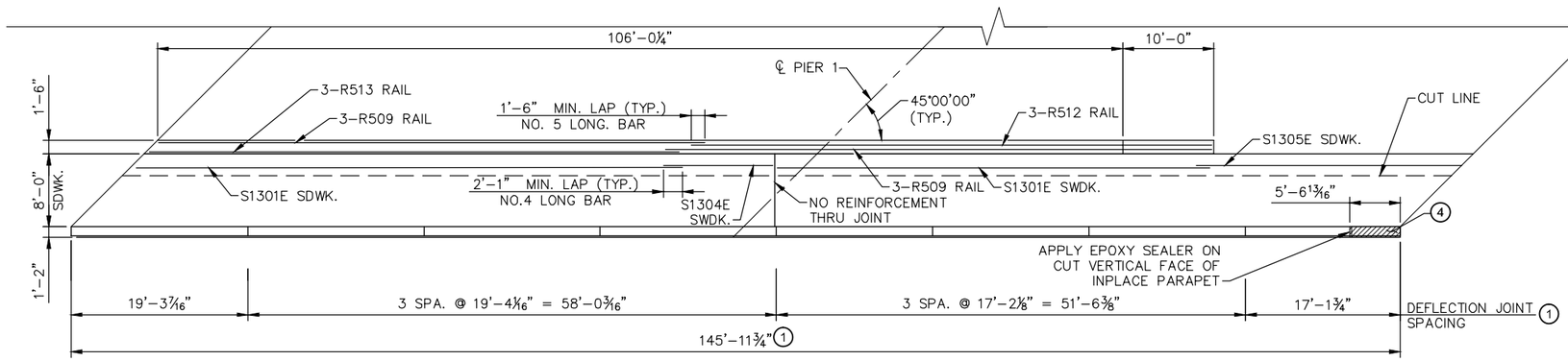
(3) MODIFIED RAILING NOT SHOWN FOR CLARITY, SEE SHEETS 10 & 11.

(4) SECTION OF INPLACE PARAPET TO BE REMOVED FOR VERTICAL CIRCULATOR.

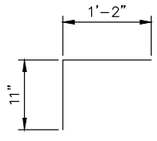
(5) SPACE S1306E TO MATCH INPLACE BARS FROM 1990 PLANS.



TRANSVERSE SECTION THRU SIDEWALK



SOUTH SIDEWALK PLAN
(WEST ABUTMENT TO PIER 2)



S1306E

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: JCW | CHECKED BY: SAD
DRAWN BY: JIK | DATE: 08/10/15

AECOM Kimley»Horn

60% SUBMISSION - 9/28/15

METROPOLITAN COUNCIL

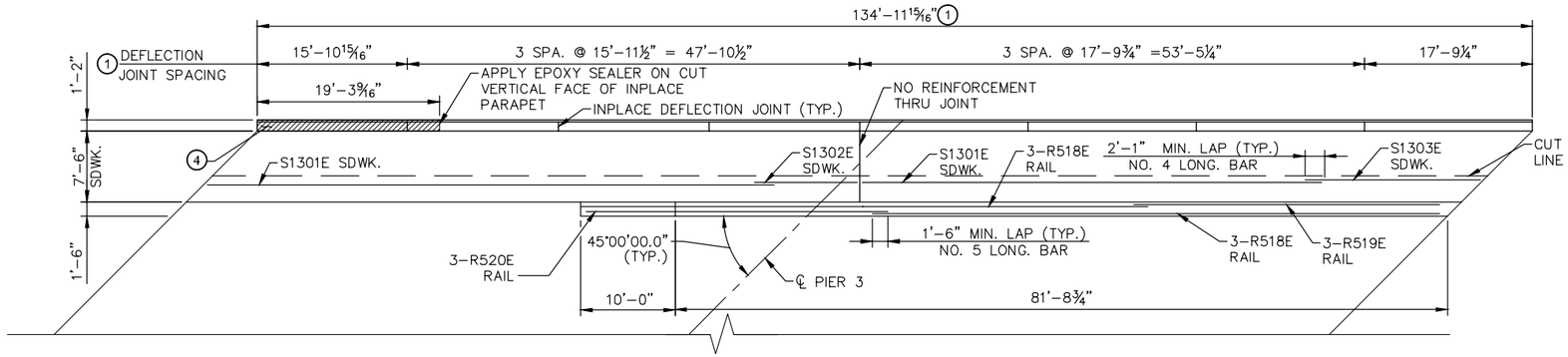
SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4
CSAH 25 (WEST LAKE STREET) (BRIDGE 27037)
BRIDGE MODIFICATIONS
SIDEWALK DETAILS & REINFORCEMENT WEST ABUT. TO PIER 2

DISCIPLINE: STRUCTURES
SHEET NAME: CBR27037-BRM-DTL-002

SHEET 5 OF 13

Aug. 10 2015 11:37 am V:\3400_ADC\CAD\SEGMENT E3\PLAN SHEETS\STRUCTURES\BR27037 MODS\CBR27037-BRM-DTL-002.dwg By: Jim.Kimble



NORTH SIDEWALK PLAN
(PIER 2 TO EAST ABUTMENT)

NOTE:
INPLACE TRANSVERSE, LONGITUDINAL, AND TIE SIDEWALK BARS NOT COMPLETELY EXPOSED TO REMAIN IN PLACE. CLEAN, STRAIGHTEN AND ADJUST AS REQUIRED. COMPLETELY EXPOSED BARS TO BE REMOVED AND DISPOSED OF.

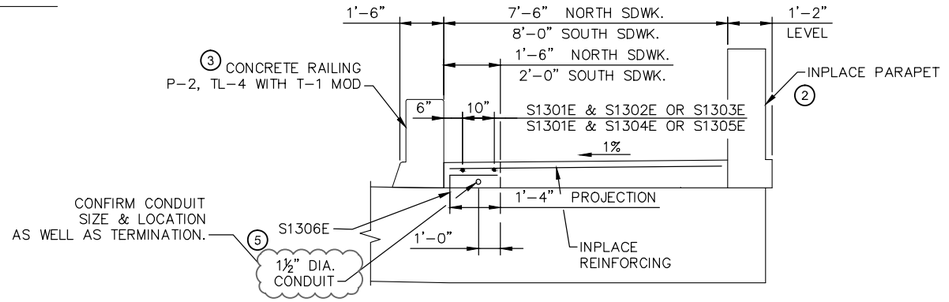
(1) PER ORIGINAL BRIDGE PLAN DATED 12-13-90.

(2) PROPOSED ORNAMENTAL METAL RAILING NOT SHOWN FOR CLARITY SEE SHEET 9.

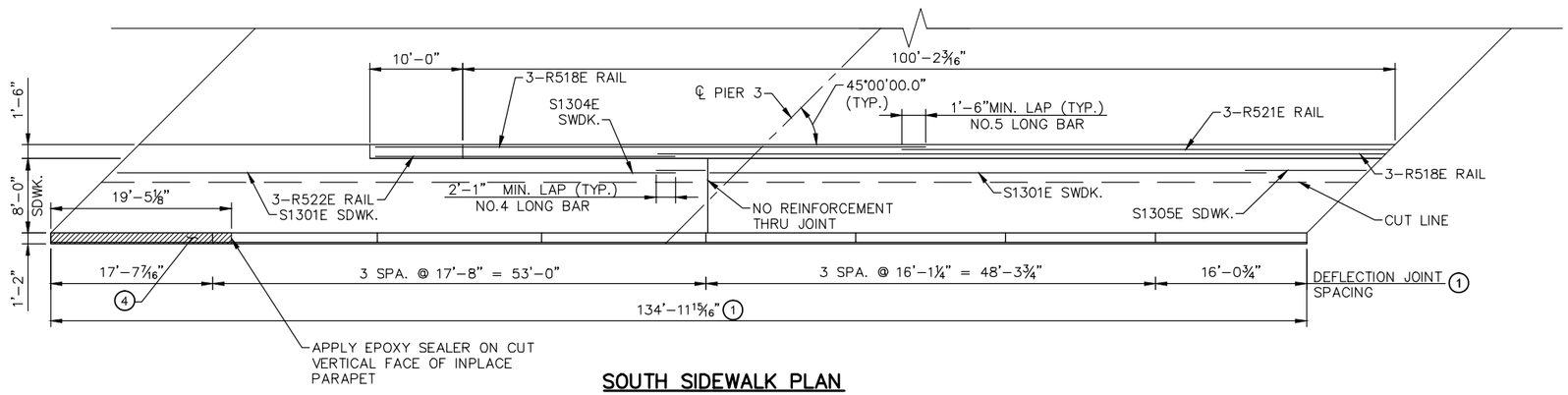
(3) MODIFIED RAILING NOT SHOWN FOR CLARITY, SEE SHEETS 10 & 11.

(4) SECTION OF INPLACE PARAPET TO BE REMOVED FOR VERTICAL CIRCULATOR.

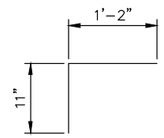
(5) SPACE S1306E TO MATCH INPLACE BARS FROM 1990 PLANS.



TRANSVERSE SECTION THRU SIDEWALK



SOUTH SIDEWALK PLAN
(PIER 2 TO EAST ABUTMENT)



S1306E

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: JCW | CHECKED BY: SAD
DRAWN BY: JIK | DATE: 08/10/15

AECOM Kimley»Horn

60% SUBMISSION - 9/28/15

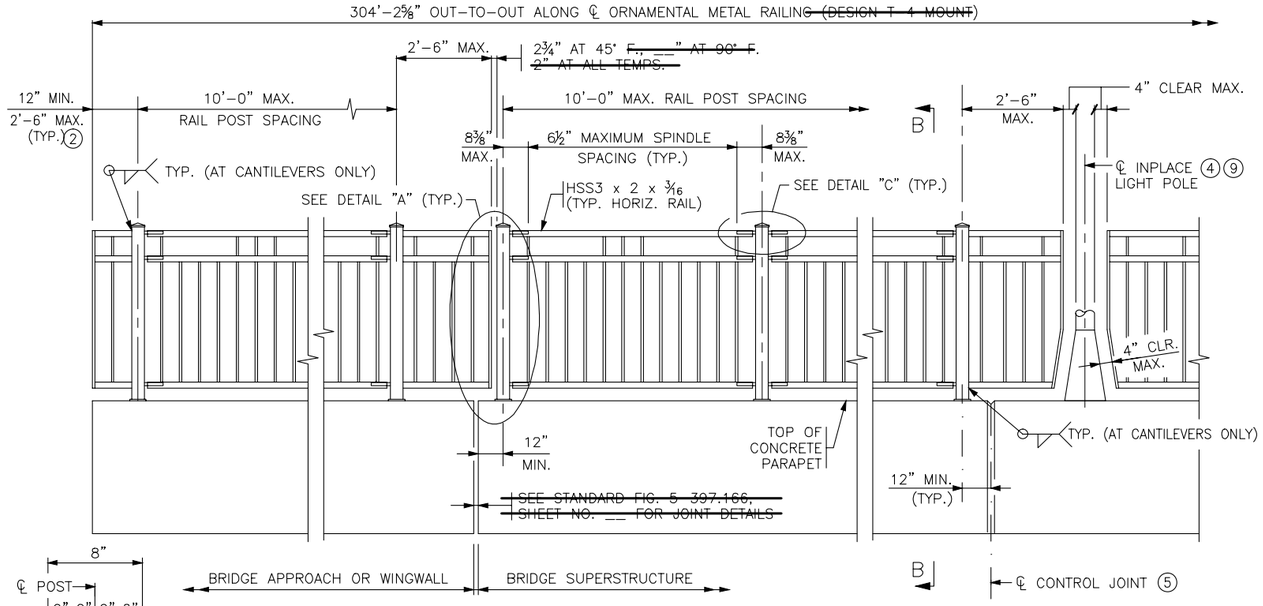
METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

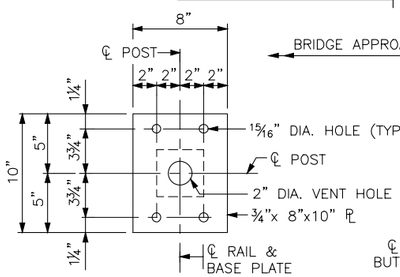
CIVIL EAST - VOLUME 4
CSAH 25 (WEST LAKE STREET) (BRIDGE 27037)
BRIDGE MODIFICATIONS
SIDEWALK DETAILS & REINFORCEMENT PIER 2 TO EAST ABUT.

DISCIPLINE: STRUCTURES
SHEET NAME: CBR27037-BRM-DTL-003

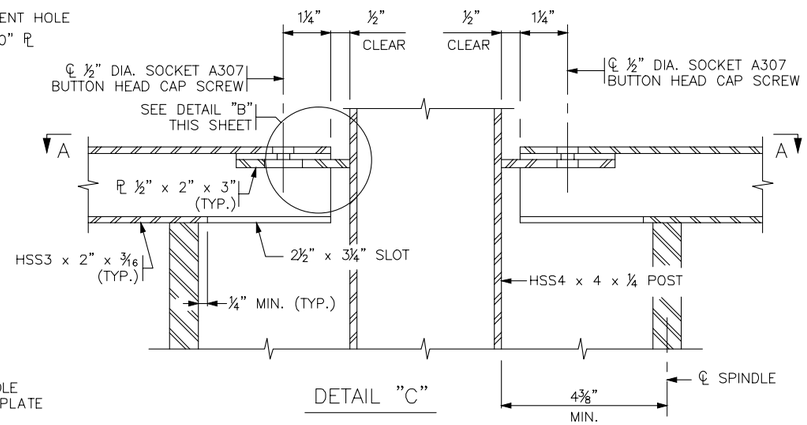
SHEET 6 OF 13



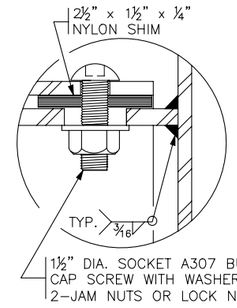
Ⓧ INSIDE ELEVATION OF RAILING



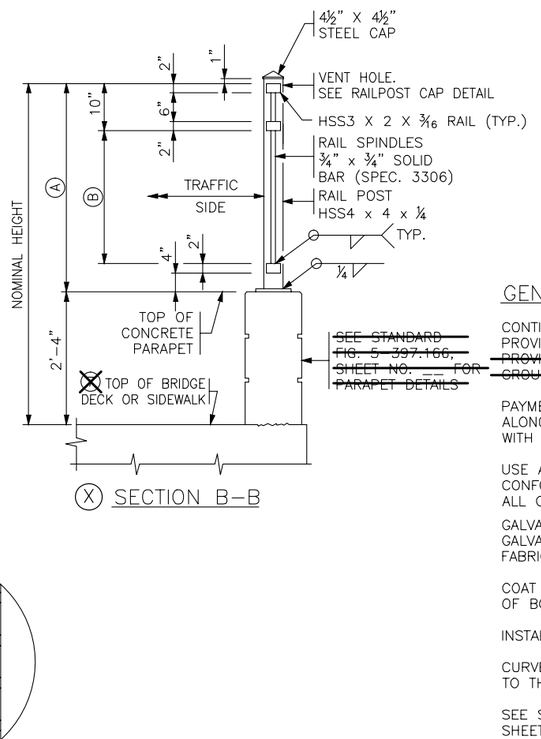
BASE PLATE



DETAIL "C"



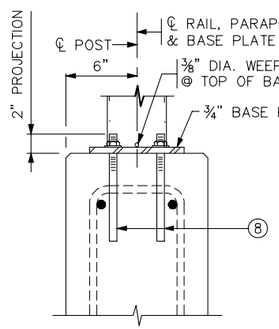
DETAIL "B"



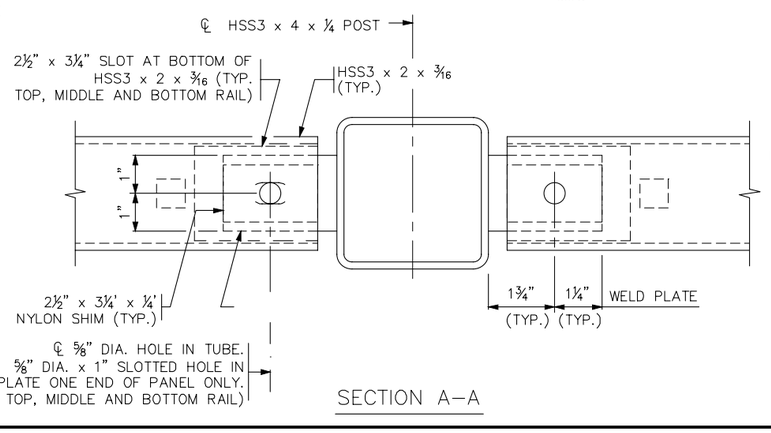
Ⓧ SECTION B-B

RAILING HEIGHT TABLE		
NOMINAL HEIGHT	Ⓐ	Ⓑ
~~4'-6"~~	~~2'-2"~~	~~10"~~
~~6'-0"~~	~~3'-8"~~	~~2'-4"~~
8'-0"	5'-8"	4'-4"

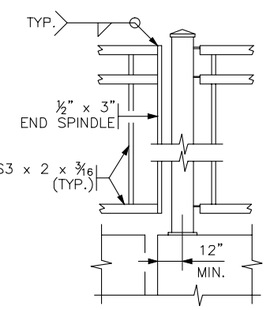
SHEET MODIFICATION:
Ⓧ DENOTES MODIFICATION TO STANDARD SHEET



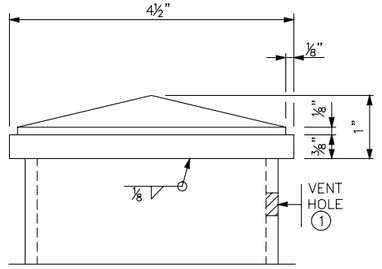
Ⓧ ANCHOR DETAIL



SECTION A-A



DETAIL "A"



RAILPOST CAP DETAIL (6)

GENERAL NOTES

CONTINUOUSLY GROUND ALL METAL RAILINGS; SEE THE SPECIAL PROVISIONS. ~~REFER TO THE ELECTRICAL PLANS AND ELECTRICAL SPECIAL PROVISIONS FOR DETAILS REGARDING BONDING MULTIPLE ELECTRICAL GROUNDING SYSTEMS.~~

PAYMENT LENGTH SHALL BE MEASURED AS THE OUT TO OUT LENGTH ALONG THE CENTERLINE OF THE RAILING BETWEEN THE OUTSIDE ENDS, WITH DEDUCTIONS FOR THE LENGTH OF CONCRETE POSTS, IF PRESENT.

USE A500, GRADE B STRUCTURAL STEEL TUBING (HSS) IN THE RAIL CONFORMING TO SPEC. 3361. FINIAL CAPS SHALL BE SPEC. 3322. ALL OTHER STEEL SHALL CONFORM TO SPEC. 3306.

GALVANIZE BOLTS, NUTS, WASHERS AND ANCHORS PER SPEC. 3392. GALVANIZE ALL OTHER STRUCTURAL STEEL PER SPEC. 3394, AFTER FABRICATION.

COAT THE GALVANIZED RAILING, BASE PLATES, AND PROTRUDING PORTIONS OF BOLTS, NUTS, ANCHORS, AND WASHERS.

INSTALL RAIL POSTS AND SPINDLES ~~[NORMAL TO GRADE OR~~ PLUMB. ~~]~~

CURVE HORIZONTAL RAILS WHERE APPLICABLE AND PLACE RAILS PARALLEL TO THE EDGE OF SIDEWALK PROFILE.

SEE SPECIAL PROVISIONS FOR REQUIREMENTS NOT INCLUDED ON THIS SHEET.

DRILL ½" DIA. MAX. VENT HOLES ON THE UNDERSIDE OF RAIL TUBES AS NECESSARY TO FACILITATE GALVANIZING.

(1) DRILL VENT HOLE IN THE RAIL POST WITHIN 2" OF THE UNDERSIDE OF THE CAP, ON THE NON-TRAFFIC SIDE OF THE POST AS NECESSARY TO FACILITATE GALVANIZING. MAXIMUM HOLE SIZE IS ½" DIA.

(2) PLACE ℄ OF END POST 12" FROM END OF CONCRETE PARAPET IF GUARDRAIL CONNECTION PLATE IS PRESENT.

(3) ~~IF LIGHT POLE IS MOUNTED ON BLISTER, RAILING MAY BE CONTINUOUS IN FRONT OF LIGHT POLE (SEE PARAPET & LIGHT POLE DETAILS).~~

(4) CONTRACTOR TO COORDINATE LIGHT POLE DETAILS WITH THE RAILING FABRICATOR TO ENSURE PROPER CLEARANCES AND RAILING CONFIGURATION ADJACENT TO THE POLE.

(5) SEE 1990 PLAN ~~SUPERSTRUCTURE SHEETS AND STANDARD FIGURE 5-397.166~~ FOR DEFLECTION JOINT SPACING AND DETAILS.

(6) PROVIDE A PYRAMID TOP STYLE STEEL CAP WELDED TO TOP OF POST WITH A SURFACE FINISH OF 1000 MICRO-INCH, OR SMOOTHER, PRIOR TO GALVANIZING.

(7) ~~IF TOP OF RAISED SIDEWALK, SEE SECTION D-D ON STANDARD FIGURE 5-397.166.~~

(8) ADHESIVE ANCHORAGE WITH ⅝" DIA. ANCHOR ROD PER SPEC. 3385, TYPE A WITH HEX NUT AND WASHER. PROVIDE AN ADHESIVE WITH A MINIMUM CHARACTERISTIC BOND STRENGTH IN UNCRACKED CONCRETE OF 1.5 KSI. EMBED THE ANCHORAGE NO LESS THAN 5" REGARDLESS OF CHARACTERISTIC BOND STRENGTH. DRILL THROUGH REINFORCEMENT (IF ENCOUNTERED) TO ACHIEVE MINIMUM EMBEDMENT. ENSURE HEX NUT IS IN CONTACT WITH THE ADJACENT SURFACE AND TORQUE TO 60 FT-LBS UNLESS A HIGHER TORQUE IS RECOMMENDED BY THE MANUFACTURER. PROOF LOAD TO 6.9 KIPS. SEE SPECIAL PROVISIONS FOR ADDITIONAL REQUIREMENTS.

(9) FOR LOCATION OF INPLACE LIGHT POLES SEE 1990 PLANS.

DRAFT-WORK IN PROCESS

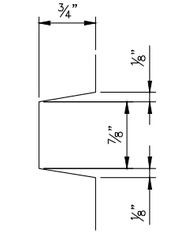
REVISION: 11-20-2014

APPROVED: NOVEMBER 6, 2013
Nancy Dorbenberger
STATE BRIDGE ENGINEER

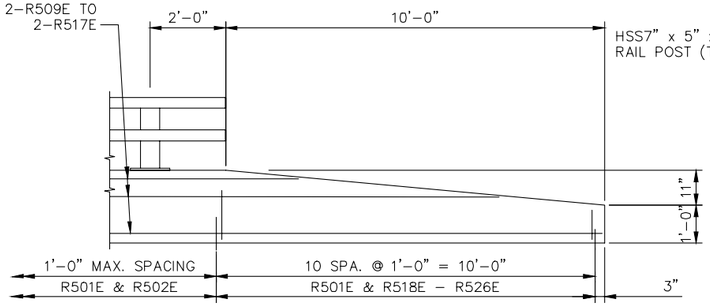
CERTIFIED BY _____ LICENSED PROFESSIONAL ENGINEER _____ DATE
NAME: LIC. NO.

TITLE: ORNAMENTAL METAL RAILING ~~(DESIGN T-4 PARAPET MOUNT)~~

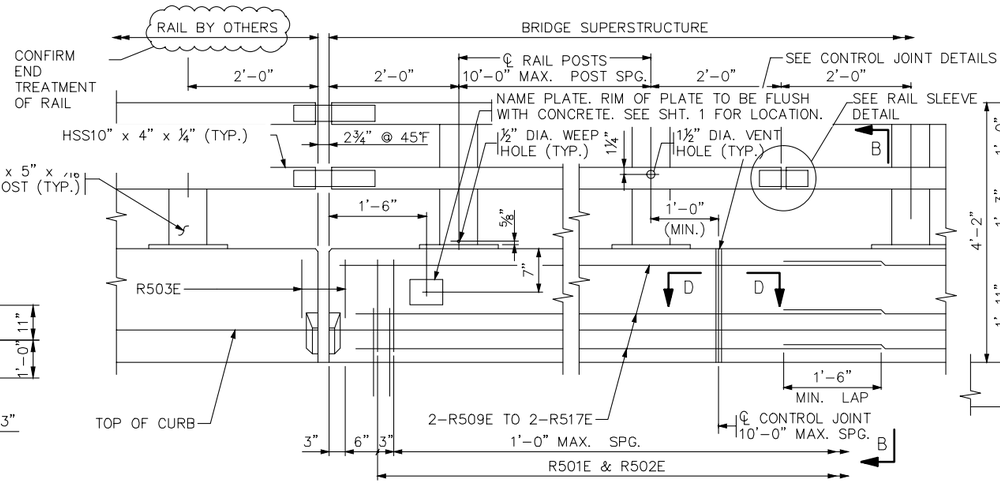
DES: JCW	DR: JIK	APPROVED:	FIG. 5-397.162 (MOD.)
CHK: SAD	CHK: _____		
SHEET NO. 7 OF 13 SHEETS			BRIDGE NO. 27037



RAIL RUSTICATION



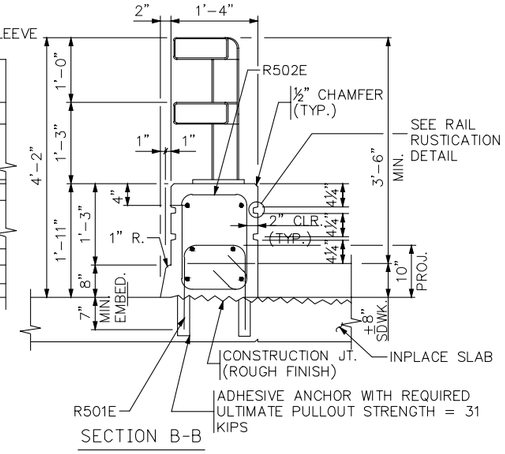
END RAIL ELEVATION



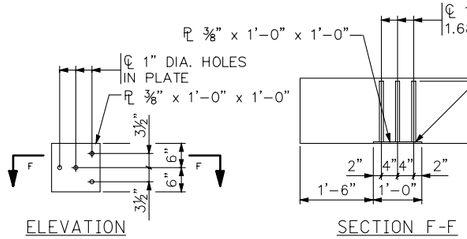
EXPANSION JOINT

DEVICE NOT SHOWN

CONTROL JOINT



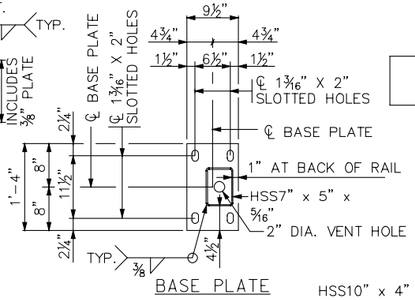
SECTION B-B



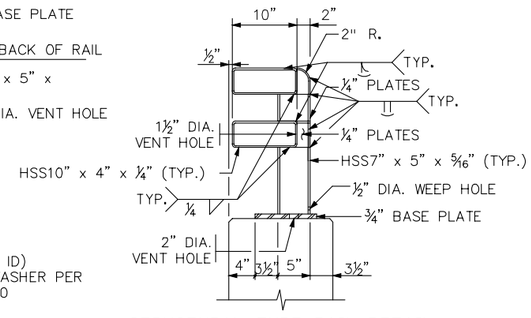
ELEVATION SECTION F-F

GUARDRAIL CONNECTION DETAIL

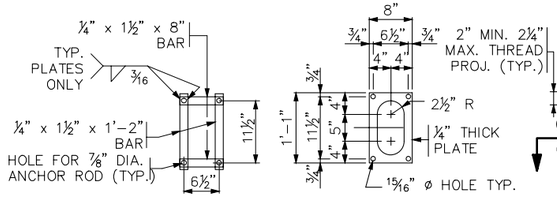
GALVANIZE AFTER FABRICATION PER Mn/DOT SPEC. 3394
ESTIMATED WEIGHT = 22 LBS.



BASE PLATE

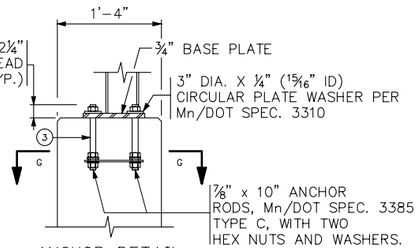


STRUCTURAL TUBE RAIL DETAIL

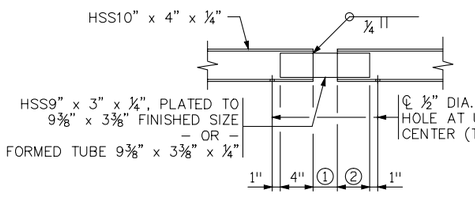


SECTION G-G
ANCHOR BAR ALTERNATE

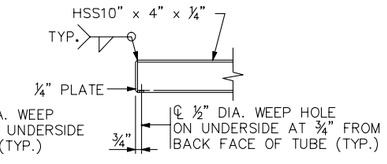
SECTION G-G
ANCHOR PLATE ALTERNATE



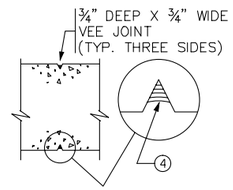
ANCHOR DETAIL



RAIL SLEEVE DETAIL



RAIL END DETAIL



SECTION D-D

CONTROL JOINT DETAILS

INSIDE ELEVATION OF RAILING

CONCRETE WEARING COURSE NOT SHOWN

RAIL MEETS TEST LEVEL 4
REQUIREMENTS OF NCHRP REPORT 350

GENERAL NOTES

FOR PAYMENT OF "TYPE P-2 (TL-4) BARRIER CONCRETE (3Y46)" MEASURE LENGTH OF CONCRETE BARRIER BETWEEN END FACES. CONCRETE PARAPET = 396 LBS./FT. (0.098 CU. YDS./FT.)

FOR PAYMENT OF "STRUCTURAL TUBE RAILING DESIGN T-1 (MOD.)" MEASURE LENGTH OF RAIL FROM END TO END OF TUBING. DO NOT DEDUCT FOR JOINTS.

FINISH ALL EDGES OF RAIL WITH ½" CHAMFER, EXCEPT WHERE OTHERWISE NOTED.

MAX. SPACING OF CONCRETE CONTROL JOINTS SHALL BE 10 FT.

PROVIDE CORRECT ALIGNMENT FOR ANCHORAGES BY PLACING THEM ACCURATELY AND NORMAL TO GRADE. SEE SPECIAL PROVISIONS.

PROVIDE STRUCTURAL STEEL AND PLATE WASHERS PER Mn/DOT SPEC. 3310. PROVIDE STRUCTURAL TUBES PER A.S.T.M. A500, GRADE B AS SPECIFIED IN Mn/DOT SPEC. 3361.

CONFIRM RAIL FINISH

GALVANIZE BOLTS, NUTS, AND WASHERS PER Mn/DOT SPEC. 3392.

GALVANIZE ALL OTHER STRUCTURAL STEEL PER Mn/DOT SPEC. 3394, AFTER FABRICATION.

PROVIDE GUARDRAIL CONNECTION STRUCTURAL STEEL PER Mn/DOT SPEC. 3306.

ALL MATERIAL IN THE CONCRETE BARRIER IS LISTED IN SUMMARY OF QUANTITIES FOR SUPERSTRUCTURE.

SEE SPECIAL PROVISIONS FOR PAINT REQUIREMENTS.

CONTINUOUSLY GROUND THE METAL RAILING AS DIRECTED IN THE SPECIAL PROVISIONS. REFER TO THE ELECTRICAL PLANS AND ELECTRICAL SPECIAL PROVISIONS FOR DETAILS REGARDING BONDING MULTIPLE ELECTRICAL GROUNDING SYSTEMS.

1. 1" AT RAILING JOINTS. AT EXPANSION JOINTS, MAKE 1" LARGER THAN GAP IN EXPANSION JOINTS.
2. 5" AT RAILING JOINTS AND 8" AT EXPANSION JOINTS.
3. SUBSTITUTION OF CHEMICAL ANCHOR RODS FOR CAST-IN-PLACE ANCHORAGE IS NOT PERMITTED.
4. SEE SPECIAL PROVISIONS FOR JOINT SEALING REQUIREMENTS.

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: JCW | CHECKED BY: SAD
DRAWN BY: JIK | DATE: 08/10/15

AECOM Kimley»Horn

60% SUBMISSION - 9/28/15

METROPOLITAN COUNCIL

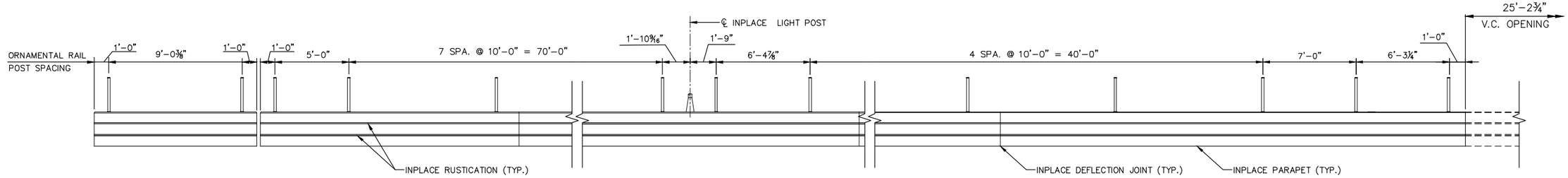
SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4
CSAH 25 (WEST LAKE STREET) (BRIDGE 27037)
BRIDGE MODIFICATIONS
STRUCTURAL TUBE RAILING DETAILS

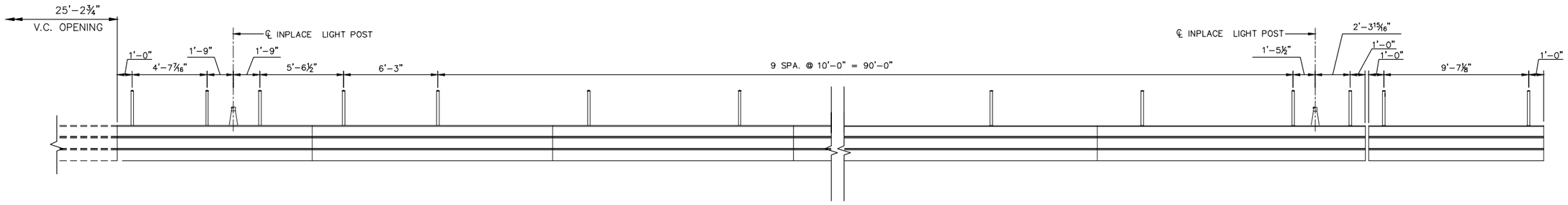
DISCIPLINE: STRUCTURES
SHEET NAME: CBR27037-BRM-DTL-005

SHEET 8 OF 13

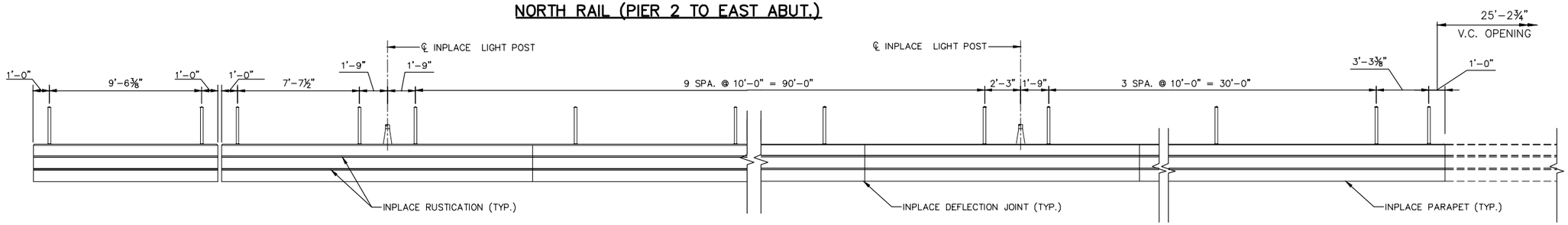
Aug, 10 2015 11:38 am v:\3400_ADC\CAD\SEGMENT E3\PLAN SHEETS\STRUCTURES\BR27037 MODS\CBR27037-BRM-DTL-005.dwg By: Jim.Kimble



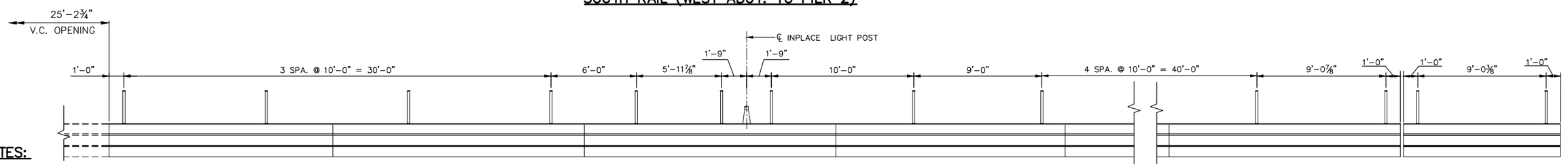
NORTH RAIL (WEST ABUT. TO PIER 2)



NORTH RAIL (PIER 2 TO EAST ABUT.)



SOUTH RAIL (WEST ABUT. TO PIER 2)



NOTES:

SEE SHEETS 5 & 6 FOR PARAPET DEFLECTION JOINT SPACING.

ORNAMENTAL METAL RAILING HORIZONTAL AND SPINDLES NOT SHOWN FOR CLARITY.

SOUTH RAIL (PIER 2 TO EAST ABUT.)

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: JCW | CHECKED BY: SAD
DRAWN BY: JIK | DATE: 08/10/15

AECOM Kimley»Horn

60% SUBMISSION - 9/28/15

METROPOLITAN COUNCIL

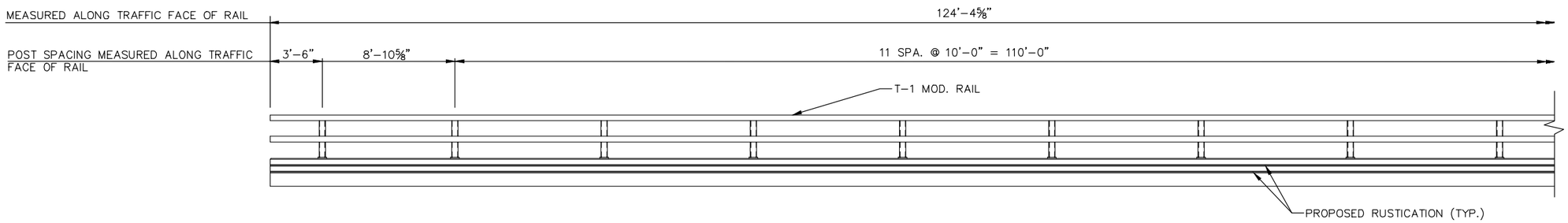
SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4
CSAH 25 (WEST LAKE STREET) (BRIDGE 27037)
BRIDGE MODIFICATIONS
ORNAMENTAL METAL RAILING ELEVATIONS

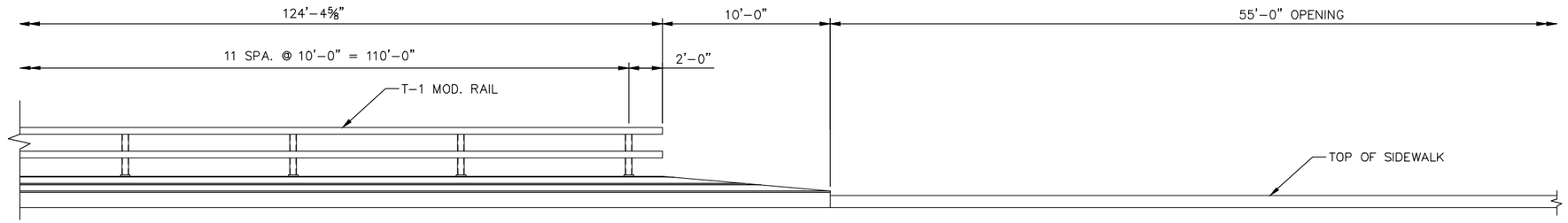
DISCIPLINE: STRUCTURES
SHEET NAME: CBR27037-BRM-DTL-006

SHEET 9 OF 13

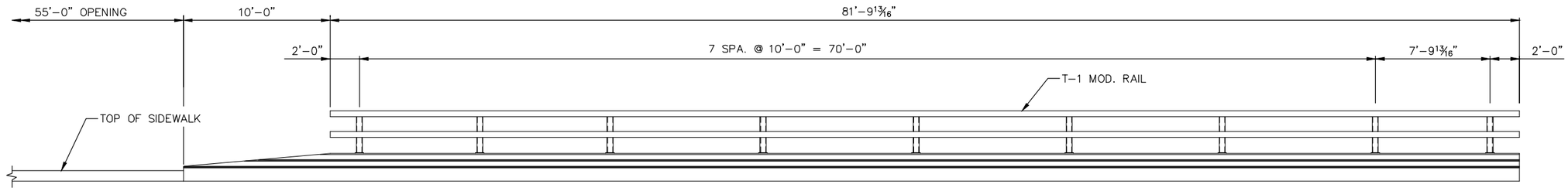
Aug. 10 2015 11:38 am V:\3400_ADC\CAD\SEGMENT E3\PLAN SHEETS\STRUCTURES\BR27037 MODS\CBR27037-BRM-DTL-006.dwg By: Jim.Kimble



PROPOSED CONCRETE RAILING ELEVATION
(NORTH RAIL)



PROPOSED CONCRETE RAILING ELEVATION
(NORTH RAIL)



PROPOSED CONCRETE RAILING ELEVATION
(NORTH RAIL)

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: JCW | CHECKED BY: SAD
DRAWN BY: JIK | DATE: 08/10/15

AECOM Kimley»Horn

60% SUBMISSION - 9/28/15

METROPOLITAN COUNCIL

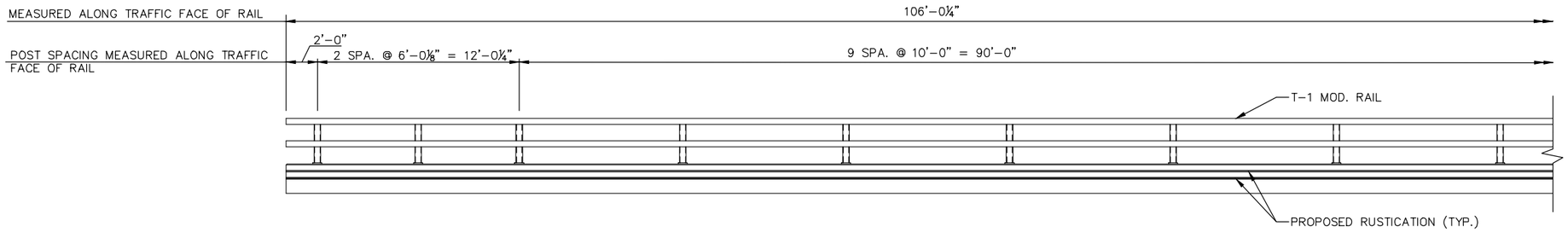
SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4
CSAH 25 (WEST LAKE STREET) (BRIDGE 27037)
BRIDGE MODIFICATIONS
NORTH RAIL ELEVATION

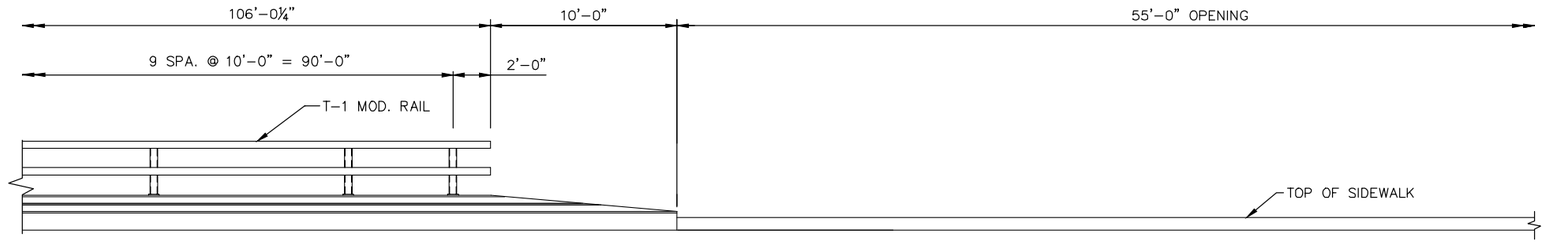
DISCIPLINE: STRUCTURES
SHEET NAME: CBR27037-BRM-DTL-007

SHEET 10 OF 13

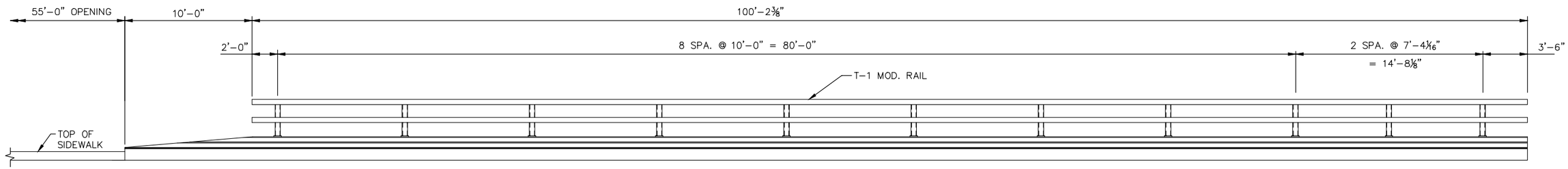
Aug, 10 2015 11:38 am V:\3400_ADC\CAD\SEGMENT E3\PLAN SHEETS\STRUCTURES\BR27037 MODS\CBR27037-BRM-DTL-007.dwg By: Jim.Kimble



PROPOSED CONCRETE RAILING ELEVATION
(SOUTH RAIL)



PROPOSED CONCRETE RAILING ELEVATION
(SOUTH RAIL)



PROPOSED CONCRETE RAILING ELEVATION
(SOUTH RAIL)

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: JCW | CHECKED BY: SAD
DRAWN BY: JIK | DATE: 08/10/15

AECOM Kimley»Horn

60% SUBMISSION - 9/28/15

METROPOLITAN COUNCIL

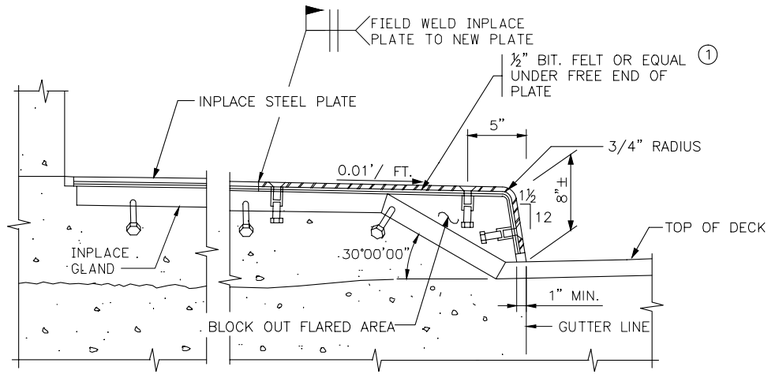
SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4
CSAH 25 (WEST LAKE STREET) (BRIDGE 27037)
BRIDGE MODIFICATIONS
SOUTH RAIL ELEVATIONS

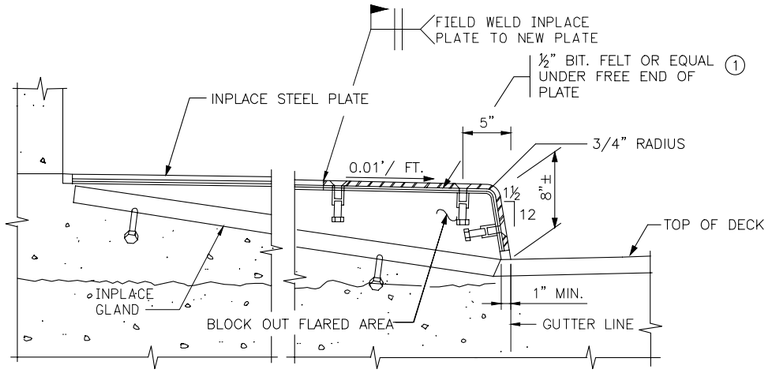
DISCIPLINE: STRUCTURES
SHEET NAME: CBR27037-BRM-DTL-008

SHEET 11 OF 13

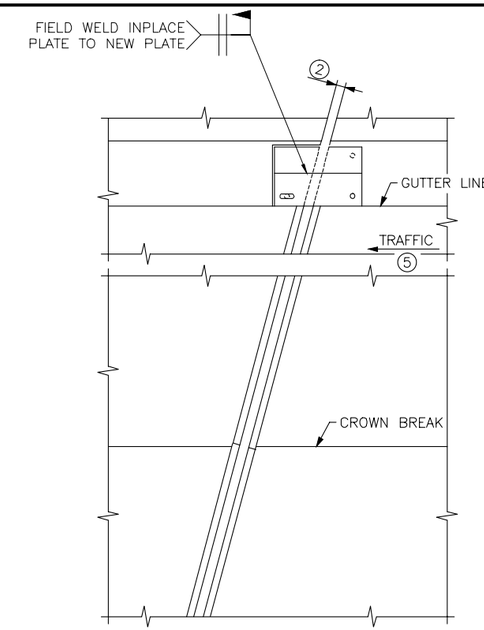
Aug, 10 2015 11:39 am V:\3400_ADC\CAD\SEGMENT E3\PLAN SHEETS\STRUCTURES\BR27037 MODS\CBR27037-BRM-DTL-008.dwg By: Jim.Kimble



SECTION THROUGH RAISED SIDEWALK – OPTION 1

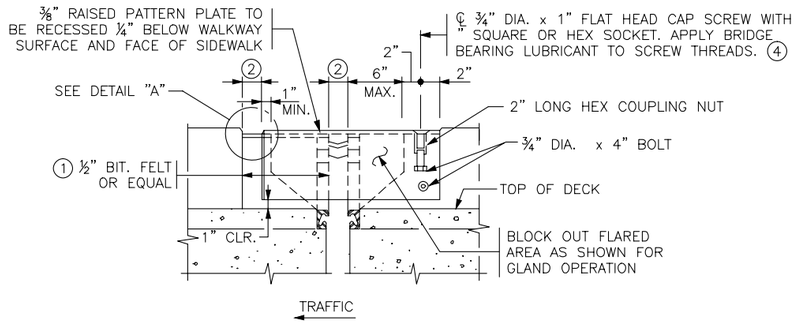


SECTION THROUGH RAISED SIDEWALK – OPTION 2



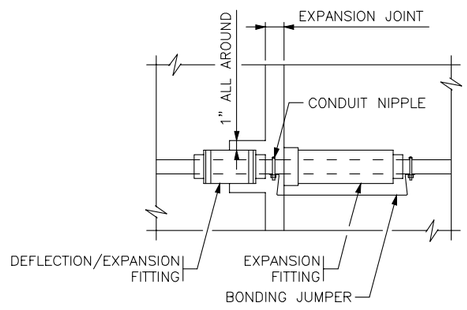
PLAN VIEW @ EXPANSION DEVICE

WITH STRAIGHT DEVICE

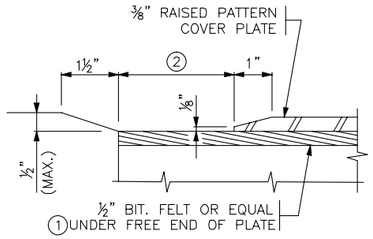


ELEVATION

RAISED SIDEWALK DETAILS



COMBINATION DEFLECTION/EXPANSION FITTING



DETAIL "A"

GENERAL NOTES

¾" DIA. X 1" FLAT HEAD CAP SCREW WITH " SQUARE OR HEX SOCKET PER SPEC 3391. CAP SCREWS SHALL BE COUNTERSUNK 1/16" BELOW TOP OF PLATE. APPLY BRIDGE BEARING LUBRICANT TO SCREW THREADS. ④

GALVANIZE STRUCTURAL STEEL AFTER FABRICATION AS PER SPEC. 3394. GALVANIZE FASTENERS AS PER SPEC. 3392.

STRUCTURAL STEEL SHALL COMPLY WITH SPEC. 3306 OR SPEC. 3309.

BOND AND GROUND THE CONDUIT SYSTEM IN ACCORDANCE WITH THE APPLICABLE PORTIONS OF MnDOT SPEC 2545.3R.

① USE LARGEST SINGLE PIECE POSSIBLE. USE OF SMALL PIECES OR SCRAPS SECURED TOGETHER IS PROHIBITED.

② 2¾" @ 45° F.

③ ⅜" (¼" MAX.).

④ LUBRICANT PER MnDOT APPROVED/QUALIFIED PRODUCTS LIST: BRIDGE – BRIDGE BEARING LUBRICANT.

⑤ SEE SHEET NO. 1 FOR DIRECTION OF TRAFFIC.

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: JCW | CHECKED BY: SAD
DRAWN BY: JIK | DATE: 07/27/15

AECOM Kimley»Horn

60% SUBMISSION - 9/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4
CSAH 25 (WEST LAKE STREET) (BRIDGE 27037)
BRIDGE MODIFICATIONS
SIDEWALK DETAILS

DISCIPLINE: STRUCTURES
SHEET NAME: CBR27037-BRM-DTL-009

SHEET 12 OF 13

Aug, 10 2015 11:39 am V:\3400_ADC\CAD\SEGMENT E3\PLAN SHEETS\STRUCTURES\BR27037 MODS\CBR27037-BRM-DTL-009.dwg By: Jim.Kimble

CONCRETE WEARING COURSE

☐ LOW SLUMP

☐ OTHER _____
TYPE OR MANUFACTURER

EXPANSION JOINTS

JOINT MANUFACTURER

MANUFACTURER'S IDENTIFICATION _____
MFR'S No. AND/OR LETTER DESIGNATION FOR JOINT USED

GLAND MANUFACTURER _____
NAME AND ADDRESS (CITY, STATE)

SIZE OF GLAND _____

MANUFACTURER'S IDENTIFICATION _____
MFR'S No. AND/OR LETTER DESIGNATION FOR GLAND USED

ELASTOMERIC BEARING PADS

PAD MANUFACTURER _____
NAME AND ADDRESS (CITY, STATE)

SPECIAL SURFACE FINISH

SYSTEM: _____ COLOR: _____

FINISHING ROADWAY FACES OF BARRIER RAILING

TYPE: _____ COLOR: _____

ANTI-GRAFFITI COATING

MANUFACTURER _____
NAME AND ADDRESS (CITY, STATE)

PRODUCT NAME: _____ LOCATION: _____

PAINT SYSTEM

Mn/DOT SPECIFICATION NUMBER _____
2478 OR 2479 OR OTHER

MANUFACTURER _____
NAME AND ADDRESS (CITY, STATE)

PRIME COAT _____
Mn/DOT MATERIAL SPECIFICATION NUMBER

INTERMEDIATE COAT _____
Mn/DOT MATERIAL SPECIFICATION NUMBER

FINISH COAT _____ _____
Mn/DOT MATERIAL SPECIFICATION NUMBER COLOR

PLAN QUALITY

RATE 1 (AGREE), 2 (NEUTRAL), OR 3 (DISAGREE, PLEASE COMMENT BELOW)

DIMENSIONING AND DETAILING ADEQUATELY DESCRIBED REQUIRED CONSTRUCTION. _____
BAR LISTS AND QUANTITIES WERE TYPICALLY COMPLETE AND FREE OF ERRORS. _____
SCALE OF DRAWINGS AND OVERALL LEGIBILITY OF LINES AND TEXT WAS GOOD. _____
(SB) SPECIAL PROVISIONS ADEQUATELY DESCRIBED SPECIAL WORK AND PAYMENT. _____

COMMENTS: _____

NUMBER OF BRIDGE SUPPLEMENTAL AGREEMENTS: _____ COST: $ _____

LIST SIGNIFICANT ERRORS OR OMISSIONS IN PLAN DETAILS OR PAY QUANTITIES IN THE SPACE PROVIDED AT RIGHT.

BRIDGE REMOVAL / BRIDGE OPENING

NUMBER OF AND DATE OLD BRIDGE WAS REMOVED (IF APPLICABLE):

BRIDGE NUMBER _____ DATE REMOVED _____

DATE NEW BRIDGE WAS OPENED TO TRAFFIC _____

NOTIFY THE BRIDGE OFFICE BRIDGE MANAGEMENT UNIT WITH THIS INFORMATION AS SOON AS POSSIBLE. (651) 366-4557

OTHER ITEMS ①

① UTILITIES ADDED DURING CONSTRUCTION AND SPECIALTY ITEMS.

FINAL QUANTITIES ENTERED ON SCHEDULE OF QUANTITIES: YES ☐ NO ☐

SUMMARY OF SIGNIFICANT AS-BUILT CHANGES

THE AS-BUILT INFORMATION WAS ADDED TO THE PLAN BY:

_____ _____
INSPECTOR(S) SIGNATURE DATE

CHECKED BY: _____ _____
PROJECT ENGINEER/SUPERVISOR SIGNATURE DATE

DRAFT-WORK IN PROCESS

AT THE TIME OF THE FINAL, THIS COMPLETED AS-BUILT BRIDGE DATA SHEET MUST BE SUBMITTED TO THE BRIDGE OFFICE - ATTN: REGIONAL CONSTRUCTION ENGINEER (MS610).

REVISION: 10-28-2008

APPROVED: SEPTEMBER 26, 2003
Daniel L Hagen
STATE BRIDGE ENGINEER

AS-BUILT DETAILS
(AS NEEDED)

FIG. 5-397.900

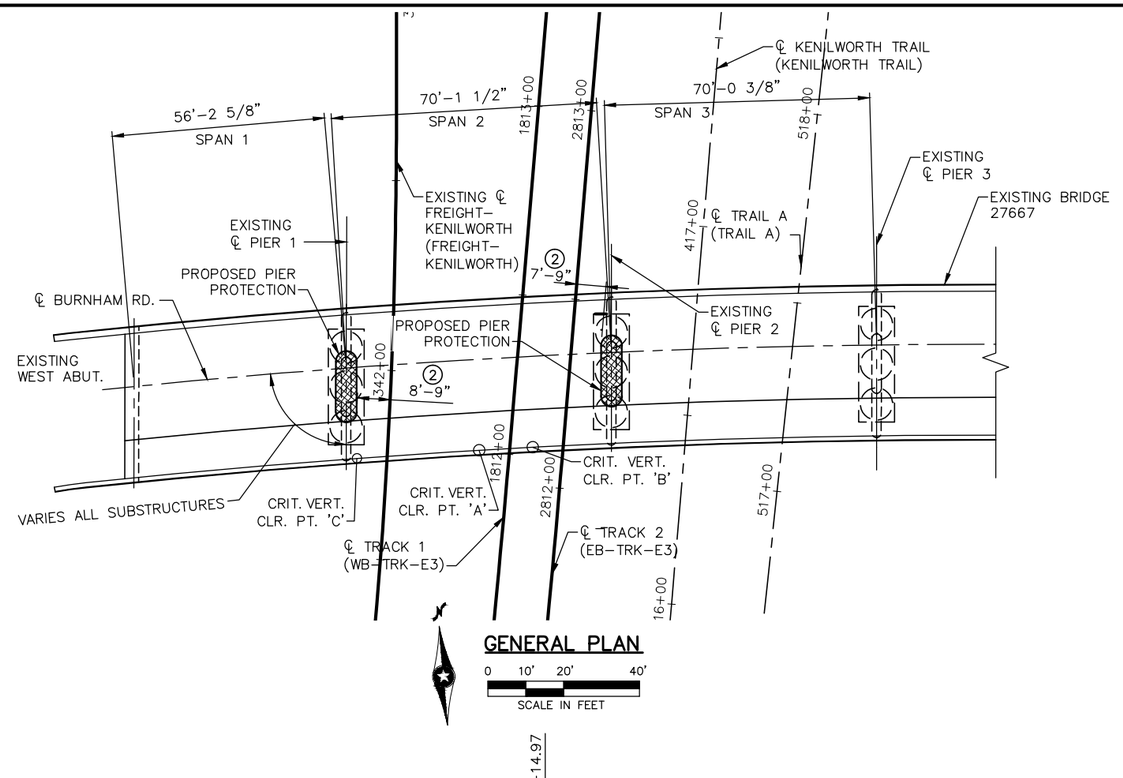
TITLE: AS-BUILT BRIDGE DATA

DES: ------ DR: ------
CHK: ------ CHK: ------

APPROVED:

SHEET NO. 13 OF 13 SHEETS

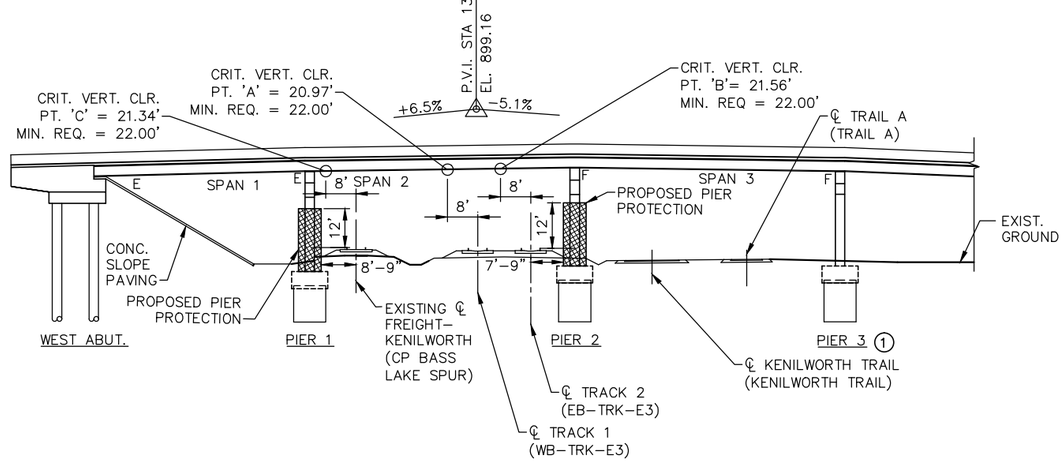
BRIDGE NO. 27037



GENERAL PLAN

0 10' 20' 40'

SCALE IN FEET



GENERAL ELEVATION

0 10' 20' 40'

SCALE IN FEET

DESIGN DATA

2014 AND CURRENT INTERIM AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS

2014 AREMA MANUAL FOR RAILWAY ENGINEERING

MNDOT DRAFT PIER PROTECTION POLICY (MARCH 15, 2015)

LOAD AND RESISTANCE FACTOR DESIGN METHOD

RAILWAY COLLISION LOAD = 600 KIP

MATERIAL DESIGN PROPERTIES:
REINFORCED CONCRETE:
f'c = 4000 PSI n = 8
fy = 60000 PSI REINFORCEMENT

SOUTHWEST LIGHT RAIL TRANSIT DESIGN CRITERIA (REVISION 4.0)

LIST OF SHEETS

SCHEDULE OF QUANTITIES OF PIER PROTECTION

ITEM NO.	DESCRIPTION	UNIT	QUANITIES
2401	STRUCTURAL CONCRETE (3Y43)	CU. YD.	
2401	REINFORCEMENT BARS	POUND	
2433	ANCHORAGES TYPE REINF. BARS	EACH	

NOTES:

① PIER PROTECTION NOT REQUIRED ON PIER 3

② HORIZONTAL OFFSET SHOWN IS MEASURED PERPENDICULAR FROM CENTERLINE OF TRACK TO FACE OF PIER PROTECTION AT CLOSEST POINT

PROPOSED PIER PROTECTION

FOR VISUAL QUALITY REQUIREMENTS REFER TO SHEET 4

BRIDGE NO. 27667

BURNHAM ROAD OVER CP RR, SOUTHWEST LRT, KENILWORTH TRAIL, AND TRAIL F.

BRIDGE I.D. NO. 501

GENERAL PLAN AND ELEVATION

SEC 32 T 29N R 24W
CITY OF MINNEAPOLIS HENNEPIN COUNTY

APPROVED: _____ DATE: _____
STATE BRIDGE ENGINEER

DRAFT-WORK IN PROCESS

JOB NO. T9N635 | STATE PROJECT NO. 9909-01 | MNDOT REVIEW: JOE NIETFELD

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AMC | CHECKED BY: LKZ
DRAWN BY: CAD | DATE: 8/6/2015

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

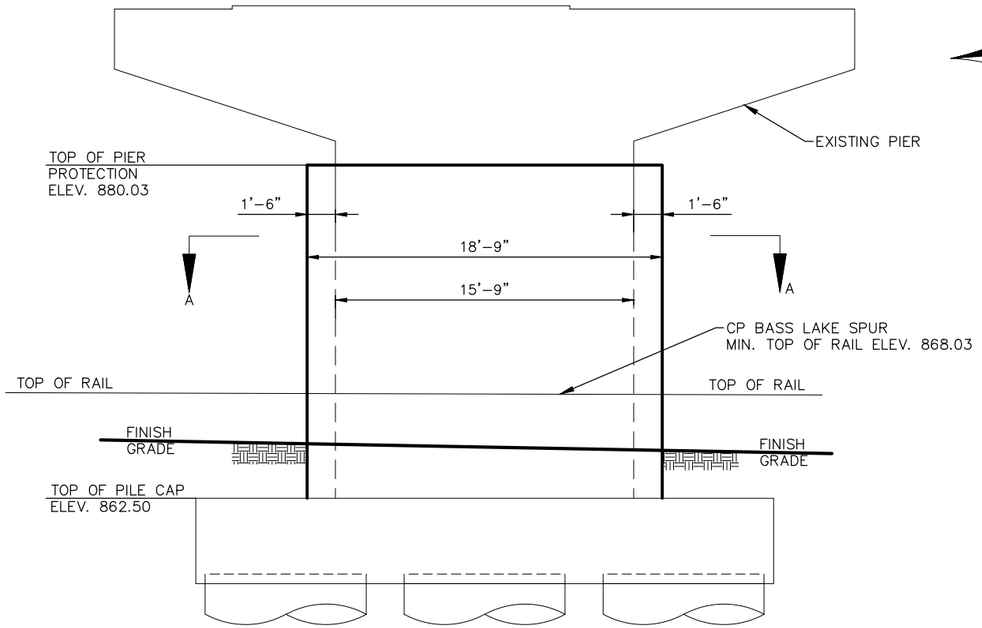
CIVIL EAST - VOLUME 4
BURNHAM ROAD (BRIDGE 27667)
PIER PROTECTION
GENERAL PLAN AND ELEVATION

DISCIPLINE: STRUCTURES

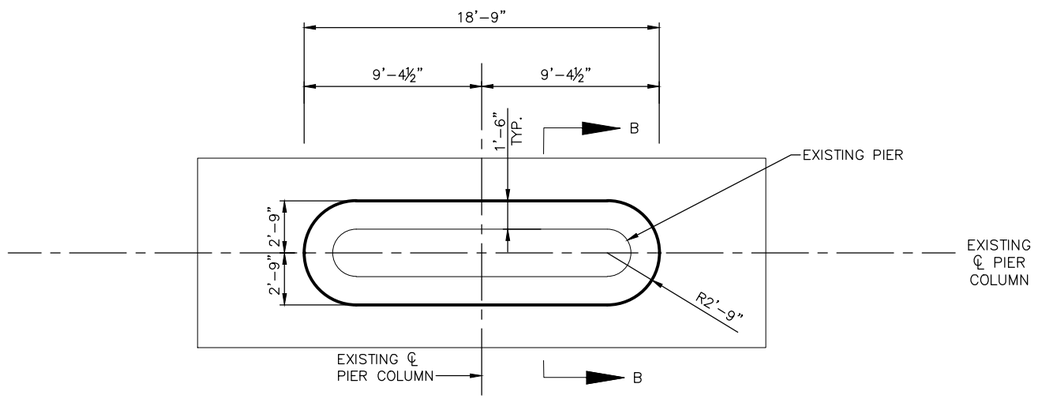
SHEET NAME: EX3-STU-PPR-BRHR-VEH-GPE-001

SHEET 1 OF 4

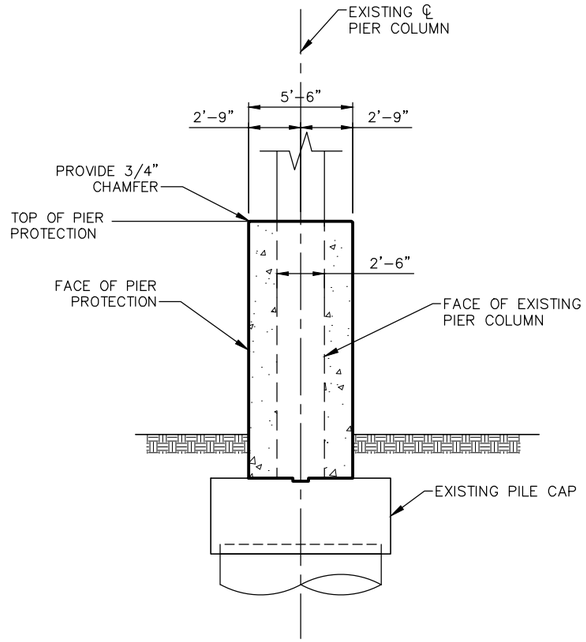
Aug, 10 2015 05:12 pm V:\3400_ADC\CAD\SEGMENT E3\PLAN SHEETS\STRUCTURES\PIER PROTECTION\EX3-STU-PPR-BRHR-VEH-DTL.dwg By: Anne.Cesnik



ELEVATION – PIER 1



SECTION A–A



SECTION B–B

NOTES:

FOR VISUAL QUALITY REQUIREMENTS REFER TO SHEET 4

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AMC | CHECKED BY: LKZ
DRAWN BY: CAD | DATE: 8/6/2015

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

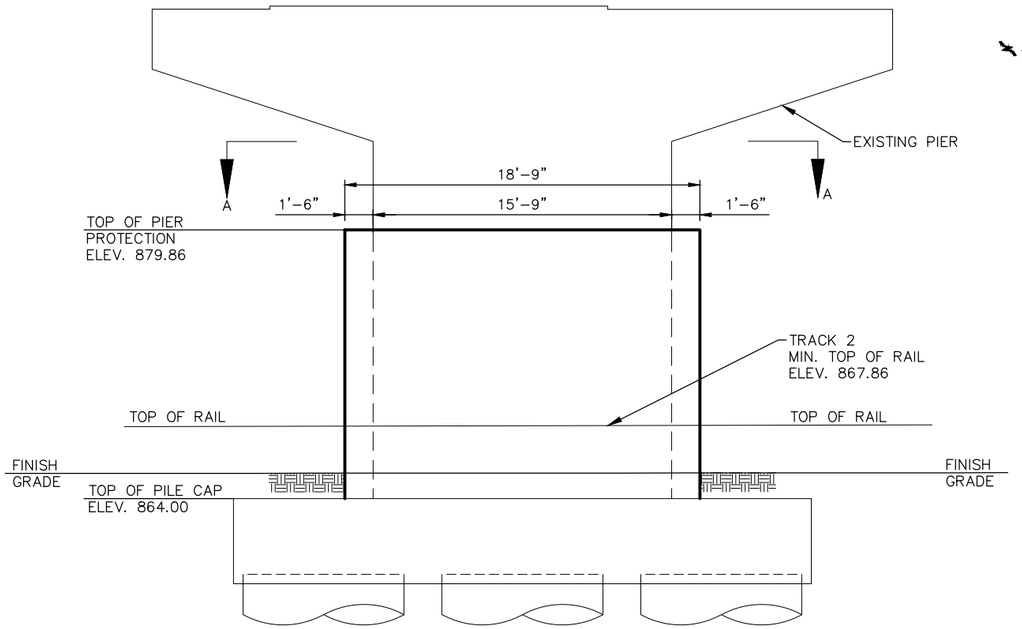
SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4
BURNHAM ROAD (BRIDGE 27667)
PIER PROTECTION
DETAILS (1 OF 2)

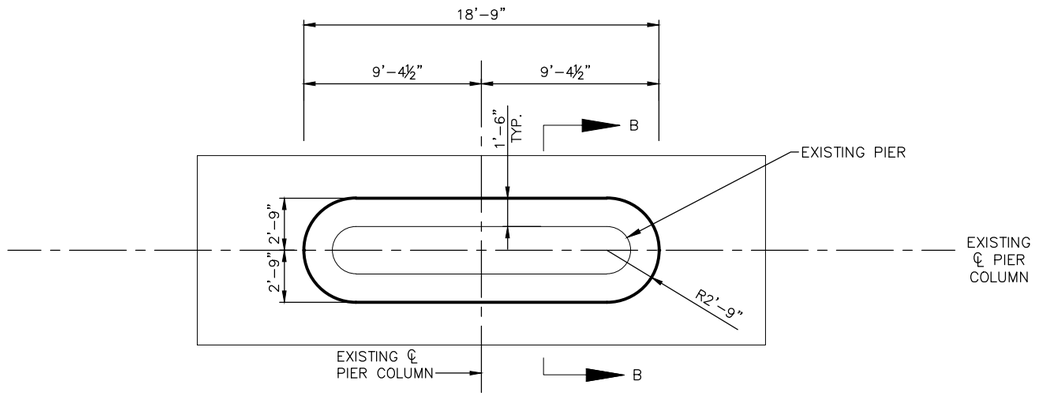
DISCIPLINE: STRUCTURES
SHEET NAME: EX3-STU-PPR-BRHR-VEH-DTL-001

SHEET 2 OF 4

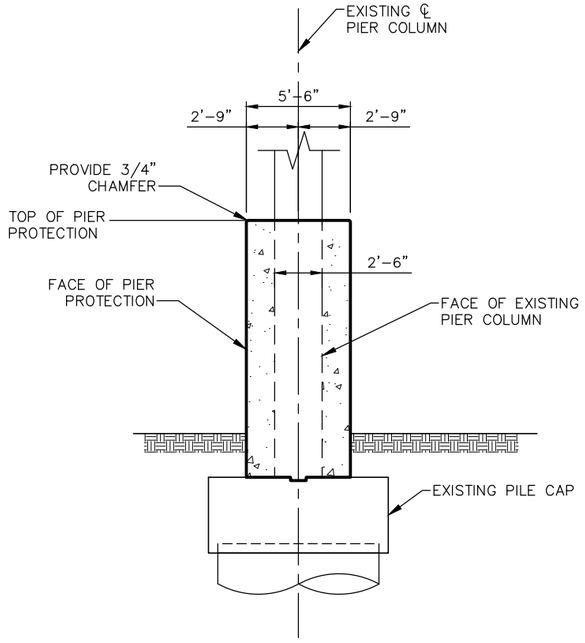
Aug, 10 2015 05:12 pm V:\3400_ADC\CAD\SEGMENT E3\PLAN SHEETS\STRUCTURES\PIER PROTECTION\EX3-STU-PPR-BRHR-VEH-DTL.dwg By: Anne.Cesnik



ELEVATION – PIER 2



SECTION A–A



SECTION B–B

NOTES:

FOR VISUAL QUALITY REQUIREMENTS REFER TO SHEET 4

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AMC | CHECKED BY: LKZ
DRAWN BY: CAD | DATE: 8/6/2015

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

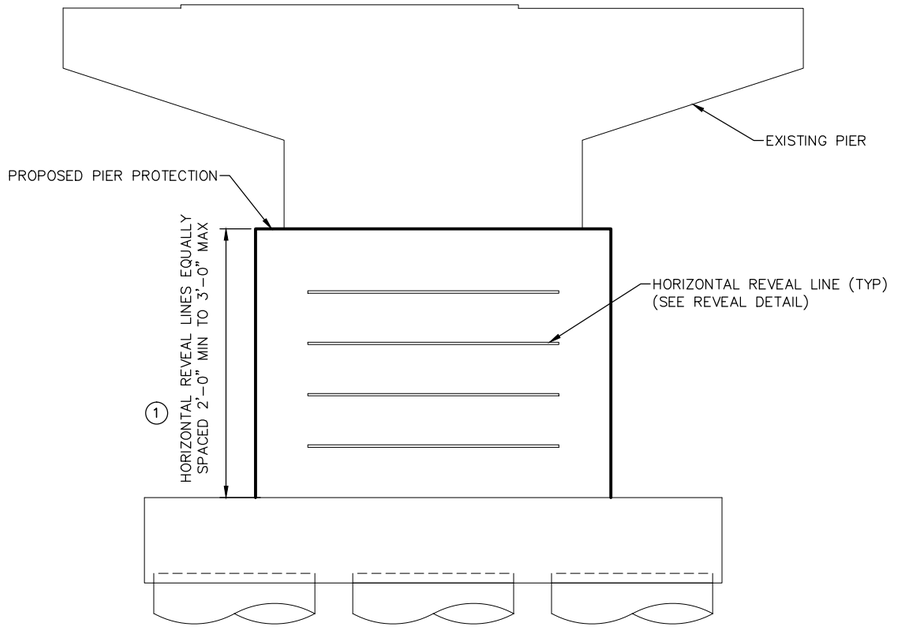
CIVIL EAST - VOLUME 4
BURNHAM ROAD (BRIDGE 27667)
PIER PROTECTION
DETAILS (2 OF 2)

DISCIPLINE: STRUCTURES

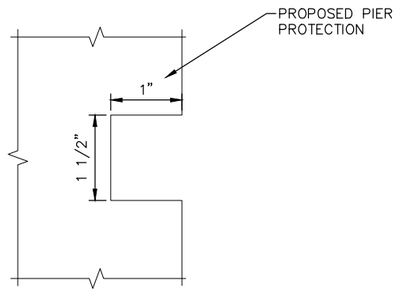
SHEET NAME: EX3-STU-PPR-BRHR-VEH-DTL-002

SHEET 3 OF 4

Aug, 10 2015 05:12 pm V:\3400_ADC\CAD\SEGMENT E3\PLAN SHEETS\STRUCTURES\PIER PROTECTION\EX3-STU-PPR-BRHR-VEH-DTL.dwg By: Anne.Cesnik



ELEVATION–PIER



REVEAL DETAIL

NOTES:

1. PROVIDE HORIZONTAL REVEAL LINES EQUALLY SPACED AS SHOWN ON FRONT AND BACK FACE OF PIER PROTECTION. DISCONTINUE REVEAL LINES AT BEGINNING OF RADIUS AT END OF WALL

   PROVIDE ¾" CHAMFER AT TOP OF PIER PROTECTION

   APPLY ANTI–GRAFFITI COATING TO VISIBLE SURFACES

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AMC | CHECKED BY: LKZ
DRAWN BY: CAD | DATE: 8/6/2015

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

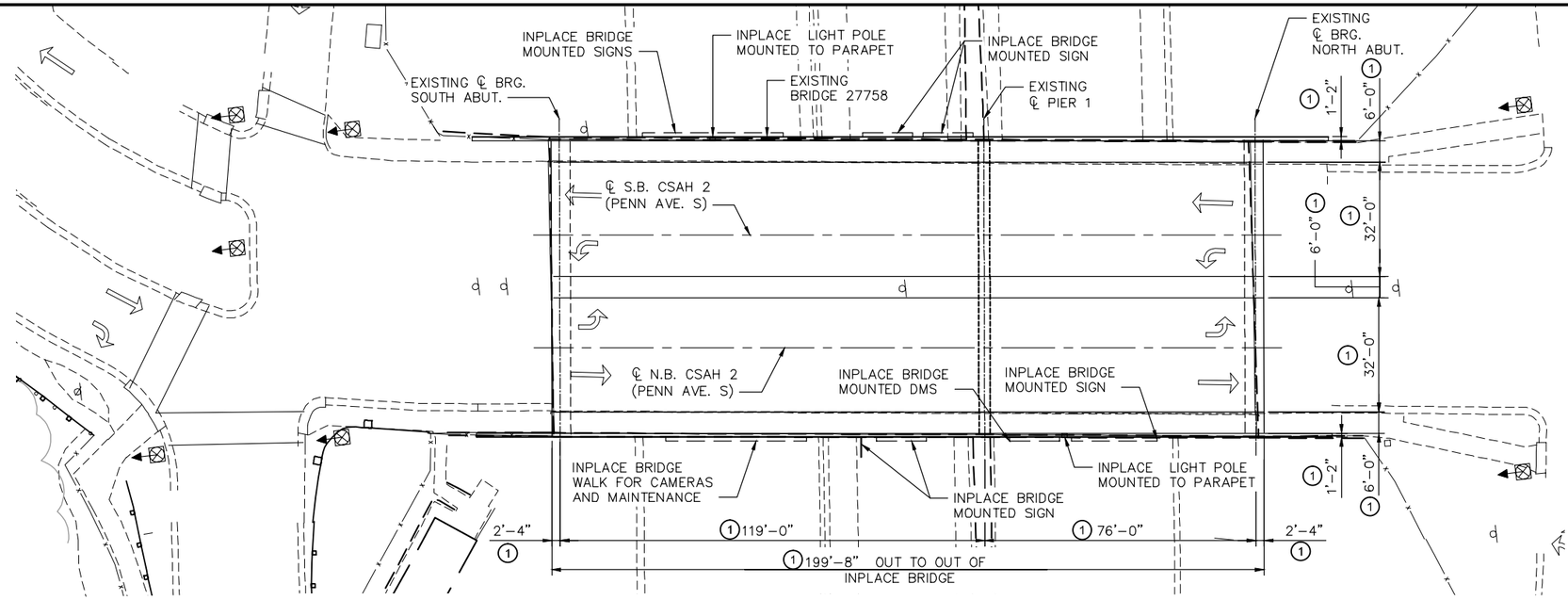
SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4
BURNHAM ROAD (BRIDGE 27667)
PIER PROTECTION
VISUAL QUALITY

DISCIPLINE: STRUCTURES
SHEET NAME: EX3-STU-PPR-BRHR-VEH-PIR-001

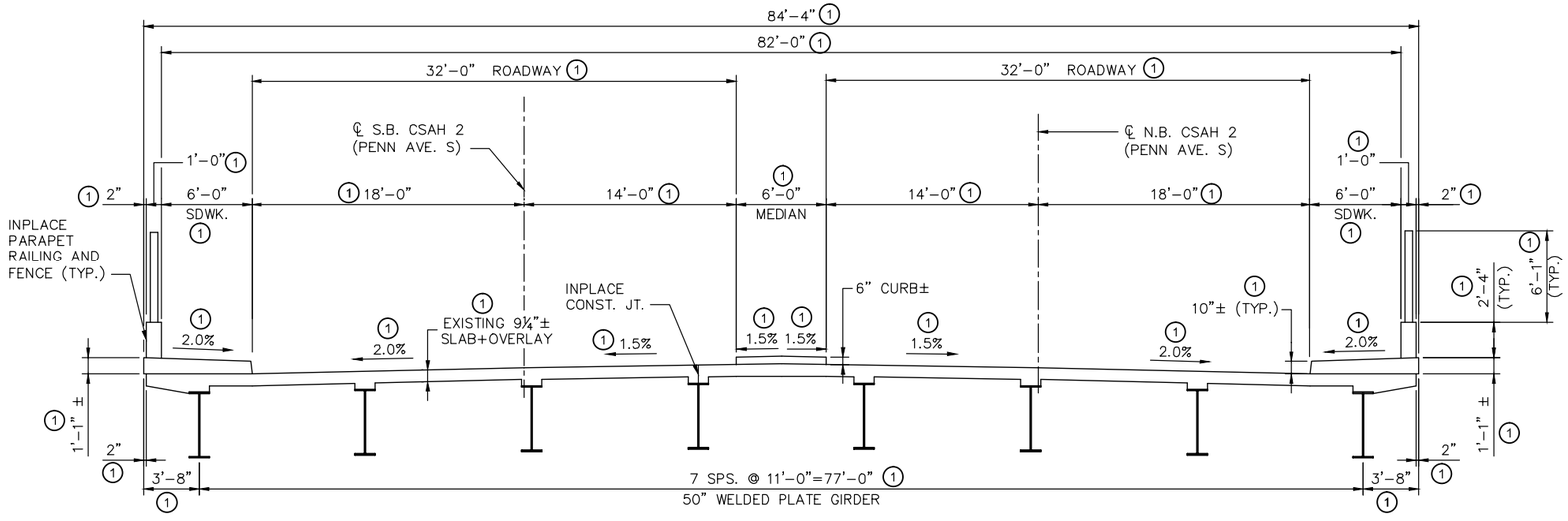
SHEET 4 OF 4

Aug, 10 2015 05:12 pm V:\3400_ADC\CAD\SEGMENT E3\PLAN SHEETS\STRUCTURES\PIER PROTECTION\EX3-STU-PPR-BRHR-VEH-DTL.dwg By: Anne.Cesnik



GENERAL PLAN – EXISTING CONDITION

0 10 20 40
SCALE IN FEET



TRANSVERSE SECTION – EXISTING CONDITION

0 2.5 5 10
SCALE IN FEET

DESIGN DATA

2014 AND CURRENT INTERIM AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS

SOUTHWEST LIGHT RAIL TRANSIT DESIGN CRITERIA (REVISION 4.0)

LOAD AND RESISTANCE FACTOR DESIGN METHOD

MATERIAL DESIGN PROPERTIES:
REINFORCED CONCRETE:
f'c = 4000 PSI n = 8
fy = 60000 PSI REINFORCEMENT

STRUCTURAL STEEL
fy = 50,000 PSI

DESIGN SPEED: OVER = 30 MPH
UNDER = 60 MPH

DECK AREA 16839 SQ. FT.

(2) HL93 LRFR INVENTORY RATING RF 1.086

(2) HL93 LRFR OPERATING RATING RF 1.408

LIST OF SHEETS

(1) PER ORIGINAL BRIDGE PLAN DATED 4-18-86.

(2) LOAD RATING INCLUDES ADDITIONAL INTERMEDIATE DIAPHRAGMS.

BRIDGE NO. 27758

CSAH 2 (PENN AVE S) OVER T.H. 394 LOCATED 1.6 MILES EAST OF JCT. OF TH 100 AND TH 394

BRIDGE I.D. NO. 301

GENERAL PLAN

SEC 29 T 118N R 24W
CITY OF MINNEAPOLIS HENNEPIN COUNTY

APPROVED: _____
STATE BRIDGE ENGINEER DATE

DRAFT-WORK IN PROCESS

JOB NO. T9N635 STATE PROJECT NO. 9909-01 MNDOT REVIEW: JOE NIETFELD

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: JCW CHECKED BY: SAD
DRAWN BY: JIK DATE: 08/10/15

AECOM Kimley»Horn

60% SUBMISSION - 9/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

CIVIL EAST-VOLUME 4
CSAH 2 (PENN AVE S) (BRIDGE 27758)
BRIDGE MODIFICATIONS
EXISTING GENERAL PLAN & SECTIONS

DISCIPLINE: STRUCTURES
SHEET NAME: CBR27758-BRM-GPE-001

SHEET 1 OF 11

CONSTRUCTION NOTES:

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

NO CUTTING WILL BE PERMITTED UNTIL THE CUTTING LIMITS HAVE BEEN OUTLINED BY THE CONTRACTOR AND APPROVED BY THE ENGINEER. REMOVAL AND RECONSTRUCTION SHALL CONFORM TO SPEC. 2433.

THE FIRST TWO DIGITS OF EACH BAR MARK INDICATES THE BAR SIZE. BARS MARKED WITH THE SUFFIX "E" SHALL BE EPOXY COATED IN ACCORDANCE WITH SPEC. 3301.

HATCHED AREAS INDICATE AREAS TO BE REMOVED.

THE CONTRACTOR SHALL FIELD VERIFY INPLACE BRIDGE ELEVATIONS AND DIMENSIONS.

INPLACE CONDUIT IN SIDEWALK TO REMAIN. CARE SHALL BE TAKEN NOT TO DAMAGE THE CONDUIT OR ITS CONTENTS.

THE CONTRACTOR SHALL MAKE FIELD MEASUREMENTS, AS NECESSARY, PRIOR TO FABRICATION OF COVER PLATES TO ASSURE PROPER FIT IN THE FINAL WORK.

INPLACE EXPANSION DEVICE TO REMAIN. CARE SHALL BE TAKEN NOT TO DAMAGE THE EXPANSION DEVICE.

QUANTITY ESTIMATE FOR ENTIRE BRIDGE

	ITEM NO.	ITEM	UNIT	QUANTITY
(1)	2401	SIDEWALK CONCRETE (3F52)	SQ. FT.	
	2401	REINFORCING BARS (EPOXY COATED)	POUND	
	2401	RESURFACE EXISTING PARAPET RAILING EXTERIOR	SQ. FT.	
	2402	ACRYLIC PAINT	SQ. FT.	
	2402	STRUCTURAL STEEL	POUND	
	2404	CHIP SEAL WEARING COURSE	SQ. FT.	
(2)	2433	REMOVE CONCRETE SIDEWALK	SQ. FT.	
(3)	2433	REMOVE CHAIN LINK FENCE	LIN. FT.	
	2557	DIAMOND MESH SAFETY RAILING	LIN. FT.	

(1) SIDEWALK CONCRETE (3F52) VOLUME IS APPROXIMATELY XX CUBIC YARDS.

(2) INCLUDES REMOVAL OF 1'-0" OF EXISTING SIDEWALK ON EACH SIDE OF THE BRIDGE.

(3) INCLUDES REMOVAL OF ALL EXISTING CHAIN LINK FENCE ON EACH SIDE OF THE BRIDGE.

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: JCW | CHECKED BY: SAD
DRAWN BY: JIK | DATE: 08/10/15

AECOM Kimley»Horn

60% SUBMISSION - 9/28/15

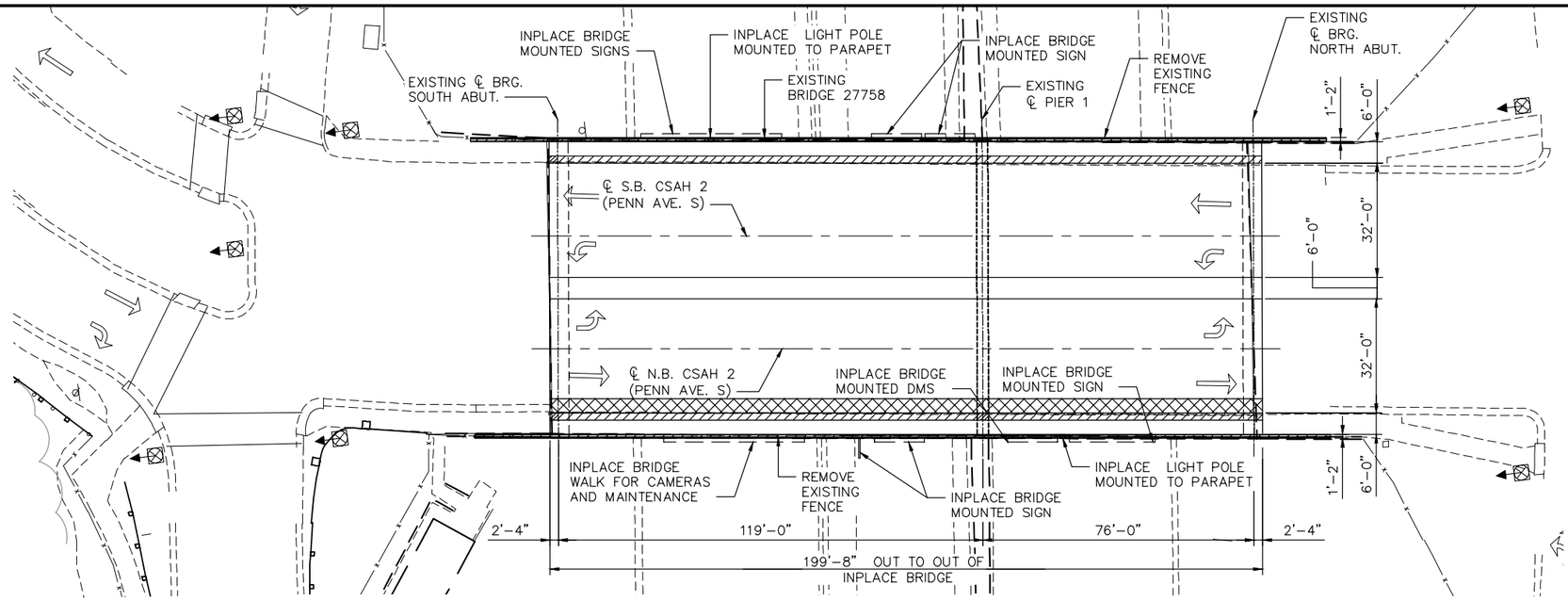
METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

CIVIL EAST-VOLUME 4
CSAH 2 (PENN AVE S) (BRIDGE 27758)
BRIDGE MODIFICATIONS
SCHEDULE OF QUANTITIES

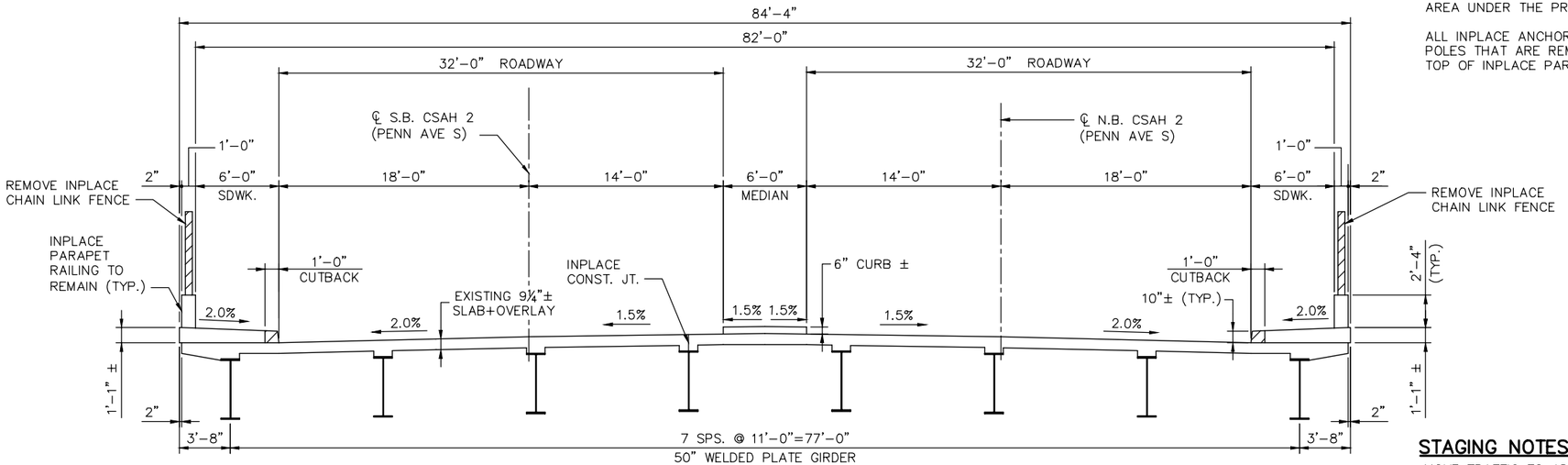
DISCIPLINE: STRUCTURES
SHEET NAME: CBR27758-BRM-TRN-001

SHEET 2 OF 11



GENERAL PLAN – REMOVALS

0 10 20 40
SCALE IN FEET



TRANSVERSE SECTION – REMOVALS

0 2.5 5 10
SCALE IN FEET

NOTES:

DENOTES AREAS TO BE REMOVED.

DENOTES AREAS OF INPLACE ASPHALT OVERLAY TO BE REMOVED ON EAST SIDE OF BRIDGE. ASPHALT TO BE REMOVED FOR AN APPROX. WIDTH OF 4'–0" IN THE AREA UNDER THE PROPOSED SIDEWALK.

ALL INPLACE ANCHOR BOLTS FOR FENCE AND LIGHT POLES THAT ARE REMOVED SHALL BE CUT FLUSH WITH TOP OF INPLACE PARAPET.

STAGING NOTES:

MOVE TRAFFIC TO ADJACENT LANES DURING CONSTRUCTION ACTIVITY IN OUTER LANES.

SIDEWALK TO BE CLOSED DURING REMOVAL AND CONSTRUCTION.

DRAFT–WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: JCW | CHECKED BY: SAD
DRAWN BY: JIK | DATE: 08/10/15

AECOM Kimley»Horn

60% SUBMISSION - 9/28/15

METROPOLITAN COUNCIL

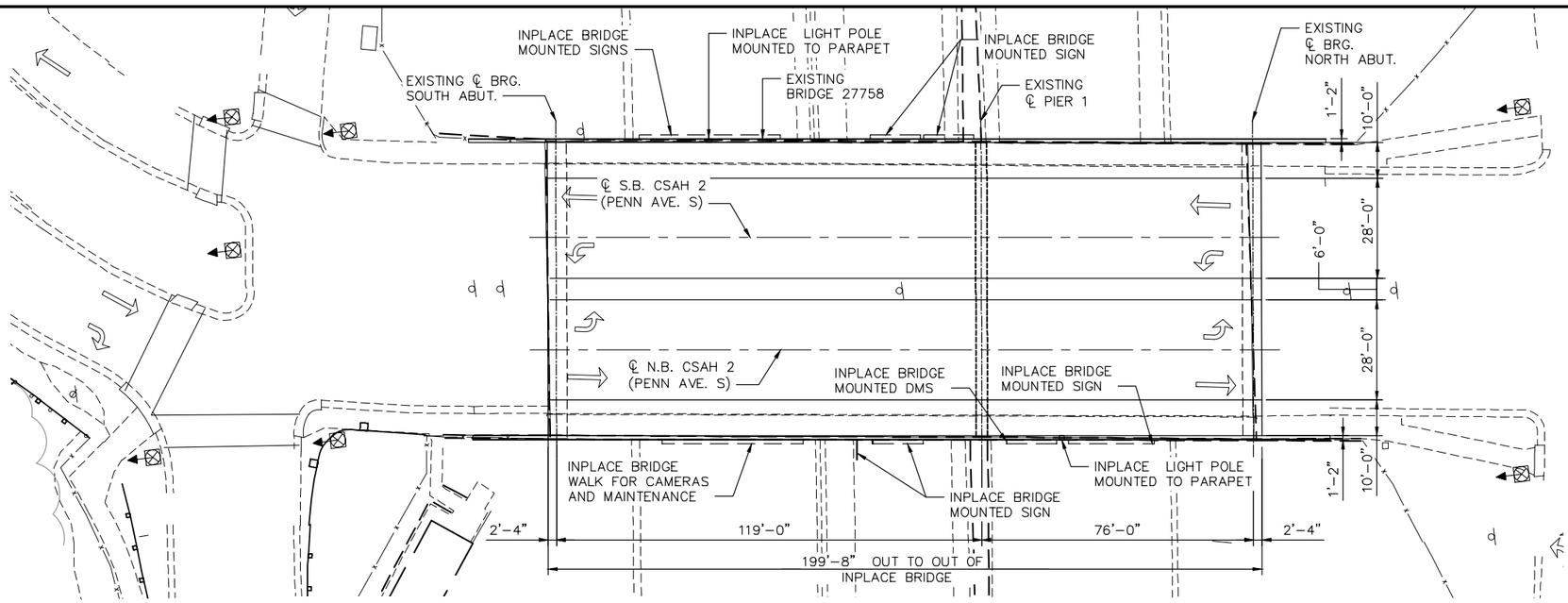
SOUTHWEST Green Line LRT Extension

CIVIL EAST-VOLUME 4
CSAH2 (PENN AVE S) (BRIDGE 27758)
BRIDGE MODIFICATIONS
REMOVAL DETAILS

DISCIPLINE: STRUCTURES
SHEET NAME: CBR27758-BRM-DTL-001

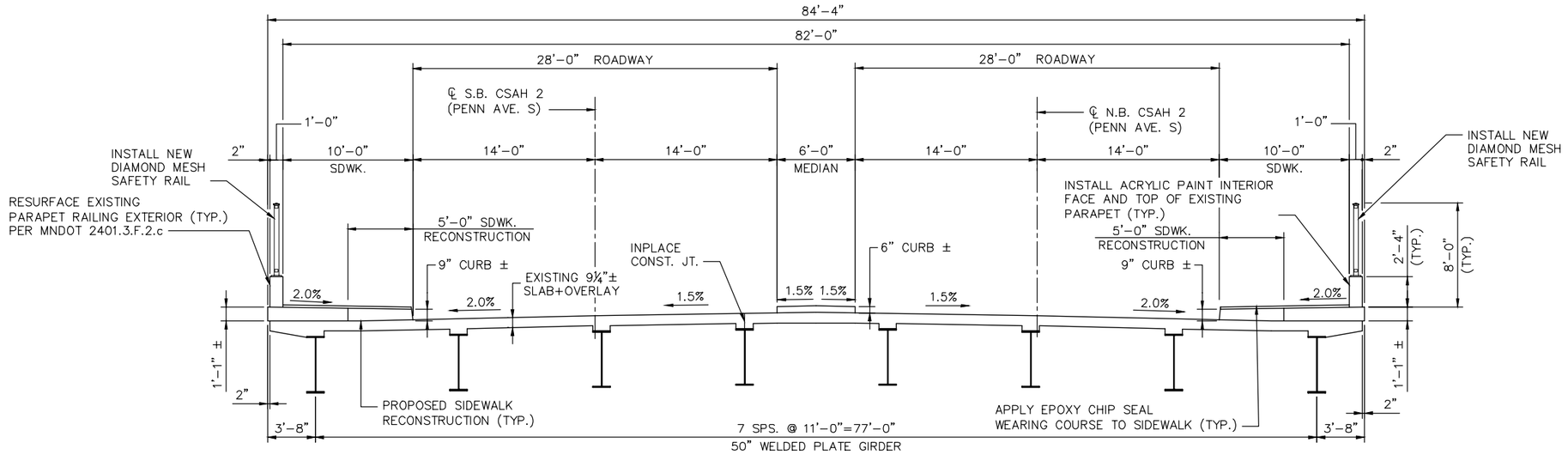
SHEET 3 OF 11

Aug, 10 2015 11:55 am V:\3400_ADC\CAD\SEGMENT E4\PLAN SHEETS\STRUCTURES\BR27758 MOD\CBR27758-BRM-DTL-001.dwg By: Jim.Kimble



GENERAL PLAN – PROPOSED

0 10 20 40
SCALE IN FEET



TRANSVERSE SECTION – PROPOSED

0 2.5 5 10
SCALE IN FEET

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: JCW | CHECKED BY: SAD
DRAWN BY: JIK | DATE: 08/10/15

AECOM Kimley»Horn

60% SUBMISSION - 9/28/15

METROPOLITAN COUNCIL

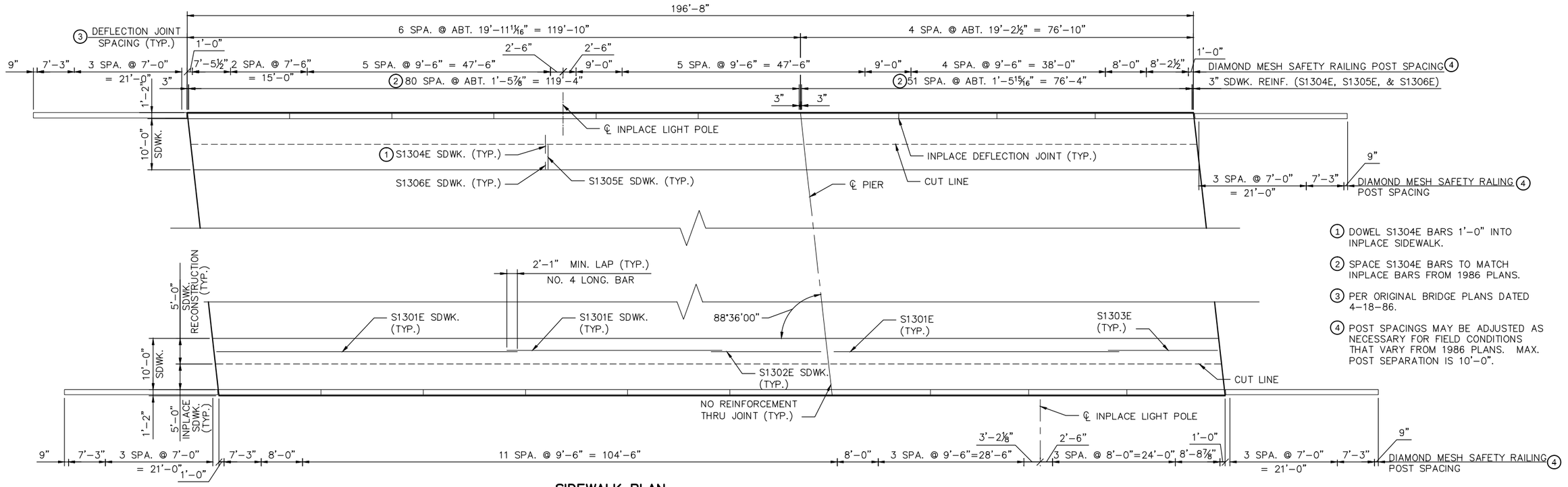
SOUTHWEST Green Line LRT Extension

CIVIL EAST-VOLUME 4
CSAH 2 (PENN AVE S) (BRIDGE 27758)
BRIDGE MODIFICATIONS
PROPOSED GENERAL PLAN & SECTION

DISCIPLINE: STRUCTURES
SHEET NAME: CBR27758-BRM-GPE-002

SHEET 4 OF 11

Aug, 10 2015 11:56 am V:\3400_ADC\CAD\SEGMENT E4\PLAN SHEETS\STRUCTURES\BR27758 MOD\CBR27758-BRM-GPE-002.dwg By: Jim.Kimble



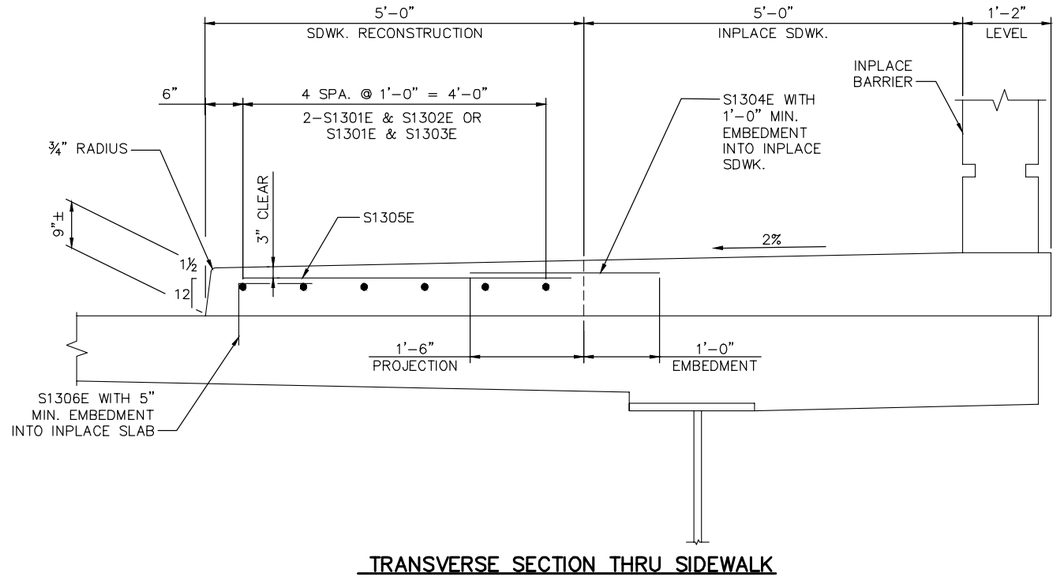
1 DOWEL S1304E BARS 1'-0" INTO INPLACE SIDEWALK.

2 SPACE S1304E BARS TO MATCH INPLACE BARS FROM 1986 PLANS.

3 PER ORIGINAL BRIDGE PLANS DATED 4-18-86.

4 POST SPACINGS MAY BE ADJUSTED AS NECESSARY FOR FIELD CONDITIONS THAT VARY FROM 1986 PLANS. MAX. POST SEPARATION IS 10'-0".

SIDEWALK PLAN

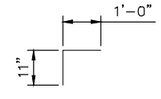


TRANSVERSE SECTION THRU SIDEWALK

NOTE:

INPLACE SLAB, SIDEWALK, AND BARRIER REINFORCING NOT SHOWN FOR CLARITY.

INPLACE TRANSVERSE, LONGITUDINAL, AND TIE SIDEWALK BARS NOT COMPLETELY EXPOSED TO REMAIN INPLACE. CLEAN, STRAIGHTEN, AND ADJUST AS REQUIRED. COMPLETELY EXPOSED BARS TO BE REMOVED AND DISPOSED OF.



S1306E

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: JCW | CHECKED BY: SAD
DRAWN BY: JIK | DATE: 08/10/15

AECOM Kimley»Horn

60% SUBMISSION - 9/28/15

METROPOLITAN COUNCIL

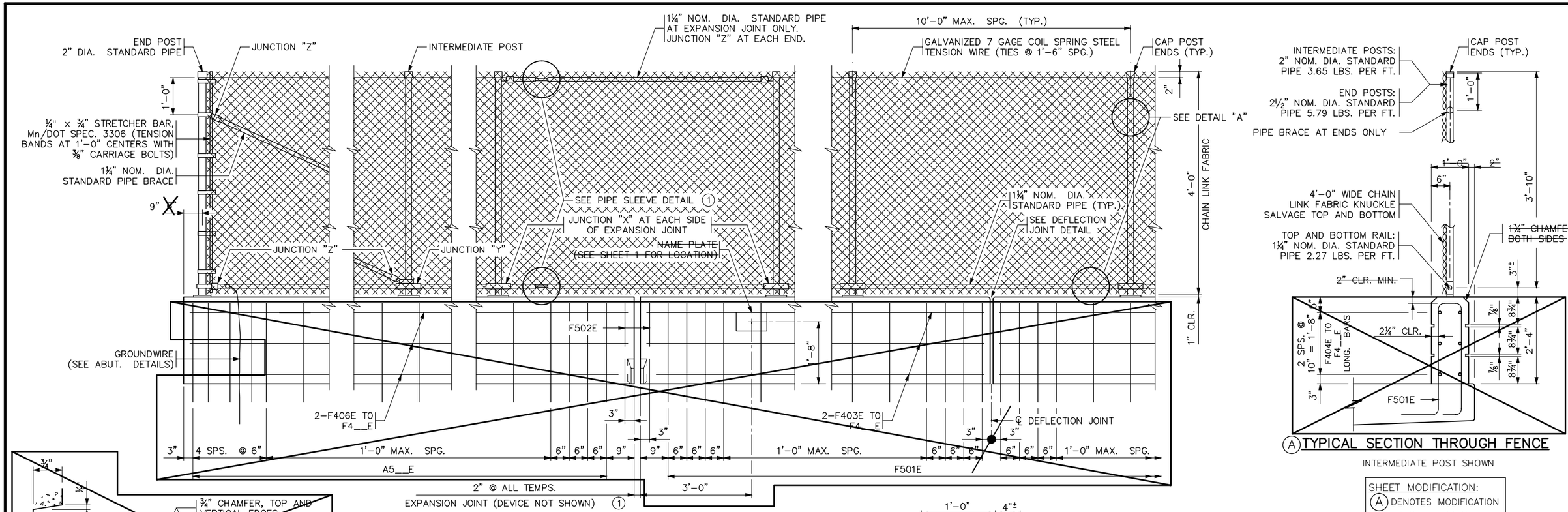
SOUTHWEST Green Line LRT Extension

CIVIL EAST-VOLUME 4
CSAH 2 (PENN AVE S) (BRIDGE 27758)
BRIDGE MODIFICATIONS
SIDEWALK DETAILS AND REINFORCEMENT

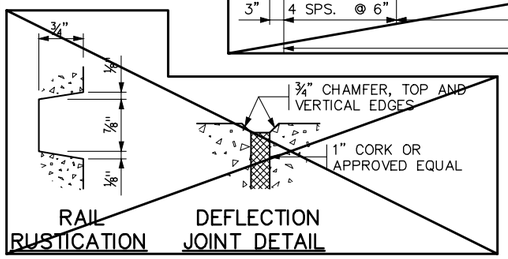
DISCIPLINE: STRUCTURES
SHEET NAME: CBR27758-BRM-DTL-002

SHEET 5 OF 11

Aug, 10 2015 11:56 am V:\3400_ADC\CAD\SEGMENT E4\PLAN SHEETS\STRUCTURES\BR27758 MOD\CBR27758-BRM-DTL-002.dwg By: Jim.Kimble



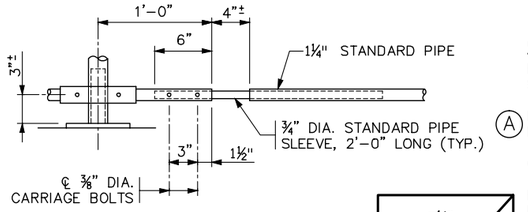
(A) INSIDE ELEVATION OF RAILING



(A) TYPICAL SECTION THROUGH FENCE

INTERMEDIATE POST SHOWN

SHEET MODIFICATION:
(A) DENOTES MODIFICATION TO STANDARD SHEET



PIPE SLEEVE DETAIL (1)

GENERAL NOTES

~~LENGTH OF "TYPE P-1 RAILING CONCRETE (3Y46 OR 3Y46A)" FOR PAYMENT SHALL BE MEASURED BETWEEN THE OUTSIDE FACES OF THE CONCRETE RAIL.~~

(A) LENGTH OF "WIRE FENCE DESIGN 48V-9322" ~~FOR PAYMENT~~ SHALL BE MEASURED BETWEEN THE CENTERS OF END RAILPOSTS.

~~CONCRETE RAILING = 350 LBS./FT. (0.086 CU. YDS./FT.)~~

FENCE POST ANCHORAGES SHALL BE TYPE A. SEE DETAIL B905 "FENCE POST ANCHORAGE".

~~MAXIMUM SPACING OF DEFLECTION JOINTS SHALL BE 20 FT. FOR SPACING OF FENCE POST, JOINTS AND ELECTRICAL GROUNDS, SEE SUPERSTRUCTURE SHEETS.~~

FENCE POSTS AND FENCE POST ANCHORAGES SHALL BE SET VERTICAL, UNLESS OTHERWISE NOTED.

℄ OF FENCE POST ANCHORAGE SHALL BE A MINIMUM OF 6" FROM JOINTS.

END POSTS AND BRACING SHALL BE AT 500 FT. MAXIMUM INTERVALS.

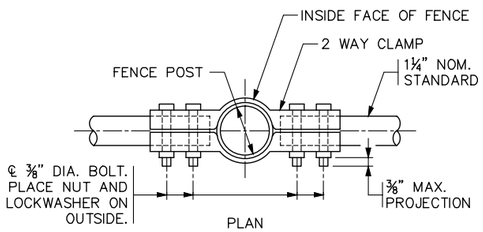
ALL POSTS SHALL HAVE A MEANS TO SECURELY HOLD THE TOP TENSION WIRE IN POSITION AND ALLOW FOR THE REMOVAL AND REPLACEMENT OF A POST WITHOUT DAMAGING THE TOP WIRE.

WIRE TIES MAY BE 9 GAGE GALVANIZED STEEL OR 0.179" MIN. ALUMINUM ALLOY CONFORMING TO A.S.T.M. B211, ALLOY 1100-H18. USE 12½GAGE GALVANIZED HOG RINGS FOR TENSION WIRE TIES.

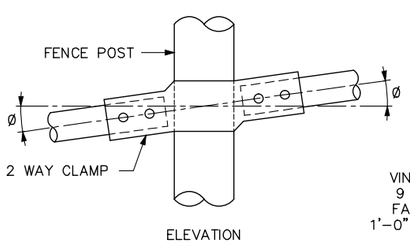
~~ALL MATERIAL IN THE CONCRETE BASE AND END POST IS INCLUDED IN THE SUPERSTRUCTURE QUANTITIES.~~

SEE SPECIAL PROVISIONS FOR REQUIREMENTS NOT INCLUDED ON THIS SHEET AND FOR BASIS OF PAYMENT.

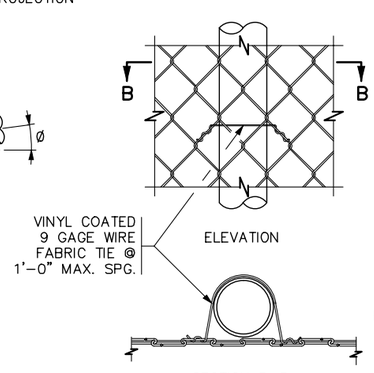
(1) PROVIDE PIPE SLEEVE IN SPAN BETWEEN THE VERTICAL POSTS AT EXPANSION JOINT. SEE SUPERSTRUCTURE SHEETS FOR LOCATION.



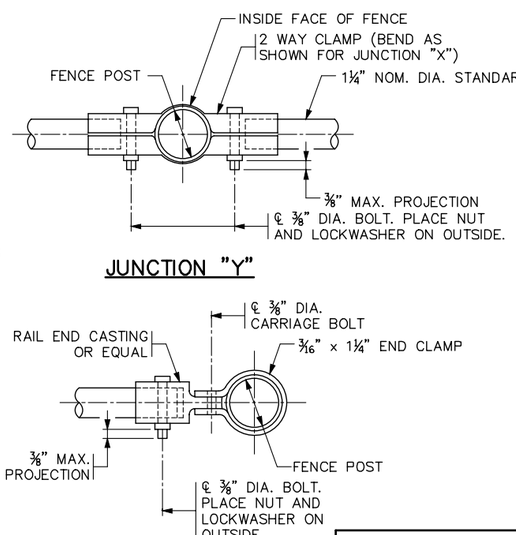
2 WAY CLAMP BENDING TABLE	
GRADE OF FENCE	Ø
0° TO 2°	0°
2° TO 6°	4°
6° TO 10°	8°



JUNCTION "X"

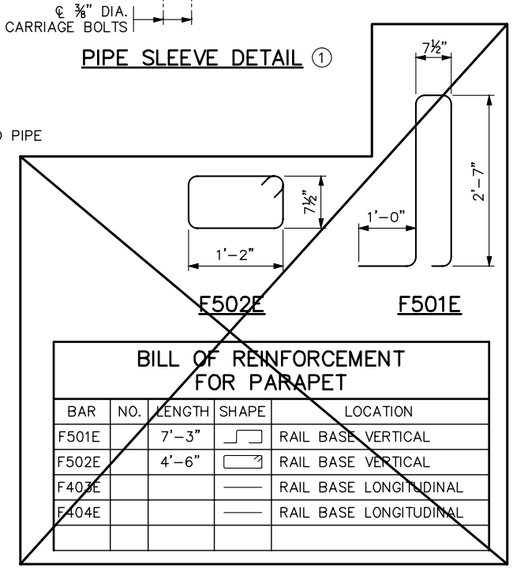


DETAIL "A"



JUNCTION "Y"

JUNCTION "Z"



F502E F501E

BILL OF REINFORCEMENT FOR PARAPET				
BAR	NO.	LENGTH	SHAPE	LOCATION
F501E		7'-3"		RAIL BASE VERTICAL
F502E		4'-6"		RAIL BASE VERTICAL
F403E				RAIL BASE LONGITUDINAL
F404E				RAIL BASE LONGITUDINAL

REVISED: 04-17-2013

APPROVED: DECEMBER 18, 2003

STATE BRIDGE ENGINEER

DRAFT-WORK IN PROCESS

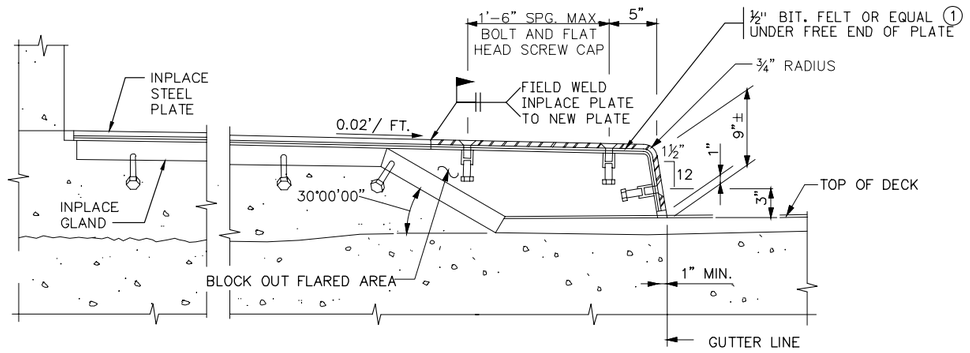
FIG. 5-397.119 (MOD.)

CERTIFIED BY _____ LICENSED PROFESSIONAL ENGINEER _____ DATE

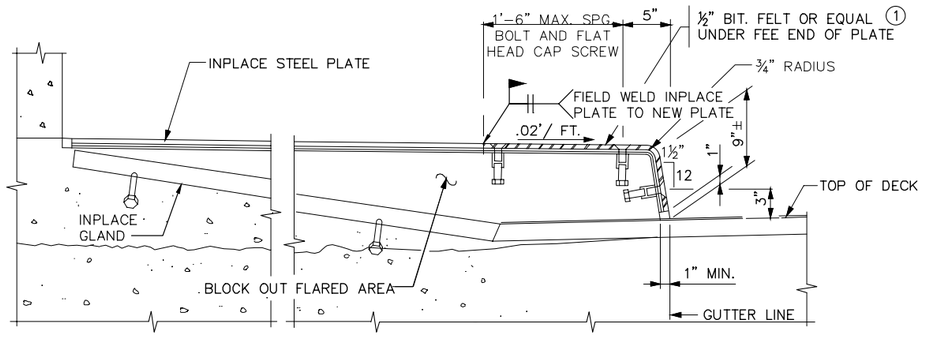
NAME: LIC. NO.

TITLE: WIRE FENCE ~~(DESIGN W-1) AND CONCRETE PARAPET (TYPE P-1)~~ ~~(WITH INTEGRAL END POST)~~

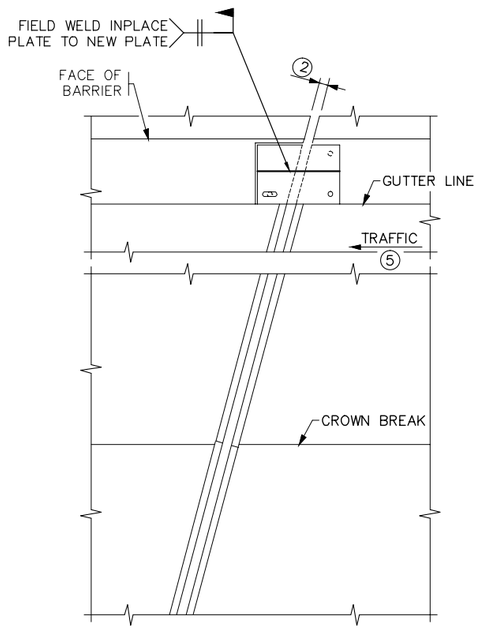
DES: JCW	DR: JIK	APPROVED:	BRIDGE NO. 27758
CHK: SAD	CHK:		
SHEET NO. 6 OF 11 SHEETS			



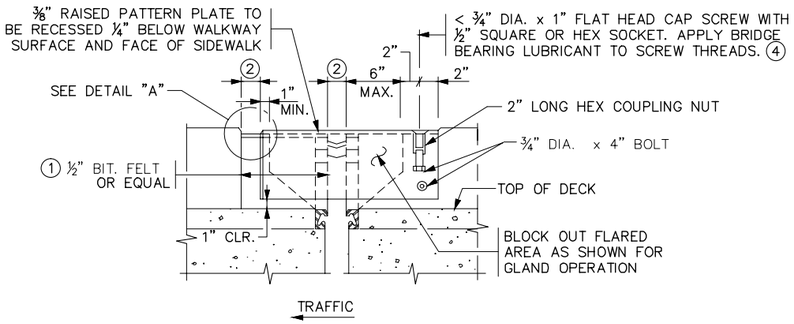
SECTION THROUGH RAISED SIDEWALK – OPTION 1



SECTION THROUGH RAISED SIDEWALK – OPTION 2

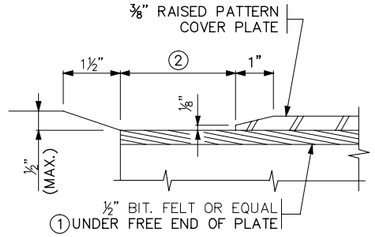


PLAN VIEW @ EXPANSION DEVICE
WITH STRAIGHT DEVICE



ELEVATION

RAISED SIDEWALK DETAILS



DETAIL "A"

GENERAL NOTES

¾" DIA. X 1" FLAT HEAD CAP SCREW WITH ½" SQUARE OR HEX SOCKET PER SPEC 3391. CAP SCREWS SHALL BE COUNTERSUNK 1/16" BELOW TOP OF PLATE. APPLY BRIDGE BEARING LUBRICANT TO SCREW THREADS. (4)

GALVANIZE STRUCTURAL STEEL AFTER FABRICATION AS PER SPEC. 3394. GALVANIZE FASTENERS AS PER SPEC. 3392.

STRUCTURAL STEEL SHALL COMPLY WITH SPEC. 3306 OR SPEC. 3309.

(1) USE LARGEST SINGLE PIECE POSSIBLE. USE OF SMALL PIECES OR SCRAPS SECURED TOGETHER IS PROHIBITED.

(2) 2" AT ALL TEMPS.

(3) ⅛" (¼" MAX.).

(4) LUBRICANT PER MnDOT APPROVED/QUALIFIED PRODUCTS LIST: BRIDGE – BRIDGE BEARING LUBRICANT.

(5) SEE SHEET NO. 1 FOR DIRECTION OF TRAFFIC.

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: JCW | CHECKED BY: SAD
DRAWN BY: JIK | DATE: 08/10/15

AECOM Kimley»Horn

60% SUBMISSION - 9/28/15

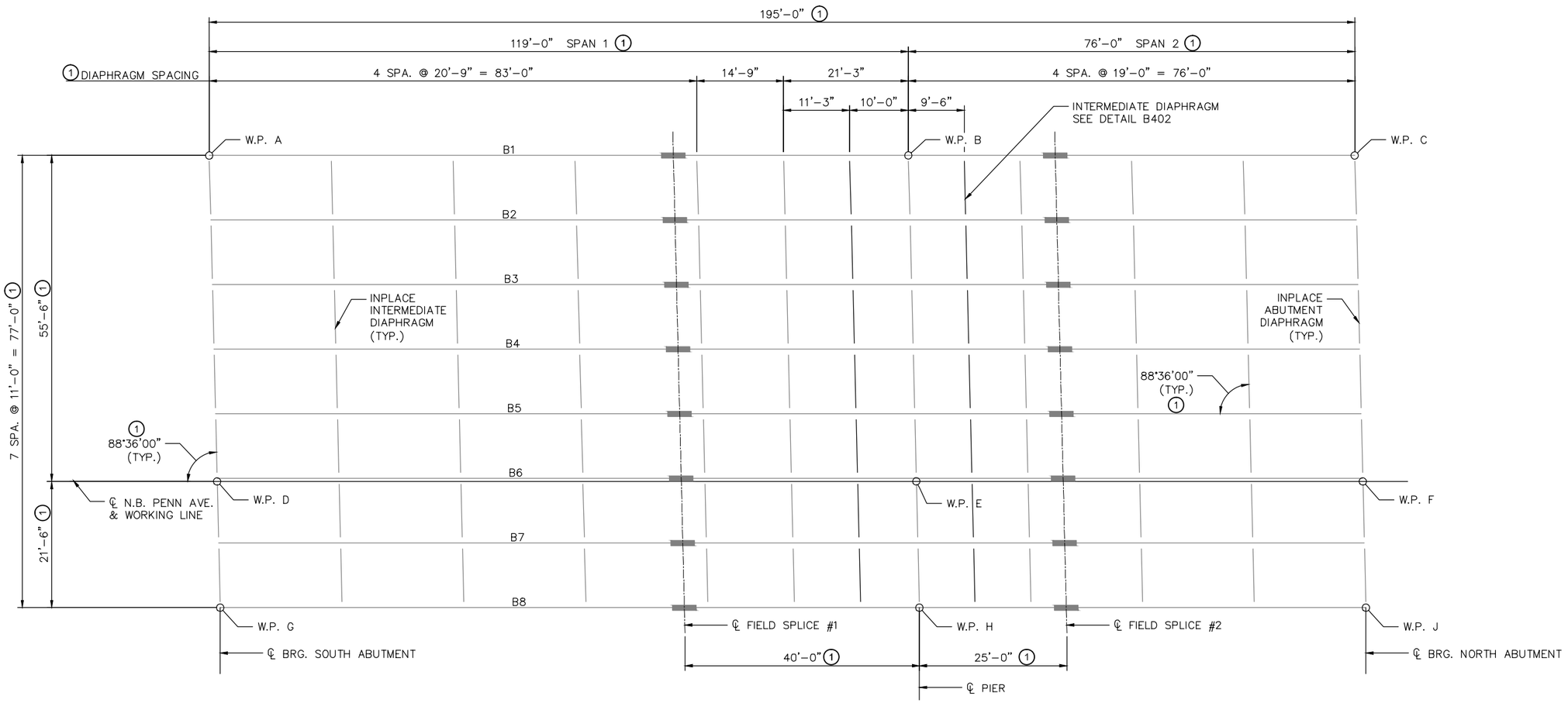
METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

CIVIL EAST-VOLUME 4
CSAH 2 (PENN AVE S) (BRIDGE 27758)
BRIDGE MODIFICATIONS
SIDEWALK DETAILS

DISCIPLINE: STRUCTURES
SHEET NAME: CBR27758-BRM-DTL-004

SHEET 7 OF 11



FRAMING PLAN

GRAPHIC SCALE IN FEET
0 5 10 20

NOTES:

(1) PER ORIGINAL BRIDGE PLAN DATED 4-18-86.

ALL DIAPHRAGMS ARE PARALLEL TO SUBSTRUCTURE

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: JCW | CHECKED BY: SAD
DRAWN BY: JIK | DATE: 08/10/15

AECOM Kimley»Horn

60% SUBMISSION - 9/28/15

METROPOLITAN COUNCIL

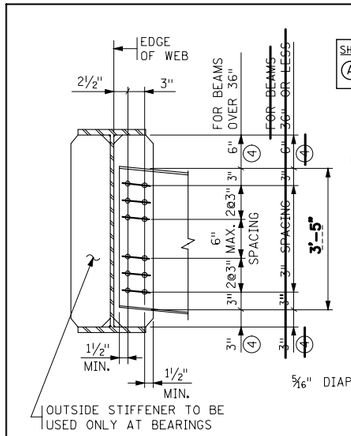
SOUTHWEST Green Line LRT Extension

CIVIL EAST-VOLUME 4
CSAH 2 (PENN AVE S) (BRIDGE 27758)
BRIDGE MODIFICATIONS
FRAMING PLAN

DISCIPLINE: STRUCTURES
SHEET NAME: CBR27758-BRM-SUP-001

SHEET 8 OF 11

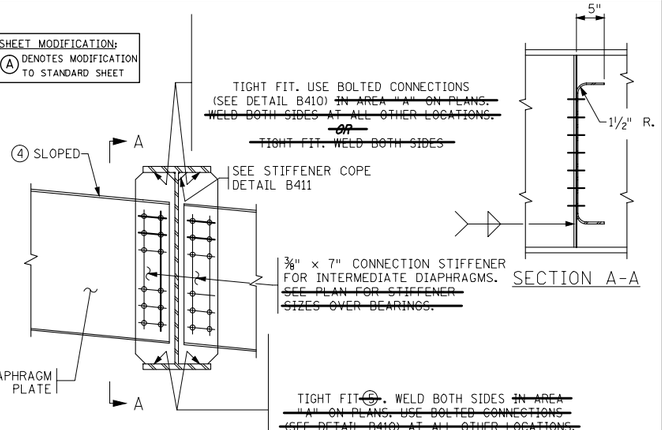
Aug, 10 2015 11:57 am V:\3400_ADC\CAD\SEGMENT E4\PLAN SHEETS\STRUCTURES\BR27758 MOD\CBR27758-BRM-SUP-001.dwg By: Jim.Kimble



FASCIA BEAM (A)

AT PIER AND INTERMEDIATE DIAPHRAGMS

SHEET MODIFICATION:
(A) DENOTES MODIFICATION TO STANDARD SHEET



INTERIOR BEAM

AT PIER AND INTERMEDIATE DIAPHRAGMS

TIGHT FIT. USE BOLTED CONNECTIONS (SEE DETAIL B410) ~~IN AREA "A" ON PLANS. WELD BOTH SIDES AT ALL OTHER LOCATIONS.~~

~~OR~~

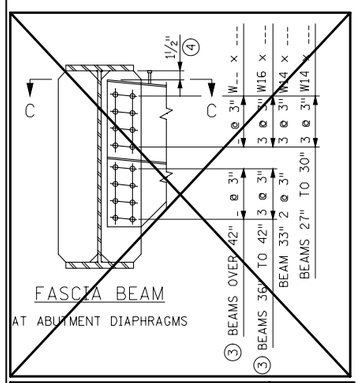
~~TIGHT FIT. WELD BOTH SIDES~~

TIGHT FIT (5). WELD BOTH SIDES ~~IN AREA "A" ON PLANS. USE BOLTED CONNECTIONS (SEE DETAIL B410) AT ALL OTHER LOCATIONS.~~

~~OR~~

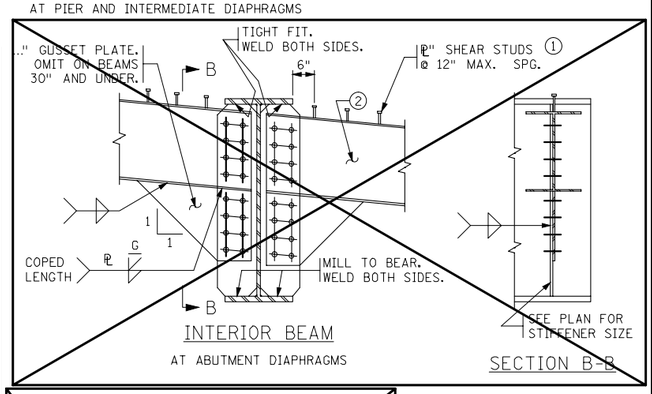
~~TIGHT FIT (5). WELD BOTH SIDES~~

SECTION A-A



FASCIA BEAM

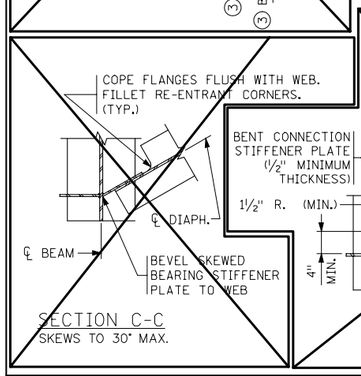
AT ABUTMENT DIAPHRAGMS



INTERIOR BEAM

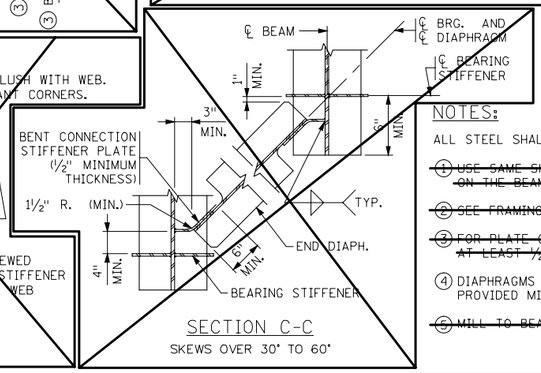
AT ABUTMENT DIAPHRAGMS

SECTION B-B



SECTION C-C

SKEWS TO 30° MAX.



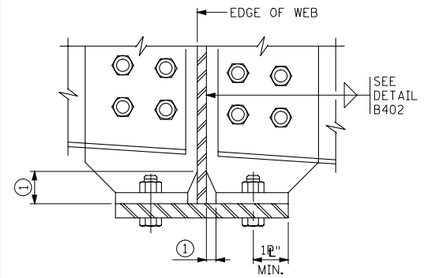
SECTION C-C

SKEWS OVER 30° TO 60°

NOTES:

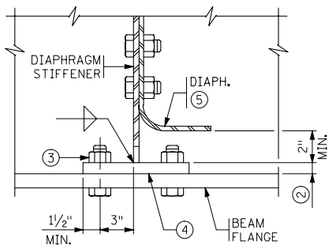
ALL STEEL SHALL CONFORM TO Mn/DOT SPEC. 3309.

1. ~~USE SAME SHEAR STUD HEIGHT AS USED ON THE BEAMS.~~
2. ~~SEE FRAMING PLAN FOR SIZE OF DIAPHRAGM.~~
3. ~~FOR PLATE GIRDERS, END DIAPHRAGMS SHALL BE AT LEAST ½ THE BEAM HEIGHT.~~
4. DIAPHRAGMS MAY BE PLACED LEVEL, PROVIDED MINIMUM CLEARANCES ARE MET.
5. ~~MILL TO BEAR FOR BEARING STIFFENERS.~~



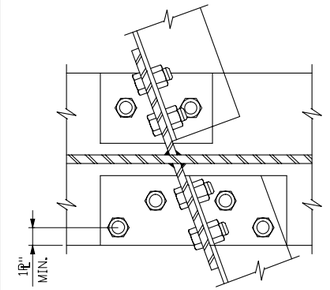
SECTION A-A

CONNECTION WITH 2 BOLTS AT INTERIOR BEAMS



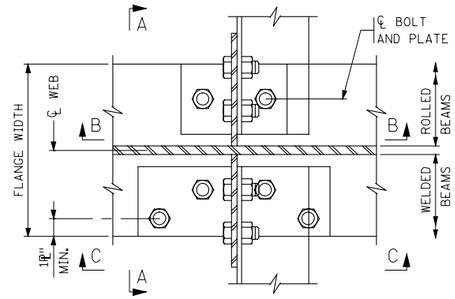
SECTION B-B

CONNECTION WITH 2 BOLTS



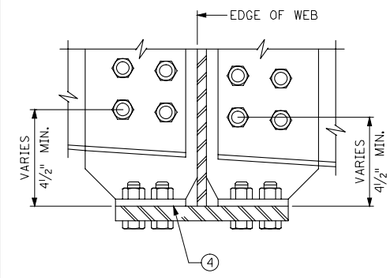
PLAN VIEW

AT INTERIOR BEAMS (UP TO 20° SKEW)



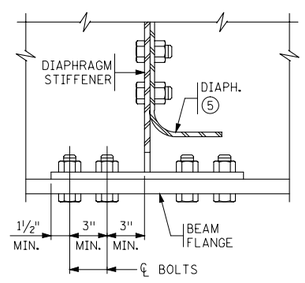
PLAN VIEW

AT INTERIOR BEAMS



SECTION A-A

CONNECTION WITH 4 BOLTS AT INTERIOR BEAMS



SECTION C-C

CONNECTION WITH 4 BOLTS

NOTES:

ALL STEEL SHALL CONFORM TO SPEC. 3309.

1. SEE DETAIL B411.
2. MINIMUM PLATE THICKNESS SHALL BE ¾".
3. BOLT PLATE TO BEAM FLANGE PRIOR TO WELDING PLATE TO DIAPHRAGM STIFFENER.
4. REMOVE LOOSE SCALE AND RUST FROM CONTACT AREA AT DIAPHRAGM CONNECTION. SURFACE MUST BE FLAT AND PRIMED.
5. BENT PLATE DIAPHRAGMS SHOWN. FOR CROSS FRAME DIAPHRAGM SEE DETAIL B407 FOR STRAIGHT BEAMS AND DETAIL B408 FOR CURVED BEAMS.

DRAFT-WORK IN PROCESS

APPROVED: MARCH 26, 2009 STATE BRIDGE ENGINEER	STATE OF MINNESOTA DEPARTMENT OF TRANSPORTATION BOLTED DIAPHRAGMS (FOR STEEL BEAMS)	REVISED	DETAIL NO. B402 (MOD.)
APPROVED: NOVEMBER 22, 2002 STATE BRIDGE ENGINEER	STATE OF MINNESOTA DEPARTMENT OF TRANSPORTATION BOLTED FLANGE TO STIFFENER DETAIL	REVISED 09-11-2004 10-28-2008 05-24-2012	DETAIL NO. B410

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: JCW | CHECKED BY: SAD
DRAWN BY: JIK | DATE: 08/10/15

AECOM Kimley»Horn

60% SUBMISSION - 9/28/15

METROPOLITAN COUNCIL

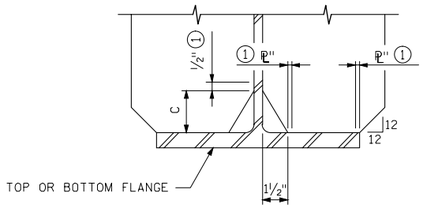
SOUTHWEST Green Line LRT Extension

CIVIL EAST-VOLUME 4
CSAH 2 (PENN AVE S) (BRIDGE 27758)
BRIDGE MODIFICATIONS
BOLTED FLANGE TO STIFFENER DETAIL

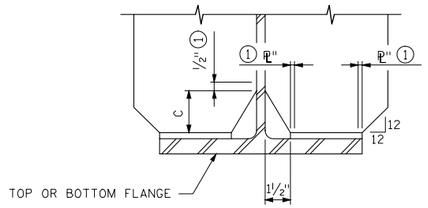
DISCIPLINE: STRUCTURES
SHEET NAME: CBR27758-BRM-DTL-005

SHEET 9 OF 11

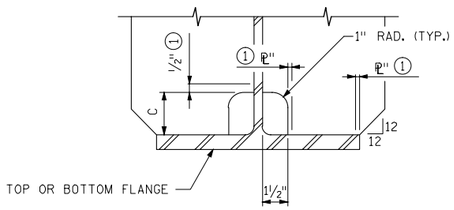
Aug. 10 2015 11:57 am V:\3400_ADC\CAD\SEGMENT E4\PLAN SHEETS\STRUCTURES\BR27758 MOD\CBR27758-BRM-DTL-005.dwg By: Jim.Kimble



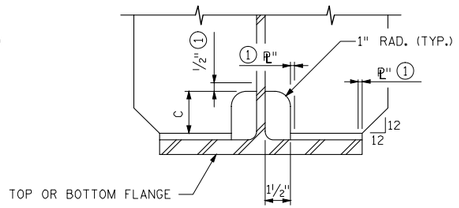
STIFFENER TO FLANGE CONNECTION
OPTION 1



STIFFENER TO TAB PLATE CONNECTION
OPTION 1



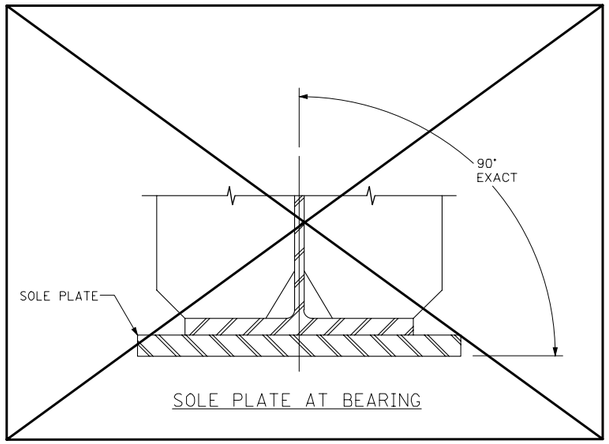
STIFFENER TO FLANGE CONNECTION
OPTION 2



STIFFENER TO TAB PLATE CONNECTION
OPTION 2

STIFFENER COPE DETAIL

PLATE GIRDER OR ROLLED BEAM



SOLE PLATE AT BEARING

WEB THICKNESS	DIMENSION C
½", ℄", ℄"	2½"
11/16", ℄"	3"

NOTES:

(1) DO NOT WELD IN THIS AREA. SEE B410 FOR CONNECTION DETAILS.

APPROVED: OCTOBER 22, 2008	STATE OF MINNESOTA DEPARTMENT OF TRANSPORTATION	REVISION	DETAIL NO.
Daniel L. Morgan STATE BRIDGE ENGINEER	STIFFENER DETAILS (FOR STEEL BEAMS)		B411 (MOD.)

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: JCW | CHECKED BY: SAD
DRAWN BY: JIK | DATE: 08/10/15

AECOM Kimley»Horn

60% SUBMISSION - 9/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

CIVIL EAST-VOLUME 4
CSAH 2 (PENN AVE S) (BRIDGE 27758)
BRIDGE MODIFICATIONS
STIFFENER DETAILS

DISCIPLINE: STRUCTURES
SHEET NAME: CBR27758-BRM-DTL-006

SHEET 10 OF 11

Aug. 10 2015 11:57 am V:\3400_ADC\CAD\SEGMENT E4\PLAN SHEETS\STRUCTURES\BR27758 MOD\CBR27758-BRM-DTL-006.dwg By: Jim.Kimble

CONCRETE WEARING COURSE

☐ LOW SLUMP

☐ OTHER _____
TYPE OR MANUFACTURER

EXPANSION JOINTS

JOINT MANUFACTURER

MANUFACTURER'S IDENTIFICATION _____
MFR'S No. AND/OR LETTER DESIGNATION FOR JOINT USED

GLAND MANUFACTURER _____
NAME AND ADDRESS (CITY, STATE)

SIZE OF GLAND _____

MANUFACTURER'S IDENTIFICATION _____
MFR'S No. AND/OR LETTER DESIGNATION FOR GLAND USED

ELASTOMERIC BEARING PADS

PAD MANUFACTURER _____
NAME AND ADDRESS (CITY, STATE)

SPECIAL SURFACE FINISH

SYSTEM: _____ COLOR: _____

FINISHING ROADWAY FACES OF BARRIER RAILING

TYPE: _____ COLOR: _____

ANTI-GRAFFITI COATING

MANUFACTURER _____
NAME AND ADDRESS (CITY, STATE)

PRODUCT NAME: _____ LOCATION: _____

PAINT SYSTEM

Mn/DOT SPECIFICATION NUMBER _____
2478 OR 2479 OR OTHER

MANUFACTURER _____
NAME AND ADDRESS (CITY, STATE)

PRIME COAT _____
Mn/DOT MATERIAL SPECIFICATION NUMBER

INTERMEDIATE COAT _____
Mn/DOT MATERIAL SPECIFICATION NUMBER

FINISH COAT _____ _____
Mn/DOT MATERIAL SPECIFICATION NUMBER COLOR

PLAN QUALITY

RATE 1 (AGREE), 2 (NEUTRAL), OR 3 (DISAGREE, PLEASE COMMENT BELOW)

DIMENSIONING AND DETAILING ADEQUATELY DESCRIBED REQUIRED CONSTRUCTION. _____
BAR LISTS AND QUANTITIES WERE TYPICALLY COMPLETE AND FREE OF ERRORS. _____
SCALE OF DRAWINGS AND OVERALL LEGIBILITY OF LINES AND TEXT WAS GOOD. _____
(SB) SPECIAL PROVISIONS ADEQUATELY DESCRIBED SPECIAL WORK AND PAYMENT. _____

COMMENTS: _____

NUMBER OF BRIDGE
SUPPLEMENTAL AGREEMENTS: _____ COST: $ _____

LIST SIGNIFICANT ERRORS OR OMISSIONS IN PLAN DETAILS OR PAY QUANTITIES IN THE SPACE PROVIDED AT RIGHT.

BRIDGE REMOVAL / BRIDGE OPENING

NUMBER OF AND DATE OLD BRIDGE WAS REMOVED (IF APPLICABLE):

BRIDGE NUMBER _____ DATE REMOVED _____

DATE NEW BRIDGE WAS OPENED TO TRAFFIC _____

NOTIFY THE BRIDGE OFFICE BRIDGE MANAGEMENT UNIT WITH THIS INFORMATION AS SOON AS POSSIBLE. (651) 366-4557

OTHER ITEMS ①

① UTILITIES ADDED DURING CONSTRUCTION AND SPECIALTY ITEMS.

FINAL QUANTITIES ENTERED ON SCHEDULE OF QUANTITIES: YES ☐ NO ☐

SUMMARY OF SIGNIFICANT AS-BUILT CHANGES

THE AS-BUILT INFORMATION WAS ADDED TO THE PLAN BY:

_____ _____
INSPECTOR(S) SIGNATURE DATE

CHECKED BY: _____ _____
PROJECT ENGINEER/SUPERVISOR SIGNATURE DATE

DRAFT-WORK IN PROCESS

AT THE TIME OF THE FINAL, THIS COMPLETED AS-BUILT BRIDGE DATA SHEET MUST BE SUBMITTED TO THE BRIDGE OFFICE - ATTN: REGIONAL CONSTRUCTION ENGINEER (MS610).

REVISION: 10-28-2008

APPROVED: SEPTEMBER 26, 2003
Daniel T. Hagen
STATE BRIDGE ENGINEER

AS-BUILT DETAILS
(AS NEEDED)

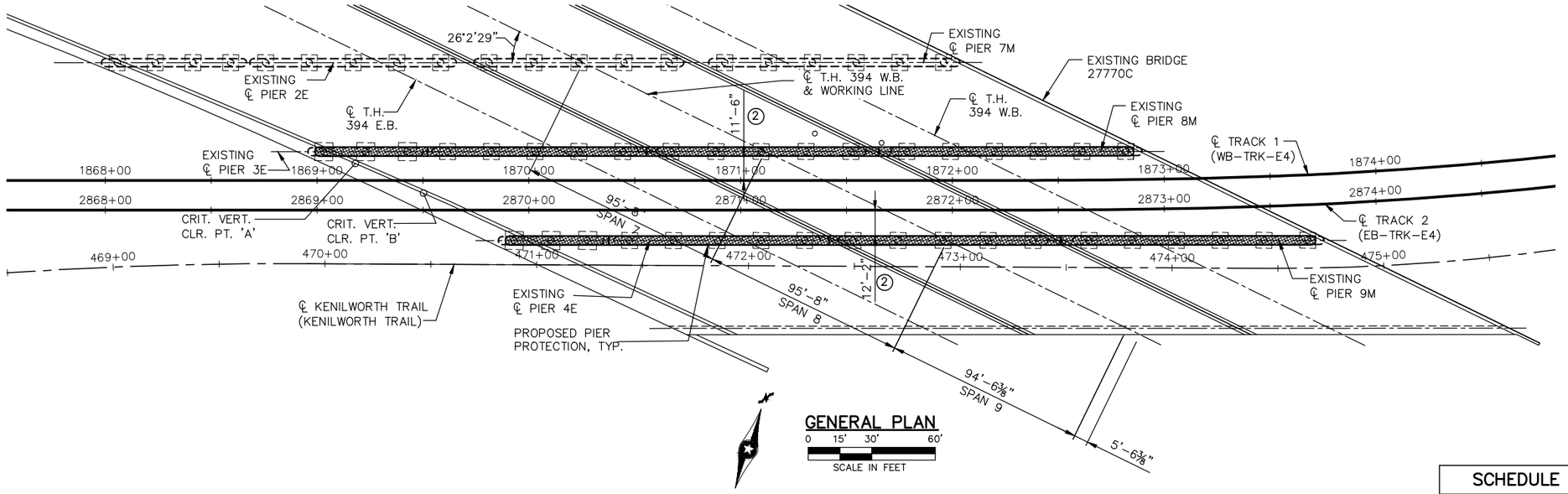
FIG. 5-397.900

TITLE: AS-BUILT BRIDGE DATA

DES: ------ DR: ------ APPROVED:
CHK: ------ CHK: ------

SHEET NO. 11 OF 11 SHEETS

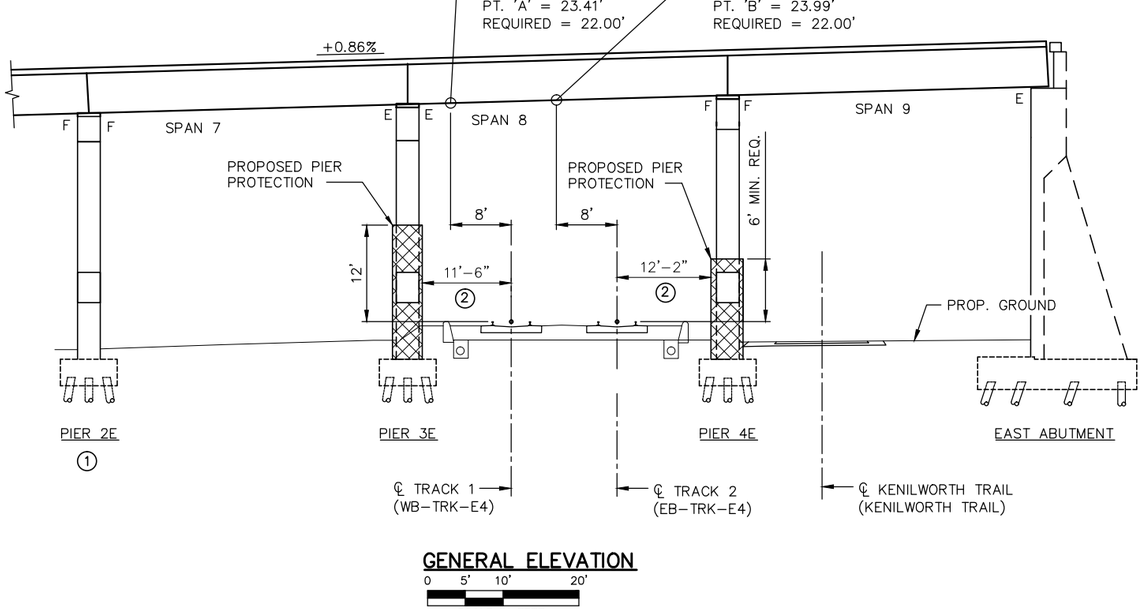
BRIDGE NO. 27758



GENERAL PLAN

0 15' 30' 60'

SCALE IN FEET



GENERAL ELEVATION

0 5' 10' 20'

SCALE IN FEET

DESIGN DATA

2014 AND CURRENT INTERIM AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS

2014 AREMA MANUAL FOR RAILWAY ENGINEERING

MNDOT DRAFT PIER PROTECTION POLICY (MARCH 15, 2015)

LOAD AND RESISTANCE FACTOR DESIGN METHOD

RAILWAY COLLISION LOAD = 600 KIP

MATERIAL DESIGN PROPERTIES:
REINFORCED CONCRETE:
f'c = 4000 PSI n = 8
fy = 60000 PSI REINFORCEMENT

SOUTHWEST LIGHT RAIL TRANSIT DESIGN CRITERIA (REVISION 4.0)

LIST OF SHEETS

SCHEDULE OF QUANTITIES FOR PIER PROTECTION

ITEM NO.	DESCRIPTION	UNIT	QUANTITY
2401	STRUCTURAL CONCRETE (3Y43)	CU. YD.	
2401	REINFORCEMENT BARS	POUND	
2433	ANCHORAGES TYPE REINF. BARS	EACH	

NOTES:

① PIER PROTECTION NOT REQUIRED ON PIERS 2E & 7M

② HORIZONTAL OFFSET SHOWN IS MEASURED PERPENDICULAR FROM CENTERLINE OF TRACK TO FACE OF PIER PROTECTION AT CLOSEST POINT

PROPOSED PIER PROTECTION

FOR VISUAL QUALITY REQUIREMENTS REFER TO SHEETS 6 & 7

BRIDGE NO. 27770C

T.H. 394 AND RAMPS OVER BNSF RR, SOUTHWEST LRT, AND CEDAR LAKE TRAIL. 1.7 MILES EAST OF JCT. T.H. 100 AND T.H. 394.

BRIDGE I.D. NO. 501

GENERAL PLAN AND ELEVATION

SEC 28 T 29N R 24W
CITY OF MINNEAPOLIS HENNEPIN COUNTY

APPROVED: _____ DATE: _____
STATE BRIDGE ENGINEER

DRAFT-WORK IN PROCESS

JOB NO. T9N635 | STATE PROJECT NO. 9909-01 | MNDOT REVIEW: JOE NIETFELD

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AMC | CHECKED BY: LKZ
DRAWN BY: AES | DATE: 8/6/2015

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

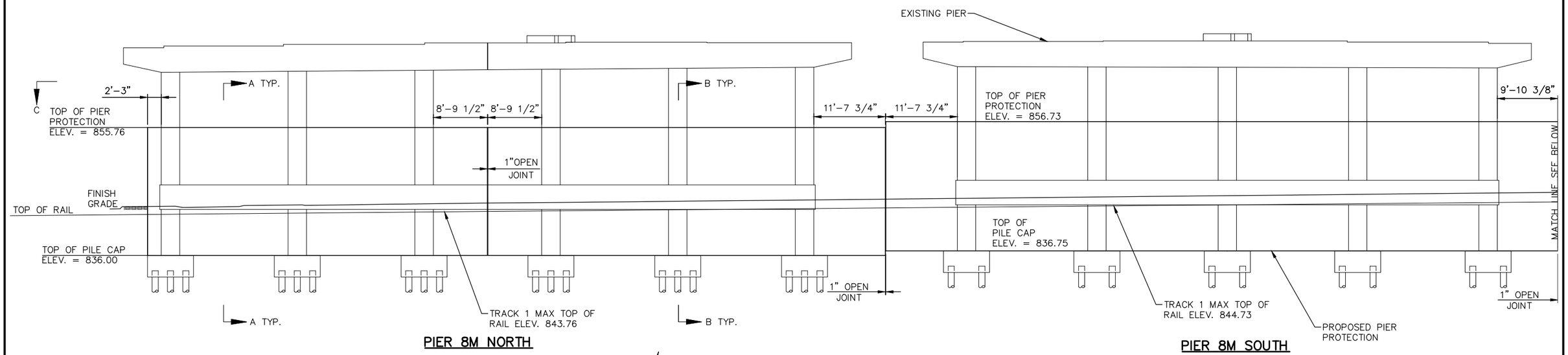
SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4
TH 394 (BRIDGE 27770C)
PIER PROTECTION
GENERAL PLAN AND ELEVATION

DISCIPLINE: STRUCTURES
SHEET NAME: EX4-STU-PPR-T394-VEH-GPE-001

SHEET 1 OF 7

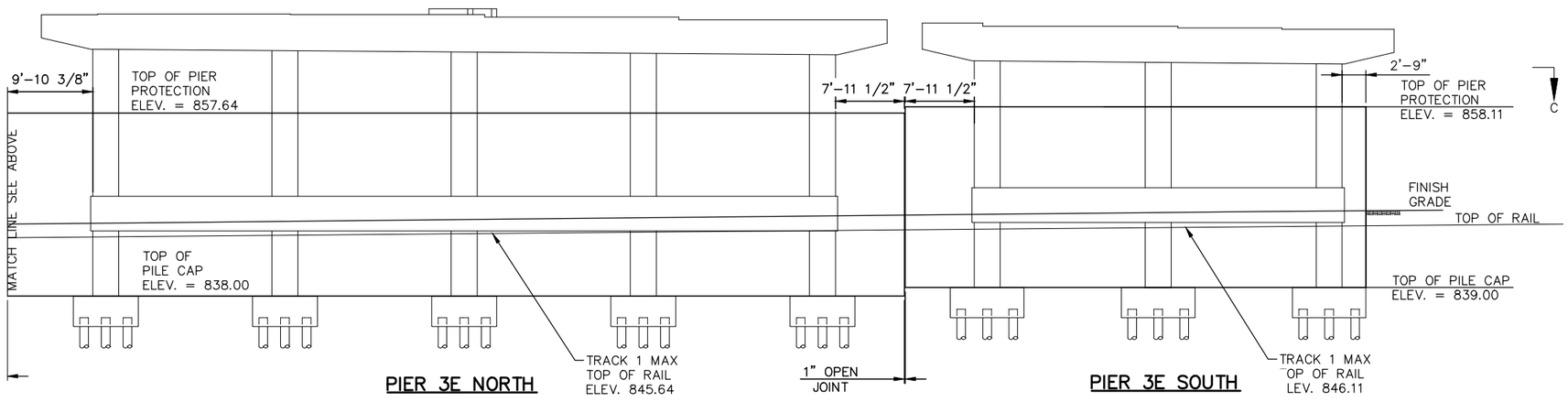
Aug. 10 2015 05:13 pm V:\3400_ADC\CAD\SEGMENT E4\PLAN SHEETS\STRUCTURES\PIER PROTECTION\EX4-STU-PPR-T394-VEH-DTL.dwg By: Anne.Cesnik



PIER 8M NORTH

PIER 8M SOUTH

PARTIAL ELEVATION



PIER 3E NORTH

PIER 3E SOUTH

PARTIAL ELEVATION

NOTES:

FOR VISUAL QUALITY REQUIREMENTS REFER TO SHEET 6

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AMC | CHECKED BY: LKZ
DRAWN BY: AES | DATE: 8/6/2015

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

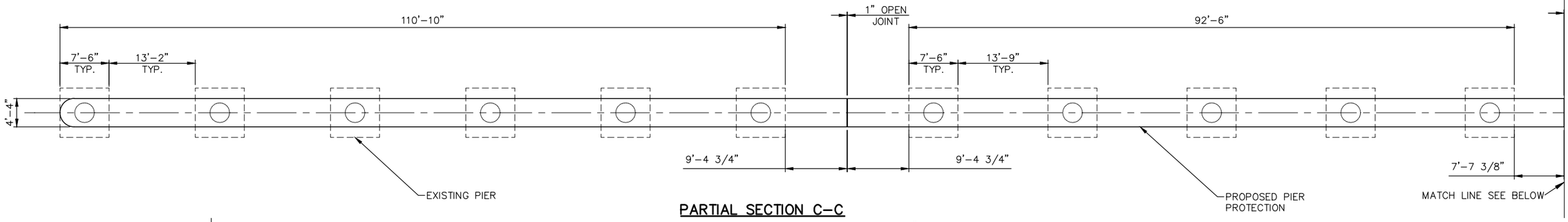
CIVIL EAST - VOLUME 4
TH 394 (BRIDGE 27770C)
PIER PROTECTION DETAILS (1 OF 4)

DISCIPLINE: STRUCTURES

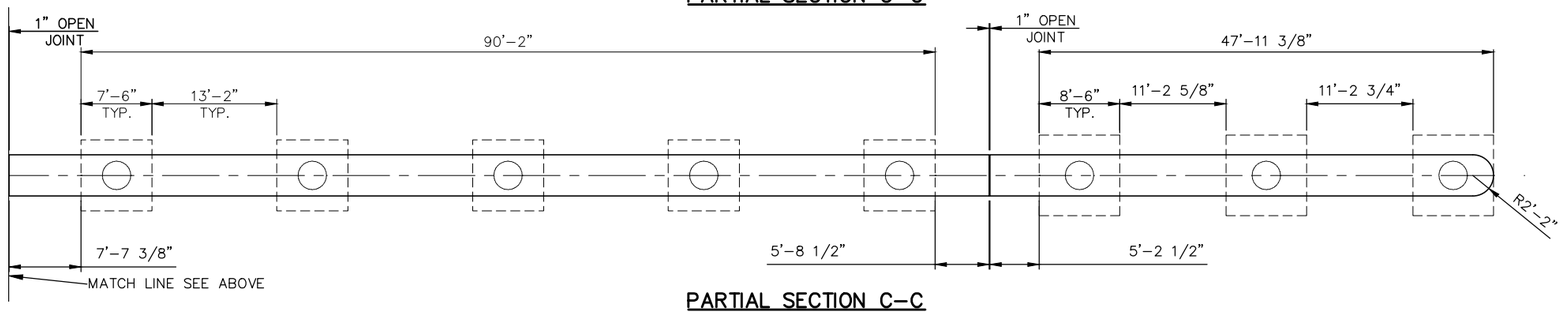
SHEET NAME: EX4-STU-PPR-T394-VEH-DTL-001

SHEET 2 OF 7

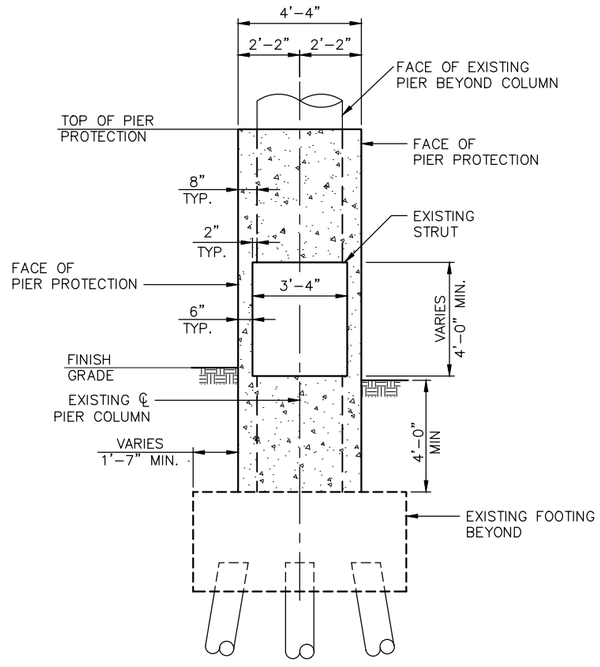
Aug, 10 2015 05:13 pm V:\3400_ADC\CAD\SEGMENT E4\PLAN SHEETS\STRUCTURES\PIER PROTECTION\EX4-STU-PPR-T394-VEH-DTL.dwg By: Anne.Cesnik



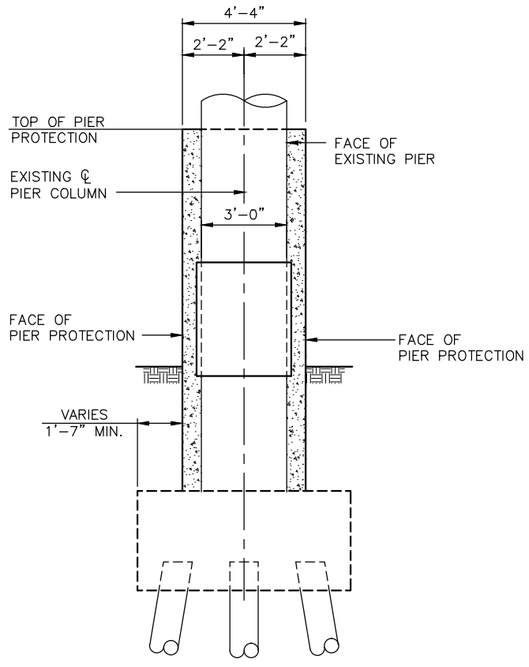
PARTIAL SECTION C-C



PARTIAL SECTION C-C



SECTION A-A TYP.



SECTION B-B TYP.

NOTES:

FOR VISUAL QUALITY REQUIREMENTS REFER TO SHEET 6

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AMC | CHECKED BY: LKZ
DRAWN BY: AES | DATE: 8/6/2015

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

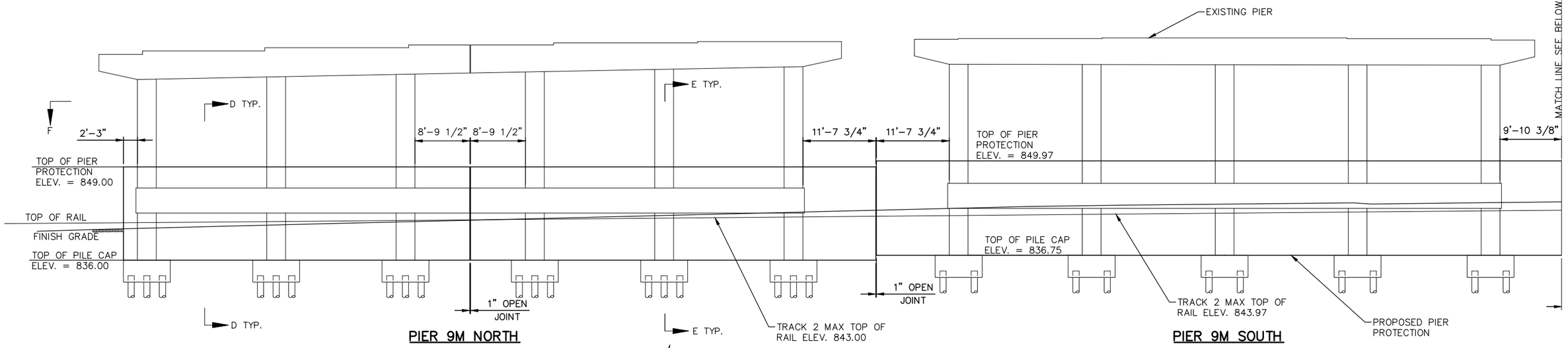
CIVIL EAST - VOLUME 4
TH 394 (BRIDGE 27770C)
PIER PROTECTION DETAILS (2 OF 4)

DISCIPLINE: STRUCTURES

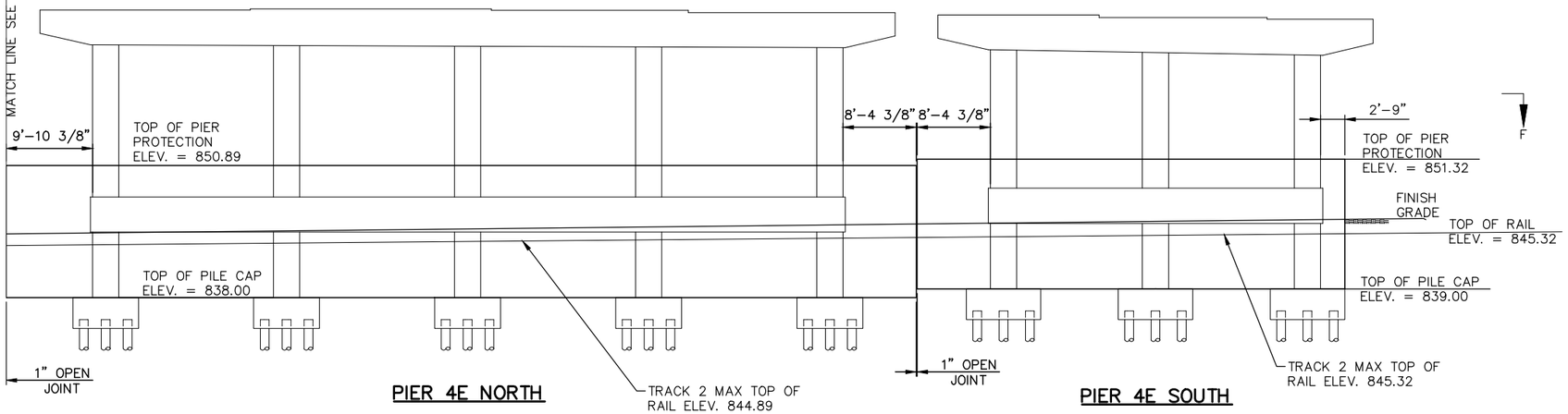
SHEET NAME: EX4-STU-PPR-T394-VEH-DTL-002

SHEET 3 OF 7

Aug, 10 2015 05:13 pm V:\3400_ADC\CAD\SEGMENT E4\PLAN SHEETS\STRUCTURES\PIER PROTECTION\EX4-STU-PPR-T394-VEH-DTL.dwg By: Anne.Cesnik



PARTIAL ELEVATION



PARTIAL ELEVATION

NOTES:

FOR VISUAL QUALITY REQUIREMENTS REFER TO SHEET 7

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AMC | CHECKED BY: LKZ
DRAWN BY: AES | DATE: 8/6/2015

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

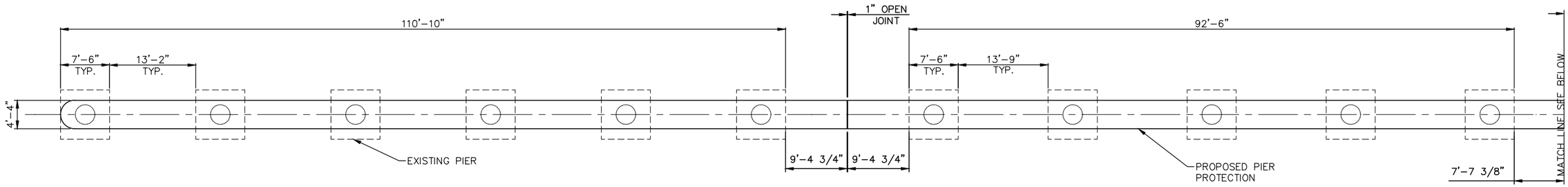
CIVIL EAST - VOLUME 4
TH 394 (BRIDGE 27770C)
PIER PROTECTION DETAILS (3 OF 4)

DISCIPLINE: STRUCTURES

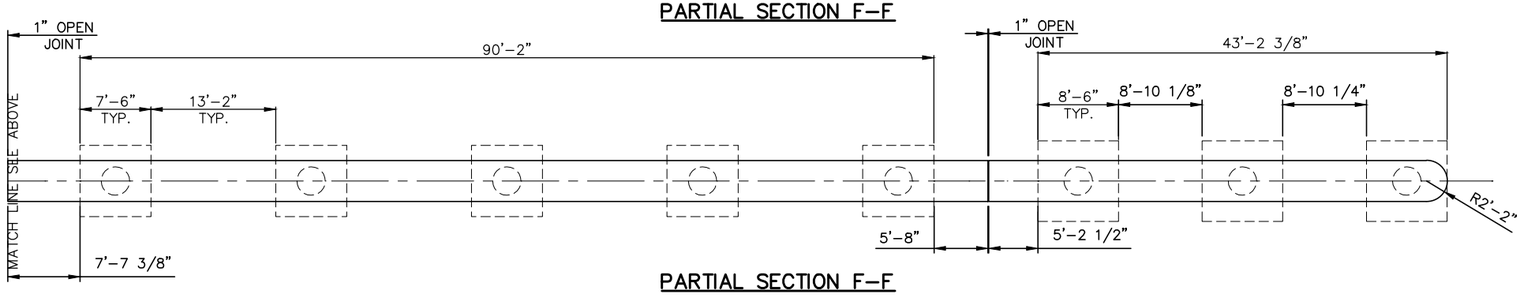
SHEET NAME: EX4-STU-PPR-T394-VEH-DTL-003

SHEET 4 OF 7

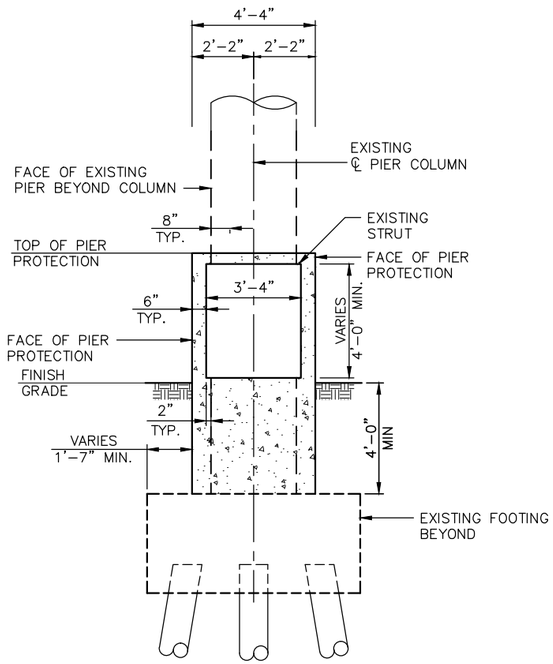
Aug, 10 2015 05:13 pm V:\3400_ADC\CAD\SEGMENT E4\PLAN SHEETS\STRUCTURES\PIER PROTECTION\EX4-STU-PPR-T394-VEH-DTL.dwg By: Anne.Cesnik



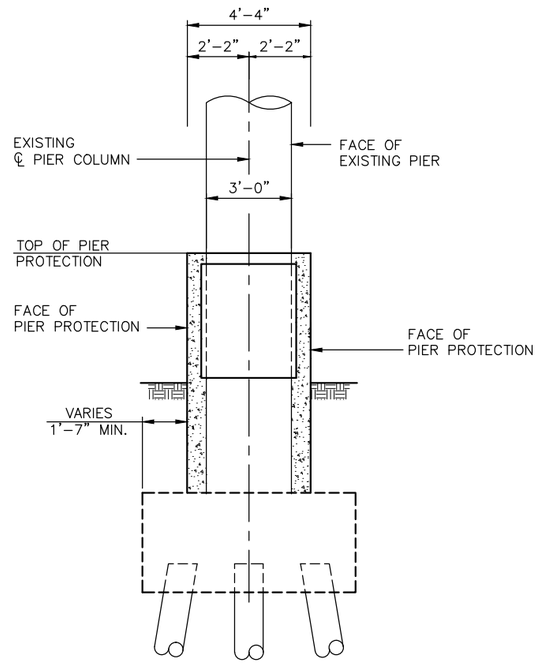
PARTIAL SECTION F-F



PARTIAL SECTION F-F



SECTION D-D TYP.



SECTION E-E TYP.

NOTES:

FOR VISUAL QUALITY REQUIREMENTS REFER TO SHEET 7

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AMC | CHECKED BY: LKZ
DRAWN BY: AES | DATE: 8/6/2015

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

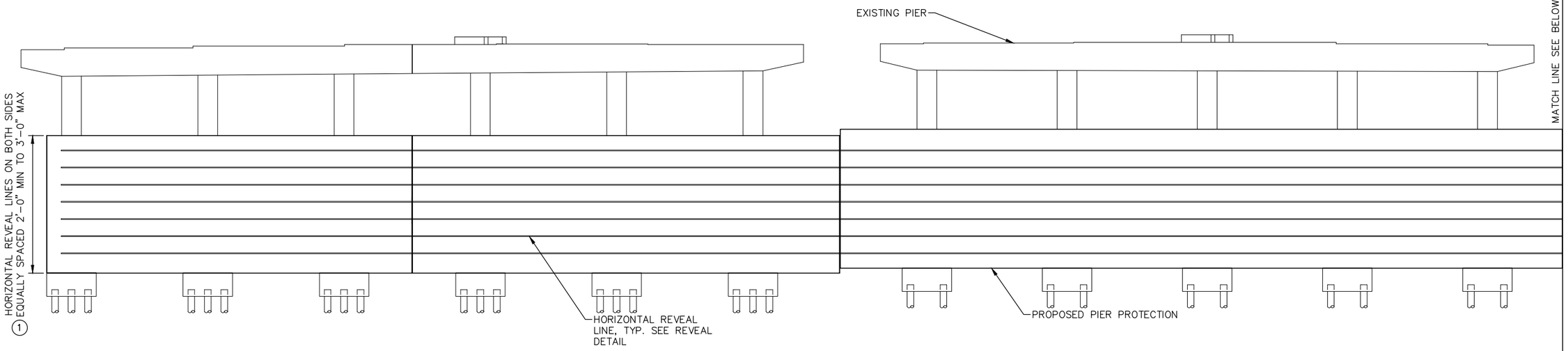
SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4
TH 394 (BRIDGE 27770C)
PIER PROTECTION
DETAILS (4 OF 4)

DISCIPLINE: STRUCTURES

SHEET NAME: EX4-STU-PPR-T394-VEH-DTL-004

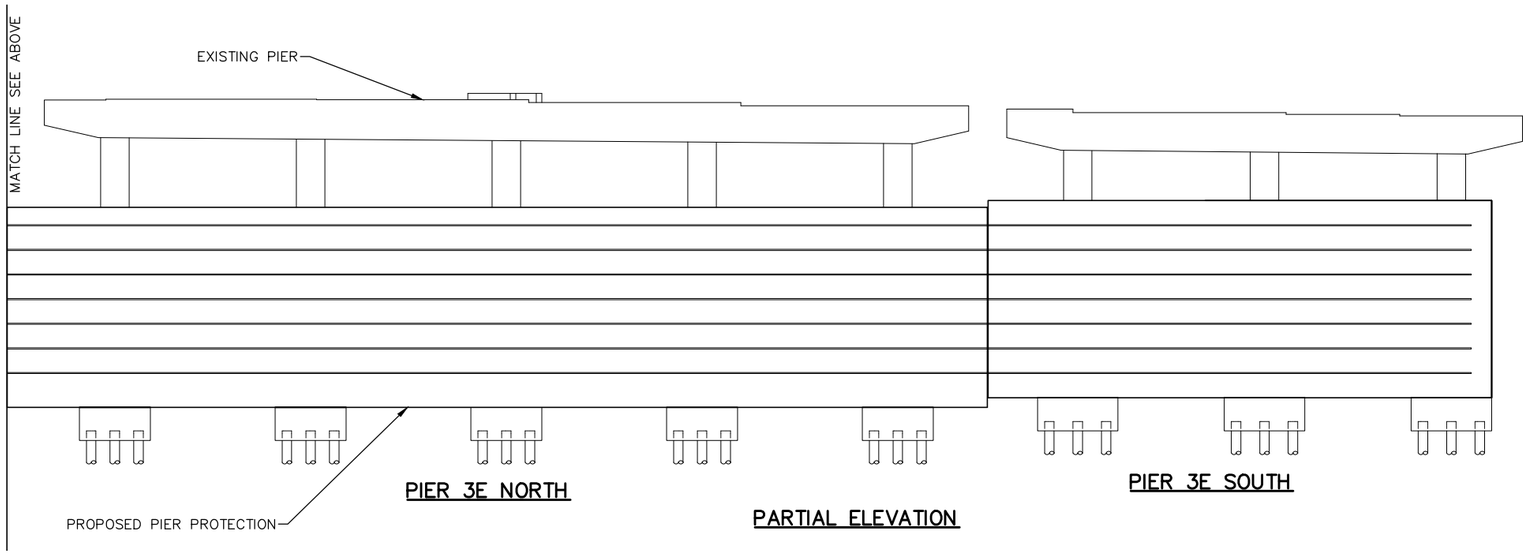
SHEET 5 OF 7



PIER 8M NORTH

PIER 8M SOUTH

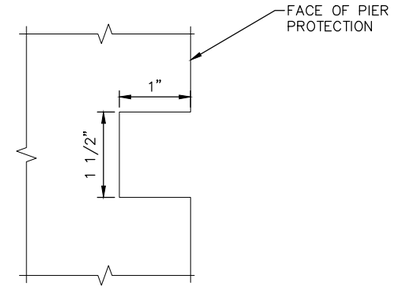
PARTIAL ELEVATION



PIER 3E NORTH

PIER 3E SOUTH

PARTIAL ELEVATION



REVEAL DETAIL

NOTES:

1. PROVIDE HORIZONTAL REVEAL LINES EQUALLY SPACED AS SHOWN ON FRONT AND BACK FACE OF PIER PROTECTION. DISCONTINUE REVEAL LINES AT BEGINNING OF RADIUS AT END OF WALL

   PROVIDE ¾" CHAMFER AT TOP OF PIER PROTECTION

   APPLY ANTI-GRAFFITI COATING TO VISIBLE SURFACES

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AMC | CHECKED BY: LKZ
DRAWN BY: AES | DATE: 8/6/2015

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

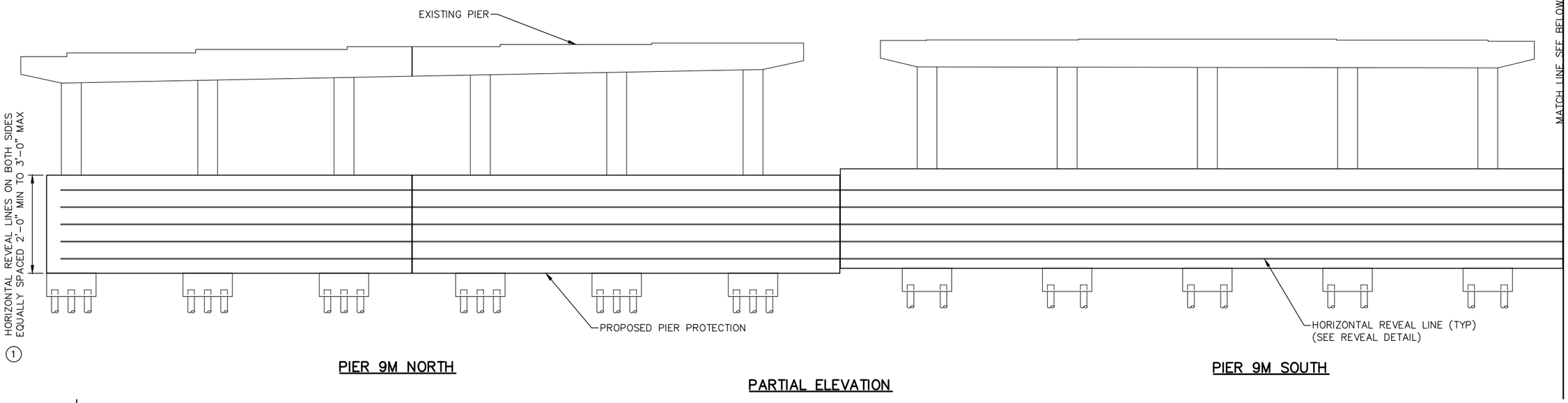
SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4
TH 394 (BRIDGE 27770C)
PIER PROTECTION
VISUAL QUALITY (1 OF 2)

DISCIPLINE: STRUCTURES

SHEET NAME: EX4-STU-PPR-T394-VEH-PIR-001

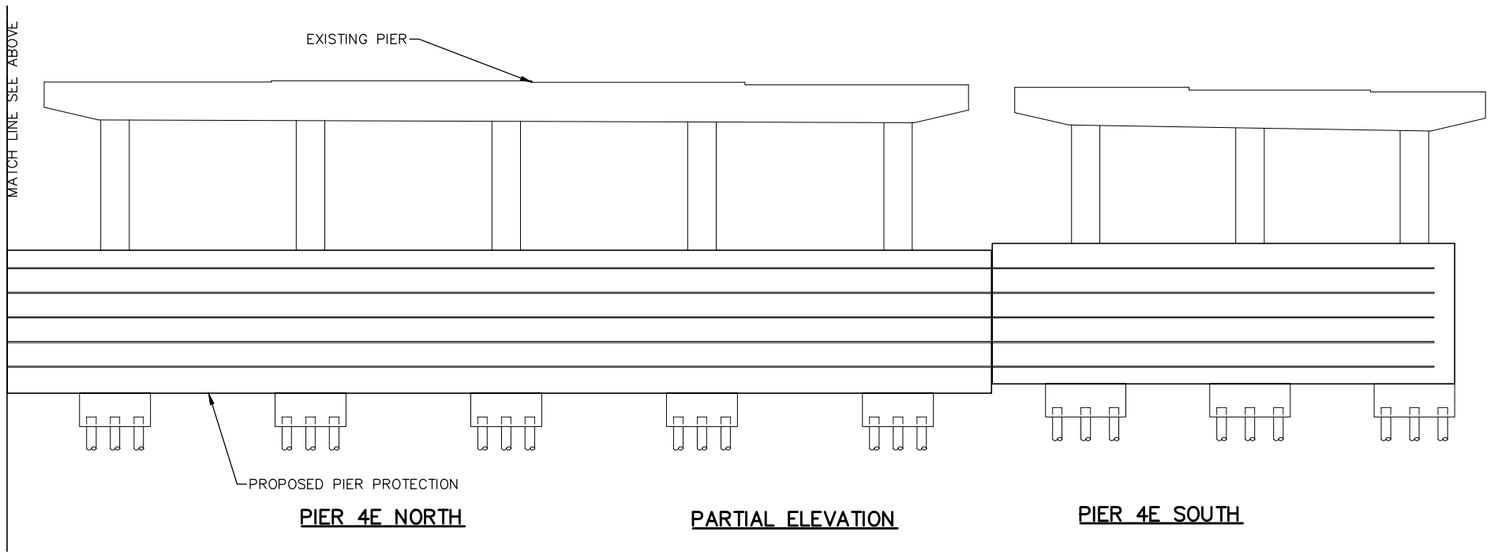
SHEET 6 OF 7



PIER 9M NORTH

PIER 9M SOUTH

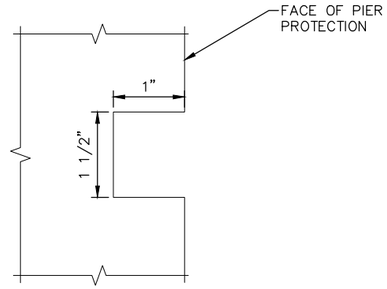
PARTIAL ELEVATION



PIER 4E NORTH

PARTIAL ELEVATION

PIER 4E SOUTH



REVEAL DETAIL

NOTES:

1. PROVIDE HORIZONTAL REVEAL LINES EQUALLY SPACED AS SHOWN ON FRONT AND BACK FACE OF PIER PROTECTION. DISCONTINUE REVEAL LINES AT BEGINNING OF RADIUS AT END OF WALL

   PROVIDE ¾" CHAMFER AT TOP OF PIER PROTECTION

   APPLY ANTI-GRAFFITI COATING TO VISIBLE SURFACES

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AMC | CHECKED BY: LKZ
DRAWN BY: AES | DATE: 8/6/2015

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

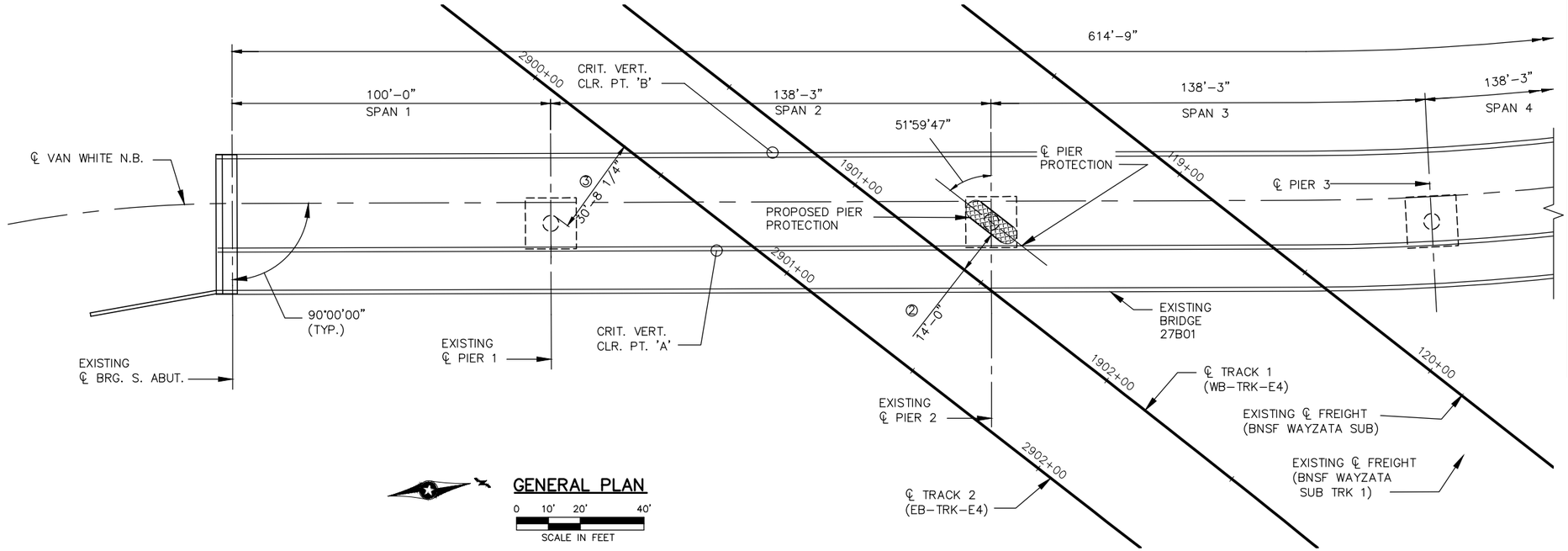
SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4
TH 394 (BRIDGE 27770C)
PIER PROTECTION
VISUAL QUALITY (2 OF 2)

DISCIPLINE: STRUCTURES

SHEET NAME: EX4-STU-PPR-T394-VEH-PIR-002

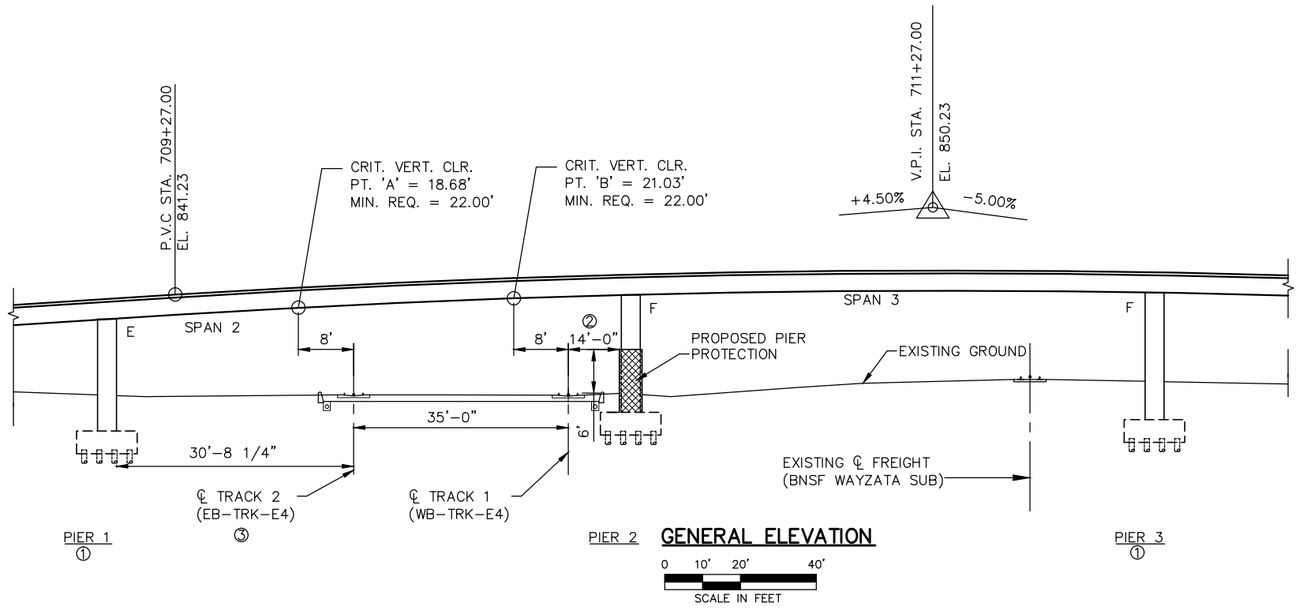
SHEET 7 OF 7



GENERAL PLAN

0 10' 20' 40'

SCALE IN FEET



GENERAL ELEVATION

0 10' 20' 40'

SCALE IN FEET

DESIGN DATA

2014 AND CURRENT INTERIM AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS

2014 AREMA MANUAL FOR RAILWAY ENGINEERING

MNDOT DRAFT PIER PROTECTION POLICY (MARCH 15, 2015)

LOAD AND RESISTANCE FACTOR DESIGN METHOD

SOUTHWEST LIGHT RAIL TRANSIT DESIGN CRITERIA (REVISION 4.0)

MATERIAL DESIGN PROPERTIES:
REINFORCED CONCRETE:
f'c = 4000 PSI n = 8
fy = 60000 PSI REINFORCEMENT

RAILWAY COLLISION LOAD = 600 KIP

LIST OF SHEETS

SCHEDULE OF QUANTITIES FOR PIER PROTETION

ITEM NO.	DESCRIPTION	UNIT	QUANTITY
2401	STRUCTURAL CONCRETE (3Y43)	CU. YD.	
2401	REINFORCEMENT BARS	POUND	
2433	ANCHORAGES TYPE REINF. BARS	EACH	

NOTES:

① PIER PROTECTION NOT REQUIRED ON PIERS 1 & 3

② HORIZONTAL OFFSET SHOWN IS MEASURED PERPENDICULAR FROM CENTERLINE OF TRACK TO FACE OF PIER PROTECTION AT CLOSEST POINT

③ HORIZONTAL OFFSET SHOWN IS MEASURED PERPENDICULAR FROM CENTERLINE OF TRACK TO FACE OF PIER AT CLOSEST POINT

FOR VISUAL QUALITY REQUIREMENTS REFER TO SHEET 3

PROPOSED PIER PROTECTION

BRIDGE NO. 27B01

VAN WHITE MEMORIAL BOULEVARD NB OVER BNSF TRACKS AND SOUTHWEST LRT 0.1 MILES NORTH OF JUNCTION OF DUNWOODY BOULEVARD AND T.H. 394

BRIDGE I.D. NO. P07

GENERAL PLAN AND ELEVATION

SEC 28 T 29N R 24W

CITY OF MINNEAPOLIS HENNEPIN COUNTY

APPROVED: _____ STATE BRIDGE ENGINEER _____ DATE

DRAFT-WORK IN PROCESS

JOB NO. T9N635 | STATE PROJECT NO. 9909-01 | MNDOT REVIEW: JOE NIETFELD

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AMC | CHECKED BY: LKZ

DRAWN BY: CAD | DATE: 8/6/2015

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

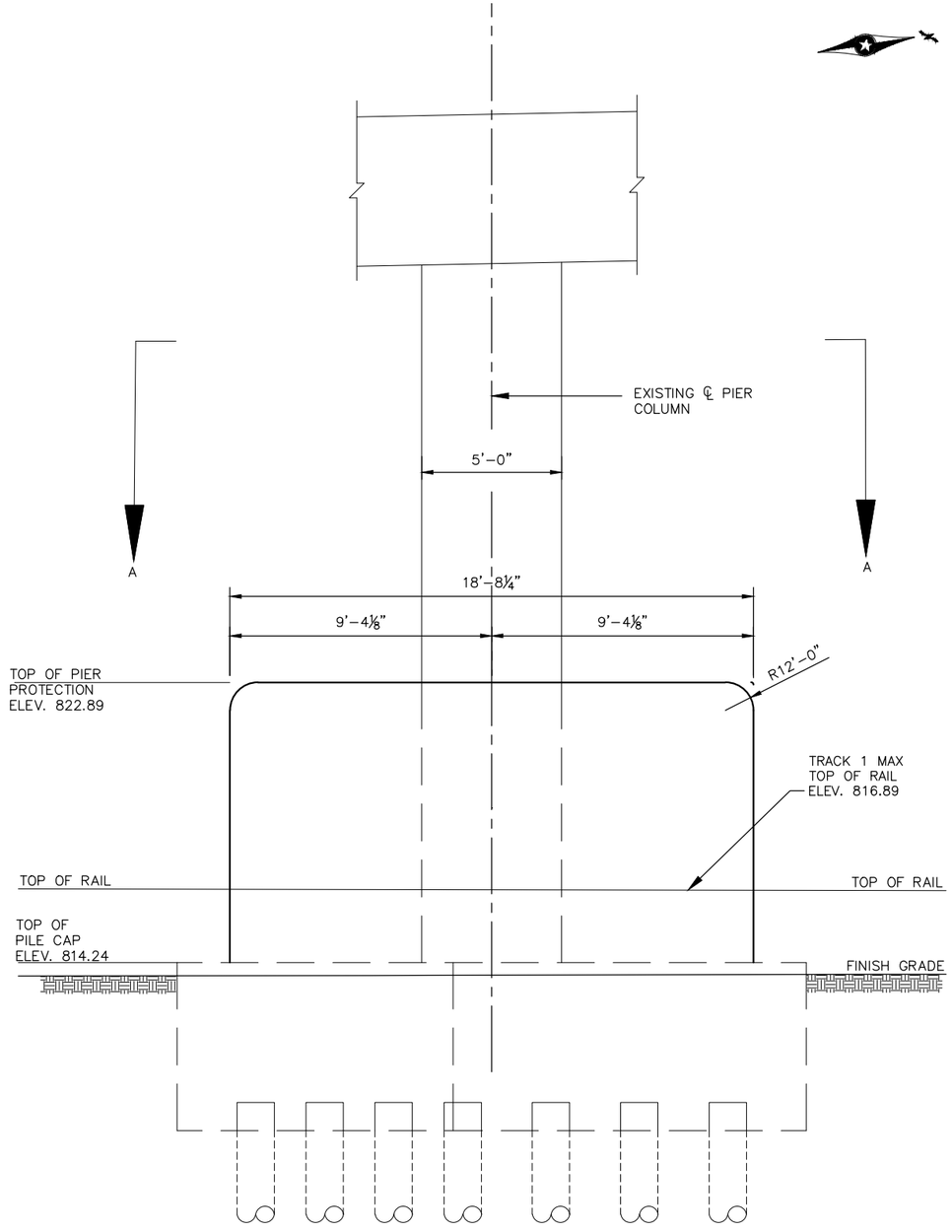
CIVIL EAST - VOLUME 4
VAN WHITE MEM. BLVD. (BRIDGE 27B01)
PIER PROTECTION
GENERAL PLAN AND ELEVATION

DISCIPLINE: STRUCTURES

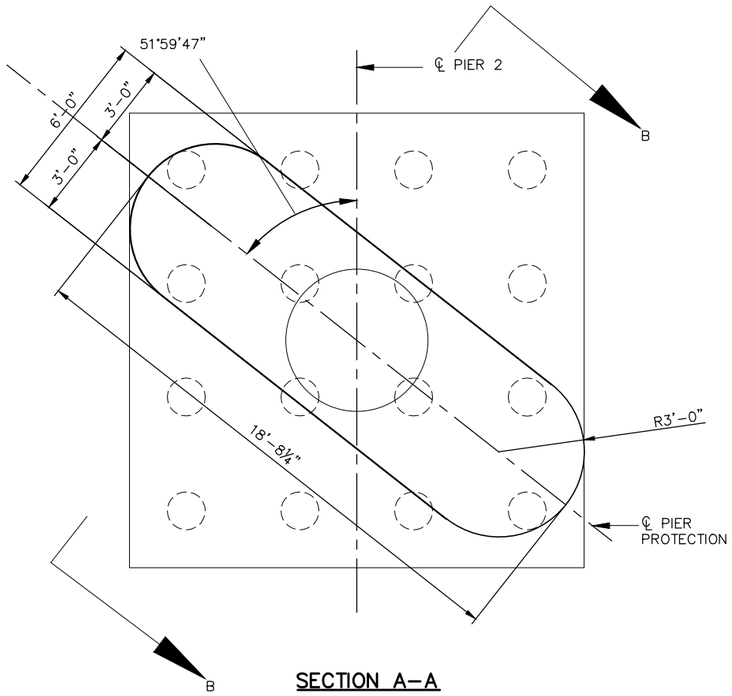
SHEET NAME: EX4-STU-PPR-VWMB-VEH-GPE-001

SHEET 1 OF 3

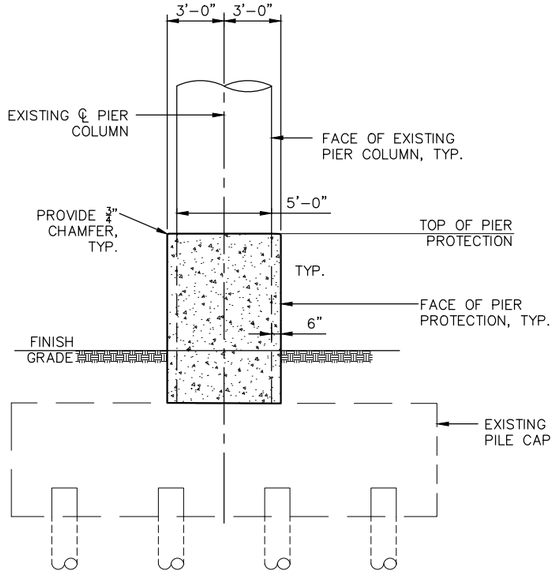
Aug. 10 2015 05:14 pm V:\3400_ADC\CAD\SEGMENT E4\PLAN SHEETS\STRUCTURES\PIER PROTECTION\EX4-STU-PPR-VWMB-VEH-DTL.dwg By: Anne.Cesnik



ELEVATION–PIER 2



SECTION A–A



SECTION B–B

NOTES:

FOR VISUAL QUALITY REQUIREMENTS REFER TO SHEET 3

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AMC | CHECKED BY: LKZ
DRAWN BY: CAD | DATE: 8/6/2015

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

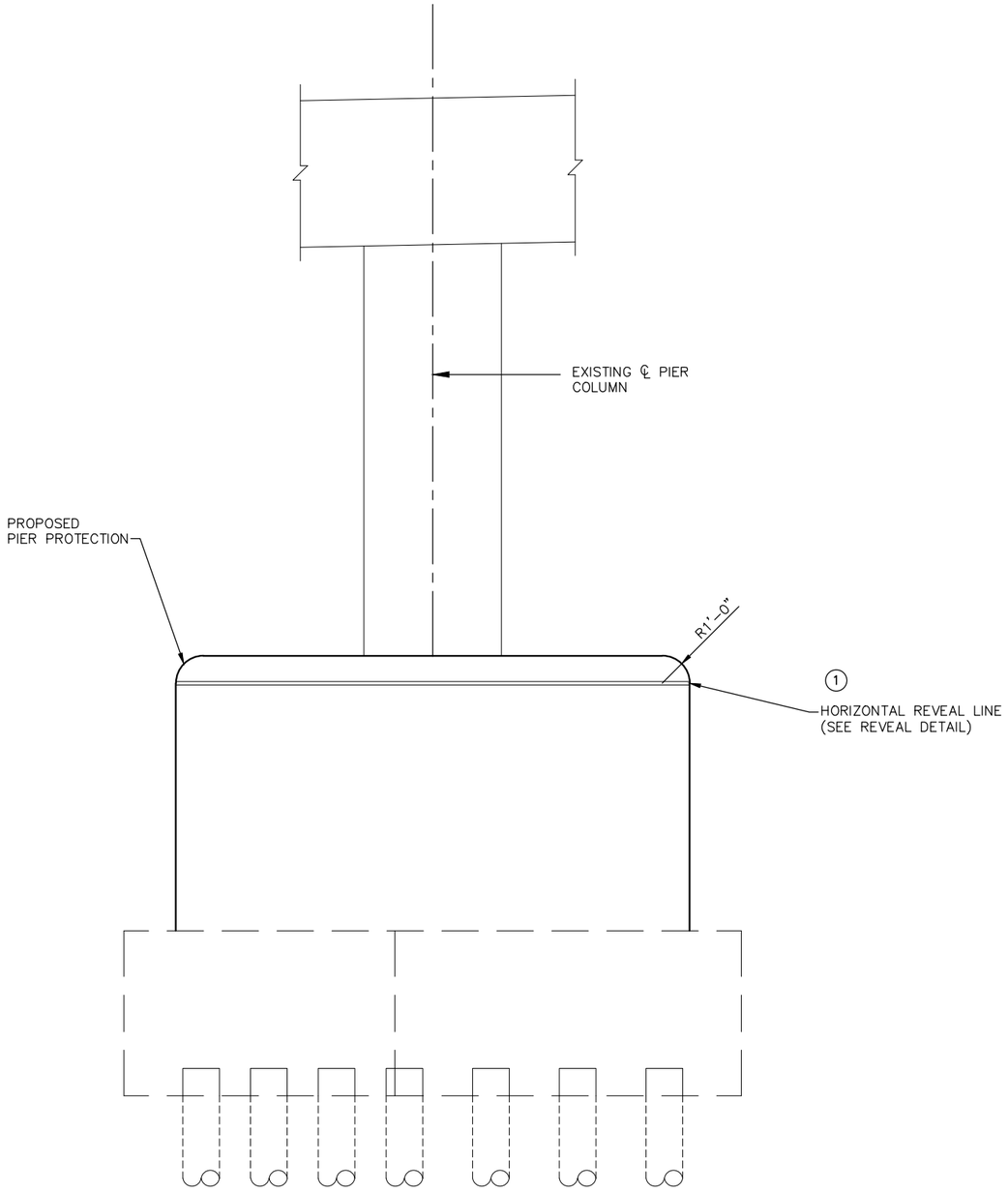
CIVIL EAST - VOLUME 4
VAN WHITE MEM. BLVD (BRIDGE 27B01)
PIER PROTECTION
DETAILS

DISCIPLINE: STRUCTURES

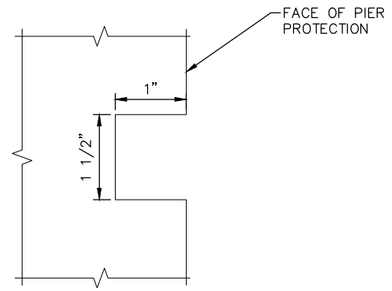
SHEET NAME: EX4-STU-PPR-VWMB-VEH-DTL-001

SHEET 2 OF 3

Aug, 10 2015 05:14 pm V:\3400_ADC\CAD\SEGMENT E4\PLAN SHEETS\STRUCTURES\PIER PROTECTION\EX4-STU-PPR-VWMB-VEH-DTL.dwg By: Anne.Cesnik



ELEVATION – PIER 2



REVEAL DETAIL

NOTES:

1. PROVIDE CONTINUOUS HORIZONTAL REVEAL LINE AND RADIUS AT TOP OF WALL AS SHOWN.

APPLY SURFACE COATING TO MATCH EXISTING BRIDGE SUBSTRUCTURE COLOR (FEDERAL COLOR XXXXX)

APPLY ANTI-GRAFFITI COATING TO VISIBLE SURFACES

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AMC | CHECKED BY: LKZ
DRAWN BY: CAD | DATE: 8/6/2015

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

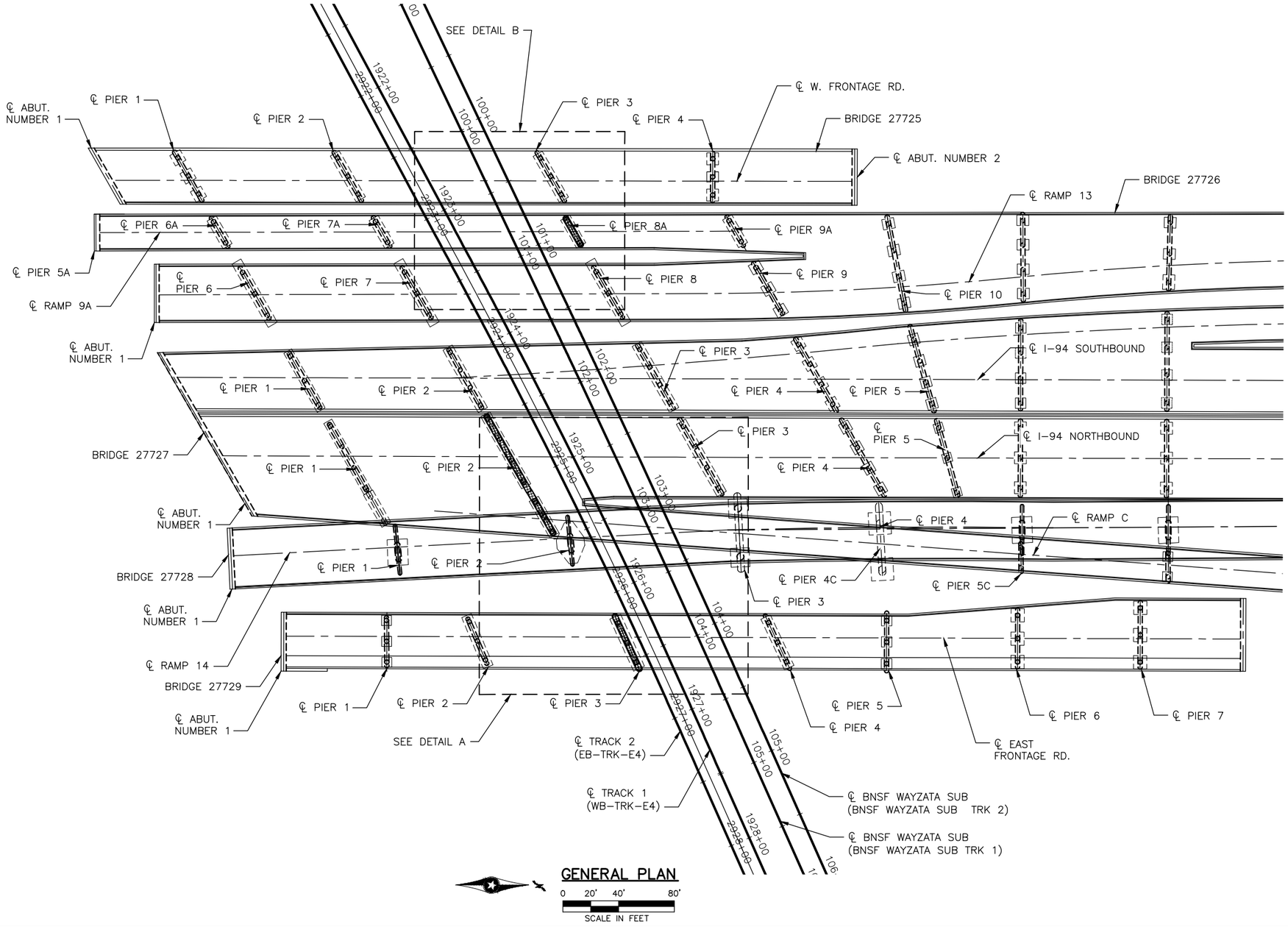
SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4
VAN WHITE MEM. BLVD (BRIDGE 27B01)
PIER PROTECTION
VISUAL QUALITY

DISCIPLINE: STRUCTURES

SHEET NAME: EX4-STU-PPR-VWMB-VEH-PIR-001

SHEET 3 OF 3



GENERAL PLAN

0 20' 40' 80'

SCALE IN FEET

DESIGN DATA

2014 AND CURRENT INTERIM AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS

2014 AREMA MANUAL FOR RAILWAY ENGINEERING

MNDOT DRAFT PIER PROTECTION POLICY (MARCH 15, 2015)

LOAD AND RESISTANCE FACTOR DESIGN METHOD

SOUTHWEST LIGHT RAIL TRANSIT DESIGN CRITERIA (REVISION 4.0)

RAILWAY COLLISION LOAD = 600 KIPS

MATERIAL DESIGN PROPERTIES:
REINFORCED CONCRETE:
f'c = 4000 PSI n = 8
fy = 60000 PSI REINFORCEMENT

LIST OF SHEETS

SCHEDULE OF QUANTITIES FOR PIER PROTECTION

ITEM NO.	DESCRIPTION	UNIT	QUANTITY
2401.501	STRUCTURAL CONCRETE (3Y43)	CU. YD.	
2401.541	REINFORCEMENT BARS	POUND	
2433.561	ANCHORAGES TYPE REINF. BARS	EACH	
2433.601	STRUCTURE EXCAVATION	LUMP SUM	

NOTES:

PROPOSED PIER PROTECTION

BRIDGES 27725-27729

WEST FRONTAGE ROAD, RAMP 9A, RAMP 13, I-94, RAMP 14, RAMP C, AND EAST FRONTAGE ROAD OVER BNSF RR AND SOUTHWEST LRT. 0.4 MILES SOUTH OF JCT. T.H. 55 & I-94.

BRIDGE I.D. NO. 401

GENERAL PLAN

SEC 22 T 29N R 24W
CITY OF MINNEAPOLIS HENNEPIN COUNTY

APPROVED: _____ STATE BRIDGE ENGINEER _____ DATE

DRAFT-WORK IN PROCESS

JOB NO. T9N635 | STATE PROJECT NO. 9909-01 | MNDOT REVIEW: JOE NIETFELD

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AMC | CHECKED BY: LKZ
DRAWN BY: CAD | DATE: 8/6/2015

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

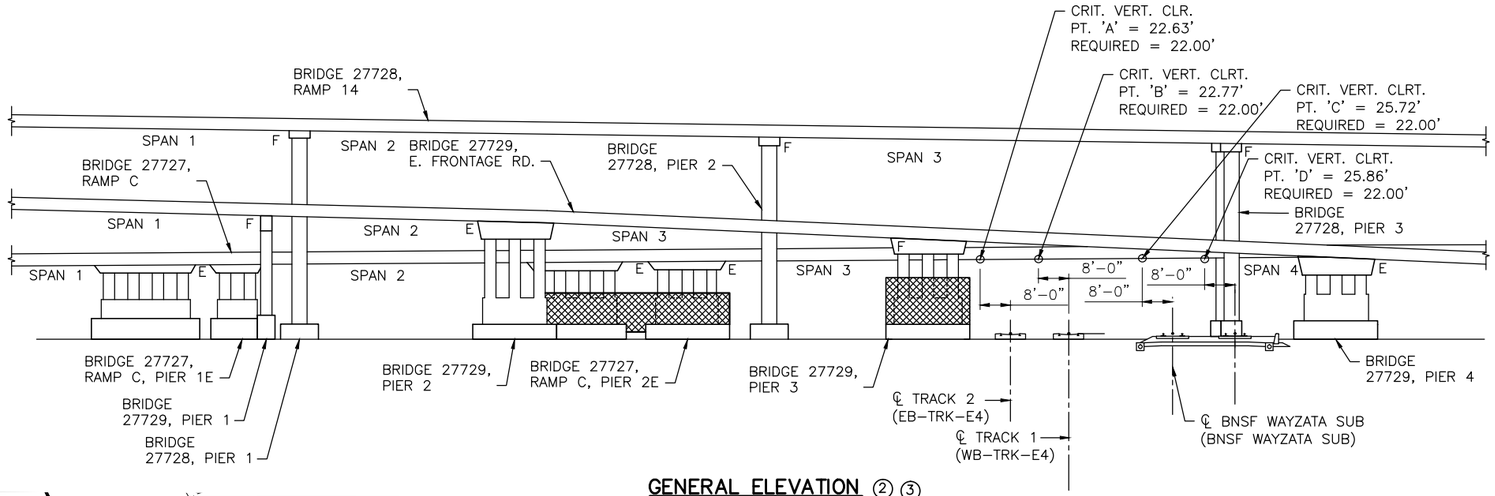
CIVIL EAST - VOLUME 4
I-94 (BRIDGES 27725-27729)
PIER PROTECTION
GENERAL PLAN

DISCIPLINE: STRUCTURES

SHEET NAME: EX4-STU-PPR-ALL94-VEH-GPE-001

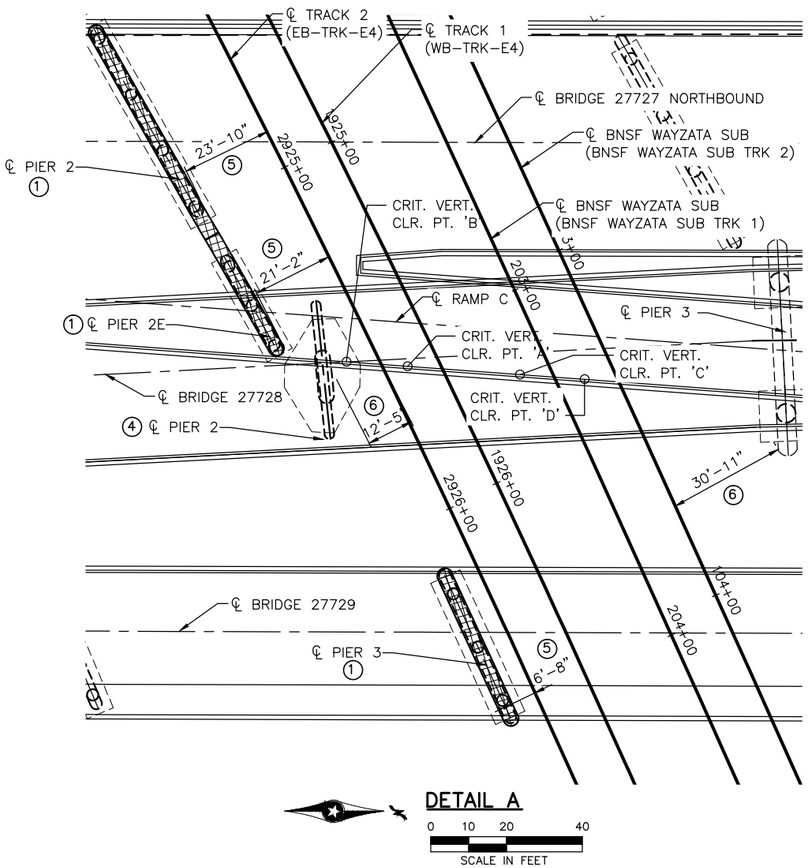
SHEET 1 OF 6

Aug. 10 2015 05:14 pm V:\3400_ADC\CAD\SEGMENT E4\PLAN SHEETS\STRUCTURES\PIER PROTECTION\EX4-STU-PPR-ALL94-VEH-DTL.dwg By: Anne.Cesnik



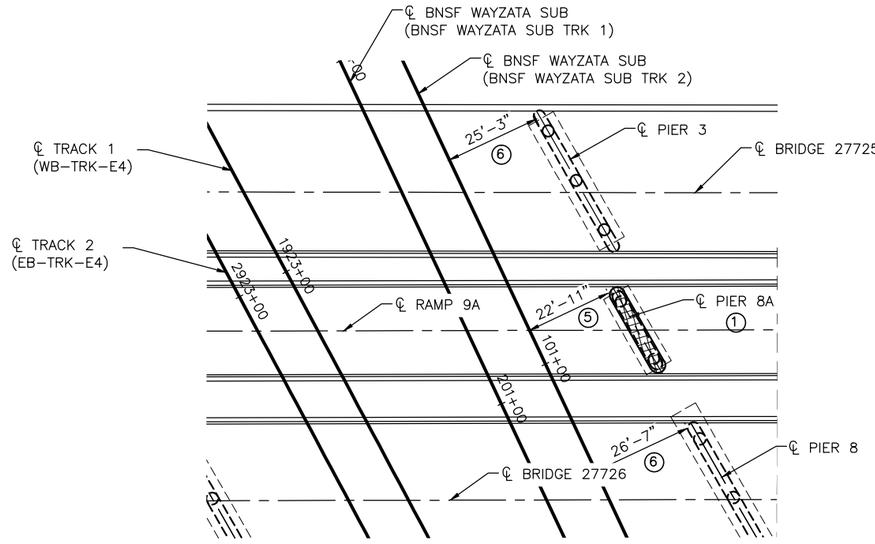
GENERAL ELEVATION ② ③

0 10 20 40
SCALE IN FEET



DETAIL A

0 10 20 40
SCALE IN FEET



DETAIL B

0 10 20 40
SCALE IN FEET

NOTES:

① PIER PROTECTION ONLY REQUIRED ON PIERS 2 & 2E OF BRIDGE 27727, PIER 8A OF BRIDGE 27726, AND PIER 3 OF BRIDGE 27729

② HORIZONTAL OFFSETS AND MINIMUM PIER PROTECTION HEIGHTS ARE NOT SHOWN DUE TO ELEVATION ANGLE

③ ELEVATION VIEW DEVELOPED ALONG POINT OF CRITICAL VERTICAL CLEARANCE

④ PIER IS OF HEAVY CONSTRUCTION. PIER PROTECTION IS NOT REQUIRED BY ANALYSIS

⑤ HORIZONTAL OFFSET SHOWN IS MEASURED PERPENDICULAR FROM CENTERLINE OF TRACK TO FACE OF PIER PROTECTION AT CLOSEST POINT

⑥ HORIZONTAL OFFSET SHOWN IS MEASURED PERPENDICULAR FROM CENTERLINE OF TRACK TO FACE OF PIER AT CLOSEST POINT

PROPOSED PIER PROTECTION

FOR VISUAL QUALITY REQUIREMENTS REFER TO SHEETS 5 AND 6

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AMC | CHECKED BY: LKZ
DRAWN BY: CAD | DATE: 8/6/2015

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

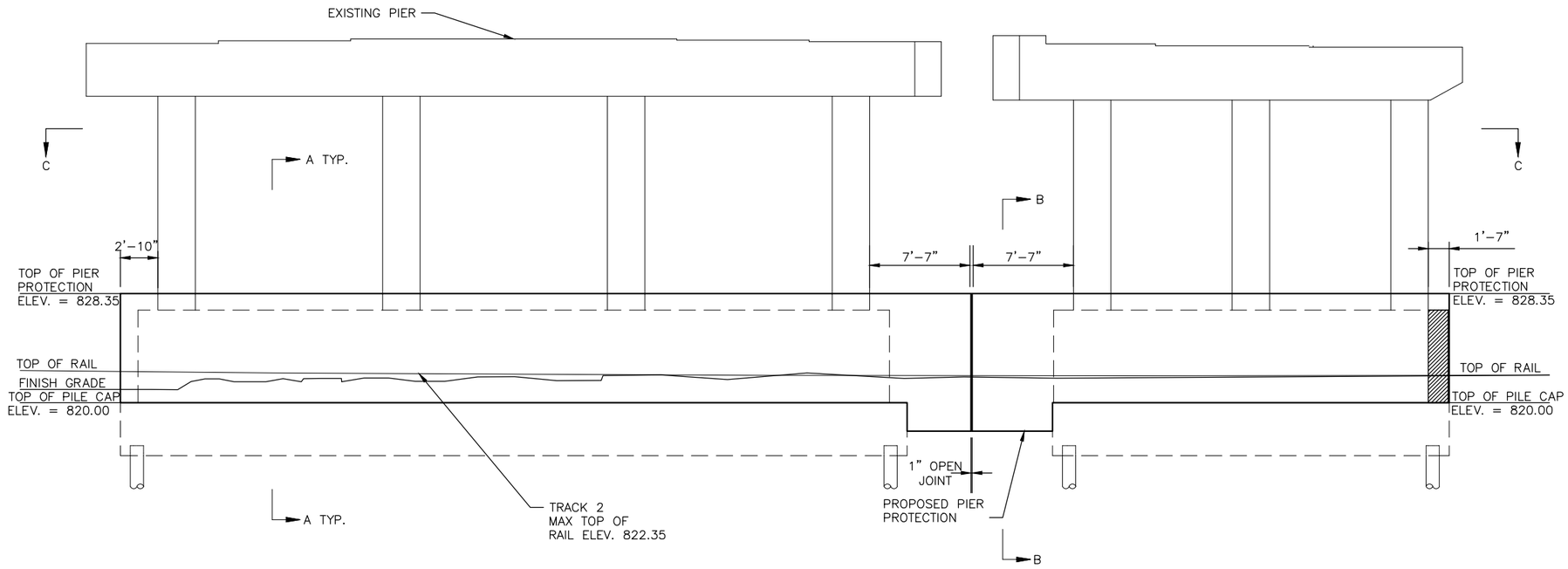
SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4
I-94 (BRIDGES 27725-27729)
PIER PROTECTION
GENERAL ELEVATION AND DETAILS

DISCIPLINE: STRUCTURES
SHEET NAME: EX4-STU-PPR-ALL94-VEH-GPE-002

SHEET 2 OF 6

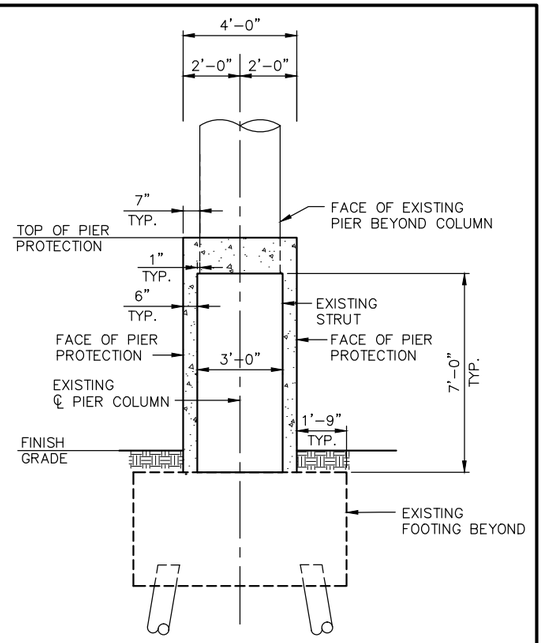
Aug, 10 2015 05:15 pm V:\3400_ADC\CAD\SEGMENT E4\PLAN SHEETS\STRUCTURES\PIER PROTECTION\EX4-STU-PPR-ALL94-VEH-DTL.dwg By: Anne.Cesnik



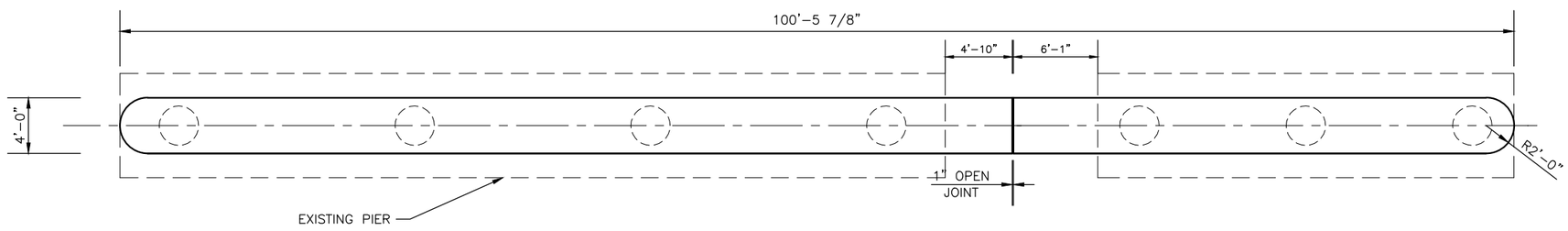
ELEVATION

PIER 2

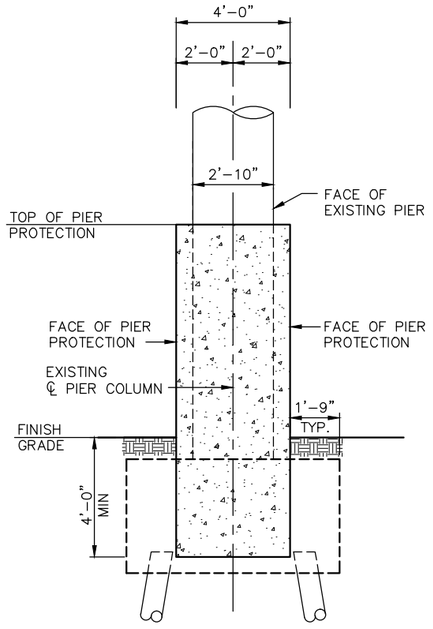
PIER 2E



SECTION A-A TYP.



SECTION C-C



SECTION B-B

NOTES:

FOR VISUAL QUALITY REQUIREMENTS REFER TO SHEET 5

PORTION OF EXISTING STRUCTURE TO BE REMOVED

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AMC | CHECKED BY: LKZ
DRAWN BY: CAD | DATE: 8/6/2015

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

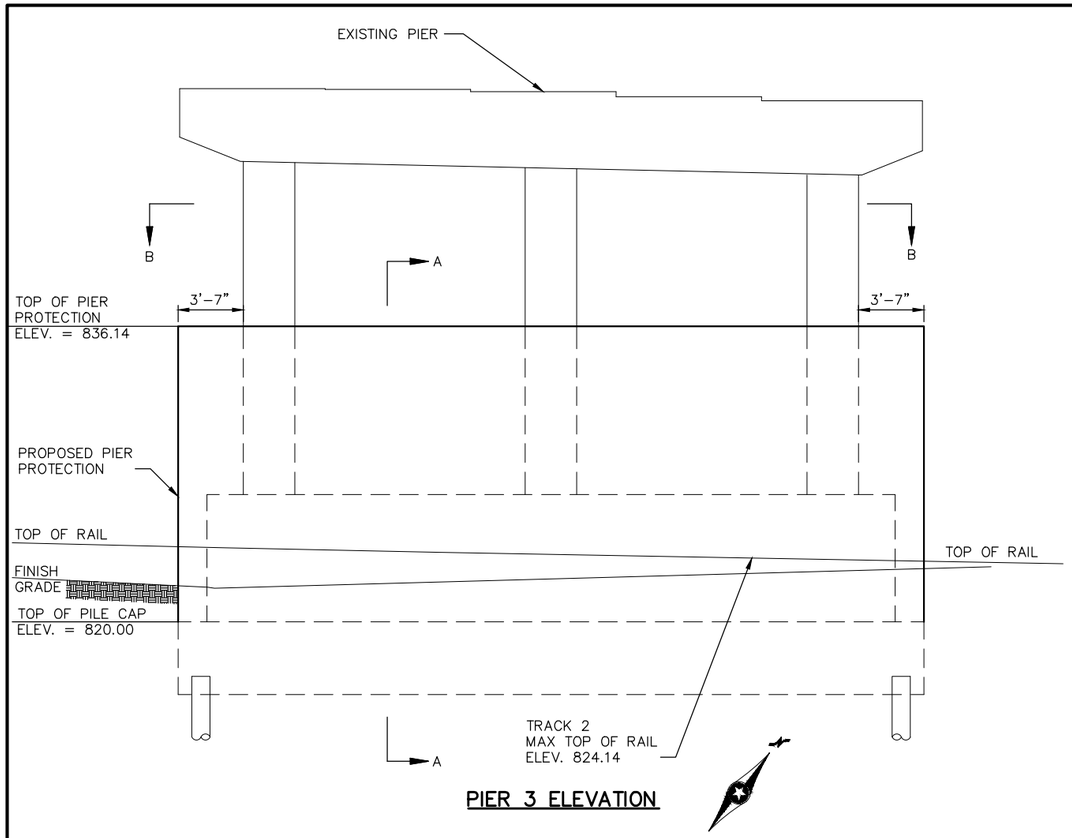
CIVIL EAST - VOLUME 4
I-94 (BRIDGES 27725-27729)
PIER PROTECTION
BRIDGE 27727 DETAILS

DISCIPLINE: STRUCTURES

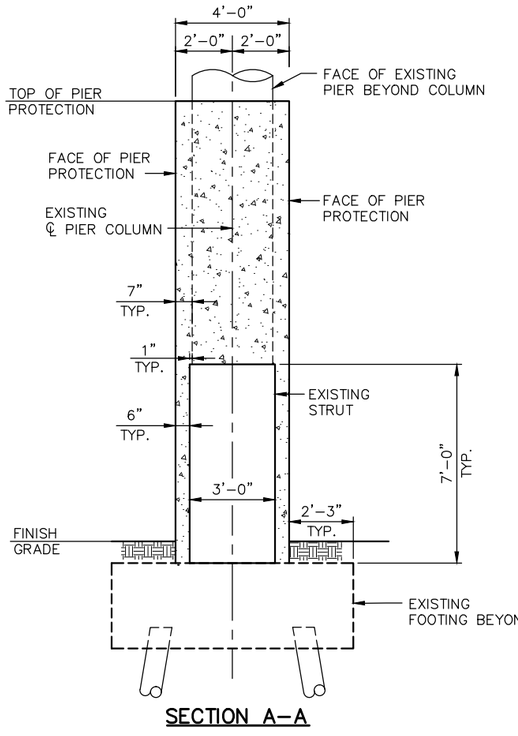
SHEET NAME: EX4-STU-PPR-ALL94-VEH-DTL-001

SHEET 3 OF 6

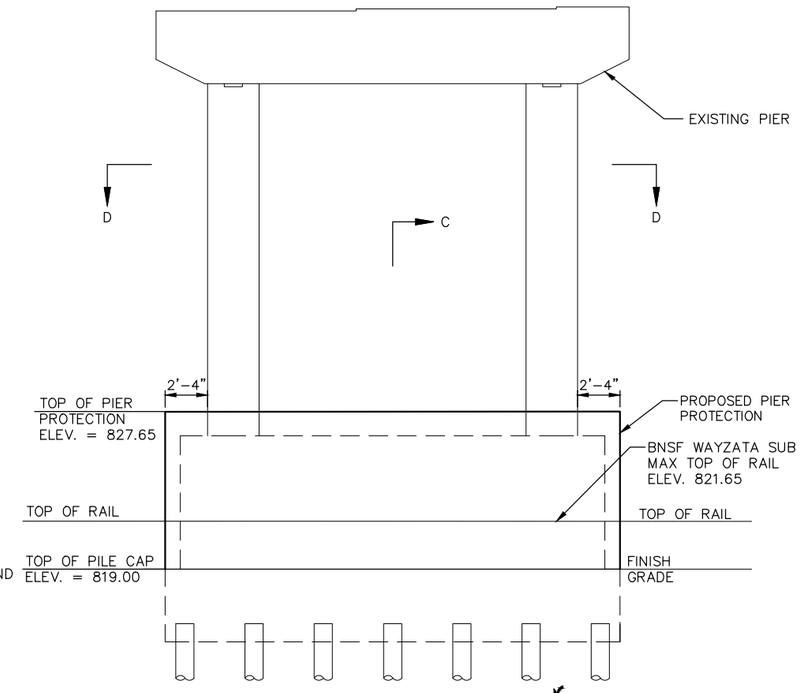
Aug, 10 2015 05:15 pm V:\3400_ADC\CAD\SEGMENT E4\PLAN SHEETS\STRUCTURES\PIER PROTECTION\EX4-STU-PPR-ALL94-VEH-DTL.dwg By: Anne.Cesnik



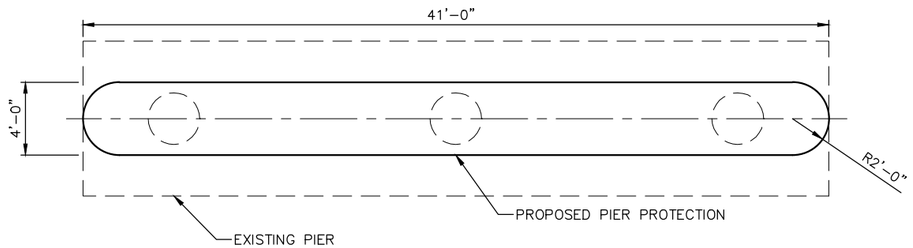
PIER 3 ELEVATION



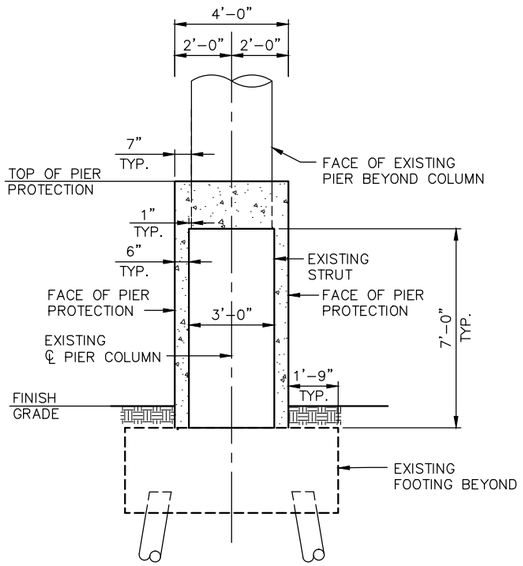
SECTION A-A



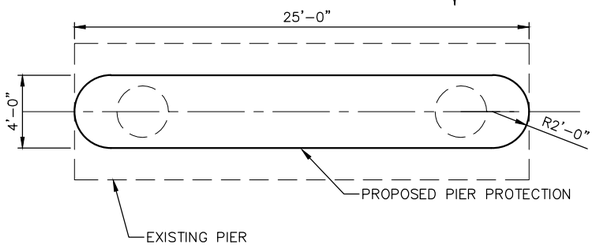
PIER 8A ELEVATION



SECTION B-B



SECTION C-C



SECTION D-D

NOTES:

FOR VISUAL QUALITY REQUIREMENTS REFER TO SHEET 6

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AMC | CHECKED BY: LKZ
DRAWN BY: CAD | DATE: 8/6/2015

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

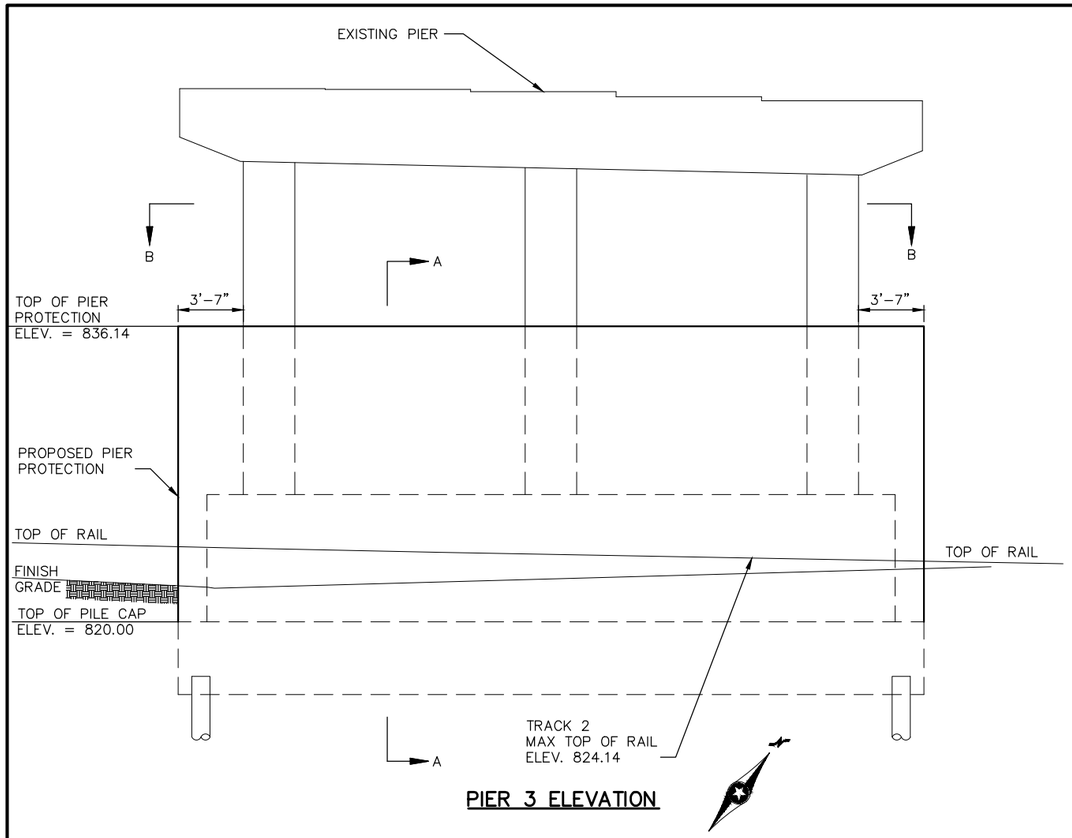
CIVIL EAST - VOLUME 4
I-94 (BRIDGE 27725-27729)
PIER PROTECTION
BRIDGES 27729 & 27726 DETAILS

DISCIPLINE: STRUCTURES

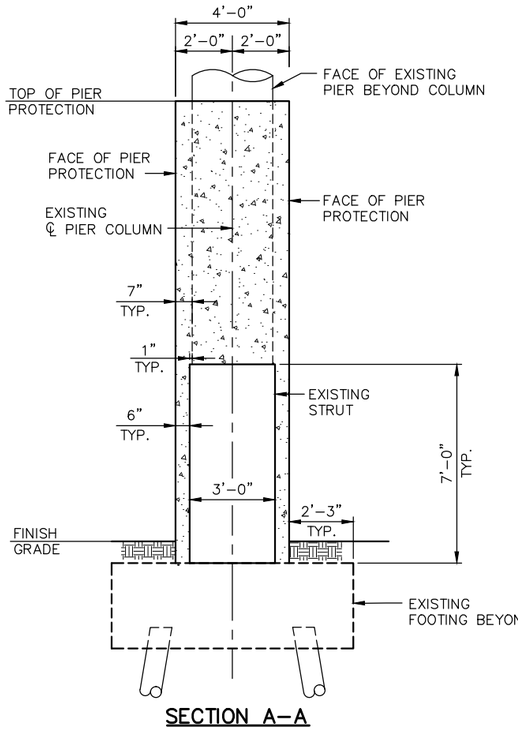
SHEET NAME: EX4-STU-PPR-ALL94-VEH-DTL-002

SHEET 4 OF 6

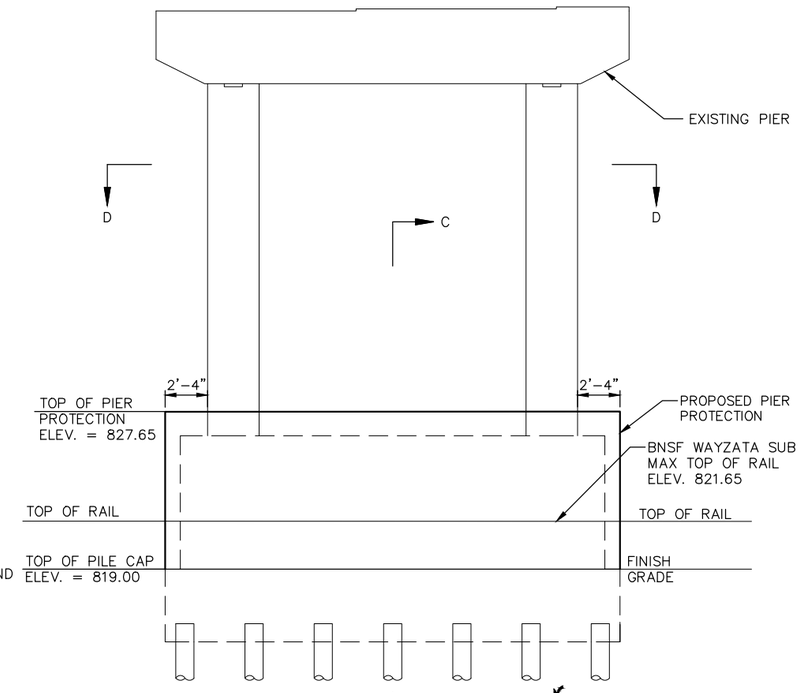
Aug. 10 2015 05:15 pm v:\3400_ADC\CAD\SEGMENT E4\PLAN SHEETS\STRUCTURES\PIER PROTECTION\EX4-STU-PPR-ALL94-VEH-DTL.dwg By: Anne.Cesnik



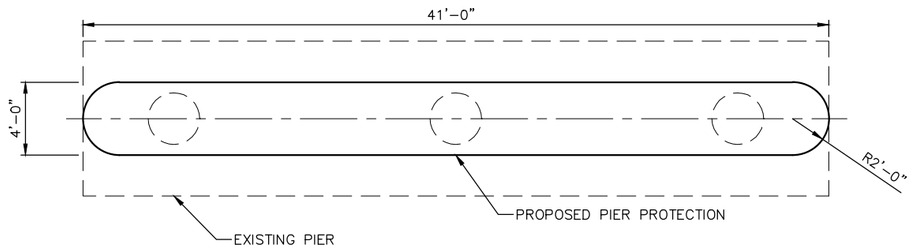
PIER 3 ELEVATION



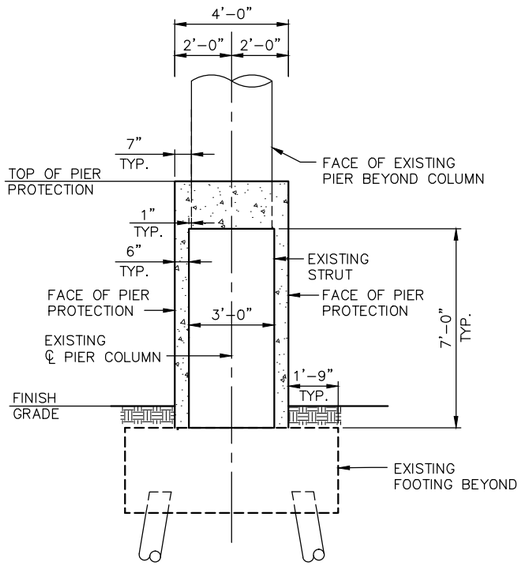
SECTION A-A



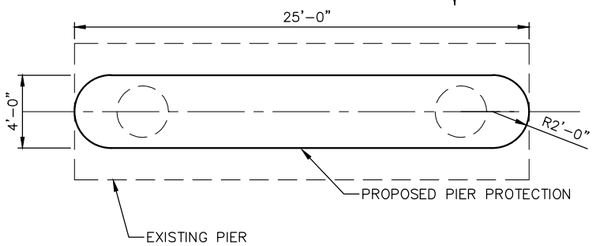
PIER 8A ELEVATION



SECTION B-B



SECTION C-C



SECTION D-D

NOTES:

FOR VISUAL QUALITY REQUIREMENTS REFER TO SHEET 6

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AMC | CHECKED BY: LKZ
DRAWN BY: CAD | DATE: 8/6/2015

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

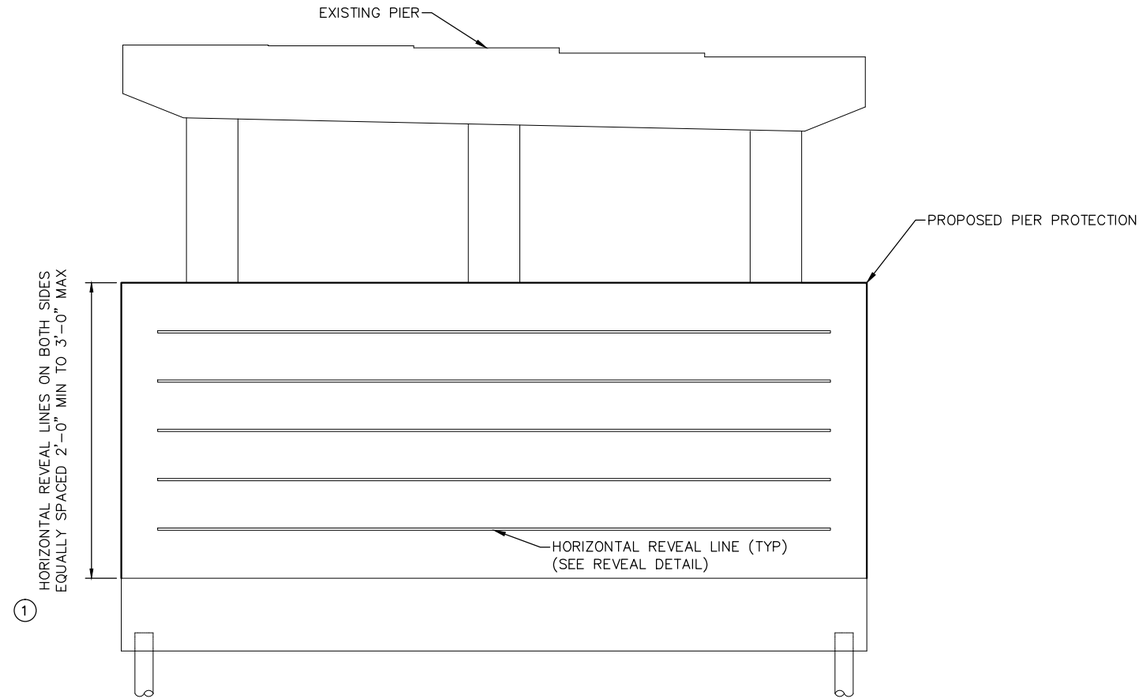
CIVIL EAST - VOLUME 4
I-94 (BRIDGE 27725-27729)
PIER PROTECTION
BRIDGES 27729 & 27726 DETAILS

DISCIPLINE: STRUCTURES

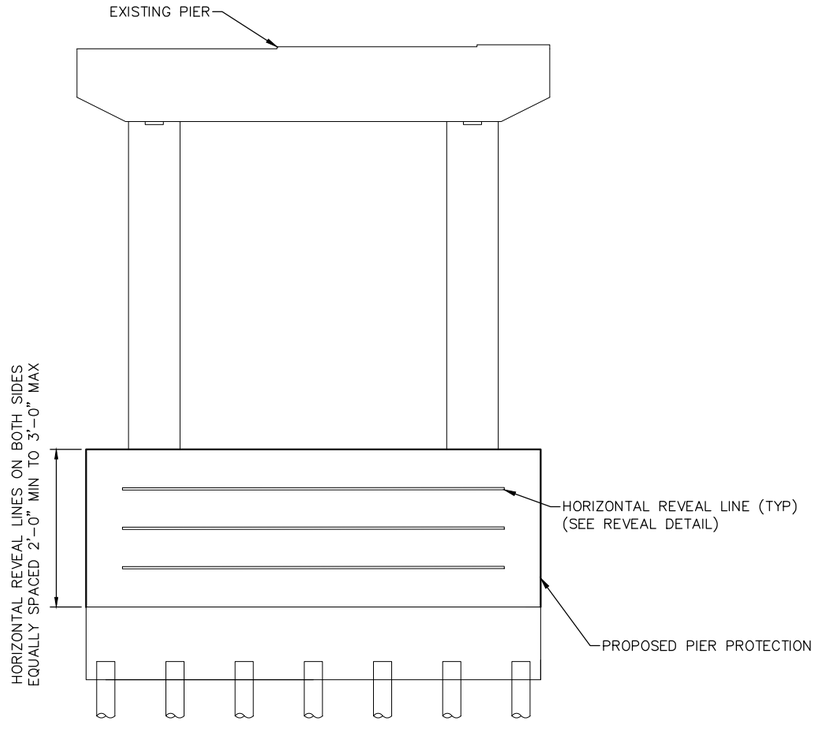
SHEET NAME: EX4-STU-PPR-ALL94-VEH-DTL-002

SHEET 4 OF 6

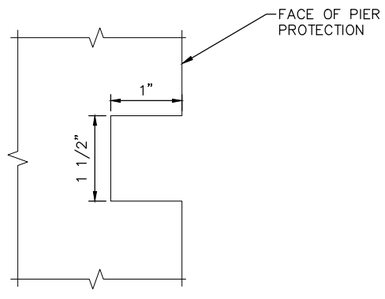
Aug. 10 2015 05:15 pm v:\3400_ADC\CAD\SEGMENT E4\PLAN SHEETS\STRUCTURES\PIER PROTECTION\EX4-STU-PPR-ALL94-VEH-DTL.dwg By: Anne.Cesnik



ELEVATION – PIER 3



ELEVATION – PIER 8A



REVEAL DETAIL

NOTES:

1. PROVIDE HORIZONTAL REVEAL LINES EQUALLY SPACED AS SHOWN ON FRONT AND BACK FACE OF PIER PROTECTION. DISCONTINUE REVEAL LINES AT BEGINNING OF RADIUS AT END OF WALL

   PROVIDE ¾" CHAMFER AT TOP OF PIER PROTECTION

   APPLY ANTI-GRAFFITI COATING TO VISIBLE SURFACES

DRAFT-WORK IN PROCESS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AMC | CHECKED BY: LKZ
DRAWN BY: CAD | DATE: 8/6/2015

AECOM Kimley»Horn

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

CIVIL EAST - VOLUME 4
I-94 (BRIDGE 27725-27729)
PIER PROTECTION
BRIDGES 27729 & 27726 VISUAL QUALITY

DISCIPLINE: STRUCTURES
SHEET NAME: EX4-STU-PPR-ALL94-VEH-PIR-002

SHEET 6 OF 6

Aug, 10 2015 05:15 pm V:\3400_ADC\CAD\SEGMENT E4\PLAN SHEETS\STRUCTURES\PIER PROTECTION\EX4-STU-PPR-ALL94-VEH-DTL.dwg By: Anne.Cesnik