METROPOLITAN COUNCIL

SOUTHWEST
Green Line LRT Extension

PLAN PACKAGE INDEX / DESCRIPTION
CIVIL WEST 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 11 - STATIONS
VOLUME 12 - SYSTEMS

CIVIL WEST CONSTRUCTION

VOLUME 4B
BRIDGES

60% SUBMISSION
DATE : 09/28/15

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 WEST

SHT #	SHEET NAME	SHEET DESCRIPTION	STATION	STATION	REV
		VOLUME 4B - BRIDGES			
1	W0-BRGB-CVR-001	COVER SHEET			
2	W0-BRG-IDX-001	VOLUME INDEX OF PLAN SHEETS SHEET 1			
3	W0-BRG-IDX-002	VOLUME INDEX OF PLAN SHEETS SHEET 2			
4	W0-GEN-KEY-001	GENERAL KEY MAP			
5	W0-GEN-NTS-001	GENERAL LEGEND AND ABBREVIATIONS SHEET 1			
6	W0-GEN-NTS-002	GENERAL LEGEND AND ABBREVIATIONS SHEET 2			
		BRIDGE R0686 - MINNETONKA/HOPKINS			
1	CBRR0686-BRG-GPE-001	KEY PLAN	2384+92	2414+92	
2	CBRR0686-BRG-GPE-002	GENERAL PLAN & ELEVATION 1			
3	CBRR0686-BRG-GPE-003	GENERAL PLAN & ELEVATION 2			
4	CBRR0686-BRG-GPE-004	GENERAL PLAN & ELEVATION 3			
5	CBRR0686-BRG-GPE-005	GENERAL PLAN & ELEVATION 4			
6	CBRR0686-BRG-GPE-006	GENERAL PLAN & ELEVATION 5			
7	CBRR0686-BRG-GPE-007	GENERAL PLAN & ELEVATION 6			
8	CBRR0686-BRG-TRN-001	TRANSVERSE SECTION & QUANTITIES			
9	CBRR0686-BRG-TRN-002	TRANSVERSE SECTION			
10	CBRR0686-BRG-TRN-003	TRANSVERSE SECTION & LOADING DIAGRAM			
11	CBRR0686-BRG-SUP-001	BRIDGE LAYOUT 1			
12	CBRR0686-BRG-SUP-002	BRIDGE LAYOUT 2			
13	CBRR0686-BRG-SUP-003	BRIDGE LAYOUT 3			
14	CBRR0686-BRG-SUP-004	BRIDGE LAYOUT 4			
15	CBRR0686-BRG-SUP-005	BRIDGE LAYOUT 5			
16	CBRR0686-BRG-SUP-006	BRIDGE LAYOUT 6			
17	CBRR0686-BRG-SUP-007	BRIDGE LAYOUT 7			
18	CBRR0686-BRG-SUP-008	BRIDGE LAYOUT 8			
19	CBRR0686-BRG-SUP-009	BRIDGE LAYOUT 9			
20	CBRR0686-BRG-ABUT-001	SOUTH ABUTMENT FOOTING DETAILS			
21	CBRR0686-BRG-ABUT-002	SOUTH ABUTMENT DETAILS 1			
22	CBRR0686-BRG-ABUT-003	SOUTH ABUTMENT DETAILS 2			
23	CBRR0686-BRG-ABUT-004	SOUTH ABUTMENT DETAILS 3			
24	CBRR0686-BRG-ABUT-005	SOUTH ABUTMENT DETAILS 4			
25	CBRR0686-BRG-ABUT-012	NORTH ABUTMENT FOOTING DETAILS			
26	CBRR0686-BRG-ABUT-013	NORTH ABUTMENT DETAILS 1			
27	CBRR0686-BRG-ABUT-014	NORTH ABUTMENT DETAILS 2			
28	CBRR0686-BRG-ABUT-015	NORTH ABUTMENT DETAILS 3			
29	CBRR0686-BRG-PIR-001	PIER DETAILS - PIERS 1-5 & 9			
30	CBRR0686-BRG-PIR-004	PIER DETAILS - PIER 6			
31	CBRR0686-BRG-PIR-007	PIER DETAILS - PIER 7			
32	CBRR0686-BRG-PIR-010	PIER DETAILS - PIER 8			
33	CBRR0686-BRG-PIR-013	PIER DETAILS - PIER 10 & 11			
34	CBRR0686-BRG-PIR-016	PIER DETAILS - PIER 12 (1)			
35	CBRR0686-BRG-PIR-017	PIER DETAILS - PIER 12 (2)			
36	CBRR0686-BRG-PIR-021	PIER DETAILS - PIER 13-15 (1)			
37	CBRR0686-BRG-PIR-022	PIER DETAILS - PIER 13-15 (2)			
38	CBRR0686-BRG-PIR-026	PIER DETAILS - PIERS 16 & 17 & 20-24 (1)			
39	CBRR0686-BRG-PIR-027	PIER DETAILS - PIERS 16 & 17 & 20-24 (2)			
40	CBRR0686-BRG-PIR-031	PIER DETAILS - PIER 18 (1)			
41	CBRR0686-BRG-PIR-032	PIER DETAILS - PIER 18 (2)			
42	CBRR0686-BRG-PIR-036	PIER DETAILS - PIER 19 (1)			
43	CBRR0686-BRG-PIR-037	PIER DETAILS - PIER 19 (2)			
44	CBRR0686-BRG-PIR-041	PIER DETAILS - PIER 25 (1)			
45	CBRR0686-BRG-PIR-042	PIER DETAILS - PIER 25 (2)			
46	CBRR0686-BRG-PIR-046	PIER DETAILS - PIERS 26 & 28 & 29			
47	CBRR0686-BRG-PIR-049	PIER DETAILS - PIER 27			
48	CBRR0686-BRG-SUP-010	FRAMING PLAN 1			
49	CBRR0686-BRG-SUP-011	FRAMING PLAN 2			
50	CBRR0686-BRG-SUP-012	FRAMING PLAN 3			
51	CBRR0686-BRG-SUP-013	FRAMING PLAN 4			
52	CBRR0686-BRG-SUP-014	FRAMING PLAN 5			
53	CBRR0686-BRG-SUP-015	FRAMING PLAN 6			
54	CBRR0686-BRG-SUP-016	FRAMING PLAN DETAILS 1			
55	CBRR0686-BRG-SUP-017	FRAMING PLAN DETAILS 2			
56	CBRR0686-Figure 5-397_507A	MN45 PRESTRESSED CONCRETE BEAM			
57	CBRR0686-Figure 5-397_507B	MN45 PRESTRESSED CONCRETE BEAM			
58	CBRR0686-BRG-PCB-003	MN45 PRESTRESSED CONC. BEAM DETAILS			
59	CBRR0686-Figure 5-397_509	MN63 PRESTRESSED CONCRETE BEAM			
60	CBRR0686-BRG-PCB-005	MN63 PRESTRESSED CONC. BEAM DETAILS			
61	CBRR0686-Figure 5-397_531	82MW PRESTRESSED CONCRETE BEAM			
62	CBRR0686-BRG-SUP-018	SUPERSTRUCTURE - SPANS 1 & 2			
63	CBRR0686-BRG-SUP-019	SUPERSTRUCTURE - SPANS 3-6 & 9-12			
64	CBRR0686-BRG-SUP-020	SUPERSTRUCTURE - SPANS 7 & 8 & 26 & 27			

CIVIL WEST

SHT #	SHEET NAME	SHEET DESCRIPTION	STATION	STATION	REV
65	CBRR0686-BRG-SUP-021	SUPERSTRUCTURE - SPANS 13-18 & 24 & 25			
66	CBRR0686-BRG-SUP-022	SUPERSTRUCTURE - SPANS 19 & 20			
67	CBRR0686-BRG-SUP-023	SUPERSTRUCTURE - SPANS 21-33			
68	CBRR0686-BRG-SUP-024	SUPERSTRUCTURE - SPANS 28-30			
69	CBRR0686-BRG-SUP-025	SUPERSTRUCTURE DETAILS 1			
70	CBRR0686-BRG-SUP-026	SUPERSTRUCTURE DETAILS 2			
71	CBRR0686-BRG-SUP-027	SUPERSTRUCTURE DETAILS 3			
72	CBRR0686-BRG-SUP-028	SUPERSTRUCTURE DETAILS 4			
73	CBRR0686-BRG-SUP-029	SUPERSTRUCTURE DETAILS 5			
74	CBRR0686-BRG-SUP-030	SUPERSTRUCTURE DETAILS 6			
75	CBRR0686-BRG-SUP-031	SUPERSTRUCTURE DETAILS 7			
76	CBRR0686-BRG-SUP-032	SUPERSTRUCTURE DETAILS 8			
77	CBRR0686-BRG-SUP-033	SUPERSTRUCTURE DETAILS 9			
78	CBRR0686-BRG-SUP-034	SUPERSTRUCTURE DETAILS 10			
79	CBRR0686-BRG-SUP-035	SUPERSTRUCTURE DETAILS 11			
80	CBRR0686-BRG-BDTL-001	BRIDGE DETAILS 1			
81	CBRR0686-BRG-BDTL-002	BRIDGE DETAILS 2			
82	CBRR0686-BRG-BDTL-003	BRIDGE DETAILS 3			
83	CBRR0686-BRG-BDTL-004	BRIDGE DETAILS 4			
84	CBRR0686-BRG-BDTL-005	BRIDGE DETAILS 5			
85	CBRR0686-BRG-BDTL-006	BRIDGE DETAILS 6			
86	CBRR0686-BRG-BDTL-007	BRIDGE DETAILS 7			
87	CBRR0686-Figure 5-397_119 mod	WIRE FENCE			
88	CBRR0686-Figure 5-397_301	CONCRETE SLOPE PAVING UNDER BRIDGES			
89	CBRR0686-Figure 5-397_627	WATERPROOF EXANSION DEVICE			
90	CBRR0686-Figure 5-397_630	WATERPROOF EXANSION DEVICE			
91	CBRR0686-Figure 5-397_900	AS-BUILT BRIDGE DATA			
92	CBRR0686-BRG-SUR-001	BRIDGE SURVEY 1			
93	CBRR0686-BRG-SUR-002	BRIDGE SURVEY 2			
94	CBRR0686-BRG-BOR-001	BRIDGE SURVEY PLAN 1			
95	CBRR0686-BRG-BOR-002	BRIDGE SURVEY PLAN 2			
96	CBRR0686-BRG-BOR-003	BRIDGE SURVEY PLAN 3			
97	CBRR0686-BRG-BOR-004	BRIDGE SURVEY PLAN 4			
98	CBRR0686-BRG-BOR-005	BRIDGE SURVEY PLAN 5			
99	CBRR0686-BRG-BOR-006	BRIDGE SURVEY PLAN 6			
100	CBRR0686-BRG-BOR-007	BRIDGE SURVEY PLAN 7			
101	CBRR0686-BRG-BOR-008	BRIDGE SURVEY PLAN 8			
102	CBRR0686-BRG-BOR-009	BRIDGE SURVEY PLAN 9			
103	CBRR0686-BRG-BOR-010	BRIDGE SURVEY PLAN 10			
104	CBRR0686-BRG-BOR-011	BRIDGE SURVEY PLAN 11			
105	CBRR0686-BRG-BOR-012	BRIDGE SURVEY PROFILE 1			
106	CBRR0686-BRG-BOR-013	BRIDGE SURVEY PROFILE 2			
107	CBRR0686-BRG-BOR-014	BRIDGE SURVEY PROFILE 3			
108	CBRR0686-BRG-BOR-015	BRIDGE SURVEY PROFILE 4			
109	CBRR0686-BRG-BOR-016	BRIDGE SURVEY PROFILE 5			
110	CBRR0686-BRG-BOR-017	BRIDGE SURVEY PROFILE 6			
111	CBRR0686-BRG-BOR-018	BRIDGE SURVEY PROFILE 7			
112	CBRR0686-BRG-BOR-019	BRIDGE SURVEY PROFILE 8			
113	CBRR0686-BRG-BOR-020	BRIDGE SURVEY PROFILE 9			
114	CBRR0686-BRG-BOR-021	BRIDGE SURVEY PROFILE 10			
115	CBRR0686-BRG-BOR-022	BRIDGE SURVEY PROFILE 11			
116	CBRR0686-BRG-AES-001	AESTHETIC DETAILS			
		BRIDGE 27C07 - NINE MILE CREEK			
1	CBR27C07-BRG-KEY	KEY PLAN AND INDEX	2213+92	2297+98	
2	CBR27C07-BRG-GPE-001	GENERAL PLAN AND ELEVATION 1			
3	CBR27C07-BRG-GPE-002	GENERAL PLAN AND ELEVATION 2			
4	CBR27C07-BRG-GPE-003	GENERAL PLAN AND ELEVATION 3			
5	CBR27C07-BRG-GPE-004	GENERAL PLAN AND ELEVATION 4			
6	CBR27C07-BRG-GPE-005	TRANSVERSE SECTION & QUANTITIES			
7	CBR27C07-BRG-GPE-006	TRANSVERSE SECTION & LOADING DIAGRAM			
8	CBR27C07-BRG-SUP-007	BRIDGE LAYOUT 1			
9	CBR27C07-BRG-SUP-008	BRIDGE LAYOUT 2			
10	CBR27C07-BRG-SUP-009	BRIDGE LAYOUT 3			
11	CBR27C07-BRG-SUP-010	BRIDGE LAYOUT 4			
12	CBR27C07-BRG-SUP-011	BRIDGE LAYOUT 5			
13	CBR27C07-BRG-SUP-012	BRIDGE LAYOUT 6			
14	CBR27C07-BRG-SUP-013	BRIDGE LAYOUT 7			
15	CBR27C07-BRG-SUP-014	BRIDGE LAYOUT 8			
16	CBR27C07-BRG-ABT-001	WEST ABUTMENT FOOTING DETAILS			
17	CBR27C07-BRG-ABT-002	WEST ABUTMENT DETAILS 1			
18	CBR27C07-BRG-ABT-003	WEST ABUTMENT DETAILS 2			
19	CBR27C07-BRG-ABT-004	WEST ABUTMENT DETAILS 3			

CIVIL WEST

SHT #	SHEET NAME	SHEET DESCRIPTION	STATION	STATION	REV
20	CBR27C07-BRG-ABT-005	EAST ABUTMENT FOOTING DETAILS			
21	CBR27C07-BRG-ABT-006	EAST ABUTMENT MSE DETAILS 1			
22	CBR27C07-BRG-ABT-007	EAST ABUTMENT MSE DETAILS 2			
23	CBR27C07-BRG-ABT-008	EAST ABUTMENT MSE DETAILS 3			
24	CBR27C07-BRG-PIR-001	PIER 1 & 2 DETAILS			
25	CBR27C07-BRG-PIR-002	PIER 3 DETAILS			
26	CBR27C07-BRG-PIR-003	PIER 4 DETAILS			
27	CBR27C07-BRG-PIR-004	PIER 5 DETAILS			
28	CBR27C07-BRG-PIR-005	PIER 6 FOOTING DETAILS			
29	CBR27C07-BRG-PIR-006	PIER 6 DETAILS			
30	CBR27C07-BRG-PIR-007	PIER 7 THRU 10 FOOTING DETAILS			
31	CBR27C07-BRG-PIR-008	PIER 7 THRU 10 DETAILS			
32	CBR27C07-BRG-PIR-009	PIER 11 FOOTING DETAILS			
33	CBR27C07-BRG-PIR-010	PIER 11 DETAILS			
34	CBR27C07-BRG-PIR-011	PIER 12 THRU 14 FOOTING DETAILS			
35	CBR27C07-BRG-PIR-012	PIER 12 THRU 14 DETAILS			
36	CBR27C07-BRG-SUP-015	FRAMING PLAN 1			
37	CBR27C07-BRG-SUP-016	FRAMING PLAN 2			
38	CBR27C07-BRG-SUP-017	FRAMING PLAN 3			
39	CBR27C07-BRG-SUP-018	FRAMING PLAN 4			
40	CBR27C07-BRG-PCB-001	MN63 PRESTRESSED CONCRETE BEAM 1			
41	CBR27C07-BRG-PCB-002	MN63 PRESTRESSED CONCRETE BEAM 2			
42	CBR27C07-BRG-PCB-003	MN63 PRESTRESSED CONCRETE DETAILS			
43	CBR27C07-BRG-SUP-001	SUPERSTRUCTURE DETAILS SLAB SPAN - SPANS 1-6 (1)			
44	CBR27C07-BRG-SUP-002	SUPERSTRUCTURE DETAILS SLAB SPAN - SPANS 1-6 (2)			
45	CBR27C07-BRG-SUP-003	SUPERSTRUCTURE DETAILS - SPANS 7-15 (1)			
46	CBR27C07-BRG-SUP-004	SUPERSTRUCTURE DETAILS - SPANS 7-15 (2)			
47	CBR27C07-BRG-SUP-005	SUPERSTRUCTURE DETAILS - SPANS 7-15 (3)			
48	CBR27C07-BRG-SUP-006	SUPERSTRUCTURE DETAILS - SPANS 7-15 (4)			
49	CBR27C07-BRG-DTL-001	B-DETAILS 1			
50	CBR27C07-BRG-DTL-002	B-DETAILS 2			
51	CBR27C07-BRG-DTL-003	B-DETAILS 3			
52	CBR27C07-BRG-DTL-004	B-DETAILS 4			
53	CBR27C07-BRG-DTL-005	B-DETAILS 5			
54	CBR27C07-BRG-DTL-006	B-DETAILS 6			
55	CBR27C07-BRG-DTL-007	WIRE FENCE RAILING			
56	CBR27C07-BRG-DTL-008	CONCRETE SLOPE PAVING UNDER BRIDGES			
57	CBR27C07-BRG-DTL-009	WATERPROOF EXPANSION DEVICE 1			
58	CBR27C07-BRG-DTL-010	WATERPROOF EXPANSION DEVICE 2			
59	CBR27C07-BRG-DTL-011	AS-BUILT BRIDGE DATA			
60	CBR27C07-BRG-SUR-001	BRIDGE SURVEY 1			
61	CBR27C07-BRG-SUR-002	BRIDGE SURVEY 2			
62	CBR27C07-BRG-BOR-001	BRIDGE SURVEY PLAN			
63	CBR27C07-BRG-BOR-002	BRIDGE SURVEY PLAN			
64	CBR27C07-BRG-BOR-003	BRIDGE SURVEY PLAN			
65	CBR27C07-BRG-BOR-004	BRIDGE SURVEY PLAN			
66	CBR27C07-BRG-BOR-005	BRIDGE SURVEY PLAN			
67	CBR27C07-BRG-BOR-006	BRIDGE SURVEY PLAN			
68	CBR27C07-BRG-BOR-007	BRIDGE SURVEY PROFILE 1			
69	CBR27C07-BRG-BOR-008	BRIDGE SURVEY PROFILE 2			
70	CBR27C07-BRG-BOR-009	BRIDGE SURVEY PROFILE 3			
71	CBR27C07-BRG-BOR-010	BRIDGE SURVEY PROFILE 4			
72	CBR27C07-BRG-BOR-011	BRIDGE SURVEY PROFILE 5			
73	CBR27C07-BRG-BOR-012	BRIDGE SURVEY PROFILE 6			
74	CBR27C07-BRG-AES-001	AESTHETICS 1			
75	CBR27C07-BRG-AES-002	AESTHETICS 2			
		BRIDGE 27J62 - PEDESTRIAN UNDERPASS 1			
1	CBR27J62-BRG-GPE-001	GENERAL PLAN AND ELEVATION	2314+26	2314+46	
2	CBR27J62-BRG-GPE-002	LOADING DIAGRAM			
3	CBR27J62-BRG-DTL-001	PRECAST CONCRETE BARREL DETAILS			
4	CBR27J62-BRG-DTL-002	CULVERT SECTIONS 1			
5	CBR27J62-BRG-DTL-003	CULVERT SECTIONS 2			
6	CBR27J62-BRG-DTL-004	BALLAST CURB DETAIL			
7	CBR27J62-BRG-DTL-005	DISTRIBUTION SLAB DETAIL			
8	CBR27J62-BRG-RAL-001	CONCRETE BARRIER (TYPE F, TL-4)			
9	CBR27J62-BRG-RAL-002	WIRE FENCE AND CONCRETE PARAPET			
10	CBR27J62-BRG-SUR-001	BRIDGE SURVEY 1			
11	CBR27J62-BRG-SUR-002	BRIDGE SURVEY 2			
12	CBR27J62-BRG-BOR-001	BRIDGE SURVEY PLAN			
13	CBR27J62-BRG-BOR-002	BRIDGE SURVEY PROFILE			

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

AECOM

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

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

DISCIPLINE: GENERAL

SHEET NAME: W0-BRG-IDX - 001

SHEET 2 OF 229

Sep. 25 2015 07:01 am V:\3400_ADC\CAD\CAD MANAGEMENT\DRAWING LIST\W1-GEN-IDX.dwg By: V-KriewaMR

CIVIL WEST

SHT #	SHEET NAME	SHEET DESCRIPTION	STATION	STATION	REV
		VOLUME 4B - BRIDGES (cont'd)			
		BRIDGE 27J63 - PEDESTRIAN UNDERPASS 2			
1	CBR27J63-BRG-GPE-001	GENERAL PLAN AND ELEVATION	2317+25	2318+20	
2	CBR27J63-BRG-GPE-002	LOADING DIAGRAM			
3	CBR27J63-BRG-DTL-001	PRECAST CONCRETE BARREL DETAILS			
4	CBR27J63-BRG-DTL-002	CULVERT SECTIONS 1			
5	CBR27J63-BRG-DTL-003	CULVERT SECTIONS 2			
6	CBR27J63-BRG-DTL-004	MOMENT SLAB DETAIL			
7	CBR27J63-BRG-RAL	CONCRETE BARRIER (TYPE F, TL-4)			
8	CBR27J63-BRG-SUR-001	BRIDGE SURVEY 1			
9	CBR27J63-BRG-SUR-002	BRIDGE SURVEY 2			
10	CBR27J63-BRG-BOR-001	BRIDGE SURVEY PLAN			
11	CBR27J63-BRG-BOR-002	BRIDGE SURVEY PROFILE			
		BRIDGE R0715 - PEDESTRIAN UNDERPASS 5			
1	CBRR0715-BRG-GPE-001	GENERAL PLAN AND ELEVATION	2315+15	2315+35	
2	CBRR0715-BRG-GPE-002	LOADING DIAGRAM			
3	CBRR0715-BRG-DTL-001	PRECAST CONCRETE BARREL DETAILS			
4	CBRR0715-BRG-DTL-002	HEADWALL DETAILS			
5	CBRR0715-BRG-RAL	WIRE FENCE			
6	CBRR0715-BRG-SUR-001	BRIDGE SURVEY 1			
7	CBRR0715-BRG-SUR-002	BRIDGE SURVEY 2			
8	CBRR0715-BRG-BOR-001	BRIDGE SURVEY PLAN			
9	CBRR0715-BRG-BOR-002	BRIDGE SURVEY PROFILE			

CIVIL WEST

SHT #	SHEET NAME	SHEET DESCRIPTION	STATION	STATION	REV

CIVIL WEST

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

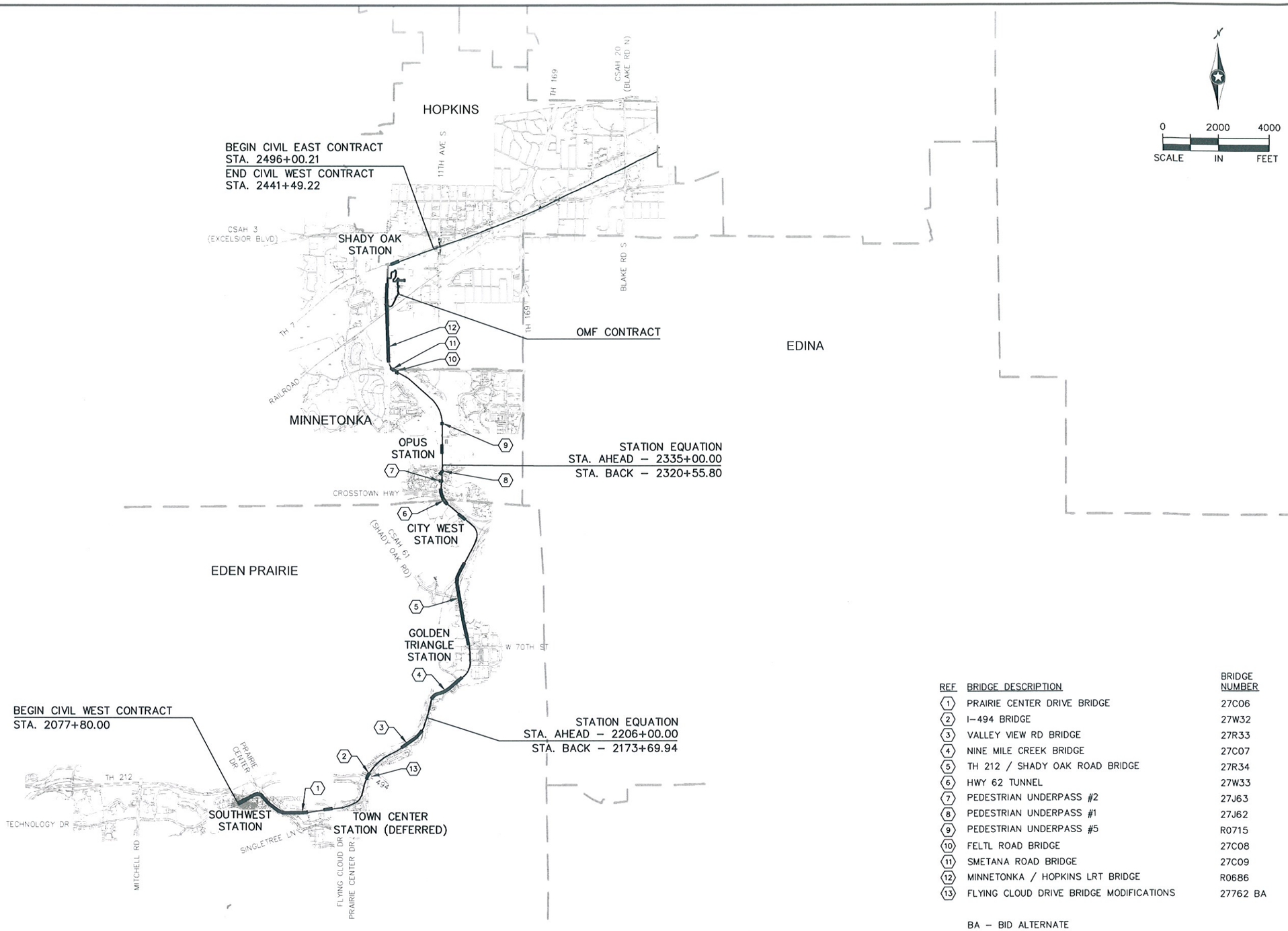
CIVIL WEST - VOLUME 4B
BRIDGES
VOLUME INDEX OF PLAN SHEETS
SHEET 2

DISCIPLINE: GENERAL

SHEET NAME: W0-BRG-IDX - 002

SHEET 3 OF 229

Sep. 25 2015 07:01 am V:\3400_ADC\CAD\CAD MANAGEMENT\DRAWING LIST\W1-GEN-IDX.dwg By: V-KriewaMR



REF	BRIDGE DESCRIPTION	BRIDGE NUMBER
1	PRAIRIE CENTER DRIVE BRIDGE	27C06
2	I–494 BRIDGE	27W32
3	VALLEY VIEW RD BRIDGE	27R33
4	NINE MILE CREEK BRIDGE	27C07
5	TH 212 / SHADY OAK ROAD BRIDGE	27R34
6	HWY 62 TUNNEL	27W33
7	PEDESTRIAN UNDERPASS #2	27J63
8	PEDESTRIAN UNDERPASS #1	27J62
9	PEDESTRIAN UNDERPASS #5	R0715
10	FELTL ROAD BRIDGE	27C08
11	SMETANA ROAD BRIDGE	27C09
12	MINNETONKA / HOPKINS LRT BRIDGE	R0686
13	FLYING CLOUD DRIVE BRIDGE MODIFICATIONS	27762 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 WEST - VOLUME 4B
GENERAL
KEY MAP

DISCIPLINE: GENERAL

SHEET NAME: W0-GEN-KEY - 001

SHEET 4 OF 229

Sep. 21 2015 06:55 am V:\3400_ADC\CAD\CAD MANAGEMENT\DRAWING LIST\W0-GEN-KEY.dwg By: V-KriewaMR

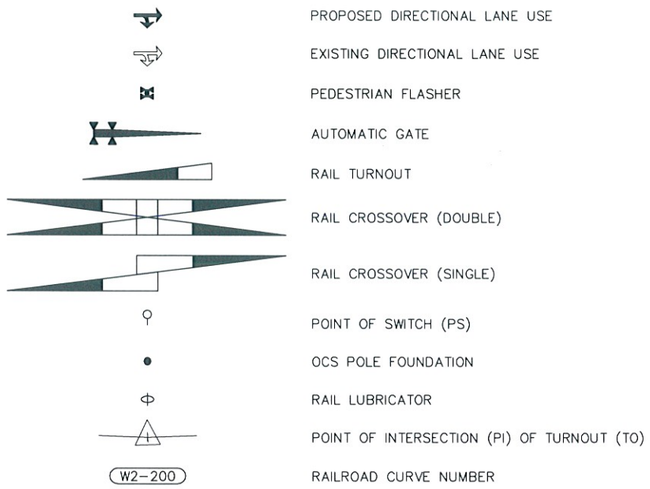
TRACK LINETYPES

- 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

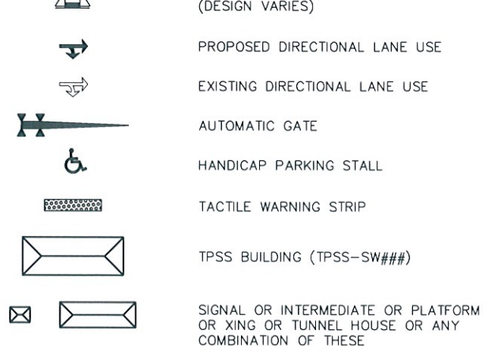
TRACK SYMBOLS



- 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 RANI ENGINEERING.
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 WEST - VOLUME 4B
GENERAL
LEGEND AND ABBREVIATIONS
SHEET 1

DISCIPLINE: GENERAL

SHEET NAME: W0-GEN-NTS - 001

SHEET 5 OF 229

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
Ea	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 WEST - VOLUME 4B
GENERAL
LEGEND AND ABBREVIATIONS
SHEET 2

DISCIPLINE: GENERAL

SHEET NAME: W0-GEN-NTS - 002

SHEET 6 OF 229

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 FIRST DIGIT OF A THREE DIGIT BAR MARK OR THE FIRST TWO DIGITS OF A FOUR DIGIT BAR MARK INDICATE THE BAR SIZE. BARS MARKED WITH THE SUFFIX "E" SHALL BE EPOXY COATED IN ACCORDANCE WITH SPEC. 3301.

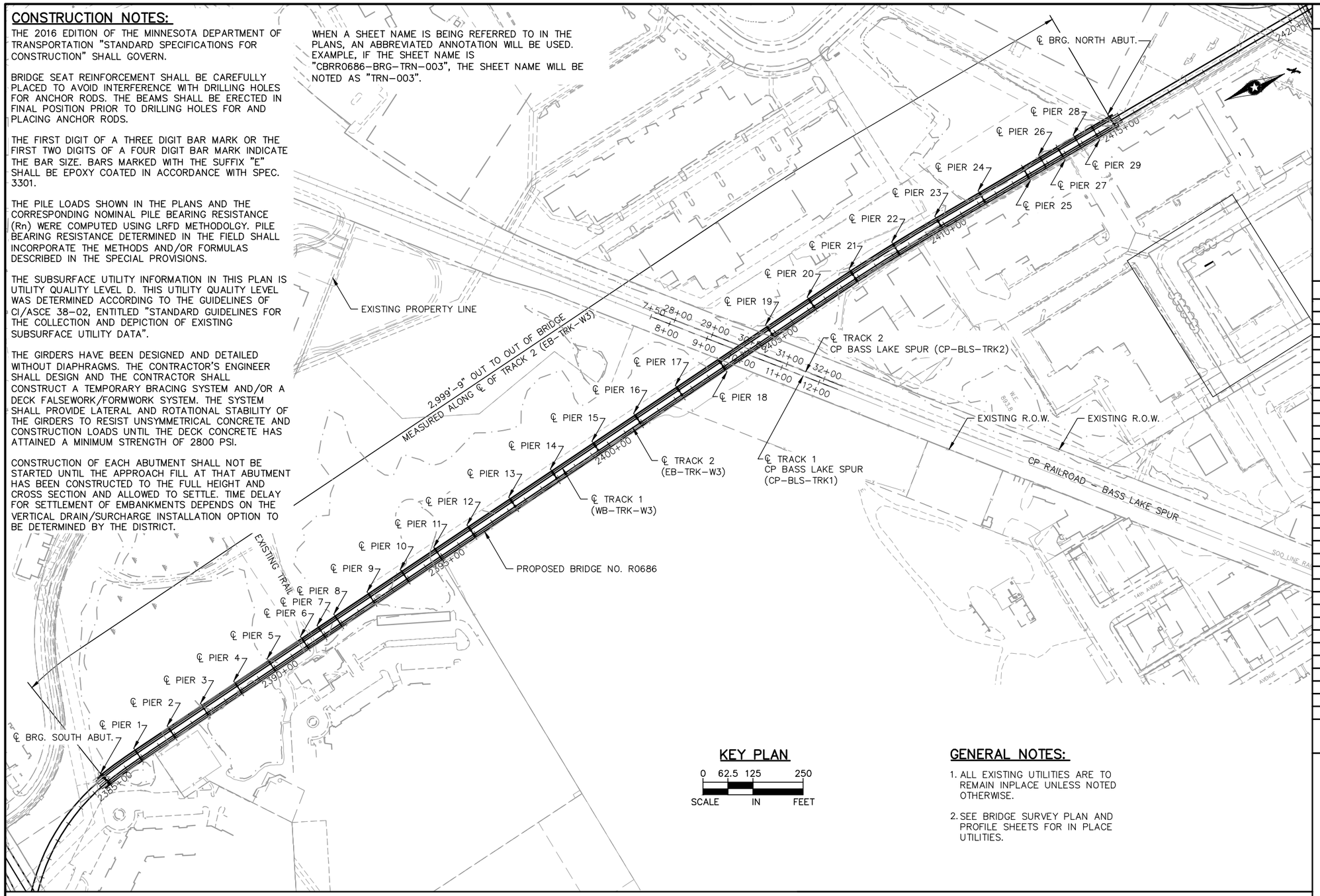
THE PILE LOADS SHOWN IN THE PLANS AND THE CORRESPONDING NOMINAL PILE BEARING RESISTANCE (Rn) WERE COMPUTED USING LRFD METHODOLGY. PILE BEARING RESISTANCE DETERMINED IN THE FIELD SHALL INCORPORATE THE METHODS AND/OR FORMULAS DESCRIBED IN THE SPECIAL PROVISIONS.

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".

THE GIRDERS HAVE BEEN DESIGNED AND DETAILED WITHOUT DIAPHRAGMS. THE CONTRACTOR'S ENGINEER SHALL DESIGN AND THE CONTRACTOR SHALL CONSTRUCT A TEMPORARY BRACING SYSTEM AND/OR A DECK FALSEWORK/FORMWORK SYSTEM. THE SYSTEM SHALL PROVIDE LATERAL AND ROTATIONAL STABILITY OF THE GIRDERS TO RESIST UNSYMMETRICAL CONCRETE AND CONSTRUCTION LOADS UNTIL THE DECK CONCRETE HAS ATTAINED A MINIMUM STRENGTH OF 2800 PSI.

CONSTRUCTION OF EACH ABUTMENT SHALL NOT BE STARTED UNTIL THE APPROACH FILL AT THAT ABUTMENT HAS BEEN CONSTRUCTED TO THE FULL HEIGHT AND CROSS SECTION AND ALLOWED TO SETTLE. TIME DELAY FOR SETTLEMENT OF EMBANKMENTS DEPENDS ON THE VERTICAL DRAIN/SURCHARGE INSTALLATION OPTION TO BE DETERMINED BY THE DISTRICT.

WHEN A SHEET NAME IS BEING REFERRED TO IN THE PLANS, AN ABBREVIATED ANNOTATION WILL BE USED. EXAMPLE, IF THE SHEET NAME IS "CBRR0686-BRG-TRN-003", THE SHEET NAME WILL BE NOTED AS "TRN-003".



KEY PLAN

0 62.5 125 250

SCALE IN FEET

GENERAL NOTES:

1. ALL EXISTING UTILITIES ARE TO REMAIN INPLACE UNLESS NOTED OTHERWISE.
2. SEE BRIDGE SURVEY PLAN AND PROFILE SHEETS FOR IN PLACE UTILITIES.

DESIGN DATA

2014 AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS
7TH EDITION AND 2015 CURRENT INTERIM

METRO LIGHT RAIL TRANSIT DESIGN CRITERIA (REVISION 4.0)

LOAD AND RESISTANCE FACTOR DESIGN METHOD

LRV & MV LOAD DIAGRAM SHOWN ON SHEET TRN-003.

MATERIAL DESIGN PROPERTIES:
REINFORCED CONCRETE:
f'c = 4 ksi, n = 8
fy = 60 ksi
PRESTRESSED CONCRETE:
f'c = 9 ksi, n = 1
fpu = 270 ksi FOR 0.6" DIA. LOW RELAXATION STRANDS
0.75 fpu FOR INITIAL PRESTRESS

DESIGN SPEED: OVER = 30/55 MPH (LRT)
UNDER = 25 MPH

APPROXIMATE DECK AREA: 97,520 SQ. FT.

LIST OF SHEETS

BRIDGE NO. R0686

SOUTHWEST LIGHT RAIL OVER CP RAIL AND WETLANDS
1 MI. NORTH OF JCT. TH 61 & TH 62 IN MINNETONKA
REINFORCED CONCRETE SLAB SPANS AND VARIABLE LENGTH PRESTRESSED CONCRETE BEAM SPANS
32'-6" OUT TO OUT DECK
0°0'0" SKEW
IDENTIFICATION NO. 501 MAIN & 209 APPROACH

KEY PLAN
SEC 26 T 117 N R 22 W
CITY OF MINNETONKA HENNEPIN COUNTY

APPROVED: _____
STATE BRIDGE ENGINEER

JOB NO: T9N635 STATE PROJECT NO: 9909-01 MNDOT REVIEW:

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AK/IGG CHECKED BY: TR
DRAWN BY: TAW DATE: 9/21/2015

AECOM

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

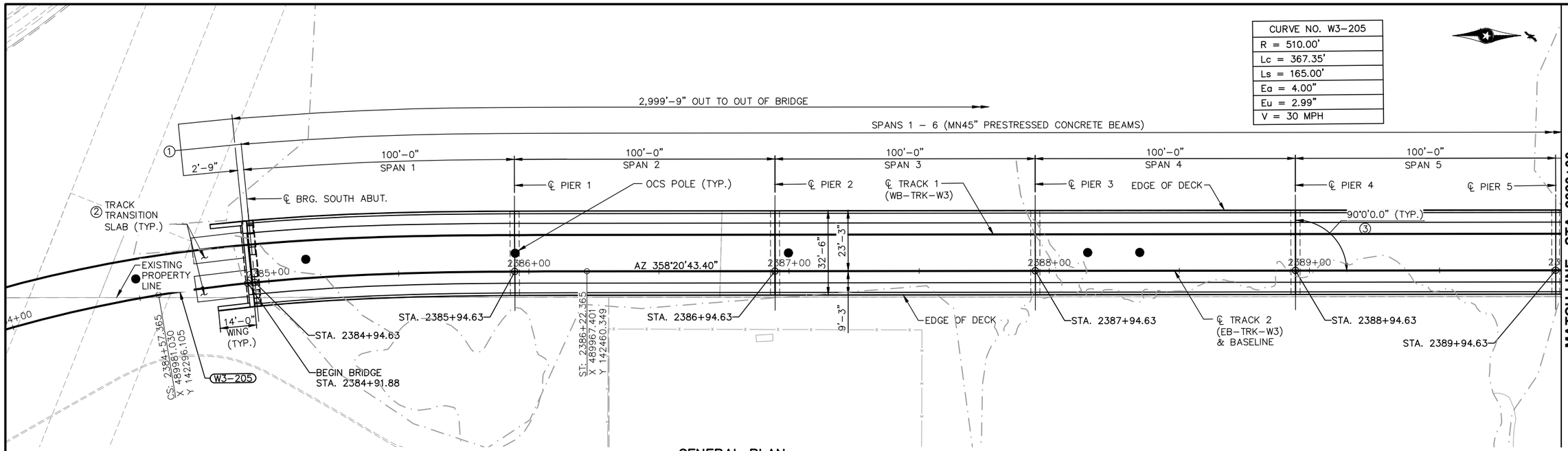
CIVIL WEST - VOLUME 4B
MINNETONKA/HOPKINS
BRIDGE R0686
KEY PLAN

DISCIPLINE: STRUCTURES
SHEET NAME: CBRR0686-BRG-GPE-001

SHEET 1 OF 116

Sep. 21 2015 08:12 am V:\3400_ADC\CAD\SEGMENT W3\PLAN SHEETS\STRUCTURES\CBRR0686\60_percent_Preliminary Plans-Dwg files\CBRR0686-BRG-KEY.dwg By: wyttenbacht

CURVE NO. W3-205
R = 510.00'
Lc = 367.35'
Ls = 165.00'
Ea = 4.00"
Eu = 2.99"
V = 30 MPH



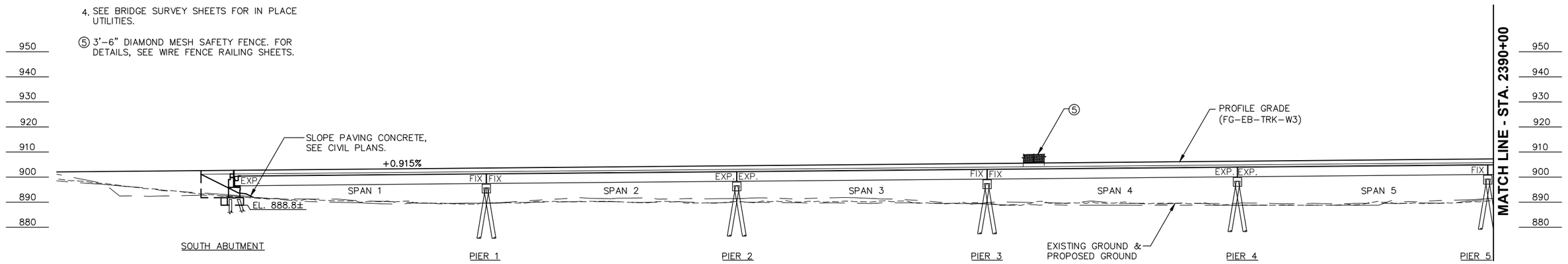
GENERAL PLAN

0 10 20 40
SCALE IN FEET

EXISTING GROUNDLINE
20' LT. ——— ——— ———
TRACK 2 C/L — — — — —
10' RT. ——— — — ———

NOTES:

1. MEASURED ALONG ℄ TRACK 2 (EB-TRK-W3)
2. SEE TRACK PLANS FOR TRANSITION SLAB DETAILS.
3. T.T.C. TYP. UNLESS SHOWN OTHERWISE.
4. SEE BRIDGE SURVEY SHEETS FOR IN PLACE UTILITIES.
5. 3'-6" DIAMOND MESH SAFETY FENCE. FOR DETAILS, SEE WIRE FENCE RAILING SHEETS.



GENERAL ELEVATION

0 10 20 40
SCALE IN FEET

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AK/IGG | CHECKED BY: TR
DRAWN BY: TAW | DATE: 9/21/2015

AECOM

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

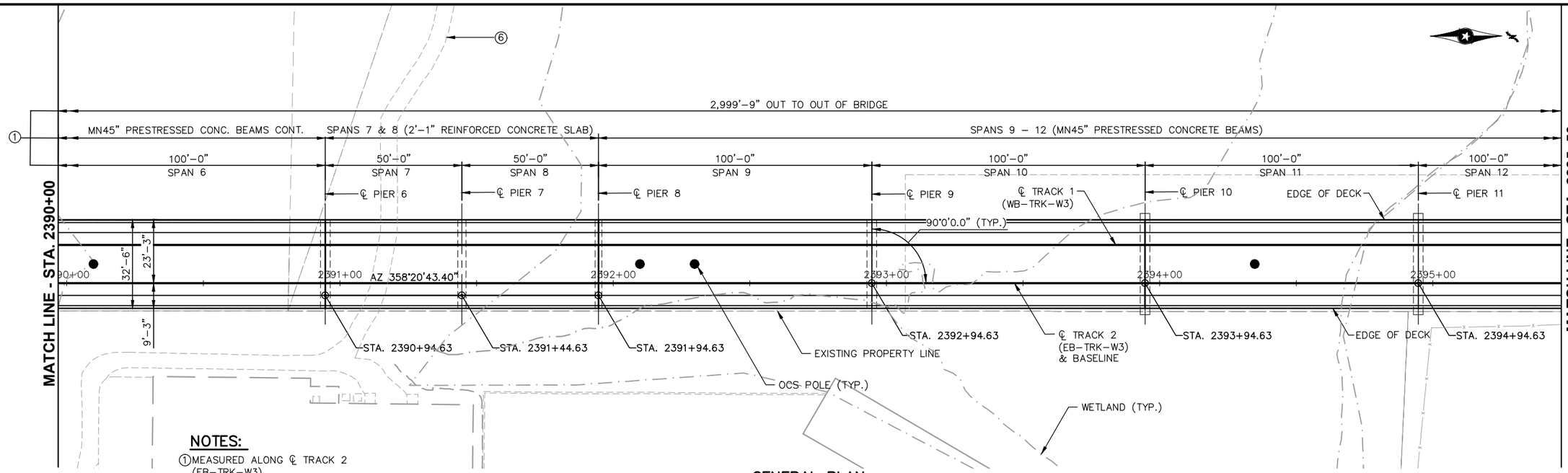
SOUTHWEST Green Line LRT Extension

CIVIL WEST - VOLUME 4B
MINNETONKA/HOPKINS
BRIDGE R0686
GENERAL PLAN & ELEVATION 1

DISCIPLINE: STRUCTURES
SHEET NAME: CBRR0686-BRG-GPE-002

SHEET 2 OF 116

Sep, 21 2015 08:13 am V:\3400_ADC\CAD\SEGMENT W3\PLAN SHEETS\STRUCTURES\CBRR0686\60_percent_Preliminary Plans-Dwg files\CBRR0686-BRG-GPE.dwg By: wyttenbacht



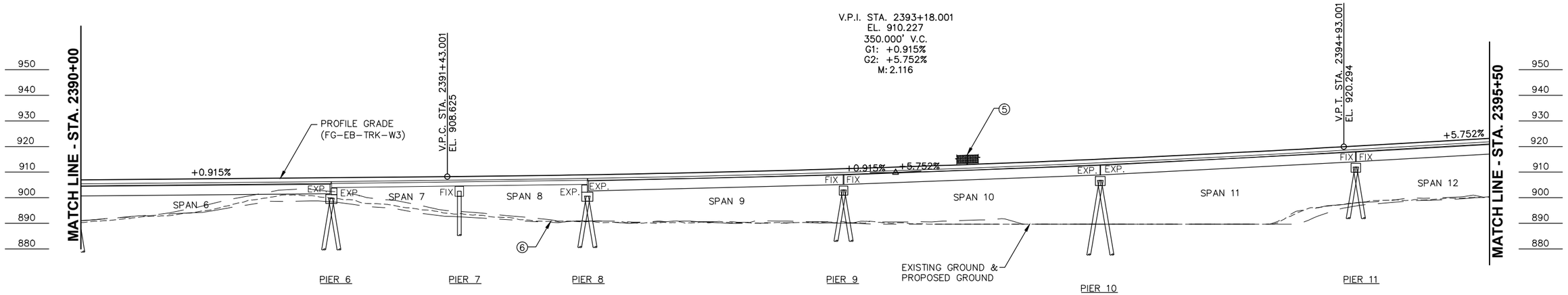
NOTES:

1. MEASURED ALONG ℄ TRACK 2 (EB-TRK-W3)
4. SEE BRIDGE SURVEY SHEETS FOR IN PLACE UTILITIES.
5. 3'-6" DIAMOND MESH SAFETY RAIL. FOR DETAILS, SEE WIRE FENCE RAILING SHEETS.
6. EXISTING PRIVATE PARTY TRAIL TO BE RELOCATED. FOR 10' VERTICAL CLEARANCE FROM PATH TO BOTTOM OF STRUCTURE THE ELEVATION OF PATH NEEDS TO BE AT 894.85 FT.

GENERAL PLAN

0 10 20 40
SCALE IN FEET

EXISTING GROUNDLINE
20' LT. ——— ——— ———
TRACK 2 C/L — — — — —
10' RT. ——— – – ———



GENERAL ELEVATION

0 10 20 40
SCALE IN FEET

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AK/IGG | CHECKED BY: TR
DRAWN BY: TAW | DATE: 9/21/2015

AECOM

60% SUBMISSION - 09/28/15

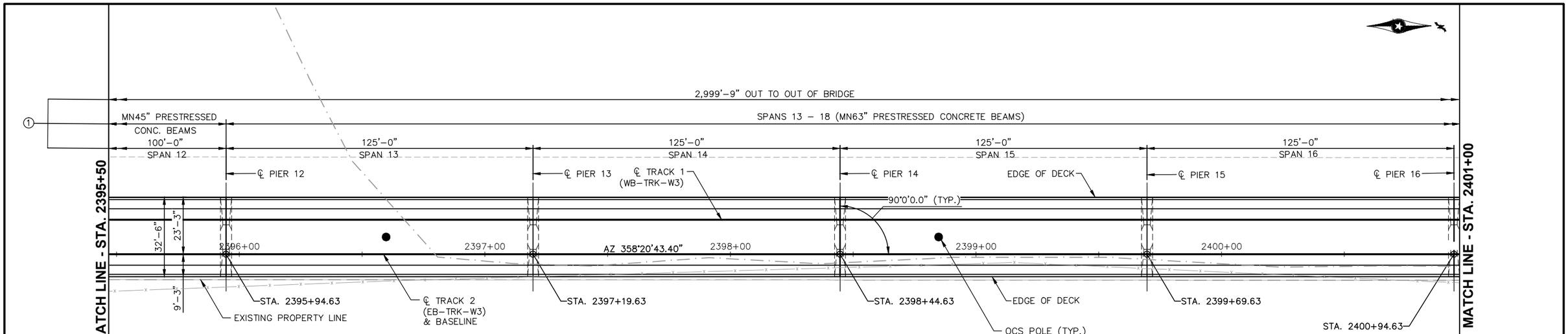
METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

CIVIL WEST - VOLUME 4B
MINNETONKA/HOPKINS
BRIDGE R0686
GENERAL PLAN & ELEVATION 2

DISCIPLINE: STRUCTURES
SHEET NAME: CBRR0686-BRG-GPE-003

SHEET 3 OF 116



NOTES:

(1) MEASURED ALONG ℄ TRACK 2 (EB-TRK-W3)

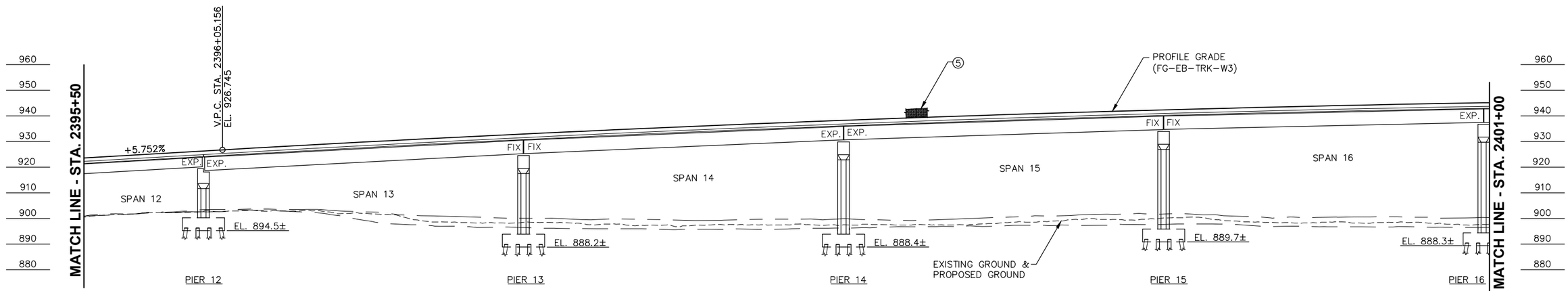
4. SEE BRIDGE SURVEY SHEETS FOR IN PLACE UTILITIES.

(5) 3'-6" DIAMOND MESH SAFETY RAIL. FOR DETAILS, SEE WIRE FENCE RAILING SHEETS.

GENERAL PLAN

0 10 20 40
SCALE IN FEET

EXISTING GROUNDLINE
20' LT. ——— ——— ———
TRACK 2 C/L — — — — —
10' RT. ——— – – ———



GENERAL ELEVATION

0 10 20 40
SCALE IN FEET

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AK/IGG | CHECKED BY: TR
DRAWN BY: TAW | DATE: 9/21/2015

AECOM

60% SUBMISSION - 09/28/15

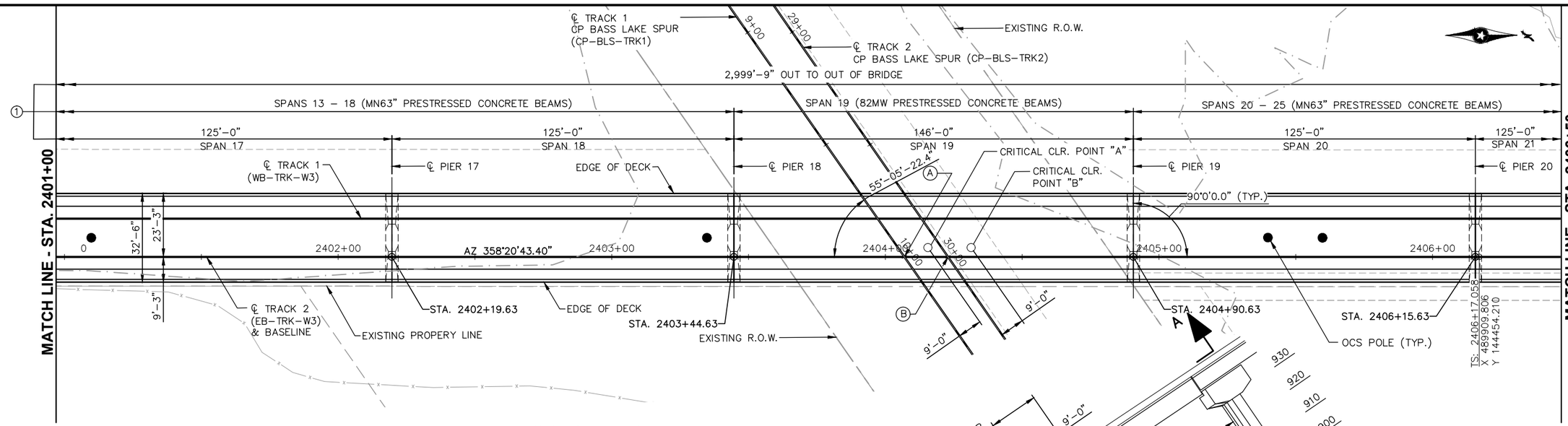
METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

CIVIL WEST - VOLUME 4B
MINNETONKA/HOPKINS
BRIDGE R0686
GENERAL PLAN & ELEVATION 3

DISCIPLINE: STRUCTURES
SHEET NAME: CBRR0686-BRG-GPE-004

SHEET 4 OF 116



NOTES:

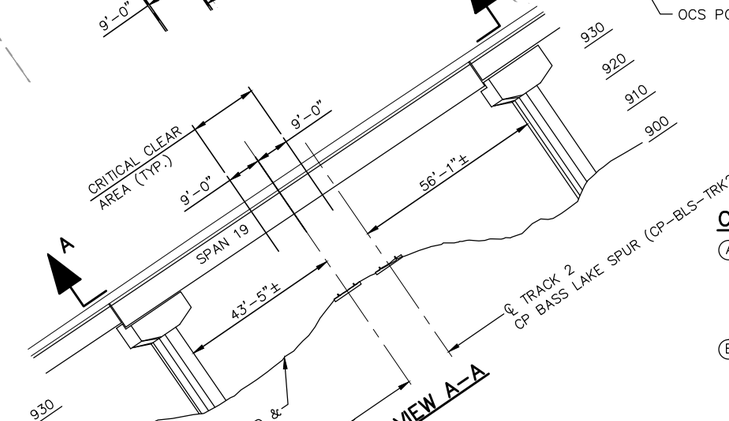
1. MEASURED ALONG ℄ TRACK 2 (EB–TRK–W3)
4. SEE BRIDGE SURVEY SHEETS FOR IN PLACE UTILITIES.
5. 3'–6" DIAMOND MESH SAFETY RAIL. FOR DETAILS, SEE WIRE FENCE RAILING SHEETS.

GENERAL PLAN

0 10 20 40
SCALE IN FEET

EXISTING GROUNDLINE
20' LT.
TRACK 2 C/L
10' RT.

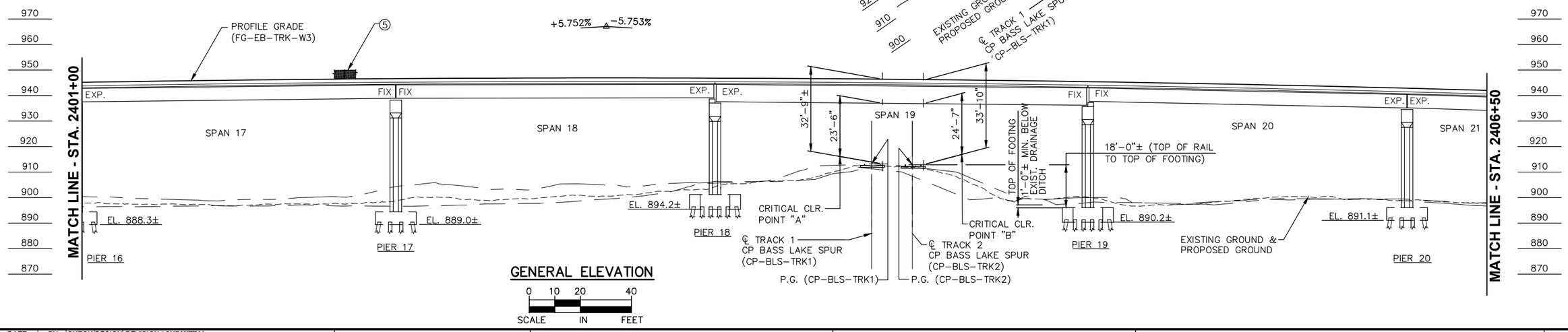
V.P.I. STA. 2403+05.156
EL. 967.011
1400.000' V.C.
G1: +5.752%
G2: –5.753%
M: –20.134



CONTROL POINTS:

(A) ℄ TRACK 2 (EB–TRK–W3) P.O.T. STA. 2404+06.947
= ℄ TRACK 1 (CP–BLS–TRK1) P.O.T. STA. 10+00.000
X = 489915.873
Y = 144244.182
ANGLE = 55°05'22.4" T.T.C.

(B) ℄ TRACK 2 (EB–TRK–W3) P.O.T. STA. 2404+22.896
= ℄ TRACK 2 (CP–BLS–TRK2) P.O.T. STA. 30+00.000
X = 489915.412
Y = 144260.125
ANGLE = 55°17'53.3" T.T.C.



GENERAL ELEVATION

0 10 20 40
SCALE IN FEET

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AK/IGG | CHECKED BY: TR
DRAWN BY: TAW | DATE: 9/21/2015

AECOM

60% SUBMISSION - 09/28/15

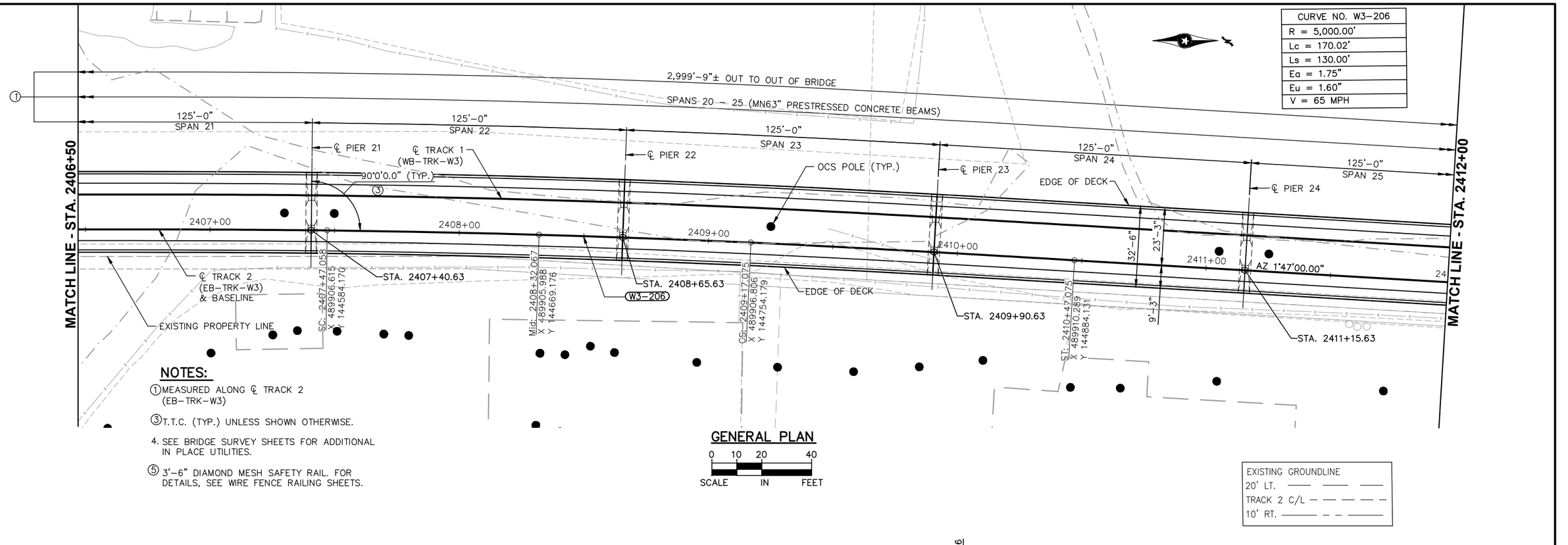
METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

CIVIL WEST - VOLUME 4B
MINNETONKA/HOPKINS
BRIDGE R0686
GENERAL PLAN & ELEVATION 4

DISCIPLINE: STRUCTURES
SHEET NAME: CBRR0686-BRG-GPE-005

SHEET 5 OF 116



NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AK/IGG | CHECKED BY: TR
DRAWN BY: TAW | DATE: 9/21/2015

AECOM

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

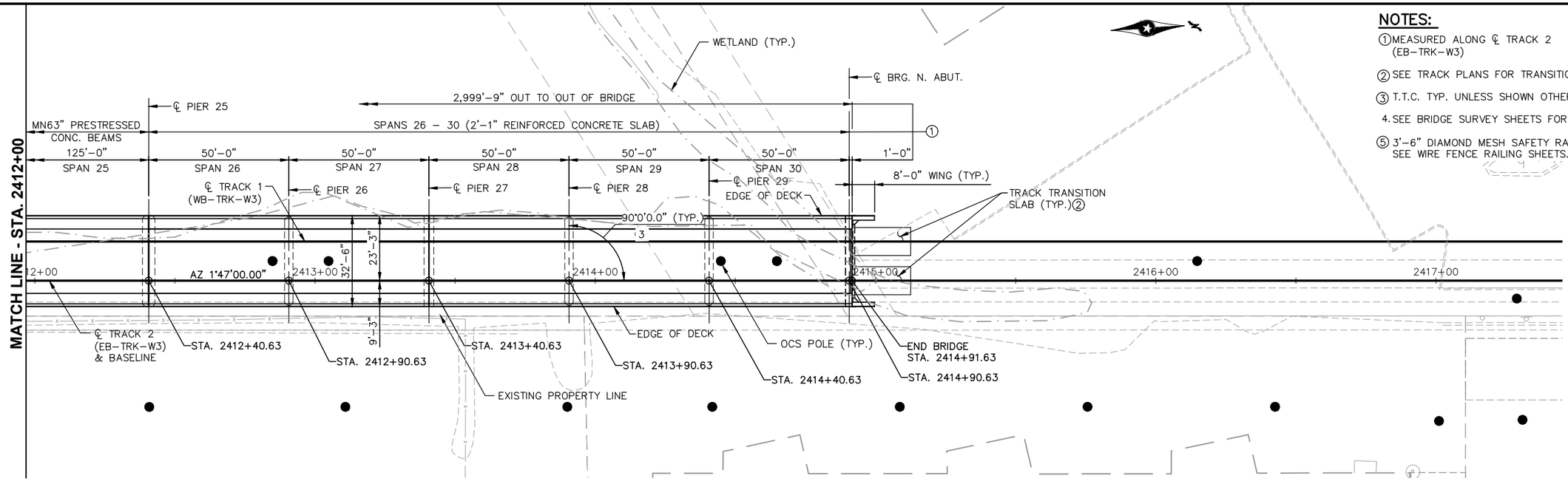
CIVIL WEST - VOLUME 4B
MINNETONKA/HOPKINS
BRIDGE R0686
GENERAL PLAN & ELEVATION 5

DISCIPLINE: STRUCTURES

SHEET NAME: CBRR0686-BRG-GPE-006

SHEET 6 OF 116

Sep. 21 2015 08:14 am V:\3400_ADC\CAD\SEGMENT W3\PLAN SHEETS\STRUCTURES\CBRR0686\60_percent_Preliminary Plans-Dwg files\CBRR0686-BRG-GPE.dwg By: wyttenbach

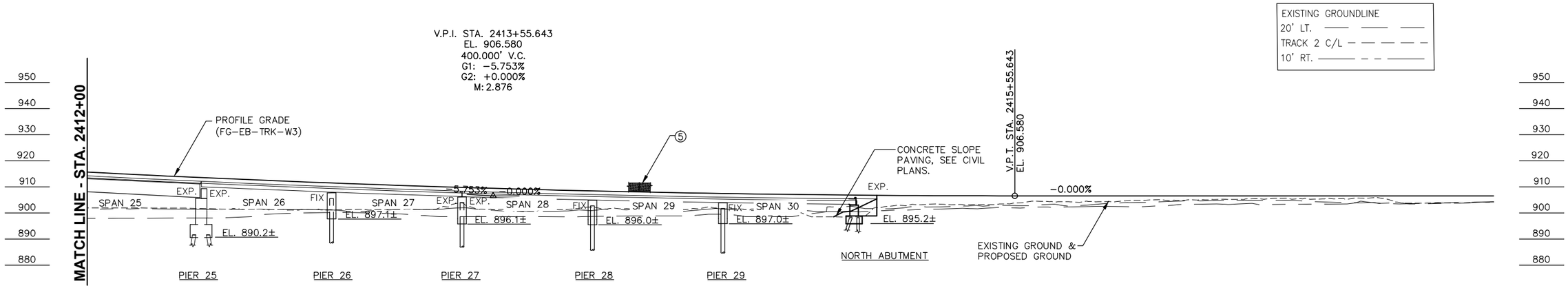


NOTES:

1. ①MEASURED ALONG ℄ TRACK 2 (EB-TRK-W3)
2. ②SEE TRACK PLANS FOR TRANSITION SLAB DETAILS.
3. ③T.T.C. TYP. UNLESS SHOWN OTHERWISE.
4. SEE BRIDGE SURVEY SHEETS FOR IN PLACE UTILITIES.
5. ⑤3'-6" DIAMOND MESH SAFETY RAIL. FOR DETAILS, SEE WIRE FENCE RAILING SHEETS.

GENERAL PLAN

0 10 20 40
SCALE IN FEET



GENERAL ELEVATION

0 10 20 40
SCALE IN FEET

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AK/IGG | CHECKED BY: TR
DRAWN BY: TAW | DATE: 9/21/2015

AECOM

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

CIVIL WEST - VOLUME 4B
MINNETONKA/HOPKINS
BRIDGE R0686
GENERAL PLAN & ELEVATION 6

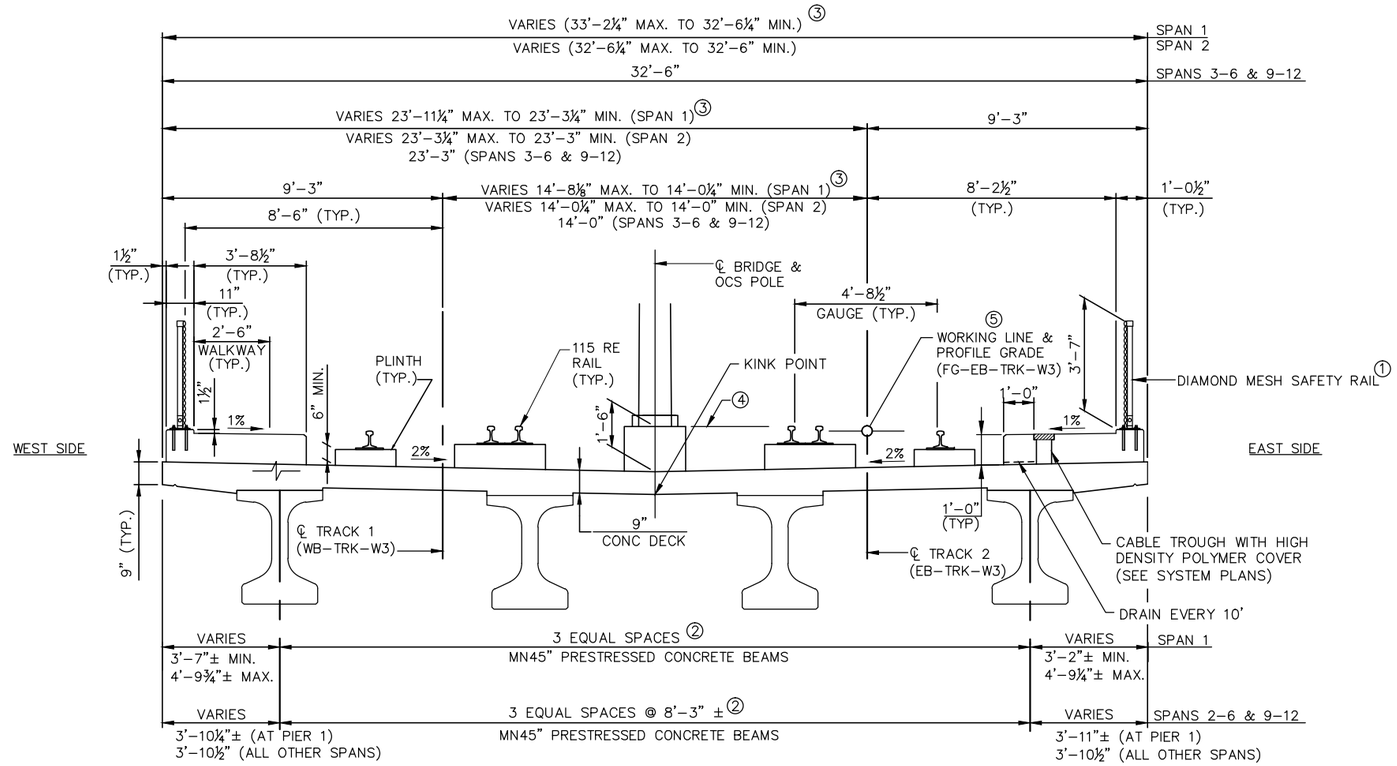
DISCIPLINE: STRUCTURES
SHEET NAME: CBRR0686-BRG-GPE-007

SHEET 7 OF 116

Sep. 21 2015 08:15 am V:\3400_ADC\CAD\SEGMENT W3\PLAN SHEETS\STRUCTURES\CBRR0686\60_percent_Preliminary Plans-Dwg files\CBRR0686-BRG-GPE.dwg By: wyttenbacht

SCHEDULE OF QUANTITIES FOR ENTIRE BRIDGE

SPEC SECTION	COMPONENT ITEM SUMMARY	UNIT	QUANTITY
MNDOT 2301	BRIDGE APPROACH PANEL	EACH	
MNDOT 2401	STRUCTURAL CONCRETE (3B52)	CU YD	
MNDOT 2401	STRUCTURAL CONCRETE (1G52)	CU YD	
MNDOT 2401	STRUCTURAL CONCRETE (3Y42)	SQ FT	
MNDOT 2401	SIDEWALK CONCRETE (3F52)	SQ FT	
MNDOT 2401	REINFORCEMENT BARS	POUND	
MNDOT 2402	ELASTOMERIC BEARING PAD TYPE 1	EACH	
MNDOT 2402	EXPANSION JOINT DEVICES TYPE 5	LIN FT	
MNDOT 2402	BEARING ASSEMBLY	EACH	
MNDOT 2405	PRESTRESSED CONCRETE BEAMS MN45	LIN FT	
MNDOT 2405	PRESTRESSED CONCRETE BEAMS MN63	LIN FT	
MNDOT 2405	PRESTRESSED CONCRETE BEAMS 82 MW	LIN FT	
MNDOT 2405	DIAPHRAGMS FOR TYPE MN45 PREST BEAMS	LIN FT	
MNDOT 2405	DIAPHRAGMS FOR TYPE MN63 PREST BEAMS	LIN FT	
MNDOT 2405	DIAPHRAGMS FOR TYPE 82 MW PREST BEAMS	LIN FT	
MNDOT 2451	AGGREGATE BACKFILL (CV)	CU YD	
MNDOT 2452	C-I-P CONCRETE PILING DELIVERED 16"	LIN FT	
MNDOT 2452	C-I-P CONCRETE PILING DRIVEN 16"	LIN FT	
MNDOT 2452	C-I-P CONCRETE TEST PILE 40 FT LONG 16"	EACH	
MNDOT 2452	C-I-P CONCRETE TEST PILE 50 FT LONG 16"	EACH	
MNDOT 2452	PILE ANALYSIS	EACH	
MNDOT 2481	DAMPPROOFING	SQ FT	
MNDOT 2514	CONCRETE SLOPE PAVING	SQ YD	
MNDOT 2557	DIAMOND MESH SAFETY RAIL	LIN FT	



TRANSVERSE SECTION – SPANS 1–6 & 9–12

0 1 2.5 5
SCALE IN FEET

NOTES:

① DIAMOND MESH SAFETY RAIL PER MNDOT FIG. 5-397.119 (MOD) WIRE FENCE.

② NUMBER AND SPACING OF BEAMS IS APPROXIMATE AND WILL BE SET DURING ADVANCED DESIGN.

③ MAXIMUM DISTANCE IS TAKEN AT ℄ OF BEARING AT SOUTH ABUTMENT. (SPAN 1)

④ 1'-6" MEASURED TO TOP OF LOW RAIL.

⑤ PROFILE GRADE LINE TRANSITIONS TO LOW RAIL IN SUPERELEVATED CURVES.

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AK/IGG | CHECKED BY: TR
DRAWN BY: TAW | DATE: 9/21/2015

AECOM

60% SUBMISSION - 09/28/15

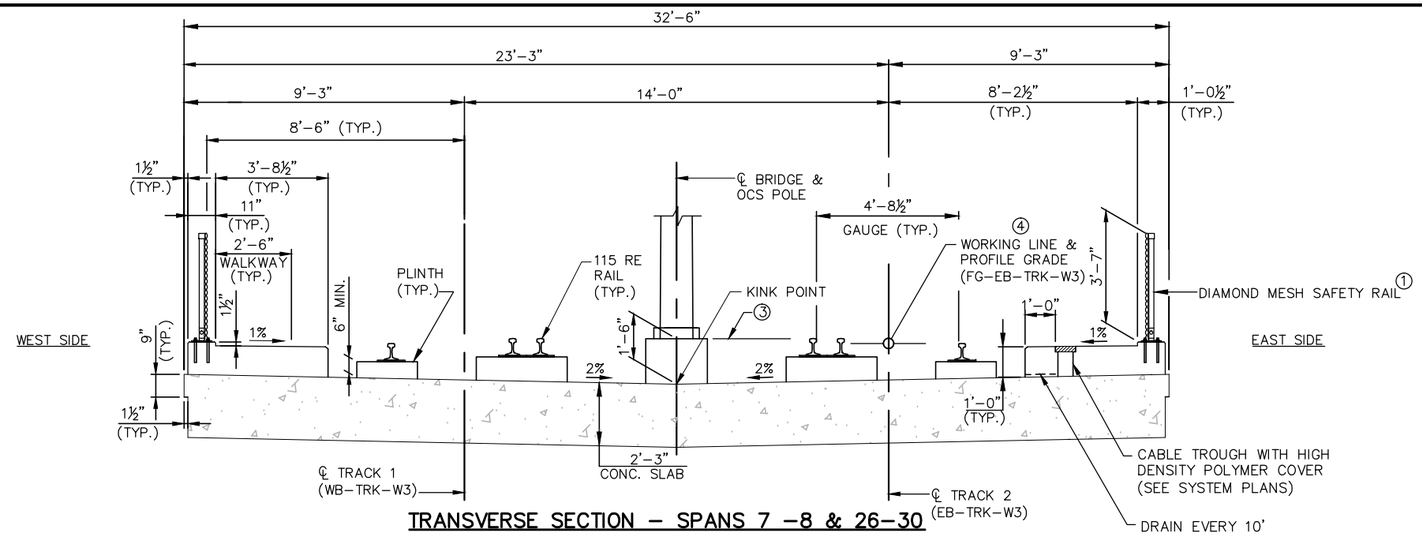
METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

CIVIL WEST - VOLUME 4B
MINNETONKA/HOPKINS
BRIDGE R0686
TRANSVERSE SECTION & QUANTITIES

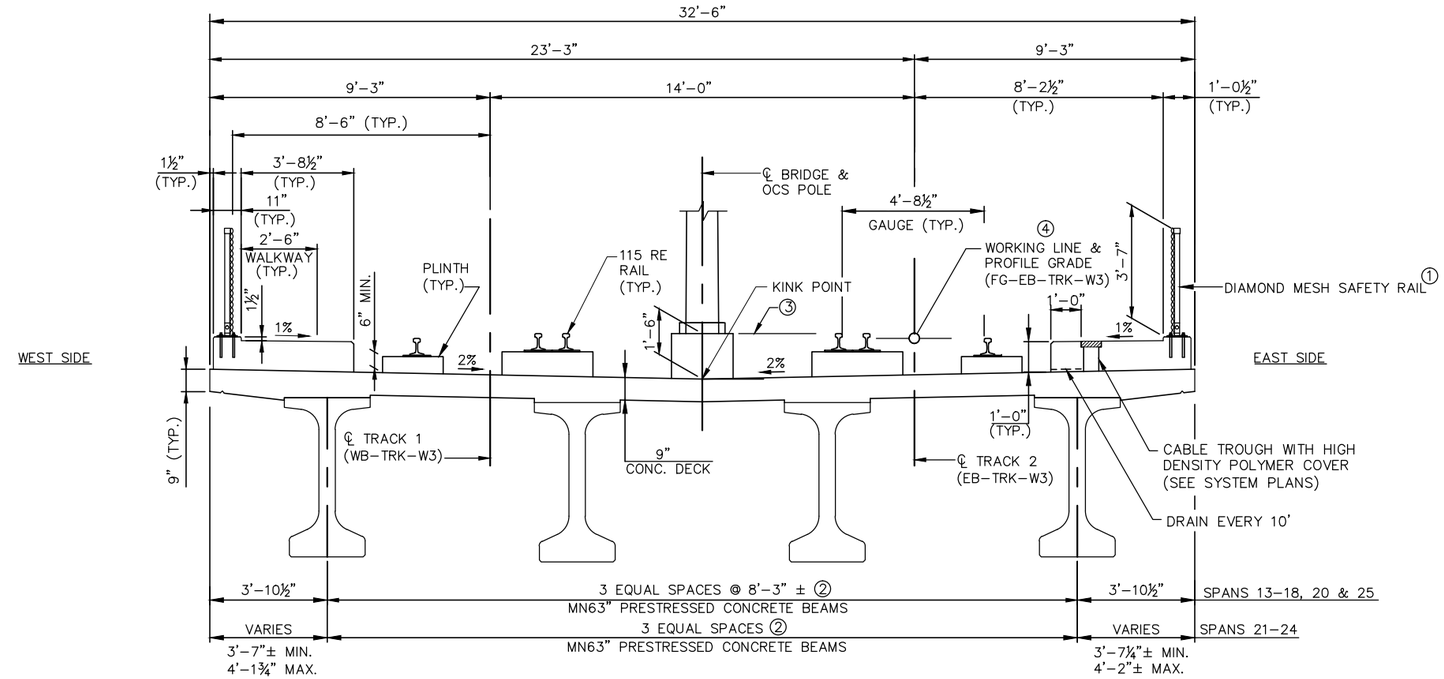
DISCIPLINE: STRUCTURES
SHEET NAME: CBRR0686-BRG-TRN-001

SHEET 8 OF 116



TRANSVERSE SECTION – SPANS 7 –8 & 26–30

SCALE 0 1 2.5 5 IN FEET



TRANSVERSE SECTION – SPANS 13–18 & 20–25

SCALE 0 1 2.5 5 IN FEET

NOTES:

① DIAMOND MESH SAFETY RAIL PER MNDOT FIG. 5–397.119 (MOD) WIRE FENCE.

② NUMBER AND SPACING OF BEAMS IS APPROXIMATE AND WILL BE SET DURING ADVANCED DESIGN.

③ 1'–6" MEASURED TO TOP OF LOW RAIL.

④ PROFILE GRADE LINE TRANSITIONS TO LOW RAIL IN SUPERELEVATED CURVES.

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AK/IGG
DRAWN BY: TAW
CHECKED BY: TR
DATE: 9/21/2015

AECOM

60% SUBMISSION - 09/28/15

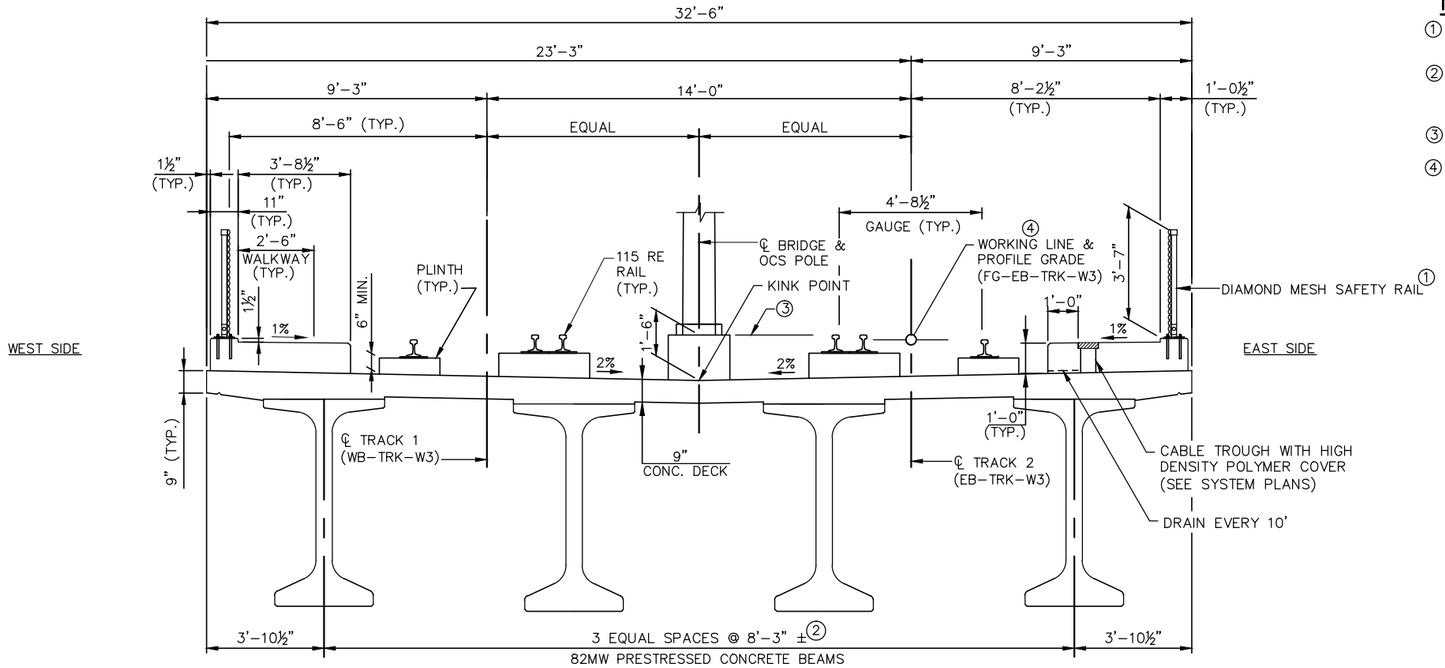
METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

CIVIL WEST - VOLUME 4B
MINNETONKA/HOPKINS
BRIDGE R0686
TRANSVERSE SECTION

DISCIPLINE: STRUCTURES
SHEET NAME: CBRR0686-BRG-TRN-002

SHEET 9 OF 116



NOTES:

① DIAMOND MESH SAFETY RAIL PER MNDOT FIG. 5-397.119 (MOD) WIRE FENCE.

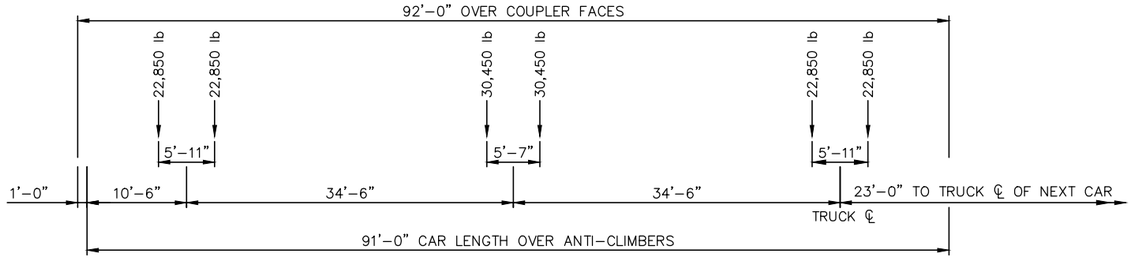
② NUMBER AND SPACING OF BEAMS IS APPROXIMATE AND WILL BE SET DURING ADVANCED DESIGN.

③ 1'-6" MEASURED TO TOP OF LOW RAIL.

④ PROFILE GRADE LINE TRANSITIONS TO LOW RAIL IN SUPERELEVATED CURVES.

TRANSVERSE SECTION – SPAN 19

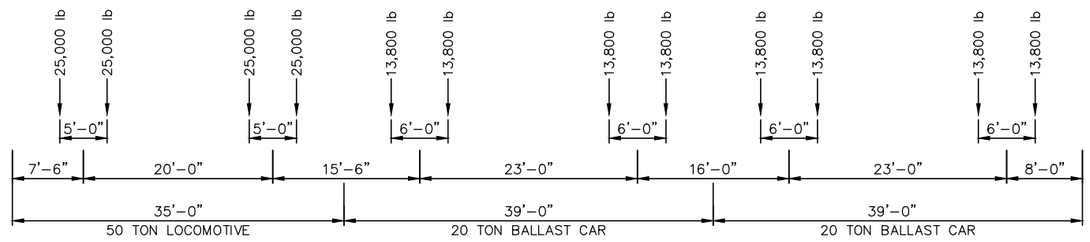
SCALE 0 1 2.5 5 IN FEET



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.



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. WEIGHT OF EMPTY BALLAST CAR IS 15,000 POUNDS.

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AK/IGG | CHECKED BY: TR
DRAWN BY: TAW | DATE: 9/21/2015

AECOM

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

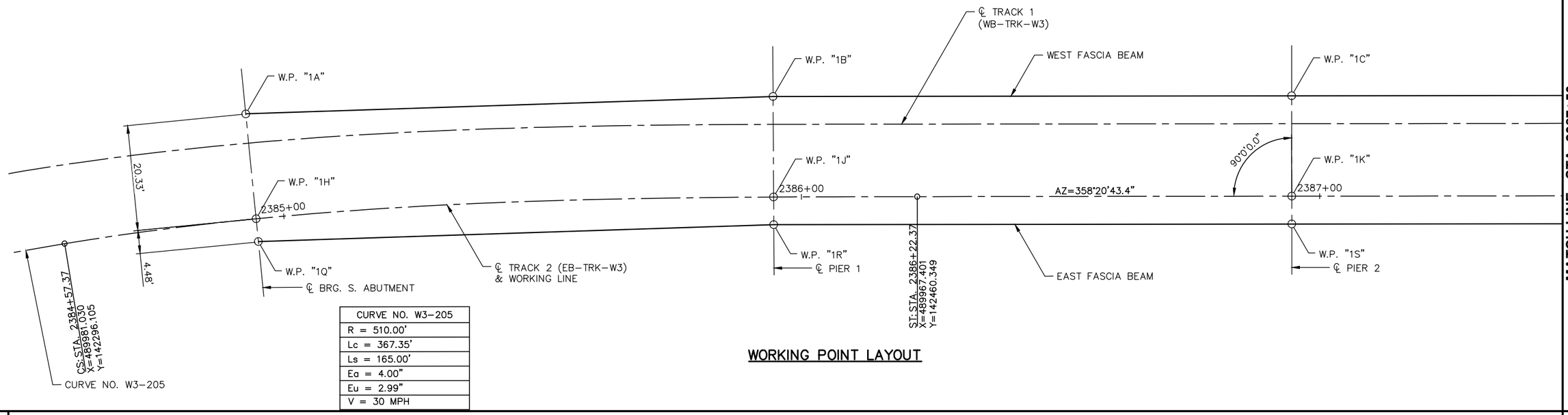
CIVIL WEST - VOLUME 4B
MINNETONKA/HOPKINS
BRIDGE R0686
TRANSVERSE SECTION & LOADING DIAGRAM

DISCIPLINE: STRUCTURES

SHEET NAME: CBRR0686-BRG-TRN-003

SHEET 10 OF 116

NOTE: SEE ALIGNMENT TABULATION SHEET XXX
FOR HORIZONTAL GEOMETRY.

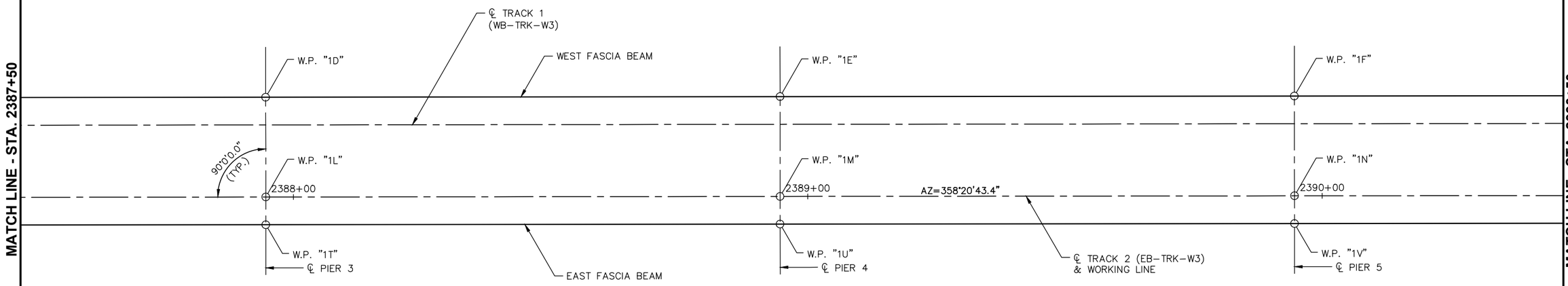


CURVE NO. W3–205
R = 510.00'
Lc = 367.35'
Ls = 165.00'
Ea = 4.00"
Eu = 2.99"
V = 30 MPH

MATCH LINE - STA. 2387+50

WORKING POINT LAYOUT

NOTE: SEE ALIGNMENT TABULATION SHEET XXX
FOR HORIZONTAL GEOMETRY.



WORKING POINT LAYOUT

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AK/IGG | CHECKED BY: TR
DRAWN BY: TAW | DATE: 9/21/2015

AECOM

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

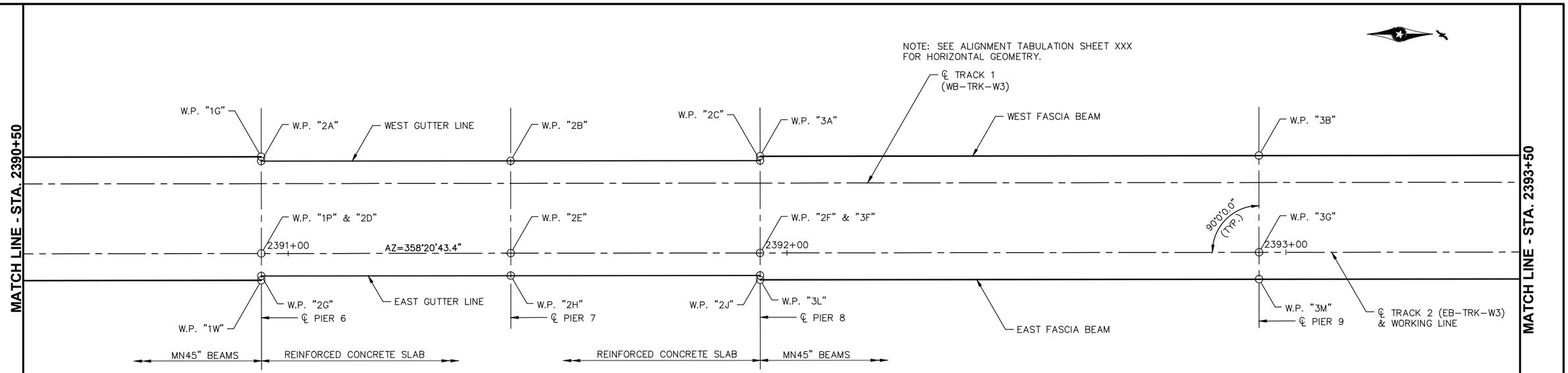
SOUTHWEST Green Line LRT Extension

CIVIL WEST - VOLUME 4B
MINNETONKA/HOPKINS
BRIDGE R0686
BRIDGE LAYOUT 1

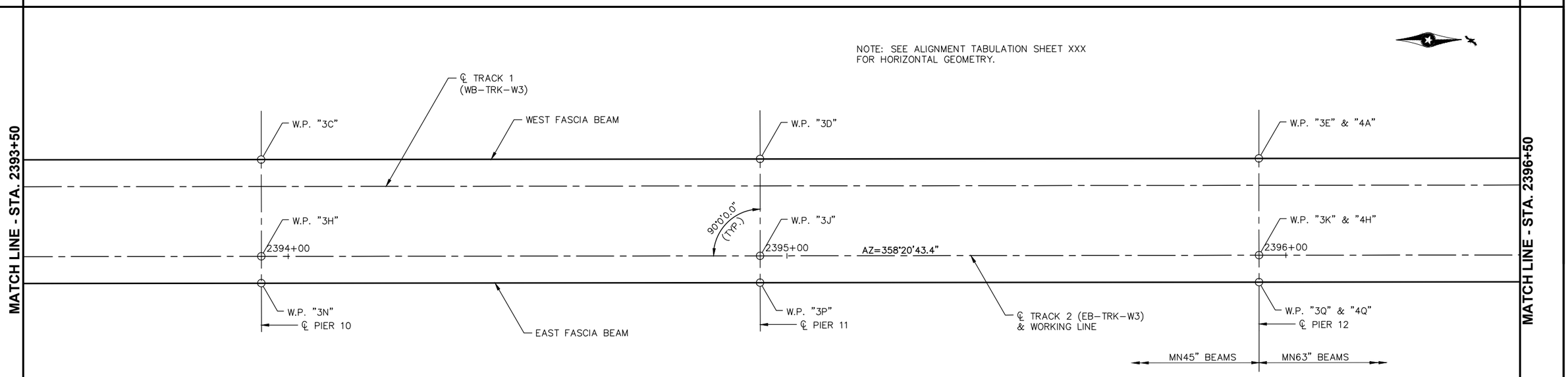
DISCIPLINE: STRUCTURES
SHEET NAME: CBRR0686-BRG-SUP-001

SHEET 11 OF 116

Sep. 21 2015 08:15 am V:\3400_ADC\CAD\SEGMENT W3\PLAN SHEETS\STRUCTURES\CBRR0686\60_percent_Preliminary Plans-Dwg files\CBRR0686-BRG-WPTS.dwg By: wyttenbacht



WORKING POINT LAYOUT



WORKING POINT LAYOUT

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AK/IGG | CHECKED BY: TR
DRAWN BY: TAW | DATE: 9/21/2015

AECOM

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

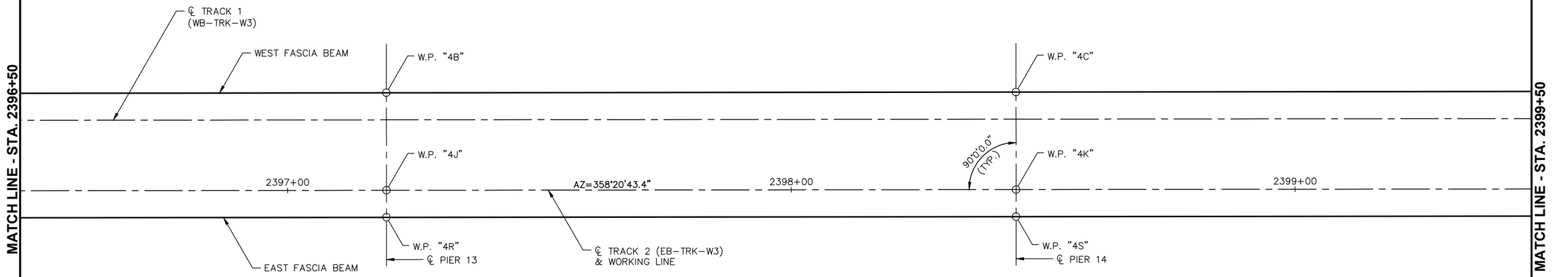
CIVIL WEST - VOLUME 4B
MINNETONKA/HOPKINS
BRIDGE R0686
BRIDGE LAYOUT 2

DISCIPLINE: STRUCTURES
SHEET NAME: CBRR0686-BRG-SUP-002

SHEET 12 OF 116

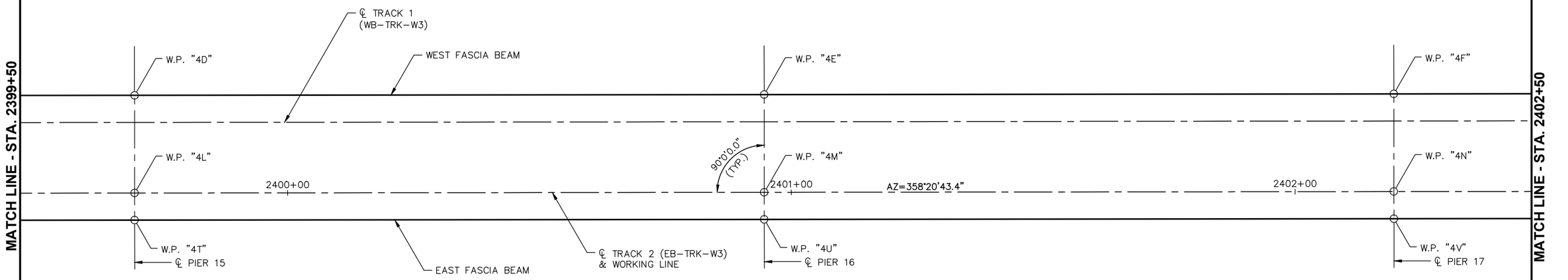
Sep. 21 2015 08:15 am V:\3400_ADC\CAD\SEGMENT W3\PLAN SHEETS\STRUCTURES\CBRR0686\60_percent_Preliminary Plans-Dwg files\CBRR0686-BRG-WPTS.dwg By: wyttenbacht

NOTE: SEE ALIGNMENT TABULATION SHEET XXX
FOR HORIZONTAL GEOMETRY.



WORKING POINT LAYOUT

NOTE: SEE ALIGNMENT TABULATION SHEET XXX
FOR HORIZONTAL GEOMETRY.



WORKING POINT LAYOUT

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AK/IGG | CHECKED BY: TR
DRAWN BY: TAW | DATE: 9/21/2015

AECOM

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST
Green Line LRT Extension

CIVIL WEST - VOLUME 4B
MINNETONKA/HOPKINS
BRIDGE R0686
BRIDGE LAYOUT 3

DISCIPLINE: STRUCTURES
SHEET NAME: CBRR0686-BRG-SUP-003

SHEET 13 OF 116

NOTE: SEE ALIGNMENT TABULATION SHEET XXX
FOR HORIZONTAL GEOMETRY.

MATCH LINE - STA. 2402+50

℄ TRACK 1
(WB–TRK–W3)

WEST FASCIA BEAM

W.P. "4G" & "5A"

℄ TRACK 2
CP BASS LAKE SPUR
(CP–BLS–TRK2)

CONTROL POINT NO. 3
℄ TRACK 2 (EB–TRK–W3) P.O.T. STA. 2404+25.964
= ℄ TRACK 2 (CP–BLS–TRK2) P.O.T. STA. 30+00.000
X = 489915.412
Y = 144260.125
ANGLE = 55°–17'–53.3" T.T.C.

W.P. "5B" & "6A"

90°0'0.0" (TYP.)

W.P. "4P" & "5C"

W.P. "5D" & "6H"

AZ=358°20'43.4"

2403+00

2404+00

10+00

30+00

2405+00

CONTROL POINT NO. 2
℄ TRACK 2 (EB–TRK–W3)
P.O.T. STA. 2404+10.015
= ℄ TRACK 1 (CP–BLS–TRK1)
P.O.T. STA. 10+00.000
X = 489915.873
Y = 144244.182
ANGLE = 55°–05'–22.4" T.T.C.

EAST FASCIA BEAM

℄ PIER 18

W.P. "4W" & "5E"

W.P. "5F" & "6Q"

℄ PIER 19

℄ TRACK 2 (EB–TRK–W3)
& WORKING LINE

MN63" BEAMS

82MW BEAMS

82MW BEAMS

MN63" BEAMS

MATCH LINE - STA. 2405+50

WORKING POINT LAYOUT

℄ TRACK 1
CP BASS LAKE SPUR
(CP–BLS–TRK1)

NOTE: SEE ALIGNMENT TABULATION SHEET XXX
FOR HORIZONTAL GEOMETRY.

MATCH LINE - STA. 2405+50

℄ TRACK 1
(WB–TRK–W3)

WEST FASCIA BEAM

℄ PIER 20

W.P. "6B"

℄ PIER 21

W.P. "6C"

90°0'0.0"

W.P. "6J"

W.P. "6K"

AZ=358°20'43.4"

2406+00

2407+00

W.P. "6R"

EAST FASCIA BEAM

TS: STA. 2406+17.06
X=489909.806
Y=144454.210

W.P. "6S"

SC: STA. 2407+47.06
X=489906.615
Y=144584.170

℄ TRACK 2 (EB–TRK–W3)
& WORKING LINE

MATCH LINE - STA. 2408+00

WORKING POINT LAYOUT

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AK/IGG | CHECKED BY: TR
DRAWN BY: TAW | DATE: 9/21/2015

AECOM

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

CIVIL WEST - VOLUME 4B
MINNETONKA/HOPKINS
BRIDGE R0686
BRIDGE LAYOUT 4

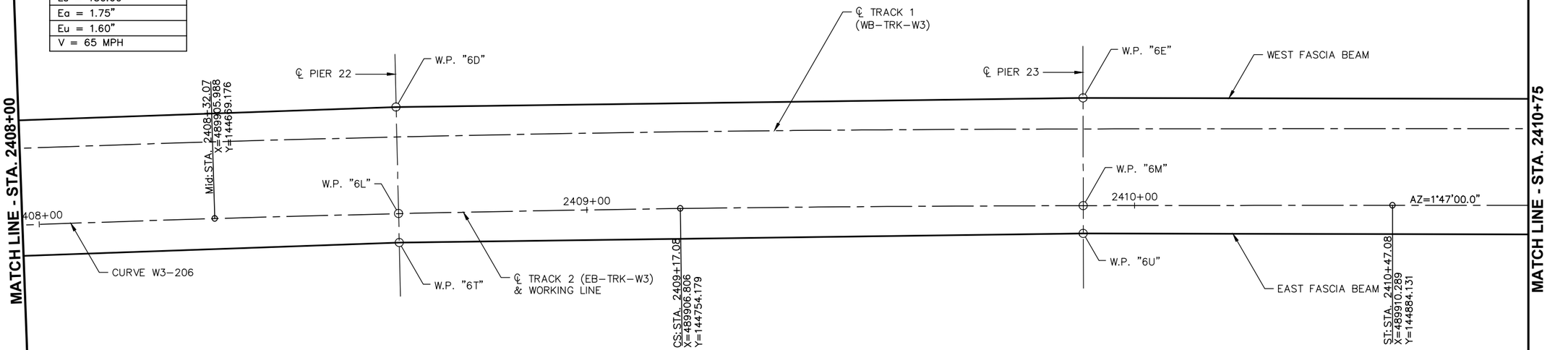
DISCIPLINE: STRUCTURES
SHEET NAME: CBRR0686-BRG-SUP-004

SHEET 14 OF 116

Sep. 21 2015 08:15 am V:\3400_ADC\CAD\SEGMENT W3\PLAN SHEETS\STRUCTURES\CBRR0686\60_percent_Preliminary Plans-Dwg files\CBRR0686-BRG-WPTS.dwg By: wyttenbacht

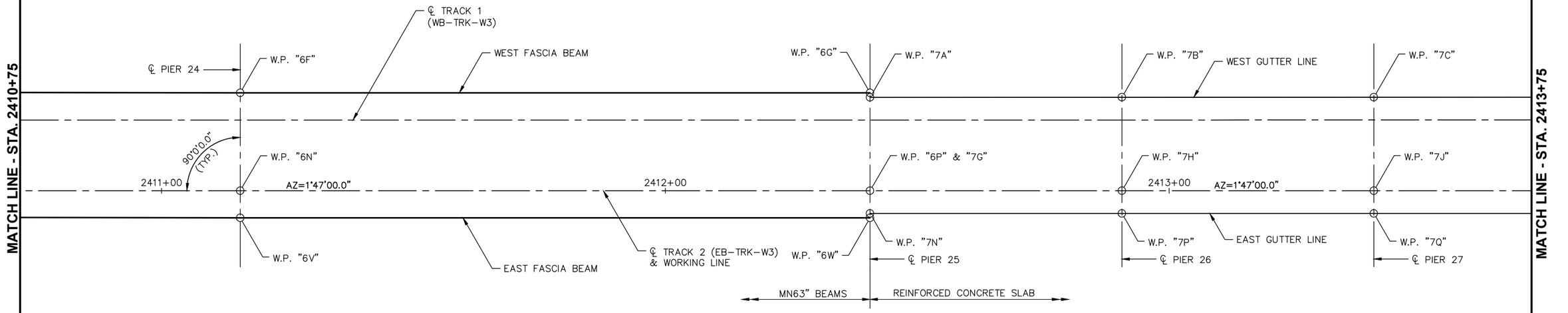
CURVE NO. W3–206
R = 5,000.00'
Lc = 170.02'
Ls = 130.00'
Ea = 1.75"
Eu = 1.60"
V = 65 MPH

NOTE: SEE ALIGNMENT TABULATION SHEET XXX
FOR HORIZONTAL GEOMETRY.



WORKING POINT LAYOUT

NOTE: SEE ALIGNMENT TABULATION SHEET XXX
FOR HORIZONTAL GEOMETRY.



WORKING POINT LAYOUT

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AK/IGG | CHECKED BY: TR
DRAWN BY: TAW | DATE: 9/21/2015

AECOM

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

CIVIL WEST - VOLUME 4B
MINNETONKA/HOPKINS
BRIDGE R0686
BRIDGE LAYOUT 5

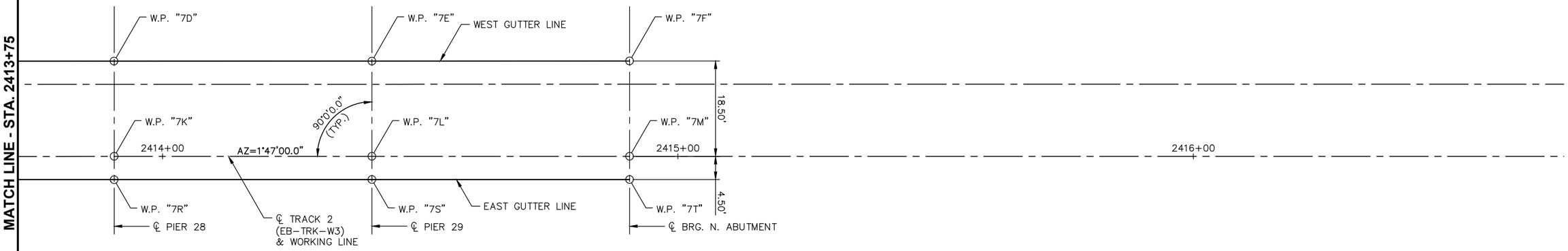
DISCIPLINE: STRUCTURES

SHEET NAME: CBRR0686-BRG-SUP-005

SHEET 15 OF 116

NOTE: SEE ALIGNMENT TABULATION SHEET XXX
FOR HORIZONTAL GEOMETRY.

MATCH LINE - STA. 2413+75



WORKING POINT LAYOUT

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AK/IGG | CHECKED BY: TR
DRAWN BY: TAW | DATE: 9/21/2015

AECOM

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

CIVIL WEST - VOLUME 4B
MINNETONKA/HOPKINS
BRIDGE R0686
BRIDGE LAYOUT 6

DISCIPLINE: STRUCTURES
SHEET NAME: CBRR0686-BRG-SUP-006

SHEET 16 OF 116

Sep. 21 2015 08:15 am V:\3400_ADC\CAD\SEGMENT W3\PLAN SHEETS\STRUCTURES\CBRR0686\60_percent_Preliminary Plans-Dwg files\CBRR0686-BRG-WPTS.dwg By: wyttenbacht

	DIMENSIONS BETWEEN WORKING POINTS (FT.)																							ELEVATIONS			
POINT	STATION	X–COORDINATE	Y–COORDINATE	1A	1B	1C	1D	1E	1F	1G	1H	1J	1K	1L	1M	1N	1P	1Q	1R	1S	1T	1U	1V	1W	TOP OF DECK	TOP OF DECK TO BR. SEAT	BRIDGE SEAT	POINT
1A	2384+94.63	489955.017	142330.350		101.81						20.35	103.13	202.50						104.12	203.00					901.45	5.23'	896.22	1A
1B	2385+94.63	489948.838	142431.975			100.09					102.52	19.42	101.95	201.03				103.21		103.11	201.62				902.36	5.06'	897.29	1B
1C	2386+94.63	489945.948	142532.026				100.00				201.26	101.87	19.38	101.86	200.94			201.40	103.00		103.02	201.53			903.27	5.23'	898.04	1C
1D	2387+94.63	489943.060	142631.984					100.00				200.94	101.86	19.38	101.86	200.94			201.50	103.02		103.02	201.53		904.19	5.06'	899.12	1D
1E	2388+94.63	489940.173	142731.942						100.00				200.94	101.86	19.38	101.86	200.94			201.52	103.02		103.02	201.53	905.10	5.23'	899.87	1E
1F	2389+94.63	489937.285	142831.901							100.00				200.94	101.86	19.38	101.86				201.53	103.02		103.02	906.02	5.06'	900.95	1F
1G	2390+94.63	489934.398	142931.859												200.94	101.86	19.38					201.53	103.02		906.93	5.23'	901.70	1G
1H	2384+94.63	489975.209	142332.904									99.96						4.44	99.91	199.89					901.34			1H
1J	2385+94.63	489968.245	142432.624										100.00					98.81	5.33	100.15	200.07				902.25			1J
1K	2386+94.63	489965.315	142532.585											100.00				199.64	100.12	5.37	100.14	200.07			903.16			1K
1L	2387+94.63	489962.427	142632.544												100.00				200.05	100.14	5.38	100.14	200.07		904.08			1L
1M	2388+94.63	489959.540	142732.502													100.00				200.07	100.14	5.38	100.14	200.07	904.99			1M
1N	2389+94.63	489956.652	142832.460														100.00				200.07	100.14	5.38	100.14	905.91			1N
1P	2390+94.63	489953.765	142932.419																			200.07	100.15	5.38	906.83			1P
1Q	2384+94.63	489979.615	142333.461																99.53						901.43	5.23'	896.20	1Q
1R	2385+94.63	489973.574	142432.803																	99.98					902.36	5.06'	897.29	1R
1S	2386+94.63	489970.687	142532.741																		100.00				903.27	5.23'	898.04	1S
1T	2387+94.63	489967.800	142632.699																			100.00			904.19	5.06'	899.12	1T
1U	2388+94.63	489964.913	142732.657																				100.00		905.10	5.23'	899.87	1U
1V	2389+94.63	489962.025	142832.615																					100.00	906.02	5.06'	900.95	1V
1W	2390+94.63	489959.138	142932.574																						906.93	5.23'	901.70	1W

	DIMENSIONS BETWEEN WORKING POINTS (FT.)												ELEVATIONS			
POINT	STATION	X–COORDINATE	Y–COORDINATE	2A	2B	2C	2D	2E	2F	2G	2H	2J	TOP OF DECK	TOP OF DECK TO BR. SEAT	BRIDGE SEAT	POINT
2A	2390+94.63	489935.273	142931.884		50.00		18.50	53.31	101.70		55.04	102.61	906.92			2A
2B	2391+44.63	489933.829	142981.864			50.00	53.32	18.50	53.31	55.04		55.04	907.37			2B
2C	2391+94.63	489932.385	143031.843				101.70	53.31	18.50	102.61	55.04		908.01			2C
2D	2390+94.63	489953.785	142932.419					50.00		4.50	50.20	100.10	906.83			2D
2E	2391+44.63	489952.321	142982.398						50.00	50.20	4.50	50.20	907.28			2E
2F	2391+94.63	489950.878	143032.377							100.10	50.20	4.50	907.92			2F
2G	2390+94.63	489958.263	142932.548								50.00		906.92			2G
2H	2391+44.63	489956.819	142982.528									50.00	907.37			2H
2J	2391+94.63	489955.376	143032.507										908.01			2J

	DIMENSIONS BETWEEN WORKING POINTS (FT.)																		ELEVATIONS			
POINT	STATION	X–COORDINATE	Y–COORDINATE	3A	3B	3C	3D	3E	3F	3G	3H	3J	3K	3L	3M	3N	3P	3Q	TOP OF DECK	TOP OF DECK TO BR. SEAT	BRIDGE SEAT	POINT
3A	2391+94.63	489931.511	143031.817		100.00				19.38	101.86	200.94				103.02	201.53			908.03	5.35'	902.68	3A
3B	2392+94.63	489928.623	143131.776			100.00			101.86	19.38	101.86	200.94		103.02		103.02	201.53		910.35	5.19'	905.16	3B
3C	2393+94.63	489925.736	143231.734				100.00		200.94	101.86	19.38	101.86	200.94	201.53	103.02		103.02	201.53	914.05	5.35'	908.70	3C
3D	2394+94.63	489922.848	143331.692					100.00		200.94	101.86	19.38	101.86		201.53	103.02		103.02	919.14	5.19'	913.95	3D
3E	2395+94.63	489919.961	143431.651								200.94	101.86	19.38			201.53	103.02		924.89	5.13'	919.76	3E
3F	2391+94.63	489950.878	143032.377							100.00				5.38	100.14	200.07			907.92			3F
3G	2392+94.63	489947.990	143132.335								100.00			100.14	5.38	100.14	200.07		910.24			3G
3H	2393+94.63	489945.103	143232.294									100.00		200.07	100.14	5.38	100.14	200.07	913.94			3H
3J	2394+94.63	489942.215	143332.252										100.00		200.07	100.14	5.38	100.14	919.03			3J
3K	2395+94.63	489939.328	143432.210													200.07	100.14	5.38	924.78			3K
3L	2391+94.63	489956.250	143032.532												100.00				908.03	5.35'	902.68	3L
3M	2392+94.63	489953.363	143132.490													100.00			910.35	5.19'	905.16	3M
3N	2393+94.63	489950.476	143232.449														100.00		914.05	5.35'	908.70	3N
3P	2394+94.63	489947.588	143332.407															100.00	919.14	5.19'	913.95	3P
3Q	2395+94.63	489944.701	143432.365																924.89	5.13'	919.76	3Q

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AK/IGG | CHECKED BY: TR
DRAWN BY: TAW | DATE: 9/21/2015

AECOM

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

CIVIL WEST - VOLUME 4B
MINNETONKA/HOPKINS
BRIDGE R0686
BRIDGE LAYOUT 7

DISCIPLINE: STRUCTURES
SHEET NAME: CBRR0686-BRG-SUP-007

SHEET 17 OF 116

	DIMENSIONS BETWEEN WORKING POINTS (FT.)																							ELEVATIONS			
POINT	STATION	X-COORDINATE	Y-COORDINATE	4A	4B	4C	4D	4E	4F	4G	4H	4J	4K	4L	4M	4N	4P	4Q	4R	4S	4T	4U	4V	4W	TOP OF DECK	TOP OF DECK TO BR. SEAT	BRIDGE SEAT	POINT
4A	2395+94.63	489919.961	143431.651		125.00						19.38	126.49	250.75						127.43	251.22					924.89	6.63'	918.26	4A
4B	2397+19.63	489916.352	143556.599			125.00					126.49	19.38	126.49	250.75				127.43		127.43	251.22				931.54	6.46'	925.08	4B
4C	2398+44.63	489912.742	143681.546				125.00				250.75	126.49	19.38	126.49	250.75			251.22	127.43		127.43	251.22			936.91	6.63'	930.29	4C
4D	2399+69.63	489909.133	143806.494					125.00				250.75	126.49	19.38	126.49	250.75			251.22	127.43		127.43	251.22		941.00	6.46'	934.54	4D
4E	2400+94.63	489905.524	143931.442						125.00				250.75	126.49	19.38	126.49	250.75			251.22	127.43		127.43	251.22	943.80	6.63'	937.18	4E
4F	2402+19.63	489901.914	144056.390							125.00				250.75	126.49	19.38	126.49				251.22	127.43		127.43	945.32	6.46'	938.86	4F
4G	2403+44.63	489898.305	144181.338												250.75	126.49	19.38					251.22	127.43		945.56	6.63'	938.93	4G
4H	2395+94.63	489939.328	143432.210									125.00						5.38	125.12	250.06					924.78			4H
4J	2397+19.63	489935.718	143557.158										125.00					125.12	5.38	125.12	250.06				931.43			4J
4K	2398+44.63	489932.109	143682.106											125.00				250.06	125.12	5.38	125.12	250.06			936.80			4K
4L	2399+69.63	489928.500	143807.054												125.00				250.06	125.12	5.38	125.12	250.06		940.89			4L
4M	2400+94.63	489924.891	143932.002													125.00				250.06	125.12	5.38	125.12	250.06	943.69			4M
4N	2402+19.63	489921.281	144056.949														125.00				250.06	125.12	5.38	125.12	945.22			4N
4P	2403+44.63	489917.672	144181.897																			250.06	125.12	5.38	945.45			4P
4Q	2395+94.63	489944.701	143432.365																125.00						924.89	6.63'	918.26	4Q
4R	2397+19.63	489941.091	143557.313																	125.00					931.54	6.46'	925.08	4R
4S	2398+44.63	489937.482	143682.261																		125.00				936.91	6.63'	930.29	4S
4T	2399+69.63	489933.873	143807.209																			125.00			941.00	6.46'	934.54	4T
4U	2400+94.63	489930.264	143932.157																				125.00		943.80	6.63'	937.18	4U
4V	2402+19.63	489926.654	144057.105																					125.00	945.32	6.46'	938.86	4V
4W	2403+44.63	489923.045	144182.053																						945.56	6.63'	938.93	4W

	DIMENSIONS BETWEEN WORKING POINTS (FT.)								ELEVATIONS			
POINT	STATION	X-COORDINATE	Y-COORDINATE	5A	5B	5C	5D	5E	5F	TOP OF DECK	TOP OF DECK TO BR. SEAT	BRIDGE SEAT	POINT
5A	2403+44.63	489898.305	144181.338		146.00	19.38			148.08	945.56	8.49'	937.07	5A
5B	2404+90.63	489894.089	144327.277			147.28	19.38	148.08		944.21	8.15'	936.06	5B
5C	2403+44.63	489917.672	144181.897				146.00	5.38	146.10	945.45			5C
5D	2404+90.63	489913.456	144327.836					146.10	5.38	944.10			5D
5E	2403+44.63	489923.045	144182.053						146.00	945.56	8.49'	937.07	5E
5F	2404+90.63	489918.829	144327.992							944.21	8.15'	936.06	5F

	DIMENSIONS BETWEEN WORKING POINTS (FT.)																							ELEVATIONS			
POINT	STATION	X-COORDINATE	Y-COORDINATE	6A	6B	6C	6D	6E	6F	6G	6H	6J	6K	6L	6M	6N	6P	6Q	6R	6S	6T	6U	6V	6W	TOP OF DECK	TOP OF DECK TO BR. SEAT	BRIDGE SEAT	POINT
6A	2404+90.63	489894.089	144327.277		125.00						19.38	126.49	250.78						127.43	251.19					944.21	6.46'	937.75	6A
6B	2406+15.63	489890.480	144452.225			125.22					126.49	19.38	126.56	251.00				127.43		127.42	251.34				941.66	6.73'	934.93	6B
6C	2407+40.63	489887.184	144577.406				125.48				250.95	126.67	19.54	126.75	251.22			251.41	127.59		127.61	251.55			937.83	6.46'	931.37	6C
6D	2408+65.63	489886.682	144702.888					125.41				251.16	126.74	19.46	126.73	251.09			251.57	127.58		127.56	251.53		932.72	6.46'	926.26	6D
6E	2409+90.63	489888.918	144828.274						125.05				251.16	126.71	19.67	126.58	250.82			251.50	127.58		127.52	251.29	926.32	6.73'	919.59	6E
6F	2411+15.63	489893.057	144953.254							125.00				250.86	126.50	19.38	126.49				251.23	127.37		127.43	919.13	6.81'	912.32	6F
6G	2412+40.63	489896.947	145078.193												250.75	126.49	19.38					251.19	127.43		912.46	6.98'	905.48	6G
6H	2404+90.63	489913.456	144327.836									125.00						5.38	125.12	250.00					944.10			6H
6J	2406+15.63	489909.847	144452.784										125.00					125.12	5.38	125.06	249.92				941.55			6J
6K	2407+40.63	489906.721	144577.741											125.00				250.04	125.09	5.21	125.04	249.92			937.72			6K
6L	2408+65.63	489906.139	144702.736												125.00				249.96	125.04	5.21	125.04	250.02		932.61			6L
6M	2409+90.63	489908.578	144827.710													125.00				249.90	125.05	5.08	125.17	250.06	926.21			6M
6N	2411+15.63	489912.422	144952.651														125.00				249.96	125.09	5.38	125.12	919.03			6N
6P	2412+40.63	489916.312	145077.590																			250.04	125.12	5.38	912.36			6P
6Q	2404+90.63	489918.829	144327.992																125.00						944.21	6.46'	937.75	6Q
6R	2406+15.63	489915.220	144452.940																	124.93					941.66	6.73'	934.93	6R
6S	2407+40.63	489911.932	144577.830																		124.87				937.83	6.46'	931.37	6S
6T	2408+65.63	489911.432	144702.694																			124.89			932.71	6.46'	926.25	6T
6U	2409+90.63	489913.658	144827.564																				124.99		926.31	6.73'	919.58	6U
6V	2411+15.63	489917.795	144952.483																					125.00	919.13	6.81'	912.32	6V
6W	2412+40.63	489921.685	145077.423																						912.46	6.98'	905.48	6W

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AK/IGG | CHECKED BY: TR
DRAWN BY: TAW | DATE: 9/21/2015

AECOM

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

CIVIL WEST - VOLUME 4B
MINNETONKA/HOPKINS
BRIDGE R0686
BRIDGE LAYOUT 8

DISCIPLINE: STRUCTURES
SHEET NAME: CBRR0686-BRG-SUP-008

SHEET 18 OF 116

DIMENSIONS BETWEEN WORKING POINTS (FT.)

POINT	STATION	X-COORDINATE	Y-COORDINATE	7A	7B	7C	7D	7E	7F	7G	7H	7J	7K	7L	7M	7N	7P	7Q	7R	7S	7T	ELEVATIONS: TOP OF DECK	ELEVATIONS: TOP OF DECK TO BR. SEAT	ELEVATIONS: BRIDGE SEAT	POINT
7A	2412+40.63	489897.821	145078.166		50.00					18.50	53.31	101.70					55.04	120.61				912.45			7A
7B	2412+90.63	489899.377	145128.142			50.00				53.31	18.50	53.31	101.70			55.04		55.04	120.61			910.36			7B
7C	2413+40.63	489900.933	145178.117				50.00			101.70	53.31	18.50	53.31	101.70		120.61	55.04		55.04	120.61		908.63			7C
7D	2413+90.63	489902.489	145228.093					50.00			101.70	53.31	18.50	53.31	101.70		120.61	55.04		55.04	120.61	907.27			7D
7E	2414+40.63	489904.045	145278.069						50.00			101.70	53.31	18.50	53.31			120.61	55.04		55.04	906.26			7E
7F	2414+90.63	489905.601	145328.045												18.50				120.61	55.04		905.61			7F
7G	2412+40.63	489916.312	145077.590								50.00					4.50	50.20	100.10				912.36			7G
7H	2412+90.63	489917.870	145127.564									50.00				50.20	4.50	50.20	100.10			910.27			7H
7J	2413+40.63	489919.424	145177.542										50.00			100.10	50.20	4.50	50.20	100.10		908.54			7J
7K	2413+90.63	489920.980	145227.517											50.00			100.10	50.20	4.50	50.20	100.10	907.18			7K
7L	2414+40.63	489922.536	145277.493												50.00			100.10	50.20	4.50	50.20	906.17			7L
7M	2414+90.63	489924.092	145327.469																100.10	50.20	4.50	905.52			7M
7N	2412+40.63	489920.810	145077.450														50.00					912.45			7N
7P	2412+90.63	489922.366	145127.426															50.00				910.36			7P
7Q	2413+40.63	489923.922	145177.402																50.00			908.63			7Q
7R	2413+90.63	489925.478	145227.377																	50.00		907.27			7R
7S	2414+40.63	489927.034	145277.353																		50.00	906.26			7S
7T	2414+90.63	489928.590	145327.329																			905.61			7T

TOP OF DECK TO BRIDGE SEAT

	DECK THICKNESS	STOOL HEIGHT	BEAM HEIGHT	BEARING HEIGHT	TOTAL: INCHES	TOTAL: FEET
S. ABUTMENT	9"	3.5"	45"	5.25"	62.75"	5.23'
PIER 1	9"	3.5"	45"	3.25"	60.75"	5.06'
PIER 2	9"	3.5"	45"	5.25"	62.75"	5.23'
PIER 3	9"	3.5"	45"	3.25"	60.75"	5.06'
PIER 4	9"	3.5"	45"	5.25"	62.75"	5.23'
PIER 5	9"	3.5"	45"	3.25"	60.75"	5.06'
PIER 6 (45" BEAM)	9"	3.5"	45"	5.25"	62.75"	5.23'
PIER 6 (SLAB)	27"	3"		1"	31"	2.58'
PIER 7	27"	0.75"		0"	27.75"	2.31'
PIER 8 (SLAB)	27"	3"		1"	31"	2.58'
PIER 8 (45" BEAM)	9"	5"	45"	5.25"	64.25"	5.35'
PIER 9	9"	5"	45"	3.25"	62.25"	5.19'
PIER 10	9"	5"	45"	5.25"	64.25"	5.35'
PIER 11	9"	5"	45"	3.25"	62.25"	5.19'
PIER 12 (45" BEAM)	9"	2.25"	45"	5.25"	61.5"	5.13'
PIER 12 (63" BEAM)	9"	2.25"	63"	5.25"	79.5"	6.63'
PIER 13	9"	2.25"	63"	3.25"	77.5"	6.46'
PIER 14	9"	2.25"	63"	5.25"	79.5"	6.63'
PIER 15	9"	2.25"	63"	3.25"	77.5"	6.46'
PIER 16	9"	2.25"	63"	5.25"	79.5"	6.63'
PIER 17	9"	2.25"	63"	3.25"	77.5"	6.46'
PIER 18 (63" BEAM)	9"	2.25"	63"	5.25"	79.5"	6.63'
PIER 18 (82" BEAM)	9"	3.5"	82"	7.375"	101.88"	8.49'
PIER 19 (82" BEAM)	9"	3.5"	82"	3.25"	97.75"	8.15'
PIER 19 (63" BEAM)	9"	2.25"	63"	3.25"	77.5"	6.46'
PIER 20 (SOUTH SIDE)	9"	2.25"	63"	5.25"	79.5"	6.63'
PIER 20 (NORTH SIDE)	9"	2.25"	63"	6.5"	80.75"	6.73'
PIER 21	9"	2.25"	63"	3.25"	77.5"	6.46'
PIER 22	9"	2.25"	63"	3.25"	77.5"	6.46'
PIER 23	9"	2.25"	63"	6.5"	80.75"	6.73'
PIER 24	9"	6.5"	63"	3.25"	81.75"	6.81'
PIER 25 (63" BEAM)	9"	6.5"	63"	5.25"	83.75"	6.98'
PIER 25 (SLAB)	27"	3"		1"	31"	2.58'
PIER 26	27"	0.75"		0"	27.75"	2.31'
PIER 27	27"	3"		1"	31"	2.58'
PIER 28	27"	0.75"		0"	27.75"	2.31'
PIER 29	27"	0.75"		0"	27.75"	2.31'
N. ABUTMENT	27"	3"		1"	31"	2.58'

NOTE:

SEE INDIVIDUAL ABUTMENT AND PIER SHEETS FOR ACTUAL BRIDGE SEAT ELEVATIONS.

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AK/IGG | CHECKED BY: TR
DRAWN BY: TAW | DATE: 9/21/2015

AECOM

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

CIVIL WEST - VOLUME 4B
MINNETONKA/HOPKINS
BRIDGE R0686
BRIDGE LAYOUT 9

DISCIPLINE: STRUCTURES
SHEET NAME: CBRR0686-BRG-SUP-009

SHEET 19 OF 116

SOUTH ABUTMENT REQUIRED NOMINAL PILE BEARING RESISTANCE FOR CIP PILES R_n – TONS/PILE		
FIELD CONTROL METHOD	φ_{dyn}	$*\ R_n$
MN/DOT PILE FORMULA 2012 (MPF12) $R_n = 20\sqrt{\frac{W \times H}{1000}} \times LOG(\frac{10}{S})$	0.50	220
PDA	0.65	170

$*\ R_n$ = (FACTORED DESIGN LOAD) / φ_{dyn}

SOUTH ABUTMENT COMPUTED PILE LOAD – TONS/PILE	
FACTORED DEAD LOAD + EARTH PRESSURE	70.6
FACTORED LIVE LOAD	20.5
* FACTORED DESIGN LOAD	110

* BASED ON STRENGTH V LOAD COMBINATION

PILE NOTES

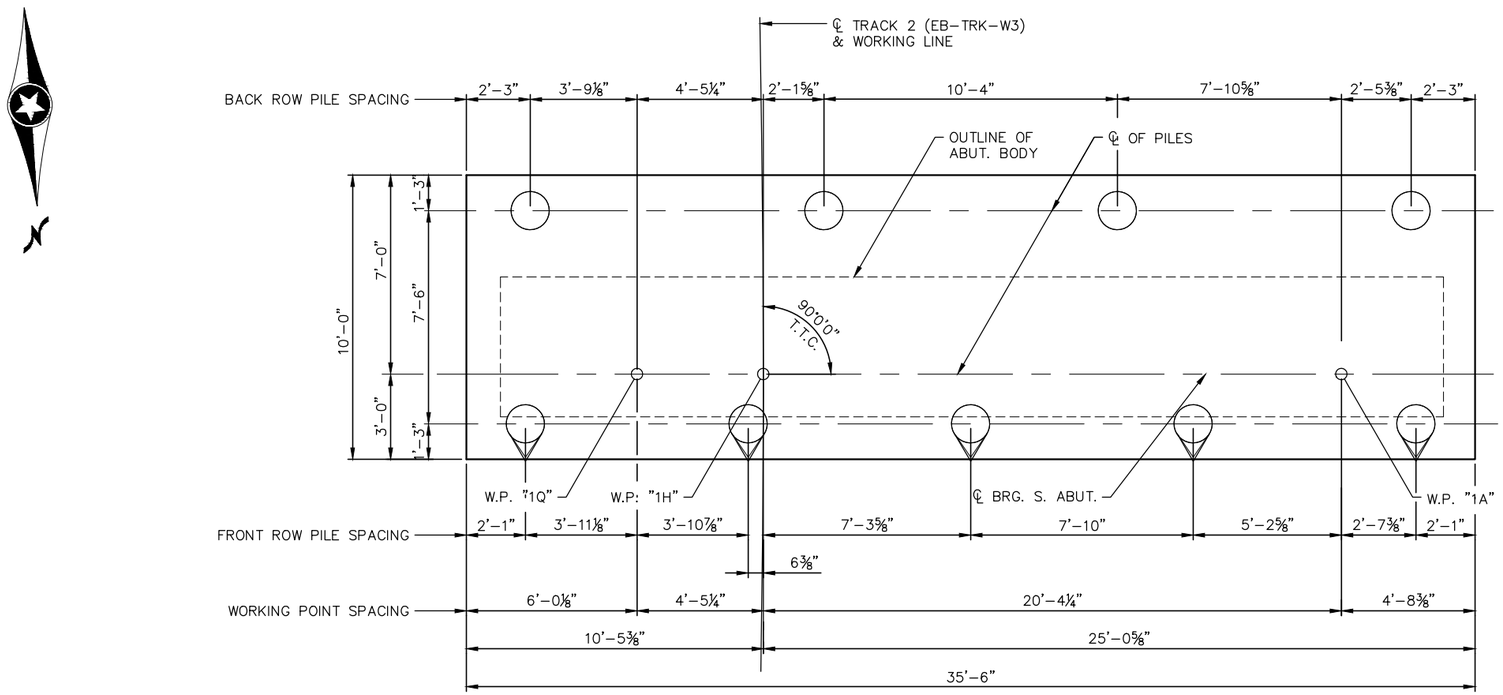
1 CAST–IN–PLACE CONC. TEST PILE 45 FT. LONG
8 CAST–IN–PLACE CONC. PILES EST. LENGTH XX FT.
9 CAST–IN–PLACE CONC. PILES REQ'D FOR SOUTH ABUT.

PILE SPACING SHOWN IS AT BOTTOM OF FOOTING.

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

PILES TO HAVE A NOMINAL DIAMETER OF 16"

FOR PILE SPLICE DETAILS SEE DETAIL B201.



FOOTING PLAN

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AK/IGG | CHECKED BY: TR
DRAWN BY: TAW | DATE: 9/21/2015

AECOM

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

CIVIL WEST - VOLUME 4B
MINNETONKA/HOPKINS
BRIDGE R0686
SOUTH ABUTMENT FOOTING DETAILS

DISCIPLINE: STRUCTURES
SHEET NAME: CBRR0686-BRG-ABT-001

SHEET 20 OF 116

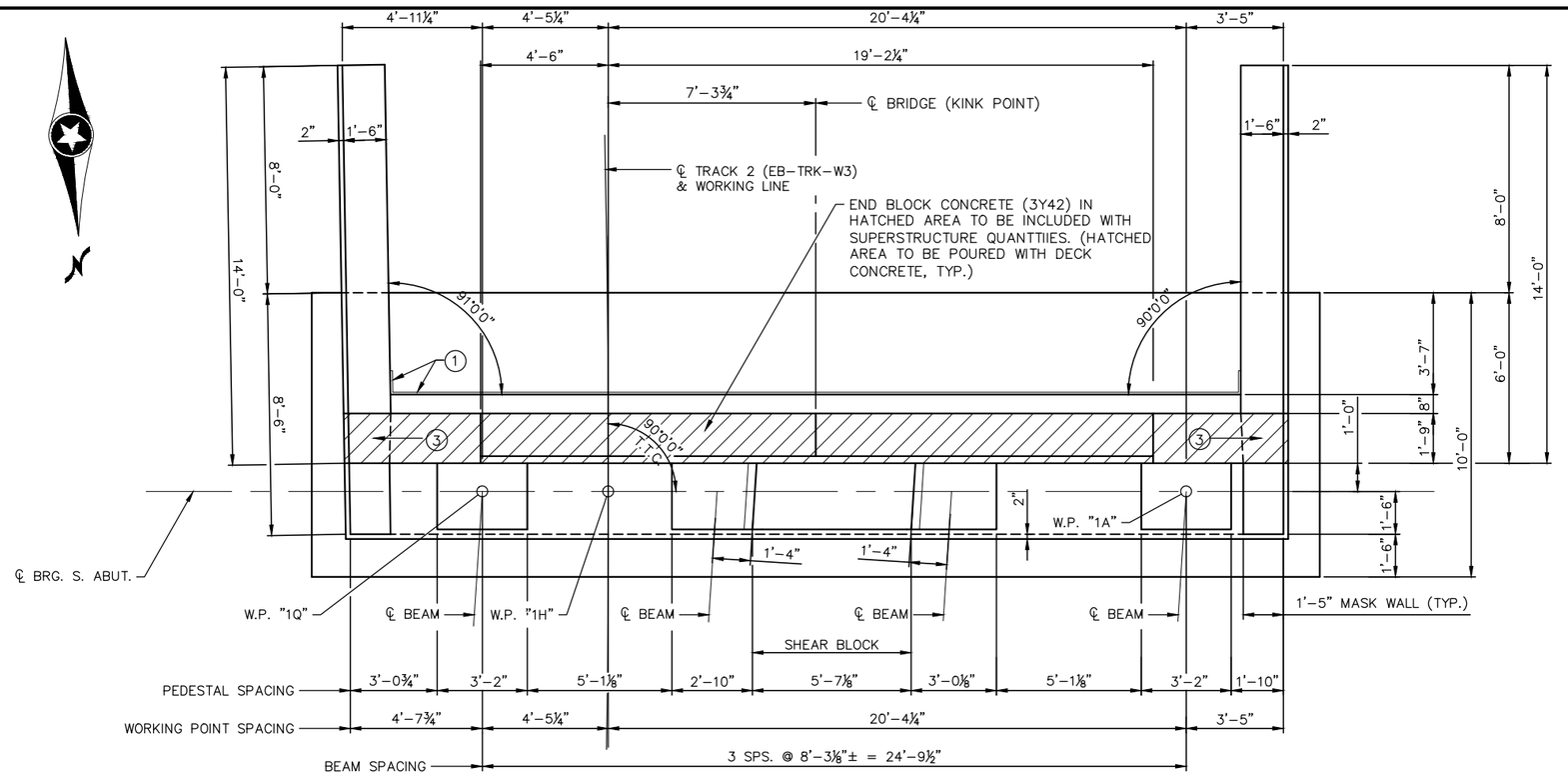
Sep, 21 2015 08:16 am V:\3400_ADC\CAD\SEGMENT W3\PLAN SHEETS\STRUCTURES\CBRR0686\60_percent_Preliminary Plans-Dwg files\CBRR0686-BRG-ABUT-001.dwg By: wyttenbacht

NOTES:

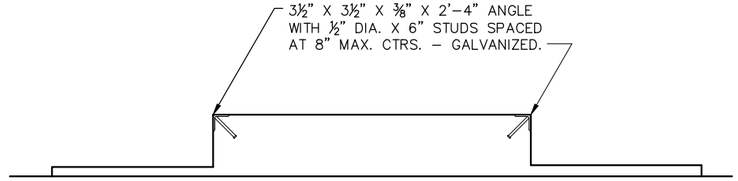
1. MEMBRANE WATERPROOFING SYSTEM PER MN/DOT 2184.3B TO BE INCLUDED IN PRICE BID FOR OTHER ITEMS. (SEAL ALL HORIZONTAL & VERTICAL JOINTS ON THE BACK FACE).
3. THERE SHALL BE A 72 HOUR MINIMUM DELAY BETWEEN CONCRETE POURS OF ADJACENT ABUTMENT SECTIONS THAT HAVE VERTICAL CONSTRUCTION JOINTS.
4. ELEVATIONS & DIMENSIONS ARE GIVEN AT THE FRONT FACE OF ABUTMENT BACKWALL.

   FOR WINGWALL DETAILS, SEE SHEETS ABUT–003 & ABUT–004.

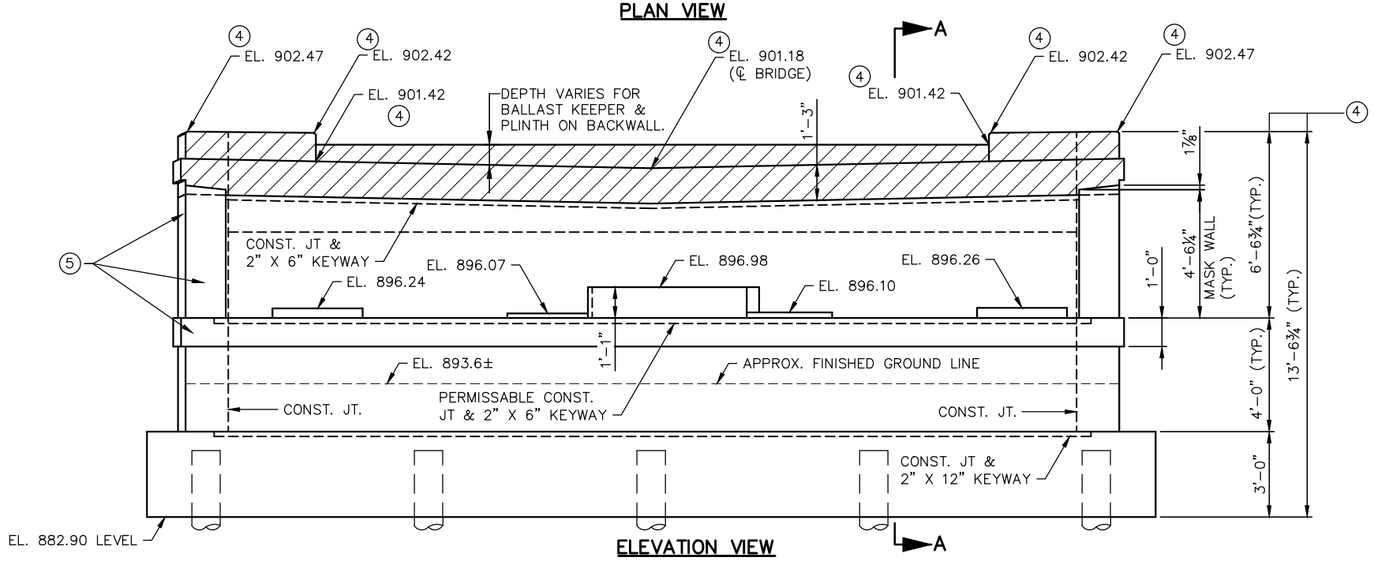
   FOR SECTION A–A, SEE SHEET ABUT–005.
5. SPECIAL SURFACE FINISH SHALL BE APPLIED TO THE ABUTMENT BODY AND WINGS. COLOR SHALL BE FEDERAL STANDARD COLOR XXXX, COLOR XXXXX. SEE SPEC. SB 2401.



PLAN VIEW



SHEAR BLOCK DETAIL



ELEVATION VIEW

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AK/IGG | CHECKED BY: TR
DRAWN BY: TAW | DATE: 9/21/2015

AECOM

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

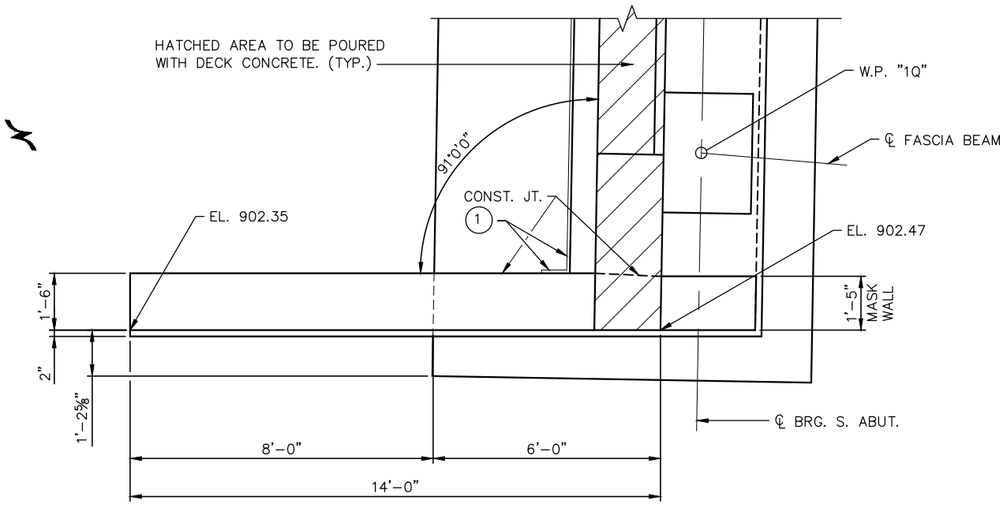
SOUTHWEST Green Line LRT Extension

CIVIL WEST - VOLUME 4B
MINNETONKA/HOPKINS
BRIDGE R0686
SOUTH ABUTMENT DETAILS 1

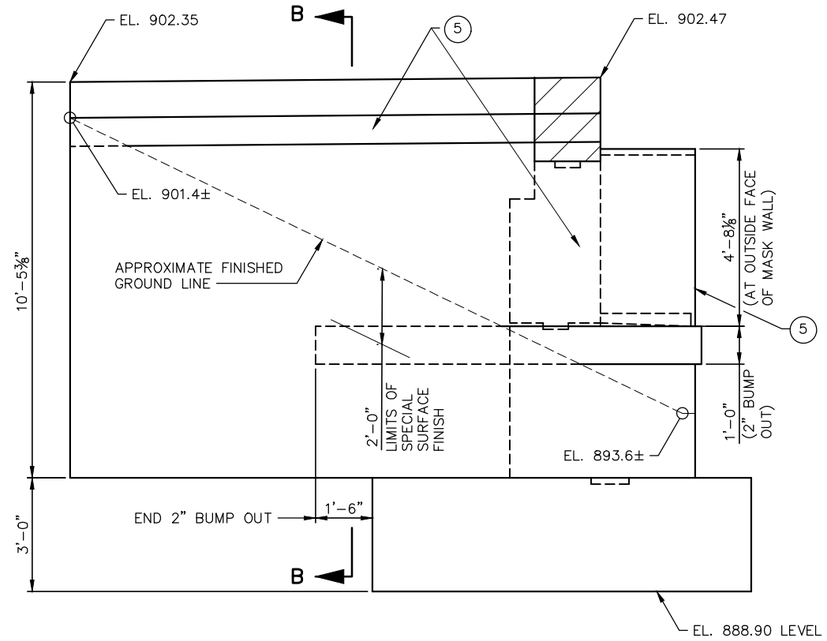
DISCIPLINE: STRUCTURES
SHEET NAME: CBRR0686-BRG-ABT-002

SHEET 21 OF 116

Sep. 21 2015 08:16 am V:\3400_ADC\CAD\SEGMENT W3\PLAN SHEETS\STRUCTURES\CBRR0686\60_percent_Preliminary Plans-Dwg files\CBRR0686-BRG-ABUT-002.dwg By: wyttenbacht



SOUTH EAST WINGWALL PLAN



SOUTH EAST WINGWALL ELEVATION

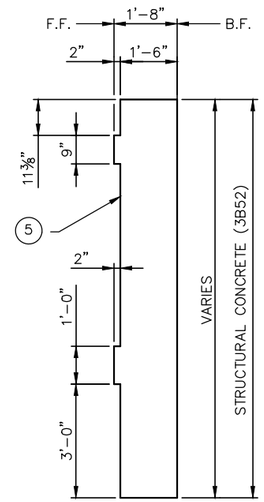
NOTES:

1. MEMBRANE WATERPROOFING SYSTEM PER MN/DOT 2184.3B TO BE INCLUDED IN PRICE BID FOR OTHER ITEMS. (SEAL ALL HORIZONTAL & VERTICAL JOINTS ON THE BACK FACE).

   F..F. DENOTES FRONT FACE.

   B..F. DENOTES BACK FACE.

5. SPECIAL SURFACE FINISH SHALL BE APPLIED TO THE ABUTMENT BODY AND WINGS. COLOR SHALL BE FEDERAL STANDARD COLOR XXXX, COLOR XXXXX. SEE SPEC. SB 2401.



SECTION B–B

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AK/IGG | CHECKED BY: TR
DRAWN BY: TAW | DATE: 9/21/2015

AECOM

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

CIVIL WEST - VOLUME 4B
MINNETONKA/HOPKINS
BRIDGE R0686
SOUTH ABUTMENT DETAILS 2

DISCIPLINE: STRUCTURES
SHEET NAME: CBRR0686-BRG-ABT-003

SHEET 22 OF 116

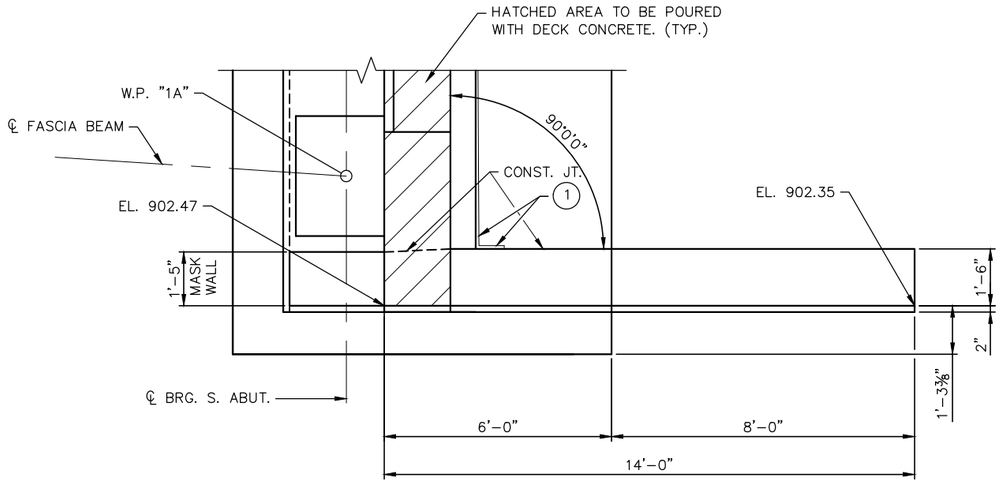
NOTES:

(1) MEMBRANE WATERPROOFING SYSTEM PER MN/DOT 2184.3B TO BE INCLUDED IN PRICE BID FOR OTHER ITEMS. (SEAL ALL HORIZONTAL & VERTICAL JOINTS ON THE BACK FACE).

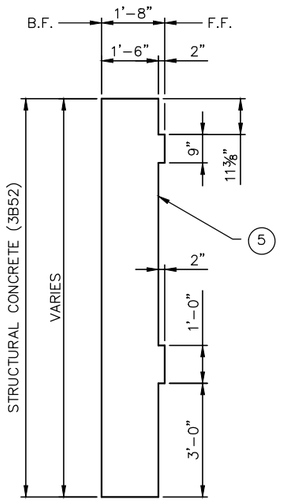
F.F. DENOTES FRONT FACE.

B.F. DENOTES BACK FACE.

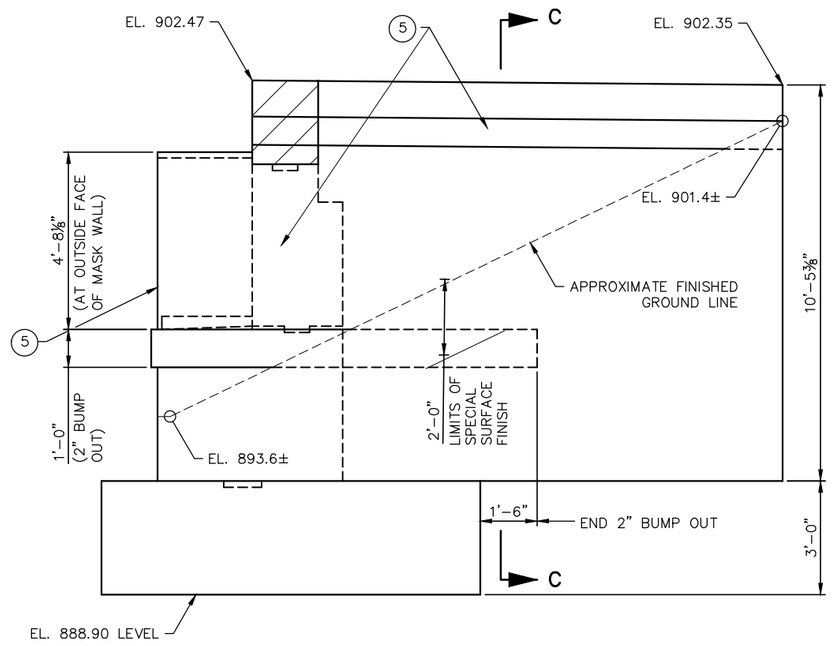
(5) SPECIAL SURFACE FINISH SHALL BE APPLIED TO THE ABUTMENT BODY AND WINGS. COLOR SHALL BE FEDERAL STANDARD COLOR XXXX, COLOR XXXXX. SEE SPEC. SB 2401.



SOUTH WEST WINGWALL PLAN



SECTION C–C



SOUTH WEST WINGWALL ELEVATION

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AK/IGG | CHECKED BY: TR
DRAWN BY: TAW | DATE: 9/21/2015

AECOM

60% SUBMISSION - 09/28/15

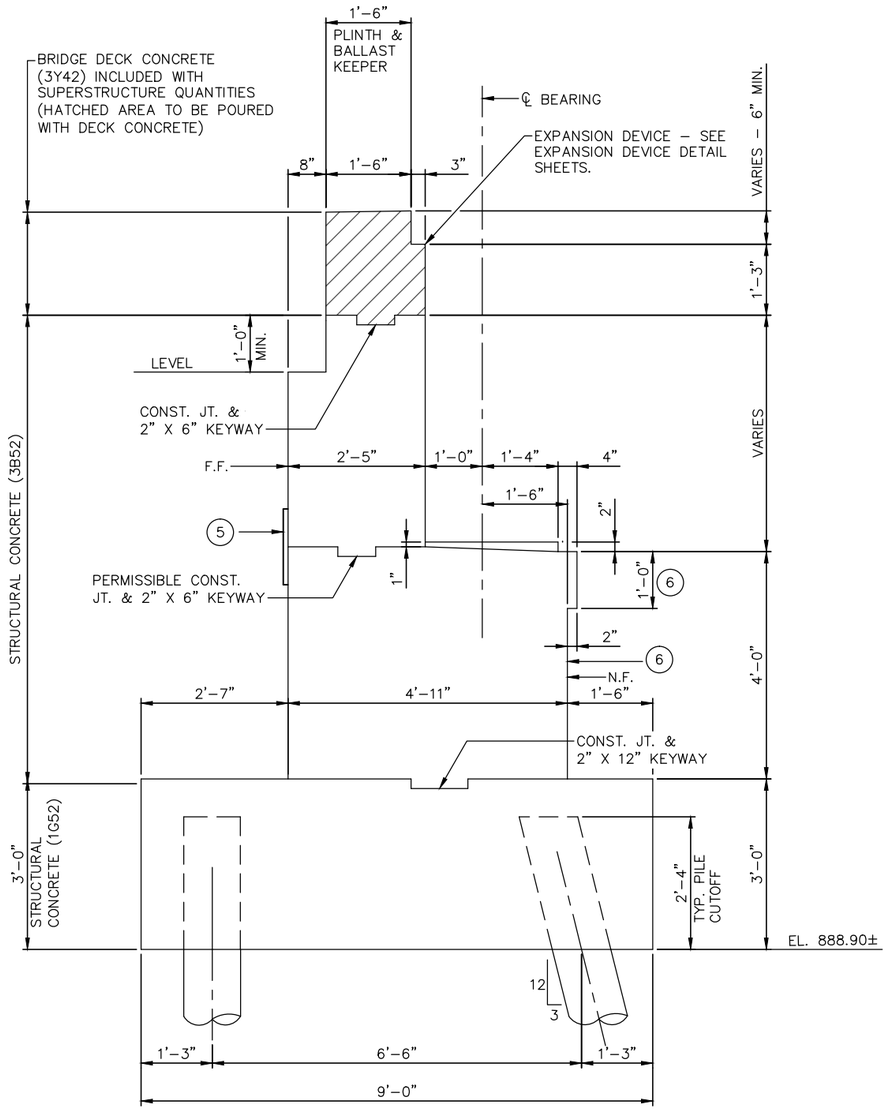
METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

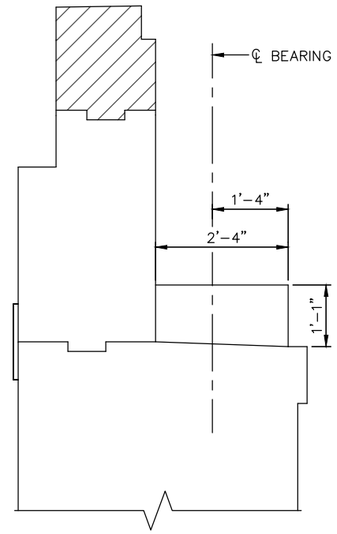
CIVIL WEST - VOLUME 4B
MINNETONKA/HOPKINS
BRIDGE R0686
SOUTH ABUTMENT DETAILS 3

DISCIPLINE: STRUCTURES
SHEET NAME: CBRR0686-BRG-ABT-004

SHEET 23 OF 116



SECTION A–A



SECTION AT SHEAR BLOCK

NOTES:

(5) MEMBRANE WATERPROOFING SYSTEM PER MN/DOT 2481.3B, EXCEPT THE STRIP SHALL BE 24" WIDE TO ALLOW MOVEMENT.

(6) SPECIAL SURFACE FINISH SHALL BE APPLIED TO THE ABUTMENT BODY AND WINGS. COLOR SHALL BE FEDERAL STANDARD COLOR XXXX, COLOR XXXXX. SEE SPEC. SB 2401.

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AK/IGG | CHECKED BY: TR
DRAWN BY: TAW | DATE: 9/21/2015

AECOM

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

CIVIL WEST - VOLUME 4B
MINNETONKA/HOPKINS
BRIDGE R0686
SOUTH ABUTMENT DETAILS 4

DISCIPLINE: STRUCTURES
SHEET NAME: CBRR0686-BRG-ABT-005

SHEET 24 OF 116

NORTH ABUTMENT
REQUIRED NOMINAL PILE BEARING RESISTANCE FOR CIP PILES R_n – TONS/PILE

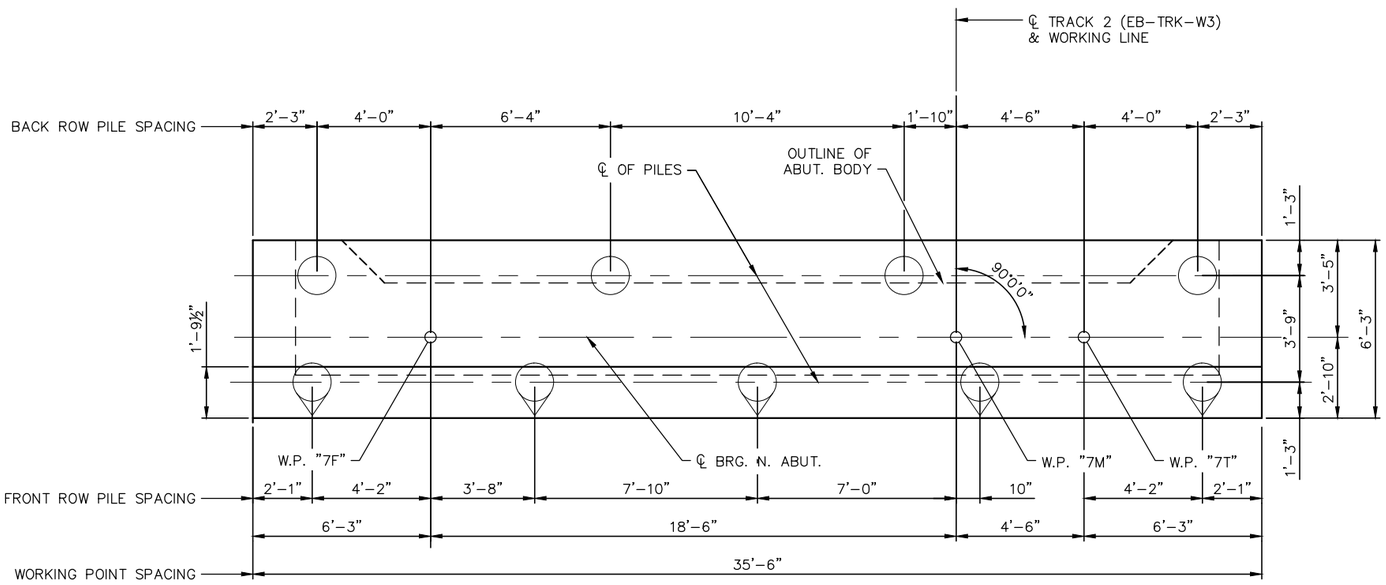
FIELD CONTROL METHOD	φ_{dyn}	$*\ R_n$
MN/DOT PILE FORMULA 2012 (MPF12) $R_n = 20\sqrt{\frac{W \times H}{1000}} \times \log(\frac{10}{S})$	0.50	220
PDA	0.65	170

$*\ R_n$ = (FACTORED DESIGN LOAD) / φ_{dyn}

NORTH ABUTMENT
COMPUTED PILE LOAD – TONS/PILE

FACTORED DEAD LOAD + EARTH PRESSURE	55.4
FACTORED LIVE LOAD	10.9
* FACTORED DESIGN LOAD	110

* BASED ON STRENGTH V LOAD COMBINATION



FOOTING PLAN

PILE NOTES

1 CAST–IN–PLACE CONC. TEST PILE 55 FT. LONG
8 CAST–IN–PLACE CONC. PILES EST. LENGTH XX FT.
9 CAST–IN–PLACE CONC. PILES REQ'D FOR NORTH ABUT.

PILE SPACING SHOWN IS AT BOTTOM OF FOOTING.

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

PILES TO HAVE A NOMINAL DIAMETER OF 16"

FOR PILE SPLICE DETAILS SEE DETAIL B201.

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AK/IGG | CHECKED BY: TR
DRAWN BY: TAW | DATE: 9/21/2015

AECOM

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

CIVIL WEST - VOLUME 4B
MINNETONKA/HOPKINS
BRIDGE R0686
NORTH ABUTMENT FOOTING DETAILS

DISCIPLINE: STRUCTURES
SHEET NAME: CBRR0686-BRG-ABT-012

SHEET 25 OF 116

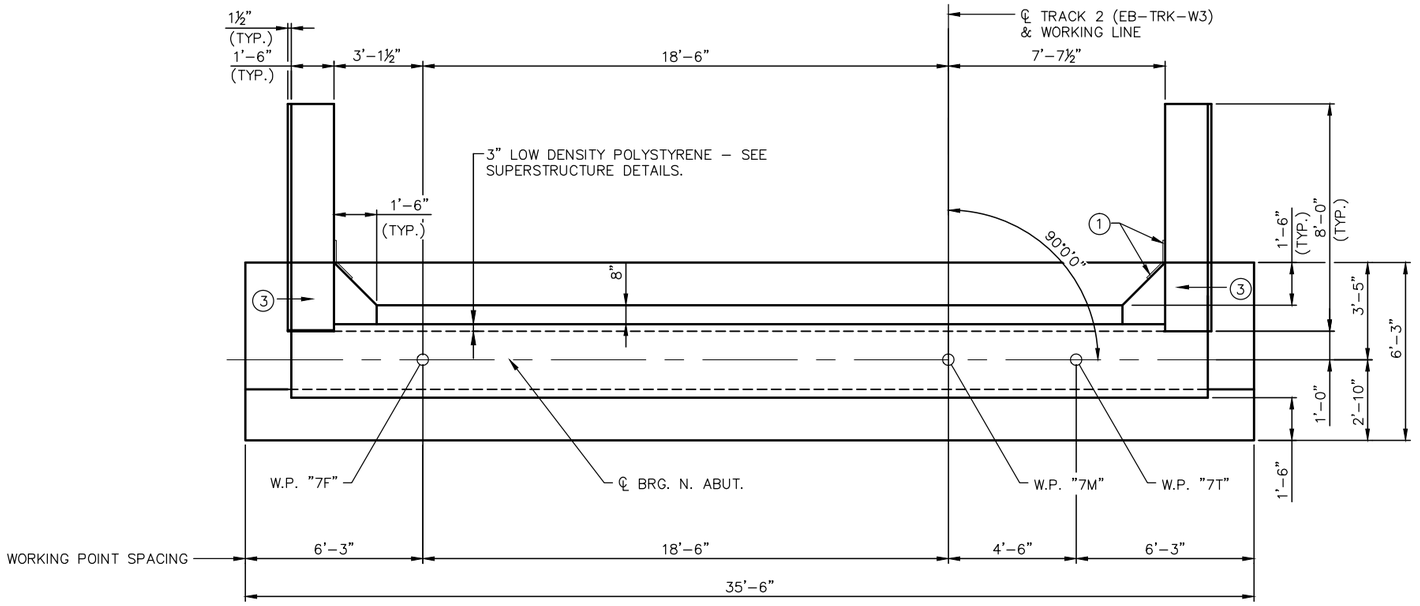
Sep, 21 2015 08:17 am V:\3400_ADC\CAD\SEGMENT W3\PLAN SHEETS\STRUCTURES\CBRR0686\60_percent_Preliminary Plans-Dwg files\CBRR0686-BRG-ABUT-012.dwg By: wyttenbacht

NOTES:

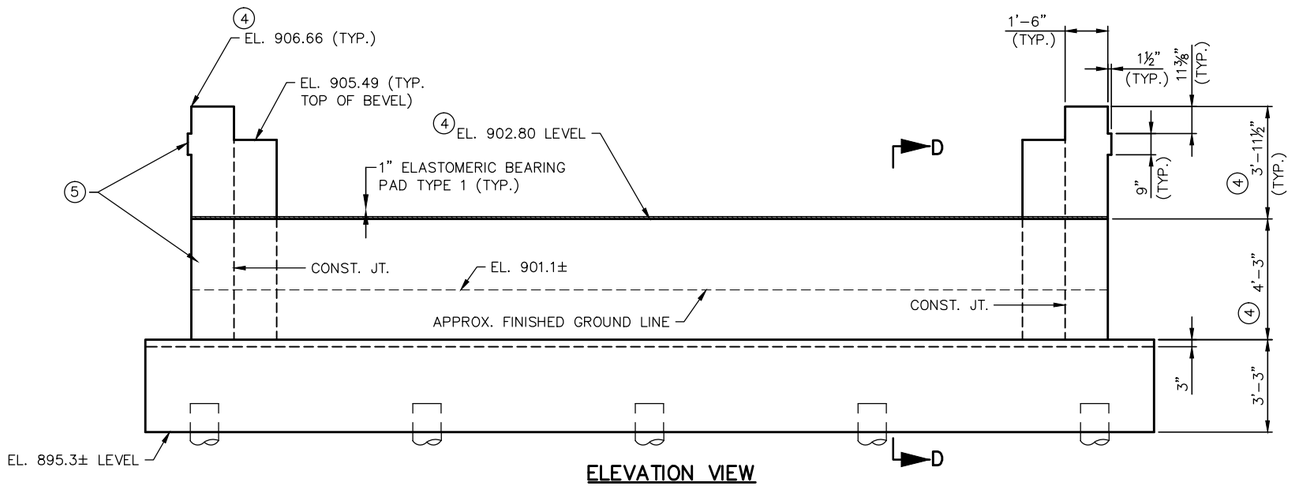
1. (1) MEMBRANE WATERPROOFING SYSTEM PER MN/DOT 2184.3B TO BE INCLUDED IN PRICE BID FOR OTHER ITEMS. (SEAL ALL HORIZONTAL & VERTICAL JOINTS ON THE BACK FACE).
2. (3) THERE SHALL BE A 72 HOUR MINIMUM DELAY BETWEEN CONCRETE POURS OF ADJACENT ABUTMENT SECTIONS THAT HAVE VERTICAL CONSTRUCTION JOINTS.
3. (4) ELEVATIONS & DIMENSIONS ARE GIVEN AT THE ℄ BEARING.

   FOR WINGWALL DETAILS, SEE SHEET ABUT–014.

   FOR SECTION D–D, SEE SHEET ABUT–015.
4. (5) SPECIAL SURFACE FINISH SHALL BE APPLIED TO THE ABUTMENT BODY AND WINGS. COLOR SHALL BE FEDERAL STANDARD COLOR XXXX, COLOR XXXXX. SEE SPEC. SB 2401.



PLAN VIEW



ELEVATION VIEW

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AK/IGG | CHECKED BY: TR
DRAWN BY: TAW | DATE: 9/21/2015

AECOM

60% SUBMISSION - 09/28/15

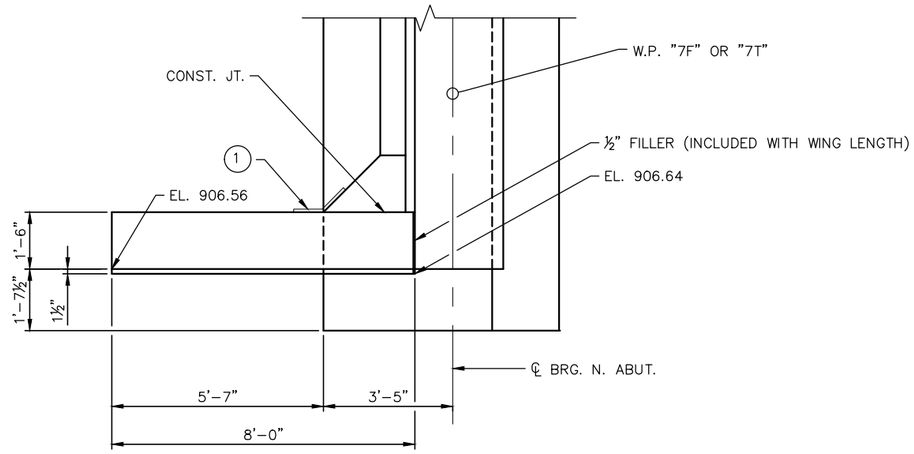
METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

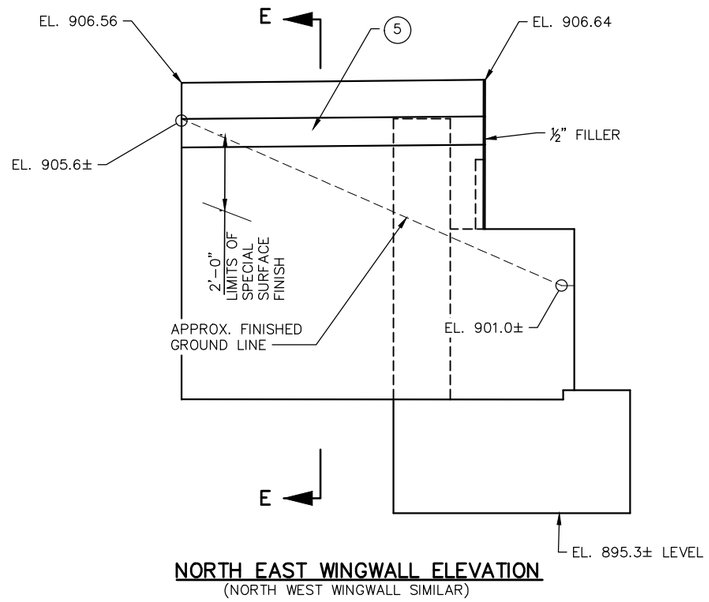
CIVIL WEST - VOLUME 4B
MINNETONKA/HOPKINS
BRIDGE R0686
NORTH ABUTMENT DETAILS 1

DISCIPLINE: STRUCTURES
SHEET NAME: CBRR0686-BRG-ABT-013

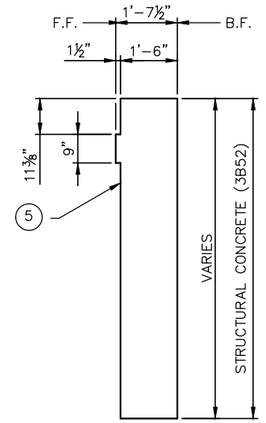
SHEET 26 OF 116



NORTH EAST WINGWALL PLAN
(NORTH WEST WINGWALL SIMILAR)



NORTH EAST WINGWALL ELEVATION
(NORTH WEST WINGWALL SIMILAR)



SECTION E–E

NOTES:

1. MEMBRANE WATERPROOFING SYSTEM PER MN/DOT 2184.3B TO BE INCLUDED IN PRICE BID FOR OTHER ITEMS. (SEAL ALL HORIZONTAL & VERTICAL JOINTS ON THE BACK FACE).

   F.F. DENOTES FRONT FACE.

   B.F. DENOTES BACK FACE.

5. SPECIAL SURFACE FINISH SHALL BE APPLIED TO THE ABUTMENT BODY AND WINGS. COLOR SHALL BE FEDERAL STANDARD COLOR XXXX, COLOR XXXXX. SEE SPEC. SB 2401.

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AK/IGG | CHECKED BY: TR
DRAWN BY: TAW | DATE: 9/21/2015

AECOM

60% SUBMISSION - 09/28/15

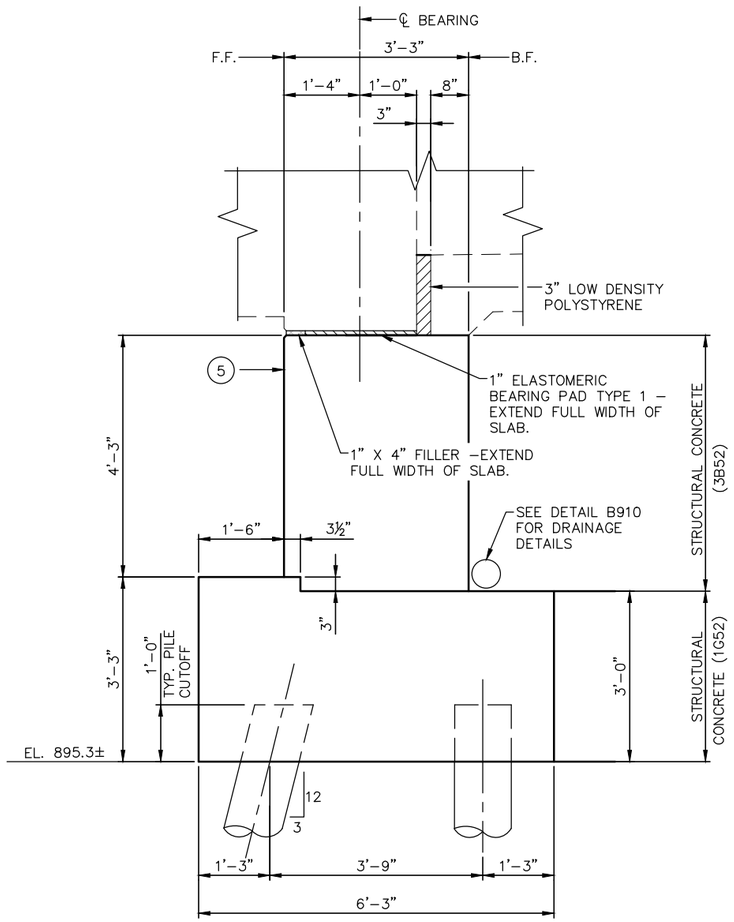
METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

CIVIL WEST - VOLUME 4B
MINNETONKA/HOPKINS
BRIDGE R0686
NORTH ABUTMENT DETAILS 2

DISCIPLINE: STRUCTURES
SHEET NAME: CBRR0686-BRG-ABT-014

SHEET 27 OF 116



SECTION A-A

NOTES:

(5) SPECIAL SURFACE FINISH SHALL BE APPLIED TO THE ABUTMENT BODY AND WINGS. COLOR SHALL BE FEDERAL STANDARD COLOR XXXX, COLOR XXXXX. SEE SPEC. SB 2401.

F.F. DENOTES FRONT FACE

B.F. DENOTES BACK FACE

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AK/IGG | CHECKED BY: TR
DRAWN BY: TAW | DATE: 9/21/2015

AECOM

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

CIVIL WEST - VOLUME 4B
MINNETONKA/HOPKINS
BRIDGE R0686
NORTH ABUTMENT DETAILS 3

DISCIPLINE: STRUCTURES
SHEET NAME: CBRR0686-BRG-ABT-015

SHEET 28 OF 116

WORKING POINTS TABLE

	WORKING POINT ①	WORKING POINT ②	WORKING POINT ③
PIER 1	"1B"	"1J"	"1R"
PIER 2	"1C"	"1K"	"1S"
PIER 3	"1D"	"1L"	"1T"
PIER 4	"1E"	"1M"	"1U"
PIER 5	"1F"	"1N"	"1V"
PIER 9	"3B"	"3G"	"3M"

NOTES:

④ SPECIAL SURFACE FINISH SHALL BE APPLIED TO THE PIER CAP AND PILES. COLOR SHALL BE FEDERAL STANDARD COLOR XXXX, COLOR XXXXX. SEE SPEC. SB 2401.

⑤ SEE TOP OF PEDESTAL ELEVATION TABLE ON THIS SHEET. ELEVATIONS GIVE AT ℄ BEARING.

⑥ ELEVATION WAS DETERMINED AT ℄ BEARING ON THE LOW SIDE OF THE PROFILE GRADE LINE.

PIERS 1–5 & 9 REQUIRED NOMINAL PILE BEARING RESISTANCE FOR CIP PILES R_n – TONS/PILE

FIELD CONTROL METHOD	φ_{dyn}	$* R_n$
MN/DOT PILE FORMULA 2012 (MPF12) $R_n = 20\sqrt{\frac{W \times H}{1000}} \times LOG(\frac{10}{S})$	0.50	320
PDA	0.65	246

$* R_n$ = (FACTORED DESIGN LOAD) / φ_{dyn}

PIERS 1–5 & 9 COMPUTED PILE LOAD – TONS/PILE

FACTORED DEAD LOAD + EARTH PRESSURE	88.5
FACTORED LIVE LOAD	22.3
* FACTORED DESIGN LOAD	160

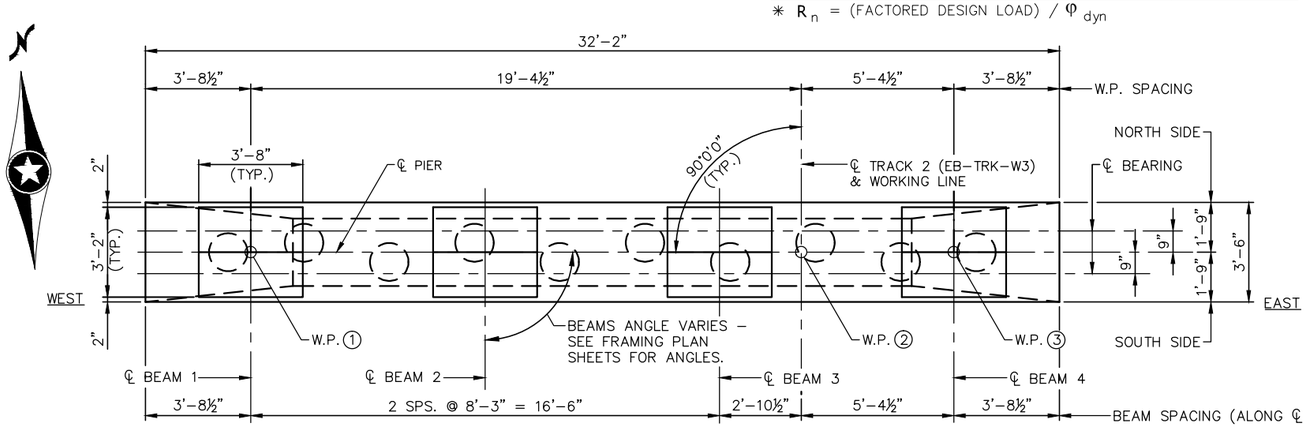
* BASED ON STRENGTH V LOAD COMBINATION

PILE NOTES

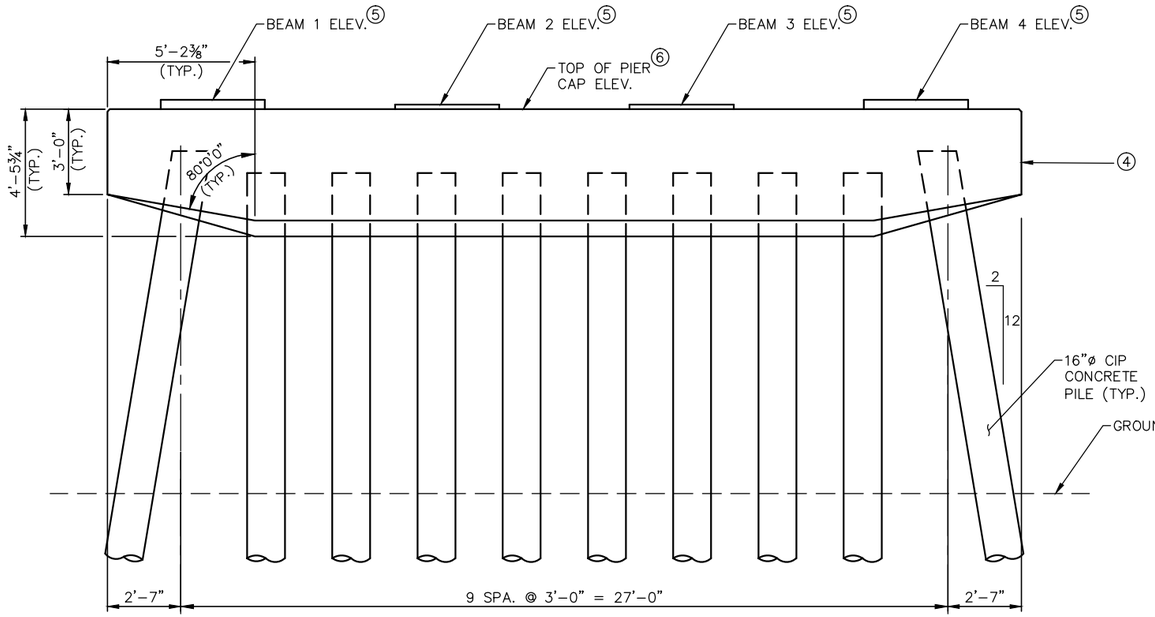
1 CAST–IN–PLACE CONC. TEST PILE XX FT. LONG
9 CAST–IN–PLACE CONC. PILES EST. LENGTH X FT.
10 CAST–IN–PLACE CONC. PILES REQ'D FOR EACH PIER

PILES TO HAVE A NOMINAL DIAMETER OF 16"

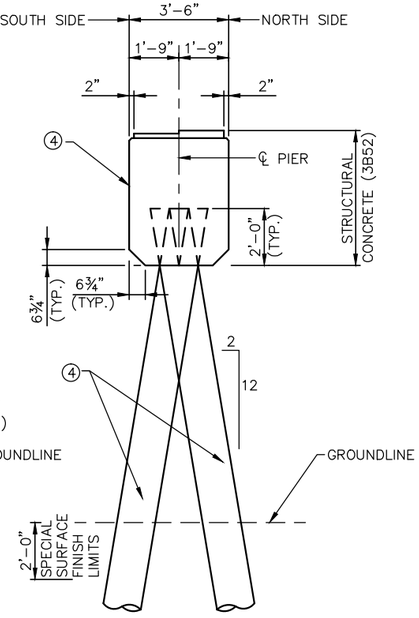
FOR PILE SPLICE DETAILS SEE DETAIL B201.



PLAN VIEW



ELEVATION VIEW



SECTION THRU INTERIOR PILES

TOP OF PEDESTAL ELEVATION TABLE ⑥

	ELEVATION – BEAM 1	ELEVATION – BEAM 2	ELEVATION – BEAM 3	ELEVATION – BEAM 4	ELEVATION – TOP OF CAP
PIER 1 – SOUTH SIDE	897.29	897.12	897.12	897.29	896.95
PIER 1 – NORTH SIDE	897.30	897.13	897.13	897.30	
PIER 2 – SOUTH SIDE	898.03	897.87	897.87	898.03	897.70
PIER 2 – NORTH SIDE	898.05	897.88	897.88	898.05	
PIER 3 – SOUTH SIDE	899.12	898.95	898.95	899.12	898.78
PIER 3 – NORTH SIDE	899.13	898.97	898.97	899.13	
PIER 4 – SOUTH SIDE	899.87	899.70	899.70	899.87	899.53
PIER 4 – NORTH SIDE	899.88	899.71	899.71	899.88	
PIER 5 – SOUTH SIDE	900.95	900.78	900.78	900.95	900.61
PIER 5 – NORTH SIDE	900.96	900.80	900.80	900.96	
PIER 9 – SOUTH SIDE	905.14	904.97	904.97	905.14	904.80
PIER 9 – NORTH SIDE	905.18	905.02	905.02	905.18	

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AK/IGG | CHECKED BY: TR
DRAWN BY: TAW | DATE: 9/21/2015

AECOM

60% SUBMISSION - 09/28/15

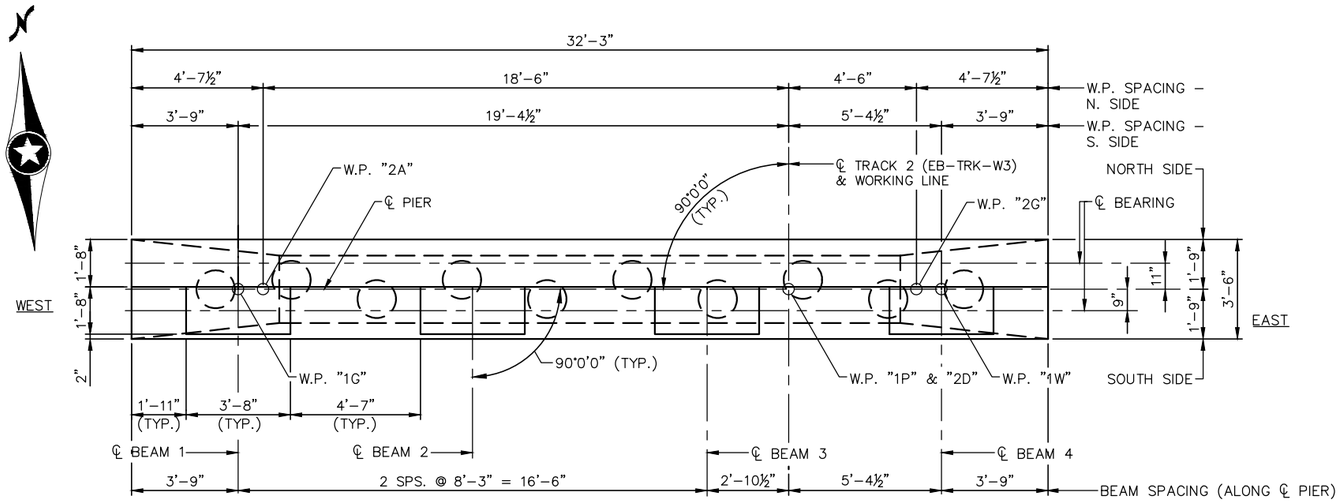
METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

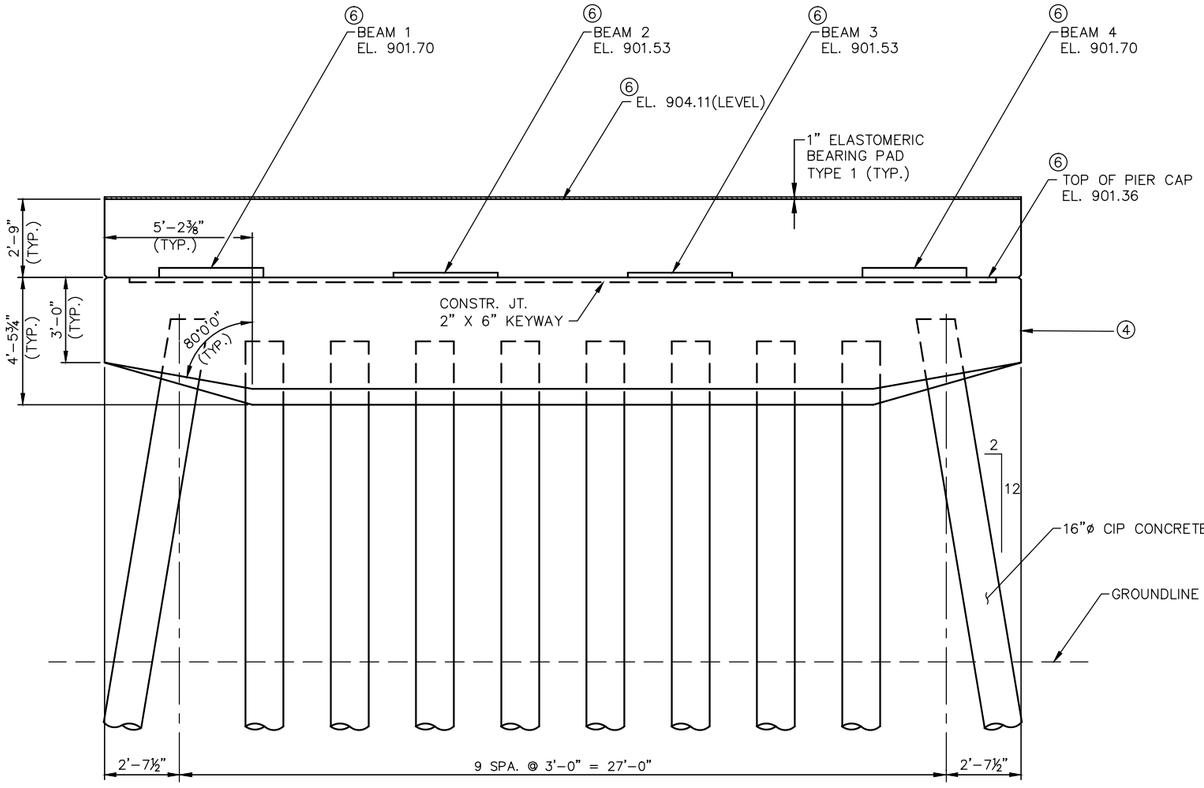
CIVIL WEST - VOLUME 4B
MINNETONKA/HOPKINS
BRIDGE R0686
PIER DETAILS - PIERS 1-5 & 9

DISCIPLINE: STRUCTURES
SHEET NAME: CBRR0686-BRG-PIR-001

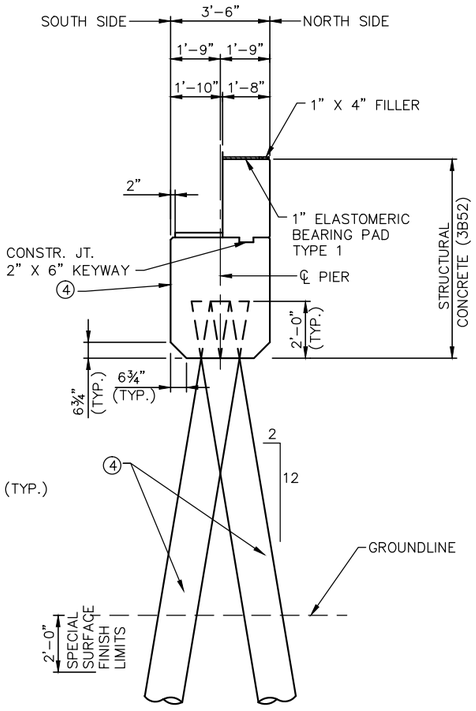
SHEET 29 OF 116



PLAN VIEW



ELEVATION VIEW



SECTION THRU INTERIOR PILES

PILE NOTES

1 CAST-IN-PLACE CONC. TEST PILE XX FT. LONG
9 CAST-IN-PLACE CONC. PILES EST. LENGTH X FT.
10 CAST-IN-PLACE CONC. PILES REQ'D FOR PIER 6

PILES TO HAVE A NOMINAL DIAMETER OF 16"

FOR PILE SPLICE DETAILS SEE DETAIL B201.

PIER 6 REQUIRED NOMINAL PILE BEARING RESISTANCE FOR CIP PILES R_n – TONS/PILE		
FIELD CONTROL METHOD	φ_{dyn}	* R_n
MN/DOT PILE FORMULA 2012 (MPF12) $R_n = 20\sqrt{\frac{W \times H}{1000}} \times \log(\frac{10}{S})$	0.50	
PDA	0.65	

* R_n = (FACTORED DESIGN LOAD) / φ_{dyn}

PIER 6 COMPUTED PILE LOAD – TONS/PILE	
FACTORED DEAD LOAD + EARTH PRESSURE	
FACTORED LIVE LOAD	
* FACTORED DESIGN LOAD	

* BASED ON STRENGTH V LOAD COMBINATION

NOTES:

④ SPECIAL SURFACE FINISH SHALL BE APPLIED TO THE PIER CAP AND PILES. COLOR SHALL BE FEDERAL STANDARD COLOR XXXX, COLOR XXXXX. SEE SPEC. SB 2401.

⑥ ELEVATIONS WERE DETERMINED AT ℄ BEARING AT TOP OF CONCRETE.

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AK/IGG | CHECKED BY: TR
DRAWN BY: TAW | DATE: 9/21/2015

AECOM

60% SUBMISSION - 09/28/15

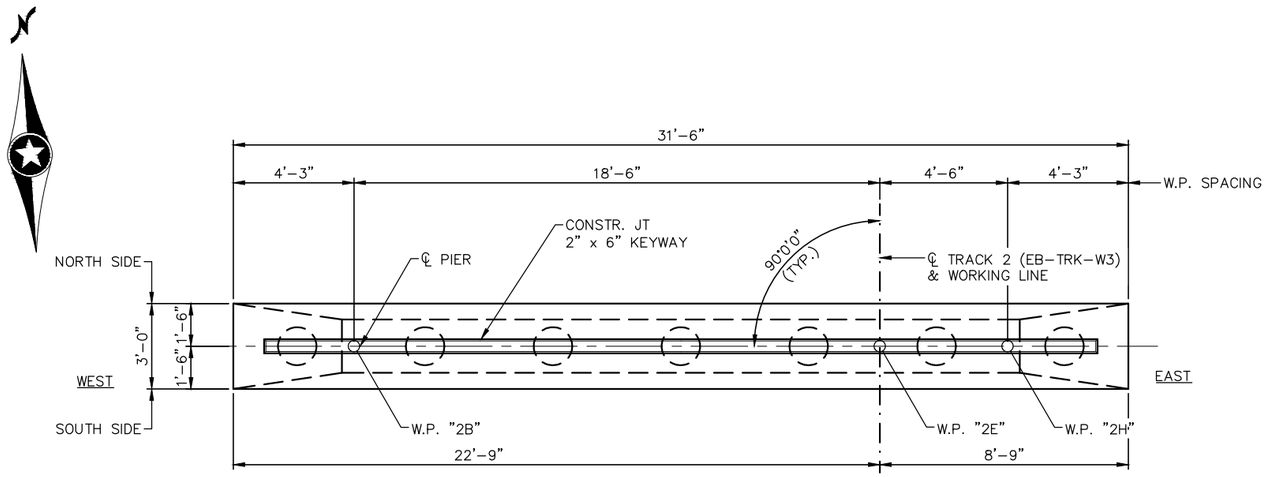
METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

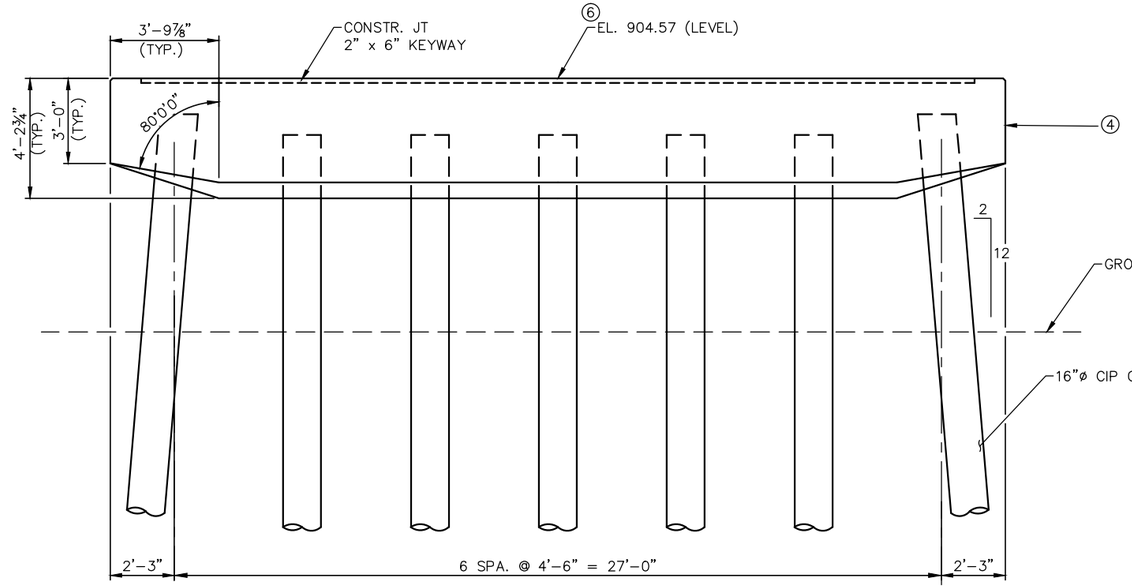
CIVIL WEST - VOLUME 4B
MINNETONKA/HOPKINS
BRIDGE R0686
PIER DETAILS - PIER 6

DISCIPLINE: STRUCTURES
SHEET NAME: CBRR0686-BRG-PIR-004

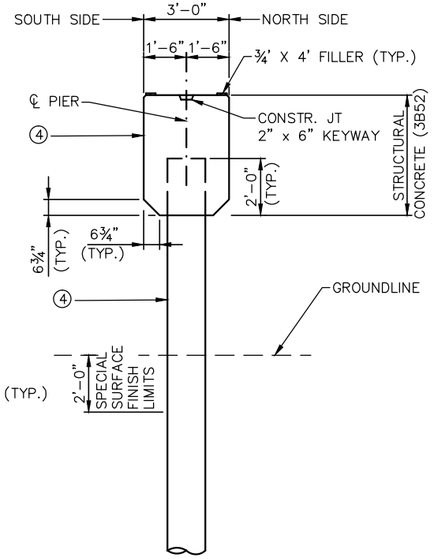
SHEET 30 OF 116



PLAN VIEW



ELEVATION VIEW



END VIEW

PILE NOTES

1 CAST-IN-PLACE CONC. TEST PILE XX FT. LONG
6 CAST-IN-PLACE CONC. PILES EST. LENGTH X FT.
7 CAST-IN-PLACE CONC. PILES REQ'D FOR PIER 7

PILES TO HAVE A NOMINAL DIAMETER OF 16"

FOR PILE SPLICE DETAILS SEE DETAIL B201.

PIER 7
REQUIRED NOMINAL PILE BEARING RESISTANCE FOR CIP PILES R_n – TONS/PILE

FIELD CONTROL METHOD	φ_{dyn}	$*\ R_n$
MN/DOT PILE FORMULA 2012 (MPF12) $R_n = 20\sqrt{\frac{W \times H}{1000}} \times LOG(\frac{10}{S})$	0.50	212
PDA	0.65	163

$*\ R_n$ = (FACTORED DESIGN LOAD) / φ_{dyn}

PIER 7
COMPUTED PILE LOAD – TONS/PILE

FACTORED DEAD LOAD + EARTH PRESSURE	82
FACTORED LIVE LOAD	20.9
* FACTORED DESIGN LOAD	106

* BASED ON STRENGTH V LOAD COMBINATION

NOTES:

④ SPECIAL SURFACE FINISH SHALL BE APPLIED TO THE PIER CAP AND PILES. COLOR SHALL BE FEDERAL STANDARD COLOR XXXX, COLOR XXXXX. SEE SPEC. SB 2401.

⑥ ELEVATIONS WERE DETERMINED AT ℄ OF PIER.

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AK/IGG | CHECKED BY: TR
DRAWN BY: TAW | DATE: 9/21/2015

AECOM

60% SUBMISSION - 09/28/15

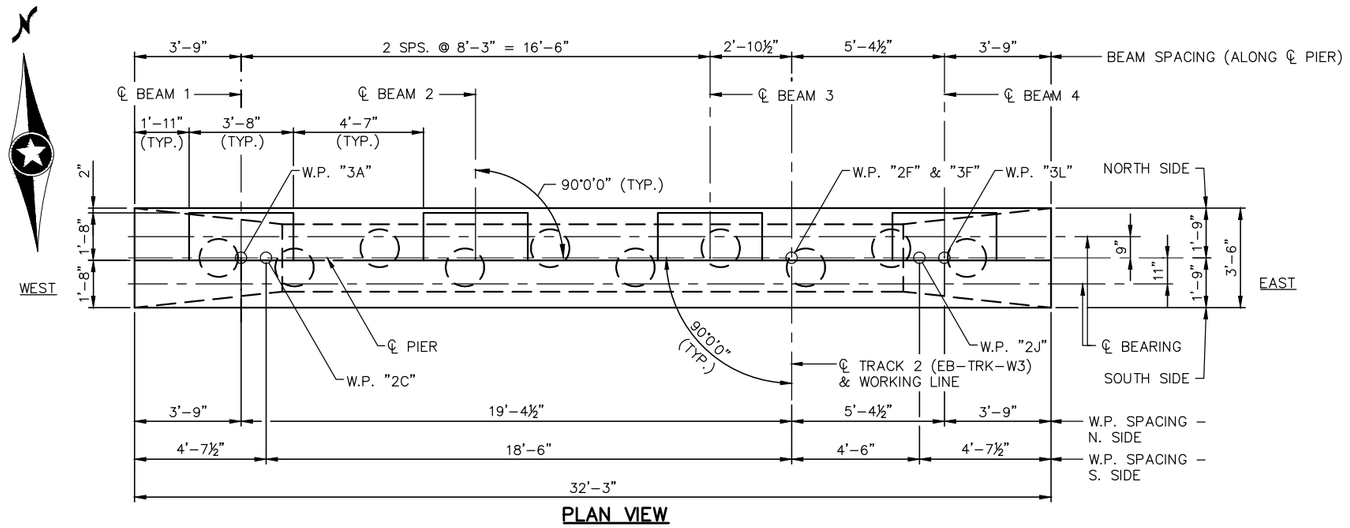
METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

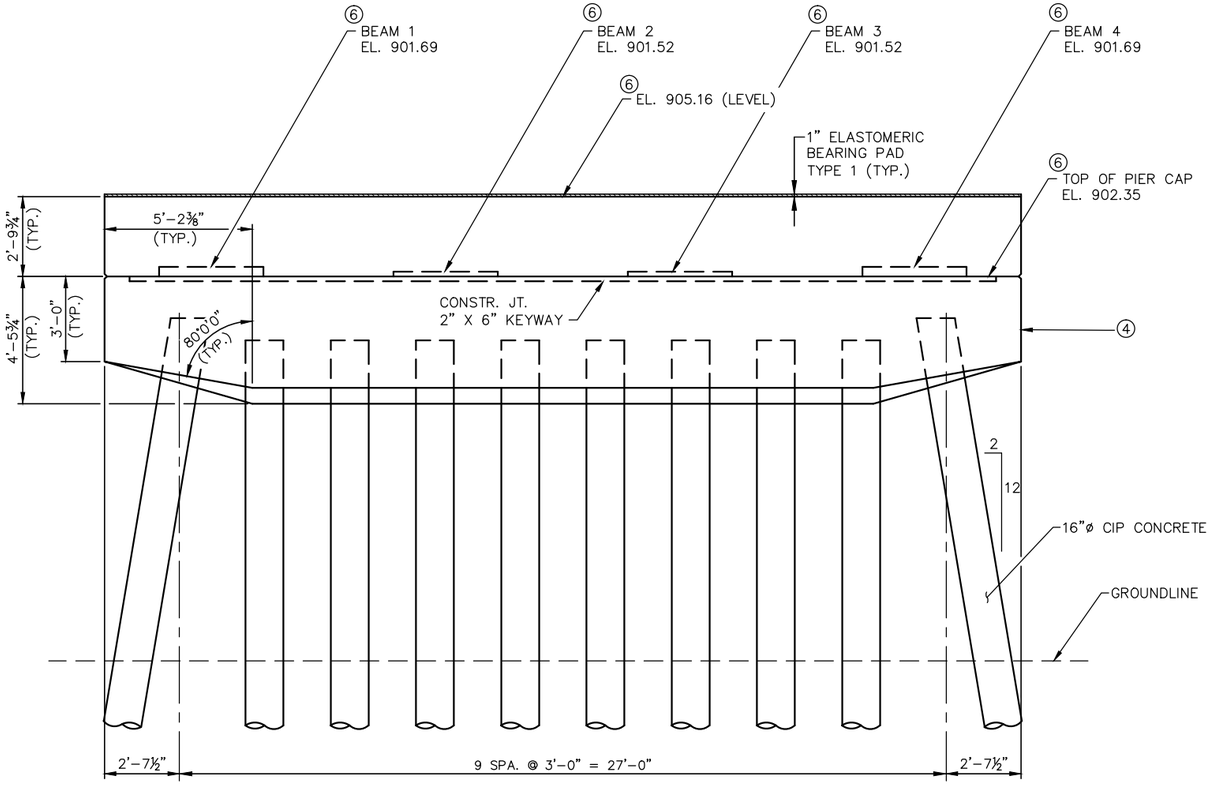
CIVIL WEST - VOLUME 4B
MINNETONKA/HOPKINS
BRIDGE R0686
PIER DETAILS - PIER 7

DISCIPLINE: STRUCTURES
SHEET NAME: CBRR0686-BRG-PIR-007

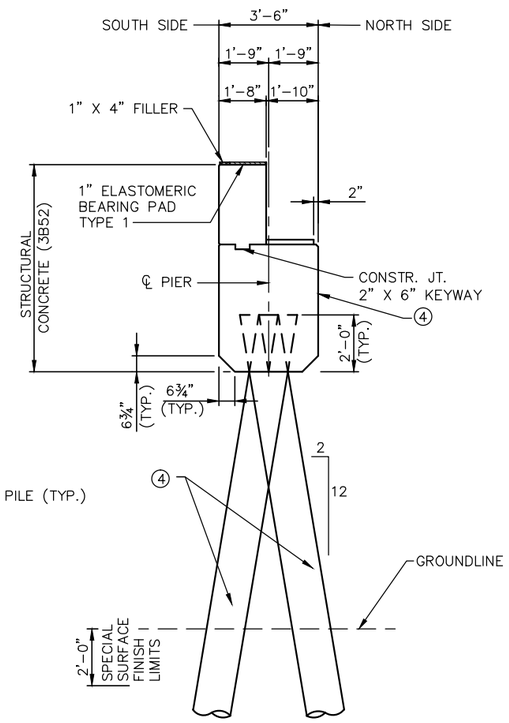
SHEET 31 OF 116



PLAN VIEW



ELEVATION VIEW



SECTION THRU INTERIOR PILES

PILE NOTES

1 CAST-IN-PLACE CONC. TEST PILE XX FT. LONG
9 CAST-IN-PLACE CONC. PILES EST. LENGTH X FT.
10 CAST-IN-PLACE CONC. PILES REQ'D FOR PIER 8

PILES TO HAVE A NOMINAL DIAMETER OF 16"

FOR PILE SPLICE DETAILS SEE DETAIL B201.

PIER 8 REQUIRED NOMINAL PILE BEARING RESISTANCE FOR CIP PILES R_n – TONS/PILE		
FIELD CONTROL METHOD	φ_{dyn}	* R_n
MN/DOT PILE FORMULA 2012 (MPF12) $R_n = 20\sqrt{\frac{W \times H}{1000}} \times \log(\frac{10}{S})$	0.50	
PDA	0.65	

* R_n = (FACTORED DESIGN LOAD) / φ_{dyn}

PIER 8 COMPUTED PILE LOAD – TONS/PILE	
FACTORED DEAD LOAD + EARTH PRESSURE	
FACTORED LIVE LOAD	
* FACTORED DESIGN LOAD	

* BASED ON STRENGTH V LOAD COMBINATION

NOTES:

④ SPECIAL SURFACE FINISH SHALL BE APPLIED TO THE PIER CAP AND PILES. COLOR SHALL BE FEDERAL STANDARD COLOR XXXX, COLOR XXXXX. SEE SPEC. SB 2401.

⑥ ELEVATIONS WERE DETERMINED AT ℄ BEARING AT THE TOP OF CONCRETE.

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AK/IGG | CHECKED BY: TR
DRAWN BY: TAW | DATE: 9/21/2015

AECOM

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

CIVIL WEST - VOLUME 4B
MINNETONKA/HOPKINS
BRIDGE R0686
PIER DETAILS - PIER 8

DISCIPLINE: STRUCTURES
SHEET NAME: CBRR0686-BRG-PIR-010

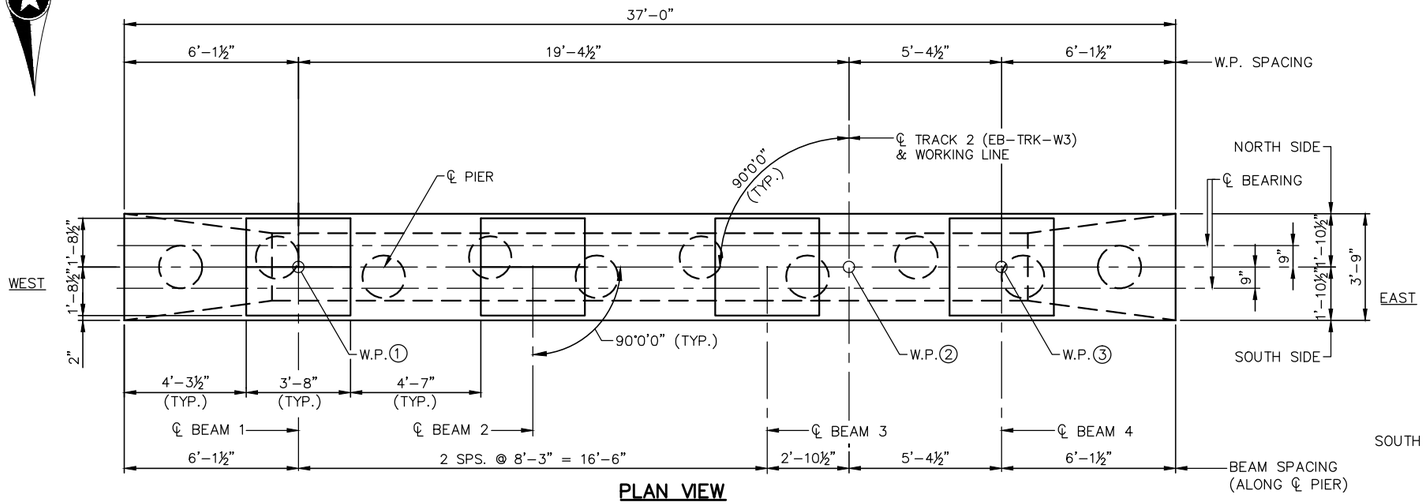
SHEET 32 OF 116

WORKING POINTS TABLE

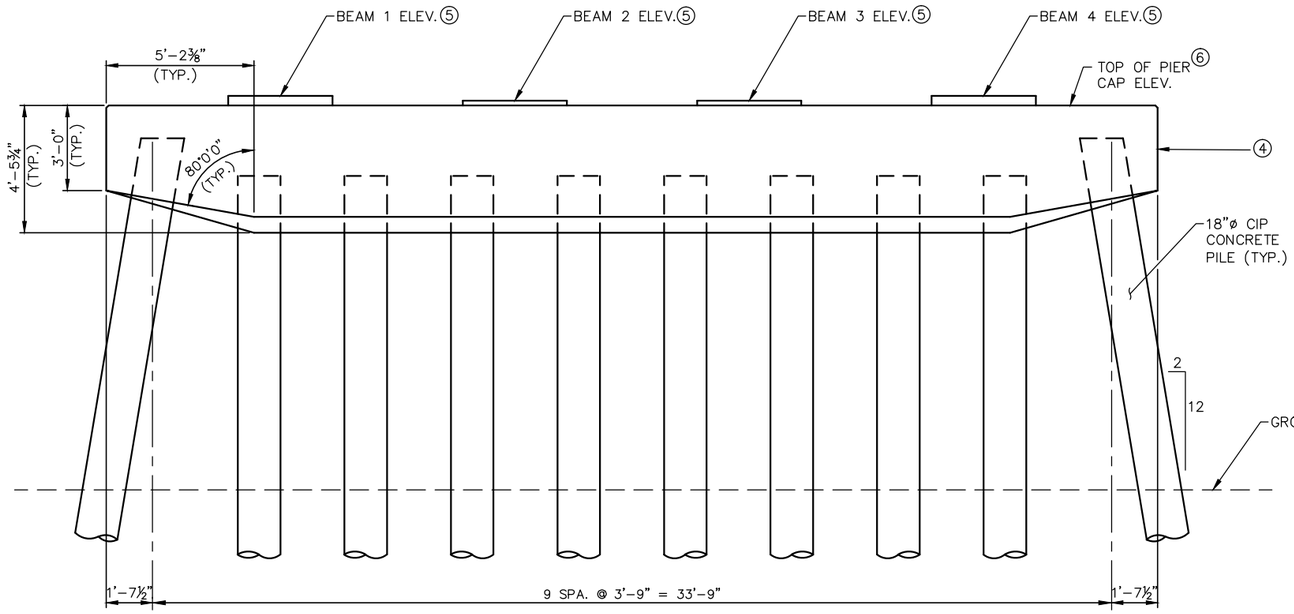
	WORKING POINT ①	WORKING POINT ②	WORKING POINT ③
PIER 13	"4B"	"4J"	"4R"
PIER 14	"4C"	"1K"	"4S"

TOP OF PEDESTAL ELEVATION TABLE

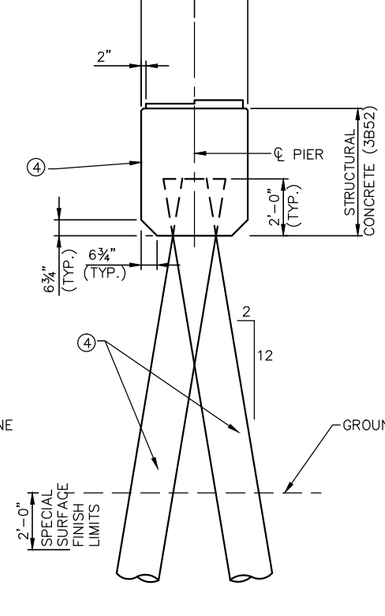
	ELEVATION – BEAM 1	ELEVATION – BEAM 2	ELEVATION – BEAM 3	ELEVATION – BEAM 4	ELEVATION – TOP OF CAP ⑥
PIER 10 – SOUTH SIDE	908.66	908.50	908.50	908.66	908.33
PIER 10 – NORTH SIDE	908.73	908.56	908.56	908.73	
PIER 11 – SOUTH SIDE	913.90	913.74	913.74	913.90	913.57
PIER 11 – NORTH SIDE	913.99	913.83	913.83	913.99	



PLAN VIEW



ELEVATION VIEW



SECTION THRU INTERIOR PILES

PILE NOTES

1 CAST–IN–PLACE CONC. TEST PILE XX FT. LONG
9 CAST–IN–PLACE CONC. PILES EST. LENGTH X FT.
10 CAST–IN–PLACE CONC. PILES REQ'D FOR PIER 10 & 11

PILES TO HAVE A NOMINAL DIAMETER OF 18"

FOR PILE SPLICE DETAILS SEE DETAIL B201.

PIER 10
REQUIRED NOMINAL PILE BEARING RESISTANCE FOR CIP PILES R_n – TONS/PILE

FIELD CONTROL METHOD	φ_{dyn}	$*\ R_n$
MN/DOT PILE FORMULA 2012 (MPF12) $R_n = 20\sqrt{\frac{W \times H}{1000}} \times LOG(\frac{10}{S})$	0.50	290
PDA	0.65	223

$*\ R_n$ = (FACTORED DESIGN LOAD) / φ_{dyn}

PIER 11
REQUIRED NOMINAL PILE BEARING RESISTANCE FOR CIP PILES R_n – TONS/PILE

FIELD CONTROL METHOD	φ_{dyn}	$*\ R_n$
MN/DOT PILE FORMULA 2012 (MPF12) $R_n = 20\sqrt{\frac{W \times H}{1000}} \times LOG(\frac{10}{S})$	0.50	360
PDA	0.65	277

$*\ R_n$ = (FACTORED DESIGN LOAD) / φ_{dyn}

PIERS 10 & 11
COMPUTED PILE LOAD – TONS/PILE

	PIER 10	PIER 11
FACTORED DEAD LOAD + EARTH PRESSURE	89.0	95.5
FACTORED LIVE LOAD	23.9	33.0
✱ FACTORED DESIGN LOAD	145	180

✱ BASED ON STRENGTH V LOAD COMBINATION

NOTES:

④ SPECIAL SURFACE FINISH SHALL BE APPLIED TO THE PIER CAP AND PILES. COLOR SHALL BE FEDERAL STANDARD COLOR XXXX, COLOR XXXXX. SEE SPEC. SB 2401.

⑤ SEE TOP OF PEDESTAL ELEVATION TABLE ON THIS SHEET. ELEVATION IS GIVEN AT ℄ BEARING.

⑥ ELEVATION WAS DETERMINED AT ℄ BEARING ON THE LOW SIDE OF THE PROFILE GRADE LINE.

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AK/IGG | CHECKED BY: TR
DRAWN BY: TAW | DATE: 9/21/2015

AECOM

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

CIVIL WEST - VOLUME 4B
MINNETONKA/HOPKINS
BRIDGE R0686
PIER DETAILS - PIERS 10 & 11

DISCIPLINE: STRUCTURES
SHEET NAME: CBRR0686-BRG-PIR-013

SHEET 33 OF 116

PIER 12
REQUIRED NOMINAL PILE BEARING RESISTANCE FOR CIP PILES R_n – TONS/PILE

FIELD CONTROL METHOD	φ_{dyn}	* R_n
MN/DOT PILE FORMULA 2012 (MPF12) $R_n = 20\sqrt{\frac{W \times H}{1000}} \times LOG(\frac{10}{S})$	0.50	262
PDA	0.65	202

* R_n = (FACTORED DESIGN LOAD) / φ_{dyn}

PIER 12
COMPUTED PILE LOAD – TONS/PILE

FACTORED DEAD LOAD + EARTH PRESSURE	61.6
FACTORED LIVE LOAD	15.5
* FACTORED DESIGN LOAD	131

* BASED ON STRENGTH V LOAD COMBINATION

PILE NOTES

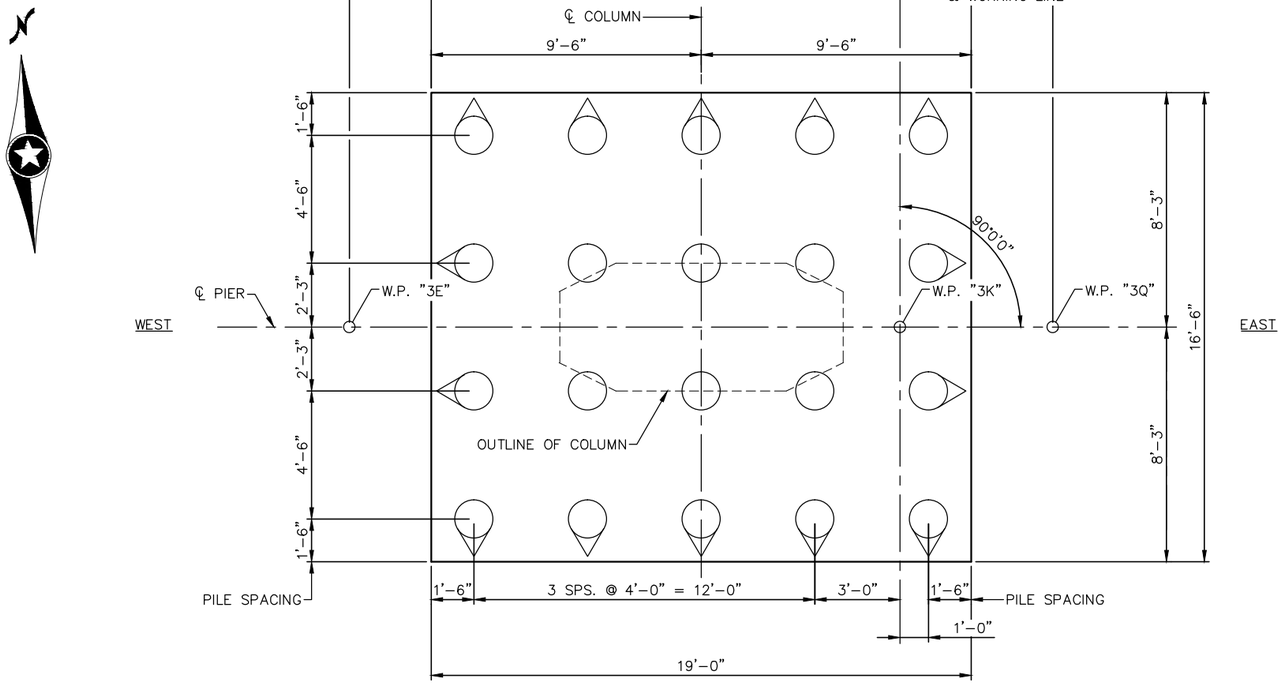
2 CAST–IN–PLACE CONC. TEST PILE 45 FT. LONG
18 CAST–IN–PLACE CONC. PILES EST. LENGTH X FT.
20 CAST–IN–PLACE CONC. PILES REQ'D FOR PIER 12

PILE SPACING SHOWN IS AT BOTTOM OF FOOTING.

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

PILES TO HAVE A NOMINAL DIAMETER OF 16"

FOR PILE SPLICE DETAILS SEE DETAIL B201.



FOOTING PLAN

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AK/IGG CHECKED BY: TR
DRAWN BY: TAW DATE: 9/21/2015

AECOM

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

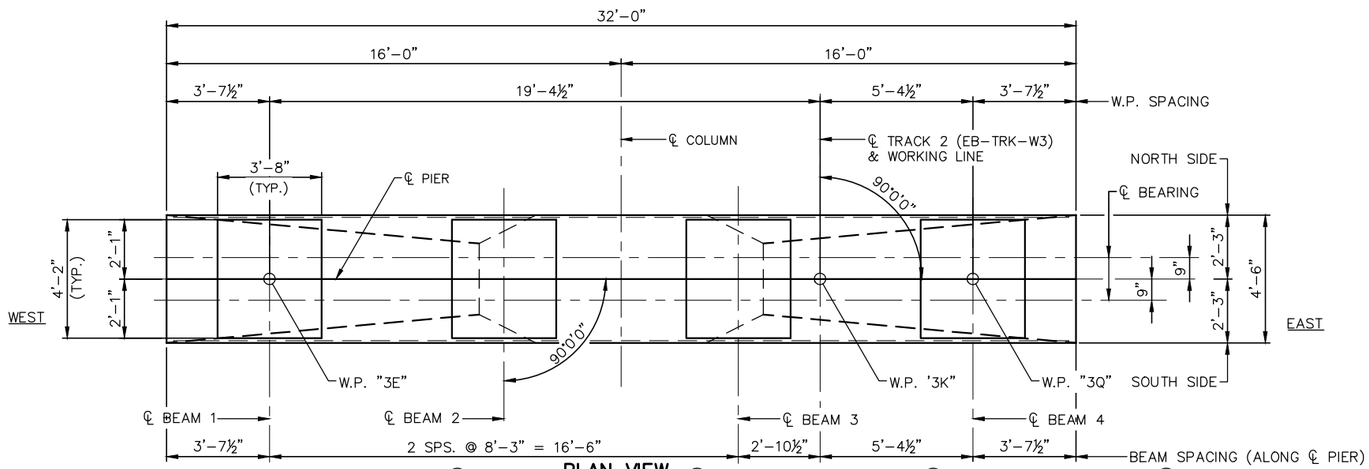
SOUTHWEST Green Line LRT Extension

CIVIL WEST - VOLUME 4B
MINNETONKA/HOPKINS
BRIDGE R0686
PIER DETAILS - PIER 12 (1)

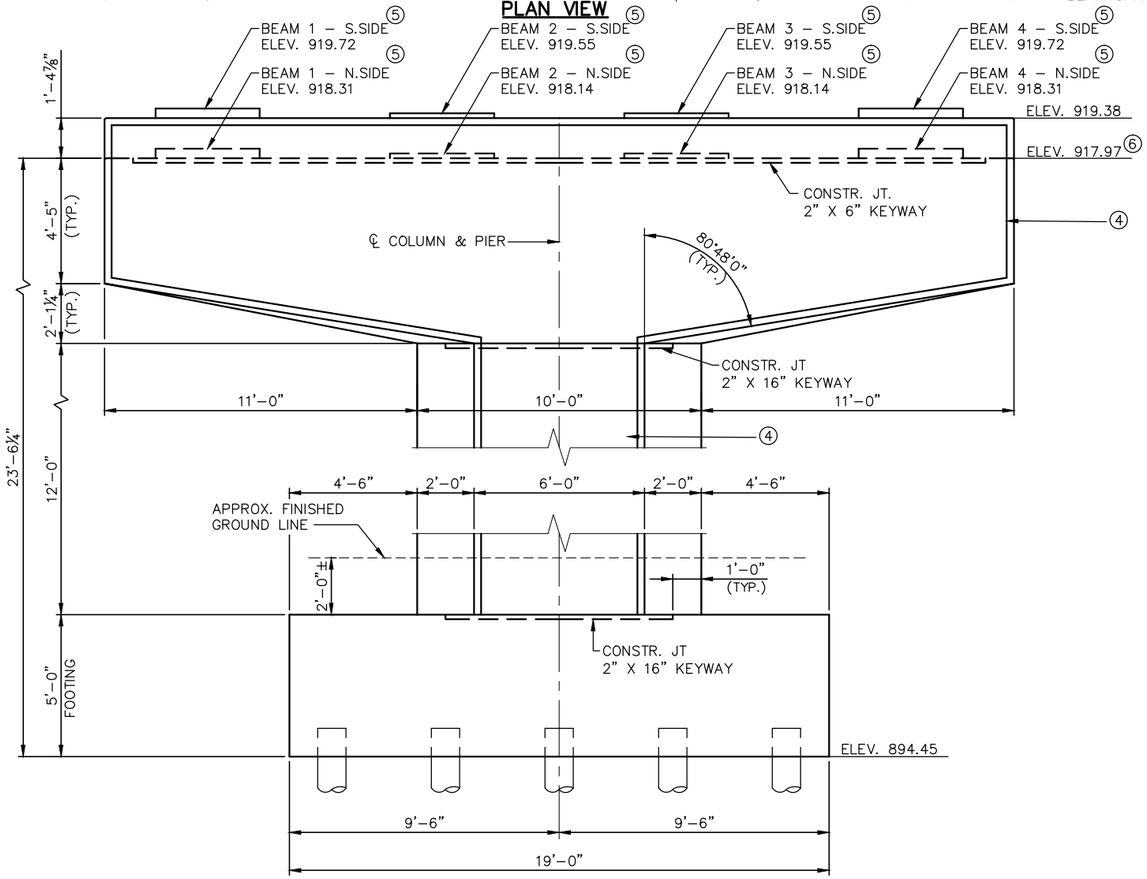
DISCIPLINE: STRUCTURES
SHEET NAME: CBRR0686-BRG-PIR-016

SHEET 34 OF 117

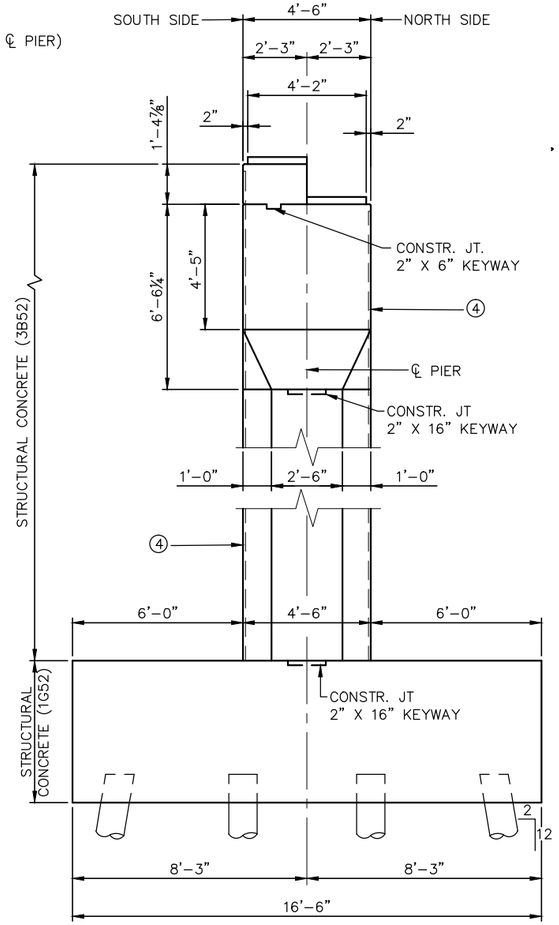
Sep. 21 2015 08:18 am V:\3400_ADC\CAD\SEGMENT W3\PLAN SHEETS\STRUCTURES\CBRR0686\60_percent_Preliminary Plans-Dwg files\CBRR0686-BRG-PIR-016.dwg By: wyttenbacht



PLAN VIEW



ELEVATION VIEW



END VIEW

NOTES:

④ SEE SHEET "AES-001" FOR TEXTURED SURFACE AESTHETIC DETAILS FOR THE PIER CAP AND SHAFT.

⑥ ELEVATIONS WERE DETERMINED AT ℄ BEARING.

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AK/IGG | CHECKED BY: TR
DRAWN BY: TAW | DATE: 9/21/2015

AECOM

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

CIVIL WEST - VOLUME 4B
MINNETONKA/HOPKINS
BRIDGE R0686
PIER DETAILS - PIER 12 (2)

DISCIPLINE: STRUCTURES
SHEET NAME: CBRR0686-BRG-PIR-017

SHEET 35 OF 116

PIERS 13–15
REQUIRED NOMINAL PILE BEARING RESISTANCE FOR CIP PILES R_n – TONS/PILE

FIELD CONTROL METHOD	φ_{dyn}	* R_n
MN/DOT PILE FORMULA 2012 (MPF12) $R_n = 20\sqrt{\frac{W \times H}{1000}} \times \text{LOG}(\frac{10}{S})$	0.50	262
PDA	0.65	202

* R_n = (FACTORED DESIGN LOAD) / φ_{dyn}

PIERS 13–15
COMPUTED PILE LOAD – TONS/PILE

FACTORED DEAD LOAD + EARTH PRESSURE	61.6
FACTORED LIVE LOAD	15.5
* FACTORED DESIGN LOAD	131

* BASED ON STRENGTH V LOAD COMBINATION

PILE NOTES

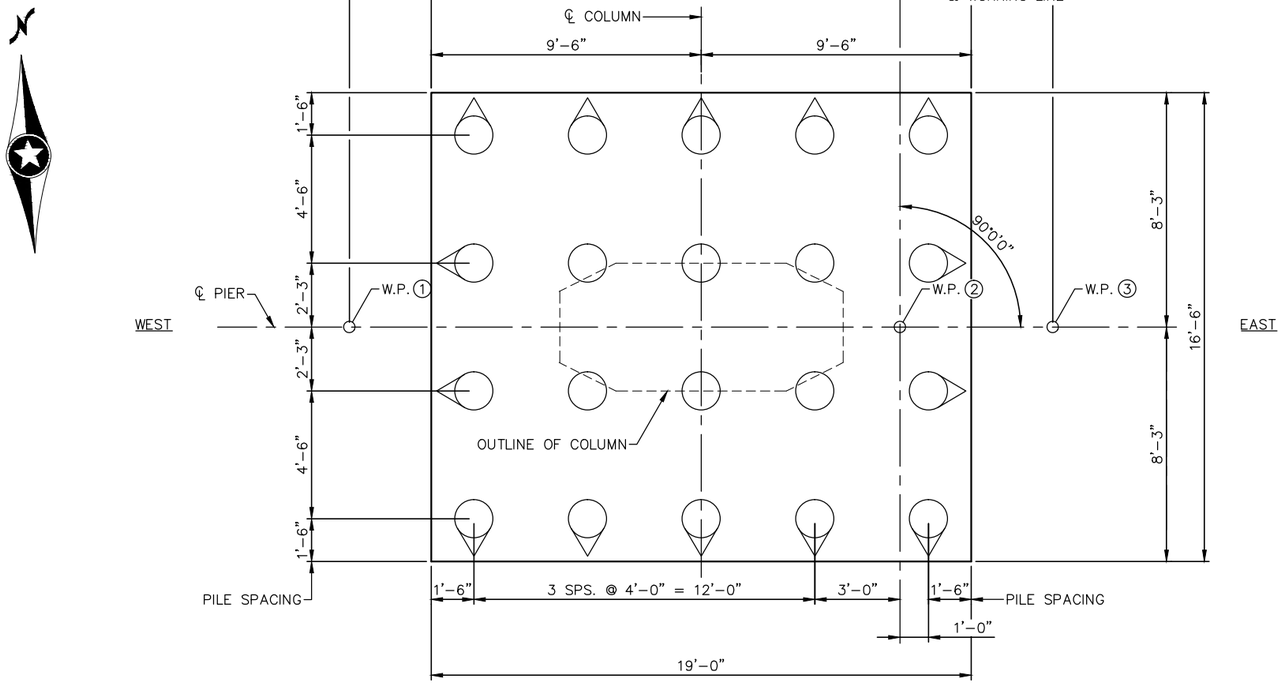
2 CAST–IN–PLACE CONC. TEST PILE XX FT. LONG
18 CAST–IN–PLACE CONC. PILES EST. LENGTH X FT.
20 CAST–IN–PLACE CONC. PILES REQ'D FOR EACH PIER

PILE SPACING SHOWN IS AT BOTTOM OF FOOTING.

PILES MARKED THUS ◯> TO BE BATTERED X" PER FOOT IN DIRECTION SHOWN.

PILES TO HAVE A NOMINAL DIAMETER OF 16"

FOR PILE SPLICE DETAILS SEE DETAIL B201.



FOOTING PLAN

WORKING POINTS TABLE

	WORKING POINT ①	WORKING POINT ②	WORKING POINT ③
PIER 13	"4B"	"4J"	"4R"
PIER 14	"4C"	"1K"	"4S"
PIER 15	"4D"	"4L"	"4T"

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AK/IGG | CHECKED BY: TR
DRAWN BY: TAW | DATE: 9/21/2015

AECOM

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

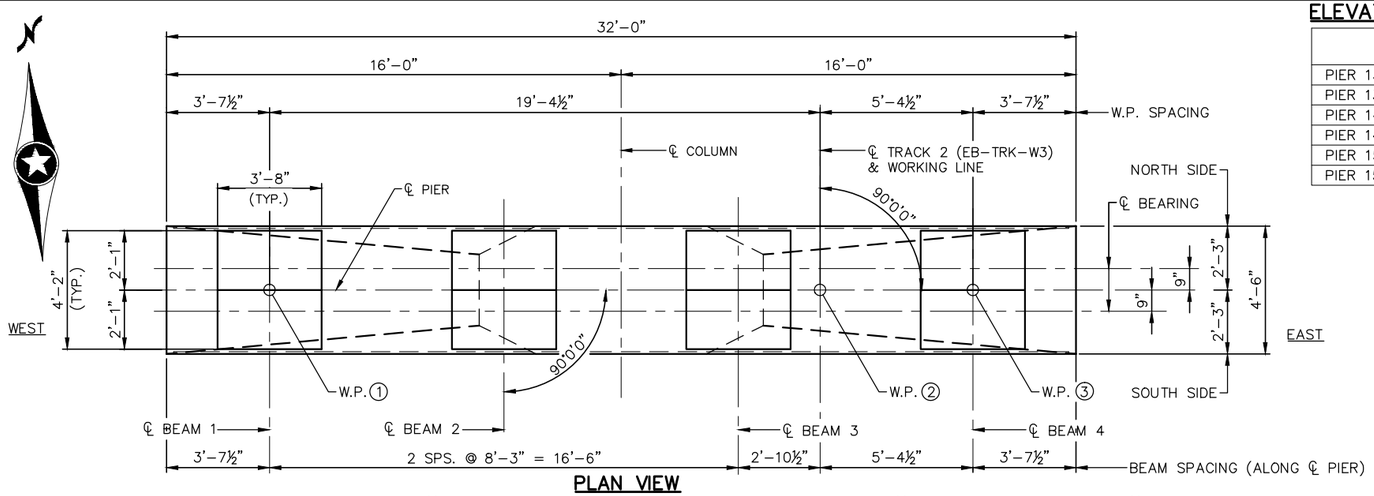
CIVIL WEST - VOLUME 4B
MINNETONKA/HOPKINS
BRIDGE R0686
PIER DETAILS - PIERS 13-15 (1)

DISCIPLINE: STRUCTURES
SHEET NAME: CBRR0686-BRG-PIR-021

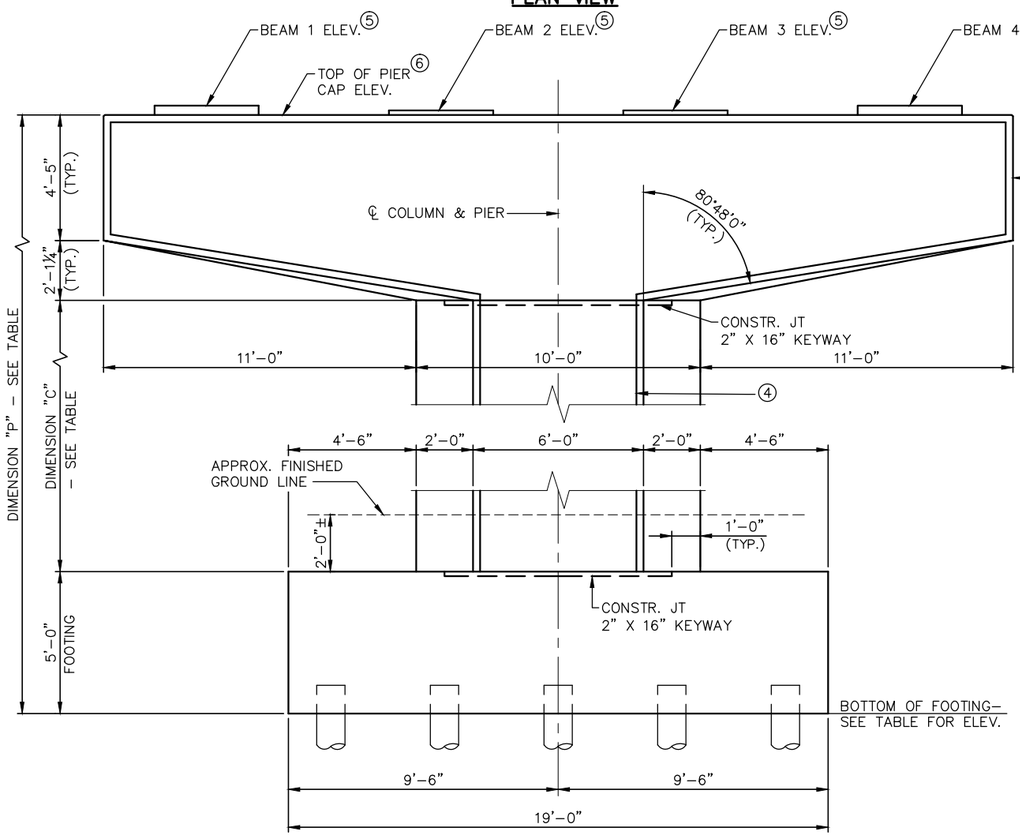
SHEET 36 OF 116

ELEVATION & DIMENSION TABLE

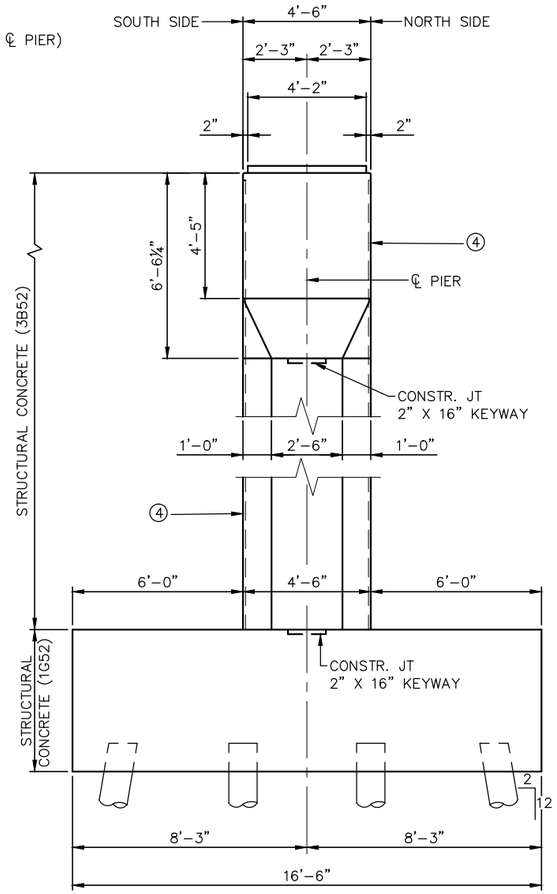
	ELEVATION – BEAM 1	ELEVATION – BEAM 2	ELEVATION – BEAM 3	ELEVATION – BEAM 4	ELEVATION – TOP OF CAP ⑥	COLUMN HT. "C"	PIER HT. "P"	ELEV. – BOTTOM OF FOOTING
PIER 13 – SOUTH SIDE	925.04	924.88	924.88	925.04	924.71	25'–0"	36'–6 1/4"	888.19
PIER 13 – NORTH SIDE	925.12	924.95	924.95	925.12				
PIER 14 – SOUTH SIDE	930.26	930.09	930.09	930.26	929.92	30'–0"	41'–6 1/4"	888.40
PIER 14 – NORTH SIDE	930.31	930.15	930.15	930.31				
PIER 15 – SOUTH SIDE	934.52	934.35	934.35	934.52	934.18	33'–0"	44'–6 1/4"	889.67
PIER 15 – NORTH SIDE	934.56	934.40	934.40	934.56				



PLAN VIEW



ELEVATION VIEW



END VIEW

WORKING POINTS TABLE

	WORKING POINT ①	WORKING POINT ②	WORKING POINT ③
PIER 13	"4B"	"4J"	"4R"
PIER 14	"4C"	"1K"	"4S"
PIER 15	"4D"	"4L"	"4T"

NOTES:

④ SEE SHEET "AES–001" FOR TEXTURED SURFACE AESTHETIC DETAILS FOR PIER CAP AND SHAFT.

⑤ SEE ELEVATION & DIMENSION TABLE ON THIS SHEET.

⑥ ELEVATIONS WERE DETERMINED AT ℄ BEARING ON THE LOW SIDE OF THE PROFILE GRADE LINE.

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AK/IGG | CHECKED BY: TR
DRAWN BY: TAW | DATE: 9/21/2015

AECOM

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

CIVIL WEST - VOLUME 4B
MINNETONKA/HOPKINS
BRIDGE R0686
PIER DETAILS - PIERS 13-15 (2)

DISCIPLINE: STRUCTURES
SHEET NAME: CBRR0686-BRG-PIR-022

SHEET 37 OF 116

PIERS 16, 17 & 20–24
REQUIRED NOMINAL PILE BEARING RESISTANCE FOR CIP PILES R_n – TONS/PILE

FIELD CONTROL METHOD	φ_{dyn}	* R_n
MN/DOT PILE FORMULA 2012 (MPF12) $R_n = 20\sqrt{\frac{W \times H}{1000}} \times \log(\frac{10}{S})$	0.50	254
PDA	0.65	195

* R_n = (FACTORED DESIGN LOAD) / φ_{dyn}

PIERS 16, 17 & 20–24
COMPUTED PILE LOAD – TONS/PILE

FACTORED DEAD LOAD + EARTH PRESSURE	63.1
FACTORED LIVE LOAD	17.6
* FACTORED DESIGN LOAD	127

* BASED ON STRENGTH V LOAD COMBINATION

PILE NOTES

2 CAST–IN–PLACE CONC. TEST PILE XX FT. LONG
18 CAST–IN–PLACE CONC. PILES EST. LENGTH X FT.
20 CAST–IN–PLACE CONC. PILES REQ'D FOR EACH PIER

PILE SPACING SHOWN IS AT BOTTOM OF FOOTING.

PILES MARKED THUS ◯> TO BE BATTERED X" PER FOOT IN DIRECTION SHOWN.

PILES TO HAVE A NOMINAL DIAMETER OF 16"

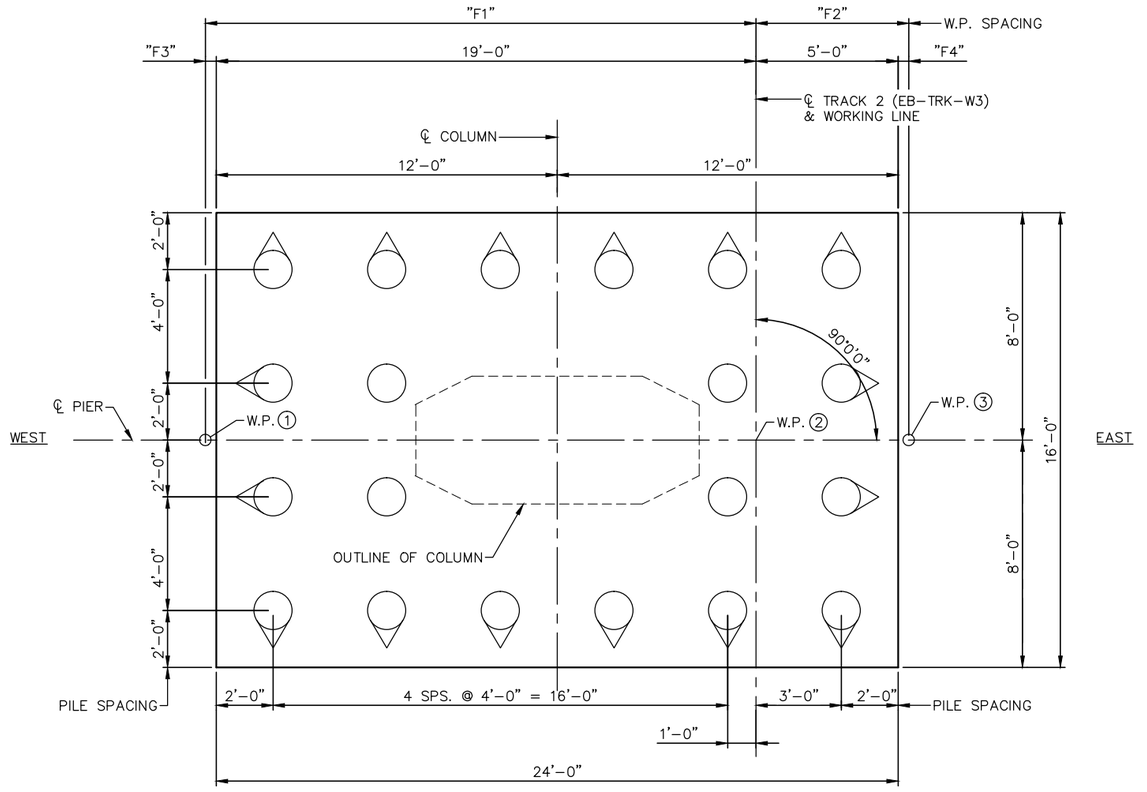
FOR PILE SPLICE DETAILS SEE DETAIL B201.

DIMENSION TABLE

	DISTANCE "F1"	DISTANCE "F2"	DISTANCE "F3"	DISTANCE "F4"
PIER 16	19'–4 1/2"	5'–4 1/2"	4 1/2"	4 1/2"
PIER 17	19'–4 1/2"	5'–4 1/2"	4 1/2"	4 1/2"
PIER 20	19'–4 1/2"	5'–4 1/2"	4 1/2"	4 1/2"
PIER 21	19'–6 1/2"	5'–2 1/2"	6 1/2"	2 1/2"
PIER 22	19'–5 1/2"	5'–3 1/2"	5 1/2"	3 1/2"
PIER 23	19'–8"	5'–1"	8"	1"
PIER 24	19'–4 1/2"	5'–4 1/2"	4 1/2"	4 1/2"

WORKING POINTS TABLE

	WORKING POINT ①	WORKING POINT ②	WORKING POINT ③
PIER 16	"4E"	"4M"	"4U"
PIER 17	"4F"	"4N"	"4V"
PIER 20	"6B"	"6J"	"6R"
PIER 21	"6C"	"6K"	"6S"
PIER 22	"6D"	"6L"	"6T"
PIER 23	"6E"	"6M"	"6U"
PIER 24	"6F"	"6N"	"6V"



FOOTING PLAN

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AK/IGG | CHECKED BY: TR
DRAWN BY: TAW | DATE: 9/21/2015

AECOM

60% SUBMISSION - 09/28/15

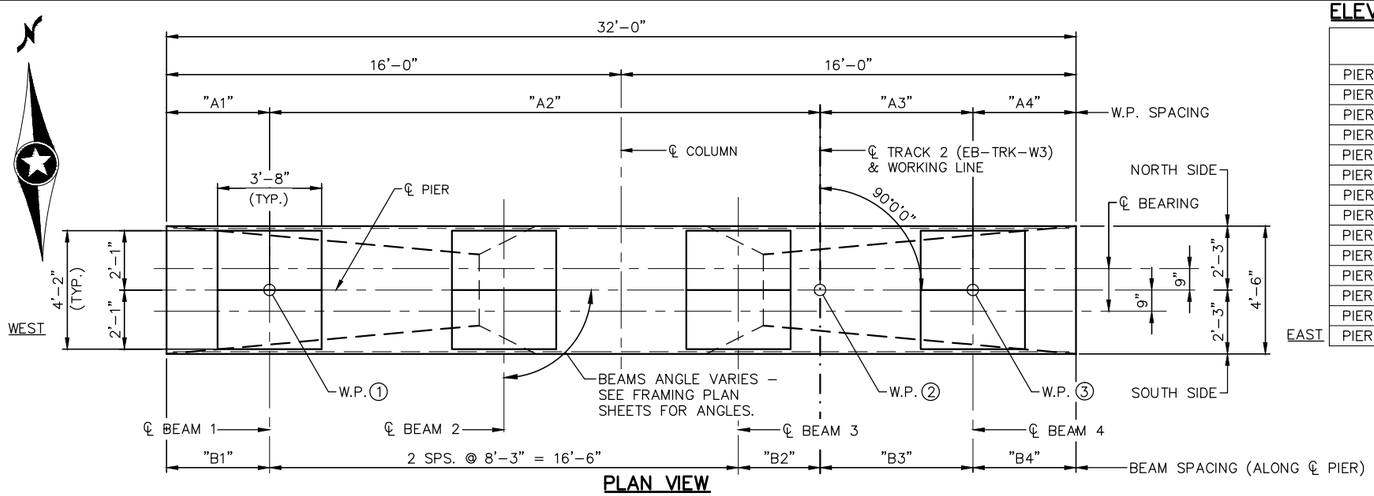
METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

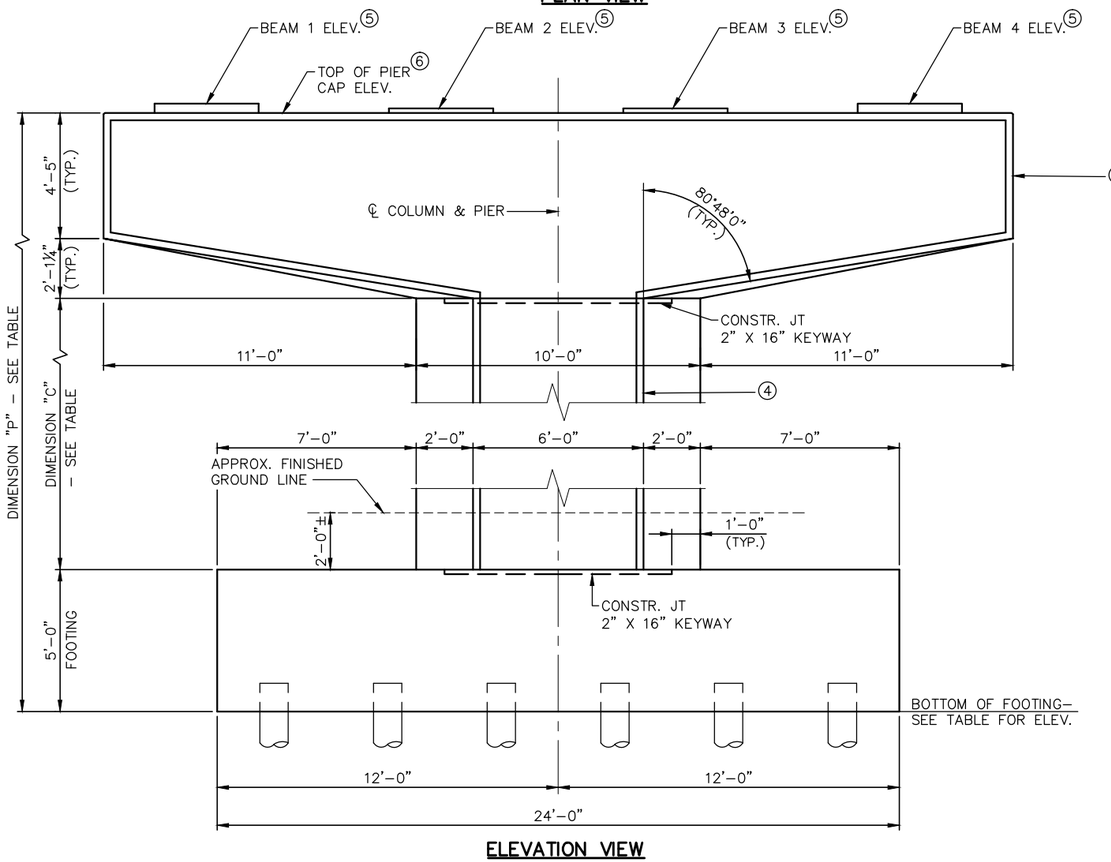
CIVIL WEST - VOLUME 4B
MINNETONKA/HOPKINS
BRIDGE R0686
PIER DETAILS - PIERS 16 & 17 & 20-24 (1)

DISCIPLINE: STRUCTURES
SHEET NAME: CBRR0686-BRG-PIR-026

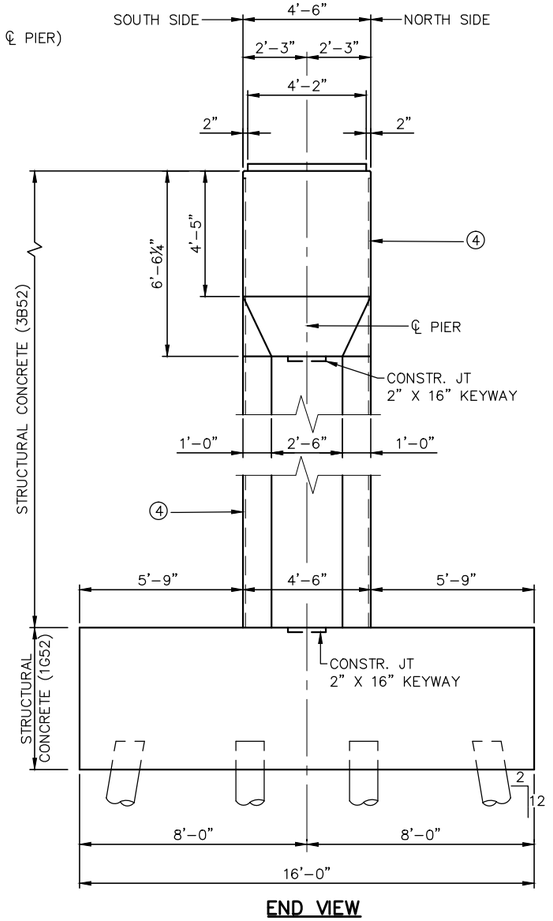
SHEET 38 OF 116



PLAN VIEW



ELEVATION VIEW



END VIEW

ELEVATION & DIMENSION TABLE ⑥

	ELEVATION - BEAM 1	ELEVATION - BEAM 2	ELEVATION - BEAM 3	ELEVATION - BEAM 4	ELEVATION - TOP OF CAP	COLUMN HT. "C"	PIER HT. "P"	ELEV. - BOTTOM OF FOOTING
PIER 16 - SOUTH SIDE	937.16	937.00	937.00	937.16	936.83	37'-0"	48'-6 1/4"	888.31
PIER 16 - NORTH SIDE	937.19	937.03	937.03	937.19				
PIER 17 - SOUTH SIDE	938.86	938.69	938.69	938.86	938.52	38'-0"	49'-6 1/4"	889.01
PIER 17 - NORTH SIDE	938.87	938.70	938.70	938.87				
PIER 20 - SOUTH SIDE	935.06	934.89	934.89	935.06				
PIER 20 - NORTH SIDE	934.91	934.75	934.75	934.91	934.58	32'-0"	43'-6 1/4"	891.06
PIER 21 - SOUTH SIDE	931.40	931.24	931.23	931.39				
PIER 21 - NORTH SIDE	931.35	931.18	931.18	931.34	931.01	31'-0"	42'-6 1/4"	888.49
PIER 22 - SOUTH SIDE	926.29	926.13	926.12	926.29				
PIER 22 - NORTH SIDE	926.22	926.06	926.05	926.22	925.89	25'-0"	36'-6 1/4"	889.37
PIER 23 - SOUTH SIDE	919.61	919.45	919.44	919.60				
PIER 23 - NORTH SIDE	919.55	919.38	919.37	919.54	919.21	17'-0"	28'-6 1/4"	890.70
PIER 24 - SOUTH SIDE	912.04	911.88	911.88	912.04				
PIER 24 - NORTH SIDE	911.96	911.79	911.79	911.96	911.62	11'-0"	22'-6 1/4"	889.10

DIMENSION TABLE

	DISTANCE "A1"	DISTANCE "A2"	DISTANCE "A3"	DISTANCE "A4"
PIER 16	3'-7 1/2"	19'-4 1/2"	5'-4 1/2"	3'-7 1/2"
PIER 17	3'-7 1/2"	19'-4 1/2"	5'-4 1/2"	3'-7 1/2"
PIER 20	3'-7 1/2"	19'-4 1/2"	5'-4 1/2"	3'-7 1/2"
PIER 21	3'-5 1/2"	19'-6 1/2"	5'-2 1/2"	3'-9 1/2"
PIER 22	3'-6 1/2"	19'-5 1/2"	5'-3 1/2"	3'-8 1/2"
PIER 23	3'-4"	19'-8"	5'-1"	3'-11"
PIER 24	3'-7 1/2"	19'-4 1/2"	5'-4 1/2"	3'-7 1/2"
	DISTANCE "B1"	DISTANCE "B2"	DISTANCE "B3"	DISTANCE "B4"
PIER 16	3'-7 1/2"	2'-10 1/2"	5'-4 1/2"	3'-7 1/2"
PIER 17	3'-7 1/2"	2'-10 1/2"	5'-4 1/2"	3'-7 1/2"
PIER 20	3'-7 1/2"	2'-10 1/2"	5'-4 1/2"	3'-7 1/2"
PIER 21	3'-5 1/2"	3'-0 1/2"	5'-2 1/2"	3'-9 1/2"
PIER 22	3'-6 1/2"	2'-11 1/2"	5'-3 1/2"	3'-8 1/2"
PIER 23	3'-4"	3'-2"	5'-1"	3'-11"
PIER 24	3'-7 1/2"	2'-10 1/2"	5'-4 1/2"	3'-7 1/2"

WORKING POINTS TABLE

	WORKING POINT ①	WORKING POINT ②	WORKING POINT ③
PIER 16	"4E"	"4M"	"4U"
PIER 17	"4F"	"4N"	"4V"
PIER 20	"6B"	"6J"	"6R"
PIER 21	"6C"	"6K"	"6S"
PIER 22	"6D"	"6L"	"6T"
PIER 23	"6E"	"6M"	"6U"
PIER 24	"6F"	"6N"	"6V"

NOTES:

④ SEE SHEET "AES-001" FOR TEXTURED SURFACE AESTHETIC DETAILS FOR PIER CAP AND SHAFT.

⑤ SEE ELEVATION & DIMENSION TABLE ON THIS SHEET.

⑥ ELEVATIONS WERE DETERMINED AT ℄ BEARING ON THE LOW SIDE OF THE PROFILE GRADE LINE.

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AK/IGG | CHECKED BY: TR
DRAWN BY: TAW | DATE: 9/21/2015

AECOM

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

CIVIL WEST - VOLUME 4B
MINNETONKA/HOPKINS
BRIDGE R0686
PIER DETAILS - PIERS 16 & 17 & 20-24 (2)

DISCIPLINE: STRUCTURES

SHEET NAME: CBRR0686-BRG-PIR-027

SHEET 39 OF 116

PIER 18
REQUIRED NOMINAL PILE BEARING RESISTANCE FOR CIP PILES R_n – TONS/PILE

FIELD CONTROL METHOD	φ_{dyn}	* R_n
MN/DOT PILE FORMULA 2012 (MPF12) $R_n = 20\sqrt{\frac{W \times H}{1000}} \times \text{LOG}(\frac{10}{S})$	0.50	306
PDA	0.65	235

* R_n = (FACTORED DESIGN LOAD) / φ_{dyn}

PIER 18
COMPUTED PILE LOAD – TONS/PILE

FACTORED DEAD LOAD + EARTH PRESSURE	64.5
FACTORED LIVE LOAD	16.1
* FACTORED DESIGN LOAD	153

* BASED ON STRENGTH V LOAD COMBINATION

PILE NOTES

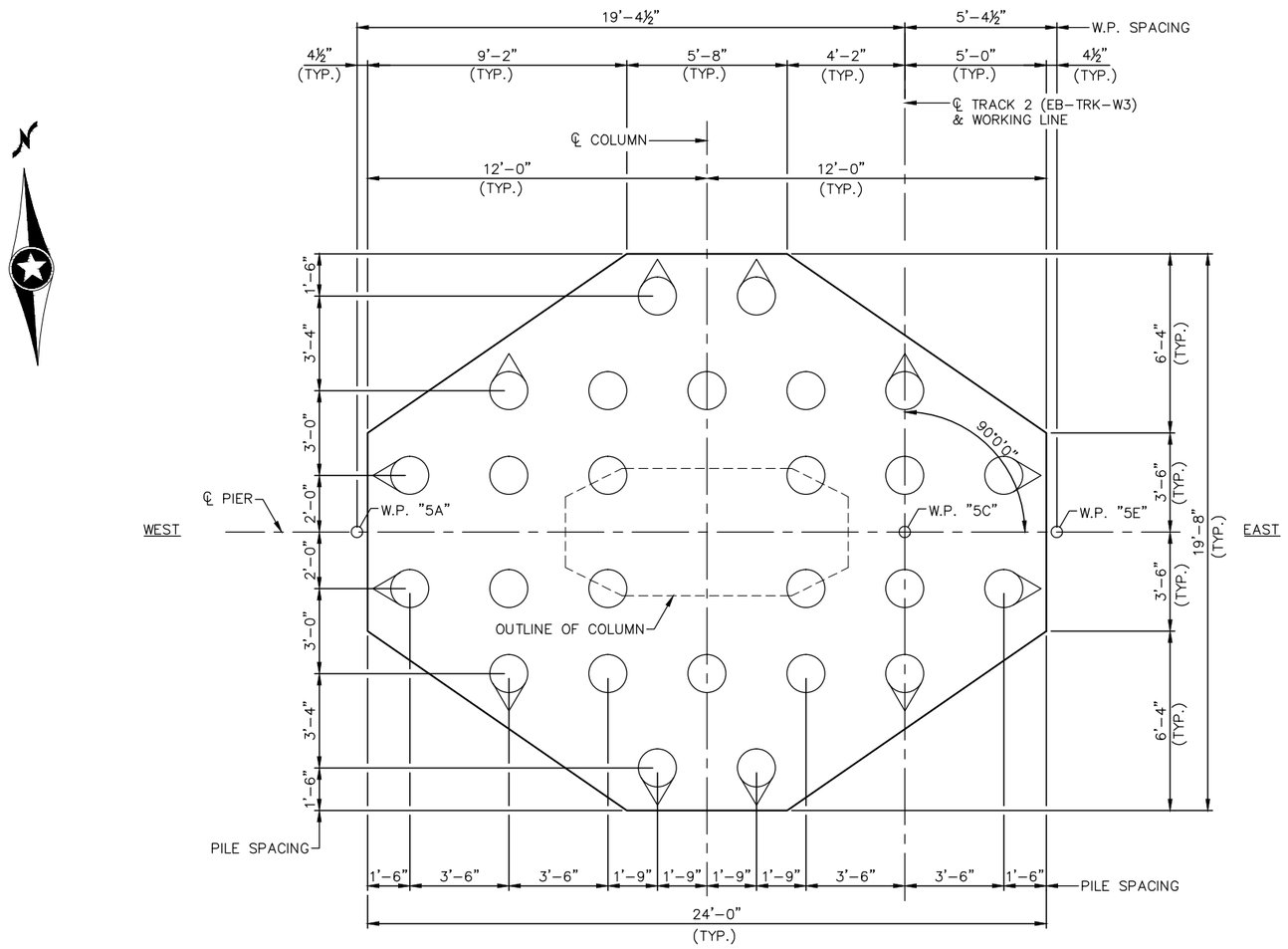
2 CAST–IN–PLACE CONC. TEST PILE 40 FT. LONG
24 CAST–IN–PLACE CONC. PILES EST. LENGTH X FT.
26 CAST–IN–PLACE CONC. PILES REQ'D FOR PIER 18

PILE SPACING SHOWN IS AT BOTTOM OF FOOTING.

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

PILES TO HAVE A NOMINAL DIAMETER OF 16"

FOR PILE SPLICE DETAILS SEE DETAIL B201.



FOOTING PLAN

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AK/IGG | CHECKED BY: TR
DRAWN BY: TAW | DATE: 9/21/2015

AECOM

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

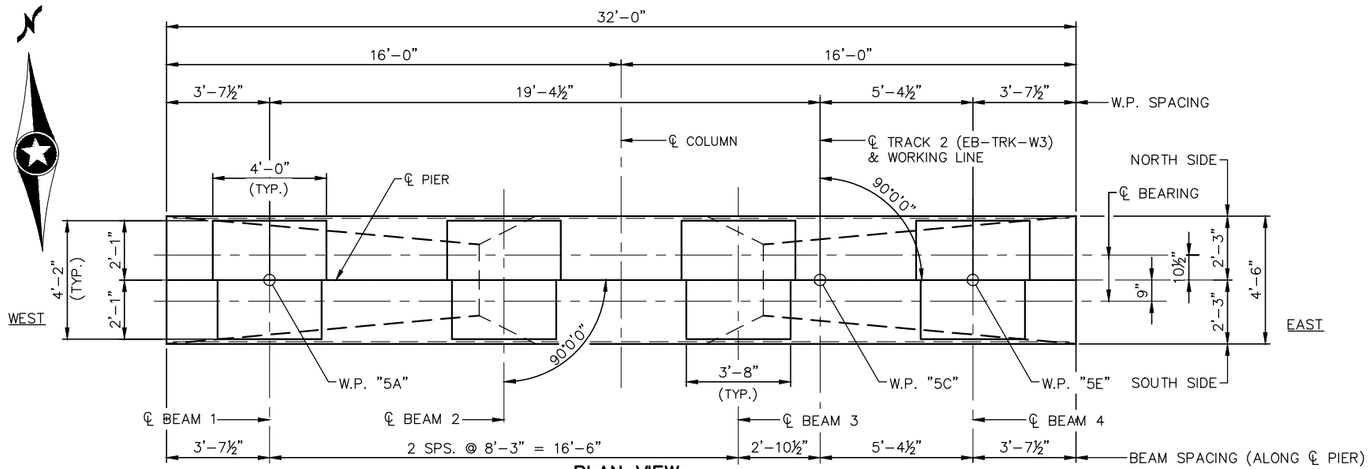
SOUTHWEST Green Line LRT Extension

CIVIL WEST - VOLUME 4B
MINNETONKA/HOPKINS
BRIDGE R0686
PIER DETAILS - PIER 18 (1)

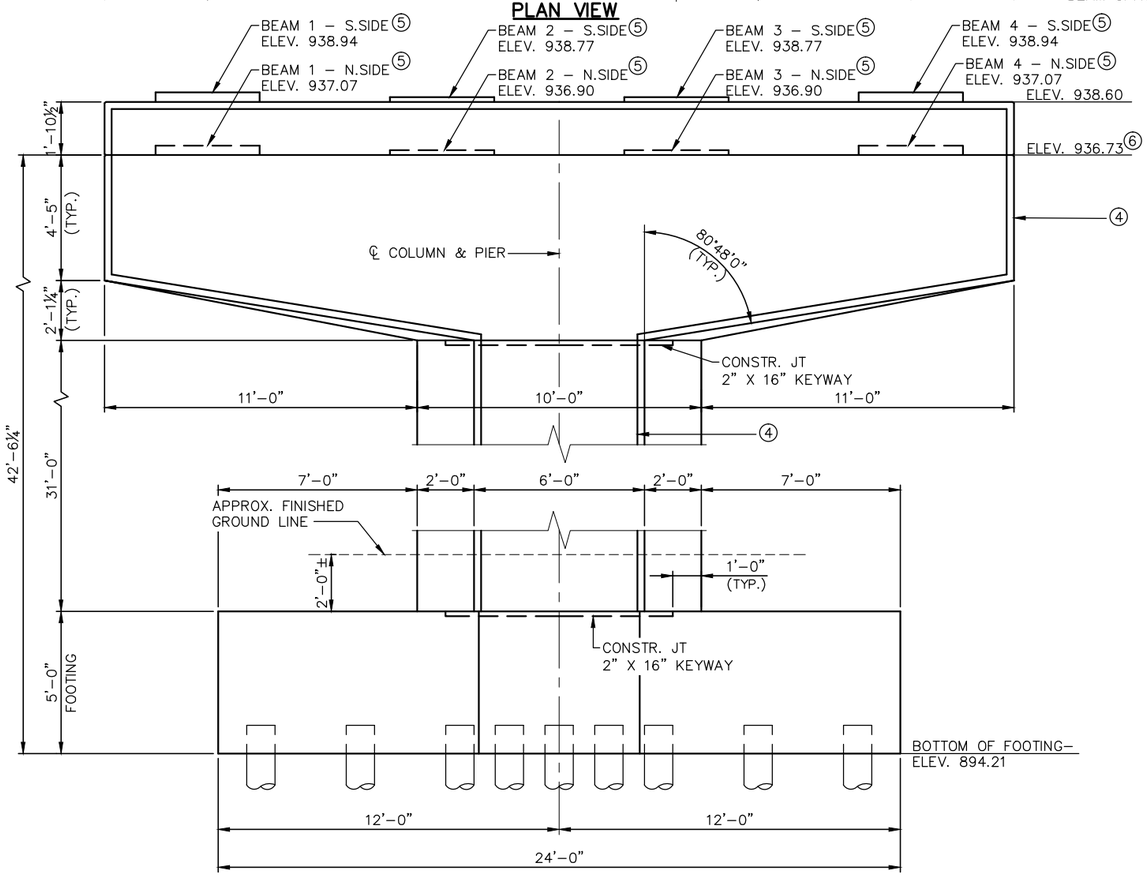
DISCIPLINE: STRUCTURES
SHEET NAME: CBRR0686-BRG-PIR-031

SHEET 40 OF 117

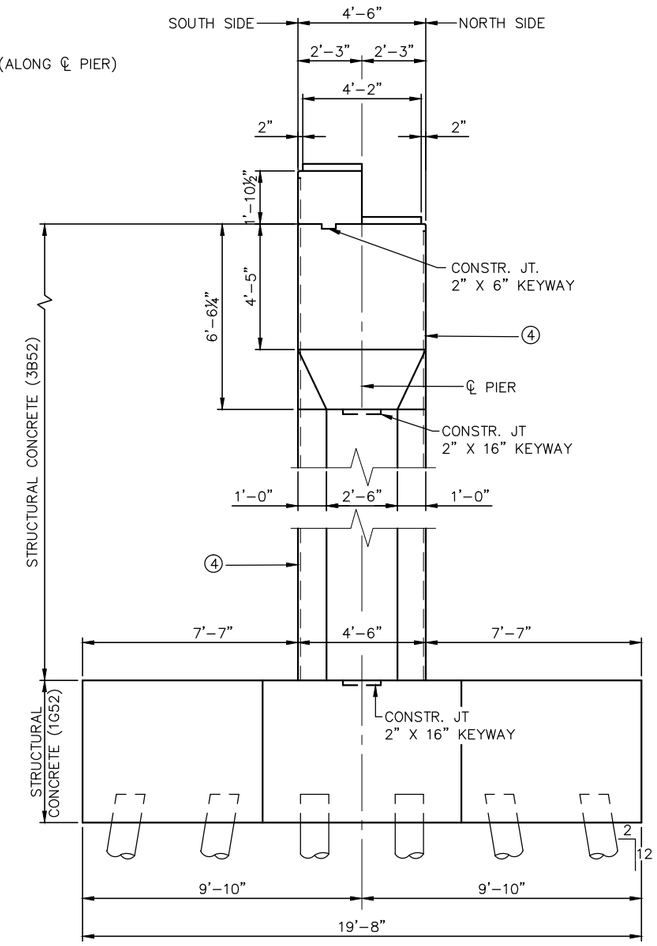
Sep. 21 2015 08:19 am V:\3400_ADC\CAD\SEGMENT W3\PLAN SHEETS\STRUCTURES\CBRR0686\60_percent_Preliminary Plans-Dwg files\CBRR0686-BRG-PIR-031.dwg By: wyttenbacht



PLAN VIEW



ELEVATION VIEW



END VIEW

NOTES:

④ SEE SHEET "AES-001" FOR TEXTURED SURFACE AESTHETIC DETAILS FOR THE PIER CAP AND SHAFT.

⑥ ELEVATION WAS DETERMINED AT ℄ BEARING ON THE NORTH SIDE OF THE PIER.

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AK/IGG | CHECKED BY: TR
DRAWN BY: TAW | DATE: 9/21/2015

AECOM

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

CIVIL WEST - VOLUME 4B
MINNETONKA/HOPKINS
BRIDGE R0686
PIER DETAILS - PIER 18 (2)

DISCIPLINE: STRUCTURES
SHEET NAME: CBRR0686-BRG-PIR-032

SHEET 41 OF 116

PIER 19
REQUIRED NOMINAL PILE BEARING RESISTANCE FOR CIP PILES R_n – TONS/PILE

FIELD CONTROL METHOD	φ_{dyn}	$* R_n$
MN/DOT PILE FORMULA 2012 (MPF12) $R_n = 20\sqrt{\frac{W \times H}{1000}} \times LOG(\frac{10}{S})$	0.50	306
PDA	0.65	235

$* R_n$ = (FACTORED DESIGN LOAD) / φ_{dyn}

PIER 19
COMPUTED PILE LOAD – TONS/PILE

FACTORED DEAD LOAD + EARTH PRESSURE	64.5
FACTORED LIVE LOAD	16.1
* FACTORED DESIGN LOAD	153

* BASED ON STRENGTH V LOAD COMBINATION

PILE NOTES

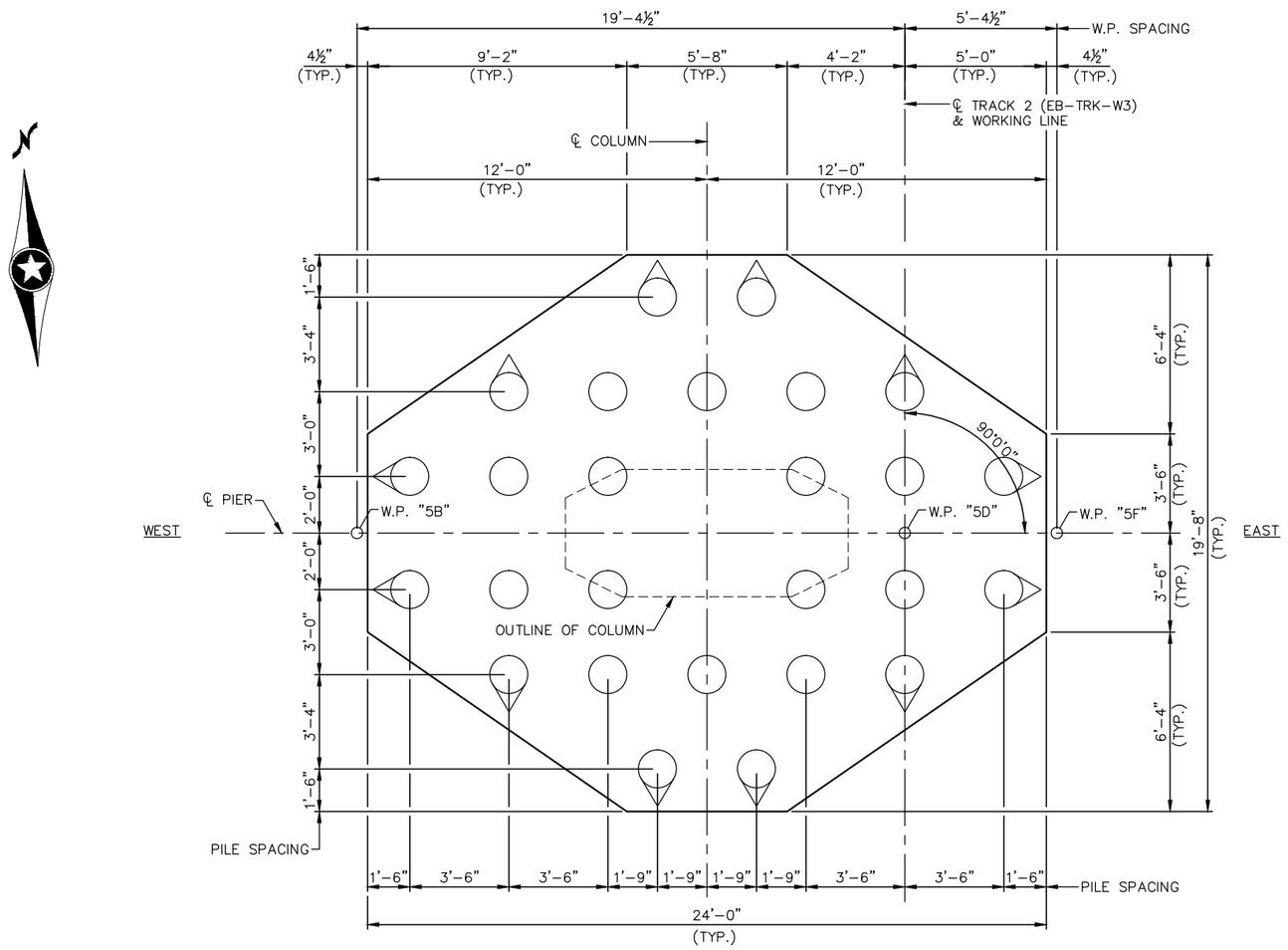
2 CAST–IN–PLACE CONC. TEST PILE 80 FT. LONG
24 CAST–IN–PLACE CONC. PILES EST. LENGTH X FT.
26 CAST–IN–PLACE CONC. PILES REQ'D FOR PIER 19

PILE SPACING SHOWN IS AT BOTTOM OF FOOTING.

PILES MARKED THUS ○> TO BE BATTERED X" PER FOOT IN DIRECTION SHOWN.

PILES TO HAVE A NOMINAL DIAMETER OF 16"

FOR PILE SPLICE DETAILS SEE DETAIL B201.



FOOTING PLAN

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AK/IGG | CHECKED BY: TR
DRAWN BY: TAW | DATE: 9/21/2015

AECOM

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

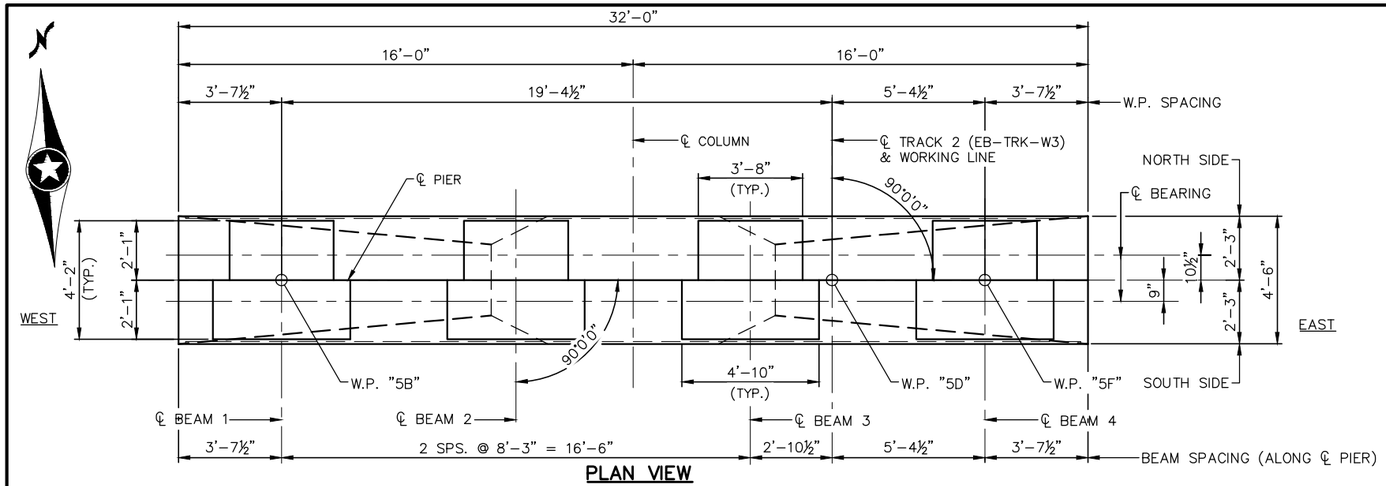
SOUTHWEST Green Line LRT Extension

CIVIL WEST - VOLUME 4B
MINNETONKA/HOPKINS
BRIDGE R0686
PIER DETAILS - PIER 19 (1)

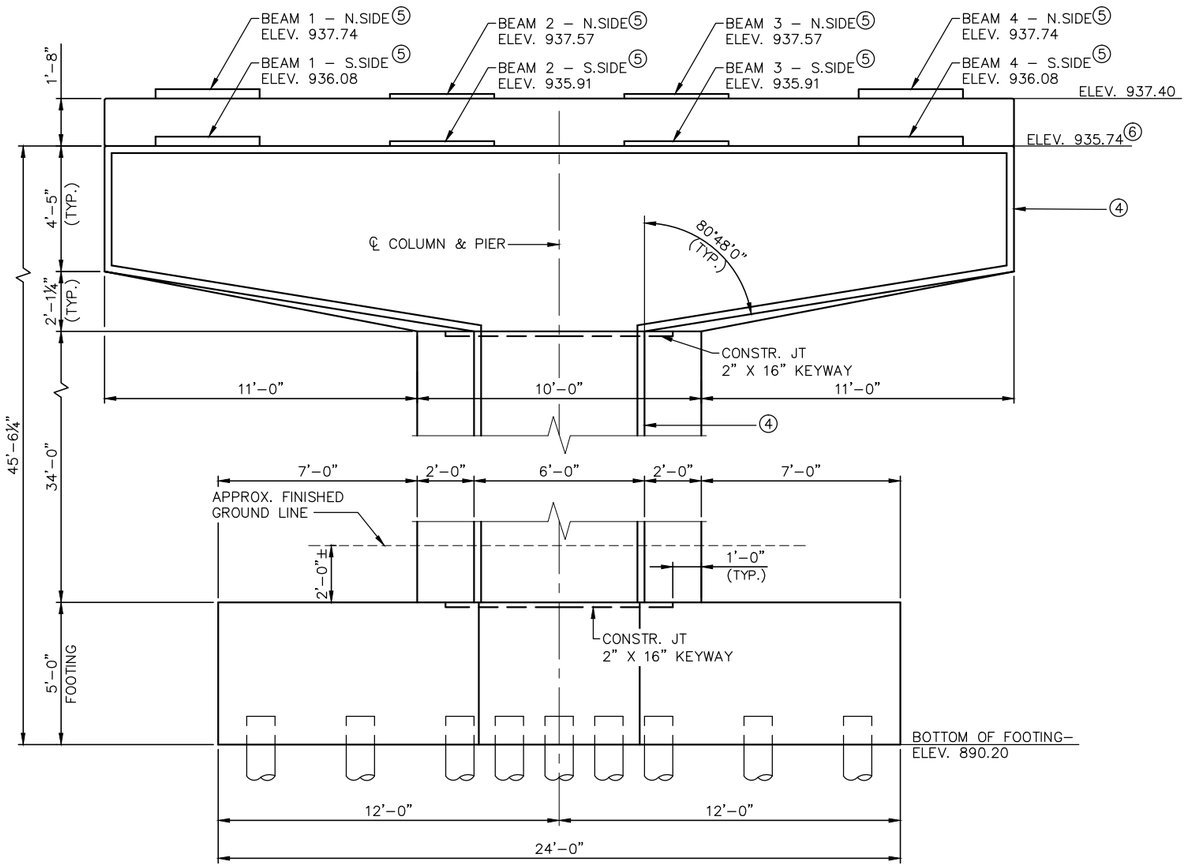
DISCIPLINE: STRUCTURES
SHEET NAME: CBRR0686-BRG-PIR-036

SHEET 42 OF 117

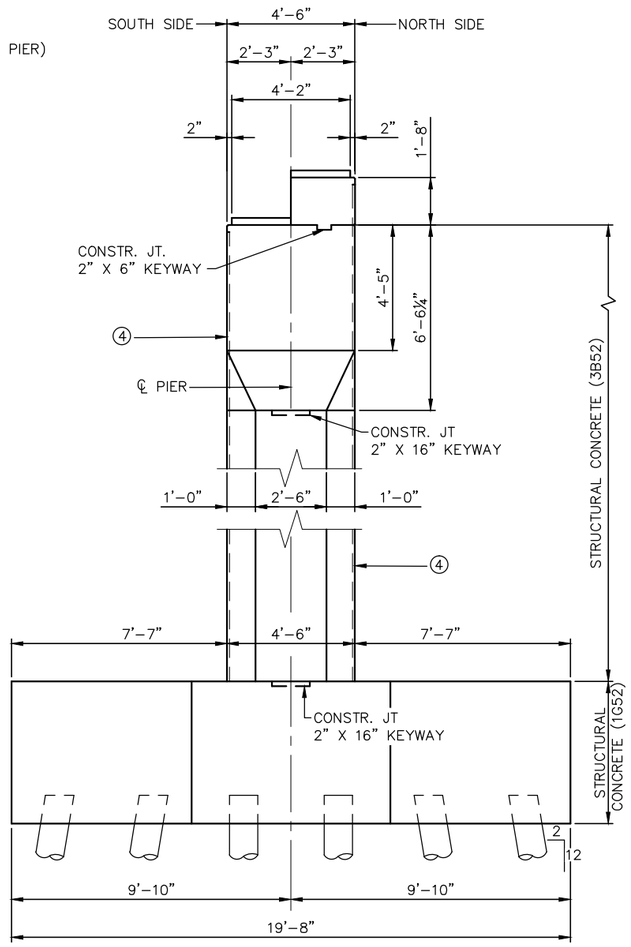
Sep. 21 2015 08:20 am V:\3400_ADC\CAD\SEGMENT W3\PLAN SHEETS\STRUCTURES\CBRR0686\60_percent_Preliminary Plans–Dwg files\CBRR0686–BRG–PIR–036.dwg By: wyttenbacht



PLAN VIEW



ELEVATION VIEW



END VIEW

NOTES:

④ SPECIAL SURFACE FINISH SHALL BE APPLIED TO THE PIER CAP AND PILES. COLOR SHALL BE FEDERAL STANDARD COLOR XXXX, COLOR XXXXX. SEE SPEC. SB 2401.

⑥ ELEVATION WAS DETERMINED AT ℄ BEARING ON THE SOUTH SIDE OF THE PIER.

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AK/IGG | CHECKED BY: TR
DRAWN BY: TAW | DATE: 9/21/2015

AECOM

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

CIVIL WEST - VOLUME 4B
MINNETONKA/HOPKINS
BRIDGE R0686
PIER DETAILS - PIER 19 (2)

DISCIPLINE: STRUCTURES
SHEET NAME: CBRR0686-BRG-PIR-037

SHEET 43 OF 116

PIER 25
REQUIRED NOMINAL PILE BEARING RESISTANCE FOR CIP PILES R_n – TONS/PILE

FIELD CONTROL METHOD	φ_{dyn}	* R_n
MN/DOT PILE FORMULA 2012 (MPF12) $R_n = 20\sqrt{\frac{W \times H}{1000}} \times LOG(\frac{10}{S})$	0.50	260
PDA	0.65	200

* R_n = (FACTORED DESIGN LOAD) / φ_{dyn}

PIER 25
COMPUTED PILE LOAD – TONS/PILE

FACTORED DEAD LOAD + EARTH PRESSURE	105
FACTORED LIVE LOAD	21.8
* FACTORED DESIGN LOAD	130

* BASED ON STRENGTH V LOAD COMBINATION

PILE NOTES

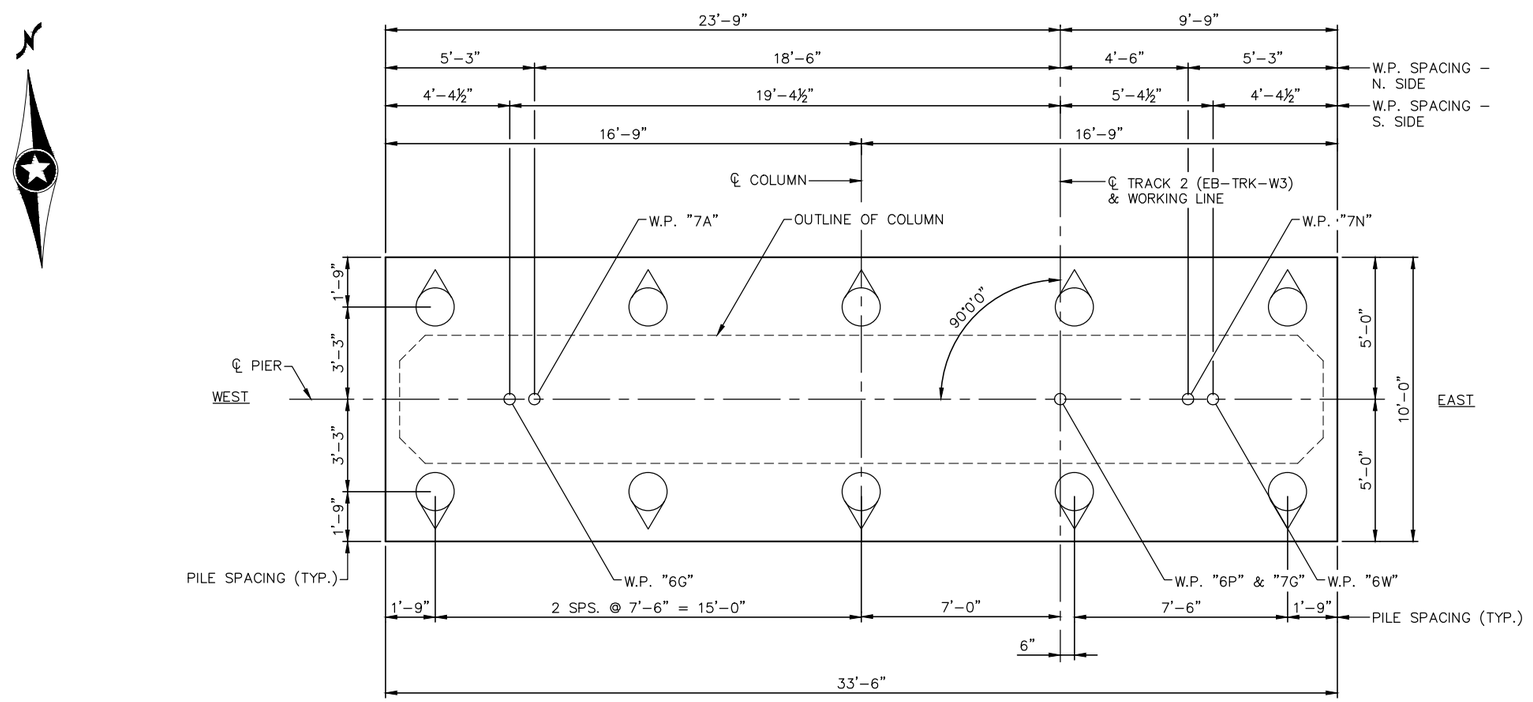
1 CAST–IN–PLACE CONC. TEST PILE 45 FT. LONG
9 CAST–IN–PLACE CONC. PILES EST. LENGTH XX FT.
10 CAST–IN–PLACE CONC. PILES REQ'D FOR PIER 25

PILE SPACING SHOWN IS AT BOTTOM OF FOOTING.

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

PILES TO HAVE A NOMINAL DIAMETER OF 16"

FOR PILE SPLICE DETAILS SEE DETAIL B201.



FOOTING PLAN

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AK/IGG | CHECKED BY: TR
DRAWN BY: TAW | DATE: 9/21/2015

AECOM

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

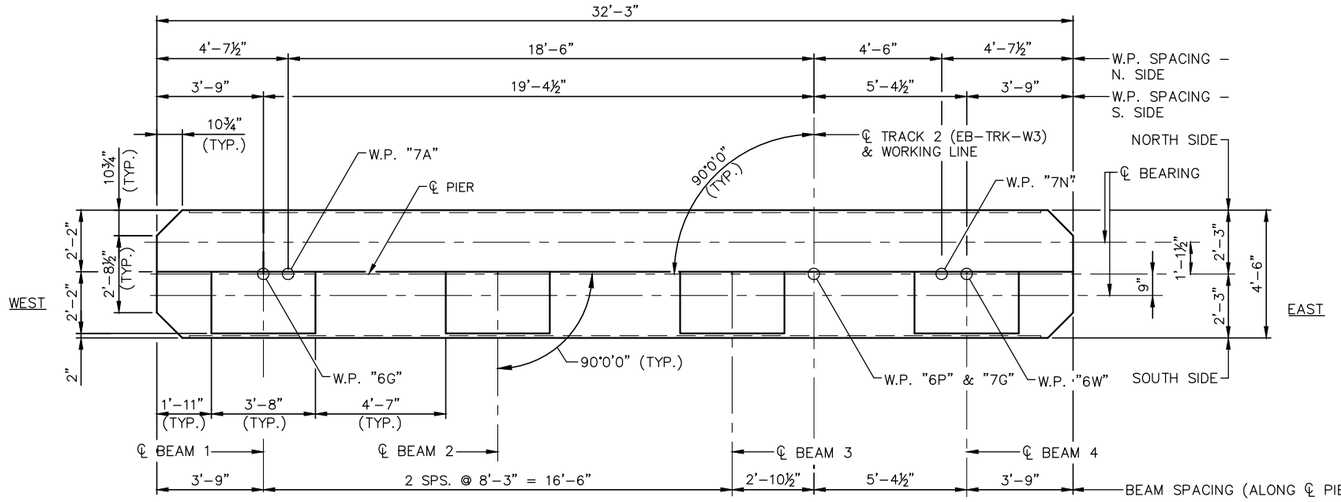
SOUTHWEST Green Line LRT Extension

CIVIL WEST - VOLUME 4B
MINNETONKA/HOPKINS
BRIDGE R0686
PIER DETAILS - PIER 25 (1)

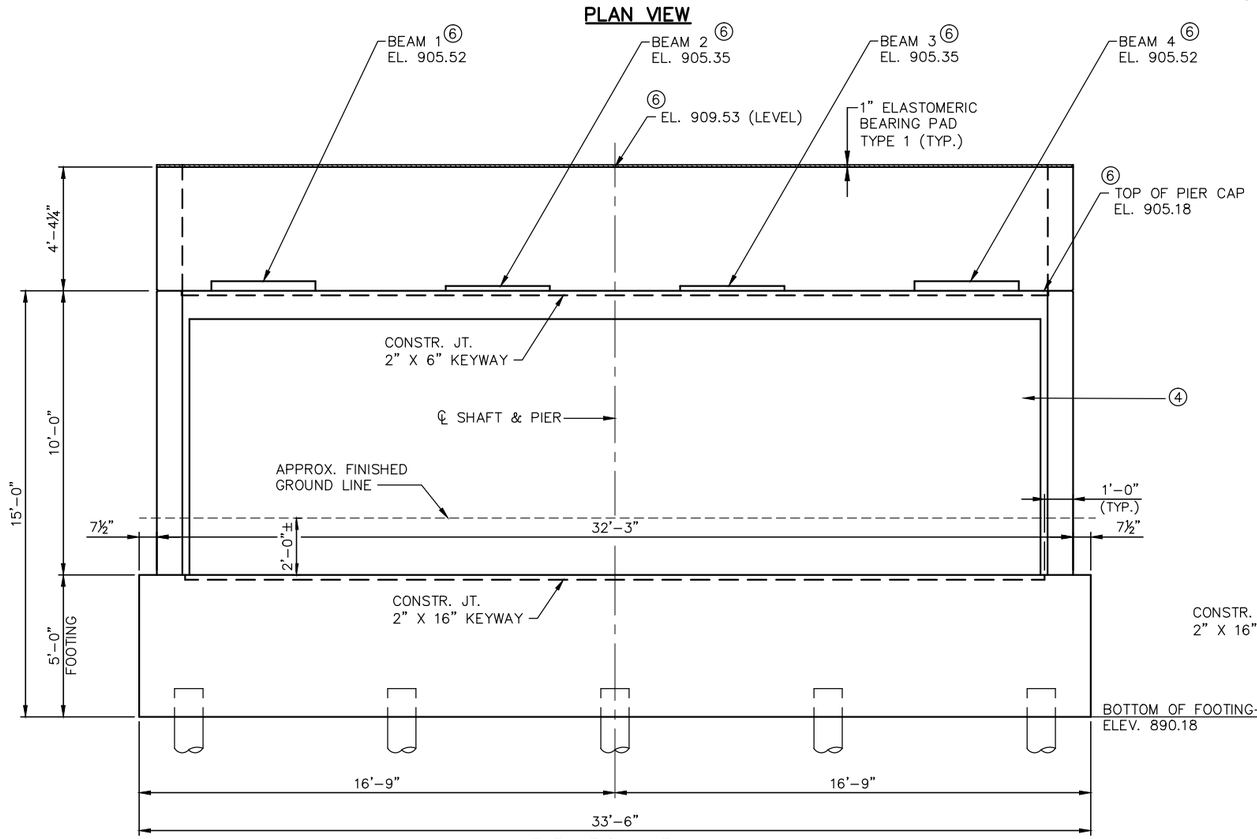
DISCIPLINE: STRUCTURES
SHEET NAME: CBRR0686-BRG-PIR-041

SHEET 44 OF 116

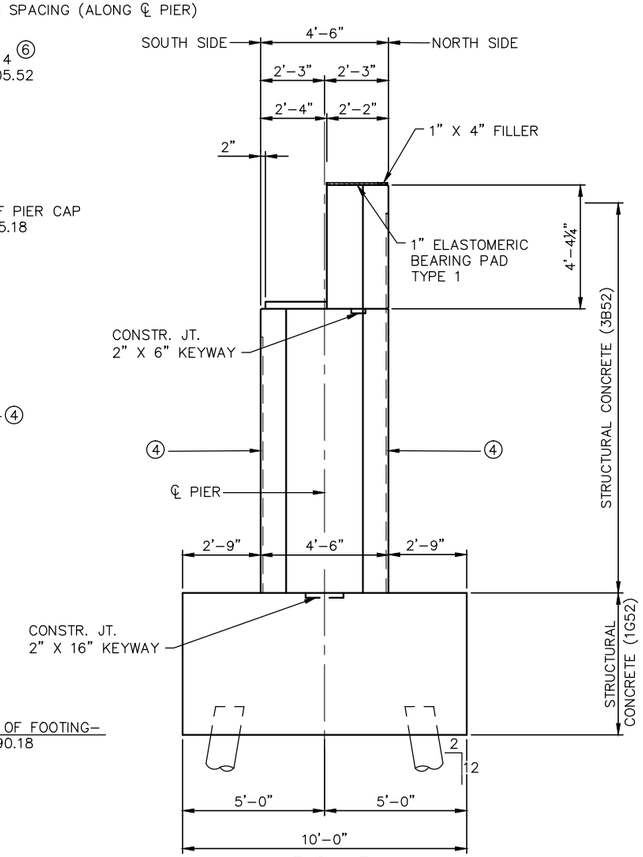
Sep, 21 2015 08:20 am V:\3400_ADC\CAD\SEGMENT W3\PLAN SHEETS\STRUCTURES\CBRR0686\60_percent_Preliminary Plans–Dwg files\CBRR0686–BRG–PIR–041.dwg By: wyttenbacht



PLAN VIEW



ELEVATION VIEW



END VIEW

NOTES:

④ SEE SHEET "AES-001" FOR TEXTURED SURFACE AESTHETIC DETAILS FOR THE WALL PIER SHAFT.

⑥ ELEVATIONS WERE DETERMINED AT ℄ BEARING.

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AK/IGG | CHECKED BY: TR
DRAWN BY: TAW | DATE: 9/21/2015

AECOM

60% SUBMISSION - 09/28/15

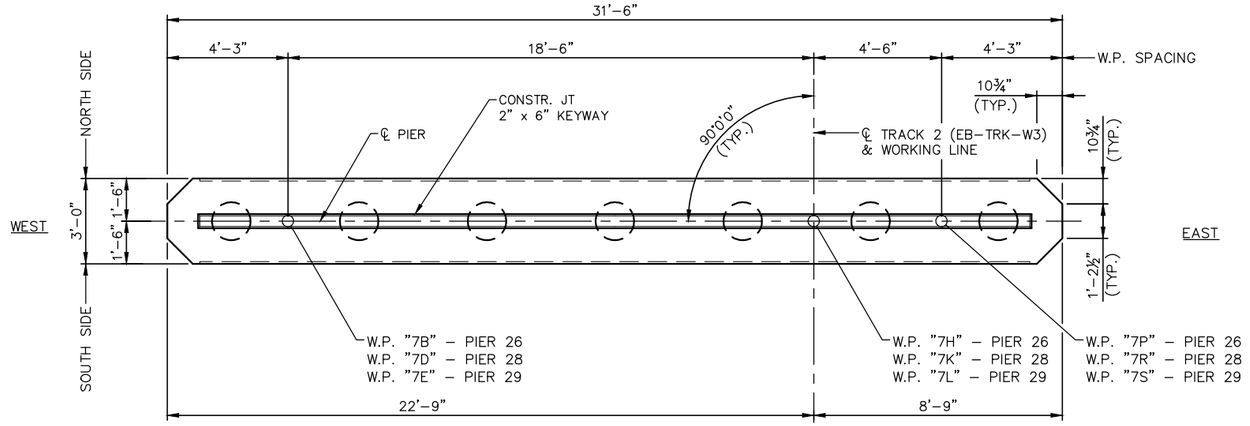
METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

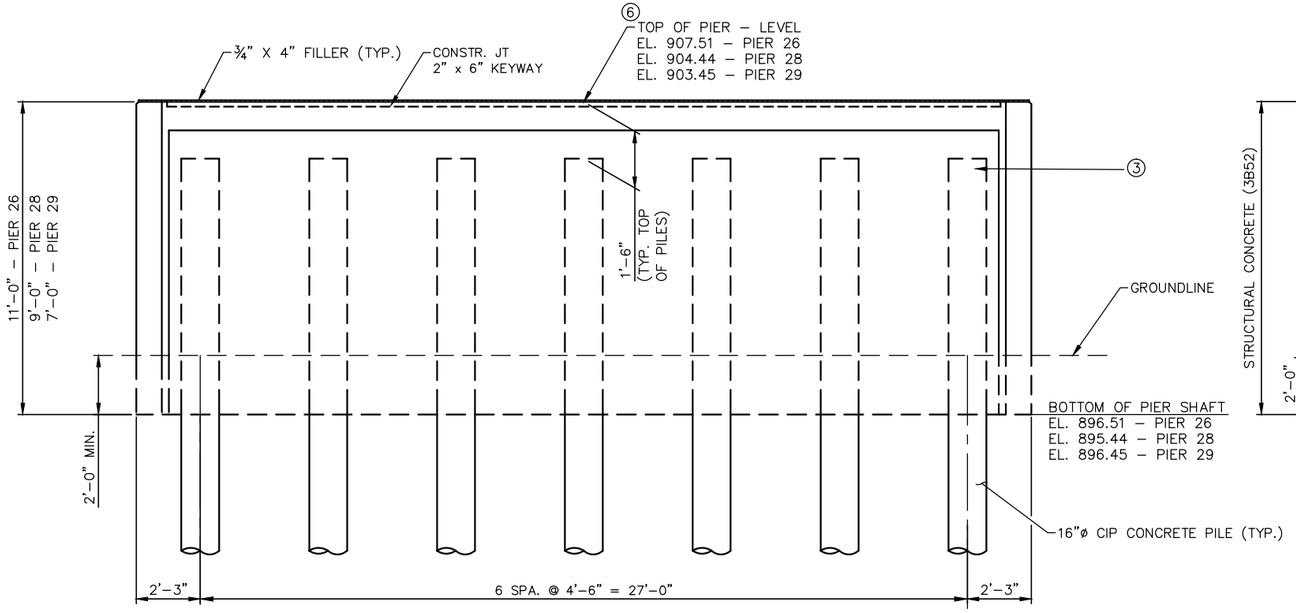
CIVIL WEST - VOLUME 4B
MINNETONKA/HOPKINS
BRIDGE R0686
PIER DETAILS - PIER 25 (2)

DISCIPLINE: STRUCTURES
SHEET NAME: CBRR0686-BRG-PIR-042

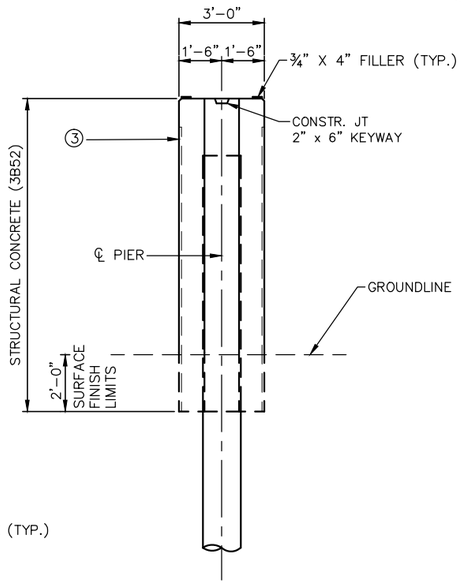
SHEET 45 OF 116



PLAN VIEW



ELEVATION VIEW



END VIEW

PILE NOTES

1 CAST-IN-PLACE CONC. TEST PILE XX FT. LONG
6 CAST-IN-PLACE CONC. PILES EST. LENGTH X FT.
7 CAST-IN-PLACE CONC. PILES REQ'D FOR EACH PIER

PILES TO HAVE A NOMINAL DIAMETER OF 16"

FOR PILE SPLICE DETAILS SEE DETAIL B201.

PIERS 26, 28 & 29
REQUIRED NOMINAL PILE BEARING RESISTANCE FOR CIP PILES R_n – TONS/PILE

FIELD CONTROL METHOD	φ_{dyn}	* R_n
MN/DOT PILE FORMULA 2012 (MPF12) $R_n = 20\sqrt{\frac{W \times H}{1000}} \times LOG(\frac{10}{S})$	0.50	228
PDA	0.65	175

* R_n = (FACTORED DESIGN LOAD) / φ_{dyn}

PIERS 26, 28 & 29
COMPUTED PILE LOAD – TONS/PILE

FACTORED DEAD LOAD + EARTH PRESSURE	88.5
FACTORED LIVE LOAD	20.9
* FACTORED DESIGN LOAD	114

* BASED ON STRENGTH V LOAD COMBINATION

NOTES:

③ SEE SHEET "AES-001" FOR TEXTURED SURFACE AESTHETIC DETAILS FOR THE WALL PIER SHAFT.

⑥ ELEVATIONS WERE DETERMINED AT ℄ OF PIER.

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AK/IGG | CHECKED BY: TR
DRAWN BY: TAW | DATE: 9/21/2015

AECOM

60% SUBMISSION - 09/28/15

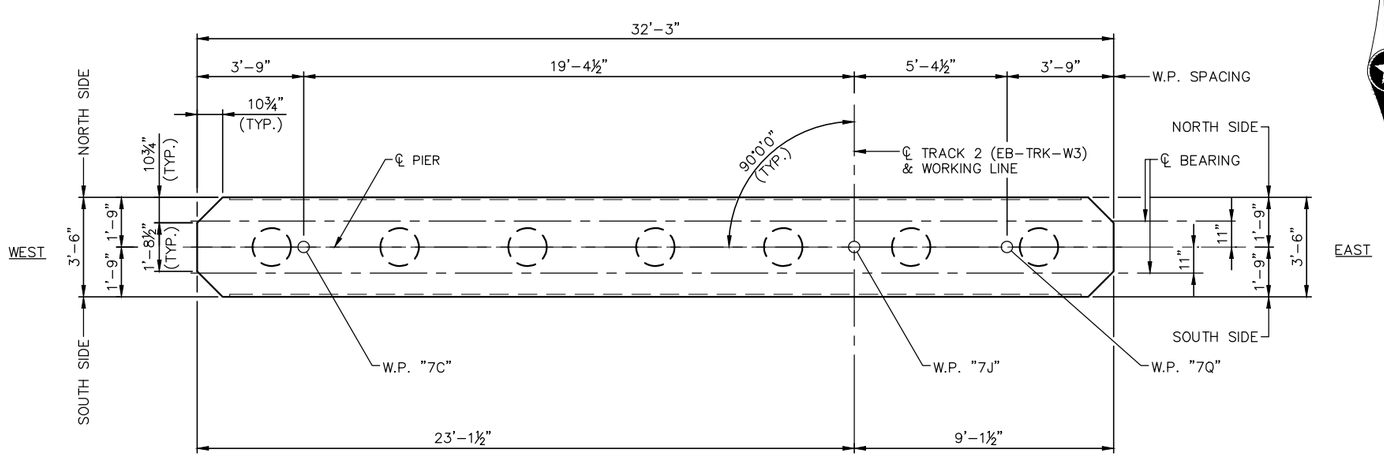
METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

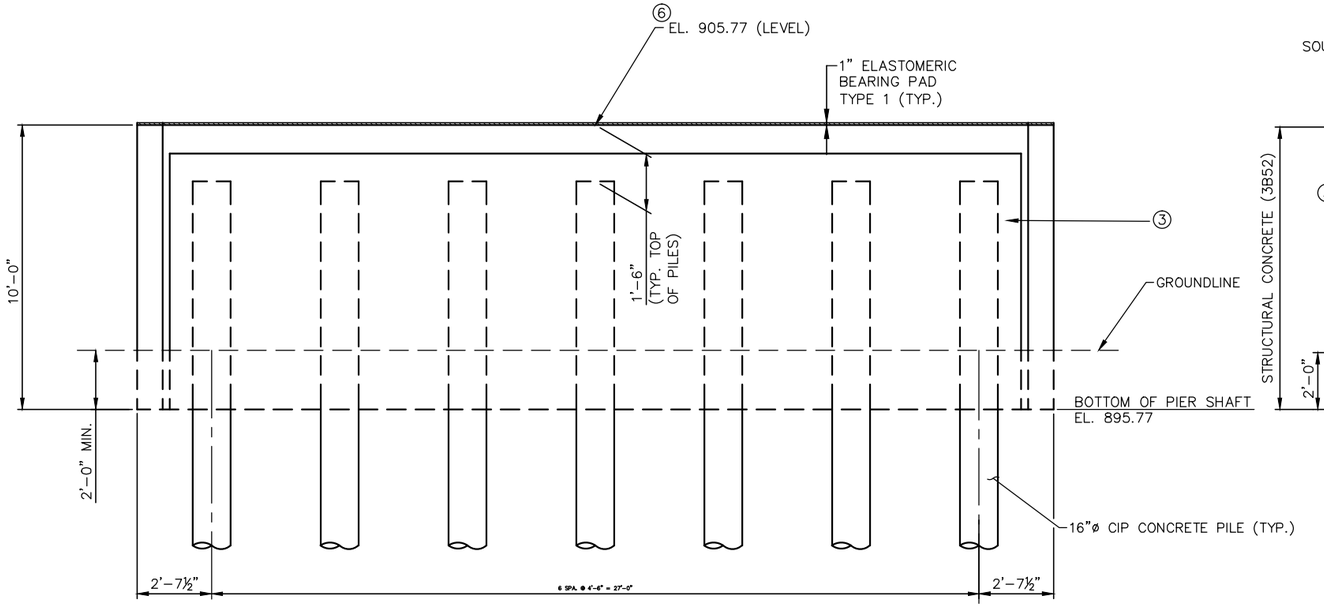
CIVIL WEST - VOLUME 4B
MINNETONKA/HOPKINS
BRIDGE R0686
PIER DETAILS - PIERS 26 & 28 & 29

DISCIPLINE: STRUCTURES
SHEET NAME: CBRR0686-BRG-PIR-046

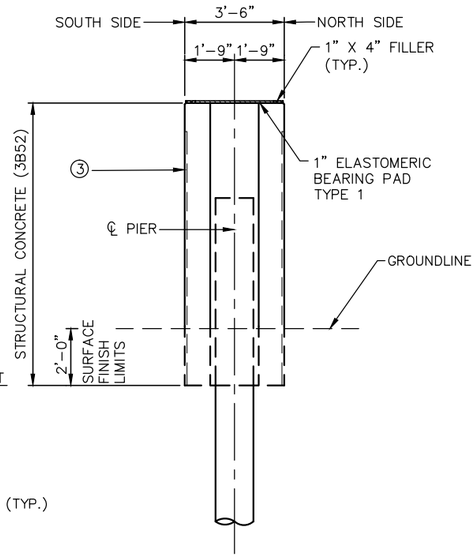
SHEET 46 OF 116



PLAN VIEW



ELEVATION VIEW



END VIEW

PILE NOTES

1 CAST-IN-PLACE CONC. TEST PILE XX FT. LONG
6 CAST-IN-PLACE CONC. PILES EST. LENGTH X FT.
7 CAST-IN-PLACE CONC. PILES REQ'D FOR PIER 27

PILES TO HAVE A NOMINAL DIAMETER OF 16"

FOR PILE SPLICE DETAILS SEE DETAIL B201.

PIER 27
REQUIRED NOMINAL PILE BEARING RESISTANCE FOR CIP PILES R_n – TONS/PILE

FIELD CONTROL METHOD	φ_{dyn}	* R_n
MN/DOT PILE FORMULA 2012 (MPF12) $R_n = 20\sqrt{\frac{W \times H}{1000}} \times \log(\frac{10}{S})$	0.50	228
PDA	0.65	175

* R_n = (FACTORED DESIGN LOAD) / φ_{dyn}

PIER 27
COMPUTED PILE LOAD – TONS/PILE

FACTORED DEAD LOAD + EARTH PRESSURE	88.5
FACTORED LIVE LOAD	20.9
* FACTORED DESIGN LOAD	114

* BASED ON STRENGTH V LOAD COMBINATION

NOTES:

③ SEE SHEET "AES-001" FOR TEXTURED SURFACE AESTHETIC DETAILS FOR WALL PIER SHAFT.

⑥ ELEVATIONS WERE DETERMINED AT ℄ OF PIER AT THE TOP OF CONCRETE..

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AK/IGG | CHECKED BY: TR
DRAWN BY: TAW | DATE: 9/21/2015

AECOM

60% SUBMISSION - 09/28/15

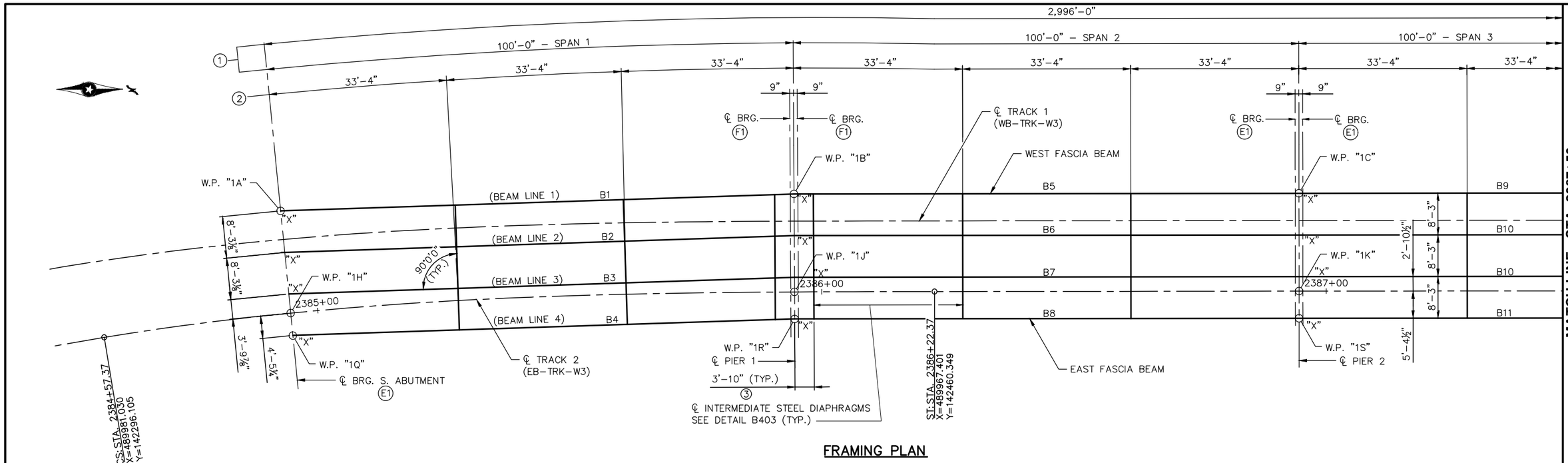
METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

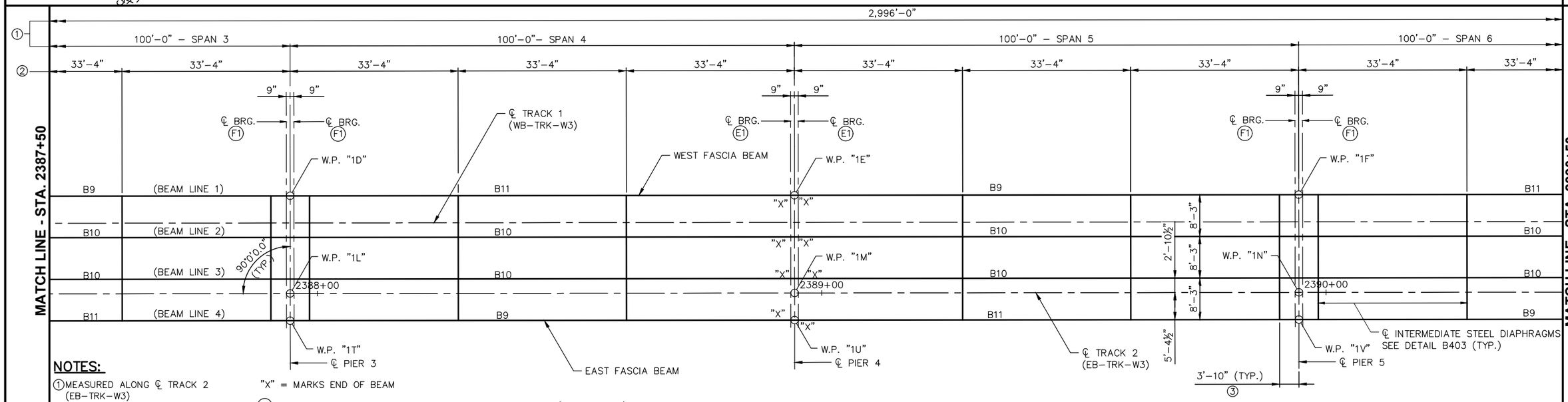
CIVIL WEST - VOLUME 4B
MINNETONKA/HOPKINS
BRIDGE R0686
PIER DETAILS - PIER 27

DISCIPLINE: STRUCTURES
SHEET NAME: CBRR0686-BRG-PIR-049

SHEET 47 OF 116



FRAMING PLAN



NOTES:

1. MEASURED ALONG ℄ TRACK 2 (EB-TRK-W3)
2. INTERMEDIATE DIAPH. SPG. MEASURED ALONG ℄ TRACK 2 (EB-TRK-W3)
3. FROM ℄ PIER TO ℄ DIAPHRAGM (ALONG ℄ TRACK 2)

"X" = MARKS END OF BEAM

(E1) = EXPANSION CURVED PLATE BEARING ASSEMBLY, TYPE 1 (20 REQUIRED)

(F1) = FIXED CURVED PLATE BEARING ASSEMBLY, TYPE 1 (24 REQUIRED)

FRAMING PLAN

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AK/IGG | CHECKED BY: TR
DRAWN BY: TAW | DATE: 9/21/2015

AECOM

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

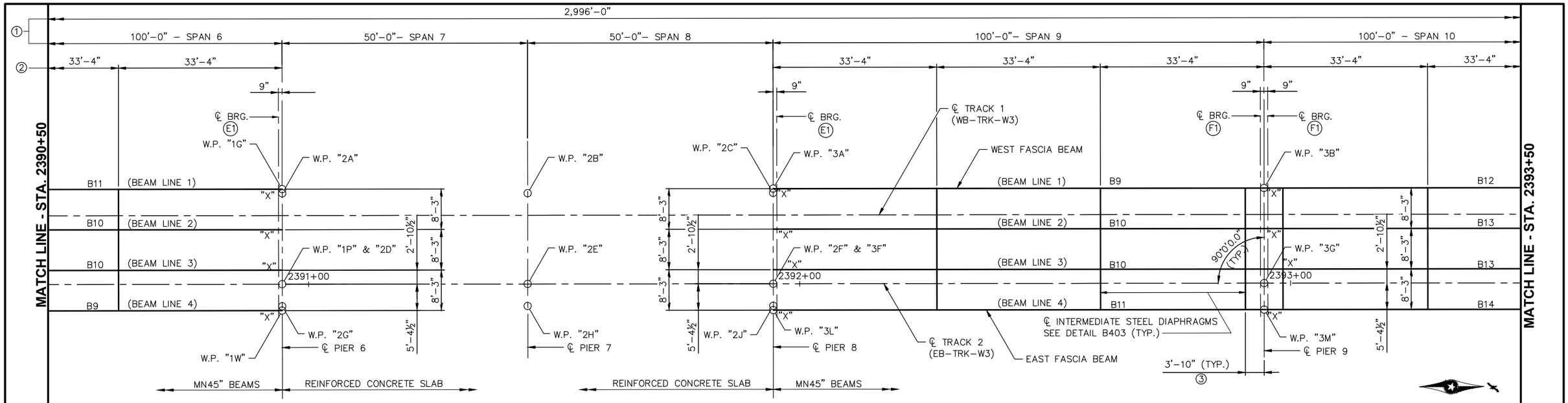
SOUTHWEST Green Line LRT Extension

CIVIL WEST - VOLUME 4B
MINNETONKA/HOPKINS
BRIDGE R0686
FRAMING PLAN 1

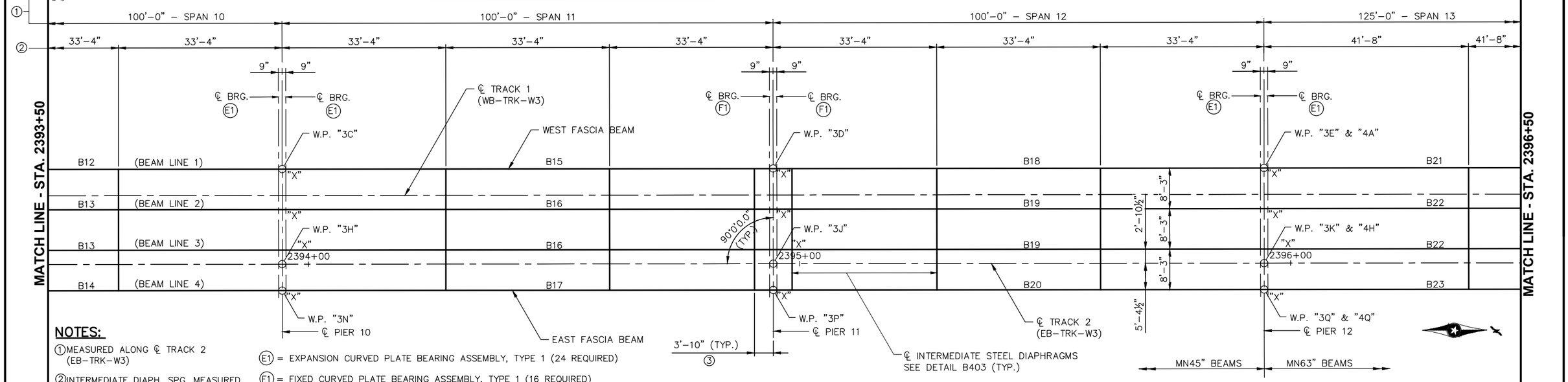
DISCIPLINE: STRUCTURES
SHEET NAME: CBRR0686-BRG-SUP-010

SHEET 48 OF 116

Sep, 21 2015 08:21 am V:\3400_ADC\CAD\SEGMENT W3\PLAN SHEETS\STRUCTURES\CBRR0686\60_percent_Preliminary Plans-Dwg files\CBRR0686-BRG-FRAM.dwg By: wyttenbacht



FRAMING PLAN



FRAMING PLAN

NOTES:

1. ① MEASURED ALONG ℄ TRACK 2 (EB-TRK-W3)
2. ② INTERMEDIATE DIAPH. SPG. MEASURED ALONG ℄ TRACK 2 (EB-TRK-W3)
3. ③ FROM ℄ PIER TO ℄ DIAPHRAGM (ALONG ℄ TRACK 2)

(E1) = EXPANSION CURVED PLATE BEARING ASSEMBLY, TYPE 1 (24 REQUIRED)

(F1) = FIXED CURVED PLATE BEARING ASSEMBLY, TYPE 1 (16 REQUIRED)

"X" = MARKS END OF BEAM

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AK/IGG | CHECKED BY: TR
DRAWN BY: TAW | DATE: 9/21/2015

AECOM

60% SUBMISSION - 09/28/15

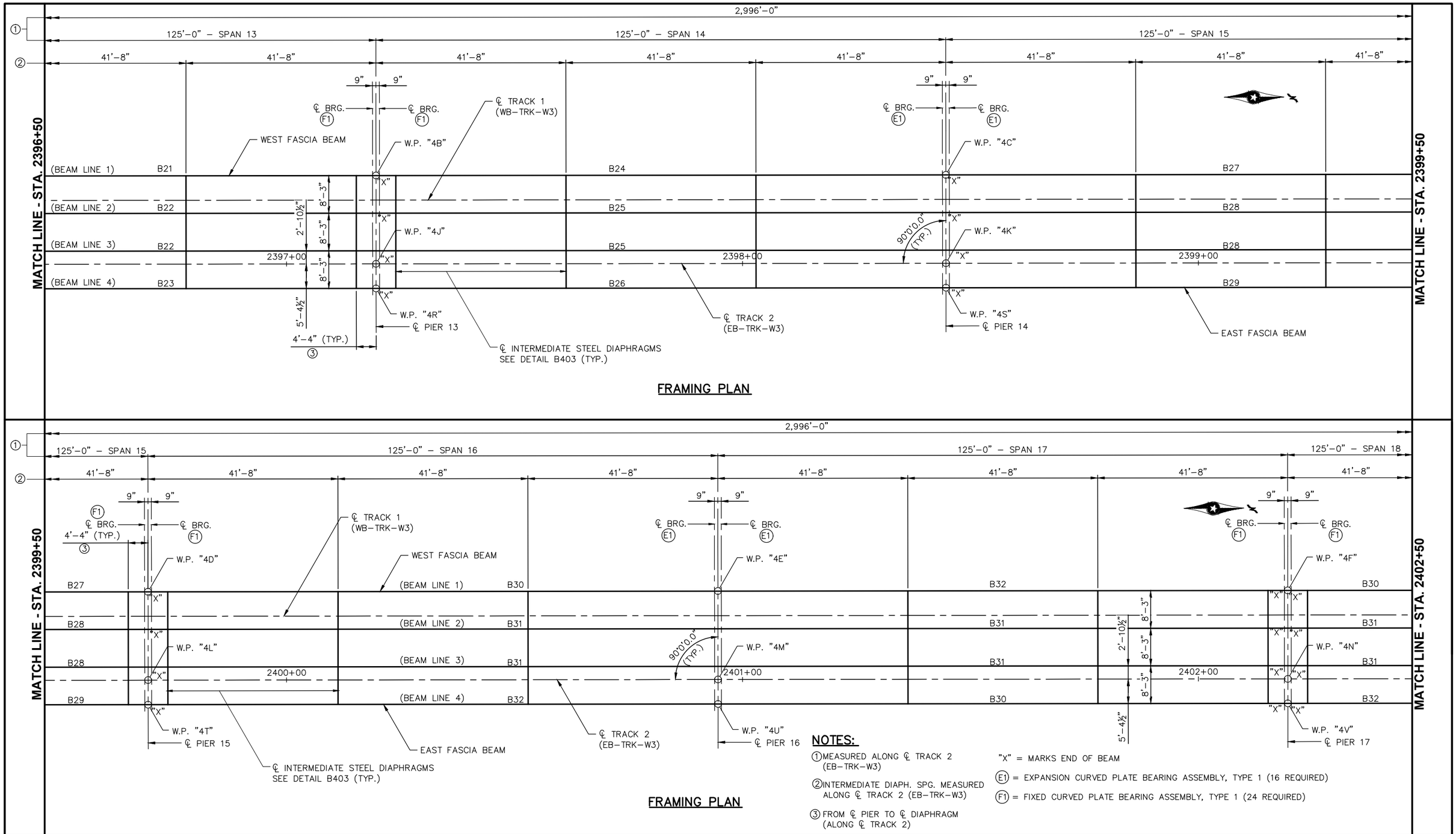
METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

CIVIL WEST - VOLUME 4B
MINNETONKA/HOPKINS
BRIDGE R0686
FRAMING PLAN 2

DISCIPLINE: STRUCTURES
SHEET NAME: CBRR0686-BRG-SUP-011

SHEET 49 OF 116



NOTES:

1. MEASURED ALONG ℄ TRACK 2 (EB-TRK-W3)
2. INTERMEDIATE DIAPH. SPG. MEASURED ALONG ℄ TRACK 2 (EB-TRK-W3)
3. FROM ℄ PIER TO ℄ DIAPHRAGM (ALONG ℄ TRACK 2)

"X" = MARKS END OF BEAM

(E1) = EXPANSION CURVED PLATE BEARING ASSEMBLY, TYPE 1 (16 REQUIRED)

(F1) = FIXED CURVED PLATE BEARING ASSEMBLY, TYPE 1 (24 REQUIRED)

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AK/IGG | CHECKED BY: TR
DRAWN BY: TAW | DATE: 9/21/2015

AECOM

60% SUBMISSION - 09/28/15

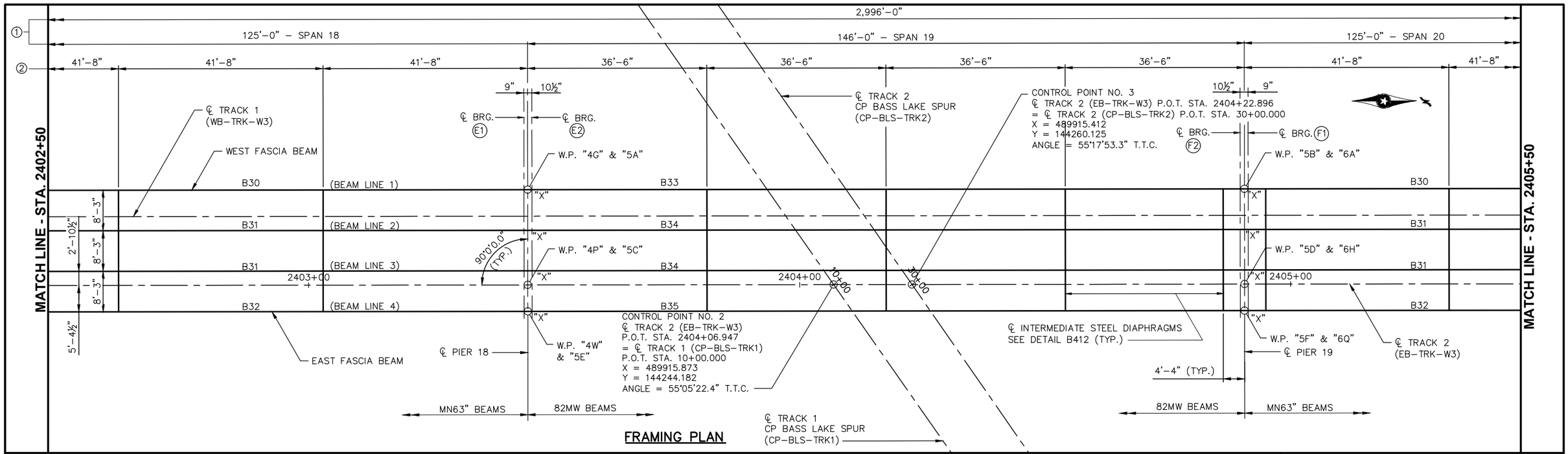
METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

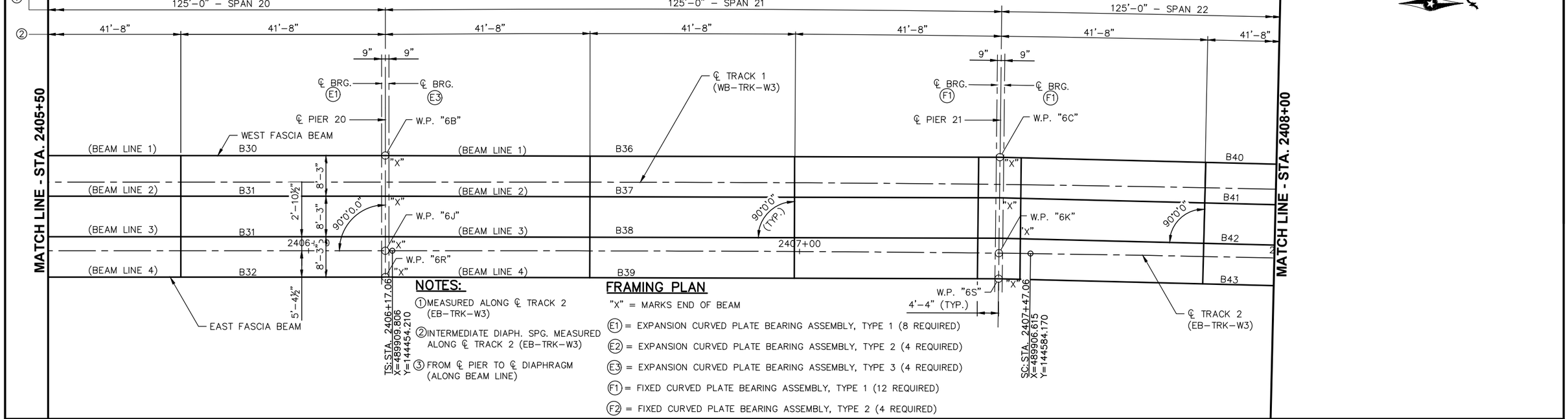
CIVIL WEST - VOLUME 4B
MINNETONKA/HOPKINS
BRIDGE R0686
FRAMING PLAN 3

DISCIPLINE: STRUCTURES
SHEET NAME: CBRR0686-BRG-SUP-012

SHEET 50 OF 116



FRAMING PLAN



NOTES:

1. MEASURED ALONG ℄ TRACK 2 (EB-TRK-W3)
2. INTERMEDIATE DIAPH. SPG. MEASURED ALONG ℄ TRACK 2 (EB-TRK-W3)
3. FROM ℄ PIER TO ℄ DIAPHRAGM (ALONG BEAM LINE)

FRAMING PLAN

"X" = MARKS END OF BEAM

(E1) = EXPANSION CURVED PLATE BEARING ASSEMBLY, TYPE 1 (8 REQUIRED)

(E2) = EXPANSION CURVED PLATE BEARING ASSEMBLY, TYPE 2 (4 REQUIRED)

(E3) = EXPANSION CURVED PLATE BEARING ASSEMBLY, TYPE 3 (4 REQUIRED)

(F1) = FIXED CURVED PLATE BEARING ASSEMBLY, TYPE 1 (12 REQUIRED)

(F2) = FIXED CURVED PLATE BEARING ASSEMBLY, TYPE 2 (4 REQUIRED)

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AK/IGG | CHECKED BY: TR
DRAWN BY: TAW | DATE: 9/21/2015

AECOM

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

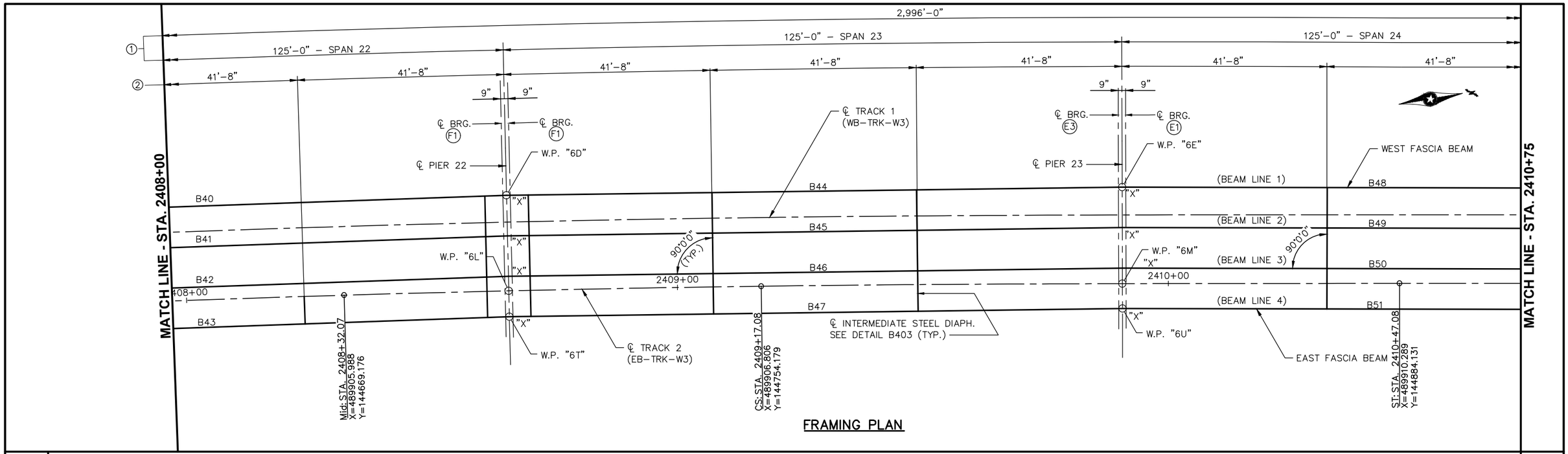
CIVIL WEST - VOLUME 4B
MINNETONKA/HOPKINS
BRIDGE R0686
FRAMING PLAN 4

DISCIPLINE: STRUCTURES

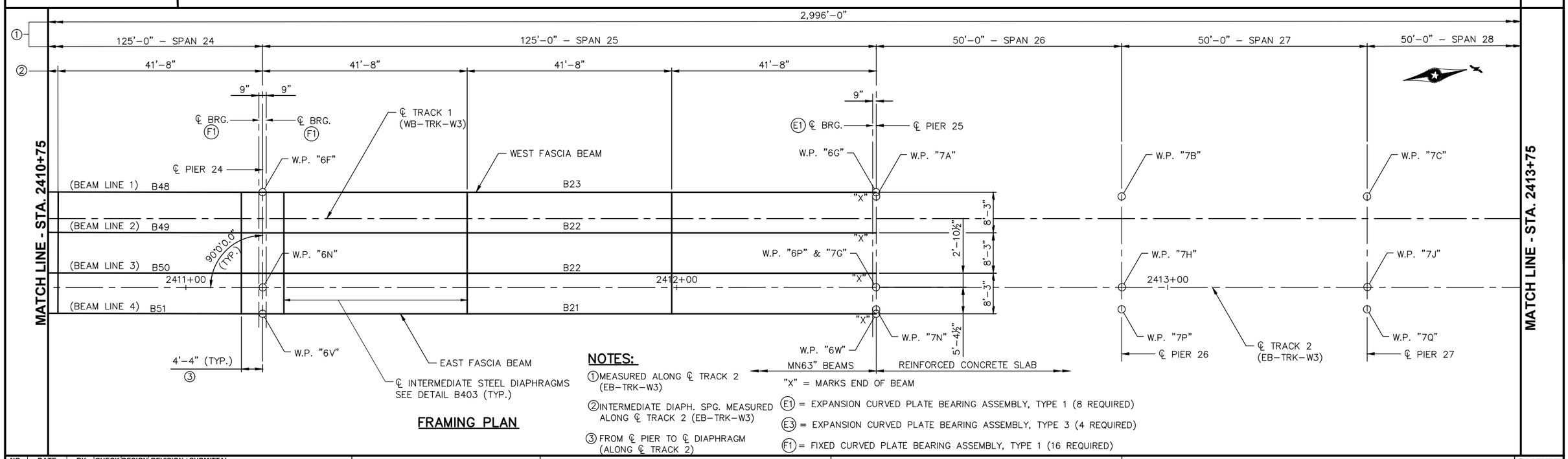
SHEET NAME: CBRR0686-BRG-SUP-013

SHEET 51 OF 116

Sep. 21 2015 08:21 am V:\3400_ADC\CAD\SEGMENT W3\PLAN SHEETS\STRUCTURES\CBRR0686\60_percent_Preliminary Plans-Dwg files\CBRR0686-BRG-FRAM.dwg By: wyttenbacht



FRAMING PLAN



FRAMING PLAN

NOTES:

① MEASURED ALONG ℄ TRACK 2 (EB-TRK-W3)

② INTERMEDIATE DIAPH. SPG. MEASURED ALONG ℄ TRACK 2 (EB-TRK-W3)

③ FROM ℄ PIER TO ℄ DIAPHRAGM (ALONG ℄ TRACK 2)

"X" = MARKS END OF BEAM

(E1) = EXPANSION CURVED PLATE BEARING ASSEMBLY, TYPE 1 (8 REQUIRED)

(E3) = EXPANSION CURVED PLATE BEARING ASSEMBLY, TYPE 3 (4 REQUIRED)

(F1) = FIXED CURVED PLATE BEARING ASSEMBLY, TYPE 1 (16 REQUIRED)

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AK/IGG | CHECKED BY: TR
DRAWN BY: TAW | DATE: 9/21/2015

AECOM

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

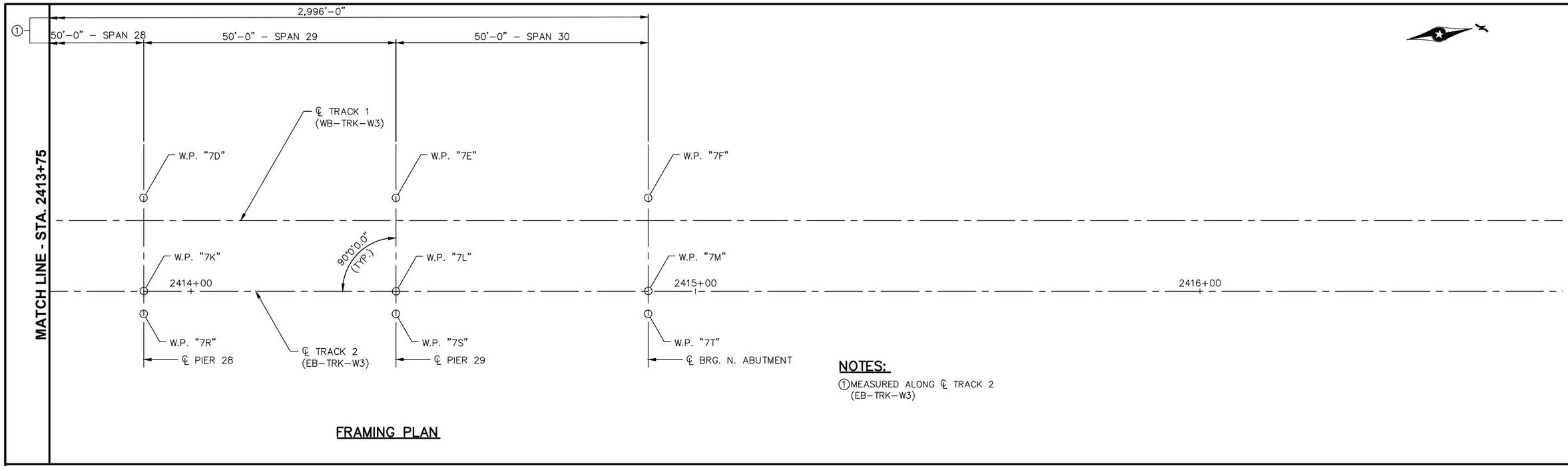
SOUTHWEST Green Line LRT Extension

CIVIL WEST - VOLUME 4B
MINNETONKA/HOPKINS
BRIDGE R0686
FRAMING PLAN 5

DISCIPLINE: STRUCTURES
SHEET NAME: CBRR0686-BRG-SUP-014

SHEET 52 OF 116

Sep, 21 2015 08:21 am V:\3400_ADC\CAD\SEGMENT W3\PLAN SHEETS\STRUCTURES\CBRR0686\60_percent_Preliminary Plans-Dwg files\CBRR0686-BRG-FRAM.dwg By: wyttenbacht



FRAMING PLAN

NOTES:

①MEASURED ALONG ℄ TRACK 2 (EB-TRK-W3)

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AK/IGG | CHECKED BY: TR
DRAWN BY: TAW | DATE: 9/21/2015

AECOM

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

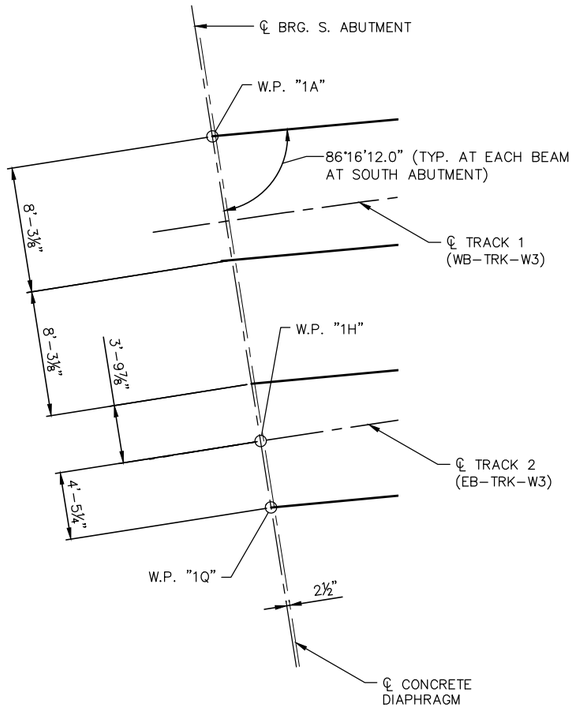
SOUTHWEST
Green Line LRT Extension

CIVIL WEST - VOLUME 4B
MINNETONKA/HOPKINS
BRIDGE R0686
FRAMING PLAN 6

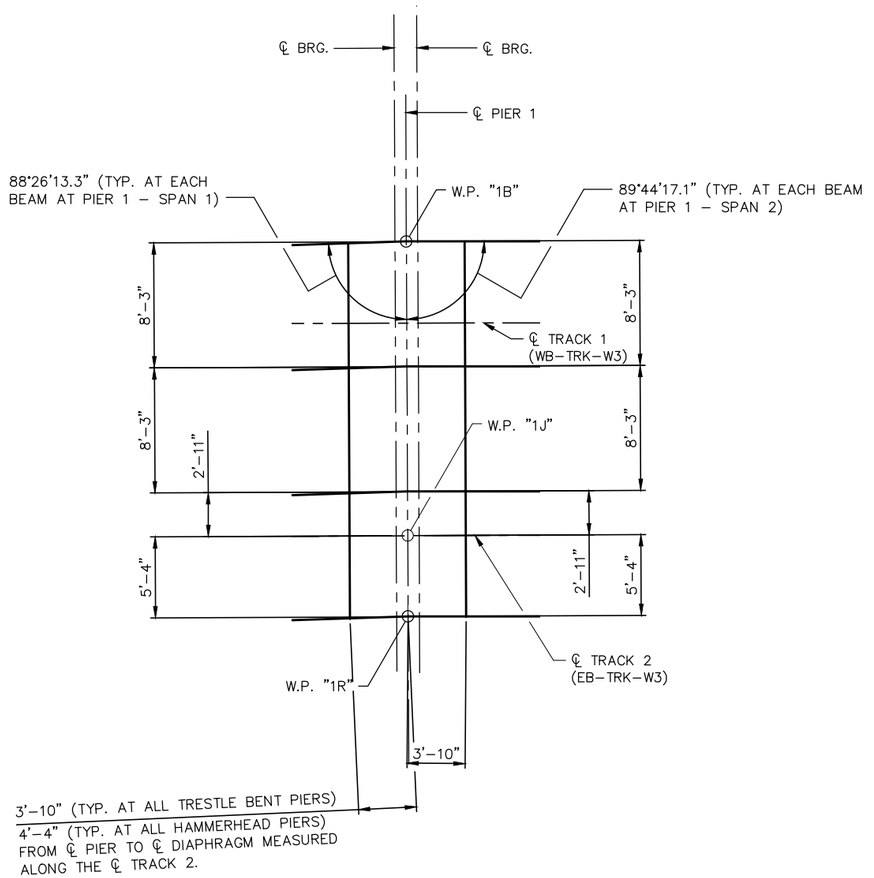
DISCIPLINE: STRUCTURES
SHEET NAME: CBRR0686-BRG-SUP-015

SHEET 53 OF 116

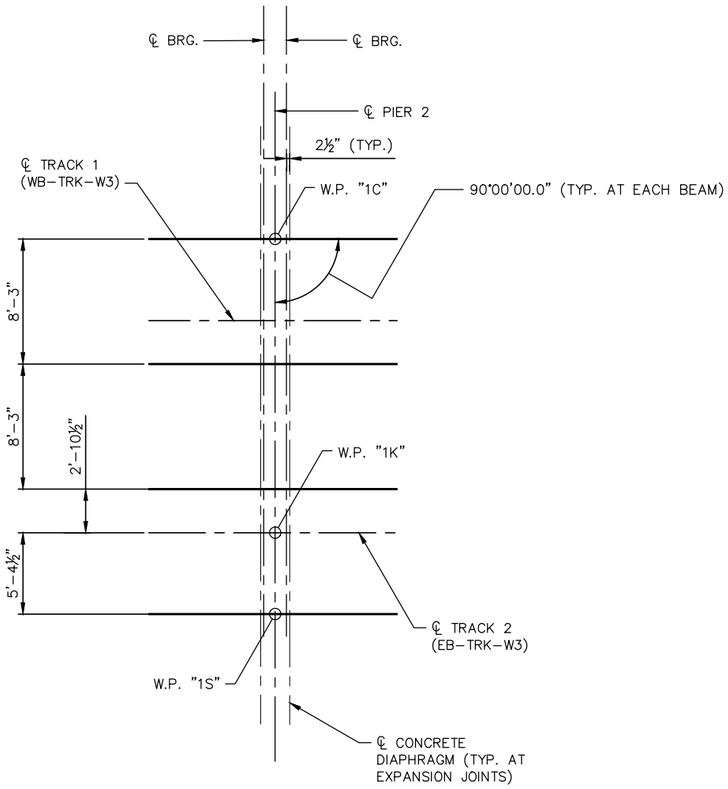
Sep. 21 2015 08:21 am V:\3400_ADC\CAD\SEGMENT W3\PLAN SHEETS\STRUCTURES\CBRR0686\60_percent_Preliminary Plans-Dwg files\CBRR0686-BRG-FRAM.dwg By: wyttenbacht



SOUTH ABUTMENT



PIER 1



PIER 2

(BEAM SPACING SHOWN AT PIER 2 – SPAN 2 SIDE, SIMILAR AT SPANS 3–6, 9–20 AND 24.)

NOTES:

DIMENSIONS BETWEEN BEAMS ARE ALONG ℄ OF BEARING.

ANGLES SHOWN ARE FROM ℄ BEAM TO ℄ OF PIER OR ℄ BRG. SOUTH ABUTMENT.

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AK/IGG | CHECKED BY: TR
DRAWN BY: TAW | DATE: 9/21/2015

AECOM

60% SUBMISSION - 09/28/15

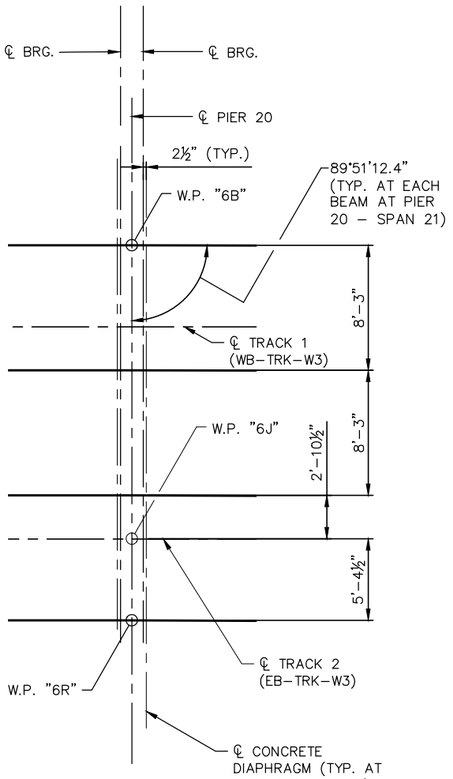
METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

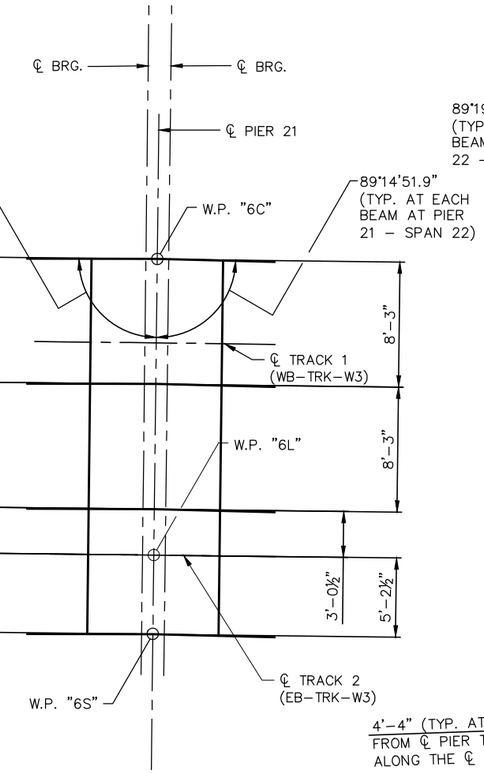
CIVIL WEST - VOLUME 4B
MINNETONKA/HOPKINS
BRIDGE R0686
FRAMING PLAN DETAILS 1

DISCIPLINE: STRUCTURES
SHEET NAME: CBRR0686-BRG-SUP-016

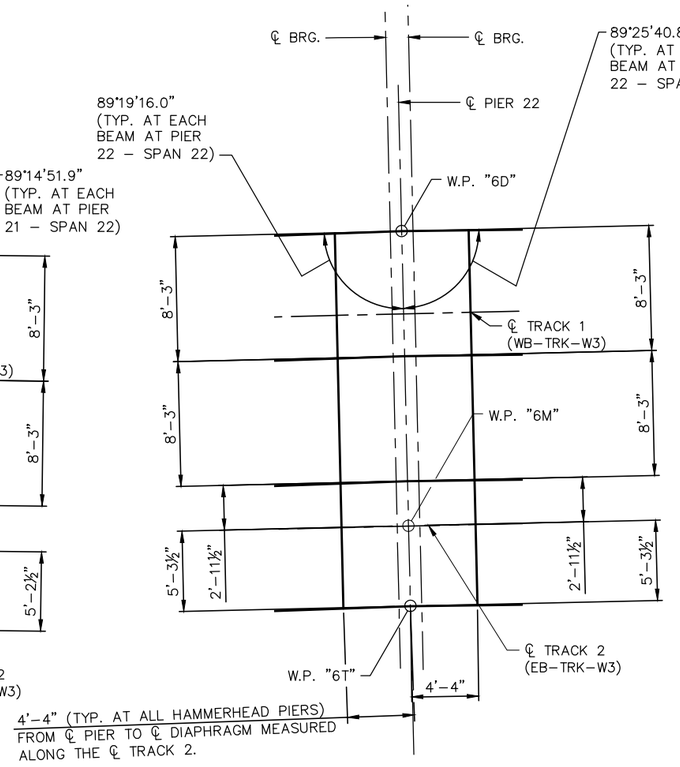
SHEET 54 OF 116



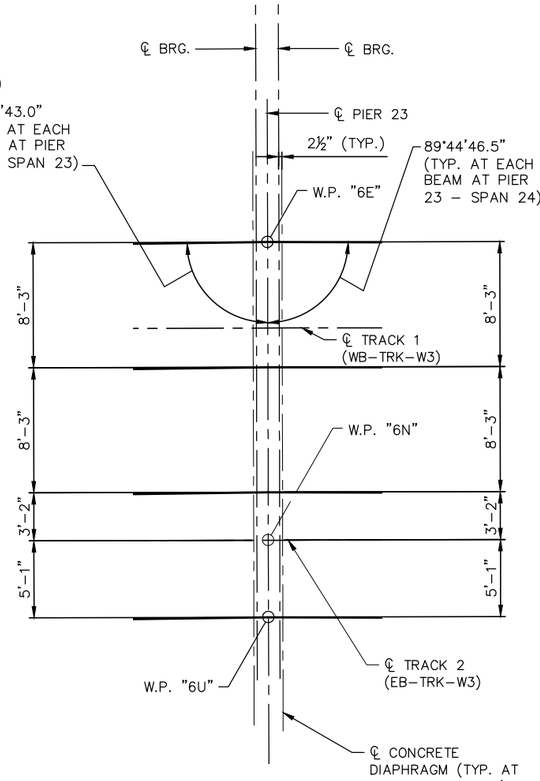
PIER 20



PIER 21



PIER 22



PIER 23

NOTES:

DIMENSIONS BETWEEN BEAMS ARE ALONG ℄ OF BEARING.

ANGLES SHOWN ARE FROM ℄ BEAM TO ℄ OF PIER.

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AK/IGG | CHECKED BY: TR
DRAWN BY: TAW | DATE: 9/21/2015

AECOM

60% SUBMISSION - 09/28/15

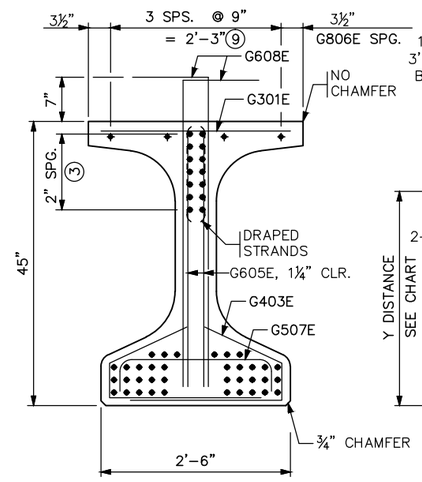
METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

CIVIL WEST - VOLUME 4B
MINNETONKA/HOPKINS
BRIDGE R0686
FRAMING PLAN DETAILS 2

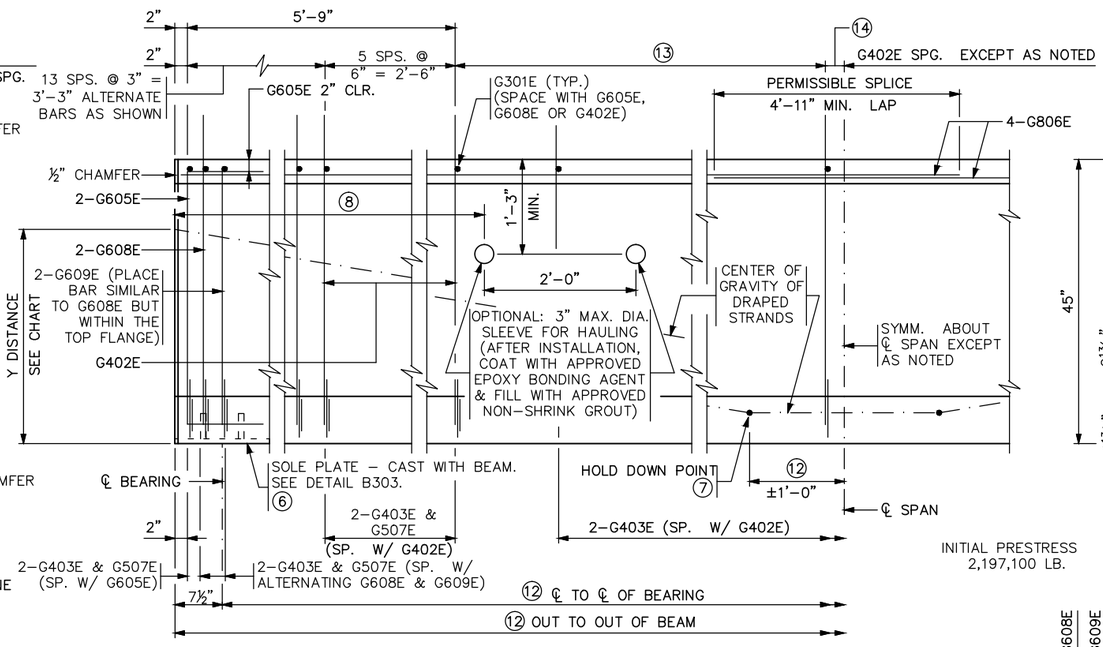
DISCIPLINE: STRUCTURES
SHEET NAME: CBRR0686-BRG-SUP-017

SHEET 55 OF 116



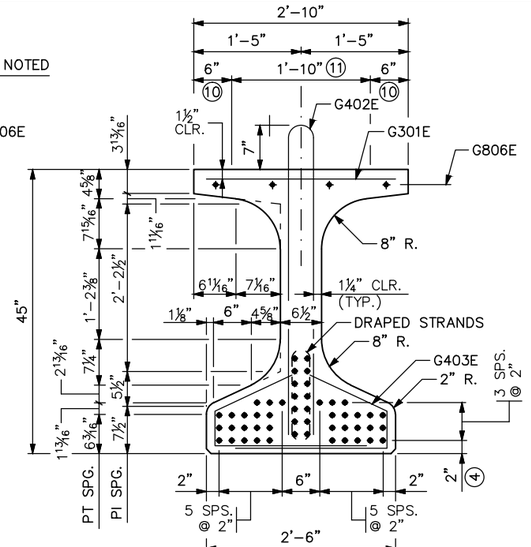
END VIEW

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



BEAM ELEVATION

INITIAL PRESTRESS 2,197,100 LB.

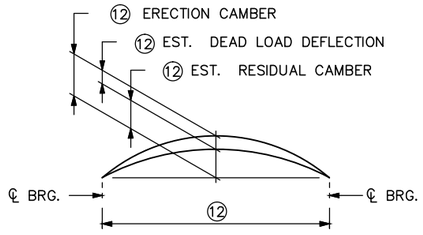


SECTION AT ℄ SPAN

Y DISTANCES (INCHES)			
	NO.	℄ SPAN	END
STRAIGHT STRANDS	36	4.67	
DRAPED STRANDS	14	9.00	36.00 ▫
TOTAL STRANDS	50	5.88	

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.

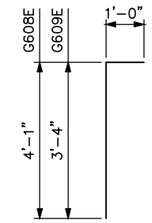
DEAD LOAD DEFLECTION SHOWN IS FOR WEIGHT OF SLAB, METAL RAIL, CURB, RUNNING RAIL, PLINTHS AND CABLE TROUGH WHERE APPLICABLE.

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.

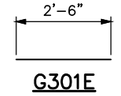
CALCULATED PRESTRESS LOSSES		
ELASTIC SHORTENING LOSS	(12)	KSI
LONG TERM LOSSES	(12)	KSI
TOTAL LOSSES	(12)	KSI

MINIMUM CONCRETE STRENGTH - K.S.I.	
(1) f'ci	(2) f'c
7.5 KSI	9 KSI

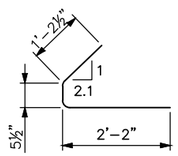
PRESTRESSING STRAND DIAMETER	
(5)	½" ☐
(5)	0.60" ☒



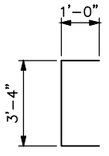
G608E & G609E



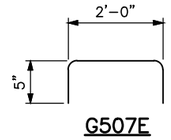
G301E



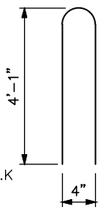
G403E



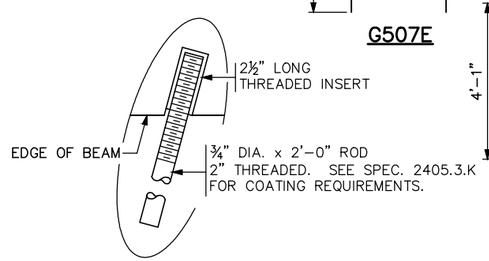
G605E



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 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 (12) 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.

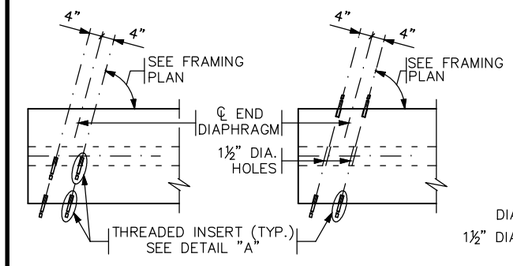
(8) DIMENSION DETERMINED BY CONTRACTOR. MAINTAIN 2" MINIMUM CLEAR FROM STRANDS.

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

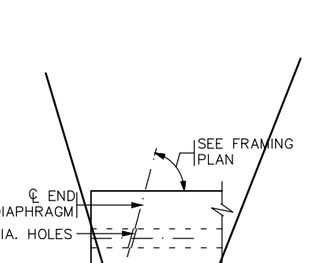
(10) STEEL TROWEL TO SMOOTH FINISH AND APPLY BOND BREAKER PER APPROVED PRODUCTS LIST.

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

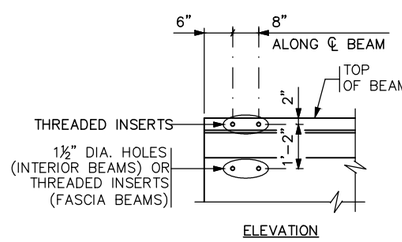
(12)(13)(14) SEE TABLE ON SHEET PCB-001.



PLAN AT FASCIA BEAMS



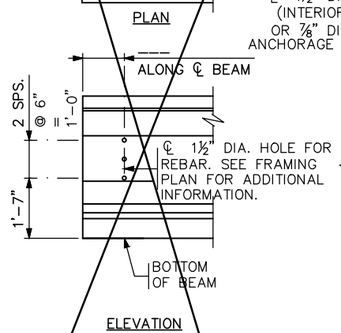
PLAN AT INTERIOR BEAMS



ELEVATION

CONCRETE END DIAPHRAGM

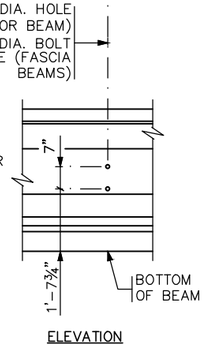
PARAPET ABUTMENT
(SEE DETAIL B814 FOR DIAPHRAGM DETAILS)



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

BEAMS B1-B4

FIG. 5-397.507

CERTIFIED BY _____ LICENSED PROFESSIONAL ENGINEER _____ DATE

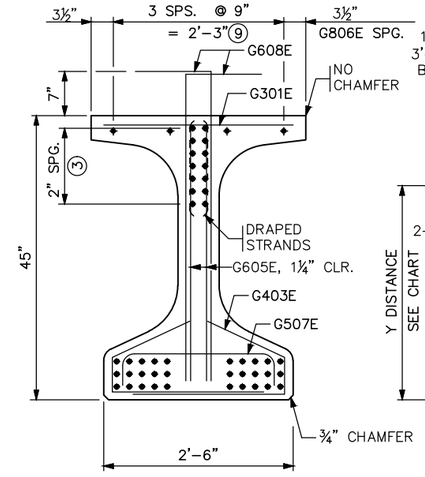
NAME: LIC. NO.

TITLE: MN45" PRESTRESSED CONCRETE BEAM (PRETENSIONED) MN45-100

DES: AK/IGG	DR: TAW	APPROVED:	BRIDGE NO.
CHK: TR	CHK: TR		R0686

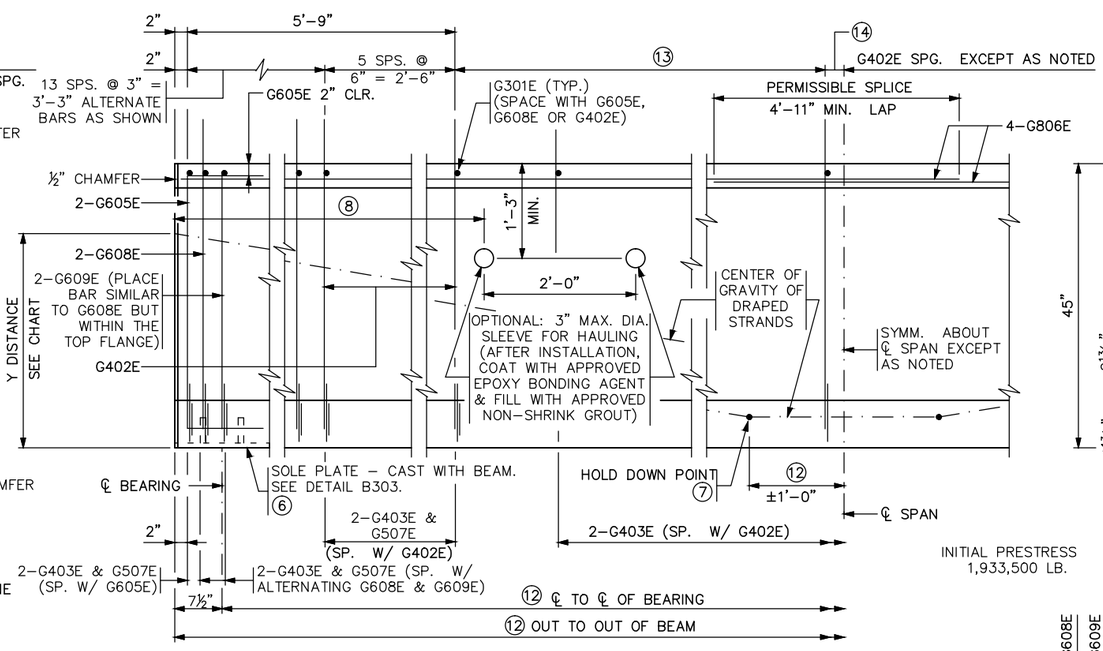
SHEET NO. 55 OF 116 SHEETS

CBRR0686-BRG-PCB-001



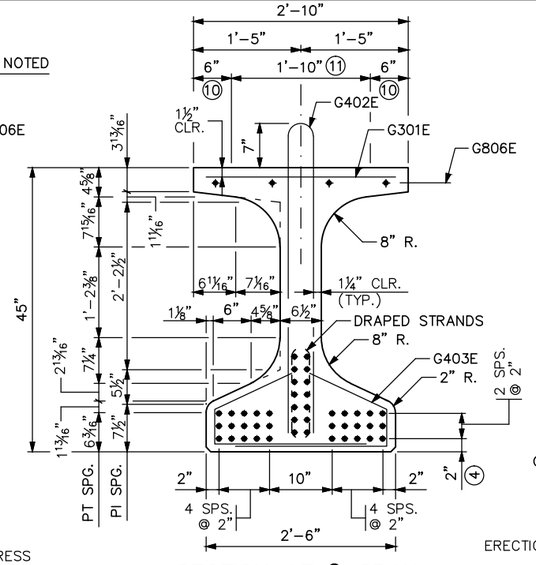
END VIEW

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



BEAM ELEVATION

INITIAL PRESTRESS 1,933,500 LB.

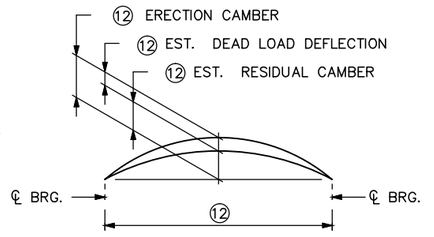


SECTION AT ℄ SPAN

Y DISTANCES (INCHES)			
	NO.	℄ SPAN	END
STRAIGHT STRANDS	30	4.00	
DRAPED STRANDS	14	9.00	36.00 ▫
TOTAL STRANDS	44	5.59	

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.

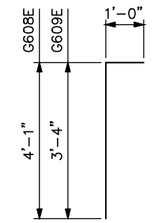
DEAD LOAD DEFLECTION SHOWN IS FOR WEIGHT OF SLAB, METAL RAIL, CURB, RUNNING RAIL, PLINTHS AND CABLE TROUGH WHERE APPLICABLE.

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	(12)	KSI
LONG TERM LOSSES	(12)	KSI
TOTAL LOSSES	(12)	KSI

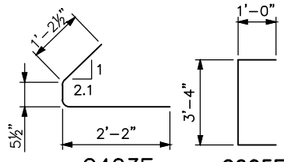
MINIMUM CONCRETE STRENGTH - K.S.I.	
(1) f'ci	(2) f'c
7 KSI	9 KSI

PRESTRESSING STRAND DIAMETER	
(5)	½" ☐
(5)	0.60" ☒



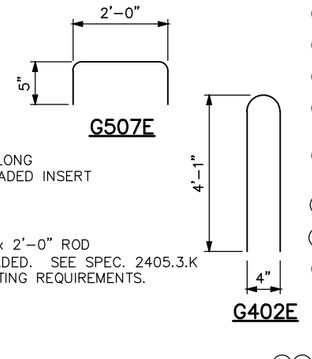
G608E & G609E

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 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 (12) 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.

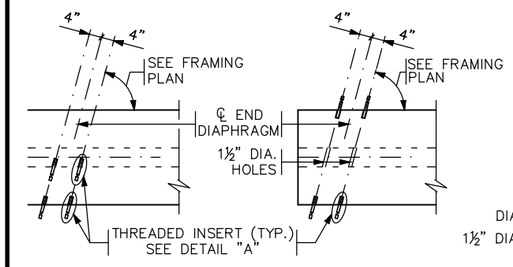
(8) DIMENSION DETERMINED BY CONTRACTOR. MAINTAIN 2" MINIMUM CLEAR FROM STRANDS.

(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.

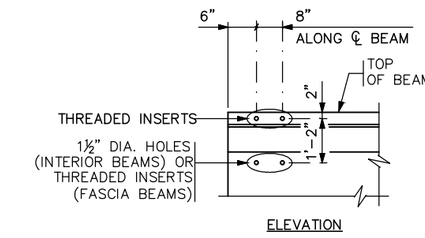
(11) ROUGH FLOAT AND BROOM TRANSVERSELY FOR BOND PER SPEC. 2405.3.D.

(12)(13)(14) SEE TABLE ON SHEET PCB-001.



PLAN AT FASCIA BEAMS

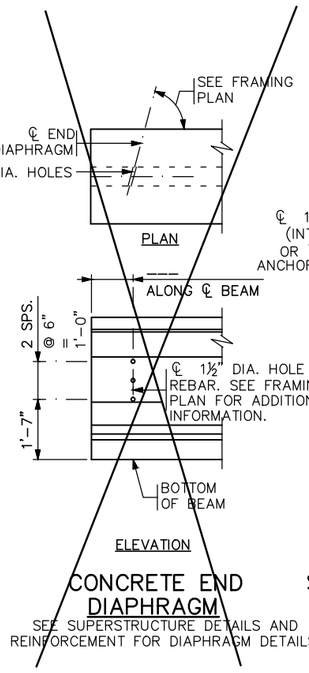
PLAN AT INTERIOR BEAMS

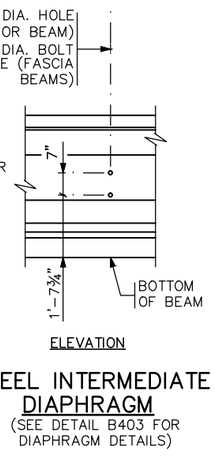


ELEVATION

CONCRETE END DIAPHRAGM

EXPANSION JOINT
(SEE DETAIL B814 FOR DIAPHRAGM DETAILS)





BEAMS B5-B20

FIG. 5-397.507

REVISED:

APPROVED: JANUARY 13, 2015
Nancy Dorbenberger
STATE BRIDGE ENGINEER

CERTIFIED BY _____ DATE
LICENSED PROFESSIONAL ENGINEER
NAME: LIC. NO.

TITLE: MN45" PRESTRESSED CONCRETE BEAM (PRETENSIONED) MN45-100

DES: AK/IGG	DR: TAW	APPROVED:	BRIDGE NO. R0686
CHK: TR	CHK: TR		
SHEET NO. 56 OF 116 SHEETS			

CBRR0686-BRG-PCB-002

Sep. 21 2015 08:22 am V:\3400_ADC\CAD\SEGMENT W3\PLAN SHEETS\STRUCTURES\CBRR0686\60_percent_Preliminary Plans-Dwg files\CBRR0686-Figure 5-397_507B.dwg By: wyttenbacht

PRESTRESSED BEAM INFORMATION ⑫						CALCULATED PRESTRESS LOSSES ⑫			CAMBER ⑫					
SPAN	BEAM NO.	CL TO CL OF BRG.	OUT TO OUT OF BEAM	WEIGHT (TONS)	HOLD DOWN POINT	ELASTIC SHORTENING LOSS (KSI)	LONG TERM LOSSES (KSI)	TOTAL LOSSES (KSI)	ERECTION CAMBER	EST. DEAD LOAD DEFLECTION	EST. RESIDUAL CAMBER	STIRRUP SPACING ⑬	STIRRUP SPACING ⑭	SLOPED LENGTH OF GIRDER (X)
1	B1	101'–0 3/4"	102'–3 3/4"	38.0	5'–1 1/2"	26.4	27.4	53.8	4 3/4"	3 3/8"	1 3/8"	45 SPS. @ 1'–0" = 45'–0"	2 7/8"	
	B2	100'–3 5/8"	101'–6 5/8"	37.7	5'–1"	26.4	27.4	53.8	4 3/4"	3 1/2"	1 1/4"	45 EQ. SPS. (1'–0" MAX) = 44'–6"	4 5/16"	
	B3	99'–6 1/2"	100'–9 1/2"	37.4	5'–0 1/4"	26.4	27.4	53.8	4 3/4"	3 1/2"	1 1/4"	44 SPS. @ 1'–0" = 44'–0"	5 3/4"	
	B4	98'–9 1/4"	100'–0 1/4"	37.2	5'–0"	26.4	27.4	53.8	4 3/4"	3 3/8"	1 3/8"	44 EQ. SPS. (1'–0" MAX) = 43'–9"	4 1/8"	
2	B5	98'–7 1/8"	99'–10 1/8"	37.1	9'–11 7/8"	24.1	26.7	50.8	4 1/4"	3 1/4"	1"	44 EQ. SPS. (1'–0" MAX) = 43'–9"	3 1/16"	
	B6	98'–6 5/8"	99'–9 5/8"	37.1	9'–11 3/4"	24.1	26.7	50.8	4 1/4"	3 1/4"	1"	44 EQ. SPS. (1'–0" MAX) = 43'–9"	2 13/16"	
	B7	98'–6 1/4"	99'–9 1/4"	37.1	9'–11 3/4"	24.1	26.7	50.8	4 1/4"	3 1/4"	1"	44 EQ. SPS. (1'–0" MAX) = 43'–9"	2 5/8"	
	B8	98'–5 3/4"	99'–8 3/4"	37.0	9'–11 5/8"	24.1	26.7	50.8	4 1/4"	3 1/4"	1"	44 EQ. SPS. (1'–0" MAX) = 43'–9"	2 3/8"	
3–6 & 9	B9	98'–6"	99'–9"	37.1	9'–11 3/4"	24.1	26.7	50.8	4 1/4"	3 1/4"	1"	44 EQ. SPS. (1'–0" MAX) = 43'–9"	2 1/2"	
	B10	98'–6"	99'–9"	37.1	9'–11 3/4"	24.1	26.7	50.8	4 1/4"	3 1/4"	1"	44 EQ. SPS. (1'–0" MAX) = 43'–9"	2 1/2"	
	B10	98'–6"	99'–9"	37.1	9'–11 3/4"	24.1	26.7	50.8	4 1/4"	3 1/4"	1"	44 EQ. SPS. (1'–0" MAX) = 43'–9"	2 1/2"	
	B11	98'–6"	99'–9"	37.1	9'–11 3/4"	24.1	26.7	50.8	4 1/4"	3 1/4"	1"	44 EQ. SPS. (1'–0" MAX) = 43'–9"	2 1/2"	
10	B12	98'–6 1/2"	99'–9 1/2"	37.1	9'–11 3/4"	24.1	26.7	50.8	4 1/4"	3 1/4"	1"	44 EQ. SPS. (1'–0" MAX) = 43'–9"	2 3/4"	X
	B13	98'–6 1/2"	99'–9 1/2"	37.1	9'–11 3/4"	24.1	26.7	50.8	4 1/4"	3 1/4"	1"	44 EQ. SPS. (1'–0" MAX) = 43'–9"	2 3/4"	X
	B13	98'–6 1/2"	99'–9 1/2"	37.1	9'–11 3/4"	24.1	26.7	50.8	4 1/4"	3 1/4"	1"	44 EQ. SPS. (1'–0" MAX) = 43'–9"	2 3/4"	X
	B14	98'–6 1/2"	99'–9 1/2"	37.1	9'–11 3/4"	24.1	26.7	50.8	4 1/4"	3 1/4"	1"	44 EQ. SPS. (1'–0" MAX) = 43'–9"	2 3/4"	X
11	B15	98'–7 5/8"	99'–10 5/8"	37.1	9'–11 7/8"	24.1	26.7	50.8	4 1/4"	3 1/4"	1"	44 EQ. SPS. (1'–0" MAX) = 43'–9"	3 5/16"	X
	B16	98'–7 5/8"	99'–10 5/8"	37.1	9'–11 7/8"	24.1	26.7	50.8	4 1/4"	3 1/4"	1"	44 EQ. SPS. (1'–0" MAX) = 43'–9"	3 5/16"	X
	B16	98'–7 5/8"	99'–10 5/8"	37.1	9'–11 7/8"	24.1	26.7	50.8	4 1/4"	3 1/4"	1"	44 EQ. SPS. (1'–0" MAX) = 43'–9"	3 5/16"	X
	B17	98'–7 5/8"	99'–10 5/8"	37.1	9'–11 7/8"	24.1	26.7	50.8	4 1/4"	3 1/4"	1"	44 EQ. SPS. (1'–0" MAX) = 43'–9"	3 5/16"	X
12	B18	98'–8 1/8"	99'–11 1/8"	37.1	9'–11 7/8"	24.1	26.7	50.8	4 1/4"	3 1/4"	1"	44 EQ. SPS. (1'–0" MAX) = 43'–9"	3 5/8"	X
	B19	98'–8 1/8"	99'–11 1/8"	37.1	9'–11 7/8"	24.1	26.7	50.8	4 1/4"	3 1/4"	1"	44 EQ. SPS. (1'–0" MAX) = 43'–9"	3 5/8"	X
	B19	98'–8 1/8"	99'–11 1/8"	37.1	9'–11 7/8"	24.1	26.7	50.8	4 1/4"	3 1/4"	1"	44 EQ. SPS. (1'–0" MAX) = 43'–9"	3 5/8"	X
	B20	98'–8 1/8"	99'–11 1/8"	37.1	9'–11 7/8"	24.1	26.7	50.8	4 1/4"	3 1/4"	1"	44 EQ. SPS. (1'–0" MAX) = 43'–9"	3 5/8"	X

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AK/IGG | CHECKED BY: TR
DRAWN BY: TAW | DATE: 9/21/2015

AECOM

60% SUBMISSION - 09/28/15

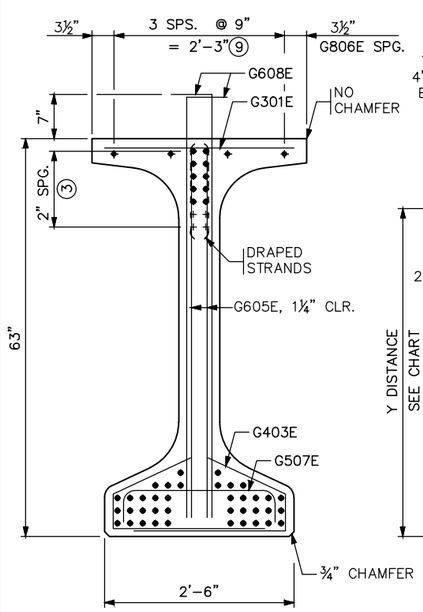
METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

CIVIL WEST - VOLUME 4B
MINNETONKA/HOPKINS
BRIDGE R0686
MN45 PRESTRESSED CONC. BEAM DETAILS

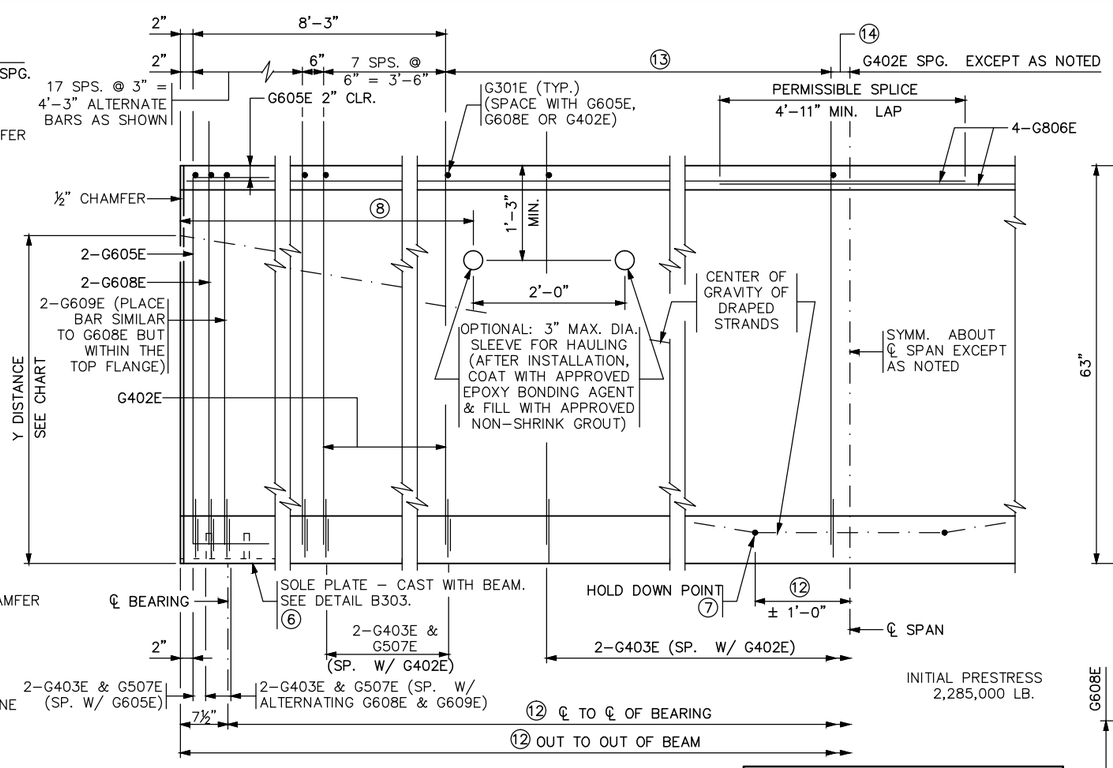
DISCIPLINE: STRUCTURES
SHEET NAME: CBRR0686-BRG-PCB-003

SHEET 58 OF 116



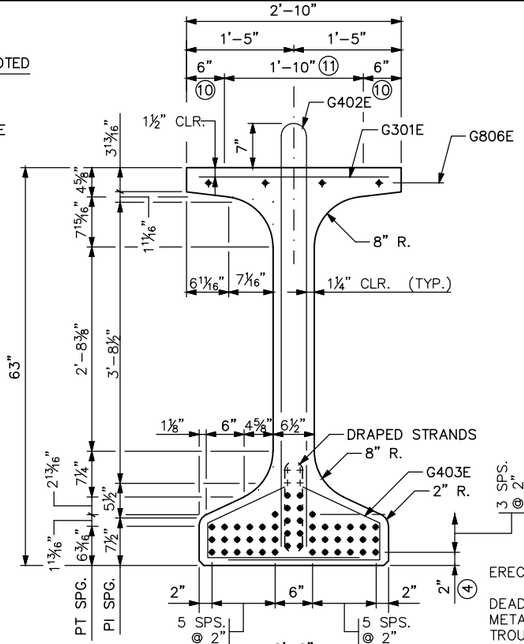
END VIEW

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



BEAM ELEVATION

INITIAL PRESTRESS 2,285,000 LB.

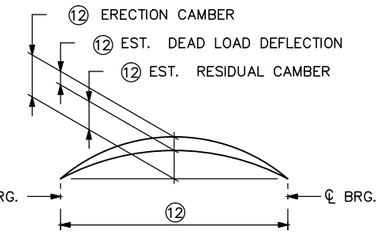


SECTION AT ℄ SPAN

Y DISTANCES (INCHES)	NO.	℄ SPAN	END
STRAIGHT STRANDS	38	4.95	
DRAPED STRANDS	10	7.00	54.00 □
TOTAL STRANDS	48	6.31	

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, METAL RAIL, CURB, RUNNING RAIL, PLINTHS AND CABLE TROUGH 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.

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 (12) 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 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.

(12)(13)(14) SEE TABLE ON SHEET PCB-002.

CALCULATED PRESTRESS LOSSES

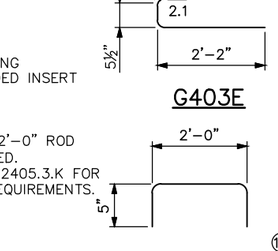
ELASTIC SHORTENING LOSS	(12)	KSI
LONG TERM LOSSES	(12)	KSI
TOTAL LOSSES	(12)	KSI

MINIMUM CONCRETE STRENGTH – K.S.I.

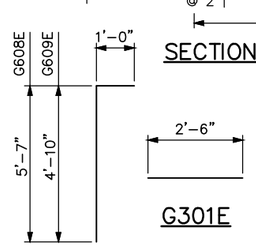
(1) f'ci	(2) f'c
7 KSI	9 KSI

PRESTRESSING STRAND DIAMETER

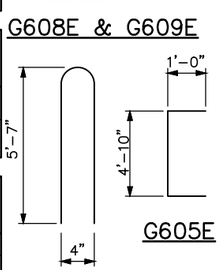
(5)	½" □
(5)	0.60" ☒



DETAIL "A"

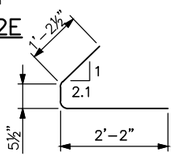


G301E



G608E & G609E

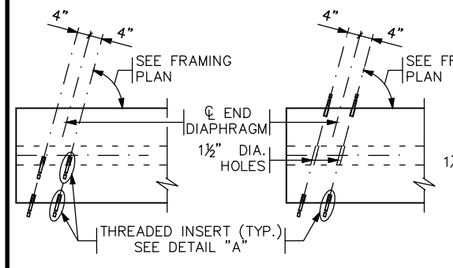
G605E



G402E

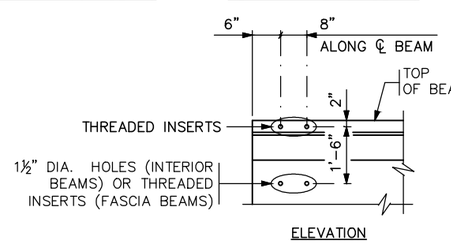
G403E

G507E



PLAN AT FASCIA BEAMS

PLAN AT INTERIOR BEAMS

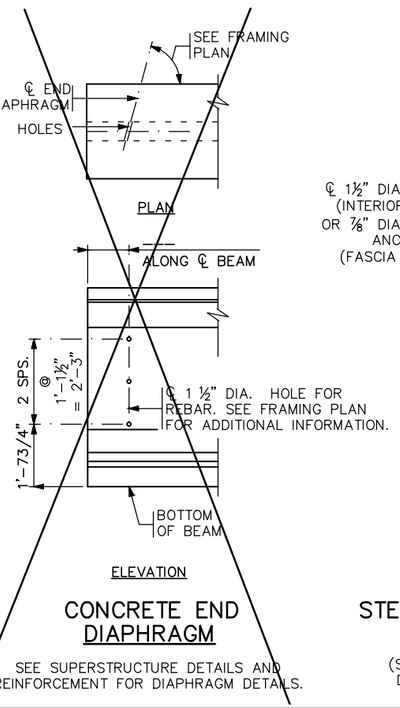


ELEVATION

CONCRETE END DIAPHRAGM

EXPANSION JOINT

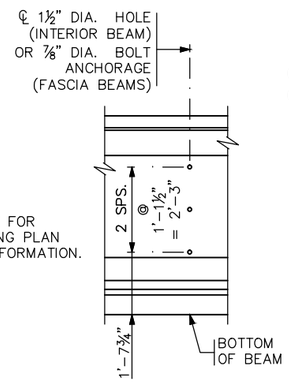
(SEE DETAIL B814 FOR DIAPHRAGM DETAILS)



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 Daubenberger, STATE BRIDGE ENGINEER

CERTIFIED BY _____ LICENSED PROFESSIONAL ENGINEER _____ DATE

NAME: _____ LIC. NO.

TITLE: MN63" PRESTRESSED CONCRETE BEAM (PRETENSIONED) MN63-125

DES: AK/IGG	DR: TAW	APPROVED:	BRIDGE NO. R0686
CHK: TR	CHK: TR		
SHEET NO. 59 OF 116 SHEETS			

BEAMS B21-B32, B36-B51

FIG. 5-397.509

CBRR0686-BRG-PCB-004

Sep. 21 2015 08:22 am V:\3400_ADC\CAD\SEGMENT W3\PLAN SHEETS\STRUCTURES\CBRR0686\60_percent_Preliminary Plans-Dwg files\CBRR0686-Figure 5-397_509.dwg By: wyttenbacht

PRESTRESSED BEAM INFORMATION ⑫						CALCULATED PRESTRESS LOSSES ⑫			CAMBER ⑫					
SPAN	BEAM NO.	CL TO CL OF BRG.	OUT TO OUT OF BEAM	WEIGHT (TONS)	HOLD DOWN POINT	ELASTIC SHORTENING LOSS (KSI)	LONG TERM LOSSES (KSI)	TOTAL LOSSES (KSI)	ERECTION CAMBER	EST. DEAD LOAD DEFLECTION	EST. RESIDUAL CAMBER	STIRRUP SPACING ⑬	STIRRUP SPACING ⑭	SLOPED LENGTH OF GIRDER (X)
13 & 25	B21	123'–8 1/8"	124'–11 1/8"	54.3	6'–3"	24.9	26.8	51.7	4 5/8"	3 1/2"	1 1/8"	54 EQ. SPS. (1'–0" MAX) = 53'–9"	3 9/16"	X
	B22	123'–8 1/8"	124'–11 1/8"	54.3	6'–3"	24.9	26.8	51.7	4 5/8"	3 3/8"	1 1/4"	54 EQ. SPS. (1'–0" MAX) = 53'–9"	3 9/16"	X
	B22	123'–8 1/8"	124'–11 1/8"	54.3	6'–3"	24.9	26.8	51.7	4 5/8"	3 3/8"	1 1/4"	54 EQ. SPS. (1'–0" MAX) = 53'–9"	3 9/16"	X
	B23	123'–8 1/8"	124'–11 1/8"	54.3	6'–3"	24.9	26.8	51.7	4 5/8"	3 1/2"	1 1/8"	54 EQ. SPS. (1'–0" MAX) = 53'–9"	3 9/16"	X
14	B24	123'–7 1/4"	124'–10 1/4"	54.3	6'–3"	24.9	26.8	51.7	4 5/8"	3 1/2"	1 1/8"	54 EQ. SPS. (1'–0" MAX) = 53'–9"	3 1/8"	X
	B25	123'–7 1/4"	124'–10 1/4"	54.3	6'–3"	24.9	26.8	51.7	4 5/8"	3 3/8"	1 1/4"	54 EQ. SPS. (1'–0" MAX) = 53'–9"	3 1/8"	X
	B25	123'–7 1/4"	124'–10 1/4"	54.3	6'–3"	24.9	26.8	51.7	4 5/8"	3 3/8"	1 1/4"	54 EQ. SPS. (1'–0" MAX) = 53'–9"	3 1/8"	X
	B26	123'–7 1/4"	124'–10 1/4"	54.3	6'–3"	24.9	26.8	51.7	4 5/8"	3 1/2"	1 1/8"	54 EQ. SPS. (1'–0" MAX) = 53'–9"	3 1/8"	X
15	B27	123'–6 7/8"	124'–9 7/8"	54.2	6'–3"	24.9	26.8	51.7	4 5/8"	3 1/2"	1 1/8"	54 EQ. SPS. (1'–0" MAX) = 53'–9"	2 15/16"	X
	B28	123'–6 7/8"	124'–9 7/8"	54.2	6'–3"	24.9	26.8	51.7	4 5/8"	3 3/8"	1 1/4"	54 EQ. SPS. (1'–0" MAX) = 53'–9"	2 15/16"	X
	B28	123'–6 7/8"	124'–9 7/8"	54.2	6'–3"	24.9	26.8	51.7	4 5/8"	3 3/8"	1 1/4"	54 EQ. SPS. (1'–0" MAX) = 53'–9"	2 15/16"	X
	B29	123'–6 7/8"	124'–9 7/8"	54.2	6'–3"	24.9	26.8	51.7	4 5/8"	3 1/2"	1 1/8"	54 EQ. SPS. (1'–0" MAX) = 53'–9"	2 15/16"	X
16–18 & 20	B30	123'–6"	124'–9"	54.2	6'–3"	24.9	26.8	51.7	4 5/8"	3 1/2"	1 1/8"	54 EQ. SPS. (1'–0" MAX) = 53'–9"	2 1/2"	
	B31	123'–6"	124'–9"	54.2	6'–3"	24.9	26.8	51.7	4 5/8"	3 3/8"	1 1/4"	54 EQ. SPS. (1'–0" MAX) = 53'–9"	2 1/2"	
	B31	123'–6"	124'–9"	54.2	6'–3"	24.9	26.8	51.7	4 5/8"	3 3/8"	1 1/4"	54 EQ. SPS. (1'–0" MAX) = 53'–9"	2 1/2"	
	B32	123'–6"	124'–9"	54.2	6'–3"	24.9	26.8	51.7	4 5/8"	3 1/2"	1 1/8"	54 EQ. SPS. (1'–0" MAX) = 53'–9"	2 1/2"	
21	B36	123'–9 1/2"	125'–0 1/2"	54.3	6'–3"	24.9	26.8	51.7	4 5/8"	3 1/2"	1 1/8"	54 EQ. SPS. (1'–0" MAX) = 53'–9"	4 1/4"	X
	B37	123'–8 3/8"	124'–11 3/8"	54.3	6'–3"	24.9	26.8	51.7	4 5/8"	3 3/8"	1 1/4"	54 EQ. SPS. (1'–0" MAX) = 53'–9"	3 11/16"	X
	B38	123'–7 1/4"	124'–10 1/4"	54.2	6'–3"	24.9	26.8	51.7	4 5/8"	3 3/8"	1 1/4"	54 EQ. SPS. (1'–0" MAX) = 53'–9"	3 1/8"	X
	B39	123'–6"	124'–9"	54.2	6'–3"	24.9	26.8	51.7	4 5/8"	3 1/2"	1 1/8"	54 EQ. SPS. (1'–0" MAX) = 53'–9"	2 1/2"	X
22	B40	124'–1 1/8"	125'–4 1/8"	54.5	6'–3"	24.9	26.8	51.7	4 5/8"	3 1/2"	1 1/8"	54 SPS. @ 1'–0" = 54'–0"	3 1/16"	X
	B41	123'–10 5/8"	125'–1 5/8"	54.4	6'–3"	24.9	26.8	51.7	4 5/8"	3 3/8"	1 1/4"	54 EQ. SPS. (1'–0" MAX) = 53'–9"	4 13/16"	X
	B42	123'–8 1/4"	124'–11 1/4"	54.3	6'–3"	24.9	26.8	51.7	4 5/8"	3 3/8"	1 1/4"	54 EQ. SPS. (1'–0" MAX) = 53'–9"	3 5/8"	X
	B43	123'–5 3/4"	124'–8 3/4"	54.2	6'–3"	24.9	26.8	51.7	4 5/8"	3 1/2"	1 1/8"	54 EQ. SPS. (1'–0" MAX) = 53'–9"	2 3/8"	X
23	B44	124'–0 3/4"	125'–3 3/4"	54.4	6'–3"	24.9	26.8	51.7	4 5/8"	3 1/2"	1 1/8"	54 SPS. @ 1'–0" = 54'–0"	2 7/8"	X
	B45	123'–10 3/4"	125'–1 3/4"	54.4	6'–3"	24.9	26.8	51.7	4 5/8"	3 3/8"	1 1/4"	54 SPS. @ 1'–0" = 54'–0"	1 7/8"	X
	B46	123'–8 5/8"	124'–11 5/8"	54.3	6'–3"	24.9	26.8	51.7	4 5/8"	3 3/8"	1 1/4"	54 EQ. SPS. (1'–0" MAX) = 53'–9"	3 7/8"	X
	B47	123'–6 5/8"	124'–9 5/8"	54.2	6'–3"	24.9	26.8	51.7	4 5/8"	3 1/2"	1 1/8"	54 EQ. SPS. (1'–0" MAX) = 53'–9"	2 13/16"	X
24	B48	123'–9 1/4"	125'–0 1/4"	54.3	6'–3"	24.9	26.8	51.7	4 5/8"	3 1/2"	1 1/8"	54 EQ. SPS. (1'–0" MAX) = 53'–9"	4 1/8"	X
	B49	123'–9"	125'–0"	54.3	6'–3"	24.9	26.8	51.7	4 5/8"	3 3/8"	1 1/4"	54 EQ. SPS. (1'–0" MAX) = 53'–9"	4"	X
	B50	123'–8 3/4"	124'–11 3/4"	54.3	6'–3"	24.9	26.8	51.7	4 5/8"	3 3/8"	1 1/4"	54 EQ. SPS. (1'–0" MAX) = 53'–9"	3 7/8"	X
	B51	123'–8 5/8"	124'–11 5/8"	54.3	6'–3"	24.9	26.8	51.7	4 5/8"	3 1/2"	1 1/8"	54 EQ. SPS. (1'–0" MAX) = 53'–9"	3 13/16"	X

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AK/IGG | CHECKED BY: TR
DRAWN BY: TAW | DATE: 9/21/2015

AECOM

60% SUBMISSION - 09/28/15

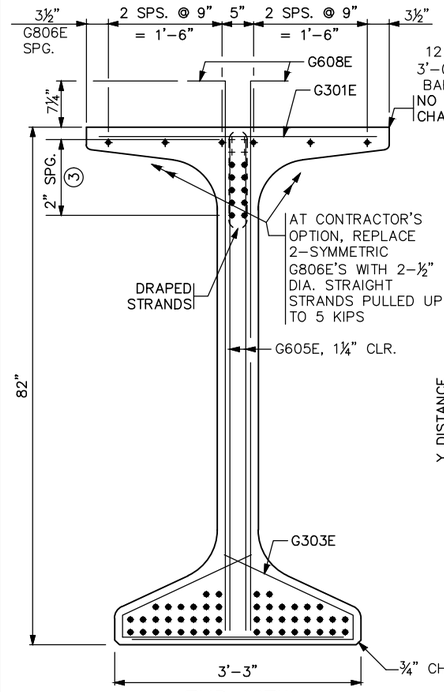
METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

CIVIL WEST - VOLUME 4B
MINNETONKA/HOPKINS
BRIDGE R0686
MN63 PRESTRESSED CONC. BEAM DETAILS

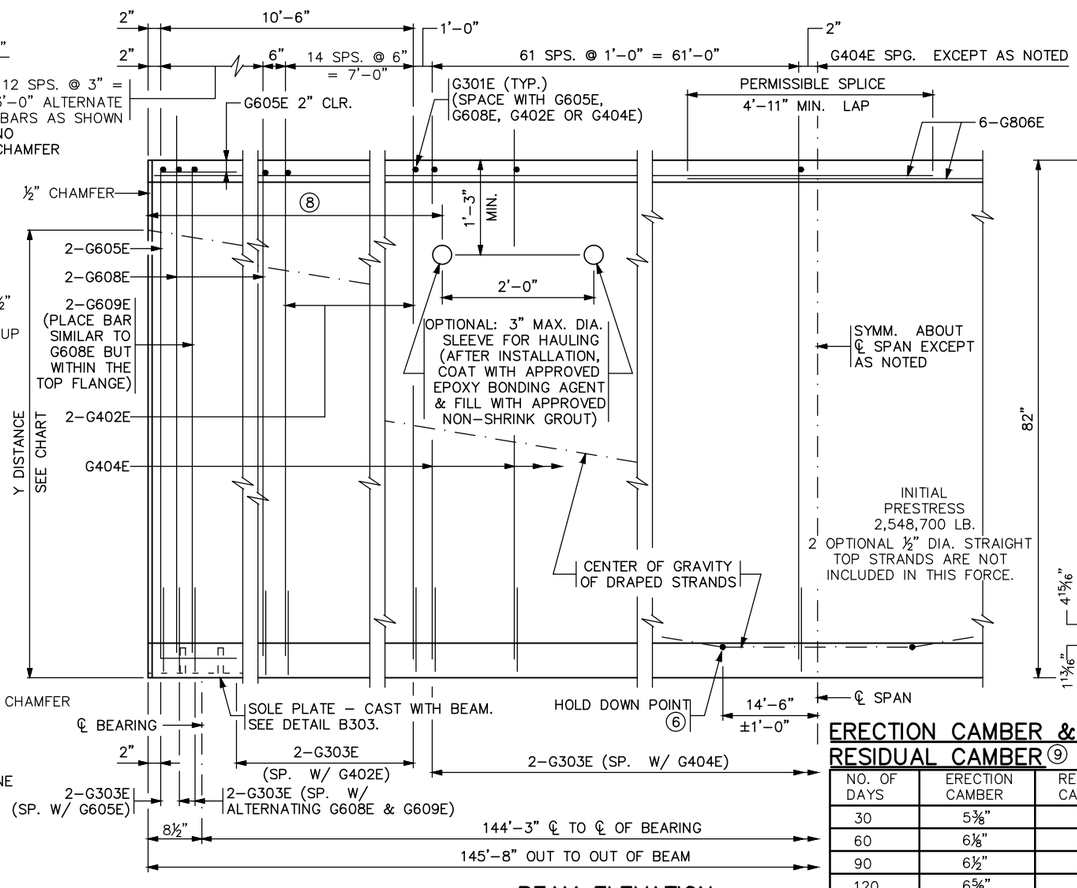
DISCIPLINE: STRUCTURES
SHEET NAME: CBRR0686-BRG-PCB-005

SHEET 60 OF 116

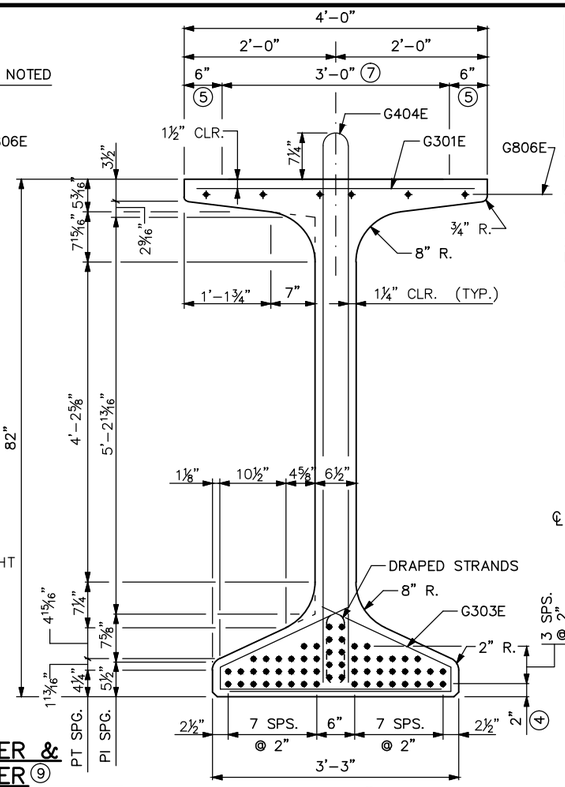


END VIEW

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



BEAM ELEVATION



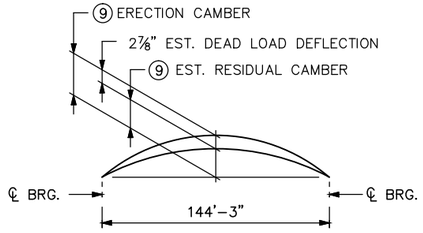
SECTION AT ℄ SPAN

Y DISTANCES (INCHES)	NO.	℄ SPAN	END
STRAIGHT STRANDS	48	4.17	
DRAPED STRANDS	10	7.00	73.00 □
TOTAL STRANDS	58	4.66	

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.

2 OPTIONAL ½" DIA. STRAIGHT STRANDS ARE NOT INCLUDED IN THIS TABLE.

□ 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, METAL RAIL, CURB, RUNNING RAIL, PLINTHS AND CABLE TROUGH 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.

ERECTION CAMBER & RESIDUAL CAMBER 9

NO. OF DAYS	ERECTION CAMBER	RESIDUAL CAMBER
30	5⅜"	2½"
60	6⅛"	3¼"
90	6½"	3⅝"
120	6⅝"	3¾"
180	6⅞"	4"

CONTRACTOR SHALL VERIFY STABILITY OF FASCIA BEAMS FROM OVERTURNING DUE TO DECK PLACEMENT OPERATIONS. CONTRACTOR SHALL PROVIDE TEMPORARY BRACING.

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 83.3 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 24 KIPS PER ANCHORAGE.

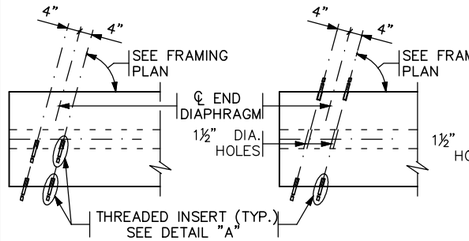
PRESTRESSING STRANDS SHALL BE 0.6" DIAMETER, 7-WIRE LOW RELAXATION STRAND, CONFORMING TO ASTM A416, GRADE 270.

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. STEEL TROWEL TO SMOOTH FINISH AND APPLY BOND BREAKER PER APPROVED PRODUCTS LIST.
6. CENTER OF GRAVITY OF HOLD DOWNS WHEN MULTIPLE HOLD DOWNS ARE USED.
7. ROUGH FLOAT AND BROOM TRANSVERSELY FOR BOND PER SPEC. 2405.3D.
8. DIMENSION DETERMINED BY CONTRACTOR. MAINTAIN 2" MINIMUM CLEAR FROM STRANDS. SEE "ERECTION CAMBER & RESIDUAL CAMBER" TABLE ON THIS SHEET.

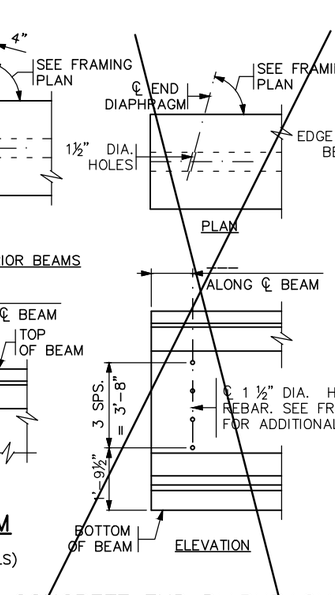
CALCULATED PRESTRESS LOSSES	
ELASTIC SHORTENING LOSS	22.7 KSI
LONG TERM LOSSES	24.2 KSI
TOTAL LOSSES	46.9 KSI

MINIMUM CONCRETE STRENGTH - K.S.I.	
① f'ci	② f'c
7 KSI	9 KSI



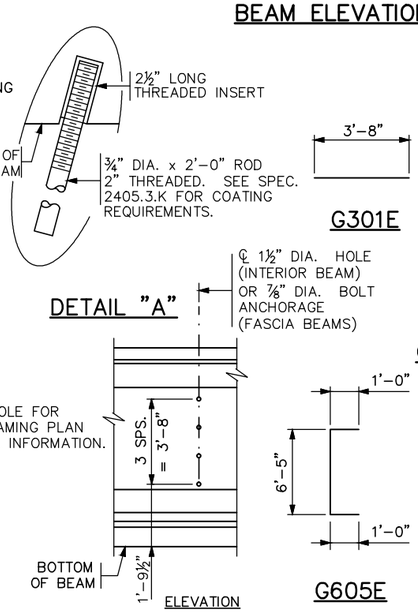
CONCRETE END DIAPHRAGM

~~PARAPET ABUTMENT~~
(SEE DETAIL B814 FOR DIAPHRAGM DETAILS)



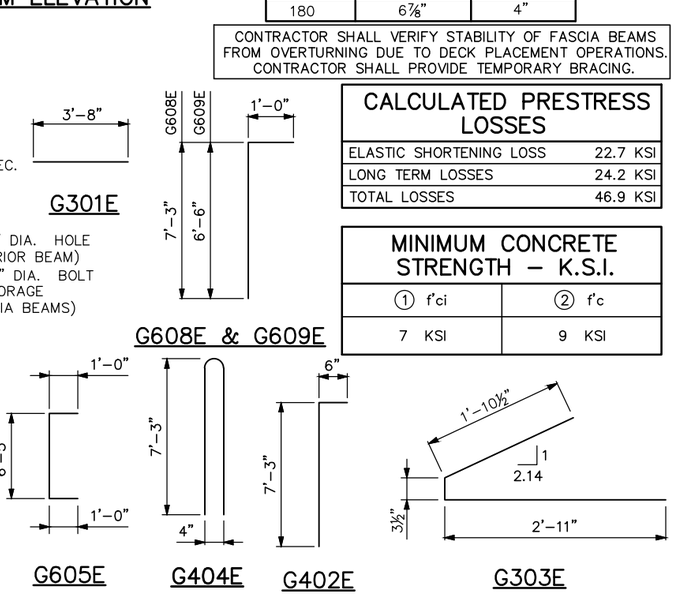
CONCRETE END DIAPHRAGM

SEMI-INTEGRAL ABUTMENT
SEE SUPERSTRUCTURE DETAILS AND REINFORCEMENT FOR DIAPHRAGM DETAILS.



STEEL INTERMEDIATE DIAPHRAGM

(SEE DETAIL B412 FOR DIAPHRAGM DETAILS)



REVISED:	
APPROVED: JANUARY 13, 2015	Nancy Daubenberger STATE BRIDGE ENGINEER

CERTIFIED BY _____ LICENSED PROFESSIONAL ENGINEER _____ DATE
NAME: _____ LIC. NO.

TITLE: 82MW PRESTRESSED CONCRETE BEAM (PRETENSIONED) 82MW-146

DES: AK/IGG	DR: TAW	APPROVED:
CHK: TR	CHK: TR	

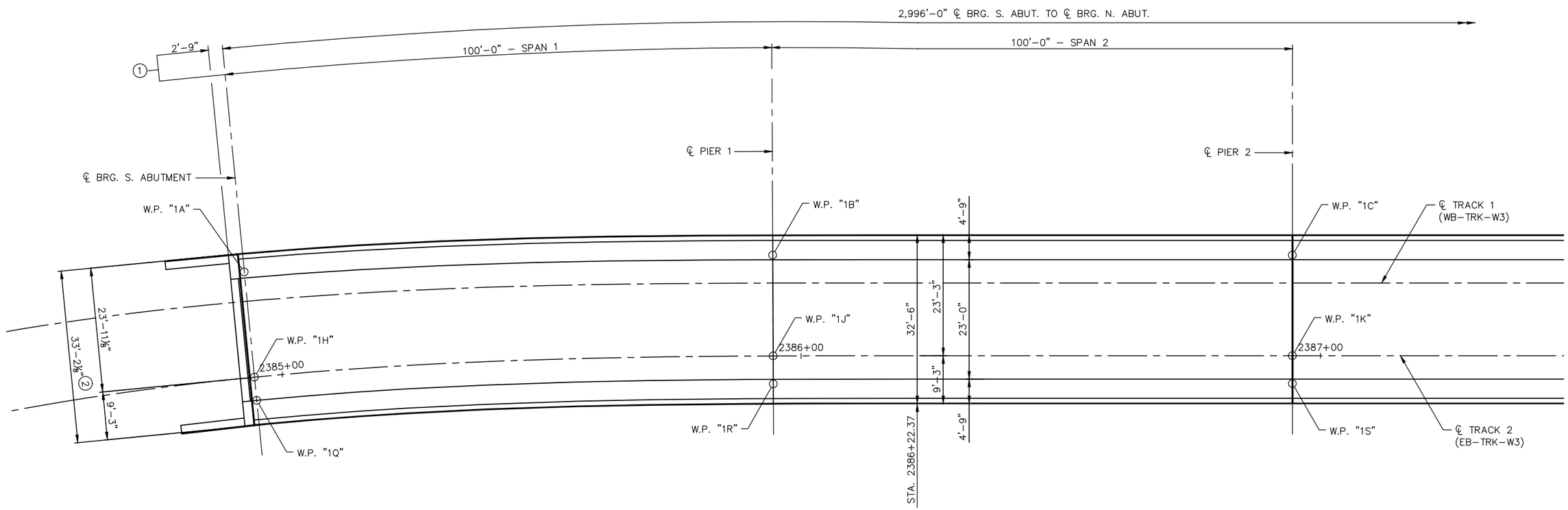
SHEET NO. 61 OF 116 SHEETS

BEAMS B33 - B35

FIG. 5-397.531

BRIDGE NO. R0686

CBRR0686-BRG-PCB-006



NOTES:

① MEASURED ALONG ℄ TRACK 2 (EB-TRK-W3)

② OUT TO OUT DECK MEASURED ALONG ℄ BRG. S. ABUTMENT

PARTIAL DECK PLAN – SPANS 1 & 2

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AK/IGG | CHECKED BY: TR
DRAWN BY: TAW | DATE: 9/21/2015

AECOM

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

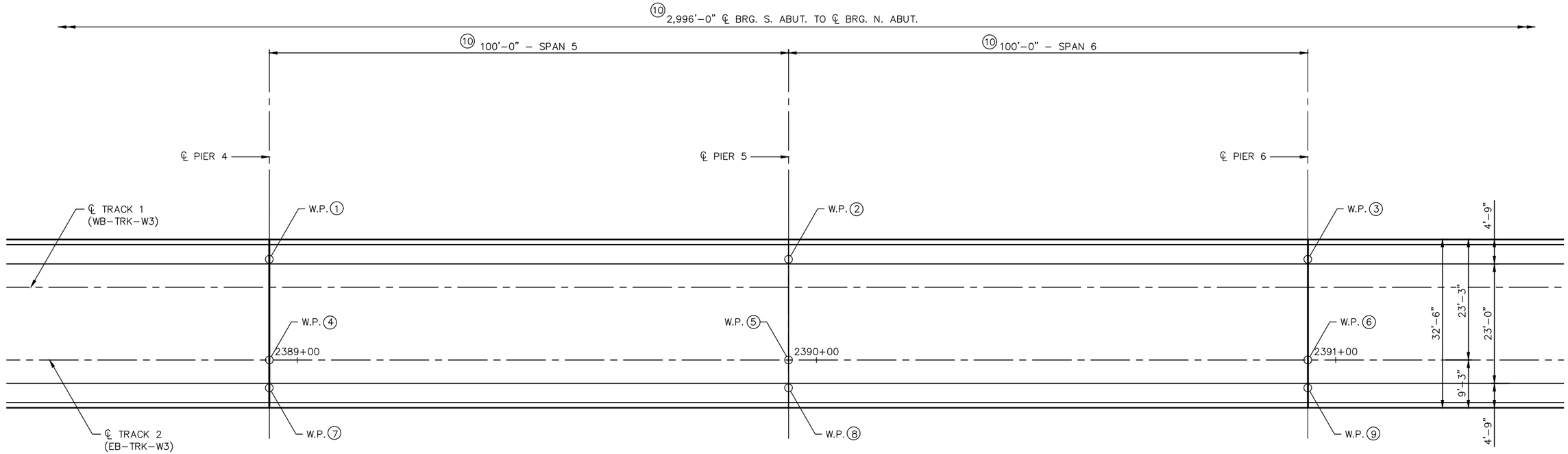
SOUTHWEST Green Line LRT Extension

CIVIL WEST - VOLUME 4B
MINNETONKA/HOPKINS
BRIDGE R0686
SUPERSTRUCTURE - SPANS 1 & 2

DISCIPLINE: STRUCTURES
SHEET NAME: CBRR0686-BRG-SUP-018

SHEET 62 OF 116

Sep. 21 2015 08:22 am V:\3400_ADC\CAD\SEGMENT W3\PLAN SHEETS\STRUCTURES\CBRR0686\60_percent_Preliminary Plans-Dwg files\CBRR0686-BRG-SUP-PRES-PLAN.dwg By: wytenbacht



NOTES:

1. "1C", "1E", "3A" & "3C"
2. "1D", "1F", "3B" & "3D"
3. "1E", "1G", "3C" & "3E"
4. "1K", "1M", "3F" & "3H"
5. "1L", "1N", "3G" & "3J"
6. "1M", "1P", "3H" & "3K"
7. "1S", "1U", "3L" & "3N"
8. "1T", "1V", "3M" & "3P"
9. "1U", "1W", "3N" & "3Q"
10. MEASURED ALONG ℄ TRACK 2 (EB-TRK-W3)

PARTIAL DECK PLAN – SPANS 5 & 6

(SPANS 5 & 6 SHOWN, SPANS 3 & 4, 9 & 10 AND 11 & 12 SIMILAR)

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AK/IGG | CHECKED BY: TR
DRAWN BY: TAW | DATE: 9/21/2015

AECOM

60% SUBMISSION - 09/28/15

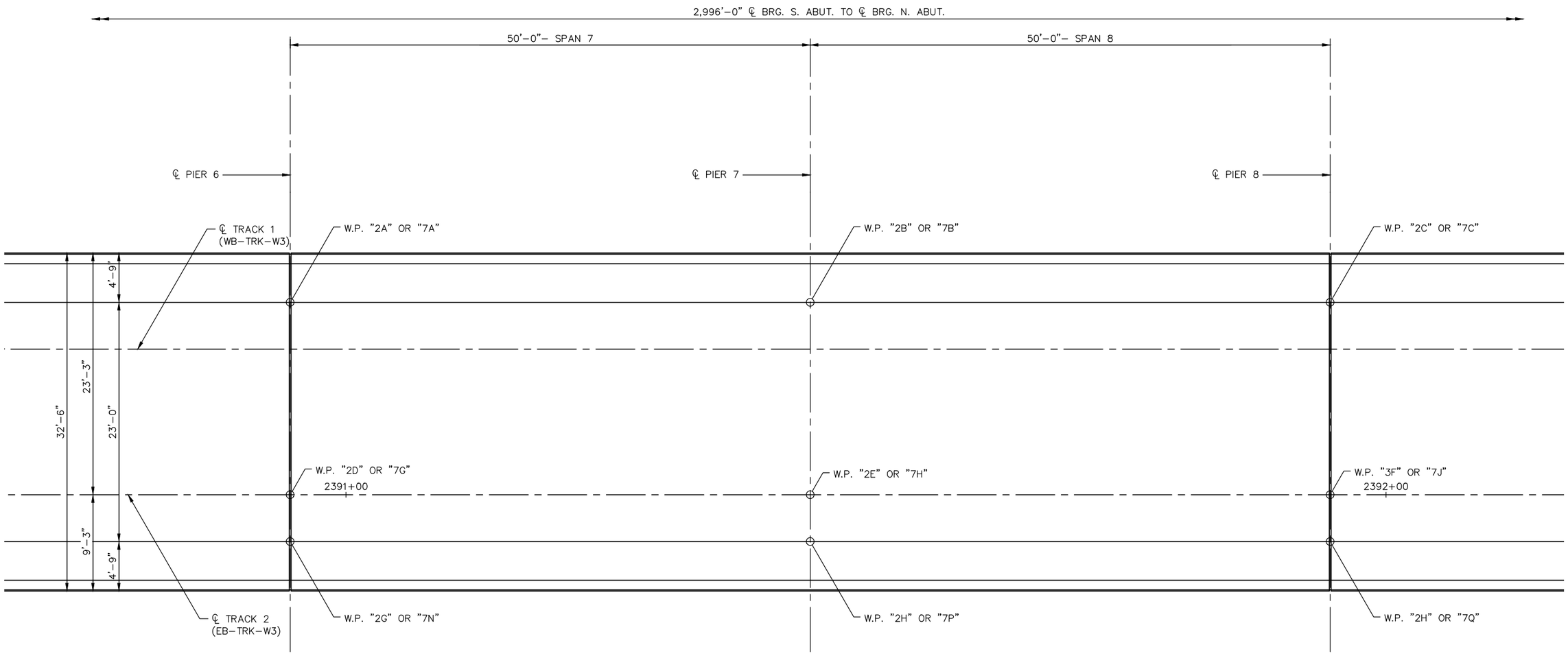
METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

CIVIL WEST - VOLUME 4B
MINNETONKA/HOPKINS
BRIDGE R0686
SUPERSTRUCTURE - SPANS 3-6 & 9-12

DISCIPLINE: STRUCTURES
SHEET NAME: CBRR0686-BRG-SUP-019

SHEET 63 OF 116



1

NOTES:

①MEASURED ALONG ℄ TRACK 2 (EB-TRK-W3)

PARTIAL DECK PLAN – SPANS 7 & 8

(SPANS 7 & 8 SHOWN, SPAN 26 & 27 SIMILAR)

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AK/IGG | CHECKED BY: TR
DRAWN BY: TAW | DATE: 9/21/2015

AECOM

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

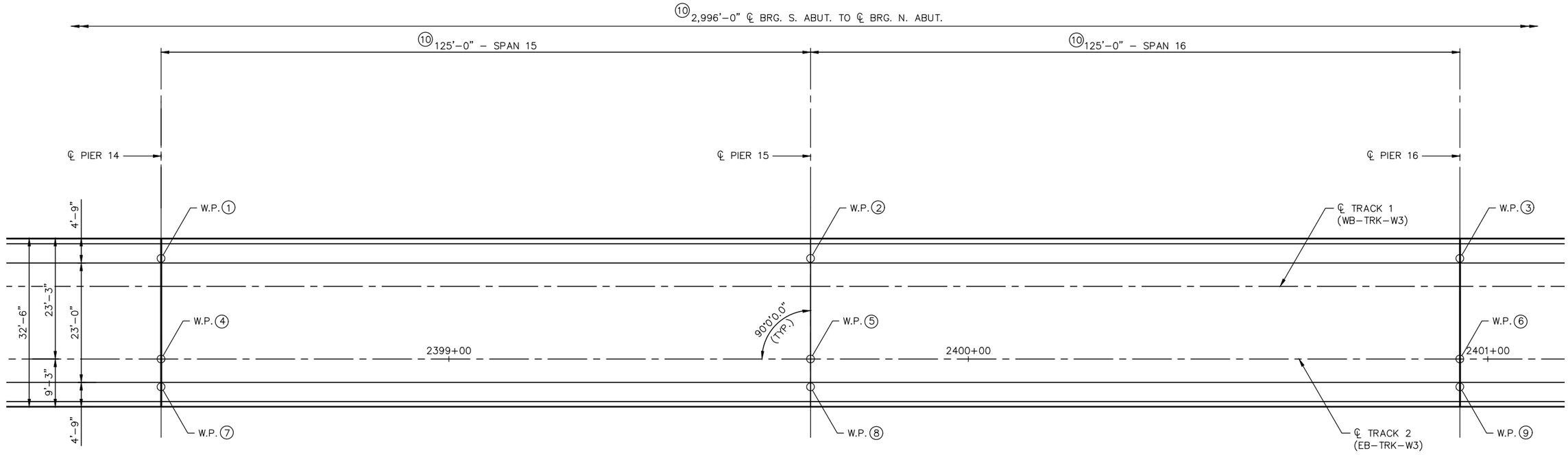
SOUTHWEST Green Line LRT Extension

CIVIL WEST - VOLUME 4B
MINNETONKA/HOPKINS
BRIDGE R0686
SUPERSTRUCTURE - SPANS 7 & 8 & 26 & 27

DISCIPLINE: STRUCTURES
SHEET NAME: CBRR0686-BRG-SUP-020

SHEET 64 OF 116

Sep. 21 2015 08:23 am V:\3400_ADC\CAD\SEGMENT W3\PLAN SHEETS\STRUCTURES\CBRR0686\60_percent_Preliminary Plans-Dwg files\CBRR0686-BRG-SUP-SLAB-PLAN.dwg By: wyttenbacht



NOTES:

① "4A", "4C", "4E" & "6E"

② "4B", "4D", "4F" & "6F"

③ "4C", "4E", "4G" & "6G"

④ "4H", "4K", "4M" & "6M"

⑤ "4J", "4L", "AN" & "6N"

⑥ "4K", "4M", "4P" & "6P"

⑦ "4Q", "4S", "4U" & "6U"

⑧ "4R", "4T", "4V" & "6V"

⑨ "4S", "4U", "4W" & "6W"

⑩ MEASURED ALONG ℄ TRACK 2 (EB–TRK–W3)

PARTIAL DECK PLAN – SPANS 15 & 16

(SPANS 15 & 16 SHOWN, SPANS 13 & 14, 17 & 18 AND 24 & 25 SIMILAR)

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AK/IGG | CHECKED BY: TR
DRAWN BY: TAW | DATE: 9/21/2015

AECOM

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

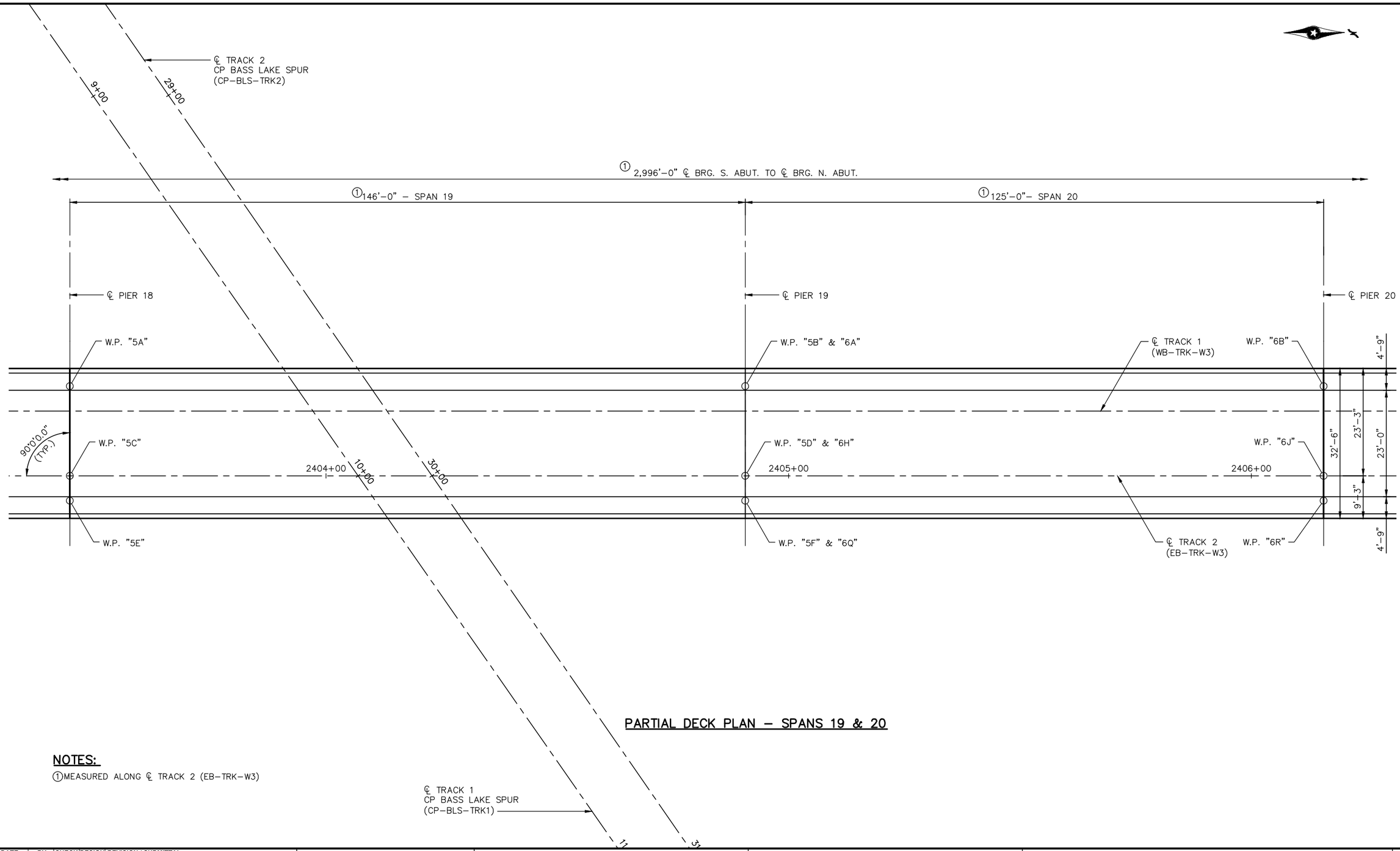
SOUTHWEST Green Line LRT Extension

CIVIL WEST - VOLUME 4B
MINNETONKA/HOPKINS
BRIDGE R0686
SUPER. - SPANS 13-18 & 24 & 25

DISCIPLINE: STRUCTURES
SHEET NAME: CBRR0686-BRG-SUP-021

SHEET 65 OF 116

Sep. 21 2015 08:23 am V:\3400_ADC\CAD\SEGMENT W3\PLAN SHEETS\STRUCTURES\CBRR0686\60_percent_Preliminary Plans-Dwg files\CBRR0686-BRG-SUP-PRES-PLAN.dwg By: wytenbacht



PARTIAL DECK PLAN – SPANS 19 & 20

NOTES:

①MEASURED ALONG ℄ TRACK 2 (EB–TRK–W3)

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AK/IGG | CHECKED BY: TR
DRAWN BY: TAW | DATE: 9/21/2015

AECOM

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

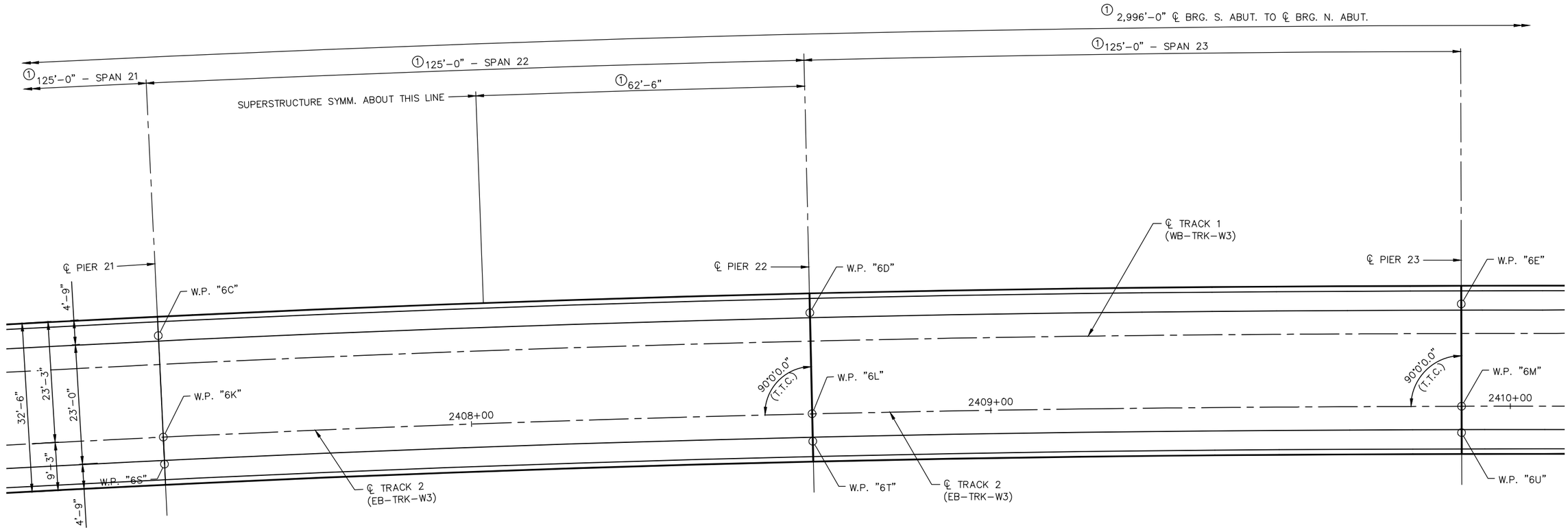
SOUTHWEST Green Line LRT Extension

CIVIL WEST - VOLUME 4B
MINNETONKA/HOPKINS
BRIDGE R0686
SUPERSTRUCTURE - SPANS 19 & 20

DISCIPLINE: STRUCTURES
SHEET NAME: CBRR0686-BRG-SUP-022

SHEET 66 OF 116

Sep. 21 2015 08:23 am V:\3400_ADC\CAD\SEGMENT W3\PLAN SHEETS\STRUCTURES\CBRR0686\60_percent_Preliminary Plans–Dwg files\CBRR0686–BRG–SUP–PRES–PLAN.dwg By: wytenbacht



NOTES:

①MEASURED ALONG ℄ TRACK 2 (EB–TRK–W3)

PARTIAL DECK PLAN – SPANS 21, 22 & 23

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AK/IGG | CHECKED BY: TR
DRAWN BY: TAW | DATE: 9/21/2015

AECOM

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

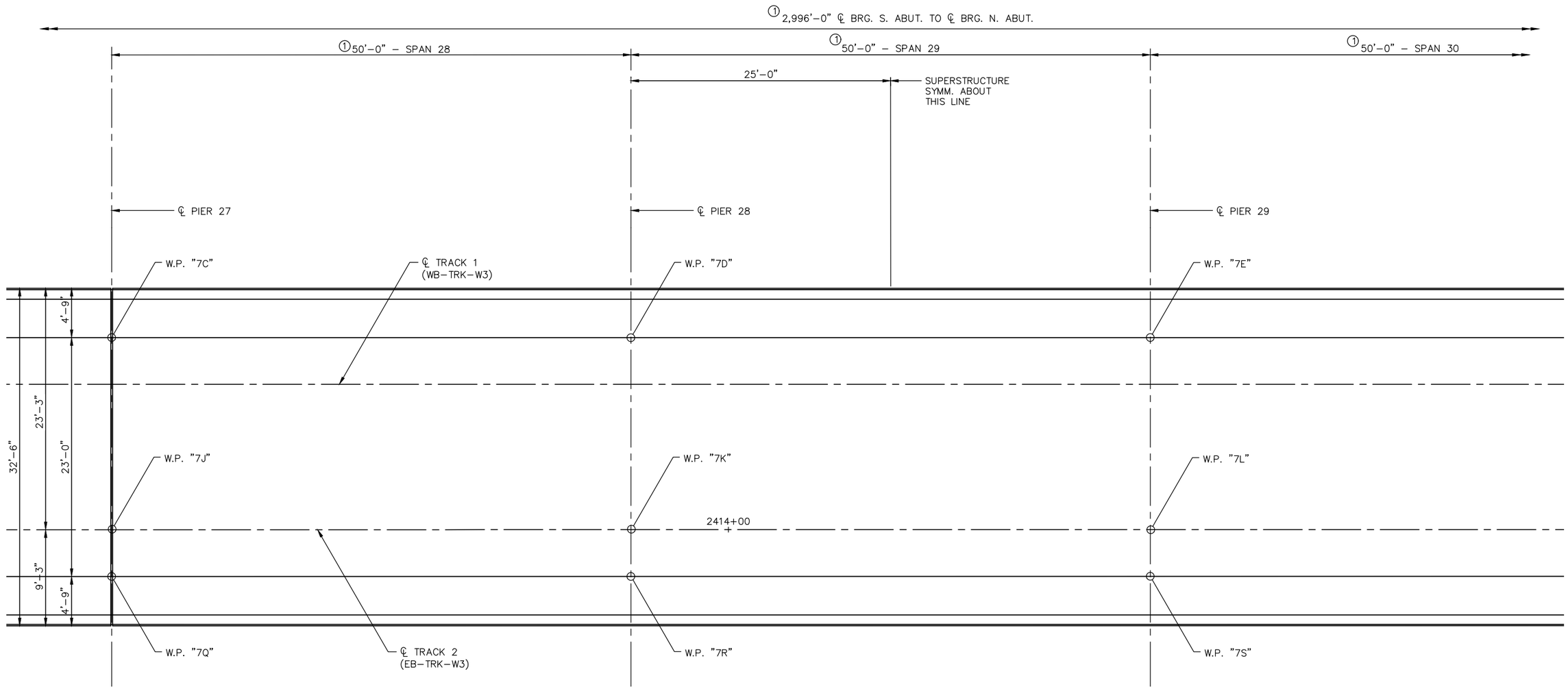
SOUTHWEST Green Line LRT Extension

CIVIL WEST - VOLUME 4B
MINNETONKA/HOPKINS
BRIDGE R0686
SUPERSTRUCTURE - SPANS 21-23

DISCIPLINE: STRUCTURES
SHEET NAME: CBRR0686-BRG-SUP-023

SHEET 67 OF 116

Sep, 21 2015 08:23 am V:\3400_ADC\CAD\SEGMENT W3\PLAN SHEETS\STRUCTURES\CBRR0686\60_percent_Preliminary Plans-Dwg files\CBRR0686-BRG-SUP-PRES-PLAN.dwg By: wytenbacht



PARTIAL DECK PLAN – SPANS 28 THRU 30

NOTES:

①MEASURED ALONG ℄ TRACK 2 (EB-TRK-W3)

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AK/IGG | CHECKED BY: TR
DRAWN BY: TAW | DATE: 9/21/2015

AECOM

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

CIVIL WEST - VOLUME 4B
MINNETONKA/HOPKINS
BRIDGE R0686
SUPERSTRUCTURE - SPANS 28-30

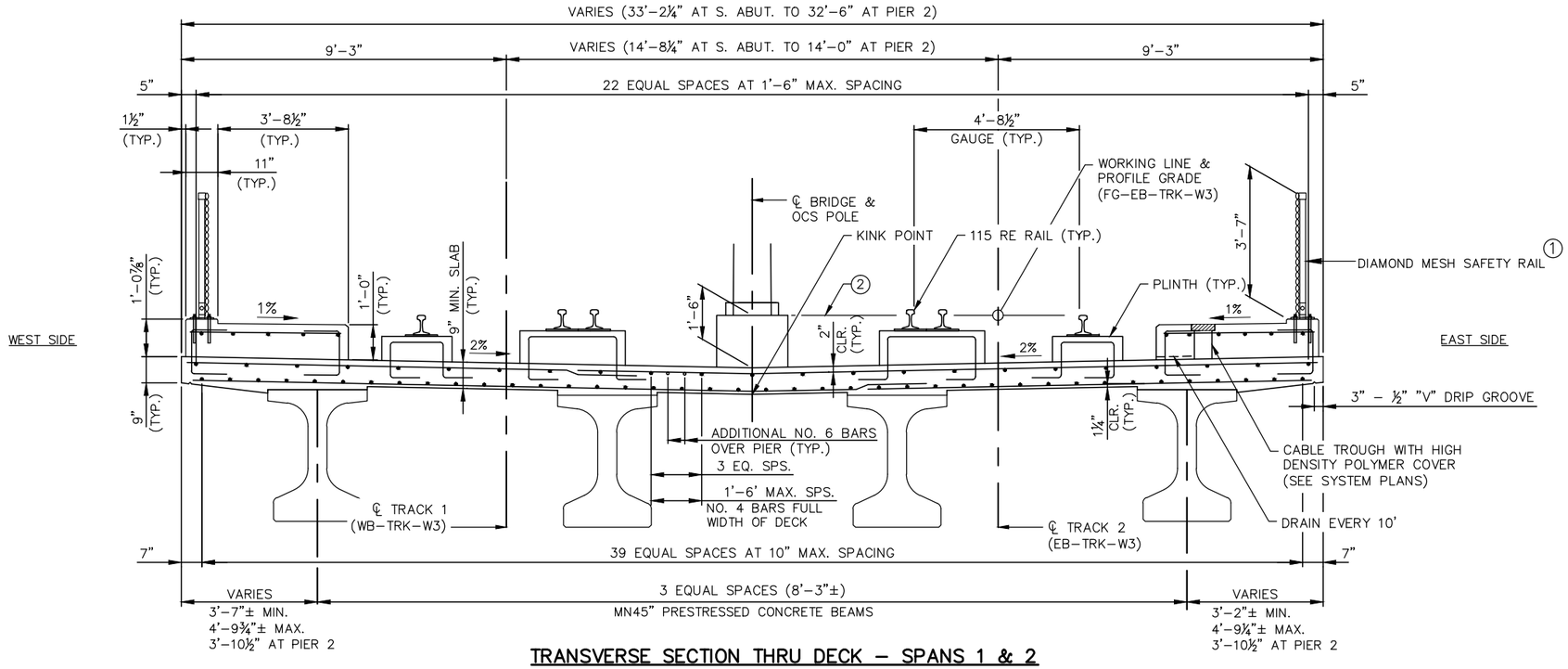
DISCIPLINE: STRUCTURES
SHEET NAME: CBRR0686-BRG-SUP-024

SHEET 68 OF 116

NOTES:

① DIAMOND MESH SAFETY RAIL PER MNDOT FIG. 5-397.119 (MOD) WIRE FENCE.

② 1'-6" MEASURED TO TOP OF LOW RAIL.



TRANSVERSE SECTION THRU DECK – SPANS 1 & 2

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AK/IGG | CHECKED BY: TR
DRAWN BY: TAW | DATE: 9/21/2015

AECOM

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

CIVIL WEST - VOLUME 4B
MINNETONKA/HOPKINS
BRIDGE R0686
SUPERSTRUCTURE DETAILS 1

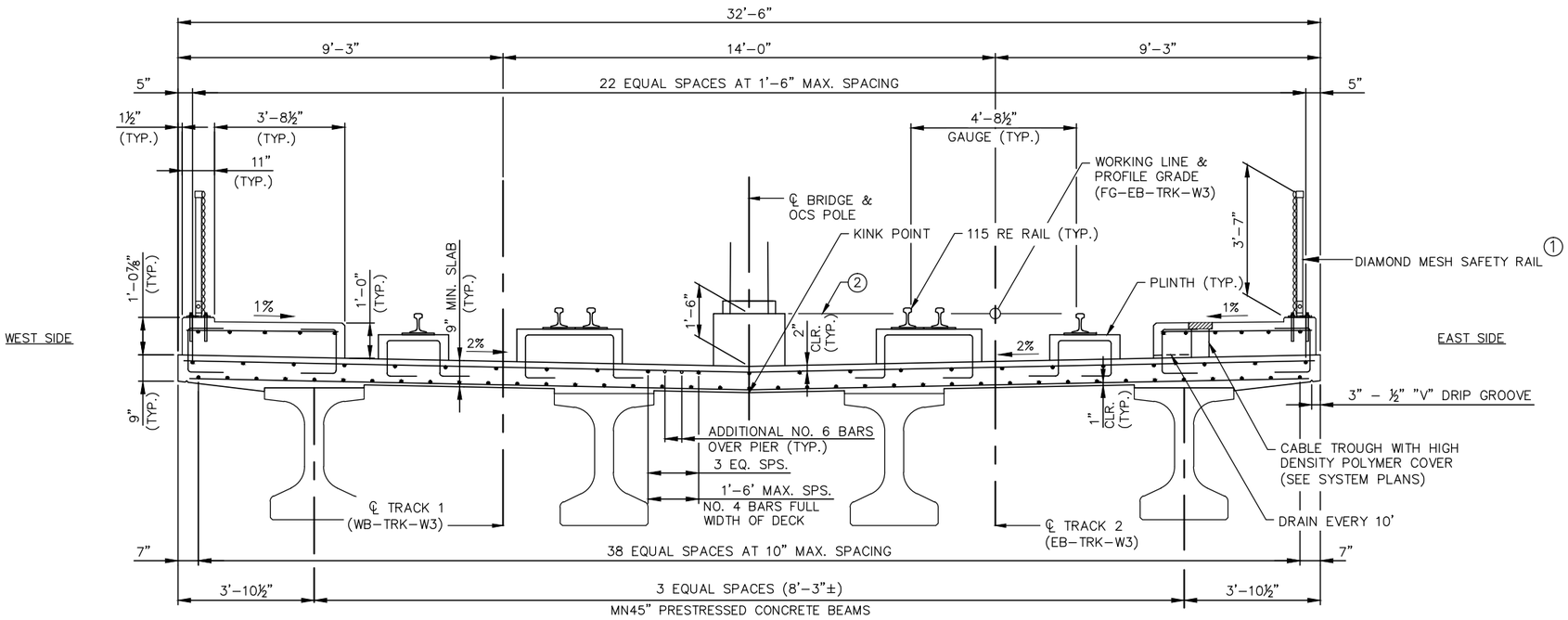
DISCIPLINE: STRUCTURES
SHEET NAME: CBRR0686-BRG-SUP-025

SHEET 69 OF 116

NOTES:

① DIAMOND MESH SAFETY RAIL PER MNDOT FIG. 5-397.119 (MOD) WIRE FENCE.

② 1'-6" MEASURED TO TOP OF LOW RAIL.



TRANSVERSE SECTION THRU DECK – SPANS 3-6 & 9-12

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AK/IGG | CHECKED BY: TR
DRAWN BY: TAW | DATE: 9/21/2015

AECOM

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

CIVIL WEST - VOLUME 4B
MINNETONKA/HOPKINS
BRIDGE R0686
SUPERSTRUCTURE DETAILS 2

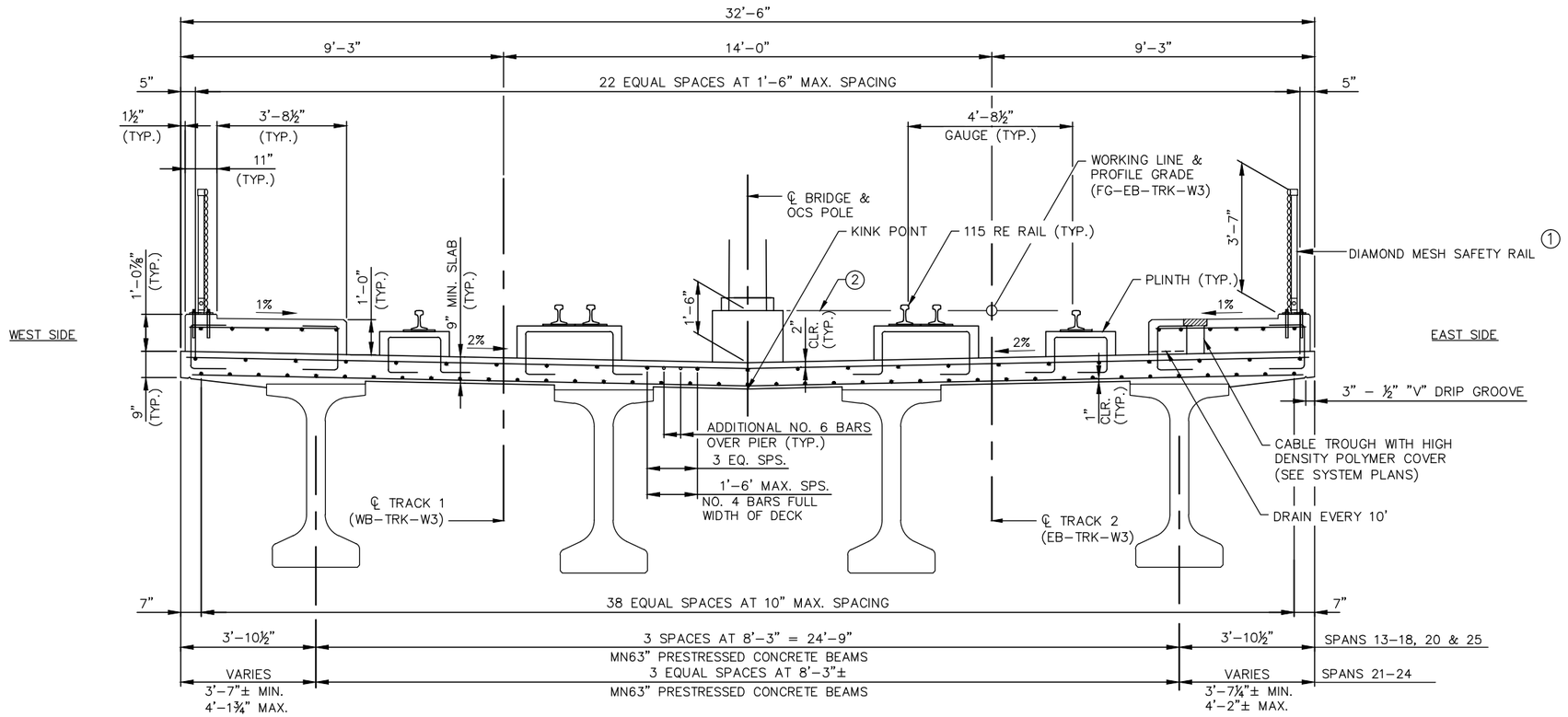
DISCIPLINE: STRUCTURES
SHEET NAME: CBRR0686-BRG-SUP-026

SHEET 70 OF 116

NOTES:

① DIAMOND MESH SAFETY RAIL PER MNDOT FIG. 5-397.119 (MOD) WIRE FENCE.

② 1'-6" MEASURED TO TOP OF LOW RAIL.



TRANSVERSE SECTION THRU DECK – SPANS 13-18 & 20-25

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AK/IGG | CHECKED BY: TR
DRAWN BY: TAW | DATE: 9/21/2015

AECOM

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

CIVIL WEST - VOLUME 4B
MINNETONKA/HOPKINS
BRIDGE R0686
SUPERSTRUCTURE DETAILS 3

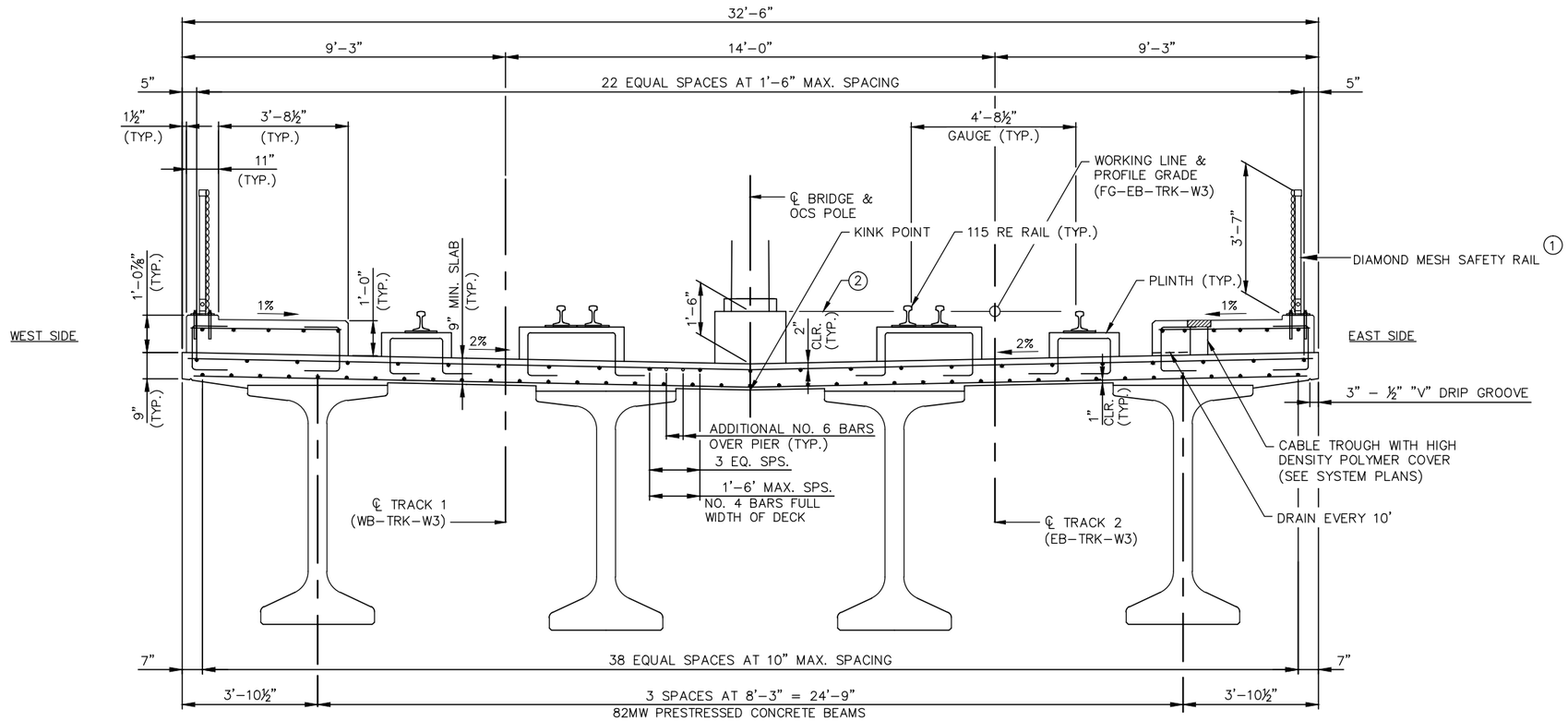
DISCIPLINE: STRUCTURES
SHEET NAME: CBRR0686-BRG-SUP-027

SHEET 70 OF 116

NOTES:

① DIAMOND MESH SAFETY RAIL PER MNDOT FIG. 5-397.119 (MOD) WIRE FENCE.

② 1'-6" MEASURED TO TOP OF LOW RAIL.



TRANSVERSE SECTION THRU DECK – SPAN 19

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AK/IGG | CHECKED BY: TR
DRAWN BY: TAW | DATE: 9/21/2015

AECOM

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

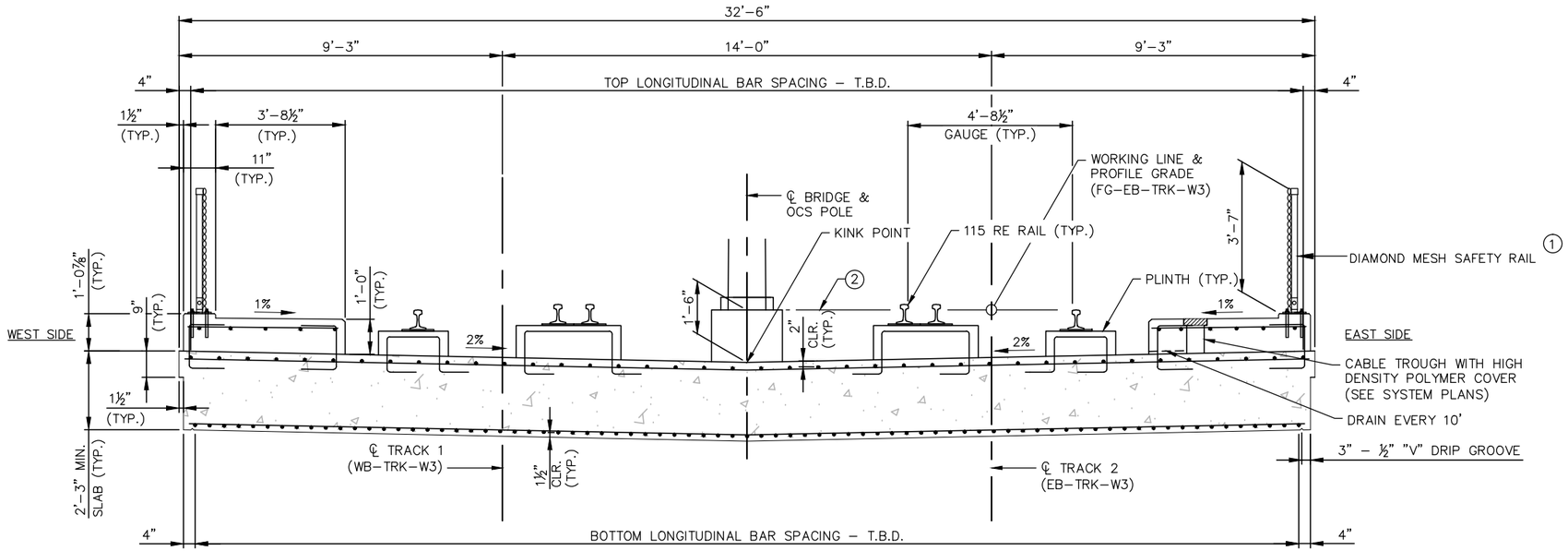
CIVIL WEST - VOLUME 4B
MINNETONKA/HOPKINS
BRIDGE R0686
SUPERSTRUCTURE DETAILS 4

DISCIPLINE: STRUCTURES
SHEET NAME: CBRR0686-BRG-SUP-028

SHEET 71 OF 116

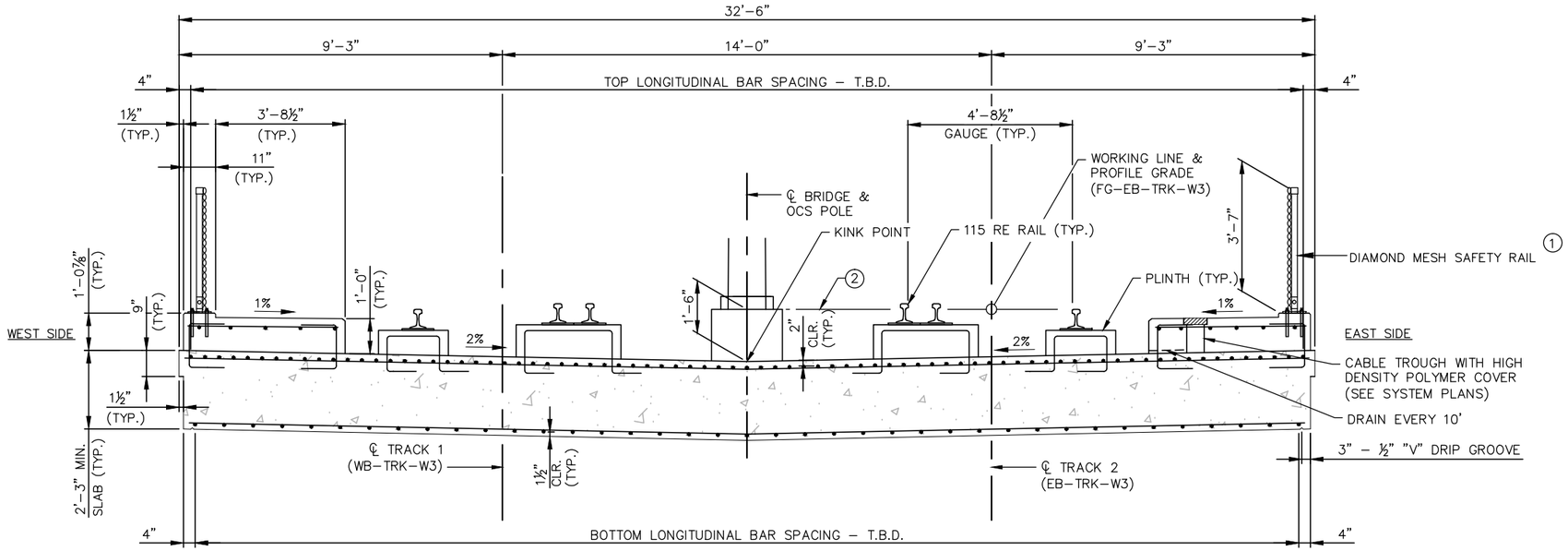
NOTES:

1. DIAMOND MESH SAFETY RAIL PER MNDOT FIG. 5-397.119 (MOD) WIRE FENCE.
2. 1'-6" MEASURED TO TOP OF LOW RAIL.



SHOWING REINFORCEMENT AT ℄ SPANS & ABUTMENTS

TRANSVERSE SECTION THRU DECK – SPANS 7-8 & 26-27



SHOWING REINFORCEMENT AT PIER

TRANSVERSE SECTION THRU DECK – SPANS 7-8 & 26-27

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AK/IGG | CHECKED BY: TR
DRAWN BY: TAW | DATE: 9/21/2015

AECOM

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

CIVIL WEST - VOLUME 4B
MINNETONKA/HOPKINS
BRIDGE R0686
SUPERSTRUCTURE DETAILS 5

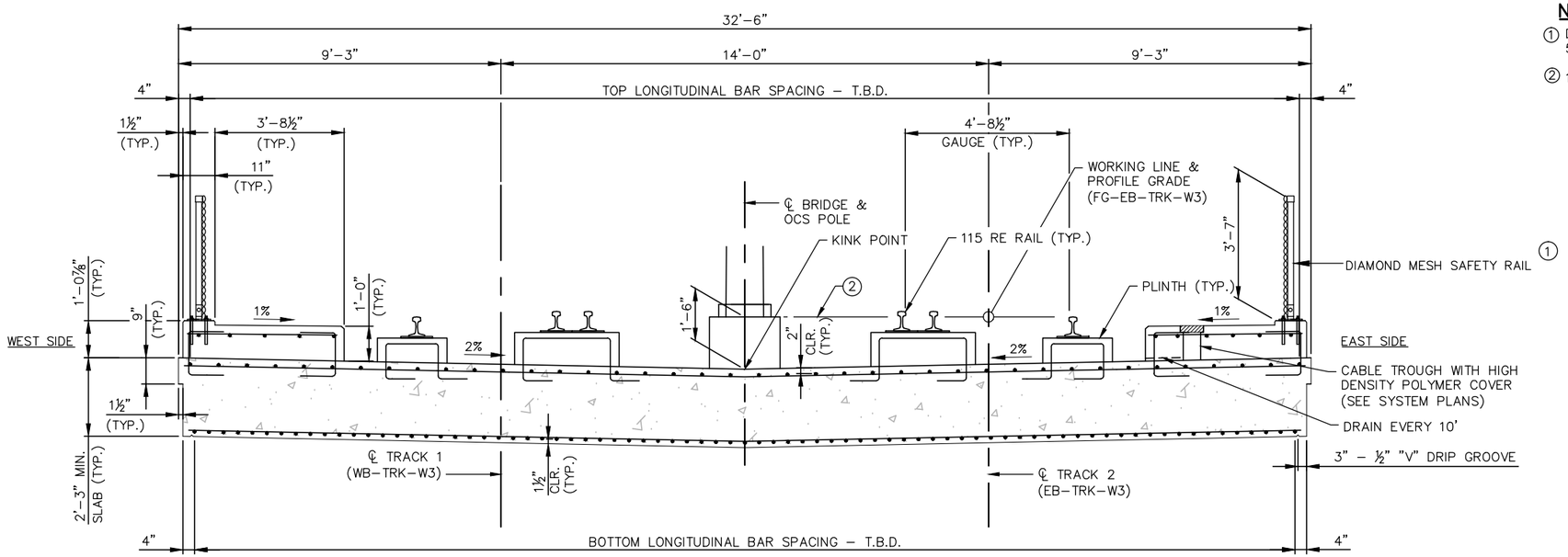
DISCIPLINE: STRUCTURES
SHEET NAME: CBRR0686-BRG-SUP-029

SHEET 72 OF 116

Sep. 21 2015 08:24 am v:\3400_ADC\CAD\SEGMENT W3\PLAN SHEETS\STRUCTURES\CBRR0686\60_percent_Preliminary Plans-Dwg files\CBRR0686-BRG-SUP-029.dwg By: wyttenbacht

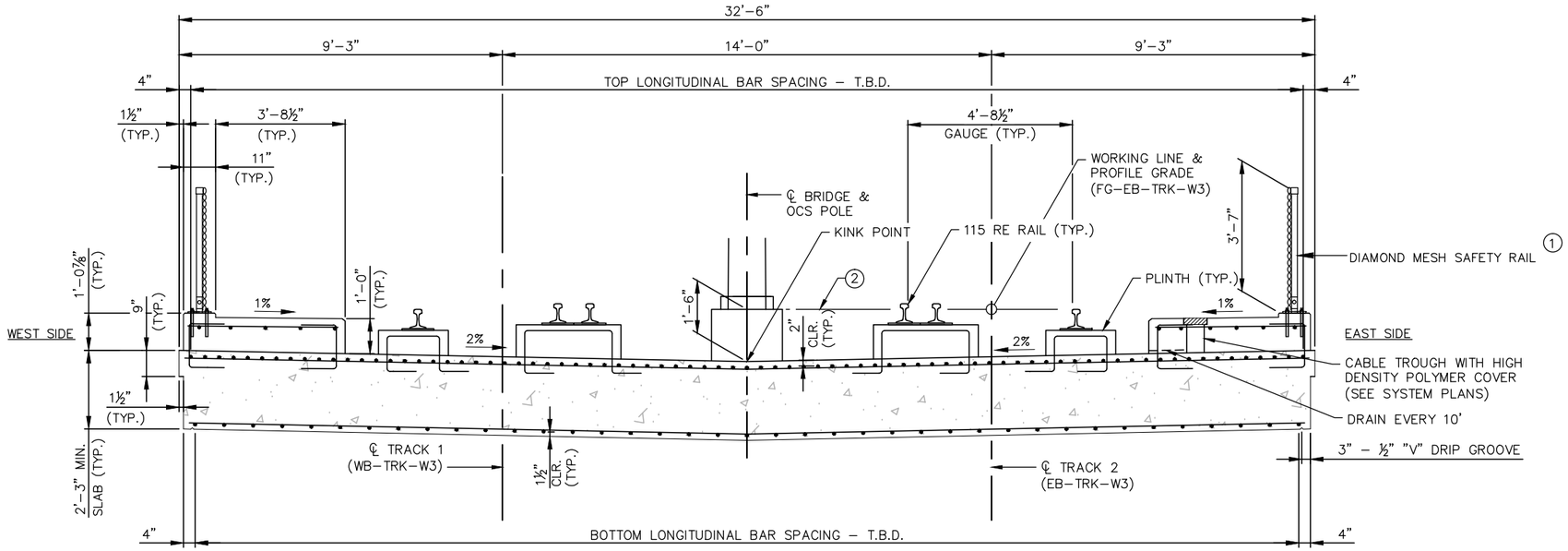
NOTES:

1. DIAMOND MESH SAFETY RAIL PER MNDOT FIG. 5-397.119 (MOD) WIRE FENCE.
2. 1'-6" MEASURED TO TOP OF LOW RAIL.



SHOWING REINFORCEMENT AT ℄ SPANS & ABUTMENTS

TRANSVERSE SECTION THRU DECK – SPANS 28–30



SHOWING REINFORCEMENT AT PIER

TRANSVERSE SECTION THRU DECK – SPANS 28–30

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AK/IGG | CHECKED BY: TR
DRAWN BY: TAW | DATE: 9/21/2015

AECOM

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

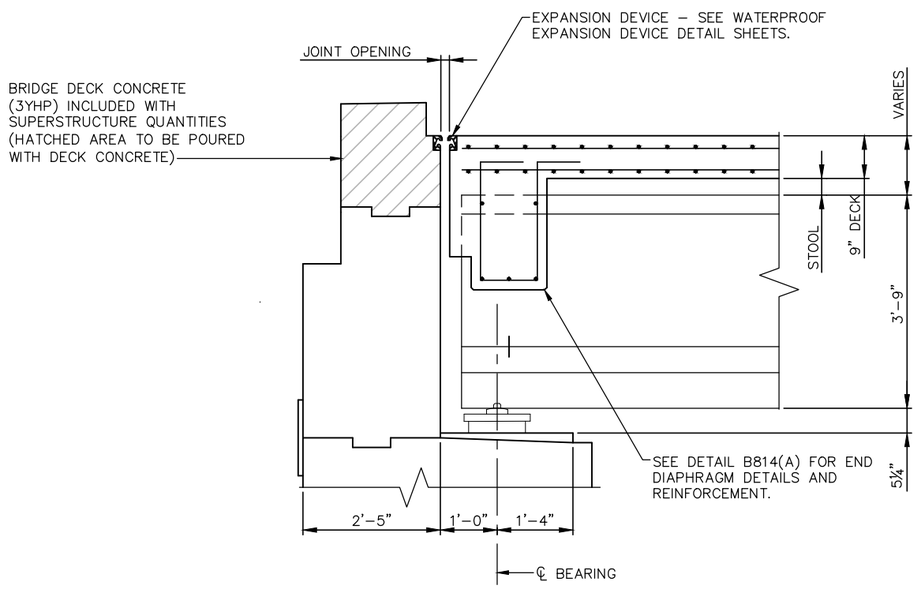
SOUTHWEST Green Line LRT Extension

CIVIL WEST - VOLUME 4B
MINNETONKA/HOPKINS
BRIDGE R0686
SUPERSTRUCTURE DETAILS 6

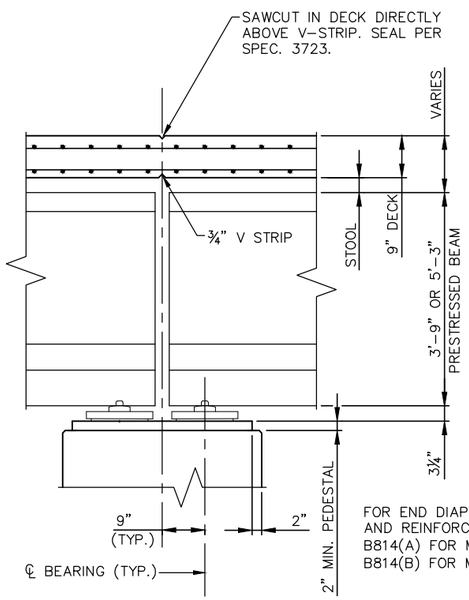
DISCIPLINE: STRUCTURES
SHEET NAME: CBRR0686-BRG-SUP-030

SHEET 73 OF 116

Sep. 21 2015 08:24 am v:\3400_ADC\CAD\SEGMENT W3\PLAN SHEETS\STRUCTURES\CBRR0686\60_percent_Preliminary Plans-Dwg files\CBRR0686-BRG-SUP-030.dwg By: wyttenbacht

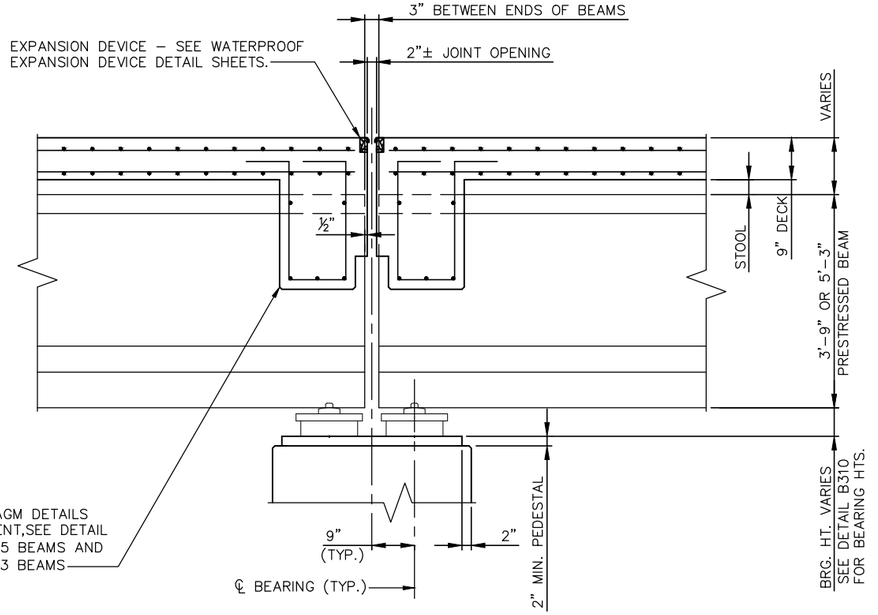


SECTION THRU SOUTH ABUTMENT



SECTION THRU PIER – FIXED

(SHOWN AT TRESTLE BENT PIER WITH 45"MN BEAM, 63"MN BEAM AT HAMMERHEAD PIERS SIMILAR)



SECTION THRU PIER – EXPANSION

(SHOWN AT TRESTLE BENT PIER WITH 45"MN BEAM, 63"MN BEAM AT HAMMERHEAD PIERS SIMILAR)

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AK/IGG | CHECKED BY: TR
DRAWN BY: TAW | DATE: 9/21/2015

AECOM

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

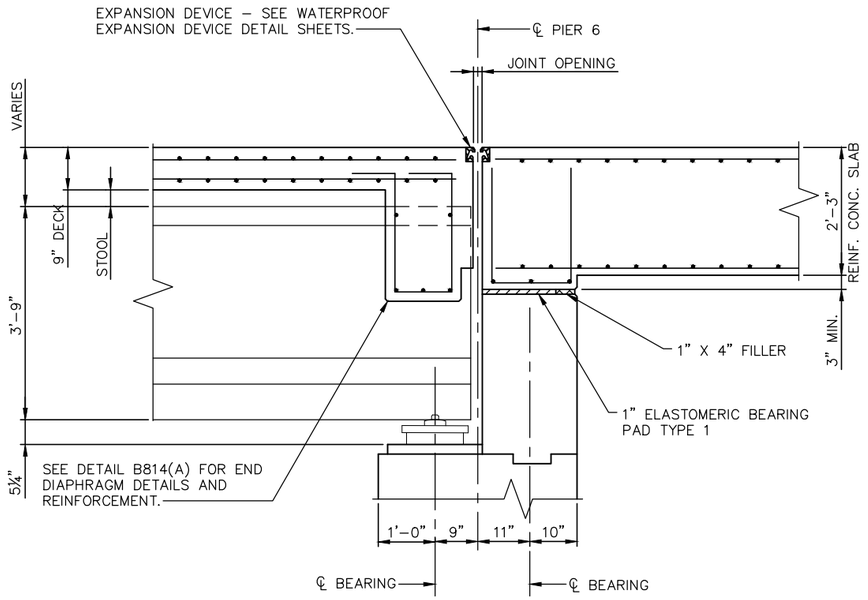
SOUTHWEST Green Line LRT Extension

CIVIL WEST - VOLUME 4B
MINNETONKA/HOPKINS
BRIDGE R0686
SUPERSTRUCTURE DETAILS 7

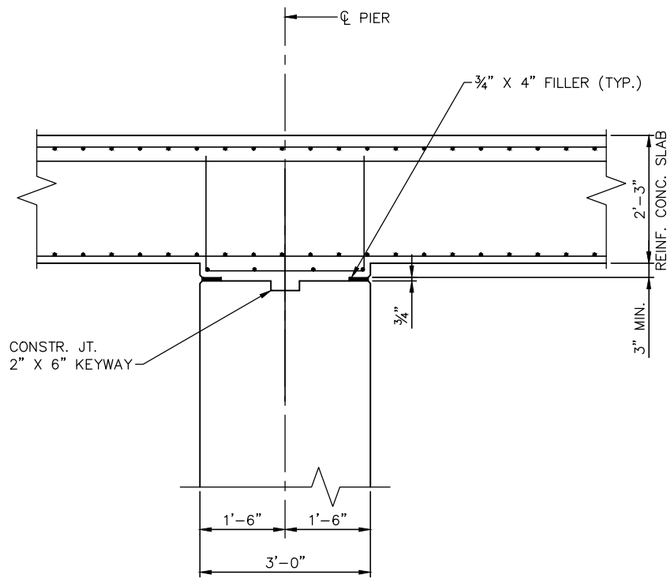
DISCIPLINE: STRUCTURES
SHEET NAME: CBRR0686-BRG-SUP-031

SHEET 74 OF 116

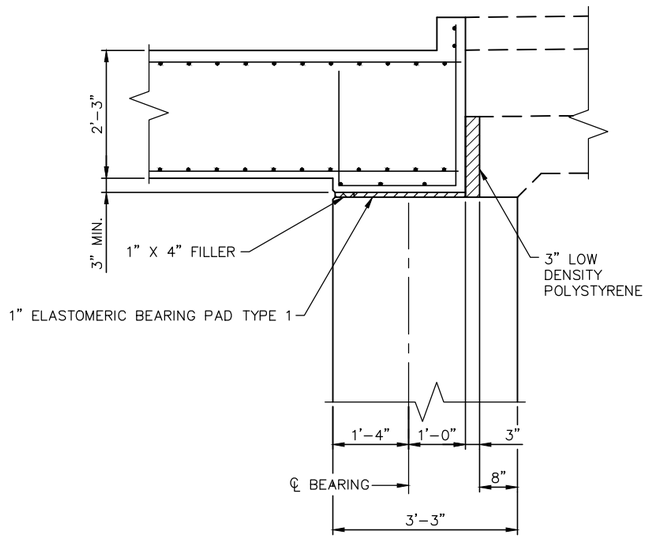
Sep. 21 2015 08:25 am V:\3400_ADC\CAD\SEGMENT W3\PLAN SHEETS\STRUCTURES\CBRR0686\60_percent_Preliminary Plans-Dwg files\CBRR0686-BRG-SUP-031.dwg By: wyttenbacht



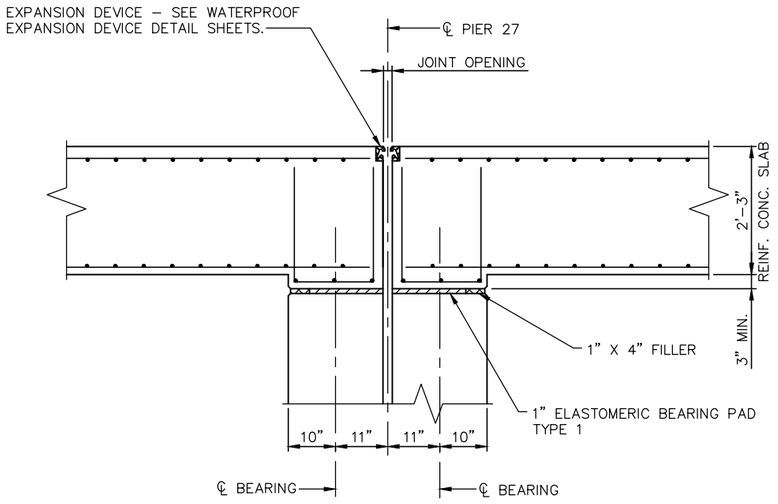
SECTION THRU PIER 6
(PIER 6 SHOWN, PIERS 8 & 25 SIMILAR)



SECTION THRU PIER 7
(PIER 7 SHOWN, PIERS 26, 28 & 29 SIMILAR)



SECTION THRU N. ABUTMENT



SECTION THRU PIER 27

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AK/IGG | CHECKED BY: TR
DRAWN BY: TAW | DATE: 9/21/2015

AECOM

60% SUBMISSION - 09/28/15

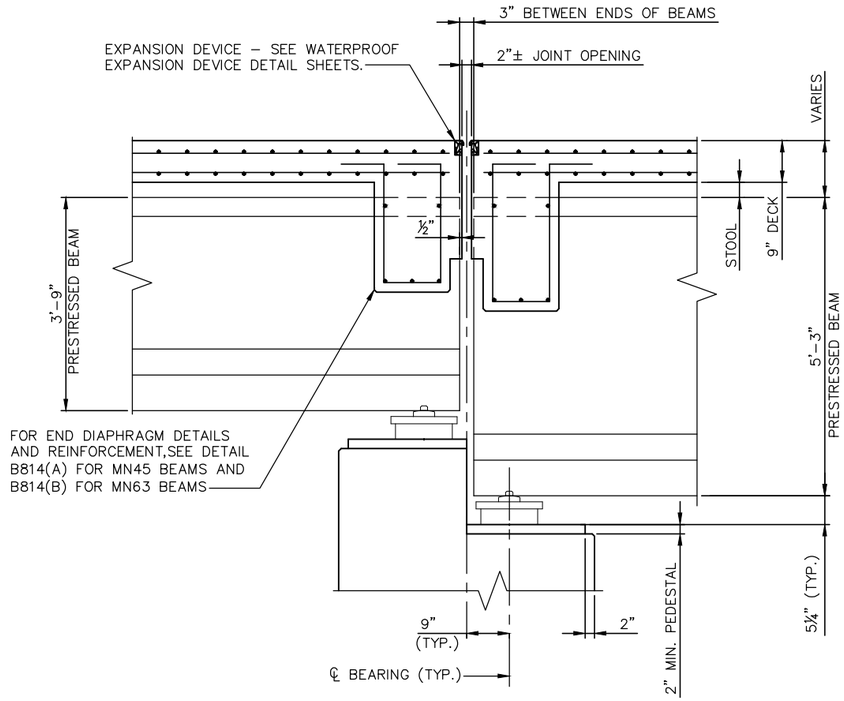
METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

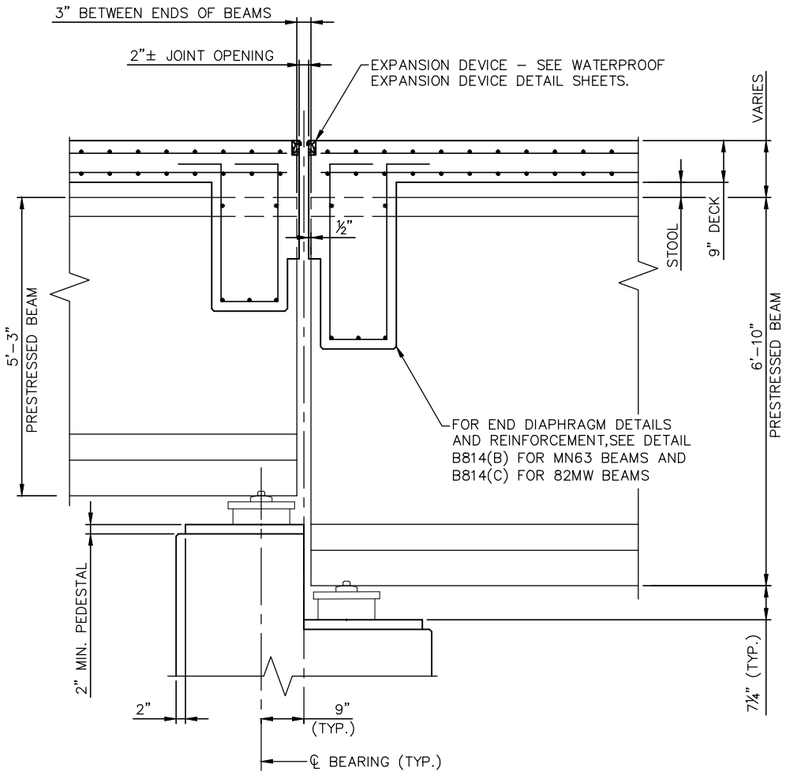
CIVIL WEST - VOLUME 4B
MINNETONKA/HOPKINS
BRIDGE R0686
SUPERSTRUCTURE DETAILS 8

DISCIPLINE: STRUCTURES
SHEET NAME: CBRR0686-BRG-SUP-032

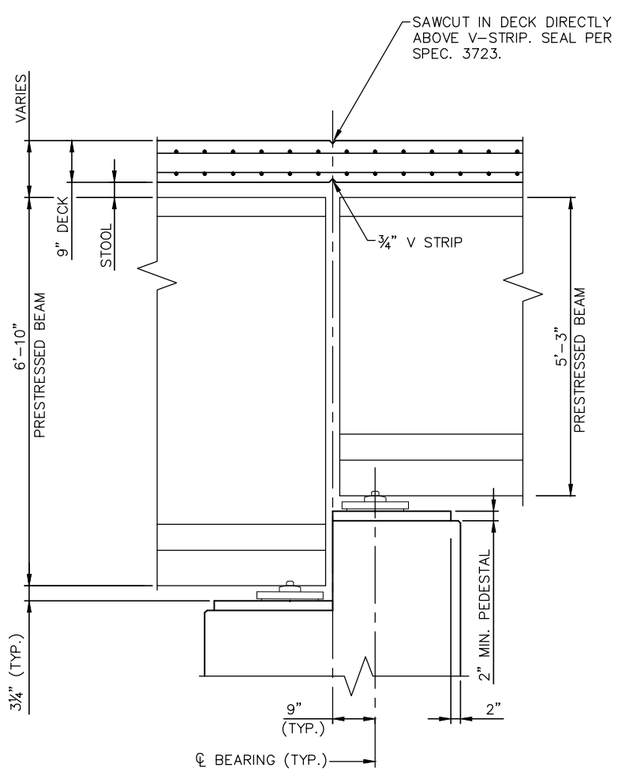
SHEET 75 OF 116



SECTION THRU PIER 12



SECTION THRU PIER 18



SECTION THRU PIER 19

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AK/IGG | CHECKED BY: TR
DRAWN BY: TAW | DATE: 9/21/2015

AECOM

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

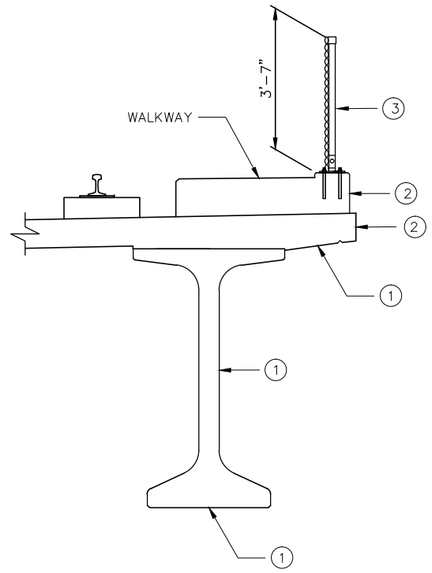
SOUTHWEST Green Line LRT Extension

CIVIL WEST - VOLUME 4B
MINNETONKA/HOPKINS
BRIDGE R0686
SUPERSTRUCTURE DETAILS 9

DISCIPLINE: STRUCTURES
SHEET NAME: CBRR0686-BRG-SUP-033

SHEET 76 OF 116

Sep. 21 2015 08:25 am v:\3400_ADC\CAD\SEGMENT W3\PLAN SHEETS\STRUCTURES\CBRR0686\60_percent_Preliminary Plans-Dwg files\CBRR0686-BRG-SUP-033.dwg By: wyttenbacht



PART TRANSVERSE SECTION AT BRIDGE

NOTES:

1. SPECIAL SURFACE FINISH SHALL BE APPLIED TO THE BOTTOM FLANGE OF ALL GIRDERS, THE OUTSIDE FACE OF FASCIA GIRDERS AND THE BOTTOM OF THE DECK BETWEEN THE EDGE OF DECK AND THE TOP FLANGE OF THE FASCIA GIRDER. COLOR SHALL BE FEDERAL STANDARD COLOR XXXX, COLOR XXXXX (COLOR). SEE SPEC. SB 2401.
2. SPECIAL SURFACE FINISH SHALL BE APPLIED TO THE EDGE OF DECK, EDGE OF WALKWAY AND COPING AT F.F. OF ABUTMENT BODY AND AT TOP OF WINGWALL. COLOR SHALL BE FEDERAL COLOR XXXX, COLOR XXXXX. SEE SPEC. SB 2401.
3. 3'-6" DIAMOND MESH SAFETY RAIL. FOR DETAILS, SEE WIRE FENCE RAILING SHEETS.

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AK/IGG | CHECKED BY: TR
DRAWN BY: TAW | DATE: 9/21/2015

AECOM

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

CIVIL WEST - VOLUME 4B
MINNETONKA/HOPKINS
BRIDGE R0686
SUPERSTRUCTURE DETAILS 10

DISCIPLINE: STRUCTURES
SHEET NAME: CBRR0686-BRG-SUP-034

SHEET 77 OF 116

BILL OF REINFORCEMENT – SUPERSTRUCTURE

BAR	NO.	LENGTH	SHAPE	LOCATION

Sep, 21 2015 08:26 am V:\3400_ADC\CAD\SEGMENT W3\PLAN SHEETS\STRUCTURES\CBRR0686\60_percent_Preliminary Plans-Dwg files\CBRR0686-BRG-SUP-035.dwg By: wyttenbacht

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AK/IGG	CHECKED BY: TR
DRAWN BY: TAW	DATE: 9/21/2015

AECOM

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

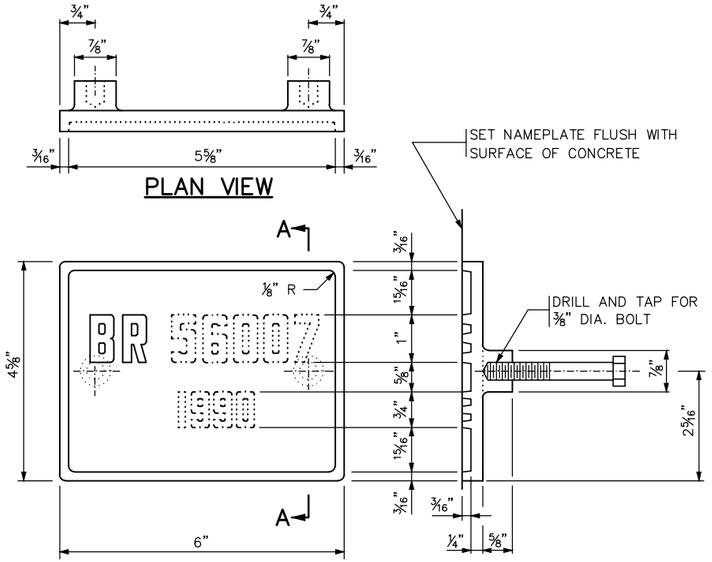
SOUTHWEST
Green Line LRT Extension

CIVIL WEST - VOLUME 4B
MINNETONKA/HOPKINS
BRIDGE R0686
SUPERSTRUCTURE DETAILS 11

DISCIPLINE: STRUCTURES

SHEET NAME: CBRR0686-BRG-SUP-035

SHEET 78 OF 116



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

BRIDGE _____

YEAR _____

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".

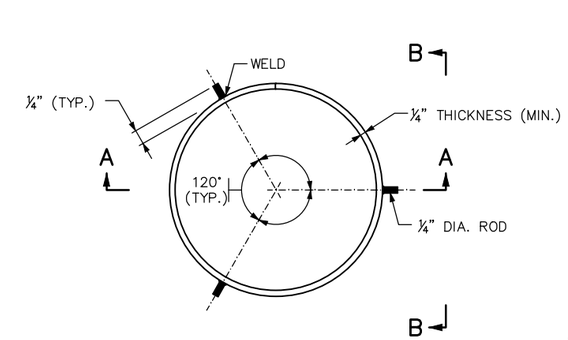
HORIZONTAL SPACING OF LETTERS AND NUMBERS SHALL PRODUCE A BALANCED LAYOUT IN PROPORTION TO SPACING SHOWN.

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

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

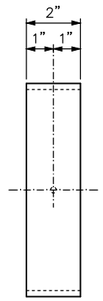
ALL DIMENSIONS FOR ¾" HIGH LETTERS AND NUMBERS SHALL BE IN DIRECT PROPORTION TO THOSE SHOWN FOR 1" HIGH LETTERS AND NUMBERS.

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



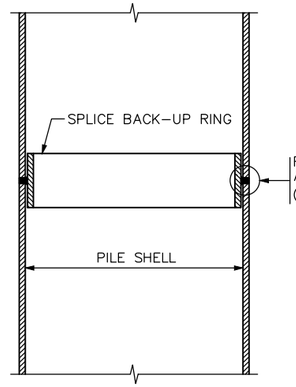
PLAN VIEW – SPLICE BACK–UP RING

PILE NOT SHOWN

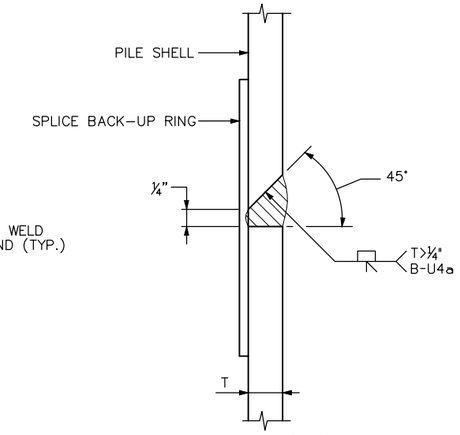


SECTION B–B

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:	DETAIL NO.
Daniel D. Morgan STATE BRIDGE ENGINEER	PILE SPLICE (CAST–IN–PLACE CONCRETE PILES)	11–06–2013	B201

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AK/IGG CHECKED BY: TR
DRAWN BY: TAW DATE: 9/21/2015

AECOM

60% SUBMISSION - 09/28/15

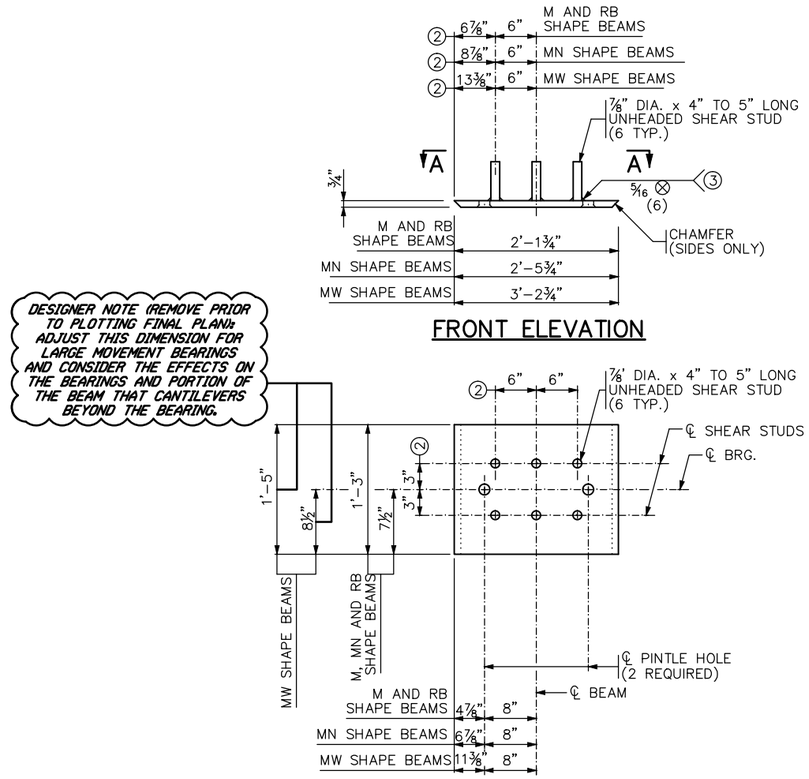
METROPOLITAN COUNCIL

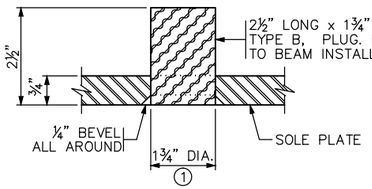
SOUTHWEST Green Line LRT Extension

CIVIL WEST - VOLUME 4B
MINNETONKA/HOPKINS
BRIDGE R0686
BRIDGE DETAILS 1

DISCIPLINE: STRUCTURES
SHEET NAME: CBRR0686-BRG-DTL-001

SHEET 80 OF 116





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.

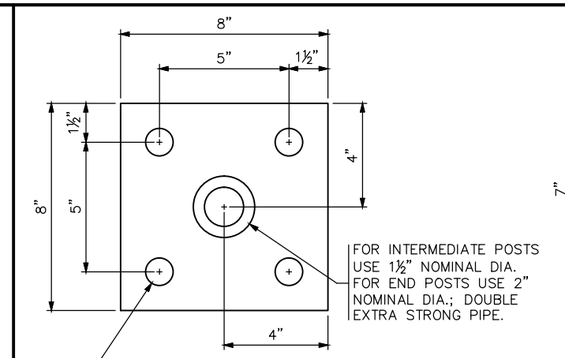
SOLE PLATES ARE INCIDENTAL TO PRESTRESSED CONCRETE BEAMS.

① FOR 1½" DIA. PINTLES.

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

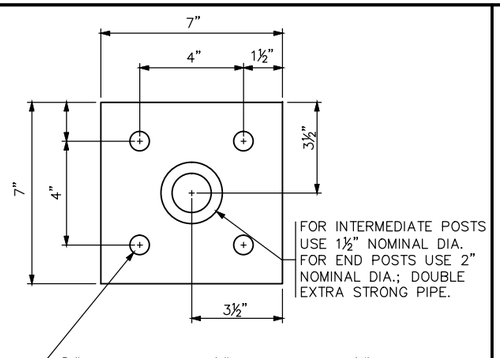
③ THE REQUIREMENTS FOR WELDING STUDS SHALL COMPLY WITH AASHTO/AWS D1.1.

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



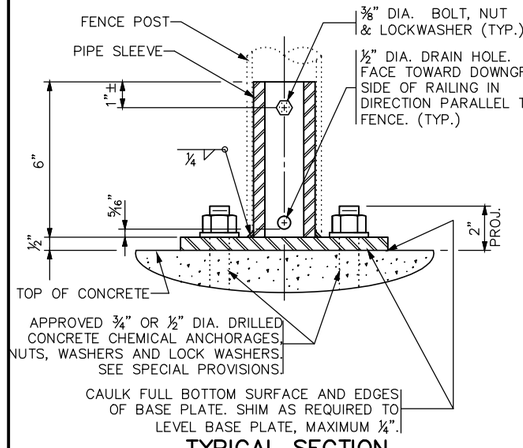
PLAN VIEW – TYPE A

ESTIMATED WEIGHT = 12 OR 14 LBS.

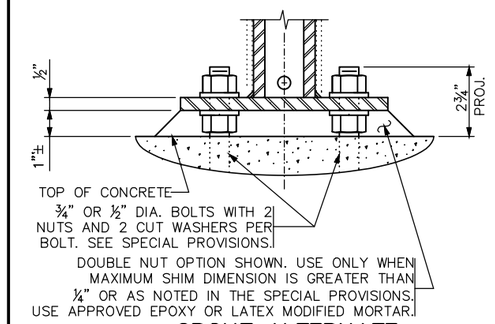


PLAN VIEW – TYPE B

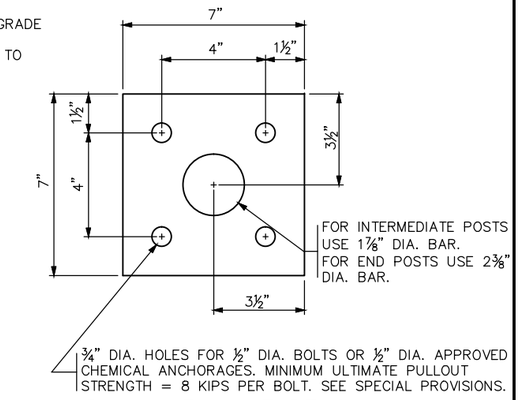
ESTIMATED WEIGHT = 10 OR 12 LBS.



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:
½" 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. Hagyan STATE BRIDGE ENGINEER	FENCE POST ANCHORAGE		B905

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AK/IGG | CHECKED BY: TR
DRAWN BY: TAW | DATE: 9/21/2015

AECOM

60% SUBMISSION - 09/28/15

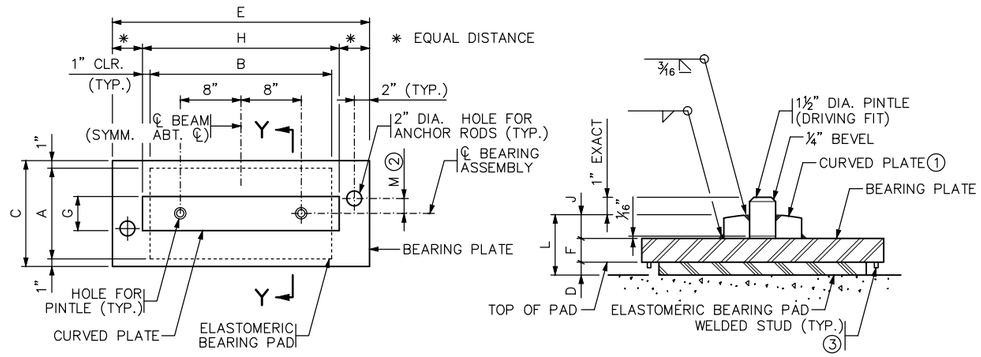
METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

CIVIL WEST - VOLUME 4B
MINNETONKA/HOPKINS
BRIDGE R0686
BRIDGE DETAILS 2

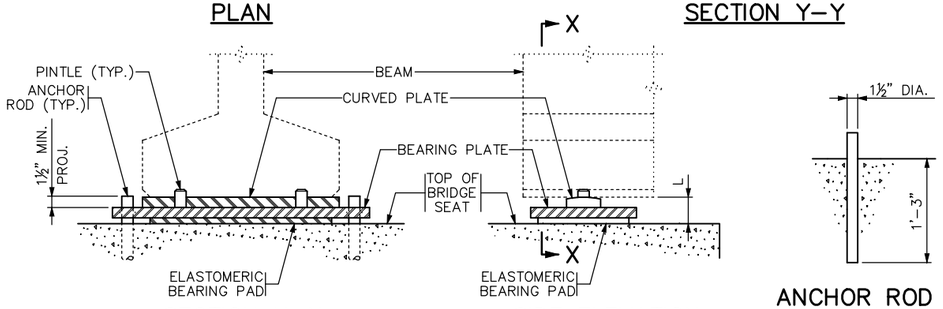
DISCIPLINE: STRUCTURES
SHEET NAME: CBRR0686-BRG-DTL-002

SHEET 81 OF 116



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	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	④	MN45 & MN63	12"	24"	½"	8.0	14"	38"	1½"	4½"	26"	1¼"	NONE	NONE	3¼"	16"
F2	⑤	82MW	16"	36"	½"	11.1	18"	47"	1½"	4½"	38"	1¼"	NONE	NONE	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".

④ PIERS 1,3,5,9,11,13,15,17,19,21,22 & 24

⑤ PIER 19

DESIGN DATA:
MAXIMUM HORIZONTAL LOAD IS 70 KIPS FOR 1½" PINTLES.

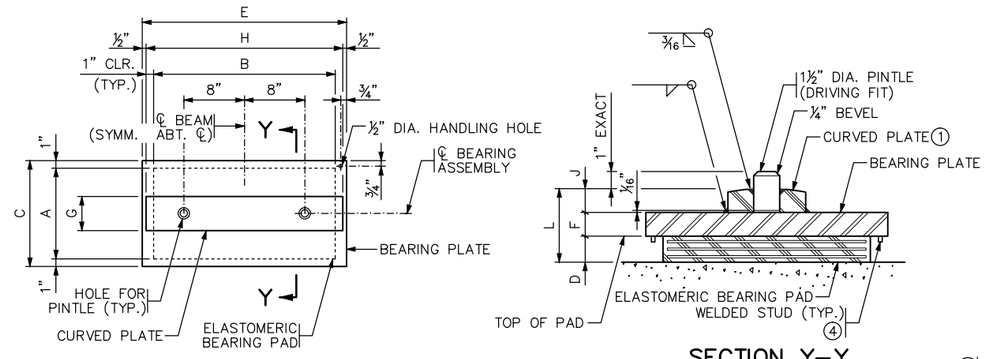
APPROVED: SEPTEMBER 22, 2011
Nancy Daubenberger
STATE BRIDGE ENGINEER

STATE OF MINNESOTA
DEPARTMENT OF TRANSPORTATION

CURVED PLATE BEARING ASSEMBLY
(PRESTRESSED CONCRETE BEAMS)
(FIXED)

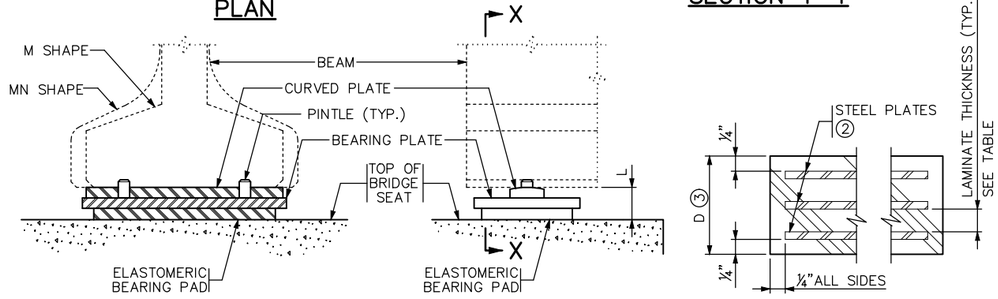
REVISED 11–06–2013

DETAIL NO. B310



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	⑤	MN45 & MN63	12"	24"	2½"	4	⅛"	3	½"	8.0	14"	27"	1½"	4½"	26"	1¼"	5¼"	16"
E2	⑥	82MW	16"	36"	4⅜"	7	⅛"	6	½"	11.1	18"	39"	1¾"	4½"	38"	1¼"	7⅜"	16"
E3	⑦	MN63	12"	24"	3¾"	6	⅛"	5	½"	8.0	14"	27"	1½"	4½"	26"	1¼"	6½"	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".

⑤ PIERS 2,4,6,8,10,12,14,16,18,25 & SOUTH ABUTMENT

⑥ PIER 18

⑦ PIERS 20 & 23

DESIGN DATA:
MAXIMUM HORIZONTAL LOAD IS 70 KIPS FOR 1½" PINTLES.

APPROVED: SEPTEMBER 22, 2011
Nancy Daubenberger
STATE BRIDGE ENGINEER

STATE OF MINNESOTA
DEPARTMENT OF TRANSPORTATION

CURVED PLATE BEARING ASSEMBLY
(PRESTRESSED CONCRETE BEAMS)
(EXPANSION)

REVISED

DETAIL NO. B311

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AK/IGG CHECKED BY: TR
DRAWN BY: TAW DATE: 9/21/2015

AECOM

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

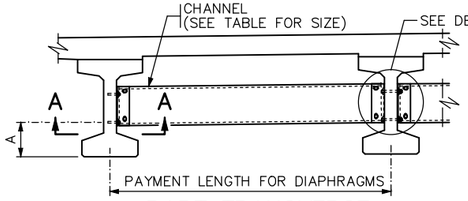
SOUTHWEST Green Line LRT Extension

CIVIL WEST - VOLUME 4B
MINNETONKA/HOPKINS
BRIDGE R0686
BRIDGE DETAILS 3

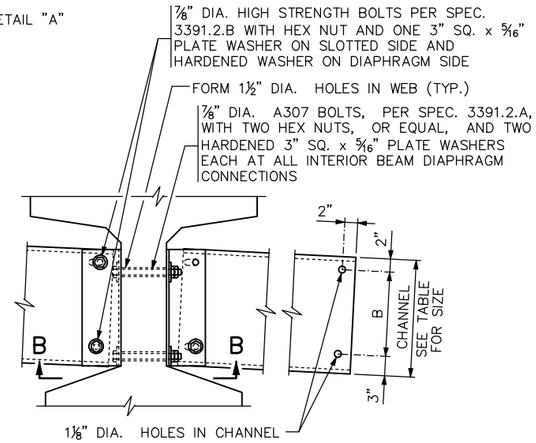
DISCIPLINE: STRUCTURES

SHEET NAME: CBRR0686-BRG-DTL-003

SHEET 82 OF 116

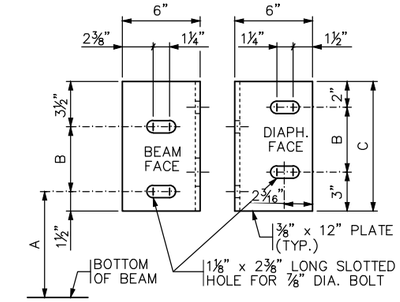


PART TRANSVERSE SECTION AT DIAPHRAGM



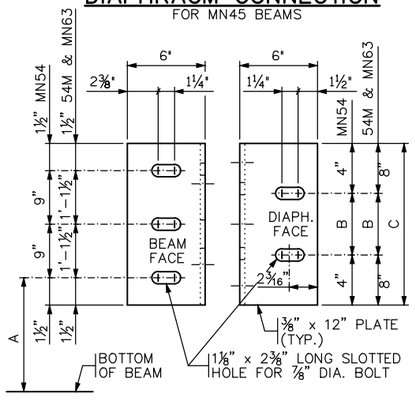
DETAIL "A"

INTERIOR BEAM WITH CONTINUOUS LINE OF DIAPHRAGMS



DIAPHRAGM CONNECTION

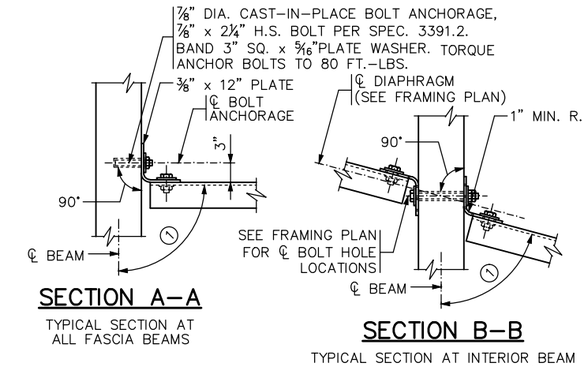
FOR MN45 BEAMS



DIAPHRAGM CONNECTION

FOR 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'-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



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.

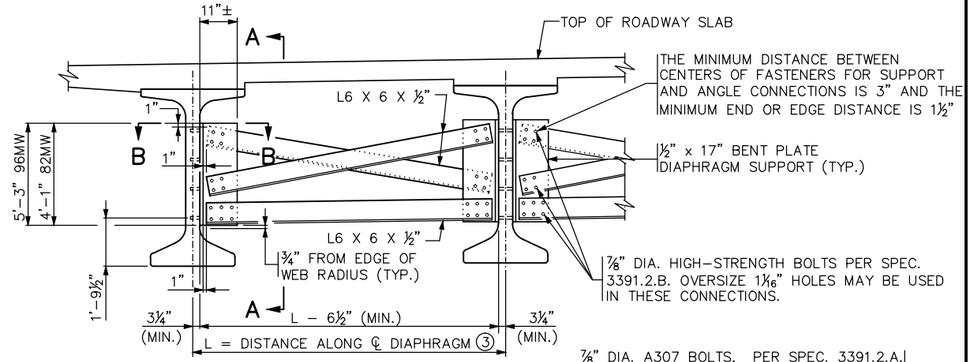
BENT PLATES MAY BE USED IN PLACE OF CHANNELS. THE BENT PLATES MUST BE THE SAME HEIGHT AS THE CHANNELS THEY REPLACE, BE 5/16" IN THICKNESS, AND HAVE LEGS 5" LONG.

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°.

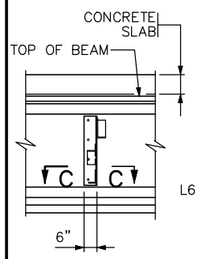
APPROVED: OCTOBER 26, 2005	STATE OF MINNESOTA DEPARTMENT OF TRANSPORTATION	REVISED 06-14-2006 10-22-2009 09-11-2014	DETAIL NO.
STATE BRIDGE ENGINEER	STEEL INTERMEDIATE DIAPHRAGM (FOR MN45 & MN63 PRESTRESSED CONCRETE BEAMS)		B403



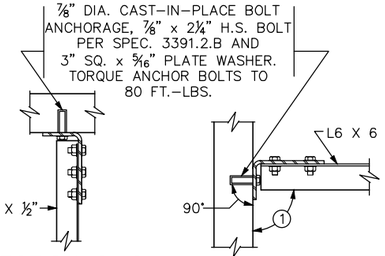
PART TRANSVERSE SECTION

SQUARE BRIDGE SHOWN

⅞" DIA. A307 BOLTS, PER SPEC. 3391.2.A, WITH TWO HEX NUTS, OR EQUAL, AND TWO HARDENED 3" SQ. x 5/16" PLATE WASHERS EACH AT ALL INTERIOR BEAM DIAPHRAGM CONNECTIONS



SECTION A–A

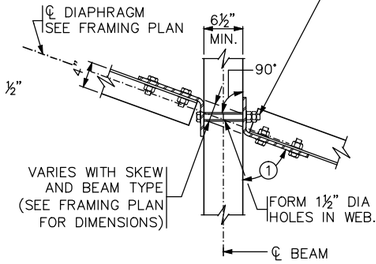


SECTION C–C

FASCIA BEAM

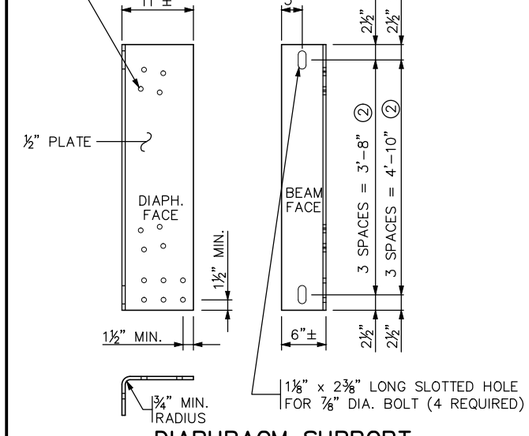
SECTION B–B

TYPICAL SECTION AT FASCIA BEAM



INTERMEDIATE DIAPHRAGM

TYPICAL SECTION AT INTERIOR BEAM WITH CONTINUOUS OR STAGGERED INTERMEDIATE DIAPHRAGMS



DIAPHRAGM SUPPORT

NOTES:

ALL STEEL SHALL CONFORM TO SPEC. 3306.

INCLUDE ALL STRUCTURAL STEEL SHOWN ON THIS DETAIL, INCLUDING BOLTS AND WASHERS, IN THE PAYMENT FOR DIAPHRAGMS FOR PRESTRESSED BEAMS.

INSTALLATION SHALL CONFORM TO SPEC. 2405.3.K.

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°.

② SPACE BOLT HOLES SO AS TO MISS PRESTRESSED STRANDS IN CONCRETE BEAMS. SEE PRESTRESSED CONCRETE BEAM SHEETS FOR MORE INFORMATION.

③ DIAPHRAGM SHOWN DESIGNED FOR BEAM SPACING UP TO 13'-0".

APPROVED: SEPTEMBER 22, 2011	STATE OF MINNESOTA DEPARTMENT OF TRANSPORTATION	REVISED 09-11-2014	DETAIL NO.
STATE BRIDGE ENGINEER	STEEL INTERMEDIATE BOLTED DIAPHRAGM (ALL MW PRESTRESSED CONCRETE BEAMS)		B412

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AK/IGG CHECKED BY: TR
DRAWN BY: TAW DATE: 9/21/2015

AECOM

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

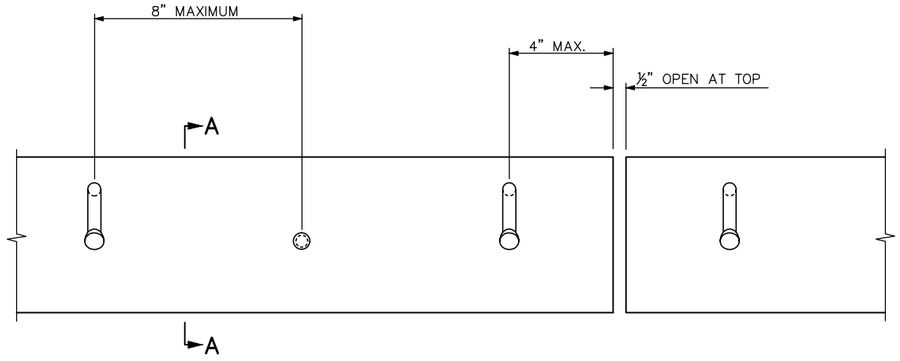
SOUTHWEST Green Line LRT Extension

CIVIL WEST - VOLUME 4B
MINNETONKA/HOPKINS
BRIDGE R0686
BRIDGE DETAILS 4

DISCIPLINE: STRUCTURES
SHEET NAME: CBRR0686-BRG-DTL-004

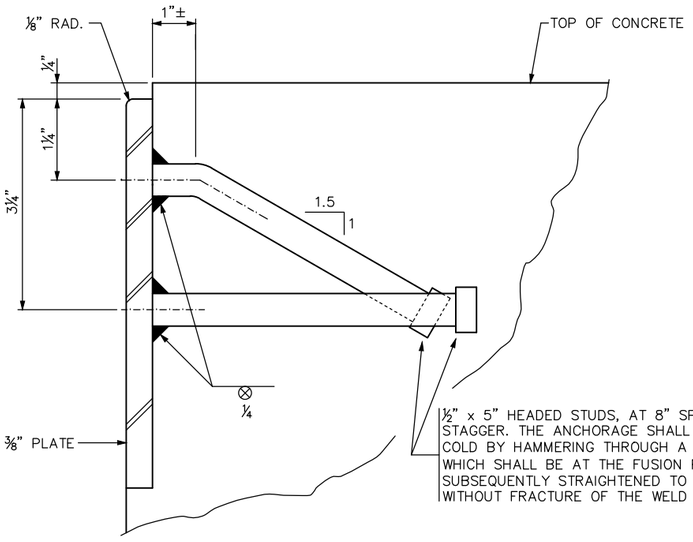
SHEET 83 OF 116

Sep. 21 2015 08:27 am V:\3400_ADC\CAD\SEGMENT W3\PLAN SHEETS\STRUCTURES\CBRR0686\60_percent_Preliminary Plans-Dwg files\CBRR0686-BRG-BDTL-004_403-412.dwg By: wyttenbacht



ELEVATION

CONCRETE NOT SHOWN



SECTION A–A

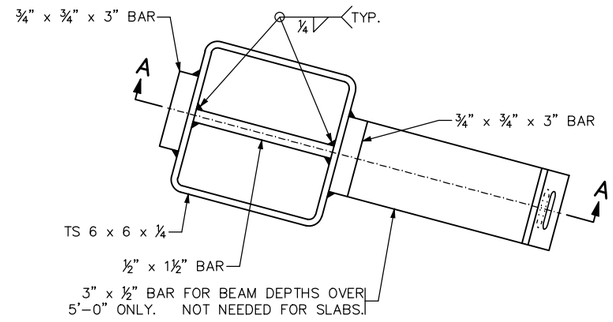
NOTES:

PLATES SHALL EXTEND FULL WIDTH OF ROADWAY BETWEEN GUTTER LINES WITH A ½" OPEN JOINT AT EACH BREAK IN CROWN PROFILE. MAX. LENGTH 22 FT.

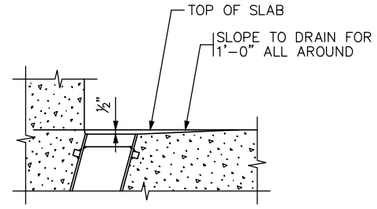
MATERIALS: STRUCTURAL STEEL PER Mn/DOT SPEC. 3306. GALVANIZE AFTER FABRICATION PER Mn/DOT SPEC. 3394

SET PLATE TO PROPER GRADE AND CROWN.

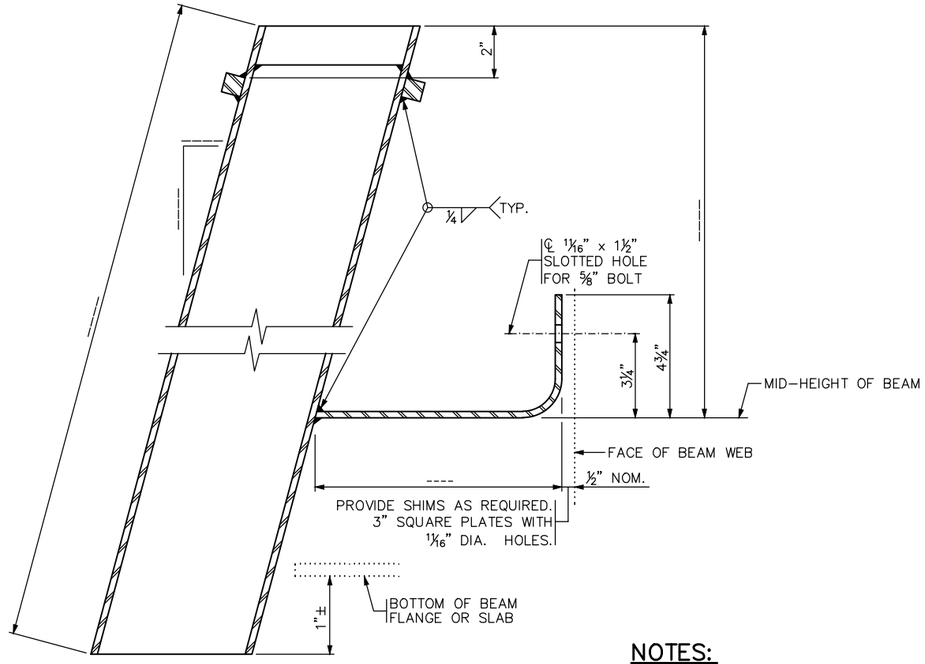
APPROVED: NOVEMBER 22, 2002	STATE OF MINNESOTA DEPARTMENT OF TRANSPORTATION	REVISION	DETAIL NO.
Jamil Z Wazyan STATE BRIDGE ENGINEER	PROTECTION PLATE (FOR END OF SLAB)		B553



PLAN VIEW



PLACEMENT DIAGRAM



SECTION A–A

NOTES:

MATERIAL TO BE STRUCTURAL STEEL PER Mn/DOT SPEC. 3306.

GALVANIZE BOLTS AND WASHER PER Mn/DOT SPEC. 3392.

GALVANIZE OTHER MATERIALS PER Mn/DOT SPEC. 3394 AFTER FABRICATION.

PAYMENT FOR FLOOR DRAIN TYPE _____ SHALL INCLUDE ALL MATERIAL SHOWN ON THIS DETAIL.

APPROVED: NOVEMBER 22, 2002	STATE OF MINNESOTA DEPARTMENT OF TRANSPORTATION	REVISED 01–13–2004	DETAIL NO.
Jamil Z Wazyan STATE BRIDGE ENGINEER	BRIDGE FLOOR DRAIN (STRUCTURAL TUBE)		B702

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AK/IGG | CHECKED BY: TR
DRAWN BY: TAW | DATE: 9/21/2015

AECOM

60% SUBMISSION - 09/28/15

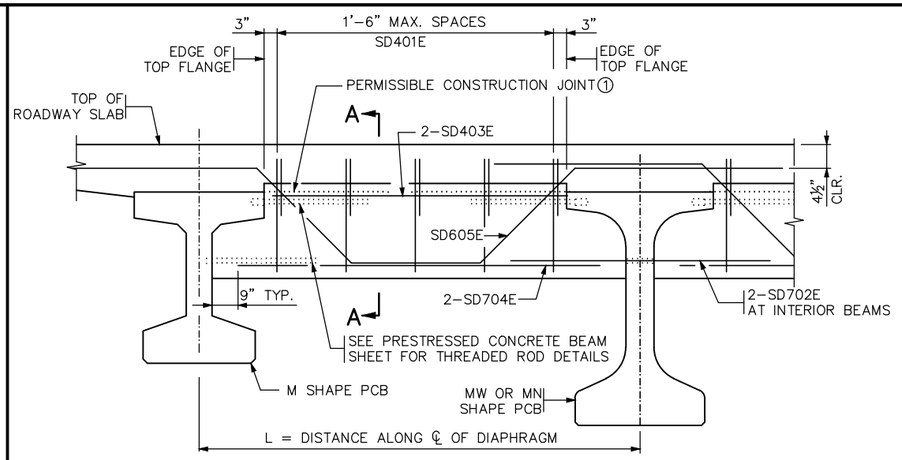
METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

CIVIL WEST - VOLUME 4B
MINNETONKA/HOPKINS
BRIDGE R0686
BRIDGE DETAILS 5

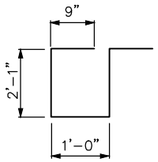
DISCIPLINE: STRUCTURES
SHEET NAME: CBRR0686-BRG-DTL-005

SHEET 84 OF 116

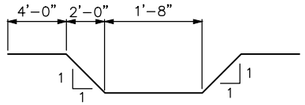


PART TRANSVERSE SECTION

(L > 8' SHOWN)

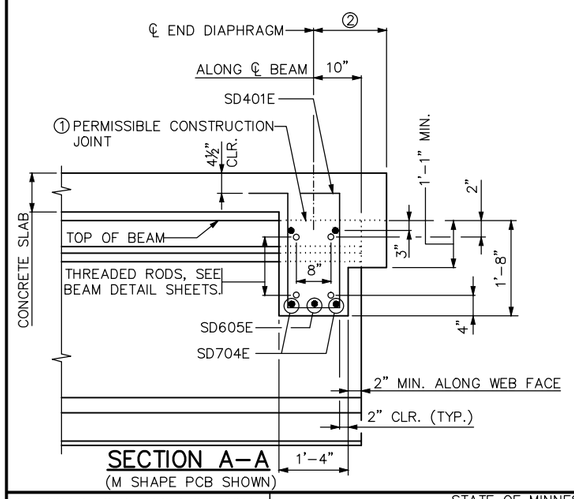


SD401E



SD605E
(IF L > 8')

BILL OF REINFORCEMENT FOR END DIAPHRAGM				
BAR	NO.	LENGTH	SHAPE	LOCATION
SD401E			⊓	VERTICAL TIE
SD702E		5'-0"	—	LONG. THRU BEAM
SD403E			—	LONG. TOP
SD704E			—	LONG. BOTTOM
SD605E			⌒	LONGITUDINAL



SECTION A–A

(M SHAPE PCB SHOWN)

1'-4"

NOTES:

CONCRETE FOR END DIAPHRAGMS SHALL BE THE SAME MIX AS USED IN DECK.

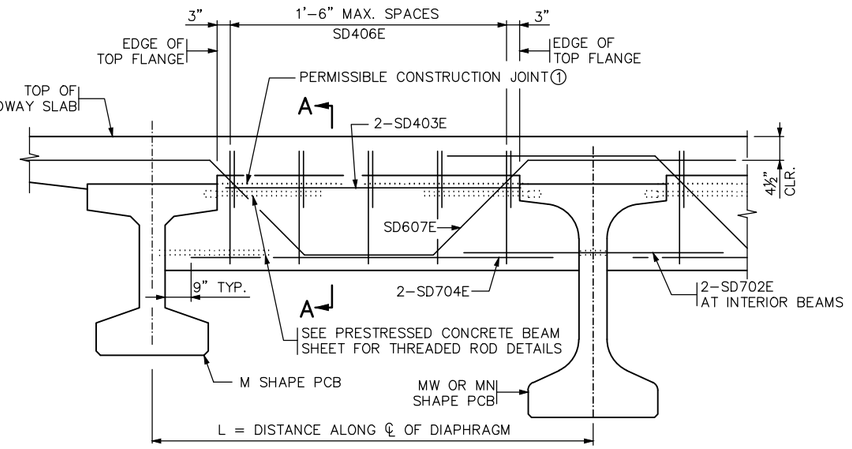
QUANTITIES FOR END DIAPHRAGM CONCRETE AND REINFORCEMENT SHOWN ON THIS DETAIL SHALL BE LISTED IN SUPERSTRUCTURE QUANTITIES.

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.

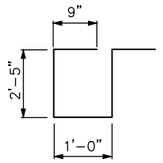
② PERPENDICULAR TO CENTERLINE OF DIAPHRAGM.
1'-0½" AT SOUTH ABUTMENT
10½" AT ALL OTHER EXP. JOINT LOCATIONS

APPROVED: SEPTEMBER 22, 2011	STATE OF MINNESOTA DEPARTMENT OF TRANSPORTATION	REVISED	DETAIL NO.
Nancy Daubenberger STATE BRIDGE ENGINEER	CONCRETE END DIAPHRAGM (MN45 PRESTRESSED CONCRETE BEAMS) (PARAPET ABUTMENT)	04-17-2013 11-06-2013	B814(A)

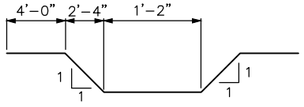


PART TRANSVERSE SECTION

(L > 8' SHOWN)

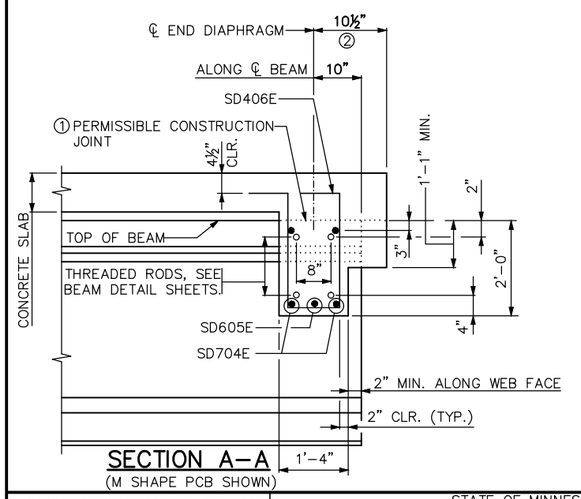


SD406E



SD607E
(IF L > 8')

BILL OF REINFORCEMENT FOR END DIAPHRAGM				
BAR	NO.	LENGTH	SHAPE	LOCATION
SD702E		5'-0"	—	LONG. THRU BEAM
SD403E			—	LONG. TOP
SD704E			—	LONG. BOTTOM
SD406E			⊓	VERTICAL TIE
SD607E			⌒	LONGITUDINAL



SECTION A–A

(M SHAPE PCB SHOWN)

1'-4"

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.

APPROVED: SEPTEMBER 22, 2011	STATE OF MINNESOTA DEPARTMENT OF TRANSPORTATION	REVISED	DETAIL NO.
Nancy Daubenberger STATE BRIDGE ENGINEER	CONCRETE END DIAPHRAGM (MN63 PRESTRESSED CONCRETE BEAMS) (PARAPET ABUTMENT)	04-17-2013 11-06-2013	B814(B)

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AK/IGG CHECKED BY: TR
DRAWN BY: TAW DATE: 9/21/2015

AECOM

60% SUBMISSION - 09/28/15

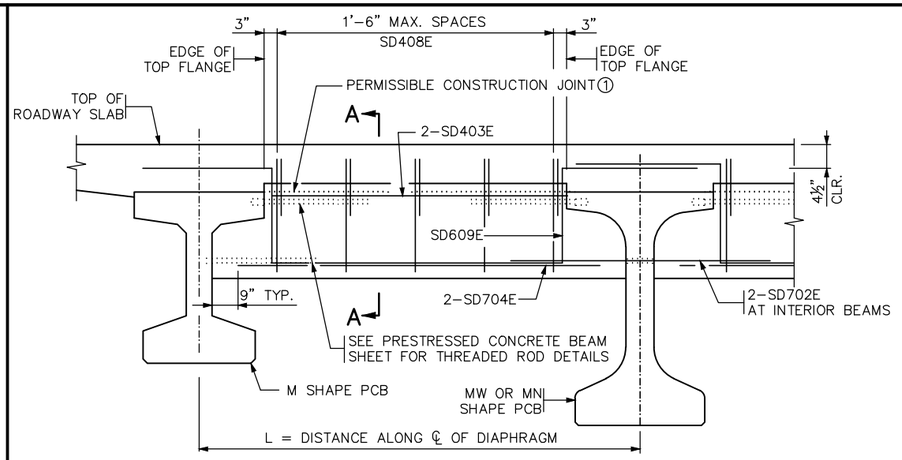
METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

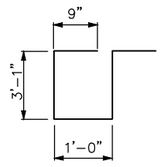
CIVIL WEST - VOLUME 4B
MINNETONKA/HOPKINS
BRIDGE R0686
BRIDGE DETAILS 6

DISCIPLINE: STRUCTURES
SHEET NAME: CBRR0686-BRG-DTL-006

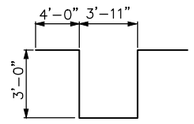
SHEET 85 OF 116



PART TRANSVERSE SECTION



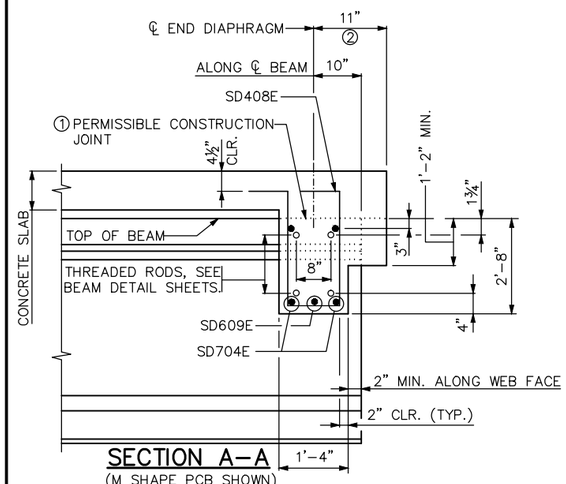
SD408E



SD609E

BILL OF REINFORCEMENT FOR END DIAPHRAGM

BAR	NO.	LENGTH	SHAPE	LOCATION
SD702E		5'-0"		LONG. THRU BEAM
SD403E				LONG. TOP
SD704E				LONG. BOTTOM
SD408E				VERTICAL TIE
SD609E				LONGITUDINAL



SECTION A–A
(M SHAPE PCB SHOWN)

NOTES:

CONCRETE FOR END DIAPHRAGMS SHALL BE THE SAME MIX AS USED IN DECK.

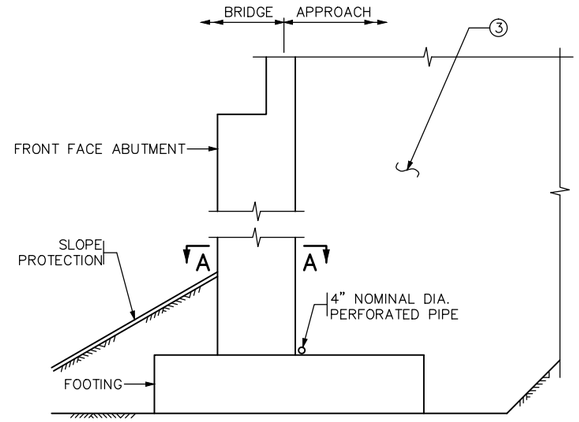
QUANTITIES FOR END DIAPHRAGM CONCRETE AND REINFORCEMENT SHOWN ON THIS DETAIL SHALL BE LISTED IN SUPERSTRUCTURE QUANTITIES.

THREADED RODS ARE INCIDENTAL TO PRESTRESSED CONCRETE BEAMS.

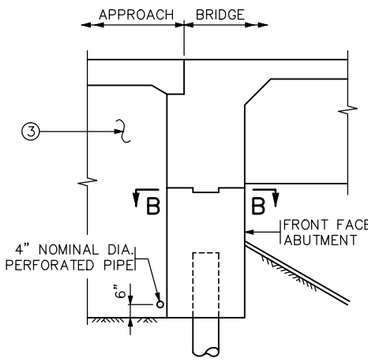
① USE OF CONSTRUCTION JOINT REQUIRES CLEARANCE FOR EXPANSION DEVICE. WHEN CONSTRUCTION JOINT IS USED AT THIS LOCATION, DIAPHRAGM FALSEWORK SHALL REMAIN INPLACE UNTIL COMPLETION OF SLAB CURING PERIOD.

② PERPENDICULAR TO CENTERLINE OF DIAPHRAGM.

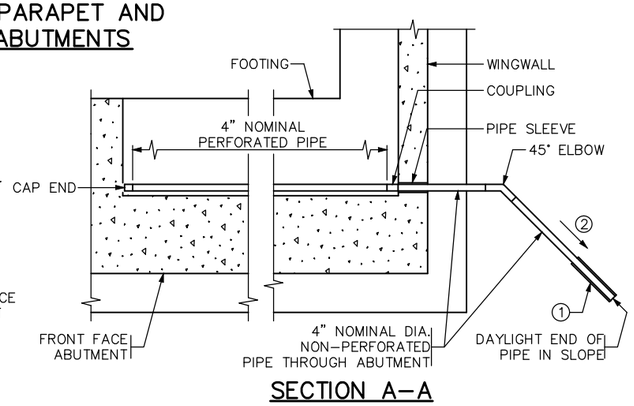
APPROVED: SEPTEMBER 22, 2011	STATE OF MINNESOTA DEPARTMENT OF TRANSPORTATION	REVISED 04–17–2013 11–06–2013	DETAIL NO.
Nancy Daubenberger STATE BRIDGE ENGINEER	CONCRETE END DIAPHRAGM (82MW PRESTRESSED CONCRETE BEAMS) (PARAPET ABUTMENT)		B814(C)



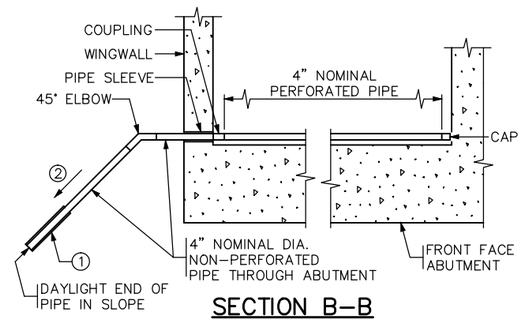
SECTION THROUGH PARAPET AND SEMI–INTEGRAL ABUTMENTS



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 MAINTAINED.

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: AK/IGG | CHECKED BY: TR
DRAWN BY: TAW | DATE: 9/21/2015

AECOM

60% SUBMISSION - 09/28/15

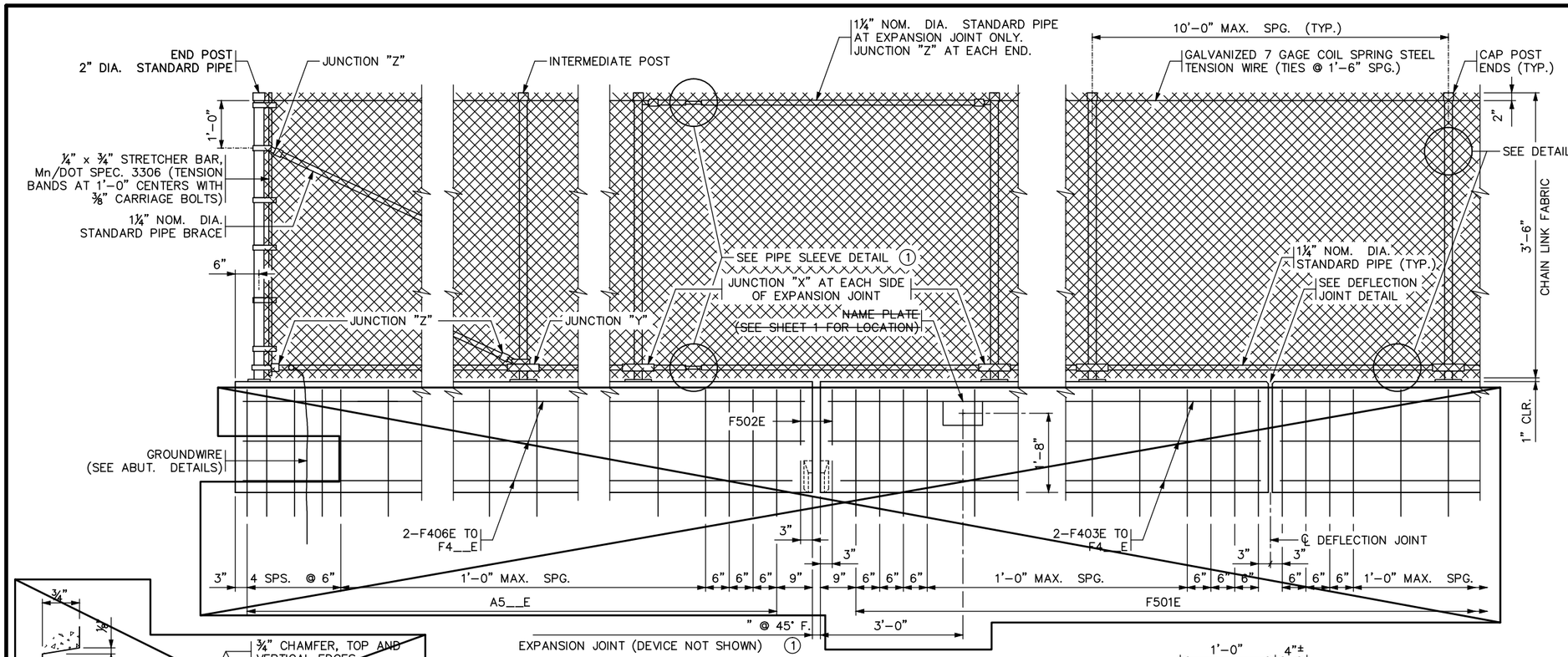
METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

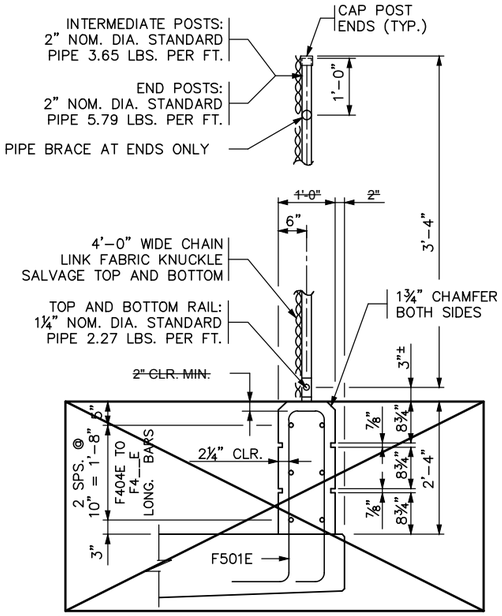
CIVIL WEST - VOLUME 4B
MINNETONKA/HOPKINS
BRIDGE R0686
BRIDGE DETAILS 7

DISCIPLINE: STRUCTURES
SHEET NAME: CBRR0686-BRG-DTL-007

SHEET 86 OF 116



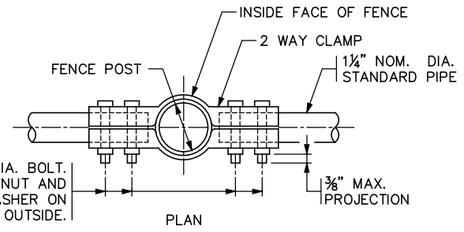
Ⓐ INSIDE ELEVATION OF RAILING



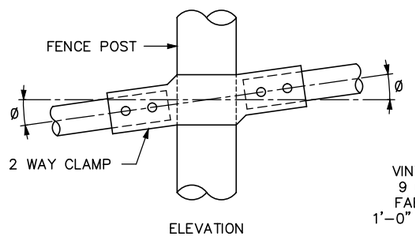
Ⓐ TYPICAL SECTION THROUGH FENCE

INTERMEDIATE POST SHOWN

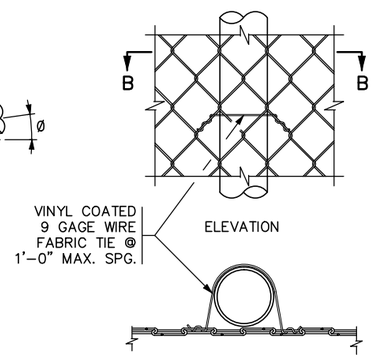
SHEET MODIFICATION:
Ⓐ DENOTES MODIFICATION TO STANDARD SHEET



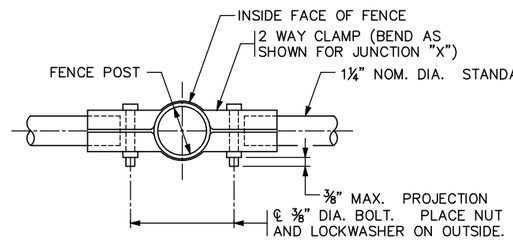
2 WAY CLAMP BENDING TABLE	
GRADE OF FENCE	Ø
0° TO 2°	0°
2° TO 6°	4°
6° TO 10°	8°



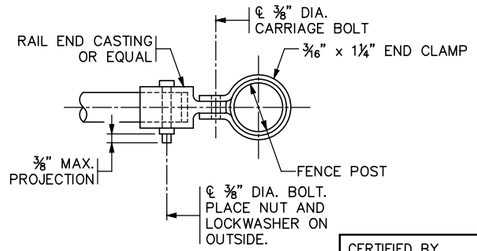
JUNCTION "X"



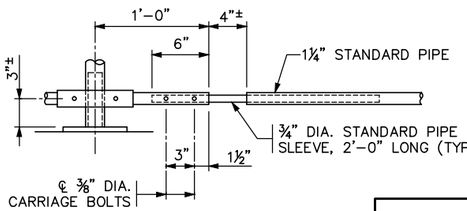
DETAIL "A"



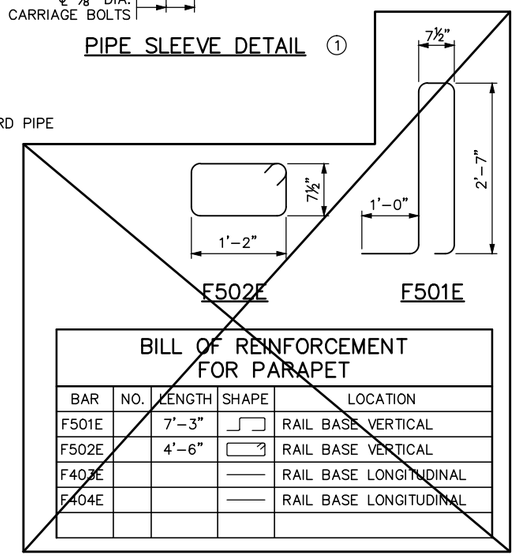
JUNCTION "Y"



JUNCTION "Z"



PIPE SLEEVE DETAIL (1)



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 PARAPET TYPE P-1 SHEET FOR PARAPET DIMENSION, 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

Daniel D. Morgan
STATE BRIDGE ENGINEER

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)~~

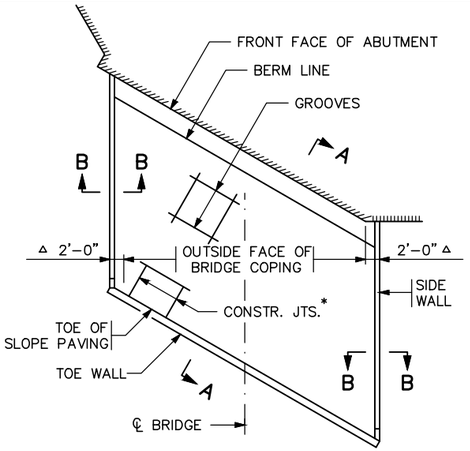
FIG. 5-397.119 (MOD.)

DES: AK/IGG	DR: TAW	APPROVED:
CHK: TR	CHK: TR	

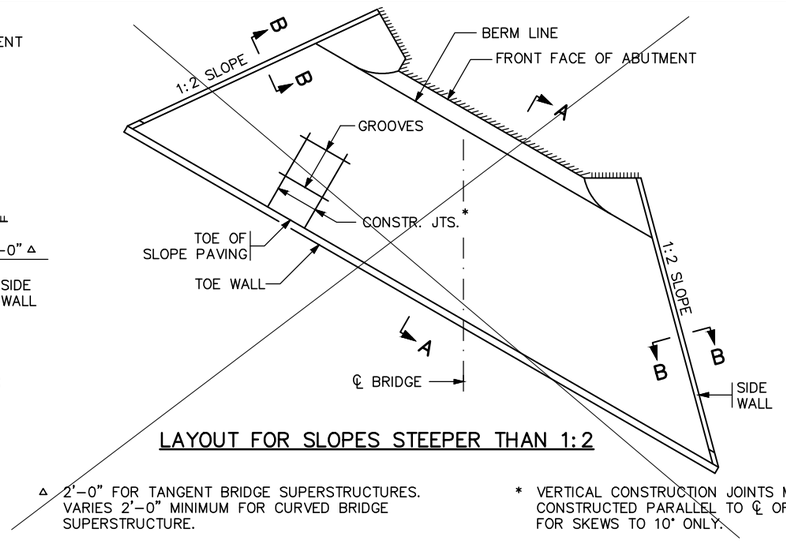
SHEET NO. 86 OF 116 SHEETS

BRIDGE NO. R0686

CBRR0686-BRG-DTL-008



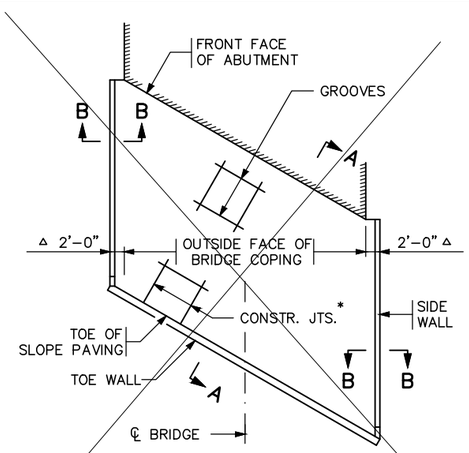
LAYOUT FOR SLOPES
1:2 OR FLATTER



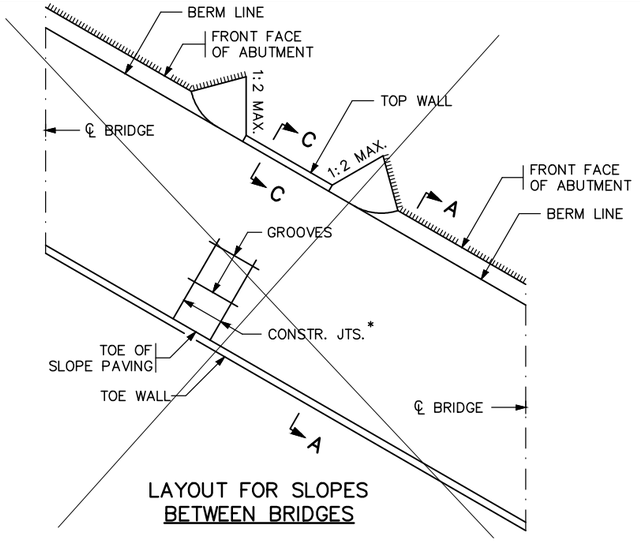
LAYOUT FOR SLOPES STEEPER THAN 1:2

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

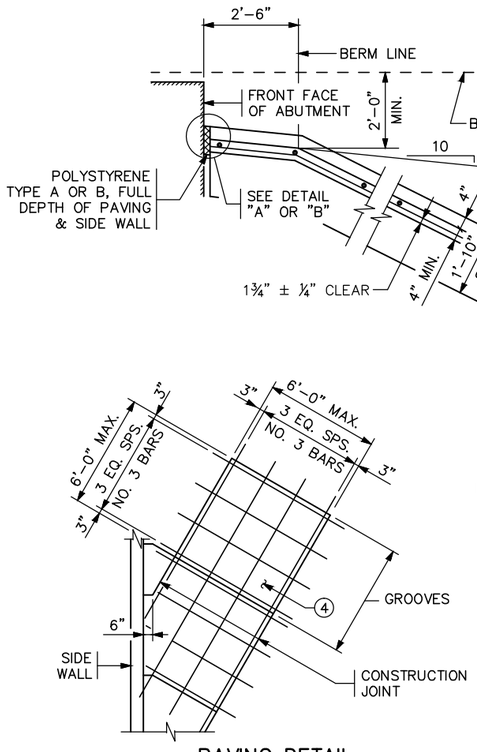
* VERTICAL CONSTRUCTION JOINTS MAY BE CONSTRUCTED PARALLEL TO ℄ OF BRIDGE FOR SKEWS TO 10° ONLY.



LAYOUT FOR SLOPES AT
ABUTMENTS WITH 8' OR
GREATER EXPOSURE

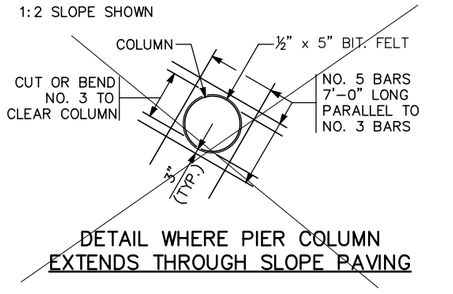


LAYOUT FOR SLOPES
BETWEEN BRIDGES

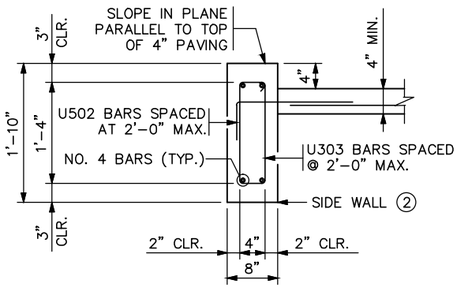


SECTION A–A
1:2 SLOPE SHOWN

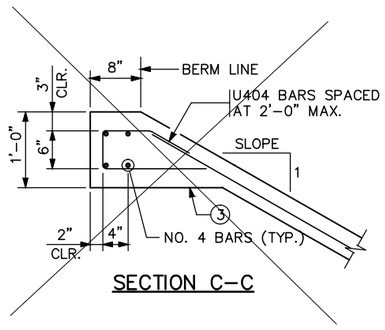
PAVING DETAIL



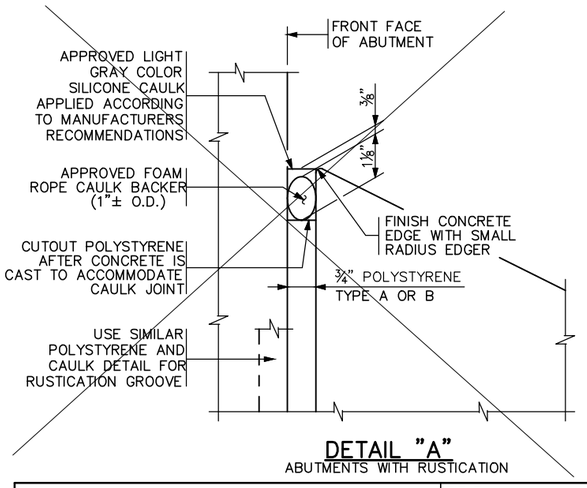
DETAIL WHERE PIER COLUMN
EXTENDS THROUGH SLOPE PAVING



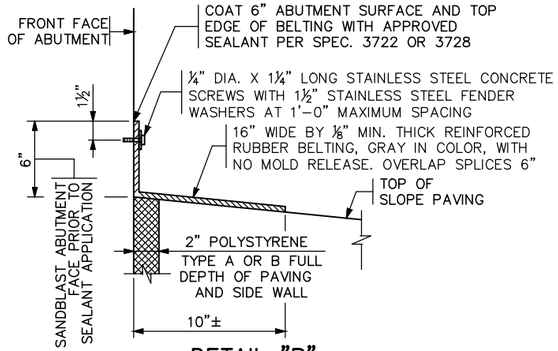
SECTION B–B
NORMAL TO SLOPE



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.

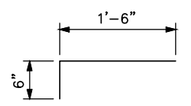
③ 0.058 CU. YD. OF CONCRETE/LIN. FT.
3.70 LBS. OF REINFORCEMENT/LIN FT.
BASED ON A SLOPE OF 1:2.

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

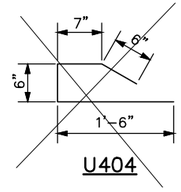
GENERAL NOTE

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

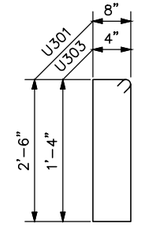
SLOPE PAVING PER SPEC. 2514.



U502



U404

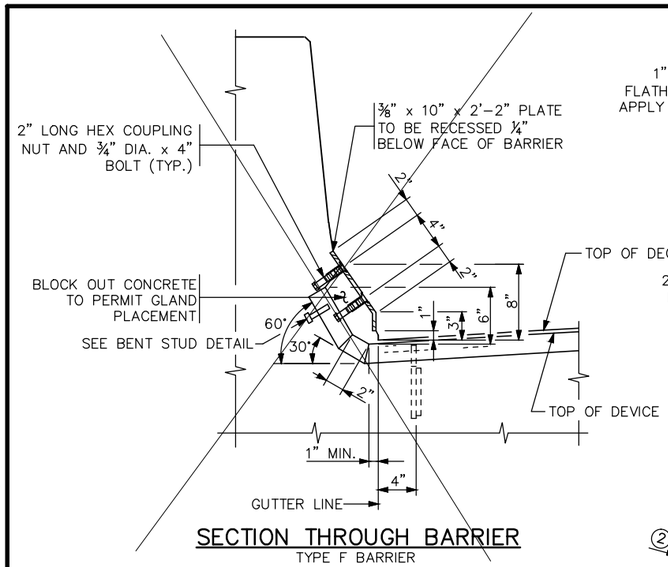


U301 & U303

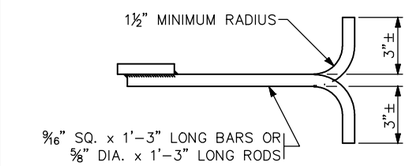
REVISION: 09–11–2014					
APPROVED: SEPTEMBER 26, 2003	CERTIFIED BY _____ LICENSED PROFESSIONAL ENGINEER _____ DATE	TITLE: CONCRETE SLOPE PAVING UNDER BRIDGES	DES: AK/IGG	DR: TAW	FIG. 5–397.301
Daniel S. Hinyon	NAME: LIC. NO.		CHK: TR	CHK: TR	APPROVED:
STATE BRIDGE ENGINEER			SHEET NO. 87 OF 116 SHEETS		BRIDGE NO. R0686

CBRR0686-BRG-DTL-009

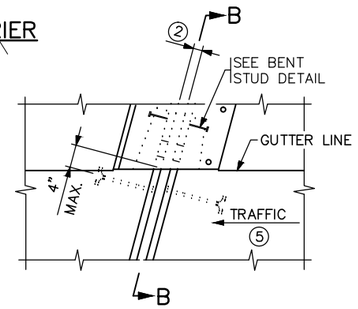
Sep, 21 2015 08:28 am V:\3400_ADC\CAD\SEGMENT W3\PLAN SHEETS\STRUCTURES\CBRR0686\60_percent_Preliminary Plans-Dwg files\CBRR0686-Figure 5-397_301.dwg By: wyttenbacht



SECTION THROUGH BARRIER
TYPE F BARRIER

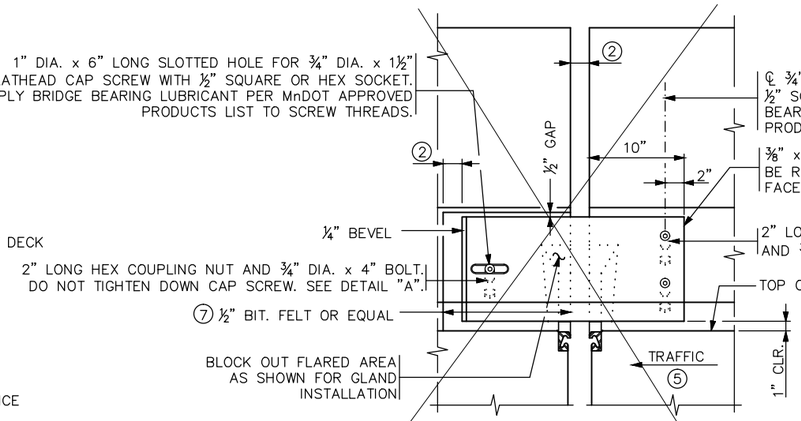


BAR-ROD DETAIL

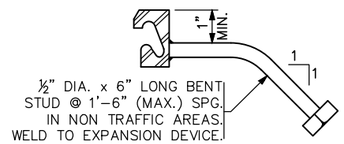


PLAN VIEW @ EXPANSION DEVICE
SIDEWALK ALTERNATE

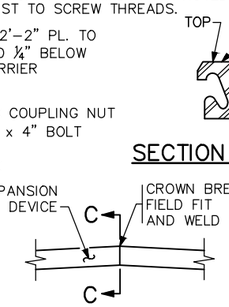
PLAN VIEW @ EXPANSION DEVICE
WITH CURVED DEVICE ALTERNATE



BARRIER ELEVATION

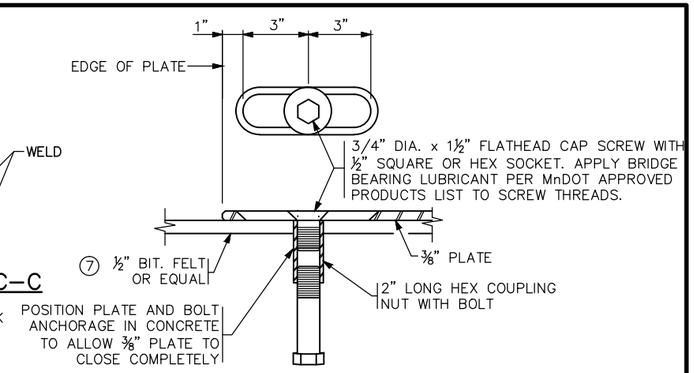


BENT STUD DETAIL

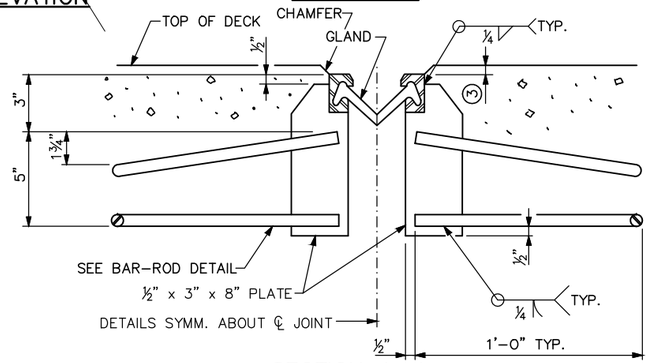


SECTION C-C

DETAIL "B"



DETAIL "A"



SECTION A-A

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.

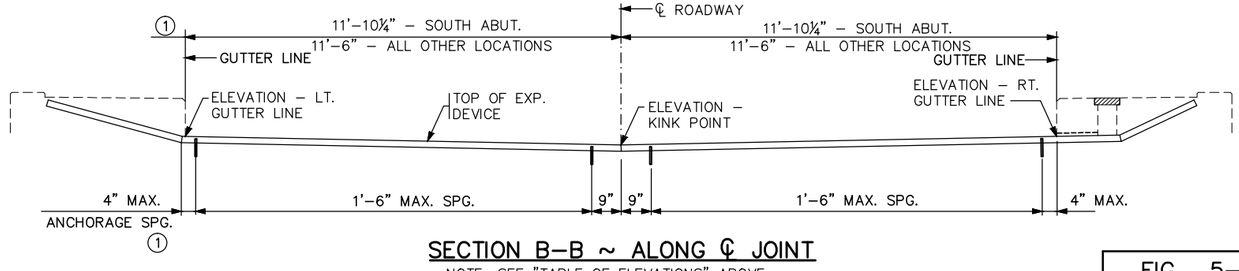
EXPANSION DEVICE SHALL BE STRAIGHTENED TO A TOLERANCE OF ⅛" IN 10 FT.

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.

TABLE OF ELEVATIONS

	ELEVATION – LEFT GUTTER LINE	ELEVATION – CENTER LINE (KINK POINT)	ELEVATION – RIGHT GUTTER LINE
SOUTH ABUTMENT	901.41	901.17	901.41
PIER 2	903.24	903.01	903.24
PIER 4	905.07	904.84	905.07
PIER 6	906.90	906.67	906.90
PIER 8	908.00	907.77	908.00
PIER 10	914.02	913.79	914.02
PIER 12	924.86	924.63	924.86
PIER 14	936.88	936.65	936.88
PIER 16	943.77	943.54	943.77
PIER 18	945.53	945.30	945.53
PIER 20	918.78	918.55	918.78
PIER 22	941.63	941.40	941.63
PIER 25	912.43	912.20	912.43
PIER 27	908.62	908.39	908.62



SECTION B-B ~ ALONG ℄ JOINT
NOTE: SEE "TABLE OF ELEVATIONS" ABOVE.

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.

REVISION: 09-11-2014

APPROVED: NOVEMBER 6, 1995
STATE BRIDGE ENGINEER

CERTIFIED BY _____ LICENSED PROFESSIONAL ENGINEER _____ DATE
NAME: LIC. NO.

TITLE: WATERPROOF EXPANSION DEVICE

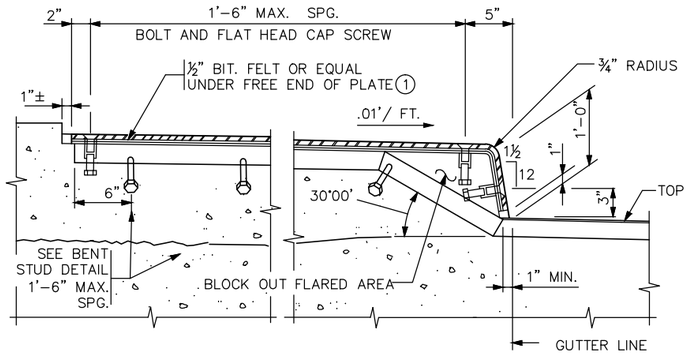
DES: AK/IGG	DR: TAW	APPROVED:
CHK: TR	CHK: TR	

SHEET NO. 89 OF 116 SHEETS

FIG. 5-397.627

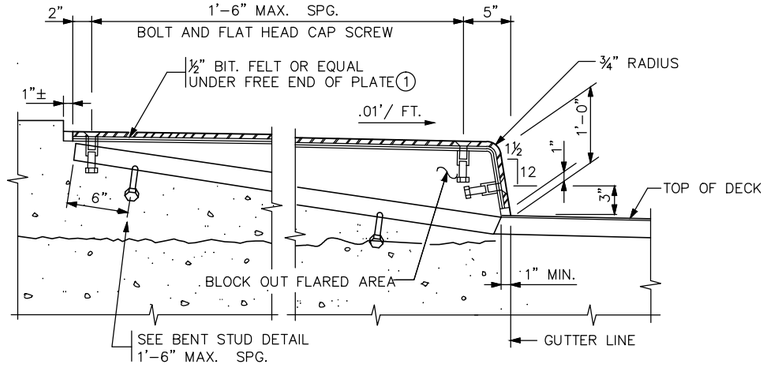
BRIDGE NO. R0686

CBRR0686-BRG-DTL-010



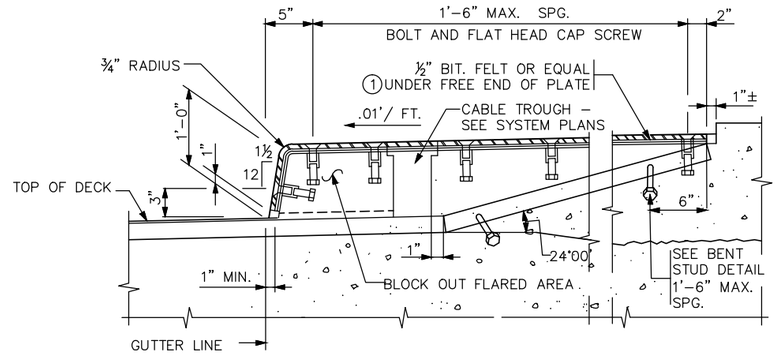
SECTION THROUGH LEFT SIDEWALK – OPTION 1

(LOOKING UPSTATION)



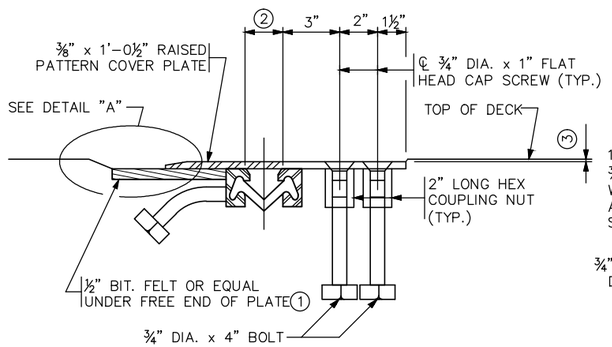
SECTION THROUGH LEFT SIDEWALK – OPTION 2

(LOOKING UPSTATION)

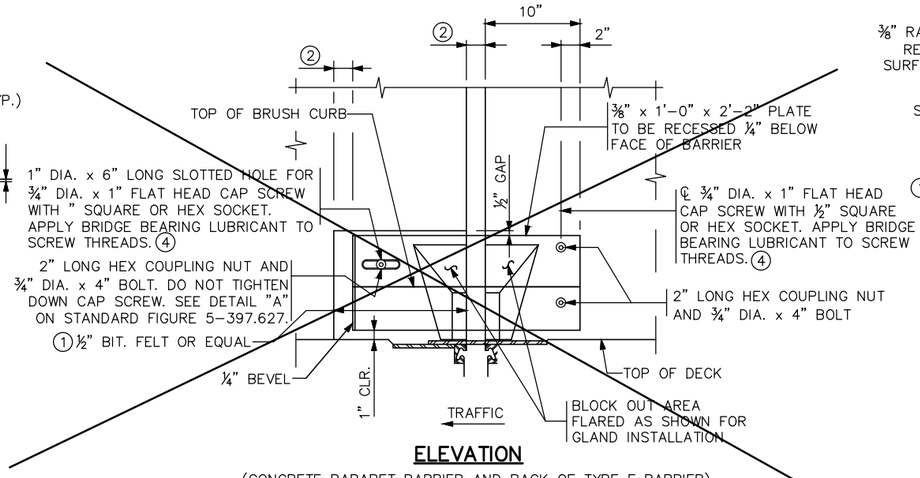


SECTION THROUGH RIGHT SIDEWALK

(LOOKING UPSTATION, AT EXPANSION JOINT WITH CABLE TROUGH)

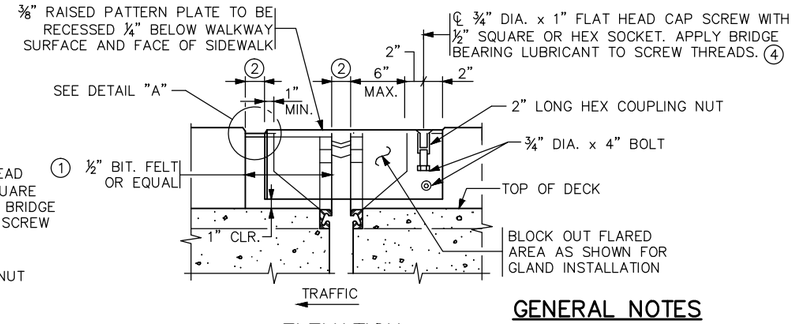


SECTION D–D



ELEVATION

(CONCRETE PARAPET BARRIER AND BACK OF TYPE F BARRIER)



ELEVATION

RAISED SIDEWALK DETAILS

GENERAL NOTES

SEE STANDARD FIGURE 5–397.627 FOR ADDITIONAL DETAILS AND NOTES.

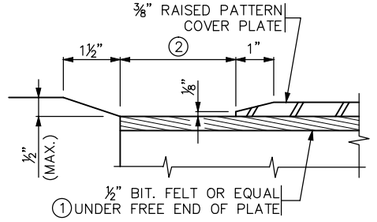
¾" DIA. X 1" FLAT HEAD CAP SCREW WITH ½" SQUARE OR HEX SOCKET PER SPEC 3391. CAP SCREWS SHALL BE COUNTERSUNK 1/16" BELOW TOP OF PLATE. APPLY BRIDGE BEARING LUBRICANT TO SCREW THREADS. (4)

(1) USE LARGEST SINGLE PIECE POSSIBLE. USE OF SMALL PIECES OR SCRAPS SECURED TOGETHER IS PROHIBITED.

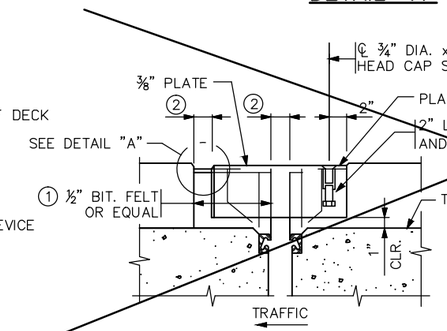
(2) SEE NOTE (2) ON STANDARD FIGURE 5–397.627.

(3) ⅛" (¼" MAX.).

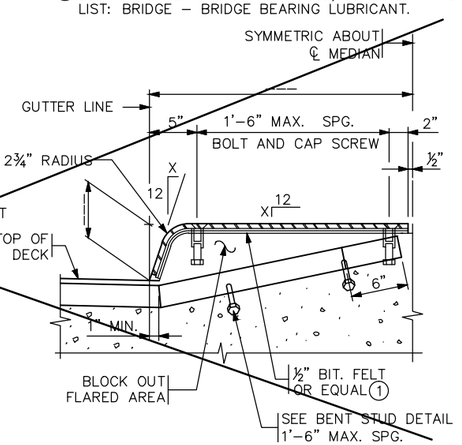
(4) LUBRICANT PER MnDOT APPROVED/QUALIFIED PRODUCTS LIST: BRIDGE – BRIDGE BEARING LUBRICANT.



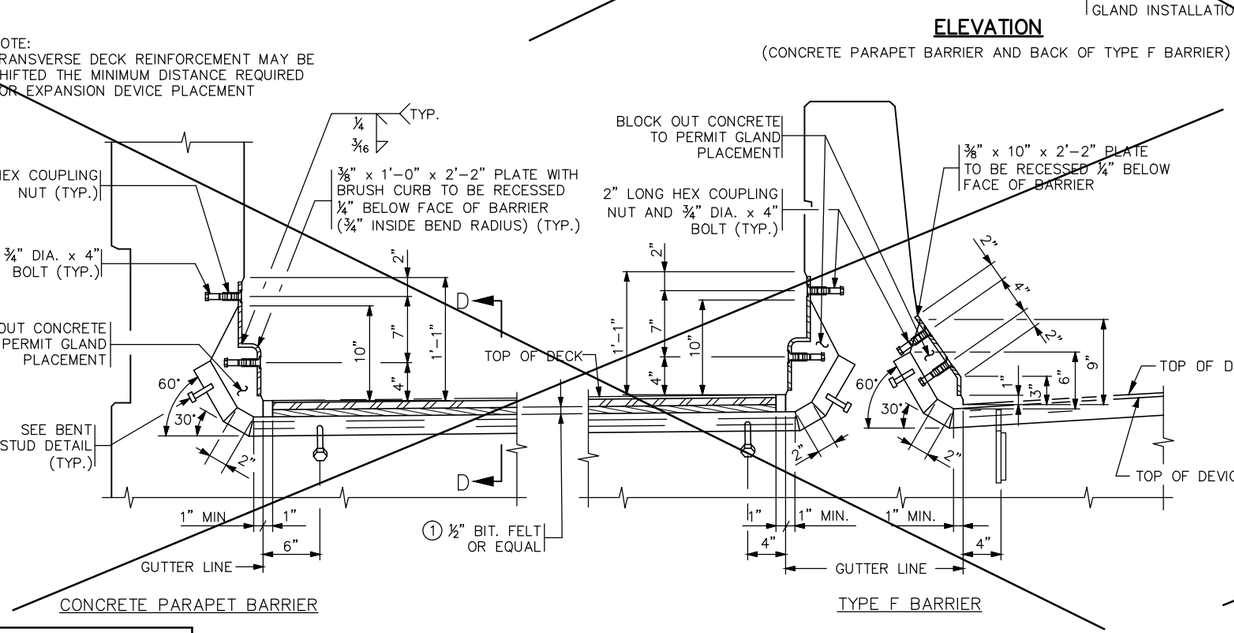
DETAIL "A"



MEDIAN ELEVATION



MEDIAN SECTION



SECTION THROUGH BARRIERS – INTEGRAL SIDEWALK

REVISION: 11-06-2013	CERTIFIED BY _____ LICENSED PROFESSIONAL ENGINEER _____ DATE	TITLE: WATERPROOF EXPANSION DEVICE	FIG. 5–397.630
APPROVED: SEPTEMBER 26, 2003 STATE BRIDGE ENGINEER	NAME: LIC. NO.	DES: AK/IGG DR: TAW CHK: TR CHK: TR	APPROVED: BRIDGE NO. R0686
		SHEET NO. 90 OF 116 SHEETS	

CBRR0686-BRG-DTL-011

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
STATE BRIDGE ENGINEER

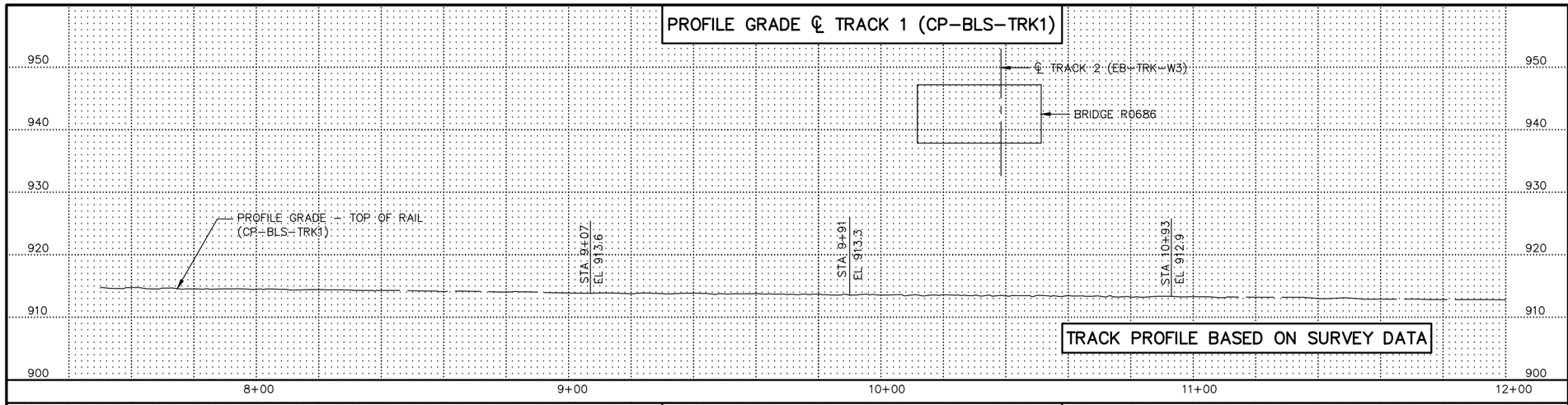
AS–BUILT DETAILS
(AS NEEDED)

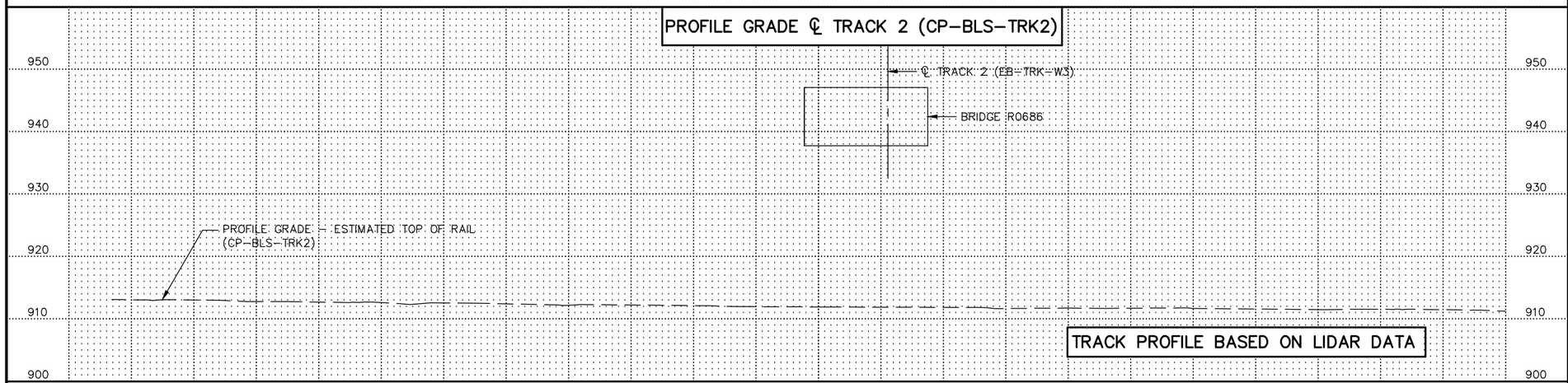
FIG. 5–397.900

TITLE:	DES: AK/IGG	DR: TAW	APPROVED:	BRIDGE NO.
AS–BUILT BRIDGE DATA	CHK: TR	CHK: TR		R0686
	SHEET NO. 90 OF 116 SHEETS			

CBRR0686-BRG-DTL-017

Sep. 21 2015 08:28 am V:\3400_ADC\CAD\SEGMENT W3\PLAN SHEETS\STRUCTURES\CBRR0686\60_percent_Preliminary Plans–Dwg files\CBRR0686–Figure 5–397_900.dwg By: wytenbacht





LOCATION ENGINEER'S OBSERVATIONS AT BRIDGE SITE

SPECIAL FEATURES: WATERFALLS, DAMS, FLOODS, ICE, DEBRIS, SLIDING BANKS, RECREATIONAL BOATING.

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 ENGINEERS RECOMMENDATION

DATE: XX–XX–XXXX

STREAM OR DITCH DESIGNATION: XXX

DRAINAGE AREA: XXX SQ. MI.

MAX FLOOD ON RECORD: XXX C.F.S. (XX–XX–XX)

MAXIMUM OBSERVED HIGHWATER ELEVATION: XXX.X FT.

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

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

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

FLOWLINE ELEVATION: XXX FT. SKEW ANGLE: XX

ESTIMATED PRELIMINARY TOTAL SCOUR AT PIER EL. XXX.X (500 OR OT YR.FREQ.)

SCOUR CONFIRMATION RECOMMENDATION

DATE: XX–XX–XXXX

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

BRIDGE SURVEY SHEETS MADE FROM SURVEY AND PHOTOGRAMMETRIC MAPPING.

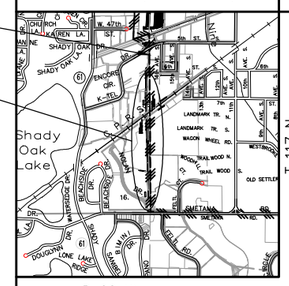
MONUMENT NAME: CONTROL POINT 6
BENCHMARK ELEVATION (NAVD88): 932.956
NORTHING (HEN. COUNTY COORDINATES NAD83(2007)): 142016.680
EASTING (HEN. COUNTY COORDINATES NAD83(2007)): 489989.960
MONUMENT DESCRIPTION: CAST IRON MONUMENT

MONUMENT NAME: CONTROL POINT 8
BENCHMARK ELEVATION (NAVD88): 919.385
NORTHING (HEN. COUNTY COORDINATES NAD83(2007)): 147263.069
EASTING (HEN. COUNTY COORDINATES NAD83(2007)): 489996.864
MONUMENT DESCRIPTION: CAST IRON MONUMENT

INDEX MAP (ONE SQ. MI.)

CITY LIMITS

PROPOSED BRIDGE R0686



BRIDGE SURVEY

1 MI NORTH OF JCT. TH 61 & TH 62 IN MINNETONKA

SOUTHWEST LIGHT RAIL OVER CP RAIL AND WETLANDS

SEC 26 T 117 R 22

CITY OF MINNETONKA HENNEPIN COUNTY

BRIDGE R0686

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AK/IGG CHECKED BY: TR
DRAWN BY: TAW DATE: 9/21/2015

AECOM

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

CIVIL WEST - VOLUME 4B
MINNETONKA/HOPKINS
BRIDGE R0686
BRIDGE SURVEY 1

DISCIPLINE: STRUCTURES

SHEET NAME: CBRR0686-BRG-SUR-001

SHEET 92 OF 116

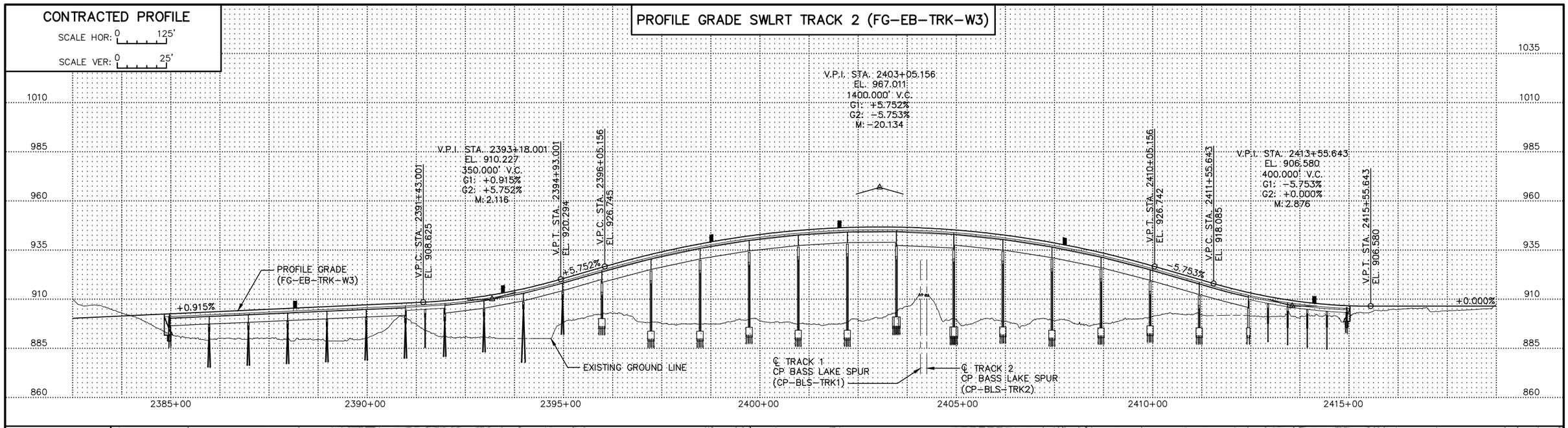
Sep, 21 2015 08:30 am V:\3400_ADC\CAD\SEGMENT W3\PLAN SHEETS\STRUCTURES\CBRR0686\60_percent_Preliminary Plans-Dwg files\CBRR0686-BRG-SUR.dwg By: wytenbacht

CONTRACTED PROFILE

SCALE HOR: 0 125'

SCALE VER: 0 25'

PROFILE GRADE SWLRT TRACK 2 (FG-EB-TRK-W3)



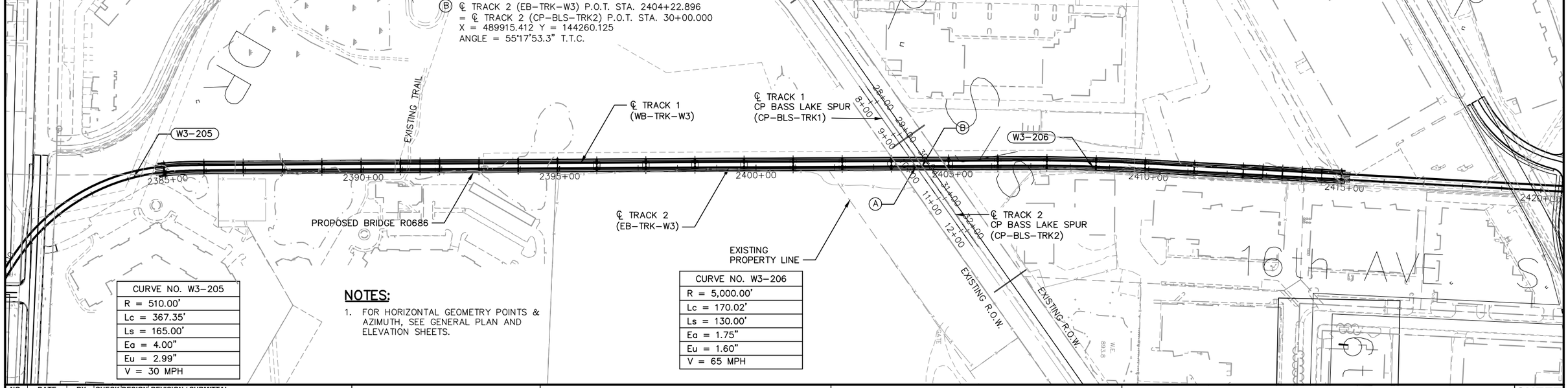
PLAT

SCALE: 0 125'

CONTROL POINTS:

Ⓐ ℄ TRACK 2 (EB-TRK-W3) P.O.T. STA. 2404+06.947
= ℄ TRACK 1 (CP-BLS-TRK1) P.O.T. STA. 10+00.000
X = 489915.873 Y = 144244.182
ANGLE = 55°05'22.4" T.T.C.

Ⓑ ℄ TRACK 2 (EB-TRK-W3) P.O.T. STA. 2404+22.896
= ℄ TRACK 2 (CP-BLS-TRK2) P.O.T. STA. 30+00.000
X = 489915.412 Y = 144260.125
ANGLE = 55°17'53.3" T.T.C.



CURVE NO. W3-205
R = 510.00'
Lc = 367.35'
Ls = 165.00'
Eq = 4.00"
Eu = 2.99"
V = 30 MPH

CURVE NO. W3-206
R = 5,000.00'
Lc = 170.02'
Ls = 130.00'
Eq = 1.75"
Eu = 1.60"
V = 65 MPH

NOTES:

1. FOR HORIZONTAL GEOMETRY POINTS & AZIMUTH, SEE GENERAL PLAN AND ELEVATION SHEETS.

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AK/IGG | CHECKED BY: TR
DRAWN BY: TAW | DATE: 9/21/2015

AECOM

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

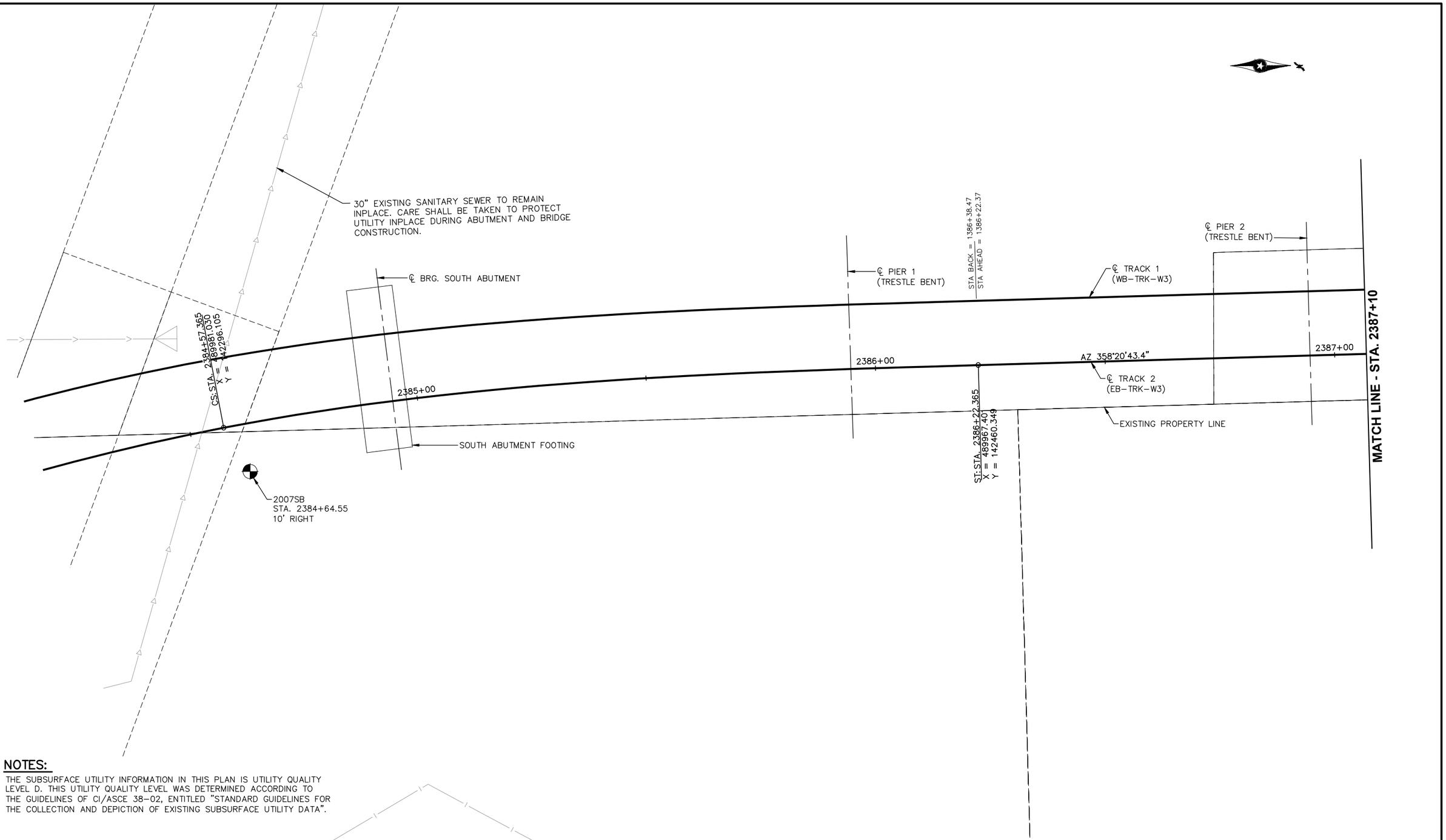
CIVIL WEST - VOLUME 4B
MINNETONKA/HOPKINS
BRIDGE R0686
BRIDGE SURVEY 2

DISCIPLINE: STRUCTURES

SHEET NAME: CBRR0686-BRG-SUR-002

SHEET 93 OF 116

Sep. 21 2015 08:30 am V:\3400_ADC\CAD\SEGMENT W3\PLAN SHEETS\STRUCTURES\CBRR0686\60_percent_Preliminary Plans-Dwg files\CBRR0686-BRG-SUR.dwg By: wytenbacht



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: AK/IGG | CHECKED BY: TR
DRAWN BY: TAW | DATE: 9/21/2015

AECOM

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

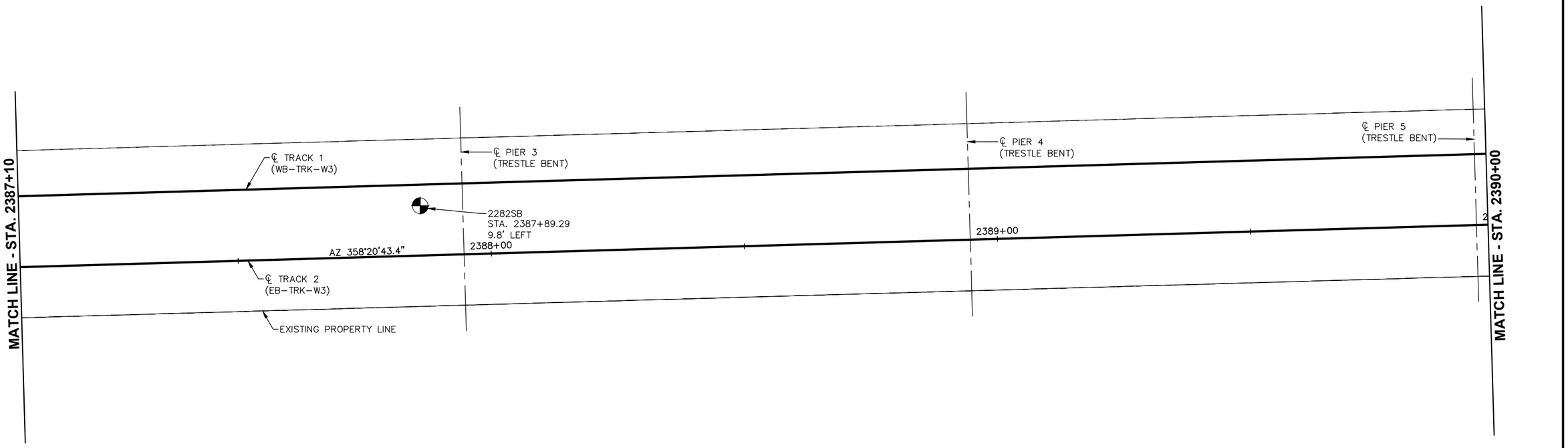
SOUTHWEST Green Line LRT Extension

CIVIL WEST - VOLUME 4B
MINNETONKA/HOPKINS
BRIDGE R0686
BRIDGE SURVEY PLAN 1

DISCIPLINE: STRUCTURES
SHEET NAME: CBRR0686-BRG-BOR-001

SHEET 94 OF 116

Sep. 21 2015 09:05 am V:\3400_ADC\CAD\SEGMENT W3\PLAN SHEETS\STRUCTURES\CBRR0686\60_percent_Preliminary Plans–Dwg files\CBRR0686–BRG–BOR.dwg By: wyttenbacht



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: AK/IGG | CHECKED BY: TR
DRAWN BY: TAW | DATE: 9/21/2015

AECOM

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

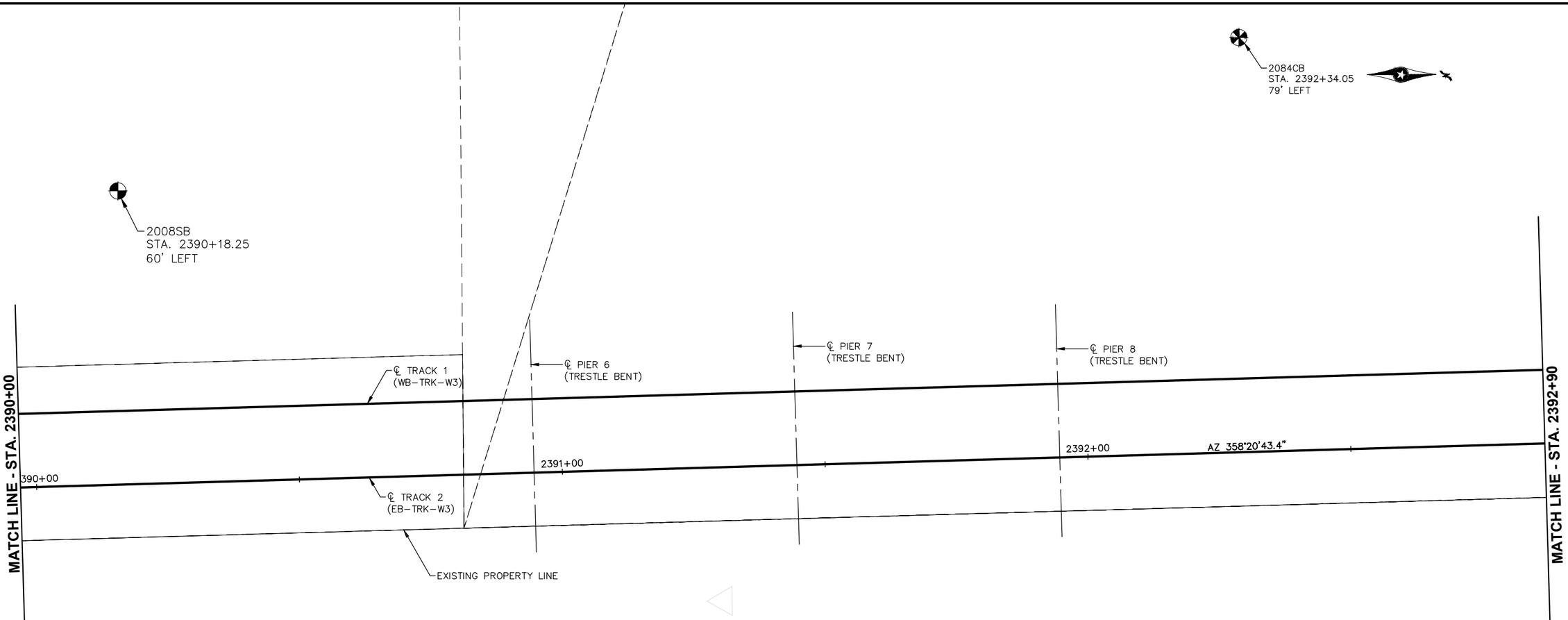
SOUTHWEST Green Line LRT Extension

CIVIL WEST - VOLUME 4B
MINNETONKA/HOPKINS
BRIDGE R0686
BRIDGE SURVEY PLAN 2

DISCIPLINE: STRUCTURES
SHEET NAME: CBRR0686-BRG-BOR-002

SHEET 95 OF 116

Sep. 21 2015 09:05 am V:\3400_ADC\CAD\SEGMENT W3\PLAN SHEETS\STRUCTURES\CBRR0686\60_percent_Preliminary Plans–Dwg files\CBRR0686–BRG–BOR.dwg By: wyttenbacht



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: AK/IGG | CHECKED BY: TR
DRAWN BY: TAW | DATE: 9/21/2015

AECOM

60% SUBMISSION - 09/28/15

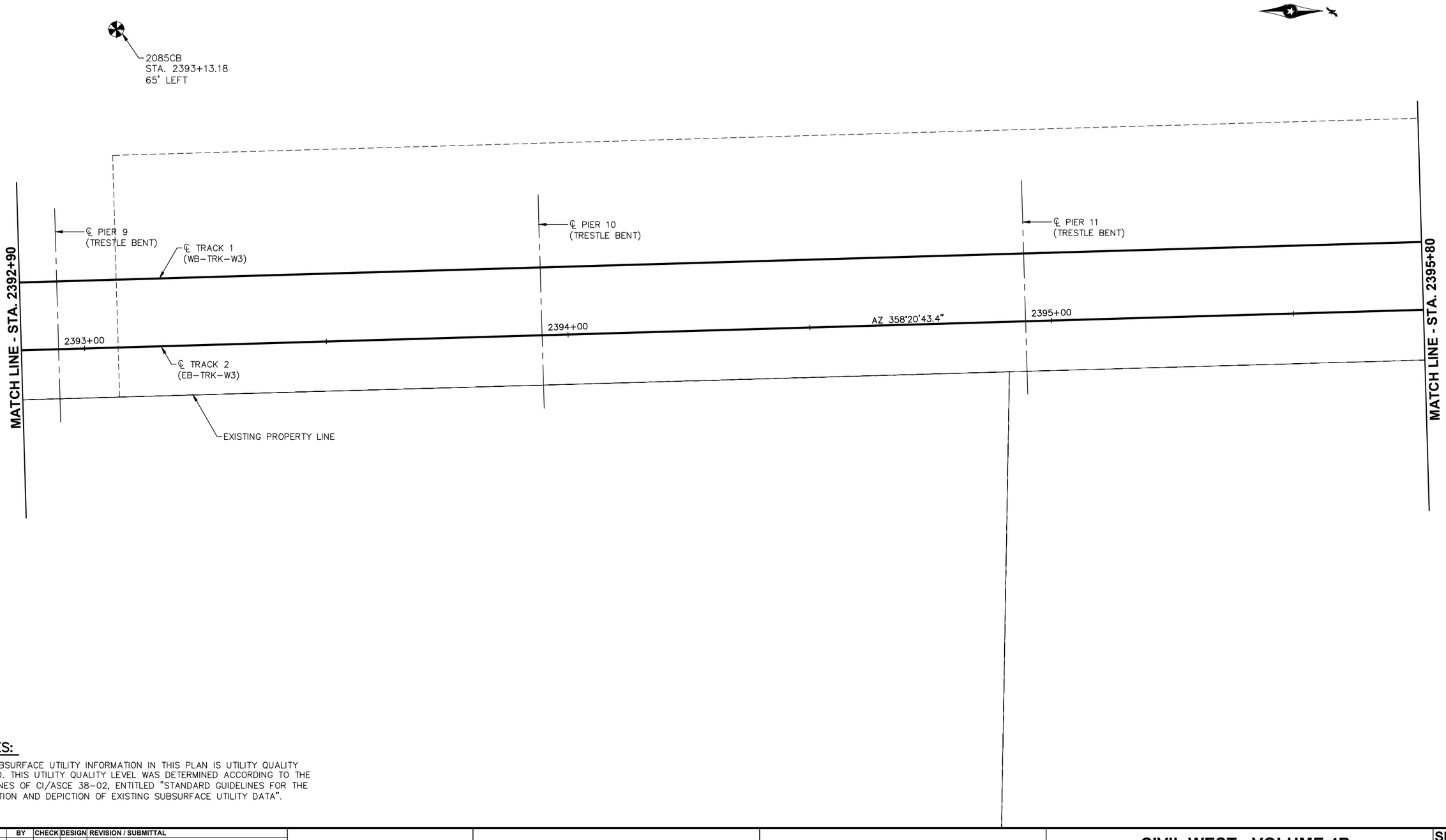
METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

CIVIL WEST - VOLUME 4B
MINNETONKA/HOPKINS
BRIDGE R0686
BRIDGE SURVEY PLAN 3

DISCIPLINE: STRUCTURES
SHEET NAME: CBRR0686-BRG-BOR-003

SHEET 96 OF 116



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: AK/IGG | CHECKED BY: TR
DRAWN BY: TAW | DATE: 9/21/2015

AECOM

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

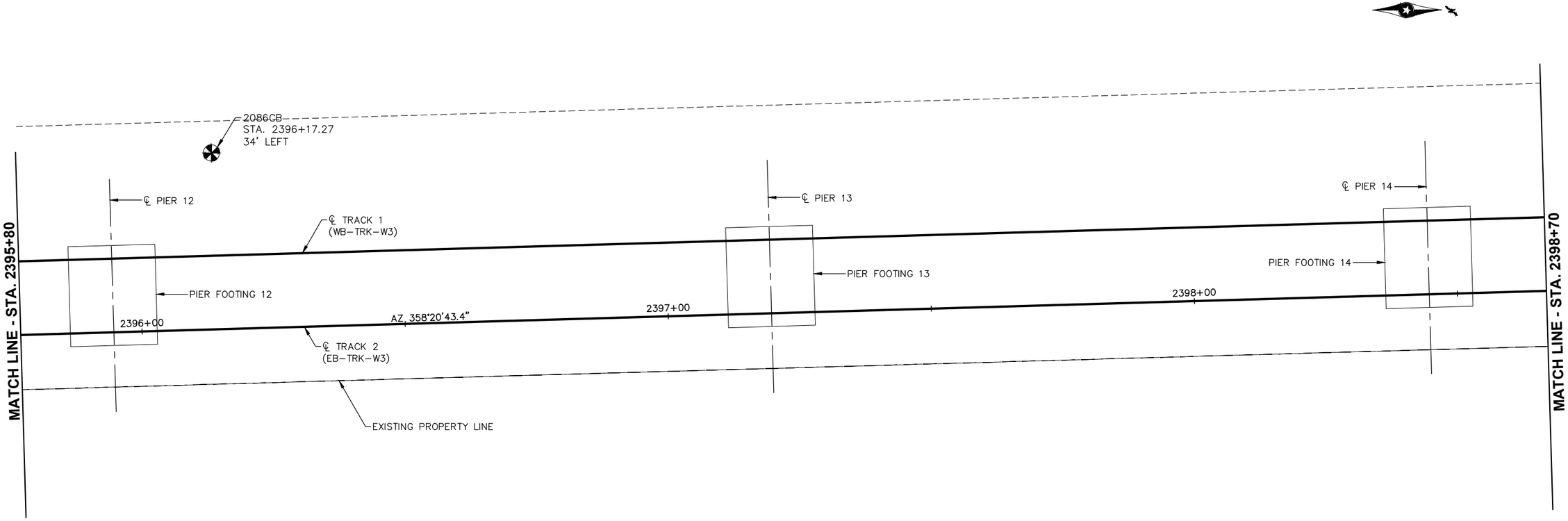
SOUTHWEST Green Line LRT Extension

CIVIL WEST - VOLUME 4B
MINNETONKA/HOPKINS
BRIDGE R0686
BRIDGE SURVEY PLAN 4

DISCIPLINE: STRUCTURES
SHEET NAME: CBRR0686-BRG-BOR-004

SHEET 97 OF 116

Sep. 21 2015 09:05 am V:\3400_ADC\CAD\SEGMENT W3\PLAN SHEETS\STRUCTURES\CBRR0686\60_percent_Preliminary Plans–Dwg files\CBRR0686–BRG–BOR.dwg By: wyttenbacht



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: AK/IGG | CHECKED BY: TR
DRAWN BY: TAW | DATE: 9/21/2015

AECOM

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

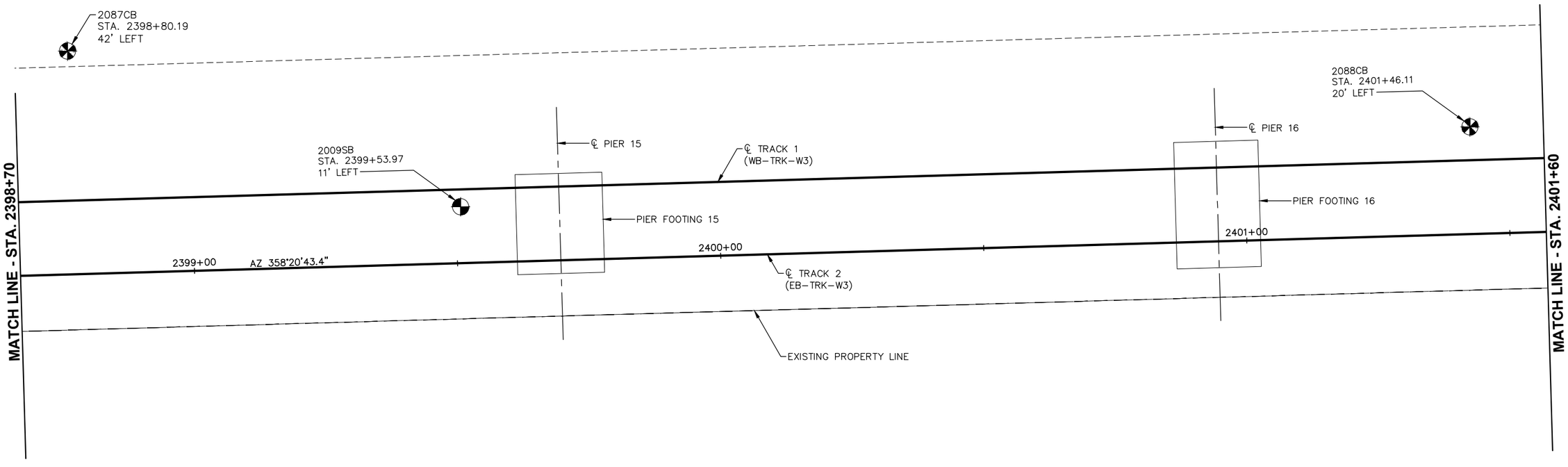
SOUTHWEST Green Line LRT Extension

CIVIL WEST - VOLUME 4B
MINNETONKA/HOPKINS
BRIDGE R0686
BRIDGE SURVEY PLAN 5

DISCIPLINE: STRUCTURES
SHEET NAME: CBRR0686-BRG-BOR-005

SHEET 98 OF 116

Sep. 21 2015 09:05 am V:\3400_ADC\CAD\SEGMENT W3\PLAN SHEETS\STRUCTURES\CBRR0686\60_percent_Preliminary Plans–Dwg files\CBRR0686–BRG–BOR.dwg By: wyttenbacht



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: AK/IGG | CHECKED BY: TR
DRAWN BY: TAW | DATE: 9/21/2015

AECOM

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

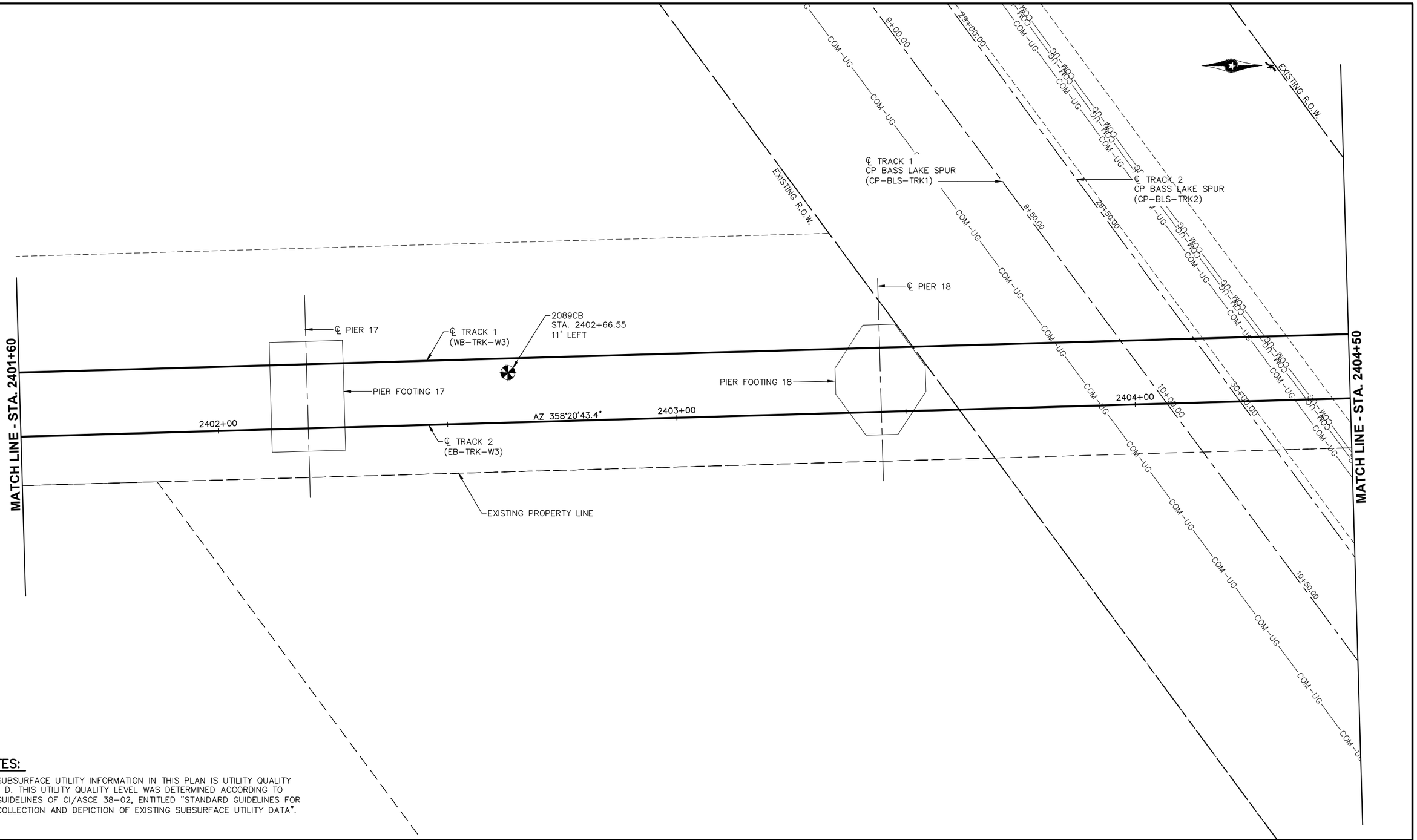
SOUTHWEST Green Line LRT Extension

CIVIL WEST - VOLUME 4B
MINNETONKA/HOPKINS
BRIDGE R0686
BRIDGE SURVEY PLAN 6

DISCIPLINE: STRUCTURES
SHEET NAME: CBRR0686-BRG-BOR-006

SHEET 99 OF 116

Sep. 21 2015 09:05 am V:\3400_ADC\CAD\SEGMENT W3\PLAN SHEETS\STRUCTURES\CBRR0686\60_percent_Preliminary Plans–Dwg files\CBRR0686–BRG–BOR.dwg By: wyttenbacht



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: AK/IGG | CHECKED BY: TR
DRAWN BY: TAW | DATE: 9/21/2015

AECOM

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

CIVIL WEST - VOLUME 4B
MINNETONKA/HOPKINS
BRIDGE R0686
BRIDGE SURVEY PLAN 7

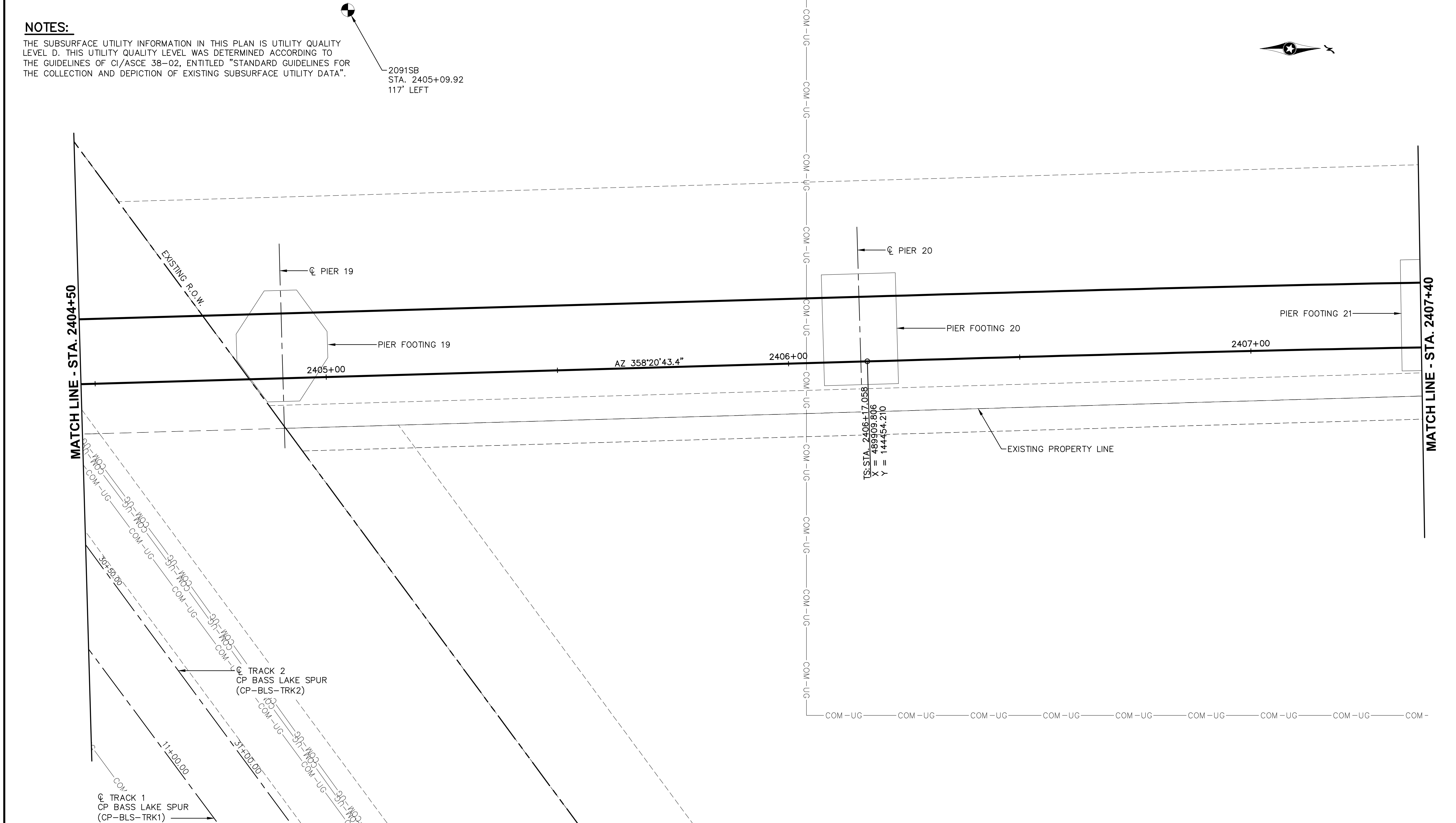
DISCIPLINE: STRUCTURES
SHEET NAME: CBRR0686-BRG-BOR-007

SHEET 100 OF 116

Sep. 21 2015 09:05 am v:\3400_ADC\CAD\SEGMENT W3\PLAN SHEETS\STRUCTURES\CBRR0686\60_percent_Preliminary Plans–Dwg files\CBRR0686–BRG–BOR.dwg By: wyttenbacht

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: AK/IGG CHECKED BY: TR
DRAWN BY: TAW DATE: 9/21/2015

AECOM

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

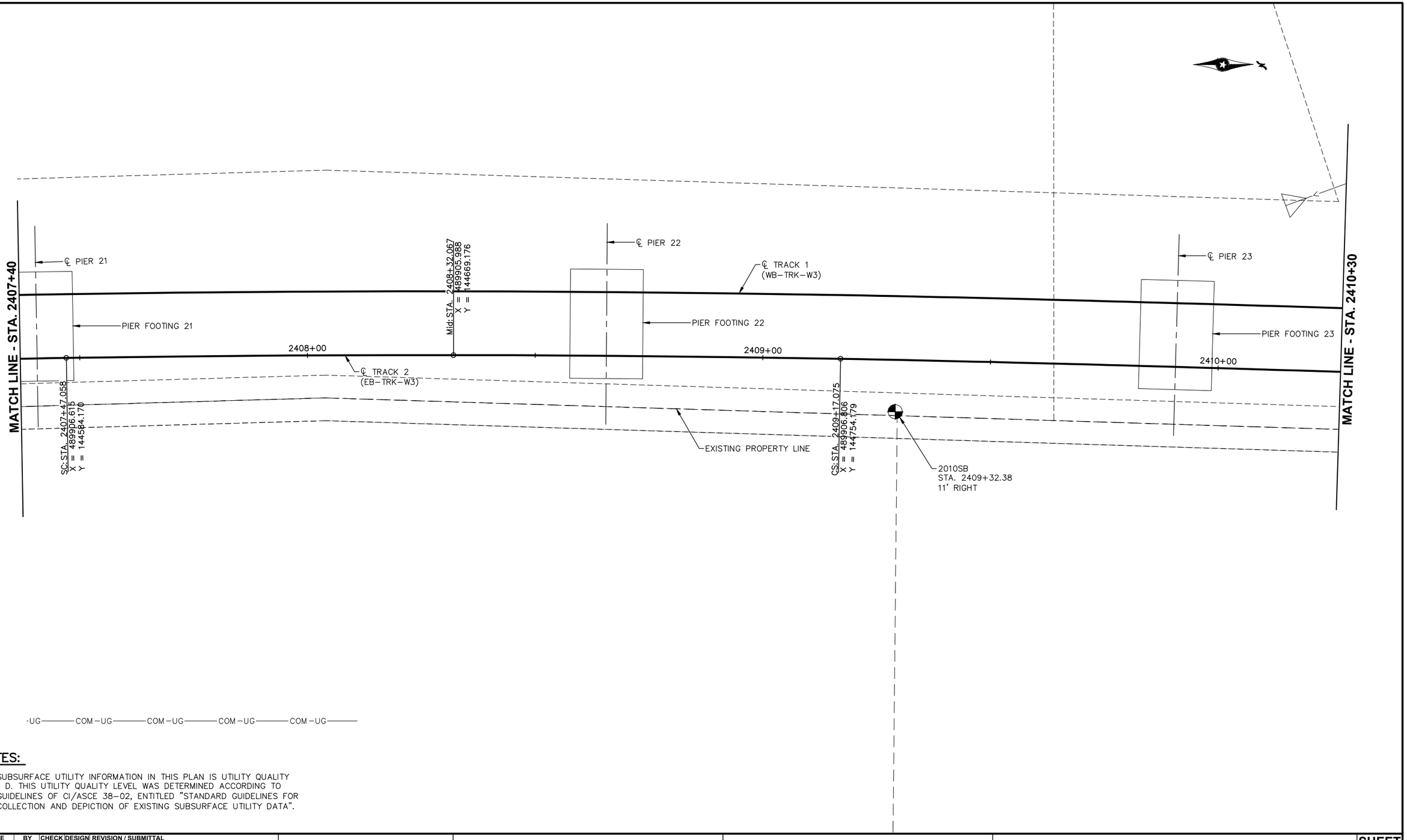
SOUTHWEST Green Line LRT Extension

CIVIL WEST - VOLUME 4B
MINNETONKA/HOPKINS
BRIDGE R0686
BRIDGE SURVEY PLAN 8

DISCIPLINE: STRUCTURES

SHEET NAME: CBRR0686-BRG-BOR-008

SHEET 101 OF 116



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: AK/IGG | CHECKED BY: TR
DRAWN BY: TAW | DATE: 9/21/2015

AECOM

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

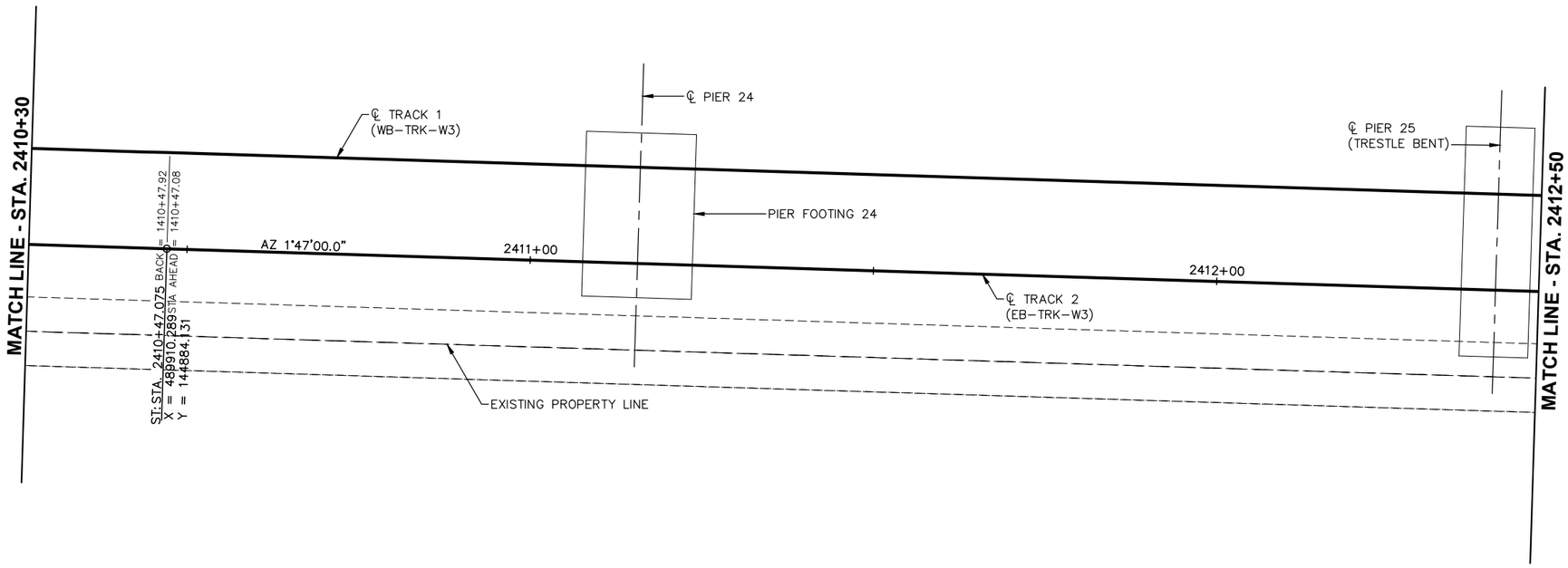
SOUTHWEST Green Line LRT Extension

CIVIL WEST - VOLUME 4B
MINNETONKA/HOPKINS
BRIDGE R0686
BRIDGE SURVEY PLAN 9

DISCIPLINE: STRUCTURES
SHEET NAME: CBRR0686-BRG-BOR-009

SHEET 102 OF 116

Sep. 21 2015 09:05 am V:\3400_ADC\CAD\SEGMENT W3\PLAN SHEETS\STRUCTURES\CBRR0686\60_percent_Preliminary Plans-Dwg files\CBRR0686-BRG-BOR.dwg By: wyttenbacht



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: AK/IGG | CHECKED BY: TR
DRAWN BY: TAW | DATE: 9/21/2015

AECOM

60% SUBMISSION - 09/28/15

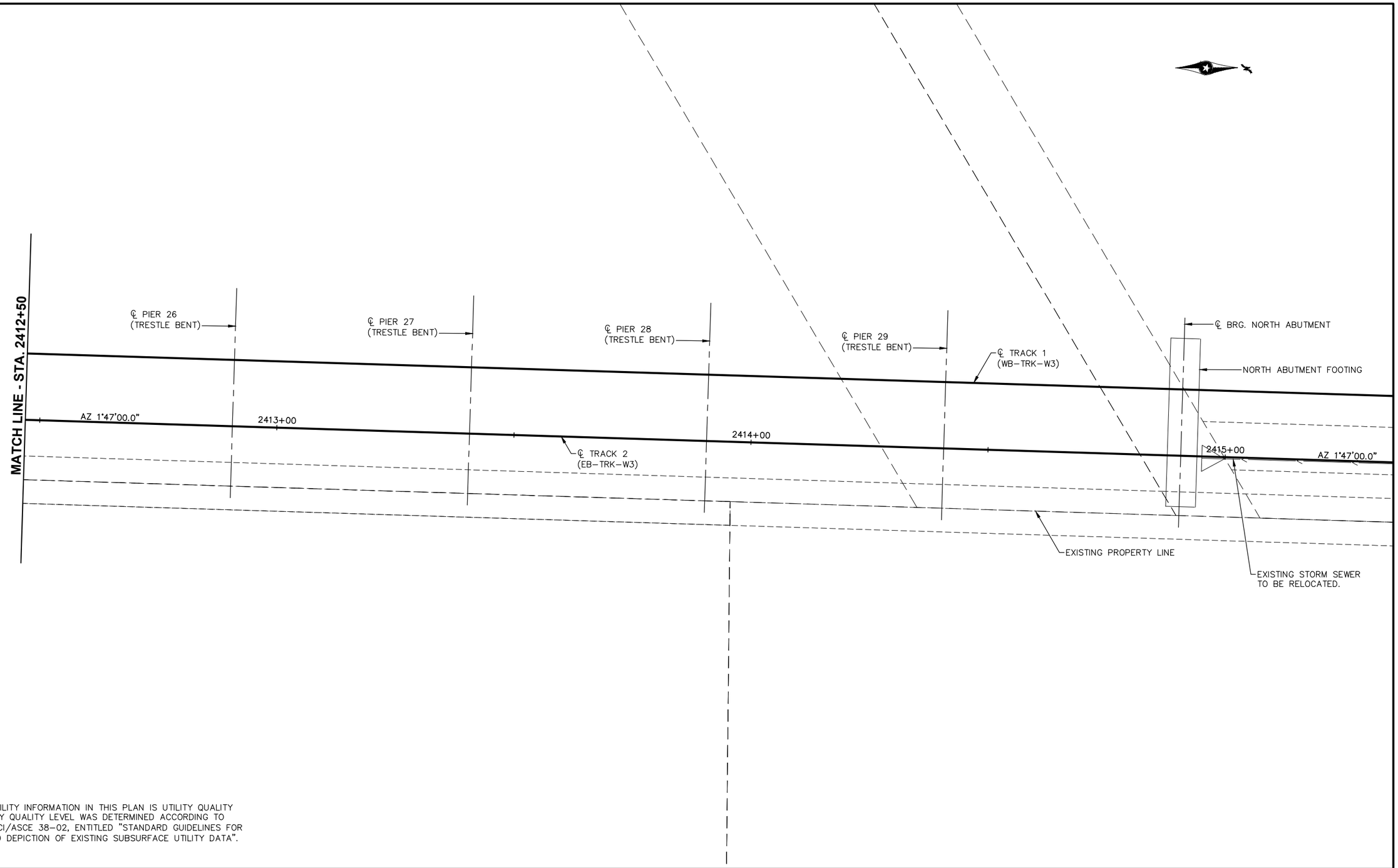
METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

CIVIL WEST - VOLUME 4B
MINNETONKA/HOPKINS
BRIDGE R0686
BRIDGE SURVEY PLAN 10

DISCIPLINE: STRUCTURES
SHEET NAME: CBRR0686-BRG-BOR-010

SHEET 103 OF 116



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: AK/IGG | CHECKED BY: TR
DRAWN BY: TAW | DATE: 9/21/2015

AECOM

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

CIVIL WEST - VOLUME 4B
MINNETONKA/HOPKINS
BRIDGE R0686
BRIDGE SURVEY PLAN 11

DISCIPLINE: STRUCTURES
SHEET NAME: CBRR0686-BRG-BOR-011

SHEET 104 OF 116

Sep. 21 2015 09:06 am v:\3400_ADC\CAD\SEGMENT W3\PLAN SHEETS\STRUCTURES\CBRR0686\60_percent_Preliminary Plans–Dwg files\CBRR0686–BRG–BOR.dwg By: wyttenbacht

EXISTING GROUNDLINE
20' LT.
TRACK 2 C/L
10' RT.

℄ BRG. SOUTH ABUTMENT
℄ PIER 1
℄ PIER 2
PROFILE GRADE
(FG-EB-TRK-W3)
+0.916%

2007SB
Elevation 896.0

30" EXISTING SANITARY SEWER AT APPROX. ELEV. 887.13. PROTECT INPLACE DURING BRIDGE CONSTRUCTION.

	Coh	N60	
		7	FILL: Sandy Lean Clay, dark brown, wet.
		13	FILL: Sandy Lean Clay, trace Gravel, brown, wet.
		7	FILL: Clayey Sand, slightly organic, trace Gravel, brown and black, wet.
▽		WH	
		12	SILTY SAND, fine- to medium-grained, with some Gravel, with occasional
		7	Lean Clay lenses, gray, moist to 15 feet then waterbearing, loose to
		6	medium dense.
		8	
		5	SANDY LEAN CLAY, trace Gravel, gray, wet, rather soft to very stiff.
		8	
		9	With slightly organic layer at 25 feet.
		14	
		15	
		22	
		29*	
		15	CLAYEY SAND, trace Gravel, with occasional Sand layers and seams, gray,
		23	wet, stiff to hard.
		44	
		41	
		50	
		61	
		61	
		57	
		28	With Gravel at 65 feet.
		35	Trace Gravel at 70 feet.
		34	
		44	

END OF BORING.
Water observed at 15 feet while drilling.
Boring immediately backfilled with bentonite grout.
Bottom of Borehole at 81 ft

920 910 900 890 880 870 860 850 840 830 820 810 800 790 780 770 760 750

2385+00 2386+00 2387+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.

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AK/IGG
DRAWN BY: TAW
CHECKED BY: TR
DATE: 9/21/2015

AECOM

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL
SOUTHWEST Green Line LRT Extension

CIVIL WEST - VOLUME 4B
MINNETONKA/HOPKINS
BRIDGE R0686
BRIDGE SURVEY PROFILE 1

DISCIPLINE: STRUCTURES
SHEET NAME: CBRR0686-BRG-BOR-012

SHEET 105 OF 116

Sep. 21 2015 09:06 am V:\3400_ADC\CAD\SEGMENT W3\PLAN SHEETS\STRUCTURES\CBRR0686\60_percent_Preliminary Plans-Dwg files\CBRR0686-BRG-BOR.dwg By: wyttenbacht

EXISTING GROUNDLINE
20' LT. — — — — — —
TRACK 2 C/L— - —— - —— - —
10' RT. ——— — — ———

℄ PIER 3 ℄ PIER 4 PROFILE GRADE (FG-EB-TRK-W3) ℄ PIER 5

+0.915%

2282 SB
Elevation 890.03

Coh	N60	
▽	2	PEAT, trace fibers, well decomposed, black, wet, ( ) swamp deposit
	2	
	WH	– With fibers at 5 feet.
	WH	– Sand lenses at 10 feet.
	WH	ORGANIC LEAN CLAY, trace Sand and fibers, gray, wet (CL–OL), swamp deposit
	1	
	6	
	10	– With Peat layer at 15 feet.
	18	– With Silt layer at 17 feet.
	22	SANDY LEAN CLAY, trace Gravel, gray, wet, rather stiff to very stiff, (CL), till
	13	
	22	
	17	– With waterbearing Sand layer at 35 feet.
	24	
	27	CLAYEY SAND with GRAVEL, brown, wet, very stiff to hard, (SC), till
	29	
	20	
	18	SILTY SAND with GRAVEL, fine– to medium grained, brown, waterbearing, medium dense, (SM), till
	21	
	20	
	26	– With waterbearing Sand seams from 50–55 feet.
	21	SANDY CLAY with GRAVEL, brown, wet, very stiff, (SC), till
	26	– With Sand seam at 65 feet.
	33	SILTY SAND with GRAVEL, fine– to medium grained, gray to brown, medium dense to dense, (SM), till
	22	– Lean Clay lens at 70 feet.
	28	
	58	– Gravel at 85 feet.
	100	CLAYEY SAND, trace Gravel, gray to brown, wet, (SC), till
	40	
	38	

Water observed at 4 feet with 4 feet of hollow–stem auger in the ground.

Water not observed at 99 1/2 feet due to mud rotary drilling techniques.

Boring immediately backfilled with bentonite grout.

920 910 900 890 880 870 860 850 840 830 820 810 800 790 780 770 760 750

2388+00 2389+00 2390+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.

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AK/IGG CHECKED BY: TR
DRAWN BY: TAW DATE: 9/21/2015

AECOM

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

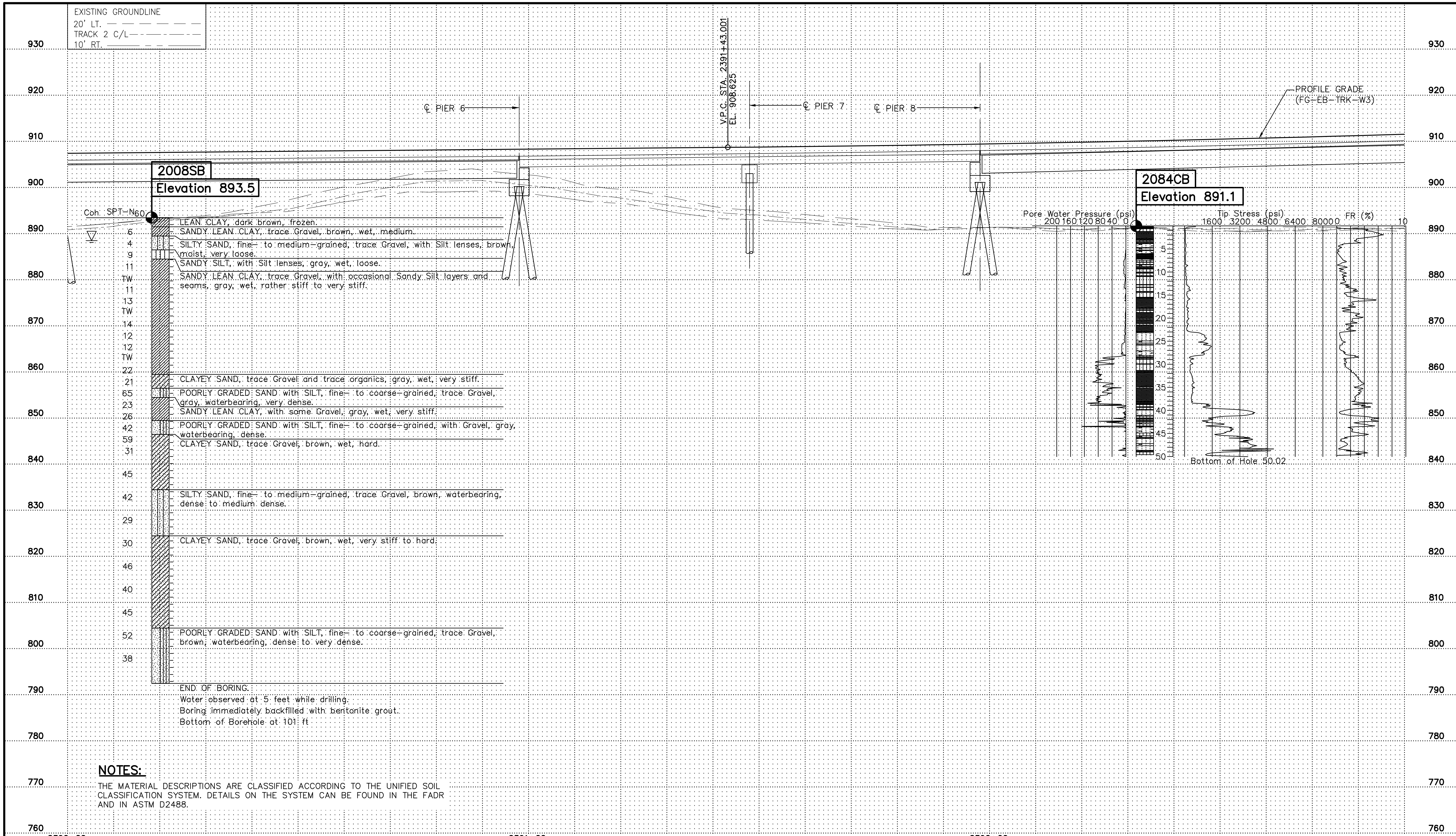
SOUTHWEST Green Line LRT Extension

CIVIL WEST - VOLUME 4B
MINNETONKA/HOPKINS
BRIDGE R0686
BRIDGE SURVEY PROFILE 2

DISCIPLINE: STRUCTURES
SHEET NAME: CBRR0686-BRG-BOR-013

SHEET 106 OF 116

Sep. 21 2015 09:06 am V:\3400_ADC\CAD\SEGMENT W3\PLAN SHEETS\STRUCTURES\CBRR0686\60_percent_Preliminary Plans-Dwg files\CBRR0686-BRG-BOR.dwg By: wyttenbacht


EXISTING GROUNDLINE
20' LT.
TRACK 2 C/L
10' RT.
930
920
910
900
890
880
870
860
850
840
830
820
810
800
790
780
770
760
V.P.C. STA. 2391+43.001
EL. 908.625
℄ PIER 6
℄ PIER 7
℄ PIER 8
PROFILE GRADE
(FG-EB-TRK-W3)
2008SB
Elevation 893.5
Coh. SPT-N 60
6
4
9
11
TW
11
13
TW
14
12
12
TW
22
21
65
23
26
42
59
31
45
42
29
30
46
40
45
52
38
LEAN CLAY, dark brown, frozen.
SANDY LEAN CLAY, trace Gravel, brown, wet, medium.
SILTY SAND, fine- to medium-grained, trace Gravel, with Silt lenses, brown, moist, very loose.
SANDY SILT, with Silt lenses, gray, wet, loose.
SANDY LEAN CLAY, trace Gravel, with occasional Sandy Silt layers and seams, gray, wet, rather stiff to very stiff.
CLAYEY SAND, trace Gravel and trace organics, gray, wet, very stiff.
POORLY GRADED SAND with SILT, fine- to coarse-grained, trace Gravel, gray, waterbearing, very dense.
SANDY LEAN CLAY, with some Gravel, gray, wet, very stiff.
POORLY GRADED SAND with SILT, fine- to coarse-grained, with Gravel, gray, waterbearing, dense.
CLAYEY SAND, trace Gravel, brown, wet, hard.
SILTY SAND, fine- to medium-grained, trace Gravel, brown, waterbearing, dense to medium dense.
CLAYEY SAND, trace Gravel, brown, wet, very stiff to hard.
POORLY GRADED SAND with SILT, fine- to coarse-grained, trace Gravel, brown, waterbearing, dense to very dense.
END OF BORING.
Water observed at 5 feet while drilling.
Boring immediately backfilled with bentonite grout.
Bottom of Borehole at 101 ft
2084CB
Elevation 891.1
Pore Water Pressure (psi)
200 160 120 80 40 0
Tip Stress (psi)
1600 3200 4800 6400 8000 0
FR (%)
10
5
10
15
20
25
30
35
40
45
50
Bottom of Hole 50.02
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.
2390+00
2391+00
2392+00

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AK/IGG — CHECKED BY: TR
DRAWN BY: TAW — DATE: 9/21/2015

AECOM

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL — SOUTHWEST Green Line LRT Extension

CIVIL WEST - VOLUME 4B
MINNETONKA/HOPKINS
BRIDGE R0686
BRIDGE SURVEY PROFILE 3

DISCIPLINE: STRUCTURES

SHEET NAME: CBRR0686-BRG-BOR-014

SHEET 107 OF 116

EXISTING GROUNDLINE
20' LT. — — — — — —
TRACK 2 C/L- - - - - -
10' RT. ——— — — ———

V.P.I. STA. 2393+18.001
EL. 910.227
350.000' V.C.
G1: +0.915%
G2: +5.752%
M: 2.116

V.P.T. STA. 2394+93.001
EL. 920.294

PROFILE GRADE
(FG-EB-TRK-W3)

℄ PIER 9

℄ PIER 10

℄ PIER 11

+0.916%

+5.752%

+5.752%

2085CB
Elevation 890.3

Pore Water Pressure (psi)
200 160 120 80 40 0

Tip Stress (psi)
1600 3200 4800 6400 8000 0

FR (%)
10

5 10 15 20 25 30 35 40 45 50

Bottom of Hole 50.02

930 920 910 900 890 880 870 860 850 840 830 820 810 800 790 780 770

2393+00 2394+00 2395+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.

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AK/IGG
DRAWN BY: TAW
CHECKED BY: TR
DATE: 9/21/2015

AECOM

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

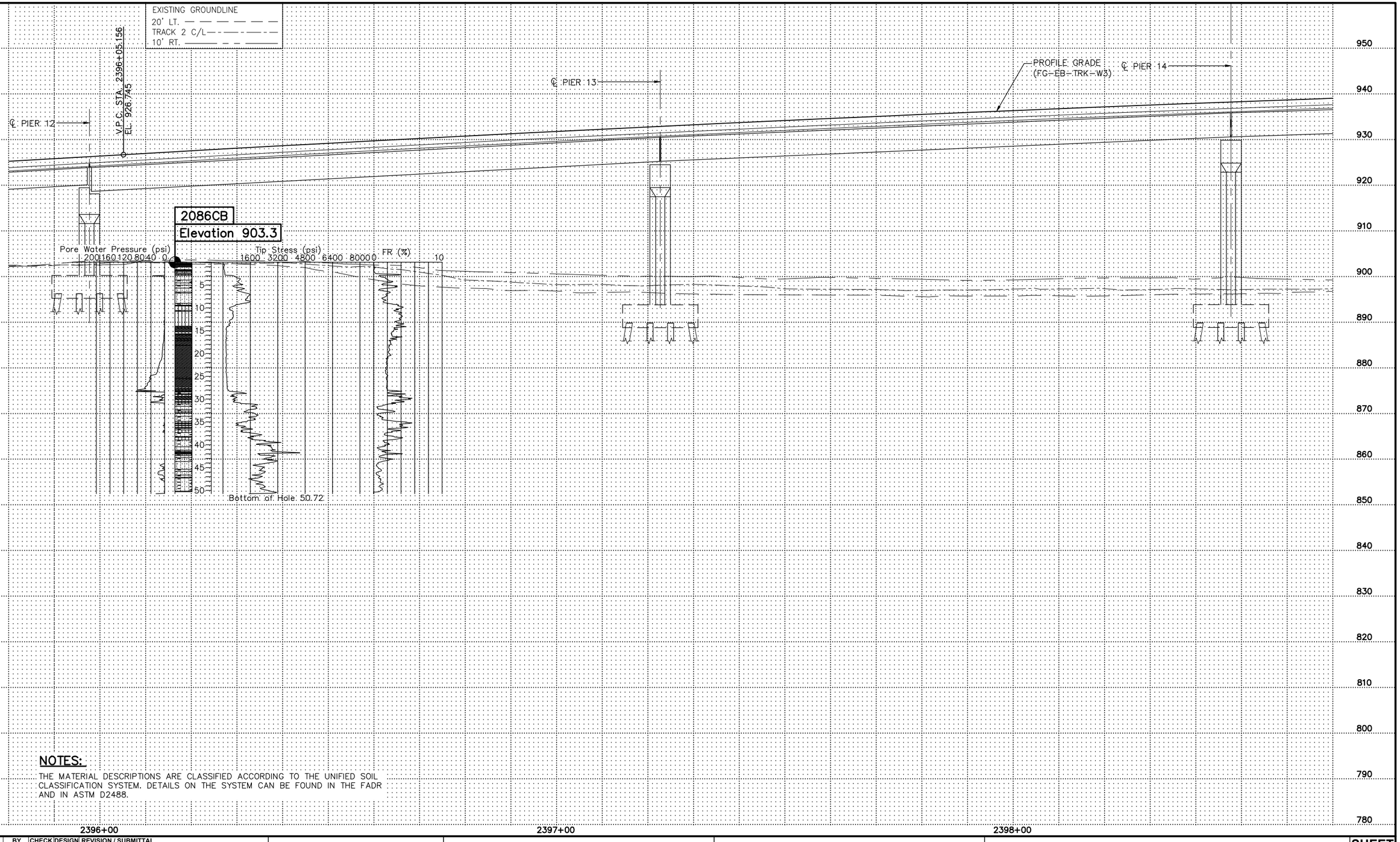
SOUTHWEST Green Line LRT Extension

CIVIL WEST - VOLUME 4B
MINNETONKA/HOPKINS
BRIDGE R0686
BRIDGE SURVEY PROFILE 4

DISCIPLINE: STRUCTURES
SHEET NAME: CBRR0686-BRG-BOR-015

SHEET 108 OF 116

Sep. 21 2015 09:06 am v:\3400_ADC\CAD\SEGMENT W3\PLAN SHEETS\STRUCTURES\CBRR0686\60_percent_Preliminary Plans-Dwg files\CBRR0686-BRG-BOR.dwg By: wyttenbacht



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.

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AK/IGG | CHECKED BY: TR
DRAWN BY: TAW | DATE: 9/21/2015

AECOM

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

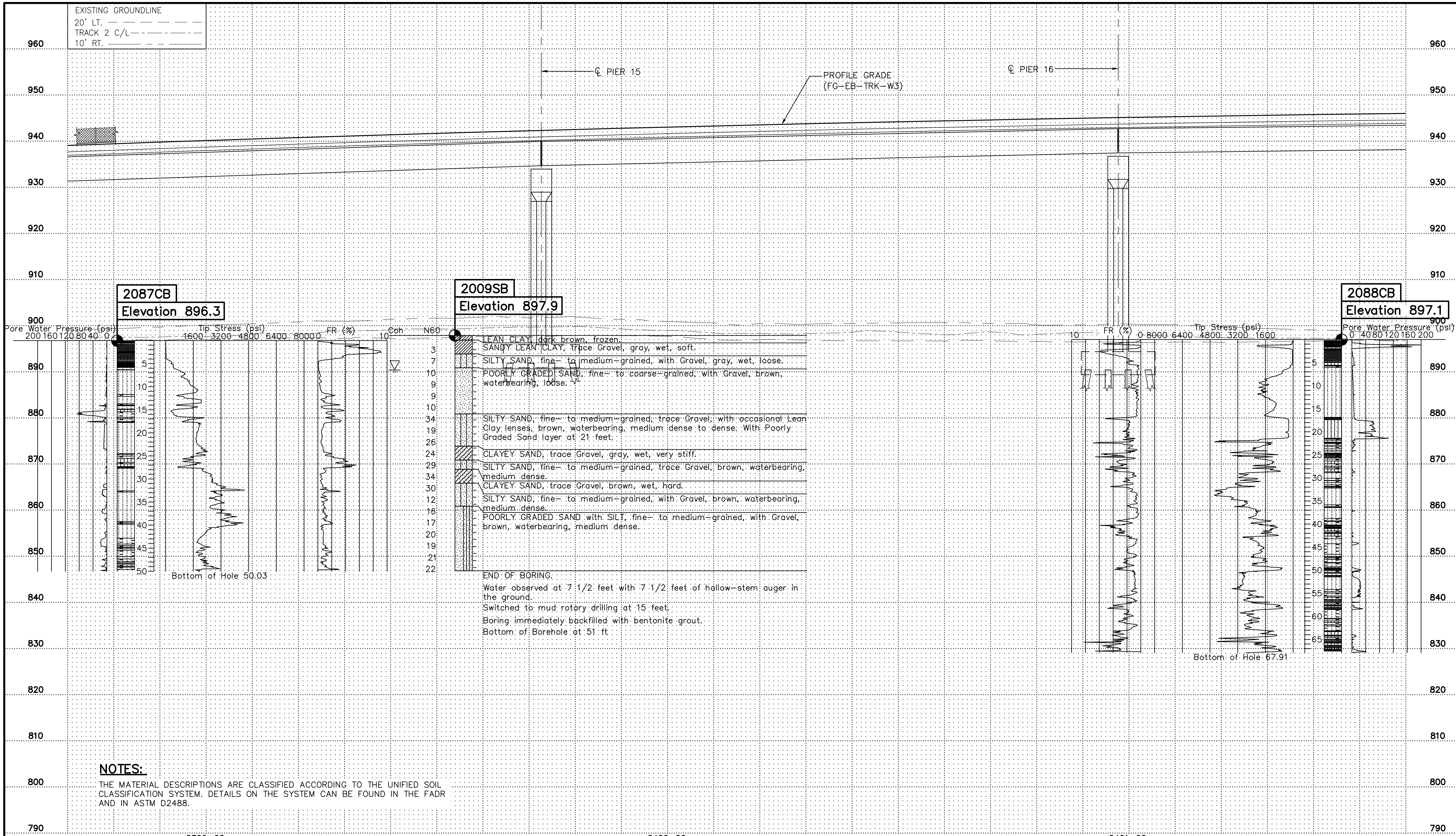
SOUTHWEST Green Line LRT Extension

CIVIL WEST - VOLUME 4B
MINNETONKA/HOPKINS
BRIDGE R0686
BRIDGE SURVEY PROFILE 5

DISCIPLINE: STRUCTURES
SHEET NAME: CBRR0686-BRG-BOR-016

SHEET 109 OF 116

Sep. 21 2015 09:06 am V:\3400_ADC\CAD\SEGMENT W3\PLAN SHEETS\STRUCTURES\CBRR0686\60_percent_Preliminary Plans-Dwg files\CBRR0686-BRG-BOR.dwg By: wyttenbacht


EXISTING GROUNDLINE
20' LT.
TRACK 2 C/L
10' RT.
960
950
940
930
920
910
900
890
880
870
860
850
840
830
820
810
800
790
℄ PIER 15
℄ PIER 16
PROFILE GRADE
(FG-EB-TRK-W3)
2087CB
Elevation 896.3
Pore Water Pressure (psi)
200 160 120 80 40 0
Tip Stress (psi)
1600 3200 4800 6400 8000
FR (%)
10
Bottom of Hole 50.03
2009SB
Elevation 897.9
Coh
N60
LEAN CLAY, dark brown, frozen.
SANDY LEAN CLAY, trace Gravel, gray, wet, soft.
SILTY SAND, fine- to medium-grained, with Gravel, gray, wet, loose.
POORLY GRADED SAND, fine- to coarse-grained, with Gravel, brown, waterbearing, loose.
SILTY SAND, fine- to medium-grained, trace Gravel, with occasional Lean Clay lenses, brown, waterbearing, medium dense to dense. With Poorly Graded Sand layer at 21 feet.
CLAYEY SAND, trace Gravel, gray, wet, very stiff.
SILTY SAND, fine- to medium-grained, trace Gravel, brown, waterbearing, medium dense.
CLAYEY SAND, trace Gravel, brown, wet, hard.
SILTY SAND, fine- to medium-grained, with Gravel, brown, waterbearing, medium dense.
POORLY GRADED SAND with SILT, fine- to medium-grained, with Gravel, brown, waterbearing, medium dense.
END OF BORING.
Water observed at 7 1/2 feet with 7 1/2 feet of hollow-stem auger in the ground.
Switched to mud rotary drilling at 15 feet.
Boring immediately backfilled with bentonite grout.
Bottom of Borehole at 51 ft
2088CB
Elevation 897.1
Pore Water Pressure (psi)
0 40 80 120 160 200
Tip Stress (psi)
0 8000 6400 4800 3200 1600
FR (%)
10
Bottom of Hole 67.91
2399+00
2400+00
2401+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.

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AK/IGG | CHECKED BY: TR
DRAWN BY: TAW | DATE: 9/21/2015

AECOM

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

CIVIL WEST - VOLUME 4B
MINNETONKA/HOPKINS
BRIDGE R0686
BRIDGE SURVEY PROFILE 6

DISCIPLINE: STRUCTURES

SHEET NAME: CBRR0686-BRG-BOR-017

SHEET 110 OF 116

EXISTING GROUNDLINE
20' LT. — — — — — —
TRACK 2 C/L— - — - — - —
10' RT. ——— _ _ ———

V.P.I.: STA. 2403+05.156
EL.: 967.011
1400.000' V.C.
G1: +5.752%
G2: -5.753%
M: -20.134
+5.752% -5.753%

℄ PIER 17

℄ PIER 18

PROFILE GRADE
(FG-EB-TRK-W3)

2089CB
Elevation 897.7

Pore Water Pressure (psi)
200 160 120 80 40 0

Tip Stress (psi)
1600 3200 4800 6400 8000 0

FR (%)
10

Bottom of Hole: 78.23

970 960 950 940 930 920 910 900 890 880 870 860 850 840 830 820 810 800

2402+00 2403+00 2404+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.

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AK/IGG
DRAWN BY: TAW
CHECKED BY: TR
DATE: 9/21/2015

AECOM

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

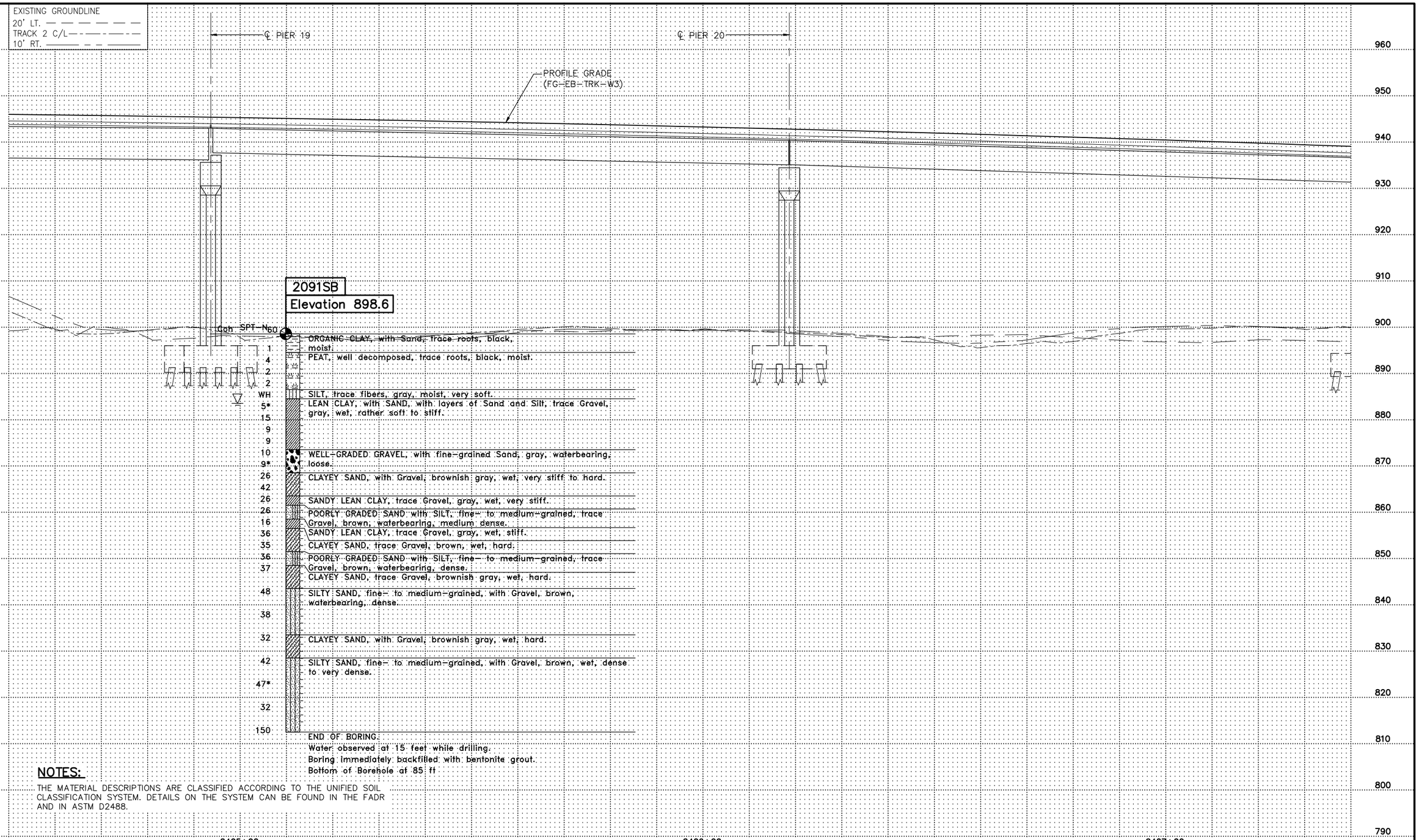
SOUTHWEST
Green Line LRT Extension

CIVIL WEST - VOLUME 4B
MINNETONKA/HOPKINS
BRIDGE R0686
BRIDGE SURVEY PROFILE 7

DISCIPLINE: STRUCTURES
SHEET NAME: CBRR0686-BRG-BOR-018

SHEET 111 OF 116

Sep. 21 2015 09:06 am v:\3400_ADC\CAD\SEGMENT W3\PLAN SHEETS\STRUCTURES\CBRR0686\60_percent_Preliminary Plans-Dwg files\CBRR0686-BRG-BOR.dwg By: wyttenbacht



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.

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AK/IGG | CHECKED BY: TR
DRAWN BY: TAW | DATE: 9/21/2015

AECOM

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

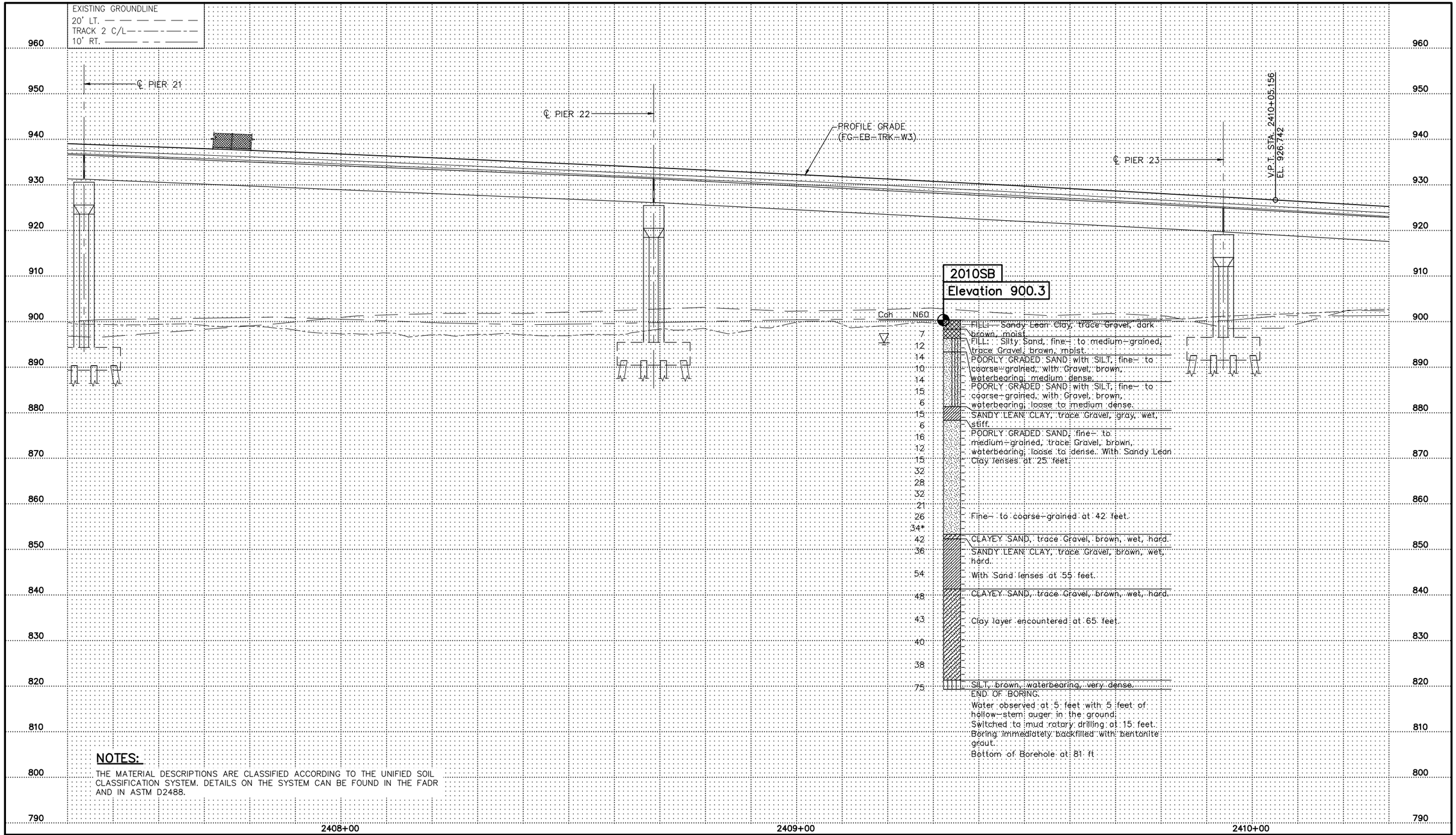
SOUTHWEST Green Line LRT Extension

CIVIL WEST - VOLUME 4B
MINNETONKA/HOPKINS
BRIDGE R0686
BRIDGE SURVEY PROFILE 8

DISCIPLINE: STRUCTURES
SHEET NAME: CBRR0686-BRG-BOR-019

SHEET 112 OF 116

Sep. 21 2015 09:06 am V:\3400_ADC\CAD\SEGMENT W3\PLAN SHEETS\STRUCTURES\CBRR0686\60_percent_Preliminary Plans-Dwg files\CBRR0686-BRG-BOR.dwg By: wyttenbacht



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.

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AK/IGG | CHECKED BY: TR
DRAWN BY: TAW | DATE: 9/21/2015

AECOM

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

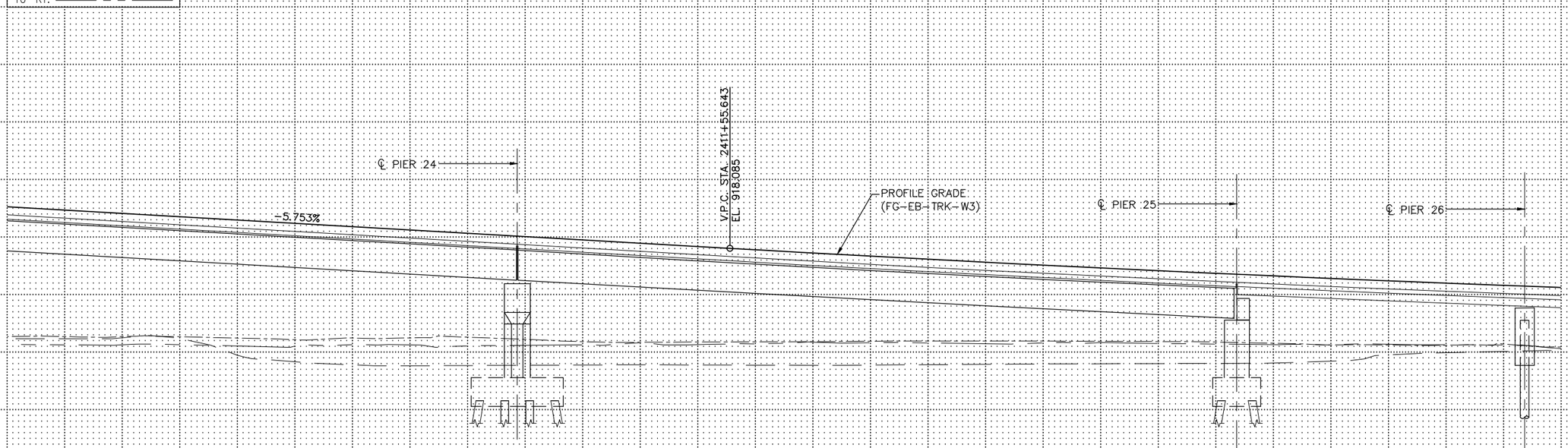
CIVIL WEST - VOLUME 4B
MINNETONKA/HOPKINS
BRIDGE R0686
BRIDGE SURVEY PROFILE 9

DISCIPLINE: STRUCTURES
SHEET NAME: CBRR0686-BRG-BOR-020

SHEET 113 OF 116

Sep. 21 2015 09:06 am V:\3400_ADC\CAD\SEGMENT W3\PLAN SHEETS\STRUCTURES\CBRR0686\60_percent_Preliminary Plans-Dwg files\CBRR0686-BRG-BOR.dwg By: wyttenbacht

EXISTING GROUNDLINE
20' LT. — — — — — —
TRACK 2 C/L — - — - — -
10' RT. ——— — — ———



960 950 940 930 920 910 900 890 880 870 860 850 840 830 820 810 800 790

2411+00 2412+00 2413+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.

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AK/IGG CHECKED BY: TR
DRAWN BY: TAW DATE: 9/21/2015

AECOM

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

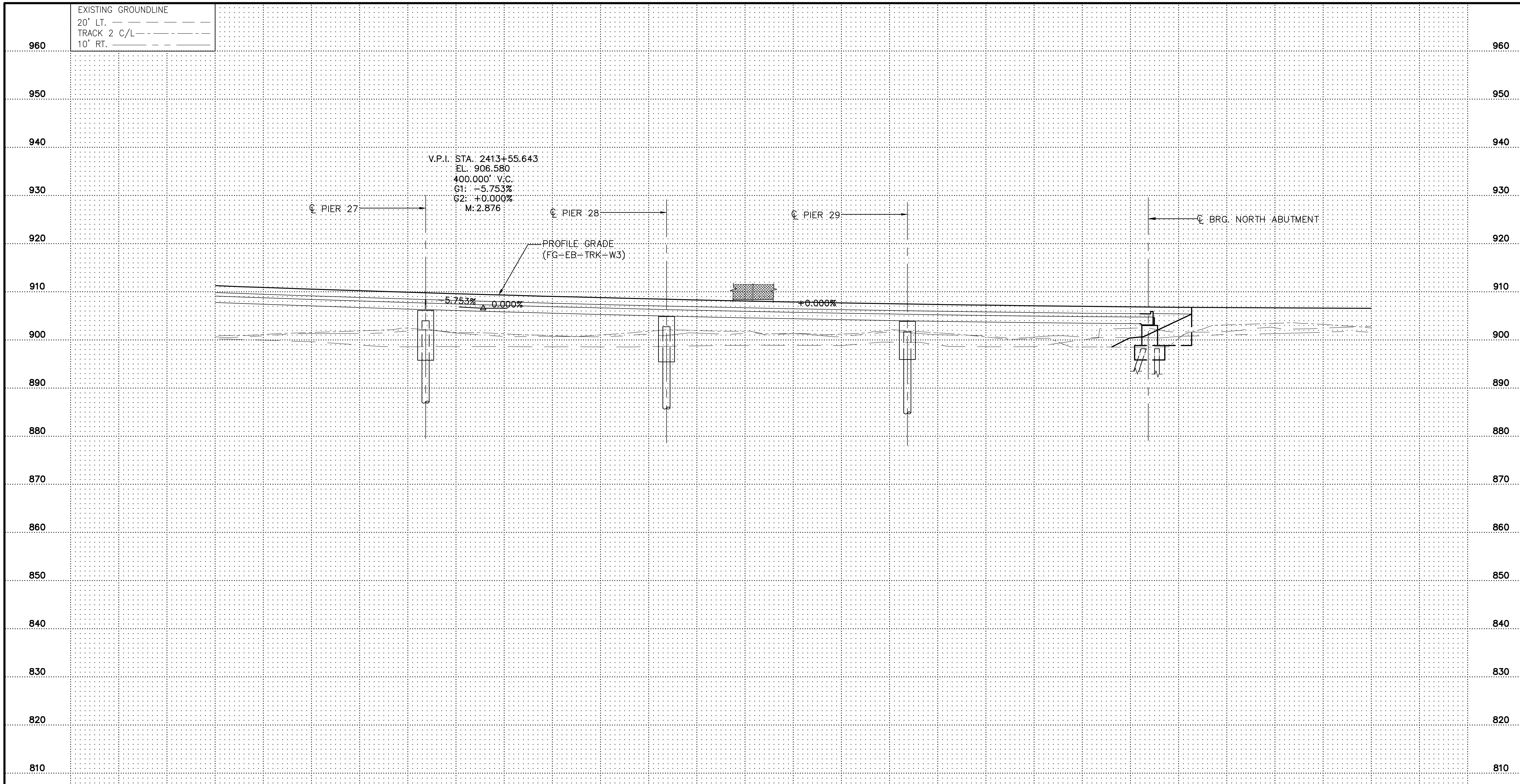
CIVIL WEST - VOLUME 4B
MINNETONKA/HOPKINS
BRIDGE R0686
BRIDGE SURVEY PROFILE 10

DISCIPLINE: STRUCTURES

SHEET NAME: CBRR0686-BRG-BOR-021

SHEET 114 OF 116

Sep. 21 2015 09:06 am V:\3400_ADC\CAD\SEGMENT W3\PLAN SHEETS\STRUCTURES\CBRR0686\60_percent_Preliminary Plans-Dwg files\CBRR0686-BRG-BOR.dwg By: wyttenbacht



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.

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AK/IGG
CHECKED BY: TR
DRAWN BY: TAW
DATE: 9/21/2015

AECOM

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

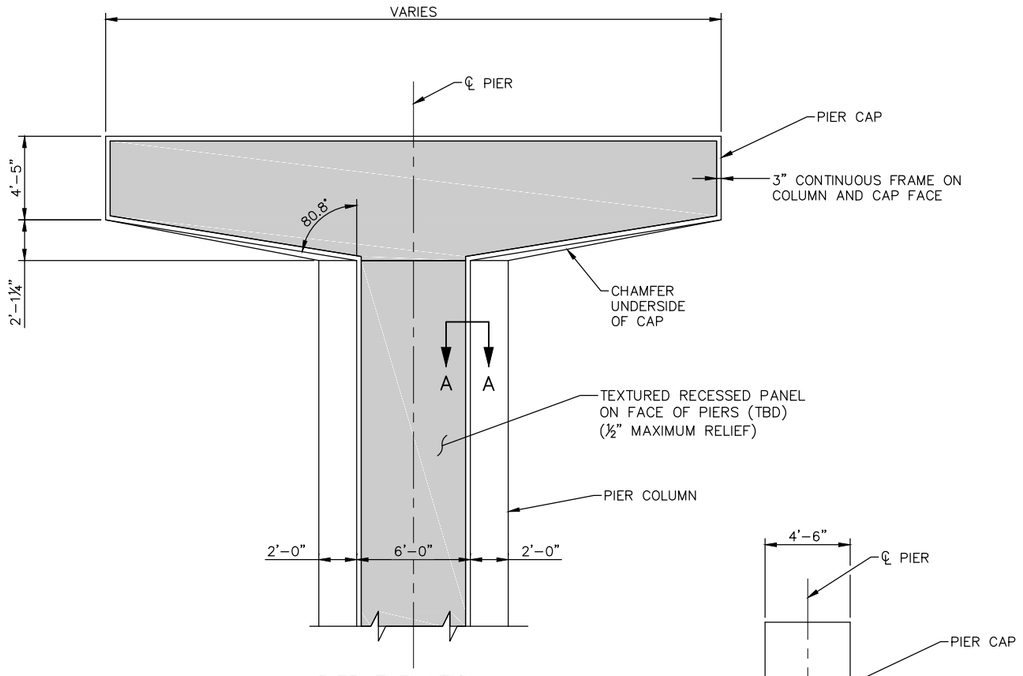
CIVIL WEST - VOLUME 4B
MINNETONKA/HOPKINS
BRIDGE R0686
BRIDGE SURVEY PROFILE 11

DISCIPLINE: STRUCTURES

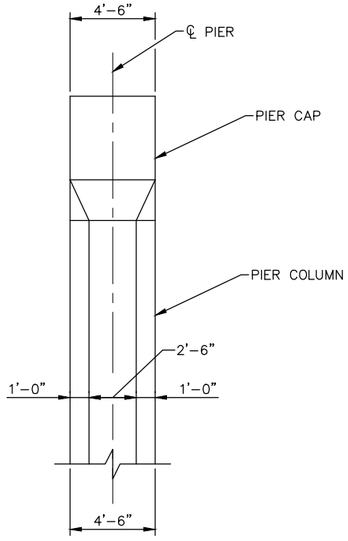
SHEET NAME: CBRR0686-BRG-BOR-022

SHEET 115 OF 116

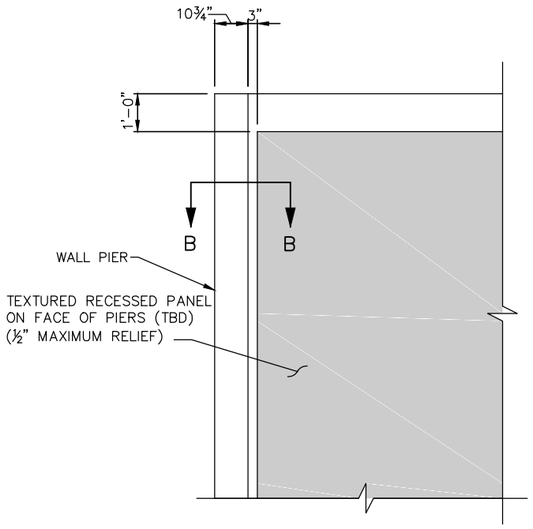
Sep. 21 2015 09:06 am V:\3400_ADC\CAD\SEGMENT W3\PLAN SHEETS\STRUCTURES\CBRR0686\60_percent_Preliminary Plans-Dwg files\CBRR0686-BRG-BOR.dwg By: wyttenbacht



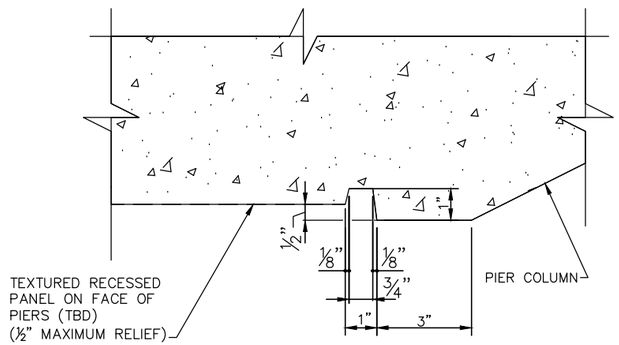
PIER ELEVATION
(PIERS 12–24)



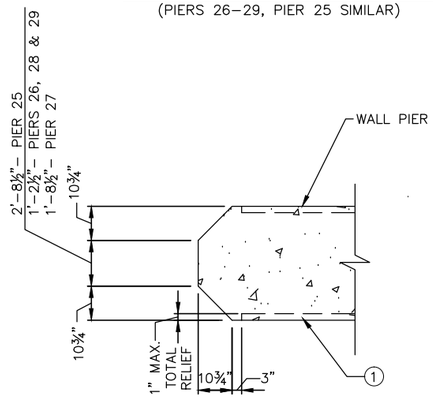
PIER END VIEW



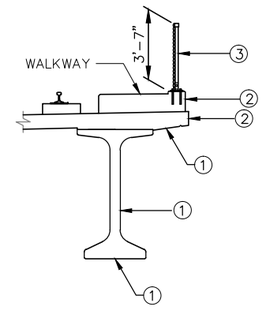
PARTIAL WALL PIER ELEVATION
(PIERS 26–29, PIER 25 SIMILAR)



SECTION A–A



SECTION B–B



PART TRANSVERSE SECTION AT BRIDGE

NOTES:

(1) SPECIAL SURFACE FINISH SHALL BE APPLIED TO THE BOTTOM FLANGE OF ALL GIRDERS, THE OUTSIDE FACE OF FASCIA GIRDERS AND THE BOTTOM OF THE DECK BETWEEN THE EDGE OF DECK AND THE TOP FLANGE OF THE FASCIA GIRDER. COLOR SHALL BE FEDERAL STANDARD COLOR XXXX, COLOR XXXXX (COLOR). SEE SPEC. SB 2401.

(2) SPECIAL SURFACE FINISH SHALL BE APPLIED TO THE EDGE OF DECK, EDGE OF WALKWAY AND COPING AT F.F. OF ABUTMENT BODY AND AT TOP OF WINGWALL. COLOR SHALL BE FEDERAL COLOR XXXX, COLOR XXXXX. SEE SPEC. SB 2401.

(3) 3'–6" DIAMOND MESH SAFETY RAIL. FOR DETAILS, SEE WIRE FENCE RAILING SHEETS.

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AK/IGG | CHECKED BY: TR
DRAWN BY: TAW | DATE: 9/21/2015

AECOM

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

CIVIL WEST - VOLUME 4B
MINNETONKA/HOPKINS
BRIDGE R0686
AESTHETIC DETAILS

DISCIPLINE: STRUCTURES
SHEET NAME: CBRR0686-BRG-AES-001

SHEET 116 OF 116

CONSTRUCTION NOTES:

THE 2014 EDITION OF THE MINNESOTA DEPARTMENT OF TRANSPORTATION "STANDARD SPECIFICATIONS FOR CONSTRUCTION" SHALL GOVERN.

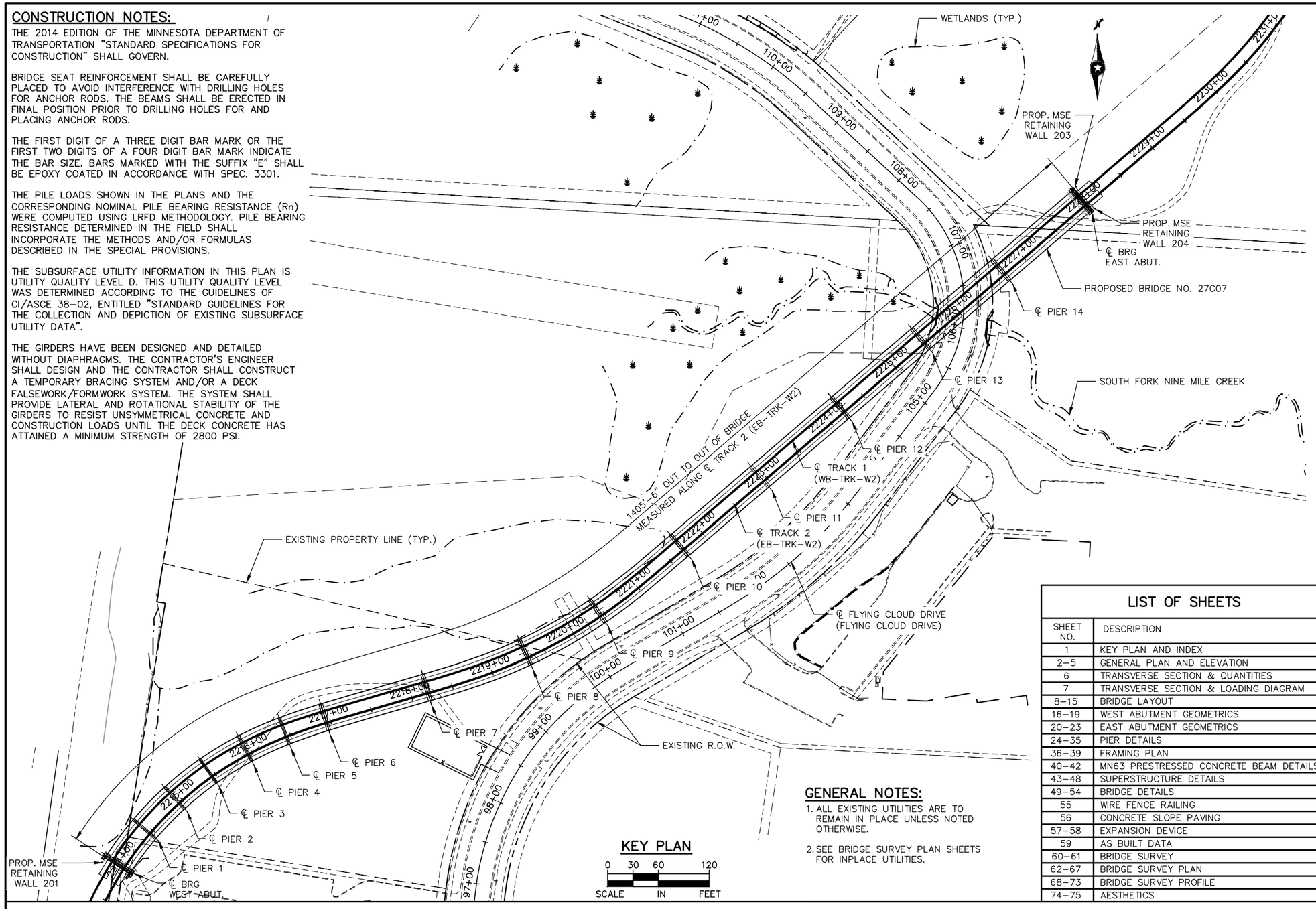
BRIDGE SEAT REINFORCEMENT SHALL BE CAREFULLY PLACED TO AVOID INTERFERENCE WITH DRILLING HOLES FOR ANCHOR RODS. THE BEAMS SHALL BE ERECTED IN FINAL POSITION PRIOR TO DRILLING HOLES FOR AND PLACING ANCHOR RODS.

THE FIRST DIGIT OF A THREE DIGIT BAR MARK OR THE FIRST TWO DIGITS OF A FOUR DIGIT BAR MARK INDICATE THE BAR SIZE. BARS MARKED WITH THE SUFFIX "E" SHALL BE EPOXY COATED IN ACCORDANCE WITH SPEC. 3301.

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".

THE GIRDERS HAVE BEEN DESIGNED AND DETAILED WITHOUT DIAPHRAGMS. THE CONTRACTOR'S ENGINEER SHALL DESIGN AND THE CONTRACTOR SHALL CONSTRUCT A TEMPORARY BRACING SYSTEM AND/OR A DECK FALSEWORK/FORMWORK SYSTEM. THE SYSTEM SHALL PROVIDE LATERAL AND ROTATIONAL STABILITY OF THE GIRDERS TO RESIST UNSYMMETRICAL CONCRETE AND CONSTRUCTION LOADS UNTIL THE DECK CONCRETE HAS ATTAINED A MINIMUM STRENGTH OF 2800 PSI.



GENERAL NOTES:

1. ALL EXISTING UTILITIES ARE TO REMAIN IN PLACE UNLESS NOTED OTHERWISE.
2. SEE BRIDGE SURVEY PLAN SHEETS FOR INPLACE UTILITIES.

LIST OF SHEETS

DESIGN DATA

2014 AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS 7TH EDITION AND SUBSEQUENT INTERIM SPECS. THRU 2015.

METRO LIGHT RAIL TRANSIT DESIGN CRITERIA (REVISION 4.0).

LOAD AND RESISTANCE FACTOR DESIGN METHOD.

LRV & MV LOAD DIAGRAM SHOWN ON SHEET 7 OF 75.

MATERIAL DESIGN PROPERTIES:
- REINFORCED CONCRETE:
  - f'c = 4000 PSI, n = 8
  - fy = 60000 PSI
- PRESTRESSED CONCRETE:
  - f'c = 9000 PSI, n = 1
  - fpu = 270 KSI
  - 0.6" DIAMETER LOW RELAXATION STRANDS
  - 0.75 fpu FOR INITIAL PRESTRESS

DESIGN SPEED: OVER = 25/55 MPH (LRT)
UNDER = 30 MPH

APPROXIMATE DECK AREA: 47,200 SQ. FT.

PROPOSED TYPE OF STRUCTURE

DECK:
- CONCRETE SLAB SPANS WITH 27" CONCRETE DECK (SPANS 1 THRU 6).
- MN63 PRESTRESSED CONCRETE BEAMS (SIMPLE SPANS) WITH 9" CAST-IN-PLACE CONCRETE DECK (SPANS 7 THRU 15).
- ALL BARS EPOXY COATED TBD.
- DIRECT FIXATION TRACK.

SUBSTRUCTURE:
- WEST ABUTMENT: HIGH PARAPET ABUTMENT SUPPORTED ON 12" CIP CONCRETE PILES.
- EAST ABUTMENT: MSE WALL/LOW PARAPET ABUTMENT SUPPORTED ON 12" CIP CONCRETE PILES.
- TRESTLE BENTS SUPPORTED ON 16" CIP CONCRETE PILES (PIERS 1 THRU 5).
- HAMMERHEAD PIERS SUPPORTED ON 16" CIP CONCRETE PILES (PIERS 6 THRU 14).

DEPTH OF STRUCTURE:
- ±7'-8" TOP OF LOW RAIL TO LOW BRIDGE.
- 4 BEAM LINES.

AESTHETICS: LEVEL B.

BRIDGE NO. 27C07

SOUTHWEST LIGHT RAIL OVER FLYING CLOUD DRIVE
0.5 MI NORTHEAST OF THE INTERSECTION OF TH 212 AND VALLEY VIEW ROAD IN EDEN PRAIRIE
100' & 125' PRESTRESSED CONCRETE BEAM SPANS
50' SLAB SPANS
32'-6" RAILWAY
0°-0'-0" SKEW
BRIDGE ID NO 501 BRIDGE & 209 APPROACH

KEY PLAN

SEC 12 T 116N R 22W
CITY OF EDEN PRAIRIE HENNEPIN COUNTY

APPROVED: _____
STATE BRIDGE ENGINEER DATE

JOB NO: T9N635 STATE PROJECT NO: 9909-01 MNDOT REVIEW:

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AV CHECKED BY: DD
DRAWN BY: GF DATE: 09/07/15

AECOM

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

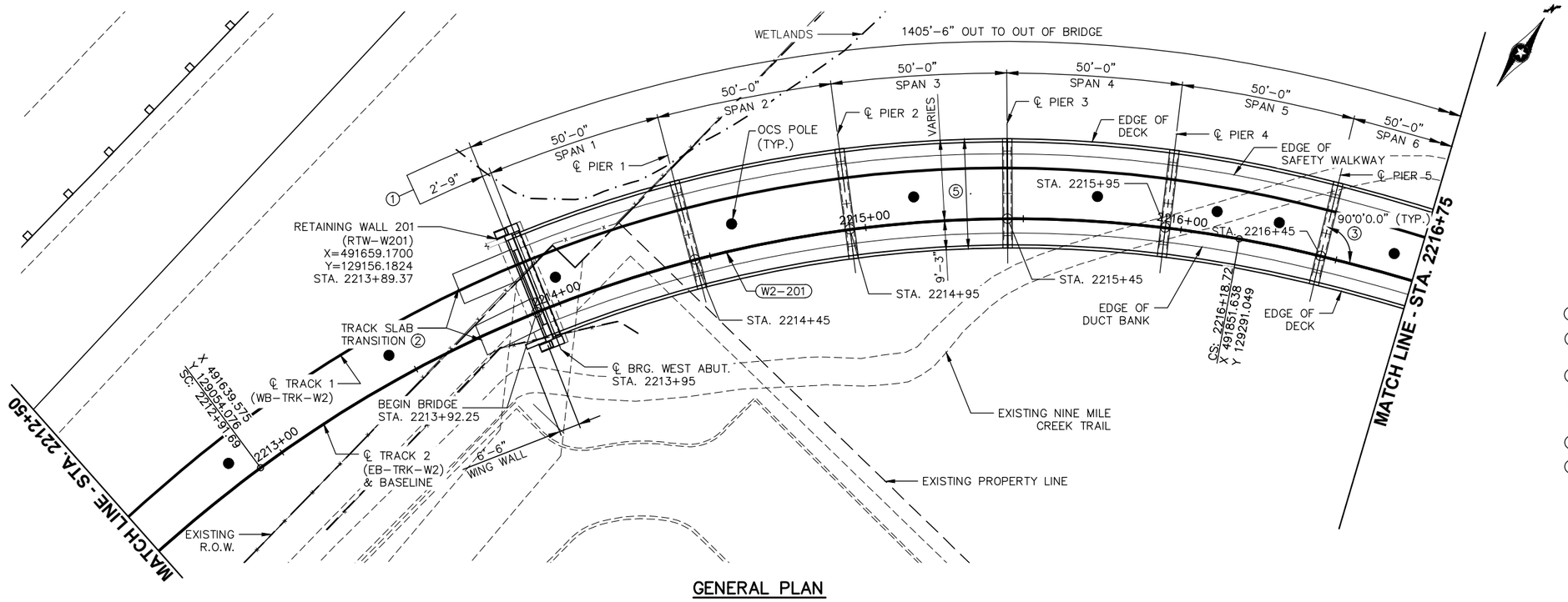
SOUTHWEST Green Line LRT Extension

CIVIL WEST - VOLUME 4B
NINE MILE CREEK
BRIDGE 27C07
KEY PLAN AND INDEX

DISCIPLINE: STRUCTURES
SHEET NAME: CBR27C07-BRG-KEY

SHEET 1 OF 75

Sep. 21 2015 08:42 am P:\60336960\3400_ADC\CAD\SEGMENT W2\PLAN SHEETS\STRUCTURES\CBR27C07\CBR27C07-BRG-GPE.dwg By: floresg



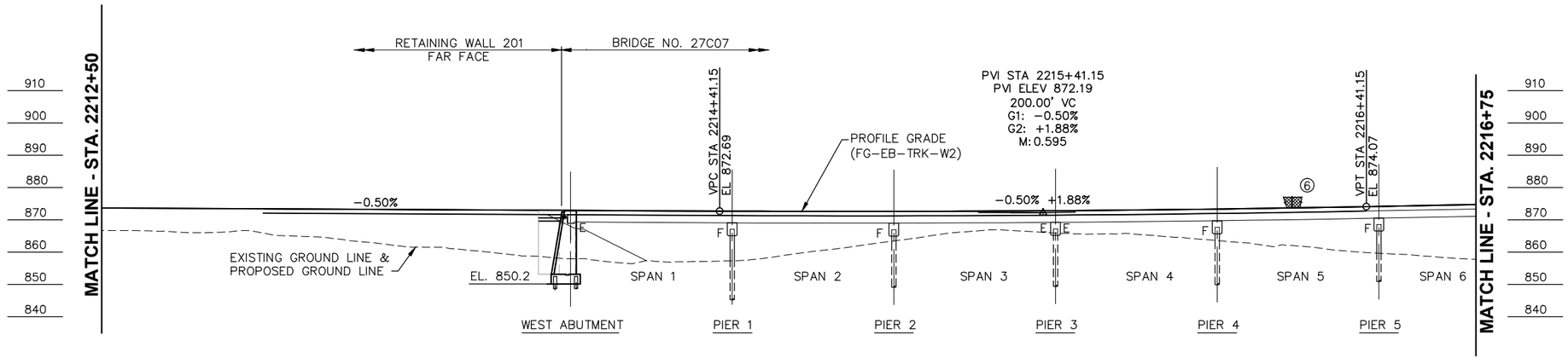
GENERAL PLAN

0 10 20 40
SCALE IN FEET

CURVE NO. W2-201
R = 400.00'
Lc = 327.04'
Ls = 120.00'
Ea = 3.50"
Eu = 2.69"
V = 25 MPH

NOTES:

1. ① MEASURED ALONG ℄ TRACK 2 (EB-TRK-W2).
2. ② SEE TRACK PLANS FOR TRANSITION SLAB DETAILS.
3. ③ TTC TYP. UNLESS SHOWN OTHERWISE.
4. SEE BRIDGE SURVEY PLAN SHEET FOR ADDITIONAL IN PLACE UTILITIES.
5. ⑤ BRIDGE WIDTH 32'-7⅝" MIN./ 35'-0⅛" MAX.
6. ⑥ 3'-6" DIAMOND MESH SAFETY RAIL. FOR DETAILS SEE SHEET 55 OF 75.



GENERAL ELEVATION

0 10 20 40
SCALE IN FEET

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AV | CHECKED BY: DD
DRAWN BY: GF | DATE: 09/07/15

AECOM

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

CIVIL WEST - VOLUME 4B
NINE MILE CREEK
BRIDGE 27C07
GENERAL PLAN AND ELEVATION 1

DISCIPLINE: STRUCTURES
SHEET NAME: CBR27C07-BRG-GPE-001

SHEET 2 OF 75

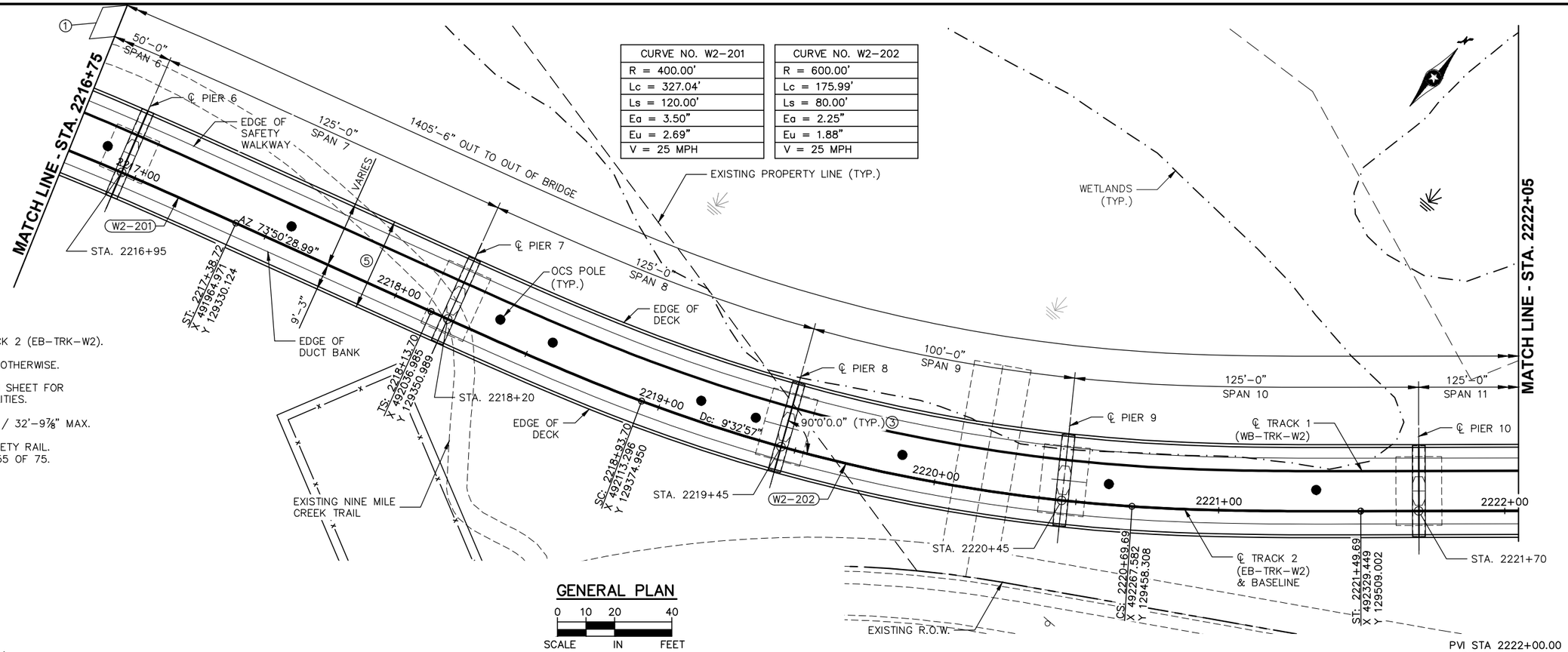
Sep. 18 2015 04:26 pm P:\60336960\3400_ADC\CAD\SEGMENT W2\PLAN SHEETS\STRUCTURES\CBR27C07\CBR27C07-BRG-GPE.dwg By: floresg

CURVE NO. W2–201
R = 400.00'
Lc = 327.04'
Ls = 120.00'
Ea = 3.50"
Eu = 2.69"
V = 25 MPH

CURVE NO. W2–202
R = 600.00'
Lc = 175.99'
Ls = 80.00'
Ea = 2.25"
Eu = 1.88"
V = 25 MPH

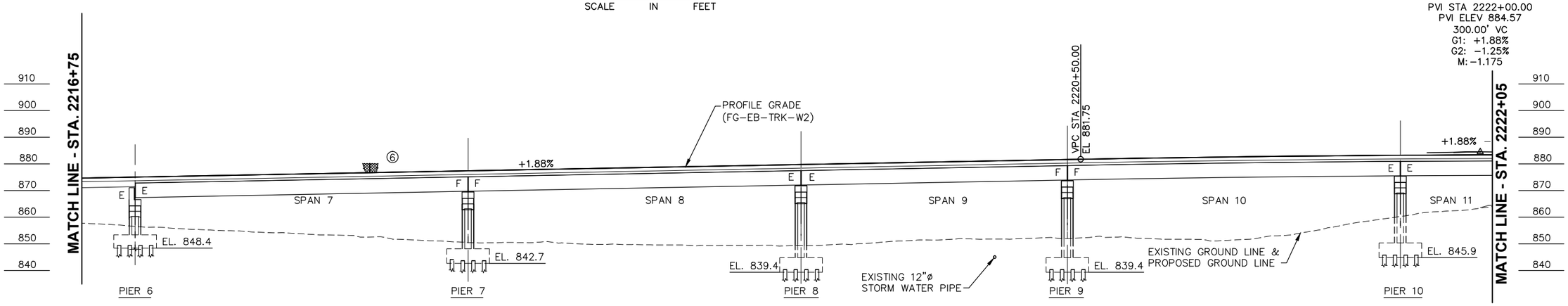
NOTES:

1. MEASURED ALONG ℄ TRACK 2 (EB–TRK–W2).
3. TTC TYP. UNLESS SHOWN OTHERWISE.
4. SEE BRIDGE SURVEY PLAN SHEET FOR ADDITIONAL IN PLACE UTILITIES.
5. BRIDGE WIDTH 32'–6" MIN./ 32'–9⅞" MAX.
6. 3'–6" DIAMOND MESH SAFETY RAIL. FOR DETAILS SEE SHEET 55 OF 75.



GENERAL PLAN

SCALE 0 10 20 40 IN FEET



GENERAL ELEVATION

SCALE 0 10 20 40 IN FEET

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AV | CHECKED BY: DD
DRAWN BY: GF | DATE: 09/07/15

AECOM

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

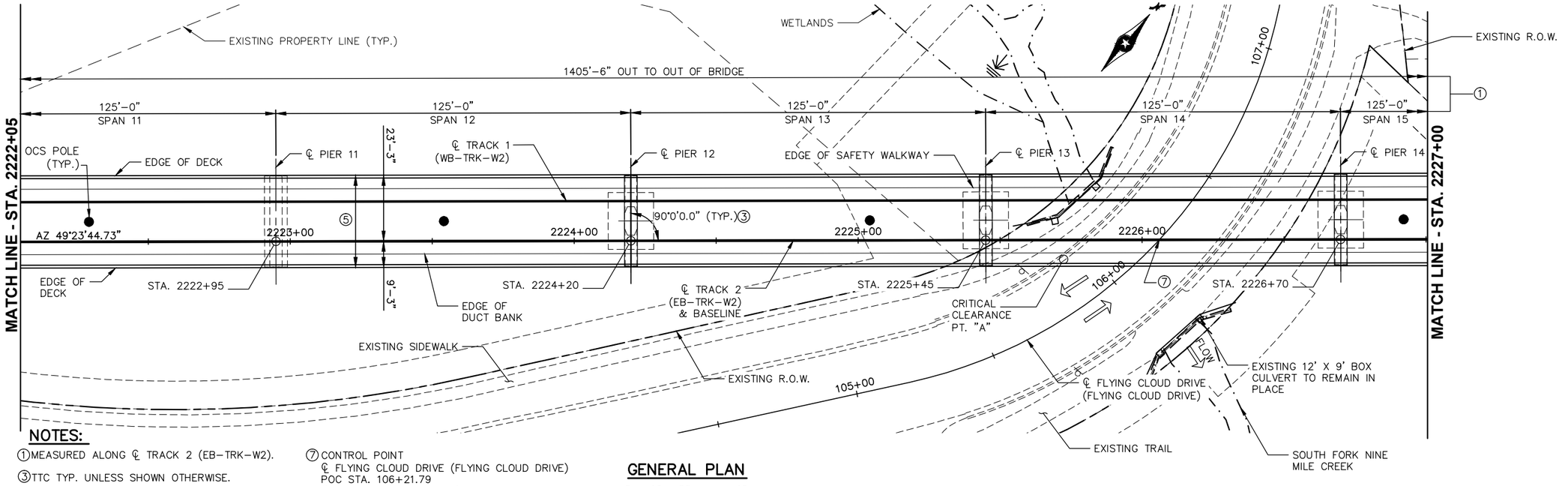
SOUTHWEST Green Line LRT Extension

CIVIL WEST - VOLUME 4B
NINE MILE CREEK
BRIDGE 27C07
GENERAL PLAN AND ELEVATION 2

DISCIPLINE: STRUCTURES

SHEET NAME: CBR27C07-BRG-GPE-002

SHEET 3 OF 75



NOTES:

①MEASURED ALONG ℄ TRACK 2 (EB-TRK-W2).

③TTC TYP. UNLESS SHOWN OTHERWISE.

4 SEE BRIDGE SURVEY PLAN SHEET FOR ADDITIONAL IN PLACE UTILITIES.

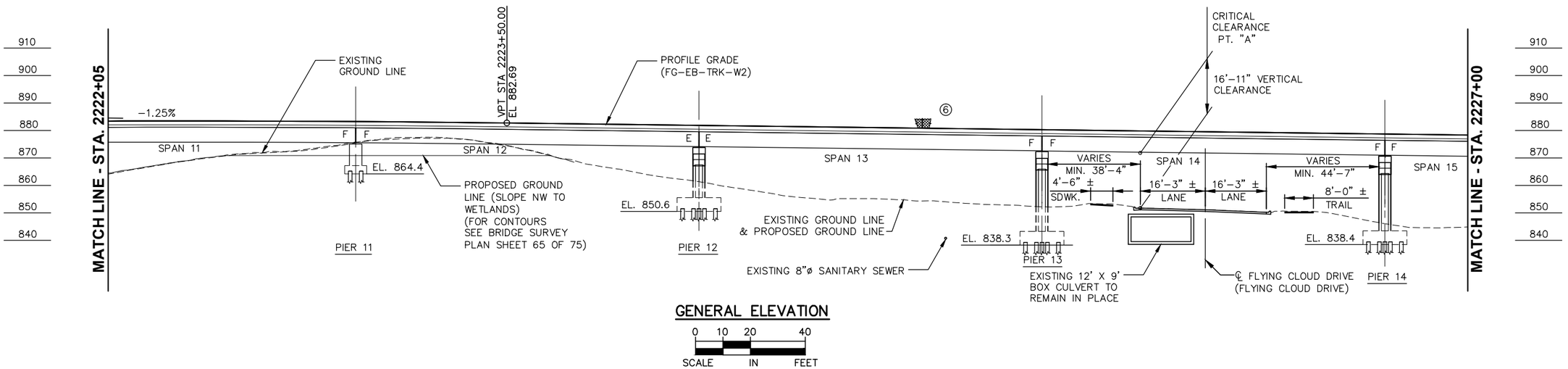
⑤BRIDGE WIDTH 32'-6" (SPANS 11-15).

⑥3'-6" DIAMOND MESH SAFETY RAIL. FOR DETAILS SEE SHEET 55 OF 75.

⑦CONTROL POINT
℄ FLYING CLOUD DRIVE (FLYING CLOUD DRIVE)
POC STA. 106+21.79
℄ TRACK 2 (EB-TRK-WS) POT STA. 2226+06.11
X: 492675.974
Y: 129806.054
ANGLE: 46°54'59" TTC

GENERAL PLAN

0 10 20 40
SCALE IN FEET



GENERAL ELEVATION

0 10 20 40
SCALE IN FEET

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AV | CHECKED BY: DD
DRAWN BY: GF | DATE: 09/07/15

AECOM

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

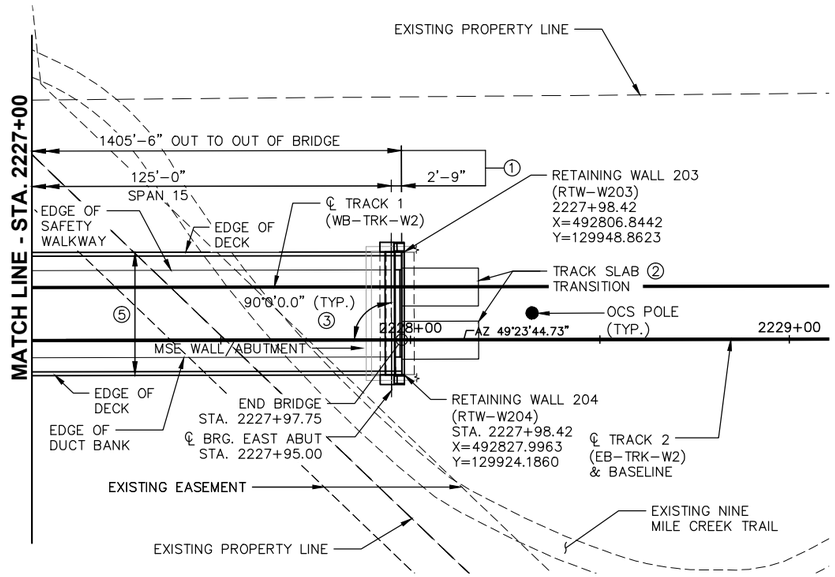
SOUTHWEST Green Line LRT Extension

CIVIL WEST - VOLUME 4B
NINE MILE CREEK
BRIDGE 27C07
GENERAL PLAN AND ELEVATION 3

DISCIPLINE: STRUCTURES
SHEET NAME: CBR27C07-BRG-GPE-003

SHEET 4 OF 75

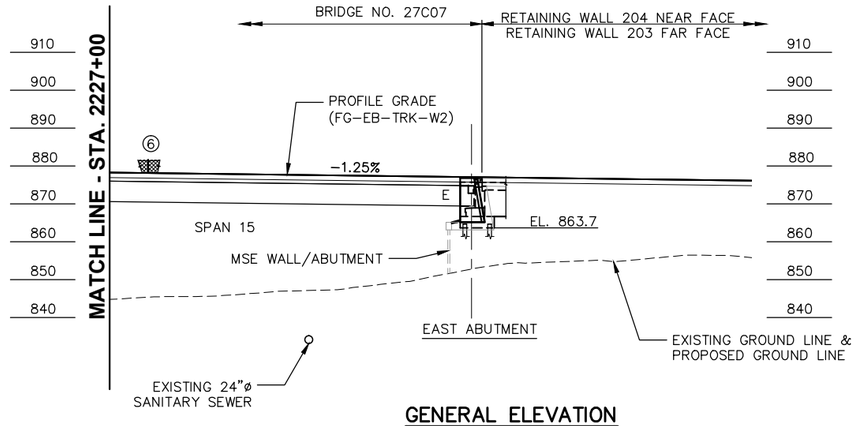
Sep. 18 2015 04:26 pm P:\60336960\3400_ADC\CAD\SEGMENT W2\PLAN SHEETS\STRUCTURES\CBR27C07\CBR27C07-BRG-GPE.dwg By: floresg



GENERAL PLAN

0 10 20 40

SCALE IN FEET



GENERAL ELEVATION

0 10 20 40

SCALE IN FEET

NOTES:

①MEASURED ALONG ℄ TRACK 2 (EB-TRK-W2).

②SEE TRACK PLANS FOR TRANSITION SLAB DETAILS.

③TTC TYP. UNLESS SHOWN OTHERWISE.

4 SEE BRIDGE SURVEY PLAN SHEET FOR ADDITIONAL IN PLACE UTILITIES.

⑤BRIDGE WIDTH 32'-6".

⑥3'-6" DIAMOND MESH SAFETY RAIL. FOR DETAILS SEE SHEET 55 OF 75.

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AV | CHECKED BY: DD
DRAWN BY: GF | DATE: 09/07/15

AECOM

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

CIVIL WEST - VOLUME 4B
NINE MILE CREEK
BRIDGE 27C07
GENERAL PLAN AND ELEVATION 4

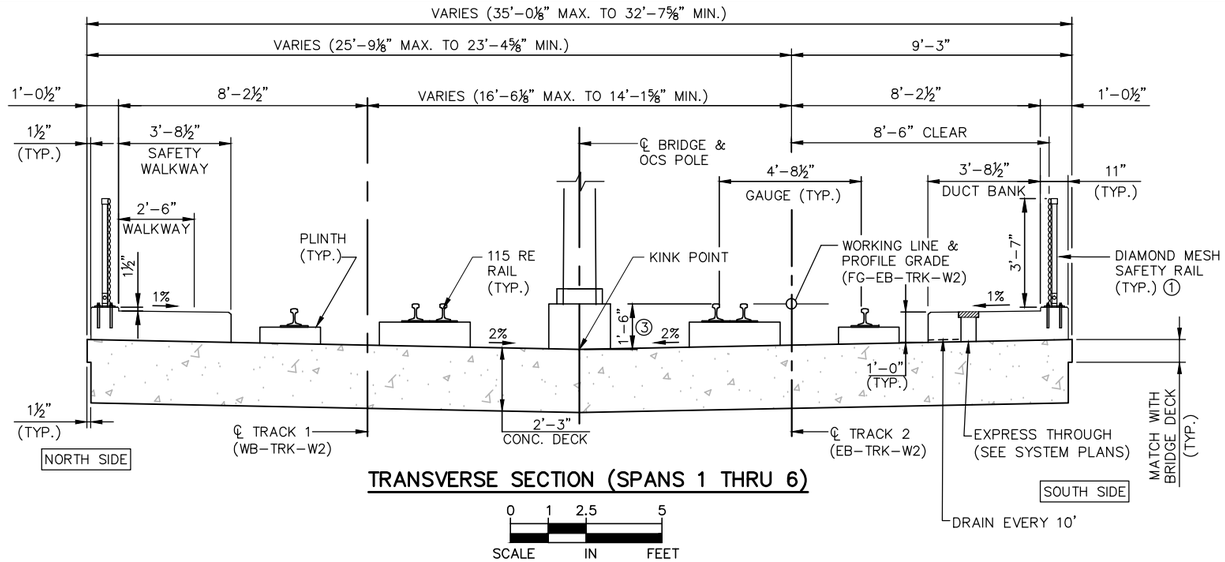
DISCIPLINE: STRUCTURES
SHEET NAME: CBR27C07-BRG-GPE-004

SHEET 5 OF 75

Sep. 18 2015 04:26 pm P:\60336960\3400_ADC\CAD\SEGMENT W2\PLAN SHEETS\STRUCTURES\CBR27C07\CBR27C07-BRG-GPE.dwg By: floresg

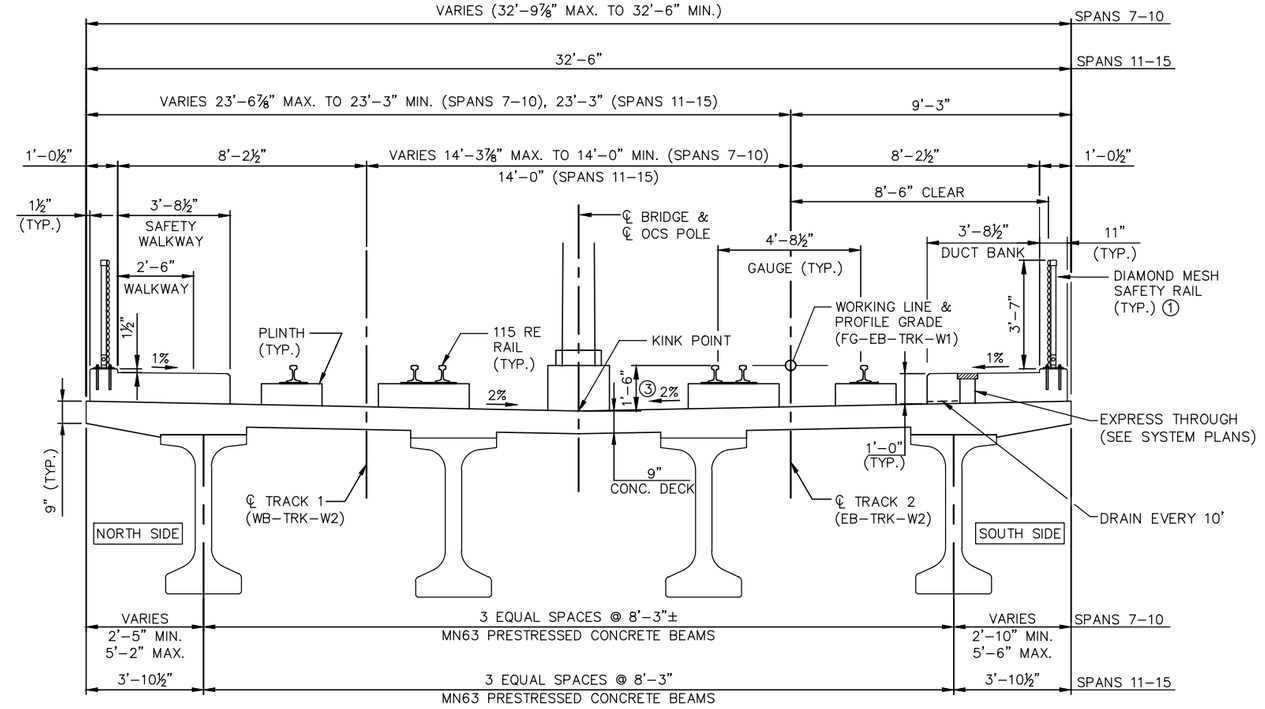
SCHEDULE OF QUANTITIES FOR ENTIRE BRIDGE

SPEC SECTION	COMPONENT ITEM SUMMARY	UNIT	QUANTITY
MNDOT 2301	BRIDGE APPROACH PANEL	EACH	
MNDOT 2401	STRUCTURAL CONCRETE (3B52)	CU YD	
MNDOT 2401	STRUCTURAL CONCRETE (1G52)	CU YD	
MNDOT 2401	STRUCTURAL CONCRETE (3Y42)	SQ FT	
MNDOT 2401	SIDEWALK CONCRETE (3F52)	SQ FT	
MNDOT 2401	REINFORCEMENT BARS	POUND	
MNDOT 2402	ELASTOMERIC BEARING PAD TYPE 1	EACH	
MNDOT 2402	EXPANSION JOINT DEVICES TYPE 5	LIN FT	
MNDOT 2402	BEARING ASSEMBLY	EACH	
MNDOT 2405	PRESTRESSED CONCRETE BEAMS MN45	LIN FT	
MNDOT 2405	PRESTRESSED CONCRETE BEAMS MN63	LIN FT	
MNDOT 2405	PRESTRESSED CONCRETE BEAMS 82 MW	LIN FT	
MNDOT 2405	DIAPHRAGMS FOR TYPE MN45 PREST BEAMS	LIN FT	
MNDOT 2405	DIAPHRAGMS FOR TYPE MN63 PREST BEAMS	LIN FT	
MNDOT 2405	DIAPHRAGMS FOR TYPE 82 MW PREST BEAMS	LIN FT	
MNDOT 2451	AGGREGATE BACKFILL (CV)	CU YD	
MNDOT 2452	C-I-P CONCRETE PILING DELIVERED 16"	LIN FT	
MNDOT 2452	C-I-P CONCRETE PILING DRIVEN 16"	LIN FT	
MNDOT 2452	C-I-P CONCRETE TEST PILE 40 FT LONG 16"	EACH	
MNDOT 2452	C-I-P CONCRETE TEST PILE 50 FT LONG 16"	EACH	
MNDOT 2452	PILE ANALYSIS	EACH	
MNDOT 2481	DAMPPROOFING	SQ FT	
MNDOT 2514	CONCRETE SLOPE PAVING	SQ YD	
MNDOT 2557	DIAMOND MESH SAFETY RAIL	LIN FT	



TRANSVERSE SECTION (SPANS 1 THRU 6)

0 1 2.5 5
SCALE IN FEET



TRANSVERSE SECTION (SPANS 7 THRU 15)

0 1 2.5 5
SCALE IN FEET

NOTES:

① 3'-6" DIAMOND MESH SAFETY RAIL. FOR DETAILS SEE SHEET 55 OF 75.

③ 1'-6" MEASURED TO TOP OF LOW RAIL.

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AV | CHECKED BY: DD
DRAWN BY: GF | DATE: 09/07/15

AECOM

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

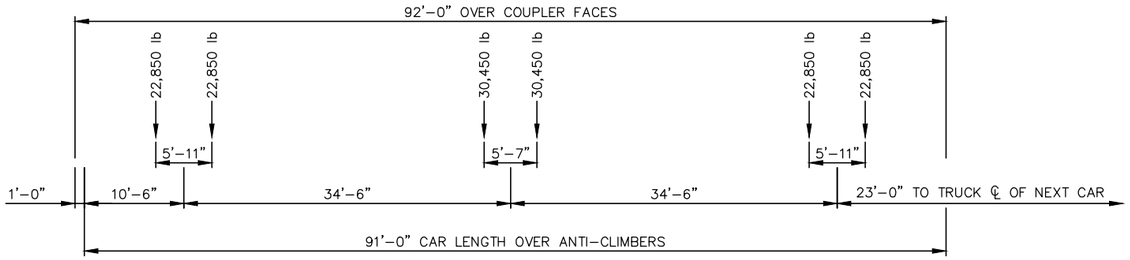
SOUTHWEST Green Line LRT Extension

CIVIL WEST - VOLUME 4B
NINE MILE CREEK
BRIDGE 27C07
TRANSVERSE SECTION & QUANTITIES

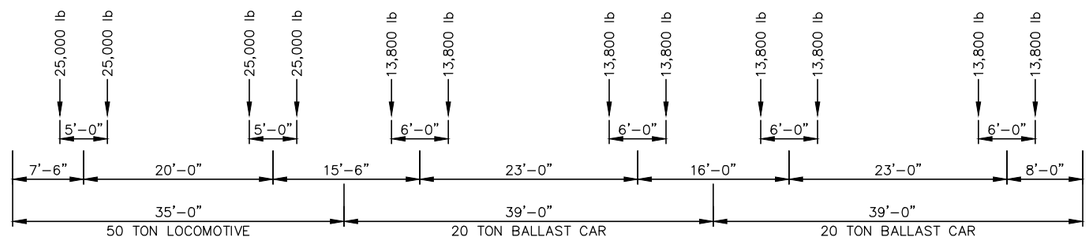
DISCIPLINE: STRUCTURES
SHEET NAME: CBR27C07-BRG-GPE-005

SHEET 6 OF 75

Sep. 18 2015 04:26 pm P:\60336960\3400_ADC\CAD\SEGMENT W2\PLAN SHEETS\STRUCTURES\CBR27C07\CBR27C07-BRG-GPE-005.dwg By: floresg



LIGHT RAIL VEHICLE LOADING DIAGRAM



MAINTENANCE TRAIN 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.

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. WEIGHT OF EMPTY BALLAST CAR IS 15,000 POUNDS.

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AV | CHECKED BY: DD
DRAWN BY: GF | DATE: 09/07/15

AECOM

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

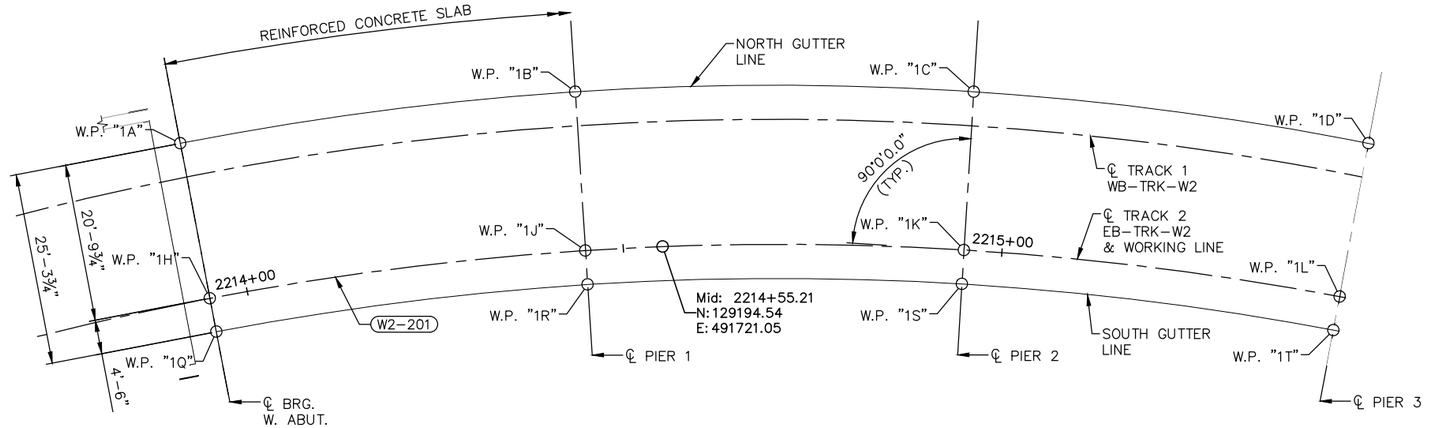
SOUTHWEST Green Line LRT Extension

CIVIL WEST - VOLUME 4B
NINE MILE CREEK
BRIDGE 27C07
TRANSVERSE SECTION & LOADING DIAGRAM

DISCIPLINE: STRUCTURES
SHEET NAME: CBR27C07-BRG-GPE-006

SHEET 7 OF 75

CURVE NO. W2–201
R = 400.00'
Lc = 327.04'
Ls = 120.00'
Ea = 3.50"
Eu = 2.69"
V = 25 MPH



WORKING POINT LAYOUT

Sep. 18 2015 04:27 pm P:\60336960\3400_ADC\CAD\SEGMENT W2\PLAN SHEETS\STRUCTURES\CBR27C07\CBR27C07-BRG-SUP-007.dwg By: floresg

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AV | CHECKED BY: DD
DRAWN BY: GF | DATE: 09/07/15

AECOM

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

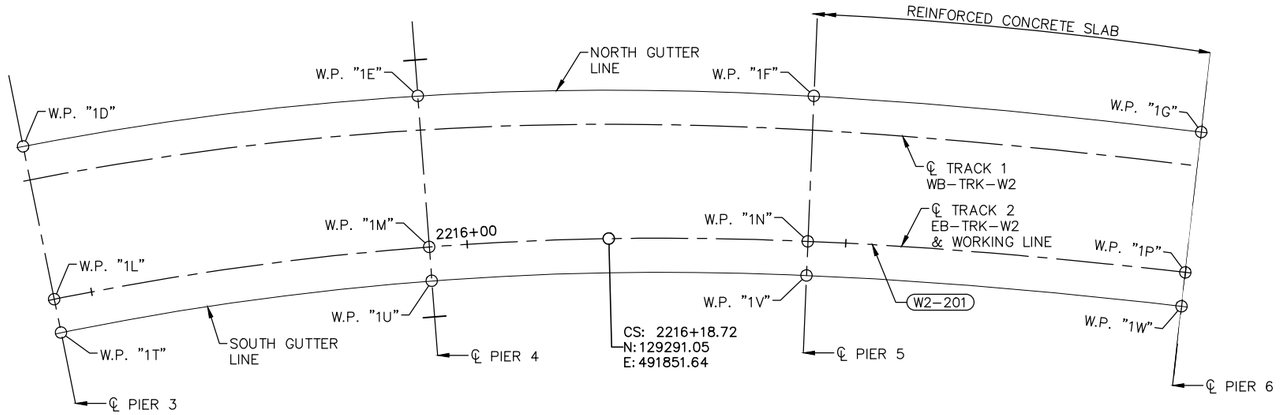
SOUTHWEST Green Line LRT Extension

CIVIL WEST - VOLUME 4B
NINE MILE CREEK
BRIDGE 27C07
BRIDGE LAYOUT 1

DISCIPLINE: STRUCTURES
SHEET NAME: CBR27C07-BRG-SUP-007

SHEET 8 OF 75

CURVE NO. W2–201
R = 400.00'
Lc = 327.04'
Ls = 120.00'
Ea = 3.50"
Eu = 2.69"
V = 25 MPH



WORKING POINT LAYOUT

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AV | CHECKED BY: DD
DRAWN BY: GF | DATE: 09/07/15

AECOM

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

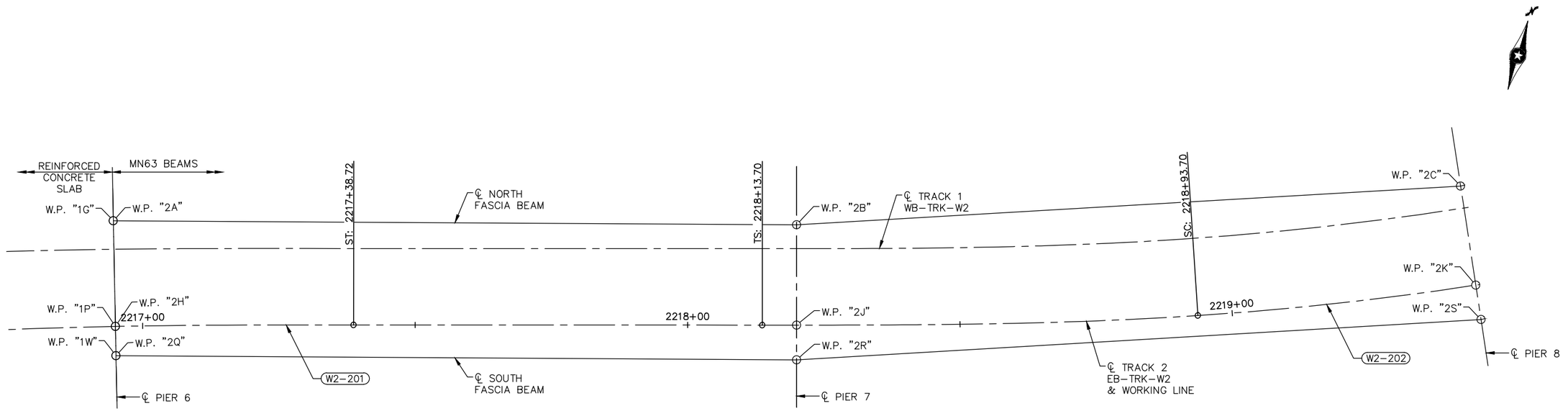
SOUTHWEST Green Line LRT Extension

CIVIL WEST - VOLUME 4B
NINE MILE CREEK
BRIDGE 27C07
BRIDGE LAYOUT 2

DISCIPLINE: STRUCTURES
SHEET NAME: CBR27C07-BRG-SUP-008

SHEET 9 OF 75

Sep, 18 2015 04:28 pm P:\60336960\3400_ADC\CAD\SEGMENT W2\PLAN SHEETS\STRUCTURES\CBR27C07\CBR27C07-BRG-SUP-008.dwg By: floresg



WORKING POINT LAYOUT

CURVE NO. W2–201
R = 400.00'
Lc = 327.04'
Ls = 120.00'
Ea = 3.50"
Eu = 2.69"
V = 25 MPH

CURVE NO. W2–202
R = 600.00'
Lc = 175.99'
Ls = 80.00'
Ea = 2.25"
Eu = 1.88"
V = 25 MPH

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AV | CHECKED BY: DD
DRAWN BY: GF | DATE: 09/07/15

AECOM

60% SUBMISSION - 09/28/15

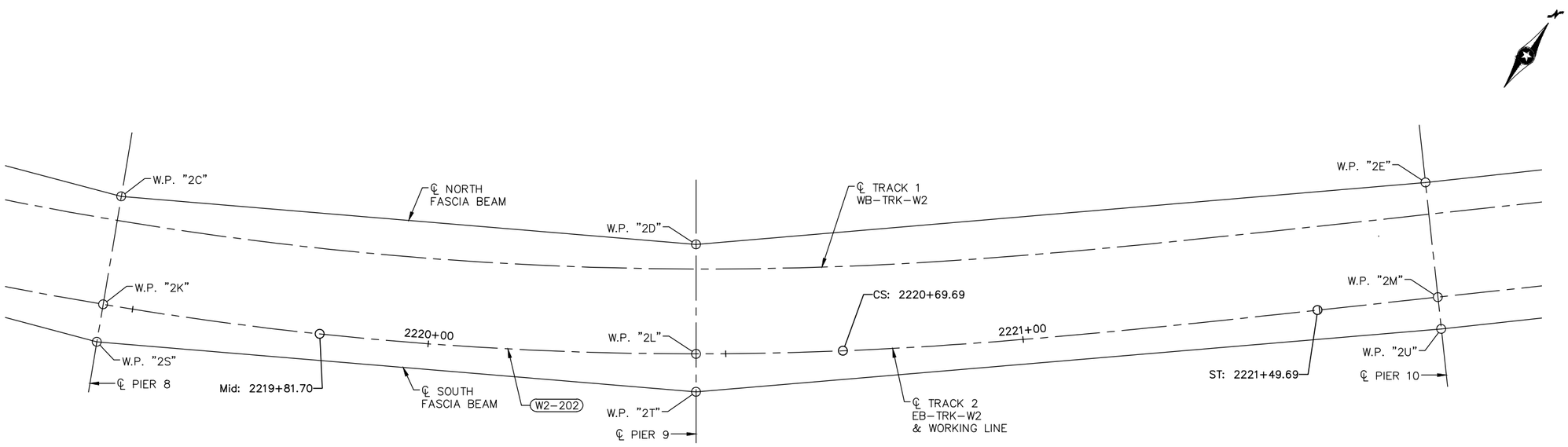
METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

CIVIL WEST - VOLUME 4B
NINE MILE CREEK
BRIDGE 27C07
BRIDGE LAYOUT 3

DISCIPLINE: STRUCTURES
SHEET NAME: CBR27C07-BRG-SUP-009

SHEET 10 OF 75



WORKING POINT LAYOUT

CURVE NO. W2–202
R = 600.00'
Lc = 175.99'
Ls = 80.00'
Ea = 2.25"
Eu = 1.88"
V = 25 MPH

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AV | CHECKED BY: DD
DRAWN BY: GF | DATE: 09/07/15

AECOM

60% SUBMISSION - 09/28/15

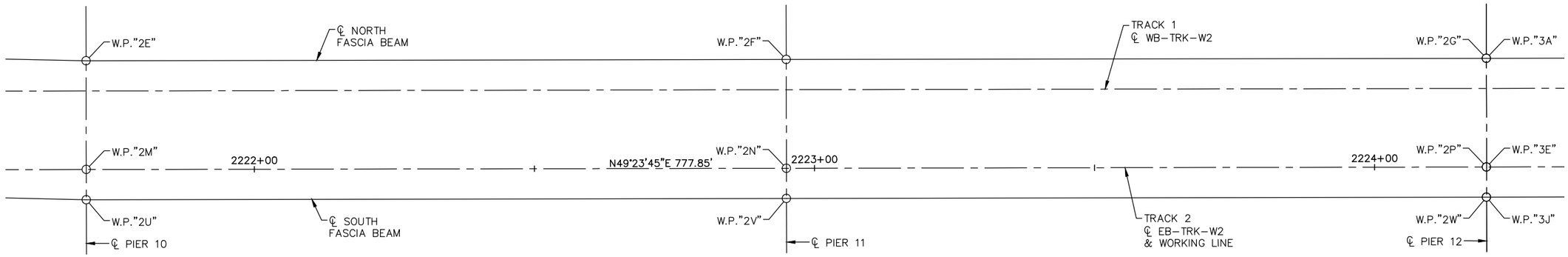
METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

CIVIL WEST - VOLUME 4B
NINE MILE CREEK
BRIDGE 27C07
BRIDGE LAYOUT 4

DISCIPLINE: STRUCTURES
SHEET NAME: CBR27C07-BRG-SUP-010

SHEET 11 OF 75



WORKING POINT LAYOUT

Sep, 18 2015 04:28 pm P:\60336960\3400_ADC\CAD\SEGMENT W2\PLAN SHEETS\STRUCTURES\CBR27C07\CBR27C07-BRG-SUP-011.dwg By: floresg

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AV | CHECKED BY: DD
DRAWN BY: GF | DATE: 09/07/15

AECOM

60% SUBMISSION - 09/28/15

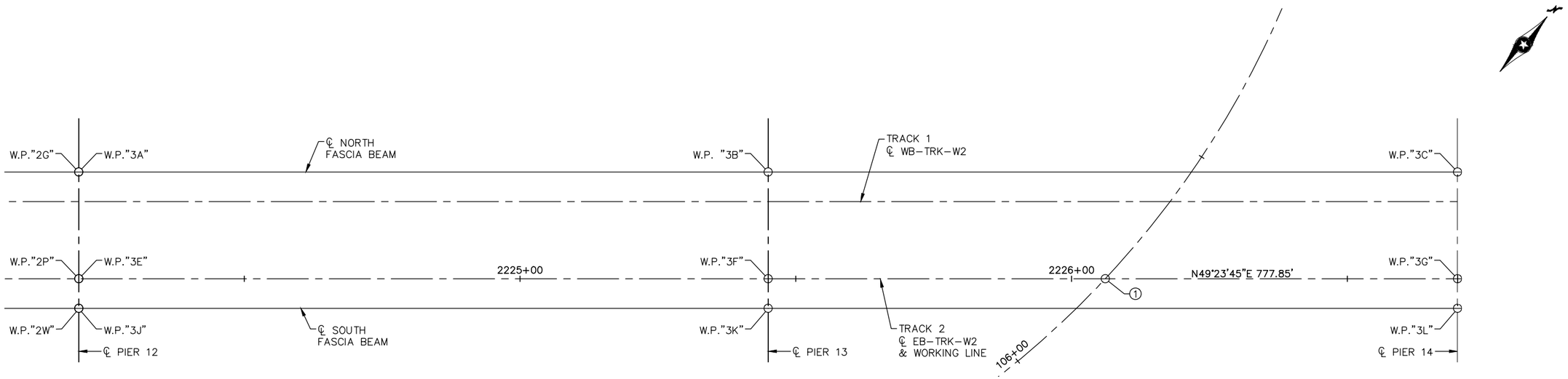
METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

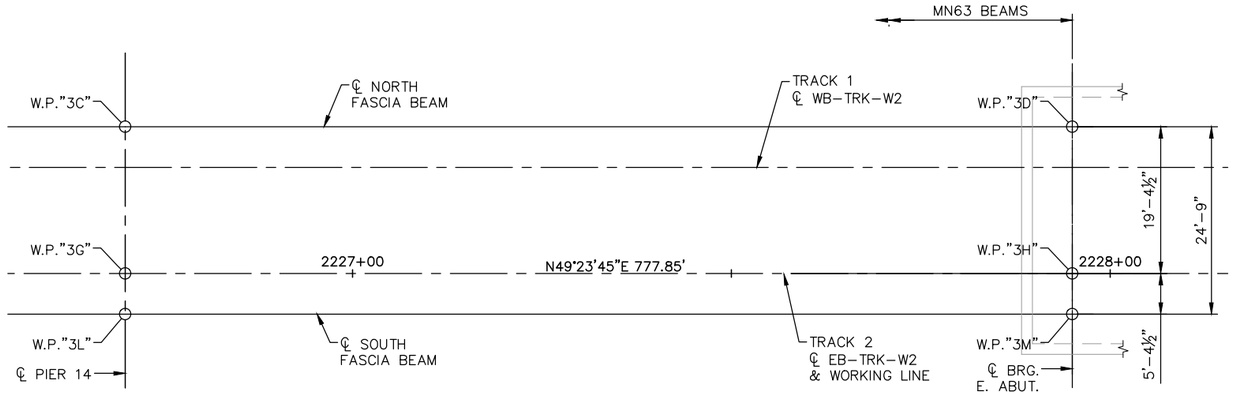
CIVIL WEST - VOLUME 4B
NINE MILE CREEK
BRIDGE 27C07
BRIDGE LAYOUT 5

DISCIPLINE: STRUCTURES
SHEET NAME: CBR27C07-BRG-SUP-011

SHEET 12 OF 75



1 CONTROL POINT
℄ FLYING CLOUD DRIVE (FLYING CLOUD DRIVE)
POC STA. 106+21.79
℄ TRACK 2 (EB–TRK–WS) POT STA. 2226+06.11
X: 492675.974
Y: 129806.054
ANGLE: 46°54'59" TTC



WORKING POINT LAYOUT

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AV | CHECKED BY: DD
DRAWN BY: GF | DATE: 09/07/15

AECOM

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

CIVIL WEST - VOLUME 4B
NINE MILE CREEK
BRIDGE 27C07
BRIDGE LAYOUT 6

DISCIPLINE: STRUCTURES
SHEET NAME: CBR27C07-BRG-SUP-012

SHEET 13 OF 75

Sep. 18 2015 04:29 pm P:\60336960\3400_ADC\CAD\SEGMENT W2\PLAN SHEETS\STRUCTURES\CBR27C07\CBR27C07-BRG-SUP-012.dwg By: floresg

	DIMENSIONS BETWEEN WORKING POINTS (FT.)																										
POINT	STATION	X-COORDINATE	Y-COORDINATE	1A	1B	1C	1D	1E	1F	1G	1H	1J	1K	1L	1M	1N	1P	1Q	1R	1S	1T	1U	1V	1W	TOP OF DECK	TOP OF DECK TO BR. SEAT	BRIDGE SEAT	POINT
1A	2213+95.00	491666.999	129158.230		52.58						20.82	55.32	104.40						56.90	104.83					871.58	2.75	868.83	1A
1B	2214+45.00	491698.332	129200.455			52.59					55.40	21.01	55.40	104.46				57.00		57.00	104.90				871.34	2.49	868.85	1B
1C	2214+95.00	491734.881	129238.264				52.56				104.43	55.37	20.93	55.37	104.43			104.87	56.96		56.96	104.87			871.26	2.49	868.77	1C
1D	2215+45.00	491776.006	129270.996					52.50				104.32	55.22	20.58	55.22	104.32			104.74	56.79		56.79	104.77		871.47	2.76	868.71	1D
1E	2215+95.00	491820.977	129298.094						52.28				104.13	54.96	19.97	54.94	103.94			104.53	56.49		56.49	104.54	871.98	2.48	869.50	1E
1F	2216+45.00	491868.818	129319.185							51.35				103.78	54.53	19.19	54.26				104.15	56.02		55.88	872.79	2.48	870.31	1F
1G	2216+95.00	491917.514	129335.474												103.02	53.90	18.64					103.44	55.45		873.72	2.75	870.97	1G
1H	2213+95.00	491684.418	129146.831									49.97						4.50	49.89	99.28					871.58	2.75	868.83	1H
1J	2214+45.00	491714.337	129186.851										49.97					49.89	4.50	49.89	99.28				871.34	2.49	868.85	1J
1K	2214+95.00	491749.012	129222.829											49.97				99.28	49.89	4.50	49.89	99.28			871.26	2.49	868.77	1K
1L	2215+45.00	491787.902	129254.203												49.97				99.28	49.89	4.50	49.89	99.32		871.47	2.76	868.71	1L
1M	2215+95.00	491830.400	129280.483													49.97				99.28	49.89	4.50	49.92	99.59	871.98	2.48	869.50	1M
1N	2216+45.00	491875.820	129301.318														49.99				99.29	49.90	4.50	50.05	872.79	2.48	870.31	1N
1P	2216+95.00	491923.056	129317.677																			99.45	50.01	4.50	873.72	2.75	870.97	1P
1Q	2213+95.00	491688.184	129144.367																49.41						871.58	2.75	868.83	1Q
1R	2214+45.00	491717.766	129183.937																	49.41					871.34	2.49	868.85	1R
1S	2214+95.00	491752.051	129219.510																		49.41				871.26	2.49	868.77	1S
1T	2215+45.00	491790.504	129250.531																			49.41			871.47	2.76	868.71	1T
1U	2215+95.00	491832.524	129276.515																				49.44		871.98	2.48	869.50	1U
1V	2216+45.00	491877.462	129297.129																					49.67	872.79	2.48	870.31	1V
1W	2216+95.00	491924.395	129313.381																						873.72	2.75	870.97	1W

	DIMENSIONS BETWEEN WORKING POINTS (FT.)																										
POINT	STATION	X-COORDINATE	Y-COORDINATE	2A	2B	2C	2D	2E	2F	2G	2H	2J	2K	2L	2M	2N	2P	2Q	2R	2S	2T	2U	2V	2W	TOP OF DECK	TOP OF DECK TO BR. SEAT	BRIDGE SEAT	POINT
2A	2216+95.00	491917.295	129336.176		125.38						19.37	126.83	250.30						127.94	251.64					873.83	6.60	867.23	2A
2B	2219+20.00	492037.914	129370.391			122.07					126.38	18.375	125.13					127.18		126.80	223.86				876.20	6.44	869.76	2B
2C	2219+45.00	492152.971	129411.186				96.83				248.20	124.50	18.37	100.04	221.70			248.71	125.96		101.91	222.75			878.55	6.60	871.94	2C
2D	2220+45.00	492237.117	129459.088					122.92				221.31	100.04	18.38	124.88	248.88			222.78	101.91		125.95	249.42		880.43	6.44	873.99	2D
2E	2221+70.00	492332.256	129536.927						125.00				222.96	125.82	19.37	126.49	250.75			224.68	127.43		127.43	251.22	882.00	6.60	875.40	2E
2F	2222+95.00	492427.159	129618.281							125.00				250.35	126.49	19.37	126.49				251.50	127.43		127.43	881.97	6.44	875.53	2F
2G	2224+20.00	492522.062	129699.634												250.75	126.49	19.37					251.22	127.43		880.56	6.71	873.85	2G
2H	2216+95.00	491923.056	129317.677									125.00						5.37	125.15	250.61					873.72	6.60	867.12	2H
2J	2218+20.00	492043.036	129352.744										124.86					125.02	6.38	125.61	225.12				876.07	6.44	869.63	2J
2K	2219+45.00	492160.701	129394.516											99.88				249.87	125.40	6.38	100.62				878.42	6.60	871.82	2K
2L	2220+45.00	492247.505	129443.931												124.93				224.84	100.62	6.37	125.21	250.04		880.30	6.44	873.86	2L
2M	2221+70.00	492344.866	129522.217													125.00				225.29	125.58	5.38	125.12	250.06	881.89	6.60	875.29	2M
2N	2222+95.00	492439.769	129603.571														125.00				250.57	125.12	5.38	125.12	881.86	6.44	875.42	2N
2P	2224+20.00	492534.671	129684.925																			250.06	125.12	5.37	880.45	6.71	873.74	2P
2Q	2216+95.00	491924.655	129312.546																124.90						873.83	6.60	867.23	2Q
2R	2218+20.00	492044.812	129346.622																	125.83					876.20	6.44	869.76	2R
2S	2219+45.00	492163.383	129388.732																		100.95				878.55	6.60	871.94	2S
2T	2220+45.00	492251.110	129438.673																			125.59			880.43	6.44	873.99	2T
2U	2221+70.00	492348.364	129518.136																				125.00		882.00	6.60	875.40	2U
2V	2222+95.00	492443.267	129599.490																					125.00	881.97	6.44	875.53	2V
2W	2224+20.00	492538.170	129680.847																						880.56	6.71	873.85	2W

TOP OF DECK TO BRIDGE SEAT				
	SLAB THICKNESS	STOOL HEIGHT	BEARING HEIGHT	TOTAL HEIGHT
WEST ABUTMENT	2.25	0.42	0.083	2.75
PIER 1	2.25	0.17	0.063	2.49
PIER 2	2.25	0.17	0.063	2.49
PIER 3	2.25	0.43	0.083	2.76
PIER 4	2.25	0.17	0.063	2.48
PIER 5	2.25	0.16	0.063	2.48
PIER 6 W	2.25	0.42	0.083	2.75

TOP OF DECK TO BRIDGE SEAT					
	DECK THICKNESS (ft.)	FILLET (ft.)	BEAM HEIGHT (ft.)	BEARING HEIGHT (ft.)	TOTAL (ft.)
PIER 6 E	0.75	0.167	5.25	0.44	6.60
PIER 7	0.75	0.167	5.25	0.27	6.44
PIER 8 W	0.75	0.167	5.25	0.44	6.60
PIER 8 E	0.75	0.167	5.25	0.39	6.55
PIER 9	0.75	0.167	5.25	0.27	6.44
PIER 10 W	0.75	0.167	5.25	0.44	6.60
PIER 10 E	0.75	0.167	5.25	0.44	6.60
PIER 11	0.75	0.167	5.25	0.27	6.44
PIER 12 W	0.75	0.167	5.25	0.44	6.60
PIER 12 E	0.75	0.167	5.25	0.54	6.71

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AV | CHECKED BY: DD
DRAWN BY: GF | DATE: 09/07/15

AECOM

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

CIVIL WEST - VOLUME 4B
NINE MILE CREEK
BRIDGE 27C07
BRIDGE LAYOUT 7

DISCIPLINE: STRUCTURES

SHEET NAME: CBR27C07-BRG-SUP-013

SHEET 14 OF 75

	DIMENSIONS BETWEEN WORKING POINTS (FT.)																		
POINT	STATION	X-COORDINATE	Y-COORDINATE	3A	3B	3C	3D	3E	3F	3G	3H	3J	3K	3L	3M	TOP OF DECK	TOP OF DECK TO BR. SEAT	BRIDGE SEAT	POINT
3A	2224+20.00	492522.062	129699.634		125.00			19.37	126.49		375.50	24.75	127.43			880.56	6.71	873.85	3A
3B	2225+45.00	492616.965	129780.988			125.00			19.37	126.49	250.75	127.43	24.75	127.43	251.22	878.99	6.44	872.55	3B
3C	2226+70.00	492711.867	129862.342				125.00			19.37	126.49	251.22	127.43	24.75	127.43	877.42	6.44	870.99	3C
3D	2227+95.00	492806.770	129943.696								19.37	375.82	251.22	127.43	24.75	875.86	6.71	869.15	3D
3E	2224+20.00	492534.671	129684.925						125.00			5.38	125.12	250.06	375.04	880.45	6.71	873.74	3E
3F	2225+45.00	492629.574	129766.278							125.00			5.38	125.12	250.06	878.88	6.44	872.45	3F
3G	2226+70.00	492724.477	129847.632								125.00			5.38	125.12	877.32	6.44	870.88	3G
3H	2227+95.00	492819.380	129928.986												5.38	875.75	6.71	869.04	3H
3J	2224+20.00	492538.170	129680.844										125.00			880.56	6.71	873.85	3J
3K	2225+45.00	492633.073	129762.197											125.00		878.99	6.44	872.55	3K
3L	2226+70.00	492727.975	129843.551												125.00	877.42	6.44	870.99	3L
3M	2227+95.00	492822.878	129924.905													875.86	6.71	869.15	3M

TOP OF ROADWAY TO BRIDGE SEAT					
	DECK THICKNESS (ft.)	FILLET (ft.)	BEAM HEIGHT (ft.)	BEARING HEIGHT (ft.)	TOTAL (ft.)
PIER 12 W	0.75	0.167	5.25	0.44	6.60
PIER 12 E	0.75	0.167	5.25	0.54	6.71
PIER 13	0.75	0.167	5.25	0.27	6.44
PIER 14	0.75	0.167	5.25	0.27	6.44
EAST ABUTMENT	0.75	0.167	5.25	0.54	6.71

Sep, 18 2015 04:29 pm P:\60336960\3400_ADC\CAD\SEGMENT W2\PLAN SHEETS\STRUCTURES\CBR27C07\CBR27C07-BRG-SUP-014.dwg By: floresg

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AV | CHECKED BY: DD
DRAWN BY: GF | DATE: 09/07/15

AECOM

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

CIVIL WEST - VOLUME 4B
NINE MILE CREEK
BRIDGE 27C07
BRIDGE LAYOUT 8

DISCIPLINE: STRUCTURES

SHEET NAME: CBR27C07-BRG-SUP-014

SHEET 15 OF 75

WEST ABUTMENT REQUIRED NOMINAL PILE BEARING RESISTANCE R_n – TONS/PILE		
FIELD CONTROL METHOD	φ_{dyn}	$*\ R_n$
MN/DOT NOMINAL RESISTANCE FORMULA	0.40	149.0
PDA	0.65	91.7

$*\ R_n$ = (FACTORED DESIGN LOAD) / φ_{dyn}

WEST ABUTMENT COMPUTED PILE LOAD – TONS/PILE	
FACTORED DEAD LOAD + EARTH PRESSURE	41.1
FACTORED LIVE LOAD	9.4
* FACTORED DESIGN LOAD	59.6

* BASED ON STRENGTH V LOAD COMBINATION

PILE NOTES:

2 CAST-IN-PLACE CONC. TEST PILE XX FT. LONG
14 CAST-IN-PLACE CONC. PILES EST. LENGTH X FT.
16 CAST-IN-PLACE CONC. PILES REQ'D FOR WEST ABUT.

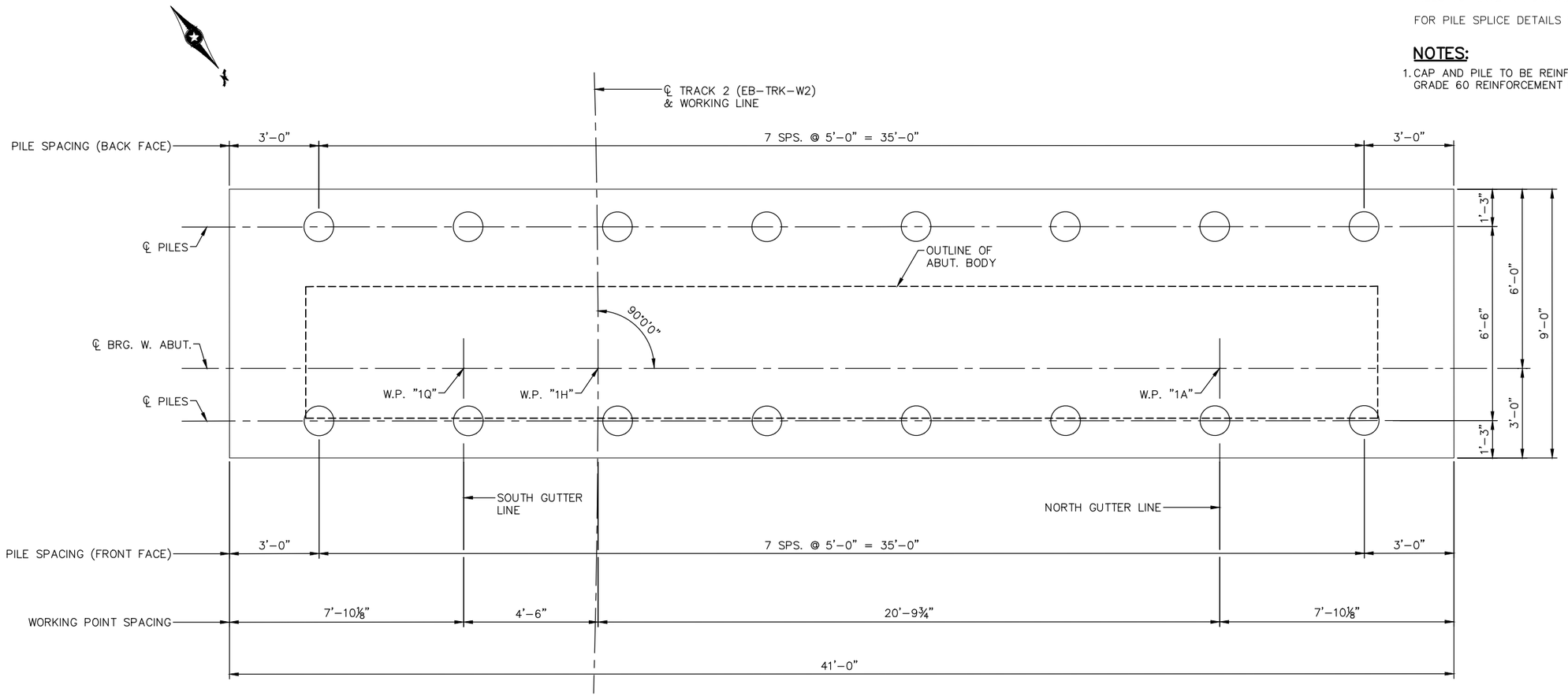
PILE SPACING SHOWN IS AT BOTTOM OF FOOTING.

PILES TO HAVE A NOMINAL DIAMETER OF 12".

FOR PILE SPLICE DETAILS SEE DETAIL B201.

NOTES:

1. CAP AND PILE TO BE REINFORCED WITH GRADE 60 REINFORCEMENT BARS.



FOOTING PLAN

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AV | CHECKED BY: DD
DRAWN BY: GF | DATE: 09/07/15

AECOM

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

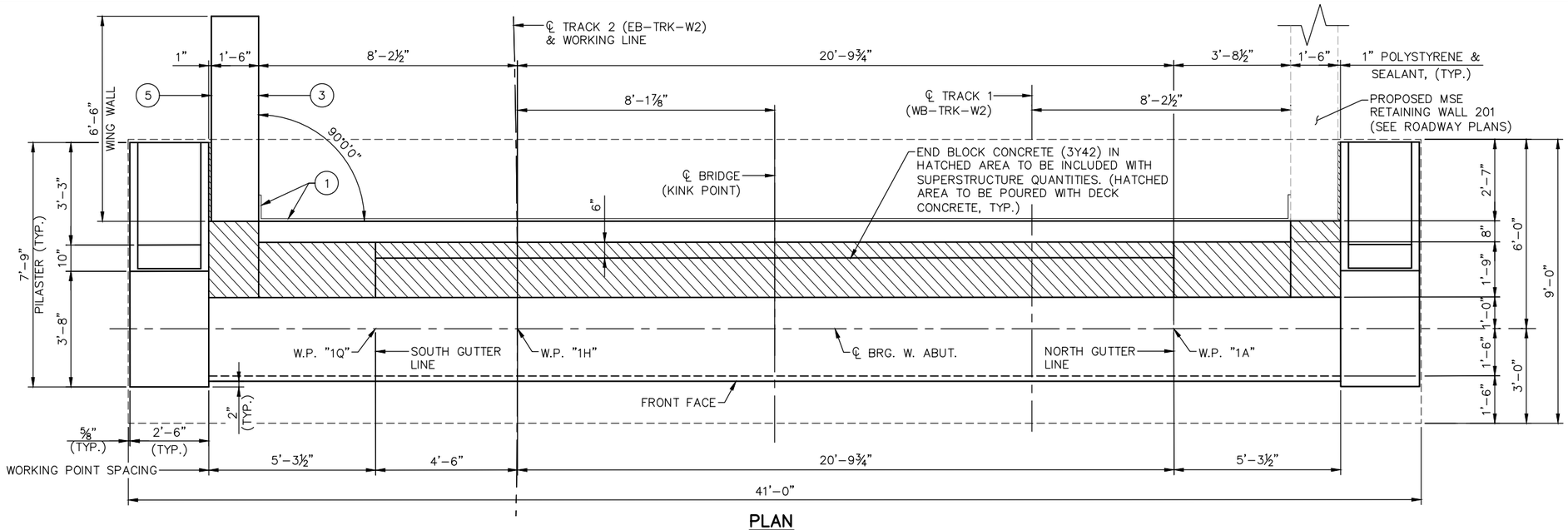
SOUTHWEST Green Line LRT Extension

CIVIL WEST - VOLUME 4B
NINE MILE CREEK
BRIDGE 27C07
WEST ABUTMENT FOOTING DETAILS

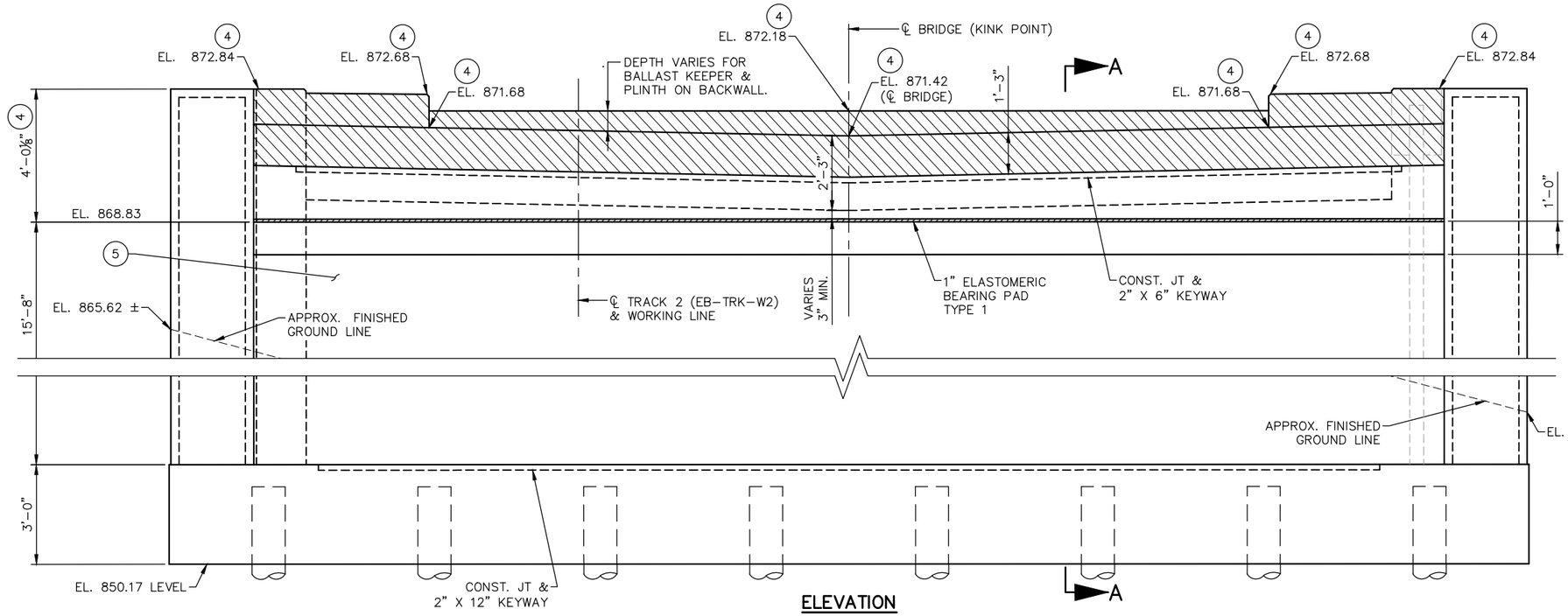
DISCIPLINE: STRUCTURES
SHEET NAME: CBR27C07-BRG-ABT-001

SHEET 16 OF 75

Sep. 21 2015 09:16 am P:\60336960\3400_ADC\CAD\SEGMENT W2\PLAN SHEETS\STRUCTURES\CBR27C07\CBR27C07-BRG-ABT-001.dwg By: floresg



PLAN



ELEVATION

NOTES:

1. MEMBRANE WATERPROOFING SYSTEM PER MN/DOT 2184.3B TO BE INCLUDED IN PRICE BID FOR OTHER ITEMS. (SEAL ALL HORIZONTAL & VERTICAL JOINTS ON THE BACK FACE).
3. THERE SHALL BE A 72 HOUR MINIMUM DELAY BETWEEN CONCRETE POURS OF ADJACENT ABUTMENT SECTIONS THAT HAVE VERTICAL CONSTRUCTION JOINTS.
4. ELEVATIONS & DIMENSIONS ARE GIVEN AT THE FRONT FACE OF ABUTMENT BACKWALL.
5. SPECIAL SURFACE FINISH SHALL BE APPLIED TO THE ABUTMENT BODY AND WINGS. COLOR SHALL BE FEDERAL STANDARD COLOR XXXX, COLOR XXXXX. SEE SPEC. SB 2401.
6. FOR WINGWALL DETAILS, SEE SHEET 18 OF 75.
7. FOR SECTION A–A, SEE SHEET 19 OF 75.

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AV | CHECKED BY: DD
DRAWN BY: GF | DATE: 09/07/15

AECOM

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

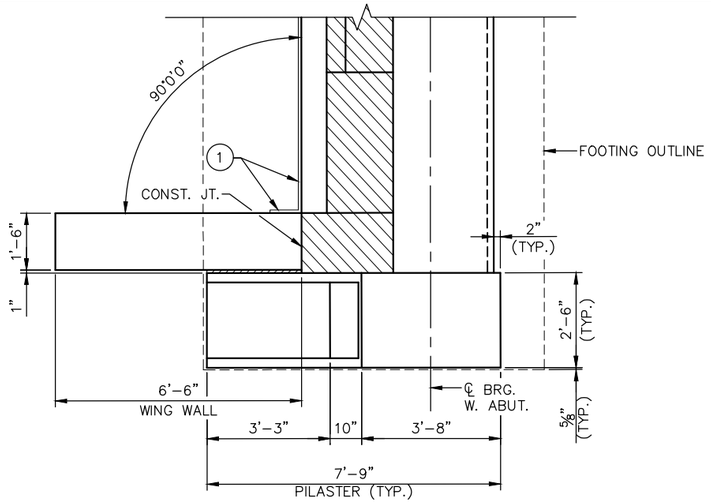
CIVIL WEST - VOLUME 4B
NINE MILE CREEK
BRIDGE 27C07
WEST ABUTMENT DETAILS 1

DISCIPLINE: STRUCTURES

SHEET NAME: CBR27C07-BRG-ABT-002

SHEET 17 OF 75

Sep. 18 2015 04:30 pm P:\60336960\3400_ADC\CAD\SEGMENT W2\PLAN SHEETS\STRUCTURES\CBR27C07\CBR27C07-BRG-ABT-002.dwg By: floresg

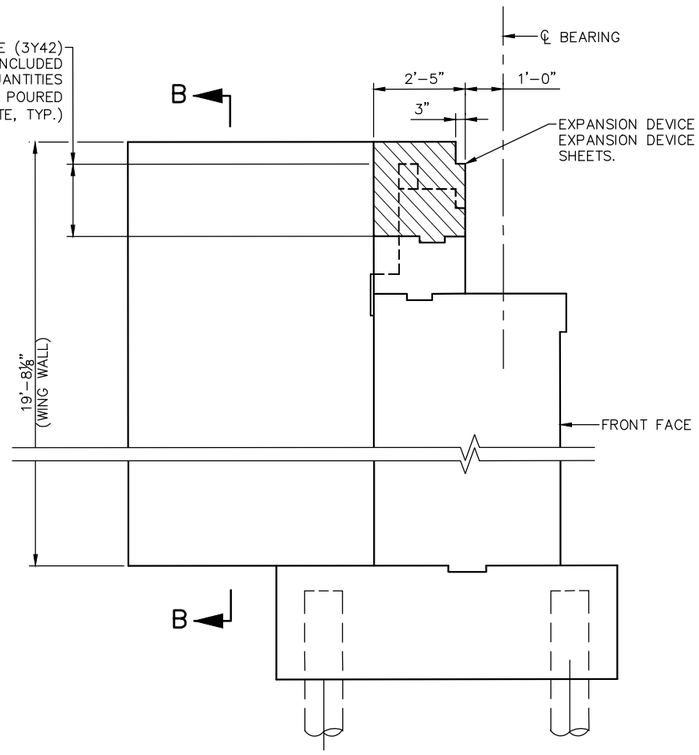


SOUTH WINGWALL PLAN

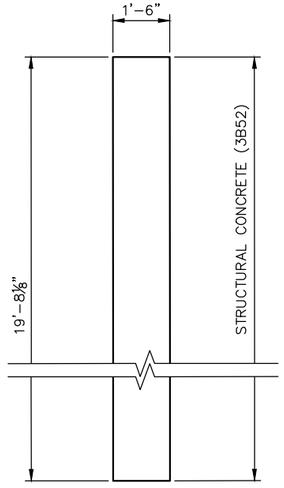
NOTES:

(1) MEMBRANE WATERPROOFING SYSTEM PER MN/DOT 2184.3B TO BE INCLUDED IN PRICE BID FOR OTHER ITEMS. (SEAL ALL HORIZONTAL & VERTICAL JOINTS ON THE BACK FACE).

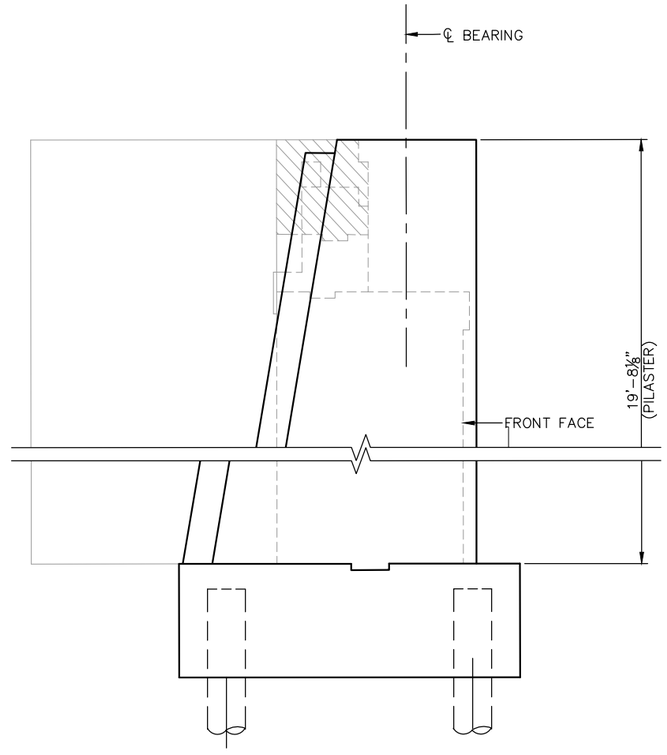
(5) SPECIAL SURFACE FINISH SHALL BE APPLIED TO THE ABUTMENT BODY AND WINGS. COLOR SHALL BE FEDERAL STANDARD COLOR XXXX, COLOR XXXXX. SEE SPEC. SB 2401.



SOUTH WINGWALL ELEVATION



SECTION B–B



PILASTER ELEVATION
(SOUTH PILASTER SHOWN, NORTH PILASTER SIMILAR)

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AV | CHECKED BY: DD
DRAWN BY: GF | DATE: 09/07/15

AECOM

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

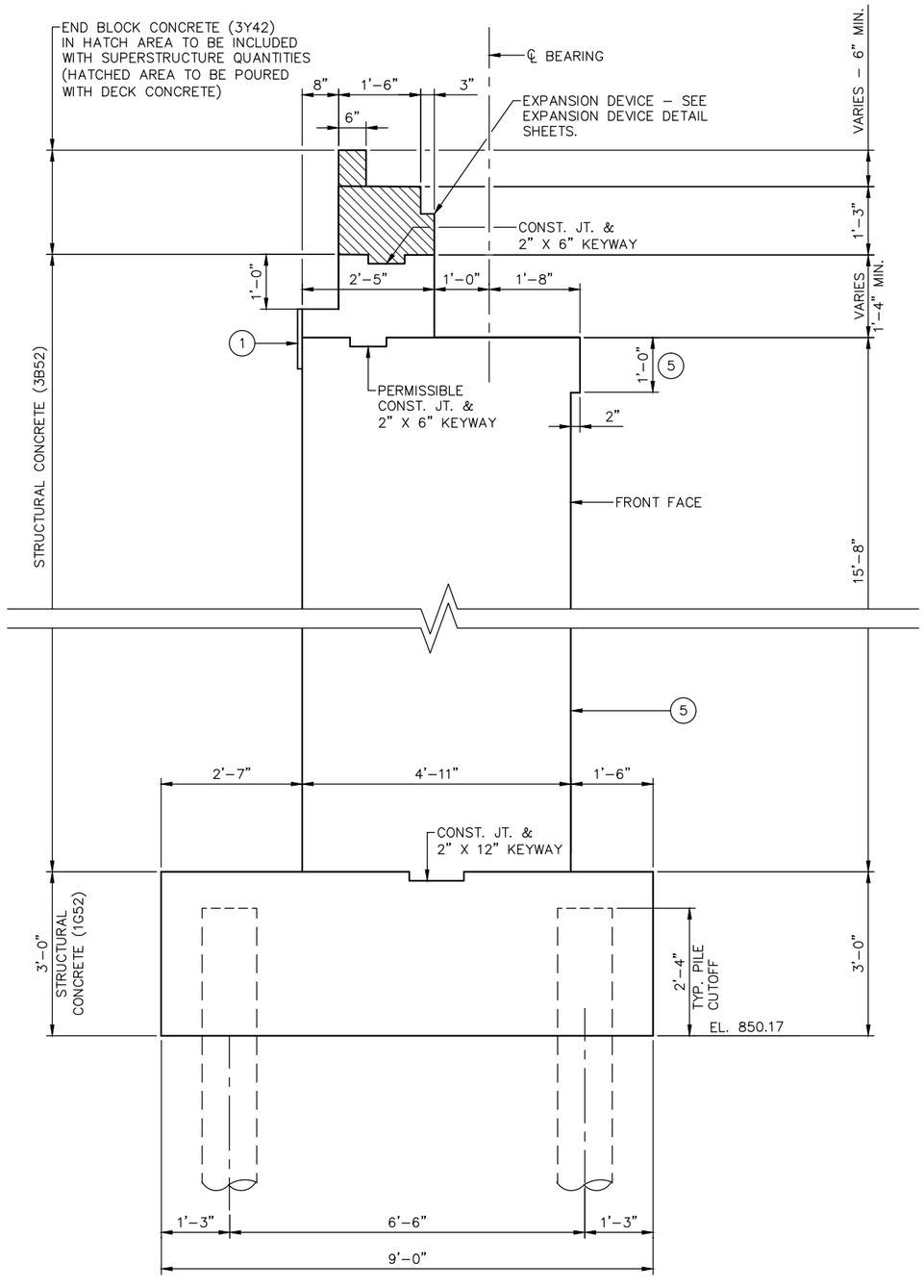
SOUTHWEST Green Line LRT Extension

CIVIL WEST - VOLUME 4B
NINE MILE CREEK
BRIDGE 27C07
WEST ABUTMENT DETAILS 2

DISCIPLINE: STRUCTURES
SHEET NAME: CBR27C07-BRG-ABT-003

SHEET 18 OF 75

Sep, 18 2015 04:30 pm P:\60336960\3400_ADC\CAD\SEGMENT W2\PLAN SHEETS\STRUCTURES\CBR27C07\CBR27C07-BRG-ABT-003.dwg By: floresg



SECTION A–A

NOTES:

(1) MEMBRANE WATERPROOFING SYSTEM PER MN/DOT 2184.3B TO BE INCLUDED IN PRICE BID FOR OTHER ITEMS. (SEAL ALL HORIZONTAL & VERTICAL JOINTS ON THE BACK FACE).

(5) SPECIAL SURFACE FINISH SHALL BE APPLIED TO THE ABUTMENT BODY AND WINGS. COLOR SHALL BE FEDERAL STANDARD COLOR XXXX, COLOR XXXXX. SEE SPEC. SB 2401.

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AV | CHECKED BY: DD
DRAWN BY: GF | DATE: 09/07/15

AECOM

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

CIVIL WEST - VOLUME 4B
NINE MILE CREEK
BRIDGE 27C07
WEST ABUTMENT DETAILS 3

DISCIPLINE: STRUCTURES
SHEET NAME: CBR27C07-BRG-ABT-004

SHEET 19 OF 75

Sep, 18 2015 04:30 pm P:\60336960\3400_ADC\CAD\SEGMENT W2\PLAN SHEETS\STRUCTURES\CBR27C07\CBR27C07-BRG-ABT-004.dwg By: floresg

EAST ABUTMENT REQUIRED NOMINAL PILE BEARING RESISTANCE R_n – TONS/PILE		
FIELD CONTROL METHOD	φ_{dyn}	$* R_n$
MN/DOT NOMINAL RESISTANCE FORMULA	0.40	255.5
PDA	0.65	157.4

$* R_n$ = (FACTORED DESIGN LOAD) / φ_{dyn}

EAST ABUTMENT COMPUTED PILE LOAD – TONS/PILE	
FACTORED DEAD LOAD + EARTH PRESSURE	67.8
FACTORED LIVE LOAD	31.2
* FACTORED DESIGN LOAD	102.3

* BASED ON EXTREME EVENT III LOAD COMBINATION

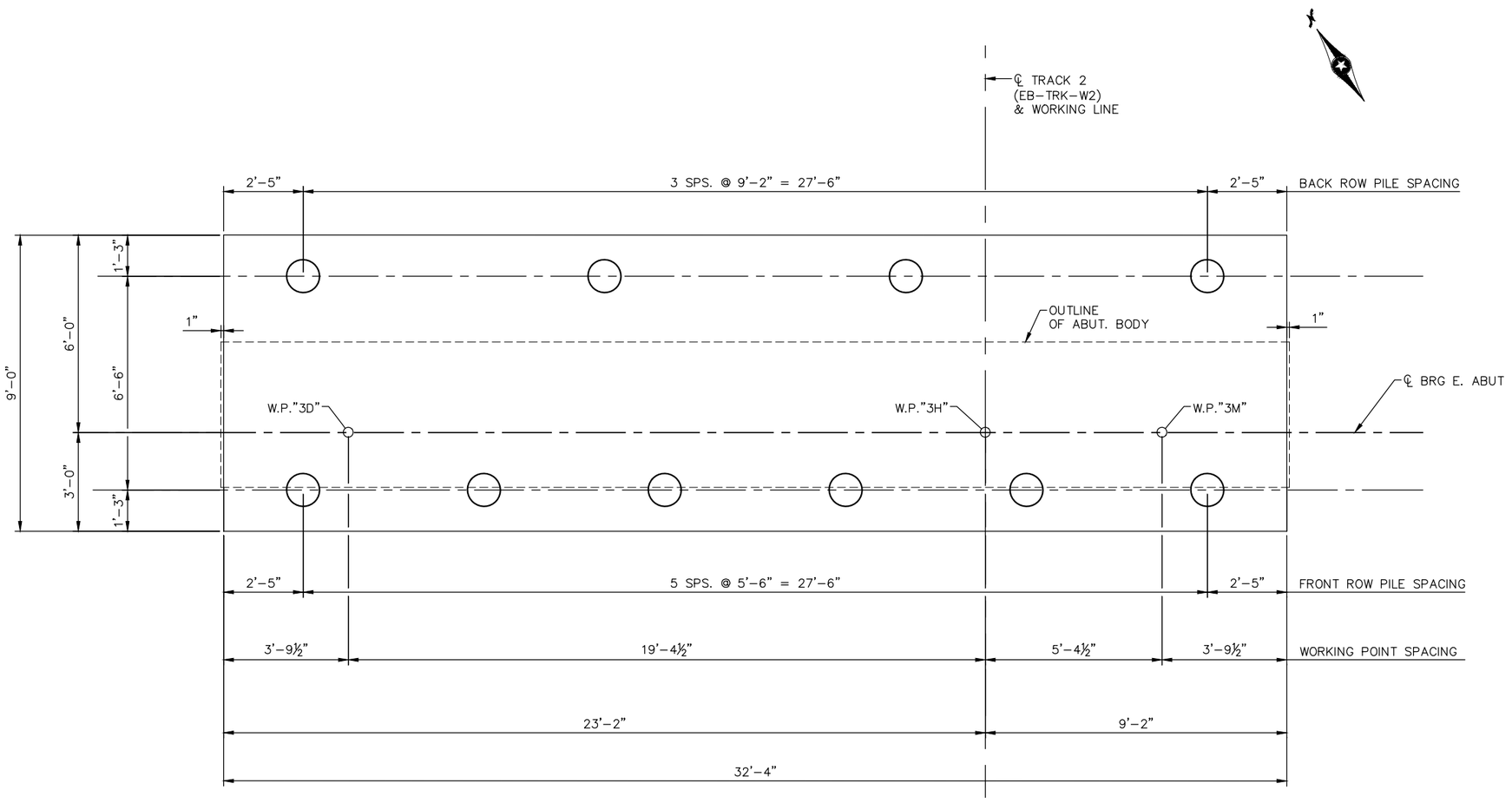
PILE NOTES

2 CAST–IN–PLACE CONC. TEST PILE XX FT. LONG
8 CAST–IN–PLACE CONC. PILES EST. LENGTH XX FT.
10 CAST–IN–PLACE CONC. PILES REQ'D FOR EAST ABUT.

PILE SPACING SHOWN IS AT BOTTOM OF FOOTING.

PILES TO HAVE A NOMINAL DIAMETER OF 12".

FOR PILE SPLICE DETAILS SEE DETAIL B201.



FOOTING PLAN

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AV | CHECKED BY: DD
DRAWN BY: GF | DATE: 09/07/15

AECOM

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

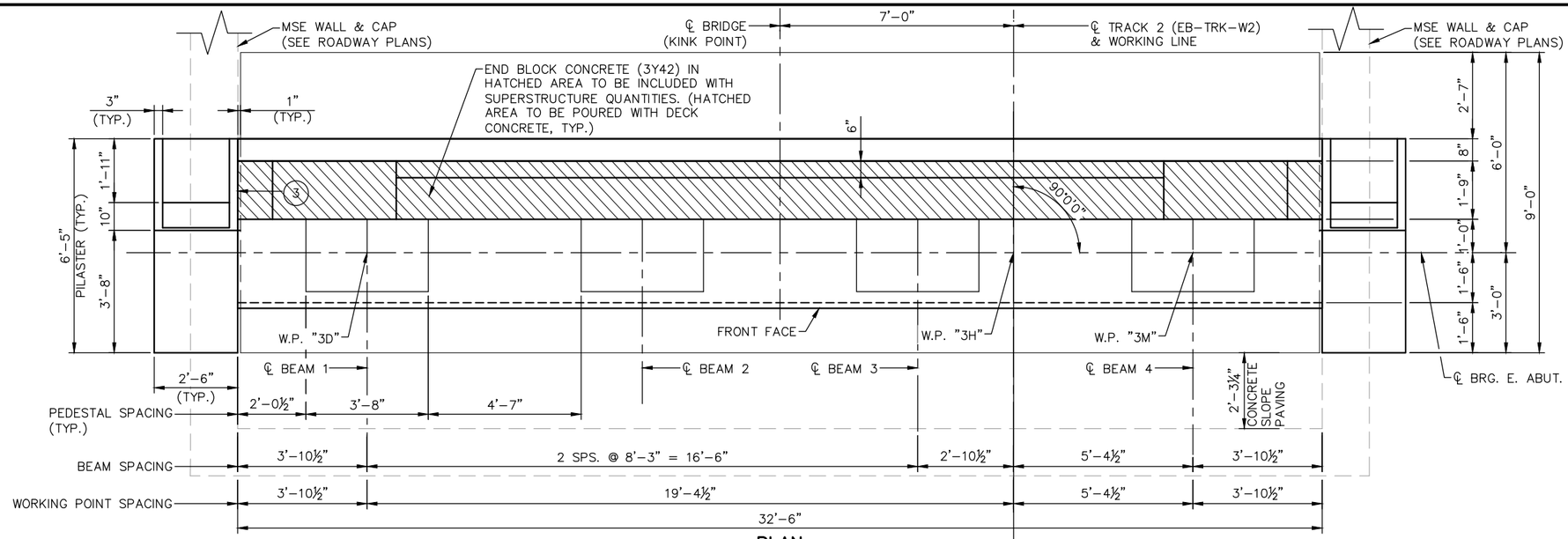
SOUTHWEST Green Line LRT Extension

CIVIL WEST - VOLUME 4B
NINE MILE CREEK
BRIDGE 27C07
EAST ABUTMENT FOOTING DETAILS

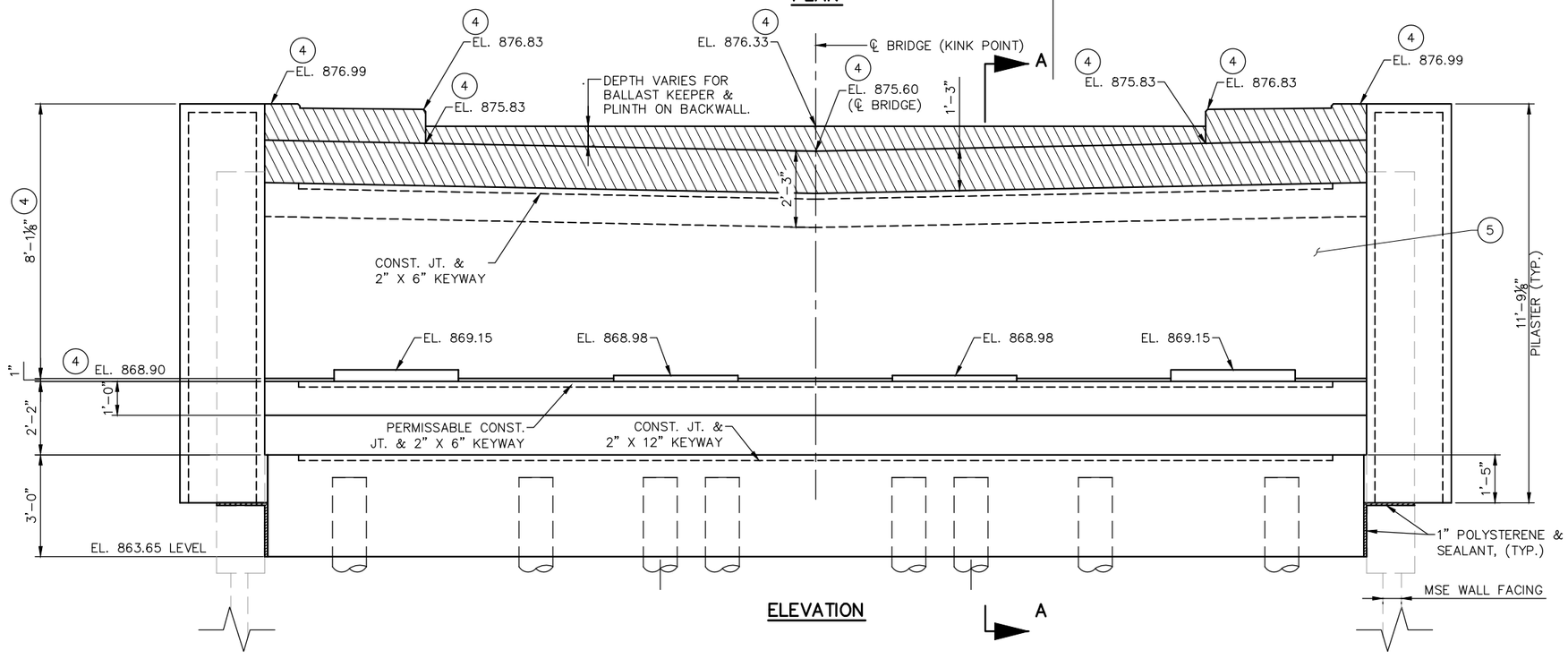
DISCIPLINE: STRUCTURES
SHEET NAME: CBR27C07-BRG-ABT-005

SHEET 20 OF 75

Sep, 18 2015 04:31 pm P:\60336960\3400_ADC\CAD\SEGMENT W2\PLAN SHEETS\STRUCTURES\CBR27C07\CBR27C07-BRG-ABT-005.dwg By: floresg



PLAN



ELEVATION

A

NOTES:

1. MEMBRANE WATERPROOFING SYSTEM PER MN/DOT 2184.3B TO BE INCLUDED IN PRICE BID FOR OTHER ITEMS. (SEAL ALL HORIZONTAL & VERTICAL JOINTS ON THE BACK FACE).
3. THERE SHALL BE A 72 HOUR MINIMUM DELAY BETWEEN CONCRETE POURS OF ADJACENT ABUTMENT SECTIONS THAT HAVE VERTICAL CONSTRUCTION JOINTS.
4. ELEVATIONS & DIMENSIONS ARE GIVEN AT THE FRONT FACE OF ABUTMENT BACKWALL.
5. SPECIAL SURFACE FINISH SHALL BE APPLIED TO THE ABUTMENT BODY AND WINGS. COLOR SHALL BE FEDERAL STANDARD COLOR XXXX, COLOR XXXXX. SEE SPEC. SB 2401.
6. FOR SECTION A-A, SEE SHEET 22 OF 75.

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AV | CHECKED BY: DD
DRAWN BY: GF | DATE: 09/07/15

AECOM

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

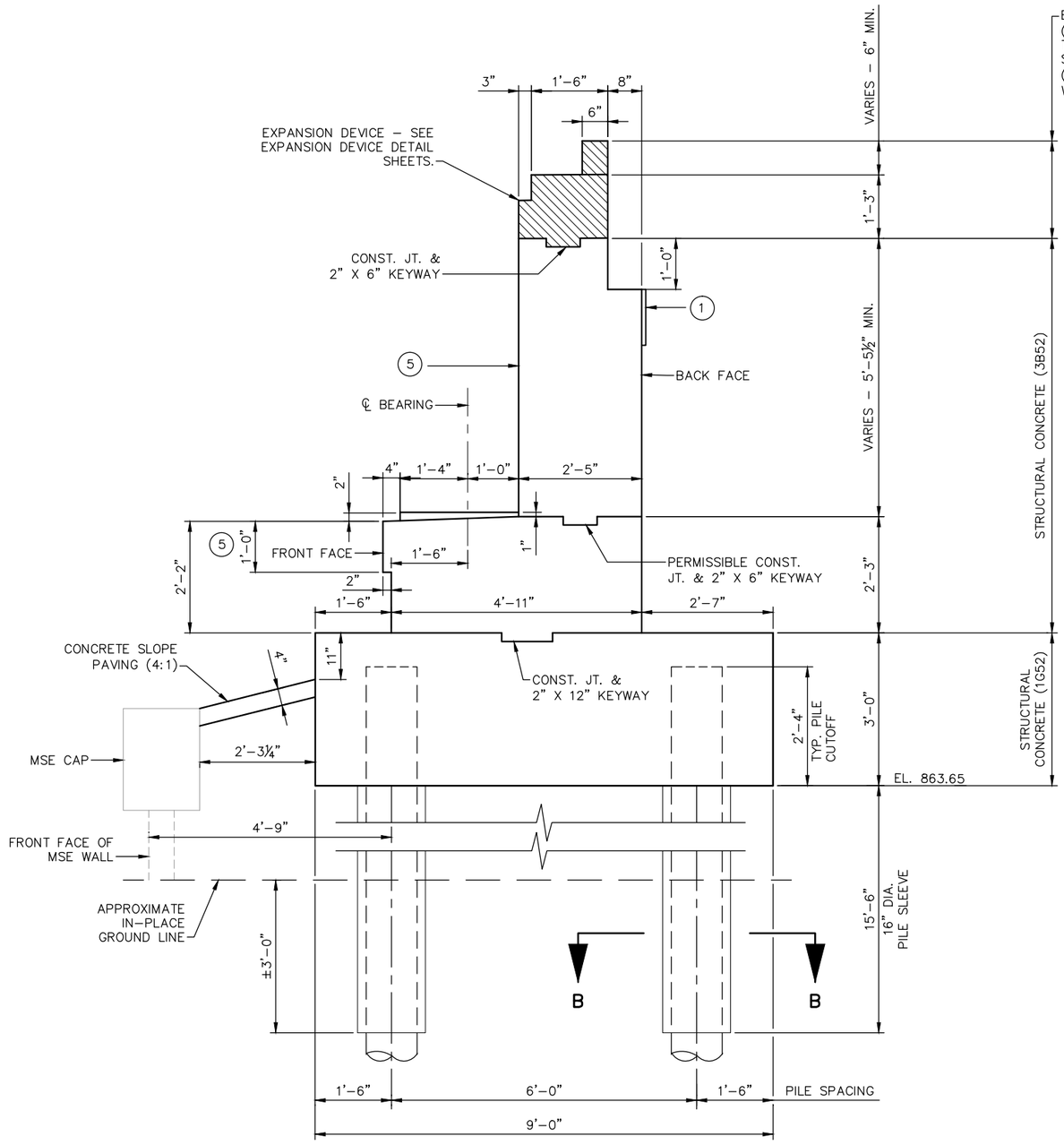
SOUTHWEST Green Line LRT Extension

CIVIL WEST - VOLUME 4B
NINE MILE CREEK
BRIDGE 27C07
EAST ABUTMENT MSE DETAILS 1

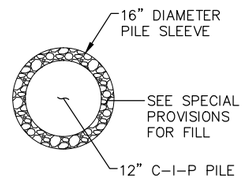
DISCIPLINE: STRUCTURES
SHEET NAME: CBR27C07-BRG-ABT-006

SHEET 21 OF 75

Sep, 18 2015 04:31 pm P:\60336960\3400_ADC\CAD\SEGMENT W2\PLAN SHEETS\STRUCTURES\CBR27C07\CBR27C07-BRG-ABT-006.dwg By: floresg



SECTION A–A



SECTION B–B

NOTES:

1. MEMBRANE WATERPROOFING SYSTEM PER MN/DOT 2481.3B, EXCEPT THE STRIP SHALL BE 24" WIDE TO ALLOW MOVEMENT.
5. SPECIAL SURFACE FINISH SHALL BE APPLIED TO THE ABUTMENT BODY AND WINGS. COLOR SHALL BE FEDERAL STANDARD COLOR XXXX, COLOR XXXXX. SEE SPEC. SB 2401.

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AV | CHECKED BY: DD
DRAWN BY: GF | DATE: 09/07/15

AECOM

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

CIVIL WEST - VOLUME 4B
NINE MILE CREEK
BRIDGE 27C07
EAST ABUTMENT MSE DETAILS 2

DISCIPLINE: STRUCTURES

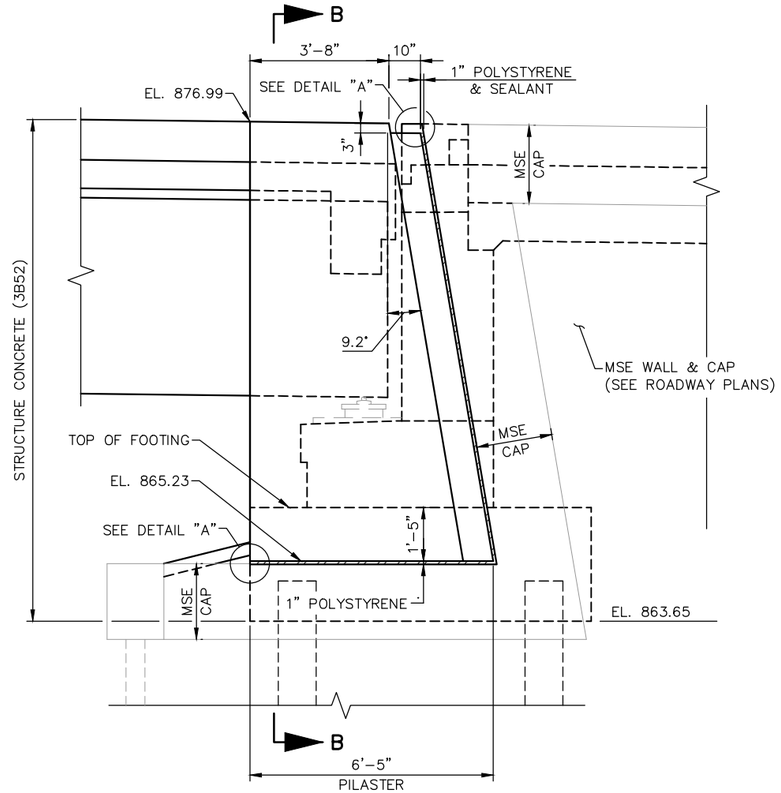
SHEET NAME: CBR27C07-BRG-ABT-007

SHEET 22 OF 75

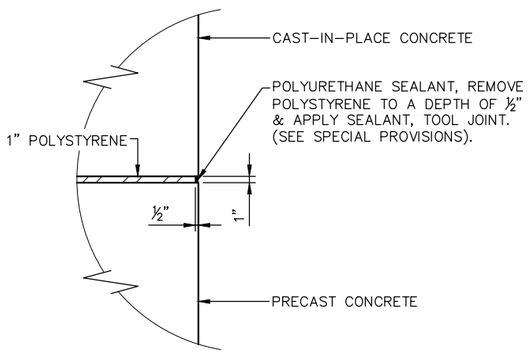
Sep. 18 2015 04:31 pm P:\60336960\3400_ADC\CAD\SEGMENT W2\PLAN SHEETS\STRUCTURES\CBR27C07\CBR27C07-BRG-ABT-007.dwg By: floresg

BILL OF REINFORCEMENT – SUPERSTRUCTURE

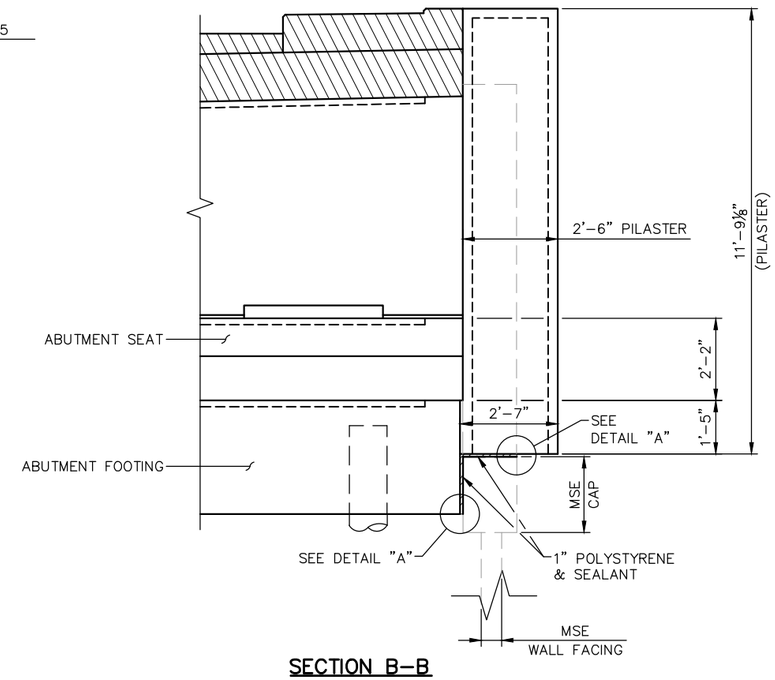
BAR	NO.	LENGTH	SHAPE	LOCATION



PILASTER ELEVATION
(SOUTH PILASTER SHOWN, NORTH PILASTER SIMILAR)



DETAIL "A"



SECTION B–B

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AV | CHECKED BY: DD
DRAWN BY: GF | DATE: 09/07/15

AECOM

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

CIVIL WEST - VOLUME 4B
NINE MILE CREEK
BRIDGE 27C07
EAST ABUTMENT MSE DETAILS 3

DISCIPLINE: STRUCTURES
SHEET NAME: CBR27C07-BRG-ABT-008

SHEET 23 OF 75

PIERS 1 & 2
REQUIRED NOMINAL PILE BEARING RESISTANCE R_n – TONS/PILE

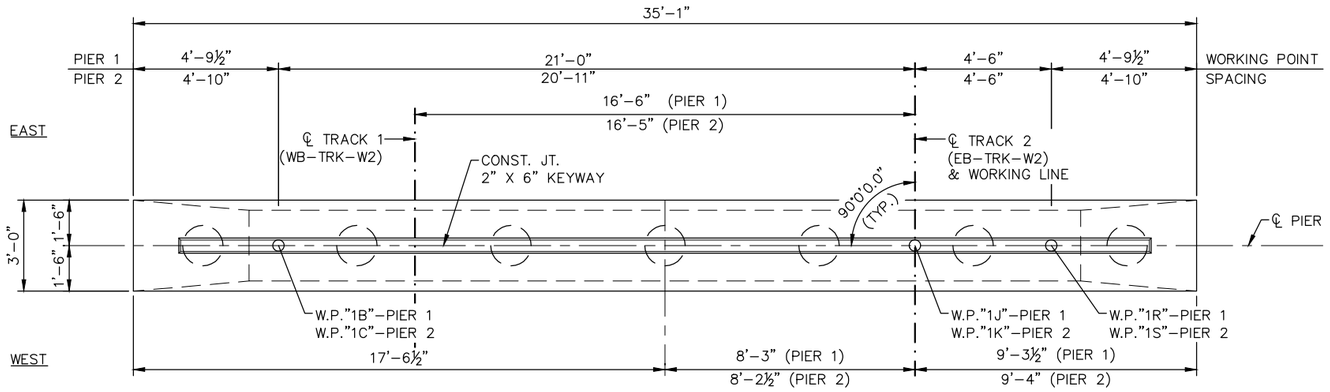
FIELD CONTROL METHOD	φ_{dyn}	$* R_n$
MN/DOT NOMINAL RESISTANCE FORMULA	0.40	277.3
PDA	0.65	170.6

$* R_n$ = (FACTORED DESIGN LOAD) / φ_{dyn}

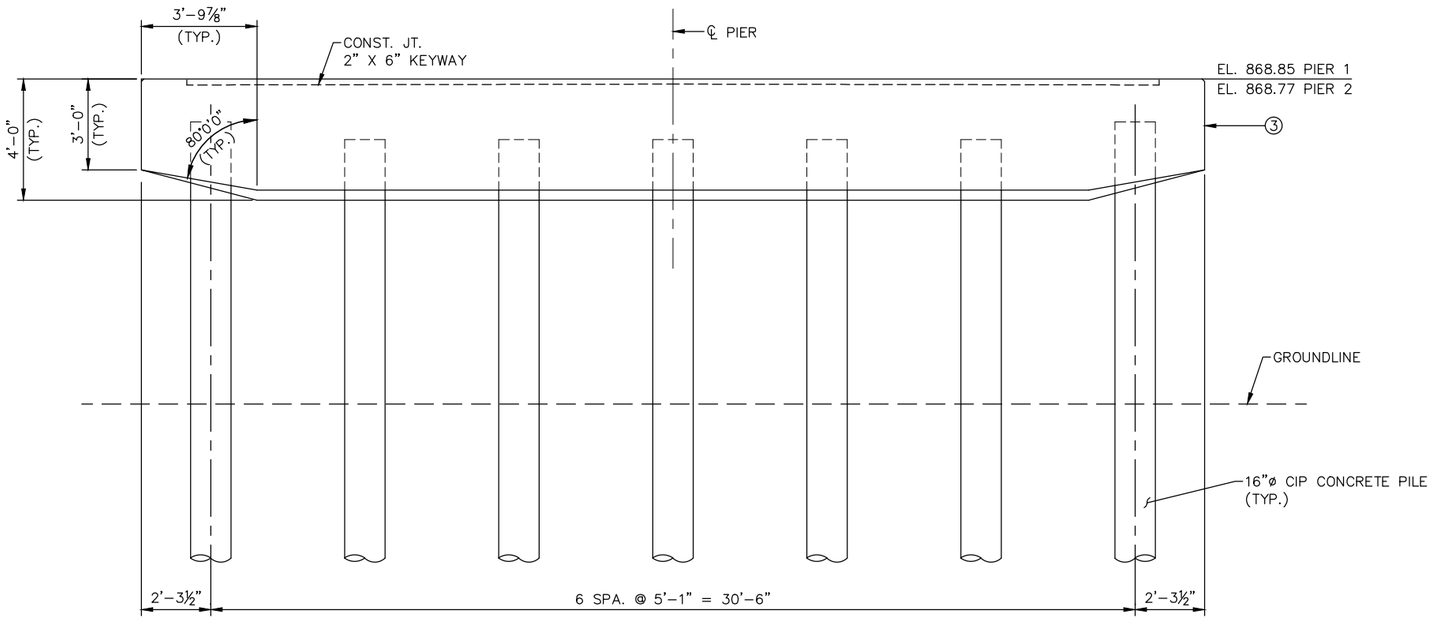
PIERS 1 & 2
COMPUTED PILE LOAD – TONS/PILE

FACTORED DEAD LOAD	71.0
FACTORED LIVE LOAD	24.0
FACTORED OVERTURNING	15.9
* FACTORED DESIGN LOAD	110.9

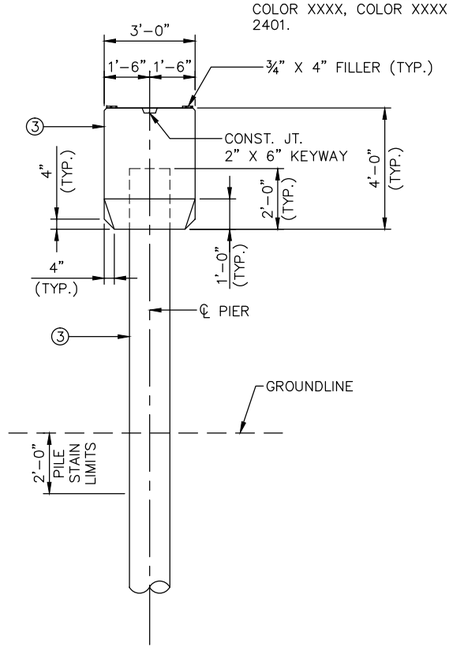
* BASED ON STRENGTH V LOAD COMBINATION



PLAN



ELEVATION



END VIEW

TRESTLE BENTS (PIERS 1 & 2)

PILE NOTES:

1 CAST-IN-PLACE CONC. TEST PILE XX FT. LONG.
6 CAST-IN-PLACE CONC. PILES EST. LENGTH X FT.
7 CAST-IN-PLACE CONC. PILES REQ'D FOR EACH PIER.

PILE SPACING SHOWN IS AT THE BOTTOM OF CAP.

PILES TO HAVE A NOMINAL DIAMETER OF 16".

FOR PILE SPLICE DETAILS SEE DETAIL B201.

NOTES:

1. CAP AND PILE TO BE REINFORCED WITH GRADE 60 REINFORCEMENT BARS.
③ SPECIAL SURFACE FINISH SHALL BE APPLIED TO THE PIER CAP AND PILES. COLOR SHALL BE FEDERAL STANDARD COLOR XXXX, COLOR XXXX SEE SPEC. SB 2401.

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AV | CHECKED BY: DD
DRAWN BY: GF | DATE: 09/07/15

AECOM

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

CIVIL WEST - VOLUME 4B
NINE MILE CREEK
BRIDGE 27C07
PIER 1 & 2 DETAILS

DISCIPLINE: STRUCTURES
SHEET NAME: CBR27C07-BRG-PIR-001

SHEET 24 OF 75

Sep. 18 2015 04:32 pm P:\60336960\3400_ADC\CAD\SEGMENT W2\PLAN SHEETS\STRUCTURES\CBR27C07\CBR27C07-BRG-PIR-001.dwg By: floresg

PIER 3
REQUIRED NOMINAL PILE BEARING RESISTANCE R_n – TONS/PILE

FIELD CONTROL METHOD	φ_{dyn}	$* R_n$
MN/DOT NOMINAL RESISTANCE FORMULA	0.40	277.3
PDA	0.65	170.6

$* R_n$ = (FACTORED DESIGN LOAD) / φ_{dyn}

PIER 3
COMPUTED PILE LOAD – TONS/PILE

FACTORED DEAD LOAD	71.0
FACTORED LIVE LOAD	24.0
FACTORED OVERTURNING	15.9
* FACTORED DESIGN LOAD	110.9

* BASED ON STRENGTH V LOAD COMBINATION

PILE NOTES:

1 CAST–IN–PLACE CONC. TEST PILE XX FT. LONG.
6 CAST–IN–PLACE CONC. PILES EST. LENGTH X FT.
7 CAST–IN–PLACE CONC. PILES REQ'D FOR PIER 3.

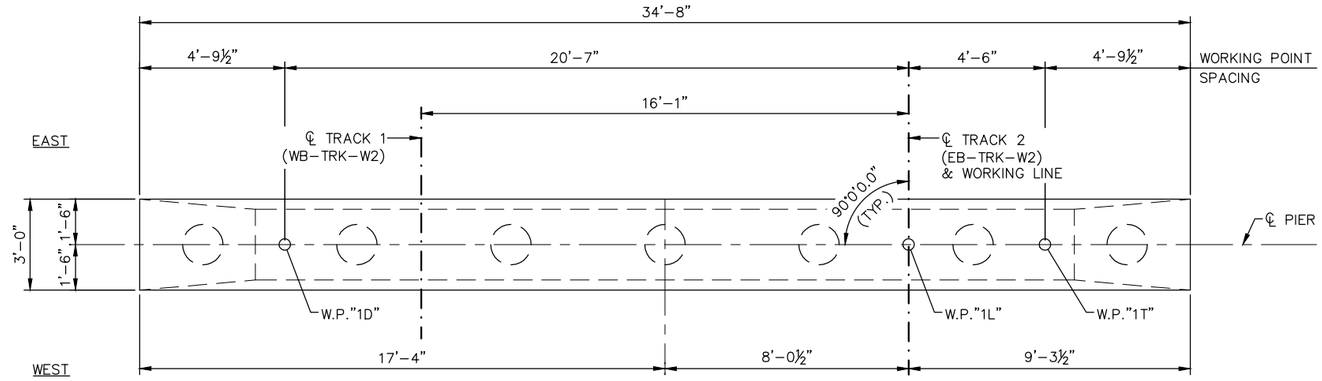
PILE SPACING SHOWN IS AT THE BOTTOM OF CAP.

PILES TO HAVE A NOMINAL DIAMETER OF 16".

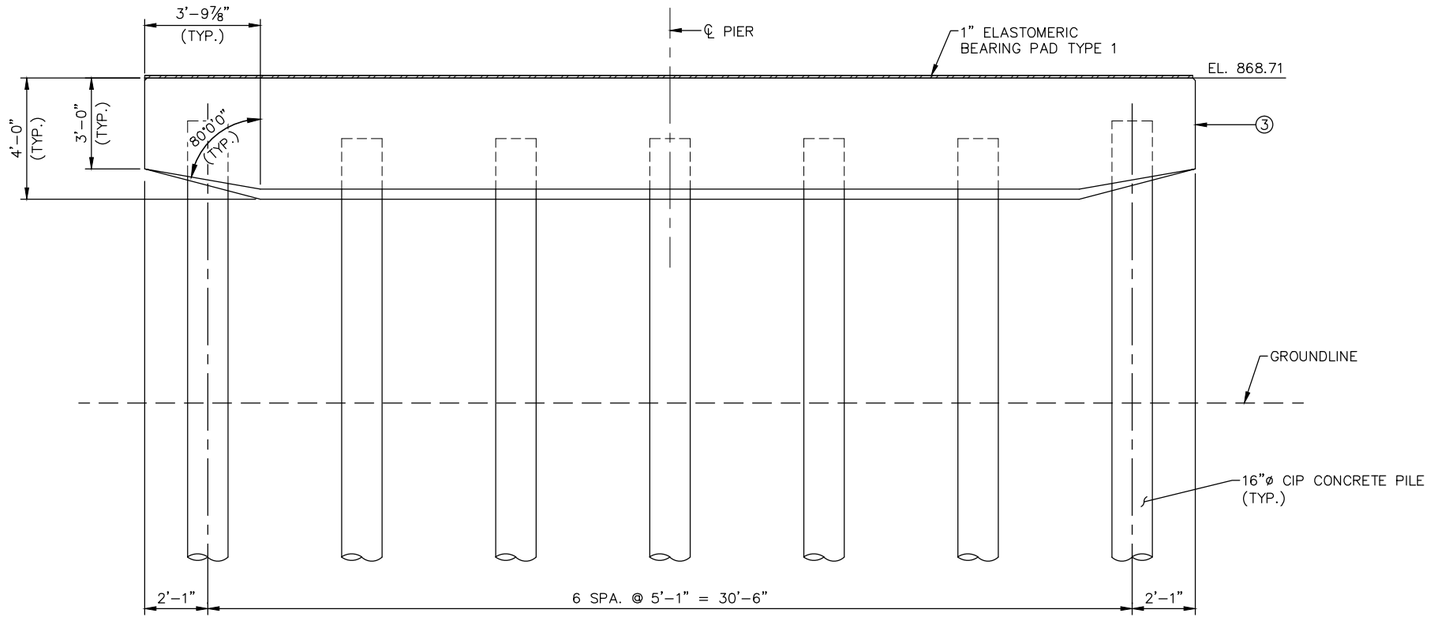
FOR PILE SPLICE DETAILS SEE DETAIL B201.

NOTES:

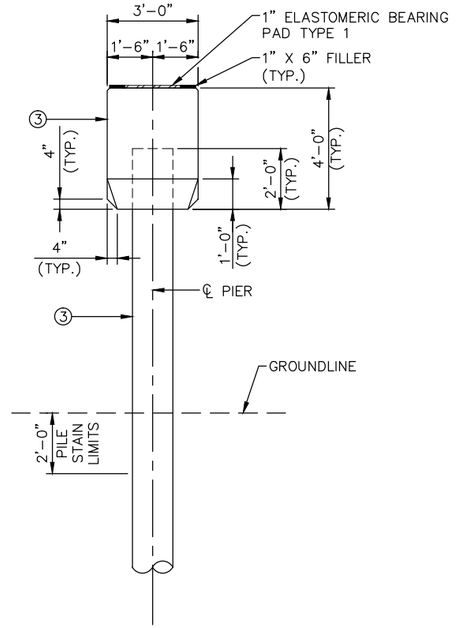
1. CAP AND PILE TO BE REINFORCED WITH GRADE 60 REINFORCEMENT BARS.
3. SPECIAL SURFACE FINISH SHALL BE APPLIED TO THE PIER CAP AND PILES. COLOR SHALL BE FEDERAL STANDARD COLOR XXXX, COLOR XXXX SEE SPEC. SB 2401.



PLAN



ELEVATION



END VIEW

TRESTLE BENTS (PIER 3)

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AV | CHECKED BY: DD
DRAWN BY: GF | DATE: 09/07/15

AECOM

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

CIVIL WEST - VOLUME 4B
NINE MILE CREEK
BRIDGE 27C07
PIER 3 DETAILS

DISCIPLINE: STRUCTURES
SHEET NAME: CBR27C07-BRG-PIR-002

SHEET 25 OF 75

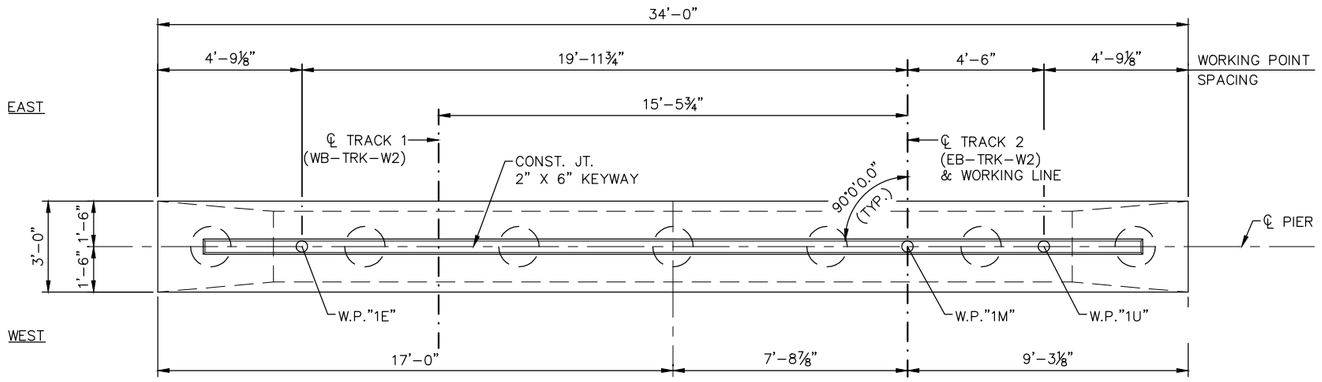
Sep. 18 2015 04:32 pm P:\60336960\3400_ADC\CAD\SEGMENT W2\PLAN SHEETS\STRUCTURES\CBR27C07\CBR27C07-BRG-PIR-002.dwg By: floresg

PIER 4 REQUIRED NOMINAL PILE BEARING RESISTANCE R_n – TONS/PILE		
FIELD CONTROL METHOD	φ_{dyn}	* R_n
MN/DOT NOMINAL RESISTANCE FORMULA	0.40	277.3
PDA	0.65	170.6

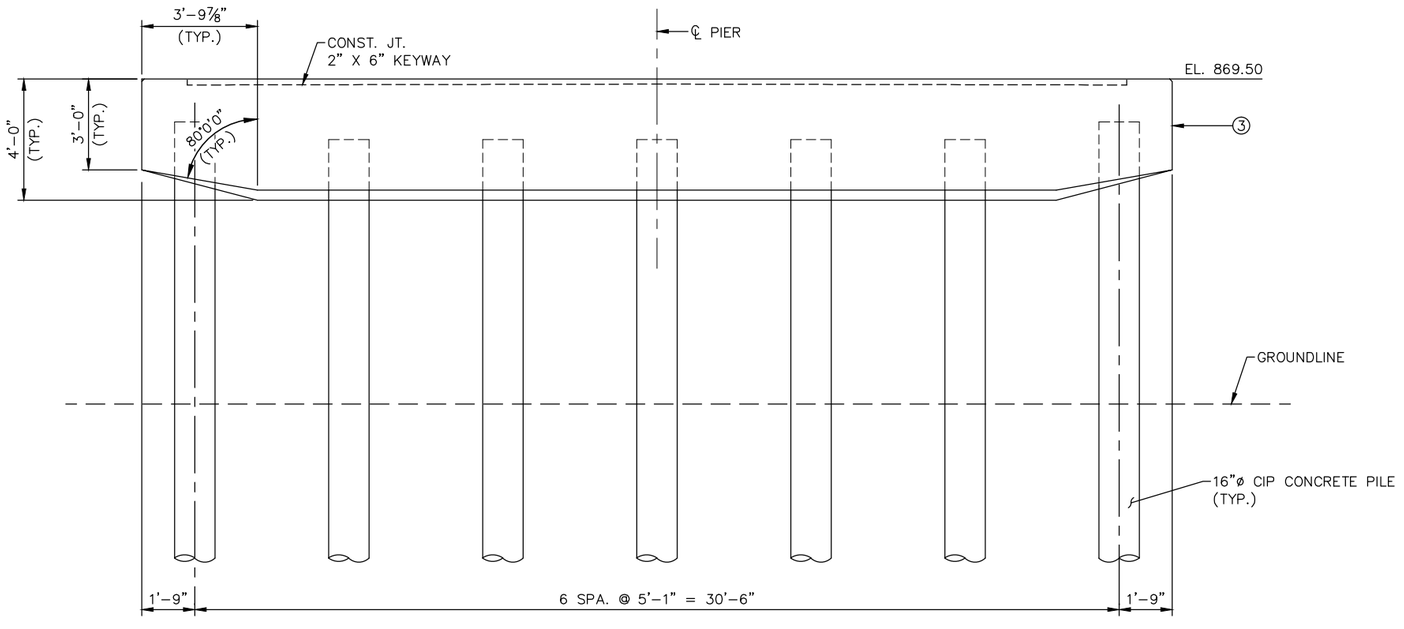
* R_n = (FACTORED DESIGN LOAD) / φ_{dyn}

PIERS 4 COMPUTED PILE LOAD – TONS/PILE	
FACTORED DEAD LOAD	71.0
FACTORED LIVE LOAD	24.0
FACTORED OVERTURNING	15.9
* FACTORED DESIGN LOAD	110.9

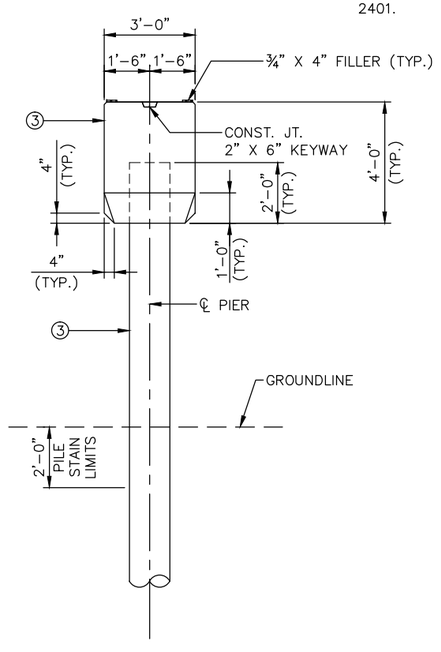
* BASED ON STRENGTH V LOAD COMBINATION



PLAN



ELEVATION



END VIEW

TRESTLE BENT (PIER 4)

PILE NOTES:

1 CAST-IN-PLACE CONC. TEST PILE XX FT. LONG.
6 CAST-IN-PLACE CONC. PILES EST. LENGTH X FT.
7 CAST-IN-PLACE CONC. PILES REQ'D FOR PIER 4.

PILE SPACING IS SHOWN AT THE BOTTOM OF CAP.

PILES TO HAVE A NOMINAL DIAMETER OF 16".

FOR PILE SPLICE DETAILS SEE DETAIL B201.

NOTES:

1. CAP AND PILE TO BE REINFORCED WITH GRADE 60 REINFORCEMENT BARS.

③ SPECIAL SURFACE FINISH SHALL BE APPLIED TO THE PIER CAP AND PILES. COLOR SHALL BE FEDERAL STANDARD COLOR XXXX, COLOR XXXX SEE SPEC. SB 2401.

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AV | CHECKED BY: DD
DRAWN BY: GF | DATE: 09/07/15

AECOM

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

CIVIL WEST - VOLUME 4B
NINE MILE CREEK
BRIDGE 27C07
PIER 4 DETAILS

DISCIPLINE: STRUCTURES
SHEET NAME: CBR27C07-BRG-PIR-003

SHEET 26 OF 75

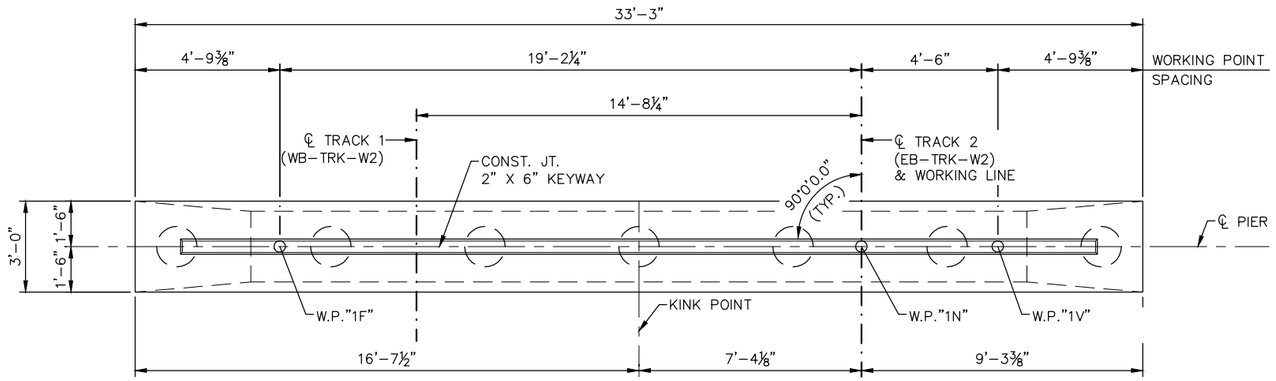
Sep. 18 2015 04:32 pm P:\60336960\3400_ADC\CAD\SEGMENT W2\PLAN SHEETS\STRUCTURES\CBR27C07\CBR27C07-BRG-PIR-003.dwg By: floresg

PIER 5 REQUIRED NOMINAL PILE BEARING RESISTANCE R_n – TONS/PILE		
FIELD CONTROL METHOD	φ_{dyn}	* R_n
MN/DOT NOMINAL RESISTANCE FORMULA	0.40	277.3
PDA	0.65	170.6

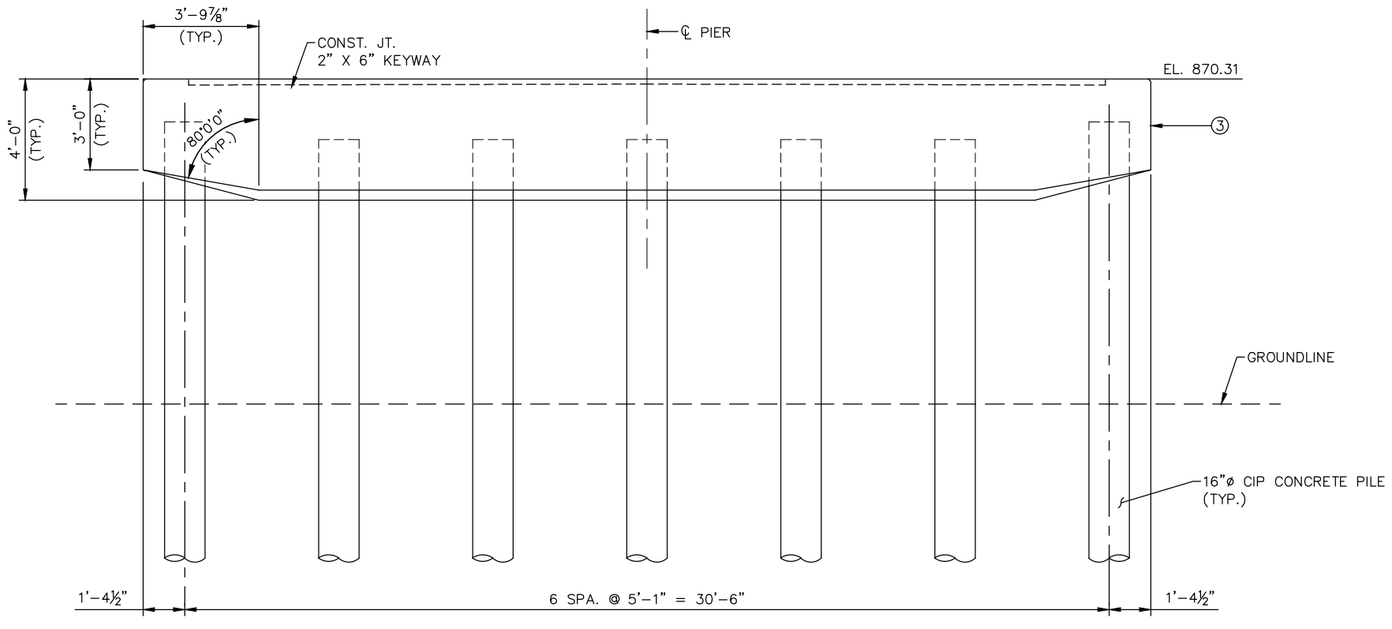
* R_n = (FACTORED DESIGN LOAD) / φ_{dyn}

PIER 5 COMPUTED PILE LOAD – TONS/PILE	
FACTORED DEAD LOAD	71.0
FACTORED LIVE LOAD	24.0
FACTORED OVERTURNING	15.9
* FACTORED DESIGN LOAD	110.9

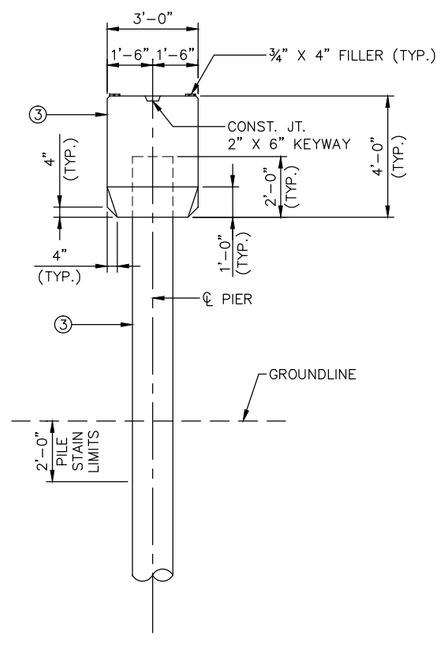
* BASED ON STRENGTH V LOAD COMBINATION



PLAN



ELEVATION



END VIEW

TRESTLE BENT (PIER 5)

PILE NOTES:

1 CAST-IN-PLACE CONC. TEST PILE XX FT. LONG.
6 CAST-IN-PLACE CONC. PILES EST. LENGTH X FT.
7 CAST-IN-PLACE CONC. PILES REQ'D FOR PIER 5.

PILE SPACING SHOWN IS AT THE BOTTOM OF CAP.

PILES TO HAVE A NOMINAL DIAMETER OF 16".

FOR PILE SPLICE DETAILS SEE DETAIL B201.

NOTES:

1. CAP AND PILE TO BE REINFORCED WITH GRADE 60 REINFORCEMENT BARS.
3. SPECIAL SURFACE FINISH SHALL BE APPLIED TO THE PIER CAP AND PILES. COLOR SHALL BE FEDERAL STANDARD COLOR XXXX, COLOR XXXX SEE SPEC. SB 2401.

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AV | CHECKED BY: DD
DRAWN BY: GF | DATE: 09/07/15

AECOM

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

CIVIL WEST - VOLUME 4B
NINE MILE CREEK
BRIDGE 27C07
PIER 5 DETAILS

DISCIPLINE: STRUCTURES
SHEET NAME: CBR27C07-BRG-PIR-004

SHEET 27 OF 75

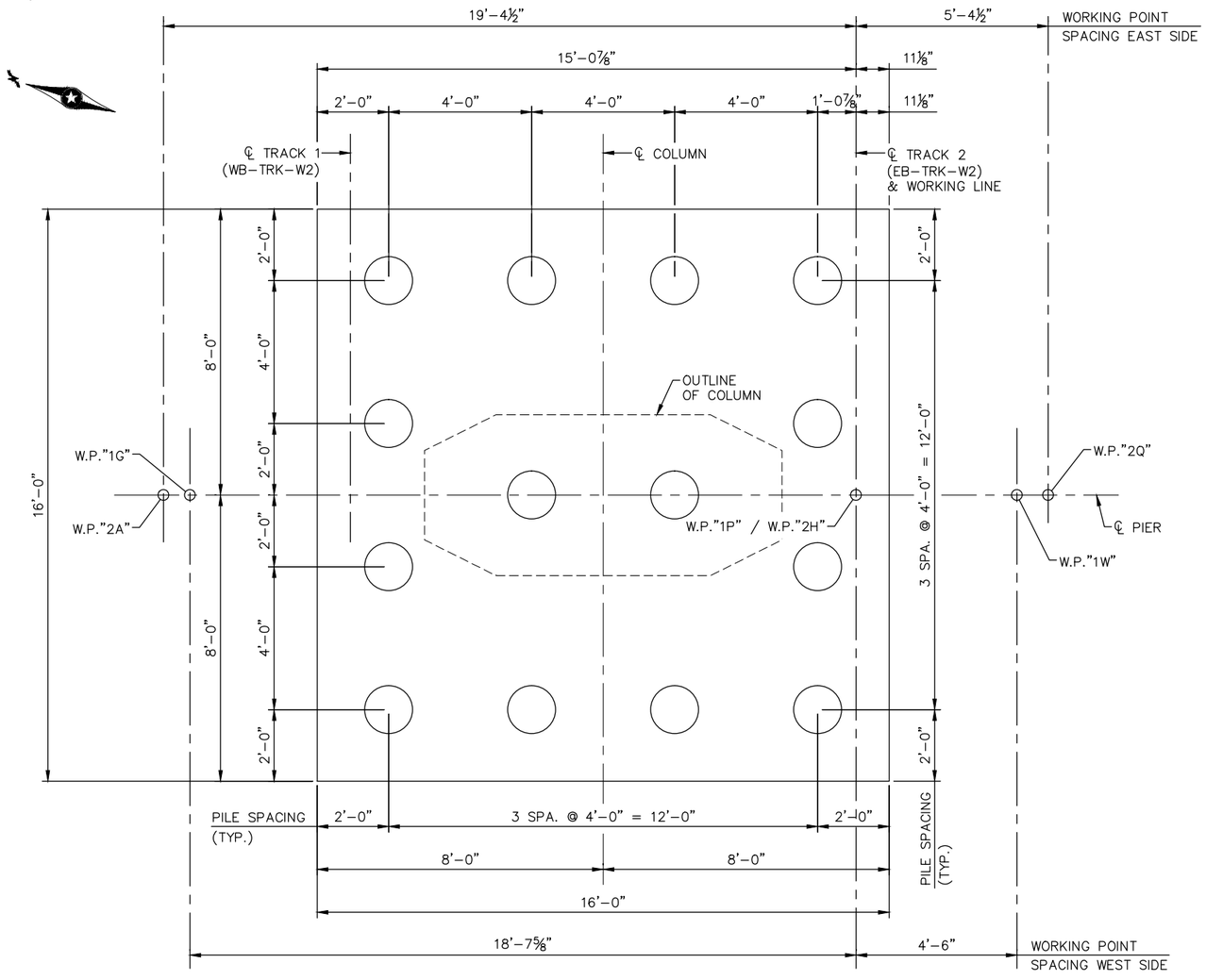
Sep. 18 2015 04:32 pm P:\60336960\3400_ADC\CAD\SEGMENT W2\PLAN SHEETS\STRUCTURES\CBR27C07\CBR27C07-BRG-PIR-004.dwg By: floresg

PIER 6 REQUIRED NOMINAL PILE BEARING RESISTANCE R_n – TONS/PILE		
FIELD CONTROL METHOD	φ_{dyn}	$*\ R_n$
MN/DOT NOMINAL RESISTANCE FORMULA	0.40	294.8
PDA	0.65	181.4

$*\ R_n$ = (FACTORED DESIGN LOAD) / φ_{dyn}

PIER 6 COMPUTED PILE LOAD – TONS/PILE	
FACTORED DEAD LOAD	68.4
FACTORED LIVE LOAD	21.5
FACTORED OVERTURNING	28.0
* FACTORED DESIGN LOAD	117.9

* BASED ON STRENGTH V LOAD COMBINATION



FOOTING PLAN

PILE NOTES

2 CAST–IN–PLACE CONC. TEST PILE XX FT. LONG.
12 CAST–IN–PLACE CONC. PILES EST. LENGTH X FT.
14 CAST–IN–PLACE CONC. PILES REQ'D FOR PIER 6.

PILE SPACING SHOWN IS AT BOTTOM OF FOOTING.

PILES TO HAVE A NOMINAL DIAMETER OF 16".

FOR PILE SPLICE DETAILS SEE DETAIL B201.

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AV | CHECKED BY: DD
DRAWN BY: GF | DATE: 09/07/15

AECOM

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

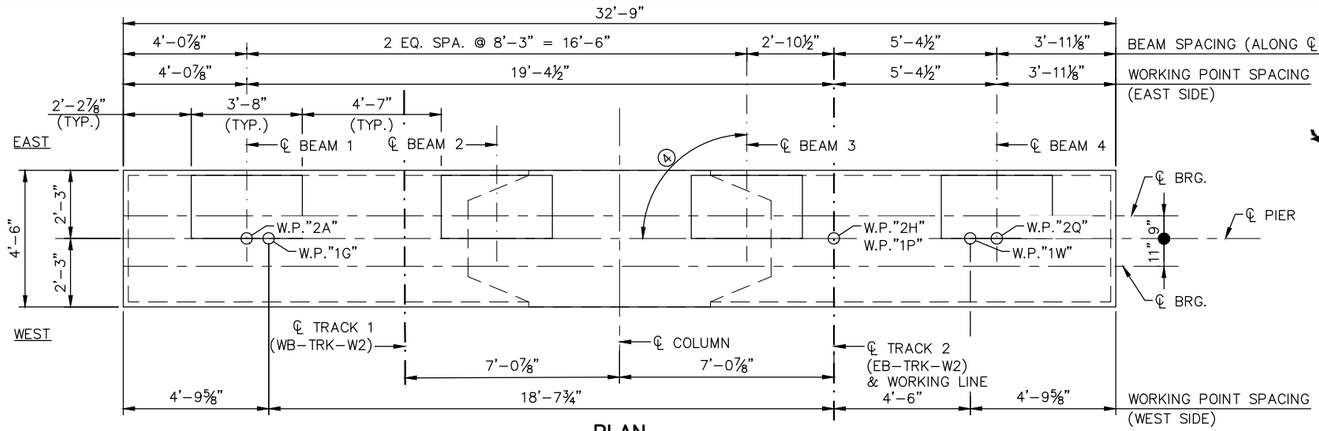
SOUTHWEST Green Line LRT Extension

CIVIL WEST - VOLUME 4B
NINE MILE CREEK
BRIDGE 27C07
PIER 6 FOOTING DETAILS

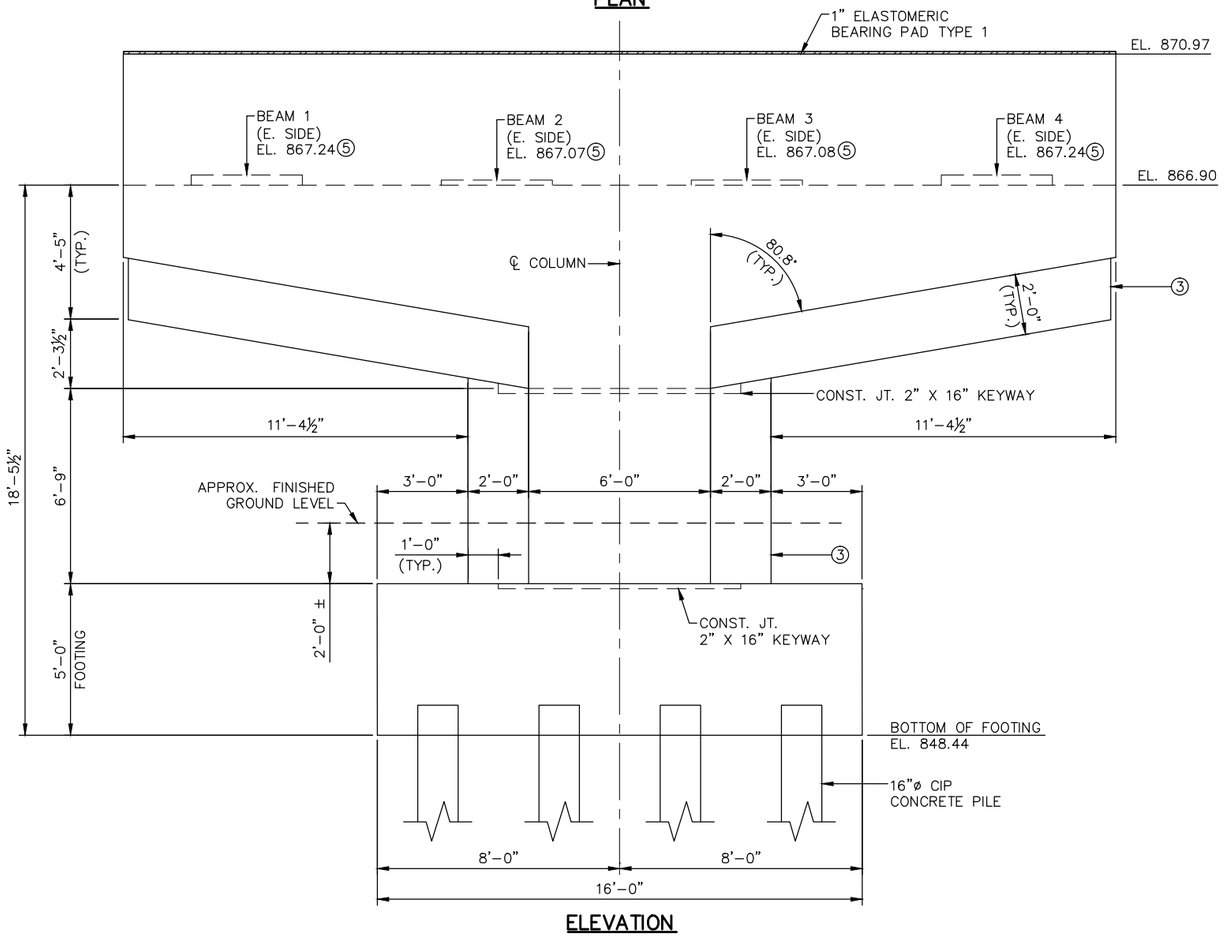
DISCIPLINE: STRUCTURES
SHEET NAME: CBR27C07-BRG-PIR-005

SHEET 28 OF 75

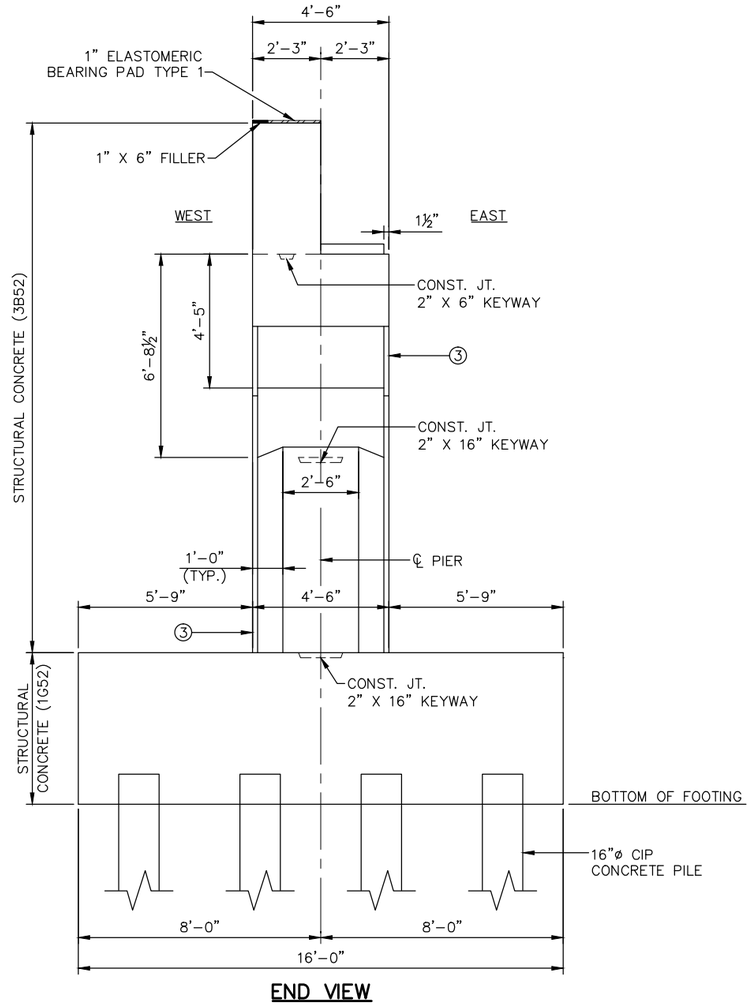
Sep. 18 2015 04:32 pm P:\60336960\3400_ADC\CAD\SEGMENT W2\PLAN SHEETS\STRUCTURES\CBR27C07\CBR27C07-BRG-PIR-005.dwg By: floresg



PLAN



ELEVATION



END VIEW

NOTES:

1. CAP AND COLUMN TO BE REINFORCED WITH GRADE 60 REINFORCEMENT BARS.

③ SPECIAL SURFACE FINISH SHALL BE APPLIED TO THE PIER CAP AND COLUMN. COLOR SHALL BE FEDERAL STANDARD COLOR XXXX, COLOR XXXX SEE SPEC. SB 2401.

④ FOR BEAM ANGLES SEE SHEET 36 OF 75.

⑤ ELEVATIONS WERE DETERMINED AT ℄ BRG.

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AV | CHECKED BY: DD
DRAWN BY: GF | DATE: 09/07/15

AECOM

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

CIVIL WEST - VOLUME 4B
NINE MILE CREEK
BRIDGE 27C07
PIER 6 DETAILS

DISCIPLINE: STRUCTURES

SHEET NAME: CBR27C07-BRG-PIR-006

SHEET 29 OF 75

Sep. 18 2015 04:32 pm P:\60336960\3400_ADC\CAD\SEGMENT W2\PLAN SHEETS\STRUCTURES\CBR27C07\CBR27C07_BRG-PIR-006.dwg By: floresg

PIERS 7–10 REQUIRED NOMINAL PILE BEARING RESISTANCE R_n – TONS/PILE

FIELD CONTROL METHOD	φ_{dyn}	$*\ R_n$
MN/DOT NOMINAL RESISTANCE FORMULA	0.40	279.8
PDA	0.65	172.2

$*\ R_n$ = (FACTORED DESIGN LOAD) / φ_{dyn}

PIERS 7–10 COMPUTED PILE LOAD – TONS/PILE

FACTORED DEAD LOAD	54.9
FACTORED LIVE LOAD	13.7
FACTORED OVERTURNING	43.3
* FACTORED DESIGN LOAD	111.9

* BASED ON STRENGTH V LOAD COMBINATION

PILE NOTES

2 CAST–IN–PLACE CONC. TEST PILE XX FT. LONG.
18 CAST–IN–PLACE CONC. PILES EST. LENGTH X FT.
20 CAST–IN–PLACE CONC. PILES REQ'D FOR EACH PIER.

PILE SPACING SHOWN IS AT BOTTOM OF FOOTING.

PILES TO HAVE A NOMINAL DIAMETER OF 16".

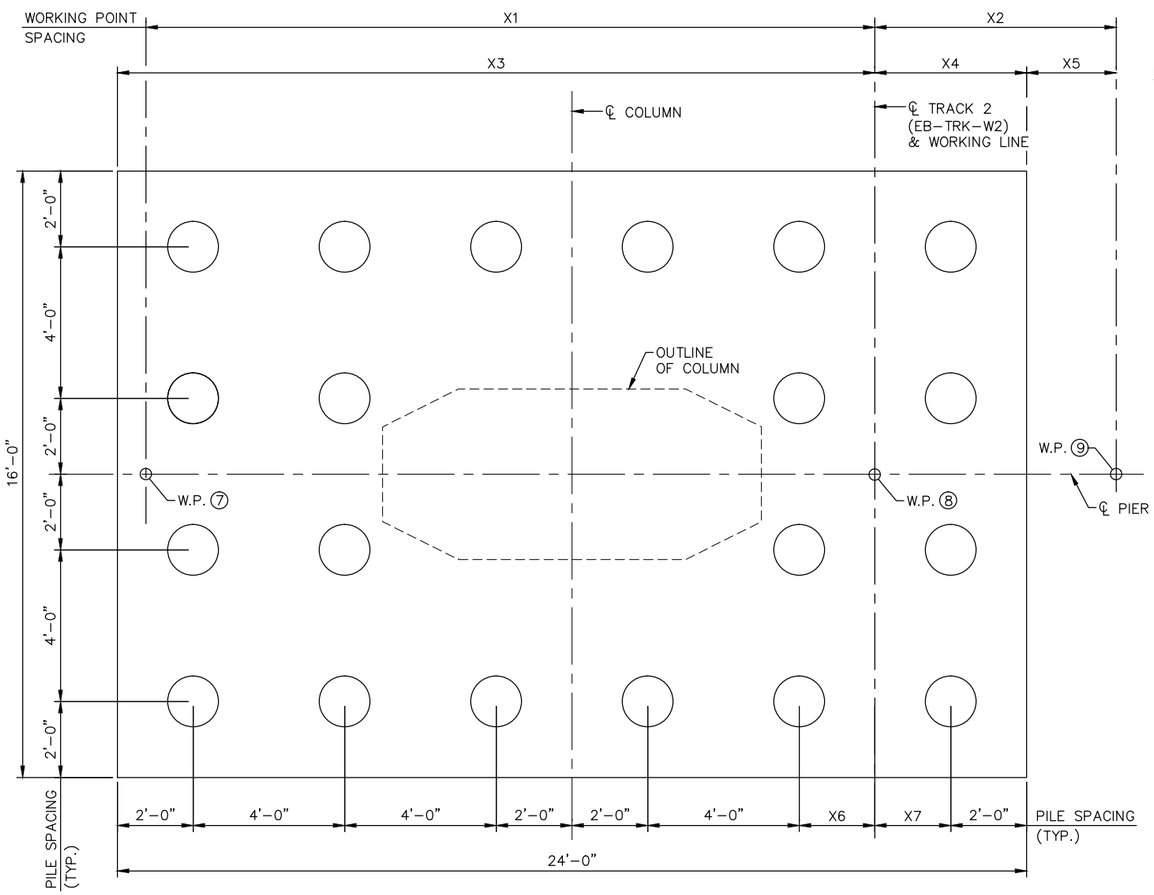
FOR PILE SPLICE DETAILS SEE DETAIL B201.

DIMENSION TABLE

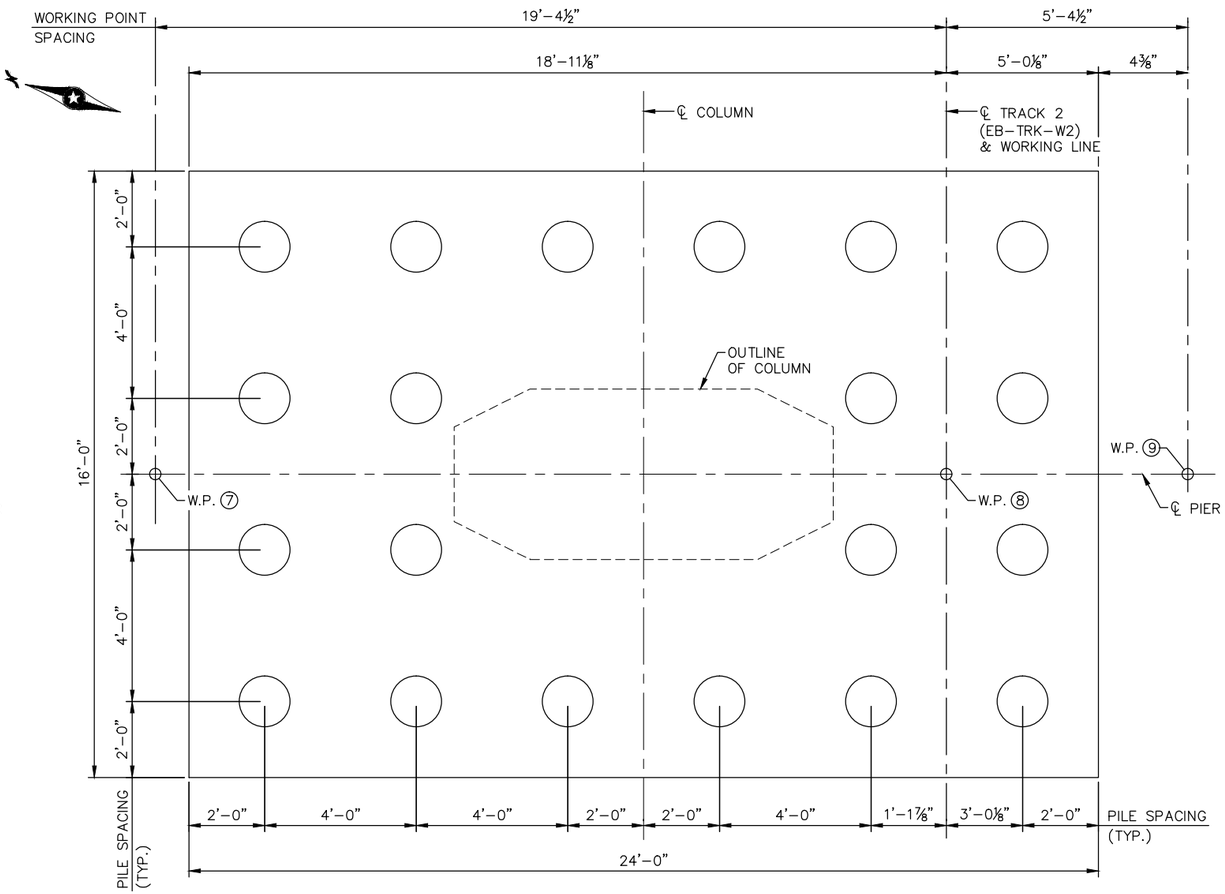
	DISTANCE "X1"	DISTANCE "X2"	DISTANCE "X3"	DISTANCE "X4"	DISTANCE "X5"	DISTANCE "X6"	DISTANCE "X7"
PIER 7	18'–4½"	6'–4½"	18'–0"	5'–0"	1'–4½"	1'–0"	3'–0"
PIER 8	18'–4½"	6'–4½"	18'–0"	4'–6"	1'–10½"	1'–1⅜"	2'–10⅝"
PIER 9	18'–4½"	6'–4½"	18'–0"	4'–10½'	1'–6"	1'–1⅛"	2'–10⅞"

WORKING POINTS TABLE

	WORKING POINT ⑦	WORKING POINT ⑧	WORKING POINT ⑨
PIER 7	"2B"	"2J"	"2R"
PIER 8	"2C"	"2K"	"2S"
PIER 9	"2D"	"2L"	"2T"
PIER 10	"2E"	"2M"	"2U"



FOOTING PLAN (PIERS 7 THRU 9)



FOOTING PLAN (PIER 10)

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AV | CHECKED BY: DD
DRAWN BY: GF | DATE: 09/07/15

AECOM

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

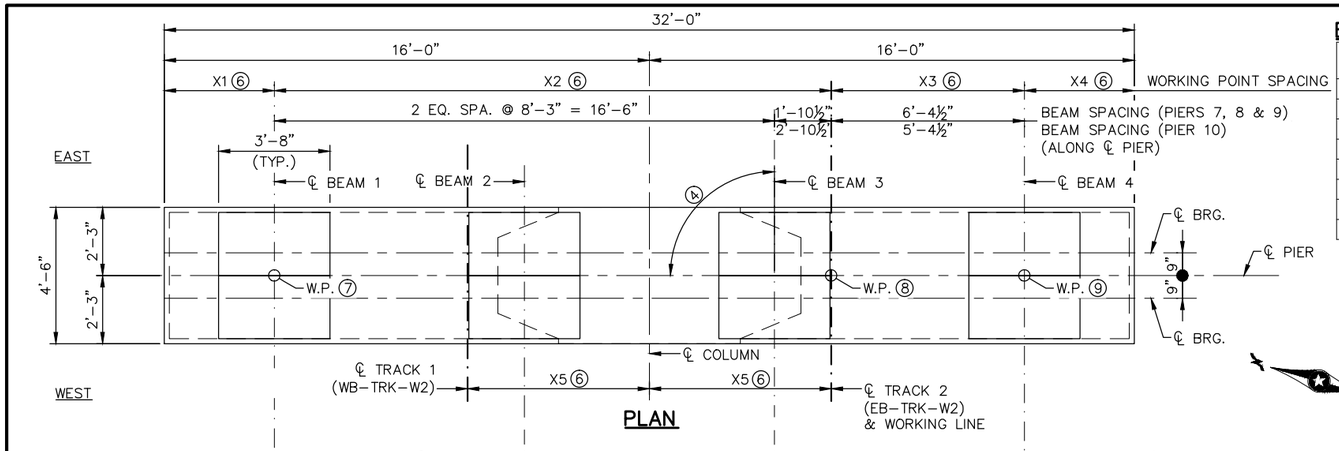
SOUTHWEST Green Line LRT Extension

CIVIL WEST - VOLUME 4B
NINE MILE CREEK
BRIDGE 27C07
PIER 7 THRU 10 FOOTING DETAILS

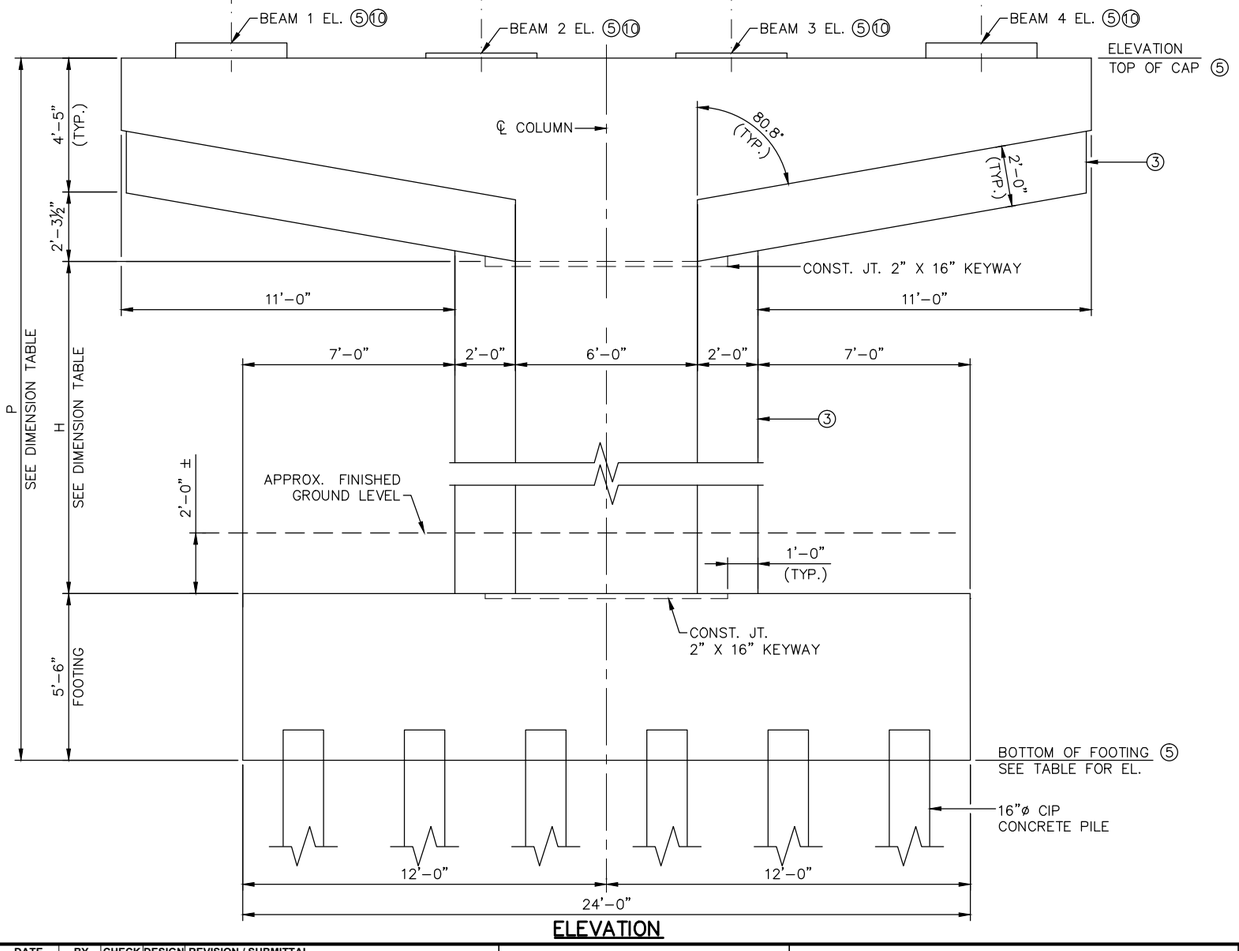
DISCIPLINE: STRUCTURES
SHEET NAME: CBR27C07-BRG-PIR-007

SHEET 30 OF 75

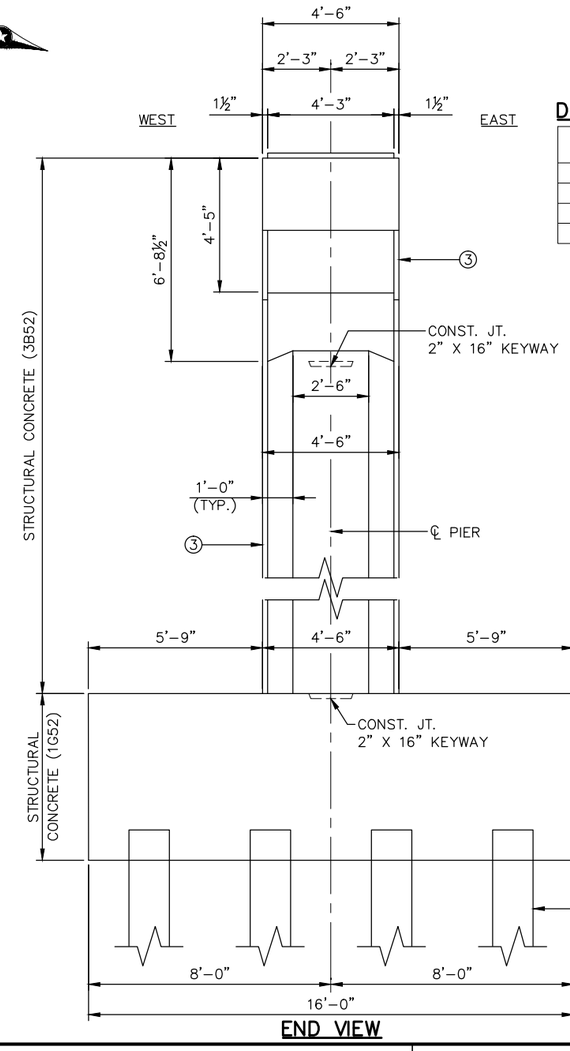
Sep, 18 2015 04:32 pm P:\60336960\3400_ADC\CAD\SEGMENT W2\PLAN SHEETS\STRUCTURES\CBR27C07\CBR27C07-BRG-PIR-007.dwg By: floresg



PLAN



ELEVATION



END VIEW

ELEVATION & DIMENSION TABLE ⑤

	ELEVATION – BEAM 1	ELEVATION – BEAM 2	ELEVATION – BEAM 3	ELEVATION – BEAM 4	ELEVATION – TOP OF CAP	COLUMN HT. "H"	PIER HT. "P"	ELEV. – BOTTOM OF FOOTING
PIER 7 – WEST SIDE	869.71	869.54	869.58	869.75	869.37	14.50	26.71	842.67
PIER 7 – EAST SIDE	869.73	869.57	869.61	869.77				
PIER 8 – WEST SIDE	871.89	871.72	871.76	871.93	871.55	20.00	32.21	839.35
PIER 8 – EAST SIDE	871.97	871.80	871.84	872.01				
PIER 9 – WEST SIDE	873.93	873.77	873.81	873.97	873.60	22.00	34.21	839.39
PIER 9 – EAST SIDE	873.96	873.80	873.84	874.00				
PIER 10 – WEST SIDE	875.39	875.23	875.23	875.39	875.06	17.00	29.21	845.85
PIER 10 – EAST SIDE	875.40	875.24	875.24	875.40				

DIMENSION TABLE ⑥

	DISTANCE "X1"	DISTANCE "X2"	DISTANCE "X3"	DISTANCE "X4"	DISTANCE "X5"
PIER 7	4'-7½"	18'-4½"	6'-4½"	2'-7½"	7'-0"
PIER 8	4'-9¼"	18'-4½"	6'-4½"	2'-5¾"	7'-1¾"
PIER 9	4'-9"	18'-4½"	6'-4½"	2'-6"	7'-1½"
PIER 10	3'-7½"	19'-4½"	5'-4½"	3'-7½"	7'-0"

WORKING POINTS TABLE

	WORKING POINT ⑦	WORKING POINT ⑧	WORKING POINT ⑨
PIER 7	"2B"	"2J"	"2R"
PIER 8	"2C"	"2K"	"2S"
PIER 9	"2D"	"2L"	"2T"
PIER 10	"2E"	"2M"	"2U"

NOTES:

1. CAP AND COLUMN TO BE REINFORCED WITH GRADE 60 REINFORCEMENT BARS.
2. ③ SPECIAL SURFACE FINISH SHALL BE APPLIED TO THE PIER CAP AND COLUMN. COLOR SHALL BE FEDERAL STANDARD COLOR XXXX, COLOR XXXX SEE SPEC. SB 2401.
3. ④ FOR BEAM ANGLES SEE SHEETS 36 & 37 OF 75.
4. ⑩ ELEVATIONS WERE DETERMINED AT ℄ BRG.

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AV | CHECKED BY: DD
DRAWN BY: GF | DATE: 09/07/15

AECOM

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST
Green Line LRT Extension

CIVIL WEST - VOLUME 4B
NINE MILE CREEK
BRIDGE 27C07
PIER 7 THRU 10 DETAILS

DISCIPLINE: STRUCTURES

SHEET NAME: CBR27C07-BRG-PIR-008

SHEET 31 OF 75

PIER 11 REQUIRED NOMINAL PILE BEARING RESISTANCE R_n – TONS/PILE		
FIELD CONTROL METHOD	φ_{dyn}	$*\ R_n$
MN/DOT NOMINAL RESISTANCE FORMULA	0.40	243.0
PDA	0.65	149.5

$*\ R_n$ = (FACTORED DESIGN LOAD) / φ_{dyn}

PIER 11 COMPUTED PILE LOAD – TONS/PILE	
FACTORED DEAD LOAD	64.1
FACTORED LIVE LOAD	20.5
FACTORED OVERTURNING	12.5
* FACTORED DESIGN LOAD	97.2

* BASED ON STRENGTH V LOAD COMBINATION

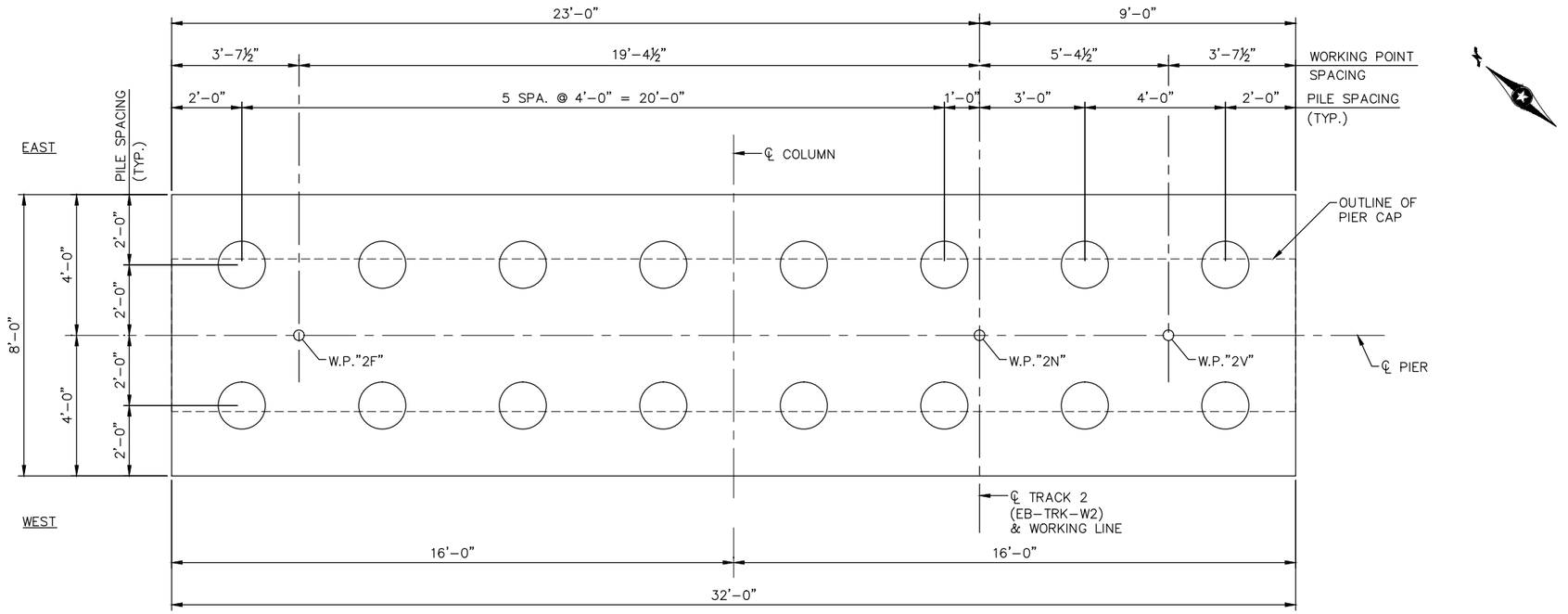
PILE NOTES

2 CAST–IN–PLACE CONC. TEST PILE XX FT. LONG.
14 CAST–IN–PLACE CONC. PILES EST. LENGTH X FT.
16 CAST–IN–PLACE CONC. PILES REQ'D FOR PIER 11.

PILE SPACING SHOWN IS AT BOTTOM OF FOOTING.

PILES TO HAVE A NOMINAL DIAMETER OF 16".

FOR PILE SPLICE DETAILS SEE DETAIL B201.



FOOTING PLAN

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AV | CHECKED BY: DD
DRAWN BY: GF | DATE: 09/07/15

AECOM

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

CIVIL WEST - VOLUME 4B
NINE MILE CREEK
BRIDGE 27C07
PIER 11 FOOTING DETAILS

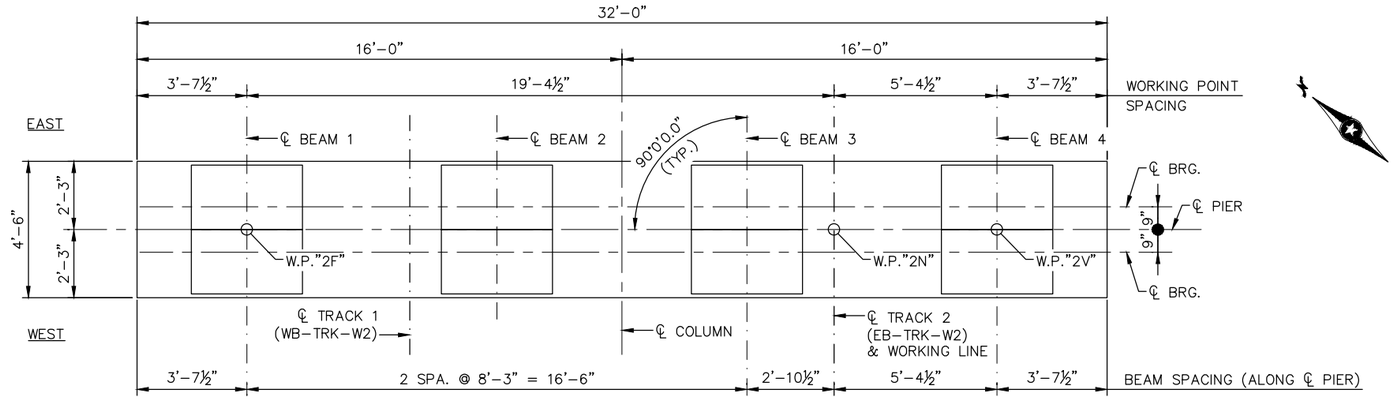
DISCIPLINE: STRUCTURES
SHEET NAME: CBR27C07-BRG-PIR-009

SHEET 32 OF 75

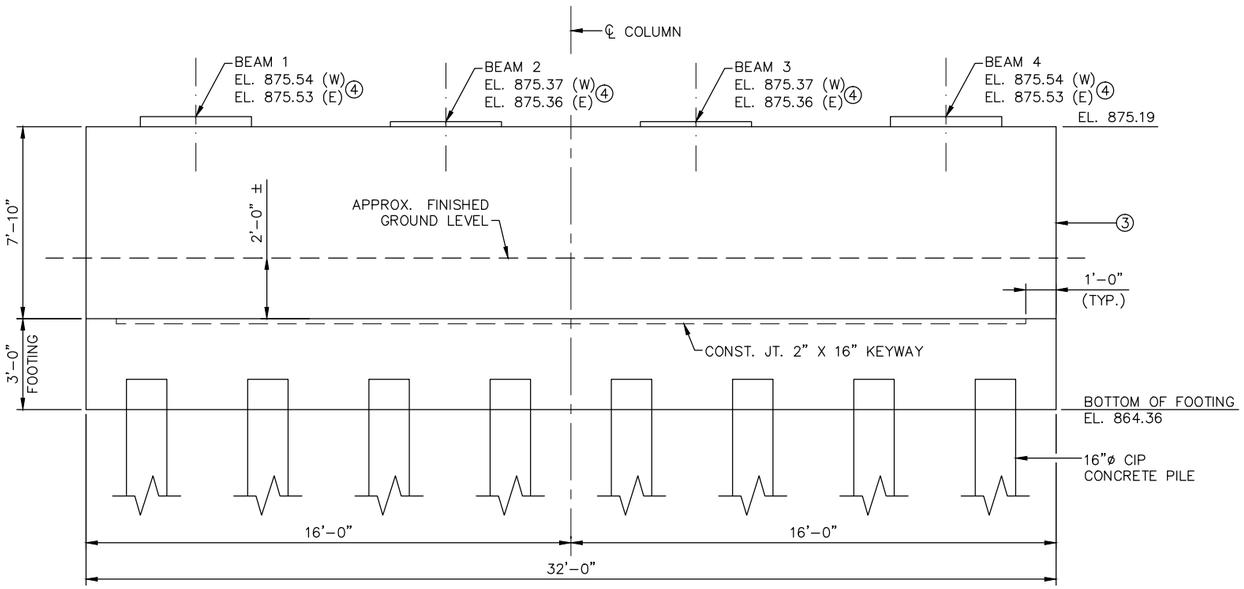
Sep, 18 2015 04:33 pm P:\60336960\3400_ADC\CAD\SEGMENT W2\PLAN SHEETS\STRUCTURES\CBR27C07\CBR27C07-BRG-PIR-009.dwg By: floresg

NOTES:

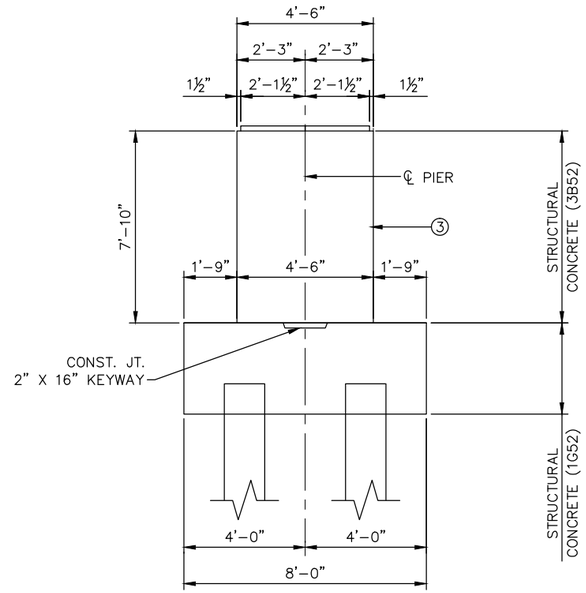
1. CAP AND COLUMN TO BE REINFORCED WITH GRADE 60 REINFORCEMENT BARS.
3. SPECIAL SURFACE FINISH SHALL BE APPLIED TO THE PIER CAP AND COLUMN. COLOR SHALL BE FEDERAL STANDARD COLOR XXXX, COLOR XXXX SEE SPEC. SB 2401.
4. ELEVATIONS WERE DETERMINED AT ℄ BRG.



PLAN



ELEVATION



END VIEW

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AV | CHECKED BY: DD
DRAWN BY: GF | DATE: 09/07/15

AECOM

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

CIVIL WEST - VOLUME 4B
NINE MILE CREEK
BRIDGE 27C07
PIER 11 DETAILS

DISCIPLINE: STRUCTURES
SHEET NAME: CBR27C07-BRG-PIR-010

SHEET 33 OF 75

PIER 12–14 REQUIRED NOMINAL PILE BEARING RESISTANCE R_n– TONS/PILE		
FIELD CONTROL METHOD	φ_{dyn}	* R_n
MN/DOT NOMINAL RESISTANCE FORMULA	0.40	302.3
PDA	0.65	186.0

* R_n = (FACTORED DESIGN LOAD) / φ_{dyn}

PIER 12–14 COMPUTED PILE LOAD – TONS/PILE	
FACTORED DEAD LOAD	72.5
FACTORED LIVE LOAD	18.4
FACTORED OVERTURNING	30.0
* FACTORED DESIGN LOAD	120.9

* BASED ON STRENGTH V LOAD COMBINATION

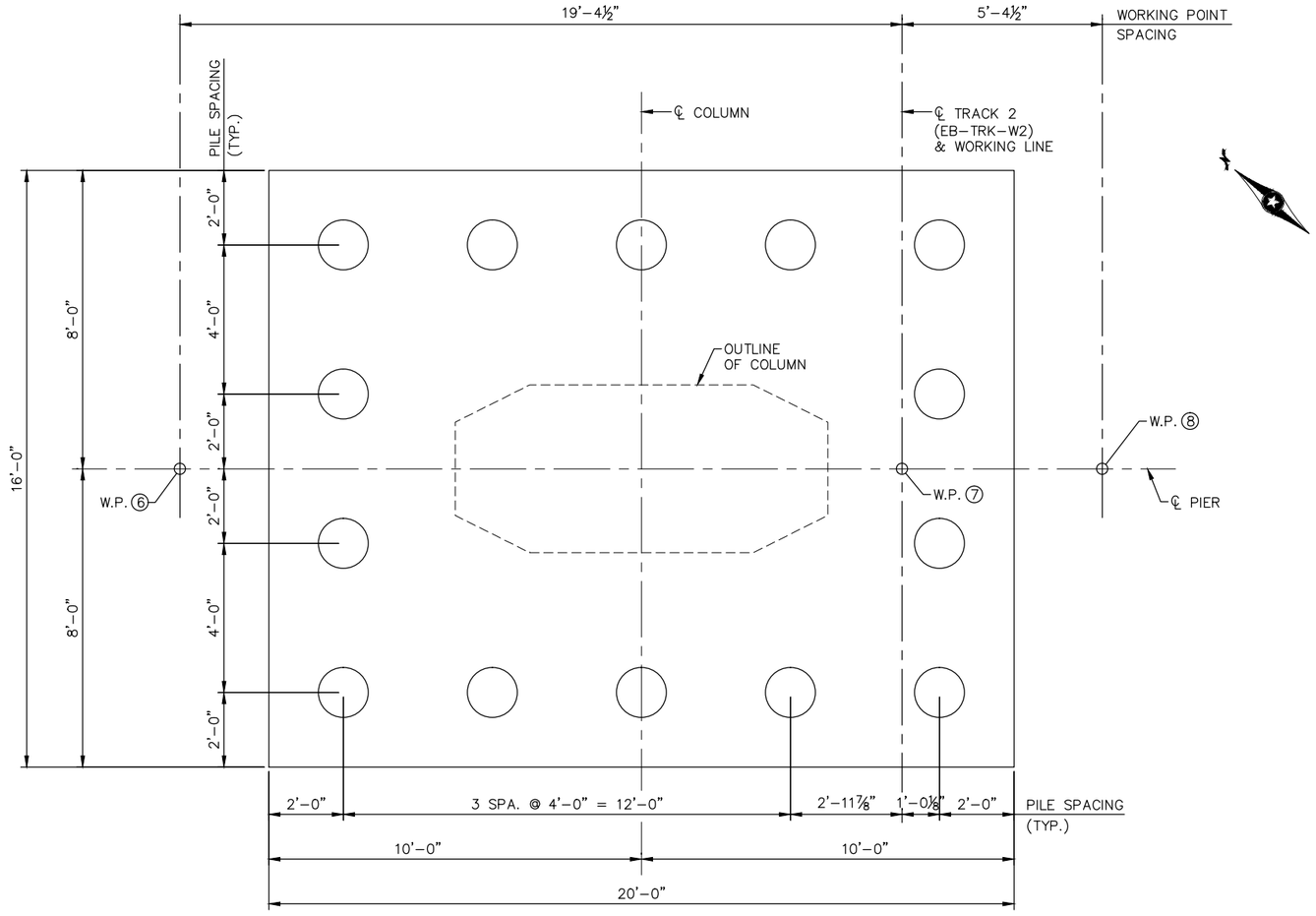
PILE NOTES

2 CAST–IN–PLACE CONC. TEST PILE XX FT. LONG.
12 CAST–IN–PLACE CONC. PILES EST. LENGTH X FT.
14 CAST–IN–PLACE CONC. PILES REQ'D FOR EACH PIER.

PILE SPACING SHOWN IS AT BOTTOM OF FOOTING.

PILES TO HAVE A NOMINAL DIAMETER OF 16".

FOR PILE SPLICE DETAILS SEE DETAIL B201.



FOOTING PLAN

WORKING POINTS TABLE

	WORKING POINT ⑥	WORKING POINT ⑦	WORKING POINT ⑧
PIER 12	"2G"/"3A"	"2P"/"3E"	"2W"/"3J"
PIER 13	"3B"	"3F"	"3K"
PIER 14	"3C"	"3G"	"3L"

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AV | CHECKED BY: DD
DRAWN BY: GF | DATE: 09/07/15

AECOM

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

CIVIL WEST - VOLUME 4B
NINE MILE CREEK
BRIDGE 27C07
PIER 12 THRU 14 FOOTING DETAILS

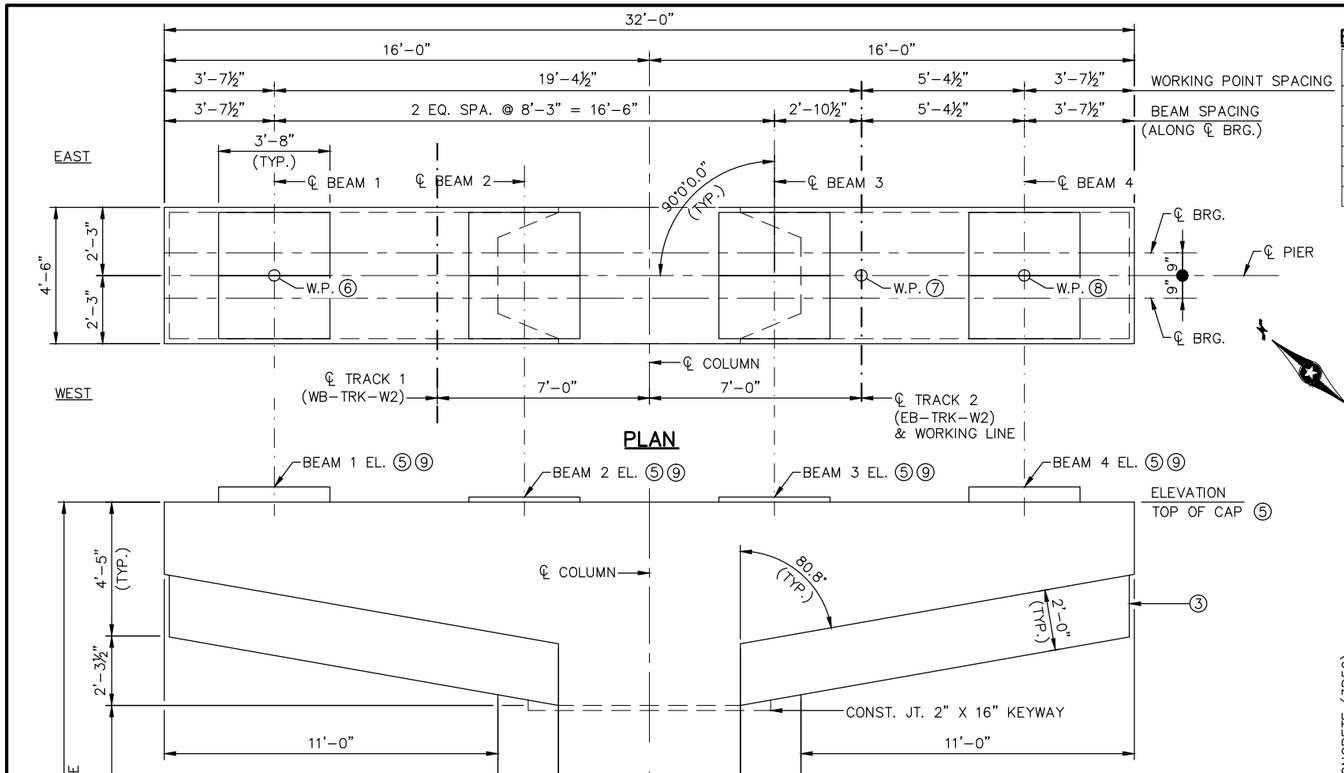
DISCIPLINE: STRUCTURES
SHEET NAME: CBR27C07-BRG-PIR-011

SHEET 34 OF 75

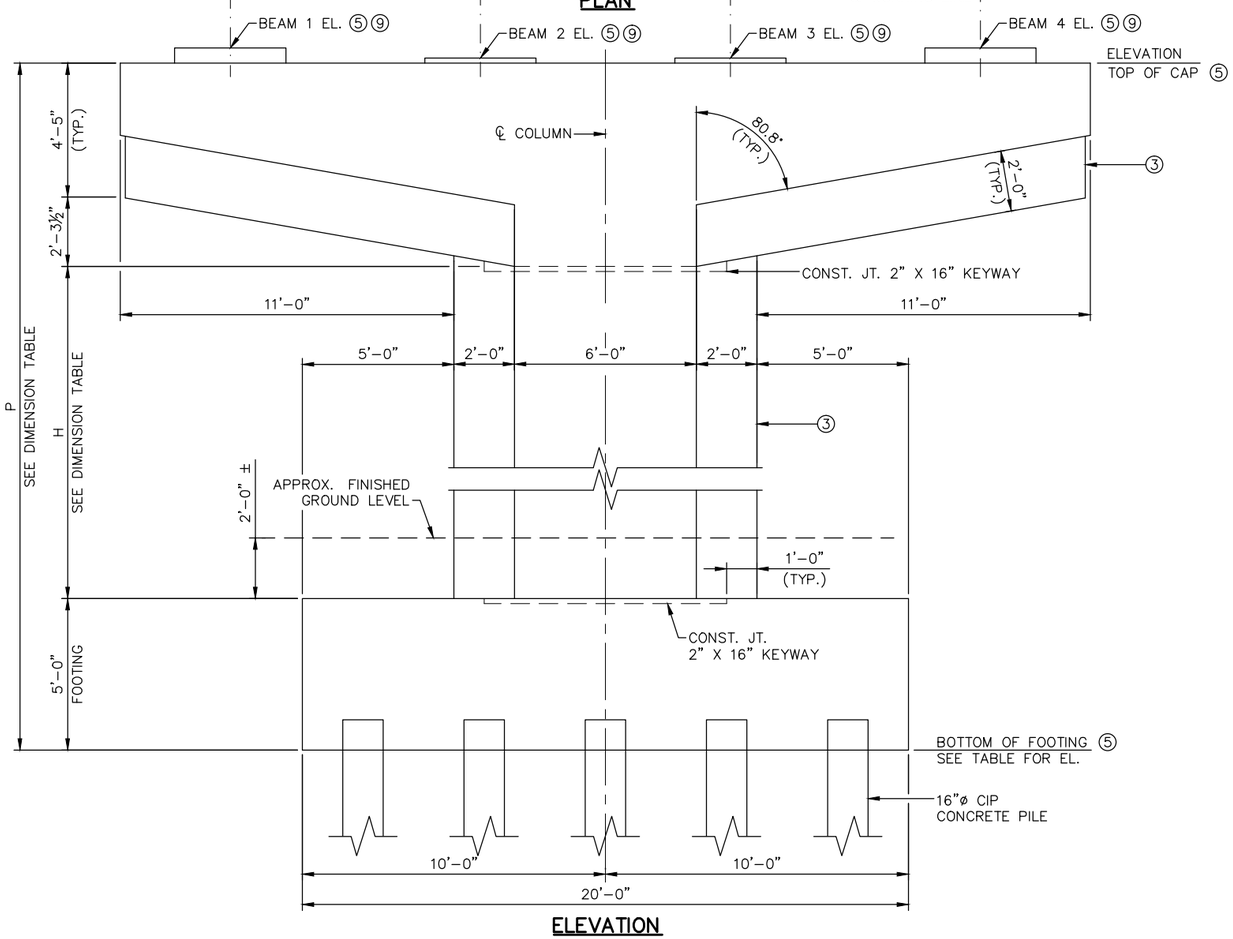
Sep, 18 2015 04:33 pm P:\60336960\3400_ADC\CAD\SEGMENT W2\PLAN SHEETS\STRUCTURES\CBR27C07\CBR27C07-BRG-PIR-011.dwg By: floresg

ELEVATION & DIMENSION TABLE ⑤

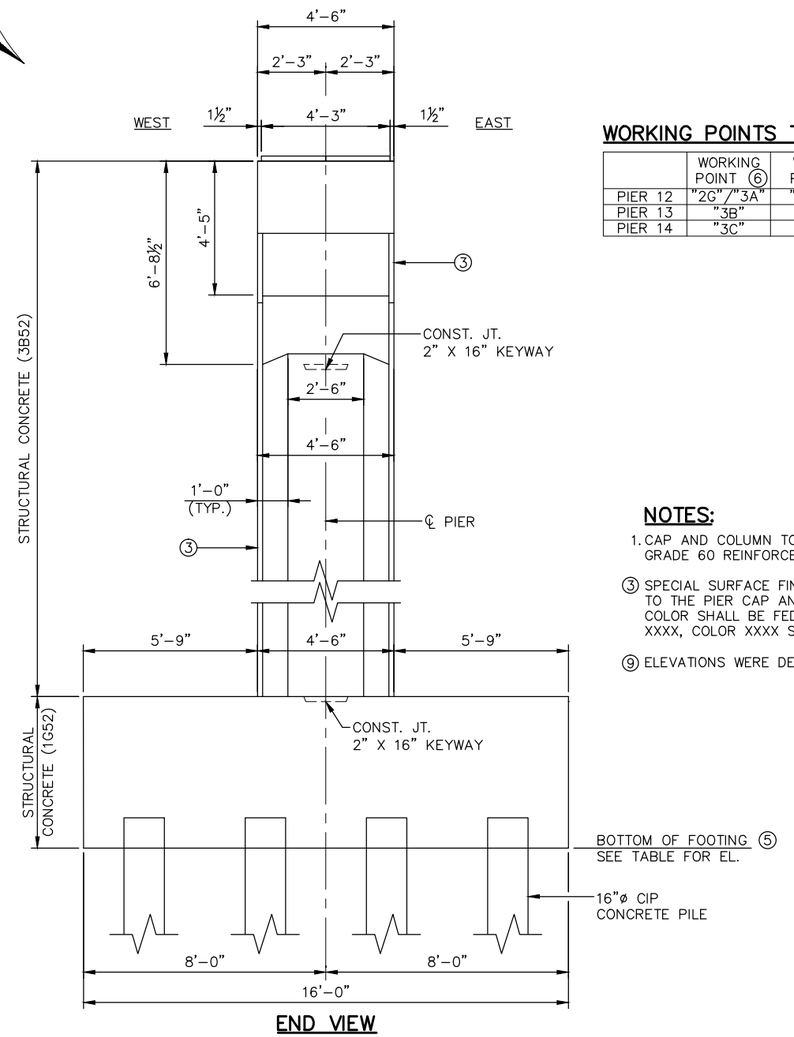
	ELEVATION – BEAM 1	ELEVATION – BEAM 2	ELEVATION – BEAM 3	ELEVATION – BEAM 4	ELEVATION – TOP OF CAP	COLUMN HT. "H"	PIER HT. "P"	ELEV. – BOTTOM OF FOOTING
PIER 12 – WEST SIDE	873.96	873.80	873.80	873.96	873.51	11.25	22.96	850.55
PIER 12 – EAST SIDE	873.84	873.68	873.68	873.84				
PIER 13 – WEST SIDE	872.56	872.40	872.40	872.56	872.21	22.25	33.96	838.25
PIER 13 – EAST SIDE	872.54	872.38	872.38	872.54				
PIER 14 – WEST SIDE	870.99	870.83	870.83	870.99	870.64	20.50	32.21	838.43
PIER 14 – EAST SIDE	870.98	870.81	870.61	870.98				



PLAN



ELEVATION



END VIEW

WORKING POINTS TABLE

	WORKING POINT ⑥	WORKING POINT ⑦	WORKING POINT ⑧
PIER 12	"2G"/"3A"	"2P"/"3E"	"2W"/"3J"
PIER 13	"3B"	"3F"	"3K"
PIER 14	"3C"	"3G"	"3L"

NOTES:

1. CAP AND COLUMN TO BE REINFORCED WITH GRADE 60 REINFORCEMENT BARS.
③ SPECIAL SURFACE FINISH SHALL BE APPLIED TO THE PIER CAP AND COLUMN. COLOR SHALL BE FEDERAL STANDARD COLOR XXXX, COLOR XXXX SEE SPEC. SB 2401.
⑨ ELEVATIONS WERE DETERMINED AT ℄ BRG.

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AV | CHECKED BY: DD
DRAWN BY: GF | DATE: 09/07/15

AECOM

60% SUBMISSION - 09/28/15

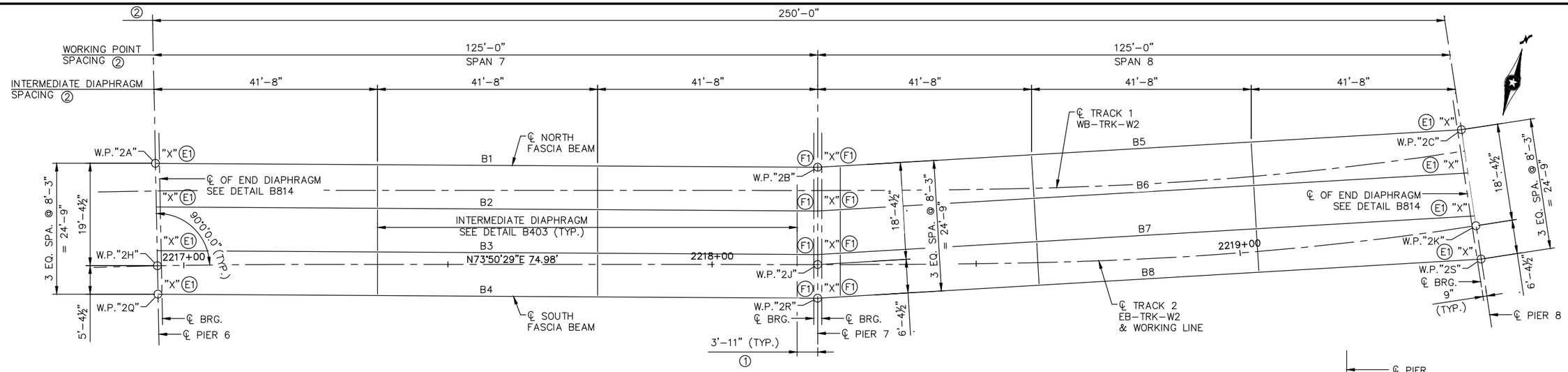
METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

CIVIL WEST - VOLUME 4B
NINE MILE CREEK
BRIDGE 27C07
PIER 12 THRU 14 DETAILS

DISCIPLINE: STRUCTURES
SHEET NAME: CBR27C07-BRG-PIR-012

SHEET 35 OF 75



FRAMING PLAN

ANGLES FROM CL BEAM TANGENT TO CL SUBSTRUCTURE			
BEAM NO.	CL PIER. 6	CL PIER. 7	CL PIER. 8
B1	88°32'13.31"	90°20'44.71"	
B2	88°32'09.02"	90°20'48.89"	
B3	91°27'55.17"	89°39'06.92"	
B4	91°27'59.37"	89°39'02.71"	
B5		93°20'24.92"	95°21'15.88"
B6		93°21'01.68"	95°20'39.12"
B7		86°38'22.29"	84°39'56.91"
B8		86°37'46.98"	84°40'32.23"

BEAM ANGLE TABLE

NOTES:

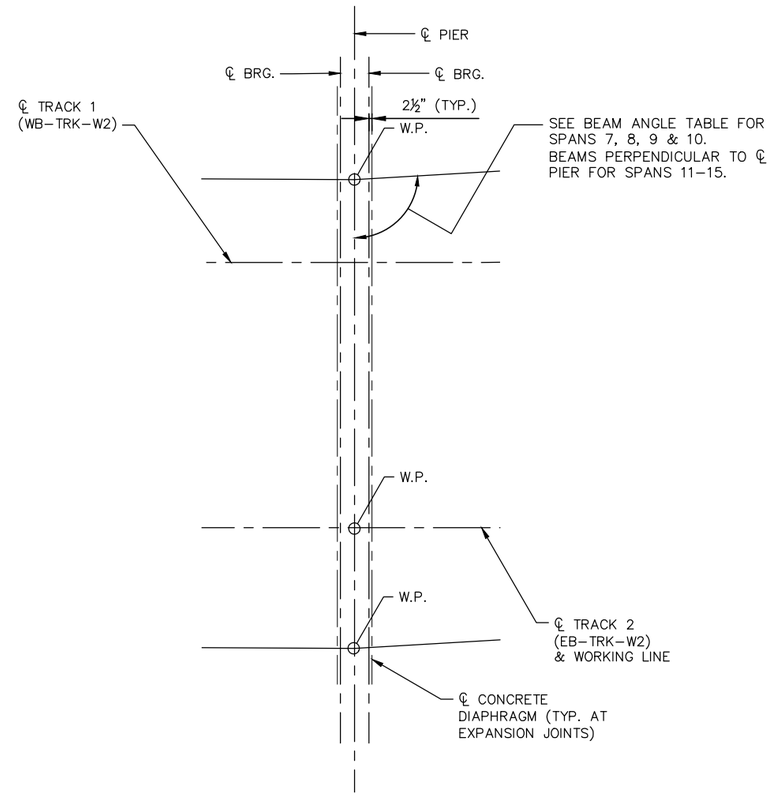
① MEASURED FROM ℄ OF PIER TO ℄ OF DIAPHRAGM. (ALONG BEAM LINE).

② MEASURED ALONG ℄ OF TRACK 2 (℄ EB-TRK-W2).

"X" = MARKS END OF BEAM.

(E1)(E2)(E3) = EXPANSION CURVED PLATE BEARING ASSEMBLY. SEE DETAIL B311.

(F1) = FIXED CURVED PLATE BEARING ASSEMBLY. SEE DETAIL B310.



END DIAPHRAGM DETAIL AT EXPANSION JOINTS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AV | CHECKED BY: DD
DRAWN BY: GF | DATE: 09/07/15

AECOM

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

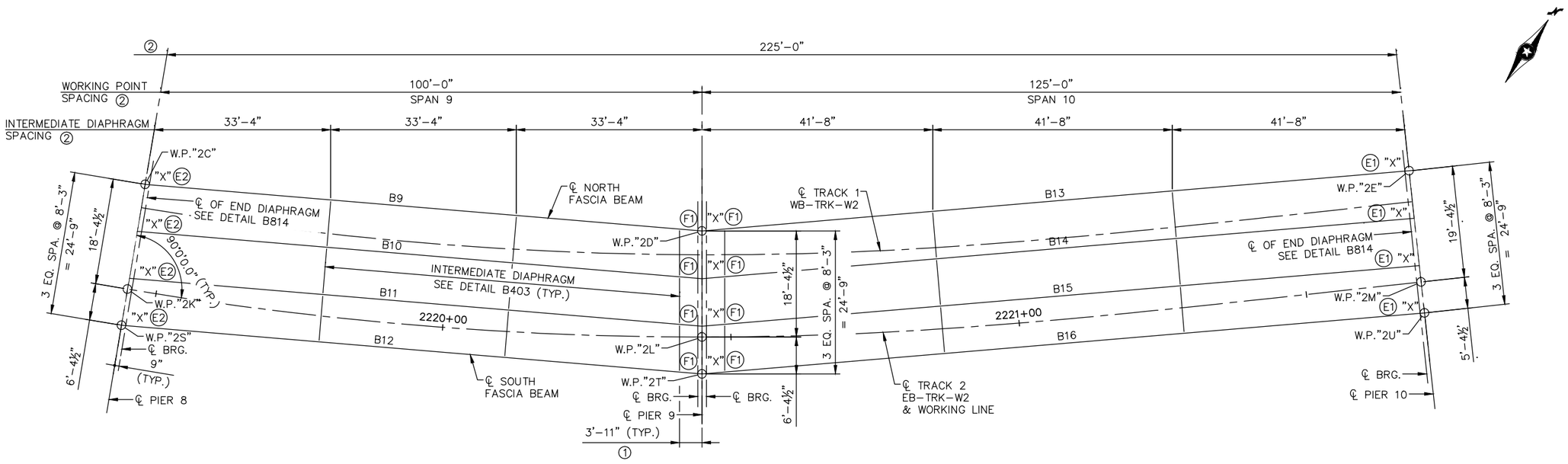
SOUTHWEST Green Line LRT Extension

CIVIL WEST - VOLUME 4B
NINE MILE CREEK
BRIDGE 27C07
FRAMING PLAN 1

DISCIPLINE: STRUCTURES
SHEET NAME: CBR27C07-BRG-SUP-015

SHEET 36 OF 75

Sep. 18 2015 04:34 pm P:\60336960\3400_ADC\CAD\SEGMENT W2\PLAN SHEETS\STRUCTURES\CBR27C07\CBR27C07-BRG-SUP-015.dwg By: floresg



FRAMING PLAN

ANGLES FROM CL BEAM TANGENT TO CL SUBSTRUCTURE			
BEAM NO.	CL PIER. 8	CL PIER. 9	CL PIER. 10
B9	94°46'28.74"	94°46'28.73"	
B10	94°46'28.74"	94°46'28.73"	
B11	85°13'31.26"	85°13'31.27"	
B12	85°13'31.26"	85°13'31.27"	
B13		95°51'44.50"	91°18'55.91"
B14		94°50'58.66"	91°19'41.75"
B15		85°09'46.53"	88°39'33.07"
B16		85°10'31.08"	88°38'48.52"

BEAM ANGLE TABLE

NOTES:

① MEASURED FROM ℄ OF PIER TO ℄ OF DIAPHRAGM. (ALONG BEAM LINE).

② MEASURED ALONG ℄ OF TRACK 2 (℄ EB–TRK–W2).

3. SEE SHEET 36 OF 75 FOR END DIAPHRAGM DETAIL AT EXPANSION JOINTS.

"X" = MARKS END OF BEAM.

(E1)(E2)(E3) = EXPANSION CURVED PLATE BEARING ASSEMBLY. SEE DETAIL B311.

(F1) = FIXED CURVED PLATE BEARING ASSEMBLY. SEE DETAIL B310.

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AV | CHECKED BY: DD
DRAWN BY: GF | DATE: 09/07/15

AECOM

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

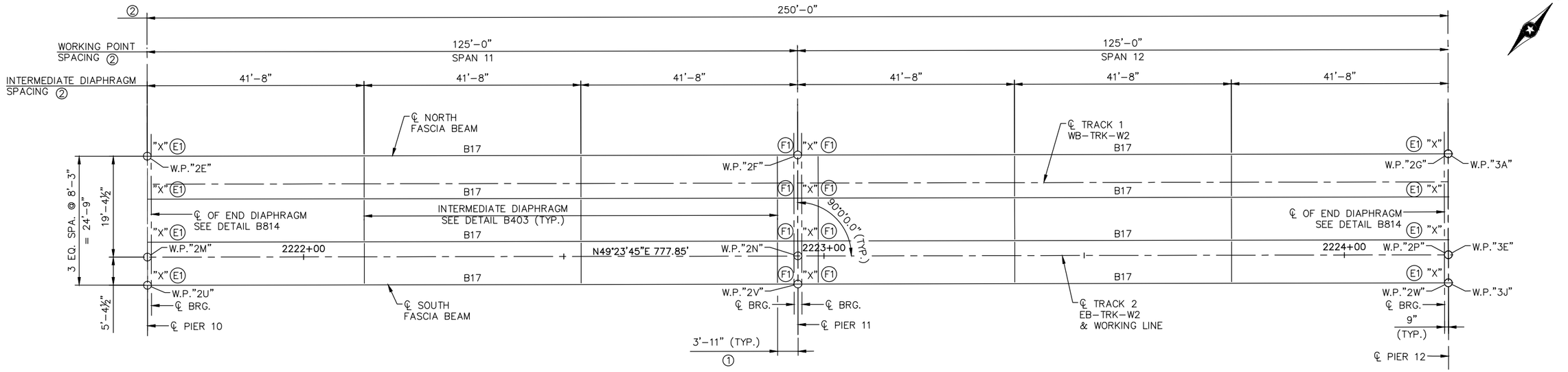
SOUTHWEST Green Line LRT Extension

CIVIL WEST - VOLUME 4B
NINE MILE CREEK
BRIDGE 27C07
FRAMING PLAN 2

DISCIPLINE: STRUCTURES
SHEET NAME: CBR27C07-BRG-SUP-016

SHEET 37 OF 75

Sep. 18 2015 04:34 pm P:\60336960\3400_ADC\CAD\SEGMENT W2\PLAN SHEETS\STRUCTURES\CBR27C07\CBR27C07-BRG-SUP-016.dwg By: floresg



FRAMING PLAN

NOTES:

① MEASURED FROM ℄ OF PIER TO ℄ OF DIAPHRAGM. (ALONG BEAM LINE).

② MEASURED ALONG ℄ OF TRACK 2 (℄ EB-TRK-W2).

3. SEE SHEET 36 OF 75 FOR END DIAPHRAGM DETAIL AT EXPANSION JOINTS.

"X" = MARKS END OF BEAM.

(E1)(E2)(E3) = EXPANSION CURVED PLATE BEARING ASSEMBLY. SEE DETAIL B311.

(F1) = FIXED CURVED PLATE BEARING ASSEMBLY. SEE DETAIL B310.

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AV | CHECKED BY: DD
DRAWN BY: GF | DATE: 09/07/15

AECOM

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

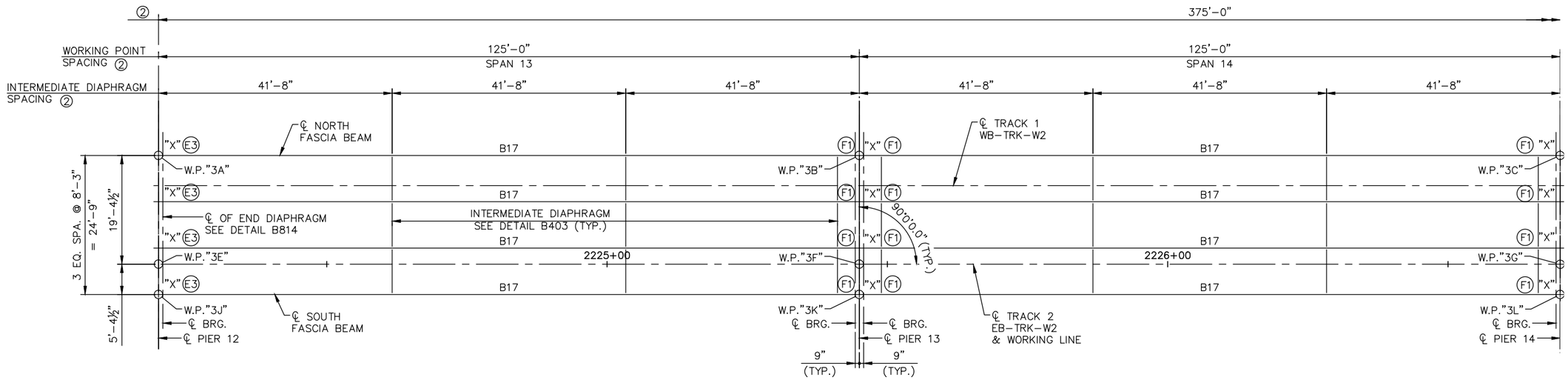
SOUTHWEST Green Line LRT Extension

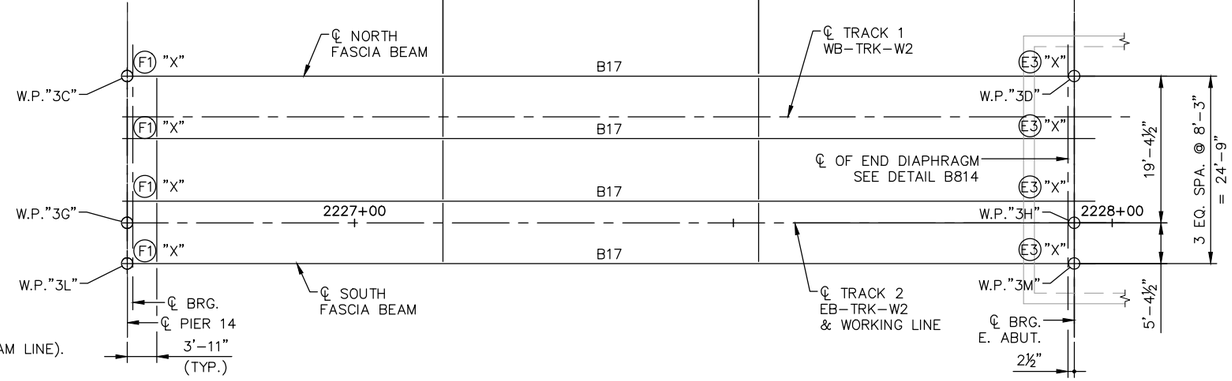
CIVIL WEST - VOLUME 4B
NINE MILE CREEK
BRIDGE 27C07
FRAMING PLAN 3

DISCIPLINE: STRUCTURES
SHEET NAME: CBR27C07-BRG-SUP-017

SHEET 38 OF 75

Sep, 18 2015 04:34 pm P:\60336960\3400_ADC\CAD\SEGMENT W2\PLAN SHEETS\STRUCTURES\CBR27C07\CBR27C07-BRG-SUP-017.dwg By: floresg





NOTES:

① MEASURED FROM ℄ OF PIER TO ℄ OF DIAPHRAGM. (ALONG BEAM LINE).

② MEASURED ALONG ℄ OF TRACK 2 (℄ EB-TRK-W2).

3. SEE SHEET 36 OF 75 FOR END DIAPHRAGM DETAIL AT EXPANSION JOINTS.

"X" = MARKS END OF BEAM.

(E1)(E2)(E3) = EXPANSION CURVED PLATE BEARING ASSEMBLY. SEE DETAIL B311.

(F1) = FIXED CURVED PLATE BEARING ASSEMBLY. SEE DETAIL B310.

FRAMING PLAN

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AV | CHECKED BY: DD
DRAWN BY: GF | DATE: 09/07/15

AECOM

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

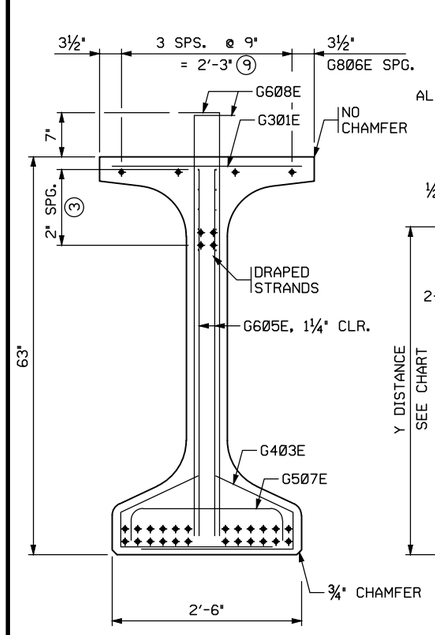
SOUTHWEST Green Line LRT Extension

CIVIL WEST - VOLUME 4B
NINE MILE CREEK
BRIDGE 27C07
FRAMING PLAN 4

DISCIPLINE: STRUCTURES
SHEET NAME: CBR27C07-BRG-SUP-018

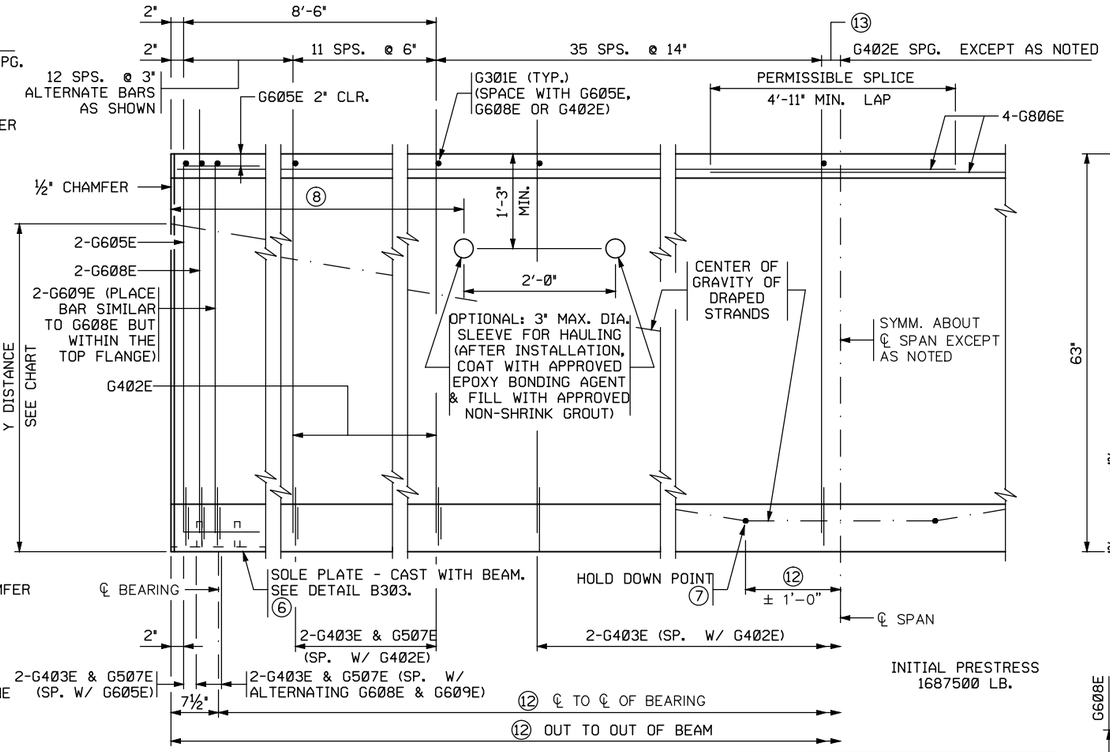
SHEET 39 OF 75

Sep. 18 2015 04:35 pm P:\60336960\3400_ADC\CAD\SEGMENT W2\PLAN SHEETS\STRUCTURES\CBR27C07\CBR27C07-BRG-SUP-018.dwg By: floresg



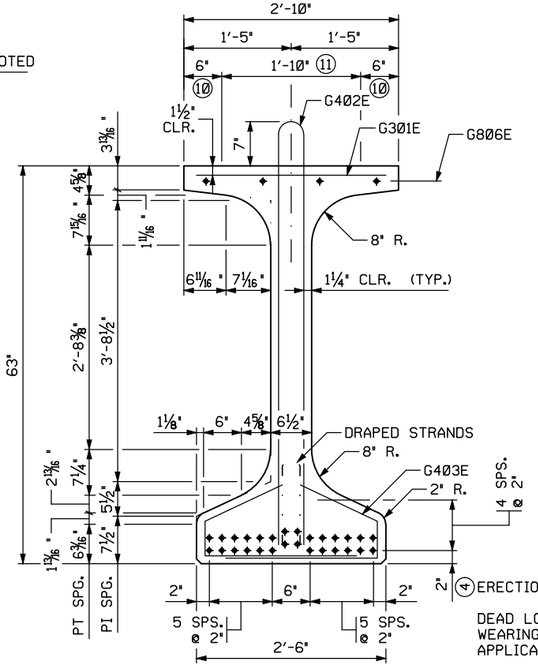
END VIEW

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



BEAM ELEVATION

INITIAL PRESTRESS 1687500 LB.

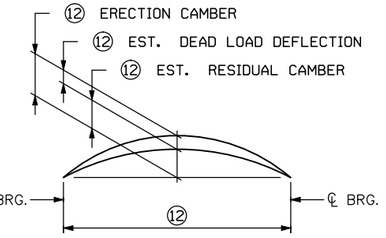


SECTION AT ℄ SPAN

Y DISTANCES (INCHES)	NO.	℄ SPAN	END
STRAIGHT STRANDS	24	3	☒
DRAPED STRANDS	4	4	49 □
TOTAL STRANDS	28	3.14	☒

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

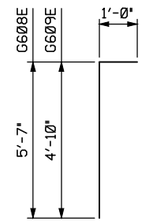


CAMBER DIAGRAM

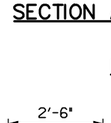
④ ERECTION CAMBER SHOWN IS AFTER DIAPHRAGMS ARE IN PLACE.

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

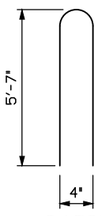
CONTRACTOR WILL TAKE ELEVATIONS AT TOP OF BEAMS AFTER ERECTION AND WILL ALLOW FOR DEFLECTION SHOWN TO ENABLE BUILDING FORMS TO CORRECT GRADE AND SPECIFIED SLAB THICKNESS. PROVIDE COPY OF ELEVATIONS TO THE ENGINEER.



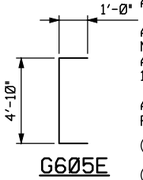
G608E & G609E



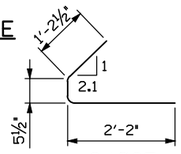
G301E



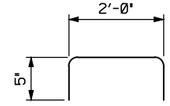
G402E



G605E



G403E



G507E

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 ⑫ 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 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.

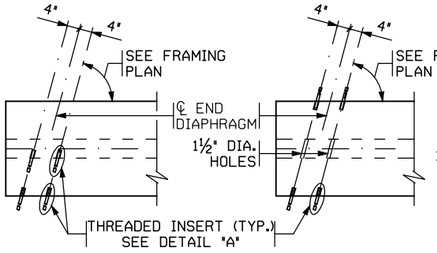
⑧ DIMENSION DETERMINED BY CONTRACTOR. MAINTAIN 2" MINIMUM CLEAR FROM STRANDS.

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

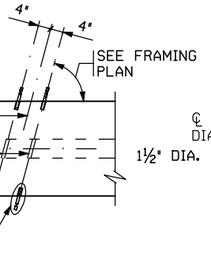
⑩ STEEL TROWEL TO SMOOTH FINISH AND APPLY BOND BREAKER PER APPROVED PRODUCTS LIST.

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

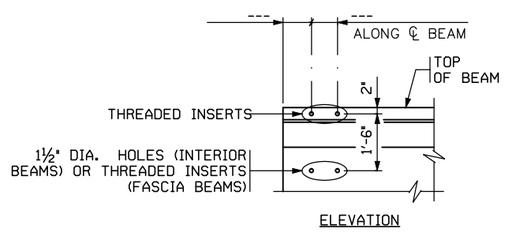
⑫ ⑬ SEE TABLE ON SHEET 42



PLAN AT FASCIA BEAMS



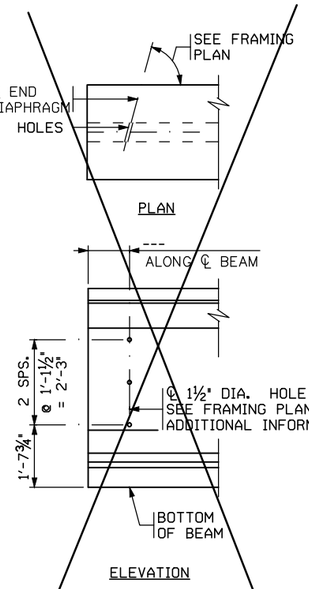
PLAN AT INTERIOR BEAMS



ELEVATION

CONCRETE END DIAPHRAGM

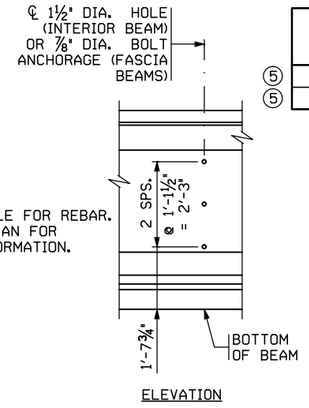
PARAPET ABUTMENT
(SEE DETAIL B814 FOR DIAPHRAGM DETAILS)



ELEVATION

CONCRETE END DIAPHRAGM

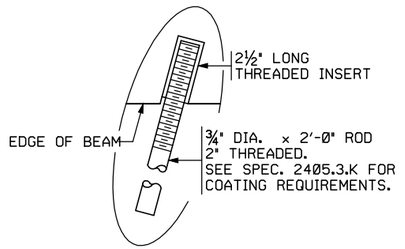
SEE SUPERSTRUCTURE DETAILS AND REINFORCEMENT FOR DIAPHRAGM DETAILS.



ELEVATION

STEEL INTERMEDIATE DIAPHRAGM

(SEE DETAIL B403 FOR DIAPHRAGM DETAILS)



DETAIL "A"

CALCULATED PRESTRESS LOSSES	
ELASTIC SHORTENING LOSS	⑫ KSI
LONG TERM LOSSES	⑫ KSI
TOTAL LOSSES	⑫ KSI

MINIMUM CONCRETE STRENGTH - K.S.I.	
① f'_{ci}	② f'_c
7.5 KSI	9 KSI

PRESTRESSING STRAND DIAMETER	
⑤	½" □
⑤	0.60" ☒

REVISED:

APPROVED: JANUARY 13, 2015
Nancy Daubenberger
STATE BRIDGE ENGINEER

CERTIFIED BY _____ LICENSED PROFESSIONAL ENGINEER _____ DATE
NAME: _____ LIC. NO. _____

TITLE: MN63" PRESTRESSED CONCRETE BEAM 1 (PRETENSIONED) MN63-100

DES:	AV	DR:	GF
CHK:	DD	CHK:	DD

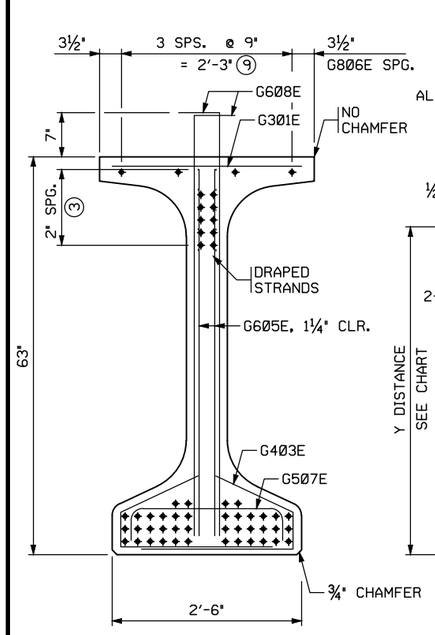
APPROVED:

SHEET NO. 40 OF 75 SHEETS

BEAMS B9-B12

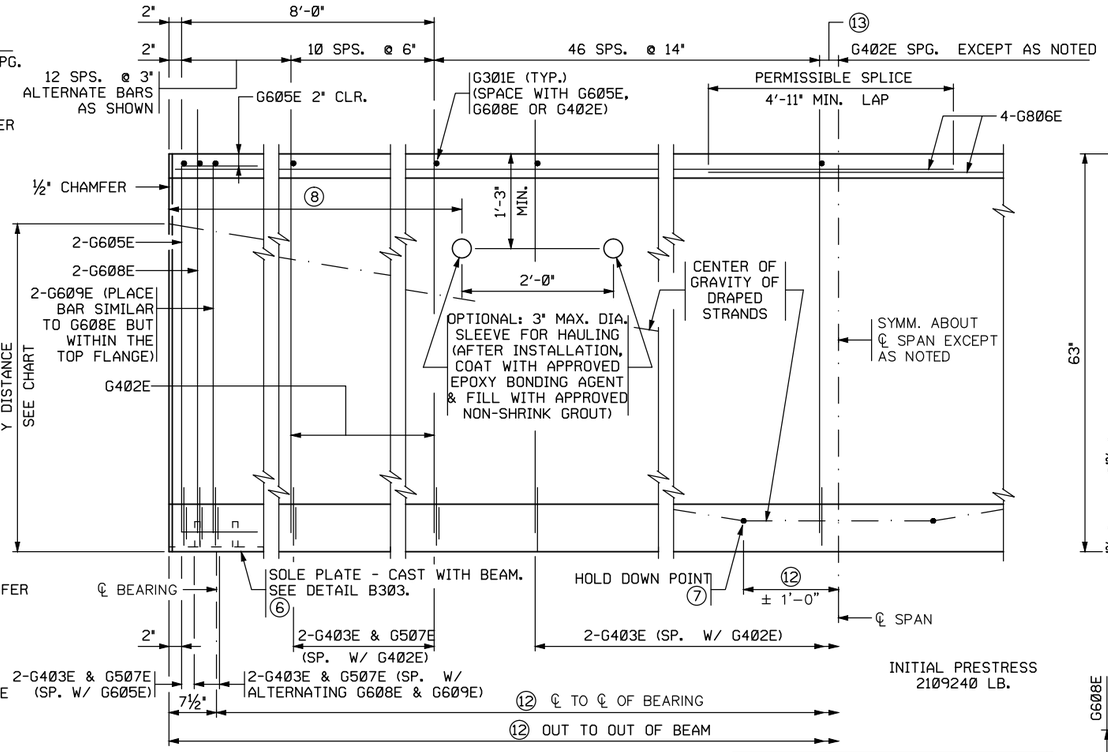
FIG. 5-397.509

BRIDGE NO. 27C07



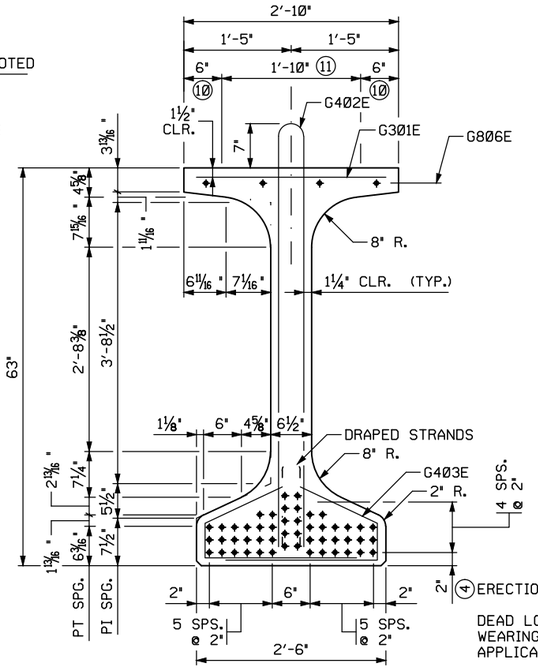
END VIEW

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



BEAM ELEVATION

INITIAL PRESTRESS 2109240 LB.



SECTION AT ℄ SPAN

④ ERECTION CAMBER SHOWN IS AFTER DIAPHRAGMS ARE IN PLACE.

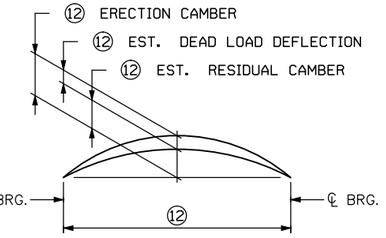
DEAD LOAD DEFLECTION SHOWN IS FOR WEIGHT OF SLAB, WEARING COURSE, BARRIER, SIDEWALK AND MEDIAN WHERE APPLICABLE.

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.

Y DISTANCES (INCHES)			
	NO.	℄ SPAN	END
STRAIGHT STRANDS	40	4.4	☒
DRAPED STRANDS	10	7	52 □
TOTAL STRANDS	50	4.92	☒

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

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 ⑫ 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 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.

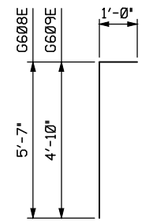
⑧ DIMENSION DETERMINED BY CONTRACTOR. MAINTAIN 2" MINIMUM CLEAR FROM STRANDS.

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

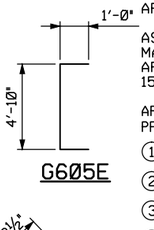
⑩ STEEL TROWEL TO SMOOTH FINISH AND APPLY BOND BREAKER PER APPROVED PRODUCTS LIST.

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

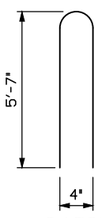
⑫ ⑬ SEE TABLE ON SHEET 42



G608E & G609E

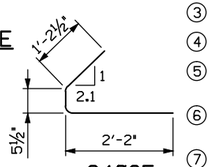


G301E

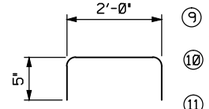


G402E

G605E



G403E

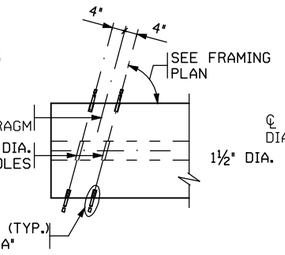


G507E

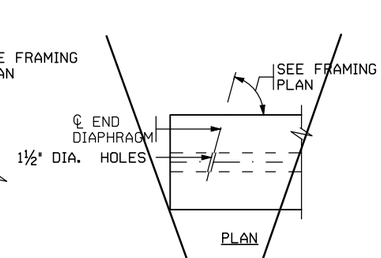
CALCULATED PRESTRESS LOSSES	
ELASTIC SHORTENING LOSS	⑫ KSI
LONG TERM LOSSES	⑫ KSI
TOTAL LOSSES	⑫ KSI

MINIMUM CONCRETE STRENGTH - K.S.I.	
① f'_{ci}	② f'_c
7.5 KSI	9 KSI

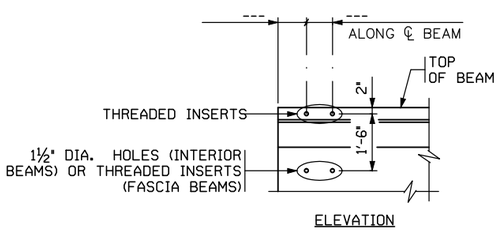
PRESTRESSING STRAND DIAMETER	
⑤	½" □
⑤	0.60" ☒



PLAN AT FASCIA BEAMS



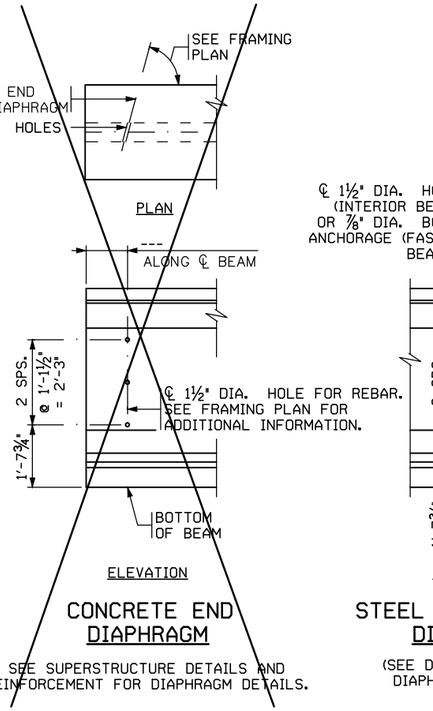
PLAN AT INTERIOR BEAMS



ELEVATION

CONCRETE END DIAPHRAGM

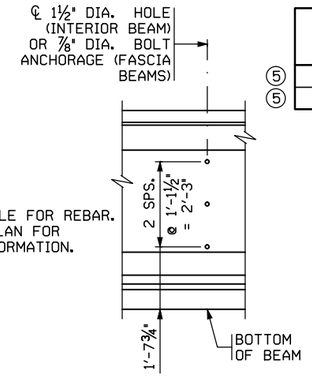
PARAPET ABUTMENT
(SEE DETAIL B814 FOR DIAPHRAGM DETAILS)



ELEVATION

CONCRETE END DIAPHRAGM

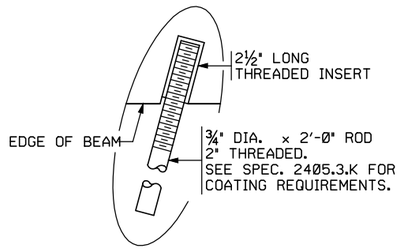
SEE SUPERSTRUCTURE DETAILS AND REINFORCEMENT FOR DIAPHRAGM DETAILS.



ELEVATION

STEEL INTERMEDIATE DIAPHRAGM

(SEE DETAIL B403 FOR DIAPHRAGM DETAILS)



DETAIL "A"

REVISED:

APPROVED: JANUARY 13, 2015
Nancy Dorbenberger
STATE BRIDGE ENGINEER

CERTIFIED BY _____ LICENSED PROFESSIONAL ENGINEER _____ DATE
NAME: _____ LIC. NO. _____

TITLE: MN63" PRESTRESSED CONCRETE BEAM 2 (PRETENSIONED) MN63-125

DES: AV	DR: GF	APPROVED:
CHK: DD	CHK: DD	

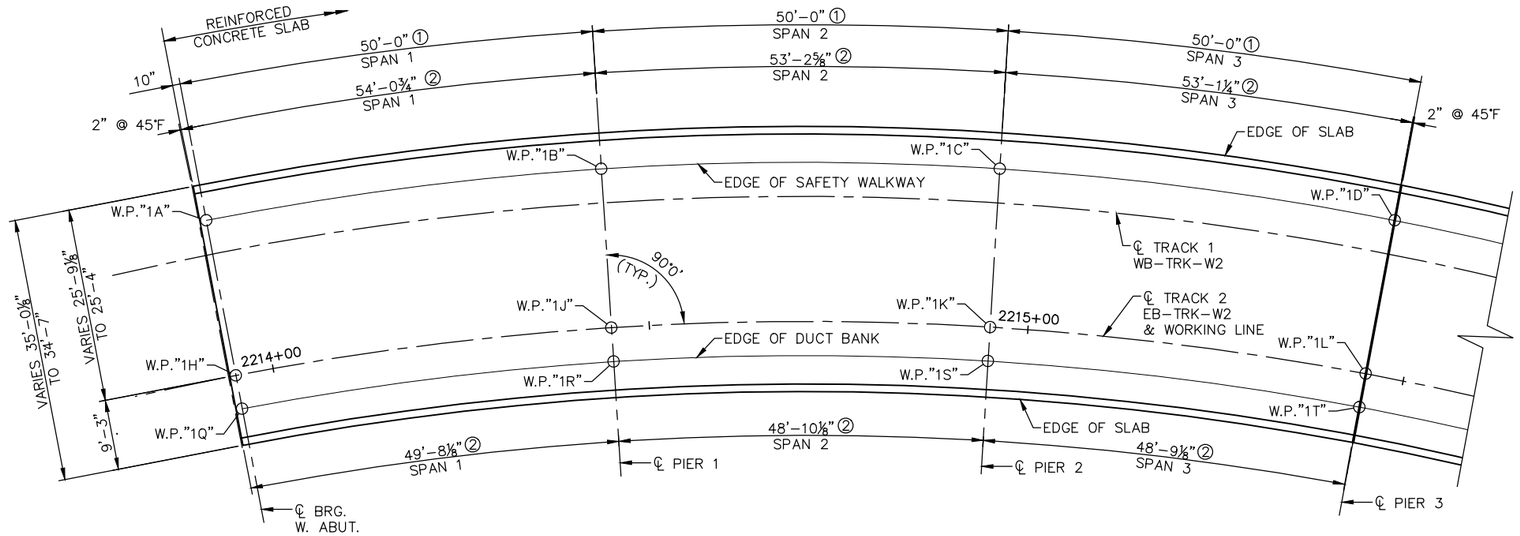
SHEET NO. 41 OF 75 SHEETS

BEAMS B1-B8,B13-B17

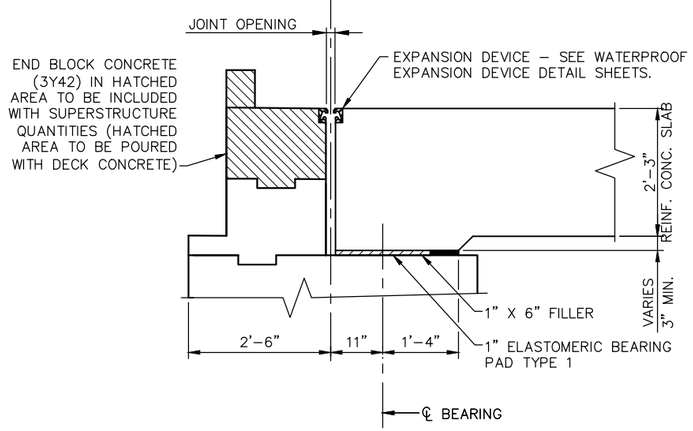
FIG. 5-397.509

BRIDGE NO. 27C07

PRESTRESSED BEAM INFORMATION (12)						CALCULATED PRESTRESSED LOSSES (12)			CAMBER (12)				(13)
SPAN	BEAM NO.	CL TO CL OF BRG. (FT)	OUT TO OUT OF BEAM (FT)	WEIGHT (TONS)	HOLD DOWN POINT (FT)	EALSTIC SHORTENING LOSS (KSI)	LONG TERM LOSSES (KSI)	TOTAL LOSSES (KSI)	INITIAL TOTAL CAMBER (IN)	EST. DEAD LOAD DEFLECTION (IN)	EST. RESIDUAL CAMBER (IN)	STIRRUP SPACING (12)	GIRDER DIMENSION
7	B1	123.878	125.128	49.32	12.51	24.8	26.8	51.7	4 5/8"	3 1/2"	1 1/8"	54 SPS. @ 1'-0" = 54'-0"	4 3/4"
	B2	123.717	124.967	49.26	12.50	24.8	26.8	51.7	4 5/8"	3 1/2"	1 1/8"	54 SPS. @ 1'-0" = 54'-0"	3 13/16"
	B3	123.557	124.807	49.20	12.48	24.8	26.8	51.7	4 5/8"	3 1/2"	1 1/8"	54 SPS. @ 1'-0" = 54'-0"	2 13/16"
	B4	123.396	124.646	49.13	12.46	24.8	26.8	51.7	4 5/8"	3 1/2"	1 1/8"	54 SPS. @ 1'-0" = 54'-0"	1 7/8"
8	B5	120.575	121.825	48.02	12.18	24.8	26.8	51.7	4 5/8"	3 1/2"	1 1/8"	52 SPS. @ 1'-0" = 52'-0"	8 15/16"
	B6	121.825	123.075	48.51	12.31	24.8	26.8	51.7	4 5/8"	3 1/2"	1 1/8"	53 SPS. @ 1'-0" = 53'-0"	4 7/16"
	B7	123.076	124.326	49.01	12.43	24.8	26.8	51.7	4 5/8"	3 1/2"	1 1/8"	53 SPS. @ 1'-0" = 53'-0"	11 15/16"
	B8	124.327	125.577	49.50	12.56	24.8	26.8	51.7	4 5/8"	3 1/2"	1 1/8"	54 SPS. @ 1'-0" = 54'-0"	7 7/16"
9	B9	95.325	96.575	38.07	9.66	24.8	26.8	51.7	4 5/8"	3 1/2"	1 1/8"	39 SPS. @ 1'-0" = 39'-0"	4 7/16"
	B10	94.698	95.948	37.82	9.59	24.8	26.8	51.7	4 5/8"	3 1/2"	1 1/8"	39 SPS. @ 1'-0" = 39'-0"	11/16"
	B11	98.072	99.322	39.15	9.93	24.8	26.8	51.7	4 5/8"	3 1/2"	1 1/8"	40 SPS. @ 1'-0" = 40'-0"	8 15/16"
	B12	99.445	100.695	39.69	10.07	24.8	26.8	51.7	4 5/8"	3 1/2"	1 1/8"	41 SPS. @ 1'-0" = 41'-0"	5 3/16"
10	B13	121.424	122.674	48.35	12.27	24.8	26.8	51.7	4 5/8"	3 1/2"	1 1/8"	53 SPS. @ 1'-0" = 53'-0"	2 1/16"
	B14	122.312	123.562	48.70	12.36	24.8	26.8	51.7	4 5/8"	3 1/2"	1 1/8"	53 SPS. @ 1'-0" = 53'-0"	7 3/8"
	B15	123.201	124.451	49.06	12.45	24.8	26.8	51.7	4 5/8"	3 1/2"	1 1/8"	54 SPS. @ 1'-0" = 54'-0"	11/16"
	B16	124.089	125.339	49.41	12.53	24.8	26.8	51.7	4 5/8"	3 1/2"	1 1/8"	54 SPS. @ 1'-0" = 54'-0"	6 1/16"
11 TO 15	B17	123.500	124.750	49.17	12.48	24.8	26.8	51.7	4 5/8"	3 1/2"	1 1/8"	54 SPS. @ 1'-0" = 54'-0"	2 1/2"
	B17	123.500	124.750	49.17	12.48	24.8	26.8	51.7	4 5/8"	3 1/2"	1 1/8"	54 SPS. @ 1'-0" = 54'-0"	2 1/2"
	B17	123.500	124.750	49.17	12.48	24.8	26.8	51.7	4 5/8"	3 1/2"	1 1/8"	54 SPS. @ 1'-0" = 54'-0"	2 1/2"
	B17	123.500	124.750	49.17	12.48	24.8	26.8	51.7	4 5/8"	3 1/2"	1 1/8"	54 SPS. @ 1'-0" = 54'-0"	2 1/2"



PARTIAL SLAB PLAN – SPANS 1–3



SECTION THRU WEST ABUTMENT

NOTES:

① MEASURED ALONG ℄ TRACK 2 (℄ EB–TRK–W2 & WORKING LINE).

② MEASURE ALONG EDGE OF SLAB.

3. SEE SHEET 6 OF 75 FOR TRANSVERSE SECTION.

4. SEE SHEET 44 OF 75 FOR SECTIONS THRU PIERS.

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AV | CHECKED BY: DD
DRAWN BY: GF | DATE: 09/07/15

AECOM

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

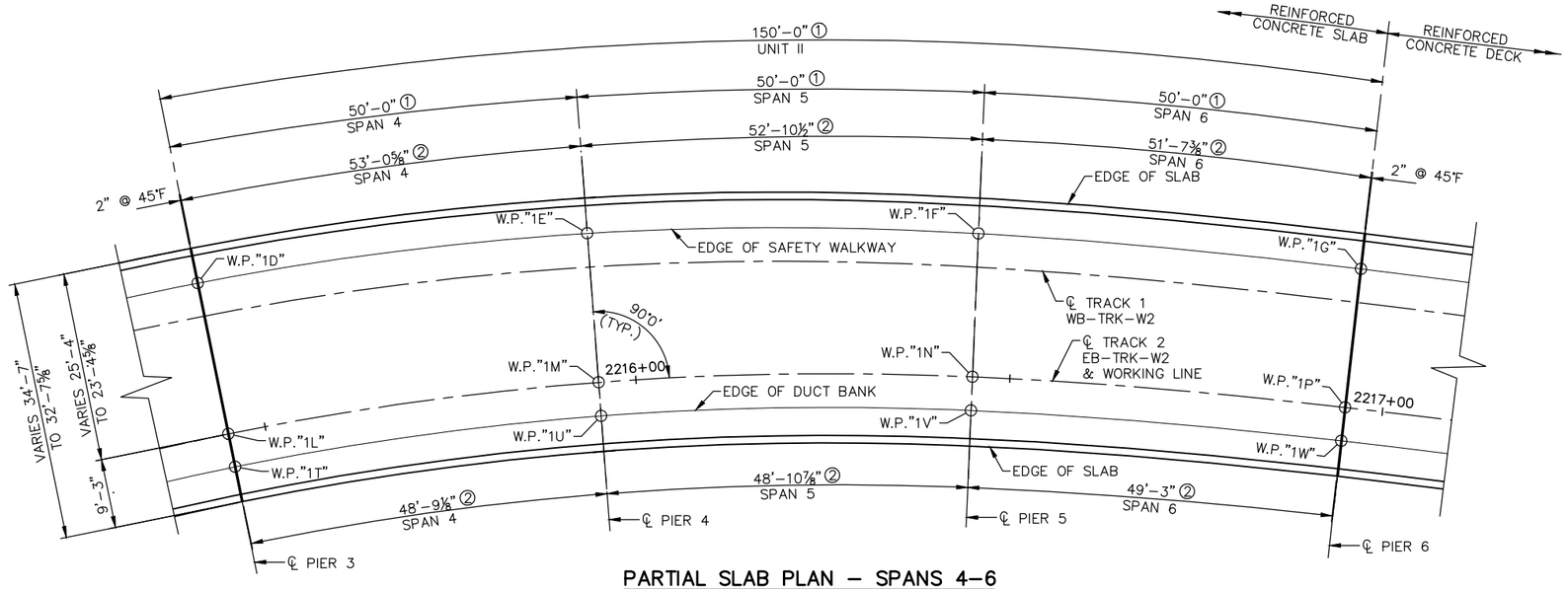
SOUTHWEST Green Line LRT Extension

CIVIL WEST - VOLUME 4B
NINE MILE CREEK
BRIDGE 27C07
SUPERST. DET. SLAB SPAN - SPANS 1-6 (1)

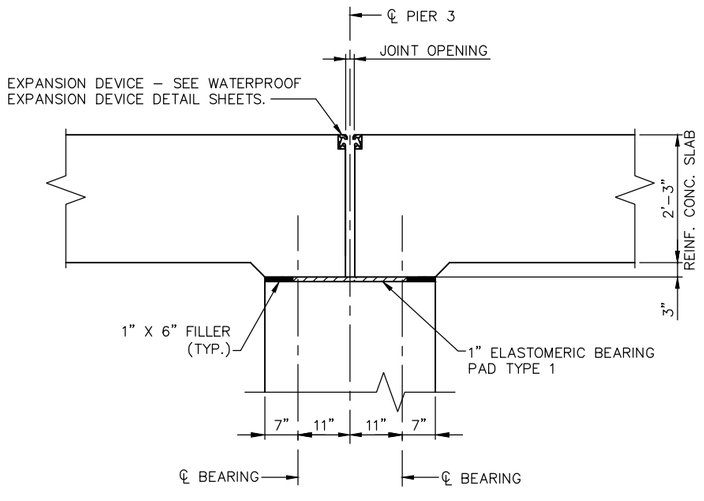
DISCIPLINE: STRUCTURES
SHEET NAME: CBR27C07-BRG-SUP-001

SHEET 43 OF 75

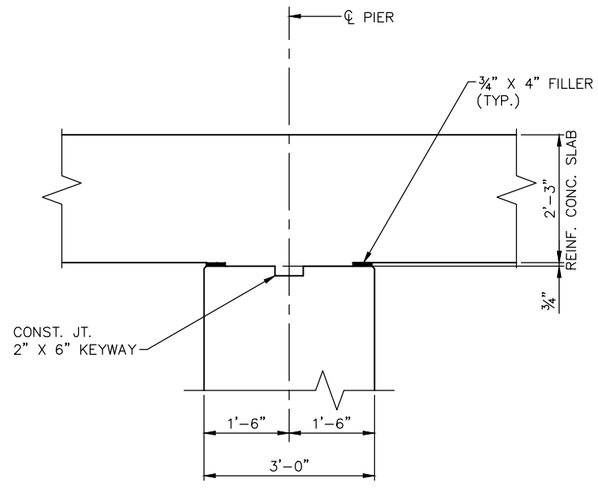
Sep, 18 2015 04:35 pm P:\60336960\3400_ADC\CAD\SEGMENT W2\PLAN SHEETS\STRUCTURES\CBR27C07\CBR27C07-BRG-SUP-001.dwg By: floresg



PARTIAL SLAB PLAN – SPANS 4–6



SECTION THRU PIER 3



SECTION THRU PIER 1

(PIER 1 SHOWN, PIERS 2, 4 & 5 SIMILAR)

NOTES:

① MEASURED ALONG ℄ TRACK 2 (℄ EB–TRK–W2 & WORKING LINE).

② MEASURE ALONG EDGE OF SLAB.

3. SEE SHEET 6 OF 75 FOR TRANSVERSE SECTION.

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AV | CHECKED BY: DD
DRAWN BY: GF | DATE: 09/07/15

AECOM

60% SUBMISSION - 09/28/15

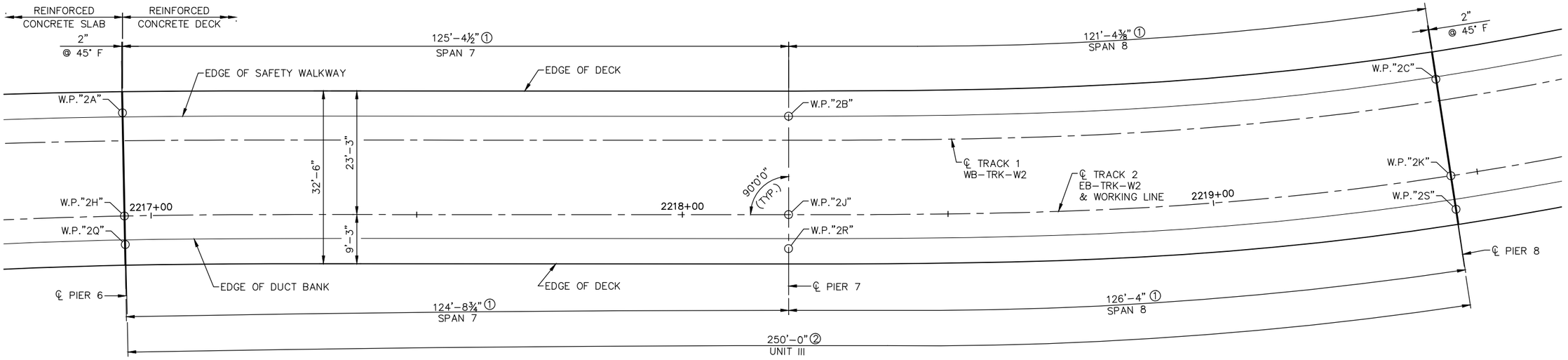
METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

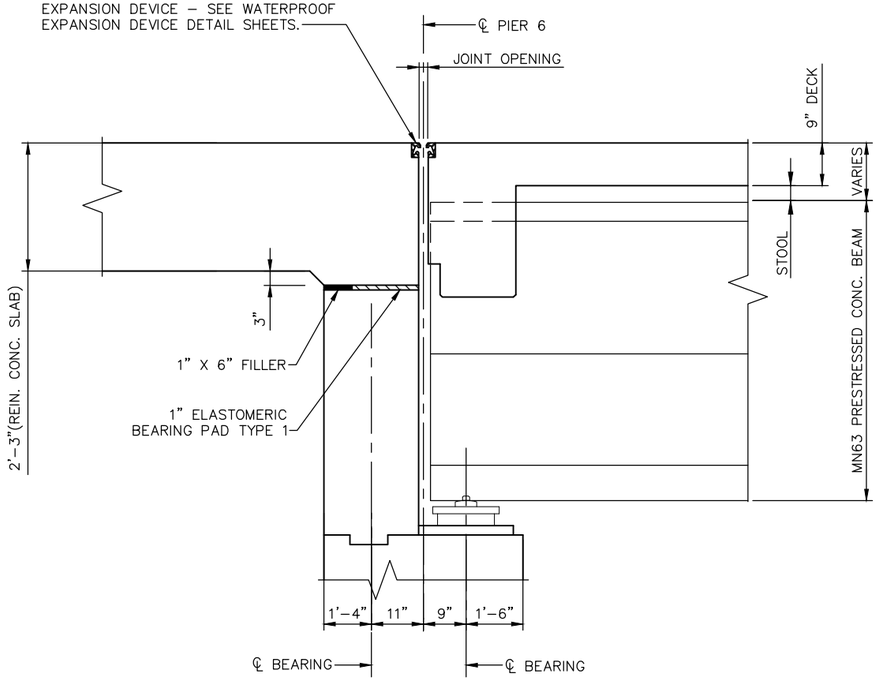
CIVIL WEST - VOLUME 4B
NINE MILE CREEK
BRIDGE 27C07
SUPERST. DET. SLAB SPAN - SPANS 1-6 (2)

DISCIPLINE: STRUCTURES
SHEET NAME: CBR27C07-BRG-SUP-002

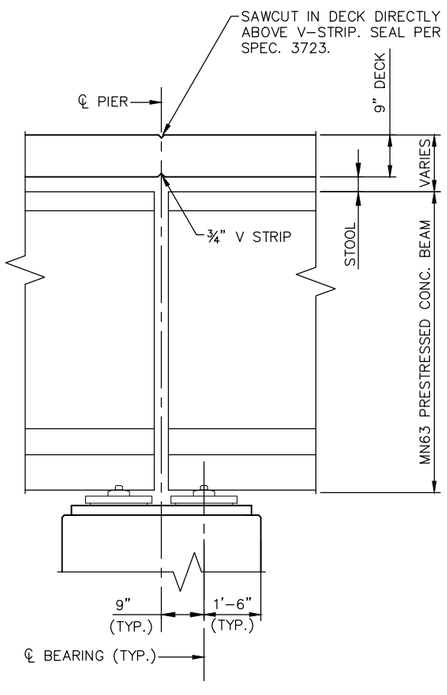
SHEET 44 OF 75



PARTIAL DECK PLAN – SPANS 7 & 8



SECTION THRU TRANSITION PIER 6 (EXPANSION)



SECTION THRU PIER 7 (FIXED)

(PIERS 9, 11 13, & 14 SIMILAR)

NOTES:

① MEASURED ALONG EDGE OF DECK.

② MEASURED ALONG ℄ TRACK 2 (EB-TRK-W2) & WORKING LINE.

3. SEE SHEET 6 OF 75 FOR TRANSVERSE SECTION.

4. SEE SHEET 46 OF 75 FOR SECTION THRU EXPANSION PIER.

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AV | CHECKED BY: DD
DRAWN BY: GF | DATE: 09/07/15

AECOM

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

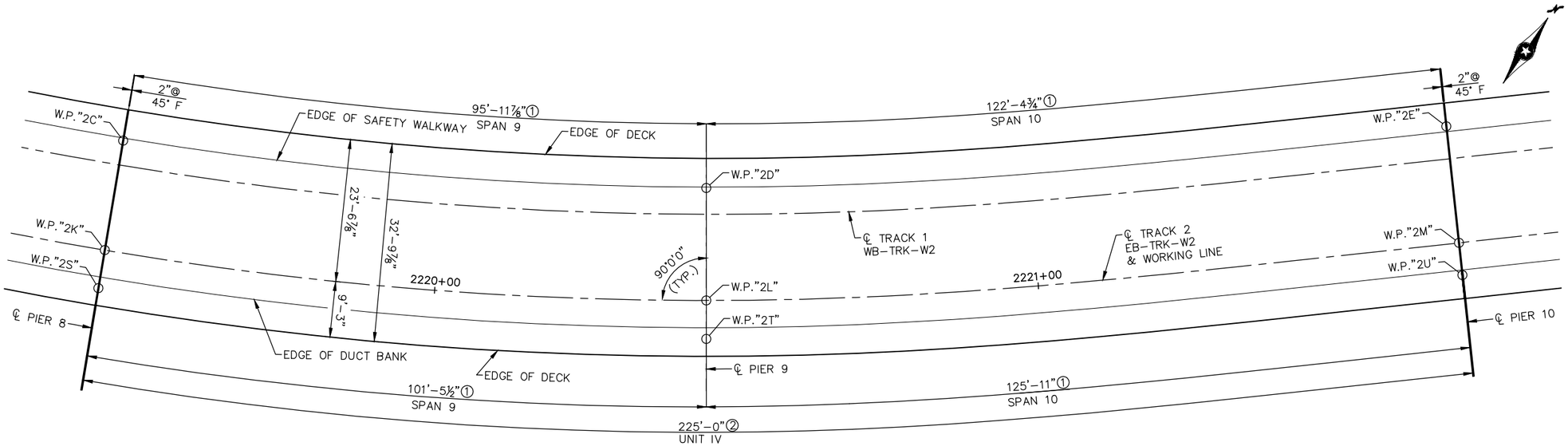
SOUTHWEST Green Line LRT Extension

CIVIL WEST - VOLUME 4B
NINE MILE CREEK
BRIDGE 27C07
SUPERSTRUCTURE DETAILS-SPANS 7-15 (1)

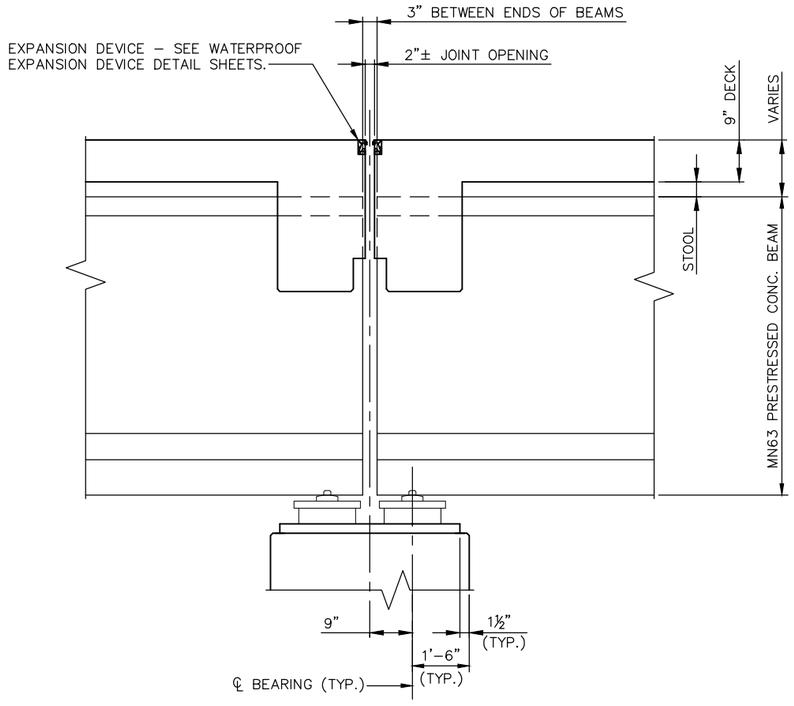
DISCIPLINE: STRUCTURES
SHEET NAME: CBR27C07-BRG-SUP-003

SHEET 45 OF 75

Sep. 18 2015 04:36 pm P:\60336960\3400_ADC\CAD\SEGMENT W2\PLAN SHEETS\STRUCTURES\CBR27C07\CBR27C07-BRG-SUP-003.dwg By: floresg



PARTIAL DECK PLAN – SPANS 9 & 10



SECTION THROUGH PIER 8

(PIERS 10 & 12 SIMILAR)

NOTES:

① MEASURED ALONG EDGE OF DECK.

② MEASURED ALONG ℄ TRACK 2 (EB-TRK-W2) & WORKING LINE.

3. SEE SHEET 6 OF 75 FOR TRANSVERSE SECTION.

4. SEE SHEET 45 OF 75 FOR SECTIONS THRU FIXED PIERS.

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AV | CHECKED BY: DD
DRAWN BY: GF | DATE: 09/07/15

AECOM

60% SUBMISSION - 09/28/15

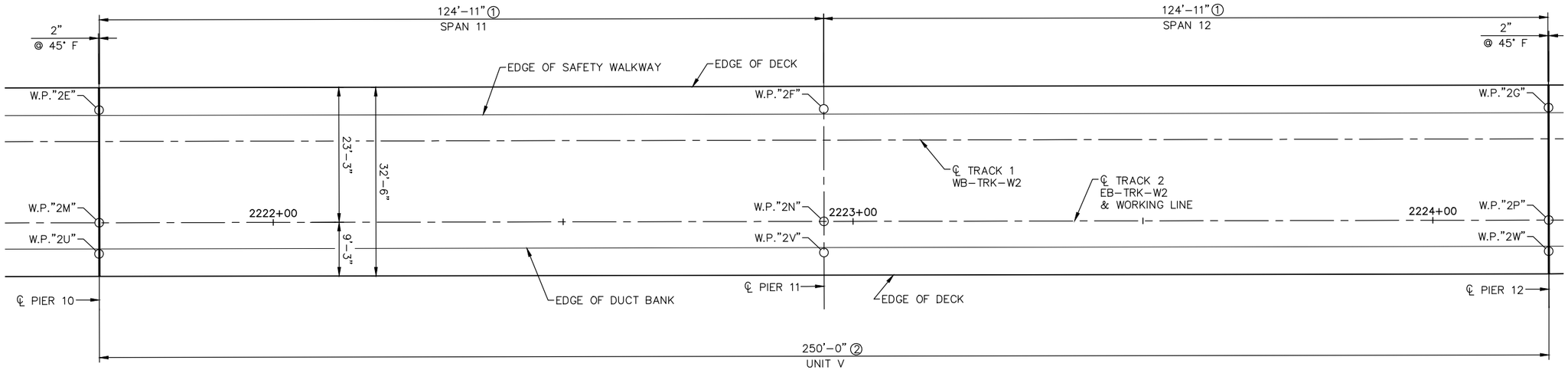
METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

CIVIL WEST - VOLUME 4B
NINE MILE CREEK
BRIDGE 27C07
SUPERSTRUCTURE DETAILS-SPANS 7-15 (2)

DISCIPLINE: STRUCTURES
SHEET NAME: CBR27C07-BRG-SUP-004

SHEET 46 OF 75



PARTIAL DECK PLAN – SPANS 11 & 12

NOTES:

① MEASURED ALONG EDGE OF DECK.

② MEASURED ALONG ℄ TRACK 2 (EB-TRK-W2) & WORKING LINE.

3. SEE SHEET 6 OF 75 FOR TRANSVERSE SECTION.
4. SEE SHEET 45 OF 75 FOR SECTION THRU FIXED PIERS.
5. SEE SHEET 46 OF 75 FOR SECTION THRU EXPANSION PIERS.

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AV | CHECKED BY: DD
DRAWN BY: GF | DATE: 09/07/15

AECOM

60% SUBMISSION - 09/28/15

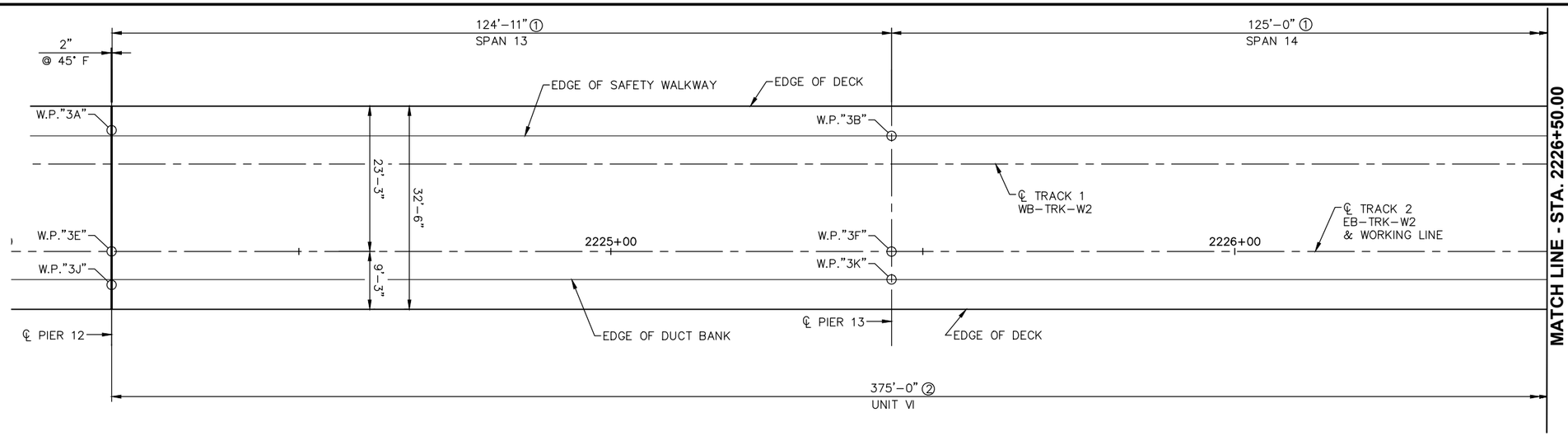
METROPOLITAN COUNCIL

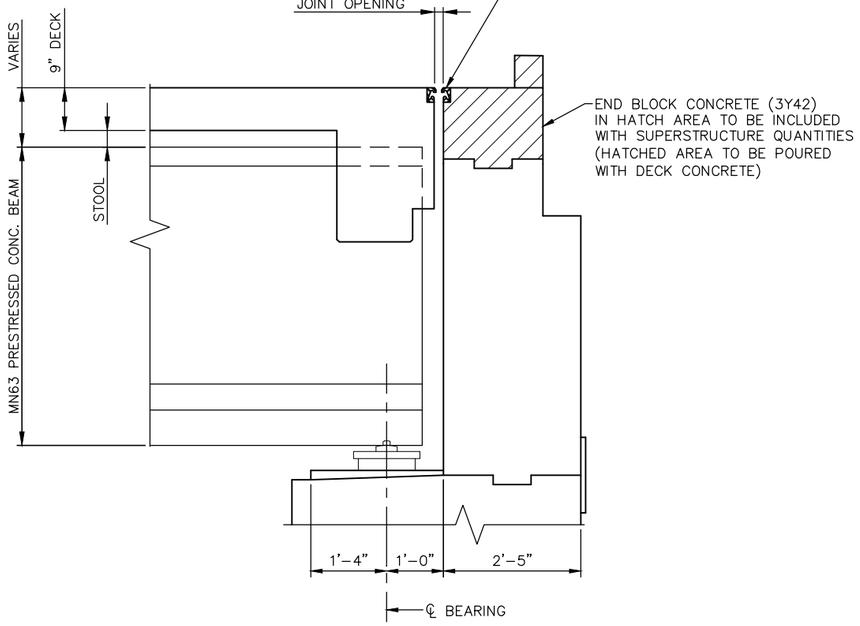
SOUTHWEST Green Line LRT Extension

CIVIL WEST - VOLUME 4B
NINE MILE CREEK
BRIDGE 27C07
SUPERSTRUCTURE DETAILS-SPANS 7-15 (3)

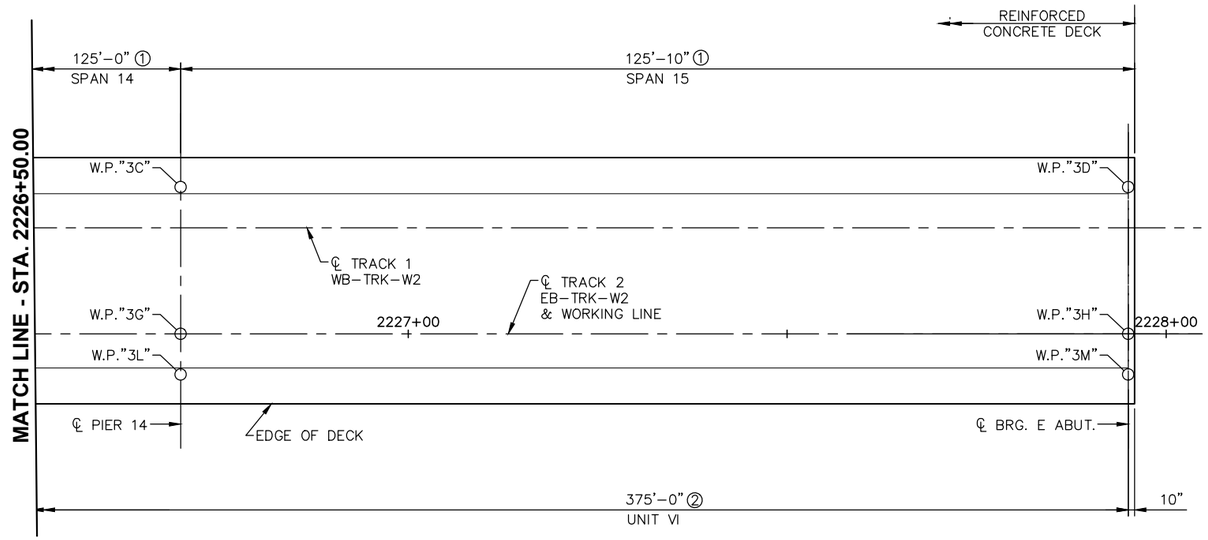
DISCIPLINE: STRUCTURES
SHEET NAME: CBR27C07-BRG-SUP-005

SHEET 47 OF 75





SECTION THRU EAST ABUTMENT (EXPANSION)



PARTIAL DECK PLAN - SPANS 13-15

NOTES:

① MEASURED ALONG EDGE OF DECK.

② MEASURED ALONG ℄ TRACK 2 (EB-TRK-W2) & WORKING LINE.

3. SEE SHEET 6 OF 75 FOR TRANSVERSE SECTION.

4. SEE SHEET 45 OF 75 FOR SECTION THRU FIXED PIERS.

5. SEE SHEET 46 OF 75 FOR SECTION THRU EXPANSION PIER.

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AV | CHECKED BY: DD
DRAWN BY: GF | DATE: 09/07/15

AECOM

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

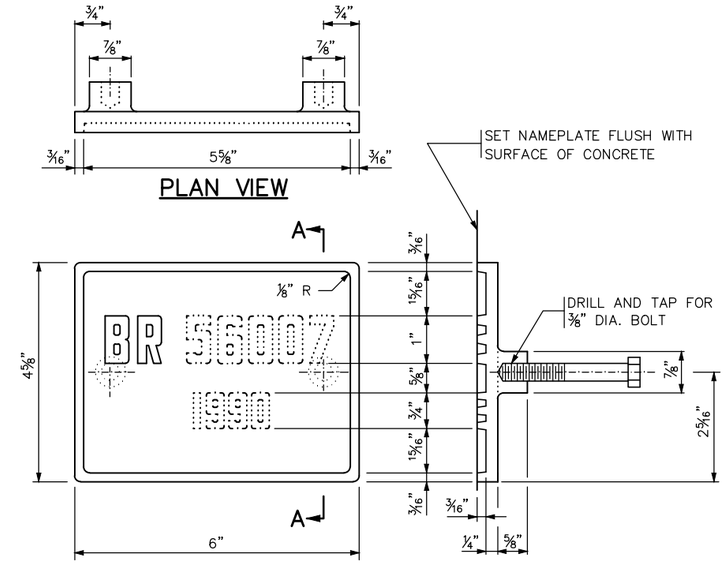
CIVIL WEST - VOLUME 4B
NINE MILE CREEK
BRIDGE 27C07
SUPERSTRUCTURE DETAILS-SPANS 7-15 (4)

DISCIPLINE: STRUCTURES

SHEET NAME: CBR27C07-BRG-SUP-006

SHEET 48 OF 75

Sep. 18 2015 04:37 pm P:\60336960\3400_ADC\CAD\SEGMENT W2\PLAN SHEETS\STRUCTURES\CBR27C07\CBR27C07-BRG-SUP-006.dwg By: floresg



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

BRIDGE _____

YEAR _____

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".

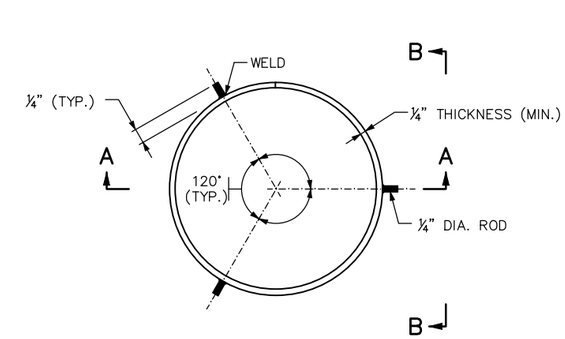
HORIZONTAL SPACING OF LETTERS AND NUMBERS SHALL PRODUCE A BALANCED LAYOUT IN PROPORTION TO SPACING SHOWN.

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

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

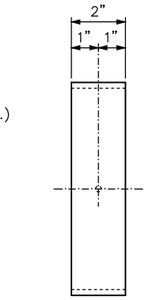
ALL DIMENSIONS FOR ¾" HIGH LETTERS AND NUMBERS SHALL BE IN DIRECT PROPORTION TO THOSE SHOWN FOR 1" HIGH LETTERS AND NUMBERS.

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



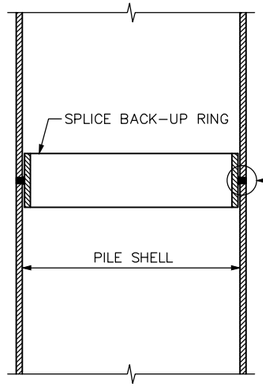
PLAN VIEW – SPLICE BACK–UP RING

PILE NOT SHOWN

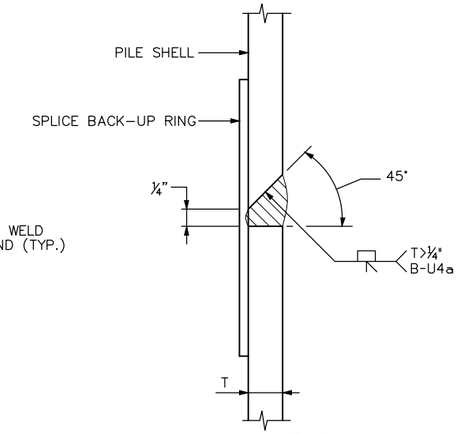


SECTION B–B

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 L Hagen STATE BRIDGE ENGINEER	PILE SPLICE (CAST–IN–PLACE CONCRETE PILES)		B201

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AV | CHECKED BY: DD
DRAWN BY: GF | DATE: 09/07/15

AECOM

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

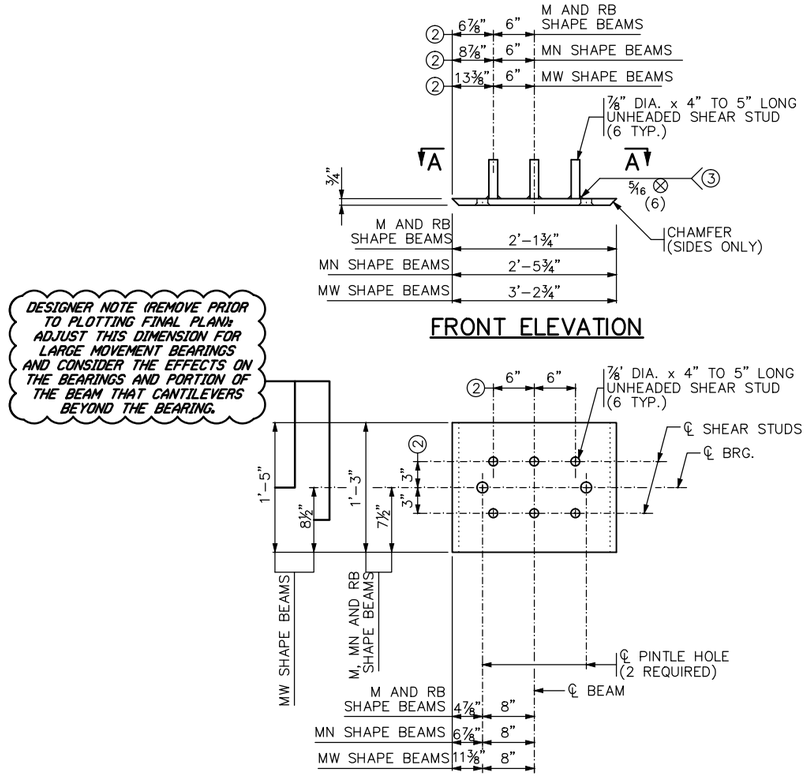
SOUTHWEST Green Line LRT Extension

CIVIL WEST - VOLUME 4B
NINE MILE CREEK
BRIDGE 27C07
B - DETAILS 1

DISCIPLINE: STRUCTURES
SHEET NAME: CBR27C07-BRG-DTL-001

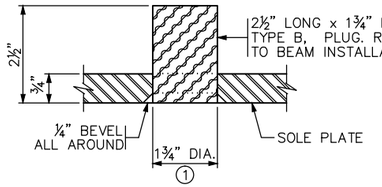
SHEET 49 OF 75

Sep. 18 2015 04:37 pm P:\60336960\3400_ADC\CAD\SEGMENT W2\PLAN SHEETS\STRUCTURES\CBR27C07\CBR27C07-BRG-



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.

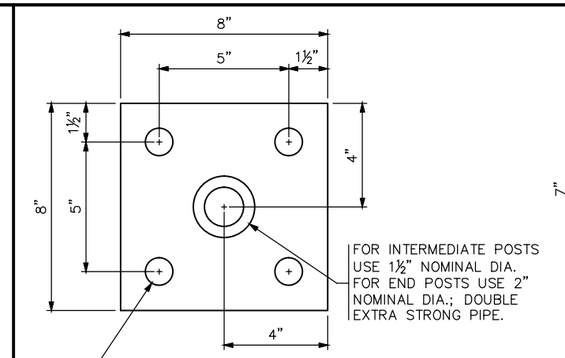
SOLE PLATES ARE INCIDENTAL TO PRESTRESSED CONCRETE BEAMS.

① FOR 1½" DIA. PINTLES.

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

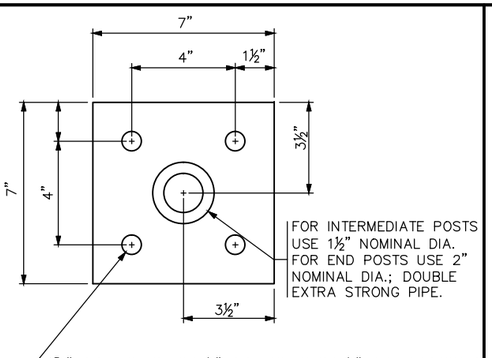
③ THE REQUIREMENTS FOR WELDING STUDS SHALL COMPLY WITH AASHTO/AWS D1.1.

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



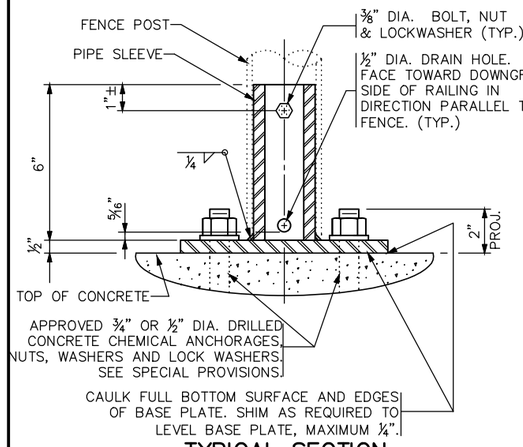
PLAN VIEW – TYPE A

ESTIMATED WEIGHT = 12 OR 14 LBS.

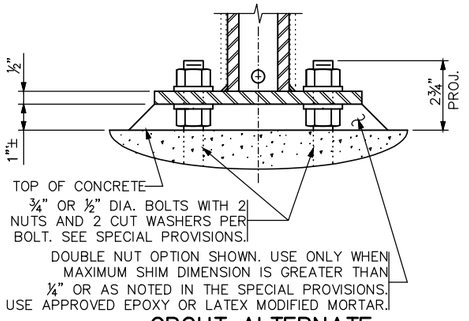


PLAN VIEW – TYPE B

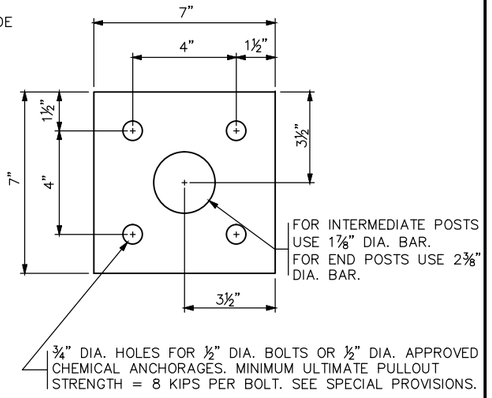
ESTIMATED WEIGHT = 10 OR 12 LBS.



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:
½" 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 C. Hogan STATE BRIDGE ENGINEER	FENCE POST ANCHORAGE		B905

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AV | CHECKED BY: DD
DRAWN BY: GF | DATE: 09/07/15

AECOM

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

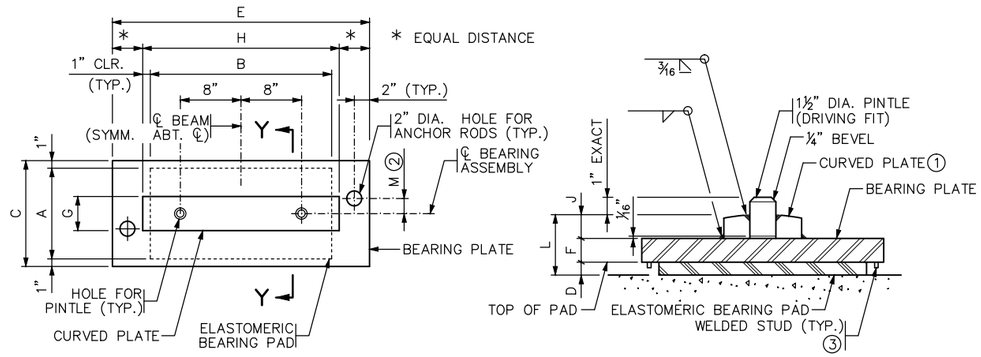
SOUTHWEST Green Line LRT Extension

CIVIL WEST - VOLUME 4B
NINE MILE CREEK
BRIDGE 27C07
B - DETAILS 2

DISCIPLINE: STRUCTURES
SHEET NAME: CBR27C07-BRG-DTL-002

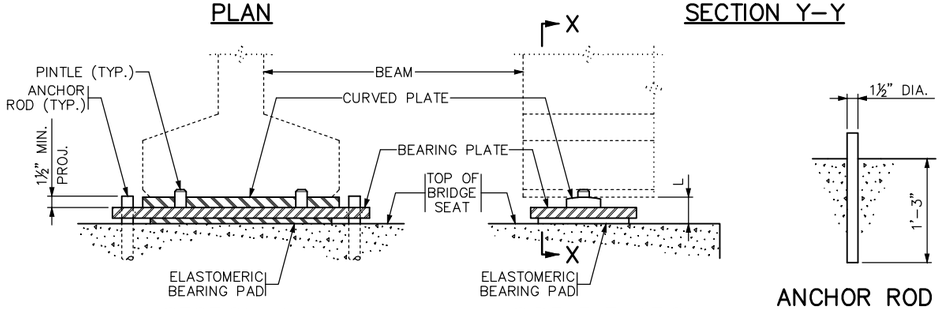
SHEET 50 OF 75

Sep. 18 2015 04:37 pm P:\60336960\3400_ADC\CAD\SEGMENT W2\PLAN SHEETS\STRUCTURES\CBR27C07\CBR27C07-BRG-DTL-002.dwg By: floresg



PLAN

SECTION Y–Y



SECTION X–X

2'–6" 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
F1	④	MN63	12"	24"	½"	8.0	14"	38"	1½"	4½"	26"	1¼"	NONE	NONE	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.

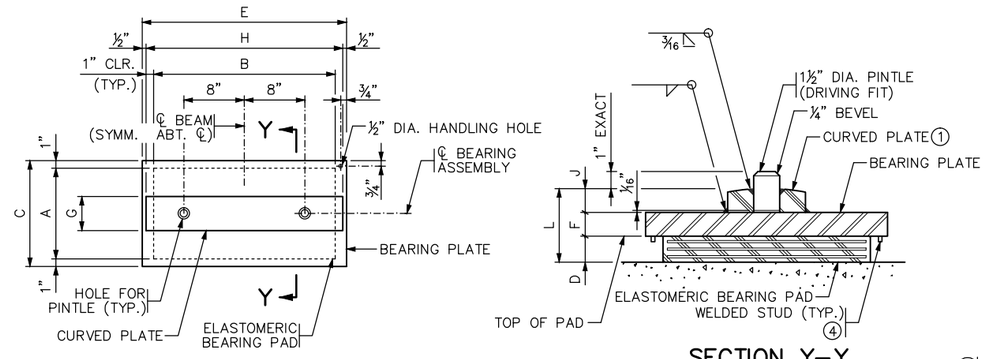
② "+" DENOTES OFFSET AS SHOWN. "–" DENOTES OFFSET OPPOSITE OF SHOWN.

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".

④ PIERS 7, 9, 11, 13 & 14

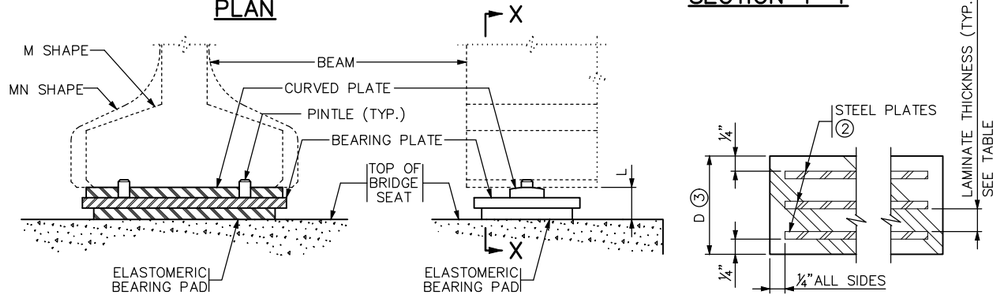
DESIGN DATA:
MAXIMUM HORIZONTAL LOAD IS 70 KIPS FOR 1½" PINTLES.

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
E1	⑤	MN63	12"	24"	**2½"**	4	⅛"	3	½"	8	14"	27"	1½"	4½"	26"	1¼"	**5¼"**	**16"**
E2	⑥	MN63	12"	24"	**1⅞"**	3	⅛"	2	½"	8	14"	27"	1½"	4½"	26"	1¼"	**4⅝"**	**16"**
E3	⑦	MN63	12"	24"	**3¾"**	6	⅛"	5	½"	8	14"	27"	1½"	4½"	26"	1¼"	**6½"**	**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".

⑤ E. BRG. PIER 6, W. BRG. PIER 8, W. BRG. PIER 10, E. BRG. PIER 10, W. BRG. PIER 12.

⑥ E. BRG. PIER 8, E. BRG. PIER 12 & BRG. E. ABUT.

⑦ E. BRG. PIER 12 & BRG. E. ABUT.

DESIGN DATA:
MAXIMUM HORIZONTAL LOAD IS 70 KIPS FOR 1½" 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

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AV CHECKED BY: DD
DRAWN BY: GF DATE: 09/07/15

AECOM

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

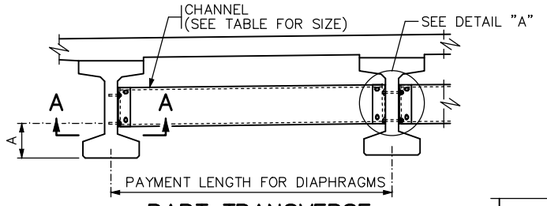
SOUTHWEST Green Line LRT Extension

CIVIL WEST - VOLUME 4B
NINE MILE CREEK
BRIDGE 27C07
B - DETAILS 3

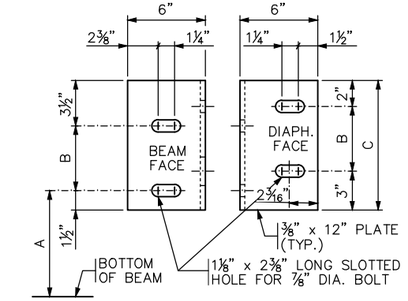
DISCIPLINE: STRUCTURES
SHEET NAME: CBR27C07-BRG-DTL-003

SHEET 51 OF 75

Sep. 18 2015 04:38 pm P:\60336960\3400_ADC\CAD\SEGMENT W2\PLAN SHEETS\STRUCTURES\CBR27C07\CBR27C07-BRG-DTL-003.dwg By: floresg

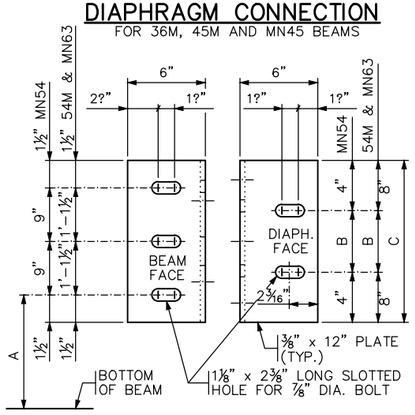


PART TRANSVERSE SECTION AT DIAPHRAGM



DIAPHRAGM CONNECTION

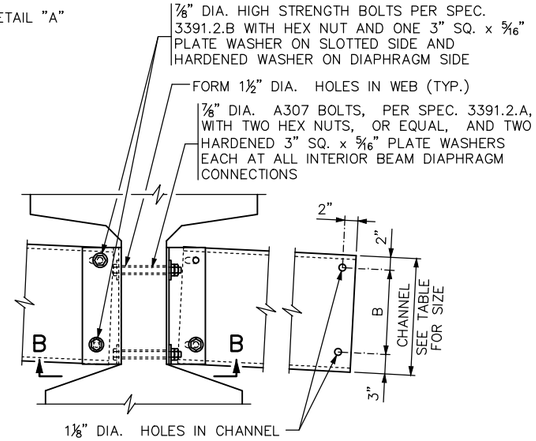
FOR 36M, 45M AND MN45 BEAMS



DIAPHRAGM CONNECTION

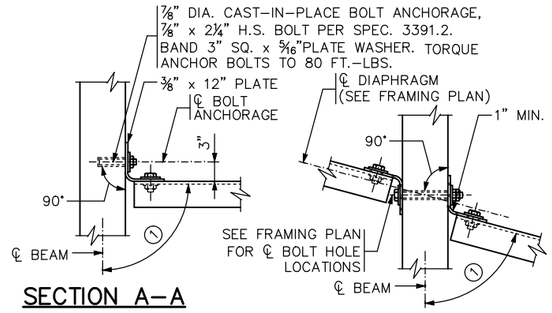
FOR 54M, MN54 AND MN63 BEAMS

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.

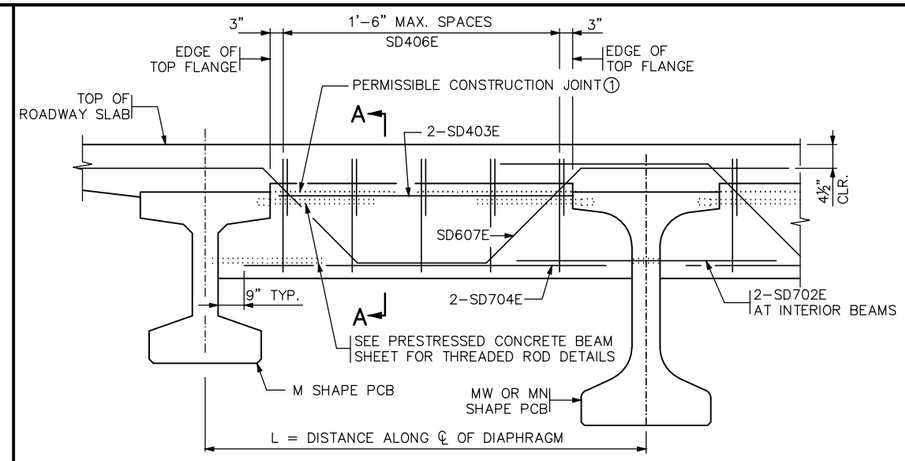
BENT PLATES MAY BE USED IN PLACE OF CHANNELS. THE BENT PLATES MUST BE THE SAME HEIGHT AS THE CHANNELS THEY REPLACE, BE 5⁄16" IN THICKNESS, AND HAVE LEGS 5" LONG.

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

GALVANIZE BOLTS, NUTS AND WASHERS PER SPEC. 3392.

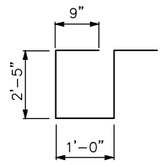
① FOR SKEW ANGLES UNDER 20°, USE 90° LESS THE SKEW ANGLE.
FOR SKEW ANGLES OVER 20°, USE 90°.

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

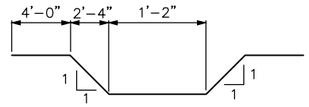


PART TRANSVERSE SECTION

(L > 8' SHOWN)



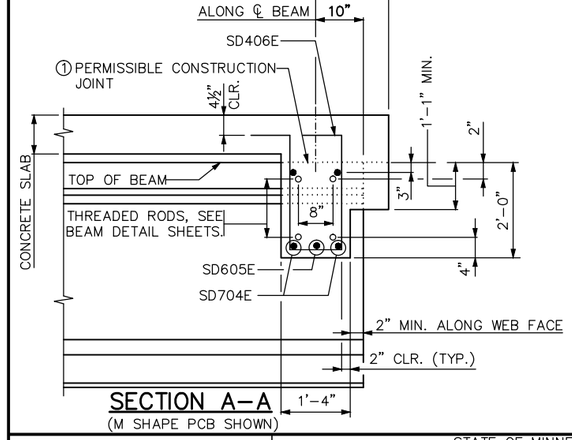
SD406E



SD607E

(IF L > 8')

BILL OF REINFORCEMENT FOR END DIAPHRAGM				
BAR	NO.	LENGTH	SHAPE	LOCATION
SD702E		5'–0"		LONG. THRU BEAM
SD403E				LONG. TOP
SD704E				LONG. BOTTOM
SD406E				VERTICAL TIE
SD607E				LONGITUDINAL



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.

APPROVED: SEPTEMBER 22, 2011	STATE OF MINNESOTA DEPARTMENT OF TRANSPORTATION	REVISED 04–17–2013 11–06–2013	DETAIL NO.
STATE BRIDGE ENGINEER	CONCRETE END DIAPHRAGM (MN63 PRESTRESSED CONCRETE BEAMS) (PARAPET ABUTMENT)		B814

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AV | CHECKED BY: DD
DRAWN BY: GF | DATE: 09/07/15

AECOM

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

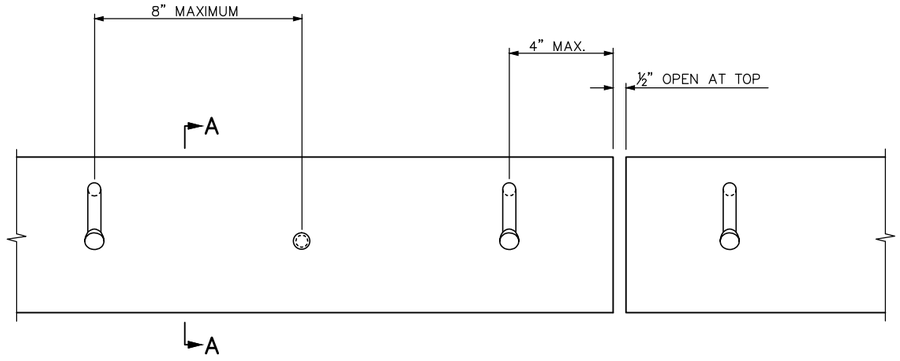
SOUTHWEST Green Line LRT Extension

CIVIL WEST - VOLUME 4B
NINE MILE CREEK
BRIDGE 27C07
B - DETAILS 4

DISCIPLINE: STRUCTURES
SHEET NAME: CBR27C07-BRG-DTL-004

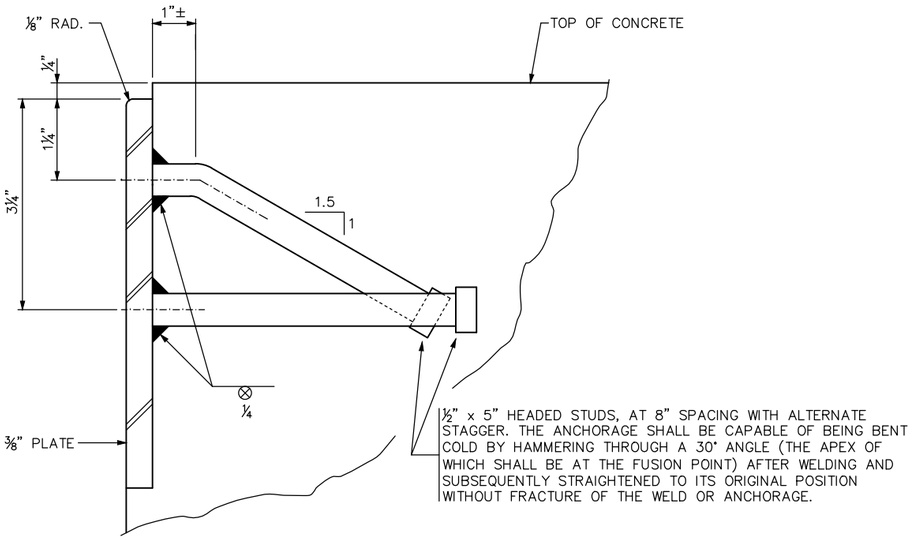
SHEET 52 OF 75

Sep. 18 2015 04:38 pm P:\60336960\3400_ADC\CAD\SEGMENT W2\PLAN SHEETS\STRUCTURES\CBR27C07\CBR27C07-BRG-DTL-004.dwg By: floresg



ELEVATION

CONCRETE NOT SHOWN



SECTION A–A

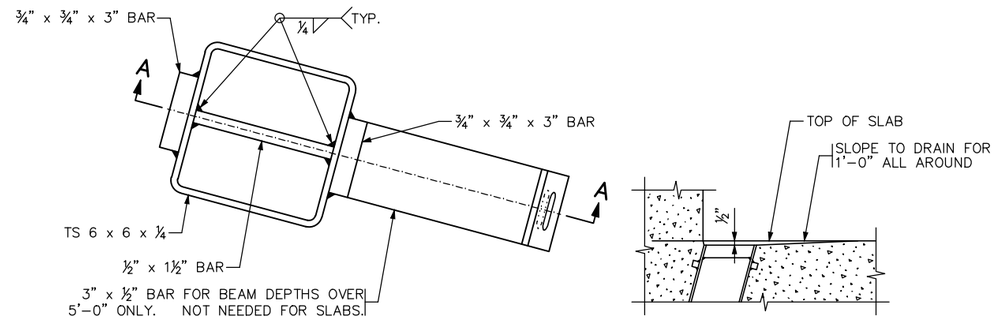
NOTES:

PLATES SHALL EXTEND FULL WIDTH OF ROADWAY BETWEEN GUTTER LINES WITH A ½" OPEN JOINT AT EACH BREAK IN CROWN PROFILE. MAX. LENGTH 22 FT.

MATERIALS: STRUCTURAL STEEL PER Mn/DOT SPEC. 3306. GALVANIZE AFTER FABRICATION PER Mn/DOT SPEC. 3394

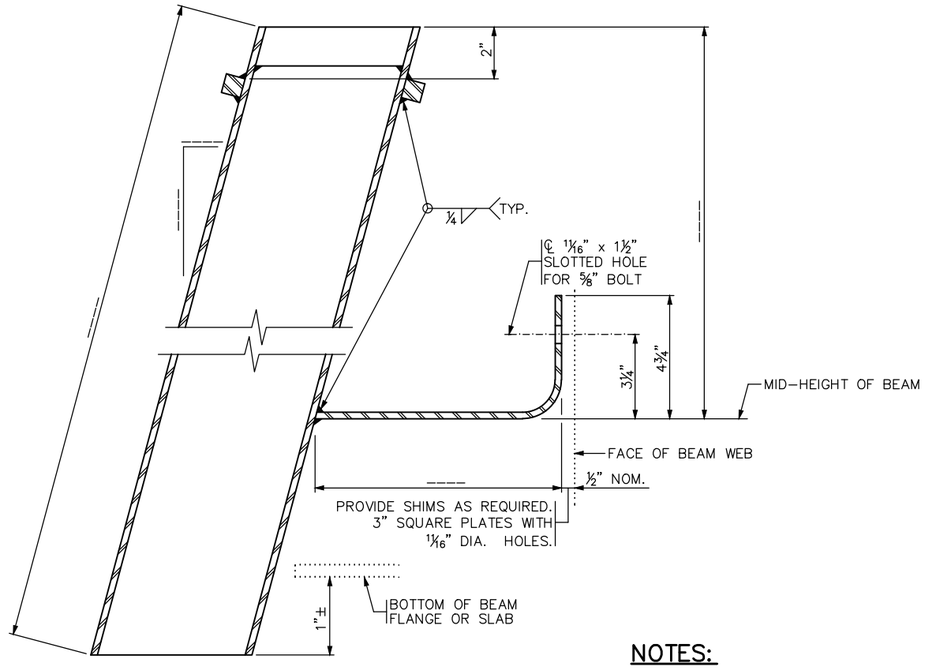
SET PLATE TO PROPER GRADE AND CROWN.

APPROVED: NOVEMBER 22, 2002	STATE OF MINNESOTA DEPARTMENT OF TRANSPORTATION	REVISION	DETAIL NO.
Daniel D. Wangen STATE BRIDGE ENGINEER	PROTECTION PLATE (FOR END OF SLAB)		B553



PLAN VIEW

PLACEMENT DIAGRAM



SECTION A–A

NOTES:

MATERIAL TO BE STRUCTURAL STEEL PER Mn/DOT SPEC. 3306.

GALVANIZE BOLTS AND WASHER PER Mn/DOT SPEC. 3392.

GALVANIZE OTHER MATERIALS PER Mn/DOT SPEC. 3394 AFTER FABRICATION.

PAYMENT FOR FLOOR DRAIN TYPE _____ SHALL INCLUDE ALL MATERIAL SHOWN ON THIS DETAIL.

APPROVED: NOVEMBER 22, 2002	STATE OF MINNESOTA DEPARTMENT OF TRANSPORTATION	REVISED 01–13–2004	DETAIL NO.
Daniel D. Wangen STATE BRIDGE ENGINEER	BRIDGE FLOOR DRAIN (STRUCTURAL TUBE)		B702

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AV CHECKED BY: DD
DRAWN BY: GF DATE: 09/07/15

AECOM

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

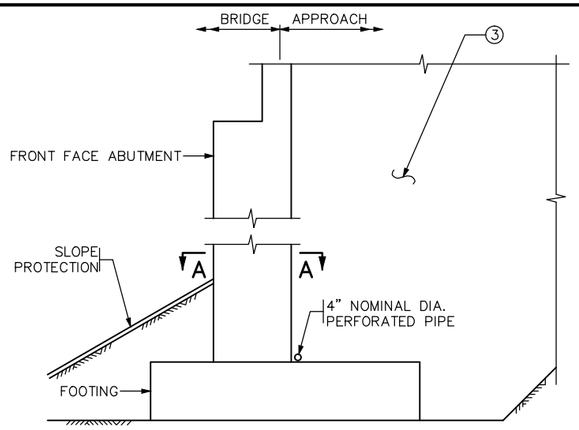
SOUTHWEST Green Line LRT Extension

CIVIL WEST - VOLUME 4B
NINE MILE CREEK
BRIDGE 27C07
B - DETAILS 5

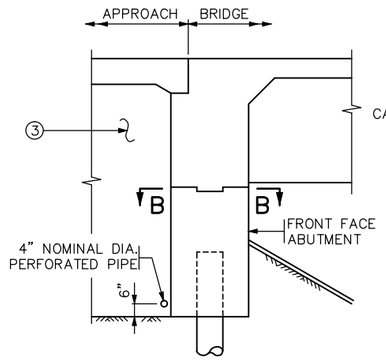
DISCIPLINE: STRUCTURES
SHEET NAME: CBR27C07-BRG-DTL-005

SHEET 53 OF 75

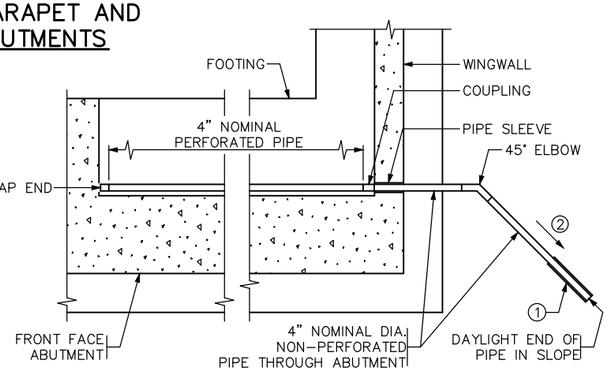
Sep. 18 2015 04:38 pm P:\60336960\3400_ADC\CAD\SEGMENT W2\PLAN SHEETS\STRUCTURES\CBR27C07\CBR27C07-BRG-DTL-005.dwg By: floresg



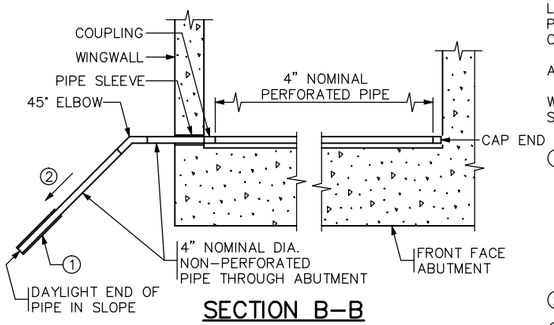
SECTION THROUGH PARAPET AND SEMI–INTEGRAL ABUTMENTS



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 MAINTAINED.

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: AV | CHECKED BY: DD
DRAWN BY: GF | DATE: 09/07/15

AECOM

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

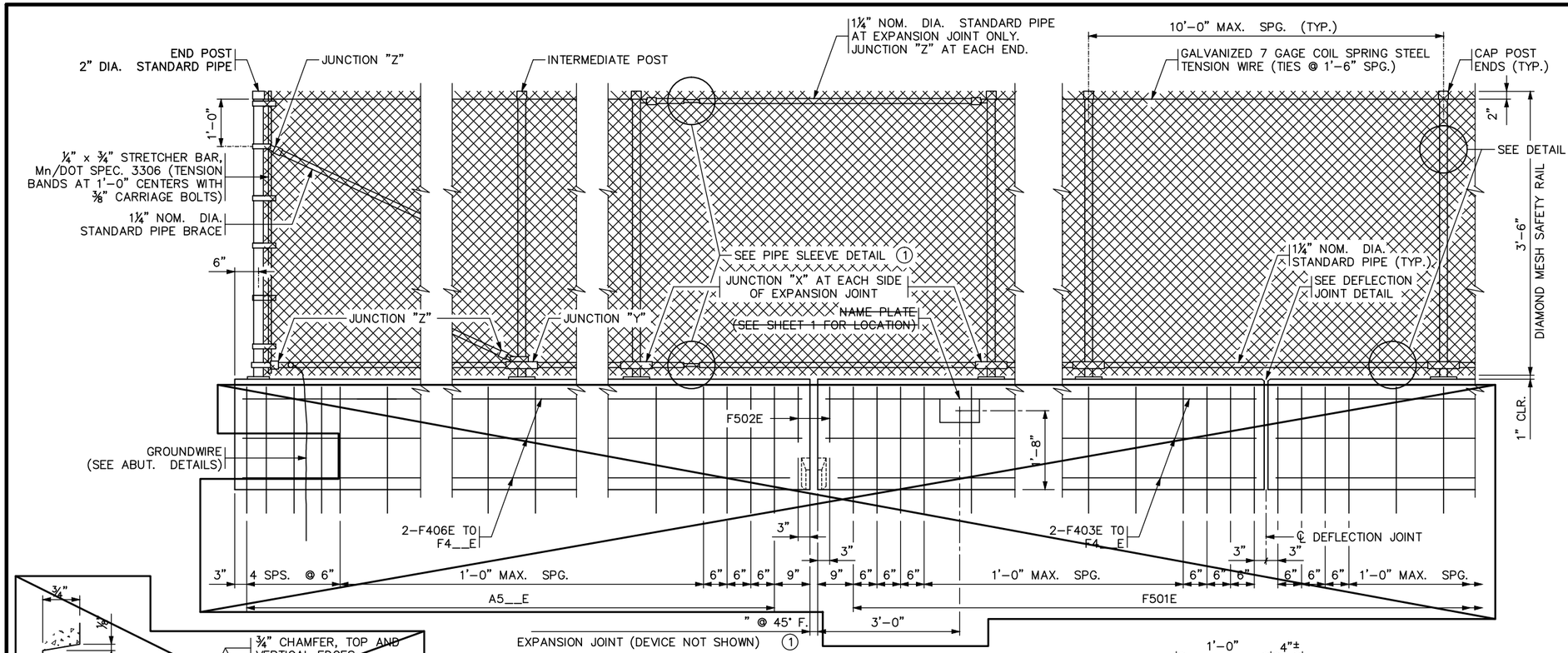
SOUTHWEST Green Line LRT Extension

CIVIL WEST - VOLUME 4B
NINE MILE CREEK
BRIDGE 27C07
B - DETAILS 6

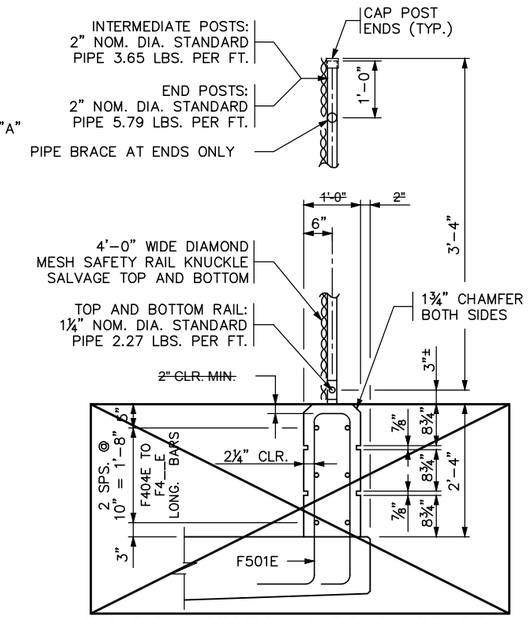
DISCIPLINE: STRUCTURES
SHEET NAME: CBR27C07-BRG-DTL-006

SHEET 54 OF 75

Sep. 18 2015 04:38 pm P:\60336960\3400_ADC\CAD\SEGMENT W2\PLAN SHEETS\STRUCTURES\CBR27C07\CBR27C07-BRG-DTL-006.dwg By: floresg



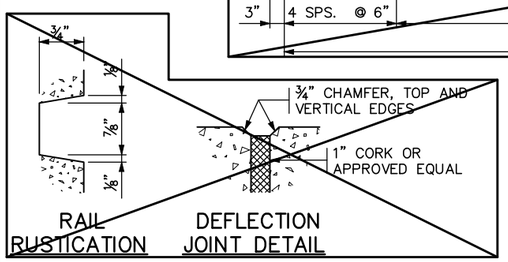
Ⓐ INSIDE ELEVATION OF RAILING

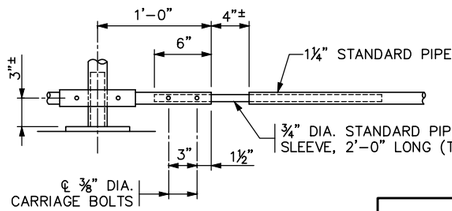


Ⓐ TYPICAL SECTION THROUGH FENCE

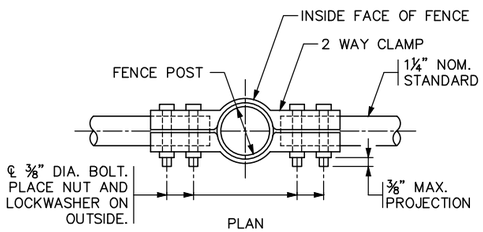
INTERMEDIATE POST SHOWN

SHEET MODIFICATION:
Ⓐ DENOTES MODIFICATION TO STANDARD SHEET

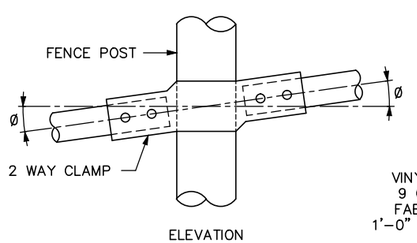




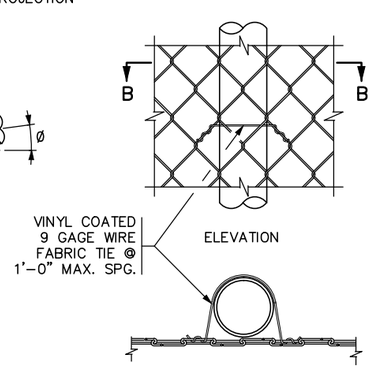
PIPE SLEEVE DETAIL (1)



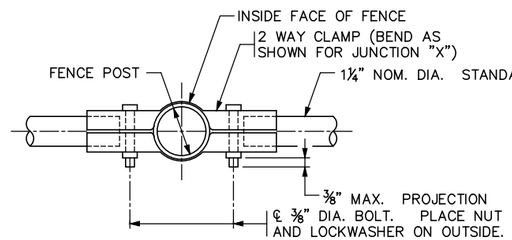
2 WAY CLAMP BENDING TABLE	
GRADE OF FENCE	Ø
0° TO 2°	0°
2° TO 6°	4°
6° TO 10°	8°



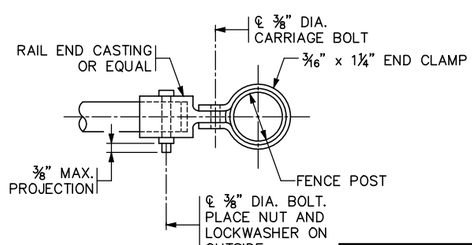
JUNCTION "X"



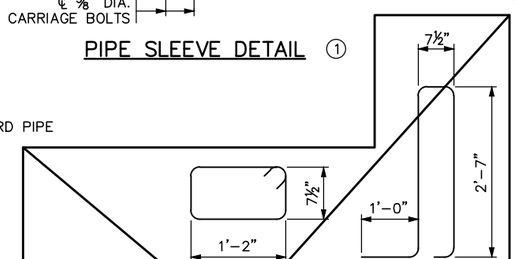
DETAIL "A"



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

GENERAL NOTES

Ⓐ SEE CONCRETE PARAPET TYPE P-1 SHEET FOR PARAPET DIMENSION, 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.

FIG. 5-397.119 (MOD.)

REVISED: 04-17-2013

APPROVED: DECEMBER 18, 2003

STATE BRIDGE ENGINEER

CERTIFIED BY _____ LICENSED PROFESSIONAL ENGINEER _____ DATE

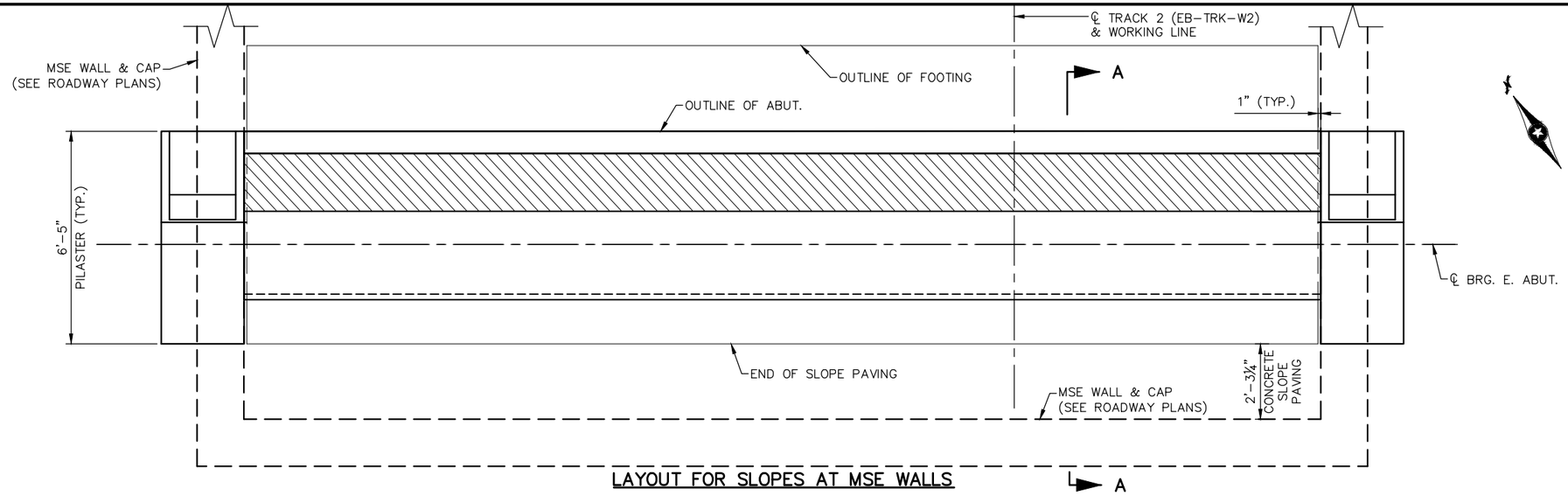
NAME: _____ LIC. NO.

TITLE: WIRE FENCE RAILING ~~(DESIGN W-1) AND CONCRETE PARAPET (TYPE P-1)~~ ~~(WITH INTEGRAL END POST)~~

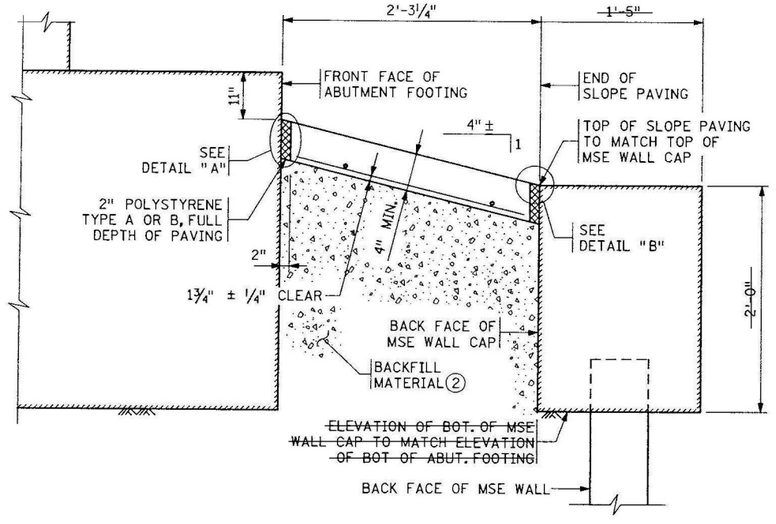
DES: AV	DR: GF	APPROVED:
CHK: DD	CHK: DD	

SHEET NO. 55 OF 75 SHEETS

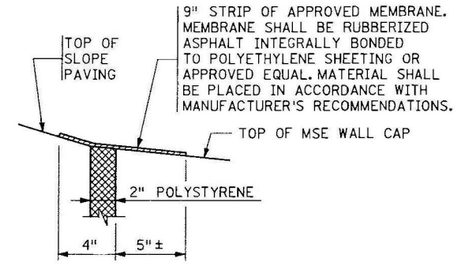
BRIDGE NO. 27C07



LAYOUT FOR SLOPES AT MSE WALLS

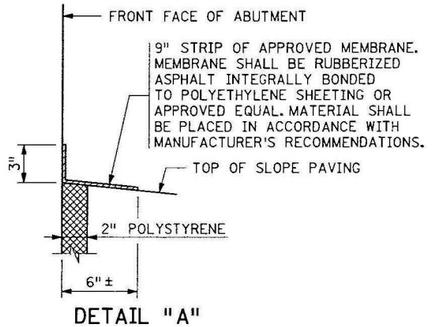


SECTION A-A



DETAIL "B"

SLOPE PAVING AS PER Mn/DOT SPEC. 2514.



DETAIL "A"

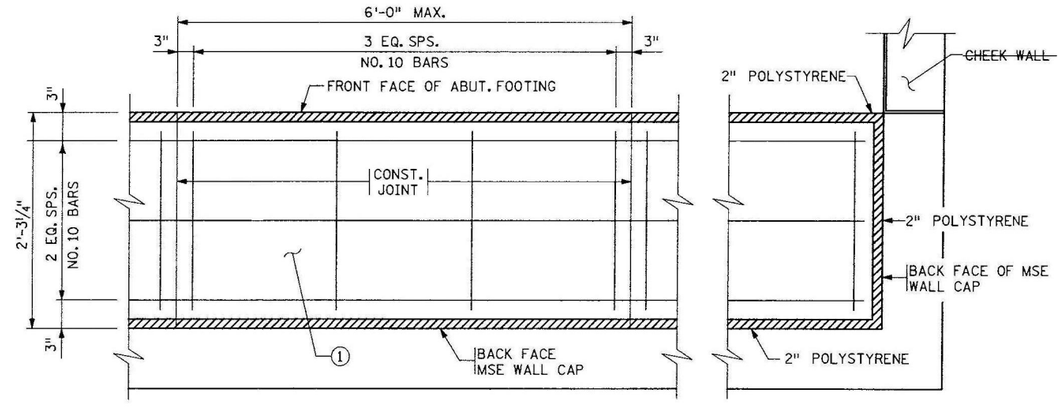
SLOPE PAVING AS PER Mn/DOT SPEC. 2514.

CONCRETE & REINFORCEMENT UNIT QUANTITIES

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

GENERAL NOTE

② BACKFILL MATERIAL SHALL BE INCLUDED IN GRADING PORTION OF CONTRACT.



PAVING DETAIL

REVISION:

APPROVED: SEPTEMBER 26, 2003
STATE BRIDGE ENGINEER

MODIFIED

FIG. 5-397.301

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AV | CHECKED BY: DD
DRAWN BY: GF | DATE: 09/07/15

AECOM

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

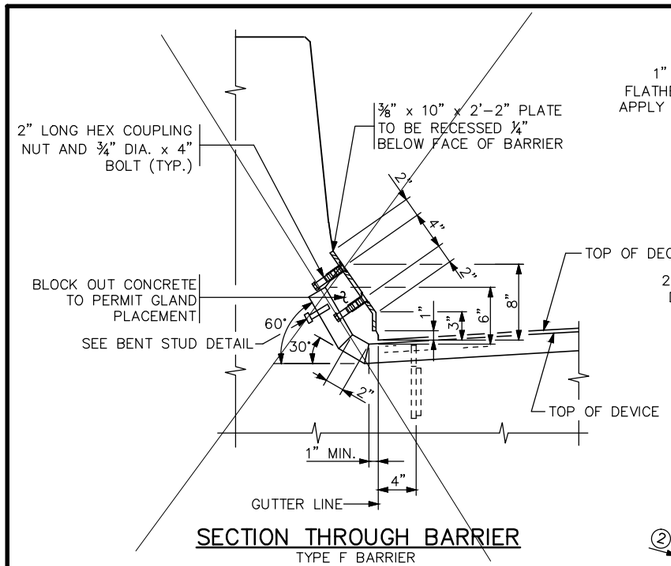
CIVIL WEST - VOLUME 4B
NINE MILE CREEK
BRIDGE 27C07
CONCRETE SLOPE PAVING UNDER BRIDGE

DISCIPLINE: STRUCTURES

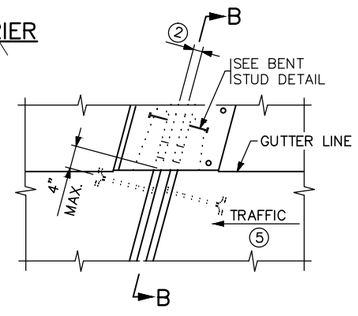
SHEET NAME: CBR27C07-BRG-DTL-008

SHEET 56 OF 75

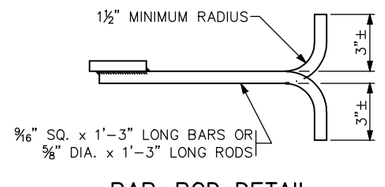
Sep. 18 2015 04:38 pm P:\60336960\3400_ADC\CAD\SEGMENT W2\PLAN SHEETS\STRUCTURES\CBR27C07\CBR27C07-BRG-DTL-008.dwg By: floresg



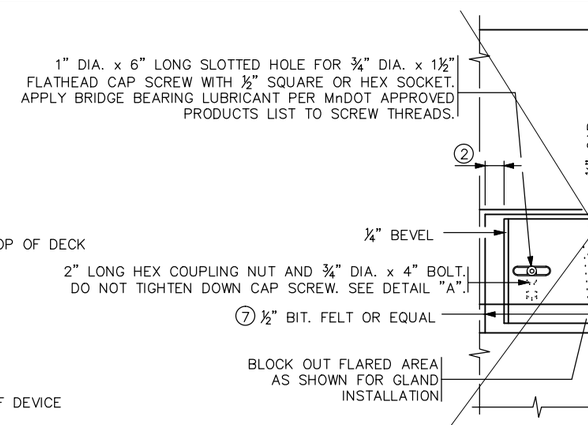
SECTION THROUGH BARRIER
TYPE F BARRIER



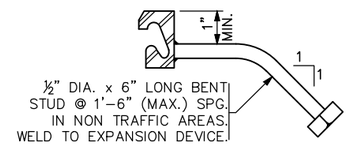
PLAN VIEW @ EXPANSION DEVICE
SIDEWALK ALTERNATE



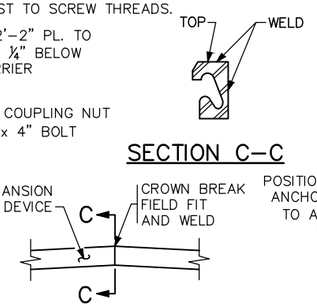
BAR-ROD DETAIL



BARRIER ELEVATION

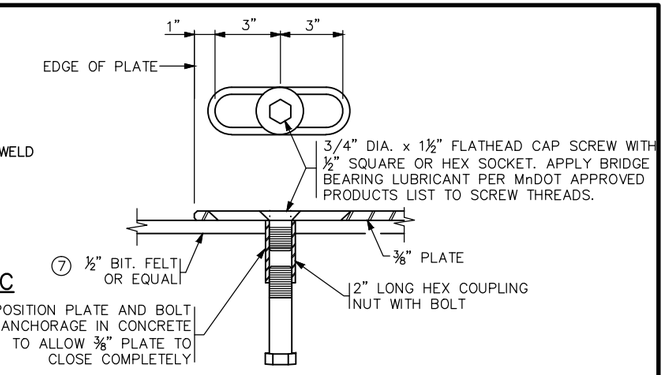


BENT STUD DETAIL

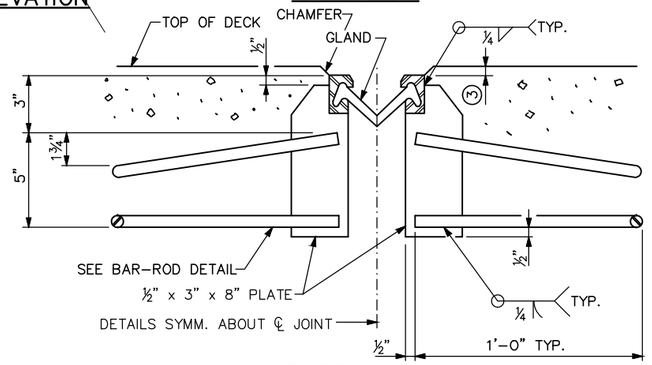


SECTION C-C

DETAIL "B"



DETAIL "A"



SECTION A-A

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.

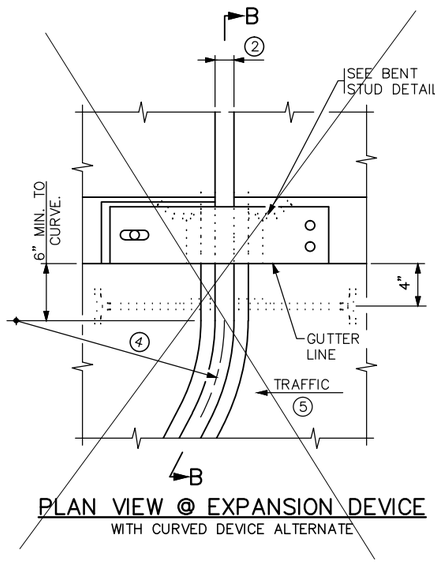
¾" DIA. X 1½" FLATHEAD CAP SCREW WITH ½" SQUARE OR HEX SOCKET PER SPEC 3391. CAP SCREWS SHALL BE COUNTERSUNK 1/16" BELOW TOP OF PLATE. APPLY BRIDGE BEARING LUBRICANT PER MnDOT APPROVED PRODUCTS LIST TO SCREW THREADS.

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.

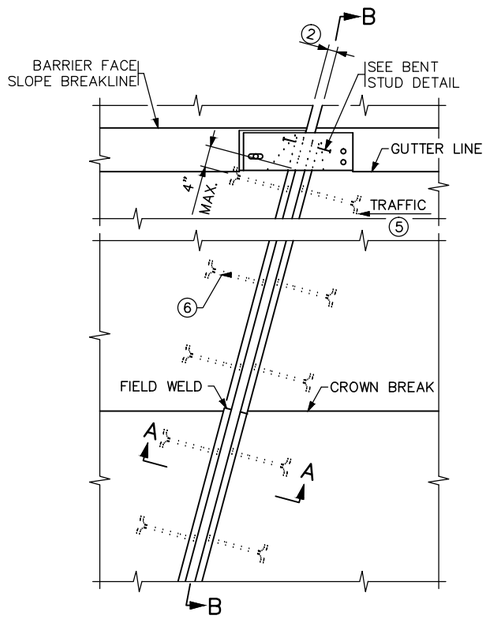
TABLE OF ELEVATIONS

	ELEVATION – LEFT GUTTER LINE	ELEVATION – CENTER LINE (KINK POINT)	ELEVATION – RIGHT GUTTER LINE
WEST ABUTMENT			
PIER 3			
PIER 6			
PIER 8			
PIER 10			
PIER 12			
EAST ABUTMENT			

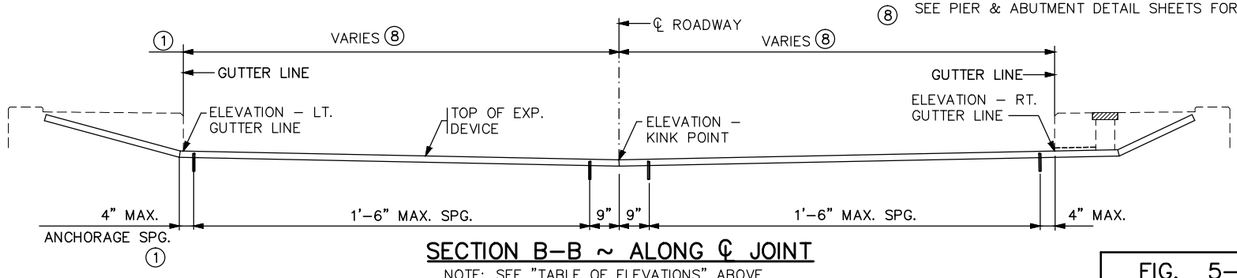
1. DIMENSIONS ARE ALONG CENTERLINE OF JOINT.
2. __AT 45° F; __ AT 90° F. 2" AT ALL TEMPS.
3. ⅛" (¼" MAX.). ½" (⅝" MAX.) WHEN SNOWPLOW FINGERS ARE USED. SNOWPLOW FINGERS ARE REQUIRED FOR SKEWS OVER 15° AND LESS THAN 50°.
4. SEE SUPERSTRUCTURE DETAILS FOR RADIUS.
5. SEE SHEET NO. __ FOR DIRECTION OF TRAFFIC.
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.
8. SEE PIER & ABUTMENT DETAIL SHEETS FOR DIMENSIONS.



PLAN VIEW @ EXPANSION DEVICE
WITH CURVED DEVICE ALTERNATE



PLAN VIEW @ EXPANSION DEVICE
WITH STRAIGHT DEVICE



SECTION B-B ~ ALONG ℄ JOINT
NOTE: SEE "TABLE OF ELEVATIONS" ABOVE.

REVISION: 09-11-2014

APPROVED: NOVEMBER 6, 1995
Donald J. Flemming
STATE BRIDGE ENGINEER

CERTIFIED BY _____ LICENSED PROFESSIONAL ENGINEER _____ DATE
NAME: LIC. NO.

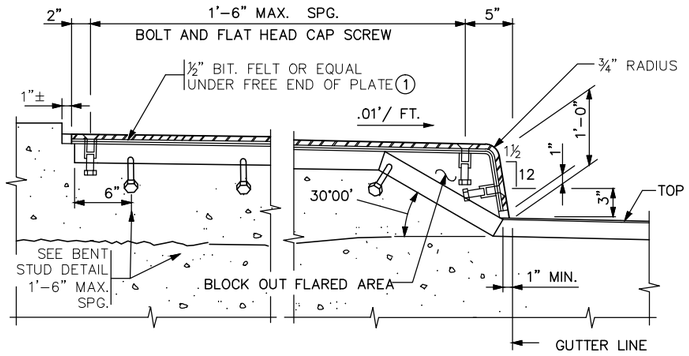
TITLE: WATERPROOF EXPANSION DEVICE 1 (WITH TYPE F BARRIER)

DES: AV	DR: GF	APPROVED:
CHK: DD	CHK: DD	

SHEET NO. 57 OF 75 SHEETS

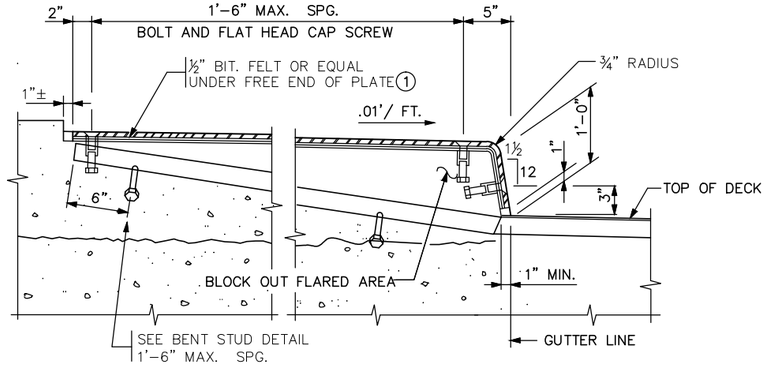
FIG. 5-397.627

BRIDGE NO. 27C07



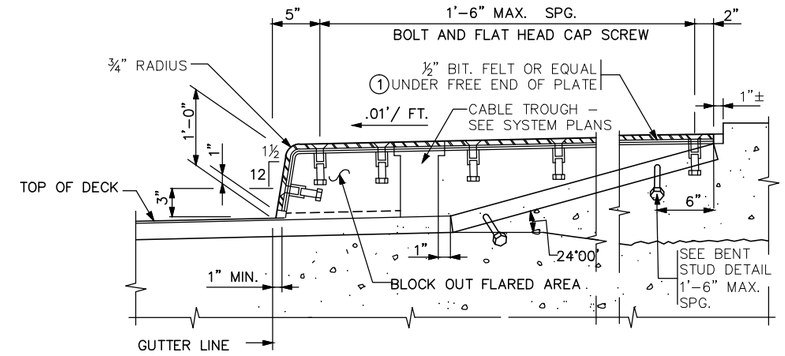
SECTION THROUGH LEFT SIDEWALK – OPTION 1

(LOOKING UPSTATION)



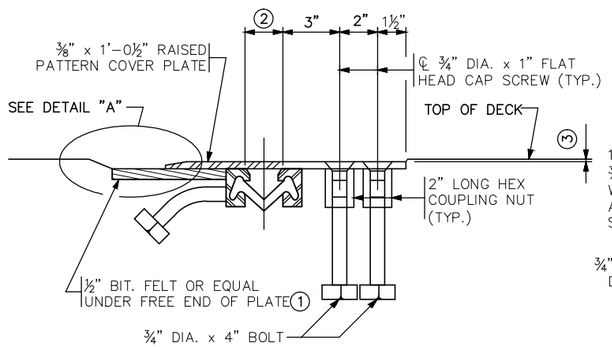
SECTION THROUGH LEFT SIDEWALK – OPTION 2

(LOOKING UPSTATION)

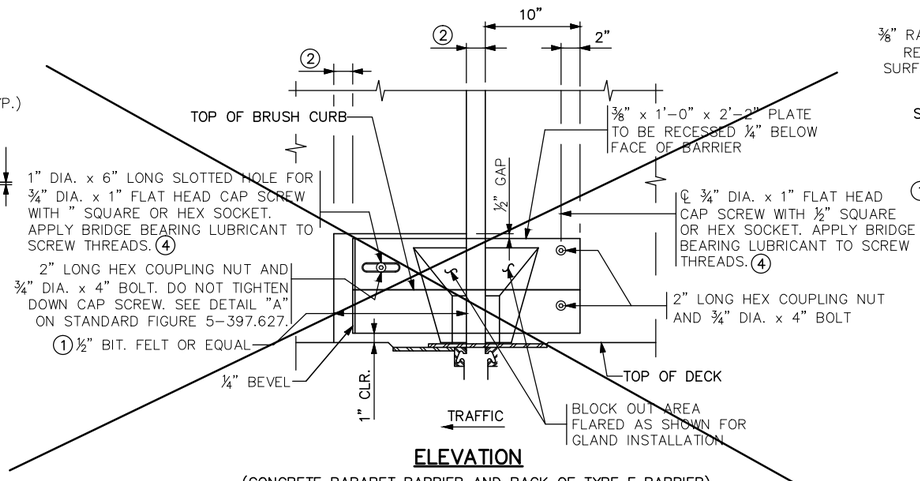


SECTION THROUGH RIGHT SIDEWALK

(LOOKING UPSTATION, AT EXPANSION JOINT WITH CABLE TROUGH)

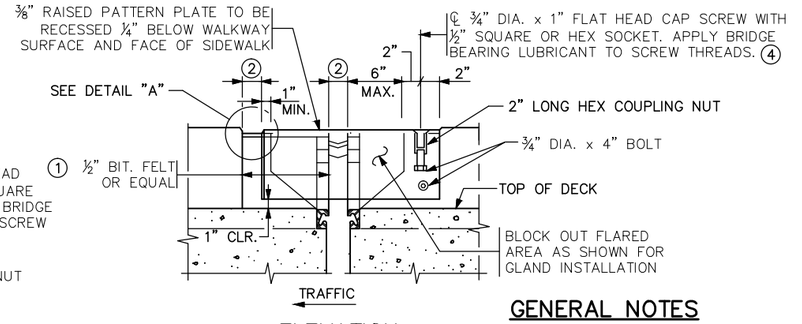


SECTION D–D



ELEVATION

(CONCRETE PARAPET BARRIER AND BACK OF TYPE F BARRIER)



ELEVATION

RAISED SIDEWALK DETAILS

GENERAL NOTES

SEE STANDARD FIGURE 5–397.627 FOR ADDITIONAL DETAILS AND NOTES.

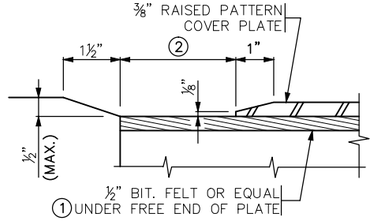
¾" DIA. X 1" FLAT HEAD CAP SCREW WITH ½" SQUARE OR HEX SOCKET PER SPEC 3391. CAP SCREWS SHALL BE COUNTERSUNK 1/16" BELOW TOP OF PLATE. APPLY BRIDGE BEARING LUBRICANT TO SCREW THREADS. (4)

(1) USE LARGEST SINGLE PIECE POSSIBLE. USE OF SMALL PIECES OR SCRAPS SECURED TOGETHER IS PROHIBITED.

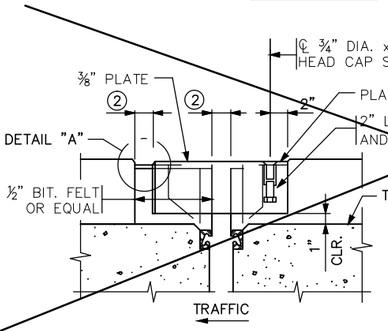
(2) SEE NOTE (2) ON STANDARD FIGURE 5–397.627.

(3) ⅛" (¼" MAX.).

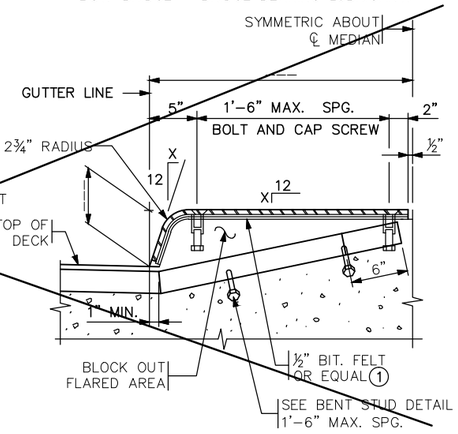
(4) LUBRICANT PER MnDOT APPROVED/QUALIFIED PRODUCTS LIST: BRIDGE – BRIDGE BEARING LUBRICANT.



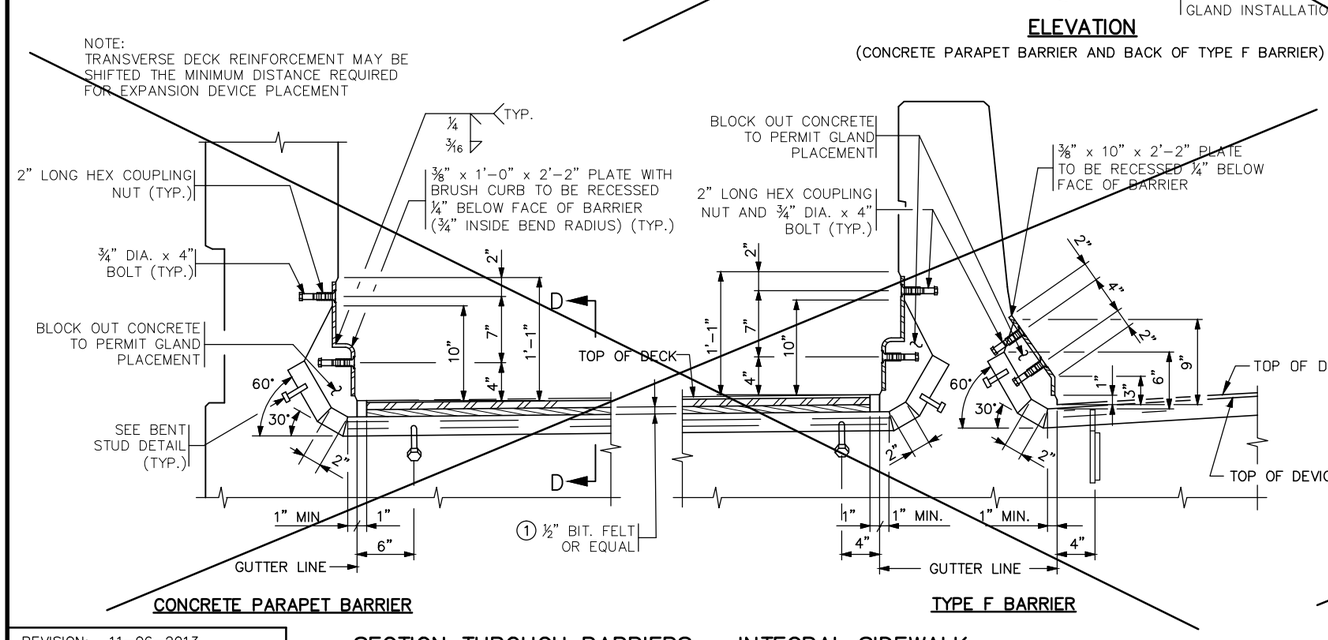
DETAIL "A"



MEDIAN ELEVATION



MEDIAN SECTION



SECTION THROUGH BARRIERS – INTEGRAL SIDEWALK

REVISION: 11–06–2013	CERTIFIED BY _____ LICENSED PROFESSIONAL ENGINEER _____ DATE	TITLE: WATERPROOF EXPANSION DEVICE 2 (RAISED MEDIAN OR SIDEWALK WITH PARAPET)	DES: AV	DR: GF	APPROVED:
APPROVED: SEPTEMBER 26, 2003	NAME: LIC. NO.		CHK: DD	CHK: DD	BRIDGE NO. 27C07
STATE BRIDGE ENGINEER			SHEET NO. 58 OF 75 SHEETS		FIG. 5–397.630

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 L. Hegeman
STATE BRIDGE ENGINEER

AS–BUILT DETAILS
(AS NEEDED)

FIG. 5–397.900

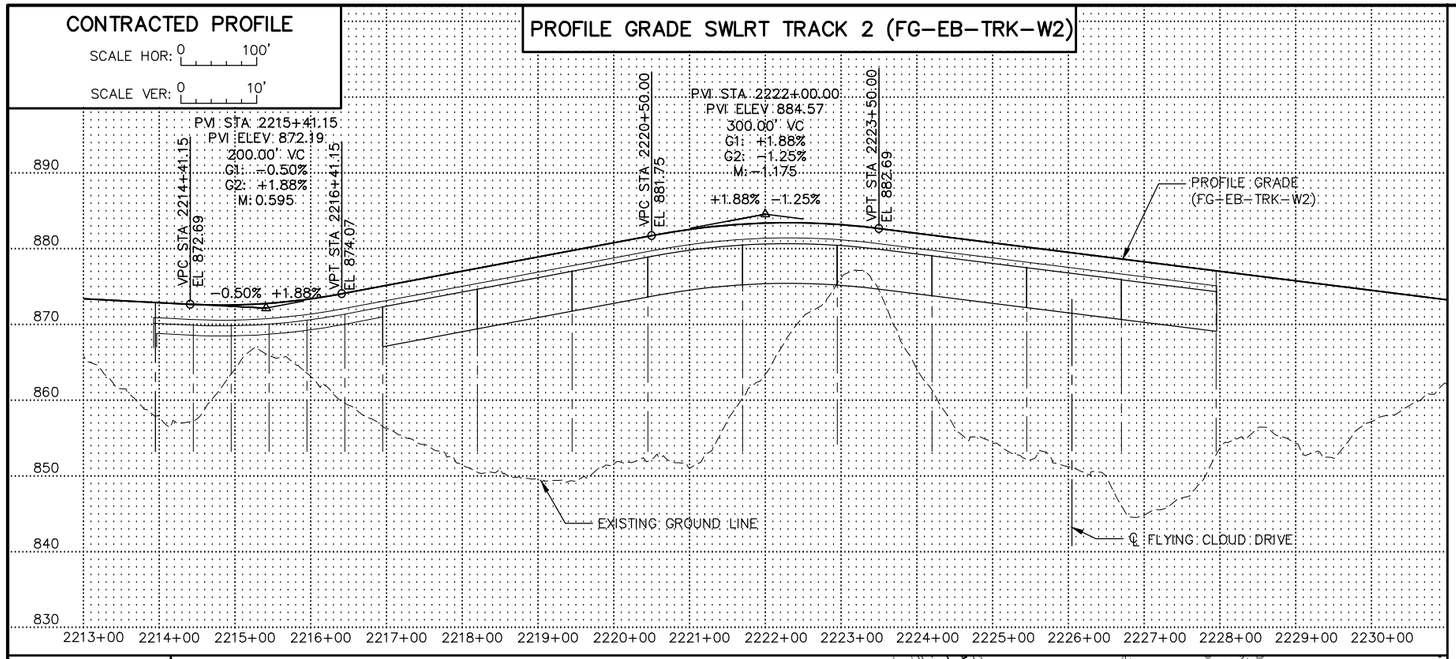
TITLE:	DES: AV	DR: GF	APPROVED:	BRIDGE NO.
AS–BUILT BRIDGE DATA	CHK: DD	CHK: DD		27C07
	SHEET NO. 59 OF 75 SHEETS			

CONTRACTED PROFILE

SCALE HOR: 0 100'

SCALE VER: 0 10'

PROFILE GRADE SWLRT TRACK 2 (FG-EB-TRK-W2)



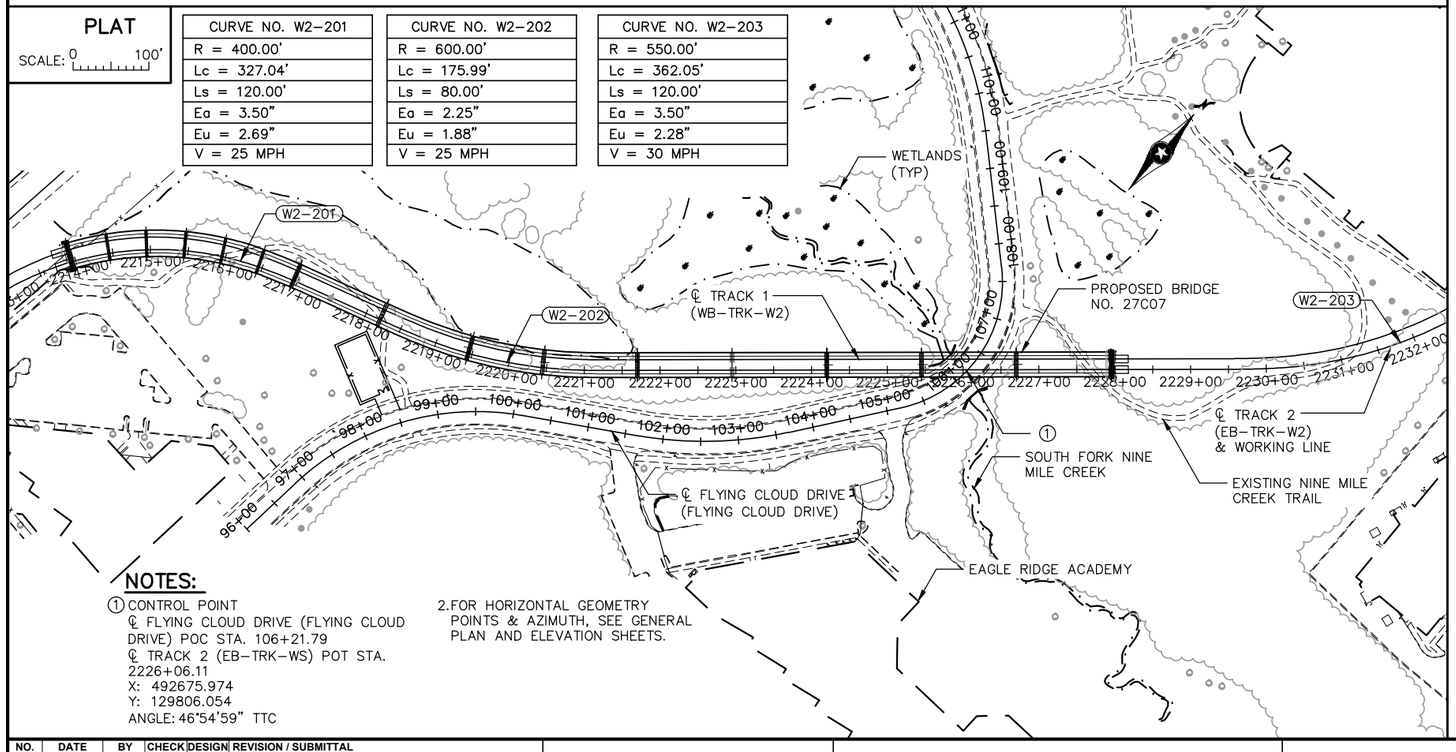
PLAT

SCALE: 0 100'

CURVE NO. W2-201
R = 400.00'
Lc = 327.04'
Ls = 120.00'
Ea = 3.50"
Eu = 2.69"
V = 25 MPH

CURVE NO. W2-202
R = 600.00'
Lc = 175.99'
Ls = 80.00'
Ea = 2.25"
Eu = 1.88"
V = 25 MPH

CURVE NO. W2-203
R = 550.00'
Lc = 362.05'
Ls = 120.00'
Ea = 3.50"
Eu = 2.28"
V = 30 MPH



NOTES:

① CONTROL POINT
℄ FLYING CLOUD DRIVE (FLYING CLOUD DRIVE) POC STA. 106+21.79
℄ TRACK 2 (EB-TRK-WS) POT STA. 2226+06.11
X: 492675.974
Y: 129806.054
ANGLE: 46°54'59" TTC

2. FOR HORIZONTAL GEOMETRY POINTS & AZIMUTH, SEE GENERAL PLAN AND ELEVATION SHEETS.

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 ENGINEERS RECOMMENDATION

DATE: 06-06-2014

STREAM OR DITCH DESIGNATION: SOUTH FORK NINE MILE CREEK

STRUCTURE NOT BEING REPLACED NO DESIGN REQUIRED

100-YEAR FLOOD ELEVATION: 847.04 FT

MAXIMUM OBSERVED HIGHWATER ELEVATION: XXX.X FT.

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

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

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

FLOWLINE ELEVATION: XXX FT. SKEW ANGLE: XX

ESTIMATED PRELIMINARY TOTAL SCOUR AT PIER EL. XXX.X (500 OR OT YR. FREQ.)

SCOUR CONFIRMATION RECOMMENDATION

DATE: XX-XX-XXXX

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

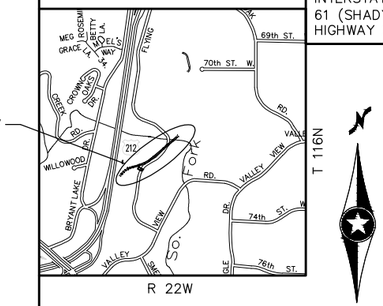
BRIDGE SURVEY SHEETS MADE FROM SURVEY AND PHOTOGRAMMETRIC MAPPING

MnDOT NAME: 2763A1 BENCH MARK ELEVATION 888.994 FEET (NAVD88) LOCATION STAMPED 2763 A 1 1979 – IN EDEN PRAIRIE, 0.5 MILE NORTH OF JUNCTION OF TRUNK HIGHWAY 212 AND INTERSTATE HIGHWAY 494, IN NORTHEAST CORNER OF VALLEY VIEW ROAD, BRIDGE NUMBER 27087 OVER TRUNK HIGHWAY 212, AT TRUNK HIGHWAY 212 MILEPOINT 159.9.

2ND MnDOT NAME: 2763C1 BENCH MARK ELEVATION 899.073 FEET (NAVD88) LOCATION STAMPED 2763 C 1 1979 – IN EDEN PRAIRIE, 1.6 MILES NORTH OF JUNCTION OF TRUNK HIGHWAY 212 AND INTERSTATE HIGHWAY 494, IN SOUTHEAST CORNER OF COUNTY ROAD 61 (SHADY OAK ROAD) BRIDGE NUMBER 27089 OVER TRUNK HIGHWAY 212, AT TRUNK HIGHWAY 212 MILEPOINT 120.3.

PROPOSED BRIDGE NO. 27C07

INDEX MAP (ONE SQ MILE)



BRIDGE SURVEY

0.5 MI NORTHEAST OF THE INTERSECTION OF TH 212 AND VALLEY VIEW ROAD IN EDEN PRAIRIE

SOUTHWEST LIGHT RAIL OVER FLYING CLOUD DRIVE

SEC 12 T 116N R 22W

CITY OF EDEN PRAIRIE HENNEPIN COUNTY

BRIDGE 27C07

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AV CHECKED BY: DD
DRAWN BY: GF DATE: 09/07/15

AECOM

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

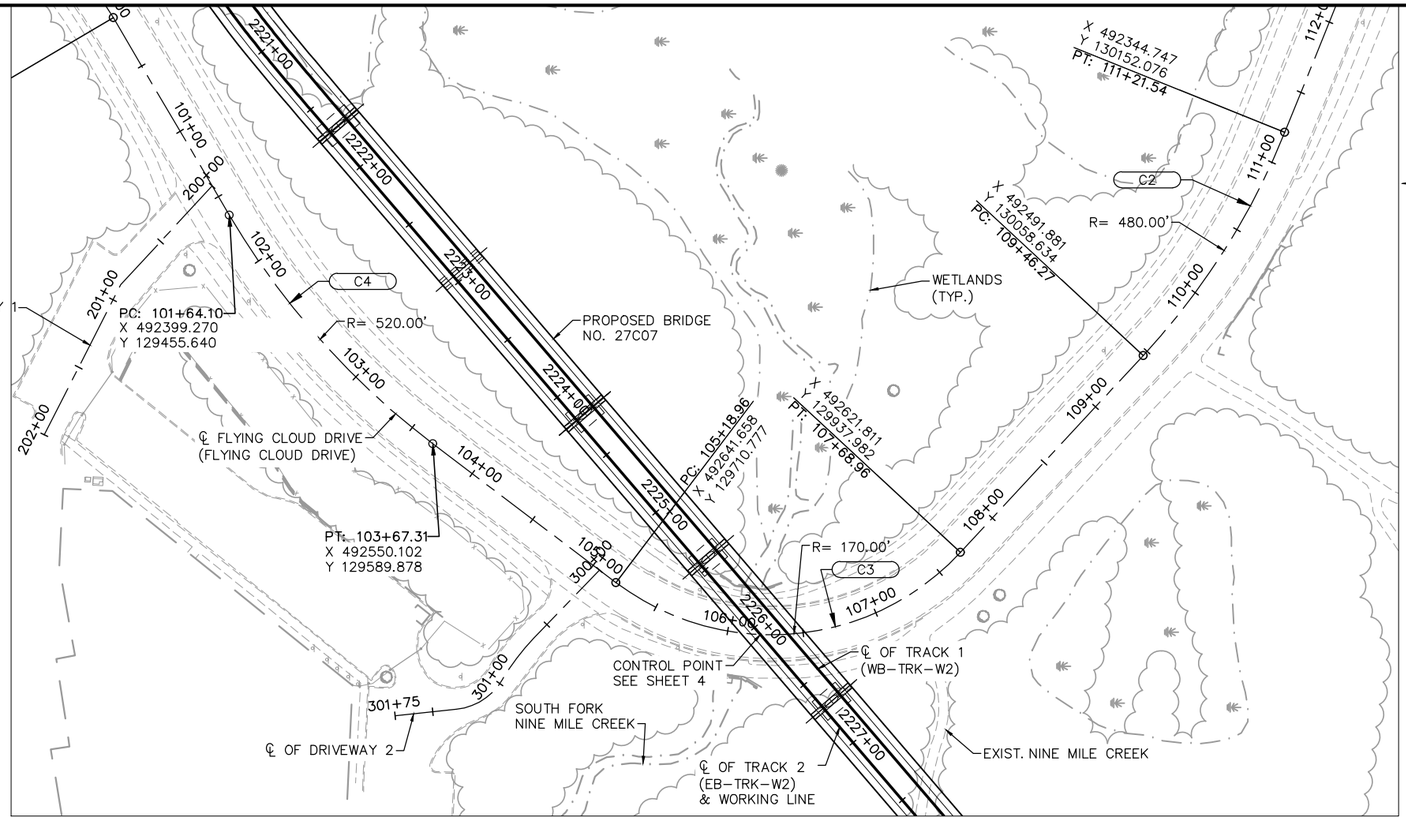
CIVIL WEST - VOLUME 4B
NINE MILE CREEK
BRIDGE 27C07
BRIDGE SURVEY 1

DISCIPLINE: STRUCTURES

SHEET NAME: CBR27C07-BRG-SUR-001

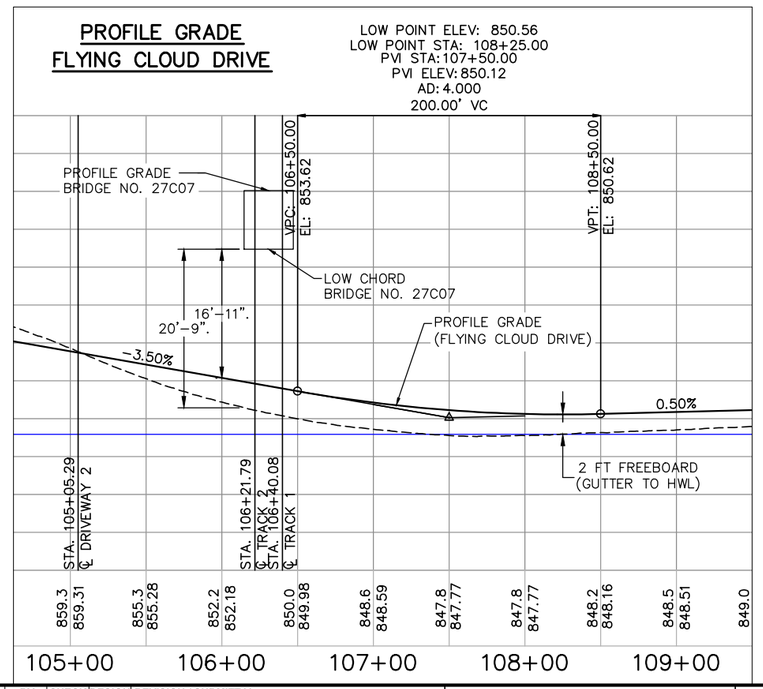
SHEET 60 OF 75

Sep. 18 2015 04:40 pm P:\60336960\3400_ADC\CAD\SEGMENT W2\PLAN SHEETS\STRUCTURES\CBR27C07\CBR27C07-BRG-SUR-001.dwg By: floresg



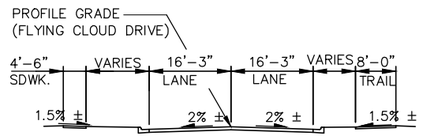
PLAN

0 25 50 100
SCALE IN FEET



PROFILE

0 25 50 100
SCALE IN FEET



PROPOSED TYPICAL APPROACH SECTION
FLYING CLOUD DRIVE

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AV | CHECKED BY: DD
DRAWN BY: GF | DATE: 09/07/15

AECOM

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

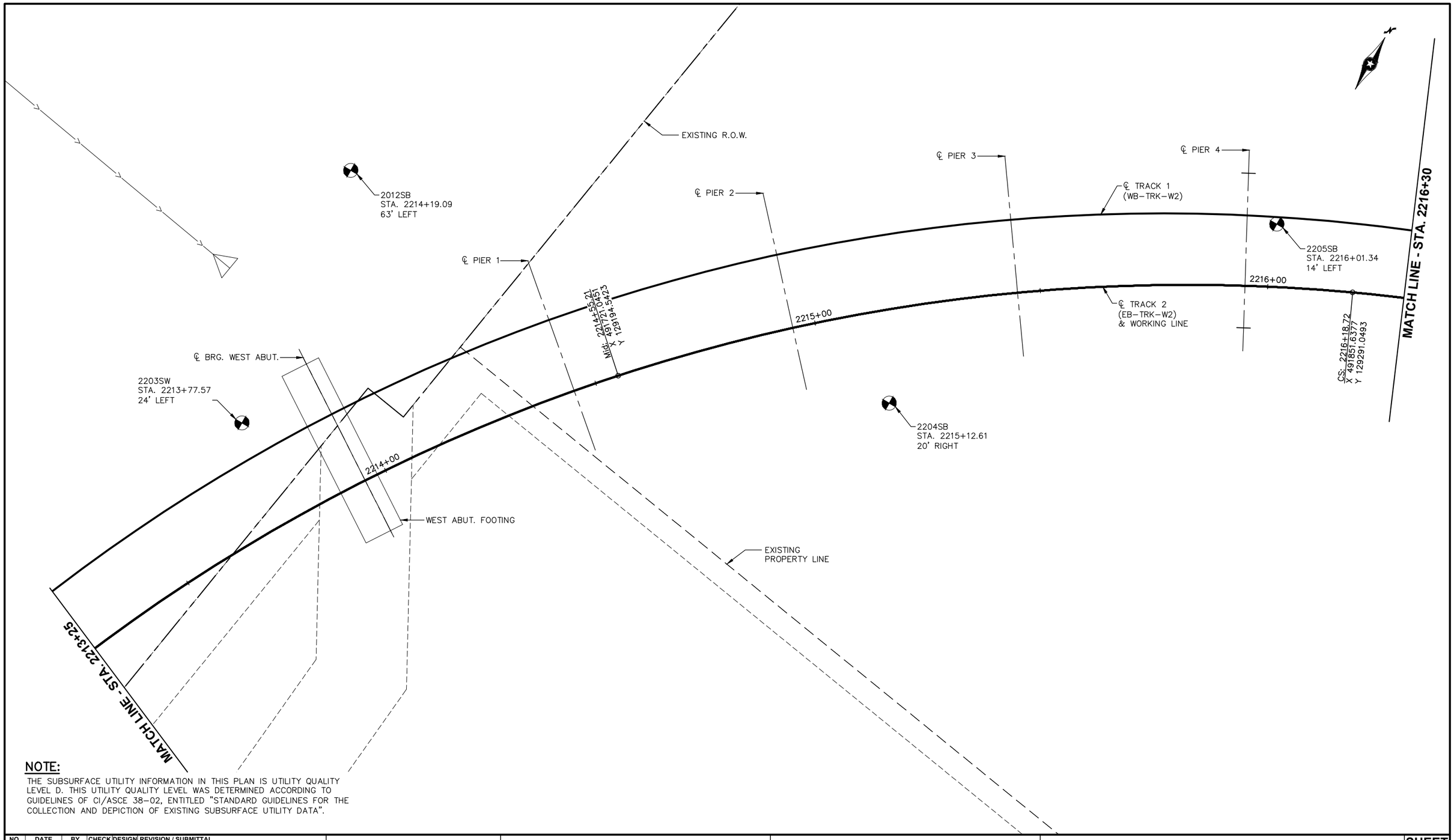
SOUTHWEST
Green Line LRT Extension

CIVIL WEST - VOLUME 4B
NINE MILE CREEK
BRIDGE 27C07
BRIDGE SURVEY 2

DISCIPLINE: STRUCTURES
SHEET NAME: CBR27C07-BRG-SUR-002

SHEET 61 OF 75

Sep. 18 2015 04:51 pm P:\60336960\3400_ADC\CAD\SEGMENT W2\PLAN SHEETS\STRUCTURES\CBR27C07\CBR27C07-BRG-SUR-002.dwg By: floresg



NOTE:

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".

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AV | CHECKED BY: DD
DRAWN BY: GF | DATE: 09/07/15

AECOM

60% SUBMISSION - 09/28/15

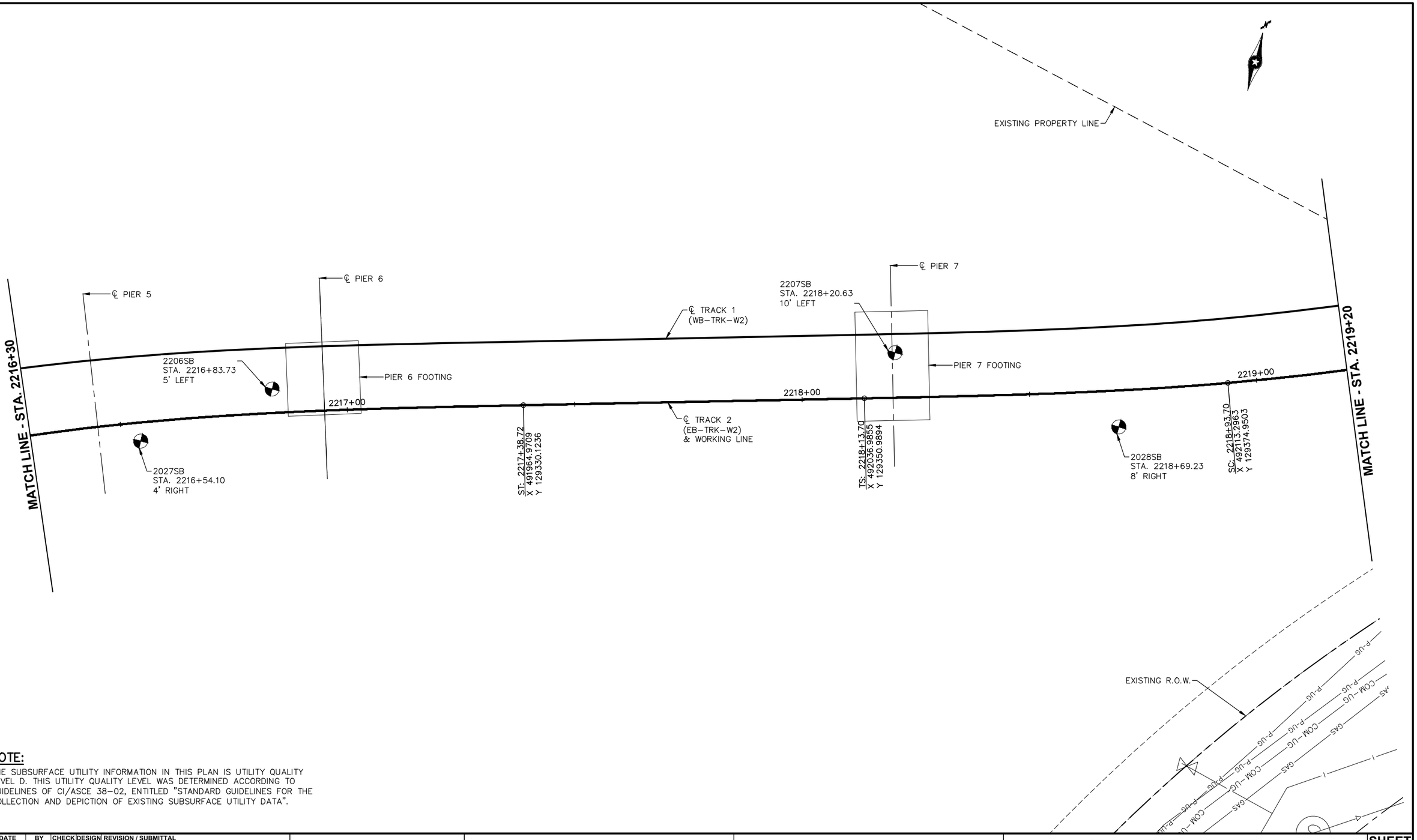
METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

CIVIL WEST - VOLUME 4B
NINE MILE CREEK
BRIDGE 27C07
BRIDGE SURVEY PLAN

DISCIPLINE: STRUCTURES
SHEET NAME: CBR27C07-BRG-BOR-001

SHEET 62 OF 75



NOTE:

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".

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AV | CHECKED BY: DD
DRAWN BY: GF | DATE: 09/07/15

AECOM

60% SUBMISSION - 09/28/15

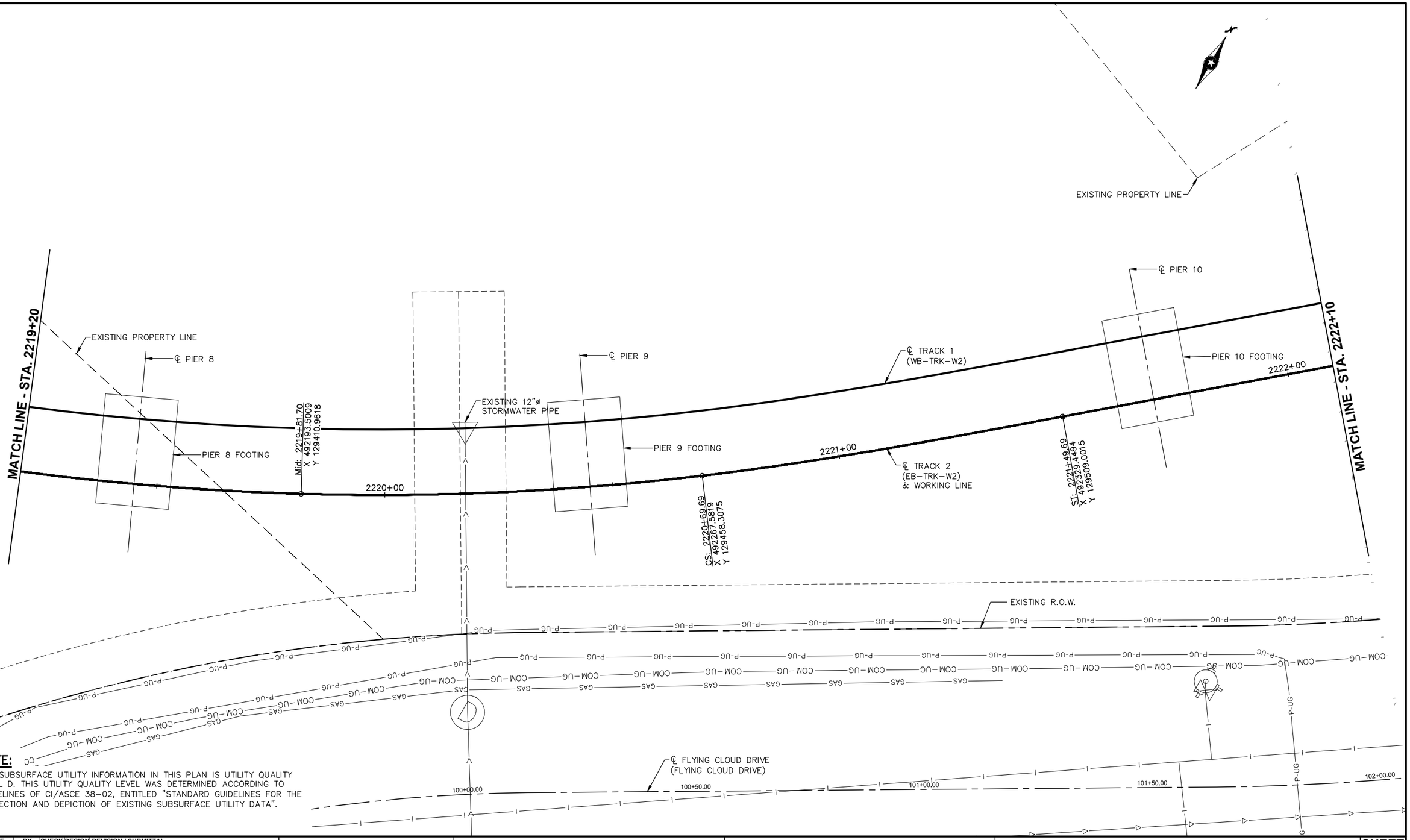
METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

CIVIL WEST - VOLUME 4B
NINE MILE CREEK
BRIDGE 27C07
BRIDGE SURVEY PLAN

DISCIPLINE: STRUCTURES
SHEET NAME: CBR27C07-BRG-BOR-002

SHEET 63 OF 75



NOTE:

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".

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AV | CHECKED BY: DD
DRAWN BY: GF | DATE: 09/07/15

AECOM

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

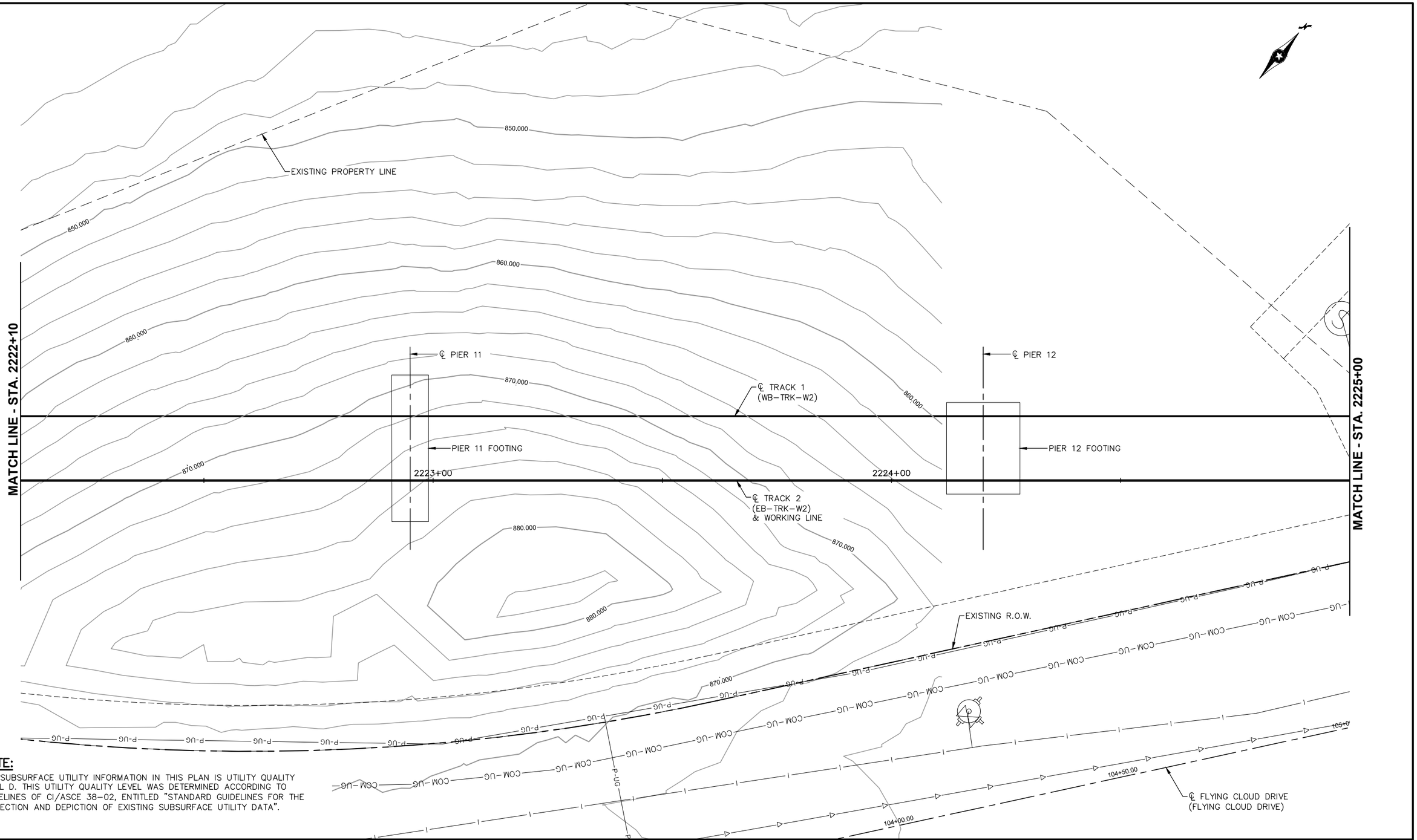
SOUTHWEST Green Line LRT Extension

CIVIL WEST - VOLUME 4B
NINE MILE CREEK
BRIDGE 27C07
BRIDGE SURVEY PLAN

DISCIPLINE: STRUCTURES

SHEET NAME: CBR27C07-BRG-BOR-003

SHEET 64 OF 75



NOTE:

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".

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AV | CHECKED BY: DD
DRAWN BY: GF | DATE: 09/07/15

AECOM

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

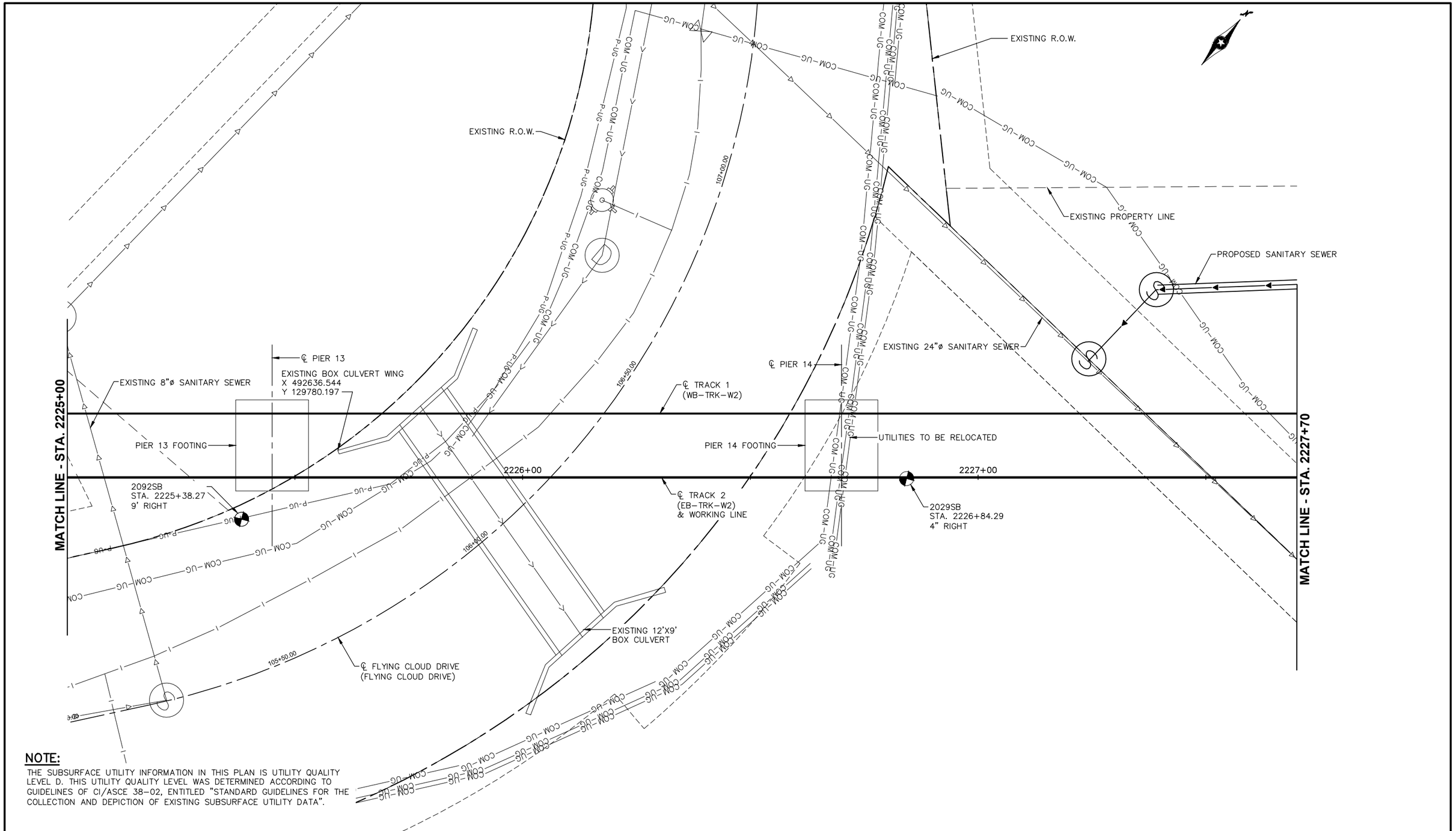
SOUTHWEST Green Line LRT Extension

CIVIL WEST - VOLUME 4B
NINE MILE CREEK
BRIDGE 27C07
BRIDGE SURVEY PLAN

DISCIPLINE: STRUCTURES

SHEET NAME: CBR27C07-BRG-BOR-004

SHEET 65 OF 75



NOTE:

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".

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AV | CHECKED BY: DD
DRAWN BY: GF | DATE: 09/07/15

AECOM

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

CIVIL WEST - VOLUME 4B
NINE MILE CREEK
BRIDGE 27C07
BRIDGE SURVEY PLAN

DISCIPLINE: STRUCTURES

SHEET NAME: CBR27C07-BRG-BOR-005

SHEET 66 OF 75

EXISTING PROPERTY LINE

PROPOSED SANITARY SEWER

℄ BRG. EAST ABUT.

℄ TRACK 1
(WB–TRK–W2)

MATCH LINE - STA. 2227+70

2228+00

2229+00

2230+00

MATCH LINE - STA. 2230+60

EAST ABUT. FOOTING

℄ TRACK 2
(EB–TRK–W2)
& WORKING LINE

2030SB
STA. 2227+91.81
12'–6" RIGHT

TS: 2229+27.55
X 492920.0129
Y 130015.2515

SC: 2230+47.55
X 493008.1737
Y 130096.5684

EXISTING 6"ø SANITARY
SEWER TO BE RELOCATED

2209SW
STA. 2229+36.31
34' RIGHT

COM–UG

NOTE:

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".

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AV | CHECKED BY: DD
DRAWN BY: GF | DATE: 09/07/15

AECOM

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

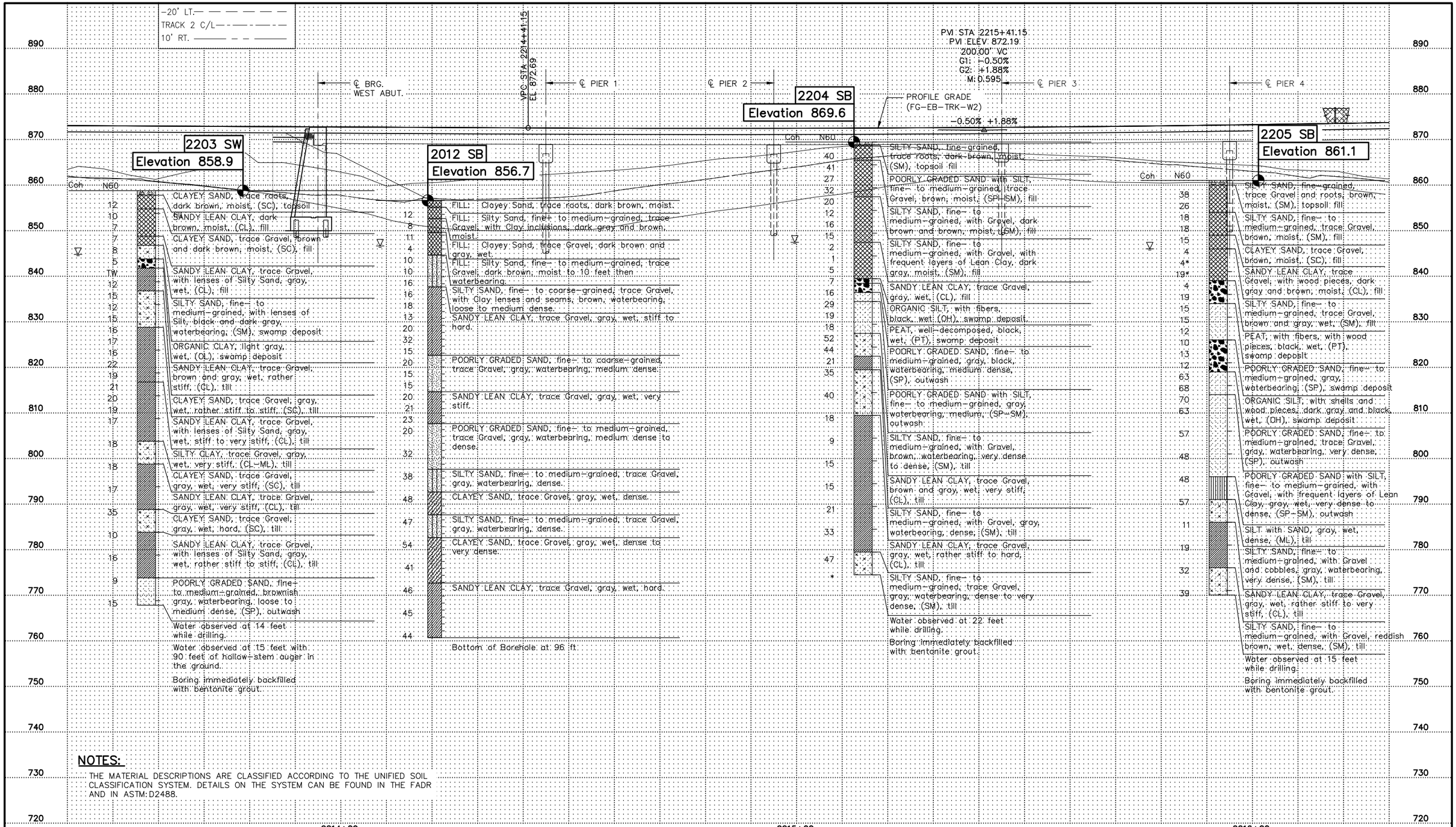
CIVIL WEST - VOLUME 4B
NINE MILE CREEK
BRIDGE 27C07
BRIDGE SURVEY PLAN

DISCIPLINE: STRUCTURES

SHEET NAME: CBR27C07-BRG-BOR-006

SHEET 67 OF 75

Sep. 18 2015 04:54 pm P:\60336960\3400_ADC\CAD\SEGMENT W2\PLAN SHEETS\STRUCTURES\CBR27C07\CBR27C07-BRG-BOR-012.dwg By: floresg



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.

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AV | CHECKED BY: DD
DRAWN BY: GF | DATE: 09/07/15

AECOM

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

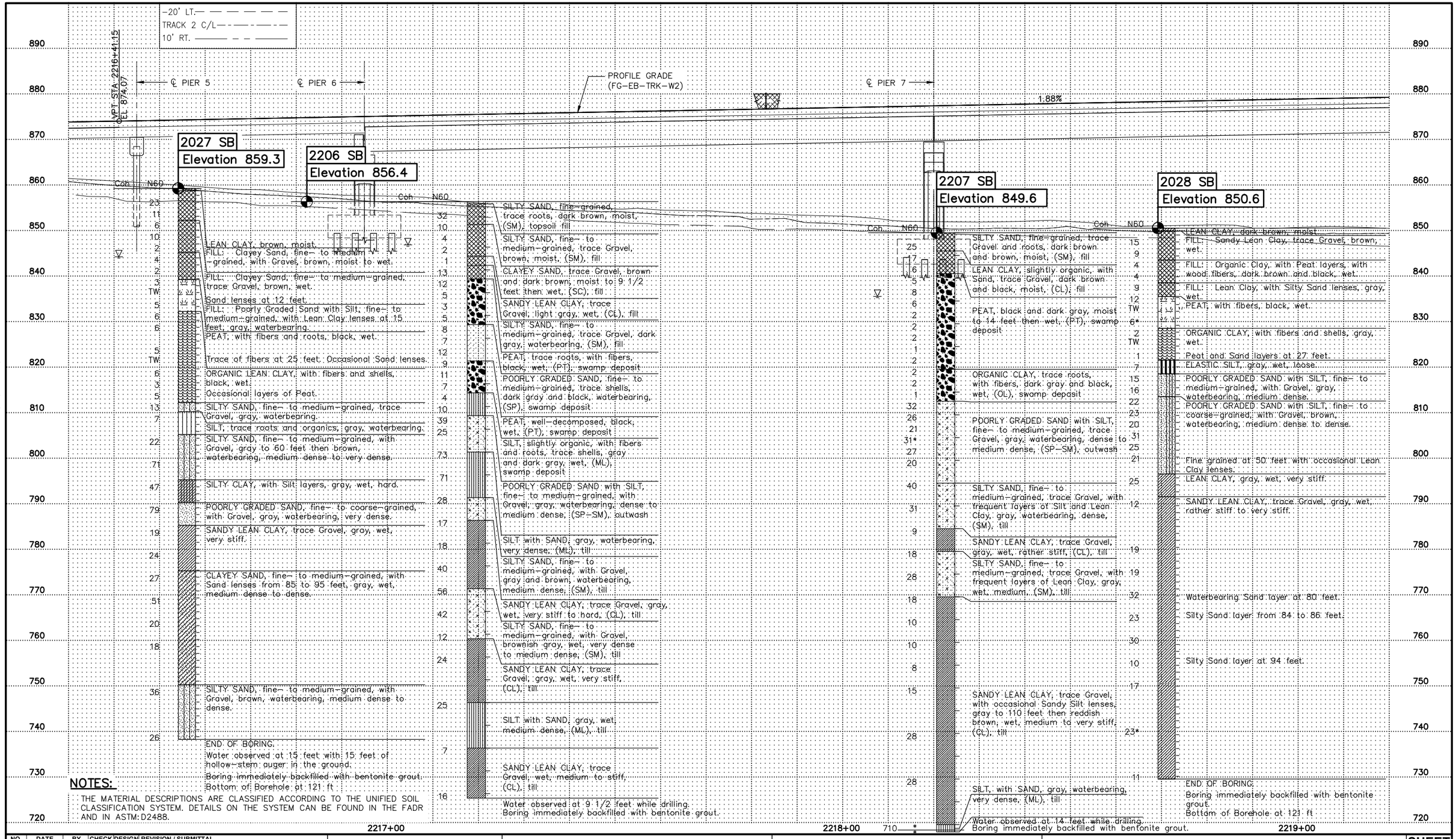
CIVIL WEST - VOLUME 4B
NINE MILE CREEK
BRIDGE 27C07
BRIDGE SURVEY PROFILE 1

DISCIPLINE: STRUCTURES

SHEET NAME: CBR27C07-BRG-BOR-007

SHEET 68 OF 75

Sep, 18 2015 04:54 pm P:\60336960\3400_ADC\CAD\SEGMENT W2\PLAN SHEETS\STRUCTURES\CBR27C07\CBR27C07-BRG-BOR-012.dwg By: floresg



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.

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AV | CHECKED BY: DD
DRAWN BY: GF | DATE: 09/07/15

AECOM

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

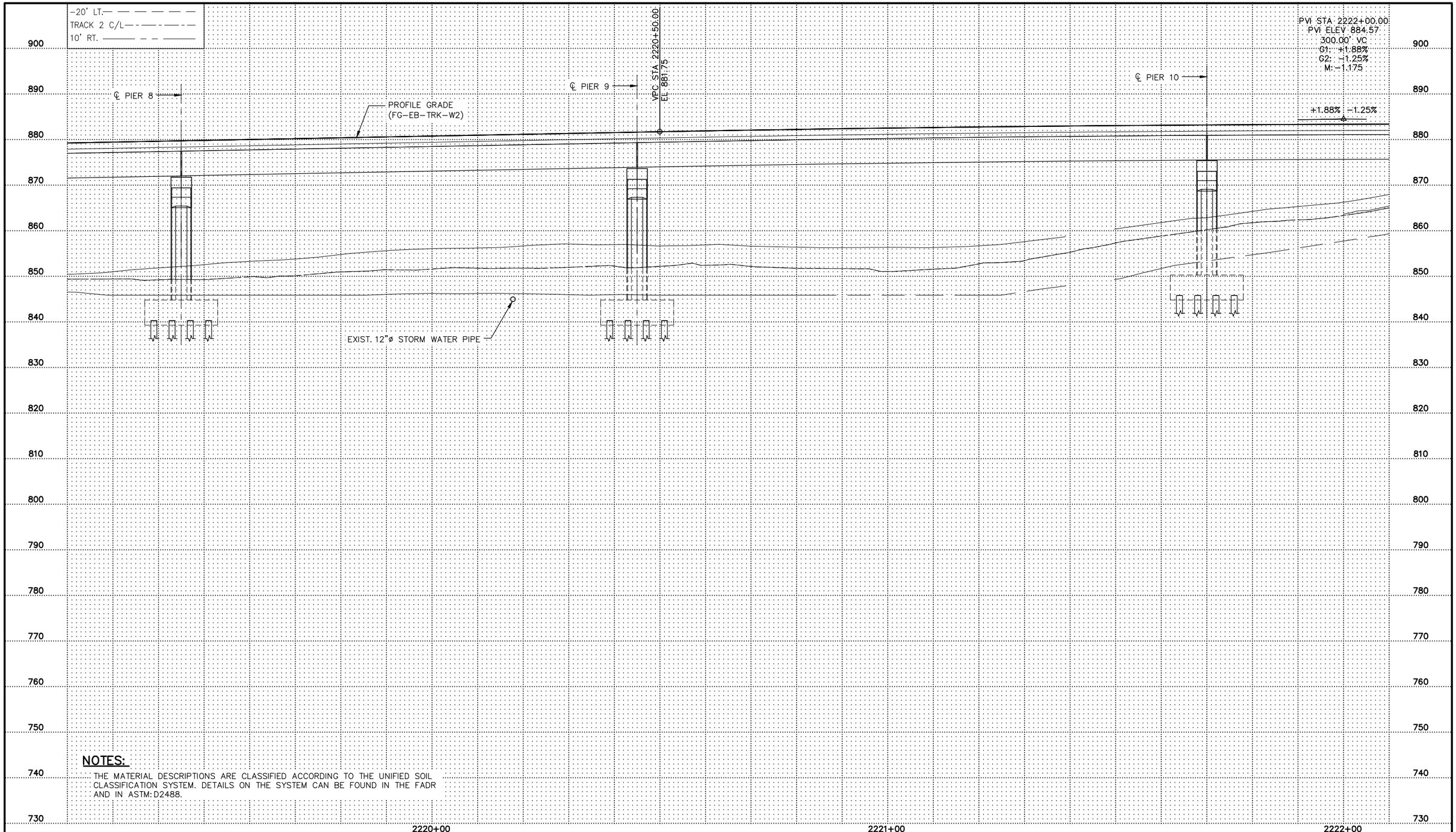
SOUTHWEST Green Line LRT Extension

CIVIL WEST - VOLUME 4B
NINE MILE CREEK
BRIDGE 27C07
BRIDGE SURVEY PROFILE 2

DISCIPLINE: STRUCTURES

SHEET NAME: CBR27C07-BRG-BOR-008

SHEET 69 OF 75



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.

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AV | CHECKED BY: DD
DRAWN BY: GF | DATE: 09/07/15

AECOM

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

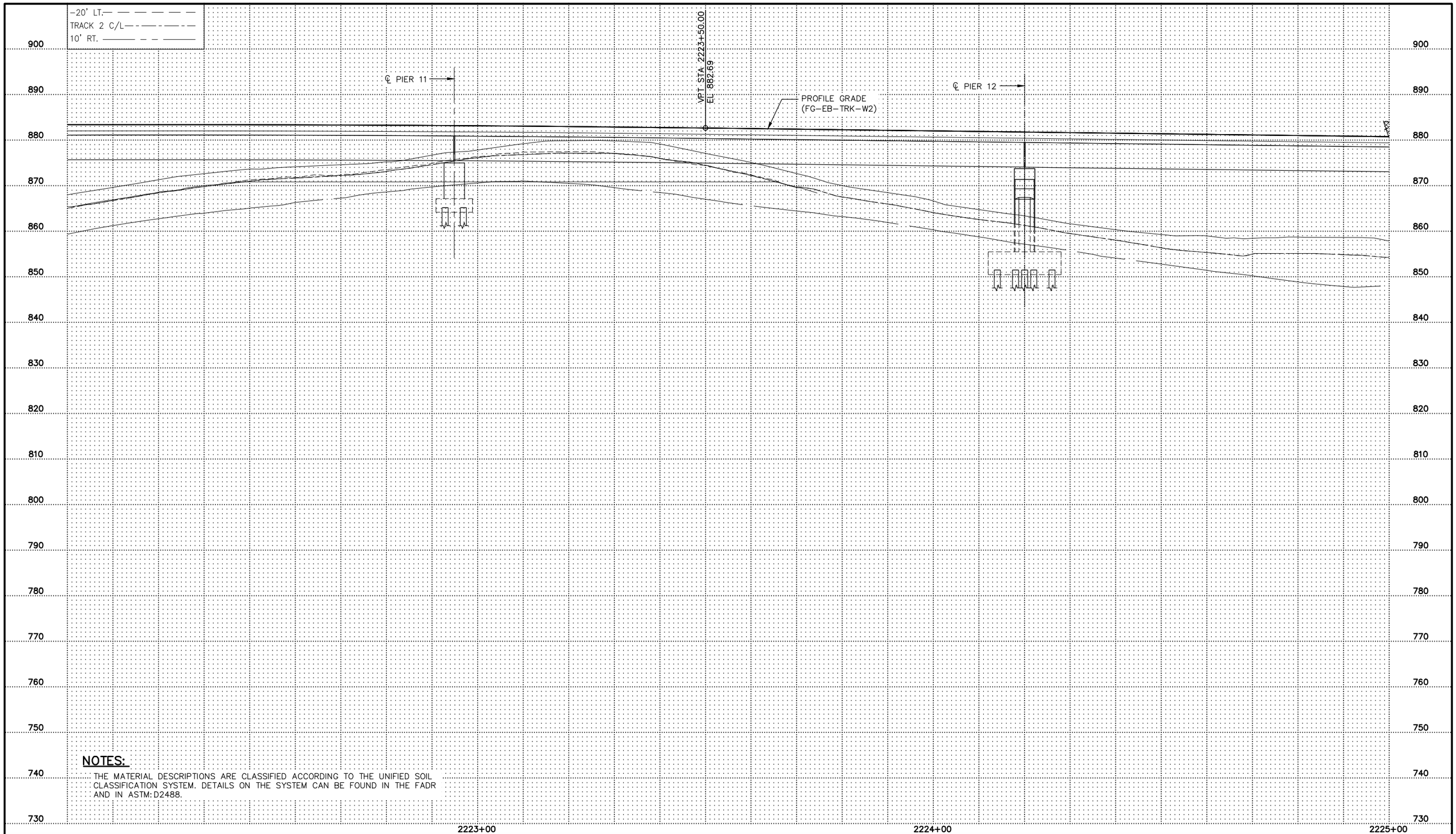
CIVIL WEST - VOLUME 4B
NINE MILE CREEK
BRIDGE 27C07
BRIDGE SURVEY PROFILE 3

DISCIPLINE: STRUCTURES

SHEET NAME: CBR27C07-BRG-BOR-009

SHEET 70 OF 75

Sep. 18 2015 04:54 pm P:\60336960\3400_ADC\CAD\SEGMENT W2\PLAN SHEETS\STRUCTURES\CBR27C07\CBR27C07-BRG-BOR-012.dwg By: floresg



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.

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AV | CHECKED BY: DD
DRAWN BY: GF | DATE: 09/07/15

AECOM

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

CIVIL WEST - VOLUME 4B
NINE MILE CREEK
BRIDGE 27C07
BRIDGE SURVEY PROFILE 4

DISCIPLINE: STRUCTURES

SHEET NAME: CBR27C07-BRG-BOR-010

SHEET 71 OF 75

Sep. 18 2015 04:54 pm P:\60336960\3400_ADC\CAD\SEGMENT W2\PLAN SHEETS\STRUCTURES\CBR27C07\CBR27C07-BRG-BOR-012.dwg By: floresg

-20' LT.
TRACK 2 C/L
10' RT.

℄ PIER 13

℄ PIER 14

PROFILE GRADE
(FG-EB-TRK-W2)

-1.25%

2092SB
Elevation 855.2

℄ FLYING CLOUD DRIVE
(FLYING CLOUD DRIVE)

EXISTING 12' X 9'
BOX CULVERT

EXISTING 8"ø
SANITARY SEWER

Coh	N60	
		Silty Sand, trace roots, dark brown, moist, (SM), topsoil / fill
	16	
	30	Poorly Graded Sand with Silt, fine- to medium-grained, with Gravel,
	18	with frequent lenses of Lean Clay, brown, moist, (SP-SM), fill
	20	
	3	
	6	Silty Sand, fine- to medium-grained, with Gravel, brown and gray,
	17	moist, (SM), fill
	22	
	*	Sandy Lean Clay, trace Gravel, gray and black, moist, (CL), fill
	21	
	9	Highly Organic Silt, wtih fibers, trace shells, black, (OH), swamp deposit
	6	
	10	SILTY SAND, fine- to coarse-grained, with Gravel, light gray, wet to
	11	waterbearing, medium dense, (SM), till
	16	
	18	
	24	POORLY GRADED SAND, fine- to coarse-grained, with Gravel, light
	23	gray, waterbearing, medium dense, (SP) outwash
	23	
	26	
		SANDY LEAN CLAY, trace Gravel, gray, wet, medium to rather stiff,
		(CL), till
	31	CLAYEY SAND, with Gravel, brownish gray to gray, wet, stiff to very
		stiff, (SC), till
	33	SANDY LEAN CLAY, trace Gravel, gray, wet, very stiff, (CL), till
	37	CLAYEY SAND, with Gravel, with frequent layers of Lean Clay,
	39	brownish gray, wet, very stiff to hard, (CL), till
	34	SILTY SAND, fine- to medium-grained, reddish brown, wet, dense,
	47	(SM), till
	41	
	48	SILTY SAND, fine- to medium-grained, with frequent layers of Silt,
		reddish brown, wet, dense, (SM), till
	48	
		Water observed at 15 feet while drilling
		Boring then sealed with bentonite grout

2029SB
Elevation 844.6

EXISTING 24"ø
SANITARY SEWER

Coh	N60	
		LEAN CLAY, dark brown, moist.
		FILL: Lean Clay, with Gravel, brwon, moist.
	23	
	46	
	26	FILL: Silty Sand, fine- to medium-grained, with Gravel, brown, moist.
	26	
	13	
	6	LEAN CLAY, with fibers, gray, wet.
	8	POORLY GRADED SAND, fine- to coarse-grained, with Gravel, brown, waterbearing, loose.
	9	SANDY LEAN CLAY, trace Gravel, gray, wet, rather stiff.
	11	CLAYEY SAND, fine- to medium-grained, trace of Gravel, brown, wet, medium dense.
	12	POORLY GRADED SAND, fine- to coarse-grained, with Gravel, brown, waterbearing, medium dense.
	17	
	25	SANDY LEAN CLAY, trace Gravel, brown, wet, stiff to very stiff.
	16	END OF BORING.
		Water observed at 15 feet with 15 feet of hollow-stem auger in the ground.
		Boring immediately backfilled with bentonite grout.
		Bottom of Borehole at 51 ft

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.

900 890 880 870 860 850 840 830 820 810 800 790 780 770 760 750 740 730

2225+00 2226+00 2227+00

Sep, 18 2015 04:54 pm P:\60336960\3400_ADC\CAD\SEGMENT W2\PLAN SHEETS\STRUCTURES\CBR27C07\CBR27C07-BRG-BOR-012.dwg By: floresg

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AV | CHECKED BY: DD
DRAWN BY: GF | DATE: 09/07/15

AECOM

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

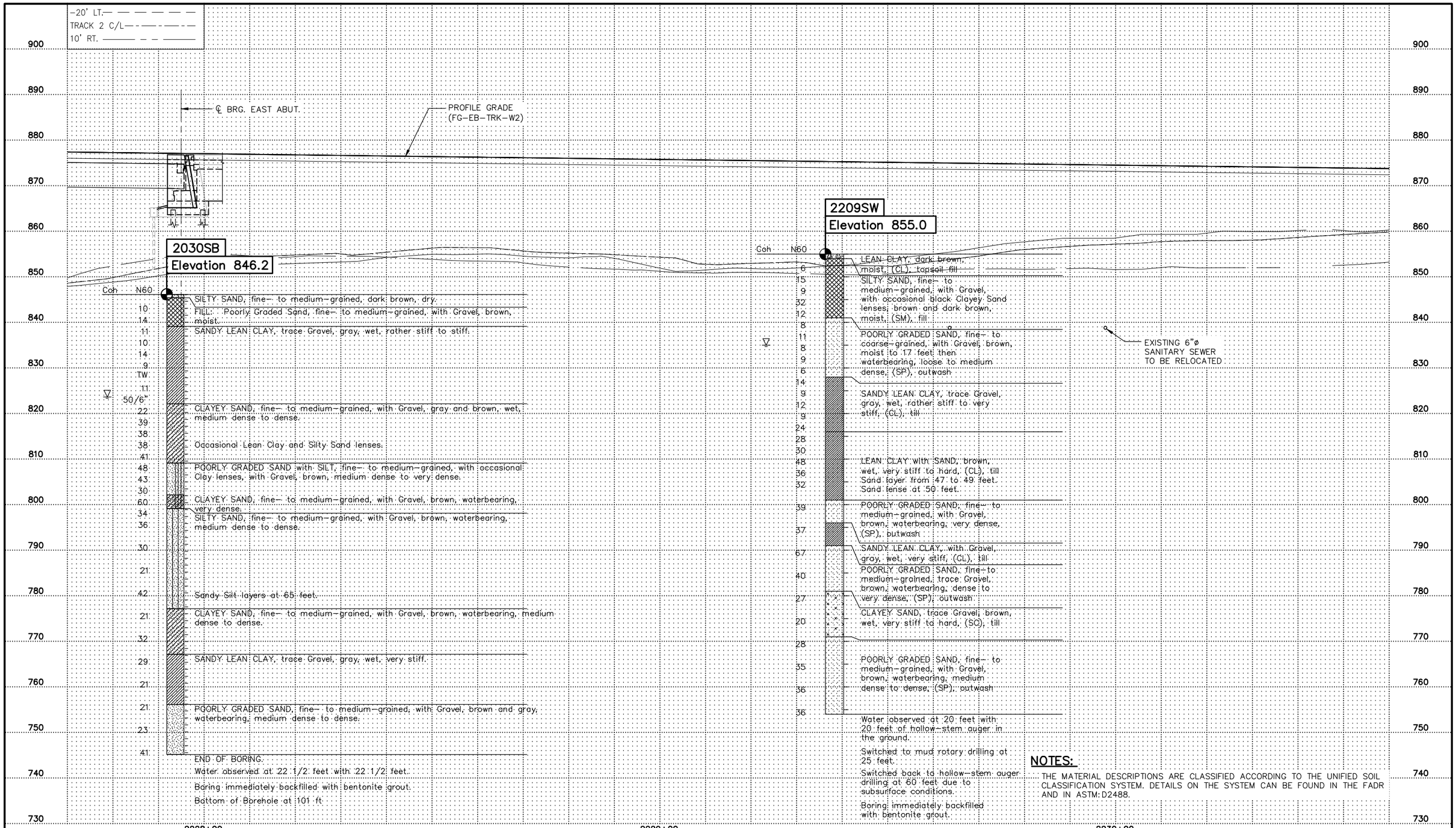
SOUTHWEST Green Line LRT Extension

CIVIL WEST - VOLUME 4B
NINE MILE CREEK
BRIDGE 27C07
BRIDGE SURVEY PROFILE 5

DISCIPLINE: STRUCTURES

SHEET NAME: CBR27C07-BRG-BOR-011

SHEET 72 OF 75



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.

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AV | CHECKED BY: DD
DRAWN BY: GF | DATE: 09/07/15

AECOM

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

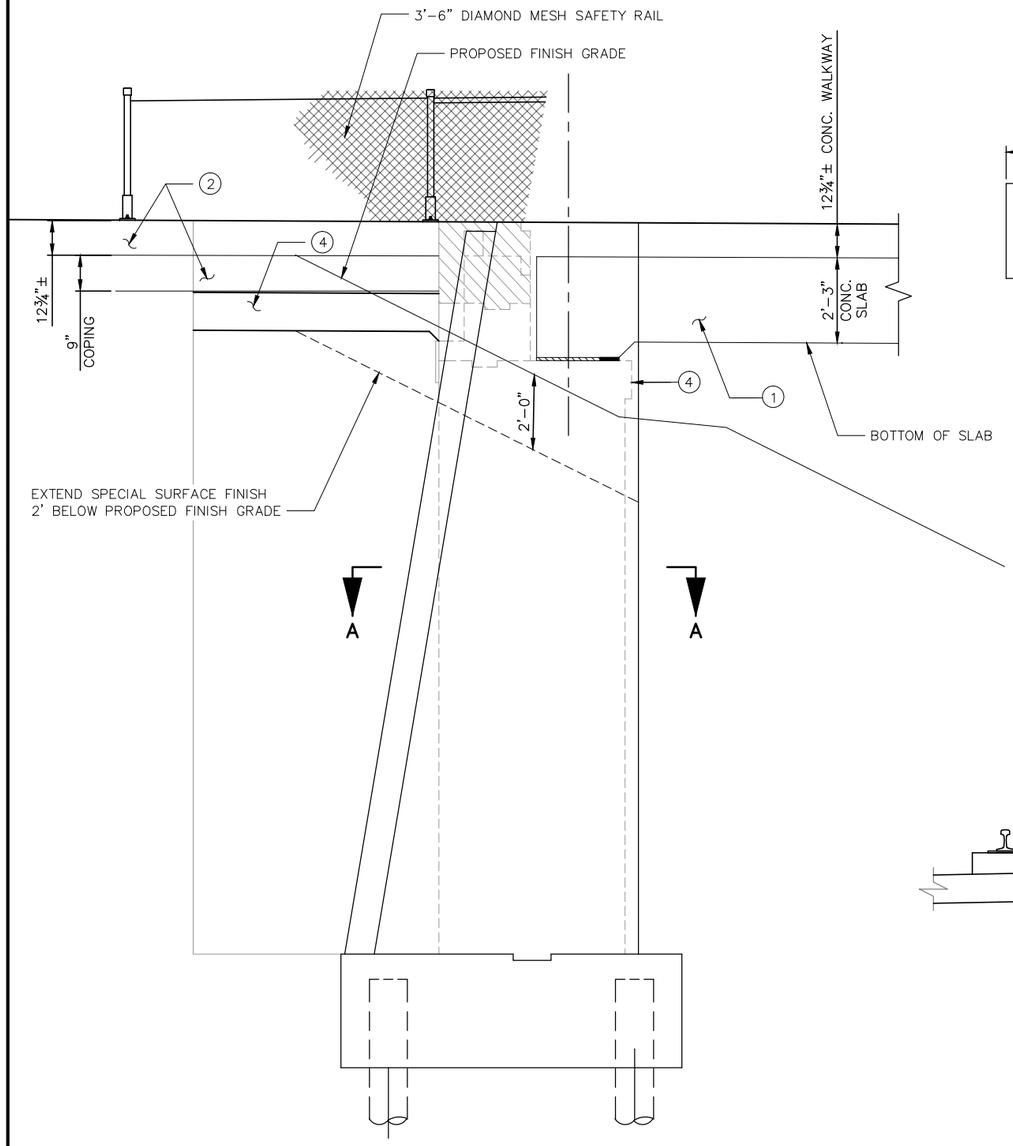
CIVIL WEST - VOLUME 4B
NINE MILE CREEK
BRIDGE 27C07
BRIDGE SURVEY PROFILE 6

DISCIPLINE: STRUCTURES

SHEET NAME: CBR27C07-BRG-BOR-012

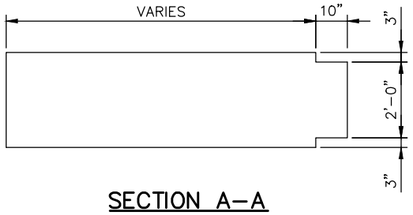
SHEET 73 OF 75

Sep, 18 2015 04:54 pm P:\60336960\3400_ADC\CAD\SEGMENT W2\PLAN SHEETS\STRUCTURES\CBR27C07\CBR27C07-BRG-BOR-012.dwg By: floresg

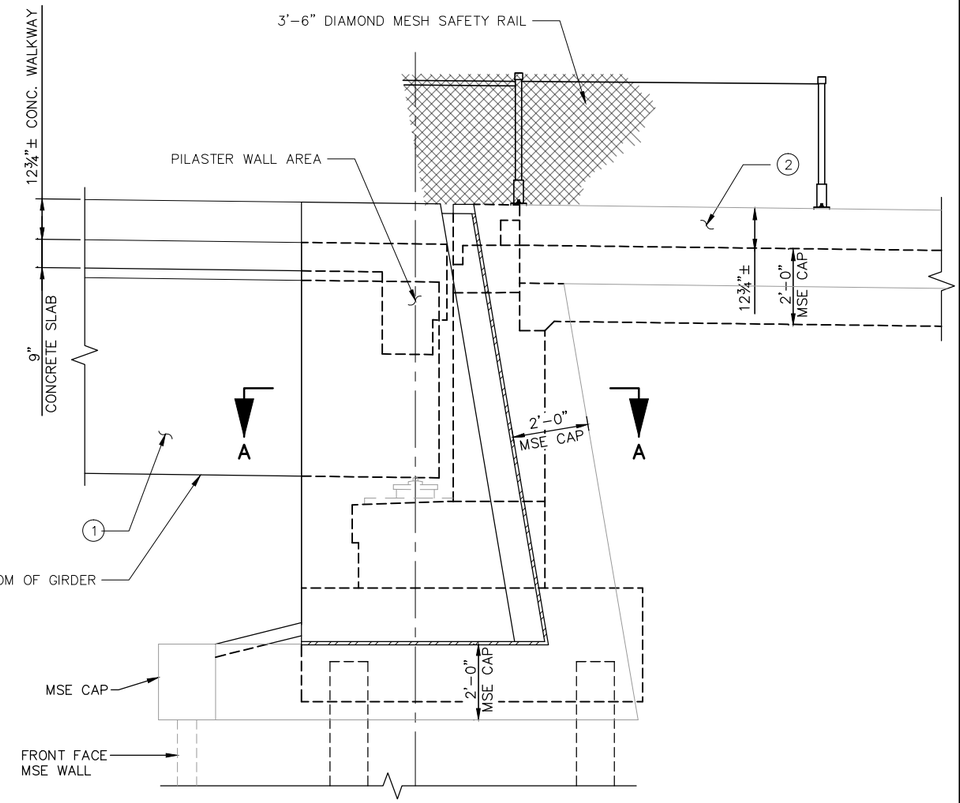


PART ELEVATION AT WEST ABUTMENT

(SOUTH PILASTER SHOWN, NORTH PILASTER SIMILAR)



SECTION A–A



PART ELEVATION AT EAST ABUTMENT

(SOUTH PILASTER SHOWN, NORTH PILASTER SIMILAR)

PART TRANSVERSE SECTION AT BRIDGE

NOTES:

1. SPECIAL SURFACE FINISH SHALL BE APPLIED TO THE BOTTOM FLANGE OF ALL GIRDERS, THE OUTSIDE FACE OF FASCIA GIRDERS AND THE BOTTOM OF THE DECK BETWEEN THE EDGE OF DECK AND THE TOP FLANGE OF THE FASCIA GIRDER. COLOR SHALL BE FEDERAL STANDARD COLOR XXXX, COLOR XXXXX (COLOR). SEE SPEC. SB 2401.
2. SPECIAL SURFACE FINISH SHALL BE APPLIED TO THE EDGE OF DECK, EDGE OF WALKWAY AND COPING AT F.F. OF ABUTMENT BODY AND AT TOP OF WINGWALL. COLOR SHALL BE FEDERAL COLOR XXXX, COLOR XXXXX. SEE SPEC. SB 2401.
3. 3'–6" HIGH DIAMOND MESH SAFETY RAIL. FOR DETAILS, SEE SHEET 55 OF 75.
4. SPECIAL SURFACE FINISH SHALL BE APPLIED TO THE WINGWALLS AND F.F. OF ABUTMENT BODY (SHADED AREA). COLOR SHALL BE FEDERAL COLOR XXXX, COLOR XXXXX. SEE SPEC. SB 2401.

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AV | CHECKED BY: DD
DRAWN BY: GF | DATE: 09/07/15

AECOM

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

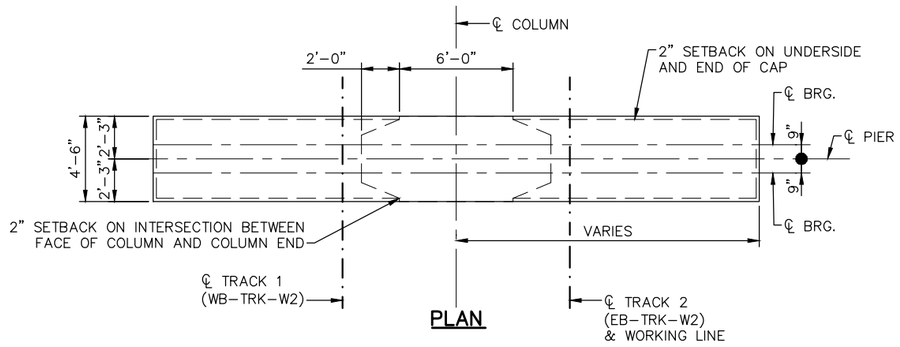
SOUTHWEST Green Line LRT Extension

CIVIL WEST - VOLUME 4B
NINE MILE CREEK
BRIDGE 27C07
AESTHETICS 1

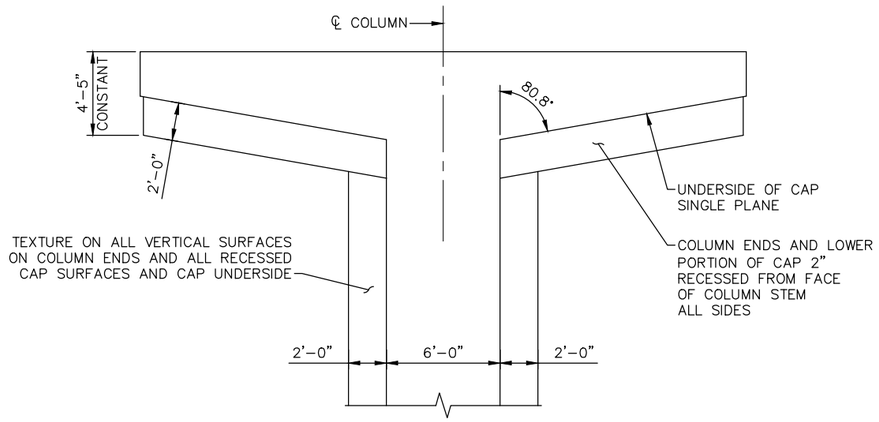
DISCIPLINE: STRUCTURES
SHEET NAME: CBR27C07-BRG-AES-001

SHEET 74 OF 75

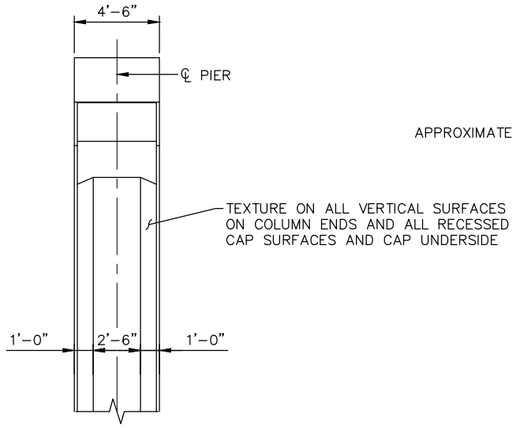
Sep. 21 2015 09:52 am P:\60336960\3400_ADC\CAD\SEGMENT W2\PLAN SHEETS\STRUCTURES\CBR27C07\CBR27C07-BRG-AES-001.dwg By: floresg



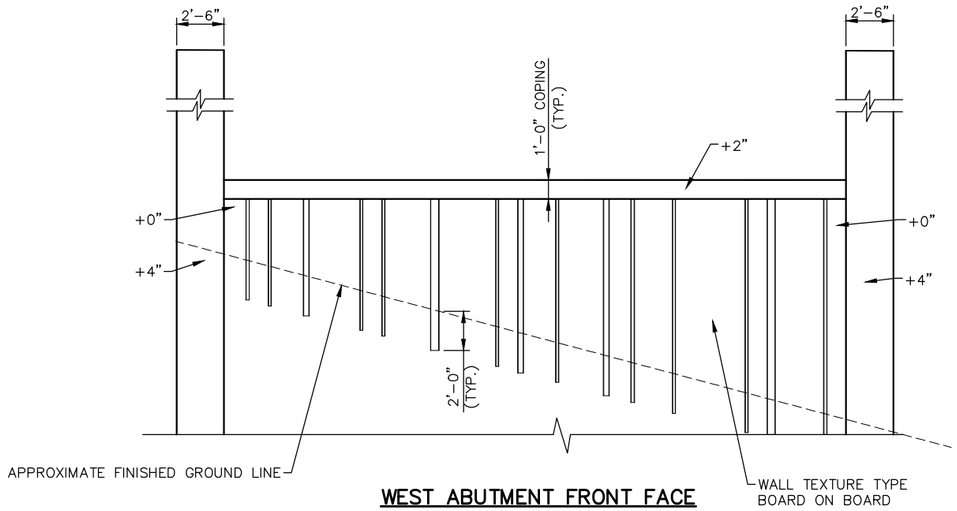
PLAN



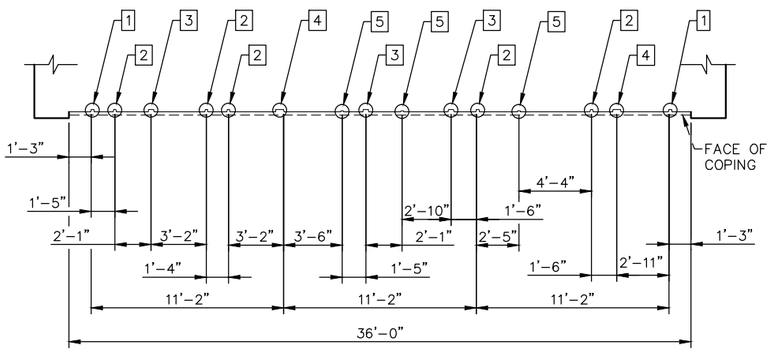
ELEVATION



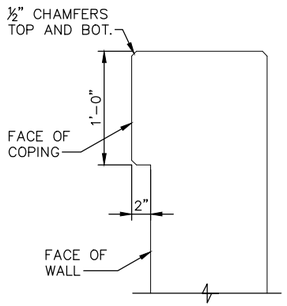
END VIEW



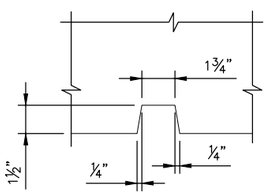
WEST ABUTMENT FRONT FACE



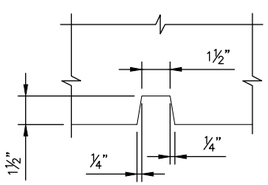
WEST ABUTMENT FRONT FACE PLAN



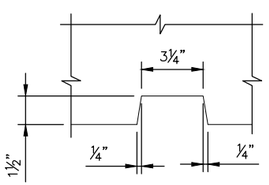
SECTION THRU COPING



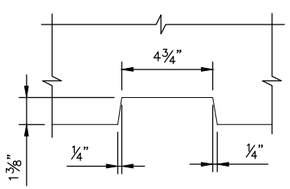
DETAIL 1



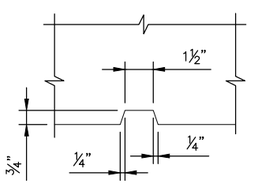
DETAIL 2



DETAIL 3



DETAIL 4



DETAIL 5

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: AV | CHECKED BY: DD
DRAWN BY: GF | DATE: 09/07/15

AECOM

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

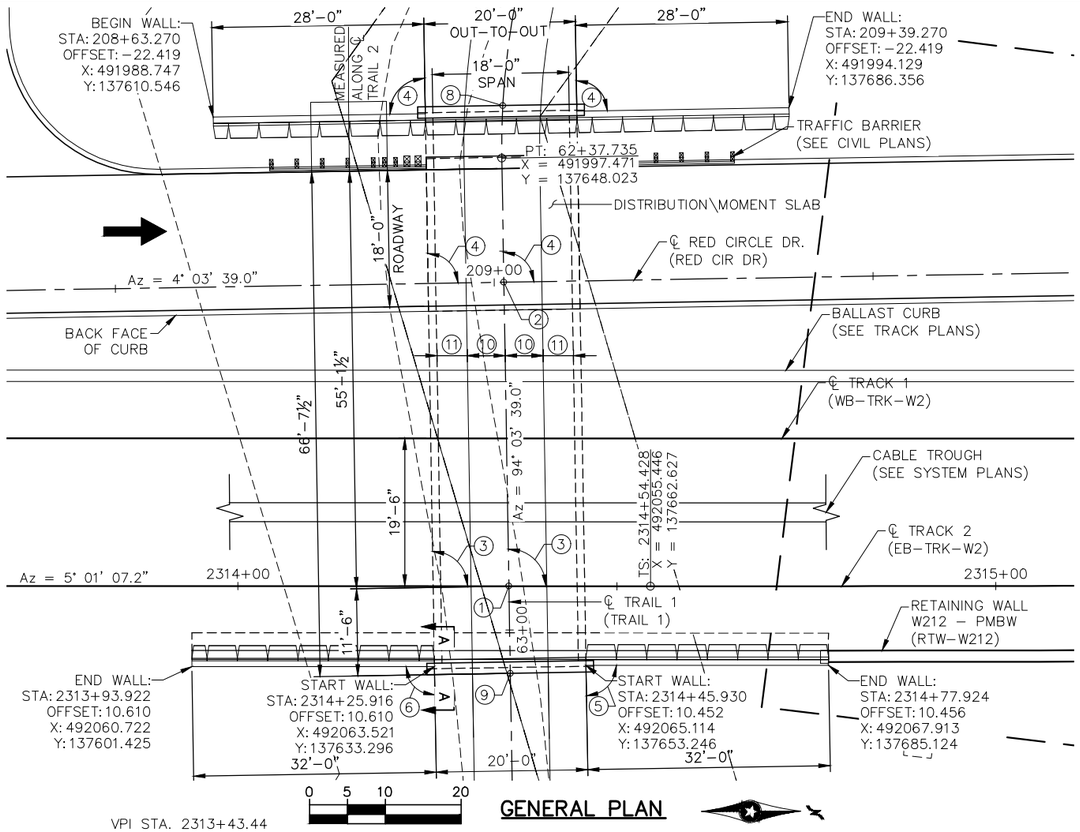
SOUTHWEST Green Line LRT Extension

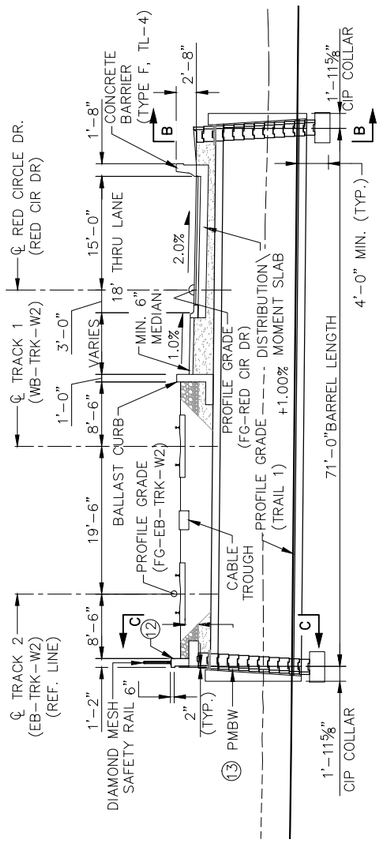
CIVIL WEST - VOLUME 4B
NINE MILE CREEK
BRIDGE 27C07
AESTHETICS 2

DISCIPLINE: STRUCTURES
SHEET NAME: CBR27C07-BRG-AES-002

SHEET 75 OF 75

Sep, 18 2015 04:54 pm P:\60336960\3400_ADC\CAD\SEGMENT W2\PLAN SHEETS\STRUCTURES\CBR27C07\CBR27C07-BRG-AES-002.dwg By: floresg





TRANSVERSE SECTION

0 5 10 20

NOTES:

SEE BRIDGE SURVEY PLAN SHEET FOR IN−PLACE UTILITIES.

TRAIL TRAFFIC TO BE DETOURED DURING CONSTRUCTION

ALL BARS TO BE EXPOY COATED

HEADWALLS AND WINGS ARE PREFABRICATED MODULAR BLOCK WALLS (PMBW) WITH SOIL REINFORCEMENT, PHASE III SYSTEM, SEE SPECIAL PROVISIONS.

PREFABRICATED MODULAR BLOCK TEXTURE MUST CONFORM TO SIMULATED NATURAL LIMESTONE ROCK PER CITY OF MINNETONKA REQUIREMENTS

(1) CONTROL POINT:
℄ TRACK 2 (EB−TRK−W2)
STA. 2314+35.753
℄ TRAIL 1 (TRAIL 1)
STA. 62+94.217
X = 492053.812
Y = 137644.023

(2) ℄ RED CIRCLE DR. (RED CIR DR)
STA. 209+01.270
℄ TRAIL 1 (TRAIL 1)
STA. 62+54.104
X = 492013.800
Y = 137646.863

(3) 90°−57'−28.2"

(4) 90°−00'−00"

(5) 89°−02'−35.8"

(6) 90°−57'−28.2"

(7) 12" MIN BALLAST AND 9" MIN SUBBALLAST (SEE TRACK PLANS)

(8) BEGIN UNDERPASS
STA: 62+30.787
TOP OF BITUMINOUS
EL: 904.96

(9) END UNDERPASS
STA: 63+05.728
TOP OF BITUMINOUS
EL: 905.71

(10) 5'−0"

(11) 4'−0"

(12) CONCRETE BARRIER (TYPE, P1 MOD)

(13) WINGWALL AND RETAINING WALL TO BE CONSTRUCTED AS ONE CONTINUOUS WALL WITHOUT A VERTICAL JOINT (BLOCK SHALL BE FROM THE SAME SUPPLIER FOR BOTH)

DESIGN DATA

2014 AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS 7TH EDITION

METRO LIGHT RAIL TRANSIT DESIGN CRITERIA (REVISION 4.0)

LOAD AND RESISTANCE FACTOR DESIGN METHOD

HL−93 LIVE LOAD (RED CIRCLE DRIVE)

LRV & MV LOAD DIAGRAM SHOWN ON SHEET #

INSIDE HEIGHT =	10'−0"
INSIDE WIDTH =	18'−0"
SKEW ANGLE =	0°57'28.2"
MINIMUM DESIGN FILL HEIGHT =	2'−6"
MAXIMUM DESIGN FILL HEIGH =	3'−5"
UNIT WEIGHT FILL =	120.0LBS/CU.FT.
ANGLE INTERNAL FRICTION =	30.00DEG

fy = 60000 P.S.I. REINFORCEMENT BARS
fy = 65000 P.S.I. STEEL FABRIC
f'c = 5000 P.S.I. CONCRETE
DESIGN SPEED OVER: 40 MPH (LRT)
25 MPH (RED CIRCLE DR.)

LIST OF SHEETS

2040 PROJECTED TRAFFIC VOLUMES

ROADWAY OVER		ROADWAY UNDER
7000	AADT	N/A
XXXX	DHV	N/A
XXXXX	ADTT	N/A

BRIDGE NO. 27J62

SOUTHWEST LRT OVER TRAIL 1
0.6 MI. W OF JCT. T.H. 62/T.H. 169 IN MINNETONKA

18' X 10' BOX CULVERT
0°−57'−28.2" SKEW

BRIDGE I.D. NO. 113

GENERAL PLAN AND ELEVATION

SEC 36 T117N R22W
CITY OF MINNETONKA HENNEPIN COUNTY

APPROVED: _____
STATE BRIDGE ENGINEER DATE

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

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: BR CHECKED BY: PLR
DRAWN BY: BR DATE: 08/10/15

AECOM

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

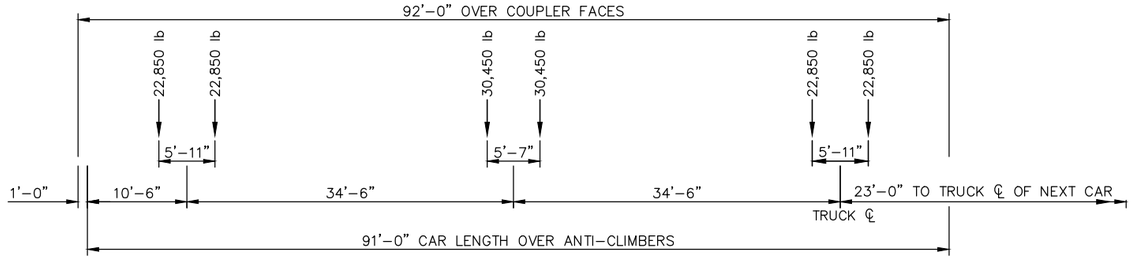
SOUTHWEST Green Line LRT Extension

CIVIL WEST - VOLUME 4B
PEDESTRIAN UNDERPASS 1
BRIDGE 27J62
GENERAL PLAN AND ELEVATION

DISCIPLINE: STRUCTURES
SHEET NAME: CBR27J62-BRG-GPE-001

SHEET 1 OF 13

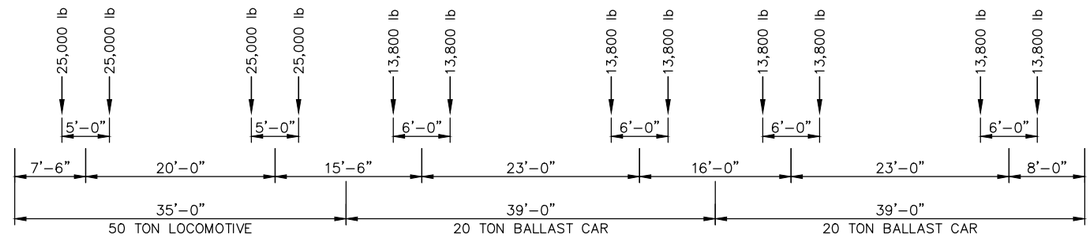
Sep. 21 2015 07:46 am v:\3400_ADC\CAD\SEGMENT W2\PLAN SHEETS\STRUCTURES\CBR27J62\CBR27J62−BRG−GPE.dwg By: RieckmBB



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.



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. WEIGHT OF EMPTY BALLAST CAR IS 15,000 POUNDS.

COMPONENT ITEM SCHEDULE – BRIDGE 27J62			
SPEC. SECTION ②	COMPONENT ITEM SUMMARY	UNIT ①	QUANTITY ①
MNDOT 2401	STRUCTURAL CONCRETE (1G52)	CU. YD.	
MNDOT 2401	STRUCTURAL CONCRETE (3B52)	CU. YD.	
MNDOT 2401	TYPE P–1 (TL–2) BARRIER CONCRETE (3S52)	LIN. FT.	
MNDOT 2401	TYPE P–4 (TL–4) BARRIER CONCRETE (3S52)	LIN. FT.	
MNDOT 2411	REINFORCEMENT BARS	POUND	
MNDOT 2411	REINFORCEMENT BARS (EPOXY COATED)	POUND	
MNDOT 2411	MODULAR BLOCK RETAINING WALL	SQ. FT.	
MNDOT 2411	STRUCTURE EXCAVATION	CU. YD.	
MNDOT 2412	18X10 PRECAST CONCRETE BOX CULVERT	LIN. FT.	
MNDOT 2451	GRANULAR BEDDING (LV)	CU. YD.	
MNDOT 2451	SELECT GRANULAR BACKFILL (LV)	CU. YD.	
MNDOT 2557	DIAMOND MESH SAFETY RAIL	LIN. FT.	

① QUANTITIES LISTED FOR THE COMPONENT ITEMS OF THE LUMP SUM BRIDGE 27J62 ITEM ARE FOR INFORMATIONAL PURPOSES. ANY ADDITIONAL ITEMS OR CHANGES IN QUANTITIES REQUIRED SHALL BE PROVIDED BY THE CONTRACTOR WITH NO ADDITIONAL COMPENSATION.

② MEASUREMENT AND PAYMENT FOR COMPONENT ITEMS SHALL BE PART OF THE LUMP SUM PAYMENT FOR THE BRIDGE 27J62. REFER TO MNDOT STANDARD SPECIFICATION OR SPECIAL PROVISION FOR TECHNICAL SPECIFICATION REQUIREMENTS FOR ALL PROVISIONS OTHER THAN MEASUREMENT & PAYMENT REQUIREMENTS.

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: BR | CHECKED BY: PLR
DRAWN BY: BR | DATE: 08/10/15

AECOM

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

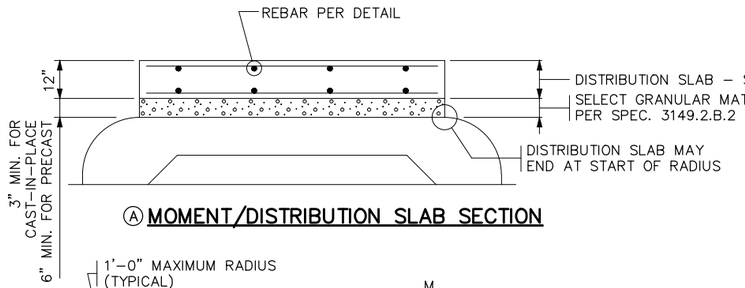
SOUTHWEST Green Line LRT Extension

CIVIL WEST - VOLUME 4B
PEDESTRIAN UNDERPASS 1
BRIDGE 27J62
LOADING DIAGRAM

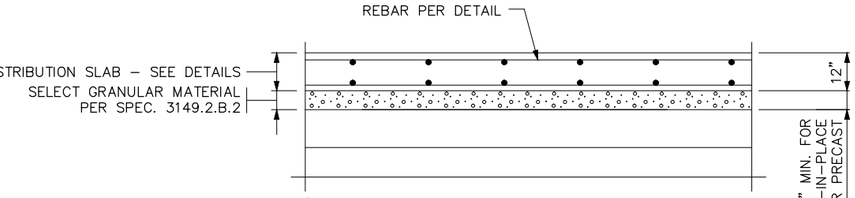
DISCIPLINE: STRUCTURES
SHEET NAME: CBR27J62-BRG-GPE-002

SHEET 2 OF 13

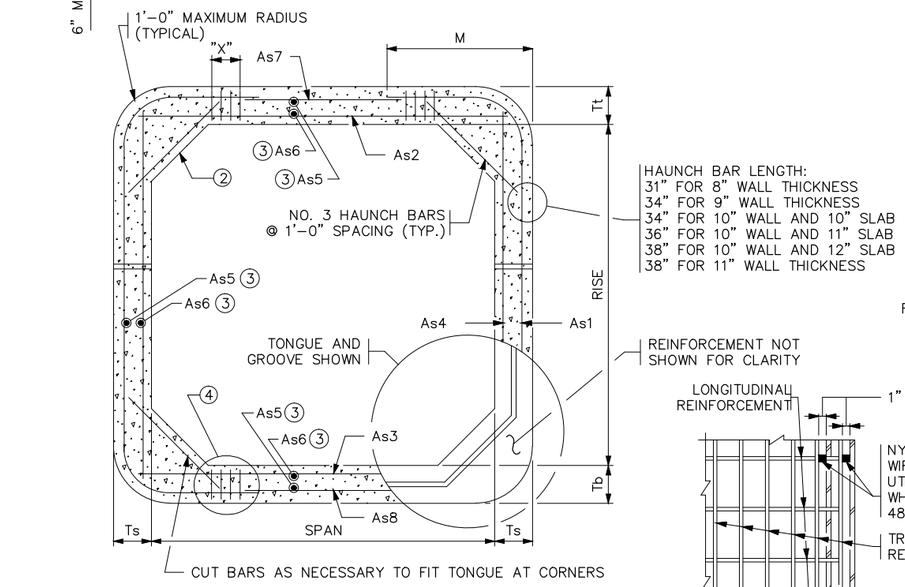
Sep, 17 2015 11:59 am v:\3400_ADC\CAD\SEGMENT W2\PLAN SHEETS\STRUCTURES\CBR27J62\CBR27J62-BRG-GPE.dwg By: RieckmBB



Ⓐ MOMENT/DISTRIBUTION SLAB SECTION

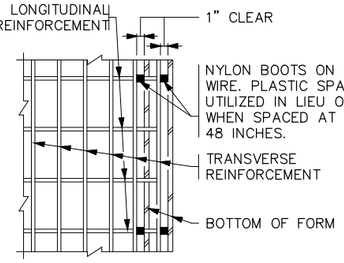


Ⓐ MOMENT/DISTRIBUTION SLAB – LONGITUDINAL SECTION

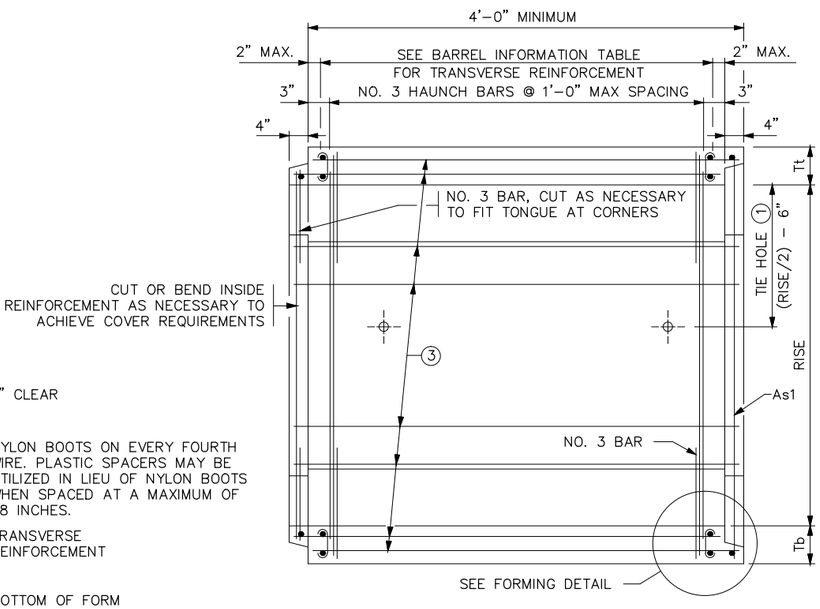


TRANSVERSE BARREL SECTION

BAR REINFORCEMENT OPTION SHOWN

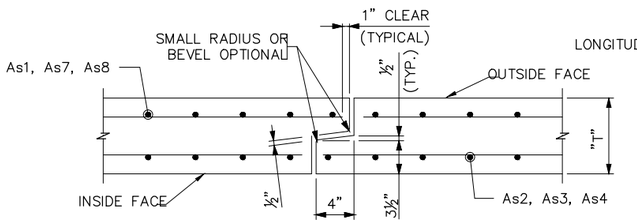


PLAN

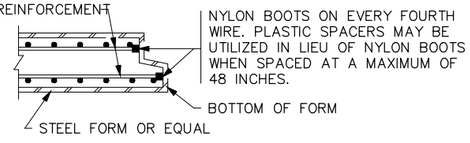


LONGITUDINAL BARREL SECTION

BAR REINFORCEMENT OPTION SHOWN

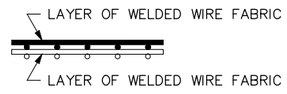


TONGUE AND GROOVE JOINT DETAIL



SECTION

FORMING DETAIL



FABRIC LAYER DETAIL

WHEN MORE THAN ONE LAYER OF WELDED WIRE FABRIC IS USED TO OBTAIN THE REQUIRED REINFORCEMENT AREAS, THE WIRES OF THE WELDED WIRE FABRIC SHALL BE PLACED AS SHOWN

SHEET MODIFICATION:
Ⓐ DENOTES MODIFICATION TO STANDARD SHEET

CONSTRUCTION NOTES

CULVERTS TO BE CONSTRUCTED AS PER SPEC. 2412 EXCEPT AS NOTED.

REFER TO THE GENERAL PLAN AND ELEVATION SHEET FOR THE DISTANCE BETWEEN BARRELS OF ADJACENT BOXES AND TO STANDARD FIGURE 5–395.115 FOR MATERIAL REQUIREMENTS FOR FILL BETWEEN ADJACENT BOXES.

THE WELDED WIRE FABRIC, SHEAR REINFORCEMENT AND REINFORCEMENT BARS SHALL CONFORM TO APPLICABLE REQUIREMENTS OF AASHTO M259.

1½" MIN. AND 2" MAX. CONCRETE COVER ON ALL REINFORCEMENT, INCLUDING SHEAR REINFORCEMENT, EXCEPT FOR TONGUE AND GROOVE DETAIL.

ANY OF THE FOLLOWING COMBINATIONS OF STEEL REINFORCEMENT MAY BE USED:
(a) 1 OR 2 LAYERS OF WELDED WIRE FABRIC OR
(b) 1 LAYER OF WELDED WIRE FABRIC AND 1 LAYER OF REINFORCEMENT BARS O
(c) 1 LAYER OF REINFORCEMENT BARS.
THE REINFORCEMENT SHALL BE DEVELOPED IN ACCORDANCE WITH AASHTO "LRFD BRIDGE DESIGN SPECIFICATIONS." IF BAR REINFORCEMENT IS SUBSTITUTED FOR WELDED WIRE FABRIC, THE AREA OF REINFORCEMENT SHALL BE INCREASED BY 8%, AND CONTRACTOR SHALL SUBMIT DESIGN CALCULATIONS VERIFYING COMPLIANCE WITH AASHTO 5.7.3.4 "CONTROL OF CRACKING BY DISTRIBUTION OF REINFORCEMENT".

THE MAXIMUM SIZE OF REINFORCEMENT BARS SHALL BE NO. 6. THE MAXIMUM WELDED WIRE FABRIC SIZE SHALL BE A W23 PER LAYER (MAXIMUM OF 2 LAYERS).

THE SPACING CENTER TO CENTER OF THE TRANSVERSE WIRES SHALL NOT BE LESS THAN 2" NOR MORE THAN 4". THE SPACING CENTER TO CENTER OF THE LONGITUDINAL WIRES SHALL NOT BE MORE THAN 8".

WELDING WILL NOT BE ALLOWED ON REINFORCEMENT BARS OR WELDED WIRE FABRIC, EXCEPT THAT THE ORIGINAL WELDING REQUIRED TO MANUFACTURE WIRE FABRIC IS ACCEPTABLE.

WHEN REINFORCEMENT IS CUT, ADDITIONAL REINFORCEMENT SHALL BE ADDED ON BOTH SIDES OF THE CUT MEMBER TO REPLACE OR EXCEED THE CUT STEEL.

CONCRETE SHALL BE MIX NO. 3W36 WITH NO CALCIUM CHLORIDE ALLOWED.

SHOP DRAWING APPROVAL PER SPEC. 3238.2.A IS REQUIRED.

COMPACT THE FIRST 1.5' (LOOSE) OF FILL ABOVE THE BOX WITH LIGHT COMPACTION EQUIPMENT SUCH AS PLATE COMPACTORS OR WALK BEHIND ROLLERS.

TRANSVERSE REINFORCEMENT IS PARALLEL TO THE CULVERT SPAN
LONGITUDINAL REINFORCEMENT IS PERPENDICULAR TO THE CULVERT SPAN.

① CULVERT TIES ARE TO BE 1" DIAMETER RODS. SEE STANDARD PLATE NO. 3145 FOR CONNECTION DETAILS.

② HAUNCH SIZES ARE TO BE 12" VERTICAL, 12" HORIZONTAL ON ALL BOX SIZES.

③ LONGITUDINAL REINFORCEMENT DENOTED AS As5 AND As6 MUST BE PLACED IN ALL SLABS AND WALLS AND MUST BE 0.06 SQ. IN./FT. MIN.

④ SEE STANDARD PLATE NO. 3007 FOR SHEAR REINFORCEMENT OPTIONS. THE MAXIMUM SHEAR REINFORCEMENT SPACING IN THE LONGITUDINAL DIRECTION SHALL BE 6".

Ⓐ ⑤ ROADWAY OR SHOULDER FILL HEIGHTS OF LESS THAN 2'–0" REQUIRE A DISTRIBUTION SLAB.

USE CONCRETE MIX 3Y43 FOR THE DISTRIBUTION SLAB.

CAST–IN–PLACE DISTRIBUTION SLABS SHALL BE 6" THICK. PROVIDE 3" MINIMUM SELECT GRANULAR MATERIAL PER SPEC. 3149.2.B.2 BETWEEN BARREL AND DISTRIBUTION SLAB.

PRECAST DISTRIBUTION SLABS SHALL BE 6" THICK AND MAY BE USED FOR FILL HEIGHTS OVER 1'–0". PROVIDE 6" MINIMUM SELECT GRANULAR MATERIAL PER SPEC. 3149.2.B.2 BETWEEN BARREL AND DISTRIBUTION SLAB.

THE WIDTH OF THE DISTRIBUTION SLAB SHALL EXTEND BETWEEN THE OUTSIDE EDGES OF THE SHOULDERS UNLESS DIRECTED BY THE ENGINEER.

PAYMENT FOR THE DISTRIBUTION SLAB AND SELECT GRANULAR MATERIAL BENEATH THE SLAB SHALL BE CONSIDERED INCIDENTAL.

IF DISTRIBUTION SLAB IS USED AS PAVEMENT SURFACE IT MUST BE REDESIGNED PER THE MnDOT PAVEMENT DESIGN MANUAL.

BARREL INFORMATION TABLE * * *

LOCATION	SIZE	f'c (P.S.I.)	OVERFILL LIMITS (FT.)	DISTRIBUTION SLAB REQUIRED *	RECESSED TIE RODS REQUIRED * *	DIMENSIONS					WEIGHT (LBS./FT.)	WELDED WIRE FABRIC REINFORCEMENT												④ SHEAR REINFORCEMENT TOP AND BOTTOM OF BARREL		
						SPAN (FT.)	RISE (FT.)	Tt (IN.)	Tb (IN.)	Ts (IN.)		As1			As2		As3		As4		As7		As8				
												AREA ($IN.^2$/FT.)	LENGTH (FT.)	M (FT.)	AREA ($IN.^2$/FT.)	LENGTH (FT.)	AREA ($IN.^2$/FT.)	LENGTH (FT.)	AREA ($IN.^2$/FT.)	LENGTH (FT.)	AREA ($IN.^2$/FT.)	LENGTH (FT.)	AREA ($IN.^2$/FT.)	LENGTH (FT.)	AREA ($IN.^2$/FT.)	MAX. SPG. (IN.)	X (IN.)
				YES	NO																					
				YES	NO																					

* ALL CLASS 1 CULVERTS WITH FILL HEIGHTS OF LESS THAN 2'–0" REQUIRE A DISTRIBUTION SLAB. IF A DISTRIBUTION SLAB IS NOT REQUIRED, INDICATE "NO" IN THIS BOX.

* * FOR PEDESTRIAN CULVERT APPLICATIONS HIDE–AWAY OR RECESSED TIE CONNECTIONS ARE REQUIRED, SEE STANDARD PLATE 3145. IF REQUIRED, INDICATE "YES" IN THIS BOX.

* * * BOX CULVERTS WITH SPANS FROM 6 TO 14 FT. ARE DESIGNED FOR HL–93 LIVE LOADS (AASHTO LRFD 3.6.2.1) NOT INCLUDING THE DESIGN LANE LOAD. BOXES WITH SPANS OF 16 FT. ARE DESIGNED FOR HL–93 LIVE LOADS INCLUDING THE DESIGN LANE LOAD.

REVISION: 09–11–2014

APPROVED: MARCH 24, 2011
Nancy Daubenberger
STATE BRIDGE ENGINEER

STATE PROJ. NO 9909–01 (T.H.) STA. + .

FIG. 5–395.101(B) (MOD)

CERTIFIED BY _____ LICENSED PROFESSIONAL ENGINEER _____ DATE

NAME: LIC. NO.

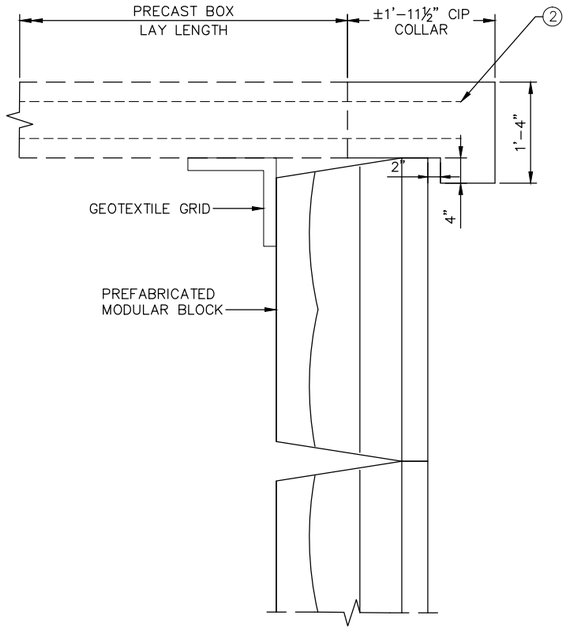
TITLE: PRECAST CONCRETE BARREL DETAILS (SPECIAL DESIGN)

DES: XXX DR: BR APPROVED:

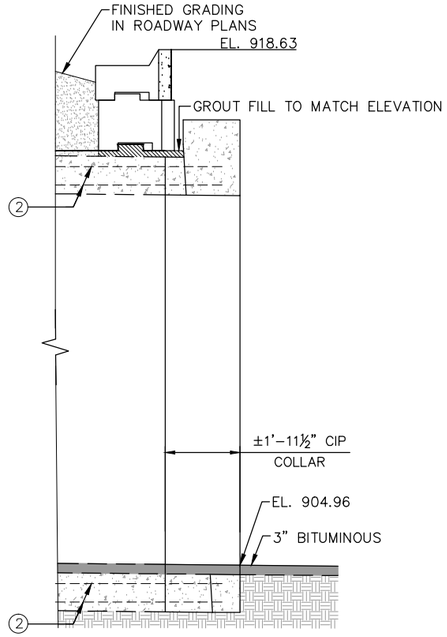
CHK: XXX CHK: XX/XX/XX

SHEET NO. 3 OF 13 SHEETS

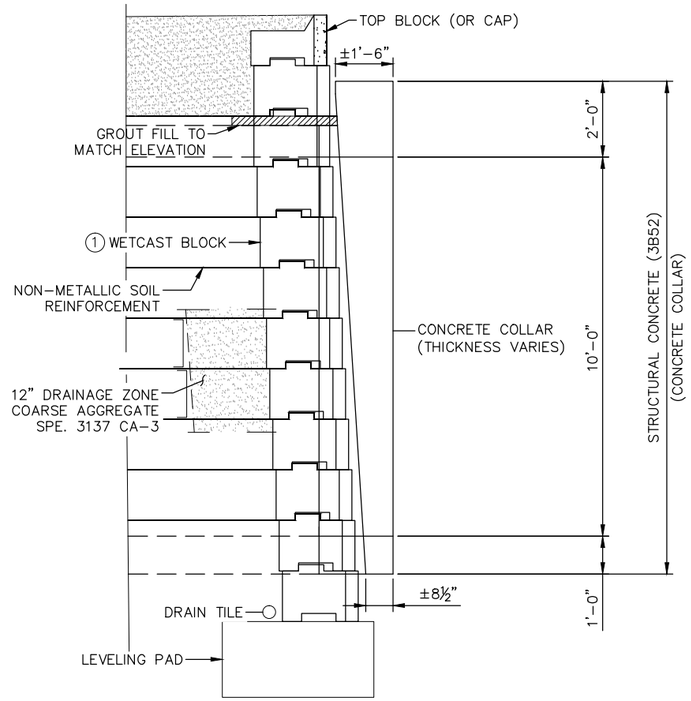
BRIDGE NO. 27J62



SECTION A–A



SECTION B–B
(℄ BOX)



SECTION B–B

SECTION B–B

NOTES:

1. (1) PMBW WITH SOIL REINFORCEMENT, PHASE III SYSTEM, SEE SPECIAL PROVISIONS
2. (2) END BOX SECTION HORIZONTAL REINFORCEMENT TO EXTEND INTO COLLAR 1'–6" MIN.

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: XXX | CHECKED BY: XXX
DRAWN BY: BR | DATE: XX/XX/XX

AECOM

60% SUBMISSION - 09/28/15

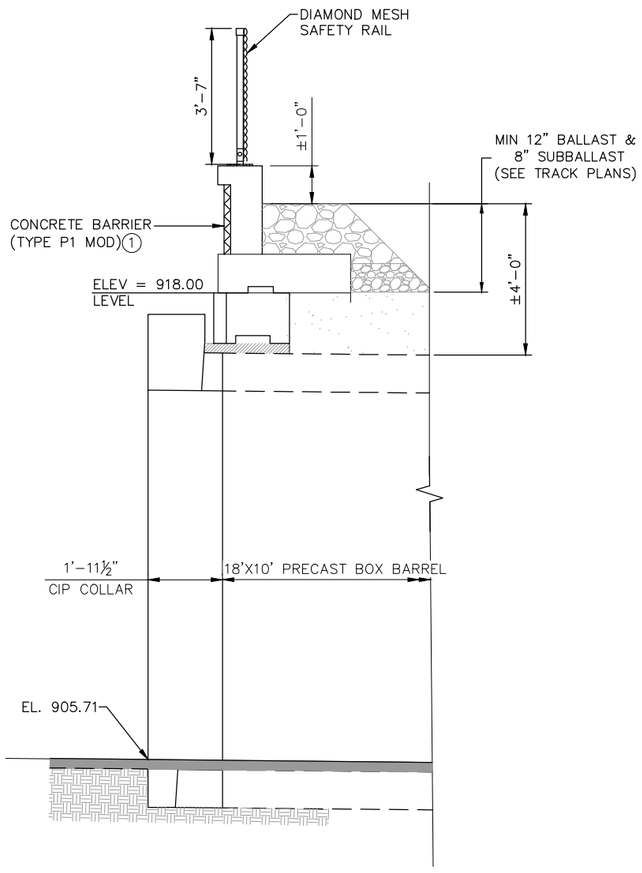
METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

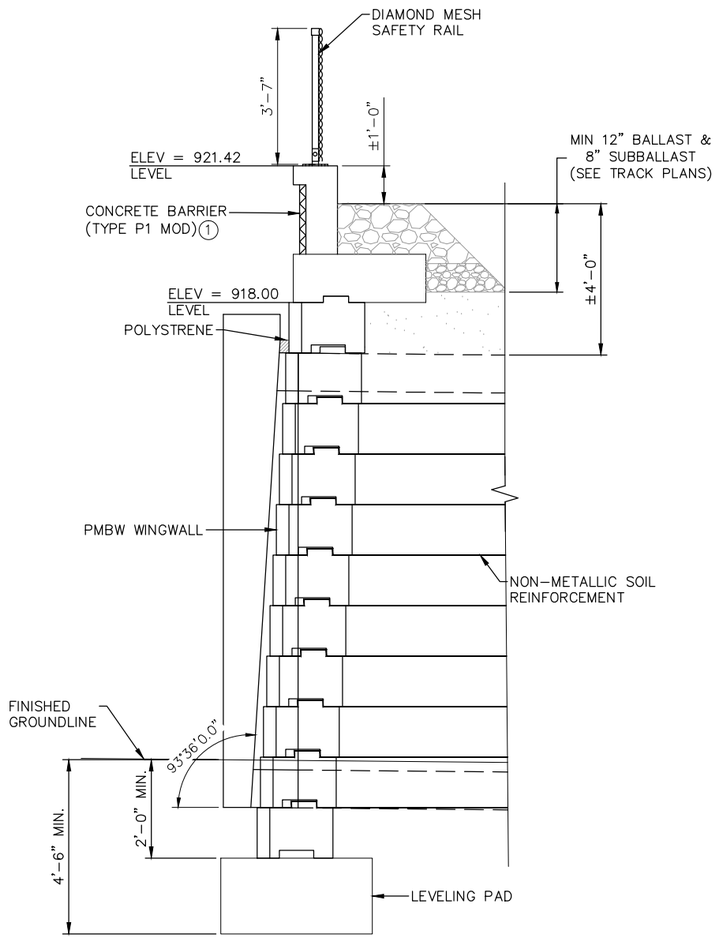
CIVIL WEST - VOLUME 4B
PEDESTRIAN UNDERPASS 1
BRIDGE 27J62
CULVERT SECTIONS 1

DISCIPLINE: STRUCTURES
SHEET NAME: CBR27J62-BRG-DTL-002

SHEET 4 OF 13



SECTION C–C
(℄ BOX)



SECTION C–C

NOTES:

① BARRIER FORMLINER TO MATCH CITY OF MINNETONKA CORRIDOR AESTHETICS – SEE SPECIAL PROVISIONS

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: XXX | CHECKED BY: XXX
DRAWN BY: BR | DATE: XX/XX/XX

AECOM

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

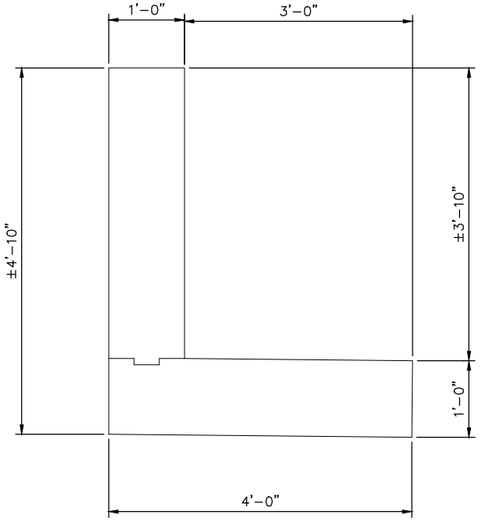
SOUTHWEST Green Line LRT Extension

CIVIL WEST - VOLUME 4B
PEDESTRIAN UNDERPASS 1
BRIDGE 27J62
CULVERT SECTIONS 2

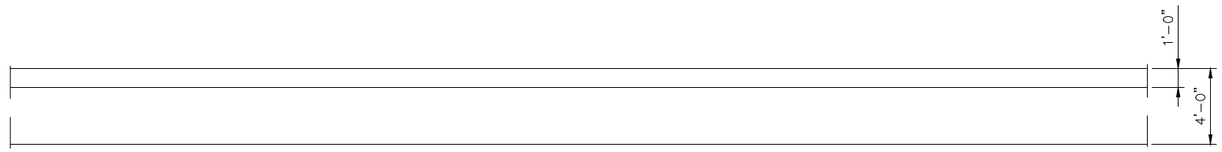
DISCIPLINE: STRUCTURES
SHEET NAME: CBR27J62-BRG-DTL-003

SHEET 5 OF 13

Sep, 17 2015 09:34 am V:\3400_ADC\CAD\SEGMENT W2\PLAN SHEETS\STRUCTURES\CBR27J62\CBR27J62-BRG-DTL-002.dwg By: RieckmBB



SECTION THRU BALLAST CURB



PLAN VIEW (TYPICAL BALLAST CURB)

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: XXX | CHECKED BY: XXX
DRAWN BY: BR | DATE: XX/XX/XX

AECOM

60% SUBMISSION - 09/28/15

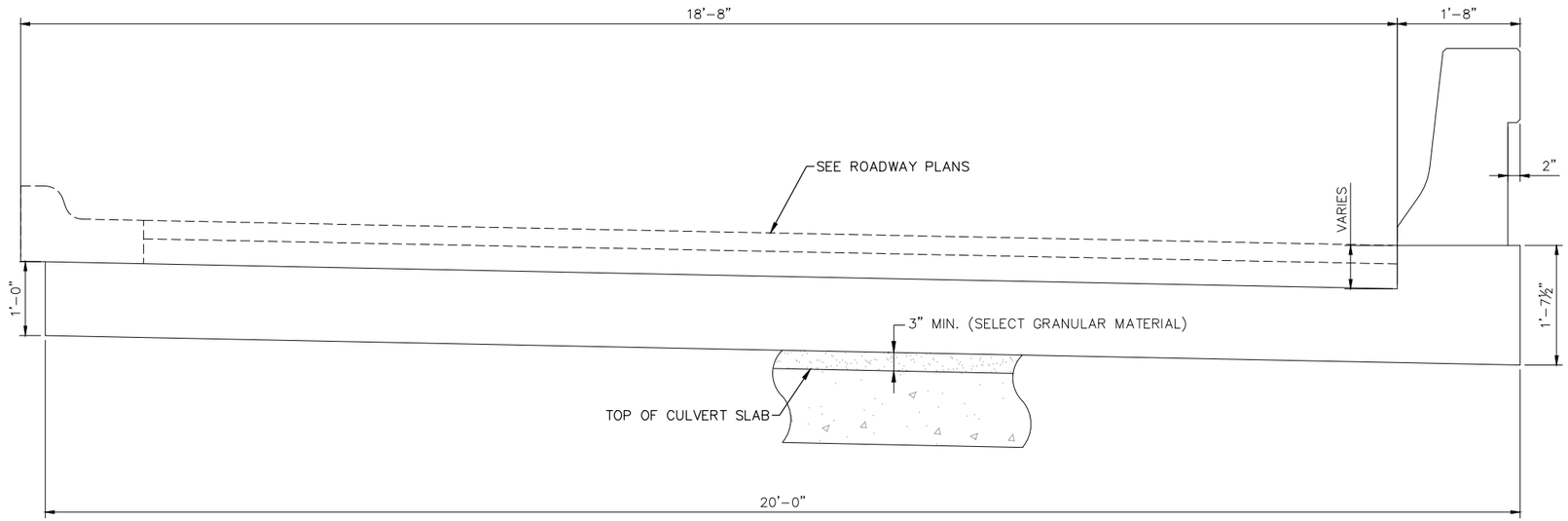
METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

CIVIL WEST - VOLUME 4B
PEDESTRIAN UNDERPASS 1
BRIDGE 27J62
BALLAST CURB DETAIL

DISCIPLINE: STRUCTURES
SHEET NAME: CBR27J62-BRG-DTL-004

SHEET 6 OF 13



MOMENT/DISTRIBUTION SLAB SECTION

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: XXX | CHECKED BY: XXX
DRAWN BY: BR | DATE: XX/XX/XX

AECOM

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

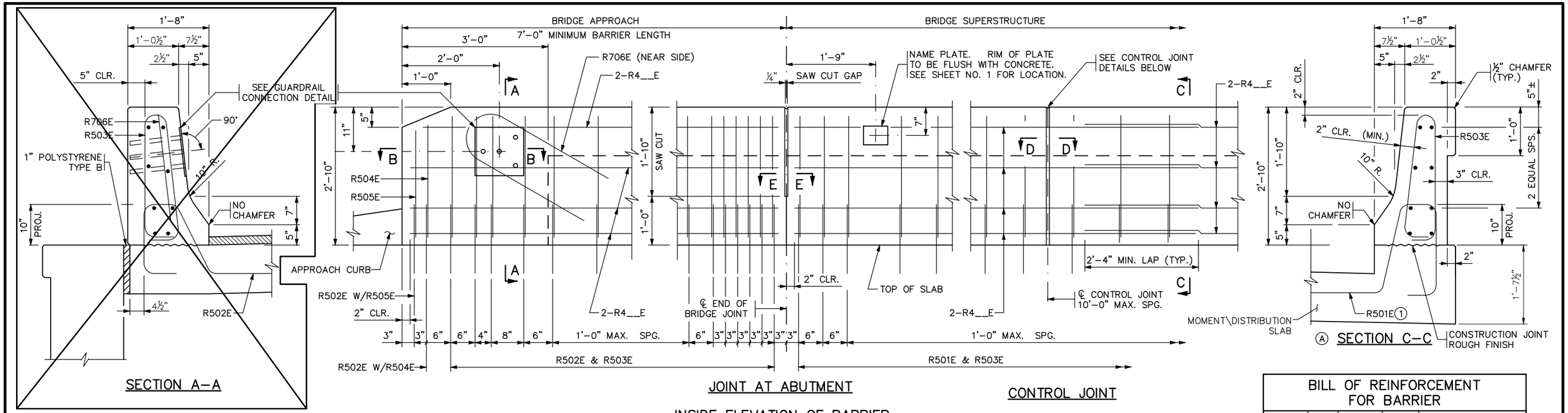
SOUTHWEST Green Line LRT Extension

CIVIL WEST - VOLUME 4B
PEDESTRIAN UNDERPASS 1
BRIDGE 27J62
DISTRIBUTION SLAB DETAIL

DISCIPLINE: STRUCTURES
SHEET NAME: CBR27J62-BRG-DTL-005

SHEET 7 OF 13

Sep. 17 2015 09:34 am V:\3400_ADC\CAD\SEGMENT W2\PLAN SHEETS\STRUCTURES\CBR27J62\CBR27J62-BRG-DTL-002.dwg By: RieckmBB



SECTION A–A

JOINT AT ABUTMENT

INSIDE ELEVATION OF BARRIER

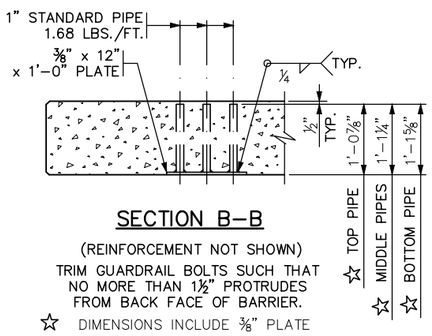
(CONCRETE WEARING COURSE NOT SHOWN)

CONTROL JOINT

Ⓐ SECTION C–C

BARRIER MEETS TEST LEVEL 4 REQUIREMENTS OF NCHRP REPORT 350

BILL OF REINFORCEMENT FOR BARRIER				
BAR	NO.	LENGTH	SHAPE	LOCATION
R501E	__	5'–3"		BARRIER DOWEL
R502E	__	5'–5"		BARRIER DOWEL
R503E	__	6'–6"		BARRIER VERTICAL
R504E	__	6'–0"		BARRIER VERTICAL
R505E	__	5'–10"		BARRIER VERTICAL
R706E	__	6'–6"		BARRIER VERTICAL
R4__E	__	__		BARRIER LONGIT.
R4__E	__	__		BARRIER LONGIT.
R4__E	__	__		BARRIER LONGIT.
R4__E	__	__		BARRIER LONGIT.
R4__E	__	__		BARRIER LONGIT.
R4__E	__	__		BARRIER LONGIT.

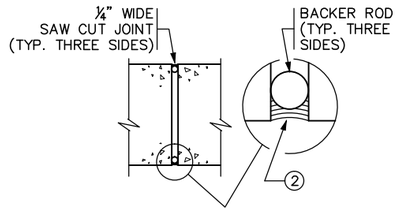


SECTION B–B

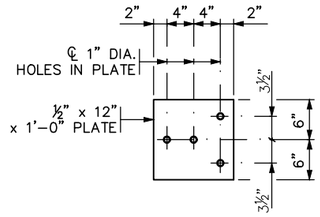
(REINFORCEMENT NOT SHOWN)

TRIM GUARDRAIL BOLTS SUCH THAT NO MORE THAN 1½" PROTRUDES FROM BACK FACE OF BARRIER.

☆ DIMENSIONS INCLUDE ⅜" PLATE

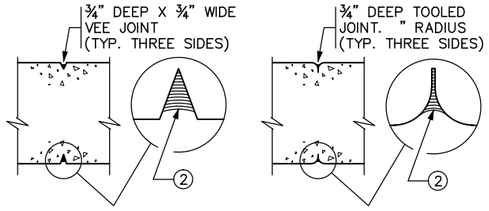


SECTION E–E



GUARDRAIL CONNECTION DETAIL

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

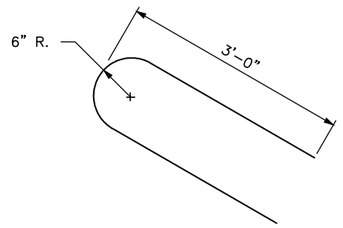


SECTION D–D
CONTRACTOR OPTION 1

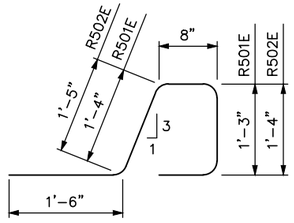
SECTION D–D
CONTRACTOR OPTION 2

CONTROL JOINT DETAILS

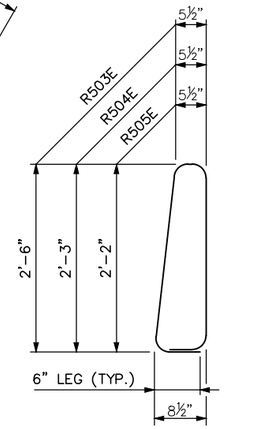
WHEN USING SLIP FORM METHOD TO PLACE THE CONCRETE, CUT JOINT 3 INCHES DEEP USING MARGIN TROWEL OR SIMILAR MEANS IMMEDIATELY AFTER CONCRETE PLACEMENT (TYP. THREE SIDES)



R706E



R501E, R502E



R503E, R505E & R506E

SHEET MODIFICATION:
Ⓐ DENOTES MODIFICATION TO STANDARD SHEET

GENERAL NOTES

MEASURE PAYMENT LENGTH BETWEEN THE OUTSIDE FACES OF THE BARRIER.

CONCRETE BARRIER = 502 LBS./FT. (0.124 CU. YDS./FT.)

FINISH ALL EDGES OF BARRIER AND END POST WITH ½" CHAMFER, EXCEPT WHERE OTHERWISE NOTED.

SPACE OF CONTROL JOINTS AT 10 FT. MAXIMUM. SEE SUPERSTRUCTURE SHEET FOR JOINT SPACING.

GUARDRAIL CONNECTION TO BE STRUCTURAL STEEL, SPEC. 3306.

GUARDRAIL CONNECTION AND NAME PLATE TO BE CONSIDERED INCIDENTAL TO BARRIER.

BARRIER QUANTITIES ARE LISTED IN SUMMARY OF QUANTITIES FOR SUPERSTRUCTURE.

① PLACE BAR ON TOP OF BOTTOM REINFORCEMENT MAT.

② JOINT SEALANT PER MnDOT APPROVED/QUALIFIED PRODUCTS LIST – CRACK AND JOINT MATERIALS – SILICONE JOINT SEALERS.

REVISION:

APPROVED: JANUARY 13, 2015
Nancy Daubenberger
STATE BRIDGE ENGINEER

CERTIFIED BY _____ XX/XX/XX
LICENSED PROFESSIONAL ENGINEER — DATE
NAME: # LIC. NO. #####

TITLE: CONCRETE BARRIER (TYPE F, TL–4)
INTEGRAL OR SEMI–INTEGRAL ABUTMENT WITH INTEGRAL END POST (WITH CONCRETE WEARING COURSE)

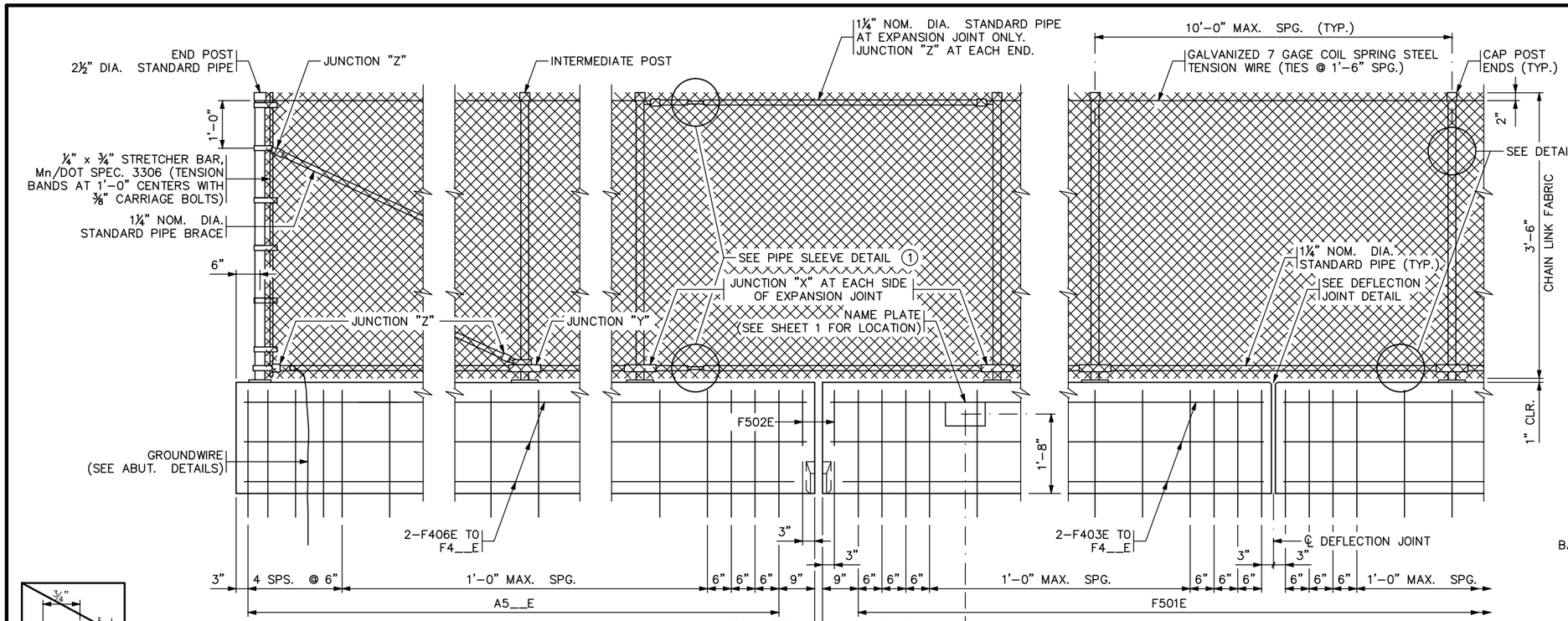
DES: XXX	DR: BR	APPROVED:
CHK: XXX	CHK: XX\XX\XX	

SHEET NO. 8 OF 13 SHEETS

FIG. 5–397.117(A)

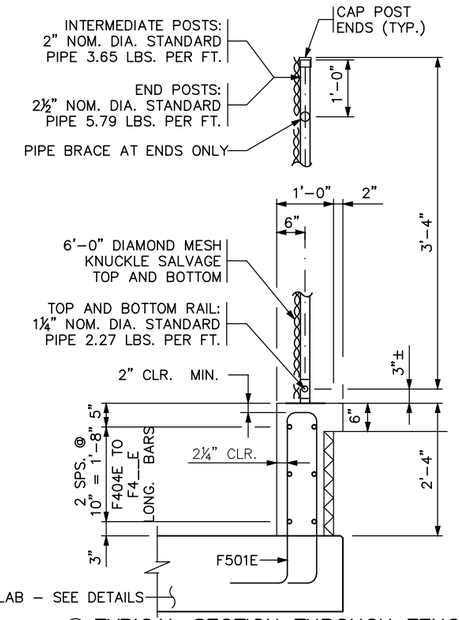
BRIDGE NO. 27J62

Sep. 17 2015 09:34 am V:\3400_ADC\CAD\SEGMENT W2\PLAN SHEETS\STRUCTURES\CBR27J62\CBR27J62-BRG-RAL-001.dwg By: RieckmBB



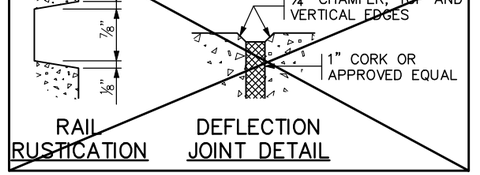
INSIDE ELEVATION OF RAILING

RAIL MEETS TEST LEVEL 2 REQUIREMENTS OF NCHRP REPORT 350.
THE RAIL MUST BE USED NEXT TO WALKWAY.
AN F-BARRIER MUST BE USED TO SEPARATE TRAFFIC FROM THIS RAIL IN THE 45 MPH (OR OVER) SPEED ZONE.



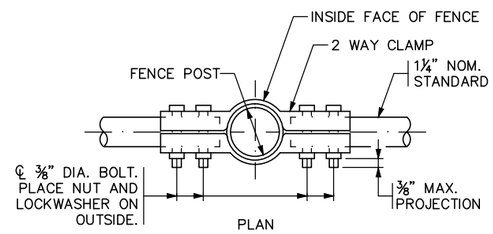
Ⓐ TYPICAL SECTION THROUGH FENCE

INTERMEDIATE POST SHOWN



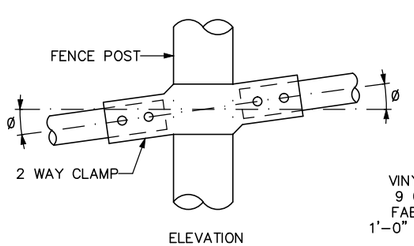
RAIL RUSTICATION

DEFLECTION JOINT DETAIL



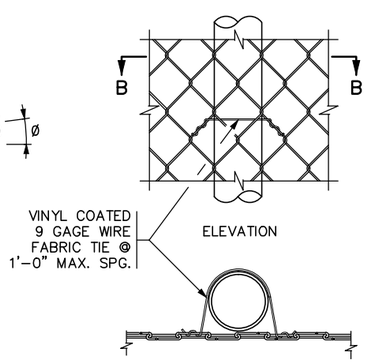
PLAN

2 WAY CLAMP BENDING TABLE	
GRADE OF FENCE	Ø
0° TO 2°	0°
2° TO 6°	4°
6° TO 10°	8°

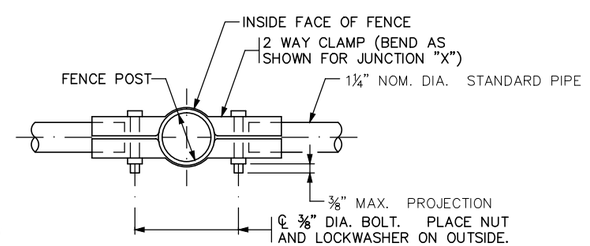


ELEVATION

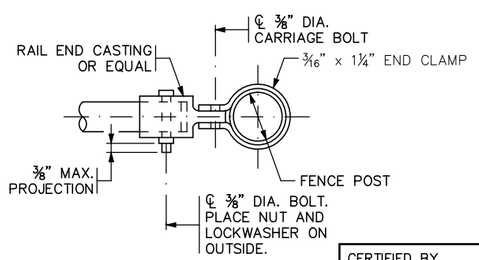
JUNCTION "X"



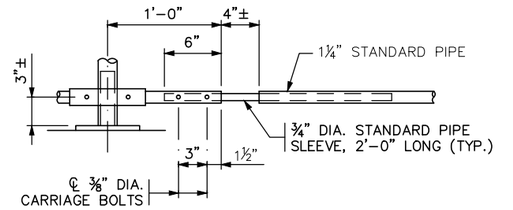
DETAIL "A"



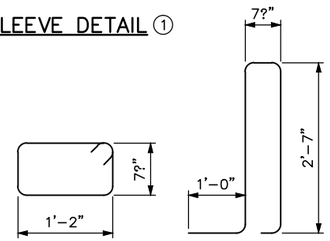
JUNCTION "Y"



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

SHEET MODIFICATION:
Ⓐ DENOTES MODIFICATION TO STANDARD SHEET

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.~~

~~LENGTH OF "WIRE FENCE, DESIGN W-1" 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
Daniel L Nelson
STATE BRIDGE ENGINEER

CERTIFIED BY _____ XX/XX/XX
LICENSED PROFESSIONAL ENGINEER — DATE
NAME: # LIC. NO. #####

TITLE: WIRE FENCE ~~(DESIGN W-1)~~ AND CONCRETE PARAPET (TYPE P-1 MOD) ~~(WITH INTEGRAL END POST)~~

FIG. 5-397.119 (MOD)

DES: XXX DR: BR APPROVED:
CHK: XXX CHK: XX\XX\XX

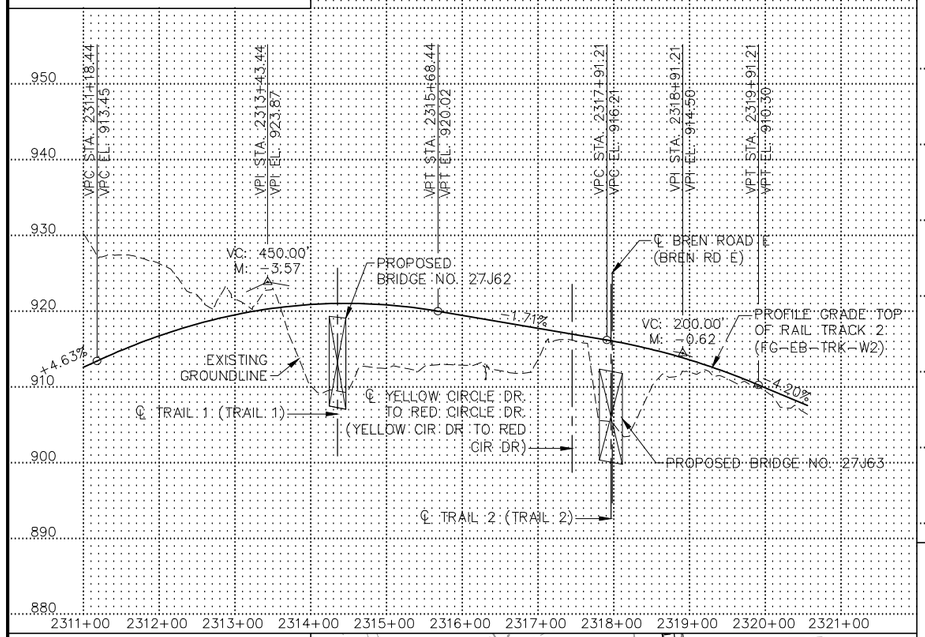
SHEET NO. 9 OF 13 SHEETS

BRIDGE NO. 27J62

Sep. 17 2015 09:34 am V:\3400_ADC\CAD\SEGMENT W2\PLAN SHEETS\STRUCTURES\CBR27J62\CBR27J62_BRG-RAL-002.dwg By: RieckmBB

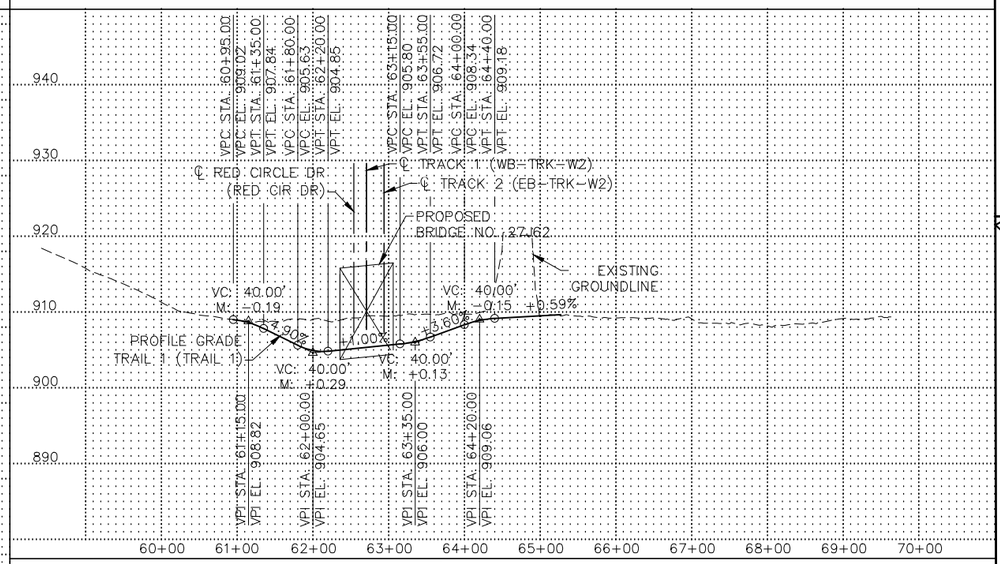
CONTRACTED PROFILE

SCALE : 0 50' 100' HORIZONTAL; 0 5' 10' VERTICAL



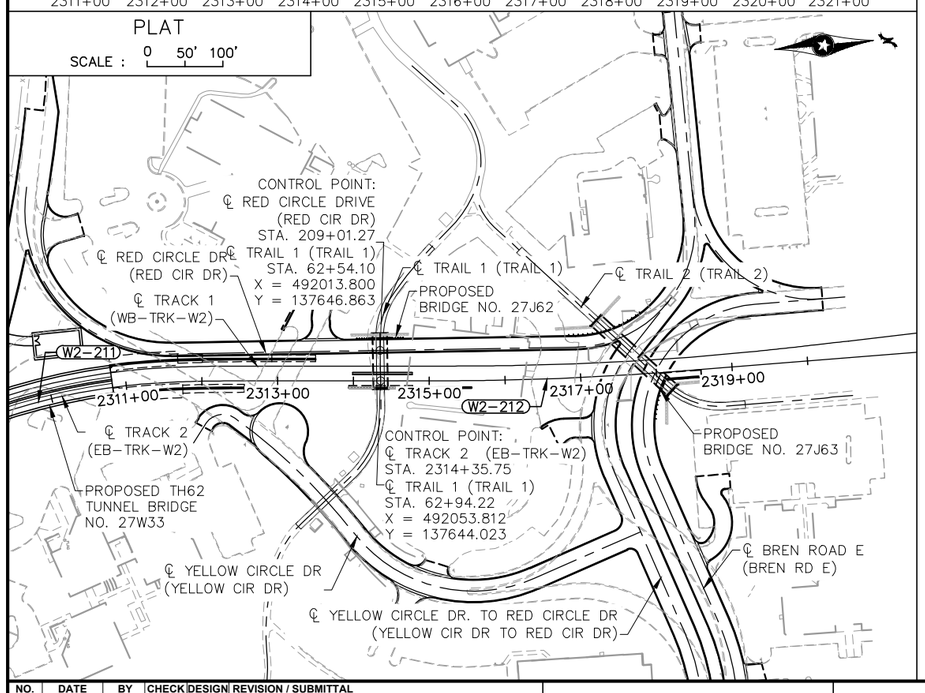
PROFILE GRADE TRACK 2 (FG-EB-TRK-W2)

PROFILE GRADE TRAIL 1 (FG-TRAIL 1)



PLAT

SCALE : 0 50' 100'



CURVE NO. W2-211
R = 800.00'
Lc = 589.82'
Ls = 170.00'
Ea = 4.00"
Eu = 3.92"
V = 40 MPH

CURVE NO. W2-212
R = 3800.00'
Lc = 173.37'
Ls = 130.00'
Ea = 1.00"
Eu = 2.15"
V = 55 MPH

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 ENGINEERS RECOMMENDATION

DATE: XX-XX-XXXX

STREAM OR DITCH DESIGNATION: XXX

DRAINAGE AREA: XXX SQ. MI.

MAX FLOOD ON RECORD: XXX C.F.S. (XX-XX-XX)

MAXIMUM OBSERVED HIGHWATER ELEVATION: XXX.X FT.

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

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

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

FLOWLINE ELEVATION: XXX FT. SKEW ANGLE: XX

ESTIMATED PRELIMINARY TOTAL SCOUR AT PIER EL. XXX.X (500 OR OT YR.FREQ.)

SCOUR CONFIRMATION RECOMMENDATION

DATE: XX-XX-XXXX

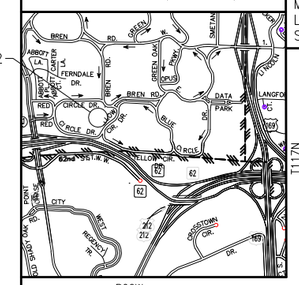
TOTAL SCOUR AT PIER EL. XXX.XX (500 OR OT YR. FREQ.)
SCOUR CODE: OBTAIN FROM HYDRAULIC ENGINEER

BRIDGE SURVEY SHEETS MADE FROM SURVEY PERFORMED BY RANI ENGINEERING

MNDOT NAME: 2773A
NORTHING (HEN. COUNTY COORDINATES): 137082.117
EASTING (HEN. COUNTY COORDINATES): 490527.817
BENCHMARK ELEVATION (NAVD88): 963.180
MONUMENT DESCRIPTION: B.M. DISK IN BRIDGE ABUTMENT
LOCATION: IN EDEN PRAIRIE, 1.1 MILES EAST ALONG T.H. HWY 62 FROM JCT. OF T.H. 62 & I-494

MONUMENT NAME: CONTROL POINT 6
NORTHING (HEN. COUNTY COORDINATES): 142016.680
EASTING (HEN. COUNTY COORDINATES): 489989.960
BENCHMARK ELEVATION (NAVD88): 932.956
MONUMENT DESCRIPTION: CAST IRON MONUMENT
LOCATION: 0.2 MILES EAST ALONG SMETANA ROAD FROM JCT. OF SMETANA ROAD & NOLAN DR

INDEX MAP (1 SQ. MI.)



BRIDGE SURVEY

0.6 MILES WEST OF JCT. T.H. 62 AND T.H. 169

PEDESTRIAN UNDERPASS UNDER SOUTHWEST LIGHT RAIL TRACKS

SEC 36 T 117 N R 22 W

CITY OF MINNETONKA HENNEPIN COUNTY

BRIDGE 27J62

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: XXX CHECKED BY: XXX
DRAWN BY: BR DATE: XX/XX/XX

AECOM

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

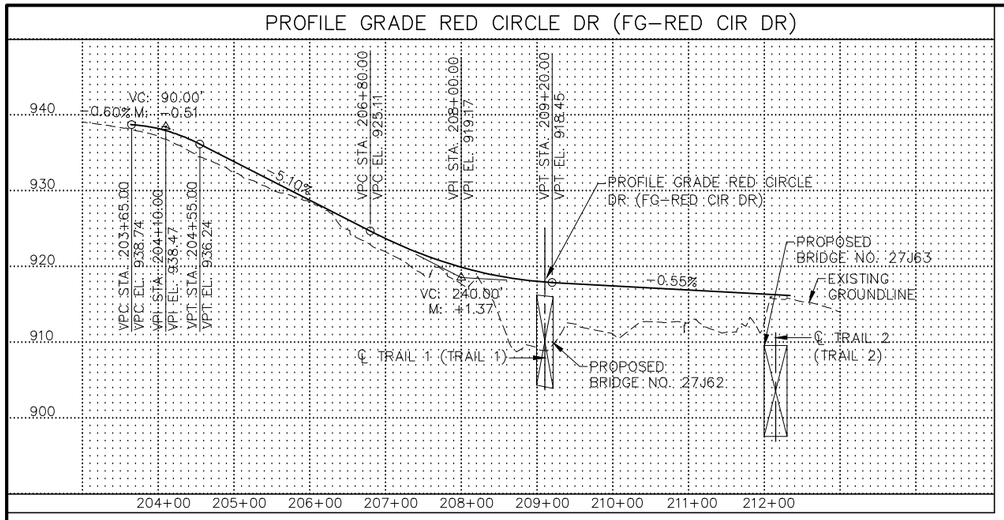
CIVIL WEST - VOLUME 4B
PEDESTRIAN UNDERPASS 1
BRIDGE 27J62
BRIDGE SURVEY 1

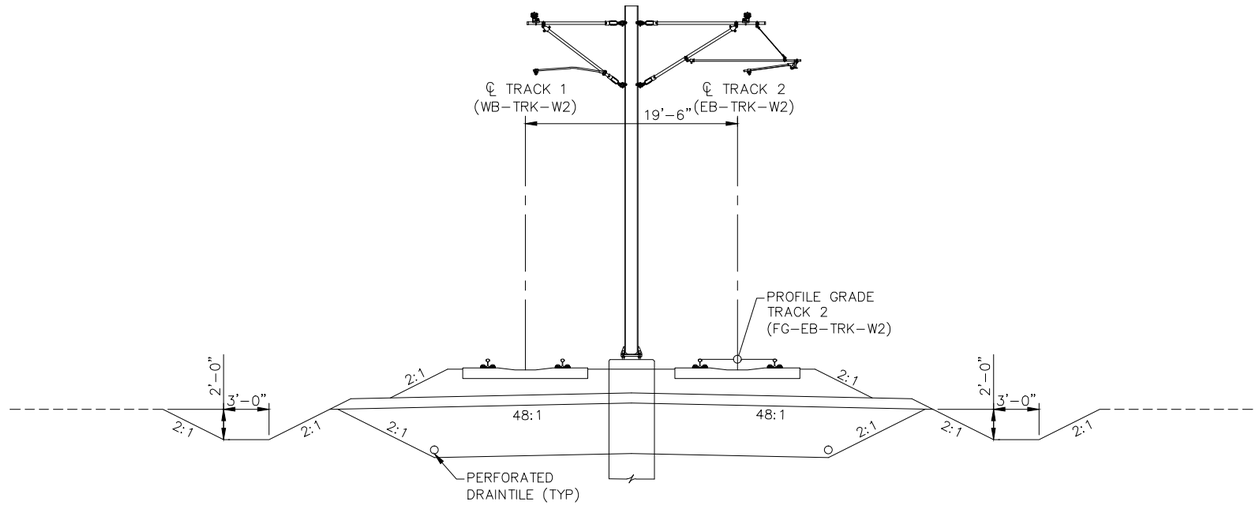
DISCIPLINE: STRUCTURES

SHEET NAME: CBR27J62-BRG-SUR-001

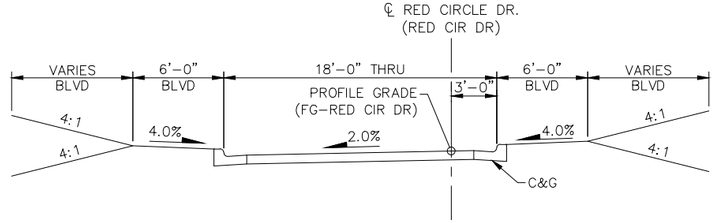
SHEET 10 OF 13

Sep. 17 2015 09:38 am v:\3400_ADC\CAD\SEGMENT W2\PLAN SHEETS\STRUCTURES\CBR27J62\CBR27J62-BRG-SUR.dwg By: RieckmBB

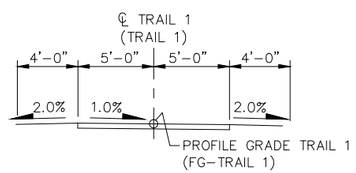




TYPICAL TRACK APPROACH SECTION



TYPICAL RED CIRCLE DRIVE SECTION



TYPICAL TRAIL 1 SECTION

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: XXX | CHECKED BY: XXX
DRAWN BY: BR | DATE: XX/XX/XX

AECOM

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

CIVIL WEST - VOLUME 4B
PEDESTRIAN UNDERPASS 1
BRIDGE 27J62
BRIDGE SURVEY 2

DISCIPLINE: STRUCTURES
SHEET NAME: CBR27J62-BRG-SUR-002

SHEET 11 OF 13

Sep, 17 2015 09:38 am V:\3400_ADC\CAD\SEGMENT W2\PLAN SHEETS\STRUCTURES\CBR27J62\CBR27J62-BRG-SUR.dwg By: RieckmBB

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) EXISTING UTILITIES IN CONFLICT WITH TUNNEL CONSTRUCTION TO BE RELOCATED.

(2) CONTROL POINT:
℄ TRACK 2 (EB-TRK-W2)
STA. 2314+35.75
℄ TRAIL 1 (TRAIL 1)
STA. 62+94.22
X = 492053.812
Y = 137644.023

Mid: 62+05.55
X 491966.2827
Y 137655.3845

PT: 62+37.73
X 491997.4714
Y 137648.0227

2230SB
44.36' LT.
℄ EB-TRK-W2
STA. 2314+46.12

2020ST
13.58' RT.
℄ EB-TRK-W2
STA. 2315+06.33

PC: 63+27.01
X 492086.5230
Y 137641.7006

TS: 2314+54.43
X = 492035.446
Y = 137662.627

SC: 2315+84.43
X = 492066.080
Y = 137792.189

℄ RED CIRCLE DR.
(RED CIR DR)

℄ TRACK 1
(WB-TRK-W2)

℄ TRACK 2
(EB-TRK-W2)
(REF. LINE)

℄ TRAIL 1 (TRAIL 1)

PROPOSED
SANITARY SEWER
IN STEEL CASING

PROPOSED
WATER MAIN IN
STEEL CASING

PROPOSED STORM
SEWER IN STEEL
CASING

PROPOSED
SANITARY SEWER
IN STEEL CASING

RETAINING WALL
W212 (RTW-W212)

208+00 209+00 210+00 2313+00 2314+00 2315+00 63+00

COM-UG GAS P-UG

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: XXX CHECKED BY: XXX
DRAWN BY: BR DATE: XX/XX/XX

AECOM

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

CIVIL WEST - VOLUME 4B
PEDESTRIAN UNDERPASS 1
BRIDGE 27J62
BRIDGE SURVEY PLAN

DISCIPLINE: STRUCTURES

SHEET NAME: CBR27J62-BRG-BOR-001

SHEET 12 OF 13

Sep, 21 2015 07:34 am V:\3400_ADC\CAD\SEGMENT W2\PLAN SHEETS\STRUCTURES\CBR27J62\CBR27J62-BRG-BOR.dwg By: RieckmBB

20' LT.
TRACK 2 C/L
10' RT.

PROFILE GRADE TOP OF RAIL
TRACK 2 (EG-EB-TRK-W2)

12" WATER MAIN IN 24" STEEL CASING.

12" SANITARY SEWER IN 24" STEEL CASING.

8" SANITARY SEWER IN 24" STEEL CASING.

C-TRAIL 1 (TRAIL)

Light Rail Station

2230SB
Elevation 908.8

Coh N60

13		SANDY LEAN CLAY, organic, with Gravel, black and brown, wet, (CL), fill
8		
8		LEAN CLAY with SAND, trace Gravel, grayish blue, wet, (CL), fill
8		-Black layer of Lean Clay at 17 feet.
9		-With Sand lenses from 18-20 feet.
14		
26		SANDY LEAN CLAY, trace Gravel, brown and gray, wet, stiff to very stiff, (CL), till
54	▽	
30		CLAYEY SAND, with Gravel, fine- to medium grained, with wet Sand lenses, brown, wet, medium dense, (SC), till
16		
18		
27		
45		SILTY SAND, with Gravel, fine- to medium grained, brown, waterbearing, medium dense to dense, (SM), till
19		
20		
18		

Water observed at 32 feet with 32 feet of hollow-stem auger in the ground.

Water not observed to cave-in depth of 30 feet immediately after withdrawal of auger.

Boring immediately backfilled with bentonite grout.

2020ST
Elevation 912.4

Coh N60

7		FILL: Clayey Sand, with Gravel, dark brown, moist.
11		FILL: Silty Sand, fine- to medium-grained, trace Gravel, brown, moist.
8		FILL: Sandy Lean Clay, trace Gravel, brown and gray, wet.
35		FILL: Clayey Sand, trace Gravel, gray, wet.
18		FILL: Silty Sand, fine- to medium-grained, trace Gravel, brown, moist.
7		FILL: Poorly Graded Sand with Silt, fine- to coarse-grained, with Gravel, brown, moist.
12		FILL: Clayey Sand, trace Gravel, brown, wet.
25		FILL: Clayey Sand, fine- to medium-grained, trace Gravel, brown, moist.
		FILL: Sandy Lean Clay, trace Gravel, brown and gray, wet.
29		SILTY SAND, fine- to medium-grained, trace Gravel, with Clay inclusions, brown, moist, medium dense to dense.
34		
27	▽	POORLY GRADED SAND with SILT, fine- to medium-grained, with some Gravel, brown, moist to 41 feet then waterbearing, medium dense to dense.
24		
44		END OF BORING.

Water observed at 41 feet with 49 1/2 feet of hollow-stem auger in the ground.
Water not observed to cave-in depth of 31 feet immediately after withdrawal of auger.

Boring immediately backfilled with bentonite grout.

Bottom of Borehole at 51 ft

960 950 940 930 920 910 900 890 880 870 860 850 840 830 820 810 800 790

2314+00 2315+00 2316+00

Sep. 17 2015 09:40 am V:\3400_ADC\CAD\SEGMENT W2\PLAN SHEETS\STRUCTURES\CBR27J62\CBR27J62-BRG-BOR.dwg By: RieckmBB

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: XXX CHECKED BY: XXX
DRAWN BY: BR DATE: XX/XX/XX

AECOM

60% SUBMISSION - 09/28/15

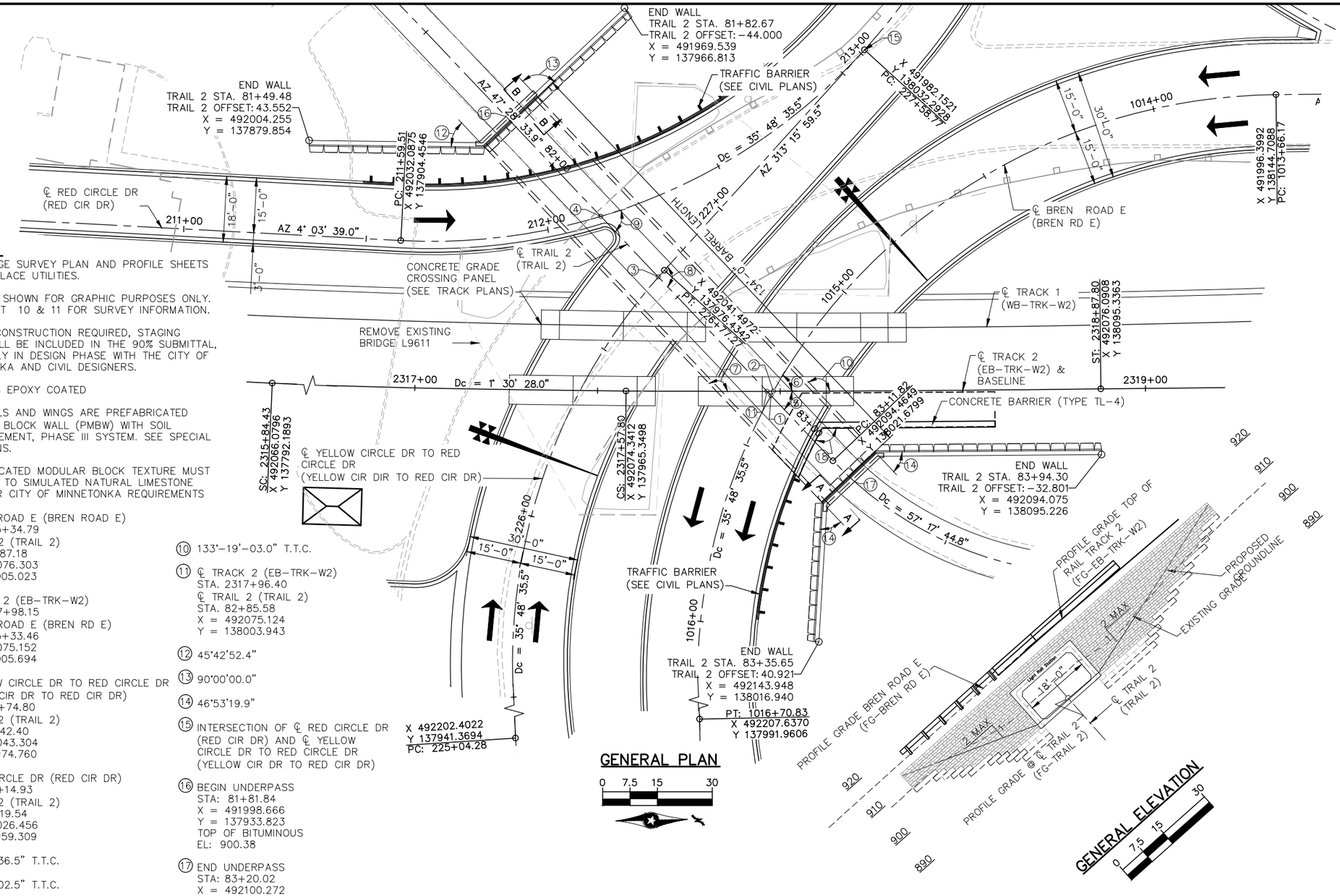
METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

CIVIL WEST - VOLUME 4B
PEDESTRIAN UNDERPASS 1
BRIDGE 27J62
BRIDGE SURVEY PROFILE

DISCIPLINE: STRUCTURES
SHEET NAME: CBR27J62-BRG-BOR-002

SHEET 13 OF 13



NOTES:

SEE BRIDGE SURVEY PLAN AND PROFILE SHEETS FOR IN-PLACE UTILITIES.

PROFILES SHOWN FOR GRAPHIC PURPOSES ONLY. SEE SHEET 10 & 11 FOR SURVEY INFORMATION.

STAGED CONSTRUCTION REQUIRED, STAGING PLANS WILL BE INCLUDED IN THE 90% SUBMITTAL, CURRENTLY IN DESIGN PHASE WITH THE CITY OF MINNETONKA AND CIVIL DESIGNERS.

ALL BARS EPOXY COATED

HEADWALLS AND WINGS ARE PREFABRICATED MODULAR BLOCK WALL (PMBW) WITH SOIL REINFORCEMENT, PHASE III SYSTEM. SEE SPECIAL PROVISIONS.

PREFABRICATED MODULAR BLOCK TEXTURE MUST CONFORM TO SIMULATED NATURAL LIMESTONE ROCK PER CITY OF MINNETONKA REQUIREMENTS

1. ℄ BREN ROAD E (BREN ROAD E)
   STA. 1015+34.79
   ℄ TRAIL 2 (TRAIL 2)
   STA. 82+87.18
   X = 492076.303
   Y = 138005.023
2. ℄ TRACK 2 (EB-TRK-W2)
   STA. 2317+98.15
   ℄ BREN ROAD E (BREN RD E)
   STA. 1015+33.46
   X = 492075.152
   Y = 138005.694
3. ℄ YELLOW CIRCLE DR TO RED CIRCLE DR (YELLOW CIR DR TO RED CIR DR)
   STA. 226+74.80
   ℄ TRAIL 2 (TRAIL 2)
   STA. 82+42.40
   X = 492043.304
   Y = 137974.760
4. ℄ RED CIRCLE DR (RED CIR DR)
   STA. 212+14.93
   ℄ TRAIL 2 (TRAIL 2)
   STA. 82+19.54
   X = 492026.456
   Y = 137959.309
5. 46°-33'-36.5" T.T.C.
6. 60°-24'-02.5" T.T.C.
7. 133°-37'-53.8" T.T.C.
8. 95°-05'-29.7" T.T.C.
9. 63°-15'-38.7" T.T.C.
10. 133°-19'-03.0" T.T.C.
11. ℄ TRACK 2 (EB-TRK-W2)
    STA. 2317+96.40
    ℄ TRAIL 2 (TRAIL 2)
    STA. 82+85.58
    X = 492075.124
    Y = 138003.943
12. 45°42'52.4"
13. 90°00'00.0"
14. 46°53'19.9"
15. INTERSECTION OF ℄ RED CIRCLE DR (RED CIR DR) AND ℄ YELLOW CIRCLE DR TO RED CIRCLE DR (YELLOW CIR DR TO RED CIR DR)
16. BEGIN UNDERPASS
    STA: 81+81.84
    X = 491998.666
    Y = 137933.823
    TOP OF BITUMINOUS
    EL: 900.38
17. END UNDERPASS
    STA: 83+20.02
    X = 492100.272
    Y = 138027.461
    TOP OF BITUMINOUS
    EL: 898.71
18. 118°-02'-17.5"

DESIGN DATA

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

METRO LIGHT RAIL TRANSIT DESIGN CRITERIA (REVISION 4.0)

LOAD AND RESISTANCE FACTOR DESIGN METHOD

HL-93 LIVE LOAD (ROADWAY)

LRV & MV LOAD DIAGRAM SHOWN ON SHEET 2

INSIDE HEIGHT =	10'-0"
INSIDE WIDTH =	18'-0"
SKEW ANGLE =	0°57'28.2"
MINIMUM DESIGN FILL HEIGHT =	2'-6"
MAXIMUM DESIGN FILL HEIGH =	5'-10"
UNIT WEIGHT FILL =	120.0LBS/CU.FT.
ANGLE INTERNAL FRICTION =	30.00DEG

fy = 60000 P.S.I. REINFORCEMENT BARS
fy = 65000 P.S.I. STEEL FABRIC
f'c = 5000 P.S.I. CONCRETE
DESIGN SPEED: 55 MPH (LRT)
25 MPH (ALL ROADS)

LIST OF SHEETS

2040 PROJECTED TRAFFIC VOLUMES

ROADWAY OVER		ROADWAY UNDER
7000	AADT	N/A
XXXX	DHV	N/A
XXXXX	ADTT	N/A

BRIDGE NO. 27J63

SOUTHWEST LRT OVER TRAIL 2
0.6 MI. W OF JCT. T.H. 62/T.H. 169 IN MINNETONKA

18' X 10' BOX CULVERT
0°-57'-28.2" SKEW

BRIDGE I.D. NO. 113

GENERAL PLAN AND ELEVATION

SEC 36 T117N R22W
CITY OF MINNETONKA HENNEPIN COUNTY

APPROVED: _____
STATE BRIDGE ENGINEER DATE

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

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: BR CHECKED BY: PLR
DRAWN BY: BR DATE: 08/10/15

AECOM

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

WEST CIVIL - VOLUME 4B
PEDESTRIAN UNDERPASS 2
BRIDGE 27J63
GENERAL PLAN AND ELEVATION

DISCIPLINE: STRUCTURES
SHEET NAME: CBR27J63-BRG-GPE-001

SHEET 1 OF 11

Sep. 19 2015 07:48 am V:\3400_ADC\CAD\segment w2\plan sheets\structures\CBR27J63\CBR27J63-BRG-GPE.dwg By: RleckmBB

NOTES:

① ℄ YELLOW CIRCLE DR TO RED CIRCLE DR (YELLOW CIR DR TO RED CIR DR)

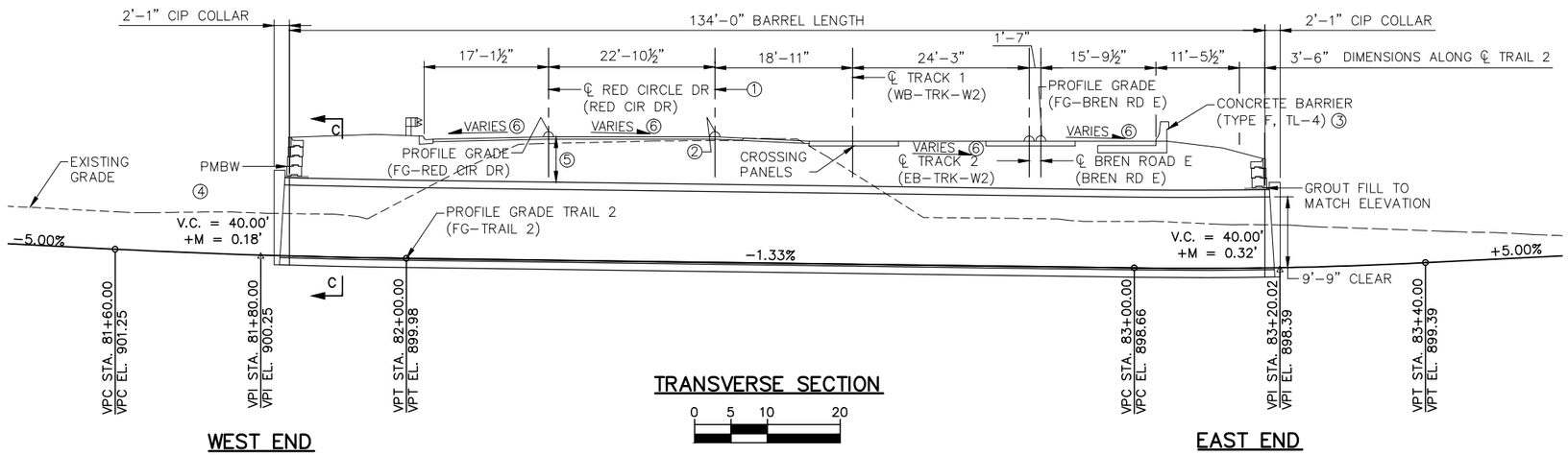
② PROFILE GRADE (FG–YELLOW CIR DR TO RED CIR DR)

③ SEE PLAN VIEW SHEET 4 FOR LAYOUT AND BARRIER/MOMENT SLAB

④ HEADWALLS AND WINGS ARE PREFABRICATED MODULAR BLOCK WALL (PMBW) WITH SOIL REINFORCEMENT, PHASE III SYSTEMS – SEE SPECIAL PROVISIONS

⑤ IN THE ZONE ABOVE THE 18'X10' PRECAST BOX: CONCRETE BARRIER (TYPE F) WITH MOMENT SLAB AND PMBW HEADWALL ARE INCLUDED IN THE STRUCTURES PLAN. FOR ALL WORK REFER TO TRACK, CIVIL, AND SYSTEMS PLANS

⑥ SEE ROADWAY SECTIONS ON BRIDGE SURVEY SHEET FOR CROSS–SLOPES.



TRANSVERSE SECTION

0 5 10 20

WEST END

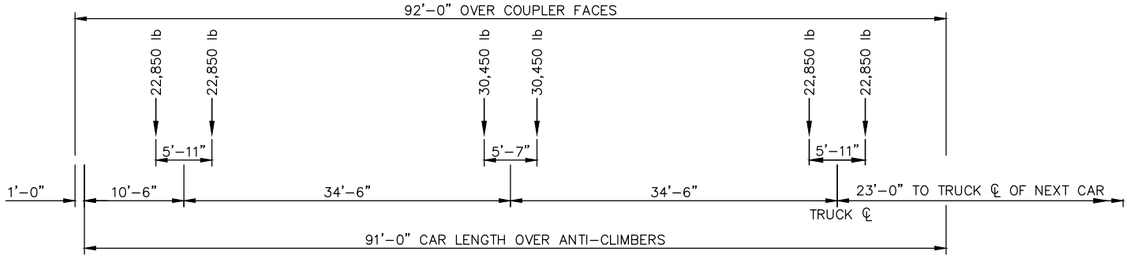
EAST END

COMPONENT ITEM SCHEDULE – BRIDGE 27J63

SPEC. SECTION ②	COMPONENT ITEM SUMMARY	UNIT ①	QUANTITY ①
MNDOT 2401	STRUCTURAL CONCRETE (1G52)	CU. YD.	
MNDOT 2401	STRUCTURAL CONCRETE (3B52)	CU. YD.	
MNDOT 2401	TYPE P–1 (TL–2) BARRIER CONCRETE (3S52)	LIN. FT.	
MNDOT 2401	TYPE P–4 (TL–4) BARRIER CONCRETE (3S52)	LIN. FT.	
MNDOT 2411	REINFORCEMENT BARS	POUND	
MNDOT 2411	REINFORCEMENT BARS (EPOXY COATED)	POUND	
MNDOT 2411	MODULAR BLOCK RETAINING WALL	SQ. FT.	
MNDOT 2411	STRUCTURE EXCAVATION	CU. YD.	
MNDOT 2412	18X10 PRECAST CONCRETE BOX CULVERT	LIN. FT.	
MNDOT 2451	GRANULAR BEDDING (LV)	CU. YD.	
MNDOT 2451	SELECT GRANULAR BACKFILL (LV)	CU. YD.	
MNDOT 2557	DIAMOND MESH SAFETY RAIL	LIN. FT.	

① QUANTITIES LISTED FOR THE COMPONENT ITEMS OF THE LUMP SUM BRIDGE 27J63 ITEM ARE FOR INFORMATIONAL PURPOSES. ANY ADDITIONAL ITEMS OR CHANGES IN QUANTITIES REQUIRED SHALL BE PROVIDED BY THE CONTRACTOR WITH NO ADDITIONAL COMPENSATION.

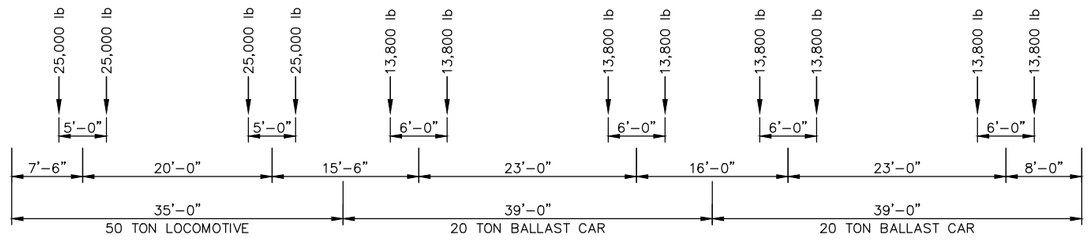
② MEASUREMENT AND PAYMENT FOR COMPONENT ITEMS SHALL BE PART OF THE LUMP SUM PAYMENT FOR THE BRIDGE 27J63. REFER TO MNDOT STANDARD SPECIFICATION OR SPECIAL PROVISION FOR TECHNICAL SPECIFICATION REQUIREMENTS FOR ALL PROVISIONS OTHER THAN MEASUREMENT & PAYMENT REQUIREMENTS.



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.



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. WEIGHT OF EMPTY BALLAST CAR IS 15,000 POUNDS.

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: BR | CHECKED BY: PLR
DRAWN BY: BR | DATE: 08/10/15

AECOM

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

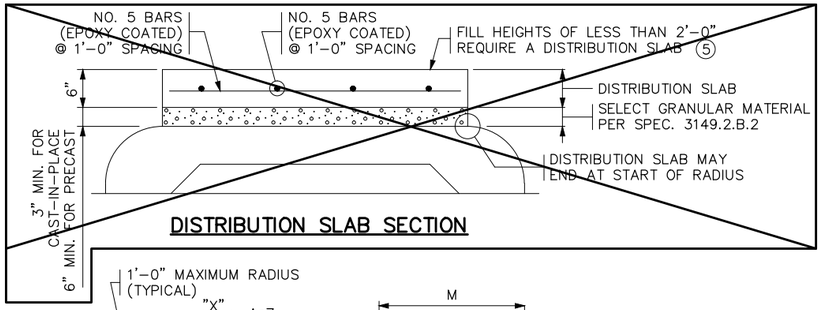
SOUTHWEST Green Line LRT Extension

WEST CIVIL - VOLUME 4B
PEDESTRIAN UNDERPASS 2
BRIDGE 27J63
LOADING DIAGRAM

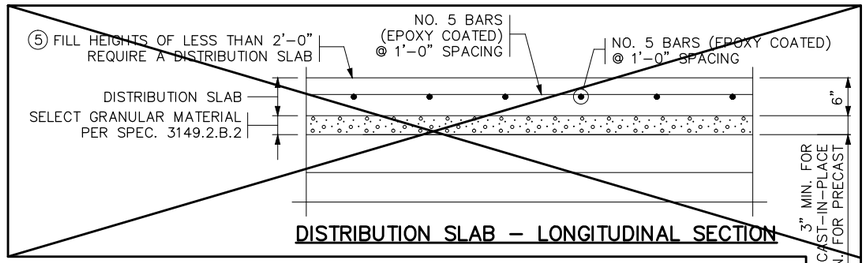
DISCIPLINE: STRUCTURES
SHEET NAME: CBR27J63-BRG-GPE-002

SHEET 2 OF 11

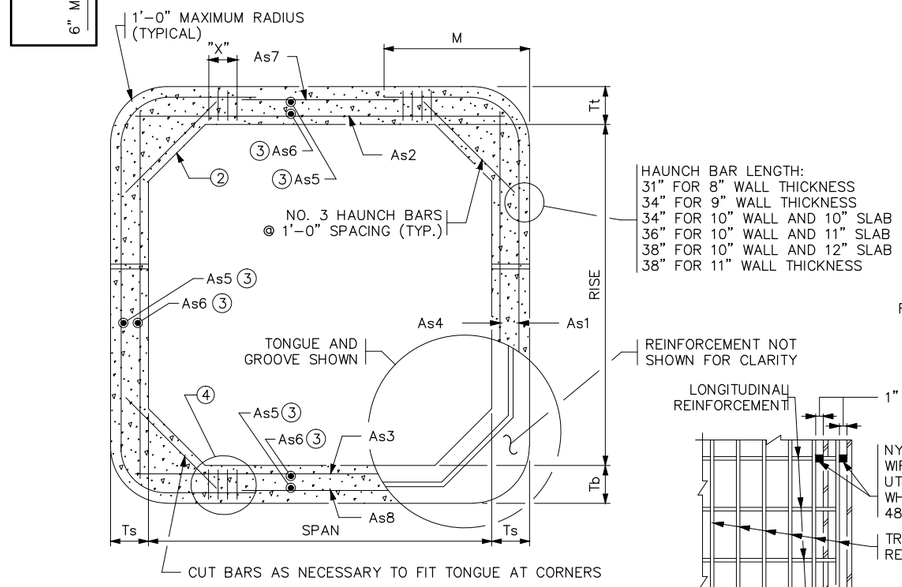
Sep. 19 2015 07:49 am V:\3400_ADC\CAD\segment w2\plan sheets\structures\CBR27J63\CBR27J63-BRG-GPE.dwg By: RieckmBB



DISTRIBUTION SLAB SECTION

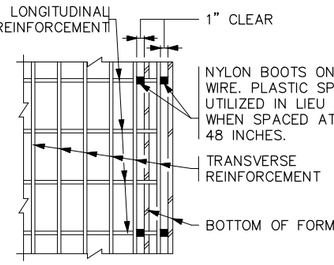


DISTRIBUTION SLAB – LONGITUDINAL SECTION

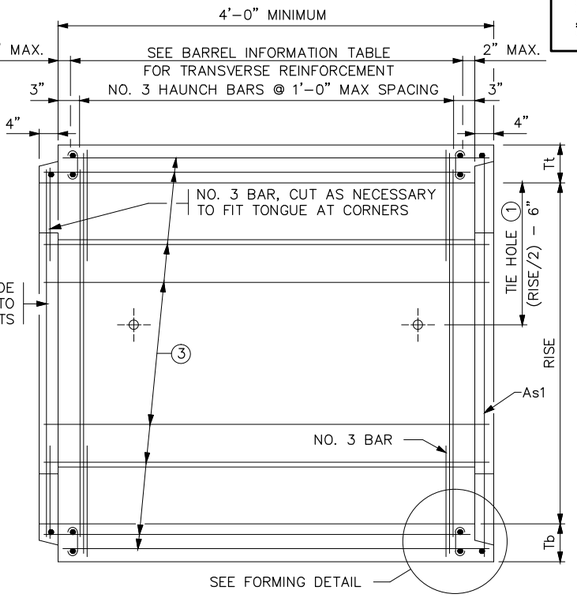


TRANSVERSE BARREL SECTION

BAR REINFORCEMENT OPTION SHOWN

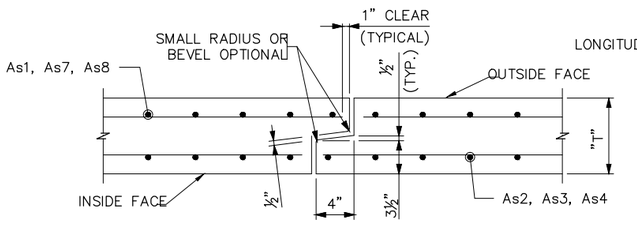


PLAN

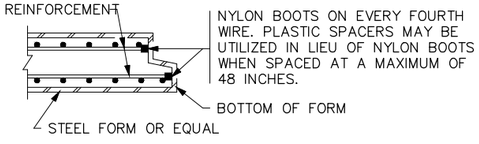


LONGITUDINAL BARREL SECTION

BAR REINFORCEMENT OPTION SHOWN

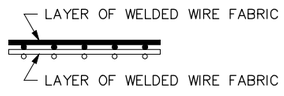


TONGUE AND GROOVE JOINT DETAIL



SECTION

FORMING DETAIL



FABRIC LAYER DETAIL

WHEN MORE THAN ONE LAYER OF WELDED WIRE FABRIC IS USED TO OBTAIN THE REQUIRED REINFORCEMENT AREAS, THE WIRES OF THE WELDED WIRE FABRIC SHALL BE PLACED AS SHOWN

CONSTRUCTION NOTES

CULVERTS TO BE CONSTRUCTED AS PER SPEC. 2412 EXCEPT AS NOTED.

REFER TO THE GENERAL PLAN AND ELEVATION SHEET FOR THE DISTANCE BETWEEN BARRELS OF ADJACENT BOXES AND TO STANDARD FIGURE 5-395.115 FOR MATERIAL REQUIREMENTS FOR FILL BETWEEN ADJACENT BOXES.

THE WELDED WIRE FABRIC, SHEAR REINFORCEMENT AND REINFORCEMENT BARS SHALL CONFORM TO APPLICABLE REQUIREMENTS OF AASHTO M259.

1½" MIN. AND 2" MAX. CONCRETE COVER ON ALL REINFORCEMENT, INCLUDING SHEAR REINFORCEMENT, EXCEPT FOR TONGUE AND GROOVE DETAIL.

ANY OF THE FOLLOWING COMBINATIONS OF STEEL REINFORCEMENT MAY BE USED:
(a) 1 OR 2 LAYERS OF WELDED WIRE FABRIC OR
(b) 1 LAYER OF WELDED WIRE FABRIC AND 1 LAYER OF REINFORCEMENT BARS O
(c) 1 LAYER OF REINFORCEMENT BARS.
THE REINFORCEMENT SHALL BE DEVELOPED IN ACCORDANCE WITH AASHTO "LRFD BRIDGE DESIGN SPECIFICATIONS." IF BAR REINFORCEMENT IS SUBSTITUTED FOR WELDED WIRE FABRIC, THE AREA OF REINFORCEMENT SHALL BE INCREASED BY 8%, AND CONTRACTOR SHALL SUBMIT DESIGN CALCULATIONS VERIFYING COMPLIANCE WITH AASHTO 5.7.3.4 "CONTROL OF CRACKING BY DISTRIBUTION OF REINFORCEMENT".

THE MAXIMUM SIZE OF REINFORCEMENT BARS SHALL BE NO. 6. THE MAXIMUM WELDED WIRE FABRIC SIZE SHALL BE A W23 PER LAYER (MAXIMUM OF 2 LAYERS).

THE SPACING CENTER TO CENTER OF THE TRANSVERSE WIRES SHALL NOT BE LESS THAN 2" NOR MORE THAN 4". THE SPACING CENTER TO CENTER OF THE LONGITUDINAL WIRES SHALL NOT BE MORE THAN 8".

WELDING WILL NOT BE ALLOWED ON REINFORCEMENT BARS OR WELDED WIRE FABRIC, EXCEPT THAT THE ORIGINAL WELDING REQUIRED TO MANUFACTURE WIRE FABRIC IS ACCEPTABLE.

WHEN REINFORCEMENT IS CUT, ADDITIONAL REINFORCEMENT SHALL BE ADDED ON BOTH SIDES OF THE CUT MEMBER TO REPLACE OR EXCEED THE CUT STEEL.

CONCRETE SHALL BE MIX NO. 3W36 WITH NO CALCIUM CHLORIDE ALLOWED.

SHOP DRAWING APPROVAL PER SPEC. 3238.2.A IS REQUIRED.

COMPACT THE FIRST 1.5' (LOOSE) OF FILL ABOVE THE BOX WITH LIGHT COMPACTION EQUIPMENT SUCH AS PLATE COMPACTORS OR WALK BEHIND ROLLERS.

TRANSVERSE REINFORCEMENT IS PARALLEL TO THE CULVERT SPAN
LONGITUDINAL REINFORCEMENT IS PERPENDICULAR TO THE CULVERT SPAN.

(1) CULVERT TIES ARE TO BE 1" DIAMETER RODS. SEE STANDARD PLATE NO. 3145 FOR CONNECTION DETAILS.

(2) HAUNCH SIZES ARE TO BE 12" VERTICAL, 12" HORIZONTAL ON ALL BOX SIZES.

(3) LONGITUDINAL REINFORCEMENT DENOTED AS As5 AND As6 MUST BE PLACED IN ALL SLABS AND WALLS AND MUST BE 0.06 SQ. IN./FT. MIN.

(4) SEE STANDARD PLATE NO. 3007 FOR SHEAR REINFORCEMENT OPTIONS. THE MAXIMUM SHEAR REINFORCEMENT SPACING IN THE LONGITUDINAL DIRECTION SHALL BE 6".

(5) ROADWAY OR SHOULDER FILL HEIGHTS OF LESS THAN 2'-0" REQUIRE A DISTRIBUTION SLAB.

USE CONCRETE MIX 3Y43 FOR THE DISTRIBUTION SLAB.

CAST-IN-PLACE DISTRIBUTION SLABS SHALL BE 6" THICK. PROVIDE 3" MINIMUM SELECT GRANULAR MATERIAL PER SPEC. 3149.2.B.2 BETWEEN BARREL AND DISTRIBUTION SLAB.

PRECAST DISTRIBUTION SLABS SHALL BE 6" THICK AND MAY BE USED FOR FILL HEIGHTS OVER 1'-0". PROVIDE 6" MINIMUM SELECT GRANULAR MATERIAL PER SPEC. 3149.2.B.2 BETWEEN BARREL AND DISTRIBUTION SLAB.

THE WIDTH OF THE DISTRIBUTION SLAB SHALL EXTEND BETWEEN THE OUTSIDE EDGES OF THE SHOULDERS UNLESS DIRECTED BY THE ENGINEER.

PAYMENT FOR THE DISTRIBUTION SLAB AND SELECT GRANULAR MATERIAL BENEATH THE SLAB SHALL BE CONSIDERED INCIDENTAL.

IF DISTRIBUTION SLAB IS USED AS PAVEMENT SURFACE IT MUST BE REDESIGNED PER THE MnDOT PAVEMENT DESIGN MANUAL.

BARREL INFORMATION TABLE * * *

LOCATION	SIZE	f'c (P.S.I.)	OVERFILL LIMITS (FT.)	DISTRIBUTION SLAB REQUIRED *	RECESSED TIE RODS REQUIRED * *	DIMENSIONS					WEIGHT (LBS./FT.)	WELDED WIRE FABRIC REINFORCEMENT												(4) SHEAR REINFORCEMENT TOP AND BOTTOM OF BARREL		
						SPAN (FT.)	RISE (FT.)	Tt (IN.)	Tb (IN.)	Ts (IN.)		As1			As2		As3		As4		As7		As8				
												AREA (IN.²/FT.)	LENGTH (FT.)	M (FT.)	AREA (IN.²/FT.)	LENGTH (FT.)	AREA (IN.²/FT.)	LENGTH (FT.)	AREA (IN.²/FT.)	LENGTH (FT.)	AREA (IN.²/FT.)	LENGTH (FT.)	AREA (IN.²/FT.)	LENGTH (FT.)	AREA (IN.²/FT.)	MAX. SPG. (IN.)	X (IN.)
				YES	NO																					
				YES	NO																					

* ALL CLASS 1 CULVERTS WITH FILL HEIGHTS OF LESS THAN 2'-0" REQUIRE A DISTRIBUTION SLAB. IF A DISTRIBUTION SLAB IS NOT REQUIRED, INDICATE "NO" IN THIS BOX.

* * FOR PEDESTRIAN CULVERT APPLICATIONS HIDE-AWAY OR RECESSED TIE CONNECTIONS ARE REQUIRED, SEE STANDARD PLATE 3145. IF REQUIRED, INDICATE "YES" IN THIS BOX.

* * * BOX CULVERTS WITH SPANS FROM 6 TO 14 FT. ARE DESIGNED FOR HL-93 LIVE LOADS (AASHTO LRFD 3.6.2.1) NOT INCLUDING THE DESIGN LANE LOAD. BOXES WITH SPANS OF 16 FT. ARE DESIGNED FOR HL-93 LIVE LOADS INCLUDING THE DESIGN LANE LOAD.

REVISION: 09-11-2014

APPROVED: MARCH 24, 2011
Nancy Daubenberger
STATE BRIDGE ENGINEER

STATE PROJ. NO 9909-01 (T.H.) STA. + .

FIG. 5-395.101(B) MOD

CERTIFIED BY _____ LICENSED PROFESSIONAL ENGINEER _____ DATE

NAME: LIC. NO.

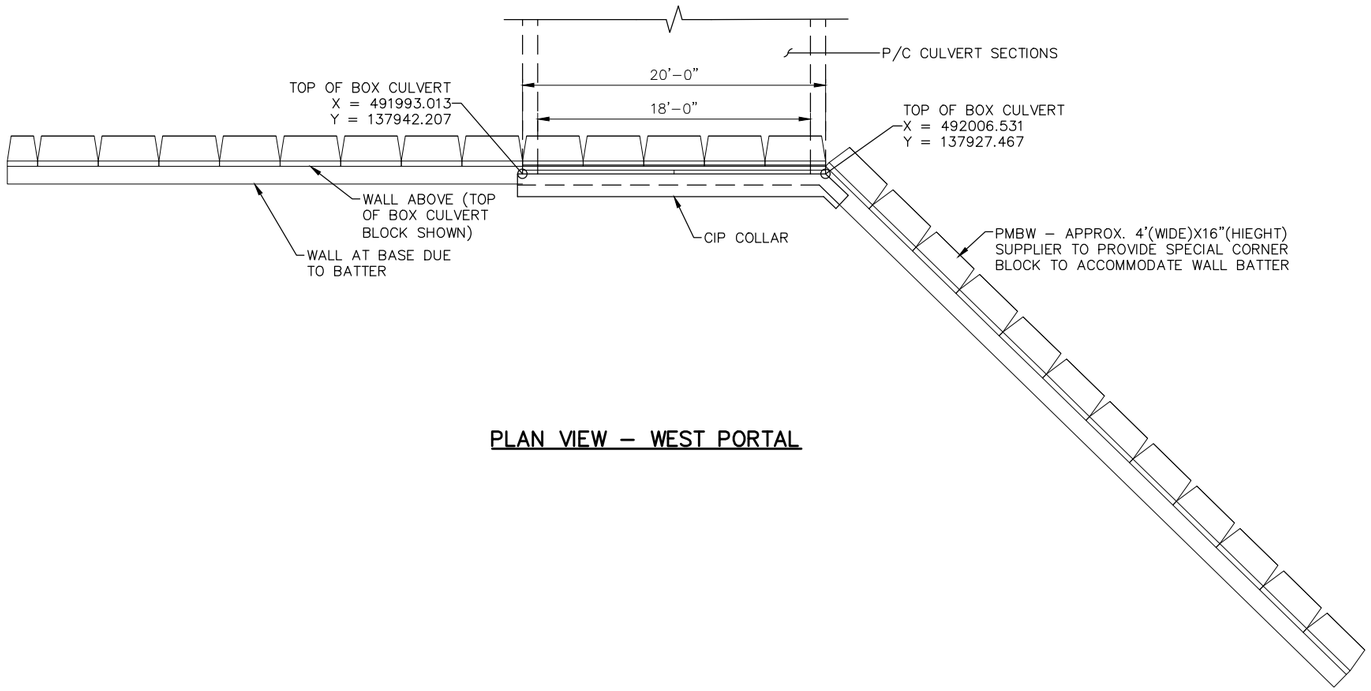
TITLE: PRECAST CONCRETE BARREL DETAILS (SPECIAL DESIGN)

DES: XXX DR: BR APPROVED:

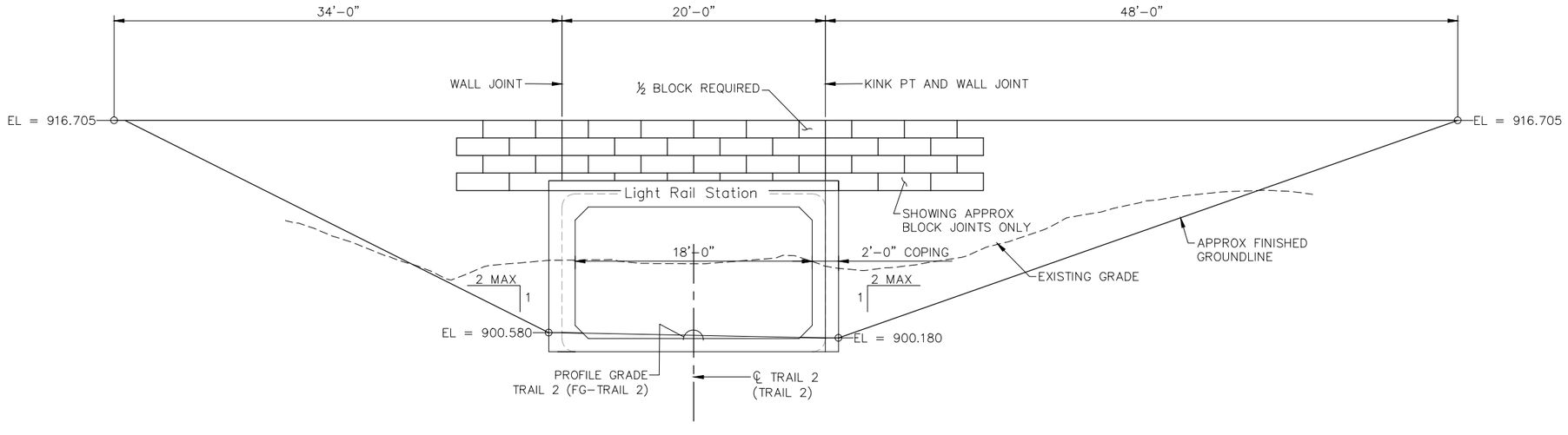
CHK: XXX CHK: XX/XX/XX

SHEET NO. 3 OF 11 SHEETS

BRIDGE NO. 27J63



PLAN VIEW - WEST PORTAL



WEST ELEVATION VIEW - UNWRAPPED

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: XXX | CHECKED BY: XXX
DRAWN BY: BR | DATE: XX/XX/XX

AECOM

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

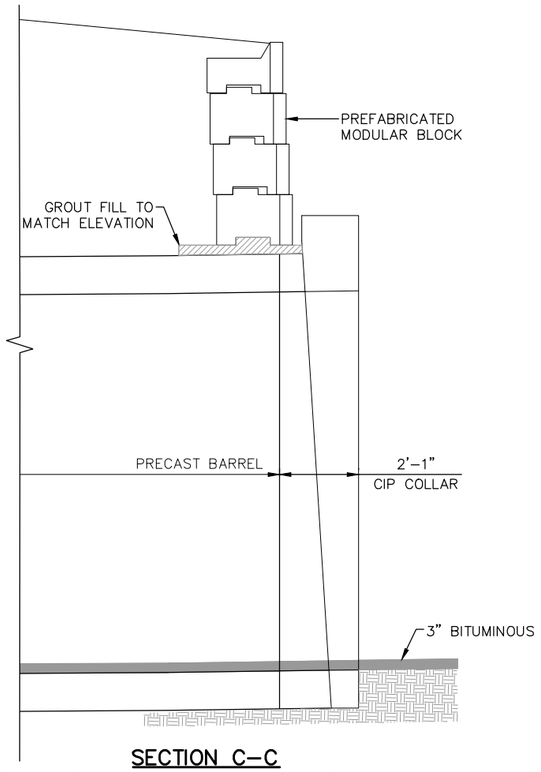
SOUTHWEST Green Line LRT Extension

WEST CIVIL - VOLUME 4B
PEDESTRIAN UNDERPASS 2
BRIDGE 27J63
CULVERT SECTIONS 1

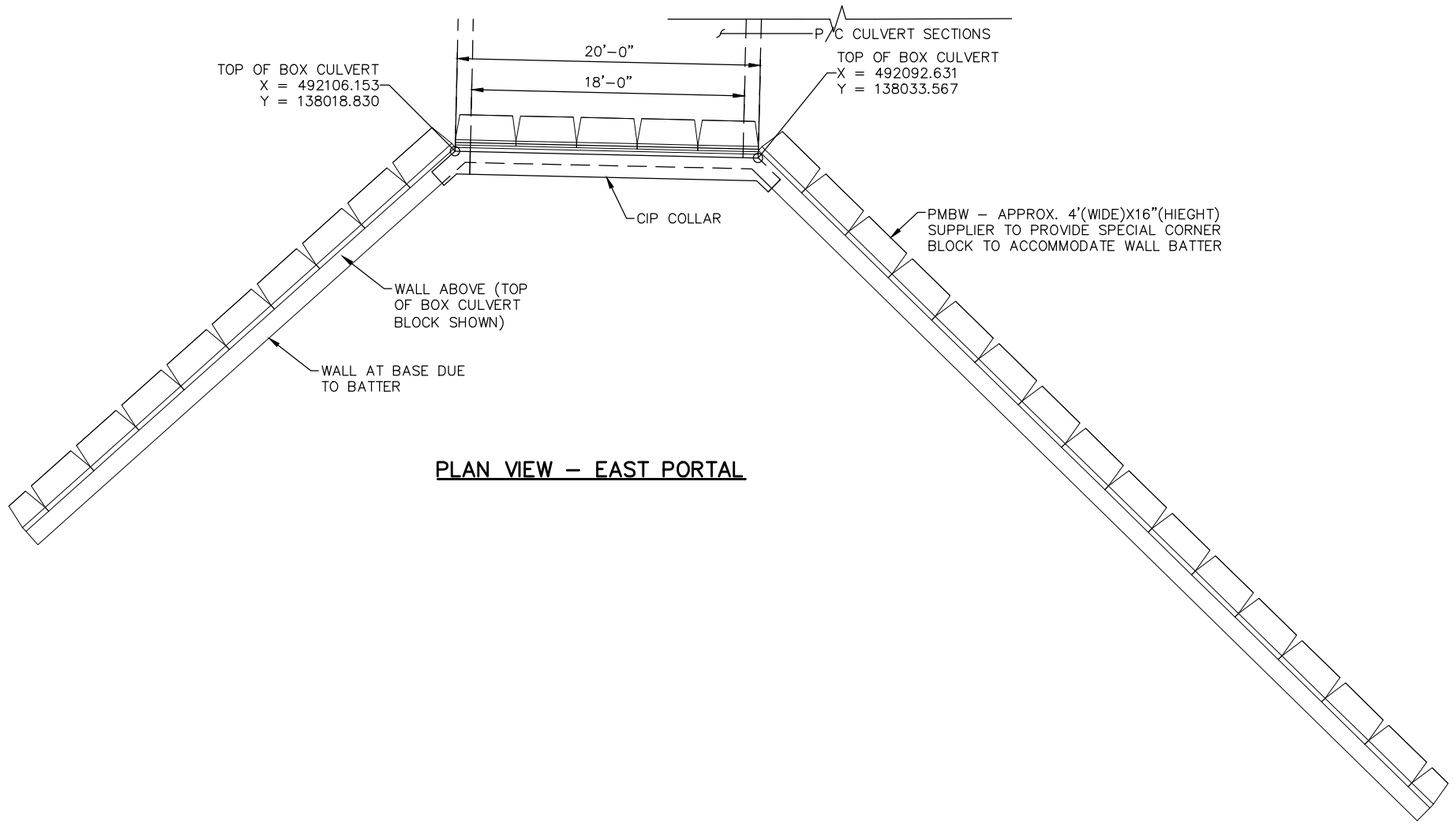
DISCIPLINE: STRUCTURES

SHEET NAME: CBR27J63-BRG-DTL-002

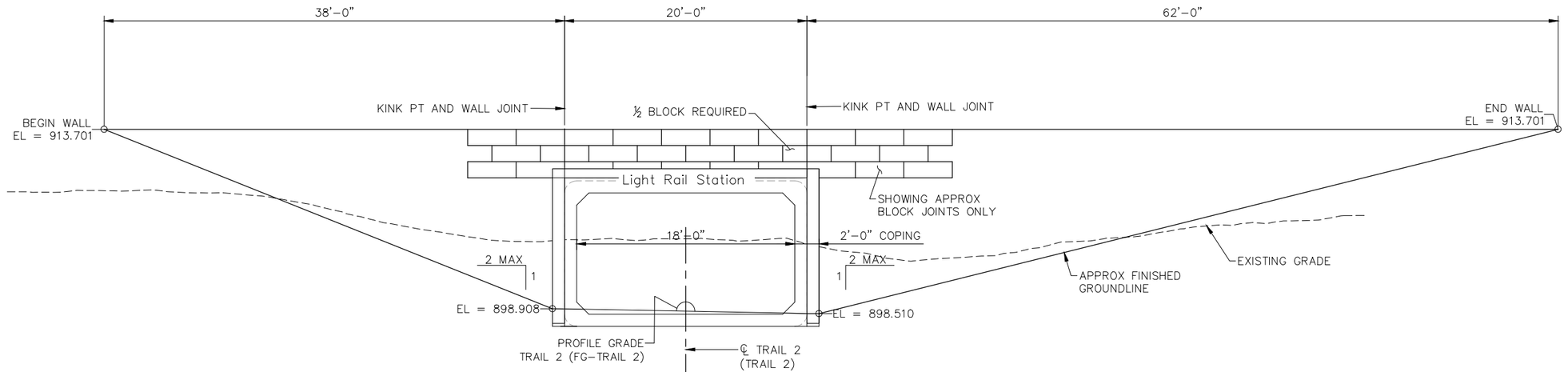
SHEET 4 OF 11



SECTION C-C
(NORTHEAST ENTRANCE)



PLAN VIEW - EAST PORTAL



EAST ELEVATION VIEW - UNWRAPPED

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: XXX | CHECKED BY: XXX
DRAWN BY: BR | DATE: XX/XX/XX

AECOM

60% SUBMISSION - 09/28/15

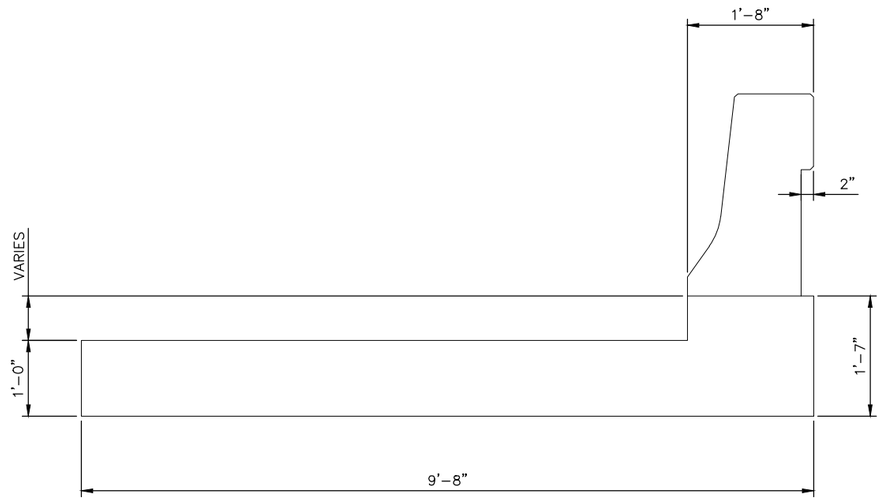
METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

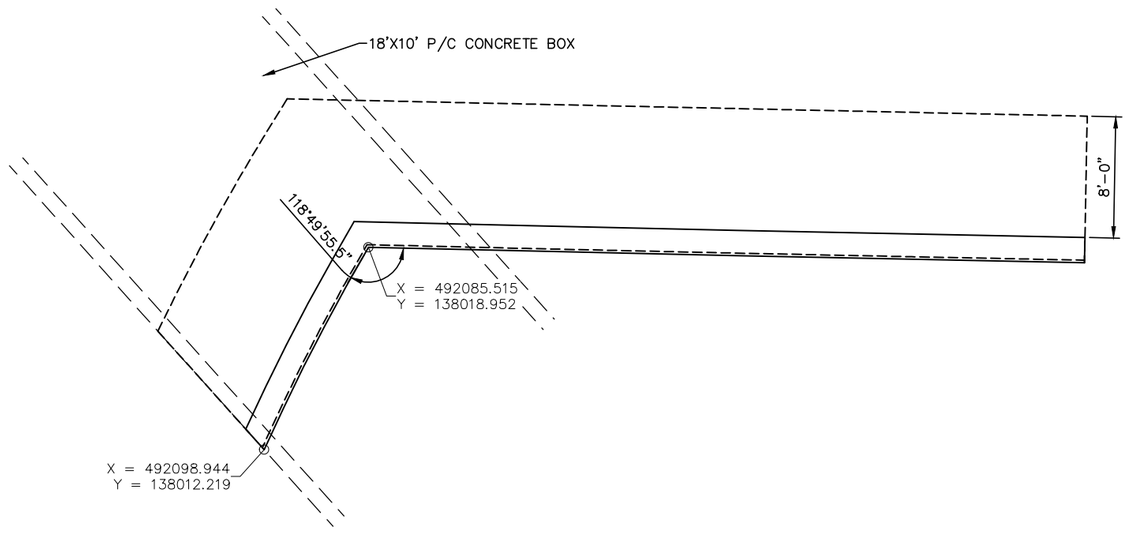
WEST CIVIL - VOLUME 4B
PEDESTRIAN UNDERPASS 2
BRIDGE 27J63
CULVERT SECTIONS 2

DISCIPLINE: STRUCTURES
SHEET NAME: CBR27J63-BRG-DTL-003

SHEET 5 OF 11



MOMENT SLAB SECTION



PLAN VIEW TYPE F BARRIER

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: XXX | CHECKED BY: XXX
DRAWN BY: BR | DATE: XX/XX/XX

AECOM

60% SUBMISSION - 09/28/15

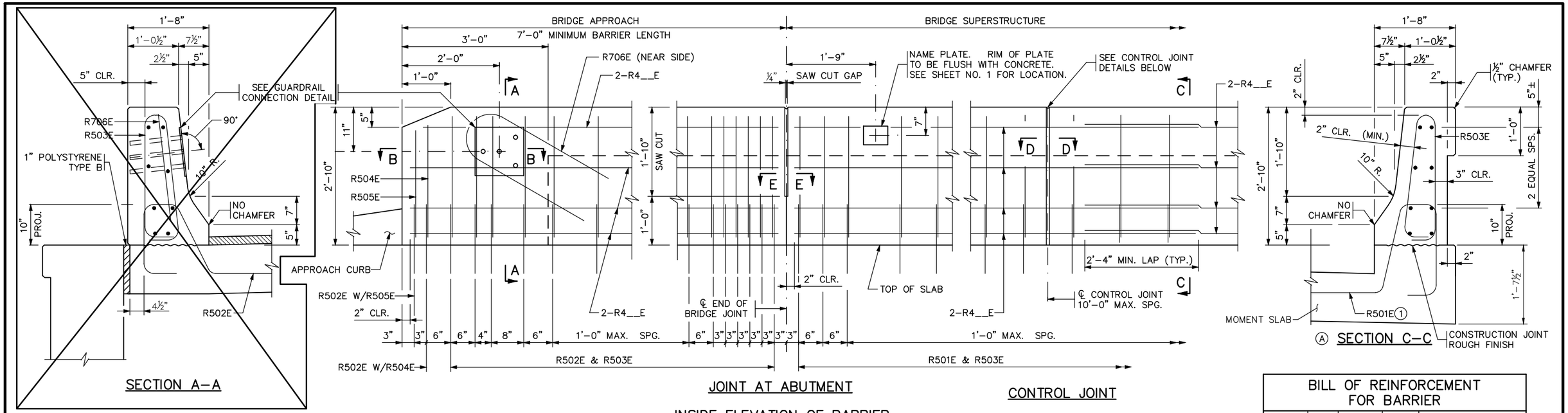
METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

WEST CIVIL - VOLUME 4B
PEDESTRIAN UNDERPASS 2
BRIDGE 27J63
MOMENT SLAB DETAIL

DISCIPLINE: STRUCTURES
SHEET NAME: CBR27J63-BRG-DTL-004

SHEET 6 OF 11



SECTION A–A

JOINT AT ABUTMENT

CONTROL JOINT

INSIDE ELEVATION OF BARRIER

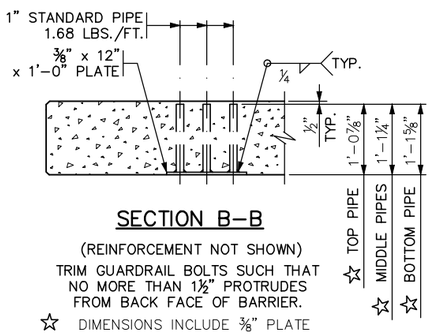
(CONCRETE WEARING COURSE NOT SHOWN)

Sep. 19 2015 07:51 am V:\3400_ADC\CAD\segment #2\plan sheets\structures\CBR27J63\CBR27J63-BRG-RAL.dwg By: RieckmBB

BARRIER MEETS TEST LEVEL 4 REQUIREMENTS OF NCHRP REPORT 350

BILL OF REINFORCEMENT FOR BARRIER

BAR	NO.	LENGTH	SHAPE	LOCATION
R501E	__	5'–3"		BARRIER DOWEL
R502E	__	5'–5"		BARRIER DOWEL
R503E	__	6'–6"		BARRIER VERTICAL
R504E	__	6'–0"		BARRIER VERTICAL
R505E	__	5'–10"		BARRIER VERTICAL
R706E	__	6'–6"		BARRIER VERTICAL
R4__E	__	__		BARRIER LONGIT.
R4__E	__	__		BARRIER LONGIT.
R4__E	__	__		BARRIER LONGIT.
R4__E	__	__		BARRIER LONGIT.
R4__E	__	__		BARRIER LONGIT.
R4__E	__	__		BARRIER LONGIT.

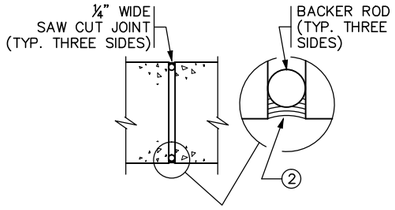


SECTION B–B

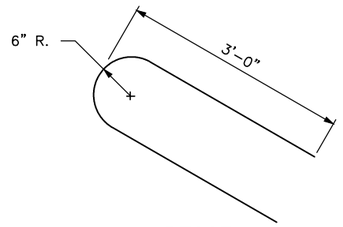
(REINFORCEMENT NOT SHOWN)

TRIM GUARDRAIL BOLTS SUCH THAT NO MORE THAN 1½" PROTRUDES FROM BACK FACE OF BARRIER.

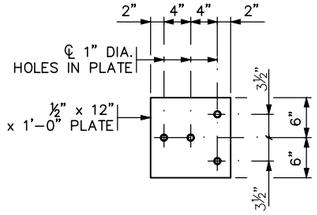
☆ DIMENSIONS INCLUDE ⅜" PLATE



SECTION E–E

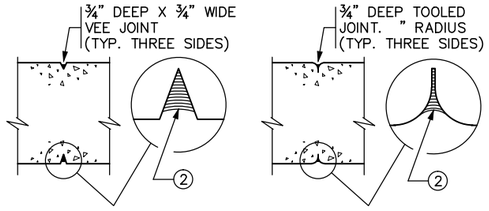


R706E



GUARDRAIL CONNECTION DETAIL

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

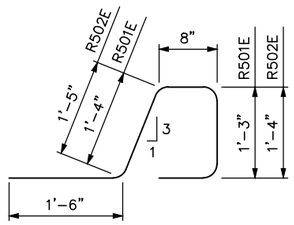


SECTION D–D
CONTRACTOR OPTION 1

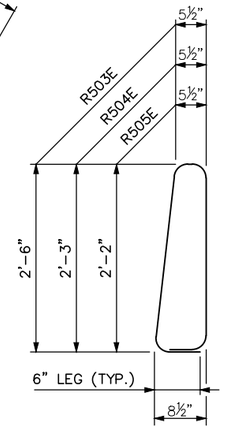
SECTION D–D
CONTRACTOR OPTION 2

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)



R501E, R502E



R503E, R505E & R506E

SHEET MODIFICATION:
Ⓐ DENOTES MODIFICATION TO STANDARD SHEET

GENERAL NOTES

MEASURE PAYMENT LENGTH BETWEEN THE OUTSIDE FACES OF THE BARRIER.

CONCRETE BARRIER = 502 LBS./FT. (0.124 CU. YDS./FT.)

FINISH ALL EDGES OF BARRIER AND END POST WITH ½" CHAMFER, EXCEPT WHERE OTHERWISE NOTED.

SPACE OF CONTROL JOINTS AT 10 FT. MAXIMUM. SEE SUPERSTRUCTURE SHEET FOR JOINT SPACING.

GUARDRAIL CONNECTION TO BE STRUCTURAL STEEL, SPEC. 3306.

GUARDRAIL CONNECTION AND NAME PLATE TO BE CONSIDERED INCIDENTAL TO BARRIER.

BARRIER QUANTITIES ARE LISTED IN SUMMARY OF QUANTITIES FOR SUPERSTRUCTURE.

① PLACE BAR ON TOP OF BOTTOM REINFORCEMENT MAT.

② JOINT SEALANT PER MnDOT APPROVED/QUALIFIED PRODUCTS LIST – CRACK AND JOINT MATERIALS – SILICONE JOINT SEALERS.

REVISION:

APPROVED: JANUARY 13, 2015
Nancy Daubenberger
STATE BRIDGE ENGINEER

CERTIFIED BY _____ XX/XX/XX
LICENSED PROFESSIONAL ENGINEER — DATE
NAME: # LIC. NO. #####

TITLE: CONCRETE BARRIER (TYPE F, TL–4)
INTEGRAL OR SEMI–INTEGRAL ABUTMENT WITH INTEGRAL END POST (WITH CONCRETE WEARING COURSE)

FIG. 5–397.117(A) MOD

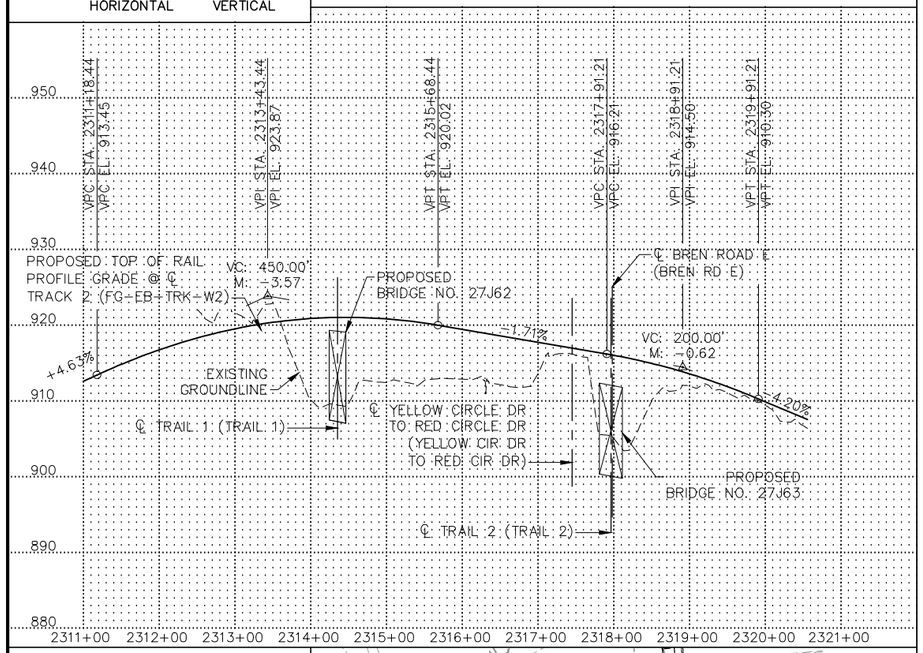
DES: XXX	DR: BR	APPROVED:	BRIDGE NO.
CHK: XXX	CHK: XX\XX\XX		27J63

SHEET NO. 7 OF 11 SHEETS

CONTRACTED PROFILE

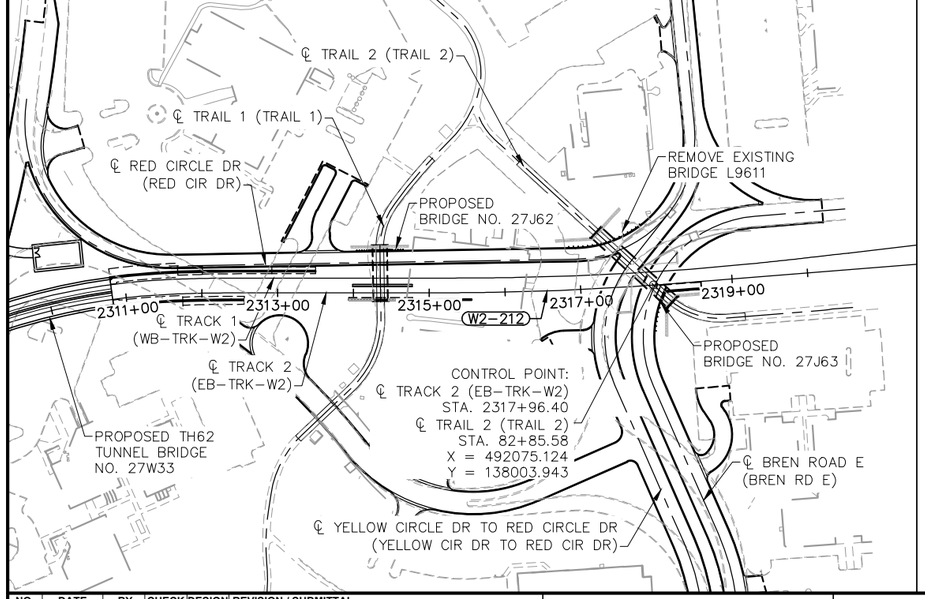
SCALE : 0 50' 100' HORIZONTAL; 0 5' 10' VERTICAL

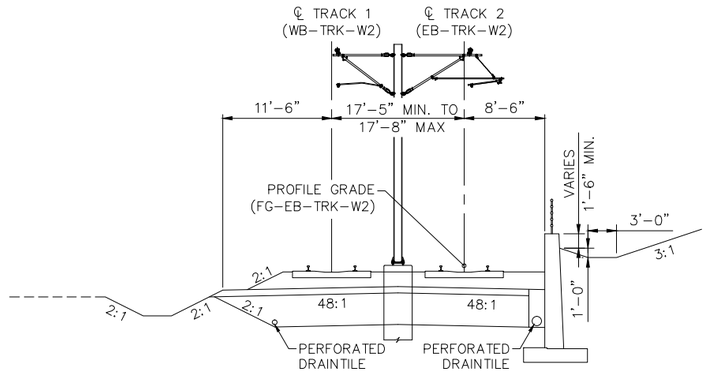
PROFILE GRADE TRACK 2 (FG–EB–TRK–W2)



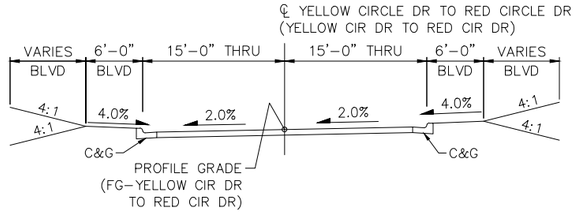
PLAT

SCALE : 0 50' 100'

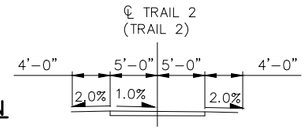




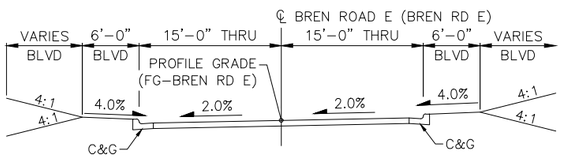
TYPICAL TRACK APPROACH SECTION



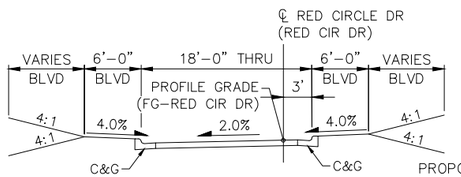
TYPICAL YELLOW CIRCLE DR TO RED CIRCLE DR SECTION



TYPICAL TRAIL 2 SECTION



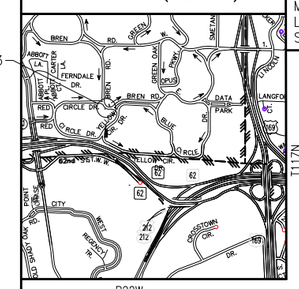
TYPICAL BREN ROAD E SECTION



TYPICAL RED CIRCLE DR SECTION

CURVE NO. W2–212
R = 3800.00'
Lc = 173.37'
Ls = 130.00'
Ea = 1.00"
Eu = 2.15"
V = 55 MPH

INDEX MAP (1 SQ. MI.)



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 ENGINEERS RECOMMENDATION

DATE: XX–XX–XXXX

STREAM OR DITCH DESIGNATION: XXX

DRAINAGE AREA: XXX SQ. MI.

MAX FLOOD ON RECORD: XXX C.F.S. (XX–XX–XX)

MAXIMUM OBSERVED HIGHWATER ELEVATION: XXX.X FT.

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

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

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

FLOWLINE ELEVATION: XXX FT. SKEW ANGLE: XX

ESTIMATED PRELIMINARY TOTAL SCOUR AT PIER EL. XXX.X (500 OR OT YR.FREQ.)

SCOUR CONFIRMATION RECOMMENDATION

DATE: XX–XX–XXXX

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

BRIDGE SURVEY SHEETS MADE FROM SURVEY PERFORMED BY RANI ENGINEERING

MNDOT NAME: 2773A
NORTHING (HEN. COUNTY COORDINATES): 137082.117
EASTING (HEN. COUNTY COORDINATES): 490527.817
BENCHMARK ELEVATION (NAVD88): 963.180
MONUMENT DESCRIPTION: B.M. DISK IN BRIDGE ABUTMENT
LOCATION: IN EDEN PRAIRIE, 1.1 MILES EAST ALONG T.H. HWY 62 FROM JCT. OF T.H. 62 & I–494

MONUMENT NAME: CONTROL POINT 6
NORTHING (HEN. COUNTY COORDINATES): 142016.680
EASTING (HEN. COUNTY COORDINATES): 489989.960
BENCHMARK ELEVATION (NAVD88): 932.956
MONUMENT DESCRIPTION: CAST IRON MONUMENT
LOCATION: 0.2 MILES EAST ALONG SMETANA ROAD FROM JCT. OF SMETANA ROAD & NOLAN DR

BRIDGE SURVEY

0.6 MILES WEST OF JCT. T.H. 62 AND T.H. 169

PEDESTRIAN UNDERPASS UNDER SOUTHWEST LIGHT RAIL TRACKS

SEC 36 T 117 N R 22 W

CITY OF MINNETONKA HENNEPIN COUNTY

BRIDGE 27J63

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: XXX CHECKED BY: XXX
DRAWN BY: BR DATE: XX/XX/XX

AECOM

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

WEST CIVIL - VOLUME 4B
PEDESTRIAN UNDERPASS 2
BRIDGE 27J63
BRIDGE SURVEY 1

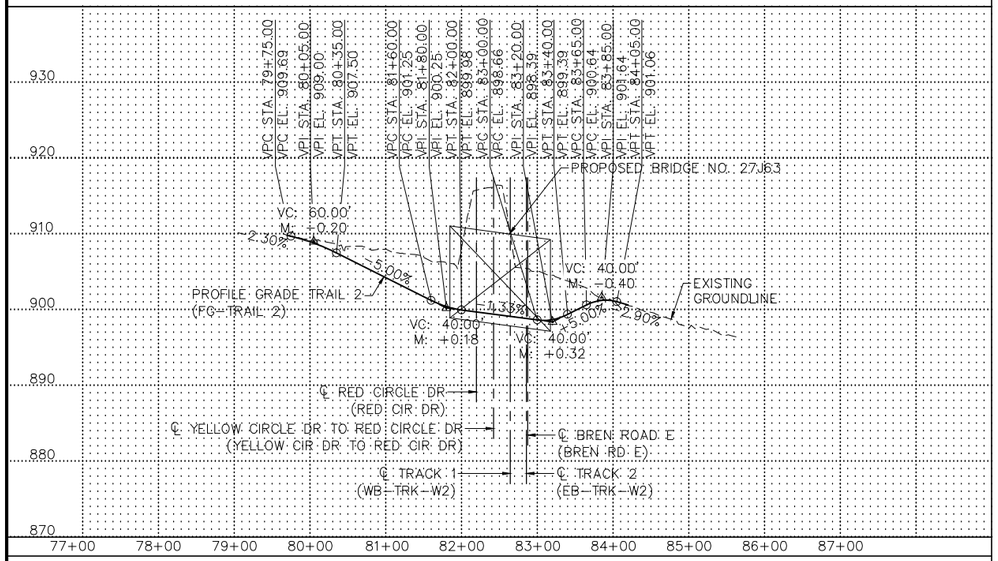
DISCIPLINE: STRUCTURES

SHEET NAME: CBR27J63-BRG-SUR-001

SHEET 8 OF 11

Sep. 19 2015 07:53 am V:\3400_ADC\CAD\segment w2\plan sheets\structures\CBR27J63\CBR27J63-BRG-SUR.dwg By: RieckmBB

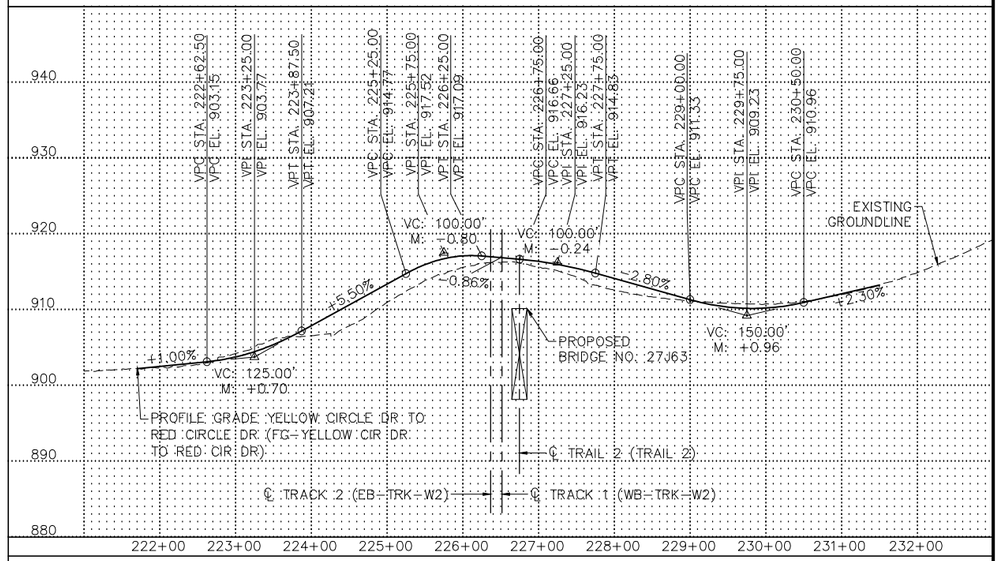
PROFILE GRADE TRAIL 2 (FG–TRAIL 2)



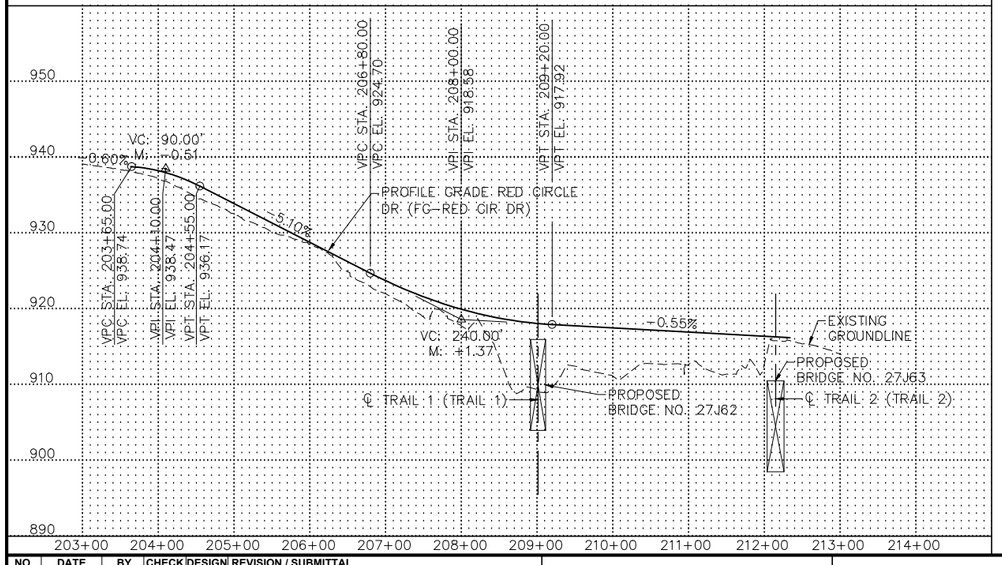
PROFILE SCALES

SCALE : 0 50' 100' HORIZONTAL 0 5' 10' VERTICAL

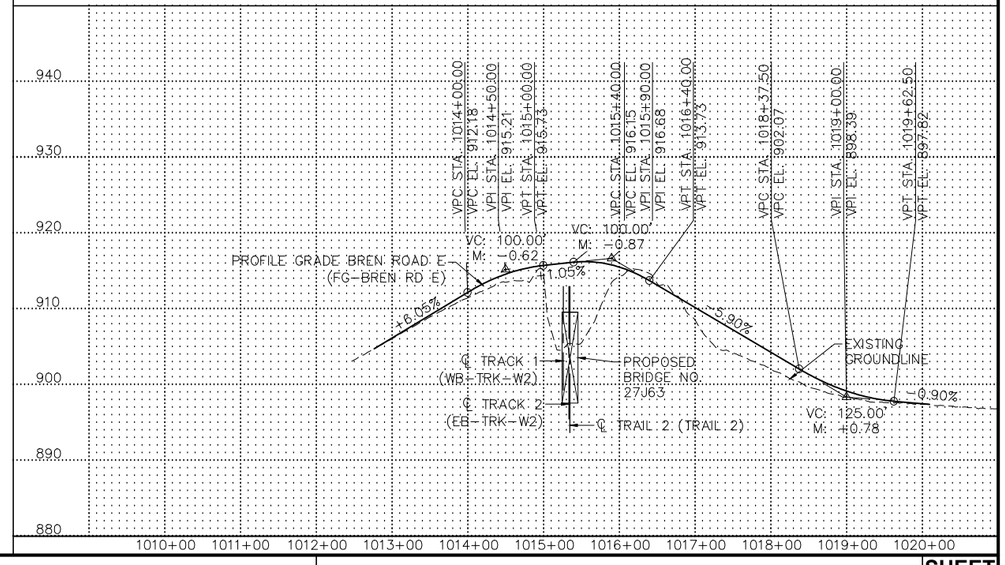
PROFILE GRADE YELLOW CIRCLE DR TO RED CIRCLE DR (FG–YELLOW CIR DR TO RED CIR DR)



PROFILE GRADE RED CIRCLE DRIVE (FG–RED CIR DR)



PROFILE GRADE BREN ROAD EAST (FG–BREN RD E)



NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: XXX CHECKED BY: XXX
DRAWN BY: BR DATE: XX/XX/XX

AECOM

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

WEST CIVIL - VOLUME 4B
PEDESTRIAN UNDERPASS 2
BRIDGE 27J63
BRIDGE SURVEY 2

DISCIPLINE: STRUCTURES

SHEET NAME: CBR27J63-BRG-SUR-002

SHEET 9 OF 11

Sep. 19 2015 07:54 am V:\3400_ADC\CAD\segment w2\plan sheets\structures\CBR27J63\CBR27J63-BRG-SUR.dwg By: RieckmBB

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".

EXISTING UTILITIES IN CONFLICT WITH TUNNEL CONSTRUCTION TO BE RELOCATED

70.15' LT.
℄ EB-TRK-W2
STA. 2317+24.19

2231SB

℄ RED CIRCLE DR
(RED CIR DR)

Az = 4° 03' 39.0"

211+00

PC: 211+59.51
X 492032.0875
Y 137904.4546

212+00

℄ TRACK 1
(WB-TRK-W2)

℄ TRACK 2
(EB-TRK-W2)
(REF. LINE)

2317+00

Mid: 2316+71.11
X 492071.1980
Y 137878.7225

Dc = 1° 30' 28.2"

Dc = 36° 25' 11.7"

226+00

CS: 2317+57.80
X 492074.3412
Y 137965.3498

EXISTING PROPERTY
LINE

Mid: 212+50.43
X 492021.5229
Y 137913.9998

PT: 226+17.21
X 492041.4972
Y 137976.4342

Dc = 36° 25' 11.7"

Az = 313° 15' 59.5"

℄ YELLOW CIRCLE DR TO RED CIRCLE DR
(YELLOW CIR DR TO RED CIR DR)

227+00

213+00

PC: 227+58.71
X 491982.1521
Y 138032.2928

EXISTING ROW
& EXISTING
PROPERTY LINE

℄ BREN ROAD E
(BREN RD E)

1015+00

Az = 47° 28' 33.9"

2318+00

PC: 83+11.82
X 492094.4649
Y 138021.6799

83+00

1016+00

2232SW

32.38' RT.
℄ EB-TRK-W2
STA. 2318+07.16

℄ TRAIL 2
(TRAIL 2)

PT: 83+93.99
X 492126.8727
Y 138094.6892

Dc = 60° 00' 00.0"

84+00

Az = 0° 23' 43.6"

2319+00 Az = 0° 26' 40.0"

ST: 2318+87.80
X 492076.0908
Y 138095.3363

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: XXX | CHECKED BY: XXX
DRAWN BY: BR | DATE: XX/XX/XX

AECOM

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST
Green Line LRT Extension

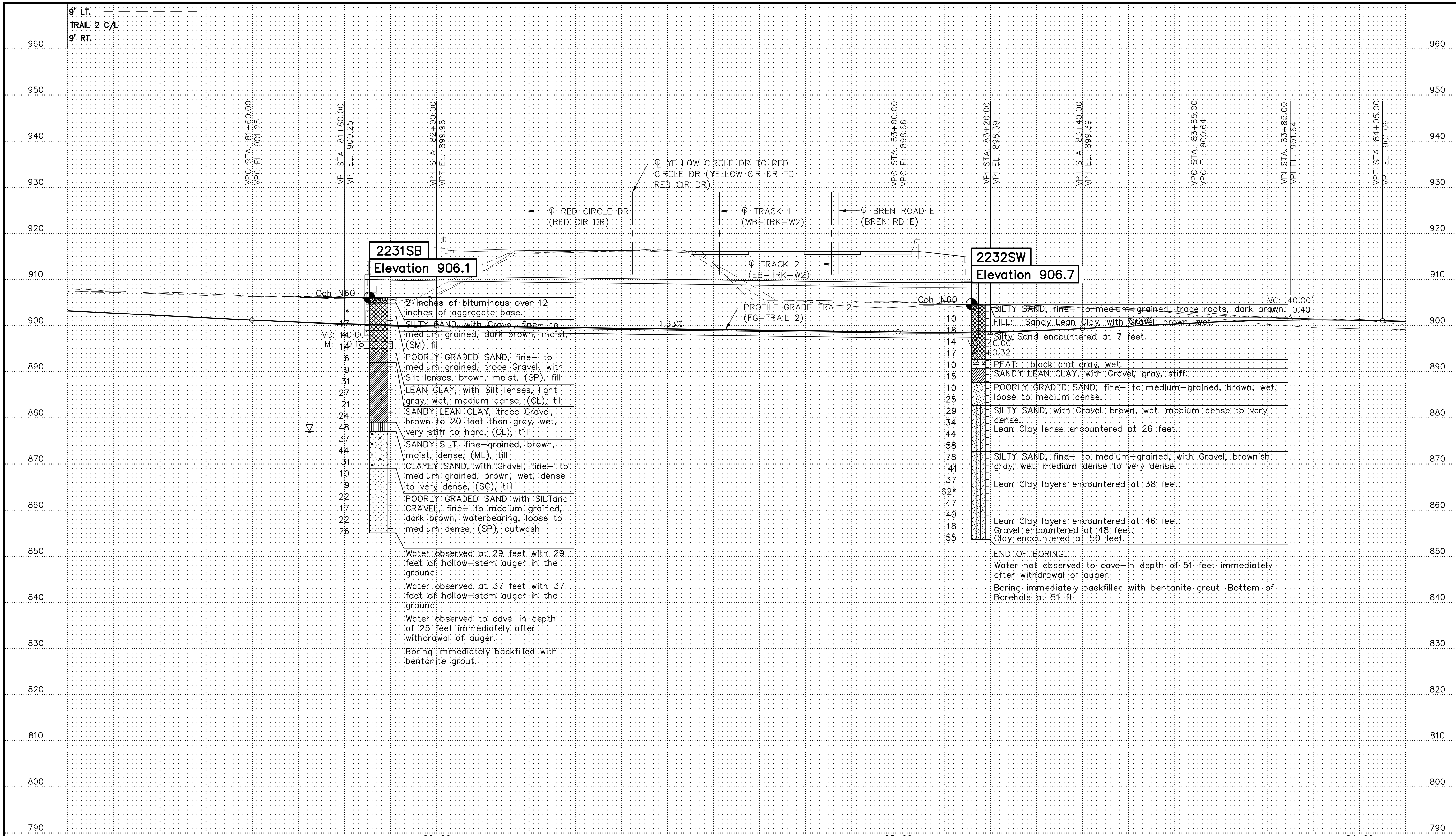
WEST CIVIL - VOLUME 4B
PEDESTRIAN UNDERPASS 2
BRIDGE 27J63
BRIDGE SURVEY PLAN

DISCIPLINE: STRUCTURES

SHEET NAME: CBR27J63-BRG-BOR-001

SHEET 10 OF 11

Sep. 19 2015 07:55 am V:\3400_ADC\CAD\segment w2\plan sheets\structures\CBR27J63\CBR27J63-BRG-BOR.dwg By: RieckmBB


9' LT.
TRAIL 2 C/L
9' RT.
VPC STA. 81+60.00 VPC EL. 901.25
VPI STA. 81+80.00 VPI EL. 900.25
VPT STA. 82+00.00 VPT EL. 899.98
℄ YELLOW CIRCLE DR TO RED CIRCLE DR (YELLOW CIR DR TO RED CIR DR)
℄ RED CIRCLE DR (RED CIR DR)
℄ TRACK 1 (WB-TRK-W2)
℄ BREN ROAD E (BREN RD E)
℄ TRACK 2 (EB-TRK-W2)
VPC STA. 83+00.00 VPC EL. 898.66
VPI STA. 83+20.00 VPI EL. 898.59
VPT STA. 83+40.00 VPT EL. 899.39
VPC STA. 83+65.00 VPC EL. 900.64
VPI STA. 83+85.00 VPI EL. 901.64
VPT STA. 84+05.00 VPT EL. 901.06
PROFILE GRADE TRAIL 2 (FG-TRAIL 2)
-1.33%
VC: 40.00 M: -0.18
VC: 40.00 M: +0.32
VC: 40.00 M: -0.40
2231SB
Elevation 906.1
Coh N60
* 17 14 14 6 19 31 27 21 24 48 37 44 31 10 19 22 17 22 26
2 inches of bituminous over 12 inches of aggregate base.
SILTY SAND, with Gravel, fine- to medium grained, dark brown, moist, (SM) fill
POORLY GRADED SAND, fine- to medium grained, trace Gravel, with Silt lenses, brown, moist, (SP), fill
LEAN CLAY, with Silt lenses, light gray, wet, medium dense, (CL), till
SANDY LEAN CLAY, trace Gravel, brown to 20 feet then gray, wet, very stiff to hard, (CL), till
SANDY SILT, fine-grained, brown, moist, dense, (ML), till
CLAYEY SAND, with Gravel, fine- to medium grained, brown, wet, dense to very dense, (SC), till
POORLY GRADED SAND with SILTand GRAVEL, fine- to medium grained, dark brown, waterbearing, loose to medium dense, (SP), outwash
Water observed at 29 feet with 29 feet of hollow-stem auger in the ground.
Water observed at 37 feet with 37 feet of hollow-stem auger in the ground.
Water observed to cave-in depth of 25 feet immediately after withdrawal of auger.
Boring immediately backfilled with bentonite grout.
2232SW
Elevation 906.7
Coh N60
10 18 14 17 10 15 10 25 29 34 44 58 78 41 37 62* 47 40 18 55
SILTY SAND, fine- to medium-grained, trace roots, dark brown.
FILL: Sandy Lean Clay, with Gravel, brown, wet.
Silty Sand encountered at 7 feet.
PEAT: black and gray, wet.
SANDY LEAN CLAY, with Gravel, gray, stiff.
POORLY GRADED SAND, fine- to medium-grained, brown, wet, loose to medium dense.
SILTY SAND, with Gravel, brown, wet, medium dense to very dense.
Lean Clay lense encountered at 26 feet.
SILTY SAND, fine- to medium-grained, with Gravel, brownish gray, wet, medium dense to very dense.
Lean Clay layers encountered at 38 feet.
Lean Clay layers encountered at 46 feet.
Gravel encountered at 48 feet.
Clay encountered at 50 feet.
END OF BORING.
Water not observed to cave-in depth of 51 feet immediately after withdrawal of auger.
Boring immediately backfilled with bentonite grout. Bottom of Borehole at 51 ft
960 950 940 930 920 910 900 890 880 870 860 850 840 830 820 810 800 790
82+00
83+00
84+00

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: XXX CHECKED BY: XXX
DRAWN BY: BR DATE: XX/XX/XX

AECOM

60% SUBMISSION - 09/28/15

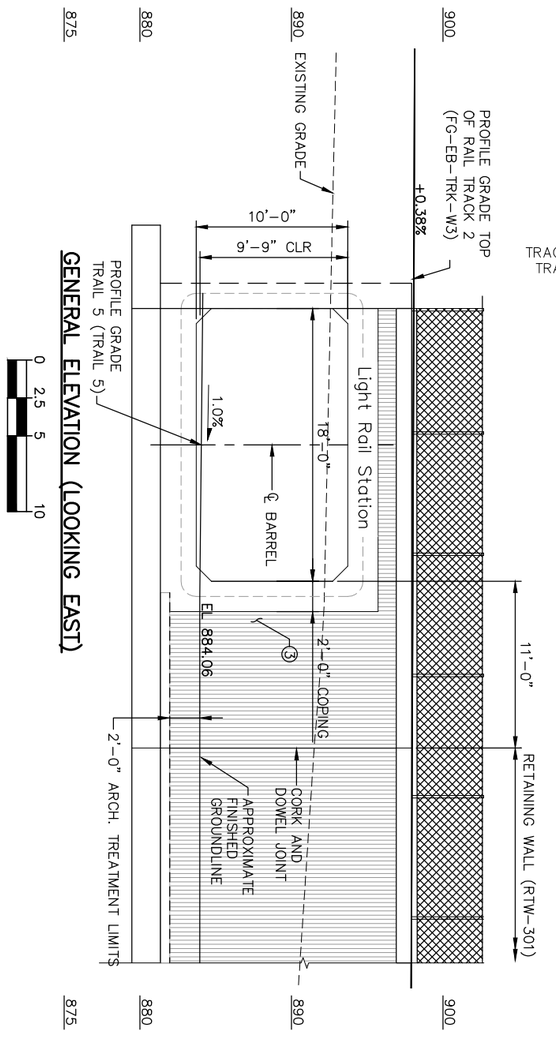
METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

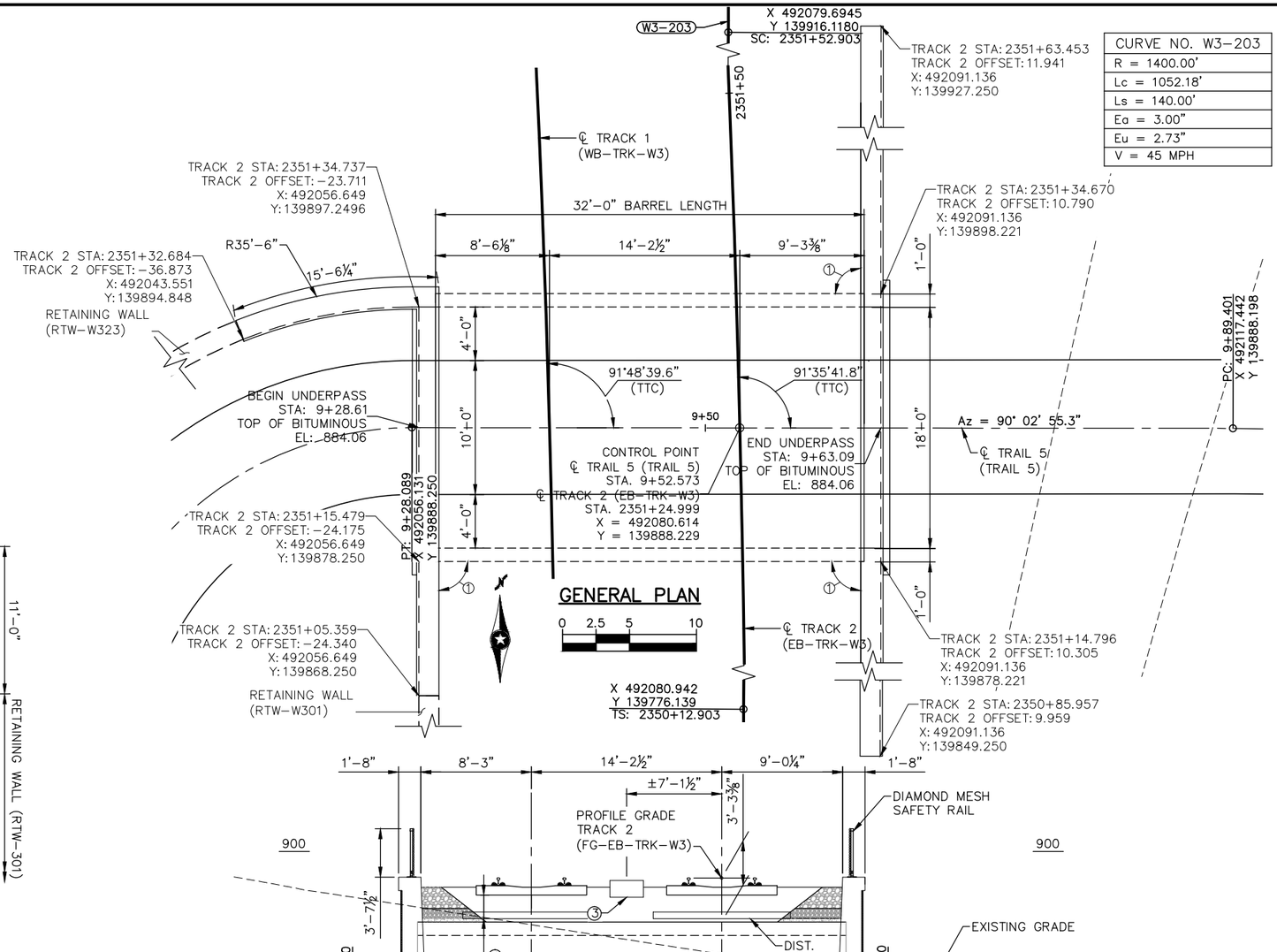
WEST CIVIL - VOLUME 4B
PEDESTRIAN UNDERPASS 2
BRIDGE 27J63
BRIDGE SURVEY PROFILE

DISCIPLINE: STRUCTURES
SHEET NAME: CBR27J63-BRG-BOR-002

SHEET 11 OF 11



GENERAL ELEVATION (LOOKING EAST)



CURVE NO. W3-203
R = 1400.00'
Lc = 1052.18'
Ls = 140.00'
Ea = 3.00"
Eu = 2.73"
V = 45 MPH

DESIGN DATA

2014 AND CURRENT INTERIMS AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS

METRO LIGHT RAIL TRANSIT DESIGN CRITERIA (REVISION 4.0)

LOAD AND RESISTANCE FACTOR DESIGN METHOD

LRV & MV LOAD DIAGRAM SHOWN ON SHEET #

INSIDE HEIGHT =	10'-0"
INSIDE WIDTH =	18'-0"
SKEW ANGLE (TRACK 2) =	1°35'42"
MINIMUM DESIGN FILL HEIGHT =	2'-0"
MAXIMUM DESIGN FILL HEIGH =	2'-0"
UNIT WEIGHT FILL =	120.0LBS/CU.FT.
ANGLE INTERNAL FRICTION =	30.00DEG

fy = 60000 P.S.I. REINFORCEMENT BARS
fy = 65000 P.S.I. STEEL FABRIC
f'c = 5000 P.S.I. CONCRETE
DESIGN SPEED OVER: 45 MPH (LRT)

LIST OF SHEETS

NOTES:

SEE BRIDGE SURVEY PLAN SHEET FOR IN-PLACE UTILITIES.

ALL BARS EPOXY COATED

FOR DIAMOND MESH SAFETY RAIL- SEE WIRE FENCE DETAIL FIG 5-397.119 MOD

① 90°-00'-00.0"

② ARCHITECTURAL CONCRETE TREATMENT US FORMLINER 2-42 NAAB - 1 INCH MAXIMUM RELIEF

③ CABLE TROUGH (SEE SYSTEM PLANS)

④ 12" MIN. BALLAST & 8" MIN SUBBALLAST (SEE TRACK PLANS)

BRIDGE NO. R0715

SOUTHWEST LIGHT RAIL OVER TRAIL 5
0.1 MI. N. OF INTERSECTION OF BREN ROAD W AND BREN ROAD E

18' X 10' BOX CULVERT
1°-35'-42" SKEW

ID NO 113

GENERAL PLAN AND ELEVATION

SEC 12 T 116N R 22W
CITY OF MINNETONKA HENNEPIN COUNTY

APPROVED: _____ STATE BRIDGE ENGINEER DATE

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

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: BR CHECKED BY: PLR
DRAWN BY: BR DATE: 08/10/15

AECOM

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

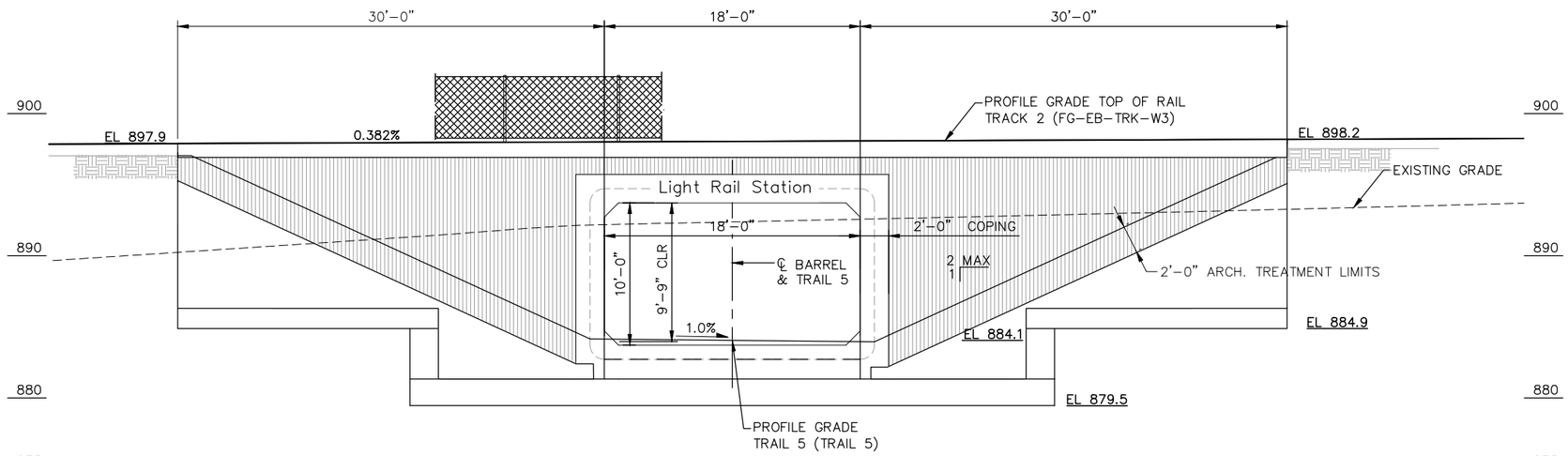
SOUTHWEST Green Line LRT Extension

WEST CIVIL - VOLUME 4B
PEDESTRIAN UNDERPASS 5
BRIDGE R0715
GENERAL PLAN AND ELEVATION

DISCIPLINE: STRUCTURES
SHEET NAME: CBRR0715-BRG-GPE-001

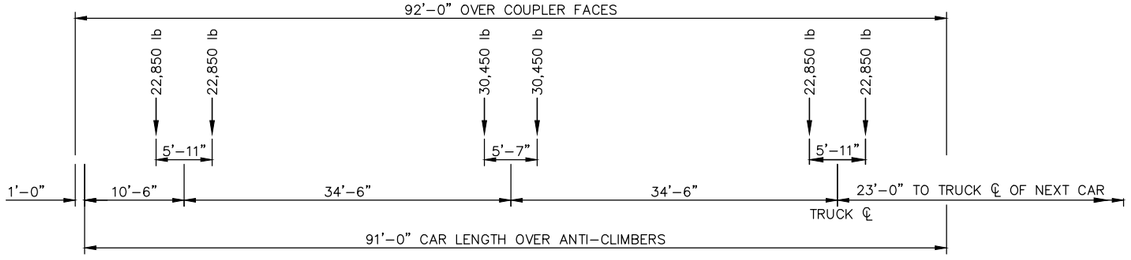
SHEET 1 OF 9

Sep. 19 2015 08:38 am V:\3400_ADC\CAD\segment w3\plan sheets\structures\CBRR0715\CBRR0715-BRG-GPE.dwg By: RieckmBB



GENERAL ELEVATION (LOOKING WEST)

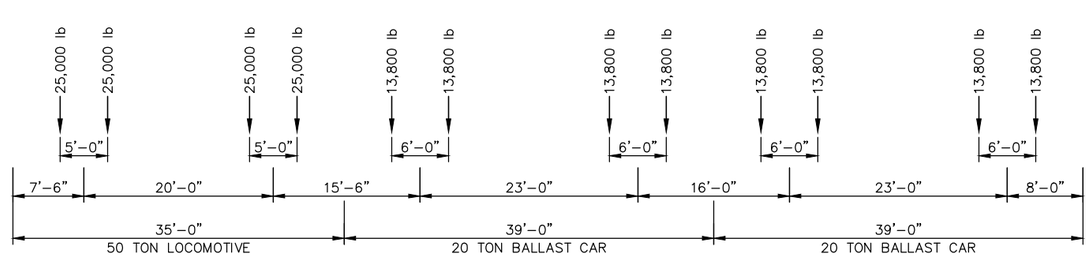
0 2.5 5 10



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.



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. WEIGHT OF EMPTY BALLAST CAR IS 15,000 POUNDS.

COMPONENT ITEM SCHEDULE – BRIDGE R0715

SPEC. SECTION ②	COMPONENT ITEM SUMMARY	UNIT ①	QUANTITY ①
MNDOT 2401	STRUCTURAL CONCRETE (1G52)	CU. YD.	
MNDOT 2401	STRUCTURAL CONCRETE (3B52)	CU. YD.	
MNDOT 2411	REINFORCEMENT BARS	POUND	
MNDOT 2411	REINFORCEMENT BARS (EPOXY COATED)	POUND	
MNDOT 2411	ARCHITECTURAL SURFACE FINISH (SINGLE COLOR)	SQ. FT.	
MNDOT 2411	ARCHITECTURAL SURFACE FINISH (ALSACE)	SQ. FT.	
MNDOT 2411	ANTI–GRAFFITI COATING	SQ. FT.	
MNDOT 2411	STRUCTURE EXCAVATION	CU. YD.	
MNDOT 2412	18X10 PRECAST CONCRETE BOX CULVERT	LIN. FT.	
MNDOT 2557	DIAMOND MESH SAFETY RAIL	LIN. FT.	

① QUANTITIES LISTED FOR THE COMPONENT ITEMS OF THE LUMP SUM BRIDGE R0715 ITEM ARE FOR INFORMATIONAL PURPOSES. ANY ADDITIONAL ITEMS OR CHANGES IN QUANTITIES REQUIRED SHALL BE PROVIDED BY THE CONTRACTOR WITH NO ADDITIONAL COMPENSATION.

② MEASUREMENT AND PAYMENT FOR COMPONENT ITEMS SHALL BE PART OF THE LUMP SUM PAYMENT FOR THE BRIDGE R0715. REFER TO MNDOT STANDARD SPECIFICATION OR SPECIAL PROVISION FOR TECHNICAL SPECIFICATION REQUIREMENTS FOR ALL PROVISIONS OTHER THAN MEASUREMENT & PAYMENT REQUIREMENTS.

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: BR | CHECKED BY: PLR
DRAWN BY: BR | DATE: 08/10/15

AECOM

60% SUBMISSION - 09/28/15

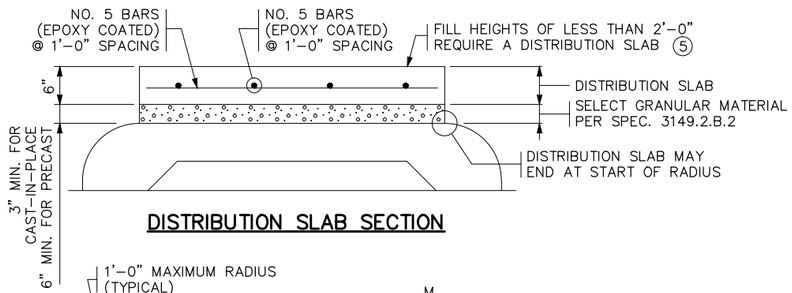
METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

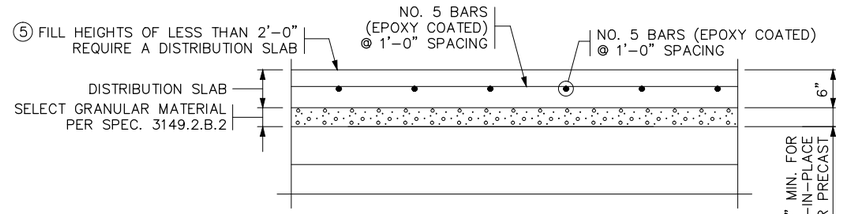
WEST CIVIL - VOLUME 4B
PEDESTRIAN UNDERPASS 5
BRIDGE R0715
LOADING DIAGRAM

DISCIPLINE: STRUCTURES
SHEET NAME: CBRR0715-BRG-GPE-002

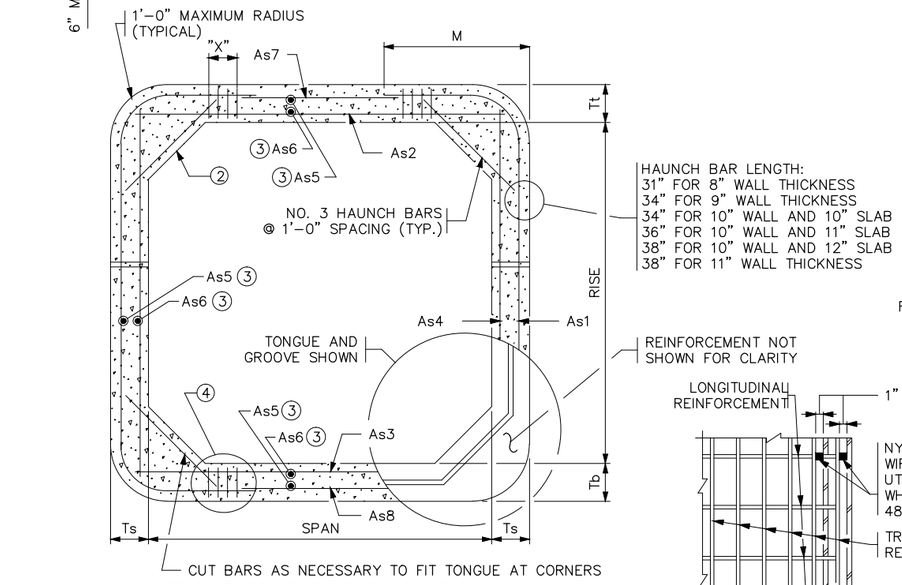
SHEET 2 OF 9



DISTRIBUTION SLAB SECTION

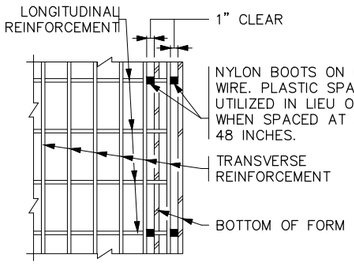


DISTRIBUTION SLAB – LONGITUDINAL SECTION

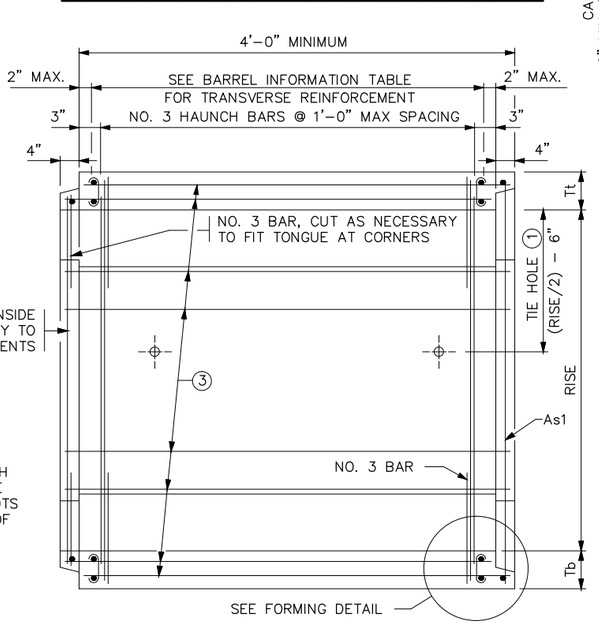


TRANSVERSE BARREL SECTION

BAR REINFORCEMENT OPTION SHOWN

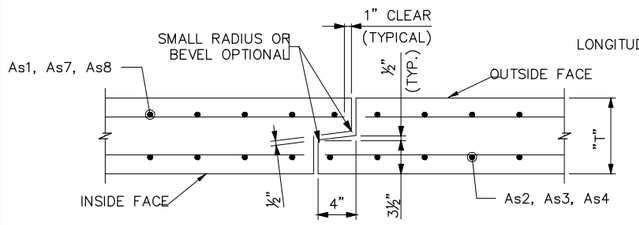


PLAN

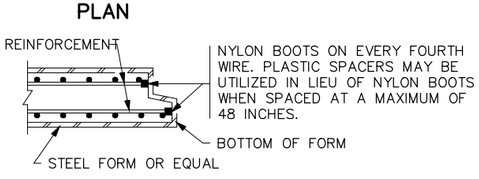


LONGITUDINAL BARREL SECTION

BAR REINFORCEMENT OPTION SHOWN

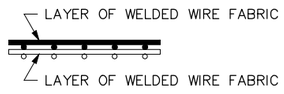


TONGUE AND GROOVE JOINT DETAIL



SECTION

FORMING DETAIL



FABRIC LAYER DETAIL

WHEN MORE THAN ONE LAYER OF WELDED WIRE FABRIC IS USED TO OBTAIN THE REQUIRED REINFORCEMENT AREAS, THE WIRES OF THE WELDED WIRE FABRIC SHALL BE PLACED AS SHOWN

CONSTRUCTION NOTES

CULVERTS TO BE CONSTRUCTED AS PER SPEC. 2412 EXCEPT AS NOTED.

REFER TO THE GENERAL PLAN AND ELEVATION SHEET FOR THE DISTANCE BETWEEN BARRELS OF ADJACENT BOXES AND TO STANDARD FIGURE 5-395.115 FOR MATERIAL REQUIREMENTS FOR FILL BETWEEN ADJACENT BOXES.

THE WELDED WIRE FABRIC, SHEAR REINFORCEMENT AND REINFORCEMENT BARS SHALL CONFORM TO APPLICABLE REQUIREMENTS OF AASHTO M259.

1½" MIN. AND 2" MAX. CONCRETE COVER ON ALL REINFORCEMENT, INCLUDING SHEAR REINFORCEMENT, EXCEPT FOR TONGUE AND GROOVE DETAIL.

ANY OF THE FOLLOWING COMBINATIONS OF STEEL REINFORCEMENT MAY BE USED:
(a) 1 OR 2 LAYERS OF WELDED WIRE FABRIC OR
(b) 1 LAYER OF WELDED WIRE FABRIC AND 1 LAYER OF REINFORCEMENT BARS O
(c) 1 LAYER OF REINFORCEMENT BARS.
THE REINFORCEMENT SHALL BE DEVELOPED IN ACCORDANCE WITH AASHTO "LRFD BRIDGE DESIGN SPECIFICATIONS." IF BAR REINFORCEMENT IS SUBSTITUTED FOR WELDED WIRE FABRIC, THE AREA OF REINFORCEMENT SHALL BE INCREASED BY 8%, AND CONTRACTOR SHALL SUBMIT DESIGN CALCULATIONS VERIFYING COMPLIANCE WITH AASHTO 5.7.3.4 "CONTROL OF CRACKING BY DISTRIBUTION OF REINFORCEMENT".

THE MAXIMUM SIZE OF REINFORCEMENT BARS SHALL BE NO. 6. THE MAXIMUM WELDED WIRE FABRIC SIZE SHALL BE A W23 PER LAYER (MAXIMUM OF 2 LAYERS).

THE SPACING CENTER TO CENTER OF THE TRANSVERSE WIRES SHALL NOT BE LESS THAN 2" NOR MORE THAN 4". THE SPACING CENTER TO CENTER OF THE LONGITUDINAL WIRES SHALL NOT BE MORE THAN 8".

WELDING WILL NOT BE ALLOWED ON REINFORCEMENT BARS OR WELDED WIRE FABRIC, EXCEPT THAT THE ORIGINAL WELDING REQUIRED TO MANUFACTURE WIRE FABRIC IS ACCEPTABLE.

WHEN REINFORCEMENT IS CUT, ADDITIONAL REINFORCEMENT SHALL BE ADDED ON BOTH SIDES OF THE CUT MEMBER TO REPLACE OR EXCEED THE CUT STEEL.

CONCRETE SHALL BE MIX NO. 3W36 WITH NO CALCIUM CHLORIDE ALLOWED.

SHOP DRAWING APPROVAL PER SPEC. 3238.2.A IS REQUIRED.

COMPACT THE FIRST 1.5' (LOOSE) OF FILL ABOVE THE BOX WITH LIGHT COMPACTION EQUIPMENT SUCH AS PLATE COMPACTORS OR WALK BEHIND ROLLERS.

TRANSVERSE REINFORCEMENT IS PARALLEL TO THE CULVERT SPAN
LONGITUDINAL REINFORCEMENT IS PERPENDICULAR TO THE CULVERT SPAN.

(1) CULVERT TIES ARE TO BE 1" DIAMETER RODS. SEE STANDARD PLATE NO. 3145 FOR CONNECTION DETAILS.

(2) HAUNCH SIZES ARE TO BE 12" VERTICAL, 12" HORIZONTAL ON ALL BOX SIZES.

(3) LONGITUDINAL REINFORCEMENT DENOTED AS As5 AND As6 MUST BE PLACED IN ALL SLABS AND WALLS AND MUST BE 0.06 SQ. IN./FT. MIN.

(4) SEE STANDARD PLATE NO. 3007 FOR SHEAR REINFORCEMENT OPTIONS. THE MAXIMUM SHEAR REINFORCEMENT SPACING IN THE LONGITUDINAL DIRECTION SHALL BE 6".

(5) ~~ROADWAY OR SHOULDER FILL HEIGHTS OF LESS THAN 2'-0" REQUIRE A~~ DISTRIBUTION SLAB REQUIRED.

USE CONCRETE MIX 3Y43 FOR THE DISTRIBUTION SLAB.

CAST-IN-PLACE DISTRIBUTION SLABS SHALL BE 6" THICK. PROVIDE 3" MINIMUM SELECT GRANULAR MATERIAL PER SPEC. 3149.2.B.2 BETWEEN BARREL AND DISTRIBUTION SLAB.

PRECAST DISTRIBUTION SLABS SHALL BE 6" THICK AND MAY BE USED FOR FILL HEIGHTS OVER 1'-0". PROVIDE 6" MINIMUM SELECT GRANULAR MATERIAL PER SPEC. 3149.2.B.2 BETWEEN BARREL AND DISTRIBUTION SLAB.

THE WIDTH OF THE DISTRIBUTION SLAB SHALL EXTEND BETWEEN THE OUTSIDE EDGES OF THE SHOULDERS UNLESS DIRECTED BY THE ENGINEER.

~~PAYMENT FOR THE DISTRIBUTION SLAB AND SELECT GRANULAR MATERIAL BENEATH THE SLAB SHALL BE CONSIDERED INCIDENTAL.~~

~~IF DISTRIBUTION SLAB IS USED AS PAVEMENT SURFACE IT MUST BE REDESIGNED PER THE MnDOT PAVEMENT DESIGN MANUAL.~~

BARREL INFORMATION TABLE * * *

LOCATION	SIZE	f'c (P.S.I.)	OVERFILL LIMITS (FT.)	DISTRIBUTION SLAB REQUIRED *	RECESSED TIE RODS REQUIRED * *	DIMENSIONS					WEIGHT (LBS./FT.)	WELDED WIRE FABRIC REINFORCEMENT												(4) SHEAR REINFORCEMENT TOP AND BOTTOM OF BARREL		
						SPAN (FT.)	RISE (FT.)	Tt (IN.)	Tb (IN.)	Ts (IN.)		As1			As2		As3		As4		As7		As8				
												AREA ($IN.^2$/FT.)	LENGTH (FT.)	M (FT.)	AREA ($IN.^2$/FT.)	LENGTH (FT.)	AREA ($IN.^2$/FT.)	LENGTH (FT.)	AREA ($IN.^2$/FT.)	LENGTH (FT.)	AREA ($IN.^2$/FT.)	LENGTH (FT.)	AREA ($IN.^2$/FT.)	LENGTH (FT.)	AREA ($IN.^2$/FT.)	MAX. SPG. (IN.)	X (IN.)
				YES	NO																					
				YES	NO																					

* ALL CLASS 1 CULVERTS WITH FILL HEIGHTS OF LESS THAN 2'-0" REQUIRE A DISTRIBUTION SLAB. IF A DISTRIBUTION SLAB IS NOT REQUIRED, INDICATE "NO" IN THIS BOX.

* * FOR PEDESTRIAN CULVERT APPLICATIONS HIDE-AWAY OR RECESSED TIE CONNECTIONS ARE REQUIRED, SEE STANDARD PLATE 3145. IF REQUIRED, INDICATE "YES" IN THIS BOX.

* * * BOX CULVERTS WITH SPANS FROM 6 TO 14 FT. ARE DESIGNED FOR HL-93 LIVE LOADS (AASHTO LRFD 3.6.2.1) NOT INCLUDING THE DESIGN LANE LOAD. BOXES WITH SPANS OF 16 FT. ARE DESIGNED FOR HL-93 LIVE LOADS INCLUDING THE DESIGN LANE LOAD.

REVISION: 09-11-2014

APPROVED: MARCH 24, 2011
Nancy Daubenberger
STATE BRIDGE ENGINEER

STATE PROJ. NO. 9909-01 (T.H.) STA. + .

FIG. 5-395.101(B)

CERTIFIED BY _____ LICENSED PROFESSIONAL ENGINEER _____ DATE

NAME: LIC. NO.

TITLE: PRECAST CONCRETE BARREL DETAILS (SPECIAL DESIGN)

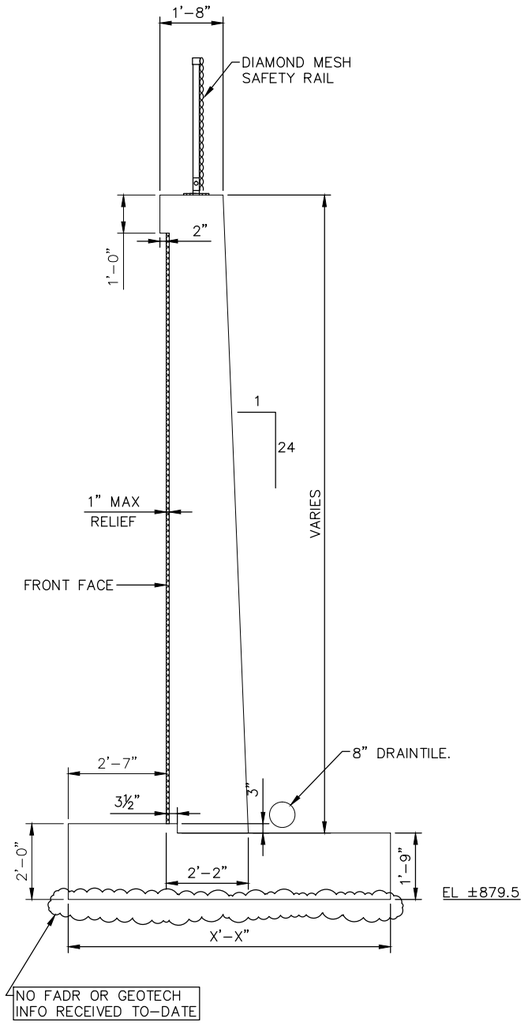
DES: XXX DR: BR APPROVED:

CHK: XXX CHK: XX/XX/XX

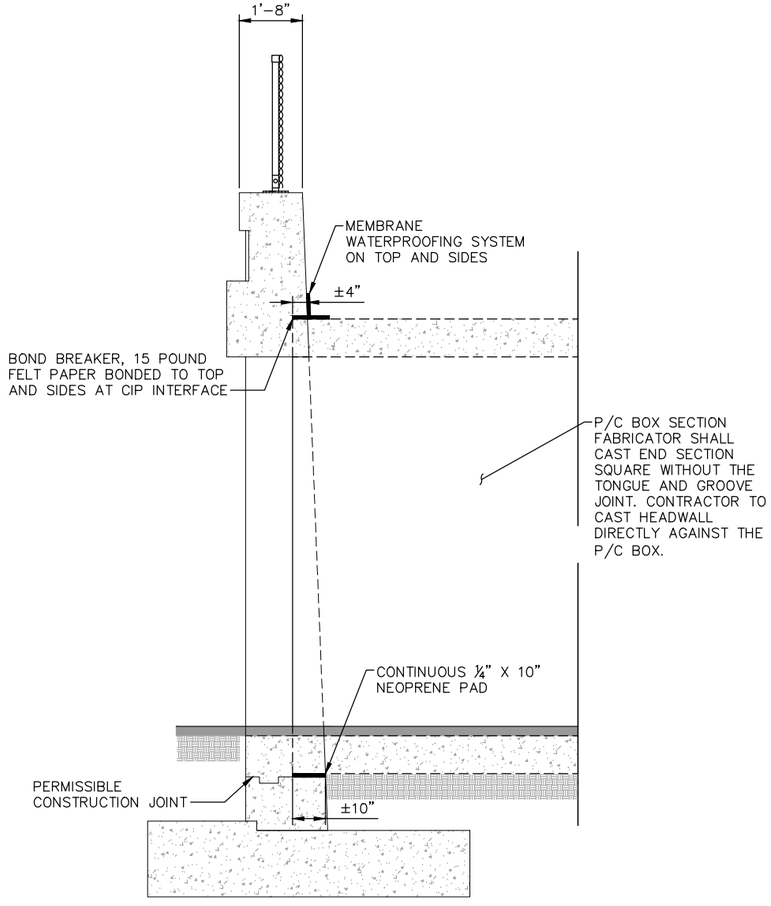
SHEET NO. 3 OF 9 SHEETS

BRIDGE NO. R0715

Sep. 19 2015 08:38 am V:\3400_ADC\CAD\segment #3\plan sheets\structures\CBRR0715\CBRR0715_CBRR0715-BRG-DTL-001.dwg By: RieckmBB



WALL SECTION



SECTION AT P/C BOX

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: XXX | CHECKED BY: XXX
DRAWN BY: XXX | DATE: XX/XX/XX

AECOM

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

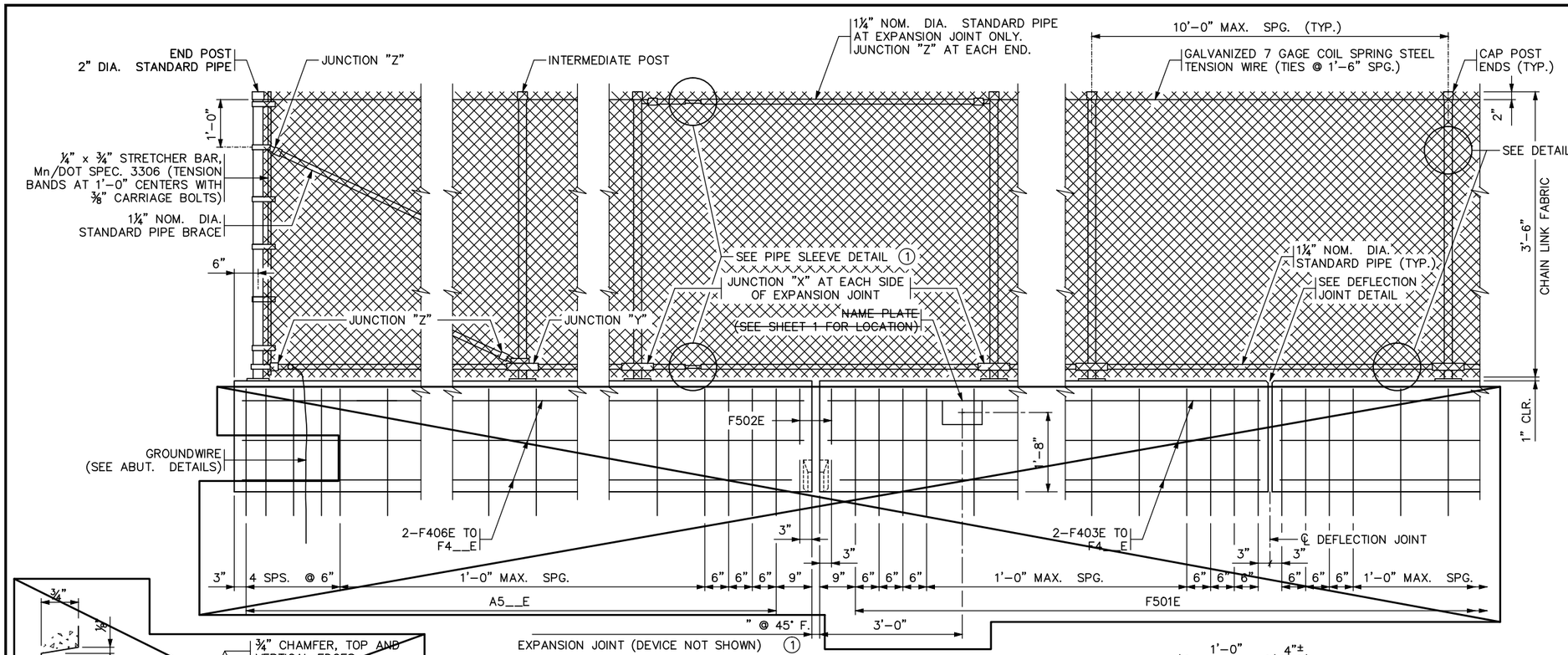
SOUTHWEST Green Line LRT Extension

WEST CIVIL - VOLUME 4B
PEDESTRIAN UNDERPASS 5
BRIDGE R0715
HEADWALL DETAILS

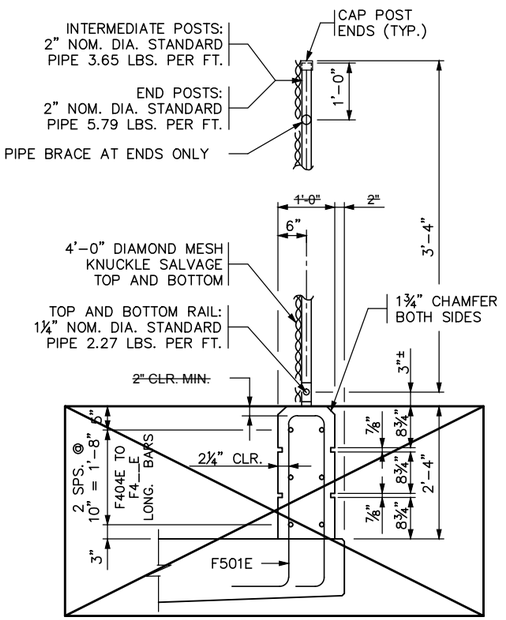
DISCIPLINE: STRUCTURES
SHEET NAME: CBRR0715-BRG-DTL-002

SHEET 4 OF 9

Sep, 19 2015 08:38 am V:\3400_ADC\CAD\segment w3\plan sheets\structures\CBRR0715\CBRR0715-BRG-DTL-002.dwg By: RieckmBB



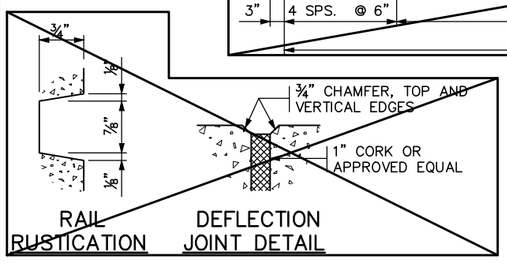
Ⓐ INSIDE ELEVATION OF RAILING

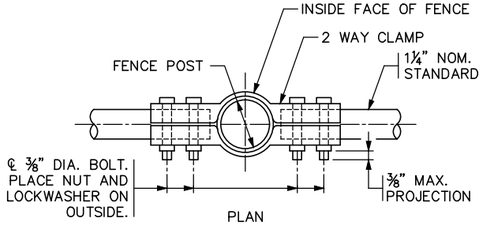


Ⓐ TYPICAL SECTION THROUGH FENCE

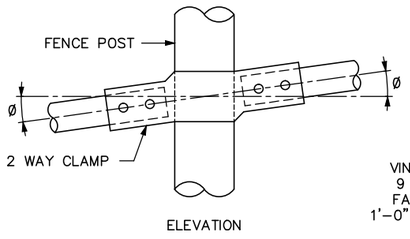
INTERMEDIATE POST SHOWN

SHEET MODIFICATION:
Ⓐ DENOTES MODIFICATION TO STANDARD SHEET

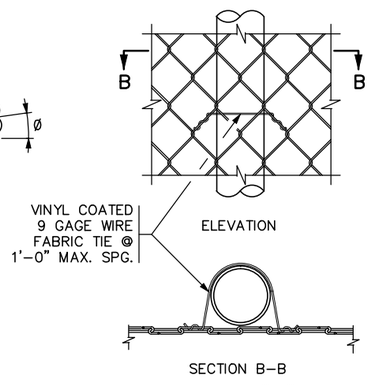




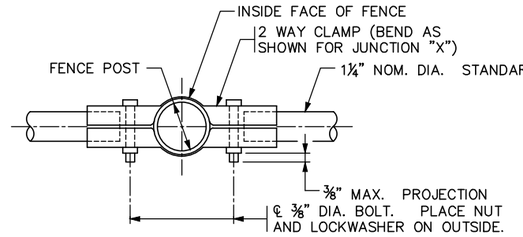
2 WAY CLAMP BENDING TABLE	
GRADE OF FENCE	Ø
0° TO 2°	0°
2° TO 6°	4°
6° TO 10°	8°



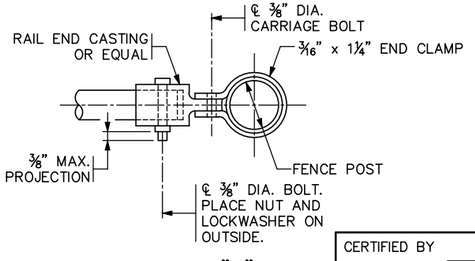
JUNCTION "X"



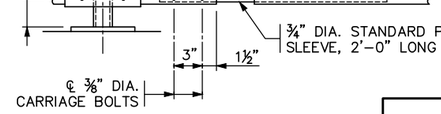
DETAIL "A"



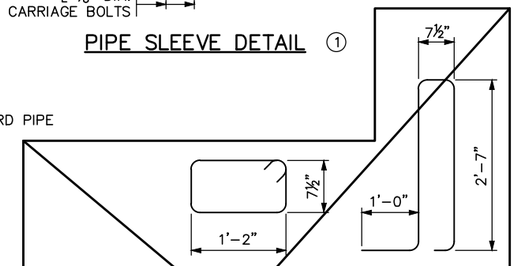
JUNCTION "Y"



JUNCTION "Z"



PIPE SLEEVE DETAIL (1)



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 PARAPET TYPE P-1 SHEET FOR PARAPET DIMENSION, 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.

FIG. 5-397.119 (MOD.)

REVISED: 04-17-2013

APPROVED: DECEMBER 18, 2003

STATE BRIDGE ENGINEER

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: XX	DR: BR	APPROVED:	BRIDGE NO.
CHK: XXX	CHK: XX/XX/XX		R0715

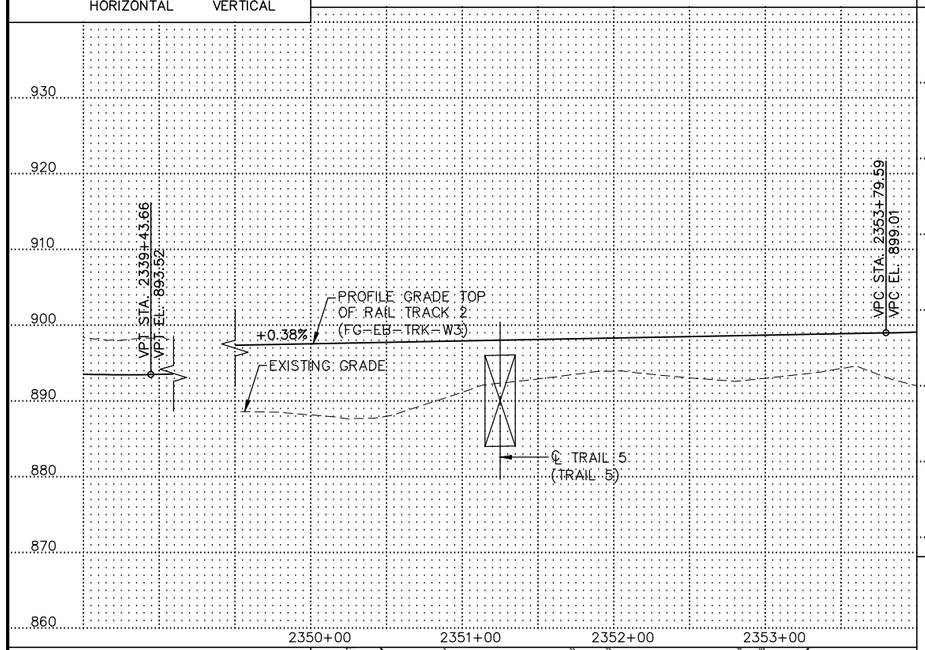
SHEET NO. 5 OF 9 SHEETS

Sep. 19 2015 08:38 am V:\3400_ADC\CAD\segment w3\plan sheets\structures\CBRR0715\CBRR0715_BRG-RAL.dwg By: RieckmBB

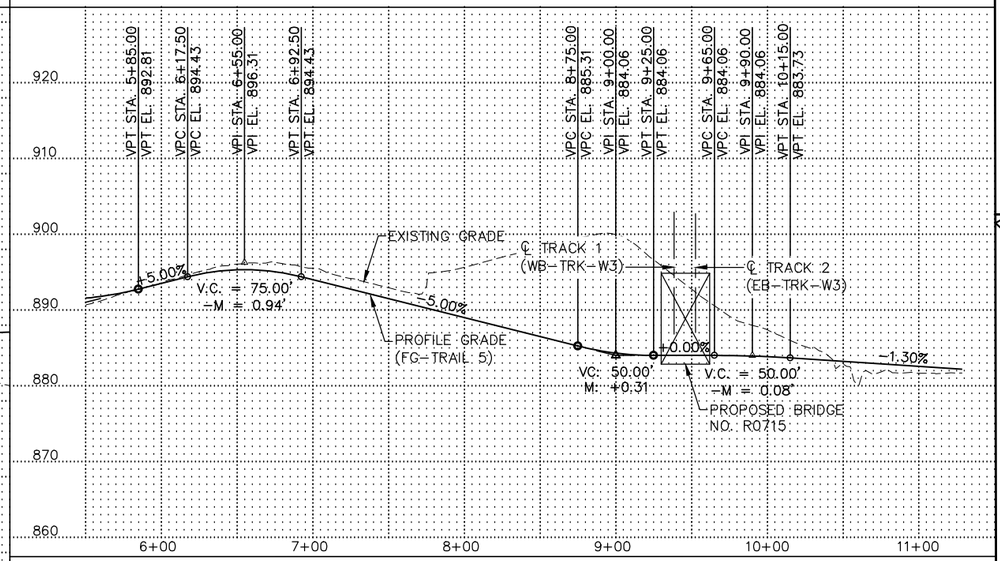
CONTRACTED PROFILE

SCALE : 0 25' 50' HORIZONTAL; 0 5' 10' VERTICAL

PROFILE GRADE TRACK 2 (EB–TRK–W3)

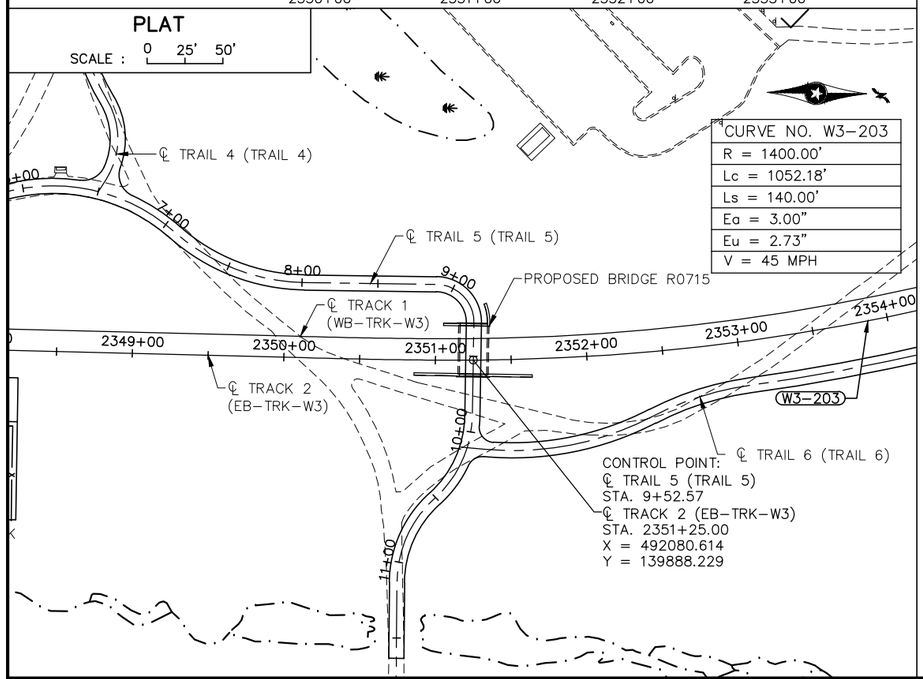


PROFILE GRADE TRAIL 5 (FG TRAIL 5)



PLAT

SCALE : 0 25' 50'



CURVE NO. W3–203
R = 1400.00'
Lc = 1052.18'
Ls = 140.00'
Ea = 3.00"
Eu = 2.73"
V = 45 MPH

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 ENGINEERS RECOMMENDATION

DATE: XX–XX–XXXX

STREAM OR DITCH DESIGNATION: XXX

DRAINAGE AREA: XXX SQ. MI.

MAX FLOOD ON RECORD: XXX C.F.S. (XX–XX–XX)

MAXIMUM OBSERVED HIGHWATER ELEVATION: XXX.X FT.

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

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

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

FLOWLINE ELEVATION: XXX FT. SKEW ANGLE: XX

ESTIMATED PRELIMINARY TOTAL SCOUR AT PIER EL. XXX.X (500 OR OT YR.FREQ.)

SCOUR CONFIRMATION RECOMMENDATION

DATE: XX–XX–XXXX

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

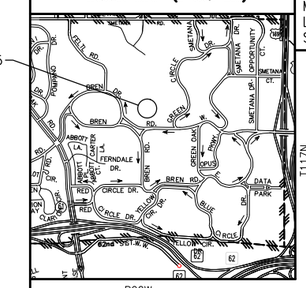
BRIDGE SURVEY SHEETS MADE FROM SURVEY PERFORMED BY RANI ENGINEERING

MNDOT NAME: 2773A
NORTHING (HEN. COUNTY COORDINATES): 137082.117
EASTING (HEN. COUNTY COORDINATES): 490527.817
BENCHMARK ELEVATION (NAVD88): 963.180
MONUMENT DESCRIPTION: B.M. DISK IN BRIDGE ABUTMENT
LOCATION: IN EDEN PRAIRIE, 1.1 MILES EAST ALONG T.H. HWY 62 FROM JCT. OF T.H. 62 & I–494

MONUMENT NAME: CONTROL POINT 6
NORTHING (HEN. COUNTY COORDINATES): 142016.680
EASTING (HEN. COUNTY COORDINATES): 489989.960
BENCHMARK ELEVATION (NAVD88): 932.956
MONUMENT DESCRIPTION: CAST IRON MONUMENT
LOCATION: 0.2 MILES EAST ALONG SMETANA ROAD FROM JCT. OF SMETANA ROAD & NOLAN DR

INDEX MAP (1 SQ. MI.)

PROPOSED BRIDGE NO. R0715



BRIDGE SURVEY

0.6 MILES WEST OF JCT. T.H. 62 AND T.H. 169

PEDESTRIAN UNDERPASS UNDER BREN ROAD WEST

SEC 36 T 117 N R 22 W

CITY OF MINNETONKA HENNEPIN COUNTY

BRIDGE R0715

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: XXX CHECKED BY: XXX
DRAWN BY: BR DATE: XX/XX/XX

AECOM

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

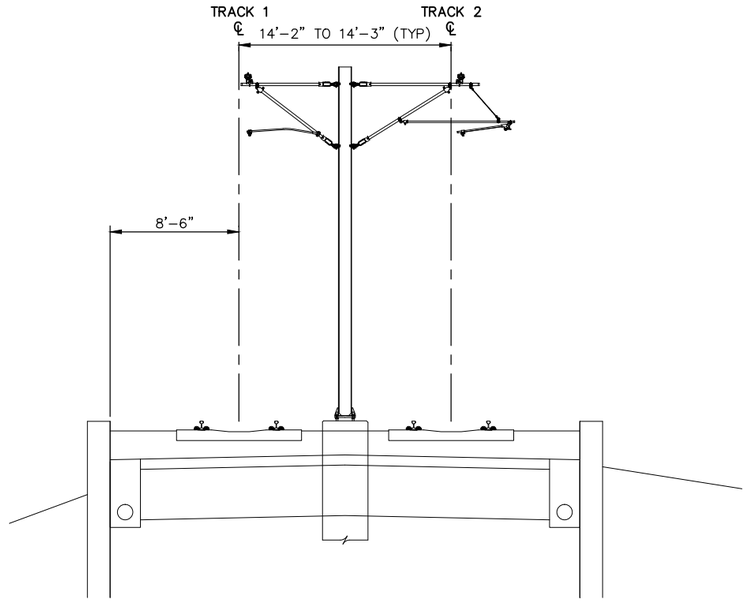
WEST CIVIL - VOLUME 4B
PEDESTRIAN UNDERPASS 5
BRIDGE R0715
BRIDGE SURVEY 1

DISCIPLINE: STRUCTURES

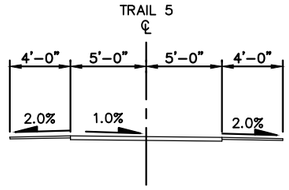
SHEET NAME: CBRR0715-BRG-SUR-001

SHEET 6 OF 9

Sep, 19 2015 08:41 am V:\3400_ADC\CAD\segment w3\plan sheets\structures\CBRR0715\CBRR0715–BRG–SUR.dwg By: RieckmBB



TYPICAL SECTION – TRACK APPROACH



TYPICAL TRAIL 5 SECTION – TRAIL APPROACH

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: XXX | CHECKED BY: XXX
DRAWN BY: BR | DATE: XX/XX/XX

AECOM

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

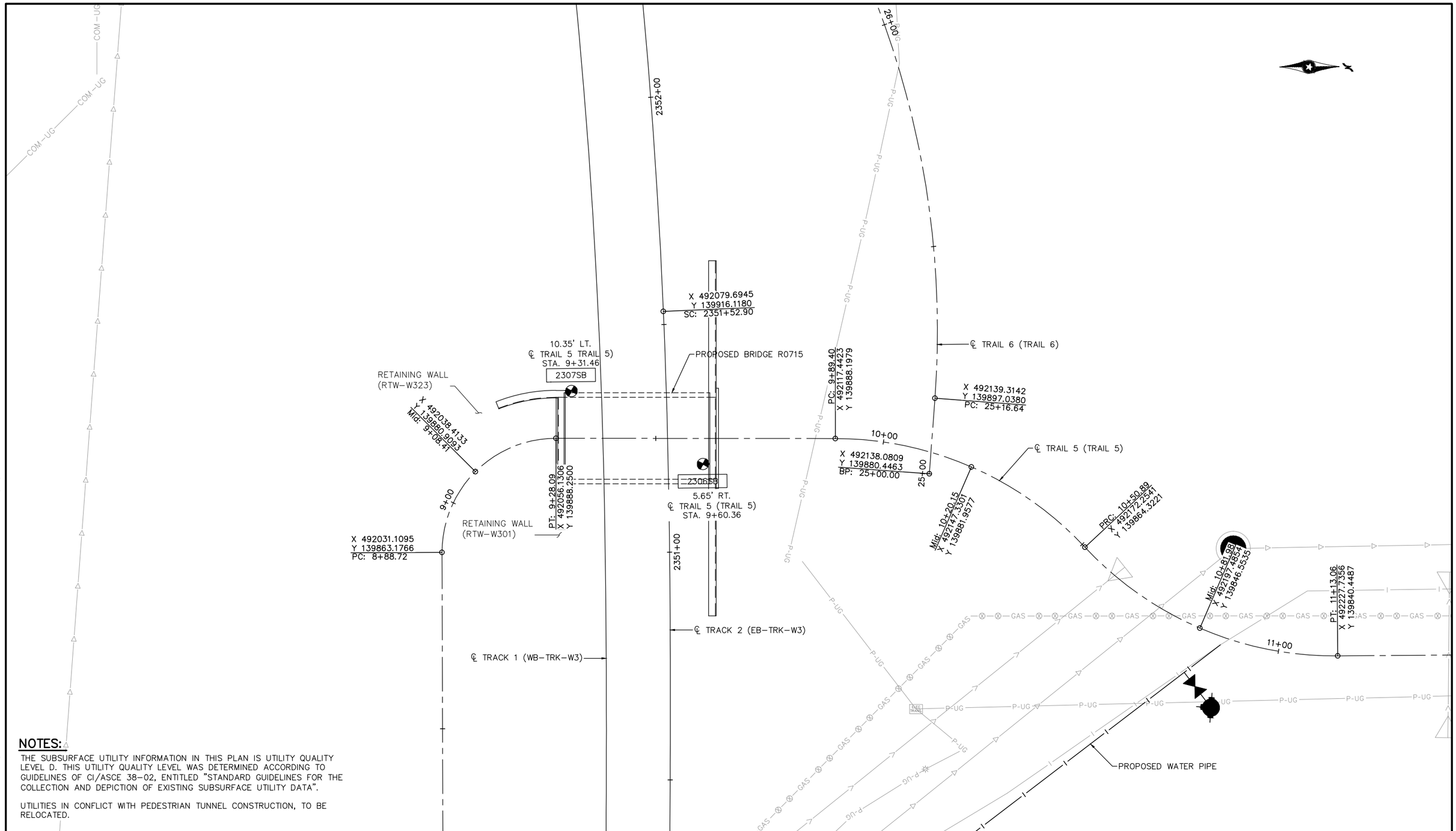
WEST CIVIL - VOLUME 4B
PEDESTRIAN UNDERPASS 5
BRIDGE R0715
BRIDGE SURVEY 2

DISCIPLINE: STRUCTURES

SHEET NAME: CBRR0715-BRG-SUR-002

SHEET 7 OF 9

Sep. 19 2015 08:41 am V:\3400_ADC\CAD\segment w3\plan sheets\structures\CBRR0715\CBRR0715-BRG-SUR.dwg By: RieckmBB



NOTES:

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".

UTILITIES IN CONFLICT WITH PEDESTRIAN TUNNEL CONSTRUCTION, TO BE RELOCATED.

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: XXX | CHECKED BY: XXX
DRAWN BY: BR | DATE: XX/XX/XX

AECOM

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

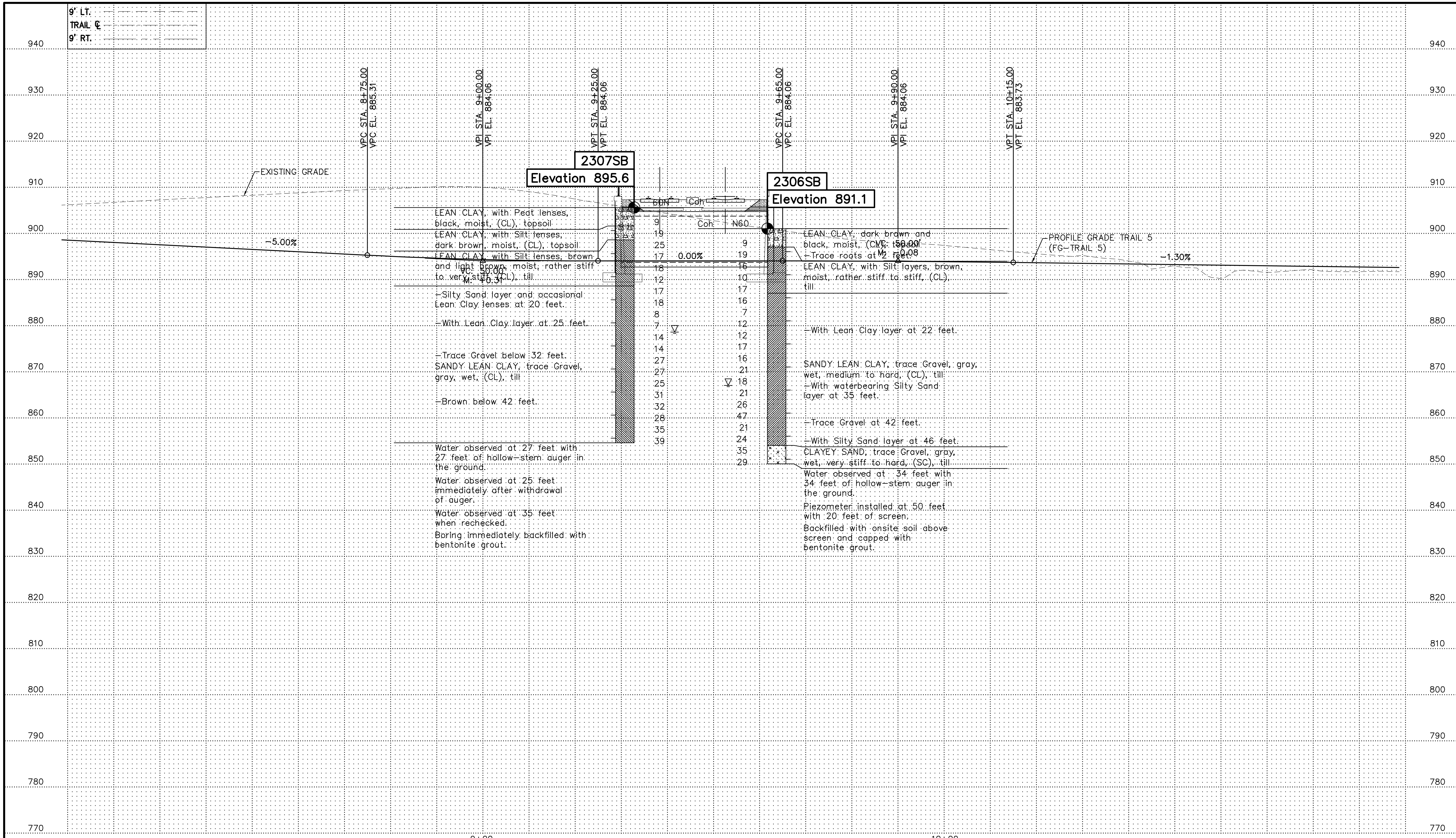
WEST CIVIL - VOLUME 4B
PEDESTRIAN UNDERPASS 5
BRIDGE R0715
BRIDGE SURVEY PLAN

DISCIPLINE: STRUCTURES

SHEET NAME: CBR0715-BRG-BOR-001

SHEET 8 OF 9

Sep, 19 2015 08:42 am V:\3400_ADC\CAD\segment w3\plan sheets\structures\CBRR0715\CBRR0715–BRG–BOR.dwg By: RieckmBB



9' LT.
TRAIL ℄
9' RT.
940
930
920
910
900
890
880
870
860
850
840
830
820
810
800
790
780
770
VPC STA. 8+75.00
VPC EL. 885.31
VPI STA. 9+00.00
VPI EL. 884.06
VPT STA. 9+25.00
VPT EL. 884.06
VPC STA. 9+65.00
VPC EL. 884.06
VPI STA. 9+90.00
VPI EL. 884.06
VPT STA. 10+15.00
VPT EL. 883.73
EXISTING GRADE
-5.00%
0.00%
-1.30%
VC: 50.00
M: +0.31
VC: 50.00
M: -0.08
PROFILE GRADE TRAIL 5
(FG-TRAIL 5)
2307SB
Elevation 895.6
2306SB
Elevation 891.1
60N
Coh
Coh
N60
LEAN CLAY, with Peat lenses, black, moist, (CL), topsoil
LEAN CLAY, with Silt lenses, dark brown, moist, (CL), topsoil
LEAN CLAY, with Silt lenses, brown and light brown, moist, rather stiff to very stiff, (CL), till
-Silty Sand layer and occasional Lean Clay lenses at 20 feet.
-With Lean Clay layer at 25 feet.
-Trace Gravel below 32 feet.
SANDY LEAN CLAY, trace Gravel, gray, wet, (CL), till
-Brown below 42 feet.
Water observed at 27 feet with 27 feet of hollow-stem auger in the ground.
Water observed at 25 feet immediately after withdrawal of auger.
Water observed at 35 feet when rechecked.
Boring immediately backfilled with bentonite grout.
9 19 25 17 18 12 17 18 8 7 14 14 27 27 25 31 32 28 35 39
9 19 16 10 17 16 7 12 12 17 16 21 18 21 26 47 21 24 35 29
LEAN CLAY, dark brown and black, moist, (CL), topsoil
-Trace roots at 2 feet.
LEAN CLAY, with Silt layers, brown, moist, rather stiff to stiff, (CL), till
-With Lean Clay layer at 22 feet.
SANDY LEAN CLAY, trace Gravel, gray, wet, medium to hard, (CL), till
-With waterbearing Silty Sand layer at 35 feet.
-Trace Gravel at 42 feet.
-With Silty Sand layer at 46 feet.
CLAYEY SAND, trace Gravel, gray, wet, very stiff to hard, (SC), till
Water observed at 34 feet with 34 feet of hollow-stem auger in the ground.
Piezometer installed at 50 feet with 20 feet of screen.
Backfilled with onsite soil above screen and capped with bentonite grout.
9+00
10+00

NO.	DATE	BY	CHECK	DESIGN	REVISION / SUBMITTAL

DESIGNED BY: XXX CHECKED BY: XXX
DRAWN BY: BR DATE: XX/XX/XX

AECOM

60% SUBMISSION - 09/28/15

METROPOLITAN COUNCIL

SOUTHWEST Green Line LRT Extension

WEST CIVIL - VOLUME 4B
PEDESTRIAN UNDERPASS 5
BRIDGE R0715
BRIDGE SURVEY PROFILE

DISCIPLINE: STRUCTURES

SHEET NAME: CBR0715-BRG-BOR-002

SHEET 9 OF 9