COTTON BELT REGIONAL RAIL
VELOWEB HIKE AND BIKE TRAIL
CITY OF CARROLLTON

CONTRACT NO. C - 2033270 - 01

100% DESIGN
AUGUST 7, 2023

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CITY OF CARROLLTON

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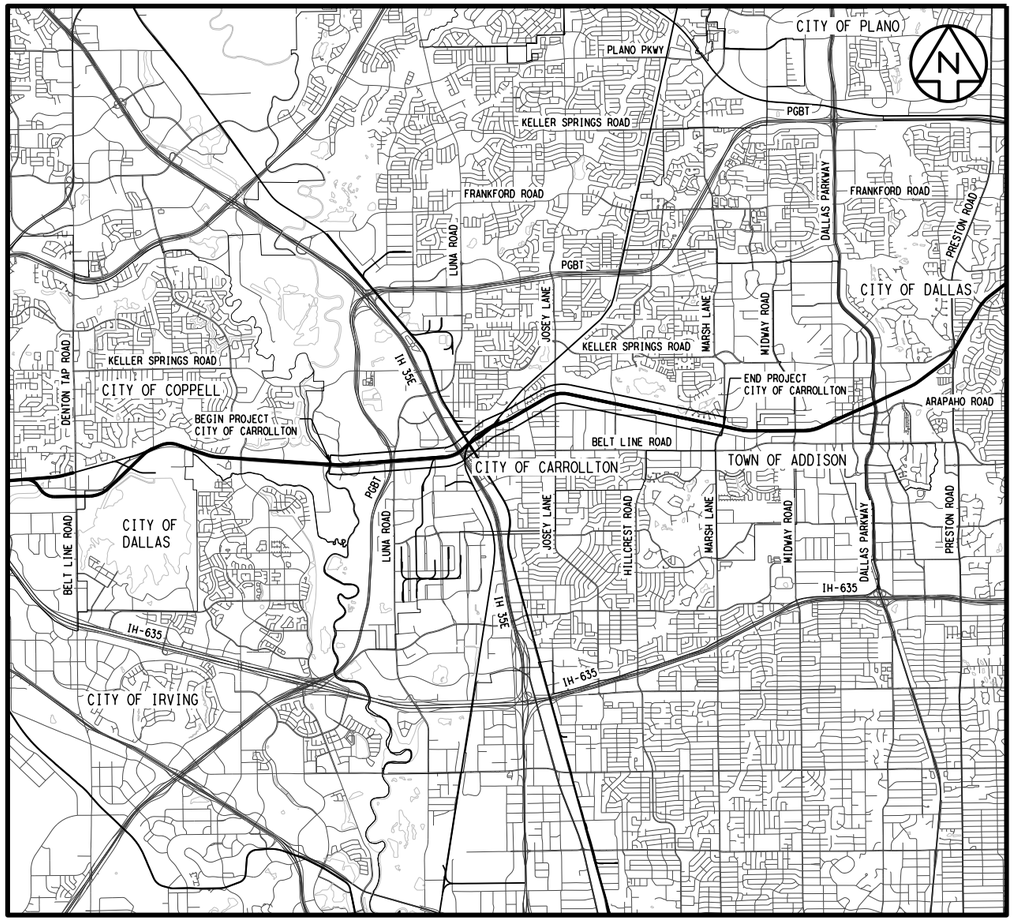
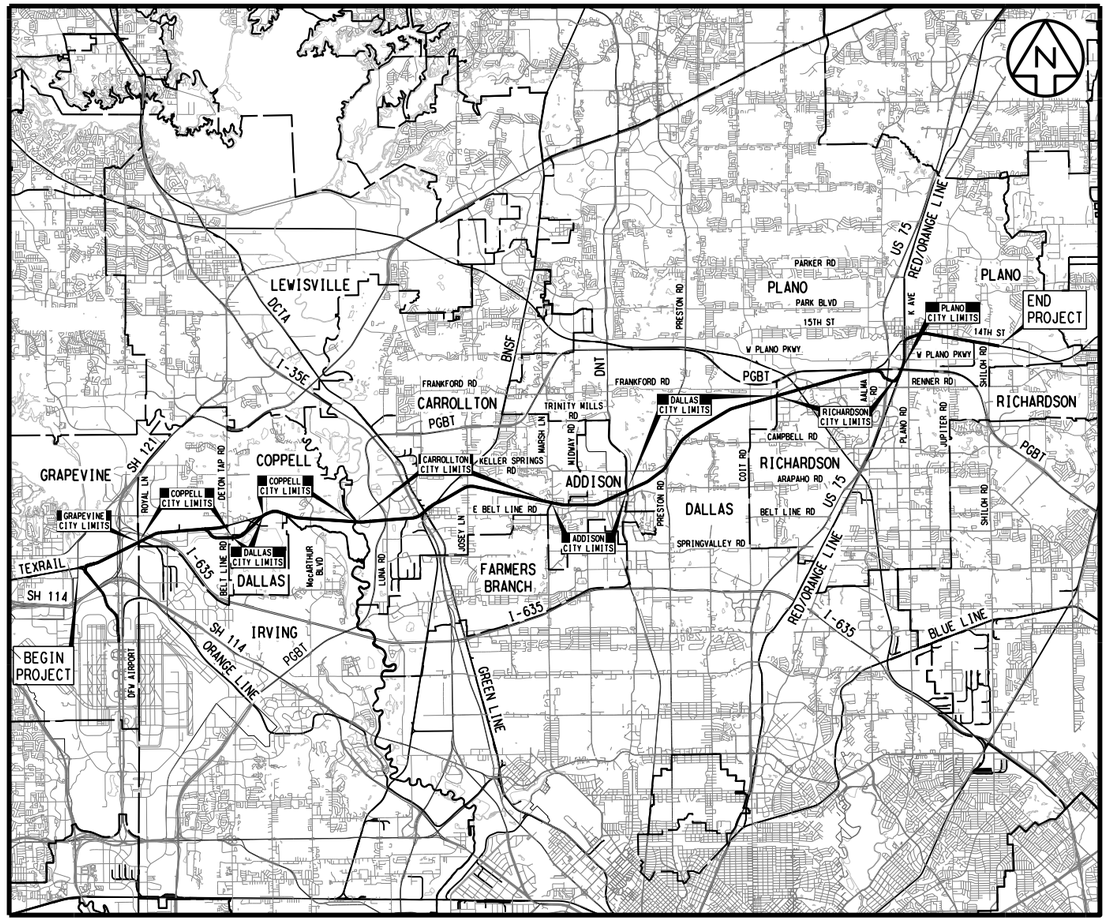
DWG No. GC1-7402



VICINITY MAP
NO SCALE



KEY MAP
VELOWEB HIKE AND BIKE TRAIL
NO SCALE

COTTON BELT REGIONAL RAIL
VELOWEB HIKE AND BIKE TRAIL
CITY OF CARROLLTON

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COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

CITY OF CARROLLTON
TITLE SHEET

CONTRACT	DWG No.	REV
C-2033270-01	GC1-7402	D

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IN CHARGE	K. MOYNAHAN
DATE	07 AUG 23

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COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

INDEX OF DRAWINGS
SHEET 1 OF 6

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179	D	CC1-0093	CITY OF CARROLLTON BOARDWALK STANDARDS SHEET 3 OF 3
180	D	CS9-0104	CHAIN LINK FENCE DETAILS SHEET 1 OF 2
181	D	CS9-0114	CHAIN LINK FENCE DETAILS SHEET 2 OF 2
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182	D	WC4-2213	TRAFFIC SIGNAL LAYOUT KELLY BLVD
183	D	WC4-2214	TRAFFIC SIGNAL SUMMARY KELLY BLVD
184	D	WC3-2043	SIGNING AND STRIPING LAYOUT DALLAS PISTOL CLUB DWY
185	D	WC3-2054	CROSSING EXHIBIT LUNA RD
186	D	WC3-2098	SIGNING AND STRIPING LAYOUT DRIVEWAYS
187	D	WC3-2106	SIGNING AND STRIPING LAYOUT BROADWAY ST
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188	D	WS9-3001	ELECTRICAL DETAILS CONDUITS & NOTES ED (1) - 14
189	D	WS9-3002	ELECTRICAL DETAILS CONDUIT SUPPORTS ED (2) - 14
190	D	WS9-3003	ELECTRICAL DETAILS CONDUCTORS ED (3) - 14
191	D	WS9-3004	ELECTRICAL DETAILS GROUND BOXES ED (4) - 14
192	D	WS9-3005	ELECTRICAL DETAILS SERVICE NOTES & DATA ED (5) - 14
193	D	WS9-3006	ELECTRICAL DETAILS SERVICE ENCLOSURE AND NOTES ED (6) - 14
194	D	WS9-3008	ELECTRICAL DETAILS TYPICAL TRAFFIC SIGNAL SYSTEM DETAILS ED (8) - 14
195	D	WS9-3009	ELECTRICAL DETAILS ELECTRICAL SERVICE SUPPORT PEDESTAL SERVICE TYPE PS ED (9) - 14
196	D	WS9-3010	ROADWAY ILLUMINATION DETAILS RID (1) - 20
197	D	WS9-3011	ROADWAY ILLUMINATION DETAILS (RDWY ILLUM FOUNDATIONS) RID (2) - 20
198	D	WS9-3012	ROADWAY ILLUMINATION DETAILS (UNDERPASS LIGHT FIXTURES) RID (3) - 20
199	D	WS9-3013	ROADWAY ILLUMINATION POLES RIP (1) - 19 SHEET 1 OF 4

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TRAFFIC: STANDARD DRAWINGS (CONT'D)			
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201	D	WS9-3015	ROADWAY ILLUMINATION POLES RIP (3) - 19 SHEET 3 OF 4
202	D	WS9-3016	ROADWAY ILLUMINATION POLES RIP (4) - 19 SHEET 4 OF 4
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204	D	WS9-3018	BRIDGE LIGHTING DETAILS BL SHEET 2 OF 2
205	D	WS9-3101	CLAMP ON FITTING ASSEMBLY FOR LUMINAIRE MAST ARM CFA-12
206	D	WS9-3102	STANDARD ASSEMBLY DRAWINGS FOR LUMINAIRE SUPPORT STRUCTURES ARM DETAILS LUM-A-12
207	D	WS9-3103	STANDARD ASSEMBLY FOR TRAFFIC SIGNAL SUPPORT STRUCTURES MAST ARM CONNECTIONS MA-C-12
208	D	WS9-3104	TRAFFIC SIGNAL CONTROLLER CABINET BASE AND PAD TS-CF-21
209	D	WS9-3105	MAST ARM DAMPING PLATE DETAILS MA-DPD-20
210	D	WS9-3106	TRAFFIC SIGNAL HEAD WITH BACKPLATE TS-BP-20
211	D	WS9-3107	TRAFFIC SIGNAL SUPPORT STRUCTURES SINGLE MAST ARM ASSEMBLY (80 MPH WIND ZONE) SMA-80 (1) - 12 (DAL) SHEET 1 OF 2
212	D	WS9-3108	TRAFFIC SIGNAL SUPPORT STRUCTURES SINGLE MAST ARM ASSEMBLY (80 MPH WIND ZONE) SMA-80 (2) - 12 (DAL) SHEET 2 OF 2
213	D	WS9-3109	TRAFFIC SIGNAL SUPPORT STRUCTURES DUAL MAST ARM ASSEMBLY (80 MPH WIND ZONE) DMA-80 (1) - 12 (DAL) SHEET 1 OF 3
214	D	WS9-3110	TRAFFIC SIGNAL SUPPORT STRUCTURES DUAL MAST ARM ASSEMBLY (80 MPH WIND ZONE) DMA-80 (2) - 12 (DAL) SHEET 2 OF 3
215	D	WS9-3111	TRAFFIC SIGNAL SUPPORT STRUCTURES DUAL MAST ARM ASSEMBLY (80 MPH WIND ZONE) DMA-80 (3) - 12 (DAL) SHEET 3 OF 3
216	D	WS9-3112	TRAFFIC SIGNAL SUPPORT STRUCTURES LONG MAST ARM ASSEMBLY(50 TO 65 FT) (80 AND 100 MPH WIND ZONE) LMA (1) - 12 (DAL) SHEET 1 OF 5
217	D	WS9-3113	TRAFFIC SIGNAL SUPPORT STRUCTURES LONG MAST ARM ASSEMBLY(50 TO 65 FT) (80 AND 100 MPH WIND ZONE) LMA (2) - 12 (DAL) SHEET 2 OF 5
218	D	WS9-3114	TRAFFIC SIGNAL SUPPORT STRUCTURES LONG MAST ARM ASSEMBLY(50 TO 65 FT) (80 AND 100 MPH WIND ZONE) LMA (3) - 12 (DAL) SHEET 3 OF 5
219	D	WS9-3115	TRAFFIC SIGNAL SUPPORT STRUCTURES LONG MAST ARM ASSEMBLY(50 TO 65 FT) (80 AND 100 MPH WIND ZONE) LMA (4) - 12 (DAL) SHEET 4 OF 5
220	D	WS9-3116	LONG MAST ARM ASSEMBLY PARTS LIST LMA (5) - 12 (DAL) SHEET 5 OF 5
221	D	WS9-3117	TRAFFIC SIGNAL SUPPORT STRUCTURES MAST ARM POLE DETAILS MA-D-12 (DAL)
222	D	WS9-3119	TRAFFIC SIGNAL HEAD DETAILS (DAL)
223	D	WS9-3120	PEDESTRIAN SIGNAL HEAD DETAILS (DAL)
224	D	WS9-3121	RADAR VEHICLE DETECTION SYSTEM RVDS-18 (DAL)
225	D	WS9-3125	TRAFFIC SIGNAL SUPPORT STRUCTURES STRAIN POLE ASSEMBLIES (80 MPH WIND ZONE) SP-80 (1) - 12 (DAL) SHEET 1 OF 2
226	D	WS9-3126	TRAFFIC SIGNAL SUPPORT STRUCTURES STRAIN POLE ASSEMBLIES (80 MPH WIND ZONE) SP-80 (2) - 12 (DAL) SHEET 2 OF 2
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228	D	WS9-3128	INSTALLATION OF BBU/EVP STAND ALONE BBU CABINET (GROUND MOUNT) DALLAS DISTRICT STANDARD SHEET 2 OF 3
229	D	WS9-3129	INSTALLATION OF BBU/EVP INSTALLATION SCENARIOS DALLAS DISTRICT STANDARD SHEET 3 OF 3
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231	D	WS9-3211	POSITION GUIDANCE USING RAISED MARKERS RELECTORIZED PROFILE MARKINGS PM (2) - 20
232	D	WS9-3212	TWO-WAY LEFT TURN LANES, RURAL LEFT TURN BAYS, AND LANE REDUCTION PAVEMENT MARKINGS PM (3) - 20
233	D	WS9-3213	CROSS WALK PAVEMENT MARKINGS PM (4) - 22
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234	D	WS9-3239	TYPICAL SIGN REQUIREMENTS TSR (4) - 13
235	D	WS9-3240	TYPICAL SIGN REQUIREMENTS TSR (5) - 13
236	D	WS9-3249	SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS GENERAL NOTES & DETAILS SMD (GEN) - 08
237	D	WS9-3250	SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS TRIANGULAR SLIPBASE SYSTEM SMD (SLIP-1) - 08
238	D	WS9-3251	SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS TRIANGULAR SLIPBASE SYSTEM SMD (SLIP-2) - 08
239	D	WS9-3252	SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS TRIANGULAR SLIPBASE SYSTEM SMD (SLIP-3) - 08
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241	D	CC6-2002	CITY OF CARROLLTON DRAINAGE CALCULATIONS SHEET 2 OF 5
242	D	CC6-2003	CITY OF CARROLLTON DRAINAGE CALCULATIONS SHEET 3 OF 5
243	D	CC6-2004	CITY OF CARROLLTON DRAINAGE CALCULATIONS SHEET 4 OF 5
244	D	CC6-2005	CITY OF CARROLLTON DRAINAGE CALCULATIONS SHEET 5 OF 5
245	D	CC6-2033	CITY OF CARROLLTON DRAINAGE AREA MAP BEGIN TO STA 2083+00 SHEET 1 OF 4
246	D	CC6-2280	CITY OF CARROLLTON DRAINAGE AREA MAP STA 2083+00 TO STA 2094+00 SHEET 2 OF 4
247	D	CC6-2531	CITY OF CARROLLTON DRAINAGE AREA MAP BEGIN TO STA 2260+00 SHEET 3 OF 4
248	D	CC6-2532	CITY OF CARROLLTON DRAINAGE AREA MAP STA 2260+00 TO END SHEET 4 OF 4
249	D	CC6-2069	CITY OF CARROLLTON DRAINAGE PLAN BEGIN TO STA 2041+50 SHEET 1 OF 15
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250	D	CC6-2070	CITY OF CARROLLTON DRAINAGE PLAN STA 2041+50 TO STA 2051+50 SHEET 2 OF 15
251	D	CC6-2071	CITY OF CARROLLTON DRAINAGE PLAN STA 2051+50 TO STA 2062+50 SHEET 3 OF 15
252	D	CC6-2072	CITY OF CARROLLTON DRAINAGE PLAN STA 2062+50 TO STA 2072+50 SHEET 4 OF 15
253	D	CC6-2073	CITY OF CARROLLTON DRAINAGE PLAN STA 2072+50 TO STA 2082+50 SHEET 5 OF 15
254	D	CC6-2310	CITY OF CARROLLTON DRAINAGE PLAN STA 2082+50 TO STA 2091+00 SHEET 6 OF 15
255	D	CC6-2311	CITY OF CARROLLTON DRAINAGE PLAN STA 2091+00 TO STA 2101+00 SHEET 7 OF 15
256	D	CC6-2566	CITY OF CARROLLTON DRAINAGE PLAN BEGIN TO STA 2222+50 SHEET 8 OF 15
257	D	CC6-2567	CITY OF CARROLLTON DRAINAGE PLAN STA 2222+50 TO STA 2232+50 SHEET 9 OF 15
258	D	CC6-2568	CITY OF CARROLLTON DRAINAGE PLAN STA 2232+50 TO STA 2242+50 SHEET 10 OF 15
259	D	CC6-2569	CITY OF CARROLLTON DRAINAGE PLAN STA 2242+50 TO STA 2252+50 SHEET 11 OF 15
260	D	CC6-2570	CITY OF CARROLLTON DRAINAGE PLAN STA 2252+50 TO STA 2262+50 SHEET 12 OF 15
261	D	CC6-2571	CITY OF CARROLLTON DRAINAGE PLAN STA 2262+50 TO STA 2272+50 SHEET 13 OF 15
262	D	CC6-2572	CITY OF CARROLLTON DRAINAGE PLAN STA 2272+50 TO STA 2282+50 SHEET 14 OF 15
263	D	CC6-2573	CITY OF CARROLLTON DRAINAGE PLAN STA 2282+50 TO END SHEET 15 OF 15
264	D	CC6-2075	CITY OF CARROLLTON CULVERT AT STA 2055+33 PLAN & PROFILE
265	D	CC6-2636	CITY OF CARROLLTON CULVERT AT STA 2216+75 PLAN & PROFILE
266	D	CC6-2634	CITY OF CARROLLTON CULVERT AT STA 2241+55 PLAN & PROFILE

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268	D	CC6-2122	CITY OF CARROLLTON STORM DRAIN PROFILES SHEET 1 OF 3
269	D	CC6-2123	CITY OF CARROLLTON STORM DRAIN PROFILES SHEET 2 OF 3
270	D	CC6-2124	CITY OF CARROLLTON STORM DRAIN PROFILES SHEET 3 OF 3
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271	D	CC6-2710	TXDOT STANDARD PSL SHEET 1 OF 2
272	D	CC6-2711	TXDOT STANDARD PSL SHEET 2 OF 2
273	D	CC6-2712	PRECAST SAFETY END TREATMENT TYPE II - PARALLEL DRAINAGE PSET-SP
274	D	CC6-2713	TXDOT STANDARD PDD
275	D	CC6-2714	TXDOT STANDARD PBGC
276	D	CC6-2715	TXDOT STANDARD PB
277	D	CC6-2716	UNDERDRAIN DETAILS SHEET 1 OF 4
278	D	CC6-2717	UNDERDRAIN DETAILS SHEET 2 OF 4
279	D	CC6-2718	UNDERDRAIN DETAILS SHEET 3 OF 4
280	D	CC6-2719	UNDERDRAIN DETAILS SHEET 4 OF 4
281	D	CC6-2720	DRAINAGE DETAILS
282	D	CC6-2721	DRAINAGE DETAILS
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283	D	CC6-2722	DRAINAGE DETAILS
284	D	CC6-2723	DRAINAGE DETAILS
285	D	CC6-2724	MISCELLANEOUS SEWER DETAILS MSD
286	D	CC6-2726	MISCELLANEOUS SEWER DETAILS MSD
287	D	CC6-2728	REINFORCED CONC. BOX CULVERT STANDARDS SECTIONS AND DETAILS COVER 18'-0" TO 30'-0
288	D	CC6-2729	TXDOT STANDARD BCS
289	D	CC6-2725	INSERTA TEE DRAINAGE DETAILS
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290	D	OC1-2051	STORM WATER POLLUTION PREVENTION PLAN SW3P NOTES AND NOI SHEET 1 OF 2
291	D	OC1-2052	STORM WATER POLLUTION PREVENTION PLAN SW3P NOTES AND NOI SHEET 2 OF 2
292	D	OC2-2069	CITY OF CARROLLTON TEMPORARY EROSION CONTROL STA 2039+24.51 TO STA 2041+50 SHEET 1 OF 15
293	D	OC2-2070	CITY OF CARROLLTON TEMPORARY EROSION CONTROL STA 2041+50 TO STA 2051+50 SHEET 2 OF 15
294	D	OC2-2071	CITY OF CARROLLTON TEMPORARY EROSION CONTROL STA 2051+50 TO STA 2062+50 SHEET 3 OF 15
295	D	OC2-2072	CITY OF CARROLLTON TEMPORARY EROSION CONTROL STA 2062+50 TO STA 2072+50 SHEET 4 OF 15
296	D	OC2-2073	CITY OF CARROLLTON TEMPORARY EROSION CONTROL STA 2072+50 TO STA 2082+50 SHEET 5 OF 15
297	D	OC2-2310	CITY OF CARROLLTON TEMPORARY EROSION CONTROL STA 2081+50 TO STA 2090+00 SHEET 6 OF 15
298	D	OC2-2311	CITY OF CARROLLTON TEMPORARY EROSION CONTROL STA 2090+00 TO STA 2100+00 SHEET 7 OF 15
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299	D	OC2-2566	CITY OF CARROLLTON TEMPORARY EROSION CONTROL STA 2213+00 TO STA 2220+00 SHEET 8 OF 15
300	D	OC2-2567	CITY OF CARROLLTON TEMPORARY EROSION CONTROL STA 2220+00 TO STA 2230+00 SHEET 9 OF 15
301	D	OC2-2568	CITY OF CARROLLTON TEMPORARY EROSION CONTROL STA 2230+00 TO STA 2240+00 SHEET 10 OF 15
302	D	OC2-2569	CITY OF CARROLLTON TEMPORARY EROSION CONTROL STA 2240+00 TO STA 2250+00 SHEET 11 OF 15
303	D	OC2-2570	CITY OF CARROLLTON TEMPORARY EROSION CONTROL STA 2250+00 TO STA 2260+00 SHEET 12 OF 15
304	D	OC2-2571	CITY OF CARROLLTON TEMPORARY EROSION CONTROL STA 2260+00 TO STA 2270+00 SHEET 13 OF 15
305	D	OC2-2572	CITY OF CARROLLTON TEMPORARY EROSION CONTROL STA 2270+00 TO STA 2280+00 SHEET 14 OF 15
306	D	OC2-2573	CITY OF CARROLLTON TEMPORARY EROSION CONTROL STA 2280+00 TO STA 2290+50 SHEET 15 OF 15
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307	D	OC9-2575	STABILIZED CONSTRUCTION EXIT SHEET 1 OF 9
308	D	OC9-2576	CURB INLET PROTECTION SHEET 2 OF 9
309	D	OC9-2577	CURB INLET PROTECTION SHEET 3 OF 9
310	D	OC9-2578	CURB INLET PROTECTION SHEET 4 OF 9
311	D	OC9-2579	CURB INLET PROTECTION SHEET 5 OF 9
312	D	OC9-2580	GRATE & DROP INLET PROTECTION SHEET 6 OF 9
313	D	OC9-2581	GRATE & DROP INLET PROTECTION SHEET 7 OF 9
314	D	OC9-2582	SILT FENCE SHEET 8 OF 9
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316	D	CC4-9128	CITY OF CARROLLTON RETAINING WALL KEY MAP SHEET 1 OF 2
317	D	CC4-9127	CITY OF CARROLLTON RETAINING WALL KEY MAP SHEET 2 OF 2
318	D	SC1-2080	CITY OF CARROLLTON RETAINING WALL HORIZONTAL ALIGNMENT DATA SHEET 1 OF 2
319	D	SC1-2081	CITY OF CARROLLTON RETAINING WALL HORIZONAL ALIGNMENT DATA SHEET 2 OF 2
320	D	SC1-2085	CITY OF CARROLLTON RETAINING WALL RW_T_R2085 TYPICAL WALL SECTIONS SHEET 1 OF 2
321	D	SC1-2086	CITY OF CARROLLTON RETAINING WALL RW_T_R2085 LAYOUT SHEET 2 OF 2
322	D	SC1-2246	CITY OF CARROLLTON RETAINING WALL RW_T_L2244 TYPICAL SECTIONS
323	D	SC1-2244	CITY OF CARROLLTON RETAINING WALL RW_T_L2244 LAYOUT SHEET 1 OF 2
324	D	SC1-2245	CITY OF CARROLLTON RETAINING WALL RW_T_L2244 LAYOUT SHEET 2 OF 2
325	D	SC1-2262	CITY OF CARROLLTON RETAINING WALL RW_T_L2261 TYPICAL WALL SECTIONS
326	D	SC1-2261	CITY OF CARROLLTON RETAINING WALL RW_T_L2261 LAYOUT
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327	D	CS9-0211	PEDESTRIAN RAIL TYPE PR11 SHEET 1 OF 2
328	D	CS9-0212	PEDESTRIAN RAIL TYPE PR11 SHEET 2 OF 2
329	D	CS9-0213	MECHANICALLY STABILIZED EARTH RETAINING WALL DESIGN DATA RW(MSE)DD

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331	D	CS9-0215	MECHANICALLY STABILIZED EARTH RETAINING WALL RW (MSE) SHEET 2 OF 2
332	D	CS9-0216	EARTH MEASURMENTS AT RETAINING WALLS RW(EM)
333	D	CS9-0217	RETAINING WALL TRAFFIC RAILING FOUNDATIONS RW (TRF)
334	D	CC6-2020	STONE RIPRAP DETAILS SHEET 1 OF 2
335	D	CC6-2021	STONE RIPRAP DETAILS SHEET 2 OF 2
336	D	CC6-2022	SAFETY END TREATMENT FOR 12" DIA TO 60" DIA PIPE CULVERTS TYPE II - CROSS DRAINAGE SETP-CD
337	D	CC6-2023	SAFETY END TREATMENT FOR 12" DIA TO 60" DIA PIPE CULVERTS TYPE II - CROSS DRAINAGE SETP-CD
338	D	CC6-2024	SAFETY END TREATMENT FOR 12" DIA TO 72" DIA PIPE CULVERTS TYPE II - PARALLEL DRAINAGE SETP-PD
339	D	SC5-5401	CITY OF CARROLLTON CIVIL DETAILS
340	D	SC5-5402	CITY OF CARROLLTON RETAINING WALL MISCELLANEOUS DETAILS
341	D	SC5-5403	CITY OF CARROLLTON RETAINING WALL COPING DETAILS
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342	D	GC5-7432	RAILROAD REQUIREMENTS FOR BRIDGE CONSTRUCTION SHEET 1 OF 3
343	D	GC5-7433	RAILROAD REQUIREMENTS FOR BRIDGE CONSTRUCTION SHEET 2 OF 3
344	D	GC5-7434	RAILROAD REQUIREMENTS FOR BRIDGE CONSTRUCTION SHEET 3 OF 3
345	D	GC5-7435	RAILROAD SCOPE OF WORK PROJECT SPECIFIC DETAILS

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ARCHER WESTERN HERZOG

DART PROJECT

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DESIGNED	M. JAHN
CHECKED	B. ALLDREDGE
IN CHARGE	K. MOYNAHAN
DATE	07 AUG 23

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CONTRACT SHEET No. 8 OF 345

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

INDEX OF DRAWINGS
SHEET 6 OF 6

CONTRACT	DWG No.	REV
C-2033270-01	GC2-0006	D

CB05-GC2-0006.001

DWG No. GC3-7403

SYMBOLS

- PROFILE GRADE LINE / ELEVATION CONTROL POINT
- DIRECTION OF FLOW
- C OR B CENTERLINE OR BASELINE
- FUTURE OR NOT IN CONTRACT
- ℄ CENTERLINE
- ℄ BASELINE
- ℙ PROPERTY LINE
- DIMENSION LINE CONTINUES
- MATCH LINE
- 510 CONTOUR LINE
- TRACK (TRANSIT) CENTER LINE
- X X X EXISTING FENCE LINE
- PROPOSED FENCE LINE
- STRUCTURE OUTLINE
- RAILROAD TRACKS
- CO CLEANOUT
- MH MANHOLE
- SIDEWALK AND MISC. LINES
- DROP INLET, CATCH BASIN OR DRAIN
- CULVERT HEADWALLS
- x 543.5 SPOT ELEVATION
- CURB LINE
- EXISTING BARRIER/RETAINING WALL
- PROPOSED RETAINING WALL
- PROPOSED BALLAST WALL
- PROPOSED SIDEWALK WALL
- NOISE IMPACT AREA
- GUARD RAIL
- HAND RAIL
- UNPAVED ROAD
- CONCRETE GUARD FENCE
- VEGETATION LINE
- T TREE
- S SHRUB
- POLE

- UTILITY POLE
- SS SANITARY (DIRECTION OF FLOW) , PLUG
- GRID OF THE STATE PLANE COORDINATE SYSTEM
- BILLBOARD
- TOTAL CENTRAL ANGLE OF SPIRAL AND CIRCULAR CURVES
- C1 SUFFIX (1) AT THE SYMBOL DENOTES DATA FOR THE FIRST CIRCULAR CURVE OF A COMPOUND CURVE
- C2 SUFFIX (2) AT THE SYMBOL DENOTES DATA FOR THE SECOND CIRCULAR CURVE OF A COMPOUND CURVE
- Θ_S CENTRAL ANGLE OF SPIRAL OR SPIRAL ANGLE
- Θ_{aAC} CENTRAL ANGLE OF COMPOUND SPIRAL OR COMPOUND ANGLE (CS1 TO CS2)
- Θ_{sAT} TOTAL CENTRAL ANGLE OF COMPOUND SPIRAL OR TOTAL COMPOUND SPIRAL ANGLE (FROM SPO TO SC2)
- WWMH WASTEWATER MANHOLE
- SMH STORM SEWER MANHOLE
- EMH, TMH, WUMH ELECTRICAL, TELEPHONE, OR WESTERN UNION MANHOLE
- REDUCER
- WM WATER METER
- WV WATER VALVE
- FH FIRE HYDRANT
- CAP OR PLUG
- GV GAS VALVE
- GM GAS METER
- PB PULL BOX OR SPLICING CHAMBER
- LIGHT POLE
- FS FIRE SERVICE STAND PIPE
- EXISTING TRAFFIC SIGN
- PROPOSED TRAFFIC SIGN
- POLE GUY AND ANCHOR
- TRANSMISSION LINE TOWER
- TRAFFIC CONTROL GATE
- CANTILEVERED RAILROAD CROSSING SIGNAL
- TEST BORING LOCATION
- (O/H) OVERHEAD LINES
- (O/H) E OVERHEAD ELECTRIC LINES
- POINT NUMBER DART PRIMARY CONTROL POINT

- OTHER SURVEY MONUMENTS
- T (UG) UNDERGROUND TELEPHONE LINE
- UG(E) UNDERGROUND ELECTRIC LINE
- OH AERIAL UTILITY
- UTILITY FACILITY LESS THAN 24"
- MAJOR UTILITY FACILITY 24" OR LARGER IN PLAN VIEW
- FACILITY TO BE ABANDONED
- DOUBLE CROSSOVER
- POINT OF SWITCH
- EXISTING DITCH
- DITCH PROPOSED SPECIAL DITCH
- STM STORM DRAIN/CULVERT
- UD UNDERDRAIN
- WW WASTEWATER
- W WATER LINE
- G GAS LINE
- TS TRAFFIC SIGNALIZATION LINE
- E ELECTRIC POWER LINE
- ESL ELECTRIC LINE, STREET LIGHTING
- T TELEPHONE LINE
- TG TELEGRAPH LINE
- TV CABLEVISION LINE
- PROPOSED CASING
- PROPOSED STREET CLOSING
- PROPOSED STREET CONSTRUCTION
- EXISTING STREET/RAILROAD RIGHT-OF-WAY LINE
- EXISTING PROPERTY LINE
- DART PROPOSED RIGHT-OF-WAY LINE
- EXISTING EASEMENT LINE
- DART PROPOSED EASEMENT LINE
- EXIST ○ SET ● COPPER, IRON PIN, PIPE IRON ROD MARKERS OR ANY PROPERTY CORNER
- □ ■ RIGHT-OF-WAY, CONTROL MONUMENT OR MARKERS
- EXISTING INTERSECTION OF PROPERTY LINES
- INTERSECTION OF PROPOSED DART RIGHT-OF-WAY LINES

- PROPOSED DART RIGHT-OF-WAY MONUMENT
- DB SYSTEMS DUCTBANK
- POINT OF SWITCH
- LEFT HAND TURNOUT
- RIGHT HAND TURNOUT
- DERAIL SWITCH
- CENTERLINE
- GAUGE LINE
- LEFT HAND CURVE
- RIGHT HAND CURVE
- SINGLE CROSSOVER,LH SHOWN
- CONTINUOUS WELDED RAIL
- PI/PVI/PITO
- NON-INSULATED JOINT
- INSULATED RAIL JOINT-BOTH RAILS
- INSULATED RAIL JOINT - L RAIL
- INSULATED RAIL JOINT - R RAIL
- INSULATED RAIL JOINT
- RESTRAINING RAIL
- PRE-CURVED RAIL
- STANDARD RAIL,GIRDER RAIL
- PREMIUM RAIL
- F SWITCH NUMBERING "F" INDICATES FUTURE
- 136#/115# TRANSITION RAIL
- NE3-A CURVE NUMBER
- BLUE FLAG
- BUMPING POST
- EQUILATERAL TURNOUT
- POWER POINT POLE
- FH PROPOSED FIRE HYDRANT
- REMOVE AND REPLACE MANHOLE
- RAILROAD GATE/CANTILEVER LOCATION
- HW 100 HEADWATER ELEVATION
- TW 100 TAILWATER ELEVATION
- CORROSION CONTROL TEST STATION
- 235 CONDUIT RUN NUMBER

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COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

CITY OF CARROLLTON
SYMBOLS

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C-2033270-01	GC3-7403	D

CB05-GC3-7403.001

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DWG No. GC3-7404

ABBREVIATIONS

AASHTO	AMERICAN ASSOCIATION OF STATE HIGHWAY & TRANSPORTATION OFFICIALS
AAR PLATE	ASSOCIATION OF AMERICAN RAILWAY PLATE
ABUT	ABUTMENT
ABV	ABOVE
ACI	AMERICAN CONCRETE INSTITUTE
AD	AREA DRAIN
ADD	ADDENDUM
ADJ	ADJACENT
A/E	ARCHITECT/ENGINEER
AFF	ABOVE FINISHED FLOOR
A/G	AT GRADE
AGG	AGGREGATE
AISC	AMERICAN INSTITUTE OF STEEL CONSTRUCTION, INC
AISI	AMERICAN IRON AND STEEL INSTITUTE
AL	ALUMINUM
ALT	ALTERNATE
ANC	ANCHOR
ANSI	AMERICAN NATIONAL STANDARDS INSTITUTE
APPROX	APPROXIMATE
APP	APPROACH
ARCH.	ARCHITECT, ARCHITECTURE
AREMA	AMERICAN RAILWAY ENGINEERING AND MAINTAINANCE OF WAY ASSOCIATION
ASA	AMERICAN STANDARDS ASSOCIATION
ASPH	ASPHALT
ASSY	ASSEMBLY
ASTM	AMERICAN SOCIETY FOR TESTING AND MATERIALS
ATR	ABOVE TOP OF RAIL
AUX	AUXILIARY
AVE	AVENUE
AVG	AVERAGE
AWG	AMERICAN WIRE GAUGE
AWS	AMERICAN WELDING SOCIETY
BAS	BRIDGE APPROACH SLAB
B/B	BACK TO BACK
B/C	BACK OF CURB
BD	BOARD, BALLAST DRAIN
BEG.	BEGINNING
BF	BOTH FACES
BH	BORED HOLE
BIT.	BITUMINOUS
BJF	BITUMINOUS JOINT FILLER
BK	BACK
BKF	BACKFILL
BKWL	BACKWALL
B/L	BUILDING LINE
BLDG	BUILDING
BLKG	BLOCKING
BLVD	BOULEVARD
BM	BEAM
BMCS	BRIDGE MOUNTED CLEARANCE SIGN
B.M.	BENCH MARK
BOT	BOTTOM
BNSF	BURLINGTON NORTHERN SANTA FE RAILWAY
BPA	BRIDGE PROTECTIVE ASSEMBLY
BRG	BEARING
BRKT	BRACKET
BS	BOTH SIDES
B/S	BOTTOM OF SLOPE
BTWN	BETWEEN
BVL	BEVELED
BW	BOTH WAYS, BOTTOM WIDTH
C_X_	AMERICAN STANDARD CHANNEL, X = SIZE BY WEIGHT
	RUNOFF COEFFICIENT
CAB.	CABINET
CALC	CALCULATED
CANT	CANTILEVER
CAT.	CATENARY
CATF	CATENARY FOUNDATION
CATP	CATENARY POLE
CB	CATCH BASIN
CC	CENTER OF CURVE
CDC	CORRIDOR DEVELOPMENT CERTIFICATE
C TO C	CENTER TO CENTER
CEM	CEMENT
CF	CUBIC FEET
CFA	CONTINUOUS FLIGHT AUGER
CFL	COUNTERFLASHING
CFS	CUBIC FEET PER SECOND
CG	CONCRETE GUTTER
C & G	CURB AND GUTTER
C/G	CORNER GUARD
CHAM	CHAMFER
CHD	CHORD
CI	CAST IRON, CURB INLET
CIH	CENTRAL INSTRUMENT HOUSE
CIP	CAST-IN-PLACE, CAST IRON PIPE
CJ	CONSTRUCTION JOINT
CL	CLASS, CURVE LENGTH, CENTERLINE
C/L	CURB LINE
CLF	CHAIN LINK FENCE
CLR	CLEARANCE, CLEAR
CMP	CORRUGATED METAL PIPE
CMU	CONCRETE MASONRY UNIT
CO	CLEAN OUT
COD	CITY OF DALLAS
COI	CITY OF IRVING
COL	COLUMN
COMB	COMBINATION
COMM	COMMUNICATIONS
COMP	COMPRESSED, COMPRESSIVE
CON	CONSTRUCTION LINES
CONC	CONCRETE
CONN	CONNECT, CONNECTOR, CONNECTION
CONST	CONSTRUCTION, CONSTRUCT
CONT	CONTINUATION, CONTINUOUS
CORR	CORRUGATED
COV	COVER
CRS	COLD ROLLED STEEL
CS	CURVE TO SPIRAL POINT
CTB	CEMENT TREATED BASE, CONCRETE TRAFFIC BARRIER
CTR	CENTER
CULV	CULVERT
CWR	CONTINUOUS WELDED RAIL
CY	CUBIC YARD
D, DEG	DEGREE OF CURVE
DART	DALLAS AREA RAPID TRANSIT
DCURD	DALLAS COUNTY UTILITY & RECLAMATION DISTRICT
DEFL	DEFLECTION
DEG	DEGREE
DEP	DEPRESSED
DET	DETAIL
DFW	DALLAS/FORT WORTH
DF	DIRECT FIXATION
DG	DOWNGUY
DI	DROP INLET, DUCTILE IRON
DIA	DIAMETER
DIM.	DIMENSION
DIP	DUCTILE IRON PIPE
DIST	DISTANCE
DL	DEAD LOAD
DN	DOWN
DP	DAMPPROOFING
DPL	DALLAS POWER & LIGHT COMPANY
DR	DOOR, DRIVE, DERAILMENT LOAD
DRN	DRAIN, DRAINAGE
DRWY	DRIVEWAY
DS	DOWNSPOUT
D.S.	DRILLED SHAFT
DWG	DRAWING
DWU	DALLAS WATER UTILITY
E	EXPANSION BEAM END, EAST, ELECTRIC
Ea	SUPERELEVATION IN INCHES
EA	EACH
EB	EAST BOUND
EBFR	EAST BOUND FRONTAGE ROAD
EBML	EAST BOUND MAINLINE
EF	EACH FACE
EFC	EXPOSED FINISH CONCRETE
E.G.	FOR EXAMPLE
EL., ELEV	ELEVATION
ELEC	ELECTRIC, ELECTRICAL
EMBED	EMBEDMENT
E/P	EDGE OF PAVEMENTS
EQ	EQUAL
EQUIV	EQUIVALENT
E/S	EDGE OF SHOULDER
ESMT	EASEMENT
EST	ESTIMATE
ETC	ET CETERA
EW	EACH WAY
EWEF	EACH WAY, EACH FACE
EXIST	EXISTING
EXP	EXPANSION
EXPJT	EXPANSION JOINT
EXPO	EXPOSED
EXT	EXTERIOR
EXPWY	EXPRESSWAY
F	FIXED BEAM END, FAHRENHEIT
F/C	FACE OF CURVE
FD	FLOOR DRAIN
FDN	FOUNDATION
FF	FINISH FLOOR, FAR FACE
FFBW	FRONT FACE BACKWALL
FG	FINISH GRADE
FH	FIRE HYDRANT
FIN.	FINISH
FL	FLOW LINE
FLEX	FLEXIBLE
FLG	FLANGE
FLR	FLOOR
FO	FIBER OPTIC
FOC	FIBER OPTIC CABLE
FOF	FACE OF FINISH
FPU	PRESTRESSING STEEL TENSILE STRENGTH
FRWY	FREEWAY
FS	FAR SIDE
FT	FOOT OR FEET
FTG	FOOTING
FURN	FURNISH
FUT	FUTURE
FWD	FORWARD
FW	FORT WORTH
G	GAS (NATURAL)
GA	GAUGE
GAL	GALLON
GALV	GALVANIZED
GEC	GENERAL ENGINEERING CONSULTANT
GEN	GENERAL
GI	GALVANIZED IRON, GRATE INLET
G/L	GROUND LINE
GM	GAS METER
GND	GROUND
GP	GAUGE PLATE, GRAND PRAIRIE
GR	GRADE
G/R	GUARD RAIL
GRAN	GRANITE, GRANULAR
G/R PL	GUARD RAIL PLATE
GRTG	GRATING
GV	GAS VALVE
GV	GATE VALVE
GVL	GRAVEL
H	HEIGHT
H/D	HEAVY DUTY
HDWL	HEADWALL
HEX	HEXAGONAL
HH	HAND HOLE
HMAC	HOT MIX ASPHALTIC CONCRETE
HORIZ	HORIZONTAL
HP_X_	BEARING PILE SHAPE, _X_ = SIZE BY WEIGHT
HPT	HIGH POINT
HSB	HIGH STRENGTH BOLT
HSS_X_X_	HOLLOW STRUCTURAL SHAPE X_(X_) = DIMENSION X DIMENSION X THICKNESS
HR	HOUR
HSS	HIGH STRENGTH STEEL
HWL	HIGH WATER LINE
HWY	HIGHWAY
ID	INSIDE DIAMETER
IF.	INSIDE FACE
IH	INTERSTATE HIGHWAY
IJ	INSULATED JOINT
IN.	INCH, INCHES
INC	INCORPORATED
INCL	INCLUDE
INT	INTERIOR
INV	INVERT
IRR.	IRRIGATION
JT	JOINT
K	KIP, RATE OF VERTICAL CURVATURE
L	TOTAL CURVE LENGTH, LENGTH, LEFT (DEFLECTION)
LB	POUND
LF	LINEAR FEET
LG	LENGTH, LONG
LIN	LINEAR, LINEAL
LL	LIVE LOAD
LN	LANE
LOC	LOCATION
LONG.	LONGITUDINAL
LPT	LOW POINT
LRT	LIGHT RAIL TRANSIT
LTD	LIMITED
LSG	LONE STAR GAS
LTL	LINTEL
LVC	LENGTH OF VERTICAL CURVE
LVL	LEVEL
LT	LEFT
M X	MISCELLANEOUS PILE SHAPE, _X_ = SIZE BY WEIGHT
MATL	MATERIAL
MAX	MAXIMUM
MBGF	METAL BEAM GUARD FENCE
MBR	MEMBER
MC_X_	MISCELLANEOUS CHANNEL, _X_ = SIZE BY WEIGHT
MCI	MCI TELECOMMUNICATIONS
MEAS	MEASURE
MEMB	MEMBRANE
MET.	METAL
MFR	MANUFACTURER
MH	MANHOLE
MIN	MINUTES, MINIMUM
MISC	MISCELLANEOUS
MKT	MISSOURI-KANSAS-TEXAS RAILROAD COMPANY
ML	MAINLINE
MOD	MODULAR, MODIFIED
MON	MONUMENT
MSE	MECHANICALLY STABILIZED EARTH
MT	MOUNTED
MTG	MOUNTING
MULT	MULTIPLE
N	NORTH
N/A	NOT APPLICABLE
NAT	NATURAL
NB	NORTHBOUND
NBFR	NORTHBOUND FRONTAGE ROAD
NBML	NORTHBOUND MAINLINE
NCTCOG	NORTH CENTRAL TEXAS COUNCIL OF GOVERNMENTS
NF	NEAR FACE
NIC	NOT IN CONTRACT
No.	NUMBER
Nos	NUMBERS
NOM	NOMINAL
NS	NEAR SIDE
N/S	NORTH/SOUTH
NTMWD	NORTH TEXAS MUNICIPAL WATER DISTRICT
NTS	NOT TO SCALE
NTTA	NORTH TEXAS TOLLWAY AUTHORITY
OC	ON CENTERS
OCEW	ON CENTER EACH WAY
OCS	OVERHEAD CATENARY SYSTEM
OD	OUTSIDE DIAMETER
OF	OUTSIDE FACE
OFF	OFFSET
OH	OVERHEAD
O TO O	OUT TO OUT
OPNG	OPENING
OPP	OPPOSITE
PC	POINT OF CURVE
PCC	POINT OF CURVE TO CURVE
P/C	PRECAST
PED	PEDESTRIAN
PEJ	PREFORMED EXPANSION JOINT
PERF	PERFORATED
PERM	PERMANENT
PERMISS	PERMISSIBLE
PERP	PERPENDICULAR
PGL	PROFILE GRADE LINE
PI	POINT OF INTERSECTION
PL	PLATE, PROPERTY LINE
PLAT.	PLATFORM
PMDF	PERMANENT METAL DECK FORMS
P/O	PART OF
POB	POINT OF BEGINNING
POC	POINT OF CURVE
POE	POINT OF ENDING
POLY	POLYETHYLENE
POS	POINT OF SPIRAL
POT	POINT OF TANGENT
PREM	PREMOLDED
PROJ.	PROJECTION
PROP	PROPOSED
PROT	PROTECTION
P/S	PRE-STRESSED
PSF	POUNDS PER SQUARE FOOT
PSI	POUNDS PER SQUARE INCH
PT	POINT OF TANGENT
PVI	POINT OF VERTICAL INTERSECTION
PVMT	PAVEMENT
PVC	POLY VINYL CHLORIDE, POINT OF VERTICAL CURVE
PVT	POINT OF VERTICAL TANGENT
Q	STORM WATER DISCHARGE
QTY	QUANTITY
R	RADIUS
R1	RIGHT (DEFLECTION)
RC	REINFORCED CONCRETE
RCB	REINFORCED CONCRETE BOX CULVERT
RCCP	REINFORCED CONCRETE CYLINDER PIPE
RCP	REINFORCED CONCRETE PIPE
RD	ROAD
REINF	REINFORCE, REINFORCED, REINFORCING, REINFORCEMENT
REQD	REQUIRED
REV	REVISE, REVISION
RH	RIGHT HAND
RO	ROUGH OPENING
ROW	RIGHT OF WAY
RR	RAILROAD
RT	RIGHT
S	SOUTH, SLOPE
S_X_	I SHAPE, _X_ = SIZE BY WEIGHT
SB	SOUTHBOUND
SBFR	SOUTHBOUND FRONTAGE ROAD
SBML	SOUTHBOUND MAINLINE
SC	SPIRAL TO CURVE
SCHED	SCHEDULE
SCR	SCREW
SD	STORM DRAIN
SDWK	SIDEWALK
SEJ	SEALED EXPANSION JOINT
SEL	SELECT
SH	STATE HIGHWAY
S/H	STRUCTURAL HEIGHT
SHLD	SHOULDER
SHT	SHEET
SIM	SIMILAR
SL	STREET LIGHT, SLAB
SLV	SLEEVE
SM	SMOOTH
SMH	SEWER MANHOLE
SP	SOUTHERN PACIFIC TRANS. CORP.
SPA	SPACE
SPEC(S)	SPECIFICATION, SPECIFICATIONS
SQ	SQUARE
SQ FT	SQUARE FOOT
SQ IN	SQUARE INCH
SS	SANITARY SEWER
SST	STAINLESS STEEL
ST	STREET, SPIRAL TO TANGENT POINT
STA	STATION, STATIONING
STD	STANDARD
STIFF	STIFFENER
STL	STEEL
STM	STORM
STRGTH	STRENGTH
STRUCT	STRUCTURE, STRUCTURAL
SURF.	SURFACE
SWR	SEWER
SY	SQUARE YARD
SYM	SYMMETRICAL
SYS	SYSTEM
T/	TOP OF
T & B	TOP AND BOTTOM
TBM	TEMPORARY BENCH MARK
T/C	TOP OF CURB
T/D	TOP OF DITCH
TCP	TRAFFIC CONTROL PLAN
TEM	TEMPORARY
TEMP	TEMPERATURE
TEN	TENSION
TES	TRACTION ELECTRIFICATION SYSTEM
THRU	THROUGH
THK	THICK, THICKNESS
TL	TRAFFIC LIGHT
TMH	TELECOM MANHOLE
TO	TURNOUT
TOC	TOP OF CONCRETE
TP	TOP OF PAVEMENT
TPSS	TRACTION POWER SUBSTATION
T/R	TOP OF RAIL
TRA	TRINITY RIVER AUTHORITY
TRAF SIG	TRAFFIC SIGNAL
TRK	TRACK
T/S	TOP OF SLOPE
T/STL	TOP OF STEEL
T/W	TOP OF WALL
TxDOT	TEXAS DEPARTMENT OF TRANSPORTATION
TWC	TIME WARNER CABLE
TYP	TYPICAL
UD	UNDERDRAIN
UG	UNDERGROUND
UNO	UNLESS NOTED OTHERWISE
UP	UNION PACIFIC RAILWAY
US	UNITED STATES
USC&GS	U.S. COAST & GEODETIC SURVEY
USGS	UNITED STATES GEOLOGICAL SURVEY
UTIL	UTILITY
V	VELOCITY
VAR	VARIABLE, VARIES
VERT	VERTICAL
VOL	VOLUME
VPI	VERTICAL POINT OF INTERSECTION
W	WEST, WATER
W/	WITH
WB	WESTBOUND
WBFR	WESTBOUND FRONTAGE ROAD
WBML	WESTBOUND MAINLINE
W_X_	WIDE FLANGE SHAPE, X = SIZE BY WEIGHT
WI	WROUGHT IRON
W/O	WITHOUT
WP	WORK POINT
W/P	WEATHERPROOF
WS	WATER SURFACE
WT	WATERTIGHT, WEIGHT
WTR	WATER
WV	WATER VALVE
WWF	WELDED WIRE FABRIC
WSEL	WATER SURFACE ELEVATION
X-ING	CROSSING
X-SECT	CROSS SECTION

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CB05-GC3-7404.001
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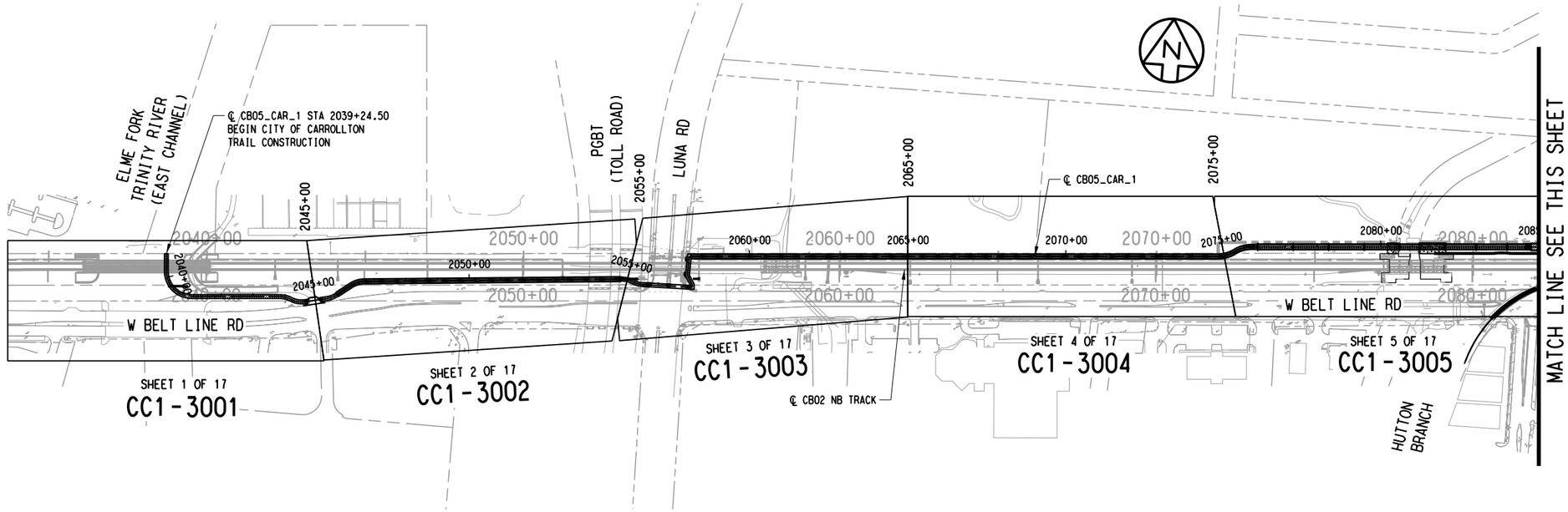

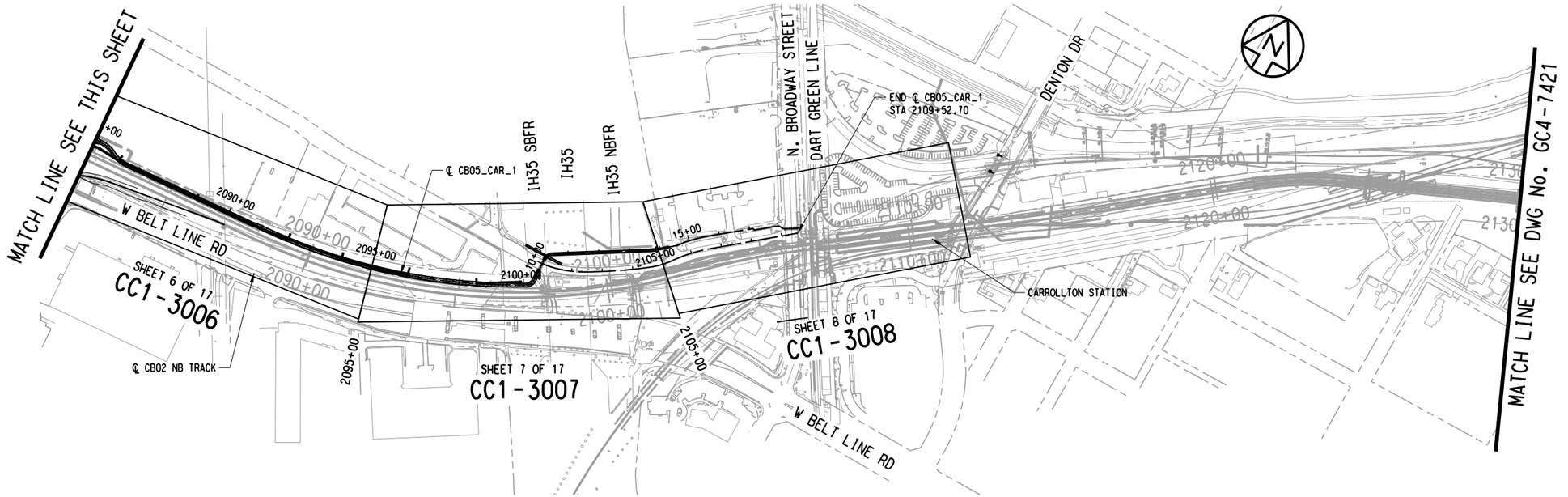

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ARS ENGINEERS, INC.
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Dallas, Texas 75243
(214) 739-3152 Fax (214) 739-3169
FIRM NO. F-819

ARCHER WESTERN HERZOG

DART PROJECT

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SCALE	NO SCALE
DRAWN	C. BAGBY
DESIGNED	C. BAGBY
CHECKED	D. LUU
IN CHARGE	D. LUU
DATE	07 AUG 23

CAES

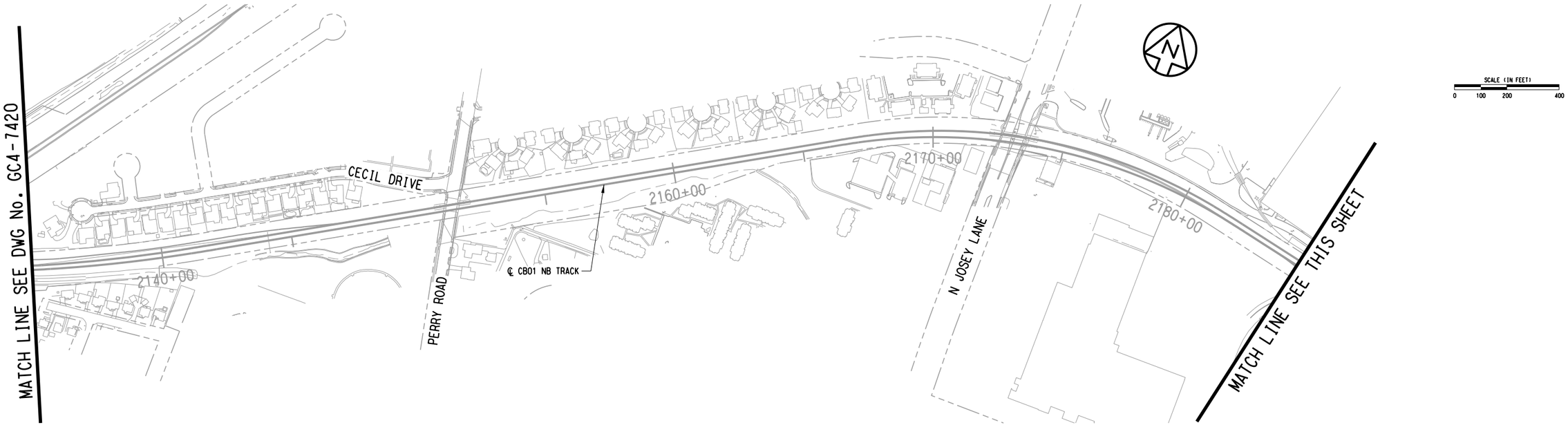
COTTON BELT REGIONAL RAIL VELOWEB HIKE & BIKE TRAIL

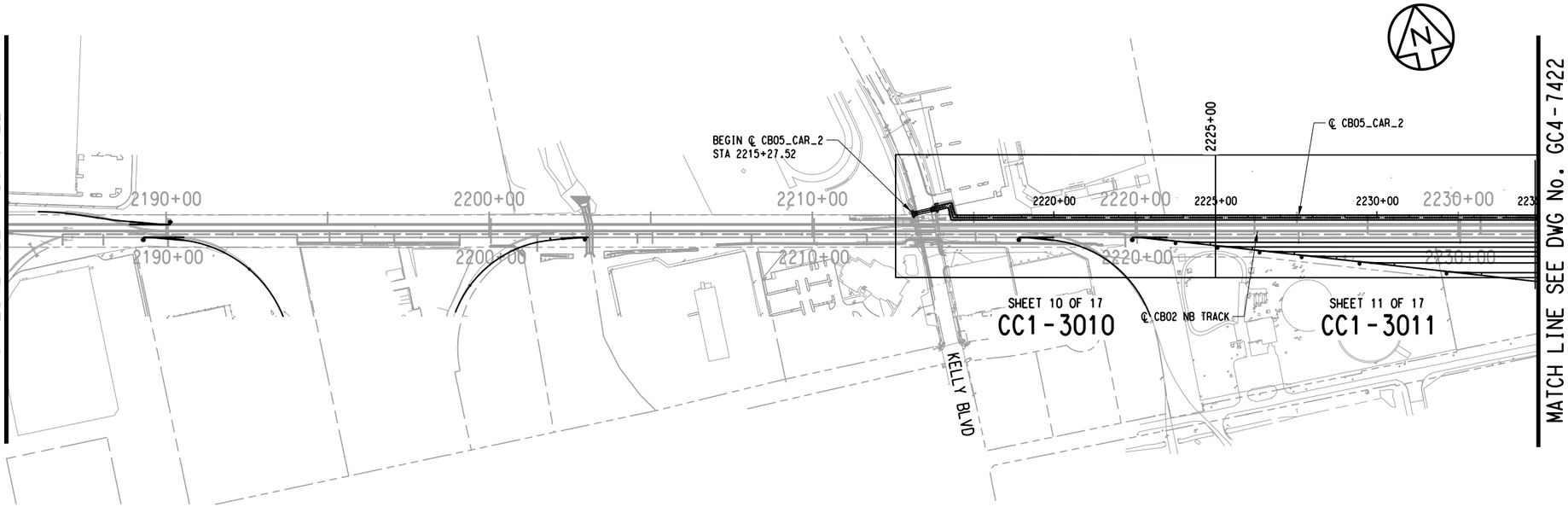
CITY OF CARROLLTON PEDESTRIAN TRAIL KEY MAP SHEET 1 OF 3

CONTRACT	DWG No.	REV
C-2033270-01	GC4-7420	D

CB05-GC4-7420.200

DWG No. GC4-7421





21-JUL-2023 15:52
CB05-GC4-7421.200

ssaleh
Default

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FINAL 100% DESIGN

CONTRACT SHEET No. 12 OF 345

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

IN-PROGRESS REVIEW
THIS DOCUMENT IS RELEASED FOR THE PURPOSE OF REVIEW UNDER THE AUTHORITY OF:
DANNY LUU, P.E., 91884
ON
21-JUL-2023 15:52
ARS
TBPELS FIRM NO. F-819/10131900
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Jacobs
1999 BRYAN ST, SUITE 1200
DALLAS, TX 75201-3136
Phone: +1 (214) 638-0145
FIRM REGISTRATION No. F-2966

ARS ENGINEERS, INC.
12801 N Central Expressway, Suite 1250
Dallas, Texas 75243
(214) 739-3152 Fax (214) 739-3169
FIRM NO. F-819

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SCALE	NO SCALE
DRAWN	C. BAGBY
DESIGNED	C. BAGBY
CHECKED	D. LUU
IN CHARGE	D. LUU
DATE	07 AUG 23

CAES

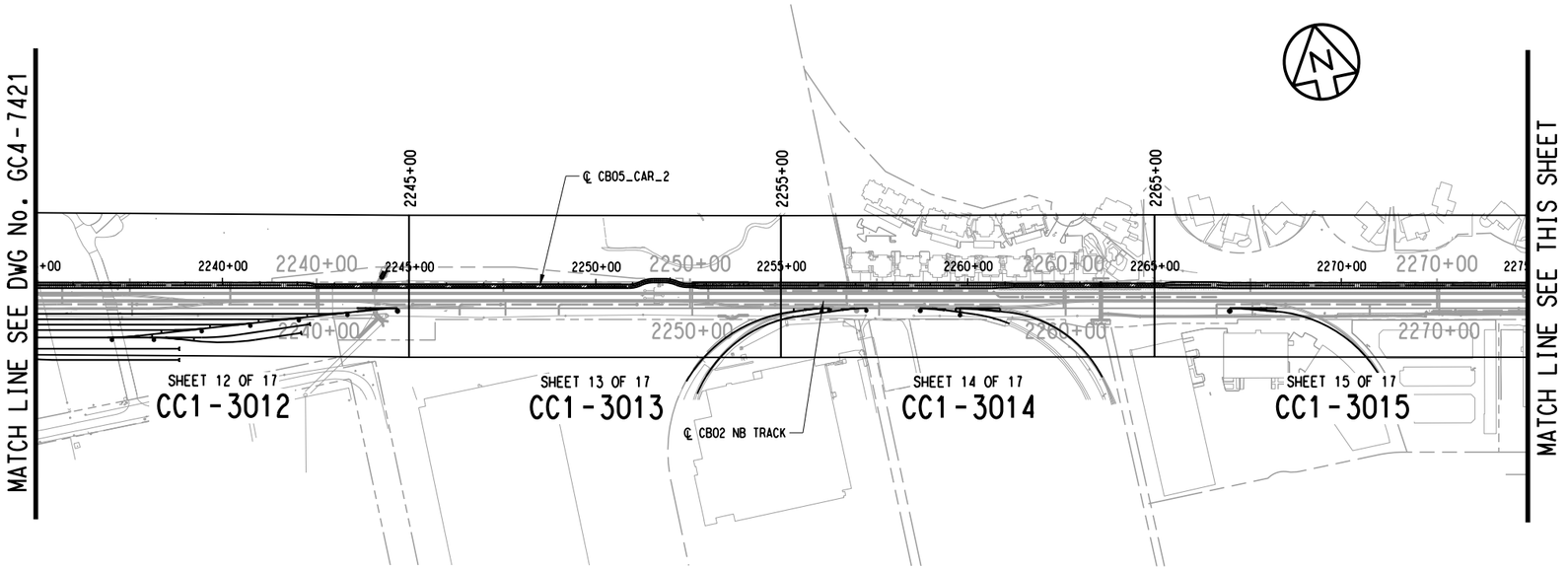
COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

CITY OF CARROLLTON
PEDESTRIAN TRAIL KEY MAP
SHEET 2 OF 3

CONTRACT	DWG No.	REV
C-2033270-01	GC4-7421	D

CB05-GC4-7421.200

DWG No. GC4-7422



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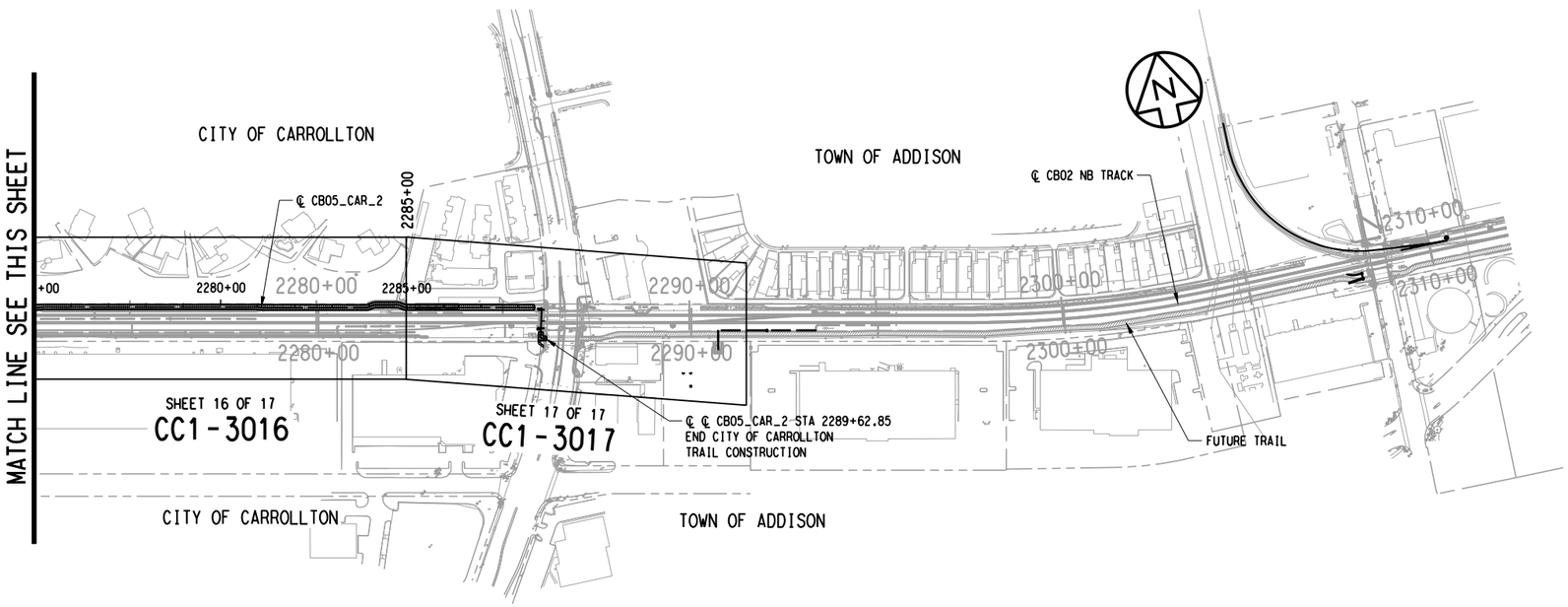

21-JUL-2023 15:52
CB05-GC4-7422.200

ssaleh
Default

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CONTRACT SHEET No. 13 OF 345

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

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FIRM NO. F-819

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SCALE	NO SCALE
DRAWN	C. BAGBY
DESIGNED	C. BAGBY
CHECKED	D. LUU
IN CHARGE	D. LUU
DATE	07 AUG 23

CAES

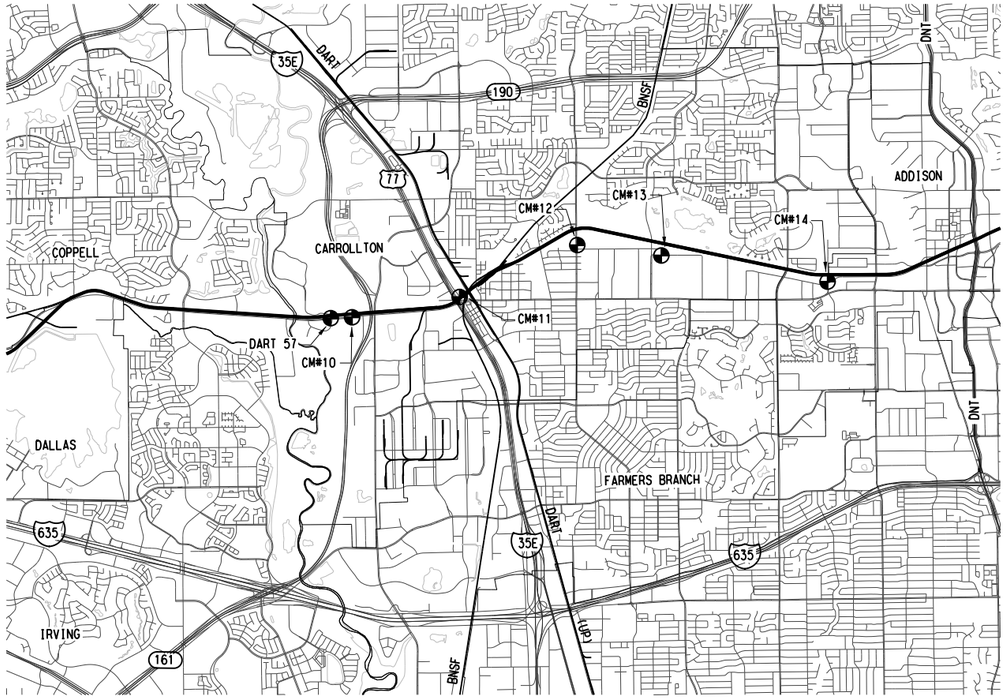
COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

CITY OF CARROLLTON
PEDESTRIAN TRAIL KEY MAP
SHEET 3 OF 3

CONTRACT	DWG No.	REV
C-2033270-01	GC4-7422	D

CB05-GC4-7422.200

DWG No. RC1-7400



SCALE (IN FEET)
0 8000 16000

COTTON BELT GEODETIC NETWORK CONTROL NOTES:

1. ALL PRIMARY CONTROL POINTS SET BY JACOBS ARE 31/2 INCH BRASS MONUMENTS STAMPED "DART CM# XX JACOBS ENGINEERING CONTROL MARKER" WITH A 3 FOOT TO 4 FOOT IRON ROD SET IN CONCRETE TO NO REFUSAL PER STANDARDS IN THE DART SURVEY RIGHT-OF-WAY AND SUBSURFACE UTILITY ENGINEERING MANUAL.
2. BASIS OF BEARING FOR THIS PROJECT IS TEXAS COORDINATE SYSTEM, NORTH CENTRAL ZONE (4202), NAD83 (ADJ 2011), NAVD 1988, GEOID 12A.
3. ALL COORDINATES AND DISTANCES SHOWN HEREON ARE PROJECT SURFACE VALUES EXPRESSED IN US SURVEY FEET WITH A GRID TO GROUND SCALE FACTOR OF 1.000136506 UNLESS OTHERWISE NOTED FOR GRID CONVERSION ILLUSTRATIONS AS USED BY THE TXDOT DALLAS DISTRICT FOR DALLAS COUNTY.
4. THE HORIZONTAL DATUM IS BASED ON NAD 83 (ADJUSTMENT 2011) DERIVED FROM THE PUBLISHED POSITIONS FOR (CORS) STATIONS ZFW1 AND TXCO.
5. THE ELEVATIONS FROM THE PRIMARY CONTROL SET BY JACOBS ENGINEERING GROUP ARE PUBLISHED BENCHMARKS FOR THIS PROJECT.
6. JACOBS BENCHMARKS WERE BASED ON DART 57 MONUMENT PUBLISHED BY MICHAEL MCGUINNESS RPLS#1965 ON FEBRUARY 19, 2009. DIGITAL LEVEL LOOPS WERE RAN FROM THIS MONUMENT IN OPPOSITE DIRECTIONS THROUGH JACOBS PRIMARY CONTROL MONUMENTS CONSTRUCTED ALONG THE VICINITY OF THE DART RAIL RIGHT-OF-WAY. VERTICAL DELTA BETWEEN JACOBS PRIMARY CONTROL AND ANY VRS NETWORK CAN BE 0.20 +/-.
7. ALL TOPOGRAPHIC SURVEYING AND CONSTRUCTION STAKING MUST BE BASED ON THE PRIMARY CONTROL SHOWN HEREON.
8. ALL TOPOGRAPHIC SURVEYING MUST BE PERFORMED UNDER THE SUPERVISION OF A REGISTERED PROFESSIONAL LAND SURVEYOR IN THE STATE OF TEXAS ACCORDING TO DART SPECIFICATIONS PUBLISHED IN DART SURVEY, ROW AND SUE MANUAL CHAPTER 6, DATED 4/22/03
9. THIS ON THE GROUND SURVEY WAS PERFORMED IN APRIL OF 2019.
10. THESE MONUMENTS ARE SUBJECT TO THE DYNAMIC FORCES OF NATURE AND OTHER OBJECTS THAT CAN DAMAGE THE INTEGRITY OF THE REPORTED VALUES SHOWN HEREON.
11. ANY DAMAGED MONUMENTS FOUND MUST BE REPORTED TO JACOBS ENGINEERING GROUP, INC.

Point ID	Northing (Surface)	Easting (Surface)	Elevation	Northing (Grid)	Easting (Grid)	Latitude (Global)	Longitude (Global)	Ellipsoid Height (Global)	Feature Code
CM#10	7,033,687.415	2,450,726.500	444.220	7,032,727.406	2,450,392.007	32°57'05.61185"	-96°55'44.02398"	355.941	3½ INCH BRASS DISK STAMPED DART-JACOBS ENGINEERING-CM#10-DART CONTROL
CM#11	7,034,761.824	2,456,405.782	448.490	7,033,801.668	2,456,070.514	32°57'15.39548"	-96°54'37.19457"	360.499	3½ INCH BRASS DISK STAMPED DART-JACOBS ENGINEERING-CM#11-DART CONTROL
CM#12	7,037,500.695	2,462,617.946	511.778	7,036,540.165	2,462,281.830	32°57'41.55450"	-96°53'23.80868"	423.968	3½ INCH BRASS DISK STAMPED DART-JACOBS ENGINEERING-CM#12-DART CONTROL
CM#13	7,036,950.615	2,467,056.041	534.361	7,035,990.160	2,466,719.319	32°57'35.43674"	-96°52'31.82791"	446.722	3½ INCH BRASS DISK STAMPED DART-JACOBS ENGINEERING-CM#13-DART CONTROL
CM#14	7,035,569.730	2,475,835.819	596.059	7,034,609.463	2,475,497.899	32°57'20.42106"	-96°50'49.05550"	508.767	3½ INCH BRASS DISK STAMPED DART-JACOBS ENGINEERING-CM#14-DART CONTROL
DART_57	7,033,641.310	2,449,595.750	442.050	7,032,681.307	2,449,261.411	32°57'05.32285"	-96°55'57.29990"	353.732	3¼ INCH BRASS DISK STAMPED DART MOUNMENT NO. 57

NOT AN APPROVED DRAWING
FINAL 100% DESIGN

CONTRACT SHEET No. 14 OF 345

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

IN-PROGRESS REVIEW
THIS DOCUMENT IS RELEASED FOR THE PURPOSE OF REVIEW UNDER THE AUTHORITY OF:
MARK E. KEETON, R.P.L.S., 6790
ON
31-JUL-2023 09:42
JACOBS
TBPE FIRM NO. F-2966
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Jacobs
1999 BRYAN ST, SUITE 1200
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FIRM REGISTRATION No. F-2966

ARCHER WESTERN HERZOG

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SCALE	1"=8000'
DRAWN	A. PITCHFORD
DESIGNED	A. PITCHFORD
CHECKED	W. KEETON
IN CHARGE	W. KEETON
DATE	07 AUG 23

CAES

COTTON BELT REGIONAL RAIL VELOWEB HIKE & BIKE TRAIL

HORIZONTAL AND VERTICAL CONTROL SHEET 1 OF 2

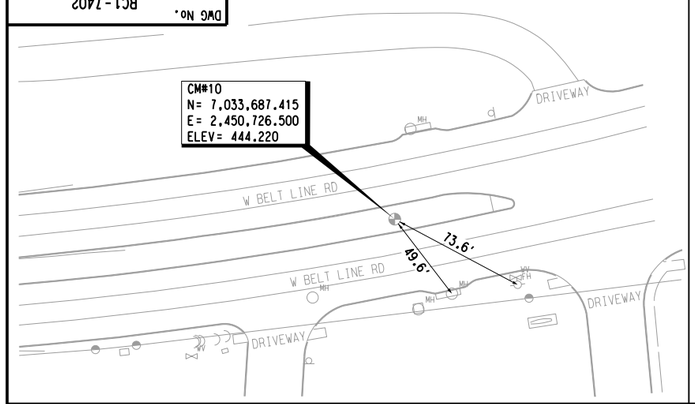
CONTRACT	DWG No.	REV
C-2033270-01	RC1-7400	D

CB00-RC1-7400.08k

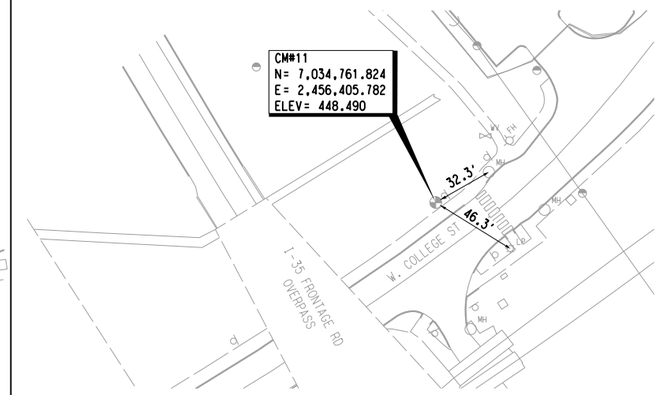
31-JUL-2023 09:42
CB00-RC1-7400.08k

JEGSVCPWU01
Default

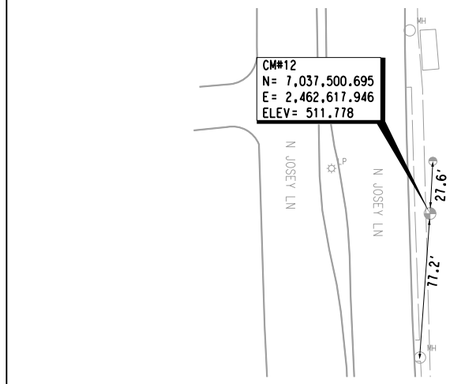
DWG No. RC1-7402



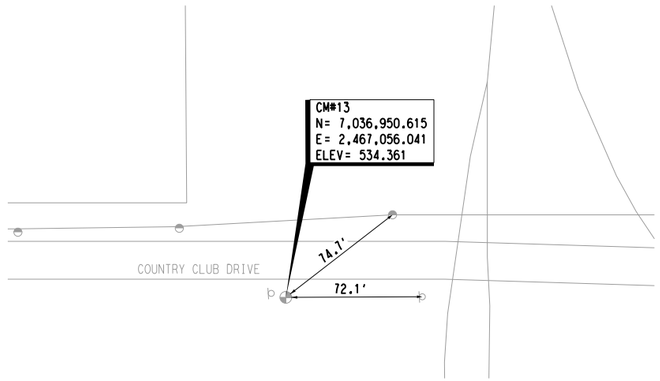
CM#10 IS LOCATED IN THE CENTER MEDIAN OF WEST BELT LINE ROAD, 960 FEET WEST OF PRESIDENT GEORGE BUSH TURNPIKE, APPROXIMATELY 73.6 FEET NORTHWEST OF A FIRE HYDRANT AND 49.6 FEET NORTHWEST OF A STORM DRAIN MANHOLE.



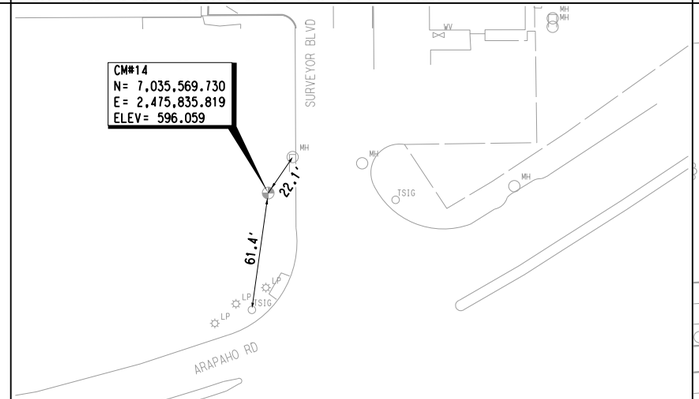
CM#11 IS LOCATED IN THE NORTH RIGHT-OF-WAY OF WEST COLLEGE STREET ON THE NORTHEAST SIDE OF I-35 AND COLLEGE STREET, 475 FEET WEST OF NORTH BROADWAY STREET, APPROXIMATELY 46.3 FEET NORTHWEST OF A LIGHT POLE AND 32.3 FEET SOUTHWEST OF A STORM DRAIN MANHOLE.



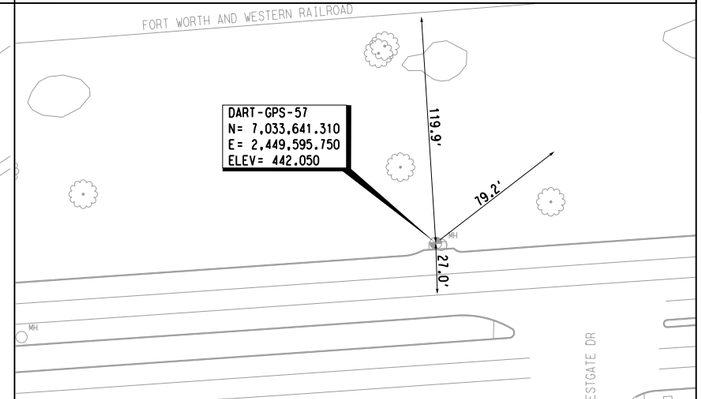
CM#12 IS LOCATED IN THE EAST RIGHT-OF-WAY OF NORTH JOSEY LANE, 200 FEET NORTH OF COUNTRY CLUB DRIVE, APPROXIMATELY 77.2 FEET NORTH OF A STORM DRAIN MANHOLE AND 27.6 FEET SOUTH OF A POWER POLE.



CM#13 IS LOCATED IN THE SOUTH RIGHT-OF-WAY OF COUNTRY CLUB DRIVE, 500 FEET EAST OF KELLY BOULEVARD, APPROXIMATELY 74.7 FEET SOUTHWEST OF A POWER POLE AND 72.1 FEET WEST OF A RAILROAD CROSSING SIGN.



CM#14 IS LOCATED AT THE NORTHWEST INTERSECTION OF ARAPAHO ROAD AND SURVEYOR BOULEVARD, 600 FEET NORTH OF BELT LINE ROAD, APPROXIMATELY 61.4 FEET NORTH OF A TRAFFIC SIGNAL AND 22.1 FEET SOUTHWEST OF A STORM DRAIN MANHOLE.



THE STATION IS A 3¼" BRASS DOMED DART DISK SET IN A CONCRETE CURB INLET. IT IS LOCATED 27.0' NORTH OF THE CENTERLINE OF THE WEST BOUND LANES OF E. BELT LINE RD.; 119.9' SOUTH OF THE CENTERLINE OF THE TRACKS; AND 79.2' SOUTHWEST OF A BURIED FIBER OPTIC CABLE SIGN.

SCALE (IN FEET)
0 40 80

COTTON BELT GEODETIC NETWORK CONTROL NOTES:

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CONTRACT SHEET No. 15 OF 345

31-JUL-2023 09:41
CB00-RC1-7402.040

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REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

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ON
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TBPE FIRM NO. F-2966
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1999 BRYAN ST, SUITE 1200
DALLAS, TX 75201-3136
Phone: +1 (214) 638-0145
FIRM REGISTRATION No. F-2966

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SCALE	1"=40'
DRAWN	A. PITCHFORD
DESIGNED	A. PITCHFORD
CHECKED	M. KEETON
IN CHARGE	M. KEETON
DATE	07 AUG 23

CAES

COTTON BELT REGIONAL RAIL VELOWEB HIKE & BIKE TRAIL

HORIZONTAL AND VERTICAL CONTROL SHEET 2 OF 2

CONTRACT	DWG No.	REV
C-2033270-01	RC1-7402	D

CB00-RC1-7402.040

DWG No. GC5-1429

31-JUL-2023 09:39
CB05-GC5-7429.010

JEGSVCPW001
Default

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

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KYLE MOYNIHAN, P.E., 125696
ON
31-JUL-2023 09:39
IEA
TBPE FIRM NO. F-10161

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1999 BRYAN ST, SUITE 1200
DALLAS, TX 75201-3136
Phone: +1 (214) 638-0145
FIRM REGISTRATION No. F-2966

IEA
18383 PRESTON ROAD, SUITE 500
DALLAS, TX 75252
Phone: +1 (214) 884-4253
Firm Registration: F-10161

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CONTRACT SHEET No. 16 OF 345

SCALE	NO SCALE
DRAWN	M. JAHN
DESIGNED	M. JAHN
CHECKED	B. ALLDREDGE
IN CHARGE	K. MOYNIHAN
DATE	07 AUG 23

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

CITY OF CARROLLTON
GENERAL NOTES

CONTRACT	DWG No.	REV
C-2033270-01	GC5-7429	D

CB05-GC5-7429.010

DWG No. GC5-7430

SUMMARY OF STRUCTURAL ITEMS

ITEM NUMBER		400	400	416	416	420	420	420	422	422	432	4196
DESC. CODE		6001	6005	6004	6005	6013	6029	6037	6001	6015	6031	6001
SHEET NO.		STRUCT EXCAV	CEM STABIL BKFL	DRILL SHAFT (36 IN)	DRILL SHAFT (42 IN)	CL C CONC (ABUT)	CL C CONC (CAP)	CL C CONC (COL)	REINF CONC SLAB	APPROACH SLAB	RIPRAP STONE PROTECTION (12 IN)	PREFAB PED STL TRUSS BRDG SPAN
		CY	CY	LF	LF	CY	CY	CY	SF	CY	CY	EA
BRIDGE LAYOUTS												
BRIDGE 17P		21	14	283	774	12	67	18	13769	19	21	8
SUBTOTALS		21	14	283	774	12	67	18	13769	19	21	8

NOTES:

1. BID ITEMS LISTED ARE FOR INFORMATION ONLY.

SUMMARY OF CIVIL ITEMS

			TXDOT ITEMS									DART ITEMS		NCTCOG ITEMS					
ITEM NUMBER			110	132	360	432	450	495	530	531	644	666	2830	2100	305.2	802.2	703.3	701.2	701.2	
DESC. CODE			6001	6007	6002	6001	6103	6002	6004	6001	6001	6170	1002	1002	1001	1002	1003	1006	1007	
SHEET NO.	LOCATION		EXCAVATION (ROADWAY)	"EMBANKMENT (FINAL) (ORD COMP) (TY D)"	"CONC PVMT (CONT REINF CRCP) (8"")"	RIPRAP (CONC) (4")	"RAIL (TY PR11)"	RAISE EXISTING STRUCT	"DRIVEWAYS (CONC)"	CONC SIDEWALKS (4")	SMALL SIGN INSTALLATION	REFL PAV MRK TY II (W) 4" (SLD)	CHAIN LINK FENCE	SITE PREPARATION	CURB RAMP	CONC SIDEWALK WALL	BOLLARD	RELOCATE ELECTRIC TRANSFORMER BOX	RELOCATE POWER POLE	BOARDWALK
	STA	STA	CY	CY	SY	CY	LF	EA	SY	SY		LF	LF	LS	SY	LF	EA	EA	EA	SY
1 OF 17	2039+25	2045+00	1,055	208	725				58						13		1			
2 OF 17	2045+00	2055+00	105	161	90		1,820		32		5				13		1			1,551
3 OF 17	2055+00	2065+00	22	132	240		3,593					226			33		2			1,166
4 OF 17	2065+00	2075+00																		1,704
5 OF 17	2075+00	2085+00	2	42	58	4	48									22				194
6 OF 17	2085+00	2095+00	213	1,720	1,339		17						394							
7 OF 17	2095+00	2105+00	297	111	763					7		384	381		14		2			
8 OF 17	2105+00	2109+53										420								
9 OF 17	10+00	14+31	63	14						428					3			1		
10 OF 17	2215+28	2225+00	3	82	147		63	1		17		94			20	63	2		1	1,367
11 OF 17	2225+00	2235+00																		1,667
12 OF 17	2235+00	2245+00	227	156	279		5,410			56									6	1,242
13 OF 17	2245+00	2255+00	411	385	611		1,486			122										627
14 OF 17	2255+00	2265+00	26	690	417		1,667			82									2	1,027
15 OF 17	2265+00	2275+00	2	64	28		1,030												2	1,619
16 OF 17	2275+00	2285+00					2,000				3								4	1,536
17 OF 17	2285+00	2289+63		11	37		344			12					8		1		1	573
SUBTOTALS			2,425	3,777	4,732	4	17,477	1	90	724	8	1,124	775	1	104	85	9	1	16	14,272

SUMMARY OF RETAINING WALL ITEMS

		TXDOT ITEMS			
*ITEM NUMBER		132	423	432	556
DESC. CODE		6008	6001	6045	6006
WALL NO.		"*EMBANKMENT (FINAL) (DENS CONT) (TY D)"	RETAINING WALL (MSE)	RIPRAP (MOW STRIP) (4 IN)	PIPE UNDERDRAINS (TY 6) (6")
		CY	SF	CY	LF
RETAINING WALL LAYOUTS					
RW_T_R2085	1 OF 1	38	254	1	43
RW_T_L2244	1 OF 1	938	7022	21	843
RW_T_L2261	1 OF 1	528	4108	12	501
TOTAL		1504	11385	34	1387

SUMMARY OF REMOVAL ITEMS

ITEM NUMBER			104	104	104	104	496	496	701.2	701.2	701.2
DESC. CODE			6001	6002	6015	6029	6006	6007	1010	1011	1012
SHEET NO.	LOCATION		REMOVE EXISTING PAVEMENT	REMOVING CONC (RIPRAP)	REMOVE EXISTING SIDEWALK	REMOVE CURB & GUTTER	REMOVING CONC (HEADWALL)	REMOVE RCP	REMOVE EXIST SIGN	REMOVE & RESET EXIST FENCE	REMOVE & RESET EXIST BRICK WALL
	STA	STA	SY	SY	SY	LF	EA	LF	EA	LF	LF
REMOVAL LAYOUTS											
1 OF 17	2039+24.50	2055+00	72			48	1	12			
2 OF 17	2055+00	2075+00	11		12	56	2		1		
3 OF 17	2075+00	2095+00		18							
4 OF 17	2095+00	2109+53			127						
5 OF 17	2215+28	2235+00				65				322	
6 OF 17	2235+00	2255+00	45	170			1				
7 OF 17	2255+00	2275+00		54			1				
8 OF 17	2275+00	2289+63		162	18	15				374	8
SUBTOTALS			128	404	157	184	5	12	1	696	8

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CONTRACT SHEET No. 17 OF 345

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

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DALLAS, TX 75252
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Firm Registration: F-10161

ARCHER WESTERN HERZOG

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DESIGNED	M. JAHN
CHECKED	B. ALLDREDGE
IN CHARGE	K. MOYNAHAN
DATE	07 AUG 23

CAES

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

CITY OF CARROLLTON
BID ITEMS SUMMARY
SHEET 1 OF 2

CONTRACT	DWG No.	REV
C-2033270-01	GC5-7430	D

CB05-GC5-7430.010

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CB05-GC5-7430.010

JEGSVCPW001
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DWG No. GC5-7431

SUMMARY OF DRAINAGE ITEMS

			TXDOT ITEMS														
ITEM NUMBER			402	432	432	464	464	464	465	465	465	465	466	467	467	467	467
DESC. CODE			6001	6010	6031	6003	6005	6008	6070	6071	6073	6074	6195	6356	6388	6389	6451
SHEET NO.	LOCATION		TRENCH EXCAVATION PROTECTION	RIPRAP (CONC) (CL B)(5 IN)	RIPRAP (STONE PROTECTION) (12 IN)	RC PIPE (CL III) (18 IN)	RC PIPE (CL III) (24 IN)	RC PIPE (CL III) (36 IN)	INLET (COMPL) (PSL)(RC) (3FTX3FT)	INLET (COMPL) (PSL)(RC) (4FTX4FT)	INLET (COMPL) (PSL)(RC) (4FTX5FT)	INLET (COMPL) (PSL)(RC) (5FTX5FT)	WINGWALL (PW -2) (HW=6FT)	SET (TY II) (18 IN) (RCP) (3:1) (C)	SET (TY II) (24 IN) (RCP) (3:1) (C)	SET (TY II) (24 IN) (RCP) (3:1) (P)	SET (TY II) (36 IN) (RCP) (4:1) (P)
	STA	STA	LF	CY	CY	LF	LF	LF	EA	EA	EA	EA	EA	EA	EA	EA	EA
DRAINAGE LAYOUTS																	
1 OF 15	2039+24.50	2041+50.00					64									2	
2 OF 15	2041+50.00	2051+50.00															
3 OF 15	2051+50.00	2062+50.00					100									2	
4 OF 15	2062+50.00	2072+50.00						126									
5 OF 15	2072+50.00	2082+50.00	51	65				70									1
6 OF 15	2082+50.00	2091+00.00	305			5	20	831		1		2		1	2		
7 OF 15	2091+00.00	2101+00.00	401			15	45	510	1	2	1	1		1	3		
8 OF 15	2215+33.34	2222+50.00			333												
9 OF 15	2222+50.00	2232+50.00			585												
10 OF 15	2232+50.00	2242+50.00			386												
11 OF 15	2242+50.00	2252+50.00			139								1				
12 OF 15	2252+50.00	2262+50.00			99												
13 OF 15	2262+50.00	2272+50.00			240												
14 OF 15	2272+50.00	2282+50.00															
15 OF 15	2282+50.00	2292+00.00			115												
SUBTOTALS			757	65	1897	20	229	1537	1	3	1	3	1	2	5	4	1

SUMMARY OF DRAINAGE ITEMS

			DART ITEMS		UPRR ITEMS	
ITEM NUMBER			2700	2700	33 42 16	33 42 16
DESC. CODE			1001	1002	1001	1002
SHEET NO.	LOCATION		DART PIPE UNDERDRAINS (10")	DART PIPE UNDERDRAINS (18")	UPRR REINFORCED CONC. BOX (5FT X 5FT)	UPRR REINFORCED CONC. BOX (6FT X 6FT)
	STA	STA	LF	LF	LF	LF
DRAINAGE LAYOUTS						
1 OF 15	2039+24.50	2041+50.00				
2 OF 15	2041+50.00	2051+50.00				
3 OF 15	2051+50.00	2062+50.00	5			
4 OF 15	2062+50.00	2072+50.00				
5 OF 15	2072+50.00	2082+50.00				
6 OF 15	2082+50.00	2091+00.00		6		
7 OF 15	2091+00.00	2101+00.00		5		
8 OF 15	2215+33.34	2222+50.00				
9 OF 15	2222+50.00	2232+50.00				
10 OF 15	2232+50.00	2242+50.00				
11 OF 15	2242+50.00	2252+50.00				22
12 OF 15	2252+50.00	2262+50.00				
13 OF 15	2262+50.00	2272+50.00			10	
14 OF 15	2272+50.00	2282+50.00				
15 OF 15	2282+50.00	2292+00.00				
SUBTOTALS			5	11	10	22

SUMMARY OF SW3P ITEMS

			NCTCOG ITEMS					
ITEM NUMBER			202.5	202.9	202.11	202.14	203.6	204.6
DESC. CODE			0001	0001	0001	0001	0001	0001
SHEET NO.	LOCATION		SILT FENCE	CHECK DAM (ROCK)	STABILIZED CONSTRUCTION EXIT	INLET PROTECTION	DUST CONTROL	SEEDING TURFGRASS
	STA	STA	LF	CY	SY	EA	K GAL	SY
SW3P LAYOUTS								
1 OF 15	2039+24.51	2041+50	330				46	1,042
2 OF 15	2041+50	2051+50	1,064		156	1	112	2,562
3 OF 15	2051+50	2062+67.60	972	18	312	2	35	795
4 OF 15	2062+67.60	2072+67.60	1,001					
5 OF 15	2072+67.60	2082+73.20	1,118	27			80	1,836
6 OF 15	2082+73.20	2092+79.72	1,171				86	1,977
7 OF 15	2092+79.72	2100+78.68	718	9	156	1	34	775
8 OF 15	2216+00	2222+36.16	1,193		156	1	4	85
9 OF 15	2222+36.16	2232+35.54	1,999					
10 OF 15	2232+35.54	2242+34.96	1,198					
11 OF 15	2242+34.96	2252+84.58	1,054	18				
12 OF 15	2252+84.58	2262+29.37	1,000	9				
13 OF 15	2262+29.37	2272+33.91	988	9				
14 OF 15	2272+33.91	2282+33.94	1,018					
15 OF 15	2282+33.94	2290+50	705		156	1	19	419
SUBTOTALS			15,529	90	936	6	416	9,491

SUMMARY OF TRAFFIC CONTROL ITEMS

ITEM NUMBER		
DESC. CODE		
SHEET NO.	LOCATION	TRAFFIC CONTROL
		LS
TCP LAYOUTS		
1 OF 5	LUNA ROAD	
2 OF 5	LUNA ROAD	
3 OF 5	COLLEGE STREET	
4 OF 5	KELLY BLVD	
5 OF 5	MARSH LANE	
SUBTOTALS		1

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CONTRACT SHEET No. 18 OF 345

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DESIGNED	M. JAHN
CHECKED	B. ALLDREDGE
IN CHARGE	K. MOYNAHAN
DATE	11 AUG 23

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COTTON BELT REGIONAL RAIL VELOWEB HIKE & BIKE TRAIL

CITY OF CARROLLTON
BID ITEMS SUMMARY
SHEET 2 OF 2

CONTRACT	DWG No.	REV
C-2033270-01	GC5-7431	D

CB05-GC5-7431.010

DWG No. CC1-2101

<* 1 Describe Chain CAR_1

Chain CAR_1 contains:
 0032 CUR CAR_11 CUR CAR_12 CUR CAR_13 CUR CAR_14 CUR CAR_15 CUR CAR_16 CUR CAR-
_17 0033 0034 0035 0036 CUR CAR_18 CUR CAR_19 0037 0038 0039 0040 0041 0042 004-
3 CUR CAR_110 CUR CAR_111 CUR CAR_112 CUR CAR_113 CUR CAR_114 CUR CAR_115 CUR C-
AR_116 CUR CAR_117 CUR CAR_118 CUR CAR_119 0044

Beginning chain CAR_1 description
==========

Point 0032 N 7,033,870.8966 E 2,450,333.3265 Sta 2039+24.50

Course from 0032 to PC CAR_11 S 4° 21' 43.84" E Dist 56.0434

Curve Data

Curve CAR_11
P.I. Station 2040+60.54 N 7,033,735.2473 E 2,450,343.6740
Delta = 90° 00' 00.00" (LT)
Degree = 71° 37' 11.01"
Tangent = 80.0000
Length = 125.6637
Radius = 80.0000
External = 33.1371
Long Chord = 113.1371
Mid. Ord. = 23.4315
P.C. Station 2039+80.54 N 7,033,815.0156 E 2,450,337.5892
P.T. Station 2041+06.21 N 7,033,741.3322 E 2,450,423.4423
C.C. N 7,033,821.1004 E 2,450,417.3574
Back = S 4° 21' 43.84" E
Ahead = N 85° 38' 16.16" E
Chord Bear = S 49° 21' 43.84" E

Course from PT CAR_11 to PC CAR_12 N 85° 38' 16.16" E Dist 278.1310

Curve Data

Curve CAR_12
P.I. Station 2044+02.74 N 7,033,763.8871 E 2,450,719.1210
Delta = 27° 34' 42.10" (RT)
Degree = 76° 23' 39.74"
Tangent = 18.4067
Length = 36.1000
Radius = 75.0000
External = 2.2257
Long Chord = 35.7525
Mid. Ord. = 2.1616
P.C. Station 2043+84.34 N 7,033,762.4870 E 2,450,700.7676
P.T. Station 2044+20.44 N 7,033,756.6311 E 2,450,736.0372
C.C. N 7,033,687.7043 E 2,450,706.4721
Back = N 85° 38' 16.16" E
Ahead = S 66° 47' 01.75" E
Chord Bear = S 80° 34' 22.80" E

Curve Data

Curve CAR_13
P.I. Station 2044+44.58 N 7,033,747.1140 E 2,450,758.2250
Delta = 35° 41' 13.64" (LT)
Degree = 76° 23' 39.74"
Tangent = 24.1428
Length = 46.7143
Radius = 75.0000
External = 3.7901
Long Chord = 45.9629
Mid. Ord. = 3.6077
P.C. Station 2044+20.44 N 7,033,756.6311 E 2,450,736.0372
P.T. Station 2044+67.15 N 7,033,752.3275 E 2,450,781.7982
C.C. N 7,033,825.5579 E 2,450,765.6023
Back = S 66° 47' 01.75" E
Ahead = N 77° 31' 44.61" E
Chord Bear = S 84° 37' 38.57" E

Course from PT CAR_13 to PC CAR_14 N 77° 31' 44.61" E Dist 69.0495

Curve Data

Curve CAR_14
P.I. Station 2045+52.79 N 7,033,770.8199 E 2,450,865.4125
Delta = 24° 56' 21.10" (LT)
Degree = 76° 23' 39.74"
Tangent = 16.5854
Length = 32.6453
Radius = 75.0000
External = 1.8119
Long Chord = 32.3882
Mid. Ord. = 1.7692
P.C. Station 2045+36.20 N 7,033,767.2383 E 2,450,849.2185
P.T. Station 2045+68.85 N 7,033,780.8957 E 2,450,878.5864
C.C. N 7,033,840.4688 E 2,450,833.0227
Back = N 77° 31' 44.61" E
Ahead = N 52° 35' 23.50" E
Chord Bear = N 65° 03' 34.06" E

Course from PT CAR_14 to PC CAR_15 N 52° 35' 23.50" E Dist 57.0484

Curve Data

Curve CAR_15
P.I. Station 2046+47.78 N 7,033,828.8506 E 2,450,941.2857
Delta = 32° 32' 16.71" (RT)
Degree = 76° 23' 39.74"
Tangent = 21.8875
Length = 42.5921
Radius = 75.0000
External = 3.1285
Long Chord = 42.0221
Mid. Ord. = 3.0032
P.C. Station 2046+25.90 N 7,033,815.5536 E 2,450,923.9003
P.T. Station 2046+68.49 N 7,033,830.7095 E 2,450,963.0941
C.C. N 7,033,755.9805 E 2,450,969.4641
Back = N 52° 35' 23.50" E
Ahead = N 85° 07' 40.22" E
Chord Bear = N 68° 51' 31.86" E

Course from PT CAR_15 to PC CAR_16 N 85° 07' 40.22" E Dist 812.4219

Curve Data

Curve CAR_16
P.I. Station 2054+99.77 N 7,033,901.3128 E 2,451,791.3741
Delta = 28° 13' 59.55" (RT)
Degree = 76° 23' 39.74"
Tangent = 18.8618
Length = 36.9572
Radius = 75.0000
External = 2.3354
Long Chord = 36.5844
Mid. Ord. = 2.2649
P.C. Station 2054+80.91 N 7,033,899.7108 E 2,451,772.5804
P.T. Station 2055+17.87 N 7,033,893.8336 E 2,451,808.6897
C.C. N 7,033,824.9818 E 2,451,778.9504
Back = N 85° 07' 40.22" E
Ahead = S 66° 38' 20.23" E
Chord Bear = S 80° 45' 20.01" E

Curve Data

Curve CAR_17
P.I. Station 2055+34.03 N 7,033,887.4229 E 2,451,823.5316
Delta = 24° 19' 45.88" (LT)
Degree = 76° 23' 39.74"
Tangent = 16.1672
Length = 31.8471
Radius = 75.0000
External = 1.7227
Long Chord = 31.6084
Mid. Ord. = 1.6841
P.C. Station 2055+17.87 N 7,033,893.8336 E 2,451,808.6897
P.T. Station 2055+49.71 N 7,033,887.6962 E 2,451,839.6965
C.C. N 7,033,962.6855 E 2,451,838.4290
Back = S 66° 38' 20.23" E
Ahead = N 89° 01' 53.88" E
Chord Bear = S 78° 48' 13.17" E

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DESIGNED	S. SALEH
CHECKED	D. LUU
IN CHARGE	D. LUU
DATE	07 AUG 23

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COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

CITY OF CARROLLTON
HORIZONTAL ALIGNMENT DATA
SHEET 1 OF 6

CONTRACT	DWG No.	REV
C-2033270-01	CC1-2101	D

CB05-CC1-2101.001

Course from PT CAR_17 to 0033 N 89° 01′ 53.88" E Dist 158.2678

Point 0033 N 7,033,890.3710 E 2,451,997.9416 Sta 2057+07.98

Course from 0033 to 0034 N 0° 58′ 06.12" W Dist 7.6237

Point 0034 N 7,033,897.9935 E 2,451,997.8128 Sta 2057+15.61

Course from 0034 to 0035 N 31° 15′ 09.90" W Dist 34.3250

Point 0035 N 7,033,927.3375 E 2,451,980.0045 Sta 2057+49.93

Course from 0035 to 0036 N 1° 04′ 01.70" E Dist 60.1970

Point 0036 N 7,033,987.5241 E 2,451,981.1256 Sta 2058+10.13

Course from 0036 to PC CAR_18 N 85° 38′ 16.16" E Dist 1,671.0470

Curve Data

Curve CAR_18					
P.I. Station	2075+09.66	N	7,034,116.7920	E	2,453,675.7346
Delta =	31° 47′ 58.22" (LT)				
Degree =	57° 17′ 44.81"				
Tangent =	28.4853				
Length =	55.5006				
Radius =	100.0000				
External =	3.9779				
Long Chord =	54.7910				
Mid. Ord. =	3.8258				
P.C. Station	2074+81.17	N	7,034,114.6253	E	2,453,647.3319
P.T. Station	2075+36.67	N	7,034,133.6001	E	2,453,698.7324
C.C.		N	7,034,214.3357	E	2,453,639.7258
Back = N	85° 38′ 16.16" E				
Ahead = N	53° 50′ 17.93" E				
Chord Bear = N	69° 44′ 17.04" E				

Curve Data

Curve CAR_19					
P.I. Station	2075+66.26	N	7,034,151.0570	E	2,453,722.6176
Delta =	32° 57′ 40.61" (RT)				
Degree =	57° 17′ 44.81"				
Tangent =	29.5846				
Length =	57.5283				
Radius =	100.0000				
External =	4.2845				
Long Chord =	56.7383				
Mid. Ord. =	4.1084				
P.C. Station	2075+36.67	N	7,034,133.6001	E	2,453,698.7324
P.T. Station	2075+94.20	N	7,034,152.7087	E	2,453,752.1561
C.C.		N	7,034,052.8646	E	2,453,757.7390
Back = N	53° 50′ 17.93" E				
Ahead = N	86° 47′ 58.54" E				
Chord Bear = N	70° 19′ 08.24" E				

Course from PT CAR_19 to 0037 N 85° 38′ 16.16" E Dist 129.6172

Point 0037 N 7,034,162.5675 E 2,453,881.3979 Sta 2077+23.82

Course from 0037 to 0038 N 85° 38′ 16.16" E Dist 112.0003

Point 0038 N 7,034,171.0863 E 2,453,993.0737 Sta 2078+35.82

Course from 0038 to 0039 N 85° 38′ 16.16" E Dist 111.9997

Point 0039 N 7,034,179.6051 E 2,454,104.7490 Sta 2079+47.82

Course from 0039 to 0040 N 85° 38′ 16.16" E Dist 112.0000

Point 0040 N 7,034,188.1239 E 2,454,216.4245 Sta 2080+59.82

Course from 754 to 755 N 85° 38′ 16.16" E Dist 144.0000

Point 755 N 7,034,199.0767 E 2,454,360.0074 Sta 2082+03.82

Course from 755 to 756 N 85° 38′ 16.16" E Dist 98.0000

Point 756 N 7,034,206.5306 E 2,454,457.7235 Sta 2083+01.82

Course from 756 to 757 N 85° 38′ 16.16" E Dist 98.0000

Point 757 N 7,034,213.9846 E 2,454,555.4396 Sta 2083+99.82

Course from 757 to PC CAR_110 N 85° 38′ 16.16" E Dist 116.3974

Curve Data

Curve CAR_110					
P.I. Station	2085+45.20	N	7,034,225.0425	E	2,454,700.4004
Delta =	32° 19′ 41.03" (RT)				
Degree =	57° 17′ 44.81"				
Tangent =	28.9846				
Length =	56.4231				
Radius =	100.0000				
External =	4.1158				
Long Chord =	55.6776				
Mid. Ord. =	3.9531				
P.C. Station	2085+16.22	N	7,034,222.8379	E	2,454,671.4998
P.T. Station	2085+72.64	N	7,034,211.4503	E	2,454,726.0004
C.C.		N	7,034,123.1276	E	2,454,679.1059
Back = N	85° 38′ 16.16" E				
Ahead = S	62° 02′ 02.81" E				
Chord Bear = S	78° 11′ 53.33" E				

Curve Data

Curve CAR_111					
P.I. Station	2086+01.63	N	7,034,197.8581	E	2,454,751.6004
Delta =	32° 19′ 41.03" (LT)				
Degree =	57° 17′ 44.81"				
Tangent =	28.9846				
Length =	56.4231				
Radius =	100.0000				
External =	4.1158				
Long Chord =	55.6776				
Mid. Ord. =	3.9531				
P.C. Station	2085+72.64	N	7,034,211.4503	E	2,454,726.0004
P.T. Station	2086+29.06	N	7,034,200.0627	E	2,454,780.5011
C.C.		N	7,034,299.7730	E	2,454,772.8950
Back = S	62° 02′ 02.81" E				
Ahead = N	85° 38′ 16.16" E				
Chord Bear = S	78° 11′ 53.33" E				

Course from PT CAR_111 to PC CAR_112 N 85° 38′ 16.16" E Dist 450.8782

Curve Data

Curve CAR_112					
P.I. Station	2090+86.82	N	7,034,234.8798	E	2,455,236.9285
Delta =	10° 28′ 31.13" (LT)				
Degree =	76° 23′ 39.74"				
Tangent =	6.8752				
Length =	13.7122				
Radius =	75.0000				
External =	0.3145				
Long Chord =	13.6931				
Mid. Ord. =	0.3132				
P.C. Station	2090+79.94	N	7,034,234.3568	E	2,455,230.0732
P.T. Station	2090+93.65	N	7,034,236.6404	E	2,455,243.5745
C.C.		N	7,034,309.1396	E	2,455,224.3686
Back = N	85° 38′ 16.16" E				
Ahead = N	75° 09′ 45.02" E				
Chord Bear = N	80° 24′ 00.59" E				

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CONTRACT SHEET No. 20 OF 345

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

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Dallas, Texas 75243
(214) 739-3152 Fax (214) 739-3169
FIRM NO. F-819

ARCHER WESTERN HERZOG

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CAES

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

CITY OF CARROLLTON
HORIZONTAL ALIGNMENT DATA
SHEET 2 OF 6

CONTRACT	DWG No.	REV
C-2033270-01	CC1-2102	D

CB05-CC1-2102.001

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Curve Data

Curve CAR_113
P.I. Station 2091+00.53 N 7,034,238.4010 E 2,455,250.2205
Delta = 10° 28' 31.13" (RT)
Degree = 76° 23' 39.75"
Tangent = 6.8752
Length = 13.7122
Radius = 75.0000
External = 0.3145
Long Chord = 13.6931
Mid. Ord. = 0.3132
P.C. Station 2090+93.65 N 7,034,236.6404 E 2,455,243.5745
P.T. Station 2091+07.37 N 7,034,238.9239 E 2,455,257.0758
C.C. N 7,034,164.1412 E 2,455,262.7804
Back = N 75° 09' 45.02" E
Ahead = N 85° 38' 16.16" E
Chord Bear = N 80° 24' 00.59" E

Course from PT CAR_113 to PC CAR_114 N 85° 38' 16.16" E Dist 14.3326

Curve Data

Curve CAR_114
P.I. Station 2095+73.08 N 7,034,274.3469 E 2,455,721.4453
Delta = 26° 03' 59.58" (LT)
Degree = 2° 56' 17.68"
Tangent = 451.3860
Length = 887.1469
Radius = 1,950.0000
External = 51.5617
Long Chord = 879.5159
Mid. Ord. = 50.2335
P.C. Station 2091+21.70 N 7,034,240.0141 E 2,455,271.3669
P.T. Station 2100+08.85 N 7,034,502.9586 E 2,456,110.6573
C.C. N 7,036,184.3652 E 2,455,123.0482
Back = N 85° 38' 16.16" E
Ahead = N 59° 34' 16.57" E
Chord Bear = N 72° 36' 16.36" E

Curve Data

Curve CAR_115
P.I. Station 2100+27.14 N 7,034,512.2235 E 2,456,126.4308
Delta = 62° 44' 51.13" (LT)
Degree = 190° 59' 09.35"
Tangent = 18.2932
Length = 32.8545
Radius = 30.0000
External = 5.1375
Long Chord = 31.2371
Mid. Ord. = 4.3863
P.C. Station 2100+08.85 N 7,034,502.9586 E 2,456,110.6573
P.T. Station 2100+41.70 N 7,034,530.4886 E 2,456,125.4172
C.C. N 7,034,528.8264 E 2,456,095.4633
Back = N 59° 34' 16.57" E
Ahead = N 3° 10' 34.55" W
Chord Bear = N 28° 11' 51.01" E

Course from PT CAR_115 to PC CAR_116 N 3° 10' 34.55" W Dist 59.0094

Curve Data

Curve CAR_116
P.I. Station 2101+69.39 N 7,034,598.0533 E 2,456,190.2798
Delta = 22° 12' 12.80" (LT)
Degree = 16° 22' 12.80"
Tangent = 68.6785
Length = 135.6338
Radius = 350.0000
External = 6.6746
Long Chord = 134.7867
Mid. Ord. = 6.5497
P.C. Station 2101+00.71 N 7,034,589.4074 E 2,456,122.1476
P.T. Station 2102+36.34 N 7,034,631.8052 E 2,456,250.0925
C.C. N 7,034,936.6229 E 2,456,078.0862
Back = N 82° 46' 04.31" E
Ahead = N 60° 33' 51.51" E
Chord Bear = N 71° 39' 57.91" E

Curve Data

Curve CAR_117
P.I. Station 2103+46.84 N 7,034,686.1059 E 2,456,346.3205
Delta = 8° 10' 10.39" (LT)
Degree = 3° 42' 11.47"
Tangent = 110.4917
Length = 220.6088
Radius = 1,547.2028
External = 3.9403
Long Chord = 220.4220
Mid. Ord. = 3.9303
P.C. Station 2102+36.34 N 7,034,631.8052 E 2,456,250.0925
P.T. Station 2104+56.95 N 7,034,753.5299 E 2,456,433.8558
C.C. N 7,035,979.2762 E 2,455,489.7252
Back = N 60° 33' 51.51" E
Ahead = N 52° 23' 41.12" E
Chord Bear = N 56° 28' 46.31" E

Curve Data

Curve CAR_118
P.I. Station 2104+94.87 N 7,034,776.6667 E 2,456,463.8938
Delta = 17° 14' 52.15" (LT)
Degree = 22° 55' 05.92"
Tangent = 37.9157
Length = 75.2578
Radius = 250.0000
External = 2.8588
Long Chord = 74.9740
Mid. Ord. = 2.8265
P.C. Station 2104+56.95 N 7,034,753.5299 E 2,456,433.8558
P.T. Station 2105+32.21 N 7,034,807.6695 E 2,456,485.7210
C.C. N 7,034,951.5883 E 2,456,281.3013
Back = N 52° 23' 41.12" E
Ahead = N 35° 08' 48.96" E
Chord Bear = N 43° 46' 15.04" E

Curve Data

Curve CAR_119
P.I. Station 2105+95.57 N 7,034,859.4761 E 2,456,522.1946
Delta = 15° 09' 48.99" (RT)
Degree = 12° 02' 12.94"
Tangent = 63.3581
Length = 125.9757
Radius = 476.0000
External = 4.1981
Long Chord = 125.6084
Mid. Ord. = 4.1614
P.C. Station 2105+32.21 N 7,034,807.6695 E 2,456,485.7210
P.T. Station 2106+58.19 N 7,034,899.9382 E 2,456,570.9498
C.C. N 7,034,533.6481 E 2,456,874.9359
Back = N 35° 08' 48.96" E
Ahead = N 50° 18' 37.95" E
Chord Bear = N 42° 43' 43.46" E

Course from PT CAR_119 to 758 N 50° 18' 37.95" E Dist 294.5187

Point 758 N 7,035,088.0256 E 2,456,797.5870 Sta 2109+52.70

==========
Ending chain CAR_1 description

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COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

CITY OF CARROLLTON
HORIZONTAL ALIGNMENT DATA
SHEET 3 OF 6

CONTRACT	DWG No.	REV
C-2033270-01	CC1-2103	D

CB05-CC1-2103.001

DWG No. CC1-2301

<* 1 Describe Chain CAR_1A

Chain CAR_1A contains:
 0045 CUR CAR_1A1 CUR CAR_1A2 0046 0047 CUR CAR_1A3 0048 0049 0050 0051 0052

Beginning chain CAR_1A description
==========

Point 0045 N 7,034,589.4074 E 2,456,122.1476 Sta 10+00.00

Course from 0045 to PC CAR_1A1 N 3° 10′ 34.55" W Dist 15.9744

Curve Data

Curve CAR_1A1
P.I. Station = 10+33.75 N 7,034,623.1070 E 2,456,120.2775
Delta = 61° 17′ 56.94" (RT)
Degree = 190° 59′ 09.35"
Tangent = 17.7770
Length = 32.0962
Radius = 30.0000
External = 4.8715
Long Chord = 30.5872
Mid. Ord. = 4.1910
P.C. Station = 10+15.97 N 7,034,605.3573 E 2,456,121.2625
P.T. Station = 10+48.07 N 7,034,632.4950 E 2,456,135.3734
C.C. N 7,034,607.0195 E 2,456,151.2164
Back = N 3° 10′ 34.56" W
Ahead = N 58° 07′ 22.38" E
Chord Bear = N 27° 28′ 23.91" E

Course from PT CAR_1A1 to PC CAR_1A2 N 58° 07′ 22.38" E Dist 312.1578

Curve Data

Curve CAR_1A2
P.I. Station = 13+75.63 N 7,034,805.4789 E 2,456,413.5312
Delta = 8° 48′ 25.57" (LT)
Degree = 28° 38′ 52.40"
Tangent = 15.4016
Length = 30.7426
Radius = 200.0000
External = 0.5921
Long Chord = 30.7123
Mid. Ord. = 0.5904
P.C. Station = 13+60.23 N 7,034,797.3453 E 2,456,400.4524
P.T. Station = 13+90.97 N 7,034,815.5191 E 2,456,425.2105
C.C. N 7,034,967.1818 E 2,456,294.8326
Back = N 58° 07′ 22.38" E
Ahead = N 49° 18′ 56.81" E
Chord Bear = N 53° 43′ 09.60" E

Course from PT CAR_1A2 to 0046 N 49° 18′ 56.81" E Dist 70.3377

Point 0046 N 7,034,861.3715 E 2,456,478.5486 Sta 14+61.31

Course from 0046 to 0047 N 34° 58′ 54.54" E Dist 20.9631

Point 0047 N 7,034,878.5473 E 2,456,490.5671 Sta 14+82.27

Course from 0047 to PC CAR_1A3 N 41° 29′ 15.09" E Dist 6.8821

Curve Data

Curve CAR_1A3
P.I. Station = 15+30.63 N 7,034,914.7694 E 2,456,522.5996
Delta = 9° 28′ 58.78" (RT)
Degree = 11° 27′ 32.96"
Tangent = 41.4721
Length = 82.7547
Radius = 500.0000
External = 1.7170
Long Chord = 82.6603
Mid. Ord. = 1.7111
P.C. Station = 14+89.15 N 7,034,883.7027 E 2,456,495.1262
P.T. Station = 15+71.91 N 7,034,940.8852 E 2,456,554.8160
C.C. N 7,034,552.4742 E 2,456,869.6761
Back = N 41° 29′ 15.09" E
Ahead = N 50° 58′ 13.86" E
Chord Bear = N 46° 13′ 44.47" E

Course from PT CAR_1A3 to 0048 N 50° 58′ 13.86" E Dist 142.0892

Point 0048 N 7,035,030.3616 E 2,456,665.1941 Sta 17+14.00

Course from 0048 to 0049 S 39° 31′ 11.14" E Dist 5.7438

Point 0049 N 7,035,025.9308 E 2,456,668.8491 Sta 17+19.74

Course from 0049 to 0050 N 50° 28′ 48.86" E Dist 82.4820

Point 0050 N 7,035,078.4178 E 2,456,732.4761 Sta 18+02.22

Course from 0050 to 0051 S 88° 35′ 00.26" E Dist 18.5285

Point 0051 N 7,035,077.9597 E 2,456,750.9990 Sta 18+20.75

Course from 0051 to 0052 N 58° 10′ 43.32" E Dist 50.5039

Point 0052 N 7,035,104.5890 E 2,456,793.9120 Sta 18+71.26

==========
Ending chain CAR_1A description

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DESIGNED	S. SALEH
CHECKED	D. LUU
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COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

CITY OF CARROLLTON
HORIZONTAL ALIGNMENT DATA
SHEET 4 OF 6

CONTRACT	DWG No.	REV
C-2033270-01	CC1-2301	D

CB05-CC1-2301.001

DWG No. CC1-2302

<* 1 Describe Chain CAR_2

Chain CAR_2 contains:
0010 0011 0012 0013 0014 CUR CAR_21 CUR CAR_22 CUR CAR_23 CUR CAR_24 0015 0016-
0017 0018 0019 0020 0021 0022 0023 0024 0025 0026 0027 0028 0029 0030 0031

Beginning chain CAR_2 description
==========

Point 0010 N 7,037,767.5113 E 2,466,507.4605 Sta 2215+46.08

Course from 0010 to 0011 N 88° 13′ 14.77" E Dist 77.5299

Point 0011 N 7,037,769.9184 E 2,466,584.9530 Sta 2216+23.61

Course from 0011 to 0012 S 43° 18′ 18.87" E Dist 62.3726

Point 0012 N 7,037,724.5293 E 2,466,627.7334 Sta 2216+85.98

Course from 0012 to 0013 S 78° 13′ 43.92" E Dist 2,363.8654

Point 0013 N 7,037,242.2940 E 2,468,941.8875 Sta 2240+49.85

Course from 0013 to 0014 S 71° 02′ 53.20" E Dist 20.0000

Point 0014 N 7,037,235.7985 E 2,468,960.8033 Sta 2240+69.85

Course from 0014 to PC CAR_21 S 78° 13′ 43.92" E Dist 1,018.5635

Curve Data

Curve CAR_21
P.I. Station 2251+05.59 N 7,037,024.5049 E 2,469,974.7609
Delta = 25° 47′ 50.04" (LT)
Degree = 76° 23′ 39.74"
Tangent = 17.1754
Length = 33.7685
Radius = 75.0000
External = 1.9415
Long Chord = 33.4840
Mid. Ord. = 1.8925
P.C. Station 2250+88.41 N 7,037,028.0087 E 2,469,957.9467
P.T. Station 2251+22.18 N 7,037,028.6676 E 2,469,991.4242
C.C. N 7,037,101.4315 E 2,469,973.2469
Back = S 78° 13′ 43.92" E
Ahead = N 75° 58′ 26.03" E
Chord Bear = N 88° 52′ 21.06" E

Curve Data

Curve CAR_22
P.I. Station 2251+39.36 N 7,037,032.8303 E 2,470,008.0875
Delta = 25° 47′ 50.04" (RT)
Degree = 76° 23′ 39.74"
Tangent = 17.1754
Length = 33.7685
Radius = 75.0000
External = 1.9415
Long Chord = 33.4840
Mid. Ord. = 1.8925
P.C. Station 2251+22.18 N 7,037,028.6676 E 2,469,991.4242
P.T. Station 2251+55.95 N 7,037,029.3264 E 2,470,024.9017
C.C. N 7,036,955.9037 E 2,470,009.6015
Back = N 75° 58′ 26.03" E
Ahead = S 78° 13′ 43.92" E
Chord Bear = N 88° 52′ 21.06" E

Course from PT CAR_22 to PC CAR_23 S 78° 13′ 43.92" E Dist 31.6865

Curve Data

Curve CAR_23
P.I. Station 2252+03.67 N 7,037,019.5909 E 2,470,071.6209
Delta = 24° 08′ 17.50" (RT)
Degree = 76° 23′ 39.74"
Tangent = 16.0363
Length = 31.5968
Radius = 75.0000
External = 1.6953
Long Chord = 31.3637
Mid. Ord. = 1.6578
P.C. Station 2251+87.64 N 7,037,022.8623 E 2,470,055.9218
P.T. Station 2252+19.23 N 7,037,010.1855 E 2,470,084.6094
C.C. N 7,036,949.4395 E 2,470,040.6216
Back = S 78° 13′ 43.92" E
Ahead = S 54° 05′ 26.43" E
Chord Bear = S 66° 09′ 35.17" E

Curve Data

Curve CAR_24
P.I. Station 2252+35.27 N 7,037,000.7801 E 2,470,097.5980
Delta = 24° 08′ 17.50" (LT)
Degree = 76° 23′ 39.74"
Tangent = 16.0363
Length = 31.5968
Radius = 75.0000
External = 1.6953
Long Chord = 31.3637
Mid. Ord. = 1.6578
P.C. Station 2252+19.23 N 7,037,010.1855 E 2,470,084.6094
P.T. Station 2252+50.83 N 7,036,997.5087 E 2,470,113.2970
C.C. N 7,037,070.9315 E 2,470,128.5972
Back = S 54° 05′ 26.43" E
Ahead = S 78° 13′ 43.92" E
Chord Bear = S 66° 09′ 35.17" E

Course from PT CAR_24 to 0015 S 78° 13′ 43.92" E Dist 813.5020

Point 0015 N 7,036,831.5520 E 2,470,909.6913 Sta 2260+64.33

Course from 0015 to 0016 S 80° 08′ 19.36" E Dist 20.0000

Point 0016 N 7,036,828.1267 E 2,470,929.3958 Sta 2260+84.33

Course from 0016 to 0017 S 78° 13′ 44.00" E Dist 440.6917

Point 0017 N 7,036,738.2245 E 2,471,360.8199 Sta 2265+25.02

Course from 0017 to 0018 S 80° 36′ 57.34" E Dist 20.0000

Point 0018 N 7,036,734.9635 E 2,471,380.5522 Sta 2265+45.02

Course from 0018 to 0019 S 78° 13′ 43.92" E Dist 121.3306

Point 0019 N 7,036,710.2117 E 2,471,499.3313 Sta 2266+66.35

Course from 0019 to 0020 S 73° 55′ 39.52" E Dist 20.0000

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COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

CITY OF CARROLLTON
HORIZONTAL ALIGNMENT DATA
SHEET 5 OF 6

CONTRACT	DWG No.	REV
C-2033270-01	CC1-2302	D

CB05-CC1-2302.001

Point 0020 N 7,036,704.6747 E 2,471,518.5495 Sta 2266+86.35

Course from 0020 to 0021 S 78° 13' 43.92" E Dist 821.1127

Point 0021 N 7,036,537.1654 E 2,472,322.3944 Sta 2275+07.47

Course from 0021 to 0022 S 82° 31' 48.32" E Dist 20.0000

Point 0022 N 7,036,534.5652 E 2,472,342.2247 Sta 2275+27.47

Course from 0022 to 0023 S 78° 13' 43.92" E Dist 565.1005

Point 0023 N 7,036,419.2831 E 2,472,895.4413 Sta 2280+92.57

Course from 0023 to 0024 S 73° 55' 39.52" E Dist 20.0000

Point 0024 N 7,036,413.7461 E 2,472,914.6596 Sta 2281+12.57

Course from 0024 to 0025 S 78° 13' 43.92" E Dist 281.3998

Point 0025 N 7,036,356.3398 E 2,473,190.1416 Sta 2283+93.97

Course from 0025 to 0026 N 81° 17' 01.74" E Dist 20.0000

Point 0026 N 7,036,359.3706 E 2,473,209.9106 Sta 2284+13.97

Course from 0026 to 0027 S 78° 13' 43.92" E Dist 63.6599

Point 0027 N 7,036,346.3838 E 2,473,272.2318 Sta 2284+77.63

Course from 0027 to 0028 S 57° 44' 29.59" E Dist 20.0000

Point 0028 N 7,036,335.7090 E 2,473,289.1448 Sta 2284+97.63

Course from 0028 to 0029 S 78° 13' 43.92" E Dist 366.2316

Point 0029 N 7,036,260.9967 E 2,473,647.6746 Sta 2288+63.86

Course from 0029 to 0030 S 14° 12' 39.47" W Dist 82.9123

Point 0030 N 7,036,180.6216 E 2,473,627.3203 Sta 2289+46.77

Course from 0030 to 0031 S 78° 13' 43.90" E Dist 16.0782

Point 0031 N 7,036,177.3416 E 2,473,643.0603 Sta 2289+62.85

==========

Ending chain CAR_2 description

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FIRM REGISTRATION No. F-2966

ARS ENGINEERS, INC.
12801 N Central Expressway, Suite 1250
Dallas, Texas 75243
(214) 739-3152 Fax (214) 739-3169
FIRM NO. F-819

ARCHER WESTERN HERZOG

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CONTRACT SHEET No. 24 OF 345

SCALE	NO SCALE
DRAWN	S. SALEH
DESIGNED	S. SALEH
CHECKED	D. LUU
IN CHARGE	D. LUU
DATE	07 AUG 23

CAES

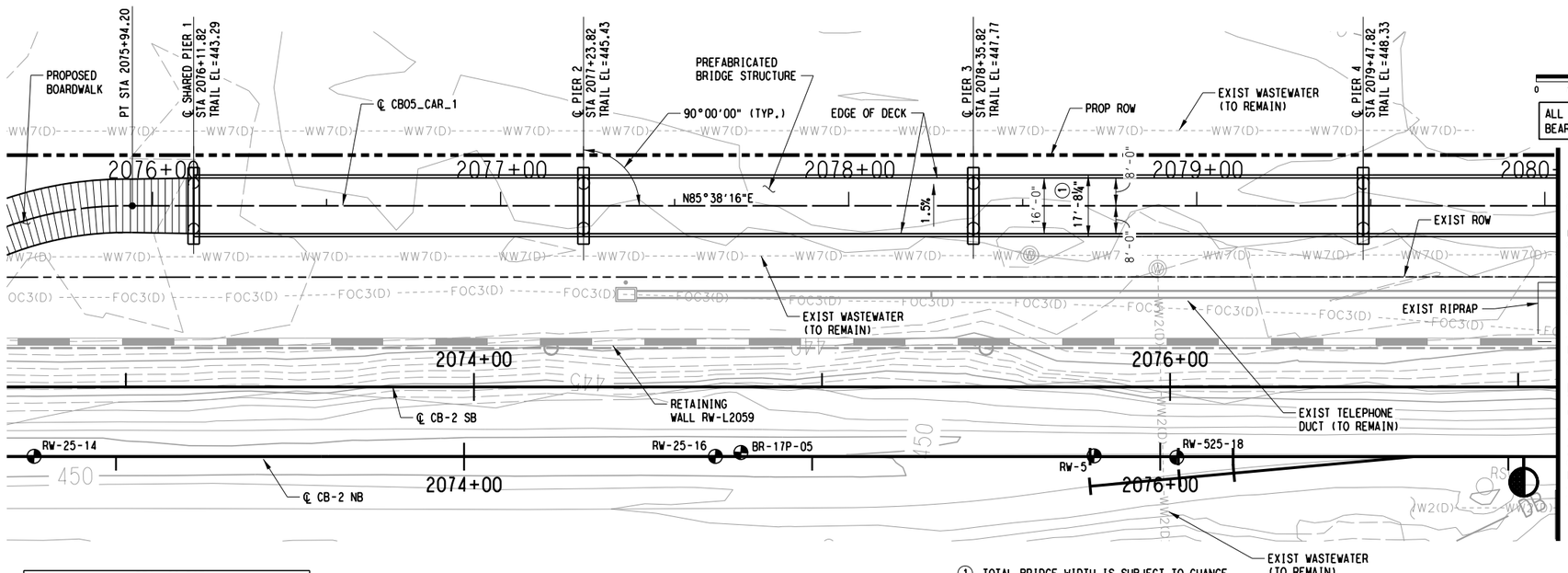
COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

CITY OF CARROLLTON
HORIZONTAL ALIGNMENT DATA
SHEET 6 OF 6

CONTRACT	DWG No.	REV
C-2033270-01	CC1-2303	D

CB05-CC1-2303.001

DWG No. SC2-1701

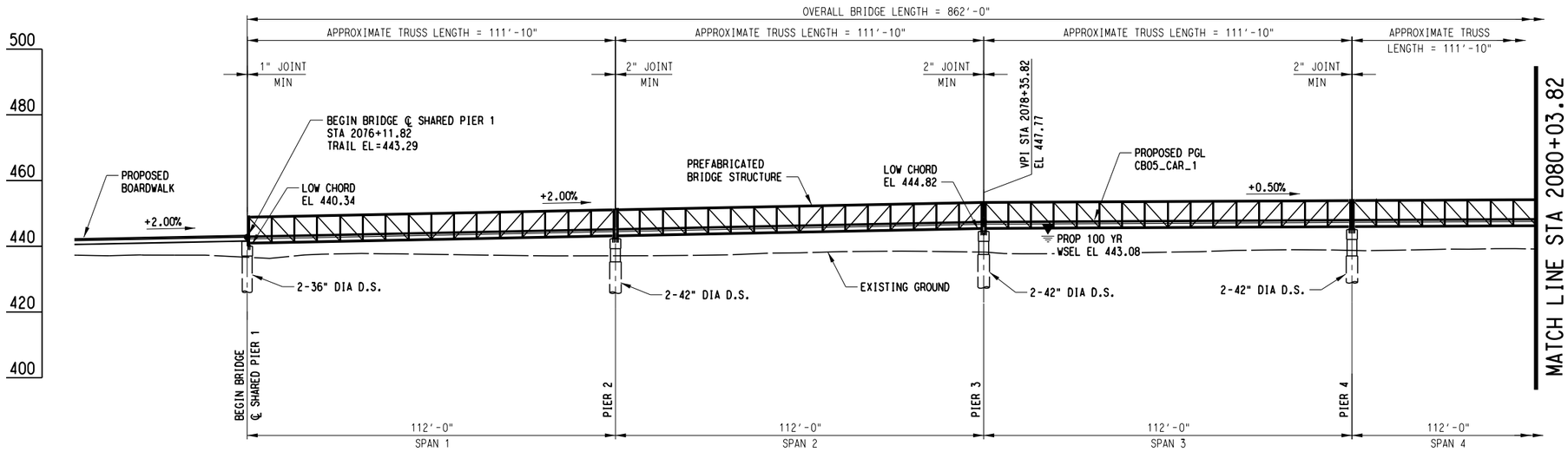


HYDRAULIC DATA		
100-Yr FLOW (CFS)	WATER SURFACE ELEV.	VELOCITY (FPS)
14,850	443.08	7.80

PLAN

SCALE: 1"=20'

① TOTAL BRIDGE WIDTH IS SUBJECT TO CHANGE. REFER TO THE PREFABRICATED BRIDGE PLANS FOR FINAL BRIDGE DETAILS.



ELEVATION

SCALE: 1"=20'

SCALE (IN FEET): 0 10 20 40

ALL PIERS ARE ALONG BEARING: N4°21'44"W

NOTES:

1. DESIGNED IN ACCORDANCE WITH AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS 8TH EDITION, 2017.
2. SPAN LENGTH STATIONING AND VERTICAL PROFILE ARE SHOWN ALONG THE CENTERLINE OF THE TRAIL. TOP OF DECK IS THE CONTROL AND PROFILE GRADE LINE.
3. FOR PEDESTRIAN TRAIL PLAN AND PROFILE, SEE VELOWEB HIKE AND BIKE PLAN AND PROFILE SHEETS.
4. FOR OTHER TRAIL DETAILS INCLUDING STRIPING AND FENCE, SEE CIVIL PLANS.
5. CONTRACTOR WILL BE RESPONSIBLE FOR COORDINATING WITH ALL APPROPRIATE UTILITY COMPANIES FOR LOCATION OF ALL UTLITIES WITHIN THE CONSTRUCTION AREA.
6. FOR DRAINAGE ELEMENTS, SEE DRAINAGE PLANS.
7. FOR EXACT LOCATIONS OF BORING LOGS AND SOIL PARAMETERS, SEE GEOTECHNICAL REPORT.
8. DESIGN PEDESTRIAN LIVE LOAD IS 90 PSF AND DESIGN VEHICULAR LIVE LOAD IS H-10.
9. TEMPORARY OR PERMANENT CASING MAY BE USED AT THE ABUTMENTS AND PIERS AS REQUIRED.
10. FOR CSAB (CEMENT STABILIZED ABUTMENT BACKFILL) DETAILS, SEE TxDOT CSAB STANDARD.
11. FOR BRIDGE APPROACH SLAB DETAILS, SEE TxDOT BAS-C STANDARD.
12. FOR PREFABRICATED BRIDGE TRUSS REQUIREMENTS AND NOTES, SEE DRAWING No. SC8-1791.
13. PREFABRICATED BRIDGE SUPERSTRUCTURE, DECK FORM, SIDE DAMS, BEARING ASSEMBLIES, EXPANSION JOINTS, AND EXPANSION JOINT COVER PLATES ARE TO BE PROVIDED BY THE PREFABRICATED BRIDGE VENDOR.
14. PREFABRICATED BRIDGE STRUCTURES AND ESTIMATED DIMENSIONS BASED ON THE PIONEER TRAILBLAZER BRIDGE TYPE. ALL SUPERSTRUCTURE DIMENSIONS AND FINAL LOADINGS SHALL BE PROVIDED BY THE VENDOR.
15. JOINT OPENING SIZES ARE MINIMUM REFER TO PREFABRICATED BRIDGE MFR PLANS FOR OPENING SIZE.
16. THE PROPOSED STEEL TRUSSES SHALL BE WEATHERING STEEL.
17. THE DISTANCE FROM PGL TO LOW CHORD IS ASSUMED TO BE 2'-11 1/16" FOR SPANS 1-4, 6-8 AT ℄ PIER CAP. THE DISTANCE FROM PGL TO LOW CHORD IS ASSUMED TO BE 3'-10 3/16" FOR SPAN 5 MEASURED AT ℄ PIER CAP. DEPTH FROM PGL TO TOP OF CAP IS ASSUMED TO BE 3'-2 3/8" FOR SPANS 1-4, 6-8 MEASURED AT ℄ PIER CAP. DEPTH FROM PGL TO TOP OF CAP IS ASSUMED TO BE 4'-1 1/2" FOR SPAN 5 MEASURED AT ℄ PIER CAP OR FRONT FACE OF BACKWALL. ASSUMED DEPTHS SHALL BE VERIFIED BY VENDOR.
18. REINFORCEMENT DESIGNATION CALLOUT IS AS FOLLOWS:

300 SERIES	--	#3 BAR
400 SERIES	--	#4 BAR
500 SERIES	--	#5 BAR
600 SERIES	--	#6 BAR
800 SERIES	--	#8 BAR
900 SERIES	--	#9 BAR
1000 SERIES	--	#10 BAR
1100 SERIES	--	#11 BAR

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CONTRACT SHEET No. 25 OF 345

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP
△								

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DART PROJECT

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DRAWN	S. KAEMMERER
DESIGNED	W. WUENKS
CHECKED	R. RILEY
IN CHARGE	J. FINKE
DATE	07 AUG 23

CAES

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

HUTTON BRANCH
PEDESTRIAN BRIDGE (#17P)
PLAN AND ELEVATION

CONTRACT	DWG No.	REV
C-2033270-01	SC2-1701	D

CB05-SC2-1701.020

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CB05-SC2-1701.020

JEGSVCPW001
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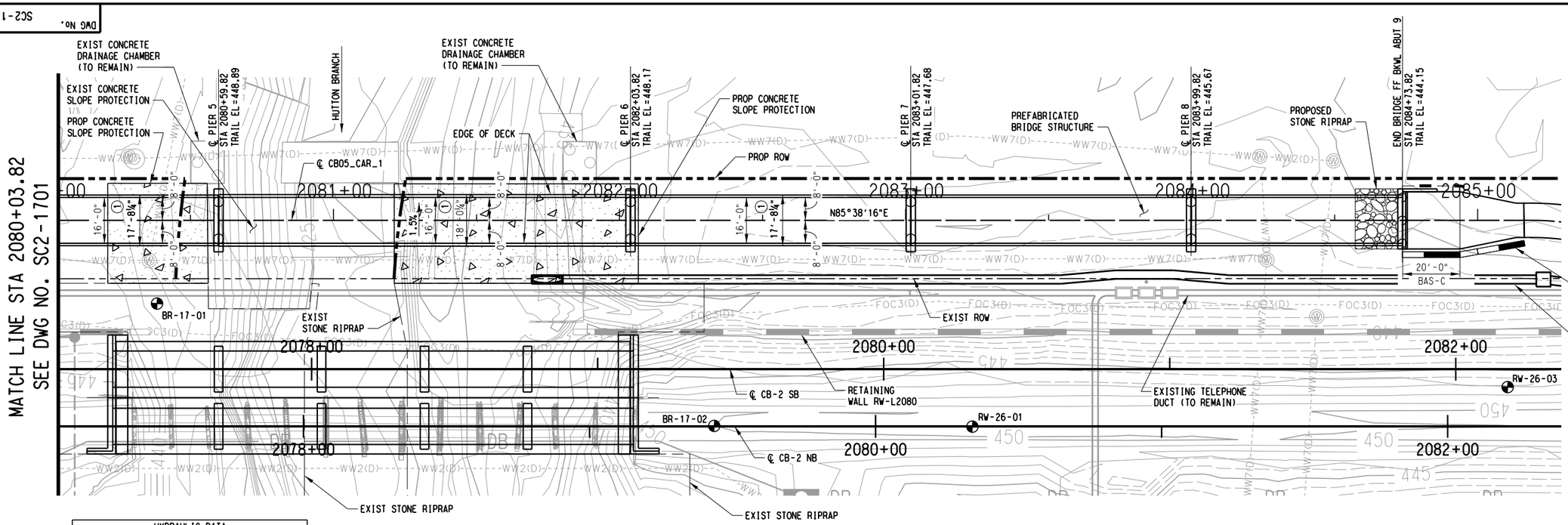
DWG No. SC2-1702



HYDRAULIC DATA		
100-Yr FLOW (CFS)	WATER SURFACE ELEV.	VELOCITY (FPS)
14,850	443.08	7.80

PLAN
SCALE: 1"=20'

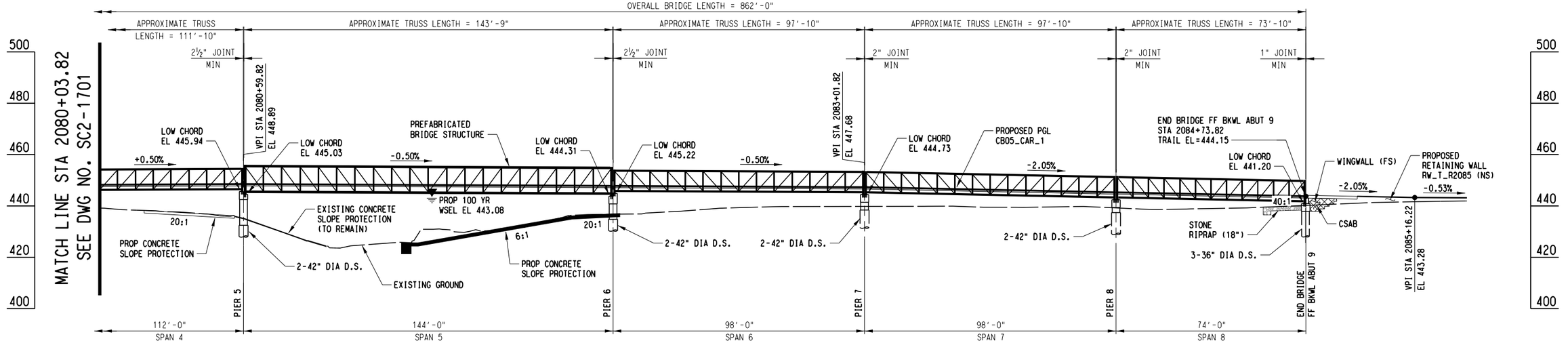
SCALE (IN FEET) 0 10 20 40

ALL PIERS ARE ALONG BEARING: N04°21'44"W

NOTES:

1. FOR NOTES, SEE DRAWING No. SC2-1701.

① TOTAL BRIDGE WIDTH IS SUBJECT TO CHANGE. REFER TO THE PREFABRICATED BRIDGE PLANS FOR FINAL BRIDGE DETAILS.



ELEVATION
SCALE: 1"=20'

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CONTRACT SHEET No. 26 OF 345

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SCALE	1"=20'
DRAWN	S. KAEMMERER
DESIGNED	W. MUENKS
CHECKED	R. RILEY
IN CHARGE	J. FINKE
DATE	07 AUG 23

CAES

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

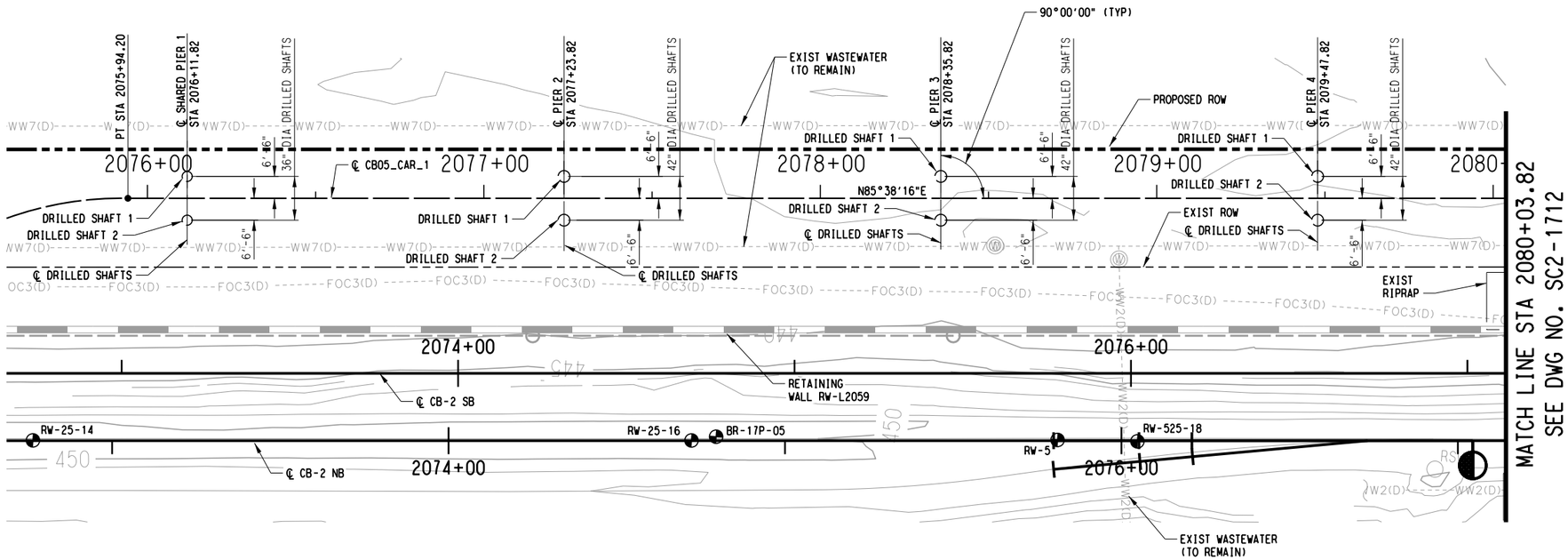
HUTTON BRANCH
PEDESTRIAN BRIDGE (#17P)
PLAN AND ELEVATION

CONTRACT	DWG No.	REV
C-2033270-01	SC2-1702	D

CB05-SC2-1702.020

31-JUL-2023 09:46
CB05-SC2-1702.020
JEGSVCPW001
Default

DWG No. SC2-1711



PLAN

SCALE: 1"=20'

SCALE (IN FEET)
0 10 20 40

ALL PIERS ARE ALONG BEARING: N4°21'44"W

NOTES:

1. ALL DIMENSIONS ARE HORIZONTAL UNLESS NOTED OTHERWISE.
2. FOR GEOMETRY INFORMATION, SEE GEOMETRY CONTROL PLAN DWG Nos SC8-1746 & SC8-1747.
3. FOR BORING LOG INFORMATION, SEE GEOTECHNICAL DESIGN REPORT.
4. FOUNDATIONS SHALL BE FOUNDED AS SHOWN IN THE SUBSTRUCTURE SCHEDULE ON DRAWING No. SC8-1711.
5. CONTRACTOR WILL BE RESPONSIBLE FOR COORDINATING WITH ALL APPROPRIATE UTILITY COMPANIES FOR LOCATION OF ALL UTILITIES WITHIN THE CONSTRUCTION AREA.

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CONTRACT SHEET No. 27 OF 345

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

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SCALE	1"=20'
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DESIGNED	W. MUENKS
CHECKED	R. RILEY
IN CHARGE	J. FINKE
DATE	07 AUG 23

CAES

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

HUTTON BRANCH
PEDESTRIAN BRIDGE (#17P)
FOUNDATION PLAN

CONTRACT	DWG No.	REV
C-2033270-01	SC2-1711	D

CB05-SC2-1711.020

31-JUL-2023 09:49
CB05-SC2-1711.020

JEGSVCPW001
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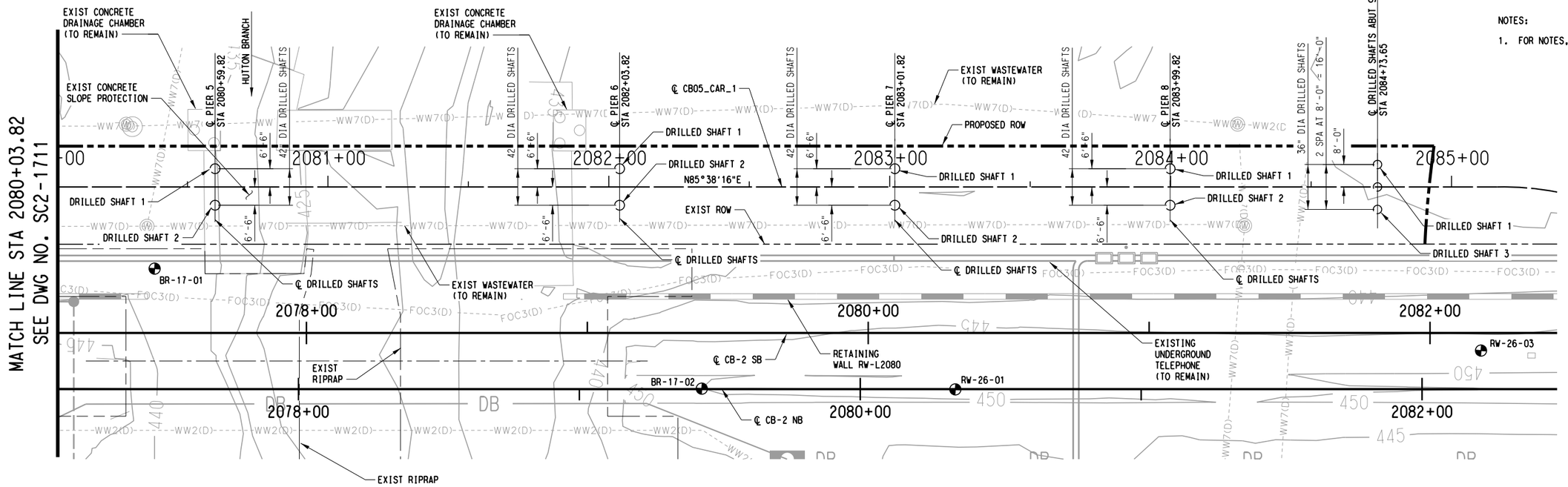
DWG No. SC2-1712



SCALE (IN FEET)
0 10 20 40

ALL PIERS ARE ALONG BEARING: N04°21'44"W

NOTES:

1. FOR NOTES, SEE DRAWING No. SC2-1711.

PLAN
SCALE: 1"=20'

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CONTRACT SHEET No. 28 OF 345

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DRAWN	S. KAEMMERER
DESIGNED	M. MUENKS
CHECKED	R. RILEY
IN CHARGE	J. FINKE
DATE	07 AUG 23

CAES

COTTON BELT REGIONAL RAIL VELOWEB HIKE & BIKE TRAIL

HUTTON BRANCH PEDESTRIAN BRIDGE (#17P) FOUNDATION PLAN

CONTRACT	DWG No.	REV
C-2033270-01	SC2-1712	D

CB05-SC2-1712.020

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CB05-SC2-1712.020
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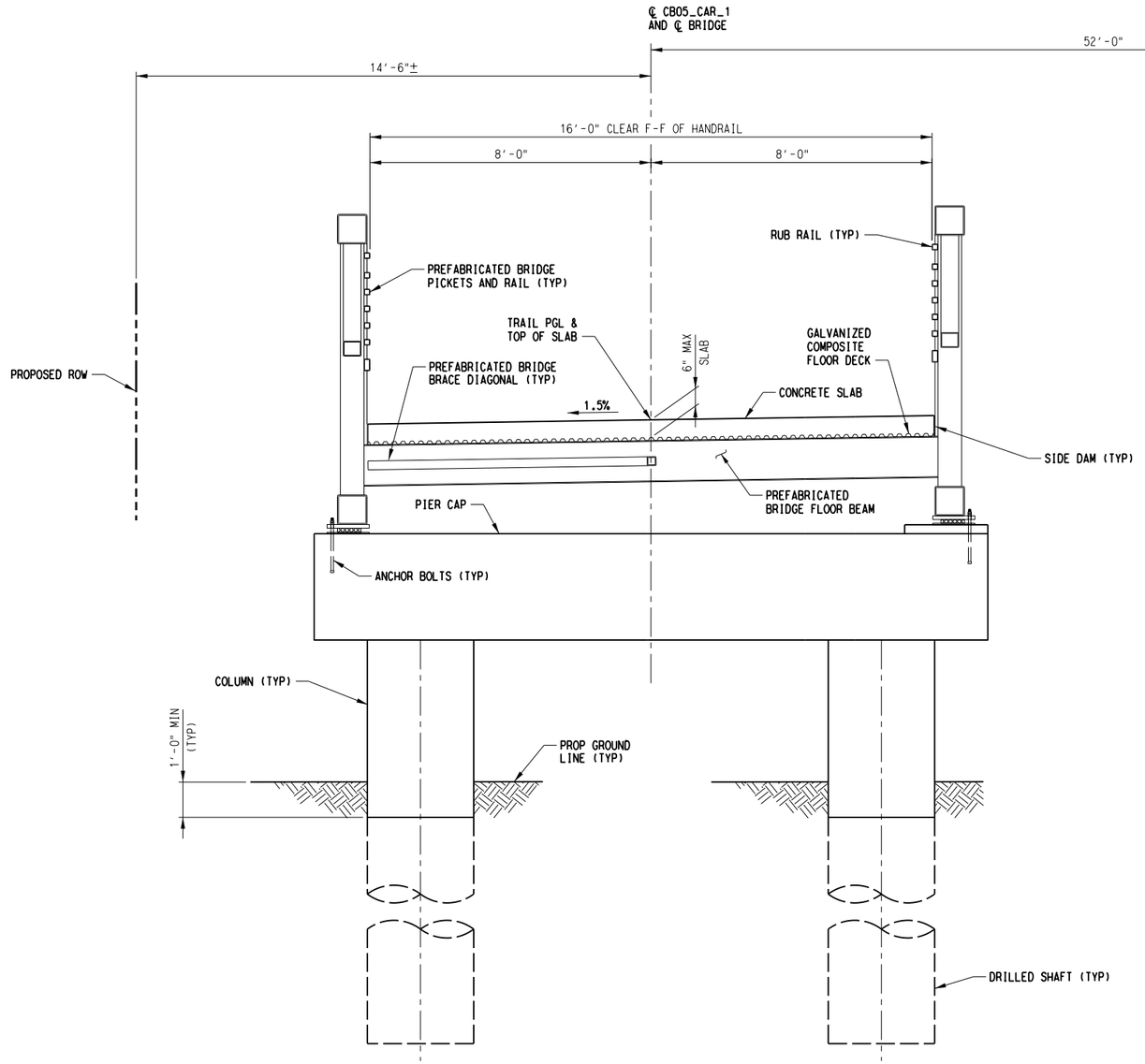
DWG No. SC8-1701



TYPICAL SECTION 1
NO SCALE

NOTES:

1. REFER TO DRAWING NO. SC2-1701 FOR NOTES.
2. RUB RAIL HORIZONTAL PICKETS ARE FOR ILLUSTRATIVE PURPOSES ONLY. REFER TO PREFABRICATED BRIDGE VENDOR DETAILS FOR DETAILS.

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CONTRACT SHEET No. 29 OF 345

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

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DESIGNED	M. MUENKS
CHECKED	M. MEYER
IN CHARGE	J. FINKE
DATE	07 AUG 23

CAES

COTTON BELT REGIONAL RAIL VELOWEB HIKE & BIKE TRAIL

HUTTON BRANCH PEDESTRIAN BRIDGE (#17P) TYPICAL SECTION

CONTRACT	DWG No.	REV
C-2033270-01	SC8-1701	D

CB05-SC8-1701.008

31-JUL-2023 09:40
CB05-SC8-1701.008

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DWG No. SC8-1711

NOTES:

1. FOR SUBSURFACE INFORMATION. SEE GENERAL NOTES AND GEOTECHNICAL REPORT.
2. FOUND DRILLED SHAFTS AT THE LENGTH SHOWN OR DEEPER TO OBTAIN MINIMUM EMBEDMENT INTO UNWEATHERED SHALE.

* REFER TO THE PREFABRICATED BRIDGE PLANS FOR BEARING SEAT ELEVATIONS.

ABUTMENT SUBSTRUCTURE SCHEDULE

ABUT No.	ABUT STATION WP	SURFACE COORDINATES AT WP		BEARING	PGL AT FF BKWL EL "A" (FT)	TOP OF BKWL EL "B" (FT)	TOP OF BKWL EL "C" (FT)	TOP OF CAP EL "D" (FT)	BOTT OF CAP\ TOP OF D.S. EL "E" (FT)	TOP OF BEARING SEAT EL "F" (FT)	TOP OF BEARING SEAT EL "G" (FT)	APPROXIMATE DRILLED SHAFT LENGTH (FEET)(UNO)	SIZE OF D.S. (IN)	MINIMUM EMBEDMENT SEE NOTE 2 (FT)
		NORTHING	EASTING											
9	2084+73.82	7034219.6132	2454629.2259	N 4°21'44" W	444.15	442.92	443.22	440.95	438.45	*	*	57	36	3

PIER SUBSTRUCTURE SCHEDULE

PIER No.	PIER STATION WP	SURFACE COORDINATES AT WP		BEARING	BEARING SEAT LOCATION BK\FWD	BEARING SEAT EL "A" (FT)	BEARING SEAT "B" (FT)	TOP OF CAP EL "C" (FT)	"BOTT OF CAP/ TOP OF COLUMN EL "D" (FT)	COLUMN	BOT OF COL EL "E" (FT)	COLUMN HEIGHT (FT)	APPROXIMATE DRILLED SHAFT LENGTH (FT)	SIZE OF D.S. (IN)	MINIMUM EMBEDMENT SEE NOTE 2 (FT)
		NORTHING	EASTING												
1	2076+11.82	7034154.0487	2453769.7223	N 4°21'44" W	BK	*	*	441.22	437.09	---	---	---	56	36	3
					FWD	*	*	440.09		---	---	---	56	36	3
2	2077+23.82	7034162.5675	2453881.3979	N 4°21'44" W	BK	*	*	442.33	439.33	1	435.33	4	55	42	4
					FWD	*	*			2	435.33	4	55	42	4
3	2078+35.82	7034171.0863	2453993.0734	N 4°21'44" W	BK	*	*	444.57	441.57	1	436.57	5	55	42	4
					FWD	*	*			2	436.57	5	55	42	4
4	2079+47.82	7034179.6051	2454104.7490	N 4°21'44" W	BK	*	*	445.13	442.13	1	437.13	5	56	42	4
					FWD	*	*			2	437.13	5	56	42	4
5	2080+59.82	7034188.1239	2454216.4245	N 4°21'44" W	BK	*	*	445.69	441.77	1	432.77	9	52	42	4
					FWD	*	*	444.77		2	432.77	9	52	42	4
6	2082+03.82	7034199.0767	2454360.0074	N 4°21'44" W	BK	*	*	444.05	441.05	1	435.05	6	54	42	4
					FWD	*	*	444.97		2	435.05	6	54	42	4
7	2083+01.82	7034206.5306	2454457.7235	N 4°21'44" W	BK	*	*	444.48	441.48	1	438.48	3	58	42	4
					FWD	*	*			2	438.48	3	58	42	4
8	2083+99.82	7034213.9846	2454555.4396	N 4°21'44" W	BK	*	*	442.47	439.47	1	437.47	2	57	42	4
					FWD	*	*			2	437.47	2	57	42	4

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CONTRACT SHEET No. 30 OF 345

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DRAWN	S. KAEMMERER
DESIGNED	W. MUENKS
CHECKED	S. HOFFMANN
IN CHARGE	J. FINKE
DATE	07 AUG 23

CAES

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

HUTTON BRANCH
PEDESTRIAN BRIDGE (#17P)
SUBSTRUCTURE SCHEDULE

CONTRACT	DWG No.	REV
C-2033270-01	SC8-1711	D

CB05-SC8-1711.008

DWG No. SC8-1712

SUMMARY OF ESTIMATED QUANTITIES

ITEM / DESCRIPTION	400 6001 STRUCT EXCAV CY	400 6005 CEM STABIL BKFL CY	416 6004 DRILL SHAFT (36 IN) LF	416 6005 DRILL SHAFT (42 IN) LF	420 6013 CL C CONC (ABUT) CY	420 6029 CL C CONC (CAP) CY	420 6037 CL C CONC (COL) CY	422 6001 REINF CONC SLAB SF	422 6015 APPROACH SLAB CY	432 6031 RIPRAP (STONE PROTECTION (12 IN) CY	4196 6001 PREFAB PED STL TRUSS BRDG SPAN EA
ABUTMENT 9	14	14	171.0		11.7				19.1	21	
SHARED PIER 1	1		112.0			9.4					
PIER 2	1			110.0		7.9	2.1				
PIER 3	1			110.0		7.9	2.6				
PIER 4	1			112.0		7.9	2.6				
PIER 5	1			104.0		9.2	4.7				
PIER 6	1			108.0		9.2	3.1				
PIER 7	1			116.0		7.9	1.6				
PIER 8	1			114.0		7.9	1.0				
111'-10" TRUSS BRIDGE								7,157			4
143'-9" TRUSS BRIDGE								2,300			1
97'-10" TRUSS BRIDGE								3,131			2
73'-10" TRUSS BRIDGE								1,181			1
TOTAL	21	14	283.0	774.0	11.7	67.3	17.7	13,769	19.1	21	8

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FIRM REGISTRATION No. F-2966

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SCALE	NO SCALE
DRAWN	S. KAEMMERER
DESIGNED	S. KAEMMERER
CHECKED	M. MUENKS
IN CHARGE	J. FINKE
DATE	07 AUG 23

CAES

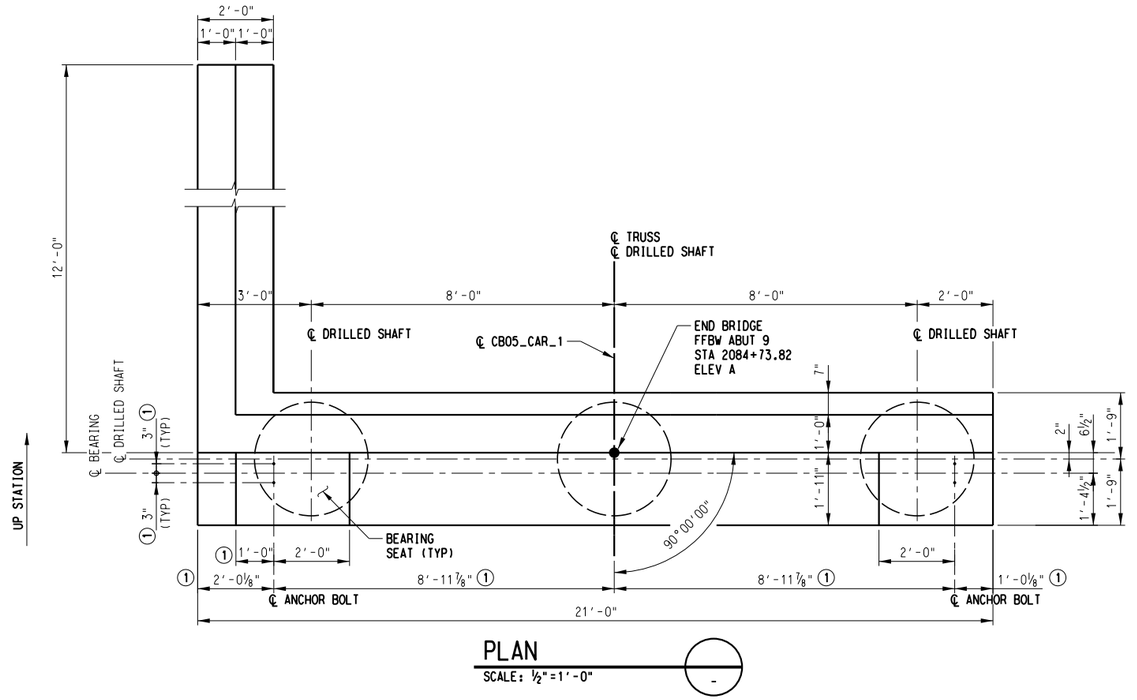
COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

HUTTON BRANCH
PEDESTRIAN BRIDGE (#17P)
QUANTITIES TABLE

CONTRACT	DWG No.	REV
C-2033270-01	SC8-1712	D

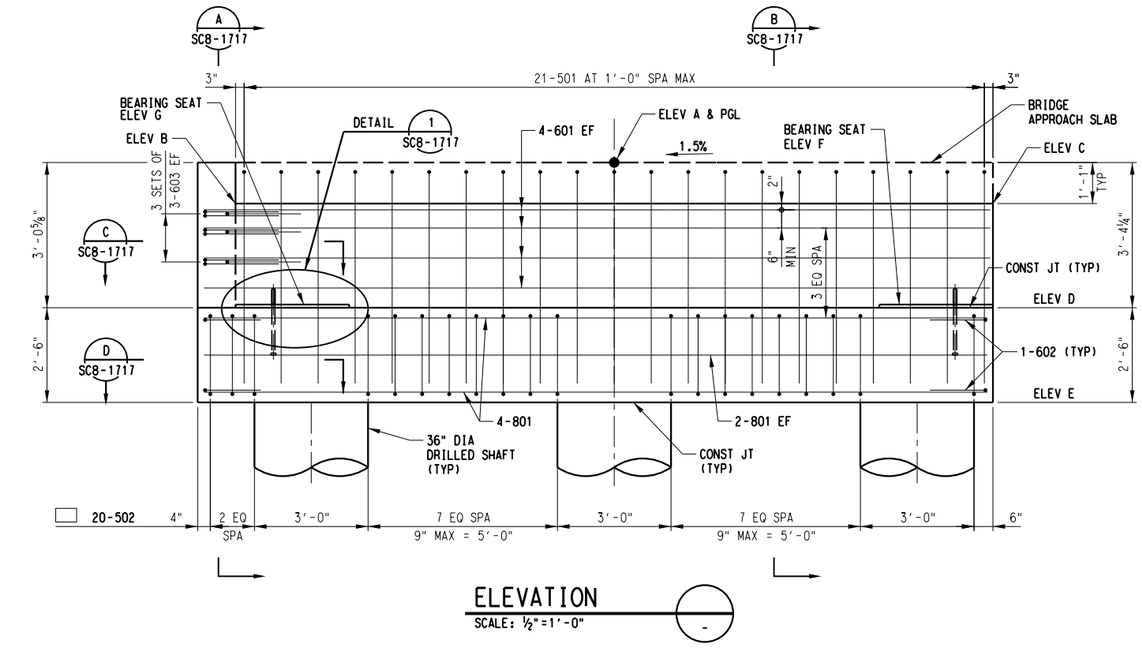
CB05-SC8-1712.008

DWG No. SC8-1716



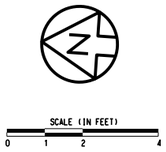
PLAN

SCALE: ½"=1'-0"



ELEVATION

SCALE: ½"=1'-0"



NOTES:

1. FOR FOUNDATION PLANS, SEE DRAWING Nos SC2-1711 AND SC2-1712.
2. FOR SCHEDULE OF ELEVATIONS AND DRILLED SHAFT LENGTHS, SEE SUBSTRUCTURE SCHEDULE DRAWING No. SC8-1711.
3. FOR GEOMETRY CONTROL PLANS, SEE DRAWING Nos SC8-1746 AND SC8-1747.
4. FOR BEARING SEAT AND ANCHOR BOLT LAYOUT AND INFORMATION, SEE DRAWING No. SC8-1717.
5. CONCRETE FOR ABUTMENT AND DRILLED SHAFTS SHALL BE CLASS "C" WITH A MINIMUM 28-DAY COMPRESSIVE STRENGTH OF 3600 PSI.
6. ALL EXPOSED EDGES OF CONCRETE MEMBERS SHALL BE CHAMFERED ¾ INCH.
7. REINFORCEMENT SHALL MEET THE REQUIREMENTS OF THE CURRENT A.S.T.M. DESIGNATION: A615 OR A706, GRADE 60.
8. BAR DIMENSIONS ARE OUT-TO-OUT.
9. MINIMUM CONCRETE COVER ON REINFORCEMENT SHALL BE TWO (2) INCHES UNLESS OTHERWISE NOTED.
10. FOR NOTES AND STANDARDS NOT SHOWN, SEE GENERAL NOTES OF THE BRIDGE STANDARD DRAWINGS.
11. ALL DIMENSIONS ARE EITHER HORIZONTAL OR VERTICAL AND MUST BE CORRECTED FOR GRADE, CROSS-SLOPE, AND/OR SUPERELEVATION.
12. ANCHOR BOLTS SHALL BE HEX HEAD ASTM F1554, GRADE 105. SEE DRAWING No. SC8-1717 FOR MORE DETAILS.

① LOCATIONS OF ANCHOR BOLTS ARE SUBJECT TO CHANGE. REFER TO THE PREFABRICATED BRIDGE PLANS FOR FINAL ANCHOR BOLT LOCATIONS.

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FINAL 100% DESIGN

CONTRACT SHEET No. 32 OF 345

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

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ARCHER WESTERN HERZOG

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CAES

SCALE	1/2"=1'-0"
DRAWN	S. KAEMMERER
DESIGNED	W. MUENKS
CHECKED	S. HOFFMANN
IN CHARGE	J. FINKE
DATE	07 AUG 23

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

HUTTON BRANCH
PEDESTRIAN BRIDGE (#17P)
ABUTMENT 9

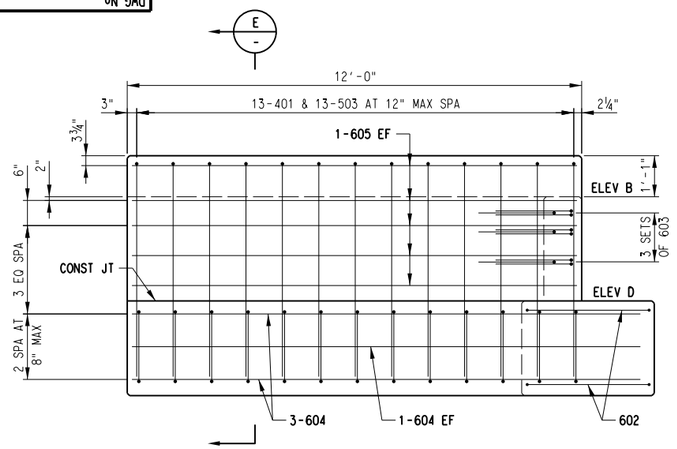
CONTRACT C-2033270-01 | DWG No. SC8-1716 | REV D

CB05-SC8-1716.008

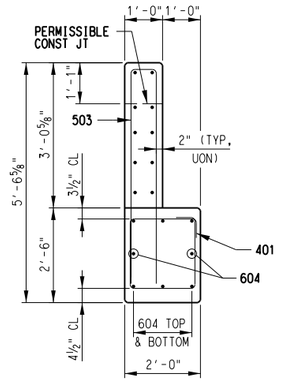
31-JUL-2023 09:40
CB05-SC8-1716.008

JEGSVCPW001
Default

DWG No. SC8-1717



SECTION A
SCALE: ½"=1'-0"
SC8-1716



SECTION E
SCALE: ½"=1'-0"
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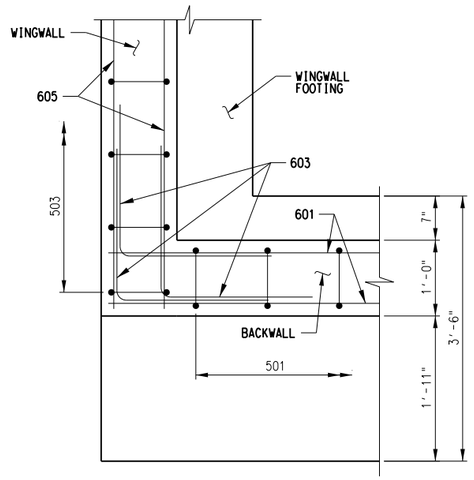
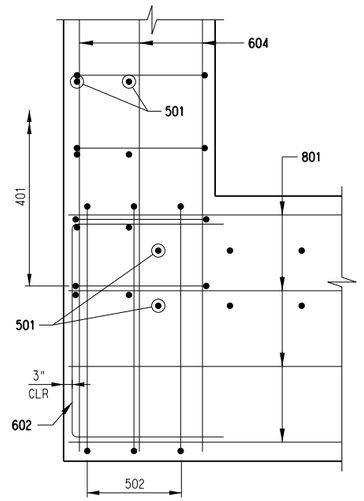


SECTION C
SCALE: ½"=1'-0"
SC8-1716



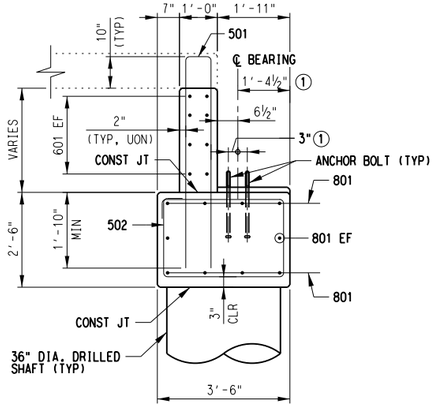
SECTION D
SCALE: ½"=1'-0"
SC8-1716

NOTE:

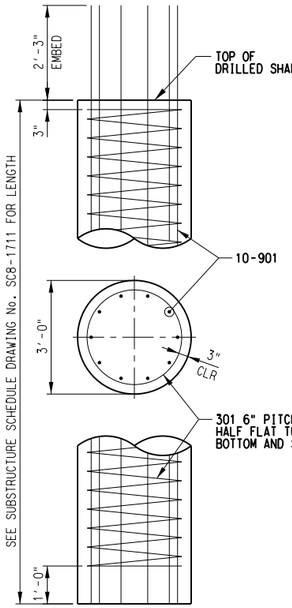
1. SEE DRAWING No. SC8-1716 FOR NOTES.

① LOCATIONS OF ANCHOR BOLTS ARE SUBJECT TO CHANGE. REFER TO THE PREFABRICATED BRIDGE PLANS FOR FINAL ANCHOR BOLT LOCATIONS.

② SEE PLAN VIEW ON DRAWING No. SC8-1716 FOR DIMENSIONS.



SECTION B
SCALE: ½"=1'-0"
SC8-1716



36" DRILLED SHAFT DETAIL
SCALE: ½"=1'-0"
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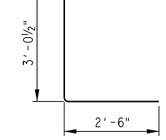
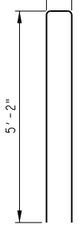
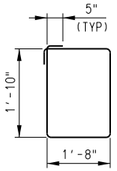


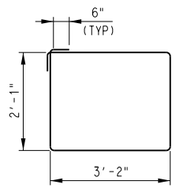
BAR 602



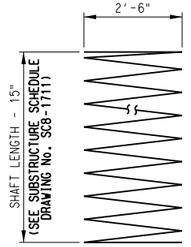
BAR 501, 503



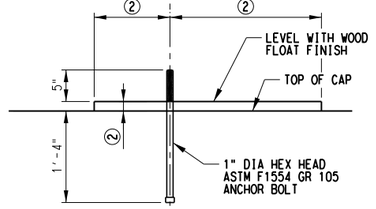
BAR 401



BAR 502

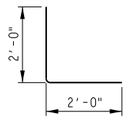


BARS 301



BEARING SEAT DETAIL
SCALE: 1"=1'-0"
1
SC8-1716

(SEE DRAWING No. SC8-1716 FOR ORIENTATION)
(BEARING SURFACE SHALL BE CLEAN AND FREE OF ALL LOOSE MATERIAL BEFORE PLACING BEARING ASSEMBLY)



BAR 603

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CONTRACT SHEET No. 33 OF 345

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FIRM REGISTRATION No. F-2966

ARCHER WESTERN HERZOG

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SCALE	AS NOTED
DRAWN	S. KAEMMERER
DESIGNED	W. MUENKS
CHECKED	W. MUENKS
IN CHARGE	J. FINKE
DATE	07 AUG 23

CAES

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

HUTTON BRANCH
PEDESTRIAN BRIDGE (#17P)
ABUTMENT 9 DETAILS

CONTRACT	DWG No.	REV
C-2033270-01	SC8-1717	D

CB05-SC8-1717.008

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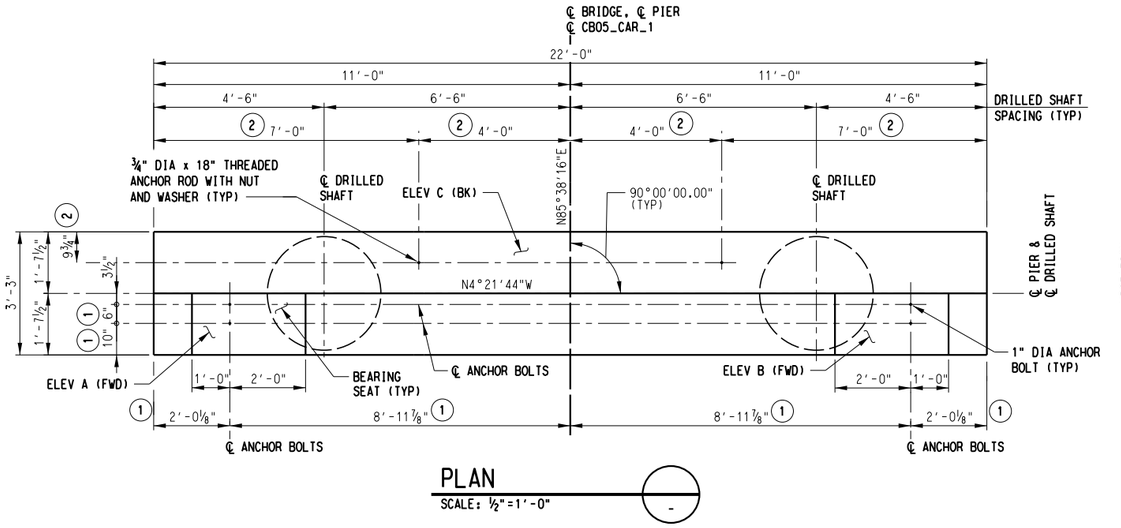
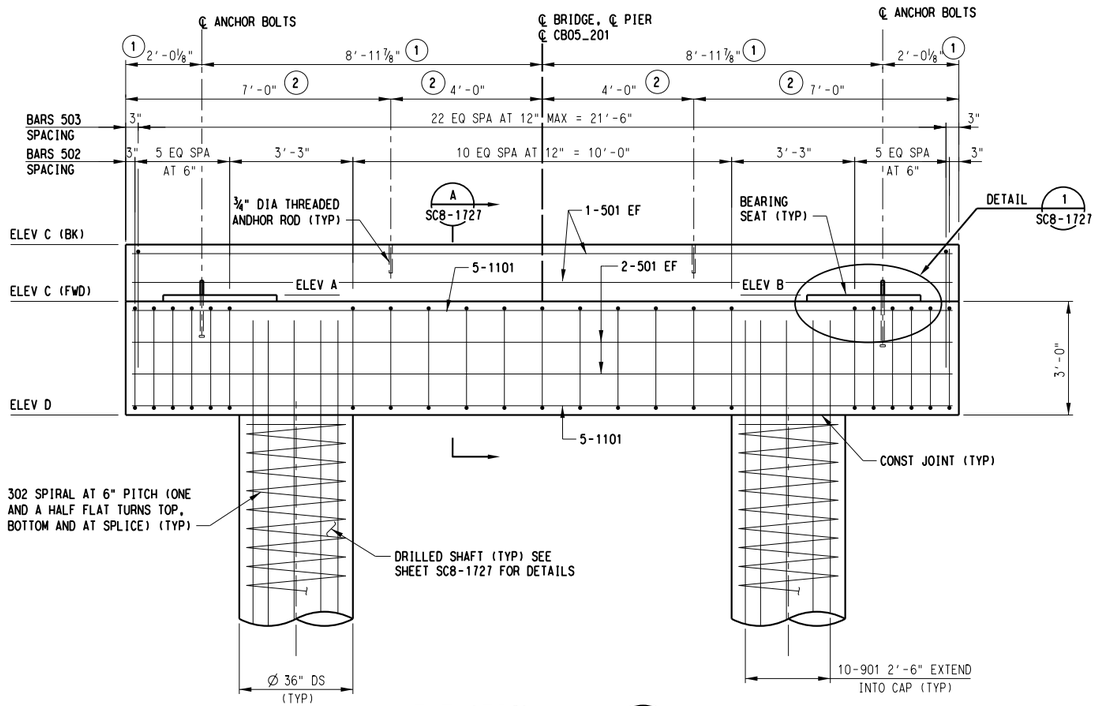
CB05-SC8-1717.008
JEGSVCPWU01
Default

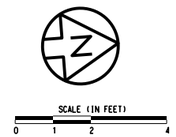
DWG No. SC8-1726



PLAN
SCALE: ½"=1'-0"



ELEVATION
SCALE: ½"=1'-0"
LOOKING BACK STATION



NOTES:

1. FOR FOUNDATION PLAN, SEE DRAWING Nos SC2-1711 AND SC2-1712.
2. FOR SCHEDULE OF ELEVATIONS AND DRILLED SHAFT LENGTHS, SEE SUBSTRUCTURE SCHEDULE DRAWING No. SC8-1715.
3. FOR GEOMETRY CONTROL PLANS, SEE DRAWING Nos SC8-1746 AND SC8-1747.
4. FOR ADDITIONAL BEARING SEAT AND ANCHOR BOLT LAYOUT AND INFORMATION, SEE DRAWING No. SC8-1727.
5. CONCRETE FOR PIER AND DRILLED SHAFTS SHALL BE CLASS "C" WITH MINIMUM 28-DAY COMPRESSIVE STRENGTH 3600 PSI.
6. ALL EXPOSED EDGES OF CONCRETE MEMBERS SHALL BE CHAMFERED ¾ INCH.
7. REINFORCEMENT SHALL MEET THE REQUIREMENTS OF THE CURRENT ASTM DESIGNATION: A615 OR A706, GRADE 60.
8. BAR DIMENSIONS ARE OUT-TO-OUT.
9. MINIMUM CONCRETE COVER ON REINFORCEMENT SHALL BE TWO (2) INCHES UNLESS OTHERWISE NOTED.
10. FOR NOTES AND STANDARDS NOT SHOWN, SEE GENERAL NOTES OF THE BRIDGE STANDARD DRAWINGS.
11. ALL DIMENSIONS ARE EITHER HORIZONTAL OR VERTICAL AND MUST BE CORRECTED FOR GRADE, CROSS-SLOPE, AND/OR SUPERELEVATION.
12. ANCHOR BOLTS SHALL BE HEX HEAD ASTM F1554 GRADE 105. SEE DRAWING No. SC8-1727 FOR MORE DETAILS.

① LOCATIONS OF ANCHOR BOLTS ARE SUBJECT TO CHANGE. REFER TO THE PREFABRICATED BRIDGE PLANS FOR FINAL ANCHOR BOLT LOCATIONS.

② LOCATIONS OF ¾" DIAx18" THREADED ANCHOR RODS ARE SUBJECT TO CHANGE. REFER TO BOARDWALK PLANS BY OTHERS FOR FINAL THREADED ANCHOR ROD LOCATIONS.

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FINAL 100% DESIGN

CONTRACT SHEET No. 34 OF 345

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

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DRAWN	S. KAEMMERER
DESIGNED	M. MUENKS
CHECKED	S. HOFFMANN
IN CHARGE	J. FINKE
DATE	07 AUG 23

CAES

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

HUTTON BRANCH
PEDESTRIAN BRIDGE (#17P)
SHARED PIER 1

CONTRACT	DWG No.	REV
C-2033270-01	SC8-1726	D

CB05-SC8-1726.008

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CB05-SC8-1726.008

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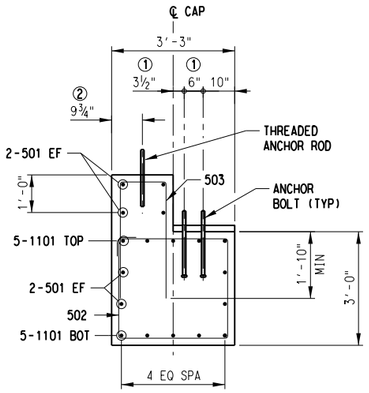
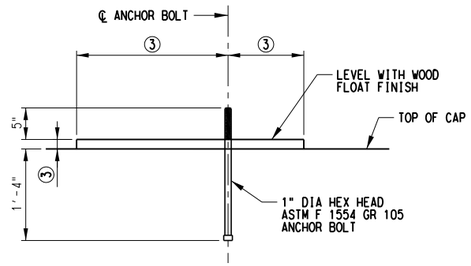
DWG No. SC8-1727



SECTION
SCALE: ½"=1'-0"
A
SC8-1726



BEARING SEAT DETAIL
SCALE: 1"=1'-0"
1
SC8-1726

(SEE DRAWING No. SC8-1726 FOR ORIENTATION)
(BEARING SURFACE SHALL BE CLEAN AND FREE OF ALL LOOSE MATERIAL BEFORE PLACING BEARING ASSEMBLY)

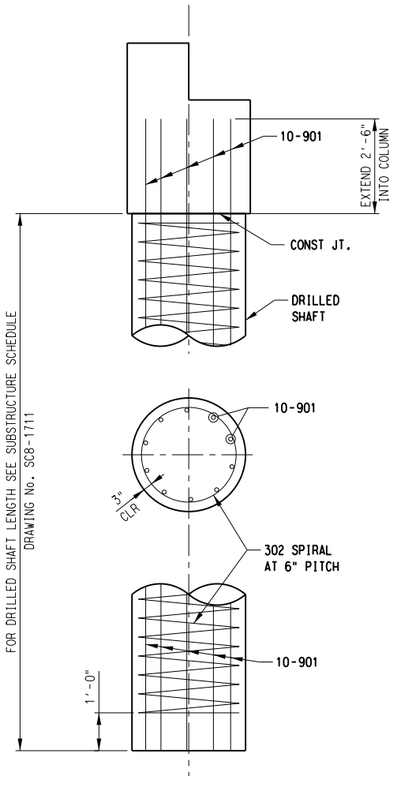
NOTES:

1. SEE DRAWING No. SC8-1726 FOR SHEET NOTES.

① LOCATIONS OF ANCHOR BOLTS ARE SUBJECT TO CHANGE. REFER TO THE PREFABRICATED BRIDGE PLANS FOR FINAL ANCHOR BOLT LOCATIONS.

② LOCATIONS OF THREADED ANCHOR RODS ARE SUBJECT TO CHANGE. REFER TO THE BOARDWALK PLANS FOR FINAL ANCHOR ROD LOCATIONS.

③ SEE PLAN VIEW ON DRAWING No. SC8-1726 FOR DIMENSIONS.



36" DRILLED SHAFT DETAIL
SCALE: ½"=1'-0"
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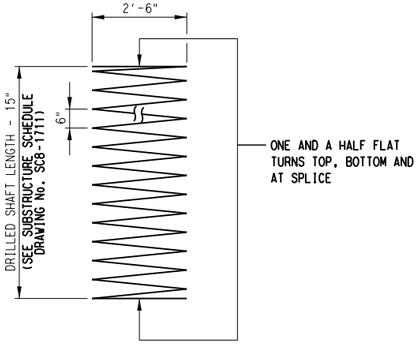
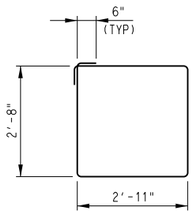
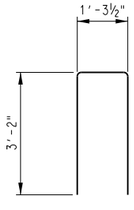


BARS 302



BAR 502



BAR 503

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CONTRACT SHEET No. 35 OF 345

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SCALE	AS NOTED
DRAWN	S. KAEMMERER
DESIGNED	M. MUENKS
CHECKED	S. HOFFMANN
IN CHARGE	J. FINKE
DATE	07 AUG 23

CAES

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

HUTTON BRANCH
PEDESTRIAN BRIDGE (#17P)
SHARED PIER 1 DETAILS

CONTRACT	DWG No.	REV
C-2033270-01	SC8-1727	D

CB05-SC8-1727.008

31-JUL-2023 09:48
CB05-SC8-1727.008
JEGSVCPW001
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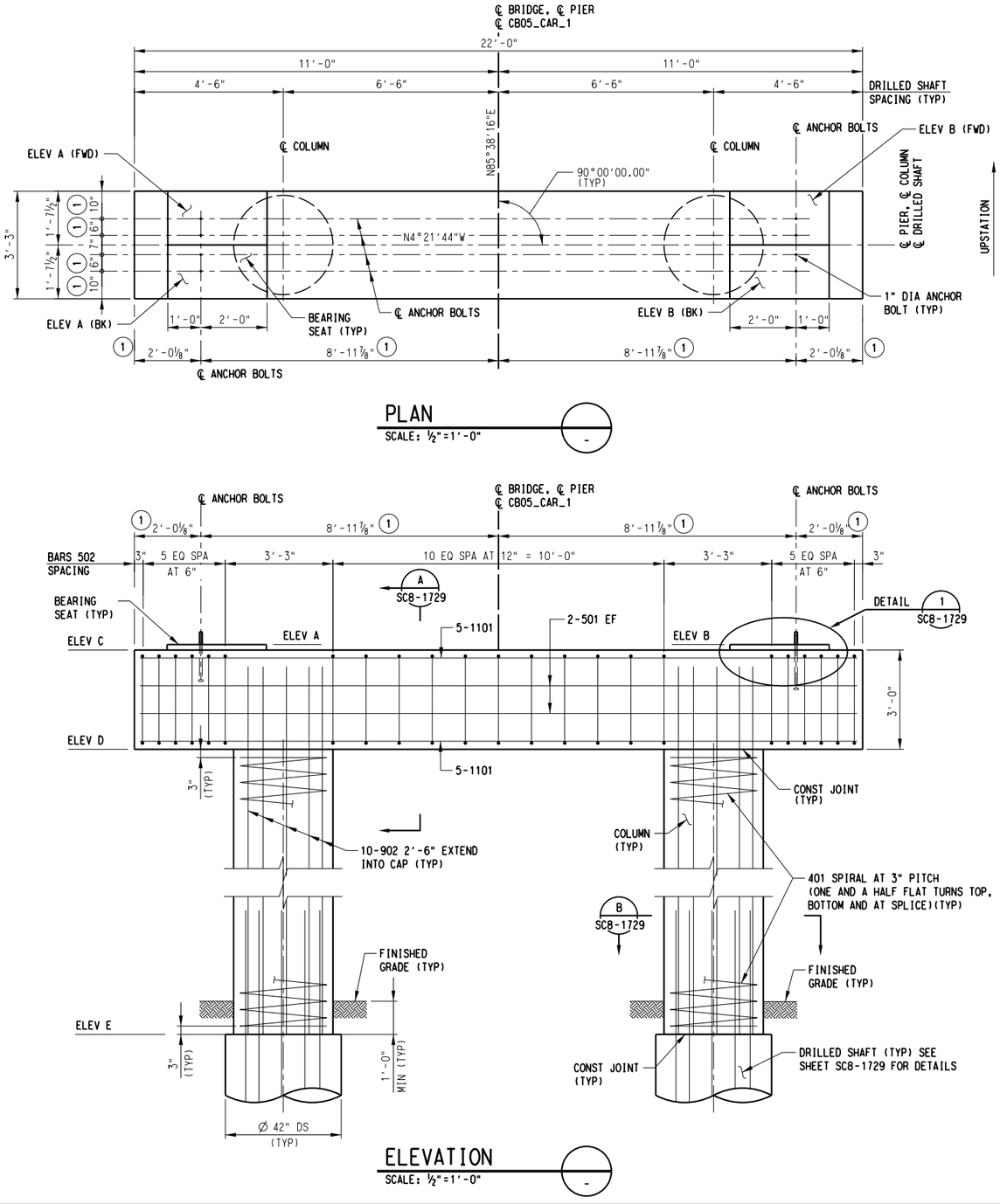
DWG No. SC8-1728

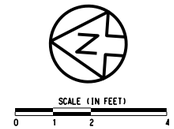


PLAN

SCALE: ½"=1'-0"

ELEVATION

SCALE: ½"=1'-0"



NOTES:

1. FOR FOUNDATION PLAN, SEE DRAWING Nos SC2-1711 AND SC2-1712.
2. FOR SCHEDULE OF ELEVATIONS AND DRILLED SHAFT LENGTHS, SEE SUBSTRUCTURE SCHEDULE DRAWING No. SC8-1715.
3. FOR GEOMETRY CONTROL PLANS, SEE DRAWING Nos SC8-1746 AND SC8-1747.
4. FOR ADDITIONAL BEARING SEAT AND ANCHOR BOLT LAYOUT AND INFORMATION, SEE DRAWING No. SC8-1729.
5. CONCRETE FOR PIER, COLUMN AND DRILLED SHAFTS SHALL BE CLASS "C" WITH MINIMUM 28-DAY COMPRESSIVE STRENGTH 3600 PSI.
6. ALL EXPOSED EDGES OF CONCRETE MEMBERS SHALL BE CHAMFERED ¾ INCH.
7. REINFORCEMENT SHALL MEET THE REQUIREMENTS OF THE CURRENT ASTM DESIGNATION: A615 OR A706, GRADE 60.
8. BAR DIMENSIONS ARE OUT-TO-OUT.
9. MINIMUM CONCRETE COVER ON REINFORCEMENT SHALL BE TWO (2) INCHES UNLESS OTHERWISE NOTED.
10. FOR NOTES AND STANDARDS NOT SHOWN, SEE GENERAL NOTES OF THE BRIDGE STANDARD DRAWINGS.
11. ALL DIMENSIONS ARE EITHER HORIZONTAL OR VERTICAL AND MUST BE CORRECTED FOR GRADE, CROSS-SLOPE, AND/OR SUPERELEVATION.
12. ANCHOR BOLTS SHALL BE HEX HEAD ASTM F1554 GRADE 105. SEE DRAWING No. SC8-1729 FOR MORE DETAILS.

① LOCATIONS OF ANCHOR BOLTS ARE SUBJECT TO CHANGE. REFER TO THE PREFABRICATED BRIDGE PLANS FOR FINAL ANCHOR BOLT LOCATIONS.

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FINAL 100% DESIGN

CONTRACT SHEET No. 36 OF 345

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

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DESIGNED	M. MUENKS
CHECKED	S. HOFFMANN
IN CHARGE	J. FINKE
DATE	07 AUG 23

CAES

COTTON BELT REGIONAL RAIL VELOWEB HIKE & BIKE TRAIL

HUTTON BRANCH PEDESTRIAN BRIDGE (#17P) PIERS 2-4, 7 AND 8

CONTRACT	DWG No.	REV
C-2033270-01	SC8-1728	D

CB05-SC8-1728.008

31-JUL-2023 09:45
CB05-SC8-1728.008
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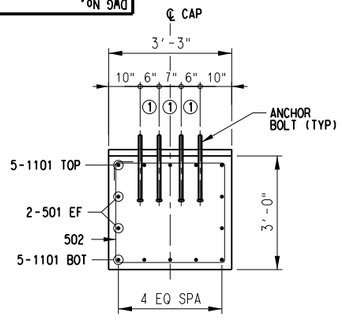
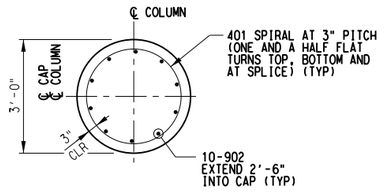
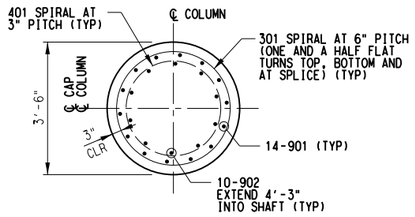


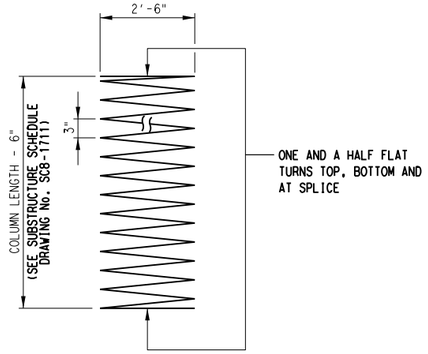
SECTION A
SCALE: ½"=1'-0"
SC8-1728



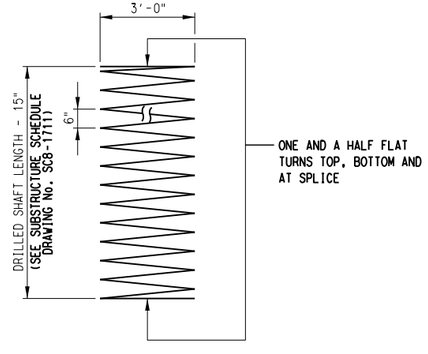
COLUMN SECTION B
SCALE: ½"=1'-0"
SC8-1728



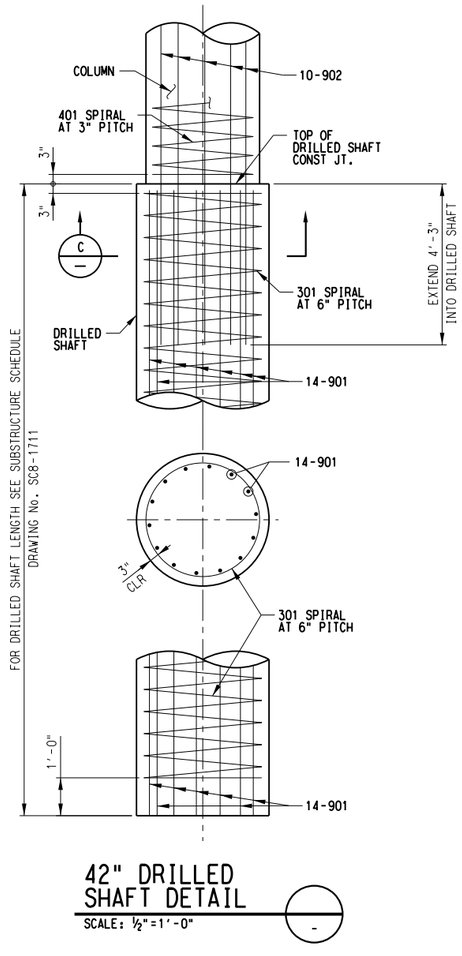
COLUMN AND DRILLED SHAFT INTERFACE
SCALE: ½"=1'-0"
C
-



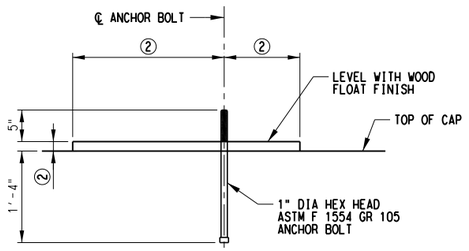
BARS 401



BARS 301

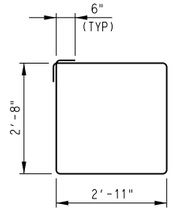


42" DRILLED SHAFT DETAIL
SCALE: ½"=1'-0"
-



BEARING SEAT DETAIL
SCALE: 1"=1'-0"
1
SC8-1728

(SEE DRAWING No. SC8-1728 FOR ORIENTATION)
(BEARING SURFACE SHALL BE CLEAN AND FREE OF ALL LOOSE MATERIAL BEFORE PLACING BEARING ASSEMBLY)



BAR 502

NOTES:

1. SEE DRAWING No. SC8-1728 FOR SHEET NOTES.

① LOCATIONS OF ANCHOR BOLTS ARE SUBJECT TO CHANGE. REFER TO THE PREFABRICATED BRIDGE PLANS FOR FINAL ANCHOR BOLT LOCATIONS.

② SEE PLAN VIEW ON DRAWING No. SC8-1728 FOR DIMENSIONS.

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CONTRACT SHEET No. 37 OF 345

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

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FIRM REGISTRATION No. F-2966

ARCHER WESTERN HERZOG

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SCALE	AS NOTED
DRAWN	S. KAEMMERER
DESIGNED	M. MUENKS
CHECKED	S. HOFFMANN
IN CHARGE	J. FINKE
DATE	07 AUG 23

CAES

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

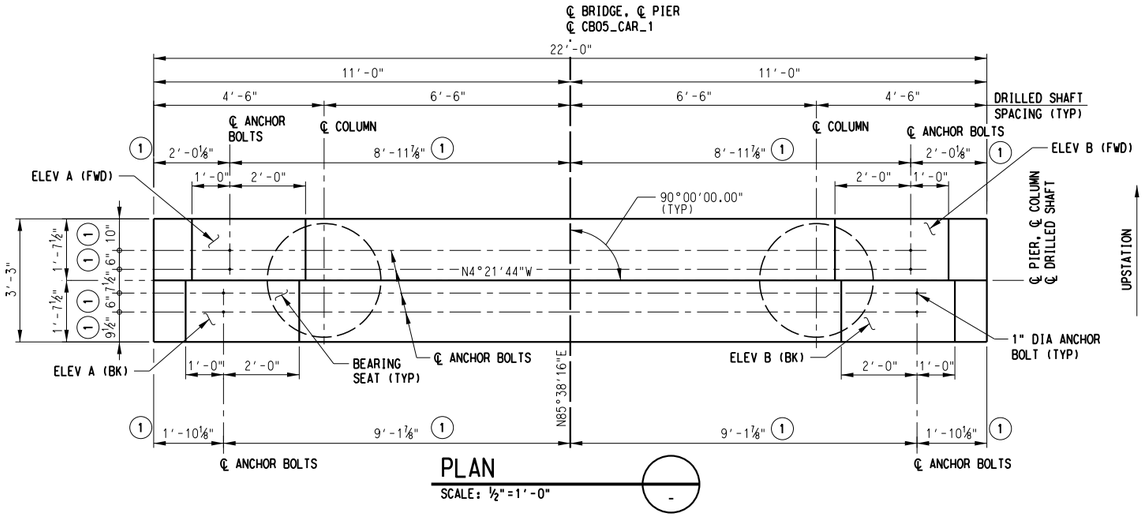
HUTTON BRANCH
PEDESTRIAN BRIDGE (#17P)
PIERS 2-4, 7 AND 8 DETAILS

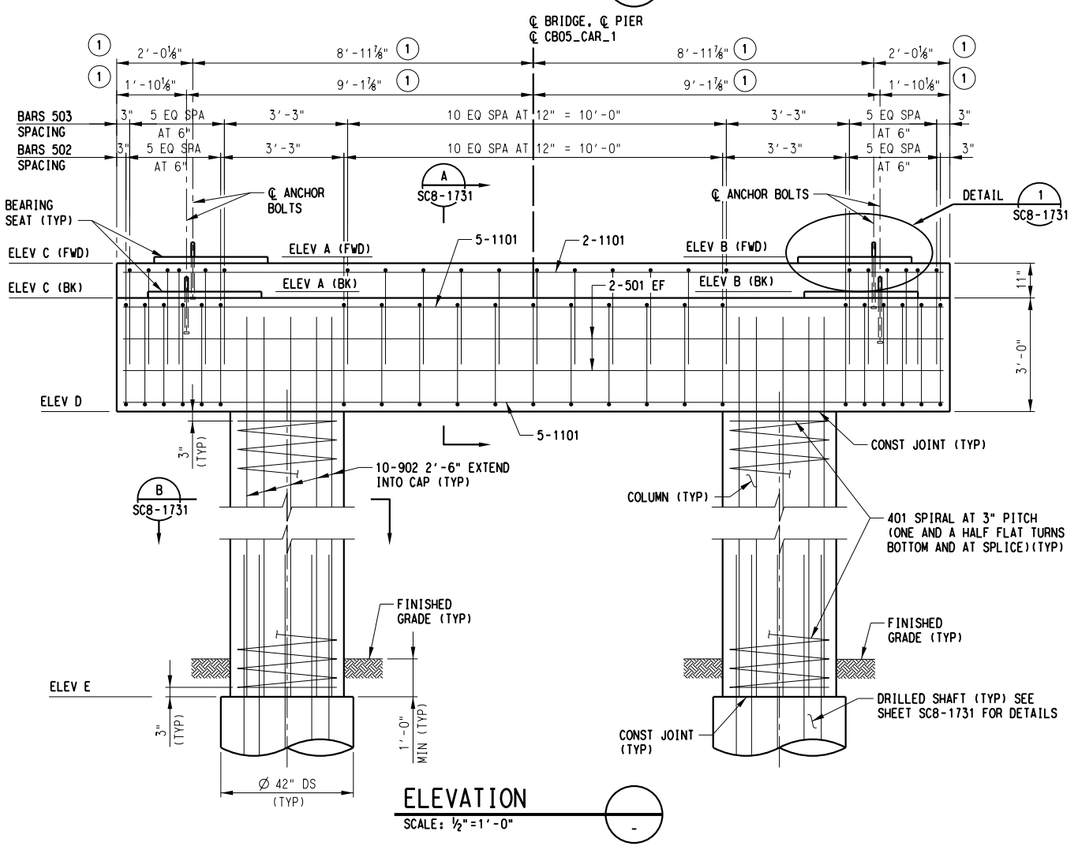
CONTRACT	DWG No.	REV
C-2033270-01	SC8-1729	D

CB05-SC8-1729.008

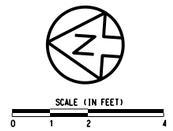
31-JUL-2023 09:45
CB05-SC8-1729.008
JEGSVCPW001
Default

DWG No. SC8-1730





NOTE: PIER 6 SHOWN, PIER 5 SIMILAR



NOTES:

1. FOR FOUNDATION PLAN, SEE DRAWING Nos SC2-1711 AND SC2-1712.
2. FOR SCHEDULE OF ELEVATIONS AND DRILLED SHAFT LENGTHS, SEE SUBSTRUCTURE SCHEDULE DRAWING No. SC8-1715.
3. FOR GEOMETRY CONTROL PLANS, SEE DRAWING Nos SC8-1746 AND SC8-1747.
4. FOR ADDITIONAL BEARING SEAT AND ANCHOR BOLT LAYOUT AND INFORMATION, SEE DRAWING No. SC8-1731.
5. CONCRETE FOR PIER, COLUMN AND DRILLED SHAFTS SHALL BE CLASS "C" WITH MINIMUM 28-DAY COMPRESSIVE STRENGTH 3600 PSI.
6. ALL EXPOSED EDGES OF CONCRETE MEMBERS SHALL BE CHAMFERED ¾ INCH.
7. REINFORCEMENT SHALL MEET THE REQUIREMENTS OF THE CURRENT ASTM DESIGNATION: A615 OR A706, GRADE 60.
8. BAR DIMENSIONS ARE OUT-TO-OUT.
9. MINIMUM CONCRETE COVER ON REINFORCEMENT SHALL BE TWO (2) INCHES UNLESS OTHERWISE NOTED.
10. FOR NOTES AND STANDARDS NOT SHOWN, SEE GENERAL NOTES OF THE BRIDGE STANDARD DRAWINGS.
11. ALL DIMENSIONS ARE EITHER HORIZONTAL OR VERTICAL AND MUST BE CORRECTED FOR GRADE, CROSS-SLOPE, AND/OR SUPERELEVATION.
12. ANCHOR BOLTS SHALL BE HEX HEAD ASTM F1554 GRADE 105. SEE DRAWING No. SC8-1731 FOR MORE DETAILS.

① LOCATIONS OF ANCHOR BOLTS ARE SUBJECT TO CHANGE. REFER TO THE PREFABRICATED BRIDGE PLANS FOR FINAL ANCHOR BOLT LOCATIONS.

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FINAL 100% DESIGN

CONTRACT SHEET No. 38 OF 345

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

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SCALE	1/2"=1'-0"
DRAWN	S. KAEMMERER
DESIGNED	W. WUENKS
CHECKED	S. HOFFMANN
IN CHARGE	J. FINKE
DATE	07 AUG 23

CAES

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

HUTTON BRANCH
PEDESTRIAN BRIDGE (#17P)
PIERS 5 AND 6

CONTRACT	DWG No.	REV
C-2033270-01	SC8-1730	D

CB05-SC8-1730.008

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CB05-SC8-1730.008

JEGSVCPWU01
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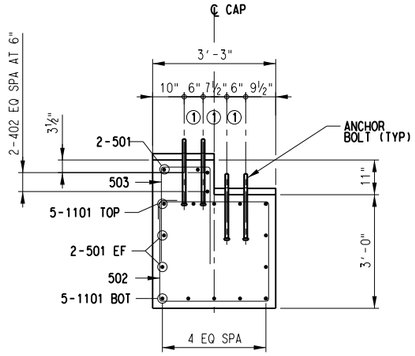
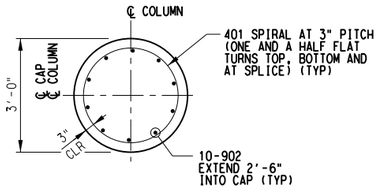
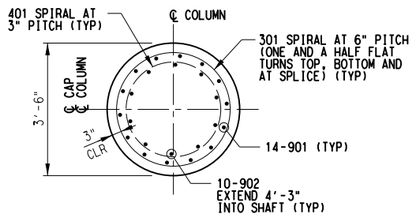


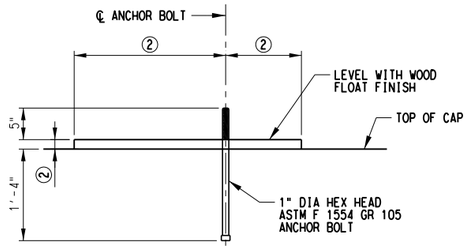
SECTION A
SCALE: ½"=1'-0"
SC8-1730



COLUMN SECTION B
SCALE: ½"=1'-0"
SC8-1730



COLUMN AND DRILLED SHAFT INTERFACE
SCALE: ½"=1'-0"
C
-



BEARING SEAT DETAIL
SCALE: 1"=1'-0"
1
SC8-1730

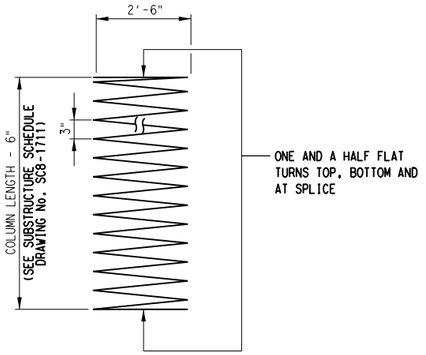
(SEE DRAWING No. SC8-1730 FOR ORIENTATION)
(BEARING SURFACE SHALL BE CLEAN AND FREE OF ALL LOOSE MATERIAL BEFORE PLACING BEARING ASSEMBLY)

NOTES:

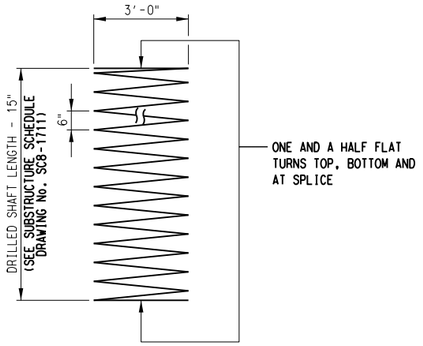
1. SEE DRAWING No. SC8-1730 FOR SHEET NOTES.

① LOCATIONS OF ANCHOR BOLTS ARE SUBJECT TO CHANGE. REFER TO THE PREFABRICATED BRIDGE PLANS FOR FINAL ANCHOR BOLT LOCATIONS.

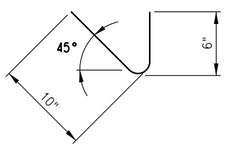
② SEE PLAN VIEW ON DRAWING No. SC8-1730 FOR DIMENSIONS.



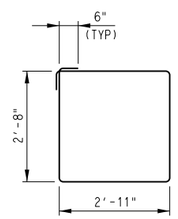
BARS 401



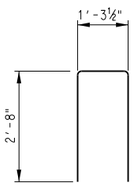
BARS 301



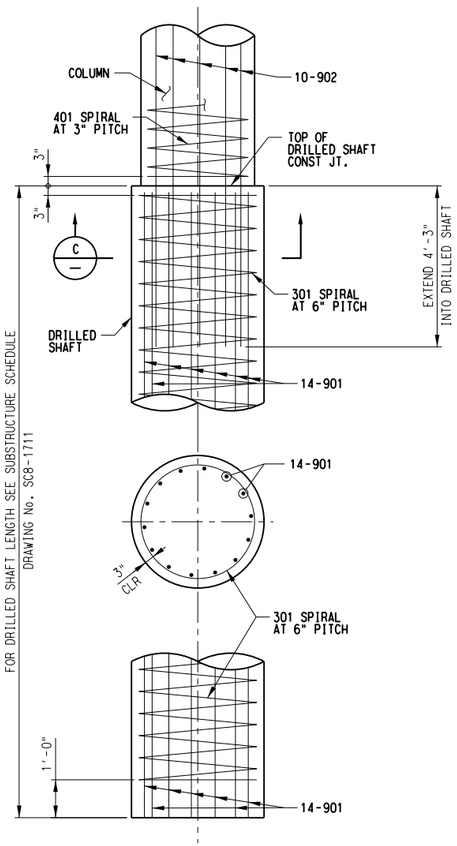
BAR 402



BAR 502



BAR 503



42" DRILLED SHAFT DETAIL
SCALE: ½"=1'-0"
-

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FINAL 100% DESIGN

CONTRACT SHEET No. 39 OF 345

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

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FIRM REGISTRATION No. F-2966

ARCHER WESTERN HERZOG

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SCALE	AS NOTED
DRAWN	S. KAEMMERER
DESIGNED	M. MUENKS
CHECKED	S. HOFFMANN
IN CHARGE	J. FINKE
DATE	07 AUG 23

CAES

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

HUTTON BRANCH
PEDESTRIAN BRIDGE (#17P)
PIERS 5 AND 6 DETAILS

CONTRACT	DWG No.	REV
C-2033270-01	SC8-1731	D

CB05-SC8-1731.008

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CB05-SC8-1731.008
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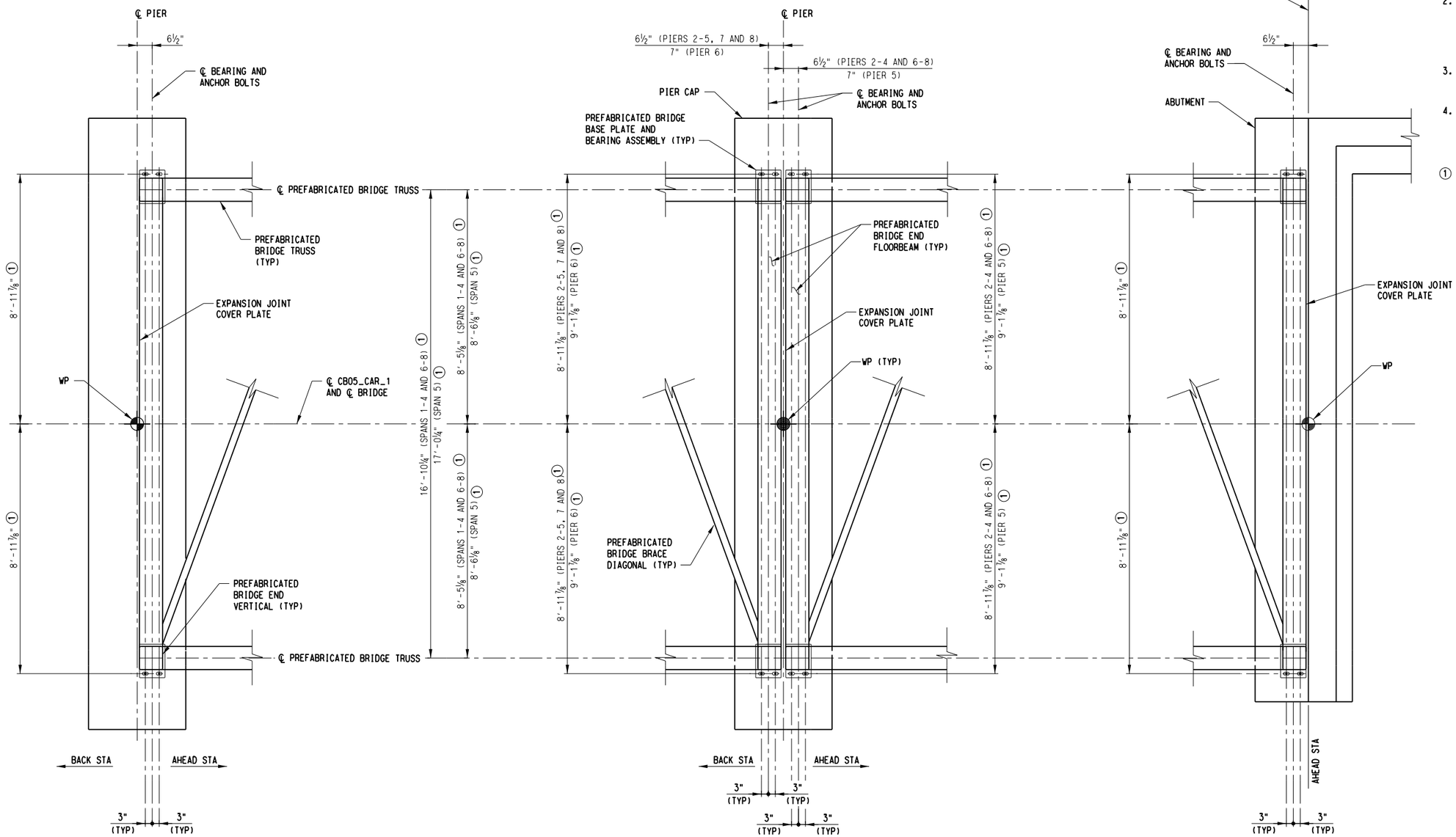
DWG No. SC8-1736



NOTES:

1. SHOP DRAWINGS FOR APPROVAL ARE REQUIRED.
2. A BEARING LAYOUT WHICH IDENTIFIES LOCATION AND ORIENTATION OF ALL BEARINGS MUST BE DEVELOPED BY THE BEARING FABRICATOR. PERMANENTLY MARK EACH BEARING IN ACCORDANCE WITH THE BEARING LAYOUT. A COPY OF THE BEARING LAYOUT IS TO BE PROVIDED TO THE ENGINEER.
3. TRUSS LAYOUT IS FOR ILLUSTRATION ONLY. SEE PREFABRICATED BRIDGE VENDOR'S PLANS FOR DETAILS.
4. PREFABRICATED SUPERSTRUCTURE, DECK FORM, SIDE DAMS, BEARING ASSEMBLIES, EXPANSION JOINTS, AND EXPANSION JOINT COVER PLATES ARE TO BE PROVIDED BY PREFABRICATED BRIDGE VENDOR.

① LOCATIONS OF BEARINGS AND ANCHOR BOLTS ARE SUBJECT TO CHANGE. REFER TO THE PREFABRICATED BRIDGE VENDOR'S PLANS FOR FINAL LOCATIONS.

TYPICAL DETAIL OF TRUSS ENDS AT PIER 1 — 1 / -
NO SCALE

TYPICAL DETAIL OF TRUSS ENDS AT PIERS 2-8 — 2 / -
NO SCALE

TYPICAL DETAIL OF TRUSS ENDS AT ABUTMENT 9 — 3 / -
NO SCALE

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CONTRACT SHEET No. 40 OF 345

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

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SCALE	NO SCALE
DRAWN	S.KAEMMERER
DESIGNED	W. MUENKS
CHECKED	M. MEYER
IN CHARGE	J. FINKE
DATE	07 AUG 23

CAES

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
HUTTON BRANCH
PEDESTRIAN BRIDGE (#17P)
PREFABRICATED BRIDGE END AND BEARING DETAILS

CONTRACT C-2033270-01 | DWG No. SC8-1736 | REV D

CB05-SC8-1736.008

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CB05-SC8-1736.008
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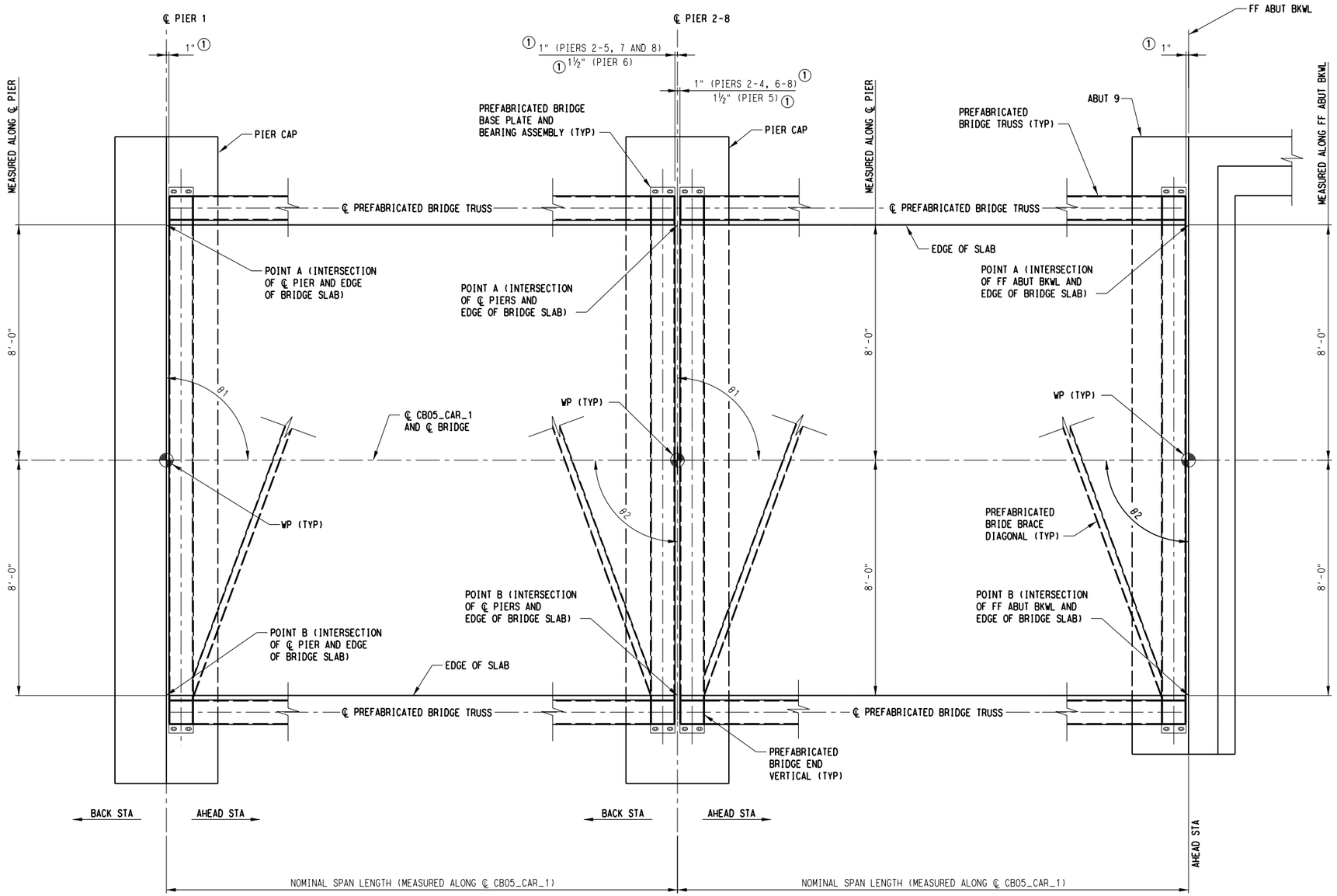
DWG No. SC8-1746



GEOMETRY CONTROL PLAN

NO SCALE

1 / -

NOTES:

1. FOR PLAN AND ELEVATION, SEE DRAWING Nos SC2-1701 AND SC2-1702.
2. FOR TYPICAL SECTION, SEE DRAWING No. SC8-1701.
3. FOR PEDESTRIAN TRAIL PLAN AND PROFILE, SEE HIKE AND BIKE TRAIL SHEETS.
4. FOR WORKING POINT COORDINATES SEE DRAWING No. SC8-1715.
5. WORK THIS DRAWING WITH DRAWING No. SC8-1747.
6. ALL DIMENSIONS SHOWN ARE HORIZONTALLY PROJECTED DIMENSIONS. THE LENGTHS SHALL BE ADJUSTED BY VERTICAL ELEVATION DIFFERENCE BETWEEN WORKING POINTS.
7. TRUSS LAYOUT IS FOR ILLUSTRATION ONLY. SEE PREFABRICATED BRIDGE VENDOR'S PLANS FOR DETAILS.

① LOCATIONS OF BEARINGS AND ANCHOR BOLTS ARE SUBJECT TO CHANGE. REFER TO THE PREFABRICATED VENDOR'S PLANS FOR FINAL LOCATIONS.

DIMENSIONS SHOWN ARE ASSUMED DIMENSIONS USED FOR THE PURPOSE OF VERIFYING ADEQUATE SUBSTRUCTURE MEMBER SIZES HAVE BEEN PROVIDED. REFER TO THE PREFABRICATED BRIDGE VENDOR'S PLANS FOR FINAL DIMENSIONS.

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CONTRACT SHEET No. 41 OF 345

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DRAWN	S. KAEMMERER
DESIGNED	M. MUENKS
CHECKED	S. HOFFMANN
IN CHARGE	J. FINKE
DATE	07 AUG 23

CAES

COTTON BELT REGIONAL RAIL VELOWEB HIKE & BIKE TRAIL

HUTTON BRANCH PEDESTRIAN BRIDGE (#17P) GEOMETRY CONTROL PLAN SHEET 1 OF 2

CONTRACT	DWG No.	REV
C-2033270-01	SC8-1746	D

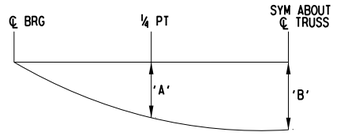
CB05-SC8-1746.008

31-JUL-2023 09:48
CB05-SC8-1746.008

JEGSVCPW001
Default

DWG No. SC8-1747

ABUT / PIER No.	ABUT / PIER STATION	WORKING POINT PGL EL AT CL	ABUT / PIER BEARING	SPAN No.	NOMINAL SPAN LENGTH (WP TO WP)	ASSUMED TRUSS DIMENSIONS: TRUSS LENGTH	CL BRG TO CL BRG	DEFL 'A' (INCH)	DEFL 'B' (INCH)	TRUSS BEARING	ANGLE FROM TRUSS TO BACK ABUT Ø1	ANGLE FROM AHEAD PIER TO ABUT Ø2
1	2076+11.82	443.29	N4°21'44"W	1	112'-0"	111'-10"	110'-11"	*	*	N85°38'16"E	90°00'00"	- - -
2	2077+23.82	445.43	N4°21'44"W	2	112'-0"	111'-10"	110'-11"	*	*	N85°38'16"E	90°00'00"	90°00'00"
3	2078+35.82	447.77	N4°21'44"W	3	112'-0"	111'-10"	110'-11"	*	*	N85°38'16"E	90°00'00"	90°00'00"
4	2079+47.82	448.33	N4°21'44"W	4	112'-0"	111'-10"	110'-11"	*	*	N85°38'16"E	90°00'00"	90°00'00"
5	2080+59.82	448.89	N4°21'44"W	5	144'-0"	143'-9"	142'-10"	*	*	N85°38'16"E	90°00'00"	90°00'00"
6	2082+03.82	448.17	N4°21'44"W	6	98'-0"	97'-10"	96'-11"	*	*	N85°35'16"E	90°00'00"	90°00'00"
7	2083+01.82	447.68	N4°21'44"W	7	98'-0"	97'-10"	96'-11"	*	*	N85°38'16"E	90°00'00"	90°00'00"
8	2083+99.82	445.67	N4°21'44"W	8	74'-0"	73'-10"	72'-11"	*	*	N85°38'16"E	- - -	90°00'00"
9	2084+73.82	444.15	N4°21'44"W									



NOTES: DEFLECTIONS SHOWN ARE DUE TO PREFABRICATED BRIDGE SUPERSTRUCTURE, CAST-IN-PLACE CONCRETE SLAB AND ALL OTHER SUPERIMPOSED DEAD LOADS. DEFLECTIONS SHOWN ARE INSTANT DEFLECTIONS. ADJUST DEFLECTIONS BASED ON FIELD OBSERVATIONS AS NEEDED.

DEAD LOAD DEFLECTIONS DIAGRAM

NO SCALE

1
-

NOTES:

1. SEE NOTES ON DRAWING No. SC8-1746.

* ANTICIPATED DEAD LOAD DEFLECTIONS SHALL BE PROVIDED BY THE PREFABRICATED BRIDGE MANUFACTURER. DEFLECTIONS SHALL BE DUE TO PREFABRICATED BRIDGE SUPERSTRUCTURE, CAST-IN-PLACE CONCRETE SLAB AND ALL OTHER SUPERIMPOSED DEAD LOADS. DEFLECTIONS SHALL BE INSTANT DEFLECTIONS.

ABUT / PIER No.	POINT	STATION	PGL EL (FT)	OFFSET (FT)	SLOPE %	TOP OF SLAB EL (FT)
1	A	2076+11.82	443.29	-8.00	1.50%	443.17
	B	2076+11.82		8.00	1.50%	443.41
2	A	2077+23.82	445.53	-8.00	1.50%	445.41
	B	2077+23.82		8.00	1.50%	445.65
3	A	2078+35.82	447.77	-8.00	1.50%	447.65
	B	2078+35.82		8.00	1.50%	447.89
4	A	2079+47.82	448.33	-8.00	1.50%	448.21
	B	2079+47.82		8.00	1.50%	448.45
5	A	2080+59.82	448.89	-8.00	1.50%	448.77
	B	2080+59.82		8.00	1.50%	449.01
6	A	2082+08.82	448.17	-8.00	1.50%	448.05
	B	2082+03.82		8.00	1.50%	448.29
7	A	2083+01.82	447.68	-8.00	1.50%	447.56
	B	2083+01.82		8.00	1.50%	447.80
8	A	2083+99.82	445.67	-8.00	1.50%	445.55
	B	2083+99.82		8.00	1.50%	445.79
9	A	2084+73.82	444.15	-8.00	1.50%	444.03
	B	2084+73.82		8.00	1.50%	444.27

NOTES: TOP OF DECK/SLAB ELEVATIONS SHOWN ARE MEASURED ALONG THE FRONT FACE OF ABUTMENT BACKWALLS AND ALONG THE CL OF PIERS. ELEVATIONS ARE TAKEN AT THE EDGE OF DECK.

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CONTRACT SHEET No. 42 OF 345

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DATE	07 AUG 23

CAES

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
HUTTON BRANCH
PEDESTRIAN BRIDGE (#17P)
GEOMETRY CONTROL PLAN
SHEET 2 OF 2

CONTRACT	DWG No.	REV
C-2033270-01	SC8-1747	D

CB05-SC8-1747.008

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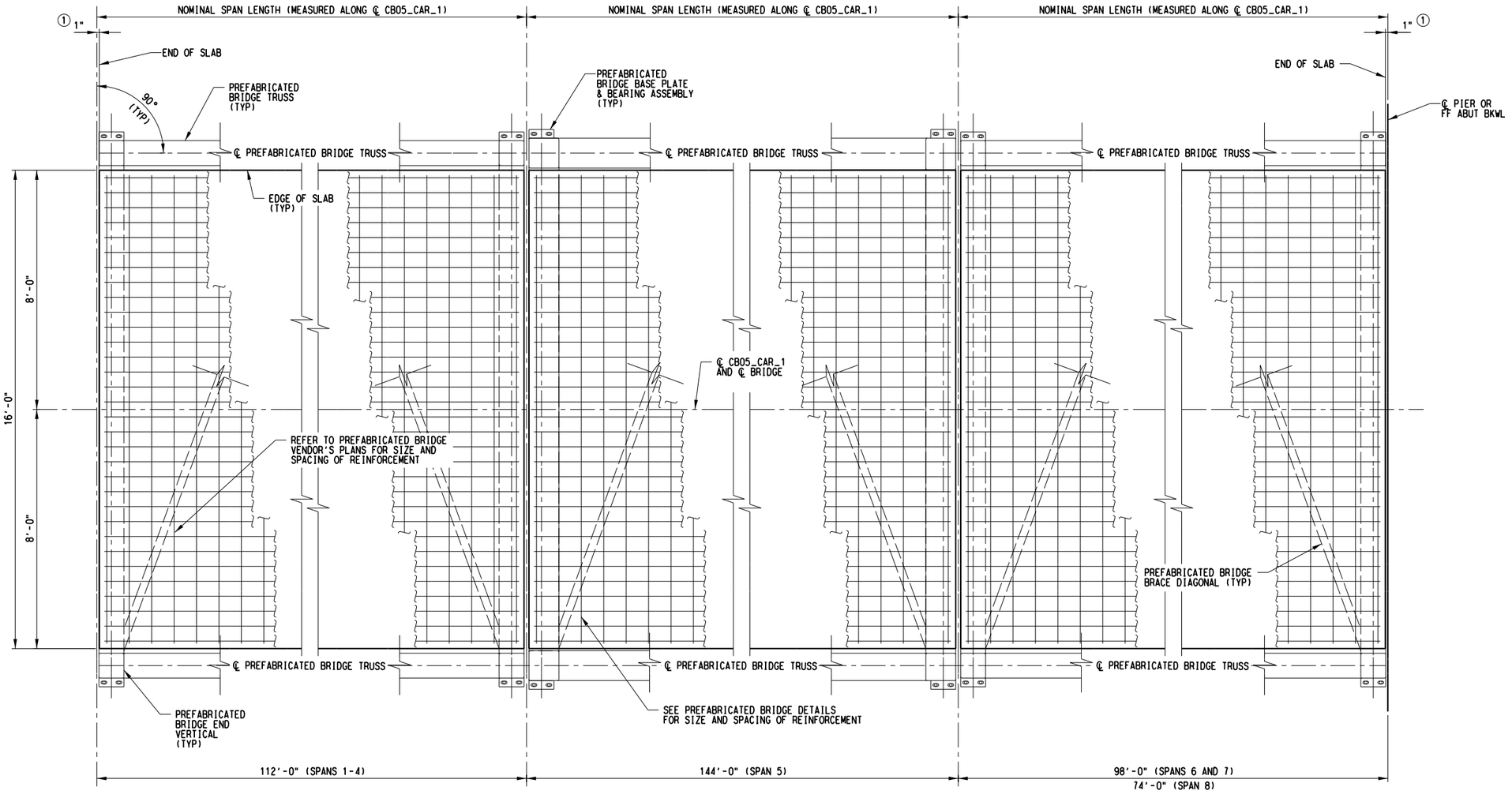
DWG No. SC3-1701



SLAB REINFORCING PLAN

NO SCALE

1

NOTES:

1. SLAB DESIGNED IN ACCORDANCE WITH AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS.
2. ALL CONCRETE SHALL BE TxDOT CLASS S CONCRETE WITH A MINIMUM COMPRESSIVE STRENGTH AT 28 DAYS OF 4,000 PSI.
3. ALL SLAB REINFORCING BARS SHALL BE ASTM A615, GRADE 60 AND EPOXY COATED.
4. FOR TYPICAL SLAB SECTION, SEE DRAWING No. SC8-1751.
5. PREFABRICATED BRIDGE SUPERSTRUCTURE, DECK FORM, SIDE DAMS, BEARING ASSEMBLIES, EXPANSION JOINTS, AND EXPANSION JOINT COVER PLATES ARE TO BE PROVIDED BY THE PREFABRICATED BRIDGE VENDOR.
6. FOR ADDITIONAL DETAILS, SEE GEOMETRY CONTROL PLANS, DRAWING Nos SC8-1746 AND SC8-1747.
7. FOR SECTION CONTROL LINE, SEE PLAN AND ELEVATION SHEETS, DRAWING Nos SC2-1701 AND SC2-1702, AND TYPICAL SECTION SHEET, DRAWING No. SC8-1701.
8. TRUSS LAYOUT IS FOR ILLUSTRATION ONLY. SEE PREFABRICATED BRIDGE VENDOR'S PLANS FOR DETAILS.
9. FOR THE FINAL SURFACE TEXTURE, A ROUGHENED BROOM FINISH SHALL BE PROVIDED AS A NON-SKID FINISH.
10. CONTROL JOINTS SHALL BE PROVIDED AT EVERY FLOOR BEAM. REFER TO THE PREFABRICATED BRIDGE VENDOR'S PLANS FOR FLOOR BEAM LOCATIONS.
11. EDGES OF SLABS ARE PERPENDICULAR TO TRUSS BEARINGS UNLESS NOTED OTHERWISE.

① TRUSS DIMENSIONS ARE SUBJECT TO CHANGE. REFER TO THE PREFABRICATED BRIDGE VENDOR'S PLANS FOR FINAL TRUSS DIMENSIONS.

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COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

HUTTON BRANCH
PEDESTRIAN BRIDGE (#17P)
SLAB REINFORCING PLAN

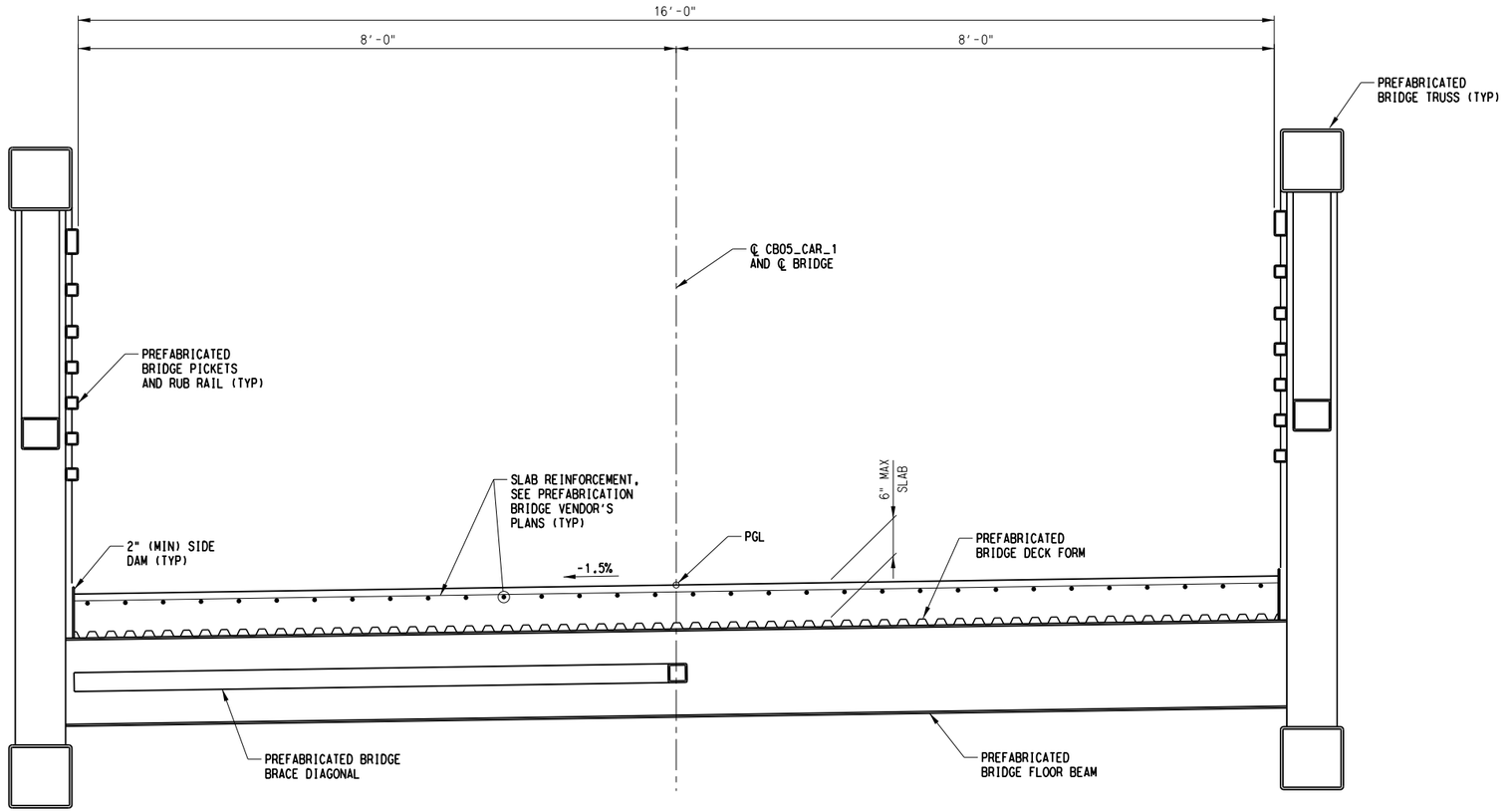
CONTRACT	DWG No.	REV
C-2033270-01	SC3-1701	D

CB05-SC3-1701.008

DWG No. SC8-1751

NOTES:

1. FOR NOTES SEE DRAWING No. SC8-1791.
2. RUB RAIL AND HORIZONTAL PICKETS ARE FOR ILLUSTRATIVE PURPOSES ONLY. REFER TO PREFABRICATED BRIDGE VENDOR DRAWINGS FOR DETAILS.



TYPICAL TRANSVERSE SECTION 1/-

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LOOKING UPSTATION

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COTTON BELT REGIONAL RAIL VELOWEB HIKE & BIKE TRAIL

HUTTON BRANCH PEDESTRIAN BRIDGE (#17P) TYPICAL SLAB SECTION

CONTRACT	DWG No.	REV
C-2033270-01	SC8-1751	D

CB05-SC8-1751.008

DWG No. SC8-1791

PREFABRICATED BRIDGE REQUIREMENTS AND NOTES

BRIDGE GEOMETRY AND DESIGN REQUIREMENTS

1. THE PREFABRICATED STRUCTURE SPAN LENGTHS FROM CENTERLINE TO CENTERLINE OF PIER OR TO FRONT FACE OF BACKWALL SHALL BE AS AS SHOWN ON THE PLAN AND ELEVATIONS. SPAN LENGTHS SHOWN ARE HORIZONTAL AND MUST BE ADJUSTED FOR GRADE.
2. THE CLEAR WIDTH OF THE BRIDGE (INSIDE OF HANDRAIL TO INSIDE OF HANDRAIL) SHALL BE 16'-0".
3. THE ELEVATION DIFFERENCE BETWEEN PIERS IS NOTED ON THE INCLUDED PLAN AND ELEVATION SHEETS.
4. LIVE LOAD DEFLECTION SHALL NOT EXCEED 1/360 OF THE SPAN LENGTH. HORIZONTAL DEFLECTIONS UNDER UNFACTORED WIND LOADING SHALL NOT EXCEED 1/360 OF THE SPAN LENGTH.
5. VIBRATIONS SHALL BE INVESTIGATED AS A SERVICE LIMIT STATE USING LOAD COMBINATION SERVICE I IN TABLE 3.4.1-1 OF AASHTO LRFD AND SHALL MEET THE CRITERIA SPECIFIED IN SECTION 6 OF THE LRFD GUIDE SPECIFICATIONS FOR THE DESIGN OF PEDESTRIAN BRIDGES. VIBRATION OF THE STRUCTURE SHALL NOT CAUSE DISCOMFORT OR CONCERN TO USERS OF THE BRIDGE.
6. PREFABRICATED BRIDGE SHALL BE CONSTRUCTED OF UNPAINTED WEATHERING STEEL.
7. THE PREFABRICATED STRUCTURE SHALL INCLUDE RAILING WITH RUB RAILS. RAILINGS SHALL MEET THE REQUIRMENTS AS SPECIFIED IN AASHTO "GUIDE FOR BICYCLE FACILITIES" 4TH EDITION, 2012. REFER TO AASHTO "LRFD BRIDGE DESIGN SPECIFICATIONS" 8TH EDITIONS FOR LOADING AND DESIGN REQUIREMENTS.
8. REFER TO THE BRIDGE PLAN AND ELEVATION SHEET FOR ASSUMED DEPTH FOR LOW CHORD AND TOP OF CAP DEPTHS.
9. MAINTAIN A FLUSH DECK WITH THE BOARDWALK AT SHARED PIER 1 AND APPROACH SLAB AT ABUTMENT 9.
10. THE PREFABRICATED STRUCTURE SHALL BE ADA COMPLIANT.
11. THE PREFABRICATED STRUCTURE SHALL INCLUDE DESIGN, DETAILS AND MATERIALS FOR THE PREFABRICATED SUPERSTRUCTURE, BEARING ASSEMBLIES, EXPANSION JOINTS, EXPANSION JOINT COVER PLATES, WIRE MESH, RAILINGS, CLEARANCE SIGN SUPPORT BRACKETS, DRIP PANS AND ANCHOR BOLT LOCATIONS.
12. FABRICATOR SHALL PROVIDE IPE WOODEN RUB RAILS.

DESIGN SPECIFICATIONS AND STANDARDS

(IN ORDER OF PRECEDENCE)

1. DART COTTON BELT DESIGN CRITERIA MANUAL.
2. TEXAS DEPARTMENT OF TRANSPORTATION (TxDOT) STANDARD SPECIFICATIONS FOR CONSTRUCTION AND MAINTENANCE OF HIGHWAYS, STREETS AND BRIDGES (2014) AND SPECIAL PROVISIONS THERETO.
3. TxDOT GEOTECHNICAL MANUAL (2020).
4. AWS D1.5 BRIDGE WELDING CODE (LATEST VERSION).
5. AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO) BRIDGE DESIGN SPECIFICATIONS 8TH EDITION (2017).
6. LRFD GUIDE SPECIFICATIONS FOR THE DESIGN OF PEDESTRIAN BRIDGES (2009) WITH 2015 INTERIM REVISIONS.
7. AASHTO STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES, AND TRAFFIC SIGNALS 1ST EDITION (2015) AND ALL INTERIM REVISIONS THERETO.
8. "ANNUAL BOOK OF ASTM STANDARDS" OF THE AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM).
9. "STANDARD SPECIFICATIONS FOR TRANSPORTATION MATERIALS AND METHODS OF SAMPLING AND TESTING" OF THE AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (2018).

DESIGN LOADS (UNFACTORED)

DEAD LOADS:

IN ADDITION TO THE SELF-WEIGHT OF THE PREFABRICATED STRUCTURE AND ANY OTHER MISC DEAD LOADS REQUIRED BY THE PRECEEDING SPECIFICATIONS AND STANDARDS, THE PREFABRICATED STRUCTURE SHALL ALSO BE DESIGNED FOR THE FOLLOWING DEAD LOADS:

1. 16'-0" WIDE BY 6" THICK (MAXIMUM) CONCRETE DECK WITH A CROSS SLOPE AS IDENTIFIED IN THE LAYOUT SHEET. MINIMUM UNIT WEIGHT FOR CONCRETE SHALL BE 150 PCF

LIVE LOADS:

IN ACCORDANCE WITH THE PRECEEDING SPECIFICATIONS AND STANDARDS, THE PREFABRICATED STRUCTURE SHALL BE DESIGNED FOR THE FOLLOWING LIVE LOADS:

1. PEDESTRIAN LIVE LOAD = 90 PSF
2. VEHICULAR LIVE LOAD = H10 LOADING

THE ABOVE LOADING IS NOT ALL-INCLUSIVE, THE PREFABRICATED STRUCTURE SHALL ALSO BE DESIGNED FOR ANY ADDITIONAL LOADS AS REQUIRED BY THE PRECEEDING SPECIFICATIONS (SUCH AS WIND LOAD, THERMAL, STREAM PRESSURE, ETC.).

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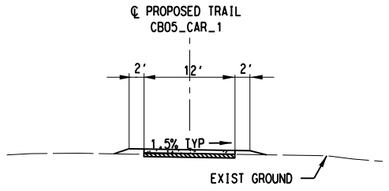
CONTRACT SHEET No. 45 OF 345

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
HUTTON BRANCH
BRIDGE STANDARD DRAWINGS
PEDESTRIAN BRIDGE (#17P)
REQUIREMENTS AND NOTES

CONTRACT	DWG No.	REV
C-2033270-01	SC8-1791	D

CB05-SC8-1791.008

DWG No. CC7-3020



TYPICAL SECTION
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℄ CB05_CAR_1 STA. 2056+87.27 TO 2058+15.43

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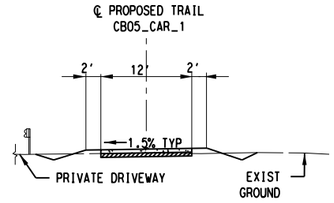

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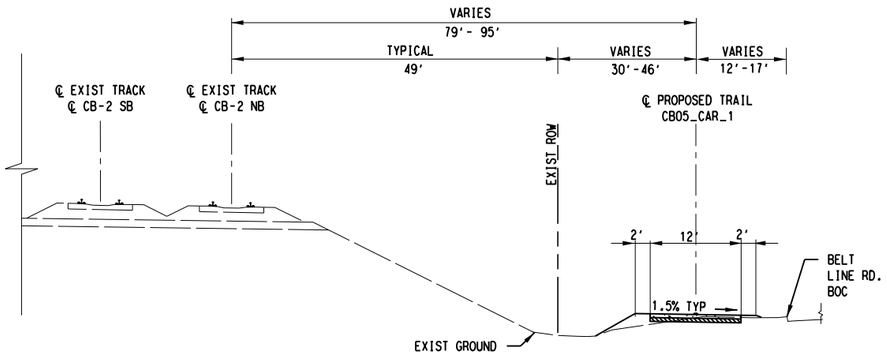

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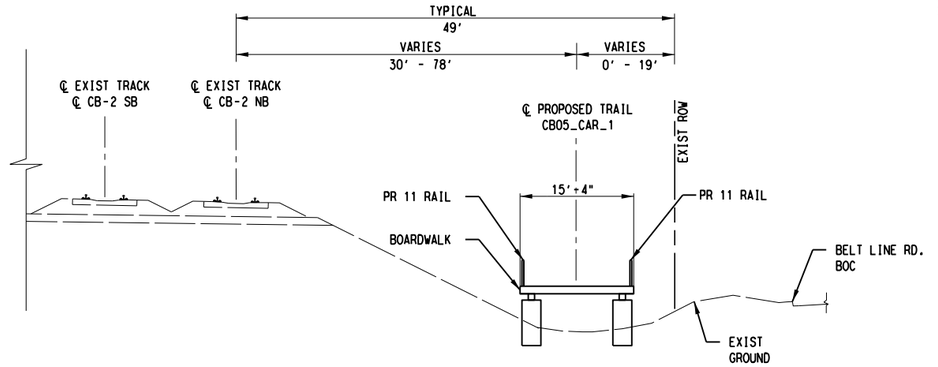


TYPICAL SECTION
℄ CB05_CAR_1 STA. 2045+70.78 TO 2054+80.91

NO SCALE

NOTES:

1. SEE TRAIL PLAN AND PROFILE SHEETS FOR FENCE LIMITS. FENCING IS REQUIRED WHERE TRAIL EDGE IS WITHIN 35' OF TRACK AND NO BARRIER STRUCTURE IS IN PLACE.
2. SEE TRAIL PLAN AND PROFILE SHEETS FOR SIDEWALK WALL LOCATIONS AND LIMITS.
3. SEE RETAINING WALL LAYOUT SHEETS FOR RETAINING WALL LIMITS.
4. SEE RR REQUIREMENTS SHEETS.

LEGEND

① 8" THICK REINFORCED CONCRETE TRAIL PAVEMENT; REFERENCE TXDOT STANDARD CRCP(1)-20

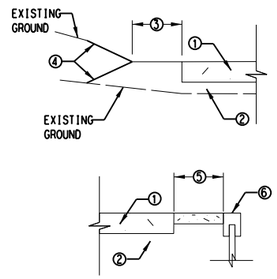
② SUBGRADE @ 95% STANDARD PROCTOR

③ DISTANCE = 2' TYPICAL @ 1.5% OR 16.6% MAXIMUM

④ MATCH EXISTING GROUND AT 4:1 TYPICAL OR 3:1 MAXIMUM

⑤ 4" THICK CONCRETE TRAIL PAVEMENT (MOW STRIP)

⑥ MECHANICALLY STABILIZED RETAINING WALL



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CAES

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

CITY OF CARROLLTON
TYPICAL SECTIONS
SHEET 1 OF 6

CONTRACT	DWG No.	REV
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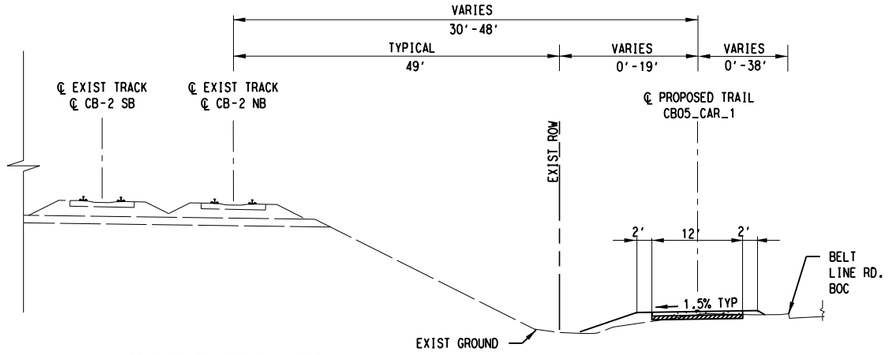

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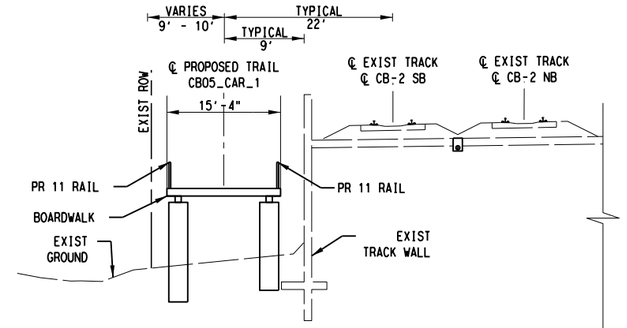

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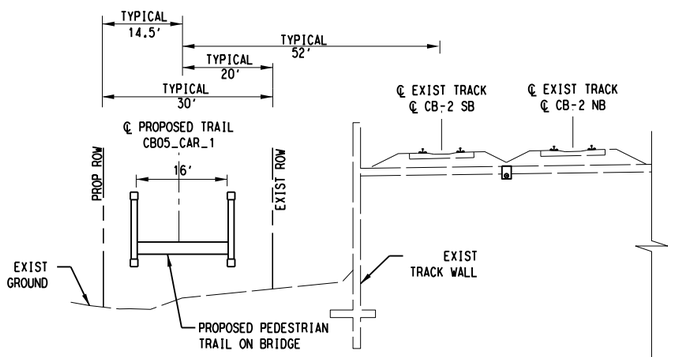

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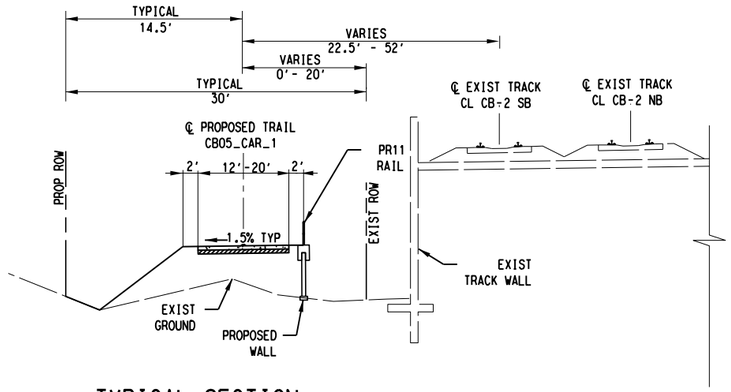


TYPICAL SECTION
℄ CB05_CAR_1 STA. 2084+73.82 TO 2085+16.22

NO SCALE

NOTES:

1. SEE TRAIL PLAN AND PROFILE SHEETS FOR FENCE LIMITS. FENCING IS REQUIRED WHERE TRAIL EDGE IS WITHIN 35' OF TRACK AND NO BARRIER STRUCTURE IS IN PLACE.
2. SEE TRAIL PLAN AND PROFILE SHEETS FOR SIDEWALK WALL LOCATIONS AND LIMITS.
3. SEE RETAINING WALL LAYOUT SHEETS FOR RETAINING WALL LIMITS.
4. SEE RR REQUIREMENTS SHEETS.

LEGEND

① 8" THICK REINFORCED CONCRETE TRAIL PAVEMENT; REFERENCE TXDOT STANDARD CRCP(1)-20

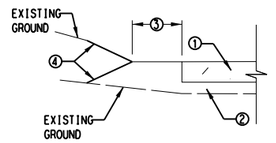
② SUBGRADE @ 95% STANDARD PROCTOR

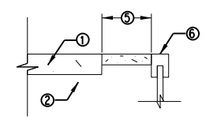
③ DISTANCE = 2' TYPICAL @ 1.5% OR 16.6% MAXIMUM

④ MATCH EXISTING GROUND AT 4:1 TYPICAL OR 3:1 MAXIMUM

⑤ 4" THICK CONCRETE TRAIL PAVEMENT (MOW STRIP)

⑥ MECHANICALLY STABILIZED RETAINING WALL





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CHECKED	D. LUU
IN CHARGE	D. LUU
DATE	07 AUG 23

CAES

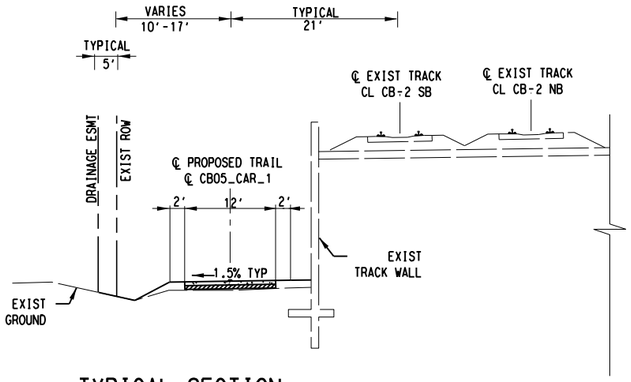
CONTRACT SHEET No. 47 OF 345

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

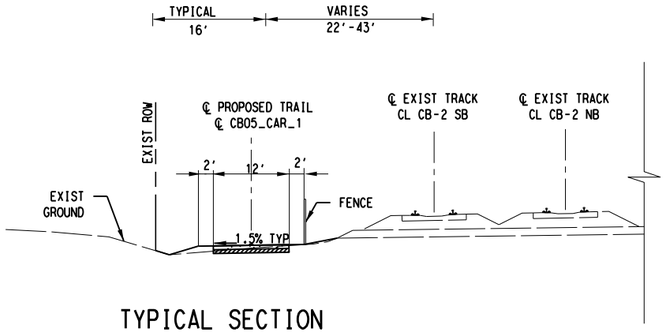
CITY OF CARROLLTON
TYPICAL SECTIONS
SHEET 2 OF 6

CONTRACT	DWG No.	REV
C-2033270-01	CC7-3021	D

CB05-CC7-3021.010



TYPICAL SECTION
℄ CB05_CAR_1 STA. 2085+16.22 TO 2091+07.37
NO SCALE



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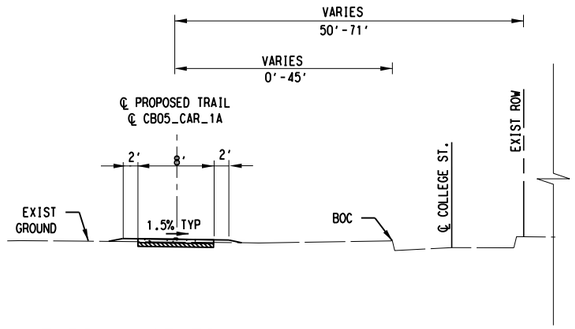
℄ CB05_CAR_1 STA. 2091+07.37 TO 2100+78.68
NO SCALE



TYPICAL SECTION
℄ CB05_CAR_1A STA. 10+12.93 TO 14+30.86
NO SCALE

NOTES:

1. SEE TRAIL PLAN AND PROFILE SHEETS FOR FENCE LIMITS. FENCING IS REQUIRED WHERE TRAIL EDGE IS WITHIN 35' OF TRACK AND NO BARRIER STRUCTURE IS IN PLACE.
2. SEE TRAIL PLAN AND PROFILE SHEETS FOR SIDEWALK WALL LOCATIONS AND LIMITS.
3. SEE RETAINING WALL LAYOUT SHEETS FOR RETAINING WALL LIMITS.
4. SEE RR REQUIREMENTS SHEETS.

LEGEND

① 8" THICK REINFORCED CONCRETE TRAIL PAVEMENT; REFERENCE TXDOT STANDARD CRCP(1)-20

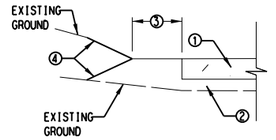
② SUBGRADE @ 95% STANDARD PROCTOR

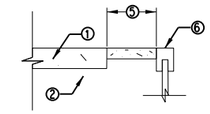
③ DISTANCE = 2' TYPICAL @ 1.5% OR 16.6% MAXIMUM

④ MATCH EXISTING GROUND AT 4:1 TYPICAL OR 3:1 MAXIMUM

⑤ 4" THICK CONCRETE TRAIL PAVEMENT (MOW STRIP)

⑥ MECHANICALLY STABILIZED RETAINING WALL





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CONTRACT SHEET No. 48 OF 345

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

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DESIGNED	S. SALEH
CHECKED	D. LUU
IN CHARGE	D. LUU
DATE	07 AUG 23

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

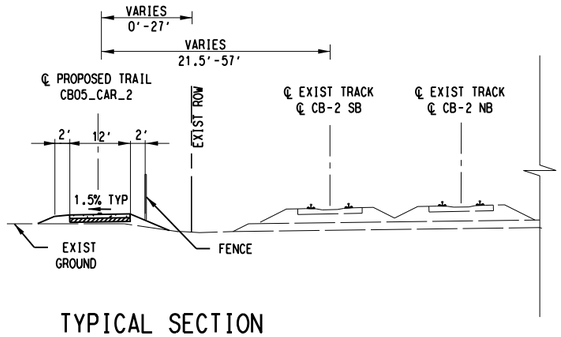
CITY OF CARROLLTON
TYPICAL SECTIONS
SHEET 3 OF 6

CONTRACT	DWG No.	REV
C-2033270-01	CC7-3022	D

CB05-CC7-3022.010

21-JUL-2023 15:01
CB05-CC7-3022.010
ssaleh
Default

DWG No. CC7-3023



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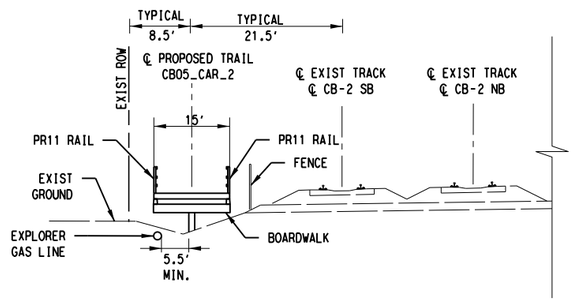
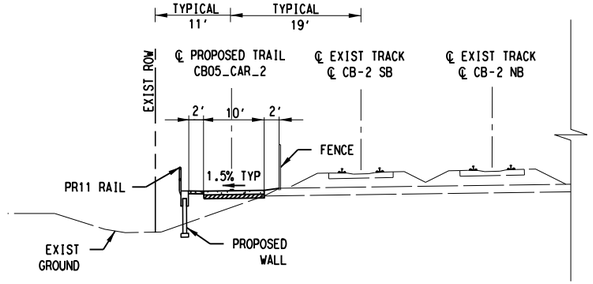


TYPICAL SECTION
℄ CB05_CAR_2 STA. 2216+79.93 TO 2242+49.07

NO SCALE



TYPICAL SECTION
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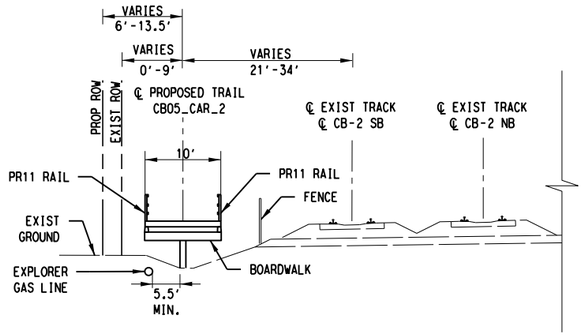
NO SCALE



TYPICAL SECTION
℄ CB05_CAR_2 STA. 2250+50 TO 2252+82.17

NO SCALE

NOTES:

1. SEE TRAIL PLAN AND PROFILE SHEETS FOR FENCE LIMITS. FENCING IS REQUIRED WHERE TRAIL EDGE IS WITHIN 35' OF TRACK AND NO BARRIER STRUCTURE IS IN PLACE.
2. SEE TRAIL PLAN AND PROFILE SHEETS FOR SIDEWALK WALL LOCATIONS AND LIMITS.
3. SEE RETAINING WALL LAYOUT SHEETS FOR RETAINING WALL LIMITS.
4. SEE RR REQUIREMENTS SHEETS.

LEGEND

① 8" THICK REINFORCED CONCRETE TRAIL PAVEMENT; REFERENCE TXDOT STANDARD CRCP(1)-20

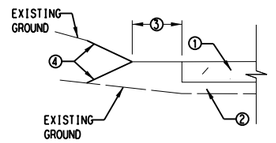
② SUBGRADE @ 95% STANDARD PROCTOR

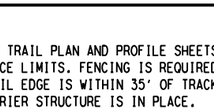
③ DISTANCE = 2' TYPICAL @ 1.5% OR 16.6% MAXIMUM

④ MATCH EXISTING GROUND AT 4:1 TYPICAL OR 3:1 MAXIMUM

⑤ 4" THICK CONCRETE TRAIL PAVEMENT (MOW STRIP)

⑥ MECHANICALLY STABILIZED RETAINING WALL





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REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

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DESIGNED	S. SALEH
CHECKED	D. LUU
IN CHARGE	D. LUU
DATE	07 AUG 23

CAES

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

CITY OF CARROLLTON
TYPICAL SECTIONS
SHEET 4 OF 6

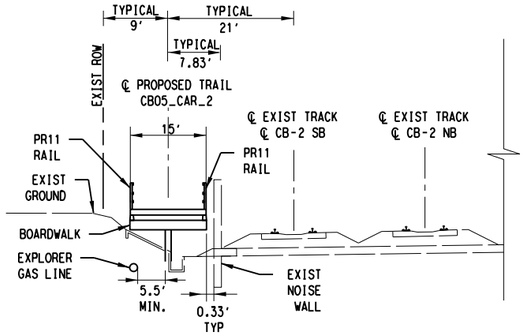
CONTRACT	DWG No.	REV
C-2033270-01	CC7-3023	D

CB05-CC7-3023.010

21-JUL-2023 15:01
CB05-CC7-3023.010

ssaleh
Default

DWG No. CC7-3024



TYPICAL SECTION
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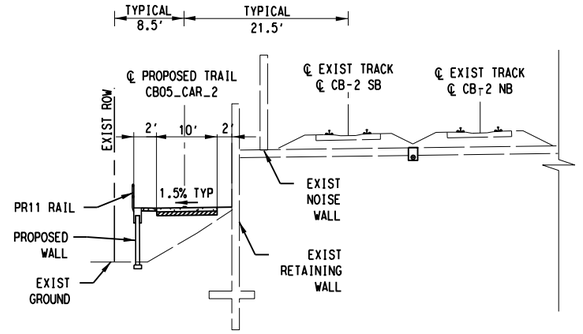

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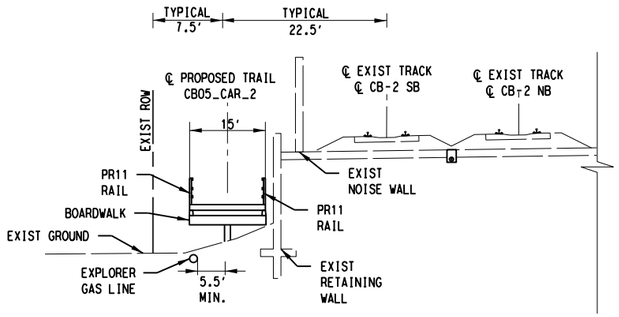

TYPICAL SECTION
℄ CB05_CAR_2 STA. 2265+25.18 TO 2266+66.36
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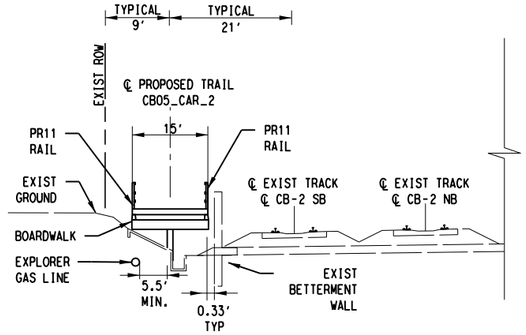


TYPICAL SECTION
℄ CB05_CAR_2 STA. 2266+66.36 TO 2275+27.47
NO SCALE

NOTES:

1. SEE TRAIL PLAN AND PROFILE SHEETS FOR FENCE LIMITS. FENCING IS REQUIRED WHERE TRAIL EDGE IS WITHIN 35' OF TRACK AND NO BARRIER STRUCTURE IS IN PLACE.
2. SEE TRAIL PLAN AND PROFILE SHEETS FOR SIDEWALK WALL LOCATIONS AND LIMITS.
3. SEE RETAINING WALL LAYOUT SHEETS FOR RETAINING WALL LIMITS.
4. SEE RR REQUIREMENTS SHEETS.

LEGEND

① 8" THICK REINFORCED CONCRETE TRAIL PAVEMENT; REFERENCE TXDOT STANDARD CRCP(1)-20

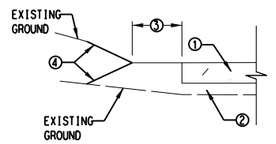
② SUBGRADE @ 95% STANDARD PROCTOR

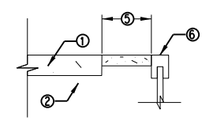
③ DISTANCE = 2' TYPICAL @ 1.5% OR 16.6% MAXIMUM

④ MATCH EXISTING GROUND AT 4:1 TYPICAL OR 3:1 MAXIMUM

⑤ 4" THICK CONCRETE TRAIL PAVEMENT (MOW STRIP)

⑥ MECHANICALLY STABILIZED RETAINING WALL





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CONTRACT SHEET No. 50 OF 345

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

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DESIGNED	S. SALEH
CHECKED	D. LUU
IN CHARGE	D. LUU
DATE	07 AUG 23

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

CITY OF CARROLLTON
TYPICAL SECTIONS
SHEET 5 OF 6

CONTRACT	DWG No.	REV
C-2033270-01	CC7-3024	D

CB05-CC7-3024.010

21-JUL-2023 15:01
CB05-CC7-3024.010
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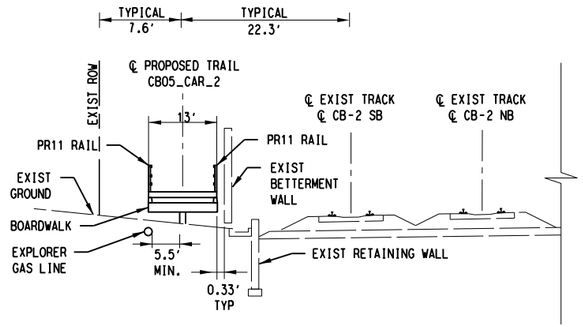
DWG No. CC7-3025



TYPICAL SECTION
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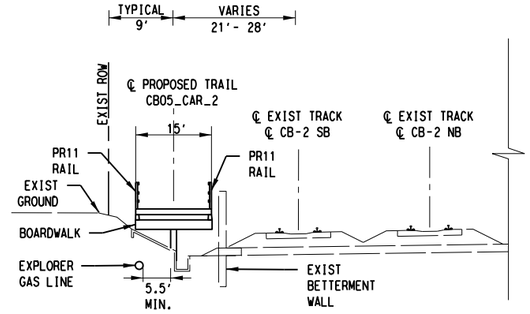

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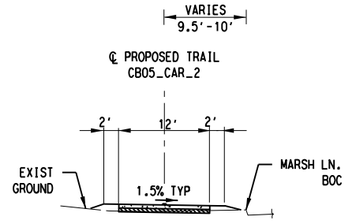


TYPICAL SECTION
℄ CB05_CAR_2 STA. 2289+29.10 TO 2289+62.85
NO SCALE

NOTES:

1. SEE TRAIL PLAN AND PROFILE SHEETS FOR FENCE LIMITS. FENCING IS REQUIRED WHERE TRAIL EDGE IS WITHIN 35' OF TRACK AND NO BARRIER STRUCTURE IS IN PLACE.
2. SEE TRAIL PLAN AND PROFILE SHEETS FOR SIDEWALK WALL LOCATIONS AND LIMITS.
3. SEE RETAINING WALL LAYOUT SHEETS FOR RETAINING WALL LIMITS.
4. SEE RR REQUIREMENTS SHEETS.

LEGEND

① 8" THICK REINFORCED CONCRETE TRAIL PAVEMENT; REFERENCE TXDOT STANDARD CRCP(1)-20

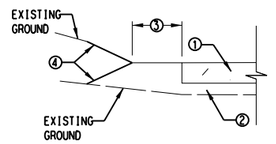
② SUBGRADE @ 95% STANDARD PROCTOR

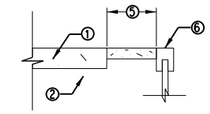
③ DISTANCE = 2' TYPICAL @ 1.5% OR 16.6% MAXIMUM

④ MATCH EXISTING GROUND AT 4:1 TYPICAL OR 3:1 MAXIMUM

⑤ 4" THICK CONCRETE TRAIL PAVEMENT (MOW STRIP)

⑥ MECHANICALLY STABILIZED RETAINING WALL





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REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP
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DRAWN	S. SALEH
DESIGNED	S. SALEH
CHECKED	D. LUU
IN CHARGE	D. LUU
DATE	07 AUG 23

CONTRACT SHEET No. 51 OF 345

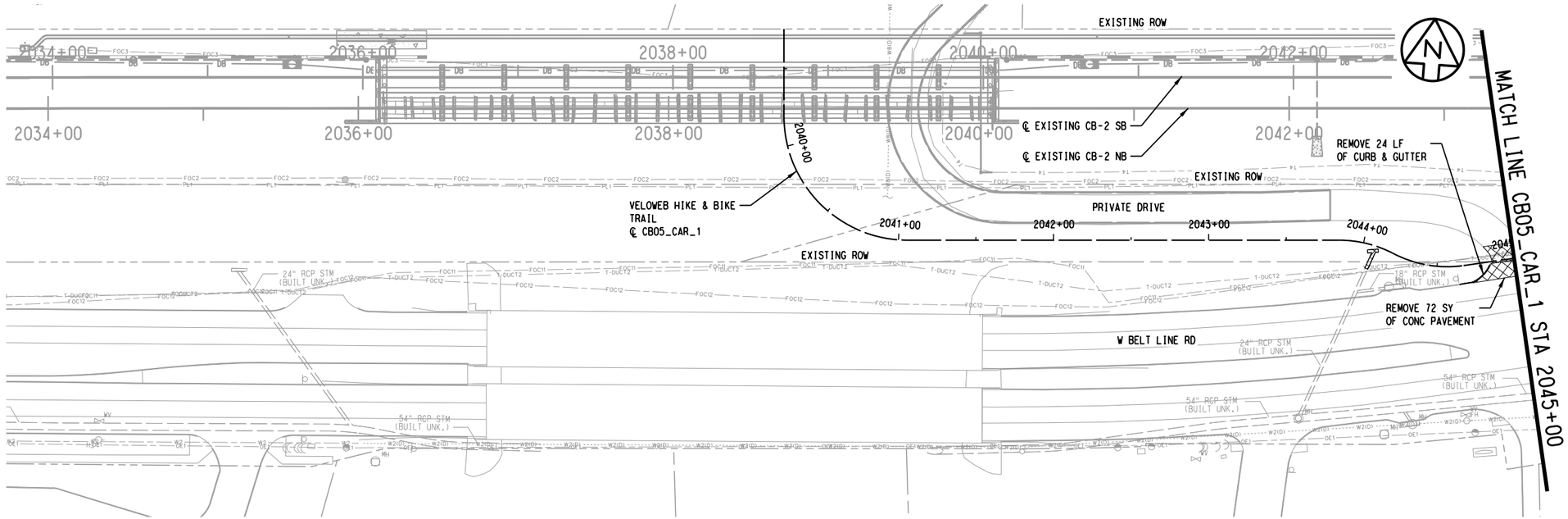
COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

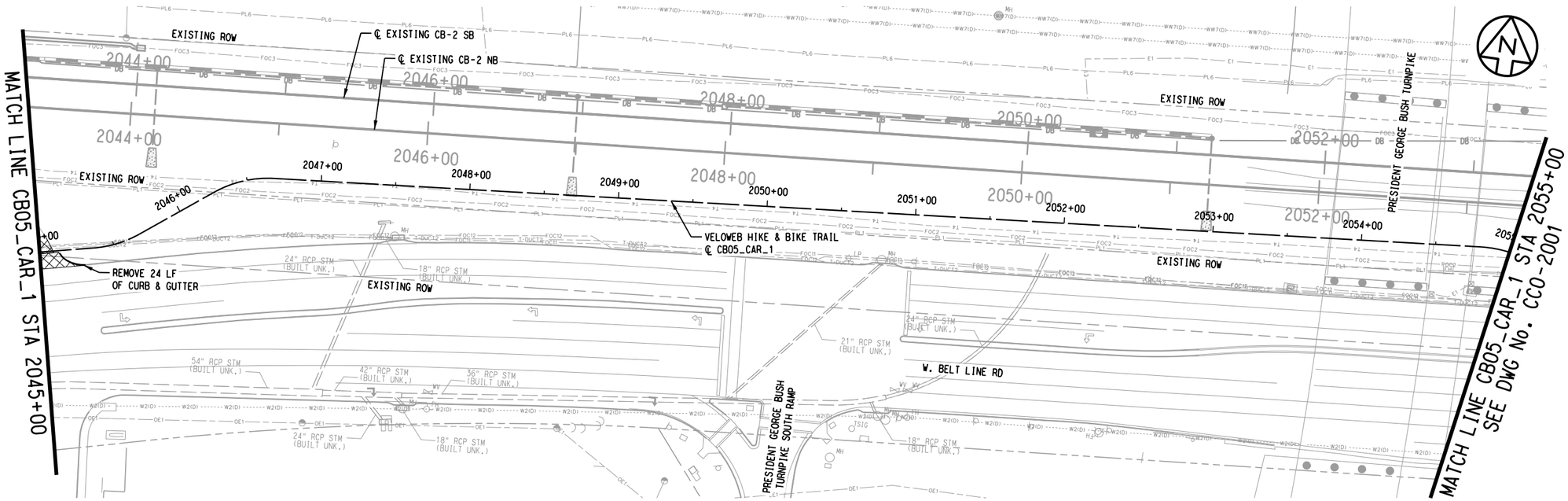
CITY OF CARROLLTON
TYPICAL SECTIONS
SHEET 6 OF 6

CONTRACT	DWG No.	REV
C-2033270-01	CC7-3025	D

CB05-CC7-3025.010

DWG No. CCO-2000





SCALE (IN FEET)
HORIZ 0 20 40 80

LEGEND:

CONCRETE REMOVAL

NOTES:

1. CONTRACTOR WILL BE RESPONSIBLE FOR COORDINATING WITH ALL APPROPRIATE UTILITY COMPANIES FOR LOCATION OF ALL UTILITIES WITHIN THE CONSTRUCTION AREA.
2. CONTRACTOR TO PROTECT IN PLACE EXISITING PAVEMENT, STRUCTURES, METERS, UTILITY VAULTS, LANDSCAPING MATERIALS AND APPURTENANCES WHICH ARE NOT BEING DEMOLISHED.

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FINAL 100% DESIGN

CONTRACT SHEET No. 52 OF 345

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

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(214) 739-3152 Fax (214) 739-3169
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SCALE	AS NOTED
DRAWN	C. BAGBY
DESIGNED	C. BAGBY
CHECKED	D. LUU
IN CHARGE	D. LUU
DATE	07 AUG 23

CAES

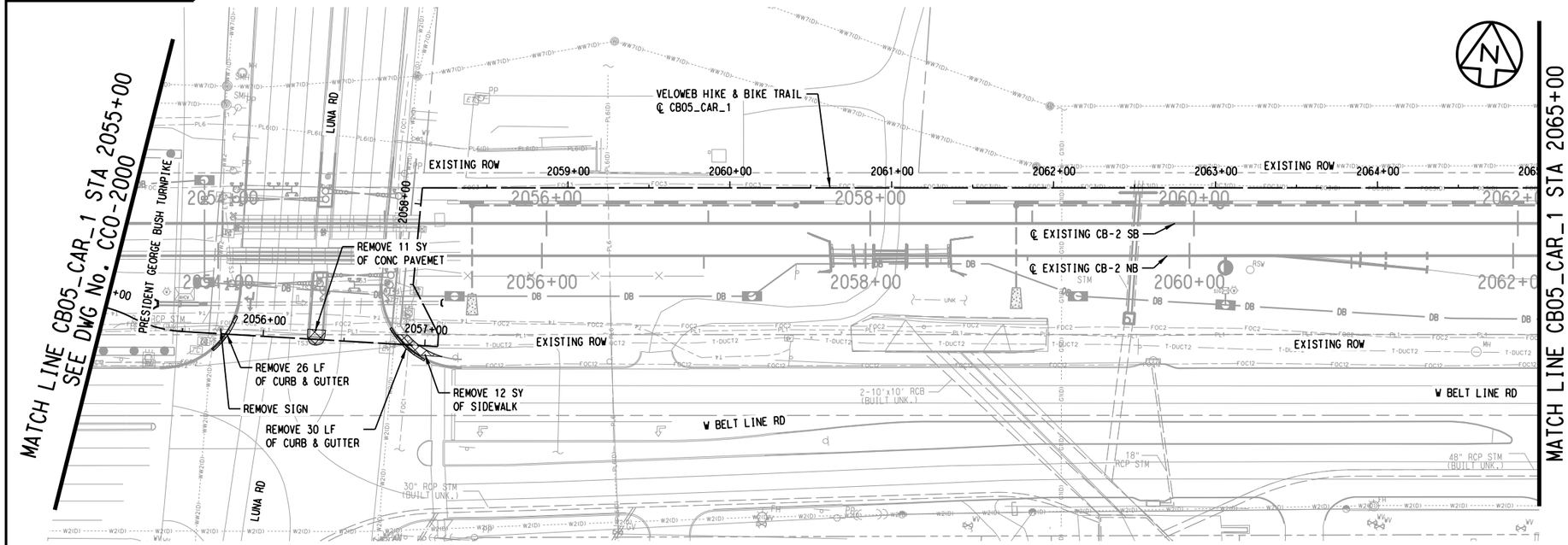
COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
CITY OF CARROLLTON
REMOVAL LAYOUT
STA 2039+24.50 TO STA 2055+00
SHEET 1 OF 8

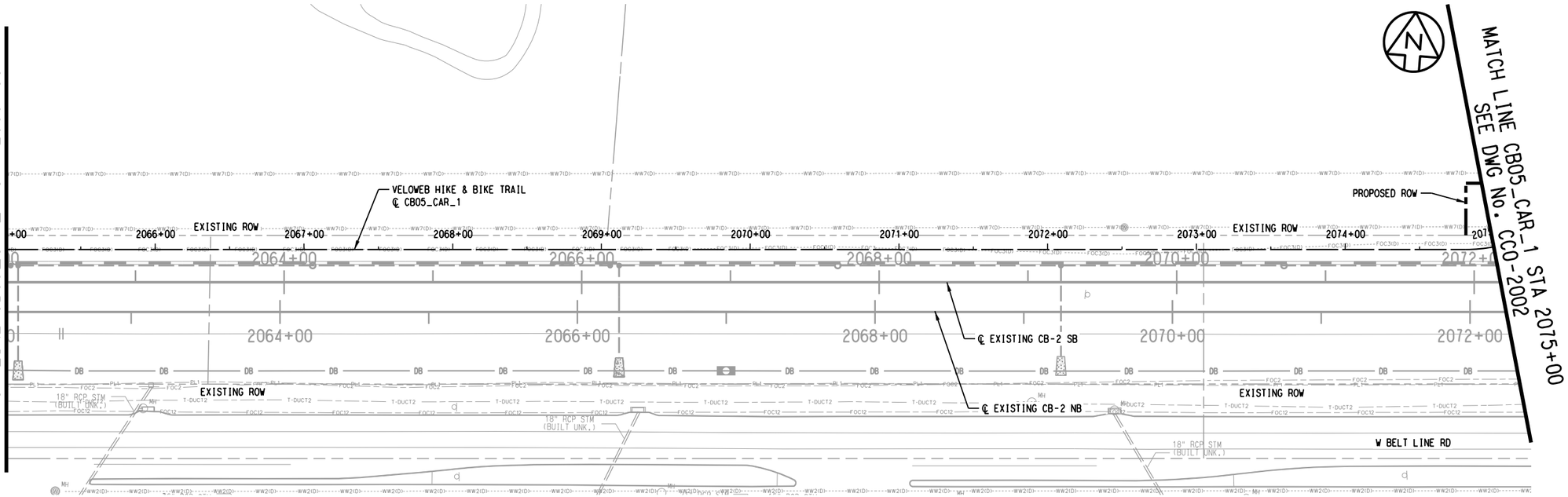
CONTRACT	DWG No.	REV
C-2033270-01	CCO-2000	D

CB05-CCO-2000.040

21-JUL-2023 15:02
CB05-CCO-2000.040
ssaleh
Default

DWG No. CCO-2001





SCALE (IN FEET)
HORIZ 0 20 40 80

LEGEND:

CONCRETE REMOVAL

NOTES:

1. CONTRACTOR WILL BE RESPONSIBLE FOR COORDINATING WITH ALL APPROPRIATE UTILITY COMPANIES FOR LOCATION OF ALL UTILITIES WITHIN THE CONSTRUCTION AREA.
2. CONTRACTOR TO PROTECT IN PLACE EXISITING PAVEMENT, STRUCTURES, METERS, UTILITY VAULTS, LANDSCAPING MATERIALS AND APPURTENANCES WHICH ARE NOT BEING DEMOLISHED.

21-JUL-2023 15:02
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REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

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CONTRACT SHEET No. 53 OF 345

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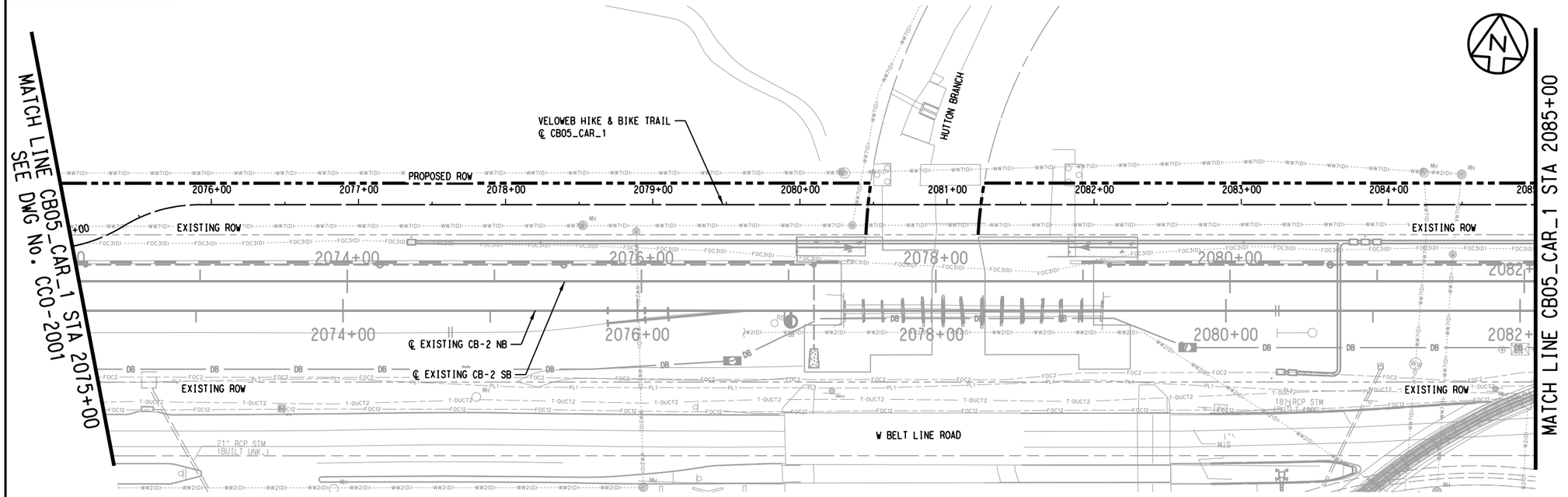
DESIGNED	C. BAGBY
CHECKED	D. LUU
IN CHARGE	D. LUU
DATE	07 AUG 23

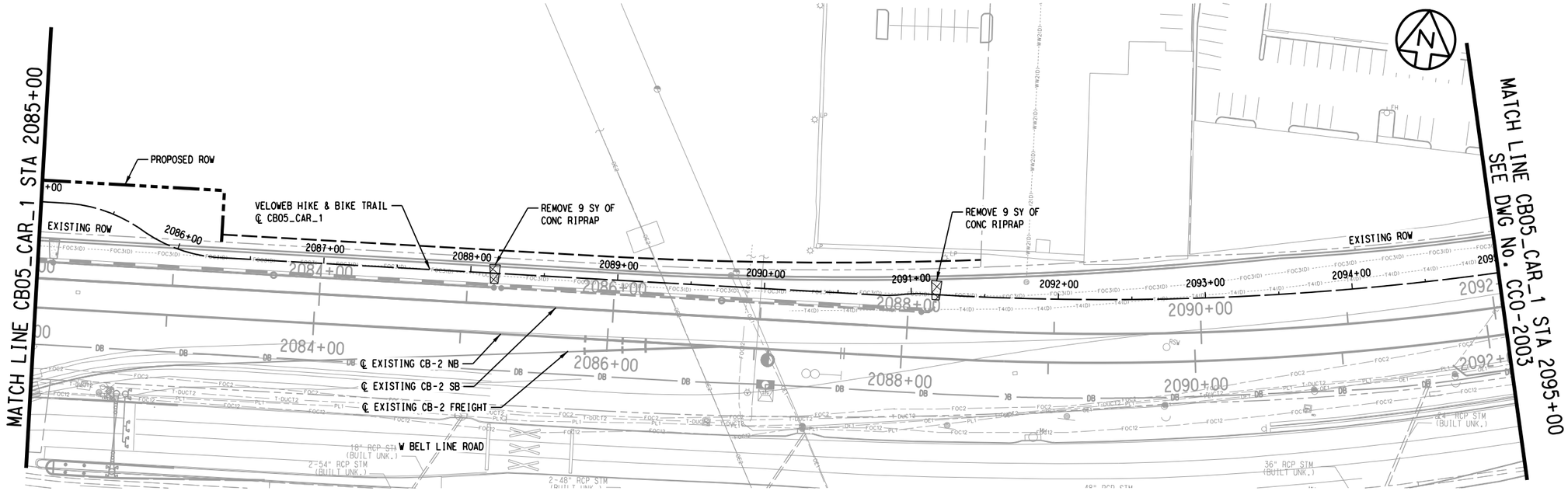
COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
CITY OF CARROLLTON
REMOVAL LAYOUT
STA 2055+00 TO STA 2075+00
SHEET 2 OF 8

CONTRACT	DWG No.	REV
C-2033270-01	CCO-2001	D

CB05-CCO-2001.040

DWG No. CCO-2002





SCALE (IN FEET)
HORIZ 0 20 40 80

LEGEND:

CONCRETE REMOVAL

NOTES:

1. CONTRACTOR WILL BE RESPONSIBLE FOR COORDINATING WITH ALL APPROPRIATE UTILITY COMPANIES FOR LOCATION OF ALL UTILITIES WITHIN THE CONSTRUCTION AREA.
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COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
CITY OF CARROLLTON
REMOVAL LAYOUT
STA 2075+00 TO STA 2095+00
SHEET 3 OF 8

CONTRACT	DWG No.	REV
C-2033270-01	CCO-2002	D

CB05-CCO-2002.040

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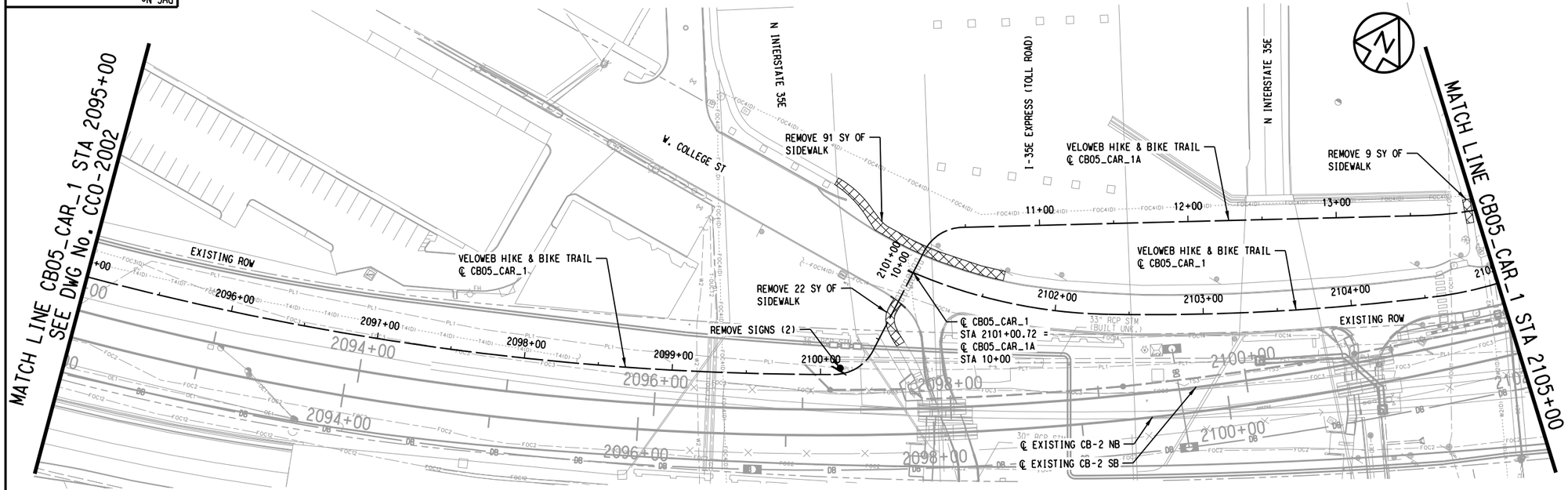
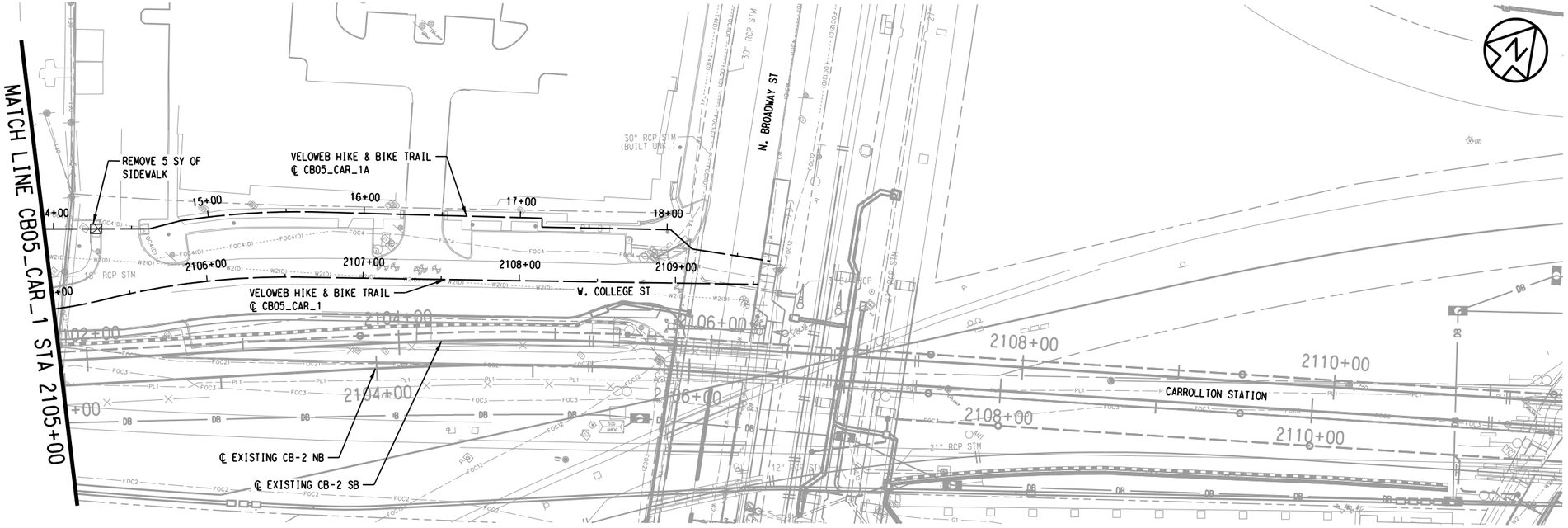
DWG No. CCO-2003





SCALE (IN FEET)
HORIZ 0 20 40 80

LEGEND:

CONCRETE REMOVAL

NOTES:

1. CONTRACTOR WILL BE RESPONSIBLE FOR COORDINATING WITH ALL APPROPRIATE UTILITY COMPANIES FOR LOCATION OF ALL UTILITIES WITHIN THE CONSTRUCTION AREA.
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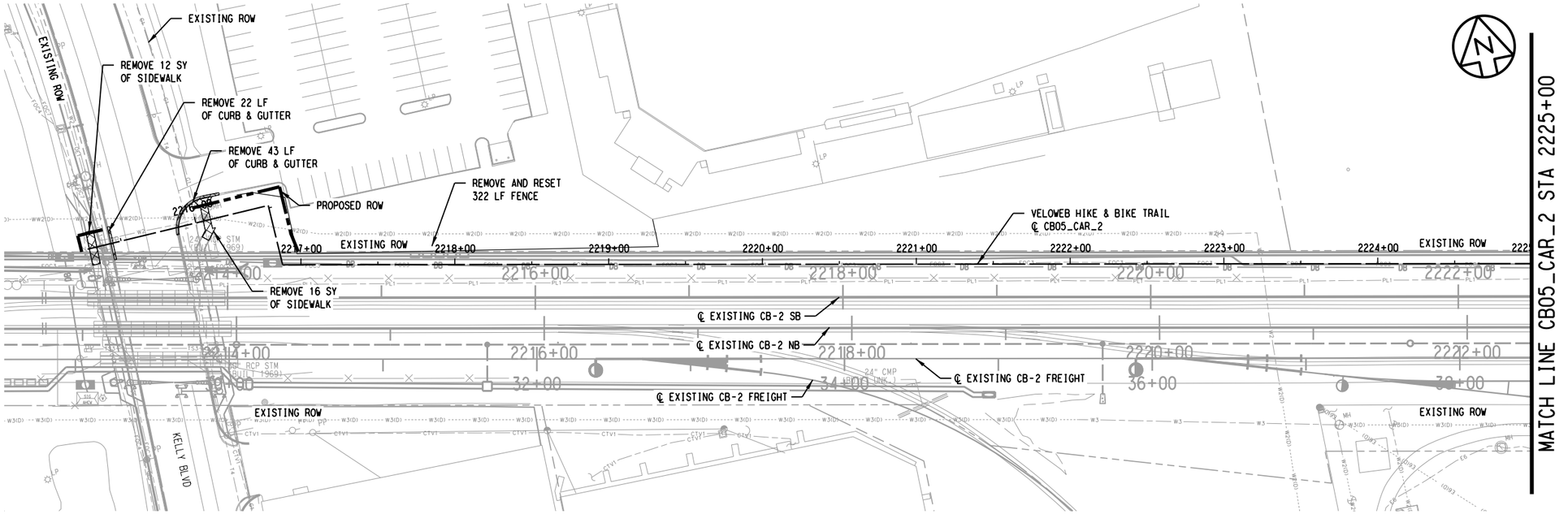
CONTRACT SHEET No. 55 OF 345

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
CITY OF CARROLLTON
REMOVAL LAYOUT
STA 2095+00 TO STA 2109+09.56
SHEET 4 OF 8

CONTRACT	DWG No.	REV
C-2033270-01	CCO-2003	D

CB05-CCO-2003.040

DWG No. CCO-2004



SCALE (IN FEET)
HORIZ 0 20 40 80

LEGEND:

CONCRETE REMOVAL

NOTES:

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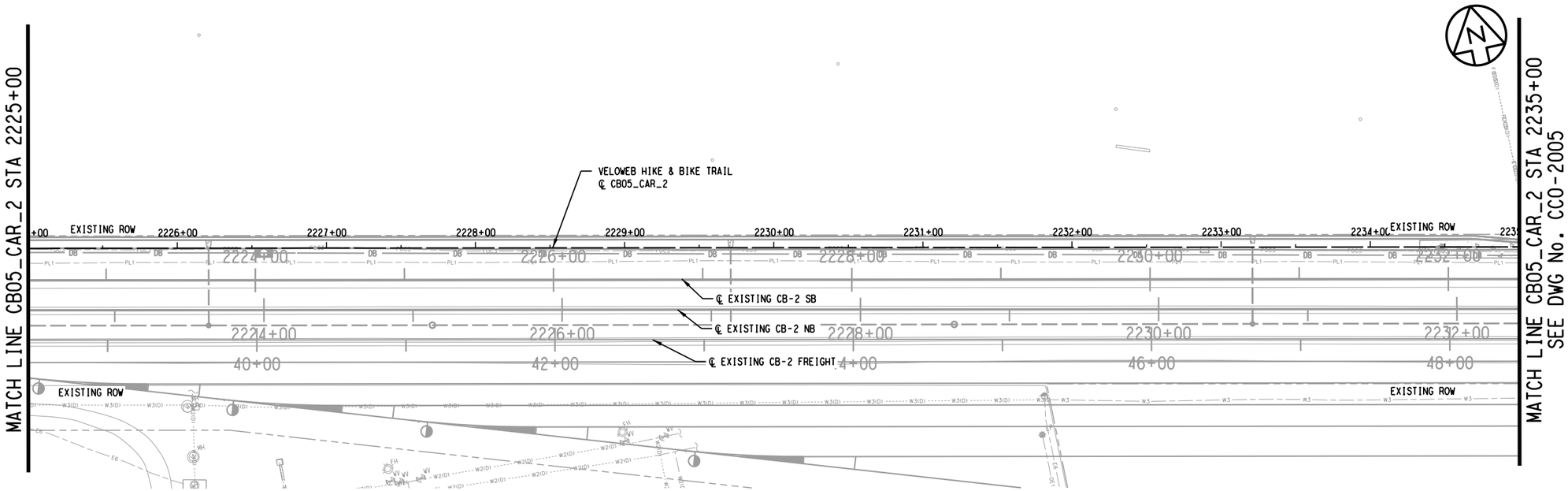

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CONTRACT SHEET No. 56 OF 345

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CHECKED	D. LUU
IN CHARGE	D. LUU
DATE	07 AUG 23

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COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
CITY OF CARROLLTON
REMOVAL LAYOUT
STA 2215+53.82 TO STA 2235+00
SHEET 5 OF 8

CONTRACT	DWG No.	REV
C-2033270-01	CCO-2004	D

CB05-CCO-2004.040

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CB05-CCO-2004.040
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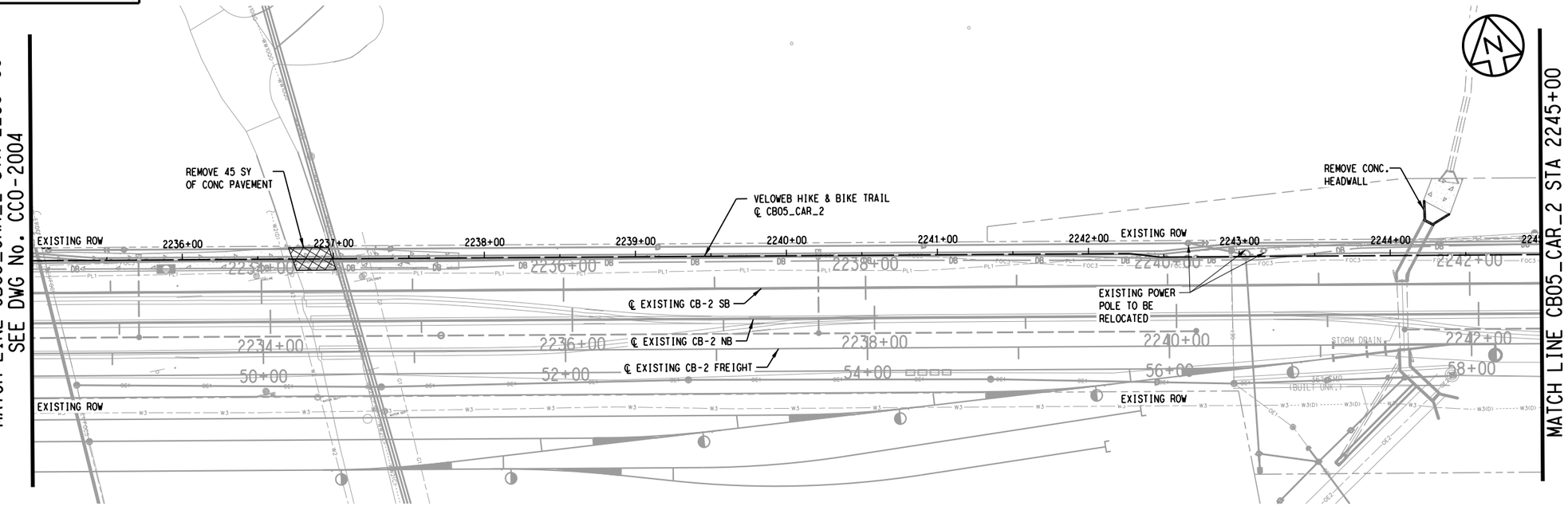
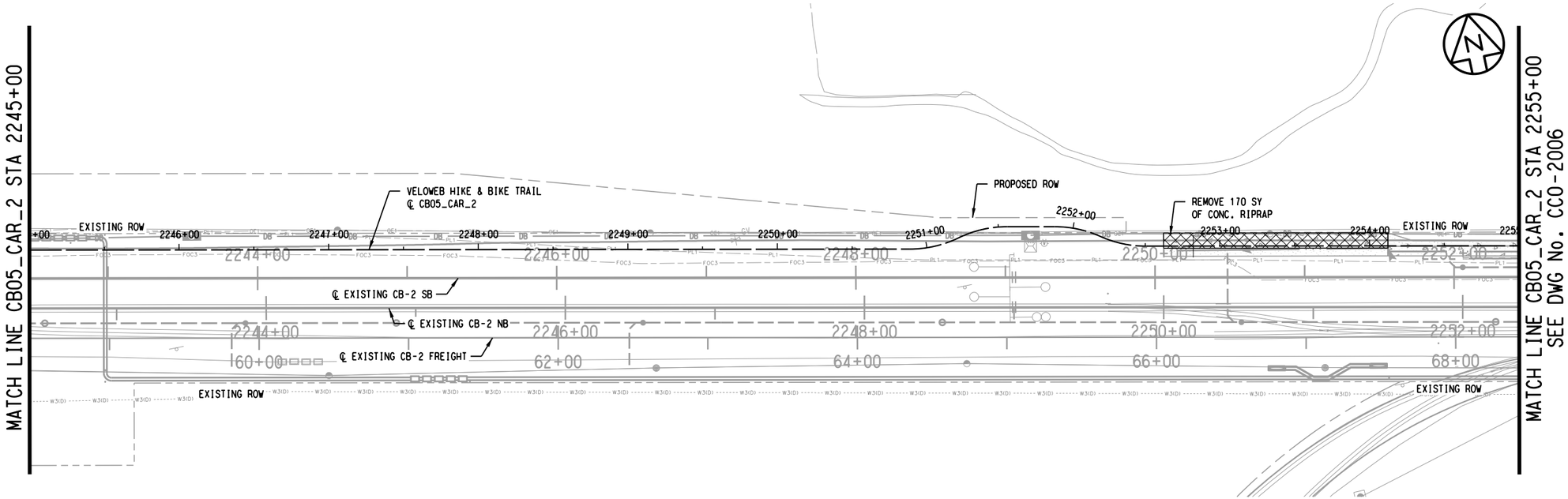
DWG No. CCO-2005





SCALE (IN FEET)
HORIZ 0 20 40 80

LEGEND:

CONCRETE REMOVAL

NOTES:

1. CONTRACTOR WILL BE RESPONSIBLE FOR COORDINATING WITH ALL APPROPRIATE UTILITY COMPANIES FOR LOCATION OF ALL UTILITIES WITHIN THE CONSTRUCTION AREA.
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CHECKED	D. LUU
IN CHARGE	D. LUU
DATE	07 AUG 23

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
CITY OF CARROLLTON
REMOVAL LAYOUT
STA 2235+00 TO STA 2255+00
SHEET 6 OF 8

CONTRACT	DWG No.	REV
C-2033270-01	CCO-2005	D

CB05-CCO-2005.040

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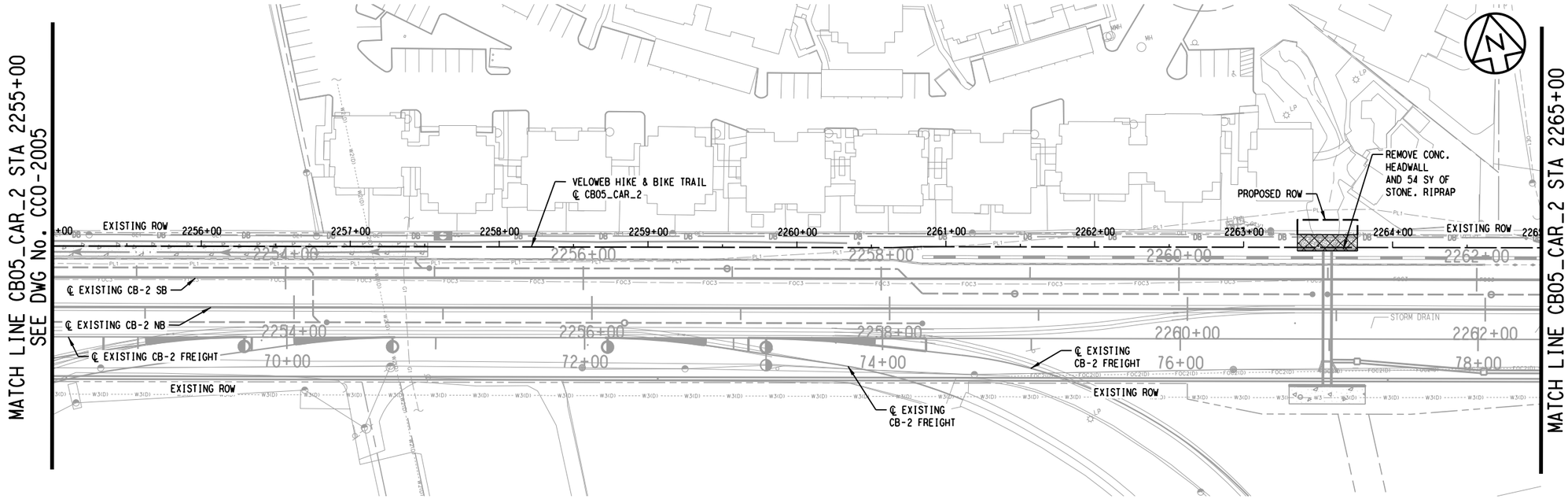
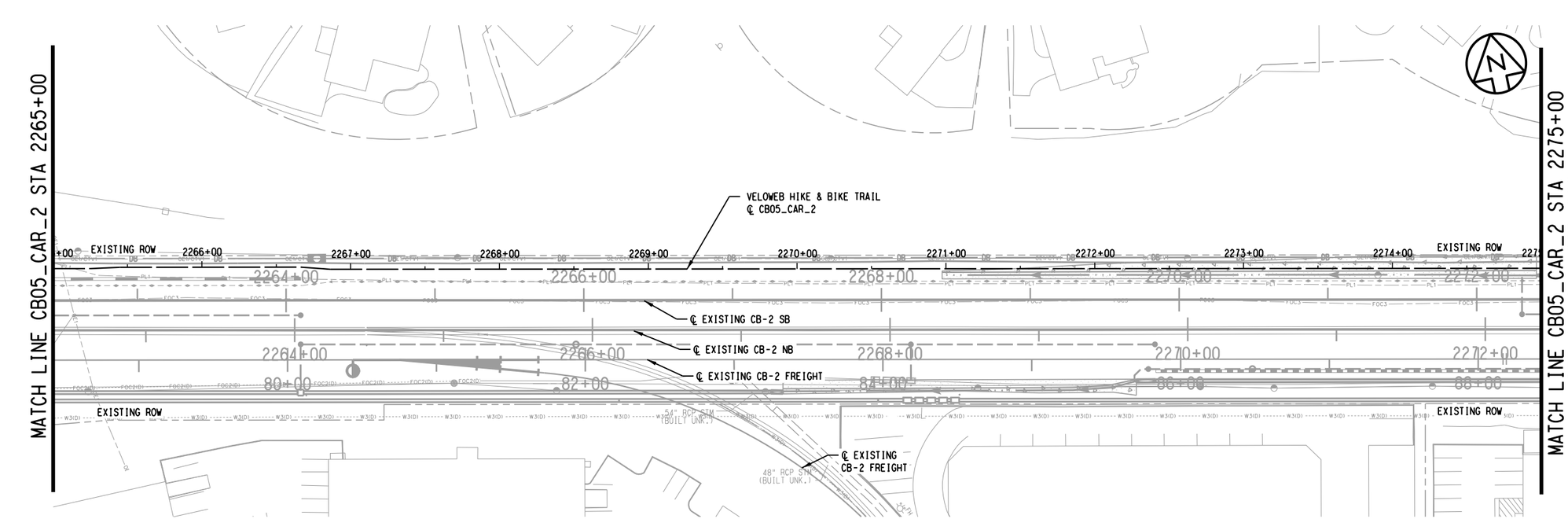
DWG No. CCO-2006





SCALE (IN FEET)
HORIZ 0 20 40 80

LEGEND:

CONCRETE REMOVAL

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DATE	07 AUG 23

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CONTRACT SHEET No. 58 OF 345

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
CITY OF CARROLLTON
REMOVAL LAYOUT
STA 2255+00 TO STA 2275+00
SHEET 7 OF 8

CONTRACT	DWG No.	REV
C-2033270-01	CCO-2006	D

CB05-CCO-2006.040

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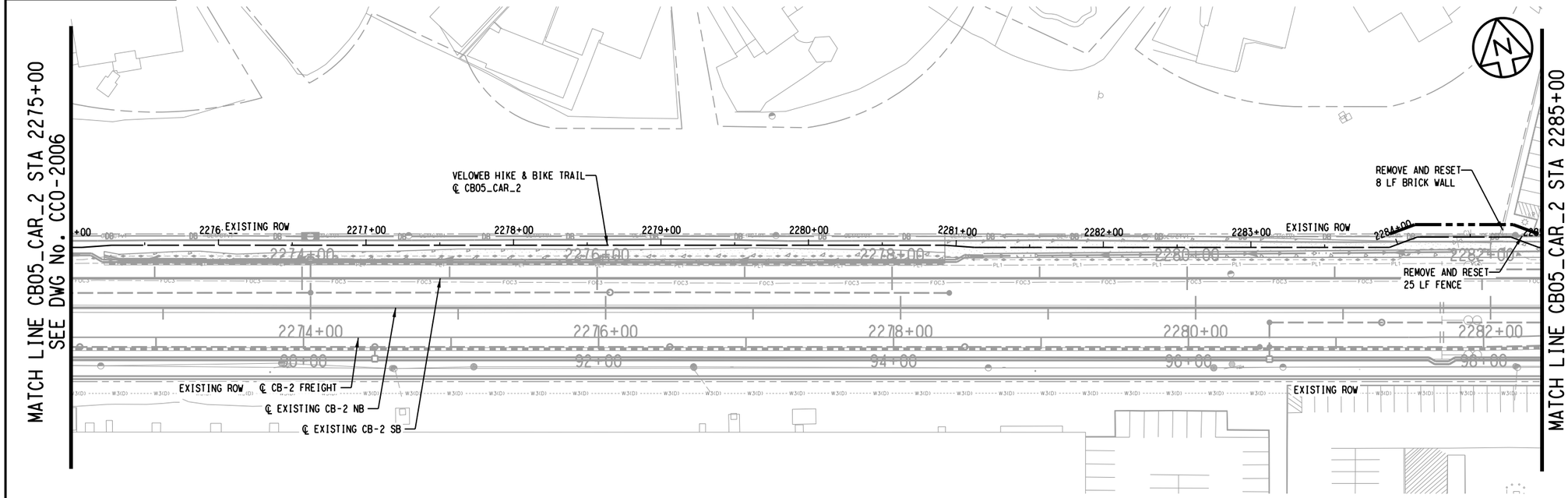
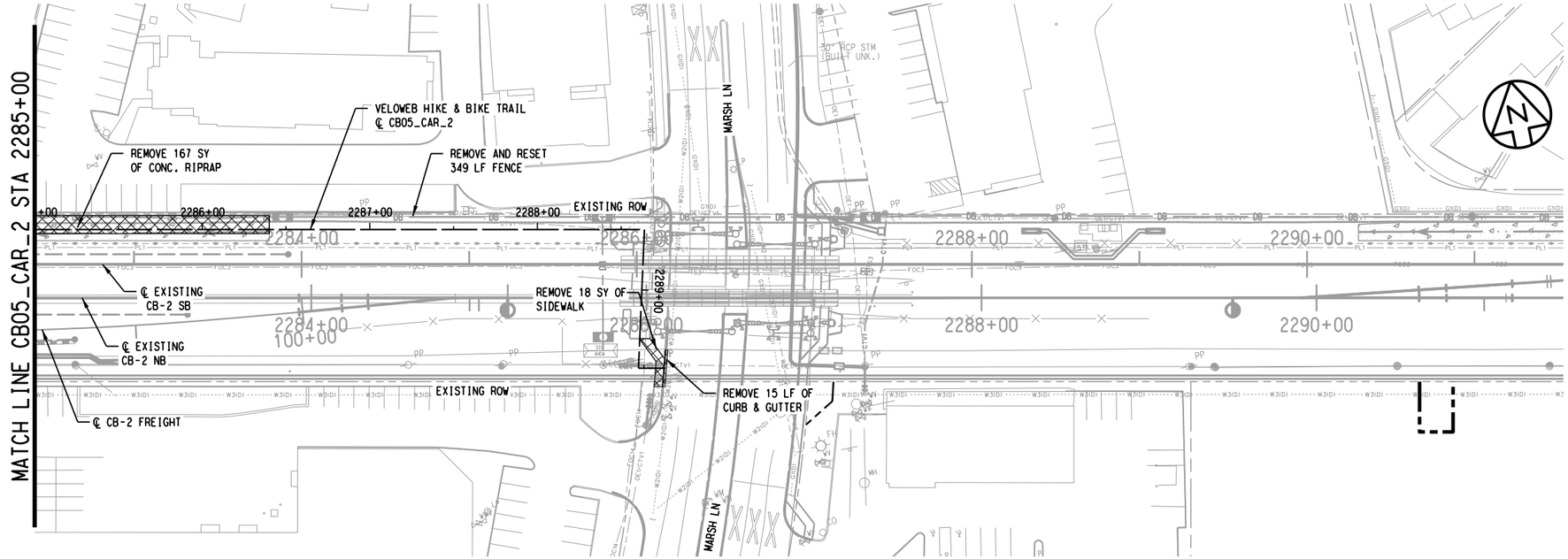
DWG No. CCO-2007





SCALE (IN FEET)
HORIZ 0 20 40 80

LEGEND:

CONCRETE REMOVAL

NOTES:

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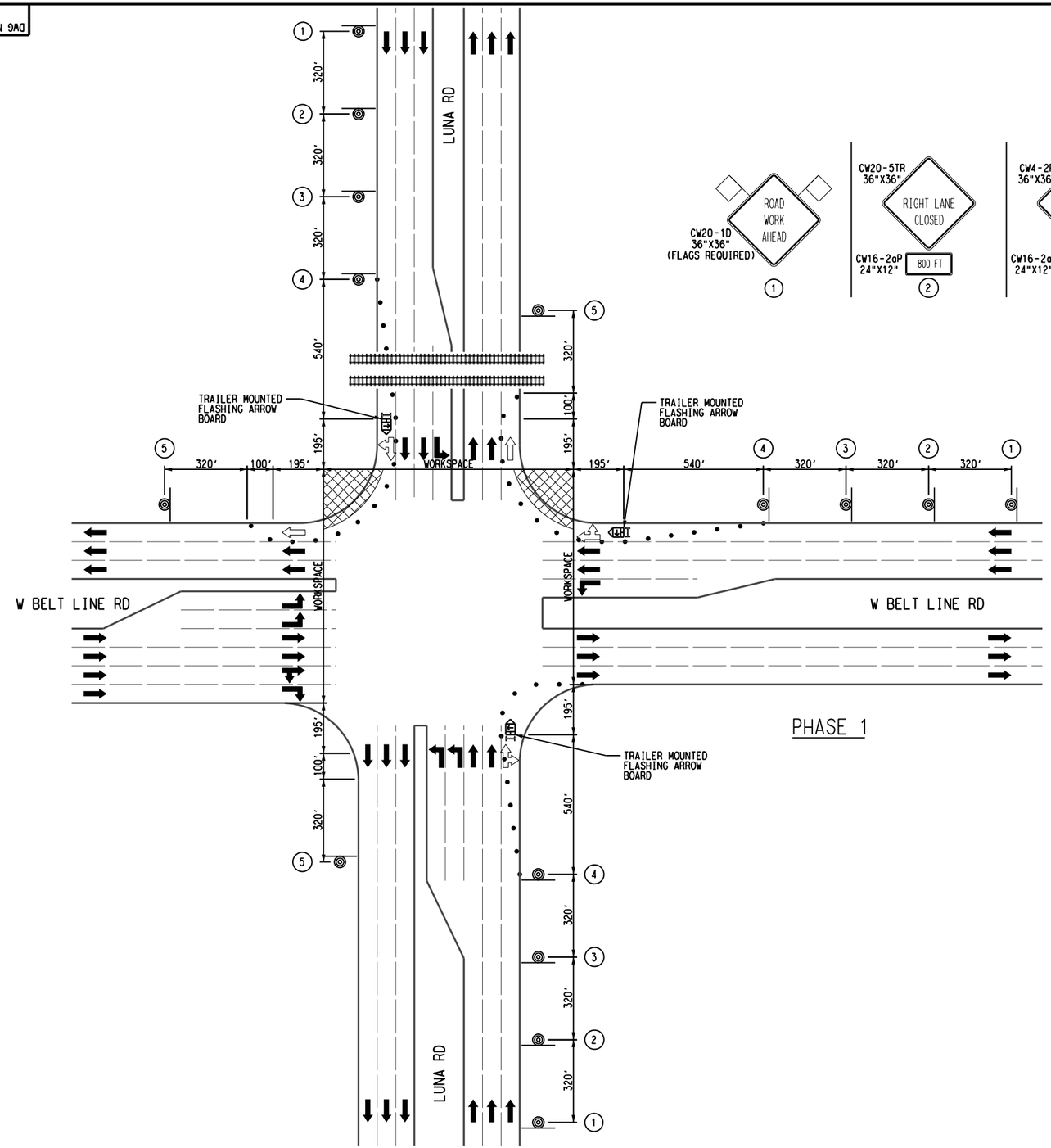
IN CHARGE	D. LUU
DATE	07 AUG 23

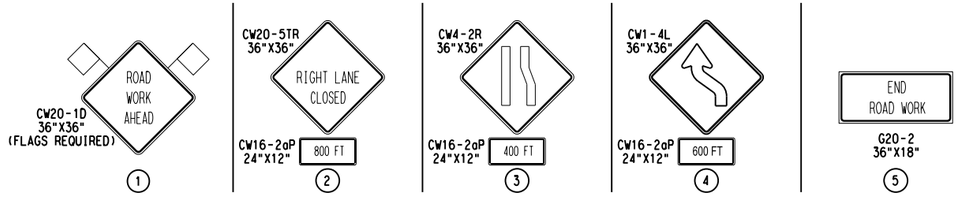
COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
CITY OF CARROLLTON
REMOVAL LAYOUT
STA 2275+00 TO STA 2289+59.32
SHEET 8 OF 8

CONTRACT	DWG No.	REV
C-2033270-01	CCO-2007	D

CB05-CCO-2007.040

DWG No. CC3-2131





LEGEND

- CONSTRUCTION THIS PHASE
- COMPLETED PERMANENT CONSTRUCTION
- SIGN
- CHANNELIZING DEVICE
- TRAFFIC DIRECTION ARROWS (OPEN LANE)
- TRAFFIC DIRECTION ARROWS (CLOSED LANE)
- TY III BARRICADE

NOTES:

1. INSTALL ALL BARRICADES, CHANNELING DEVICES, SIGNS, AND PORTABLE SIGNALS AS SHOWN ON THE PLAN. THIS WORK SHALL BE IN ACCORDANCE WITH THE MUTCD 2009 EDITION, AND AS DIRECTED BY THE ENGINEER.

2. ANY EXISTING SIGNS THAT MAY BE IN CONFLICT WITH THE PROPOSED TRAFFIC CONTROL SHALL BE REMOVED OR COVERED TEMPORARILY DURING CONSTRUCTION.

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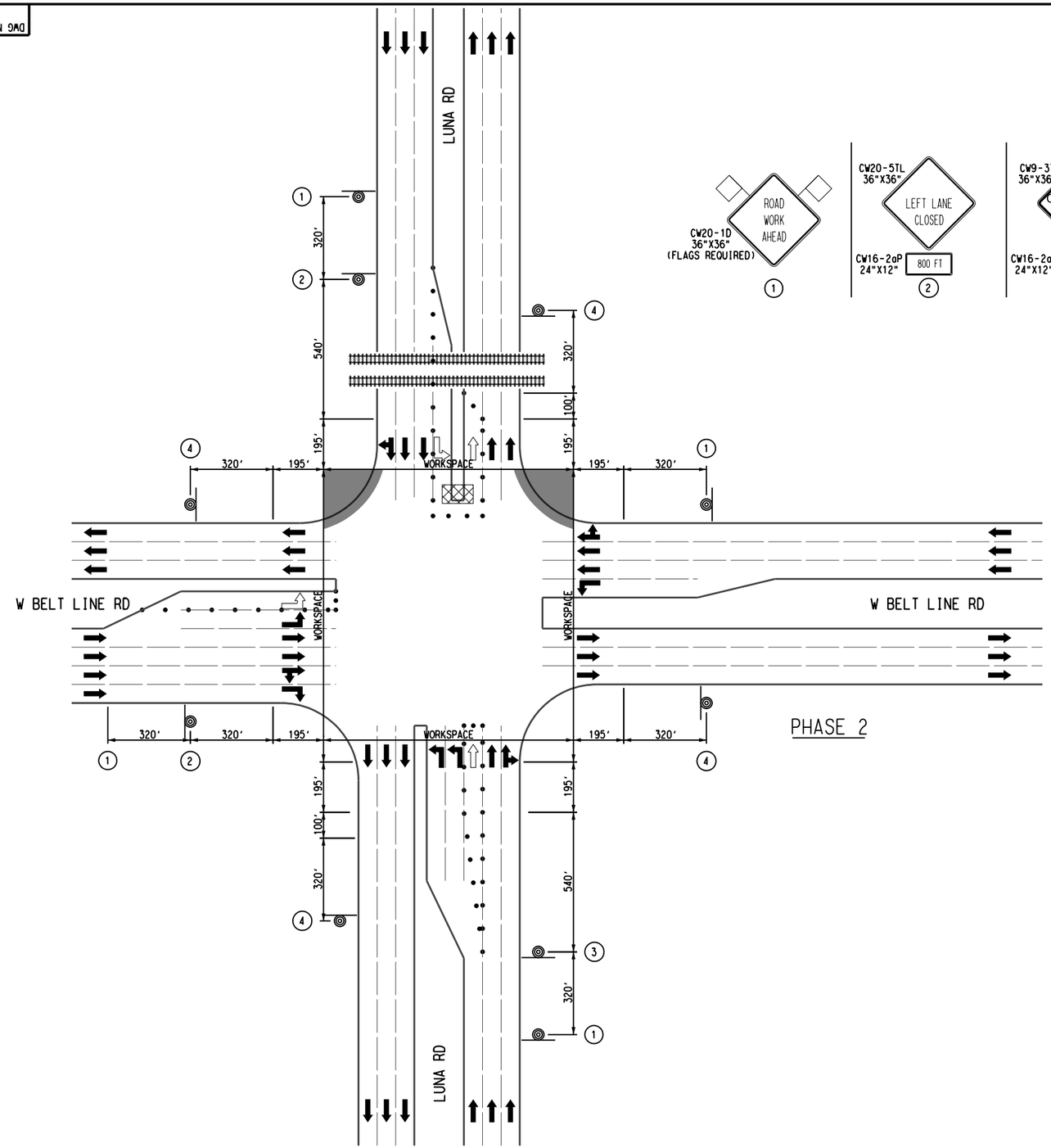
CONTRACT SHEET No. 60 OF 345

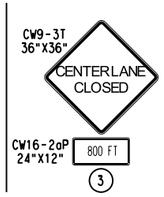
COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
CITY OF CARROLLTON
LUNA ROAD
TRAFFIC CONTROL PLAN
SHEET 1 OF 5

CONTRACT	DWG No.	REV
C-2033270-01	CC3-2131	D

CB05-CC3-2131.001

DWG No. CC3-2132





LEGEND

- CONSTRUCTION THIS PHASE
- COMPLETED PERMANENT CONSTRUCTION
- SIGN
- CHANNELIZING DEVICE
- TRAFFIC DIRECTION ARROWS (OPEN LANE)
- TRAFFIC DIRECTION ARROWS (CLOSED LANE)
- TY III BARRICADE

NOTES:

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DESIGNED	C. BAGBY
CHECKED	D. LUU
IN CHARGE	D. LUU
DATE	07 AUG 23

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
CITY OF CARROLLTON
LUNA ROAD
TRAFFIC CONTROL PLAN
SHEET 2 OF 5

CONTRACT	DWG No.	REV
C-2033270-01	CC3-2132	D

CB05-CC3-2132.001

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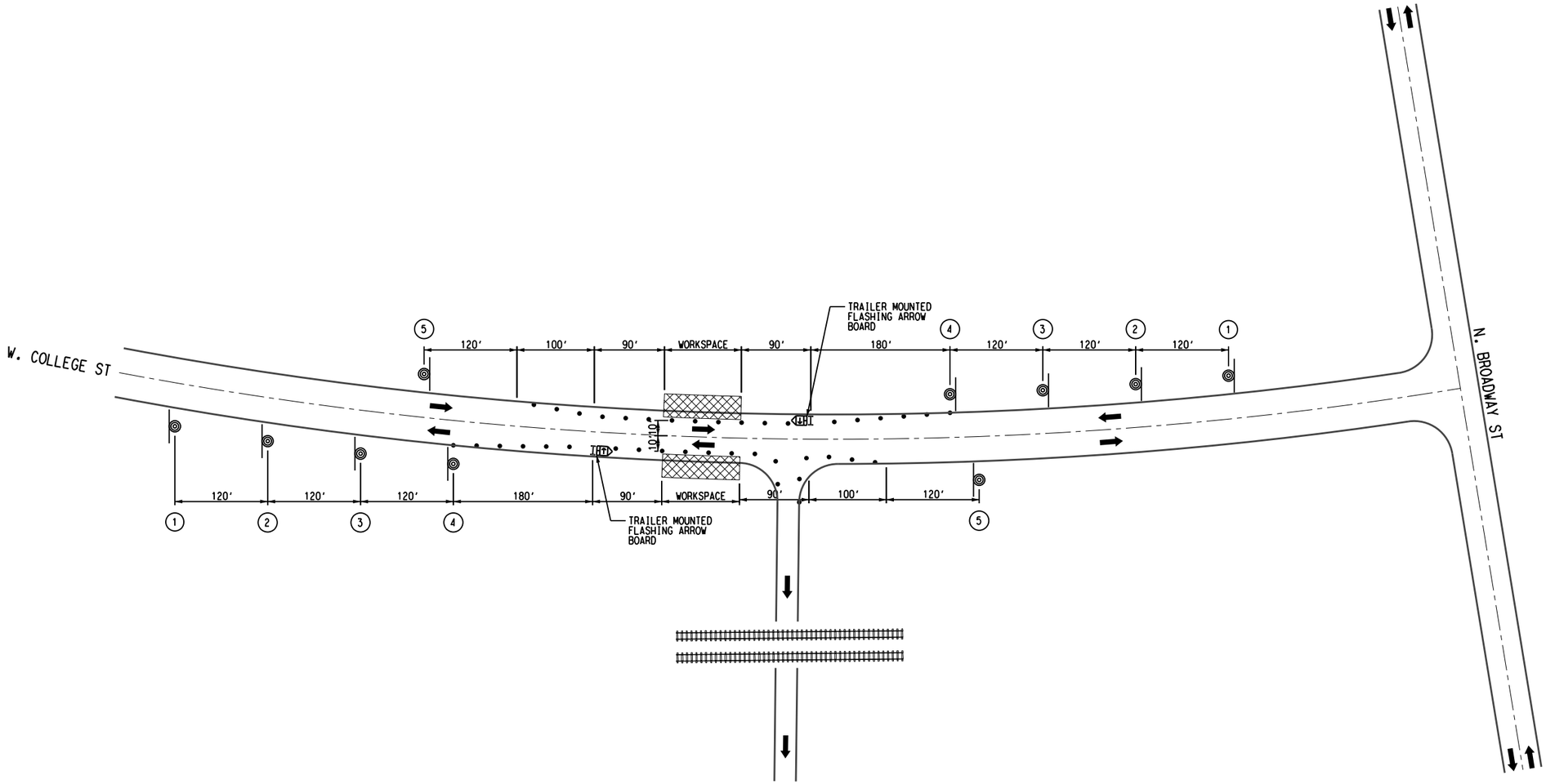
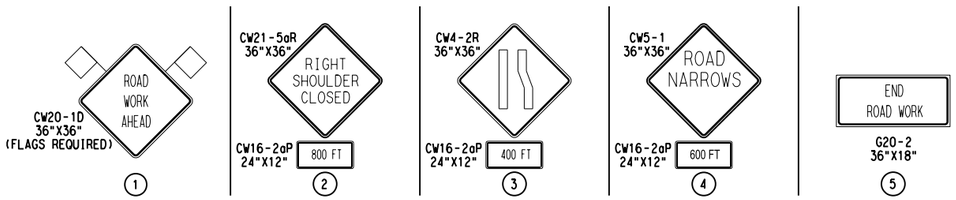
DWG No. CC3-2133





LEGEND

- CONSTRUCTION THIS PHASE
- COMPLETED PERMANENT CONSTRUCTION
- SIGN
- CHANNELIZING DEVICE
- TRAFFIC DIRECTION ARROWS (OPEN LANE)
- TRAFFIC DIRECTION ARROWS (CLOSED LANE)
- TY III BARRICADE

NOTES:

1. INSTALL ALL BARRICADES, CHANNELING DEVICES, SIGNS, AND PORTABLE SIGNALS AS SHOWN ON THE PLAN. THIS WORK SHALL BE IN ACCORDANCE WITH THE MUTCD 2009 EDITION, AND AS DIRECTED BY THE ENGINEER.

2. ANY EXISTING SIGNS THAT MAY BE IN CONFLICT WITH THE PROPOSED TRAFFIC CONTROL SHALL BE REMOVED OR COVERED TEMPORARILY DURING CONSTRUCTION.

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FINAL 100% DESIGN

CONTRACT SHEET No. 62 OF 345

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

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12801 N Central Expressway, Suite 1250
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(214) 739-3152 Fax (214) 739-3169
FIRM NO. F-819

ARCHER WESTERN HERZOG

DART PROJECT

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SCALE	NO SCALE
DRAWN	C. BAGBY
DESIGNED	C. BAGBY
CHECKED	D. LUU
IN CHARGE	D. LUU
DATE	07 AUG 23

CAES

COTTON BELT REGIONAL RAIL VELOWEB HIKE & BIKE TRAIL

CITY OF CARROLLTON
W. COLLEGE STREET
TRAFFIC CONTROL PLAN
SHEET 3 OF 5

CONTRACT	DWG No.	REV
C-2033270-01	CC3-2133	D

CB05-CC3-2133.001

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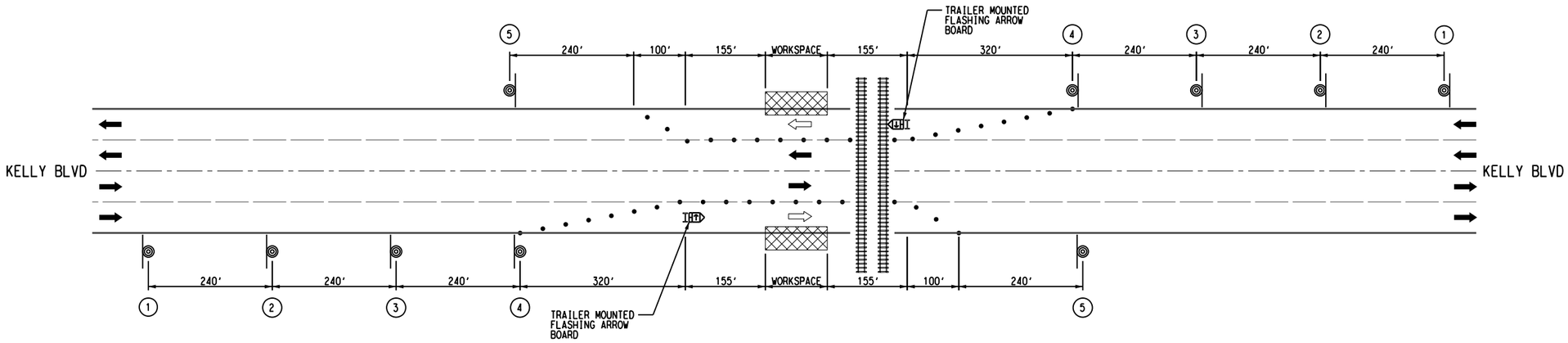
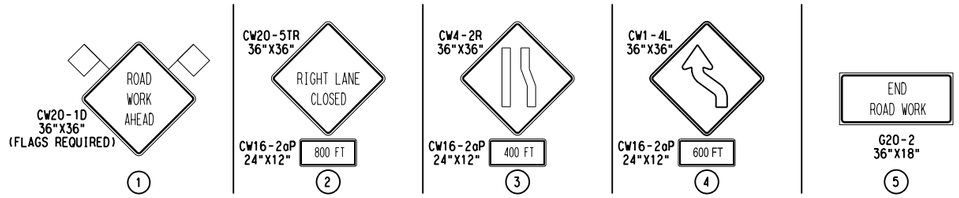
CB05-CC3-2133.001

ssaleh
Default

DWG No. CC3-2134





LEGEND

- CONSTRUCTION THIS PHASE
- COMPLETED PERMANENT CONSTRUCTION
- SIGN
- CHANNELIZING DEVICE
- TRAFFIC DIRECTION ARROWS (OPEN LANE)
- TRAFFIC DIRECTION ARROWS (CLOSED LANE)
- TY III BARRICADE

NOTES:

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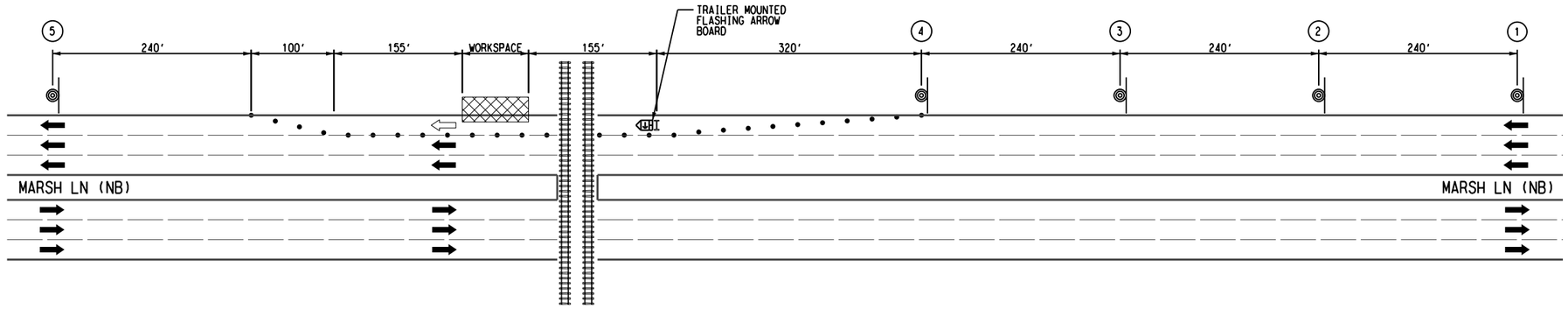
DRAWN	C. BAGBY
DESIGNED	C. BAGBY
CHECKED	D. LUU
IN CHARGE	D. LUU
DATE	07 AUG 23

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
CITY OF CARROLLTON
KELLY BLVD
TRAFFIC CONTROL PLAN
SHEET 4 OF 5

CONTRACT	DWG No.	REV
C-2033270-01	CC3-2134	D

CB05-CC3-2134.001

DWG No. CC3-2135



LEGEND

- CONSTRUCTION THIS PHASE
- COMPLETED PERMANENT CONSTRUCTION
- SIGN
- CHANNELIZING DEVICE
- TRAFFIC DIRECTION ARROWS (OPEN LANE)
- TRAFFIC DIRECTION ARROWS (CLOSED LANE)
- TY III BARRICADE

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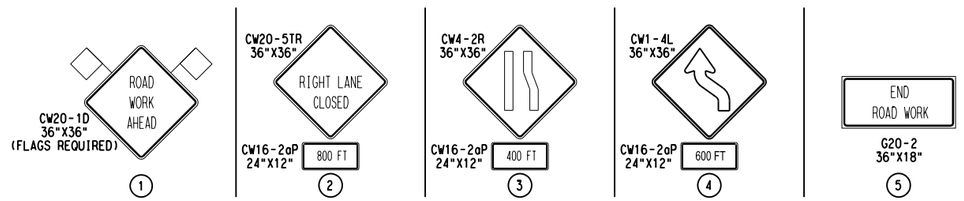

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REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

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SCALE	NO SCALE
DRAWN	C. BAGBY
DESIGNED	C. BAGBY
CHECKED	D. LUU
IN CHARGE	D. LUU
DATE	07 AUG 23

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
CITY OF CARROLLTON
MARSH LANE
TRAFFIC CONTROL PLAN
SHEET 5 OF 5

CONTRACT	DWG No.	REV
C-2033270-01	CC3-2135	D

CB05-CC3-2135.001

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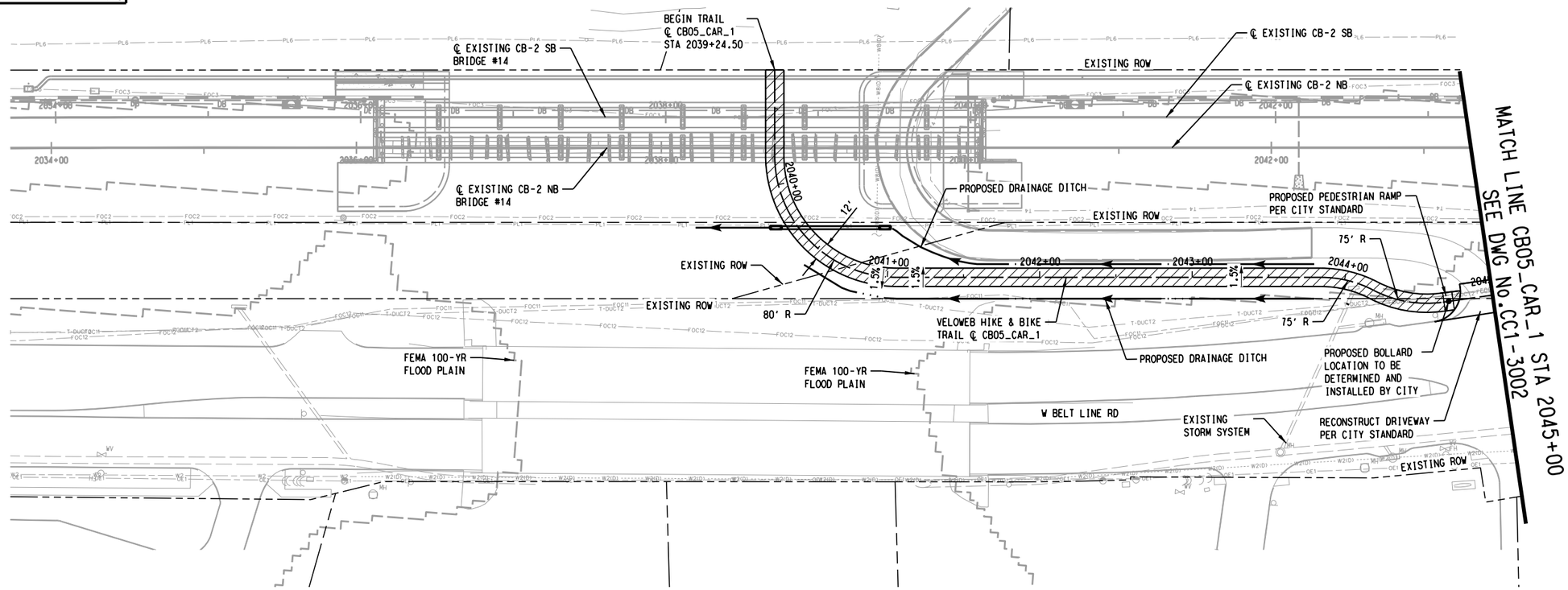
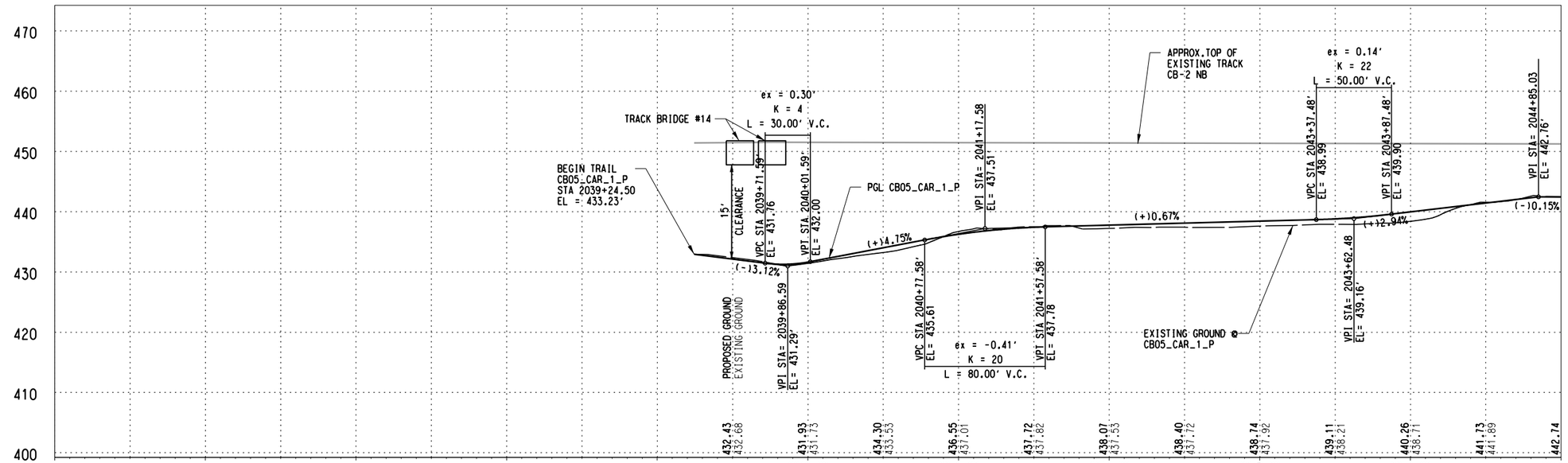
ssaleh
Default

DWG No. CC1-3001





SCALE (IN FEET)
HORIZ 0 20 40 80
SCALE (IN FEET)
VERT 0 5 10 15 20

LEGEND:
- TRAIL PAVEMENT
- TRAIL BRIDGE
- TRAIL BOARDWALK
- 1.50% → TRAIL CROSS-SLOPE

NOTES:
1. PROPOSED ROW AND EASEMENTS ARE APPROXIMATE.
2. SEE SURVEY CONTROL SHEETS FOR BENCHMARK LOCATIONS.
3. SEE DRAINAGE PLAN AND PROFILE SHEETS FOR TRAIL DRAINAGE DESIGN.
4. SEE RETAINING WALL LAYOUT SHEETS FOR ADDITIONAL INFORMATION.
5. SEE BRIDGE LAYOUT SHEETS FOR ADDITIONAL PEDESTRIAN BRIDGE INFORMATION.
6. SEE TYPICAL SECTION SHEETS FOR ADDITIONAL INFORMATION.
7. SIGN PLACEMENT SHALL BE AS PER CHAPTER 9 OF THE TMUTCD.
8. CONTRACTOR WILL BE RESPONSIBLE FOR COORDINATING WITH ALL APPROPRIATE UTILITY COMPANIES FOR LOCATION OF ALL UTILITIES WITHIN THE CONSTRUCTION AREA.
9. CONTRACTOR TO CONTACT EXPLORER TO COORDNIATE TRAIL CONSTRUCTION WITH EXPLORER CATHODIC TEST STATION.

WARNING!!! EXPLORER'S HIGH-PRESSURE PETROLEUM PRODUCTS PIPELINE

AT LEAST 48 HOURS BEFORE ANY CONSTRUCTION WITHIN 25 FEET OF EXPLORER'S PIPELINE, CONTACT EXPLORER PIPELINE AT (888) 876-0036

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CONTRACT SHEET No. 65 OF 345

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REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

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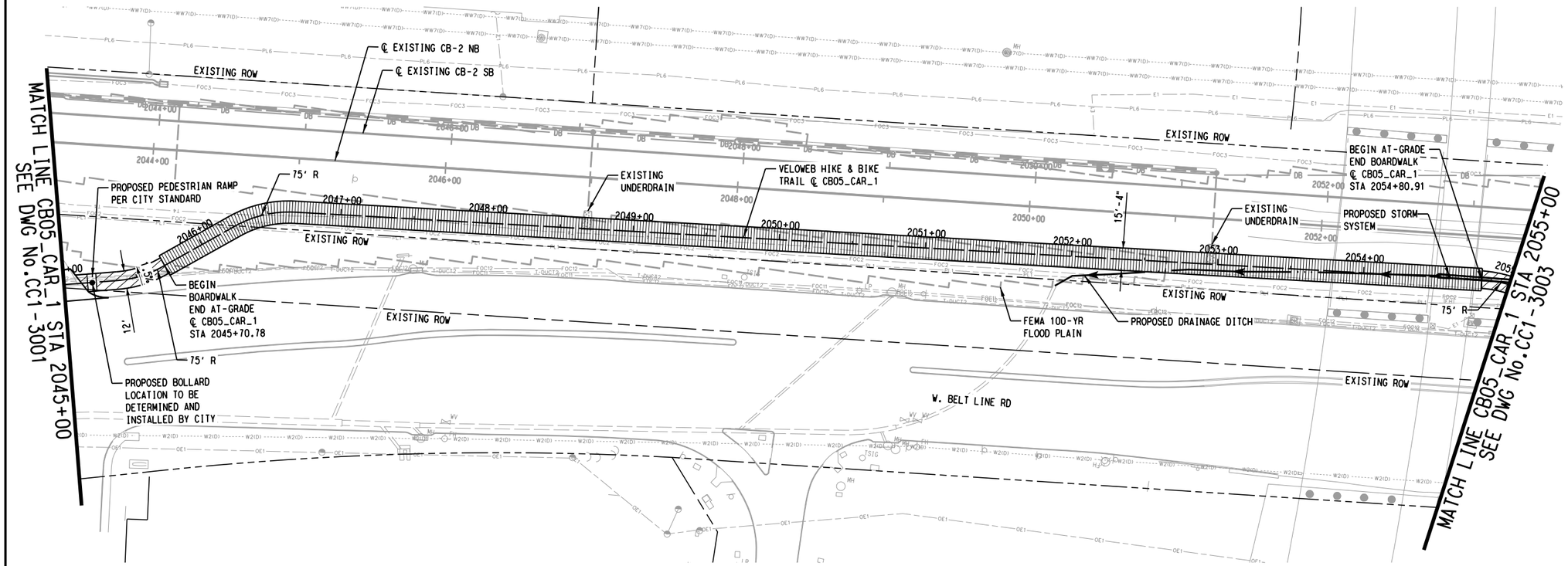
SCALE	1"=40'
DRAWN	S. SALEH
DESIGNED	S. SALEH
CHECKED	D. LUU
IN CHARGE	D. LUU
DATE	07 AUG 23

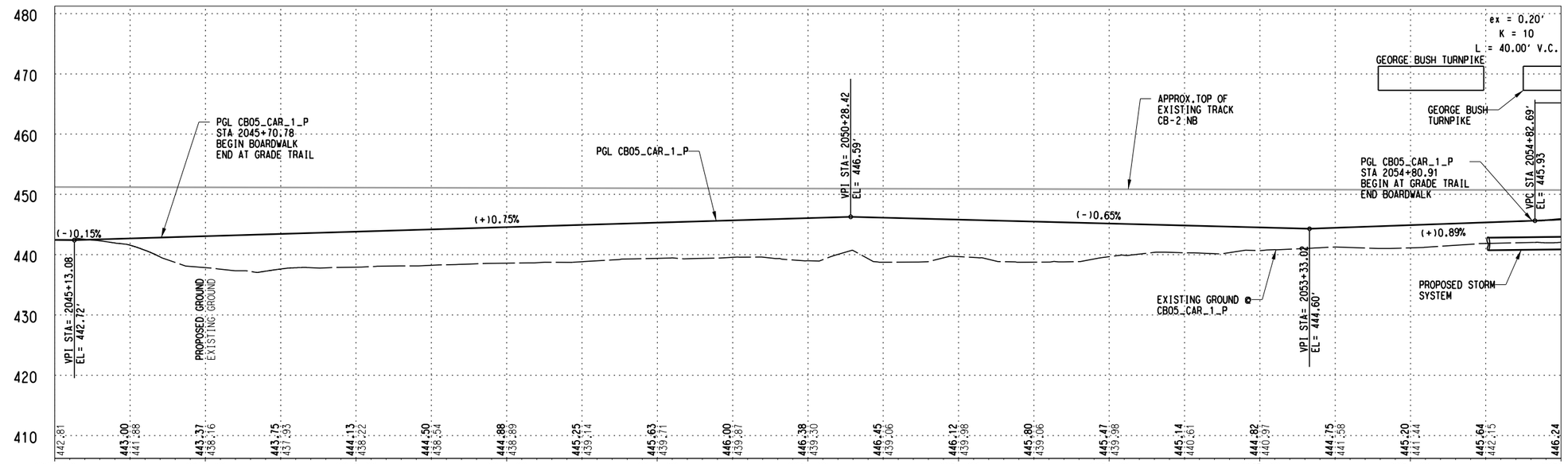
COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
CITY OF CARROLLTON
PLAN & PROFILE
STA 2039+24.50 TO STA 2045+00
SHEET 1 OF 19

CONTRACT	DWG No.	REV
C-2033270-01	CC1-3001	D

CB05-CC1-3001.040

DWG No. CC1-3002





SCALE (IN FEET)
HORIZ 0 20 40 80
SCALE (IN FEET)
VERT 0 5 10 15 20

LEGEND:
- TRAIL PAVEMENT
- TRAIL BRIDGE
- TRAIL BOARDWALK
- 1.50% → TRAIL CROSS-SLOPE

NOTES:
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5. SEE BRIDGE LAYOUT SHEETS FOR ADDITIONAL PEDESTRIAN BRIDGE INFORMATION.
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9. CONTRACTOR TO CONTACT EXPLORER TO COORDNIATE TRAIL CONSTRUCTION WITH EXPLORER CATHODIC TEST STATION.

WARNING!!! EXPLORER'S HIGH-PRESSURE PETROLEUM PRODUCTS PIPELINE

AT LEAST 48 HOURS BEFORE ANY CONSTRUCTION WITHIN 25 FEET OF EXPLORER'S PIPELINE, CONTACT EXPLORER PIPELINE AT (888) 876-0036

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SCALE	1"=40'
DRAWN	S. SALEH
DESIGNED	S. SALEH
CHECKED	D. LUU
IN CHARGE	D. LUU
DATE	07 AUG 23

CAES

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
CITY OF CARROLLTON
PLAN & PROFILE
STA 2045+00 TO 2055+00
SHEET 2 OF 19

CONTRACT	DWG No.	REV
C-2033270-01	CC1-3002	D

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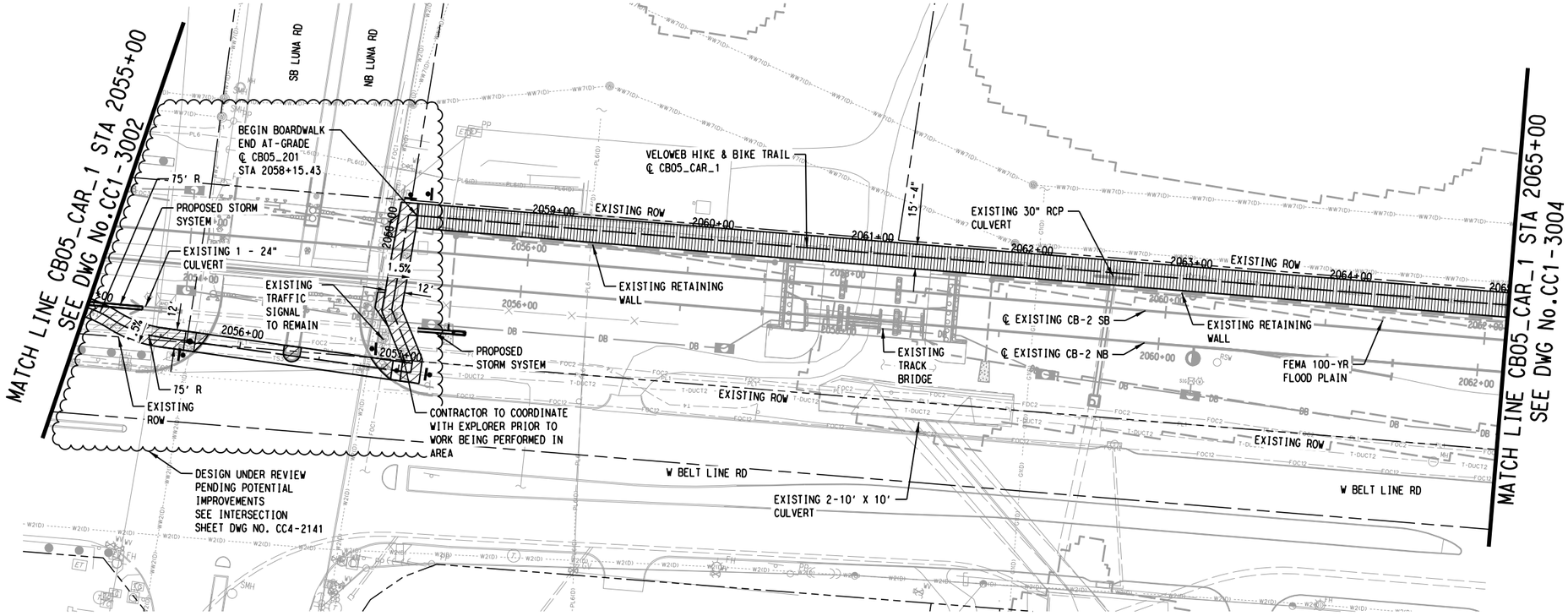
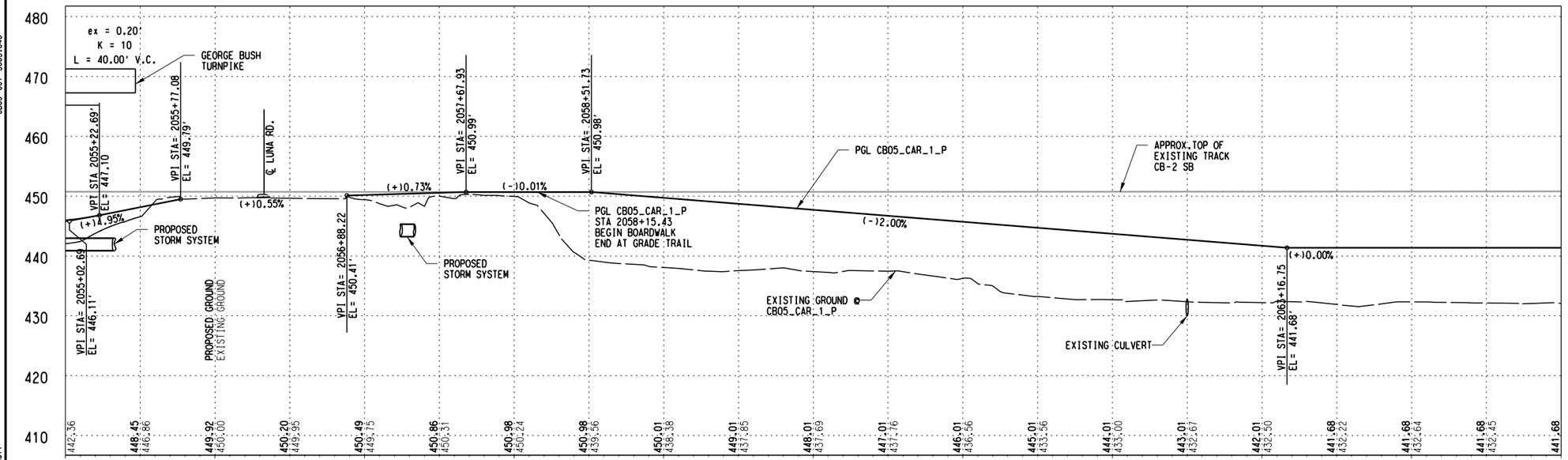
DWG No. CC1-3003





SCALE (IN FEET)
HORIZ 0 20 40 80
SCALE (IN FEET)
VERT 0 5 10 15 20

LEGEND:
- TRAIL PAVEMENT
- TRAIL BRIDGE
- TRAIL BOARDWALK
- 1.50% → TRAIL CROSS-SLOPE

NOTES:
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FINAL 100% DESIGN

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REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

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FIRM NO.F-819
ARCHER WESTERN HERZOG

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SCALE	1"=40'
DRAWN	S. SALEH
DESIGNED	S. SALEH
CHECKED	D. LUU
IN CHARGE	D. LUU
DATE	07 AUG 23

CAES

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
CITY OF CARROLLTON
PLAN & PROFILE
STA 2055+00 TO 2065+00
SHEET 3 OF 19

CONTRACT	DWG No.	REV
C-2033270-01	CC1-3003	D

CB05-CC1-3003.040

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CB05-CC1-3003.040
ssaleh
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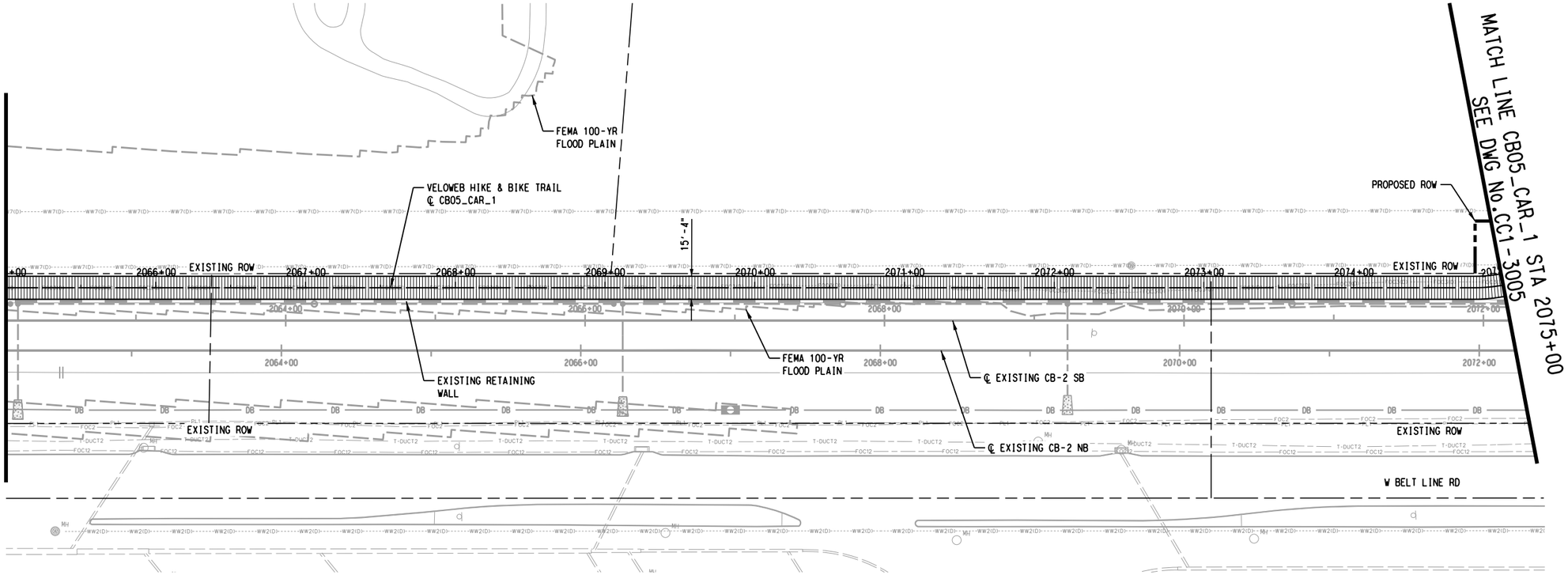
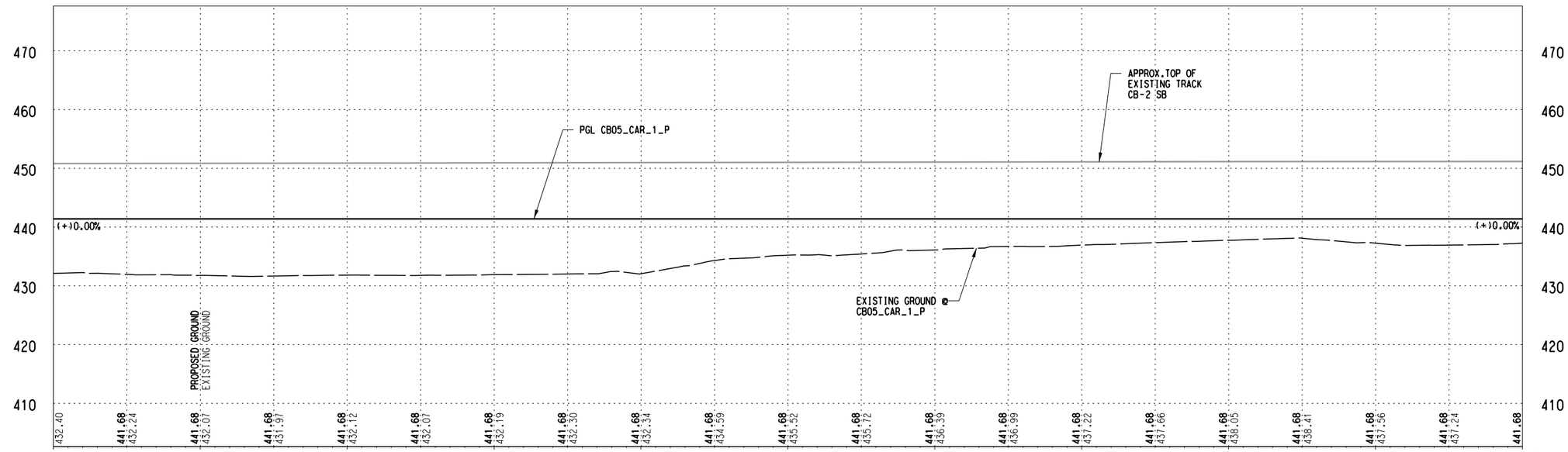
DWG No. CC1-3004

MATCH LINE CB05_CAR_1 STA 2065+00
SEE DWG No.CC1-3003

MATCH LINE CB05_CAR_1 STA 2075+00
SEE DWG No.CC1-3005





LEGEND:

- TRAIL PAVEMENT
- TRAIL BRIDGE
- TRAIL BOARDWALK
- 1.50% → TRAIL CROSS-SLOPE

NOTES:

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9. CONTRACTOR TO CONTACT EXPLORER TO COORDNIATE TRAIL CONSTRUCTION WITH EXPLORER CATHODIC TEST STATION.

SCALE (IN FEET)
HORIZ 0 20 40 80
VERT 0 5 10 15 20

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DESIGNED	S. SALEH
CHECKED	D. LUU
IN CHARGE	D. LUU
DATE	07 AUG 23

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
CITY OF CARROLLTON
PLAN & PROFILE
STA 2065+00 TO 2075+00
SHEET 4 OF 19

CONTRACT	DWG No.	REV
C-2033270-01	CC1-3004	D

CB05-CC1-3004.040

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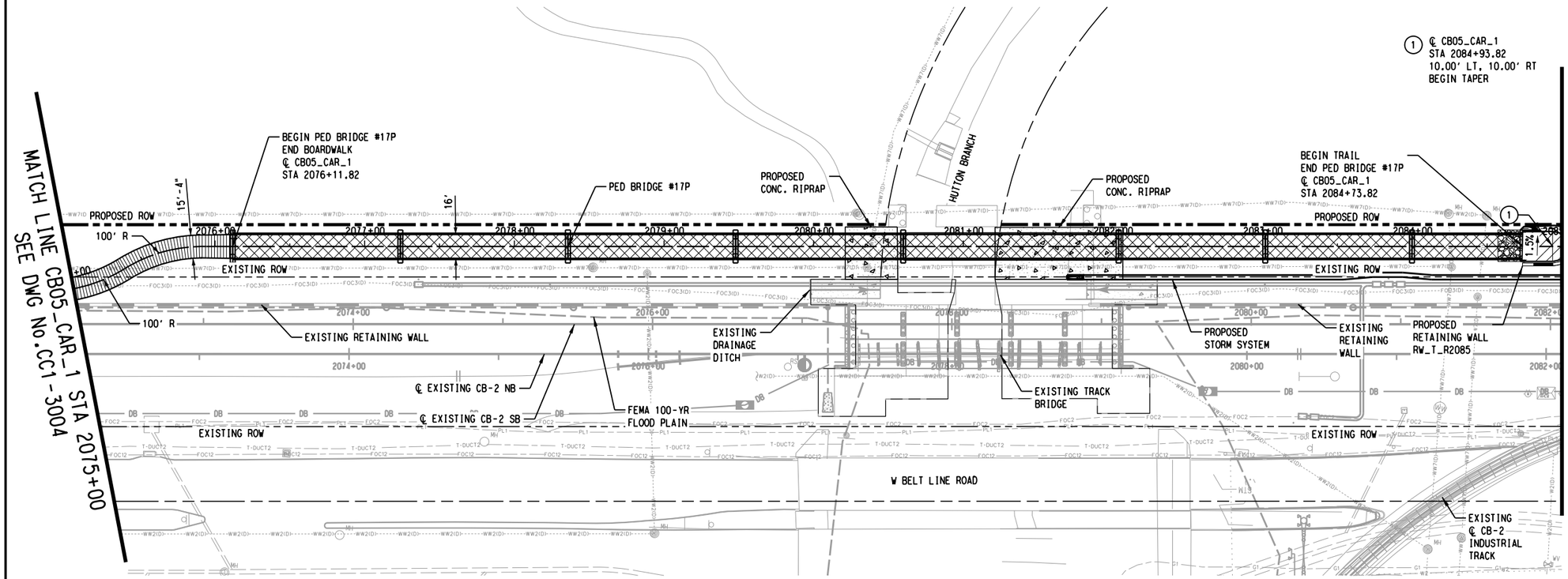

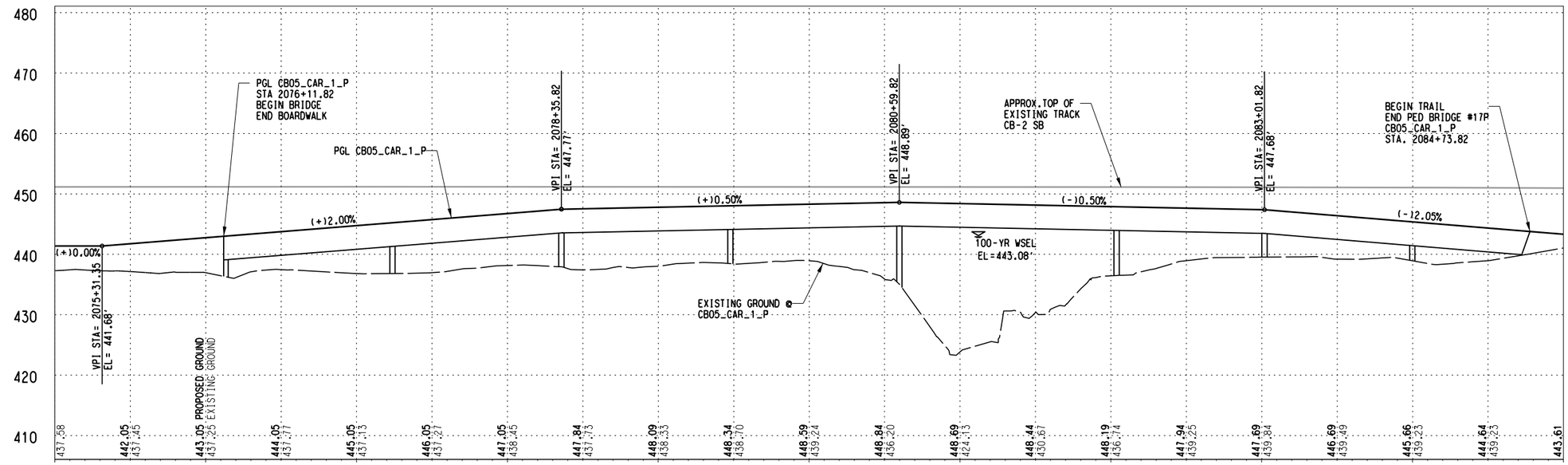

437.58	442.05 437.46	443.05 PROPOSED GROUND 437.25 EXISTING GROUND	444.05 437.77	445.05 437.13
446.05 437.27	447.05 438.45	447.84 437.73	448.09 438.33	448.34 438.70
448.59 439.24	448.84 436.20	448.69 424.13	448.44 430.67	448.19 436.74
447.94 439.25	447.69 439.84	446.69 439.49	445.66 439.23	444.64 439.23
443.61				

LEGEND:

- TRAIL PAVEMENT
- TRAIL BRIDGE
- TRAIL BOARDWALK
- 1.50% → TRAIL CROSS-SLOPE

NOTES:

1. PROPOSED ROW AND EASEMENTS ARE APPROXIMATE.
2. SEE SURVEY CONTROL SHEETS FOR BENCHMARK LOCATIONS.
3. SEE DRAINAGE PLAN AND PROFILE SHEETS FOR TRAIL DRAINAGE DESIGN.
4. SEE RETAINING WALL LAYOUT SHEETS FOR ADDITIONAL INFORMATION.
5. SEE BRIDGE LAYOUT SHEETS FOR ADDITIONAL PEDESTRIAN BRIDGE INFORMATION.
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9. CONTRACTOR TO CONTACT EXPLORER TO COORDNIATE TRAIL CONSTRUCTION WITH EXPLORER CATHODIC TEST STATION.

SCALE (IN FEET) HORIZ 0 20 40 80
SCALE (IN FEET) VERT 0 5 10 15 20

WARNING!!! EXPLORER'S HIGH-PRESSURE PETROLEUM PRODUCTS PIPELINE

AT LEAST 48 HOURS BEFORE ANY CONSTRUCTION WITHIN 25 FEET OF EXPLORER'S PIPELINE, CONTACT EXPLORER PIPELINE AT (888) 876-0036

NOT AN APPROVED DRAWING
FINAL 100% DESIGN

CONTRACT SHEET No. 69 OF 345

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

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ARS ENGINEERS, INC.
12801 N Central Expressway, Suite 1250
Dallas, Texas 75243
(214) 739-352 Fax (214) 739-3169
FIRM NO.F-819

ARCHER WESTERN HERZOG

DART PROJECT

DART

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SCALE	1"=40'
DRAWN	S. SALEH
DESIGNED	S. SALEH
CHECKED	D. LUU
IN CHARGE	D. LUU
DATE	11 AUG 23

CAES

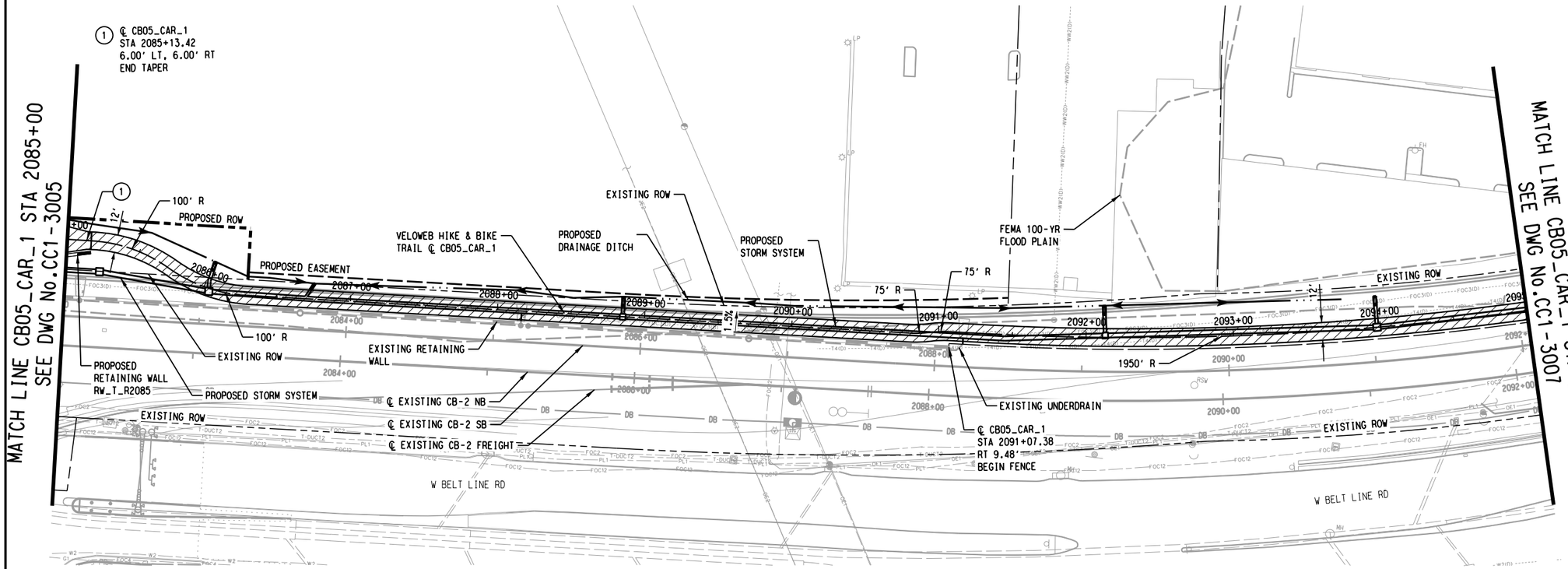
COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
CITY OF CARROLLTON
PLAN & PROFILE
STA 2075+00 TO 2085+00
SHEET 5 OF 19

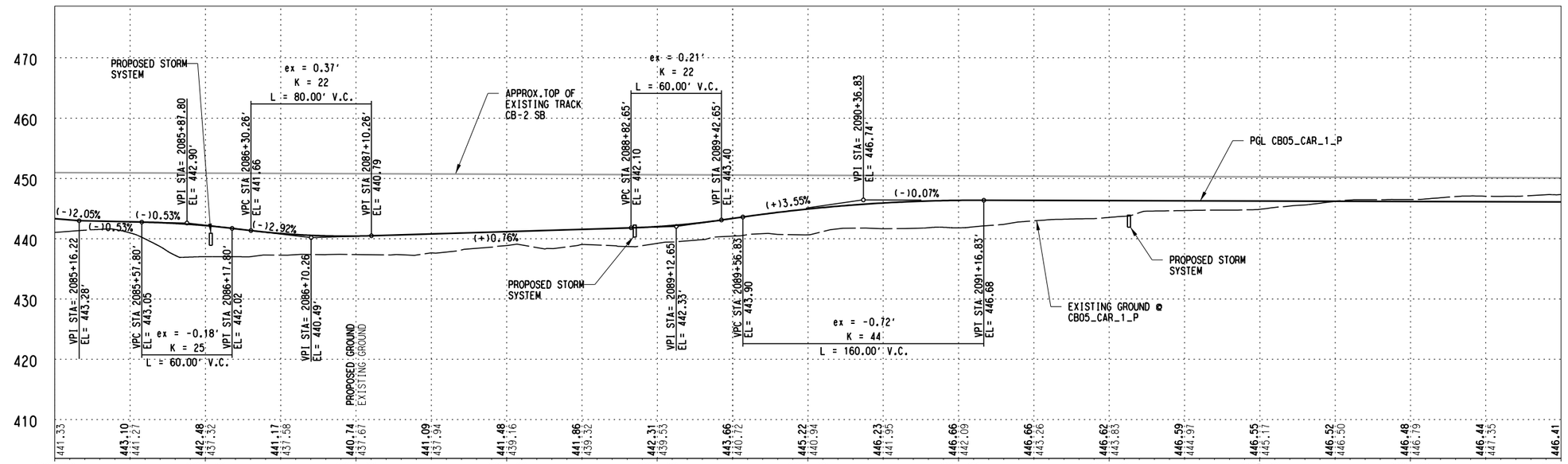
CONTRACT	DWG No.	REV
C-2033270-01	CC1-3005	D

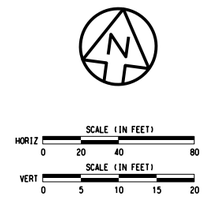
CB05-CC1-3005.040

15-AUG-2023 10:04
CB05-CC1-3005.040
ssaleh
Default

DWG No. CC1-3006







LEGEND:

- TRAIL PAVEMENT
- TRAIL BRIDGE
- TRAIL BOARDWALK
- 1.50% → TRAIL CROSS-SLOPE

NOTES:

1. PROPOSED ROW AND EASEMENTS ARE APPROXIMATE.
2. SEE SURVEY CONTROL SHEETS FOR BENCHMARK LOCATIONS.
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9. CONTRACTOR TO CONTACT EXPLORER TO COORDINATE TRAIL CONSTRUCTION WITH EXPLORER CATHODIC TEST STATION.

WARNING!!! EXPLORER'S HIGH-PRESSURE PETROLEUM PRODUCTS PIPELINE

AT LEAST 48 HOURS BEFORE ANY CONSTRUCTION WITHIN 25 FEET OF EXPLORER'S PIPELINE, CONTACT EXPLORER PIPELINE AT (888) 876-0036

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FINAL 100% DESIGN

CONTRACT SHEET No. 70 OF 345

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

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12801 N Central Expressway, Suite 1250
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(214) 739-352 Fax (214) 739-3169
FIRM NO. F-819

ARCHER WESTERN HERZOG

DART PROJECT

DART

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SCALE	1"=40'
DRAWN	S. SALEH
DESIGNED	S. SALEH
CHECKED	D. LUU
IN CHARGE	D. LUU
DATE	07 AUG 23

CAES

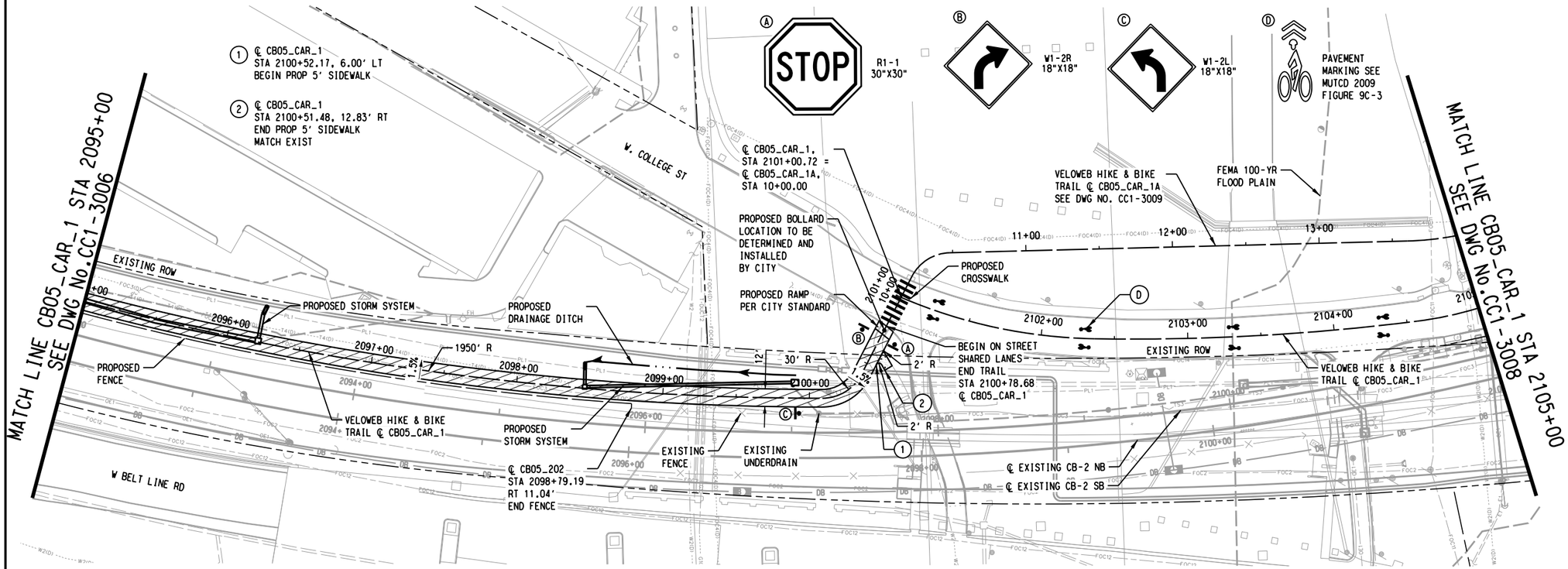
COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
CITY OF CARROLLTON
PLAN & PROFILE
STA 2085+00 TO 2095+00
SHEET 6 OF 19

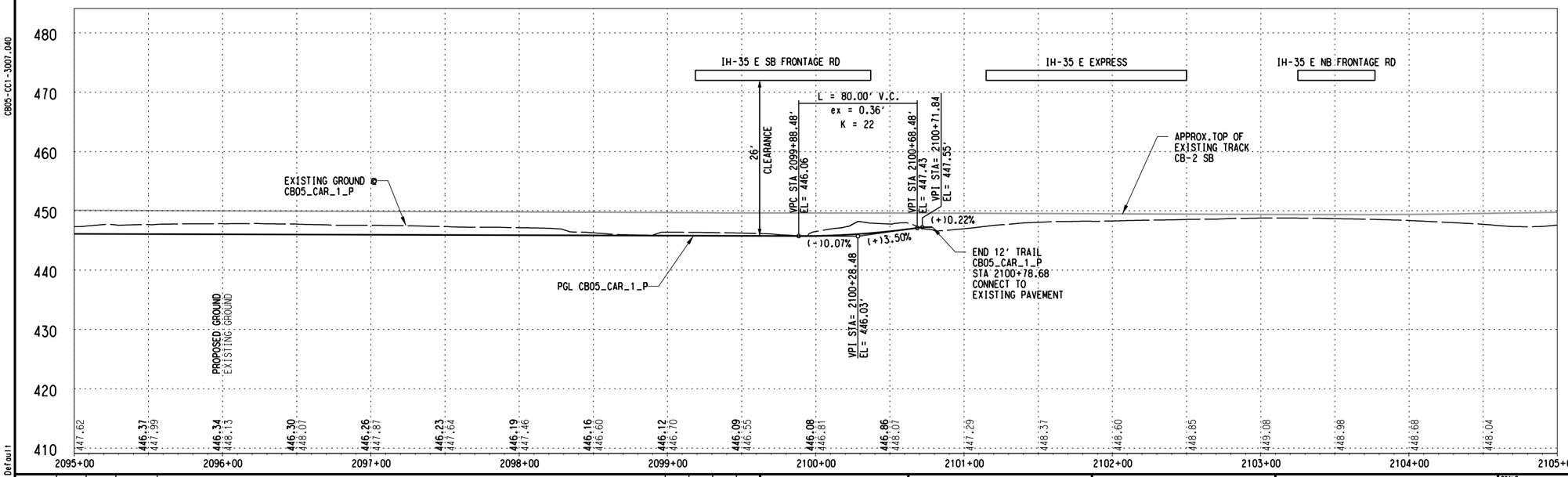
CONTRACT	DWG No.	REV
C-2033270-01	CC1-3006	D

CB05-CC1-3006.040

21-JUL-2023 15:06
CB05-CC1-3006.040
ssaleh
Default

DWG No. CC1-3007





21-JUL-2023 15:06
CB05-CC1-3007.040

ssaleh
Default

SCALE (IN FEET)
HORIZ 0 20 40 80
SCALE (IN FEET)
VERT 0 5 10 15 20

LEGEND:
TRAIL PAVEMENT
1.5% TRAIL CROSS-SLOPE

NOTES:

1. PROPOSED ROW AND EASEMENTS ARE APPROXIMATE.
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FINAL 100% DESIGN

CONTRACT SHEET No. 71 OF 345

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

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ARS ENGINEERS, INC.
12801 N Central Expressway, Suite 1250
Dallas, Texas 75243
(214) 739-3152 Fax (214) 739-3169
FIRM NO. F-819

ARCHER WESTERN HERZOG

DART PROJECT

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SCALE	1"=40'
DRAWN	S. SALEH
DESIGNED	S. SALEH
CHECKED	D. LUU
IN CHARGE	D. LUU
DATE	07 AUG 23

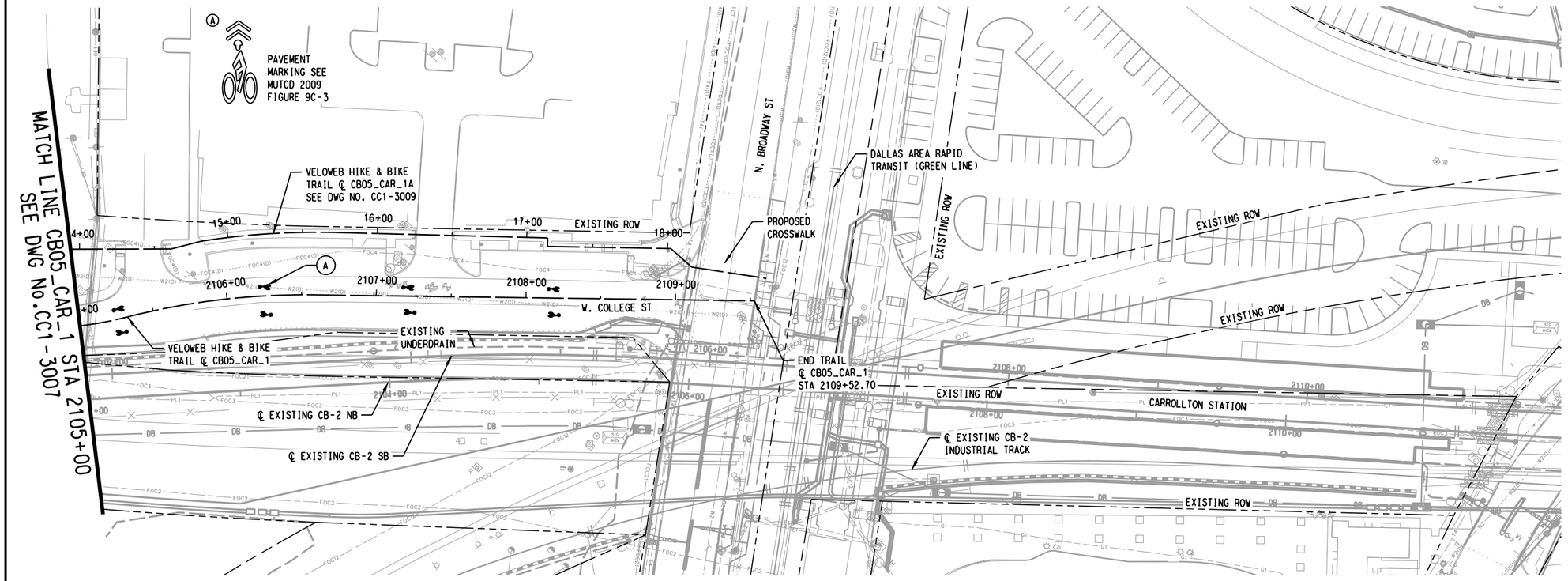
CAES

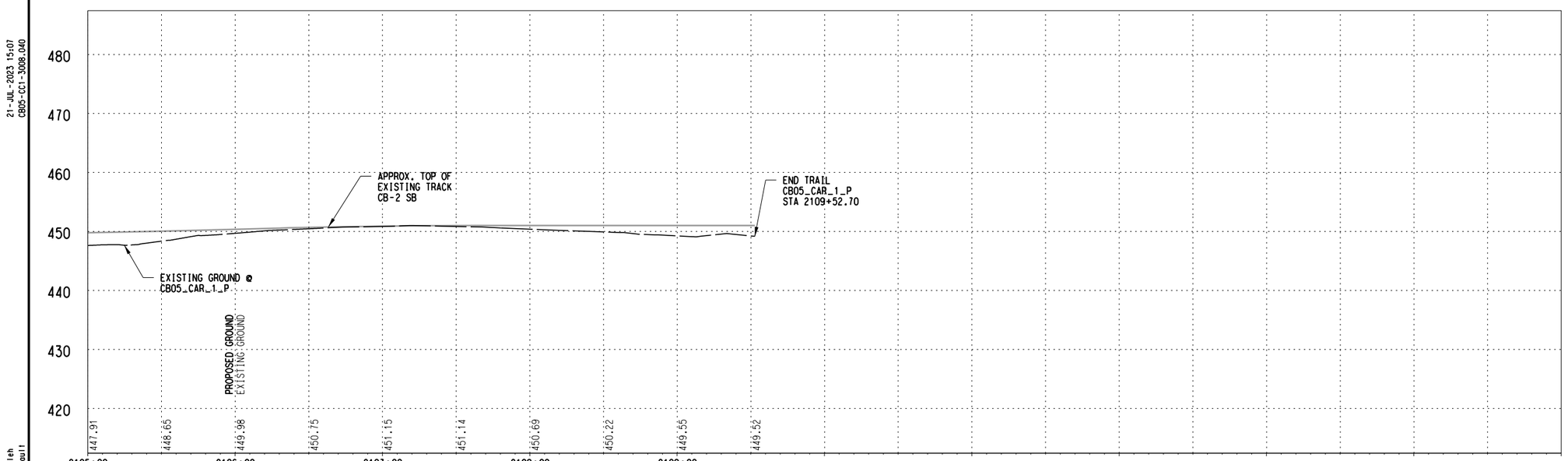
COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
CITY OF CARROLLTON
PLAN & PROFILE
STA 2095+00 TO 2105+00
SHEET 7 OF 19

CONTRACT	DWG No.	REV
C-2033270-01	CC1-3007	D

CB05-CC1-3007.040

DWG No. CC1-3008





SCALE (IN FEET)
HORIZ 0 20 40 80
SCALE (IN FEET)
VERT 0 5 10 15 20

LEGEND:
- TRAIL PAVEMENT
- TRAIL BRIDGE
- TRAIL BOARDWALK
- 1.50% → TRAIL CROSS-SLOPE

NOTES:
1. PROPOSED ROW AND EASEMENTS ARE APPROXIMATE.
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WARNING!!! EXPLORER'S HIGH-PRESSURE PETROLEUM PRODUCTS PIPELINE

AT LEAST 48 HOURS BEFORE ANY CONSTRUCTION WITHIN 25 FEET OF EXPLORER'S PIPELINE, CONTACT EXPLORER PIPELINE AT (888) 876-0036

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FINAL 100% DESIGN

CONTRACT SHEET No. 72 OF 345

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

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12801 N Central Expressway, Suite 1250
Dallas, Texas 75243
(214) 739-3152 Fax (214) 739-3169
FIRM NO. F-819

ARCHER WESTERN HERZOG

DART PROJECT

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CAES

SCALE	1"=40'
DRAWN	S. SALEH
DESIGNED	S. SALEH
CHECKED	D. LUU
IN CHARGE	D. LUU
DATE	07 AUG 23

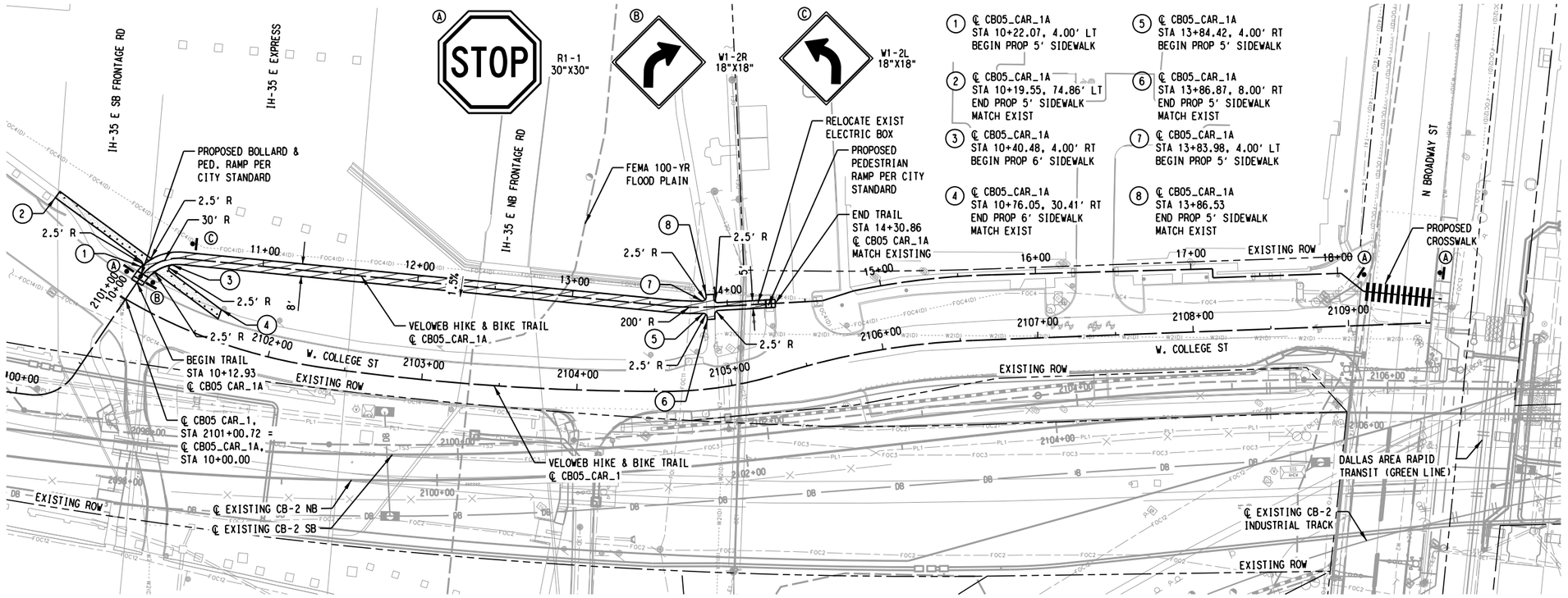
COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
CITY OF CARROLLTON
PLAN & PROFILE
STA 2105+00 TO 2109+52.70
SHEET 8 OF 19

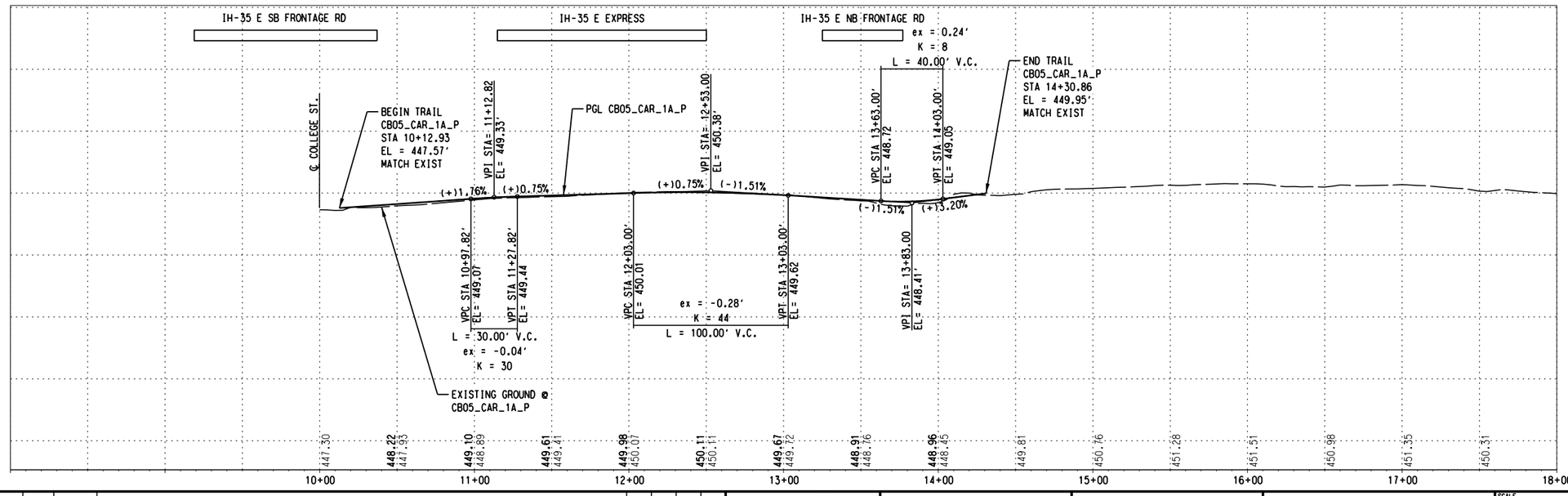
CONTRACT	DWG No.	REV
C-2033270-01	CC1-3008	D

CB05-CC1-3008.040

21-JUL-2023 15:07
CB05-CC1-3008.040
ssaleh
Default

DWG No. CC1-3009





SCALE (IN FEET)
HORIZ 0 20 40 80
SCALE (IN FEET)
VERT 0 5 10 15 20

LEGEND:
- TRAIL PAVEMENT
- TRAIL BRIDGE
- TRAIL BOARDWALK
- 1.50% → TRAIL CROSS-SLOPE

NOTES:
1. PROPOSED ROW AND EASEMENTS ARE APPROXIMATE.
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FINAL 100% DESIGN

CONTRACT SHEET No. 73 OF 345

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

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(214) 739-352 Fax (214) 739-3169
FIRM NO.F-819

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DART PROJECT

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CAES

SCALE	1"=40'
DRAWN	S. SALEH
DESIGNED	S. SALEH
CHECKED	D. LUU
IN CHARGE	D. LUU
DATE	07 AUG 23

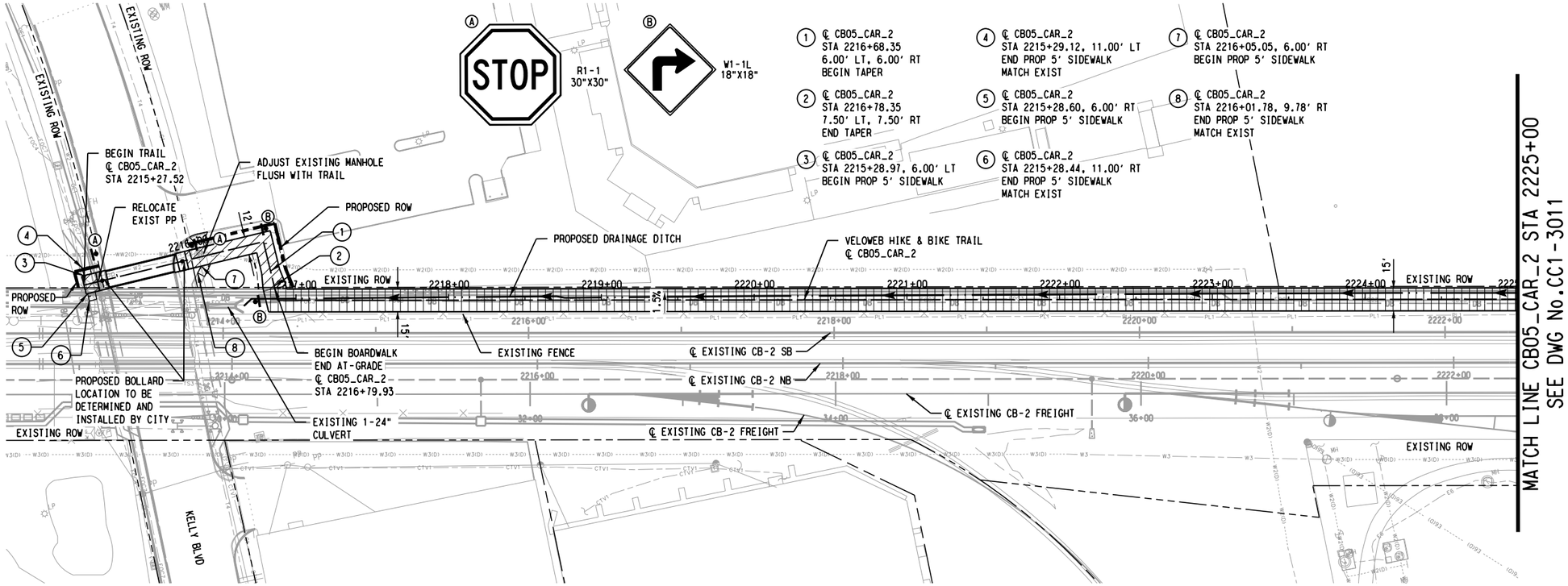
COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
CITY OF CARROLLTON
PLAN & PROFILE
STA 10+00 TO 14+30.86
SHEET 9 OF 19

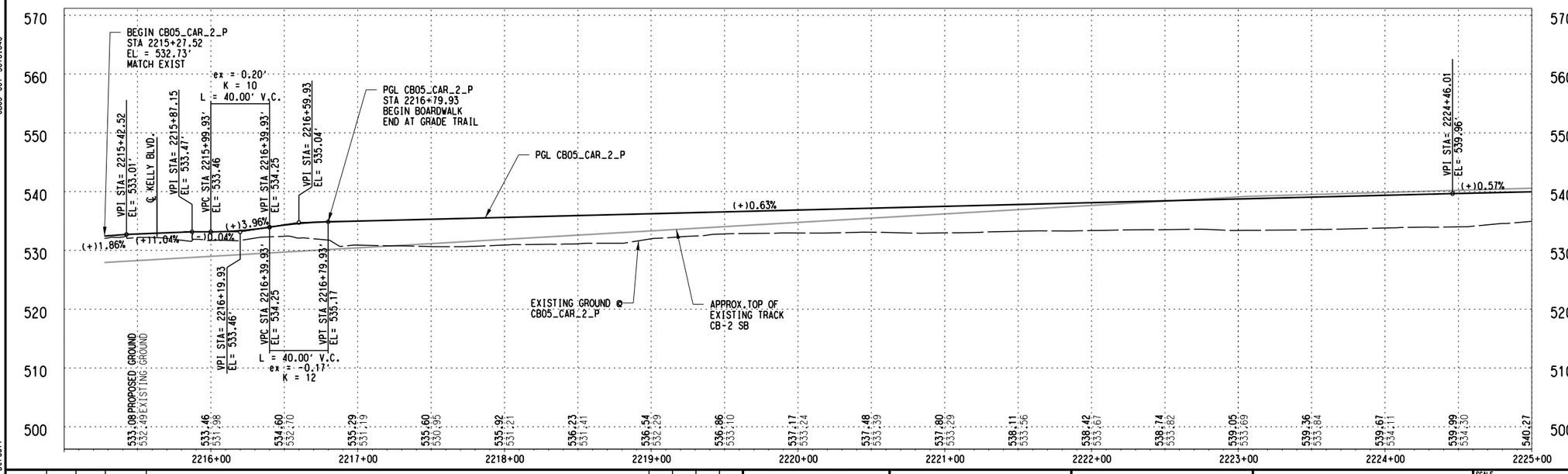
CONTRACT	DWG No.	REV
C-2033270-01	CC1-3009	D

CB05-CC1-3009.040

21-JUL-2023 15:07
CB05-CC1-3009.040
ssaleh
Plan and Profile Alternative College

DWG No. CC1-3010





SCALE (IN FEET)
HORIZ 0 20 40 80
SCALE (IN FEET)
VERT 0 5 10 15 20

LEGEND:
- TRAIL PAVEMENT
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FINAL 100% DESIGN

CONTRACT SHEET No. 74 OF 345

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

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12801 N Central Expressway, Suite 1250
Dallas, Texas 75243
(214) 739-3152 Fax (214) 739-3169
FIRM NO. F-819

ARCHER WESTERN HERZOG

DART PROJECT

DART

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CAES

SCALE	1"=40'
DRAWN	S. SALEH
DESIGNED	S. SALEH
CHECKED	D. LUU
IN CHARGE	D. LUU
DATE	07 AUG 23

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
CITY OF CARROLLTON
PLAN & PROFILE
STA 2215+27.52 TO STA 2225+00
SHEET 10 OF 19

CONTRACT	DWG No.	REV
C-2033270-01	CC1-3010	D

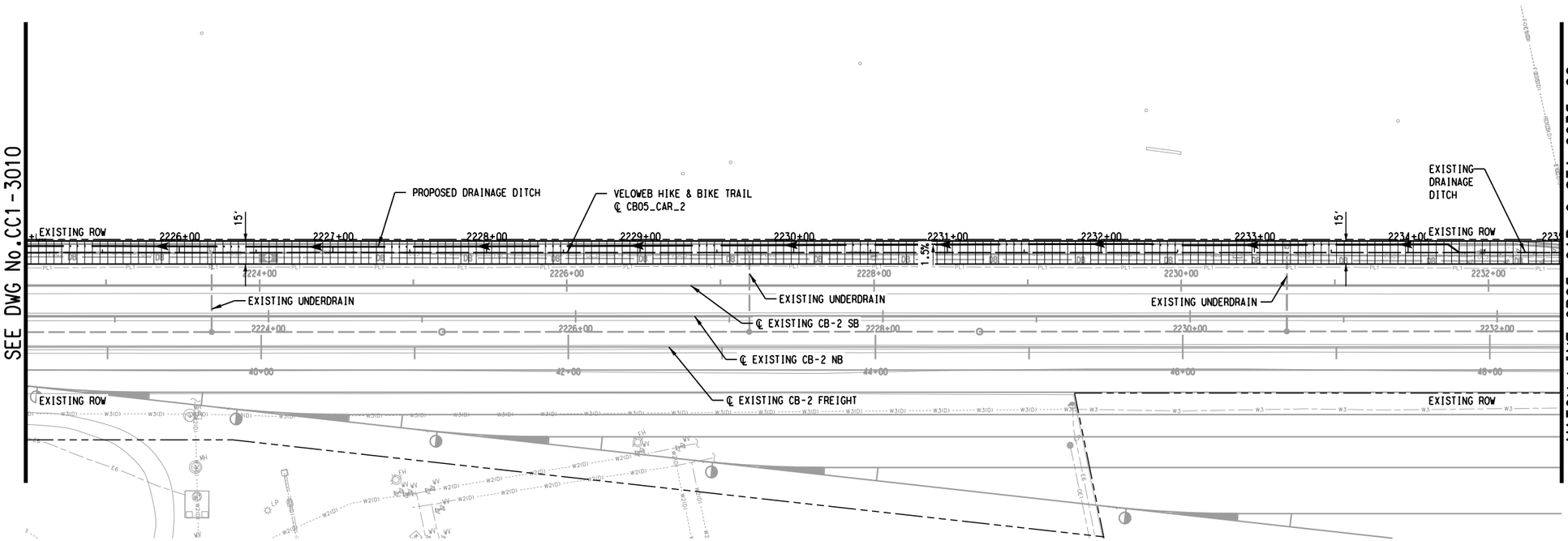
CB05-CC1-3010.040

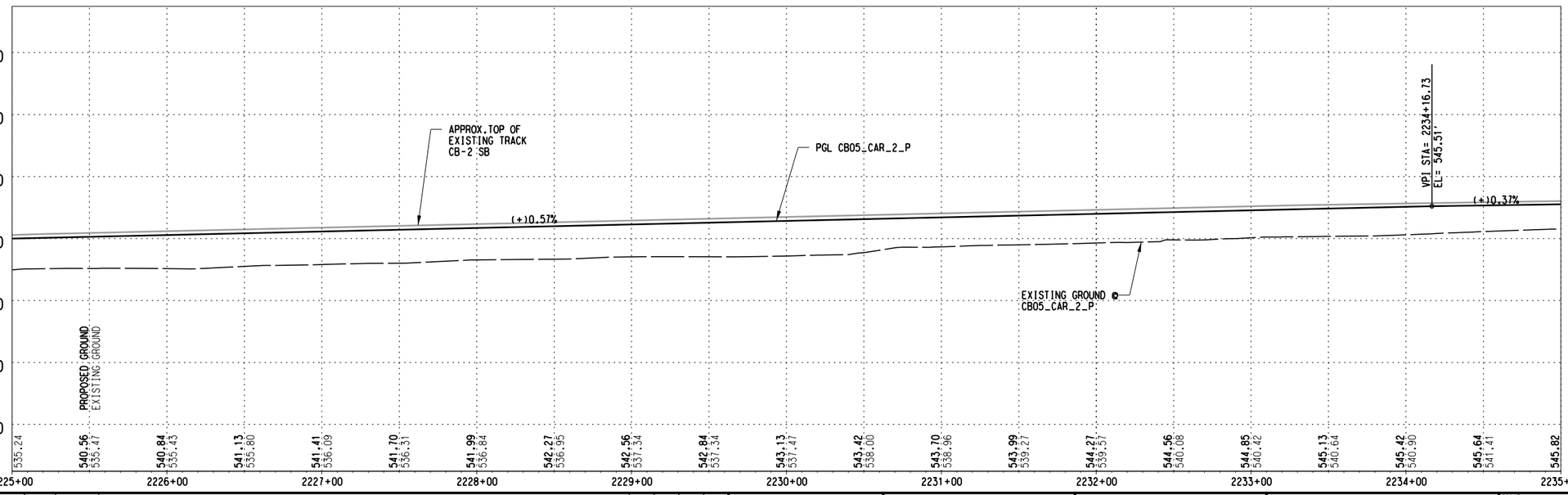
21-JUL-2023 15:07
CB05-CC1-3010.040
ssaleh
Default

DWG No. CC1-3011

MATCH LINE CB05_CAR_2 STA 2225+00
SEE DWG No.CC1-3010

MATCH LINE CB05_CAR_2 STA 2235+00
SEE DWG No.CC1-3012





HORIZ SCALE (IN FEET) 0 20 40 80
VERT SCALE (IN FEET) 0 5 10 15 20

LEGEND:
- TRAIL PAVEMENT
- TRAIL BRIDGE
- TRAIL BOARDWALK
- 1.50% TRAIL CROSS-SLOPE

NOTES:
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CONTRACT SHEET No. 75 OF 345

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

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FIRM REGISTRATION No. F-2966

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12801 N Central Expressway, Suite 1250
Dallas, Texas 75243
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FIRM NO.F-819

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DART PROJECT

DART

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CAES

SCALE	1"=40'
DRAWN	S. SALEH
DESIGNED	S. SALEH
CHECKED	D. LUU
IN CHARGE	D. LUU
DATE	07 AUG 23

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
CITY OF CARROLLTON
PLAN & PROFILE
STA 2225+00 TO STA 2235+00
SHEET 11 OF 19

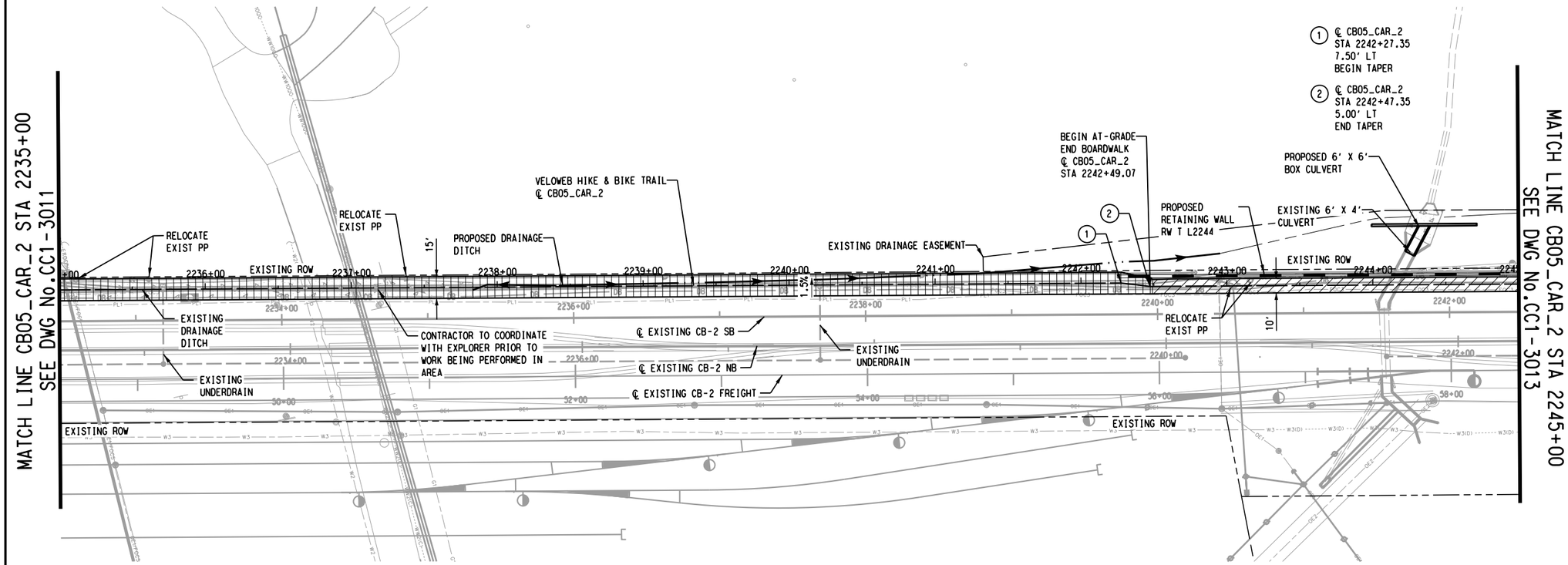
CONTRACT	DWG No.	REV
C-2033270-01	CC1-3011	D

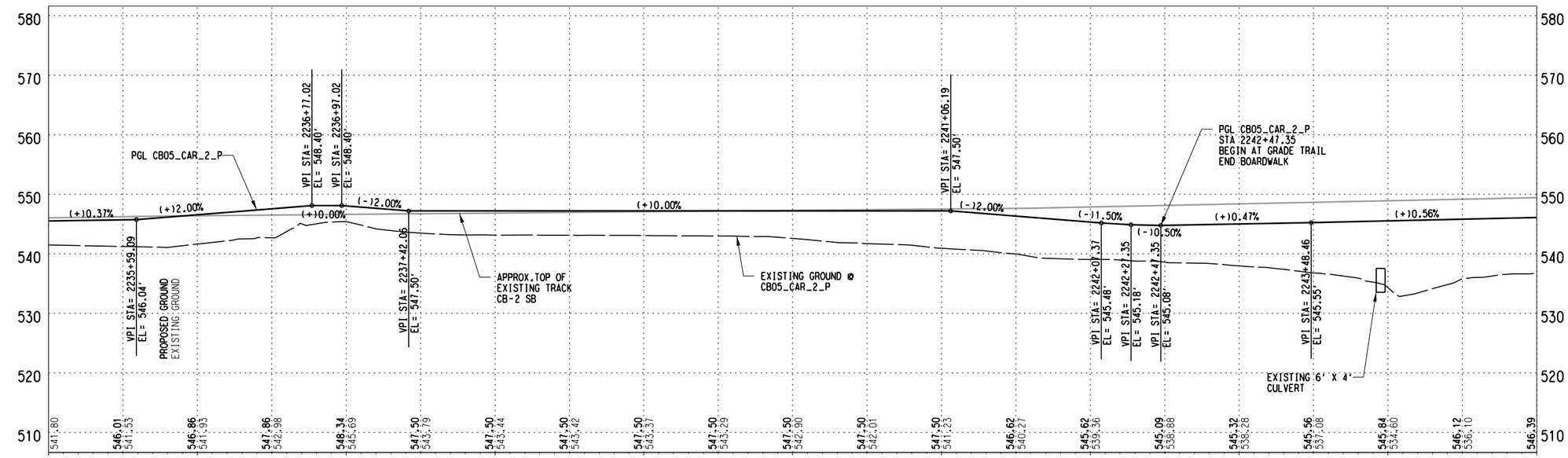
21-JUL-2023 15:07
CB05-CC1-3011.040

ssaleh
Default

CB05-CC1-3011.040

DWG No. CC1-3012





LEGEND:

- TRAIL PAVEMENT
- TRAIL BRIDGE
- TRAIL BOARDWALK
- 1.50% TRAIL CROSS-SLOPE

SCALE (IN FEET) HORIZ 0 20 40 80
SCALE (IN FEET) VERT 0 5 10 15 20

NOTES:

1. PROPOSED ROW AND EASEMENTS ARE APPROXIMATE.
2. SEE SURVEY CONTROL SHEETS FOR BENCHMARK LOCATIONS.
3. SEE DRAINAGE PLAN AND PROFILE SHEETS FOR TRAIL DRAINAGE DESIGN.
4. SEE RETAINING WALL LAYOUT SHEETS FOR ADDITIONAL INFORMATION.
5. SEE BRIDGE LAYOUT SHEETS FOR ADDITIONAL PEDESTRIAN BRIDGE INFORMATION.
6. SEE TYPICAL SECTION SHEETS FOR ADDITIONAL INFORMATION.
7. SIGN PLACEMENT SHALL BE AS PER CHAPTER 9 OF THE TMUTCD.
8. CONTRACTOR WILL BE RESPONSIBLE FOR COORDINATING WITH ALL APPROPRIATE UTILITY COMPANIES FOR LOCATION OF ALL UTILITIES WITHIN THE CONSTRUCTION AREA.
9. CONTRACTOR TO CONTACT EXPLORER TO COORDNIATE TRAIL CONSTRUCTION WITH EXPLORER CATHODIC TEST STATION.

WARNING!!! EXPLORER'S HIGH-PRESSURE PETROLEUM PRODUCTS PIPELINE

AT LEAST 48 HOURS BEFORE ANY CONSTRUCTION WITHIN 25 FEET OF EXPLORER'S PIPELINE, CONTACT EXPLORER PIPELINE AT (888) 876-0036

NOT AN APPROVED DRAWING
FINAL 100% DESIGN

CONTRACT SHEET No. 76 OF 345

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

IN-PROGRESS REVIEW
THIS DOCUMENT IS RELEASED FOR THE PURPOSE OF REVIEW UNDER THE AUTHORITY OF:
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21-JUL-2023 15:08
ARS
TBPELS FIRM NO. F-819/10131900
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Jacobs
1999 BRYAN ST, SUITE 1200
DALLAS, TX 75201-3136
Phone: +1 (214) 638-0145
FIRM REGISTRATION No. F-2966

ARS ENGINEERS, INC.
12801 N Central Expressway, Suite 1250
Dallas, Texas 75243
(214) 739-3152 Fax (214) 739-3169
FIRM NO.F-819

ARCHER WESTERN HERZOG

DART PROJECT

DART®

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CAES

SCALE	1"=40'
DRAWN	S. SALEH
DESIGNED	S. SALEH
CHECKED	D. LUU
IN CHARGE	D. LUU
DATE	07 AUG 23

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
CITY OF CARROLLTON
PLAN & PROFILE
STA 2235+00 TO STA 2245+00
SHEET 12 OF 19

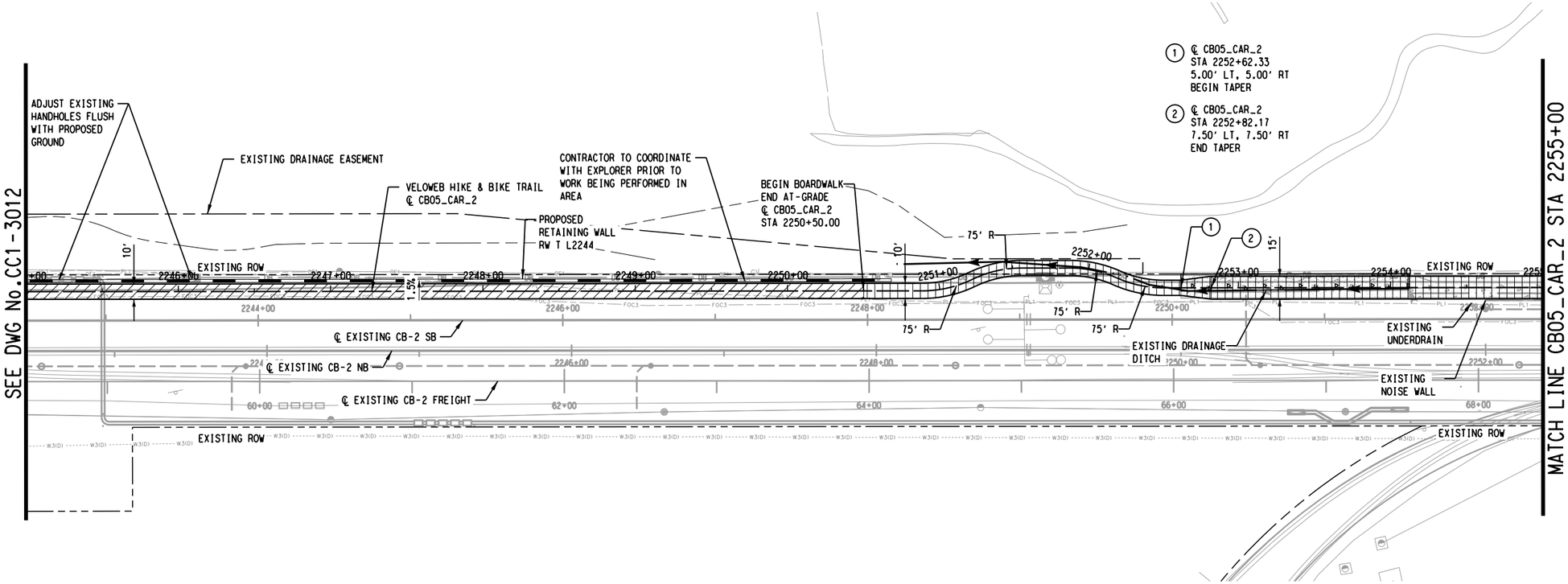
CONTRACT	DWG No.	REV
C-2033270-01	CC1-3012	D

CB05-CC1-3012.040

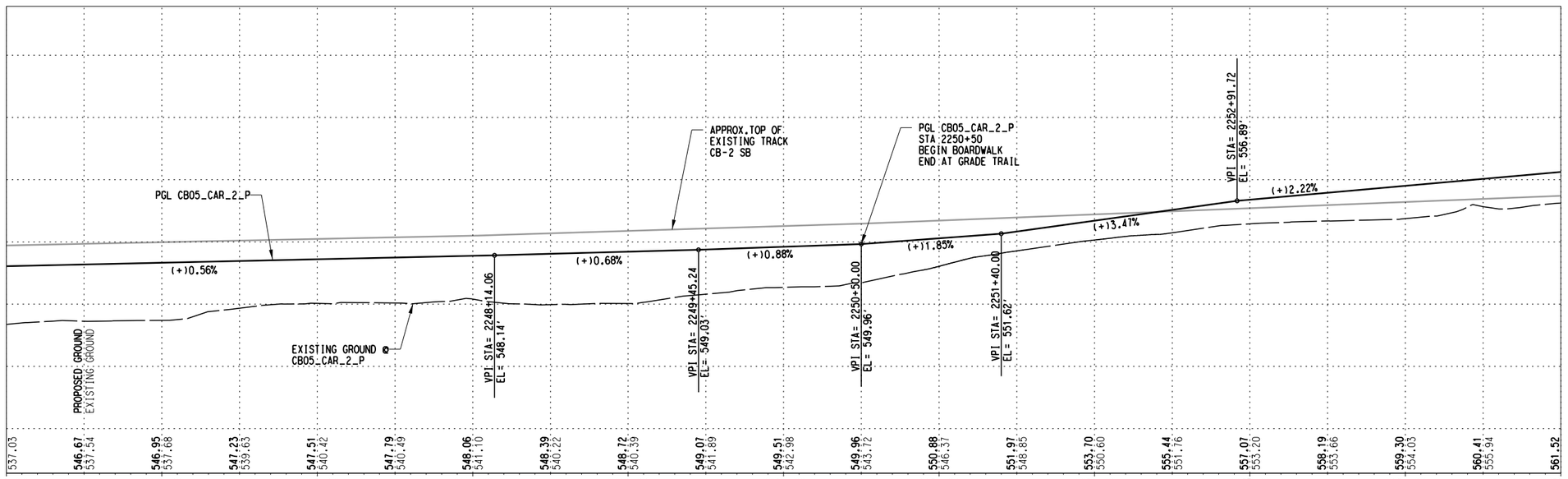
21-JUL-2023 15:08
CB05-CC1-3012.040
ssaleh
Default

DWG No. CC1-3013

MATCH LINE CB05_CAR_2 STA 2245+00
SEE DWG No.CC1-3012



MATCH LINE CB05_CAR_2 STA 2255+00
SEE DWG No.CC1-3014



537.03	546.67 537.54	546.95 537.68	547.23 539.63
547.51 540.42	547.79 540.49	548.06 541.10	548.39 540.22
548.72 540.39	549.07 541.89	549.51 542.98	549.96 543.72
550.88 546.37	551.97 548.85	553.70 550.60	555.44 551.76
557.07 553.20	558.19 553.66	559.30 554.03	560.41 555.94
561.52			

LEGEND:

- TRAIL PAVEMENT
- TRAIL BRIDGE
- TRAIL BOARDWALK
- 1.50% → TRAIL CROSS-SLOPE

NOTES:

1. PROPOSED ROW AND EASEMENTS ARE APPROXIMATE.
2. SEE SURVEY CONTROL SHEETS FOR BENCHMARK LOCATIONS.
3. SEE DRAINAGE PLAN AND PROFILE SHEETS FOR TRAIL DRAINAGE DESIGN.
4. SEE RETAINING WALL LAYOUT SHEETS FOR ADDITIONAL INFORMATION.
5. SEE BRIDGE LAYOUT SHEETS FOR ADDITIONAL PEDESTRIAN BRIDGE INFORMATION.
6. SEE TYPICAL SECTION SHEETS FOR ADDITIONAL INFORMATION.
7. SIGN PLACEMENT SHALL BE AS PER CHAPTER 9 OF THE TMUTCD.
8. CONTRACTOR WILL BE RESPONSIBLE FOR COORDINATING WITH ALL APPROPRIATE UTILITY COMPANIES FOR LOCATION OF ALL UTILITIES WITHIN THE CONSTRUCTION AREA.
9. CONTRACTOR TO CONTACT EXPLORER TO COORDNIATE TRAIL CONSTRUCTION WITH EXPLORER CATHODIC TEST STATION.

WARNING!!! EXPLORER'S HIGH-PRESSURE PETROLEUM PRODUCTS PIPELINE

AT LEAST 48 HOURS BEFORE ANY CONSTRUCTION WITHIN 25 FEET OF EXPLORER'S PIPELINE, CONTACT EXPLORER PIPELINE AT (888) 876-0036

NOT AN APPROVED DRAWING
FINAL 100% DESIGN

CONTRACT SHEET No. 77 OF 345

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

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ARS ENGINEERS, INC.
12801 N Central Expressway, Suite 1250
Dallas, Texas 75243
(214) 739-3152 Fax (214) 739-3169
FIRM NO.F-819

ARCHER WESTERN HERZOG

DART PROJECT

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CAES

SCALE	1"=40'
DRAWN	S. SALEH
DESIGNED	S. SALEH
CHECKED	D. LUU
IN CHARGE	D. LUU
DATE	07 AUG 23

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
CITY OF CARROLLTON
PLAN & PROFILE
STA 2245+00 TO STA 2255+00
SHEET 13 OF 19

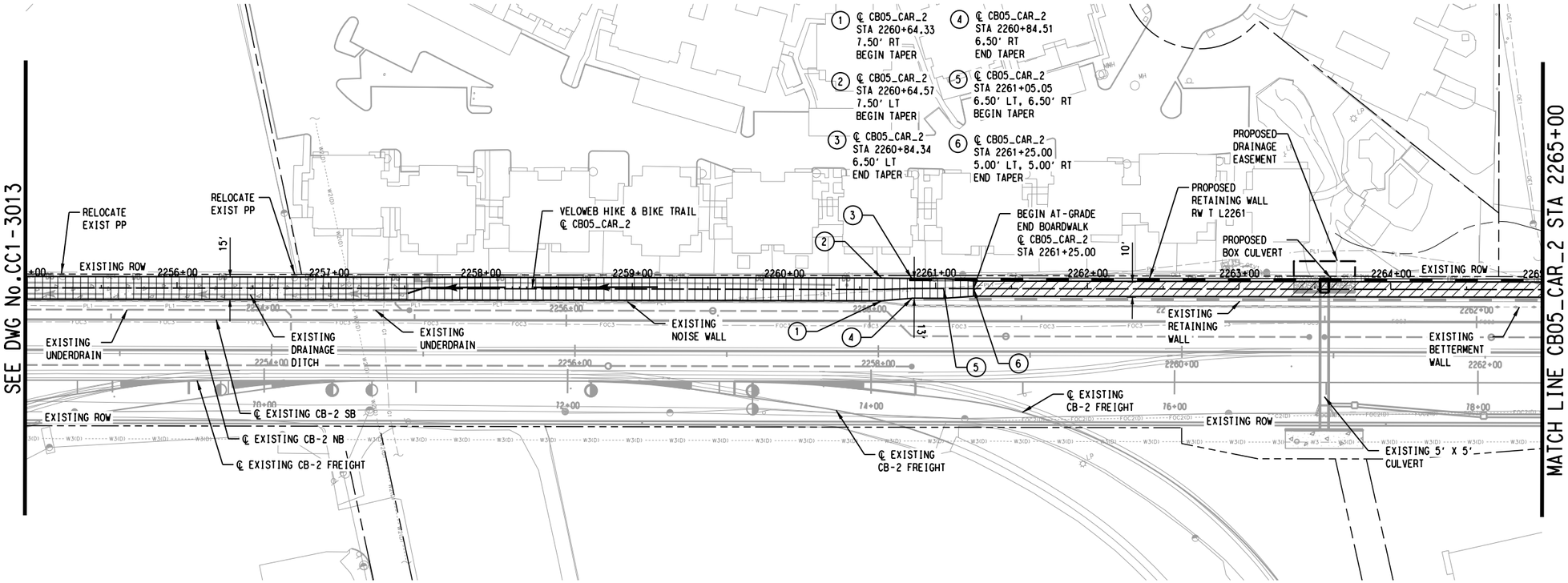
CONTRACT	DWG No.	REV
C-2033270-01	CC1-3013	D

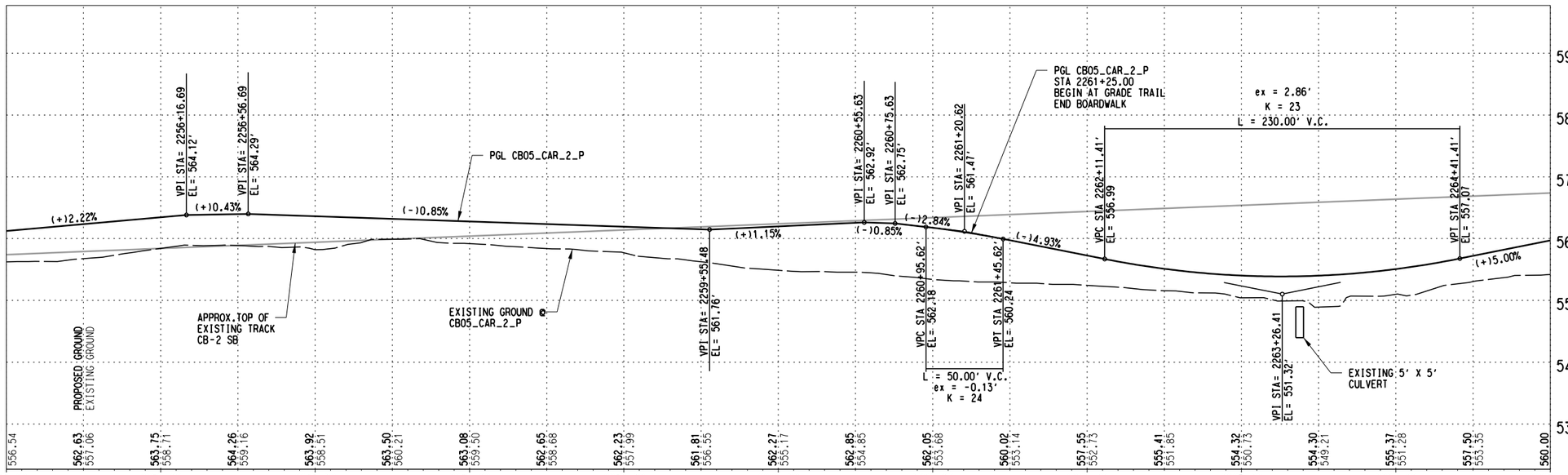
CB05-CC1-3013.040

21-JUL-2023 15:08
CB05-CC1-3013.040

ssaleh
Default

DWG No. CC1-3014





HORIZ SCALE (IN FEET) 0 20 40 80

VERT SCALE (IN FEET) 0 5 10 15 20

LEGEND:

- TRAIL PAVEMENT
- TRAIL BRIDGE
- TRAIL BOARDWALK
- 1.50% → TRAIL CROSS-SLOPE

NOTES:

1. PROPOSED ROW AND EASEMENTS ARE APPROXIMATE.
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WARNING!!! EXPLORER'S HIGH-PRESSURE PETROLEUM PRODUCTS PIPELINE

AT LEAST 48 HOURS BEFORE ANY CONSTRUCTION WITHIN 25 FEET OF EXPLORER'S PIPELINE, CONTACT EXPLORER PIPELINE AT (888) 876-0036

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CONTRACT SHEET No. 78 OF 345

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

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12801 N Central Expressway, Suite 1250
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FIRM NO.F-819

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CAES

SCALE	1"=40'
DRAWN	S. SALEH
DESIGNED	S. SALEH
CHECKED	D. LUU
IN CHARGE	D. LUU
DATE	07 AUG 23

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
CITY OF CARROLLTON
PLAN & PROFILE
STA 2255+00 TO STA 2265+00
SHEET 14 OF 19

CONTRACT	DWG No.	REV
C-2033270-01	CC1-3014	D

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CB05-CC1-3014.040

ssaleh
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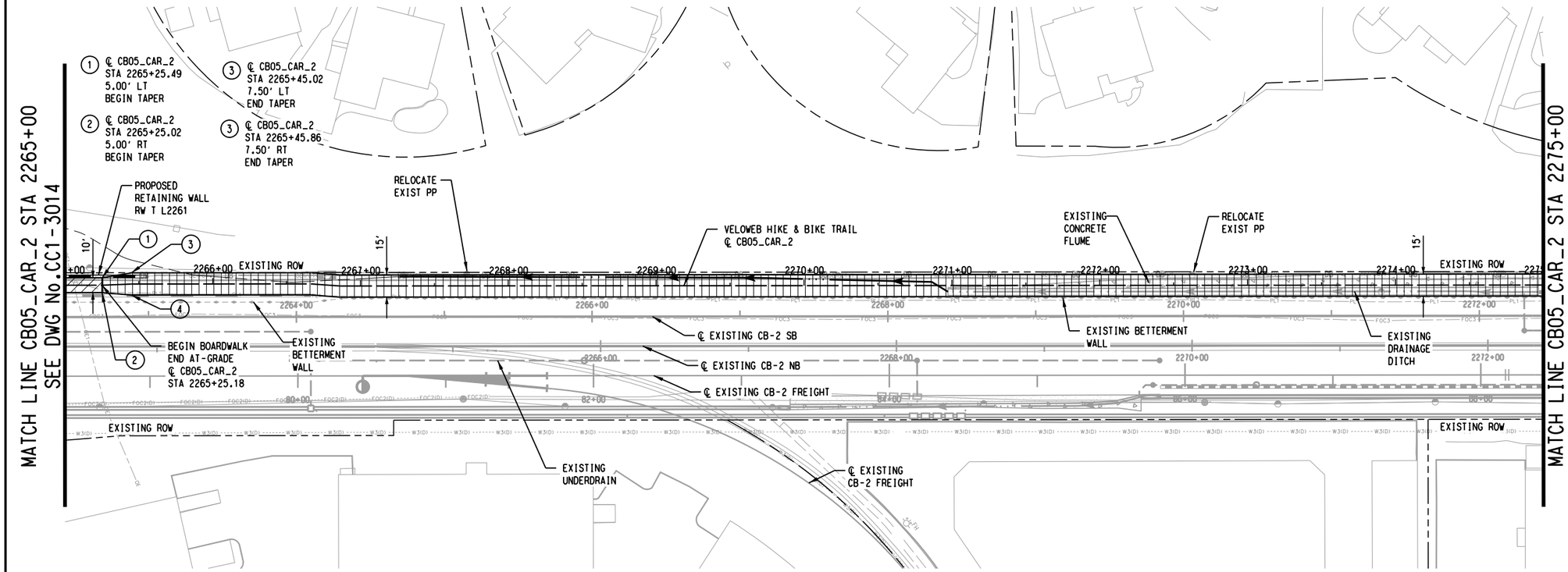
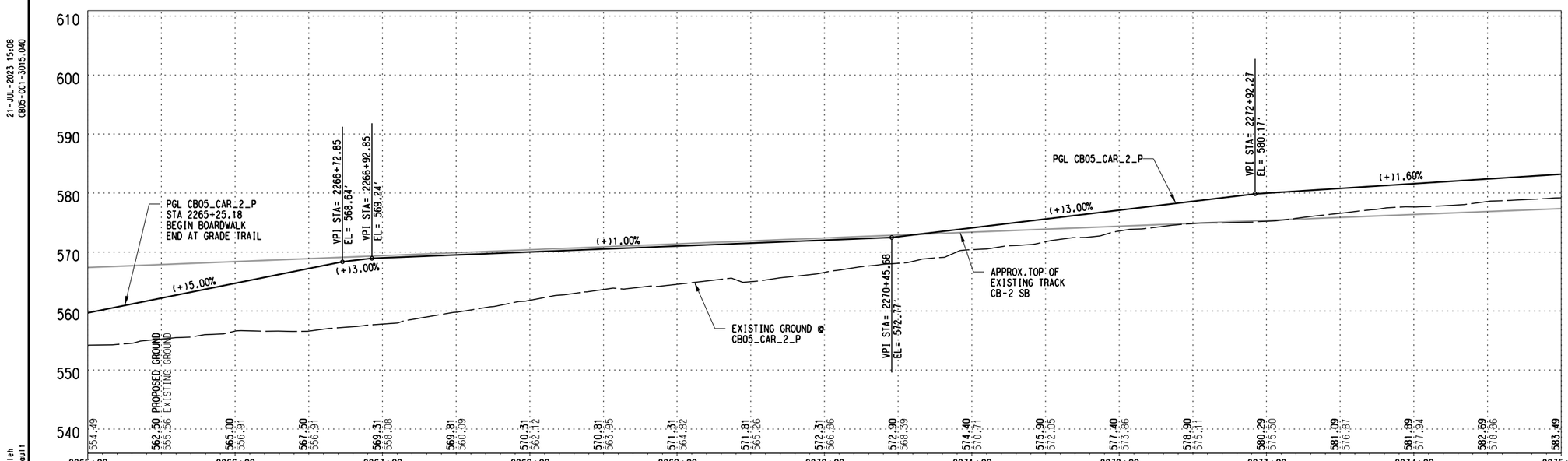
CB05-CC1-3014.040

DWG No. CC1-3015





SCALE (IN FEET)
HORIZ 0 20 40 80
SCALE (IN FEET)
VERT 0 5 10 15 20

LEGEND:
- TRAIL PAVEMENT
- TRAIL BRIDGE
- TRAIL BOARDWALK
- 1.50% → TRAIL CROSS-SLOPE

NOTES:
1. PROPOSED ROW AND EASEMENTS ARE APPROXIMATE.
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WARNING!!! EXPLORER'S HIGH-PRESSURE PETROLEUM PRODUCTS PIPELINE

AT LEAST 48 HOURS BEFORE ANY CONSTRUCTION WITHIN 25 FEET OF EXPLORER'S PIPELINE, CONTACT EXPLORER PIPELINE AT (888) 876-0036

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FINAL 100% DESIGN

CONTRACT SHEET No. 79 OF 345

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

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ARS ENGINEERS, INC.
12801 N Central Expressway, Suite 1250
Dallas, Texas 75243
(214) 739-3152 Fax (214) 739-3169
FIRM NO. F-819

ARCHER WESTERN HERZOG

DART PROJECT

DART

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CAES

SCALE	1"=40'
DRAWN	S. SALEH
DESIGNED	S. SALEH
CHECKED	D. LUU
IN CHARGE	D. LUU
DATE	07 AUG 23

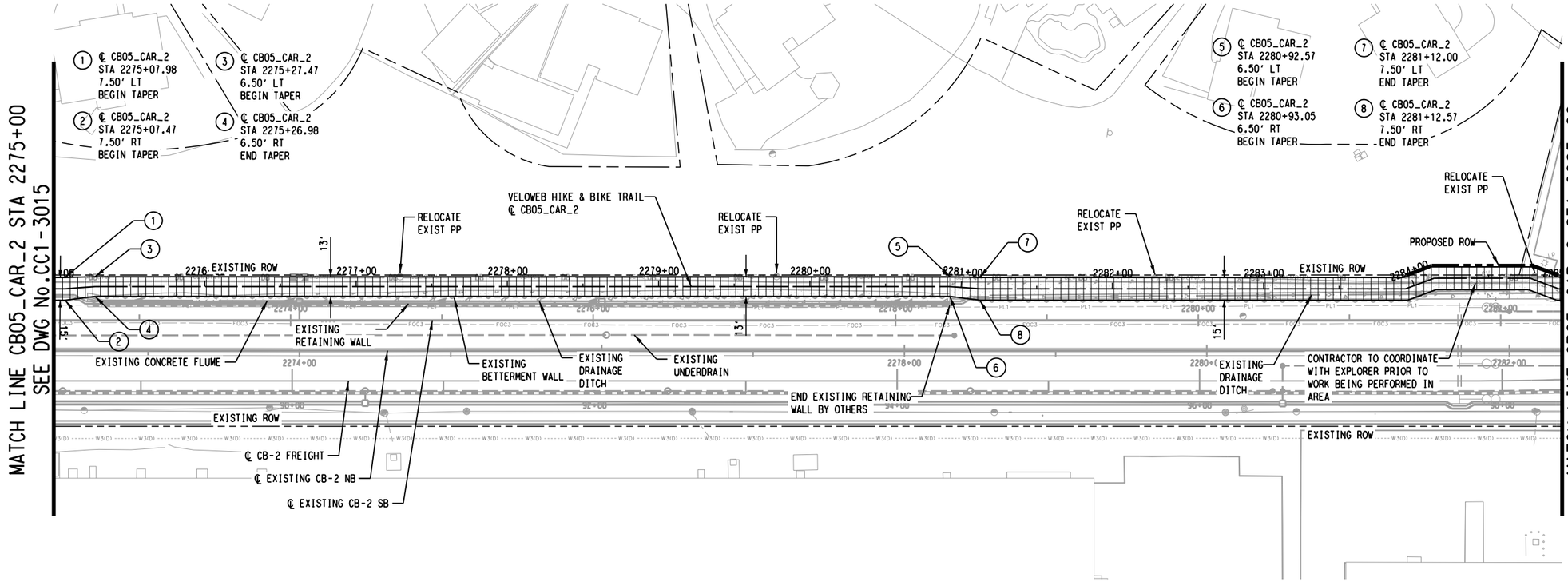
COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
CITY OF CARROLLTON
PLAN & PROFILE
STA 2265+00 TO STA 2275+00
SHEET 15 OF 19

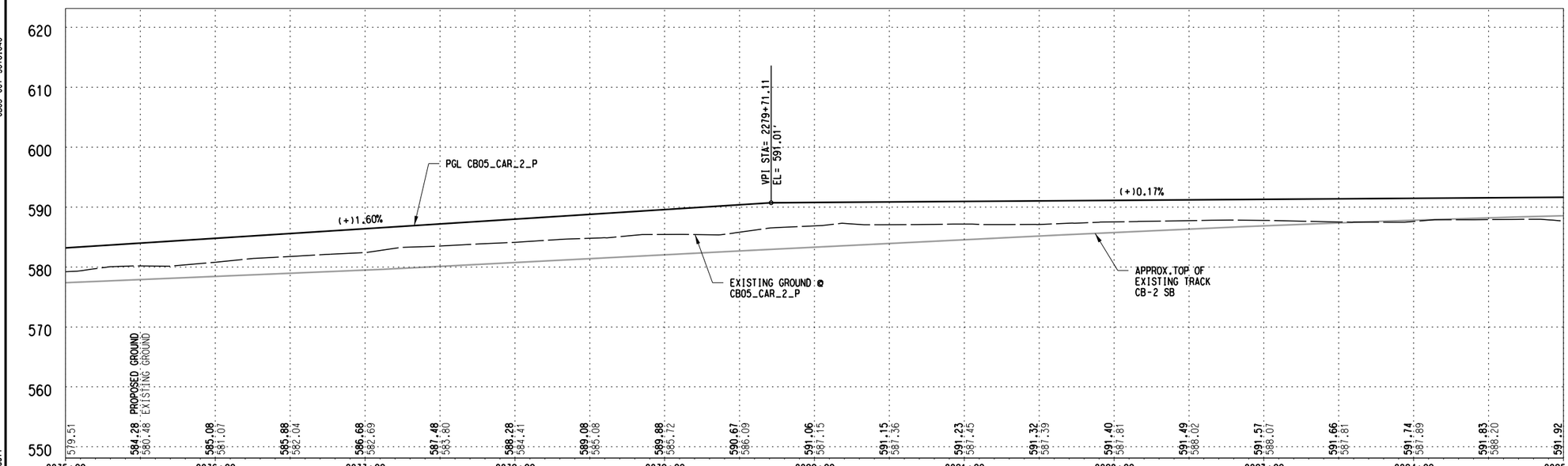
CONTRACT	DWG No.	REV
C-2033270-01	CC1-3015	D

CB05-CC1-3015.040

21-JUL-2023 15:08
CB05-CC1-3015.040
ssaleh
Default

DWG No. CC1-3016





SCALE (IN FEET) HORIZ 0 20 40 80
SCALE (IN FEET) VERT 0 5 10 15 20

LEGEND:
- TRAIL PAVEMENT
- TRAIL BRIDGE
- TRAIL BOARDWALK
- 1.50% TRAIL CROSS-SLOPE

NOTES:
1. PROPOSED ROW AND EASEMENTS ARE APPROXIMATE.
2. SEE SURVEY CONTROL SHEETS FOR BENCHMARK LOCATIONS.
3. SEE DRAINAGE PLAN AND PROFILE SHEETS FOR TRAIL DRAINAGE DESIGN.
4. SEE RETAINING WALL LAYOUT SHEETS FOR ADDITIONAL INFORMATION.
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6. SEE TYPICAL SECTION SHEETS FOR ADDITIONAL INFORMATION.
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WARNING!!! EXPLORER'S HIGH-PRESSURE PETROLEUM PRODUCTS PIPELINE

AT LEAST 48 HOURS BEFORE ANY CONSTRUCTION WITHIN 25 FEET OF EXPLORER'S PIPELINE, CONTACT EXPLORER PIPELINE AT (888) 876-0036

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FINAL 100% DESIGN

CONTRACT SHEET No. 80 OF 345

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

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12801 N Central Expressway, Suite 1250
Dallas, Texas 75243
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FIRM NO.F-819

ARCHER WESTERN HERZOG

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DART

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SCALE	1"=40'
DRAWN	S. SALEH
DESIGNED	S. SALEH
CHECKED	D. LUU
IN CHARGE	D. LUU
DATE	07 AUG 23

CAES

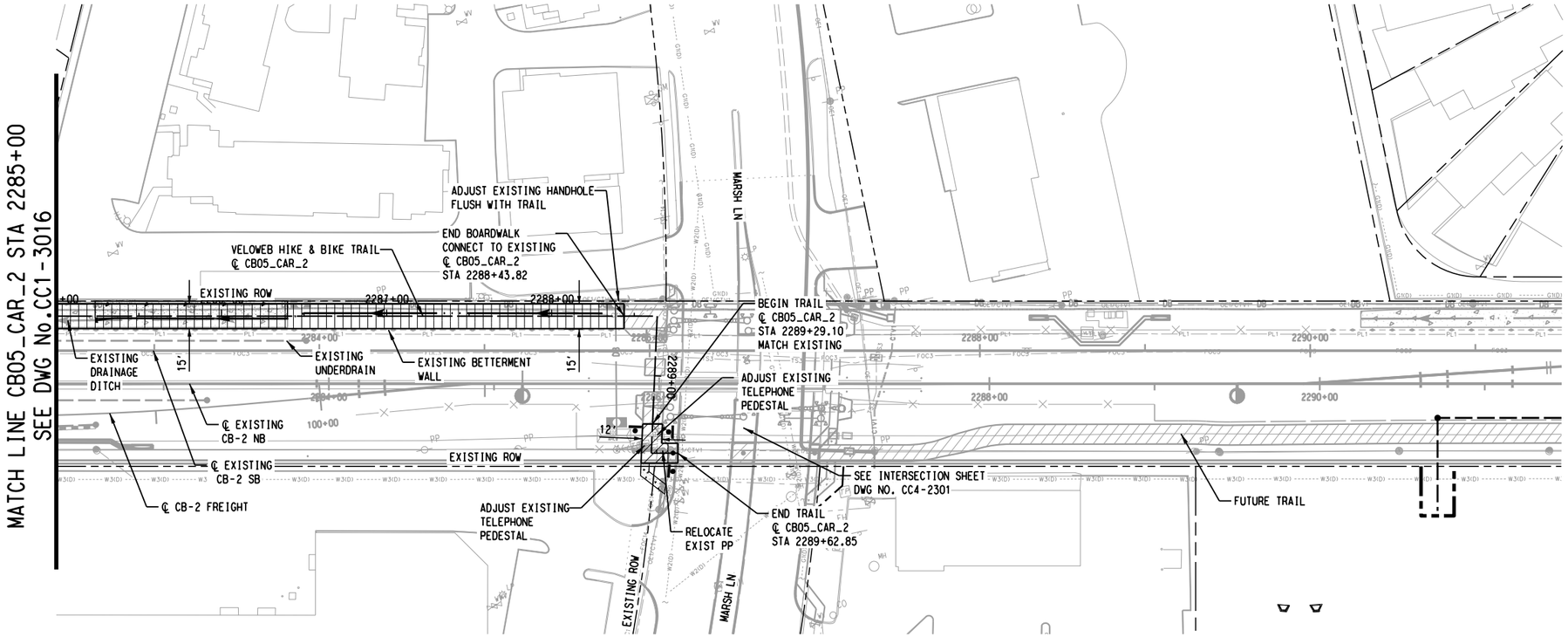
COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
CITY OF CARROLLTON
PLAN & PROFILE
STA 2275+00 TO STA 2285+00
SHEET 16 OF 19

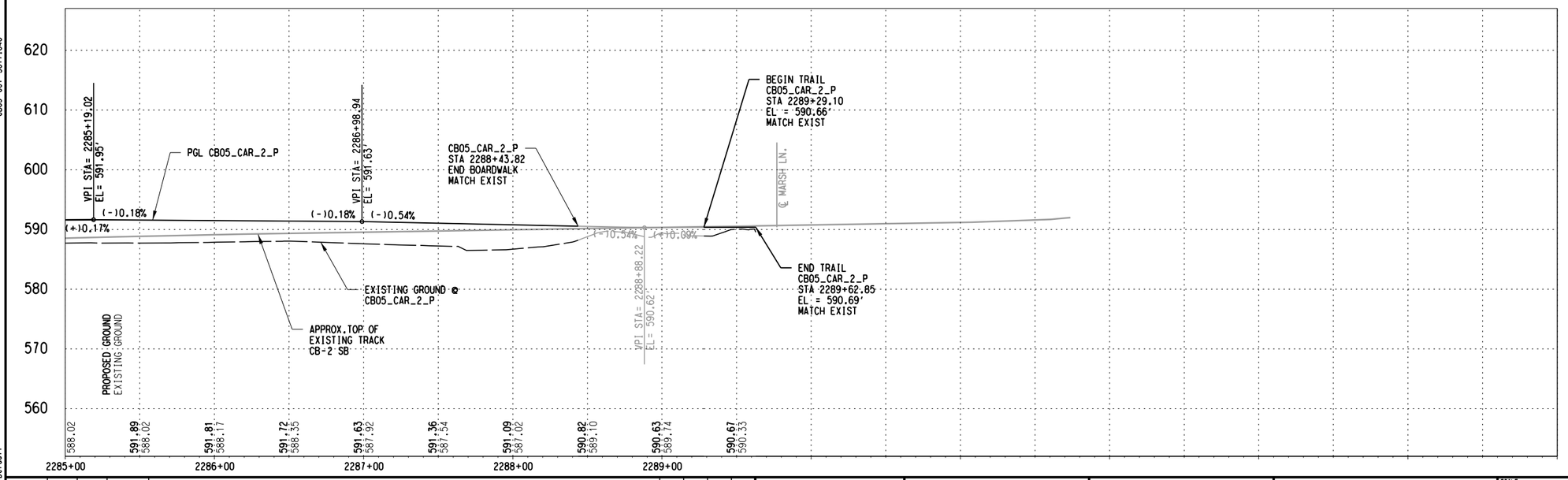
CONTRACT	DWG No.	REV
C-2033270-01	CC1-3016	D

CB05-CC1-3016.040

21-JUL-2023 15:08
CB05-CC1-3016.040
ssaleh
Default

DWG No. CC1-3017





SCALE (IN FEET)
HORIZ 0 20 40 80
SCALE (IN FEET)
VERT 0 5 10 15 20

LEGEND:
- TRAIL PAVEMENT
- TRAIL BRIDGE
- TRAIL BOARDWALK
- 1.50% → TRAIL CROSS-SLOPE

NOTES:
1. PROPOSED ROW AND EASEMENTS ARE APPROXIMATE.
2. SEE SURVEY CONTROL SHEETS FOR BENCHMARK LOCATIONS.
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WARNING!!! EXPLORER'S HIGH-PRESSURE PETROLEUM PRODUCTS PIPELINE

AT LEAST 48 HOURS BEFORE ANY CONSTRUCTION WITHIN 25 FEET OF EXPLORER'S PIPELINE, CONTACT EXPLORER PIPELINE AT (888) 876-0036

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FINAL 100% DESIGN

CONTRACT SHEET No. 81 OF 345

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

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Phone: +1 (214) 638-0145
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12801 N Central Expressway, Suite 1250
Dallas, Texas 75243
(214) 739-3152 Fax (214) 739-3169
FIRM NO.F-819

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DART PROJECT

DART®

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CAES

SCALE	1"=40'
DRAWN	S. SALEH
DESIGNED	S. SALEH
CHECKED	D. LUU
IN CHARGE	D. LUU
DATE	07 AUG 23

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
CITY OF CARROLLTON
PLAN & PROFILE
STA 2285+00 TO STA 2289+62.85
SHEET 17 OF 19

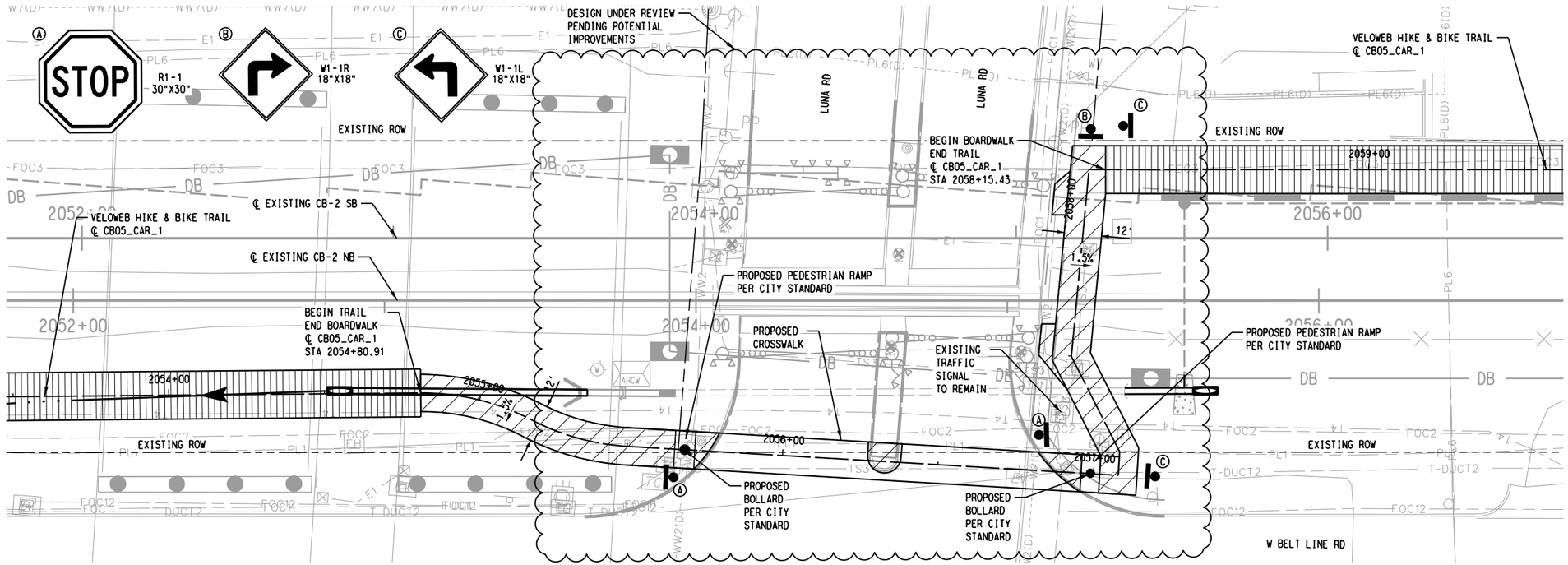
CONTRACT	DWG No.	REV
C-2033270-01	CC1-3017	D

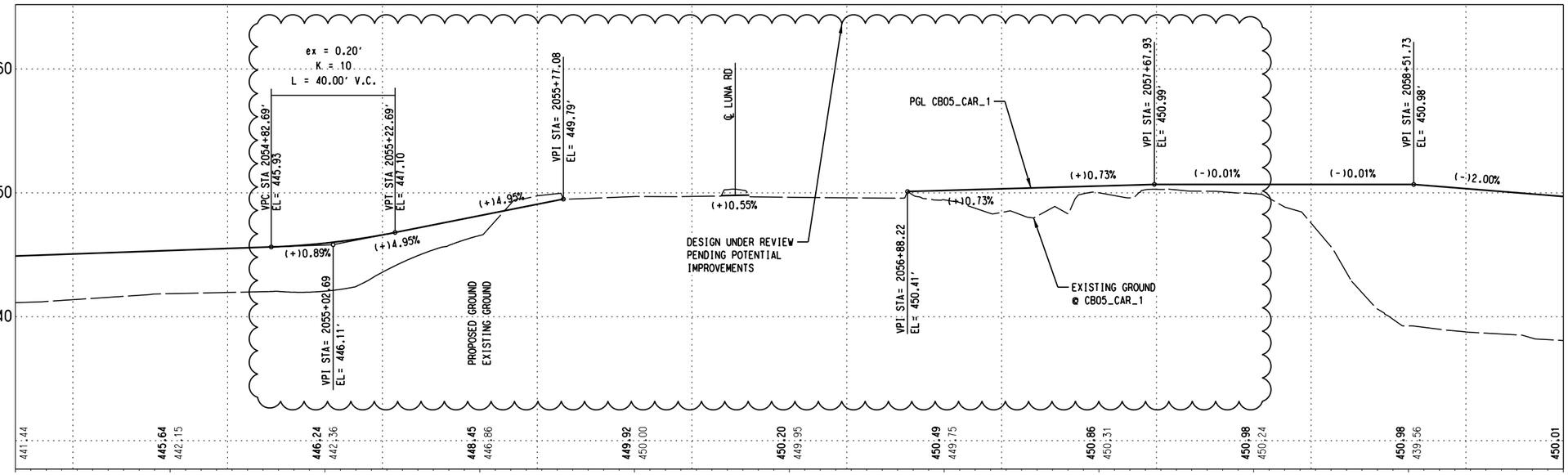
21-JUL-2023 16:09
CB05-CC1-3017.040

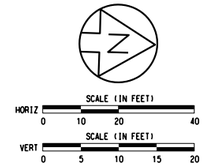
cmcdorman
Default

CB05-CC1-3017.040

DWG No. CC4-2141







LEGEND:

- TRAIL PAVEMENT
- 1.50% TRAIL CROSS-SLOPE
- SIDEWALK PAVEMENT
- TRAIL BOARDWALK

NOTES:

1. PROPOSED ROW AND EASEMENTS ARE APPROXIMATE.
2. SEE SURVEY CONTROL SHEETS FOR BENCHMARK LOCATIONS.
3. SEE DRAINAGE PLAN AND PROFILE SHEETS FOR TRAIL DRAINAGE DESIGN.
4. SEE RETAINING WALL LAYOUT SHEETS FOR ADDITIONAL INFORMATION.
5. SEE BRIDGE LAYOUT SHEETS FOR ADDITIONAL PEDESTRIAN BRIDGE INFORMATION.
6. SEE TYPICAL SECTION SHEETS FOR ADDITIONAL INFORMATION.
7. SIGN PLACEMENT SHALL BE AS PER CHAPTER 9 OF THE TMUTCD
8. PROPOSED BOLLARD LOCATION TO BE DETERMINED AND INSTALLED BY CITY

NOT AN APPROVED DRAWING
FINAL 100% DESIGN

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

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ARS ENGINEERS, INC.
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Dallas, Texas 75243
(214) 739-3152 Fax (214) 739-3169
FIRM NO.F-819

ARCHER WESTERN HERZOG

DART PROJECT

DART

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CAES

SCALE	1"=40'
DRAWN	S. SALEH
DESIGNED	S. SALEH
CHECKED	D. LUU
IN CHARGE	D. LUU
DATE	07 AUG 23

CONTRACT SHEET No. 82 OF 345

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
CITY OF CARROLLTON
PLAN & PROFILE
LUNA RD INTERSECTION
SHEET 18 OF 19

CONTRACT	DWG No.	REV
C-2033270-01	CC4-2141	D

21-JUL-2023 15:31
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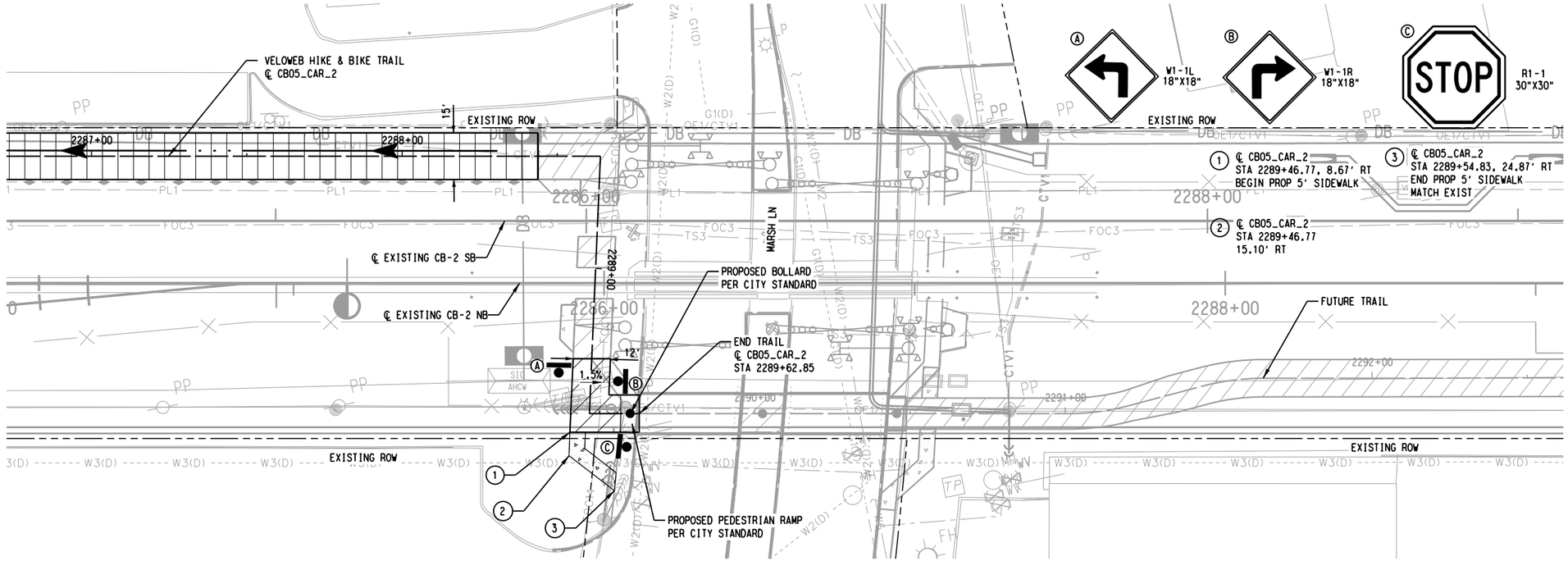
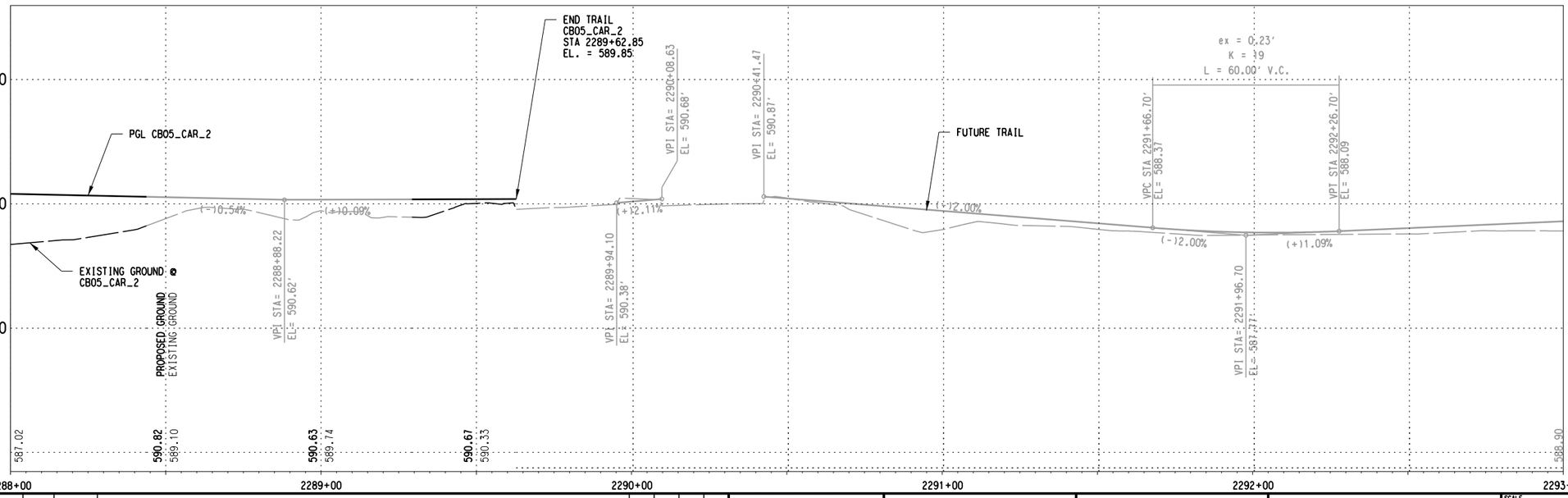
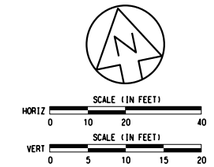
ssaleh
Default

CB05-CC4-2141.0

DWG No. CC4-2301







LEGEND:

- TRAIL PAVEMENT
- 1.50% → TRAIL CROSS-SLOPE
- SIDEWALK PAVEMENT
- TRAIL BOARDWALK

NOTES:

1. PROPOSED ROW AND EASEMENTS ARE APPROXIMATE.
2. SEE SURVEY CONTROL SHEETS FOR BENCHMARK LOCATIONS.
3. SEE DRAINAGE PLAN AND PROFILE SHEETS FOR TRAIL DRAINAGE DESIGN.
4. SEE RETAINING WALL LAYOUT SHEETS FOR ADDITIONAL INFORMATION.
5. SEE BRIDGE LAYOUT SHEETS FOR ADDITIONAL PEDESTRIAN BRIDGE INFORMATION.
6. SEE TYPICAL SECTION SHEETS FOR ADDITIONAL INFORMATION.
7. SIGN PLACEMENT SHALL BE AS PER CHAPTER 9 OF THE TMUTCD
8. PROPOSED BOLLARD LOCATION TO BE DETERMINED AND INSTALLED BY CITY

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REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

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CONTRACT SHEET No. 83 OF 345

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
CITY OF CARROLLTON
PLAN & PROFILE
MARSH LANE INTERSECTION
SHEET 19 OF 19

CONTRACT	DWG No.	REV
C-2033270-01	CC4-2301	D

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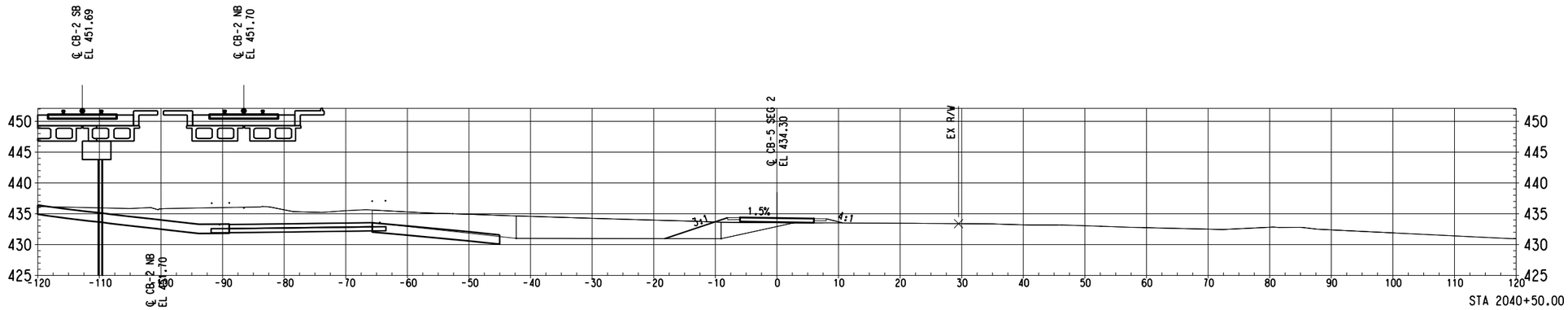
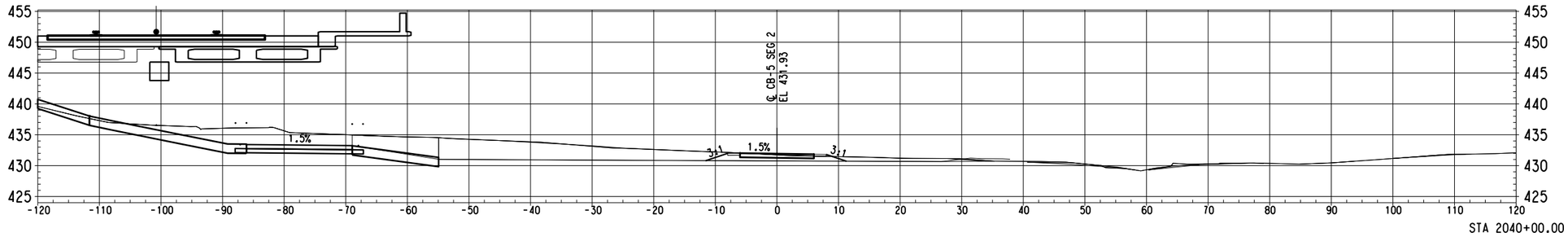
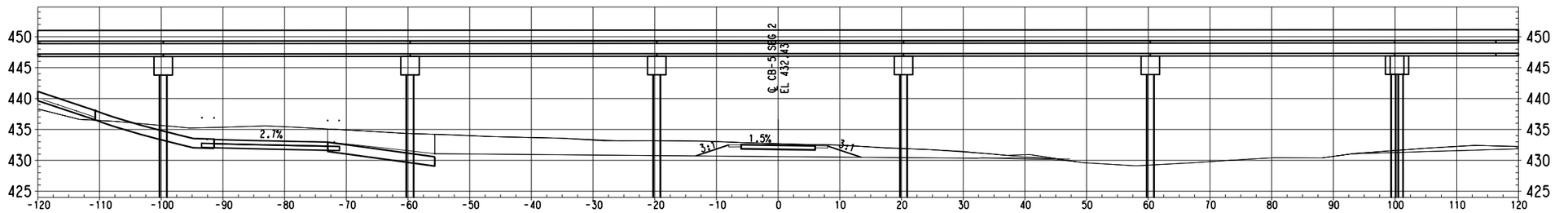
ssaleh
Default

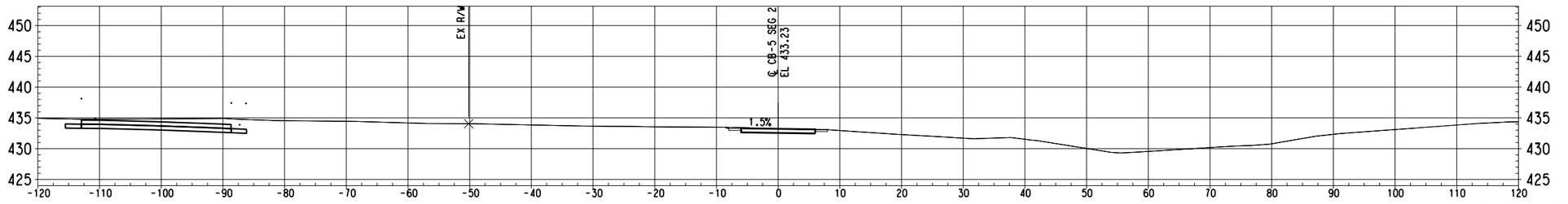
CB05-CC4-2301.0

DWG No. CC1-6520









NOTE:
SEE PLAN AND PROFILE SHEETS FOR FENCE AND RIP RAP LOCATIONS AND LIMITS

SCALE (IN FEET)
HORIZ 0 5 10 20
SCALE (IN FEET)
VERT 0 5 10 20

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DATE	07 AUG 23

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CONTRACT SHEET No. 84 OF 345

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

CITY OF CARROLLTON
CROSS SECTIONS
SHEET 1 OF 80

CONTRACT	DWG No.	REV
C-2033270-01	CC1-6520	D

CB05-CC1-6520.000

2-AUG-2023 12:00
CB05-CC1-6520.000

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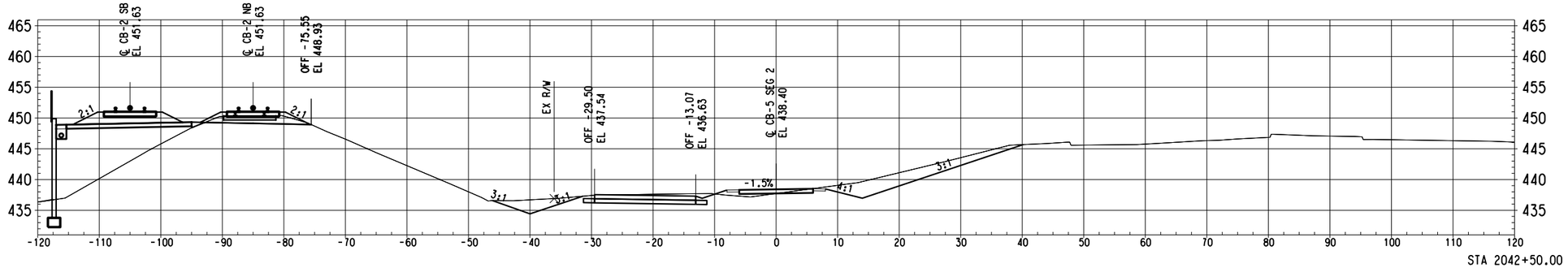
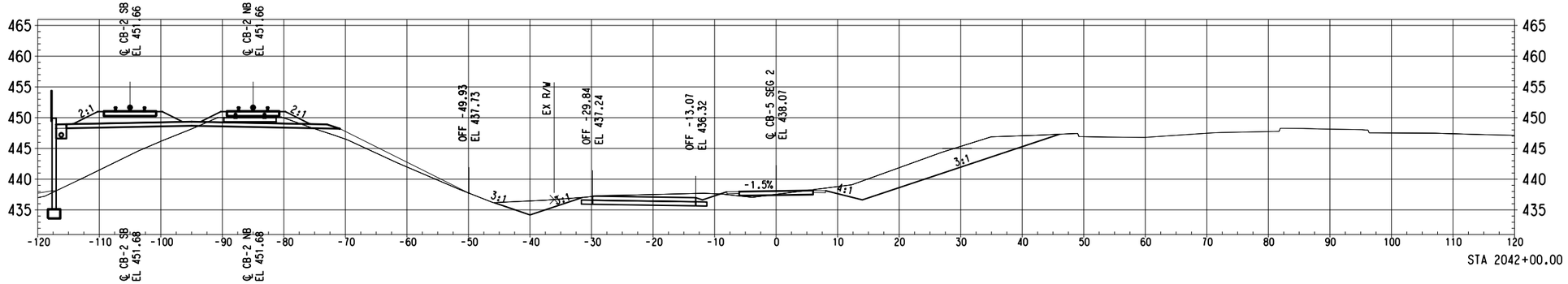
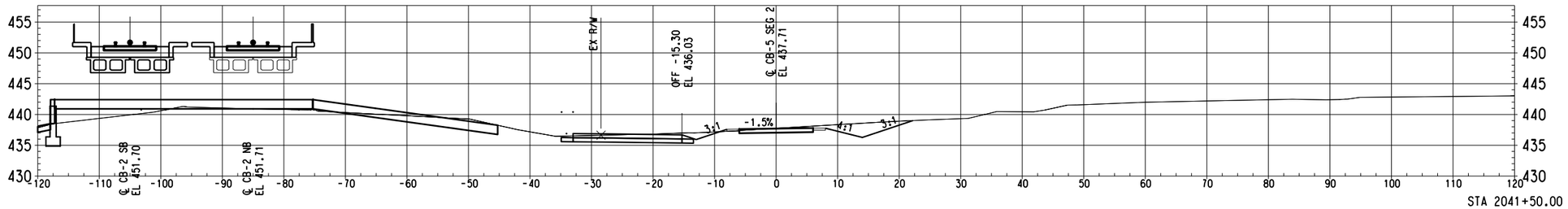
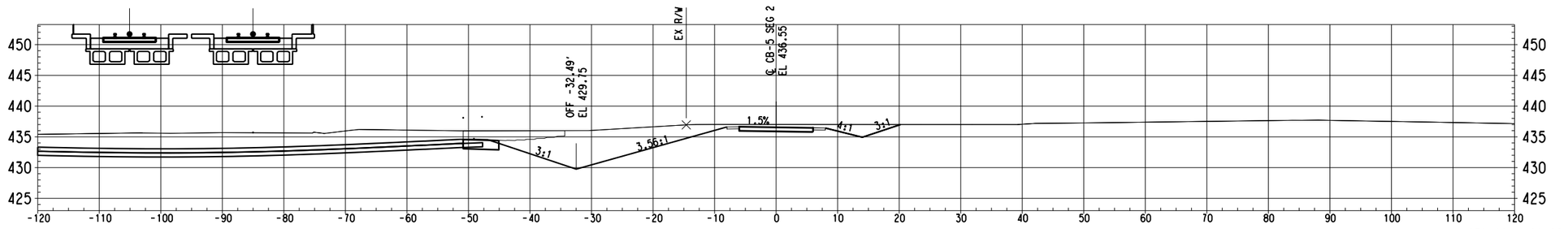
201 - 2039+24.50 - Copy-1

DWG No. CC1-6521









NOTE:
SEE PLAN AND PROFILE SHEETS FOR FENCE AND RIP RAP LOCATIONS AND LIMITS

HORIZ SCALE (IN FEET) 0 5 10 20

VERT SCALE (IN FEET) 0 5 10 20

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REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

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IN CHARGE	D. LUU
DATE	07 AUG 23

CONTRACT SHEET No. 85 OF 345

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

CITY OF CARROLLTON
CROSS SECTIONS
SHEET 2 OF 80

CONTRACT	DWG No.	REV
C-2033270-01	CC1-6521	D

CB05-CC1-6521.000

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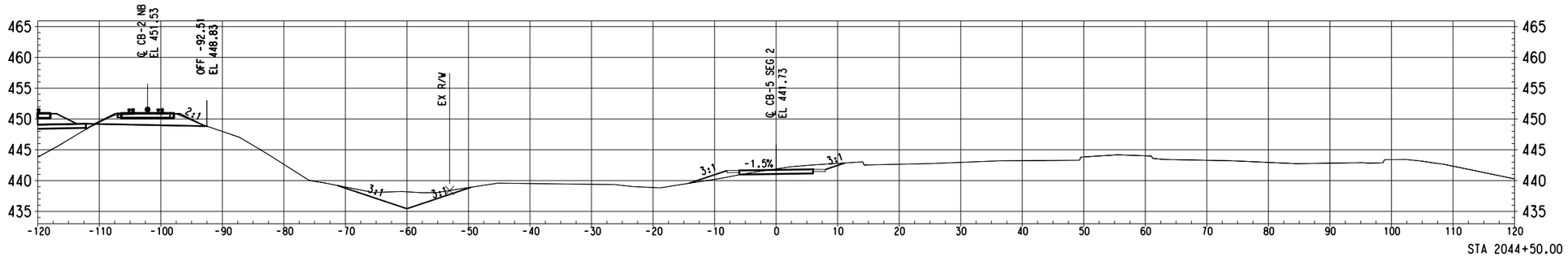
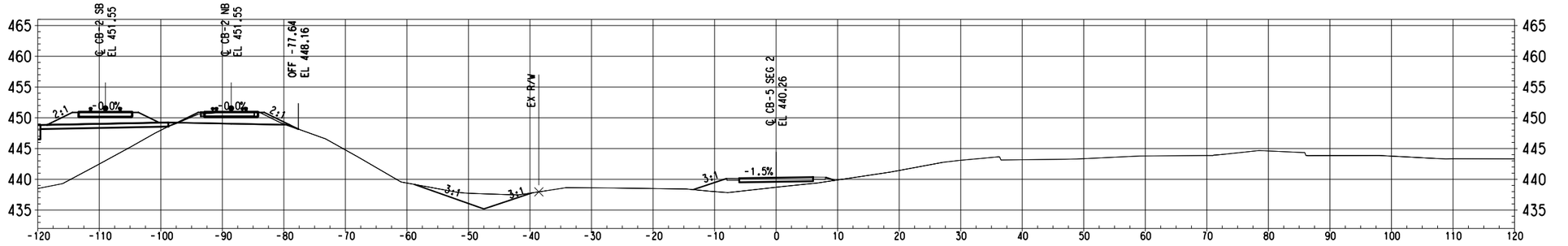
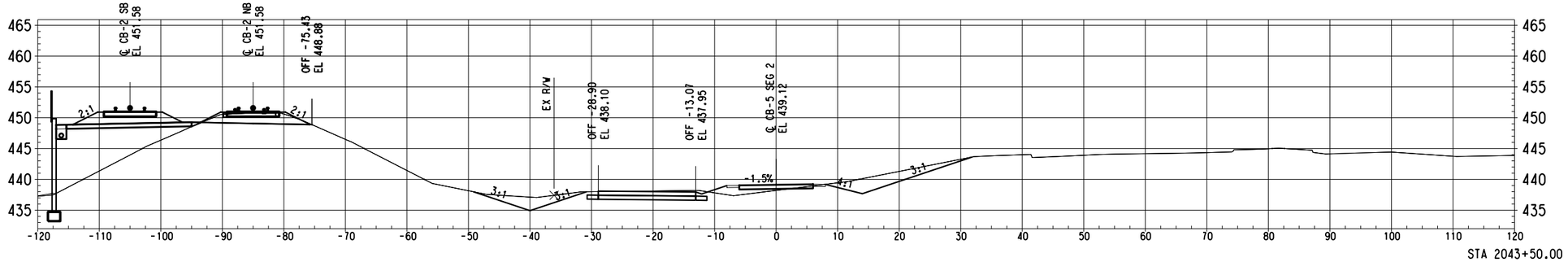
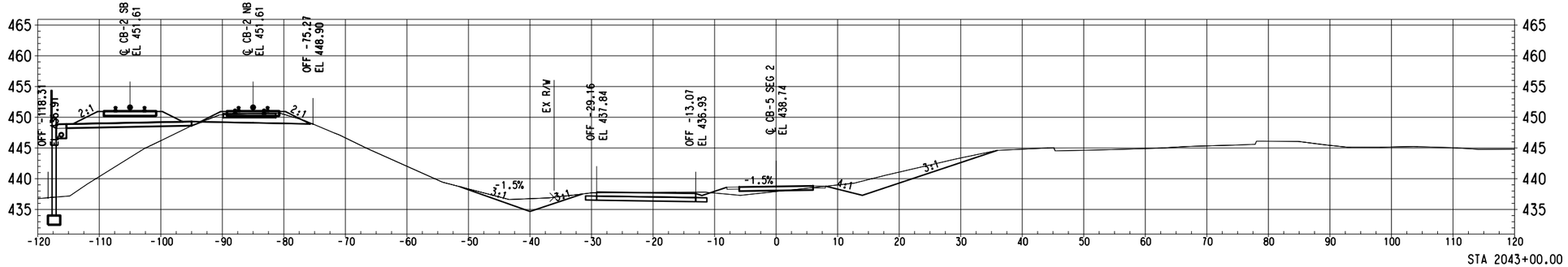
DWG No. CC1-6522









NOTE:
SEE PLAN AND PROFILE SHEETS FOR FENCE AND RIP RAP LOCATIONS AND LIMITS

HORIZ SCALE (IN FEET) 0 5 10 20

VERT SCALE (IN FEET) 0 5 10 20

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CHECKED	D. LUU
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DATE	07 AUG 23

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CONTRACT SHEET No. 86 OF 345

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

CITY OF CARROLLTON
CROSS SECTIONS
SHEET 3 OF 80

CONTRACT	DWG No.	REV
C-2033270-01	CC1-6522	D

CB05-CC1-6522.000

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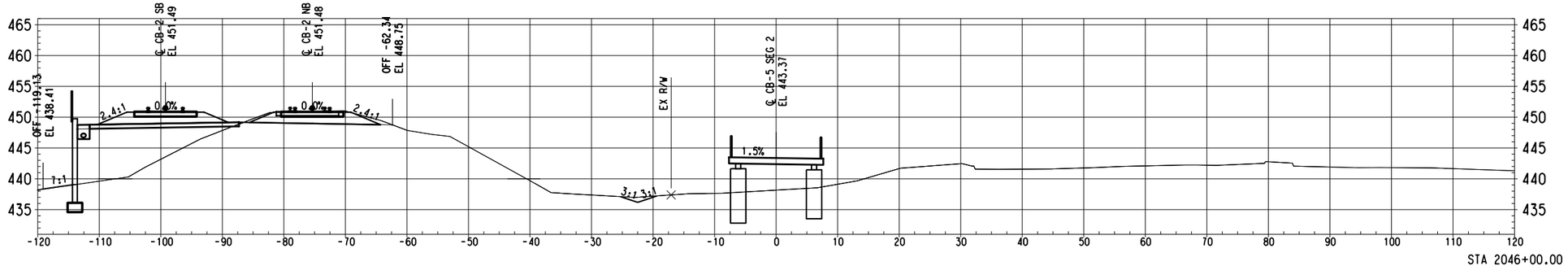
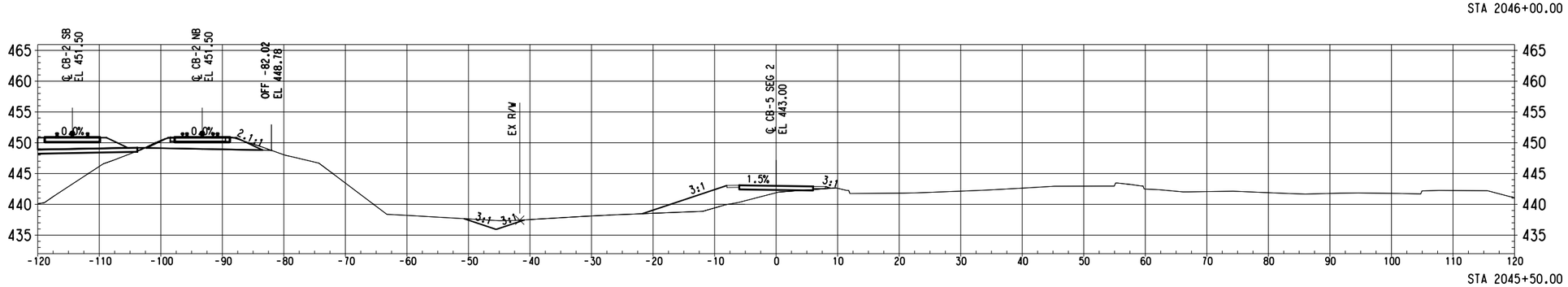
DWG No. CC1-6523

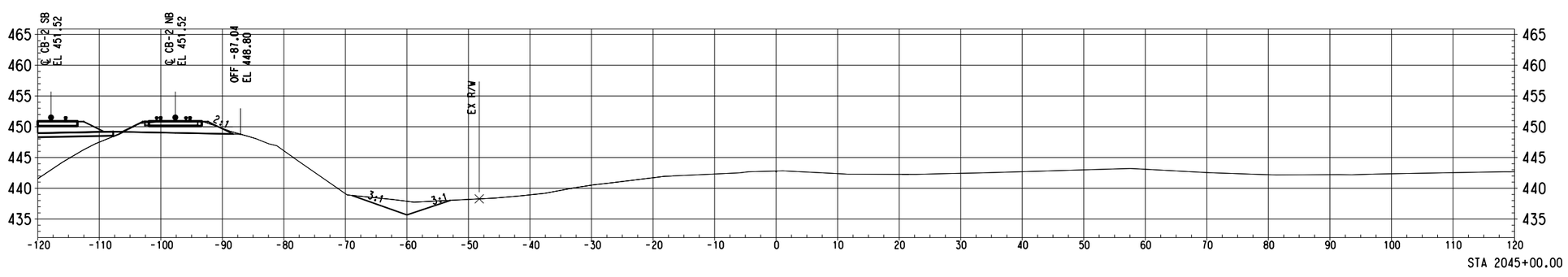
NOTE:
SEE PLAN AND PROFILE SHEETS FOR FENCE
AND RIP RAP LOCATIONS AND LIMITS

HORIZ SCALE (IN FEET) 0 5 10 20

VERT SCALE (IN FEET) 0 5 10 20







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DESIGNED	S. SALEH
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DATE	07 AUG 23

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COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

CITY OF CARROLLTON
CROSS SECTIONS
SHEET 4 OF 80

CONTRACT	DWG No.	REV
C-2033270-01	CC1-6523	D

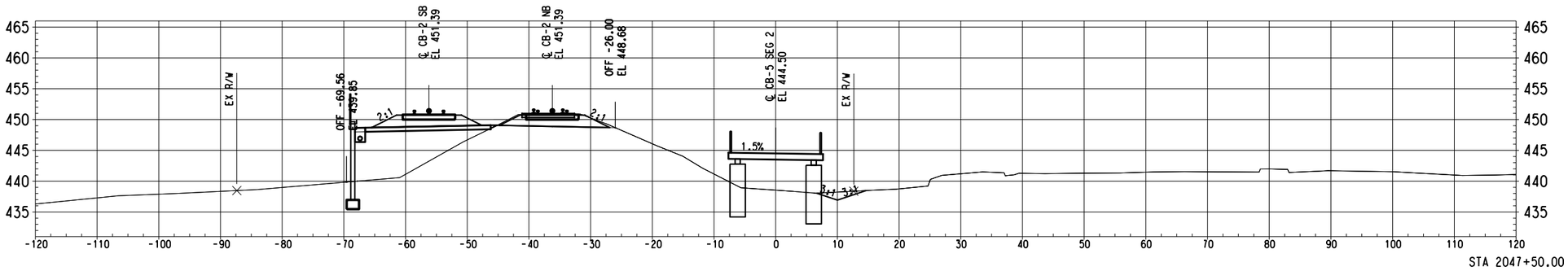
CB05-CC1-6523.000

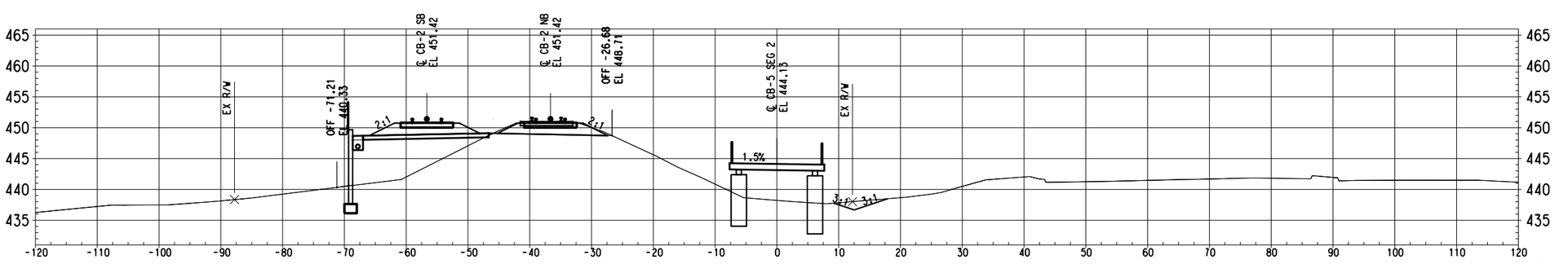
DWG No. CC1-6524

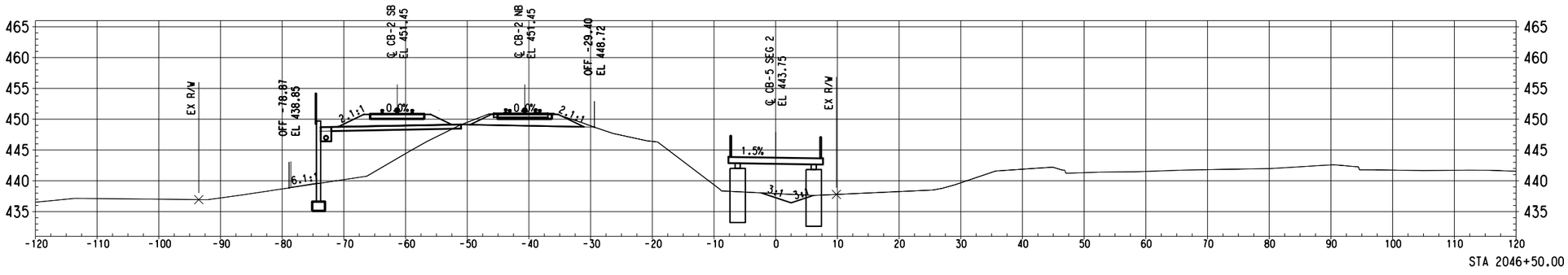
NOTE:
SEE PLAN AND PROFILE SHEETS FOR FENCE AND RIP RAP LOCATIONS AND LIMITS

HORIZ SCALE (IN FEET) 0 5 10 20

VERT SCALE (IN FEET) 0 5 10 20







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CONTRACT SHEET No. 88 OF 345

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

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DESIGNED	S. SALEH
CHECKED	D. LUU
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DATE	07 AUG 23

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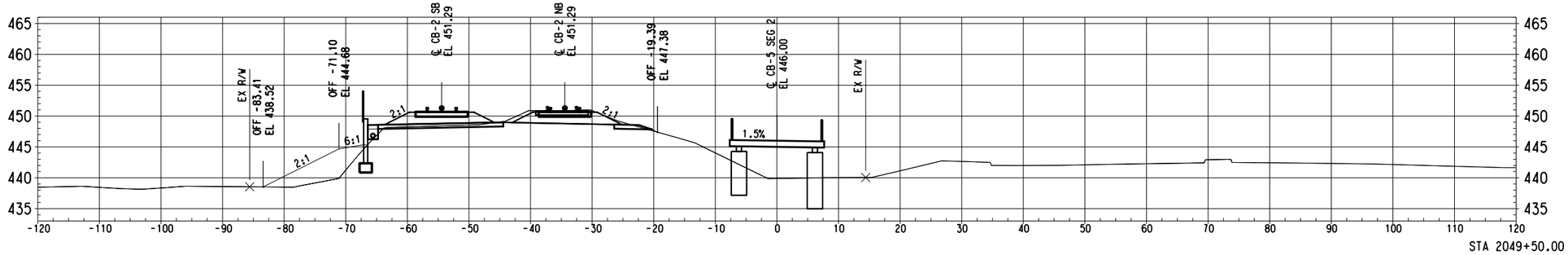
COTTON BELT REGIONAL RAIL VELOWEB HIKE & BIKE TRAIL

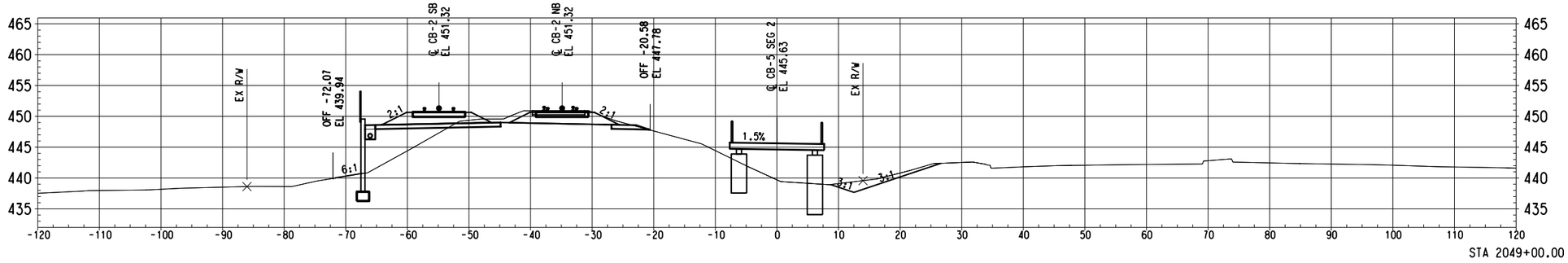
CITY OF CARROLLTON CROSS SECTIONS SHEET 5 OF 80

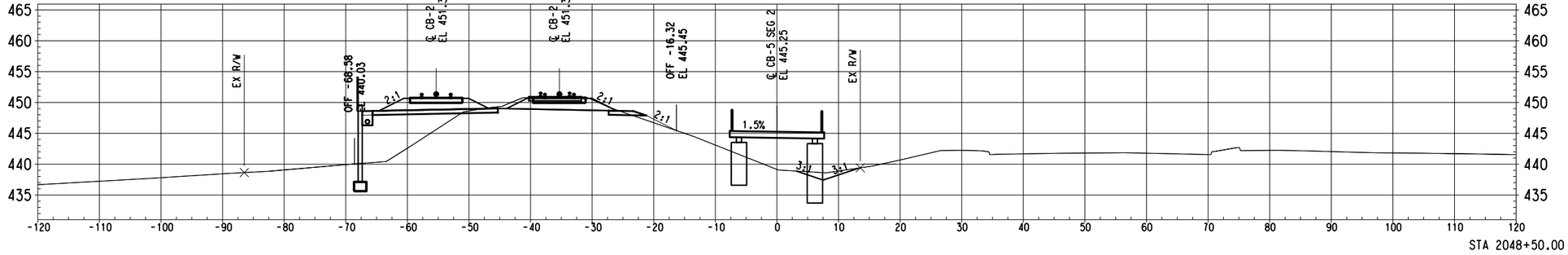
CONTRACT	DWG No.	REV
C-2033270-01	CC1-6524	D

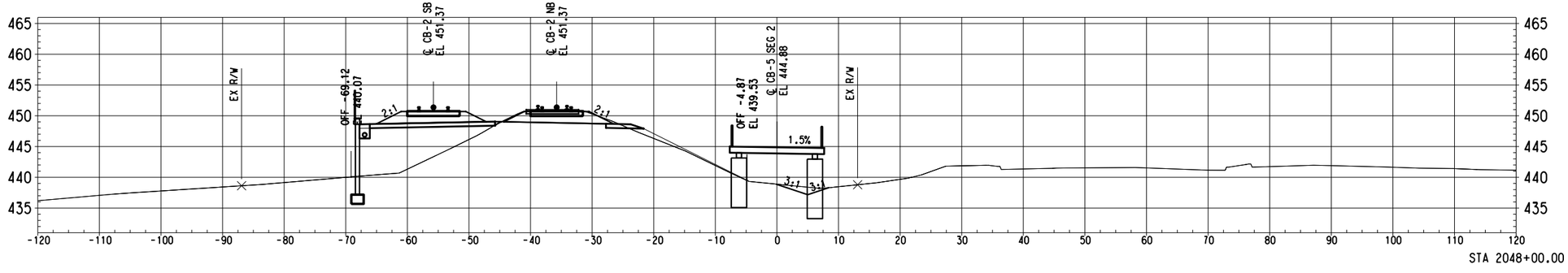
CB05-CC1-6524.000

DWG No. CC1-6525









NOTE:
SEE PLAN AND PROFILE SHEETS FOR FENCE AND RIP RAP LOCATIONS AND LIMITS

HORIZ SCALE (IN FEET) 0 5 10 20

VERT SCALE (IN FEET) 0 5 10 20

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CONTRACT SHEET No. 89 OF 345

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

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DRAWN	S. SALEH
DESIGNED	S. SALEH
CHECKED	D. LUU
IN CHARGE	D. LUU
DATE	07 AUG 23

CAES

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

CITY OF CARROLLTON
CROSS SECTIONS
SHEET 6 OF 80

CONTRACT	DWG No.	REV
C-2033270-01	CC1-6525	D

CB05-CC1-6525.000

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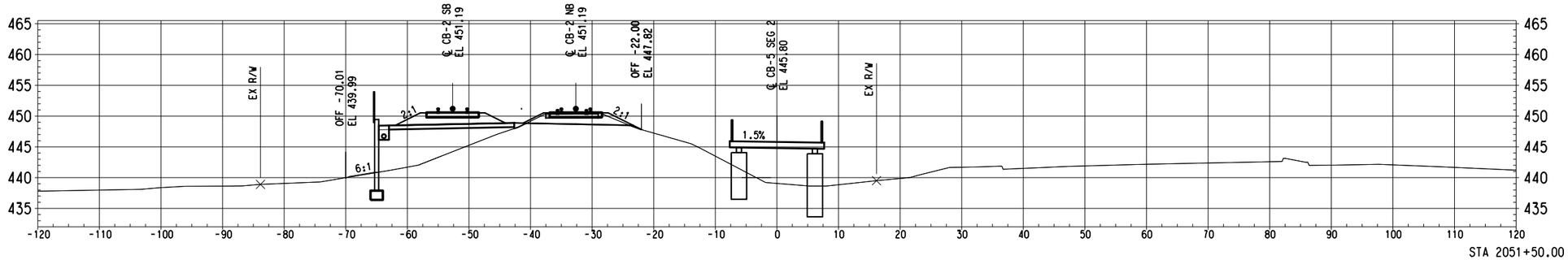
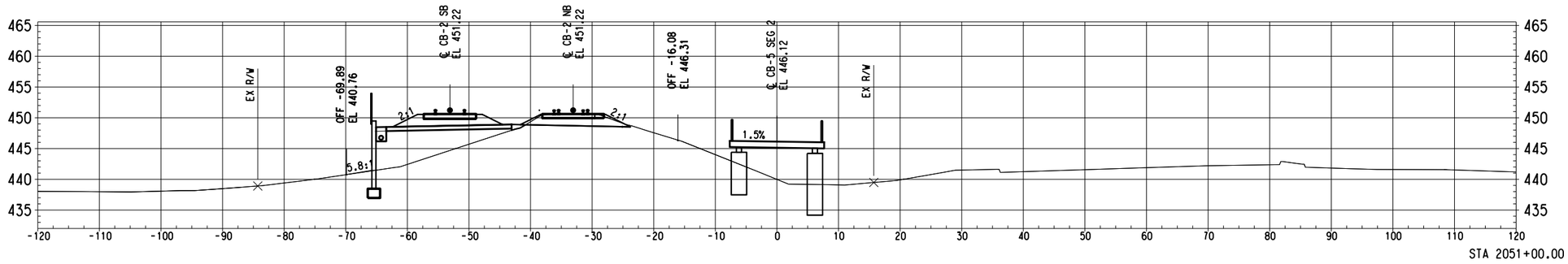
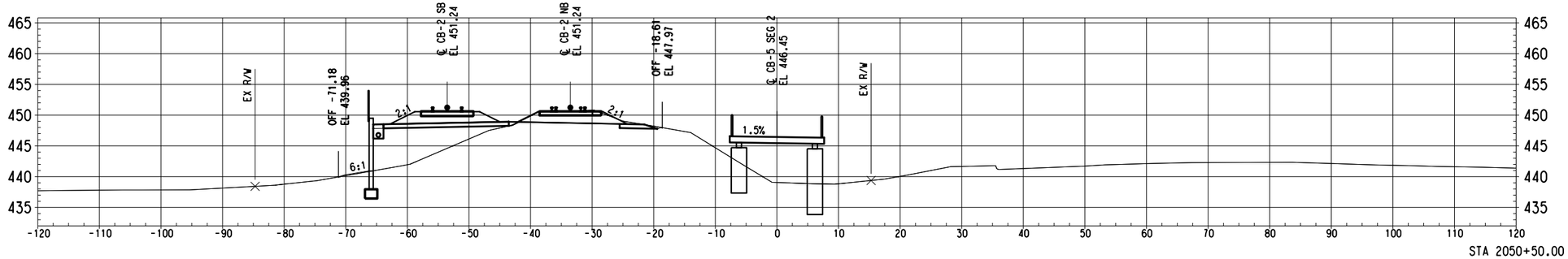
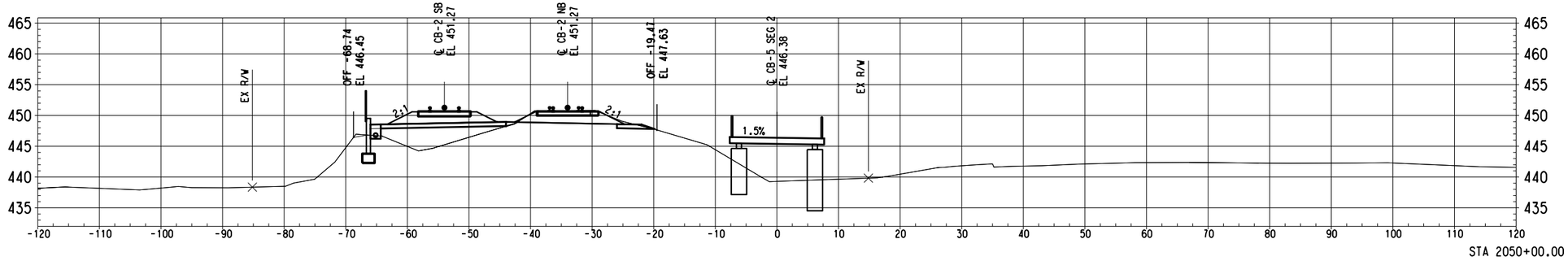
DWG No. CC1-6526









NOTE:
SEE PLAN AND PROFILE SHEETS FOR FENCE AND RIP RAP LOCATIONS AND LIMITS

HORIZ SCALE (IN FEET) 0 5 10 20

VERT SCALE (IN FEET) 0 5 10 20

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CONTRACT SHEET No. 90 OF 345

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

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DESIGNED	S. SALEH
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COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

CITY OF CARROLLTON
CROSS SECTIONS
SHEET 7 OF 80

CONTRACT	DWG No.	REV
C-2033270-01	CC1-6526	D

CB05-CC1-6526.000

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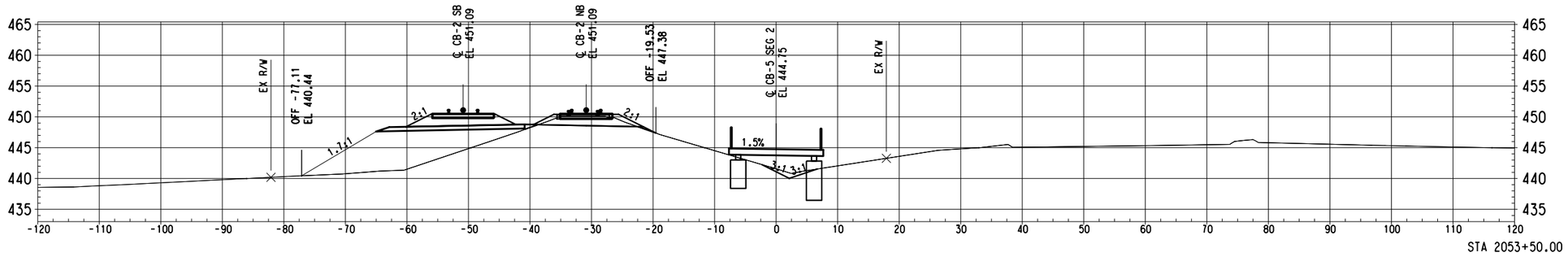
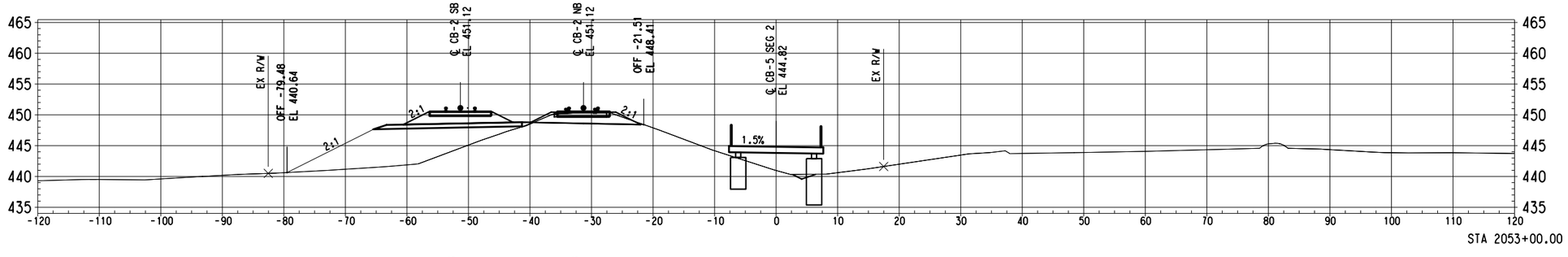
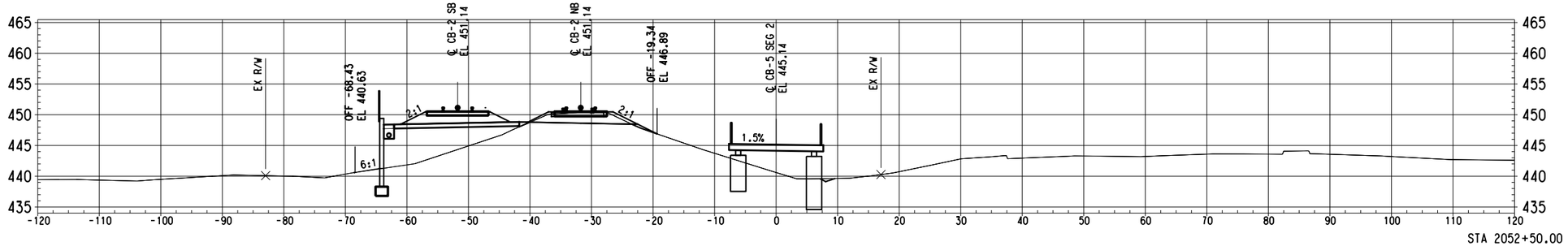
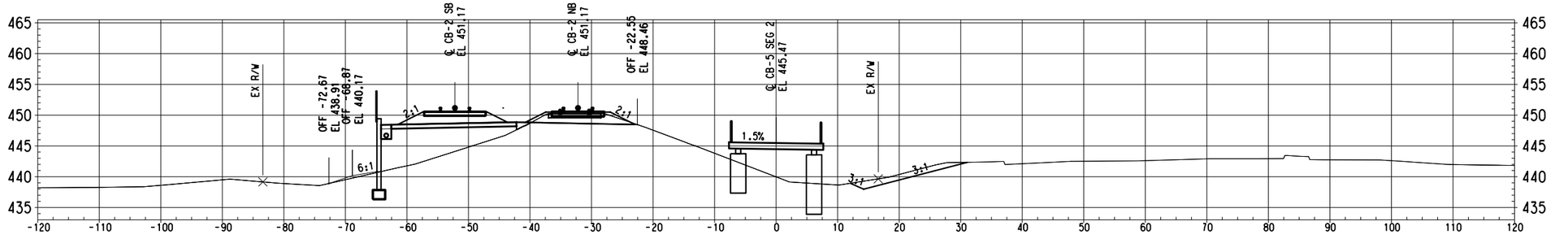
DWG No. CC1-6527









NOTE:
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CONTRACT SHEET No. 91 OF 345

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

CITY OF CARROLLTON
CROSS SECTIONS
SHEET 8 OF 80

CONTRACT	DWG No.	REV
C-2033270-01	CC1-6527	D

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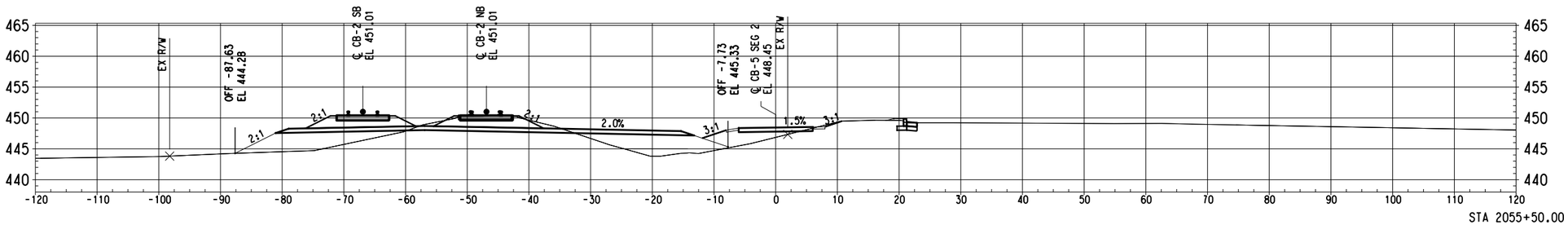
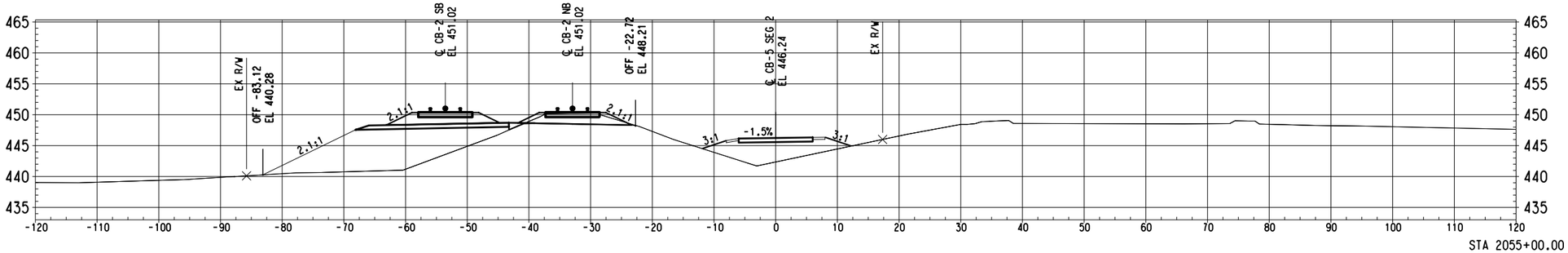
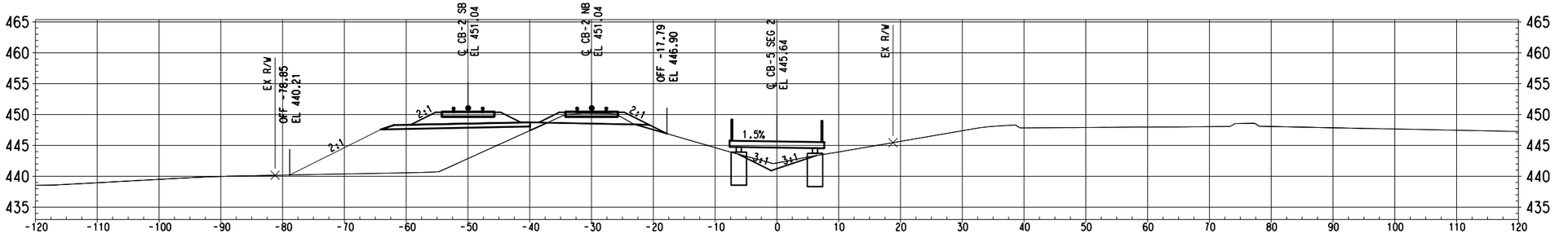
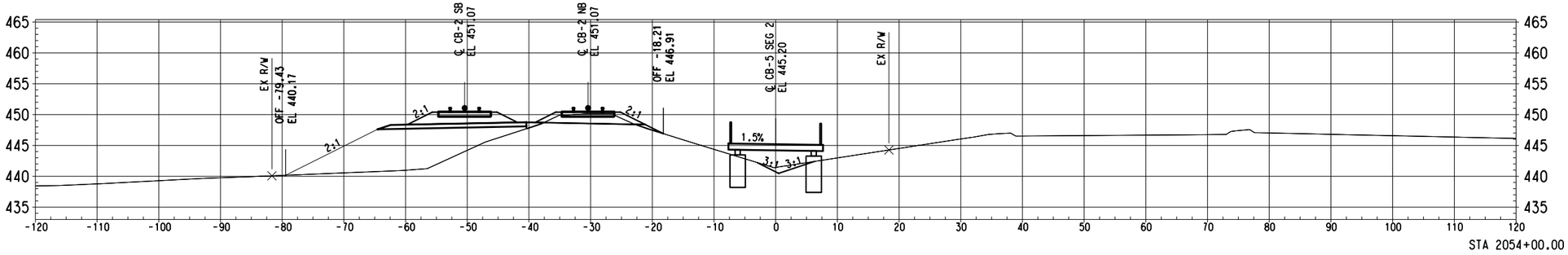
DWG No. CC1-6528









NOTE:
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HORIZ SCALE (IN FEET) 0 5 10 20

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CONTRACT SHEET No. 92 OF 345

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

CITY OF CARROLLTON
CROSS SECTIONS
SHEET 9 OF 80

CONTRACT	DWG No.	REV
C-2033270-01	CC1-6528	D

CB05-CC1-6528.000

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NOTE:
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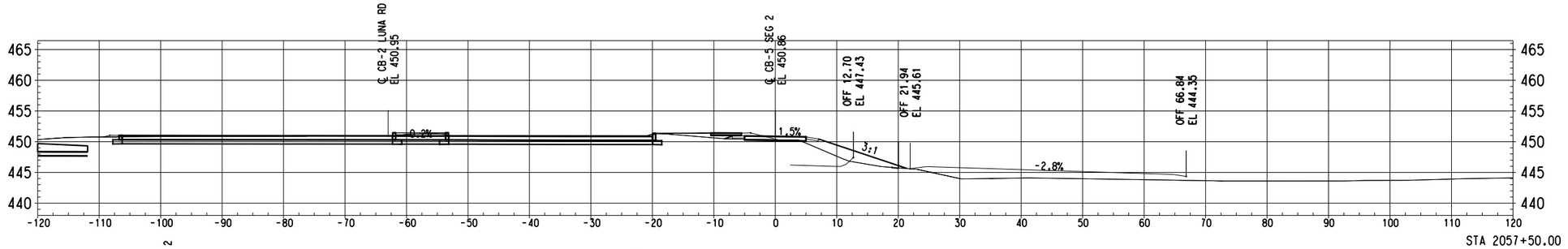
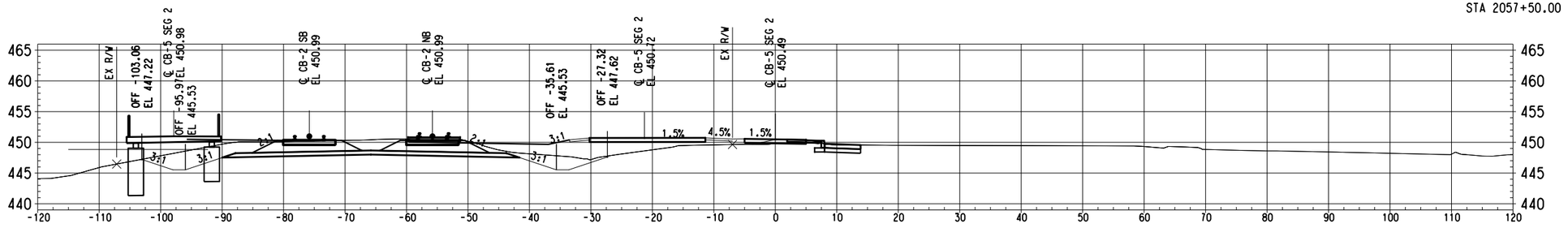
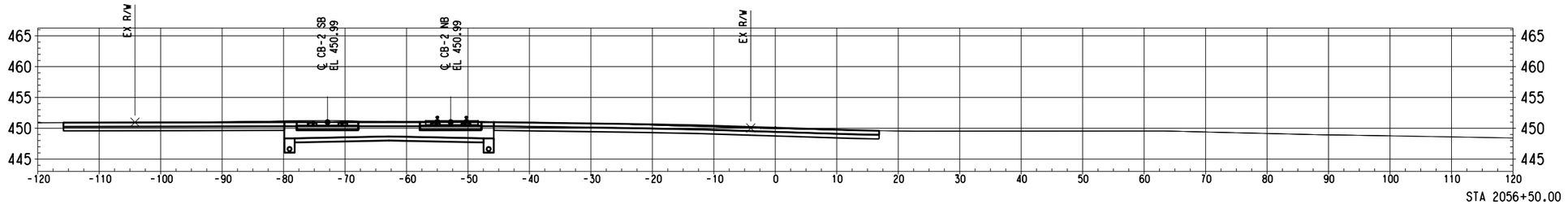
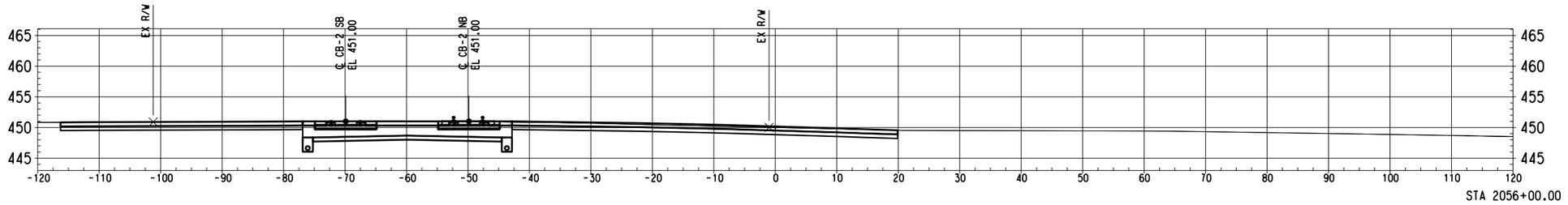
VERT SCALE (IN FEET) 0 5 10 20









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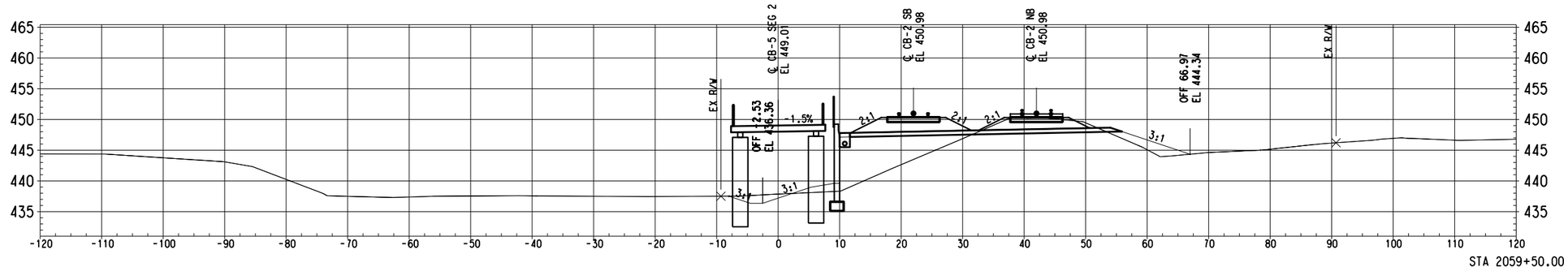
COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

CITY OF CARROLLTON
CROSS SECTIONS
SHEET 10 OF 80

CONTRACT	DWG No.	REV
C-2033270-01	CC1-6529	D

CB05-CC1-6529.000

DWG No. CC1-6530



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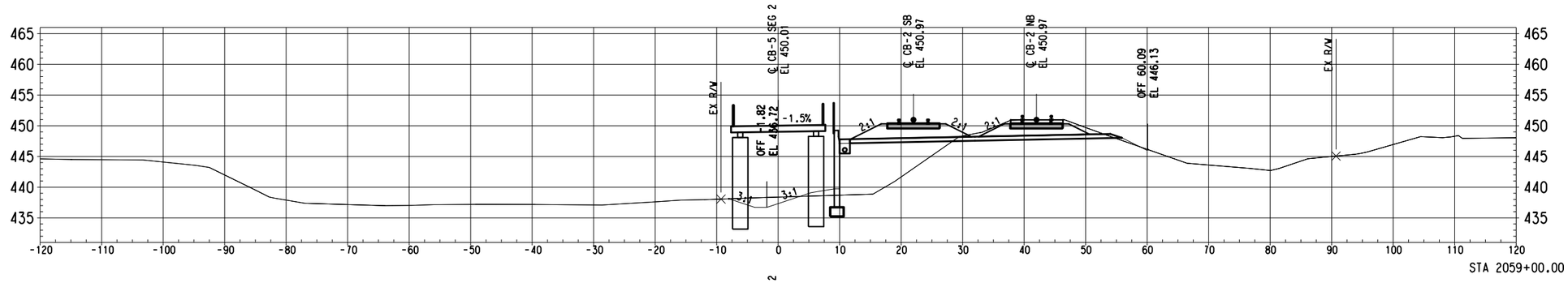

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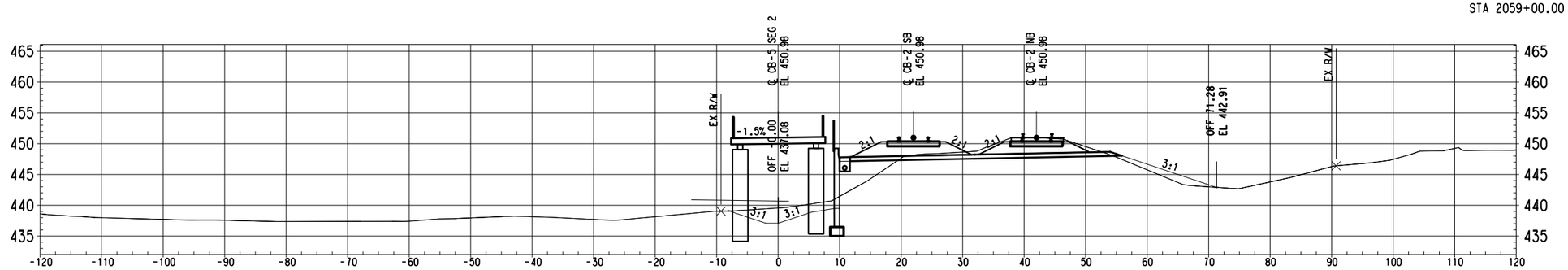

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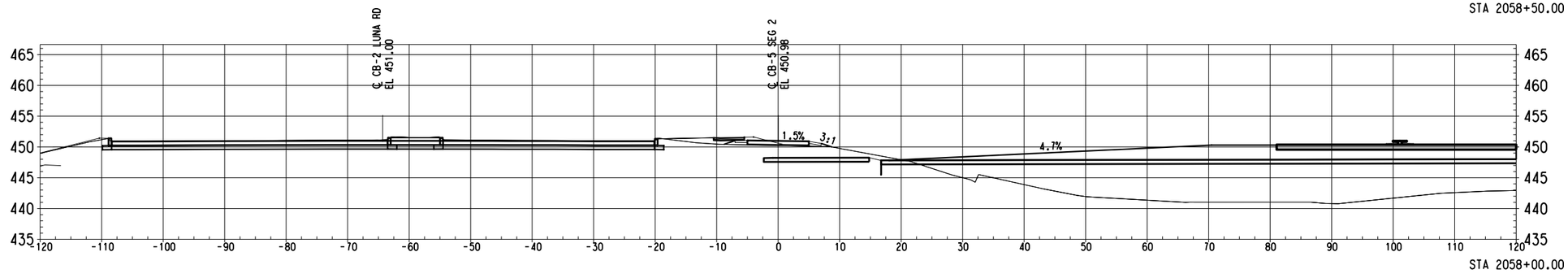

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NOTE:
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HORIZ SCALE (IN FEET) 0 5 10 20

VERT SCALE (IN FEET) 0 5 10 20

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CONTRACT SHEET No. 94 OF 345

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

CITY OF CARROLLTON
CROSS SECTIONS
SHEET 11 OF 80

CONTRACT	DWG No.	REV
C-2033270-01	CC1-6530	D

CB05-CC1-6530.000

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DWG No. CC1-6531

NOTE:
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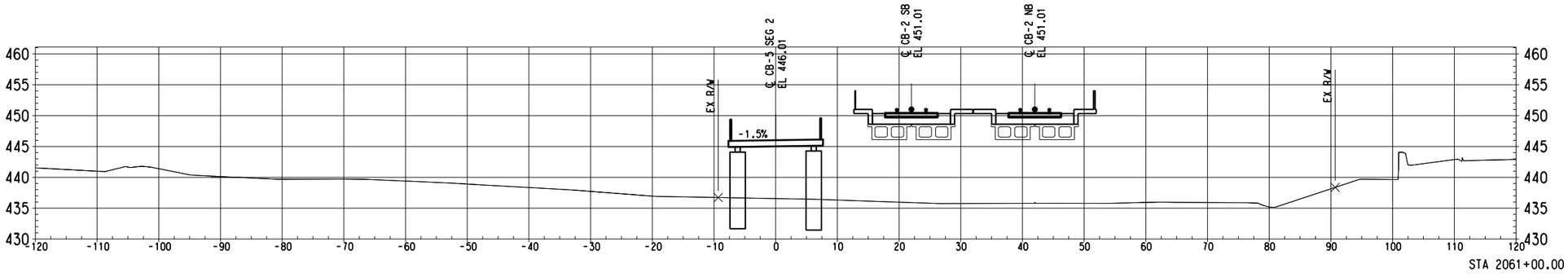
VERT SCALE (IN FEET) 0 5 10 20



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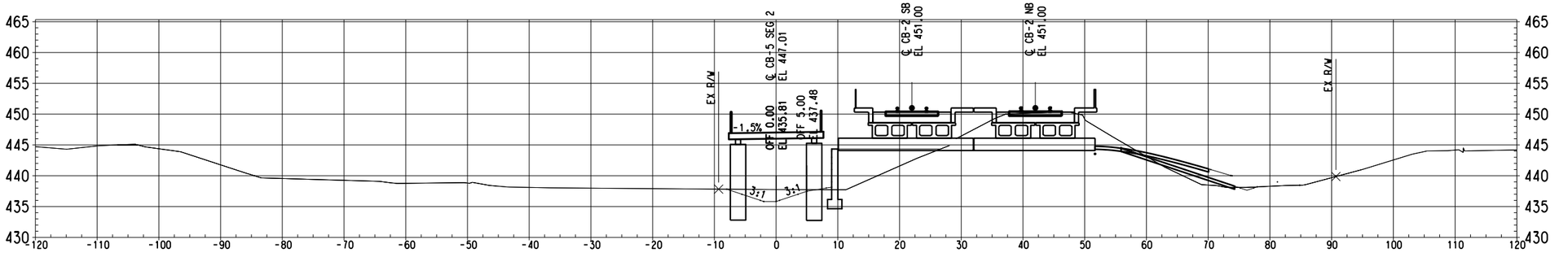

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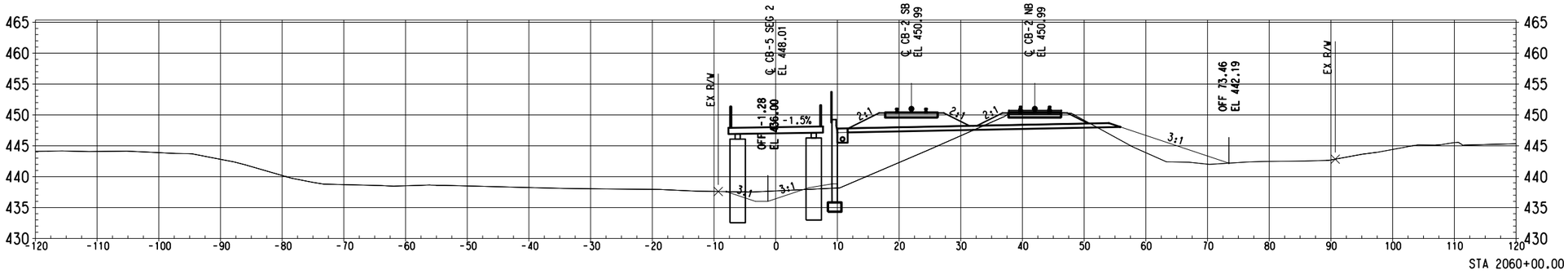

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VELOWEB HIKE & BIKE TRAIL

CITY OF CARROLLTON
CROSS SECTIONS
SHEET 12 OF 80

CONTRACT	DWG No.	REV
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NOTE:
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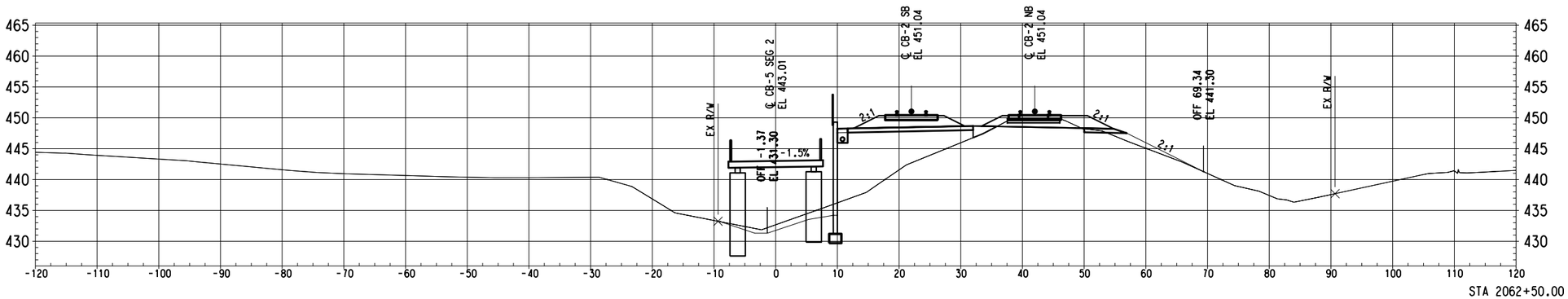
HORIZ SCALE (IN FEET) 0 5 10 20

VERT SCALE (IN FEET) 0 5 10 20



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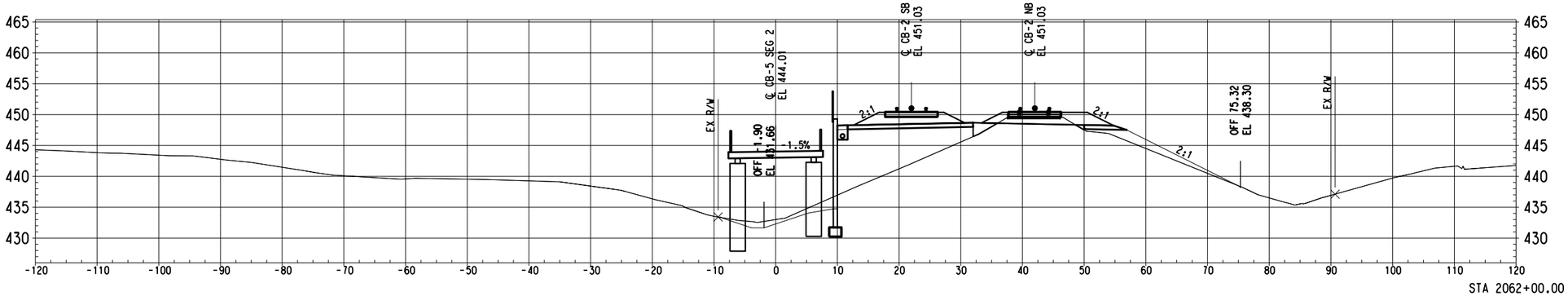

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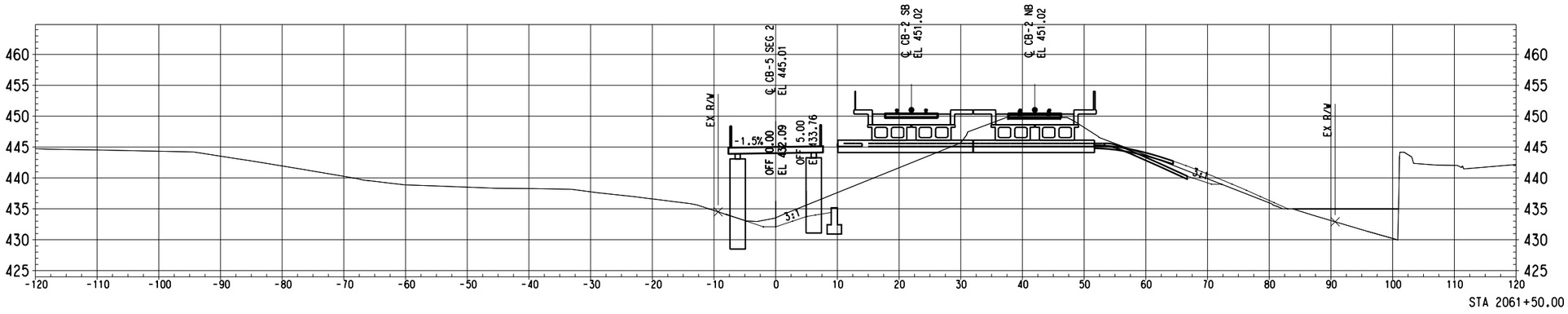

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CONTRACT SHEET No. 96 OF 345

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

CITY OF CARROLLTON
CROSS SECTIONS
SHEET 13 OF 80

CONTRACT	DWG No.	REV
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DWG No. CC1-6533

NOTE:
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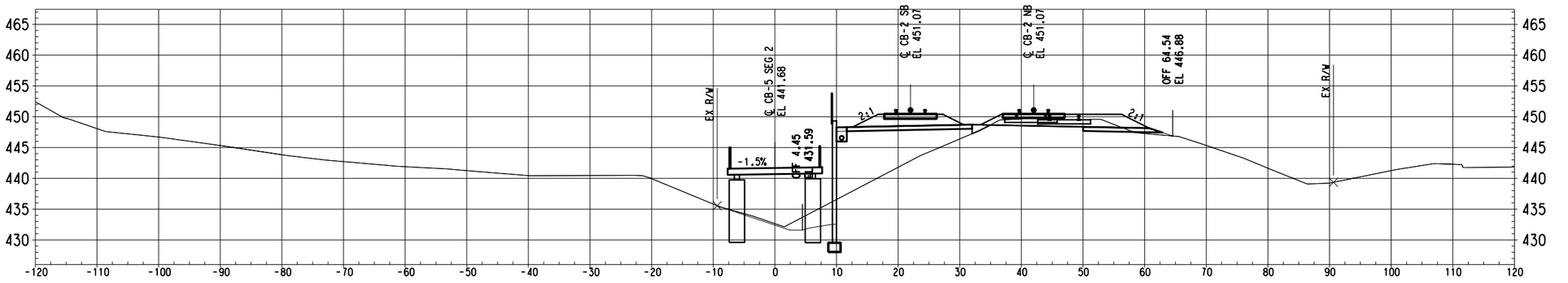
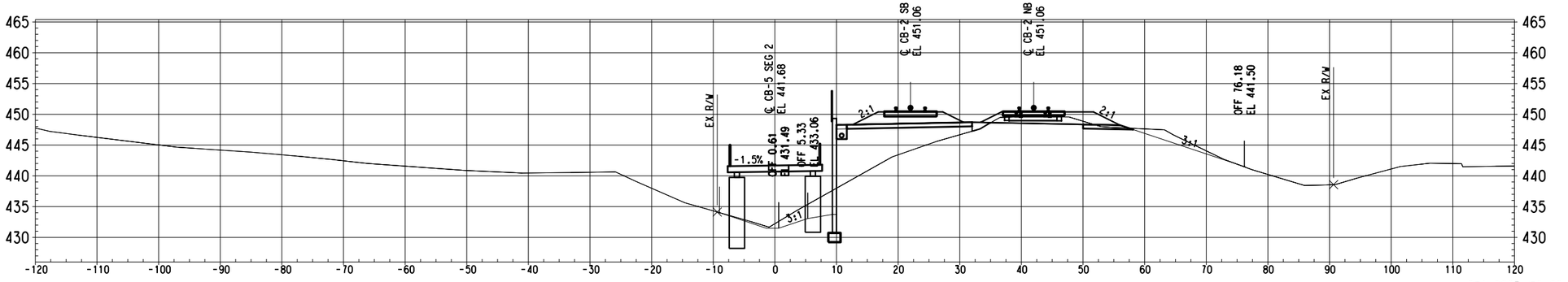
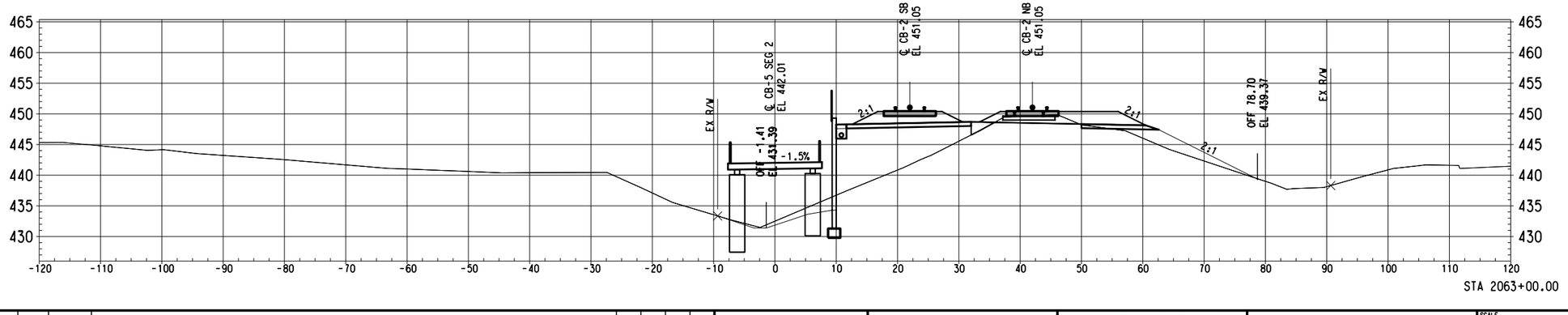
HORIZ SCALE (IN FEET) 0 5 10 20

VERT SCALE (IN FEET) 0 5 10 20







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DESIGNED	S. SALEH
CHECKED	D. LUU
IN CHARGE	D. LUU
DATE	07 AUG 23

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CONTRACT SHEET No. 97 OF 345

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

CITY OF CARROLLTON
CROSS SECTIONS
SHEET 14 OF 80

CONTRACT	DWG No.	REV
C-2033270-01	CC1-6533	D

CB05-CC1-6533.000

DWG No. CC1-6534

NOTE:
SEE PLAN AND PROFILE SHEETS FOR FENCE AND RIP RAP LOCATIONS AND LIMITS

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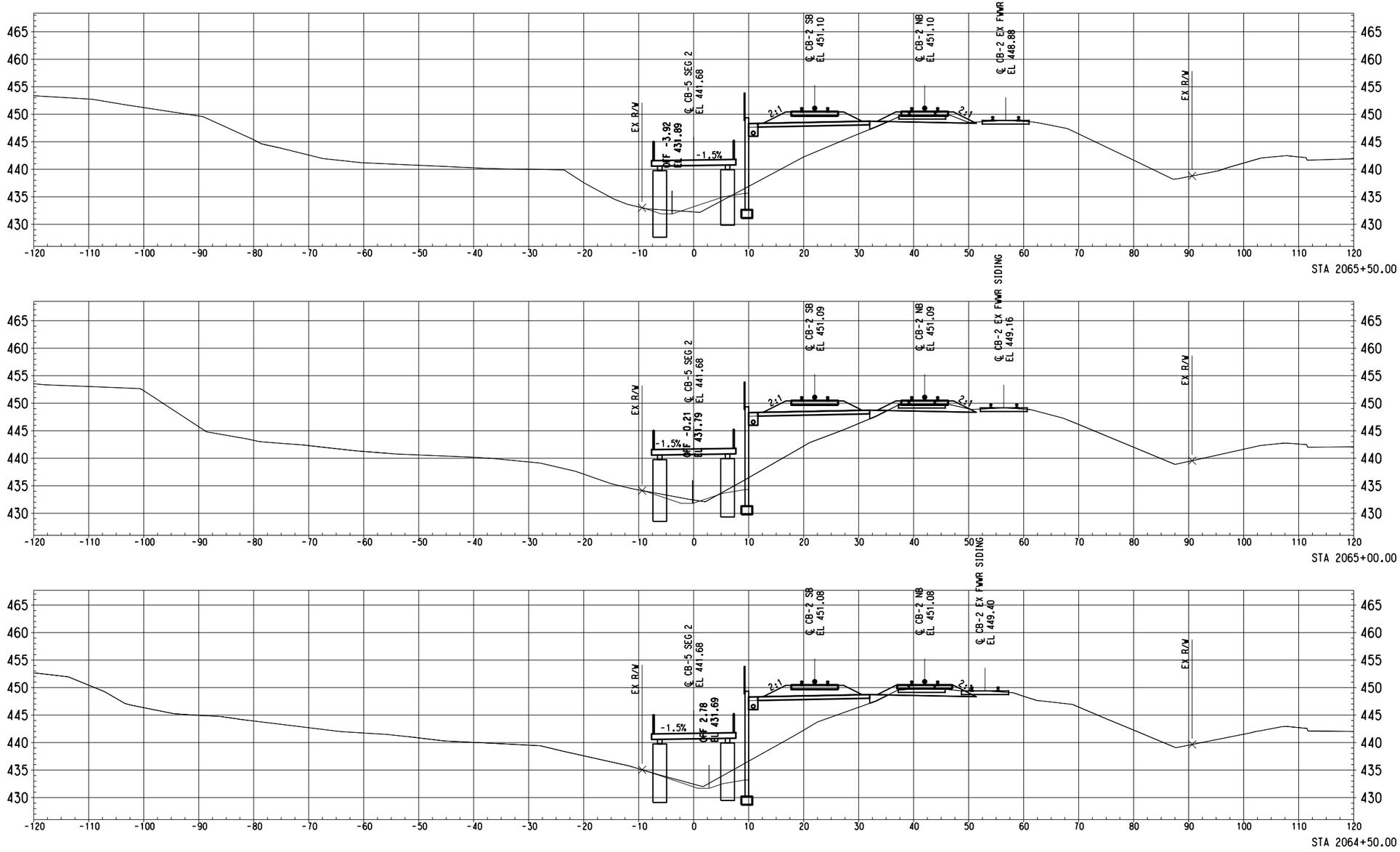
VERT SCALE (IN FEET) 0 5 10 20



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CONTRACT SHEET No. 98 OF 345

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

CITY OF CARROLLTON
CROSS SECTIONS
SHEET 15 OF 80

CONTRACT	DWG No.	REV
C-2033270-01	CC1-6534	D

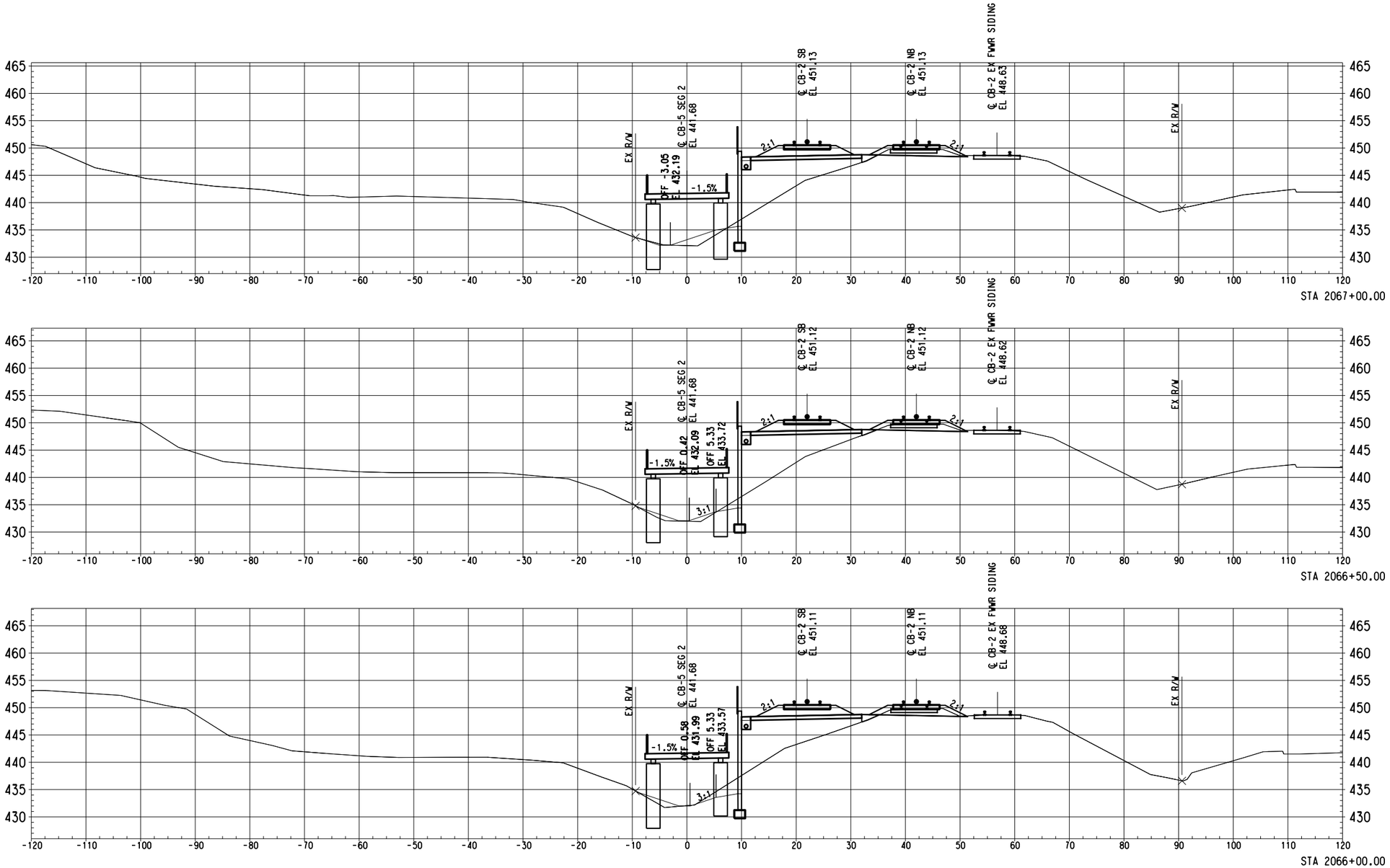
CB05-CC1-6534.000

DWG No. CC1-6535

NOTE:
SEE PLAN AND PROFILE SHEETS FOR FENCE AND RIP RAP LOCATIONS AND LIMITS

HORIZ SCALE (IN FEET) 0 5 10 20

VERT SCALE (IN FEET) 0 5 10 20



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CONTRACT SHEET No. 99 OF 345

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

CITY OF CARROLLTON
CROSS SECTIONS
SHEET 16 OF 80

CONTRACT	DWG No.	REV
C-2033270-01	CC1-6535	D

CB05-CC1-6535.000

DWG No. CC1-6536

NOTE:
SEE PLAN AND PROFILE SHEETS FOR FENCE AND RIP RAP LOCATIONS AND LIMITS

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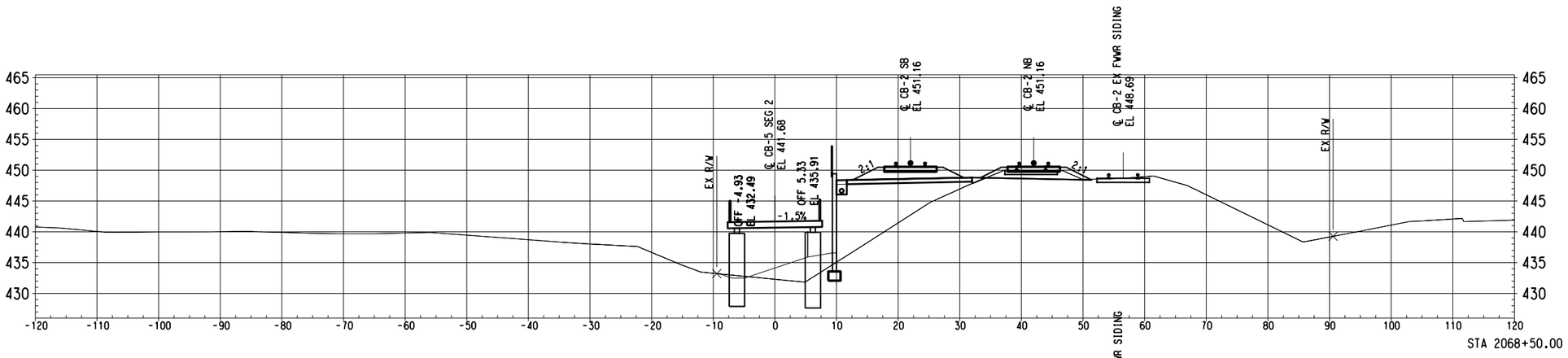
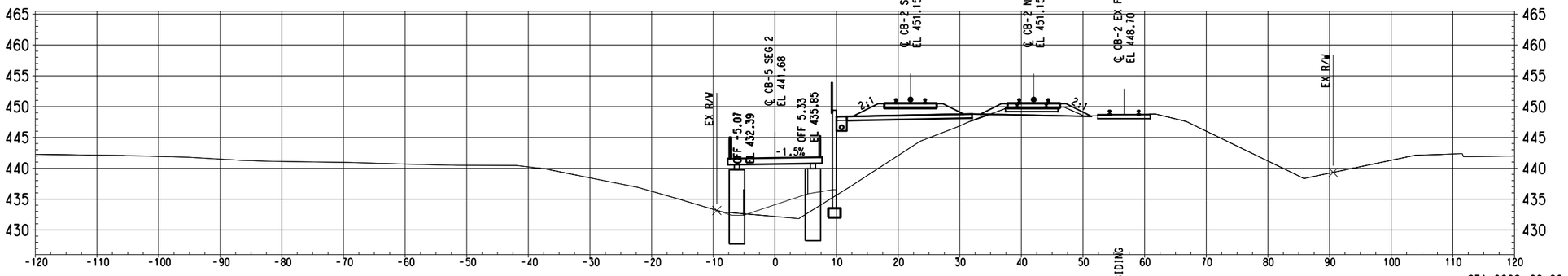
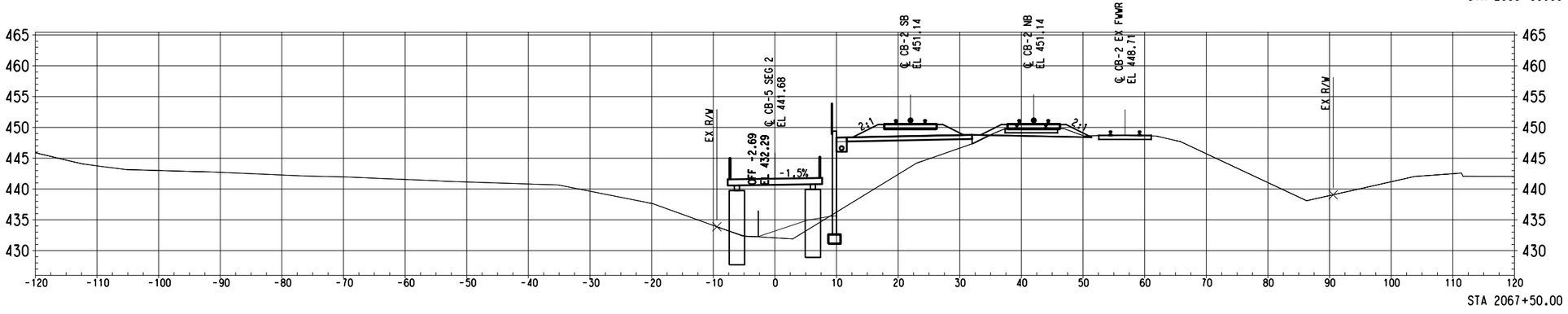
VERT SCALE (IN FEET) 0 5 10 20







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CONTRACT SHEET No. 100 OF 345

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

CITY OF CARROLLTON
CROSS SECTIONS
SHEET 17 OF 80

CONTRACT	DWG No.	REV
C-2033270-01	CC1-6536	D

CB05-CC1-6536.000

DWG No. CC1-6537

NOTE:
SEE PLAN AND PROFILE SHEETS FOR FENCE AND RIP RAP LOCATIONS AND LIMITS

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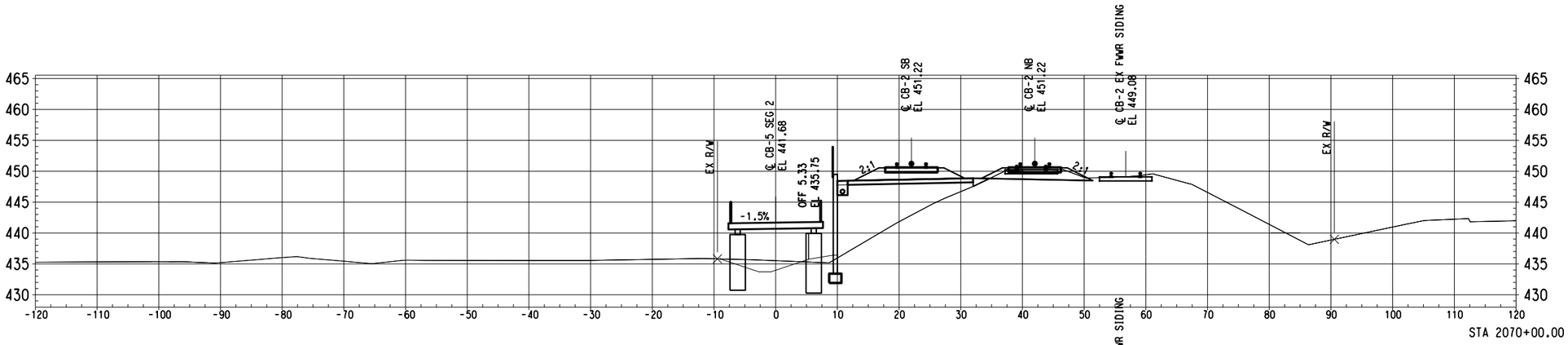
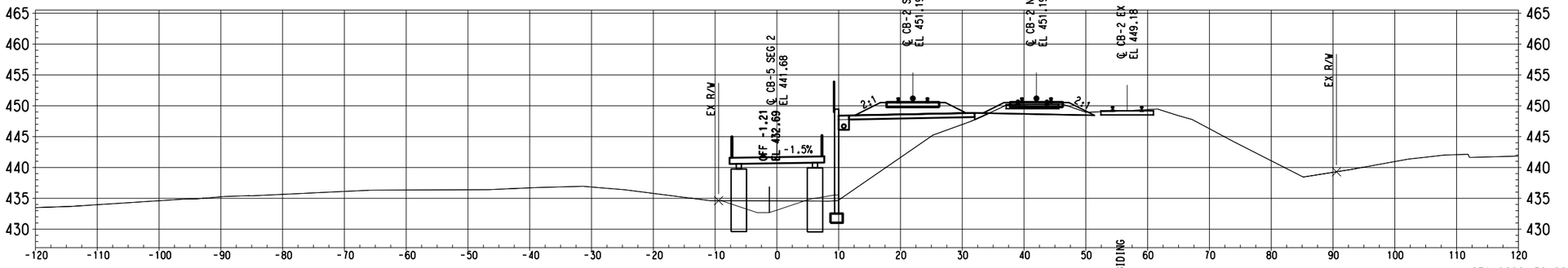
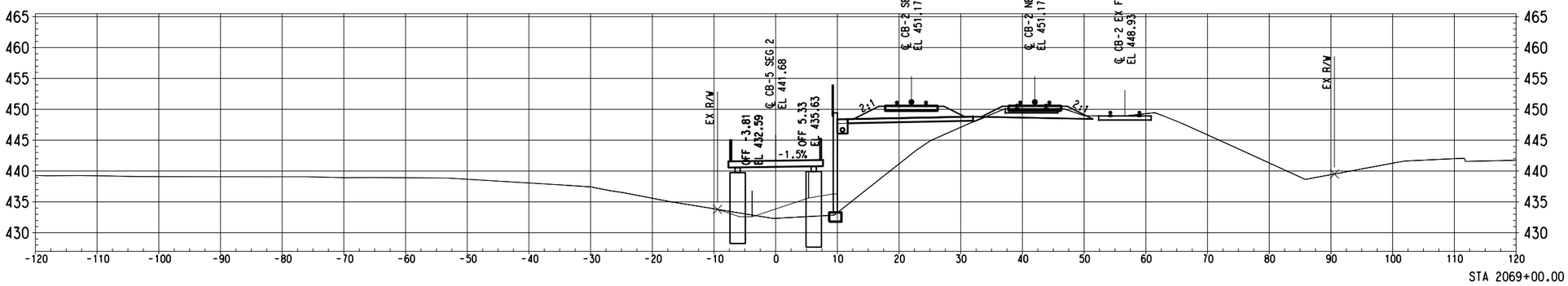
VERT SCALE (IN FEET) 0 5 10 20







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CONTRACT SHEET No. 101 OF 345

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

CITY OF CARROLLTON
CROSS SECTIONS
SHEET 18 OF 80

CONTRACT	DWG No.	REV
C-2033270-01	CC1-6537	D

CB05-CC1-6537.000

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DWG No. CC1-6538

NOTE:
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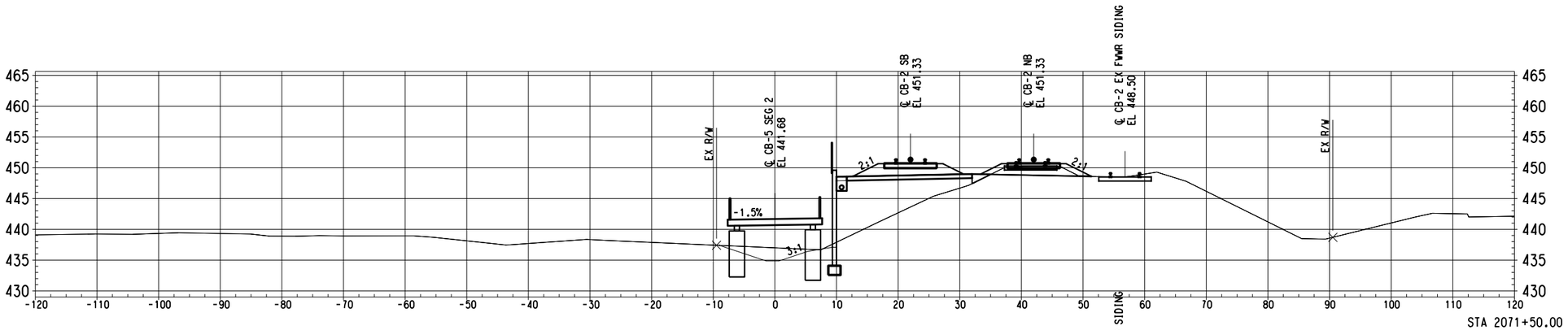
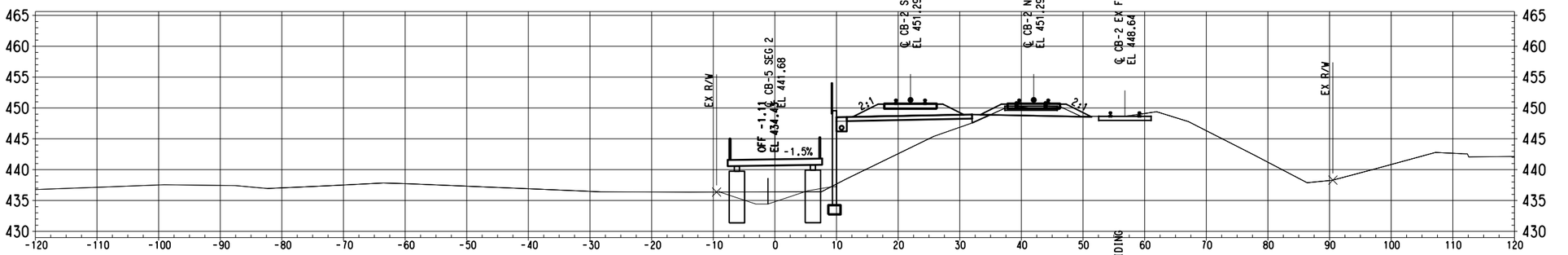
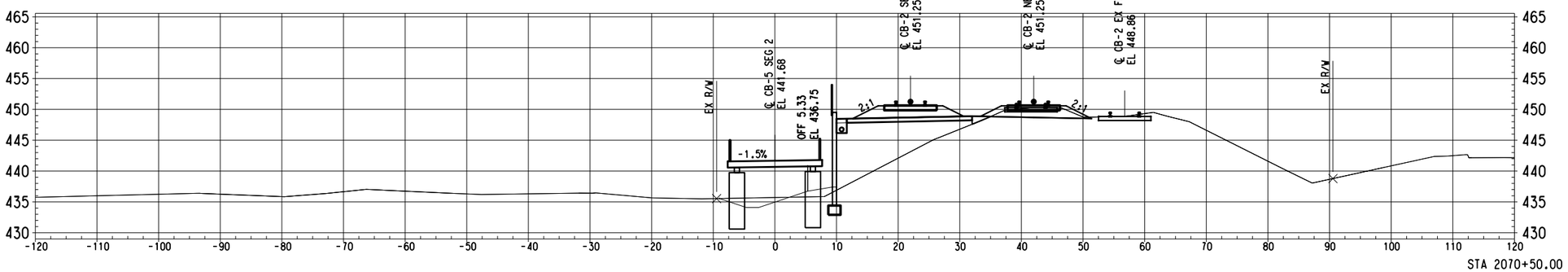
HORIZ SCALE (IN FEET) 0 5 10 20

VERT SCALE (IN FEET) 0 5 10 20







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COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

CITY OF CARROLLTON
CROSS SECTIONS
SHEET 19 OF 80

CONTRACT	DWG No.	REV
C-2033270-01	CC1-6538	D

CB05-CC1-6538.000

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DWG No. CC1-6539

NOTE:
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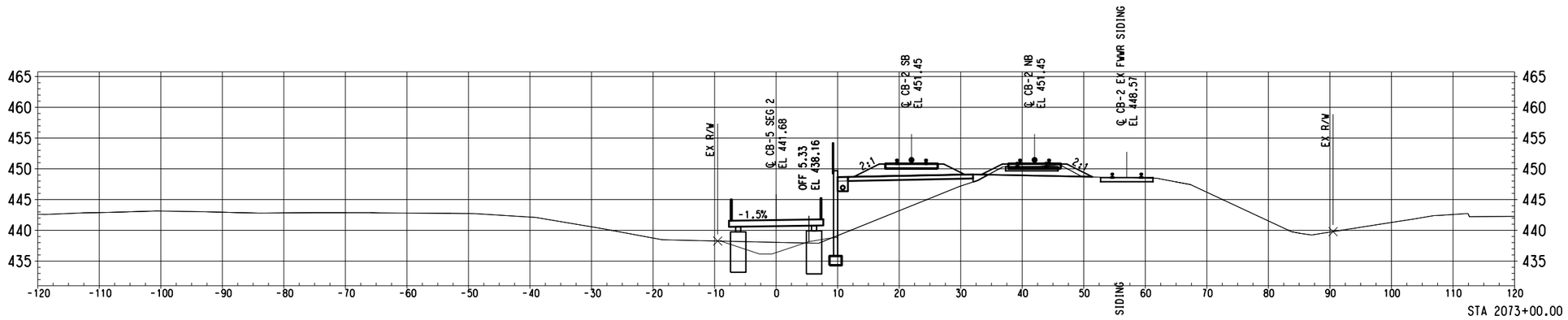
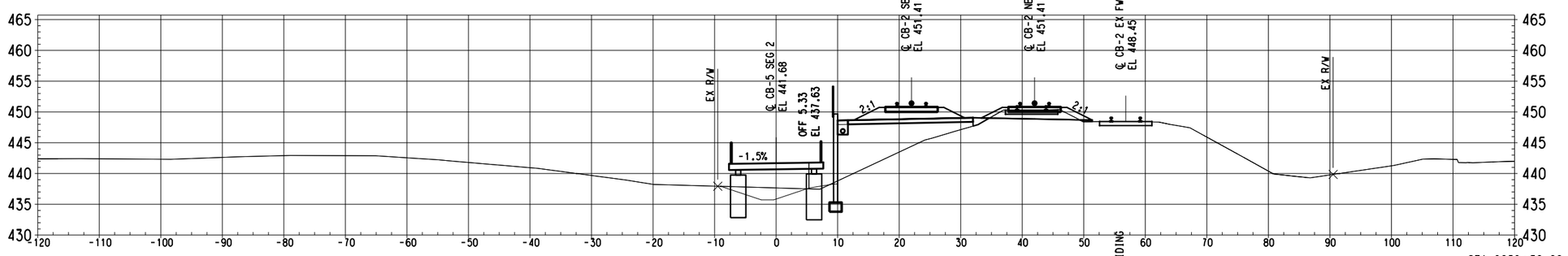
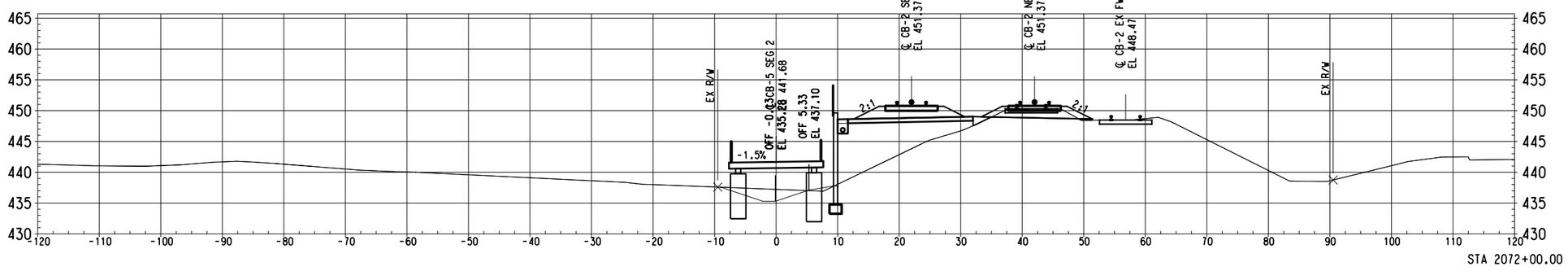
HORIZ SCALE (IN FEET) 0 5 10 20

VERT SCALE (IN FEET) 0 5 10 20







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CONTRACT SHEET No. 103 OF 345

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

CITY OF CARROLLTON
CROSS SECTIONS
SHEET 20 OF 80

CONTRACT	DWG No.	REV
C-2033270-01	CC1-6539	D

CB05-CC1-6539.000

DWG No. CC1-6540

NOTE:
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AND RIP RAP LOCATIONS AND LIMITS

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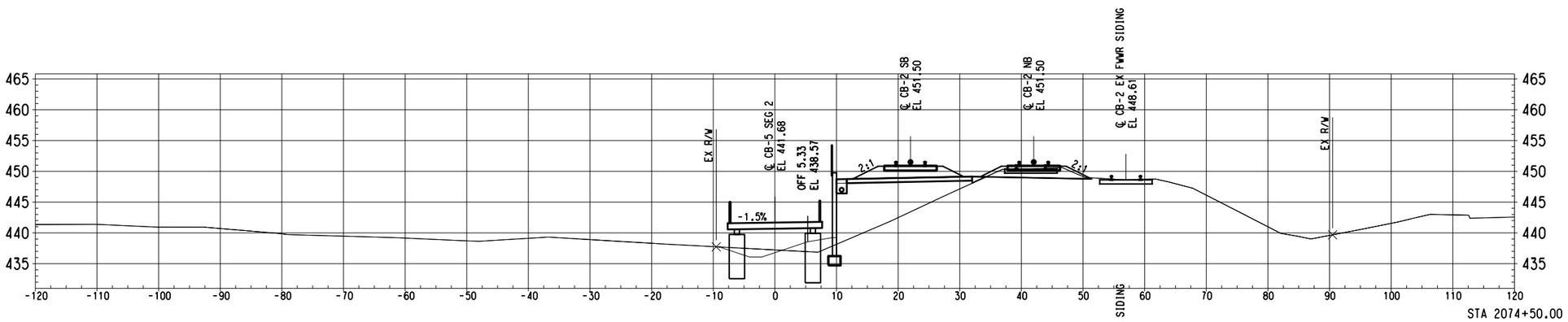
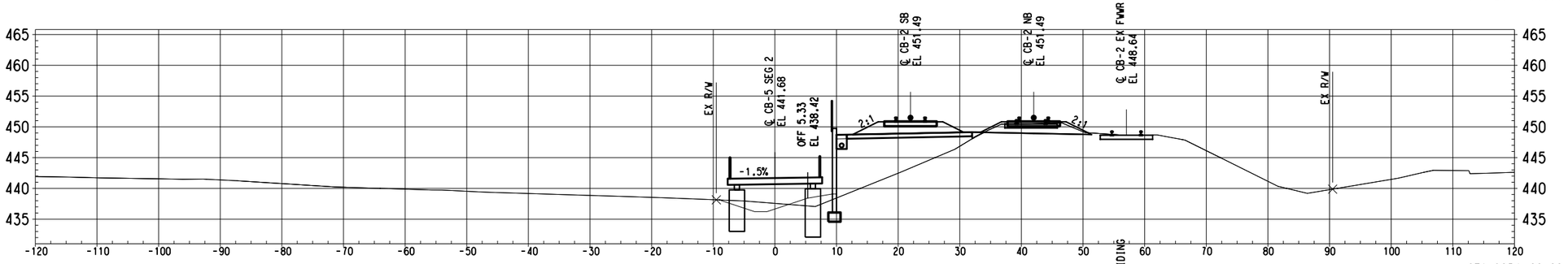
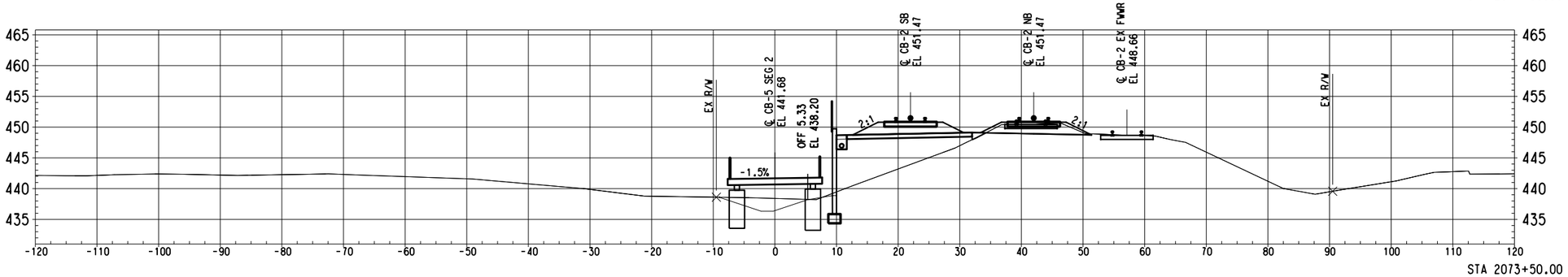
VERT SCALE (IN FEET) 0 5 10 20







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CONTRACT SHEET No. 104 OF 345

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

CITY OF CARROLLTON
CROSS SECTIONS
SHEET 21 OF 80

CONTRACT	DWG No.	REV
C-2033270-01	CC1-6540	D

CB05-CC1-6540.000

DWG No. CC1-6541

NOTE:
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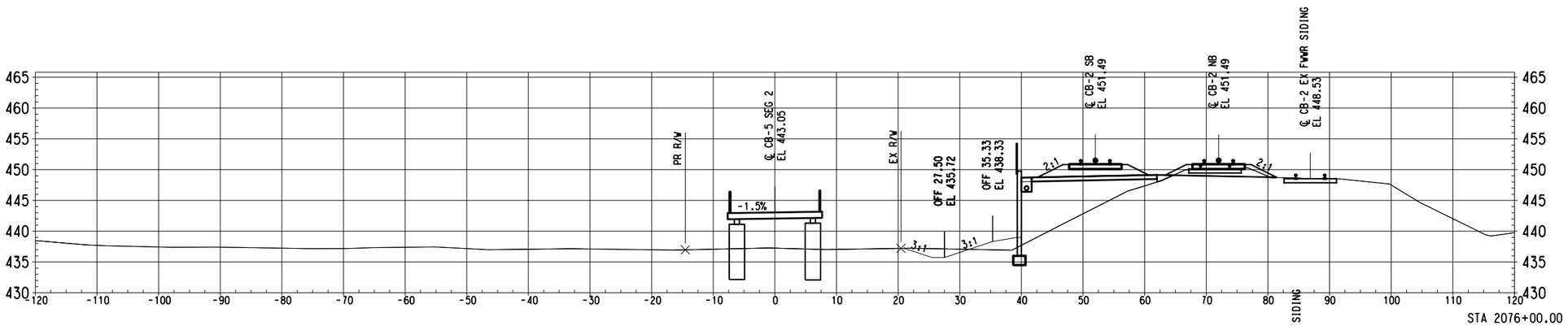
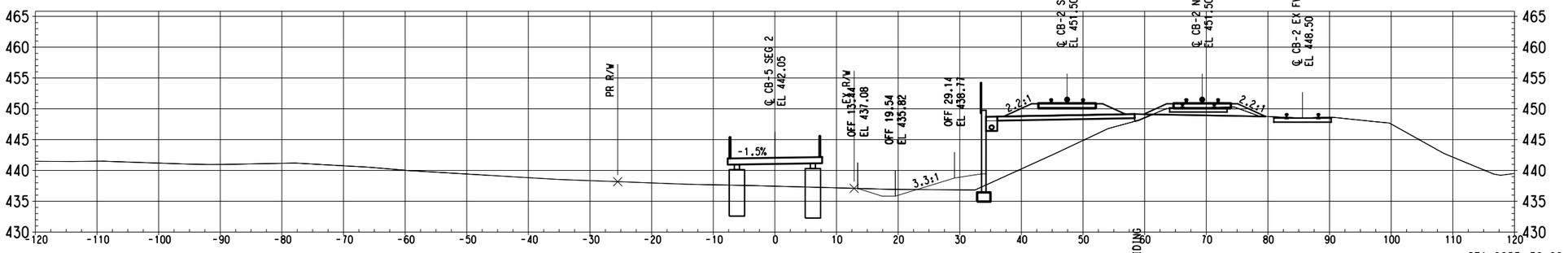
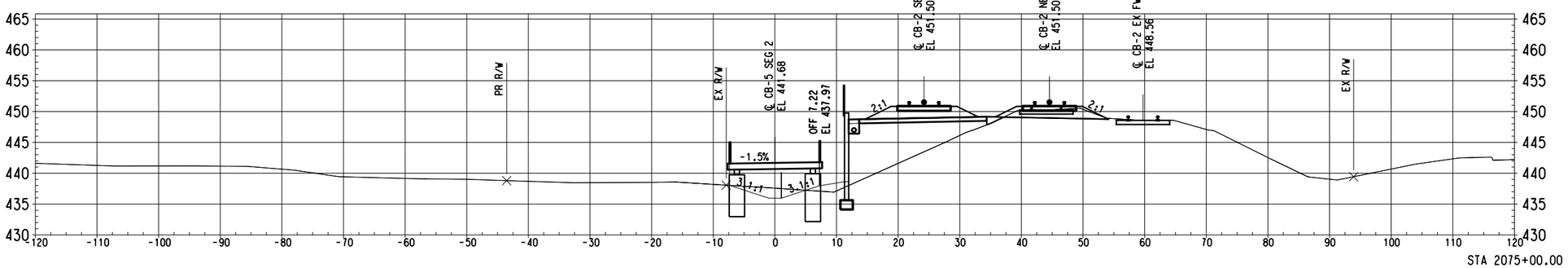
SCALE (IN FEET)
HORIZ 0 5 10 20
SCALE (IN FEET)
VERT 0 5 10 20







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CONTRACT SHEET No. 105 OF 345

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

CITY OF CARROLLTON
CROSS SECTIONS
SHEET 22 OF 80

CONTRACT	DWG No.	REV
C-2033270-01	CC1-6541	D

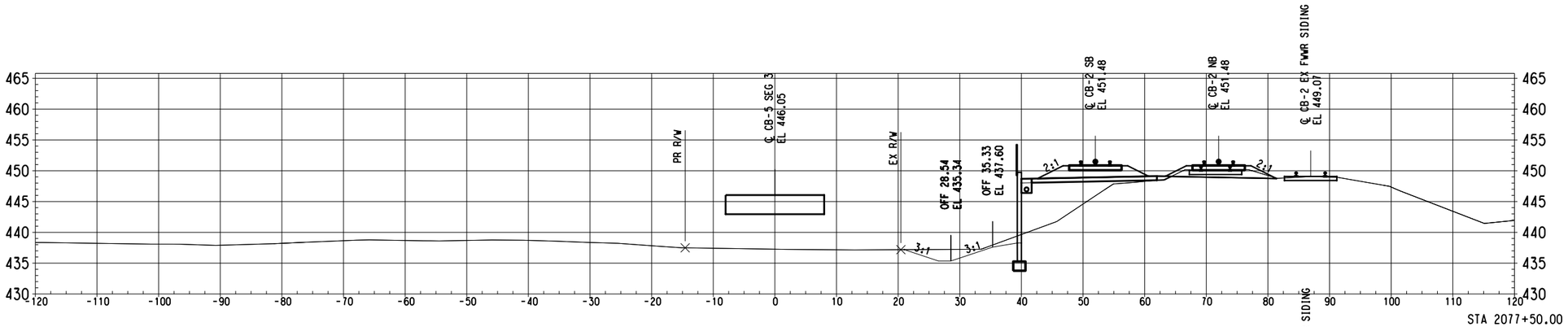
CB05-CC1-6541.000

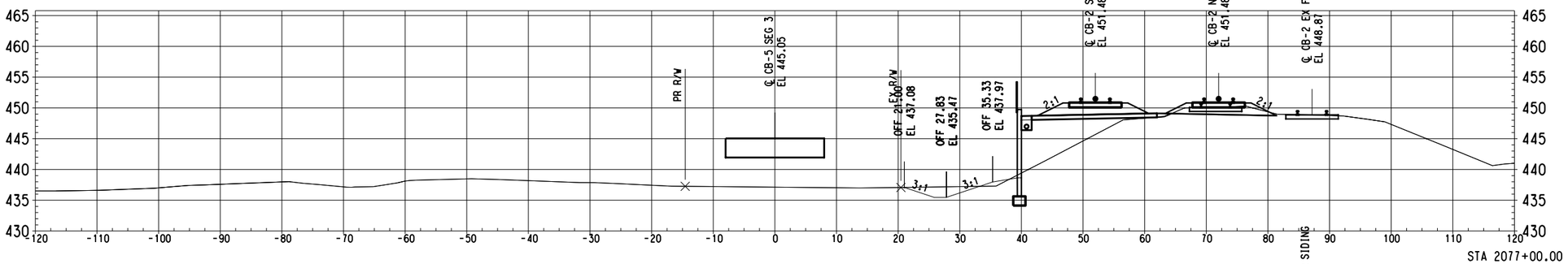
DWG No. CC1-6542

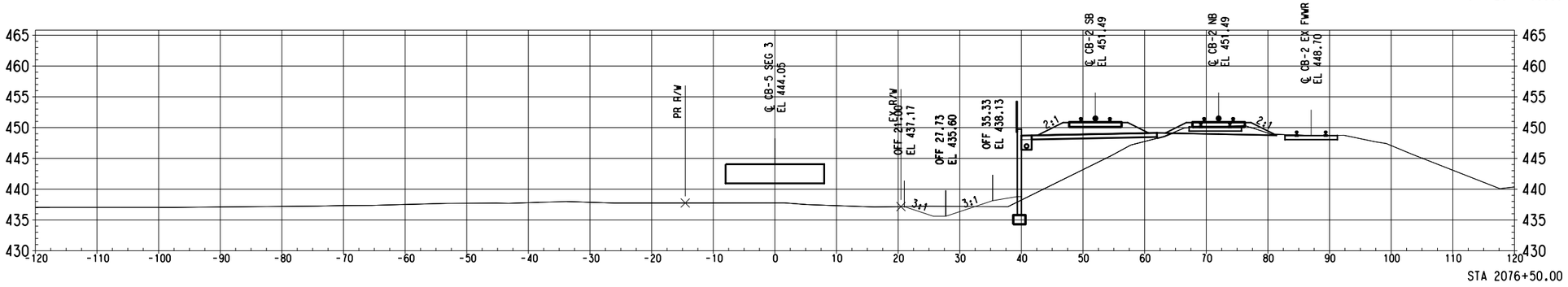
NOTE:
SEE PLAN AND PROFILE SHEETS FOR FENCE AND RIP RAP LOCATIONS AND LIMITS

HORIZ SCALE (IN FEET) 0 5 10 20

VERT SCALE (IN FEET) 0 5 10 20







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IN CHARGE	D. LUU
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CONTRACT SHEET No. 106 OF 345

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

CITY OF CARROLLTON
CROSS SECTIONS
SHEET 23 OF 80

CONTRACT	DWG No.	REV
C-2033270-01	CC1-6542	D

CB05-CC1-6542.000

2-AUG-2023 12:01
CB05-CC1-6542.000

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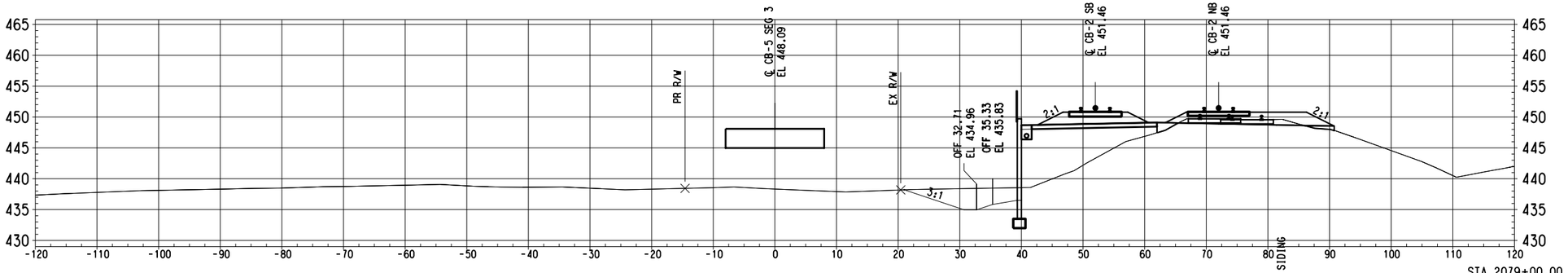
201 - 2076+50.00

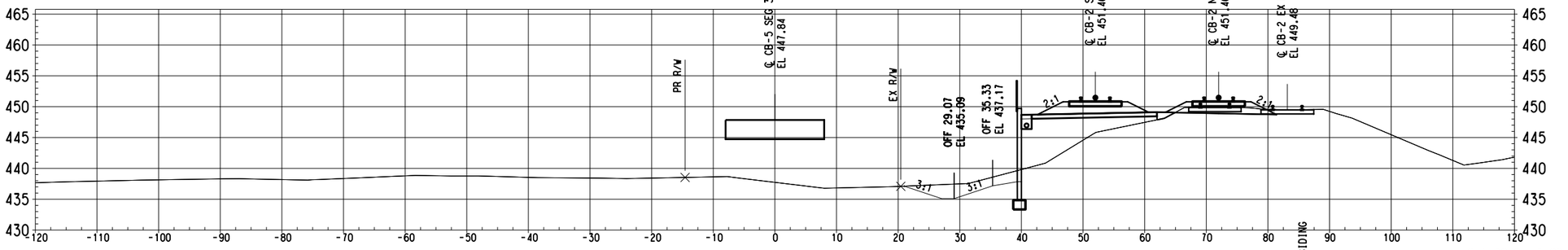
DWG No. CC1-6543

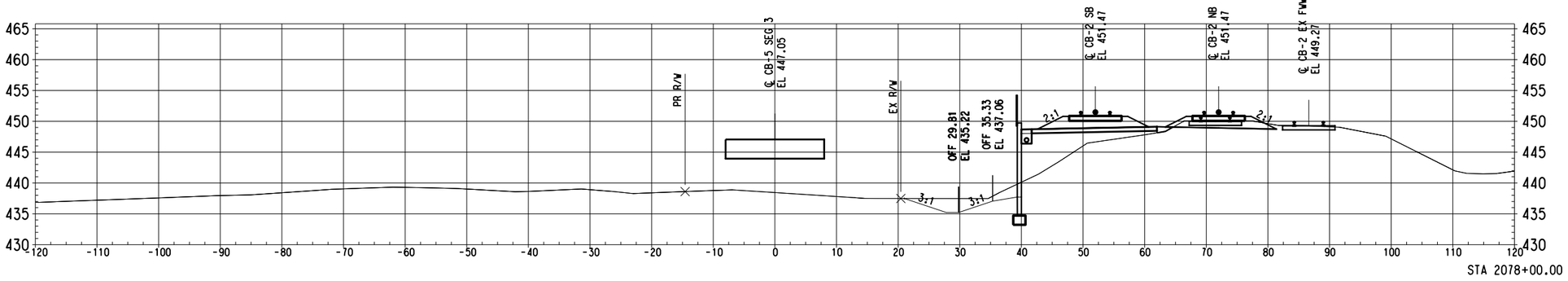
NOTE:
SEE PLAN AND PROFILE SHEETS FOR FENCE AND RIP RAP LOCATIONS AND LIMITS

HORIZ SCALE (IN FEET) 0 5 10 20

VERT SCALE (IN FEET) 0 5 10 20







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DESIGNED	S. SALEH
CHECKED	D. LUU
IN CHARGE	D. LUU
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CONTRACT SHEET No. 107 OF 345

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

CITY OF CARROLLTON
CROSS SECTIONS
SHEET 24 OF 80

CONTRACT	DWG No.	REV
C-2033270-01	CC1-6543	D

CB05-CC1-6543.000

2-AUG-2023 12:01
CB05-CC1-6543.000

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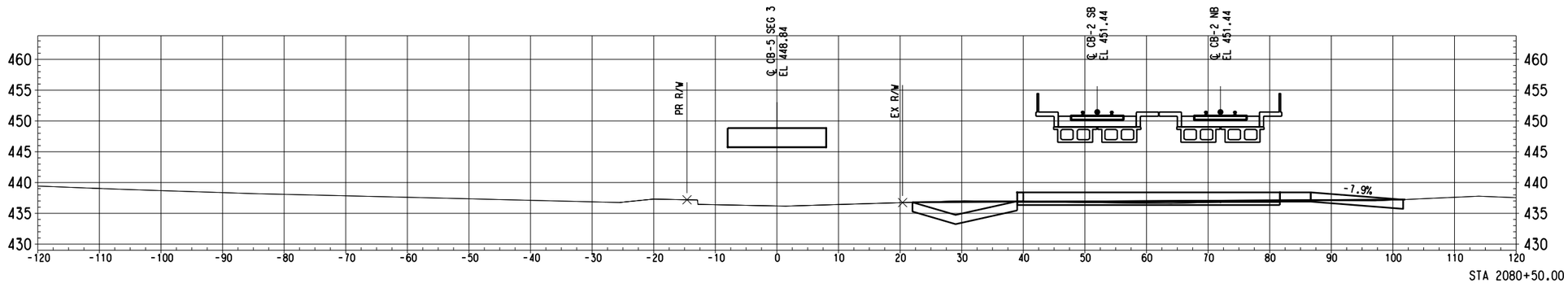
201 - 2078+00.00

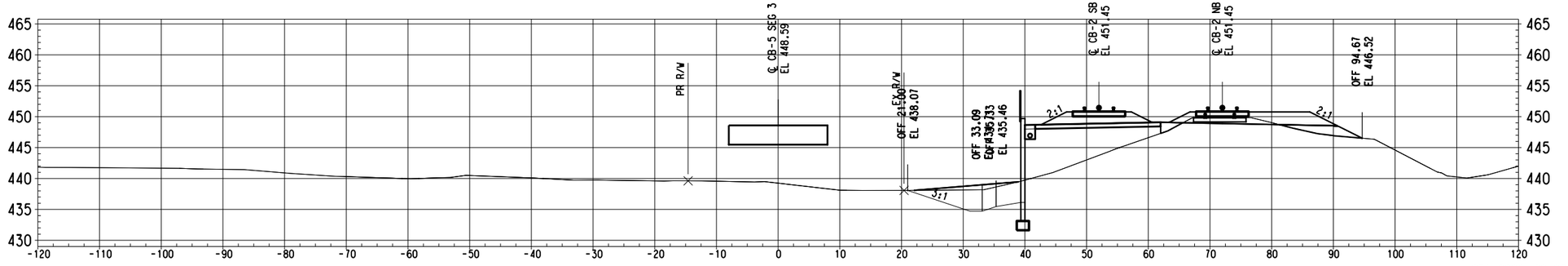
DWG No. CC1-6544

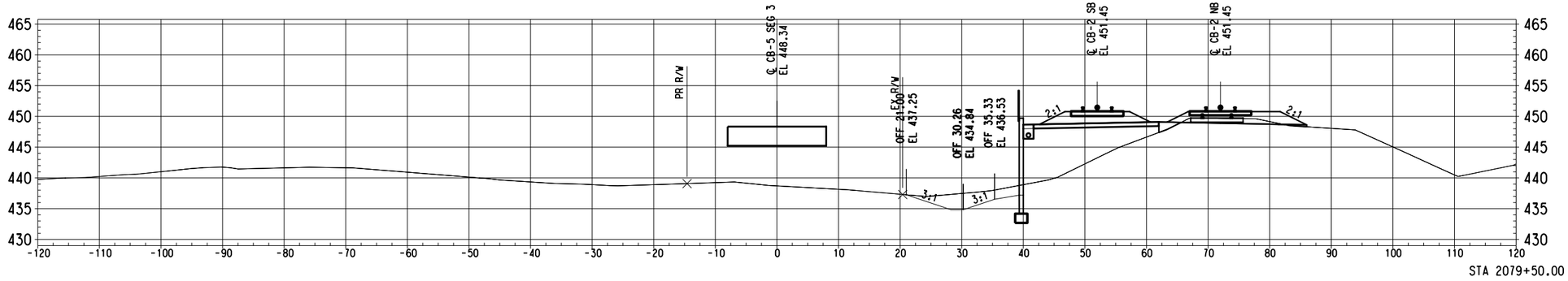
NOTE:
SEE PLAN AND PROFILE SHEETS FOR FENCE
AND RIP RAP LOCATIONS AND LIMITS

HORIZ SCALE (IN FEET) 0 5 10 20

VERT SCALE (IN FEET) 0 5 10 20







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DESIGNED	S. SALEH
CHECKED	D. LUU
IN CHARGE	D. LUU
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CONTRACT SHEET No. 108 OF 345

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

CITY OF CARROLLTON
CROSS SECTIONS
SHEET 25 OF 80

CONTRACT	DWG No.	REV
C-2033270-01	CC1-6544	D

CB05-CC1-6544.000

DWG No. CC1-6545

NOTE:
SEE PLAN AND PROFILE SHEETS FOR FENCE AND RIP RAP LOCATIONS AND LIMITS

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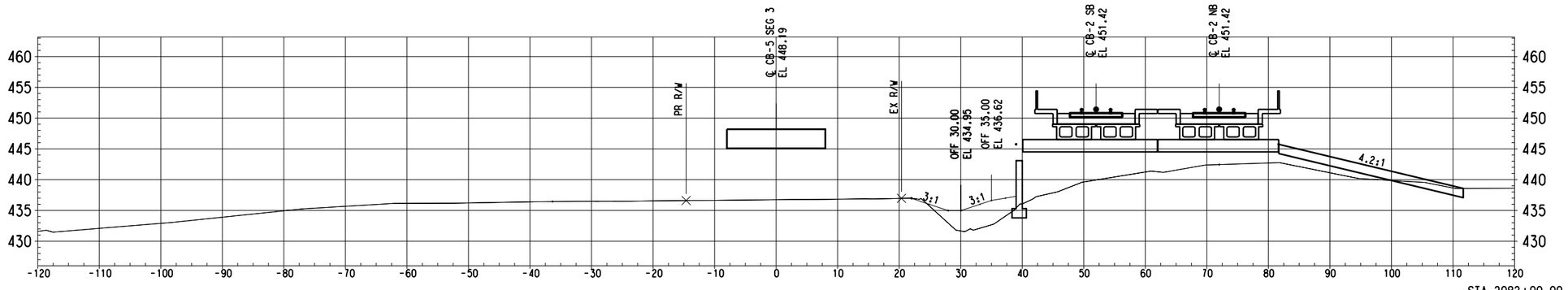
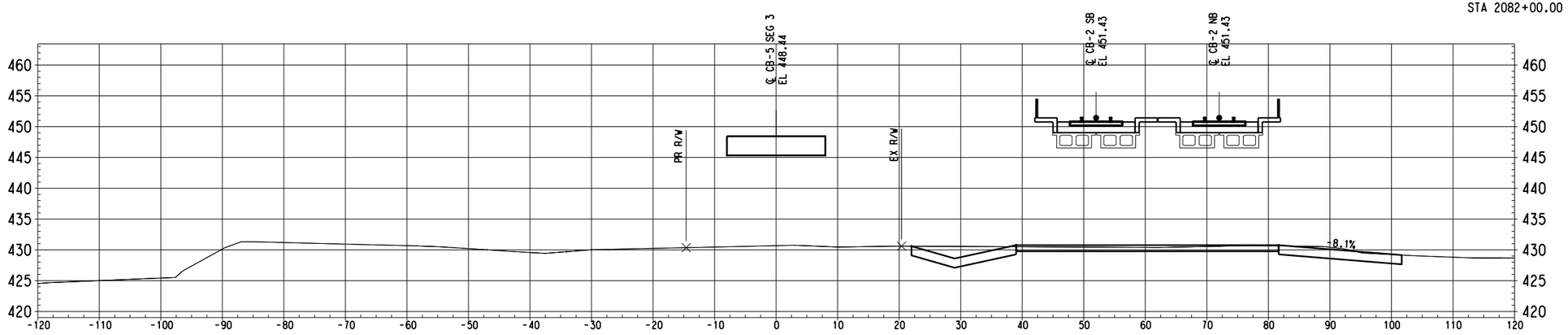
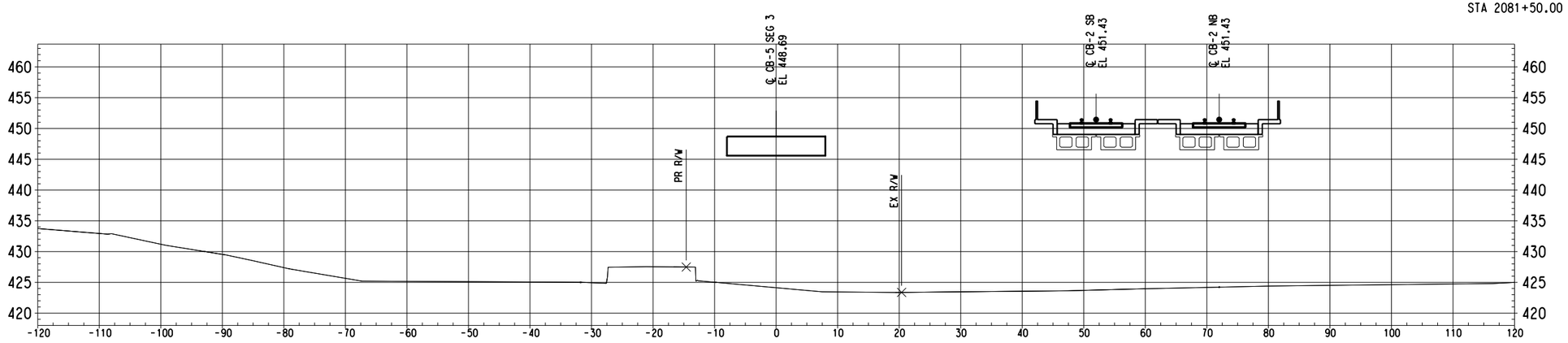
VERT SCALE (IN FEET) 0 5 10 20







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DESIGNED	S. SALEH
CHECKED	D. LUU
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CONTRACT SHEET No. 109 OF 345

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

CITY OF CARROLLTON
CROSS SECTIONS
SHEET 26 OF 80

CONTRACT	DWG No.	REV
C-2033270-01	CC1-6545	D

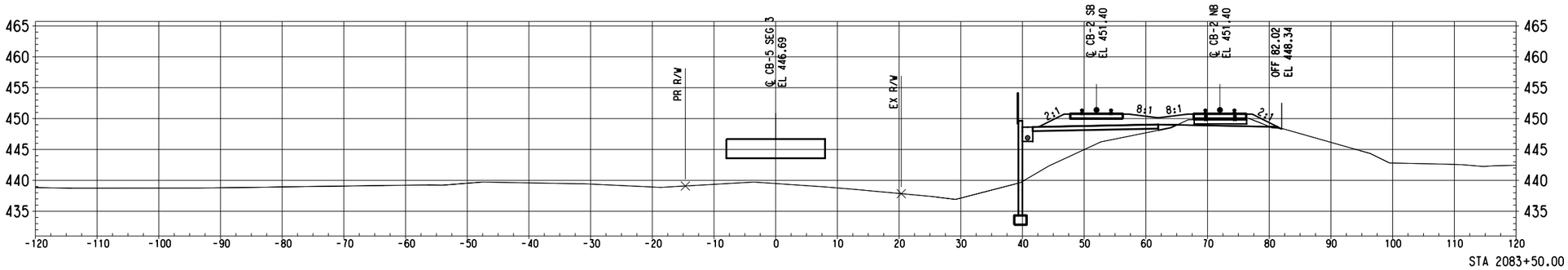
CB05-CC1-6545.000

DWG No. CC1-6546

NOTE:
SEE PLAN AND PROFILE SHEETS FOR FENCE
AND RIP RAP LOCATIONS AND LIMITS

HORIZ SCALE (IN FEET) 0 5 10 20

VERT SCALE (IN FEET) 0 5 10 20



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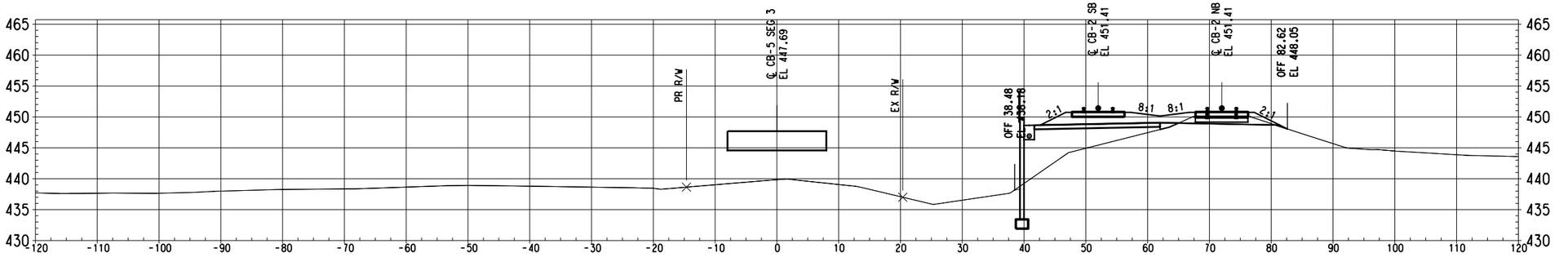

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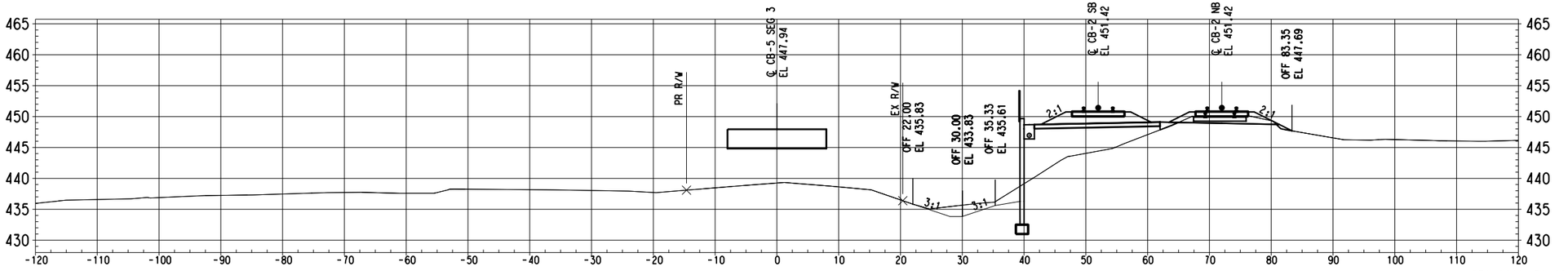

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CONTRACT SHEET No. 110 OF 345

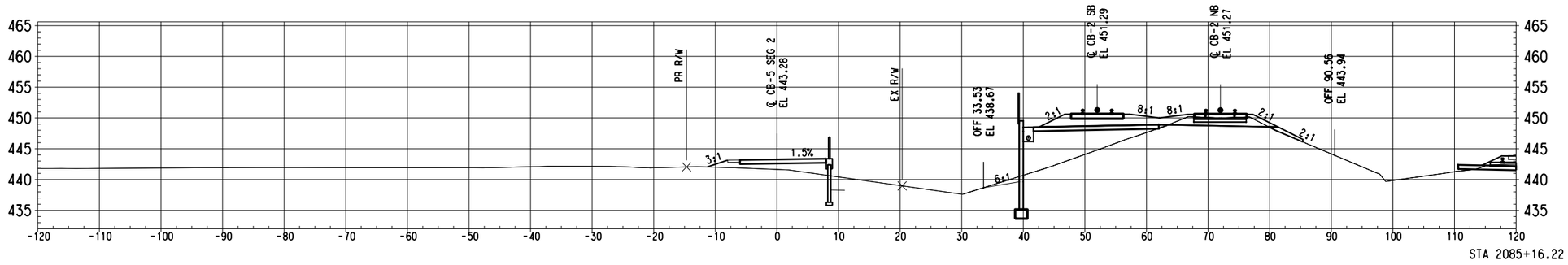
COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

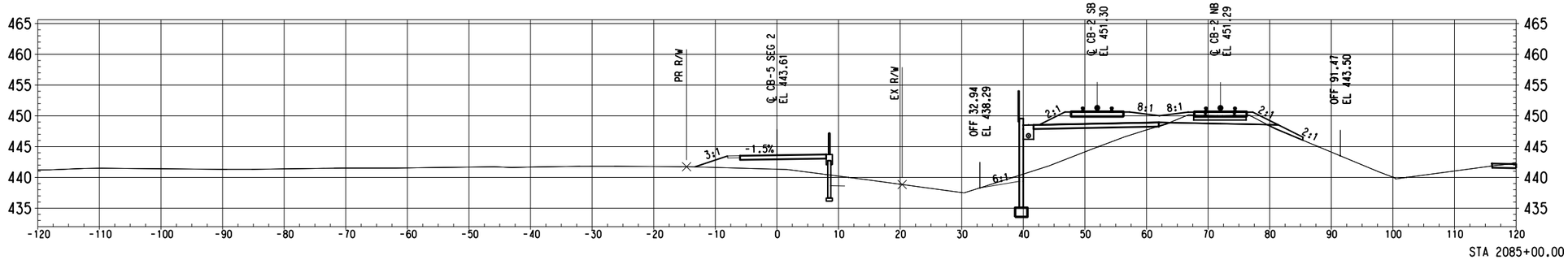
CITY OF CARROLLTON
CROSS SECTIONS
SHEET 27 OF 80

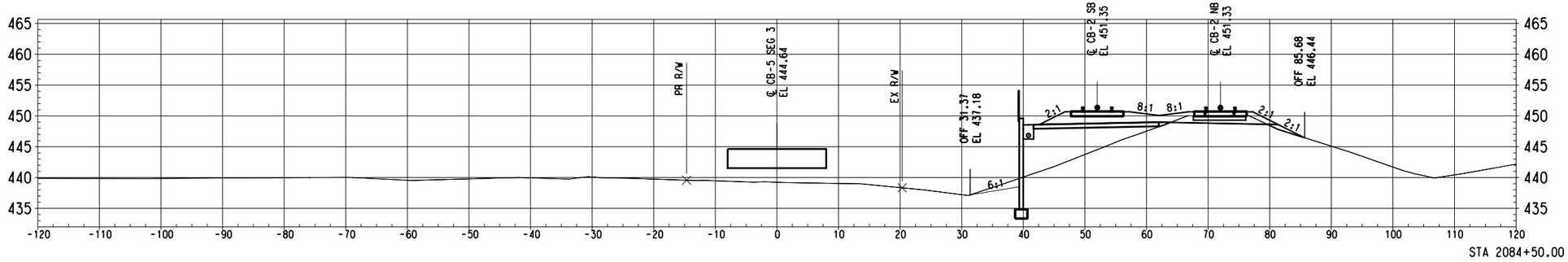
CONTRACT	DWG No.	REV
C-2033270-01	CC1-6546	D

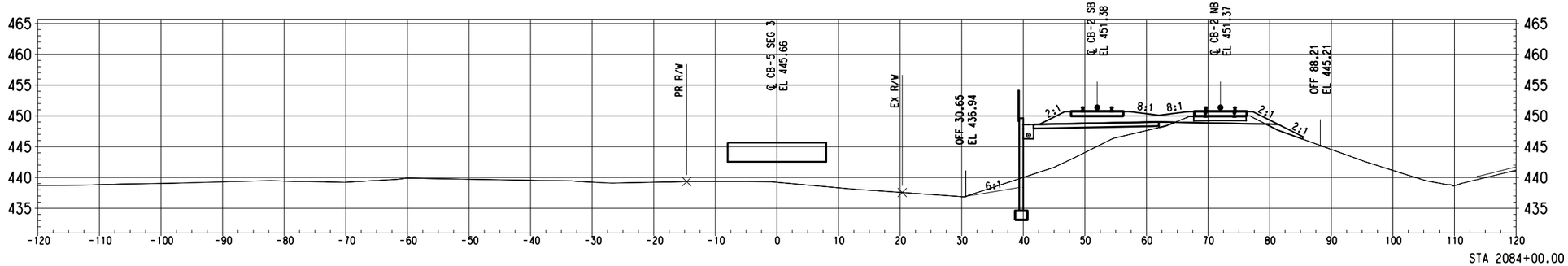
CB05-CC1-6546.000

DWG No. CC1-6547









NOTE:
SEE PLAN AND PROFILE SHEETS FOR FENCE AND RIP RAP LOCATIONS AND LIMITS

HORIZ SCALE (IN FEET) 0 5 10 20

VERT SCALE (IN FEET) 0 5 10 20

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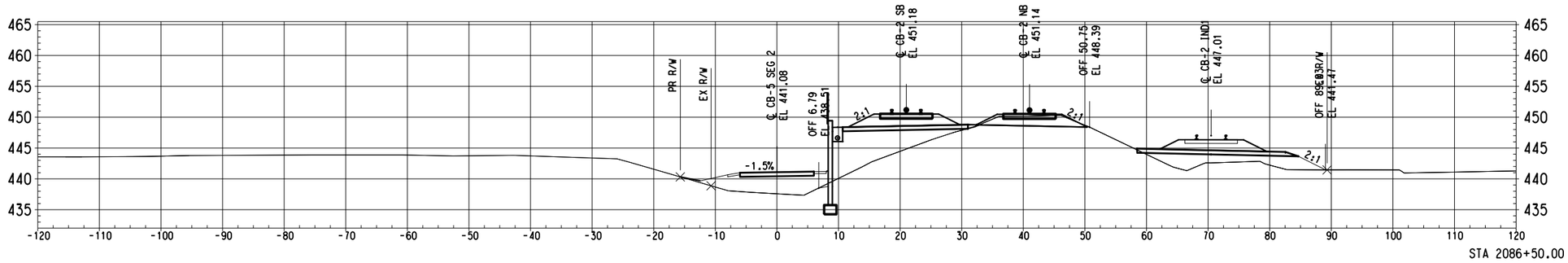
COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

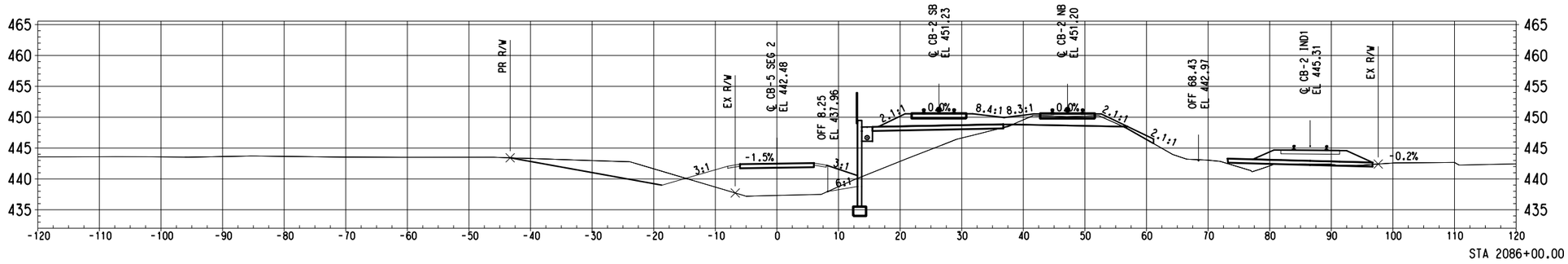
CITY OF CARROLLTON
CROSS SECTIONS
SHEET 28 OF 80

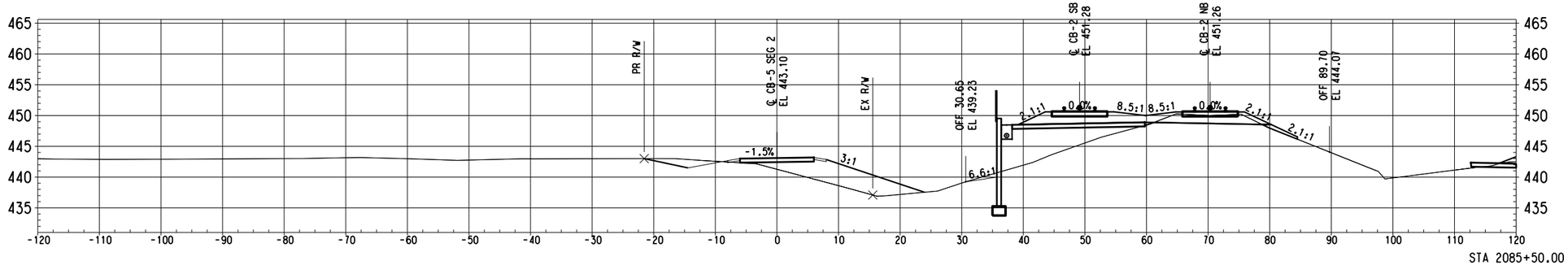
CONTRACT	DWG No.	REV
C-2033270-01	CC1-6547	D

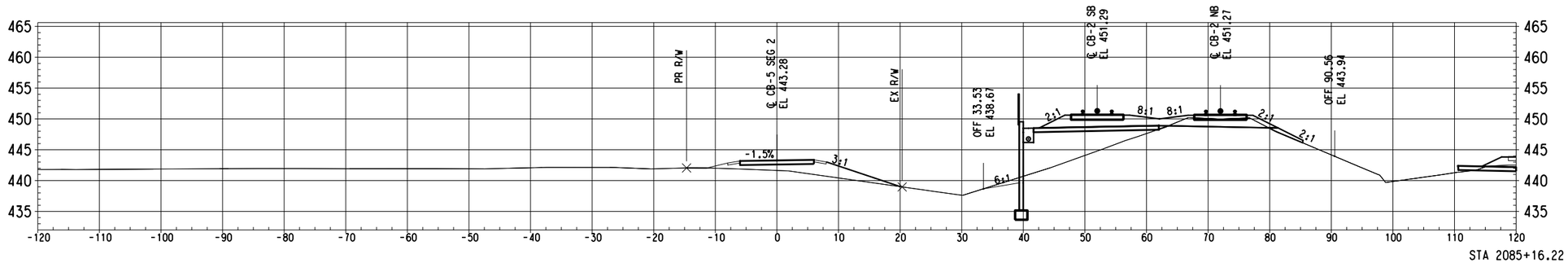
CB05-CC1-6547.000

DWG No. CC1-6548









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SCALE (IN FEET)
HORIZ 0 5 10 20
SCALE (IN FEET)
VERT 0 5 10 20

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CONTRACT SHEET No. 112 OF 345

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

CITY OF CARROLLTON
CROSS SECTIONS
SHEET 29 OF 80

CONTRACT	DWG No.	REV
C-2033270-01	CC1-6548	D

CB05-CC1-6548.000

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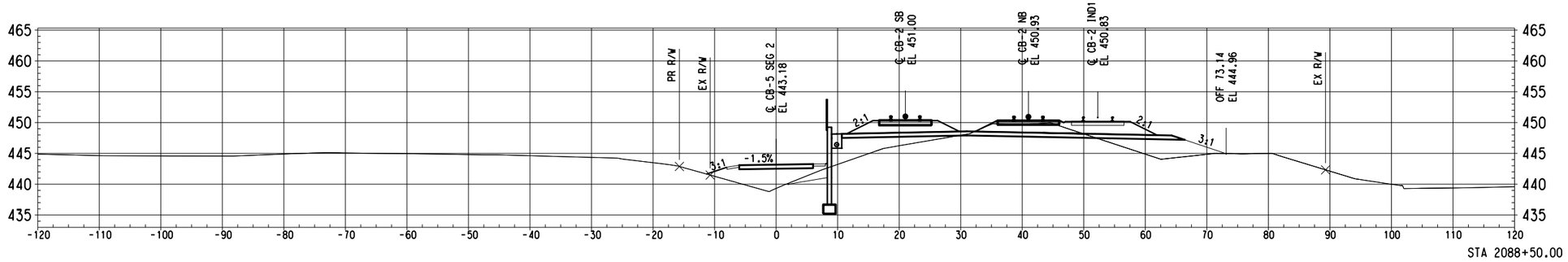
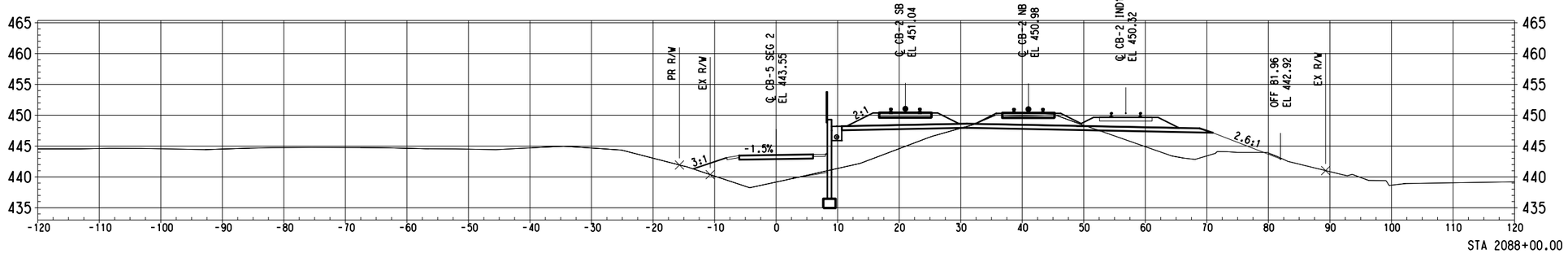
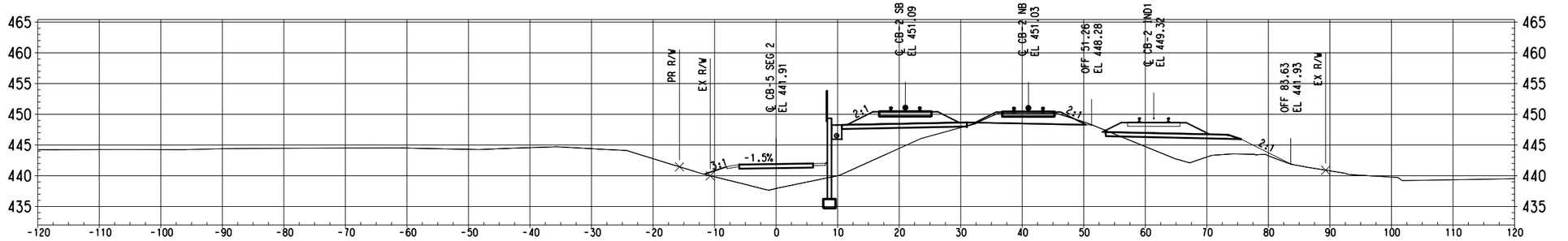
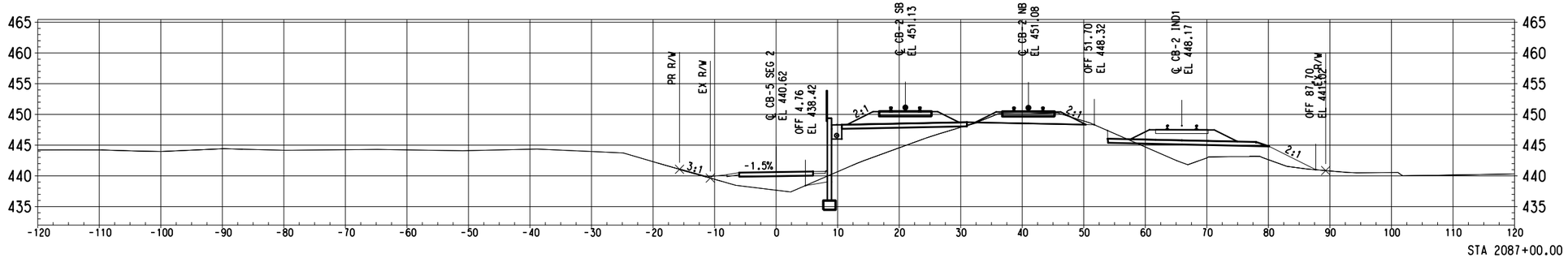
JEGSVCPWJ01
202 - 2085+16.22

DWG No. CC1-6549









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HORIZ SCALE (IN FEET) 0 5 10 20

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DATE	07 AUG 23

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CONTRACT SHEET No. 113 OF 345

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

CITY OF CARROLLTON
CROSS SECTIONS
SHEET 30 OF 80

CONTRACT	DWG No.	REV
C-2033270-01	CC1-6549	D

CB05-CC1-6549.000

2-AUG-2023 10:10
CB05-CC1-6549.000

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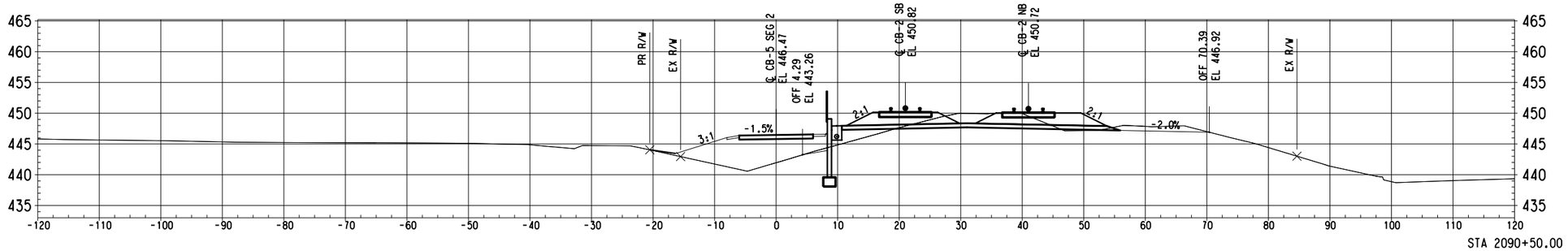
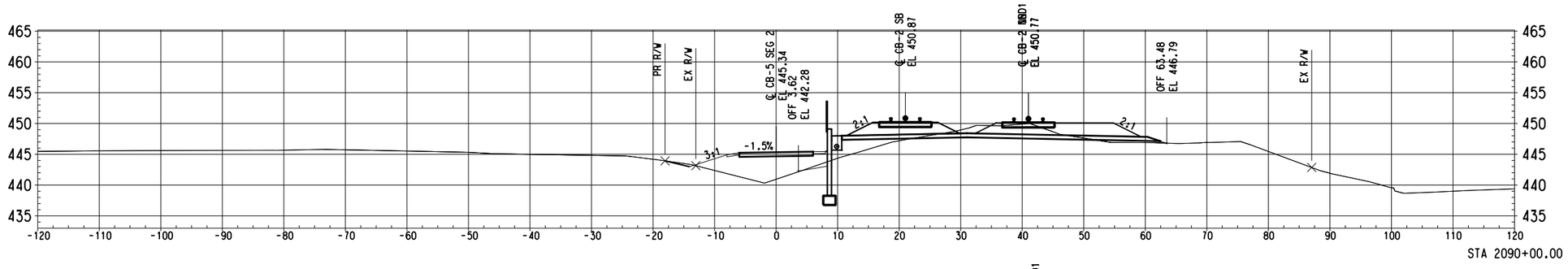
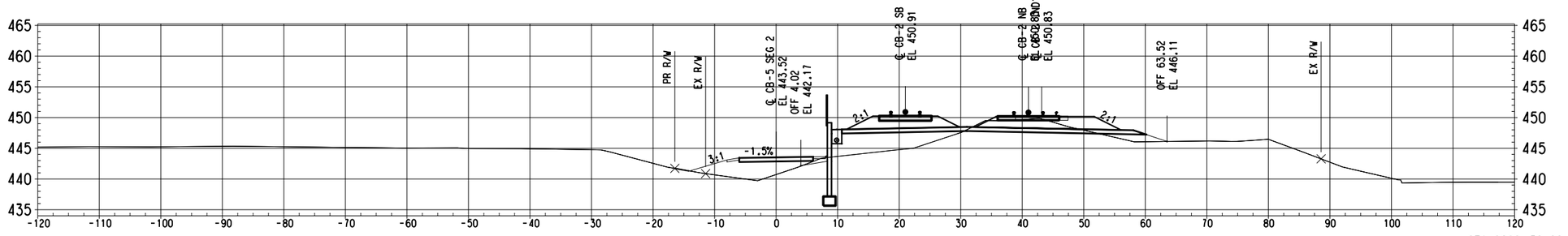
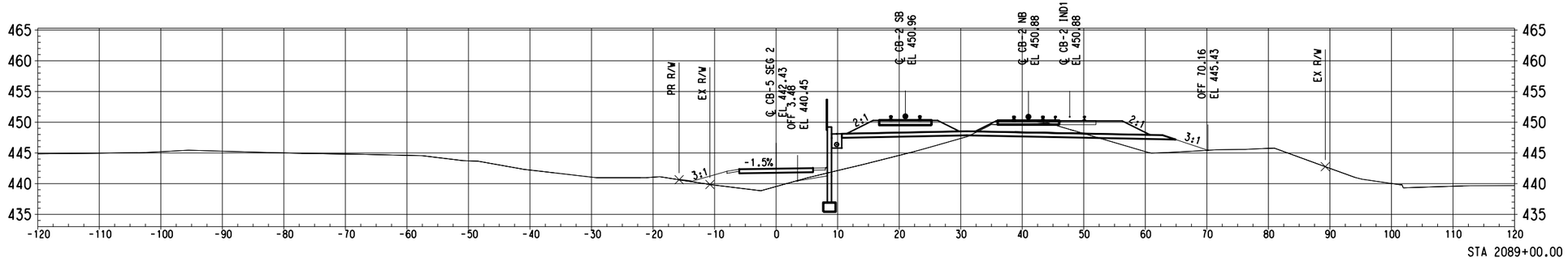
DWG No. CC1-6550









NOTE:
SEE PLAN AND PROFILE SHEETS FOR FENCE AND RIP RAP LOCATIONS AND LIMITS

HORIZ SCALE (IN FEET) 0 5 10 20

VERT SCALE (IN FEET) 0 5 10 20

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DESIGNED	S. SALEH
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IN CHARGE	D. LUU
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CONTRACT SHEET No. 114 OF 345

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

CITY OF CARROLLTON
CROSS SECTIONS
SHEET 31 OF 80

CONTRACT	DWG No.	REV
C-2033270-01	CC1-6550	D

CB05-CC1-6550.000

2-AUG-2023 10:16
CB05-CC1-6550.000

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DWG No. CC1-6551

NOTE:
SEE PLAN AND PROFILE SHEETS FOR FENCE AND RIP RAP LOCATIONS AND LIMITS

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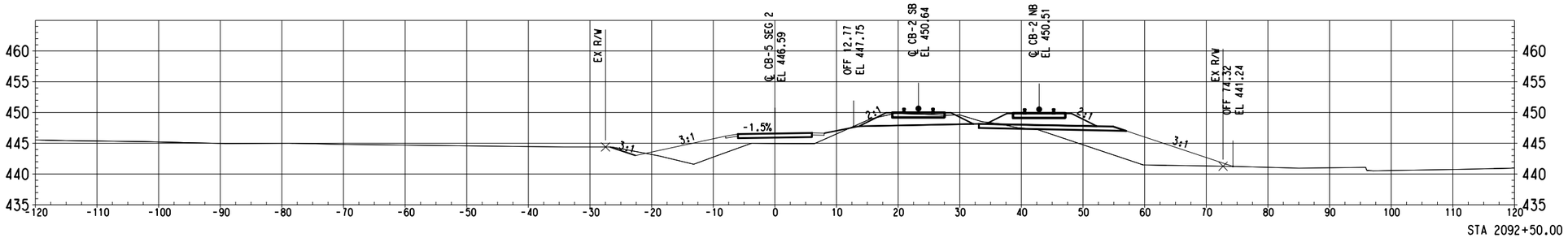
VERT SCALE (IN FEET) 0 5 10 20



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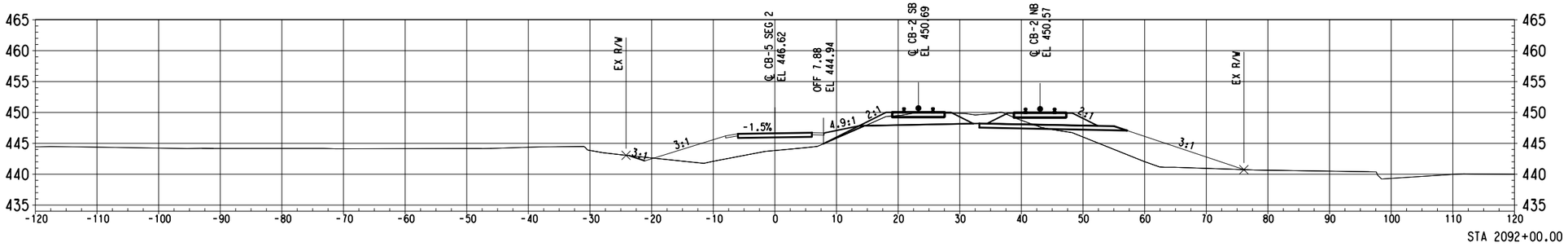

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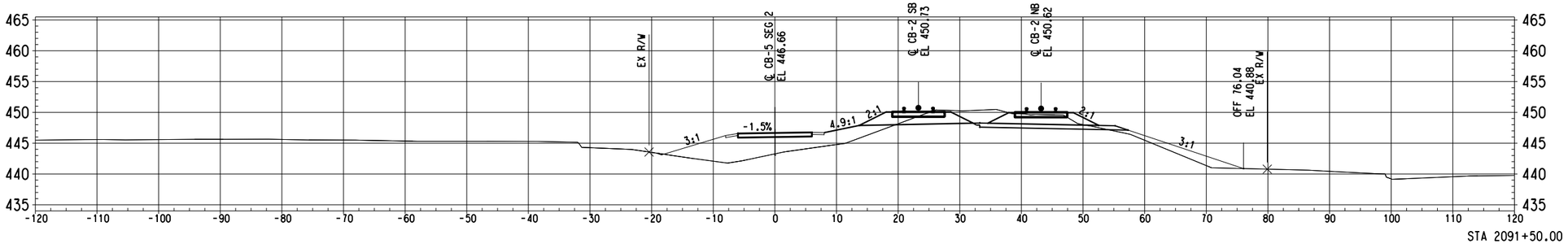

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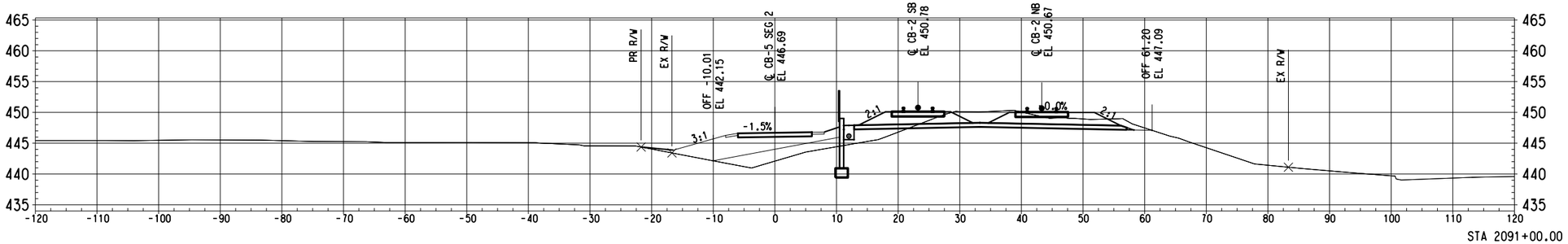

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CONTRACT SHEET No. 115 OF 345

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

CITY OF CARROLLTON
CROSS SECTIONS
SHEET 32 OF 80

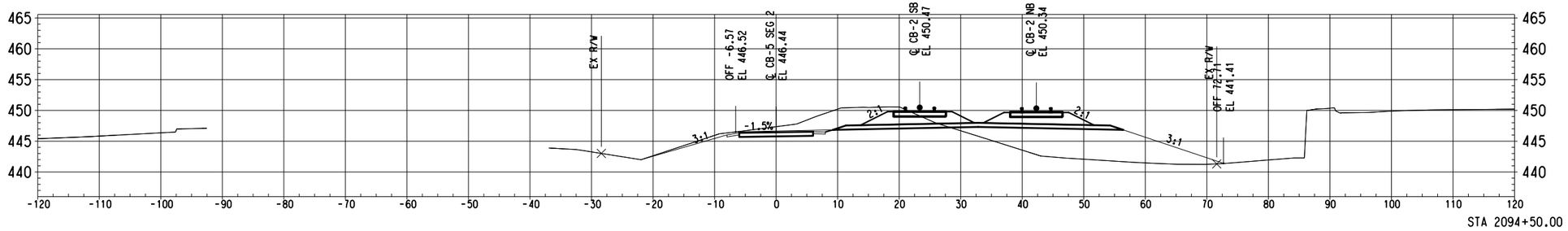
CONTRACT	DWG No.	REV
C-2033270-01	CC1-6551	D

CB05-CC1-6551.000

DWG No. CC1-6552

NOTE:
SEE PLAN AND PROFILE SHEETS FOR FENCE AND RIP RAP LOCATIONS AND LIMITS

HORIZ SCALE (IN FEET) 0 5 10 20
VERT SCALE (IN FEET) 0 5 10 20



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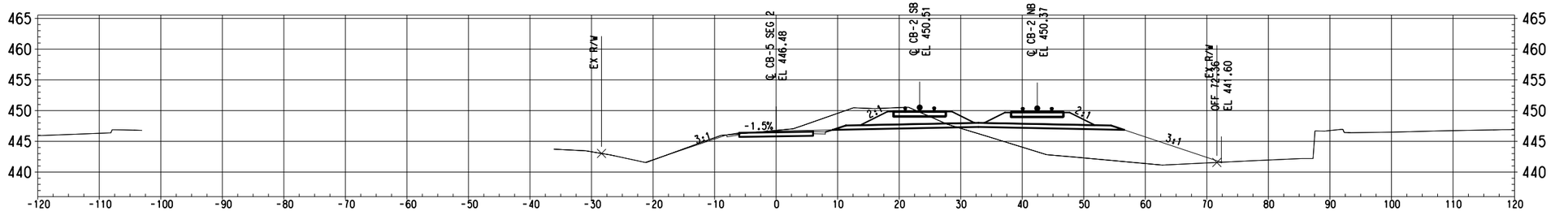

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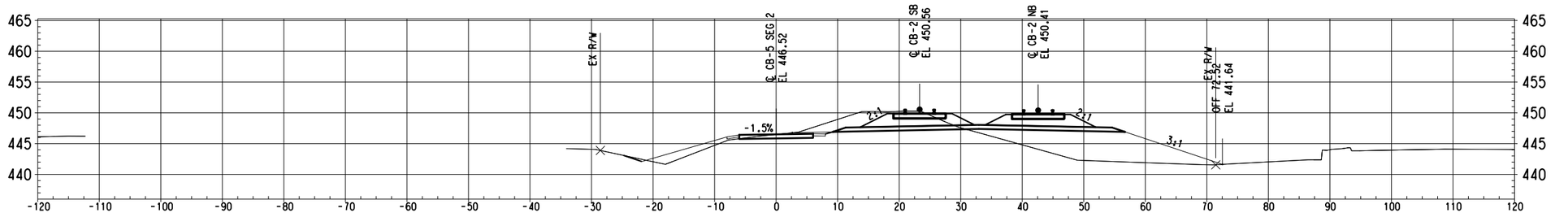

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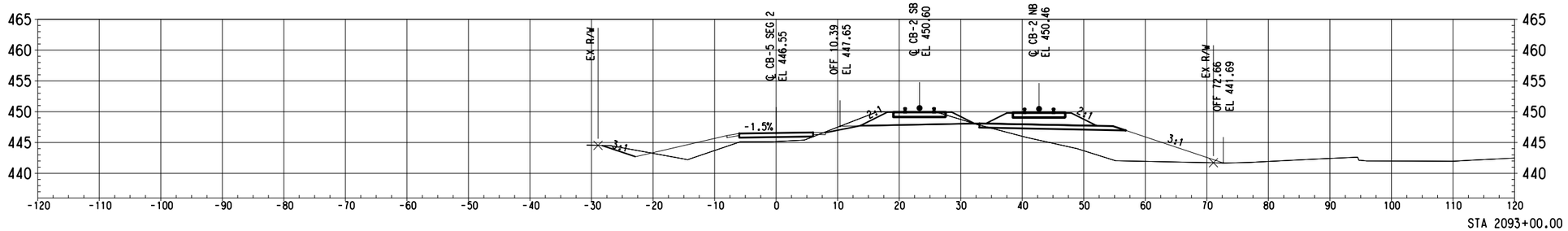

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COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

CITY OF CARROLLTON
CROSS SECTIONS
SHEET 33 OF 80

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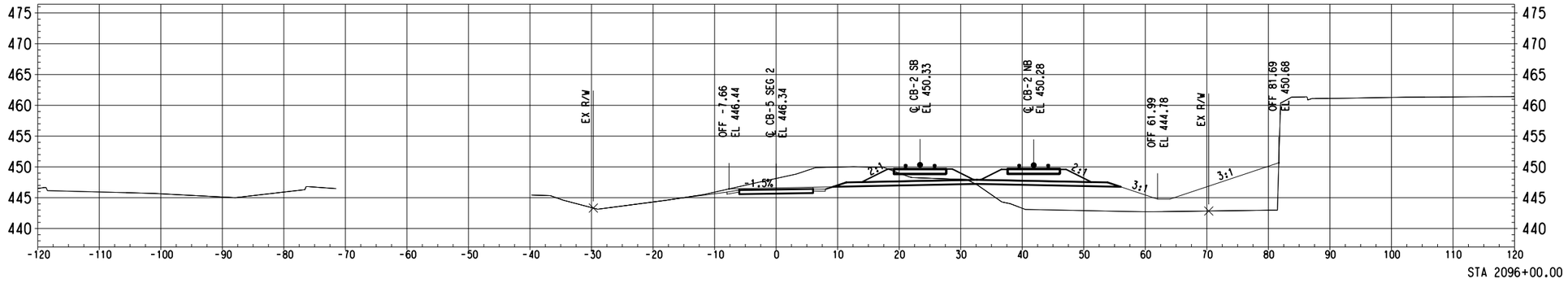
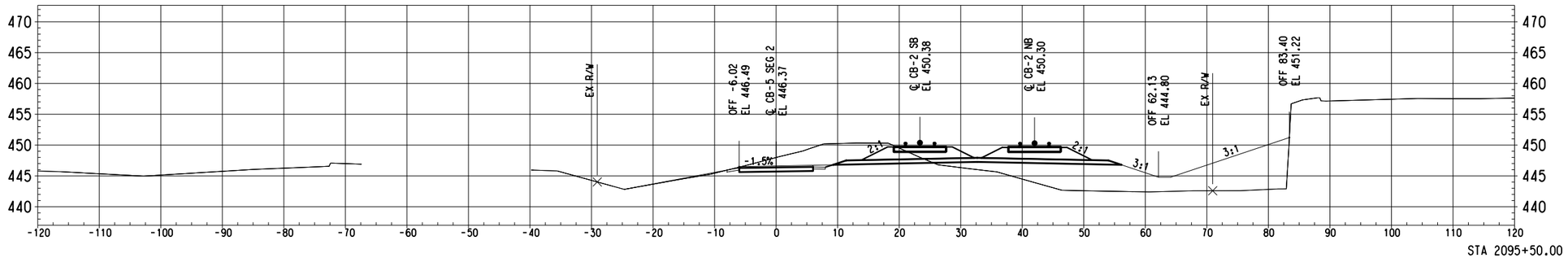
DWG No. CC1-6553

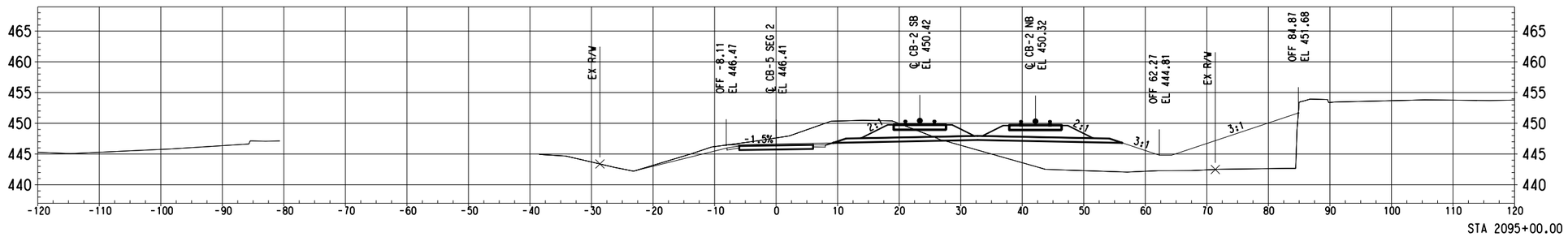
NOTE:
SEE PLAN AND PROFILE SHEETS FOR FENCE AND RIP RAP LOCATIONS AND LIMITS

HORIZ SCALE (IN FEET) 0 5 10 20

VERT SCALE (IN FEET) 0 5 10 20







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CAES

CONTRACT SHEET No. 117 OF 345

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

CITY OF CARROLLTON
CROSS SECTIONS
SHEET 34 OF 80

CONTRACT	DWG No.	REV
C-2033270-01	CC1-6553	D

CB05-CC1-6553.000

DWG No. CC1-6554

NOTE:
SEE PLAN AND PROFILE SHEETS FOR FENCE AND RIP RAP LOCATIONS AND LIMITS

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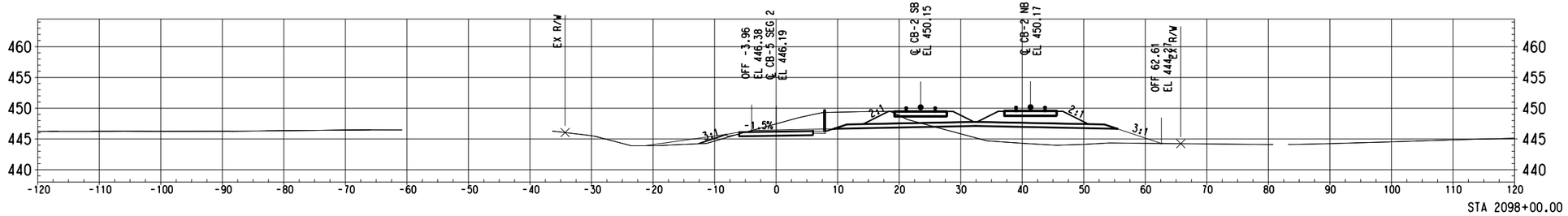
VERT SCALE (IN FEET) 0 5 10 20



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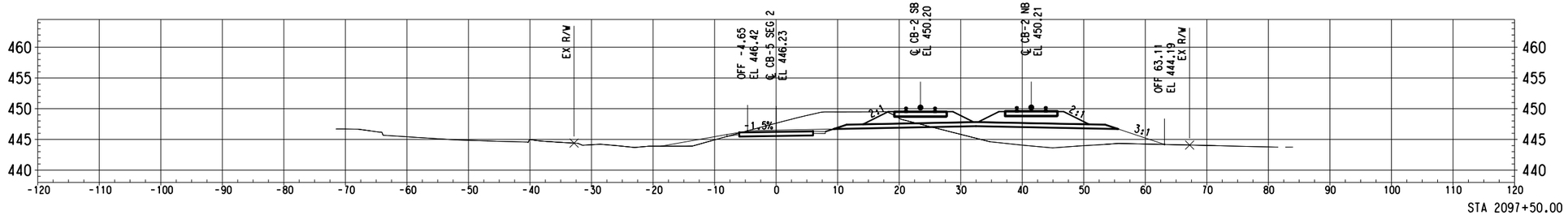

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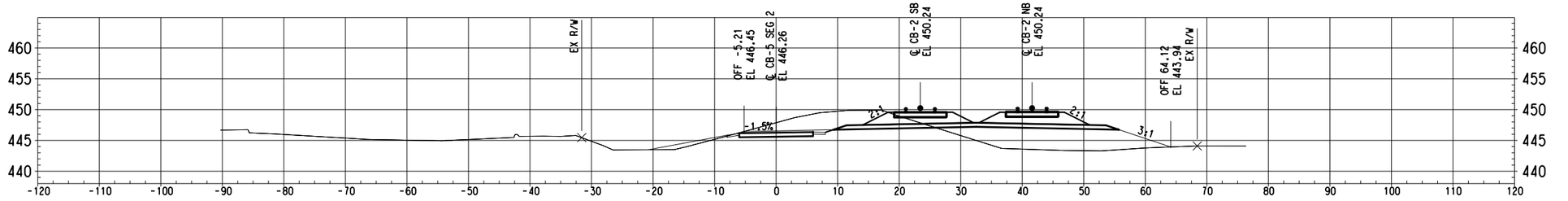

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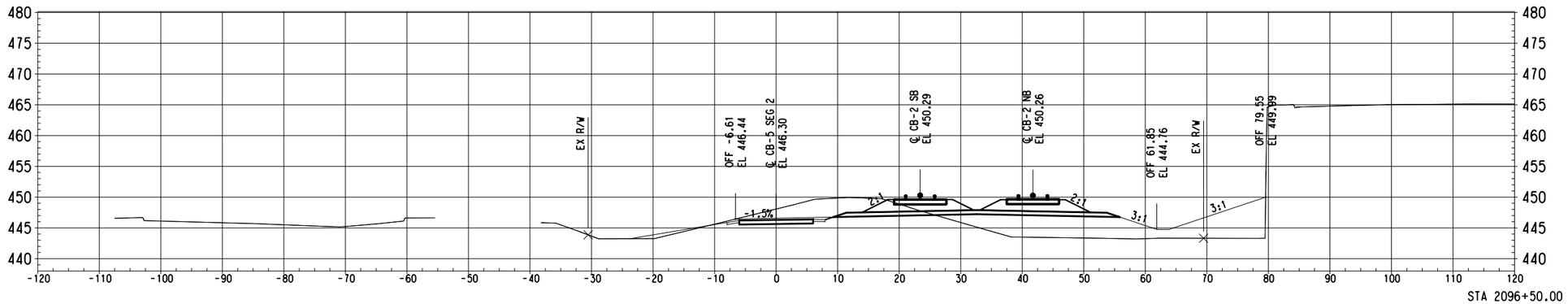

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CONTRACT SHEET No. 118 OF 345

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

CITY OF CARROLLTON
CROSS SECTIONS
SHEET 35 OF 80

CONTRACT	DWG No.	REV
C-2033270-01	CC1-6554	D

CB05-CC1-6554.000

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DWG No. CC1-6555

NOTE:
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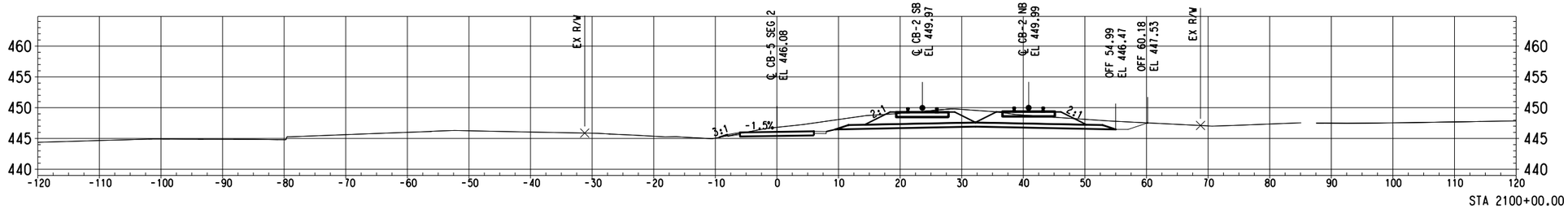
VERT SCALE (IN FEET) 0 5 10 20



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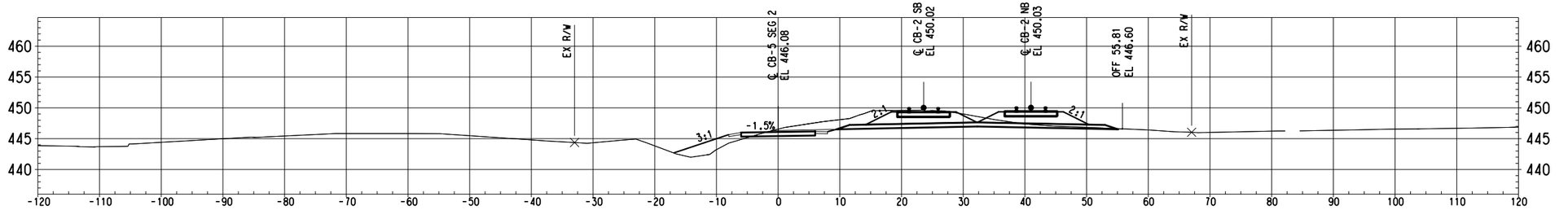

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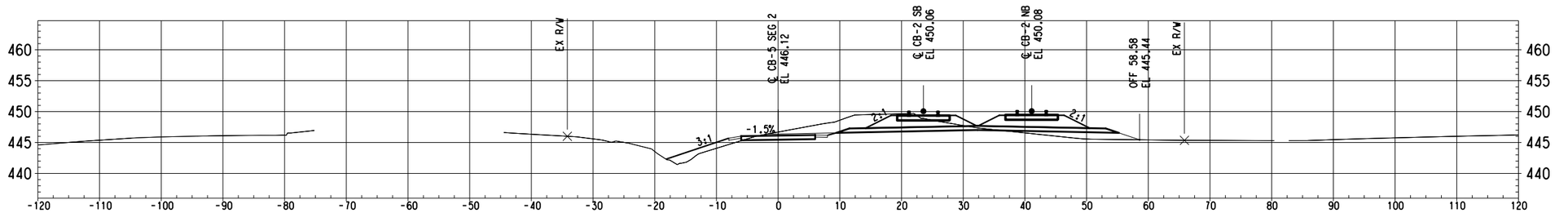

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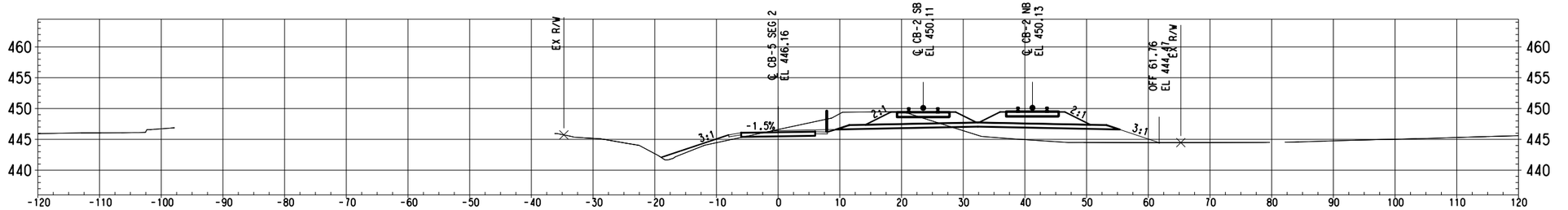

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CONTRACT SHEET No. 119 OF 345

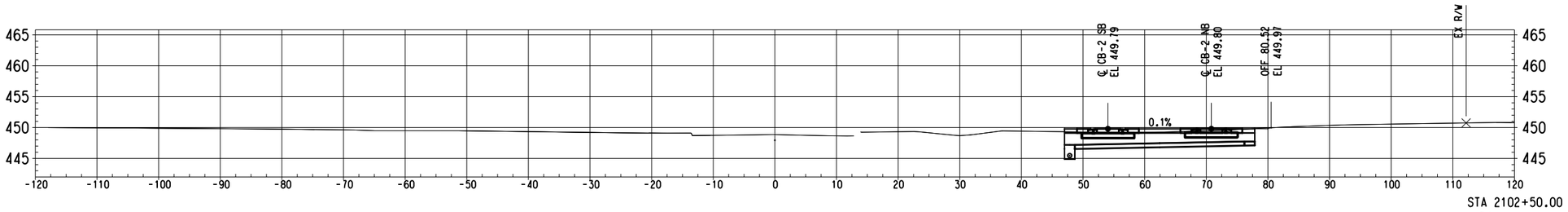
COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

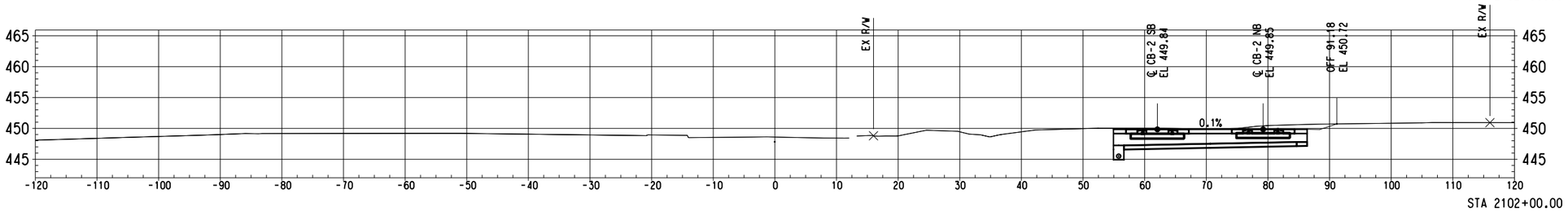
CITY OF CARROLLTON
CROSS SECTIONS
SHEET 36 OF 80

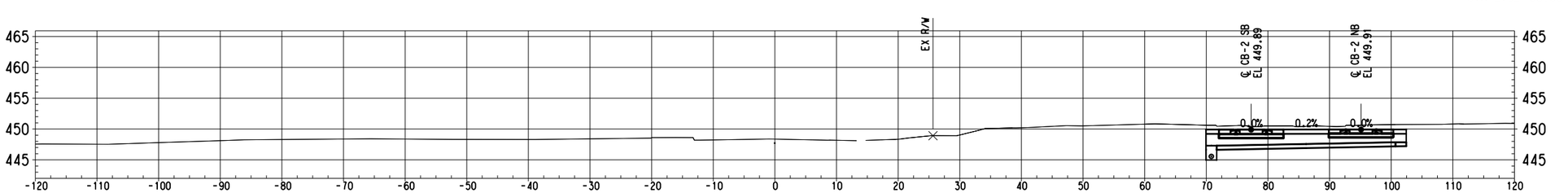
CONTRACT	DWG No.	REV
C-2033270-01	CC1-6555	D

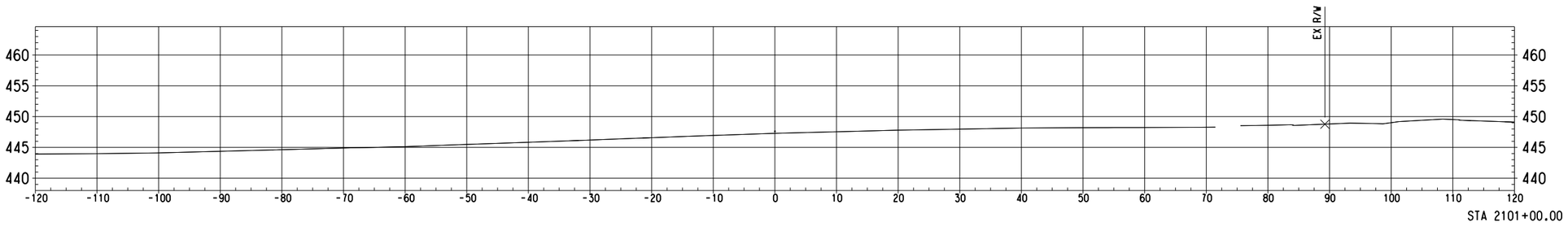
CB05-CC1-6555.000

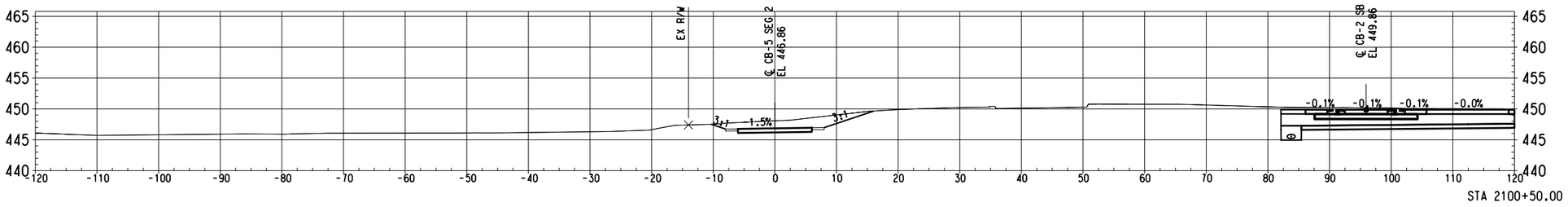
DWG No. CC1-6556











NOTE:
SEE PLAN AND PROFILE SHEETS FOR FENCE AND RIP RAP LOCATIONS AND LIMITS

HORIZ SCALE (IN FEET) 0 5 10 20

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CONTRACT SHEET No. 120 OF 345

COTTON BELT REGIONAL RAIL
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CITY OF CARROLLTON
CROSS SECTIONS
SHEET 37 OF 80

CONTRACT	DWG No.	REV
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DWG No. CC1-6557

NOTE:
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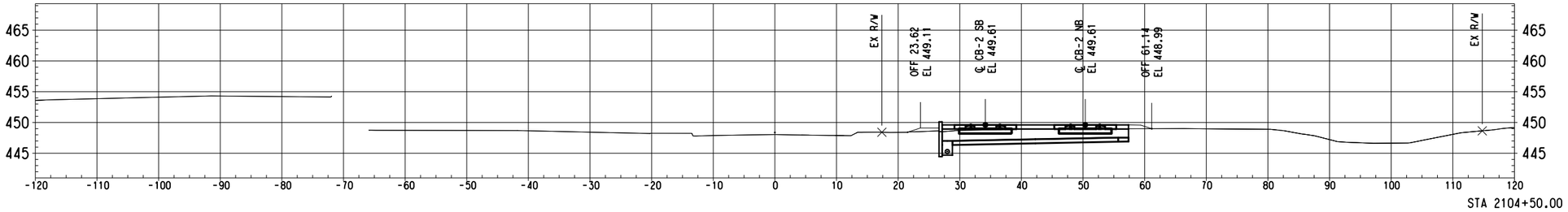
HORIZ SCALE (IN FEET) 0 5 10 20

VERT SCALE (IN FEET) 0 5 10 20



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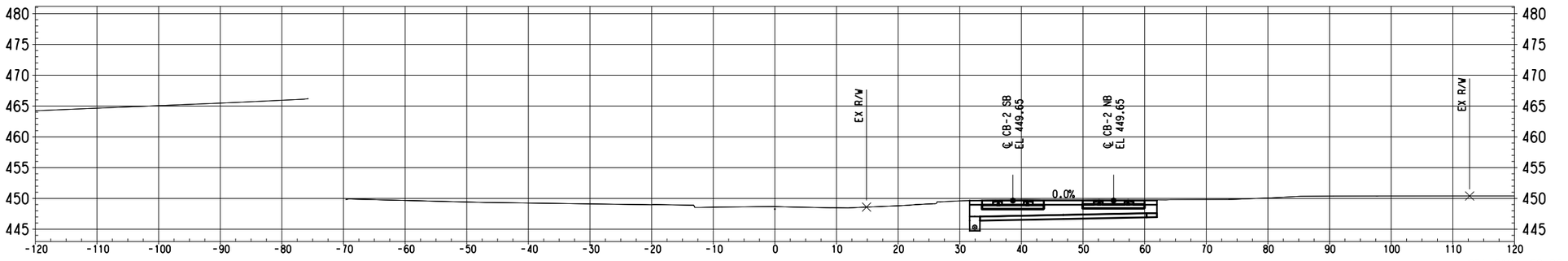

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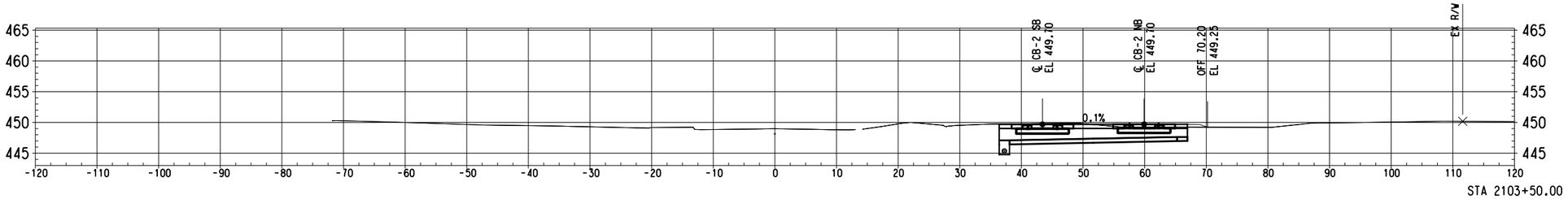

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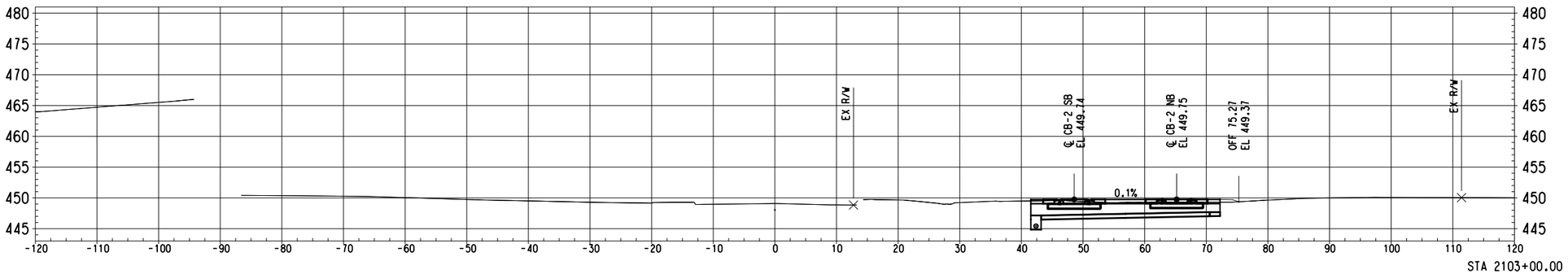

STA 2103+00.00

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CHECKED	D. LUU
IN CHARGE	D. LUU
DATE	07 AUG 23

CONTRACT SHEET No. 121 OF 345

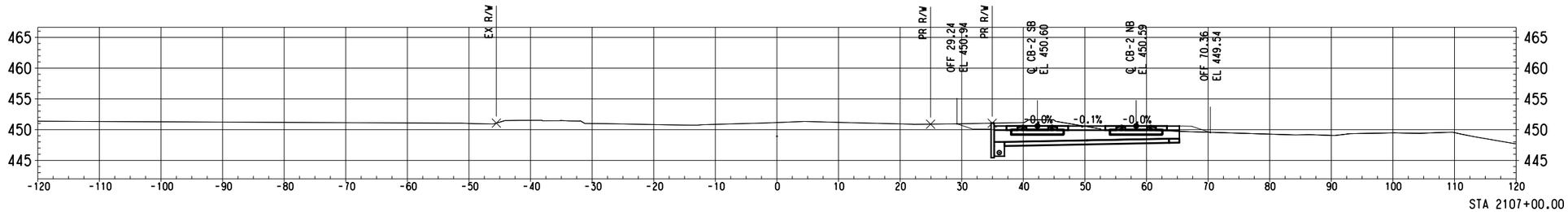
COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

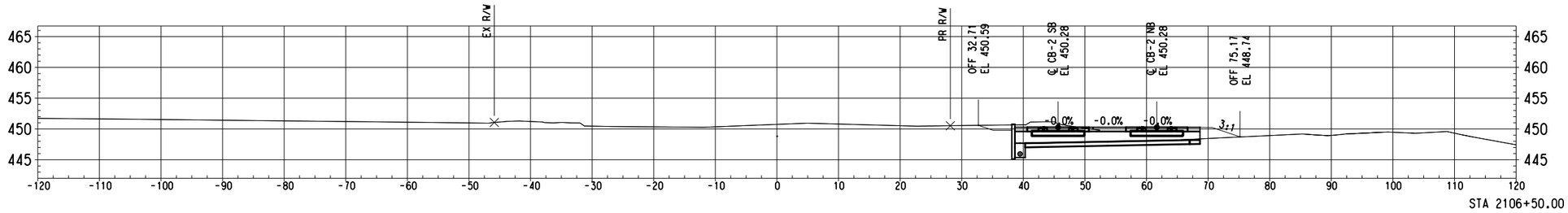
CITY OF CARROLLTON
CROSS SECTIONS
SHEET 38 OF 80

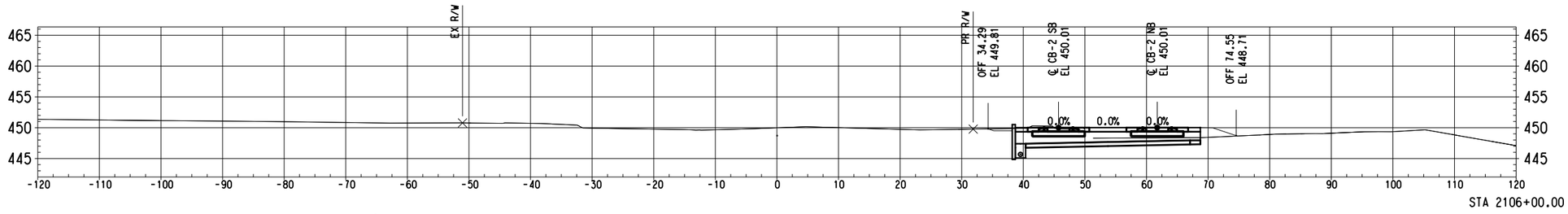
CONTRACT	DWG No.	REV
C-2033270-01	CC1-6557	D

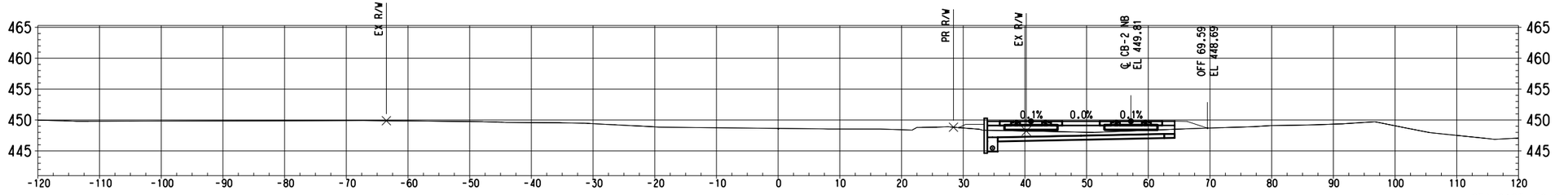
CB05-CC1-6557.000

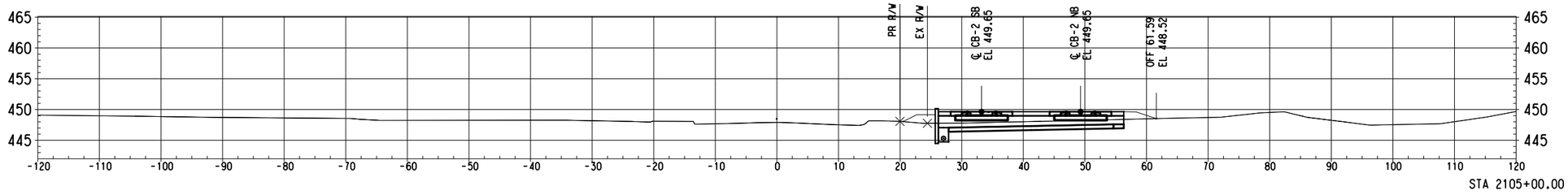
DWG No. CC1-6558











NOTE:
SEE PLAN AND PROFILE SHEETS FOR FENCE AND RIP RAP LOCATIONS AND LIMITS

HORIZ SCALE (IN FEET) 0 5 10 20

VERT SCALE (IN FEET) 0 5 10 20

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CONTRACT SHEET No. 122 OF 345

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

CITY OF CARROLLTON
CROSS SECTIONS
SHEET 39 OF 80

CONTRACT	DWG No.	REV
C-2033270-01	CC1-6558	D

CB05-CC1-6558.000

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CB05-CC1-6558.000
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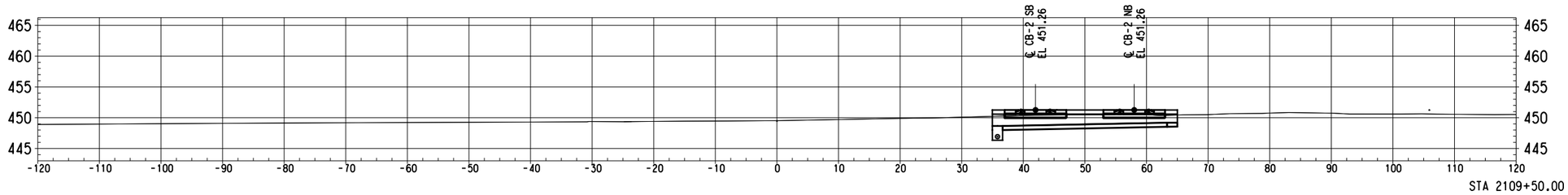
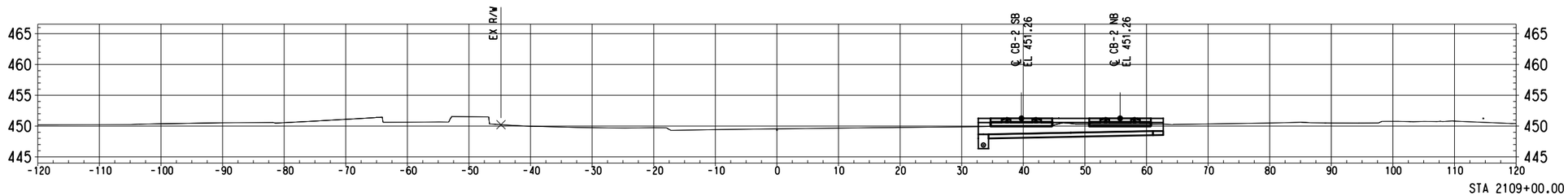
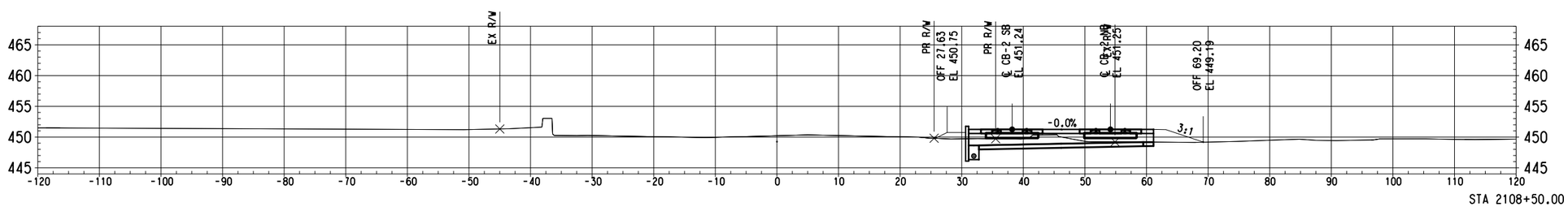
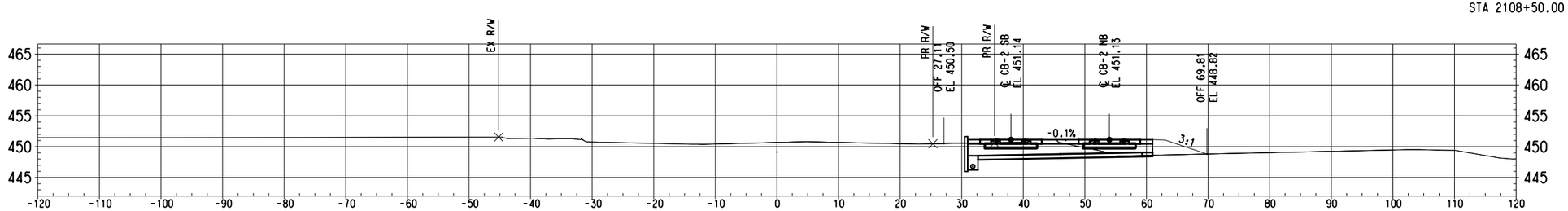
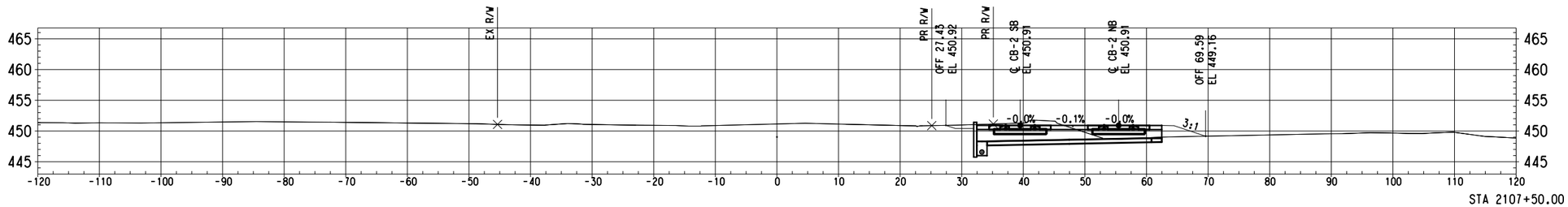
DWG No. CC1-6559











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CONTRACT SHEET No. 123 OF 345

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

CITY OF CARROLLTON
CROSS SECTIONS
SHEET 40 OF 80

CONTRACT	DWG No.	REV
C-2033270-01	CC1-6559	D

CB05-CC1-6559.000

2-AUG-2023 10:11
CB05-CC1-6559.000
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202 - 2107+50.00

DWG No. CC1-6560

NOTE:
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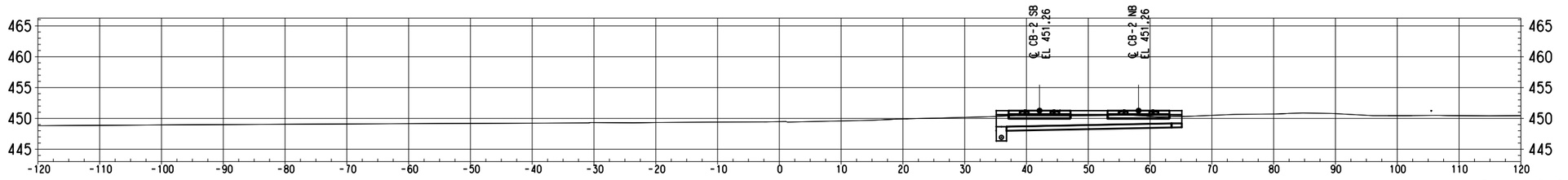
VERT SCALE (IN FEET) 0 5 10 20



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CONTRACT SHEET No. 124 OF 345

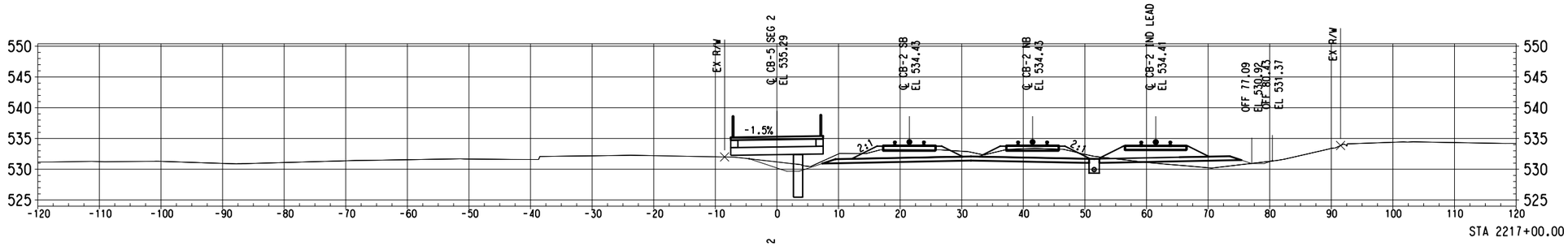
COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

CITY OF CARROLLTON
CROSS SECTIONS
SHEET 41 OF 80

CONTRACT	DWG No.	REV
C-2033270-01	CC1-6560	D

CB05-CC1-6560.000

DWG No. CC1-6561



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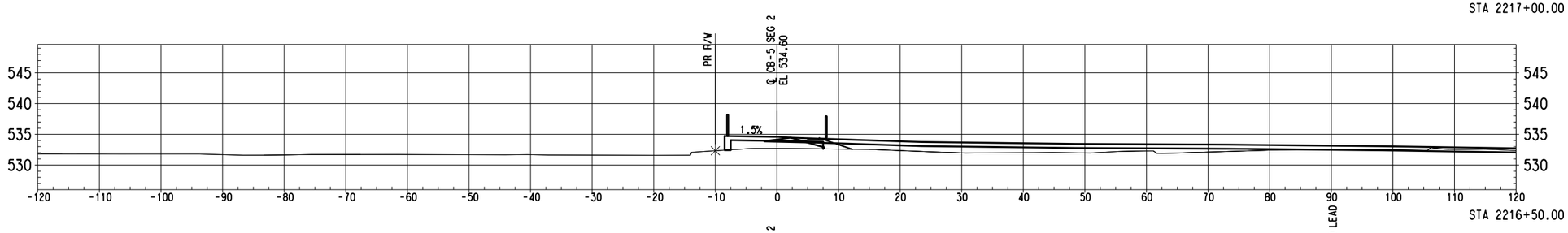

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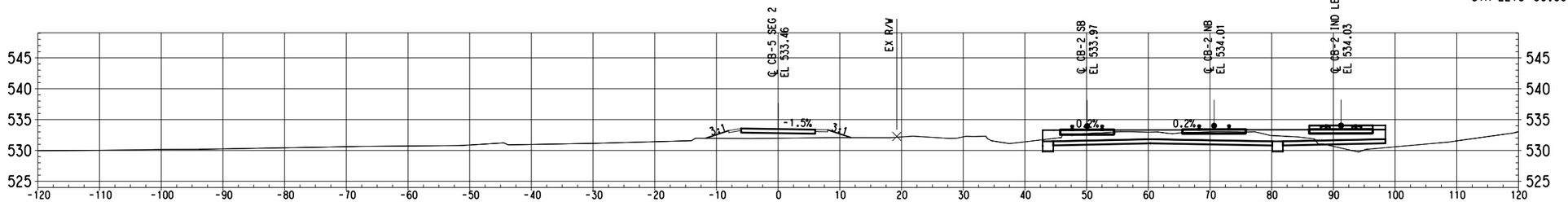

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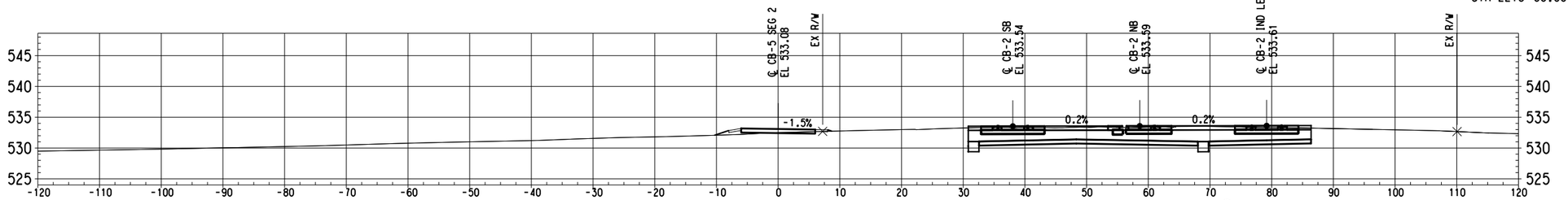

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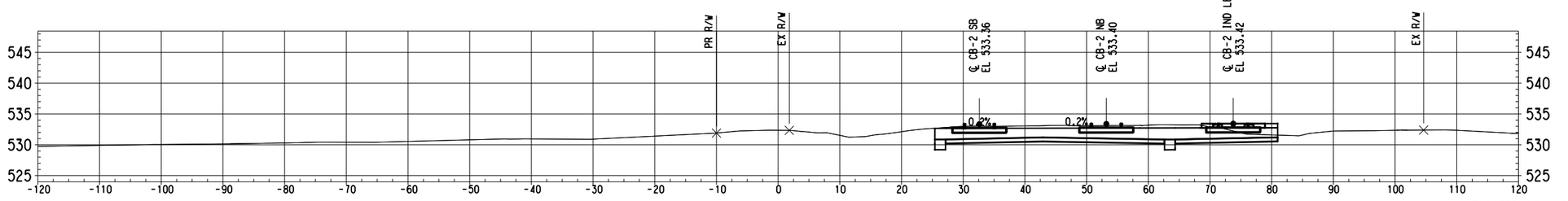

STA 2215+27.52

NOTE:
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HORIZ SCALE (IN FEET) 0 5 10 20

VERT SCALE (IN FEET) 0 5 10 20

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COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

CITY OF CARROLLTON
CROSS SECTIONS
SHEET 42 OF 80

CONTRACT SHEET No. 125 OF 345

CONTRACT	DWG No.	REV
C-2033270-01	CC1-6561	D

CB05-CC1-6561.000

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DWG No. CC1-6562

NOTE:
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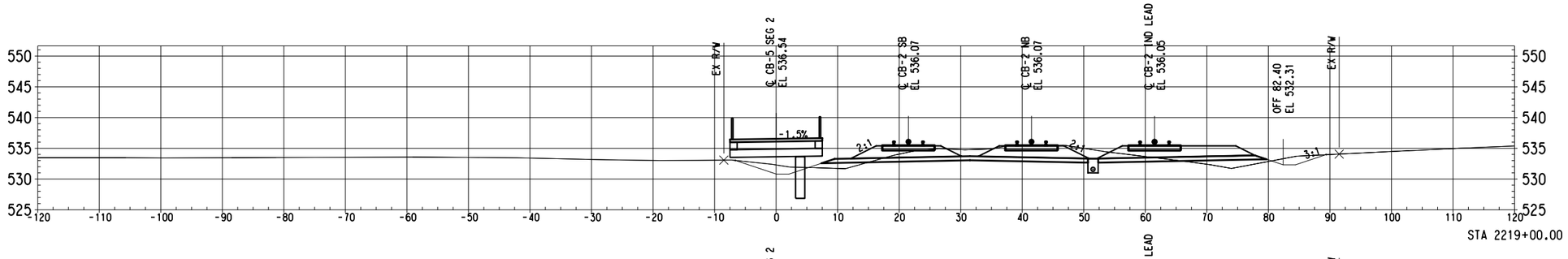
VERT SCALE (IN FEET) 0 5 10 20



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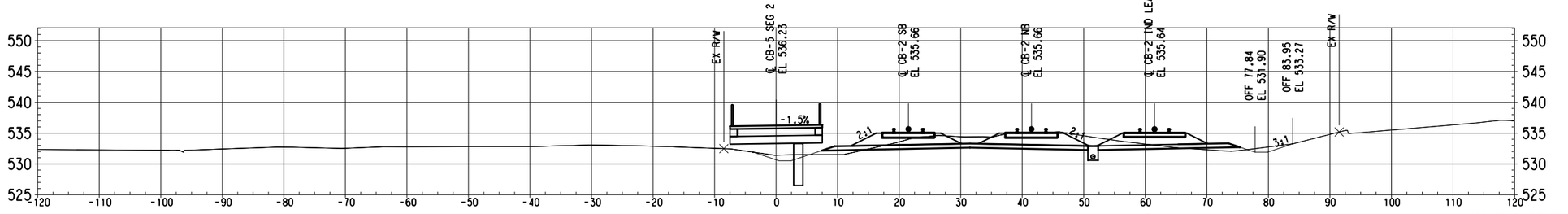

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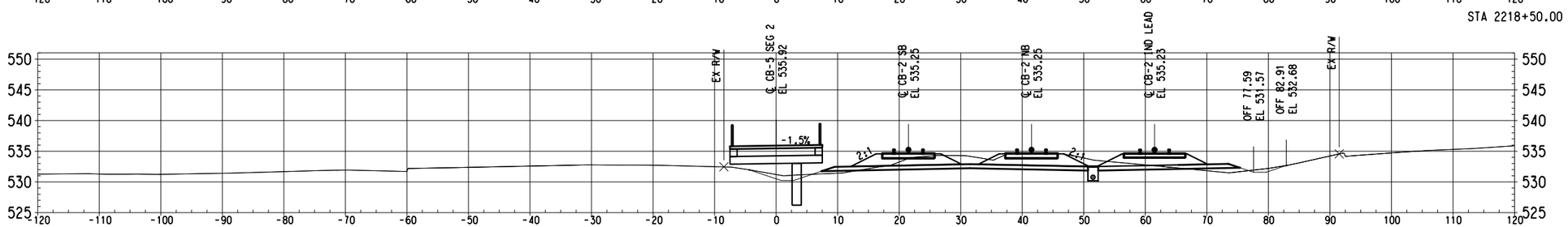

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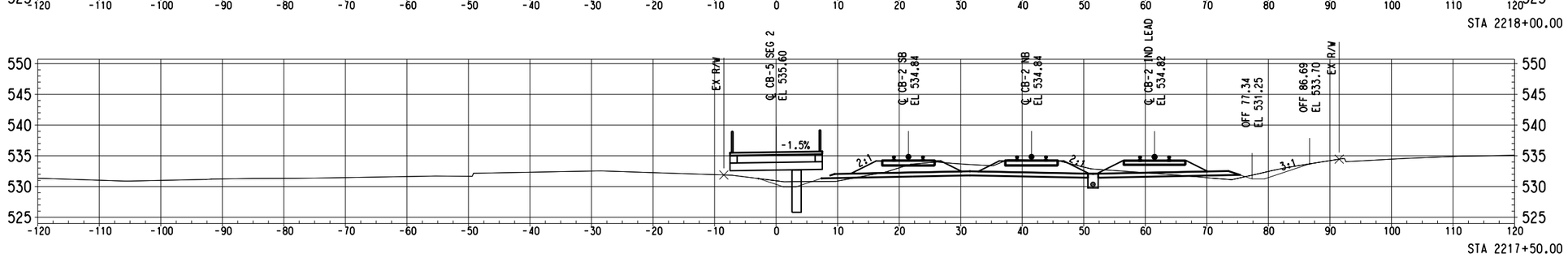

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CONTRACT SHEET No. 126 OF 345

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

CITY OF CARROLLTON
CROSS SECTIONS
SHEET 43 OF 80

CONTRACT	DWG No.	REV
C-2033270-01	CC1-6562	D

CB05-CC1-6562.000

DWG No. CC1-6563

NOTE:
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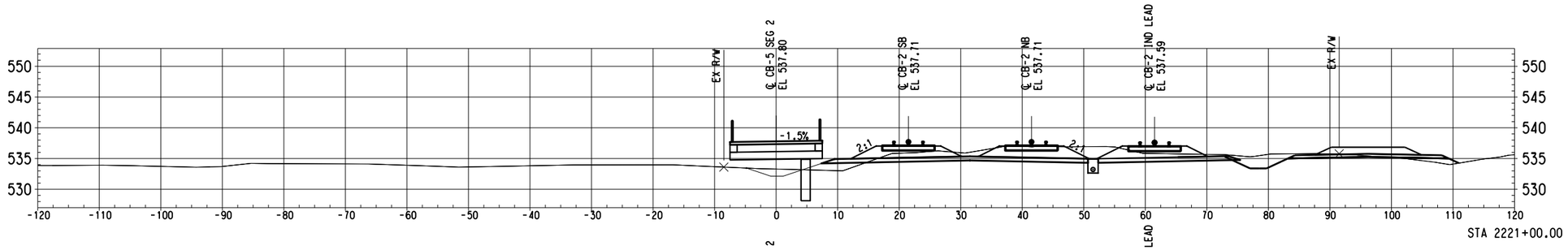
HORIZ SCALE (IN FEET) 0 5 10 20

VERT SCALE (IN FEET) 0 5 10 20



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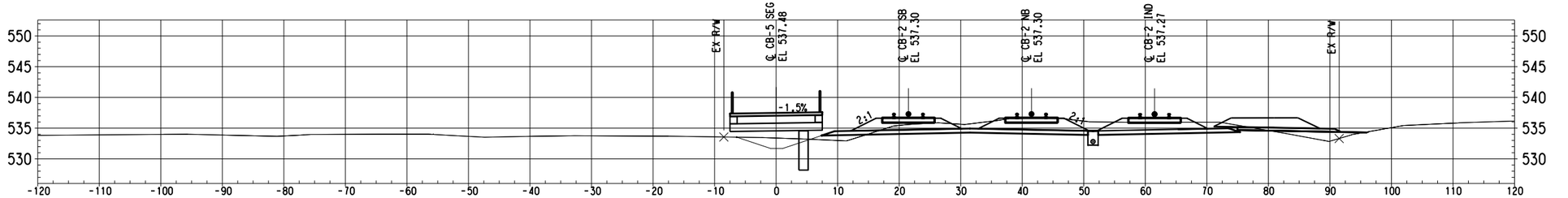

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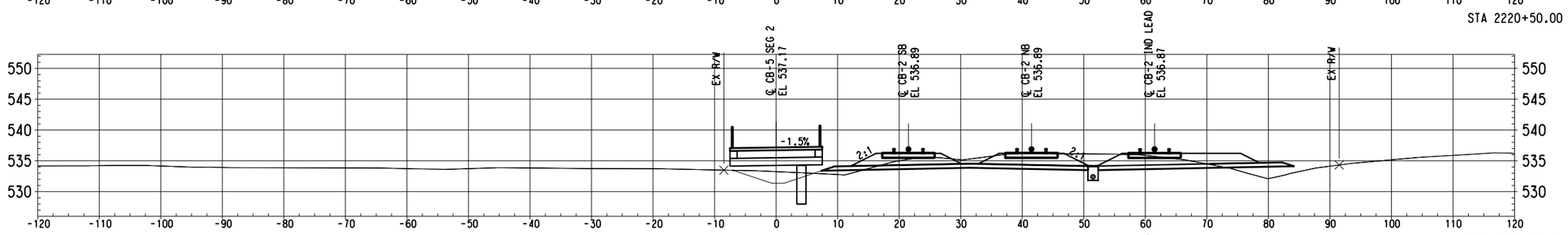

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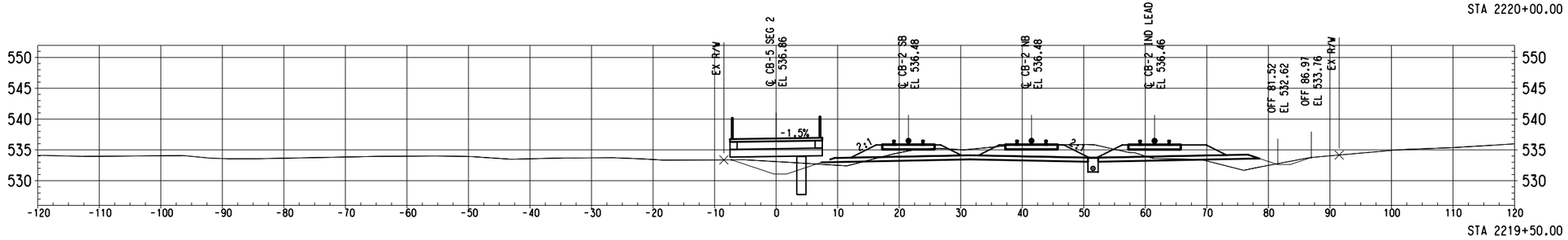

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CONTRACT SHEET No. 127 OF 345

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

CITY OF CARROLLTON
CROSS SECTIONS
SHEET 44 OF 80

CONTRACT	DWG No.	REV
C-2033270-01	CC1-6563	D

CB05-CC1-6563.000

DWG No. CC1-6564

NOTE:
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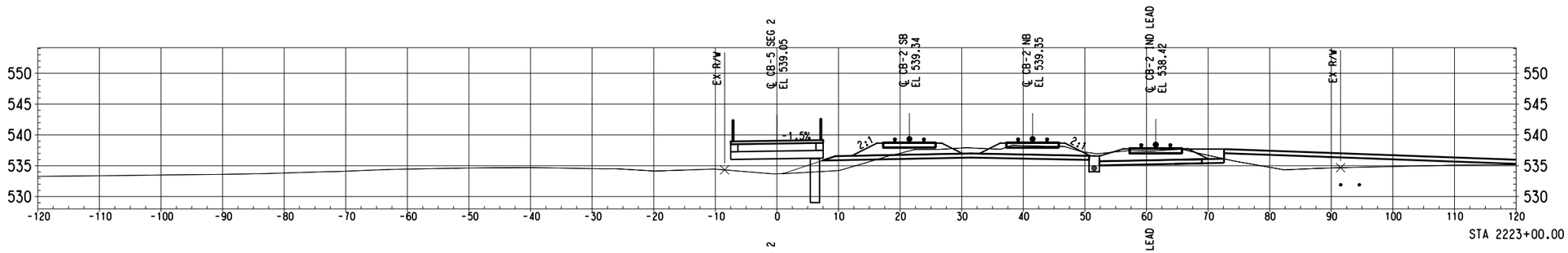
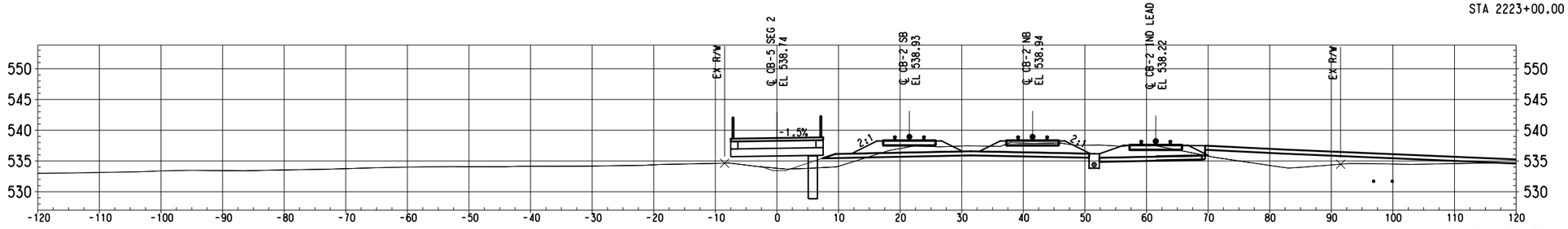
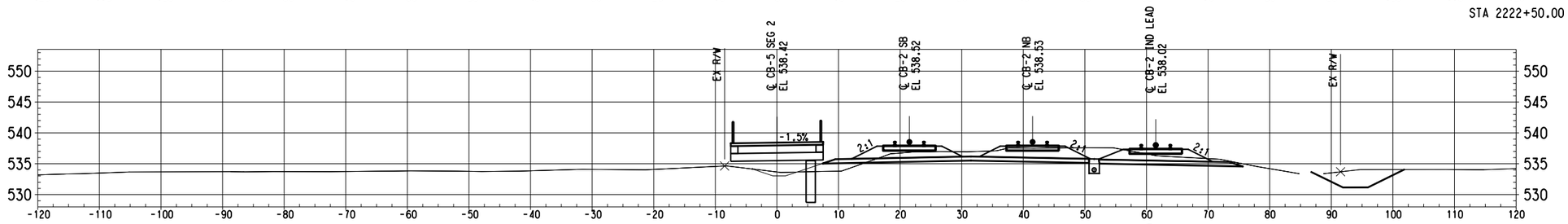
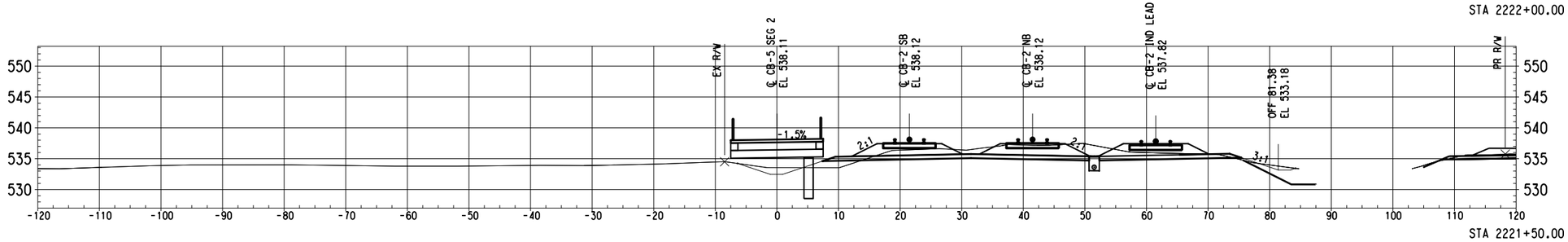
SCALE (IN FEET)
HORIZ 0 5 10 20
SCALE (IN FEET)
VERT 0 5 10 20









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CONTRACT SHEET No. 128 OF 345

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

CITY OF CARROLLTON
CROSS SECTIONS
SHEET 45 OF 80

SCALE	AS NOTED
DRAWN	S. SALEH
DESIGNED	S. SALEH
CHECKED	D. LUU
IN CHARGE	D. LUU
DATE	07 AUG 23

CAES

CONTRACT	DWG No.	REV
C-2033270-01	CC1-6564	D

CB05-CC1-6564.000

DWG No. CC1-6565

NOTE:
SEE PLAN AND PROFILE SHEETS FOR FENCE
AND RIP RAP LOCATIONS AND LIMITS

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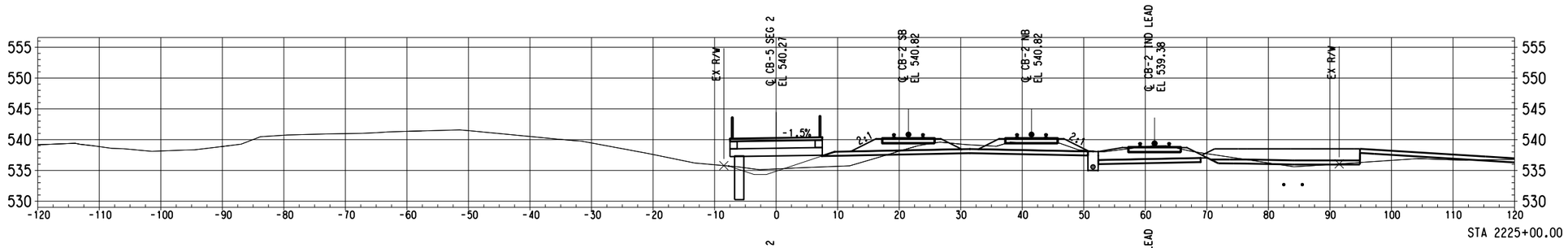
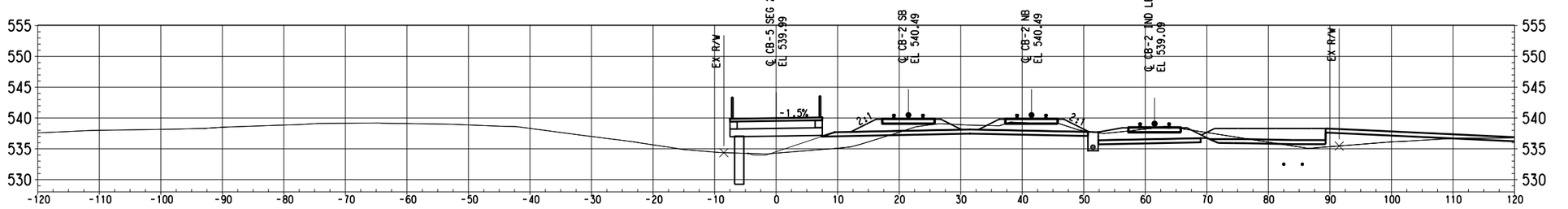
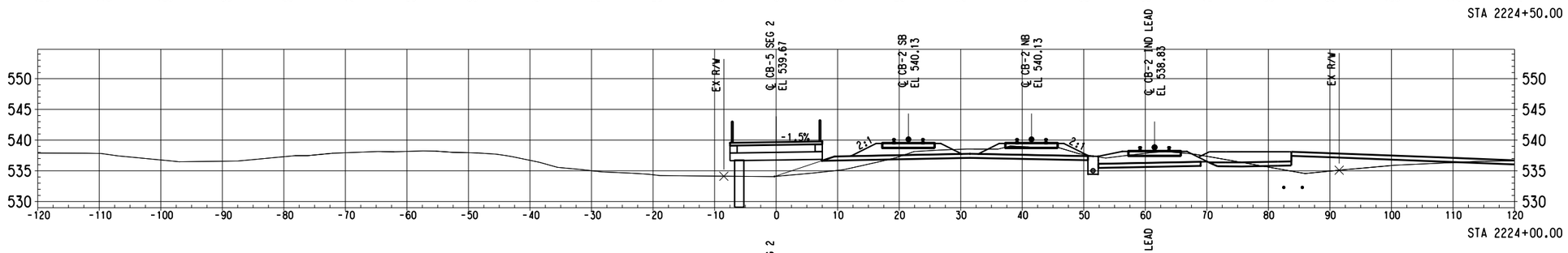
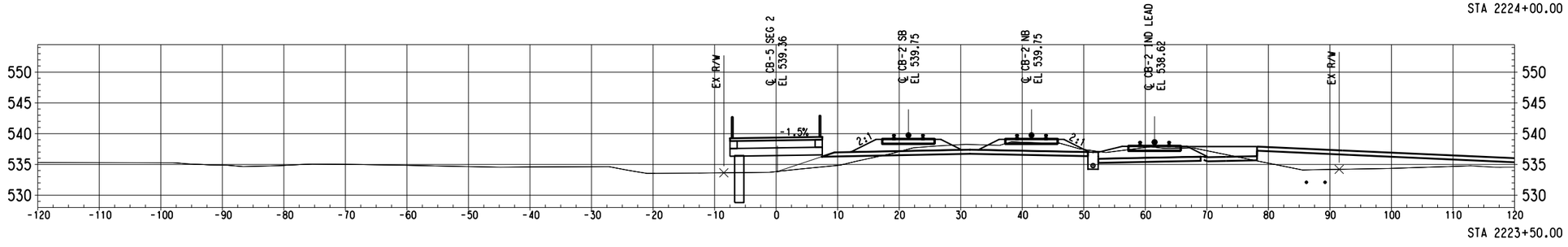
VERT SCALE (IN FEET) 0 5 10 20









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DRAWN	S. SALEH
DESIGNED	S. SALEH
CHECKED	D. LUU
IN CHARGE	D. LUU
DATE	07 AUG 23

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CONTRACT SHEET No. 129 OF 345

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

CITY OF CARROLLTON
CROSS SECTIONS
SHEET 46 OF 80

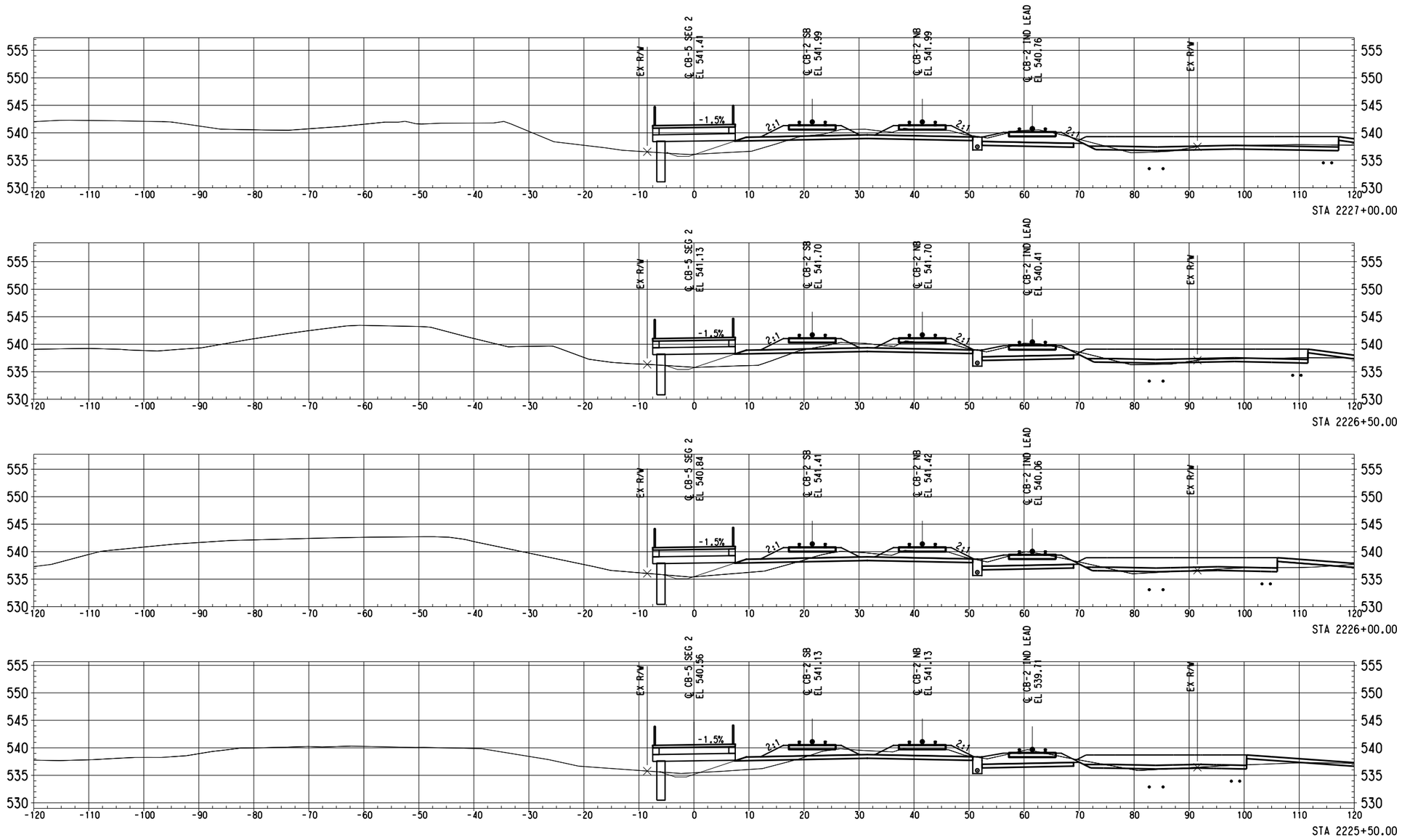
CONTRACT	DWG No.	REV
C-2033270-01	CC1-6565	D

CB05-CC1-6565.000

DWG No. CC1-6566

NOTE:
SEE PLAN AND PROFILE SHEETS FOR FENCE AND RIP RAP LOCATIONS AND LIMITS

SCALE (IN FEET)
HORIZ 0 5 10 20
SCALE (IN FEET)
VERT 0 5 10 20



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DESIGNED	S. SALEH
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IN CHARGE	D. LUU
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CONTRACT SHEET No. 130 OF 345

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

CITY OF CARROLLTON
CROSS SECTIONS
SHEET 47 OF 80

CONTRACT	DWG No.	REV
C-2033270-01	CC1-6566	D

CB05-CC1-6566.000

DWG No. CC1-6567

NOTE:
SEE PLAN AND PROFILE SHEETS FOR FENCE AND RIP RAP LOCATIONS AND LIMITS

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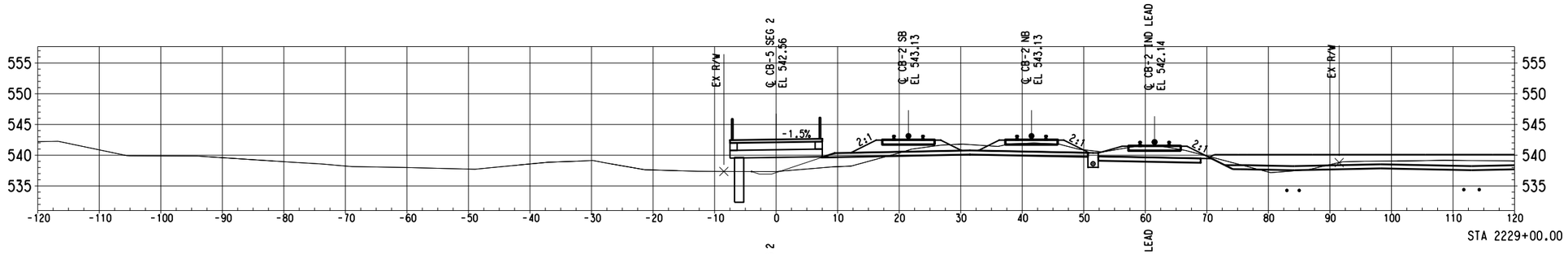
VERT SCALE (IN FEET) 0 5 10 20



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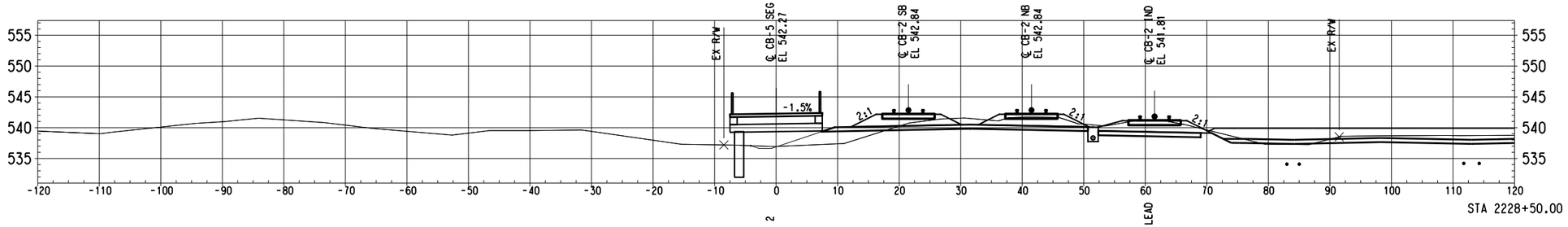

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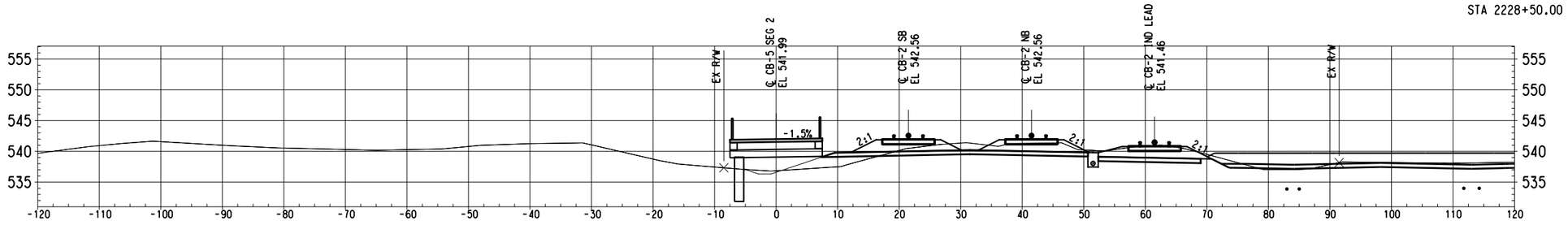

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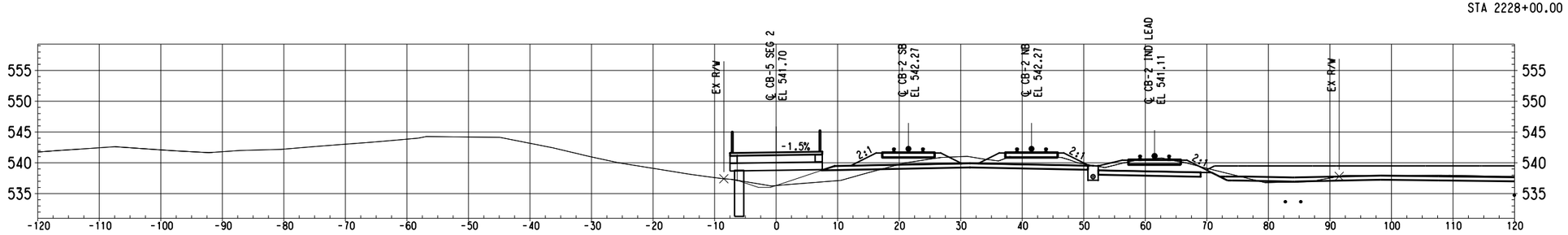

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DESIGNED	S. SALEH
CHECKED	D. LUU
IN CHARGE	D. LUU
DATE	07 AUG 23

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CONTRACT SHEET No. 131 OF 345

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

CITY OF CARROLLTON
CROSS SECTIONS
SHEET 48 OF 80

CONTRACT	DWG No.	REV
C-2033270-01	CC1-6567	D

CB05-CC1-6567.000

DWG No. CC1-6568

NOTE:
SEE PLAN AND PROFILE SHEETS FOR FENCE AND RIP RAP LOCATIONS AND LIMITS

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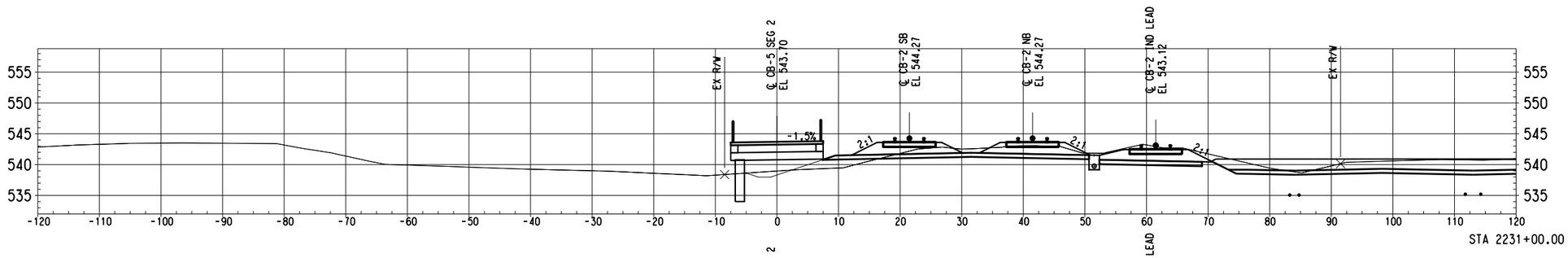

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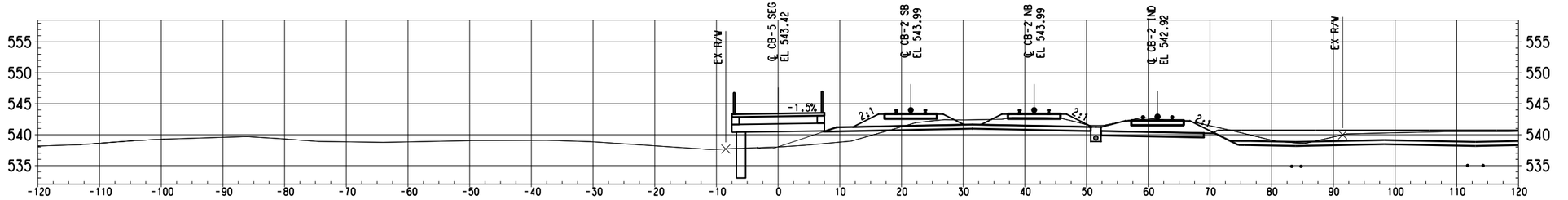

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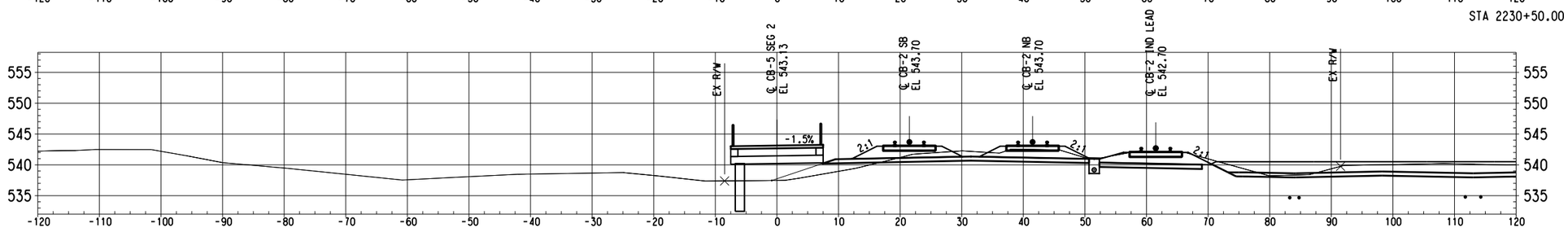

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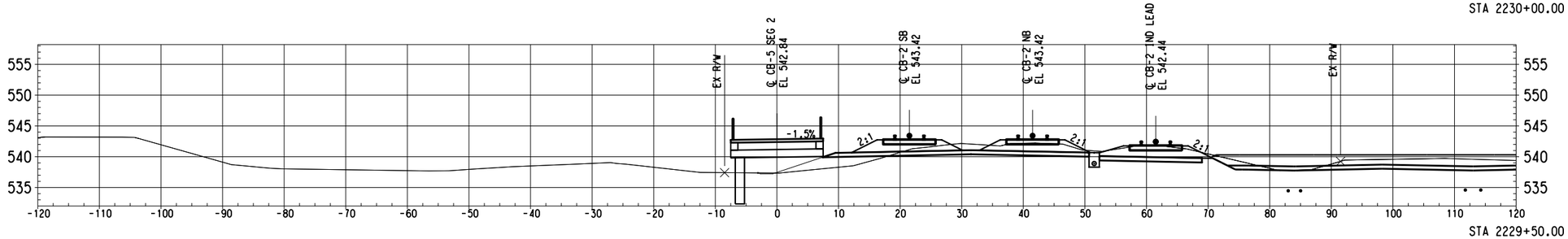

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CHECKED	D. LUU
IN CHARGE	D. LUU
DATE	07 AUG 23

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CONTRACT SHEET No. 132 OF 345

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

CITY OF CARROLLTON
CROSS SECTIONS
SHEET 49 OF 80

CONTRACT	DWG No.	REV
C-2033270-01	CC1-6568	D

CB05-CC1-6568.000

DWG No. CC1-6569

NOTE:
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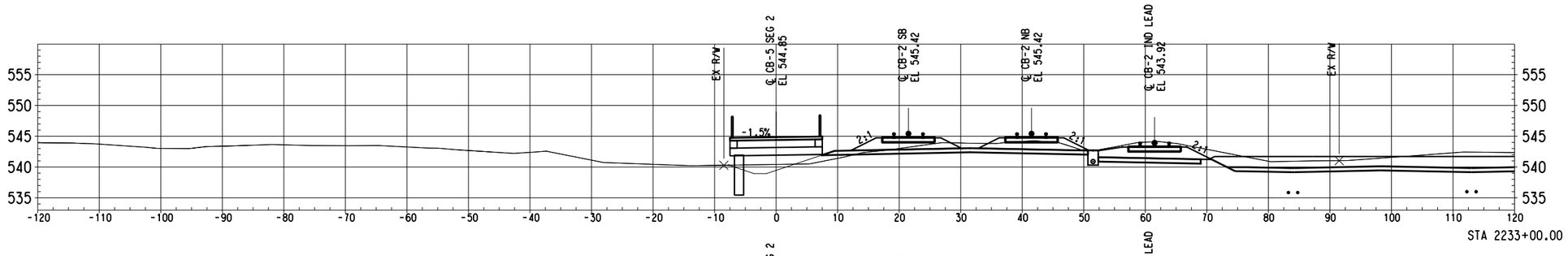
VERT SCALE (IN FEET) 0 5 10 20



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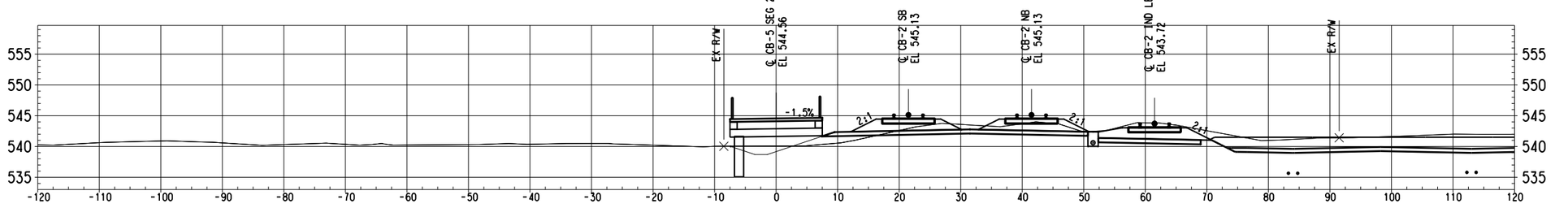

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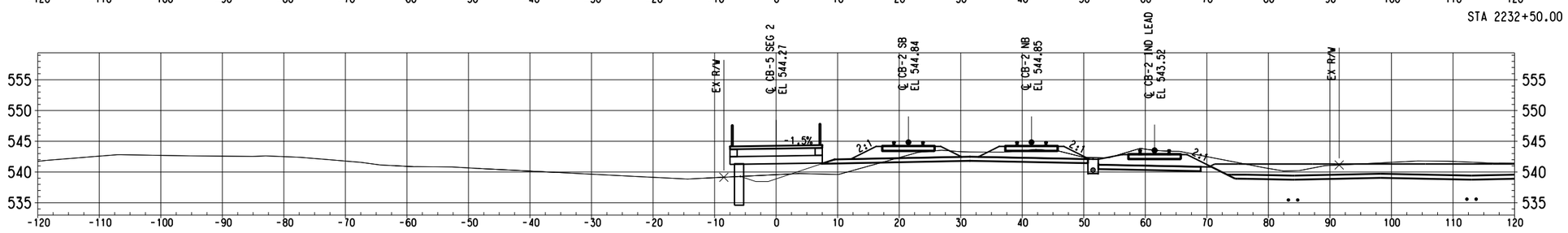

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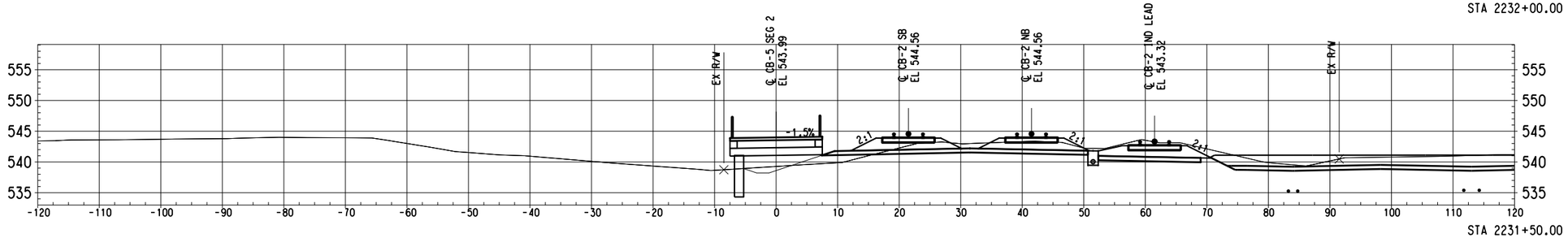

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CONTRACT SHEET No. 133 OF 345

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

CITY OF CARROLLTON
CROSS SECTIONS
SHEET 50 OF 80

CONTRACT	DWG No.	REV
C-2033270-01	CC1-6569	D

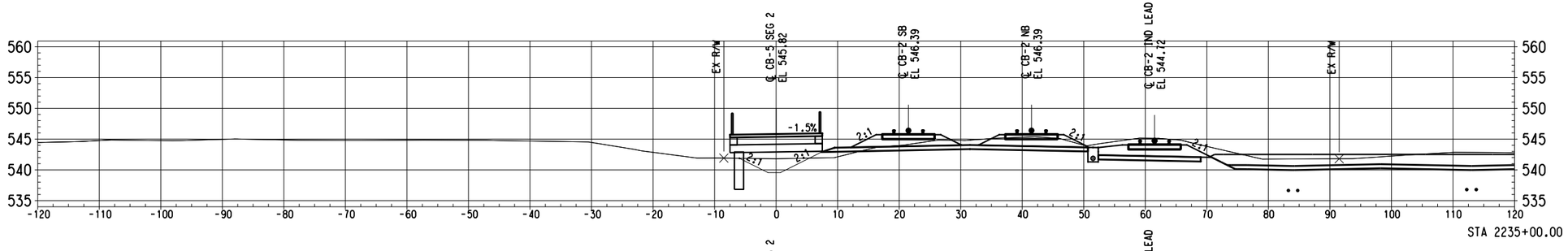
CB05-CC1-6569.000

DWG No. CC1-6570

NOTE:
SEE PLAN AND PROFILE SHEETS FOR FENCE AND RIP RAP LOCATIONS AND LIMITS

HORIZ SCALE (IN FEET) 0 5 10 20

VERT SCALE (IN FEET) 0 5 10 20



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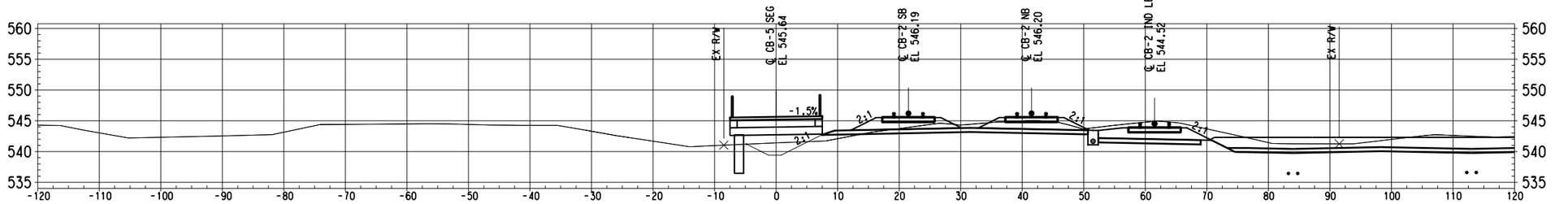

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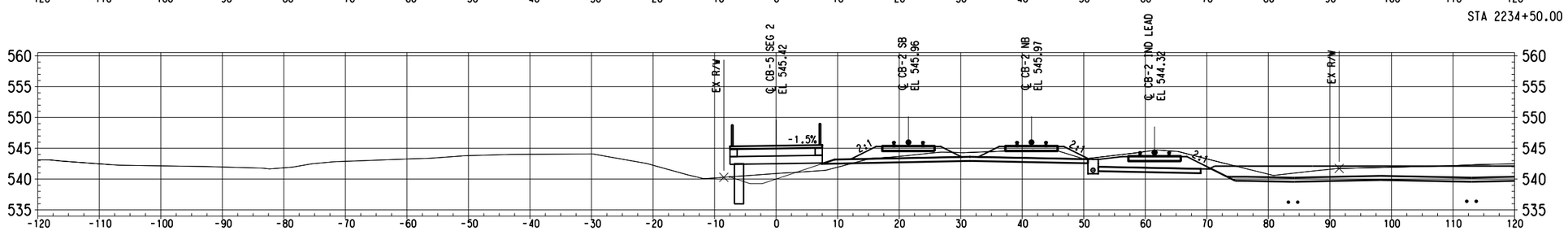

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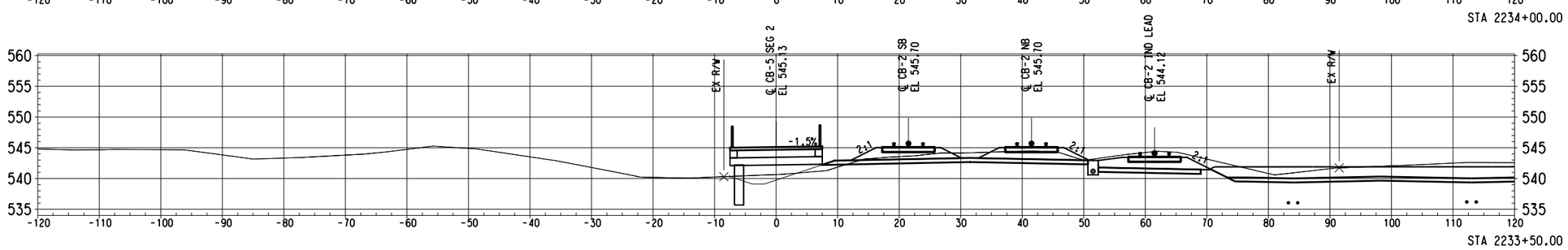

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DRAWN	S. SALEH
DESIGNED	S. SALEH
CHECKED	D. LUU
IN CHARGE	D. LUU
DATE	07 AUG 23

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CONTRACT SHEET No. 134 OF 345

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

CITY OF CARROLLTON
CROSS SECTIONS
SHEET 51 OF 80

CONTRACT	DWG No.	REV
C-2033270-01	CC1-6570	D

CB05-CC1-6570.000

DWG No. CC1-6571

NOTE:
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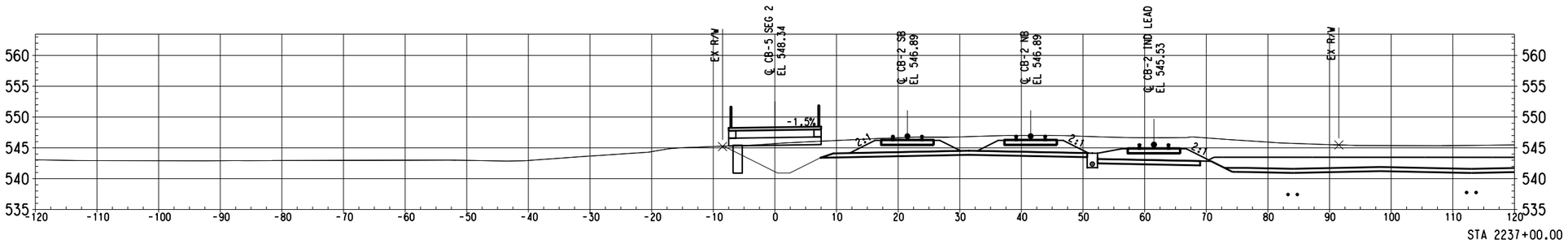
SCALE (IN FEET)
VERT 0 5 10 20



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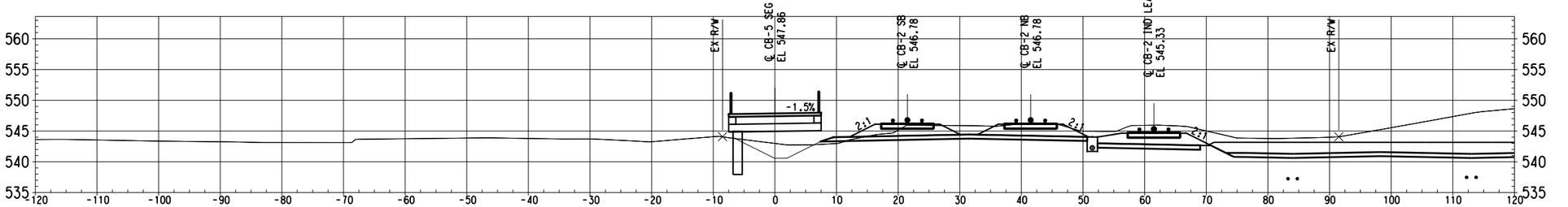

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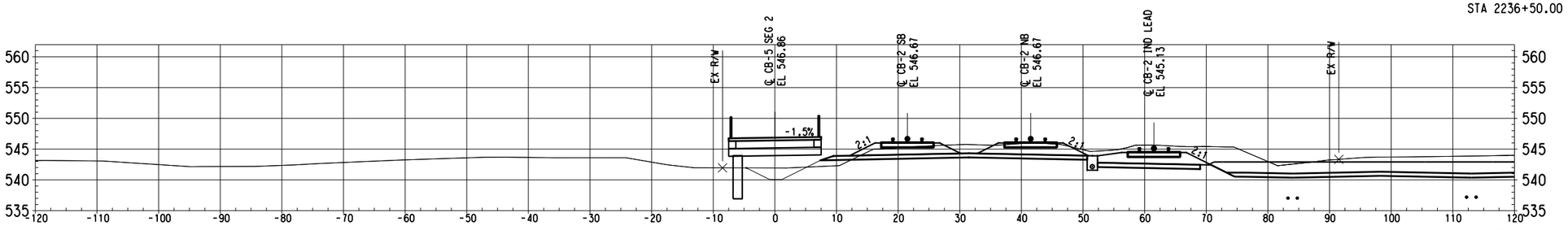

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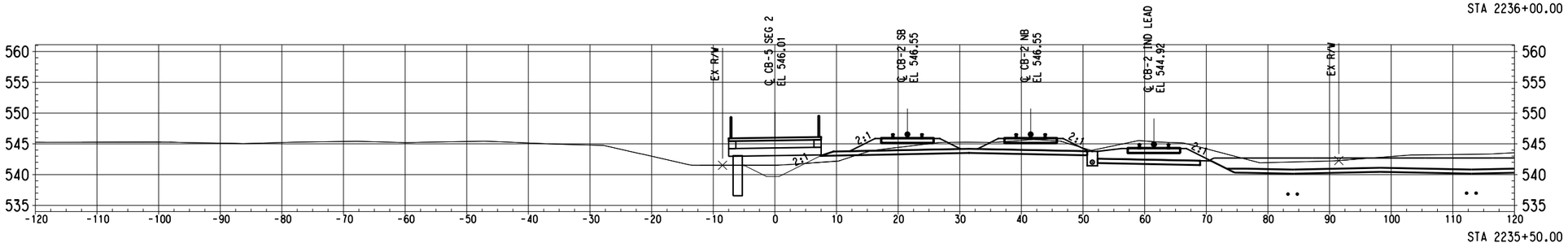

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DESIGNED	S. SALEH
CHECKED	D. LUU
IN CHARGE	D. LUU
DATE	07 AUG 23

CAES

CONTRACT SHEET No. 135 OF 345

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

CITY OF CARROLLTON
CROSS SECTIONS
SHEET 52 OF 80

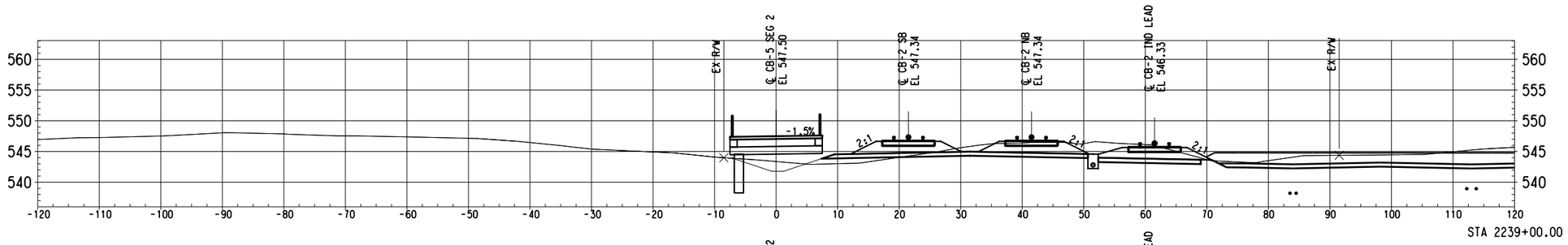
CONTRACT	DWG No.	REV
C-2033270-01	CC1-6571	D

CB05-CC1-6571.000

DWG No. CC1-6572

NOTE:
SEE PLAN AND PROFILE SHEETS FOR FENCE AND RIP RAP LOCATIONS AND LIMITS

SCALE (IN FEET)
HORIZ 0 5 10 20
SCALE (IN FEET)
VERT 0 5 10 20



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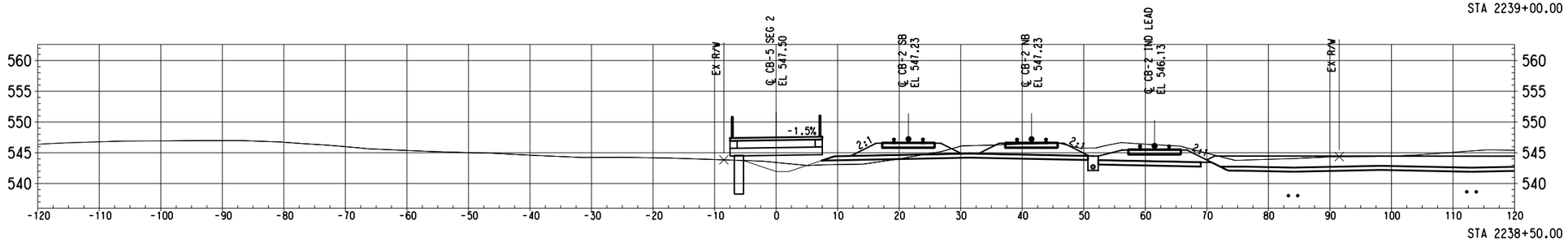

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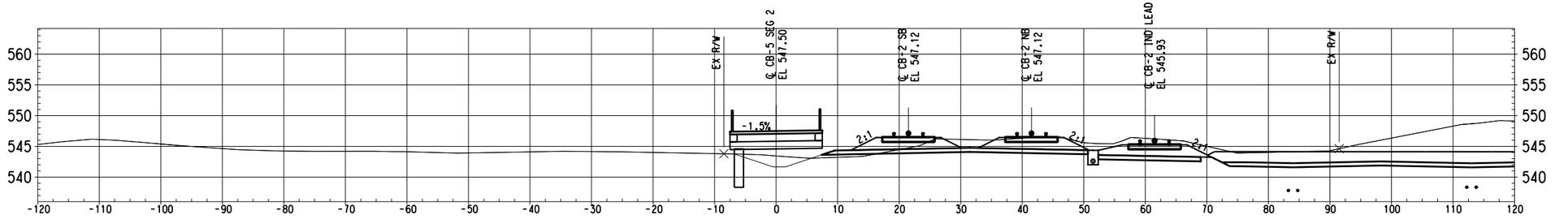

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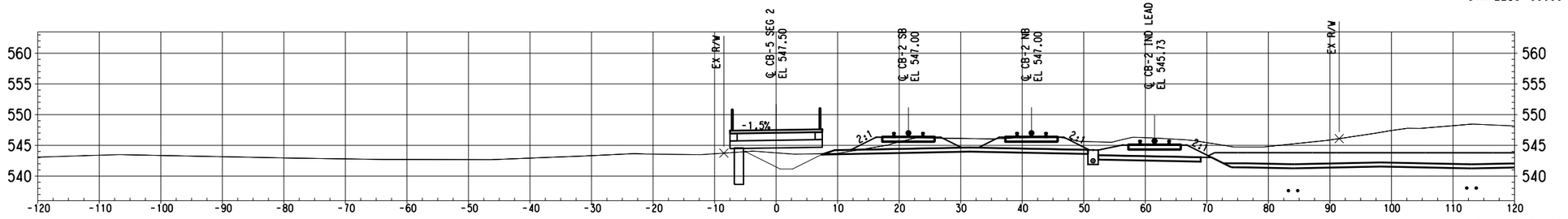

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COTTON BELT REGIONAL RAIL VELOWEB HIKE & BIKE TRAIL

CITY OF CARROLLTON
CROSS SECTIONS
SHEET 53 OF 80

CONTRACT	DWG No.	REV
C-2033270-01	CC1-6572	D

CB05-CC1-6572.000

DWG No. CC1-6573

NOTE:
SEE PLAN AND PROFILE SHEETS FOR FENCE AND RIP RAP LOCATIONS AND LIMITS

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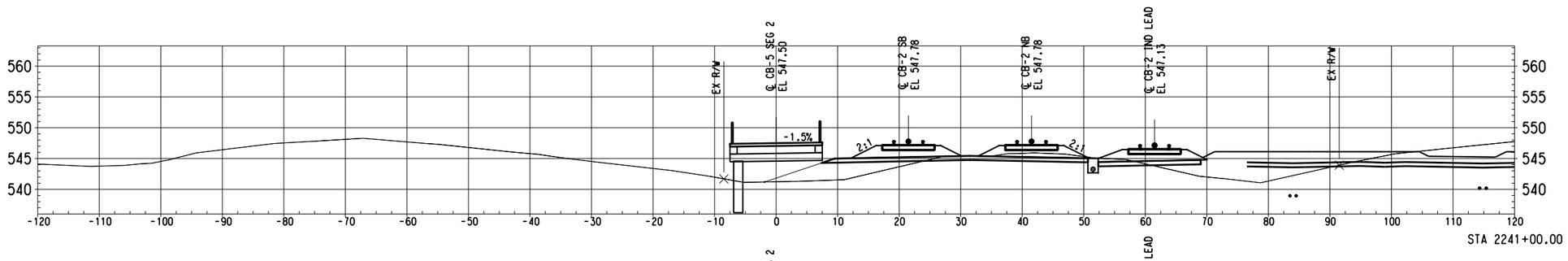
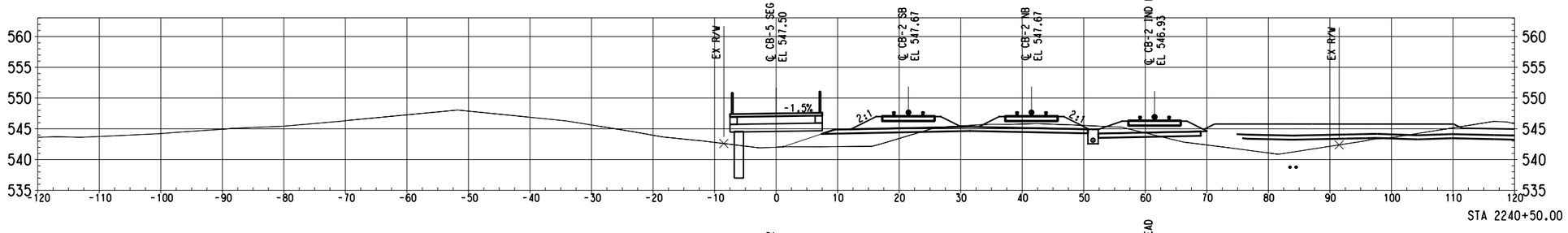
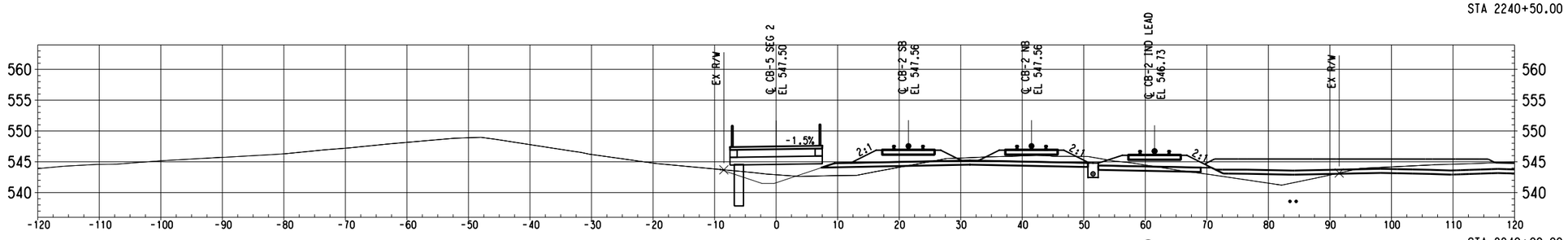
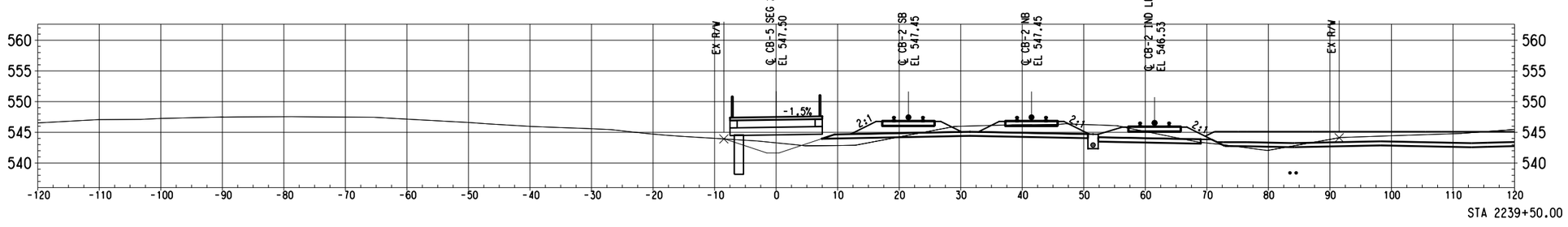
VERT SCALE (IN FEET) 0 5 10 20









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CHECKED	D. LUU
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DATE	07 AUG 23

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CONTRACT SHEET No. 137 OF 345

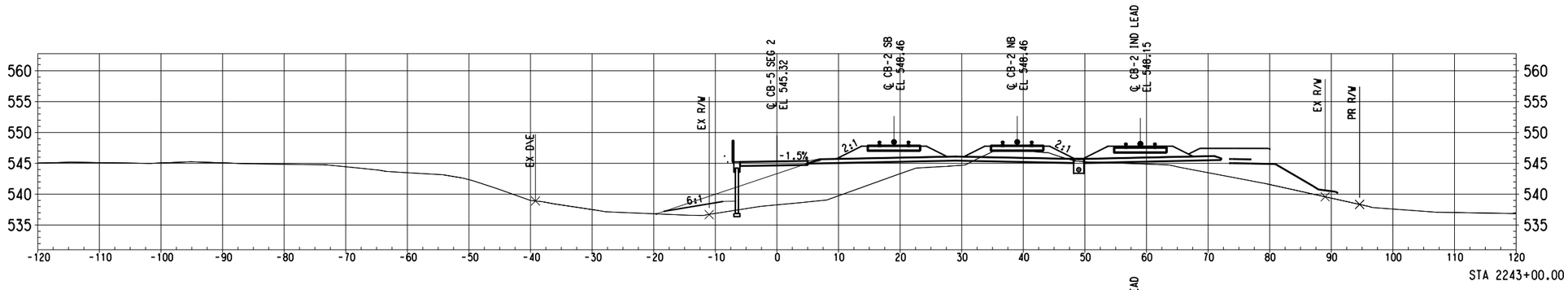
COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

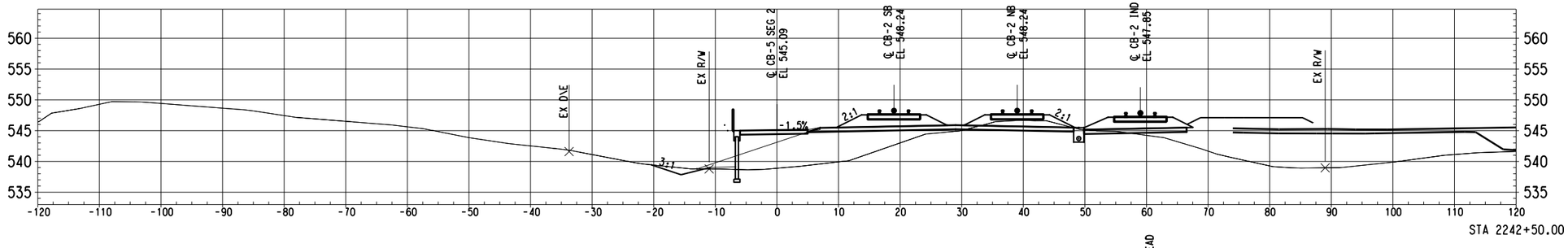
CITY OF CARROLLTON
CROSS SECTIONS
SHEET 54 OF 80

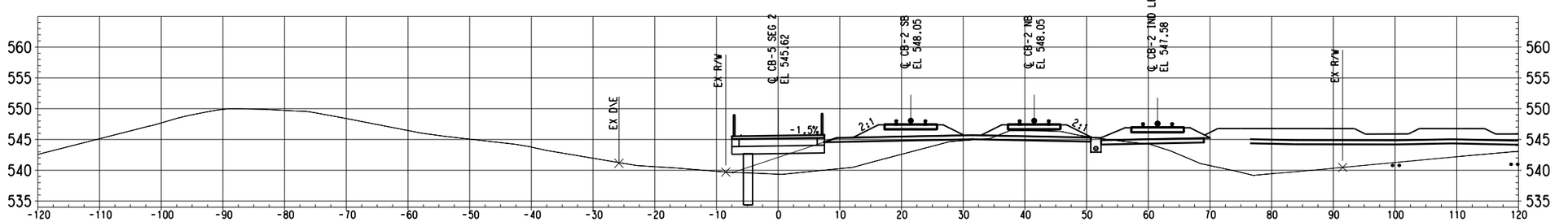
CONTRACT	DWG No.	REV
C-2033270-01	CC1-6573	D

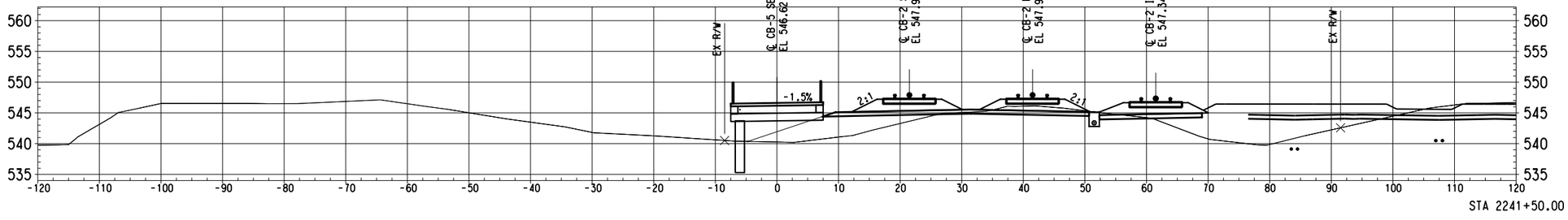
CB05-CC1-6573.000

DWG No. CC1-6574









NOTE:
SEE PLAN AND PROFILE SHEETS FOR FENCE AND RIP RAP LOCATIONS AND LIMITS

HORIZ SCALE (IN FEET) 0 5 10 20

VERT SCALE (IN FEET) 0 5 10 20

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CONTRACT SHEET No. 138 OF 345

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

CITY OF CARROLLTON
CROSS SECTIONS
SHEET 55 OF 80

SCALE	AS NOTED
DRAWN	S. SALEH
DESIGNED	S. SALEH
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IN CHARGE	D. LUU
DATE	07 AUG 23

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CONTRACT	DWG No.	REV
C-2033270-01	CC1-6574	D

CB05-CC1-6574.000

DWG No. CC1-6575

NOTE:
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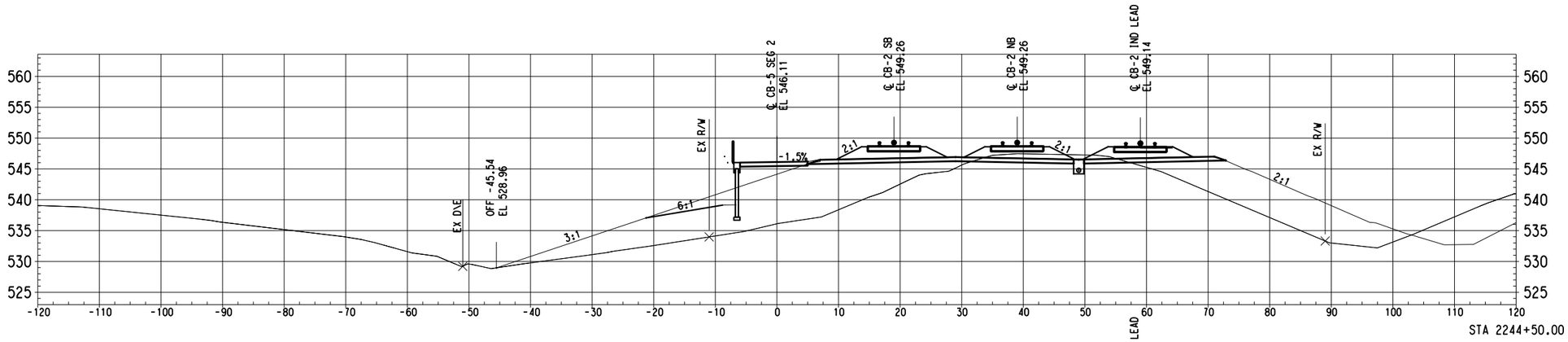
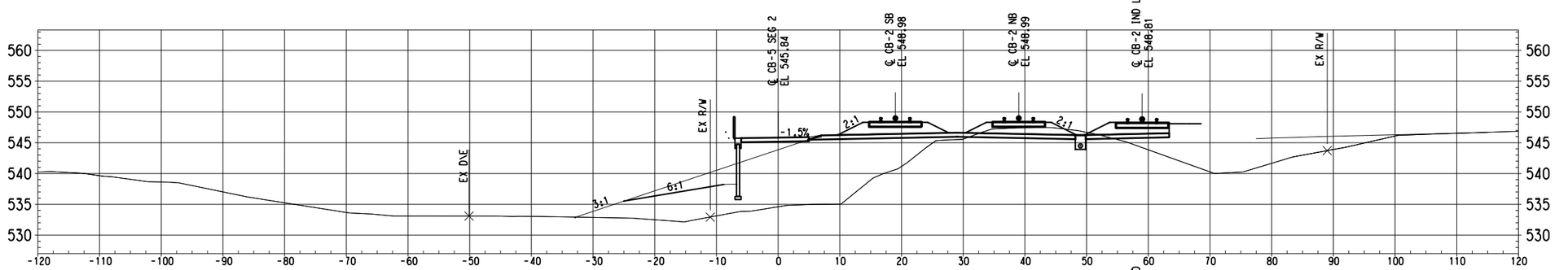
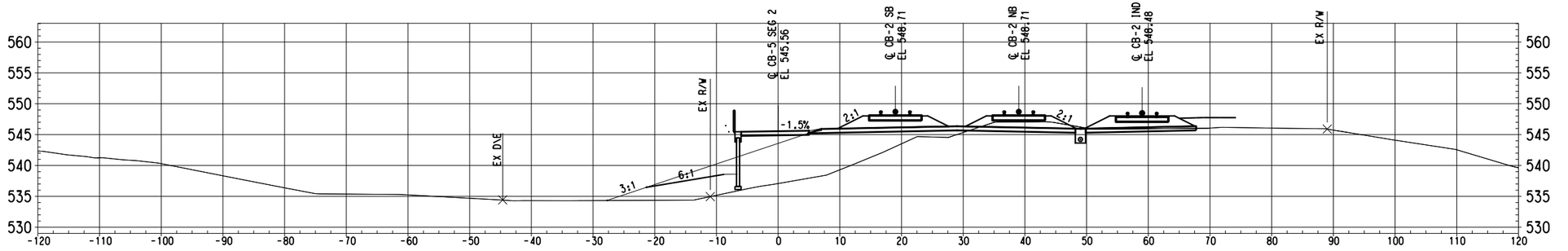
VERT SCALE (IN FEET) 0 5 10 20







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CONTRACT SHEET No. 139 OF 345

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

CITY OF CARROLLTON
CROSS SECTIONS
SHEET 56 OF 80

CONTRACT	DWG No.	REV
C-2033270-01	CC1-6575	D

CB05-CC1-6575.000

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DWG No. CC1-6576

NOTE:
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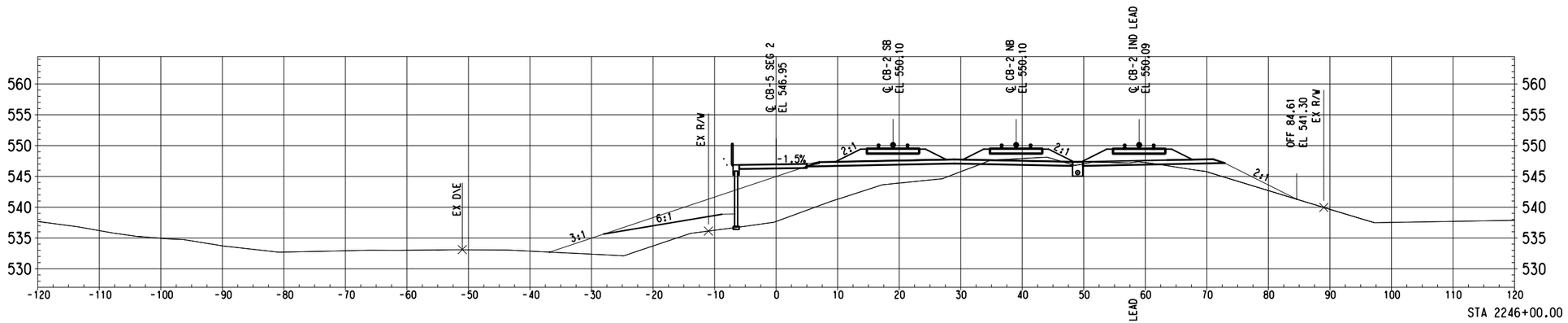
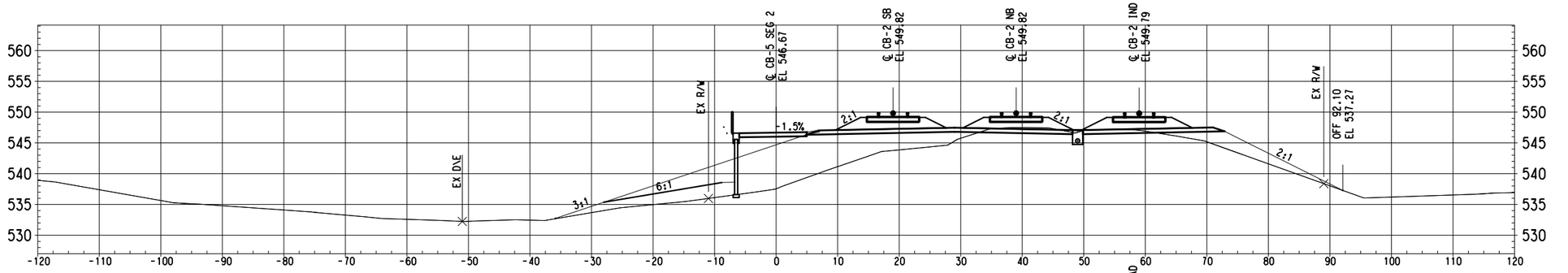
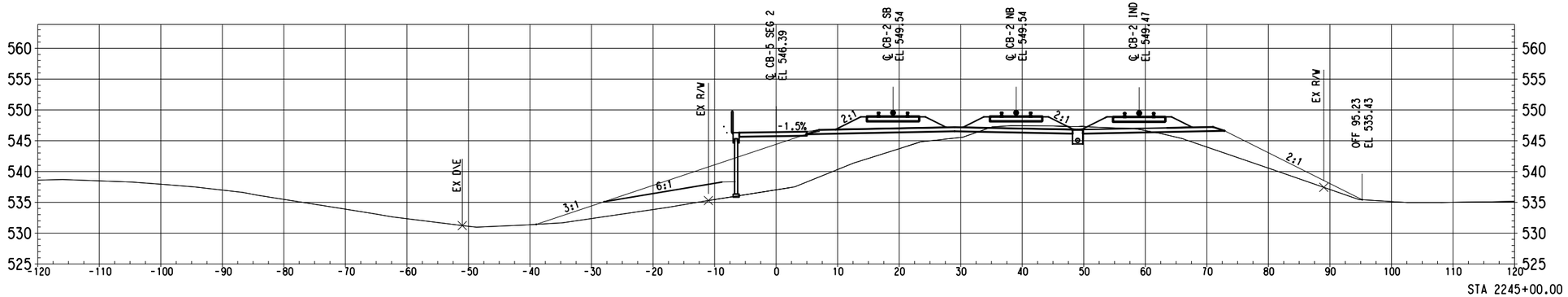
HORIZ SCALE (IN FEET) 0 5 10 20

VERT SCALE (IN FEET) 0 5 10 20







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CONTRACT SHEET No. 140 OF 345

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

CITY OF CARROLLTON
CROSS SECTIONS
SHEET 57 OF 80

CONTRACT	DWG No.	REV
C-2033270-01	CC1-6576	D

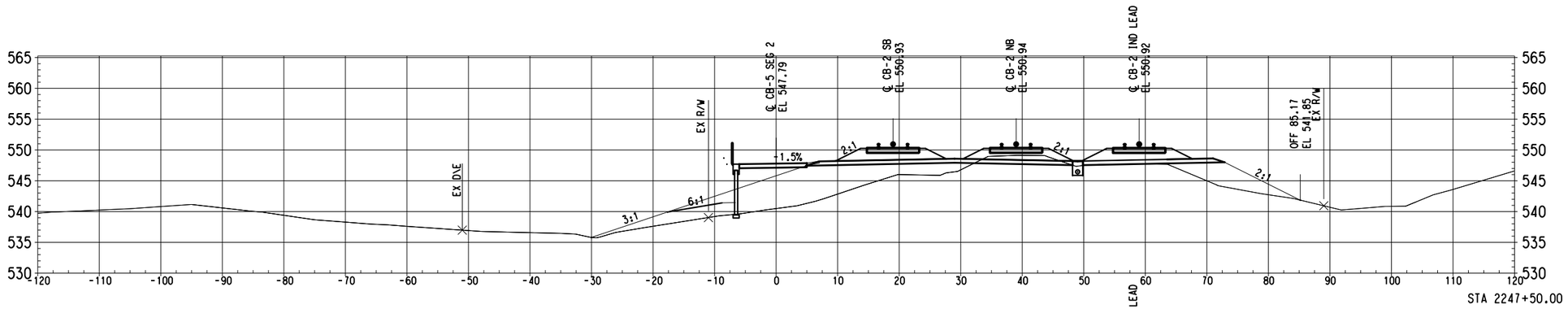
CB05-CC1-6576.000

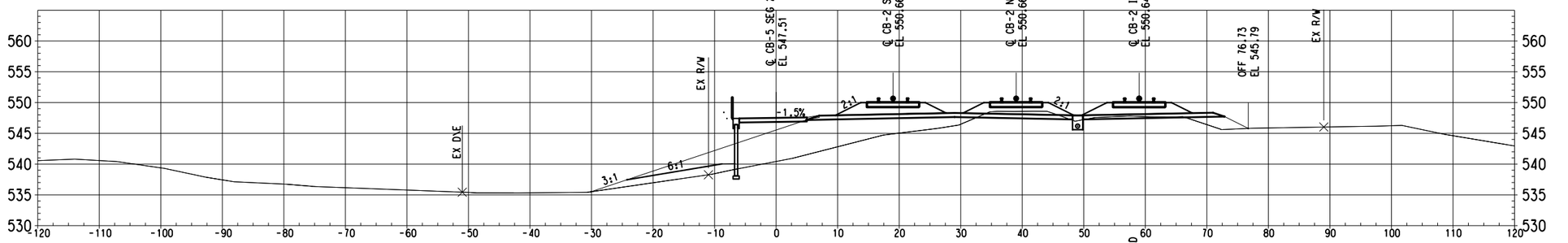
DWG No. CC1-6577

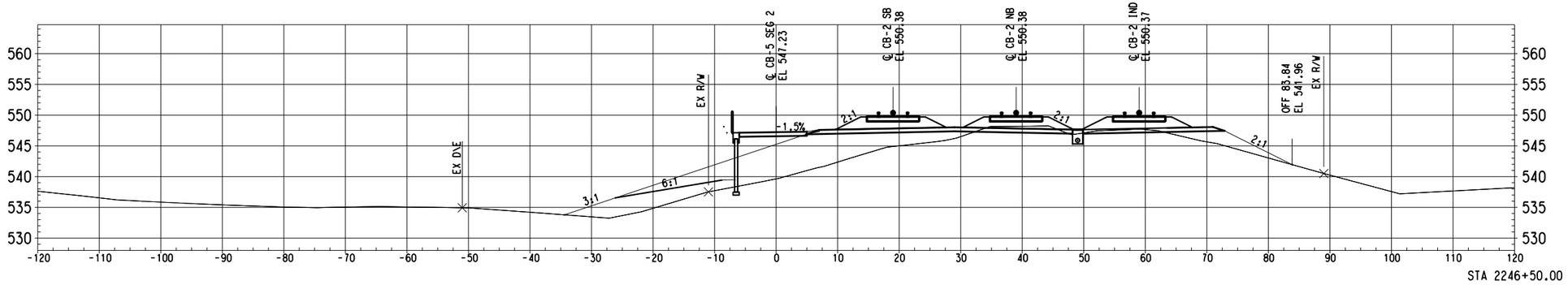
NOTE:
SEE PLAN AND PROFILE SHEETS FOR FENCE
AND RIP RAP LOCATIONS AND LIMITS

HORIZ SCALE (IN FEET) 0 5 10 20

VERT SCALE (IN FEET) 0 5 10 20







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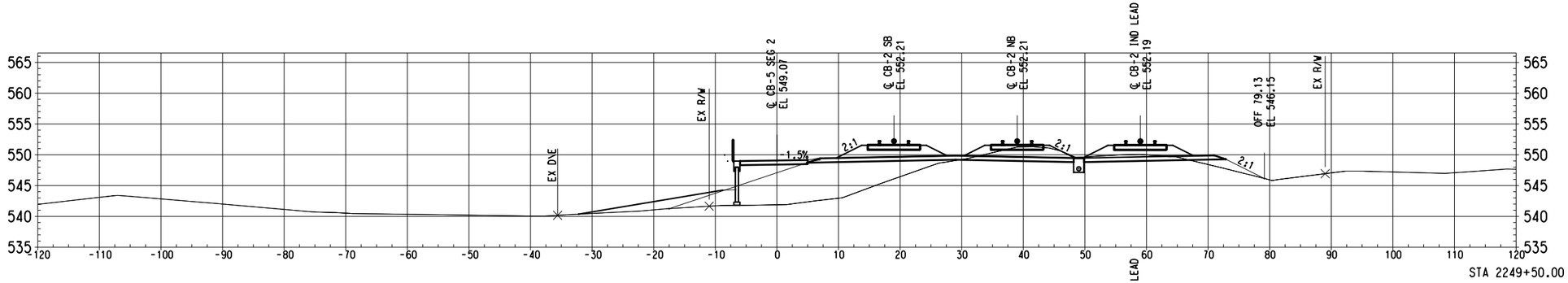
COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

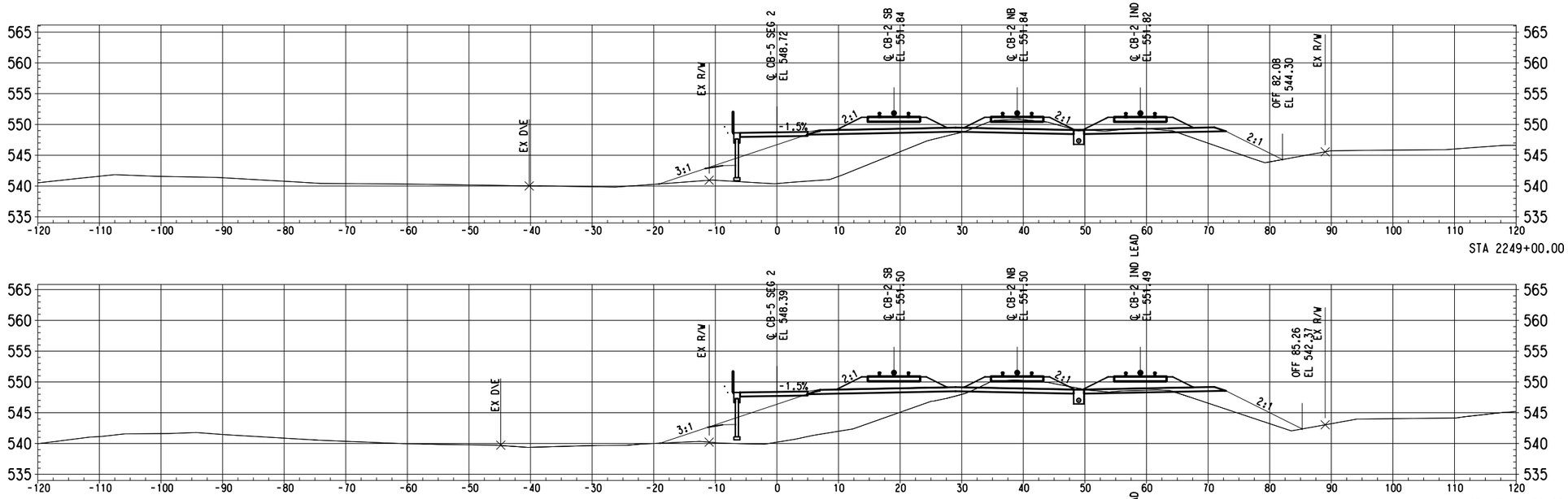
CITY OF CARROLLTON
CROSS SECTIONS
SHEET 58 OF 80

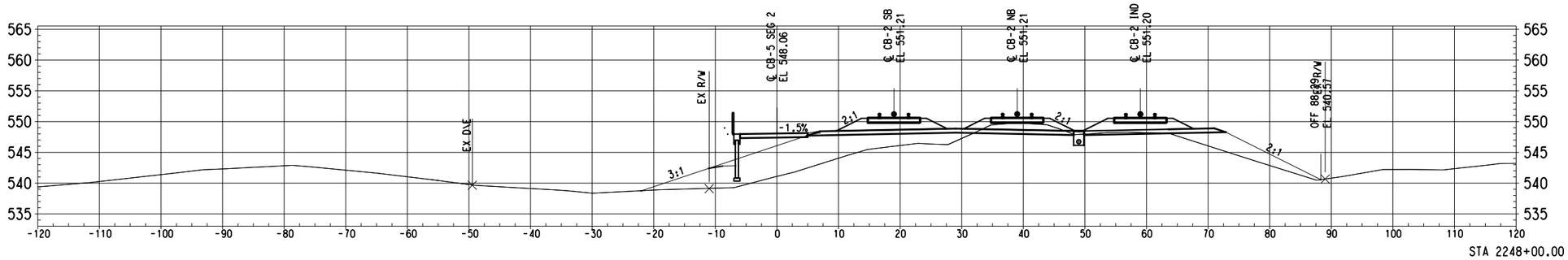
CONTRACT	DWG No.	REV
C-2033270-01	CC1-6577	D

CB05-CC1-6577.000

DWG No. CC1-6578







NOTE:
SEE PLAN AND PROFILE SHEETS FOR FENCE AND RIP RAP LOCATIONS AND LIMITS

HORIZ SCALE (IN FEET) 0 5 10 20

VERT SCALE (IN FEET) 0 5 10 20

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CONTRACT SHEET No. 142 OF 345

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

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DESIGNED	S. SALEH
CHECKED	D. LUU
IN CHARGE	D. LUU
DATE	07 AUG 23

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COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

CITY OF CARROLLTON
CROSS SECTIONS
SHEET 59 OF 80

CONTRACT	DWG No.	REV
C-2033270-01	CC1-6578	D

CB05-CC1-6578.000

2-AUG-2023 10:16
CB05-CC1-6578.000

JEGSVCPWU01
CAR_2_N - 2248+00.00

DWG No. CC1-6579

NOTE:
SEE PLAN AND PROFILE SHEETS FOR FENCE AND RIP RAP LOCATIONS AND LIMITS

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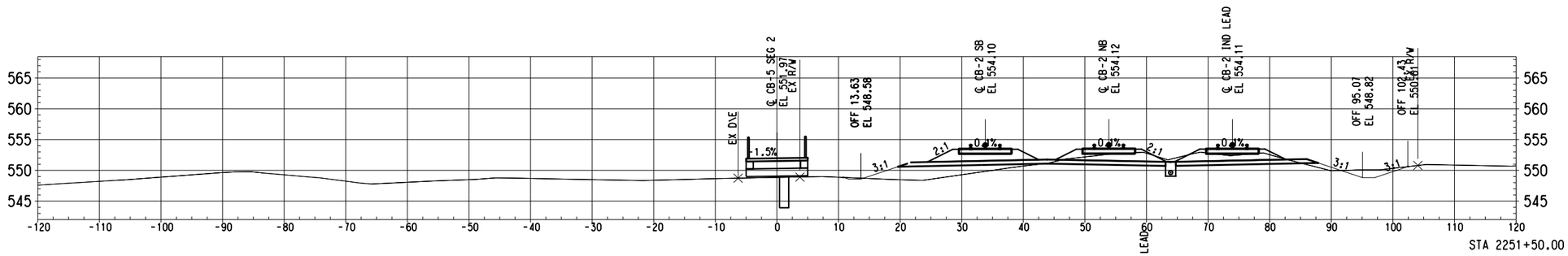
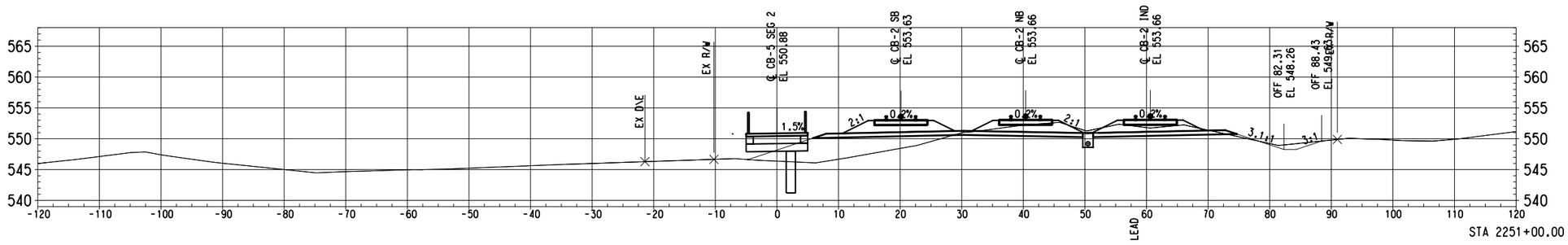
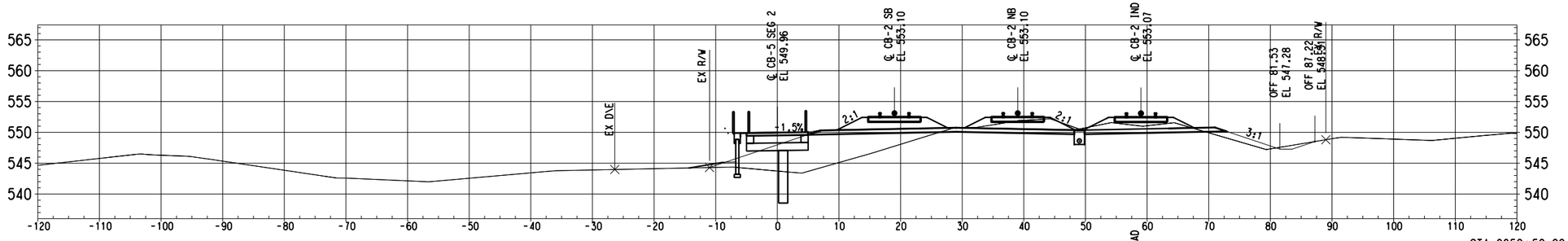
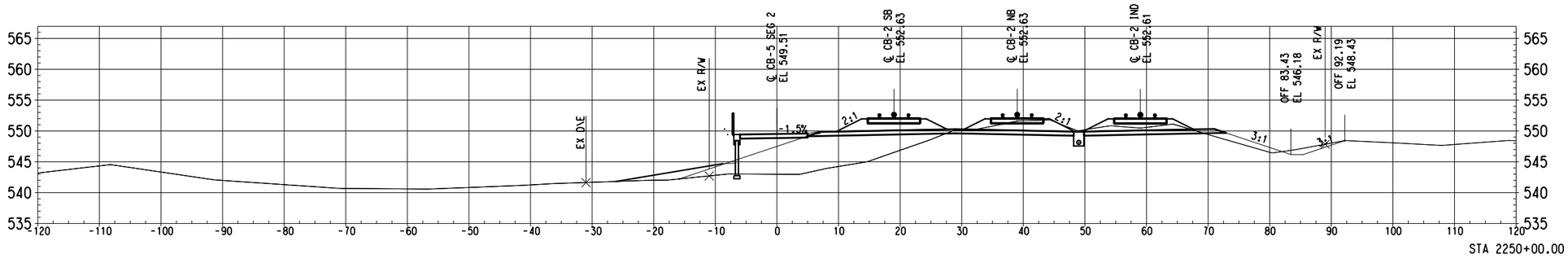
VERT SCALE (IN FEET) 0 5 10 20









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CONTRACT SHEET No. 143 OF 345

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

CITY OF CARROLLTON
CROSS SECTIONS
SHEET 60 OF 80

SCALE	AS NOTED
DRAWN	S. SALEH
DESIGNED	S. SALEH
CHECKED	D. LUU
IN CHARGE	D. LUU
DATE	07 AUG 23

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CONTRACT	DWG No.	REV
C-2033270-01	CC1-6579	D

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DWG No. CC1-6580

NOTE:
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AND RIP RAP LOCATIONS AND LIMITS

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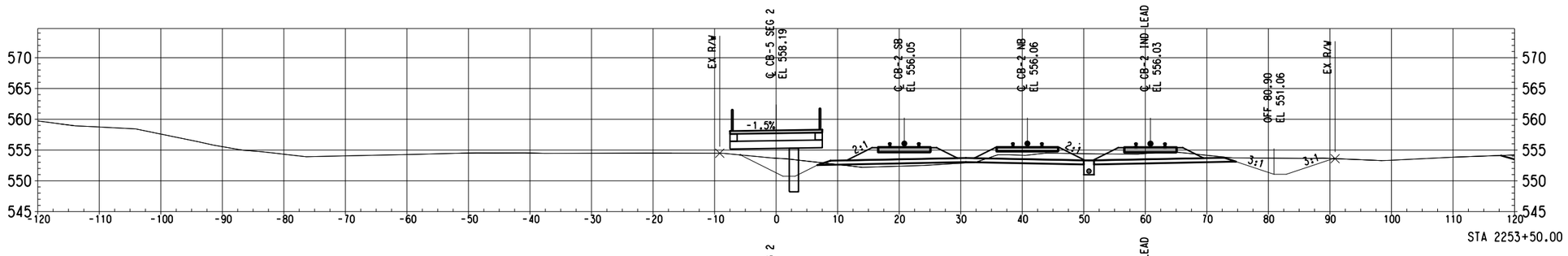
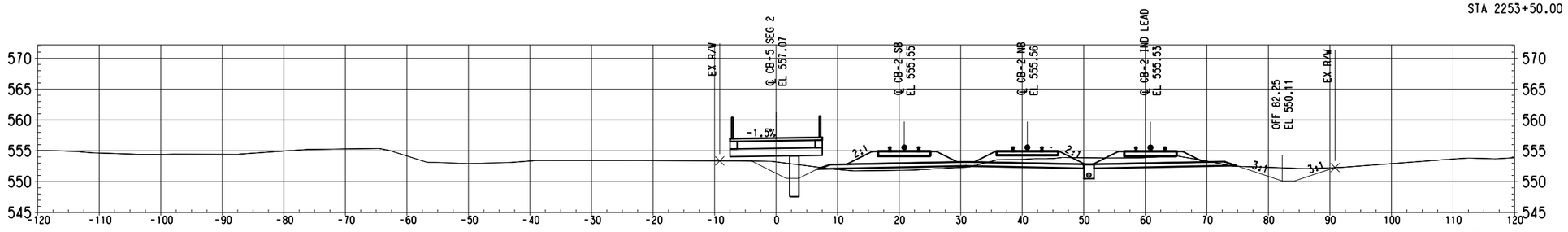
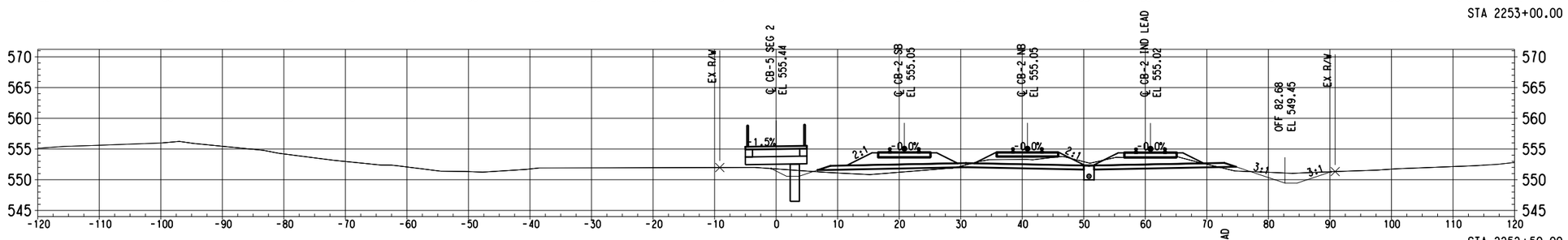
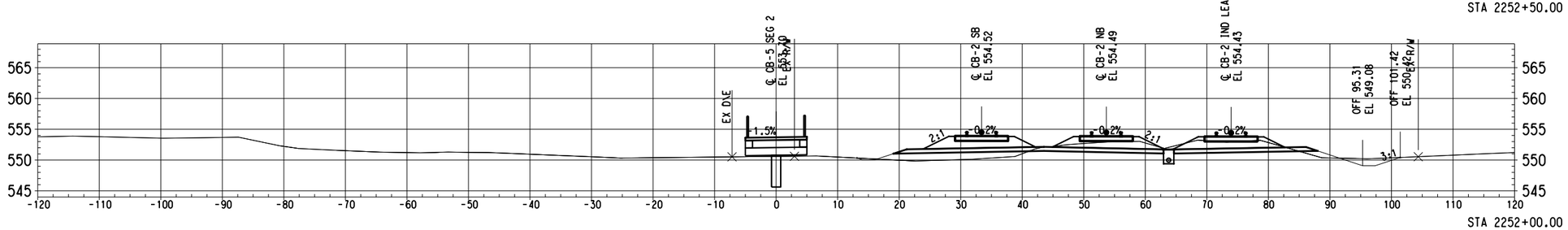
VERT SCALE (IN FEET) 0 5 10 20









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IN CHARGE	D. LUU
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CONTRACT SHEET No. 144 OF 345

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

CITY OF CARROLLTON
CROSS SECTIONS
SHEET 61 OF 80

CONTRACT	DWG No.	REV
C-2033270-01	CC1-6580	D

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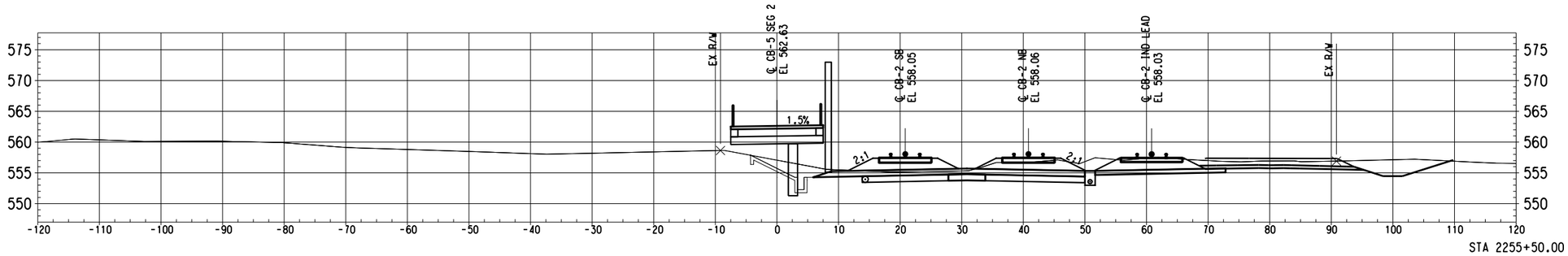
DWG No. CC1-6581



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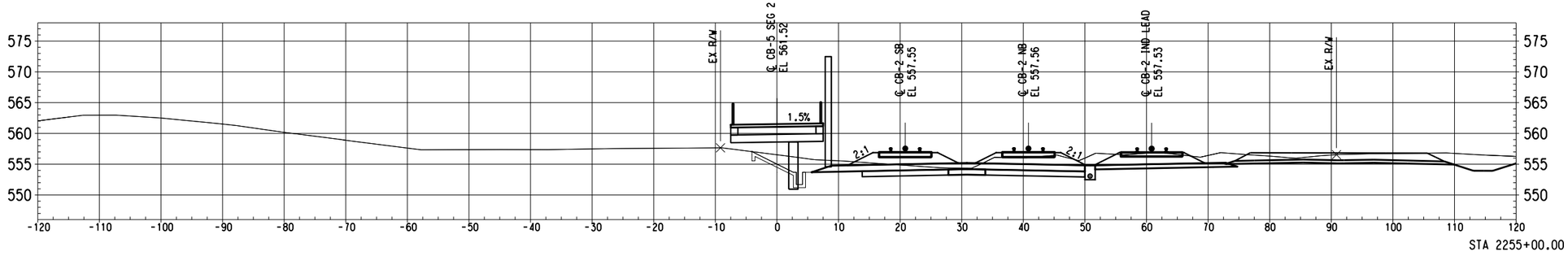

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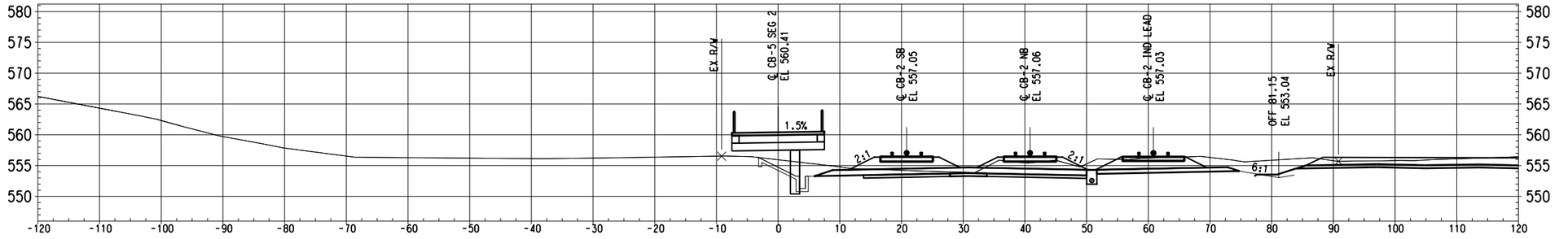

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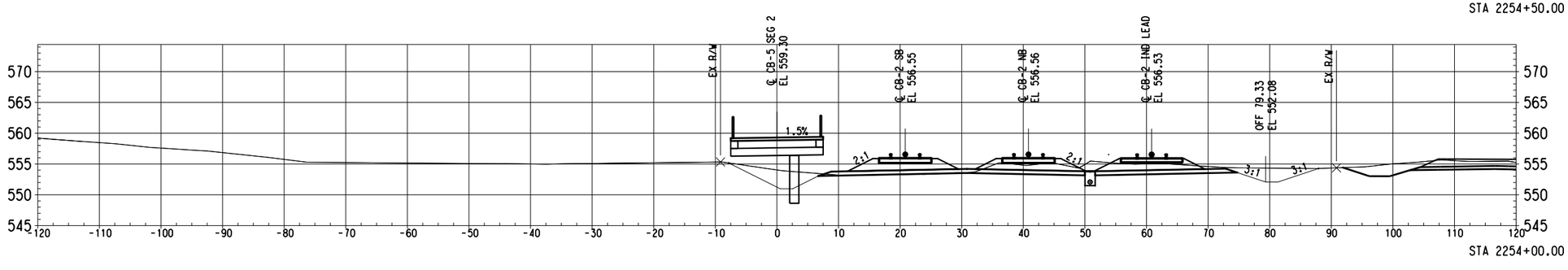

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NOTE:
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VERT SCALE (IN FEET) 0 5 10 20

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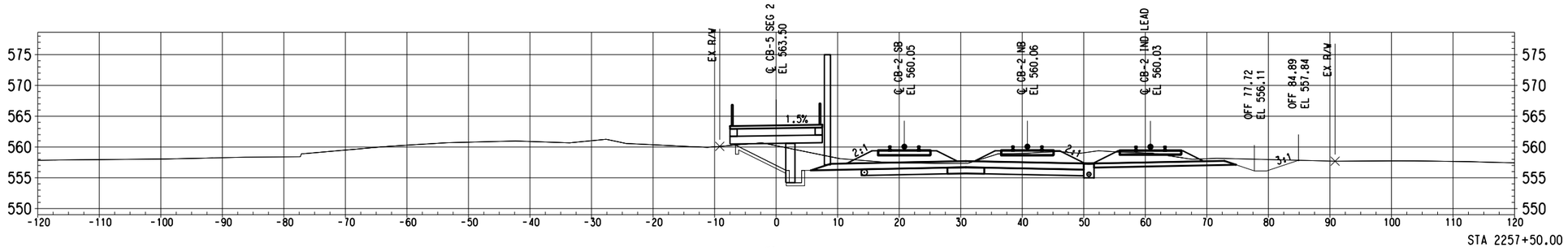
COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

CITY OF CARROLLTON
CROSS SECTIONS
SHEET 62 OF 80

CONTRACT	DWG No.	REV
C-2033270-01	CC1-6581	D

DWG No. CC1-6582



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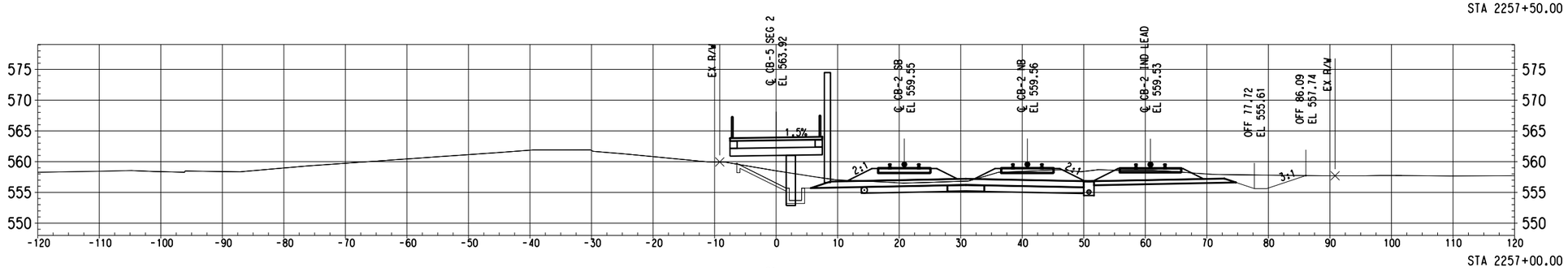

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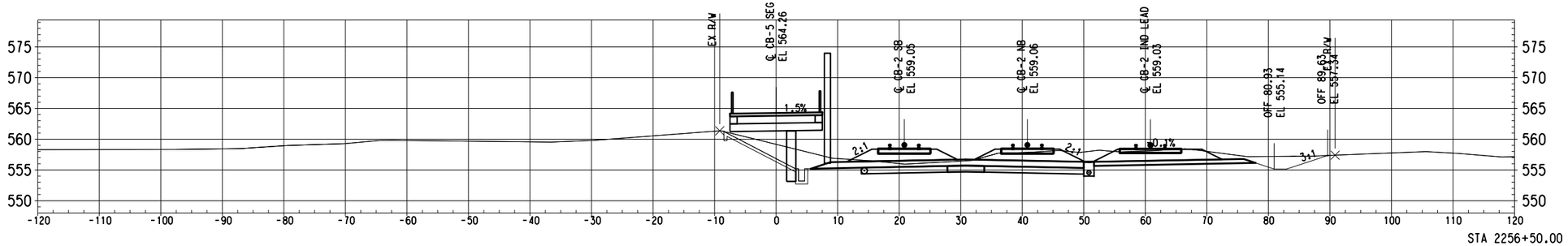

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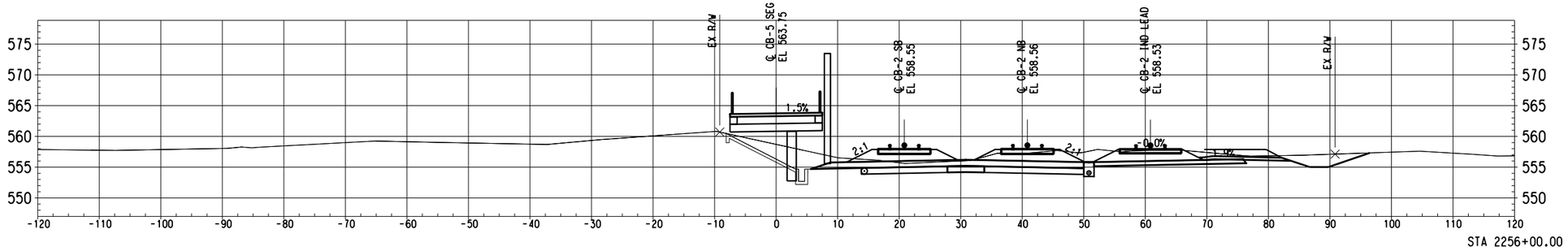

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NOTE:
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HORIZ SCALE (IN FEET) 0 5 10 20

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IN CHARGE	D. LUU
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CONTRACT SHEET No. 146 OF 345

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

CITY OF CARROLLTON
CROSS SECTIONS
SHEET 63 OF 80

CONTRACT	DWG No.	REV
C-2033270-01	CC1-6582	D

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DWG No. CC1-6583

NOTE:
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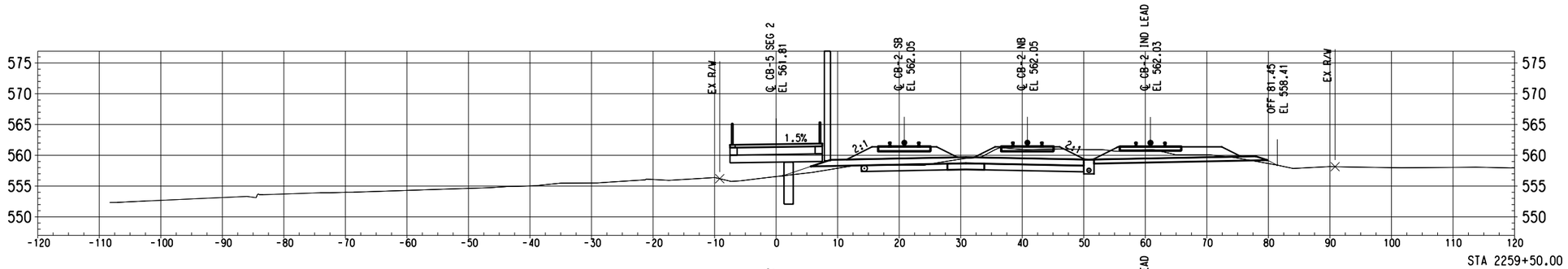
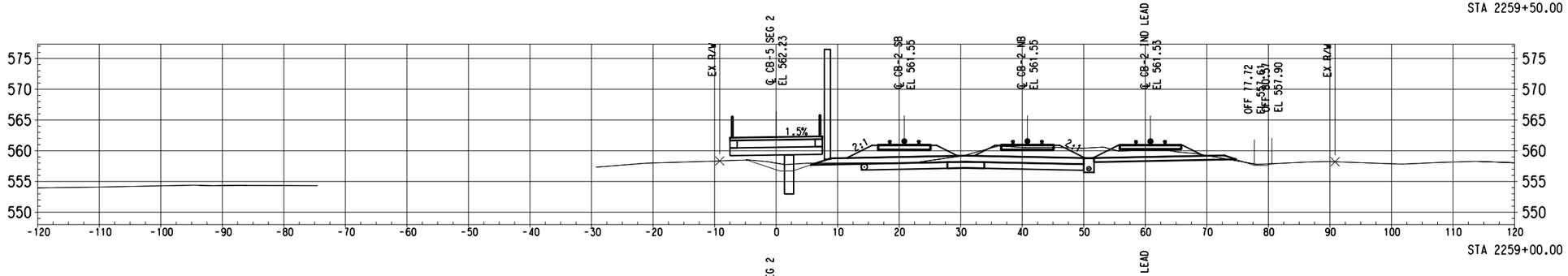
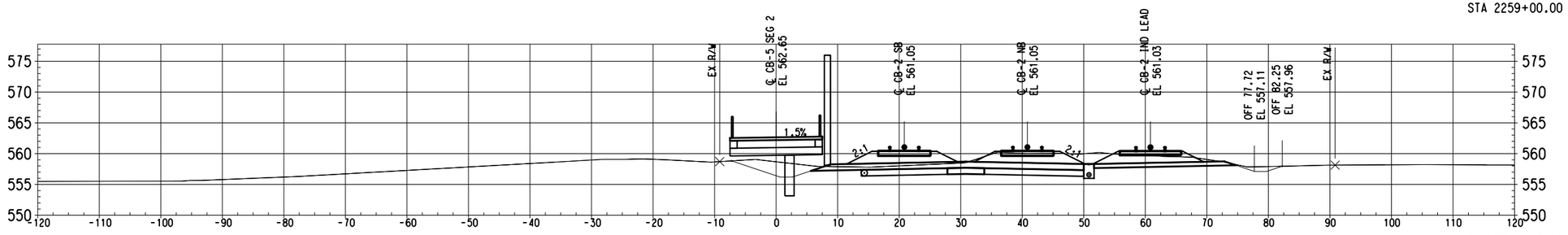
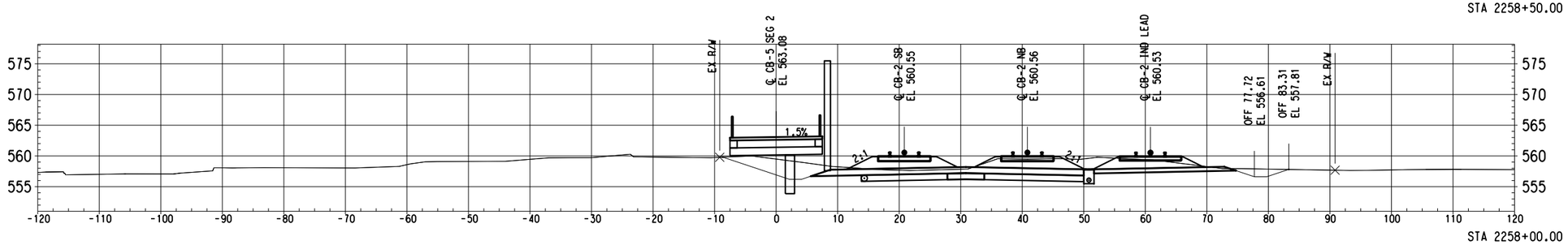
VERT SCALE (IN FEET) 0 5 10 20









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DESIGNED	S. SALEH
CHECKED	D. LUU
IN CHARGE	D. LUU
DATE	07 AUG 23

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CONTRACT SHEET No. 147 OF 345

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

CITY OF CARROLLTON
CROSS SECTIONS
SHEET 64 OF 80

CONTRACT	DWG No.	REV
C-2033270-01	CC1-6583	D

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DWG No. CC1-6584

NOTE:
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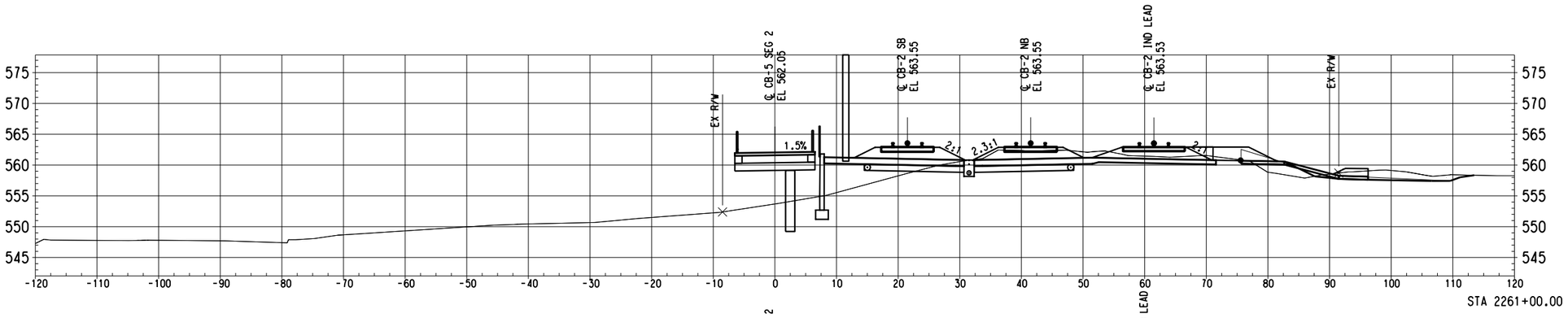
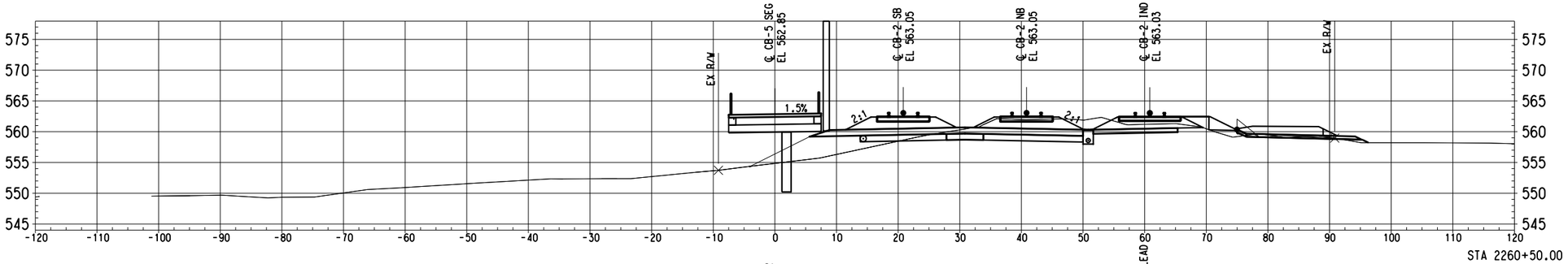
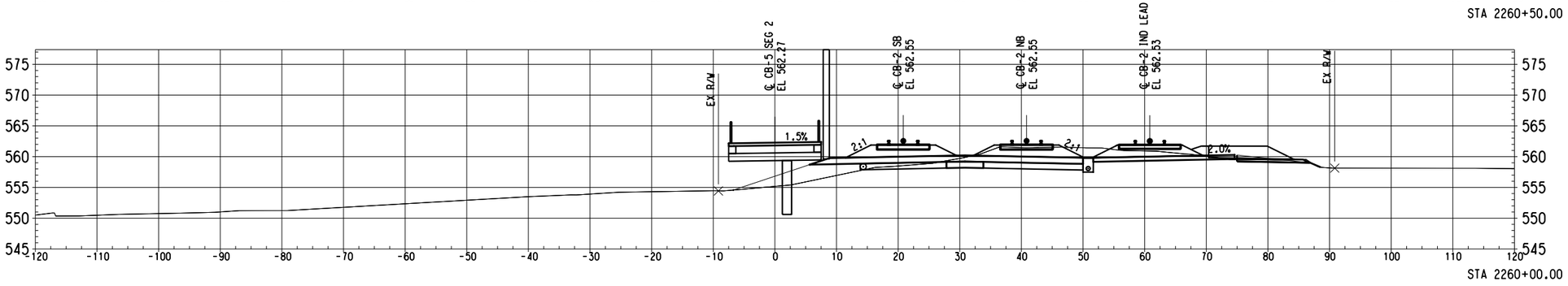
HORIZ SCALE (IN FEET) 0 5 10 20

VERT SCALE (IN FEET) 0 5 10 20







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COTTON BELT REGIONAL RAIL VELOWEB HIKE & BIKE TRAIL

CITY OF CARROLLTON
CROSS SECTIONS
SHEET 65 OF 80

CONTRACT	DWG No.	REV
C-2033270-01	CC1-6584	D

CB05-CC1-6584.000

DWG No. CC1-6585

NOTE:
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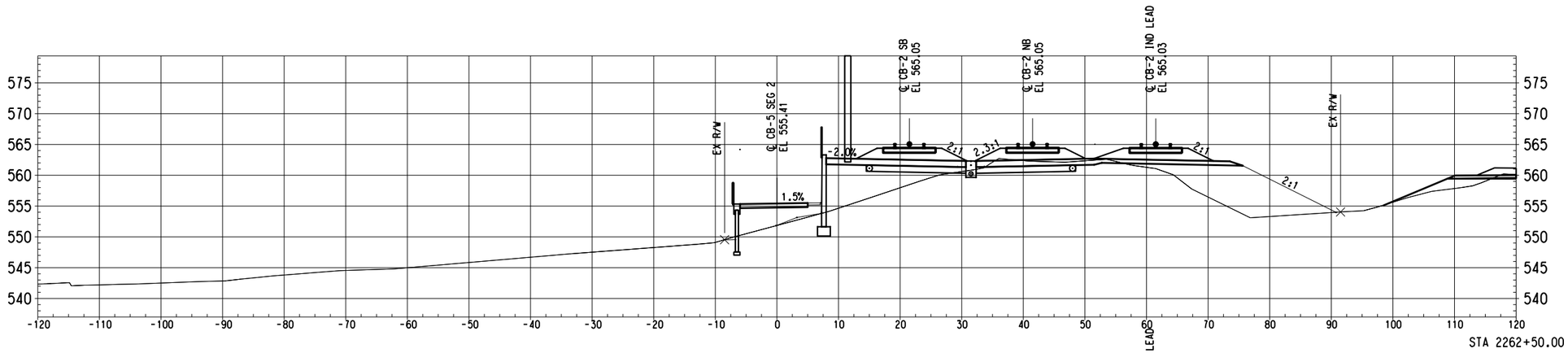
HORIZ SCALE (IN FEET) 0 5 10 20

VERT SCALE (IN FEET) 0 5 10 20



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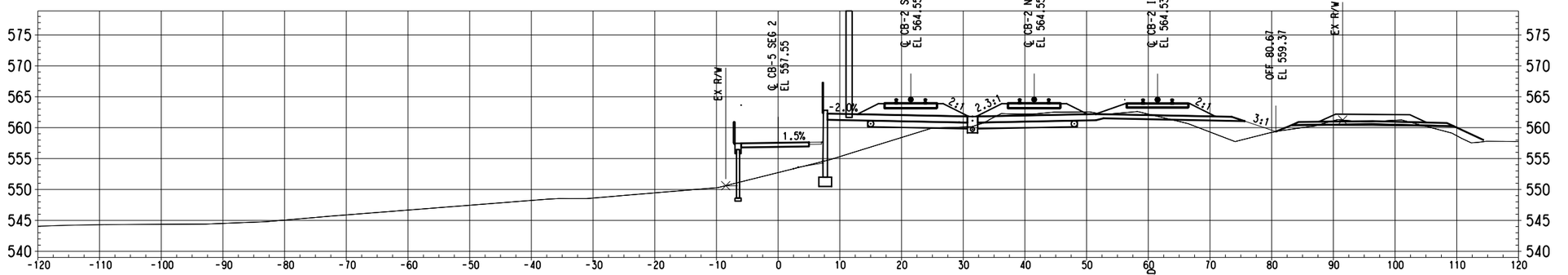

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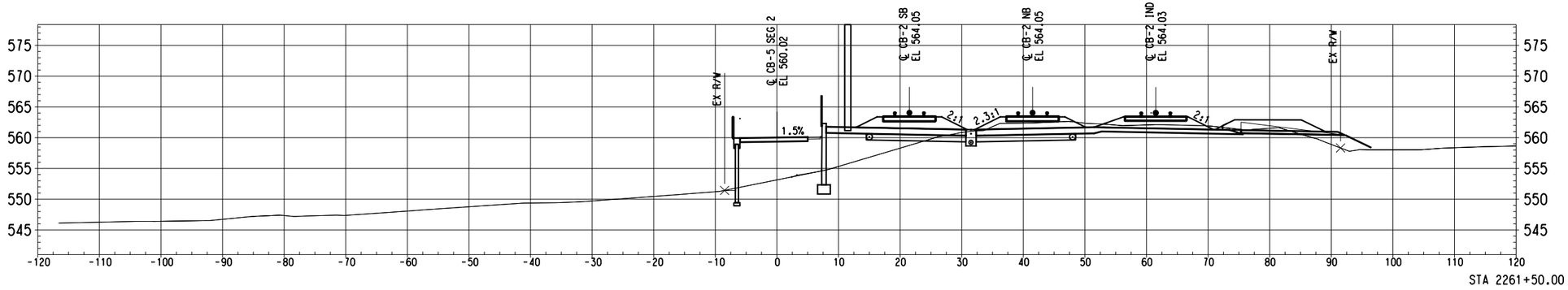

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DESIGNED	S. SALEH
CHECKED	D. LUU
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CONTRACT SHEET No. 149 OF 345

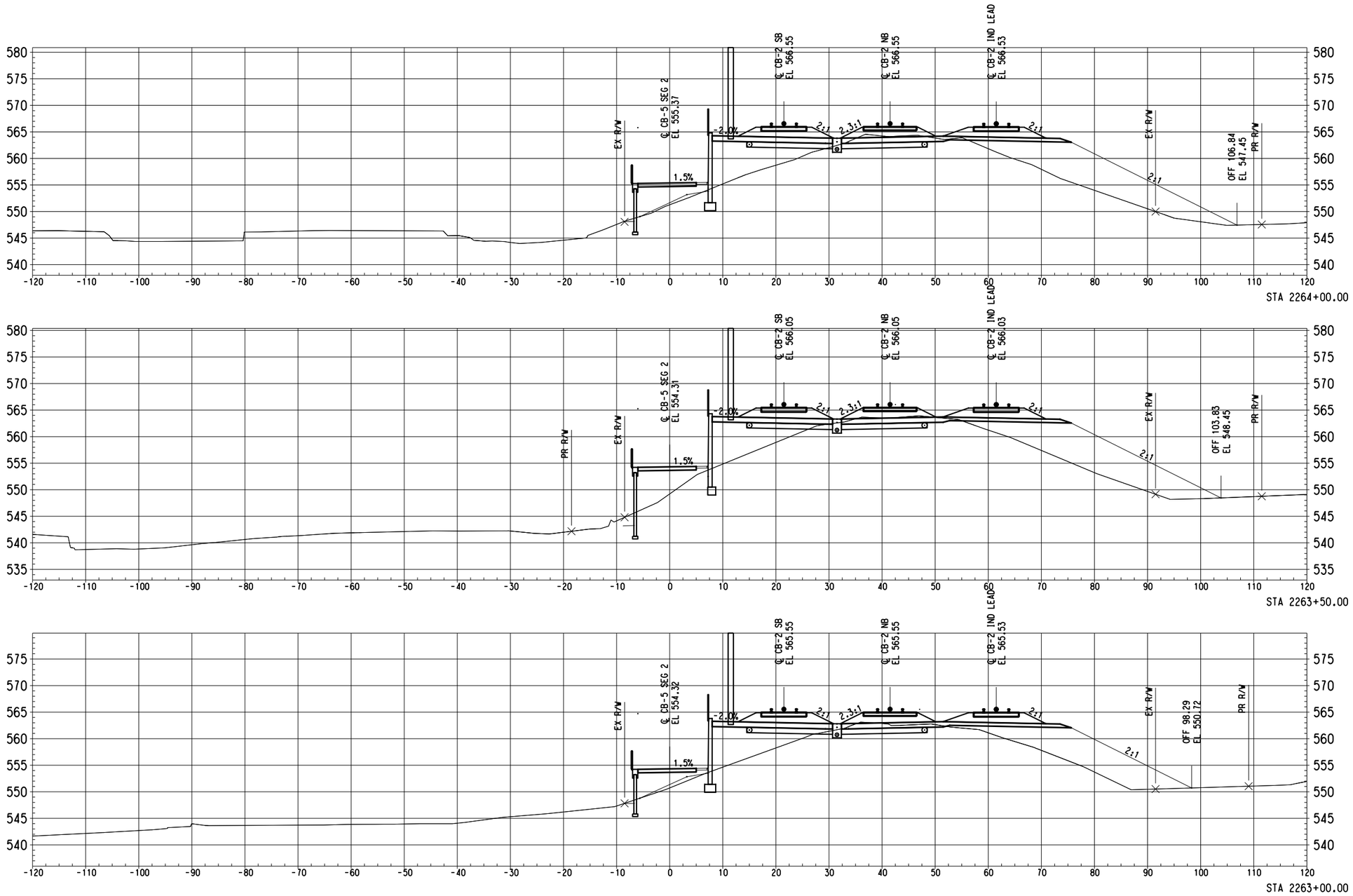
COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

CITY OF CARROLLTON
CROSS SECTIONS
SHEET 66 OF 80

CONTRACT	DWG No.	REV
C-2033270-01	CC1-6585	D

CB05-CC1-6585.000

DWG No. CC1-6586



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VERT SCALE (IN FEET) 0 5 10 20

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CONTRACT SHEET No. 150 OF 345

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

CITY OF CARROLLTON
CROSS SECTIONS
SHEET 67 OF 80

SCALE	AS NOTED
DRAWN	S. SALEH
DESIGNED	S. SALEH
CHECKED	D. LUU
IN CHARGE	D. LUU
DATE	07 AUG 23

CAES

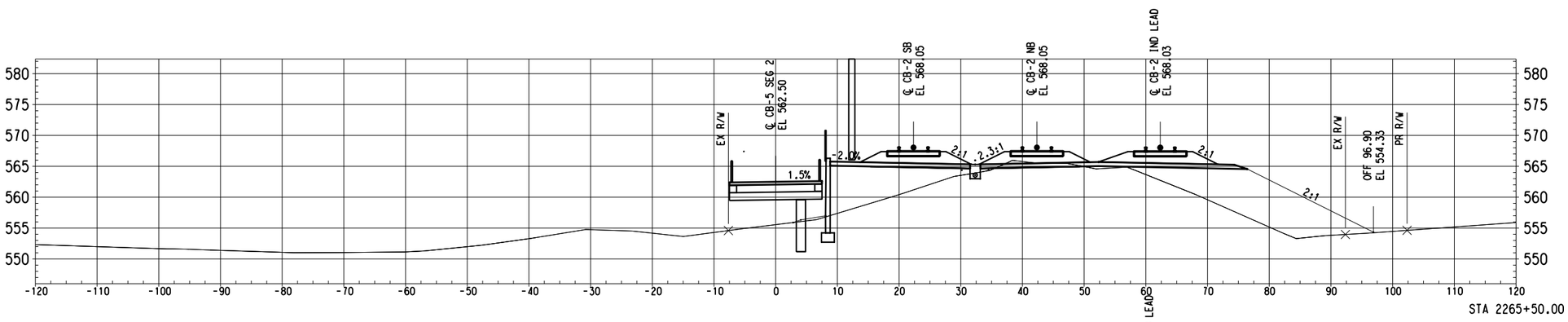
CONTRACT	DWG No.	REV
C-2033270-01	CC1-6586	D

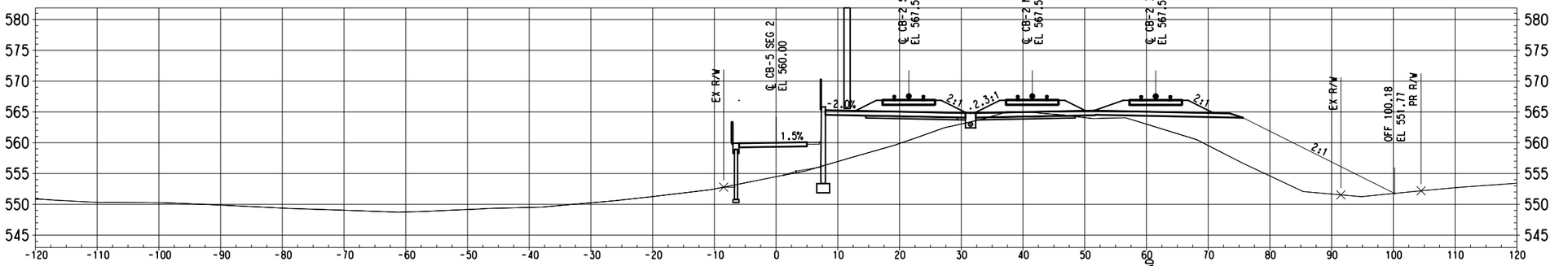
CB05-CC1-6586.000

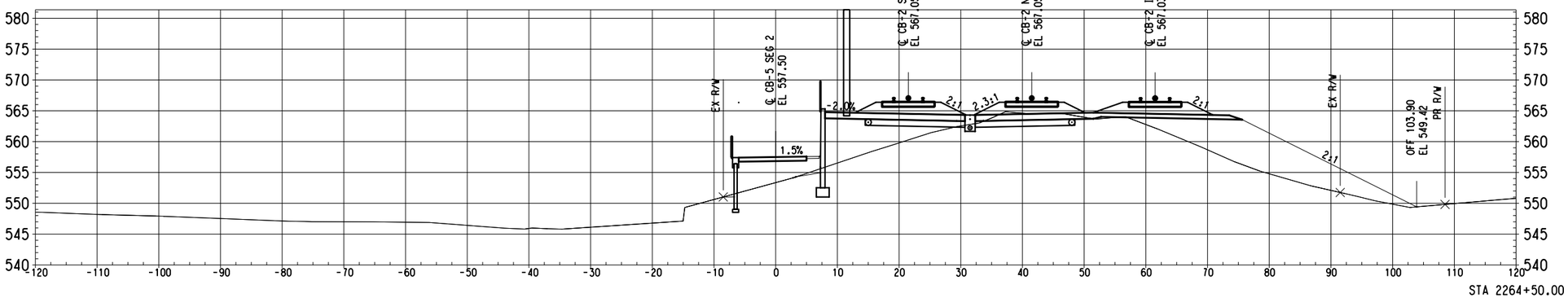
DWG No. CC1-6587

NOTE:
SEE PLAN AND PROFILE SHEETS FOR FENCE
AND RIP RAP LOCATIONS AND LIMITS

HORIZ SCALE (IN FEET) 0 5 10 20
VERT SCALE (IN FEET) 0 5 10 20







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CONTRACT SHEET No. 151 OF 345

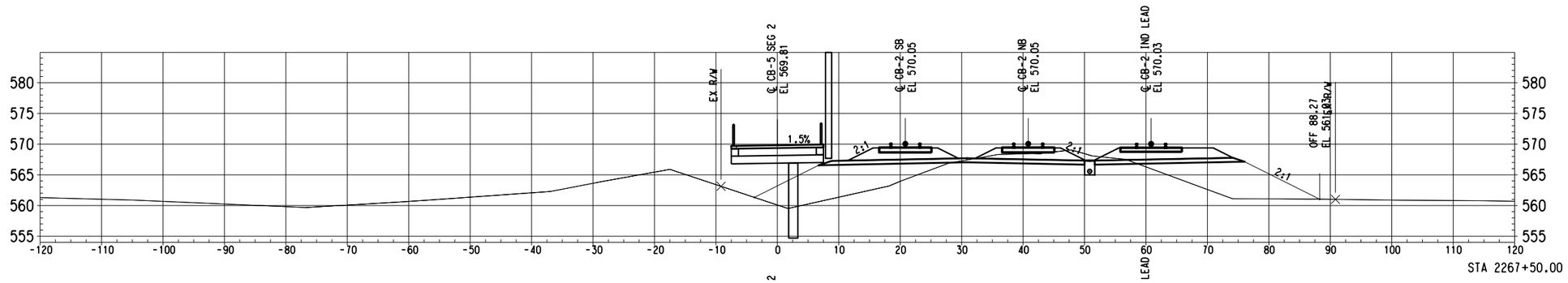
COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

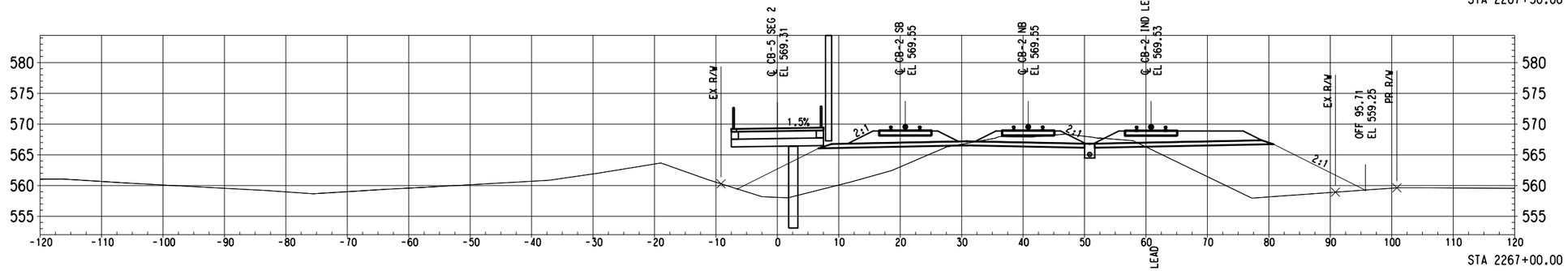
CITY OF CARROLLTON
CROSS SECTIONS
SHEET 68 OF 80

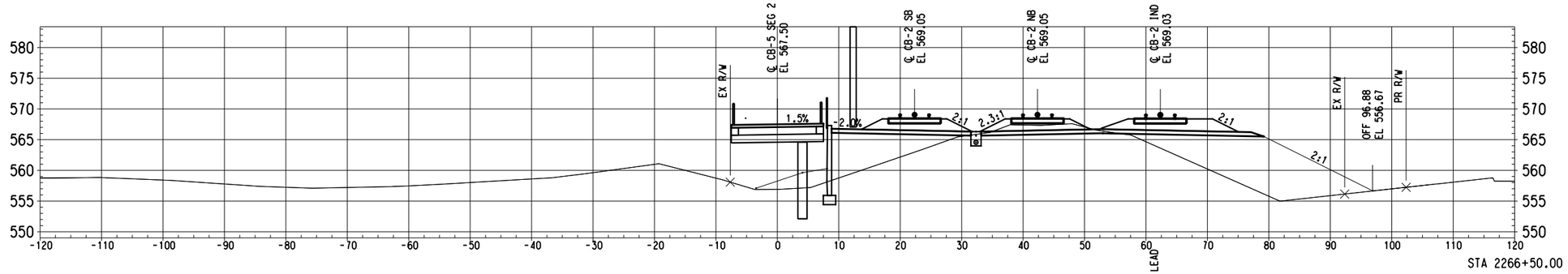
CONTRACT	DWG No.	REV
C-2033270-01	CC1-6587	D

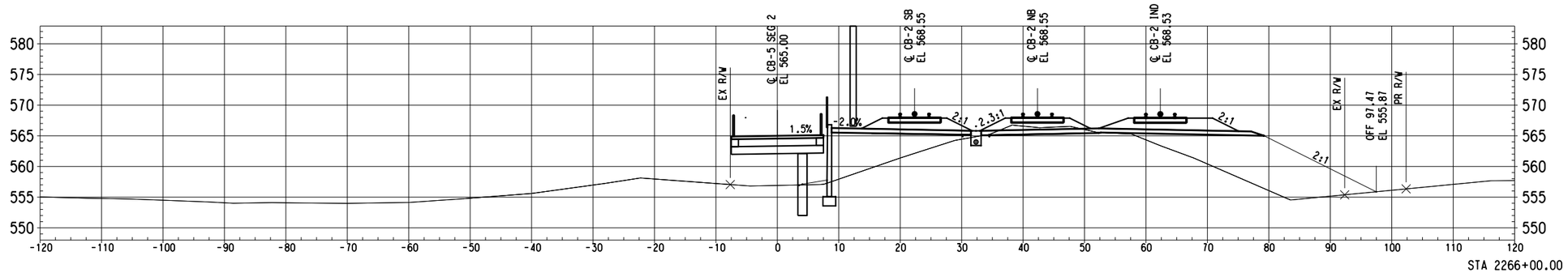
CB05-CC1-6587.000

DWG No. CC1-6588









NOTE:
SEE PLAN AND PROFILE SHEETS FOR FENCE AND RIP RAP LOCATIONS AND LIMITS

HORIZ SCALE (IN FEET) 0 5 10 20

VERT SCALE (IN FEET) 0 5 10 20

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REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

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DESIGNED	S. SALEH
CHECKED	D. LUU
IN CHARGE	D. LUU
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CONTRACT SHEET No. 152 OF 345

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

CITY OF CARROLLTON
CROSS SECTIONS
SHEET 69 OF 80

CONTRACT	DWG No.	REV
C-2033270-01	CC1-6588	D

CB05-CC1-6588.000

2-AUG-2023 13:06
CB05-CC1-6588.000

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CAR_2_N - 2266+00.00

DWG No. CC1-6589

NOTE:
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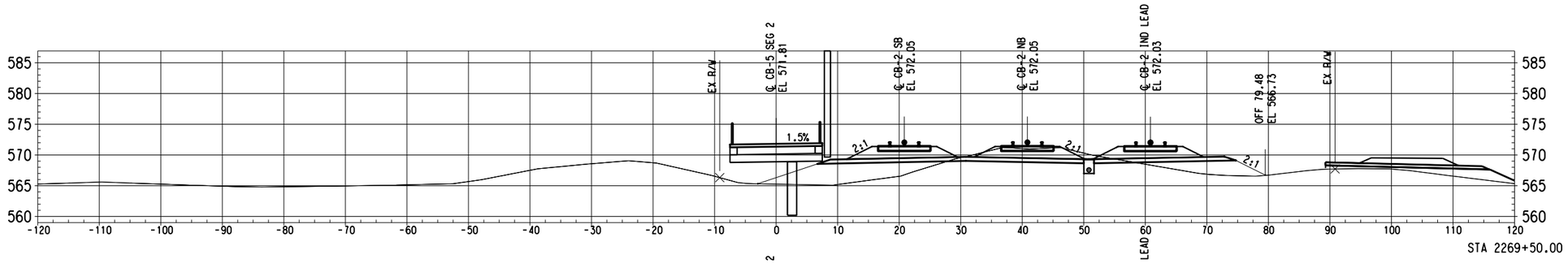
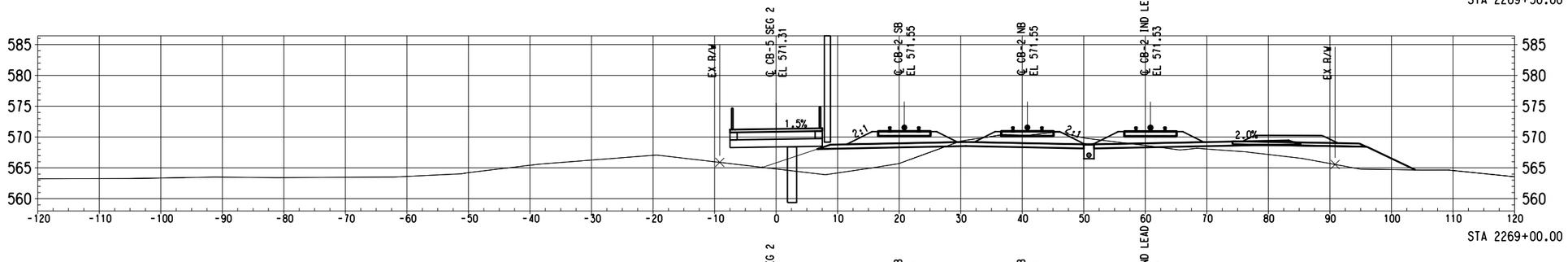
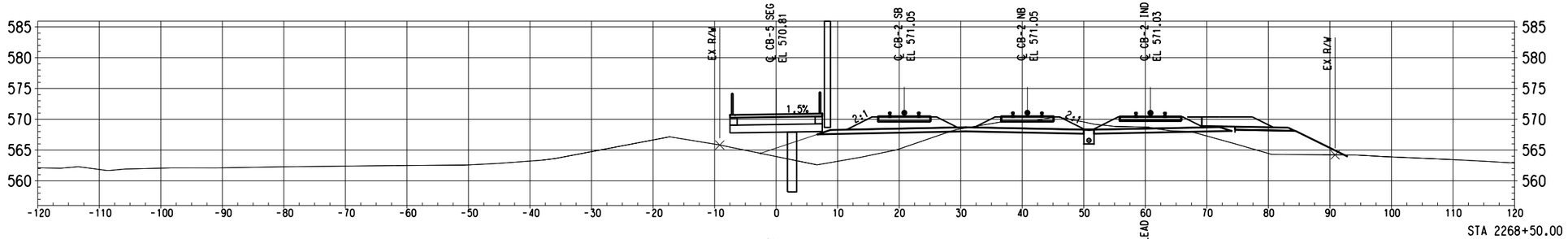
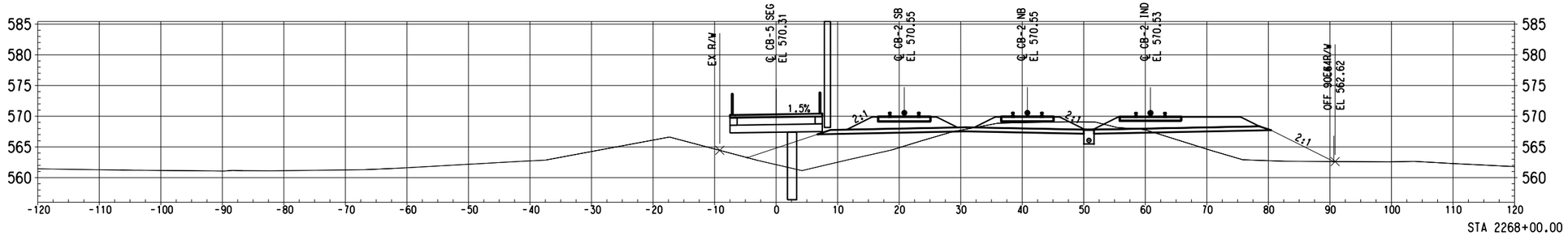
HORIZ SCALE (IN FEET) 0 5 10 20
VERT SCALE (IN FEET) 0 5 10 20









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COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

CITY OF CARROLLTON
CROSS SECTIONS
SHEET 70 OF 80

CONTRACT	DWG No.	REV
C-2033270-01	CC1-6589	D

CB05-CC1-6589.000

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DWG No. CC1-6590

NOTE:
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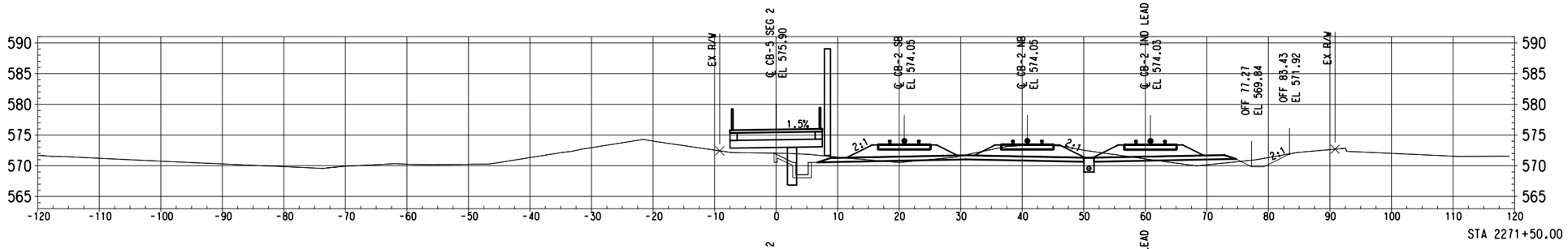
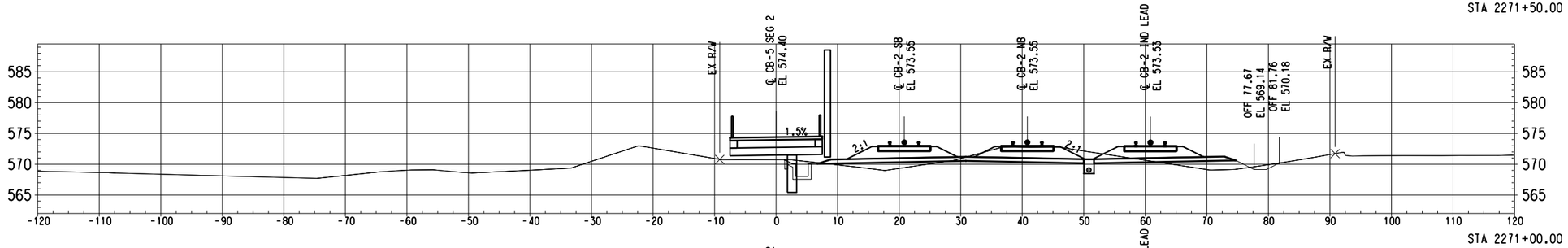
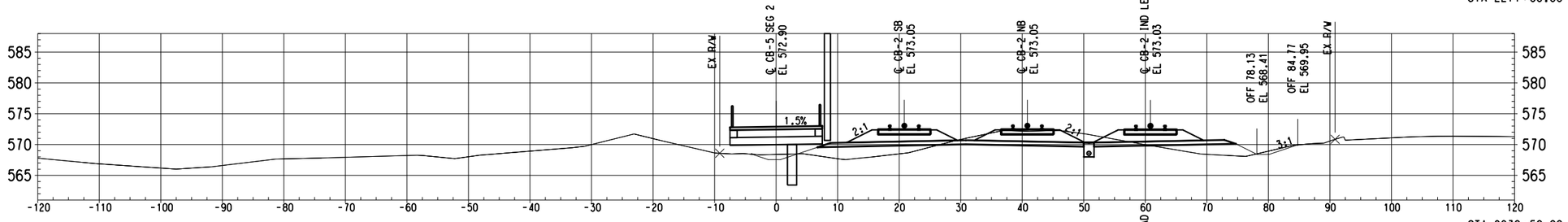
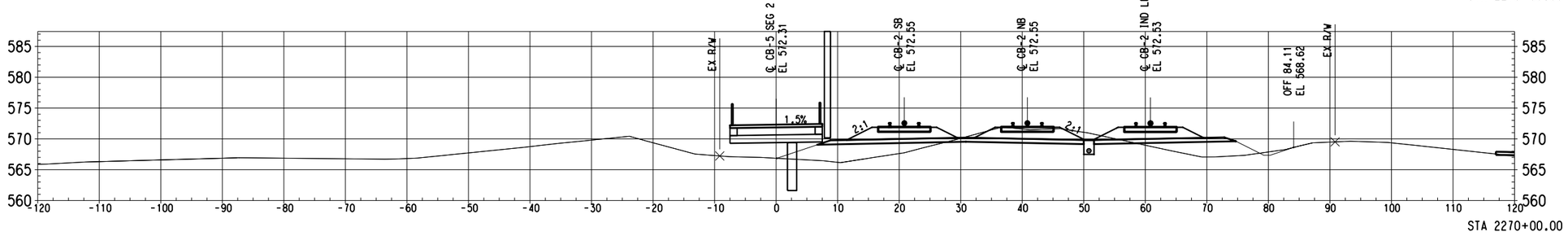
VERT SCALE (IN FEET) 0 5 10 20









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IN CHARGE	D. LUU
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CONTRACT SHEET No. 154 OF 345

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

CITY OF CARROLLTON
CROSS SECTIONS
SHEET 71 OF 80

CONTRACT	DWG No.	REV
C-2033270-01	CC1-6590	D

CB05-CC1-6590.000

DWG No. CC1-6591

NOTE:
SEE PLAN AND PROFILE SHEETS FOR FENCE AND RIP RAP LOCATIONS AND LIMITS

SCALE (IN FEET)
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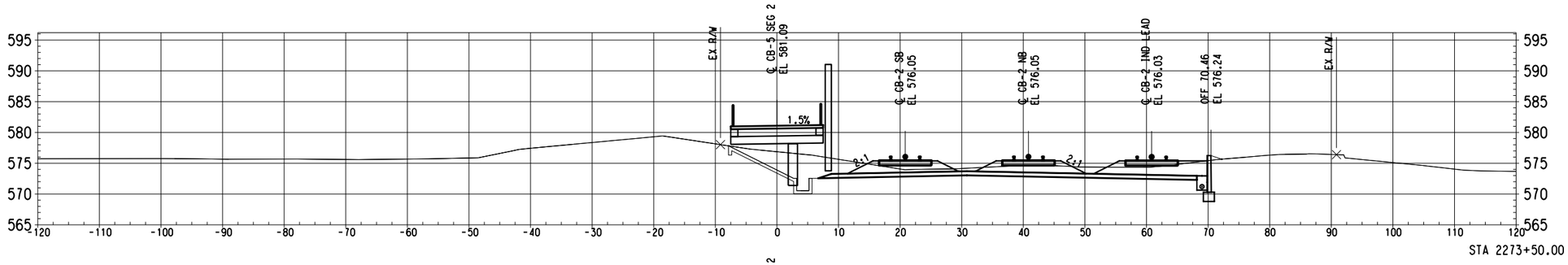
SCALE (IN FEET)
VERT 0 5 10 20



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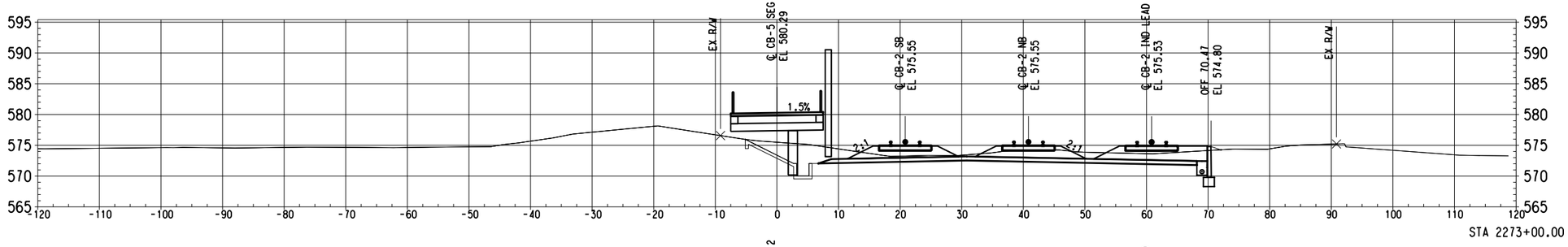

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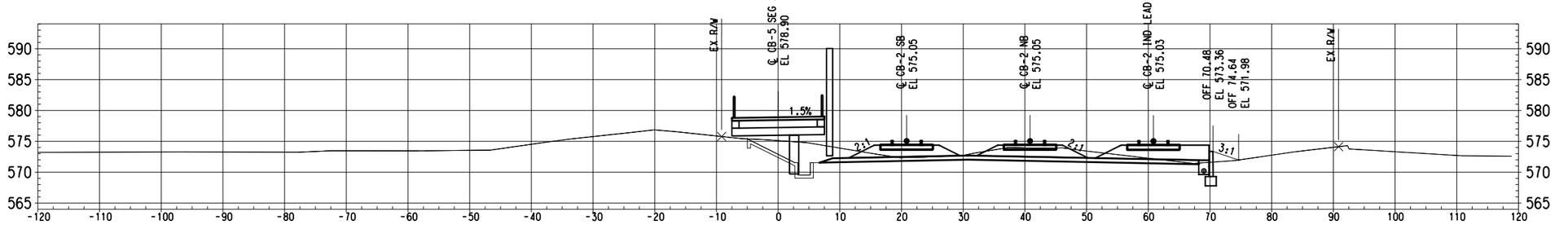

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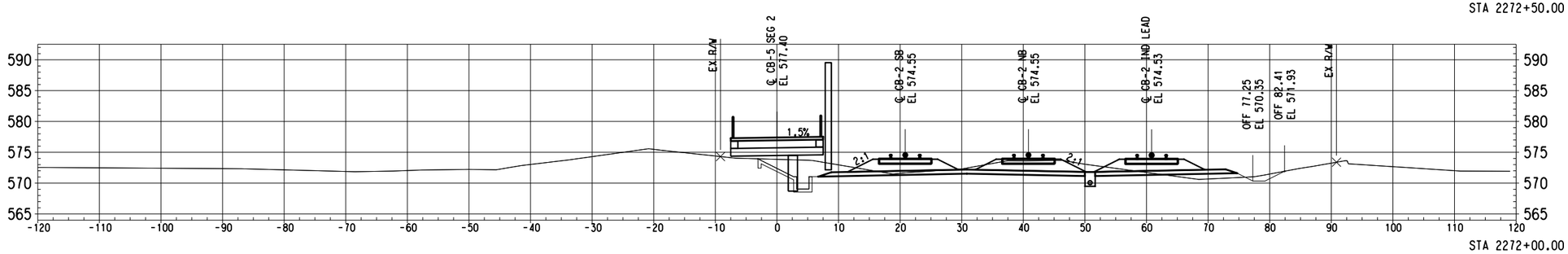

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CONTRACT SHEET No. 155 OF 345

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

CITY OF CARROLLTON
CROSS SECTIONS
SHEET 72 OF 80

CONTRACT	DWG No.	REV
C-2033270-01	CC1-6591	D

CB05-CC1-6591.000

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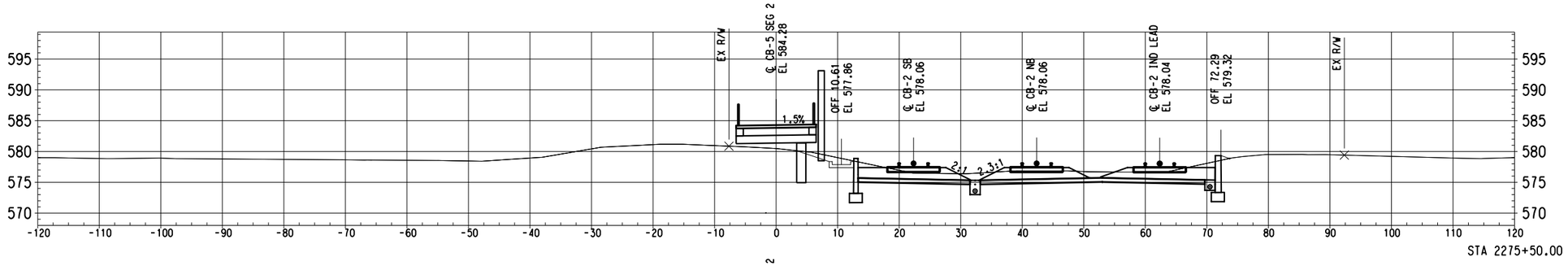
DWG No. CC1-6592



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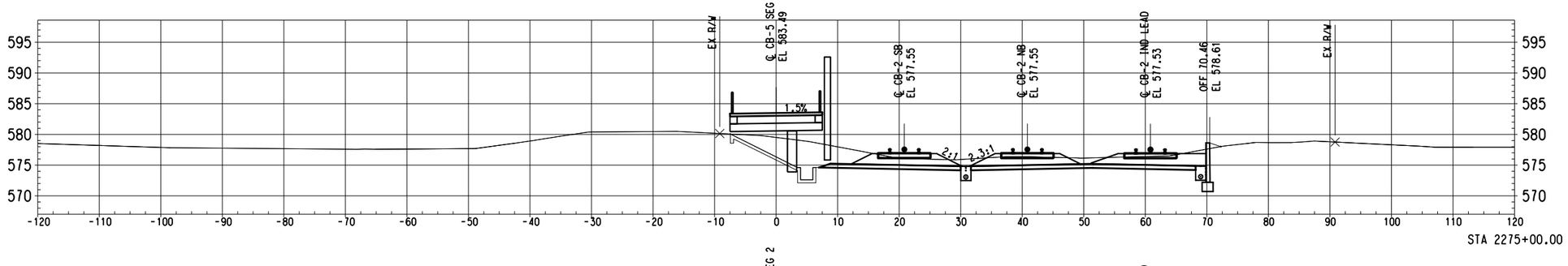

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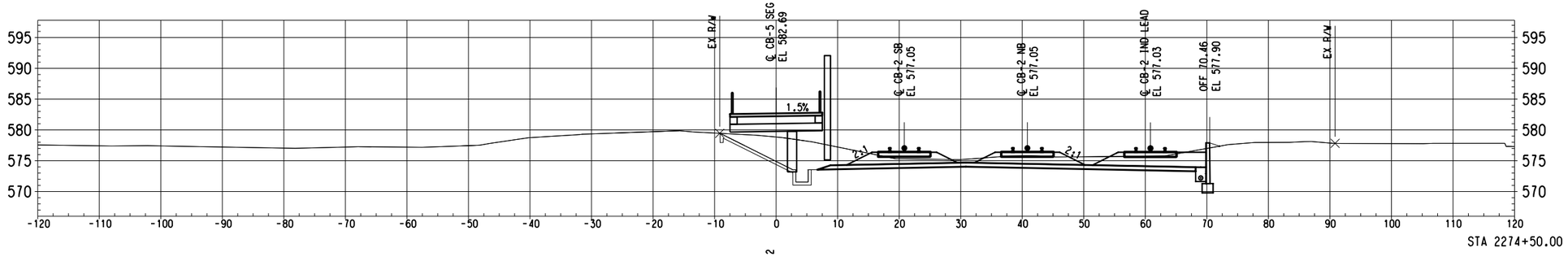

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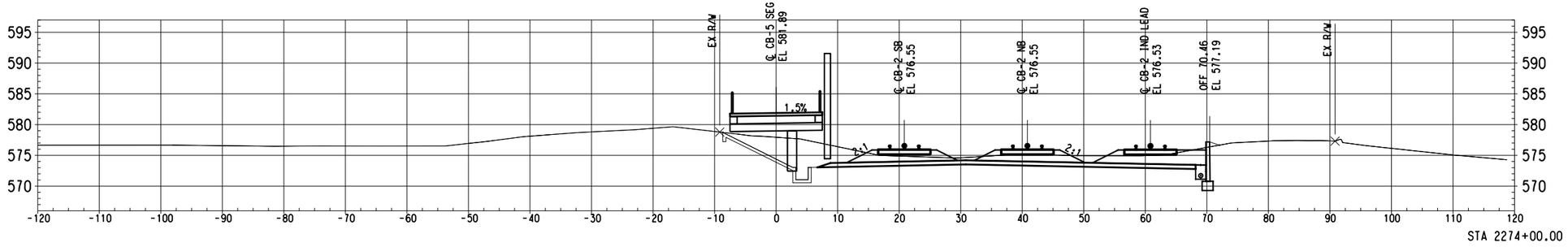

STA 2274+00.00

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VERT SCALE (IN FEET) 0 5 10 20

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CONTRACT SHEET No. 156 OF 345

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

CITY OF CARROLLTON
CROSS SECTIONS
SHEET 73 OF 80

CONTRACT	DWG No.	REV
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CB05-CC1-6592.000

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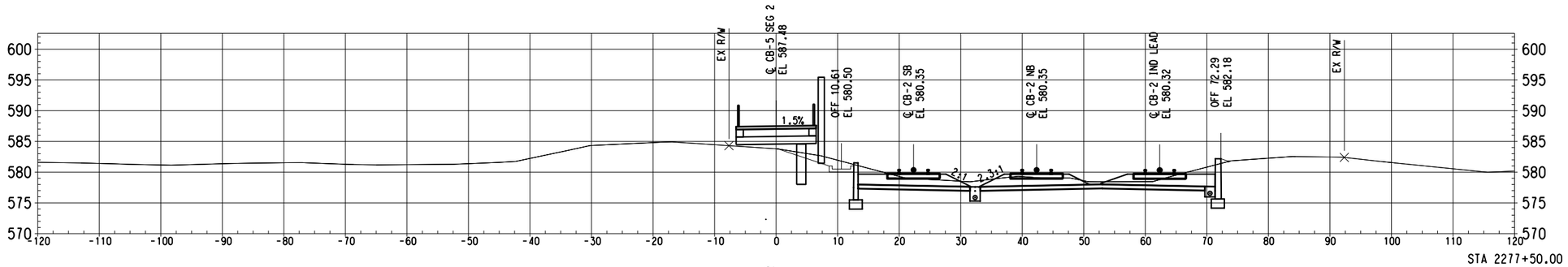
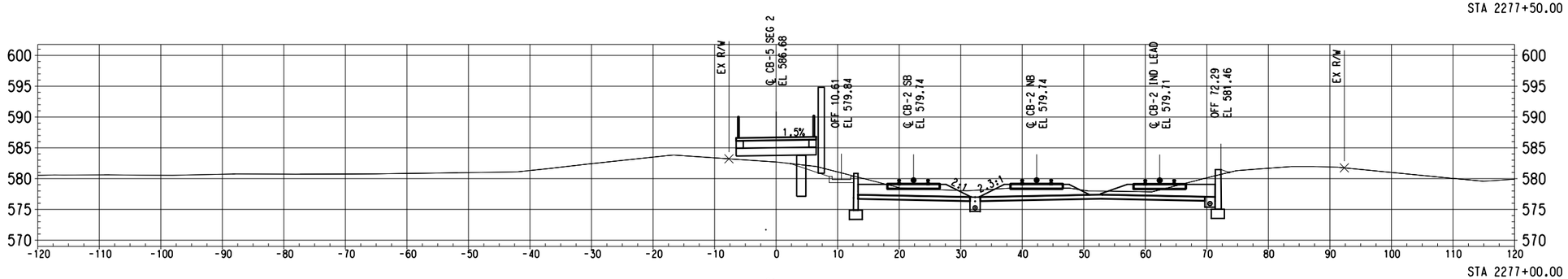
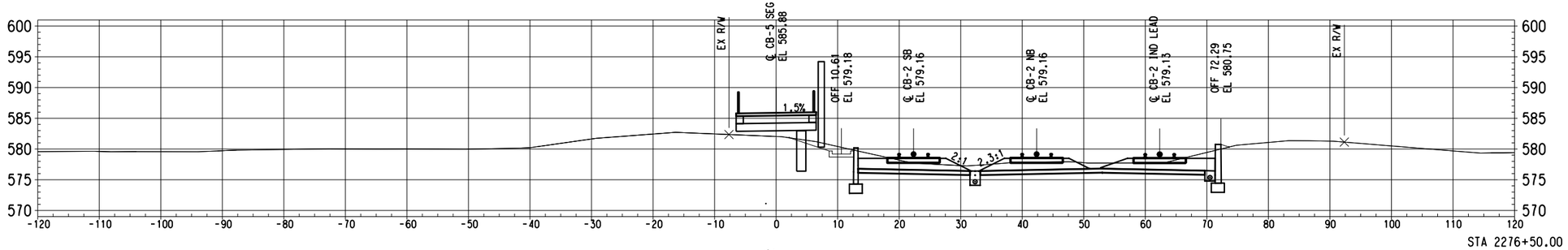
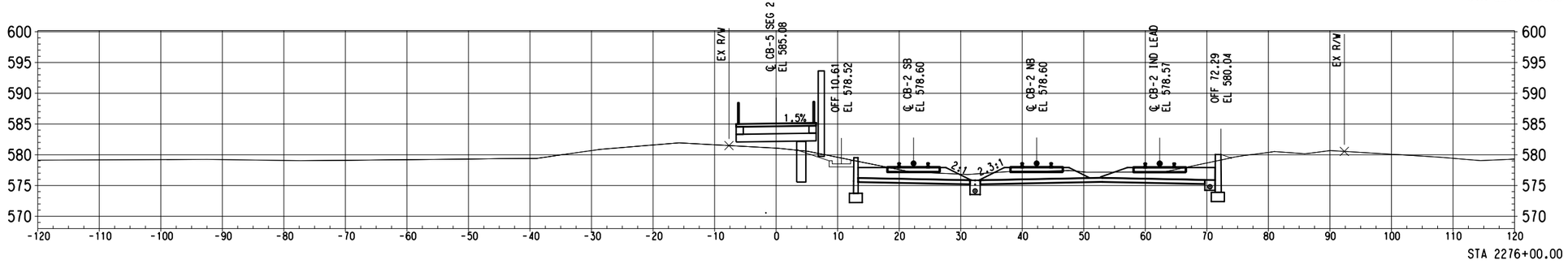
DWG No. CC1-6593









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VERT SCALE (IN FEET) 0 5 10 20

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CHECKED	D. LUU
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COTTON BELT REGIONAL RAIL VELOWEB HIKE & BIKE TRAIL

CITY OF CARROLLTON
CROSS SECTIONS
SHEET 74 OF 80

CONTRACT	DWG No.	REV
C-2033270-01	CC1-6593	D

CB05-CC1-6593.000

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CB05-CC1-6593.000

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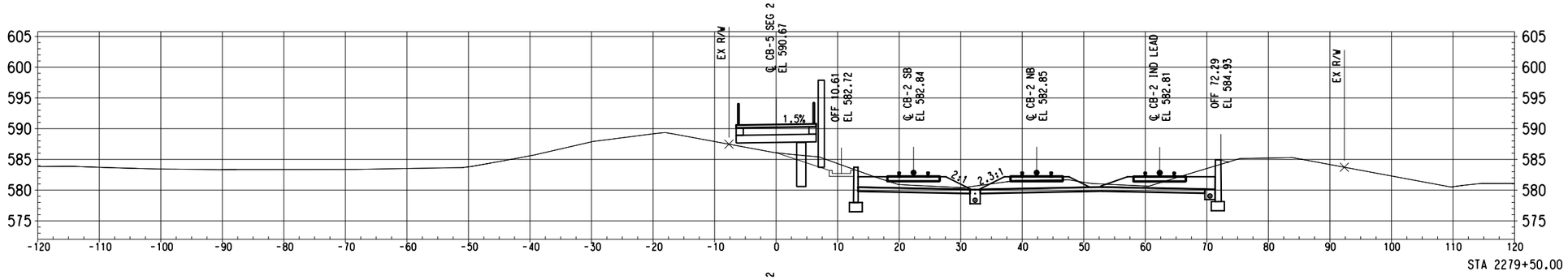
DWG No. CC1-6594



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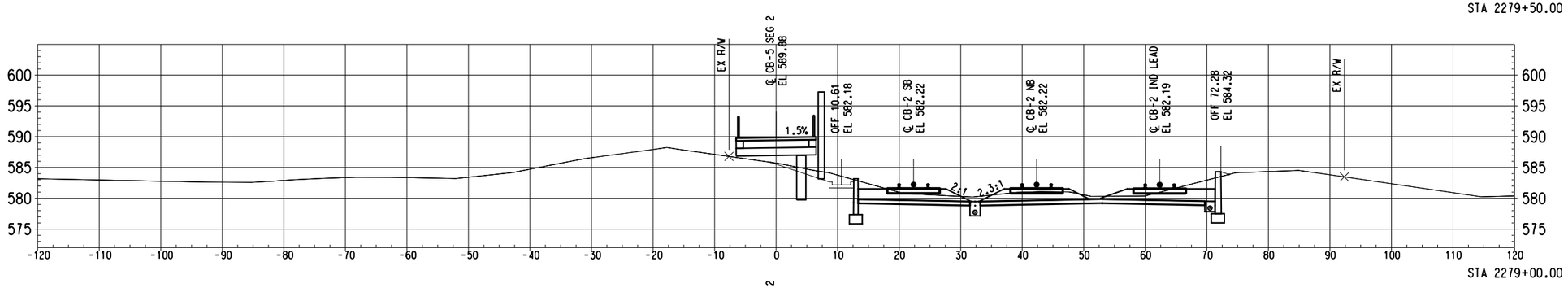

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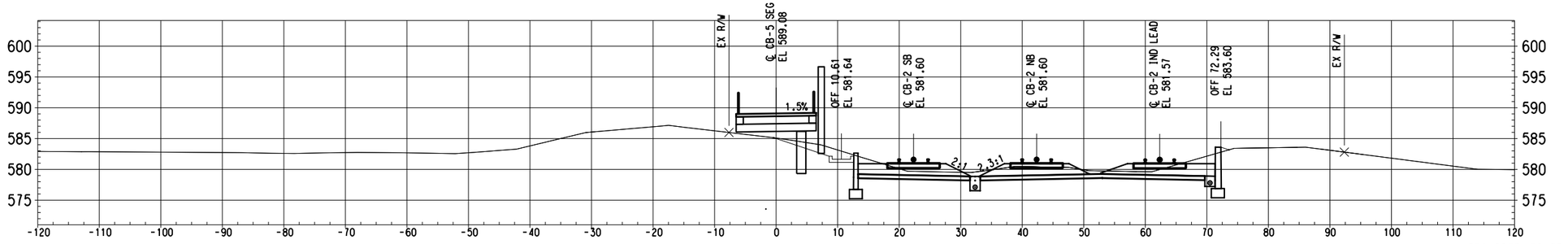

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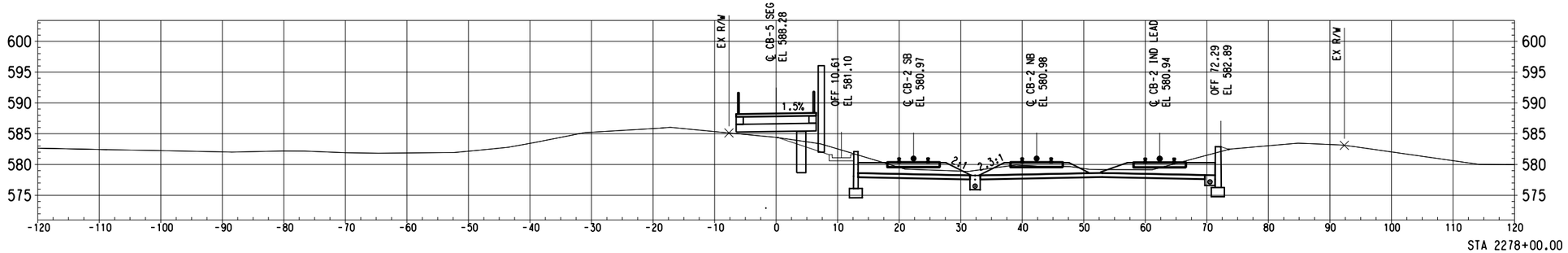

STA 2278+00.00

NOTE:
SEE PLAN AND PROFILE SHEETS FOR FENCE AND RIP RAP LOCATIONS AND LIMITS

HORIZ SCALE (IN FEET) 0 5 10 20

VERT SCALE (IN FEET) 0 5 10 20

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FIRM REGISTRATION No. F-2966
ARS ENGINEERS, INC.
12801 N Central Expressway, Suite 1250
Dallas, Texas 75243
(214) 739-3152 Fax (214) 739-3169
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ARCHER WESTERN HERZOG

DART PROJECT

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SCALE	AS NOTED
DRAWN	S. SALEH
DESIGNED	S. SALEH
CHECKED	D. LUU
IN CHARGE	D. LUU
DATE	07 AUG 23

CAES

CONTRACT SHEET No. 158 OF 345

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

CITY OF CARROLLTON
CROSS SECTIONS
SHEET 75 OF 80

CONTRACT	DWG No.	REV
C-2033270-01	CC1-6594	D

CB05-CC1-6594.000

2-AUG-2023 10:16
CB05-CC1-6594.000

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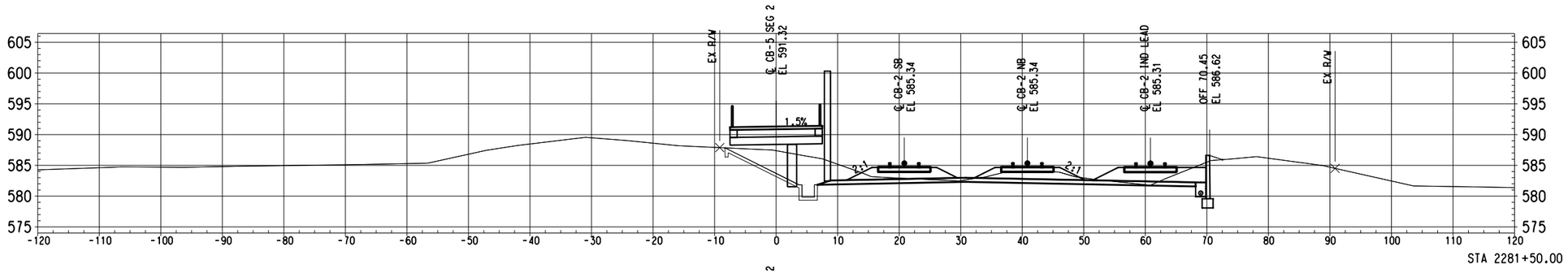
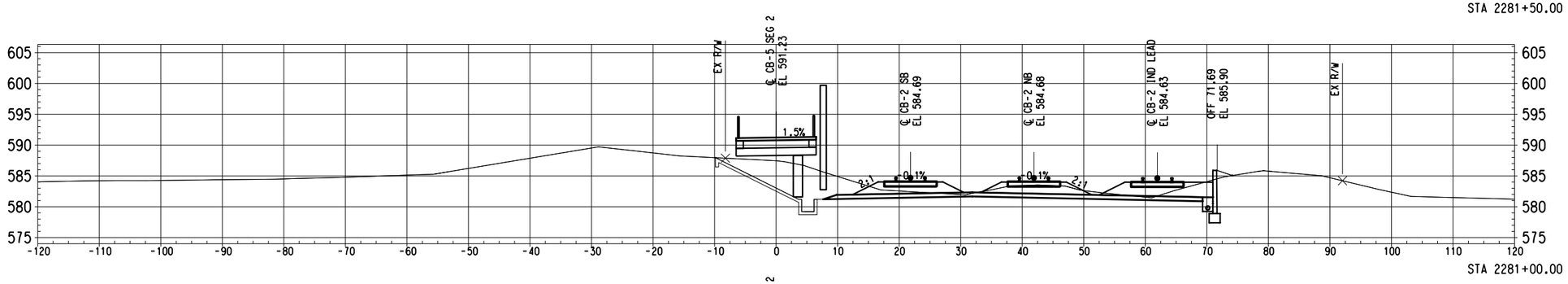
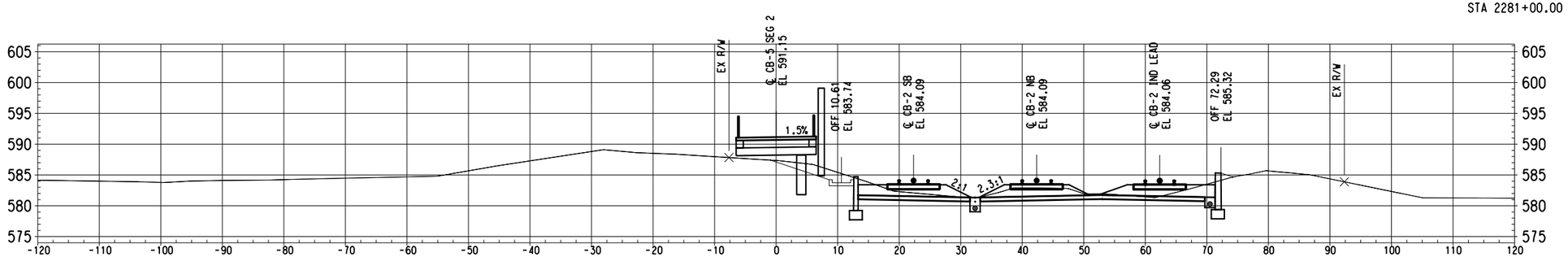
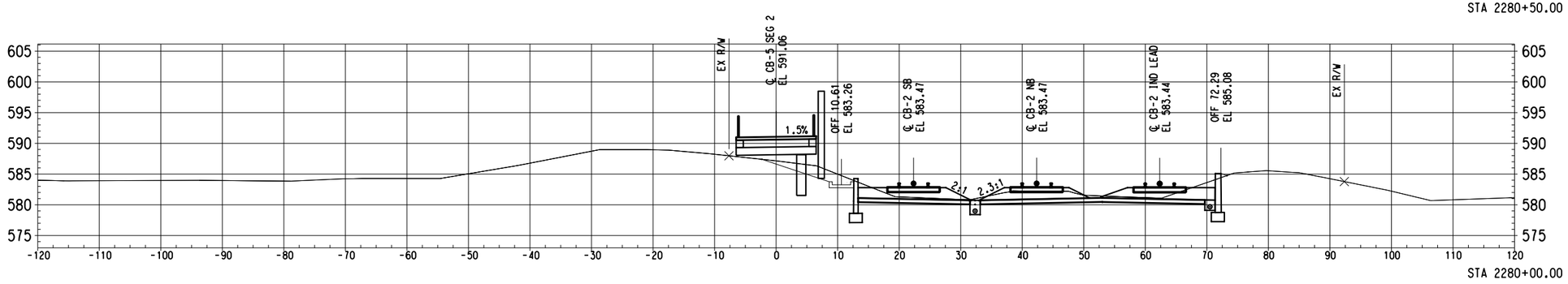
CAR_2_N - 2278+00.00

DWG No. CC1-6595









NOTE:
SEE PLAN AND PROFILE SHEETS FOR FENCE AND RIP RAP LOCATIONS AND LIMITS

HORIZ SCALE (IN FEET) 0 5 10 20

VERT SCALE (IN FEET) 0 5 10 20

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CB05-CC1-6595.000

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CAR_2_N - 2280+00.00

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CHECKED	D. LUU
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CONTRACT SHEET No. 159 OF 345

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

CITY OF CARROLLTON
CROSS SECTIONS
SHEET 76 OF 80

CONTRACT	DWG No.	REV
C-2033270-01	CC1-6595	D

CB05-CC1-6595.000

DWG No. CC1-6596

NOTE:
SEE PLAN AND PROFILE SHEETS FOR FENCE AND RIP RAP LOCATIONS AND LIMITS

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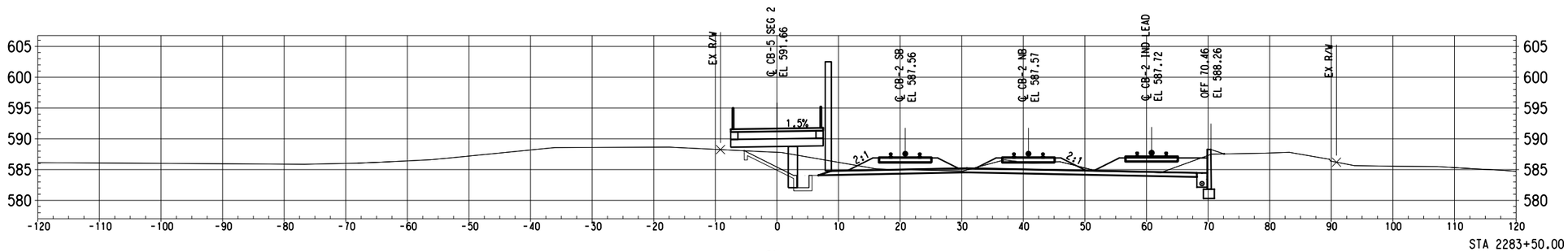
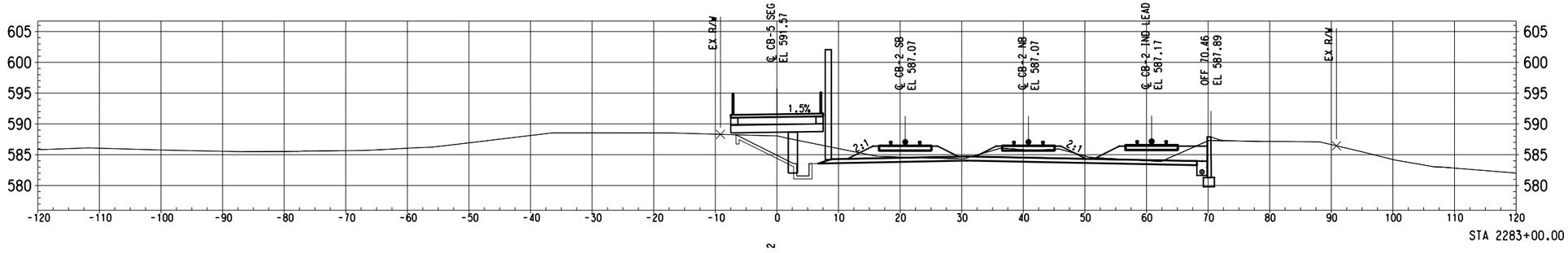
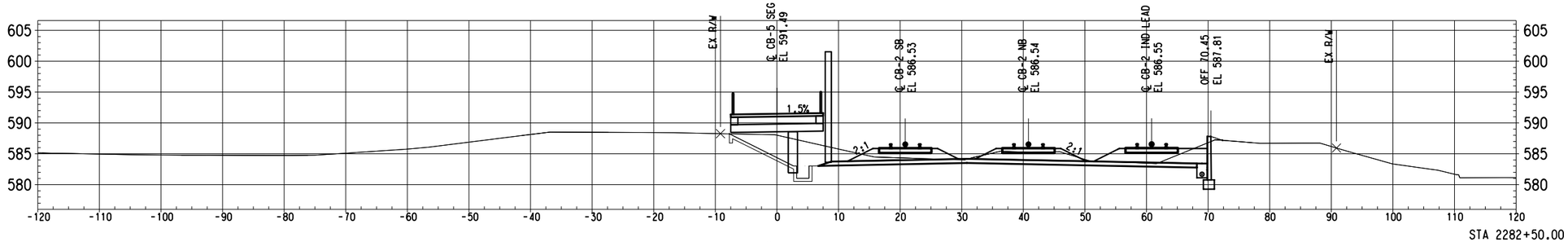
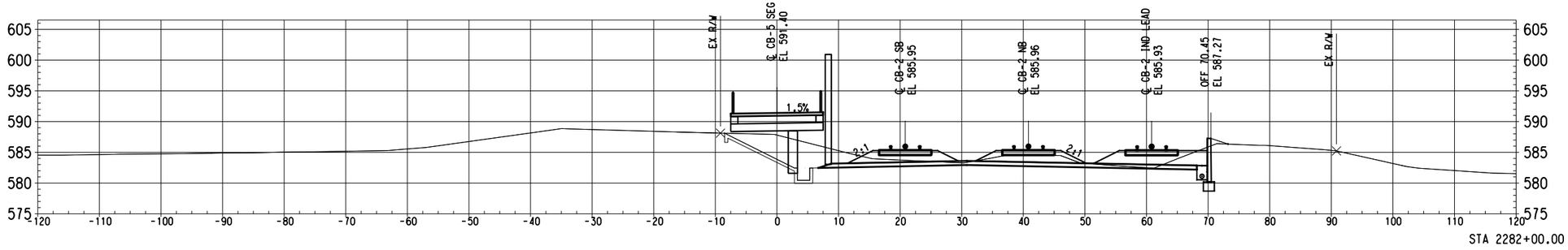
VERT SCALE (IN FEET) 0 5 10 20









2-AUG-2023 10:22
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CONTRACT SHEET No. 160 OF 345

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

CITY OF CARROLLTON
CROSS SECTIONS
SHEET 77 OF 80

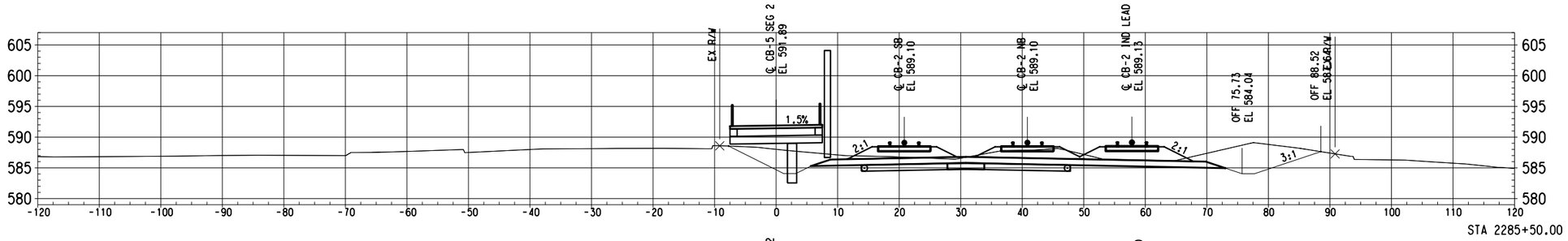
CONTRACT	DWG No.	REV
C-2033270-01	CC1-6596	D

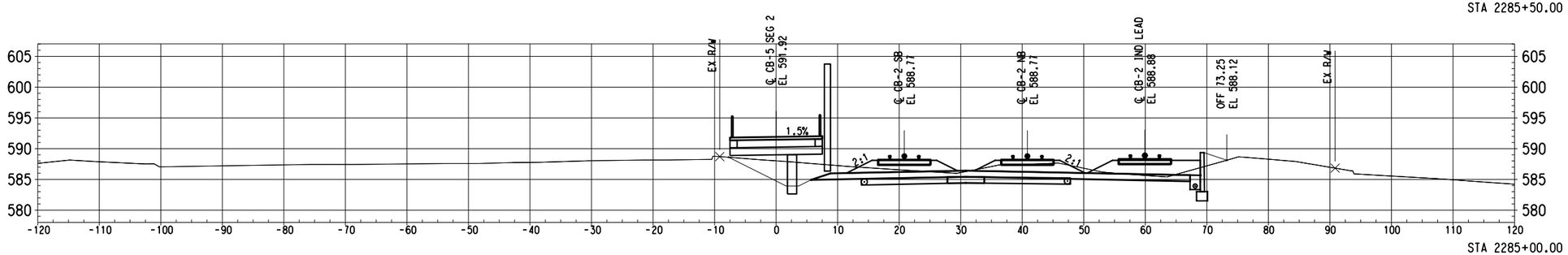
CB05-CC1-6596.000

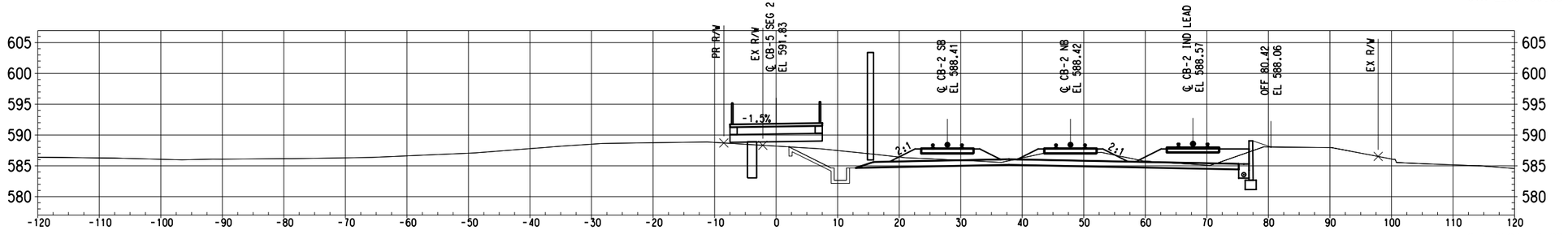
DWG No. CC1-6597

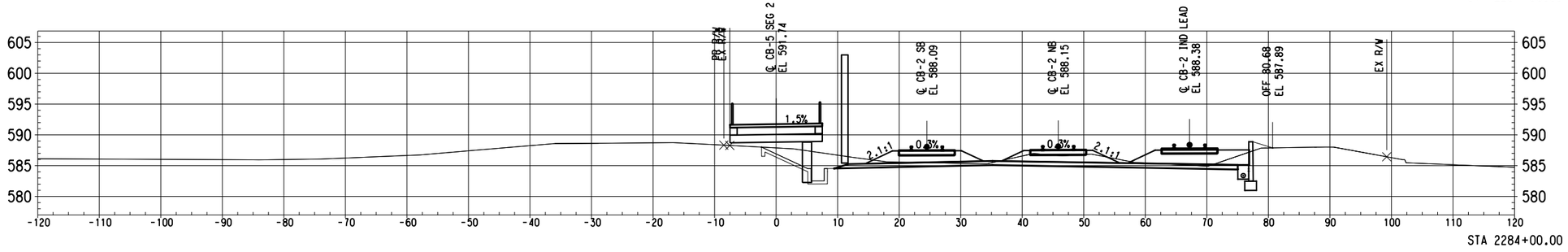
NOTE:
SEE PLAN AND PROFILE SHEETS FOR FENCE AND RIP RAP LOCATIONS AND LIMITS

SCALE (IN FEET)
HORIZ 0 5 10 20
VERT 0 5 10 20









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DESIGNED	S. SALEH
CHECKED	D. LUU
IN CHARGE	D. LUU
DATE	07 AUG 23

CAES

CONTRACT SHEET No. 161 OF 345

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

CITY OF CARROLLTON
CROSS SECTIONS
SHEET 78 OF 80

CONTRACT	DWG No.	REV
C-2033270-01	CC1-6597	D

CB05-CC1-6597.000

2-AUG-2023 10:15
CB05-CC1-6597.000

JEGSVCPWU01
CAR_2_N - 2284+00.00

DWG No. CC1-6598

NOTE:
SEE PLAN AND PROFILE SHEETS FOR FENCE AND RIP RAP LOCATIONS AND LIMITS

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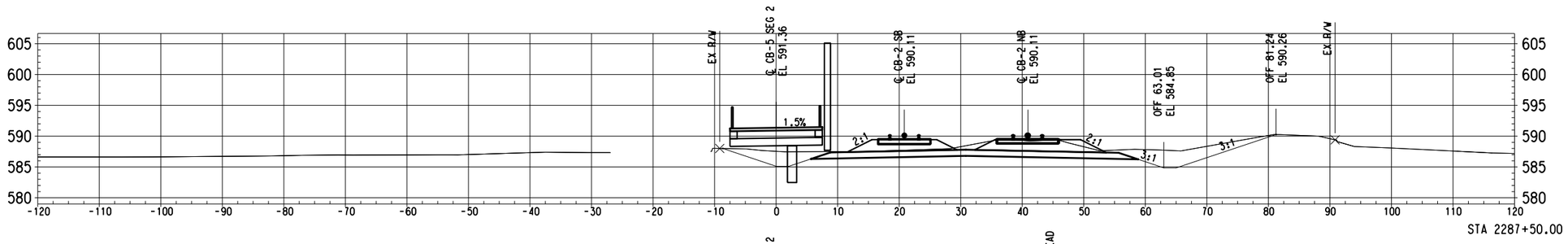
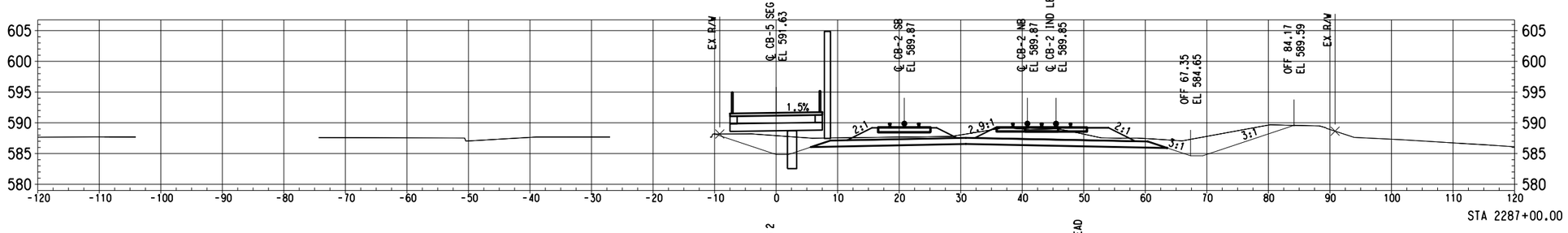
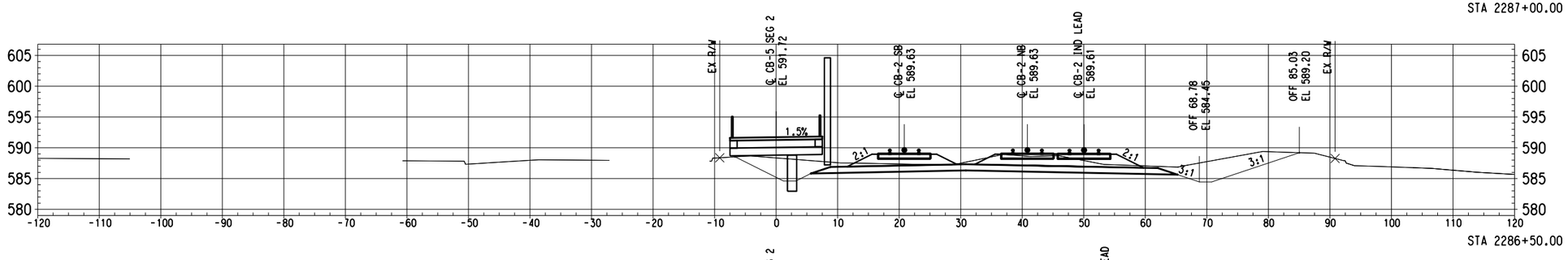
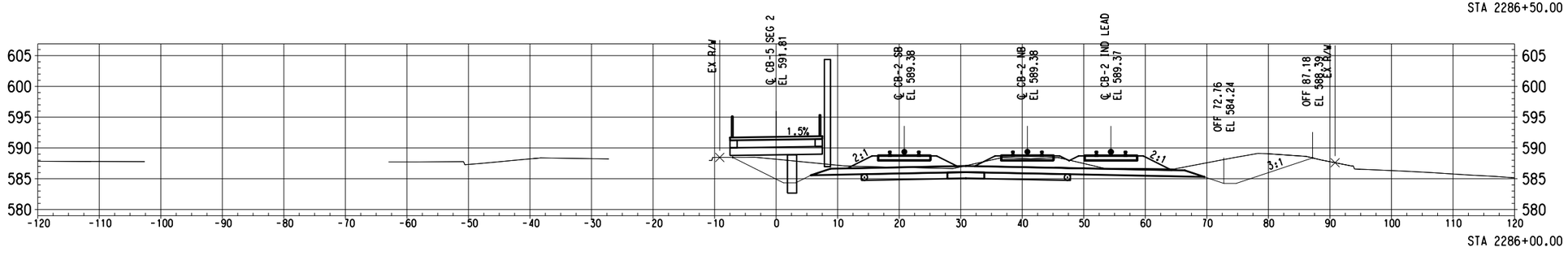
VERT SCALE (IN FEET) 0 5 10 20









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DESIGNED	S. SALEH
CHECKED	D. LUU
IN CHARGE	D. LUU
DATE	07 AUG 23

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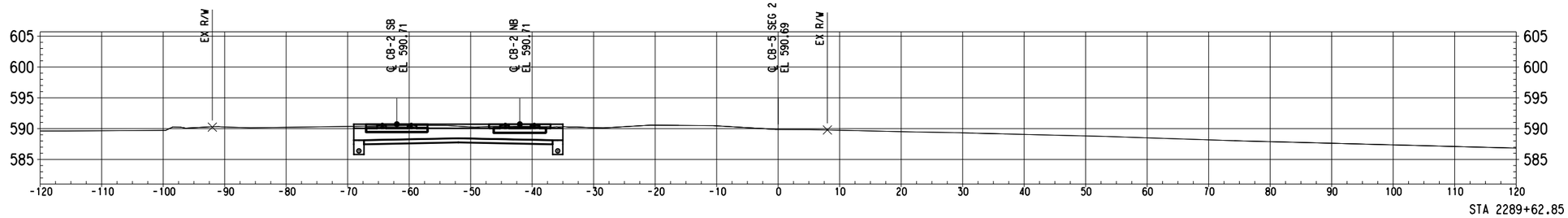
COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

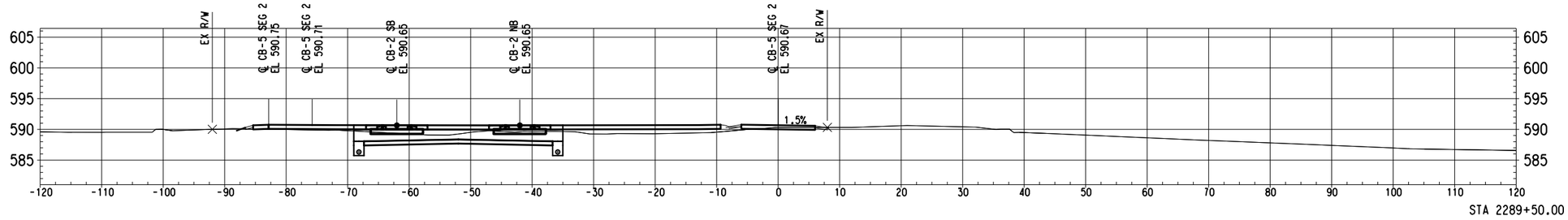
CITY OF CARROLLTON
CROSS SECTIONS
SHEET 79 OF 80

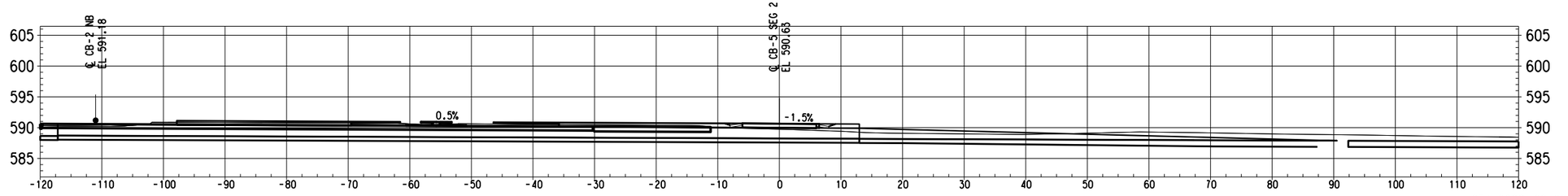
CONTRACT	DWG No.	REV
C-2033270-01	CC1-6598	D

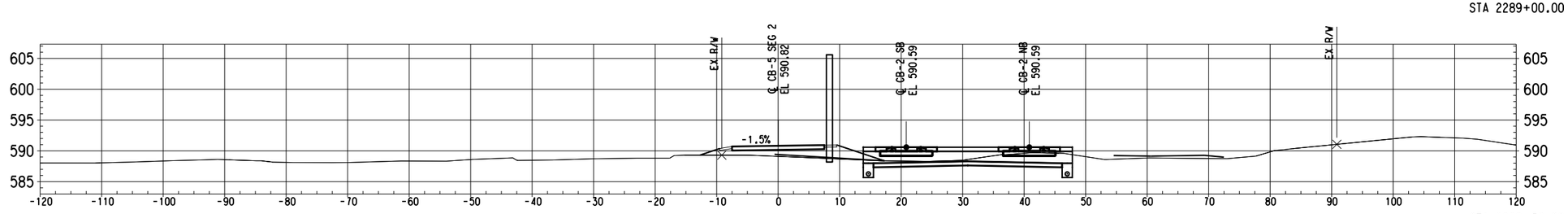
CB05-CC1-6598.000

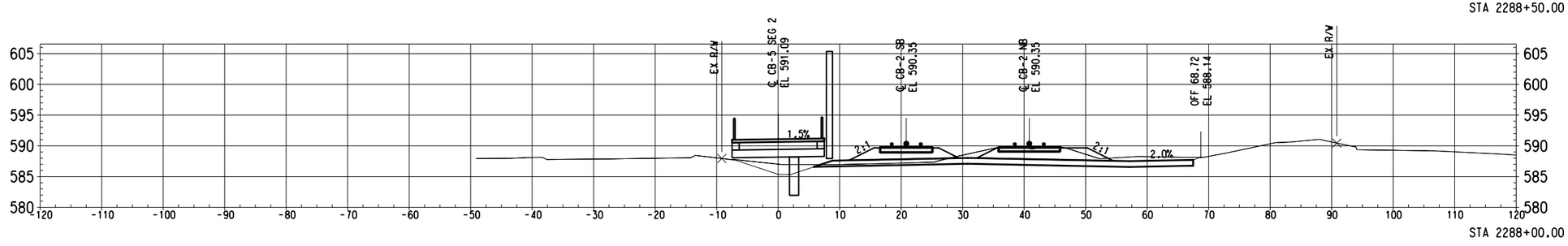
DWG No. CC1-6599











NOTE:
SEE PLAN AND PROFILE SHEETS FOR FENCE AND RIP RAP LOCATIONS AND LIMITS

HORIZ SCALE (IN FEET) 0 5 10 20

VERT SCALE (IN FEET) 0 5 10 20

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DESIGNED	S. SALEH
CHECKED	D. LUU
IN CHARGE	D. LUU
DATE	07 AUG 23

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CONTRACT SHEET No. 163 OF 345

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

CITY OF CARROLLTON
CROSS SECTIONS
SHEET 80 OF 80

CONTRACT	DWG No.	REV
C-2033270-01	CC1-6599	D

CB05-CC1-6599.000

2-AUG-2023 10:15
CB05-CC1-6599.000

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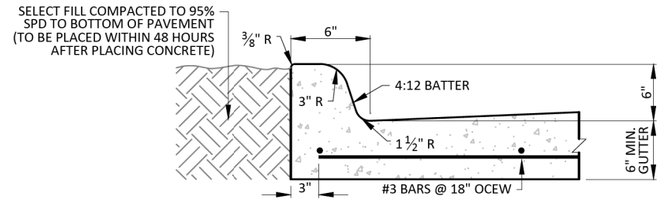
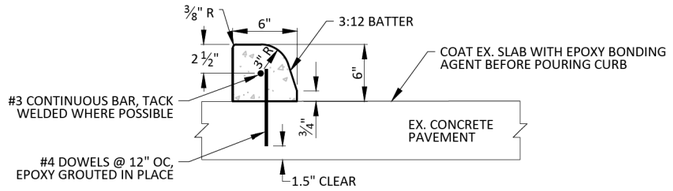
CAR_2_N - 2288+00.00

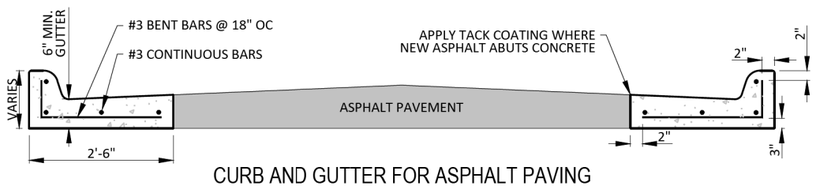
DWG No. CC1-0078



MONOLITHIC CURB



DOWELED CURB (WITH PERMISSION OF DIRECTOR OF ENGINEERING)



CURB AND GUTTER FOR ASPHALT PAVING

NOTES:

1. CONCRETE SHALL BE 4000 PSI COMPRESSIVE @ 28 DAYS.
2. DOWELED CURB NOT TO BE USED IN NEW CONSTRUCTION OR RECONSTRUCTION PROJECTS.
3. SUBGRADE SHALL MEET SAME STANDARDS AS CONCRETE PAVING.

CARROLLTON TEXAS

GENERAL DESIGN STANDARDS
PAVING DETAILS

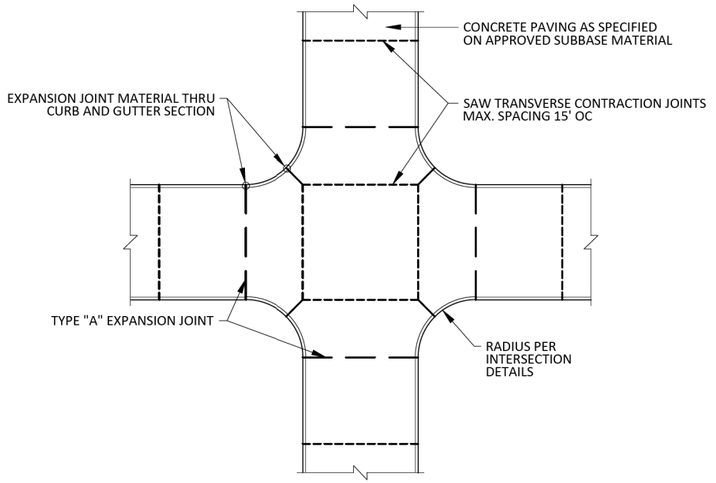
SCALE: NTS DATE: 01/2015
SHEET 1 OF 1

CURB DETAILS

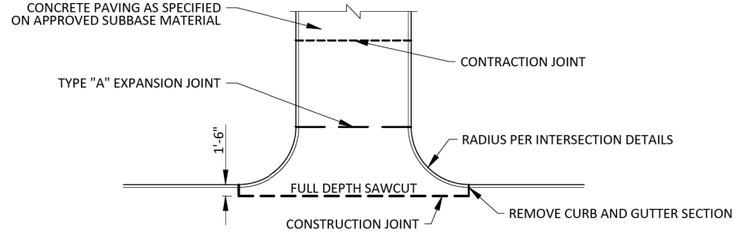
P-9
ENGINEERING DEPARTMENT

FILENAME: P-9_1-1.DWG

1945 E. JACKSON ROAD CARROLLTON, TEXAS 75006 WWW.CITYOFCARROLLTON.COM (972)466-3200



TYPICAL INTERSECTION JOINTING



EXISTING CONCRETE TO NEW CONCRETE ROADWAY TEE INTERSECTION

NOTES:

1. LONGITUDINAL JOINTS ARE REQUIRED ON ANY STREET PAVEMENT WIDER THAN 22.5' (BACK TO BACK).
2. SPACING OF EXPANSION JOINTS IS NOT TO EXCEED 200'.

CARROLLTON TEXAS

GENERAL DESIGN STANDARDS
PAVING DETAILS

SCALE: NTS DATE: 01/2015
SHEET 1 OF 1

STREET INTERSECTION JOINTING DETAILS

P-10
ENGINEERING DEPARTMENT

FILENAME: P-10_1-1.DWG

1945 E. JACKSON ROAD CARROLLTON, TEXAS 75006 WWW.CITYOFCARROLLTON.COM (972)466-3200

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CONTRACT SHEET No. 164 OF 345

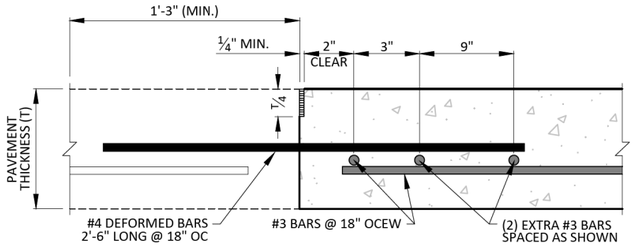
COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

CITY OF CARROLLTON
CITY STANDARDS - CIVIL
SHEET 1 OF 13

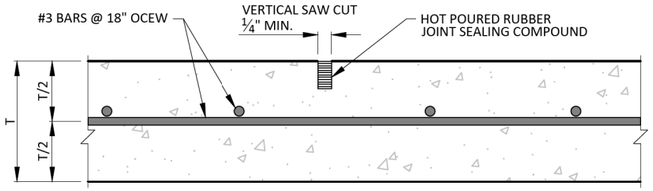
CONTRACT	DWG No.	REV
C-2033270-01	CC1-0078	D

CB05-CC1-0078.001

DWG No. CC1-0079



CONSTRUCTION JOINT



CONTRACTION JOINT

NOTES:

1. ALL #4 x 2'-6" BARS ARE TO BE SET IN DRILLED HOLES USING EPOXY GROUT IN THE MANUFACTURER'S RECOMMEND QUANTITIES.
2. ALL REINFORCING BARS SHALL HAVE WIRE TIES AT EVERY INTERSECTION (100% TIE).
3. WHERE NEW CONCRETE IS TO BE POURED AGAINST OLD CONCRETE, THE OLD CONCRETE SHALL HAVE A COAT OF EPOXY BONDING AGENT APPLIED AT THE MANUFACTURER'S SPECIFIED RATES.
4. MAXIMUM SPACING FOR SAWN TRANSVERSE JOINTS SHALL BE 15'.

GENERAL DESIGN STANDARDS
PAVING DETAILS

SCALE: NTS DATE: 01/2010
SHEET 1 OF 1

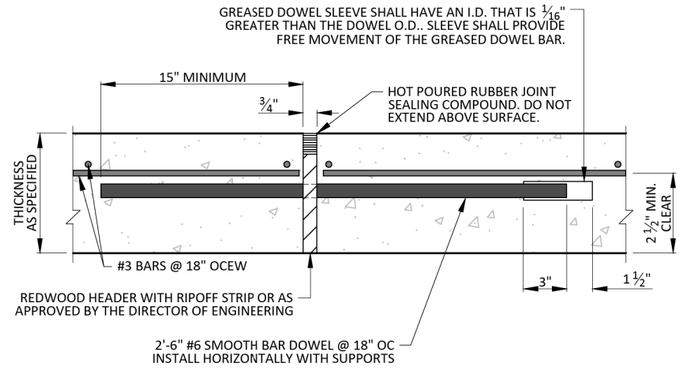
CARROLLTON TEXAS

CONSTRUCTION AND CONTRACTION JOINT DETAILS

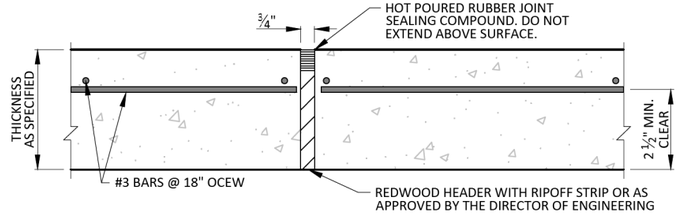
P-11
ENGINEERING DEPARTMENT

FILENAME: P-11_1-1.DWG

1945 E. JACKSON ROAD CARROLLTON, TEXAS 75006 WWW.CITYOFCARROLLTON.COM (972)466-3200



EXPANSION JOINT TYPE "A"



EXPANSION JOINT TYPE "B"

NOTE:

TYPE B EXPANSION JOINTS SHALL BE USED AROUND MANHOLE LEAVE OUTS IN PAVING AREAS.

GENERAL DESIGN STANDARDS
PAVING DETAILS

SCALE: NTS DATE: 01/2016
SHEET 1 OF 1

CARROLLTON TEXAS

EXPANSION JOINT DETAILS

P-12
ENGINEERING DEPARTMENT

FILENAME: P-12_1-1.DWG

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COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

CITY OF CARROLLTON
CITY STANDARDS - CIVIL
SHEET 2 OF 13

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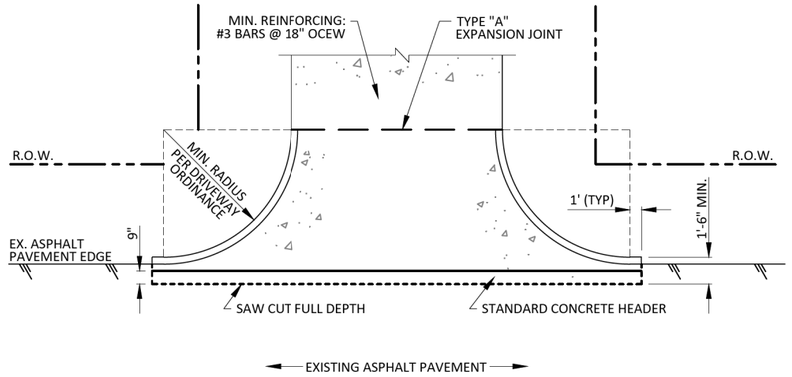
DATE	

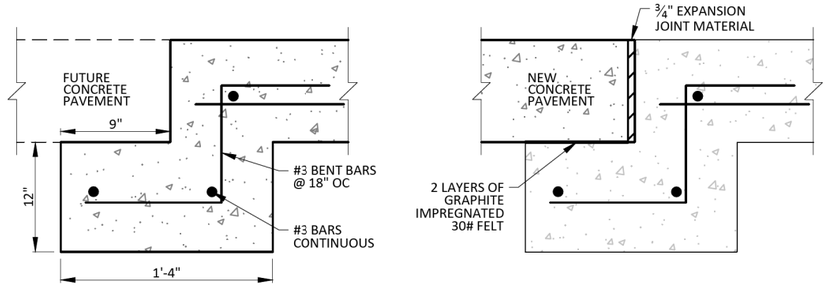
CONTRACT	DWG No.	REV
C-2033270-01	CC1-0079	D

CB05-CC1-0079.001

DWG No. CC1-0080



CONCRETE TO ASPHALT ROADWAY TEE INTERSECTION



PAVING HEADER DETAIL

GENERAL DESIGN STANDARDS
PAVING DETAILS

SCALE: NTS DATE: 04/2017
SHEET 1 OF 1

CARROLLTON TEXAS

ROADWAY TEE INTERSECTION
WITH PAVING HEADER

P-13
ENGINEERING
DEPARTMENT

FILENAME: P-13_1-1.DWG

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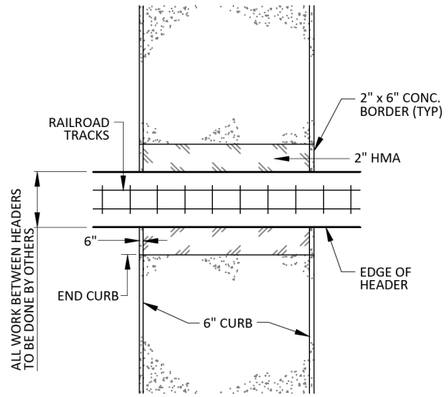
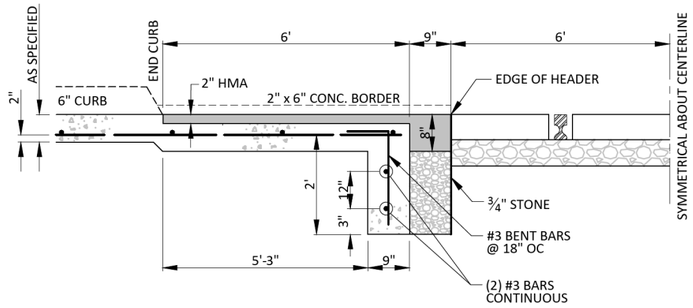


RAILROAD CROSSING



RAILROAD CROSSING HEADER DETAIL

GENERAL DESIGN STANDARDS
PAVING DETAILS

SCALE: NTS DATE: 01/2004
SHEET 1 OF 1

CARROLLTON TEXAS

TYPICAL RAILROAD CROSSING
HEADER DETAILS

P-14
ENGINEERING
DEPARTMENT

FILENAME: P-14_1-1.DWG

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CONTRACT SHEET No. 166 OF 345

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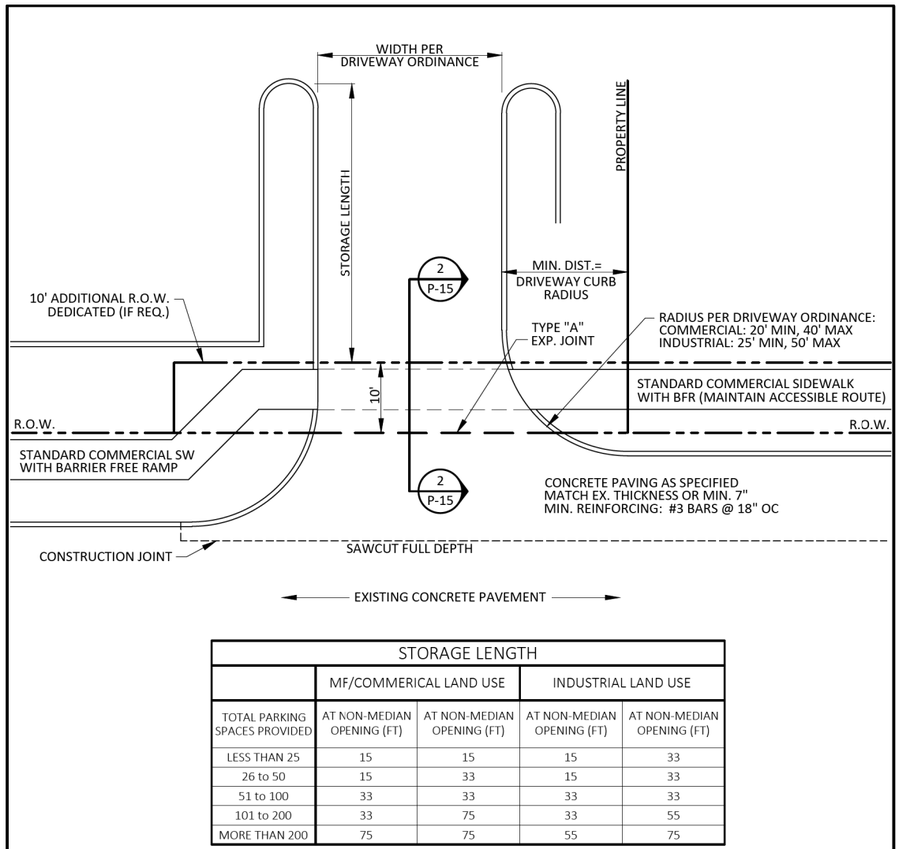
VELOWEB HIKE & BIKE TRAIL

CITY OF CARROLLTON
CITY STANDARDS - CIVIL
SHEET 3 OF 13

CONTRACT	DWG No.	REV
C-2033270-01	CC1-0080	D

CB05-CC1-0080.001

DWG No. CC1 - 0081



STORAGE LENGTH				
	MF/COMMERICAL LAND USE		INDUSTRIAL LAND USE	
TOTAL PARKING SPACES PROVIDED	AT NON-MEDIAN OPENING (FT)	AT NON-MEDIAN OPENING (FT)	AT NON-MEDIAN OPENING (FT)	AT NON-MEDIAN OPENING (FT)
LESS THAN 25	15	15	15	33
26 to 50	15	33	15	33
51 to 100	33	33	33	33
101 to 200	33	75	33	55
MORE THAN 200	75	75	55	75

NOTES:

1. FOR CONSTRUCTION JOINT DETAILS, SEE P-11. FOR EXPANSION JOINT DETAILS, SEE P-12.
2. STORAGE LENGTHS SHALL BE AS SHOWN OR IN ACCORDANCE WITH THE LATEST VERSION OF CHAPTER 53 OF THE CARROLLTON CODE OF ORDINANCES.
3. SIDEWALK SHALL BE AT A 2% CROSS SLOPE ACROSS THE DRIVEWAY.

GENERAL DESIGN STANDARDS
PAVING DETAILS

SCALE: NTS DATE: 05/2017
SHEET 1 OF 2

CARROLLTON TEXAS

COMMERCIAL DRIVE APPROACH

P-15
ENGINEERING DEPARTMENT

FILENAME: P-15_1-2.DWG

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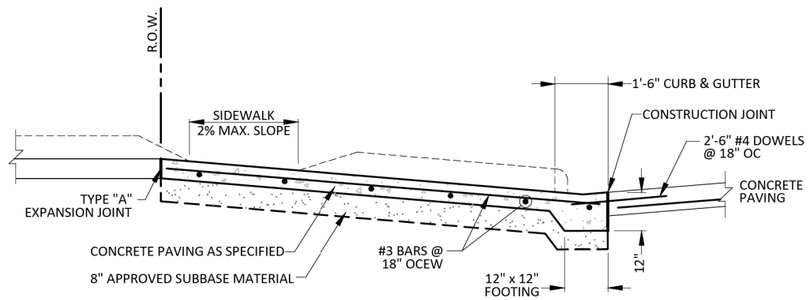
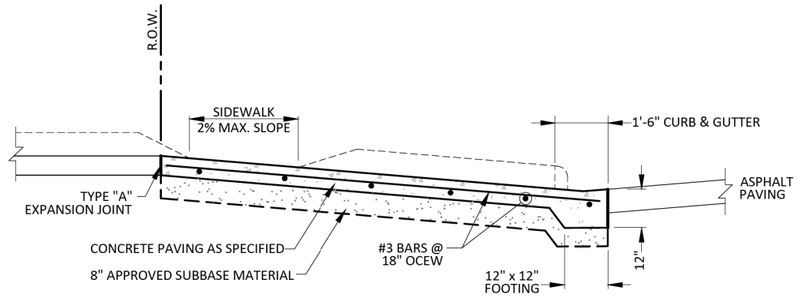


COMMERCIAL APPROACH (CONCRETE PAVING)



COMMERCIAL APPROACH (ASPHALT PAVING)

NOTE:

SEE P-18 FOR BARRIER FREE RAMP DETAIL.

GENERAL DESIGN STANDARDS
PAVING DETAILS

SCALE: NTS DATE: 05/2017
SHEET 2 OF 2

CARROLLTON TEXAS

COMMERCIAL DRIVE APPROACH
CROSS SECTIONS

P-15
ENGINEERING DEPARTMENT

FILENAME: P-15_2-2.DWG

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COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

CITY OF CARROLLTON
CITY STANDARDS - CIVIL
SHEET 4 OF 13

SCALE	DRAWN	DESIGNED	CHECKED	IN CHARGE	DATE

CONTRACT	DWG No.	REV
C-2033270-01	CC1-0081	D

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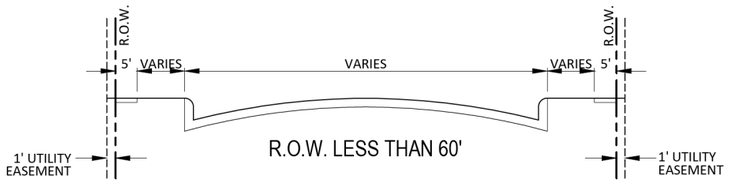
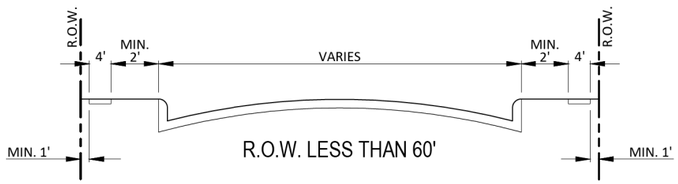
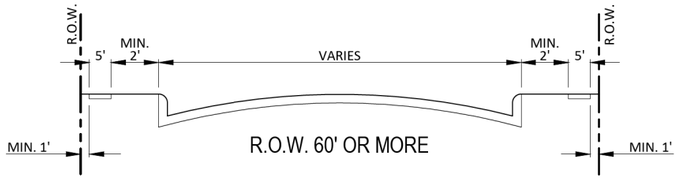
DWG No. CC1-0082



NOTE:
WHEN A 5' RESIDENTIAL SIDEWALK IS ADJACENT TO THE RIGHT-OF-WAY LINE, A 1' UTILITY EASEMENT SHALL BE PROVIDED ON PRIVATE PROPERTY (AS SHOWN.)



NOTE:
FOR COLLECTOR STREETS ADJACENT TO T.U. R.O.W., COMMON AREAS, PARKS, AND PUBLIC OPEN SPACES, SIDEWALKS SHALL BE PLACED IN THE STREET PARKWAY A MINIMUM OF 1' OFF THE PROPERTY LINE AND A MINIMUM OF 2' FROM THE BACK OF CURB.



NOTE:
FOR ARTERIAL AND MAJOR COLLECTOR STREETS, SIDEWALKS SHALL BE PLACED IN THE STREET PARKWAY A MINIMUM OF 1' OFF THE PROPERTY LINE AND A MINIMUM OF 2' FROM THE BACK OF THE CURB.

NOTE:

THESE CROSS SECTIONS ARE EXCEPTIONS TO THE P-2 DETAILS. ALL SIDEWALKS SHALL REMAIN AT A 2% CROSS SLOPE.

GENERAL DESIGN STANDARDS
PAVING DETAILS

SCALE: NTS DATE: 07/2017
SHEET 1 OF 3

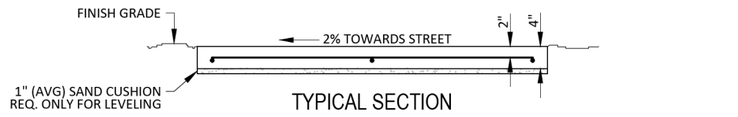
CARROLLTON TEXAS

SIDEWALK
CROSS SECTION DETAILS

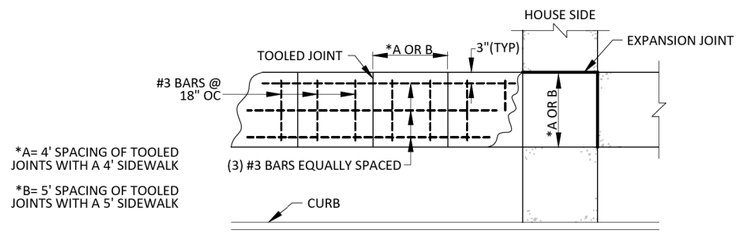
P-17
ENGINEERING DEPARTMENT

1945 E. JACKSON ROAD CARROLLTON, TEXAS 75006 WWW.CITYOFCARROLLTON.COM (972)466-3200

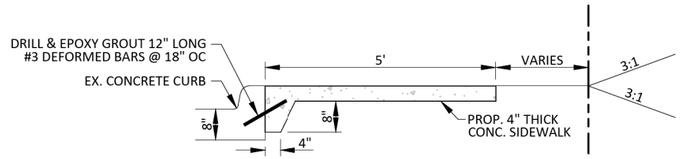
FILENAME: P-17_1-3.DWG



TYPICAL SECTION



TYPICAL MARKING



SIDEWALKS & LEAD WALKS AGAINST EX. CONCRETE CURB

NOTES:

1. CONCRETE SHALL BE 3000 PSI COMPRESSIVE AT 28 DAYS.
2. ALL MARKINGS SHALL BE CUT 1" DEEP, FOLLOWED BY GROOVING TOOL. ½" REDWOOD EXPANSION JOINT MATERIAL SHALL BE PLACED WHERE NEW WORK ABUTS OLD OR NEW WORK IS ADJACENT TO OTHER CONCRETE WORK, EXCEPT ALONG CURBS.
3. TRANSVERSE EXPANSION JOINTS SHALL BE ½" THICK REDWOOD FOR FULL DEPTH OF SIDEWALK AND LUG TO ENSURE SEPARATION OF CONCRETE AND INCLUDE 24" LONG, ½" DIAMETER GREASED SMOOTH DOWEL STEEL BARS WITH CAPS. MAX. SPACING: 40'.
4. WHEN REPLACING EXISTING SIDEWALK DOWEL NEW PAVING INTO ADJACENT SIDEWALK AND INTO THE STREET PAVEMENT BELOW THE GUTTER LINE OR CURB (SEE DETAIL.)
5. SURFACE SHALL BE BROOM FINISHED.

GENERAL DESIGN STANDARDS
PAVING DETAILS

SCALE: NTS DATE: 01/2015
SHEET 2 OF 3

CARROLLTON TEXAS

SIDEWALK
REINFORCING STEEL DETAILS

P-17
ENGINEERING DEPARTMENT

1945 E. JACKSON ROAD CARROLLTON, TEXAS 75006 WWW.CITYOFCARROLLTON.COM (972)466-3200

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COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

CITY OF CARROLLTON
CITY STANDARDS - CIVIL
SHEET 5 OF 13

CONTRACT C-2033270-01
DWG No. CC1-0082
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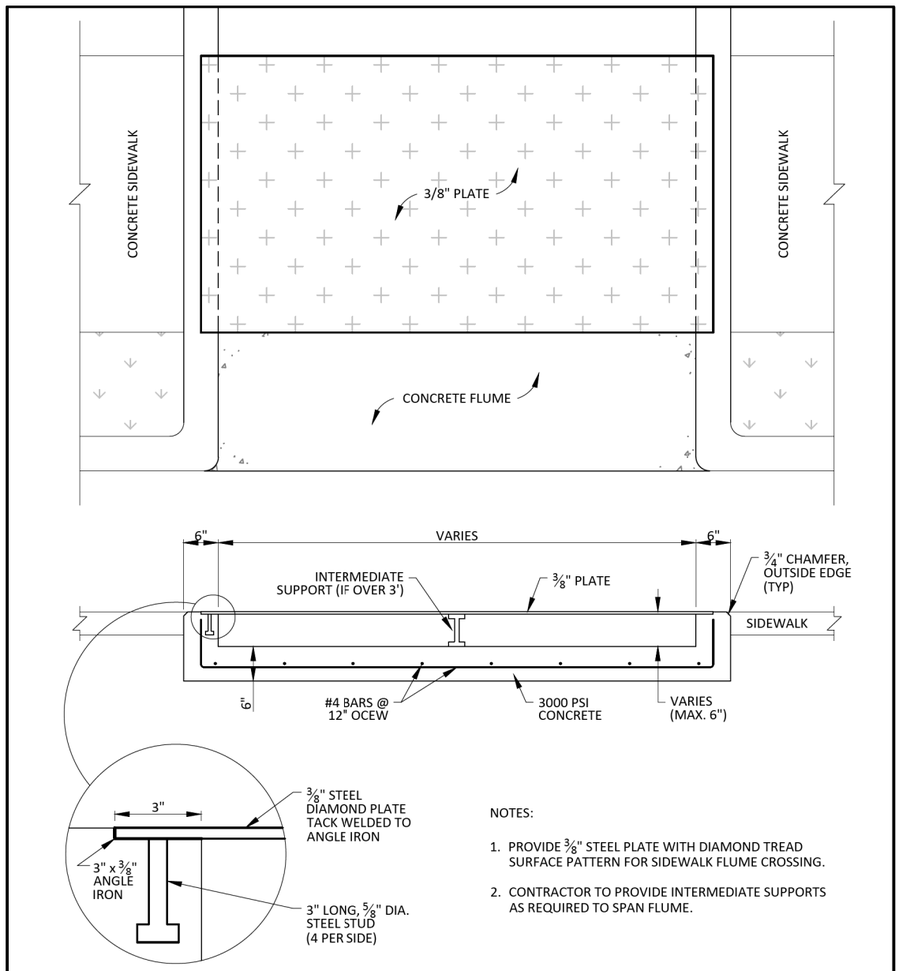
DWG No. CC1-0083



NOTES:

1. PROVIDE 3/8" STEEL PLATE WITH DIAMOND TREAD SURFACE PATTERN FOR SIDEWALK FLUME CROSSING.
2. CONTRACTOR TO PROVIDE INTERMEDIATE SUPPORTS AS REQUIRED TO SPAN FLUME.

GENERAL DESIGN STANDARDS
PAVING DETAILS

SCALE: NTS DATE: 05/2017
SHEET 3 OF 3

CARROLLTON TEXAS

SIDEWALK
DETAIL AT FLUME

P-17
ENGINEERING DEPARTMENT

FILENAME: P-17_3-3.DWG

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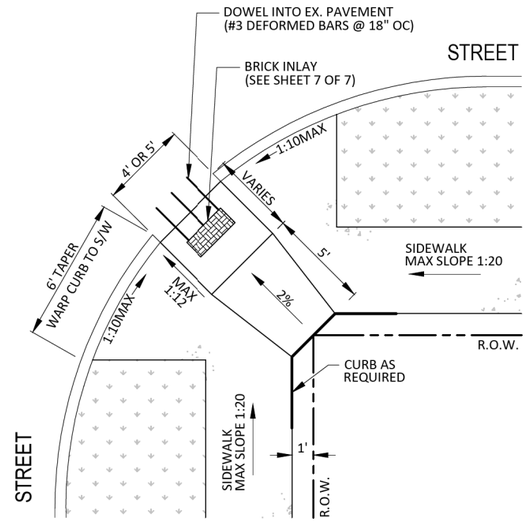

BARRIER FREE RAMP AT STREET INTERSECTION

NOTES:

1. BARRIER FREE RAMPS SHALL BE CONSTRUCTED IN ACCORDANCE WITH CURRENT ACCESSIBILITY STANDARDS AND AS EXTENSIONS OF STANDARD CONCRETE SIDEWALKS.
2. MAXIMUM RUNNING SLOPE ON RAMP PORTION SHALL NOT EXCEED 1" PER FOOT AT ANY LOCATION. VERTICAL DISTANCE BETWEEN STREET AND RAMP SHALL NOT EXCEED 1/4".
3. DESIGNS SHOWN ARE FOR 6" CURBS. FOR CURBS WITH HEIGHT GREATER THAN 6", DIMENSIONS SHALL BE INCREASED PROPORTIONATELY.
4. STREETS ON STEEP GRADE WILL REQUIRE LONGER TRANSITIONS ON UPGRADE SIDE.
5. LOCATION OF BARRIER FREE RAMP MAY BE SHIFTED TO CLEAR OBSTRUCTIONS WITH THE APPROVAL OF THE ENGINEERING DEPARTMENT.

GENERAL DESIGN STANDARDS
PAVING DETAILS

SCALE: NTS DATE: 01/2015
SHEET 1 OF 7

CARROLLTON TEXAS

BARRIER FREE RAMP DETAILS
RAMP AT STREET INTERSECTION

P-18
ENGINEERING DEPARTMENT

FILENAME: P-18_1-7.DWG

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CITY STANDARDS - CIVIL
SHEET 6 OF 13

CONTRACT	DWG No.	REV
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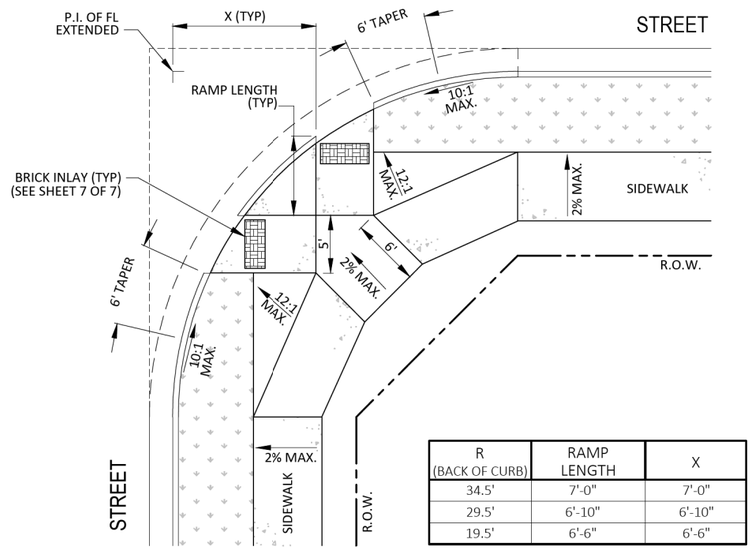
CB05-CC1-0083.001

DWG No. CC1-0084



R (BACK OF CURB)	RAMP LENGTH	X
34.5'	7'-0"	7'-0"
29.5'	6'-10"	6'-10"
19.5'	6'-6"	6'-6"

DUAL BARRIER FREE RAMP AT STREET INTERSECTION

NOTES:

1. BARRIER FREE RAMPS SHALL BE CONSTRUCTED IN ACCORDANCE WITH CURRENT ACCESSIBILITY STANDARDS AND AS EXTENSIONS OF STANDARD CONCRETE SIDEWALKS.
2. MAXIMUM RUNNING SLOPE ON RAMP PORTION SHALL NOT EXCEED 1" PER FOOT AT ANY LOCATION. VERTICAL DISTANCE BETWEEN STREET AND RAMP SHALL NOT EXCEED $\frac{1}{4}$".
3. DESIGNS SHOWN ARE FOR 6" CURBS. FOR CURBS WITH HEIGHT GREATER THAN 6", DIMENSIONS SHALL BE INCREASED PROPORTIONATELY.
4. STREETS ON STEEP GRADE WILL REQUIRE LONGER TRANSITIONS ON UPGRADE SIDE.
5. LOCATION OF BARRIER FREE RAMP MAY BE SHIFTED TO CLEAR OBSTRUCTIONS WITH THE APPROVAL OF THE ENGINEERING DEPARTMENT.

FILENAME: P-18_2-7.DWG

CARROLLTON TEXAS

GENERAL DESIGN STANDARDS
PAVING DETAILS

SCALE: NTS DATE: 07/2017
SHEET 2 OF 7

BARRIER FREE RAMP DETAILS
DUAL RAMP AT STREET INTERSECTION

P-18
ENGINEERING DEPARTMENT

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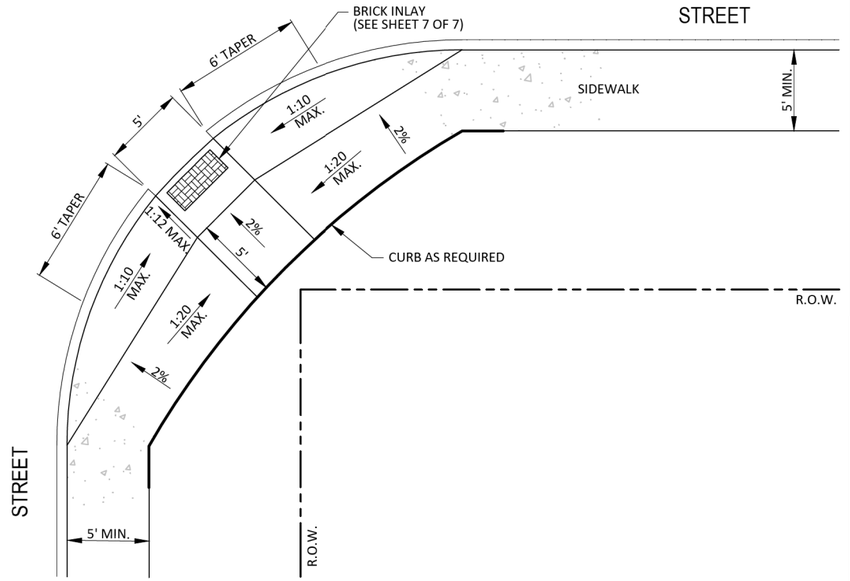

BARRIER FREE RAMP WITH BOTH SIDEWALKS ADJACENT TO CURB

NOTES:

1. BARRIER FREE RAMPS SHALL BE CONSTRUCTED IN ACCORDANCE WITH CURRENT ACCESSIBILITY STANDARDS AND AS EXTENSIONS OF STANDARD CONCRETE SIDEWALKS.
2. MAXIMUM RUNNING SLOPE ON RAMP PORTION SHALL NOT EXCEED 1" PER FOOT AT ANY LOCATION. VERTICAL DISTANCE BETWEEN STREET AND RAMP SHALL NOT EXCEED $\frac{1}{4}$".
3. DESIGNS SHOWN ARE FOR 6" CURBS. FOR CURBS WITH HEIGHT GREATER THAN 6", DIMENSIONS SHALL BE INCREASED PROPORTIONATELY.
4. STREETS ON STEEP GRADE WILL REQUIRE LONGER TRANSITIONS ON UPGRADE SIDE.
5. LOCATION OF BARRIER FREE RAMP MAY BE SHIFTED TO CLEAR OBSTRUCTIONS WITH THE APPROVAL OF THE ENGINEERING DEPARTMENT.

FILENAME: P-18_3-7.DWG

CARROLLTON TEXAS

GENERAL DESIGN STANDARDS
PAVING DETAILS

SCALE: NTS DATE: 01/2007
SHEET 3 OF 7

BARRIER FREE RAMP DETAILS
BOTH SIDEWALKS ADJACENT TO CURB

P-18
ENGINEERING DEPARTMENT

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COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

CITY OF CARROLLTON
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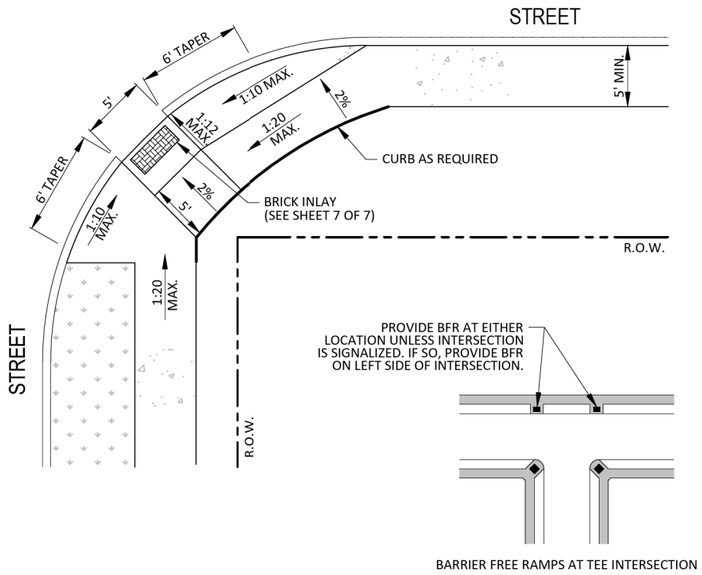
DWG No. CC1-0085



BARRIER FREE RAMPS AT TEE INTERSECTION

BARRIER FREE RAMP WITH SINGLE SIDEWALK ADJACENT TO CURB

NOTES:

1. BARRIER FREE RAMPS SHALL BE CONSTRUCTED IN ACCORDANCE WITH CURRENT ACCESSIBILITY STANDARDS AND AS EXTENSIONS OF STANDARD CONCRETE SIDEWALKS.
2. MAXIMUM RUNNING SLOPE ON RAMP PORTION SHALL NOT EXCEED 1" PER FOOT AT ANY LOCATION. VERTICAL DISTANCE BETWEEN STREET AND RAMP SHALL NOT EXCEED ¼".
3. DESIGNS SHOWN ARE FOR 6" CURBS. FOR CURBS WITH HEIGHT GREATER THAN 6", DIMENSIONS SHALL BE INCREASED PROPORTIONATELY.
4. STREETS ON STEEP GRADE WILL REQUIRE LONGER TRANSITIONS ON UPGRADE SIDE.
5. LOCATION OF BARRIER FREE RAMP MAY BE SHIFTED TO CLEAR OBSTRUCTIONS WITH THE APPROVAL OF THE ENGINEERING DEPARTMENT.

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PAVING DETAILS

SCALE: NTS DATE: 02/2011
SHEET 4 OF 7

BARRIER FREE RAMP DETAILS
SINGLE SIDEWALK ADJACENT TO CURB

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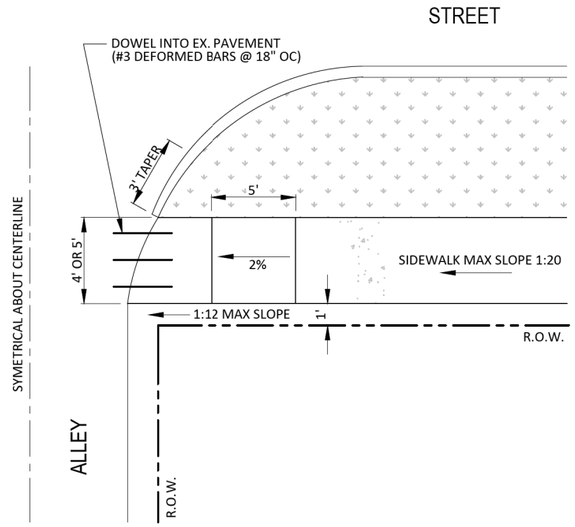

BARRIER FREE RAMP AT ALLEY

NOTES:

1. BARRIER FREE RAMPS SHALL BE CONSTRUCTED IN ACCORDANCE WITH CURRENT ACCESSIBILITY STANDARDS AND AS EXTENSIONS OF STANDARD CONCRETE SIDEWALKS.
2. MAXIMUM RUNNING SLOPE ON RAMP PORTION SHALL NOT EXCEED 1" PER FOOT AT ANY LOCATION. VERTICAL DISTANCE BETWEEN STREET AND RAMP SHALL NOT EXCEED ¼".
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FILENAME: P-18_5-7.DWG

CARROLLTON TEXAS

GENERAL DESIGN STANDARDS
PAVING DETAILS

SCALE: NTS DATE: 01/2015
SHEET 5 OF 7

BARRIER FREE RAMP DETAILS
RAMP AT ALLEY

P-18
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VELOWEB HIKE & BIKE TRAIL

CITY OF CARROLLTON
CITY STANDARDS - CIVIL
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CONTRACT	DWG No.	REV
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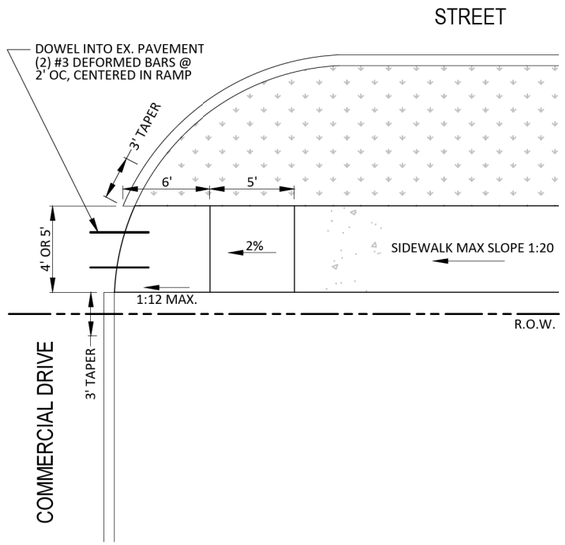

BARRIER FREE RAMP AT COMMERCIAL DRIVE

NOTES:

1. BARRIER FREE RAMPS SHALL BE CONSTRUCTED IN ACCORDANCE WITH CURRENT ACCESSIBILITY STANDARDS AND AS EXTENSIONS OF STANDARD CONCRETE SIDEWALKS.
2. MAXIMUM RUNNING SLOPE ON RAMP PORTION SHALL NOT EXCEED 1" PER FOOT AT ANY LOCATION. VERTICAL DISTANCE BETWEEN STREET AND RAMP SHALL NOT EXCEED ¼".
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GENERAL DESIGN STANDARDS
PAVING DETAILS

SCALE: NTS DATE: 01/2015
SHEET 6 OF 7

CARROLLTON TEXAS

BARRIER FREE RAMP DETAILS
RAMP AT COMMERCIAL DRIVE

P-18
ENGINEERING DEPARTMENT

FILENAME: P-18_6-7.DWG

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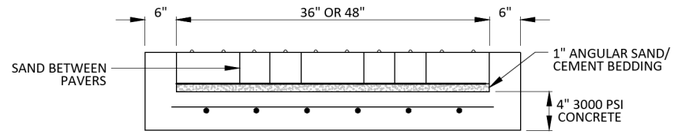
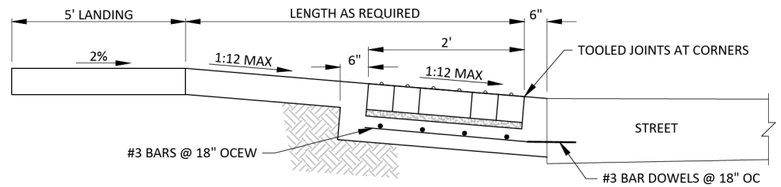
NOTE:
SEAL WITH SUREBOND, SB-1300 JOINT STABILIZING SEALER (OR EQUAL) AFTER SAND INSTALLATION



SECTION THRU WIDTH



SECTION THRU LENGTH

NOTES:

1. BRICK PAVERS SHALL BE 8" x 4" x 2 ½" IN A COLOR MEETING ADA SECTION 4.29.2 (WHITACRE GREER ANTIQUE RED SHADE NO. 32 OR APPROVED EQUAL) AND SHALL BE LAID IN A 2 UNIT BY 2 UNIT BASKET WEAVE PATTERN. COLOR SHALL BE CONTRASTING TO ADJACENT SIDEWALK COLORS.
2. PAVERS SHALL HAVE A DETECTABLE WARNING FEATURE THAT CONSISTS OF RAISED TRUNCATED DOMES WITH A DIAMETER OF 0.9", A NOMINAL HEIGHT OF 0.2", AND A NOMINAL SPACING OF 2.35" ON CENTER.
3. BRICK INLAYS (OR DETECTABLE WARNINGS) SHALL ONLY BE INSTALLED AT STREET INTERSECTIONS AND ARE NO LONGER REQUIRED AT DRIVEWAYS AND ALLEYS.
4. ADDITIONAL BARRIER FREE RAMP DETAILS AND NOTES CAN BE FOUND ON TXDOT DETAIL PED-02, PEDESTRIAN FACILITIES, CURB RAMPS.
5. IN LIEU OF BRICK PAVERS, DETECTABLE WARNING PANELS MANUFACTURED BY ARMORCAST PRODUCTS COMPANY (818-982-3600), ADA SOLUTIONS (800-372-0519), OR EQUAL, MAY BE INSTALLED. APPROVAL FOR PROPOSED PRODUCT MUST BE SUBMITTED PRIOR TO INSTALLATION.

GENERAL DESIGN STANDARDS
PAVING DETAILS

SCALE: NTS DATE: 12/2007
SHEET 7 OF 7

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BARRIER FREE RAMP DETAILS
BRICK INLAY

P-18
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FILENAME: P-18_7-7.DWG

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CITY OF CARROLLTON
CITY STANDARDS - CIVIL
SHEET 9 OF 13

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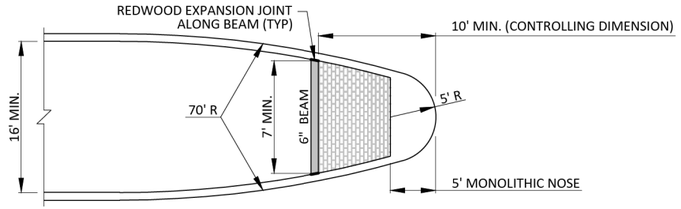
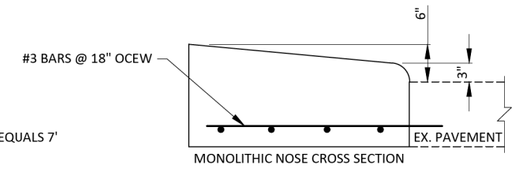
DWG No. CC1-0087

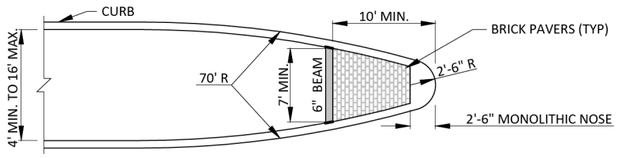


MEDIAN NOSE TYPE "C"

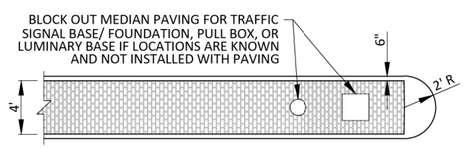


MONOLITHIC NOSE CROSS SECTION

NOTE:
PAVERS SHALL EXTEND UNTIL WIDTH EQUALS 7'
FOR MEDIAN NOSE TYPES 'B' AND 'C'



MEDIAN NOSE TYPE "B"



MEDIAN NOSE TYPE "A" (STANDARD LEFT TURN LANE MEDIAN)

NOTES:

1. SEE SECTION 7, PAGE 7-8 FOR BRICK PAVER SPECIFICATIONS.
2. 6" BEAM SHALL BE 6" x 6" REINFORCED CONCRETE W/ (2) #3 BARS ACROSS SPAN.
3. ALL PAVER SUBGRADE CONCRETE SHALL BE DOWELED INTO PAVEMENT.

GENERAL DESIGN STANDARDS
PAVING DETAILS

SCALE: NTS DATE: 02/2011
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MEDIAN NOSE DETAILS
DIMENSIONS

P-19
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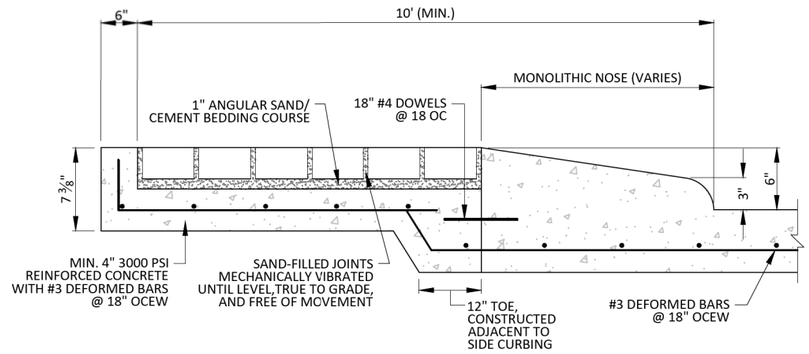

TYPICAL CROSS SECTION

NOTE:

WHERE BEDDING SLAB IS TO BE PART OF A BRIDGE STRUCTURE, BEDDING SLAB THICKNESS SHALL BE INCREASED TO MATCH BRIDGE CONTROL DIMENSIONS.

GENERAL DESIGN STANDARDS
PAVING DETAILS

SCALE: NTS DATE: 12/2008
SHEET 2 OF 2

CARROLLTON TEXAS

MEDIAN NOSE DETAILS
PAVING STONE INSTALLATION

P-19
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FILENAME: P-19_2-2.DWG

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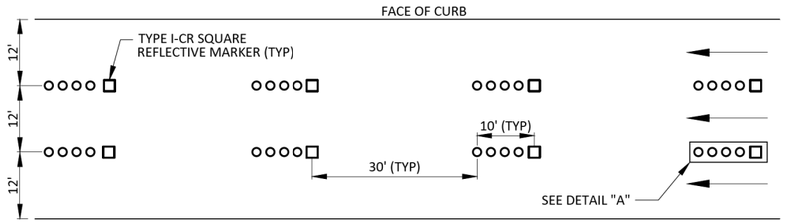
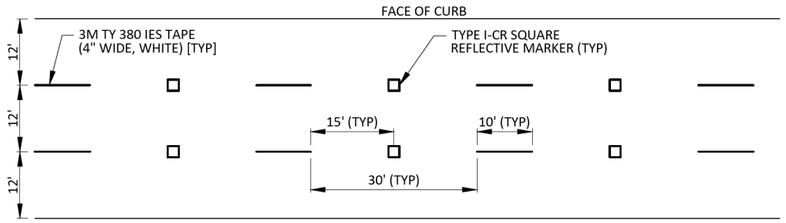


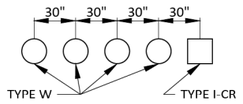
LANE LINES FOR ARTERIALS (A6D) ONE SIDE



LANE LINES FOR ARTERIALS (A6D) ONE SIDE
(ALTERNATIVE DESIGN APPROVED BY THE DIRECTOR OF ENGINEERING)

NOTES:

1. ON ROADWAYS WITH AN ADT GREATER THAN 6000, TRANSVERSE MARKINGS AND SYMBOLS WILL BE INSTALLED USING 90 MIL THERMOPLASTIC. ALL LONGITUDINAL MARKINGS SHALL BE WITH 3M TYPE 380 IES (WHITE) OR 381 IES (YELLOW). CONSULT WITH THE PUBLIC WORKS TRAFFIC OPERATIONS FOR DETAILS.
2. PAVEMENT MARKINGS HAVE DIMENSIONS AS SPECIFIED IN TXDOT STANDARD SHEET RPM(1).



DETAIL "A"

GENERAL DESIGN STANDARDS
PAVING DETAILS

SCALE: NTS DATE: 01/2015
SHEET 1 OF 5

CARROLLTON TEXAS

PAVEMENT MARKING DETAILS
ARTERIALS

P-22
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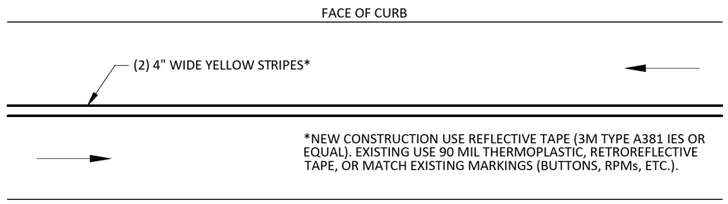
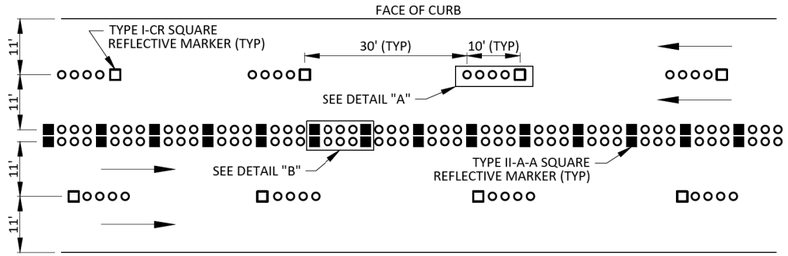
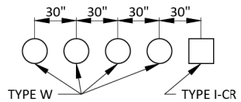


*NEW CONSTRUCTION USE REFLECTIVE TAPE (3M TYPE A381 IES OR EQUAL). EXISTING USE 90 MIL THERMOPLASTIC, RETROREFLECTIVE TAPE, OR MATCH EXISTING MARKINGS (BUTTONS, RPMs, ETC.).

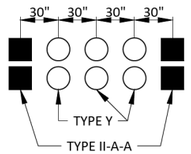
LANE LINES FOR COLLECTORS (C2U) BOTH SIDES



LANE LINES FOR COLLECTORS (C4U) BOTH SIDES



DETAIL "A"
(LANE DIVIDE MARKINGS)



DETAIL "B"
(CENTERLINE MARKINGS)

NOTE:

PAVEMENT MARKINGS HAVE DIMENSIONS AS SPECIFIED IN TXDOT STANDARD SHEET RPM(1).

GENERAL DESIGN STANDARDS
PAVING DETAILS

SCALE: NTS DATE: 01/2015
SHEET 2 OF 5

CARROLLTON TEXAS

PAVEMENT MARKING DETAILS
COLLECTORS

P-22
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CITY STANDARDS - CIVIL
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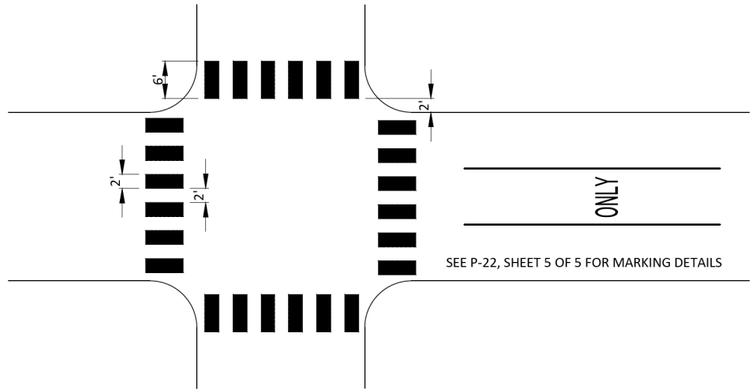
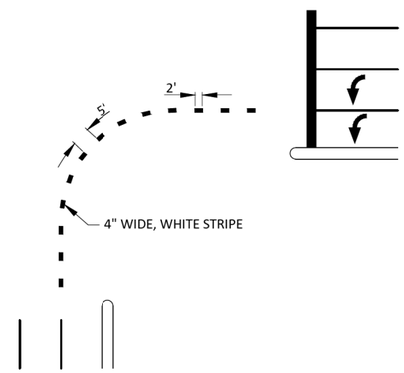
DWG No. CC1-0089



TYPICAL CROSSWALK LAYOUT



TYPICAL "PUPPY TRACK" PAVEMENT MARKING LAYOUT

NOTES:

1. AT TRAILS, CROSSWALK WIDTH SHALL EQUAL THE WIDTH OF THE TRAIL.
2. CROSSWALK AND PUPPY TRACK STRIPING SHALL BE EXTRUDED THERMOPLASTIC 90 MIL THICKNESS.

GENERAL DESIGN STANDARDS
PAVING DETAILS

SCALE: NTS DATE: 01/2015
SHEET 3 OF 5

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PAVEMENT MARKING DETAILS
CROSSWALK & PUPPY TRACKS

P-22
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FILENAME: P-22_3-5.DWG

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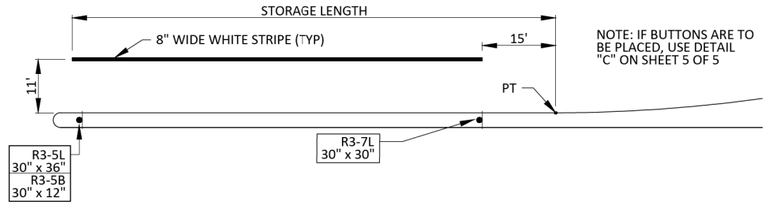
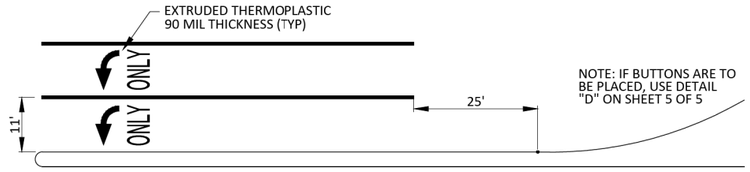
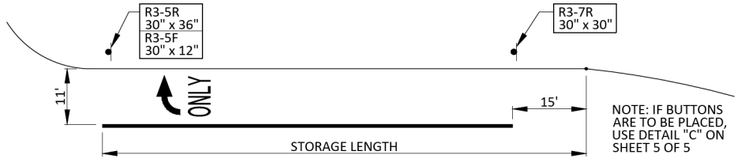


STANDARD LEFT TURN LANE MARKINGS



DUAL LEFT TURN LANE MARKINGS



STANDARD RIGHT TURN LANE MARKINGS

NOTE:

TURN LANE MARKINGS SHALL BE 8" WIDE 3M TAPE OR THERMOPLASTIC. BUTTONS MAY BE USED AS APPROVED BY THE DIRECTOR OF ENGINEERING.

GENERAL DESIGN STANDARDS
PAVING DETAILS

SCALE: NTS DATE: 01/2015
SHEET 4 OF 5

CARROLLTON TEXAS

PAVEMENT MARKING DETAILS
TURN LANES

P-22
ENGINEERING DEPARTMENT

FILENAME: P-22_4-5.DWG

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CONTRACT SHEET No. 175 OF 345

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

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DALLAS, TX 75201-3136
Phone: +1 (214) 638-0145
FIRM REGISTRATION No. F-2966

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Dallas, Texas 75243
(214) 739-3152 Fax (214) 739-3169
FIRM NO. F-819

ARCHER WESTERN HERZOG

DART PROJECT

DART

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CAES

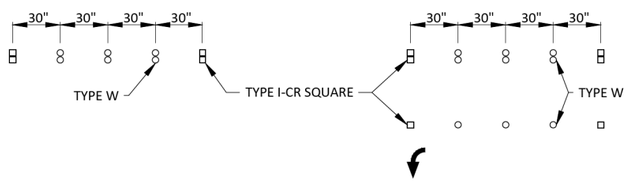
COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

CITY OF CARROLLTON
CITY STANDARDS - CIVIL
SHEET 12 OF 13

CONTRACT	DWG No.	REV
C-2033270-01	CC1-0089	D

CB05-CC1-0089.001

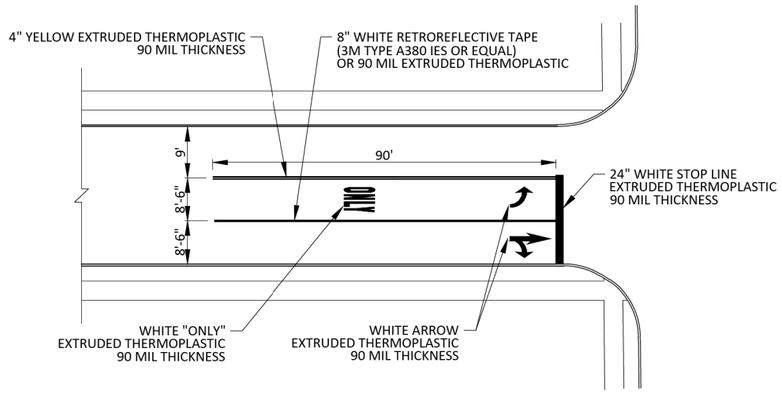
DWG No. CC1-0090



DETAIL "C"

DETAIL "D"

STANDARD BUTTON MARKING DETAILS



NOTE:

ALL MARKINGS SHALL COMPLY WITH TXMUTCD AND CITY OF CARROLLTON STANDARDS. ARROWS AND WORDS SHALL BE EXTRUDED THERMOPLASTIC 90 MIL THICKNESS IN ACCORDANCE WITH TXDOT CRITERIA.

GENERAL DESIGN STANDARDS
PAVING DETAILS

SCALE: NTS DATE: 01/2015
SHEET 5 OF 5

CARROLLTON TEXAS

PAVEMENT MARKING DETAILS

P-22

ENGINEERING DEPARTMENT

FILENAME: P-22_5-5.DWG

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CITY OF CARROLLTON
CITY STANDARDS - CIVIL
SHEET 13 OF 13

CONTRACT	DWG No.	REV
C-2033270-01	CC1-0090	D

CB05-CC1-0090.001

DWG No. CC1 - 0091

DART TRAIL BOARDWALK

DESIGN DATA

1. BOARDWALK SHALL BE DESIGNED IN ACCORDANCE WITH THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS AND THE LRFD GUIDE SPECIFICATION FOR THE DESIGN OF PEDESTRIAN BRIDGES.

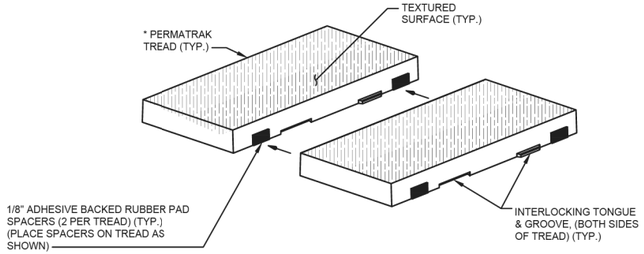
2. DESIGN LIVE LOAD: PEDESTRIAN LOADING - 90 PSF UNIFORM
VEHICULAR LOADING - H-10 DESIGN TRUCK (20,000 LB. VEHICLE)

MATERIAL

1. FASTENERS, BOLTS AND HARDWARE SHALL BE EITHER FIBER REINFORCED POLYMER (FRP) OR GRADE 316 STAINLESS STEEL.

2. ALL REINFORCING SHALL BE GRADE 60 CONFORMING TO ASTM A615.

3. CAST-IN-PLACE CONCRETE SHALL HAVE A 28-DAY CONCRETE COMPRESSIVE STRENGTH OF 4000 PSI.



*NOTES:

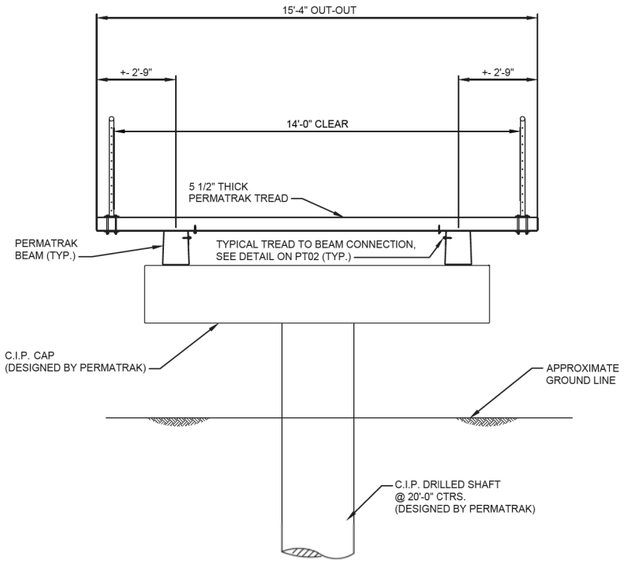
1. TREADS SHALL RECEIVE A SLIP RESISTANT INTEGRAL TEXTURE OR PERMAGRIP, PROVIDED BY PERMATRAK.

2. PERMATRAK TREAD COLOR SHALL BE INTEGRAL (MELBOURNE TAN OR ADELAIDE GRAY).

3. TEXTURED SURFACE SHALL ONLY APPEAR ON THE TOP SURFACE OF THE TREADS AND SHALL HAVE NO VISIBLE SEAMS IN ANY DIRECTION.

TYPICAL TREAD RUBBER SPACING DETAIL

SCALE: NOT TO SCALE



TYPICAL SECTION: PERMATRAK BOARDWALK

N.T.S.

PERMATRAK NORTH AMERICA
8050 CORPORATE CENTER DRIVE
SUITE 100-J
CHARLOTTE, NC 28226
TBPE FIRM NO. 18057

Patented Product: U.S. Patent #5,906,084 #8,302,362 #8,522,505 #8,839,588 #9,096,975

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PREPARED FOR: Jacobs Engineering

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PermaTrak® The Concrete Boardwalk Company
www.permatrak.com TEL: 877-332-7862

OFFICE LOCATIONS: FLORIDA, TEXAS, LOUISIANA, NORTH CAROLINA, OHIO

PROJECT TITLE: DART Trail Boardwalk
Carrollton, TX

JOB NUMBER:	2022-1720
DATE:	09/21/22
DESIGNED BY:	KAS
DRAWN BY:	KAS
CHECKED BY:	AMC
SHEET NO.	PT01

FINAL 100% DESIGN

CONTRACT SHEET No. 177 OF 345

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

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FIRM NO. F-819

ARCHER WESTERN HERZOG

DART PROJECT

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CAES

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

CITY OF CARROLLTON
BOARDWALK STANDARDS
SHEET 1 OF 3

CONTRACT	DWG No.	REV
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CB05-CC1-0091.001

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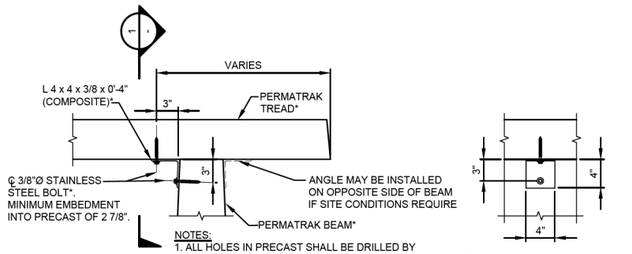
DWG No. CC1-0092

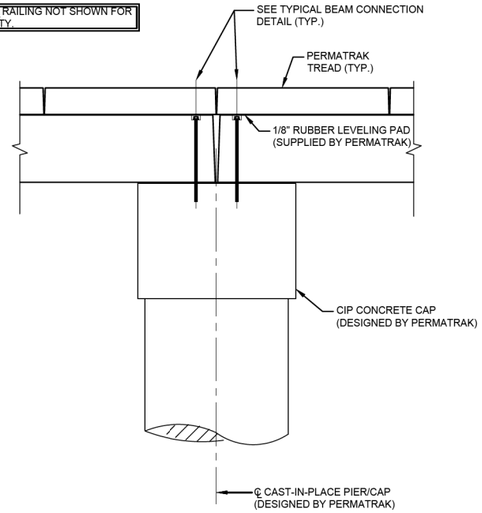


1 SECTION
Scale: 1 1/2" = 1'-0"

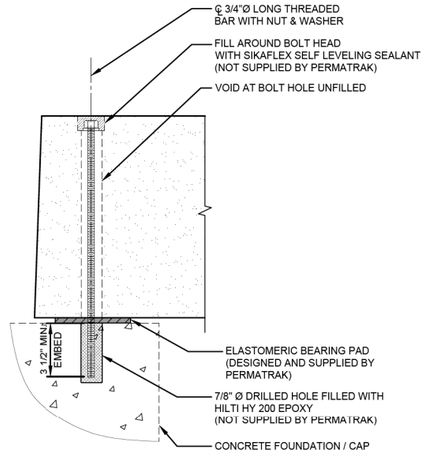
NOTES:
1. ALL HOLES IN PRECAST SHALL BE DRILLED BY CONTRACTOR.
2. DRILLED HOLES IN PRECAST SHALL BE 2 7/8" DEEP AND 3/8"Ø.
3. PRIOR TO INSTALLING BOLT, HOLE SHALL BE THOROUGHLY CLEANED.
4. * INDICATES SUPPLIED BY PERMATRAK.
5. MAXIMUM INSTALLATION TORQUE: 35 FT-LB.
6. ONE (1) CLIP ANGLE IS REQUIRED PER TREAD. LOCATION OF CLIP ANGLE ON TREAD SHALL ALTERNATE SIDES FROM TREAD TO TREAD.

TREAD TO BEAM CONNECTION
SCALE: NOT TO SCALE

NOTE: RAILING NOT SHOWN FOR CLARITY.



TYPICAL PIER CONNECTION DETAIL
SCALE: 1" = 1'-0"



TYPICAL BEAM TO CONCRETE FOUNDATION/CAP CONNECTION DETAIL
SCALE: NOT TO SCALE

PERMATRAK NORTH AMERICA
8050 CORPORATE CENTER DRIVE
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CHARLOTTE, NC 28226
TBPE FIRM NO. 18057

Patented Product: U.S. Patent #5,906,084 #8,302,362 #8,522,505 #8,839,588 #9,096,975

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PREPARED FOR: Jacobs Engineering

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NOT FOR CONSTRUCTION

PermaTrak® The Concrete Boardwalk Company
www.permatrak.com TEL: 877-332-7862

OFFICE LOCATIONS: FLORIDA, TEXAS, LOUISIANA, NORTH CAROLINA, OHIO

PROJECT TITLE: DART Trail Boardwalk
Carrollton, TX

JOB NUMBER:	2022-1720
DATE:	09/21/22
DESIGNED BY:	KAS
DRAWN BY:	KAS
CHECKED BY:	AMC
SHEET NO.	PT02

FINAL 100% DESIGN

CONTRACT SHEET No. 178 OF 345

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

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COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

CITY OF CARROLLTON
BOARDWALK STANDARDS
SHEET 2 OF 3

CONTRACT	DWG No.	REV
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DWG No. CC1-0093

ELEVATED PRECAST CONCRETE BOARDWALK PROJECT SPECIFICATIONS

V4.0 UPDATED SEPTEMBER 2020

PRECAST CONCRETE BOARDWALK SYSTEM

PART 1-GENERAL

1.1 SUMMARY

A. These specifications are for a precast concrete boardwalk and shall be regarded as minimum standards for this project. These specifications are based upon products designed and supplied by:

PermaTrak North America LLC
Ph: (864) 354-4870
Ph: 877-332-7862
www.permatrak.com
Contact: Mr. John Pyle
jpyle@permatrak.com

This item shall also include the design, specification, and construction of a railing and foundation system that is attached to the proposed boardwalk system.

1.2 MINIMUM STANDARDS: The selected boardwalk shall have the following minimum characteristics:

A. The precast system shall be designed as a modular flexible system allowing a prescribed settlement at pier locations. Joints shall be designed for such movement to occur without damage to the structural integrity of the system.

B. Boardwalk system (beams, treads, and curbs if applicable) must be reinforced precast concrete. A material change, including cast-in-place concrete, is not considered an equal to the design shown on the bid documents.

C. Walking surface (treads) shall be made of reinforced precast concrete, and supported by reinforced precast concrete beams. Where applicable, edges of treads will receive precast concrete curbs.

D. Walking surface (finish) of top surface of treads shall have a formliner finish of PermaTrak's PermaGrip texture. Texture must be integral with the concrete and shall not be an applied post pour wearing surface.

E. Precast concrete treads shall be structural load bearing elements and shall interlock with one another via a "tongue and groove" connection.

F. All precast shall consist of integrally colored concrete in a color selected by the owner from one of PermaTrak's "standard colors".

G. DESIGN LOADS: See PT01 for pedestrian and vehicular design live loads.

H. Treads shall maintain a "boardwalk appearance", specifically meaning each tread shall have a width: length ratio ranging from a minimum of 3:1 to a maximum of 14:1. Width is defined as the tread dimension perpendicular to the normal direction of travel. Length is defined as the tread dimension measured in the direction of travel.

I. Tread width shall be as noted on the contract drawings. Alignment should follow the horizontal and vertical alignment shown on the contract plans.

J. Connectors for curbs (if applicable) to treads shall not be visible to boardwalk users while viewed from the top of the walkway.

K. All tread-to-beam connectors shall be non-corrosive, and hidden from view. Metallic tread-to-beam connectors are not acceptable for this project.

L. Boardwalk supplier shall provide a field representative on site for a minimum of 2 days. Field representative shall be knowledgeable in the installation of precast concrete boardwalks.

1.3 QUALITY ASSURANCE

A. The contractor performing the installation of the pile foundations shall have installed piles of size and length similar to those shown on the plans for a minimum of three (3) years prior to the bid date for this project. The contractor shall submit a list containing at least three (3) projects completed in the last three (3) years on which the contractor has installed piles of a size and length similar to those shown on the plans. The list of projects shall contain names and phone numbers of owner's representatives who can verify the Contractor's participation on those projects.

B. Manufacturer Qualifications: Not less than 10 years experience in the actual production of precast products as described below.

1. Components shall be factory fabricated and engineered by single entity. This entity shall be registered to do business in the State of the project location.
2. Boardwalk supplier (Precaster) for the boardwalk shall have in-house color mixing facilities for color pigmentation.
3. Boardwalk supplier (Precaster) shall have either a minimum experience of 5 years or 50 boardwalk projects in design, production, and field consultation.
4. Boardwalk supplier (Precaster) must be certified by PCI or NPCA.
5. Precast components must be manufactured with the use of hot rolled steel skin in reinforced steel forms. Temporary (i.e., Timber) and/or single use forms are unacceptable unless approved in writing by the Boardwalk Engineer.

C. Acceptability Criteria for Treads and Curbs (if applicable): The finished visible (in the final installed position) surface shall have no obvious imperfections other than minimal color or texture variations from the approved samples or evidence of repairs when viewed in good typical daylight illumination with the unaided naked eye at a 20 ft. viewing distance. Appearance of the surface shall not be evaluated when light is illuminating the surface from an extreme angle as it tends to accentuate the minor surface irregularities. The following is a list of finish defects that shall be properly repaired, if obvious when viewed at a 20 ft. distance. Patching (by a trained skilled concrete repair person) is an acceptable repair method.

1. Ragged or irregular surfaces.
2. Excessive air voids (commonly called bug holes) larger than ¼ in. evident on the top surface of the tread or curbs (if applicable).
3. Adjacent flat and return surfaces with greater texture and/or color differences than the approved samples or mockups.
4. Casting and/or aggregate segregation lines evident from different concrete placement lifts and consolidation.
5. Visible mold joints or irregular surfaces.
6. Rust stains on exposed surfaces.
7. Units with excessive variation in texture and/or color from the approved samples, within the unit or compared with adjacent units.
8. Blocking stains evident on exposed surfaces.
9. Areas of backup concrete bleeding through the facing concrete.
10. Foreign material embedded in the surface.
11. Visible repairs at a 20 ft. viewing distance.
12. Reinforcement shadow lines.
13. Cracks visible at a 20 ft. viewings distance.

D. Installer Qualifications: Firm with 3 years experience in installation of systems similar in complexity to those required for this Project.

E. Mock-Up: Provide, if required by Architect/ Engineer, a mock-up for evaluation of the boardwalk showing the surface preparation techniques and application workmanship.

1. Finish areas designated by Architect / Engineer.
2. Do not proceed with remaining work until mock-up is accepted by Architect / Engineer.
3. Refinish mock-up area as required to produce acceptable work.

1.4 DESIGN

A. For applications requiring minimum disturbance due to tree roots or other existing objects specified by the Owner to be avoided during construction, the Boardwalk Manufacturer requires the Contractor or Engineer/Architect to provide a survey of the proposed boardwalk location identifying items of interest including tree roots that cannot be disturbed per the Owner.

B. The designer of the boardwalk, foundation and railing system shall be a qualified registered Professional Engineer licensed in the State of the project location and having a minimum of 20 years of experience in the design of concrete structures, foundation and railing systems.

C. The foundation design shown on the boardwalk drawings are based recommendations found in the geotechnical report entitled referenced on PT01 (if applicable).

A. DESIGN CRITERIA: The design of the boardwalk and railing system shall comply with the following guidelines:

1. AASHTO LRFD Guide Specifications for The Design of Pedestrian Bridges, 2nd Edition with 2015 Interim Revisions.
2. Latest Version of AASHTO LRFD Bridge Design Specifications for Highway Bridges.
3. Latest Version of American Concrete Institute - Building Code and Commentary.
4. In addition to the dead loads of the system, the structure shall be designed for the live loads defined in Section 1.2 G above.

1.5 SUBMISSIONS: Prior to the start of fabrication or construction, the Contractor shall submit to the Engineer a design package, which shall include, but is not limited to, the following:

A. FOR APPROVAL SUBMISSIONS: Prior to the start of fabrication or construction, the Contractor shall submit to the Engineer a design package, which shall include but not limited to the following:

1. DETAILED PLANS:
   a. PLAN VIEW: Full plan view of the boardwalk, foundation and railing system drawn to scale. The plan view must reflect the proposed horizontal alignment as shown on the design plans.
   b. PARTIAL ELEVATION VIEW (IF REQUESTED): Full elevation view of the boardwalk, railing and foundation system drawn to scale which reflect the actual vertical alignment. Elevation views shall indicate the elevation at the top and bottom of the boardwalk and foundation system components.
   c. DETAILS: Details of all boardwalk and railing system components and their connections such as the length, size and where changes occur; connections; etc.
   d. CODE REFERENCE: Design parameters used along with AASHTO references.

2. CONSTRUCTION SPECIFICATIONS:
   a. Construction methods specific to the boardwalk vendor chosen. Submittal requirements such as certification, quality and acceptance/rejection criteria shall be included. Details on connection of boardwalk units and foundation system such that assurance of uniform load transfer shall be checked.

B. FINAL SUBMISSION: Once a boardwalk, foundation and railing system design has been reviewed and accepted by the Owner, the Contractor shall submit the final plans. The designer of the boardwalk, foundation and railing system is responsible for the review of any drawings prepared for fabrication. One set of all approved shop drawings shall be submitted to the Engineer's permanent records.

C. SUBMITTALS: Product Data: Submit Manufacturer's technical product data for railing components and accessories.
Manufacturer to supply submittal drawings for approval to include the following:

1. Section-thru details.
2. Mounting methods.
3. Typical Elevations.
4. Key plan layout.

D. SHOP DRAWINGS: Shop drawings shall:

1. Be stamped by a licensed Professional Engineer in the State of the project location.
2. Show actual field conditions and true elevation and location supplied after field verification.
3. Clearly detail reinforcement in beams, treads and curbs including clear dimension from concrete edge, size and amount of rebar.
4. Clearly state concrete compressive strength, steel type and strength, and a listing of all component weights including lifting locations.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Store products in manufacturer's unopened packaging until ready for installation.

B. Field Measurements: Where handrails and railings are indicated to fit to other construction, check actual dimensions of other construction by accurate field measurements before fabrication; show recorded measurements on final shop drawings:

1. Where field measurements cannot be made without delaying the railing fabrication and delivery, obtain guaranteed dimensions in writing by the Contractor and proceed with fabrication of products so as not to delay fabrication, delivery and installation.

C. Coordinate fabrication and delivery schedule of handrails with construction progress and sequence to avoid delay of railing installation.

1. Air entrained composed of Portland cement, fine and course aggregates, admixtures and water. The air-entraining feature may be obtained by the use of either an air entraining Portland cement or an air entraining admixture. The entrained air-content shall be not less than four percent or more than seven percent.

1.7 WARRANTY:

A. Contractor will be responsible for installation defects associated with the boardwalk and abutment components, foundation system, and railings for a period of 12 calendar months from the date of final acceptance by the Owner.

B. Boardwalk manufacturer shall warranty all precast concrete components against defects in material and workmanship for a period of 10 years.

C. Railing manufacturer shall warranty the railing against defects in materials and workmanship for a period of 12 months.

1.8 MEASUREMENT AND PAYMENT

A. Precast concrete boardwalk, railings, and foundations shall be paid for at the contract lump sum price as listed in the bid proposal for "Precast Concrete Boardwalk". This price shall include all materials, equipment, labor and work necessary for and incidental to the design, construction, delivery, unloading, assembly, and placement of the boardwalk and foundation as shown in the contract plans including all railings on the superstructure.

PART 2-MATERIALS & TESTING

2.1 PRECAST CONCRETE: shall conform to the following:

A. The minimum compressive strength of the concrete shall be 4000 psi measured at 28 days.
B. All precast concrete shall contain structural steel reinforcement as designed by the Engineer of record.
C. All precast concrete components shall be air entrained composed of Portland cement, fine and course aggregates, admixtures and water. The air-entraining feature may be obtained by the use of either an air entraining Portland cement or an air entraining admixture. The entrained air-content shall be not less than four percent or more than seven percent.
D. All reinforcing steel shall be standard uncoated steel conforming to ASTM A615

PART 3 - EXECUTION

1.1 PRECAST CONCRETE BOARDWALK

A. Installation of the precast concrete boardwalk system and railings, if applicable, shall be performed in accordance to the approved plans and manufacturers installation instructions. Boardwalk manufacturer shall provide a field representative to review installation instructions with the Contractor and Engineer and to certify that the installation has been performed according to the approved drawings and manufacturer's instructions.

PERMATRAK NORTH AMERICA
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Patented Product: U.S. Patent #5,906,084 #8,302,362 #8,522,505 #8,839,588 #9,096,975

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PREPARED FOR: Jacobs Engineering

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SHEET NO. Precast Specs

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CB05-CC1-0093.001

ssoleh
Default

FINAL 100% DESIGN

CONTRACT SHEET No. 179 OF 345

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

Jacobs
1999 BRYAN ST, SUITE 1200
DALLAS, TX 75201-3136
Phone: +1 (214) 638-0145
FIRM REGISTRATION No. F-2966

ARS ENGINEERS, INC.
12801 N Central Expressway, Suite 1250
Dallas, Texas 75243
(214) 739-3152 Fax (214) 739-3169
FIRM NO. F-819

Archer Western Herzog

DART PROJECT

DART®

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SCALE
DRAWN
DESIGNED
CHECKED
IN CHARGE
DATE

CAES

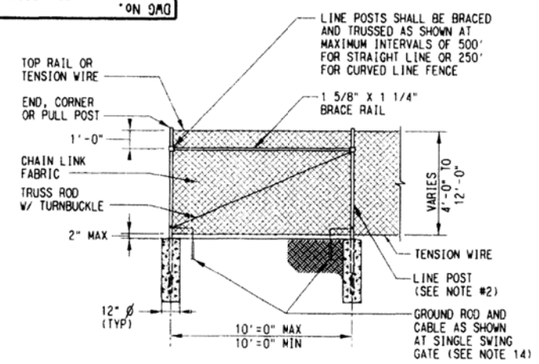
COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

CITY OF CARROLLTON
BOARDWALK STANDARDS
SHEET 3 OF 3

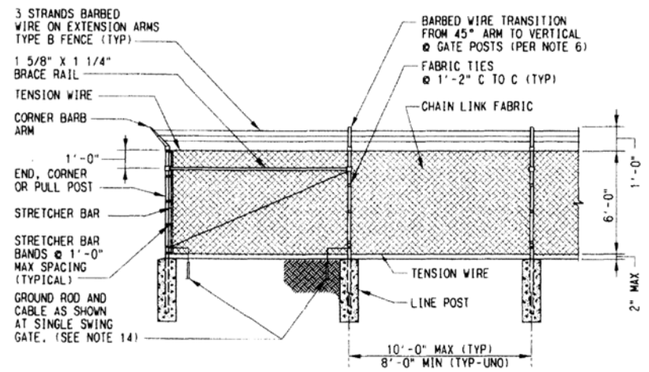
CONTRACT	DWG No.	REV
C-2033270-01	CC1-0093	D

CB05-CC1-0093.001

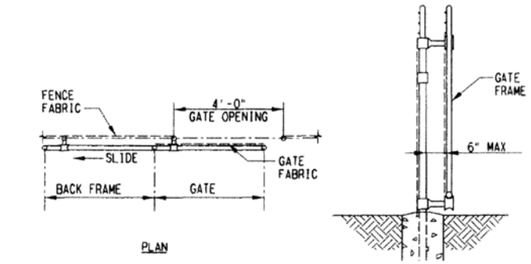
DWG No. CS1-0008



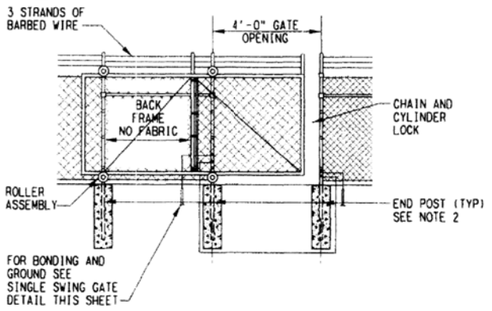
1 — TYPE A AND A-1 FENCE
NTS



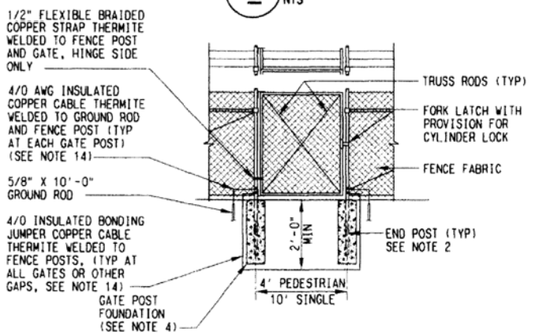
2 — TYPE B FENCE
NTS



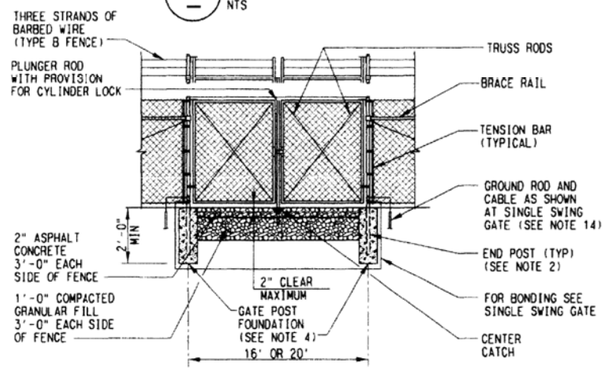
3 — SLIDING GATE
NTS



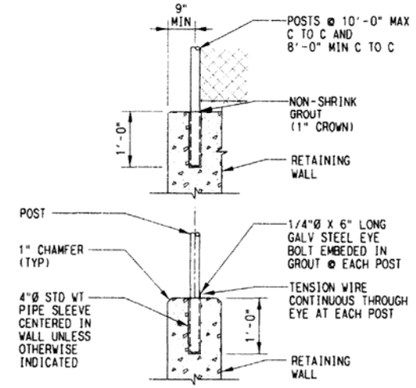
4 — SLIDING GATE ELEVATION
NTS



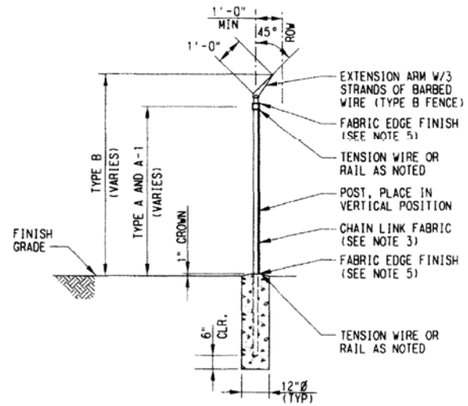
5 — SINGLE SWING GATE
NTS



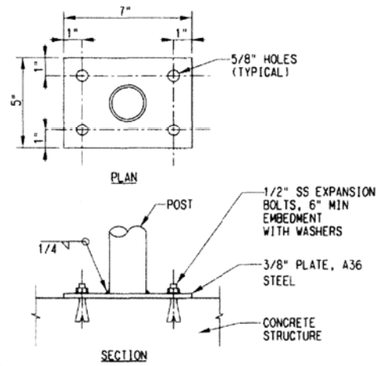
6 — DOUBLE SWING GATE
NTS



7 — FENCE ON RETAINING WALL
NTS



8 — TYPICAL FENCE POST
NTS



NOTE:
POST AND PLATE SHALL BE HOT DIPPED GALV AFTER FABRICATION.

9 — ALTERNATIVE FENCE/HANDRAIL POST MOUNTING
NTS

NOTES:

1. LOCATION OF FENCE AND GATES, GATE WIDTH AND DIRECTION OF SWING, AND ANY SPECIAL FEATURES NECESSARY FOR CONSTRUCTION SHALL BE SHOWN ON PLAN/PROFILE SHEETS..
2. FENCE POSTS FOR 6 FOOT HIGH FENCE TO BE AS FOLLOWS UNLESS OTHERWISE NOTED.
   LINE POST: 1 1/2" NPS GALVANIZED STEEL PIPE WEIGHING 2.72 LBS/FT. SET IN CONCRETE IN A HOLE 2'-6" DEEP AND 12 INCHES DIAMETER.
   TERMINAL, END POST AND CORNER POST: 2 1/2" NPS GALVANIZED STEEL PIPE WEIGHING 5.80 LBS/FT. SET IN CONCRETE IN A HOLE 3 FEET DEEP AND 12 INCHES IN DIAMETER.
   TOP RAIL: 1 1/4" NPS GALVANIZED STEEL PIPE WEIGHING 2.27 LBS/FT.
   POSTS FOR FENCES GREATER THAN 6 FEET IN HEIGHT TO BE AS NOTED ON OTHER DRAWINGS.
3. ALL FENCE FABRIC SHALL BE BARBED ON THE TOP EDGE AND SHALL BE GALVANIZED STEEL UNLESS OTHERWISE NOTED ON OTHER DRAWINGS.
4. THE CONTRACTOR SHALL CONSULT WITH THE GATE MANUFACTURER TO DETERMINE THE SIZE OF THE GATE POST FOUNDATION. THE FOUNDATION SIZE SHALL BE SHOWN ON THE SHOP DRAWINGS.
5. TYPE A AND B FENCE - TENSION WIRE AT TOP AND BOTTOM, FENCE TIED TO TENSION WIRE WITH HOG RINGS 2'-0" CENTER TO CENTER. TYPE A-1 FENCE- TOP RAIL AT TOP OF FENCE. FABRIC TIED TO TOP RAIL WITH TIE WIRES, AND SHALL HAVE ENDS TWISTED TOGETHER DURING INSTALLATION.
6. WHEN 3 STRAND BARBED WIRE IS TO BE ADDED TO TOP OF FENCE, POST EXTENSIONS AND BARBED WIRE ARMS ON THE GATES SHALL BE VERTICAL.
7. POSTS, RAILS AND RODS TO BE INSTALLED INSIDE OF FENCE FABRIC.
8. FENCE AND GATE POSTS AND FRAMES SHALL BE GROUNDED. SEE SPECIFICATIONS FOR FABRICATION, INSTALLATION, AND GROUNDING REQUIREMENTS FOR FENCING.
9. COAT ALL THERMITEE WELDS WITH COAL TAR EPOXY OR EQUIVALENT.
10. THE MINIMUM HEIGHT FOR TYPE B FENCE WITH BARBED WIRE IS SEVEN FEET.
11. LOCATE FENCE POSTS AS SHOWN ON CONTRACT DRAWINGS.
12. SEE ARCHITECTURAL STANDARDS FOR ADDITIONAL FENCING REQUIREMENTS.
13. REFER TO CONSTRUCTION PLANS FOR FABRIC SIZE, GAUGE AND FENCING LIMITS.
14. GROUNDING AND BONDING SHALL BE IN ACCORDANCE WITH NATIONAL ELECTRIC SAFETY CODE (IEEE C2-1990). GROUND RODS ARE REQUIRED AT EACH END POST, GATE POST, POWER LINE CROSSING (OVERHEAD OR UNDER-GROUND AND AT INTERVALS OF 150 FEET (MAXIMUM). A BURIED BONDING JUMPER IS REQUIRED AT EVERY GATE OR GAP.

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
SHEET NO. 180 OF 345
DWG NO. CS9-0104
CONTRACT NO. C-2033270-01

FENCE CODE: (1) (2) (3) (4)
CL-6WA

(1) TYPE OF CHAIN LINK FABRIC:
CL = ZINC COATED STEEL
ACS = ALUMINUM COATED STEEL
ACL = ALUMINUM CLAD STEEL
AA = ALUMINUM ALLOY
PVC = POLY-VINYL COATED STEEL

(2) WIDTH OF FABRIC IN FEET/HEIGHT ERECTED

(3) TYPE OF TOP/BOTTOM SUPPORTS
W = TENSION WIRE
P = PIPE RAIL

(4) INCLINATION OF EXTENSION ARMS
A = AWAY FROM PROTECTED FACILITY
O = NO BARBED WIRE OR EXTENSION ARMS USED

TYPE	HEIGHT FENCE	TOP LINE	BOTTOM LINE	SELVAGE
A	4'-0" - 12'-0"	TENSION WIRE	TENSION WIRE	TWISTED AND BARBED TOP AND BOT.
A-1	4'-0" - 12'-0"	TOP RAIL	TENSION WIRE	TWISTED AND BARBED TOP AND BOT.
B	7'-0" MIN W/ BARBED WIRE	TENSION WIRE	TENSION WIRE	TWISTED AND BARBED TOP AND BOT.

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

STATE OF TEXAS
B. N. REDDY CHIDANANDA
58001
LICENSED
PROFESSIONAL ENGINEER
12/23/05

CONFORMED

CARTER BURGESS
JACOBS CIVIL INC
STV INCORPORATED
KAI ALLIANCE

DART PROJECT

SCALE	NOT TO SCALE
DRAWN	B. SKINNER
DESIGNED	T. WILLIAMS
CHECKED	G. CELERIER
IN CHARGE	B.N. REDDY CHIDANANDA
DATE	30 NOV 05

CAES

CONTRACT SHEET No. 13 OF 307

CIVIL STANDARD

CHAIN LINK FENCE DETAILS SHEET 1 OF 2

CONTRACT	DWG No.	REV
	CS1-0008	0

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DWG No. CS1-0009

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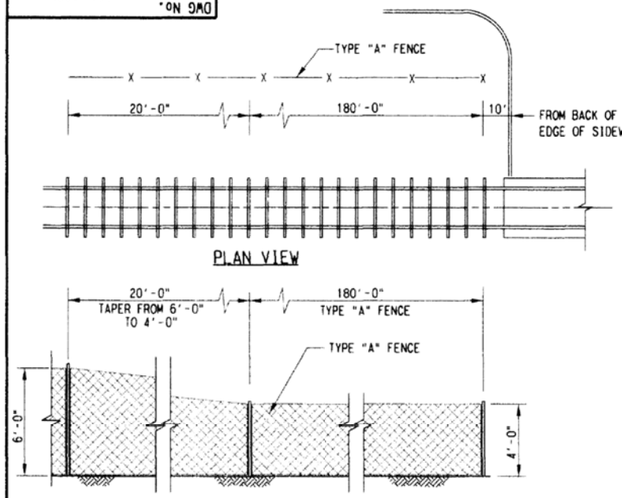
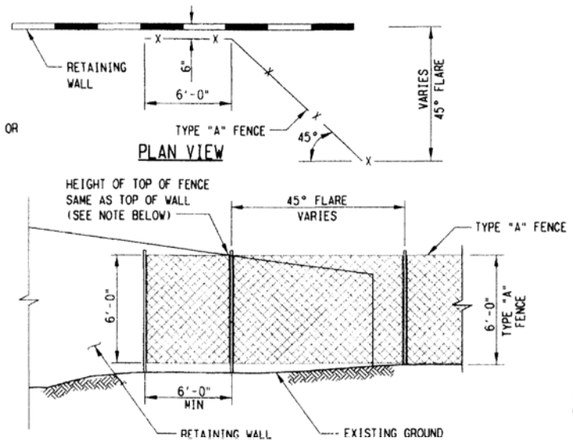


NOTE: FOR FENCES LOCATED WITHIN 50' OR LESS FROM NEAREST TRACK CENTER LINE.

FENCE TAPER AT GRADE CROSSINGS (1)

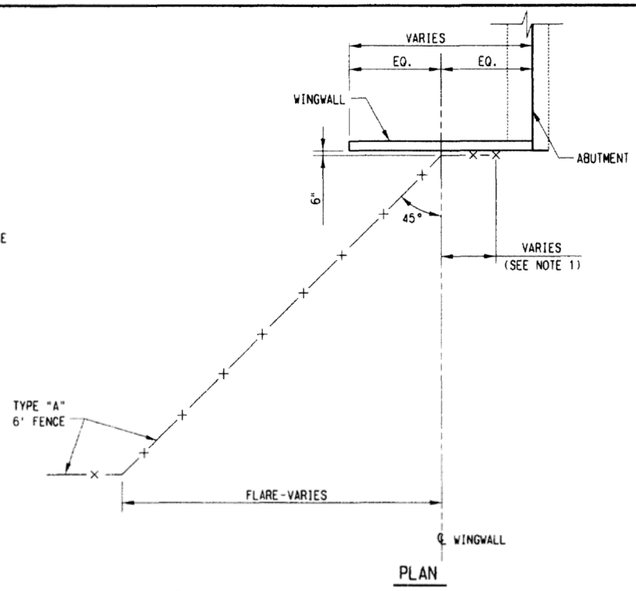
NTS



NOTE: FENCE SHALL EXTEND ALONG RETAINING WALL TO THE LOCATION WHERE THE WALL IS 6'-0" IN HEIGHT, MINIMUM, PLUS AN ADDITIONAL 6'-0".

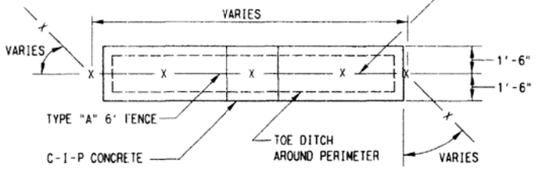
FENCE TERMINATION AT RETAINING WALL (2)

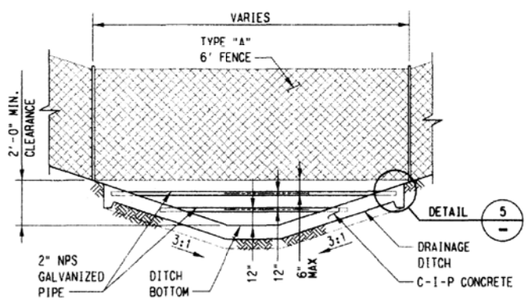
NTS



NOTE:

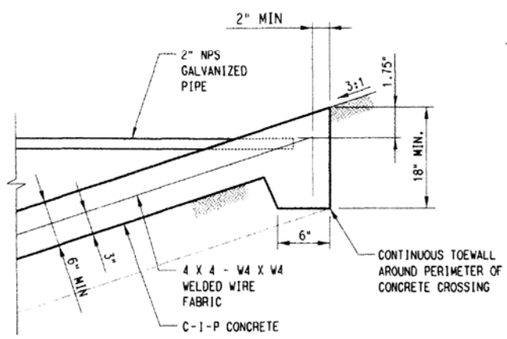
1. FENCE SHALL EXTEND DOWN SLOPE TO A POINT WHERE THE WING WALL IS AT LEAST 6'-0" HIGH.
2. 2" NPS GALVANIZED PIPE NOT SHOWN FOR CLARITY. PIPE ALIGNS UNDER FENCE.





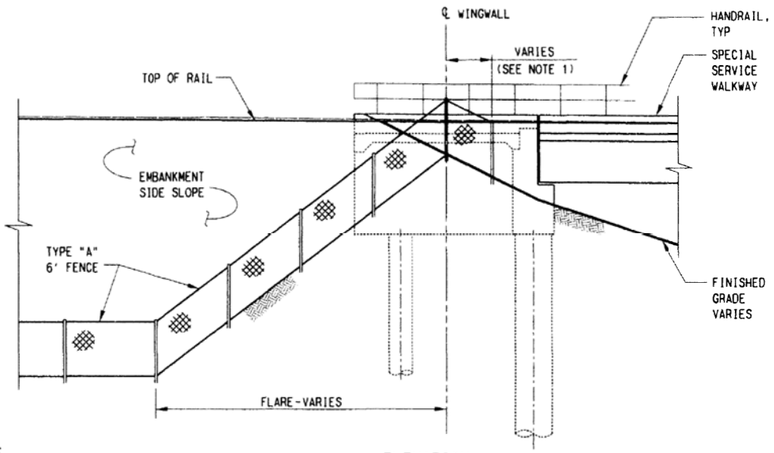
FENCE CROSSING OVER DRAINAGE DITCH (3)

NTS



DETAIL (5)

NTS



FENCE TERMINATION AT BRIDGE ABUTMENTS (4)

NTS

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
SHEET NO. 181 OF 345
DWG NO. CS9-0114
CONTRACT NO. C-2033270-01

CONTRACT SHEET No. 14 OF 307

NO.	AMEND	BY	DATE	DESCRIPTION	BY	ENG	CHK	APP

STATE OF TEXAS
B. N. REDDY CHIDANANDA
58001
LICENSED PROFESSIONAL ENGINEER
12/23/05

CARTER BURGESS
JACOBS CIVIL INC
STV INCORPORATED
KAI ALLIANCE

DART PROJECT

SCALE	NOT TO SCALE
DRAWN	B. SKINNER
DESIGNED	T. WILLIAMS
CHECKED	G. CELERIER
IN CHARGE	B.N. REDDY CHIDANANDA
DATE	30 NOV 05

CAES

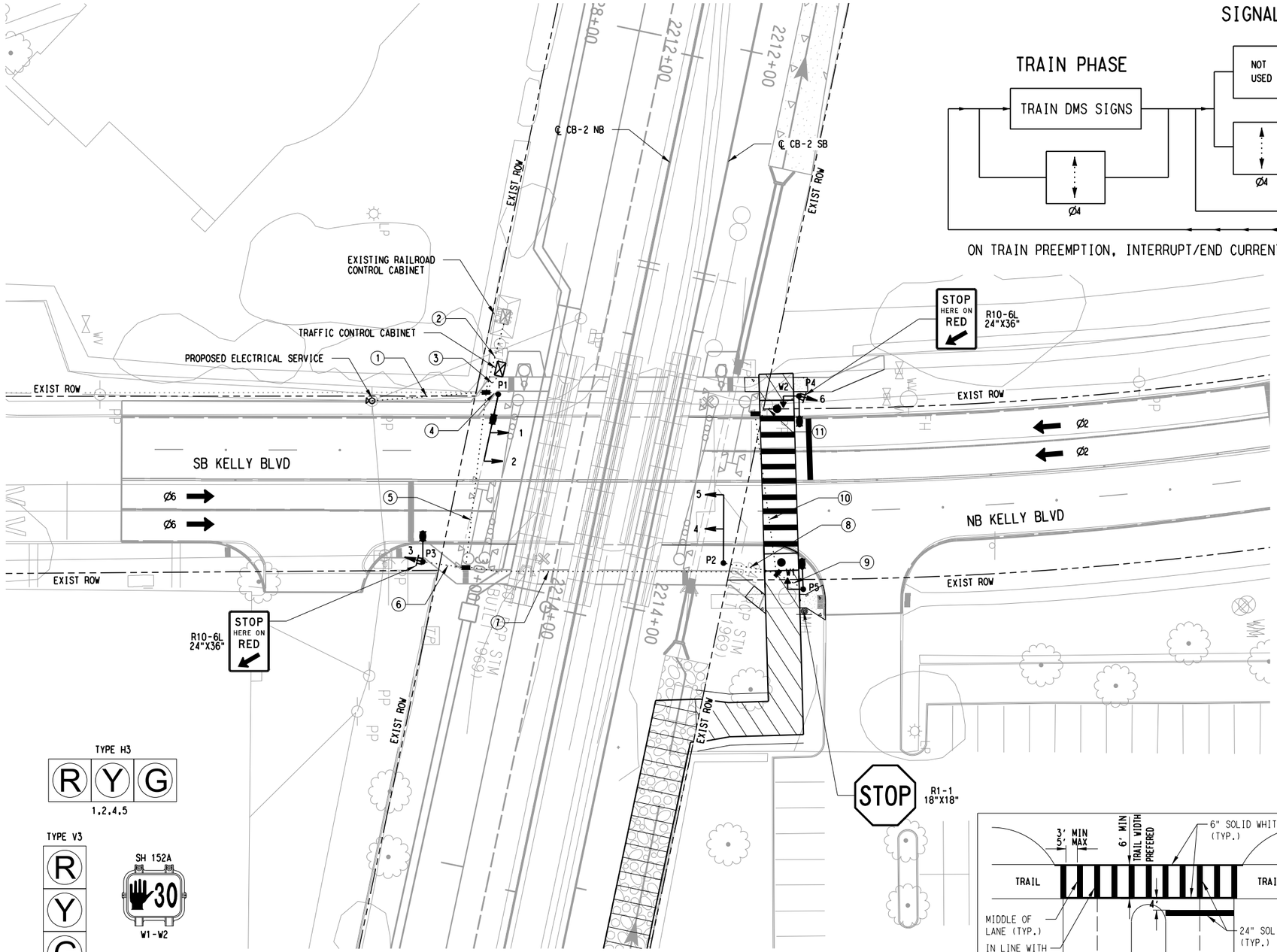
CIVIL STANDARD

CHAIN LINK FENCE DETAILS SHEET 2 OF 2

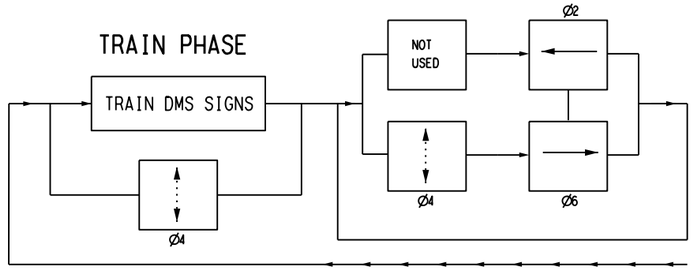
CONTRACT	DWG No.	REV
	CS1-0009	0

CONFORMED

DWG No. WC4-2213



SIGNAL PHASE DIAGRAM

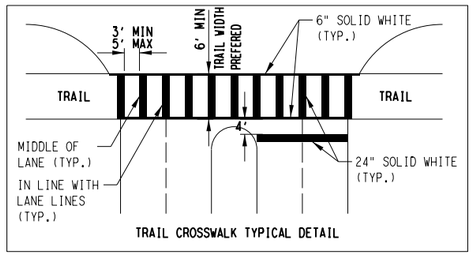


ON TRAIN PREEMPTION, INTERRUPT/END CURRENT PHASE AND RUN PHASE 4

SCALE (IN FEET)
0 10 20 40

LEGEND

- CONTROLLER CABINET
- ELECTRICAL SERVICE
- P1 SIGNAL POLE NUMBER
- SIGNAL POLE AND MAST ARM
- 1 2 SIGNAL HEAD NUMBER
- SIGN MOUNTED ON POLE/MAST ARM
- W1 PEDESTRIAN SIGNAL HEAD
- TYPE C GROUND BOX
- PROPOSED CONDUIT RUN
- (1) CONDUIT RUN NUMBER
- LUMINAIRE



TRAIL CROSSWALK TYPICAL DETAIL

1. THE CONTRACTOR SHALL ADJUST STRIPING IN ACCORDANCE WITH THE TRAIL CROSSING TYPICAL DETAIL.
2. CROSSWALKS MUST BE CONSISTEN WITH CARROLLTON GENERAL DESIGN STANDARDS (GDS P-22).

NOT AN APPROVED DRAWING
FINAL 100% DESIGN

CONTRACT SHEET No. 182 OF 345

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

IN-PROGRESS REVIEW
THIS DOCUMENT IS RELEASED FOR THE PURPOSE OF REVIEW UNDER THE AUTHORITY OF:
EDWARD J. PULTORAK, P.E., 93881
ON
22-AUG-2023 18:41
JACOBS
TBPE FIRM NO. F-2966
IT IS NOT TO BE USED FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES.

Jacobs
1999 BRYAN ST, SUITE 1200
DALLAS, TX 75201-3136
Phone: +1 (214) 638-0145
FIRM REGISTRATION No. F-2966

ARCHER WESTERN HERZOG

DART PROJECT

DART

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SCALE	1"=20'
DRAWN	B. SCHAAP
DESIGNED	B. SCHAAP
CHECKED	E. PULTORAK
IN CHARGE	E. PULTORAK
DATE	11 AUG 23

CAES

COTTON BELT REGIONAL RAIL VELOWEB HIKE & BIKE TRAIL

TRAFFIC SIGNAL LAYOUT KELLY BLVD

CONTRACT	DWG No.	REV
C-2033270-01	WC4-2213	D

CB05-WC4-2213.020

22-AUG-2023 18:41
CB05-WC4-2213.020

AlconPA
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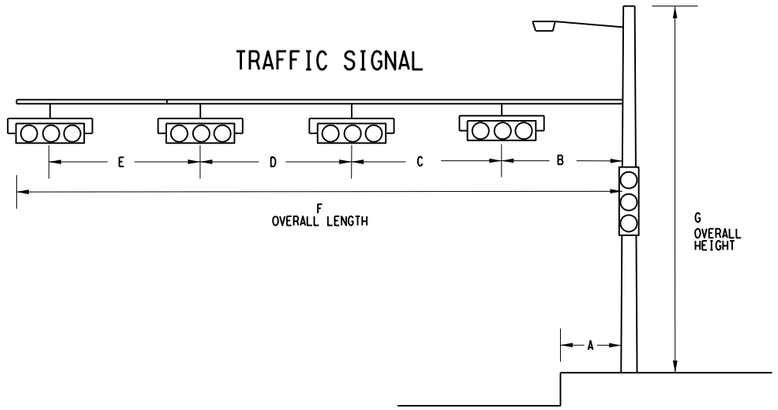
DWG No. WC4-2214



SIGNAL POLES														
POLE NO.	A	B	C	D	E	F	G	NO. HEADS		ILSN	LUM	PED	FOUNDATION	
								M.A.	POLE	(EA)	(EA)	(EA)	TYPE	DEPTH
P1	7	14	10			24	30	2			1		30-A	11
P2	7	12	12			24	20	2					30-A	11
P3	7	STREET LIGHT POLE					30		1		1		24-A	6
P4	7	STREET LIGHT POLE					30		1		1	1	24-A	6
P5	7	STREET LIGHT POLE					30				1	1	24-A	6

ELECTRIC SERVICE DATA										
ELECTRIC SERVICE DESCRIPTION	SERVICE CONDUIT NO./SIZE	SERVICE CONDUCTORS NO./SIZE	SAFETY SWITCH AMPS	MAIN DISCONNECT CKT.BRK POLE/AMPS	TWO-POLE CONTRACTOR AMPS	PANEL BD./ LOADCENTER AMP RATING (MIN)	CIRCUIT NO.	BRANCH CKT. BRK. POLE/AMPS	BRANCH CKT. BRK. POLE/AMPS	KVA LOAD
TYPE D (120/240) 070(NS)SS(E)PS(U)	2"	3 / #4	N/A	2P/70	30	100	T.S.	1P/50	23	<7.1
							LIGHTING	1P/20	5	

CONDUIT RUNS										
		CONDUIT TYPE			WIRE				SGNL CABLE	
RUN NO.	LENGTH OF RUN (LF)	TRENCH SCH 40 PVC 3"	BORED SCH 40 PVC 4"	STEEL ENCASED 3"	NO. 6 BARE QTY/RUN	NO. 6 INSULATED QTY/RUN	NO. 8 BARE QTY/RUN	NO. 8 INSULATED QTY/RUN	10 CNDR 14 AWG QTY/RUN	2 CNDR 12 AWG QTY/RUN
1	40	1			1	2	1	2		
2	25	1			1				1	
3	10	1			1	2			6	2
4	5	1			1		1	2	1	
5	65		1		1		1	2	4	2
6	15	1			1		1	2	1	
7	110	1		2	1		1	2	3	2
8	20	1			1				1	
9	10	1			1		1	2	1	1
10	55		1		1		1	2	1	1
11	20	1			1		1	2	1	1
TOTAL (LF)		255	120	220	375	100	320	640	800	455

CABLE TERMINATION CHART						
CNDR NO.	CONDUCTOR COLOR	CABLE 1 FROM P1 TO CNTRL 10 CNDR	CABLE 2 FROM P2 TO CNTRL 10 CNDR	CABLE 3 FROM P3 TO CNTRL 10 CNDR	CABLE 4 FROM P4 TO CNTRL 10 CNDR	CABLE 5 FROM P5 TO CNTRL 10 CNDR
1	BLACK	SPARE	SPARE	SPARE	SPARE	SPARE
2	WHITE	SIG COMM	SIG COMM	SIG COMM	SIG COMM	SIG COMM
3	RED	PH. 2 SH 1,2 RED BALL	PH. 6 SH 4,5 RED BALL	PH. 6 SH 3 RED BALL	PH. 2 SH 6 RED BALL	SPARE
4	GREEN	PH. 2 SH 1,2 GREEN BALL	PH. 6 SH 4,5 GREEN BALL	PH. 6 SH 3 GREEN BALL	PH. 2 SH 6 GREEN BALL	SPARE
5	ORANGE	PH. 2 SH 1,2 YELLOW BALL	PH. 6 SH 4,5 YELLOW BALL	PH. 6 SH 3 YELLOW BALL	PH. 2 SH 6 YELLOW BALL	SPARE
6	BLUE	SPARE	SPARE	SPARE	SH W2:W	SH W1:W
7	WHITE/BLACK	SPARE	SPARE	SPARE	SH W2:DW	SH W1:DW
8	RED/BLACK	SPARE	SPARE	SPARE	SPARE	SPARE
9	GREEN/BLACK	SPARE	SPARE	SPARE	SPARE	SPARE
10	ORANGE/BLACK	SPARE	SPARE	SPARE	SPARE	SPARE

NOTES:

1. LOCATE ALL UTILITIES, DRAINAGE STRUCTURES AND OTHER CONFLICTS PRIOR TO TRENCHING, INSTALLING DRILLED SHAFTS OR POLES. IF NECESSARY, ADJUST LOCATIONS IN ACCORDANCE WITH TXDOT'S POLE PLACEMENT GUIDELINES AND AS DIRECTED BY THE ENGINEER.
2. TRAFFIC SIGNAL POLES SHALL BE ASSEMBLED AND INSTALLED PER TXDOT SMA-80-12 AND TS-FD-12 STANDARDS.

NOT AN APPROVED DRAWING
FINAL 100% DESIGN

CONTRACT SHEET No. 183 OF 345

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

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1999 BRYAN ST, SUITE 1200
DALLAS, TX 75201-3136
Phone: +1 (214) 638-0145
FIRM REGISTRATION No. F-2966

ARCHER WESTERN HERZOG

DART PROJECT

DART

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SCALE	1"=20'
DRAWN	B. SCHAAP
DESIGNED	B. SCHAAP
CHECKED	E. PULTORAK
IN CHARGE	E. PULTORAK
DATE	11 AUG 23

CAES

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

TRAFFIC SIGNAL SUMMARY
KELLY BLVD

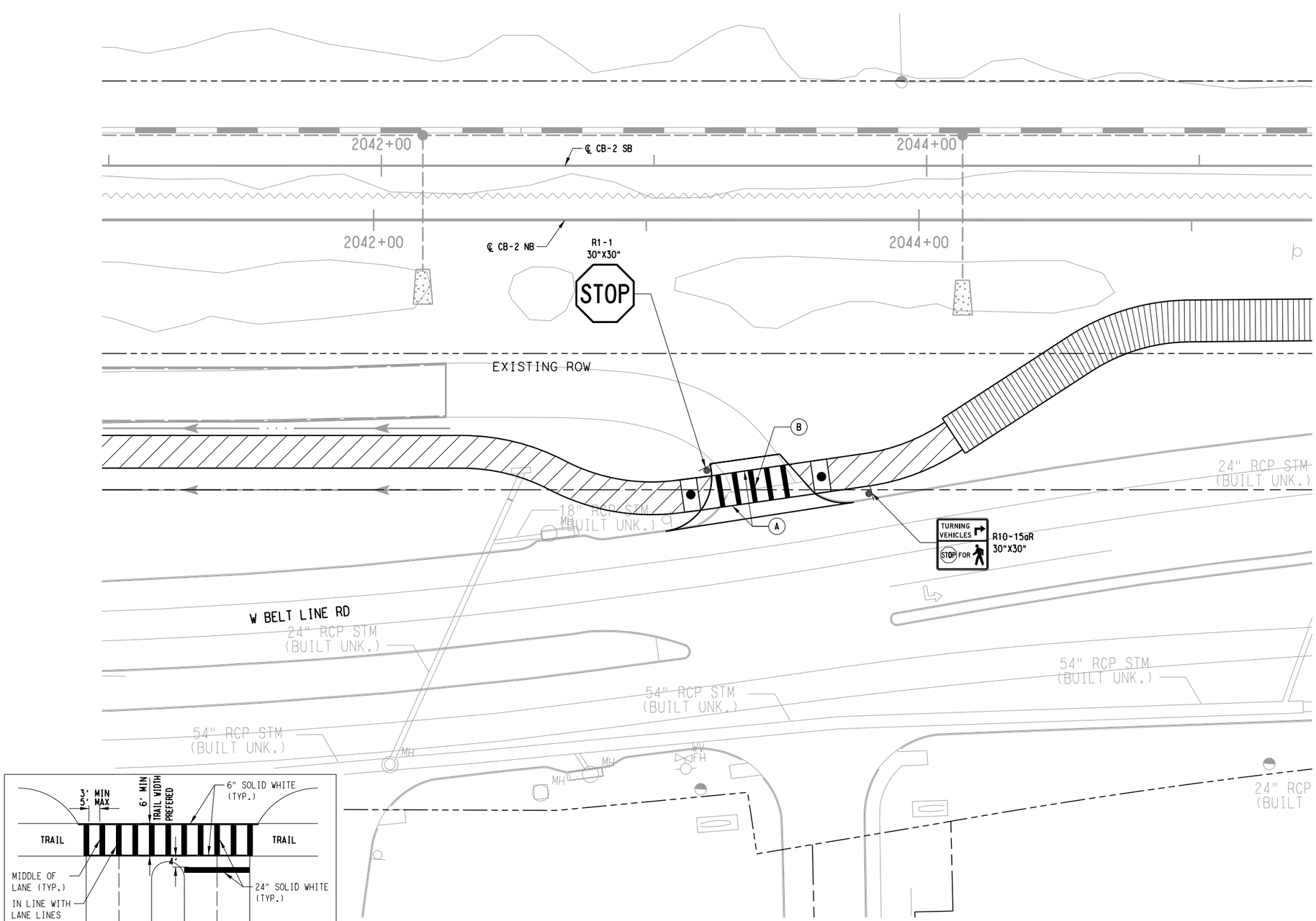
CONTRACT	DWG No.	REV
C-2033270-01	WC4-2214	D

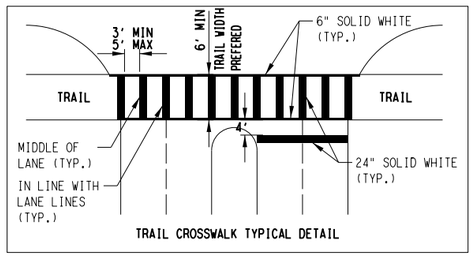
CB05-WC4-2214.020

22-AUG-2023 18:41
CB05-WC4-2214.020

AlcornPA
Default

DWG No. WC3-2043





TRAIL CROSSWALK TYPICAL DETAIL

SCALE (IN FEET)
0 10 20 40

LEGEND

- (A) THERMO PAV MARK (6" WHITE) (SOLID)
- (B) THERMO PAV MARK (24" WHITE) (SOLID)
- (C) THERMO PAV MARK (8" WHITE) (SOLID)
- (D) THERMO PAV MARK (12" WHITE) (SOLID)
- (E) RAILROAD PAVEMENT MARKING
- (F) LANE ASSIGNMENT MARKING
- (*) PROPOSED SMALL SIGN
- EXISTING SMALL SIGN

1. CROSSWALKS MUST BE CONSISTENT WITH CARROLLTON GENERAL DESIGN STANDARDS (GDS P-22).

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CONTRACT SHEET No. 184 OF 345

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

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ARCHER WESTERN HERZOG

DART PROJECT

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SCALE	1"=20'
DRAWN	B. SCHAAP
DESIGNED	B. SCHAAP
CHECKED	E. PULTORAK
IN CHARGE	E. PULTORAK
DATE	07 AUG 23

CAES

COTTON BELT REGIONAL RAIL VELOWEB HIKE & BIKE TRAIL

SIGNING AND STRIPING LAYOUT DALLAS PISTOL CLUB DWY

CONTRACT	DWG No.	REV
C-2033270-01	WC3-2043	D

CB05-WC3-2043.020

31-JUL-2023 09:41
CB05-WC3-2043.020

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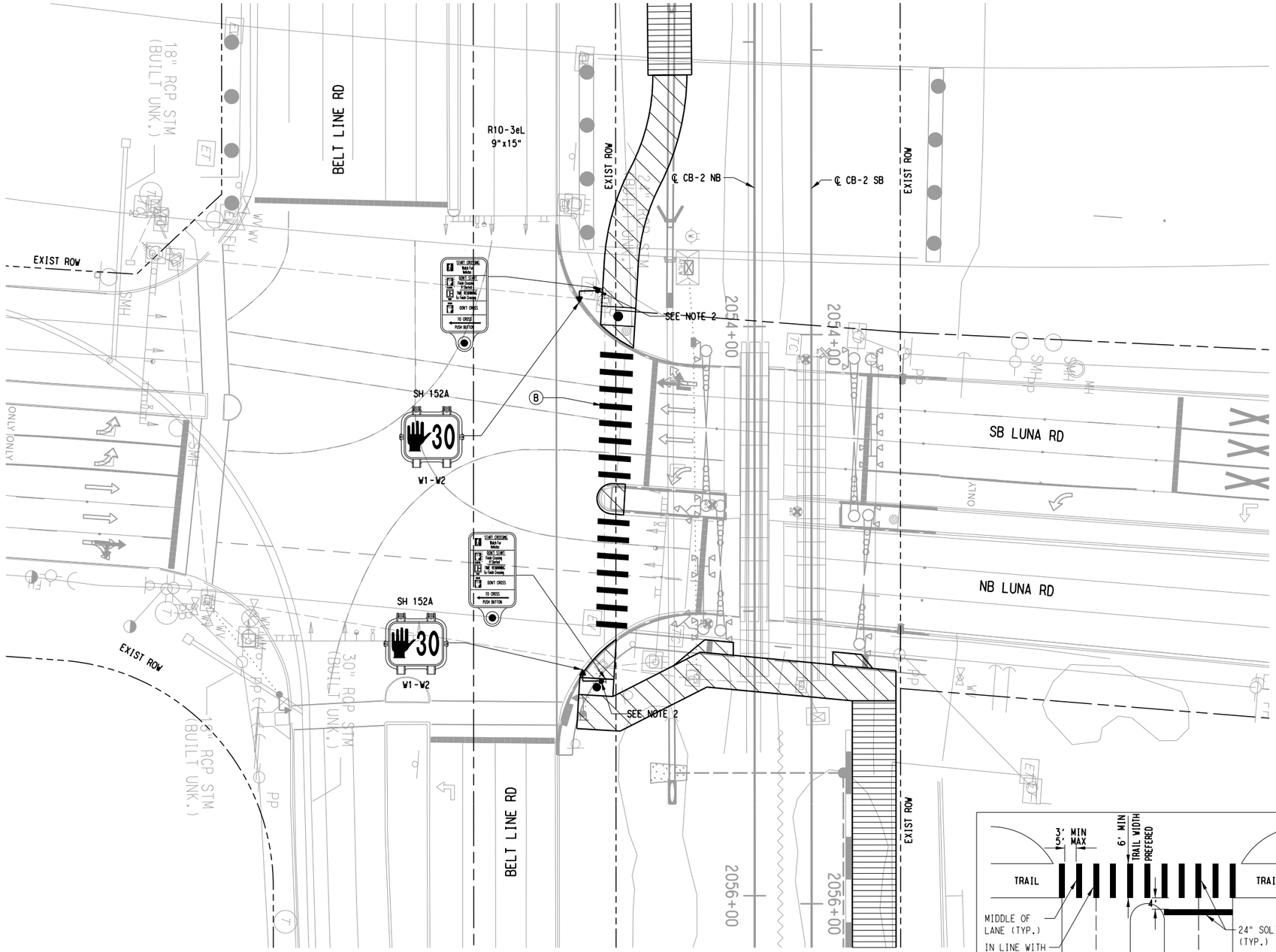
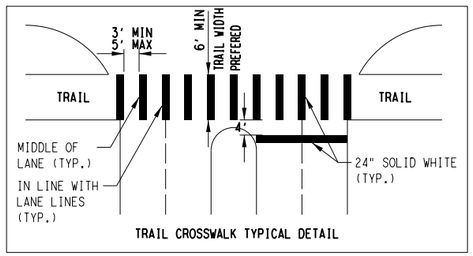
Default

DWG No. WC3-2054





TRAIL CROSSWALK TYPICAL DETAIL

SCALE (IN FEET)
0 10 20 40

LEGEND

- (A) THERMO PAV MARK (6" WHITE) (SOLID)
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- (E) RAILROAD PAVEMENT MARKING
- (F) LANE ASSIGNMENT MARKING
- (*) PROPOSED SMALL SIGN
- EXISTING SMALL SIGN

1. CROSSWALKS MUST BE CONSISTENT WITH CARROLLTON GENERAL DESIGN STANDARDS (GDS P-22).
2. CONTRACTOR SHALL INSTALL TWO 10' PEDESTAL POLES ON 6' TYPE 24-A FOUNDATIONS ON EITHER SIDE OF LUNA ROAD ADJACENT TO THE TRAIL. EACH OF THESE POLES SHALL INCLUDE ONE COUNTDOWN WALK SIGNAL HEAD AND AUDIBLE PEDESTRIAN SIGNAL WITH PUSHBUTTON AND SIGN PLACED WITHIN 18" REACH OF THE LANDING FOR THE TRAIL CROSSWALK. CONTRACTOR SHALL CONNECT A 3" CONDUIT FROM THE POLE TO THE ADJACENT TRAFFIC SIGNAL GROUND BOX. THE CONTRACTOR SHALL WIRE EACH PEDESTAL POLE TO THE CONTROLLER CABINET VIA THE TRAFFFIC SIGNAL CONDUITS WITH ONE 2 CONDUCTOR 12 AWG FOR THE AUDIBLE PEDESTRIAN SIGNAL AND ONE 10 CONDUCTOR 14 AWG FOR THE WALK SIGNAL HEAD.

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DESIGNED	B. SCHAAP
CHECKED	E. PULTORAK
IN CHARGE	E. PULTORAK
DATE	07 AUG 23

CAES

CONTRACT SHEET No. 185 OF 345

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

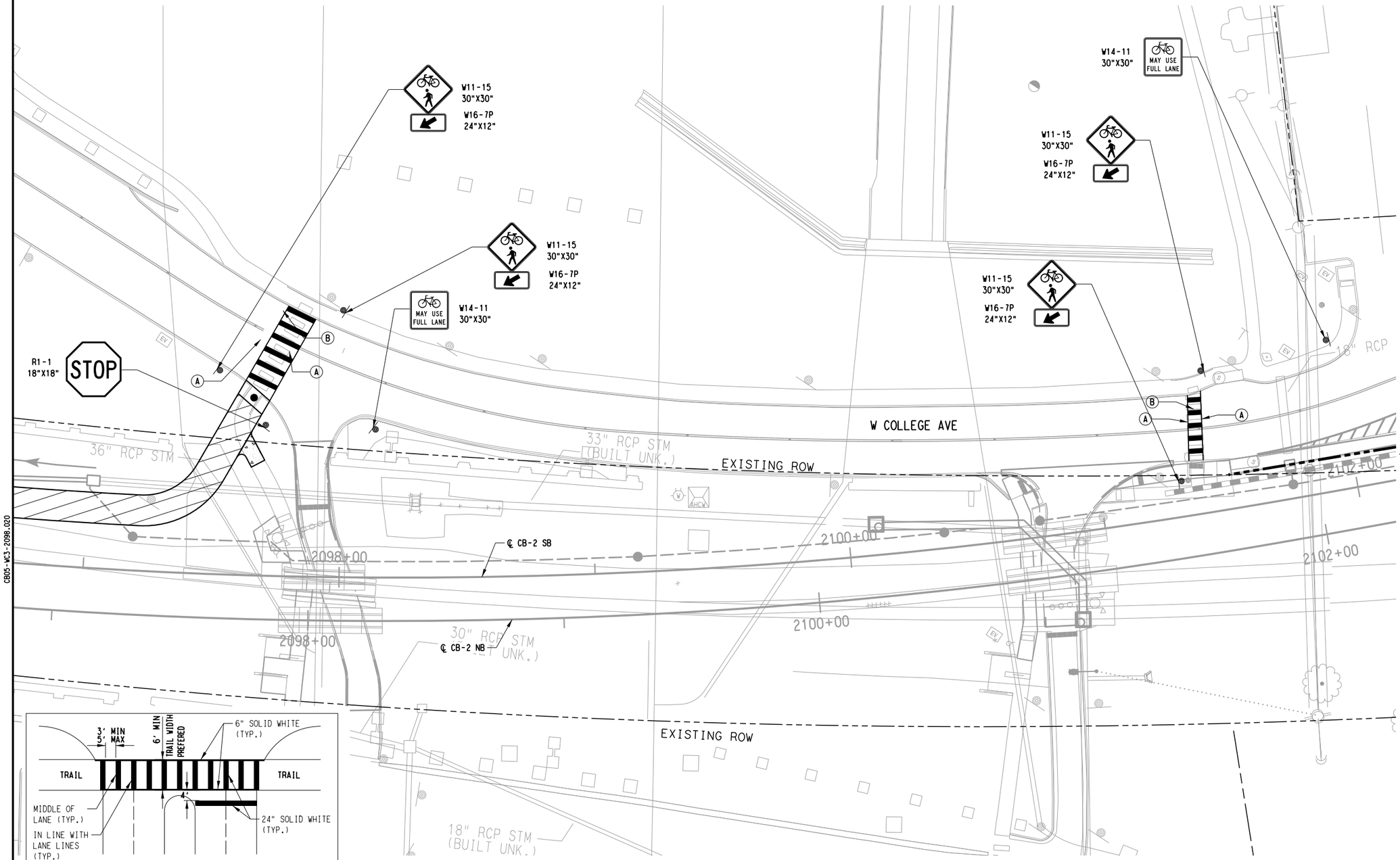
CROSSING EXHIBIT
LUNA RD

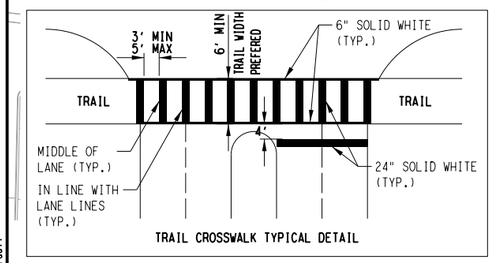
CONTRACT	DWG No.	REV
C-2033270-01	WC3-2054	D

CB05-WC3-2054.020

31-JUL-2023 09:43
CB05-WC3-2054.020
JEGSVCPW001
Default

DWG No. WC3-2098





TRAIL CROSSWALK TYPICAL DETAIL

SCALE (IN FEET)
0 10 20 40

LEGEND

- (A) THERMO PAV MARK (6" WHITE) (SOLID)
- (B) THERMO PAV MARK (24" WHITE) (SOLID)
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- (F) LANE ASSIGNMENT MARKING
- (*) PROPOSED SMALL SIGN
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REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

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DRAWN	B. SCHAAP
DESIGNED	B. SCHAAP
CHECKED	E. PULTORAK
IN CHARGE	E. PULTORAK
DATE	07 AUG 23

CAES

CONTRACT SHEET No. 186 OF 345

COTTON BELT REGIONAL RAIL VELOWEB HIKE & BIKE TRAIL

SIGNING AND STRIPING LAYOUT DRIVEWAYS

CONTRACT	DWG No.	REV
C-2033270-01	WC3-2098	D

CB05-WC3-2098.020

31-JUL-2023 09:43
CB05-WC3-2098.020

JEGSVCPW001
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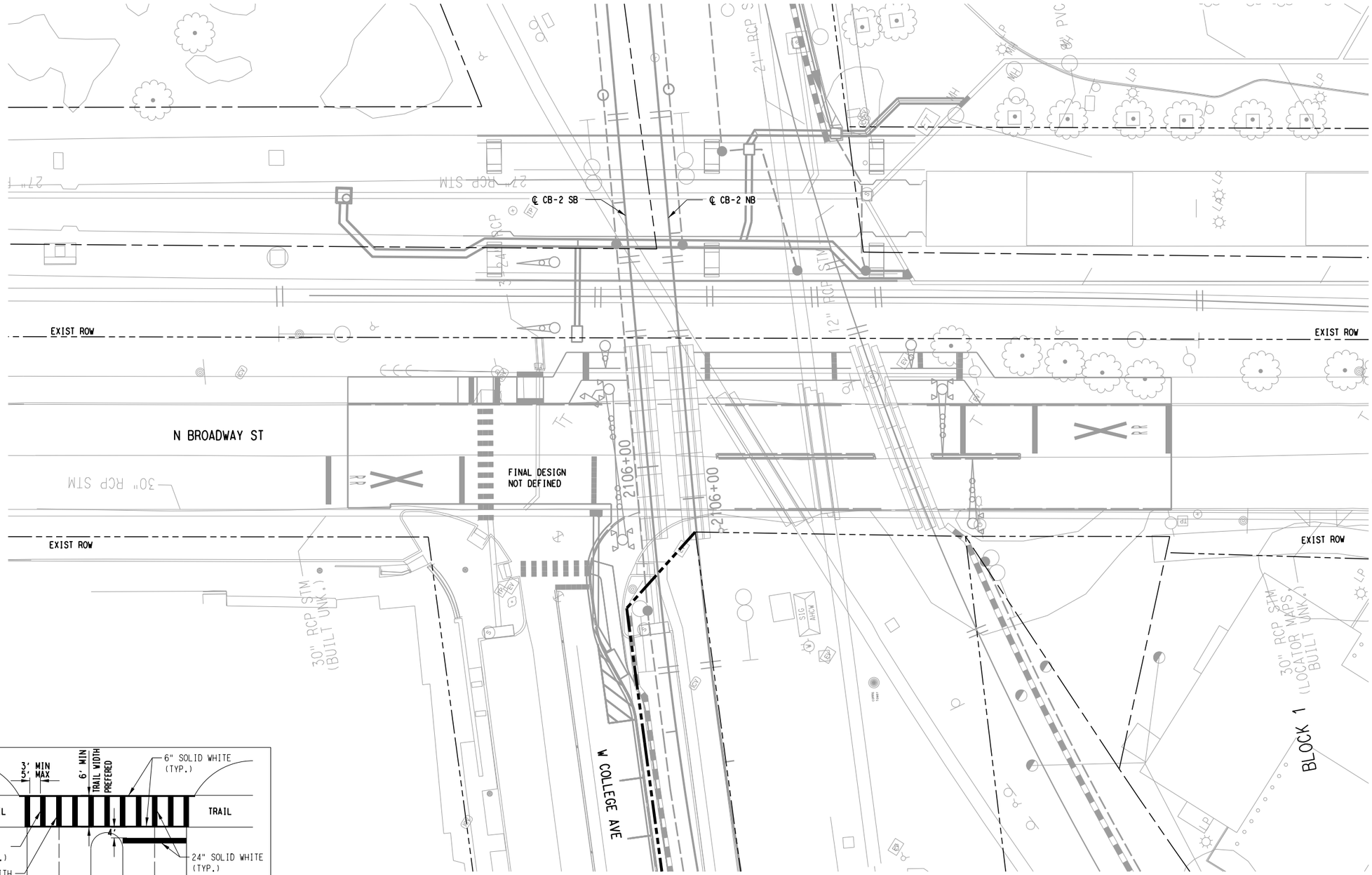
DWG No. WC3-2106



SCALE (IN FEET)
0 10 20 40

LEGEND

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- (B) THERMO PAV MARK (24" WHITE) (SOLID)
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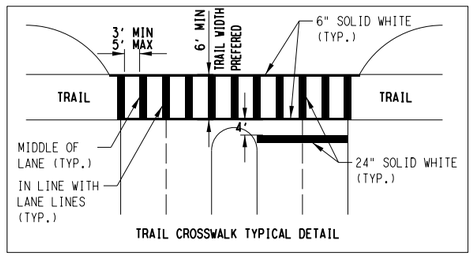
1. CROSSWALKS MUST BE CONSISTENT WITH CARROLLTON GENERAL DESIGN STANDARDS (GDS P-22).



TRAIL CROSSWALK TYPICAL DETAIL

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CONTRACT SHEET No. 187 OF 345

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

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SCALE	1"=20'
DRAWN	B. SCHAAP
DESIGNED	B. SCHAAP
CHECKED	E. PULTORAK
IN CHARGE	E. PULTORAK
DATE	07 AUG 23

CAES

COTTON BELT REGIONAL RAIL VELOWEB HIKE & BIKE TRAIL

SIGNING AND STRIPING LAYOUT BROADWAY ST

CONTRACT	DWG No.	REV
C-2033270-01	WC3-2106	D

CB05-WC3-2106.020

31-JUL-2023 09:41
CB05-WC3-2106.020
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GENERAL NOTES FOR ALL ELECTRICAL WORK

1. The location of all conduits, junction boxes, ground boxes, and electrical services is diagrammatic and may be shifted to accommodate field conditions.

2. Provide new and unused materials. Ensure that all materials and installations comply with the applicable articles of the National Electrical Code (NEC), TxDOT standards and specifications, National Electrical Manufacturers Association (NEMA), and are listed by Underwriters Laboratories (UL) or a Nationally Recognized Testing Lab (NRTL). NRTLs such as Canadian Standard Association (CSA), Intertek Testing Services NA Inc., or FM Approvals LLC can be considered equivalent to UL. Where reference is made to NEMA listed devices, International Electrotechnical Commission (IEC) listed devices will not be considered an acceptable equal to a NEMA listed device. Acceptable devices may have both a NEMA and IEC listing. Faulty fabrication or poor workmanship in any material, equipment, or installation is justification for rejection. Replace or reinstall rejected material or equipment at no additional cost to the Department.

3. Miscellaneous nuts, bolts and hardware, except for high strength bolts, may be stainless steel when plans specify galvanized, provided the bolt size is ½ in. or less in diameter.

4. Provide the following test equipment as required by the Engineer to confirm compliance with the contract and the NEC: voltmeter, ammeter, megohm meter (1000 volt DC), ground resistance tester, torque wrenches, and torque screwdrivers. Ensure all equipment has been properly calibrated within the last year. Provide calibration certification to the Engineer upon request. Operate test equipment during inspection as requested by the Engineer.

5. Install grounding as shown on the plans and in accordance with the NEC. Ensure all metallic conduits; metal poles; luminaires; and metal enclosures are bonded to the equipment grounding conductor. Provide stranded bare copper or green insulated grounding conductors. Ground rods, connectors, and bonding jumpers are subsidiary to the various bid items.

6. When required by the Engineer, notify the Department in writing of materials from the Material Producers List (MPL) intended for use on each project. Prequalified materials are listed on the MPL on TxDOT's website under "Roadway Illumination and Electrical Supplies." No substitutions will be allowed for materials on this list.

CONDUIT

A. MATERIALS

1. Provide conduit, junction boxes, fittings, and hardware as per TxDOT Departmental Material Specification (DMS) 11030 "Conduit" and Item 618 "Conduit" of TxDOT's "Standard Specifications For Construction And Maintenance Of Highways, Streets, And Bridges," latest edition. Provide conduits listed under Item 618 on the MPL under "Roadway Illumination and Electrical Supplies." Provide conduit types according to the descriptive code or as shown on the plans. Do not substitute other types of conduits for those shown. Provide liquidtight flexible metal conduit (LFMC) when flexible conduit is called for on galvanized steel rigid metallic conduit (RMC) systems. Provide liquidtight flexible nonmetallic conduit (LFNC) when flexible conduit is called for on polyvinyl chloride (PVC) systems.

2. Provide galvanized steel RMC for all exposed conduits, unless otherwise shown on the plans. Properly bond all metal conduits.

3. Unless otherwise shown on the plans, provide junction boxes with a minimum size as shown in the following table, which applies to the greatest number of conductors entering the box through one conduit with no more than four conduits per box. When a mixture of conductor sizes is present, count the conductors as if all are of the larger size. For situations not applicable to the table, size junction boxes in accordance with NEC.

AWG	3 CONDUCTORS	5 CONDUCTORS	7 CONDUCTORS
#1	10" x 10" x 4"	12" x 12" x 4"	16" x 16" x 4"
#2	8" x 8" x 4"	10" x 10" x 4"	12" x 12" x 4"
#4	8" x 8" x 4"	10" x 10" x 4"	10" x 10" x 4"
#6	8" x 8" x 4"	8" x 8" x 4"	10" x 10" x 4"
#8	8" x 8" x 4"	8" x 8" x 4"	8" x 8" x 4"

4. Junction boxes with an internal volume of less than 100 cu. in. and supported by entering raceways must have threaded entries or hubs identified for the intended purpose and supported by connection of two or more rigid metal conduits. Secure conduit within 3 ft. of the enclosure or within 18 in. of the enclosure if all conduit entries are on the same side. Mechanically secure all junction boxes with an internal volume greater than 100 cu. inches.

5. Provide hot dipped galvanized cast iron or sand cast aluminum outlet boxes for junction boxes containing only 10 AWG or 12 AWG conductors. Do not use die cast aluminum boxes. Size outlet boxes according to the NEC.

6. Do not use intermediate metal conduit (IMC) or electrical metallic tubing (EMT) unless specifically required by the plan sheets. When EMT is called for, provide junction boxes made from galvanized steel sheeting, listed and approved for outdoor use, unless otherwise noted on the plans. Size all galvanized steel junction boxes in accordance with the NEC. Provide junction boxes for IMC conduit systems that meet the same requirements for junction boxes used with RMC systems.

7. Provide PVC junction boxes intended for outdoor use on PVC conduit systems, unless otherwise noted on the plans.

8. Provide PVC elbows in PVC conduit systems, unless otherwise shown on the plans. Use only a flat, high tensile strength polyester fiber pull tape for pulling conductors through the PVC conduit system. When galvanized steel RMC elbows are specifically called for in the plans and any portion of the RMC elbow is buried less than 18 in., ground the RMC elbow by means of a grounding bushing on a rigid metal extension. Grounding of the rigid metal elbow is not required if the entire RMC elbow is encased in a minimum of 2 in. of concrete. PVC extensions are allowed on these concrete encased rigid metal elbows. RMC or PVC elbows are subsidiary to various bid items.

9. When required, provide High-Density Polyethylene (HDPE) conduit with factory installed internal conductors according to Item 622 "Duct Cable." At the Contractor's request and with approval by the Engineer, substitute HDPE conduit with no conductors for bored schedule 40 or schedule 80 PVC conduit bid under Item 618. Ensure bored HDPE substituted for PVC is schedule 40 and of the same size PVC called for in the plans. Ensure the substituted HDPE meets the requirements of Item 622, except that the conduit is supplied without factory-installed conductors. Make the transition of the HDPE conduit to PVC (or RMC elbow when required) at the bore pit. Provide conduit of the size and schedule as shown on the plans. Do not extend substituted conduit into ground boxes or foundations. Provide PVC or galvanized steel RMC elbows as called for at all ground boxes and foundations.

10. Use two-hole straps when supporting 2 in. and larger conduits. On electrical service poles, properly sized stainless steel or hot dipped galvanized one-hole standoff straps are allowed on the service riser conduit.

B. CONSTRUCTION METHODS

1. Provide and install expansion joint conduit fittings on all structure-mounted conduits at the structure's expansion joints to allow for movement of the conduit. In addition, provide and install expansion joint fittings on all continuous runs of galvanized steel RMC conduit externally exposed on structures such as bridges at maximum intervals of 150 ft. When requested by the project Engineer, supply manufacturer's specification sheet for expansion joint conduit fittings. Repair or replace expansion joint fittings that do not allow for movement at no additional cost to the Department. Provide the method of determining the amount of expansion to the Engineer upon request. Do not use LFMC or LFNC as a substitute for the required expansion conduit fittings.

2. Space all conduit supports at maximum intervals of 5 ft. Install conduit spacers when attaching metal conduit to surface of concrete structures. See "Conduit Mounting Options" on ED(2). Install conduit support within 3 ft. of all enclosures and conduit terminations.

3. Do not attach conduit supports directly to pre-stressed concrete beams except as shown specifically in the plans or as approved by the Engineer.

4. Unless otherwise shown on the plans, jack or bore conduit placed beneath existing roadways, driveways, sidewalks, or after the base or surfacing operation has begun. Backfill and compact the bore pits below the conduit per Item 476 "Jacking, Boring, or Tunneling Pipe or Box" prior to installing conduit or duct cable to prevent bending of the connections.

5. When placing conduit in the sub-grade of new roadways, backfill all trenches with excavated material unless otherwise noted on the plans. When placing conduit in the sub-base of new roadways, backfill all trenches with cement-stabilized base as per requirements of Items 110 "Excavation", 400 "Excavation and Backfill for Structures", 401 "Flowable Backfill", 402 "Trench Excavation Protection", and 403 "Temporary Special Shoring."

6. Provide and place warning tape approximately 10 in. above all trenched conduit as per Item 618.

7. During construction, temporarily cap or plug open ends of all conduit and raceways immediately after installation to prevent entry of dirt, debris and animals. Temporary caps constructed of durable duct tape are allowed. Tightly fix the tape to the conduit opening. Clean out the conduit and prove it clear in accordance with Item 618 prior to installing any conductors.

8. Ensure conduit entry into the top of any enclosure is waterproof by installing conduit sealing hubs or using boxes with threaded bosses. This includes surface mounted safety switches, meter cans, service enclosures, auxiliary enclosures and junction boxes. Grounding bushings on water tight sealing hubs are not required.

9. Fit the ends of all PVC conduit terminations with bushings or bell end fittings. Provide and install a grounding type bushing on all metal conduit terminations.

10. Install a bonding jumper from each grounding bushing to the nearest ground rod, grounding lug, or equipment grounding conductor. Ensure all bonding jumpers are the same size as the equipment grounding conductor. Bonding of conduit used as a casing under roadways for duct cable is not required, if the duct extends the full length through the casing.

11. At all electrical services, install a 6 AWG solid copper grounding electrode conductor.

12. Place conduits entering ground boxes so that the conduit openings are between 3 in. and 6 in. from the bottom of the box. See the ground box detail on sheet ED(4).

13. Seal ends of all conduits with duct seal, expandable foam, or by other methods approved by the Engineer. Seal conduit immediately after completion of conductor installation and pull tests. Do not use duct tape as a permanent conduit sealant. Do not use silicone caulk as a conduit sealant.

14. File smooth the cut ends of all mounting strut and conduit. Before installing, paint the field cut ends of all mounting strut and RMC (threaded or non-threaded) with zinc rich paint (94% or more zinc content) to alleviate overspray. Use zinc rich paint to touch up galvanized material as allowed under Item 445 "Galvanizing." Do not paint non-galvanized material with a zinc rich paint as an alternative for materials required to be galvanized.

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
SHEET NO. 188 OF 345
DWG NO. WS9-3001
CONTRACT NO. C-2033270-01

Texas Department of Transportation

Traffic Operations Division Standard

ELECTRICAL DETAILS CONDUITS & NOTES

ED(1)-14

FILE:	ed1-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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REVISIONS					
		DIST	COUNTY		SHEET NO.

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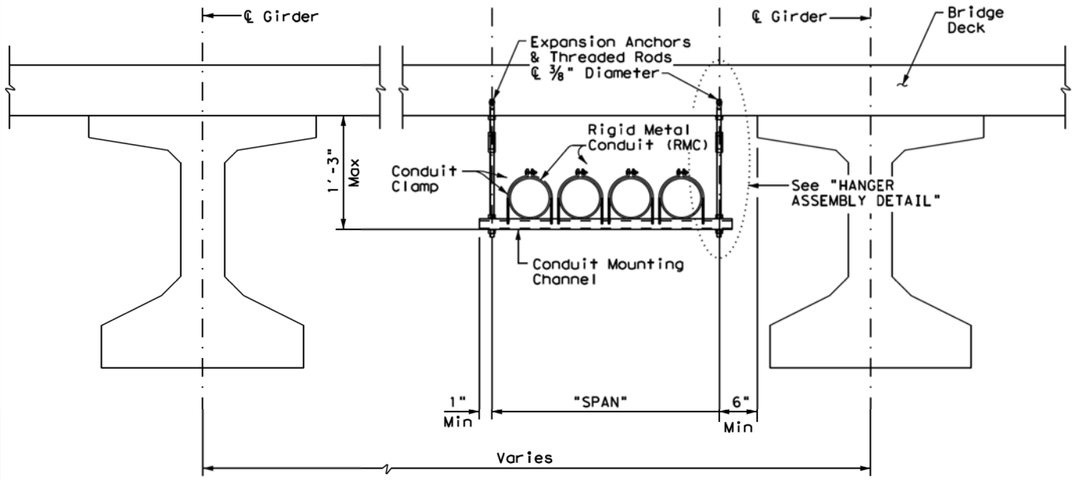
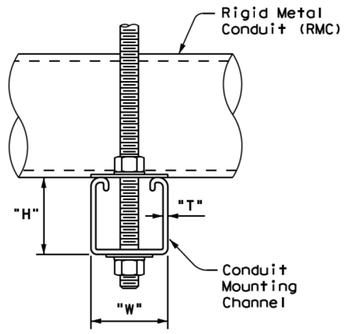
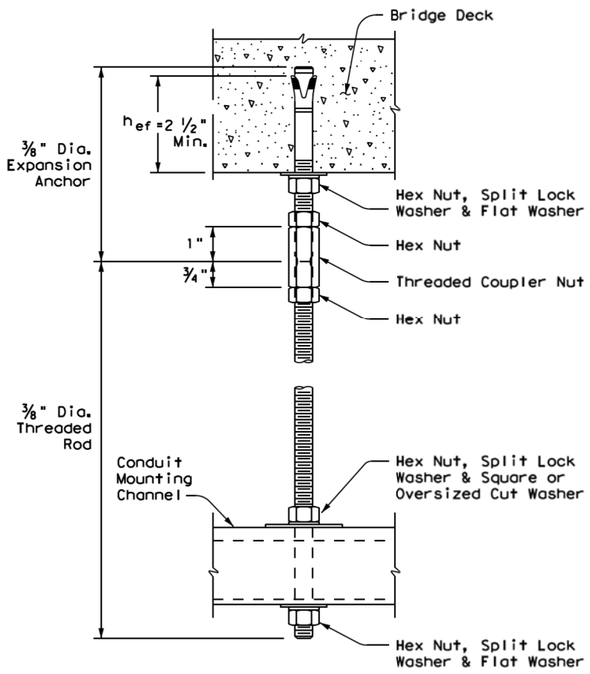


CONDUIT HANGING DETAIL

CONDUIT MOUNTING CHANNEL		
"SPAN"	"W" x "H"	"T"
less than 2'	1 5/8" x 1 3/8"	12 Ga.
2'-0" to 2'-6"	1 5/8" x 1 5/8"	12 Ga.
>2'-6" to 3'-0"	1 5/8" x 2 7/16"	12 Ga.

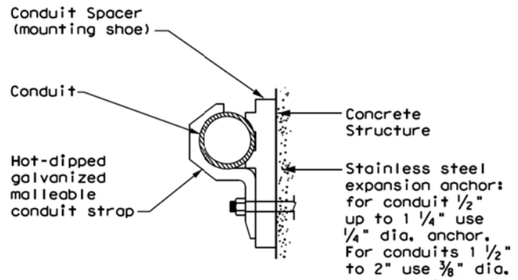
Channels with round or short slotted hole patterns are allowed, if the load carrying capacity is not reduced by more than 15%.

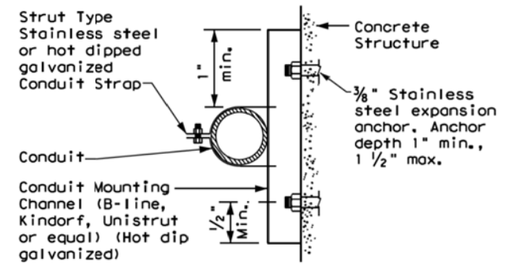




HANGER ASSEMBLY DETAIL

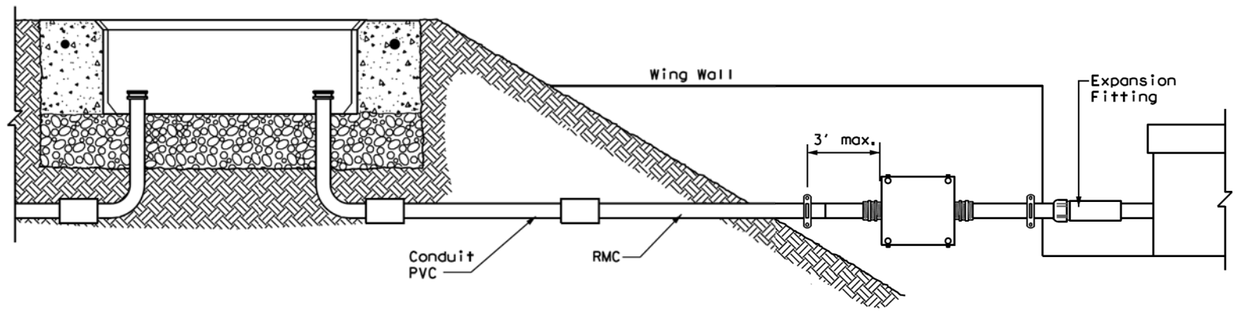
ELECTRIC CONDUIT TO BRIDGE DECK ATTACHMENT





CONDUIT MOUNTING OPTIONS

Attachment to concrete surfaces
See ED(1)B.2



TYPICAL CONDUIT ENTRY TO BRIDGE STRUCTURE DETAIL

EXPANSION ANCHOR NOTES FOR BRIDGE DECK ATTACHMENT

1. Use torque controlled mechanical expansion anchors that are approved for use in cracked concrete by the International Code Council, Evaluation Service (ICC-ES). The chosen anchor product shall have a designated ICC-ES Evaluation Report number, and its approval status shall be maintained on the ICC-ES website under Division 031600 for Concrete Anchors.
2. Unless otherwise approved by the Engineer: do not use adhesive anchors; do not use expansion anchors that are not included in the ICC-ES approval list; and do not use expansion anchors that are only approved for use in uncracked concrete.
3. Use anchors manufactured with stainless steel expansion wedges. Anchors manufactured with carbon steel expansion wedges are not allowed. Anchor bodies can be either zinc-plated carbon steel or stainless steel. For application in marine environment, both the anchor body and expansion wedge shall be stainless steel.
4. Install anchors as shown on the plans and in accordance with the anchor manufacturer's published installation instructions. Arrange a field demonstration test to evaluate the procedures and tools. The test shall be witnessed and approved by the Engineer prior to furnishing anchors on the structure.
5. Prior to hole drilling, use rebar locator to ensure clearing of existing deck strands or reinforcement. Install anchors to ensure a minimum effective embedment depth, (h_{ef}), as shown. Increase (h_{ef})as needed to ensure sufficient thread length for proper torqueing and tightening of anchors.
6. Use anchors of minimum 1600 Lbs tensile capacity (minimum of steel, concrete breakout, and concrete pullout strengths as determined by ACI 318 Appendix D) at the required minimum embedment depth (h_{ef}). No lateral loads shall be introduced after conduit installation.

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
SHEET NO. 189 OF 345
DWG NO. WS9-3002
CONTRACT NO. C-2033270-01

Texas Department of Transportation

Traffic Operations Division Standard

ELECTRICAL DETAILS
CONDUIT SUPPORTS

ED(2)-14

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ELECTRICAL CONDUCTORS

A. MATERIAL INFORMATION

1. Provide Type XHHW insulated conductors in accordance with Departmental Material Specification (DMS)11040 "Conductors" and Item 620 "Electrical Conductors." Provide conductors as listed on the Material Producers List (MPL) on the Department web site under "Roadway Illumination and Electrical Supplies" Item 620. Color code insulated conductors in conformance with the NEC. Identify grounded (neutral) conductors with white insulation. Identify grounding conductors (ground wires) with green insulation or bare conductors. Identify ungrounded (hot) conductors with any color insulation except green, white, or gray. Keep color scheme consistent throughout the wiring system. Identify conductors 6 American Wire Gauge (AWG) and smaller by continuous color jacket. Identify electrical conductors 4 AWG and larger by continuous color jacket or by colored tape. When identifying conductors with colored tape, mark at least 6 in. of the conductor's insulation with half laps of tape.

2. Provide a solid copper 6 AWG grounding electrode conductor to bond the electrical service equipment to the concrete encased grounding electrode or the ground rod at the service location. Connect the grounding electrode conductor to the ground rod with a UL listed connector in accordance with DMS 11040. Connect the grounding electrode conductor to the concrete encased grounding electrode as shown in the plans.

3. Where two or more circuits are present in one conduit or enclosure, permanently identify the conductors of each branch circuit by attaching a non-metallic tag around both circuit conductors at each accessible location. Provide tags with two straps, large enough to indicate circuit number, letter, or other identification as shown in the plans. Print circuit identification on the tag with a permanent marker.

4. Use listed compression or screw type pressure connectors, terminal blocks, or split bolt connectors for splicing as specified in DMS 11040. Use hot melt adhesive tape to fill the gap and seal the ends of heat shrink tubing. Provide UL listed gel-filled insulating splice covers. Splicing materials, insulating materials, breakaway disconnects, splice covers, and fuse holders are subsidiary to various bid items.

B. CONSTRUCTION METHODS

1. Use only a flat, high tensile strength polyester fiber pull tape for pulling conductors through the conduit system. After installing conductors in conduit, perform conductor pull test. If a conductor cannot be freely pulled, make any needed alterations or repairs at no additional cost to the department. Perform insulation resistance tests in accordance with Item 620. Coordinate with the Engineer to witness the tests.

2. Leave 2 ft. minimum, 3 ft. maximum length for each conductor up to the splice in ground boxes. Leave 3 ft. minimum, 4 ft. maximum length of conductor in ground boxes when pulled through with no splice. Leave 1 ft. minimum, 1.5 ft. maximum length of conductor at enclosures, weatherheads and pole bases.

3. Make splices only in junction boxes, ground boxes, pole bases, or electrical enclosures and use only listed compression or screw type pressure connectors, terminal blocks, or split bolt connectors. Insulate splices with heavy wall heat shrink tubing or gel-filled insulating splice covers to provide a watertight splice. Overlap conductor insulation with heat shrink tubing a minimum of 2 in. past both sides of the splice. Where heat shrink tubing may not shrink sufficiently to provide a watertight seal around the individual conductors, prior to heating the tubing, increase the diameter of the conductor insulation using hot melt adhesive tape to provide a watertight seal between the individual conductors and the heat shrink tubing. Ensure the tape extends past the heat shrink tubing. Use hot melt adhesive tape to fill the gap and seal the ends of heat shrink tubing. Heat shrink tubing that appears to have been burned, or overheated, is considered defective and must be replaced.

4. Size and install gel-filled insulating splice covers according to manufacturer's specifications when used in place of heat shrink tubing.

5. Wire nuts with factory applied waterproof sealant may be used for 8 AWG or smaller conductors in above ground junction boxes, but not in pole bases or ground boxes. Install wire nuts in an upright position to prevent the accumulation of water.

6. Support conductors in illumination poles with a J-hook at the top of the pole.

7. When terminating conductors, remove the insulation and jacketing material without nicking the individual strands of the conductor. Conductors with nicked individual conductor strands or removed strands will be considered damaged.

8. Replace conductors and cables that are damaged beyond repair or that fail an insulation resistance test at no additional cost to the department.

9. Do not repair damaged conductors with duct tape, electrical tape, or wire nuts. Use only approved splicing methods.

10. Do not terminate more than one conductor under a single connector, unless the connector is rated for multiple conductors. Do not exceed the pressure connector's listing for maximum number and size of conductors allowed.

11. Install breakaway connectors on conductors bid under Item 620 whenever those conductors pass through a breakaway support device. Follow manufacturer's instructions when terminating conductors to breakaway connectors. Properly torque threaded connections. Proper terminations are critical to the safe operation of breakaway devices. Trim waterproofing boots on breakaway connectors to fit snugly around the conductor to ensure waterproof connection. Only one conductor may enter a single opening in a boot. Provide waterproof boots with the correct number of openings. Leave unused openings factory sealed. Use prequalified breakaway connectors as shown on the MPL.

12. Provide and install a separate stranded equipment grounding conductor (EGC) in all conduits that contain circuit wiring of 50 volts or more. Unless shown elsewhere, size the EGC to be the same size as the largest current carrying conductor contained in the conduit. Ensure all EGCs are bonded together at every accessible location. For traffic signal installations, provide a minimum size 8 AWG EGC. The EGC is paid for under Item 620.

C. TEMPORARY WIRING

1. Install temporary conductors and electrical equipment in accordance with the NEC article "Temporary Installations" and Department standard sheets.

2. Provide a ground fault circuit interrupter (GFCI) for power outlets for portable electrical equipment, power tools, ice machines, ice storage bins and refrigerators located outdoors at grade. GFCI may be any one of the following: molded cord and plug set, receptacle, or circuit breaker type.

3. Use listed wire nuts with factory applied sealant for temporary wiring where approved.

4. Enclose conductor splices within a listed enclosure or ground box, or ensure the splices are more than 10 ft. above grade vertically and more than 5 ft. horizontally from any metal structure. Where installing temporary conductors in areas subject to vehicle traffic or mobile construction equipment, ensure the vertical clearance to ground is at least 18 ft. when measured at the lowest point. Ground messenger wires that support power conductors in conformance with the NEC.

5. Protect and when necessary repair any existing electrical conduits uncovered during the construction process in a timely manner and in conformance with the NEC.

GROUND RODS & GROUNDING ELECTRODES

A. MATERIAL INFORMATION

1. Provide and install a grounding electrode at electrical services. Provide ground rods according to DMS 11040 and the plans. Larger diameter or longer length rods may be called for in some specific locations, see the individual plans sheets. Concrete encased grounding electrodes may be called for in specific locations including electrical service, see individual plan sheets.

B. CONSTRUCTION METHODS

1. Furnish auxiliary ground rods for lightning protection and install in soil, concrete, or both, as called for in the plans. For ground rods installed in concrete, ensure the connection of the conductor to the ground rod is readily accessible for inspection or repairs. For ground rods installed in soil, ensure that the upper end is between 2 to 4 in. below finished grade.

2. Do not place ground rods in the same drilled hole as a timber pole.

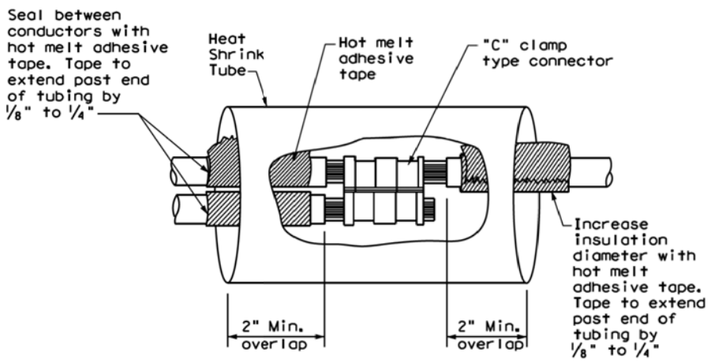
3. Install ground rods so the imprinted part number is at the upper end of the rod.

4. Remove all non-conductive coatings such as concrete splatter from the rod at the clamp location.

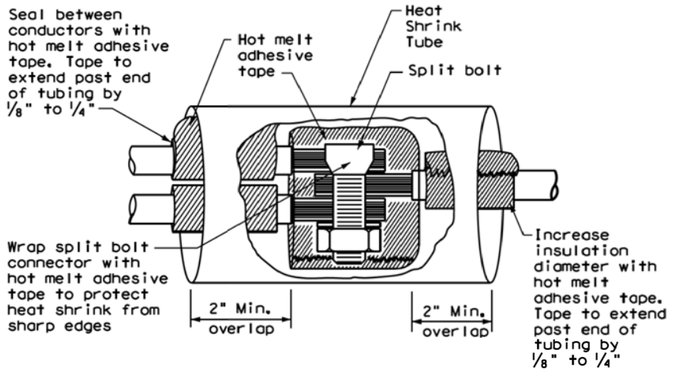
5. Route all conductors as short and straight as possible for connection to lightning protection ground rods. When a bend is required, ensure a minimum radius bend of four inches for these conductors.

6. Unless otherwise called for in the plans, protect grounding electrode conductors with non-metallic conduit. When protecting grounding electrode conductors with metal conduit, provide and install a grounding type bushing and properly sized bonding jumper on each end of the metal conduit.

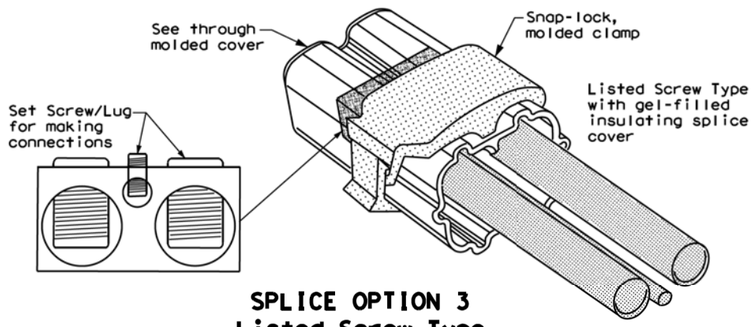
7. Written authorization is required before installing a ground rod in a horizontal trench for rocky soil or a solid rock bottom.



SPLICE OPTION 1
Compression Type



SPLICE OPTION 2
Split Bolt Type



SPLICE OPTION 3
Listed Screw Type

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VELOWEB HIKE & BIKE TRAIL
SHEET NO. 190 OF 345
DWG NO. WS9-3003
CONTRACT NO. C-2033270-01

Texas Department of Transportation

Traffic Operations Division Standard

ELECTRICAL DETAILS CONDUCTORS

ED(3)-14

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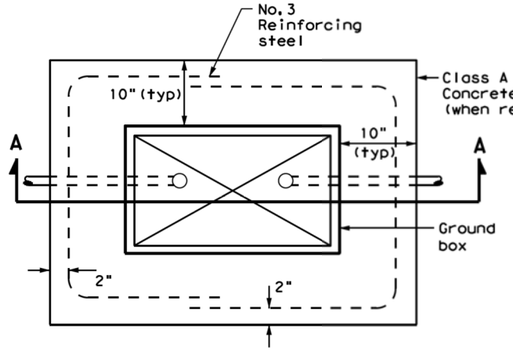
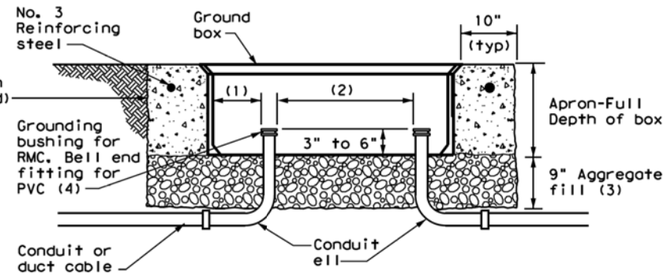


PLAN VIEW



SECTION A - A

APRON FOR GROUND BOX

(1) Uniformly space ends of conduits within the ground box. Position ends of conduits so that ground box walls do not interfere with the installation of grounding bushings or bell end fittings.

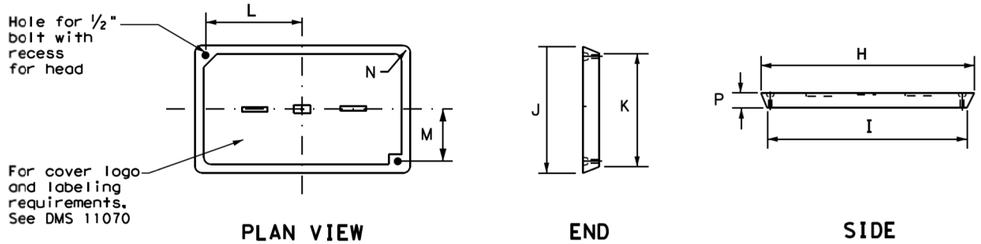
(2) Maintain sufficient space between conduits to allow for proper installation of bushing.

(3) Place aggregate under the box, not in the box. Aggregate should not encroach on the interior volume of the box.

(4) Install a grounding bushing on the upper end of all RMC terminating in a ground box. Ground RMC elbows when any part of the elbow is less than 18 in. below the bottom of the ground box. Install a PVC bushing or bell end fitting on the upper end of all PVC conduits terminating in a ground box.

GROUND BOX DIMENSIONS	
TYPE	OUTSIDE DIMENSIONS (INCHES) (Width x Length X Depth)
A	12 X 23 X 11
B	12 X 23 X 22
C	16 X 29 X 11
D	16 X 29 X 22
E	12 X 23 X 17

GROUND BOX COVER DIMENSIONS								
TYPE	DIMENSIONS (INCHES)							
	H	I	J	K	L	M	N	P
A, B & E	23 1/4	23	13 3/4	13 1/2	9 7/8	5 1/8	1 3/8	2
C & D	30 1/2	30 1/4	17 1/2	17 1/4	13 1/4	6 3/4	1 3/8	2



PLAN VIEW | END | SIDE

GROUND BOX COVER

GROUND BOXES

A. MATERIALS

1. Provide polymer concrete ground boxes measuring 16x30x24 in. (WxLxD) or smaller in accordance with Departmental Material Specification (DMS) 11070 "Ground Boxes" and Item 624 "Ground Boxes."
2. Provide Type A, B, C, D, and E ground boxes as shown in the plans, and as listed on the Material Producers List (MPL) on the Department web site under "Roadway Illumination and Electrical Supplies," Item 624.
3. Ensure ground box cover is correctly labeled in accordance with DMS 11070.
4. Provide larger ground boxes in accordance with Item 624 and as shown in the plans.

B. CONSTRUCTION METHODS

1. Remove all gravel and dirt from conduit. Cap all conduits prior to placing aggregate and setting ground box. Provide Grade 3 or 4 coarse aggregate as shown on Table 2 of Item 302 "Aggregates for Surface Treatments." Ensure aggregate bed is in place and at least 9 inches deep, prior to setting the ground box. Install ground box on top of aggregate.
2. Cast ground box aprons in place. Reinforcing steel may be field bent. Ensure the depth of concrete for the apron extends from finished grade to the top of the aggregate bed under the box. Ground box aprons, including concrete and reinforcing steel, are subsidiary to ground boxes when called for by descriptive code.
3. Keep bolt holes in the box clear of dirt. Bolt covers down when not working in ground boxes.
4. Install all conduits and ells in a neat and workmanlike manner. Uniformly space conduits so grounding bushings and bell end fittings can easily be installed.
5. Temporarily seal all conduits in the ground box until conductors are installed.
6. Permanently seal conduits immediately after the completion of conductor installation and pull tests. Permanently seal the ends of all conduits with duct seal, expandable foam, or other method as approved. Do not use duct tape as a permanent conduit sealant. Do not use silicone caulk as a sealant.
7. When a ground rod is present in a ground box, bond all equipment grounding conductors together and to the ground rod with listed connectors.
8. When a type B or D ground box is stacked to meet volume requirements, it is allowable to cut an appropriately sized hole for conduit entry in the side wall at least 18 inches below grade.
9. If an existing ground box in the contract has a metal cover, bond the cover to the equipment grounding conductor with a 3 ft. long stranded bonding jumper the same size as the grounding conductor. The bonding jumper is subsidiary to various bid items. Verify existing ground boxes with metal covers are shown on the plans, with notes fully describing the work required.
10. If other ground boxes with metal covers are within the project limits but are not part of the contract, the Engineer may direct the Contractor to bond the metal covers, identifying the specific boxes in writing. This work will be paid for separately.
11. Bond metal ground box covers to the grounding conductor with a tank ground type lug.

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VELOWEB HIKE & BIKE TRAIL
SHEET NO. 191 OF 345
DWG NO. WS9-3004
CONTRACT NO. C-2033270-01

Texas Department of Transportation

Traffic Operations Division Standard

ELECTRICAL DETAILS
GROUND BOXES

ED(4)-14

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ELECTRICAL SERVICES NOTES

1. Provide new materials. Ensure installation and materials comply with the applicable provisions of the National Electrical Code (NEC) and National Electrical Manufacturers Association (NEMA) standards. Ensure material is Underwriters Laboratories (UL) listed. Provide and install electrical service conduits, conductors, disconnects, contactors, circuit breaker panels, and branch circuit breakers as shown on the Electrical Service Data chart in the plans. Faulty fabrication or poor workmanship in material, equipment, or installation is justification for rejection. Where manufacturers provide warranties and guarantees as a customary trade practice, furnish these to the State.

2. Provide electrical services in accordance with Electrical Details standard sheets, Departmental Material Specification (DMS) 11080 "Electrical Services,"DMS 11081 "Electrical Services-Type A," DMS 11082 "Electrical Services-Type C," DMS 11083 "Electrical Services-Type D," DMS 11084 "Electrical Services-Type T," DMS 11085 "Electrical Services-Pedestal (PS)", and Item 628 "Electrical Services" of the Standard Specifications. Provide electrical service types A, C, and D, as listed on the Material Producers List (MPL) on the Department web site under "Roadway Illumination and Electrical Supplies," Item 628. Provide other service types as detailed on the plans.

3. Provide all work, materials, services, and any incidentals needed to install a complete electrical service as specified in the plans.

4. Coordinate with the Engineer and the utility provider for metering and compliance with utility requirements. Primary line extensions, connection charges, meter charges, and other charges by the utility company to provide power to the location are paid for in accordance with Item 628. Get approval for the costs associated with these charges prior to engaging the utility company to do the work. Consult with the utility provider to determine costs and requirements, and coordinate the work as approved.

5. The enclosure manufacturer will provide Master Lock Type 2 with brass tumblers keyed #2195 for all custom electrical enclosures. Installing Contractor is to provide Master Lock #2195 Type 2 with brass tumblers for "off the shelf" enclosures. Master Lock #2195 keys and locks become property of the State. Unless otherwise approved, do not energize electrical service equipment until locks are installed.

6. Enclosures with external disconnects that de-energize all equipment inside the enclosure do not need a dead front trim. Protect incoming line terminations from incidental contact as required by the NEC.

7. When galvanized is specified for nuts, screws, bolts or miscellaneous hardware, stainless steel may be used.

8. Provide wiring and electrical components rated for 75°C. Provide red, black, and white colored XHHW service entrance conductors of minimum size 6 American Wire Gauge (AWG). Identify size 6 AWG conductors by continuous color jacket. Identify electrical conductors sized 4 AWG and larger by continuous color jacket or by colored tape. Mark at least 6 inches of the conductor's insulation with half laps of colored tape, when identifying conductors. Ensure each service entrance conductor exits through a separately bushed non-metallic opening in the weatherhead. The lengths of the conductors outside the weatherhead are to be 12 inches minimum, 18 inches maximum, or as required by utility.

9. All electrical service conduit and conductors attached to the electrical service including the riser or the elbow below ground are subsidiary to the electrical service. For an underground utility feed, all service conduit and conductors after the elbow, including service conduit and conductors for the utility pole riser when furnished by the Contractor, will be paid for separately.

10. Provide rigid metal conduit (RMC) for all conduits on service, except for the ½ in. PVC conduit containing the electrical service grounding electrode conductor. Size the service entrance conduit as shown in the plans. Ensure conduit for branch circuit entry to enclosure is the same size as that shown on the layout sheets for branch circuit conduit. Extend all rigid metal conduits a minimum of 6 inches underground and then couple to the type and schedule of the conduit shown on the layout for that particular branch circuit. Install a grounding bushing on the RMC where it terminates in the service enclosure.

11. Use of liquidtight flexible metal conduit (LFMC) is allowed between the meter and service enclosure when they are mounted 90 to 180 degrees to each other. Size the LFMC the same size as service entrance conduit. LFMC must not exceed 3 feet in length. Strap LFMC within 1 foot of each end. LFMC less than 12 inches in length need not be strapped. Each end of LFMC must have a grounding bushing or be terminated with a grounding fitting. The LFMC must contain a grounded (neutral) conductor. Ensure any bend in LFMC never exceeds 180 degrees. A pull test is required on all installed conductors, with at least six inches of free conductor movement demonstrated to the satisfaction of the Engineer.

12. Ensure all mounting hardware and installation details of services conform to utility company specifications.

13. For all electrical service enclosures listed under Item 628 on the MPL, the UL 508 enclosure manufacturers will prepare and submit a schematic drawing unique to each service. Before shipment to the job site, place the applicable laminated schematic drawings and the laminated plan sheet showing the electrical service data chart used to build the enclosure in the enclosure's data pocket. The installing contractor will copy and laminate the actual project plan sheets detailing all equipment and branch circuits supplied by that service. The laminated plan sheets are to be placed in the service enclosure's document pocket. Reduce 11 in. x 17 in. plan sheets to 8 ½ in. x 11 in. before laminating. If the installation differs from the plan sheets, the installing contractor is to redline plan sheets before laminating.

14. When providing an "Off The Shelf" Type D or Type T service, provide laminated plan sheets detailing equipment and branch circuits supplied by that service. Reduce 11 in. x 17 in. plan sheets to 8 ½ in. x 11 in before laminating. Deliver these drawings before completion of the work to the Engineer, instead of placing in enclosure that has no door pocket.

15. Do not install conduit in the back wall of a service enclosure where it would penetrate the equipment mounting panel inside the enclosure. Provide grounding bushings on all metal conduits, and terminate bonding jumpers to grounding bus. Grounding bushings are not required when the end of the metal conduit is fitted with a conduit sealing hub or threaded boss, such as a meter base hub.

SERVICE ASSEMBLY ENCLOSURE

1. Provide threaded hub for all conduit entries into the top of enclosure.

2. Type galvanized steel (GS) enclosures may be used for Type C panelboards and for Type D and T services that do not use an enclosure mounted photocell or lighting contactor. Provide GS enclosures in accordance with DMS 11080, 11082, 11083, and 11084.

3. Provide aluminum (AL) and stainless steel (SS) enclosures for Types A, C, and D in accordance with DMS 11080, 11081, 11082, 11083, and 11084. Do not paint stainless steel.

4. Provide pedestal service (PS) enclosures in accordance with ED(9) and DMS 11080 and 11085. Do not provide GS pedestal services. If GS is shown in the PS descriptive code, provide an AL enclosure.

MAIN DISCONNECT & BRANCH CIRCUIT BREAKERS

1. Field drill flange-mounted remote operator handle if needed, to ensure handle is lockable in both the "On" and "Off" positions.

2. When the utility company provides a transformer larger than 50 KVA, verify that the available fault current is less than the circuit breaker's ampere interrupting capacity (AIC) rating and provide documentation from the electric utility provider to the Engineer.

PHOTOELECTRIC CONTROL

1. Provide photocell as listed on the MPL. Move, adjust, or shield the photocell from stray or ambient night time light to ensure proper operation. Mount photocell facing north when practical. Mount top of pole photocells as shown on Top Mounted Photocell Detail.

*ELECTRICAL SERVICE DATA

Elec. Service ID	Plan Sheet Number	Electrical Service Description	Service Conduit **Size	Service Conductors No./Size	Safety Switch Amps	Main Ckt. Bkr. Pole/Amps	Two-Pole Contractor Amps	Panelbd/ Loadcenter Amp Rating	Branch Circuit ID	Branch Ckt. Bkr. Pole/Amps	Branch Circuit Amps	KVA Load
SB 183	289	ELC SRV TY A 240/480 100(SS)AL(E)SF(U)	2"	3/#2	100	2P/100	100	N/A	Lighting NB	2P/40	26	28.1
									Lighting SB	2P/40	25	
									Underpass	1P/20	15	
NB Access	30	ELC SRV TY D 120/240 060(NS)SS(E)TS(O)	1 ¼"	3/#6	N/A	2P/60		100	Sig. Controller	1P/30	23	5.3
							30		Luminaires	2P/20	9	
									CCTV	1P/20	3	
2nd & Main	58	ELC SRV TY T 120/240 000(NS)GS(N)SP(O)	1 ¼"	3/#6	N/A	N/A	N/A	70	Flashing Beacon 1	1P/20	4	1.0
									Flashing Beacon 2	1P/20	4	

* Example only, not for construction. All new electrical services must have electrical service data chart specific to that service as shown in the plans.

** Verify service conduit size with utility. Size may change due to utility meter requirements. Ensure conduit size meets the National ELectrical Code.

EXPLANATION OF ELECTRICAL SERVICE DESCRIPTIVE CODE

ELEC SERV TY X XXX/XXX XXX (XX) XX (X) XX (X)

Schematic Type

Service Voltage V / V

Disconnect Amp Rating
000 indicates main lug only/
Typically Type T

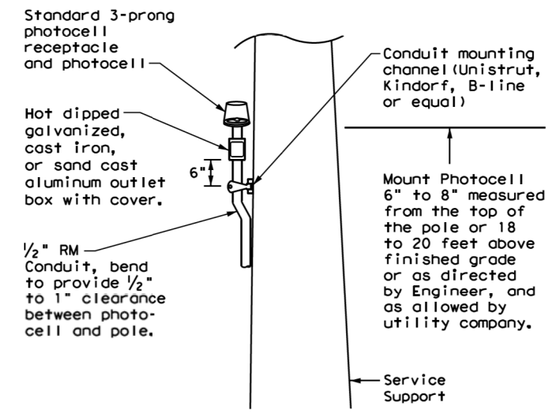
(SS)= Safety Switch Ahead of Meter-Check with Utility
(NS)= No safety Switch Ahead of Meter-Check with Utility

Enclosure Type
GS= Galvanized steel("off the shelf")
SS= Stainless steel(Custom Enclosure)See MPL
AL= Aluminum (Custom Enclosure)See MPL

Photocell Mounting Location
(E)= Inside Service/Enclosure Mounted
(T)= Top of pole
(L)= Luminaire mounted
(N)= None/No Photocell or Lighting Contactor Required

Service Support Type
GC= Granite concrete
OC= Other concrete
TP= Timber pole
SP= Steel pole
SF= Steel frame
OT= Pole by others or paid for separately
EX= Existing pole
TS= Service on traffic signal pole
PS= Pedestal Service

O= Overhead Service Feed from Utility
U= Underground Service Feed from Utility



TOP MOUNTED PHOTOCELL

Install conduit strap maximum 3 feet from box. 5 foot maximum spacing between straps supporting conduit.

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ELECTRICAL DETAILS SERVICE NOTES & DATA

ED(5)-14

COTTON BELT REGIONAL RAI
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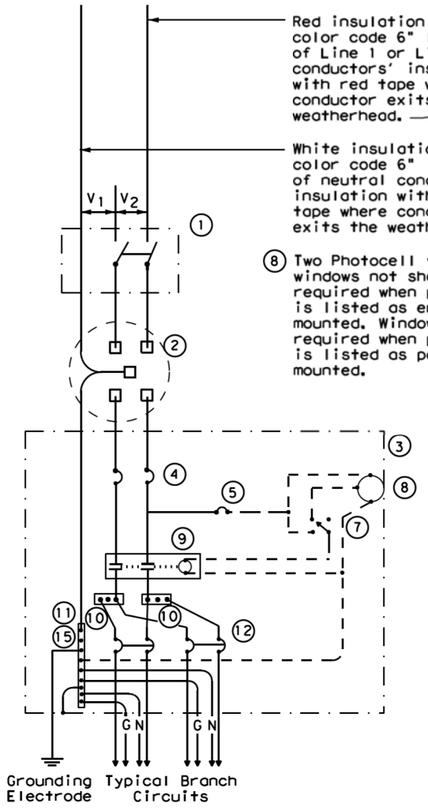
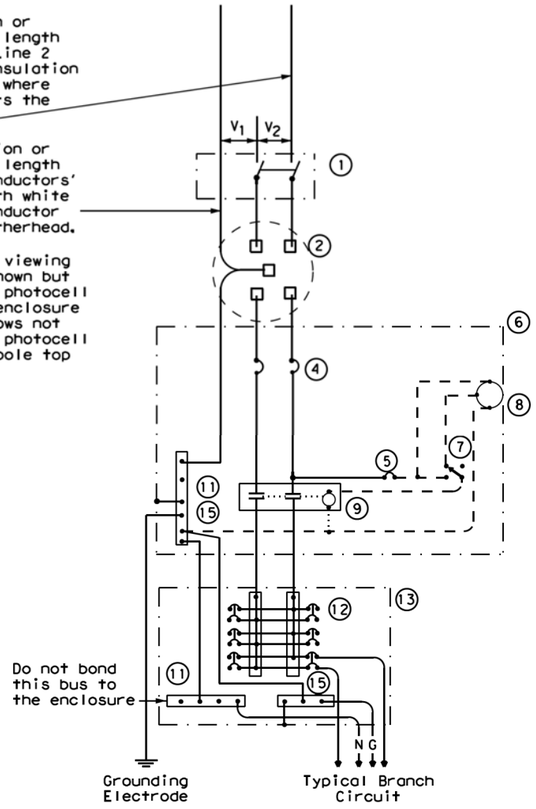
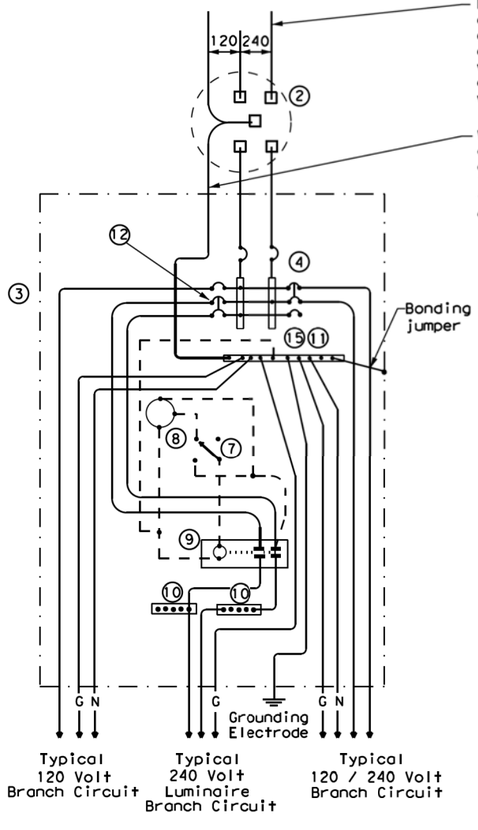


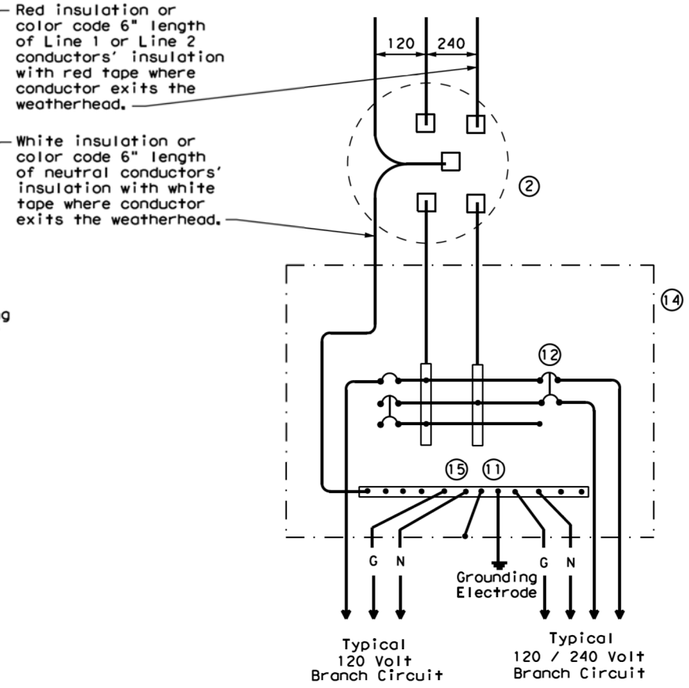
SCHEMATIC TYPE A
THREE WIRE



SCHEMATIC TYPE C
THREE WIRE



SCHEMATIC TYPE D - CUSTOM
120/240 VOLTS - THREE WIRE



SCHEMATIC TYPE T
120/240 VOLTS - THREE WIRE

Galvanized steel-"Buy Off The Shelf" only. When required install photocell top of the pole or on luminaire only, no lighting contractor will be installed.

WIRING LEGEND	
———	Power Wiring
- - - -	Control Wiring
—N—	Neutral Conductor
—G—	Equipment grounding conductor-always required

SCHEMATIC LEGEND	
1	Safety Switch (when required)
2	Meter (when required-verify with electric utility provider)
3	Service Assembly Enclosure
4	Main Disconnect Breaker (See Electrical Service Data)
5	Circuit Breaker, 15 Amp (Control Circuit)
6	Auxiliary Enclosure
7	Control Station ("H-O-A" Switch)
8	Photo Electric Control (enclosure-mounted shown)
9	Lighting Contactor
10	Power Distribution Terminal Blocks
11	Neutral Bus
12	Branch Circuit Breaker (See Electrical Service Data)
13	Separate Circuit Breaker Panelboard
14	Load Center
15	Ground Bus

COTTON BELT REGIONAL RAI
VELOWEB HIKE & BIKE TRAI
SHEET NO. 193 OF 345
DWG NO. WS9-3006
CONTRACT NO. C-2033270-01

Texas Department of Transportation

Traffic Operations Division Standard

ELECTRICAL DETAILS SERVICE ENCLOSURE AND NOTES

ED(6)-14

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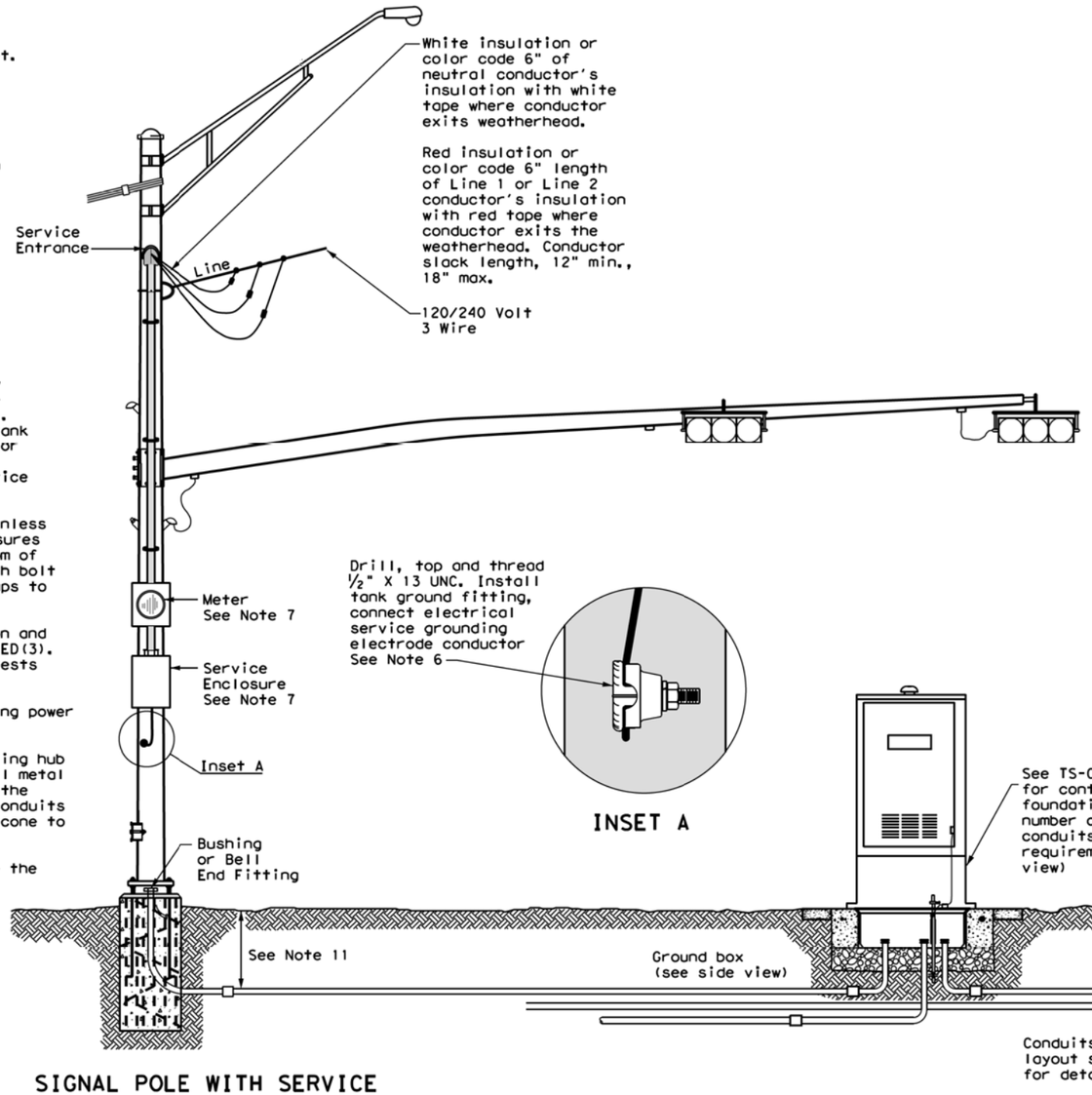
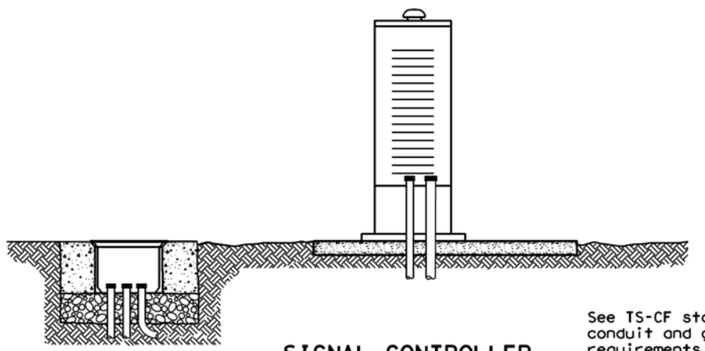
TRAFFIC SIGNAL NOTES

1. Do not pass luminaire conductors through the signal controller cabinet.
2. Include an equipment grounding conductor in all conduits throughout the electrical system. Bond all exposed metal parts to the grounding conductor.
3. Provide roadway luminaires, when required, in accordance with the material and construction sections of Item 610, "Roadway Illumination Assemblies," except for performance testing of luminaires. Test installed roadway luminaires for proper operation as a part of the associated traffic signal system test.
4. If internally illuminated street name signs are approved for use, ground the fixture to the pole with a 12 AWG green XHHW conductor.
5. Bond anchor bolts to rebar cage in two locations using #3 bars or 6 AWG stranded copper conductors. Use listed mechanical connectors rated for embedment in concrete. See TXDOT standard TS-FD for further details.
6. Drill and tap signal poles for ½ in. X 13 UNC tank ground fitting. Provide and install tank ground fitting 4 in. to 6 in. directly below electrical service enclosure. Provide properly sized hole through the bottom of the enclosure for the service grounding electrode conductor. Connect the electrical service grounding electrode conductor to the tank ground fitting. Ensure electrical service grounding electrode conductor is as short and straight as possible from the enclosure to the tank ground fitting. See Inset A detail for further information. Size service entrance conduit and branch circuit conduit as shown in the plans.
7. Mount electrical service enclosure and meter to signal pole with stainless steel bands. Ensure bands are a minimum width of ¾ in. Secure enclosures to bands using two-bolt brackets. Install brackets near top and bottom of each enclosure. Install properly sized stainless steel washers on each bolt in the enclosure. Band or drill and tap properly sized stand-off straps to signal pole for attaching conduit.
8. Conduct pull tests and insulation resistance tests on all illumination and power conductors as required in Item 620 "Electrical Conductors" and ED(3). To prevent electronics damage, do not conduct insulation resistance tests on traffic signal cables after termination.
9. Lock all enclosures and bolt down all ground box covers before applying power to the signal installation.
10. Terminate conduits entering the top of enclosures with a conduit-sealing hub or threaded boss such as meter hub. Install a grounding bushing on all metal conduits not connected to conduit-sealing hub or threaded boss. Bond the grounding bushing to the ground bus with a bonding jumper. Seal all conduits entering enclosures with duct seal or expanding foam. Do not use silicone to seal conduit ends.
11. For all conduits, ensure the burial depth is a minimum of 18". Ensure the minimum burial depth for conduit placed under a roadway is 24".



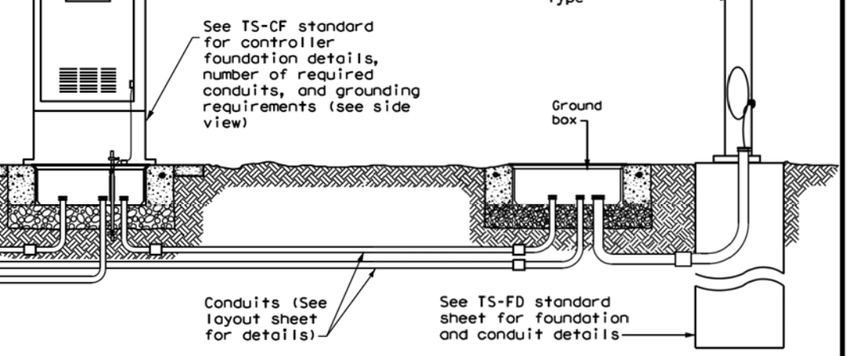
SIGNAL POLE WITH SERVICE

Type T electrical service mounted on signal pole shown as an example. See electrical details, layout sheets, and electrical service data chart for additional details.



SIGNAL CONTROLLER SIDE VIEW

See TS-CF standard for conduit and grounding requirements. See layout sheets for ground box locations and any additional conduits that are required.



SIGNAL CONTROLLER FRONT VIEW

SIGNAL POLE

COTTON BELT REGIONAL RAI
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SHEET NO. 194 OF 345
DWG NO. WS9-3008
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Texas Department of Transportation

Traffic Operations Division Standard

ELECTRICAL DETAILS TYPICAL TRAFFIC SIGNAL SYSTEM DETAILS

ED(8)-14

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PEDESTAL SERVICE NOTES

1. Manufacture pedestal electrical services in accordance with Departmental Material Specifications (DMS)11080 "Electrical Services", 11085 "Electrical Services-Pedestal (PS)" and Item 628 "Electrical Services. "Provide pedestal electrical services as listed on the Material Producers list (MPL) on the Department's web site under "Roadway Illumination and Electrical Supplies," Item 628. Ensure all mounting hardware and installation details of services meet utility company specifications. Contact the local utility company for approval of pedestal details prior to installing the electrical pedestal service. Submit any changes required by the utility company prior to manufacturing the pedestal enclosure.

2. When a meter socket is required, provide a socket with a minimum 100 amp rating that complies with local utility requirements.

3. Provide Class A or C concrete for pedestal service foundations in accordance with Item 420, "Concrete Substructures," except that concrete will not be paid for directly but is considered subsidiary to Item 628.

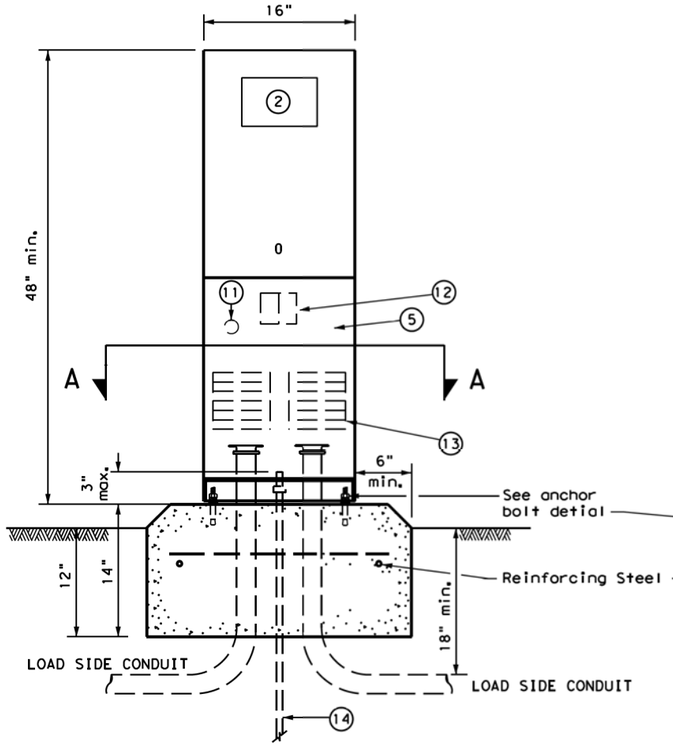
4. Provide #4 reinforcing steel for foundations in accordance with Item 440, "Reinforcement for Concrete."

5. Install ½ in. X 2 ⅛ in. minimum length concrete single expansion type anchors for mounting pedestal enclosure to foundation. Anchor location to match mounting holes in each corner of enclosure. Secure each of the four corners of the pedestal enclosure to the anchors in the foundation with a ½ in. galvanized or stainless steel machine thread bolt, a properly sized locknut and a flat washer.

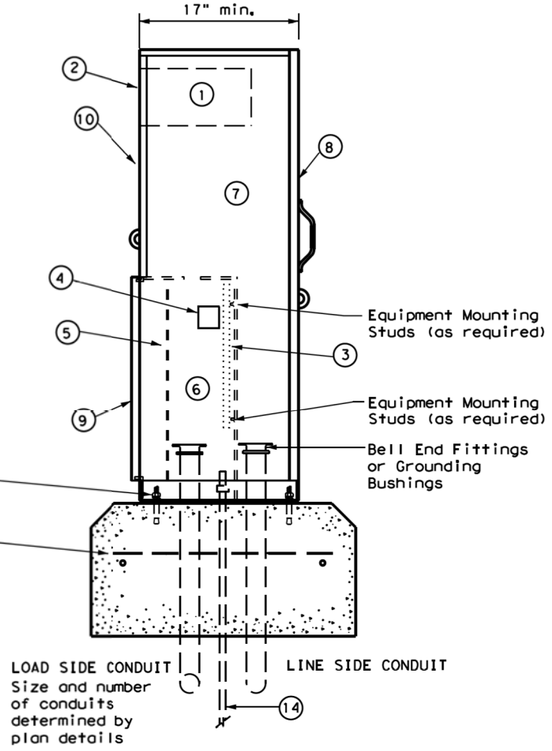
6. Finish top of concrete foundation in a neat and workmanlike manner. If leveling washers are used, ensure no more than ⅛ in. gap at any corner. Do not exceed a maximum dip or rise in the foundation of ⅛ in. per foot. When properly installed, ensure the top of the service enclosure is level front to back and side to side within ¼ in. Repair rocking or movement of the service enclosure at no additional cost to the department.

7. Do not use liquidtight flexible metal conduit (LFMC) on pedestal type services.

8. Ensure all elbows in the foundation are sized as per utility provider's conduit requirements for underground conduit and feeders. PVC extensions may be installed provided the ends of the rigid metal conduits are more than 2 in. below the top of the concrete foundation. Where extension conduits are metal, grounding bushings must be installed with a bonding jumper properly terminated.

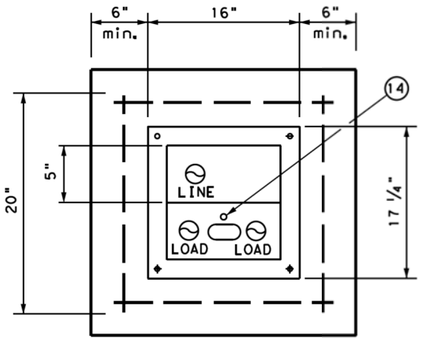


FRONT VIEW

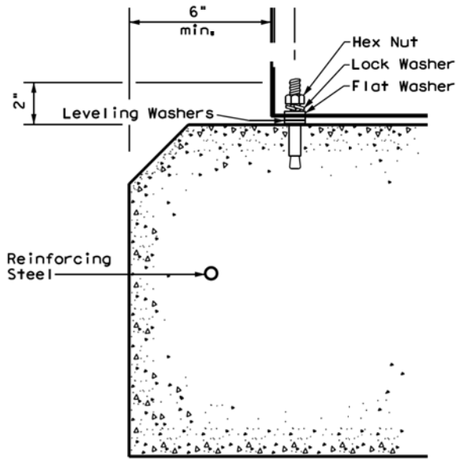


SIDE VIEW

TYPE C shown, TYPE A similar except that TYPE A shall have individual circuit breakers (CB) mounted on an equipment mounting panel. CB Handles shall protrude through hinged deadfront trim.



SECTION A-A



ANCHOR BOLT DETAIL

LEGEND	
1	Meter Socket, (when required)
2	Meter Socket Window, (when required)
3	Equipment Mounting Panel
4	Photo Electric Control Window, (When required)
5	Hinged Deadfront Trim
6	Load Side Conduit Trim
7	Line Side Conduit Area
8	Utility Access Door, with handle
9	Pedestal Door
10	Hinged Meter Access
11	Control Station (H-O-A Switch)
12	Main Disconnect
13	Branch Circuit Breakers
14	Copper Clad Ground Rod - 5/8" X 10'

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Texas Department of Transportation

Traffic Operations Division Standard

ELECTRICAL DETAILS
ELECTRICAL SERVICE SUPPORT
PEDESTAL SERVICE TYPE PS
ED(9)-14

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ROADWAY ILLUMINATION ASSEMBLY NOTES

1. Details apply to roadway lighting installations bid or referenced under Item 610, "Roadway Illumination Assemblies." Provide, furnish, and install all other materials not shown on the plans which may be necessary for complete and proper construction. Where manufacturers provide warranties or guarantees as a customary trade practice, furnish to the State such warranties or guarantees.

2. The locations of poles and fixtures may be shifted by the Engineer to accommodate local conditions. Install or remove poles and luminaires located near overhead electrical lines using established industry and utility safety practices and in accordance with laws governing such work. Consult with the appropriate utility company prior to beginning such work.

3. Provide new and unused materials. Ensure that all materials and installations comply with the applicable articles of the National Electrical Code (NEC),TxDOT standards and specifications, National Electrical Manufacturers Association (NEMA),and are listed by Underwriters Laboratories (UL) or a Nationally Recognized Testing Lab (NRTL). NRTLs such as Canadian Standard Association, Intertek Testing Services NA Inc., or FM Approvals LLC can be considered equivalent to UL. Faulty fabrication or poor workmanship in any material, equipment, or installation is justification for rejection.

4. Provide Roadway Illumination Light Fixtures as per TxDOT Departmental Material Specification (DMS) 11010, Item 610, and as shown on the Material Producers List (MPL) for Roadway Illumination and Electrical Supplies.

5. Fabricate steel roadway illumination poles in accordance with Roadway Illumination Poles (RIP) standards and Item 610. Poles fabricated according to RIP standards do not require shop drawing submittals.

   a. Alternate designs to RIP standards or the use of aluminum to fabricate poles will require the submission of shop drawings electronically. For instructions on submitting shop drawings electronically see "Guide to Electronic Shop Drawing Submittal" on the TxDOT web site.

   b. Limitations on use of the RIP standard: The RIP standard details were developed for installations in locations where the 3-second gust basic maximum wind speed is 110 mph, and where the elevation of the base of the pole is less than (i.e. not more than) 25' above the elevation of the surrounding terrain, in accordance with the "AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals," 6th Edition (2013) of the AASHTO Design Specifications. For poles to be installed in regions where the maximum basic wind speed exceeds 110 mph or to be mounted more than 25' above the surrounding terrain, provide poles meeting the following requirements:

      i. Submittals. Following the electronic shop drawing submittal process (see Guide to Electronic Shop Drawing Submittal on the TxDOT web site), submit to the Engineer for approval fabrication drawings and calculations for the poles, sealed by a Texas licensed professional engineer (P.E.).

      ii. Luminaire Structural Support Requirements. Provide light poles, arms, and anchor bolt assemblies with a 25 year design life to safely resist dead loads, ice loads and the required basic wind speeds at the location of installation in accordance with the 6th edition (2013) of the AASHTO Design Specifications. For transformer base poles, include transformer base and connecting hardware in calculations and shop drawing submittals. Structurally test all transformer bases to resist the theoretical plastic moment capacity of the pole. Submit certification of the plastic moment load test and FHWA breakaway requirement test of the model of base being furnished with the shop drawings. Show breakaway base model number, manufacturer's name, and logo on shop drawings. Include on manufacturer's shop drawings the ASTM designations for all materials to be used.

6. For both transformer and shoe-base type illumination poles, provide and install double-pole breakaway fuse holders as specified by DMS-11040. Breakaway fuse holders are listed on the MPL for Roadway Illumination and Electrical Supplies under Items 610 & 620. Provide 10 amp time delay fuses for breakaway connectors in light poles, or inside the light fixture for underpass luminaires. In each pole, connect luminaires to the breakaway connector with continuous stranded 12 AWG copper conductors as listed on the MPL. Bond all equipment grounding conductors together and to the ground lug in the transformer base or hand hole.

7. Tighten anchor bolts for shoe base, concrete traffic barrier base, and bridge mount roadway illumination poles, in accordance with Item 449.

8. Install T-Base with following procedure:

   a. Anchor Bolt Tightening.

      i. Coat the threads of the anchor bolts with electrically conductive lubricant.

      ii. Place the T-base over the anchor bolts. Foundation must be level and flat. The maximum permissible gap under any one corner of the t-base is 1/8" before nuts are tightened.

      iii. Coat the bearing surfaces of the nuts and washers with electrically conductive lubricant. Install (1) 1/2" hold down washer, (1) lock washer, and (1) nut on each anchor bolt. Turn the nuts onto the bolts so that each is hand-tight against the washer.

      iv. Using a torque wrench, tighten each nut to 150 ft-lb. Uniform contact is required between the foundation and the T-base in the corner regions of the T-base, and all corner gaps must be closed after applying torque. If a gap still exists after torquing to 150 ft-lbs, continue torquing each bolt incrementally until gap is closed or maximum allowable torque of 250 ft. pound is reached, whichever comes first. If 250 ft-lbs is not enough to close the gap the foundation must be leveled. Gaps along the straight sides of the T-bases and the foundation are permissible. Ensure that no high point of contact occurs between the straight sides of the T-base and the foundation.

      v. Check top of T-base for level. If not level then foundation must be leveled.

   b. Top Bolt Procedure

      i. Erect pole over T-base with crane. Coat bolts, nuts, washers, and lock washers with electrically conductive lubricant.

      ii. Install bolts and 1/2" connecting washers from the inside of the T-base, thread up through the pole base. Install flat washers, lock washers and nuts snug tight according to Item 447, "Structural Bolting."

      iii. Tighten each nut to 150 ft-lb. using a torque wrench.

   c. Level and Plumb

      i. Ensure pole is plumb and mast arm is perpendicular to the roadway according to plans to within 5 degrees.

9. Construct luminaire pole foundations in accordance with Item 416, "Drilled Shaft Foundations," and TxDOT standard sheet RID(2).

10. Provide and install underpass luminaires in accordance with Item 610, DMS-11010, and TxDOT standard sheet RID(3). Typical luminaire size for underpass luminaires is 150W HPS or 150W EQ LED.

11. Mount luminaires on arms level as shown by the luminaire level indicator.

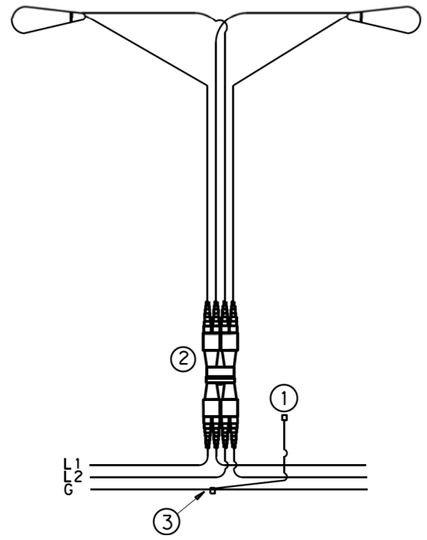
12. Orient luminaires perpendicular to the roadway intended to be lit unless otherwise shown on the plans.

Wiring Diagram Notes:

(1) Use 1/2 in.-13 UNC threaded, copper or tin-plated copper, pole bonding connector, sized appropriately for conductors, bonded to T-base, or use ground lug in handhole as available.

(2) Use pre-qualified two-pole breakaway connectors for all luminaire pole installations. For luminaires fed by a circuit with a neutral conductor, use double pole breakaway connectors with the neutral side unfused and marked white.

(3) Split Bolt or other connector.



L1,L2 = Hot Conductors
G = Grounding Conductor

TYPICAL WIRING DIAGRAM

LUMINAIRES SERVED AT 480V ON 240/480 VOLT SERVICE OR LUMINAIRES SERVED AT 240V FOR 120/240 VOLT SERVICE.

Decorative LED Lighting Notes:

1. LED Drivers in Remote Outdoor enclosures (for drivers that do not include an enclosure as part of a factory assembly):

   a. Provide NEMA 3R outdoor enclosure or as approved.

   b. Install enclosure at least 12" above ground or other horizontal surface. Mount vertically or on ceiling, and avoid direct sun where possible.

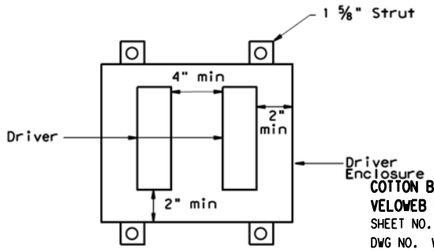
   c. Install drivers with at least 2 inches of space from enclosure walls.

   d. For multiple drivers in an enclosure, provide at least 4 inches side to side and 1 inch end to end from other drivers or electronic equipment

   e. For drivers mounted on back wall of enclosure, mount enclosure on 1 5/8" strut or other standoff to dissipate heat, or mount driver to side of the enclosure or to the metal cover.

   f. Provide remote drivers with a maximum of 100 watts

   g. Provide drivers with documentation of 100,000 hr lifetime at Tcase of 65C or higher.



Driver Spacing In Remote Enclosure

Texas Department of Transportation

Traffic Safety Division Standard

ROADWAY ILLUMINATION DETAILS

RID(1)-20

COTTON BELT REGIONAL RAIL
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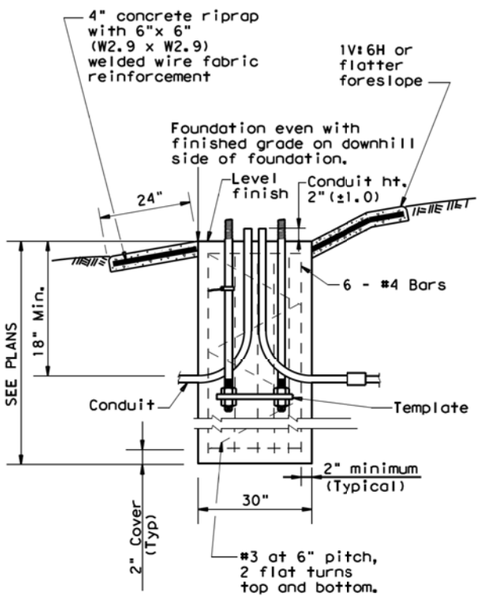
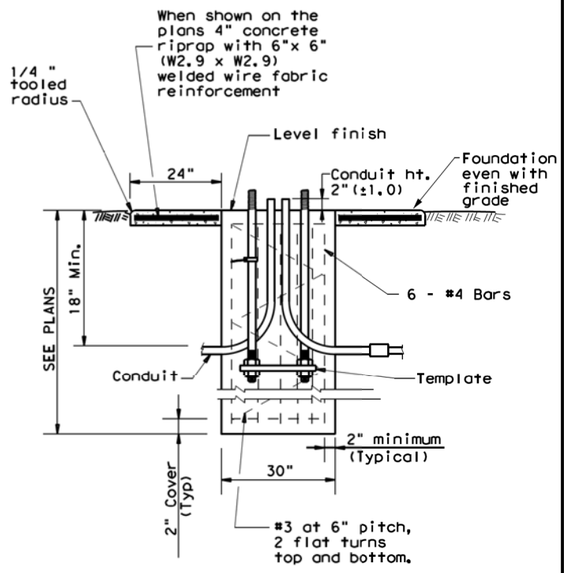


SECTION A-A
SHOWING SLOPED GRADE



SECTION A-A
SHOWING CONSTANT GRADE

TABLE 1

ANCHOR BOLTS

POLE MOUNTING HEIGHT	BOLT CIRCLE		ANCHOR BOLT SIZE
	Shoe Base	T-Base	
<40 ft.	13 in.	14 in.	1in. x 30in.
40-50 ft.	15 in.	17 ¼in.	1 ¼in. x 30in.

TABLE 2

RECOMMENDED FOUNDATION LENGTHS
(See note 1)

MOUNTING HEIGHT	TEXAS CONE PENETROMETER N Blows/ft		
	10	15	40
≤20 ft.	6′	6′	6′
>20 ft. to 30 ft.	8′	6′	6′
>30 ft. to 40 ft.	8′	8′	6′
>40 ft. to 50 ft.	10′	8′	6′

TABLE 3

PAY QUANTITY OF RIPRAP PER FOUNDATION (Install only when shown on the plans)

Foundation Diameter	RIPRAP DIAMETER	RIPRAP (CONC) (CL B)
30 in.	78 in.	0.35 CY

GENERAL NOTES:

1. "Recommended Foundation Lengths" table is for information purposes only. Foundation lengths shall be as shown on the plans, or as directed by the Engineer. Foundations will be paid for under Item 416, "Drilled Shaft Foundations," unless otherwise shown on the plans.
2. Erect roadway illumination assembly poles plumb and true. Form and level the top 6" of the foundation so the pole will be plumb. Use leveling nuts to plumb shoe base poles. Do not use shims or leveling nuts under transformer bases. Do not grout between baseplate and the foundation.
3. Ensure Class 2A and 2B fit for anchor bolts and nuts. Tap and chase nuts after galvanizing. Anchor bolt body with rolled threads need not be full size.
4. Use appropriate class of concrete as specified in Items 416 and 432. Concrete for riprap may be upgraded to Class C at no extra cost to the Department.
5. Place riprap around the foundation when called for elsewhere in the plans. Riprap will be paid for under Item 432.
6. Locate breakaway roadway illumination assemblies as shown in the placement table, unless otherwise dimensioned on the plans. Protect non-breakaway illumination assemblies from vehicular impact (i.e. 2.5 ft. behind guard rail or mounted on traffic barrier), or located outside the clear zone, except that 2.5 ft. from curb face is minimum desired for light poles on city streets, 45 mph or less. See Roadway Design Manual for further information.
7. Use 4 hold down and 4 connecting washers on transformer base poles as recommended by the manufacturer and supplied with base.
8. Install a minimum of 2 conduits in each foundation. See lighting layout sheets for locations of foundations with more than 2 conduits. Cap unused conduits in foundations on both ends.
9. Conduit location in foundations is critical for breakaway devices. Place conduits 2 in. apart on centerline as shown.
10. Bond anchor bolt to rebar cage with #6 bare stranded copper conductor. Use listed mechanical connectors rated for embedment in concrete. The bonded steel in the foundation creates a concrete encased grounding electrode which replaces the ground rod.
11. Grade earthwork around T-base foundations even with the finished grade as shown in Section A-A to ensure proper function of the breakaway device. Use riprap on T-base foundations that are located on sloped grades, and as shown on the plans for level grades.

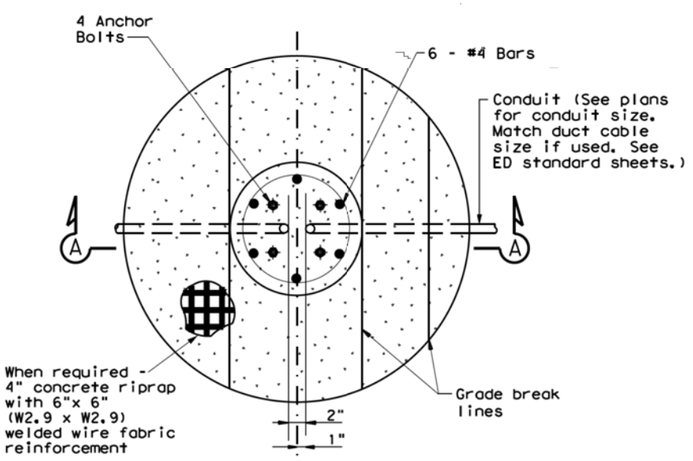
TABLE 4

BREAKAWAY POLE PLACEMENT (See note 6)

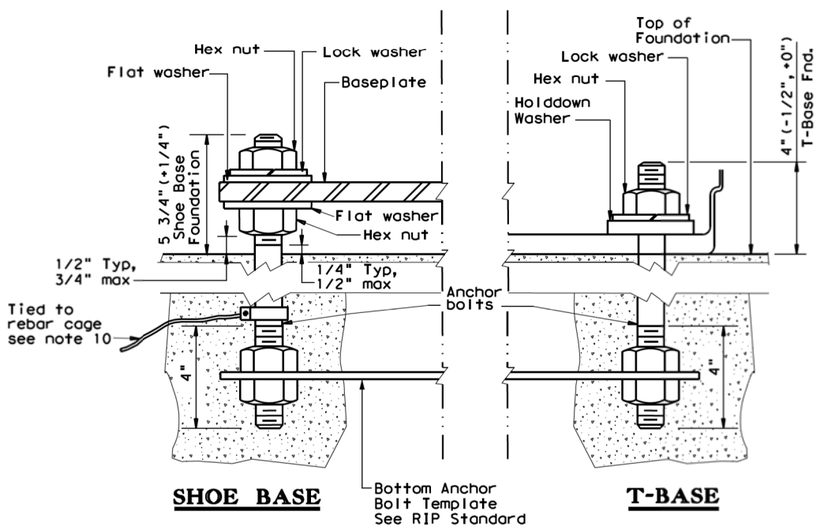
ROADWAY FUNCTIONAL CLASSIFICATION	** POLE OFFSET (DISTANCE TO FACE OF TRANSFORMER BASE)
Freeway Mainlanes (roadway with full control of access)	15 ft. (minimum and typical) from lane edge
All curbed, 45 mph or less design speed	2.5 ft. minimum (15 ft. desirable) from curb face
All others	10 ft. minimum*(15 ft. desirable) from lane edge

* or as close to ROW line as is practical

** provide 2/5 of the luminaire mounting height behind the pole for "falling area" to prevent encroachment on the other travel lanes. See design guidelines.



FOUNDATION DETAIL



SHOE BASE T-BASE

ANCHOR BOLT DETAIL

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
SHEET NO. 197 OF 345
DWG NO. WS9-3011
CONTRACT NO. C-2033270-01

Texas Department of Transportation

Traffic Safety Division Standard

ROADWAY ILLUMINATION DETAILS
(RDWY ILLUM FOUNDATIONS)
RID(2)-20

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1-11	DIST	COUNTY		SHEET NO.
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12-20				

72B

DATE:
FILE:

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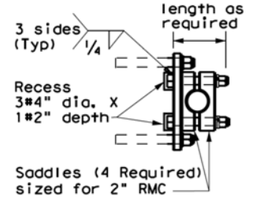
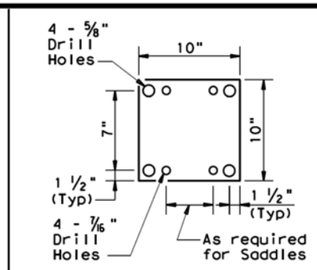
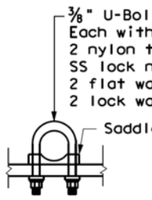


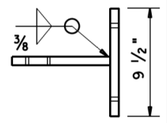
SECTION A-A



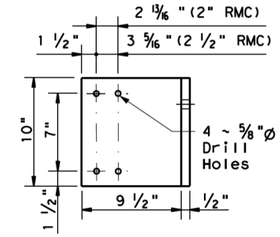
MOUNTING PLATE
(ASTM A-36 or better)



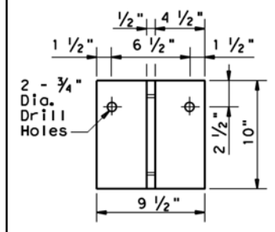
CLAMP DETAIL
(2 Req'd)



PLAN VIEW

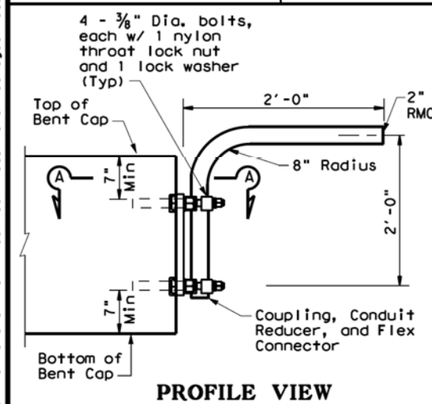


FRONT

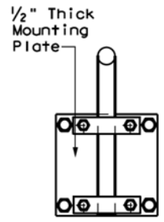


SIDE

BRACKET DETAIL
Make from 1/2" plate (ASTM A-36 or better)

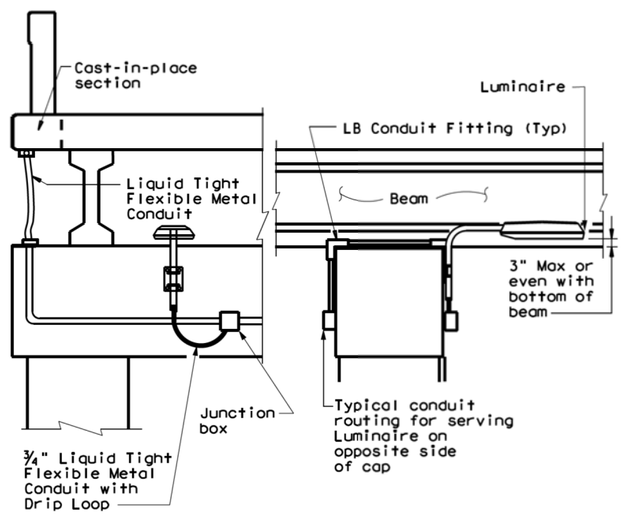


PROFILE VIEW
Or as Required
(See Note A.3)



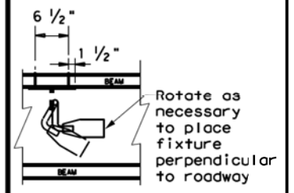
END VIEW

UNDERPASS LIGHTING ARM



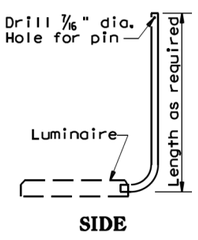
IN RD IL AM (U/P)(TY 1)
If bridge has pre-cast panels under deck, run circuit under deck edge.

UNDERPASS LIGHTING TYPE 1

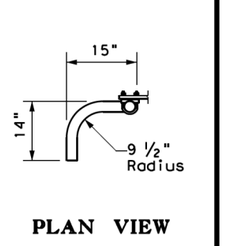


PLAN VIEW

FIXTURE ORIENTATION

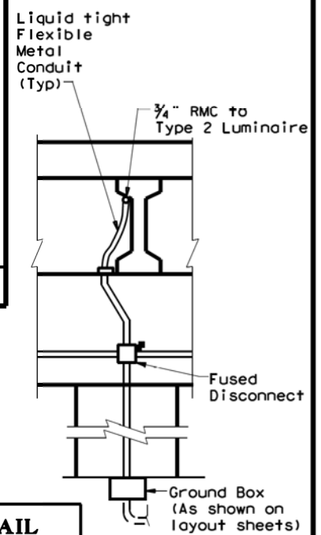


SIDE



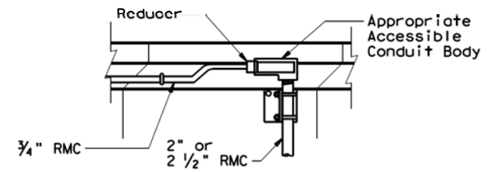
PLAN VIEW

ARM DETAIL

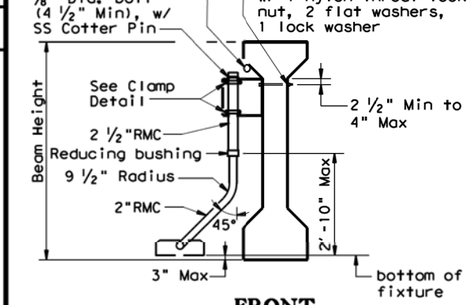


3 - No. 12 XHHW in 3/4" RMC for Branch Circuit runs from fused disconnect to underpass Luminaires

CONDUIT DETAIL

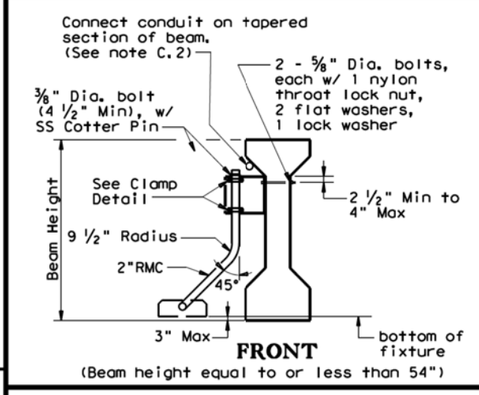


CONDUIT CONNECTION PROFILE



FRONT
(Beam height greater than 54")

IN RD IL AM (U/P)(TY 2)



FRONT
(Beam height equal to or less than 54")

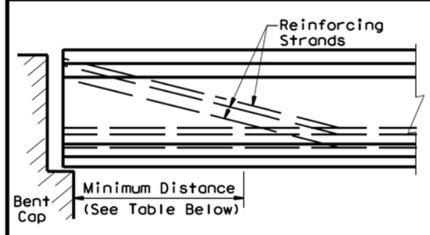


TABLE 5
LOCATION OF UNDERPASS LIGHT MOUNTING BRACKET TABLE

SPAN LENGTH	MINIMUM DISTANCE
≤ 50'	10'-0"
50' - 70'	15'-0"
70' - 90'	20'-0"
> 90'	25'-0"

LOCATION OF UNDERPASS LIGHT MOUNTING BRACKETS

UNDERPASS LIGHTING TYPE 2

GENERAL NOTES:

A. ALL 150 watt HPS and 150 watt equivalent LED Luminaires

1. Luminaire locations, conduit and conductor sizes and routing are typical and diagrammatic only. See project layout sheets for specific details.
2. Conduit will be paid for under Item 618, "Conduit" and conductors will be paid for under Item 620, "Electrical Conductors," unless otherwise shown on the plans.
3. Adjust conduit in saddles to place fixture height and orientation as required. See fixture orientation detail and plans. Where practicable, place luminaires so the bottom of luminaire is above the bottom of the beam, maximum of 3 in. (See detail UNDERPASS LIGHTING ARM TYPE 2)
4. Except as noted, galvanize all structural steel and exposed bolts, nuts, and washers in accordance with Item 445 "Galvanizing".
5. Fabrication of brackets and support arms will not be paid for directly but is subsidiary to Item 610, "Roadway Illumination Assemblies."
6. Install a heavy duty NEMA 3R fused disconnect or breaker enclosure rated at 30 amps and 480 volts to switch underpass luminaires as shown on plans, with at least one per bridge circuit. Install 20 amp time-delay fuses or inverse-time circuit breakers. Mount disconnect or breaker enclosure 10 ft. (min) above grade on columns or bent caps as approved by the Department. Modify disconnect to allow padlocking in the "ON" and "OFF" positions. Padlocks and disconnect switches or circuit breakers for underpass fixtures will not be paid for directly but are subsidiary to the various bid items of the contract.
7. Conduit on columns, caps, and slab is shown surface mounted. For new columns and caps, embed PVC conduit in concrete. Bond and ground metal junction boxes and conduit.

B. TYPE 1

1. Provide 2 in. rigid metal conduit (2.375" O.D., 0.146" wall) for Type 1 arm shaft.
2. Use 3/8 in. stainless steel bolt or stud non-epoxy type expansion anchors for concrete for Type 1 mounting. Except as noted, provide an allowable 2650 lbs minimum pull-out force (after consideration of adjustment factors for edge distance and bolt spacing) for each anchor. Install each anchor to the embedment depth recommended by the manufacturer.
3. Attach conduit to plate with 4 saddles, four - 3/8 in. diameter bolts, nylon throat lock nuts, and lock washers.

C. TYPE 2

1. Provide 2 in. rigid metal conduit (2.375" O.D., 0.146" wall) or provide a combination of 2 1/2 in. (2.875" O.D., 0.193" wall) and 2 in. (2.375" O.D., 0.146" wall) rigid metal conduits with a reducing bushing as beam height stipulated for Type 2 arm shaft. Field cutting and threading will be permitted. Paint cut and threaded areas with zinc rich paint after conduit is connected to adjacent fitting.
2. Connecting conduit may be strapped to tapered section only of precast beams as shown. Anchor as approved by the Engineer. Maximum anchor depth is 1 in.
3. Indiscriminate drilling into precast concrete beams may result in reduced beam strength. Use drilling location and method as directed by the Engineer. See Location of Underpass Lighting Mounting Bracket detail. The locations shown in the table are such that reinforcing strands will not be damaged.

Texas Department of Transportation

Traffic Safety Division Standard

ROADWAY ILLUMINATION DETAILS
(UNDERPASS LIGHT FIXTURES)

RID(3)-20

FILE:	rid3-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT	May 2013	CONT	SECT	JOB	HIGHWAY
REVISIONS					
2-14		DIST	COUNTY		SHEET NO.
7-17					
12-20					

72C

COTTONWOOD NATIONAL RAIL
VELOWER HIKE & BIKE TRAIL
SHEET NO. 198 OF 345
DWG NO. WS9-3012
CONTRACT NO. C-2033270-01

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SHIPPING PARTS LIST - POLES AND LUMINAIRE ARMS

Nominal Mounting Ht. (ft)	Shoe Base Designation				Quantity	T-Base Designation				Quantity	CSB/SSCB Mounted Designation				Quantity
	Pole	A1	A2	Luminaire		Pole	A1	A2	Luminaire		Pole	A1	A2	Luminaire	
20	(Type SA 20 S - 4)			(150W EQ) LED		(Type SA 20 T - 4)			(150W EQ) LED						
	(Type SA 20 S - 4 - 4)			(150W EQ) LED		(Type SA 20 T - 4 - 4)			(150W EQ) LED						
30	(Type SA 30 S - 4)			(250W EQ) LED		(Type SA 30 T - 4)			(250W EQ) LED		(Type SP 28 S - 4)			(250W EQ) LED	
	(Type SA 30 S - 4 - 4)			(250W EQ) LED		(Type SA 30 T - 4 - 4)			(250W EQ) LED		(Type SP 28 S - 4 - 4)			(250W EQ) LED	
	(Type SA 30 S - 8)			(250W EQ) LED		(Type SA 30 T - 8)			(250W EQ) LED		(Type SP 28 S - 8)			(250W EQ) LED	
	(Type SA 30 S - 8 - 8)			(250W EQ) LED		(Type SA 30 T - 8 - 8)			(250W EQ) LED		(Type SP 28 S - 8 - 8)			(250W EQ) LED	
40	(Type SA 40 S - 4)			(250W EQ) LED		(Type SA 40 T - 4)			(250W EQ) LED		(Type SP 38 S - 4)			(250W EQ) LED	
	(Type SA 40 S - 4 - 4)			(250W EQ) LED		(Type SA 40 T - 4 - 4)			(250W EQ) LED		(Type SP 38 S - 4 - 4)			(250W EQ) LED	
	(Type SA 40 S - 8)			(250W EQ) LED		(Type SA 40 T - 8)			(250W EQ) LED		(Type SP 38 S - 8)			(250W EQ) LED	
	(Type SA 40 S - 8 - 8)			(250W EQ) LED		(Type SA 40 T - 8 - 8)			(250W EQ) LED		(Type SP 38 S - 8 - 8)			(250W EQ) LED	
	(Type SA 40 S - 10)			(250W EQ) LED		(Type SA 40 T - 10)			(250W EQ) LED		(Type SP 38 S - 10)			(250W EQ) LED	
	(Type SA 40 S - 10 - 10)			(250W EQ) LED		(Type SA 40 T - 10 - 10)			(250W EQ) LED		(Type SP 38 S - 10 - 10)			(250W EQ) LED	
	(Type SA 40 S - 12)			(250W EQ) LED		(Type SA 40 T - 12)			(250W EQ) LED		(Type SP 38 S - 12)			(250W EQ) LED	
	(Type SA 40 S - 12 - 12)			(250W EQ) LED		(Type SA 40 T - 12 - 12)			(250W EQ) LED		(Type SP 38 S - 12 - 12)			(250W EQ) LED	
50	(Type SA 50 S - 4)			(400W EQ) LED		(Type SA 50 T - 4)			(400W EQ) LED		(Type SP 48 S - 4)			(400W EQ) LED	
	(Type SA 50 S - 4 - 4)			(400W EQ) LED		(Type SA 50 T - 4 - 4)			(400W EQ) LED		(Type SP 48 S - 4 - 4)			(400W EQ) LED	
	(Type SA 50 S - 8)			(400W EQ) LED		(Type SA 50 T - 8)			(400W EQ) LED		(Type SP 48 S - 8)			(400W EQ) LED	
	(Type SA 50 S - 8 - 8)			(400W EQ) LED		(Type SA 50 T - 8 - 8)			(400W EQ) LED		(Type SP 48 S - 8 - 8)			(400W EQ) LED	
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	(Type SA 50 S - 10 - 10)			(400W EQ) LED		(Type SA 50 T - 10 - 10)			(400W EQ) LED		(Type SP 48 S - 10 - 10)			(400W EQ) LED	
	(Type SA 50 S - 12)			(400W EQ) LED		(Type SA 50 T - 12)			(400W EQ) LED		(Type SP 48 S - 12)			(400W EQ) LED	
	(Type SA 50 S - 12 - 12)			(400W EQ) LED		(Type SA 50 T - 12 - 12)			(400W EQ) LED		(Type SP 48 S - 12 - 12)			(400W EQ) LED	

OTHER Designation				Quantity
Pole	A1	A2	Luminaire	

GENERAL NOTES:

1. All work, materials and services not shown on the plans which may be necessary for complete and proper construction shall be performed, furnished and installed by the Contractor. Faulty fabrication or poor workmanship in any material, equipment or installation will be considered justification for rejection. Where manufacturers provide warranties or guarantees as a customary trade practice, furnish to the Department such warranties or guarantees.

2. The location of poles and fixtures are diagrammatic only and may be shifted by the Engineer to accommodate local conditions. Install or remove poles and luminaires located near overhead electrical lines using established industry and utility safety practices and in accordance with laws governing such work. Consult with the appropriate utility company prior to beginning such work.

3. Standard Steel Pole Designs. Steel poles fabricated in accordance with the details and dimensions shown herein, shall be considered standard designs. Submission of shop drawings and design calculations for standard designs is not required.

4. Optional Steel Pole Designs. Multi-sided steel poles may be allowed as optional designs, if steel poles are permitted or required, pending approval by the Department as outlined below.

   a. Shop Drawings. Optional designs require submission of shop drawings and design calculations bearing the seal of an engineer licensed in the State of Texas, in accordance with Item 441, "Steel Structures." The Department may elect to pre-approve some shop drawings for optionally designed poles. Submission of shop drawings and design calculations is not required for structures fabricated in accordance with the details of shop drawings on the pre-approved list maintained by the TxDOT Traffic Operations Division. Any deviation from the pre-approved shop drawings will require submission of shop drawings of the complete assembly and design calculations as described above.
   b. Structural Support Design for Luminaires. Lighting support structures shall be designed for a 25 year design life in accordance with the AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals, 6th Edition (2013) and Interim Revisions thereto. All poles shall be designed for 110 mph 3-second gust wind speeds. The Gust Factor, G, and Wind Importance Factor, Ir, shall be applied as per the AASHTO Specifications assuming a 25-year design life. The design wind pressure for hurricane wind velocities greater than 100 mph shall not be less than the design wind pressure using 100 mph with the non-hurricane Wind Importance Factor, Ir, value. For transformer base poles, fabricator shall include transformer base and connecting hardware in design calculations and shop drawing submittals. All transformer bases shall have been structurally tested to resist the theoretical plastic moment capacity of the pole. Certification of the plastic moment load test and FHWA breakaway requirement test of the model of base being furnished shall be submitted with the shop drawings. Shop drawings shall show breakaway base model number, and manufacturer's name and logo. Manufacturer's shop drawings shall include the ASTM designations for all materials to be used.
   c. Mast Arm Attachments. All poles and attachments shall be structurally designed to support two 12-foot mast arms and luminaires. Poles shall be supplied with mast arm combinations as shown in the plans. All mast arms shall be designed for a 60-pound luminaire having an effective projected area of 1.6 square feet.
   d. Anchor Bolt Assembly. Anchor bolt assemblies for optionally designed poles shall be the same as those shown herein.

5. Aluminum Pole Designs. Aluminum pole designs may be allowed, if aluminum poles are permitted or required, pending approval by the Department as outlined below.

   a. Meet all of the requirements stated above for optional steel pole designs and the following:
      1. Aluminum poles shall be fabricated in accordance with "Structural Welding Code-Aluminum" AWS D1.2.
      2. Aluminum pole designs shall use the same anchor bolt assembly and be subject to the same geometric restraints and other requirements for steel poles specified herein.
      3. Aluminum poles shall be equipped with vibration mitigation devices, as approved by the engineer.
      4. Pole components shall be constructed using the following material:
         Shaft: ASTM B221 or B241 Alloy 6063-T6, ASTM B209 Alloy 5086-H34, ASTM B221 Alloy 6005-T5.
         Base Flange: ASTM B26 Alloy 356.0-T6 or ASTM B108 Alloy 356.0-T6 (Yield strength test required).
         Mast Arm Fitting: ASTM B209 Alloy 6061-T6 or ASTM B221 Alloy 6005-T5.
         Mast Arms: ASTM B241 Alloy 6061-T6 or Alloy 6063-T6.
         Pole Cap: ASTM B209 Alloy 5086-H32 or ASTM B108 or B26 Alloy 356.0-T6.
         Bolts: Stainless Steel AISI 300 series. Bolts threading into aluminum threads shall be treated with anti-seize compound, Never-Seez Compound, Permatex 133K or equal.

6. Special Designs. Poles with architectural treatments shall meet the requirements shown elsewhere in the plans.

7. Luminaire Mounting Height. Actual luminaire mounting height shall be the nominal mounting height given on RIP(2) for all pole-arm combinations except for poles with 4 ft. luminaire arms, which shall be 3'-0" lower than the nominal height, unless otherwise shown or directed.

EXPLANATION OF ROADWAY ILLUMINATION ASSEMBLY DESIGNATIONS

(TYPE SA 50 T - X - X) (400W EQ) LED

- SA: Pole and mast arm may be steel or aluminum.
- ST: Pole and mast arm must be steel.
- AL: Pole and mast arm must be aluminum.
- SP: Special (ovalized) steel or aluminum pole for installing on CSB or SSCB. See standard sheet CSB (4), or SSCB (4).

Two numerical digits denote nominal mounting height in feet.

Next letter denotes type of base, (S-Shoe Base, T-Transformer Base, or B-Bridge/Ret.Wall Mount)

First number denotes length of mast arm in feet.

Use of second mast arm is indicated by second dashed number which denotes length in feet.

Luminaire rating in watts (i.e. 400W). Equivalent wattage LED fixtures will include EQ (i.e. 400W EQ)

Last letters indicate light source (S - High Pressure Sodium; LED - LED luminaire)

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
SHEET NO. 199 OF 345
DWG NO. WS9-3013
CONTRACT NO. C-2033270-01

SHEET 1 OF 4

Texas Department of Transportation

Traffic Safety Division Standard

ROADWAY ILLUMINATION POLES

RIP(1)-19

FILE: rip-19.dgn	DN:	CK:	DW:	CK:
©TxDOT January 2007	CONT	SECT	JOB	HIGHWAY
REVISIONS				
7-17	DIST	COUNTY		SHEET NO.
12-19				

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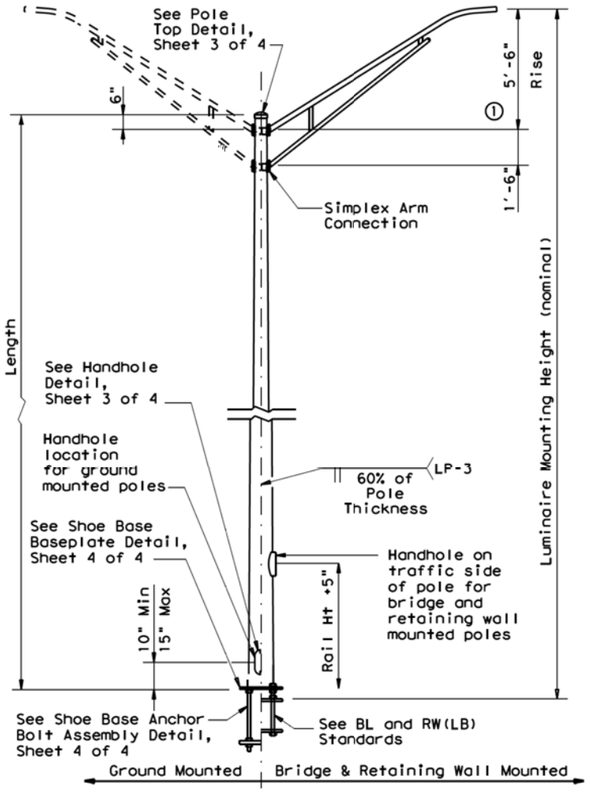
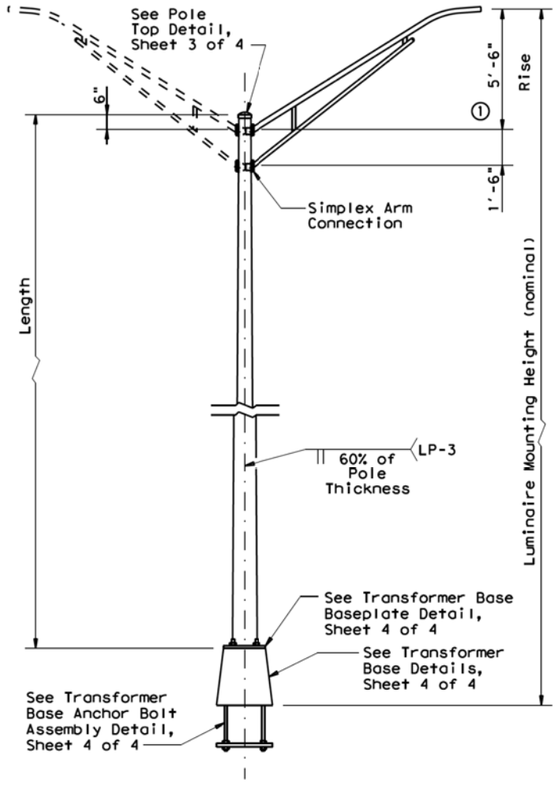


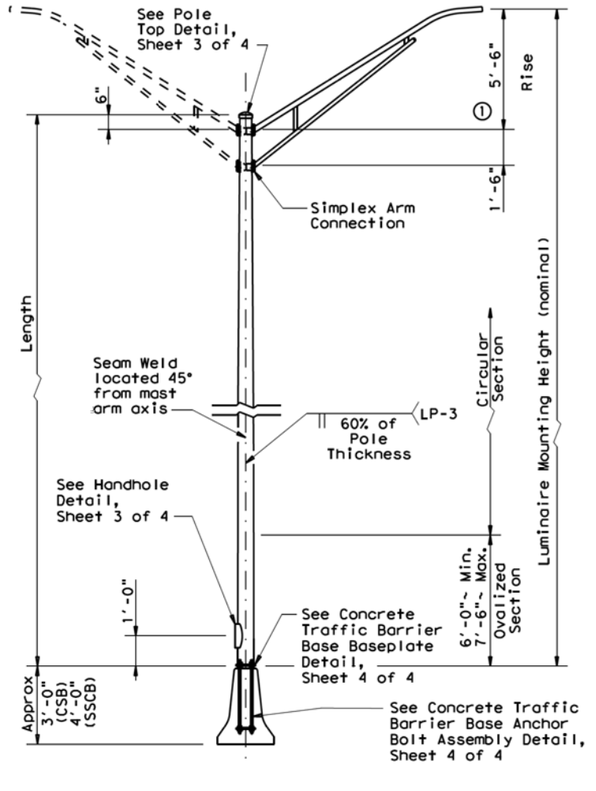
SHOE BASE POLE

SHOE BASE POLE					
Luminaire Mounting Height (Nominal) (ft)	Base Diameter (in)	Top Diameter (in)	Length (ft)	Pole Thickness (in)	Design Moment (K-ft)
20.00	7.00	4.90	15.00	0.1196	7.1
30.00	7.50	4.00	25.00	0.1196	13.2
31.00-39.00	8.00	4.36-3.24	26.00-34.00	0.1196	20.7
40.00	8.50	3.60	35.00	0.1196	20.7
50.00	10.50	4.20	45.00	0.1196	30.3



TRANSFORMER BASE POLE

TRANSFORMER BASE POLE					
Luminaire Mounting Height (Nominal) (ft)	Base Diameter (in)	Top Diameter (in)	Length (ft)	Pole Thickness (in)	Design Moment (K-ft)
20.00	7.00	5.11	13.50	0.1196	7.1
30.00	7.50	4.21	23.50	0.1196	13.2
31.00-39.00	8.00	4.57-3.45	24.50-32.50	0.1196	20.7
40.00	8.50	3.81	33.50	0.1196	20.7
50.00	10.00	3.91	43.50	0.1196	30.3



CONCRETE TRAFFIC BARRIER BASE POLE

CONCRETE TRAFFIC BARRIER BASE POLE (CSB/SSCB)						
Luminaire Mounting Height (Nominal) (ft)	Base ② Diameter (in)	Top Diameter (in)	Length (ft)	Pole Thickness (in)	Design Moment (K-ft)	
					About ℄ of Rail	Perp. to Rail
28.00	9.00	5.78	23.00	0.1196	10.3	13.2
38.00	9.00	4.38	33.00	0.1196	16.6	20.8
48.00	10.50	4.48	43.00	0.1345	25.1	30.5

MATERIAL DATA		
COMPONENT	ASTM DESIGNATION	MIN. YIELD (ksi)
Pole Shaft (0.14"/ft. Taper)	A572 Gr 50, A595 Gr A, A1011 HSLAS Gr 50 Cl 2 ③, or A1008 HSLAS Gr 50 Cl 2	50
Base Plate and Handhole Frame	A572 Gr.50, or A36	36
T-Base Connecting Bolts	F3125 Gr A325	92
Anchor Bolts	F1554 Gr 55, A193-B7 or A321	55 105
Anchor Bolt Templates	A36	36
Heavy Hex (H.H.) Nuts	A194 Gr 2H, or A563 Gr DH	
Flat Washers	F436	

NOTES:

① 2'-6" rise for 4 ft. luminaire arms.

② Before ovalized as shown on Concrete Traffic Barrier Base Baseplate details, Sheet 4 of 4.

③ A1011 SS Gr 50 may be used instead of HSLAS, provided the material meets the elongation requirements for HSLAS.

POLE ASSEMBLY FABRICATION TOLERANCES TABLE	
DIMENSION	TOLERANCE
Shaft length	+1"
I.D. of outside piece of slip fitting pieces	+1/8", -1/16"
O.D. of inside piece of slip fitting pieces	+1/32", -1/8"
Shaft diameter: other	+3/16"
Out of "round"	1/4"
Straightness of shaft	±1/4" in 10 ft
Twist in multi-sided shaft	4° in 50 ft
Perpendicular to baseplate	1/8" in 24"
Pole centered on baseplate	±1/4"
Location of Attachments	±1/4"
Bolt hole spacing	±1/16"

GENERAL NOTES:

1. Designs conform to AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals , 6th Edition (2013) and Interim Revisions thereto. Design 3-Second Gust Wind Speed equals 110 mph with a 1.14 gust factor. A wind importance factor of 0.80 is applied to adjust the wind speed to a 25 year recurrence interval. Design moments listed in tables assume base of pole is 25' above natural ground level.
2. Structures are designed to support two 12' luminaire mast arms and luminaires. Mast arms are designed to support a 60-pound luminaire having an effective projected area of 1.6 square feet.
3. Fabrication shall be in accordance with the Specifications and with the details, dimensions, and weld procedures shown herein. Do not submit shop drawings for roadway illumination pole assemblies fabricated in accordance with the details, dimensions, and weld procedures shown herein. Weld references call for preapproved weld procedures which the Fabricator must obtain prior to fabrication. Materials, fabrication tolerances, and shipping practices shall meet the requirements of these sheets and the Specifications. In the absence of specified fabrication tolerances, dimensions shall be within the tolerances generally obtainable in normal fabrication practice.
4. For mounting heights between values shown in the tables, use base diameter and thickness values for the larger height.
5. Unless otherwise noted, all steel parts shall be galvanized in accordance with Item 445, "Galvanizing."
6. Steel poles shall be fabricated in accordance with Item 441, "Steel Structures." Longitudinal seam welds for pole sections shall have 60% minimum penetration. All welding shall be in accordance with AWS D1.1, Structural Welding Code-Steel.
7. Two-section poles joined by circumferential welds will not be permitted, unless otherwise shown on the plans. Poles may be fabricated in two sections and field-assembled by the lap-joint method. The two sections shall telescope together with a lap length of not less than 1-1/2 times the shaft diameter at the lap joint.
8. Alternate material equal to or better than material specified may be substituted with the approval of the Engineer.
9. Lubricate and tighten anchor bolts, when erecting shoe base poles and concrete traffic barrier base poles, in accordance with Item 449, "Anchor Bolts."
10. All poles, except Transformer Base Poles, shall have hand holes with reinforcing frames and covers. For ground mounted shoe base poles, hand holes shall be placed 90 degrees to mast arm unless otherwise noted on the plans. For poles mounted on a concrete traffic barrier with one luminaire arm, hand holes shall be located 180 degrees from luminaire arm. For poles mounted on a concrete traffic barrier with two luminaire arms, all hand holes shall be on the same side of the barrier. For poles mounted on a bridge lighting bracket or a retaining wall lighting bracket, hand hole shall be on traffic side of the pole, at a height that will clear the barrier.
11. The finished pole shall have a smooth, uniform finish free of pits, blisters, or other defects. Scratched, chipped, and other damaged galvanized areas on poles and mast arms shall be repaired in accordance with Item 445, "Galvanizing."
12. Pole length is based on a 5'-6" luminaire arm rise. 4 ft. luminaire arms have a 2'-6" rise. A pole with 4 ft. luminaire arms will have an actual mounting height 3'-0" less than the nominal mounting height. Increasing the pole length to meet the nominal mounting height is allowed, but unnecessary unless otherwise directed by the engineer.
13. Erect transformer base poles in accordance with sheet RID(1).

Texas Department of Transportation

Traffic Safety Division Standard

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
SHEET NO. 200 OF 345
DWG NO. WS9-3014
CONTRACT NO. C-2033270-01

ROADWAY ILLUMINATION POLES

RIP(2)-19

FILE: rip-19.dgn	DN:	CK:	DW:	CK:
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	DIST	COUNTY		SHEET NO.

73B

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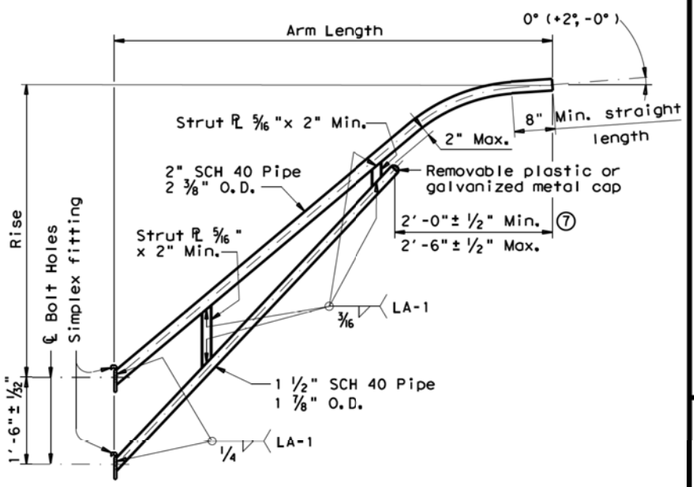
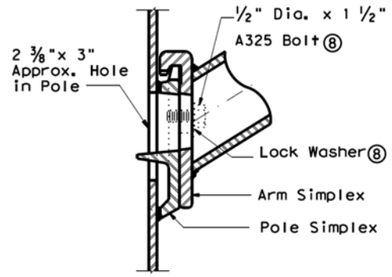


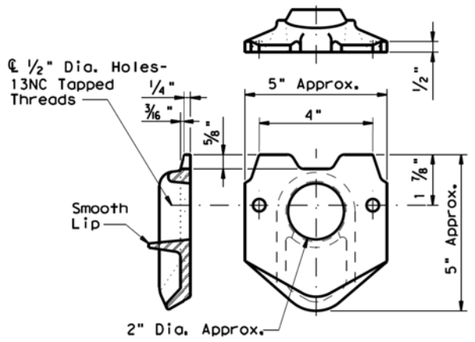
LUMINAIRE ARM

LUMINAIRE ARM DIMENSIONS		
Nominal Arm Length	Arm Length	Rise
4'-0"	3'-6"	2'-6"
6'-0"	5'-6"	5'-6"
8'-0"	7'-6"	5'-6"
10'-0"	9'-6"	5'-6"
12'-0"	11'-6"	5'-6"

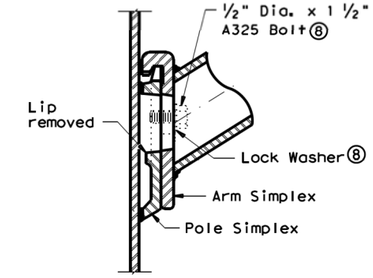
ARM ASSEMBLY FABRICATION TOLERANCES TABLE	
DIMENSION	TOLERANCE
Arm Length	±1"
Arm Rise	±1"
Deviation from flat	1/8" in 12"
Spacing between holes	±1/32"



UPPER SIMPLEX FITTING
(Gusset not shown for clarity)

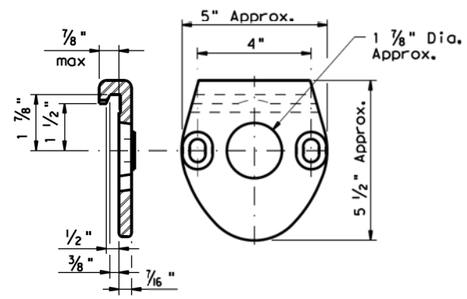


POLE SIMPLEX DETAIL ⑨



LOWER SIMPLEX FITTING
(Gusset not shown for clarity)

SECTION B-B



ARM SIMPLEX DETAIL ⑨

NOTES:

④ Any of the materials listed for plates may be used where the drawings do not specify a particular ASTM designation.

⑤ A576 must be suitable for forging and also meet minimum tensile strength of 65 ksi, minimum yield of 35 ksi, and elongation in 2 inches of 22 percent.

⑥ A572, A1008 HSLAS-F, and A1011 HSLAS-F materials may have higher yield strengths but shall not have less elongation than the grade indicated.

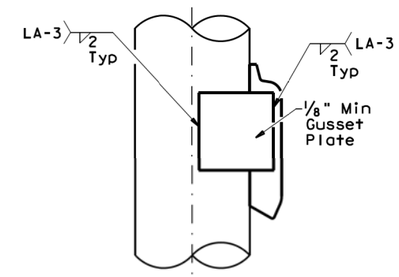
⑦ Dimensional limits are given to show acceptable variation in design. All of a Fabricator's production of a particular arm length shall have the same dimensions within specified tolerances.

⑧ Each pole simplex fitting shall be supplied with 2 bolts and 2 lock washers of the size specified. The bolts and lock washers shall be secured to the pole with the other hardware items called for in the plans.

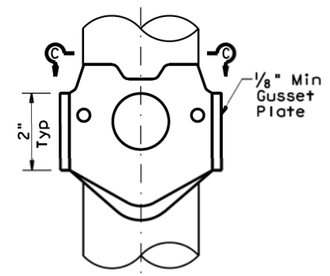
⑨ Proposed deviations in arm simplex dimensions or materials must be submitted to the Department for approval.

⑩ A welded handhole frame is permissible. Maximum of two (2) CJP weld splices is allowed.

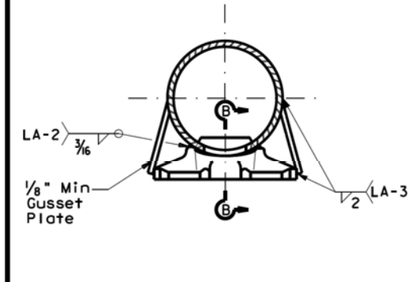
MATERIALS	
Pole or Arm Simplex	ASTM A27 Gr 65-35 or Gr 70-36, A148 Gr 80-50, A576 Gr 1021 ⑤, or A36 (Arm only)
Arm Pipes	ASTM A53 Gr A or B, A500 Gr B, A501, A 1008 HSLAS-F Gr 50 ⑥, or A1011 HSLAS-F Gr 50 ⑥
Arm Struts and Gusset Plates ④	ASTM A36, A572 Gr 50 ⑥, or A588
Misc.	ASTM designations as noted



SIDE

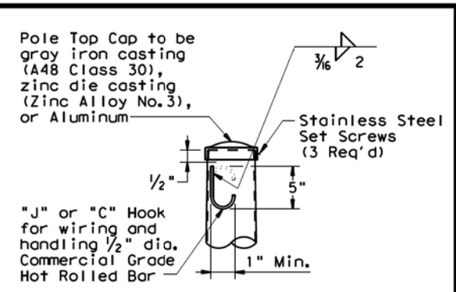


ELEVATION

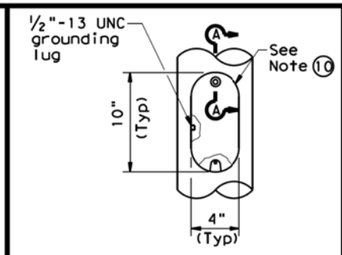


SECTION C-C

SIMPLEX ATTACHMENT DETAIL



POLE TOP



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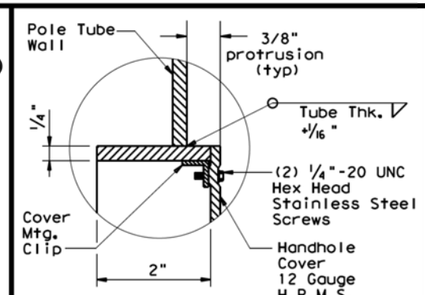

SECTION A-A

HANDHOLE

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
SHEET NO. 201 OF 345
DWG NO. WS9-3015
CONTRACT NO. C-2033270-01

SHEET 3 OF 4

Texas Department of Transportation

Traffic Safety Division Standard

ROADWAY ILLUMINATION POLES

RIP(3)-19

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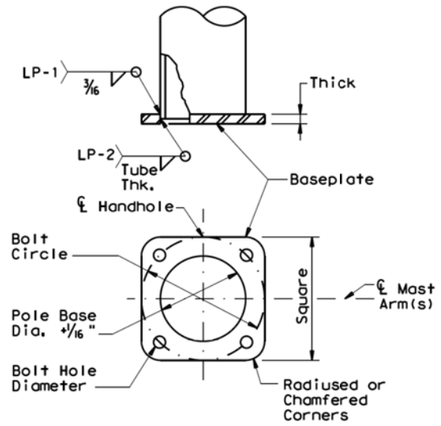
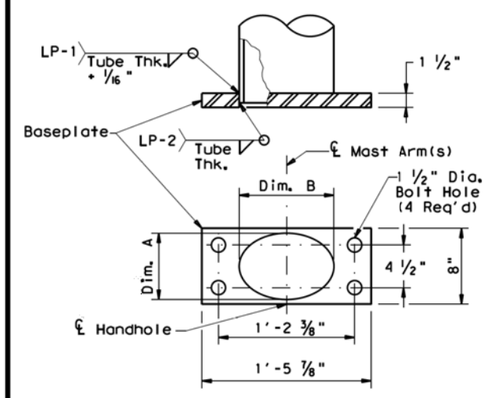


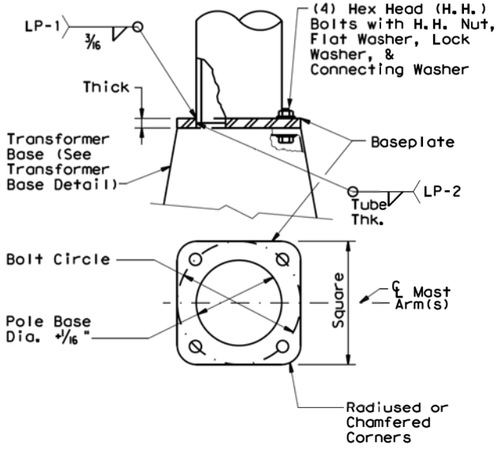
SHOE BASE BASEPLATE

SHOE BASE BASEPLATE TABLE				
MOUNTING HEIGHTS (nominal)	BOLT CIRCLE	SQUARE	THICK	BOLT HOLE DIAMETER
20' - 39'	13"	13"	1 1/4"	1 1/4"
40'	15"	15"	1 1/4"	1 1/2"
50'	15"	15"	1 1/2"	1 1/2"



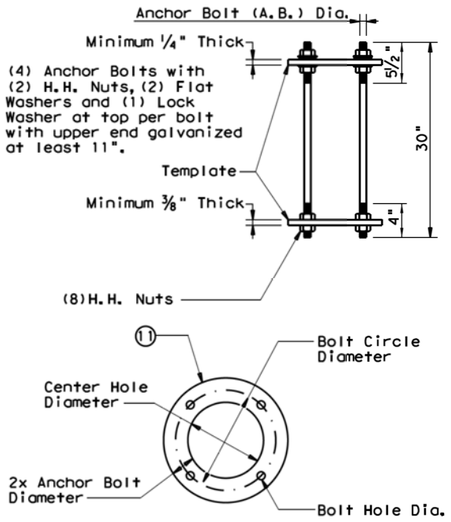
CONCRETE TRAFFIC BARRIER BASE BASEPLATE

CONCRETE TRAFFIC BARRIER BASE BASEPLATE TABLE			
MOUNTING HEIGHTS (nominal)	POLE DIA.(12)	DIM. A	DIM. B
28' - 38'	9"	7"± 1/4"	10"± 1/4"
48'	10 1/2"	7"± 1/4"	13"± 1/4"



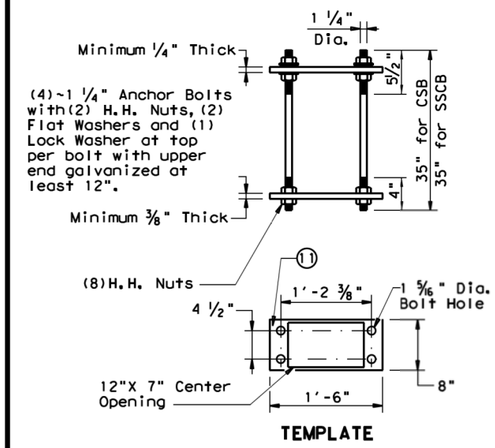
TRANSFORMER BASE BASEPLATE

TRANSFORMER BASE BASEPLATE TABLE						
MOUNTING HEIGHTS (nominal)	BOLT CIRCLE	SQUARE	THICK	CONNECTING BOLT DIA.	BOLT HOLE DIAMETER	TRANSFOMER BASE TYPE
20' - 39'	13"	13"	1 1/4"	1"	1 1/4"	A
40'	15"	15"	1 1/4"	1 1/4"	1 1/2"	B
50'	15"	15"	1 1/2"	1 1/4"	1 1/2"	B



SHOE BASE ANCHOR BOLT ASSEMBLY

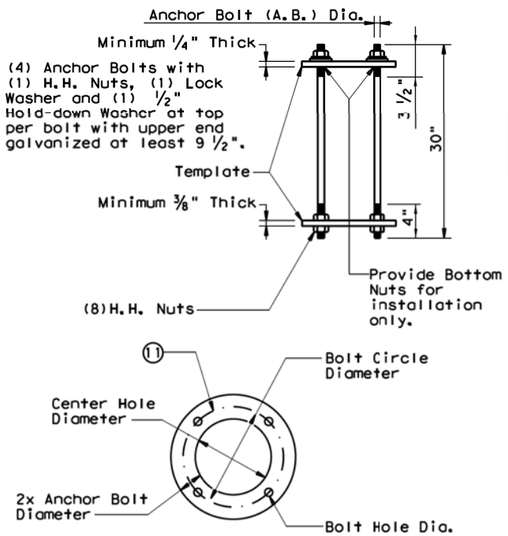
SHOE BASE ANCHOR BOLT ASSEMBLY TABLE				
MOUNTING HEIGHTS (nominal)	A.B. Dia.	BOLT CIRCLE DIAMETER	CTR. HOLE DIAMETER	BOLT HOLE DIAMETER
20'-39'	1"	13"	11"	1 1/16"
40'-50'	1 1/4"	15"	12 1/2"	1 5/16"



TEMPLATE

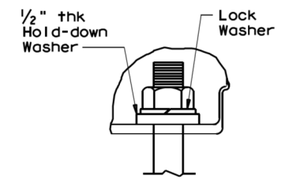
CONCRETE TRAFFIC BARRIER BASE ANCHOR BOLT ASSEMBLY

TRANSFORMER BASE ANCHOR BOLT ASSEMBLY TABLE				
MOUNTING HEIGHTS (nominal)	A.B. Dia.	BOLT CIRCLE DIAMETER	CTR. HOLE DIAMETER	BOLT HOLE DIAMETER
20' - 39'	1"	14"	12"	1 1/16"
40' - 50'	1 1/4"	17 1/4"	14 3/4"	1 5/16"

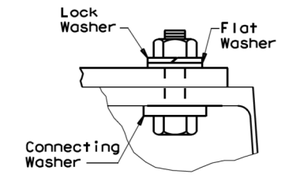


TRANSFORMER BASE ANCHOR BOLT ASSEMBLY

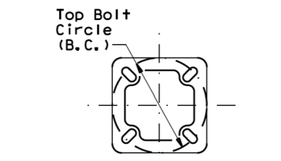
TRANSFORMER BASE TABLE		
TYPE	TOP B.C.	BTM. B.C.
A	13"	14"
B	15"	17 1/4"



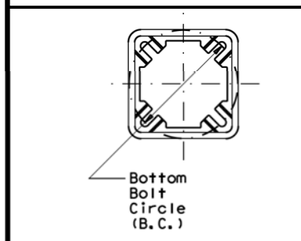
DETAIL A



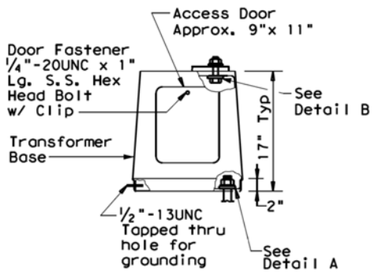
DETAIL B



TOP PLAN



BOTTOM PLAN



ELEVATION

TRANSFORMER BASE DETAILS

GENERAL NOTES:

1. For mounting heights between those shown in the table, use the values in the table for the larger mounting height.
2. All breakaway bases shall meet the breakaway requirements of the AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals, 6th Edition (2013) and Interim Revisions thereto, and shall have been tested by FHWA-approved methods. All bases shall have been structurally tested to resist 150% of the design moment.
3. Transformer bases shall be cast from aluminum, ASTM B108 or B26 Alloy 356.0-T6, or other material approved by the Engineer. Four Hex Head (H.H.) bolts with four H.H. nuts, four lock washers, four flat washers, and connecting and hold-down washers as recommended by the manufacturer, galvanized to ASTM A153 Class C or D, or B695 Class 50, shall be provided with each transformer base for connecting the pole. Bolts shall be ASTM A325 or approved equal. Nuts shall be ASTM A563 grade DH galvanized.
4. Bases shall be stamped, incised or by other approved permanent means, marked to show fabricator's name or logo, and model number. Such information shall be placed in a readily seen location, inside or outside the base, but shall not be placed on the door.
5. Doors for transformer bases shall be made of plastic, fiberglass or other non-metallic material approved by the Engineer and shall be attached with stainless steel screws or bolts. Transformer bases shall be cleaned by grit blast cleaning after heat treatment. Certification by the manufacturer of heat treatment shall be furnished with transformer bases. The certification shall show the metal alloy and temper and that the base meets those requirements, chemical and physical. The certification shall also show the material ASTM specification. Transformer bases shall be cast with a removable tab bar for material testing. Some bars may have been removed by the manufacturer for testing.

NOTES:

(11) Anchor Bolt Templates do not need to be galvanized.

(12) Pole diameter before ovalized.

ANCHOR BOLT FABRICATION TOLERANCES TABLE	
DIMENSION	TOLERANCE
Length	± 1/2"
Threaded length	± 1/2"
Galvanized length (if required)	- 1/4"

Texas Department of Transportation

Traffic Safety Division Standard

ROADWAY ILLUMINATION POLES

RIP(4)-19

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DATE:
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CONSTRUCTION OF REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
SHEET NO. 202 OF 345
DWG NO. WS9-3016
CONTRACT NO. C-2033270-01

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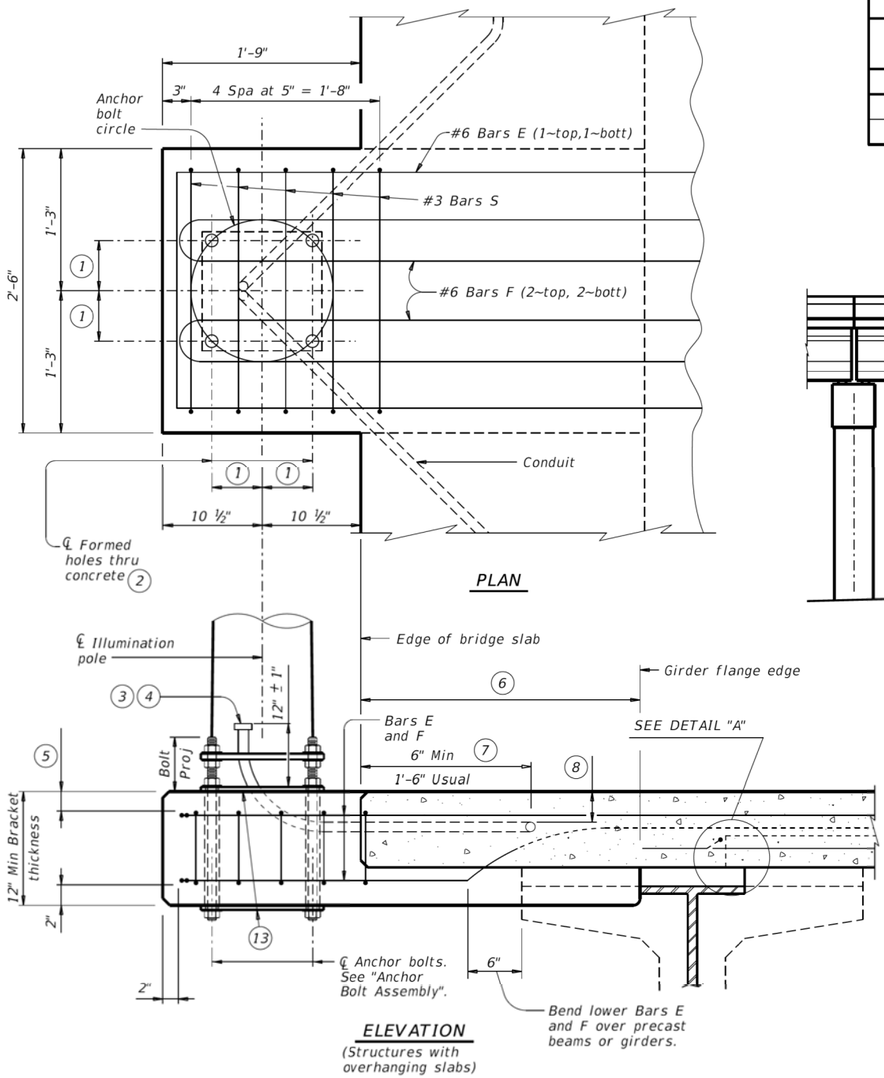
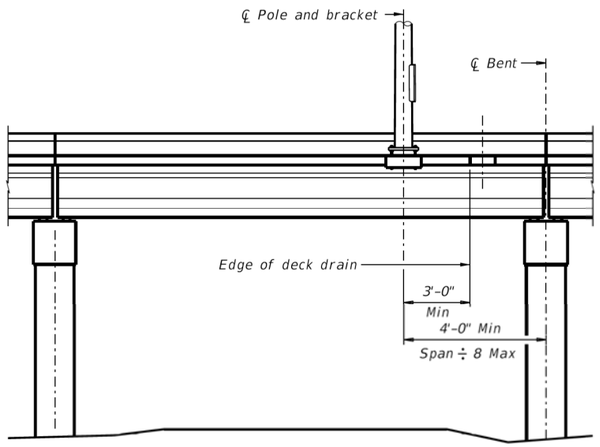


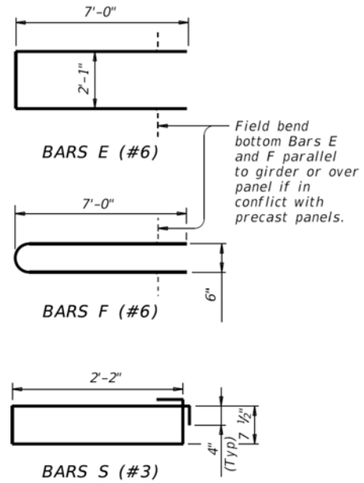
ILLUMINATION POLE BRACKET LOCATION AND REINFORCING

TABLE OF ANCHOR BOLT AND ANCHOR BOLT PLATE INFORMATION						
ANCHOR BOLT CIRCLE DIAMETER	ANCHOR BOLT OFFSET	ANCHOR BOLT DIAMETER	ANCHOR BOLT HOLE SIZE		TOP AND BOTTOM ANCHOR BOLT PLATE SIZE	CENTER HOLE DIAMETER IN TOP ANCHOR BOLT PLATE
			CONCRETE	STEEL		
IN	IN	IN	IN	IN	IN	IN
13	4 ⅝	1	1 ¼	1 ¼	PL ½ X 13 X 1'-1"	9 ½
15	5 5/16	1 ¼	1 ½	1 ½	PL ½ X 15 ½ X 1'-3 ½"	10 ½

ESTIMATED QUANTITIES~ONE BRACKET			
ITEM		UNIT	QUANT
CONCRETE	(9) (10)	CY	0.2
REINFORCING STEEL	(10)	LB	146
STRUCTURAL STEEL	(10) (11)	LB	112
CONDUIT	(12)	LF	4



TYPICAL BRIDGE ELEVATION



1. See table for anchor bolt offset dimension.
2. See table for hole diameter size.
3. If lighting is to be placed on future contract, extend conduit only 6" and provide water tight cap.
4. Ream burrs and install bell ends or bushings on all conduit ends.
5. Provide same clear cover required for bridge slab. Place Bars E and F beneath top slab reinforcing only if necessary to provide this cover.
6. If slab edge to girder flange edge exceeds 3'-11", lengthen Bars E and F proportionally to ensure Bars E and F extend 1'-6" Min beyond girder flange edge.
7. Clear rail anchors, drains, etc 1 ½" Min.
8. 1 ½" Min cover and always beneath top layer slab reinforcing.
9. Variation due to slab thickness is insignificant.
10. For Contractor's information only.
11. Anchor bolts, nuts, washers, and 2 plates. Verify anchor bolt lengths prior to ordering.
12. Additional to main run (size and type as shown elsewhere on the plans).
13. See "Anchor Bolt Assembly", "Anchor Bolt Plate", and table for anchor bolt, and anchor bolt plate information.

MATERIAL NOTES:

Galvanize anchor bolts, nuts, washers, and anchor bolt plates. Repair galvanizing damage from tack welding per Item 445, "Galvanizing".

Provide Grade 60 reinforcing steel.

Epoxy coat or galvanize all reinforcing steel if slab bars are epoxy coated or galvanized.

Concrete for Illumination Pole Brackets must be of the same type and placed monolithically with the bridge slab. The bracket quantity is considered subsidiary to the Item "Reinforced Concrete Slab".

GENERAL NOTES:

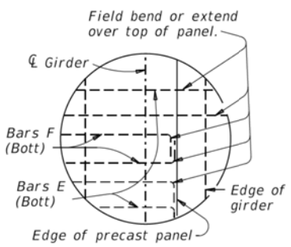
Designed for up to 50 ft light pole with one 12 ft arm, 60 lb luminaire with 1.6 sq ft EPA at maximum design wind speed of 110 mph (3 second gusts). A special design is required if luminaire mounting height exceeds 100 ft above average surrounding terrain.

The anchor bolts, nuts, washers, and anchor bolt plates are subsidiary to the Item "Roadway Illumination Assemblies".

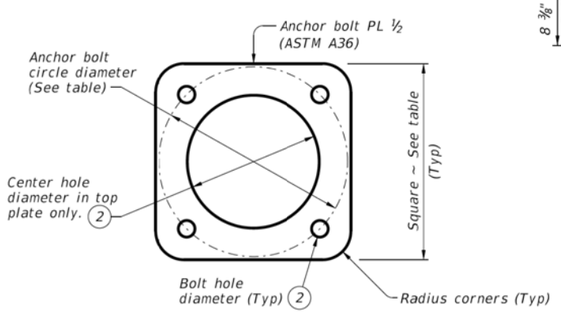
The type and size of conduit, the anchor bolt circle diameter, and the number and location of brackets is shown elsewhere on the plans. Brackets found to conflict with other components of the bridge may be relocated as necessary.

See Roadway Illumination Poles standard for details and notes not shown.

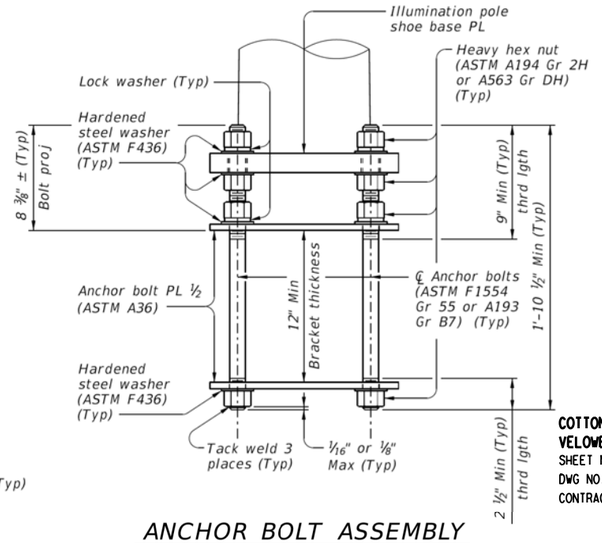
Cover dimensions are clear dimensions, unless noted otherwise.
Reinforcing bar dimensions shown are out-to-out of bar.



DETAIL "A"



ANCHOR BOLT PLATE



ANCHOR BOLT ASSEMBLY

(See table for anchor bolt diameter)

SHEET 1 OF 2

Texas Department of Transportation

Bridge Division Standard

BRIDGE LIGHTING DETAILS

BL

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
SHEET NO. 203 OF 345
DWG NO. WS9-3017
CONTRACT NO. C-2033270-01

FILE: blstde01-19.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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	DIST	COUNTY		SHEET NO.

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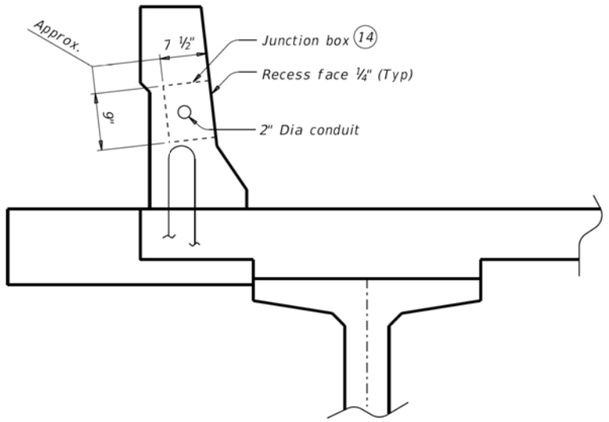
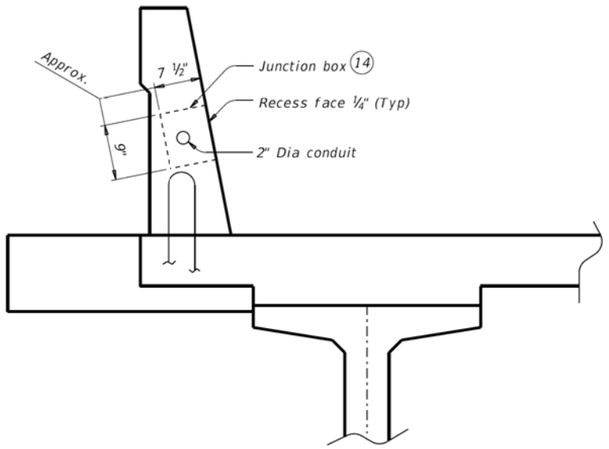


SHOWING T551, T552, AND T80HT



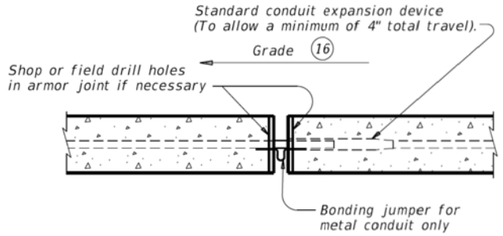
SHOWING SSTR AND T80SS

(4) Ream burrs and install bell ends or bushings on all conduit ends.

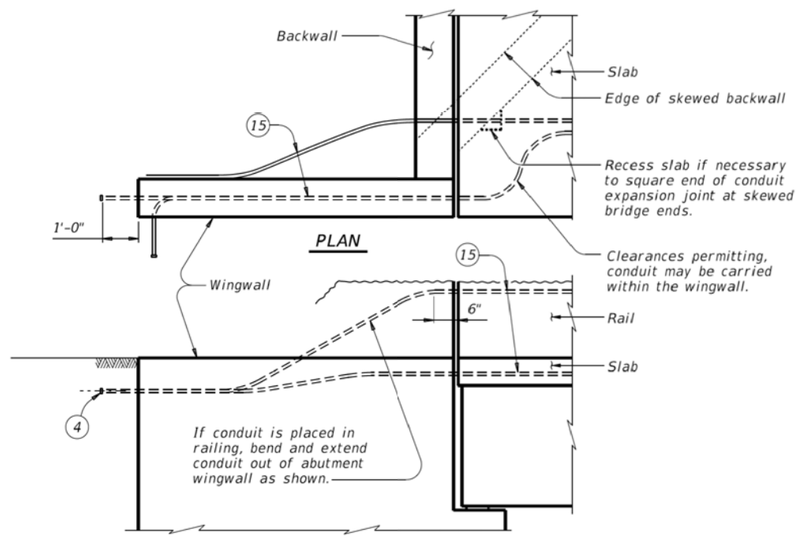
(14) Provide polymer concrete junction boxes meeting the requirements of DMS 11030.

(15) Position of conduit shown elsewhere on the plans or as directed by the Engineer.

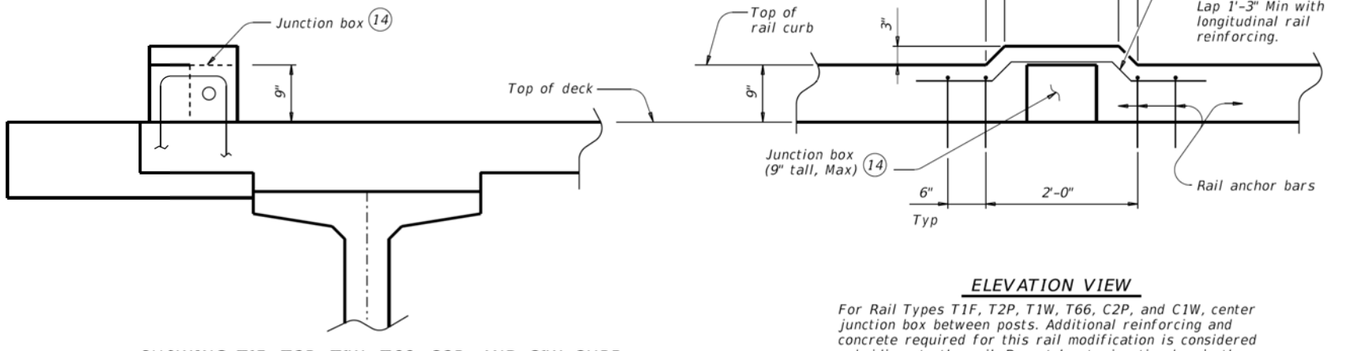
(16) Place conduit expansion device on high side of expansion joint.



CONDUIT EXPANSION JOINT



TREATMENT AT END OF BRIDGE



SHOWING T1F, T2P, T1W, T66, C2P, AND C1W CURB

See Elevation View for curb modifications

ELEVATION VIEW

For Rail Types T1F, T2P, T1W, T66, C2P, and C1W, center junction box between posts. Additional reinforcing and concrete required for this rail modification is considered subsidiary to the rail. Do not locate junction box in the same bay as a drain slot in rail curb.

JUNCTION BOX LOCATION

Use these details as a guide in locating junction boxes in rail types not shown.

Texas Department of Transportation

Bridge Division Standard

BRIDGE LIGHTING DETAILS

BL

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
SHEET NO. 204 OF 345
DWG NO. WS9-3018
CONTRACT NO. C-2033270-01

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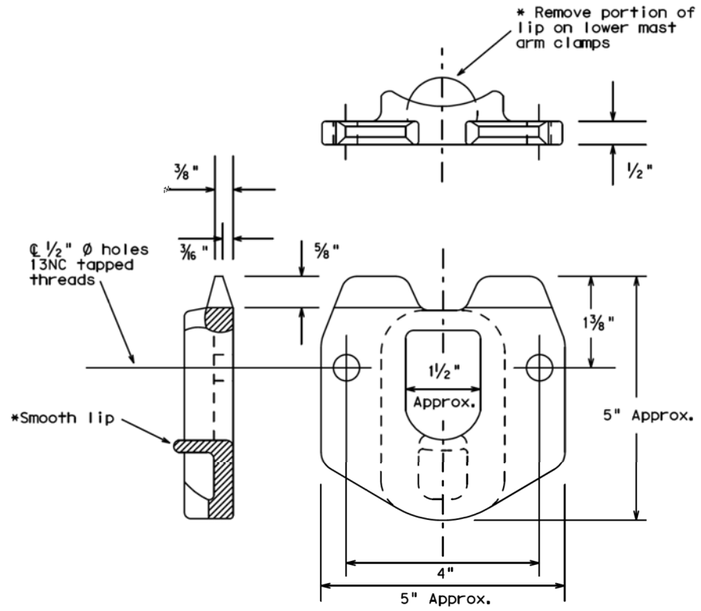
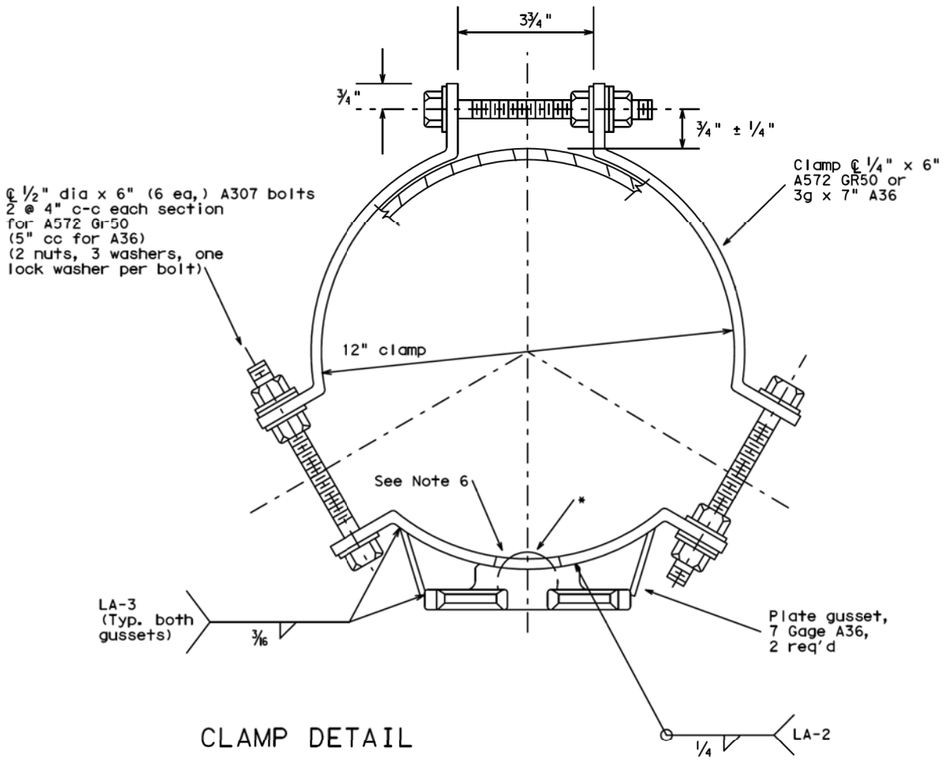
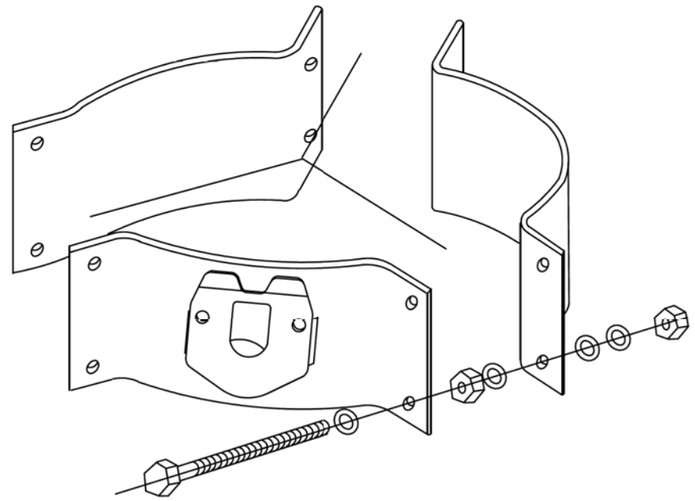


POLE SIMPLEX DETAILS



CLAMP DETAIL



PROJECTION

OTHER MATERIALS:

1. Pole simplex shall be ASTM A27 GR65-35 or A148 GR80-50 or A576 GR1021. ASTM A576 must be suitable for forging and also meet minimum tensile of 65ksi, minimum yield of 35ksi, and a minimum elongation of 22 percent in 2 inches.
2. Welded tabs and backplates shall be ASTM A-36 steel or better.
3. Nylon insert locknuts shall conform to ASTM A563.

GENERAL NOTES:

1. Materials and fabrication shall be in accordance with Standard Sheet "MA-C" and with the details, dimensions, and weld procedures shown herein. Weld references call for preapproved weld procedures which the Fabricator must obtain prior to fabrication. In the absence of specified fabrication tolerances, dimensions shall be within the tolerances generally obtainable in normal fabrication practice.
2. All parts shall be galvanized after fabrication in accordance with Item 445, "Galvanizing". The throat of the Simplex shall be made free of all rough or sharp edges resulting from the galvanizing process.
3. Each simplex fitting shall be supplied with 2 ASTM A325 bolts, ½in. X 1½in. and 2 lock washers. The bolts and lock washers shall be secured to the clamp with the other hardware items. The Fabricator shall ship clamp assembly together in a single package, including all bolts, nuts, and washers required for the clamp and simplex fitting.
4. Design conforms to 1994 AASHTO "Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals" and interim revisions thereto. Design Wind Speed equals 80 mph plus a 1.3 gust factor. Clamps are designed to support a 60 lb. luminaire having an effective projected area (actual area times drag coefficient) of 1.6 sq.ft.,12 ft. maximum arm length.
5. Each assembly shall consist of one upper piece simplex fitting having a smooth lip and one lower piece simplex fitting with the lip removed.
6. Approximately 2 in. diameter hole in upper mast arm clamp.

For 8.9 - 12 inch diameter Signal Poles
(Two req'd for each mast arm)

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
SHEET NO. 205 OF 345
DWG NO. WS9-3101
CONTRACT NO. C-2033270-01

Texas Department of Transportation
Traffic Operations Division

CLAMP ON FITTING ASSEMBLY FOR LUMINAIRE MAST ARM

CFA-12

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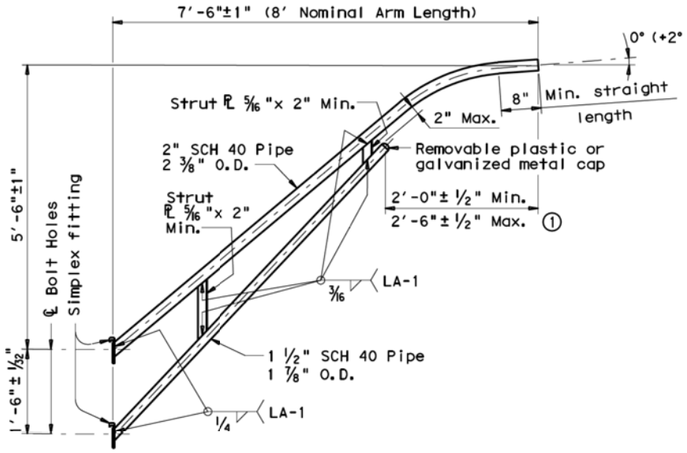
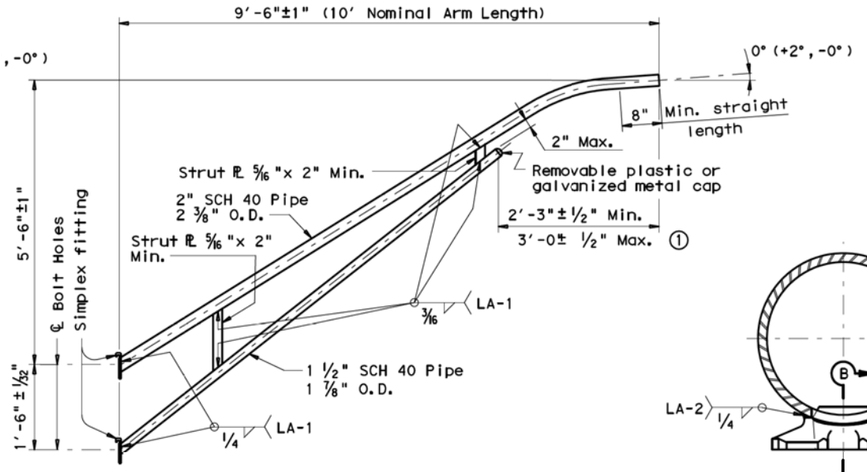
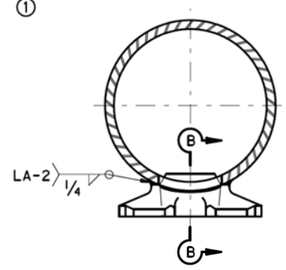


8-FOOT LUMINAIRE ARM



10-FOOT LUMINAIRE ARM



DIRECT ATTACHMENT DETAIL

MATERIALS	
Pole or Arm Simplex	ASTM A27 Gr.65-35 or A148 Gr.80-50, A576 Gr.1021 (3), or A36 (Arm only)
Arm Pipes	ASTM A53 Gr.B, A501, A1008 HSLAS-F Gr.50 (4), or A1011 HSLAS-F Gr.50 (4)
Arm Strut Plates (2)	ASTM A36, A572 Gr.50 (4), or A588
Misc.	ASTM designations as noted

(1) Dimensional limits are given to show acceptable variation in design. All of a Fabricator's production of a particular arm length shall have the same dimensions within specified tolerances.

(2) Any of the materials listed for plates may be used where the drawings do not specify a particular ASTM designation.

(3) A576 must be suitable for forging and also meet minimum tensile strength of 65 ksi, minimum yield of 35 ksi, and elongation in 2 inches of 22 percent.

(4) ASTM A572, A1008 HSLAS-F, and A1011 HSLAS-F may have higher yield strengths but shall not have less elongation than the grade indicated.

GENERAL NOTES:

Design conforms to 1994 AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals and Interim Revisions thereto. Design Wind Speed equals 90 mph plus a 1.3 gust factor. Arms are designed to support a 60 lb. luminaire having an effective projected area (actual area times drag coefficient) of 1.6 sq. ft.

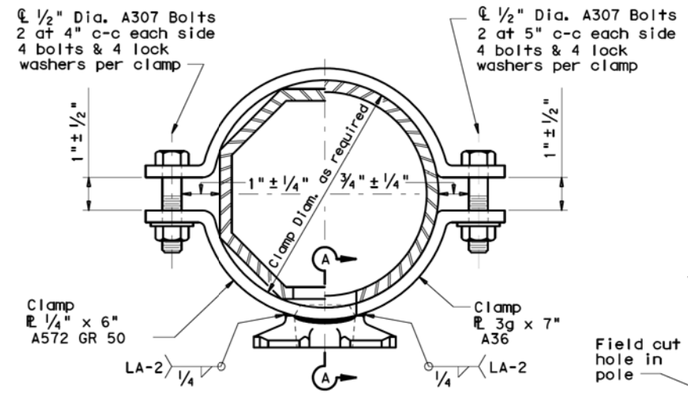
Materials and fabrication shall be in accordance with Item 686, "Traffic Signal Pole Assemblies (Steel)" and with the details, dimensions, and weld procedures shown herein. Weld references call for preapproved weld procedures which the Fabricator must obtain prior to fabrication. In the absense of specified Fabricaton tolerances, dimensions shall be within the tolerances generally obtainable in normal fabrication practice.

Unless otherwise noted, all parts shall be galvanized after fabrication in accordance with Item 445, "Galvanizing".

Deviation from the details and dimensions shown herein require submission of shop drawings in accordance with Item 441, "Steel Structures". Alternate designs are not acceptable.

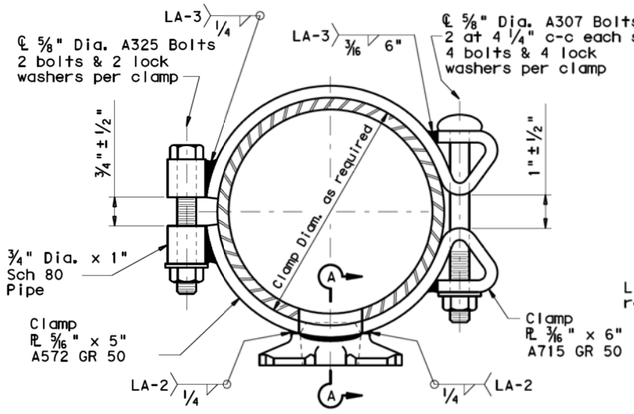
Each pole simplex fitting shall be supplied with 2 ASTM A325 bolts and 2 lock washers of the size specified. The bolts and lock washers shall be secured to the pole with the other hardware items called for in the plans. When clamp attachment is specified, the Fabricator shall ship the clamp assembly securely attached to the pole at the location shown on the plans.

If clamp assemblies are ordered without poles, the Fabricator shall ship one upper and one lower clamp assembly together in a single package, including all nuts and washers required for the clamps and simplex fittings.



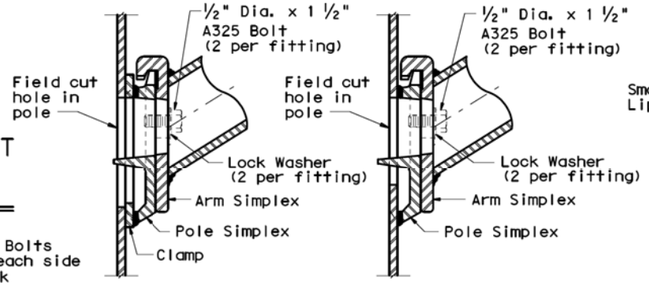
CLAMP ATTACHMENT DETAIL NO. 1 (HALF SECTION)

CLAMP ATTACHMENT DETAIL NO. 2 (HALF SECTION)



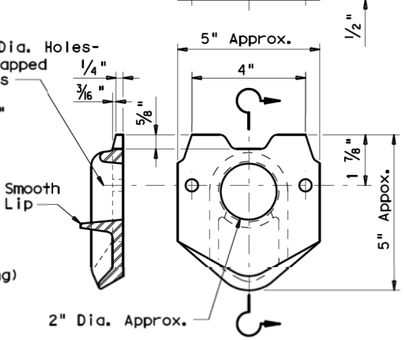
CLAMP ATTACHMENT DETAIL NO. 3 (HALF SECTION)

CLAMP ATTACHMENT DETAIL NO. 4 (HALF SECTION)

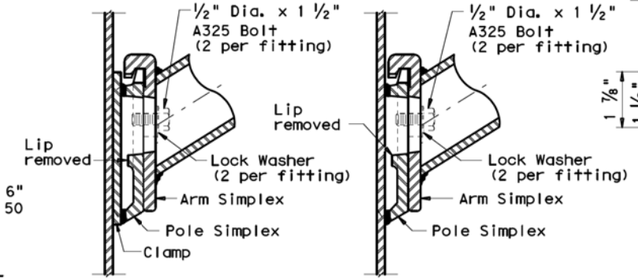


UPPER SIMPLEX FITTING

UPPER SIMPLEX FITTING



POLE SIMPLEX DETAIL

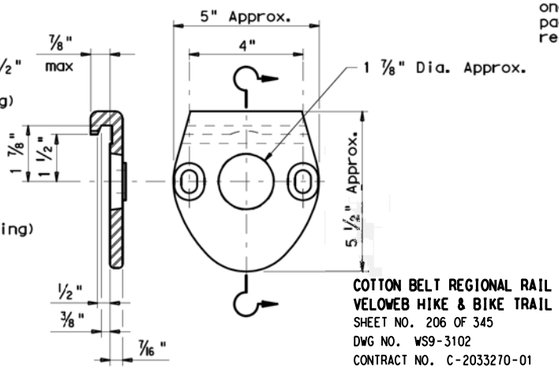


LOWER SIMPLEX FITTING

LOWER SIMPLEX FITTING

SECTON A-A

SECTON B-B



ARM SIMPLEX DETAIL

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
SHEET NO. 206 OF 345
DWG NO. WS9-3102
CONTRACT NO. C-2033270-01

Texas Department of Transportation
Traffic Operations Division

STANDARD ASSEMBLY DRAWINGS FOR LUMINAIRE SUPPORT STRUCTURES

ARM DETAILS

LUM-A-12

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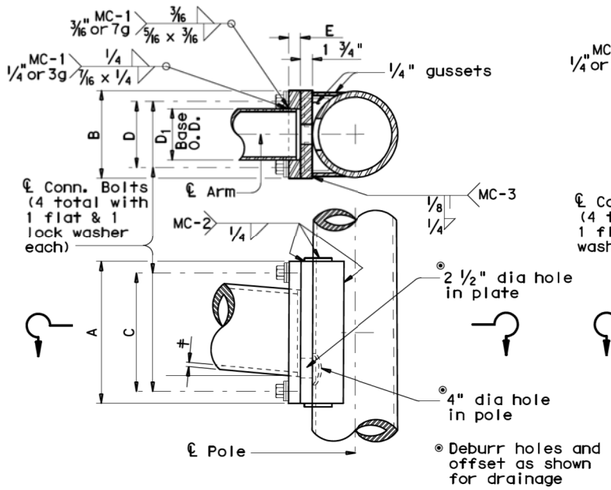
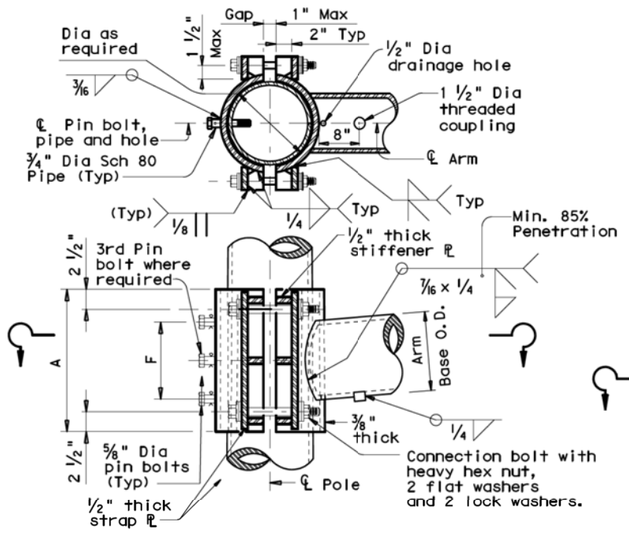
ARM SIZE D_1	ARM SIZE ǂ	A	B	C	D	E	CONN BOLT DIA
in.	in.	in.	in.	in.	in.	in.	in.
6.5	.179	12	9	9	6	1 ¾	1
7.5	.179	13	9	10	6	1 ¾	1
8.0	.179	14	10	11	7	2	1 ¼
9.0	.179	16	11	13	8	2	1 ¼
9.5	.179	17	12	14	9	2	1 ¼
9.5	.239	18	12	15	9	2	1 ¼
10.0	.239	18	12	15	9	2	1 ¼
10.5	.239	18	13	15	10	3	1 ½
11.0	.239	18	13	15	10	3	1 ½



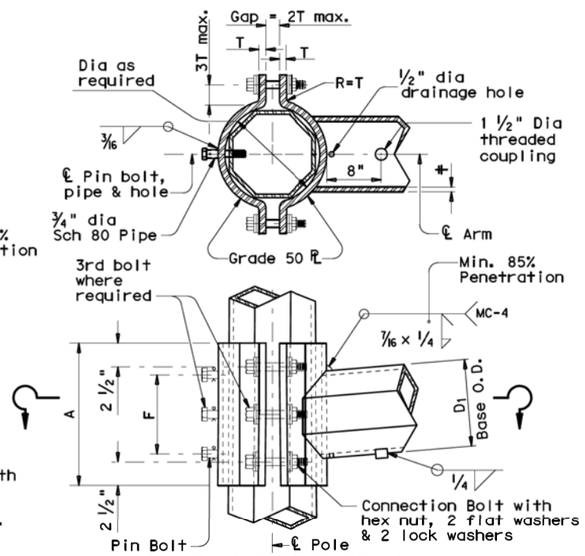
FIXED MOUNT DETAIL 1

ARM SIZE D_1	ARM SIZE ǂ	A	F	CONN. BOLTS No.	CONN. BOLTS Dia	PIN BOLTS No.	PIN BOLTS Dia
in.	in.	in.	in.	ea.	in.	ea.	in.
6.5	.179	12	6	4	1	2	5/8
7.5	.179	14	8	4	1	2	5/8
8.0	.179	14	8	4	1	2	5/8
9.0	.179	16	10	4	1	2	5/8
9.5	.179	18	12	4	1 1/4	3	5/8
9.5	.239	18	12	4	1 1/4	3	5/8
10.0	.239	18	12	4	1 1/4	3	5/8



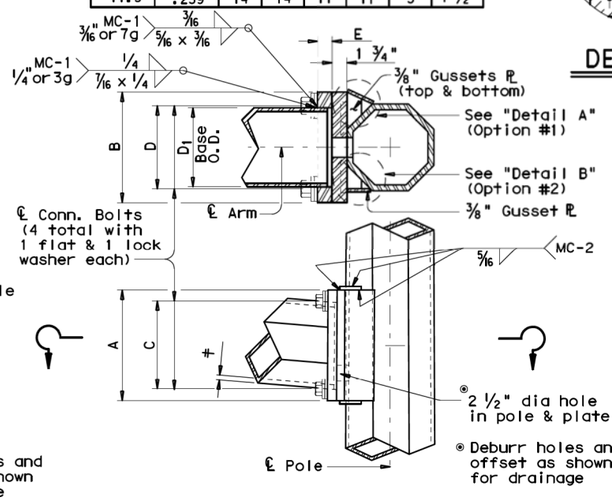
CLAMP-ON DETAIL 1

ARM SIZE D_1	ARM SIZE ǂ	A	F	T	CONN. BOLTS No.	CONN. BOLTS Dia	PIN BOLTS No.	PIN BOLTS Dia
in.	in.	in.	in.	in.	ea.	in.	ea.	in.
7.0	.179	12	6	¾	4	¾	2	5/8
7.5	.179	14	8	¾	4	¾	2	5/8
8.0	.179	14	8	¾	4	¾	2	5/8
9.0	.179	16	10	⅞	4	1	2	5/8
10.0	.179	18	10	⅞	4	1	2	5/8
9.5	.239	18	10	1	6	1	3	5/8
10.0	.239	18	10	1	6	1	3	5/8

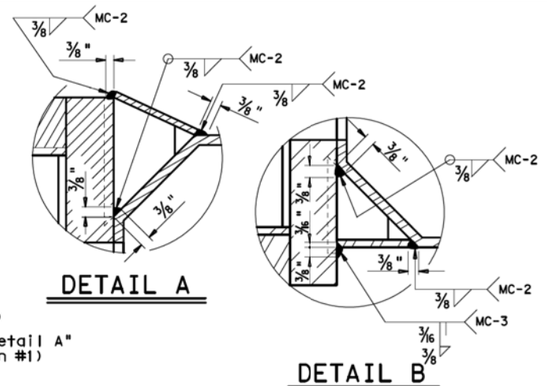


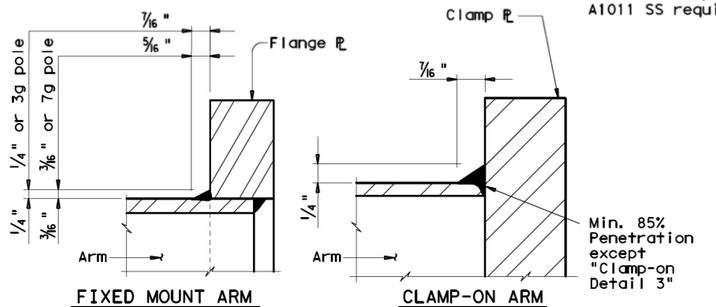
CLAMP-ON DETAIL 2

ARM SIZE D_1	ARM SIZE ǂ	A	B	C	D	E	CONN BOLT DIA
in.	in.	in.	in.	in.	in.	in.	in.
7.0	.179	11	11	8	8	1 ¾	1 ¼
7.5	.179	11	11	8	8	1 ¾	1 ¼
8.0	.179	11	11	8	8	2	1 ¼
9.0	.179	13	13	10	10	2	1 ¼
10.0	.179	13	13	10	10	2	1 ¼
9.5	.239	13	13	10	10	2	1 ¼
10.0	.239	14	14	11	11	2	1 ½
11.0	.239	14	14	11	11	3	1 ½
11.5	.239	14	14	11	11	3	1 ½



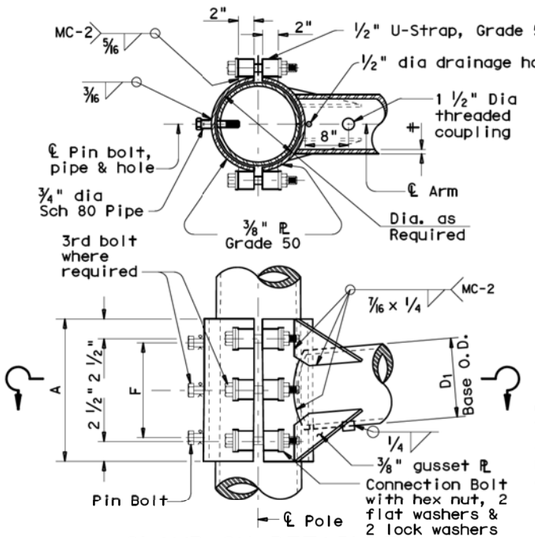
FIXED MOUNT DETAIL 2





ARM BASE WELD DETAILS

ARM SIZE D_1	ARM SIZE ǂ	A	F	CONN. BOLTS No.	CONN. BOLTS Dia	PIN BOLTS No.	PIN BOLTS Dia
in.	in.	in.	in.	ea.	in.	ea.	in.
6.5	.179	12	6	4	1	2	5/8
7.5	.179	14	8	4	1	2	5/8
8.0	.179	14	8	4	1	2	5/8
9.0	.179	16	10	4	1	2	5/8
9.5	.179	18	12	6	1	3	5/8
9.5	.239	18	12	6	1	3	5/8
10.0	.239	18	12	6	1	3	5/8



ARM BASE WELD DETAILS

MATERIALS	
Round Shafts or Polygonal Shafts ①	ASTM A595 Gr.A, A588, A1008 HSLAS Gr.50 Class 2, A1011 HSLAS Gr.50 Class 2, A572 Gr.50 or A1011 SS Gr.50 ②
Plates ①	ASTM A36, A588, or A572 Gr.50
Connection Bolts	ASTM A325 or A449, except where noted
Pin Bolts	ASTM A325
Pipe ①	ASTM A53 Gr.B, A501, A1008 HSLAS-F Gr.50, A1011 HSLAS-F Gr.50
Misc. Hardware	Galvanized steel or stainless steel or as noted

① ASTM A572, A1008 HSLAS, A1011 HSLAS, A1008 HSLAS-F, A1011 HSLAS-F or A1011 SS may have higher yield strengths but shall not have less elongation than the grade indicated.

② ASTM A1011 SS Gr.50 material shall also have a minimum elongation of 18 percent in 8 inches or 23 percent in 2 inches. Material thickness in excess of those stipulated under A1011 SS will be acceptable providing the material meets all other A1011 SS requirements and the requirements of this item.

GENERAL NOTES:

Clamp-on details are used for the second arm on dual mast arm assemblies. A Maximum 1 ½" wide vertical slotted hole shall be cut in the front clamp plate to facilitate drainage during galvanizing. The slot shall be centered behind the arm and shall be no longer than the arm diameter minus 1"

Fixed mount details are used for single mast arm assemblies and for the first arm on dual mast arm assemblies.

Where duplicate parts occur on a detail, welds shown for one part shall apply to all similar parts on the detail.

Pin bolts are required to prevent rotation of clamp-on arms under design wind forces.

NOTE:

Pin bolts shall be A325 with threads excluded from the shear plane. Pin bolt and ¾" dia pipe shall have 9/16" dia holes for a ⅛" dia galvanized cotter pin. Back clamp plate shall be furnished with a ¾" dia hole for each pin bolt. An 11/16" dia hole for each pin bolt shall be field drilled through the pole after arm orientations have been approved by the Engineer.

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
SHEET NO. 207 OF 345
DWG NO. WS9-3103
CONTRACT NO. C-2033270-01

Texas Department of Transportation
Traffic Operations Division

STANDARD ASSEMBLY FOR TRAFFIC SIGNAL SUPPORT STRUCTURES

MAST ARM CONNECTIONS

MA-C-12

© TxDOT August 1995

DN: MS	CK: JSY	DW: MMF	CK: JSY
CONT	SECT	JOB	HIGHWAY
DIST	COUNTY		SHEET NO.

REVISIONS
5-96
5-09
1-12

126A

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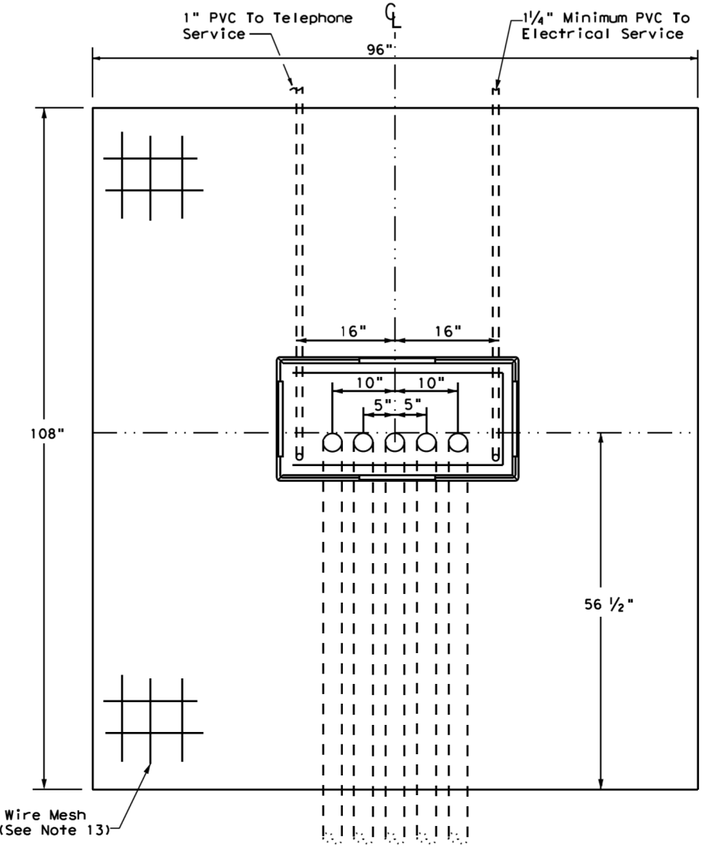
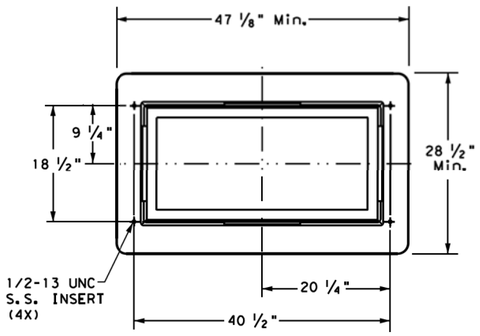
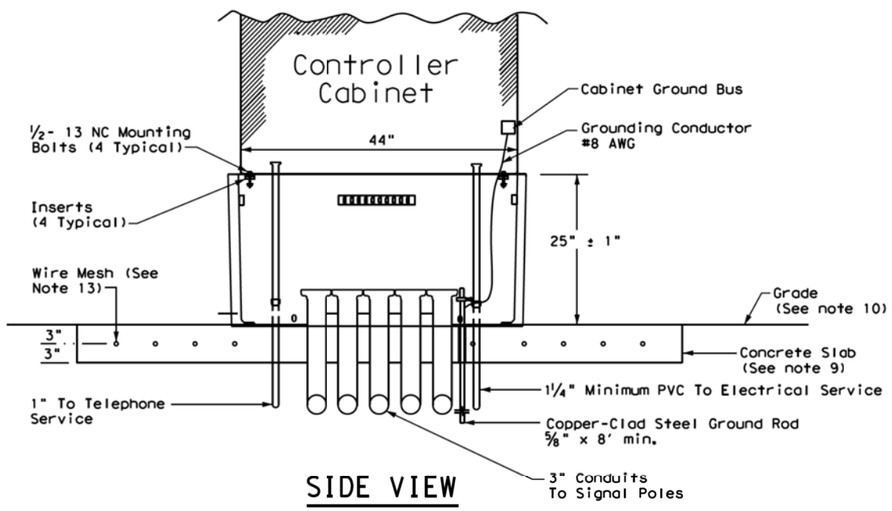


TOP VIEW



CABINET BASE



SIDE VIEW

TRAFFIC SIGNAL CONTROLLER BASE:

1. Provide a traffic signal controller base (cabinet base) manufactured of polymer concrete material consisting of calcareous and siliceous stone; glass fibers and thermoset polyester resin. The polymer concrete cabinet base must be reinforced on the inside of the cabinet base with fiberglass matting. Provide one of the following bases: Armorcast Part # A6001848X24, Quazite Model # PG3048Z709, or other as approved by TxDOT Traffic Safety Division.

2. The polymer concrete material must have a minimum compressive strength of 10,300 pounds per square inch (psi), minimum flexural strength of 3600 psi, and minimum shear strength of 3600 psi.

3. The polymer concrete cabinet base must conform to the dimensions shown and must accommodate a standard TxDOT basemount cabinet.

4. Supply the cabinet base with four 1#2"-13 UNC stainless steel inserts for attachment of the cabinet to the base. Inserts must withstand a minimum torque of 50 ft-lb and a minimum straight pull out strength of 750 lbs.

5. Provide the cabinet base with 4 cable racks mounted one on each side of the base 2" to 7 " from the top edge of the base. Unless approved otherwise, cable racks must be 1-1/2 x 9#16x 3#16inch steel channel with eight T-slots spaced at 1-1/2 inches. The cable racks must easily accommodate the insertion of tie wraps to attach field wiring to the racks to serve as strain relief. Secure cable racks to the base using 1#2"-13 UNC stainless steel screws and inserts.

6. The cabinet base, when secured to the concrete slab with controller cabinet attached, must withstand a minimum wind load of 125 mph or a 850 lb force applied at 49" above the bottom of the base without causing the base or cabinet to come out of their anchored position or cause any permanent deformation. The manufacturer must supply certification by an independent testing laboratory or sealed by a Texas Licensed Professional Engineer. Provide the cabinet base with hardware for attachment to a concrete slab.

7. The traffic signal base must be permanently marked either by impress or by permanent ink with the manufacturer's model number and name or logo.

8. Seal the base to the concrete with a silicone caulk bead and fastened to the slab per manufacturer's instructions.

CONCRETE SLAB:

9. Traffic signal controller pad must be a portland cement concrete slab poured in place, must conform to the dimensions shown, and must be level.

10. Grade earthwork such that it is flush with the concrete pad on all four sides, unless otherwise shown on the plans. Subsidiary to ITEM 680, four inch rip rap may be used in lieu of earthwork. Slopes shall gradually contour to match plans.

11. Bond a #8 AWG copper ground wire and an 8 ft ground rod bonded to the reinforcing mesh by a suitable UL Listed clamp and terminated to the cabinet grounding bus for the purpose of providing a local ground for the electrical grounding conductor. The electrical grounding conductor specified in Item 680-3.A.4 is required and must be terminated to the cabinet ground bus.

12. Install a PVC sleeve to prevent the ground rod from direct embedment in the slab.

13. Provide welded wire mesh 6X6-W2.9 X W2.9 for reinforcement. Provide joints and splices in the mesh with a minimum 6-inch overlap. Center the mesh between top and bottom and provide a minimum 3 inch cover on the edges.

14. Provide Class B concrete minimum for the slab in accordance with Item 421. Construct the slab in accordance with Item 531.

CONDUITS:

15. Stub up and run 3-inch conduits through the slab to the various traffic signal poles and ground boxes as shown on the layouts. Install the number of conduits as shown on layouts plus two additional 3 inch conduits for future use. Terminate the conduits with a bushing between 2 and 4-inches above the slab.

16. Extend conduits for future use at least 18-inches from the edge of the slab, terminate underground with a coupling, and cap and seal so that the seal can be removed without damaging the coupling. This must also apply to unused telephone conduit.

17. Stub up two separate conduits through the slab from the electrical and telephone services. Run the conduit for the electrical feed directly to the electrical service enclosure. Run the conduit for the telephone line directly to the telephone service, usually located on the same pole as the electrical service. Telephone must not under any circumstance share a conduit with any other function.

18. Terminate electric and telephone conduits above the slab with a coupling. After the base is installed, extend the conduits above the top of the base and secure to the base using a steel one-hole strap or similar suitable substitute.

CONTROLLER CABINET:

19. Anchor the controller cabinet to the base using four stainless steel 1/2-13 NC bolts.

20. The silicone caulk bead specified in Item 680.3.B must be RTV 133.

PAYMENT:

21. Bid TS-CF as subsidiary to Item 680.

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
SHEET NO. 208 OF 345
DWG NO. WS9-3104
CONTRACT NO. C-2033270-01

Texas Department of Transportation

Traffic Safety Division Standard

TRAFFIC SIGNAL CONTROLLER CABINET BASE AND PAD
TS-CF-21

FILE: ts-cf-21.dgn	DN:	CK:	DW:	CK:
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REVISIONS				
12-04	DIST	COUNTY		SHEET NO.
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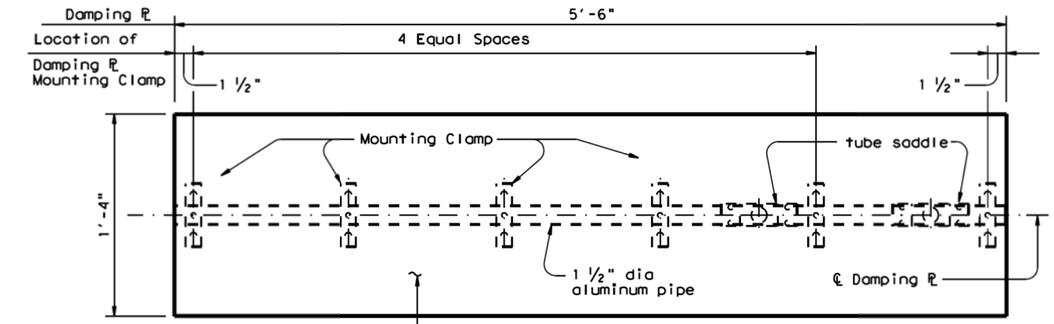
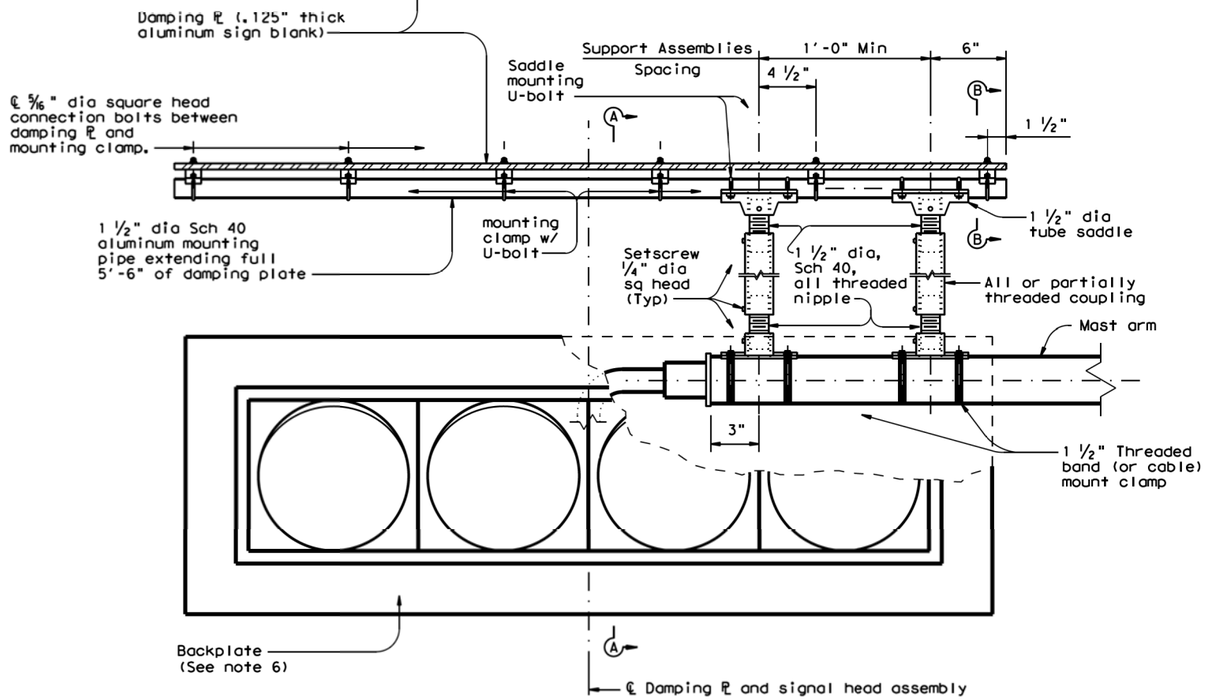


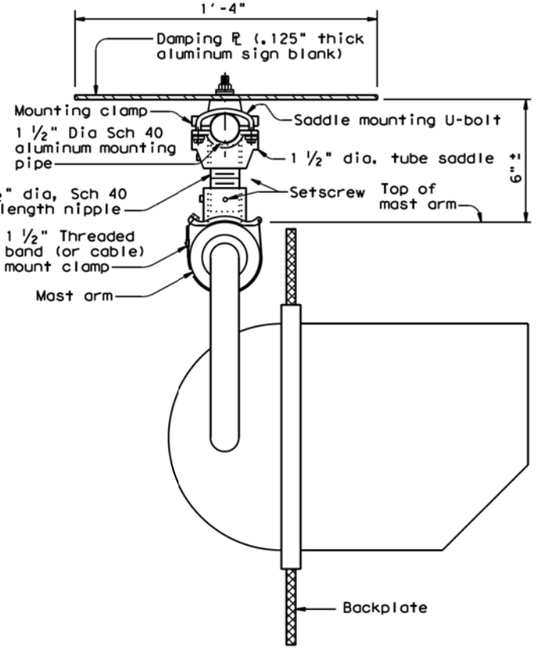
PLAN



ELEVATION

DAMPING PLATE MOUNTING DETAILS

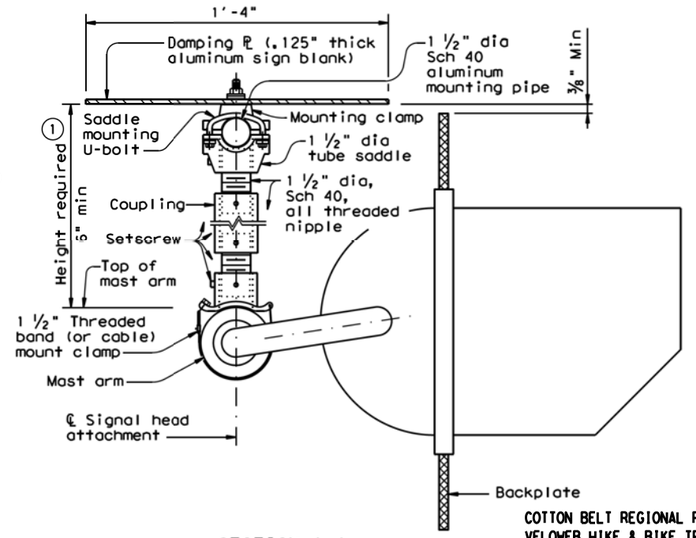
(Showing alternate placement of signal head)



SECTION A-A

(Showing standard placement of signal head)

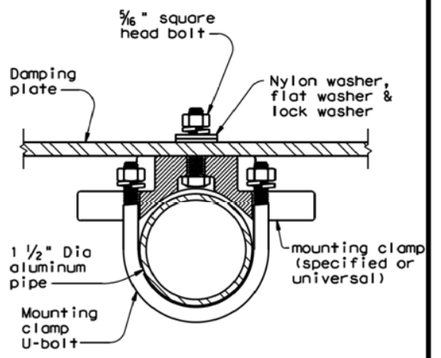
(Mounting clamp U-bolt is not shown for clarity)



SECTION A-A

(Showing alternate placement of signal head)

(Mounting clamp U-bolt is not shown for clarity)



SECTION B-B

(Showing damping plate attachment)

① Recommended supporting assemblies to achieve required height for horizontal section heads

Height required	One nipple each length	Two nipples each length plus	One coupling each length
6"-6 ¾"	3"	-	-
7"-8 ½"	4"	-	-
9"-10 ½"	6"	-	-
11"-15 ½"	-	4"	5"
16"-24"	-	6"	10"

GENERAL NOTES:

1. In accordance with the findings of TxDOT sponsored research, the installation of a damping plate in accordance with the details shown here at the end of signal mast arms of SMA and DMA standard structures reduces excessive harmonic vertical vibration, and thus fatigue damage. Any deviation from these details may reduce the effectiveness of this damping device.
2. Aluminum sign blank for damping plate will conform to Departmental Material Specifications DMS-7110. Materials for mast arm mounting clamp and tube saddle will be aluminum castings or aluminum alloys as in accordance with manufacturers' stipulations. Mounting pipe, pipe nipple and coupling will be aluminum alloy 6061-T6 or 6063-T6. Damping plate mounting clamp and u-bolt assemblies will conform to Standard sheet SMD(GEN). U-bolts for saddle mounting will have a minimum yield strength of 36 ksi.
3. Damping plate will be mounted horizontally. Position centerline of damping plate to align with centerline of mast arm or horizontal signal head assembly. Vertical clearance between signal head (with or without backing plate) and bottom of damping plate will be maintained as shown. The attachments shown here are examples only, other supporting details which meet both alignment and vertical clearance requirements are also acceptable.
4. Unless stipulated by the manufacturers, all steel parts will be galvanized finish in accordance with Standard Specification Item 445, "Galvanizing".
5. Contractor will verify applicable field dimensions before the installation.
6. Backplates are optional for traffic signals. When backplates are used, Backplates will have a 2-inch fluorescent yellow AASHTO Type B_{FL} or C_{FL} retroreflective border conforming to TxDOT DMS-8300 "Sign Face Materials." See Sheet TS-BP-20 for backplate details.

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
SHEET NO. 209 OF 345
DWG NO. WS9-3105
CONTRACT NO. C-2033270-0

Texas Department of Transportation

Traffic Safety Division Standard

MAST ARM DAMPING PLATE DETAILS

MA-DPD-20

FILE: ma-dpd-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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REVISIONS 6-20	DIST	COUNTY		SHEET NO.

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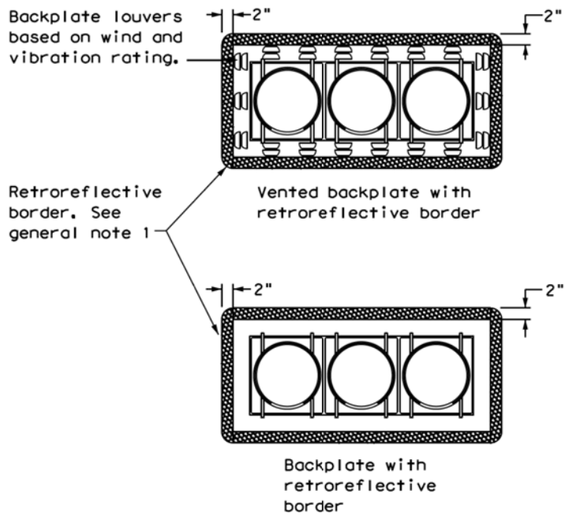
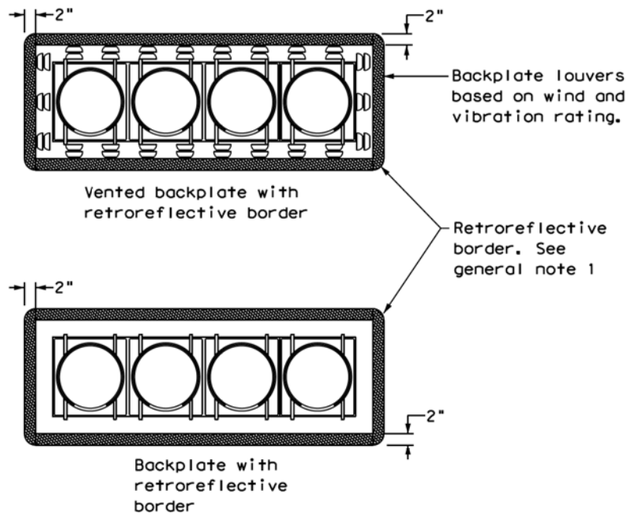
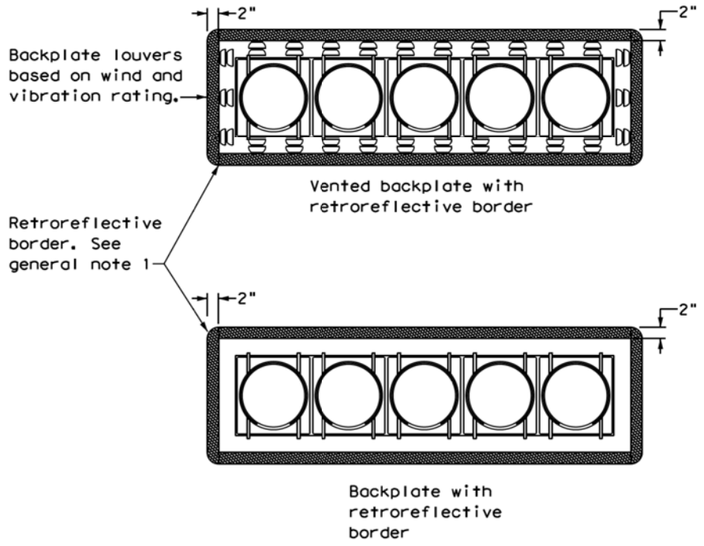


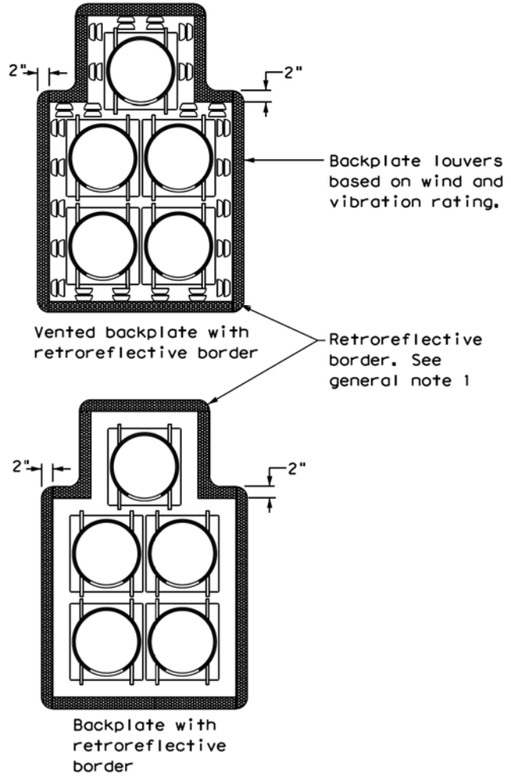
THREE-SECTION HEAD
HORIZONTAL OR VERTICAL



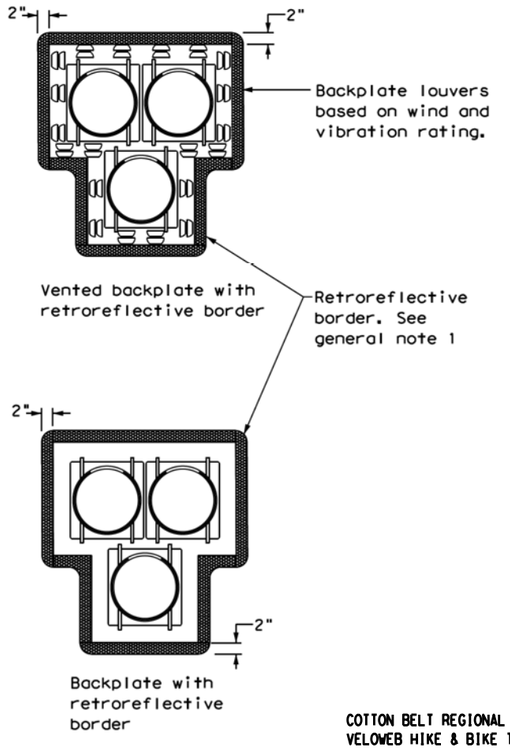
FOUR-SECTION HEAD
HORIZONTAL OR VERTICAL



FIVE-SECTION HEAD
HORIZONTAL OR VERTICAL



FIVE-SECTION HEAD
CLUSTER



PEDESTRIAN HYBRID
BEACON

GENERAL NOTES:

1. Backplates are optional for traffic signals and pedestrian hybrid beacons. When backplates are used, a 2-inch wide fluorescent yellow AASHTO Type B_{FL} or C_{FL} retroreflective border conforming to TxDOT DMS-8300 is required. Place on all approaches when used.
2. Signal head and backplate compatability must be verified by the contractor prior to installation.
3. When using backplates on signal heads, venting is preferred to reduce cyclic vibration stress.
4. When a vented backplate is used, the retroreflective border must not be placed over the louvers.
5. This standard sheet applies to all signal heads with backplates, including but not limited to:
   - Pole mounted
   - Overhead mounted
   - Span wire mounted
   - Mast arm mounted
   - Vertical signal heads
   - Horizontal signal heads
   - Clustered signal heads
   - Pedestrian hybrid beacons

Texas Department of Transportation

Traffic Safety Division Standard

TRAFFIC SIGNAL HEAD WITH BACKPLATE

TS-BP-20

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
SHEET NO. 210 OF 345
DWG NO. WS9-3106
CONTRACT NO. C-2033270-0

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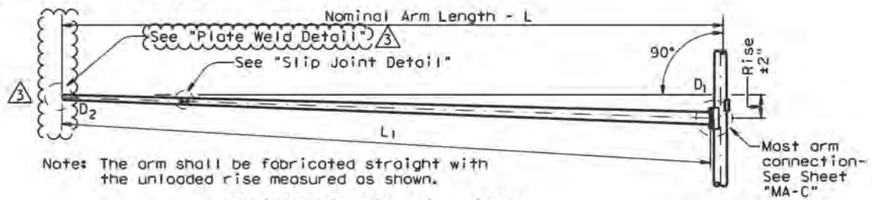
Arm Length	ROUND POLES					POLYGONAL POLES					Foundation Type
	D_B	D_{19}	D_{24}	D_{30}	① thk	D_B	D_{19}	D_{24}	D_{30}	① thk	
ft.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	
20	10.5	7.8	7.1	6.3	.179	11.5	8.5	7.7	6.8	.179	30-A
24	11.0	8.3	7.6	6.8	.179	12.0	9.0	8.2	7.3	.179	30-A
28	11.5	8.8	8.1	7.3	.179	12.5	9.5	8.7	7.8	.179	30-A
32	12.5	9.8	9.1	8.3	.179	12.0	9.0	8.2	7.3	.239	30-A
36	12.0	9.3	8.6	7.8	.239	12.5	9.5	8.7	7.8	.239	36-A
40	12.0	9.3	8.6	7.8	.239	13.5	10.5	9.7	8.8	.239	36-A
44	12.5	9.8	9.1	8.3	.239	14.0	11.0	10.2	9.3	.239	36-A
48	13.0	10.3	9.6	8.8	.239	15.0	12.0	11.2	10.3	.239	36-A

Arm Length	ROUND ARMS					POLYGONAL ARMS				
	L_1	D_1	D_2	① thk	Rise	L_1	D_1	② D_2	① thk	Rise
ft.	ft.	in.	in.	in.		ft.	in.	in.	in.	
20	19.1	6.5	3.8	.179	1'-9"	19.1	7.0	3.5	.179	1'-8"
24	23.1	7.5	4.3	.179	1'-10"	23.1	7.5	3.5	.179	1'-9"
28	27.1	8.0	4.2	.179	1'-11"	27.1	8.0	3.5	.179	1'-10"
32	31.0	9.0	4.7	.179	2'-1"	31.0	9.0	3.5	.179	2'-0"
36	35.0	9.5	4.6	.179	2'-4"	35.0	10.0	3.5	.179	2'-1"
40	39.0	9.5	4.1	.239	2'-8"	39.0	9.5	3.5	.239	2'-3"
44	43.0	10.0	4.1	.239	2'-11"	43.0	10.0	3.5	.239	2'-6"
48	47.0	10.5	4.1	.239	3'-4"	47.0	11.0	3.5	.239	2'-9"

D_B = Pole Base O.D.
D_{19} = Pole Top O.D. with no Luminaire and no ILSN
D_{24} = Pole Top O.D. with ILSN w/out Luminaire
D_{30} = Pole Top O.D. with Luminaire
D_1 = Arm Base O.D.
D_2 = Arm End O.D.
L_1 = Shaft Length
L = Nominal Arm Length

① Thickness shown are minimums, thicker materials may be used.

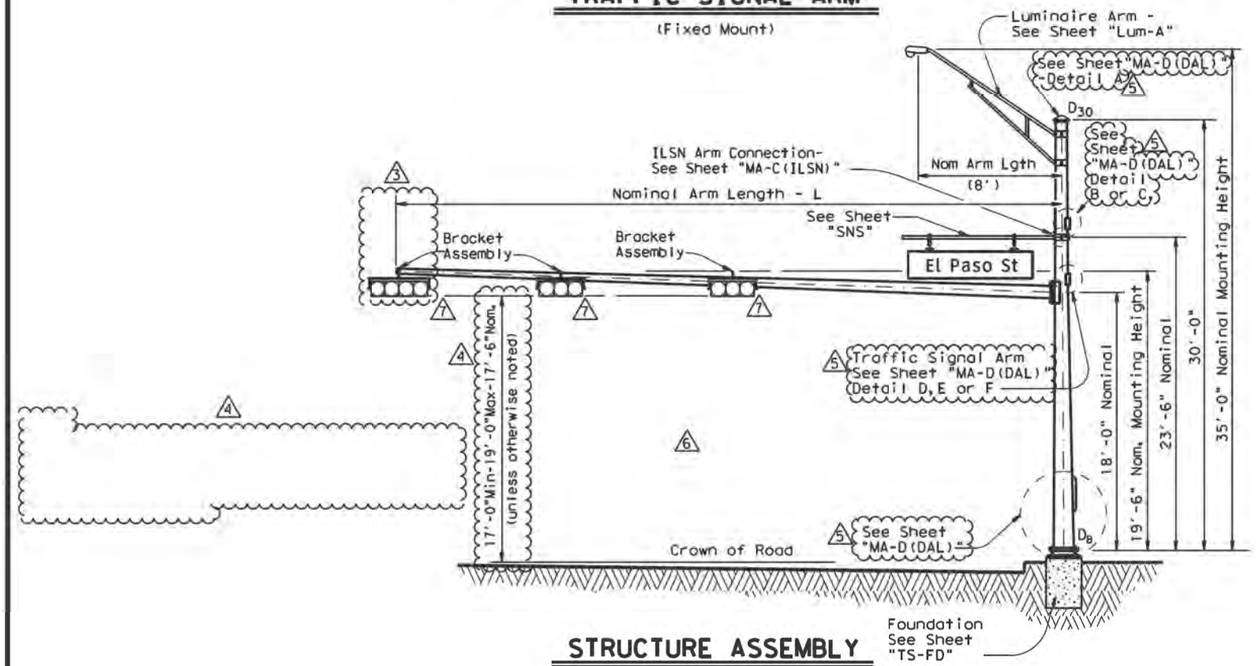
② D_2 may be increased by up to 1" for polygonal arms.



Note: The arm shall be fabricated straight with the unloaded rise measured as shown.

TRAFFIC SIGNAL ARM

(Fixed Mount)



STRUCTURE ASSEMBLY

SHIPPING PARTS LIST

Ship each pole with the following attached: enlarged hand hole, pole cap, fixed-arm connection bolts and washers and any additional hardware listed in the table.

Nominal Arm Length	30' Poles With Luminaire		24' Poles With ILSN		19' Poles With No Luminaire and No ILSN	
	Above hardware plus: One (or two if ILSN attached) small hand hole, clamp-on simplex		Above hardware plus one small hand hole		See note above	
ft	Designation	Quantity	Designation	Quantity	Designation	Quantity
20	20L-80		20S-80		20-80	
24	24L-80		24S-80		24-80	
28	28L-80		28S-80		28-80	
32	32L-80		32S-80		32-80	
36	36L-80		36S-80		36-80	
40	40L-80		40S-80		40-80	
44	44L-80		44S-80		44-80	
48	48L-80		48S-80		48-80	

Traffic Signal Arms (1 per Pole) Ship each arm with the listed equipment attached

Nominal Arm Length	Type I Arm (1 Signal)		Type II Arm (2 Signals)		Type III Arm (3 Signals)	
	1 Bracket Assembly		2 Bracket Assemblies		3 Bracket Assemblies	
ft	Designation	Quantity	Designation	Quantity	Designation	Quantity
20	20I-80					
24	24I-80		24II-80			
28	28I-80		28II-80			
32			32II-80		32III-80	
36			36II-80		36III-80	
40			2 40II-80		40III-80	
44			44II-80		44III-80	
48					48III-80	

Luminaire Arms (1 per 30' pole)

Nominal Arm Length	Quantity
8' Arm	

ILSN Arm (Max. 2 per pole) Ship with clamps, bolts and washers

Nominal Arm Length	Quantity
7' Arm	
9' Arm	

Anchor Bolt Assemblies (1 per pole)

Anchor Bolt Diameter	Anchor Bolt Length	Quantity
1 1/2"	3'-4"	
1 3/4"	3'-10"	

Each anchor bolt assembly consists of the following: Top and Bottom templates, 4 anchor bolts, 8 nuts, 8 flat washers, and 4 nut anchor devices (Type 2) per Standard Drawing "TS-FD".

Templates may be removed for shipment.

MODIFICATIONS:

1. REPLACED CGB CONNECTOR WITH BRACKET ASSEMBLY. (2/12)
2. ADDITIONAL OPTION. (3/12)
3. REPLACED TENON DETAIL WITH PLATE WELD DETAIL. (2/12)
4. REVISED MINIMUM SIGNAL HEIGHT. (3/12)
5. REPLACED "MA-D" WITH "MA-D(DAL)". (2/12)
6. REMOVED TABLE OF DIMENSIONS "A". (2/12)
7. REMOVED CGB CONNECTORS. (2/12)

SHEET 1 OF 2

Texas Department of Transportation

TRAFFIC SIGNAL SUPPORT STRUCTURES

SINGLE MAST ARM ASSEMBLY

(80 MPH WIND ZONE)

SMA-80(1)-12(DAL)

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REVISIONS
5-96
11-99
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DN: MS	CK: JSY	DW: MWF	CK: JSY
CONT	SECT	JOB	HIGHWAY
#CONT	#SECT	#JOB	#HWY
DIST	COUNTY		SHEET NO.
18	#CNTY		

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
SHEET NO. 211 OF 345
DWG NO. WS9-3107
CONTRACT NO. C-2033270-01

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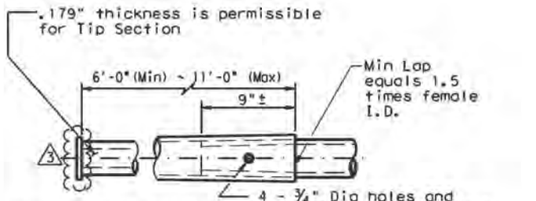


Note: A slip joint is permissible for arms 40' and greater in length. The slip joint shall be made in the shop, but may be match marked and shipped disassembled.

SLIP JOINT DETAIL

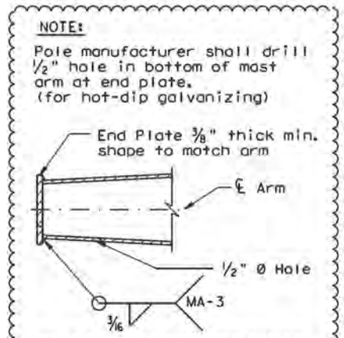


PLATE WELD DETAIL

Stainless steel bands (or Cables) and cast bracket as in "Astro-Brac", "Sky Bracket" or "Easy Bracket" with 1 ½" Dia Threaded Coupling.

BRACKET ASSEMBLY

VIBRATION WARNING

Mast Arms of SMA and DMA structures and clamp-on Arms of LMA structures of approximately 40 ft or longer are subject to harmonic vertical vibrations in light wind conditions due to the aeroelastic characteristics of a few of the myriads of possible combinations of the following: signal numbers, weights and positions; existence/solidity of backplates; presence of additional attachments to the arm, such as signs and cameras; arm-wind orientation; and arm-pole stiffness.

Such vibrations may cause fatigue damage to the structure and may lead to galloping in moderate wind conditions which may further damage the structure and alarm the public. Tests have indicated that when wind is blowing toward the back side of signal heads having un-vented backplates attached the probability of unacceptable harmonic vibration and/or galloping is rather high.

If backplates are not required for improved visibility they should not be applied to the signal heads or, if they must be applied, they should be vented as a first and inexpensive measure to mitigate vibrations.

The traffic signal mast arms shall be visually inspected in 5 to 20 mph wind conditions after installation of signal heads and any attachments, including any required backpates. If vertical movements with a total excursion (maximum upward excursion to maximum downward excursion) of more than approximately 8" are observed at the arm tip, a damping plate shall be fitted to the arm. See "Damping Plate Mounting Details" on standard sheet, MA-DPD-10.

This visual inspection shall be repeated after each modification of the structure that could affect its aeroelastic response. Excessive vibrations shall not be allowed to continue for more than two days.

GENERAL NOTES:

Design conforms to 1994 AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals and Interim Specifications thereto. Design Wind Speed equals 80 mph plus a 1.3 gust factor.

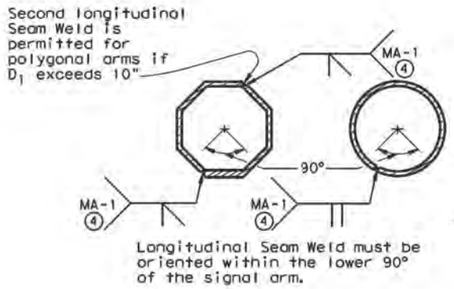
Poles are designed to support one 8'-0" luminaire arm, one 9'-0" internally lighted street name sign and one traffic signal arm with a length as tabulated. The specified luminaire load applied at the end of the luminaire arm equals 60 lbs vertical dead load plus the horizontal wind load on an effective projected area of 1.6 sq ft. The specified internally lighted street name sign load applied 4.5 ft from the centerline of the pole equals 85 lbs vertical dead load plus horizontal wind load on an effective projected area of 11.5 sq ft. The specified signal load applied at the end of the traffic signal arm equals 180 lbs vertical dead load plus the horizontal wind load on an effective projected area of 32.4 sq ft (actual area times drag coefficient).

5 See Standard Sheet "MA-D(DAL)" for pole details, "MA-C" for traffic signal arm connection details, "MA-C (ILSN)" for internally lighted street name sign arm connection details, "LUM-A" for luminaire arm and connection details, "SNS" for internally lighted street name sign details, and "TS-FD" for anchor bolt and foundation details. See "MA-C" for material specifications.

Fabrication shall be in accordance with Item 686, "Traffic Signal Pole Assemblies (Steel)" and with the details, dimensions, and weld procedures shown herein. Weld references call for preapproved weld procedures which the Fabricator must obtain prior to fabrication. Materials, fabrication tolerances, and shipping practices shall meet the requirements of this sheet and Item 686, "Traffic Signal Pole Assemblies (Steel)".

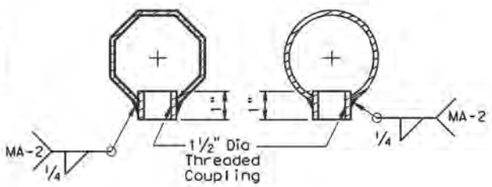
Unless otherwise noted, all parts shall be galvanized in accordance with Item 445, "Galvanizing", after fabrication.

Deviation from the details and dimensions shown herein require submission of shop drawings in accordance with Item 441, "Steel Structures". Alternate designs are not acceptable.



ARM WELD DETAIL

4 60% Min. penetration 100% pemetration within 6" of circumferential base welds.



ARM COUPLING DETAILS

3 REPLACED TENON DETAIL WITH PLATE WELD DETAIL (2/12).

5 REPLACED "MA-D" WITH "MA-D(DAL)" (2/12).

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
SHEET NO. 212 OF 345
DWG NO. WS9-3108
CONTRACT NO. C-2033270-01

Texas Department of Transportation

TRAFFIC SIGNAL SUPPORT STRUCTURES
SINGLE MAST ARM ASSEMBLY
(80 MPH WIND ZONE)
SMA-80(2)-12(DAL)

©TxDOT August 1995

DN: MS	CK: JSY	DW: MAF	CK: JSY

REVISIONS
5-96
1-12

CONT	SECT	JOB	HIGHWAY
#CONT	#SECT	#JOB	#HWY
DIST	COUNTY		SHEET NO.
18	#CNTY		

122B

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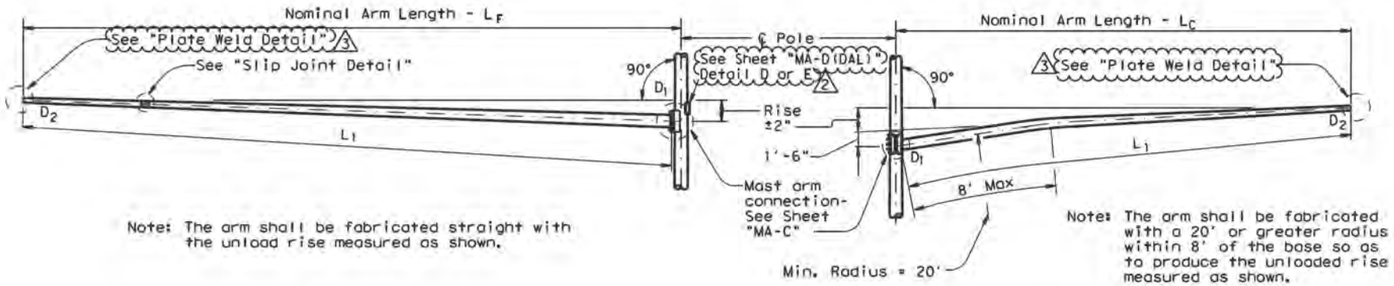
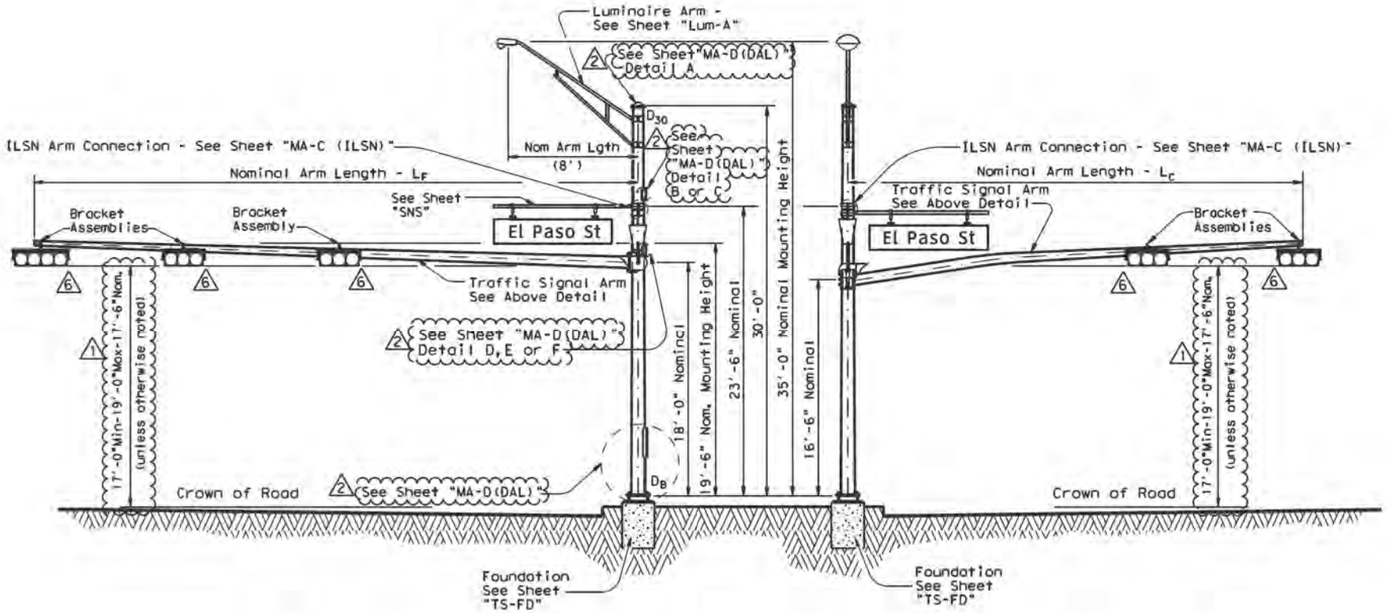


Note: The arm shall be fabricated straight with the unload rise measured as shown.

Note: The arm shall be fabricated with a 20' or greater radius within 8' of the base so as to produce the unloaded rise measured as shown.

FIXED MOUNT TRAFFIC SIGNAL ARM

CLAMP-ON TRAFFIC SIGNAL ARM



ELEVATION
(Showing fixed mount arm)

STRUCTURE ASSEMBLY

ELEVATION
(Showing clamp mount arm)

MODIFICATIONS:

1. REVISED MINIMUM SIGNAL HEIGHT. (3/12)
2. REPLACED "MA-D" WITH "MA-D(DAL)". (2/12)
3. REPLACED TENON DETAIL WITH PLATE WELD DETAIL. (2/12)
4. NOT USED
5. REMOVED TABLE OF DIMENSIONS "A". (2/12)
6. REMOVED CGB CONNECTORS. (2/12)

GENERAL NOTES:

Design conforms to 1994 AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals and Interim Specifications thereto. Design Wind Speed equals 80 mph plus a 1.3 gust factor. Designs are based on an arm included angle of 90 degrees or more. Angles of less than approximately 75 degrees will require a special design.

Poles are designed to support one 8'-0" luminaire arm, two 9'-0" internally lighted street name signs and two traffic signal arms with length combinations as tabulated. The specified luminaire load applied at the end of luminaire arm equals 60 lbs vertical dead load plus the horizontal wind load on an effective projected area of 1.6 sq ft. The specified internally lighted street name sign applied 4'-6" from the centerline of the pole equals 85 lbs vertical dead load plus the horizontal wind load on an effective projected area of 11.5 sq ft. The specified signal load applied at the end of the traffic signal arm equals 180 lbs vertical dead load plus the horizontal wind load on an effective projected area of 32.4 sq ft (actual area times drag coefficient).

2 See Standard Sheet "MA-D(DAL)" for pole details, "MA-C" for traffic signal arm connection details, "MA-C (ILSN)" for internally lighted street name sign arm connection details, "LUM-A" for luminaire arm and connection details, "SNS" for internally lighted street name sign details, and "TS-FD" for anchor bolt and foundation details. See "MA-C" for material specifications.

Fabrication shall be in accordance with Item 686, "Traffic Signal Pole Assemblies (Steel)" and with the details, dimensions, and weld procedures shown herein. Weld references call for preapproved weld procedures which the Fabricator must obtain prior to fabrication. Materials, fabrication tolerances, and shipping practices shall meet the requirements of this sheet and Item 686, "Traffic Signal Pole Assemblies (Steel)".

Unless otherwise noted, all parts shall be galvanized in accordance with Item 445, "Galvanizing", after fabrication.

Deviation from the details and dimensions shown herein require submission of shop drawings in accordance with Item 441, "Steel Structures". Alternate designs are not acceptable.

5

1

SHEET 1 OF 3

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
SHEET NO. 213 OF 345
DWG NO. WS9-3109
CONTRACT NO. C-2033270-01

Texas Department of Transportation

TRAFFIC SIGNAL SUPPORT STRUCTURES

DUAL MAST ARM ASSEMBLY (80 MPH WIND ZONE)

DMA-80 (1)-12(DAL)

© TxDOT August 1995

REVISIONS	DN: MS	CK: JSY	DW: MAF	CK: JSY
5-96	CONT	SECT	JOB	HIGHWAY
1-12	#CONT	#SECT	#JOB	#HWY
	DIST	COUNTY		SHEET NO.
	18	#CNTY		

124A

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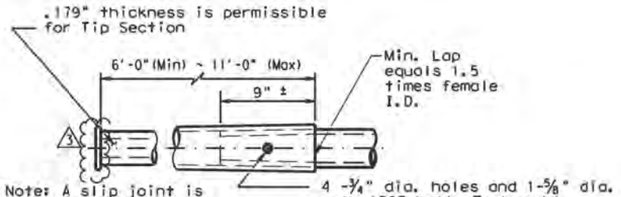


SLIP JOINT DETAIL

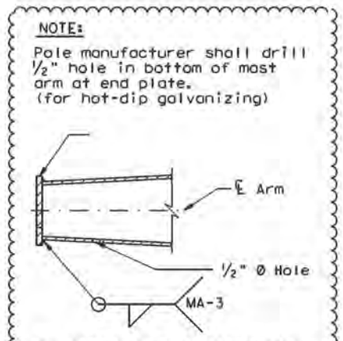


PLATE WELD DETAIL

△3

Stainless steel bands (or Cables) and cast bracket as in "Astro-Brac", "Sky Bracket" or "Easy Bracket" with 1 ½" Dia Threaded Coupling.

BRACKET ASSEMBLY

VIBRATION WARNING

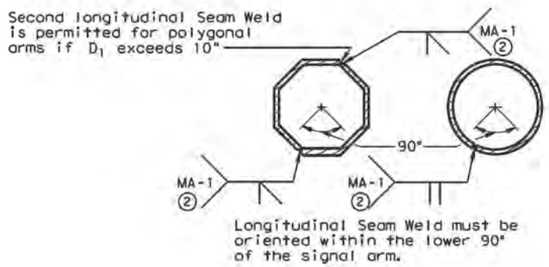
Mast Arms of SMA and DMA structures and clamp-on Arms of LMA structures of approximately 40 ft or longer are subject to harmonic vertical vibrations in light wind conditions due to the aeroelastic characteristics of a few of the myriads of possible combinations of the following: signal numbers, weights and positions; existence/solidity of backplates; presence of additional attachments to the arm, such as signs and cameras; arm-wind orientation; and arm-pole stiffness.

Such vibrations may cause fatigue damage to the structure and may lead to galloping in moderate wind conditions which may further damage the structure and alarm the public. Tests have indicated that when wind is blowing toward the back side of signal heads having un-vented backplates attached the probability of unacceptable harmonic vibration and/or galloping is rather high.

If backplates are not required for improved visibility they should not be applied to the signal heads or, if they must be applied, they should be vented as a first and inexpensive measure to mitigate vibrations.

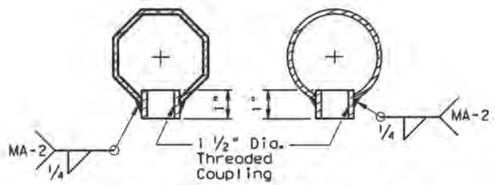
The traffic signal mast arms shall be visually inspected in 5 to 20 mph wind conditions after installation of signal heads and any attachments, including any required backpates. If vertical movements with a total excursion (maximum upward excursion to maximum downward excursion) of more than approximately 8" are observed at the arm tip, a damping plate shall be fitted to the arm. See "Damping Plate Mounting Details" on standard sheet, MA-DPD-10.

This visual inspection shall be repeated after each modification of the structure that could affect its aeroelastic response. Excessive vibrations shall not be allowed to continue for more than two days.



ARM WELD DETAIL

②60% Min. penetration 100% pemetration within 6" of circumferential base welds.



ARM COUPLING DETAILS

△3 REPLACED TENON DETAIL WITH PLATE WELD DETAIL (2/12).

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
SHEET NO. 214 OF 345
DWG NO. WS9-3110
CONTRACT NO. C-2033270-01

Texas Department of Transportation

TRAFFIC SIGNAL SUPPORT STRUCTURES

DUAL MAST ARM ASSEMBLY

(80 MPH WIND ZONE)

DMA-80 (2)-12(DAL)

©TxDOT August 1995

DN: MS	CK: JSY	DW: MAF	CK: JSY

REVISIONS
5-96
1-12

CONT	SECT	JOB	HIGHWAY
#CONT	#SECT	#JOB	#HWY
DIST	COUNTY		SHEET NO.
18	#CNTY		

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SHIPPING PARTS LIST

Ship each pole with the following attached: enlarged hand hole, pole cap, fixed arm connection bolts and washers and any additional hardware listed in the table.

Nominal Arm Length		30' Poles With Luminaire		24' Poles With ILSN		19' Poles With no Luminaire and no ILSN	
		See note above plus: one (or two if ILSN attached) small hand hole, clamp-on simplex		See note above plus one small hand hole		See note above	
LF	Lc						
ft.	ft.	Designation	Quantity	Designation	Quantity	Designation	Quantity
20	20	2020L-80		2020S-80		2020-80	
24	20	2420L-80		2420S-80		2420-80	
	24	2424L-80		2424S-80		2424-80	
28	20	2820L-80		2820S-80		2820-80	
	24	2824L-80		2824S-80		2824-80	
	28	2828L-80		2828S-80		2828-80	
32	20	3220L-80		3220S-80		3220-80	
	24	3224L-80		3224S-80		3224-80	
	28	3228L-80		3228S-80		3228-80	
	32	3232L-80		3232S-80		3232-80	
36	20	3620L-80		3620S-80		3620-80	
	24	3624L-80		3624S-80		3624-80	
	28	3628L-80		3628S-80		3628-80	
	32	3632L-80		3632S-80		3632-80	
	36	3636L-80		3636S-80		3636-80	
40	20	4020L-80		4020S-80		4020-80	
	24	4024L-80		4024S-80		4024-80	
	28	4028L-80		4028S-80		4028-80	
	32	4032L-80		4032S-80		4032-80	
	36	4036L-80		4036S-80		4036-80	
44	20	4420L-80		4420S-80		4420-80	
	24	4424L-80		4424S-80		4424-80	
	28	4428L-80		4428S-80		4428-80	
	32	4432L-80		4432S-80		4432-80	
	36	4436L-80		4436S-80		4436-80	

Traffic Signal Arms (Fixed Mount) (1 per pole) Ship each arm w/ the listed equipment attached

Nominal Arm Length	Type I Arm (1 Signal)		Type II Arm (2 Signals)		Type III Arm (3 Signals)	
	④ 1 Bracket Assembly		2 Bracket Assemblies		3 Bracket Assemblies	
ft.	Designation	Quantity	Designation	Quantity	Designation	Quantity
20	20I-80					
24	24I-80		24II-80			
28	28I-80		28II-80			
32			32II-80		32III-80	
36			36II-80		36III-80	
40			⑦ 40II-80		40III-80	
44					44III-80	

Traffic Signal Arms (Clamp-On Mount) (1 per pole) Ship each arm w/ the listed equipment attached

Nominal Arm Length	Type I Arm (1 Signal)		Type II Arm (2 Signals)		Type III Arm (3 Signals)	
	1 Bracket Assembly and 1 clamp w/bolts and washers		2 Bracket Assemblies and; 1 clamp w/bolts and washers		3 Bracket Assemblies and; 1 clamp w/bolts and washers ④	
ft.	Designation	Quantity	Designation	Quantity	Designation	Quantity
20	20I-80		20II-80			
24	24I-80		24II-80			
28	28I-80		28II-80			
32			32II-80		32III-80	
36			36II-80		36III-80	

Luminaire Arms (1 per 30' pole)

Nominal Arm Length	Quantity
8' Arm	

ILSN Arm (1 or 2 per pole) ship with clamps, bolts and washers

Nominal Arm Length	Quantity
7' Arm	
9' Arm	

Anchor Bolt Assemblies (1 per pole)

Anchor Bolt Diameter	Anchor Bolt Length	Quantity
1 1/2"	3'-4"	
1 3/4"	3'-10"	
2"	4'-3"	

Each anchor bolt assembly consists of the following: Top and Bottom templates, 4 anchor bolts, 8 nuts, 8 flat washers, and 4 nut anchor devices (Type 2) per Standard Drawing "TS-FD".

Templates may be removed for shipment.

ARMS		ROUND POLES					POLYGONAL POLES					Foundation Type
LF	Lc	D_B	D_{19}	D_{24}	D_{30}	③ thk	D_B	D_{19}	D_{24}	D_{30}	③ thk	
ft.	ft.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	
20	20	11.5	8.8	8.1	7.3	.179	12.5	9.5	8.7	7.8	.179	30-A
24	20	12.0	9.3	8.6	7.8	.179	13.0	10.0	9.2	8.3	.179	30-A
	24	12.0	9.3	8.6	7.8	.179	13.0	10.0	9.2	8.3	.239	30-A
28	20	12.5	9.8	9.1	8.3	.179	12.0	9.0	8.2	7.3	.239	30-A
	24	12.5	9.8	9.1	8.3	.179	12.0	9.0	8.2	7.3	.239	30-A
	28	13.0	10.3	9.6	8.8	.179	12.5	9.5	8.7	7.8	.239	30-A
32	20	13.0	10.3	9.6	8.8	.179	12.5	9.5	8.7	7.8	.239	30-A
	24	13.0	10.3	9.6	8.8	.179	12.5	9.5	8.7	7.8	.239	30-A
	28	12.0	9.3	8.6	7.8	.239	13.0	10.0	9.2	8.3	.239	30-A
	32	12.0	9.3	8.6	7.8	.239	13.5	10.5	9.7	8.8	.239	36-A
36	20	12.0	9.3	8.6	7.8	.239	13.5	10.5	9.7	8.8	.239	36-A
	24	12.0	9.3	8.6	7.8	.239	13.5	10.5	9.7	8.8	.239	36-A
	28	12.5	9.8	9.1	8.3	.239	13.5	10.5	9.7	8.8	.239	36-A
	32	12.5	9.8	9.1	8.3	.239	13.5	10.5	9.7	8.8	.239	36-A
	36	12.5	9.8	9.1	8.3	.239	14.0	11.0	10.2	9.3	.239	36-A
40	20	12.5	9.8	9.1	8.3	.239	14.0	11.0	10.2	9.3	.239	36-A
	24	12.5	9.8	9.1	8.3	.239	14.0	11.0	10.2	9.3	.239	36-A
	28	13.0	10.3	9.6	8.8	.239	14.0	11.0	10.2	9.3	.239	36-A
	32	13.0	10.3	9.6	8.8	.239	15.0	12.0	11.2	10.3	.239	36-A
	36	13.5	10.8	10.1	9.3	.239	15.0	12.0	11.2	10.3	.239	36-A
44	20	13.5	10.8	10.1	9.3	.239	15.0	12.0	11.2	10.3	.239	36-A
	24	13.5	10.8	10.1	9.3	.239	15.0	12.0	11.2	10.3	.239	36-A
	28	13.5	10.8	10.1	9.3	.239	15.0	12.0	11.2	10.3	.239	36-A
	32	14.0	11.3	10.6	9.8	.239	15.5	12.5	11.7	10.8	.239	36-B
	36	14.0	11.3	10.6	9.8	.239	15.5	12.5	11.7	10.8	.239	36-B

Arm LF or Lc	ROUND ARMS					POLYGONAL ARMS				
	L_1	D_1	D_2	③ thk	Rise	L_1	D_1	④ D_2	③ thk	Rise
ft.	ft.	in.	in.	in.		ft.	in.	in.	in.	
20	19.1	6.5	3.8	.179	1'-9"	19.1	7.0	3.5	.179	1'-8"
24	23.1	7.5	4.3	.179	1'-10"	23.1	7.5	3.5	.179	1'-9"
28	27.1	8.0	4.2	.179	1'-11"	27.1	8.0	3.5	.179	1'-10"
32	31.0	9.0	4.7	.179	2'-1"	31.0	9.0	3.5	.179	2'-0"
36	35.0	9.5	4.6	.179	2'-4"	35.0	10.0	3.5	.179	2'-1"
40	39.0	9.5	4.1	.239	2'-8"	39.0	9.5	3.5	.239	2'-3"
44	43.0	10.0	4.1	.239	2'-11"	43.0	10.0	3.5	.239	2'-6"

D_B = Pole Base O.D.
D_{19} = Pole Top O.D. with no Luminaire and no ILSN
D_{24} = Pole Top O.D. with ILSN w/out Luminaire
D_{30} = Pole Top O.D. with Luminaire

D_1 = Arm Base O.D.
D_2 = Arm End O.D.
L_1 = Shaft Length
L_F = Fixed Arm Length
L_C = Clamp-on Arm Length (36' Max)

③ Thickness shown are minimums, thicker materials may be used.

④ D_2 may be increased by up to 1.0" for polygonal arms.

④ REPLACED CGB CONNECTOR WITH BRACKET ASSEMBLY(2/12).

⑦ ADDITIONAL OPTION(2/12).

SHEET 3 OF 3

Texas Department of Transportation

TRAFFIC SIGNAL SUPPORT STRUCTURES

DUAL MAST ARM ASSEMBLY

(80 MPH WIND ZONE)

DMA-80 (3)-12(DAL)

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
SHEET NO. 215 OF 345
DWG NO. WS9-3111
CONTRACT NO. C-2033270-01

©TxDOT August 1995

REVISIONS	DN: MS	CK: JSY	DW: MAF	CK: JSY
5-96 1-12	CONT	SECT	JOB	HIGHWAY
	#CONT	#SECT	#JOB	#HWY
	DIST	COUNTY		SHEET NO.
	18	#CNTY		

124C

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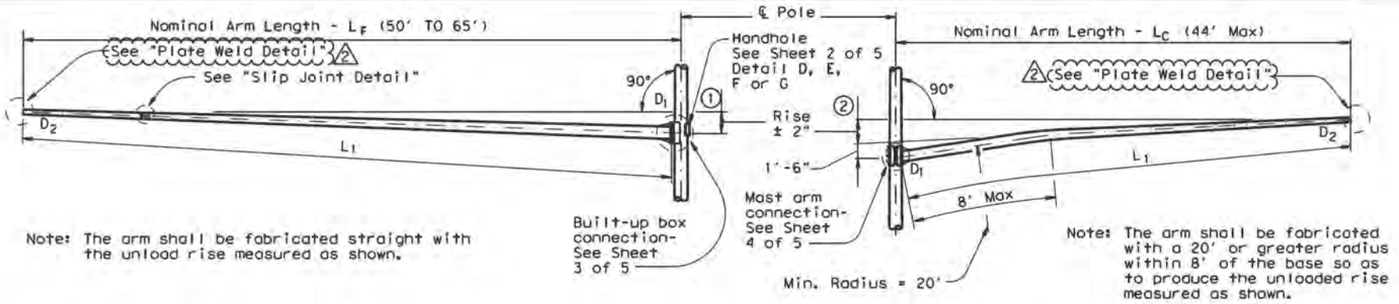


Note: The arm shall be fabricated straight with the unload rise measured as shown.

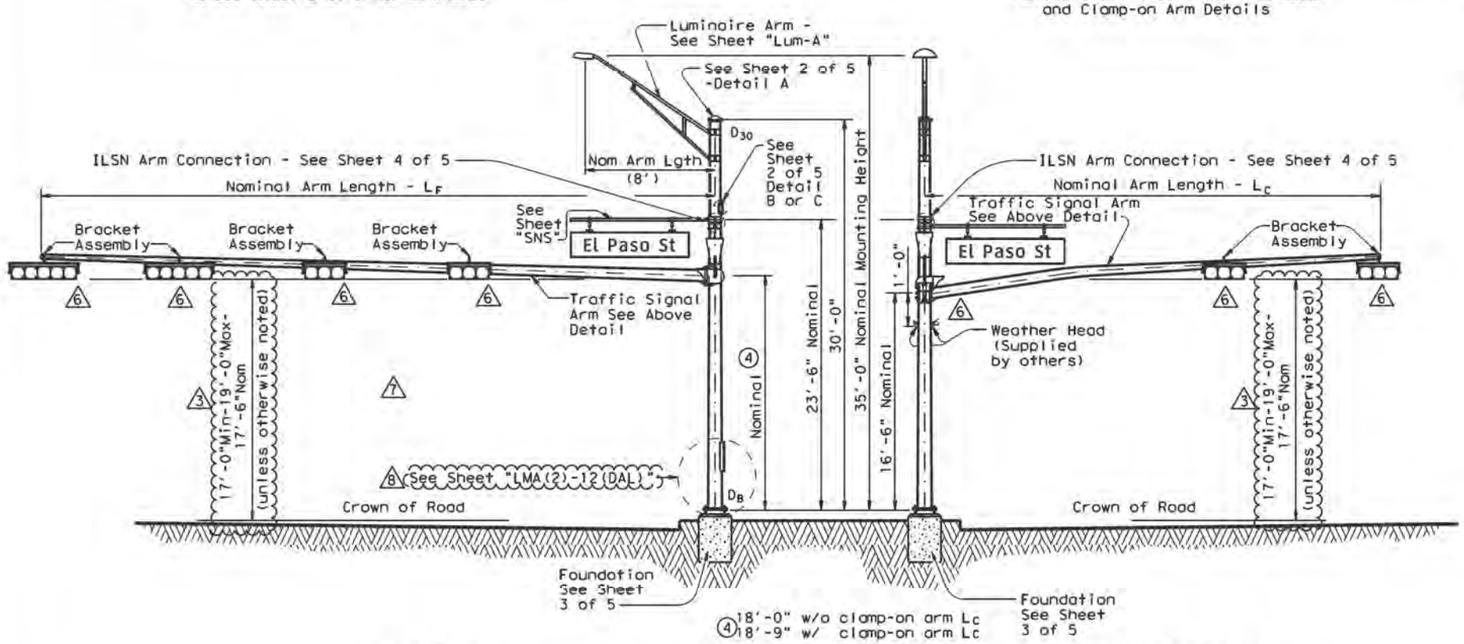
Note: The arm shall be fabricated with a 20' or greater radius within 8' of the base so as to produce the unloaded rise measured as shown.

FIXED MOUNT TRAFFIC SIGNAL ARM

1 See Sheet 3 of 5 for Arm Rise

CLAMP-ON TRAFFIC SIGNAL ARM (IF REQUIRED)

2 See Sheet 4 of 5 for Arm Rise and Clamp-on Arm Details



ELEVATION (Showing fixed mount arm)

STRUCTURE ASSEMBLY

ELEVATION (Showing clamp-on arm)

GENERAL NOTES:

Design conforms to 1994 AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals and Interim Specifications thereto. Design Wind Speed can be either 100 mph or 80 mph plus a 1.3 gust factor. If clamp-on traffic signal is required, designs are based on an arm included angle of 90 degrees or more. Angles of less than approximately 75 degrees will require a special design.

Poles are designed to support one 8'-0" luminaire arm, two 9'-0" internally lighted street name (ILSN) signs and two traffic signal arms with limited length combinations.

Each arm with its related attachment is shown below

Arm	Equivalent DL (5)	WL EPA (5)(6)
8' Luminaire Arm	Luminaire 60 lbs	1.6 sq ft
9' ILSN Arm	Sign 85 lbs	11.5 sq ft
50' to 65' Fixed Mount Arm	Signal Loads 310 lbs	52 sq ft
Up to 44' Clamp-on Arm	Signal Loads 180 lbs	32.4 sq ft

(5) Equivalent dead load plus horizontal wind load applied at the end of arm except ILSN arm, which applied 4.5' from the centerline of the pole.

(6) Effective projected area (actual area times drag coefficient) for the application of horizontal wind load.

4 Except as noted in Sheet 1 thru 5 of 5, other details not covered shall refer to Standard Sheet "LUM-A" for luminaire arm and connection details, "SNS" for internally lighted street name sign details, and "TS-FD" for anchor bolt and foundation details.

Fabrication shall be in accordance with Item 686, "Traffic Signal Pole Assemblies (Steel)" and with the details, dimensions, and weld procedures shown herein. Weld references call for preapproved weld procedures which the Fabricator must obtain prior to fabrication. Material, fabrication tolerances, and shipping practices shall also meet the requirements of this sheet and Item 686, "Traffic Signal Pole Assemblies (Steel)".

Unless otherwise noted, all parts shall be galvanized in accordance with Item 445, "Galvanizing" after fabrication.

Deviations from the details and dimensions shown herein require submission of shop drawings in accordance with the Item 441, "Steel Structures". Alternate designs are not acceptable.

Installation of damping plate for the long mast arm is not recommended.

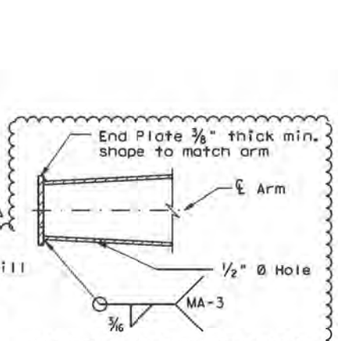
Provision of the bracket assembly used to support the traffic signal heads shall be under the direction of the Engineer for approval.

Design also conforms to NCHRP Report 412 for fatigue resistance except that there are no stiffeners at the base plate. TxDOT is conducting tests to determine if stiffeners at the base plate will or will not result in optimal performance; depending upon the results of the tests, poles may need a retrofit to ensure optimal fatigue performance.

MODIFICATIONS:

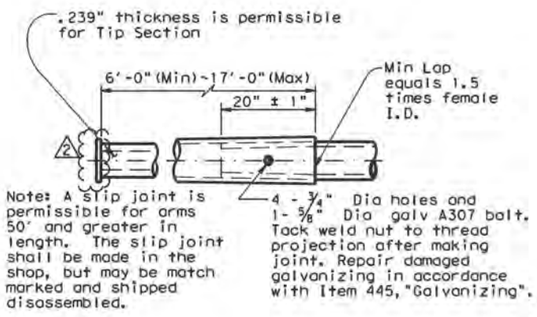
1. NOT USED
2. REPLACED TENON DETAIL WITH PLATE WELD DETAIL. (2/12)
3. REVISED MINIMUM SIGNAL HEIGHT. (3/12)
4. REMOVED "MA-D" REFERENCE. (2/12)
5. REMOVED TABLE OF DIMENSIONS "A". (2/12)
6. REMOVED CGB CONNECTORS. (2/12)
7. REMOVED THREADED COUPLING FOR CGB CONNECTOR. (2/12)
8. REVISED THE ELEVATION OF ACCESS COMPARTMENT. (3/12)

5



NOTE:
Pole manufacturer shall drill ½" hole in bottom of mast arm at end plate. (for hot-dip galvanizing)

PLATE WELD DETAIL



Note: A slip joint is permissible for arms 50' and greater in length. The slip joint shall be made in the shop, but may be match marked and shipped disassembled.

SLIP JOINT DETAIL (FIXED MOUNT ARM)

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
SHEET NO. 216 OF 345
DWG NO. WS9-3112
CONTRACT NO. C-2033270-01

Texas Department of Transportation

TRAFFIC SIGNAL SUPPORT STRUCTURES
LONG MAST ARM ASSEMBLY (50 TO 65 FT) (80 AND 100 MPH WIND ZONE) LMA(1)-12(DAL)

Sheet 1 of 5

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DW: JSY	CK: ARC	DW: TGG	CK: JSY
REVISIONS	CONT	SECT	JOB	HIGHWAY
4-20-01 1-12				
	DIST	COUNTY	SHEET NO.
	18		

131A

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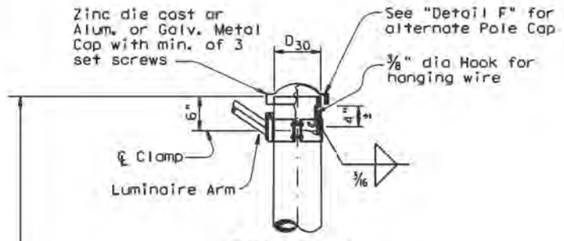
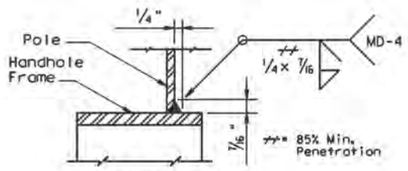
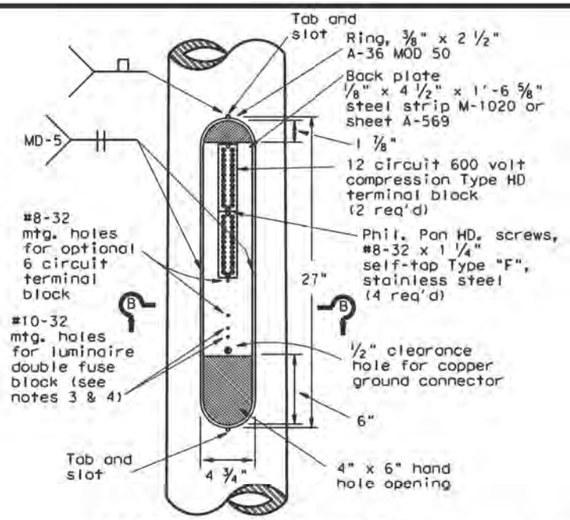


DETAIL A

(for pole with luminaire)



DETAIL H

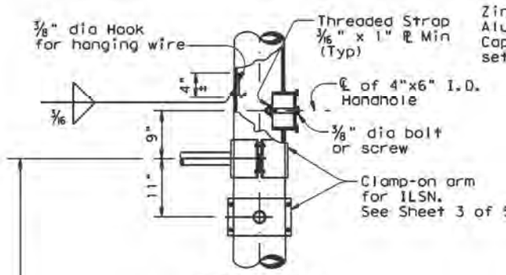


ACCESS COMPARTMENT

MATERIALS	
Round Shafts or Polygonal Shafts (7)	ASTM A595 Gr.A, A588, A1008 HSLAS Gr.50 Class 2, A1011 HSLAS Gr.50 Class 2, A572 Gr.50 or A1011 SS Gr.50 (8)
Plates (7)	ASTM A36, A588, or A572 Gr.50
Connection Bolts	ASTM A325, or A449 except where noted
Pin Bolts	ASTM A325
Pipe (7)	ASTM A53 Gr.B, A501, A1008 HSLAS-F Gr.50, A1011 HSLAS-F Gr.50
Misc. Hardware	Galvanized steel or stainless steel or as noted

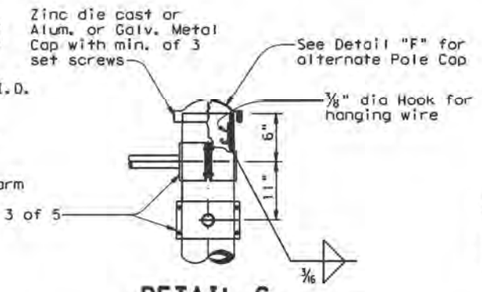
(7) ASTM A572, A1008 HSLAS, A1011 HSLAS, A1008 HSLAS-F, A1011 HSLAS-F, or A1011 SS may have higher yield strengths but shall not have less elongation than the grade indicated.

(8) ASTM A1011 SS Gr.50 shall also have a minimum elongation of 18 percent in 8 inches or 23 percent in 2 inches. Material thickness in excess of those stipulated under A1011 SS will be acceptable providing the material meets all other A1011 SS requirements and the requirements of this item.

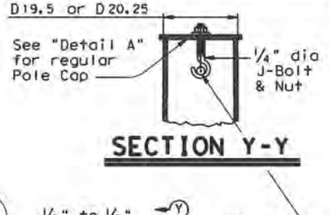


DETAIL B

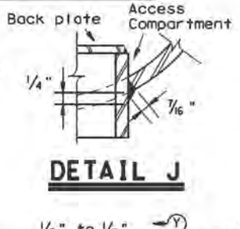
(If ILSN applied)



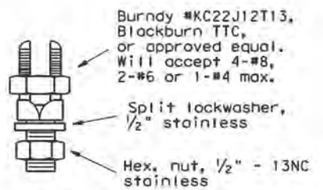
DETAIL C



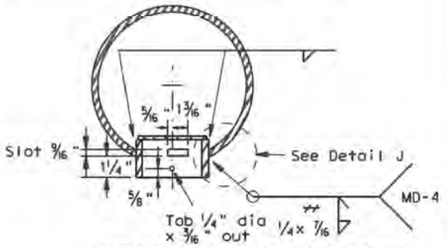
SECTION Y-Y



DETAIL J



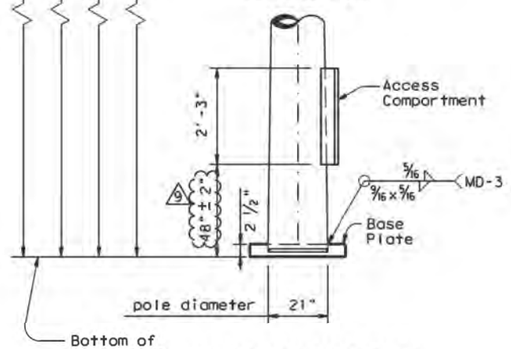
COPPER GROUND CONNECTOR



SECTION B-B

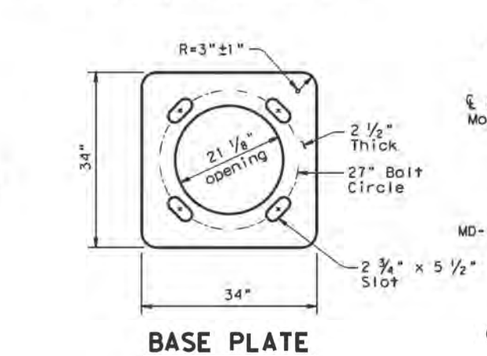
** 85% Min. Penetration

Opening for access compartment shall be no more than 1/16 inch wider than the access compartment itself.



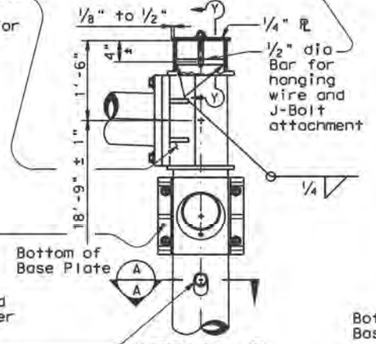
POLE ELEVATION

(for 30' pole with luminaire and ILSN sign)



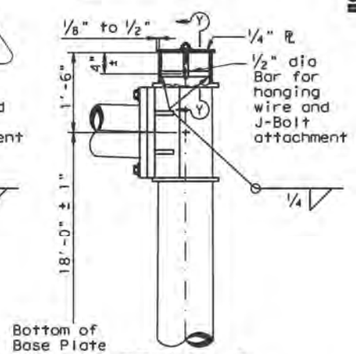
DETAIL E

(for 24' pole with ILSN sign and no luminaire, single or dual mast arm)



DETAIL F

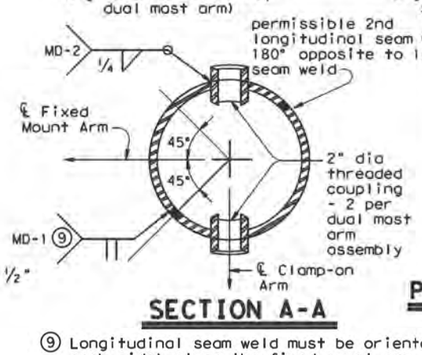
(for 20.25' pole with no ILSN sign and no luminaire, dual mast arm)



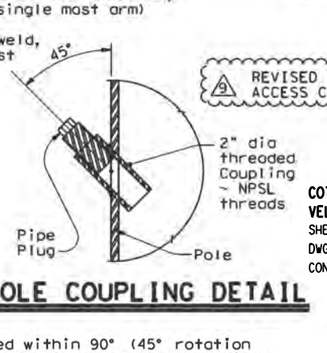
DETAIL G

(for 19.5' pole with no ILSN sign and no luminaire, single mast arm)

BASE PLATE



SECTION A-A



POLE COUPLING DETAIL

(9) Longitudinal seam weld must be oriented within 90° (45° rotation each side) along the fixed mount arm. 60% min penetration required, 100% penetration within 6" of circumferential base weld.

(9) REVISED THE ELEVATION OF ACCESS COMPARTMENT (2/12).

ACCESS COMPARTMENT NOTES:

1. The cover shall be one piece formed from ABS plastic, shall be a pearl gray color, and shall be suitable for exposure to harsh sunlight and extreme weather. Cover shall latch with two screw latches and shall fit tightly to the enclosure ring to create a rainproof seal. Latch screws shall be 1/4-20 stainless flat socket head screws with tamper proof feature.
2. The pole manufacturer shall provide with each pole a separate kit consisting of: one cover with two latching assemblies, two terminal strips (Marathon #985GP12CU or approved equal), four #8-32 x 1 1/4" self tapping type "F" stainless steel pan head screws, and one ground connector (Blackburn TTC, Burndy KC22J12T13, or Ilsco SSS-5). The traffic signal contractor shall install the kit items in the field.
3. The screw hole spacing on the enclosure back plate shall be for two Marathon #985GP12 terminal strips, one Marathon #985GP06CU terminal strip, and one Bussmann #BM6032B fuse block.
4. Install one Bussmann #BM6032B, Littelfuse #L60030M-2C, or Ferraz-Shawmut #30352 fuse block for poles where luminaires are to be installed.

Texas Department of Transportation

TRAFFIC SIGNAL SUPPORT STRUCTURES
LONG MAST ARM ASSEMBLY (50 TO 65 FT) (80 AND 100 MPH WIND ZONE)

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
SHEET NO. 217 OF 345
DWG NO. WS9-3113
CONTRACT NO. C-2033270-01

Sheet 2 of 5 LMA(2)-12(DAL)

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REVISIONS	DN: JSY	CK: ARC	DW: TGC	CK: JSY
4-20-01 1-12	CONT	SECT	JOB	HIGHWAY
	#CONT	#SECT	#JOB	#HWY
	DIST	COUNTY		SHEET NO.
	18	#CNTY		

131B

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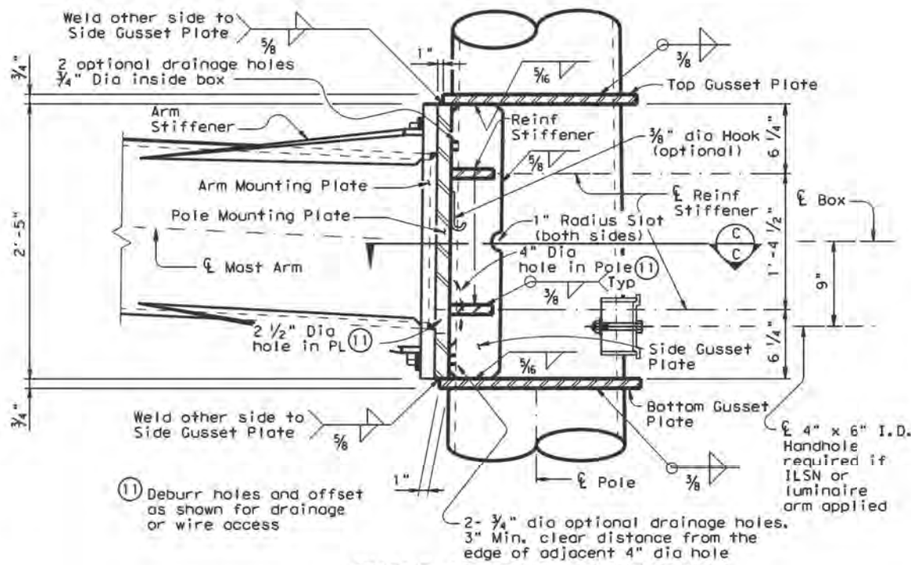
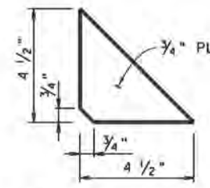
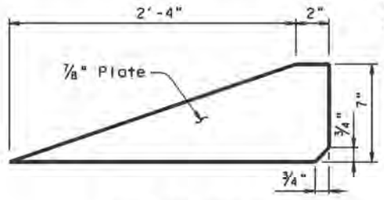


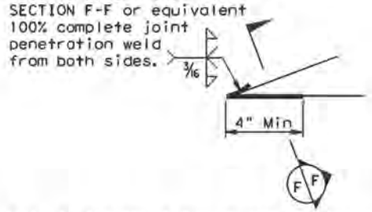
BUILT-UP BOX CONNECTION



REINFORCING STIFFENER

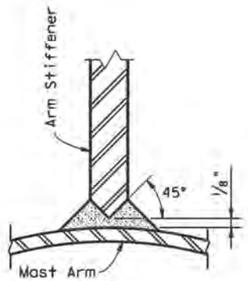


ARM STIFFENER
(Cut to match arm inclination and taper)



Only 4" length at tip of Arm Stiffener requires a complete joint penetration weld. Smooth weld radius to connect Stiffener. Only a fillet weld is required for the remaining weld length.

DETAIL "K"



SECTION F-F

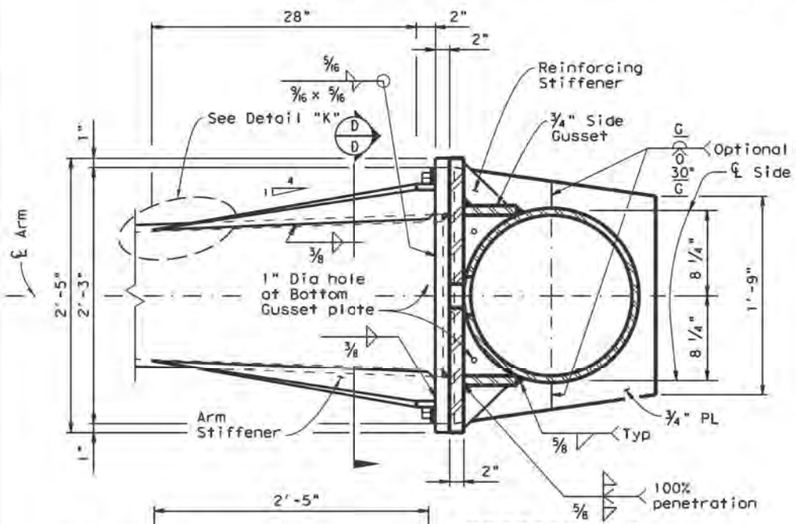
Fixed Mount Arm L_F	ROUND POLES (13)					Foundation Type
	D_B	$D_{19.5}$ or $D_{20.25}$	D_{24}	D_{30}	(12) thk	
ft.	in.	in.	in.	in.	in.	
50', 55' 60', 65'	21.0	18.2	17.6	16.8	.3125	48-A

Fixed Mount Arm L_F	ROUND ARMS (13)				
	L_1	D_1	D_2	(12) thk	Rise
ft.	ft.	in.	in.	in.	
50	49	18.5	11.7	.3125	3'- 3"
55	54	18.5	11.0	.3125	3'- 7"
60	59	18.5	10.3	.3125	3'-11"
65	64	18.5	9.6	.3125	4'- 4"

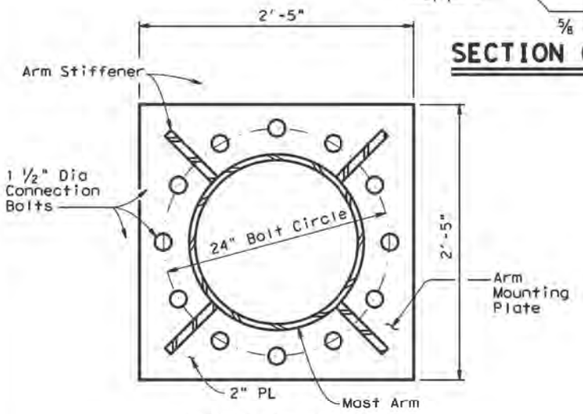
D_B = Pole Base O.D.
$D_{19.5}$ = Pole Top O.D. with no Luminaire and no ILSN (single mast arm)
$D_{20.25}$ = Pole Top O.D. with no Luminaire and no ILSN (dual mast arm)
D_{24} = Pole Top O.D. with ILSN w/out Luminaire
D_{30} = Pole Top O.D. with Luminaire
D_1 = Arm Base O.D.
D_2 = Arm End O.D.
L_1 = Shaft Length
L_F = Fixed Arm Length

(12) Thickness shown is minimum, thicker materials may be used.

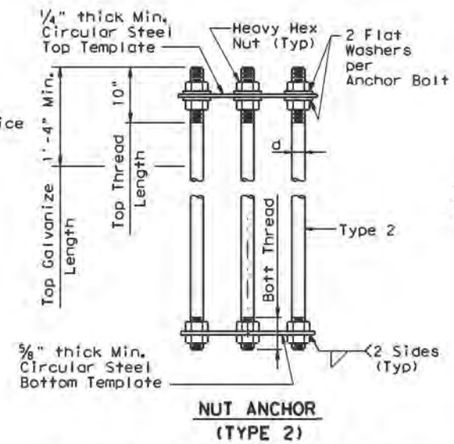
(13) Shaft profile 16-sided or 18-sided is considered to be equivalent to round section.



SECTION C-C

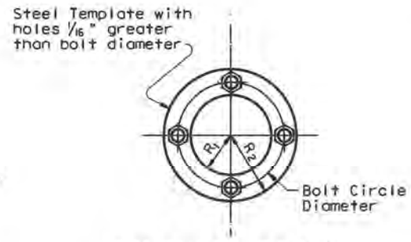


SECTION D-D



NUT ANCHOR
(TYPE 2)

ANCHOR BOLT ASSEMBLY



TEMPLATE DETAIL

ANCHOR BOLT & TEMPLATE SIZE						
Bolt Dia in.	Length ‡	Top Thread	Bottom Thread	Bolt Circle	R_2	R_1
2 1/2"	5'-2"	10"	6 1/2"	27"	16"	11"

‡ Min dimension given, longer bolts are acceptable.

FOUNDATION DESIGN TABLE													
FDN TYPE	DRILLED SHAFT DIA	REINFORCING STEEL		DRILLED SHAFT LENGTH-ft (16), (17), (18)			ANCHOR BOLT DESIGN (14)				FOUNDATION DESIGN LOAD (15)		TYPICAL APPLICATION
		VERT BARS	SPIRAL & PITCH	TEXAS CONE PENETROMETER N blows/ft			ANCHOR BOLT DIA	Fy (ksi)	BOLT CIR DIA	ANCHOR TYPE	MOMENT K-ft	SHEAR Kips	
				10	15	40							
48-A	48"	20 #9	#4 at 6"	21.9	19.5	14.7	2 1/2"	55	27"	2	490	10	50' to 65' Mast arm assembly.

SEE SHEET "TS-FD" FOR ADDITIONAL DETAILS.

(14) Anchor bolt design develops the foundation capacity given under Foundation Design Loads.

(15) Foundation Design Loads are the allowable moments and shears at the base of the structure.

(16) Field Penetrometer readings at a depth of approximately 3 to 5 feet may be used to adjust shaft lengths.

(17) If rock is encountered, the Drilled Shaft shall extend a minimum of two diameters into solid rock.

(18) Decimal lengths in Design Table are to allow interpolation for other penetrometer values. Round to nearest foot for entry into Summary Table.

GENERAL NOTES:

Built-up Box Connection: For the welded arm-to-pole connection as a build-up box configuration illustrated here is an example only, fabricators are required to submit a shop drawing of box connection for approval. The drawing shall specify the details of each box element, welds of arm-to-pole connection, arm-to-plate socket connection, and arm rise creation. Specify the proper location of drain holes along the pole. 2 1/2" dia hole in the pole mounting plate and 4" dia hole in the pole need to be aligned for wiring access or drainage. Arm stiffeners cut to match arm inclination and taper shall also be included.

The deviation from flat for either arm or pole mounting plate shall not exceed 1/32 in., which is measured along the center of mounting plate to a radial distance of 13.5 in. The deformed-from-flat connection between arm and pole mounting plates shall not be allowed if the center of both mounting plates cannot contact directly.

Fixed mount details are used for single mast arm assemblies and for the first arm on dual mast arm assemblies.

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
SHEET NO. 218 OF 345
DWG NO. WS9-3114
CONTRACT NO. C-2033270-01

Texas Department of Transportation

TRAFFIC SIGNAL SUPPORT STRUCTURES
LONG MAST ARM ASSEMBLY (50 TO 65 FT)
(80 AND 100 MPH WIND ZONE)

Sheet 3 of 5 LMA(3)-12

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REVISIONS	DWN JSY	CKD ARC	DWN TGC	CKD JSY
4-20-01 1-12	CONT	SECT	JOB	HIGHWAY
	#CONT	#SECT	#JOB	#HWY
	DIST	COUNTY		SHEET NO.
	18	#CNTY		

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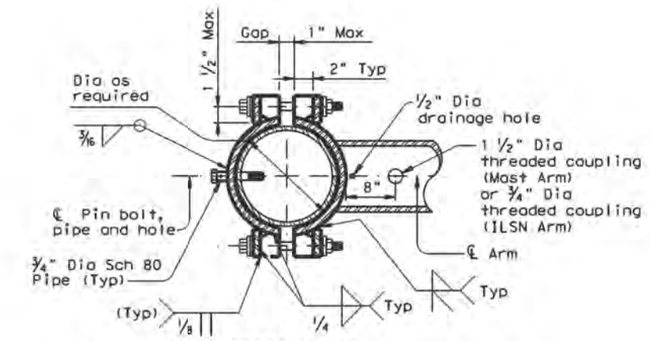


CLAMP-ON CONNECTION

80 MPH WIND

Clamp-on Arm LC	ROUND ARMS					POLYGONAL ARMS				
	L_1	D_1	D_2	thk (12)	Rise	L_1	D_1	D_2	thk (12)	Rise
ft.	ft.	in.	in.	in.		ft.	in.	in.	in.	
20	19.1	6.5	3.8	.179	1'-9"	19.1	7.0	3.5	.179	1'-8"
24	23.1	7.5	4.3	.179	1'-10"	23.1	7.5	3.5	.179	1'-9"
28	27.1	8.0	4.2	.179	1'-11"	27.1	8.0	3.5	.179	1'-10"
32	31.0	9.0	4.7	.179	2'-1"	31.0	9.0	3.5	.179	2'-0"
36	35.0	9.5	4.6	.179	2'-4"	35.0	10.0	3.5	.179	2'-1"
40	39.0	9.5	4.1	.239	2'-8"	39.0	9.5	3.5	.239	2'-3"
44	43.0	10.0	4.1	.239	2'-11"	43.0	10.0	3.5	.239	2'-6"

100 MPH WIND

Clamp-on Arm LC	ROUND ARMS					POLYGONAL ARMS				
	L_1	D_1	D_2	thk (12)	Rise	L_1	D_1	D_2	thk (12)	Rise
ft.	ft.	in.	in.	in.		ft.	in.	in.	in.	
20	19.1	8.0	5.3	.179	1'-8"	19.1	8.0	3.5	.179	1'-7"
24	23.1	9.0	5.8	.179	1'-9"	23.1	9.0	3.5	.179	1'-8"
28	27.1	9.5	5.7	.179	1'-10"	27.1	10.0	3.5	.179	1'-9"
32	31.0	9.5	5.2	.239	1'-11"	31.0	9.5	3.5	.239	1'-10"
36	35.0	10.0	5.1	.239	2'-0"	35.0	10.0	3.5	.239	1'-11"
40	39.0	10.5	5.1	.239	2'-3"	39.0	11.0	3.5	.239	2'-1"
44	43.0	11.0	5.1	.239	2'-8"	43.0	11.5	4.0	.239	2'-3"

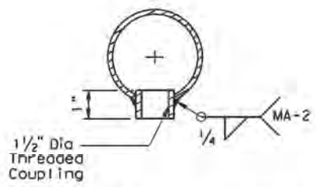
D_1 = Arm Base O.D.
D_2 = Arm End O.D.
L_1 = Shaft Length
LC = Clamp-on Arm Length

(12) Thickness shown is minimum, thicker materials may be used.

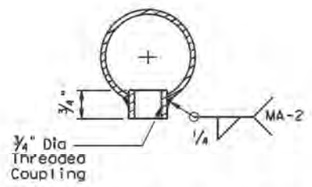
CLAMP-ON ARM CONNECTION

ILSN Arm Size		A	F	4 Conn. Bolts	5/8" Dia. Pin Bolts
Sch 40 pipe Dia	Thick			Dia	No.
in.	in.	in.	in.	in.	ea
3	.216	10	4	¾	2

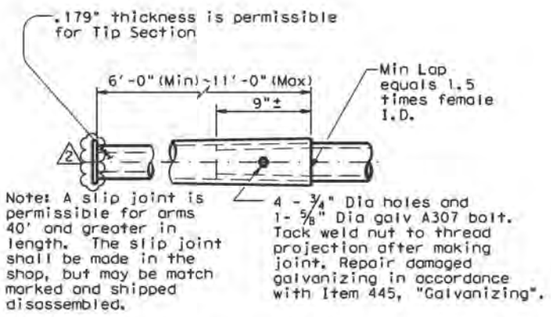
Mast Arm Size		A	F	4 Conn. Bolts	5/8" Dia. Pin Bolts
Base Dia	Thick			Dia	No.
in.	in.	in.	in.	in.	ea
6.5	.179	12	6	1	2
7.5	.179	14	8	1	2
8.0	.179	14	8	1	2
9.0	.179	16	10	1	2
9.5	.179	18	12	1 ¼	3
9.5	.239	18	12	1 ¼	3
10.0	.239	18	12	1 ¼	3
10.5	.239	18	12	1 ¼	3
11.0	.239	18	12	1 ¼	3
11.5	.239	18	12	1 ¼	3



ARM COUPLING DETAIL



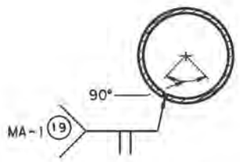
ILSN ARM COUPLING DETAIL



SLIP JOINT DETAIL (CLAMP-ON ARM)

Stainless steel bands (or Cables) and cast bracket as in "Astro-Brac", "Sky Bracket" or "Easy Bracket" with 1 ½" Dia Threaded Coupling.

BRACKET ASSEMBLY



ARM WELD DETAIL

(19) Longitudinal Seam Weld must be oriented within the lower 90° of the signal arm.
60% Min penetration
100% penetration within 6" of circumferential base welds.

GENERAL NOTES:

Clamp-on details are used for the second arm on dual mast arm assemblies or ILSN arm support. For a clamp-on mast arm, a maximum 1 ½" wide vertical slotted hole may be cut in the front clamp plate to facilitate drainage during galvanizing. The slot shall be centered behind the arm and shall be no longer than the arm diameter minus 1". For an ILSN arm, a 1 ½" diameter hole shall be cut in the front clamp plate for wire access. A matched hole shall be field drilled through the pole to provide wire access after arm is oriented. Deburr both holes.

Where duplicate parts occur on a detail, welds shown for part shall apply to all similar parts on the detail.

Pin bolts are required to prevent rotation of clamp-on arms under design wind forces. Pin bolts shall be ASTM A325 with threads excluded from the shear plane. Pin bolt and ¾" diameter pipe shall have 3/16" diameter holes for a ⅛" diameter galvanized cotter pin. Back clamp plate shall be furnished with a ¾" diameter hole for each pin bolt. An 11/16" diameter hole for each pin bolt shall be field drilled through the pole after arm orientations have been approved by the Engineer.

2 REPLACED TENON DETAIL WITH PLATE WELD DETAIL (2/12).

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
SHEET NO. 219 OF 345
DWG NO. WS9-3115
CONTRACT NO. C-2033270-01

Texas Department of Transportation

TRAFFIC SIGNAL SUPPORT STRUCTURES
LONG MAST ARM ASSEMBLY (50 TO 65 FT) (80 AND 100 MPH WIND ZONE)

Sheet 4 of 5 LMA(4)-12(DAL)

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DSN JK	CK1 GRB	DW FDN	CK2 CAL
CONT	SECT	JOB	HIGHWAY
%CONT	%SECT	%JOB	%HWY
DIST	COUNTY		SHEET NO.
18	%CNTY		

REVISIONS
4-20-01 1-12

131D

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Shipping Parts List

Ship each pole with the following attached: enlarged hand hole, pole cap, fixed arm connection bolts and washers, and any additional hardware listed in the table.

Nominal Arm Length	30' Poles with Luminaire: See note above plus: one (or two if ILSN attached) small hand hole, clamp-on simplex		24' Poles with ILSN: See note above plus one small hand hole		19.50' (Single Mast Arm) 20.25' (Dual Mast Arm) Poles with no Luminaire and no ILSN: See note above	
Single Mast Arm						
Lf ft.	Designation	Quantity	Designation	Quantity	Designation	Quantity
50	50L		50S		50	
55	55L		55S		55	
60	60L		60S		60	
65	65L	4	65S		65	
Dual Mast Arm						
Lf ft. / Lc ft.	Designation	Quantity	Designation	Quantity	Designation	Quantity
50 / 20	5020L		5020S		5020	
50 / 24	5024L		5024S		5024	
50 / 28	5028L		5028S		5028	
50 / 32	5032L		5032S		5032	
50 / 36	5036L		5036S		5036	
50 / 40	5040L		5040S		5040	
50 / 44	5044L		5044S		5044	
55 / 20	5520L		5520S		5520	
55 / 24	5524L		5524S		5524	
55 / 28	5528L		5528S		5528	
55 / 32	5532L		5532S		5532	
55 / 36	5536L		5536S		5536	
55 / 40	5540L		5540S		5540	
55 / 44	5544L		5544S		5544	
60 / 20	6020L		6020S		6020	
60 / 24	6024L		6024S		6024	
60 / 28	6028L		6028S		6028	
60 / 32	6032L		6032S		6032	
60 / 36	6036L		6036S		6036	
60 / 40	6040L		6040S		6040	
60 / 44	6044L		6044S		6044	
65 / 20	6520L		6520S		6520	
65 / 24	6524L		6524S		6524	
65 / 28	6528L		6528S		6528	
65 / 32	6532L		6532S		6532	
65 / 36	6536L		6536S		6536	
65 / 40	6540L		6540S		6540	
65 / 44	6544L		6544S		6544	

Foundation Summary Table **

Location Ident.	Avg. N Blow/ft.	No. Each	Drill Shaft *** Length (feet) 48-A
Total Drill Shaft Length			

Notes

** Foundations may be listed separately or grouped according to similarity of location and type. Quantities are for the Contractor's information only.

*** Decimal lengths in Design Table are to allow interpolation for other penetrometer values. Round to nearest foot for entry into Summary Table.

Shipping Parts List

Traffic Signal Arms (Fixed Mount) (1 per pole)
Ship each arm with listed equipment attached

Nominal Arm Length ft.	Type IV Arm (4 Signals) 1 4 Bracket Assemblies: Designation	Quantity
50	50IV	
55	55IV	
60	60IV	
65	65IV	4

Luminaire Arms (1 per 30' pole)

Nominal Arm Length	Quantity
8' Arm	4

ILSN Arm (Max. 2 per pole) Ship with clamps, bolts and washers

Nominal Arm Length	Quantity
7' Arm	
9' Arm	

Traffic Signal Arms (80 MPH Clamp-On Mount) (1 per pole) Ship each arm with listed equipment attached

Nominal Arm Length ft.	Type I Arm (1 Signal) 1 Bracket Assembly and 1clamp w/bolts and washers: Designation	Quantity	Type II Arm (2 Signals) 2 Bracket Assemblies and 1clamp w/bolts and washers: Designation	Quantity	Type III Arm (3 Signals) 3 Bracket Assemblies and 1clamp w/bolts and washers: Designation	Quantity
20	20I-80					
24	24I-80		24II-80			
28	28I-80		28II-80			
32			32II-80		32III-80	
36			36II-80		36III-80	
40					40III-80	
44					44III-80	

Traffic Signal Arms (100 MPH Clamp-On Mount) (1 per pole) Ship each arm with listed equipment attached

Nominal Arm ft.	Type I Arm (1 Signal) 1 Bracket Assembly and 1clamp w/bolts and washers: Designation	Quantity	Type II Arm (2 Signals) 2 Bracket Assemblies and 1clamp w/bolts and washers: Designation	Quantity	Type III Arm (3 Signals) 3 Bracket Assemblies and 1clamp w/bolts and washers: Designation	Quantity
20	20I-100					
24	24I-100		24II-100			
28	28I-100		28II-100			
32			32II-100		32III-100	
36			36II-100		36III-100	
40					40III-100	
44					44III-100	

Anchor Bolt Assemblies (1 per pole)

Anchor Bolt Diameter	Anchor Bolt Length	Quantity
2 1/2 "	5' - 3"	4

Each anchor bolt assembly consists of the following: Top and bottom templates, 4 anchor bolts, 8 nuts, 8 flat washers and 4 nut anchor devices (type 2) per Standard Drawing "TS-FD". Templates may be removed for shipment.

Abbreviations
Lf= Fixed Arm Length
Lc= Clamp-on Arm Length (44' Max.)

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
SHEET NO. 220 OF 345
DWG NO. WS9-3116
CONTRACT NO. C-2033270-01

1 REPLACED CGB CONNECTOR WITH BRACKET ASSEMBLY(2/12).

Texas Department of Transportation

LONG MAST ARM ASSEMBLY PARTS LIST

LMA(5)-12(DAL)

Sheet 5 of 5

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DSN JK	CK: GRB	DW: FDN	CK: CAL

REVISIONS
4-20-01
1-12

CONT	SECT	JOB	HIGHWAY
#CONT	#SECT	#JOB	#HWY
DIST	COUNTY		SHEET NO.
18	#CNTY		

131E

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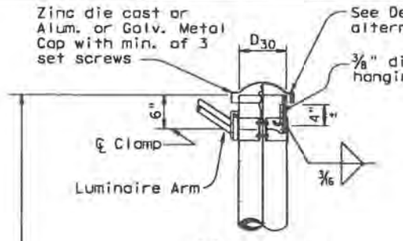
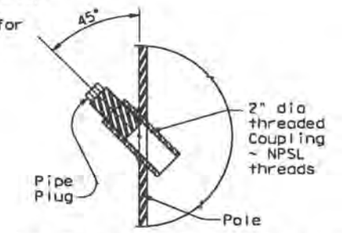
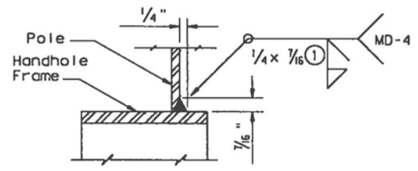


DETAIL A

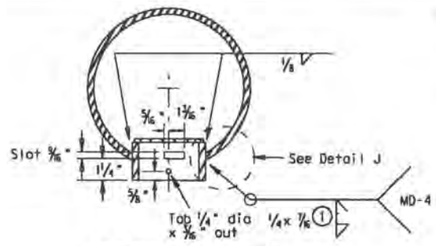
(for pole with luminaire)



POLE COUPLING DETAIL

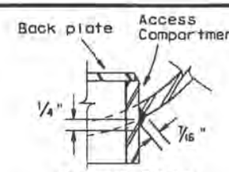


DETAIL G

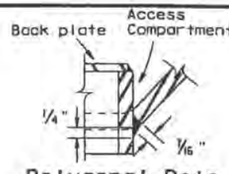


SECTION X-X

Opening for access compartment shall be no more than 1/16 inch wider than the access compartment itself.

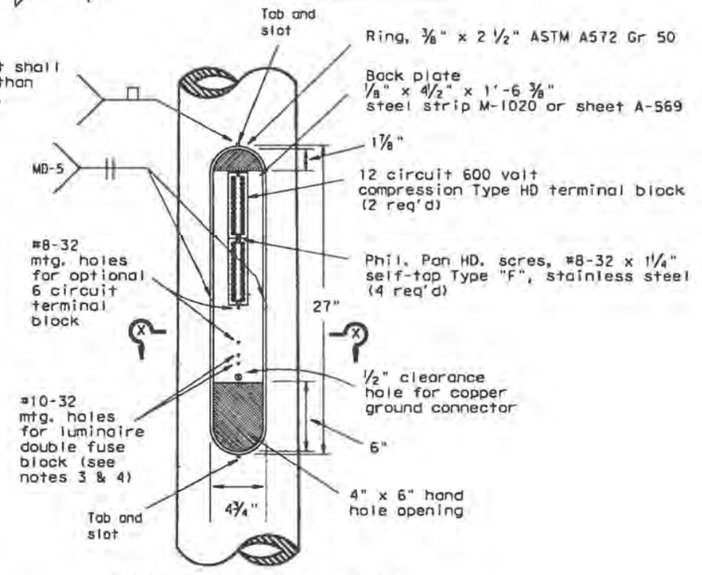


Round Pole

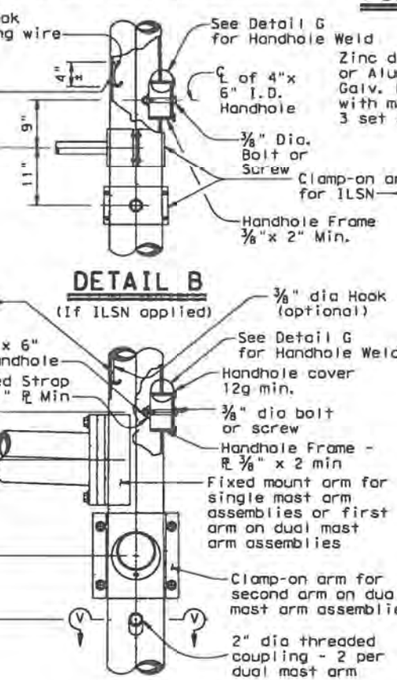


Polygonal Pole

DETAIL J

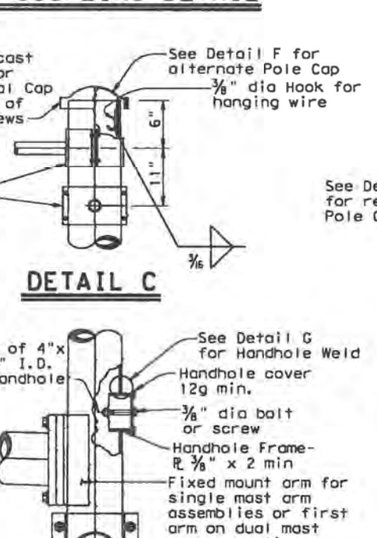


ACCESS COMPARTMENT

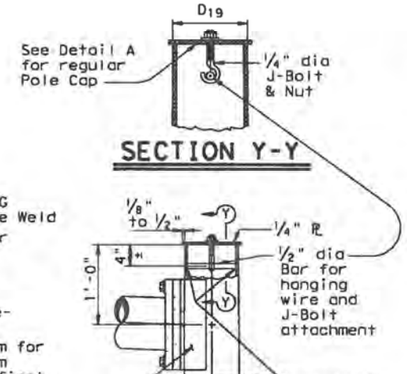


DETAIL B

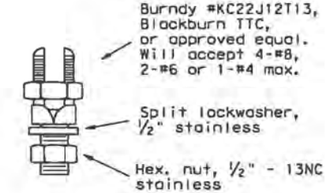
(If ILSN applied)



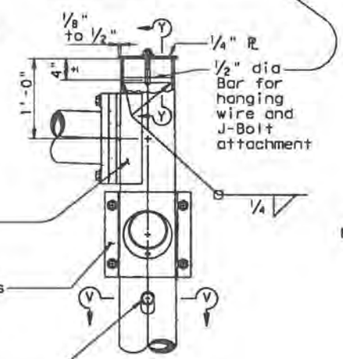
DETAIL C



SECTION Y-Y

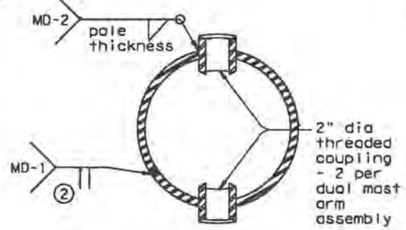


COPPER GROUND CONNECTOR

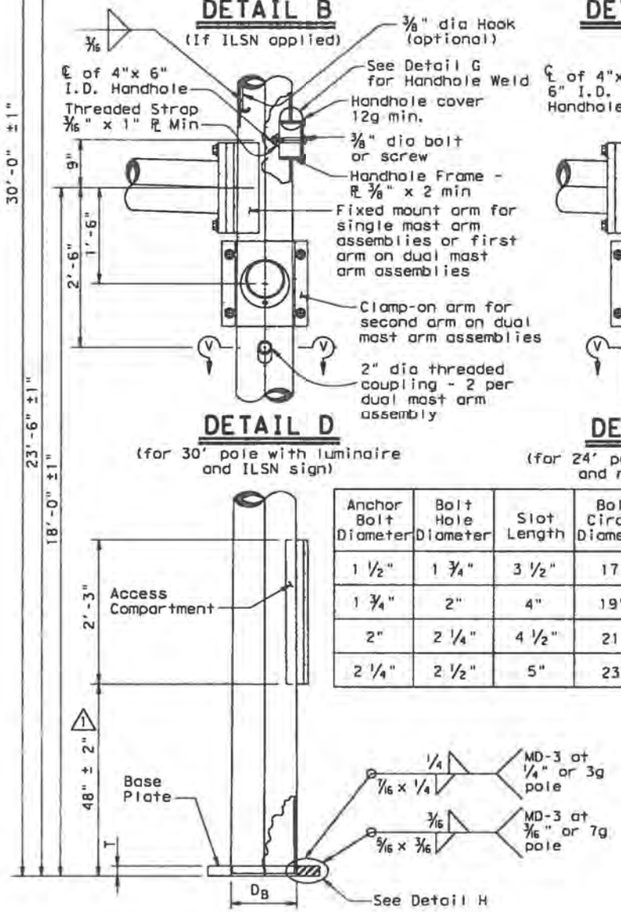


DETAIL F

(for 19' pole with no ILSN sign and no luminaire)



SECTION V-V

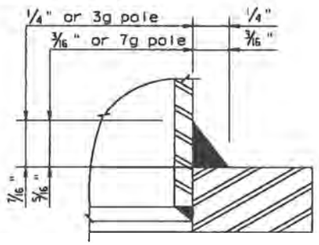


POLE ELEVATION

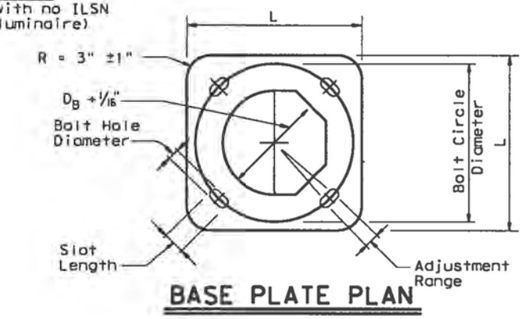
(for 30' pole with luminaire and ILSN sign)

(for 24' pole with ILSN sign and no luminaire)

Anchor Bolt Diameter	Bolt Hole Diameter	Slot Length	Bolt Circle Diameter	Base R Dim. L x T	Adjust. Range
1 ½"	1 ¾"	3 ½"	17"	18" x 1 ½"	13.4*
1 ¾"	2"	4"	19"	20" x 1 ¾"	13.5*
2"	2 ¼"	4 ½"	21"	22" x 2"	13.6*
2 ¼"	2 ½"	5"	23"	24" x 2 ¼"	13.7*



DETAIL H



BASE PLATE PLAN

NOTES:

1. The cover shall be one piece formed from ABS plastic, shall be a pearl gray color, and shall be suitable for exposure to harsh sunlight and extreme weather. Cover shall latch with two screw latches and shall fit tightly to the enclosure ring to create a rainproof seal. Latch screws shall be 1/4-20 stainless flat socket head screws with tamper proof feature.
2. The pole manufacturer shall provide with each pole a separate kit consisting of: one cover with two latching assemblies, two terminal strips (Marathon #985GP12CU or approved equal), four #8-32 x 1 ¼" self tapping type "F" stainless steel pan head screws, and one ground connector (Blackburn TTC, Burndy KC22J12T13, or Ilsco SSS-5). The traffic signal contractor shall install the kit items in the field.
3. The screw hole spacing on the enclosure back plate shall be for two Marathon #985GP12 terminal strips, one Marathon #985GP06CU terminal strip, and one Bussmann #BM6032B fuse block.
4. Install one Bussmann #BM6032B, Littelfuse #L60030M-2C, or Ferraz-Shawmut #30352 fuse block for poles where luminaires are to be installed.

① 85% Min. penetration

② 60% Min. penetration 100% pemetration within 6" of circumferential base welds.

⚠ REVISED THE ELEVATION OF ACCESS COMPARTMENT (2/12).

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
SHEET NO. 221 OF 345
DWG NO. WS9-3117
CONTRACT NO. C-2033270-01

Texas Department of Transportation

TRAFFIC SIGNAL SUPPORT STRUCTURES MAST ARM POLE DETAILS

MA-D-12(DAL)

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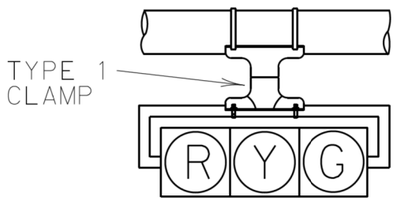
DN: MS	CK: JSY	DW: FDN	CK: CAL

REVISIONS
8-99
1-12

CONT	SECT	JOB	HIGHWAY
DIST	COUNTY		SHEET NO.
18			



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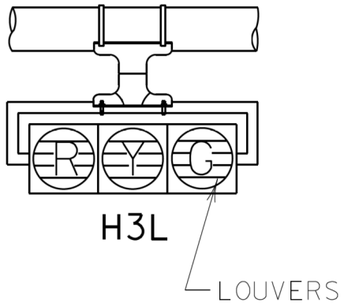

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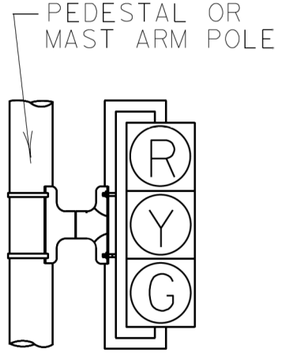

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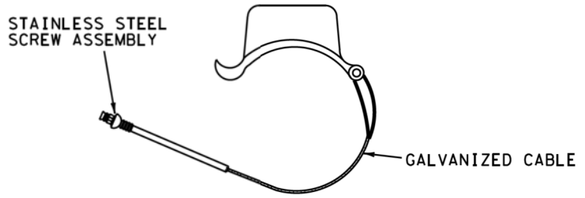
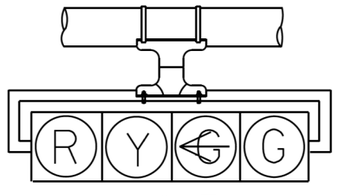


TYPE 1 AND 2 CLAMPS



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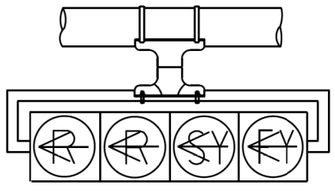

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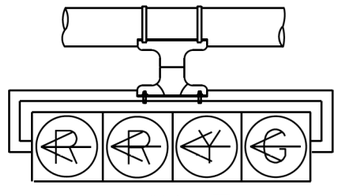
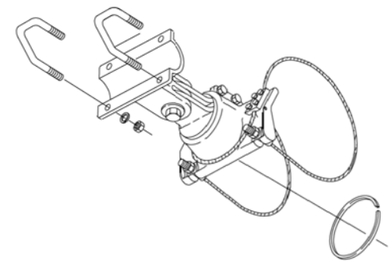


H4PLT

H5LT

H5FLT

V5RT



TYPE 2 CLAMP KIT

SHALL BE INSTALLED WHEN ROTATION ABOUT
THE HORIZONTAL AND VERTICAL AXES ARE NEEDED.

NOTES:

1. VEHICLE SIGNAL HEADS SHALL BE MOUNTED WITH TYPE 1 CLAMP AND APPROPRIATE TUBING.
2. ALL POLE MOUNTED VEHICLE HEADS SHALL BE INSTALLED ON THE AWAY-FROM-TRAFFIC SIDE OF THE PEDESTAL OR MAST ARM POLE.
3. THE SIGNAL HEADS SHOWN ARE NOT MEANT TO REFLECT ALL POSSIBLE SIGNAL HEADS, BUT ARE REPRESENTATIVE OF SIGNAL HEADS COMMONLY IN USE. SEE THE TRAFFIC SIGNAL LAYOUT FOR REQUIRED SIGNAL HEADS, AND THE NUMBER AND ORIENTATION OF LOUVERS.

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
SHEET NO. 222 OF 345
DWG NO. WS9-3119
CONTRACT NO. C-2033270-01

TRAFFIC SIGNAL HEAD DETAILS (DAL)

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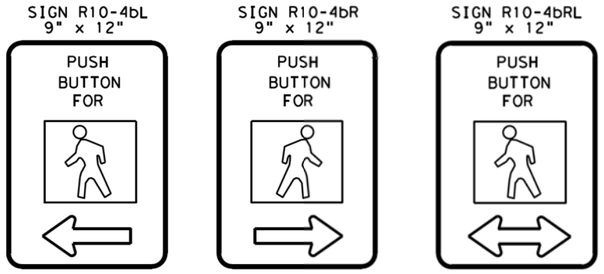
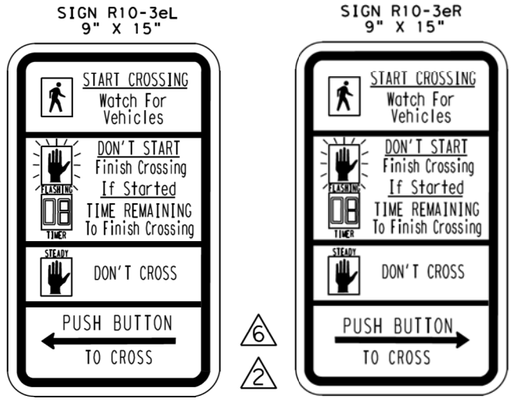
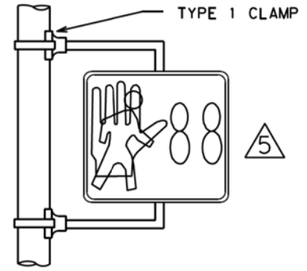
FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	(SEE TITLE SHEET)		101
STATE	STATE DIST.	COUNTY	
TEXAS	DALLAS	DENTON, ETC.	
CONT.	SECT.	JOB	HIGHWAY NO.
0081	03	081	US 377, ETC.



PEDESTRIAN PUSHBUTTON SIGN DETAILS

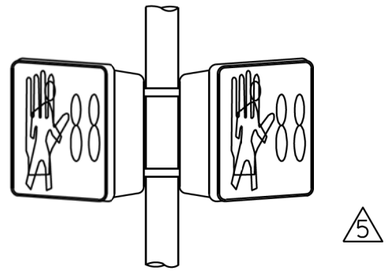


COUNTDOWN PEDESTRIAN PUSHBUTTON SIGN DETAILS



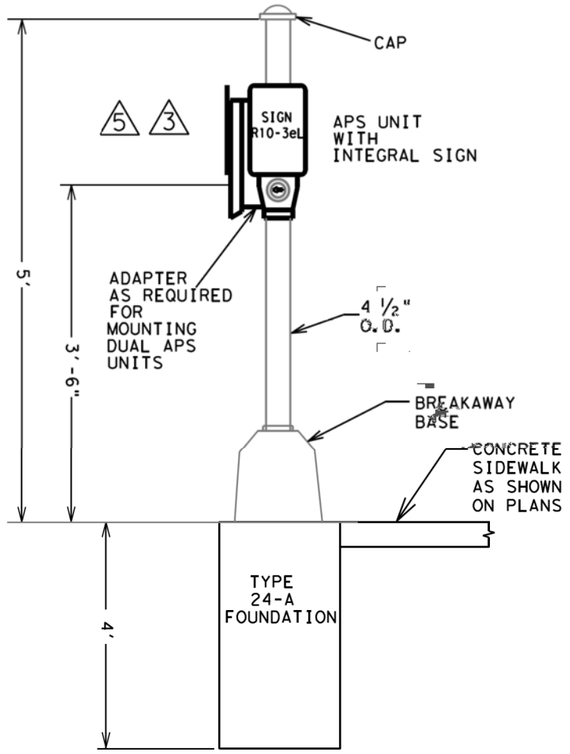
PEDESTRIAN SIGNAL HEAD MOUNTING FOR ONE PEDESTRIAN SIGNAL HEAD

152A

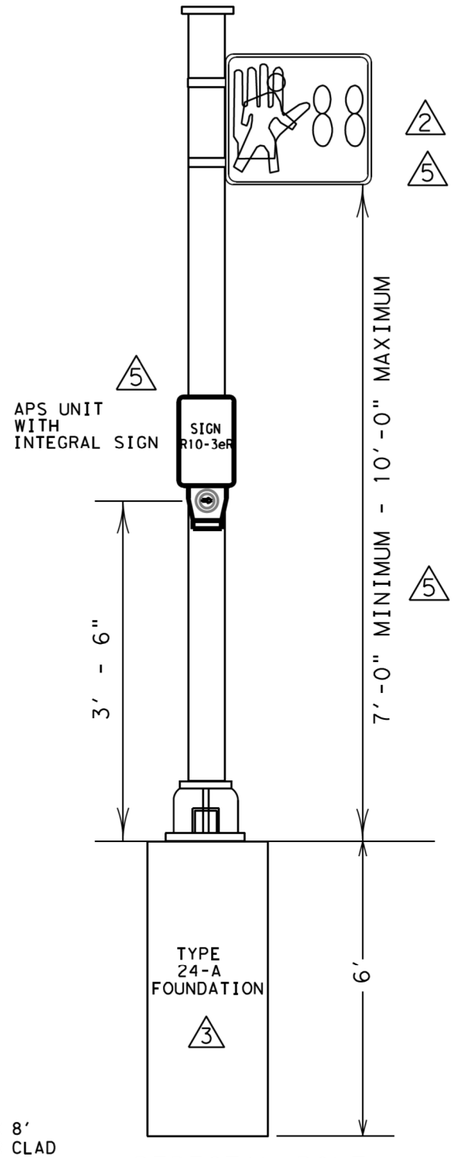


PEDESTRIAN SIGNAL HEAD MOUNTING FOR TWO PEDESTRIAN SIGNAL HEADS

143C



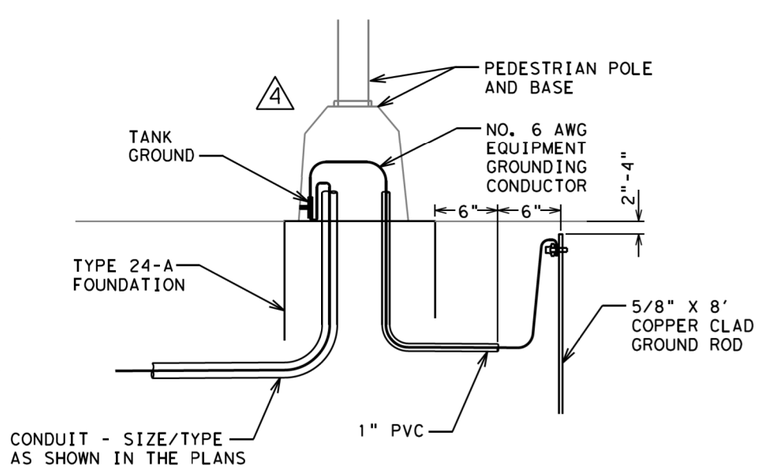
PEDESTRIAN PUSH BUTTON POLE



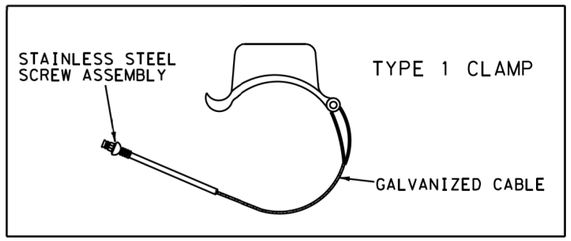
PEDESTAL POLE

NOTE:

THE POLES ON THIS DRAWING ARE SHOWN AS AN EXAMPLE ONLY. POLES OF SIMILAR DESIGN FOR ANY CROSS SECTION WHICH MEET THE SPECIFICATIONS AND REQUIREMENTS SHOWN ON THESE DRAWINGS AND ARE APPROVED BY THE ENGINEER WILL BE DEEMED ACCEPTABLE.



PEDESTRIAN PUSH BUTTON POLE GROUNDING DETAILS



1 NOTE: EITHER TYPE 1 CLAMPS OR CLAM SHELL MOUNTING HARDWARE MAY BE USED AS APPROVED BY THE ENGINEER. FOR CLAM SHELLS, USE ICC P/N 4805 OR McCAIN QUICKMOUNT OR APPROVED EQUAL.

5

1 ALTERNATIVE MOUNTING METHOD revised 12-92

2 ALTERNATIVE PEDESTRIAN SIGNAL HEAD AND SIGNING revised 10-08

3 PEDESTRIAN PUSH BUTTON POLE revised 01-11

4 PEDESTRIAN PUSH BUTTON POLE GROUNDING DETAILS revised 09-15

5 APS UNIT ADDED "SYMBOLS ONLY" PEDESTRIAN SIGNAL HEAD REMOVED MOUNTING HARDWARE NOTES REVISED MOUNTING HEIGHT REVISED revised 06-17

6 APS SIGN REVISED revised 11-20

NOTES:

5
1. ALL PEDESTRIAN SIGNAL HEADS SHALL BE INSTALLED ON THE AWAY-FROM-TRAFFIC SIDE OF THE PEDESTAL OR MAST ARM POLE.
2. ALL WIRING FOR PEDESTRIAN SIGNALS SHALL BE TOTALLY ENCLOSED WITHIN THE SIGNAL MOUNTING HARDWARE.
3. ALL PEDESTRIAN SIGNAL HEADS AND PUSH BUTTON SIGNS SHALL DISPLAY THE SYMBOLIZED MESSAGES SHOWN ABOVE.

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
SHEET NO. 223 OF 345
DWG NO. WS9-3120
CONTRACT NO. C-2033270-01

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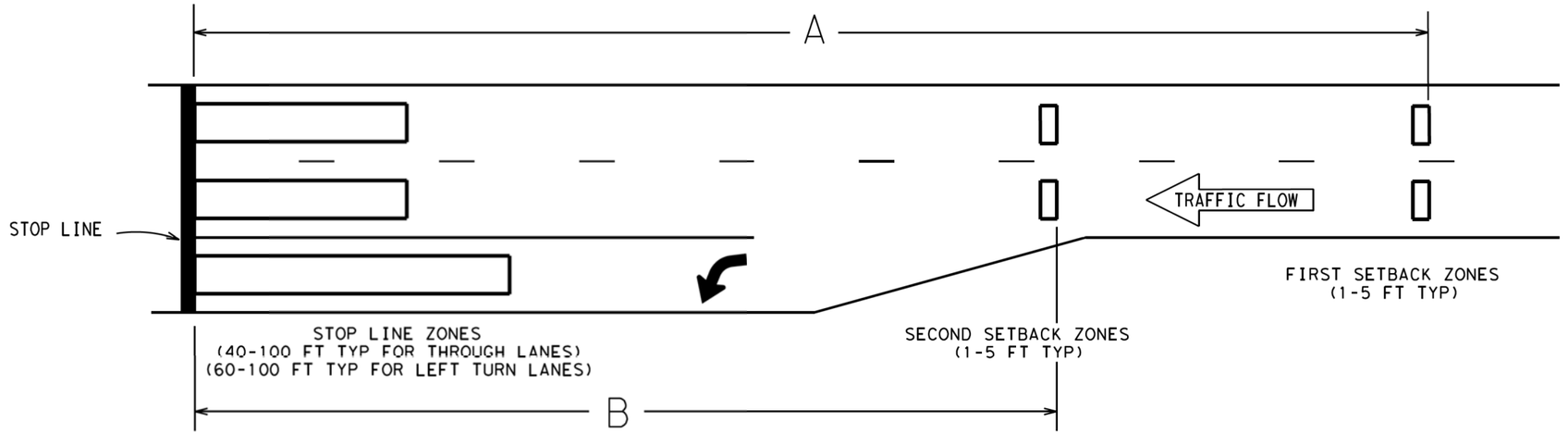
FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6	(SEE TITLE SHEET)		
STATE	STATE DIST.	COUNTY	
TEXAS	18	DENTON	
CONT.	SECT.	JOB	HIGHWAY NO.
1567	01	037	FM 720

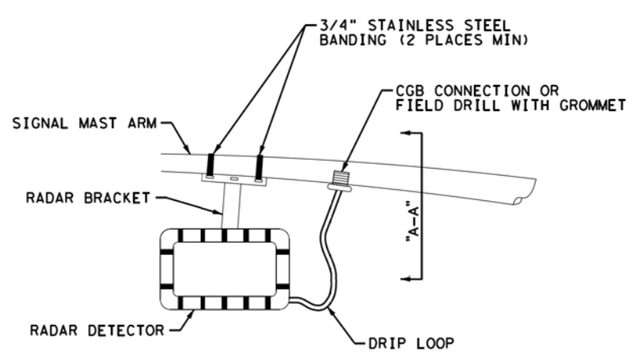
PEDESTRIAN SIGNAL HEAD DETAILS (DAL)

RADAR DETECTION ZONE LOCATIONS

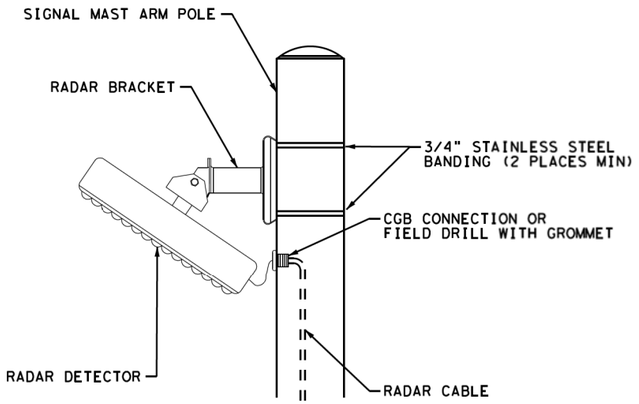


APPROACH SPEED LIMIT (MPH)	DISTANCE A (FT)	DISTANCE B (FT)	MINIMUM RANGE OF DETECTION (LF)
45	360	245	400
50	405	300	440
55	445	325	490
60	485	355	530
65	525	380	575
70	565	410	620

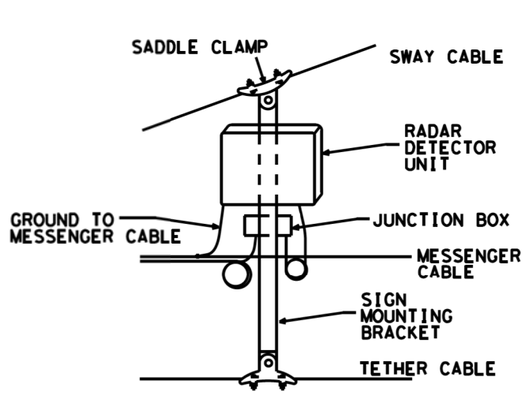
RADAR DETECTION INSTALLATION DETAILS



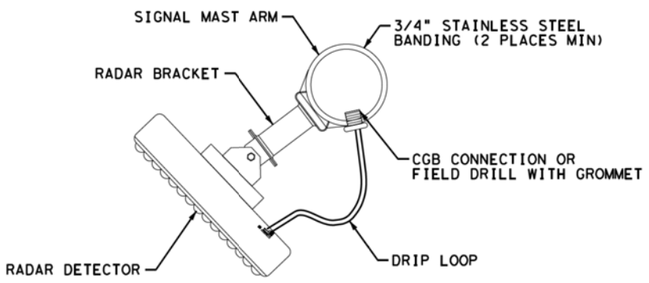
MAST ARM MOUNT



POLE MOUNT



SPAN WIRE MOUNT FOR ADVANCE RADAR



SECTION "A-A"

NOTES:

1. THE RADAR SENSOR MOUNTING BRACKET MUST BE ADJUSTABLE TO TILT UP, DOWN, LEFT, RIGHT, AND TO ROTATE.

2. THE RADAR DETECTOR UNITS SHOWN ARE NOT INTENDED TO REPRESENT ANY SPECIFIC BRAND OR PRODUCT, AND ALTERNATE MOUNTING METHODS MAY BE SUBMITTED FOR APPROVAL.

DALLAS DISTRICT STANDARD

Texas Department of Transportation
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RADAR VEHICLE DETECTION SYSTEM
RVDS-18 (DAL)

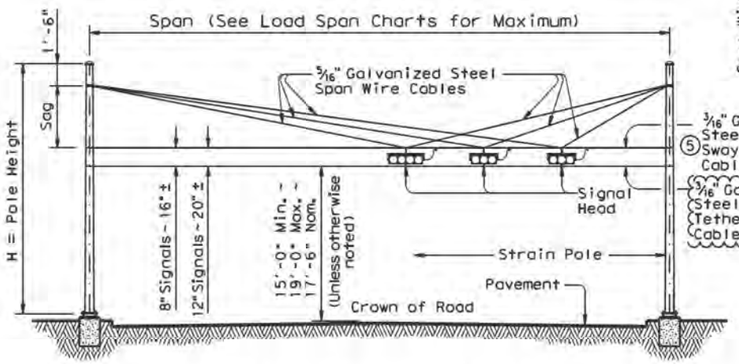
©TxDOT May 2018		DN: EF	CK: ---	DW: EF	CK: TRF-Aus.
REVISIONS	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.			HIGHWAY NO.
	6	(SEE TITLE SHEET)			$HWY
	STATE	DISTRICT	COUNTY		SHEET NO.
	TEXAS	18	$CNTY		
	CONTROL	SECTION	JOB		
	$CONT	$SECT	$JOB		

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
SHEET NO. 224 OF 345
DWG NO. WS9-3121
CONTRACT NO. C-203327C-01

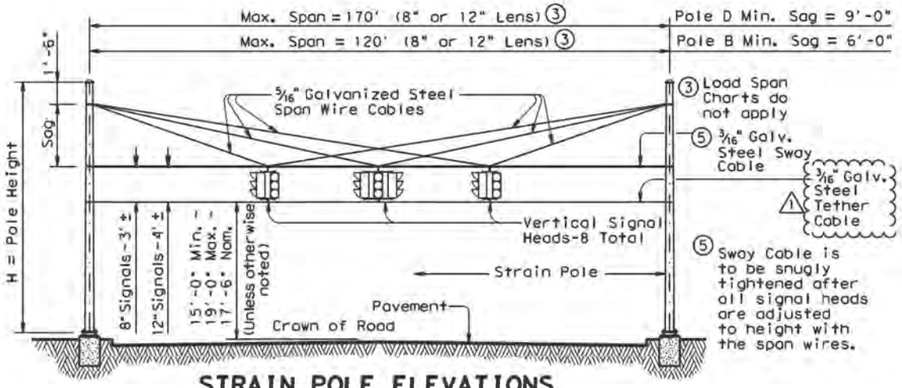
DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

STRAIN POLE DESCRIPTION	Pole Type	Foundation Type	Maximum Permissible Span Wire Load (lbs.)
26' Pole	A	36-A	5200
30' Pole	B	36-A	4600
30' Pole with Lum.	B	36-A	4400
30' Pole with 20' Mast Arm	C	36-B	5600
30' Pole with 24' Mast Arm	C	36-B	5500
30' Pole with 28' Mast Arm	C	36-B	5300
30' Pole with 32' Mast Arm	C	36-B	5100
30' Pole with 36' Mast Arm	C	36-B	4900
30' Pole with 20' Mast Arm & Lum.	C	36-B	5300
30' Pole with 24' Mast Arm & Lum.	C	36-B	5200
30' Pole with 28' Mast Arm & Lum.	C	36-B	5000
30' Pole with 32' Mast Arm & Lum.	C	36-B	4800
30' Pole with 36' Mast Arm & Lum.	C	36-B	4500
34' Pole	D	36-B	5600
34' Pole with Lum.	D	36-B	5400

② Numbers on Load Span Charts indicate the number of signal heads on the span. The total span wire design load is based on one 5-section head and one or more additional 3-section head(s). Design wind pressures on cables are assumed as 1.0 lb/ft. Weight of span wire cables (one per signal head) is assumed as 0.65 lb/ft which includes an allowance for conductor cables and miscellaneous hardware. The effect of the sway cable on load distribution is ignored as it is assumed to break at design wind conditions. When a pole supports 2 spans, the span wire design loads for both spans should be added vectorially to determine the design load for that pole.



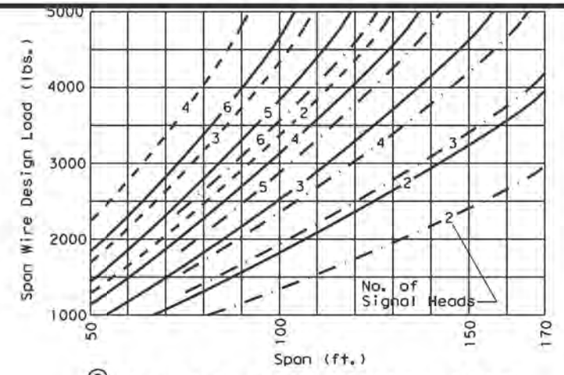
STRAIN POLE ELEVATIONS HORIZONTAL SIGNALS



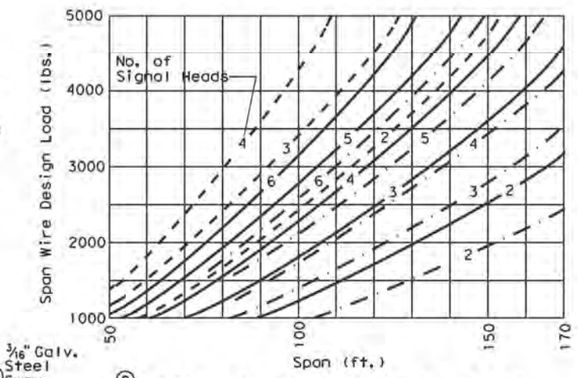
⑤ Sway Cable is to be snugly tightened after all signal heads are adjusted to height with the span wires.

STRAIN POLE ELEVATIONS VERTICAL SIGNALS

(Mast arms are not used with vertical signals)



② SIGNALS WITH 12-INCH LENS



② SIGNALS WITH 8-INCH LENS

Signal Head Type	Wt. Per Head	Wind Area ◆
5-Section, 12" Lens	125 lbs	9.6 sq. ft.
5-Section, 8" Lens	70 lbs	4.8 sq. ft.
3-Section, 12" Lens	75 lbs	5.64 sq. ft.
3-Section. 8" Lens	45 lbs	3.0 sq. ft.

◆ Effective projected design wind area (actual area times drag coefficient)

- - - - - - Sag = 4'-6" (26' or 30' Pole)
——— Sag = 8'-0" (30' or 34' Pole)
— · — · — Sag = 11'-6" (34' Pole)

SHIPPING PARTS LIST

Poles (Without Traffic Signal Arm)

Pole Type	Strain poles with Luminaire: Ship each pole with the following hardware attached: handhole at base, pole cap, 2 clamp-on simplex and 1 pipe plug.			Strain poles without Luminaire: Ship each pole with the following hardware attached: handhole at base, pole cap and 1 pipe plug.		
	Description	Designation	Quantity	Description	Designation	Quantity
A				26' Strain Pole	SP 26 A-80	
B	30' Strain Pole	SPL 30 B-80		30' Strain Pole	SP 30 B-80	
D	34' Strain Pole	SPL 34 D-80		34' Strain Pole	SP 34 D-80	

Poles (With Traffic Signal Arm)

Pole Type	Strain poles with Luminaire: Ship each pole with the following hardware attached: handhole at base, pole cap, clamp-on simplex and 3 pipe plugs.			Strain poles without Luminaire: Ship each pole with the following hardware attached: handhole at base, pole cap and 3 pipe plugs.		
	Description	Designation	Quantity	Description	Designation	Quantity
C	30' SPw/TS Arm	SPL 30 C-80		30' SPw/TS Arm	SP 30 C-80	

Traffic Signal Arms (For Type C poles)

Nominal Arm Length	Type I Arm (1 Signal): Ship each Type I Arm with the following hardware attached: 2 CGB Connectors, 1 clamp with bolts and washers		Type II Arm (2 Signals): Ship each Type II Arm with the following hardware attached: 1 Bracket Assembly ①, 3 CGB Connectors and 1 clamp with bolts and washers		Type III Arm (3 Signals): Ship each Type III Arm with the following hardware attached: 2 Bracket Assemblies ①, 4 CGB Connectors and 1 clamp with bolts and washers	
ft.	Designation	Quantity	Designation	Quantity	Designation	Quantity
20	20I-80					
24	24I-80		24 II -80			
28	28I-80		28 II -80			
32			32 II -80		32 III -80	
36			36 II -80		36 III -80	

Anchor Bolt Assemblies (1 per pole)

Anchor Bolt Diameter	Anchor Bolt Length	Templates may be removed for shipment. Quantity
1 3/4"	3'-10"	
2"	4'-3"	

Each Anchor Bolt Assembly consists of the following: Top and Bottom templates, 4 anchor bolts, 8 nuts, 8 flat washers, and 4 nut anchor devices (Type 2) per Standard Drawing "TS-FD".

Luminaire Arms

Nominal Arm Length	Quantity
8' Arm	

① See Sheet "DMA-80"

Pole Type	ROUND POLES D_B in.	D_T in.	(4)thk in.	H ft.	POLYGONAL POLES D_B in.	D_T in.	(4)thk in.	H ft.
A	12.5	8.9	.239	26	13.0	9.0	.239	26
B	13.5	9.3	.239	30	14.0	9.0	.239	30
C	15.5	11.3	.239	30	16.0	11.0	.239	30
D	15.5	10.7	.239	34	16.0	11.0	.239	34

④ Thickness shown are minimum, thicker materials may be used.

D_B = Pole Base O.D. D_T = Pole Top O.D. H = Pole Height

MODIFICATIONS:

⚠1 ADDED BOTTOM STEEL TETHER CABLE. (2/12)

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
SHEET NO. 225 OF 345
DWG NO. WS9-3125
CONTRACT NO. C-2033270-01

SHEET 1 OF 2

Texas Department of Transportation

TRAFFIC SIGNAL SUPPORT STRUCTURES STRAIN POLE ASSEMBLIES

(80 MPH WIND ZONE)

SP-80(1)-12(DAL)

©TxDOT March 1996

REVISIONS	DN: MS	CK: JSY	DW: BR	CK: JSY
6-96	CONT	SECT	JOB	HIGHWAY
1-12	#CONT	#SECT	#JOB	#HWY
	DIST	COUNTY		SHEET NO.
	18	#CNTY		

120A

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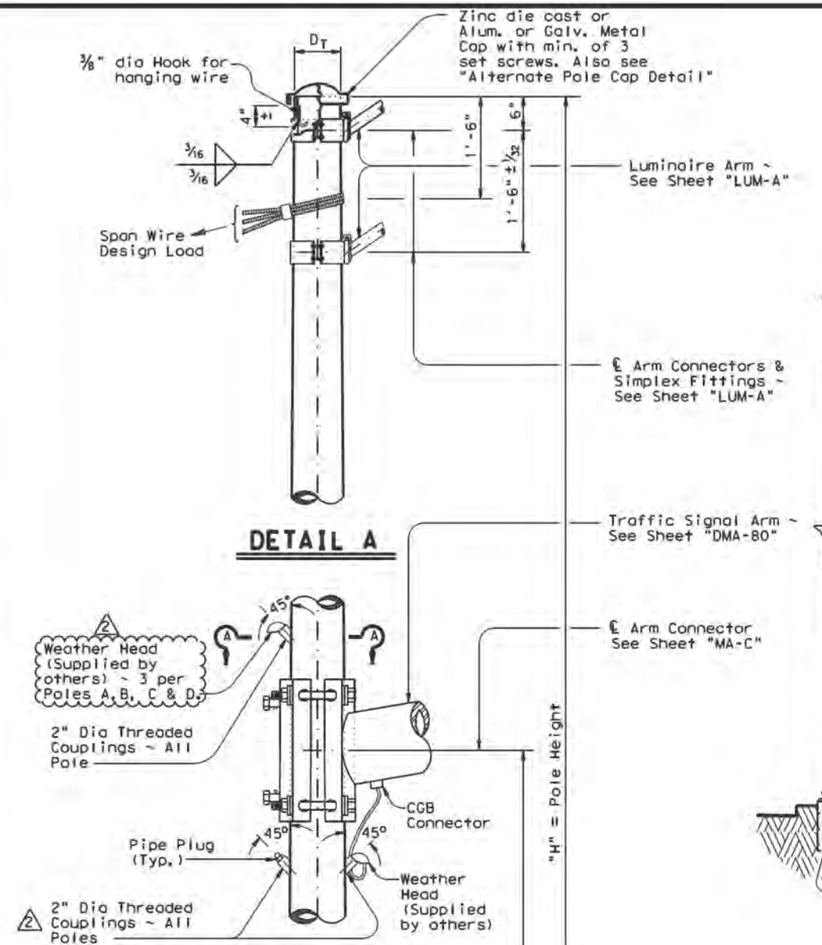
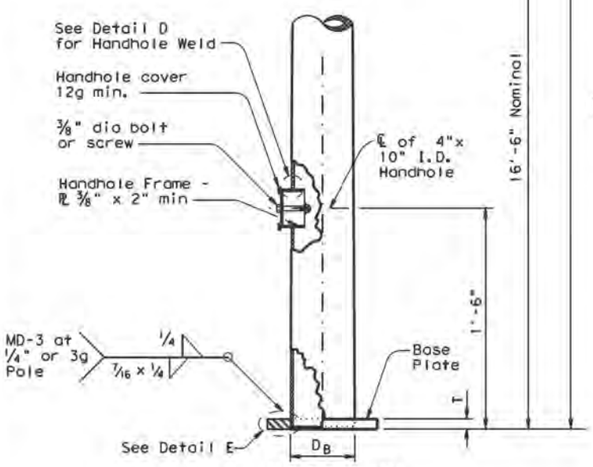


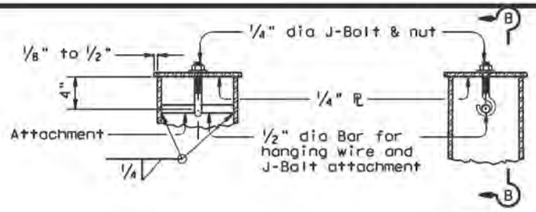
DETAIL A

DETAIL B



DETAIL C

POLE ELEVATION



SECTION B-B

ALTERNATE POLE CAP DETAIL

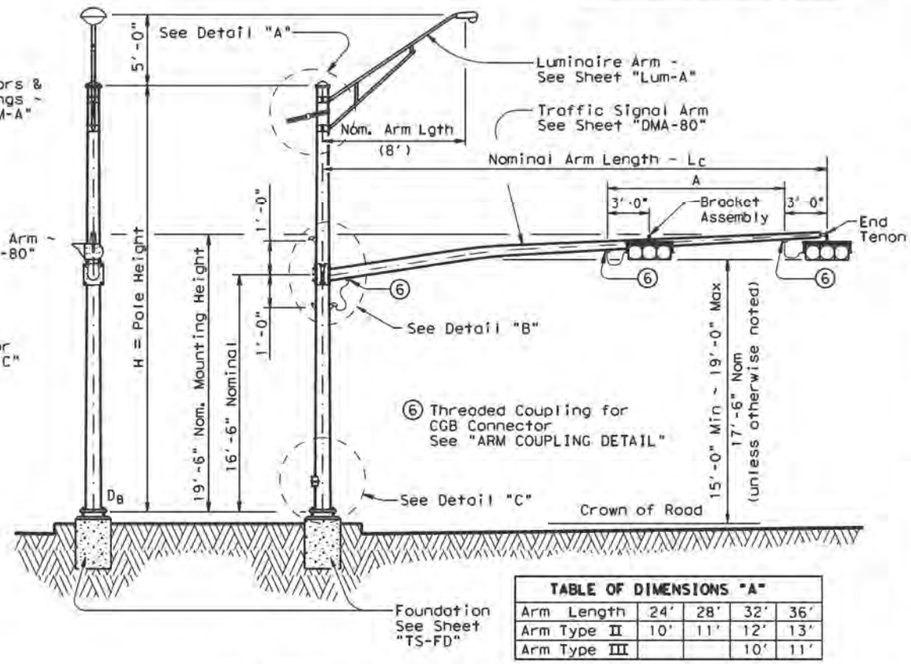
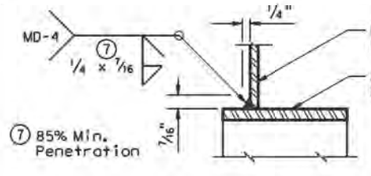
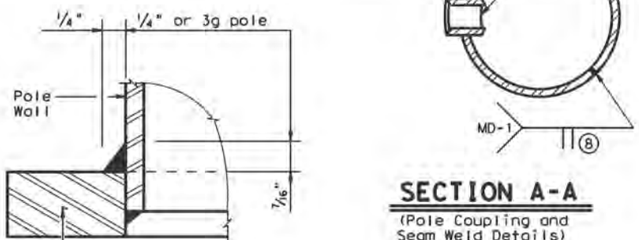


TABLE OF DIMENSIONS "A"				
Arm Length	24'	28'	32'	36'
Arm Type II	10'	11'	12'	13'
Arm Type III			10'	11'

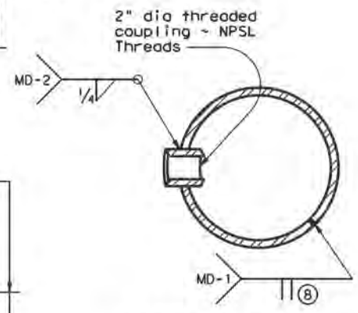
STRUCTURE ASSEMBLY



DETAIL D



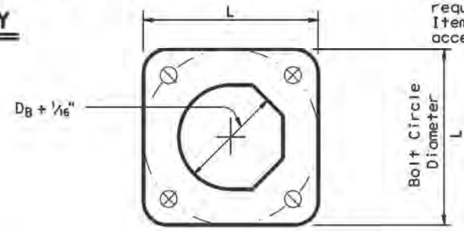
DETAIL E



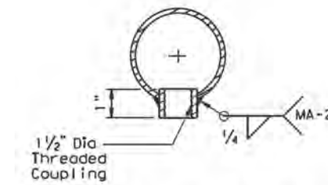
SECTION A-A

(Pole Coupling and Seam Weld Details)

⑧ 60% Min. penetration, except 100% penetration within 6" of circumferential base welds.



BASE PLATE PLAN



ARM COUPLING DETAIL

MATERIALS	
Round Shafts or Polygonal Shafts ⑨	ASTM A595 Gr.A, A588, A1008 HSLAS Gr.50 Class 2, A1011 HSLAS Gr.50 Class 2, A572 Gr.50 or A1011 SS Gr.50 ⑩
Plates ⑨	ASTM A36, A588, or A572 Gr.50
Connection Bolts	ASTM A325 except where noted
Pin Bolts	ASTM A325
Pipe ⑨	ASTM A53 Gr.B, A501, A1008 HSLAS-F Gr.50, A1011 HSLAS-F Gr.50
Steel Cable	ASTM A475, 7 Wire Utilities Grade
Misc. Hardware	Galvanized steel or stainless steel or as noted

⑨ ASTM A572, A1008 HSLAS, A1011 HSLAS, A1008 HSLAS-F, A1011 HSLAS-F, or A1011 SS may have higher yield strengths but shall not have less elongation than the grade indicated.

⑩ ASTM A1011 SS Gr.50 shall also have a minimum elongation of 18 percent in 8 inches or 23 percent in 2 inches. Material thickness in excess of those stipulated under A1011 SS will be acceptable providing the material meets all other A1011 SS requirements and the requirements of this item.

GENERAL NOTES

Design conforms to 1994 AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals and Interim Specifications thereto. Design Wind Speed equals 80 mph plus a 1.3 gust factor. The maximum permissible span wire design loads tabulated are calculated at a stress load of 1.4 times the basic allowable stress. A simultaneous wind on the pole, mast arm, and luminaire is also included.

See standard sheet "DMA-80" for details of clamp-on traffic signal arms, sheet "MA-C" for traffic signal arm connection details, sheet "LUM-A" for luminaire arm and connection details, and sheet "TS-FD" for anchor bolt and foundation details.

Fabrication shall be in accordance with Item 686, "Traffic Signal Pole Assemblies (Steel)" and with the details, dimensions, and weld procedures shown herein. Weld references call for preapproved weld procedures which the Fabricator must obtain prior to fabrication. Materials, fabrication tolerances, and shipping practices shall meet the requirements of this sheet and Item 686, "Traffic Signal Pole Assemblies (Steel)".

Unless otherwise noted, all parts shall be galvanized in accordance with Item 445, "Galvanizing", after fabrication.

Deviation from the details and dimensions shown herein require submission of shop drawings in accordance with Item 441, "Steel Structures". Alternate designs are not acceptable.

Foundation Type	Anchor Bolt Diameter	Bolt Hole Diameter	Bolt Circle Diameter	Base ℄ Dim. L x T
36-A	1 3/4"	2"	19"	19" x 1 3/4"
36-B	2"	2 1/4"	21"	21" x 2"

Texas Department of Transportation

TRAFFIC SIGNAL SUPPORT STRUCTURES STRAIN POLE ASSEMBLIES

(80 MPH WIND ZONE)

SP-80(2)-12(DAL)

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
SHEET NO. 226 OF 345
DWG NO. WS9-3126
CONTRACT NO. C-2033270-01

©TxDOT March 1996

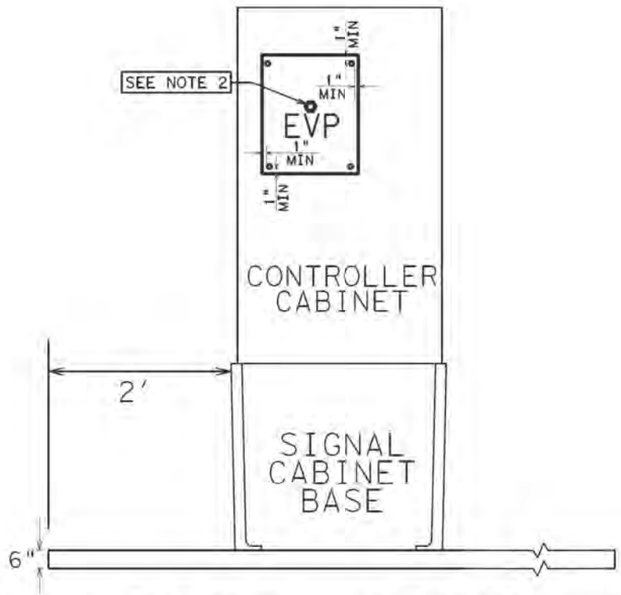
DW# MS	CK# JSY	DW# BR	CK# JSY

REVISIONS	CONT	SECT	JOB	HIGHWAY
6-96	#CONT	#SECT	#JOB	#HWY
1-12	DIST	COUNTY		SHEET NO.
	18	#CNTY		

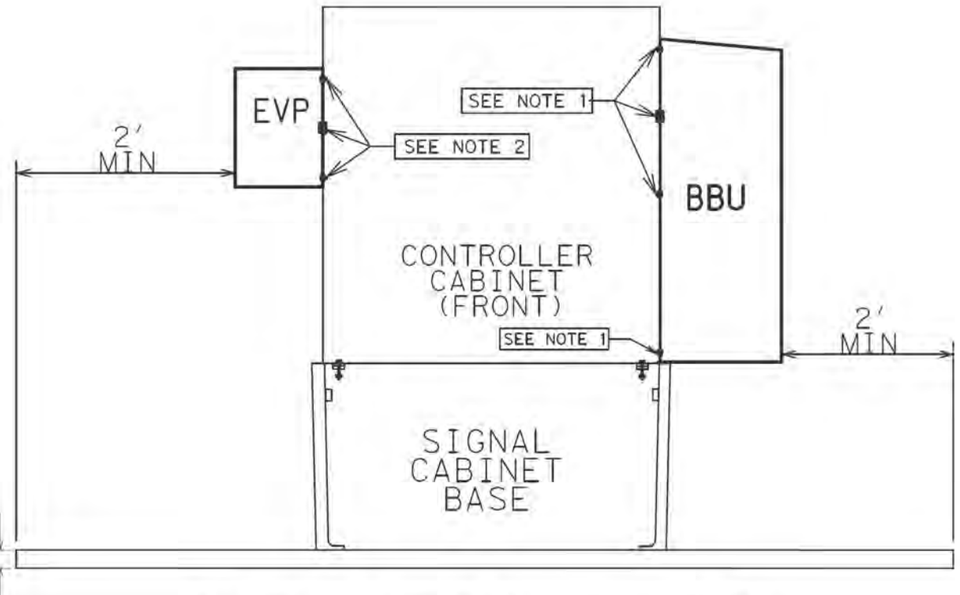
⚠2 CHANGED TO 3 WEATHERHEAD ACCESS POINTS FOR POLES A, B, C AND D(3/12).

NOTES:

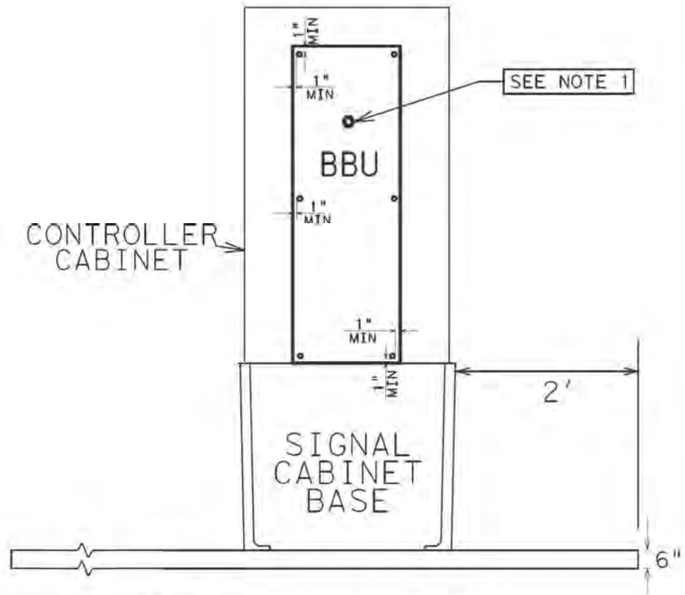
1. INSTALL 1½" ALL THREAD NIPPLE WITH BONDING BUSHINGS ON BOTH ENDS AND 6 EA OF ½" X 1½" 13 UNC MOUNTING BOLTS BETWEEN THE TWO CABINETS (SIGNAL AND BBU).
2. INSTALL 2 " FITTING FOR EVP CABLES/WIRES AND 4 EA OF ½" X 1½" 13 UNC MOUNTING BOLTS BETWEEN THE TWO CABINETS (SIGNAL AND EVP).
3. USE SILICON SEALANT TO SEAL BETWEEN THE CABINETS OF THE CONTROLLER, EVP AND BBU UNIT.
4. THE ABOVE WORK PERFORMED AND MATERIALS FURNISHED WILL NOT BE PAID FOR DIRECTLY, BUT WILL BE SUBSIDIARY TO PERTINENT ITEMS.



SIDE VIEW (EVP)



ELEVATION VIEW

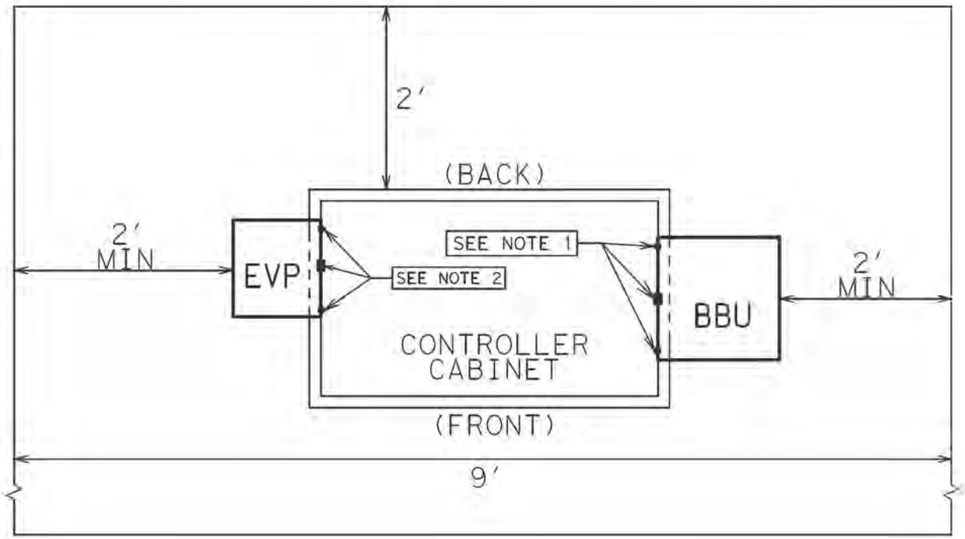


SIDE VIEW (BBU)

REQUIRED CABLE/CONDUCTORS FOR EVP			
QUANTITY EACH	WIRE SIZE	COLOR	FUNCTION
1	#14	BLACK	120 VAC FOR EVP
1	#14	RED	120 VAC FOR FAN & CABINET LIGHT
1	#14	WHITE	AC NEUTRAL
1	#14	GREEN	CHASIS GROUND
1	#18	GRAY	LOGIC GROUND
4	#18	BLUE	PREEMPT COMMANDS
4	-	-	CABLE FROM DETECTOR UNIT

REQUIRED CONDUCTORS FOR BBU			
QUANTITY EACH	WIRE SIZE	COLOR	FUNCTION
1	-	BLACK	120 VAC FROM SERVICE
1	-	WHITE	AC NEUTRAL FROM SERVICE
1	#6	BLACK	120 VAC TO CONTROLLER
1	#6	WHITE	AC NEUTRAL TO CONTROLLER
1	#6	GREEN	GROUND

LEGEND:
EVP-EMERGENCY VEHICLE PREEMPTION CABINET.
BBU-BATTERY BACKUP UNIT.



PLAN VIEW

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
SHEET NO. 227 OF 345
DWG NO. WS9-3127
CONTRACT NO. C-2033270-01

Texas Department of Transportation
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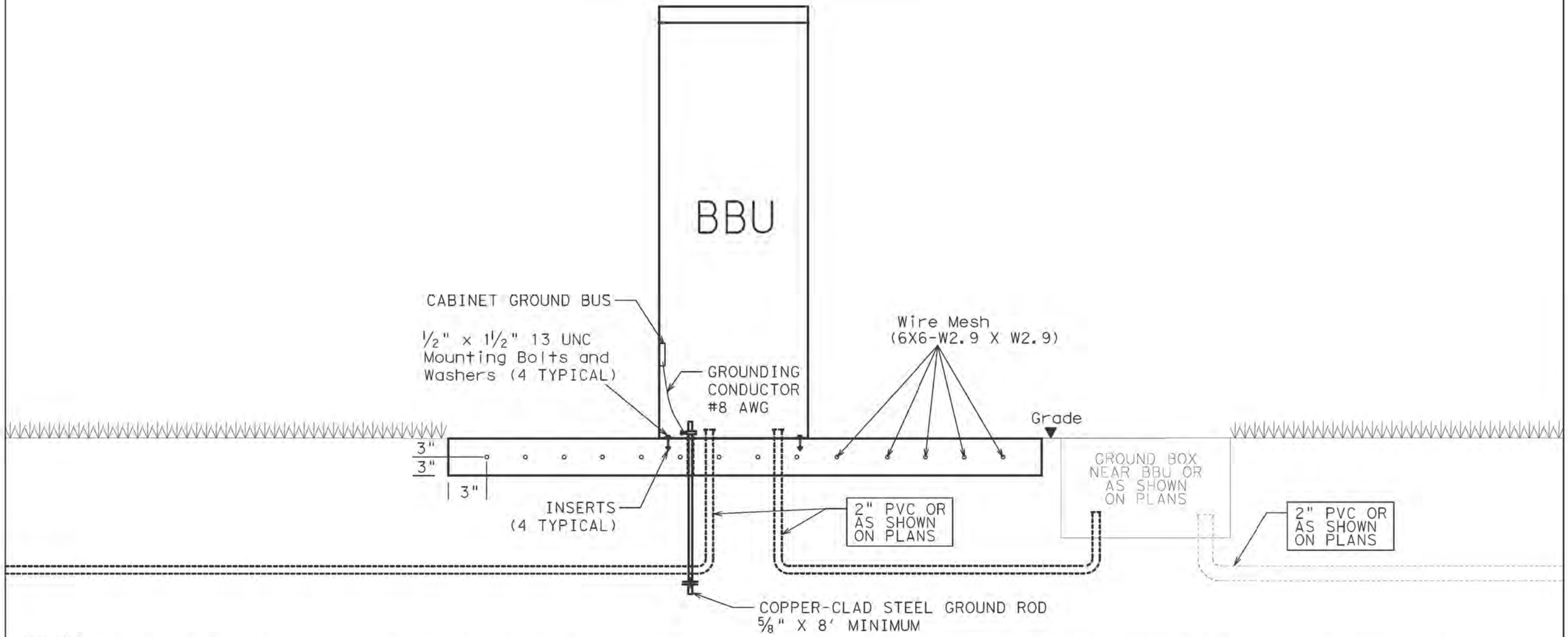
INSTALLATION OF BBU/EVP

EXTERNAL SIDE MOUNT CABINET INSTALLATION DETAILS
DALLAS DISTRICT STANDARD

N. T. S.

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
6	(SEE TITLE SHEET)		
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	DALLAS		
CONTROL	SECTION	JOB	



NOTES:

1. INSTALL A 5' X 5' CONCRETE PAD AT THE LOCATION DIRECTED BY THE ENGINEER. THE PAD MAY BE CAST-IN-PLACE OR PRE-CAST AS APPROVED BY THE ENGINEER.
2. PROVIDE WELDED WIRE MESH 6X6-W2.9 X W2.9 FOR REINFORCEMENT. PROVIDE JOINTS AND SPLICES IN THE MESH WITH A MINIMUM 6-INCH OVERLAP. PROVIDE A MINIMUM 3 INCH COVER BETWEEN WIRE MESH AND EDGE OF CONCRETE PAD.
3. PROVIDE CLASS B CONCRETE MINIMUM FOR THE CONCRETE PAD IN ACCORDANCE WITH ITEM 421. CONSTRUCT THE CONCRETE PAD IN ACCORDANCE WITH ITEM 531, EXCEPT FOR PAYMENT.
4. INSTALL THE BACK OF BBU CABINET 10" FROM THE EDGE OF CONCRETE PAD AND CENTER THE CABINET ON THE PAD FROM SIDE TO SIDE.
5. SUPPLY FOUR ½" X 1½" 13 UNC STAINLESS STEEL INSERTS FOR ATTACHMENT OF THE BBU CABINET TO THE CONCRETE PAD. INSERTS MUST WITHSTAND A MINIMUM TORQUE OF 50 FT-LB AND A MINIMUM STRAIGHT PULL OUT STRENGTH OF 750 LBS.
6. BOND A #8 AWG COPPER GROUND WIRE AND AN 8 FT GROUND ROD TO THE REINFORCING MESH WITH A SUITABLE UL LISTED CLAMP, AND TERMINATE THE GROUND WIRE TO THE CABINET GROUNDING BUS.
7. INSTALL A PVC SLEEVE TO PREVENT THE GROUND ROD FROM DIRECT EMBEDMENT IN THE CONCRETE PAD.
8. THE ABOVE WORK PERFORMED AND MATERIALS FURNISHED WILL NOT BE PAID FOR DIRECTLY, BUT WILL BE SUBSIDIARY TO PERTINENT ITEMS.

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
SHEET NO. 228 OF 345
DWG NO. WS9-3128
CONTRACT NO. C-2033270-01

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INSTALLATION OF BBU/EVP

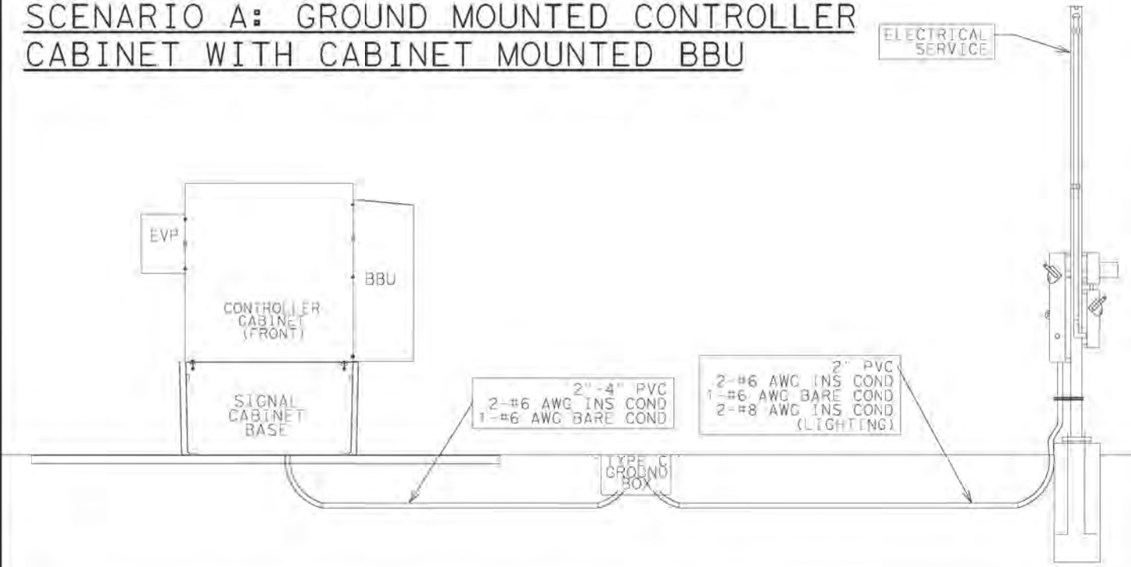
STAND ALONE BBU CABINET (GROUND MOUNT)

DALLAS DISTRICT STANDARD

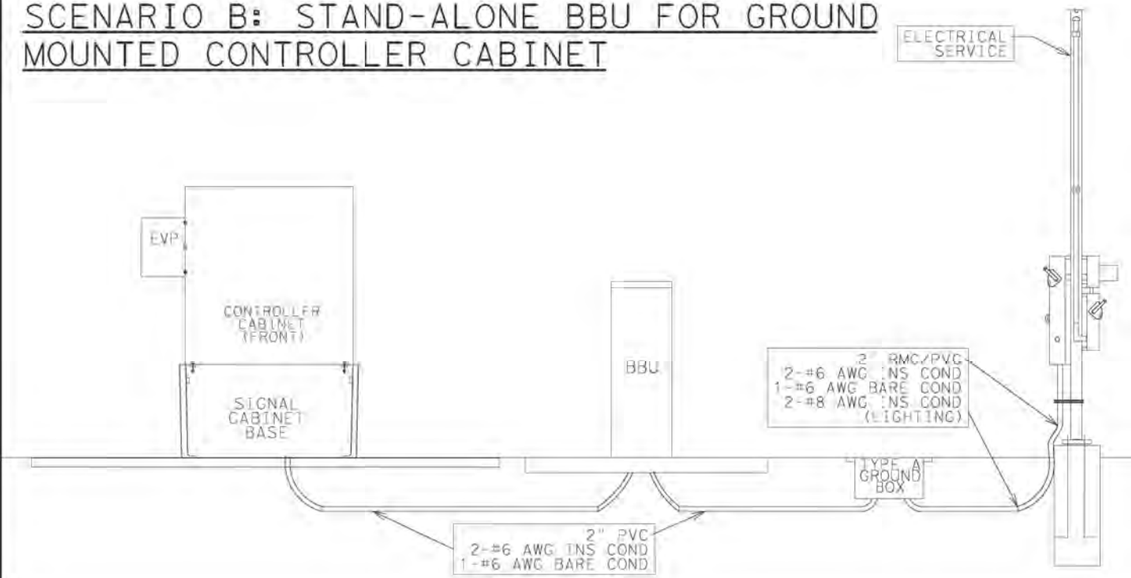
N.T.S.

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
6	(SEE TITLE SHEET)		
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	DALLAS		
CONTROL	SECTION	JOB	

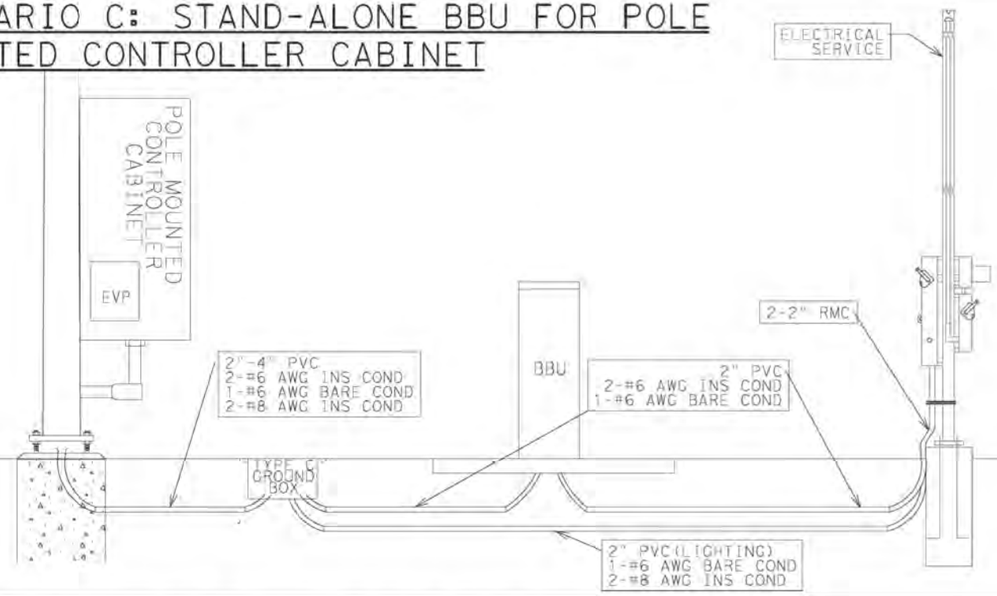
SCENARIO A: GROUND MOUNTED CONTROLLER CABINET WITH CABINET MOUNTED BBU



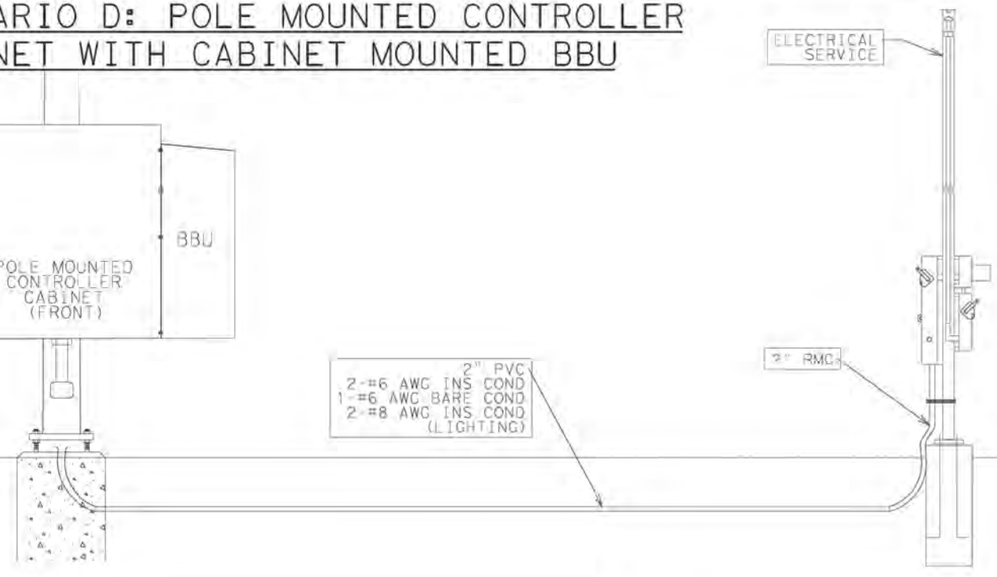
SCENARIO B: STAND-ALONE BBU FOR GROUND MOUNTED CONTROLLER CABINET



SCENARIO C: STAND-ALONE BBU FOR POLE MOUNTED CONTROLLER CABINET



SCENARIO D: POLE MOUNTED CONTROLLER CABINET WITH CABINET MOUNTED BBU



NOTE:

ABOVE SCENARIOS ARE TYPICAL BBU/EVP INSTALLATIONS USED IN THE DALLAS DISTRICT. SEE TRAFFIC SIGNAL DESIGN PLANS FOR GROUND BOX, CONDUIT AND CONDUCTOR QUANTITIES AND SIZES SPECIFIC TO EACH INTERSECTION.

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
SHEET NO. 229 OF 345
DWG NO. WS9-3129
CONTRACT NO. C-2033270-01

Texas Department of Transportation
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INSTALLATION OF BBU/EVP

INSTALLATION SCENARIOS

DALLAS DISTRICT STANDARD

N.T.S. SHEET 3 OF 3

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
6	(SEE TITLE SHEET)		
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	DALLAS		
CONTROL	SECTION	JOB	

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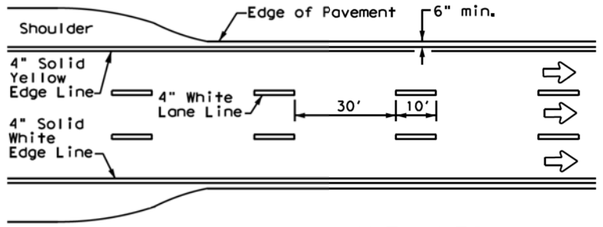
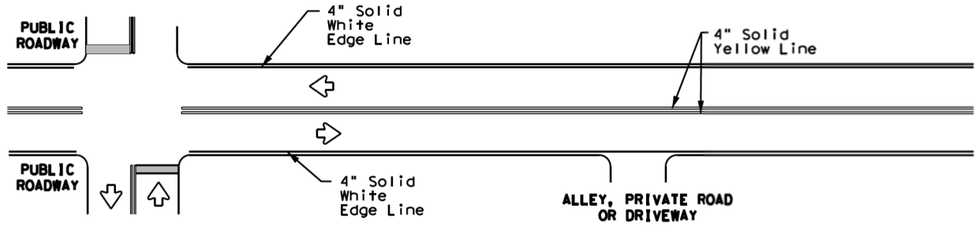
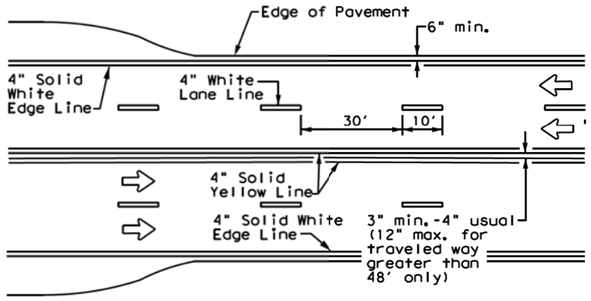


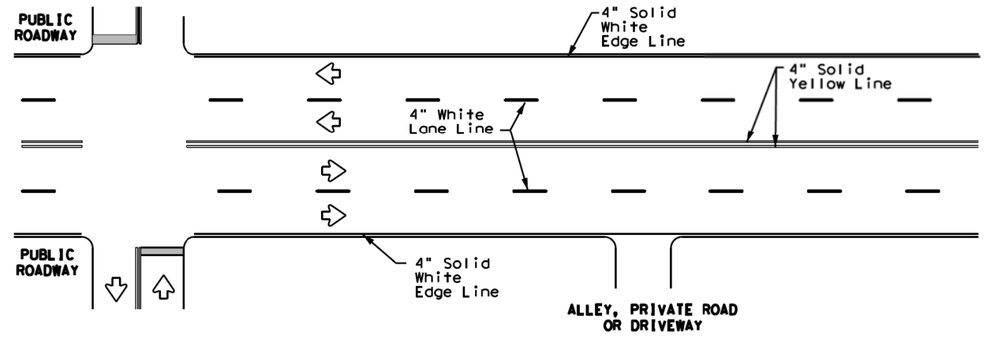
EDGE LINE AND LANE LINES ONE-WAY ROADWAY WITH OR WITHOUT SHOULDERS



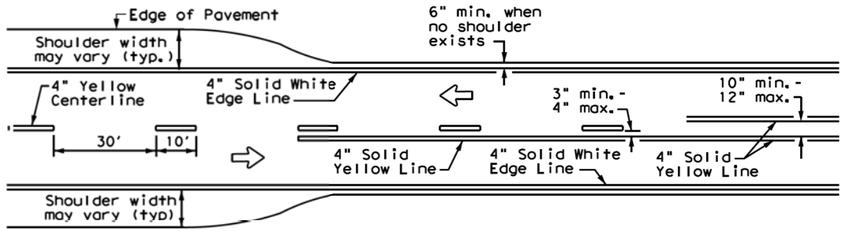
TYPICAL TWO-LANE, TWO-WAY PAVEMENT MARKINGS THROUGH INTERSECTIONS



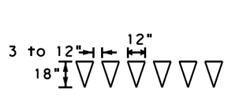
CENTERLINE AND LANE LINES FOUR LANE TWO-WAY ROADWAY WITH OR WITHOUT SHOULDERS



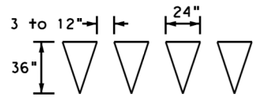
TYPICAL MULTI-LANE, TWO-WAY PAVEMENT MARKINGS THROUGH INTERSECTIONS



TWO LANE TWO-WAY ROADWAY WITH OR WITHOUT SHOULDERS

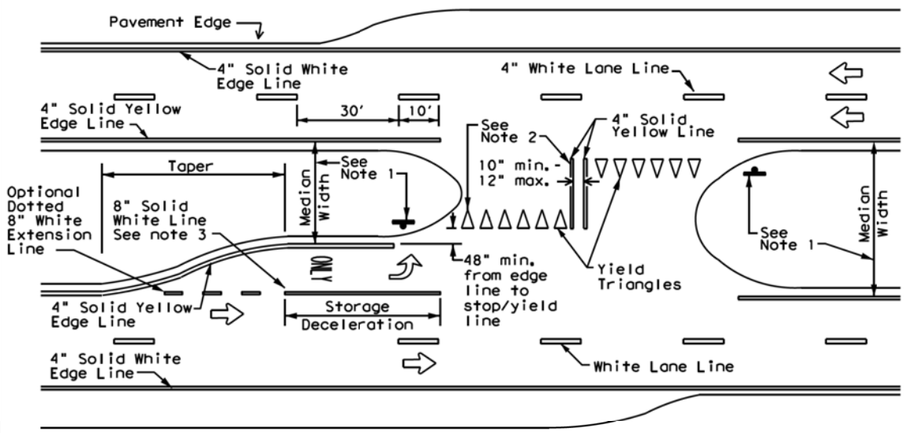


For posted speed on road being marked equal to or less than 40 MPH.



For posted speed on road being marked equal to or greater than 45 MPH.

YIELD LINES



FOUR LANE DIVIDED ROADWAY CROSSOVERS

NOTES

1. Where divided highways are separated by median widths at the median opening itself of 30 feet or more, median openings shall be signed as two separate intersections. Each median opening has two width measurements, with one measurement for each approach. The narrow median width will be the controlling width to determine if signs are required. Yield signs are the typical intersection control. Stop signs are optional as determined by the Engineer.

2. Install median striping (double yellow centerlines and stop bars/yield triangles) when a 50' or greater median centerline can be placed. Stop bars shall only be used with stop signs. Yield traingles shall only be used with yield signs.

3. Length of turn bays, including taper, deceleration, and storage lengths shall be as shown on the plans or as directed by the Engineer.

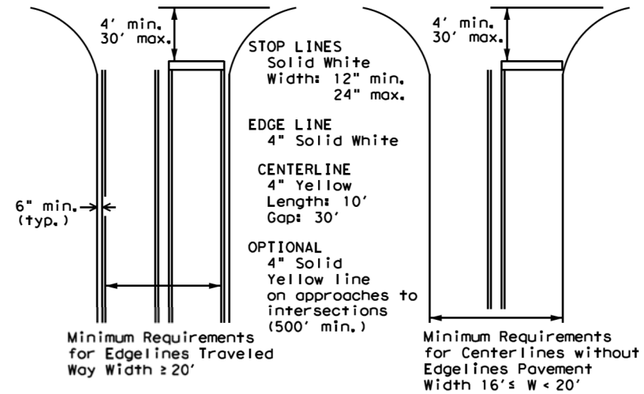
GENERAL NOTES

1. Edgeline striping shall be as shown in the plans or as directed by the Engineer. The edgeline should not be placed less less than 6 inches from the edge of pavement. This distance may vary due to pavement raveling or other conditions. Edgelines are not required in curb and gutter sections of roadways.

2. The traveled way includes only that portion of the roadway used for vehicular travel. It does not include the parking lanes, sidewalks, berms and shoulders. The traveled ways shall be measured from the inside of edgeline to the inside of edgeline of a two lane roadway.

MATERIAL SPECIFICATIONS	
PAVEMENT MARKERS (REFLECTORIZED)	DMS-4200
EPOXY AND ADHESIVES	DMS-6100
BITUMINOUS ADHESIVE FOR PAVEMENT MARKERS	DMS-6130
TRAFFIC PAINT	DMS-8200
HOT APPLIED THERMOPLASTIC	DMS-8220
PERMANENT PREFABRICATED PAVEMENT MARKINGS	DMS-8240

All pavement marking materials shall meet the required Departmental Material Specifications as specified by the plans.



GUIDE FOR PLACEMENT OF STOP LINES, EDGE LINE & CENTERLINE

Based on Traveled Way and Pavement Widths for Undivided Highways

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
SHEET NO. 230 OF 345
DWG NO. WS9-3210
CONTRACT NO. C-2033270-01

Texas Department of Transportation

Traffic Safety Division Standard

TYPICAL STANDARD PAVEMENT MARKINGS

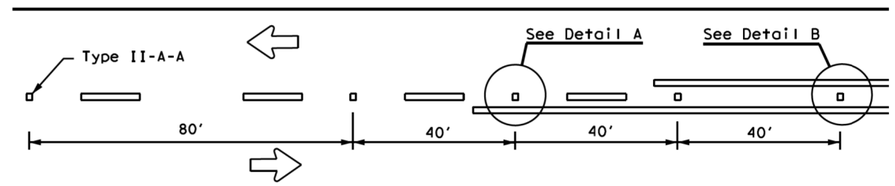
PM(1)-20

FILE: pm1-20.dgn	DN:	CK:	DW:	CK:
©TxDOT November 1978	CONT	SECT	JOB	HIGHWAY
REVISIONS				
8-95 3-03	DIST	COUNTY		SHEET NO.
5-00 2-12				
8-00 6-20				

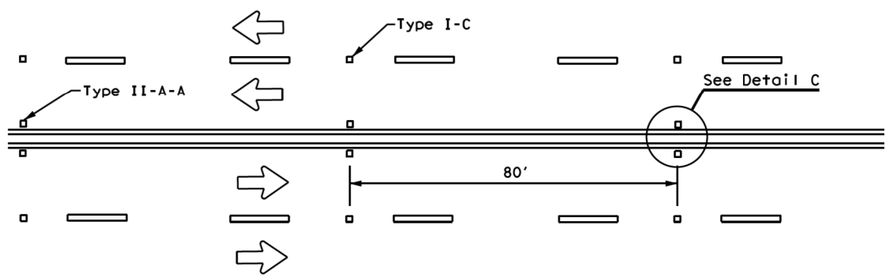
22A

DATE:
FILE:

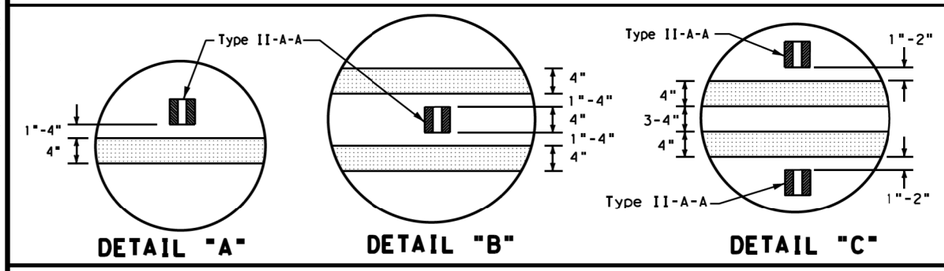
REFLECTIVE RAISED PAVEMENT MARKERS FOR VEHICLE POSITIONING GUIDANCE



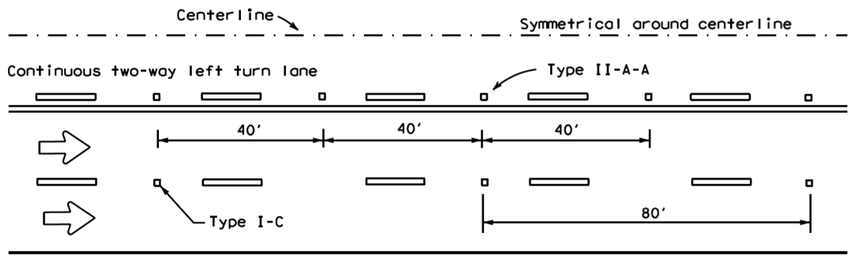
CENTERLINE FOR ALL TWO LANE ROADWAYS



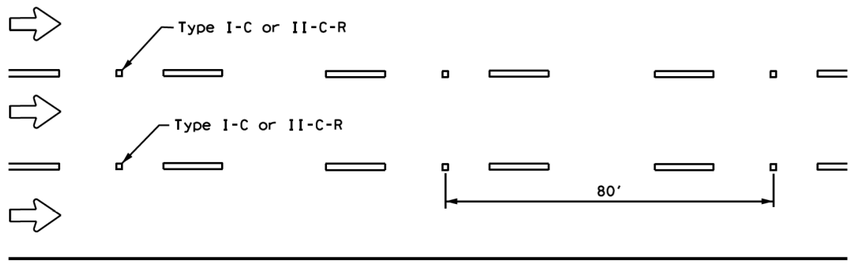
CENTERLINE & LANE LINES FOR FOUR LANE TWO-WAY HIGHWAYS



DETAIL "A" **DETAIL "B"** **DETAIL "C"**



CENTERLINE AND LANE LINES FOR TWO-WAY LEFT TURN LANE

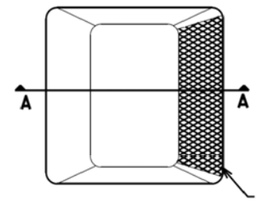


LANE LINES FOR ONE-WAY ROADWAY (NON-FREEWAY FACILITIES)

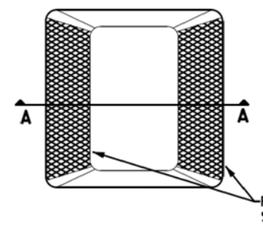
Raised pavement markers Type II-C-R shall have clear face toward normal traffic and red face toward wrong-way traffic.

MATERIAL SPECIFICATIONS	
PAVEMENT MARKERS (REFLECTORIZED)	DMS-4200
EPOXY AND ADHESIVES	DMS-6100
BITUMINOUS ADHESIVE FOR PAVEMENT MARKERS	DMS-6130
TRAFFIC PAINT	DMS-8200
HOT APPLIED THERMOPLASTIC	DMS-8220
PERMANENT PREFABRICATED PAVEMENT MARKINGS	DMS-8240

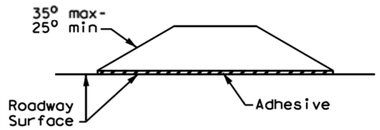
All pavement marking materials shall meet the required Departmental Material Specifications as specified by the plans.



Type I (Top View)

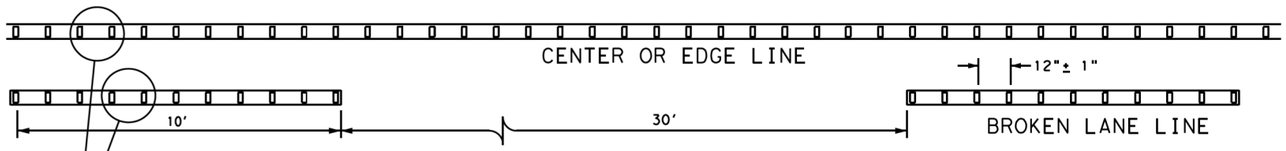


Type II (Top View)



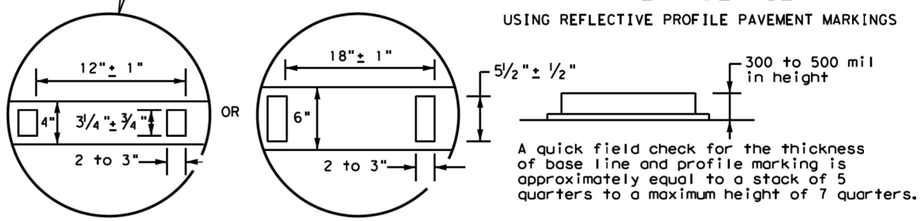
SECTION A

RAISED PAVEMENT MARKERS



REFLECTORIZED PROFILE PATTERN DETAIL

USING REFLECTIVE PROFILE PAVEMENT MARKINGS



4" EDGE LINE, CENTER LINE OR LANE LINE

OPTIONAL 6" EDGE LINE, CENTER LINE OR LANE LINE

A quick field check for the thickness of base line and profile marking is approximately equal to a stack of 5 quarters to a maximum height of 7 quarters.

NOTE

Profile markings shall not be placed on roadways with a posted speed limit of 45 MPH or less.

GENERAL NOTES

1. All raised pavement markers placed in broken lines shall be placed in line with and midway between the stripes.
2. On concrete pavements the raised pavement markers should be placed to one side of the longitudinal joints.

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
SHEET NO. 231 OF 345
DWG NO. WS9-3211
CONTRACT NO. C-2033270-01

Texas Department of Transportation

Traffic Safety Division Standard

POSITION GUIDANCE USING RAISED MARKERS RELECTORIZED PROFILE MARKINGS PM(2)-20

FILE: pm2-20.dgn	DN:	CK:	DW:	CK:
©TxDOT April 1977	CONT	SECT	JOB	HIGHWAY
REVISIONS				
4-92 2-10	DIST	COUNTY		SHEET NO.
5-00 2-12				
8-00 6-20				

22B

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DATE:
FILE:

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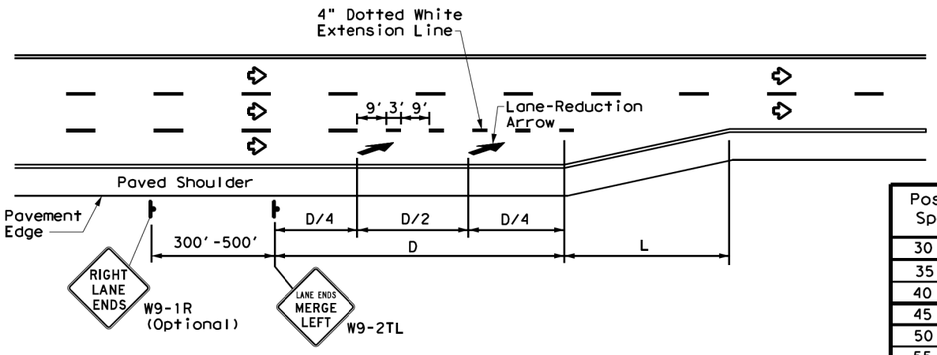
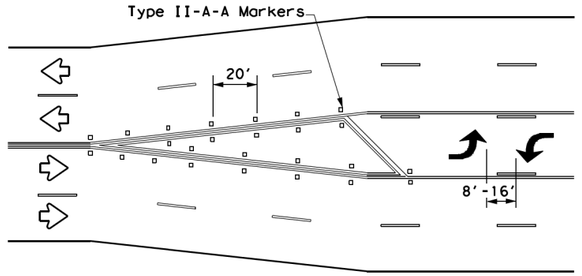


LANE REDUCTION

Posted Speed	D (ft)	L (ft)
30 MPH	460	$L=\frac{WS^2}{60}$
35 MPH	565	
40 MPH	670	
45 MPH	775	L=WS
50 MPH	885	
55 MPH	990	
60 MPH	1,100	
65 MPH	1,200	
70 MPH	1,250	
75 MPH	1,350	

NOTES

1. Lane reduction pavement markings are used where the number of through lanes is reduced because of narrowing of the roadway or because of a section of on-street parking in what would otherwise be a through lane. For Texas Super 2 Passing Lanes, see TS2(PL) standard sheets.
2. On divided highways, an additional W9-1R "RIGHT LANE ENDS" sign may be installed in the median aligned with the W9-1R sign on the right side of the highway.
3. Lane reduction arrows are required for speeds of 45 mph or greater. An optional third lane reduction arrow may be added based on engineering judgement. If used, the optional third lane reduction arrow should be centered between the first and last lane reduction arrows.
4. For lane reductions on Freeways and Expressways, signing shall conform to the TxDOT Freeway Signing Handbook.



A two-way left-turn (TWLT) lane-use arrow pavement marking should be used at or just downstream from the beginning of a two-way left-turn lane within a corridor. Repeating the marking after each intersection or dedicated turn bay is not required unless stated elsewhere in the plans.

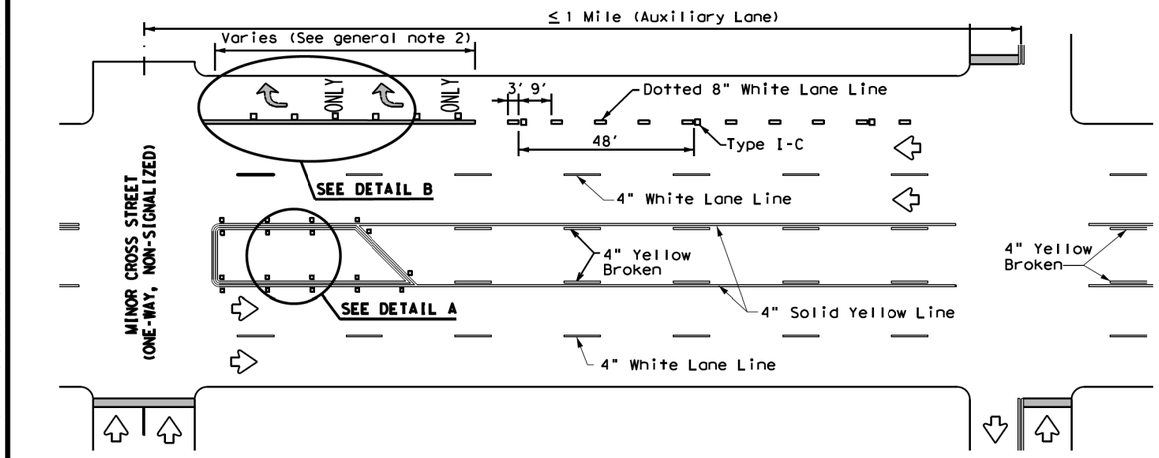
TYPICAL TRANSITION FOR TWLTL AND DIVIDED HIGHWAY

GENERAL NOTES

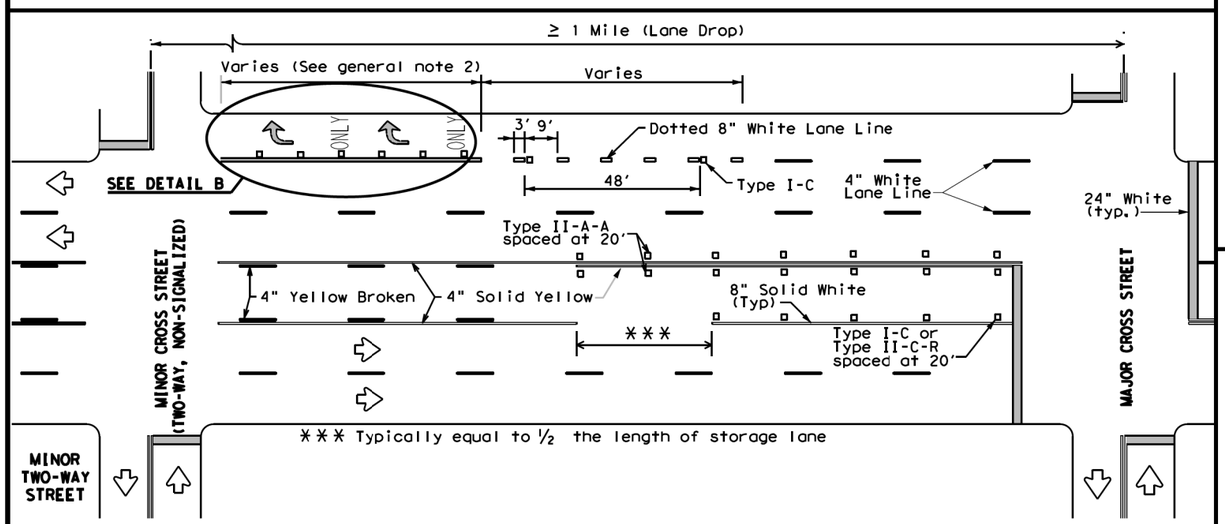
1. Lane use word and arrow markings shall be used where through lanes approaching an intersection become mandatory turn lanes. Lane use word and arrow markings should be used in auxiliary lanes of substantial length. Lane use arrow markings or word and arrow markings may be used in other lanes and turn bays for emphasis. Details for words and arrows are as shown in the Standard Highway Sign Designs for Texas.
2. When lane-use words and arrow markings are used, two sets of arrows should be used if the length of the bay is greater than 180 feet. When a single lane use arrow or word and arrow marking is used for a short turn lane, it should be located at or near the upstream end of the full-width turn lane.
3. Use raised pavement marker Type I-C with undivided highways, flush medians and two way left turn lanes. Use raised pavement marker Type II-C-R with divided highways and raised medians.
4. Length of turn bays, including taper, deceleration, and storage lengths shall be as shown on the plans or as directed by the Engineer.

MATERIAL SPECIFICATIONS	
PAVEMENT MARKERS (REFLECTORIZED)	DMS-4200
EPOXY AND ADHESIVES	DMS-6100
BITUMINOUS ADHESIVE FOR PAVEMENT MARKERS	DMS-6130
TRAFFIC PAINT	DMS-8200
HOT APPLIED THERMOPLASTIC	DMS-8220
PERMANENT PREFABRICATED PAVEMENT MARKINGS	DMS-8240

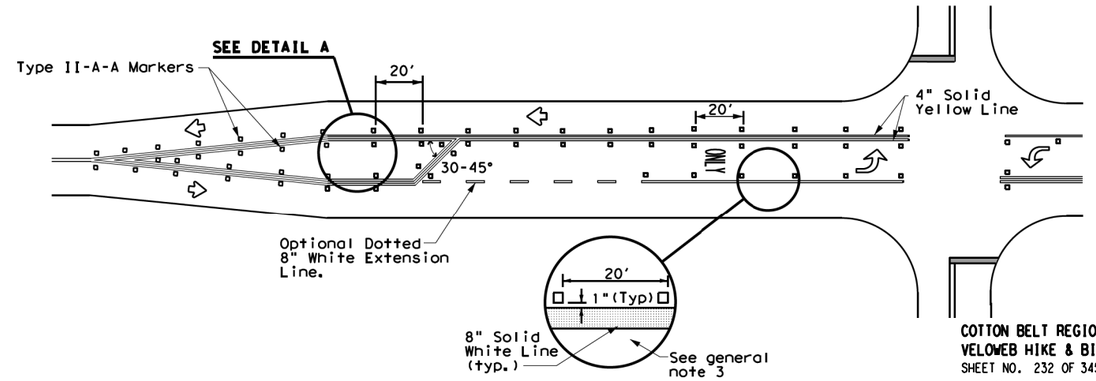
All pavement marking materials shall meet the required Departmental Material Specifications as specified by the plans.



TYPICAL TWLTL AT ONE-WAY STREET AND RIGHT TURN AUXILIARY LANE

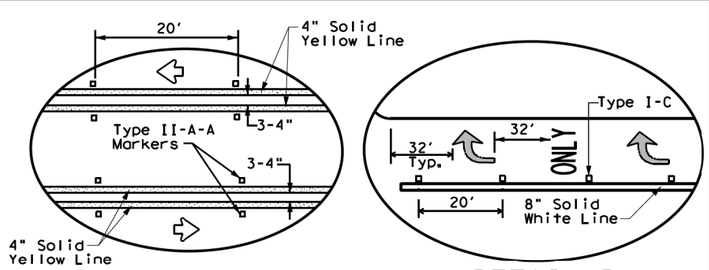


TYPICAL TWLTL AT TWO-WAY CROSS STREET AND RIGHT TURN LANE DROP



COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
SHEET NO. 232 OF 345
DWG NO. WS9-3212
CONTRACT NO. C-2033270-01

TYPICAL TWO-LANE HIGHWAY INTERSECTION WITH LEFT TURN BAYS



Texas Department of Transportation

Traffic Safety Division Standard

TWO-WAY LEFT TURN LANES, RURAL LEFT TURN BAYS, AND LANE REDUCTION PAVEMENT MARKINGS PM(3)-20

FILE: pm3-20.dgn	DN:	CK:	DW:	CK:
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REVISIONS 5-00 2-10 8-00 2-12 3-03 6-20	DIST	COUNTY		SHEET NO.

22C

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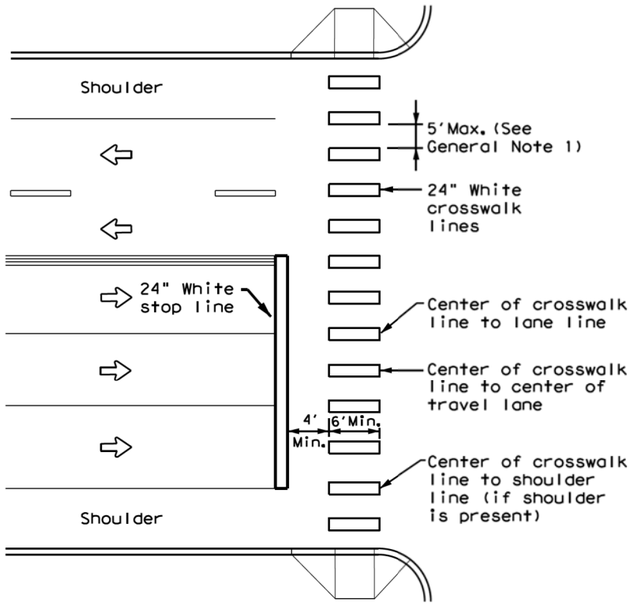


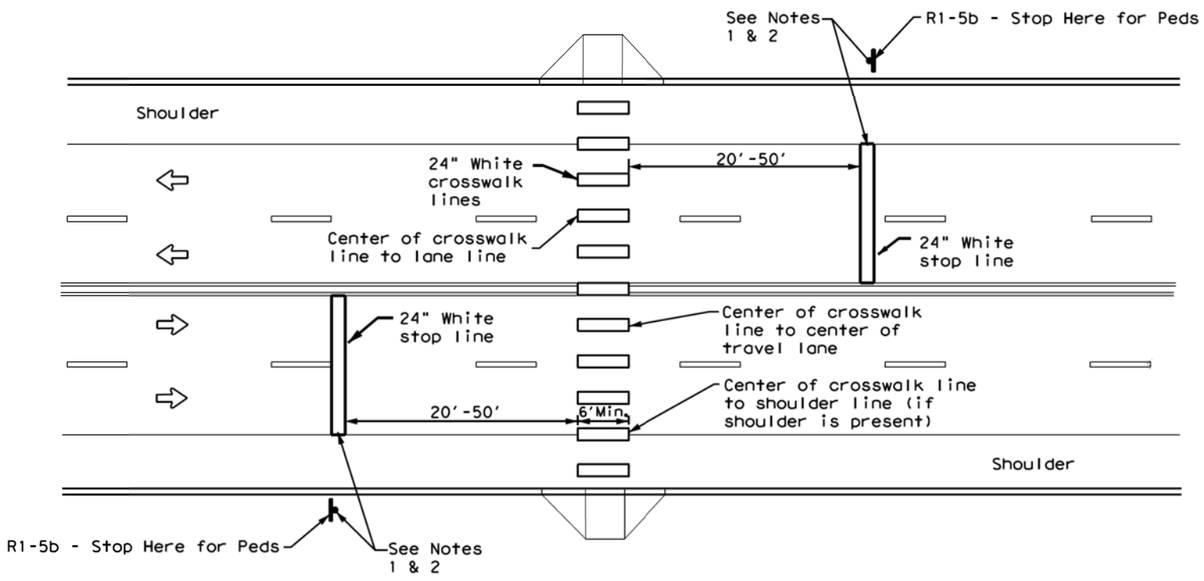
HIGH-VISIBILITY LONGITUDINAL CROSSWALK AT CONTROLLED APPROACH

GENERAL NOTES

1. Longitudinal crosswalk lines should not be placed in the wheel path of vehicles. Center the crosswalk lines on travel lanes, lane lines, and shoulder lines (if present).
2. A minimum 6" clear distance shall be provided to the curb face. If the last crosswalk line falls into this distance it must be omitted.
3. For divided roadways, adjustments in spacing of the crosswalk lines should be made in the median so that the crosswalk lines are maintained in their proper location across the travel portion of the roadway.
4. At skewed crosswalks, the crosswalk lines are to remain parallel to the lane lines.
5. Each crosswalk shall be a minimum of 6' wide.
6. The High-Visibility Longitudinal Crosswalk is the preferred crosswalk pattern on State Highways. Other crosswalk patterns as shown in the "Texas Manual on Uniform Traffic Control Devices" may be used. All crosswalk designs and dimension shall comply with the "Texas Manual on Uniform Traffic Control Devices."
7. Final placement of Stop Bar and Crosswalk shall be approved by the Engineer in the field.

MATERIAL SPECIFICATIONS	
PAVEMENT MARKERS (REFLECTORIZED)	DMS-4200
EPOXY AND ADHESIVES	DMS-6100
BITUMINOUS ADHESIVE FOR PAVEMENT MARKERS	DMS-6130
TRAFFIC PAINT	DMS-8200
HOT APPLIED THERMOPLASTIC	DMS-8220
PERMANENT PREFABRICATED PAVEMENT MARKINGS	DMS-8240

All pavement marking materials shall meet the required Departmental Material Specifications as specified by the plans.



UNSIGNALIZED MID BLOCK HIGH-VISIBILITY LONGITUDINAL CROSSWALK

NOTES:

1. Use stop bars with "Stop Here for Pedestrians" signs at unsignalized mid block cross walks.
2. Use stop bars with "Stop Here on Red" signs at mid block crosswalks controlled by traffic signals or pedestrian hybrid beacons.

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
SHEET NO. 233 OF 345
DWG NO. WS9-3213
CONTRACT NO. C-2033270-01

Texas Department of Transportation

Traffic Safety Division Standard

CROSSWALK PAVEMENT MARKINGS

PM(4)-22

FILE: pm4-22.dgn	DN:	CK:	DW:	CK:
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REVISIONS 3-22				
	DIST	COUNTY		SHEET NO.

22D

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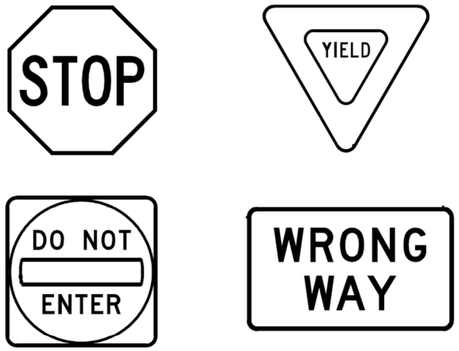
REQUIREMENTS FOR RED BACKGROUND REGULATORY SIGNS
(STOP, YIELD, DO NOT ENTER AND WRONG WAY SIGNS)



REQUIREMENTS FOR FOUR SPECIFIC SIGNS ONLY

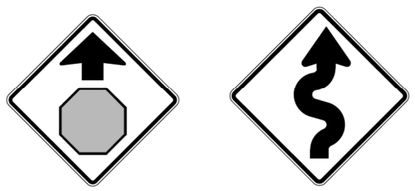
SHEETING REQUIREMENTS		
USAGE	COLOR	SIGN FACE MATERIAL
BACKGROUND	RED	TYPE B OR C SHEETING
BACKGROUND	WHITE	TYPE B OR C SHEETING
LEGEND & BORDERS	WHITE	TYPE B OR C SHEETING
LEGEND	RED	TYPE B OR C SHEETING

REQUIREMENTS FOR WHITE BACKGROUND REGULATORY SIGNS
(EXCLUDING STOP, YIELD, DO NOT ENTER AND WRONG WAY SIGNS)

TYPICAL EXAMPLES

SHEETING REQUIREMENTS		
USAGE	COLOR	SIGN FACE MATERIAL
BACKGROUND	WHITE	TYPE A SHEETING
BACKGROUND	ALL OTHERS	TYPE B OR C SHEETING
LEGEND, BORDERS AND SYMBOLS	BLACK	ACRYLIC NON-REFLECTIVE FILM
LEGEND, BORDERS AND SYMBOLS	ALL OTHER	TYPE B OR C SHEETING

REQUIREMENTS FOR WARNING SIGNS



TYPICAL EXAMPLES

SHEETING REQUIREMENTS		
USAGE	COLOR	SIGN FACE MATERIAL
BACKGROUND	FLOURESCENT YELLOW	TYPE B_{FL} OR C_{FL} SHEETING
LEGEND & BORDERS	BLACK	ACRYLIC NON-REFLECTIVE FILM
LEGEND & SYMBOLS	ALL OTHER	TYPE B OR C SHEETING

REQUIREMENTS FOR SCHOOL SIGNS

TYPICAL EXAMPLES

SHEETING REQUIREMENTS		
USAGE	COLOR	SIGN FACE MATERIAL
BACKGROUND	WHITE	TYPE A SHEETING
BACKGROUND	FLOURESCENT YELLOW GREEN	TYPE B_{FL} OR C_{FL} SHEETING
LEGEND, BORDERS AND SYMBOLS	BLACK	ACRYLIC NON-REFLECTIVE FILM
SYMBOLS	RED	TYPE B OR C SHEETING

GENERAL NOTES

1. Signs to be furnished shall be as detailed elsewhere in the plans and/or as shown on sign tabulation sheet. Standard sign designs and arrow dimensions can be found in the "Standard Highway Sign Designs for Texas" (SHSD).
2. Sign legend shall use the Federal Highway Administration (FHWA) Standard Highway Alphabets (B, C, D, E, Emod or F).
3. Lateral spacing between letters and numerals shall conform with the SHSD, and any approved changes thereto. Lateral spacing of legend shall provide a balanced appearance when spacing is not shown.
4. Black legend and borders shall be applied by screening process or cut-out acrylic non-reflective black film to background sheeting, or combination thereof.
5. White legend and borders shall be applied by screening process with transparent colored ink, transparent colored overlay film to white background sheeting or cut-out white sheeting to colored background sheeting, or combination thereof.
6. Colored legend shall be applied by screening process with transparent colored ink, transparent colored overlay film or colored sheeting to background sheeting, or combination thereof.
7. Sign substrate shall be any material that meets the Departmental Material Specification requirements of DMS-7110 or approved alternative.
8. Mounting details for roadside mounted signs are shown in the "SMD series" Standard Plan Sheets.

ALUMINUM SIGN BLANKS THICKNESS	
Square Feet	Minimum Thickness
Less than 7.5	0.080
7.5 to 15	0.100
Greater than 15	0.125

DEPARTMENTAL MATERIAL SPECIFICATIONS	
ALUMINUM SIGN BLANKS	DMS-7110
SIGN FACE MATERIALS	DMS-8300

The Standard Highway Sign Designs for Texas (SHSD) can be found at the following website.

http://www.txdot.gov/

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
SHEET NO. 234 OF 345
DWG NO. WS9-3239
CONTRACT NO. C-2033270-01

Texas Department of Transportation

Traffic Operations Division Standard

TYPICAL SIGN REQUIREMENTS

TSR(4)-13

FILE: tsr4-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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REVISIONS				
12-03 7-13	DIST	COUNTY		SHEET NO.
9-08				

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DATE:
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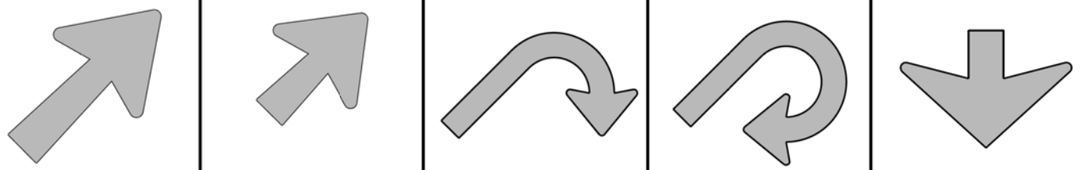
ARROW DETAILS

for Large Ground-Mounted and Overhead Guide Signs



TYPE	LETTER SIZE	USE
A-1	10.67" U/L and 10" Caps	Single Lane Exits
A-2	13.33" U/L and 12" Caps	
A-3	16" & 20" U/L	
B-1	10.67" U/L and 10" Caps	Multiple Lane Exits
B-2	13.33" U/L and 12" Caps	
B-3	16" & 20" U/L	

CODE	USED ON SIGN NO.
E-3	E5-1aT
E-4	E5-1bT

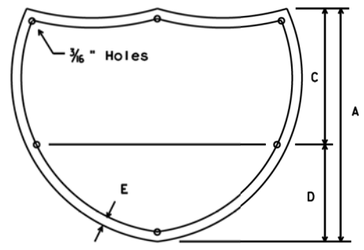
NOTE

Arrow dimensions are shown in the "Standard Highway Sign Designs for Texas" manual.

The Standard Highway Sign Designs for Texas (SHSD) can be found at the following website.

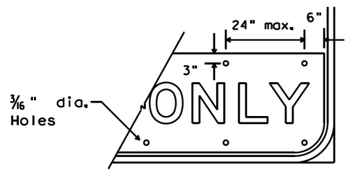
http://www.txdot.gov/

SIGN BLANK PUNCHING DETAILS FOR ATTACHMENTS WHEN SPECIFIED TO BE TYPE A ALUMINUM SIGNS (FOR MOUNTING TO GUIDE SIGN FACE)

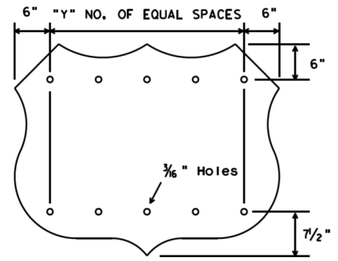


INTERSTATE ROUTE MARKERS

A	C	D	E
36	21	15	1 1/2
48	28	20	1 3/4

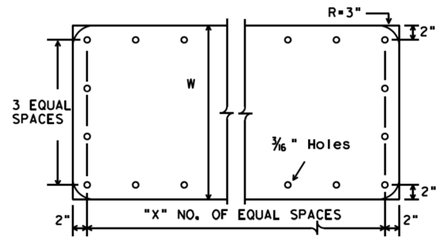


EXIT ONLY PANEL



U.S. ROUTE MARKERS

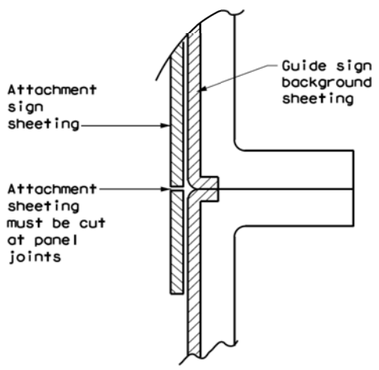
Sign Size	"Y"
24x24	2
30x24	3
36x36	3
45x36	4
48x48	4
60x48	5



STATE ROUTE MARKERS

No. of Digits	W	X
4	24	4
4	36	5
4	48	6
3	24	3
3	36	4
3	48	5

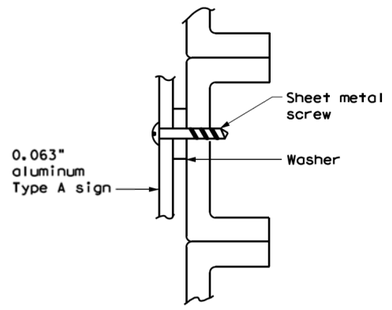
MOUNTING DETAILS OF ATTACHMENTS TO GUIDE SIGN FACE ("EXIT ONLY" AND "LEFT EXIT" PANELS, ROUTE MARKERS AND OTHER ATTACHMENTS)



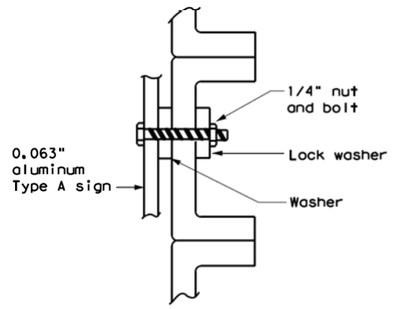
DIRECT APPLIED ATTACHMENT

NOTE:

1. Sheeting for legend, symbols, and borders must be cut at panel joints.
2. Direct applied attachment signs will be subsidiary to "Aluminum Signs" or "Fiberglass Signs".



SCREW ATTACHMENT



NUT/BOLT ATTACHMENT

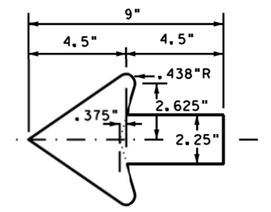
NOTE:

Furnish Type A aluminum sign attachments only when specified in the plans. These signs will be paid for under "Aluminum Signs".

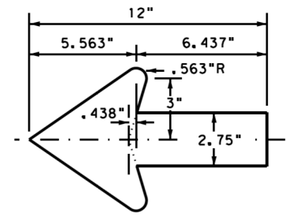
COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
SHEET NO. 235 OF 345
DWG NO. WS9-3240
CONTRACT NO. C-2033270-01

ARROW DETAILS

for Destination Signs (Type D)



Standard arrow to be used with 6 inch letters.



Standard arrow to be used with 8 inch letters.

Texas Department of Transportation

Traffic Operations Division Standard

TYPICAL SIGN REQUIREMENTS

TSR(5)-13

FILE: tsr5-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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12-03 7-13	DIST	COUNTY		SHEET NO.
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SIGN SUPPORT DESCRIPTIVE CODES

(Descriptive Codes correspond to project estimate and quantities sheets)

SM RD SGN ASSM TY XXXXX(X)XX(X-XXXX)

Post Type

FRP = Fiberglass Reinforced Plastic Pipe (see SMD(FRP))
TWT = Thin-Walled Tubing (see SMD(TWT))
10BWG = 10 BWG Tubing (see SMD(SLIP-1) to (SLIP-3))
S80 = Schedule 80 Pipe (see SMD(SLIP-1) to (SLIP-3))

Number of Posts (1 or 2)

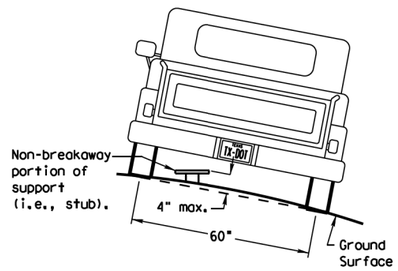
Anchor Type

UA = Universal Anchor - Concreted (see SMD(FRP) and (TWT))
UB = Universal Anchor - Bolted down (see SMD(FRP) and (TWT))
WS = Wedge Anchor Steel - (see SMD(TWT))
WP = Wedge Anchor Plastic (see SMD(TWT))
SA = Slipbase - Concreted (see SMD(SLIP-1) to (SLIP-3))
SB = Slipbase - Bolted Down (see SMD(SLIP-1) to (SLIP-3))

Sign Mounting Designation

P = Prefab. "Plain" (see SMD(SLIP-1) to (SLIP-3), (TWT), (FRP))
T = Prefab. "T" (see SMD(SLIP-1) to (SLIP-3), (TWT))
U = Prefab. "U" (see SMD(SLIP-1) to (SLIP-3))
IF REQUIRED
1EXT or 2EXT = Number of Extensions (see SMD(SLIP-1) to (SLIP-3), (TWT))
BM = Extruded Wind Beam (see SMD(SLIP-1) to (SLIP-3))
WC = 1.12 #/ft Wing Channel (see SMD(SLIP-1) to (SLIP-3))
EXAL = Extruded Aluminum Sign Panels (see SMD(SLIP-1) to (SLIP-3))

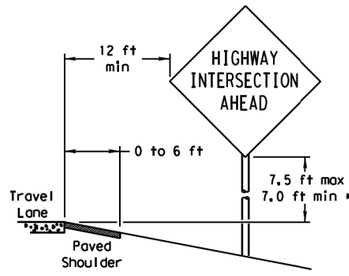
REQUIRED CLEARANCE FOR BREAKAWAY SUPPORT



To avoid vehicle undercarriage snagging, any substantial remains of a breakaway support, when it is broken away, should not project more than 4 inches above a 60-inch chord (i.e., typical space between wheel paths).

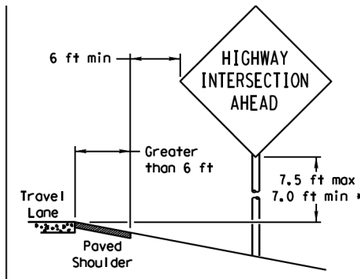
SIGN LOCATION

PAVED SHOULDERS



LESS THAN 6 FT. WIDE

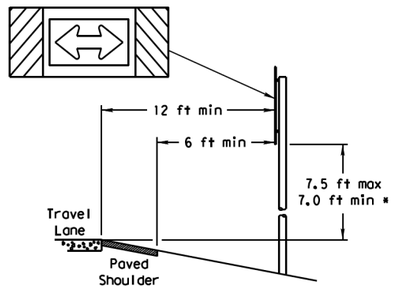
When the shoulder is 6 ft. or less in width, the sign must be placed at least 12 ft. from the edge of the travel lane.



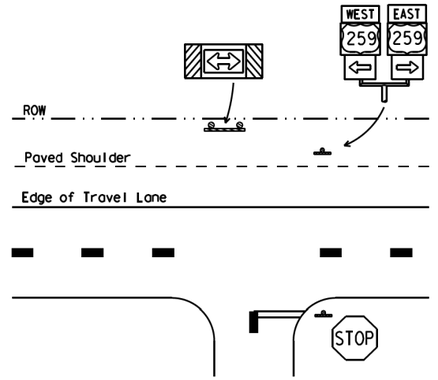
GREATER THAN 6 FT. WIDE

When the shoulder is greater than 6 ft in width, the sign must be placed at least 6 ft. from the edge of the shoulder.

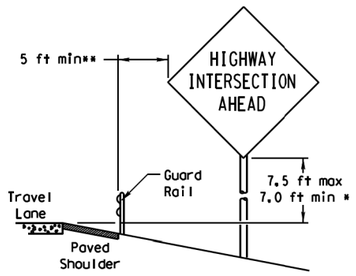
T-INTERSECTION



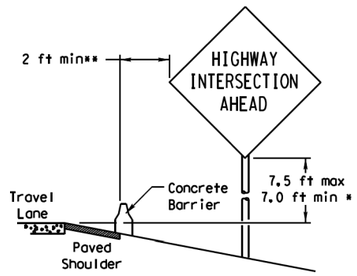
When this sign is needed at the end of a two-lane, two way roadway, the right edge of the sign should be in line with the centerline of the roadway. Place as close to ROW as practical.



BEHIND BARRIER



BEHIND GUARDRAIL



BEHIND CONCRETE BARRIER

**Sign clearance based on distance required for proper guard rail or concrete barrier performance.

* Signs shall be mounted using the following condition that results in the greatest sign elevation:

(1) a minimum of 7 to a maximum of 7.5 feet above the edge of the travel lane or

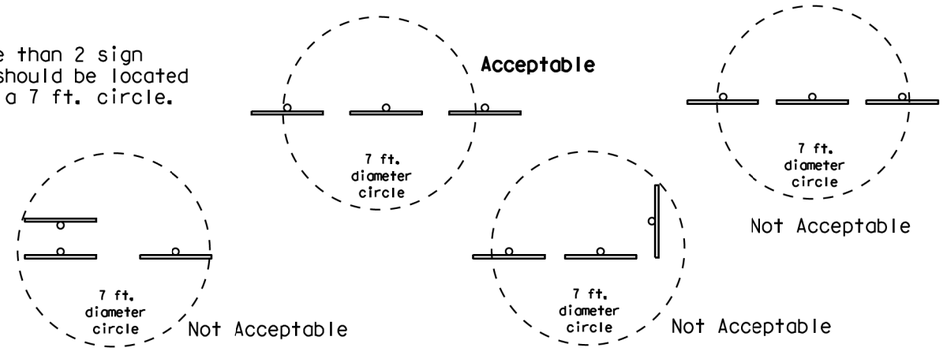
(2) a minimum of 7 to a maximum of 7.5 feet above the grade at the base of the support when sign is installed on the backslope.

The maximum values may be increased when directed by the Engineer.

See the Traffic Operations Division website for detailed drawings of sign clamps, Triangular Slipbase System components and Wedge Anchor System components.

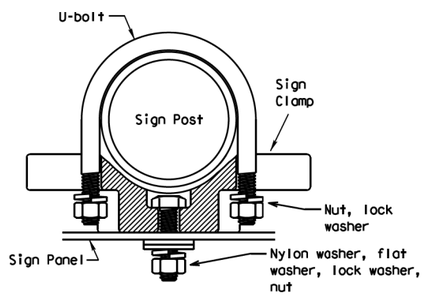
The website address is:
http://www.txdot.gov/publications/traffic.htm

No more than 2 sign posts should be located within a 7 ft. circle.

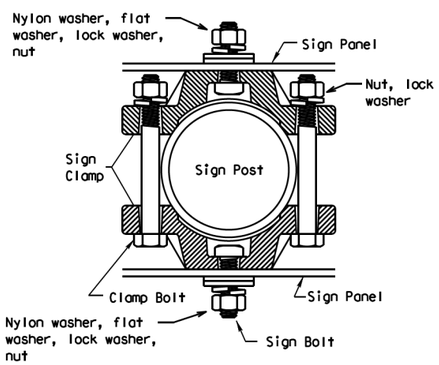


TYPICAL SIGN ATTACHMENT DETAIL

Single Signs



Back-to-Back Signs



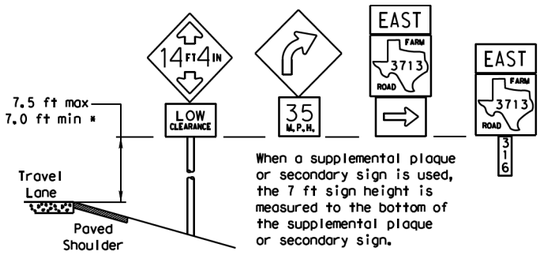
Bolts used to mount sign panels to the clamp are 5/16-18 UNC galvanized square head with nut, nylon washer, flat washer and lock washer. The bolt length is 1 inch for aluminum.

When two sign clamps are used to mount signs back-to-back, use a 5/16-18 UNC galvanized hex head per ASTM A307 with nut and helical-spring lock washer. The approximate bolt lengths for various post sizes and sign clamp types are given in the table at right. The bolt length may need to be adjusted depending upon field conditions.

Sign clamps may be either the specific size clamp or the universal clamp.

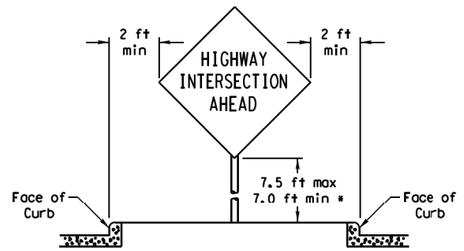
Pipe Diameter	Approximate Bolt Length	
	Specific Clamp	Universal Clamp
2" nominal	3"	3 or 3 1/2"
2 1/2" nominal	3 or 3 1/2"	3 1/2 or 4"
3" nominal	3 1/2 or 4"	4 1/2"

SIGNS WITH PLAQUES



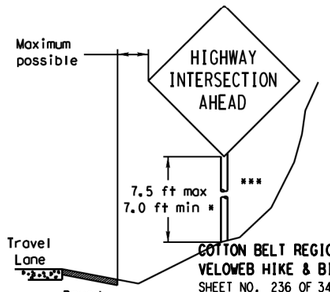
When a supplemental plaque or secondary sign is used, the 7 ft sign height is measured to the bottom of the supplemental plaque or secondary sign.

CURB & GUTTER OR RAISED ISLAND



RESTRICTED RIGHT-OF-WAY

(When 6 ft min. is not possible.)



Right-of-way restrictions may be created by rocks, water, vegetation, forest, buildings, a narrow island, or other factors.

In situations where a lateral restriction prevents the minimum horizontal clearance from the edge of the travel lane, signs should be placed as far from the travel lane as practical.

*** Post may be shorter if protected by guardrail or if Engineer determines the post could not be hit due to extreme slope.

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
SHEET NO. 236 OF 345
DWG NO. WS9-3249
CONTRACT NO. C-2033270-01

Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS GENERAL NOTES & DETAILS

SMD(GEN)-08

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CONT	SECT	JOB	HIGHWAY
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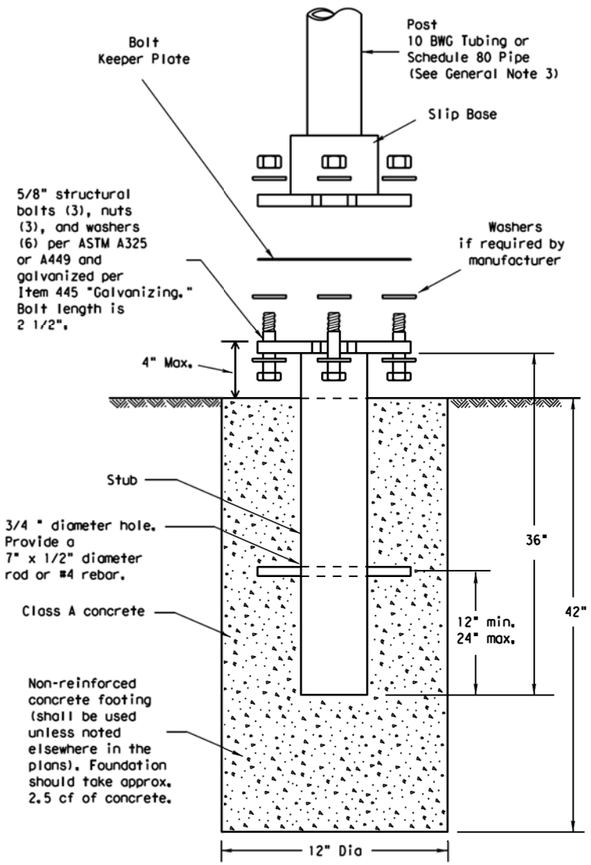
TRIANGULAR SLIPBASE INSTALLATION GENERAL REQUIREMENTS



SM RD SGN ASSM TY XXXXX(X)SA(X-XXXX)

NOTE

There are various devices approved for the Triangular Slipbase System. Please reference the Material Producer List for approved slip base systems. http://www.txdot.gov/business/producer_list.htm The devices shall be installed per manufacturers' recommendations. Installation procedures shall be provided to the Engineer by Contractor.

GENERAL NOTES:

1. Slip base shall be permanently marked to indicate manufacturer. Method, design, and location of marking are subject to approval of the TxDOT Traffic Standards Engineer.
2. Material used as post with this system shall conform to the following specifications:
   10 BWG Tubing (2.875" outside diameter)
   - 0.134" nominal wall thickness
   - Seamless or electric-resistance welded steel tubing or pipe
   - Steel shall be HSLAS Gr 55 per ASTM A1011 or ASTM A1008
   - Other steels may be used if they meet the following:
     - 55,000 PSI minimum yield strength
     - 70,000 PSI minimum tensile strength
     - 20% minimum elongation in 2"
   - Wall thickness (uncoated) shall be within the range of 0.122" to 0.138"
   - Outside diameter (uncoated) shall be within the range of 2.867" to 2.883"
   - Galvanization per ASTM A123 or ASTM A653 G210. For precoated steel tubing (ASTM A653), recoat tube outside diameter weld seam by metallizing with zinc wire per ASTM B833.

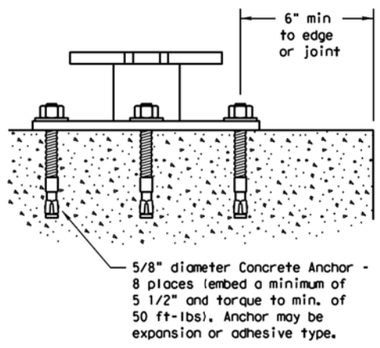
   Schedule 80 Pipe (2.875" outside diameter)
   - 0.276" nominal wall thickness
   - Steel tubing per ASTM A500 Gr C
   - Other seamless or electric-resistance welded steel tubing or pipe with equivalent outside diameter and wall thickness may be used if they meet the following:
     - 46,000 PSI minimum yield strength
     - 62,000 PSI minimum tensile strength
     - 21% minimum elongation in 2"
   - Wall thickness (uncoated) shall be within the range of 0.248" to 0.304"
   - Outside diameter (uncoated) shall be within the range of 2.855" to 2.895"
   - Galvanization per ASTM A123
3. See the Traffic Operations Division website for detailed drawings of sign clamps and Texas Universal Triangular Slipbase System components. The website address is: http://www.txdot.gov/publications/traffic.htm
4. Sign supports shall not be spliced except where shown. Sign support posts shall not be spliced.

ASSEMBLY PROCEDURE

Foundation
1. Prepare 12-inch diameter by 42-inch deep hole. If solid rock is encountered, the depth of the foundation may be reduced such that it is embedded a minimum of 18 inches into the solid rock.
2. The Engineer may permit batches of concrete less than 2 cubic yards to be mixed with a portable, motor-driven concrete mixer. For small placements less than 0.5 cubic yards, hand mixing in a suitable container may be allowed by Engineer. Concrete shall be Class A.
3. Push the pipe end of the slip base stub into the center of the concrete. Rotate the stub back and forth while pushing it down into the concrete to assure good contact between the concrete and stub. Continue to work the stub into the concrete until it is between 2 to 4 inches above the ground.
4. Plumb the stub. Allow a minimum of 4 days to set, unless otherwise directed by the Engineer.
5. The triangular slipbase system is multidirectional and is designed to release when struck from any direction.

Support
1. Cut support so that the bottom of the sign will be 7 to 7.5 feet above the edge of the travelway (i.e., edge of the closest lane) when slip plate is below the edge of pavement or 7 to 7.5 feet above slip plate when the slip plate is above the edge of the travelway. The cut shall be plumb and straight.
2. Attach sign to support using connections shown. When multiple signs are installed on the same support, ensure the minimum clearance between each sign is maintained. See SMD(SLIP-2) for clearances based on sign types.

CONCRETE ANCHOR



SM RD SGN ASSM TY XXXXX(X)SB(X-XXXX)

Concrete anchor consists of 5/8" diameter stud bolt with UNC series bolt threads on the upper end. Heavy hex nut per ASTM A563, and hardened washer per ASTM F436. The stud bolt shall have a minimum yield and ultimate tensile strength of 50 and 75 KSI, respectively. Nuts, bolts and washers shall be galvanized per Item 445, "Galvanizing." Adhesive type anchors shall have stud bolts installed with Type III epoxy per DMS-6100, "Epoxies and Adhesives." Adhesive anchors may be loaded after adequate epoxy cure time per the manufacturer's recommendations. Top of bolt shall extend at least flush with top of the nut when installed. The anchor, when installed in 4000 psi normal-weight concrete with a 5 1/2" minimum embedment, shall have a minimum allowable tension and shear of 3900 and 3100 psi, respectively.

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
SHEET NO. 237 OF 345
DWG NO. WS9-3250
CONTRACT NO. C-2033270-01

Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS
SMALL ROADSIDE SIGNS
TRIANGULAR SLIPBASE SYSTEM

SMD(SLIP-1)-08

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	DIST	COUNTY		SHEET NO.

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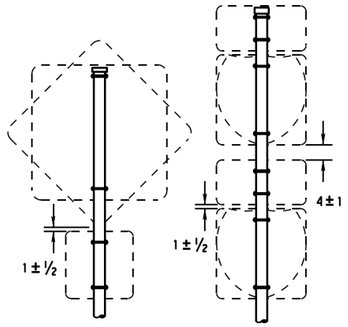
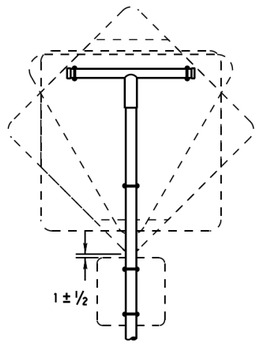


SM RD SGN ASSM TY XXXXX(1)XX(P)



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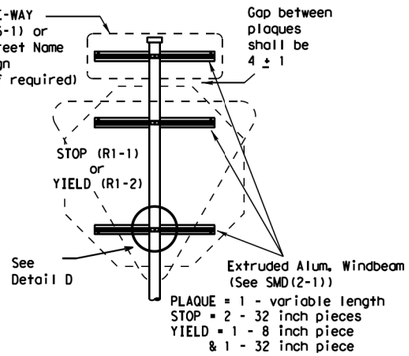
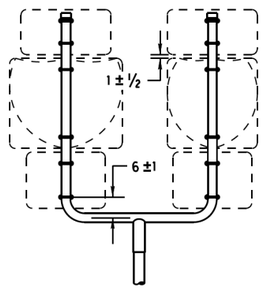
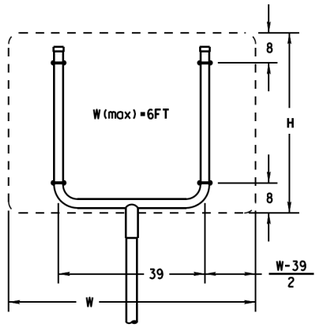


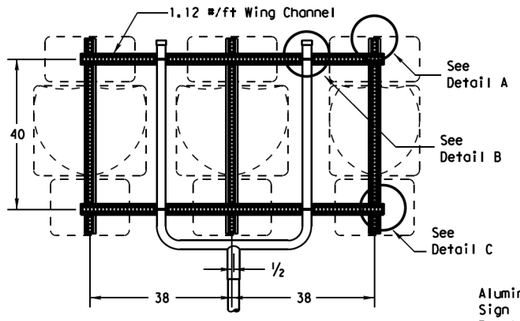
SM RD SGN ASSM TY XXXXX(1)XX(P-BM)



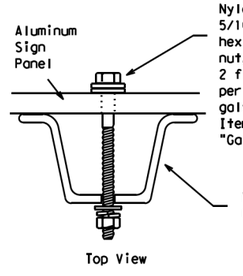
SM RD SGN ASSM TY XXXXX(1)XX(U)



SM RD SGN ASSM TY XXXXX(1)XX(U)

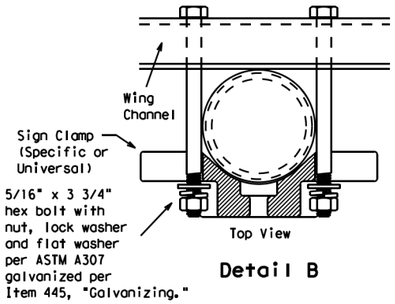


SM RD SGN ASSM TY XXXXX(1)XX(U-WC)
(See Note 11)



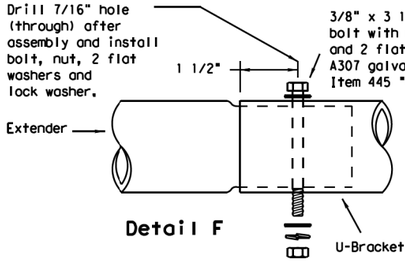
Top View

Detail A



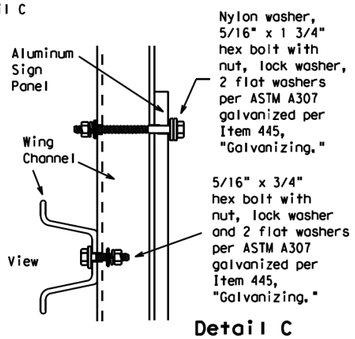
Top View

Detail B

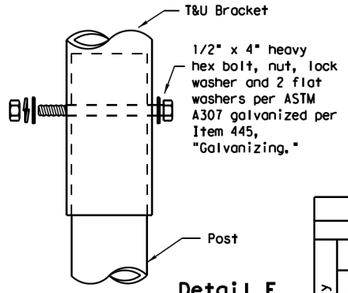


Detail F

Splices shall only be allowed behind the sign substrate.



Detail C

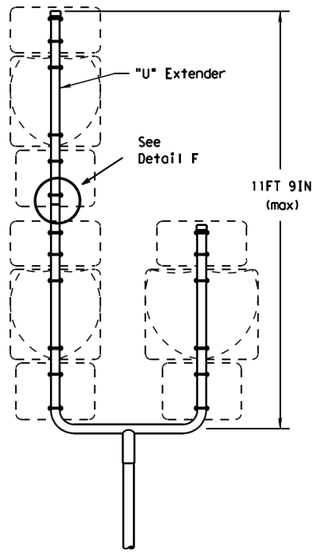


Detail E

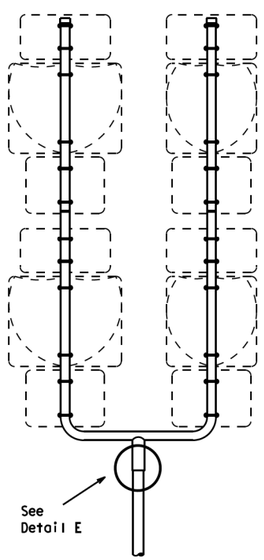
GENERAL NOTES:

SIGN SUPPORT	# OF POSTS	MAX. SIGN AREA
10 BWG	1	16 SF
10 BWG	2	32 SF
Sch 80	1	32 SF
Sch 80	2	64 SF

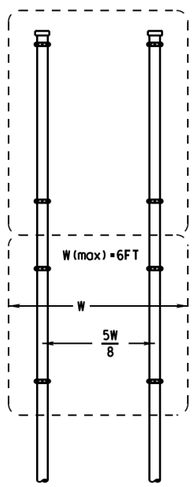
2. The Engineer may require that a Schedule 80 post be used in place of a 10 BWG where a sign height is abnormally high due to a fill slope.
3. Sign supports shall not be spliced except where shown. Sign support posts shall not be spliced.
4. Aluminum sign blanks shall conform to Departmental Material Specifications DMS-7110 and shall have the following minimum thicknesses: 0.080 for signs less than 7.5 sq. ft., 0.100 for signs 7.5 to 15 sq. ft., and 0.125 for signs greater than 15 sq. ft.
5. Signs that require specific supports due to reasons in addition to windloading are indicated on the "REQUIRED SUPPORT" table on this sheet.
6. For horizontal rectangular signs fabricated from flat aluminum, T-brackets are used for signs 24 inches or less in height. U-brackets are used for signs of greater height.
7. When two triangular slipbase supports are used to support a single sign, they shall not be "rigidly" connected to each other except through the sign panel. This will allow each support to act independently when impacted by an errant vehicle.
8. Wing channel shall meet ASTM A 1011 SS Gr 50 and be galvanized per ASTM A 123.
9. Excess pipe, wing channel, or windbeam shall be cut off so that it does not extend beyond the sign panel (i.e., excess support shall not be visible when the sign is viewed from the front.) Repair galvanized coating at cut support ends per Item 445, "Galvanizing."
10. Additional route markers may be added vertically, provided the total sign area does not exceed the maximum allowable amount per Note 1.
11. Additional sign clamp required on the "T-bracket" post for 24 inch height signs. Place the clamp 3 inches above bottom of sign when possible.
12. Post open ends shall be fitted with Friction Caps.
13. Sign blanks shall be the sizes and shapes shown on the plans.



SM RD SGN ASSM TY S80(1)XX(U-1EXT)

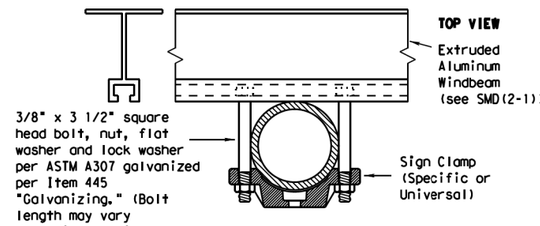


SM RD SGN ASSM TY S80(1)XX(U-2EXT)

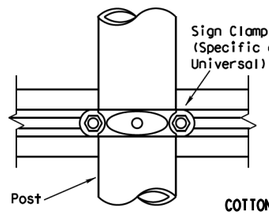


SM RD SGN ASSYM TY XXXXX(2)XX(P)

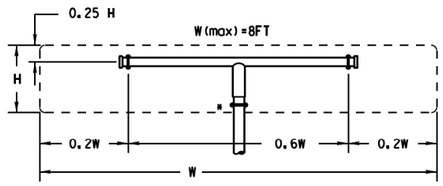
SIDE VIEW



Detail D



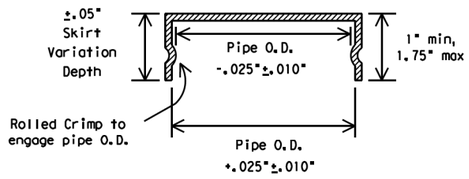
REQUIRED SUPPORT		
	SIGN DESCRIPTION	SUPPORT
Regulatory	48-inch STOP sign (R1-1)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	60-inch YIELD sign (R1-2)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	48x16-inch ONE-WAY sign (R6-1)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	36x48, 48x36, and 48x48-inch signs	TY 10BWG(1)XX(T)
	48x60-inch signs	TY S80(1)XX(T)
Warning	48x48-inch signs (diamond or square)	TY 10BWG(1)XX(T)
	48x60-inch signs	TY S80(1)XX(T)
	48-inch Advance School X-ing sign (S1-1)	TY 10BWG(1)XX(T)
	48-inch School X-ing sign (S2-1)	TY 10BWG(1)XX(T)
	Large Arrow sign (W1-6 & W1-7)	TY 10BWG(1)XX(T)



All dimensions are in english unless detailed otherwise.

SM RD SGN ASSM TY XXXXX(1)XX(T)
(* - See Note 12)

FRICTION CAP DETAIL



Friction caps may be manufactured from hot rolled or cold rolled steel sheets. The minimum sheet metal thickness shall be 24 gauge for all cap sizes.

The rim edges shall be reasonably straight and smooth. Caps shall be sized and formed in such a manner as to produce a drive-on friction fit and have no tendency to rock when seated on the pipe. The depth shall be sufficient to give positive protection against entrance of rainwater. They shall be free of sharp creases or indentations and show no evidence of metal fracture.

Caps shall have an electrodeposited coating of zinc in accordance with the requirements of ASTM B633 Class FE/ZN 8.

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
SHEET NO. 238 OF 345
DWG NO. WS9-3251
CONTRACT NO. C-2033270-01

Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS
SMALL ROADSIDE SIGNS
TRIANGULAR SLIPBASE SYSTEM

SMD(SLIP-2)-08

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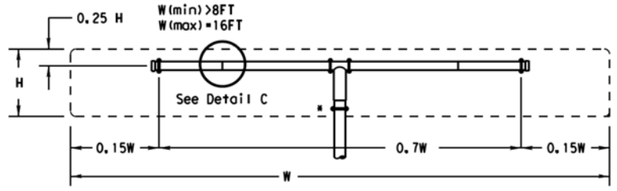
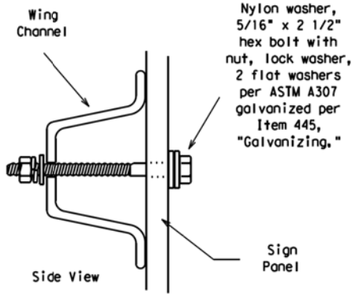
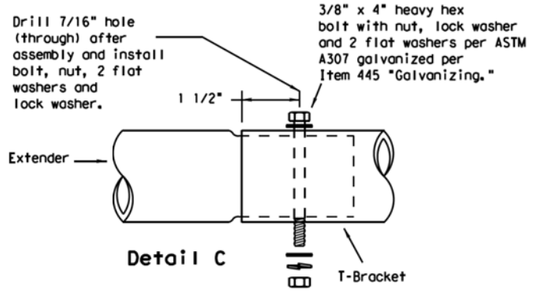


SM RD SGN ASSM TY XXXXX(1)XX(T-2EXT)
(* - See Note 12)



Detail B



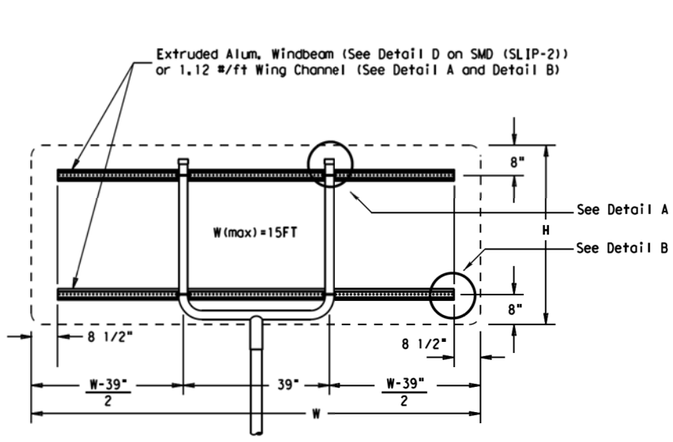
Detail C

Splices shall only be allowed behind the sign substrate.

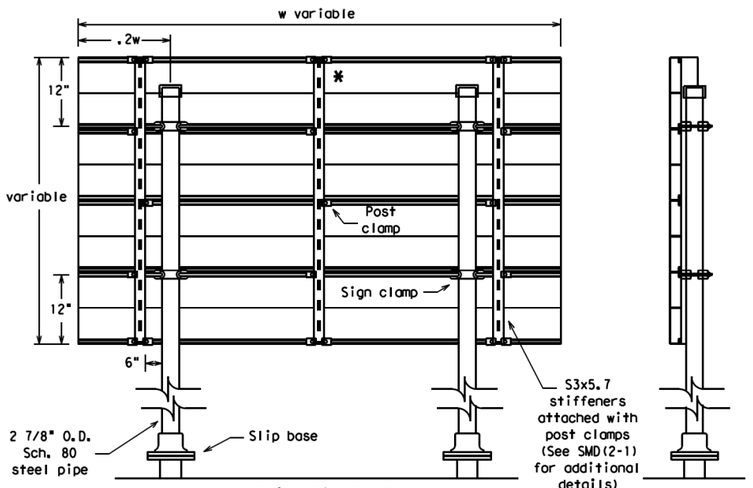
GENERAL NOTES:

SIGN SUPPORT	# OF POSTS	MAX. SIGN AREA
10 BWG	1	16 SF
10 BWG	2	32 SF
Sch 80	1	32 SF
Sch 80	2	64 SF

1. The Engineer may require that a Schedule 80 post be used in place of a 10 BWG where a sign height is abnormally high due to a fill slope.
2. Sign supports shall not be spliced except where shown. Sign support posts shall not be spliced.
3. Aluminum sign blanks shall conform to Departmental Material Specifications DMS-7110 and shall have the following minimum thicknesses: 0.080 for signs less than 7.5 sq. ft., 0.100 for signs 7.5 to 15 sq. ft., and 0.125 for signs greater than 15 sq. ft.
4. Signs that require specific supports due to reasons in addition to windloading are indicated on the "REQUIRED SUPPORT" table on this sheet.
5. For horizontal rectangular signs fabricated from flat aluminum, T-brackets are used for signs 24 inches or less in height. U-brackets are used for signs of greater height.
6. When two triangular slipbase supports are used to support a single sign, they shall not be "rigidly" connected to each other except through the sign panel. This will allow each support to act independently when impacted by an errant vehicle.
7. Wing channel shall meet ASTM A 1011 SS Gr 50 and be galvanized per ASTM A 123.
8. Excess pipe, wing channel, or windbeam shall be cut off so that it does not extend beyond the sign panel (i.e., excess support shall not be visible when the sign is viewed from the front.) Repair galvanized coating at cut support ends per Item 445, "Galvanizing."
9. Sign blanks shall be the sizes and shapes shown on the plans.
10. Additional sign clamp required on the "T-bracket" post for 24 inch high signs. Place the clamp 3 inches above bottom of sign when possible.
11. Post open ends shall be fitted with Friction Caps.



SM RD SGN ASSM TY XXXXX(1)XX(U-XX)

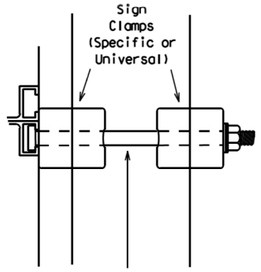


Typical Sign Mount

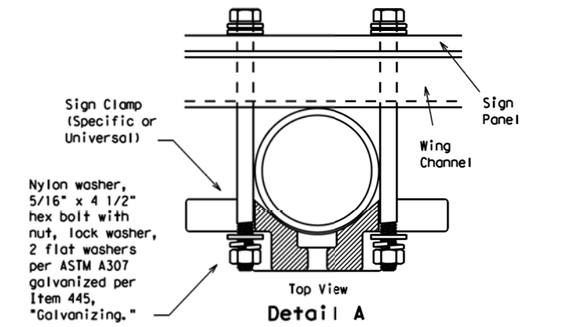
SM RD SGN ASSM TY S80(2)XX(P-EXAL)

* Additional stiffener placed at approximate center of signs when sign width is greater than 10'.

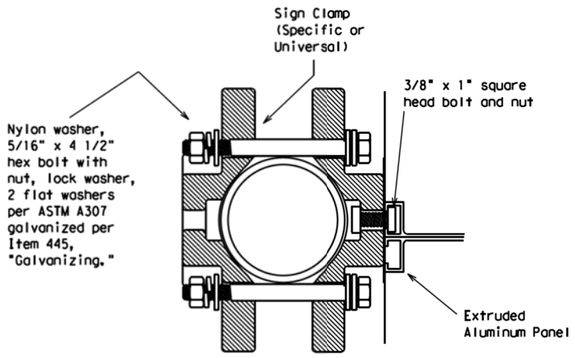
See Detail E for clamp installation



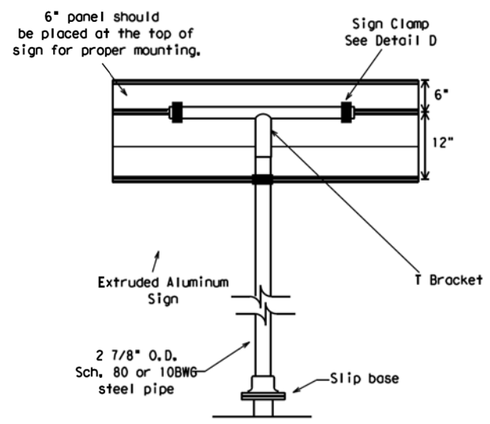
Detail E



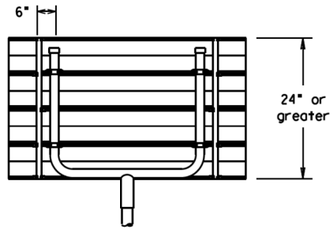
Detail A



Detail D
EXTRUDED ALUMINUM SIGN WITH T BRACKET



Extruded Aluminum Sign
With T Bracket



Use Extruded Alum. Windbeam as stiffeners
See SMD (2-1) for additional details

See Detail E
for clamp installation

REQUIRED SUPPORT		
	SIGN DESCRIPTION	SUPPORT
Regulatory	48-inch STOP sign (R1-1)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	60-inch YIELD sign (R1-2)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	48x16-inch ONE-WAY sign (R6-1)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	36x48, 48x36, and 48x48-inch signs	TY 10BWG(1)XX(T)
	48x60-inch signs	TY S80(1)XX(T)
Warning	48x48-inch signs (diamond or square)	TY 10BWG(1)XX(T)
	48x60-inch signs	TY S80(1)XX(T)
	48-inch Advance School X-ing sign (S1-1)	TY 10BWG(1)XX(T)
	48-inch School X-ing sign (S2-1)	TY 10BWG(1)XX(T)
	Large Arrow sign (W1-6 & W1-7)	TY 10BWG(1)XX(T)

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
SHEET NO. 239 OF 345
DWG NO. WS9-3252
CONTRACT NO. C-2033270-01

Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS TRIANGULAR SLIPBASE SYSTEM

SMD(SLIP-3)-08

© TxDOT July 2002

DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
CONT	SECT	JOB	HIGHWAY
DIST	COUNTY		SHEET NO.

9-08 REVISIONS

DATE:
FILE:

DWG No. CC6-2001

DRAINAGE AREA CALCULATIONS (LESS THAN 200 ACRES)													
AREA NUMBER	AREA BY ZONING			RATIONAL METHOD Q=CIA									COMMENTS
	GRASS/ROW (ACRES) 0.40	PAVEMENT/ INDUSTRIAL (ACRES) 0.90	BALLAST (ACRES) 0.90	AREA (ACRES)	Tc (MIN)	RUNOFF "C"	INTENSITY 10-YEAR (IN/HR)	Q10 (CFS)	INTENSITY 50-YEAR (IN/HR)	Q50 (CFS)	INTENSITY 100-YEAR (IN/HR)	Q100 (CFS)	
B-11	1.30	0.16	0.23	1.68	10.00	0.51	6.48	5.56	8.16	7.01	8.88	7.63	
B-12	0.80	0.21	0.70	1.71	10.00	0.67	6.48	7.41	8.16	9.33	8.88	10.15	
B-13	0.48	0.15	0.29	0.93	10.00	0.64	6.48	3.85	8.16	4.85	8.88	5.28	
B-14	0.19	0.03	0.24	0.46	10.00	0.69	6.48	2.08	8.16	2.61	8.88	2.85	
B-15	1.25			1.25	10.00	0.40	6.48	3.25	8.16	4.09	8.88	4.45	
B-18	2.44			2.44	10.00	0.40	6.48	6.32	8.16	7.96	8.88	8.67	
B-20	1.12			1.12	10.00	0.40	6.48	2.90	8.16	3.66	8.88	3.98	

NOTES:

1. DRAINAGE CALCULATIONS PERTAIN TO STATIONS 2039+24.50 TO 2081+10.00.
2. RUNOFF COMPUTATIONS HAVE BEEN PERFORMED ACCORDING TO DART DESIGN CRITERIA MANUAL, VOL. 1, DRAINAGE CRITERIA, CHAPTER 7, JANUARY 31, 2003.
3. THE DESIGN STORM FOR DRAINAGE SYSTEMS CONVEYING FLOWS FROM TRAIL AND TRACK IS 100-YEAR. THE DESIGN STORM FOR DRAINAGE SYSTEMS CONVEYING FLOWS FROM THE TRAIL ONLY IS 50-YEAR.

CULVERT INPUT DATA (HY-8)												
MINOR CULVERTS												
STATION/ID	TRACK OR ROADWAY/TRAIL	DESCRIPTION	DRAINAGE AREA ID	INLET STATION (FT)	INLET ELEV (FT)	UPPER-BREAK STATION (FT)	UPPER-BREAK ELEV (FT)	LOWER-BREAK STATION (FT)	LOWER-BREAK ELEV (FT)	OUTLET STATION (FT)	OUTLET ELEV (FT)	TAILWATER DATA
CB-2 NB 2040+31	ROADWAY/TRAIL	1-24" RCP	B-11	0.00	429.75	N/A	N/A	N/A	N/A	64.00	429.56	TW CONDITION TRAPEZOIDAL CHANNEL WITH 4:1 SIDE SLOPES & 4' BOTTOM WIDTH, 0.86% CHANNEL SLOPE, MANNING N = 0.035.
CB-2 NB 2055+33	ROADWAY/TRAIL	1-24" RCP	B-14	0.00	443.27	13.00	443.23	144.19	440.94	231.00	440.78	TW CONDITION SET TO EXISTING TW ELEVATION

CULVERT HYDRAULIC DATA																												
MINOR CULVERTS																												
STATION/ID	TRACK OR ROADWAY/TRAIL	DESCRIPTION	DRAINAGE AREA ID	ALLOWABLE HEADWATER (FT)	BOT OF SUBBALLAST ELEV (FT)	10 YEAR (DESIGN STORM FREQUENCY)								50 YEAR (DESIGN STORM FREQUENCY)								100 YEAR (DESIGN STORM FREQUENCY)								COMMENTS
						FLOW "Q" (CFS)	HW ELEV (FT)	HW DEPTH (FT)	EGL ELEV (FT)	TW ELEV (FT)	TW DEPTH (FT)	OUTLET VEL (FT/S)	TW VEL (FT/S)	FLOW "Q" (CFS)	HW ELEV (FT)	HW DEPTH (FT)	EGL ELEV (FT)	TW ELEV (FT)	TW DEPTH (FT)	OUTLET VEL (FT/S)	TW VEL (FT/S)	FLOW "Q" (CFS)	HW ELEV (FT)	HW DEPTH (FT)	EGL ELEV (FT)	TW ELEV (FT)	TW DEPTH (FT)	OUTLET VEL (FT/S)	TW VEL (FT/S)	
CB-2 NB 2040+31	ROADWAY/TRAIL	1-24" RCP	B-11	432.80	448.22	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	6.68	431.18	1.43	430.67	429.88	0.32	4.76	21.13	100 YR DESIGN CONTROLS
CB-2 NB 2055+33	ROADWAY/TRAIL	1-24" RCP	B-14	446.48	447.70	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	2.85	444.17	0.82	443.86	441.60	0.90	3.62	3.62	100 YR DESIGN CONTROLS, ALLOWABLE HW SET TO EXISTING HW ELEVATION

DITCH B-11-1									
HIKE AND BIKE STATION		SLOPE (FT/FT)	Q100 (CFS)	MANNING'S 'n'	DITCH SECTION FS	DITCH SECTION BW	DITCH SECTION BS	VELOCITY (FT/S)	DEPTH OF FLOW (FT)
FROM	TO								
2043+80 RT	2040+50 RT	0.0131	65.50	0.030	3.00	0.00	2.00	5.67	2.15

DITCH B-11-2									
HIKE AND BIKE STATION		SLOPE (FT/FT)	Q100 (CFS)	MANNING'S 'n'	DITCH SECTION FS	DITCH SECTION BW	DITCH SECTION BS	VELOCITY (FT/S)	DEPTH OF FLOW (FT)
FROM	TO								
2043+80 LT	2041+00 LT	0.0664	7.68	0.030	3.00	0.00	2.00	6.10	0.71

DITCH B-11-3									
HIKE AND BIKE STATION		SLOPE (FT/FT)	Q100 (CFS)	MANNING'S 'n'	DITCH SECTION FS	DITCH SECTION BW	DITCH SECTION BS	VELOCITY (FT/S)	DEPTH OF FLOW (FT)
FROM	TO								
2040+22 RT	2040+08 RT	0.0086	7.71	0.030	3.00	4.00	3.00	2.54	0.54

DITCH B-13-1									
HIKE AND BIKE STATION		SLOPE (FT/FT)	Q100 (CFS)	MANNING'S 'n'	DITCH SECTION FS	DITCH SECTION BW	DITCH SECTION BS	VELOCITY (FT/S)	DEPTH OF FLOW (FT)
FROM	TO								
2054+51 LT	2051+90 RT	1.30%	79.56	0.030	3.00	0.00	3.00	5.74	2.15

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CONTRACT SHEET No. 240 OF 345

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ARCHER WESTERN HERZOG

DART PROJECT

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DESIGNED	J. RODRIGUEZ
CHECKED	A. DORANTES
IN CHARGE	A. DORANTES
DATE	07 AUG 23

CAES

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

CITY OF CARROLLTON
DRAINAGE CALCULATIONS
SHEET 1 OF 5

CONTRACT	DWG No.	REV
C-2033270-01	CC6-2001	D

CB05-CC6-2001.010

DWG No. CC6-2002

DRAINAGE AREA CALCULATIONS (LESS THAN 200 ACRES)

AREA NUMBER	AREA BY ZONING			RATIONAL METHOD Q=CIA									COMMENTS
	GRASS/ROW (ACRES)	PAVEMENT/ INDUSTRIAL (ACRES)	BALLAST (ACRES)	AREA (ACRES)	Tc (MIN)	RUNOFF "C"	INTENSITY 10-YEAR (IN/HR)	Q10 (CFS)	INTENSITY 50-YEAR (IN/HR)	Q50 (CFS)	INTENSITY 100-YEAR (IN/HR)	Q100 (CFS)	
	0.40	0.90	0.90										
B-61	3.29	0.12	1.91	5.32	18.00	0.59	5.24	16.43	6.62	20.79	7.21	22.62	
B-64	0.83	0.11	0.58	1.52	10.00	0.63	6.48	6.21	8.16	7.81	8.88	8.50	
B-65	7.63	9.52		17.15	23.00	0.68	4.76	55.54	6.62	77.20	6.65	77.55	
B-66	0.85		0.51	1.36	10.00	0.59	6.48	5.20	8.16	6.55	8.88	7.13	
B-67	0.95	0.33	1.81	3.09	10.00	0.75	6.48	15.02	8.16	18.91	8.88	20.58	
B-70	0.62	0.17	2.05	2.84	10.00	0.79	6.48	14.54	8.16	18.31	8.88	19.92	
B-71	1.03	50.55	2.57	54.15	25.00	0.89	4.57	220.39	5.84	281.45	6.39	307.96	

NOTES:

1. DRAINAGE CALCULATIONS PERTAIN TO STATIONS 2216+75.00 TO 2288+63.86
2. RUNOFF COMPUTATIONS HAVE BEEN PERFORMED ACCORDING TO DART DESIGN CRITERIA MANUAL, VOL. 1, DRAINAGE CRITERIA, CHAPTER 7, JANUARY 31, 2003.
3. THE DESIGN STORM FOR DRAINAGE SYSTEMS CONVEYING FLOWS FROM TRAIL AND TRACK IS 100-YEAR. THE DESIGN STORM FOR DRAINAGE SYSTEMS CONVEYING FLOWS FROM THE TRAIL ONLY IS 50-YEAR.

CULVERT INPUT DATA (HY-8)

MINOR CULVERTS

STATION/ID	TRACK OR ROADWAY/TRAIL	DESCRIPTION	DRAINAGE AREA ID	INLET STATION (FT)	INLET ELEV (FT)	UPPER-BREAK STATION (FT)	UPPER-BREAK ELEV (FT)	LOWER-BREAK STATION (FT)	LOWER-BREAK ELEV (FT)	OUTLET STATION (FT)	OUTLET ELEV (FT)	TAILWATER DATA
CB-2 NB 2214+00	ROADWAY	1-24" RCP	B-61	0.00	529.52	99.00	528.67	N/A	N/A	165.00	526.45	TW CONDITION SET TO EXISTING TW ELEVATION
CB-2 NB 2241+55	TRACK	1- 6'X6' SBC (E80)	B-65, B-66	0.00	532.20	39.00	531.24	84.00	529.78	147.00	529.58	TW CONDITION SET TO EXISTING TW ELEVATION
CB-2 NB 2260+92	TRACK	1- 5'X5' SBC (E80)	B-71	0.00	543.90	N/A	N/A	N/A	N/A	101.00	543.24	TW CONDITION SET TO NORMAL DEPTH

CULVERT HYDRAULIC DATA

MINOR CULVERTS

STATION/ID	TRACK OR ROADWAY/TRAIL	DESCRIPTION	DRAINAGE AREA ID	ALLOWABLE HEADWATER (FT)	BOT OF SUBALLAST ELEV (FT)	10 YEAR (DESIGN STORM FREQUENCY)								50 YEAR (DESIGN STORM FREQUENCY)								100 YEAR (DESIGN STORM FREQUENCY)								COMMENTS
						FLOW "Q" (CFS)	HW ELEV (FT)	HW DEPTH (FT)	EGL ELEV (FT)	TW ELEV (FT)	TW DEPTH (FT)	OUTLET VEL (FT/S)	TW VEL (FT/S)	FLOW "Q" (CFS)	HW ELEV (FT)	HW DEPTH (FT)	EGL ELEV (FT)	TW ELEV (FT)	TW DEPTH (FT)	OUTLET VEL (FT/S)	TW VEL (FT/S)	FLOW "Q" (CFS)	HW ELEV (FT)	HW DEPTH (FT)	EGL ELEV (FT)	TW ELEV (FT)	TW DEPTH (FT)	OUTLET VEL (FT/S)	TW VEL (FT/S)	
CB-2 NB 2214+00	ROADWAY	1-24" RCP	B-61	533.00	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	22.62	532.89	3.37	535.45	527.56	1.11	12.85	4.81	100 YR DESIGN CONTROLS, ALLOWABLE HW SET TO EXISTING HW ELEVATION
CB-2 NB 2241+55	TRACK	1-6'X6' SBC (E80)	B-65, B-66	544.63	545.63	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	84.68	534.97	2.77	537.18	531.01	1.17	11.92	11.92	100 YR DESIGN CONTROLS, ALLOWABLE HW SET TO EXISTING HW ELEVATION
CB-2 NB 2260+92	TRACK	1- 5'x5' SBC (E80)	B-71	553.89	563.05	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	307.96	553.89	9.99	556.34	548.14	4.90	12.56	12.56	100 YR DESIGN CONTROLS, ALLOWABLE HW SET TO EXISTING HW ELEVATION

DITCH B-61-1

HIKE AND BIKE STATION		SLOPE (FT/FT)	Q100 (CFS)	MANNING'S 'n'	DITCH SECTION FS	DITCH SECTION BW	DITCH SECTION BS	VELOCITY (FT/S)	DEPTH OF FLOW (FT)
FROM	TO								
2238+41 LT	2237+83 LT	0.50%	0.60	0.030	3.00	0.00	2.00	1.22	0.44

DITCH B-61-2

HIKE AND BIKE STATION		SLOPE (FT/FT)	Q100 (CFS)	MANNING'S 'n'	DITCH SECTION FS	DITCH SECTION BW	DITCH SECTION BS	VELOCITY (FT/S)	DEPTH OF FLOW (FT)
FROM	TO								
2234+33 LT	2232+36 LT	0.44%	6.35	0.030	3.00	0.00	2.00	2.10	1.10
2232+36 LT	2227+14 LT	0.44%	11.83	0.030	3.00	2.00	2.00	2.43	1.05
2227+14 LT	2220+00 LT	0.67%	19.32	0.030	3.00	2.00	2.00	3.23	1.20
2220+00 LT	2218+71 LT	0.56%	20.68	0.030	3.00	2.00	2.00	3.07	1.29
2218+71 LT	2216+86 RT	0.56%	22.62	0.030	3.00	4.00	2.00	2.29	1.34

DITCH B-64-1

HIKE AND BIKE STATION		SLOPE (FT/FT)	Q100 (CFS)	MANNING'S 'n'	DITCH SECTION FS	DITCH SECTION BW	DITCH SECTION BS	VELOCITY (FT/S)	DEPTH OF FLOW (FT)
FROM	TO								
2238+42 LT	2240+05 LT	0.29%	2.28	0.030	3.00	0.00	2.00	1.39	0.81
2240+05 LT	2241+33 LT	0.85%	4.07	0.030	3.00	0.00	2.00	2.41	0.82
2241+33 LT	2242+27 LT	2.19%	5.38	0.030	3.00	0.00	2.00	3.68	0.76
2242+27 LT	2242+96 LT	2.19%	6.35	0.035	4.00	0.00	3.00	3.20	0.75

DITCH B-67-1

HIKE AND BIKE STATION		SLOPE (FT/FT)	Q100 (CFS)	MANNING'S 'n'	DITCH SECTION FS	DITCH SECTION BW	DITCH SECTION BS	VELOCITY (FT/S)	DEPTH OF FLOW (FT)
FROM	TO								
2259+17 LT	2257+53 LT	1.00%	6.45	0.030	3.00	2.00	2.00	2.80	0.64

DITCH B-67-2

HIKE AND BIKE STATION		SLOPE (FT/FT)	Q100 (CFS)	MANNING'S 'n'	DITCH SECTION FS	DITCH SECTION BW	DITCH SECTION BS	VELOCITY (FT/S)	DEPTH OF FLOW (FT)
FROM	TO								
2254+12 LT	2252+62 LT	0.43%	11.79	0.015	2.00	3.75	2.00	3.90	0.61
2252+62 LT	2252+11 LT	1.24%	12.34	0.030	3.00	3.75	2.00	3.43	0.66
2252+11 LT	2251+61 LT	3.30%	12.87	0.030	3.00	0.00	2.00	5.34	0.98
2251+61 LT	2250+68 LT	3.23%	13.87	0.030	3.00	0.00	2.00	5.39	1.01

DITCH B-70-1

HIKE AND BIKE STATION		SLOPE (FT/FT)	Q100 (CFS)	MANNING'S 'n'	DITCH SECTION FS	DITCH SECTION BW	DITCH SECTION BS	VELOCITY (FT/S)	DEPTH OF FLOW (FT)
FROM	TO								
2288+31 LT	2286+40 LT	0.50%	1.64	0.030	2.00	2.00	2.00	1.53	0.39
2286+40 LT	2285+60 LT	0.50%	2.33	0.015	3.00	3.75	2.00	2.37	0.23
2285+60 LT	2285+24 LT	0.67%	2.64	0.015	3.00	3.75	2.00	2.73	0.22

DITCH B-70-2

HIKE AND BIKE STATION		SLOPE (FT/FT)	Q100 (CFS)	MANNING'S 'n'	DITCH SECTION FS	DITCH SECTION BW	DITCH SECTION BS	VELOCITY (FT/S)	DEPTH OF FLOW (FT)
FROM	TO								
2270+97 LT	2269+48 LT	1.81%	16.48	0.030	2.00	2.00	2.00	4.64	0.92
2269+48 LT	2268+49 LT	1.01%	17.33	0.030	2.00	2.00	2.00	3.80	1.09
2268+49 LT	2267+70 LT	1.61%	18.01	0.030	2.00	2.00	2.00	4.55	0.99
2267+70 LT	2267+62 LT	18.75%	18.07	0.030	2.00	2.00	2.00	11.12	0.53
2267+62 LT	2267+26 LT	3.45%	18.38	0.030	2.00	2.00	2.00	6.06	0.83

NOT AN APPROVED DRAWING
FINAL 100% DESIGN

CONTRACT SHEET No. 241 OF 345

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

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DESIGNED	J. RODRIGUEZ
CHECKED	A. DORANTES
IN CHARGE	A. DORANTES
DATE	07 AUG 23

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COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

CITY OF CARROLLTON
DRAINAGE CALCULATIONS
SHEET 2 OF 5

CONTRACT	DWG No.	REV
C-2033270-01	CC6-2002	D

CB05-CC6-2002.010

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DWG No. CC6-2003

DRAINAGE AREA CALCULATIONS (LESS THAN 200 ACRES)

AREA NUMBER	AREA BY ZONING									RATIONAL METHOD Q=CIA							COMMENTS
	GRASS (ACRES) 0.40	SF (ACRES) 0.65	INDUSTRIAL (ACRES) 0.90	PAVEMENT (ACRES) 0.95	ROW (ACRES) 0.40	MF (ACRES) 0.80	TC (ACRES) 0.85	BALLAST (ACRES) 0.90	COMMERCIAL (ACRES) 0.85	AREA (ACRES)	Tc (MIN)	RUNOFF "C"	INTENSITY_50yr (IN/HR)	Q50 (CFS)	INTENSITY_100yr (IN/HR)	Q100 (CFS)	
B-22A	0.01		0.02	0.02						0.04	10.00	0.85	8.16	0.29	8.88	0.31	DITCH TO HUTTON BRANCH CREEK
B-22B	0.06		0.07	0.03						0.17	10.00	0.72	8.16	1.00	8.88	1.09	DITCH TO SETP-CD B-22B
B-22C	0.06		0.57	0.06						0.69	10.00	0.86	8.16	4.84	8.88	5.27	DITCH TO SETP-CD B-22C
B-22D								0.29		0.29	10.00	0.90	8.16	2.15	8.88	2.34	EXIST UD TO PROP 36"
B-22E	0.08		0.47	0.07						0.62	10.00	0.84	8.16	4.26	8.88	4.64	DITCH TO SETP-CD B-22E
B-22F								0.32		0.32	10.00	0.90	8.16	2.35	8.88	2.56	EXIST UD TO PROP 36"
B-22G	0.07		0.45	0.04				0.08		0.64	10.00	0.85	8.16	4.47	8.88	4.86	DITCH TO SETP-CD B-22G
B-22H	0.21		0.96	0.10				0.20		1.47	10.00	0.83	8.16	9.98	8.88	10.86	DITCH TO SETP-CD B-22H
B-22I	0.13		0.27	0.05				0.11		0.55	10.00	0.79	8.16	3.56	8.88	3.88	DITCH TO SETP-CD B-22I
B-22J	0.16		0.31	0.07				0.14		0.68	10.00	0.79	8.16	4.36	8.88	4.75	DITCH TO SETP-CD B-22J

NOTES:

1. DRAINAGE CALCULATIONS PERTAIN TO STATIONS 2081+10.00 TO 2216+75.00.
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COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

CITY OF CARROLLTON
DRAINAGE CALCULATIONS
SHEET 3 OF 5

CONTRACT	DWG No.	REV
C-2033270-01	CC6-2003	D

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DWG No. CC6-2004

PIPE CALCULATIONS																			
PIPE ID.	FROM	TO	DESIGN FREQUENCY	CUMULATIVE DISCHARGE	CAPACITY	LENGTH	SIZE	UPSTREAM FL	DOWNSTREAM FL	MANNING'S N	PIPE SLOPE	FRICTION SLOPE	CRITICAL DEPTH	NORMAL DEPTH	ACTUAL DOWNSTREAM DEPTH	HGL UPSTREAM	HGL DOWNSTREAM	ACTUAL VELOCITY	NO. OF BARRELS	REMARKS
			(YR)	(CFS)	(CFS)	(FT)	(IN)	(FT)	(FT)		(%)	(%)	(FT)	(FT)	(FT)	(FT)	(FT)	(FT/S)		
Pipe-B-22A	MH-B-22A	B-22-OUT	100	30.11	38.67	351.41	36"	432.80	431.62	0.013	0.34	0.20	1.78	1.99	8.25	440.59	439.87	4.26	1	100-YEAR
Pipe-B-22B	MH-B-22B	MH-B-22A	100	30.36	81.53	70.27	36"	435.50	434.45	0.013	1.49	0.21	1.79	1.27	4.60	439.20	439.05	4.30	1	100-YEAR
Pipe-B-22C	B-22C JUNCTION	MH-B-22B	100	29.59	64.87	63.43	36"	436.10	435.50	0.013	0.95	0.20	1.76	1.42	3.77	439.39	439.27	4.19	1	100-YEAR
Pipe-B-22E	MH-B-22E	B-22C JUNCTION	100	25.10	48.09	213.54	36"	437.21	436.10	0.013	0.52	0.14	1.62	1.54	3.39	439.73	439.49	6.88	1	100-YEAR
Pipe-B-22G	MH-B-22G	MH-B-22E	100	21.41	52.93	323.93	36"	439.25	437.21	0.013	0.63	0.42	1.49	1.33	2.58	440.74	439.79	7.09	1	100-YEAR
Pipe-B-22H	MH-B-22H	MH-B-22G	100	14.42	43.05	180.03	36"	440.00	439.25	0.013	0.42	0.32	1.21	1.20	1.63	441.21	440.88	5.48	1	100-YEAR
Pipe-B-22I	MH-B-22I	MH-B-22H	100	3.90	43.92	219.09	36"	440.95	440.00	0.013	0.43	0.20	0.62	0.6	1.32	441.57	441.32	3.84	1	100-YEAR
Pipe-B-22J	MH-B-22J	B-22J-OUT	100	4.78	9.83	139.40	18"	441.52	440.30	0.013	0.88	0.85	0.84	0.74	0.74	442.36	441.04	5.52	1	100-YEAR
Pipe-B-22B-L	B-22B	MH-B-22B	100	1.10	82.06	18.24	24"	438.90	436.50	0.013	13.16	0.63	0.36	0.16	2.77	439.26	439.27	9.16	1	100-YEAR
Pipe-B-22C-L-1	B-22C	B-22C-L TRANSITION	100	5.31	65.95	6.41	18"	439.48	436.95	0.013	39.42	14.90	0.89	0.29	2.69	440.36	439.64	22.40 *	1	100-YEAR
Pipe-B-22C-L-2	B-22C-L TRANSITION	B-22C JUNCTION	100	5.31	18.91	3.08	18"	436.95	436.85	0.013	3.24	0.26	0.89	0.54	2.64	439.50	439.49	3.01	1	100-YEAR
Pipe-B-22E-L-1	B-22E	B-22E-L TRANSITION	100	4.68	109.13	8.53	24"	440.28	438.30	0.013	23.27	16.81	0.76	0.28	1.54	441.05	439.84	17.30 *	1	100-YEAR
Pipe-B-22E-L-2	B-22E-L TRANSITION	MH-B-22E	100	4.68	38.65	3.08	24"	438.30	438.21	0.013	2.92	0.05	0.76	0.47	1.58	439.79	439.79	8.32	1	100-YEAR
Pipe-B-22G-L	B-22G	MH-B-22G	100	4.90	50.60	18.29	24"	441.91	441.00	0.013	5.00	2.01	0.78	0.42	0.47	442.69	441.47	10.20	1	100-YEAR
Pipe-B-22H-L	B-22H	MH-B-22H	100	10.94	38.99	18.75	24"	441.56	441.00	0.013	2.97	1.23	1.19	0.72	0.85	442.74	441.85	10.65	1	100-YEAR
Pipe-B-22I-L	B-22I	MH-B-22I	100	3.91	51.61	23.00	24"	443.15	441.95	0.013	5.21	2.49	0.69	0.37	0.40	443.84	442.35	9.68	1	100-YEAR
Pipe-B-22J-L	B-22J	MH-B-22J	100	4.78	12.44	15.23	18"	441.73	441.52	0.013	1.40	1.31	0.84	0.65	0.93	442.57	442.45	6.58	1	100-YEAR

* HIGH VELOCITY ONLY OCCURS IN THE UPPER SEGMENT OF A BROKEN BACK PIPE.

NOTES:

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COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

CITY OF CARROLLTON
DRAINAGE CALCULATIONS
SHEET 4 OF 5

CONTRACT	DWG No.	REV
C-2033270-01	CC6-2004	D

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DWG No. CC6-2005

DITCH B-22A					
DRAINAGE AREA: B-22A					
TRAIL		SLOPE	Q100	VELOCITY	DEPTH OF
FROM	TO	(ft/ft)	(cfs)	(ft/s)	FLOW (ft)
2085+16	2084+95	0.0218	0.15	0.78	0.07
2084+95	2084+72	0.0332	0.31	1.34	0.12

DITCH B-22B-1					
DRAINAGE AREA: B-22B (PARTIAL)					
TRAIL		SLOPE	Q100	VELOCITY	DEPTH OF
FROM	TO	(ft/ft)	(cfs)	(ft/s)	FLOW (ft)
2085+16	2085+53	0.0143	0.35	1.51	0.22
2085+53	2086+01	0.0536	0.82	3.97	0.26

DITCH B-22B-2					
DRAINAGE AREA: B-22B (PARTIAL)					
TRAIL		SLOPE	Q100	VELOCITY	DEPTH OF
FROM	TO	(ft/ft)	(cfs)	(ft/s)	FLOW (ft)
2086+30	2086+01	0.0382	0.27	2.64	0.18

DITCH B-22C-1					
DRAINAGE AREA: B-22C (PARTIAL)					
TRAIL		SLOPE	Q100	VELOCITY	DEPTH OF
FROM	TO	(ft/ft)	(cfs)	(ft/s)	FLOW (ft)
2086+30	2086+75	0.0077	1.09	1.57	0.45

DITCH B-22C-2					
DRAINAGE AREA: B-22C (PARTIAL)					
TRAIL		SLOPE	Q100	VELOCITY	DEPTH OF
FROM	TO	(ft/ft)	(cfs)	(ft/s)	FLOW (ft)
2088+51	2088+14	0.0147	0.89	1.99	0.37
2088+14	2086+75	0.0144	4.18	2.79	0.66

DITCH B-22E-1					
DRAINAGE AREA: B-22E (PARTIAL)					
TRAIL		SLOPE	Q100	VELOCITY	DEPTH OF
FROM	TO	(ft/ft)	(cfs)	(ft/s)	FLOW (ft)
2088+51	2088+85	0.0510	0.62	3.42	0.25

DITCH B-22E-2					
DRAINAGE AREA: B-22E (PARTIAL)					
TRAIL		SLOPE	Q100	VELOCITY	DEPTH OF
FROM	TO	(ft/ft)	(cfs)	(ft/s)	FLOW (ft)
2091+08	2090+01	0.0087	1.93	2.17	0.53
2090+01	2089+73	0.0392	2.43	3.76	0.46
2089+73	2089+23	0.0280	3.35	3.81	0.52
2089+23	2088+85	0.0063	4.02	10.18	0.36

DITCH B-22G-1					
DRAINAGE AREA: B-22G (PARTIAL)					
TRAIL		SLOPE	Q100	VELOCITY	DEPTH OF
FROM	TO	(ft/ft)	(cfs)	(ft/s)	FLOW (ft)
2091+08	2092+12	0.0197	3.40	3.13	0.59

DITCH B-22G-2					
DRAINAGE AREA: B-22G (PARTIAL)					
TRAIL		SLOPE	Q100	VELOCITY	DEPTH OF
FROM	TO	(ft/ft)	(cfs)	(ft/s)	FLOW (ft)
2092+57	2092+12	0.0293	1.46	2.93	0.40

DITCH B-22H					
DRAINAGE AREA: B-22H (PARTIAL)					
TRAIL		SLOPE	Q100	VELOCITY	DEPTH OF
FROM	TO	(ft/ft)	(cfs)	(ft/s)	FLOW (ft)
2092+57	2093+75	0.0122	3.54	3.16	0.61

DITCH B-22J					
DRAINAGE AREA: B-22J (PARTIAL)					
TRAIL		SLOPE	Q100	VELOCITY	DEPTH OF
FROM	TO	(ft/ft)	(cfs)	(ft/s)	FLOW (ft)
2099+91	2099+75	0.0039	0.42	0.98	0.29
2099+75	2099+50	0.0144	1.08	2.41	0.30
2099+50	2098+50	0.0061	3.72	1.91	0.67
2098+50	2098+45	0.0720	3.84	4.92	0.44

NOTES:

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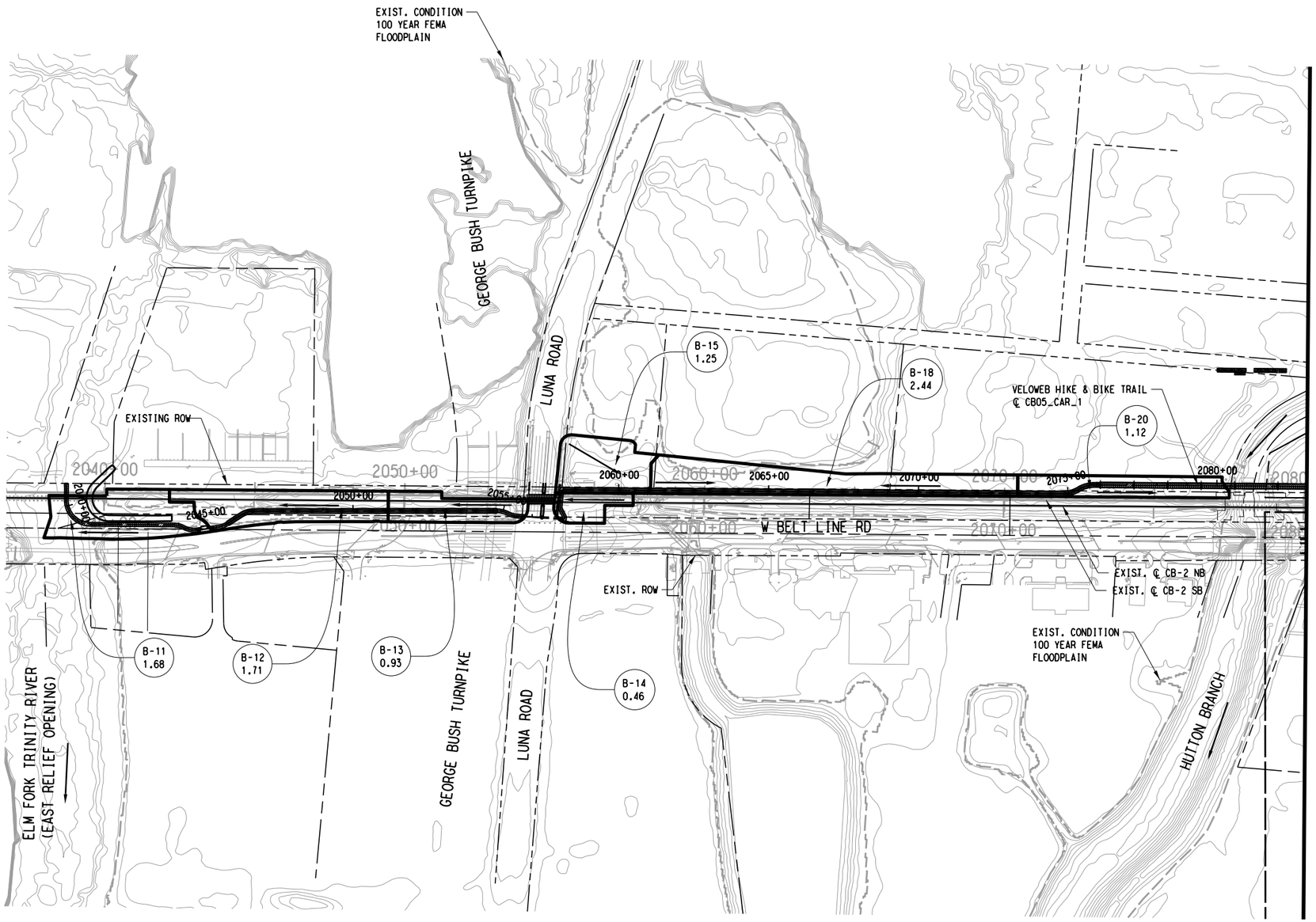
COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

CITY OF CARROLLTON
DRAINAGE CALCULATIONS
SHEET 5 OF 5

CONTRACT	DWG No.	REV
C-2033270-01	CC6-2005	D

CB05-CC6-2005.010

DWG No. CC6-2033



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LEGEND

- DRAINAGE AREA BOUNDARY
- PROPOSED CONTOUR
- DRAINAGE FLOW
- XX — DRAINAGE AREA NUMBERS
- XXX — DRAINAGE AREA IN ACRES

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CHECKED	A. DORANTES
IN CHARGE	A. DORANTES
DATE	07 AUG 23

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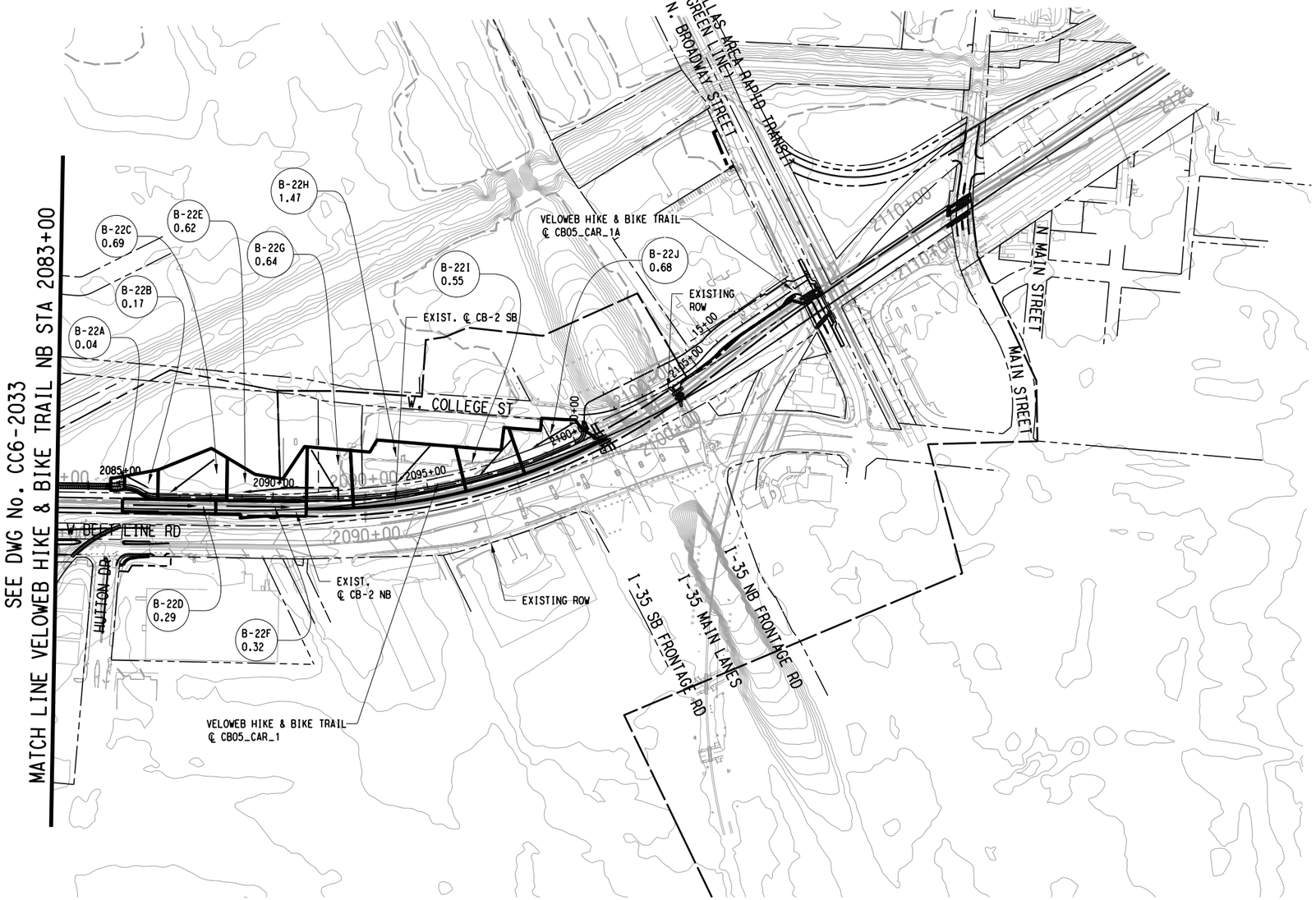
COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
CITY OF CARROLLTON
DRAINAGE AREA MAP
BEGIN TO STA 2083+00
SHEET 1 OF 4

CONTRACT	DWG No.	REV
C-2033270-01	CC6-2033	D

CB05-CC6-2033.200

DWG No. CC6-2280



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LEGEND

- DRAINAGE AREA BOUNDARY
- MINOR DRAINAGE AREA BOUNDARY
- DRAINAGE FLOW
- XX — DRAINAGE AREA NUMBERS
- XXX — DRAINAGE AREA IN ACRES

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DATE	07 AUG 23

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
CITY OF CARROLLTON
DRAINAGE AREA MAP
STA 2083+00 TO STA 2094+00
SHEET 2 OF 4

CONTRACT	DWG No.	REV
C-2033270-01	CC6-2280	D

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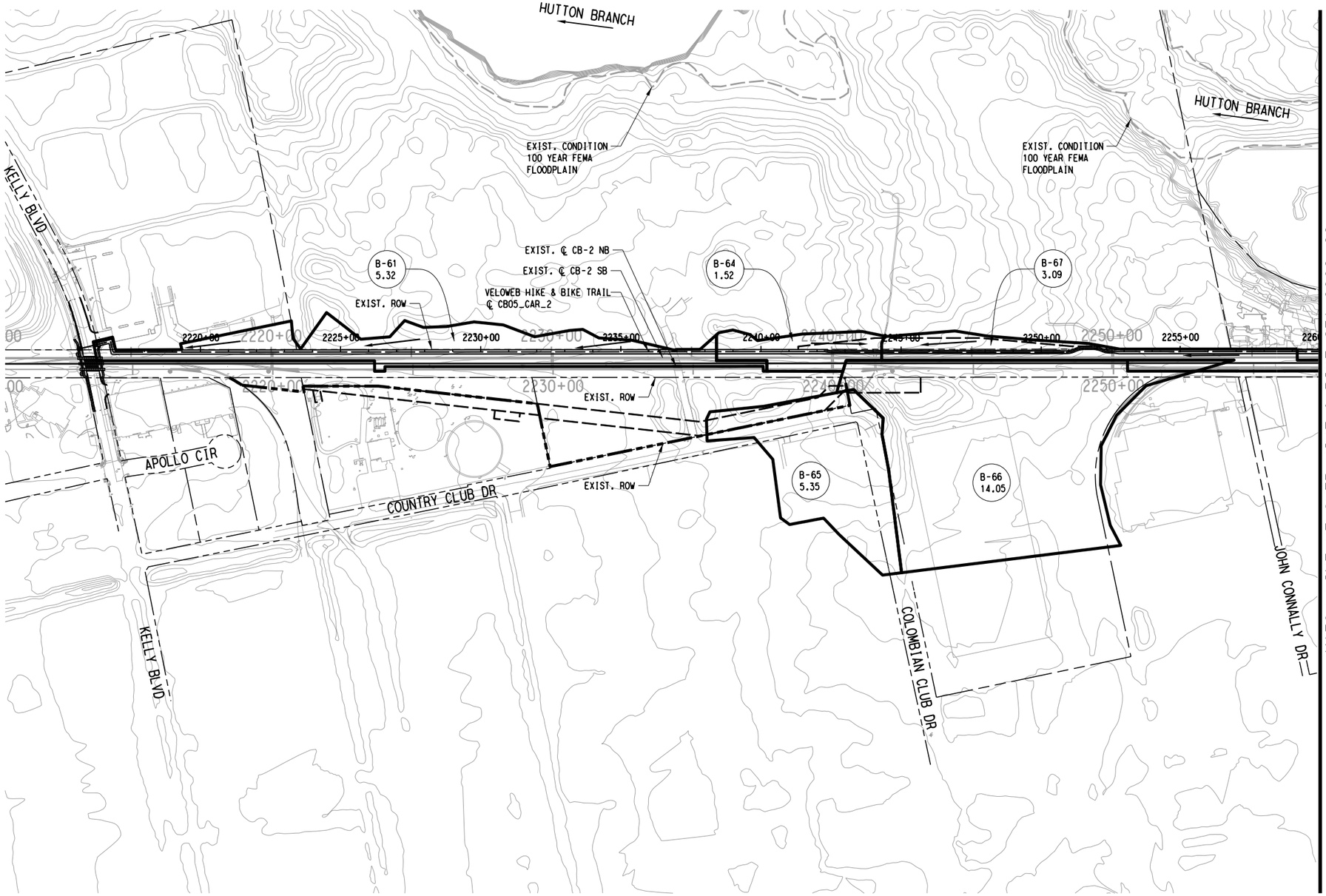
DWG No. CC6-2531



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LEGEND

- DRAINAGE AREA BOUNDARY
- PROPOSED CONTOUR
- DRAINAGE FLOW
- XX / XXX — DRAINAGE AREA NUMBERS / DRAINAGE AREA IN ACRES

NOTES:

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REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

IN-PROGRESS REVIEW
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ARCHER WESTERN HERZOG

DART PROJECT

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SCALE	1"=200'
DRAWN	D. ESCALANTE
DESIGNED	J. RODRIGUEZ
CHECKED	A. DORANTES
IN CHARGE	A. DORANTES
DATE	07 AUG 23

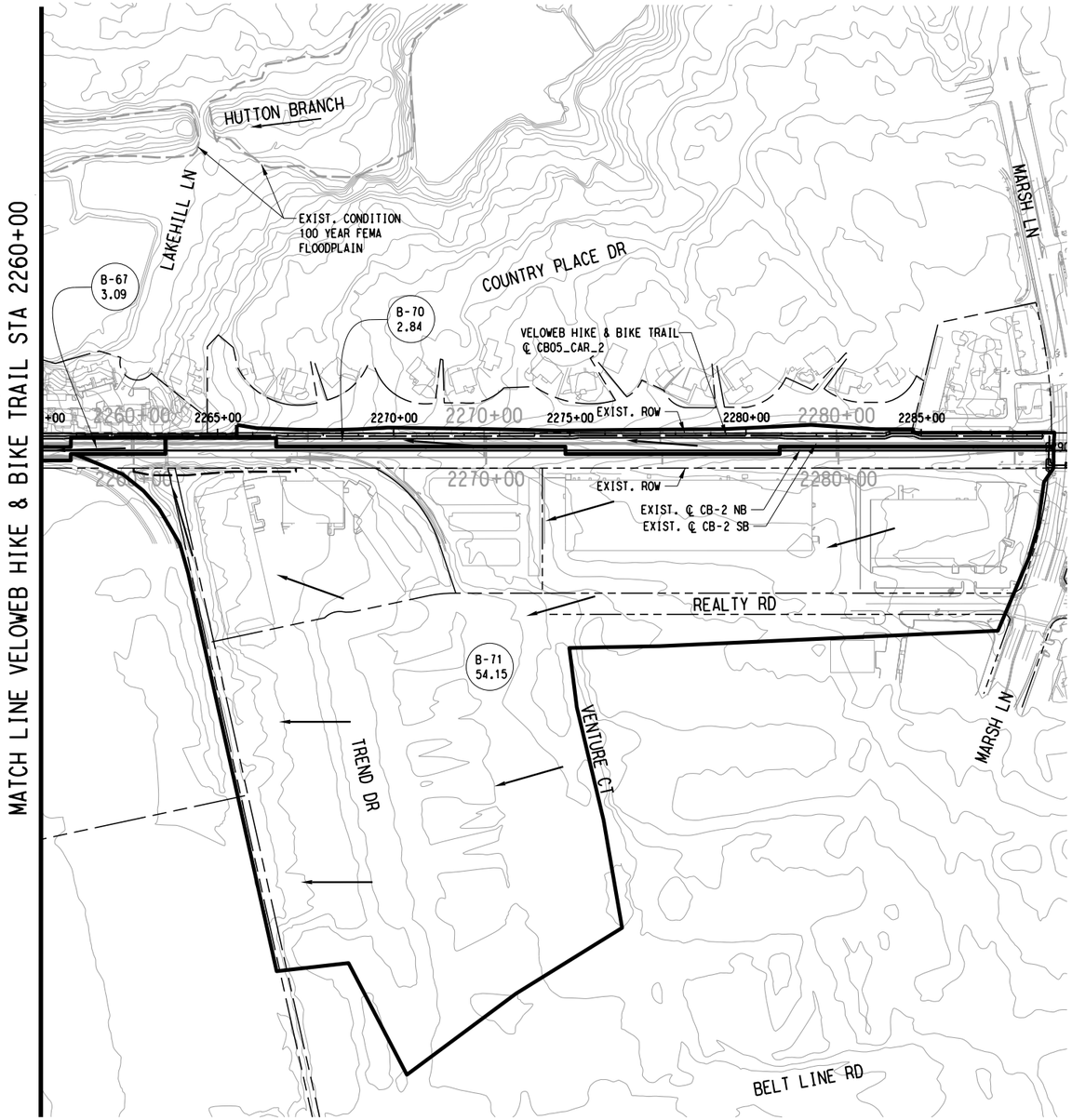
CAES

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
CITY OF CARROLLTON
DRAINAGE AREA MAP
BEGIN TO STA 2260+00
SHEET 3 OF 4

CONTRACT	DWG No.	REV
C-2033270-01	CC6-2531	D

CB05-CC6-2531.200

DWG No. CC6-2532



SCALE (IN FEET)
0 100 200 400

LEGEND

- DRAINAGE AREA BOUNDARY
- PROPOSED CONTOUR
- DRAINAGE FLOW
- XX — DRAINAGE AREA NUMBERS
- XXX — DRAINAGE AREA IN ACRES

NOTES:

1. DART DESIGN MANUAL UTILIZED FOR PROJECT.
2. TOPOGRAPHIC DATA SOURCE: TNRIS STRATMAP 2009 1-M DEM

31-JUL-2023 09:39
CB05-CC6-2532.200

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REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

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SCALE	1"=200'
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IN CHARGE	A. DORANTES
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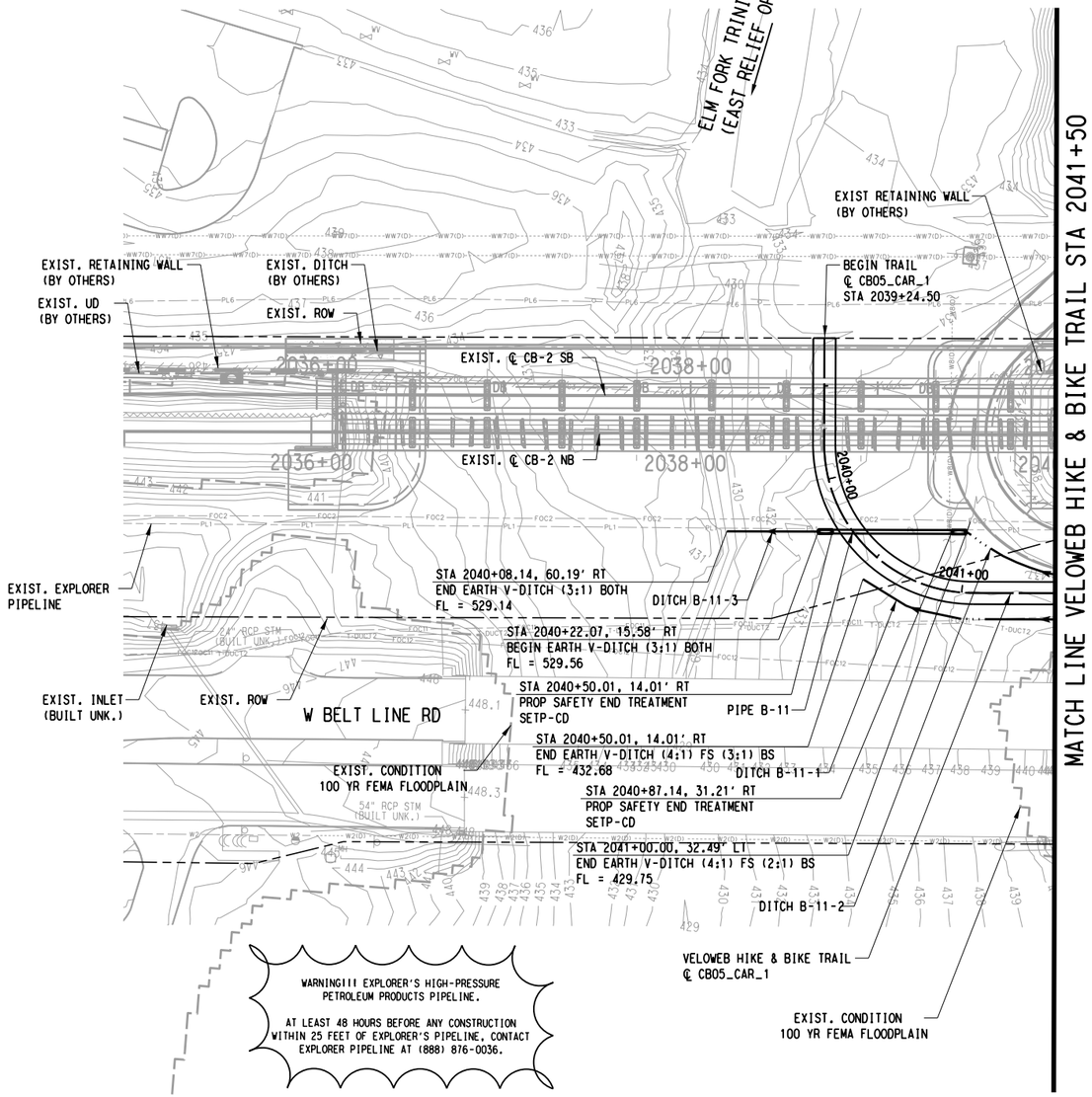
COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
CITY OF CARROLLTON
DRAINAGE AREA MAP
STA 2260+00 TO END
SHEET 4 OF 4

CONTRACT	DWG No.	REV
C-2033270-01	CC6-2532	D

CB05-CC6-2532.200

DWG No. CC6-2069



SCALE (IN FEET)
0 20 40 80

LEGEND

- CENTERLINE OF SPECIAL DITCH
- PROP FLUME
- PROP LIMITS OF CONCRETE LINED DITCH

NOTES:

1. ALL STATION CALLOUTS ARE IN REFRENCE TO THE VELOWEB HIKE & BIKE TRAIL CENTERLINE, UNLESS NOTED OTHERWISE.
2. ALL STORM DRAIN PIPES AND CULVERT CROSSINGS NB AND SB TRACK SHALL BE CLASS V UNLESS NOTED OTHERWISE.
3. DISTURBED AREAS REQUIRING GROUND COVER SHALL BE SEEDED BY HYDROMULCHING, UNLESS OTHERWISE NOTED.
4. ALL DITCH SIDE SLOPES SHALL BE 3:1 MAX, UNLESS OTHERWISE NOTED.
5. CONTOURS SHOWN IN PLAN VIEW ARE EXISTING UNLESS OTHERWISE NOTED.

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CONTRACT SHEET No. 249 OF 345

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

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DATE	07 AUG 23

CAES

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
CITY OF CARROLLTON
DRAINAGE PLAN
BEGIN TO STA 2041+50
SHEET 1 OF 15

CONTRACT	DWG No.	REV
C-2033270-01	CC6-2069	D

CB05-CC6-2069.040

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CB05-CC6-2069.040

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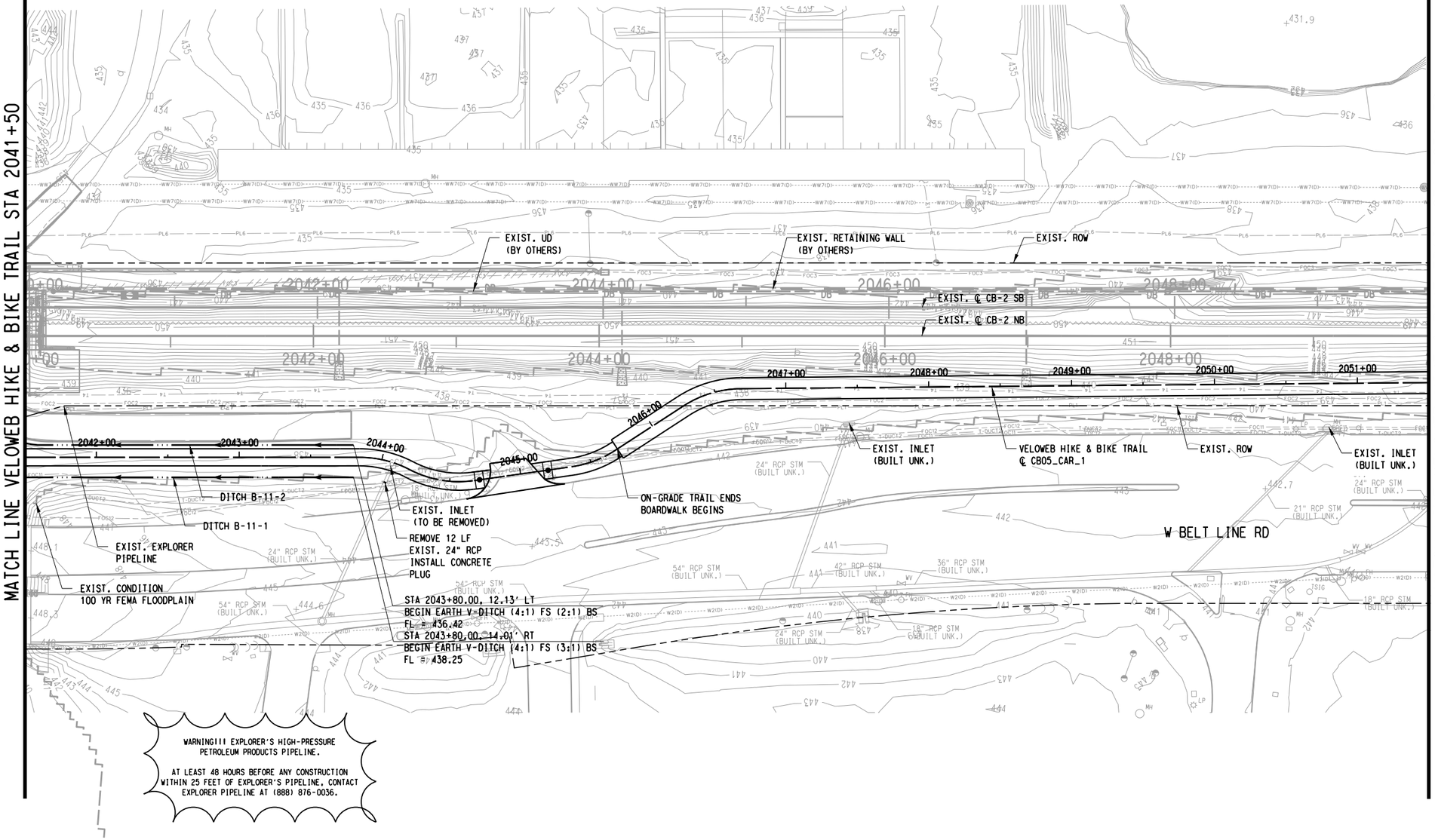
DWG No. CC6-2070

MATCH LINE VELOWEB HIKE & BIKE TRAIL STA 2041+50
SEE DWG No. CC6-2069

MATCH LINE VELOWEB HIKE & BIKE TRAIL STA 2051+50
SEE DWG No. CC6-2071



WARNING!!! EXPLORER'S HIGH-PRESSURE PETROLEUM PRODUCTS PIPELINE.

AT LEAST 48 HOURS BEFORE ANY CONSTRUCTION WITHIN 25 FEET OF EXPLORER'S PIPELINE, CONTACT EXPLORER PIPELINE AT (888) 876-0036.

SCALE (IN FEET)
0 20 40 80

LEGEND

- CENTERLINE OF SPECIAL DITCH
- PROP FLUME
- PROP LIMITS OF CONCRETE LINED DITCH

NOTES:

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4. ALL DITCH SIDE SLOPES SHALL BE 3:1 MAX, UNLESS OTHERWISE NOTED.
5. CONTOURS SHOWN IN PLAN VIEW ARE EXISTING UNLESS OTHERWISE NOTED.
6. THE DESIGN STORM FOR VELOWEB HIKE & BIKE TRAIL BOARDWALK IS 10-YEAR. THE VERTICAL PROFILE OF THE BOARDWALK HAS BEEN SET TO BE ABOVE THE FEMA 10-YEAR WATER SURFACE ELEVATION IN FLOODPLAIN AREAS.

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CONTRACT SHEET No. 250 OF 345

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

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DESIGNED	J. RODRIGUEZ
CHECKED	A. DORANTES
IN CHARGE	A. DORANTES
DATE	07 AUG 23

CAES

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
CITY OF CARROLLTON
DRAINAGE PLAN
STA 2041+50 TO STA 2051+50
SHEET 2 OF 15

CONTRACT	DWG No.	REV
C-2033270-01	CC6-2070	D

CB05-CC6-2070.040

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CB05-CC6-2070.040
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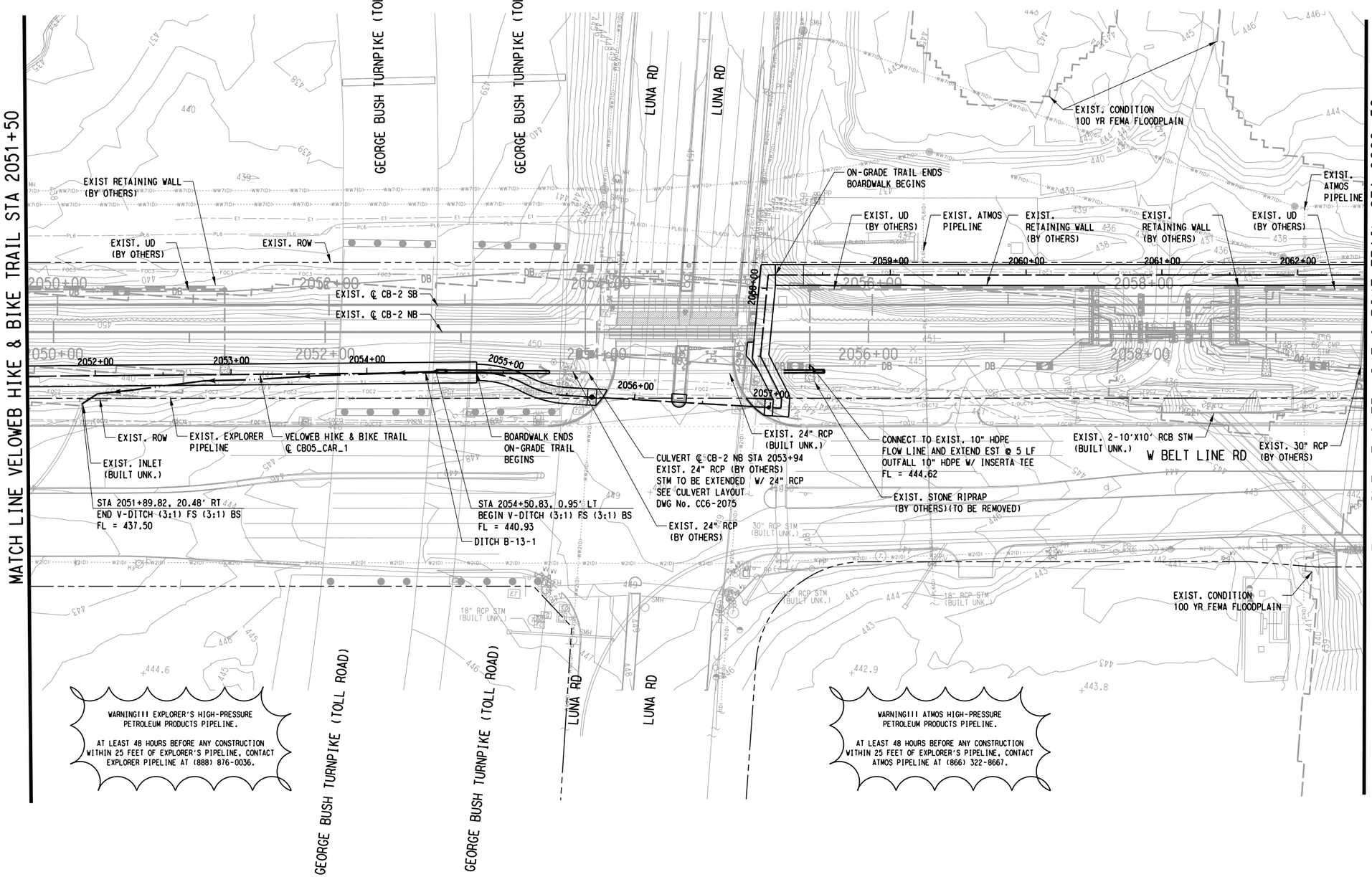
DWG No. CC6-2071

SEE DWG No. CC6-2070

MATCH LINE VELOWEB HIKE & BIKE TRAIL STA 2051+50

SEE DWG No. CC6-2072

MATCH LINE VELOWEB HIKE & BIKE TRAIL STA 2062+50



SCALE (IN FEET)
0 20 40 80

LEGEND

- CENTERLINE OF SPECIAL DITCH
- PROP FLUME
- PROP LIMITS OF CONCRETE LINED DITCH

NOTES:

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CONTRACT SHEET No. 251 OF 345

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

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DRAWN	J. RODRIGUEZ
DESIGNED	J. RODRIGUEZ
CHECKED	A. DORANTES
IN CHARGE	A. DORANTES
DATE	07 AUG 23

CAES

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
CITY OF CARROLLTON
DRAINAGE PLAN
STA 2051+50 TO STA 2062+50
SHEET 3 OF 15

CONTRACT	DWG No.	REV
C-2033270-01	CC6-2071	D

CB05-CC6-2071.040

31-JUL-2023 09:37
CB05-CC6-2071.040
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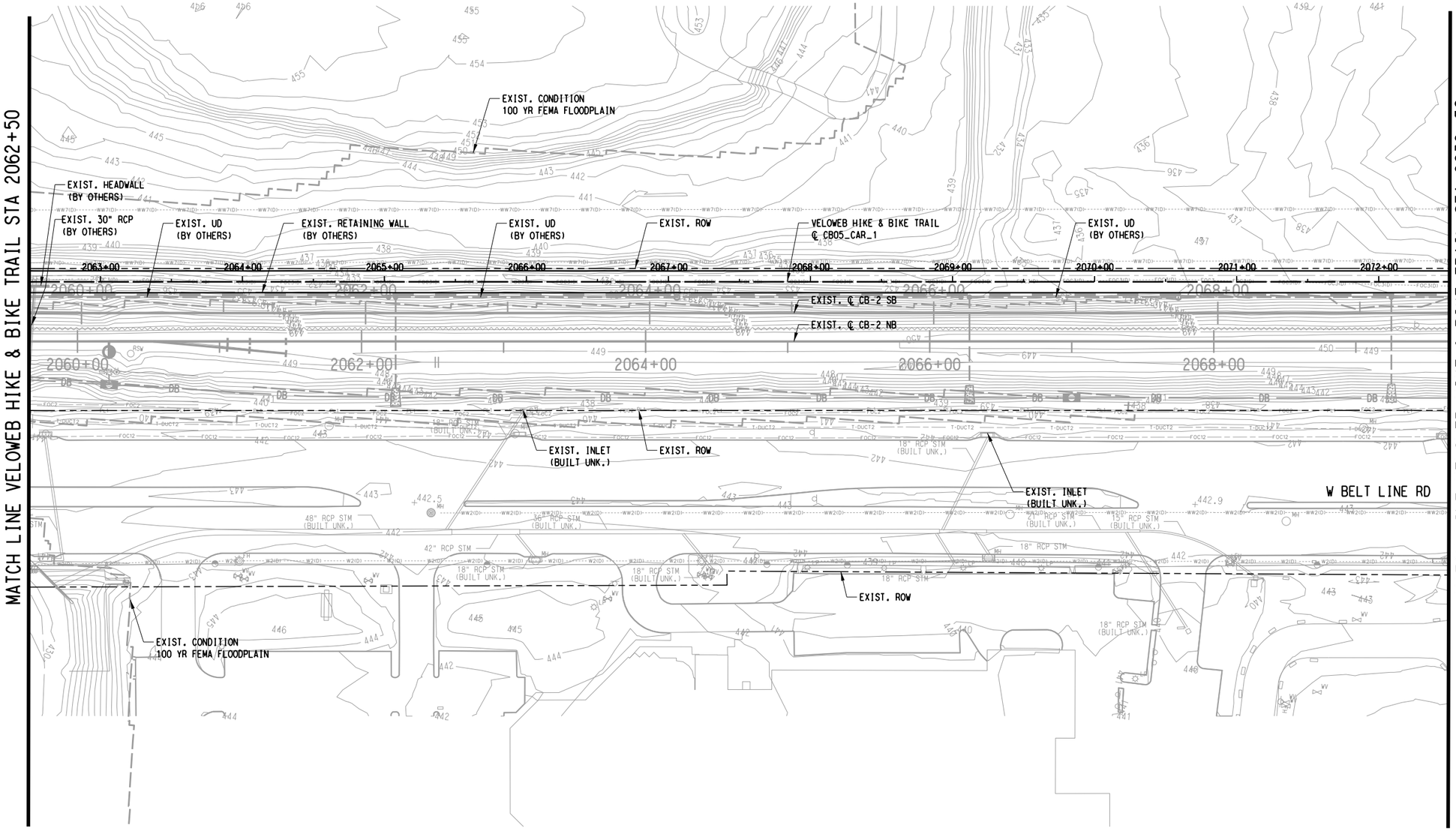
DWG No. CC6-2012



SCALE (IN FEET)
0 20 40 80

LEGEND

- CENTERLINE OF SPECIAL DITCH
- PROP FLUME
- PROP LIMITS OF CONCRETE LINED DITCH

NOTES:

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CONTRACT SHEET No. 252 OF 345

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

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SCALE	1"=40'
DRAWN	J. RODRIGUEZ
DESIGNED	J. RODRIGUEZ
CHECKED	A. DORANTES
IN CHARGE	A. DORANTES
DATE	07 AUG 23

CAES

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
CITY OF CARROLLTON
DRAINAGE PLAN
STA 2062+50 TO STA 2072+50
SHEET 4 OF 15

CONTRACT	DWG No.	REV
C-2033270-01	CC6-2072	D

CB05-CC6-2072.040

31-JUL-2023 09:36
CB05-CC6-2072.040
JEGSVCPW001
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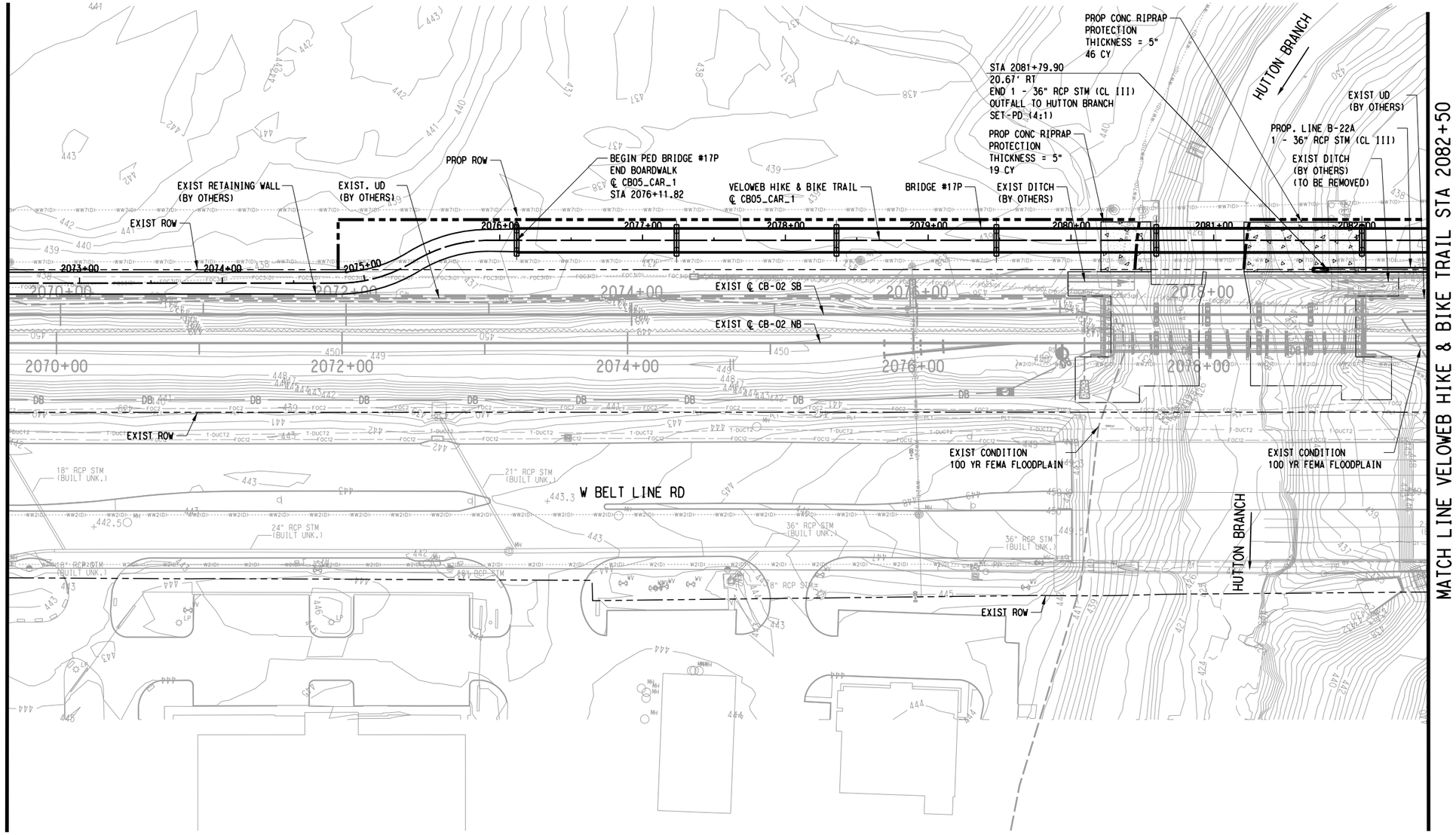
DWG No. CC6-2073



SCALE (IN FEET)
0 20 40 80

LEGEND

- CENTERLINE OF SPECIAL DITCH
- PROP FLUME
- PROP LIMITS OF CONCRETE LINED DITCH

NOTES:

1. ALL STATION CALLOUTS ARE IN REFRENCE TO THE VELOWEB HIKE & BIKE TRAIL CENTERLINE, UNLESS NOTED OTHERWISE.
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CONTRACT SHEET No. 253 OF 345

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

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SCALE	1"=40'
DRAWN	S. AHMED
DESIGNED	S. AHMED
CHECKED	H. MU
IN CHARGE	H. MU
DATE	07 AUG 23

CAES

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
CITY OF CARROLLTON
DRAINAGE PLAN
STA 2072+50 TO STA 2082+50
SHEET 5 OF 15

CONTRACT	DWG No.	REV
C-2033270-01	CC6-2073	D

CB05-CC6-2073.040

31-JUL-2023 09:37
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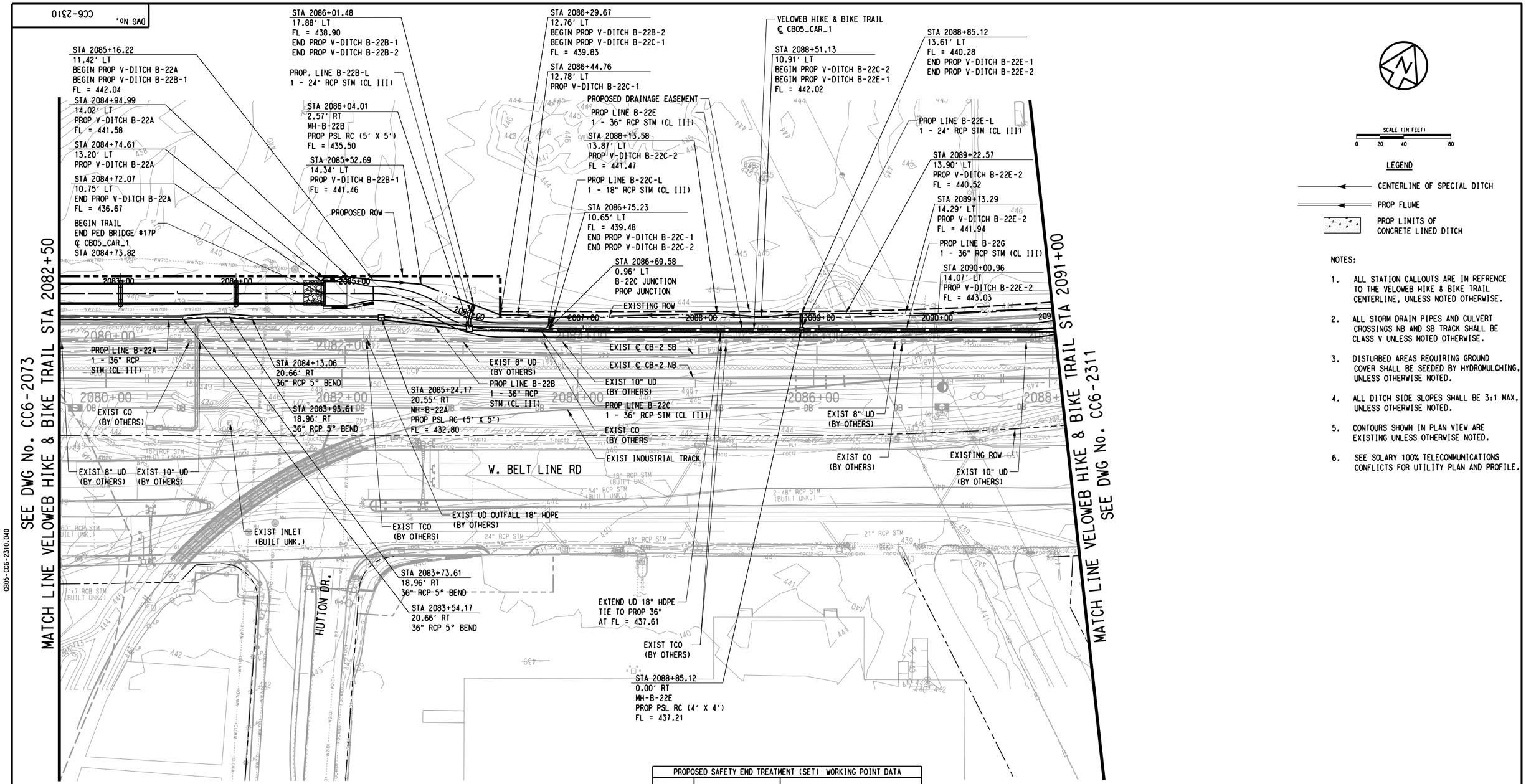
DWG No. CC6-2310



SCALE (IN FEET)
0 20 40 80

LEGEND

- CENTERLINE OF SPECIAL DITCH
- PROP FLUME
- PROP LIMITS OF CONCRETE LINED DITCH

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6. SEE SOLARY 100% TELECOMMUNICATIONS CONFLICTS FOR UTILITY PLAN AND PROFILE.

PROPOSED SAFETY END TREATMENT (SET) WORKING POINT DATA					
SET NO.	SET TYPE	STATION/OFFSET			
B-22B	SETP-CD (3:1)	TRAIL	2081+79.90	13.53'	LT
B-22C	SETP-CD (3:1)	TRAIL	2086+72.71	6.33'	LT
B-22E	SETP-CD (3:1)	TRAIL	2088+85.11	8.61'	LT

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CONTRACT SHEET No. 254 OF 345

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

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DESIGNED	S. AHMED
CHECKED	H. MU
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DATE	07 AUG 23

CAES

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
CITY OF CARROLLTON
DRAINAGE PLAN
STA 2082+50 TO STA 2091+00
SHEET 6 OF 15

CONTRACT	DWG No.	REV
C-2033270-01	CC6-2310	D

CB05-CC6-2310.040

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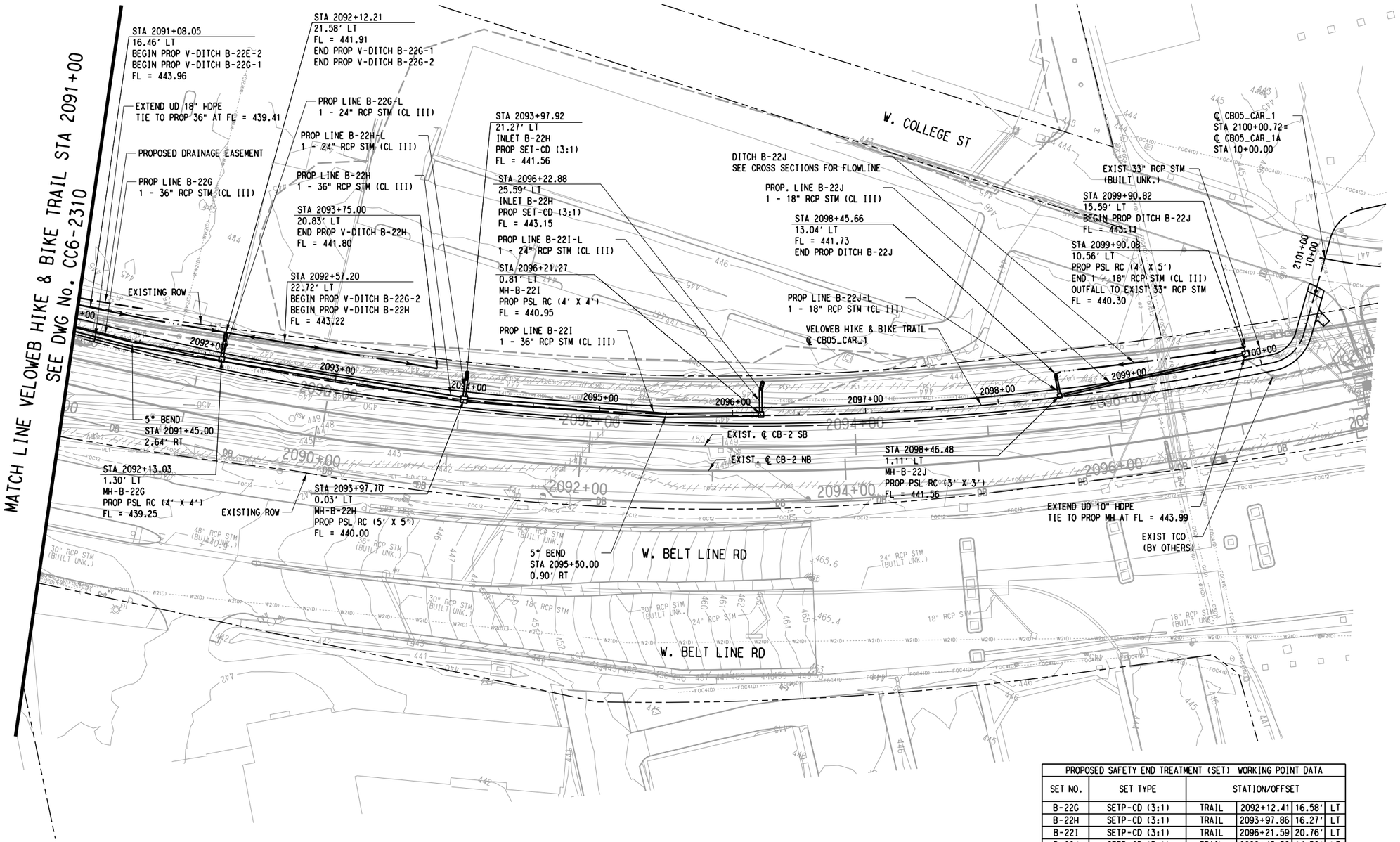
DWG No. CC6-2311



SCALE (IN FEET)
0 20 40 80

LEGEND

- CENTERLINE OF SPECIAL DITCH
- PROP FLUME
- PROP LIMITS OF CONCRETE LINED DITCH

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PROPOSED SAFETY END TREATMENT (SET) WORKING POINT DATA

SET NO.	SET TYPE	STATION/OFFSET			
B-22G	SETP-CD (3:1)	TRAIL	2092+12.41	16.58'	LT
B-22H	SETP-CD (3:1)	TRAIL	2093+97.86	16.27'	LT
B-22I	SETP-CD (3:1)	TRAIL	2096+21.59	20.76'	LT
B-22J	SETP-CD (3:1)	TRAIL	2098+45.56	14.30'	LT

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FINAL 100% DESIGN

CONTRACT SHEET No. 255 OF 345

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

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DRAWN	S. AHMED
DESIGNED	S. AHMED
CHECKED	H. WU
IN CHARGE	H. WU
DATE	07 AUG 23

CAES

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
CITY OF CARROLLTON
DRAINAGE PLAN
STA 2091+00 TO STA 2101+00
SHEET 7 OF 15

CONTRACT	DWG No.	REV
C-2033270-01	CC6-2311	D

CB05-CC6-2311.040

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CB05-CC6-2311.040
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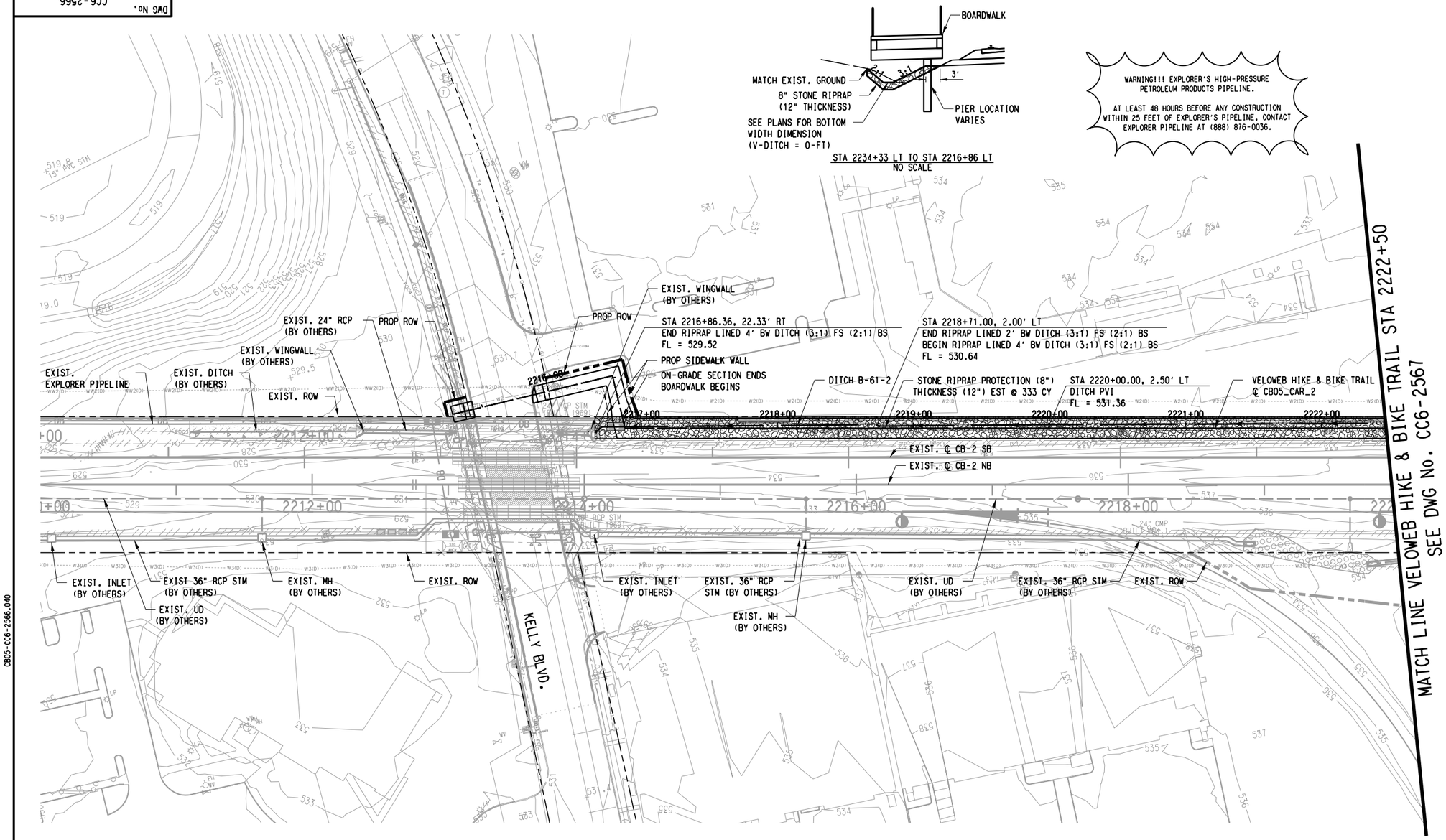
DWG No. CC6-2566



SCALE (IN FEET)
0 20 40 80

LEGEND

- CENTERLINE OF SPECIAL DITCH
- PROP FLUME
- PROP LIMITS OF CONCRETE LINED DITCH

NOTES:

1. ALL STATION CALLOUTS ARE IN REFRENCE TO THE VELOWEB HIKE & BIKE TRAIL CENTERLINE, UNLESS NOTED OTHERWISE.
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4. ALL DITCH SIDE SLOPES SHALL BE 3:1 MAX, UNLESS OTHERWISE NOTED.
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CONTRACT SHEET No. 256 OF 345

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

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ARCHER WESTERN HERZOG

DART PROJECT

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SCALE	1" = 40'
DRAWN	D. ESCALANTE
DESIGNED	J. RODRIGUEZ
CHECKED	A. DORANTES
IN CHARGE	A. DORANTES
DATE	07 AUG 23

CAES

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
CITY OF CARROLLTON
DRAINAGE PLAN
BEGIN TO STA 2222+50
SHEET 8 OF 15

CONTRACT	DWG No.	REV
C-2033270-01	CC6-2566	D

CB05-CC6-2566.040

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DWG No. CC6-2567

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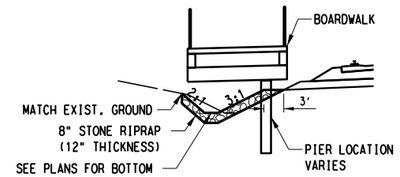
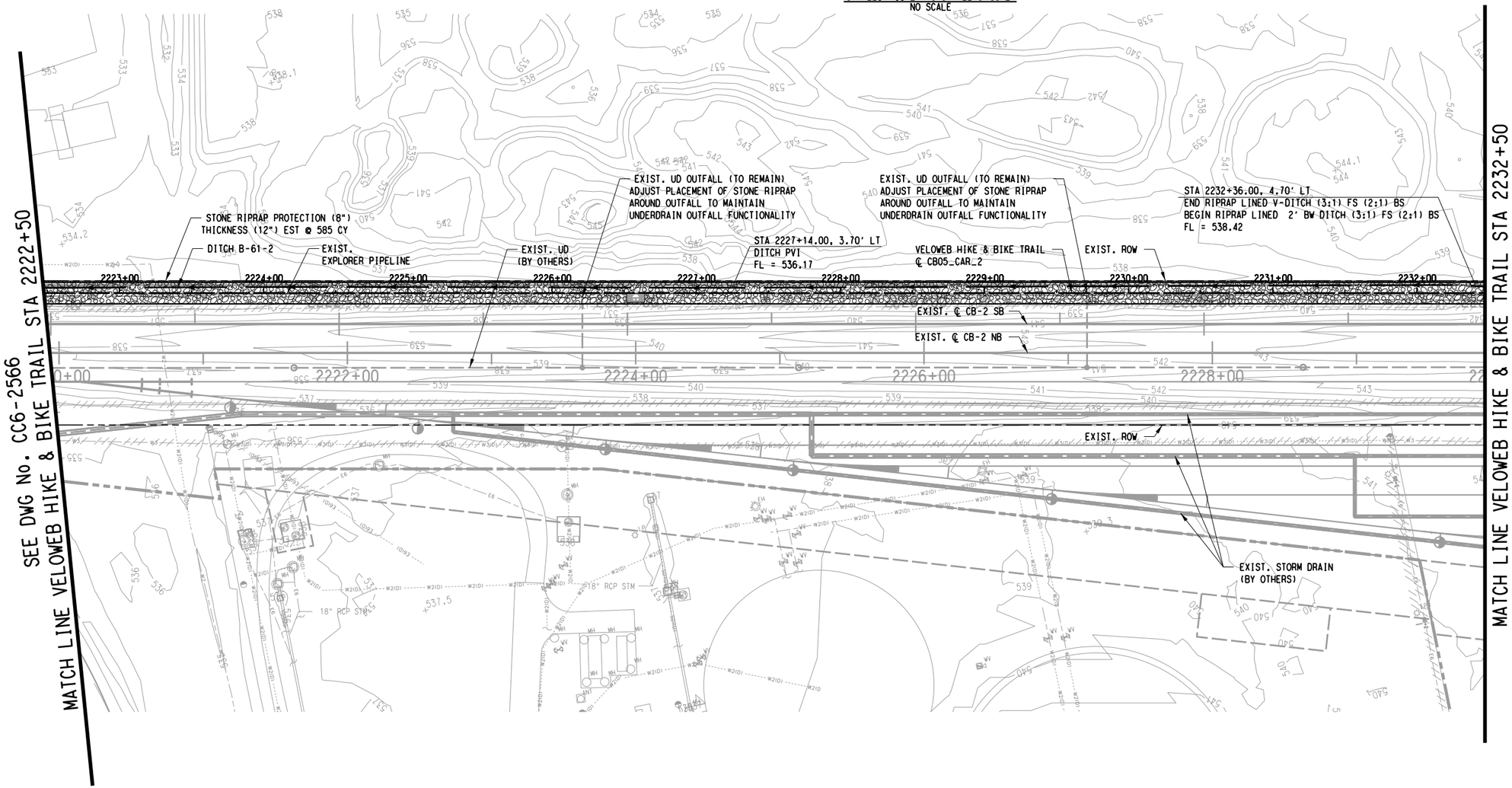


STA 2234+33 LT TO STA 2216+86 LT
NO SCALE



SCALE (IN FEET)
0 20 40 80

LEGEND

- CENTERLINE OF SPECIAL DITCH
- PROP FLUME
- PROP LIMITS OF CONCRETE LINED DITCH

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CAES

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
CITY OF CARROLLTON
DRAINAGE PLAN
STA 2222+50 TO STA 2232+50
SHEET 9 OF 15

CONTRACT	DWG No.	REV
C-2033270-01	CC6-2567	D

CB05-CC6-2567.040

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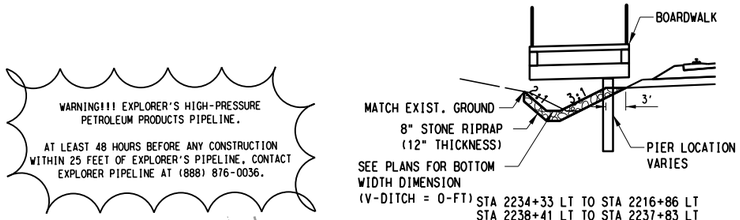
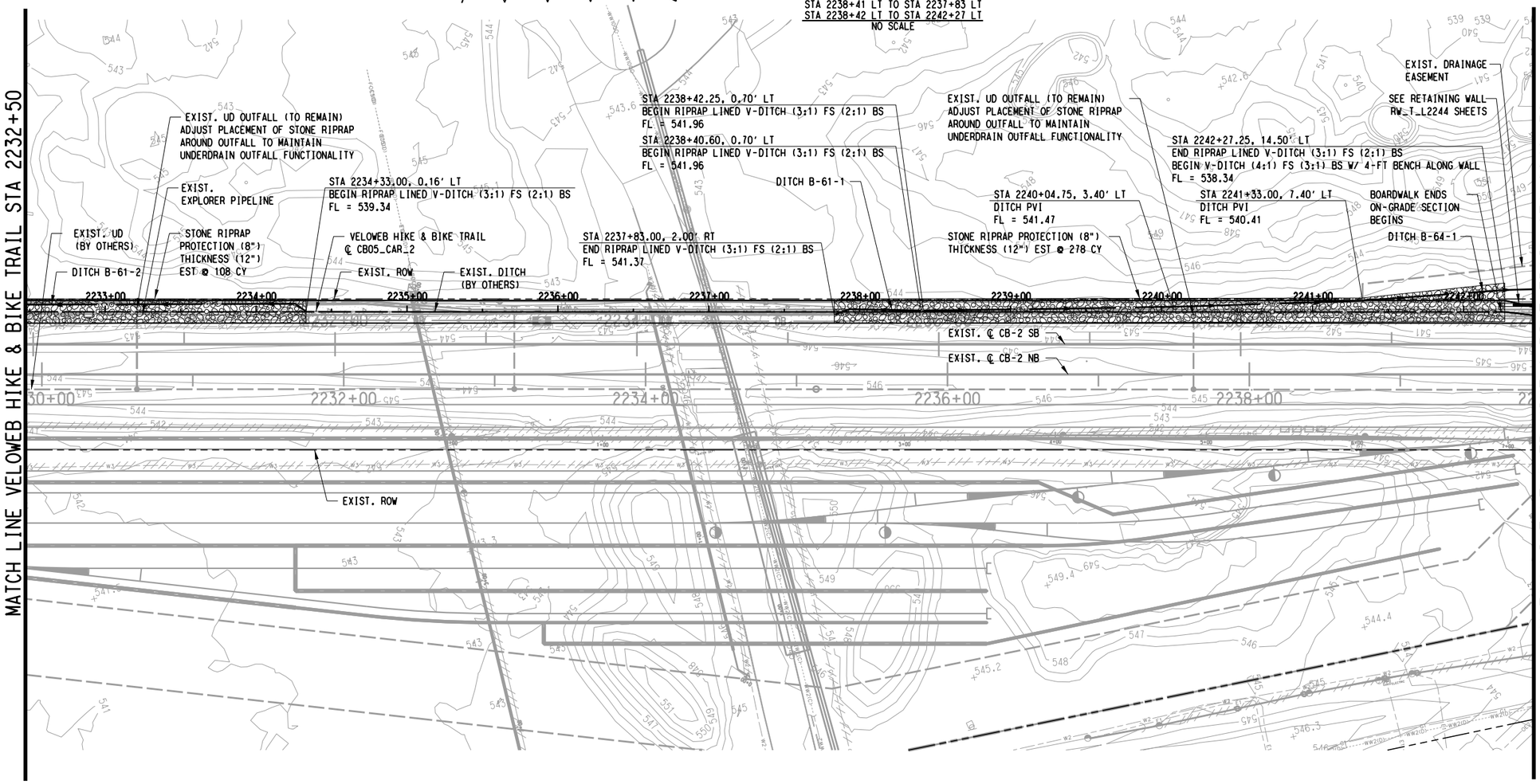
CB05-CC6-2567.040
JEGSVCPW001
Default

DWG No. CC6-2568



STA 2234+33 LT TO STA 2216+86 LT
STA 2238+41 LT TO STA 2237+83 LT
STA 2238+42 LT TO STA 2242+27 LT
NO SCALE



SCALE (IN FEET)
0 20 40 80

LEGEND
- CENTERLINE OF SPECIAL DITCH
- PROP FLUME
- PROP LIMITS OF CONCRETE LINED DITCH

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CAES

COTTON BELT REGIONAL RAIL VELOWEB HIKE & BIKE TRAIL

CITY OF CARROLLTON
DRAINAGE PLAN
STA 2232+50 TO STA 2242+50
SHEET 10 OF 15

CONTRACT	DWG No.	REV
C-2033270-01	CC6-2568	D

CB05-CC6-2568.040

31-JUL-2023 09:36
CB05-CC6-2568.040

JEGSVCPW001
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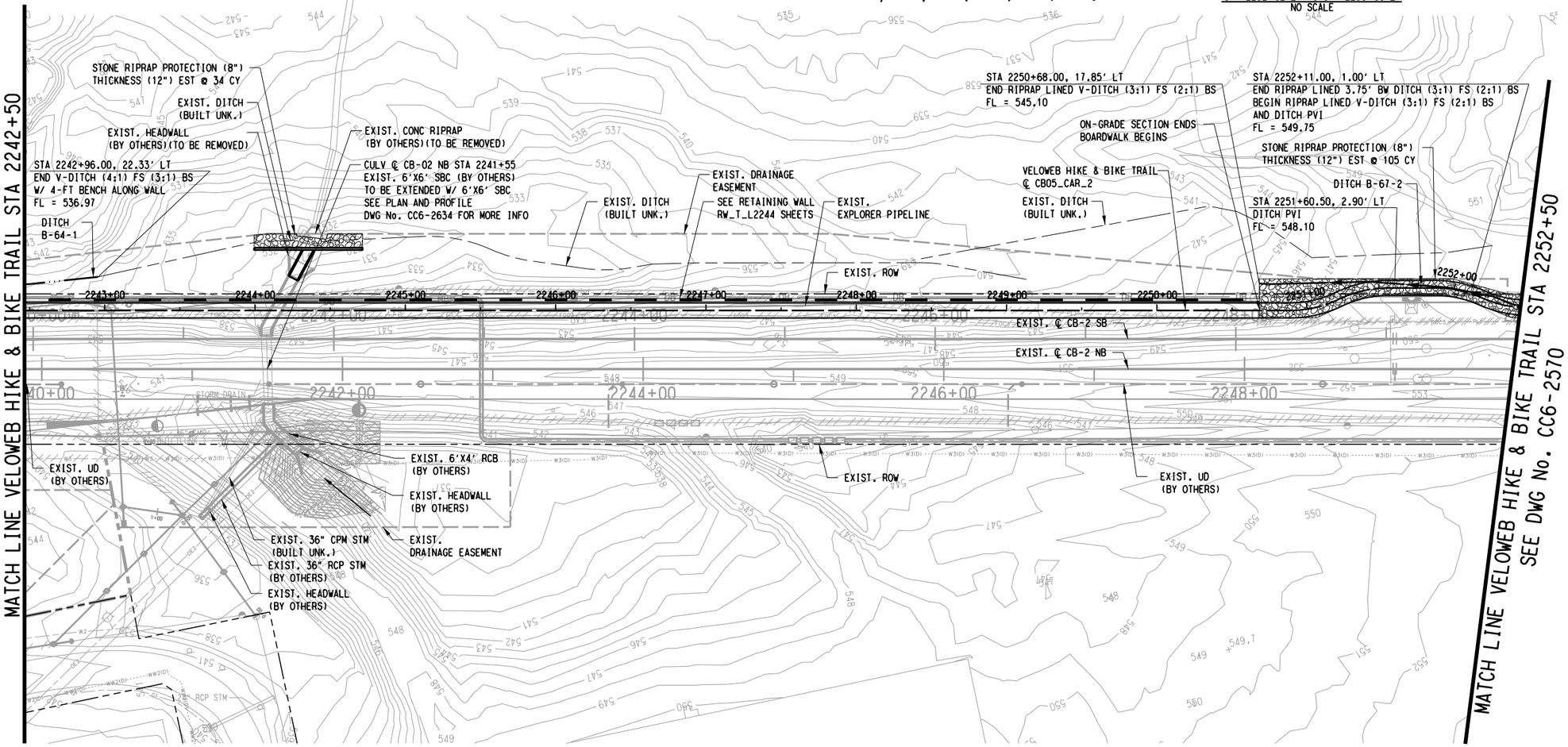
DWG No. CC6-2569



SCALE (IN FEET)
0 20 40 80

LEGEND

- CENTERLINE OF SPECIAL DITCH
- PROP FLUME
- PROP LIMITS OF CONCRETE LINED DITCH

NOTES:

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CONTRACT SHEET No. 259 OF 345

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DESIGNED	J. RODRIGUEZ
CHECKED	A. DORANTES
IN CHARGE	A. DORANTES
DATE	07 AUG 23

CAES

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
CITY OF CARROLLTON
DRAINAGE PLAN
STA 2242+50 TO STA 2252+50
SHEET 11 OF 15

CONTRACT	DWG No.	REV
C-2033270-01	CC6-2569	D

CB05-CC6-2569.040

31-JUL-2023 09:37
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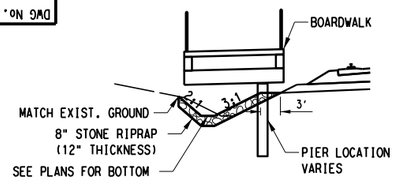
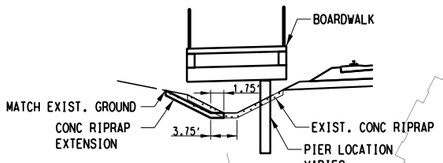
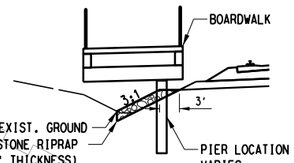
DWG No. CC6-2570



STA 2252+62 LT TO STA 2250+66 LT
NO SCALE



STA 2254+12 LT TO STA 2252+62 LT
NO SCALE



STA 2259+18 LT TO STA 2260+83 LT
NO SCALE

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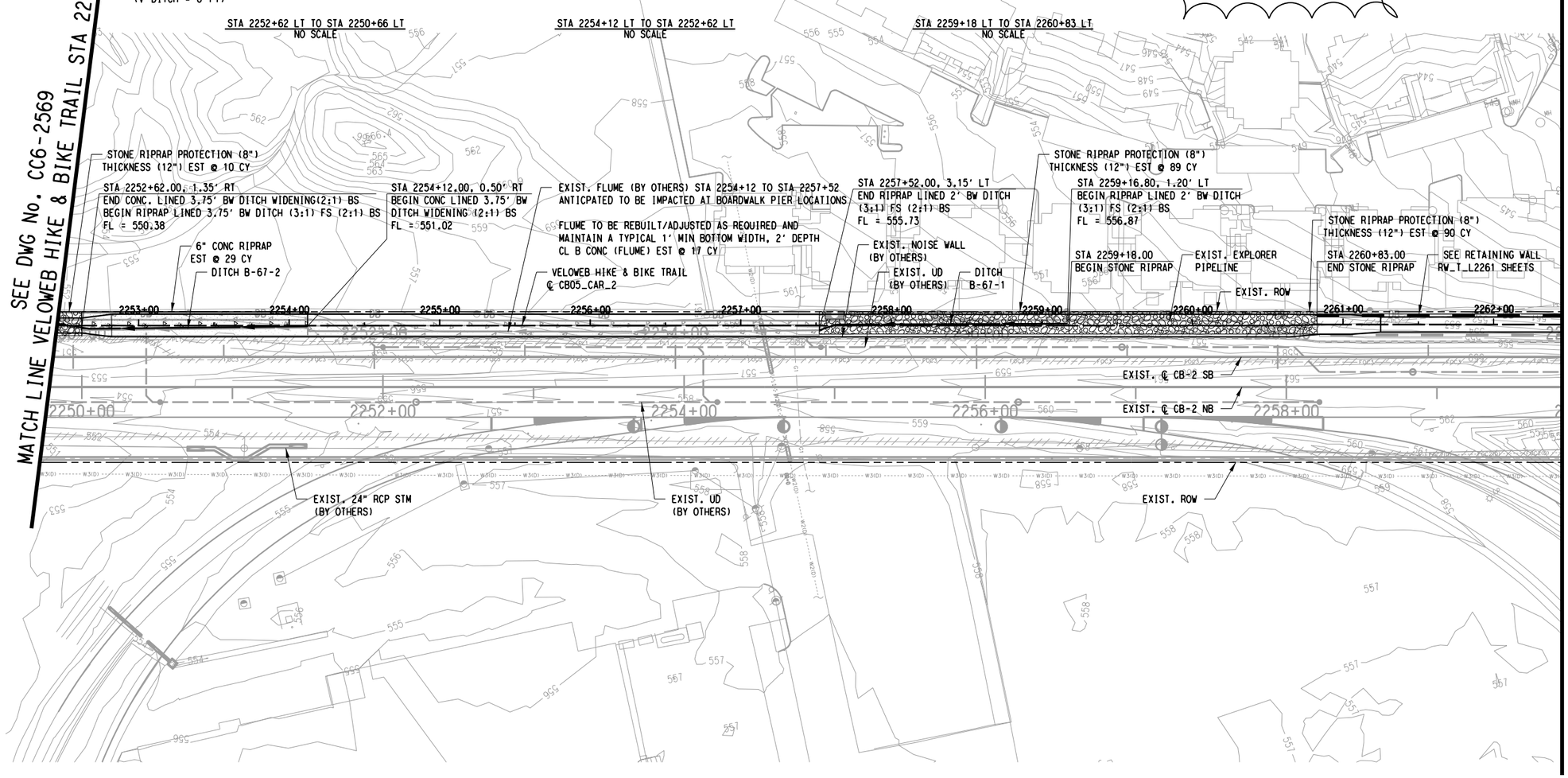

SCALE (IN FEET)
0 20 40 80

LEGEND

- CENTERLINE OF SPECIAL DITCH
- PROP FLUME
- PROP LIMITS OF CONCRETE LINED DITCH

NOTES:

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DRAWN	D. ESCALANTE
DESIGNED	J. RODRIGUEZ
CHECKED	A. DORANTES
IN CHARGE	A. DORANTES
DATE	07 AUG 23

CAES

CONTRACT SHEET No. 260 OF 345

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
CITY OF CARROLLTON
DRAINAGE PLAN
STA 2252+50 TO STA 2262+50
SHEET 12 OF 15

CONTRACT	DWG No.	REV
C-2033270-01	CC6-2570	D

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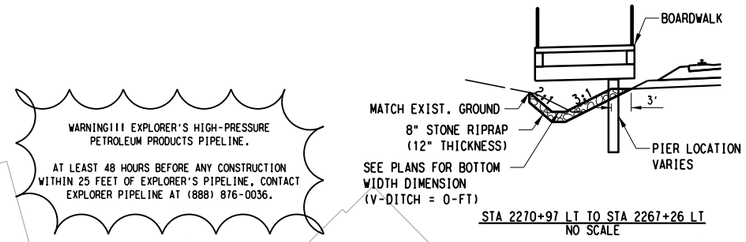
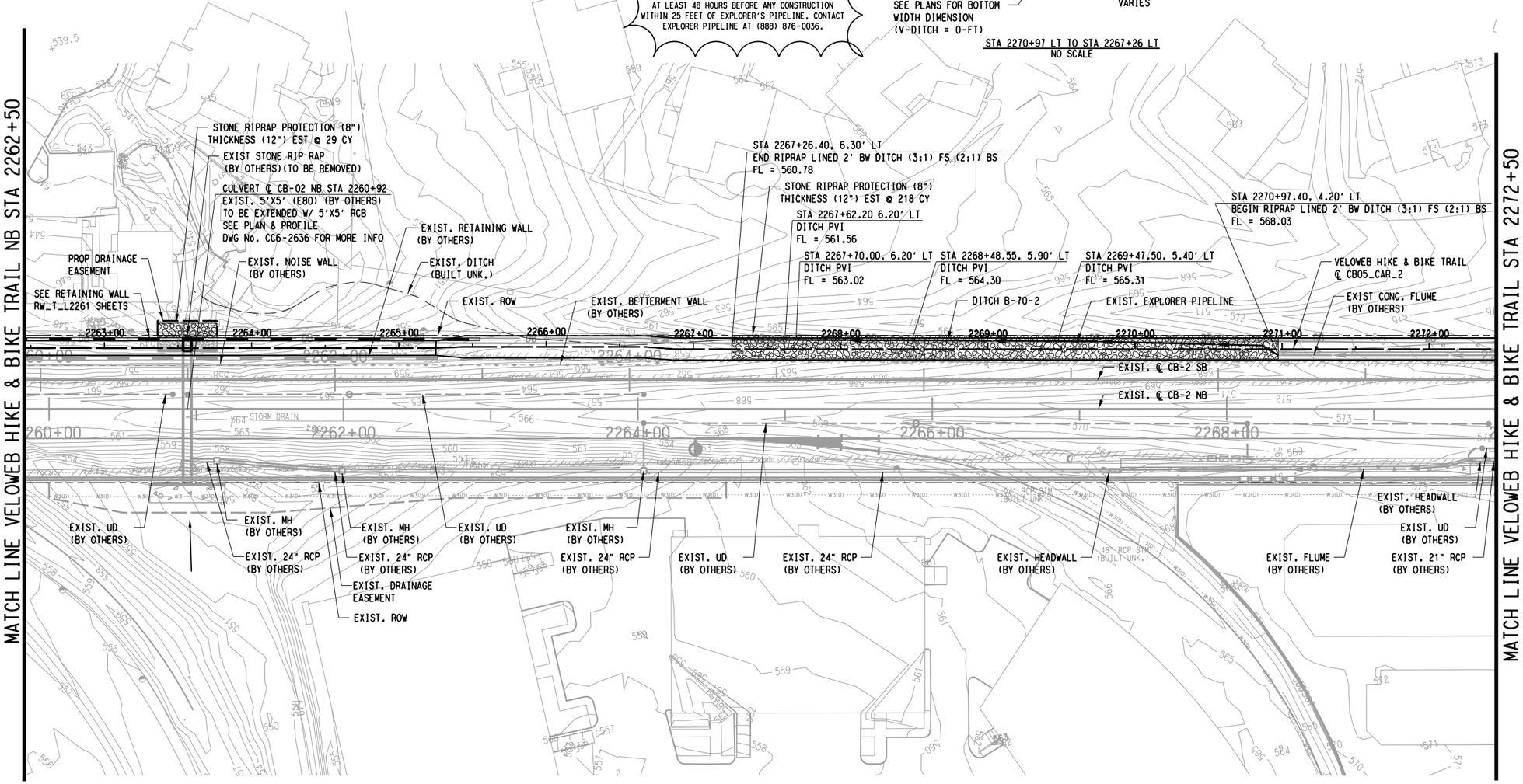
DWG No. CC6-2571



STA 2270+97 LT TO STA 2267+26 LT
NO SCALE



SCALE (IN FEET)
0 20 40 80

LEGEND

- CENTERLINE OF SPECIAL DITCH
- PROP FLUME
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CAES

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
CITY OF CARROLLTON
DRAINAGE PLAN
STA 2262+50 TO STA 2272+50
SHEET 13 OF 15

CONTRACT	DWG No.	REV
C-2033270-01	CC6-2571	D

CB05-CC6-2571.040

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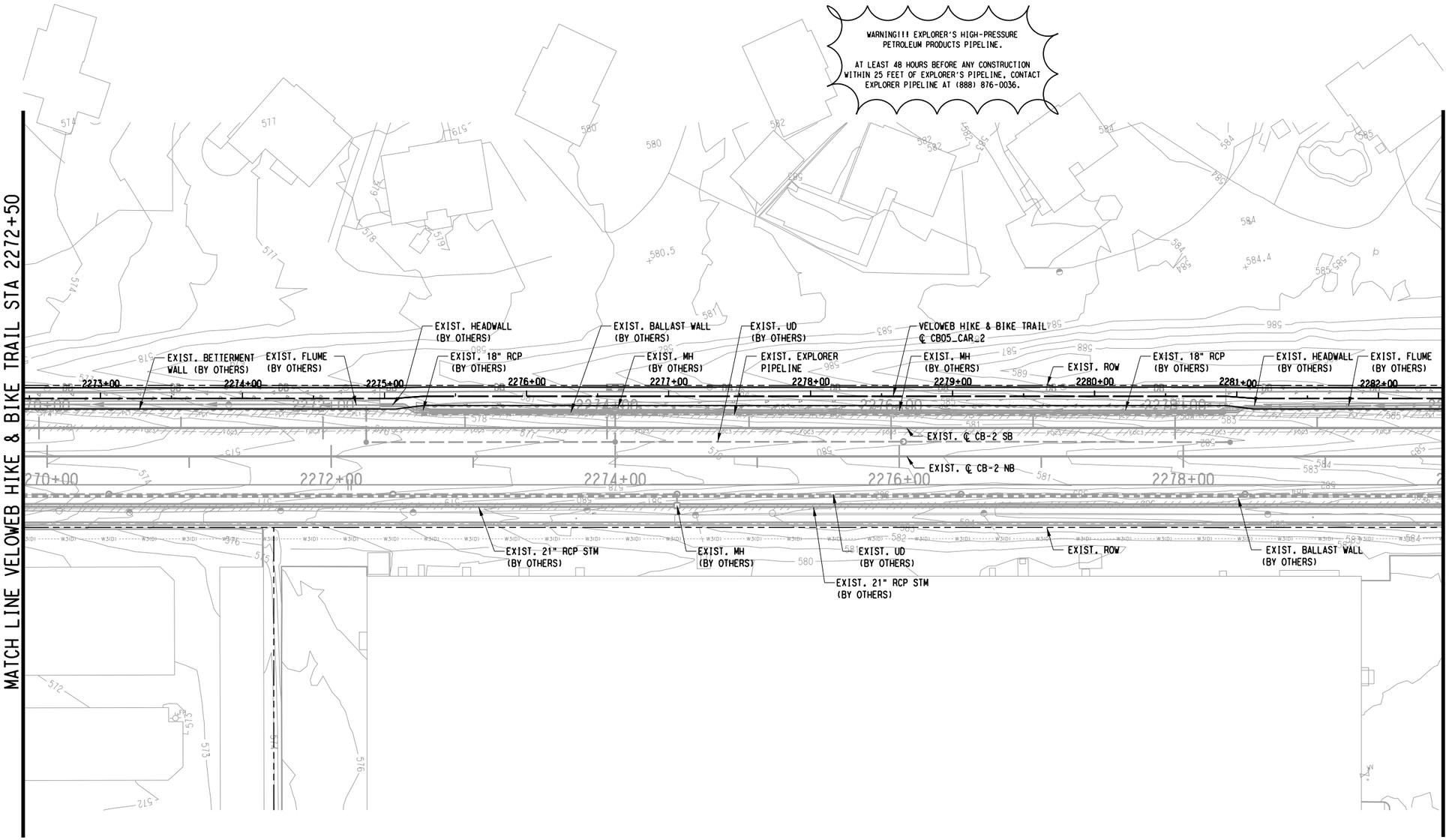
DWG No. CC6-2572

SEE DWG No. CC6-2571

MATCH LINE VELOWEB HIKE & BIKE TRAIL STA 2272+50



MATCH LINE VELOWEB HIKE & BIKE TRAIL STA 2282+50

SEE DWG No. CC6-2573

SCALE (IN FEET)
0 20 40 80

LEGEND

- CENTERLINE OF SPECIAL DITCH
- PROP FLUME
- PROP LIMITS OF CONCRETE LINED DITCH

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IN CHARGE	A. DORANTES
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CAES

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
CITY OF CARROLLTON
DRAINAGE PLAN
STA 2272+50 TO STA 2282+50
SHEET 14 OF 15

CONTRACT	DWG No.	REV
C-2033270-01	CC6-2572	D

CB05-CC6-2572.040

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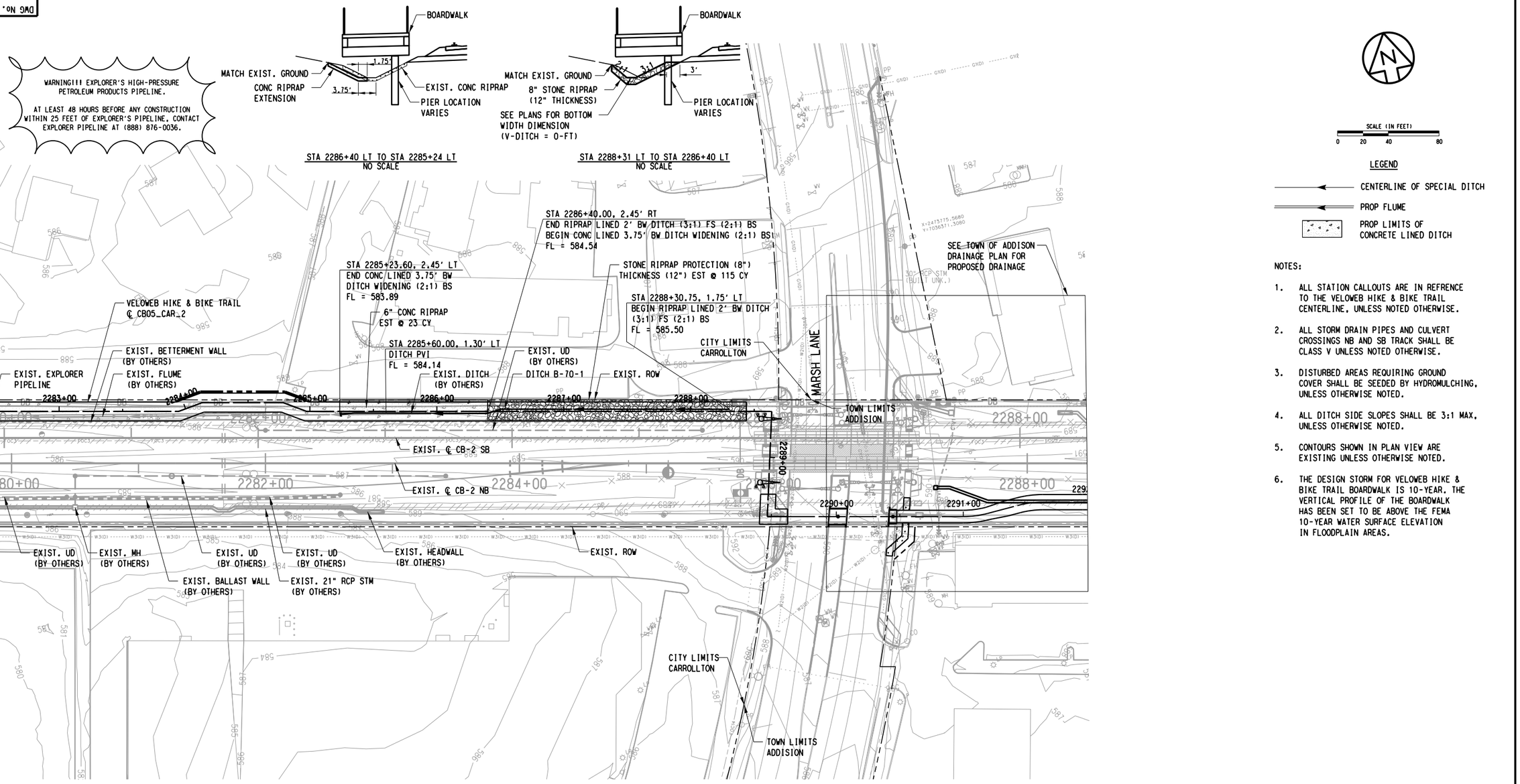
DWG No. CC6-2573



SCALE (IN FEET)
0 20 40 80

LEGEND

- CENTERLINE OF SPECIAL DITCH
- PROP FLUME
- PROP LIMITS OF CONCRETE LINED DITCH

NOTES:

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2. ALL STORM DRAIN PIPES AND CULVERT CROSSINGS NB AND SB TRACK SHALL BE CLASS V UNLESS NOTED OTHERWISE.
3. DISTURBED AREAS REQUIRING GROUND COVER SHALL BE SEEDED BY HYDROMULCHING, UNLESS OTHERWISE NOTED.
4. ALL DITCH SIDE SLOPES SHALL BE 3:1 MAX, UNLESS OTHERWISE NOTED.
5. CONTOURS SHOWN IN PLAN VIEW ARE EXISTING UNLESS OTHERWISE NOTED.
6. THE DESIGN STORM FOR VELOWEB HIKE & BIKE TRAIL BOARDWALK IS 10-YEAR. THE VERTICAL PROFILE OF THE BOARDWALK HAS BEEN SET TO BE ABOVE THE FEMA 10-YEAR WATER SURFACE ELEVATION IN FLOODPLAIN AREAS.

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CONTRACT SHEET No. 263 OF 345

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

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ARCHER WESTERN HERZOG

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SCALE	1"=40'
DRAWN	D. ESCALANTE
DESIGNED	J. RODRIGUEZ
CHECKED	A. DORANTES
IN CHARGE	A. DORANTES
DATE	07 AUG 23

CAES

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
CITY OF CARROLLTON
DRAINAGE PLAN
STA 2282+50 TO END
SHEET 15 OF 15

CONTRACT	DWG No.	REV
C-2033270-01	CC6-2573	D

CB05-CC6-2573.040

31-JUL-2023 09:37
CB05-CC6-2573.040

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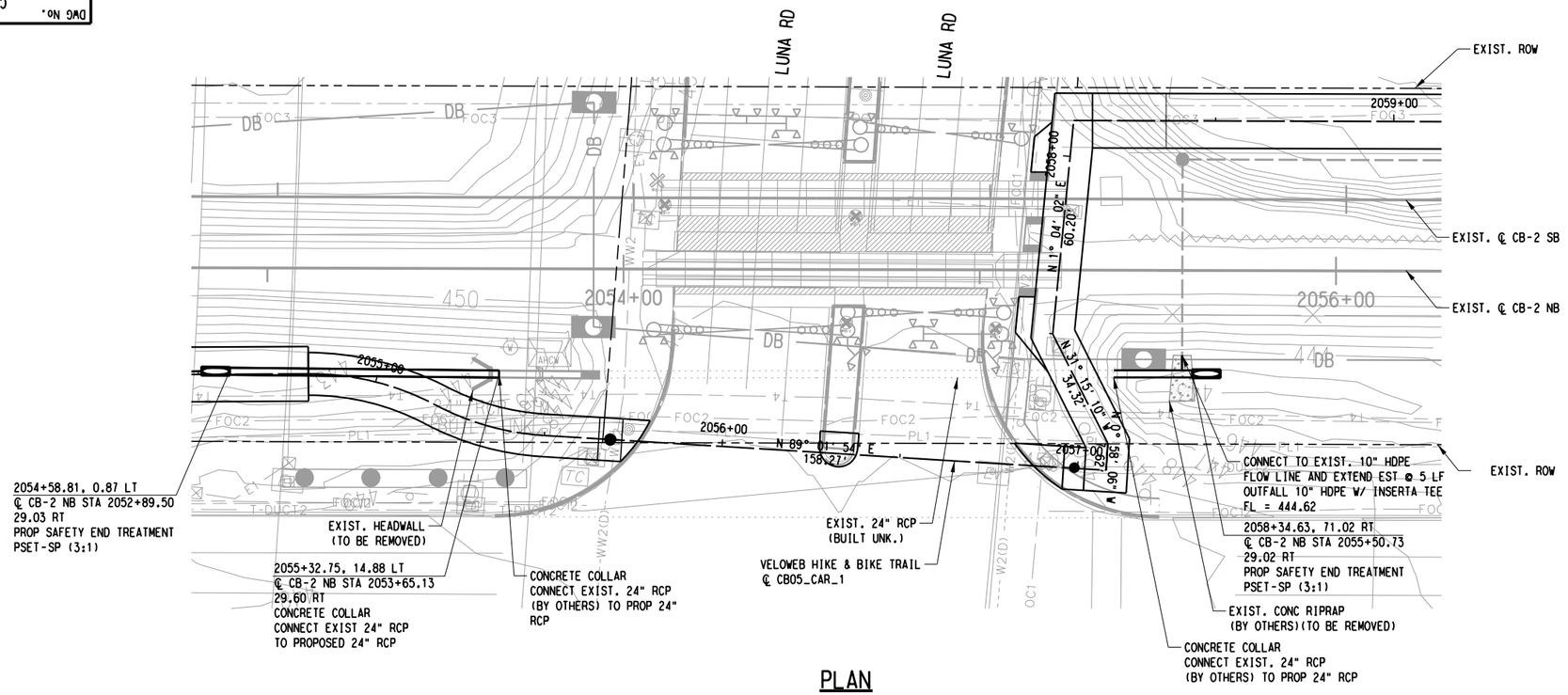
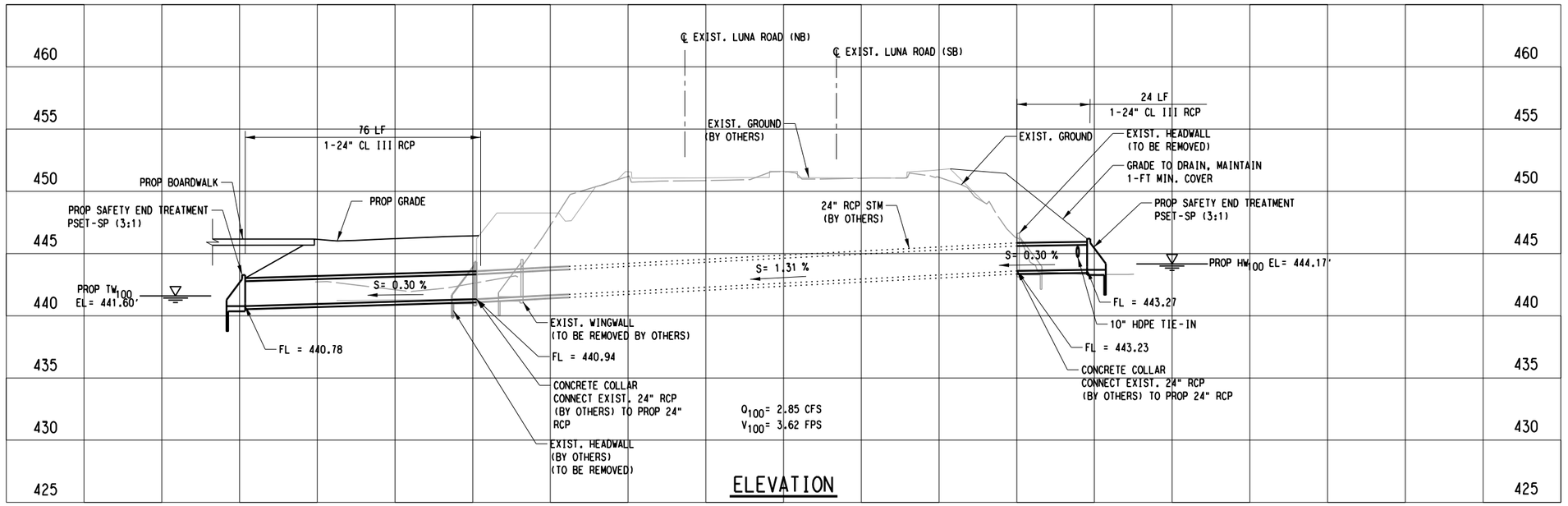
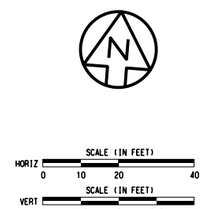
DWG No. CC6-2075



PLAN



ELEVATION



NOTES:

1. ALL STATIONS CALLOUTS ARE IN REFRENCE TO THE VELOWEB HIKE & BIKE TRAIL CENTERLINE, UNLESS NOTED OTHERWISE.
2. SEE UTILITY MODIFICATION SHEET FOR UTILITY MODIFICATIONS.
3. ALL STORM DRAIN PIPES AND CULVERT CROSSINGS NB AND SB TRACK SHALL BE CLASS V UNLESS NOTED OTHERWISE.
4. DISTURBED AREAS REQUIRING GROUND COVER SHALL BE SEEDED BY HYDROMULCHING, UNLESS OTHERWISE NOTED.
5. ALL DITCH SIDE SLOPES SHALL BE 3:1 MAX, UNLESS OTHERWISE NOTED.
6. CONTOURS SHOWN IN PLAN VIEW ARE EXIST. UNLESS OTHERWISE NOTED.

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CHECKED	A. DORANTES
IN CHARGE	A. DORANTES
DATE	11 AUG 23

CAES

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

CITY OF CARROLLTON
CULVERT AT STA 2055+33
PLAN & PROFILE

CONTRACT	DWG No.	REV
C-2033270-01	CC6-2075	D

CB05-CC6-2075.020

21-AUG-2023 15:38
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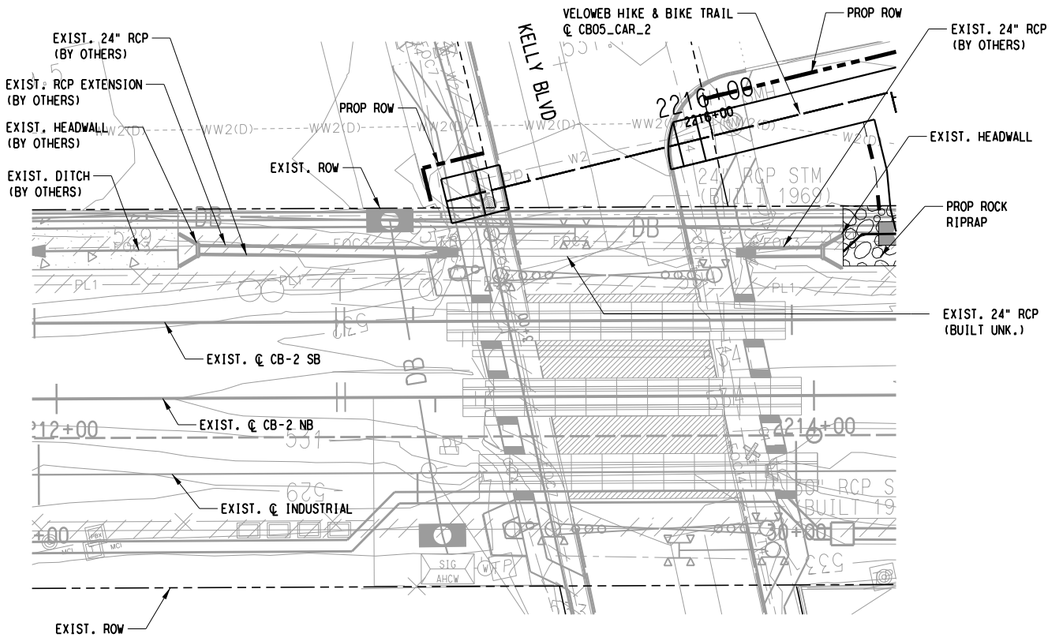
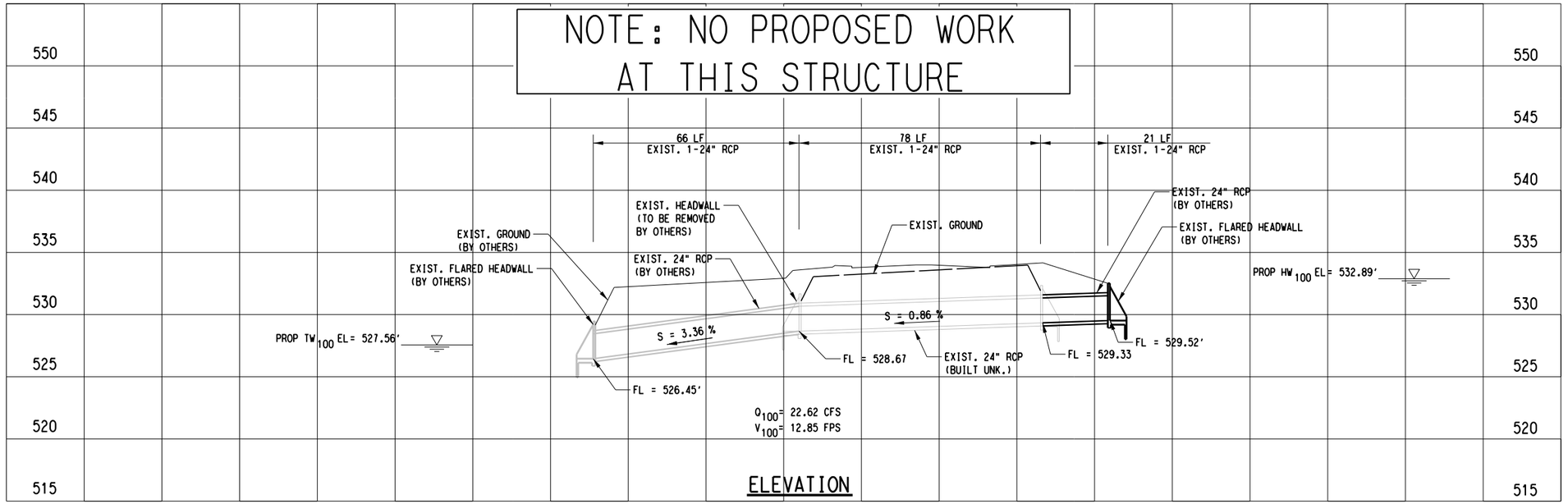
DWG No. CC6-2636



PLAN



ELEVATION

SCALE (IN FEET)
HORIZ 0 10 20 40
SCALE (IN FEET)
VERT 0 2.5 5 7.5 10

NOTES:

1. ALL STATIONS CALLOUTS ARE IN REFRENCE TO THE VELOWEB HIKE & BIKE TRAIL CENTERLINE, UNLESS NOTED OTHERWISE.
2. SEE UTILITY MODIFICATION SHEET FOR UTILITY MODIFICATIONS.
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5. ALL DITCH SIDE SLOPES SHALL BE 3:1 MAX, UNLESS OTHERWISE NOTED.
6. CONTOURS SHOWN IN PLAN VIEW ARE EXIST. UNLESS OTHERWISE NOTED.

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DESIGNED	J. RODRIGUEZ
CHECKED	H. MU
IN CHARGE	A. DORANTES
DATE	07 AUG 23

CAES

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

CITY OF CARROLLTON
CULVERT AT STA 2216+75
PLAN & PROFILE

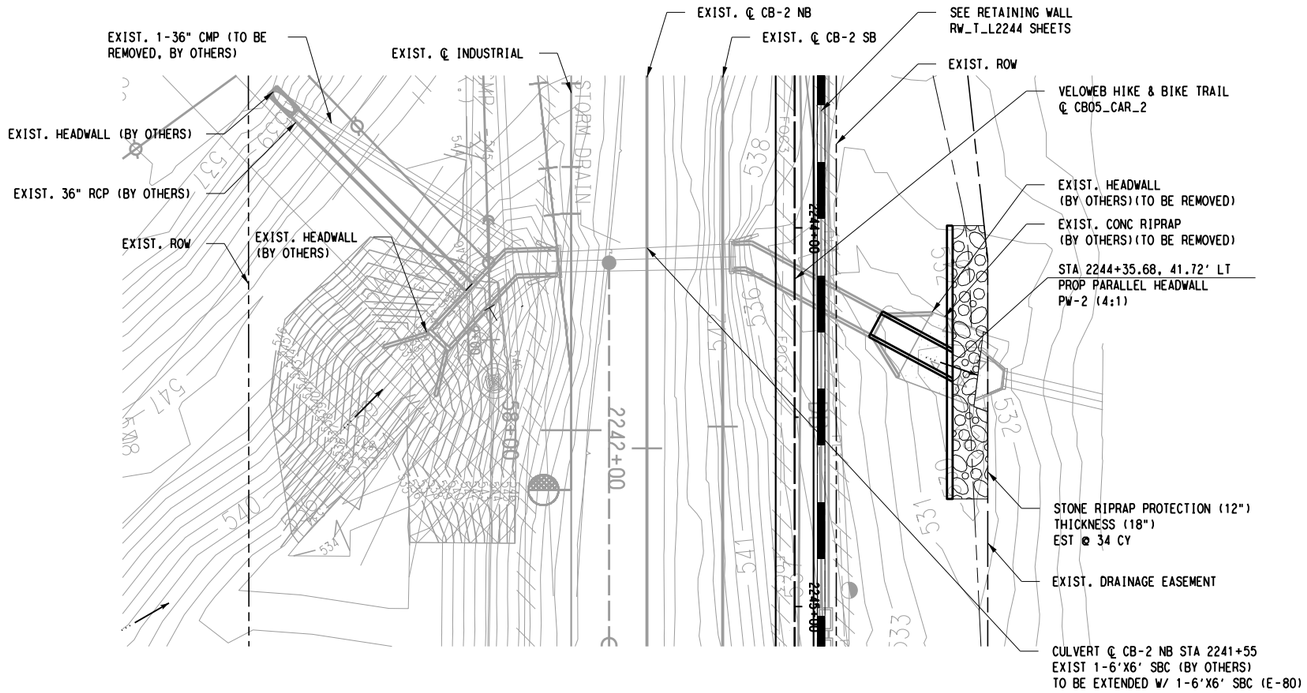
CONTRACT	DWG No.	REV
C-2033270-01	CC6-2636	D

CB05-CC6-2636.020

31-JUL-2023 09:37
CB05-CC6-2636.020

JEGSVCPW001
Default

DWG No. CC6-2634



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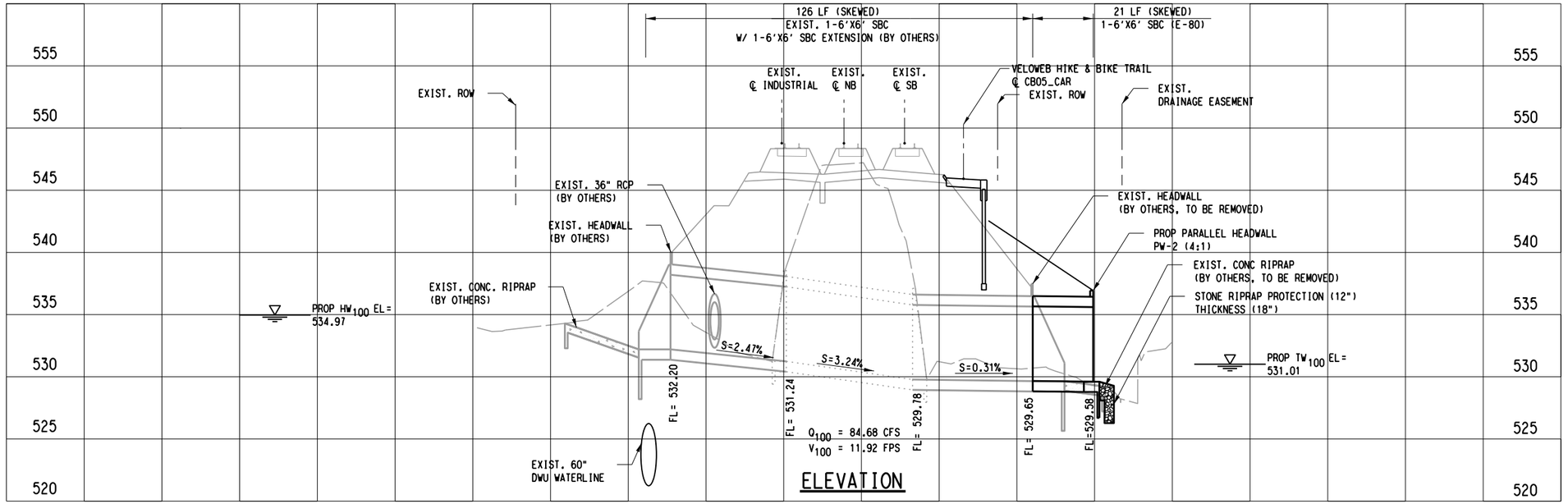
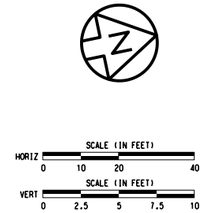


ELEVATION



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5. CONTOURS SHOWN IN PLAN VIEW ARE EXISTING UNLESS OTHERWISE NOTED.
6. SEE UPRR REINFORCED BOX CULVERT STANDARD SIZE 6'X6' & COVER 18' TO 30'
7. CONSTRUCTION OF CONNECTION OF EXIST. CULVERT TO PROP CULVERT SHALL BE IN ACCORDANCE WITH UPRR SPECIFICATION 33 42 16 REINFORCED CONCRETE BOX CULVERTS PART 3.08

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CONTRACT SHEET No. 266 OF 345

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

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IN CHARGE	A. DORANTES
DATE	07 AUG 23

CAES

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

CITY OF CARROLLTON
CULVERT AT STA 2241+55
PLAN & PROFILE

CONTRACT	DWG No.	REV
C-2033270-01	CC6-2634	D

CB05-CC6-2634.020

31-JUL-2023 09:38
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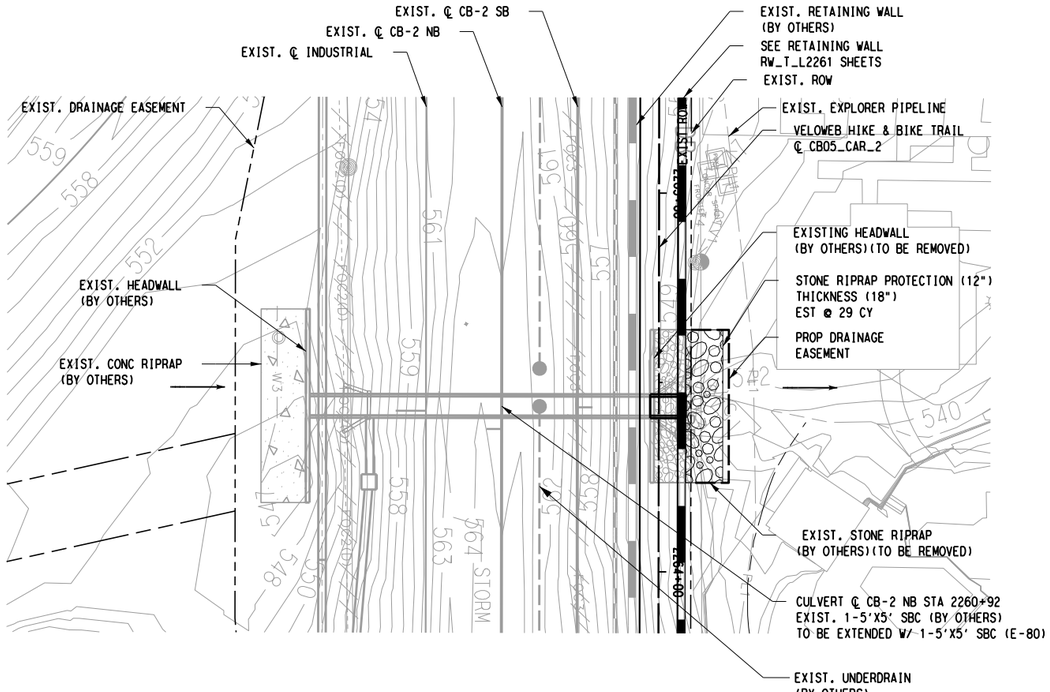
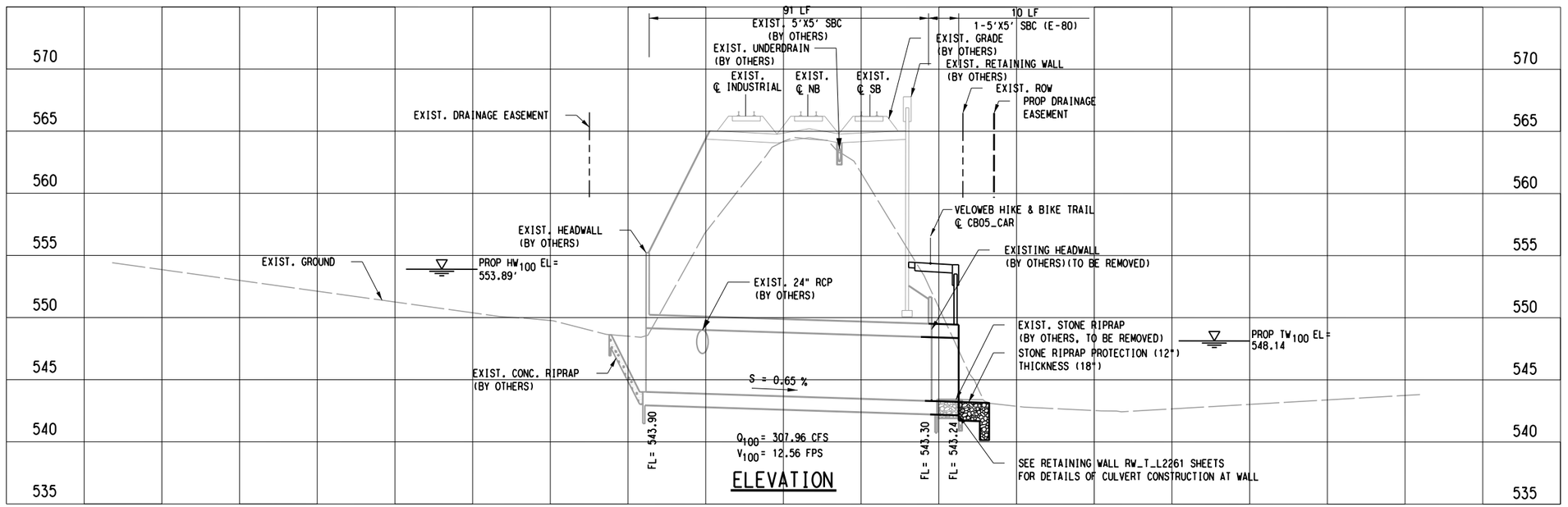
DWG No. CC6-2635



PLAN



ELEVATION

WARNING!!! EXPLORER'S HIGH-PRESSURE PETROLEUM PRODUCTS PIPELINE.

AT LEAST 48 HOURS BEFORE ANY CONSTRUCTION WITHIN 25 FEET OF EXPLORER'S PIPELINE, CONTACT EXPLORER PIPELINE AT (888) 876-0036.

SCALE (IN FEET)
HORIZ 0 10 20 40
SCALE (IN FEET)
VERT 0 2.5 5 7.5 10

NOTES:

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REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

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IN CHARGE	A. DORANTES
DATE	07 AUG 23

CAES

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

CITY OF CARROLLTON
CULVERT AT STA 2260+92
PLAN & PROFILE

CONTRACT	DWG No.	REV
C-2033270-01	CC6-2635	D

CB05-CC6-2635.020

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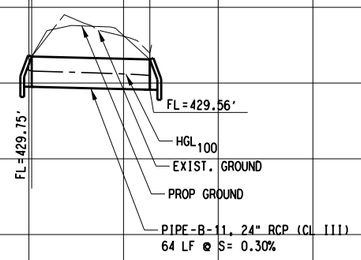
DWG No. CC6-2122



LINE B-11

SCALE (IN FEET)
HORIZ 0 10 20 40
SCALE (IN FEET)
VERT 0 2.5 5 7.5 10

NOTES:

1. ALL STATIONS/OFFSETS ARE IN REFERENCE TO THE VELOWEB HIKE & BIKE TRAIL CENTERLINE, UNLESS NOTED OTHERWISE.

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CONTRACT SHEET No. 268 OF 345

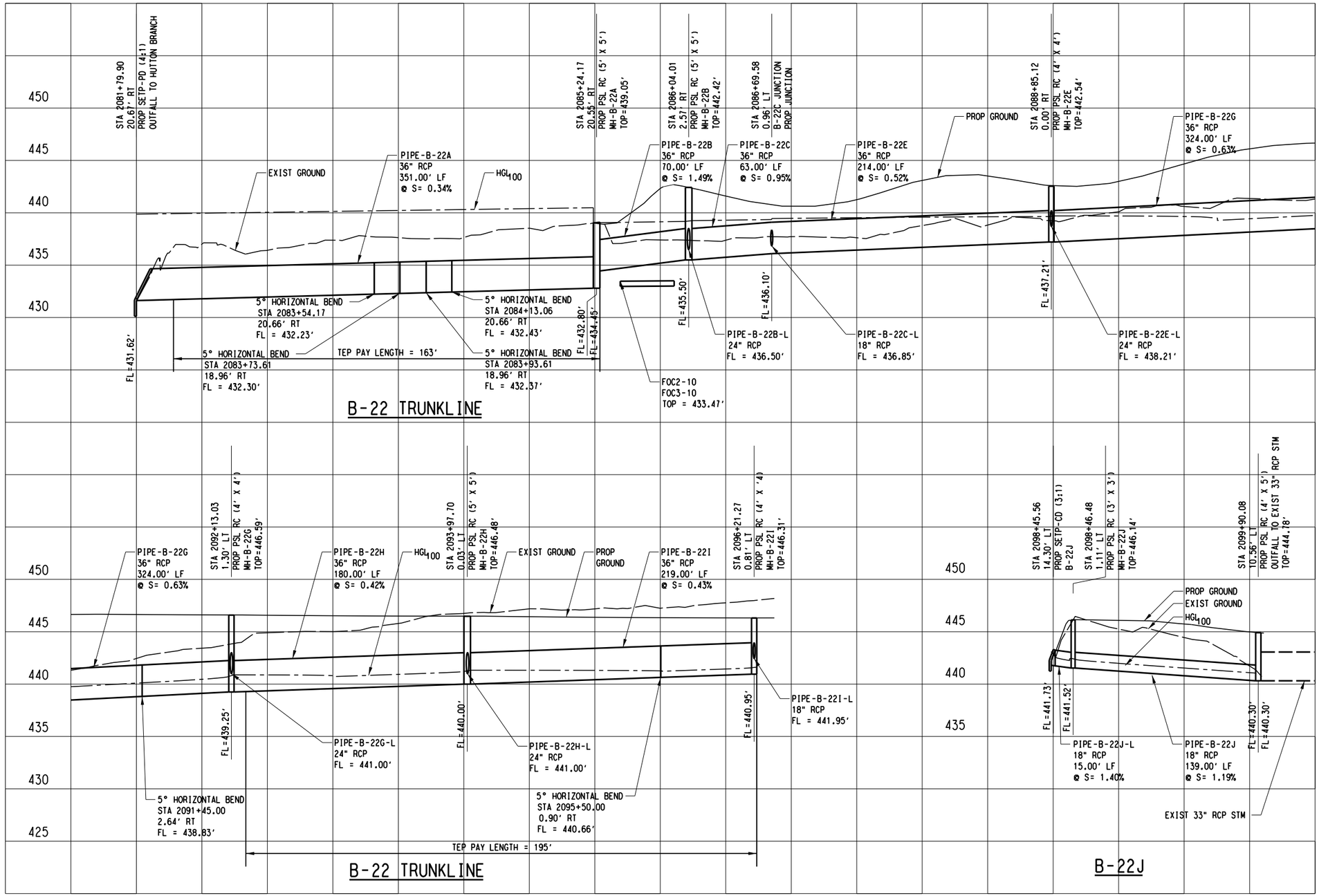
COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

CITY OF CARROLLTON
STORM DRAIN PROFILES
SHEET 1 OF 3

CONTRACT	DWG No.	REV
C-2033270-01	CC6-2122	D

CB05-CC6-2122.020

DWG No. CC6-2123



SCALE (IN FEET)
HORIZ 0 10 20 40
SCALE (IN FEET)
VERT 0 2.5 5 7.5 10

NOTES:

1. ALL STATIONS/OFFSETS ARE IN REFERENCE TO THE VELOWEB HIKE & BIKE TRAIL CENTERLINE, UNLESS NOTED OTHERWISE.
2. HUTTON BRANCH 10YR-WSE IS USED AS THE DOWNSTREAM KNOWN WATER SURFACE ELEVATION FOR THE B-22 TRUNKLINE. REFER TO TABLE 1.10 IN THE ISWM HYDRAULICS TECHNICAL MANUAL FOR THE COINCIDENTAL PEAK CRITERIA.
3. CONTRACTOR SHALL VERIFY ALL EXIST UTILITY INFORMATION PRIOR TO THE CONSTRUCTION OF THE PROPOSED STORM SEWER PIPE.
4. SEE SOLARY 100% TELECOMMUNICATIONS CONFLICTS FOR UTILITY PLAN AND PROFILE.

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CONTRACT SHEET No. 269 OF 345

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

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IN CHARGE	H. MU
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COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

CITY OF CARROLLTON
STORM DRAIN PROFILES
SHEET 2 OF 3

CONTRACT	DWG No.	REV
C-2033270-01	CC6-2123	D

CB05-CC6-2123.020

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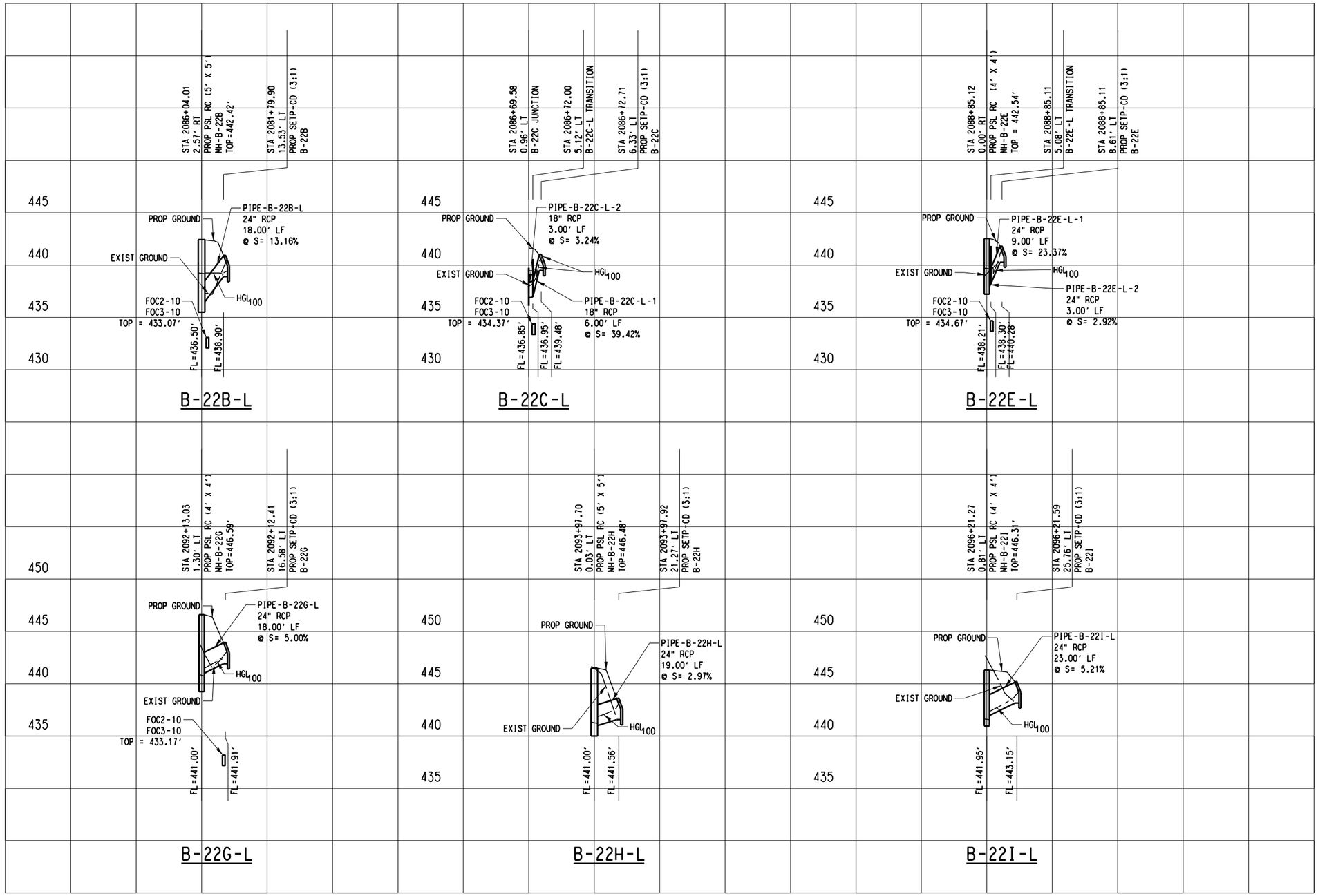
DWG No. CC6-2124



SCALE (IN FEET)
HORIZ 0 10 20 40
SCALE (IN FEET)
VERT 0 2.5 5 7.5 10

NOTES:

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4. SEE SOLARY 100% TELECOMMUNICATIONS CONFLICTS FOR UTILITY PLAN AND PROFILE.

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mjohn
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DESIGNED	S. AHMED
CHECKED	H. WU
IN CHARGE	H. WU
DATE	07 AUG 23

CAES

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

CITY OF CARROLLTON
STORM DRAIN PROFILES
SHEET 3 OF 3

CONTRACT C-2033270-01 | DWG No. CC6-2124 | REV D

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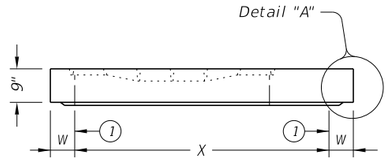
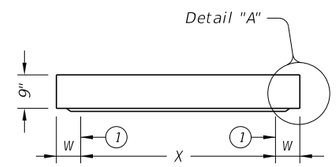
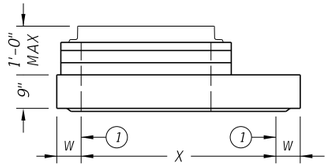


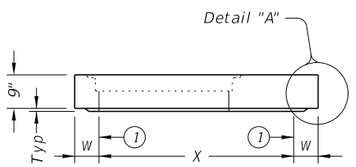
STYLE 'FG'



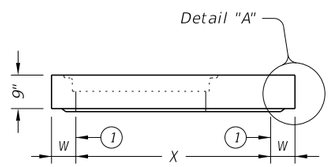
ELEVATION VIEW



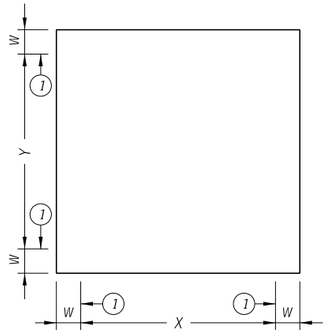
ELEVATION VIEW



ELEVATION VIEW



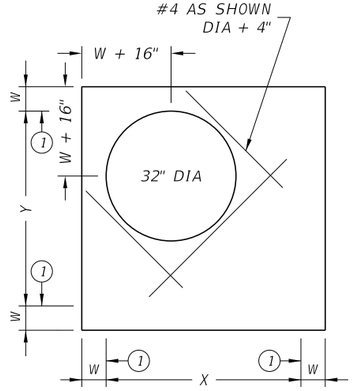
ELEVATION VIEW



PLAN VIEW

NO OPENINGS

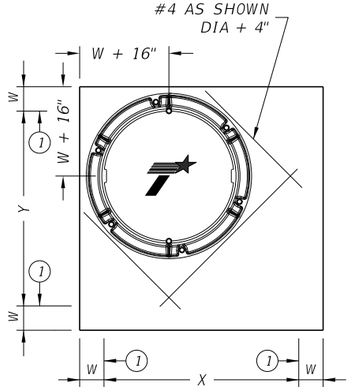
STYLE 'SL'



PLAN VIEW

SHIP LOOSE RING & COVER

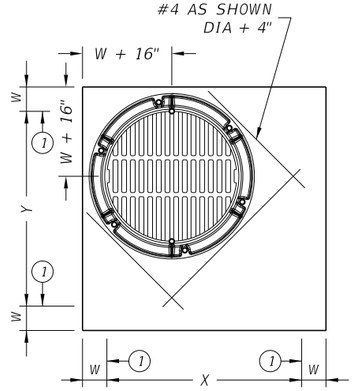
STYLE 'RH'



PLAN VIEW

32" DIA CAST-IN RING & COVER

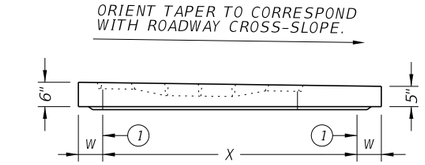
STYLE 'RC'



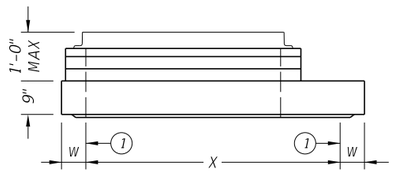
PLAN VIEW

32" DIA CAST-IN RING & GRATE

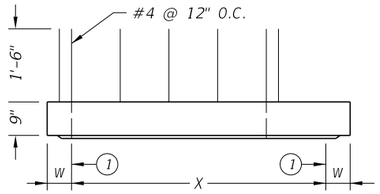
STYLE 'RG'



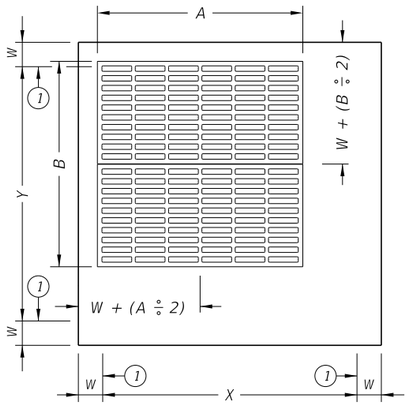
STYLE 'SFG'
ELEVATION VIEW



ELEVATION VIEW



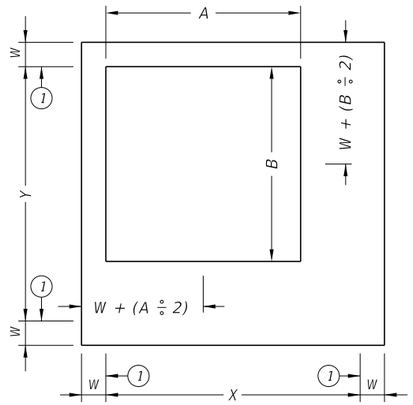
ELEVATION VIEW



PLAN VIEW

CAST-IN FRAME & GRATE

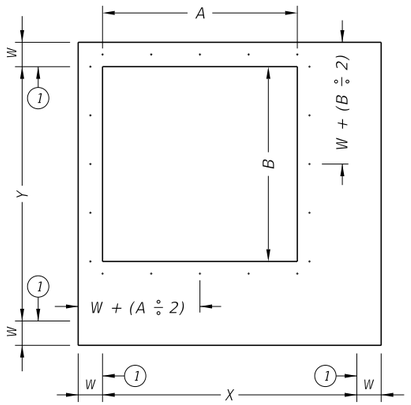
STYLES 'FG' & 'SFG'



PLAN VIEW

SHIP LOOSE FRAME & GRATE

STYLE 'SH'



PLAN VIEW

EXPOSED REBAR

STYLE 'S1'

(1) Matches inside face of wall of precast base or riser below inlet.

HL93 LOADING

SHEET 1 OF 2

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
SHEET NO. 271 OF 345
DWG NO. CC6-2710
CONTRACT NO. C-2033270-01

Texas Department of Transportation

Bridge Division Standard

PRECAST SLAB LID

PSL

FILE: prestd05-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS				
	DIST	COUNTY		SHEET NO.

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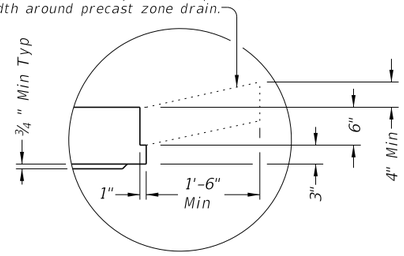
DATE:
FILE:

Style	Size (X x Y)	W (2)	A x B (nominal)	Short Span Reinf Steel Area	Long Span Reinf Steel Area
SL	3'x3'	6"	n/a	0.37 in²/ft	0.37 in²/ft
RH,RC,RG,SH,S1,FG	3'x3'	6"	3'x3' or 32" Dia	0.37 in²/ft	0.37 in²/ft
SFG	3'x3'	6"	3'x3'	0.32 in²/ft	0.32 in²/ft
SL	4'x4'	6"	n/a	0.34 in²/ft	0.34 in²/ft
RH,RC,RG,SH,S1,FG	4'x4'	6"	3'x3' or 32" Dia	0.41 in²/ft	0.41 in²/ft
SH,S1,FG	4'x4'	6"	4'x4'	0.41 in²/ft	0.41 in²/ft
SFG	4'x4'	6"	4'x4'	0.32 in²/ft	0.32 in²/ft
SL	3'x5'	6"	n/a	0.39 in²/ft	0.39 in²/ft
RH,RC,RG,SH,S1,FG	3'x5'	6"	3'x3' or 32" Dia	0.48 in²/ft	0.48 in²/ft
SH,S1,FG	3'x5'	6"	3'x5'	0.48 in²/ft	0.48 in²/ft
SFG	3'x5'	6"	3'x5'	0.32 in²/ft	0.32 in²/ft
SL	4'x5'	6"	n/a	0.42 in²/ft	0.42 in²/ft
RH,RC,RG,SH,S1,FG	4'x5'	6"	3'x3' or 32" Dia	0.42 in²/ft	0.42 in²/ft
SH,S1,FG	4'x5'	6"	4'x4'	0.63 in²/ft	0.63 in²/ft
SH,S1,FG	4'x5'	6"	3'x5'	0.66 in²/ft	0.66 in²/ft
SL	5'x5'	6"	n/a	0.36 in²/ft	0.36 in²/ft
RH,RC,RG,SH,S1,FG	5'x5'	6"	3'x3' or 32" Dia	0.43 in²/ft	0.43 in²/ft
SH,S1,FG	5'x5'	6"	4'x4'	0.63 in²/ft	0.63 in²/ft
SH,S1,FG	5'x5'	6"	3'x5'	0.63 in²/ft	0.63 in²/ft
SL	5'x6'	6"/8"	n/a	0.48 in²/ft	0.48 in²/ft
RH,RC,RG,SH,S1,FG	5'x6'	6"/8"	3'x3' or 32" Dia	0.48 in²/ft	0.48 in²/ft
SH,S1,FG	5'x6'	6"/8"	4'x4'	0.60 in²/ft	0.60 in²/ft
SH,S1,FG	5'x6'	6"/8"	3'x5'	0.60 in²/ft	0.60 in²/ft
SL	6'x6'	6"/8"	n/a	0.43 in²/ft	0.43 in²/ft
RH,RC,RG,SH,S1,FG	6'x6'	6"/8"	3'x3' or 32" Dia	0.56 in²/ft	0.56 in²/ft
SH,S1,FG	6'x6'	6"/8"	4'x4'	0.56 in²/ft	0.56 in²/ft
SH,S1,FG	6'x6'	6"/8"	3'x5'	0.59 in²/ft	0.59 in²/ft
SL	8'x8'	8"/10"	n/a	0.45 in²/ft	0.45 in²/ft
RH,RC,RG,SH,S1,FG	8'x8'	8"/10"	3'x3' or 32" Dia	0.45 in²/ft	0.45 in²/ft
SH,S1,FG	8'x8'	8"/10"	4'x4'	0.45 in²/ft	0.45 in²/ft
SH,S1,FG	8'x8'	8"/10"	3'x5'	0.45 in²/ft	0.45 in²/ft

(2) See sheet PDD for corresponding wall thickness (W) of base unit or riser.

Construct cast-in-place reinforced concrete apron, when shown elsewhere in plans. Use Class "A" concrete. Apron is subsidiary to PSL. Apron is 1'-6" Min width around precast zone drain.



DETAIL "A"

(Reinforcing not shown for clarity)

When an apron is to be cast around PSL, use detail above to create an apron ledge on all 4 sides.

FABRICATION NOTES:

1. Locate penetration (Style 'RH'), ring and cover (Style 'RC'), ring and grate (Style 'RG'), and frame and grate (Style 'FG') in a corner. Only one penetration is allowed per slab lid.
2. Provide Class "H" concrete in accordance with Item 421 and having a minimum compressive strength of 5,000 psi.
3. Provide Grade 60 reinforcing steel or equivalent area of WWR.
4. Provide clear cover of ¾" to reinforcing from lower outside shoulder of slab for structural reinforcement, and 2" from top of slab for shrinkage and temperature reinforcement. Place short span reinforcing closest to surface.
5. Slabs with a thickness of 8" or greater require shrinkage and temperature reinforcing. Provide steel area = 0.11 in²/ft each way.
6. No substitution is allowed for diagonal #4 bars around openings.
7. Design tongue and groove joints for full closure on both shoulders. Minimum spigot depth is ¾".
8. Provide lifting devices in conformance with Manufacturer's recommendations.

INSTALLATION NOTES:

1. Precast slab lids are intended for direct traffic and may be placed in roadway.
2. Seal tongue and groove joints with preformed or bulk mastic in conformance with Manufacturer's recommendations. Tongue and groove joints may be grouted no more than 1" between each section, or ½ the joint depth, whichever is greater.
3. Do not grout rubber gasket joints without Manufacturer's recommendation.
4. Initial installation of grade adjustment rings for Styles 'RH' and 'SH' is limited to 1'-0" Max as shown.
5. Grade adjustment rings for Styles 'RH' and 'SH' may be increased to 2'-0" Max when future construction affects final grade of structure. Make adjustments greater than 2'-0" with additional risers. Adjustments can be made up to Max depth shown on sheet PDD. Structure must be evaluated if Max depth will be exceeded.
6. Orient long dimension of grate slots perpendicular to traffic, unless noted otherwise on plans

GENERAL NOTES:

1. Designed according to ASTM C913.
2. Payment for lid is per Item 465, "Junction Boxes, Manholes, and Inlets" by type, style, size, and opening size (when applicable).

Cover dimensions are clear dimensions, unless noted otherwise.

HL93 LOADING

Texas Department of Transportation

Bridge Division Standard

PRECAST SLAB LID

PSL

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
SHEET NO. 272 OF 345
DWG NO. CC6-2711
CONTRACT NO. C-2033270-01

FILE: prestd05-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	DIST	COUNTY		SHEET NO.

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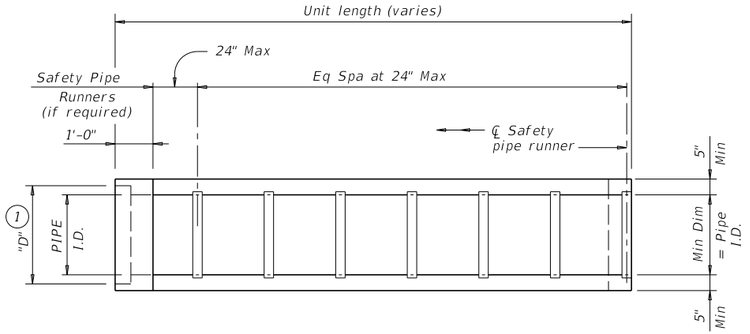
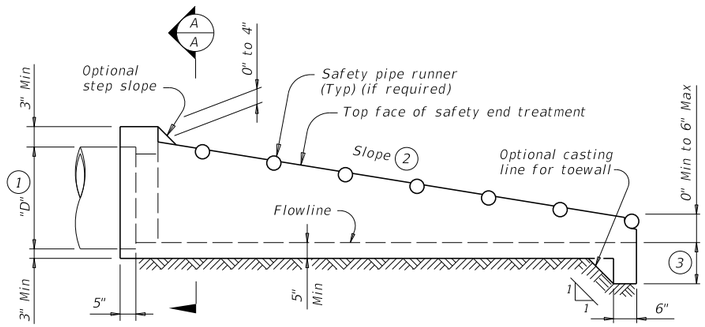
DATE:
FILE:



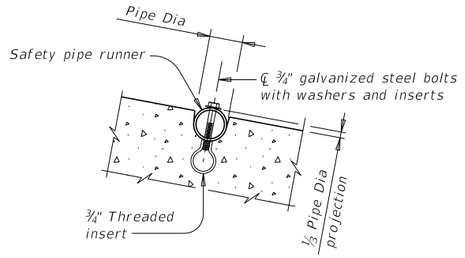
PLAN

(Showing bell end connection.)



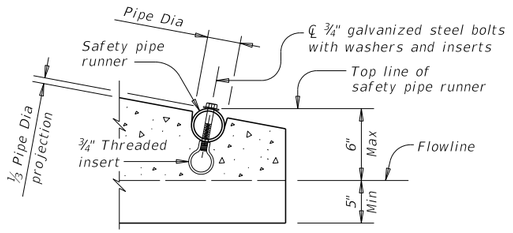
LONGITUDINAL ELEVATION

(Showing bell end connection.)

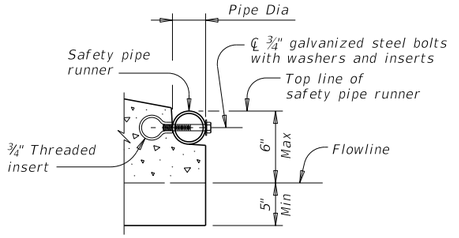


INSTALLATION DETAIL FOR SAFETY PIPE RUNNERS

(If required)



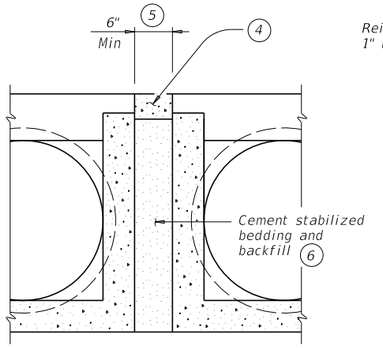
OPTION A



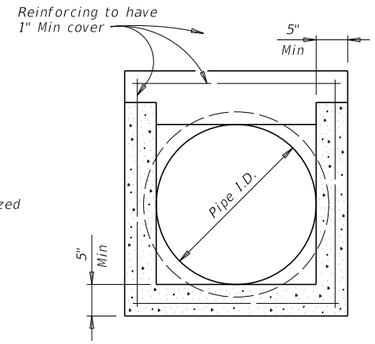
OPTION B

END DETAILS FOR INSTALLATION OF SAFETY PIPE RUNNERS

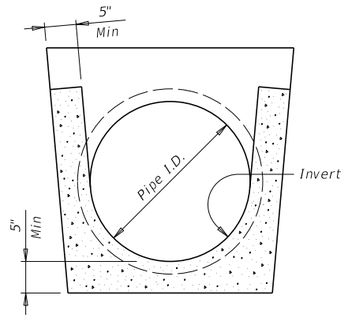
(If required)



MULTIPLE PIPE INSTALLATION

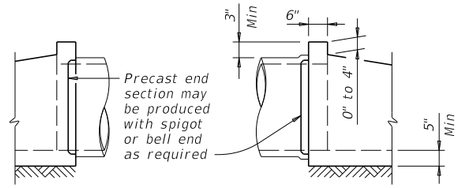


OPTION WITH SQUARE BOTTOM



OPTION WITH INVERT BOTTOM

SECTION A-A



OPTIONAL JOINT FOR RCP

(Showing joint between RCP and precast safety end treatment.)

REQUIREMENTS FOR CULVERT PIPES AND SAFETY PIPE RUNNERS

Pipe I.D.	RCP Wall "B" Thickness	TP Wall Thickness (7)	"D" (1)	Slope	Min Length	Pipe Runners Required		Required Pipe Runner Size		
						Single Pipe	Multiple Pipe	Nominal Dia.	O.D.	I.D.
12"	2"	1.15"	17.00"	6:1	4' – 9"	No	Yes, for > 2 pipes	3" STD	3.500"	3.068"
15"	2 ¼"	1.30"	20.50"	6:1	6' – 5"	No	Yes, for > 2 pipes	3" STD	3.500"	3.068"
18"	2 ½"	1.60"	24.00"	6:1	8' – 0"	No	Yes, for > 2 pipes	3" STD	3.500"	3.068"
24"	3"	1.95"	31.00"	6:1	11' – 3"	No	Yes, for > 2 pipes	3" STD	3.500"	3.068"
30"	3 ½"	2.65"	38.50"	6:1	14' – 8"	No	Yes	4" STD	4.500"	4.026"
36"	4"	2.75"	45.50"	6:1	17' – 11"	Yes	Yes	4" STD	4.500"	4.026"
42"	4 ½"	2.7"	52.50"	6:1	21' – 2"	Yes	Yes	4" STD	4.500"	4.026"

(1) Dimension "D" is based on reinforced concrete pipe (RCP) meeting the requirements of ASTM C–76, Class III, (RCP Wall "B" thickness). Adjust "D" for any other wall thickness used. For thermoplastic pipe (TP) take into account the annular space requirements for grouted connections.

(2) Slope as shown elsewhere in the plans. Slope of 6:1 or flatter is required for vehicle safety.

(3) Toewall to be used only when dimension is shown elsewhere in the plans.

(4) Fill the top 4" of void between precast end treatments with concrete riprap. Concrete riprap is considered subsidiary to the Item 467, "Safety End Treatment".

(5) Adjust clear distance between pipes to provide for the minimum distance between safety end treatments.

(6) Provide cement stabilized bedding and backfill in accordance with the Item 400, "Excavation and Backfill for Structures". Bedding and backfill is considered subsidiary to the Item 467, "Safety End Treatment". When concrete riprap is specified around the safety end treatment, backfill as directed by Engineer.

(7) Thermoplastic pipe wall thickness may vary. Adjust accordingly. Thermoplastic pipe requires the safety end treatments to have a bell end for grouted connections.

GENERAL NOTES:

Precast safety end treatment for reinforced concrete pipe (RCP), and thermoplastic pipe (TP) may be used for TYPE II end treatment as specified in Item "Safety End Treatment".

When precast safety end treatment is used as a Contractor's alternate to mitered RCP, riprap will not be required unless noted otherwise on the plans.

Synthetic fibers listed on the "Fibers for Concrete" Material Producer List (MPL) may be used in lieu of steel reinforcing in riprap concrete unless noted otherwise.

Manufacture this product in accordance with Item 467, "Safety End Treatment" except as noted below :

A. Provide minimum reinforcing of #4 at 6" (Grade 40) or #4 at 9" (Grade 60) each way or 6"x6" – D12 x D12 or 5"x5" – D10 x D10 welded wire reinforcement (WWR).

B. For precast (steel formed) sections, provide Class "C" concrete (f'c = 3,600 psi).

At the option and expense of the Contractor the next larger size of safety end treatment may be furnished; as long as the "D" dimension cast is that of the required size of pipe.

Pipe runners are designed for a traversing load of 10,000 Lbs at yield as recommended by Research Report 280–2F, "Safety Treatment of Roadside Parallel–Drainage Structures", Texas Transportation Institute, March 1981.

Provide pipe runners meeting the requirements of ASTM A53 (Type E or S, Grade B), ASTM A500 (Grade B), or API 5LX52.

Galvanize all steel components except reinforcing steel after fabrication. Repair galvanizing damaged during transport or construction in accordance with the specifications.

Connect RCP using the Optional Joint for RCP detail shown or in accordance with Item 464, "Reinforced Concrete Pipe". Connect TP by grouting. See Pipe and Box Grouted Connections (PBGC) standard for grouted connections with TP and precast safety end treatment.

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
SHEET NO. 273 OF 345
DWG NO. CC6-2712
CONTRACT NO. C-2033270-01

Texas Department of Transportation

Bridge Division Standard

PRECAST SAFETY END TREATMENT

TYPE II ~ PARALLEL DRAINAGE

PSET-SP

FILE: psetspss-21.dgn	DN: RLW	CK: KLR	DW: JTR	CK: GAF
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS 12-21: Added 42" TP				
	DIST	COUNTY		SHEET NO.

		MAX DEPTH = 15 ft. to top of BASE SLAB										MAX DEPTH = 25 ft. to top of BASE SLAB												
		Base Slab			Base Unit or Riser Walls			Below Grade Slab (w/PJB) Reducing Slab (w/PB)				Base Slab			Base Unit or Riser Walls			Below Grade Slab (w/PJB) Reducing Slab (w/PB)				Min Height (See Gen Note 3)	Max HOLE DIA (See Fab Note 2)	Max KO DIA (See Fab Note 2)
	Size	Short Span Reinf Steel Area	Long Span Reinf Steel Area	Thickness	Short Span Reinf Steel Area	Long Span Reinf Steel Area	Thickness	Reduced Riser Size	Short Span Reinf Steel Area	Long Span Reinf Steel Area	Thickness	Short Span Reinf Steel Area	Long Span Reinf Steel Area	Thickness	Short Span Reinf Steel Area	Long Span Reinf Steel Area	Thickness	Reduced Riser Size	Short Span Reinf Steel Area	Long Span Reinf Steel Area	Thickness			
	X x Y	Ashort	Along	BS	Bshort	Blong	W	RWSxRWL or ID	Dshort	Dlong	TS	Ashort	Along	BS	Bshort	Blong	W	RWSxRWL or ID	Dshort	Dlong	TS	BH MIN	HOLE DIA	KO DIA
	ft.	in^2/ft	in^2/ft	in.	in^2/ft	in^2/ft	in.	ft. **	in^2/ft	in^2/ft	in.	in^2/ft	in^2/ft	in.	in^2/ft	in^2/ft	in.	ft. **	in^2/ft	in^2/ft	in.	ft.	in.	in.
Precast Junction Box (PJB)	3x3	0.23	0.23	6	0.19	0.19	6	N/A	0.37	0.37	9	0.29	0.29	6	0.24	0.24	6	N/A	0.37	0.37	9	3.5	36	36
	4x4	0.29	0.29	6	0.24	0.24	6	N/A	0.41	0.41	9	0.47	0.47	6	0.38	0.38	6	N/A	0.41	0.41	9	4.5	48	48
	3x5	0.29	0.18	6	0.19	0.35	6	N/A	0.48	0.48	9	0.39	0.18	6	0.23	0.59	6	N/A	0.48	0.48	9	3.5	36/60	36/60
	4x5	0.36	0.18	6	0.22	0.34	6	N/A	0.42	0.42	9	0.53	0.26	6	0.39	0.59	6	N/A	0.42	0.42	9	4.5	48/60	48/60
	5x5	0.36	0.36	6	0.34	0.34	6	N/A	0.43	0.43	9	0.62	0.62	6	0.59	0.59	6	N/A	0.43	0.43	9	5.5	60	60
	5x6	0.27	0.27	9	0.34	0.45	6	N/A	0.48	0.48	9	0.47	0.45	9	0.38	0.54	8	N/A	0.48	0.48	9	5.5	60/72	60/72
	6x6	0.27	0.27	9	0.45	0.45	6	N/A	0.56	0.56	9	0.52	0.52	9	0.54	0.54	8	N/A	0.56	0.56	9	6.5	72	72
	8x8	0.46	0.46	9	0.51	0.51	8	N/A	0.45	0.45	12	0.87	0.87	9	0.59	0.59	10	N/A	0.45	0.45	12	8.5	96	72
Precast Base (PB)	3x3	0.23	0.23	6	0.19	0.19	6	N/A	N/A	N/A	N/A	0.29	0.29	6	0.24	0.24	6	N/A	N/A	N/A	N/A	3.5	36	36
	4x4	0.29	0.29	6	0.24	0.24	6	N/A	N/A	N/A	N/A	0.47	0.47	6	0.38	0.38	6	N/A	N/A	N/A	N/A	4.5	48	48
	3x5	0.29	0.18	6	0.19	0.35	6	3x3	0.30	0.34	9	0.39	0.18	6	0.23	0.59	6	3x3	0.40	0.40	9	3.5	36/60	36/60
	4x5	0.36	0.18	6	0.22	0.34	6	3x3	0.30	0.30	9	0.53	0.26	6	0.39	0.59	6	3x3	0.46	0.37	9	4.5	48/60	48/60
	4x5	0.36	0.18	6	0.22	0.34	6	4x4	0.30	0.30	9	0.53	0.26	6	0.39	0.59	6	4x4	0.39	0.39	9	4.5	48/60	48/60
	4x5	0.36	0.18	6	0.22	0.34	6	48"	0.39	0.39	9	0.53	0.26	6	0.39	0.59	6	48"	0.47	0.47	9	4.5	48/60	48/60
	4x5	0.36	0.18	6	0.22	0.34	6	3x5	0.33	0.40	9	0.53	0.26	6	0.39	0.59	6	3x5	0.48	0.48	9	4.5	48/60	48/60
	5x5	0.36	0.36	6	0.34	0.34	6	3x3	0.34	0.34	9	0.62	0.62	6	0.59	0.59	6	3x3	0.53	0.53	9	5.5	60	60
	5x5	0.36	0.36	6	0.34	0.34	6	4x4	0.36	0.36	9	0.62	0.62	6	0.59	0.59	6	4x4	0.64	0.64	9	5.5	60	60
	5x5	0.38	0.38	6	0.34	0.34	6	48"	0.36	0.36	9	0.62	0.62	6	0.59	0.59	6	48"	0.64	0.64	9	5.5	60	60
	5x5	0.36	0.36	6	0.34	0.34	6	3x5	0.34	0.40	9	0.62	0.62	6	0.59	0.59	6	3x5	0.53	0.53	9	5.5	60	60
	5x6	0.31	0.31	9	0.34	0.45	6	3x3	0.34	0.34	9	0.47	0.45	9	0.38	0.54	8	3x3	0.61	0.50	9	5.5	60/72	60/72
	5x6	0.27	0.27	9	0.34	0.45	6	4x4	0.36	0.45	9	0.47	0.45	9	0.38	0.54	8	4x4	0.74	0.57	9	5.5	60/72	60/72
	5x6	0.29	0.29	9	0.34	0.45	6	48"	0.36	0.45	9	0.47	0.45	9	0.38	0.54	8	48"	0.74	0.57	9	5.5	60/72	60/72
	5x6	0.29	0.29	9	0.34	0.45	6	3x5	0.45	0.45	9	0.47	0.45	9	0.38	0.54	8	3x5	0.61	0.61	9	5.5	60/72	60/72
	6x6	0.29	0.29	9	0.45	0.45	6	3x3	0.41	0.41	9	0.52	0.52	9	0.54	0.54	8	3x3	0.74	0.74	9	6.5	72	72
	6x6	0.27	0.27	9	0.45	0.45	6	4x4	0.45	0.45	9	0.52	0.52	9	0.54	0.54	8	4x4	0.87	0.87	9	6.5	72	72
	6x6	0.29	0.29	9	0.45	0.45	6	48"	0.45	0.45	9	0.52	0.52	9	0.54	0.54	8	48"	0.87	0.87	9	6.5	72	72
	6x6	0.29	0.29	9	0.45	0.45	6	3x5	0.45	0.45	9	0.52	0.52	9	0.54	0.54	8	3x5	0.87	0.87	9	6.5	72	72
	8x8	0.52	0.52	9	0.51	0.51	8	3x3	0.61	0.61	12	0.91	0.91	9	0.70	0.70	10	3x3	0.85	0.85	12	8.5	96	72
	8x8	0.52	0.52	9	0.51	0.51	8	4x4	0.70	0.70	12	0.87	0.87	9	0.70	0.70	10	4x4	1.01	1.01	12	8.5	96	72
	8x8	0.52	0.52	9	0.51	0.51	8	48"	0.70	0.70	12	0.87	0.87	9	0.70	0.70	10	48"	1.01	1.01	12	8.5	96	72
	8x8	0.52	0.52	9	0.51	0.51	8	3x5	0.70	0.85	12	0.87	0.87	9	0.70	0.70	10	3x5	1.01	1.01	12	8.5	96	72

** Unless otherwise indicated.

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DATE:
FILE:

FABRICATION NOTES:
1. Maximum spacing of reinforcement is 8".
2. At manufacturer's option, provide cast or cored holes or thin wall panels (KO) to the maximum diameter shown for each. When no penetration is required, it is acceptable to provide a wall with no sectional reduction.

GENERAL NOTES:
1. Precast Junction Box consists of base slab, base unit, risers (as required), and below grade slab. See sheet PJB for details.
2. Precast Base consists of base slab, base unit, risers (as required), reducing slab (as required), and reduced risers (as required). See sheet PB for details.
3. Min Height shown is for stock base units. Use stock base units whenever practical. Smaller height base units can be used in special installation circumstances, when noted elsewhere in the plans. Absolute minimum height of base units is 2'-6".

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
SHEET NO. 274 OF 345
DWG NO. CC6-2713
CONTRACT NO. C-2033270-01

HL93 LOADING

Texas Department of Transportation

Bridge Division Standard

DESIGN DATA FOR PRECAST BASE AND JUNCTION BOX

PDD

FILE: prestd10-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
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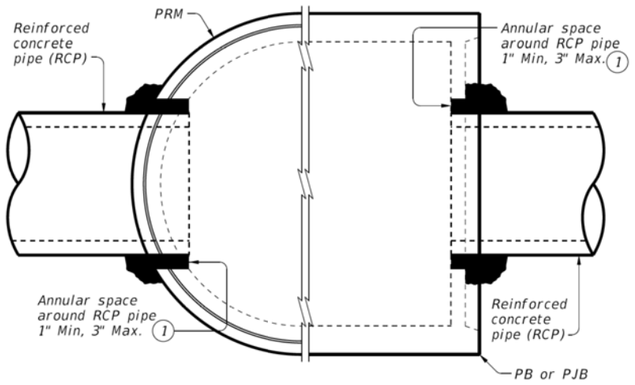
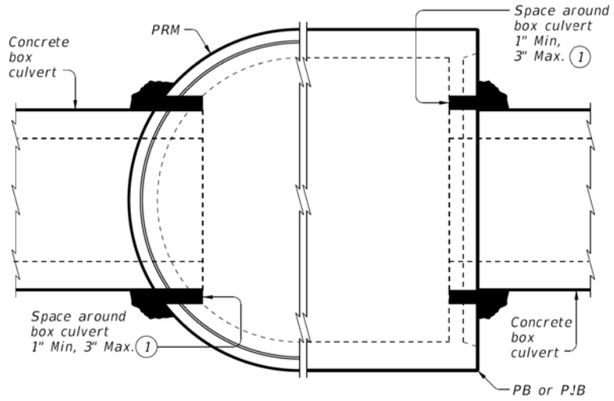


PRECAST ROUND MANHOLE (PRM) WITH THROUGH-HOLE

PRECAST BASE (PB) OR PRECAST JUNCTION BOX (PJB) WITH THIN-WALL KNOCK-OUT

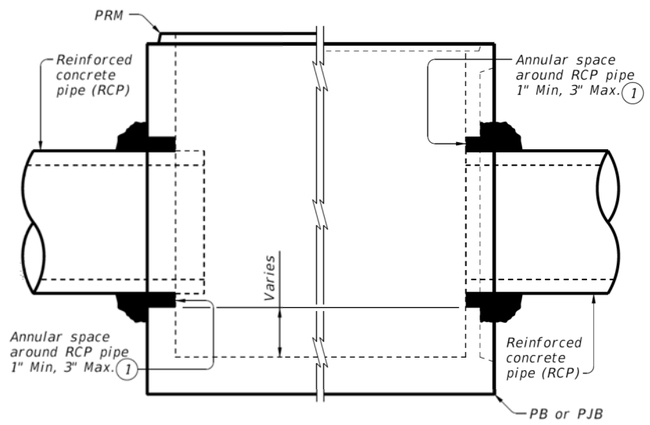
TYPICAL HALF PLAN



PRECAST ROUND MANHOLE (PRM) WITH THROUGH-HOLE

PRECAST BASE (PB) OR PRECAST JUNCTION BOX (PJB) WITH THIN-WALL KNOCK-OUT

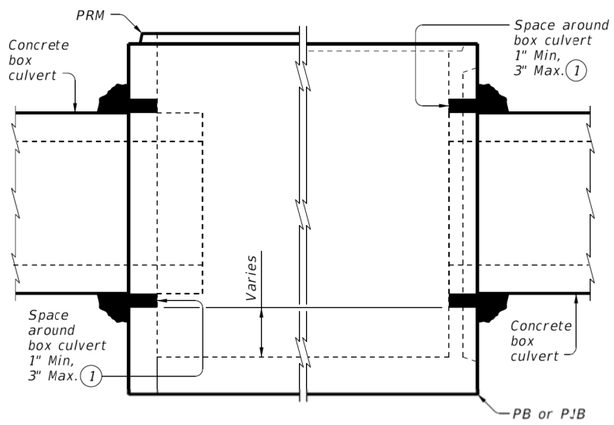
TYPICAL HALF PLAN



PRECAST ROUND MANHOLE (PRM) WITH THROUGH-HOLE

PRECAST BASE (PB) OR PRECAST JUNCTION BOX (PJB) WITH THIN-WALL KNOCK-OUT

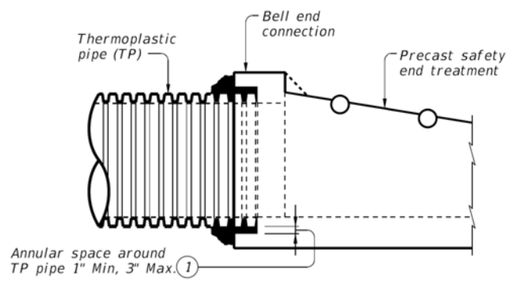
TYPICAL HALF ELEVATION



PRECAST ROUND MANHOLE (PRM) WITH THROUGH-HOLE

PRECAST BASE (PB) OR PRECAST JUNCTION BOX (PJB) WITH THIN-WALL KNOCK-OUT

TYPICAL HALF ELEVATION



TYPICAL PARTIAL ELEVATION OF PRECAST SAFETY END TREATMENTS

Showing square PSET for parallel drainage, cross drainage shown similar.

(1) Completely fill the void between the precast structure and the connecting pipe or box with cementitious grouts and mortars in accordance with DMS-4675 "Cementitious Grouts and Mortars for Miscellaneous Application".

CONSTRUCTION NOTES:

Do not grout rubber gasket joints without Manufacturer's recommendations.

Do not use bricks, masonry blocks, native stone, or similar materials in conjunction with grouted connections when filling void spaces around pipes or box culverts.

MATERIAL NOTES:

Provide grouted connections in accordance with DMS-4675 "Cementitious Grouts and Mortars for Miscellaneous Application".

GENERAL NOTES:

See applicable standards for notes and details not shown:

- Precast Base (PB)
- Precast Junction Box (PJB)
- Precast Round Manhole (PRM)
- Precast Safety End Treatments C/D Square (PSET-SC)
- Precast Safety End Treatments P/D Square (PSET-SP)

Provide Concrete Box Culverts in accordance with Item 462 "Concrete Box Culverts and Drains".

Provide Reinforced Concrete Pipe (RCP) in accordance with Item 464 "Reinforced Concrete Pipe".

Provide Thermoplastic Pipe (TP) in accordance with Special Specification Thermoplastic Pipe.

Payment for grouted connections is considered subsidiary to other bid Items.

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
SHEET NO. 275 OF 345
DWG NO. CC6-2714
CONTRACT NO. C-2033270-01

Texas Department of Transportation

Bridge Division Standard

PIPE AND BOX GROUTED CONNECTIONS FOR PRECAST STRUCTURES

PBGC

FILE: pbgcstd1-20.dgn	DN: TxDOT	CK: TAR	DW: JTR	CK: TAR
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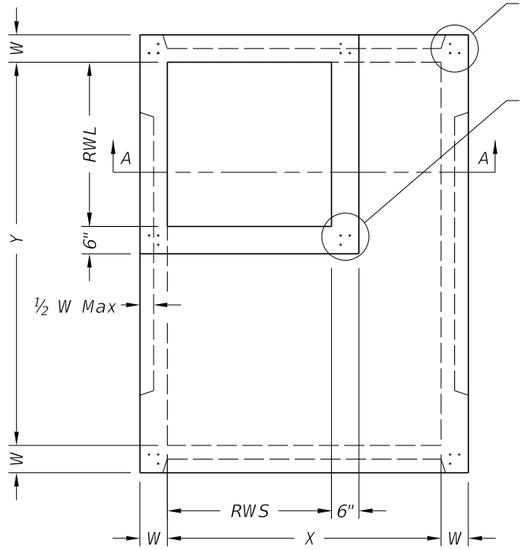
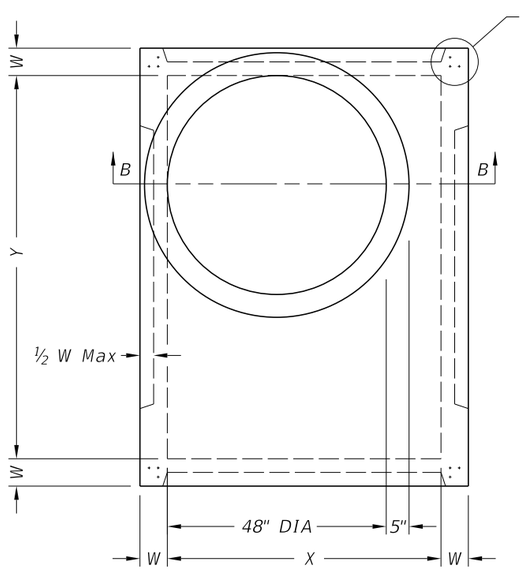
FILE:



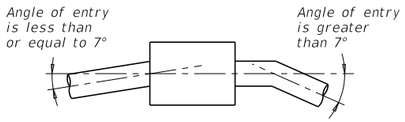
PLAN VIEW "A"

SQUARE REDUCED RISER OPTION



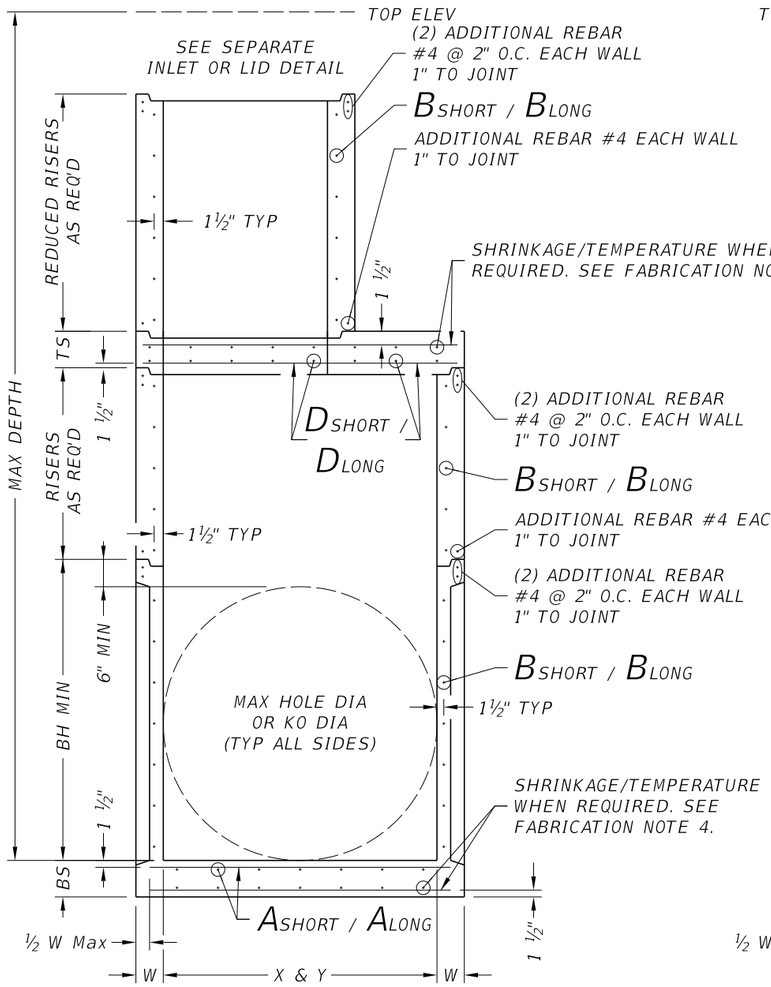
PLAN VIEW "B"

ROUND REDUCED RISER OPTION



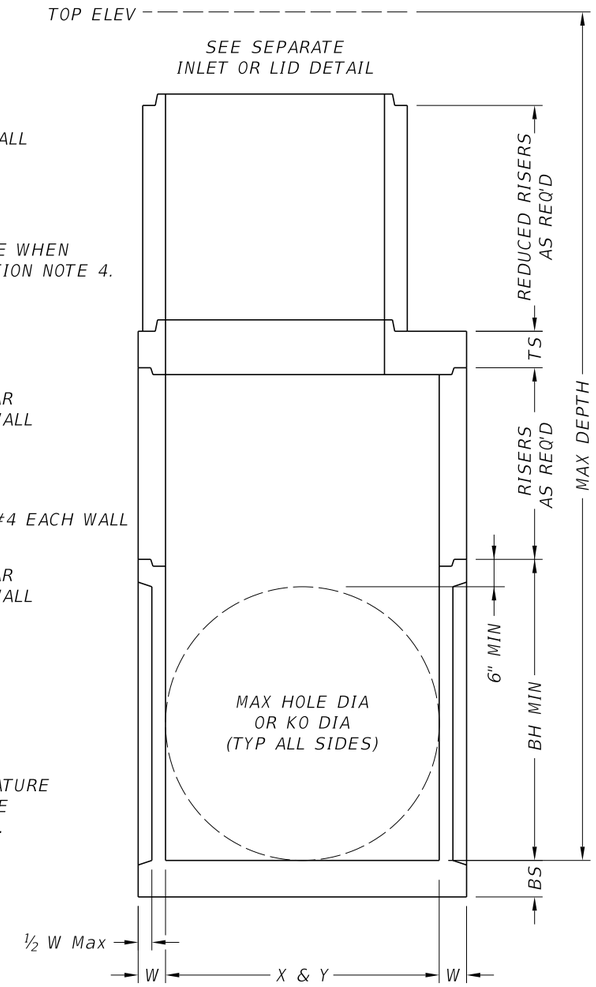
PIPE CONNECTION DETAIL

Connect pipes within 7° of normal to PB wall.
If necessary, use pipe elbow or curved
approach alignment to stay within this limit.



SECTION A-A

SQUARE REDUCED RISER OPTION



SECTION B-B

ROUND REDUCED RISER OPTION

FABRICATION NOTES:

1. Provide Class "H" concrete in accordance with Item 421 and having a minimum compressive strength of 5,000 psi.
2. Provide Grade 60 reinforcing steel or equivalent area of WWR.
3. Provide typical clear cover of 1 ½" to reinforcing steel at interior or exterior walls.
4. Walls or slabs with a thickness of 8" or greater require shrinkage and temperature reinforcing steel. Provide steel area = 0.11 in²/ft each way.
5. No substitution is allowed for vertical and horizontal #4 bars in corners.
6. Manufacture base and risers to nearest 3" increment.
7. Design tongue and groove joints for full closure on both shoulders. Minimum spigot depth is ¾".
8. Provide lifting devices in conformance with Manufacturer's recommendations.
9. See sheet PDD for sizes, dimensions, and reinforcing steel not shown.

Cover dimensions are clear dimensions, unless noted otherwise.

INSTALLATION NOTES:

1. If required elsewhere. Inverts (benching) to be provided by Contractor. Concrete or mortar used for invert is subsidiary to specified inlet or manhole.
2. Seal tongue and groove joints with preformed or bulk mastic in conformance with Manufacturer's recommendations. Tongue and groove joints may be grouted no more than 1" between each section, or ½ the joint depth, whichever is greater.
3. Do not grout rubber gasket joints without Manufacturer's recommendation.
4. For rigid pipe, cut hole in thin wall panel (KO) 4" Max, 2" Min larger than pipe OD.
5. For flexible pipe, consult boot/seal Manufacturer's specification for placement tolerance and hole size. Center pipe in hole and install boot/seal per Manufacturer's specification.

GENERAL NOTES:

1. Precast Base consists of base slab, base unit, risers (as required), reducing slab (as required), and reduced risers (as required). See sheet PDD for sizes.
2. Designed according to ASTM C913.
3. Payment for precast base is subsidiary to the specified inlet, per Item 465, "Junction Boxes, Manholes, and Inlets."

HL93 LOADING

Texas Department of Transportation

Bridge Division Standard

PRECAST BASE

PB

FILE: prestd01-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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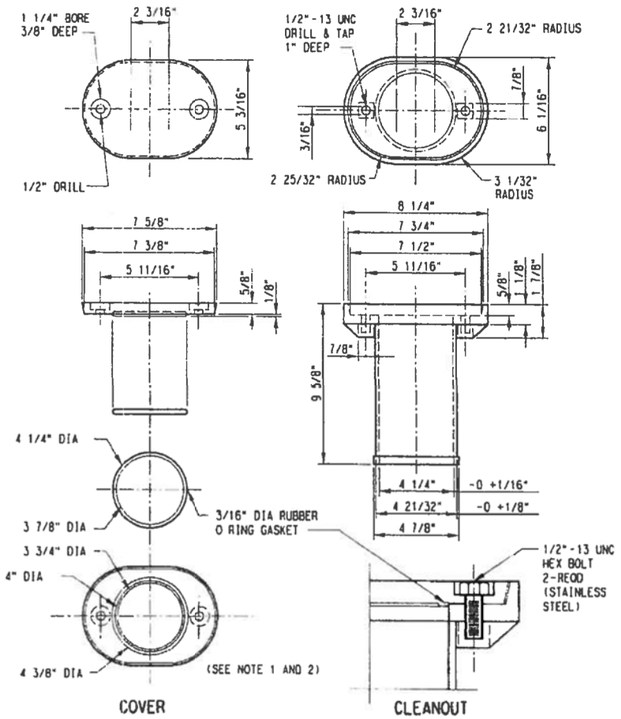
REVISIONS				
	DIST	COUNTY		SHEET NO.

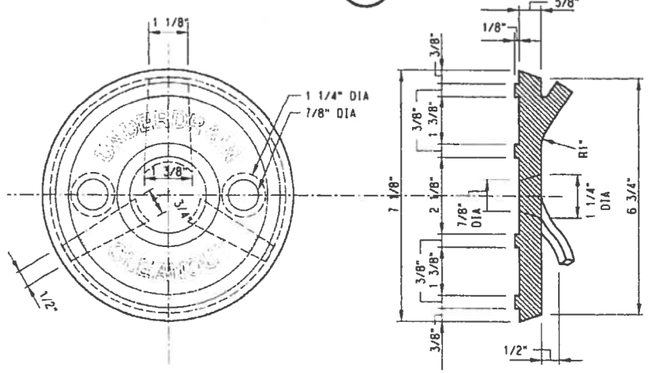
COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
SHEET NO. 276 OF 345
DWG NO. CC6-2715
CONTRACT NO. C-2033270-01

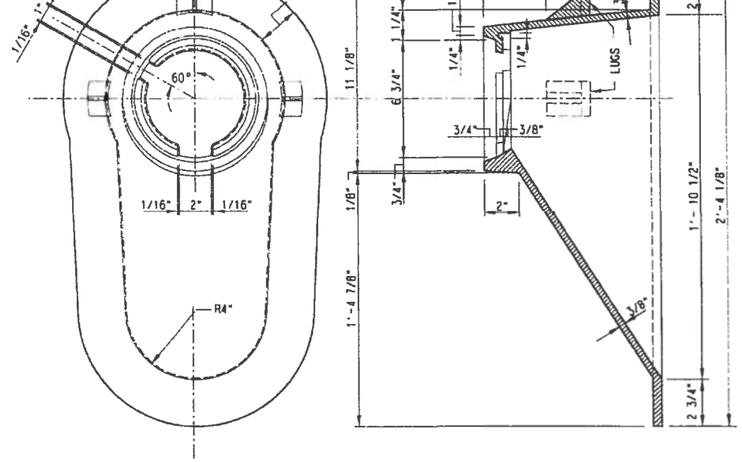
DWG No. CS6-0021



4" CLEANOUT CASTING DETAIL 1

NTS CS6-0023





CLEANOUT CASTING DETAIL 2

NTS CS6-0023

NOTES:

1. THE WORDS "UNDERDRAIN CLEANOUT" OR "CLEANOUT" SHALL BE CAST INTO TOP OF COVER ALONG WITH DART LOGO AS SHOWN ON DETAIL 4 SHEET CSG-0008. LOGO SHALL HAVE A DIAMETER OF 2".
2. PIPE MATERIAL TO BE PVC PLASTIC.
3. PIPE EMBEDMENT CLASSES FOR CLEANOUTS AND MIX M-1 CONCRETE SPECIFIED ON THIS SHEET ARE DESCRIBED IN THE STANDARD SPECIFICATIONS.

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
SHEET NO. 277 OF 345
DWG NO. CC6-2716
CONTRACT NO. C-2033270-01

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

STATE OF TEXAS
B. N. REDDY CHIDAMANDI
58001
LICENSED
PROFESSIONAL ENGINEER
12/22/05

CARTER BURGESS
JACOBS CIVIL INC
STV INCORPORATED
KAI ALLIANCE

DART PROJECT

SCALE	NO SCALE
DRAWN	B. SKINNER
DESIGNED	T. WILLIAMS
CHECKED	G. CELERIER
IN CHARGE	B.N. REDDY CHIDAMANDI
DATE	30 NOV 05

CAES

CONTRACT SHEET No. 35 OF 307

CIVIL STANDARD

UNDERDRAIN DETAILS
SHEET 1 OF 4

CONTRACT	DWG No.	REV
	CS6-0021	0

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Thu Dec 22 10:58:07 2005
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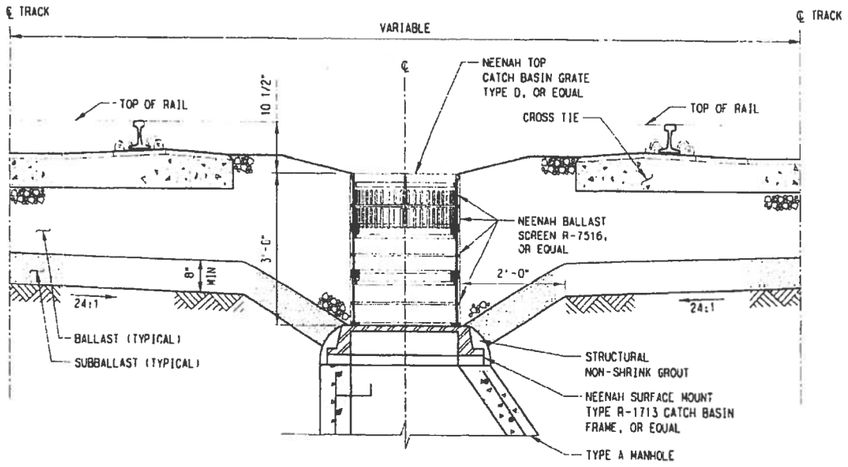
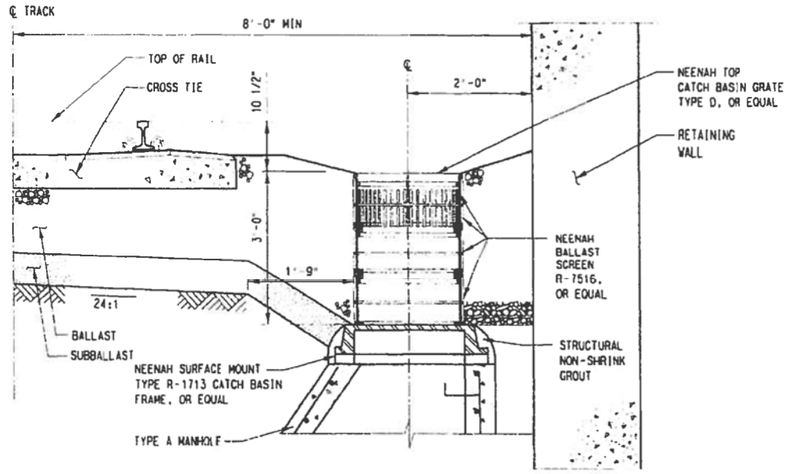
DWG No. CS6-0022



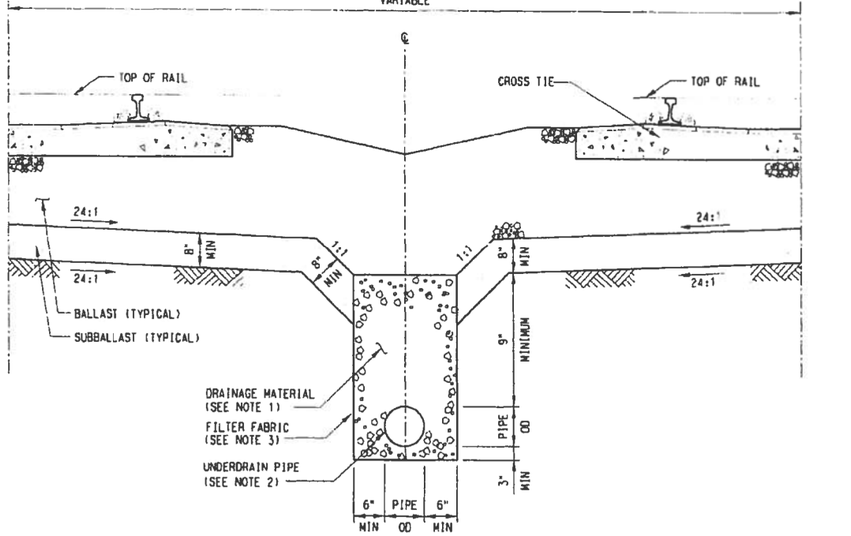
BETWEEN TRACK
BALLAST SCREEN DETAILS 1



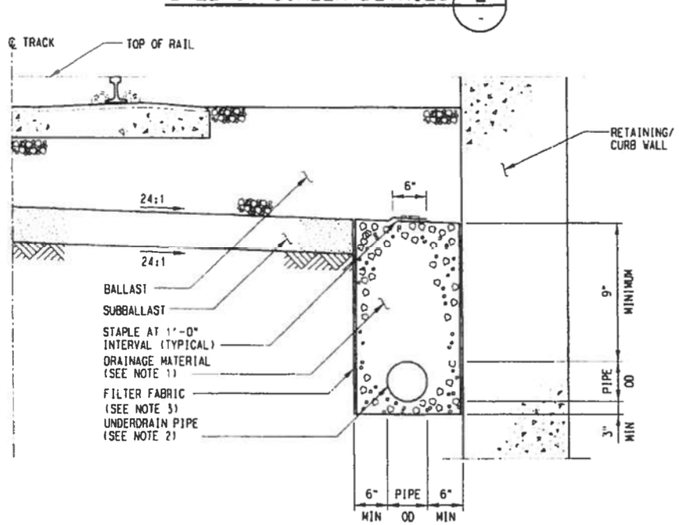
ADJACENT TO WALL
BALLAST SCREEN DETAILS 2

NOTES:

1. DRAINAGE MATERIAL SHALL CONSIST OF CLEAN, CRUSHED, ROCK, GRAVEL, WITH 1 1/2" MAXIMUM PARTICLE SIZE AND MAXIMUM 2 PERCENT BY WEIGHT PASSING SIZE 4 SIEVE.
2. UNDERDRAIN PIPE SHALL BE 8" MIN DIAMETER PERFORATED PIPE. SEE SECTION 02700 OF THE STANDARD SPECIFICATIONS. UNDERDRAIN PIPE SHALL BE INSTALLED WITH PERFORATIONS FACING DOWN. UNDERDRAIN SHALL BE WRAPPED IN GEOTEXTILE FABRIC.
3. NON-WOVEN FILTER FABRIC SEE SECTION 02700 OF THE STANDARD SPECIFICATIONS.



BETWEEN TRACK
UNDERDRAIN DETAILS 3



ADJACENT TO WALL
UNDERDRAIN DETAILS 4

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

B. N. REDDY CHIDANANDA 58001 LICENSED PROFESSIONAL ENGINEER 12/23/05

CARTER BURGESS
JACOBS CIVIL INC
STV INCORPORATED
KAI ALLIANCE

DART PROJECT

SCALE	NO SCALE
DRAWN	G. SKINNER
DESIGNED	T. WILLIAMS
CHECKED	G. GELERIER
IN CHARGE	B.N. REDDY CHIDANANDA
DATE	30 NOV 05

CAES

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
SHEET NO. 278 OF 345
DWG NO. CC6-2717
CONTRACT NO. C-2033270-01

CONTRACT SHEET No. 36 OF 307

CIVIL STANDARD

UNDERDRAIN DETAILS
SHEET 2 OF 4

CONTRACT	DWG No.	REV
	CS6-0022	0

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DWG No. CS6-0023

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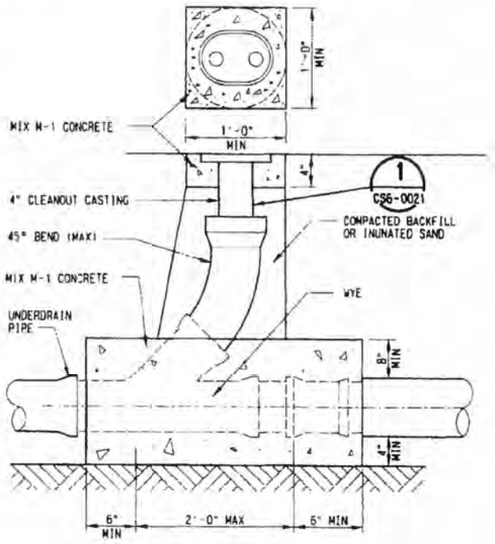
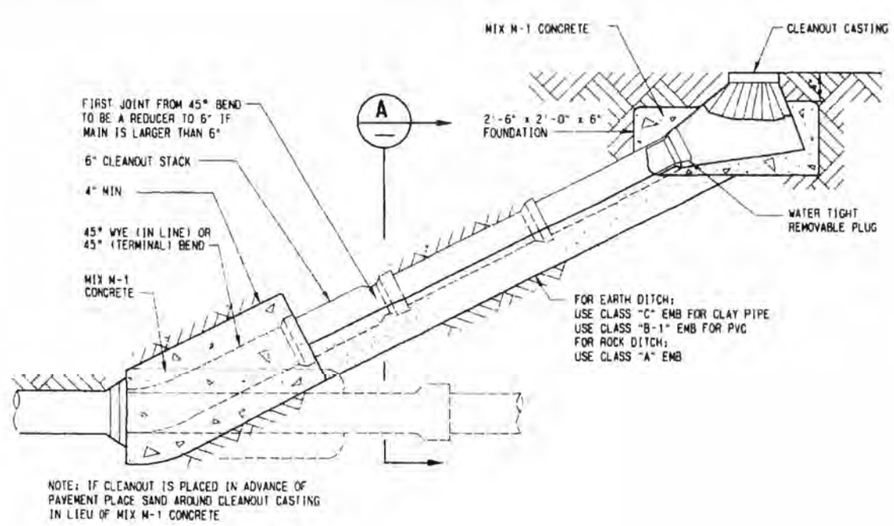
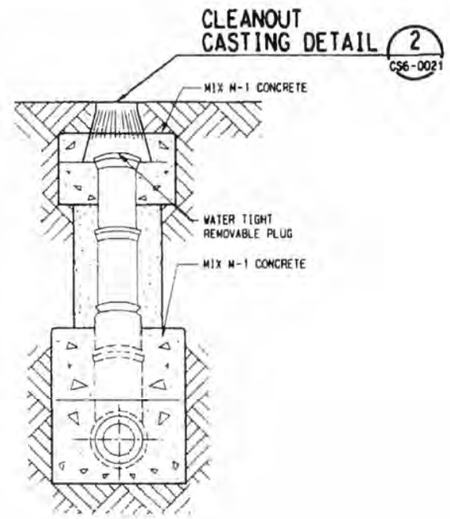
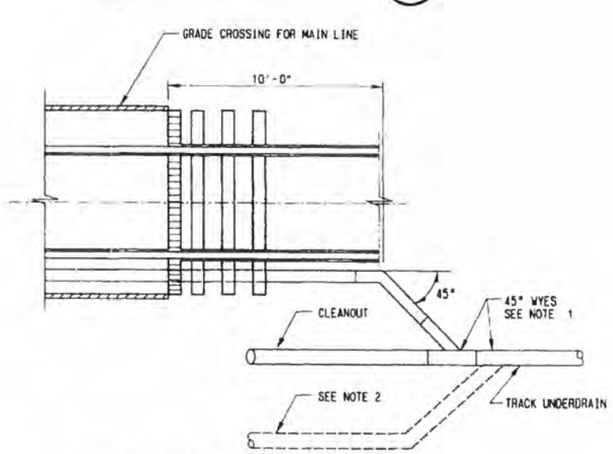


UNDERDRAIN CLEANOUT VERTICAL RISER DETAIL 1
NTS

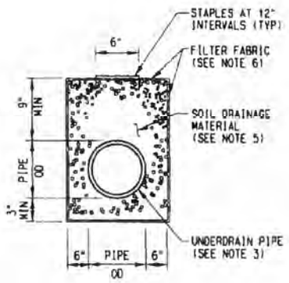


UNDERDRAIN CLEANOUT IN-LINE AND TERMINAL DETAIL 2
NTS





GRADE CROSING UNDERDRAIN TIE TO TRACK UNDERDRAIN 3
NTS



UNDERDRAIN DETAIL 4
NTS

(SEE NOTE 4)

SECTION A
NTS

NOTES:

1. CONTRACTOR TO CONNECT GRADE CROSSING UNDERDRAINS TO TRACK UNDERDRAINS AS SHOWN ON THIS SHEET.
2. WHEN THE TRACK UNDERDRAIN IS BETWEEN THE TRACKS, TWO 45° WYES WILL BE REQUIRED TO CONNECT THE GRADE CROSSING UNDERDRAINS. THEREFORE THE GRADE CROSSING UNDERDRAINS WILL BE DIFFERENT LENGTHS TO STAGGER THE CONNECTIONS.
3. UNDERDRAIN PIPE SHALL BE 8" MINIMUM DIAMETER PERFORATED PIPE. SEE SECTION 02700 OF THE STANDARD SPECIFICATIONS. PIPE SHALL BE WRAPPED IN FILTER FABRIC MATERIAL AND INSTALLED WITH PERFORATIONS DOWN.
4. THIS DETAIL TO BE USED FOR ALL UNDERDRAINS UNLESS NOTED OTHERWISE.
5. SOIL DRAINAGE MATERIAL SHALL CONSIST OF CLEAN, CRUSHED ROCK AND GRAVEL WITH 1 1/2" MAX PARTICLE SIZE AND MAX 2 PERCENT BY WEIGHT PASSING No.4 SIEVE. BALLAST DRAIN SHALL BE WRAPPED IN GEOTEXTILE FABRIC. OVERLAY FABRIC AT TOP AND PIN.
6. FILTER FABRIC SHALL BE NON-WOVEN GEOTEXTILE FABRIC AS DESCRIBED IN SPECIFICATION 02700.
7. SEE CASTING DETAILS SHEET CS6-0021.

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
SHEET NO. 279 OF 345
DWG NO. CC6-2718
CONTRACT NO. C-2033270-01

REV	AMEND	CR	DATE	DESCRIPTION	BY	CHG	CHK	APP

B. N. REDDY CHIDAMANDA 58001 LICENSED PROFESSIONAL ENGINEER 12/23/05

CARTER BURGESS
JACOBS CIVIL INC
STV INCORPORATED
KAI ALLIANCE

DART PROJECT

SCALE	NO SCALE
DRAWN	B. SKINNER
DESIGNED	T. WILLIAMS
CHECKED	G. CELERIER
IN CHARGE	B.N. REDDY CHIDAMANDA
DATE	30 NOV 05

CAES

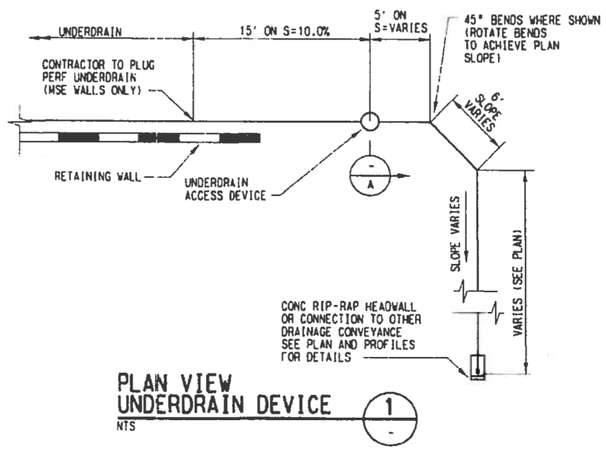
CONTRACT SHEET No. 37 OF 307

CIVIL STANDARD

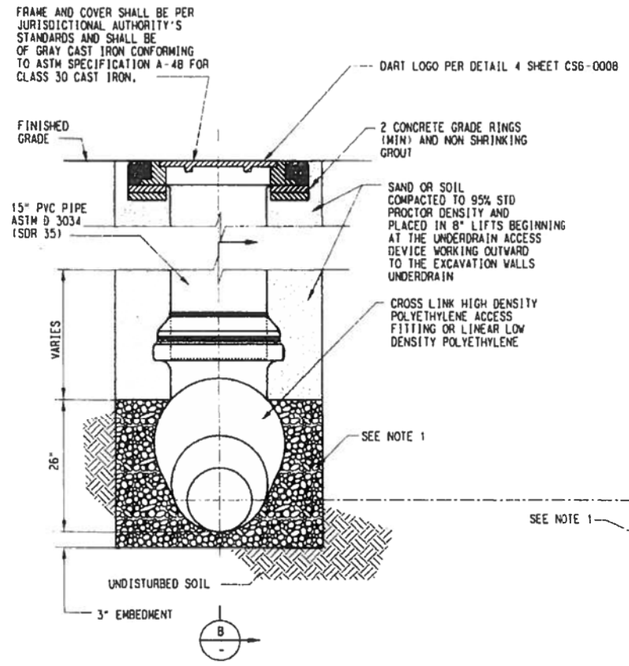
UNDERDRAIN DETAILS
SHEET 3 OF 4

CONTRACT	DWG No.	REV
	CS6-0023	0

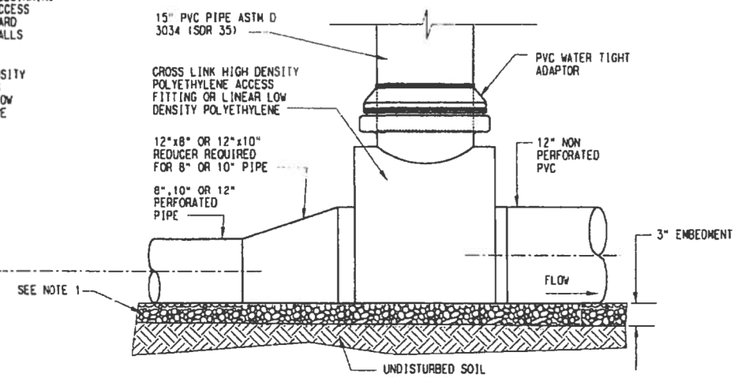
DWG No. CS6-0024



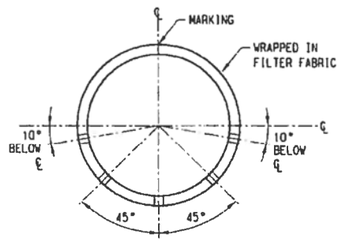
PLAN VIEW
UNDERDRAIN DEVICE (1)
NTS



SECTION (A)
NTS



SECTION VIEW (B)
NTS



NOMINAL DIAMETER IN.	MINIMUM ROWS OF PERFORATIONS	HOLE SIZE IN.	HOLE SPACING IN.
8 & 10	4	3/8	3
12	6	3/8	3
15	6	3/8	3

UNDERDRAIN PERFORATION SCHEDULE (3)
NTS

NOTE:
1. FREE DRAINING CLEAN & CRUSHED ROCK OR GRAVEL WITH 1½INCH MAXIMUM PARTICLE SIZE. NO MORE THAN FIVE PERCENT BY WEIGHT MAY PASS A⅜-INCH SIEVE. CRUSHED LIMESTONE SHALL NOT BE USED.

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
SHEET NO. 280 OF 345
DWG NO. CC6-2719
CONTRACT NO. C-2033270-01

CONTRACT SHEET No. 38 OF 307

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP
0								

STATE OF TEXAS
B. N. REDDY CHIDANANDA
58001
LICENSED PROFESSIONAL ENGINEER
12/23/05

ACT 21
CARTER BURGESS
JACOBS CIVIL INC
STV INCORPORATED
KAI ALLIANCE

DART PROJECT

SCALE	NO SCALE
DRAWN	B. SKINNER
DESIGNED	T. WILLIAMS
CHECKED	G. CELERIER
IN CHARGE	B.N. REDDY CHIDANANDA
DATE	30 NOV 05

CAES

CIVIL STANDARD

UNDERDRAIN DETAILS
SHEET 4 OF 4

CONTRACT	DWG No.	REV
	CS6-0024	0

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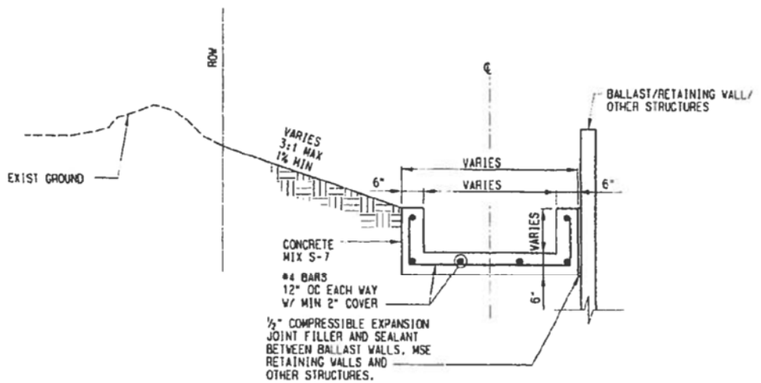
DWG No. CS6-0013



CONCRETE FLUME 1
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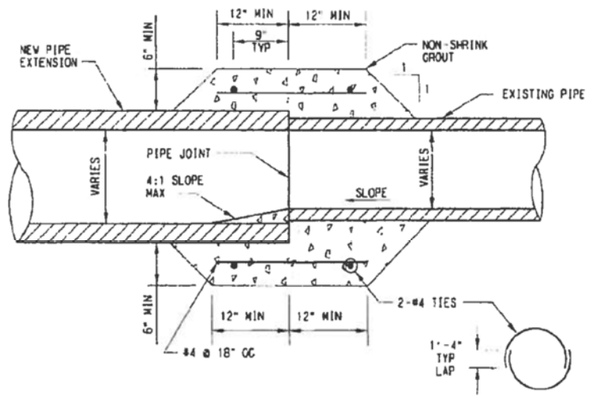

CONCRETE COLLAR FOR A PIPE CONNECTION FOR DISSIMILAR DIAMETERS 2
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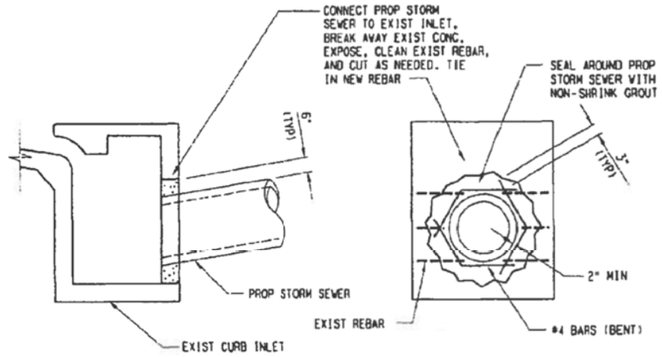

PIPE TO INLET CONNECTION DETAIL 3
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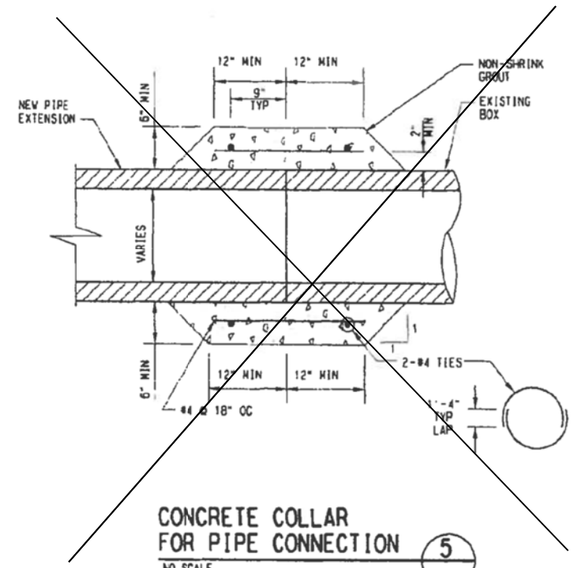

CONCRETE COLLAR FOR PIPE CONNECTION 5
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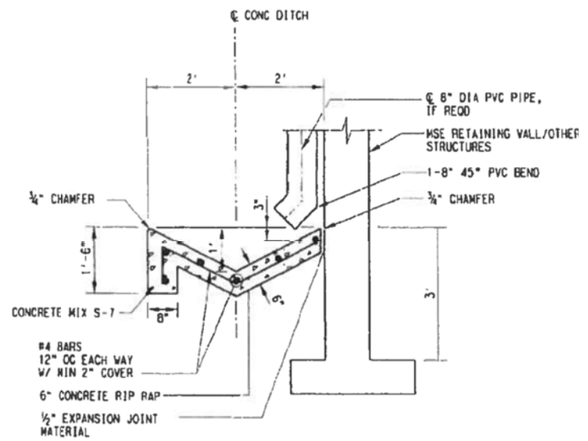

4' WIDE CONC DITCH DETAIL 4
NO SCALE

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
SHEET NO. 281 OF 345
DWG NO. CC6-2720
CONTRACT NO. C-2033270-01

REV	AMEND	DR	DATE	DESCRIPTION	BY	ING	CHK	APP

B. N. REDDY CHIDANANDA
58001
LICENSED
PROFESSIONAL ENGINEER
12/21/05

CARTER BURGESS
JACOBS CIVIL INC
STV INCORPORATED
KAI ALLIANCE

DART PROJECT

SCALE	NO SCALE
DRAWN	B. SKINNER
DESIGNED	I. WILLIAMS
CHECKED	G. CELERIER
IN CHARGE	B.N. REDDY CHIDANANDA
DATE	30 NOV 05

CAES

CONTRACT SHEET No. 27 OF 307

CIVIL STANDARD

GUIDEWAY DRAINAGE
DRAINAGE DETAILS
SHEET 2 OF 6

CONTRACT	DWG No.	REV
	CS6-0013	0

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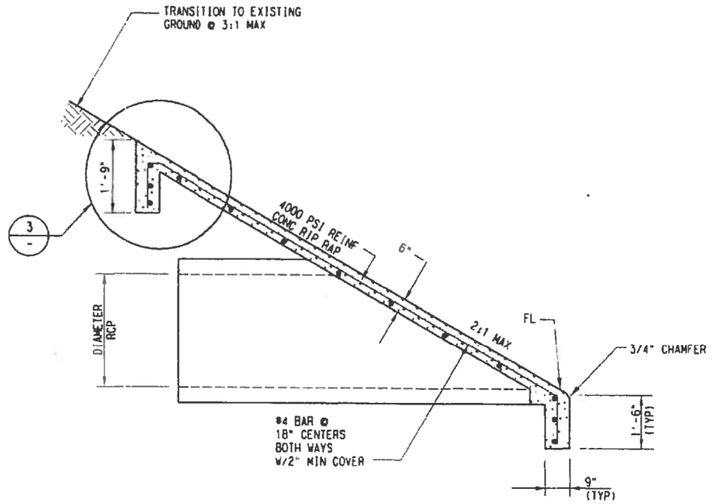
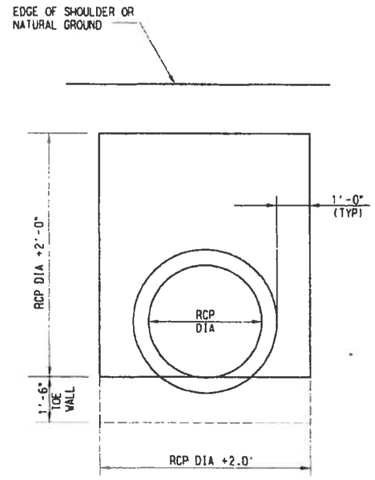


SIDE VIEW



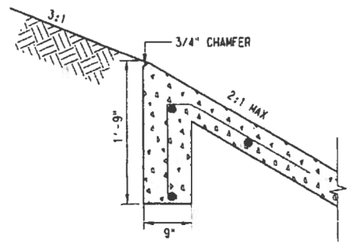
END VIEW

CONCRETE RIP RAP HEADWALL DETAIL 1/-

NO SCALE

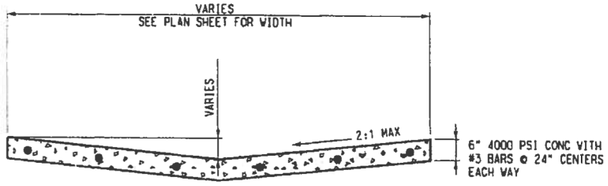
NOTES:

1. CONCRETE TO BE MIX S-7.
2. FILL SHALL BE SELECT FILL COMPACTED TO 95% STANDARD PROCTOR DENSITY.



HEADWALL FOOTING DETAIL 3/-

NO SCALE



CONCRETE V-DITCH 2/-

NO SCALE

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
SHEET NO. 282 OF 345
DWG NO. CC6-2721
CONTRACT NO. C-2033270-01

CONTRACT SHEET No. 28 OF 307

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP
0								

B. N. REDDY CHIDAMANDA 59001 LICENSED PROFESSIONAL ENGINEER 12/29/05

CARTER BURGESS
JACOBS CIVIL INC
STV INCORPORATED
KAI ALLIANCE

DART PROJECT

SCALE	NO SCALE
DRAWN	B. SKINNER
DESIGNED	T. VILLIAMS
CHECKED	G. CELERIER
IN CHARGE	B.N. REDDY CHIDAMANDA
DATE	30 NOV 05

CAES

CIVIL STANDARD

GUIDEWAY DRAINAGE
DRAINAGE DETAILS
SHEET 3 OF 6

CONTRACT	DWG No.	REV
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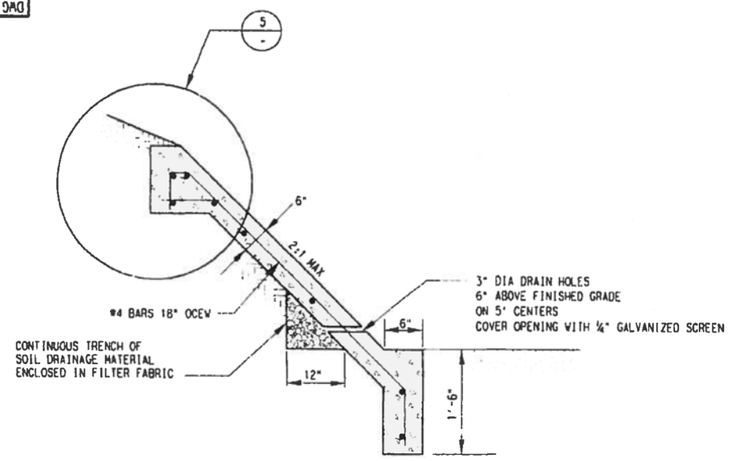
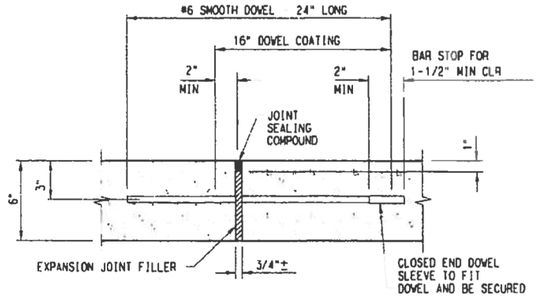


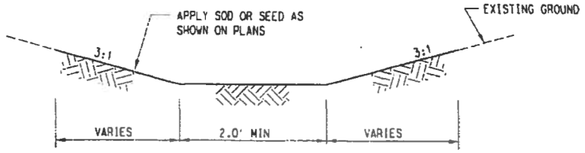
CONCRETE SLOPE PROTECTION 3
NO SCALE



EXPANSION JOINT FOR
CONCRETE SLOPE PROTECTION 4

GENERAL NOTES:

1. CONCRETE TO BE MIX "S-7".
2. CONCRETE DITCH TO BE PLACED ON UNDISTURBED SOIL OR SELECT FILL COMPACTED TO 95% STANDARD PROCTOR DENSITY.
3. EXPANSION JOINTS SHALL BE PLACED IN THE CONCRETE SLOPE PROTECTION AT 90° CENTERS (MAX).



UNLINED DITCH (TYPICAL) 1
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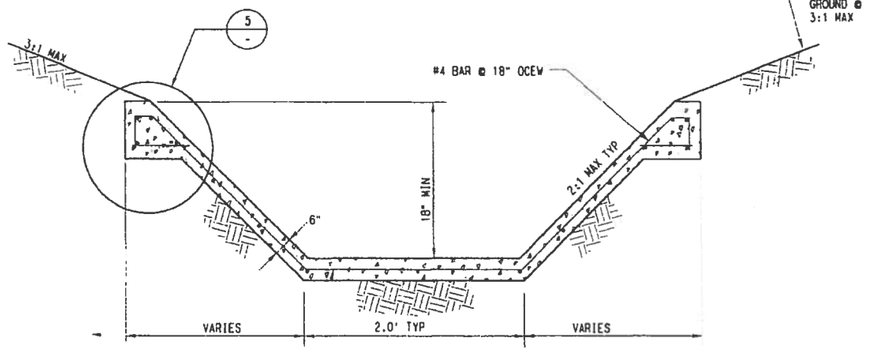
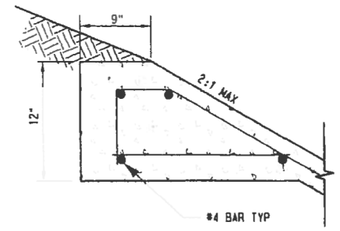


CONCRETE LINED TRAPEZOIDAL DITCH 2
NO SCALE



DITCH FOOTING DETAIL 5
NO SCALE

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
SHEET NO. 283 OF 345
DWG NO. CC6-2722
CONTRACT NO. C-2033270-01

CONTRACT SHEET No. 29 OF 307

REV	AMEND	DR	DATE	DESCRIPTION	BY	ENG	CHK	APP

B. N. REDDY CHIDANANDA
58001
LICENSED
PROFESSIONAL ENGINEER
12/23/05

CARTER BURGESS
JACOBS CIVIL INC
STV INCORPORATED
KAI ALLIANCE

DART PROJECT

SCALE	NO SCALE
DRAWN	B. SKINNER
DESIGNED	T. WILLIAMS
CHECKED	G. CELERIER
IN CHARGE	B.N. REDDY CHIDANANDA
DATE	30 NOV 05

CAES

CIVIL STANDARD

GUIDEWAY DRAINAGE
DRAINAGE DETAILS
SHEET 4 OF 6

CONTRACT	DWG No.	REV
	CS6-0015	0

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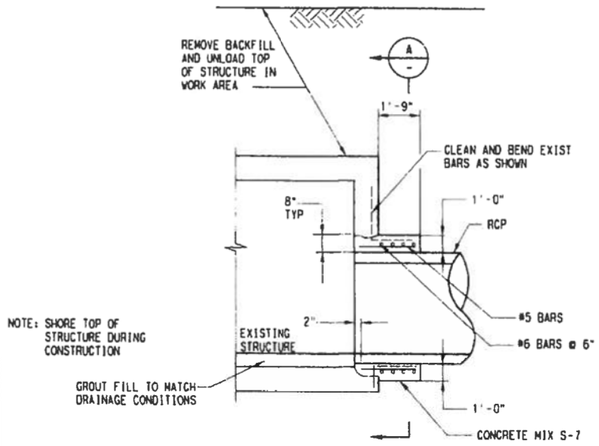
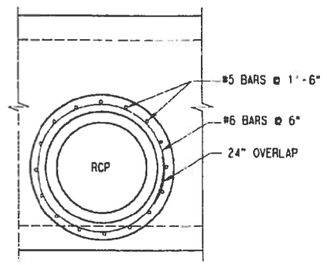
DWG No. CS6-0016

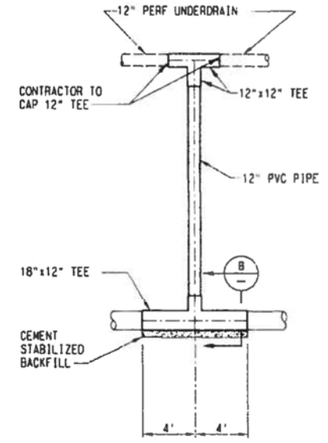




SECTION A
NO SCALE

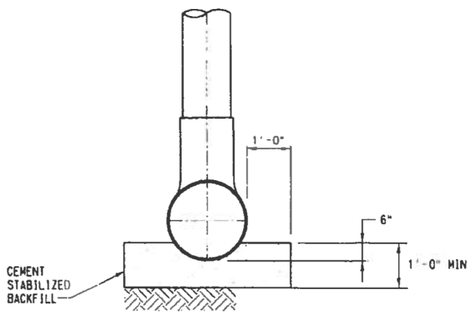
RCP TIE INTO EXISTING STRUCTURE OTHER THAN INLETS 1

NO SCALE



PVC TEE CONNECTION DETAIL 3

NO SCALE



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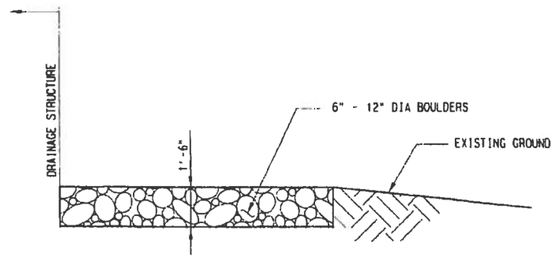

SEE DRAINAGE PLANS FOR LOCATIONS AND DIMENSIONS.

STONE RIP RAP 2

NO SCALE

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
SHEET NO. 284 OF 345
DWG NO. CC6-2723
CONTRACT NO. C-2033270-01

CONTRACT SHEET No. 30 OF 307

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

STATE OF TEXAS — B. N. REDDY CHIDANANDA — 58001 — LICENSED PROFESSIONAL ENGINEER — 12/23/05

CARTER BURGESS
JACOBS CIVIL INC
STV INCORPORATED
KAI ALLIANCE

DART PROJECT

SCALE	NO SCALE
DRAWN	B. SKINNER
DESIGNED	T. WILLIAMS
CHECKED	G. CELERIER
IN CHARGE	B.N. REDDY CHIDANANDA
DATE	30 NOV 05

CAES

CIVIL STANDARD

GUIDEWAY DRAINAGE
DRAINAGE DETAILS
SHEET 5 OF 6

CONTRACT	DWG No.	REV
	CS6-0016	0

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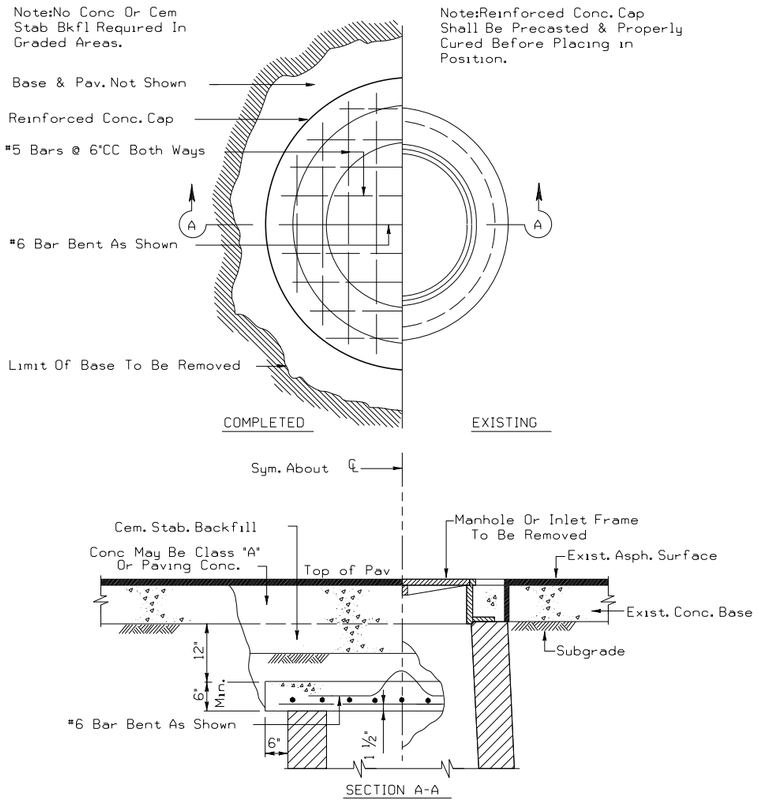
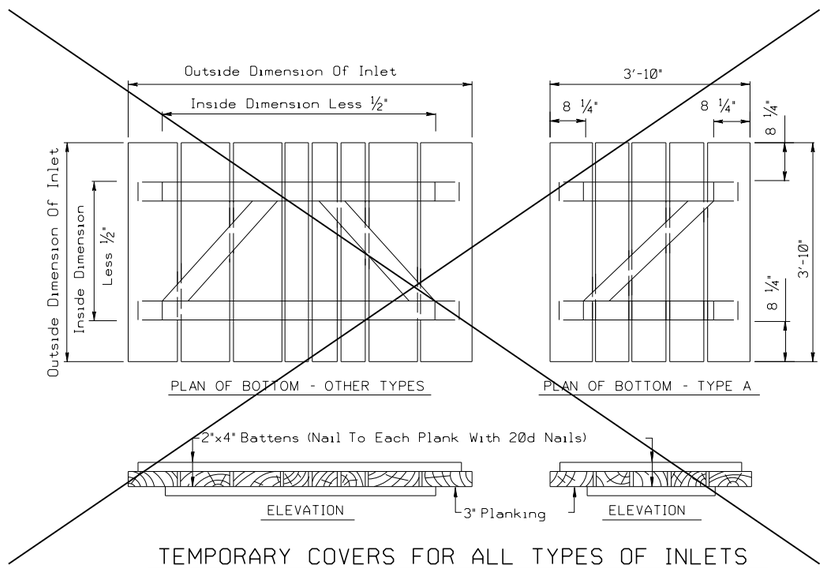
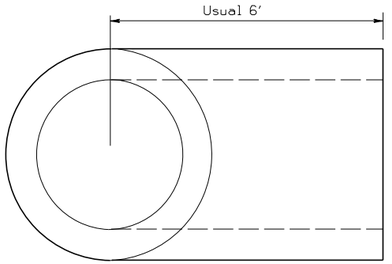


DETAIL SHOWING METHOD OF CAPPING ABANDONED MANHOLES OR INLETS (GRADED OR PAVED AREAS)

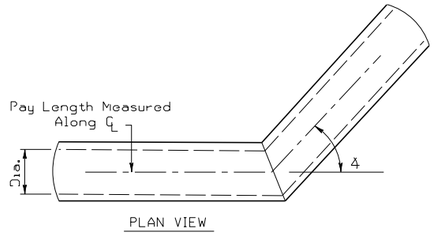


TEMPORARY COVERS FOR ALL TYPES OF INLETS



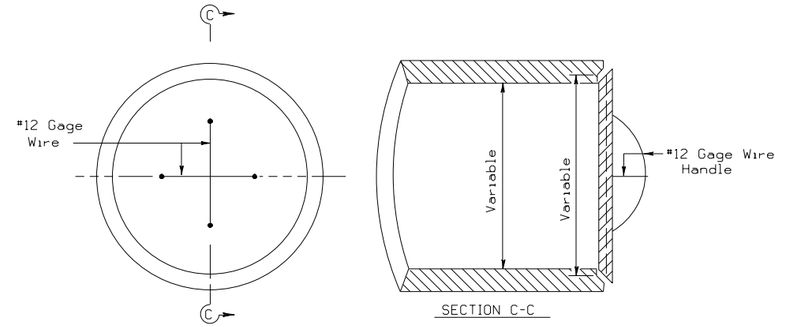
Note: Jointing Material Shall Conform To Requirements Of Item "Reinforced Concrete Pipe." Material For Tees Shall Conform To Requirements Of Item "Reinforced Concrete Pipe." Payment For Tee To Be In Accordance With Item "Reinforced Concrete Pipe."

PRECAST STORM SEWER TEE



BENDING DETAIL

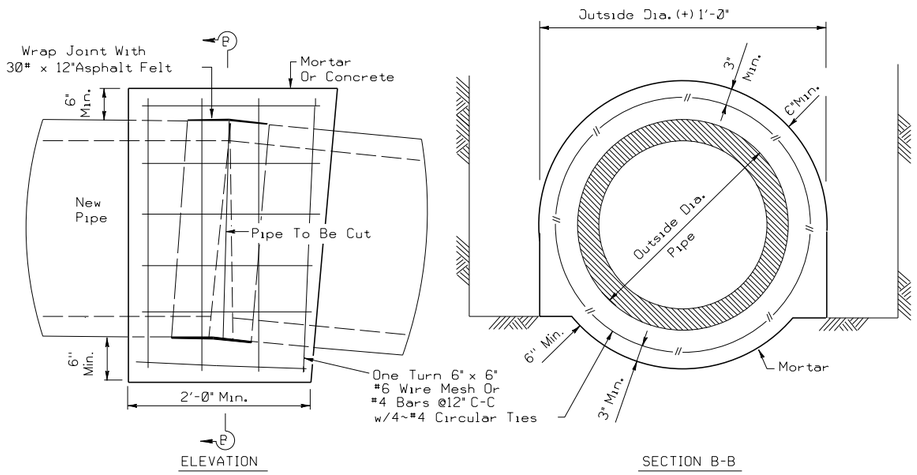
Note: Bending Of Proposed Pipe Sewer Or RCP In A Vertical & /Or Horizontal Plane Shall Be Accomplished By The Use Of A "Pipe Collar" Or A "Precast Elbow", As Approved By The Engineer.
Price Of "Pipe Collar" Or "Precast Elbow" Shall Be Subsidiary To The Unit Prices Bid For Item Reinforced Concrete Pipe.
Pay Length Measurement To Be Along Horizontal C ℄ & Horizontal Plane Of Pipes.



Note: The Price Of Plug Shall Be Subsidiary To The Unit Bid Price For Pipe Sewer Or RCP. Mortar Joints To Be Used As Directed By The Engineer. Removal Of The Existing Plugs For Storm Sewer Or RCP Conns. Shall Be Considered Incidental To Item "Excavation And Backfill For Structures."

Concrete Plug For End Of Pipe Culvert Or Sewer

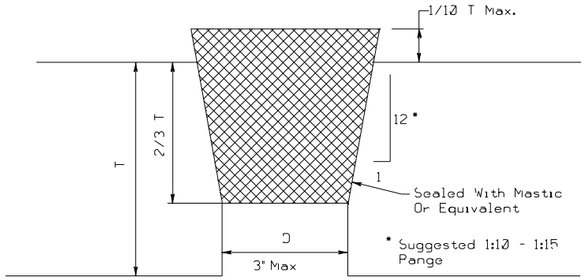
CONCRETE PLUG FOR PIPE



PIPE COLLAR DETAIL

For Horizontal Or Vertical Placement

d = Diameter
R = Radius



T = Wall Thickness On Top Of Box Or Pipe
D = Diameter Of Lifting Hole

Minimum Length Of Plug Is 2/3 T +/-
Minimum Diameter At Bottom Of Plug = D - ⅛"
Maximum 1/10 T Of Plug Not Seated In Lifting Hole

Note: The Plug Shall Be Cast With The Same Taper As The Lifting Hole.

DETAIL OF PLUG FOR LIFTING HOLES IN RCB AND RCP

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
SHEET NO. 285 OF 345
DWG NO. CC6-2724
CONTRACT NO. C-2033270-01

Texas Department of Transportation
Houston District (Bridge)

MISCELLANEOUS SEWER DETAILS

MSD

FILE: STDD11.DGN	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK:
© TxDOT Mar 2004	DISTRICT	FED REG	PROJECT NO.	SHEET
REVISIONS 3/2015 2014 Specs	HOU	6		
	COUNTY	CONTROL	SECT	JOB	HIGHWAY

STDD11.DGN

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DATE:
FILE:

TABLE OF DIMENSIONS AND REINFORCING STEEL
(Wings for one structure end)

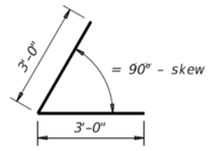
Dimensions					Variable Reinforcing				Estimated Quantities per ft of wing (2~wings) (4)		Estimated Quantities per ft of Toewall (1~toewall)	
					Bars J1		Bars J2					
Maximum Wingwall Height Hw	W	X	Y	Z	Size	Spa	Size	Spa	Reinf (Lb/Ft)	Conc (CY/Ft)	Reinf (Lb/Ft)	Conc (CY/Ft)
2'-6"	2'-10"	10"	1'-0"	7"	#4	1'-0"	#4	1'-0"	48.64	0.406	6.85	0.071
2'-9"	2'-10"	10"	1'-0"	7"	#4	1'-0"	#4	1'-0"	49.31	0.424	6.85	0.071
3'-0"	2'-10"	10"	1'-0"	7"	#4	1'-0"	#4	1'-0"	49.98	0.444	6.85	0.071
3'-3"	2'-10"	10"	1'-0"	7"	#4	1'-0"	#4	1'-0"	53.32	0.462	6.85	0.071
3'-6"	2'-10"	10"	1'-0"	7"	#4	1'-0"	#4	1'-0"	53.98	0.480	6.85	0.071
4'-0"	3'-2"	1'-2"	1'-0"	7"	#4	1'-0"	#4	1'-0"	55.77	0.532	6.85	0.071
4'-6"	3'-2"	1'-2"	1'-0"	7"	#4	1'-0"	#4	1'-0"	59.77	0.568	6.85	0.071
5'-0"	3'-9"	1'-7"	1'-2"	7"	#4	1'-0"	#4	1'-0"	63.45	0.632	6.96	0.075
5'-6"	3'-9"	1'-7"	1'-2"	7"	#4	1'-0"	#4	1'-0"	67.46	0.668	6.96	0.075
6'-0"	4'-4"	2'-0"	1'-4"	7"	#5	1'-0"	#5	1'-0"	80.67	0.730	7.07	0.078
6'-6"	4'-4"	2'-0"	1'-4"	7"	#5	1'-0"	#5	1'-0"	85.05	0.768	7.07	0.078
7'-0"	5'-0"	2'-3"	1'-9"	8"	#5	1'-0"	#5	1'-0"	92.15	0.864	8.07	0.093
7'-6"	5'-0"	2'-3"	1'-9"	8"	#5	1'-0"	#5	1'-0"	96.54	0.902	8.07	0.093
8'-0"	5'-6"	2'-8"	1'-10"	8"	#5	6"	#5	6"	139.04	0.962	8.13	0.095
8'-6"	5'-6"	2'-8"	1'-10"	8"	#5	6"	#5	6"	144.47	1.000	8.13	0.095
9'-6"	6'-0"	2'-10"	2'-2"	9"	#5	6"	#5	6"	156.93	1.136	8.41	0.110
10'-6"	6'-5"	3'-0"	2'-5"	9"	#6	6"	#5	6"	196.27	1.234	8.57	0.117
11'-6"	7'-2"	3'-6"	2'-8"	11"	#6	6"	#6	6"	230.13	1.438	9.52	0.140
12'-6"	7'-8"	3'-9"	2'-11"	1'-0"	#7	6"	#6	6"	283.41	1.592	9.74	0.157
13'-6"	8'-2"	4'-0"	3'-2"	1'-2"	#8	6"	#6	6"	348.72	1.804	10.02	0.186
14'-6"	8'-10"	4'-5"	3'-5"	1'-4"	#9	6"	#6	6"	432.94	2.046	10.30	0.218
15'-6"	9'-6"	4'-10"	3'-8"	1'-6"	#9	6"	#7	6"	489.52	2.302	11.24	0.253
16'-0"	9'-11"	5'-0"	3'-11"	1'-7"	#9	6"	#7	6"	505.72	2.448	11.47	0.279

TABLE OF WINGWALL REINFORCING
(2~wings)

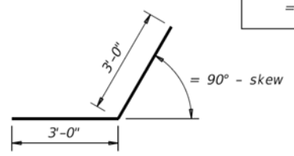
Bar	Size	No.	Spa
D1	#6	~	1'-0"
D2	#6	~	1'-0"
E1	#4	~	1'-0"
F	#4	~	1'-0"
G	#6	~	8"
M1	#4	4	~
P	#4	~	1'-0"
V	#4	~	1'-0"

TABLE OF TOEWALL REINFORCING

Bar	Size	No.	Spa
J3	#4	~	1'-0"
M2	#4	2	~
E2	#4	~	1'-0"



BARS D1



BARS D2

WING DIMENSION FORMULAS:

(All values are in feet.)

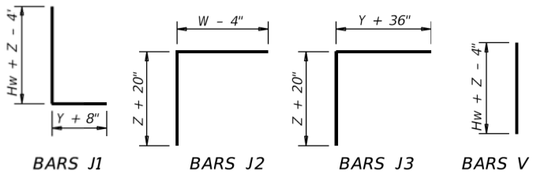
Hw = H + T + C
Lw = (Hw) (SL) ÷ cosine (θ) for Type PW-1
= (Hw - 1') (SL) ÷ cosine (θ) for Type PW-2 and Hw ≥ 4'
= (Hw - 0.5') (SL) ÷ cosine (θ) for Type PW-2 and Hw < 4'

For cast-in-place culverts:
Ltw = [(N) (S) + (N + 1) (U)] ÷ cosine (θ)

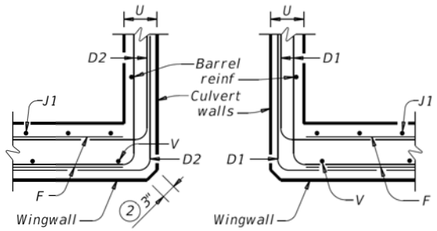
For precast culverts:
Ltw = [(N) (2 U + S) + (N - 1) (0.5')] ÷ cosine (θ)
Total Wingwall Area (two wings ~ SF)
= (2)(Hw)(Lw) for Type PW-1
= (2)(Hw)(Lw) - 6 SF for Type PW-2 and Hw ≥ 4'
= (2)(Hw)(Lw) - 1.5 SF for Type PW-2 and Hw < 4'

Hw = Height of wingwall
Lw = Length of wingwall
Ltw = Culvert toewall length
N = Number of culvert spans
SL:1 = Channel slope ratio. (horizontal: 1 vertical, usual value is 2:1)
θ = Culvert skew

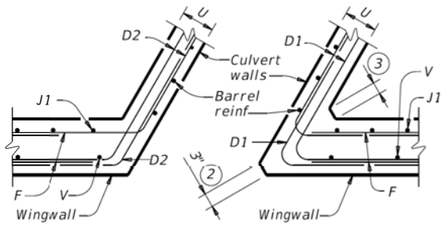
See applicable box culvert standard sheet for S, H, T, and U values.



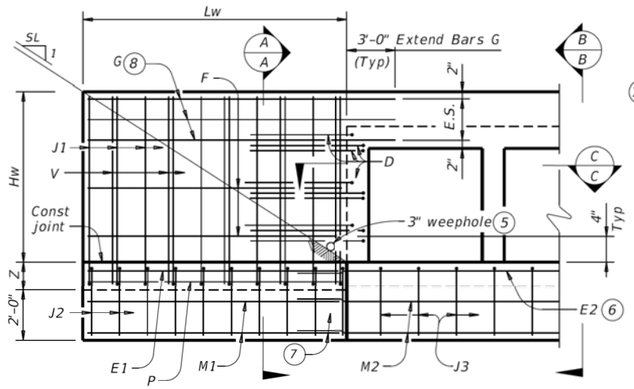
BARS J1 BARS J2 BARS J3 BARS V



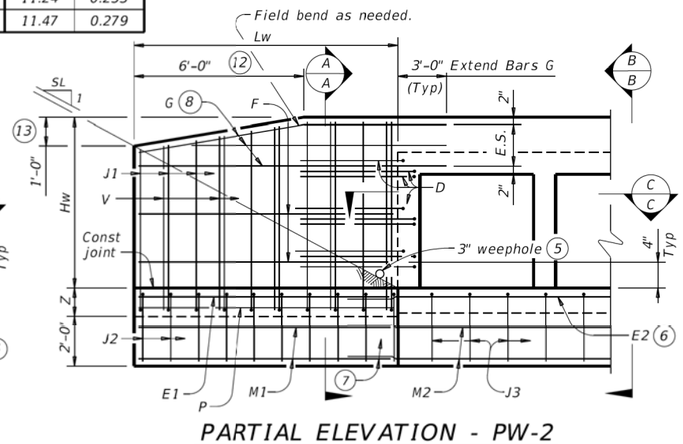
SECTION C-C - PW-1



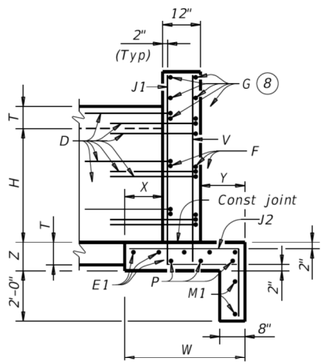
SECTION C-C - PW-2



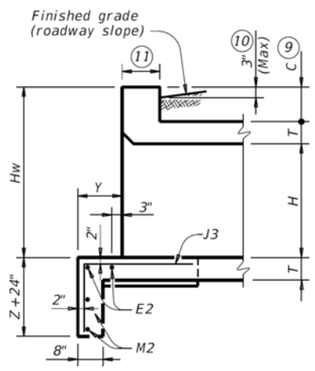
PARTIAL ELEVATION - PW-1



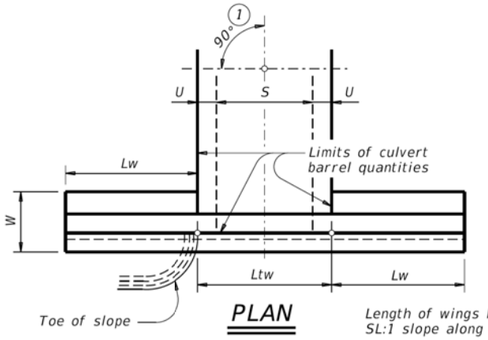
PARTIAL ELEVATION - PW-2



SECTION A-A
(Showing wing reinforcement.)

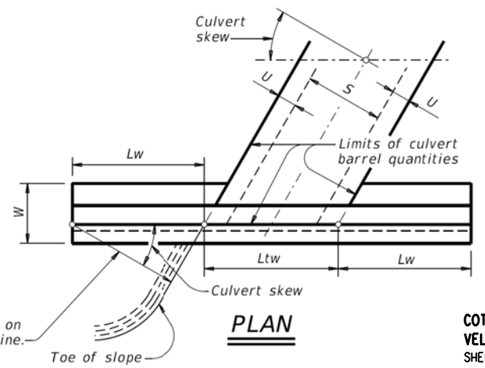


SECTION B-B
(Showing wing reinforcement.)



PLAN

DETAILS FOR NON-SKEWED BOX CULVERTS



PLAN

DETAILS FOR SKEWED BOX CULVERTS
(Showing 30° skew.)

1. Skew = 0°
2. At discharge end, chamfer may be ¾" minimum.
3. For 15° skew ~ 1"
   For 30° skew ~ 2"
   For 45° skew ~ 3"
4. Quantities shown are for two Type PW-1 wings. Adjust concrete volume for Type PW-2 wings. To determine estimated quantities for two wings, multiply the tabulated values by Lw. Quantities shown do not include weight of Bars D.
5. Provide weepholes for Hw = 5'-0" and greater. Fill around weepholes with coarse gravel.
6. Extend Bars E2 1'-6" minimum into the wingwall footing.
7. Lap Bars M1 1'-6" minimum with Bars M2.
8. Place Bars G as shown, equally spaced at 8" maximum. Provide at least two pairs of Bars G per wing.
9. 0" Min to 5'-0" Max. Estimated curb heights are shown elsewhere in the plans. For structures with pedestrian rail or curbs taller than 1'-0, refer to the Extended Curb Details (ECD) standard sheet. For structures with T631 or T631LS bridge rail, refer to the Mounting Details for T631 & T631LS Rails (T631-CM) standard sheet. Refer to the Box Culvert Rail Mounting Details (RAC) standard sheet for structures with bridge rail other than T631 or T631LS.
10. For vehicle safety, the following requirements must be met:
    - For structures without bridge rail, construct curbs no more than 3" above finished grade.
    - For structures with bridge rail, construct curbs flush with finished grade.

    Reduce curb heights, if necessary, to meet the above requirements. No changes will be made in quantities and no additional compensation will be allowed for this work.
11. 1'-0" typical. 2'-3" when the Box Culvert Rail Mounting Details (RAC) standard sheet is referred to elswhere in the plans.
12. 3'-0" for Hw < 4'.
13. 6" for Hw < 4'.

DESIGNER NOTES:

Type PW-1 can be used for all applications and must be used if railing is to be mounted to the wingwall.
Type PW-2 can only be used for applications without a railing mounted to the wingwall.

MATERIAL NOTES:

Provide Class C concrete (f'c=3,600 psi).
Provide Grade 60 reinforcing steel.
Provide galvanized reinforing steel if required elsewhere in the plans.

GENERAL NOTES:

Designed in accordance with AASHTO LRFD Bridge Design Specifications.
Depth of toewalls for wingwalls and culverts may be reduced or eliminated when founded on solid rock, when directed by the Engineer.
See Box Culvert Supplement (BCS) standard sheet for wingwall type and additional dimensions and information.
Quantities for concrete and reinforcing steel resulting from the formulas given on this sheet are for the Contractor's information only.

Cover dimensions are clear dimensions, unless noted otherwise.
Reinforcing dimensions are out-to-out of bars.

Texas Department of Transportation

Bridge Division Standard

CONCRETE WINGWALLS
WITH PARALLEL WINGS FOR BOX CULVERTS
TYPES PW-1 AND PW-2

PW

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
SHEET NO. 286 OF 345
DWG NO. CC6-2726
CONTRACT NO. C-2033270-01

FILE: pwstde01-20.dgn	DN: GAF	CK: CAT	DW: TxDOT	CK: TxDOT
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	DIST	COUNTY		SHEET NO.

SINGLE CELL BOX CULVERTS

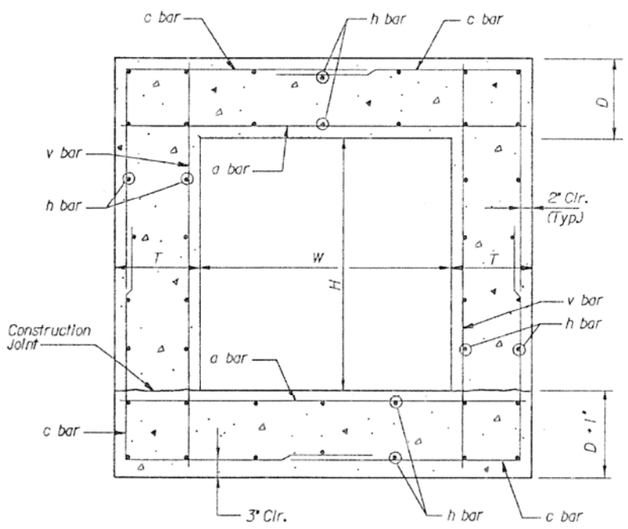
BOX SIZE (WxH)	T	D	a bar			c bar					* h bar			v bar			QUANTITIES	
			BAR SIZE	SPA.	LENG.	BAR SIZE	SPA.	LENG.	DIM. "X" (Horiz.)	DIM. "Y" (Vert.)	BAR SIZE	SPA. (MIN.)	NO. OF BARS IN X-SECTION	BAR SIZE	SPA.	LENG.	Conc.	Reinf. Steel
Ft.xFt.	In.	In.		In.	Ft-In		In.	Ft-In	Ft-In	Ft-In		In.			In.	Ft-In	Cu.Yd./Ft.	Lb./Ft.
5x5	13	13	5	5	6-10	5	5	8-6	4-3	4-3	5	8	66	5	5	6-10	1.00	222
6x6	15	15	5	5	8-2	5	5	9-10	4-11	4-11	5	7	92	5	5	8-2	1.37	276
8x8	19	19	6	5	10-10	6	5	12-6	6-3	6-3	5	6	152	6	5	10-10	2.28	495
10x10	23	23	6	5	13-6	7	5	15-6	7-9	7-9	5	5	228	6	5	13-6	3.43	737
5x4	13	13	5	5	6-10	4	5	8-0	4-3	3-9	5	8	62	4	5	5-10	0.92	169
7x5	18	18	5	5	9-8	5	5	10-4	5-8	4-8	5	6	114	5	5	7-8	1.70	309
8x6	19	19	6	5	10-10	5	5	11-6	6-3	5-3	5	6	136	5	5	8-10	2.05	379
10x8	23	23	6	5	13-6	6	5	14-2	7-7	6-7	5	5	210	6	5	11-6	3.14	602

* h bar lengths are determined by the length of the culvert plus splices.

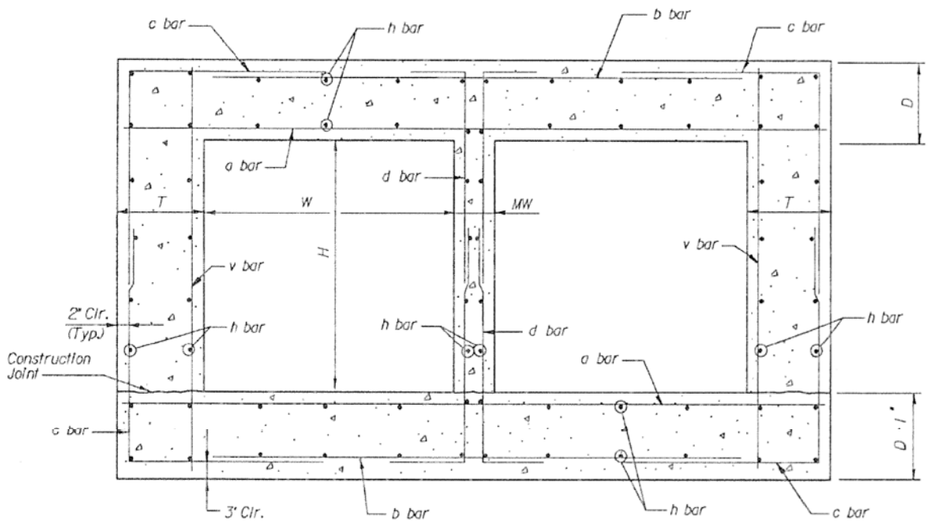
DOUBLE CELL BOX CULVERTS

BOX SIZE (WxH)	T	D	MW	a bar			b bar			c bar					d bar					* h bar			v bar			QUANTITIES	
				BAR SIZE	SPA.	LENG.	BAR SIZE	SPA.	LENG.	BAR SIZE	SPA.	LENG.	DIM. "X" (Horiz.)	DIM. "Y" (Vert.)	BAR SIZE	SPA.	LENG.	DIM. "X" (Horiz.)	DIM. "Y" (Vert.)	BAR SIZE	SPA. (MIN.)	NO. OF BARS IN X-SECTION	BAR SIZE	SPA.	LENG.	Conc.	Reinf. Steel
Ft.xFt.	In.	In.	In.		In.	Ft-In		In.	Ft-In		In.	Ft-In	Ft-In	Ft-In		In.	Ft-In	Ft-In	Ft-In		In.			In.	Ft-In	Cu.Yd./Ft.	Lb./Ft.
5x5	14	14	10	5	5	12-10	5	5	7-8	5	5	8-6	4-3	4-3	4	5	5-3	1-0	4-3	5	7	118	4	5	7-0	1.76	367
6x6	16	16	10	5	5	15-2	5	5	8-8	5	5	9-10	4-11	4-11	4	5	5-11	1-0	4-11	5	6	158	6	5	8-4	2.36	481
8x8	20	20	10	5	5	19-10	6	5	10-8	6	5	12-6	6-3	6-3	4	5	7-3	1-0	6-3	5	5	252	8	5	11-0	3.79	807
10x10	24	24	11	6	5	24-7	7	5	13-1	6	5	15-6	7-9	7-9	4	5	8-7	1-0	7-7	5	4	372	9	5	13-8	5.59	1195
5x4	14	14	10	5	5	12-10	5	5	7-8	5	5	8-0	4-3	3-9	4	5	4-9	1-0	3-9	5	7	110	5	5	6-0	1.65	358
7x5	19	19	10	5	5	17-8	6	5	9-8	6	5	10-4	5-8	4-8	4	5	5-8	1-0	4-8	5	5	194	8	5	7-10	2.91	646
8x6	20	20	10	5	5	19-10	6	5	10-8	6	5	11-6	6-3	5-3	4	5	6-3	1-0	5-3	5	5	232	8	5	9-0	3.48	740
10x8	24	24	10	5	5	24-6	6	5	12-8	6	5	14-2	7-7	6-7	4	5	7-7	1-0	6-7	5	4	346	10	5	11-8	5.19	1068

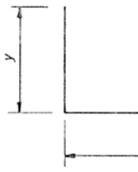
* h bar lengths are determined by the length of the culvert plus splices.



SECTION THRU SINGLE BARREL



SECTION THRU DOUBLE BARREL



BAR C

GENERAL NOTES:

Design and workmanship per current AREA Specifications Chapter 8.
Fill Heights - 18'-0" Minimum to 30'-0" Maximum measured from top of tie to top of box. Box Design Control Depth is 30'-0".

Reinforcing Steel Shall Conform To Requirements Of ASTM A-615, Grade 60.

Minimum 28 Day Compressive Strength Of Concrete Shall Be 4000 psi.

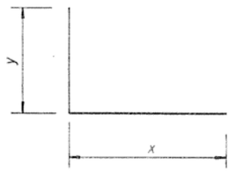
Minimum Cover For Concrete Shall Be 2 Inches, Except For Transverse Bars In Bottom Of Bottom Slab Requiring 3 Inches Of Cover.

All Exposed Edges Shall Be Chamfered 3/4 Inch.

Bar Lap Splices Of Longitudinal h Bars Shall Be 2'-0".

New and replacement culvert lengths are to be based on standard branch or main line roadbed sections.

Precast reinforced concrete box sections shall include a minimum of three positive mechanical couplers at locations where pipe sections are joined together to prevent them from future separation.



BAR D

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
SHEET NO. 287 OF 345
DWG NO. CC6-2728
CONTRACT NO. C-2033270-01

UNION PACIFIC RAILROAD CO.
OFFICE OF CHIEF ENGINEER

ENGINEERING STANDARDS

REINFORCED CONC. BOX CULVERT STANDARDS SECTIONS AND DETAILS COVER 18'-0" TO 30'-0"

ADOPTED: DECEMBER 1, 1987
REVISED: JANUARY 26, 1990
FILE NO. SINGBOX1

PAGE NO.
4216-A

Culvert Station and/or Creek Name followed by applicable end (Lt, Rt or Both)	Description of Box Culvert No. Spans ~ Span X Height	Max Fill Height (Ft)	Applicable Box Culvert Standard (4)	Applicable Wingwall or End Treatment Standard	Skew Angle (0°,15°, 30° or 45°)	Side Slope or Channel Slope Ratio (SL:1)	T Culvert Top Slab Thickness (In)	U Culvert Wall Thickness (In)	C Estimated Curb Height (Ft)	Hw (1) Height of Wingwall (Ft)	A Curb to End of Wingwall (Ft)	B 0 set of End of Wingwall (Ft)	Lw Length of Longest Wingwall (Ft)	Ltw Culvert Toewall Length (Ft)	Atw Anchor Toewall Length (Ft)	Riprap Apron (CY)	Class "C" Conc (Curb) (2) (CY)	Class "C" Conc (Wingwall) (3) (CY)	Total Wingwall Area (SF)
CULVERT AT STA 2241+55 (Lt)	1 - 6'x 6'	16'	UPR RCB	PW-2	30°	4:1	15"	15"	0.500'	7.750'	N/A	N/A	31.177'	9.815'	N/A	0.0	0.2	30.7	477

NOTES:
Skew = 0° on SW-0, FW-0, SETB-CD, SETB-SW-0, and SETB-FW-0 standard sheets;
30° maximum for safety end treatment

SL:1 = Horizontal : 1 Vertical
- Side slope at culvert for ared or straight wingwalls.
- Channel slope for parallel wingwalls.
- Slope must be 3:1 or atter for safety end treatments.

T = Box culvert top slab thickness. Dimension can be found on the applicable box culvert standard sheet.

U = Box culvert wall thickness. Dimension can be found on the applicable box culvert standard sheet.

C = Curb height

See applicable wing or end treatment standard sheets for calculations of Hw, A, B, Lw, Ltw, Atw, and Total Wingwall Area.

Hw = Height of wingwall

A = Distance from face of curb to end of wingwall (not applicable to parallel or straight wingwalls)

B = 0 set of end of wingwall (not applicable to parallel or straight wingwalls)

Lw = Length of longest wingwall.

Ltw = Length of culvert toewall (not applicable when using riprap apron)

Atw = Length of anchor toewall (applicable to safety end treatment only)
Total Wingwall Area = Wingwall area in sq. ft. for two wingwalls (one structure end) if Lt or Rt.
Area for four wingwalls (two structure ends) if Both.

(1) Round the wall heights shown to the nearest foot for bidding purposes.

(2) Concrete volume shown is for box culvert curb only. For curbs using the Box Culvert Rail Mounting Details (RAC) standard sheet quantities shown must be increased by a factor of 2.25. If Class S concrete is required for the top slab of the culvert, also provide Class S concrete for the curb. Curb concrete is considered part of the Box Culvert for payment.

(3) Concrete volume shown is total of wings, footings, culvert toewall (if any), anchor toewalls (if any) and wingwall toewalls. Riprap aprons, culverts, and curb quantities are not included.

(4) Regardless of the type of culvert shown on this sheet, the Contractor has the option of furnishing cast-in-place or precast culverts unless otherwise shown elsewhere on the plans. If the Contractor elects to provide culverts of a di erent type than those shown on this sheet, it is the Contractor's responsibility to make the necessary adjustments to the dimensions and quantities shown.

SPECIAL NOTE:

This sheet is a supplement to the box culvert standards. It is to be lled out by the culvert speci er and provides dimensions for the construction of the box culvert wingwalls and safety end treatments.

An Excel 2010 spreadsheet to assist in completing this table can be downloaded from the Bridge Standards (English) web page on the TxDOT web site. The completed sheet must be signed, sealed, and dated by a licensed Professional Engineer.

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
SHEET NO. 288 OF 345
DWG NO. CC6-2729
CONTRACT NO. C-2033270-01

Texas Department of Transportation

Bridge Division Standard

BOX CULVERT SUPPLEMENT
WINGS AND END TREATMENTS

BCS

FILE: bcsstde1-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS				
	DIST	COUNTY		SHEET NO.

DISCLAIMER:
The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

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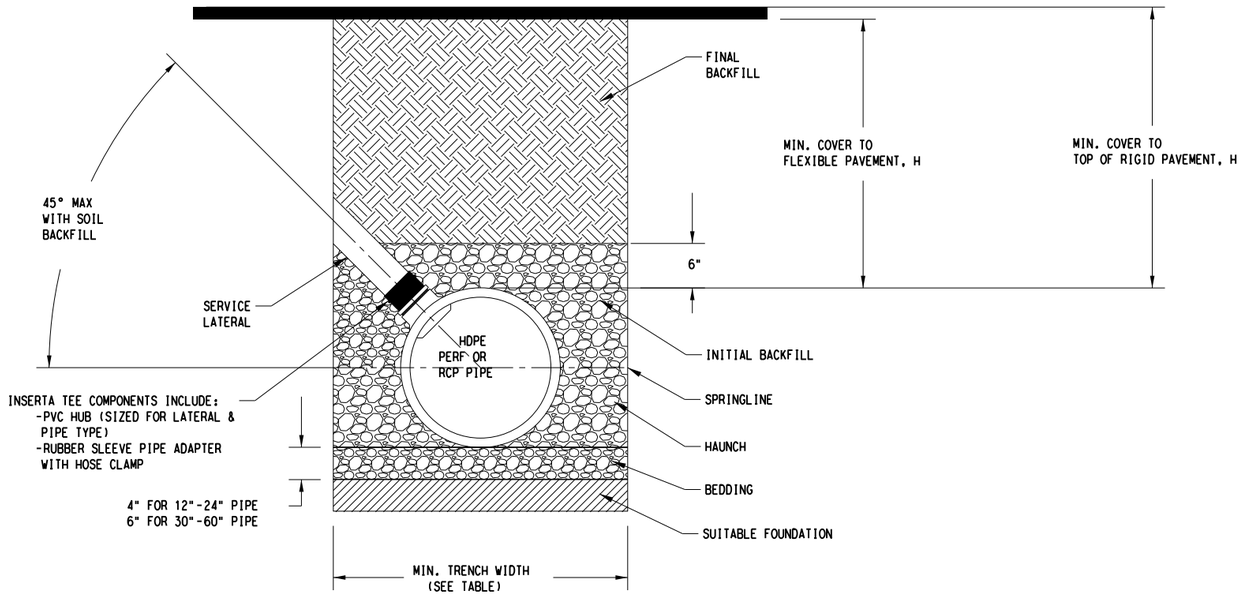

TABLE OF STANDARD EXCAVATION	
PIPE DIA	MIN TRENCH WIDTH
4"	21"
6"	23"
8"	26"
10"	28"
12"	30"
15"	34"
18"	39"
24"	48"
30"	56"
36"	64"
42"	72"
48"	80"
54"	88"
54"	96"

NOTES:

1. CONTRACTOR HAS THE OPTION TO USE THE INSERTA TEE CONNECTION OR AN APPROVED EQUAL FLEXIBLE CONNECTOR.
2. ALL PIPE SYSTEMS SHALL BE INSTALLED IN ACCORDANCE WITH ASTM D2321, "STANDARD PRACTICE FOR UNDERGROUND INSTALLATION OF THERMOPLASTIC PIPE FOR SEWERS AND OTHER GRAVITY FLOW APPLICATIONS", LATEST ADDITION
3. MEASURES SHOULD BE TAKEN TO PREVENT MIGRATION OF NATIVE FINES INTO BACKFILL MATERIAL, WHEN REQUIRED.
4. THE INSERTA TEE CONNECTION SHOULD NOT BE PLACED AT AN ANGLE EXCEEDING 45° FROM THE SPRINGLINE. GREATER ANGLES ARE SUBJECT TO DESIGN ENGINEER APPROVAL AND MAY REQUIRE PREMIUM BACKFILL.
5. FOUNDATION: WHERE THE TRENCH BOTTOM IS UNSTABLE, THE CONTRACTOR SHALL EXCAVATE TO A DEPTH REQUIRED BY THE ENGINEER AND REPLACE WITH SUITABLE MATERIAL AS SPECIFIED BY THE ENGINEER. AS AN ALTERNATIVE AND AT THE DISCRETION OF THE DESIGN ENGINEER, THE TRENCH BOTTOM MAY BE STABILIZED USING A GEOTEXTILE MATERIAL.
6. BEDDING: SUITABLE MATERIAL SHALL BE CLASS I, II OR III. THE CONTRACTOR SHALL PROVIDE DOCUMENTATION FOR MATERIAL SPECIFICATION TO ENGINEER. UNLESS OTHERWISE NOTED BY THE ENGINEER, MINIMUM BEDDING THICKNESS SHALL BE 4" FOR 4"-24"; 6" FOR 30"-60".
7. INITIAL BACKFILL: SUITABLE MATERIAL SHALL BE CLASS I, II OR III IN THE PIPE ZONE EXTENDING NOT LESS THAN 6" ABOVE CROWN OF PIPE. THE CONTRACTOR SHALL PROVIDE DOCUMENTATION FOR MATERIAL SPECIFICATION TO ENGINEER. MATERIAL SHALL BE INSTALLED AS REQUIRED IN ASTM D2321, LATEST EDITION.
8. MINIMUM COVER: MINIMUM COVER, H, IN NON-TRAFFIC APPLICATIONS (GRASS OR LANDSCAPE AREAS) IS 12" FROM THE TOP OF PIPE TO GROUND SURFACE. ADDITIONAL COVER MAY BE REQUIRED TO PREVENT FLOTATION. FOR TRAFFIC APPLICATIONS, MINIMUM COVER, H, IS 12" UP TO 48" DIAMETER PIPE AND 24" OF COVER FOR 54"-60" DIAMETER PIPE, MEASURED FROM TOP OF PIPE TO BOTTOM OF FLEXIBLE PAVEMENT OR TO TOP OF RIGID PAVEMENT.

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DESIGNED	J. RODRIGUEZ
CHECKED	A. DORANTES
IN CHARGE	A. DORANTES
DATE	07 AUG 23

CAES

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

INSERTA TEE
DRAINAGE DETAILS

CONTRACT	DWG No.	REV
C-2033270-01	CC6-2725	D

CB05-CC6-2725.010

DWG No. OC1-2051

STORM WATER POLLUTION PREVENTION PLAN

COTTON BELT REGIONAL RAIL DESIGN BUILD VELOWEB HIKE AND BIKE TRAIL CITY OF CARROLLTON FLOODPLAIN LOCATIONS

I. SITE DESCRIPTION

PROJECT DESCRIPTION: Proposed 26-mile Cotton Belt Corridor that extends between DFW Airport in Tarrant County through Dallas County and Shiloh Road in Plano in Collin County. The alignment traverses seven cities: Grapevine, Coppell, Dallas, Carrollton, Addison, Richardson, and Plano.

PROJECT LIMITS: DFW Airport in Tarrant County to east of Shiloh Road in Plano in Collin County.

CITY OF CARROLLTON LIMITS: (East of President George Bush Turnpike to Marsh Lane).

LATITUDE: 32°57'06" LONGITUDE: 96°56'20"

The Standard industrial classification for this project is: 1629.

NATURE OF THE CONSTRUCTION ACTIVITY:
FOR SUB SEGEMENT: Construction of approximately 7.21 miles of 12-foot-wide concrete Hike & Bike Trail and associated structures, storm drainage systems and existing street modifications.

POTENTIAL POLLUTANTS AND SOURCES: Potential pollutants include slurries from concrete cutting and coring, sediments associated with earthwork, hydrocarbons (grease, oil, gasoline, etc.) from fuels, lubricants associated with construction equipment, waste concrete and other solid waste (including floatable) from daily contractor operations, paint, concrete curing compounds, and other common pollutants associated with construction activities of this scope and nature.

NOTE: Contractor will attach its construction schedule if its activities differ in order or scope from those provided above.

PHASE 1 – 24P @ TOTAL PROJECT AREA:

Overall site: (East of President George Bush Turnpike to Marsh Lane) – 28.02 ACRES

SOILS LIKELY TO BE ENCOUNTERED DURING CONSTRUCTION: ERODIBILITY ("K") FACTORS

Clay	0.32
Fine Sandy Loam	0.32

RUNOFF COEFFICIENT: Before Construction ~ 0.5 After Construction ~ 0.9

NAME OF RECEIVING WATERS: Elm Fork Trinity River, Hutton Branch

NAME OF ADJACENT WETLANDS: Elm Fork Trinity River, Hutton Branch

II. EROSION AND SEDIMENT CONTROLS

The erosion and sediment controls presented in the baseline SW3P have been designed to retain sediment on-site to the greatest extent practicable based on the anticipated type and sequence of construction activities, topography, soil type, and rainfall.

The Contractor is responsible for ensuring that controls are installed as depicted. A log indicating the date of BMP installation shall be included in the SW3P. If controls fail to perform as originally intended, it is the responsibility of the Contractor to develop, propose, and install alternate controls that will better limit the off-site transport of sediment. The Contractor is also responsible for ensuring that litter, construction debris, and construction materials are not transferred from the site.

Should any dewatering of site utility trenches become necessary during the duration of the project, it shall be the responsibility of the contractor to provide filtering devices for the prevention of downstream siltation in accordance with all North Central Texas Council of Governments (NCTCOG), TCEQ, EPA, and other applicable requirements.

The following temporary soil stabilization practices will be used on the project site. The Contractor may propose additional measures to improve stabilization:

- _X_ Seeding;
- _X_ Mulching;
- _X_ Sodding;
- _X_ Tree protection;
- _X_ Vegetative Buffer Strips;
- _X_ Erosion Control Matting;
- _X_ Wattles;
- _X_ Silt Fencing;
- _X_ Pavement sweeping;

Disturbed areas of the site where construction activities have either temporarily or permanently ceased will be stabilized within 14 days unless activities are scheduled to resume within 21 days. One of the "temporary soil stabilization practices" indicated above must be used.

The following permanent soil stabilization practices will be used on the project site. The Contractor may propose additional measures to improve stabilization:

- _X_ Seeding;
- _X_ Mulching of Hydromulching;
- _X_ Sodding;
- _X_ Placement of Riprap;
- ___ Use of Gabions;
- _X_ Installation of Geotextile fabrics;
- _X_ Grass/native vegetation;
- ___ Asphalt/concrete parking lots, driveways, walkways, slab foundation, entrances, etc.;
- _X_ Concrete curbing;

The contractor must indicate the location and date of installation of any seeding, mulching, sodding, or erosion control matting on the site map.

The following structural best management practices (BMPs) will be used on the project site. The Contractor may propose additional measures to be used on site:

- _X_ Silt fence;
- _X_ Rock berms;
- _X_ Storm sewer inlet protection;
- _X_ Construction entrance stabilization;

NOTE: Sediment basins are not appropriate based on the size of this site.

III. SITE HOUSEKEEPING BEST MANAGEMENT PRACTICES

TEMPORARY STOCKPILES: The Contractor is responsible for all soil stockpiles. Stockpiles used for the temporary storage of topsoil, fill soils, or other material will be located in such a manner as to prevent erosion by storm water. In addition, silt fence or other filtration device will be placed downgradient to prevent storm water from transporting the material off-site. The contractor must include and update as needed the location of stockpiles, borrows, and fills material of both on-site and off-site material storage areas on the site map contained in the SW3P.

OFF-SITE VEHICLE TRACKING: Off-site tracking of construction site sediments or other substances will be minimized. Stabilized construction entrances and frequent sweeping of adjacent streets will be used to control and minimize off-site vehicle tracking of sediment and dust generation.

HAZARDOUS AND REGULATED MATERIALS: Any products or materials in the following categories will be considered as potentially hazardous or toxic: fuels, lubricants, solvents, paints, fertilizers, pesticides, herbicides, mortar mixes, concrete or cement mixes, asphaltic products, chemical additives for soil stabilization, concrete curing compounds and additives, and other unspecified chemicals. If any of these products, materials, or chemicals are maintained on-site, they will be stored in a manner that protects them from exposure to storm water and facilitates containment. Absorbent materials will be kept on-site for use in the event of a spill.

The contractor must maintain in the SW3P a list of hazardous and/or regulated material kept on-site. The location of all listed materials and spill clean-up supplies shall be shown on the site map.

SPILLS: The SW3P must contain a log of spills at the site as well as the contact information of appropriate personnel to be called in the event of a spill.

If a spill of hazardous and/or regulated products, materials, or chemicals does occur, the Contractor shall, after containment and cleanup of the spill, notify all proper regulatory authorities as required by the nature of the spill. The Contractor shall file in the SW3P a report that describes the nature, quantity, location, and cause of the spill, and the actions taken to prevent similar spills in the future. The Authority and DART's contracting officer shall be contacted immediately in the event of a spill.

STABILIZED CONSTRUCTION ENTRANCE: Construction traffic should enter and exit the site at a stabilized construction entrance.

CONSTRUCTION STORAGE: Construction staging areas, haul roads, jobsite office trailers location, and vehicle and/or equipment parking areas that have more than 25 vehicle trips per day will be graveled as well as monitored for vehicle tracking and fugitive dust generation.

ECS Revision Date: 05/22/2009

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IN CHARGE	J. TOONE
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COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
STORM WATER POLLUTION PREVENTION PLAN
SW3P NOTES AND NOI
SHEET 1 OF 2

CONTRACT	DWG No.	REV
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CONTROL OF DUST AND DEBRIS: Fugitive dust, including dust generated from soil stabilization operations or vehicle tracking, will be controlled by using water. Any excess or runoff water used to control dust will first be routed to a sediment trapping device before leaving the site. Concrete slurry resulting from concrete sawing shall be removed to reduce dust and contamination of runoff. Upon completion of construction activities, the site shall be stabilized to reduce dust.

CONTROL OF SEDIMENTS: Sediment that accumulates in sediment trapping devices, such as silt fence, inlet protection, and detention basins, shall be removed as necessary to prevent storm water from carrying it off-site.

EQUIPMENT MAINTENANCE AND REPAIR: Both on- and off-site equipment maintenance and repair areas must be described in the SW3P and depicted on the site map. On-site activities will be restricted to areas that either drain into a sump pit or other pollutant-trapping device, or are not exposed to storm water.

SOLID WASTE: The Contractor must develop controls to limit the off-site transport of litter, construction debris, and construction materials. All such materials shall be removed from the site at the completion of the project.

SANITARY WASTE: All sanitary waste will be collected on-site in portable units placed at locations convenient for construction site personnel. The location of portable units will be depicted on the site map. Portable units will be maintained and sanitary waste property disposed of by a licensed sanitary waste management contractor as required by local regulations.

IV. MAINTENANCE PROCEDURES

All erosion and sediment controls will be maintained in good working order. If repair, replacement, or cleaning of a structural practice or control is required, it will be addressed as soon as practicable before the next expected rainfall event, and no later than 7 days following the observation. The SW3P shall contain a log of all maintenance activities such as repair, replacement, cleaning of controls, and the execution of BMPs i.e., sweep of parking lots, etc.

Locations on the site adjacent to surface waterways, wetlands, or other environmentally sensitive areas, or off-site areas subject to vehicle tracking of sediments will receive the highest maintenance priority, followed by the protection of drainage ways and storm sewer inlets and outfalls.

Erosion and sediment controls that have been intentionally disabled, run-over, removed, or otherwise rendered ineffective must be replaced or corrected by the Contractor immediately upon discovery.

V. INSPECTION PROCEDURES

Refer to section 4.0, 7.6, and appendix 5 of the approved AWH NOI SW3P document for more info related to inspection procedures. The Contractor must conduct inspections at least once every seven (7) days. The inspection must occur on a specifically defined day, regardless of whether or not there has been a rainfall event since the previous inspection.

The Contractor's Environmental Compliance Manager must inspect all disturbed areas of the construction site that have not reached final stabilization. The inspection shall cover all areas where materials are stored and stockpiled, areas where vehicles enter or exit the site, and areas where temporary and permanent soil stabilization practices have been implemented, but have not yet reached final stabilization. All structural erosion and sediment control practices and Best Management Practices (BMP) shall be inspected to ensure that they have been installed correctly, are operating properly, and are sufficient in reducing sediments from traveling off-site.

Reference section 6.1 of the approved AWH NOI SW3P document for BMP maintenance requirements. The Contractor shall install all controls and conduct maintenance as is necessary to ensure compliance with the TPDES General Permit number TXR150000.

The Contractor, as the operator with day-to-day control of the site, shall be delegated the responsibility of making all modifications to the SW3P. Modifications will be based on the results of inspections and are intended to better prevent pollutants from being carried off-site by runoff. Revision of the SW3P must be completed within seven (7) calendar days following the inspection.

A report summarizing the scope of the inspection, names and qualifications of personnel making the inspection, the dates of the inspection, and major observations relating to the implementation of the SW3P will be made and retained as part of the SW3P. Major observations will include:

- The locations of discharges of sediment or other pollutants from the site;
- Locations of BMPs that need to be maintained;
- Locations of BMPs that failed to operate as designed or proved inadequate for a particular location; and
- The locations where additional BMPs are needed.

Action taken as a result of inspections must be described and retained as part of the SW3P. Reports must identify any incidents of non-compliance. Where a report does not identify any incidents of non-compliance, the report must contain a certification that the site is in compliance with the SW3P and the TCEQ TPDES General Permit TXR150000. The inspection report must be signed by the Contractors Environmental Compliance Manager, who has been delegated signatory authority as required in 30 TAC §305.128 (relating to signatories to reports).

VI. NON-STORM WATER DISCHARGES

The following indicated non-storm water discharges might occur on this project. Care will be exercised to prevent sediment or other pollutants from being released off-site as part of these discharges.

- Uncontaminated water used to control dust;
- Water for removing dirt from vehicles or equipment to reduce off-site tracking;
- Potable water sources including waterline flushings (not including hyperchlorinated water);
- Irrigation system drainage.

The following non-storm water discharges will not be released from the construction site. They will be discharged on-site into a sump pit, sediment trap, or otherwise into an area with protected storm sewer inlets.

- Standing water from the sight
- Discharge of uncontaminated ground or spring water
- Concrete truck mixer and delivery chute washout;
- Concrete slurry from pavement sawing, cutting, or grinding;

VII. THREATENED AND ENDANGERED SPECIES INFORMATION

The proposed construction project would have a minimal to negligible effect on any of the endangered and threatened species listed for Dallas, Tarrant, and Collin Counties. The construction project is on current DART owned property and will have minimal disturbed area with the major scope of work involving building renovation.

VIII. APPROVED NOI & TPDES STORMWATER CONSTRUCTION GENERAL PERMIT INFORMATION

The original approved NOI for the overall project is on file with DART and governs. The TPDES General permit for stormwater construction number and effective coverage date are listed as follows:

TPDES Stormwater Construction General Permit Number: TXR15753W; Coverage Effective Date: April 15, 2019.

IX. CERTIFICATION STATEMENT

In accordance with the signatory requirements of the TPDES General Permit number TXR150000, which authorizes storm water discharges from construction activities, the following certification statement is executed by the individual whose name, title, and signature is affixed below.

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or the persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations."

Deanna Leggett, CMQ/OE, AICP
Executive Vice President - Growth and Regional Development
Dallas Area Rapid Transit

Date

ECS Revision Date: 05/22/2009

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DESIGNED	F. CHARAKUPA
CHECKED	J. TOONE
IN CHARGE	J. TOONE
DATE	07 AUG 23

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COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
STORM WATER POLLUTION PREVENTION PLAN
SW3P NOTES AND NOI
SHEET 2 OF 2

CONTRACT	DWG No.	REV
C-2033270-01	OC1-2052	D

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DWG No. OC2-2069

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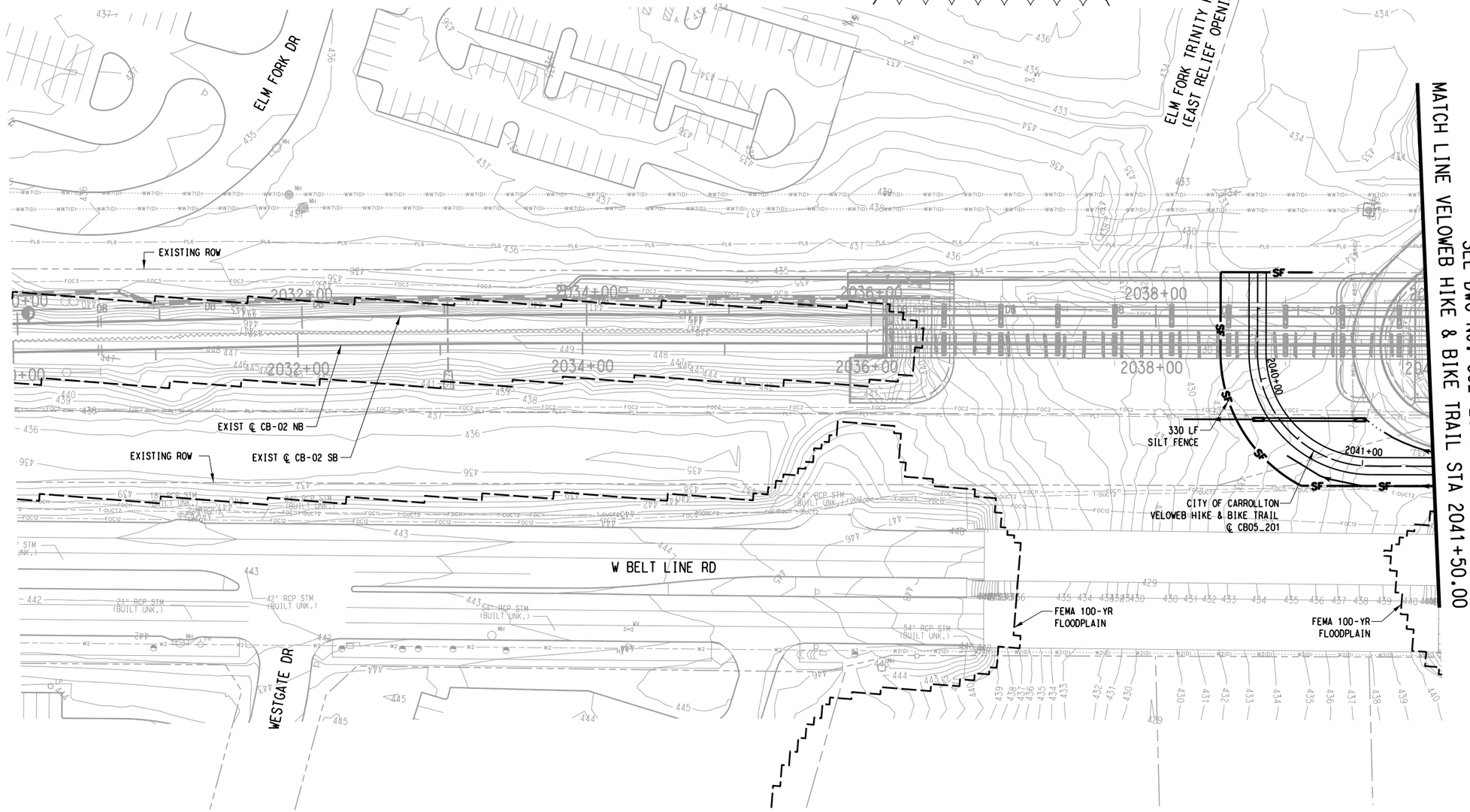

SCALE (IN FEET)
0 20 40 80

LEGEND

- SF — SILT FENCE
- R — ROCK BERM
- DITCH CHECK
- SILT FENCE OR GRAVEL(STANDARD) INLET PROTECTION
- STABILIZED CONSTRUCTION ENTRANCE

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CONTRACT SHEET No. 292 OF 345

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

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Firm Registration: F-10161

ARCHER WESTERN HERZOG

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DRAWN	C. ALTAMERO
DESIGNED	F. CHARAKUPA
CHECKED	J. TOONE
IN CHARGE	J. TOONE
DATE	07 AUG 23

CAES

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
CITY OF CARROLLTON
TEMPORARY EROSION CONTROL
STA 2039+24.51 TO STA 2041+50
SHEET 1 OF 15

CONTRACT	DWG No.	REV
C-2033270-01	OC2-2069	D

CB05-OC2-2069.040

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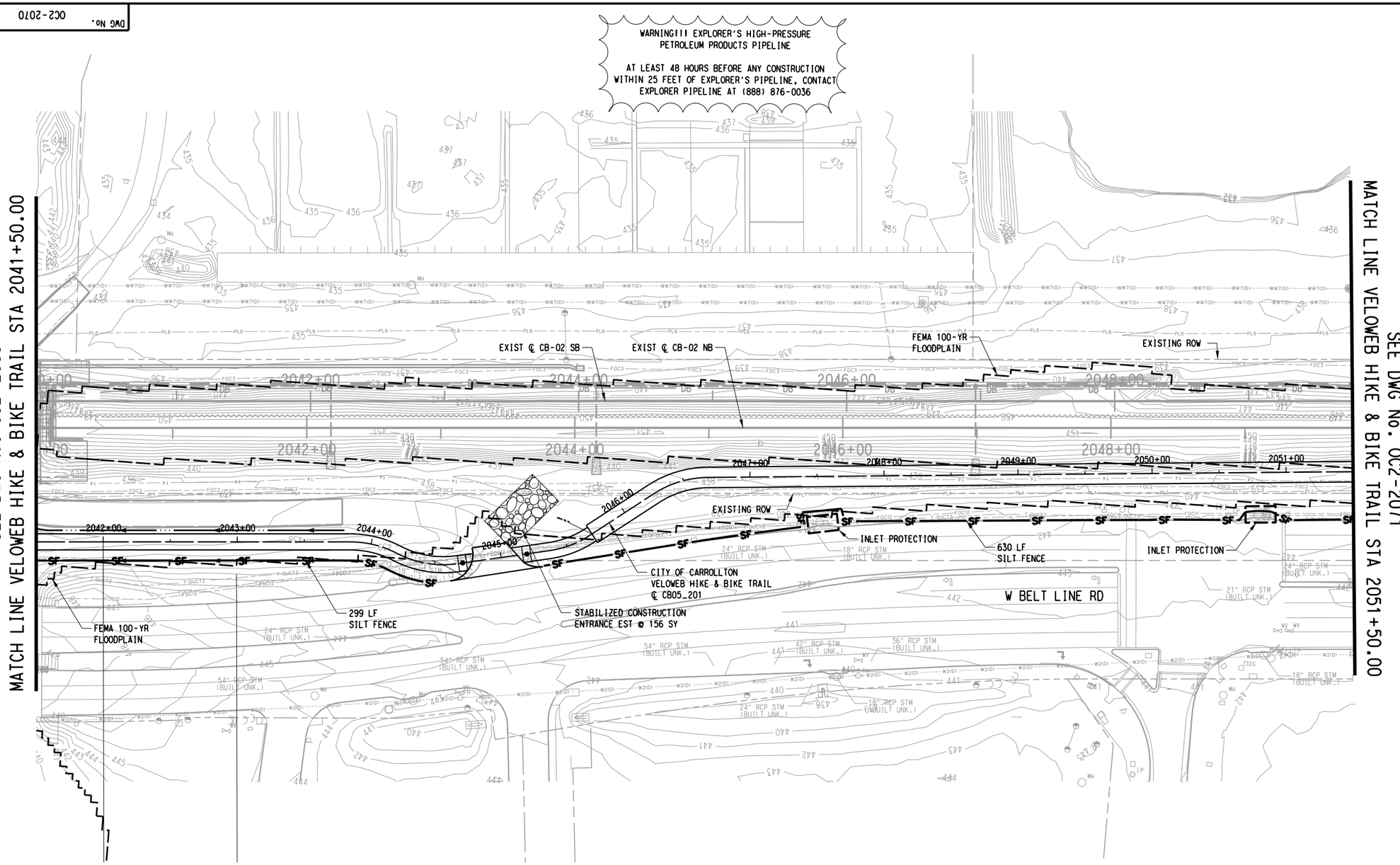
JEGSVCPWU01
Default

DWG No. OC2-2070



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VELOWEB HIKE & BIKE TRAIL
CITY OF CARROLLTON
TEMPORARY EROSION CONTROL
STA 2041+50 TO STA 2051+50
SHEET 2 OF 15

CONTRACT	DWG No.	REV
C-2033270-01	OC2-2070	D

CB05-OC2-2070.040

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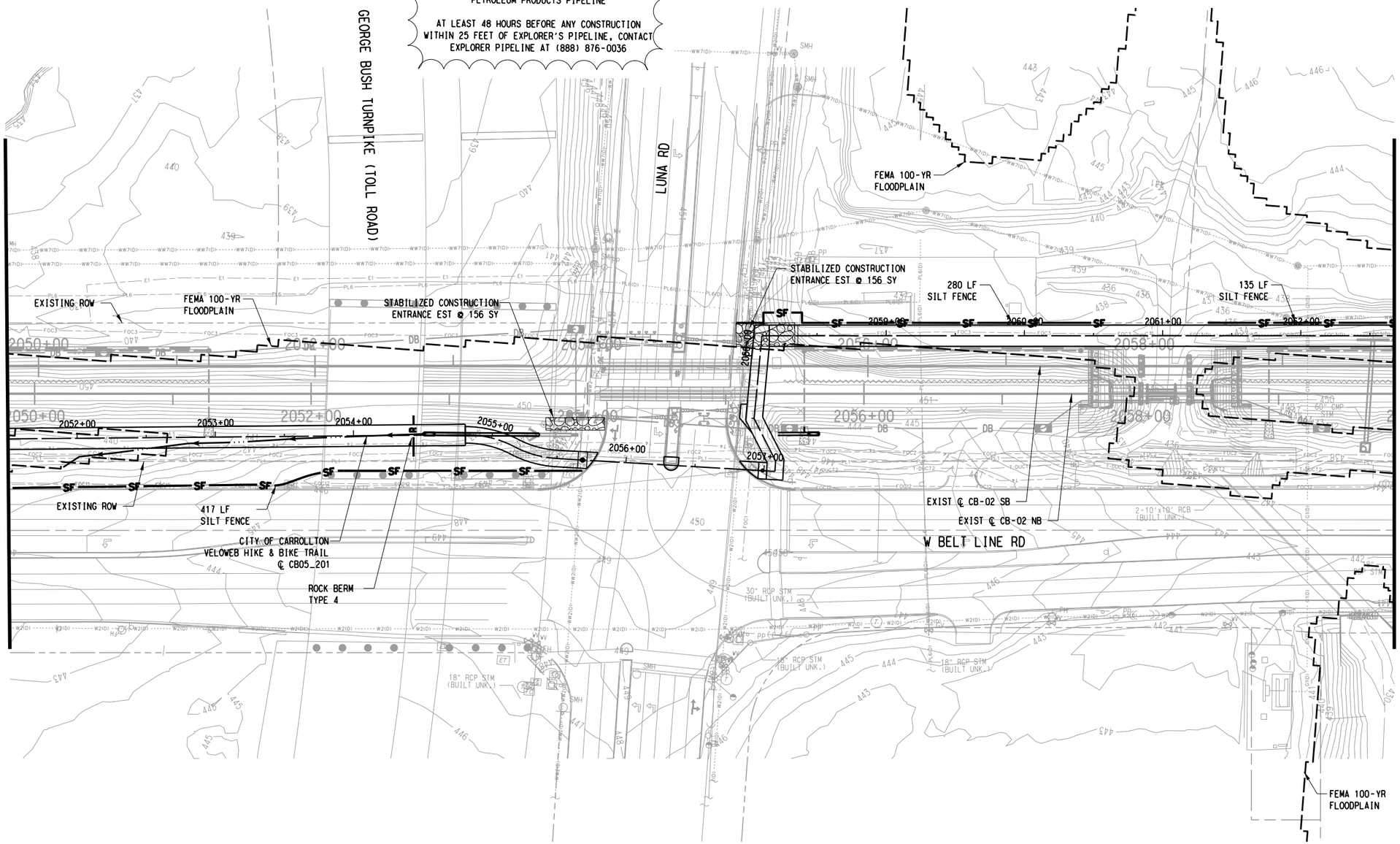
DWG No. OC2-2071



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COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
CITY OF CARROLLTON
TEMPORARY EROSION CONTROL
STA 2051+50 TO STA 2062+67.62
SHEET 3 OF 15

CONTRACT	DWG No.	REV
C-2033270-01	OC2-2071	D

CB05-OC2-2071.040

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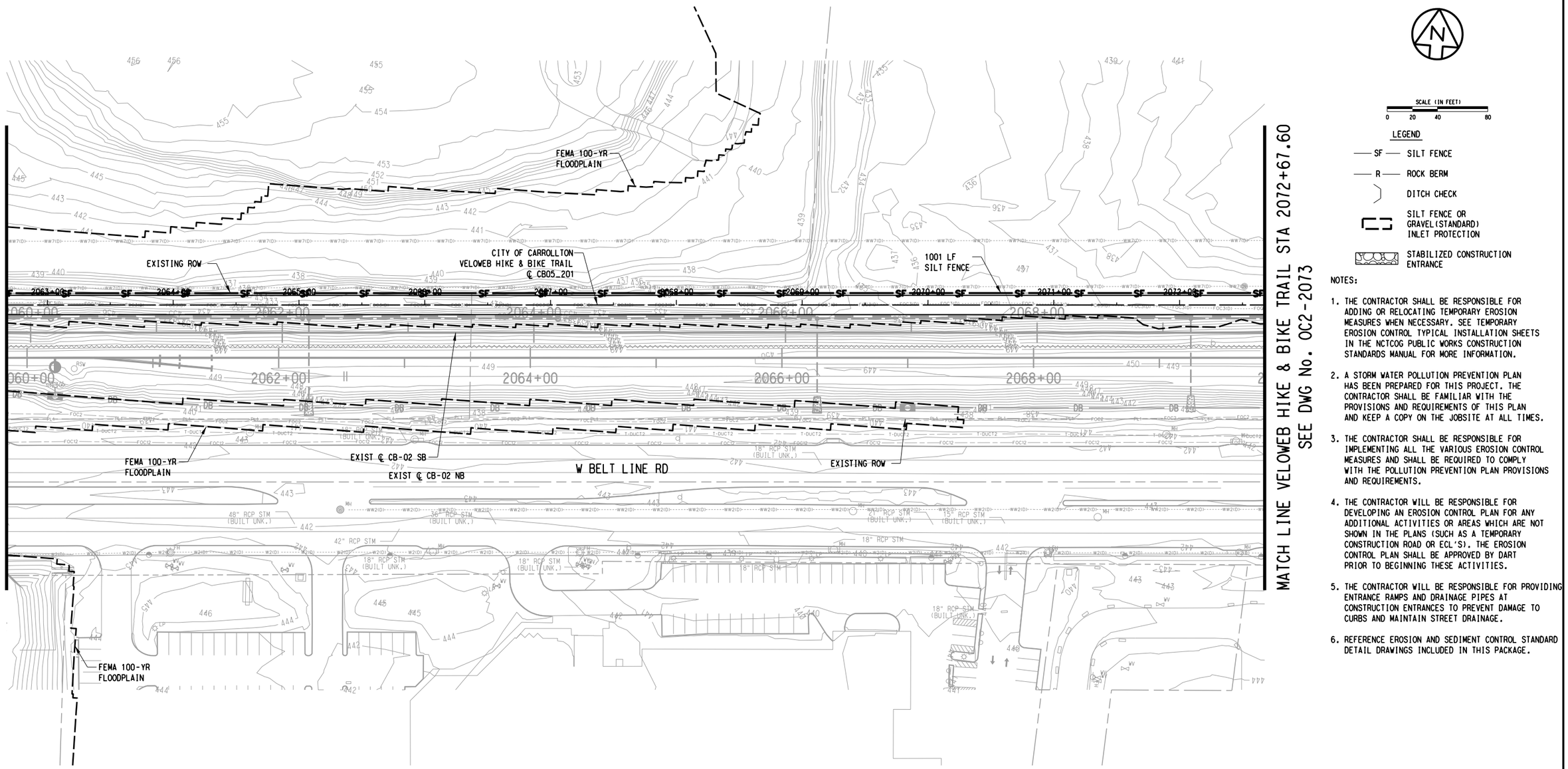
DWG No. OC2-2012



SCALE (IN FEET)
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LEGEND

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VELOWEB HIKE & BIKE TRAIL
CITY OF CARROLLTON
TEMPORARY EROSION CONTROL
STA 2062+50 TO STA 2072+50
SHEET 4 OF 15

CONTRACT	DWG No.	REV
C-2033270-01	OC2-2072	D

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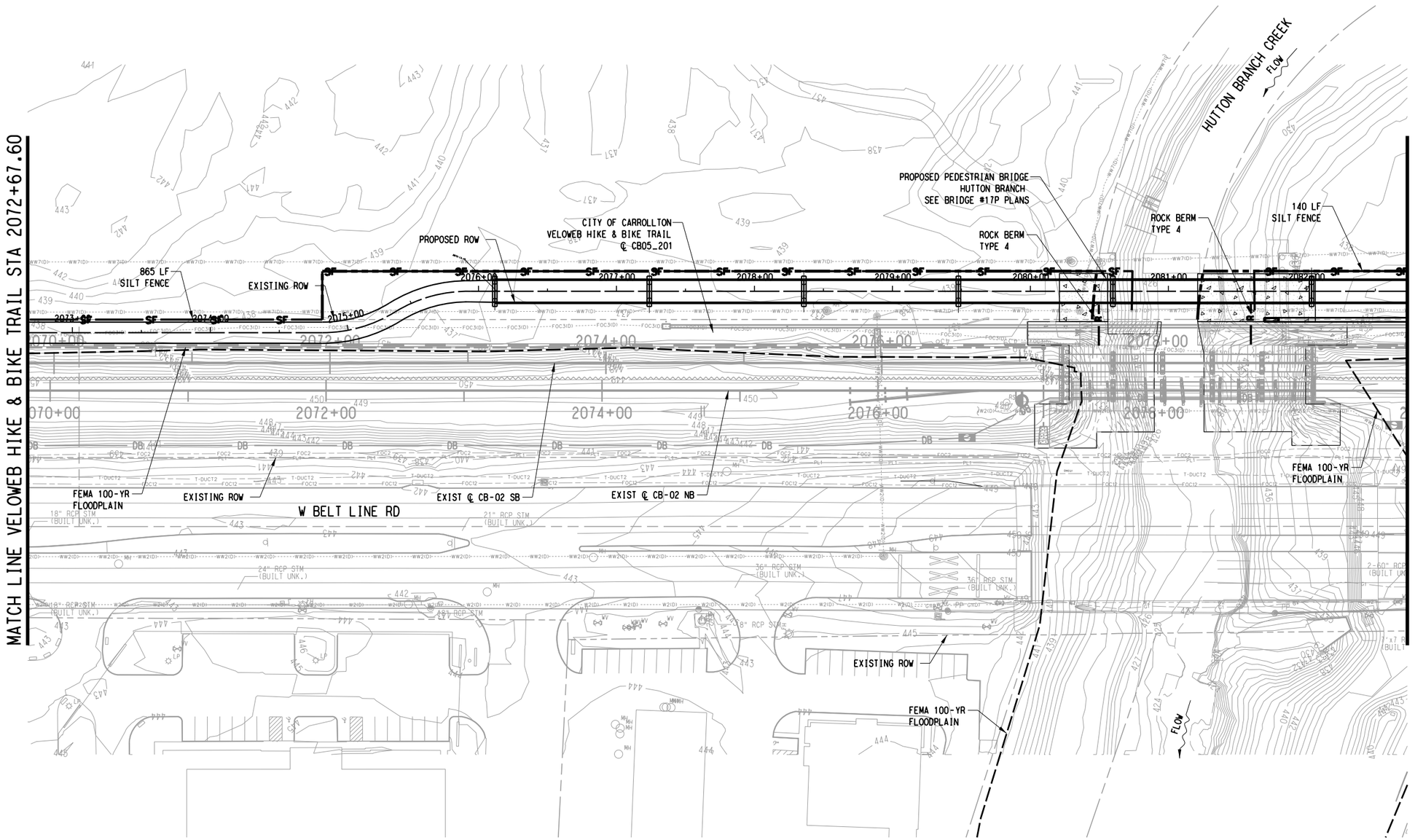
DWG No. OC2-2073



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COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
CITY OF CARROLLTON
TEMPORARY EROSION CONTROL
STA 2072+50 TO STA 2082+50
SHEET 5 OF 15

CONTRACT	DWG No.	REV
C-2033270-01	OC2-2073	D

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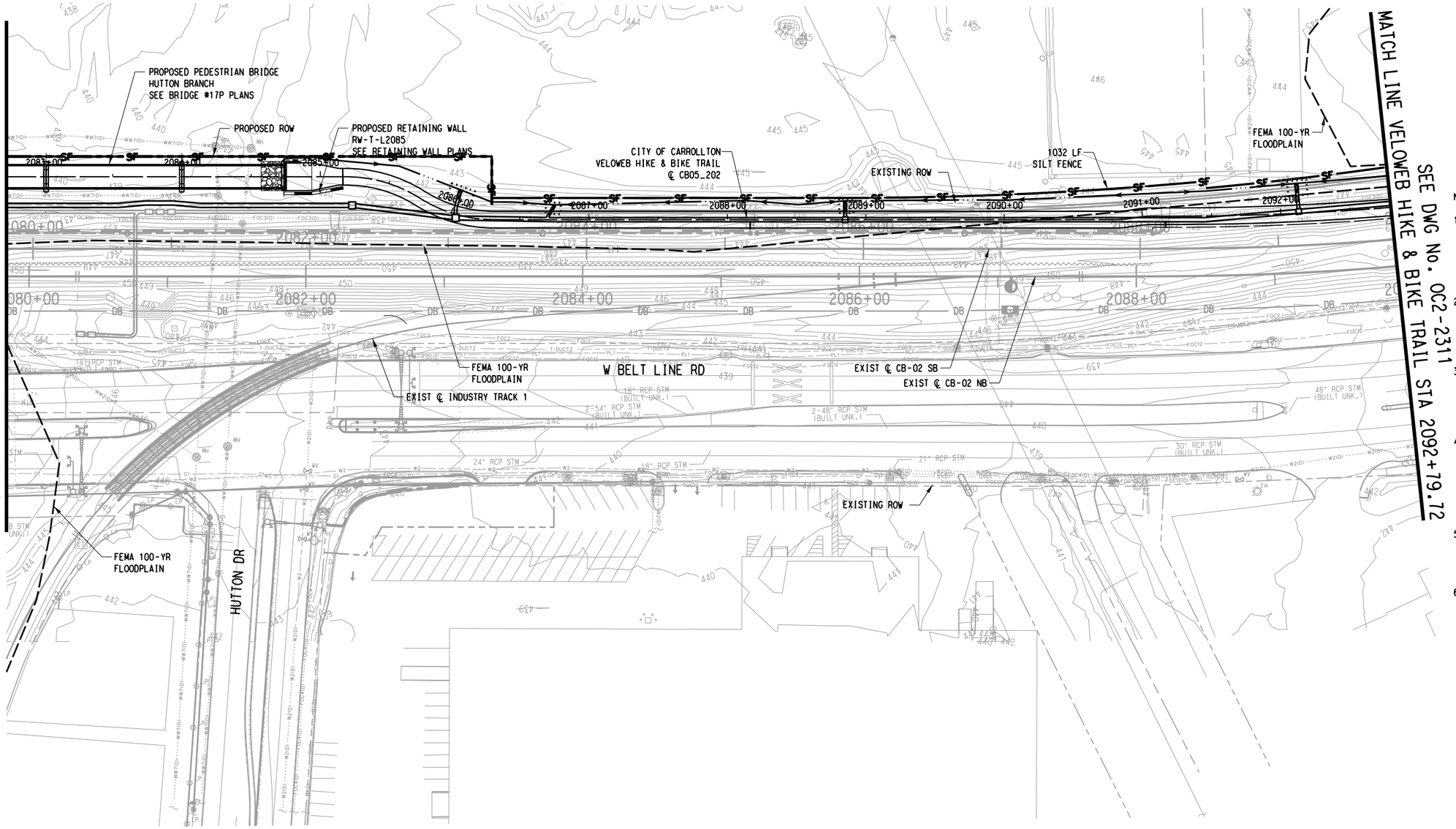
DWG No. OC2-2310



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COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
CITY OF CARROLLTON
TEMPORARY EROSION CONTROL
STA 2081+50 TO STA 2090+00
SHEET 6 OF 15

CONTRACT	DWG No.	REV
C-2033270-01	OC2-2310	D

CB05-OC2-2310.040

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CB05-OC2-2310.040
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DWG No. OC2-2311

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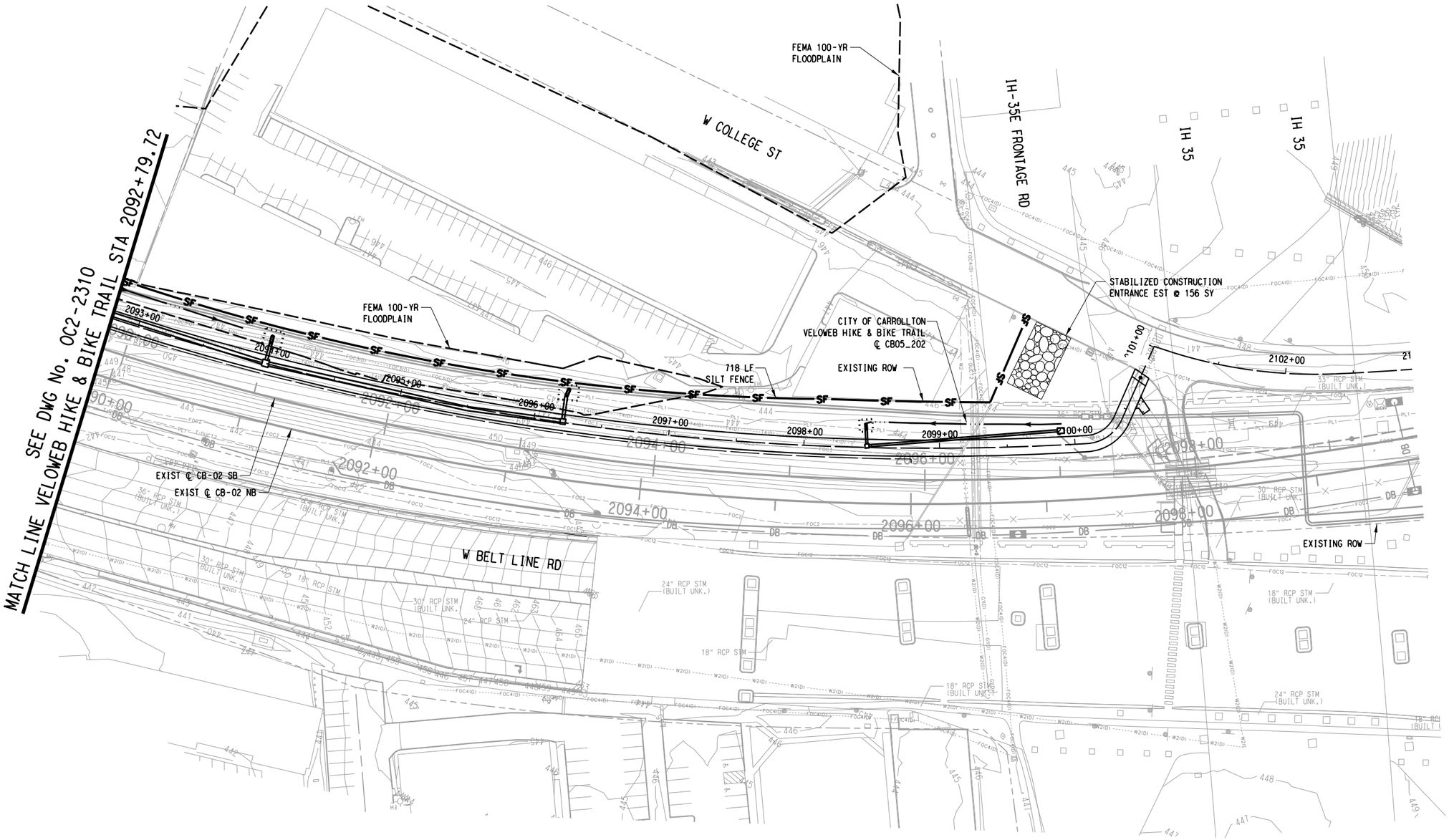

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TEMPORARY EROSION CONTROL
STA 2090+00 TO STA 2100+00
SHEET 7 OF 15

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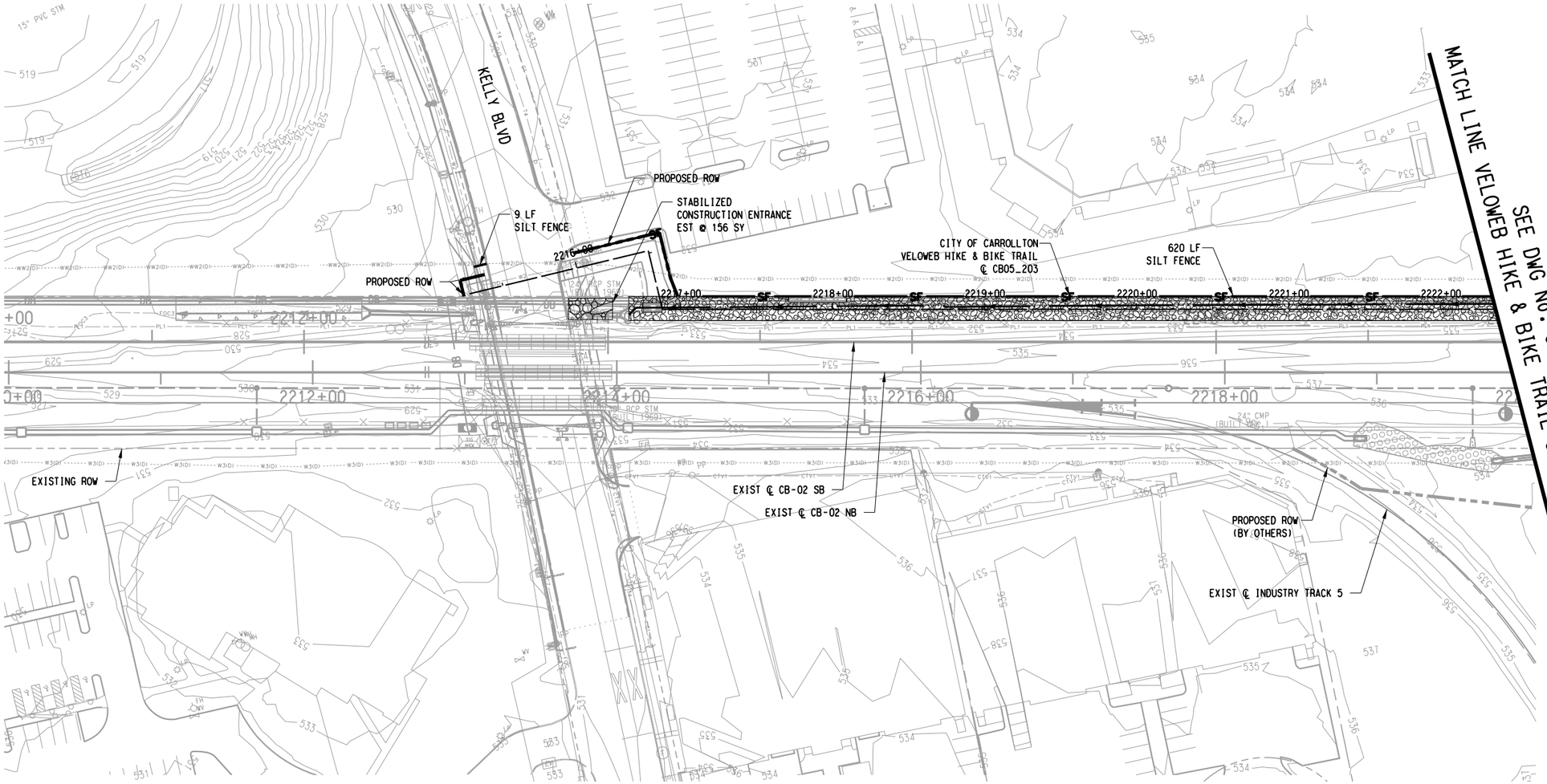

SCALE (IN FEET)
0 20 40 80

LEGEND

- SF — SILT FENCE
- R — ROCK BERM
- DITCH CHECK
- SILT FENCE OR GRAVEL (STANDARD) INLET PROTECTION
- STABILIZED CONSTRUCTION ENTRANCE

NOTES:

1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ADDING OR RELOCATING TEMPORARY EROSION MEASURES WHEN NECESSARY. SEE TEMPORARY EROSION CONTROL TYPICAL INSTALLATION SHEETS IN THE NCTCOG PUBLIC WORKS CONSTRUCTION STANDARDS MANUAL FOR MORE INFORMATION.
2. A STORM WATER POLLUTION PREVENTION PLAN HAS BEEN PREPARED FOR THIS PROJECT. THE CONTRACTOR SHALL BE FAMILIAR WITH THE PROVISIONS AND REQUIREMENTS OF THIS PLAN AND KEEP A COPY ON THE JOBSITE AT ALL TIMES.
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CONTRACT SHEET No. 299 OF 345

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

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ARCHER WESTERN HERZOG

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SCALE	1"=40'
DRAWN	C. ALTAMERO
DESIGNED	F. CHARAKUPA
CHECKED	J. TOONE
IN CHARGE	J. TOONE
DATE	07 AUG 23

CAES

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
CITY OF CARROLLTON
TEMPORARY EROSION CONTROL
STA 2213+00 TO STA 2220+00
SHEET 8 OF 15

CONTRACT	DWG No.	REV
C-2033270-01	OC2-2566	D

CB05-OC2-2566.040

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JEGSVCPW001
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DWG No. OC2-2567

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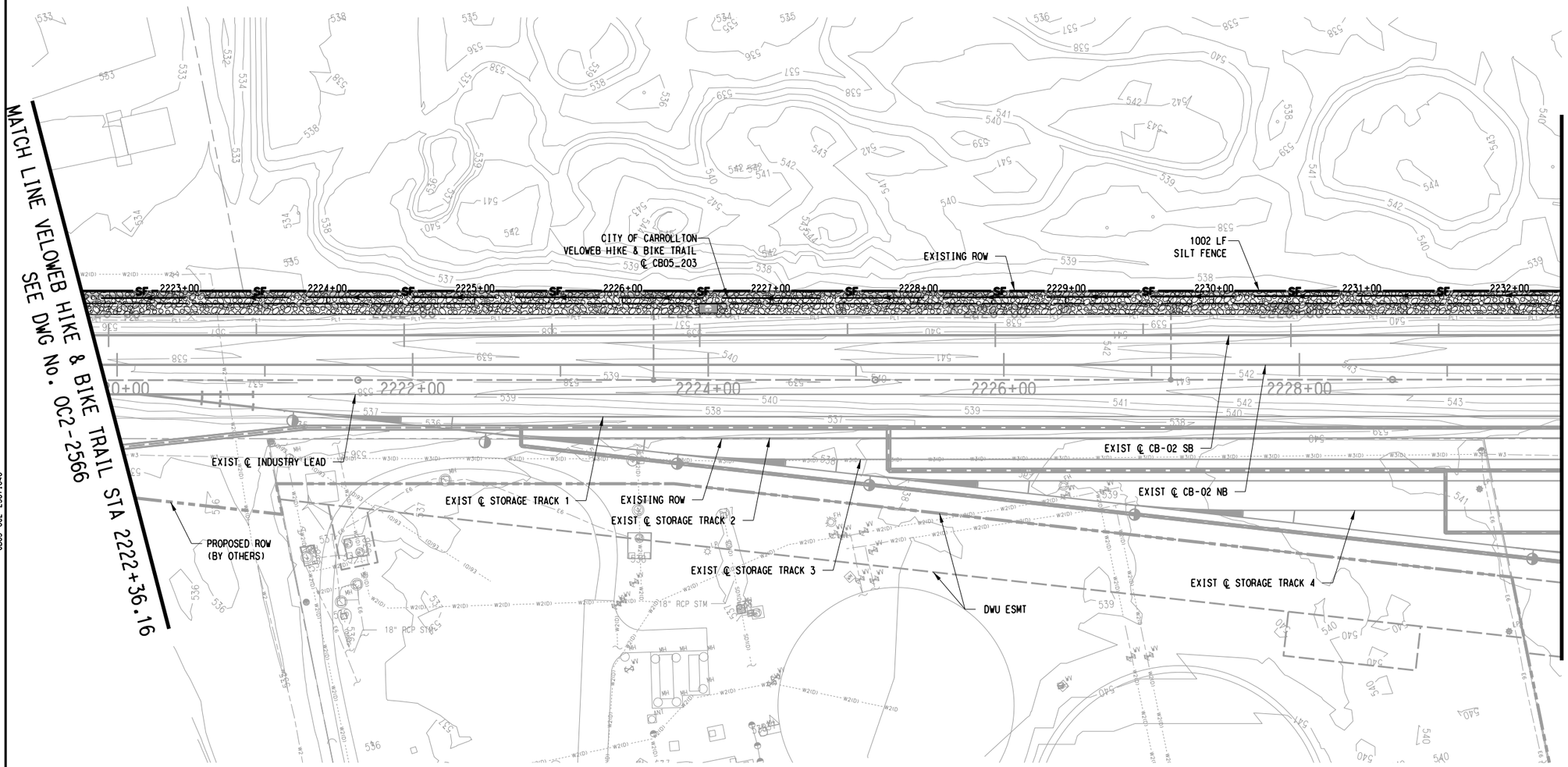

SCALE (IN FEET)
0 20 40 80

LEGEND

- SF — SILT FENCE
- R — ROCK BERM
- DITCH CHECK
- SILT FENCE OR GRAVEL(STANDARD) INLET PROTECTION
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COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
CITY OF CARROLLTON
TEMPORARY EROSION CONTROL
STA 2220+00 TO STA 2230+00
SHEET 9 OF 15

CONTRACT	DWG No.	REV
C-2033270-01	OC2-2567	D

CB05-OC2-2567.040

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DWG No. OC2-2568

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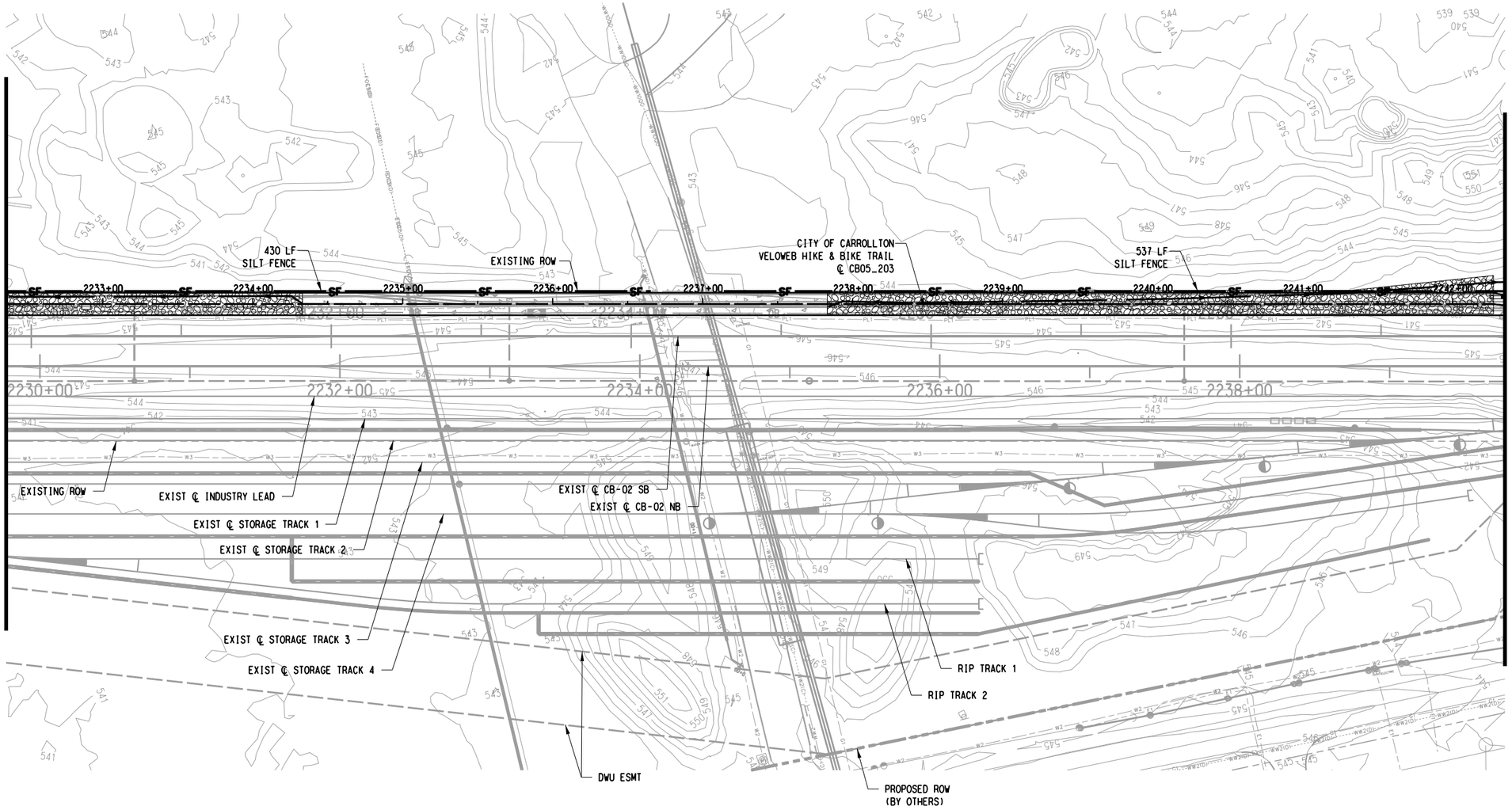

SCALE (IN FEET)
0 20 40 80

LEGEND

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- R — ROCK BERM
- DITCH CHECK
- SILT FENCE OR GRAVEL (STANDARD) INLET PROTECTION
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COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
CITY OF CARROLLTON
TEMPORARY EROSION CONTROL
STA 2230+00 TO STA 2240+00
SHEET 10 OF 15

CONTRACT	DWG No.	REV
C-2033270-01	OC2-2568	D

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DWG No. OC2-2569

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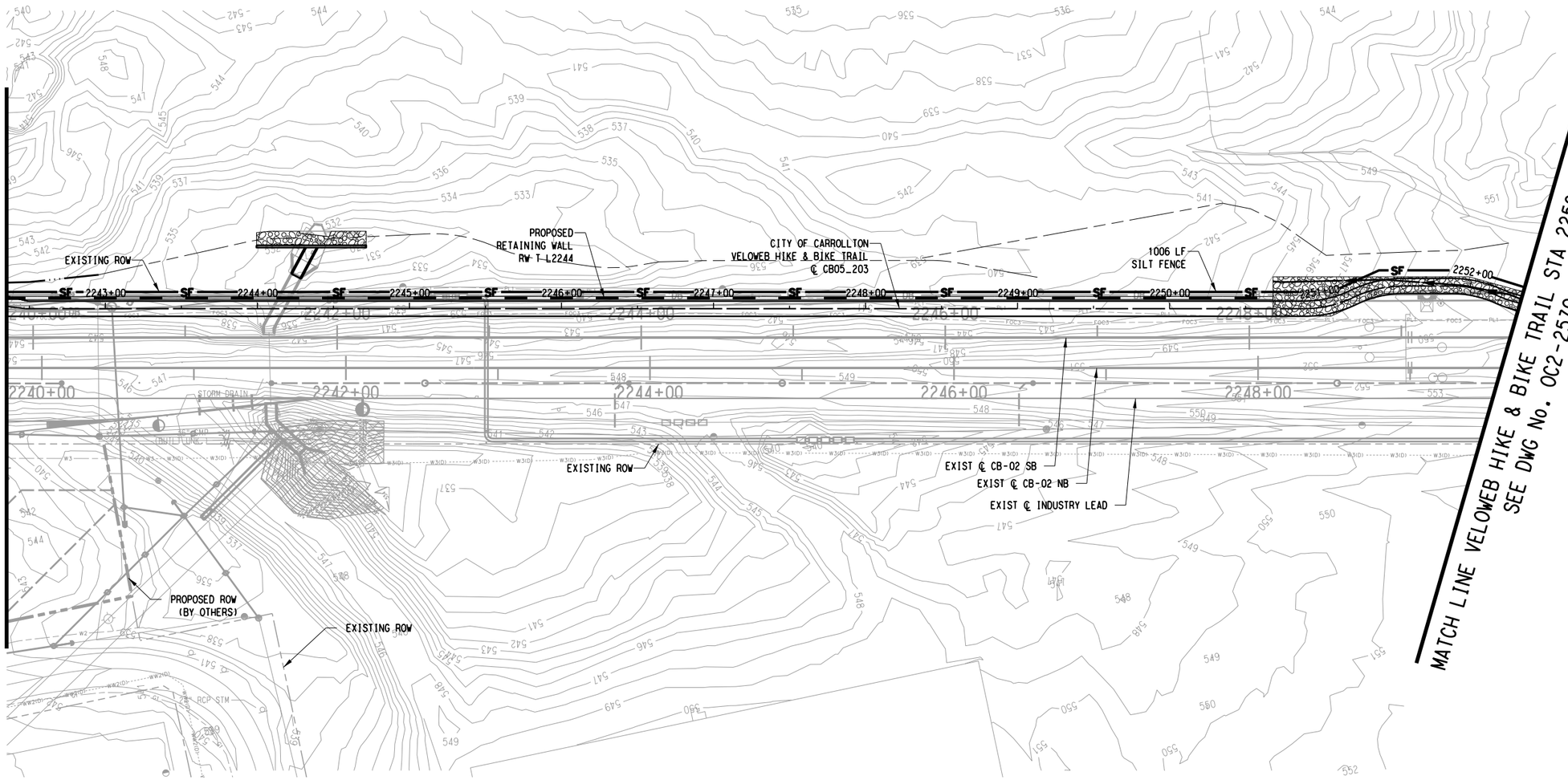

SCALE (IN FEET)
0 20 40 80

LEGEND

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- R — ROCK BERM
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CHECKED	J. TOONE
IN CHARGE	J. TOONE
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CAES

COTTON BELT REGIONAL RAIL VELOWEB HIKE & BIKE TRAIL

CITY OF CARROLLTON TEMPORARY EROSION CONTROL STA 2240+00 TO STA 2250+00 SHEET 11 OF 15

CONTRACT	DWG No.	REV
C-2033270-01	OC2-2569	D

CB05-OC2-2569.040

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CB05-OC2-2569.040
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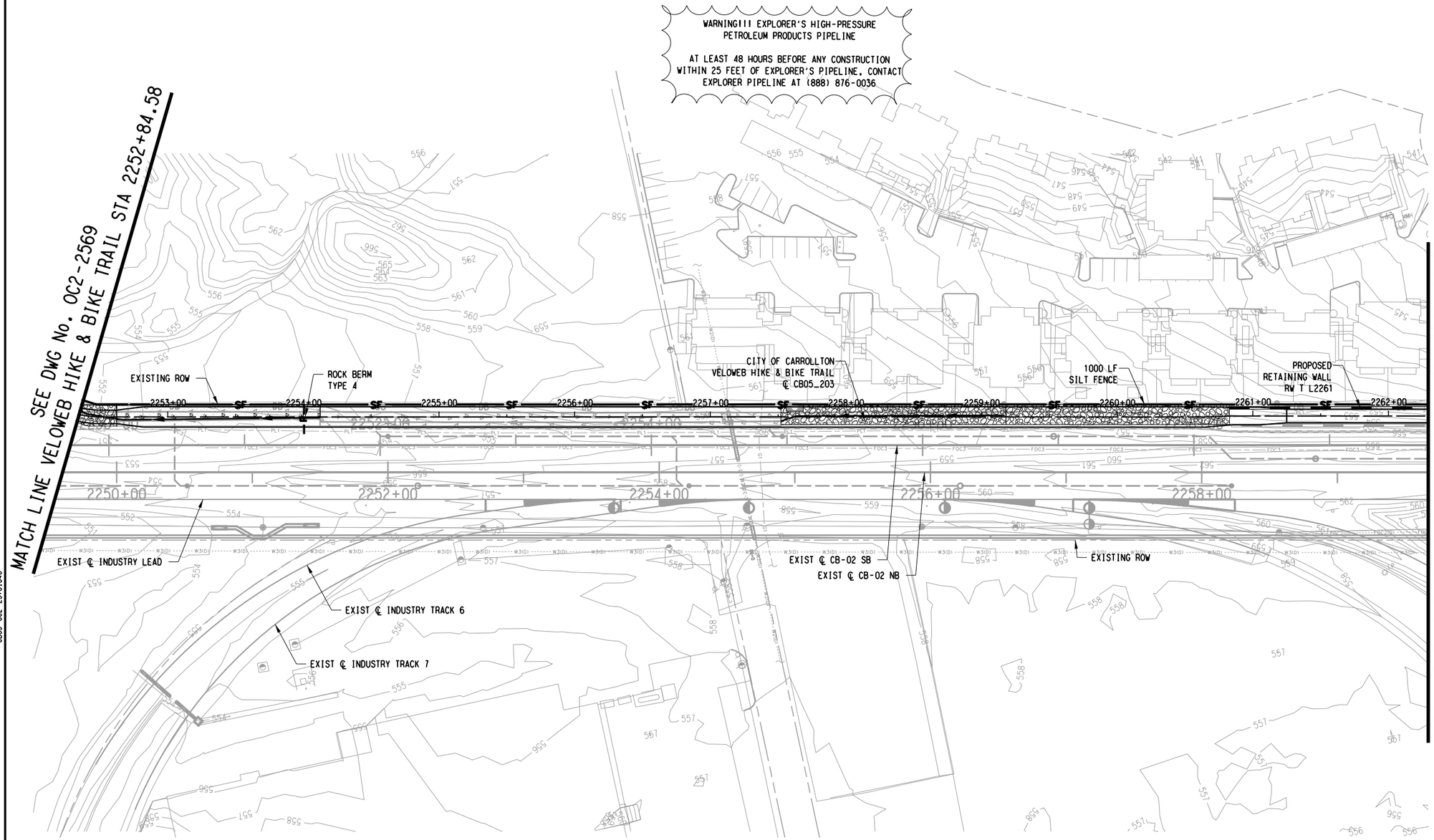
DWG No. OC2-2570



SCALE (IN FEET)
0 20 40 80

LEGEND

- SF — SILT FENCE
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REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

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DESIGNED	F. CHARAKUPA
CHECKED	J. TOONE
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DATE	07 AUG 23

CAES

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
CITY OF CARROLLTON
TEMPORARY EROSION CONTROL
STA 2250+00 TO STA 2260+00
SHEET 12 OF 15

CONTRACT	DWG No.	REV
C-2033270-01	OC2-2570	D

CB05-OC2-2570.040

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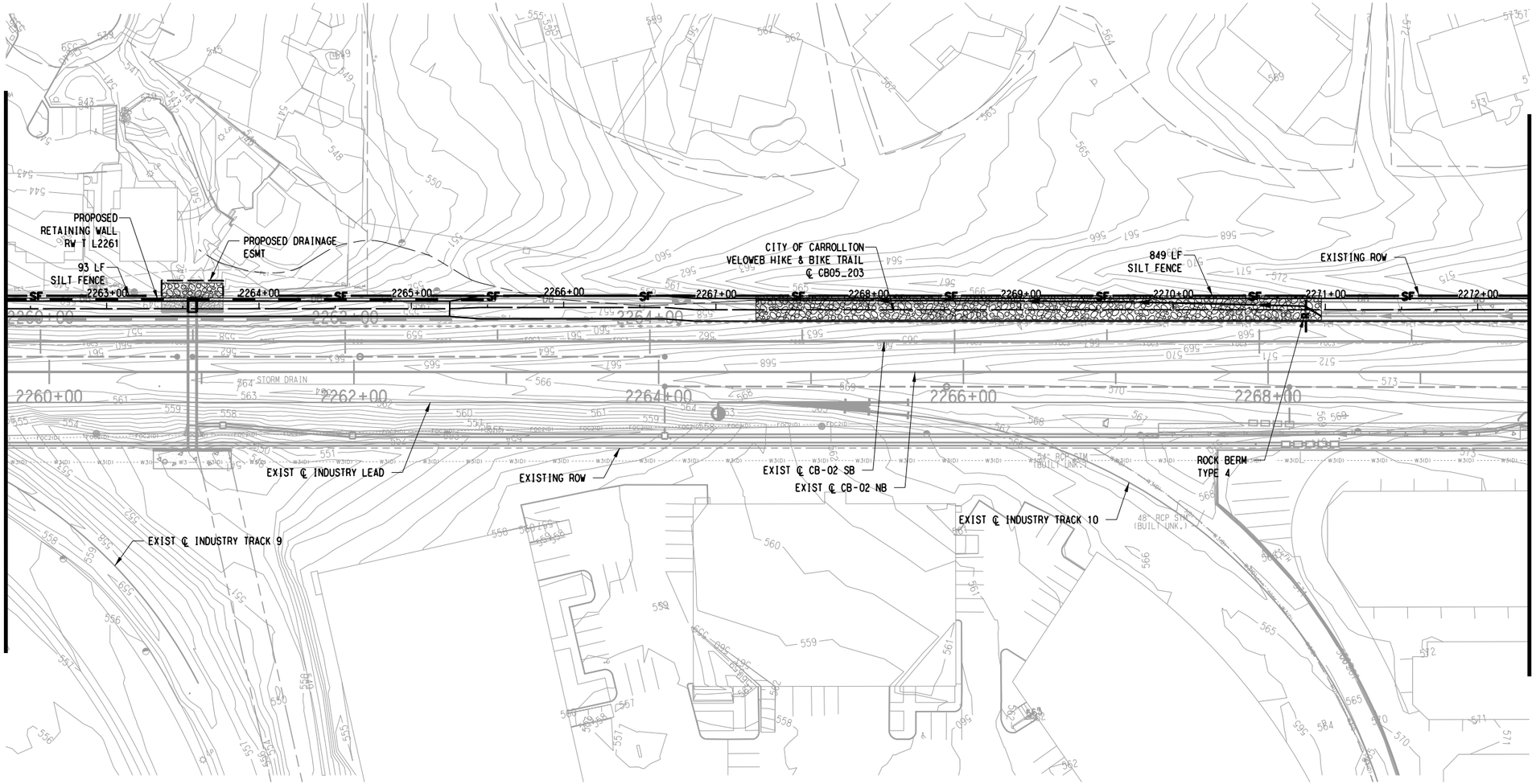

SCALE (IN FEET)
0 20 40 80

LEGEND

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CAES

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
CITY OF CARROLLTON
TEMPORARY EROSION CONTROL
STA 2260+00 TO STA 2270+00
SHEET 13 OF 15

CONTRACT	DWG No.	REV
C-2033270-01	OC2-2571	D

CB05-OC2-2571.040

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DWG No. OC2-2572

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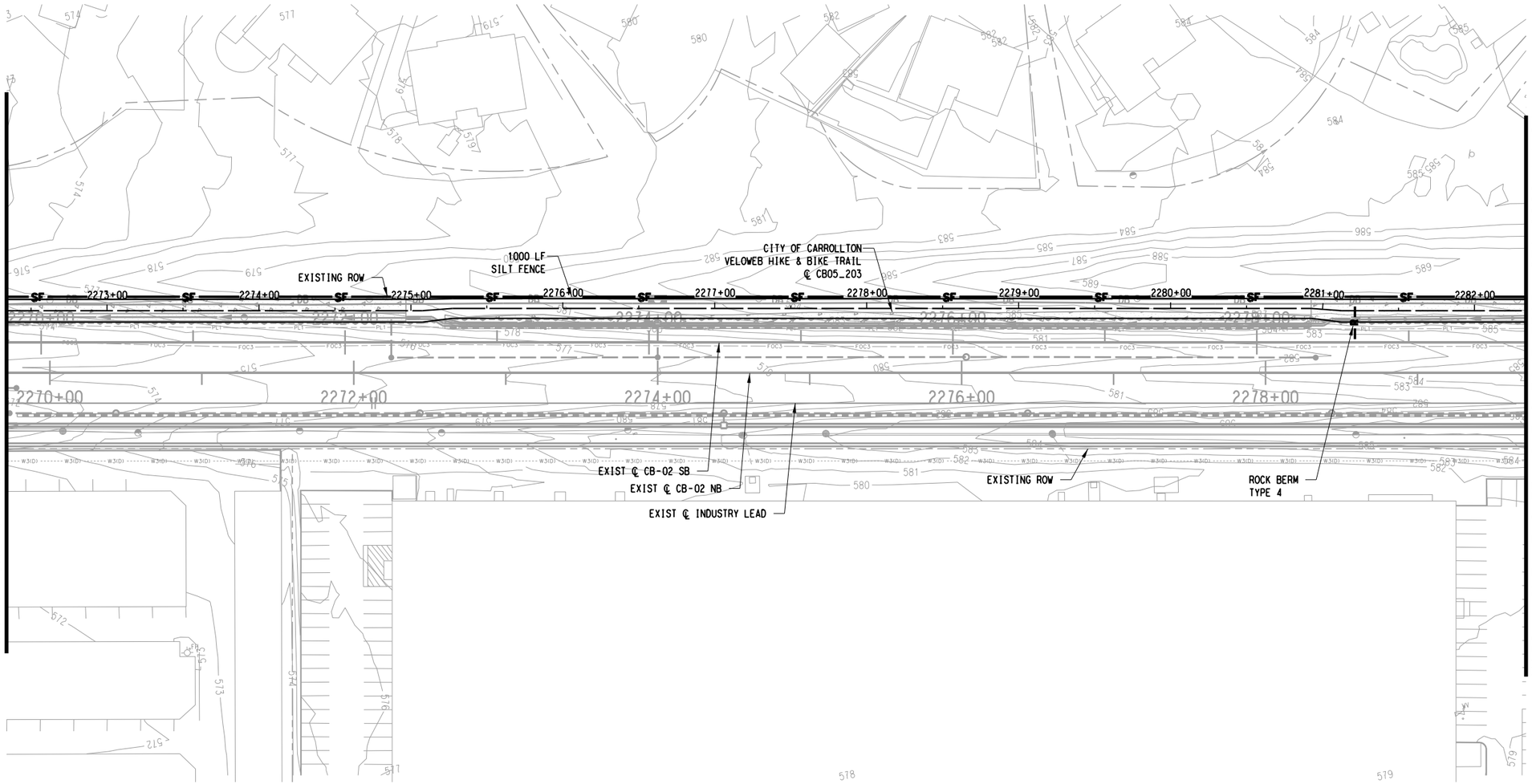

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IN CHARGE	J. TOONE
DATE	07 AUG 23

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
CITY OF CARROLLTON
TEMPORARY EROSION CONTROL
STA 2270+00 TO STA 2280+00
SHEET 14 OF 15

CONTRACT	DWG No.	REV
C-2033270-01	OC2-2572	D

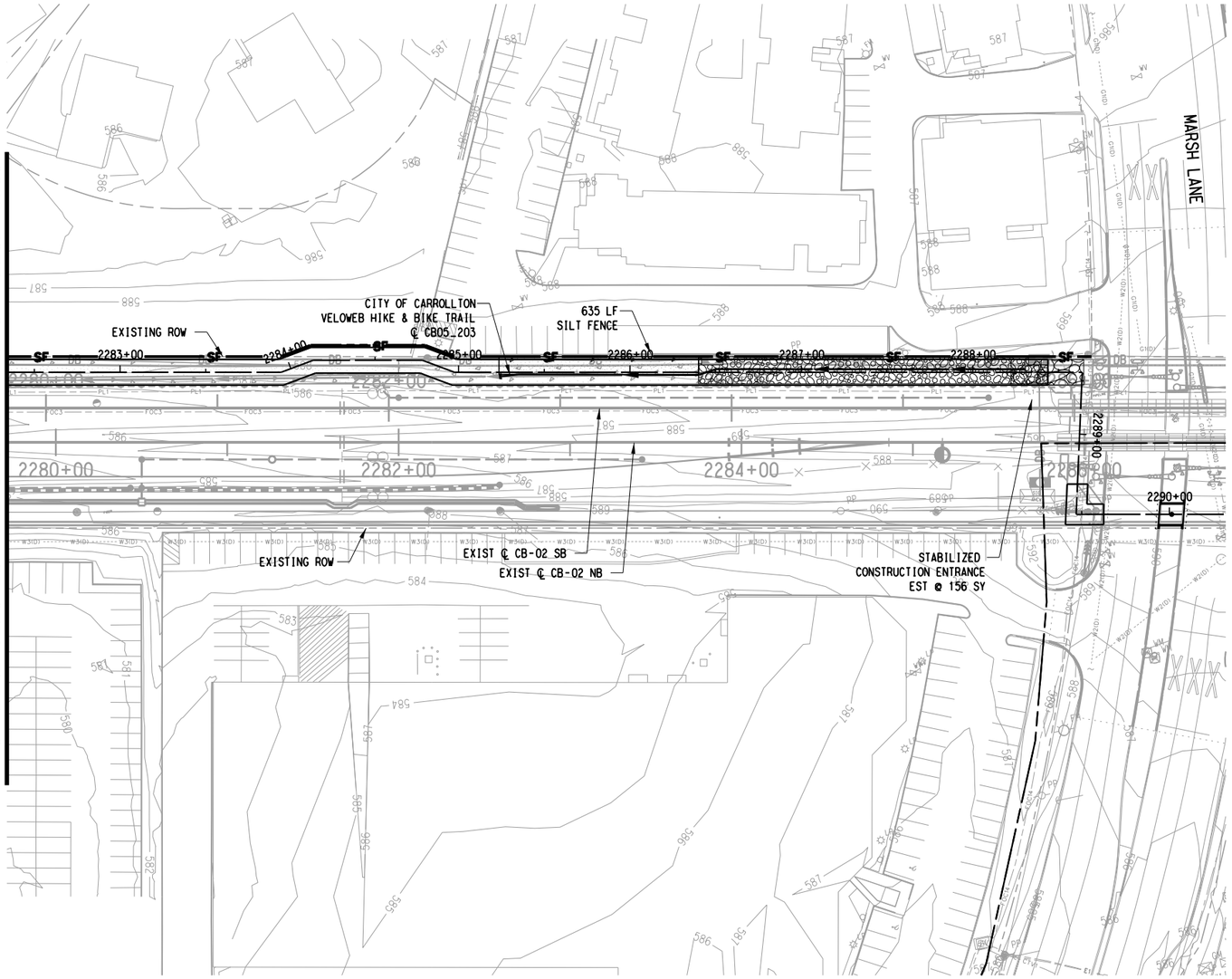
CB05-OC2-2572.040

31-JUL-2023 09:48
CB05-OC2-2572.040
JEGSVCPW101
Default

DWG No. OC2-2573

WARNING!!! EXPLORER'S HIGH-PRESSURE PETROLEUM PRODUCTS PIPELINE

AT LEAST 48 HOURS BEFORE ANY CONSTRUCTION WITHIN 25 FEET OF EXPLORER'S PIPELINE, CONTACT EXPLORER PIPELINE AT (888) 876-0036



SCALE (IN FEET)
0 20 40 80

LEGEND

- SF — SILT FENCE
- R — ROCK BERM
- DITCH CHECK
- SILT FENCE OR GRAVEL(STANDARD) INLET PROTECTION
- STABILIZED CONSTRUCTION ENTRANCE

NOTES:

1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ADDING OR RELOCATING TEMPORARY EROSION MEASURES WHEN NECESSARY. SEE TEMPORARY EROSION CONTROL TYPICAL INSTALLATION SHEETS IN THE NCTCOG PUBLIC WORKS CONSTRUCTION STANDARDS MANUAL FOR MORE INFORMATION.
2. A STORM WATER POLLUTION PREVENTION PLAN HAS BEEN PREPARED FOR THIS PROJECT. THE CONTRACTOR SHALL BE FAMILIAR WITH THE PROVISIONS AND REQUIREMENTS OF THIS PLAN AND KEEP A COPY ON THE JOBSITE AT ALL TIMES.
3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR IMPLEMENTING ALL THE VARIOUS EROSION CONTROL MEASURES AND SHALL BE REQUIRED TO COMPLY WITH THE POLLUTION PREVENTION PLAN PROVISIONS AND REQUIREMENTS.
4. THE CONTRACTOR WILL BE RESPONSIBLE FOR DEVELOPING AN EROSION CONTROL PLAN FOR ANY ADDITIONAL ACTIVITIES OR AREAS WHICH ARE NOT SHOWN IN THE PLANS (SUCH AS A TEMPORARY CONSTRUCTION ROAD OR ECL'S). THE EROSION CONTROL PLAN SHALL BE APPROVED BY DART PRIOR TO BEGINNING THESE ACTIVITIES.
5. THE CONTRACTOR WILL BE RESPONSIBLE FOR PROVIDING ENTRANCE RAMPS AND DRAINAGE PIPES AT CONSTRUCTION ENTRANCES TO PREVENT DAMAGE TO CURBS AND MAINTAIN STREET DRAINAGE.
6. REFERENCE EROSION AND SEDIMENT CONTROL STANDARD DETAIL DRAWINGS INCLUDED IN THIS PACKAGE.

NOT AN APPROVED DRAWING
FINAL 100% DESIGN

CONTRACT SHEET No. 306 OF 345

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

IN-PROGRESS REVIEW
THIS DOCUMENT IS RELEASED FOR THE PURPOSE OF REVIEW UNDER THE AUTHORITY OF:
JUSTIN C. TOONE, P.E., 121959
ON
31-JUL-2023 09:50
IEA
TBPE FIRM NO. F-10161
IT IS NOT TO BE USED FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES.

Jacobs
1999 BRYAN ST, SUITE 1200
DALLAS, TX 75201-3136
Phone: +1 (214) 638-0145
FIRM REGISTRATION No. F-2966

IEA
18383 PRESTON ROAD, SUITE 500
DALLAS, TX 75252
Phone: +1 (214) 884-4253
Firm Registration: F-10161

ARCHER WESTERN HERZOG

DART PROJECT

DART

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SCALE	1"=40'
DRAWN	C. ALTAMERO
DESIGNED	F. CHARAKUPA
CHECKED	J. TOONE
IN CHARGE	J. TOONE
DATE	07 AUG 23

CAES

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
CITY OF CARROLLTON
TEMPORARY EROSION CONTROL
STA 2280+00 TO STA 2290+50
SHEET 15 OF 15

CONTRACT	DWG No.	REV
C-2033270-01	OC2-2573	D

CB05-OC2-2573.040

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CB05-OC2-2573.040
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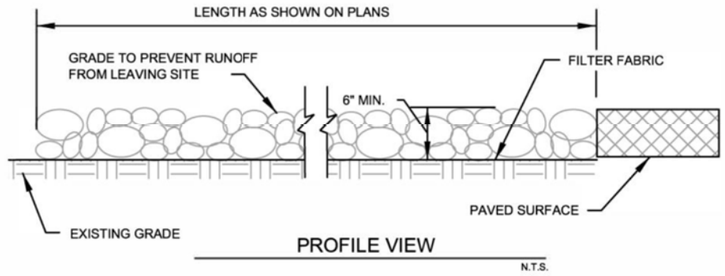
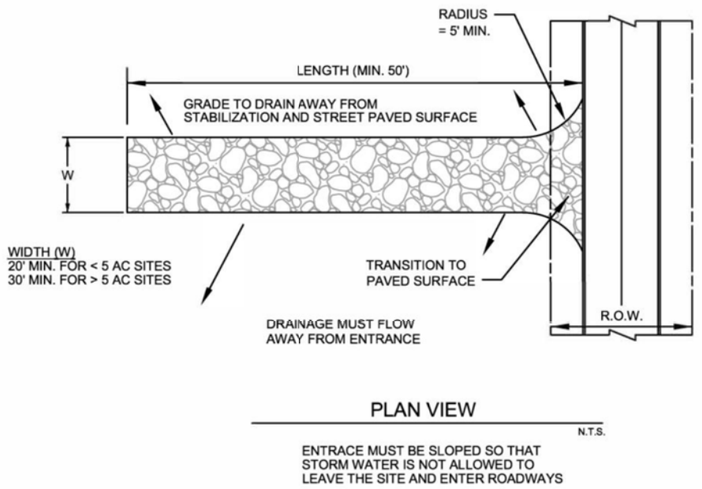


PROFILE VIEW

N.T.S.



PLAN VIEW

N.T.S.

ENTRACE MUST BE SLOPED SO THAT STORM WATER IS NOT ALLOWED TO LEAVE THE SITE AND ENTER ROADWAYS

Revised 2018

Figure 3.32 Schematics of Stabilized Construction Exit

STABILIZED CONSTRUCTION ENTRANCE GENERAL NOTES:

1. SEE NCTCOG STANDARD SPECIFICATIONS (2017), SECTION 202.11

2. THE THICKNESS SHALL NOT BE LESS THAN 6 INCHES.

3. STONE SHALL BE 3 TO 5 INCH DIAMETER COURSE AGGREGATE, NO CRUSHED PORTLAND CEMENT CONCRETE ALLOWED.

4. LENGTH SHALL BE SHOWN ON PLANS, WITH A MINIMUM LENGTH OF 50 FEET.

5. THE WIDTH SHALL BE NO LESS THAN 20' FOR SITES LESS THAN 5 AC, AND 30' FOR SITES GREATER THAN 5 AC, AT ALL POINTS OF INGRESS OR EGRESS.

6. WHEN NECESSARY, VEHICLES SHALL BE CLEANED TO REMOVE SEDIMENT PRIOR TO ENTRANCE ONTO A PUBLIC ROADWAY. WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON AN AREA STABILIZED WITH CRUSHED STONE WITH DRAINAGE FLOWING AWAY FROM BOTH THE STREET AND THE STABILIZED ENTRANCE. ALL SEDIMENT SHALL BE PREVENTED FROM ENTERING ANY STORM DRAIN, DITCH OR WATERCOURSE USING APPROVED METHODS.

7. THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PAVED SURFACES. THIS MAY REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL STONE AS CONDITIONS DEMAND. ALL SEDIMENT SPILLED, DROPPED, WASHED, OR TRACKED ONTO PAVED SURFACES MUST BE REMOVED IMMEDIATELY.

8. THE ENTRANCE MUST BE PROPERLY GRADED OR INCORPORATE A DRAINAGE SWALE TO PREVENT RUNOFF FROM LEAVING THE CONSTRUCTION SITE.

9. INSPECTION SHALL BE SPECIFIED IN THE SWPPP.

Revised 2018

Figure 3.33 Stabilized Construction Entrance General Notes

31-JUL-2023 09:47
STD5-0C9-2575.001
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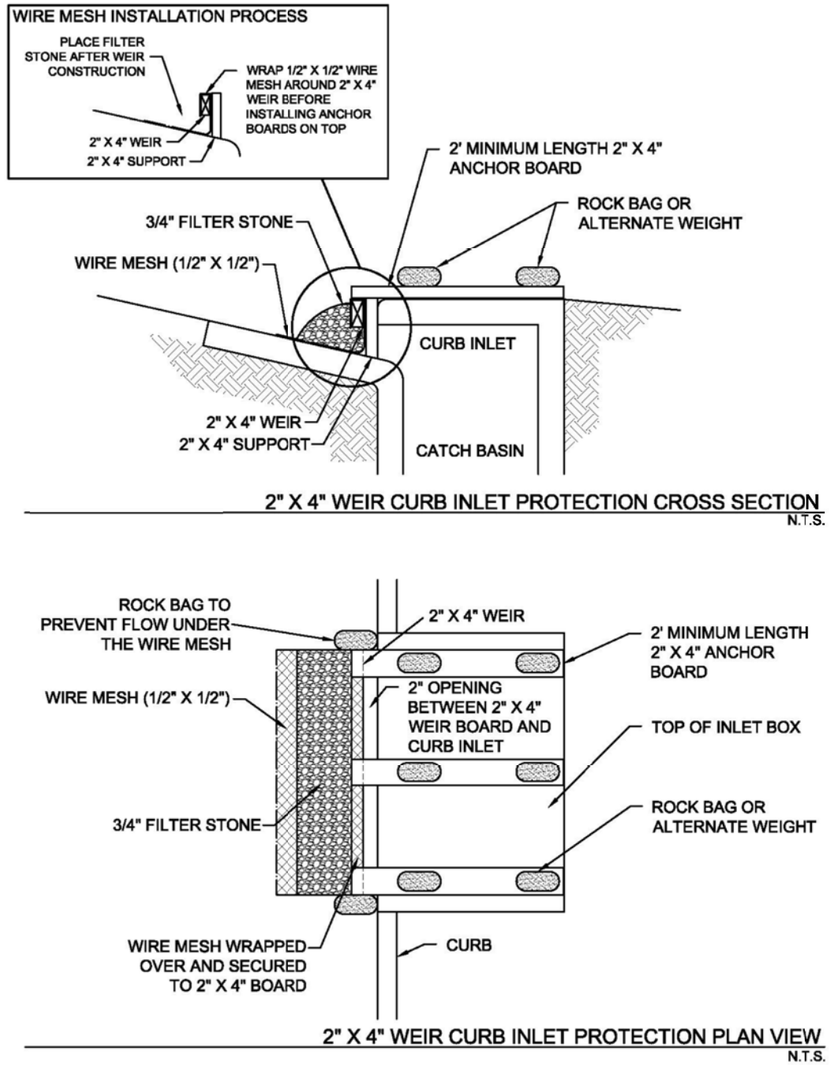
Default
STD5-0C9-2575.001
COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
SHEET NO. 307 OF 345
DWG NO. 0C9-2575
CONTRACT NO. C-2033270-01



NOTE: THIS CONTROL WILL DECREASE THE CAPACITY OF THE INLET. IT SHALL ONLY BE USED WHEN AN ENGINEER HAS DETERMINED THERE IS ADEQUATE STORAGE OR POSITIVE OVERFLOW.

Figure 3.5 Schematics of 2"x4" Weir Curb Inlet Protection
(Source: Modified from Washington Suburban Sanitary Commission Detail SC-16.0)

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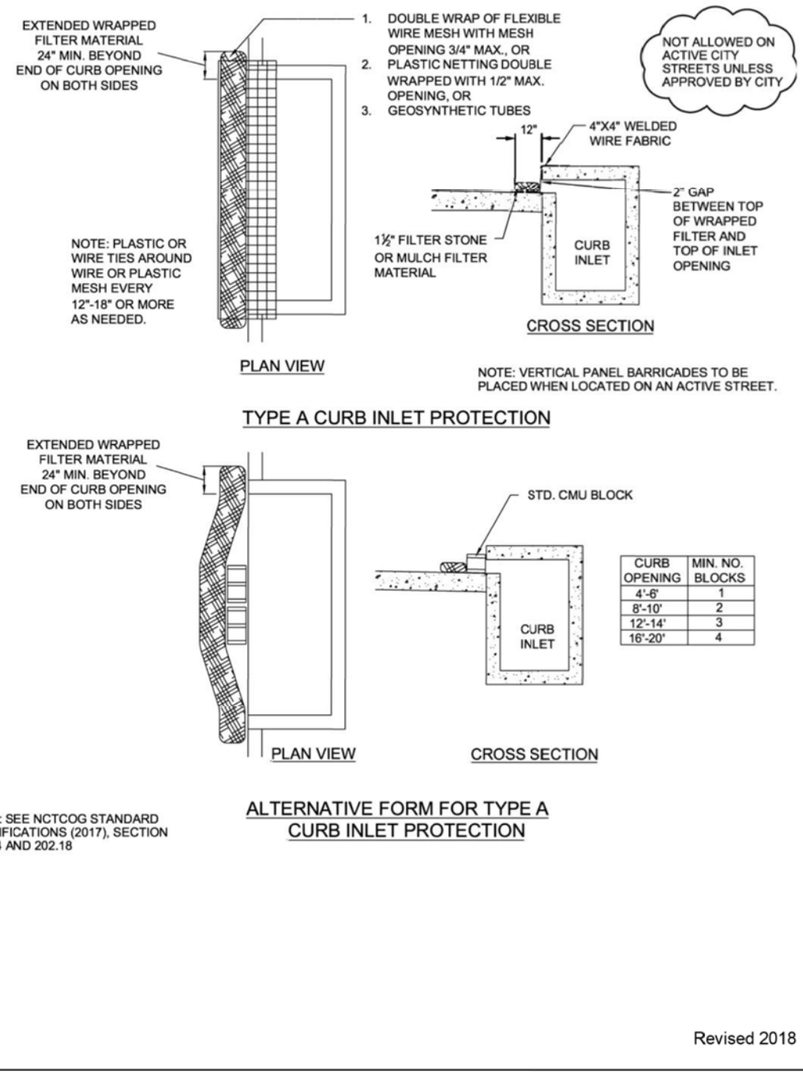
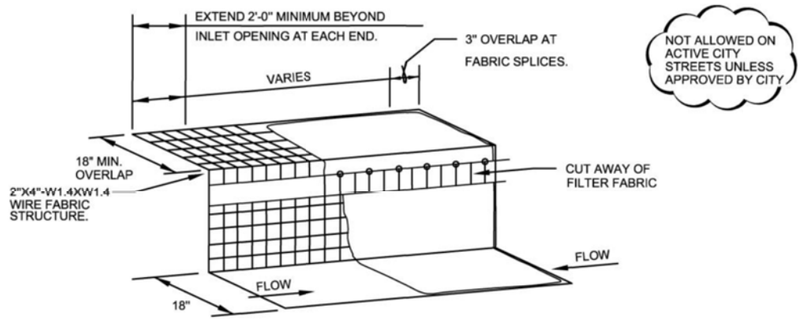


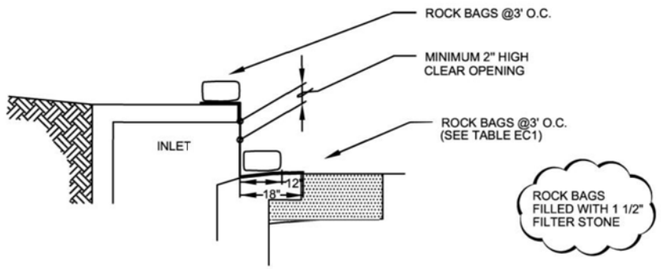
Figure 3.6 Schematics of Organic Filter Tube Curb Inlet Protection
(Source: Modified from City of Plano BMP SP-4)

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
SHEET NO. 308 OF 345
DWG NO. 0C9-2576
CONTRACT NO. C-2033270-01
STD5-0C9-2576.001



HOG WIRE WEIR CURB INLET PROTECTION ISOMETRIC VIEW

N.T.S.



HOG WIRE WEIR CURB INLET PROTECTION CROSS SECTION

N.T.S.

NOTE: THIS CONTROL WILL DECREASE THE CAPACITY OF THE INLET. IT SHALL ONLY BE USED WHEN AN ENGINEER HAS DETERMINED THERE IS ADEQUATE STORAGE OR POSITIVE OVERFLOW.

REFERENCE: NCTCOG STANDARD SPECIFICATIONS (2017), SECTION 202.14

Revised 2018

Figure 3.7 Schematics of Hog Wire Weir Curb Inlet Protection
(Source: Modified from City of Round Rock Detail E-03)

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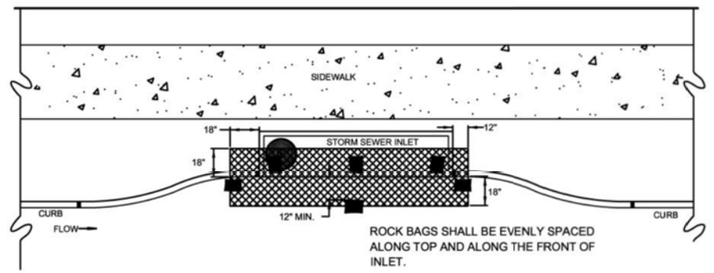
JEGSWCPW001
Default



HOG WIRE WEIR CURB INLET PROTECTION PLAN VIEW

N.T.S.

TABLE EC1

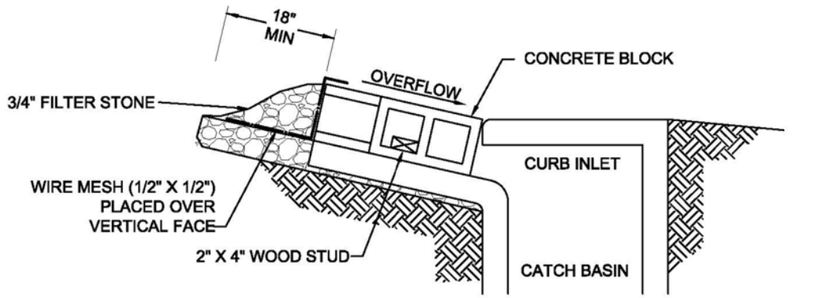
INLET OPENING	MINIMUM NUMBER OF ROCK BAGS	
	TOP	FRONT
5'	2	3
10'	3	3
15'	3	4
20'	4	4

NOTES:
1. A SECTION OF FILTER FABRIC SHALL BE REMOVED AS SHOWN ON THIS DETAIL TO PROVIDE A 2" MINIMUM CLEAR OPENING. FABRIC MUST BE SECURED TO WIRE BACKING WITH CLIPS OR HOG RINGS AT THIS LOCATION.
2. INSPECTION SHALL BE MADE BY THE CONTRACTOR AND SILT ACCUMULATION MUST BE REMOVED WHEN DEPTH REACHES 2".
3. INLET PROTECTIONS SHALL BE REMOVED AS SOON AS THE SOURCE OF SEDIMENT IS STABILIZED.

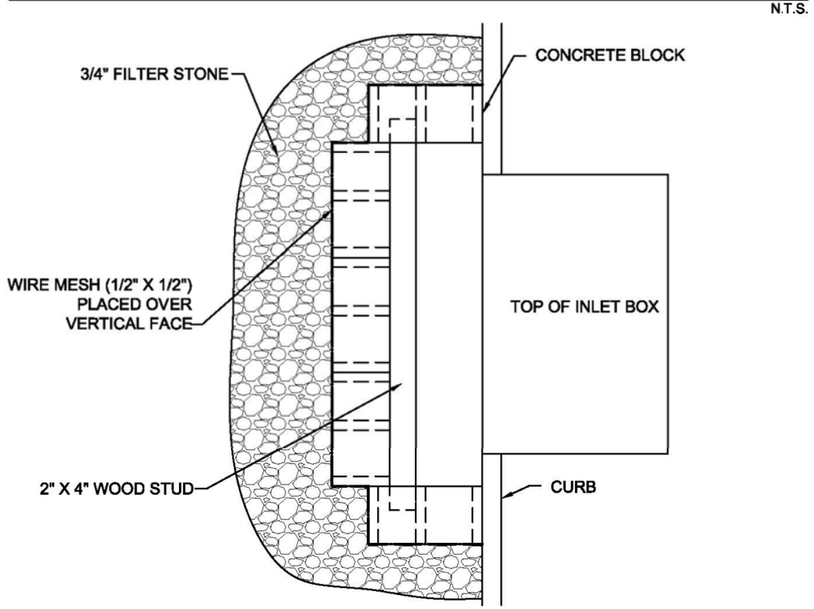
Revised 2018

Figure 3.8 Hog Wire Weir Curb Inlet Protection

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
SHEET NO. 309 OF 345
DWG NO. 0C9-2577
CONTRACT NO. C-2033270-01
STD5-0C9-2577.001



BLOCK AND GRAVEL FILTER CURB INLET PROTECTION CROSS SECTION
N.T.S.



BLOCK AND GRAVEL FILTER CURB INLET PROTECTION PLAN VIEW
N.T.S.

NOTES:
1. DO NOT INSTALL ON INLETS IN A PUBLIC STREET OR OTHER ACTIVE TRAVEL LANE. BLOCK AND GRAVEL FILTER IS INTENDED FOR USE ON LOW POINT (SUMP) INLETS IN PARKING LOTS AND OTHER PAVEMENT THAT IS NOT AN ACTIVE TRAVEL LANE. THIS INLET PROTECTION METHOD ALLOWS FOR FULL USE OF THE INLET DESIGN CAPACITY.
2. INSTALL TRAFFIC CONES AS NEEDED TO MINIMIZE THE POTENTIAL FOR CARS HITTING THE BLOCK AND GRAVEL.

Figure 3.9 Schematics of Block and Gravel Filter Curb Inlet Protection

31-JUL-2023 09:51
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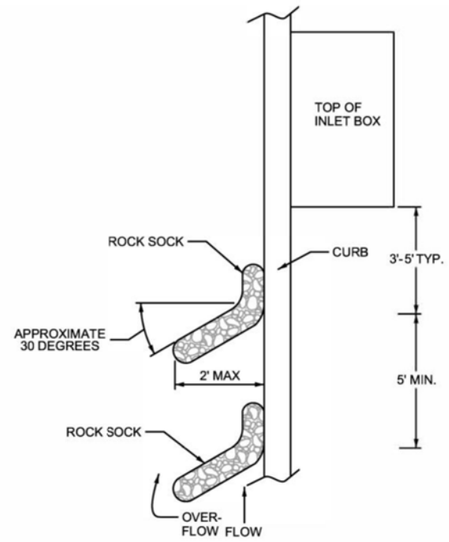
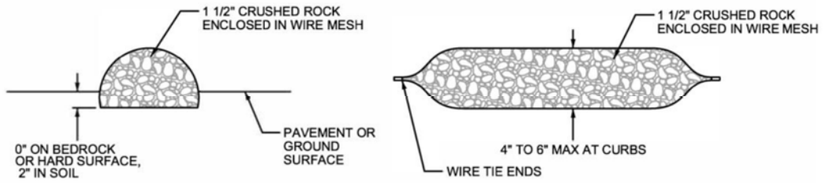
COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
SHEET NO. 310 OF 345
DWG NO. 0C9-2578
CONTRACT NO. C-2033270-01
STD5-0C9-2578.001



CURB ROCK SOCK ON-GRADE CURB INLET PROTECTION DETAIL

N.T.S.



ROCK SOCK SECTION

N.T.S.

ROCK SOCK PLAN

N.T.S.

Revised 2018

Figure 3.10 Schematic of Organic Filter Tube On-Grade Curb Inlet Protection

CURB ROCK SOCK ON-GRADE CURB INLET PROTECTION GENERAL NOTES:

1. THIS DETAIL IS INTENDED FOR USE WITH ON-GRADE INLETS (NOT A LOW POINT) TO TRAP SEDIMENT.
2. DO NOT INSTALL ON INLETS WHERE THE ROCK SOCKS WOULD EXTEND INTO AN ACTIVE TRAVEL LANE.
3. ROCK SOCKS MAY BE USED ON PAVED OR UNPAVED SURFACES.
4. MAXIMUM ROCK SOCK DIAMETER 4" TO 6".
5. MINIMUM OF 2 CURB ROCK SOCKS.

Revised 2018

Figure 3.11 Organic Filter Tube On-Grade Curb Inlet Protection General Notes

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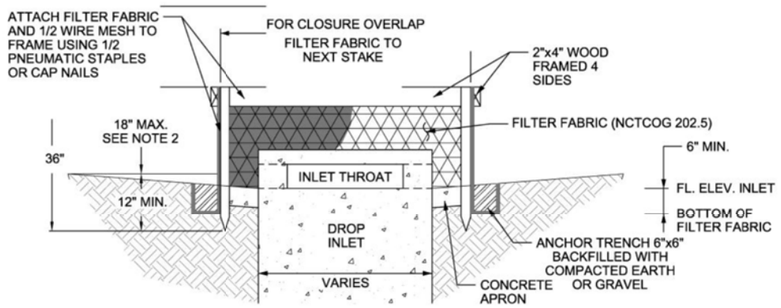
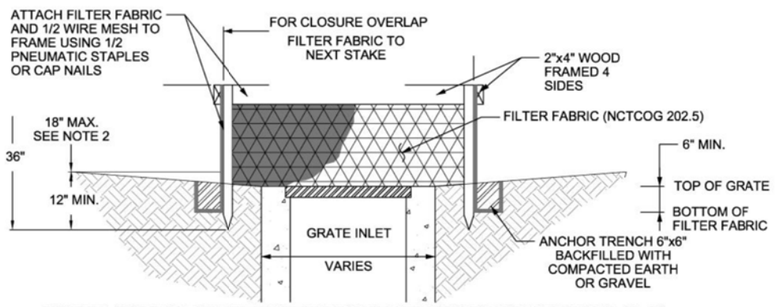
STD5-0C9-2579.001
COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
SHEET NO. 311 OF 345
DWG NO. 0C9-2579
CONTRACT NO. C-2033270-01



FILTER FABRIC DROP INLET PROTECTION CROSS SECTION (A-A)

N.T.S.



FILTER FABRIC GRATE INLET PROTECTION CROSS SECTION (A-A)

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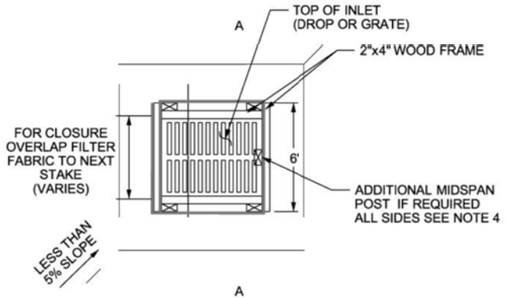

NOTE:
1. STAKES SHALL CONFORM TO SPECIFICATIONS SECTION 202.5.2.2
2. HEIGHT OF INLET PROTECTION SURROUNDING THE INLET SHALL BE SHOWN ON THE PLANS AND MUST BE CHECKED TO VERIFY PONDING WATER WILL NOT CAUSE FLOODING OF PROPERTY OR DAMAGE.
3. CONCENTRATED DITCH FLOW COMING FROM ONE OR MORE SIDES TOWARD THE INLET MAY REQUIRE A STONE OVERFLOW STRUCTURE TO BE CONSTRUCTED ON ONE SIDE OF THE INLET.
4. POST SHALL BE INSTALLED AT EACH CORNER AND BETWEEN CORNERS IF THE DISTANCE IS GREATER THAN 6' BETWEEN CORNER POSTS.

AREA INLET PROTECTION FILTER BARRIER PLAN VIEW

N.T.S.

Revised 2019

31-JUL-2023 09:48
STD5-0C9-2580.001

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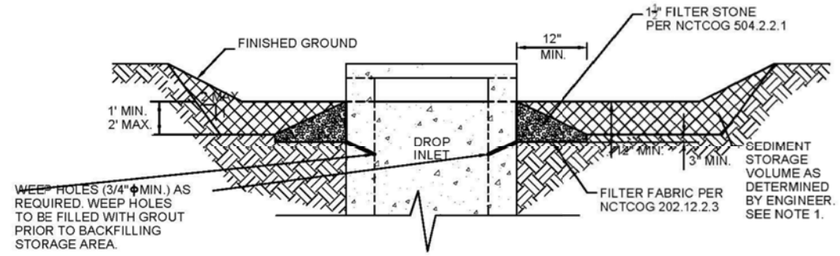
Figure 3.12 Schematics of Filter Fabric Area Inlet Protection
(Source: City of Plano BMP SP-4)



EXCAVATED INLET PROTECTION "Y" INLET SECTION A-A

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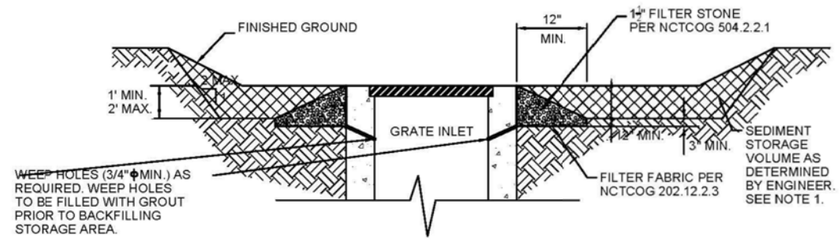

EXCAVATED INLET PROTECTION GRATE INLET SECTION A-A

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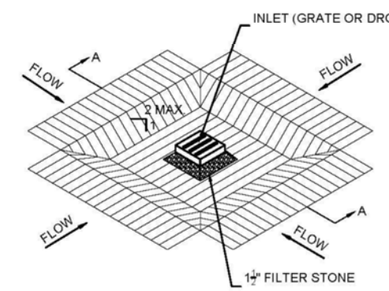


NOTE:
1. STORAGE VOLUME SHALL BE DESIGN STORM VOLUME OR 3,600 CUBIC FEET PER ACRE DISTURBED.
2. CONCENTRATED DITCH FLOW COMING FROM ONE OR MORE SIDES TOWARD THE INLET MAY REQUIRE A STONE OVERFLOW STRUCTURE TO BE CONSTRUCTED ON ONE SIDE OF THE INLET.

EXCAVATED INLET PROTECTION PLAN VIEW

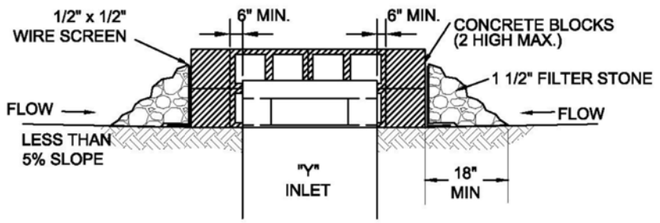
N.T.S.

Revised 2019

Figure 3.13 Schematics of Excavated Impoundment Area Inlet Protection

STD5-0C9-2580.001

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
SHEET NO. 312 OF 345
DWG NO. 0C9-2580
CONTRACT NO. C-2033270-01



BLOCK AND GRAVEL "Y" INLET PROTECTION CROSS SECTION
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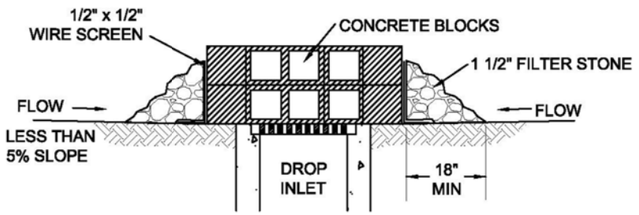

BLOCK AND GRAVEL DROP INLET PROTECTION CROSS SECTION
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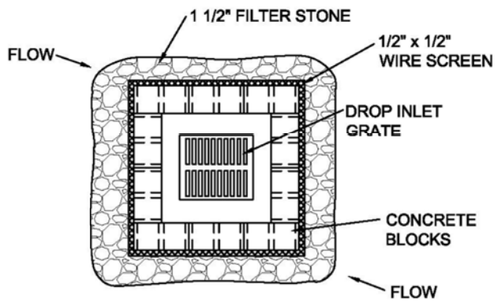

BLOCK AND GRAVEL AREA INLET PROTECTION PLAN VIEW
N.T.S.

Figure 3.14 Schematics of Block and Gravel Area Inlet Protection
(Source: Modified from City of Plano BMP SP-4)

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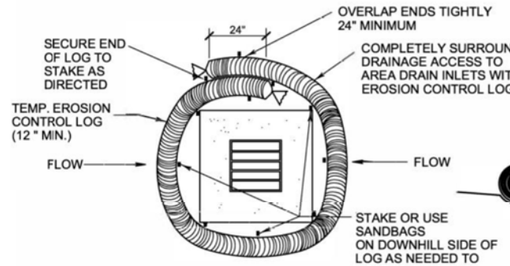
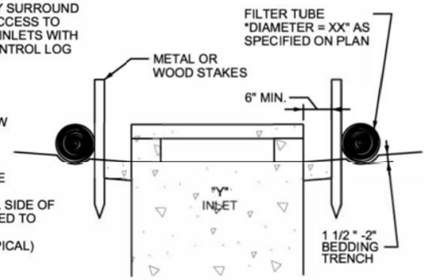
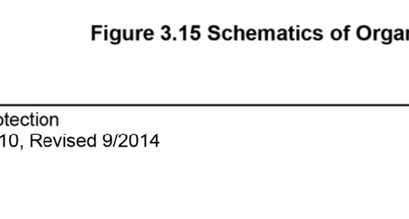


FILTER TUBE AREA
INLET PROTECTION PLAN VIEW
N.T.S.

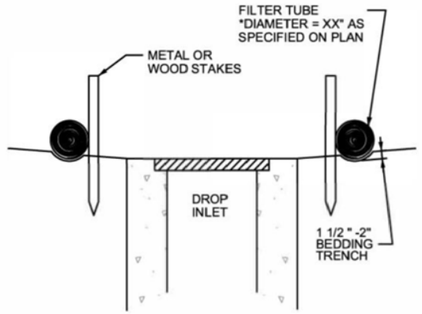


FILTER TUBE "Y" INLET
PROTECTION CROSS SECTION
N.T.S.



NOTE: COMPACT EXCAVATED
SOIL TO PREVENT
UNDERCUTTING.

EMBEDMENT EXAMPLE
FOR FILTER TUBE
N.T.S.



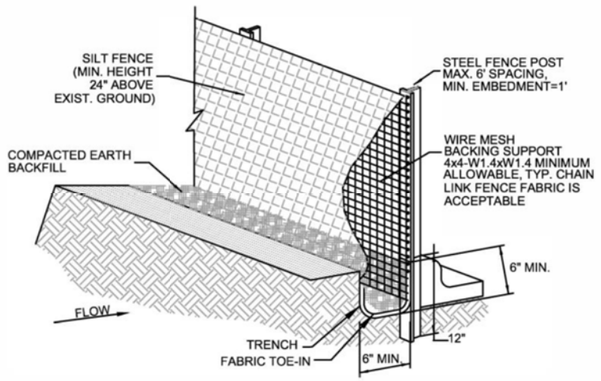
FILTER TUBE DROP INLET
PROTECTION CROSS SECTION
N.T.S.

NOTE: SEE NCTCOG STANDARD SPECIFICATIONS (2017), SECTION 202.18

Revised 2018

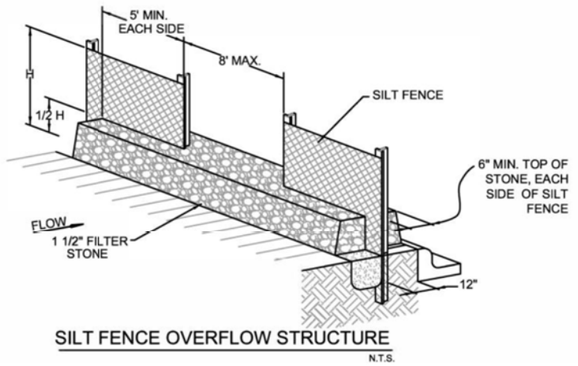
Figure 3.15 Schematics of Organic Filter Tube Area Inlet Protection

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
SHEET NO. 313 OF 345
DWG NO. 0C9-2581
CONTRACT NO. C-2033270-01
STD5-0C9-2581.001



ISOMETRIC PLAN VIEW

N.T.S.



SILT FENCE OVERFLOW STRUCTURE

N.T.S.

Revised 2018

Figure 3.30 Schematics of Silt Fence

SILT FENCE GENERAL NOTES:

1. DESIGN SHALL SHOW ON THE DRAWINGS THE LOCATIONS WHERE OVERFLOW STRUCTURES SHALL BE INSTALLED. OVERFLOW STRUCTURES ARE REQUIRED AT ALL LOW POINTS AND AT A SPACING OF APPROXIMATELY 300 FEET WHERE NO LOW POINT IS APPARENT.

2. DESIGNER SHALL SHOW ON THE DRAWINGS THE LOCATIONS WHERE SILT FENCE IS TO BE TURNED UPSLOPE AT THE ENDS. UPSLOPE LENGTHS SHALL BE A MINIMUM OF 10 FEET.

3. POST WHICH SUPPORT THE SILT FENCE SHALL BE INSTALLED ON A SLIGHT ANGLE TOWARD THE ANTICIPATED RUNOFF SOURCE. POST MUST BE EMBEDDED A MINIMUM OF ONE FOOT.

4. THE TOE OF THE SILT FENCE SHALL BE TRENCHED IN WITH A SPADE OR MECHANICAL TRENCHER, SO THAT THE DOWNSLOPE FACE OF THE TRENCH IS FLAT AND PERPENDICULAR TO THE LINE OF FLOW.

5. THE TRENCH MUST BE A MINIMUM OF 6 INCHES DEEP AND 6 INCHES WIDE TO ALLOW FOR THE SILT FENCE FABRIC TO BE LAID IN THE GROUND AND BACKFILLED WITH COMPACTED MATERIAL.

6. SILT FENCE SHOULD BE SECURELY FASTENED TO EACH SUPPORT POST OR TO WIRE BACKING, WHICH IN TURN IS ATTACHED TO THE FENCE POST. THERE SHALL BE A 3 FOOT OVERLAP, SECURELY FASTENED WHERE ENDS OF FABRIC MEET.

7. INSPECTION SHALL BE AS SPECIFIED IN THE SWPPP. REPAIR OR REPLACEMENT SHALL BE MADE PROMPTLY AS NEEDED.

8. SILT FENCE SHALL BE REMOVED WHEN FINAL STABILIZATION IS ACHIEVED OR ANOTHER EROSION OR SEDIMENT CONTROL DEVICE IS EMPLOYED.

9. ACCUMULATED SILT SHALL BE REMOVED WHEN IT REACHES A DEPTH OF HALF THE HEIGHT OF THE FENCE. THE SILT SHALL BE DISPOSED OF AT AN APPROVED SITE AND IN SUCH A MANNER AS TO NOT CONTRIBUTE TO ADDITIONAL SILTATION.

10. SEE NCTCOG STANDARD SPECIFICATIONS (2017), SECTION 202.5

Revised 2018

Figure 3.31 Silt Fence General Notes

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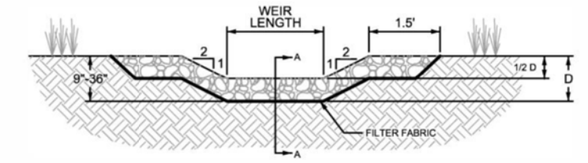
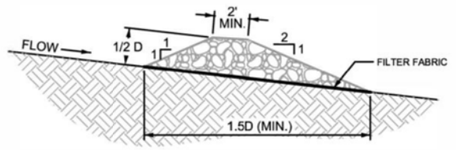
COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
SHEET NO. 314 OF 345
DWG NO. OC9-2582
CONTRACT NO. C-2033270-01
STD5-OC9-2582.001



ROCK CHECK DAM VIEW LOOKING UPSTREAM

N.T.S.



CROSS SECTION A-A

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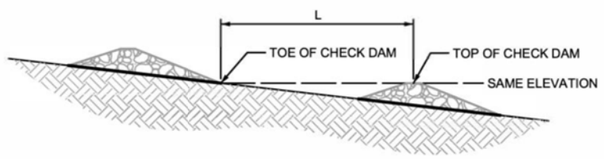

SPACE BETWEEN ROCK CHECK DAMS

N.T.S.

NOTES:
ACTUAL DIMENSIONS OF THE CHECK DAMS SHALL BE DESIGNED BASED ON FLOW CONDITIONS IN THE DRAINAGE SWALE OR DITCH. PROVIDE CALCULATIONS THAT DOCUMENT THE FOLLOWING PARAMETERS USED TO DESIGN THE CHECK DAM.

-HEIGHT OF CHECK DAMS (D) BASED ON SWALE OR DITCH DIMENSIONS AND FLOW CONDITIONS

-SPACING OF CHECK DAMS BASED ON GRADE OF THE SWALE OR DITCH. TOP OF DOWNSTREAM DAM SHALL BE AT THE SAME ELEVATION AS TOE OF UPSTREAM DAM

Revised 2019

Figure 2.1 Schematics of Rock Check Dams
(Source: Modified from Stormwater Management Manual for Western Washington)

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ROCK CHECK DAM GENERAL NOTES:

1. SEE NCTCOG STANDARD SPECIFICATIONS (2017), SECTION 202.9 CHECK DAM (ROCK).

2. STONE SHALL BE WELL GRADED WITH SIZE RANGE FROM 1 1/2 TO 3 1/2 INCHES IN DIAMETER DEPENDING ON EXPECTED FLOWS.

3. THE CHECK DAM SHALL BE INSPECTED AS SPECIFIED IN THE SWPPP AND SHALL BE REPLACED WHEN THE STRUCTURE CEASES TO FUNCTION AS INTENDED DUE TO SILT ACCUMULATION AMONG THE ROCKS, WASHOUT, CONSTRUCTION TRAFFIC DAMAGE, ETC.

4. WHEN SILT REACHES A DEPTH EQUAL TO ONE-THIRD OF THE HEIGHT OF THE CHECK DAM OR ONE FOOT, WHICHEVER IS LESS, THE SILT SHALL BE REMOVED AND DISPOSED OF PROPERLY.

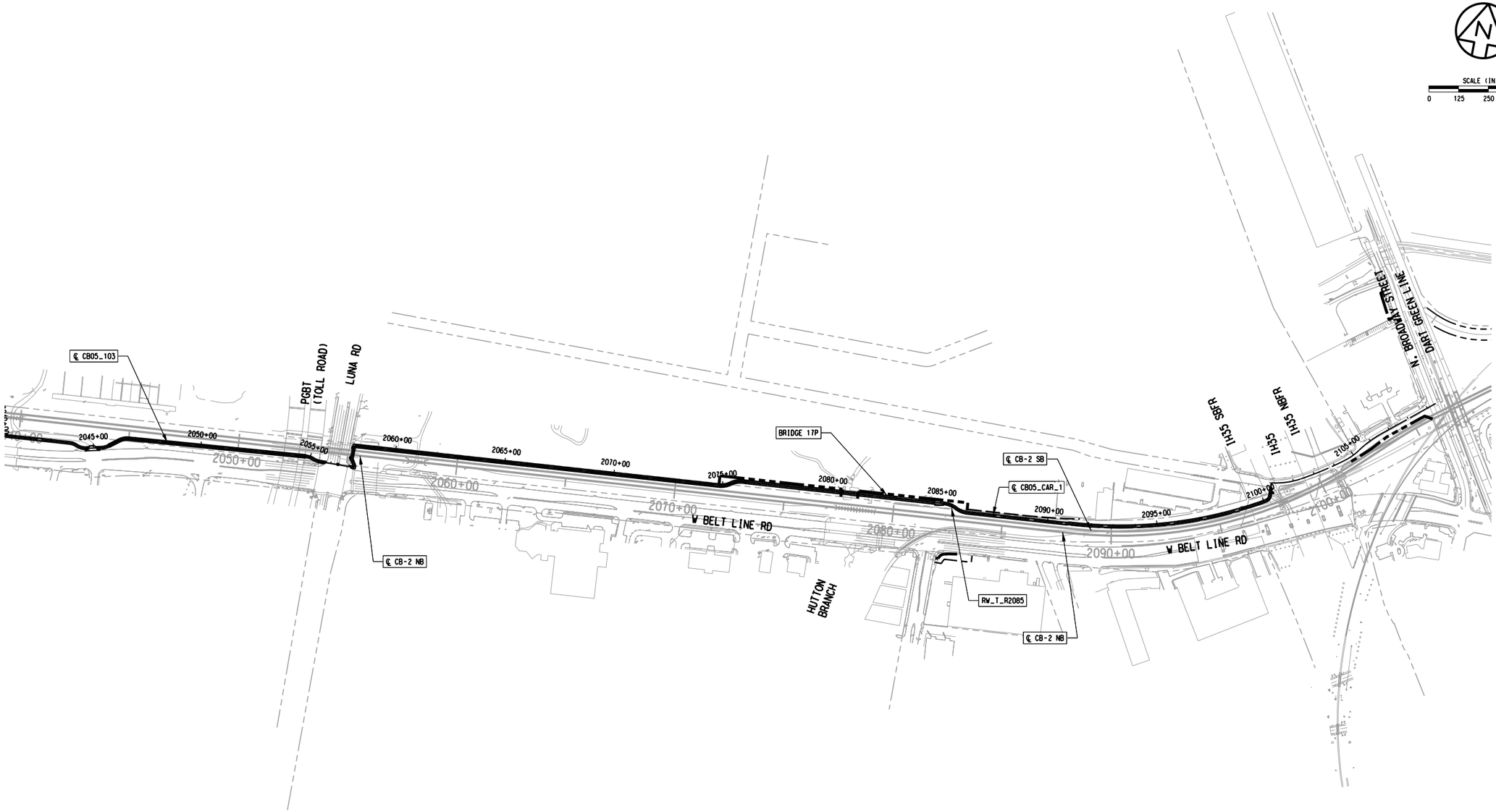
5. WHEN THE SITE HAS ACHIEVED FINAL STABILIZATION OR ANOTHER EROSION OR SEDIMENT CONTROL DEVICE IS EMPLOYED, THE CHECK DAM AND ACCUMULATED SILT SHALL BE REMOVED AND DISPOSED OF IN AN APPROVED MANNER.

Revised 2019

Figure 2.2 Rock Check Dams Schematic General Notes
(Source: Modified from Stormwater Management Manual for Western Washington)

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
SHEET NO. 315 OF 345
DWG NO. 0C9-2583
CONTRACT NO. C-2033270-01
STD5-0C9-2583.001

DWG No. CC4-9128



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DESIGNED	L. WEAVER
CHECKED	R. BAUM
IN CHARGE	J. FINKE
DATE	07 AUG 23

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COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
CITY OF CARROLLTON
RETAINING WALL
KEY MAP
SHEET 1 OF 2

CONTRACT	DWG No.	REV
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CB05-CC4-9128.250

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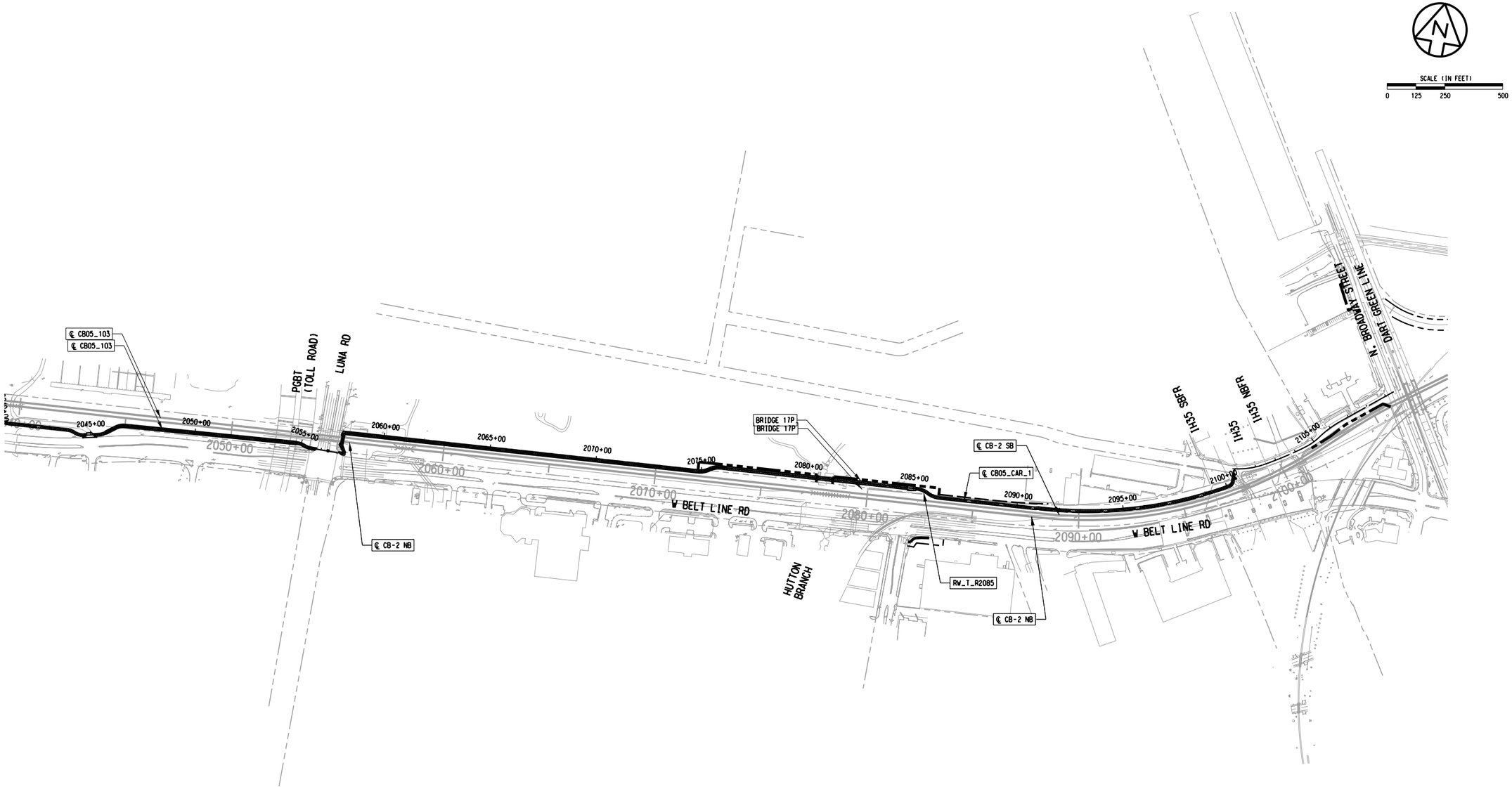
DWG No. CC4-9127



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VELOWEB HIKE & BIKE TRAIL
CITY OF CARROLLTON
RETAINING WALL
KEY MAP
SHEET 2 OF 2

CONTRACT	DWG No.	REV
C-2033270-01	CC4-9127	D

CB05-CC4-9127.200

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DWG No. SC1-2080

Chain RW_T_L2244 contains:
2701 2702

Beginning chain RW_T_L2244 description

Point 2701 N 7,037,217.2673 E 2,469,088.9464 Sta 9+49.08

Course from 2701 to 2702 S 78° 13' 43.92" E Dist 900.9259

Point 2702 N 7,037,033.4758 E 2,469,970.9261 Sta 18+50.00

Ending chain RW_T_L2244 description

Chain RW_T_L2261 contains:
2654 2655

Beginning chain RW_T_L2261 description

Point 2654 N 7,036,841.9799 E 2,470,897.2309 Sta 9+50.02

Course from 2654 to 2655 S 78° 13' 43.92" E Dist 616.6122

Point 2655 N 7,036,716.1893 E 2,471,500.8759 Sta 15+66.63

Ending chain RW_T_L2261 description

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VELOWEB HIKE & BIKE TRAIL
CITY OF CARROLLTON
RETAINING WALL
HORIZONTAL ALIGNMENT DATA
SHEET 1 OF 2

CONTRACT	DWG No.	REV
C-2033270-01	SC1-2080	D

CB05-SC1-2080.040

DWG No. SC1-2081

Chain RW_T_R2085

Chain RW_T_R2085 contains:
133 134 135 136

Beginning chain RW_T_R2085 description
==========

Point 133 N 7,034,208.3507 E 2,454,630.5865 Sta 10+00.00

Course from 133 to 134 N 85° 38' 16.16" E Dist 19.5000

Point 134 N 7,034,209.8339 E 2,454,650.0300 Sta 10+19.50

Course from 134 to 135 N 78° 50' 50.80" E Dist 19.7343

Point 135 N 7,034,213.6509 E 2,454,669.3916 Sta 10+39.23

Course from 135 to 136 N 85° 38' 16.15" E Dist 2.8008

Point 136 N 7,034,213.8640 E 2,454,672.1843 Sta 10+42.04

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VELOWEB HIKE & BIKE TRAIL
CITY OF CARROLLTON
RETAINING WALL
HORIZONAL ALIGNMENT DATA
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CONTRACT	DWG No.	REV
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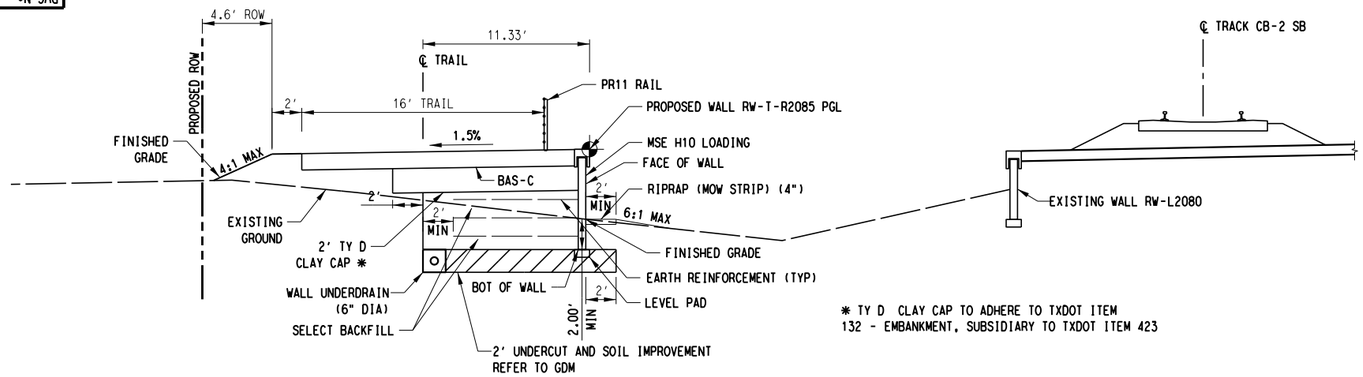

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SC1-2086

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VELOWEB HIKE & BIKE TRAIL
CITY OF CARROLLTON
RETAINING WALL RW_T_R2085
TYPICAL WALL SECTIONS
SHEET 1 OF 2

CONTRACT	DWG No.	REV
C-2033270-01	SC1-2085	D

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VELOWEB HIKE & BIKE TRAIL

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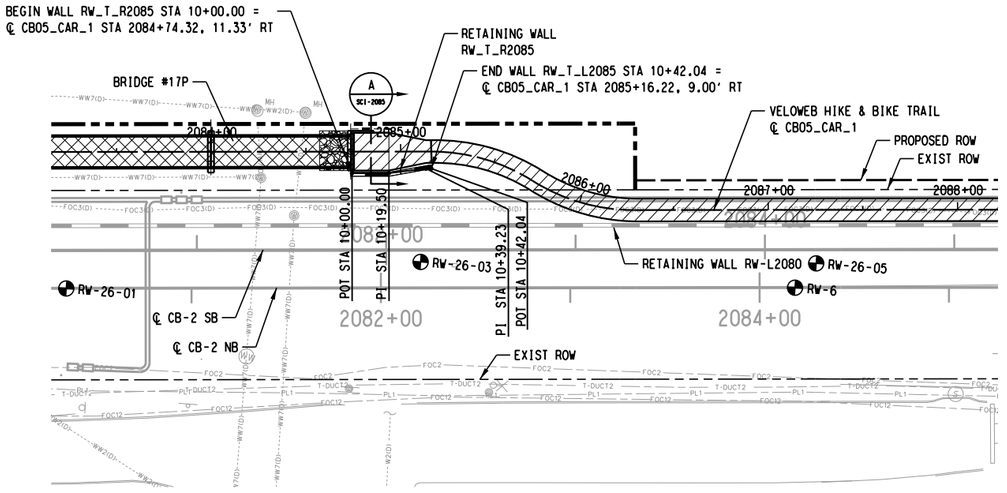

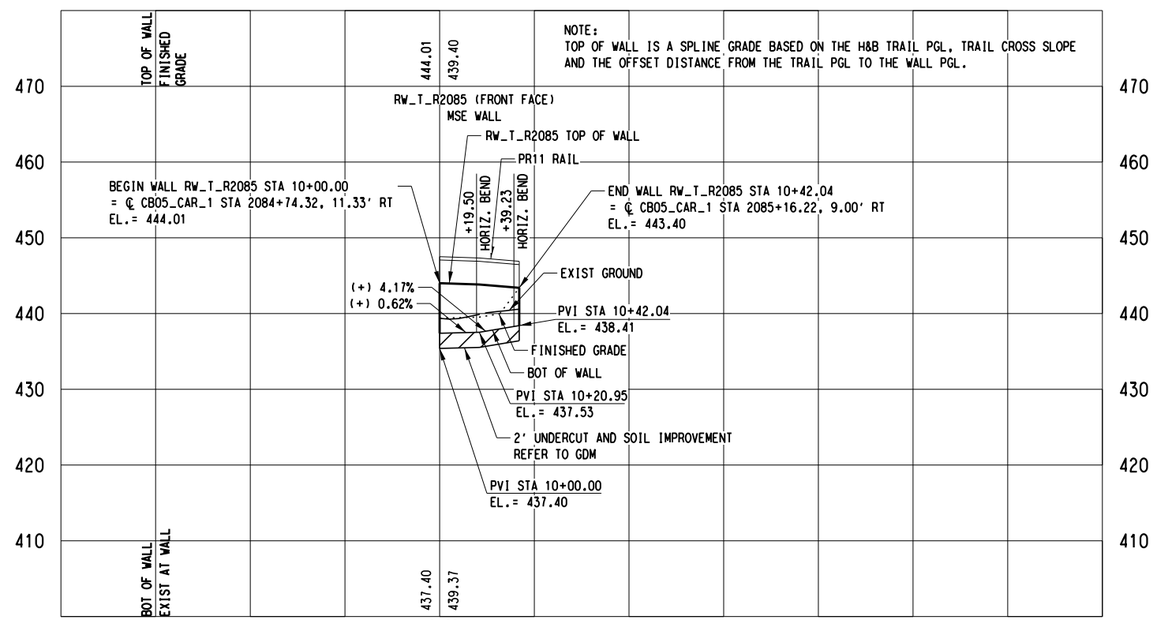

NOTES:

1. SEE TXDOT STANDARDS RW(MSE)DD, RW(MSE)MOD, RW(MSE), RW(EM), RW(TRF) FOR MSE WALL REQUIREMENTS. (CS9-0213, CS9-0214, CS9-0215, CS9-0216, CS9-0217)
2. SEE RETAINING WALL HORIZONTAL ALIGNMENT DATA SHEET (SC1-2081)
3. SEE RIGHT-OF-WAY PLANS FOR EASEMENT AND RIGHT-OF-WAY REQUIREMENTS.
4. SEE UTILITY MODIFICATION SHEETS FOR UTILITY MODIFICATIONS.
5. SEE SURVEY CONTROL SHEETS FOR BENCHMARK LOCATIONS.
6. SEE DRAINAGE PLAN AND PROFILE SHEETS FOR TRAIL DRAINAGE DESIGN.
7. MSE WALL LOADING = H10
8. FOR PED RAIL DETAIL SEE TXDOT STANDARD PR11 (CS9-0211, CS9-0212.
9. FOR DUCT BANK DETAILS REFER TO SYSTEMS SHEETS.
10. FOR BORING LOG INFORMATION, BACKFILL AND DRAINAGE REQUIREMENTS SEE GEOTECHNICAL DESIGN MEMORANDUM (GDM) DART VELOWEB HIKE AND BIKE TRAIL BRIDGE 17P - HUTTON BRANCH
11. SEE SC5-5402 MISC RETAINING WALL DETAILS.
12. MATCH SILVERLINE WALL AESTHETIC PACKAGE UNLESS OTHERWISE INDICATED IN THE PLANS; RECO BUSH HAMMER FINISH TY 1607 PANELS, SMOOTH FINISH COPING.

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CITY OF CARROLLTON
RETAINING WALL RW_T_R2085 LAYOUT
SHEET 2 OF 2

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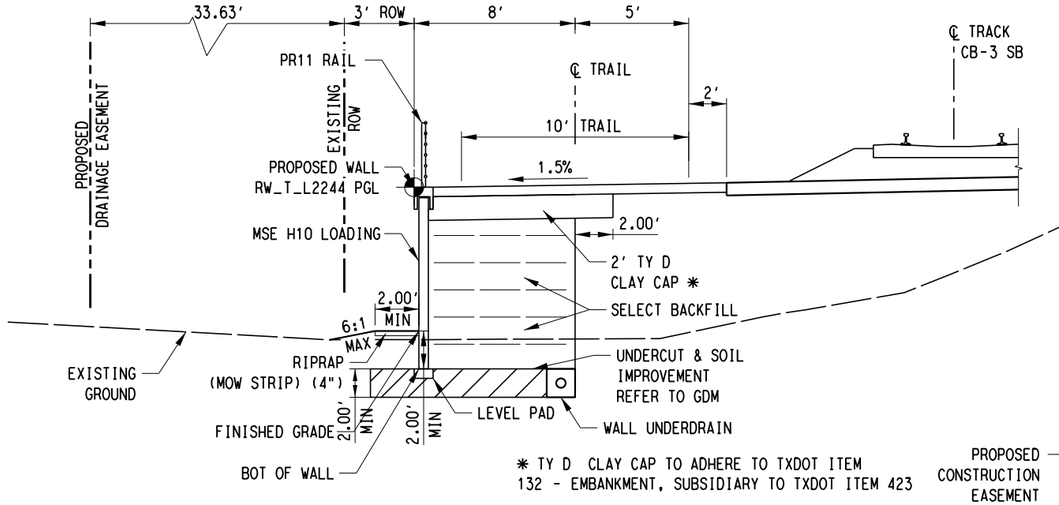
DWG No. SC1-2246



* TY D CLAY CAP TO ADHERE TO TXDOT ITEM 132 - EMBANKMENT, SUBSIDIARY TO TXDOT ITEM 423

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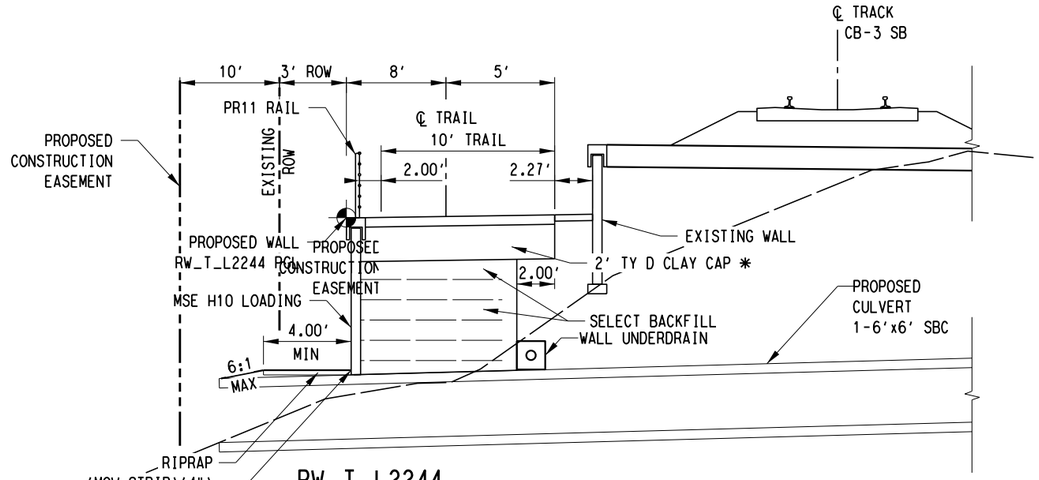

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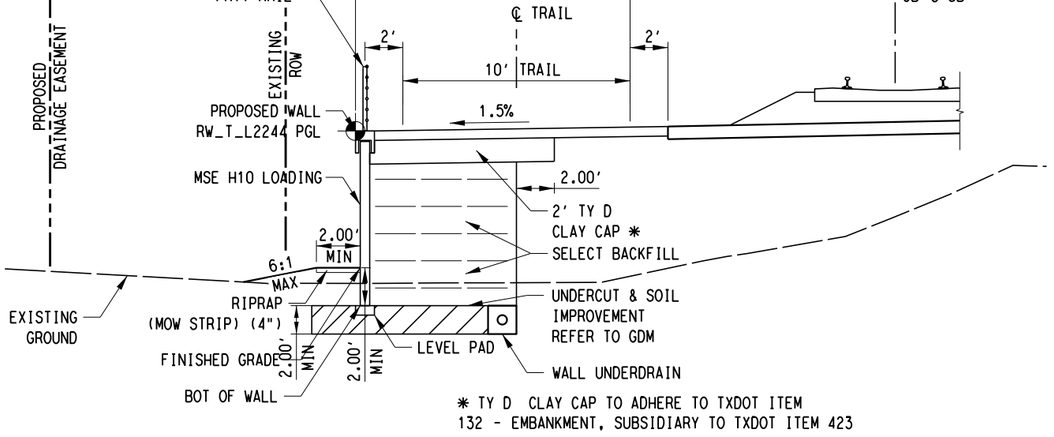

* TY D CLAY CAP TO ADHERE TO TXDOT ITEM 132 - EMBANKMENT, SUBSIDIARY TO TXDOT ITEM 423

RW_T_L2244
SECTION C (C / -)
RW_T_L2244
STA 16+50.00
NO SCALE

NOTES:

1. SEE TXDOT STANDARDS RW(MSE)DD, RW(MSE) AND RW(EM) FOR MSE WALL REQUIREMENTS (CS9-0213, CS9-0214, CS9-0215, CS9-0216).
2. SEE RETAINING WALL HORIZONTAL ALIGNMENT DATA SHEETS (SC1-2080 & SC1-2081).
3. SEE RIGHT-OF-WAY PLANS FOR EASEMENT AND RIGHT-OF-WAY REQUIREMENTS.
4. SEE UTILITY MODIFICATION SHEETS FOR UTILITY MODIFICATIONS.
5. SEE SURVEY CONTROL SHEETS FOR BENCHMARK LOCATIONS.
6. SEE DRAINAGE PLAN AND PROFILE SHEETS FOR TRAIL DRAINAGE DESIGN.
7. MSE WALL LOADING = H10
8. FOR PED RAIL DETAIL SEE TXDOT STANDARD PR11.
9. FOR DUCT BANK DETAILS REFER TO SYSTEMS SHEETS.
10. FOR BORING LOG INFORMATION, BACKFILL AND DRAINAGE REQUIREMENTS SEE GEOTECHNICAL DESIGN MEMORANDUM (GDM) BRIDGE 17P- BOARDWALK.
11. SEE CS9-0217 FOR MISC RETAINING WALL DETAILS.
12. MATCH SILVERLINE WALL AESTHETIC PACKAGE UNLESS OTHERWISE INDICATED IN THE PLANS: RECO BUSH HAMMER FINISH TY 1607 PANELS, SMOOTH FINISH COPING.

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COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

CITY OF CARROLLTON
RETAINING WALL RW_T_L2244
TYPICAL SECTIONS

CONTRACT	DWG No.	REV
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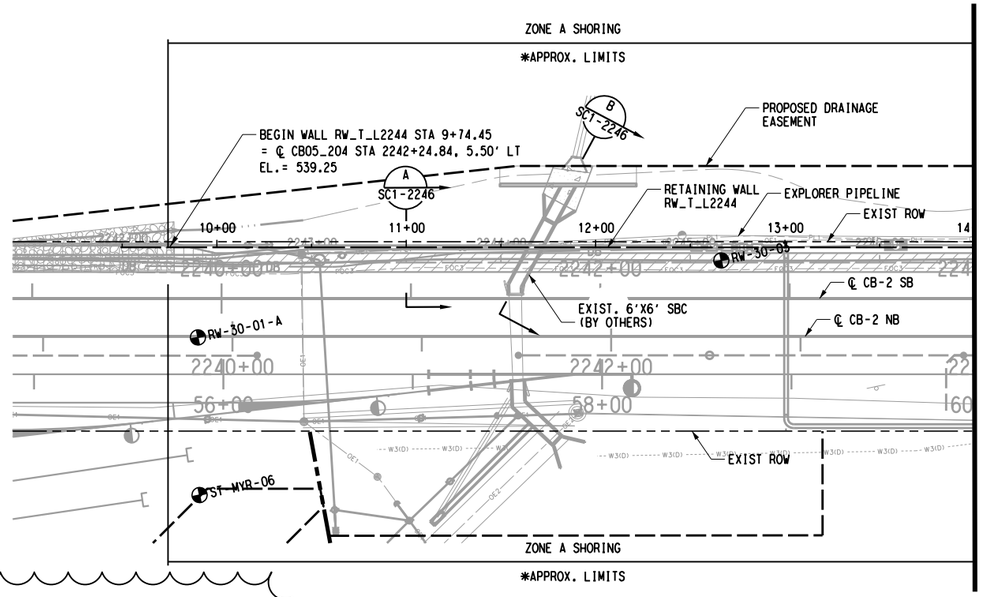
RW Plan 6

DWG No. SC1-2244



WARNING!!! EXPLORER'S HIGH-PRESSURE PETROLEUM PRODUCTS PIPELINE

AT LEAST 48 HOURS BEFORE ANY CONSTRUCTION WITHIN 25 FEET OF EXPLORER'S PIPELINE, CONTACT EXPLORER PIPELINE AT (888) 876-0036

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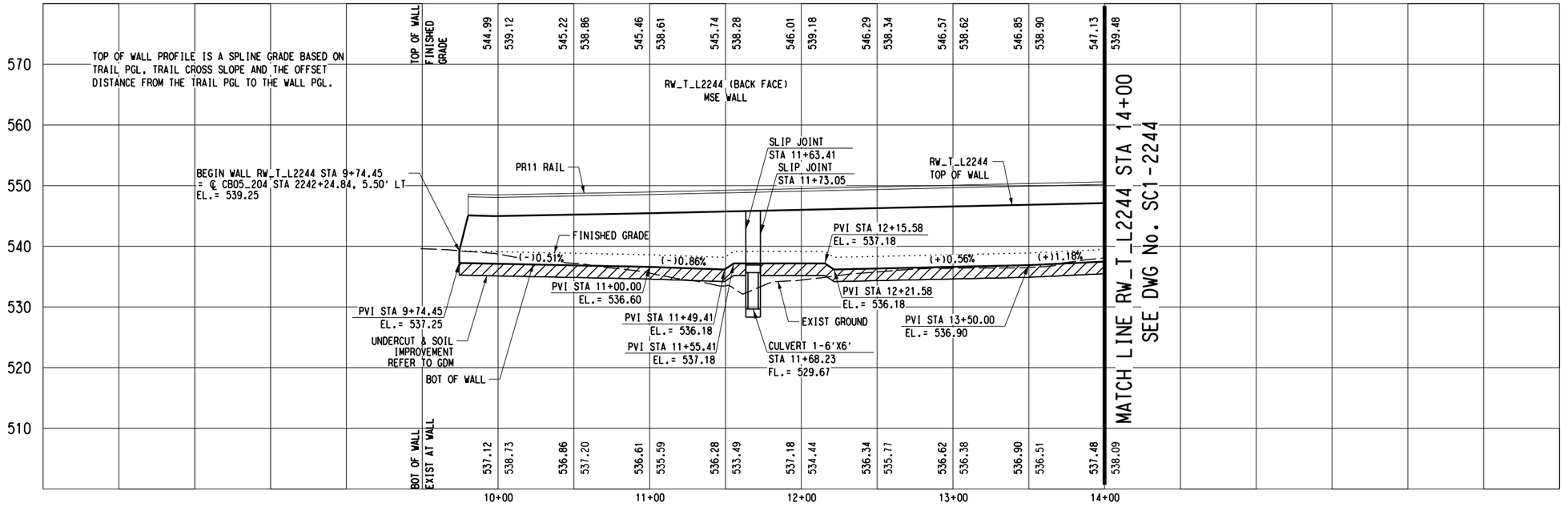

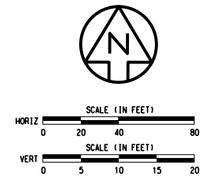

NOTES:

1. SEE TXDOT STANDARDS RW(MSE)DD, RW(MSE), RW(EM), RW(TRF) FOR MSE WALL REQUIREMENTS (CS9-0213, CS9-0214, CS9-0215, CS9-0216 CS9-0217).
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4. SEE UTILITY MODIFICATION SHEETS FOR UTILITY MODIFICATIONS.
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6. SEE DRAINAGE PLAN AND PROFILE SHEETS FOR TRAIL DRAINAGE DESIGN.
7. MSE WALL LOADING = H10
8. FOR PED RAIL DETAIL SEE TXDOT STANDARD PR11.
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11. SEE SC5-5402 FOR MISC RETAINING WALL DETAILS.
12. MATCH SILVERLINE WALL AESTHETIC PACKAGE UNLESS OTHERWISE INDICATED IN THE PLANS: RECO BUSH HAMMER FINISH TY 1607 PANELS, SMOOTH FINISH COPING.

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CONTRACT SHEET No. 323 OF 345

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

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ARCHER WESTERN HERZOG

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DRAWN	W. SHELTON
DESIGNED	J. SHEPHERD
CHECKED	B. ALLDREDGE
IN CHARGE	J. SHEPHERD
DATE	07 AUG 23

CAES

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
CITY OF CARROLLTON
RETAINING WALL RW_T_L2244
LAYOUT
SHEET 1 OF 2

CONTRACT	DWG No.	REV
C-2033270-01	SC1-2244	D

CB05-SC1-2244.040

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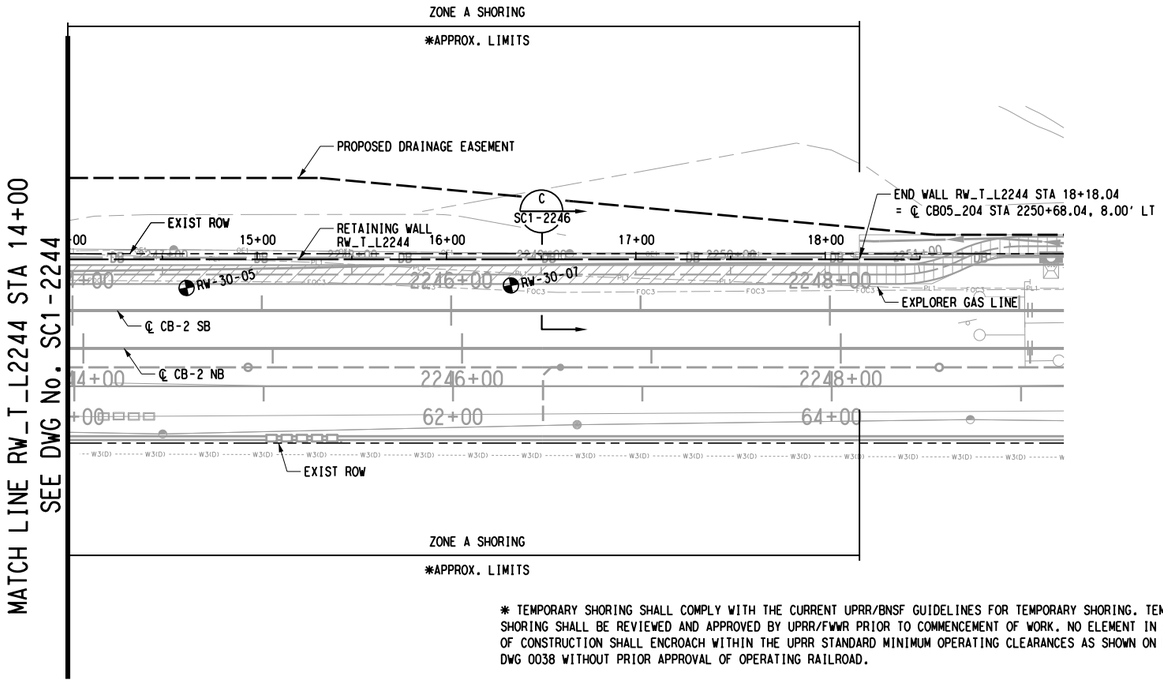
CB05-SC1-2244.040

JEGSVCPW001
RW Plan 6

DWG No. SC1-2245



WARNING!!! EXPLORER'S HIGH-PRESSURE PETROLEUM PRODUCTS PIPELINE

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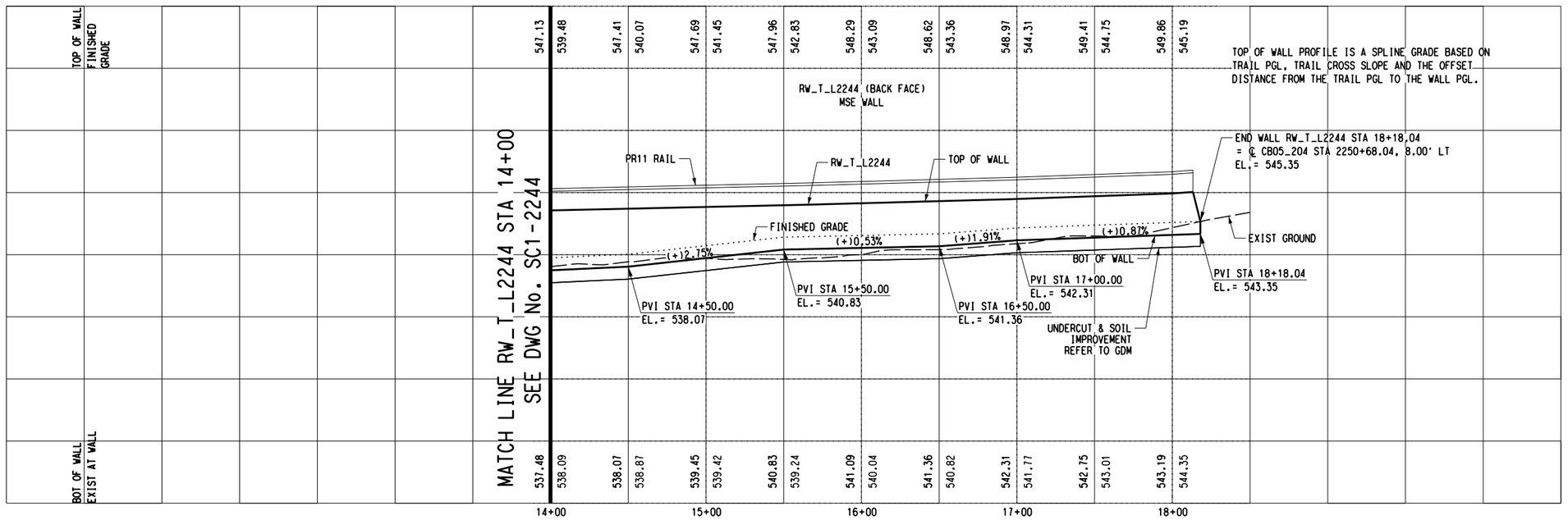

NOTES:

1. SEE TXDOT STANDARDS RW(MSE)DD, RW(MSE), RW(EM), RW(TRF) FOR MSE WALL REQUIREMENTS (CS9-0213, CS9-0214, CS9-0215, CS9-0216 CS9-0217).
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11. SEE SC5-5402 FOR MISC RETAINING WALL DETAILS.
12. MATCH SILVERLINE WALL AESTHETIC PACKAGE UNLESS OTHERWISE INDICATED IN THE PLANS: RECO BUSH HAMMER FINISH TY 1607 PANELS, SMOOTH FINISH COPING.

HORIZ SCALE (IN FEET) 0 20 40 80
VERT SCALE (IN FEET) 0 5 10 15 20

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DESIGNED	J. SHEPHERD
CHECKED	B. ALLDREDGE
IN CHARGE	J. SHEPHERD
DATE	07 AUG 23

CAES

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
CITY OF CARROLLTON
RETAINING WALL RW_T_L2244
LAYOUT
SHEET 2 OF 2

CONTRACT	DWG No.	REV
C-2033270-01	SC1-2245	D

CB05-SC1-2245.040

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CB05-SC1-2245.040

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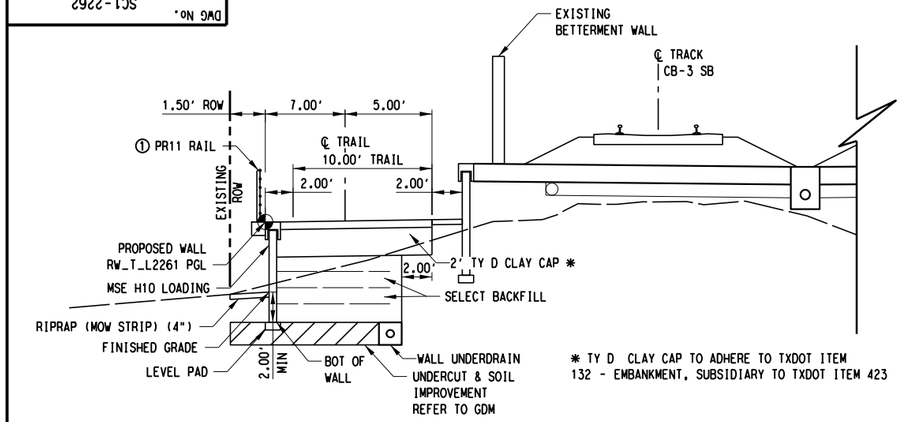
RW Plan 6

DWG No. SC1-2262



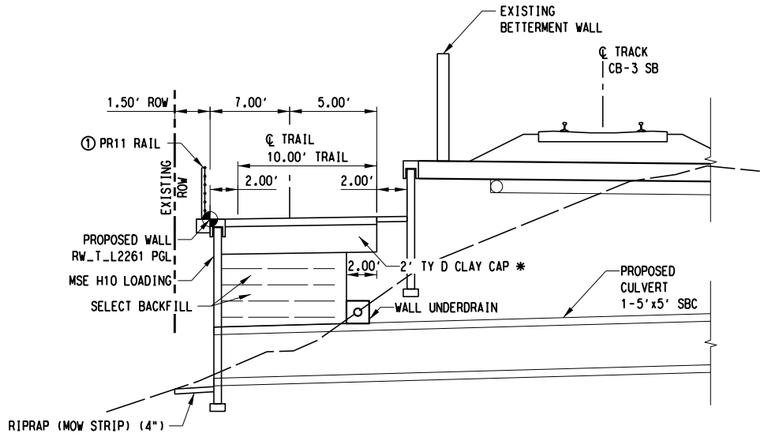
* TY D CLAY CAP TO ADHERE TO TXDOT ITEM 132 - EMBANKMENT, SUBSIDIARY TO TXDOT ITEM 423

RW_T_L2261 SECTION A

RW_T_L2261
STA 11+00.00
NO SCALE

A SC1-2261

① REFERENCE CITY OF CARROLLTON RETAINING WALL COPING DETAIL CB05-SC5-5403.008

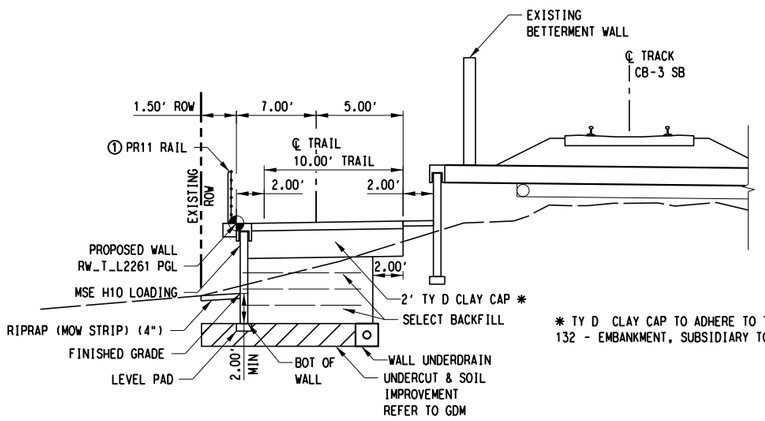


* TY D CLAY CAP TO ADHERE TO TXDOT ITEM 132 - EMBANKMENT, SUBSIDIARY TO TXDOT ITEM 423

RW_T_L2261 SECTION B

RW_T_L2261
STA 12+55.00
NO SCALE

B SC1-2261



* TY D CLAY CAP TO ADHERE TO TXDOT ITEM 132 - EMBANKMENT, SUBSIDIARY TO TXDOT ITEM 423

RW_T_L2261 SECTION C

RW_T_L2261
STA 14+00.00
NO SCALE

C SC1-2261

NOTES:

1. SEE TXDOT STANDARDS RW(MSE)DD, RW(MSE) AND RW(EM) FOR MSE WALL REQUIREMENTS (CS9-0213, CS9-0214, CS9-0215, CS9-0216).
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11. SEE CS9-0217 FOR MISC RETAINING WALL DETAILS.
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DESIGNED	J. SHEPHERD
CHECKED	B. ALLDREDGE
IN CHARGE	J. SHEPHERD
DATE	11 AUG 23

CAES

CONTRACT SHEET No. 325 OF 345

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
CITY OF CARROLLTON
RETAINING WALL RW_T_L2261
TYPICAL WALL SECTIONS

CONTRACT	DWG No.	REV
C-2033270-01	SC1-2262	D

CB05-SC1-2262.040

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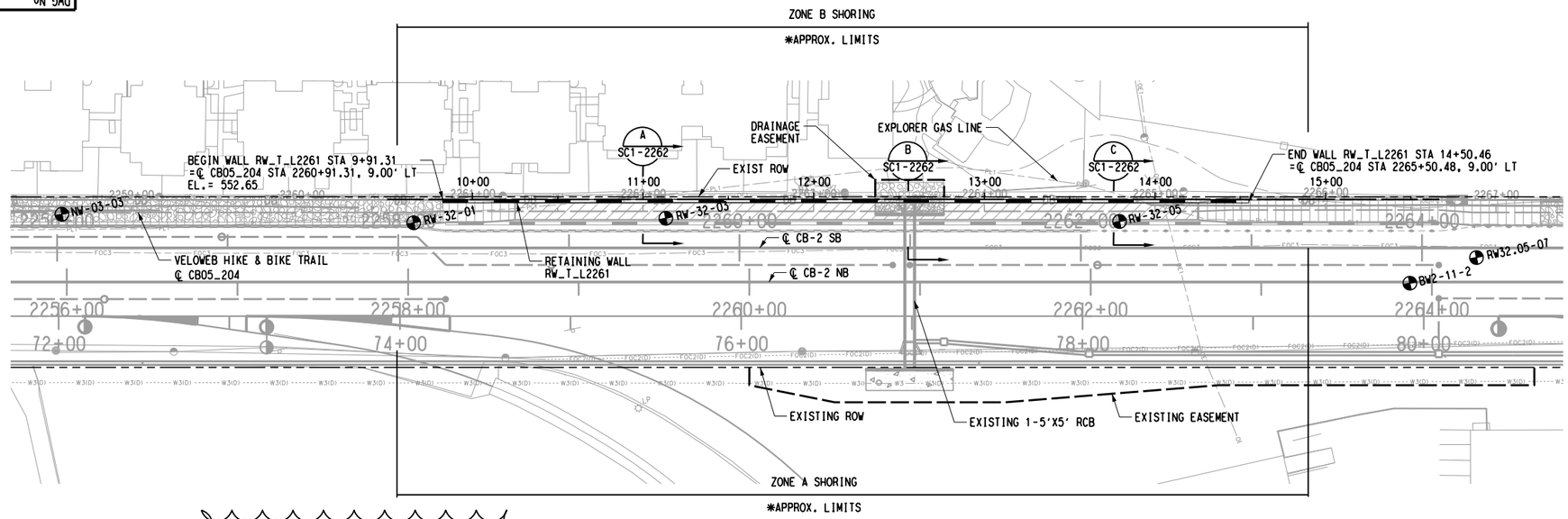
CB05-SC1-2262.040
cjones
RW Plan 3

DWG No. SC1-2261



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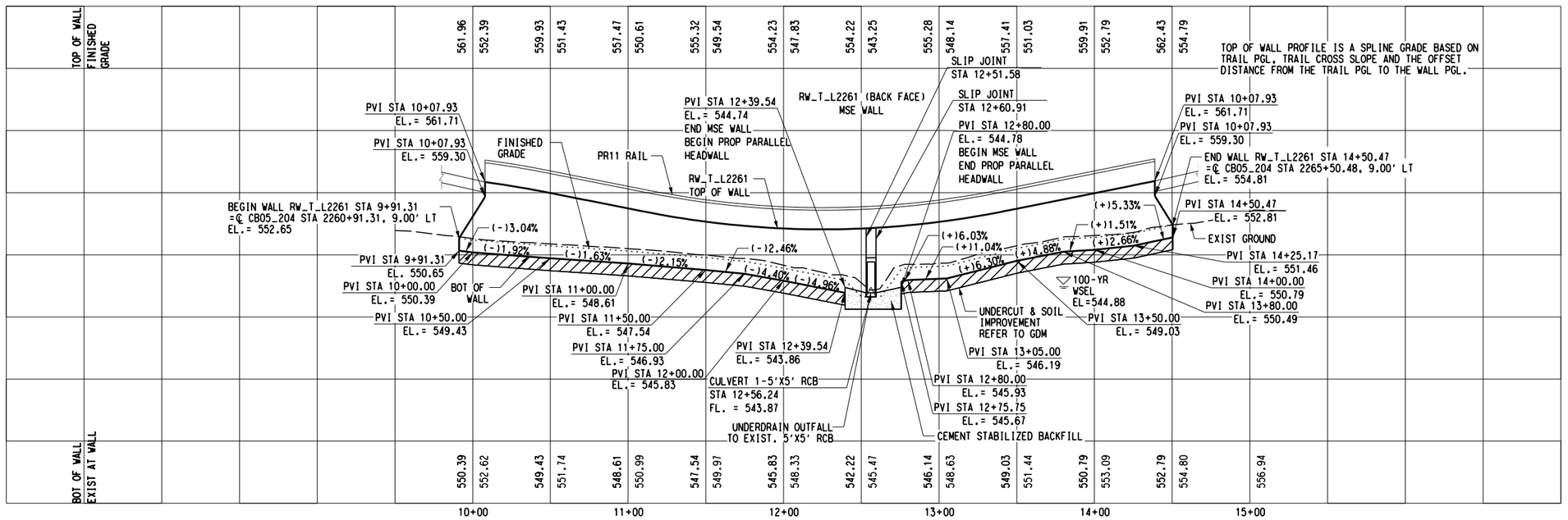

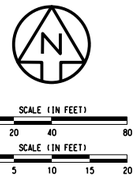

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REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

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DESIGNED	J. SHEPHERD
CHECKED	B. ALLDREDGE
IN CHARGE	J. SHEPHERD
DATE	11 AUG 23

CAES

CONTRACT SHEET No. 326 OF 345

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

CITY OF CARROLLTON
RETAINING WALL RW_T_L2261
LAYOUT

CONTRACT	DWG No.	REV
C-2033270-01	SC1-2261	D

CB05-SC1-2261.040

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CB05-SC1-2261.040
cjones
RW Plan 6

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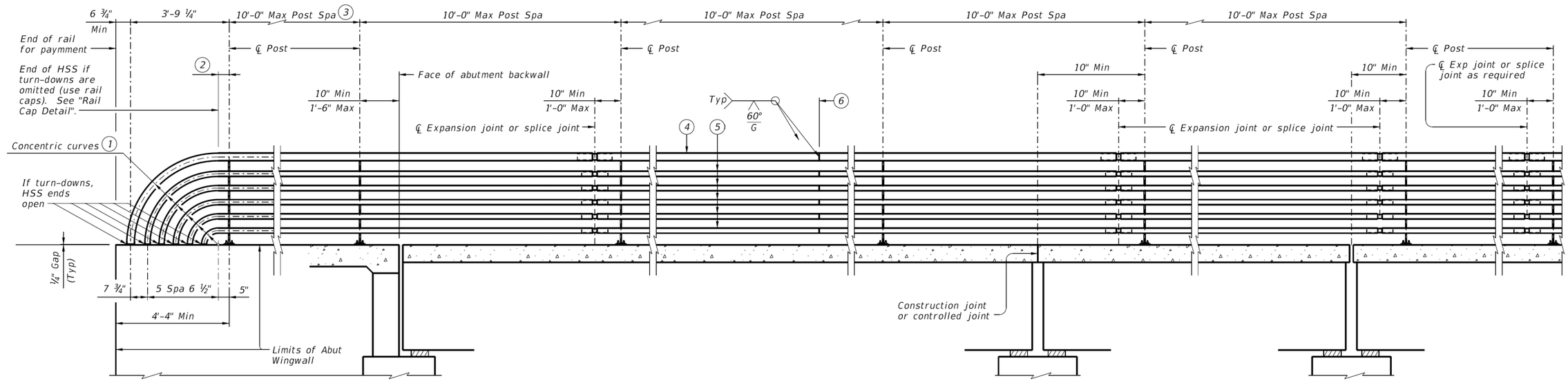
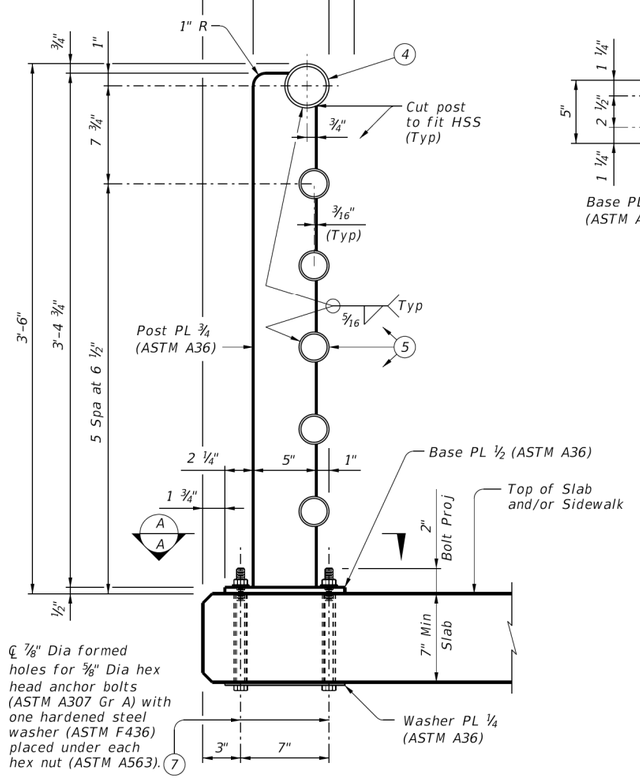


AT ABUTMENTS

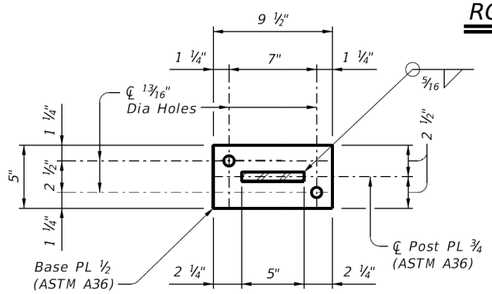
AT BENTS WITHOUT SLAB EXP JOINTS

AT BENTS WITH SLAB EXP JOINTS

ROADWAY ELEVATION OF RAIL

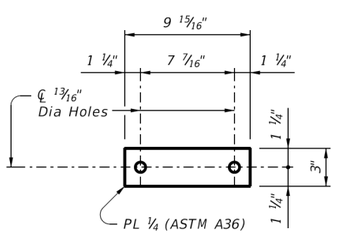


ON BRIDGE SLAB

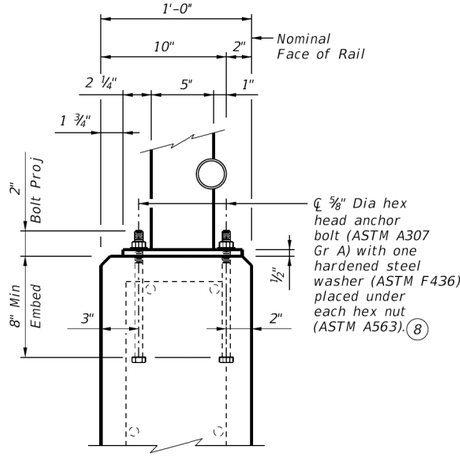


SECTION A-A

Showing base plate detail.

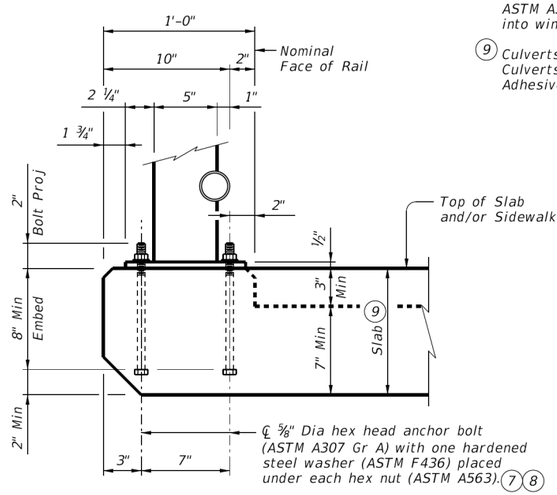


WASHER PLATE DETAIL



ON ABUTMENT WINGWALLS OR CIP RETAINING WALLS

SECTIONS THRU RAIL



ON CULVERTS WITH OR WITHOUT CURBS

Used with 1'-0" Min thick parallel wings on culverts.

(1) Portion of railing with turn-downs to be used or omitted as indicated on Bridge Layout.

(2) 10" Min ~ 1'-6" Max if turn-downs are omitted.

(3) Min of 2 posts required on wingwall.

(4) HSS 3.500 x 0.216 (Rail Member)

(5) HSS 2.375 x 0.154 (Rail Member)

(6) One shop splice per panel is permitted (with minimum 85 percent penetration). The weld may be square groove or single vee groove. Grind smooth.

(7) At Contractor's option, adhesive anchors may be used. Adhesive anchors must be ⅝" Dia ASTM A307 Grade A fully threaded rods. Minimum adhesive anchor embedment depth is 5" into slabs or culverts without curbs. See "Material Notes" for adhesive anchor requirements.

(8) At Contractor's option, adhesive anchors may be used. Adhesive anchors must be ⅝" Dia ASTM A307 Grade A fully threaded rods. Minimum adhesive anchor embedment depth is 7" into wingwalls or culverts with curbs. See "Material Notes" for adhesive anchor requirements.

(9) Culverts without curbs for cast-in-place anchor bolts require a 10" Min slab thickness. Culverts with curbs for cast-in-place anchor bolts require a curb plus slab thickness of 10" Min. Adhesive anchors may be used with a 7" Min slab thickness or culverts with curbs.

Texas Department of Transportation

Bridge Division Standard

PEDESTRIAN RAIL

TYPE PR11

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
SHEET NO. 327 OF 345
DWG NO. CS9-0211
CONTRACT NO. C-2033270-01

FILE: rlstd028-19.dgn	DN: TAR	CK: TBE	DW: JTR	CK: TAR
©TxDOT September 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	DIST	COUNTY		SHEET NO.

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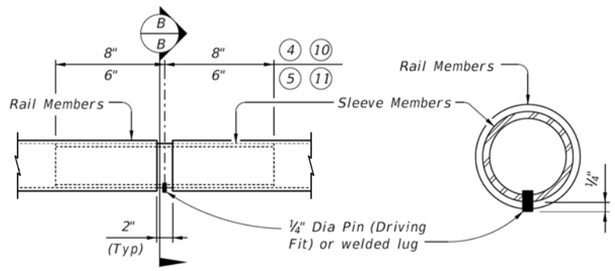
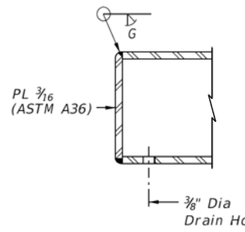


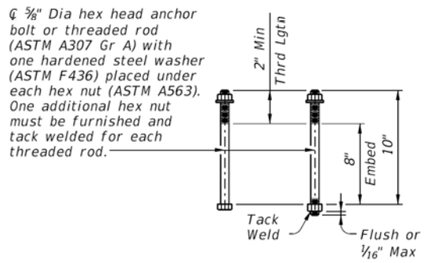
AT SPLICES OR EXP JTS

SECTION B-B

PIPE SPLICE DETAIL



RAIL CAP DETAIL



CAST-IN-PLACE & FORMED HOLE ANCHOR BOLT OPTIONS

4 HSS 3.500 x 0.216 (Rail Member)

5 HSS 2.375 x 0.154 (Rail Member)

10 HSS 2.875 x 0.203 (Sleeve Member)

11 HSS 1.900 x 0.145 (Sleeve Member)

CONSTRUCTION NOTES:

Panel lengths of railing must be attached to a minimum of three posts except at abutment wingwalls.

At the Contractor's option anchor bolts may be an adhesive anchorage system. See "Material Notes".

Test adhesive anchors in accordance with Item 450.3.3, "Tests". Test 3 anchors per 100 anchors installed. Perform corrective measures to provide adequate capacity if any of the tests do not meet the required test load. Repair damage from testing as directed.

Face of rail and posts must be vertical transversely unless otherwise approved. Posts must be perpendicular to adjacent roadway grade. Use Type VIII epoxy mortar under post base plates if gaps larger than 1/16" exist.

For curved railing applications, fabricate the HSS rail to the radius when the radius is 600' or less. Submit shop drawings for approval when tubes are required to be fabricated to a radius. Shop drawings must be submitted to the Engineer for approval.

Round or chamfer all exposed edges of steel components 1/16" by grinding prior to galvanizing.

MATERIAL NOTES:

Provide ASTM A500 Gr B, A1085 or A53 Gr B for all HSS.

Galvanize all metal components of steel rail system. Apply additional coatings when shown elsewhere on the plans. When plans require paint over galvanizing, follow the requirements for painting galvanized steel in Item 445, "Galvanizing" and when field painting, Item 446, "Field Cleaning and Painting Steel". Sleeve members and anchor bolts must receive galvanization prior to installation and only field paint after installation unless directed otherwise by Engineer.

Anchor bolts must be ⅝" Dia ASTM A307 Gr A with one hardened steel washer (ASTM F436) placed under each hex nut or ASTM A307 Gr A threaded rods with one tack welded hex nut each and with one hex nut with one hardened steel washer (ASTM F436) each. Nuts must conform to ASTM A563 requirements.

Optional adhesive anchorage system must be ⅝" Dia ASTM A307 Gr A fully threaded rods with one hex nut and one hardened steel washer (ASTM F436). Nuts must conform to ASTM A563 requirements. Embed fully threaded rods into slab, wingwalls, or culvert curbs using a Type III, Class C, D, E, or F anchor adhesive. Anchor adhesive chosen must be able to achieve a nominal bond strength in tension, Na, of a single anchor of 10 kips (edge distance must be accounted for). Submit signed and sealed calculations or the manufacturer's published literature showing the proposed anchor adhesive's ability to develop this load to the Engineer for approval prior to use. Anchor installation, including hole size, drilling, and clean out, must be in accordance with Item 450, "Railing".

GENERAL NOTES:

Designed according to AASHTO LRFD Specifications.

Do not use this railing on bridges with expansion joints providing more than 5" movement.

Rail anchorage details shown on this standard may require modification for select structure types. See appropriate details elsewhere in plans for these modifications.

For all rails, submit erection drawings showing section lengths, splice locations, rail post spacing and anchor bolt setting for approval.

Average weight of railing is 30 plf.

Texas Department of Transportation

Bridge Division Standard

PEDESTRIAN RAIL

TYPE PR11

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
SHEET NO. 328 OF 345
DWG NO. CS9-0212
CONTRACT NO. C-2033270-01

FILE:	r1std028-19.dgn	DN: TAR	CK: TBE	DW: JTR	CK: TAR
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REVISIONS					
		DIST	COUNTY		SHEET NO.

DATE: 31-JUL-2023 09:53
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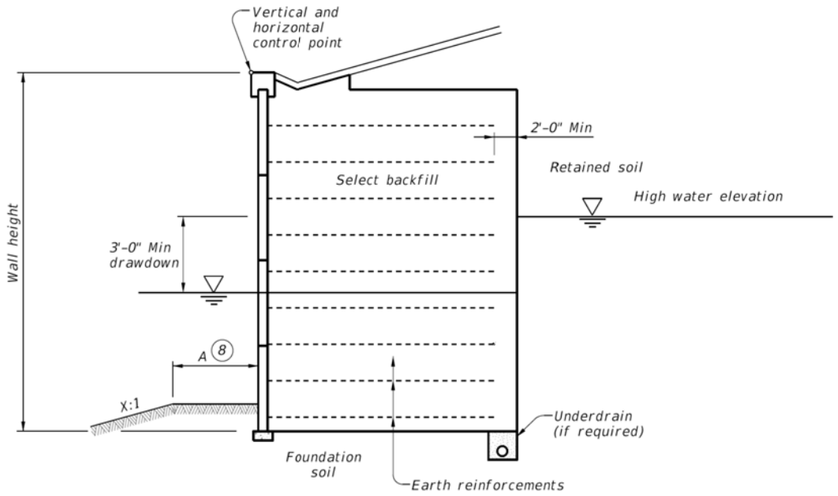
WALL SUMMARY

MSE Retaining Wall	Begin Station (1)	End Station (1)	Retained Soil Friction Angle (2)	Foundation Soil Friction Angle (2)	Ground Improvement (3)	Min Earth Reinf. Length (4)	Min Wall Embedment (5)	Underdrain Required (6)	Drawdown Analysis (7)	Bench Width (8)
RW_T_R2085	10+00.00	10+42.04	26	34	2	8	2	YES	YES	2
RW_T_L2244	9+74.45	18+18.04	26	34	2	11	2	YES	NO	2
RW_T_L2261	9+91.31	14+50.46	26	34	2	11.5	2	YES	NO	2



TYPICAL SECTION
(Rapid drawdown condition.)

(1) Indicate limits for which the stated soil design requirements and assumptions are applicable.

(2) Base the listed retained and foundation friction angle on local experience or measured/correlated long term strength values.

(3) Indicate if ground improvement is required or not required. If shown as required, refer to ground improvement detail(s) shown elsewhere in the plans for additional information.

(4) Indicate on table both the minimum length and length ratio required. The minimum default length of earth reinforcements is either 8 feet or 70% of the wall height, whichever is greater. Wall height and design wall height may differ depending on project geometry and loading conditions. Note: Wall height at bridge abutments is equal to the distance between the top of leveling pad and finished grade at the bridge abutment backwall.

(5) Guidance to wall designer of record for determination of minimum wall embedment. Unless noted elsewhere in the plans, provide a minimum embedment from the top of leveling pad to finish grade of
- 1 foot for level ground where there is no potential for erosion or future excavation, or
- 2 feet for sloping ground (4.0H:1.0V or steeper) or where there is potential for removal of soil in front of the wall.

(6) Indicate if underdrain is required or not required.

(7) Indicate if rapid drawdown analysis is required.

(8) Horizontal bench width at base of wall varies. Use the following criteria to establish base width:
A = 2-foot Min for X > 4 or
A = 4-foot Min for X ≤ 4
Applicable to both drawdown and dry condition.

SPECIAL NOTES:
This sheet is to be filled out by the wall designer of record at time of plan preparation to provide soil strength parameters for the design of the specified walls.
The completed sheet must be signed, sealed, and dated by a licensed Professional Engineer.

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
SHEET NO. 329 OF 345
DWG NO. CS9-0213
CONTRACT NO. C-2033270-01

Texas Department of Transportation | Bridge Division Standard

MECHANICALLY STABILIZED EARTH RETAINING WALL DESIGN DATA

RW(MSE)DD

FILE: RW-MSEDD-22.dgn	DN: TxDOT	CK: RLE	DW: JER	CK: RLE
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REVISIONS				
	DIST	COUNTY		SHEET NO.

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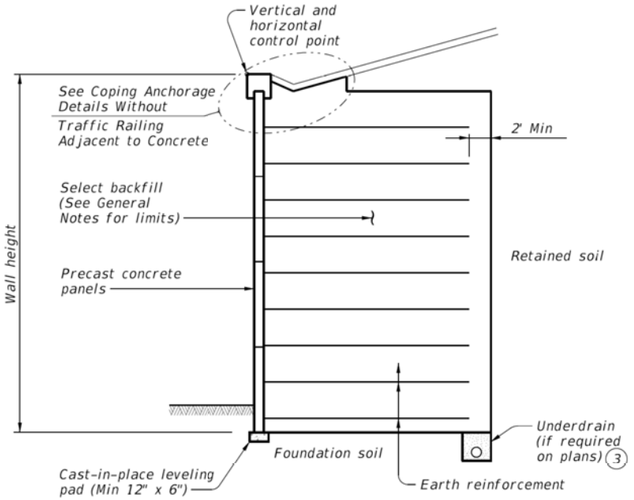
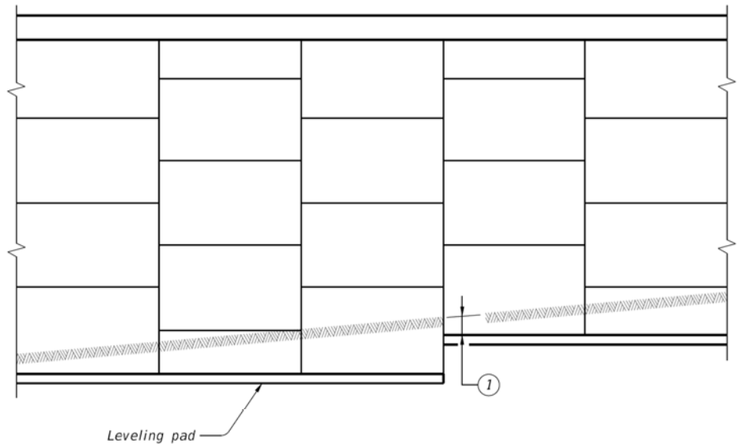


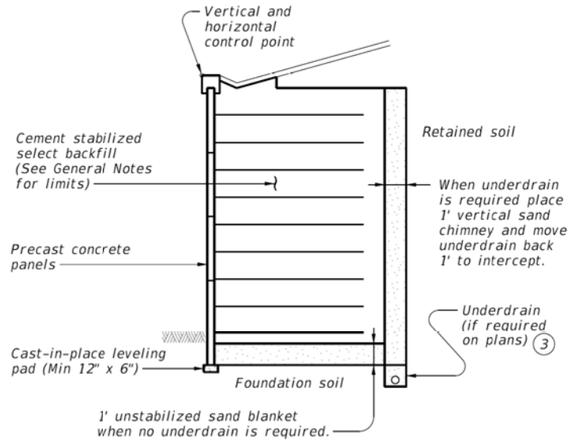
TYPICAL SECTION

(Wall at bottom of slope.)



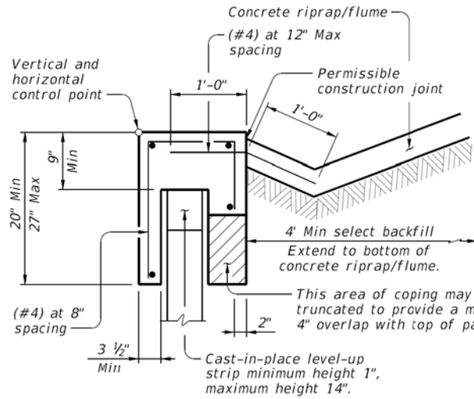
ELEVATION

1. Minimum embedment conforming to values given on the RW(MSE)DD standard.
2. Form map of Texas emblem into a wall panel next to each bridge abutment. Submit the exact location of each emblem to the Engineer for approval. The cost of forming the emblems will not be paid for directly, but is subsidiary to Item 423, "Retaining Walls." Inset the map of Texas a minimum of ¾" into the face of the panel with a smooth finish. Finish the inset area in a contrasting color as approved by the Engineer.
3. Provide underdrain pipe and filter material in accordance with Item 556, "Pipe Underdrains."
4. Anchor precast coping to prevent rotation or displacement. Use these details to develop custom anchorage for precast copings. Provide details that include coping reinforcement. Concrete flume (if required) is paid for separately from Item 423, "Retaining Walls."



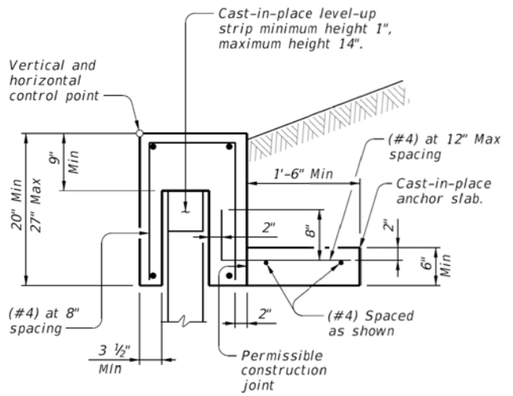
SPECIAL DRAINAGE PROVISIONS

(When cement stabilized backfill is used.)



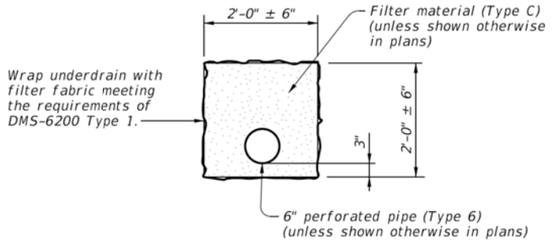
ADJACENT TO CONCRETE

(Excluding concrete pavement)



ADJACENT TO SOIL

COPING ANCHORAGE DETAILS WITHOUT TRAFFIC RAILING 4



UNDERDRAIN DETAIL 3

MAP OF TEXAS EMBLEM 2

IN-PROGRESS REVIEW

THIS DOCUMENT IS RELEASED FOR THE PURPOSE OF REVIEW UNDER THE AUTHORITY OF:

JOHN E. FINKE, P.E., 121220
ON
31-JUL-2023 09:49
JACOBS
TBPE FIRM NO. F-2966

IT IS NOT TO BE USED FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES.

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
SHEET NO. 330 OF 345
DWG NO. CS9-0214
CONTRACT NO. C-2033270-01

Texas Department of Transportation — Bridge Division Standard

MECHANICALLY STABILIZED EARTH RETAINING WALL

RW(MSE)

FILE: RW-MSE-22.dgn	DN: TxDOT	CK: TxDOT	DW: JER	CK: RLE
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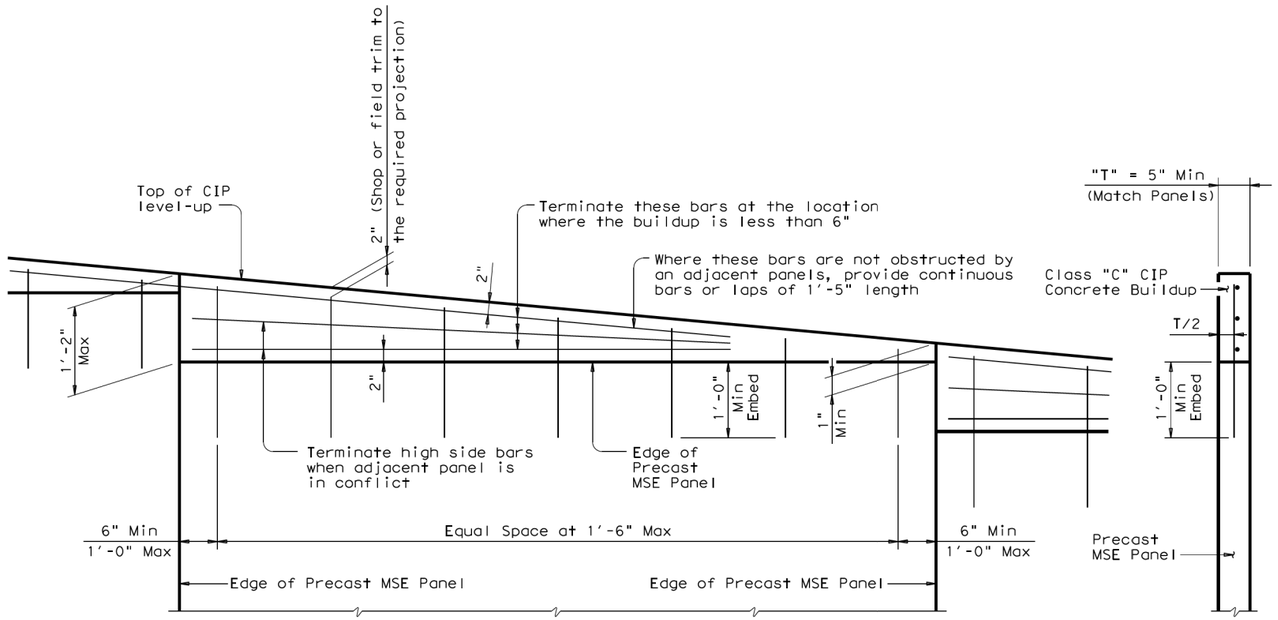


LEVEL UP DETAIL (5)

Provide Grade 60 (#4) Reinforcement

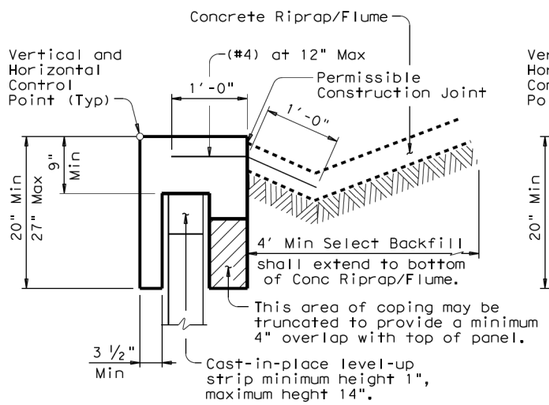
(3) Precast coping shall be anchored to prevent rotation or displacement. Use these details to develop custom anchorage for precast copings. Details shall include coping reinforcement. Concrete flume (if required) shall be paid for separately from Item 423.

(4) Soil design parameter must be based on long term soil strength. Design parameters must be listed on the RW(MSE)DD standard.

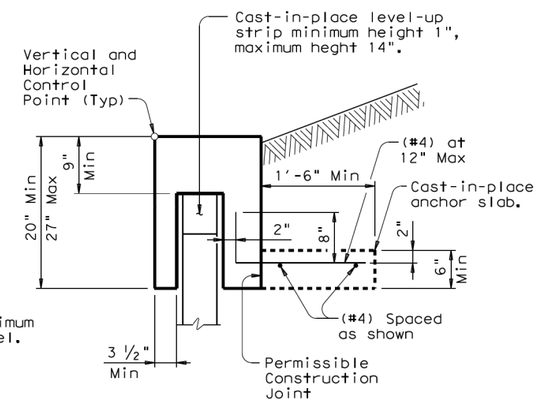
(5) Cast vertical bars into the top of panels. At contractor's option vertical bars may be embedded 4" with a Type III Clac C epoxy anchorage system. Follow manufacturer's directions for installing the epoxied vertical bars.

(6)

SELECT BACKFILL UNIT WEIGHT			
Type AS, BS & DS	Unit Weight	Inernal Stability	External Stability
	105 PCF	Pullout	Sliding, Overturning, Eccentricity
	125 PCF	Rupture	Bearing



ADJACENT TO CONCRETE
(Excluding Concrete Pavement)



ADJACENT TO SOIL

COPING ANCHORAGE DETAILS WITHOUT TRAFFIC RAILING (3)

DESIGN PARAMETERS:

Design of retaining walls shall be based on the following design parameters unless stated elsewhere in the plans:

Retained Soil	Unit Weight = 125 pcf Ø = (4) C = 0 psf
Foundation Soil	Ø = (4) C = 0 psf
Select Backfill	Unit Weight = See Table (6) Ø = 34 C = 0 psf
Cement Stabilized Select Backfill	Unit Weight = 125 pcf Ø = 45 C = 0 psf

Stress in steel and concrete shall be in accordance with current AASHTO Standard and Interim Specifications. The minimum length of earth reinforcements are as shown on the RW(MSE)DD standard.

STABILITY CRITERIA:

Stability criteria applies to both dry and drawdown analysis.
Factor of safety in sliding along the base of the structure shall be greater than or equal to 1.5.
Factor of safety in overturning shall be greater than or equal to 2.0.
The base pressure resultant shall fall within the middle third of the retaining wall.
The factor of safety against pullout of the earth reinforcements shall be greater than or equal to 1.5 at each level. Pullout resistance shall be determined from test data evaluated at ¾ inch strain.

CORROSION CRITERIA:

The earth reinforcement elements shall be designed to have a minimum design life of 75 years, using current AASHTO corrosion rates.
Stress calculations (rupture) shall be done on the calculated earth reinforcement section remaining after 75 years. Pullout calculations may be based on non-corroded section.

PRECAST COPINGS:

Wall supplier is to maximize lengths of precast coping. Precast coping is to be provided in 10' minimum lengths (typical). To optimize coping lengths at radiuses, end of runs or other wall geometric conditions favorable to shorter coping sections, shorter lengths may be used pending approval by the Engineer. This applies only to coping without railing.

JOINT SEALER:

The joints between coping segments must be sealed in accordance with the DMS-6310 "Joint Sealant's and Fillers", joint sealing material, Class 4. The joint must be sealed 3" below and 6" above the adjoining pavement surface, or as directed by the Engineer. The purpose of the joint sealing is to contain surface drainage and prevent infiltration into the retaining wall backfill.

GENERAL NOTES:

Section and elevation shown is for informational purposes only. Specific geometry is to be determined based on wall layouts and other plan information.
The select backfill specified for use within the mechanically stabilized earth volume shall extend horizontally from the back of the panels to a minimum 2' beyond the end of the earth reinforcements. The select backfill shall extend vertically from the top of the leveling pad or 4" below the lowest earth reinforcement, whichever is lower, to the top of panels.
The uppermost earth reinforcements shall be no more than 3.0' below the top of wall.
The lowest level of earth reinforcements shall be no more than 2.0' above the top of the leveling pad.
Minimum wire size for earth reinforcements shall be W7.0. If different longitudinal and cross wires are used in an earth reinforcement mesh, the smaller wire shall have at least 50% of the cross sectional area of the larger wire.
A maximum of four wire mesh configurations (wire sizes) will be allowed on a project. Each mesh configuration shall have a unique transverse bar spacing, differing from other configurations by a minimum of 3". Earth reinforcement lengths shall be stepped in increments no finer than 12".
Standard precast concrete panels shall have a maximum height of 6', and a maximum surface area of 50 sq ft. Top and bottom panels may exceed these limitations as necessary to achieve required wall grades. Maximum height of any panel shall be 7'-6". Minimum panel thickness shall be 5". Panels shall be arranged to provide offset horizontal joints.
An open joint shall be provided around the perimeter of the concrete panels. The joint configuration shall be such that 1) the filter fabric and/or pad materials are not exposed at the wall face and 2) the design opening is between ⅜" and ¾".
A one-piece corner panel shall be provided for wall angle changes of greater than 30 degrees. Butting of chamfered panels will be allowed for angle changes of 30 degrees or less.
Concrete coping shall be provided along the top of wall, at the vertical steps at bridge backwalls, and at other vertical steps along the top of wall. The joints between all coping segments shall be sealed to prevent infiltration of water into the retaining wall backfill. Sealing shall be in accordance with the DMS-6310 "Joint Sealants and Fillers", using Class 4 joint sealant.
When obstructions (inlets, drilled shafts, piling, etc.) prevent placement of soil reinforcements in their normal locations, provide details and calculations that establish support for the affected panels. Furnish the same earth reinforcement coverage as that required in the absence of the obstruction. For skewed (rotated) earth reinforcements no adjustment in length is needed for skew angles between 1 and 10 degrees. For skew angles greater than 10 degrees adjust the length of earth reinforcement to provide a cosine length of the reinforcement equivalent to the stated design length for the section of wall. Provide calculations that justify any alterations made to the soil reinforcements or modifications to their normal placement. Do not use panels without any soil reinforcements connected to them unless they are connected with galvanized hardware to adjacent panels which do have supporting Soil reinforcements attached to them and as approved by the Engineer.
Reinforced concrete must be Class "C", Precast concrete Class "H", Unreinforced concrete Class "A".
All reinforcing steel must be Grade 60.
Coping and anchor slabs are considered subsidiary to the Item "Retaining Wall".
These details are to be used in conjunction with the retaining wall layout, standard RW(MSE)DD and other applicable standards.

Texas Department of Transportation

Bridge Division Standard

MECHANICALLY STABILIZED EARTH RETAINING WALL

RW(MSE)

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
SHEET NO. 232 OF 232
DWG NO. CS9-0215
CONTRACT NO. C-2033270-01

FILE: rwstde01.dgn	DN: TxDOT	CK: TxDOT	DW: JGD	CK: MJG
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REVISIONS 04-11: Added Table & Corrosion Criteria. 01-13: Wall embed, (WS) table, retained fill, soil strength.	DIST	COUNTY		SHEET NO.

STD5-CS9-0215.001

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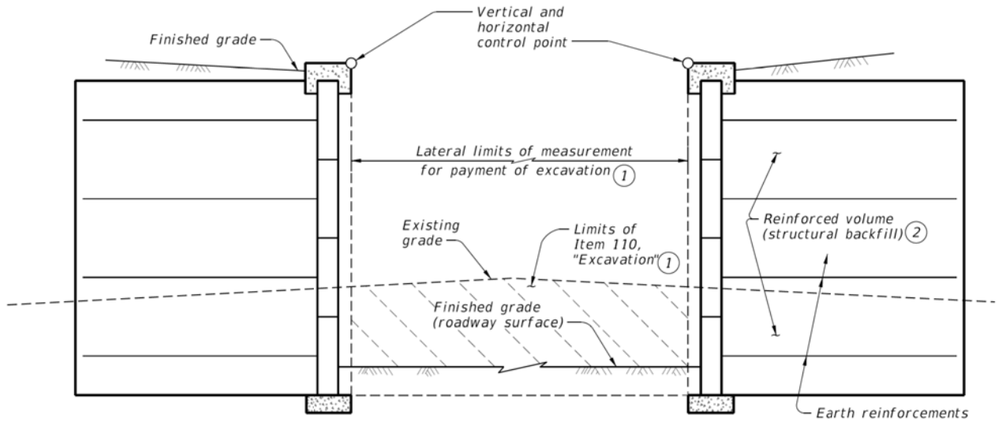
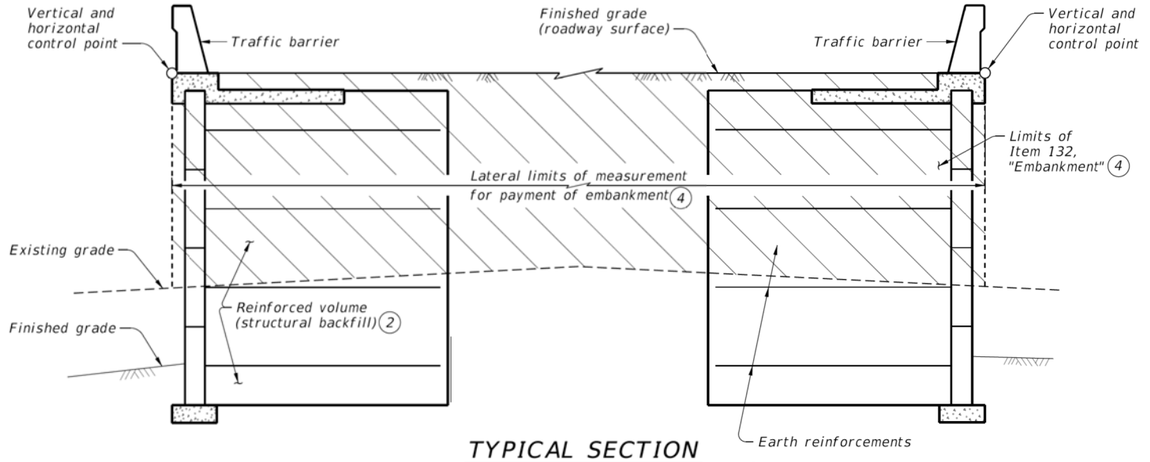


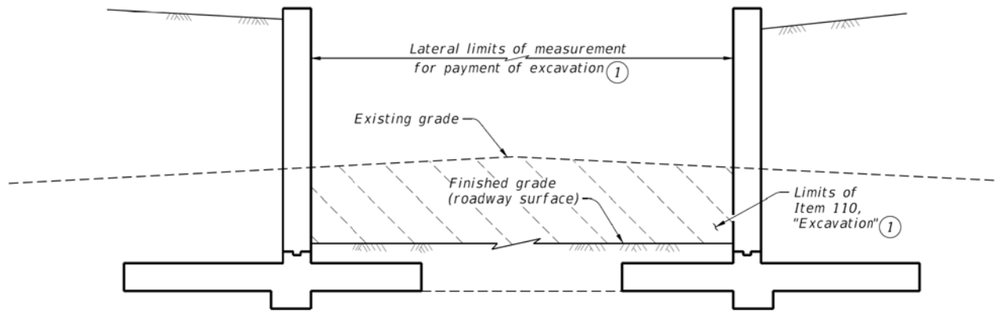
TYPICAL SECTION

(Excavation between MSE retaining walls.) (3)



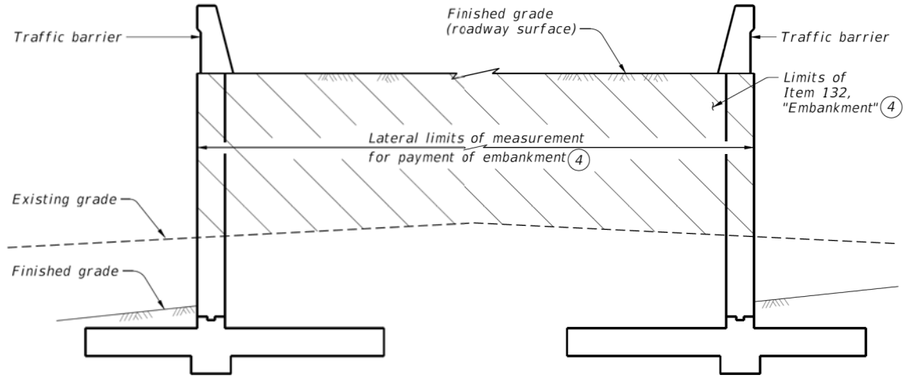
TYPICAL SECTION

(Embankment between MSE retaining walls.) (3)



TYPICAL SECTION

(Excavation between conventional retaining walls.)



TYPICAL SECTION

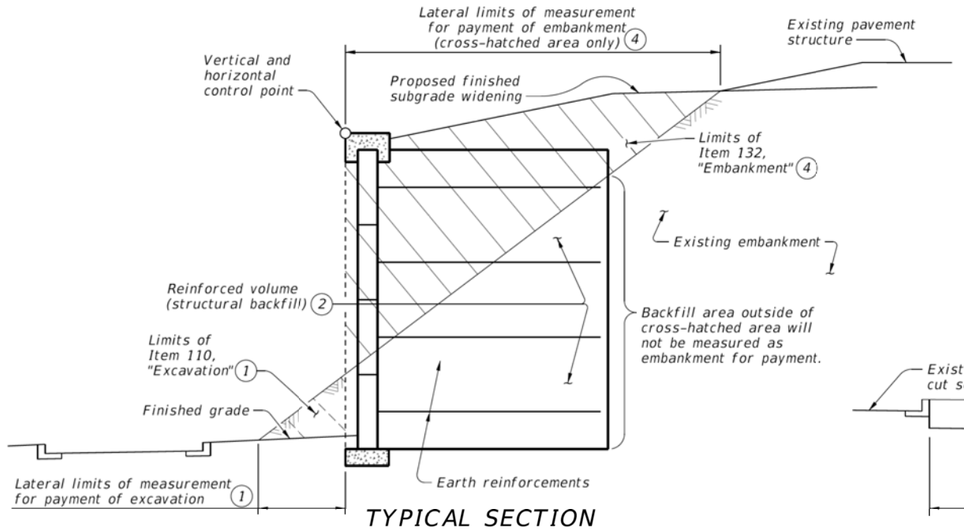
(Embankment between conventional retaining walls.)

(1) Only the excavation above the proposed subgrade elevation will be measured for payment.

(2) Meeting requirements for Item 423, "Retaining Walls."

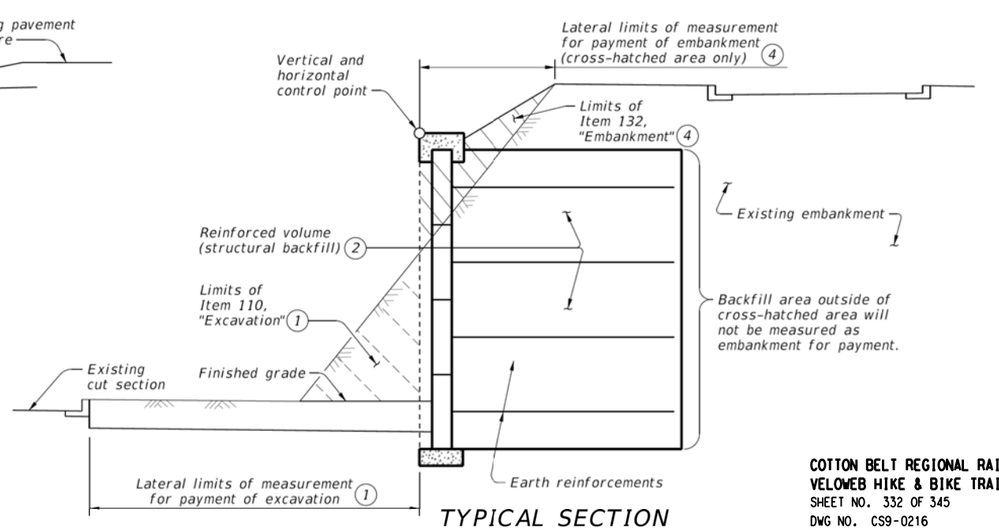
(3) Earthwork measurement with other retaining wall types will be made to the outside finished face in the same manner.

(4) Only the embankment above the existing ground line will be measured for payment.



TYPICAL SECTION

(Widening embankment with MSE retaining walls.) (3)



TYPICAL SECTION

(Widening cut section with MSE retaining walls.) (3)

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
SHEET NO. 332 OF 345
DWG NO. CS9-0216
CONTRACT NO. C-2033270-01

Texas Department of Transportation

Bridge Division Standard

EARTHWORK MEASUREMENT AT RETAINING WALL

RW(EM)

FILE: RW-EM-22.dgn	DN: TxDOT	CK: TxDOT	DW: JER	CK: RLE
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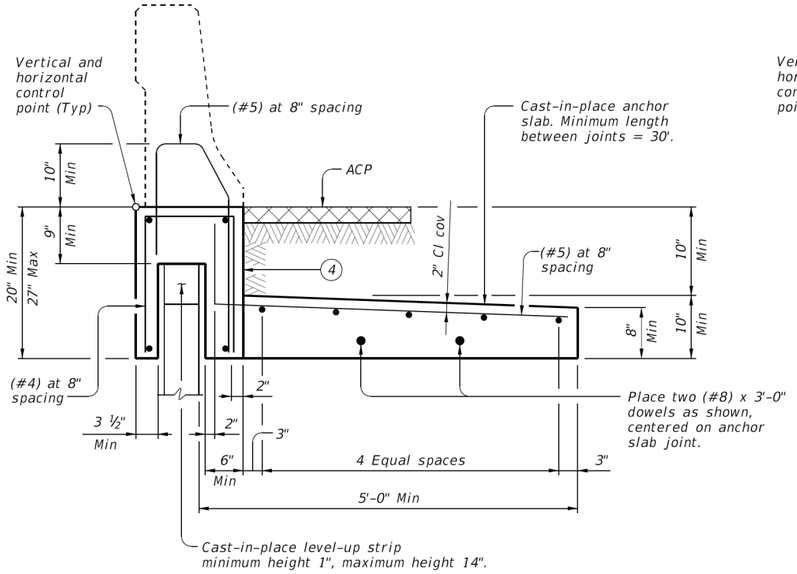
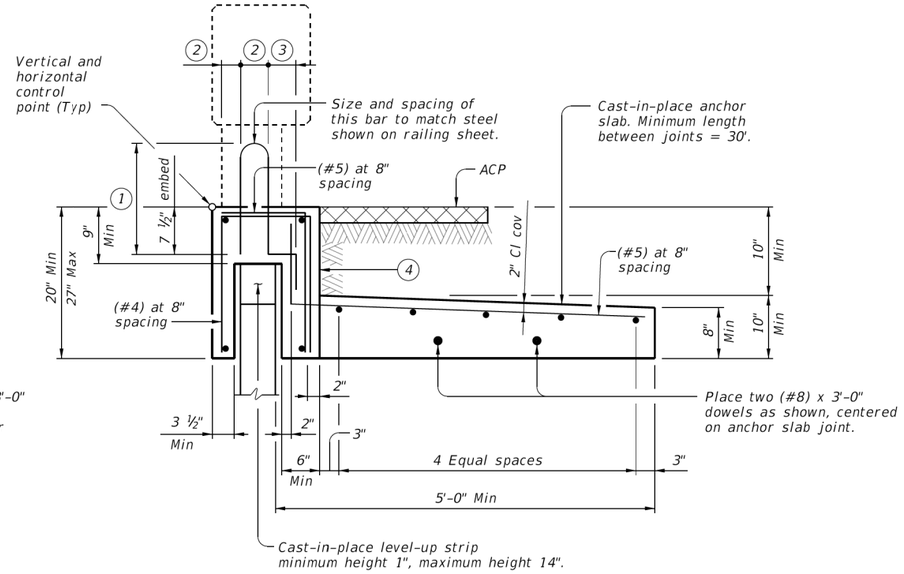


"WIDE BASED" ADJACENT TO ACP

(Showing T551 Rail, other rails listed similar.)



"NARROW BASED" ADJACENT TO ACP

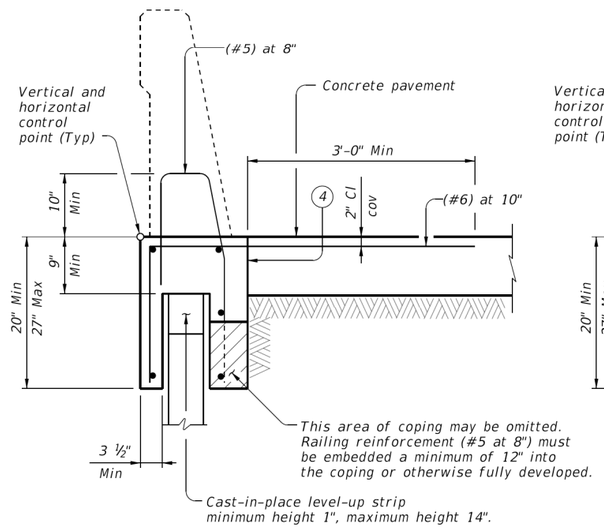
(Showing T223 Rail, other rails listed similar.)

(1) Reinforcement length equal to length shown on the appropriate rail standard plus 1 inch.

(2) Match dimension on the appropriate rail standard.

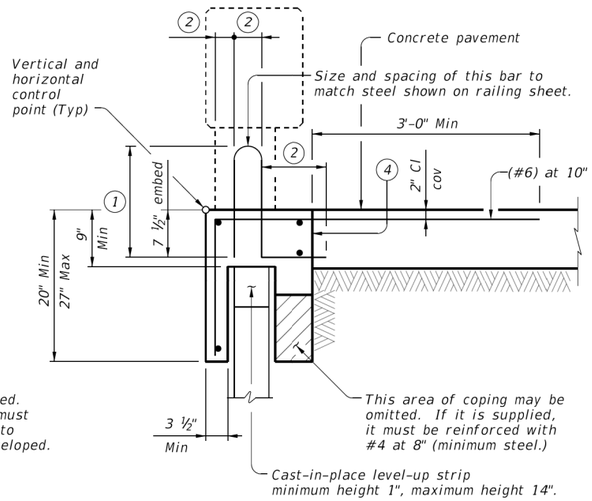
(3) Match dimension on the appropriate rail standard. Bend end of rail anchorage reinforcing as shown as required to maintain clear cover.

(4) See "Coping Joint Sealer Details."



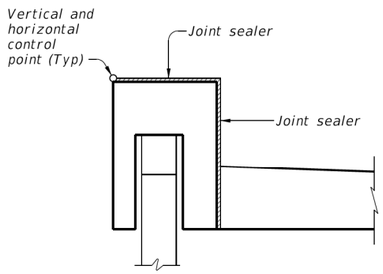
"WIDE BASED" ADJACENT TO CONCRETE PAVEMENT

(Showing SSTR Rail, other rails listed similar.)

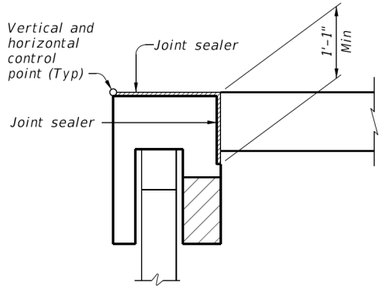


"NARROW BASED" ADJACENT TO CONCRETE PAVEMENT

(Showing T223 Rail, other rails listed similar.)



ADJACENT TO ACP



ADJACENT TO CONCRETE PAVEMENT

COPING JOINT SEALER DETAILS

(Reinforcing steel not shown for clarity.)

Rail Type	Detail	Precasting Rail with Coping Allowed
T1F/T1W/C1W/T2P/C2P	NARROW	NO
T221/C221/T222	NARROW	YES
T223/C223	NARROW	NO
T402/C402	NARROW	NO
T411/C411	NARROW	NO
T551/T552	WIDE	YES
T66	NARROW	NO
SSTR	WIDE	YES

CAST-IN-PLACE COPINGS:

Provide compressible material to isolate precast panel from cast-in-place coping to prevent cracking. Attach compressible material to both sides of precast panel prior to casting concrete for coping.

When cast-in-place coping is anchored to reinforced concrete pavement, provide a smooth level-up strip on the top of the precast panels. The purpose of the level-up is to allow the pavement and coping to move longitudinally relative to the wall without causing damage.

Align coping and railing joints with precast panel joints. Optional rail joints are allowed as approved by Engineer. Provide railing construction joints or expansion joints at 100-foot maximum spacing.

PRECAST COPINGS:

Provide a smooth level-up strip on top of the precast panels prior to installation of the coping. Shims may be used on top of level-up strips to facilitate alignment. Total shim thickness not to exceed 1 inch.

Provide precast coping in 10-foot minimum lengths.

JOINTED CONCRETE PAVEMENT:

When coping is adjacent to and anchored into jointed concrete pavement, align the coping joints with the pavement joints.

JOINT SEALANT:

Seal joints between coping segments in accordance with Item 438, "Cleaning and Sealing Joints." Provide Class 4 joint seal. Place sealant flush with coping surface. The purpose of the joint sealing is to reduce surface drainage infiltration into the retaining wall backfill. Sealing coping joint is considered subsidiary to other items.

MATERIAL NOTES:

Provide Class C concrete (f'c=3,600 psi.)
Provide Grade 60 reinforcing steel.
Provide #4 longitudinal bars, unless otherwise shown.

GENERAL NOTES:

Details on this sheet are to be used in development of specific details for mounting traffic railing on mechanically stabilized earth (MSE) walls.

The specific details proposed must have strengths equivalent to those shown on this sheet and must be submitted for approval. Areas of particular importance are the connection of the coping to the railing, the strength of the vertical coping leg connecting the railing to the anchor slab, and the connection of the coping to the anchor slab or concrete pavement.

Submit shop drawings for the traffic railing foundations to the Engineer in accordance with Item 423, "Retaining Walls." The shop drawings must include bar bending details.

Precasting of railing with the coping will be allowed as noted in the table on this sheet.

The Contractor's attention is directed to the fact that various configurations of precast coping/railing combinations are covered by patent. The Contractor must provide for use of these systems in accordance with Article 7.5.

Coping and anchor slabs are considered subsidiary to Item 423, "Retaining Walls." Payment for traffic railing is per the linear foot for the appropriate railing type.

Cover dimensions are clear dimensions, unless noted otherwise.

Texas Department of Transportation

Bridge Division Standard

RETAINING WALL TRAFFIC RAILING FOUNDATIONS

RW(TRF)

FILE: RW-TRF-22.dgn	DN: TxDOT	CK: TxDOT	DW: JTR	CK: TAR
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	DIST	COUNTY		SHEET NO.

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
SHEET NO. 333 OF 345
DWG NO. CS9-0217
CONTRACT NO. C-2033270-01

DATE: 31-JUL-2023 10:02
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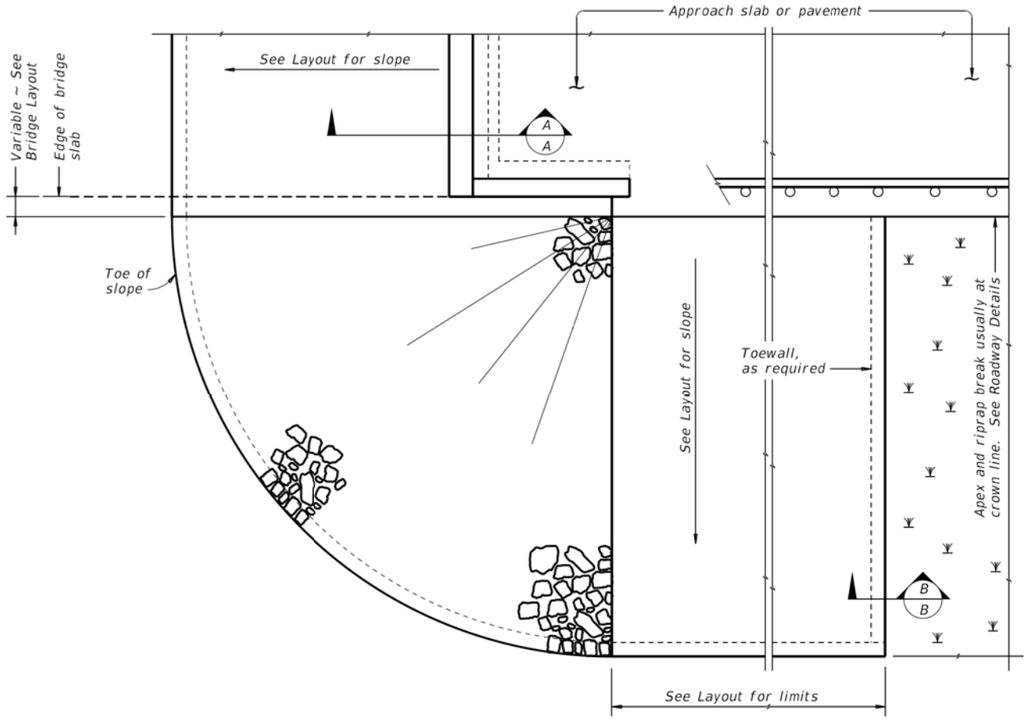
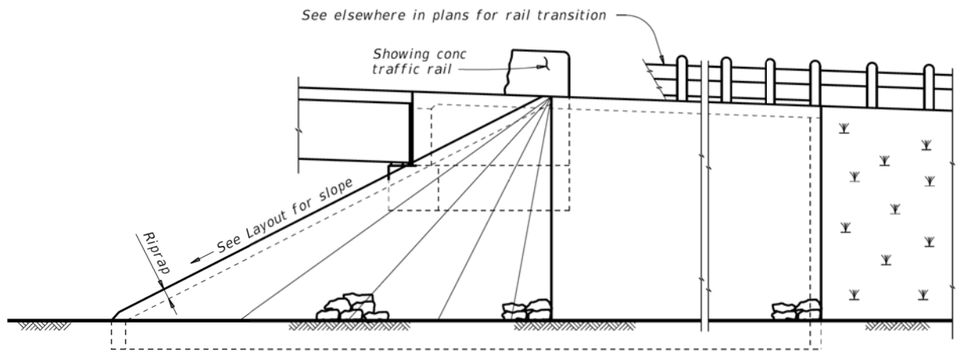
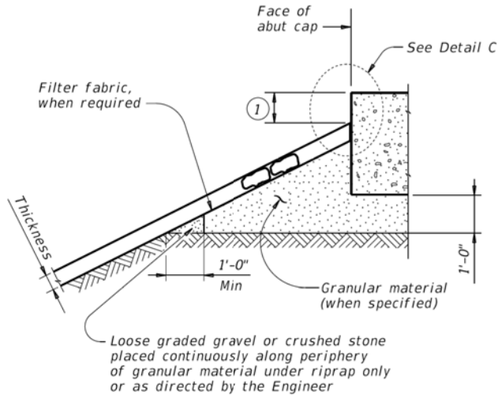


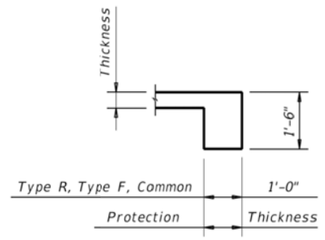
PLAN



ELEVATION

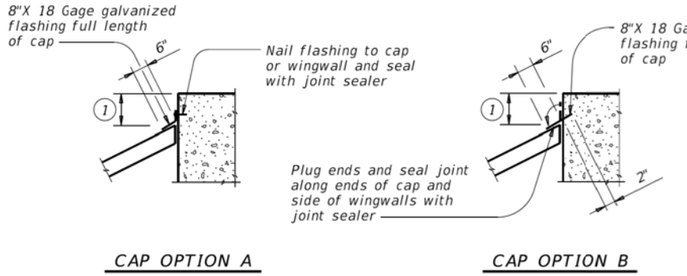


SECTION A-A AT CAP



SECTION B-B

Provide toewall when shoulder drain is located adjacent to limits of stone riprap. Omit toewall when thickness of protection riprap is greater than 18".



CAP OPTION A

CAP OPTION B

DETAIL C

(1) Top of cap to top of riprap dimension varies as directed by the Engineer. Provide 9" Min for beam/slab type bridges and 1'-6" for slab span, box beam, or slab beam bridges.

GENERAL NOTES:

Refer to Item 432, "Riprap" for stone size and gradation, and construction details. See Layout for limits and thickness of riprap specified.

See elsewhere in plans for locations and details of shoulder drains.

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
SHEET NO. 334 OF 345
DWG NO. CC6-2020
CONTRACT NO. C-2033270-01

Texas Department of Transportation

Bridge Division Standard

STONE RIPRAP

SRR

FILE: srrstde1-19.dgn	DN: AES	CK: JGD	DW: BWH	CK: AES
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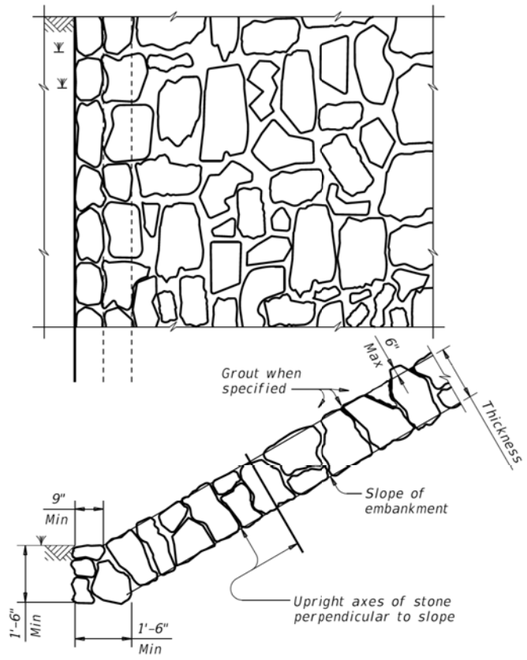


FIGURE 1 ~ TYPE R STONE RIPRAP

dry or grouted

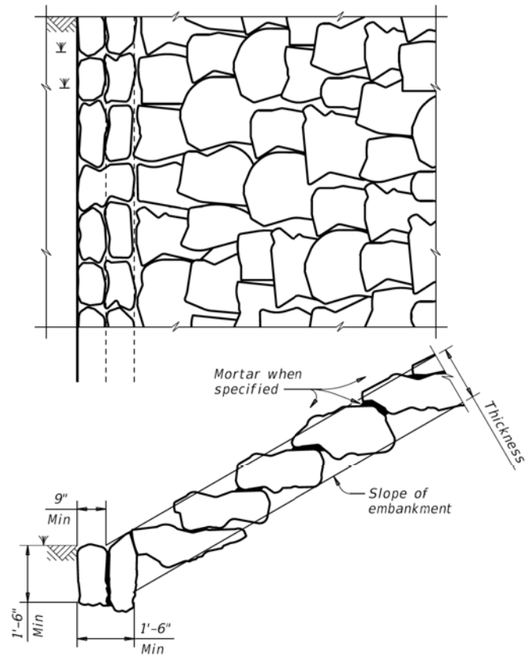


FIGURE 2 ~ TYPE F STONE RIPRAP

dry or mortared

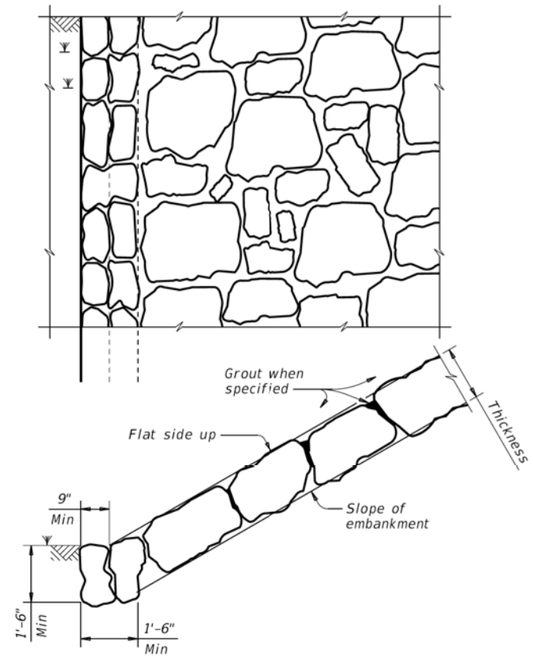


FIGURE 3 ~ TYPE F STONE RIPRAP

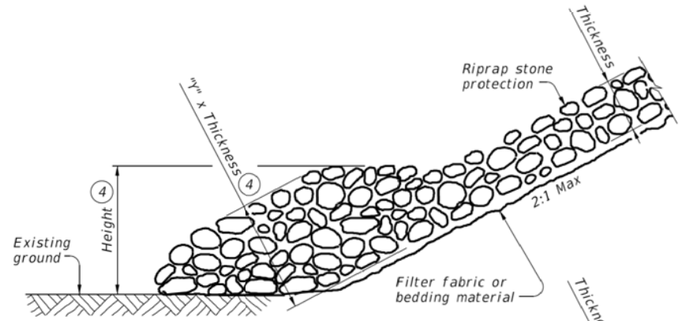
grouted

(2) Provide bedding material instead of filter fabric if shown elsewhere in plans. See Layout for thickness of bedding material.

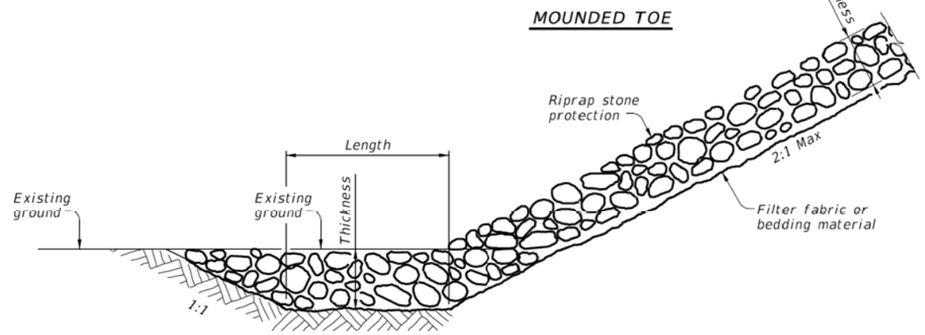
(3) Minimum toe depth is the larger of the maximum scour depth or 2 times the riprap thickness.

(4) "Y" and Height need to be defined. See layout or detail sheet for values if this option is used.

(5) List Stone Protection as size (XX inch) and thickness (YY inch) on the layout.
Example: Riprap (Stone Protection) XX inch, Thickness = YY inch.



MOUNDED TOE



EXTENDED ROCK FILLED TRENCH

PROTECTION STONE RIPRAP TOE OPTIONS (5)

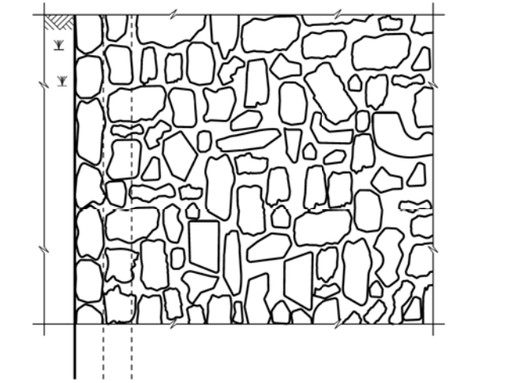


FIGURE 4 ~ COMMON STONE RIPRAP

dry or grouted

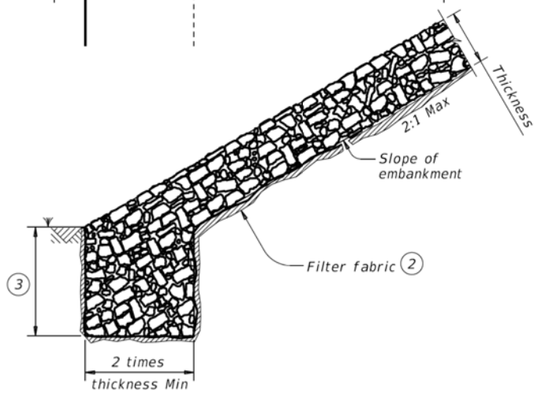


FIGURE 5 ~ PROTECTION STONE RIPRAP (5)

SHEET 2 OF 2

Texas Department of Transportation

Bridge Division Standard

STONE RIPRAP

SRR

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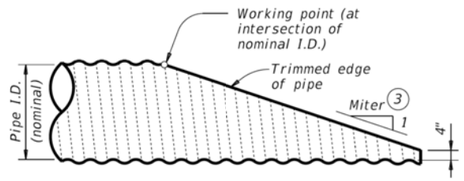
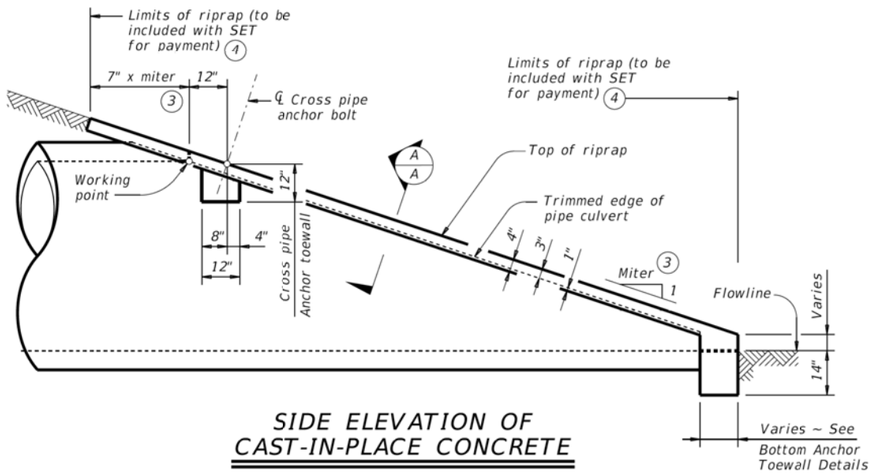
SHEET NO. 335 OF 345
DWG NO. CC6-2021
CONTRACT NO. C-2033270-01



NOTE: All pipe runners, calculations, and dimensions are based on the pipe culverts mitered as shown in this detail. Alternate styles of mitered ends will require that appropriate adjustments be made to the values presented on this standard.

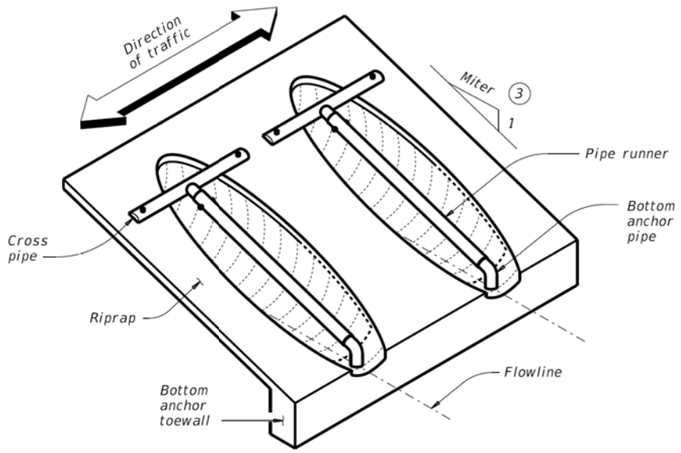
SIDE ELEVATION OF TYPICAL PIPE CULVERT MITER

(Showing corrugated metal pipe (CMP) culvert.
Details of reinforced concrete pipe (RCP) culvert are similar.)



SIDE ELEVATION OF CAST-IN-PLACE CONCRETE

(Showing reinforced concrete pipe (RCP) culvert.
Details of corrugated metal pipe (CMP) culvert
are similar. Pipe runners not shown for clarity)



ISOMETRIC VIEW OF TYPICAL INSTALLATION

(Showing installation with no skew.)

CROSS PIPE LENGTHS AND PIPE RUNNER LENGTHS (1) (2)

Nominal Culvert I.D.	Pipe Culvert Spa ~ G	Cross Pipe Length	Pipe Runner Length											
			3:1 Side Slope				4:1 Side Slope				6:1 Side Slope			
			0° Skew	15° Skew	30° Skew	45° Skew	0° Skew	15° Skew	30° Skew	45° Skew	0° Skew	15° Skew	30° Skew	45° Skew
24"	1' – 7"	3' – 5"	N/A	N/A	N/A	5' – 10"	N/A	N/A	N/A	8' – 1"	N/A	N/A	N/A	12' – 9"
27"	1' – 8"	3' – 8"	N/A	N/A	5' – 5"	6' – 11"	N/A	N/A	7' – 7"	9' – 7"	N/A	N/A	11' – 11"	14' – 11"
30"	1' – 10"	3' – 11"	N/A	N/A	6' – 4"	8' – 0"	N/A	N/A	8' – 9"	11' – 0"	N/A	N/A	13' – 8"	17' – 0"
33"	1' – 11"	4' – 2"	6' – 2"	6' – 5"	7' – 3"	9' – 1"	8' – 6"	8' – 10"	10' – 0"	12' – 5"	13' – 3"	13' – 9"	15' – 5"	19' – 2"
36"	2' – 1"	4' – 5"	6' – 11"	7' – 3"	8' – 2"	10' – 2"	9' – 6"	9' – 11"	11' – 2"	13' – 10"	14' – 9"	15' – 3"	17' – 2"	21' – 3"
42"	2' – 4"	4' – 11"	8' – 6"	8' – 10"	9' – 11"	12' – 4"	11' – 7"	12' – 0"	13' – 6"	16' – 8"	17' – 9"	18' – 5"	20' – 8"	25' – 7"
48"	2' – 7"	5' – 5"	10' – 1"	10' – 5"	11' – 9"	N/A	13' – 7"	14' – 2"	15' – 10"	N/A	20' – 9"	21' – 6"	24' – 2"	N/A
54"	3' – 0"	5' – 11"	11' – 8"	12' – 1"	N/A	N/A	15' – 8"	16' – 3"	N/A	N/A	23' – 10"	24' – 8"	N/A	N/A
60"	3' – 3"	6' – 5"	13' – 3"	N/A	N/A	N/A	17' – 9"	N/A	N/A	N/A	26' – 10"	N/A	N/A	N/A

TYPICAL PIPE CULVERT MITERS (3)

Side Slope	0° Skew	15° Skew	30° Skew	45° Skew
3:1	3:1	3.106:1	3.464:1	4.243:1
4:1	4:1	4.141:1	4.619:1	5.657:1
6:1	6:1	6.212:1	6.928:1	8.485:1

CONDITIONS WHERE PIPE RUNNERS ARE NOT REQUIRED (2)

Nominal Culvert I.D.	Single Pipe Culvert	Multiple Pipe Culverts
12" thru 21"	Skews thru 45°	Skews thru 45°
24"	Skews thru 45°	Skews thru 30°
27"	Skews thru 30°	Skews thru 15°
30"	Skews thru 15°	Skews thru 15°
33"	Skews thru 15°	Always required
36"	Normal (no skew)	Always required
42" thru 60"	Always required	Always required

STANDARD PIPE SIZES AND MAX PIPE RUNNER LENGTHS (1)

Pipe Size	Pipe O.D.	Pipe I.D.	Max Pipe Runner Length
2" STD	2.375"	2.067"	N/A
3" STD	3.500"	3.068"	10' – 0"
4" STD	4.500"	4.026"	19' – 8"
5" STD	5.563"	5.047"	34' – 2"

ESTIMATED CONCRETE RIPRAP QUANTITIES (CY) (5)

Nominal Culvert I.D.	3:1 Side Slope				4:1 Side Slope				6:1 Side Slope			
	0° Skew	15° Skew	30° Skew	45° Skew	0° Skew	15° Skew	30° Skew	45° Skew	0° Skew	15° Skew	30° Skew	45° Skew
12"	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.6	0.7	0.7	0.7	0.8
15"	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.7	0.7	0.7	0.8	0.9
18"	0.5	0.5	0.6	0.6	0.6	0.7	0.7	0.8	0.8	0.8	0.9	1.0
21"	0.6	0.6	0.6	0.7	0.7	0.7	0.8	0.9	0.9	0.9	1.0	1.2
24"	0.6	0.7	0.7	0.8	0.8	0.8	0.8	1.0	1.0	1.0	1.1	1.3
27"	0.7	0.7	0.8	0.9	0.8	0.9	0.9	1.1	1.1	1.1	1.2	1.4
30"	0.8	0.8	0.8	0.9	0.9	0.9	1.0	1.2	1.2	1.2	1.3	1.6
33"	0.8	0.8	0.9	1.0	1.0	1.0	1.1	1.3	1.3	1.4	1.5	1.7
36"	0.9	0.9	0.9	1.1	1.1	1.1	1.2	1.4	1.4	1.5	1.6	1.8
42"	1.0	1.0	1.1	1.3	1.2	1.3	1.3	1.6	1.6	1.7	1.8	2.1
48"	1.1	1.1	1.2	N/A	1.4	1.4	1.5	N/A	1.9	1.9	2.1	N/A
54"	1.3	1.3	N/A	N/A	1.6	1.6	N/A	N/A	2.1	2.1	N/A	N/A
60"	1.4	N/A	N/A	N/A	1.7	N/A	N/A	N/A	2.3	N/A	N/A	N/A

(1) Provide pipe runner of the size shown in the tables. Provide cross pipe of the same size as the pipe runner. Provide cross pipe stub out and bottom anchor pipe of the next smaller size pipe as shown in the Standard Pipe Sizes and Max Pipe Runner Lengths tabie.

(2) This standard allows for the placement of only one pipe runner across each culvert pipe opening. In order to limit the clear opening to be traversed by an errant vehicle, the following conditions must be met:

For 60" culvert pipes, the skew must not exceed 0°.
For 54" culvert pipes, the skew must not exceed 15°.
For 48" culvert pipes, the skew must not exceed 30°.
For all culvert pipe sizes 42" and less, the skew must not exceed 45°.

If the above conditions cannot be met, the designer should consider using a safety end treatment with flared wings. For further information, refer to the TxDOT Roadway Design Manual.

(3) Miter = slope of mitered end of pipe culvert.

(4) Riprap placed beyond the limits shown will be paid for as concrete riprap in accordance with Item 432, "Riprap".

(5) Quantities shown are for one end of one reinforced concrete pipe (RCP) culvert. For multiple pipe culverts or for corrugated metal pipe (CMP) culverts, quantities will need to be adjusted. Riprap quantities are for Contractor's information only.

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
SHEET NO. 336 OF 345
DWG NO. CC6-2022
CONTRACT NO. C-2033270-01

Texas Department of Transportation

Bridge Division Standard

SAFETY END TREATMENT

FOR 12" DIA TO 60" DIA
PIPE CULVERTS
TYPE II ~ CROSS DRAINAGE

SETP-CD

FILE: setpcdse-20.dgn	DN: GAF	CK: CAT	DW: JRP	CK: GAF
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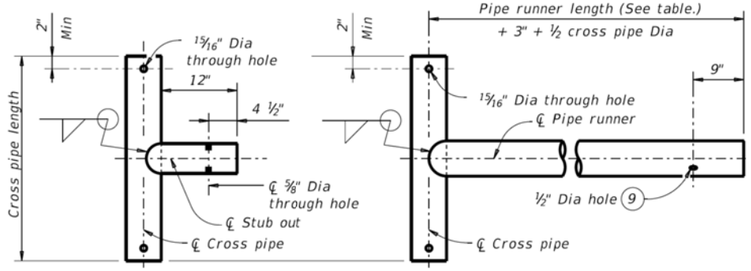
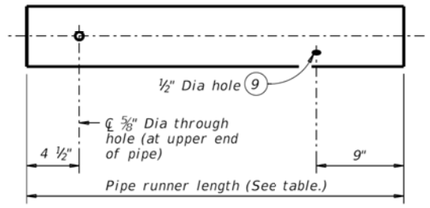


OPTION A1 OPTION A2

CROSS PIPE AND CONNECTIONS DETAILS

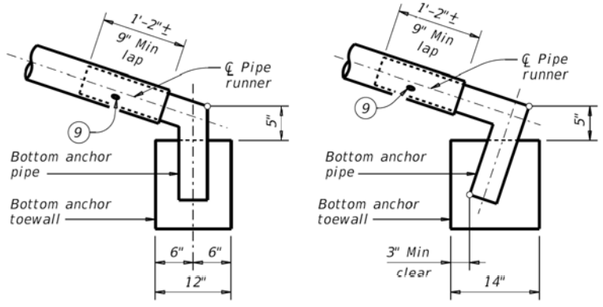


NOTE: The separate pipe runner shown is required when Cross Pipe Connection Option A1 is used.

PIPE RUNNER DETAILS

OPTION B1 OPTION B2

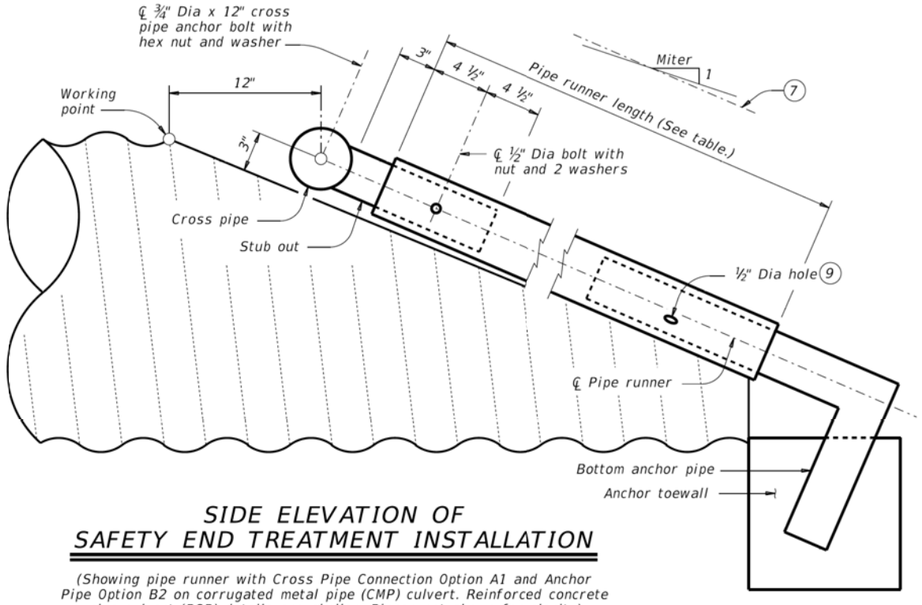
BOTTOM ANCHOR PIPE DETAILS (10)



OPTION B1 OPTION B2

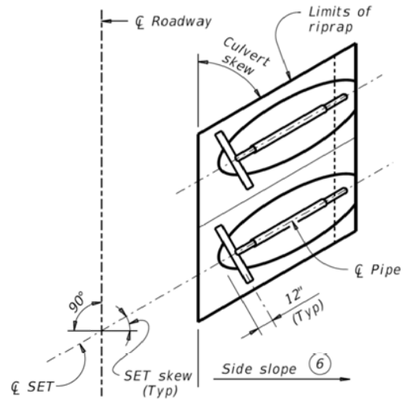
BOTTOM ANCHOR TOEWALL DETAILS

(Culvert and riprap not shown for clarity.)

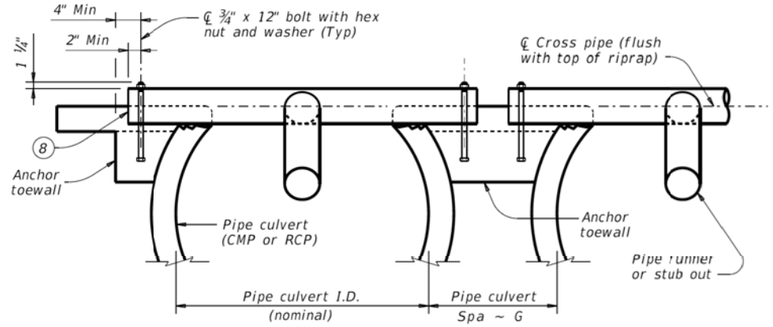


SIDE ELEVATION OF SAFETY END TREATMENT INSTALLATION

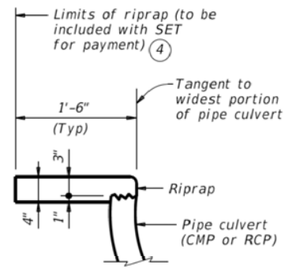
(Showing pipe runner with Cross Pipe Connection Option A1 and Anchor Pipe Option B2 on corrugated metal pipe (CMP) culvert. Reinforced concrete pipe culvert (RCP) details are similar. Riprap not shown for clarity)



PLAN OF SKEWED INSTALLATION



SHOWING CROSS PIPE AND ANCHOR TOEWALL



SHOWING TYPICAL PIPE CULVERT AND RIPRAP

SECTION A-A

(4) Riprap placed beyond the limits shown will be paid for as concrete riprap in accordance with Item 432, "Riprap".

(6) Recommended values of side slope are 3:1, 4:1, and 6:1. All quantities, calculations, and dimensions shown herein are based on these recommended values. Slope of 3:1 or flatter is required for vehicle safety.

(7) Note that actual slope of pipe runner may vary slightly from side slope of riprap and trimmed culvert pipe edge.

(8) Ensure that riprap concrete does not flow into the cross pipe so as to permit disassembly of the bolted connection to allow cleanout access.

(9) After installation, inspect the 1/2" hole to ensure that the lap of the pipe runner with the bottom anchor pipe is adequate.

(10) At fabricator's option, a heat bend to a smooth 5" radius or a manufactured elbow (of the same material as the runner) may be substituted for the mitered and welded joint in the bottom anchor pipe.

MATERIAL NOTES:

Synthetic fibers listed on the "Fibers for Concrete" Material Producer List (MPL) may be used in lieu of steel reinforcing in riprap concrete unless noted otherwise.

Provide pipe runners, cross pipes, and anchor pipes conforming to the requirements of ASTM A53 (Type E or S, Gr B), ASTM A500 Gr B, or API 5LX52.

Provide ASTM A307 bolts and nuts.

Galvanize all steel components, except concrete reinforcing, after fabrication.

Repair galvanizing damaged during transport or construction in accordance with the specifications.

GENERAL NOTES:

Pipe runners are designed for a traversing load of 1,800 pounds at yield as recommended by Research Report 280-1, "Safety Treatment of Roadside Cross-Drainage Structures", Texas Transportation Institute, March 1981.

Safety end treatments (SET) shown herein are intended for use in those installations where out of control vehicles are likely to traverse the openings approximately perpendicular to the pipe runners.

Payment for riprap and toewall is included in the price bid for each safety end treatment.

Construct concrete riprap and all necessary inverts in accordance with the requirements of Item 432, "Riprap".

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
SHEET NO. 337 OF 345
DWG NO. CC6-2023
CONTRACT NO. C-2033270-01

Texas Department of Transportation

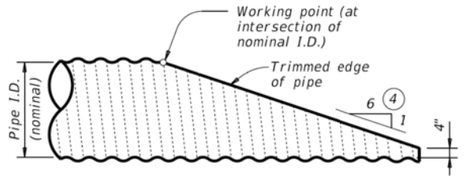
Bridge Division Standard

SAFETY END TREATMENT

FOR 12" DIA TO 60" DIA
PIPE CULVERTS
TYPE II ~ CROSS DRAINAGE

SETP-CD

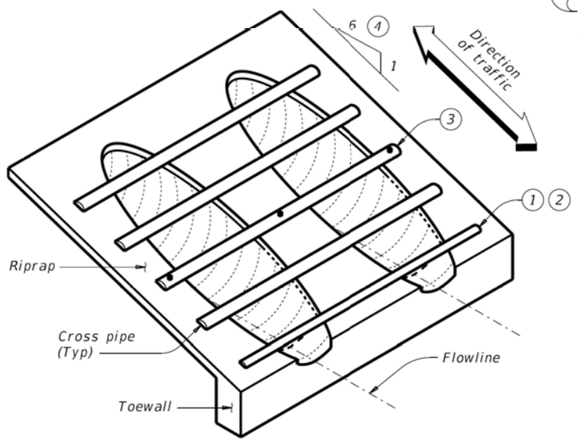
FILE: setpcdse-20.dgn	DN: GAF	CK: CAT	DW: JRP	CK: GAF
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS				
	DIST	COUNTY		SHEET NO.



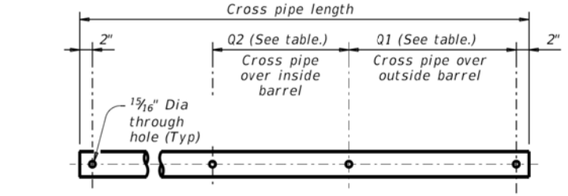
NOTE: All cross pipes, calculations, and dimensions are based on the pipe culverts mitered as shown in this detail. Alternate styles of mitered ends will require that appropriate adjustments be made to the values presented on this standard.

SIDE ELEVATION OF TYPICAL PIPE CULVERT MITER

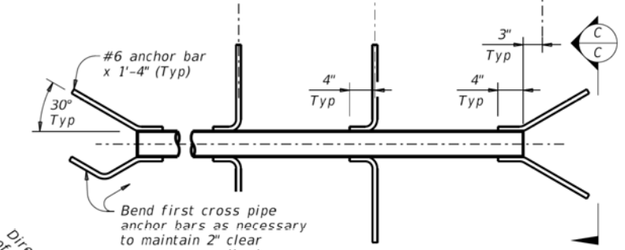
(Showing corrugated metal pipe (CMP) culvert Details at reinforced concrete pipe (RCP) culvert are similar.)



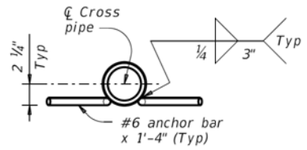
ISOMETRIC VIEW OF TYPICAL INSTALLATION



PIPE WITH BOLTED ANCHOR

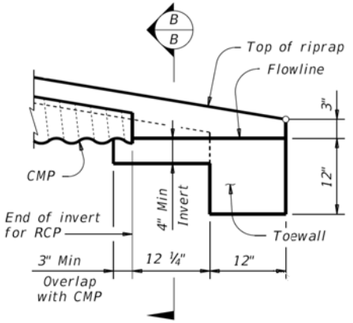


PIPE WITH ANCHOR BARS



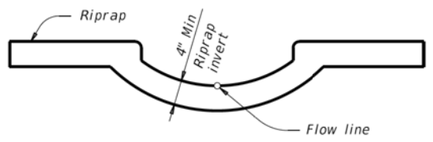
SECTION C-C

CROSS PIPE DETAILS



DETAIL "A"

(Showing invert with corrugated metal pipe (CMP) culvert. Reinforced concrete pipe (RCP) culvert details are similar. Cross pipes not shown for clarity.)



SECTION B-B

(Cross pipes not shown for clarity.)

CROSS PIPE LENGTHS, REQUIRED PIPE SIZES, AND RIPRAP QUANTITIES (2)

Nominal Culvert I.D.	Conc Riprap (CY) (6)	Pipe Culvert Spa ~ G	Single Barrel ~ Q1	Multi-Barrel ~ Q1	Q2	Conditions for Use of Cross Pipes	Cross Pipe Sizes
12"	0.6	0' - 9"	N/A	2' - 1"	1' - 9"	3 or more pipe culverts	3" Std (3.500" O.D.)
15"	0.7	0' - 11"	N/A	2' - 5"	2' - 2"		
18"	0.8	1' - 2"	N/A	2' - 10"	2' - 8"		
21"	0.9	1' - 4"	N/A	3' - 2"	3' - 1"		
24"	0.9	1' - 7"	N/A	3' - 6"	3' - 7"		
27"	1.0	1' - 8"	N/A	3' - 10"	3' - 11"	3 or more pipe culverts	3 1/2" Std (4.000" O.D.)
30"	1.1	1' - 10"	N/A	4' - 2"	4' - 4"	2 or more pipe culverts	
33"	1.2	1' - 11"	4' - 2"	4' - 5"	4' - 8"	All pipe culverts	
36"	1.3	2' - 1"	4' - 5"	4' - 9"	5' - 1"	All pipe culverts	4" Std (4.500" O.D.)
42"	1.5	2' - 4"	4' - 11"	5' - 5"	5' - 10"		
48"	1.7	2' - 7"	5' - 5"	6' - 0"	6' - 7"	All pipe culverts	5" Std (5.563" O.D.)
54"	2.0	3' - 0"	5' - 11"	6' - 9"	7' - 6"		
60"	2.2	3' - 3"	6' - 5"	7' - 4"	8' - 3"		
66"	2.4	3' - 3"	6' - 11"	7' - 10"	8' - 9"		
72"	2.7	3' - 4"	7' - 5"	8' - 5"	9' - 4"		

(1) The proper installation of the first cross pipe is critical for vehicle safety. Place the top of the first cross pipe no more than 6" above the flow line.

(2) Provide cross pipes, except the first bottom pipe, of the size shown in the table. Provide a 3 1#2" standard pipe (4" O.D.) for the first bottom pipe.

(3) Install the third cross pipe from the bottom of the culvert using a bolted connection. Ensure that riprap concrete does not flow into the cross pipe so as to permit disassembly of the bolted connection to aliow cleanout access. At the Contractor's option, install all other cross pipes using the bolted connection details.

(4) Match cross slope as shown elsewhere in the plans. Cross slope of 6:1 or flatter is required for vehicle safety.

(5) Riprap placed beyond the limits shown will be paid for as concrete riprap in accordance with Item 432, "Riprap".

(6) Quantities shown are for one end of one reinforced concrete pipe (RCP) culvert. For multiple pipe culverts or for corrugated metal pipe (CMP) culverts, quantities will need to be adjusted. Riprap quantities are for contractor's information only.

MATERIAL NOTES:

Synthetic fibers listed on the "Fibers for Concrete" Material Producer List (MPL) may be used in lieu of steel reinforcing in riprap concrete unless noted otherwise.

Provide cross pipes that meet the requirements of ASTM A53 (Type E or S, Gr B), ASTM A500 (Gr B), or API 5LX52.

Provide ASTM A307 bolts and nuts.

Galvanize all steel components, except concrete reinforcing, after fabrication. Repair galvanizing damaged during transport or construction in accordance with the specifications.

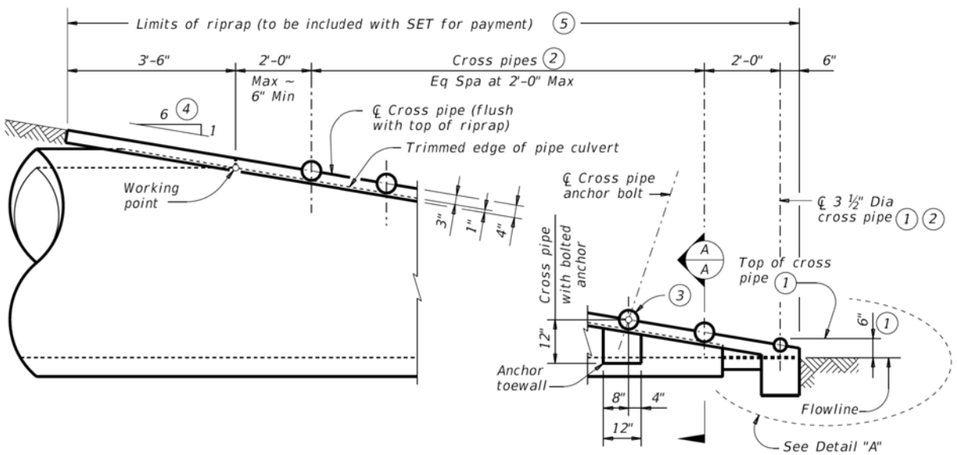
GENERAL NOTES:

Cross pipes are designed for a traversing load of 10,000 pounds at yield as recommended by Research Report 280-2F, "Safety Treatment of Roadside Parallel-Drainage Structures", Texas Transportation Institute, March 1981.

Safety end treatments (SET) shown herein are intended for use in those installations where out of control vehicles are likely to traverse the openings approximately perpendicular to the cross pipes.

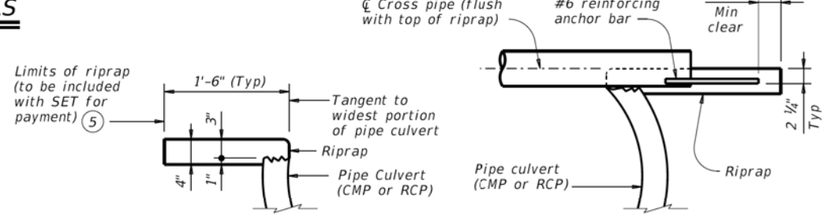
Construct concrete riprap and all necessary inverts in accordance with the requirements of Item 432, "Riprap".

Payment for riprap and toewall is included in the Price Bid for each Safety End Treatment.



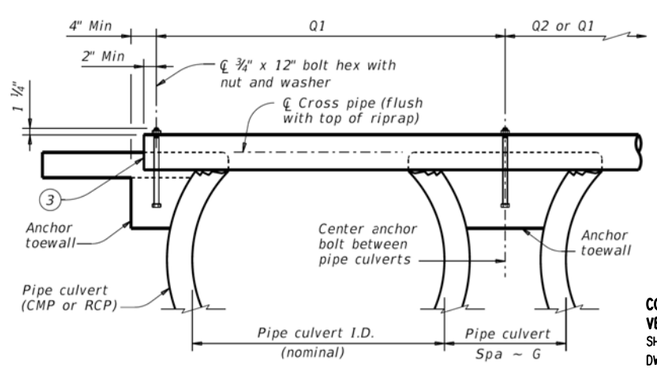
SIDE ELEVATION OF CAST-IN-PLACE CONCRETE

(Showing reinforced concrete pipe (RCP) culvert. Details at corrugated metal pipe (CMP) culvert are similar.)



SHOWING TYPICAL PIPE CULVERT AND RIPRAP

SHOWING CROSS PIPE WITH ANCHOR BAR



SHOWING CROSS PIPE WITH BOLTED ANCHOR

SECTION A-A

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
SHEET NO. 338 OF 345
DWG NO. CC6-2024
CONTRACT NO. C-2033270-01

Texas Department of Transportation

Bridge Division Standard

SAFETY END TREATMENT

FOR 12" DIA TO 72" DIA
PIPE CULVERTS
TYPE II ~ PARALLEL DRAINAGE

SETP-PD

FILE: setppdse-20.dgn	DN: GAF	CK: CAT	DW: JRP	CK: GAF
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	DIST	COUNTY		SHEET NO.

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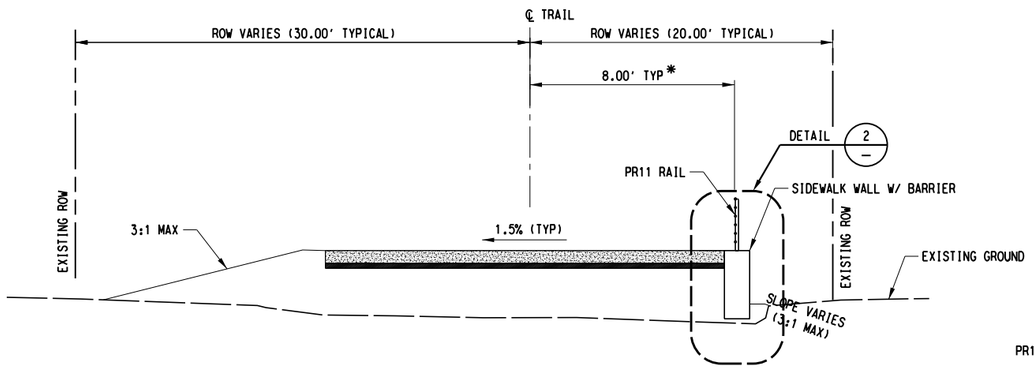

SIDEWALK WALL DETAIL 1
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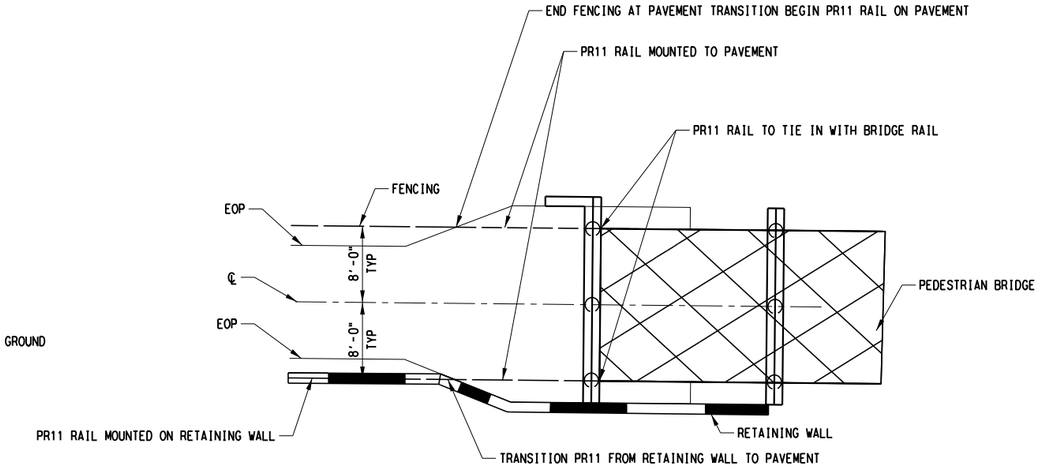


TYPICAL RAIL TREATMENT AT BRIDGE APPROACH
NO SCALE

GENERAL NOTES:

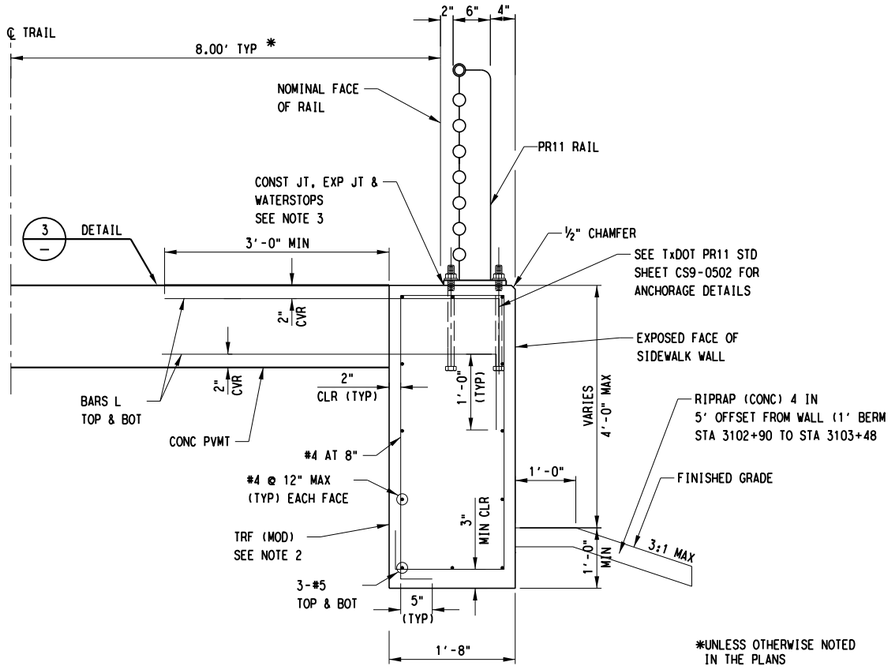
1 PEDESTRIAN RAIL PR11 (TXDOT STANDARD PEDESTRIAN RAIL TYPE PR11).

2 SEE TXDOT STD TRF FOR ADDITIONAL DETAILS.

3 SEE TXDOT STD DWG RW 2 FOR CONSTRUCTION JOINT, EXPANSION JOINT AND WATERSTOP DETAILS. PROVIDE CONSTRUCTION JOINTS AT 32' SPACING AND EXPANSION JOINTS AT 96' SPACING.

4 CLASS "C" CONCRETE: MIN F'C = 3,600 PSI.

5 REINFORCING STEEL GRADE 60.



SIDEWALK WALL DETAIL 2
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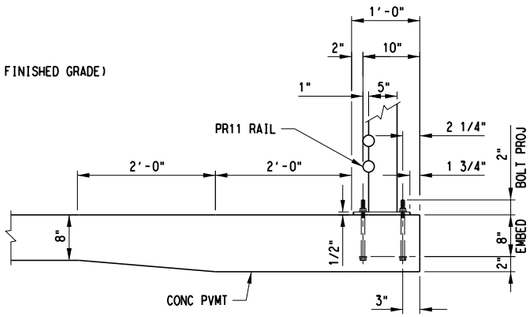

PAVEMENT TRANSITION DETAIL
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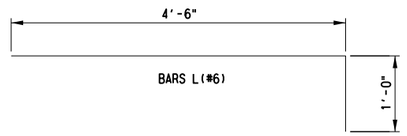

SIDEWALK WALL DETAIL 3
NO SCALE

NOT AN APPROVED DRAWING
FINAL 100% DESIGN

CONTRACT SHEET No. 339 OF 345

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

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FIRM REGISTRATION No. F-2966

ARS ENGINEERS, INC.
12801 N Central Expressway, Suite 1250
Dallas, Texas 75243
(214) 739-3152 Fax (214) 739-3169
FIRM NO. F-819

ARCHER WESTERN HERZOG

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SCALE	NO SCALE
DRAWN	C. BAGBY
DESIGNED	D. LUU
CHECKED	C. BAGBY
IN CHARGE	D. LUU
DATE	07 AUG 23

CAES

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

CITY OF CARROLLTON
CIVIL DETAILS

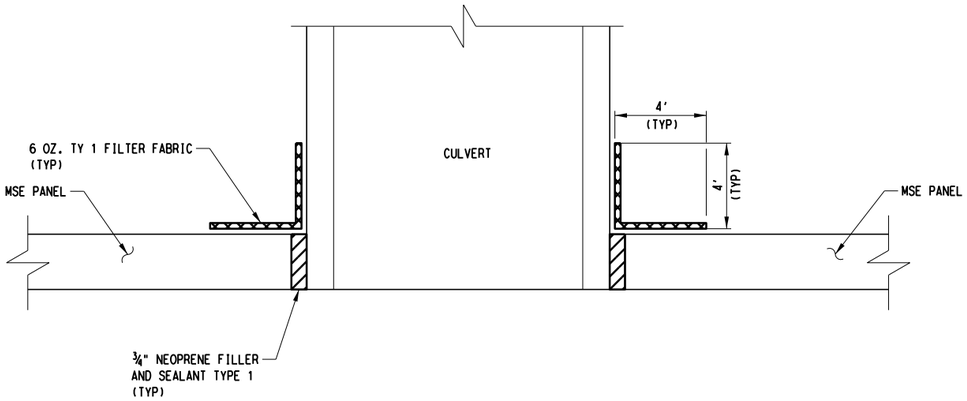
CONTRACT	DWG No.	REV
C-2033270-01	SC5-5401	D

CB05-SC5-5401.040

02-AUG-2023 11:24
CB05-SC5-5401.040

ssaleh
RW Plan 11

DWG No. SC5-5402



WALL / SIDES OF CULVERT JOINT DETAIL
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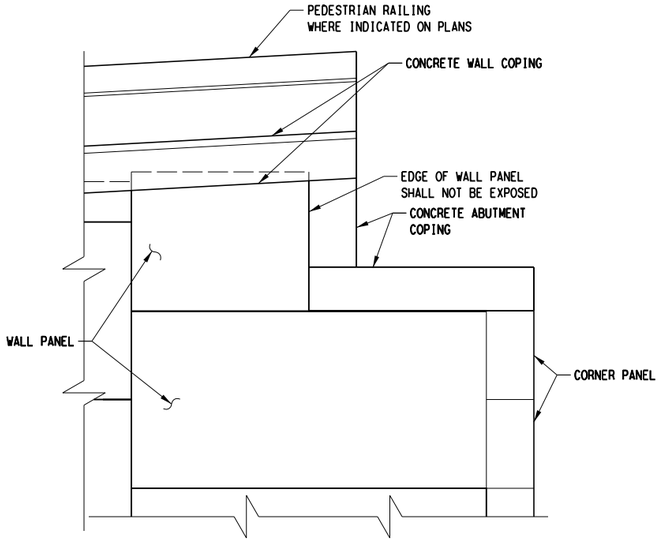
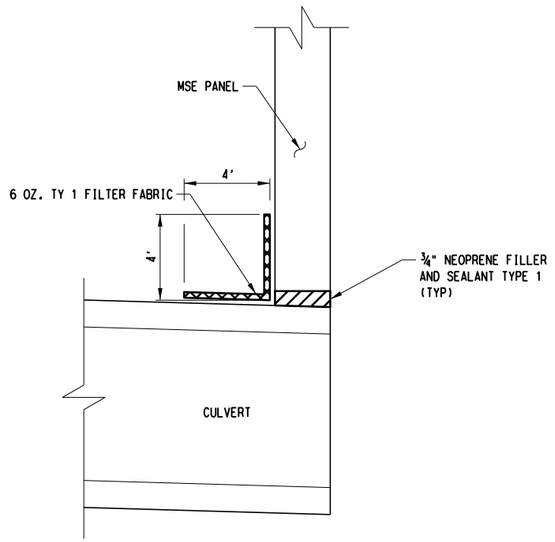


ABUTMENT COPING DETAIL
NO SCALE

NOTES:

1. REFERENCE PR11 STANDARD DETAILS ON MOUNTING TO CIP RETAINING WALLS. PR11 TO BE ANCHORED TO MSE COPING SIMILAR TO CIP RETAINING WALLS. COPING TO BE 10" MINIMUM FOR THESE APPLICATIONS.



WALL / TOP OF CULVERT JOINT DETAIL
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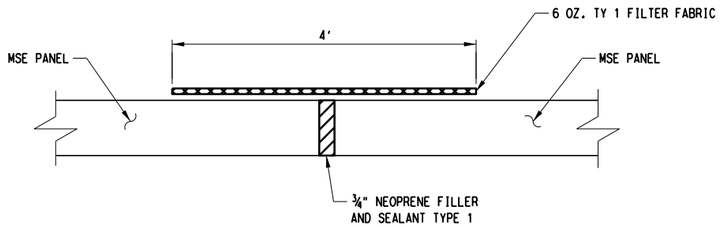

SLIP JOINT DETAIL
NO SCALE

NOT AN APPROVED DRAWING
FINAL 100% DESIGN

CONTRACT SHEET No. 340 OF 345

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Phone: +1 (214) 638-0145
FIRM REGISTRATION No. F-2966

ARCHER WESTERN HERZOG

DART PROJECT

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SCALE	NO SCALE
DRAWN	L. WEAVER
DESIGNED	L. WEAVER
CHECKED	R. BAUM
IN CHARGE	J. FINKE
DATE	07 AUG 23

CAES

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

CITY OF CARROLLTON
RETAINING WALL
MISCELLANEOUS DETAILS

CONTRACT	DWG No.	REV
C-2033270-01	SC5-5402	D

CB05-SC5-5402.040

31-JUL-2023 09:49
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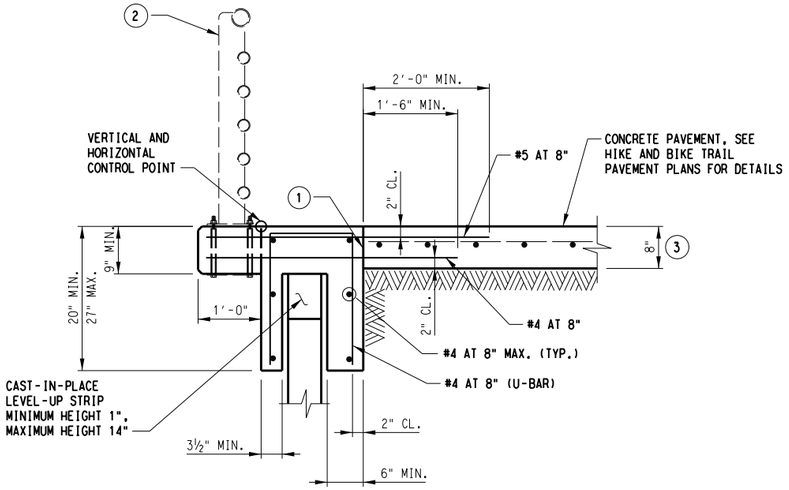
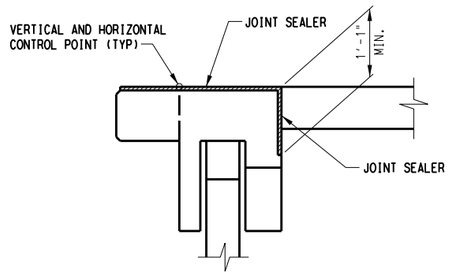
JEGSVCPW001
RW_D

DWG No. SC5-5403



ADJACENT TO CONCRETE PAVEMENT



COPING JOINT SEALER DETAILS

(REINFORCING STEEL NOT SHOWN FOR CLARITY.)

1. SEE "COPING JOINT SEALER" DETAIL
2. SEE TxDOT STANDARD PEDESTRIAN RAIL, TYPE PR11 FOR FORMED HOLE DETAILS NOT SHOWN.
3. SEE TxDOT STANDARD CONTINUOUSLY REINFORCED CONCRETE PAVEMENT, CRCP(1)-23 FOR DETAILS NOT SHOWN OF ADJACENT PAVEMENT.

CAST-IN-PLACE COPINGS:

PROVIDE COMPRESSIBLE MATERIAL TO ISOLATE PRECAST PANEL FROM CAST-IN-PLACE COPING TO PREVENT CRACKING. ATTACH COMPRESSIBLE MATERIAL TO BOTH SIDES OF PRECAST PANEL PRIOR TO CASTING CONCRETE FOR COPING.

WHEN CAST-IN-PLACE COPING IS ANCHORED TO REINFORCED CONCRETE PAVEMENT, PROVIDE A SMOOTH LEVEL-UP STRIP ON THE TOP OF THE PRECAST PANELS. THE PURPOSE OF THE LEVEL-UP IS TO ALLOW THE PAVEMENT AND COPING TO MOVE LONGITUDINALLY RELATIVE TO THE WALL WITHOUT CAUSING DAMAGE.

ALIGN COPING AND RAILING JOINTS WITH PRECAST PANEL JOINTS. PROVIDE ADDITIONAL RAILING CONSTRUCTION JOINTS OR EXPANSION JOINTS PER TxDOT STANDARD PEDESTRIAN RAILING TYPE PR11.

PRECAST COPINGS:

PROVIDE A SMOOTH LEVEL-UP STRIP ON TOP OF THE PRECAST PANELS PRIOR TO INSTALLATION OF THE COPING. SHIMS MAY BE USED ON TOP OF LEVEL-UP STRIPS TO FACILITATE ALIGNMENT. TOTAL SHIM THICKNESS NOT TO EXCEED 1 INCH.

PROVIDE PRECAST COPING IN 10-FOOT MINIMUM LENGTHS.

JOINTED CONCRETE PAVEMENT:

WHEN COPING IS ADJACENT TO AND ANCHORED INTO JOINTED CONCRETE PAVEMENT, ALIGN THE COPING JOINTS WITH THE PAVEMENT JOINTS.

JOINT SEALANT:

SEAL JOINTS BETWEEN COPING SEGMENTS IN ACCORDANCE WITH ITEM 438, "CLEANING AND SEALING JOINTS." PROVIDE CLASS 4 JOINT SEAL. PLACE SEALANT FLUSH WITH COPING SURFACE. THE PURPOSE OF THE JOINT SEALING IS TO REDUCE SURFACE DRAINAGE INFILTRATION INTO THE RETAINING WALL BACKFILL. SEALING COPING JOINT IS CONSIDERED SUBSIDIARY TO OTHER ITEMS.

MATERIAL NOTES:

PROVIDE CLASS C CONCRETE (f'c=3,600 PSI.)
PROVIDE GRADE 60 REINFORCING STEEL.
PROVIDE #4 LONGITUDINAL BARS, UNLESS OTHERWISE SHOWN.

GENERAL NOTES:

DETAILS ON THIS SHEET ARE TO BE USED IN DEVELOPMENT OF SPECIFIC DETAILS FOR MOUNTING PR11 RAILING ON MECHANICALLY STABILIZED EARTH (MSE) WALLS.

SUBMIT SHOP DRAWINGS FOR THE PR11 RAILING FOUNDATIONS TO THE ENGINEER IN ACCORDANCE WITH ITEM 423, "RETAINING WALLS." THE SHOP DRAWNGS MUST INCLUDE BAR BENDING DETAILS.

COPING AND ANCHOR SLABS ARE CONSIDERED SUBSIDIARY TO ITEM 423, "RETAINING WALLS." PAYMENT FOR PR11 RAILING IS PER THE LINEAR FOOT FOR RAIL (Ty PR11).

COVER DIMENSIONS ARE CLEAR DIMENSIONS, UNLESS NOTED OTHERWISE.

31-JUL-2023 09:28
CB05-SC5-5403.008

JEGSVCPW001
Default

NOT AN APPROVED DRAWING
FINAL 100% DESIGN

CONTRACT SHEET No. 341 OF 345

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

IN-PROGRESS REVIEW
THIS DOCUMENT IS RELEASED FOR THE PURPOSE OF REVIEW UNDER THE AUTHORITY OF:
JOHN E. FINKE, P.E. 121220
ON
31-JUL-2023 09:28
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DALLAS, TX 75201-3136
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FIRM REGISTRATION No. F-2966

ARCHER WESTERN HERZOG

DART PROJECT

DART®

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SCALE	NO SCALE
DRAWN	S. KAEMMERER
DESIGNED	M. MUENKS
CHECKED	M SCHURK
IN CHARGE	J. FINKE
DATE	07 AUG 23

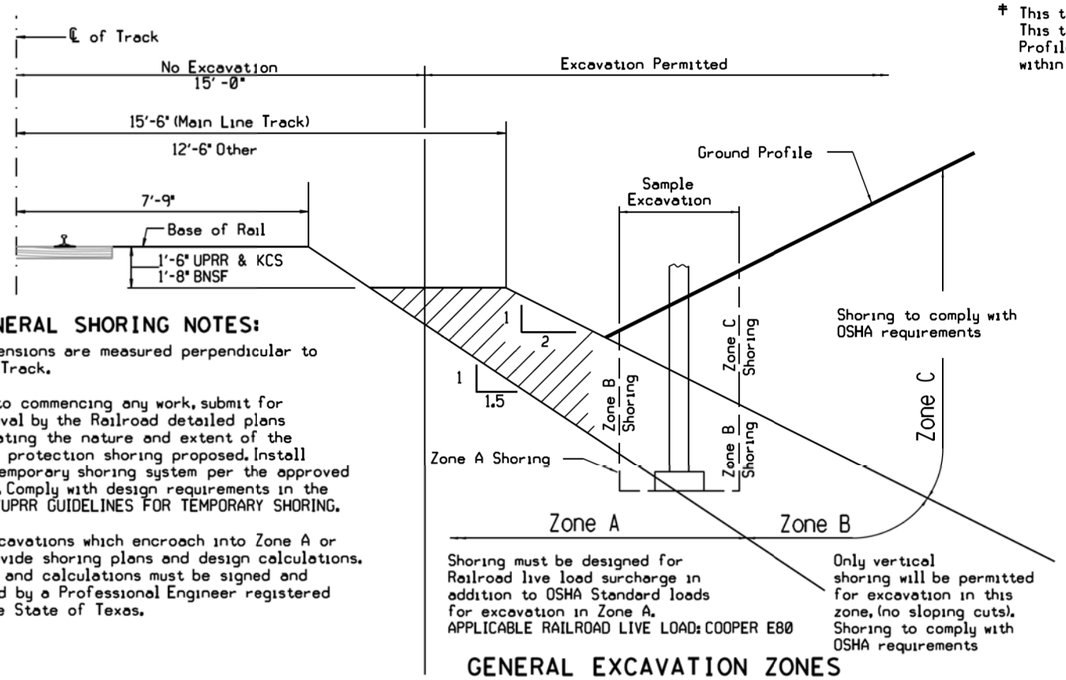
CAES

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

CITY OF CARROLLTON
RETAINING WALL
COPING DETAILS

CONTRACT	DWG No.	REV
C-2033270-01	SC5-5403	D

CB05-SC5-5403.008



GENERAL EXCAVATION ZONES

GENERAL SHORING NOTES:

1. All dimensions are measured perpendicular to ℄ of Track.
2. Prior to commencing any work, submit for approval by the Railroad detailed plans indicating the nature and extent of the track protection shoring proposed. Install the temporary shoring system per the approved plans. Comply with design requirements in the BNSF/UPRR GUIDELINES FOR TEMPORARY SHORING.
3. For excavations which encroach into Zone A or B, provide shoring plans and design calculations. Plans and calculations must be signed and sealed by a Professional Engineer registered in the State of Texas.

GENERAL SHORING REQUIREMENTS *

RAILROAD GENERAL NOTES:

1. Railroad review and approval of shoring, erection, demolition, and falsework is required. Allow a minimum of four weeks for the review and approval of each submittal.
2. The proposed grade separation project shall not increase the quantity and/or characteristics of the flow in the Railroad's ditches and/or drainage structures. In the rare event that a grade separation project will increase the quantity and/or characteristics of flow in such elements, such a design must be reviewed and approved by the Railroad.
3. Verify the elevation of the existing top-of-rail profile before beginning construction. Bring all discrepancies to the attention of the Railroad prior to construction.
4. Submit a proposed method of erosion and sediment control for approval by the Railroad.
5. Design and construct all shoring systems that impact the Railroad's operations and/or support the Railroad's embankment per current Railroad Guidelines for Temporary Shoring.
6. Comply with Railroad Demolition Guidelines for all demolitions within the Railroad's right of way and/or demolition that may impact the Railroad's tracks or operations.
7. Design erection methods over the Railroad's right of way to cause no interruption to the Railroad's operation, enabling the track(s) to remain open to traffic per the Railroad's requirements. Coordinate construction work windows with the Railroad's Designated Representative.
8. Design all construction phasing that may impact the Railroad operations to cause no interruption to the Railroad's operations, enabling the track(s) to remain open to traffic per the Railroad's requirements. Coordinate construction work windows with the Railroad's Designated Representative.
9. Comply with minimum construction clearances for falsework outlined in the Railroad's Guidelines.
10. Verify all permanent clearances before project closing.
11. For Railroad coordination please refer to Sheets 2 and 3 and the TxDOT Standard Specifications.

For shoring/excavations in Zone A or B, TxDOT requires a predesigned and approved shoring design in the PS&E. If this is the case no Contractor submittal is required.

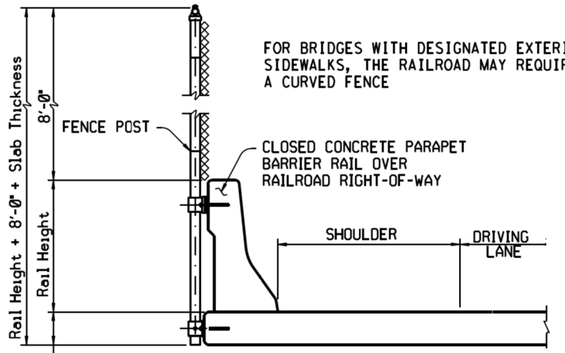
* This table is primarily required for overpass projects. This table is not required for underpass projects if the provided Plan and Profile sheets indicate this information at a minimum of every 100 ft and within bounds including 1500 ft before and after the limits of trackwork.

TABLE OF TOP OF RAIL PROFILE *

(STATIONS INCREASE WITH MILEPOST INCREASE)

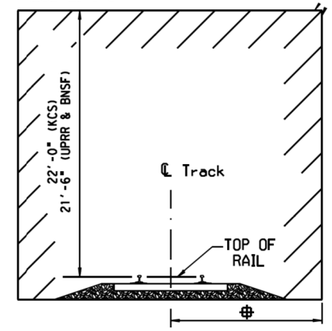
	MAIN LINE			
	ALIGNMENT: LEFT RAIL 100' STATIONS	ELEVATION	ALIGNMENT: RIGHT RAIL 100' STATIONS	ELEVATION
1000' PRIOR TO PROJECT	0+00	DATA FLD	0+00	DATA FLD
	1+00	DATA FLD	1+00	DATA FLD
	2+00	DATA FLD	2+00	DATA FLD
	3+00	DATA FLD	3+00	DATA FLD
	4+00	DATA FLD	4+00	DATA FLD
	5+00	DATA FLD	5+00	DATA FLD
	6+00	DATA FLD	6+00	DATA FLD
	7+00	DATA FLD	7+00	DATA FLD
	8+00	DATA FLD	8+00	DATA FLD
	9+00	DATA FLD	9+00	DATA FLD
WITHIN PROJECT	0+00	DATA FLD	0+00	DATA FLD
	0+00	DATA FLD	0+00	DATA FLD
	0+00	DATA FLD	0+00	DATA FLD
	0+00	DATA FLD	0+00	DATA FLD
	0+00	DATA FLD	0+00	DATA FLD
	0+00	DATA FLD	0+00	DATA FLD
	0+00	DATA FLD	0+00	DATA FLD
	0+00	DATA FLD	0+00	DATA FLD
	0+00	DATA FLD	0+00	DATA FLD
	0+00	DATA FLD	0+00	DATA FLD
	0+00	DATA FLD	0+00	DATA FLD
1000' AFTER PROJECT	▬ 10+00	DATA FLD	▬ 10+00	DATA FLD
	11+00	DATA FLD	11+00	DATA FLD
	12+00	DATA FLD	12+00	DATA FLD
	13+00	DATA FLD	13+00	DATA FLD
	14+00	DATA FLD	14+00	DATA FLD
	15+00	DATA FLD	15+00	DATA FLD
	16+00	DATA FLD	16+00	DATA FLD
	17+00	DATA FLD	17+00	DATA FLD
	18+00	DATA FLD	18+00	DATA FLD
	19+00	DATA FLD	19+00	DATA FLD
	20+00	DATA FLD	20+00	DATA FLD

▬ ± EXISTING TRACK STA. 10+00
= t CONSTRUCTION STA. XX+XX



TYPICAL FENCE ON BARRIER DETAIL

ONLY REQUIRED ON OVERPASSES IF SHOWN ON BRIDGE LAYOUT. (AREAS WITH PEDESTRIANS ON BRIDGE, RAIL YARDS, OR HISTORY OF VANDALISM)



MINIMUM CONSTRUCTION CLEARANCE ENVELOPE

(NORMAL TO RAILROAD)
15'-0" (UPRR), (BNSF) and 14'-0" (KCS)

FOR THE FOLLOWING INFORMATION PLEASE REFER TO THE PLAN AND ELEVATION DRAWINGS OF THE BRIDGE PLANS. THE PLAN AND ELEVATION DRAWINGS SHALL SHOW ALL REQUIRED INFORMATION PER BNSF/UPRR GUIDELINES FOR RAILROAD GRADE SEPARATION PROJECT PLAN NO. 711100 SHEET 2.

1. Centerline of bridge and/or centerline of project.
2. Track layout and limits of Railroad right of way with respect to centerline of main lines.
3. Future tracks, access roadways and existing tracks as main line, siding, spur, etc.
4. Point of minumum vertical clearance and distance, Measured perpendicular, from the centerline of nearest track.
5. Horizontal clearance at right angle from centerline of nearest existing or future track to the face of obstruction such as substructure above grade.
6. Horizontal clearance at right angle from centerline of nearest existing or future track to the face of nearest foundation below grade.
7. Horizontal spacing at right angle between centerlines of existing and/or future tracks.
8. Limits of shoring and minimum distance at right angle from centerline of nearest track.
9. All existing facilities and utilities and their proposed relocation, if required.
10. Toe of riprap or earth slope and/or limits of retaining wall.
11. Existing and proposed contours. (not required if the existing groundlines or drainage characteristics in Railroad ROW will not be altered).
12. Railroad Milepost and direction of increasing Milepost.
13. Direction of flow for all drainage systems within project limits.
14. Limits of barrier rail and fence with respect to centerline of track.
15. Depth of foundation below bottom of tie. (for footings only)
16. Top and bottom of pier protection wall elevation relative to top of rail elevation.
17. Controlling dimensions of drainage ditches and/or drainage structures.
18. Top of rail elevations for all tracks.
19. Minimum permanent vertical clearance above top of high rail to the lowest point under the bridge.
20. Existing and proposed groundline & roadway profile.
21. Type of riprap slope paving.
22. Location of deck drains.
23. Total width of superstructure.
24. Width of shoulder and/or sidewalk.

GENERAL NOTES:

Design and Construction for Railroad Projects shall be in accordance with the AREMA Manual for Railway Engineering and BNSF/UPRR Guidelines for Railroad Grade Separation Projects or Kansas City Southern Guidelines for the Design and Construction of Overpasses and Underpasses, or DART Light Rail Project Design Criteria Manual, and the TxDOT Standard Specifications for Construction and Maintenance of Highways, Streets and Bridges AS APPLICABLE TO THE RAILROAD COMPANY INVOLVED.

See BNSF/UPRR Guidelines for Grade Seperation Projects Plan No. 711100 and TxDOT Railroad Fence Details Sheet for additional information. A curved top fence extending 8'-0" above top of sidewalk is acceptable only where there is a traffic rail between roadway and sidewalk.

See Kansas City Southern Guidelines for the Design and Construction of Overpasses and Underpasses for corresponding BNSF/UPRR sheets referenced.

P.E. SEAL REQUIRED

PRELIMINARY

SUBJECT TO REVISION

This document is released for informational purposes under the authority of

P.E. on .

It is not to be used for regulatory approval, permit, bidding, or construction purposes.

Texas Department of Transportation — Rail Division

RAILROAD REQUIREMENTS FOR BRIDGE CONSTRUCTION

FILE:	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT October 2014	CONT	SECT	JOB	HIGHWAY
REVISIONS March 2020				
	DIST	COUNTY		SHEET NO.

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
SHEET NO. 342 OF 345
DWG NO. GC5-7432
CONTRACT NO. C-2033270-01

DATE:
FILE: RAILROAD REQUIREMENTS FOR BRIDGE CONSTRUCTION.dgn

PART 1 - GENERAL

1.01 DESCRIPTION

This project includes construction work within the right of way and/or properties of the Railroad Company and adjacent to its tracks, wire lines and other facilities. These sheets describe the minimum special requirements for coordination with the Railroad when working upon, over or under Railroad Right of Way or when impacting current or future railroad operations. Coordinate with the Railroad while performing the work outlined herein, and afford the same cooperation with the Railroad as with TxDOT. Complete all submittals and work in accordance with TxDOT Standard Specifications, Railroad Guidelines and AREMA recommendations as modified by these minimum special requirements or as directed in writing by the Railroad Designated Representative.

For purposes of this project, the Railroad Designated Representative is the person or persons designated by the Railroad Manager of Industry and Public Projects to handle specific tasks related to the project.

1.02 REQUEST FOR INFORMATION / CLARIFICATION

Submit Requests for Information ("RFI") involving work within any Railroad Right of Way to the TxDOT Engineer. The TxDOT Engineer will submit the RFI to the Railroad Designated Representative for review and approval for RFI's corresponding to work within Railroad Right of Way. Allow six (6) weeks total time for review and approval, which includes four (4) weeks for review and approval by the Railroad.

1.03 PLANS / SPECIFICATIONS

TxDOT has received written Railroad approval of the plans and specifications for this project. Any revisions or changes in the plans after award of the Contract must have the approval of TxDOT and the Railroad.

PART 2 - UTILITIES AND FIBER OPTIC

Construct all utility installations in accordance with current AREMA recommendations, Railroad, TxDOT and owning utility specifications and requirements. Railroad general guidelines can be found on the Railroad's website or by contacting the Railroad Designated Representative.

PART 3 - CONSTRUCTION

3.01 GENERAL

A. Perform all work in compliance with all applicable Railroad, FRA (Federal Railway Administration) and TxDOT rules and regulations. Arrange and conduct work in a manner that does not endanger or interfere with the safe operation of the tracks and property of the Railroad and the traffic moving on such tracks, or the wires, signals and other property of the Railroad, its tenants or licensees, at or in the vicinity of the Work. The safe operation of Railroad's train movements takes precedence over any work to be performed by the Contractor. The Contractor is responsible for train delay cost and lost revenue claims due to any delays or interruption of train operations resulting from Contractor's construction or other activities.

B. Construction activities within 15 feet of the operational tracks will only be allowed if absolutely necessary and the Railroad's Designated Representative grants approval. Construction activities within 15 feet of the operational track(s) preferably allow the tracks to stay operational. In such cases, coordination and approval by the Railroad Track Manager is required with regard to schedule, flagging, and slow orders. See Sections 3.07 and 3.08 for additional information.

C. Provide track protection for all work equipment (including rubber tired equipment) operating within 25 feet from nearest rail. When not in use, keep Contractor's machinery and materials at least 50 feet from the Railroad's nearest track.

D. Vehicular crossings of railroad track are allowed only at existing crossings, or haul road crossings developed with railroad approval.

E. The Contractor is also advised that new railroad facilities within the project may be built by the Railroad. If applicable, these facilities are delineated in the plans. Be aware of the limits of responsibilities and coordinate efforts with the Railroad and TxDOT.

3.02 RAILROAD OPERATIONS

A. Trains and/or equipment are expected on any track, at any time, in either direction. Become familiar with the train schedules in this location and structure bid assuming intermittent track windows in this period, as defined in Paragraph B that follows.

B. All railroad tracks within and adjacent to the contract site are active, and rail traffic over these facilities shall be maintained throughout the Project. Activities may include both through moves and switching moves to local customers. Railroad traffic and operations will occur continuously throughout the day and night on these tracks and shall be maintained at all times as defined herein. Coordinate and schedule the work so that construction activities do not interfere with railroad operations.

C. Coordinate work windows with TxDOT and the Railroad's Designated Representative. Types of work windows include Conditional Work Windows and Absolute Work Windows, as defined below:

1. Conditional Work Window: A Conditional Work Window is a period of time that railroad operations have priority over construction activities. When construction activities may occur on and/or adjacent to the railroad tracks within 25 feet of the nearest track, a railroad flag person will be required. At the direction of the Railroad's flag person, upon approach of a train, and when trains are present on the tracks, the tracks must be cleared (i.e., no construction equipment, materials or personnel within 25 feet, or as directed by the Railroad Designated Representative, from the tracks). Conditional Work Windows are available for the Project.

2. Absolute Work Window: An Absolute Work Window is a period of time that construction activities are given priority over railroad operations. During this time frame, the designated railroad track(s) will be inactive for train movements and may be fouled by the Contractor. At the end of an Absolute Work Window, the railroad tracks and/or signals must be completely operational for train operations and all Railroad, Public Utilities Commission (PUC) and FRA requirements, codes and regulations for operational tracks must be satisfied. In the situation where the operating tracks and/or signals have been affected, the Railroad will perform inspections of the work prior to placing that track back into service. A railroad flag person will be required for construction activities requiring an Absolute Work Window. Absolute Work Windows will not generally be granted. Any request will require a detailed explanation for Railroad review.

3.03 RIGHT OF ENTRY, ADVANCE NOTICE AND WORK STOPPAGES

A. Do not perform any work within Railroad Right of Way without a valid executed Right of Entry Agreement if required on this project.

B. Give advance notice to the Railroad as required in the "Contractor's Right of Entry Agreement" before commencing work in connection with construction upon or over Railroad Right of Way and observe the Railroad's rules and regulations with respect thereto.

C. Perform all work upon Railroad Right of Way in a manner to avoid interference with or endanger the operations of the Railroad. Whenever work may affect the operations or safety of trains, submit the work method to the Railroad Designated Representative for approval. Approval does not relieve the Contractor from liability. Do not commence any work which requires flagging service or inspection service until the flagging protection required by the Railroad is available at the job site. See Section 3.18 for railroad flagging requirements.

D. Make requests in writing for both Absolute and Conditional Work Windows, at least 30 days in advance of any work. Include in the written request:
1. Exactly what the work entails.
2. The days and hours that work will be performed.
3. The exact location of work, and proximity to the tracks.
4. The type of window requested and the amount of time requested.
5. The designated contact person.

Provide a written confirmation notice to the Railroad at least 48 hours before commencing work in connection with approved work windows when work is within 25 feet of nearest rail. Perform all work in accordance with previously approved work plans.

E. Make provisions to protect operations and property of the Railroad should a condition arising from, or in connection with the work, require immediate and unusual action. If in the judgment of the Railroad Designated Representative such provisions are insufficient, the Railroad Designated Representative may require or provide such provisions as deemed necessary. In any event, such provisions shall be at the Contractor's expense and without cost to the Railroad or TxDOT. The Railroad or TxDOT shall have the right to order the Contractor to temporarily cease operations in the event of an emergency or, if in the opinion of the Railroad Designated Representative, the Contractor's operations could endanger railroad operations. In the event of such an order, immediately notify TxDOT of the order.

3.04 INSURANCE

Do not begin work upon or over Railroad Right of Way until furnishing the Railroad with the insurance policies, binders, certificates and endorsements required by the "Contractor's Right of Entry Agreement", and until the Railroad Designated Representative has advised TxDOT that such insurance is in accordance with the Agreement.

3.05 RAILROAD SAFETY ORIENTATION

A. Complete the Railroad's course "Orientation for Contractor's Safety", and maintain current registration prior to working on the Railroad's property. This course is required to be completed annually by Contractor and Subcontractor personnel working on site.

"UPRR, BNSF, KCS/TEXMEX will not accept on-track safety training certificates from other Railroads. Refer to each Railroad's specific contractor right of entry for training information."

B. Know and follow the "Contractor's Right of Entry Agreement" EXHIBIT D, MINIMUM SAFETY REQUIREMENTS regarding clothing, personal protective equipment, and general safety requirements.

3.06 COOPERATION

The Railroad will cooperate with Contractor so that work may be conducted in an efficient manner, and will cooperate with Contractor in enabling use of Railroad Right of Way in performing the work.

3.07 MINIMUM CONSTRUCTION CLEARANCES FOR FALSEWORK AND OTHER TEMPORARY STRUCTURES

Abide by the following minimum temporary clearances during the course of construction:
A. 15' - 0" (BNSF)(UPRR), and 14' - 0" (KCS) horizontal from centerline of track
B. 22' - 0" (KCS) and 21' - 6" (UPRR & BNSF) vertically above top of rail.

For construction clearance less than listed above, obtain local Railroad Operating Unit review and approval.

3.08 APPROVAL OF REDUCED CLEARANCES

A. Maintain minimum track clearances during construction as specified in Section 3.07.

B. Submit any proposed infringement on the specified minimum clearances to the Railroad Designated Representative through TxDOT at least 30 days in advance of the work. Do not proceed with such infringement without written approval by the Railroad Designated Representative.

C. Do not commence work involving an approved infringement until receiving written assurance from the Railroad Designated Representative that arrangements have been made for any necessary flagging service.

Texas Department of Transportation | Rail Division

RAILROAD REQUIREMENTS FOR
FOR BRIDGE CONSTRUCTION

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
SHEET NO. 343 OF 345
DWG NO. GC5-7433
CONTRACT NO. C-2033270-01

FILE:	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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REVISIONS March 2020				
	DIST	COUNTY		SHEET NO.

DATE:
FILE:

RAILROAD REQUIREMENTS FOR BRIDGE CONSTRUCTION.dgn

3.09 CONSTRUCTION AND AS-BUILT SUBMITTALS

A. Provide TxDOT submittals for construction materials and procedures as outlined below and indicated in TxDOT Standard Specifications. A summary of most TxDOT submittal requirements can be found at: www.dot.state.tx.us/publications/bridge/items reviewed.pdf

B. The tables below provide the Railroad's minimum submittal requirements for the construction items noted. Submittal requirements are in addition to those specified elsewhere in these bid documents. The review times indicated below represent the total time, including the Railroad's required four (4) weeks.

C. TxDOT will forward relevant submittals to the Railroad Manager of Industry and Public Projects unless otherwise directed by the Railroad. TxDOT and the Engineer of Record will review and include comments prior to forwarding to the Railroad. Submit items in Table 1 for both railroad overpass and underpass projects, as applicable. Submit items in Table 2 for railroad underpass projects only.

TABLE 1 - RAILROAD SUBMITTAL REQUIREMENTS FOR OVERPASS & UNDERPASS PROJECTS

ITEM	DESCRIPTION	SETS	REVIEW TIME
1	Shoring design and details	6	6 weeks
2	Falsework design and details	6	6 weeks
3	Drainage design provisions	6	6 weeks
4	Erection diagrams and sequence	6	6 weeks
5	Demolition diagram and sequence	6	6 weeks

TABLE 2 - RAILROAD SUBMITTAL REQUIREMENTS FOR UNDERPASS PROJECTS

ITEM	DESCRIPTION	SETS	NOTES	REVIEW TIME
1	Shop drawings	6	Steel and Concrete members	6 weeks
2	Bearings	6	For all structures	6 weeks
3	Concrete Mix Designs	6	For all structures	6 weeks
4	Rebar & Strand certifications	6	For superstructure only	6 weeks
5	28 day concrete strength	6	For superstructure only	6 weeks
6	Waterproofing material certifications and installation procedure	6	Waterproofing & protective boards	6 weeks
7	Structural steel certifications	6	All fracture critical members & other members requiring improved notch toughness	6 weeks
8	Fabrication and Test reports	6	All fracture critical members & other members requiring improved notch toughness	6 weeks
9	Welding Procedures and Welder Certification	6	AWS requirements	6 weeks
10	Foundation Construction Reports or Notes	6	Pile driving, drilled shaft construction, bearing pressure test reports for spread footings	6 weeks
11	Compaction testing reports for backfill at abutments	6	Must meet 95% maximum dry density, Modified Procter ASTM D1557	6 weeks

D. TxDOT shall submit As-Built Records to the Railroad when TxDOT has processed the final project plans. These records shall consist of the following items:

Overpass Projects

1. Electronic files of all structure design drawings with as constructed modifications shown, in Microstation J or Acrobat .PDF format.
2. Hard copies of all structure design drawings with as constructed modifications shown.

Underpass Projects

1. Electronic files of all structure design drawings with as constructed modifications shown, in Microstation J or Acrobat .PDF format.
2. Hard copies of all structure design drawings with as constructed modifications shown.
3. Final approved copies of shop drawings for concrete and steel members.
4. Foundation Construction Reports
5. Compaction testing reports for backfill at abutments

3.10 APPROVAL OF DETAILS

Submit details of the construction affecting Railroad's tracks and property not already included in the Contract Plans to the Railroad Designated Representative through TxDOT for the Railroad's review and written approval before such work is undertaken. Allow a total six (6) weeks for review and approval of these submittals, which includes the Railroad's four (4) week review time.

3.11 MAINTENANCE OF RAILROAD FACILITIES

A. Maintain all ditches and drainage structures free of silt or other obstructions resulting from Contractor's operations. Repair eroded areas and any other damage within Railroad Right of Way and repair any other damage to the property of the Railroad, or its tenants.

B. Perform all such maintenance and repair of damages due to the Contractor's operations at Contractor's expense.

C. Submit a proposed method of erosion control for review by the Railroad prior to beginning any grading on the Project Site. Comply with all applicable local, state and federal regulations when developing and implementing such erosion control.

3.12 SITE INSPECTIONS BY RAILROAD's DESIGNATED REPRESENTATIVE

A. In addition to the office reviews of construction submittals, site inspections may be performed by the Railroad Designated Representative at significant points during construction, including the following if applicable:
1. Pre-construction meetings.
2. Pile driving/drilling of caissons or drilled shafts.
3. Reinforcement and concrete placement for railroad bridge substructure and/or superstructure.
4. Erection of precast concrete or steel bridge superstructure.
5. Placement of waterproofing (prior to placing ballast on bridge deck).
6. Completion of the bridge structure.

B. Site inspection is not limited to the milestone events listed above. Site visits to check progress of the work may be performed at any time throughout the construction as deemed necessary by the Railroad.

C. Provide a detailed construction schedule, including the proposed temporary horizontal and vertical clearances and construction sequence for all work to TxDOT for submittal to the Railroad Designated Representative for review prior to commencement of work. Include the anticipated dates when the above listed events will occur. Update this schedule for the above listed events as necessary and each month at a minimum to allow the Railroad to schedule site inspections.

3.13 RAILROAD REPRESENTATIVES

Railroad representatives, conductors, flag person or watch person will be provided by the Railroad, at expense of TxDOT, to protect Railroad's facilities, property and movements of its trains or engines. In general, the Railroad will furnish such personnel or other protective services as follows:

A. When any part of any equipment is standing or being operated within 25 feet, measured horizontally, from nearest rail of any track on which trains may operate, or when any object is off the ground and any dimension thereof could extend inside the 25 foot limit, or when any erection or construction activities are in progress within such limits, regardless of elevation above or below track.

B. For any excavation below elevation of track subgrade if, in the opinion of the Railroad Designated Representative, track or other railroad facilities may be subject to settlement or movement.

C. During any clearing, grubbing, excavation or grading in proximity to Railroad's facilities, which, in the opinion of the Railroad Designated Representative, may endanger railroad facilities or operations.

D. During any contractor's operations when, in the opinion of the Railroad Designated Representative, Railroad facilities, including, but not limited to, tracks, buildings, signals, wire lines, or pipe lines, may be endangered.

E. Arrange with the Railroad Designated Representative to provide the adequate number of flag persons to accomplish the work.

3.14 WALKWAYS REQUIRED

Maintain along the outer side of each exterior track of multiple operated track, and on each side of single operated track, an unobstructed continuous space suitable for trainman's use in walking along trains, extending to a line not less than twelve feet (12') from centerline of track. Remove any temporary impediments to walkways and track drainage encroachments or obstructions allowed during work hours before the close of each work day. Construct walkways with railings over open excavation areas when in close proximity of track. Do not violate allowable clearances of these railings to centerline of track: 8' - 6" horizontally for tangent track or 9' - 6" horizontally for curved track.

3.15 COMMUNICATIONS AND SIGNAL LINES

If required, the Railroad will rearrange its communications and signal lines, its grade crossing warning devices, train signals and tracks, and facilities that are in use and maintained by the Railroad's forces in connection with its operation at expense of TxDOT. This work by the Railroad, will be done by its own forces and it is not a part of the Work under this Contract.

3.16 TRAFFIC CONTROL

Coordinate any operations that control traffic across or around railroad facilities with the Railroad Designated Representative.

3.17 CONSTRUCTION EXCAVATIONS AND BORING ACTIVITIES UNDER TRACK

A. Take special precaution and care in connection with excavating and shoring. Excavations for construction of footings, piers, columns, walls or other facilities that require shoring shall comply with requirements of TxDOT, OSHA, AREMA and Railroad "Guidelines for Temporary Shoring".

B. The project plans indicate whether there are fiber optic lines or other such telecommunications systems that require consideration. Regardless, contact the necessary call center to determine if such cable systems are present:

UPRR 1-800-336-9193
7:00 AM to 9:00 PM CST Monday-Friday except holidays,
staffed 24 hrs/day for emergencies
48 hrs notice required

BNSF 1-800-533-2891
24 hour number
5 working days notice required

KCS 1-800-344-8377
Texas One Call, a 24 hour number
48 hrs notice required, excluding weekends and holidays

If a telecommunications system is buried anywhere on or near Railroad's property, coordinate with TxDOT, the Railroad and the Telecommunication Company(ies) to arrange for relocation or protective measures prior to beginning work on or near railroad property. Refer to the project General Notes for additional information.

C. Projects involving a boring or jack and bore operation under track such as drainage pipes or culverts and utilities require an installation plan reviewed and approved by the Railroad and TxDOT prior to proceeding with such construction. A railroad inspector and contractor-assisted monitoring of ground and track movement is required to maintain safe passage of rail traffic. Stop installation and do not allow passage of trains if movements in excess of 1/4 inch vertical or horizontal is detected in the tracks. Immediately repair the damage to the satisfaction of TxDOT and the Railroad before proceeding.

3.18 RAILROAD FLAGGING

Per the RIGHT OF ENTRY agreement for flagging, notify the Railroad Representative at least 10 working days in advance of Contractor work and at least 30 working days in advance of any Contractor work in which any person or equipment will be within 25 feet of nearest rail or as specified in the Contractor Right of Entry (CROE).

3.19 CLEANING OF RIGHT-OF-WAY

When work is complete, remove all tools, implements, and other materials brought into Railroad Right of Way and leave the Right of Way in a clean and presentable condition to the satisfaction of TxDOT and the Railroad.

Texas Department of Transportation — Rail Division

RAILROAD REQUIREMENTS FOR BRIDGE CONSTRUCTION

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
SHEET NO. 344 OF 345
DWG NO. GC5-7434
CONTRACT NO. C-2033270-01

FILE:	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT October 2014	CONT	SECT	JOB	HIGHWAY
REVISIONS March 2020	DIST	COUNTY		SHEET NO.

DATE:
FILE: RAILROAD REQUIREMENTS FOR BRIDGE CONSTRUCTION.dgn

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DATE:
FILE:

I. WORK AT CROSSING LOCATIONS (AT GRADE, HIGHWAY OVERPASS, HIGHWAY UNDERPASS, PEDESTRIAN, OR CLOSED/ABANDONED)

DOT #: _____
Crossing Type: ** _____
RR Company Owning Track at Crossing: _____
Operating RR Company at Track: _____
RR MP: _____
RR Subdivision: _____
City: _____
County: _____
CSJ at this Crossing: _____
Highway/Roadway name crossing the railroad: _____
# of regularly scheduled trains per day at this crossing: ____
# of switching movements per day at this crossing: ____
% of estimated contract cost of work within railroad ROW: _____

Scope of Work at this Crossing to Be Performed by State Contractor:

_____
_____
_____
_____

Scope of Work at this Crossing to Be Performed by Railroad Company:

_____
_____
_____
_____

** Choose: Highway Overpass, Highway Underpass, At Grade, Pedestrian, or Closed/Abandoned

II. OTHER PROJECT WORK WITHIN RAILROAD RIGHTS-OF-WAY (ROW)

_____
_____
_____
_____

III. FLAGGING

of Days of Railroad Flagging Expected: ____

On this project, night or weekend flagging is:

☐ Expected
☐ Not Expected

Flagging services will be provided by:

☐ Railroad Company: TxDOT will pay flagging invoices
☐ Outside Party: Contractor will pay flagging invoices, to be reimbursed by TxDOT

Contractor must incorporate flaggers into anticipated construction schedule. The railroad requires a 30 day notice if their flaggers are to be utilized. If contractor falls behind schedule due to their own negligence and is not ready for scheduled flaggers, any flagging charges will be paid by Contractor.

Contact Information for Flagging:

_____
_____
_____
_____
_____
_____

IV. CONSTRUCTION WORK TO BE PERFORMED BY THE RAILROAD

On this project, construction work to be performed by a railroad company is:

☐ Required
☐ Not Required

Coordinate with TxDOT for any work to be performed by the railroad company. TxDOT must issue a work order for any work done by the rail road company prior to the work being performed.

V. RAILROAD INSURANCE REQUIREMENTS

Contractor shall provide the proper insurance as shown in the table below.

Insurance policies must be issued for and on behalf of the Railroad. Where more than one Railroad Company is operating on the same right of way or where several railroad companies are involved and operate on their own separate rights of way, provide separate insurance policies in the name of each Railroad Company.

No direct compensation will be made to the contractor for providing the insurance coverages shown below or any deductibles. These costs are incidental to the various bid items.

Type of Insurance	Amount of Coverage (Minimum)
Workers Compensation	$500,000 / $500,000 / $500,000
Commercial General Liability	$2,000,000 / $2,000,000
Business Automobile	$2,000,000 combined single limit
Railroad Protective Liability	** / **

VI. CONTRACTOR'S RIGHT-OF-ENTRY (ROE) AGREEMENT

On this project, an ROE agreement is:

☐ Not Required
☐ Required: TxDOT to assist in obtaining (see Item 5, Article 8.3)

With the following railroad companies: _____

☐ Required: Contractor to obtain (see Item 5, Article 8.4)

With the following railroad companies: _____

To view previously approved ROE agreement templates agreed upon between the State and railroad company, see:

http://www.txdot.gov/inside-txdot/division/traffic/samples.html

Approved ROE agreement templates are not to be modified by the Contractor.

Contractor shall not operate within railroad rights of way without an executed Construction & Maintenance agreement between the state and the railroad and an executed ROE agreement between the contractor and the railroad if required on project.

VII. RAILROAD COORDINATION MEETING

On this project, a Railroad Coordination Meeting is:

☐ Not Required
☐ Required

See Item 5, Article 8.1 for more details.

VIII. SUBCONTRACTORS

Contractor shall not subcontract work without written consent of TxDOT. Subcontractors are required to maintain the same insurance coverage as required of the Contractor.

IX. EMERGENCY NOTIFICATION

In Case of Railroad Emergency
Call ******* Railroad Emergency Line
at XXX-XXX-XXXX
Location: DOT ********
RR Milepost ***** ********** Subdivision

COTTON BELT REGIONAL RAIL
VELOWEB HIXE & BIXE TRAIL
SHEET NO. 345 OF 345
DWG NO. GC5-7435
CONTRACT NO. C-2033270-01

Texas Department of Transportation | Traffic Operations Division

RAILROAD SCOPE OF WORK

PROJECT SPECIFIC DETAILS

FILE: RR Scope of Work.dgn	DN: TxDOT	CK:	DW:	CK:
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REVISIONS				
	DIST	COUNTY		SHEET NO.