COTTON BELT REGIONAL RAIL
VELOWEB HIKE AND BIKE TRAIL
TOWN OF ADDISON

CONTRACT NO. C - 2033270 - 01

100% DESIGN
MARCH 20, 2023

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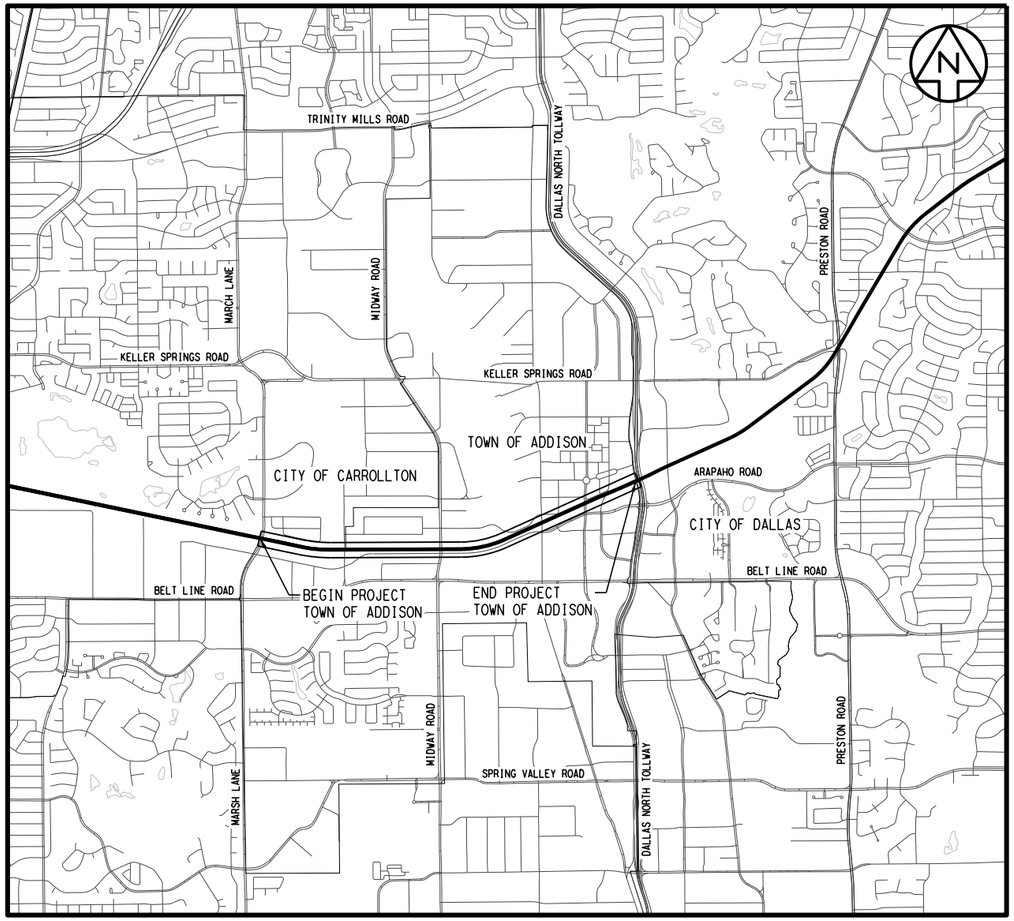
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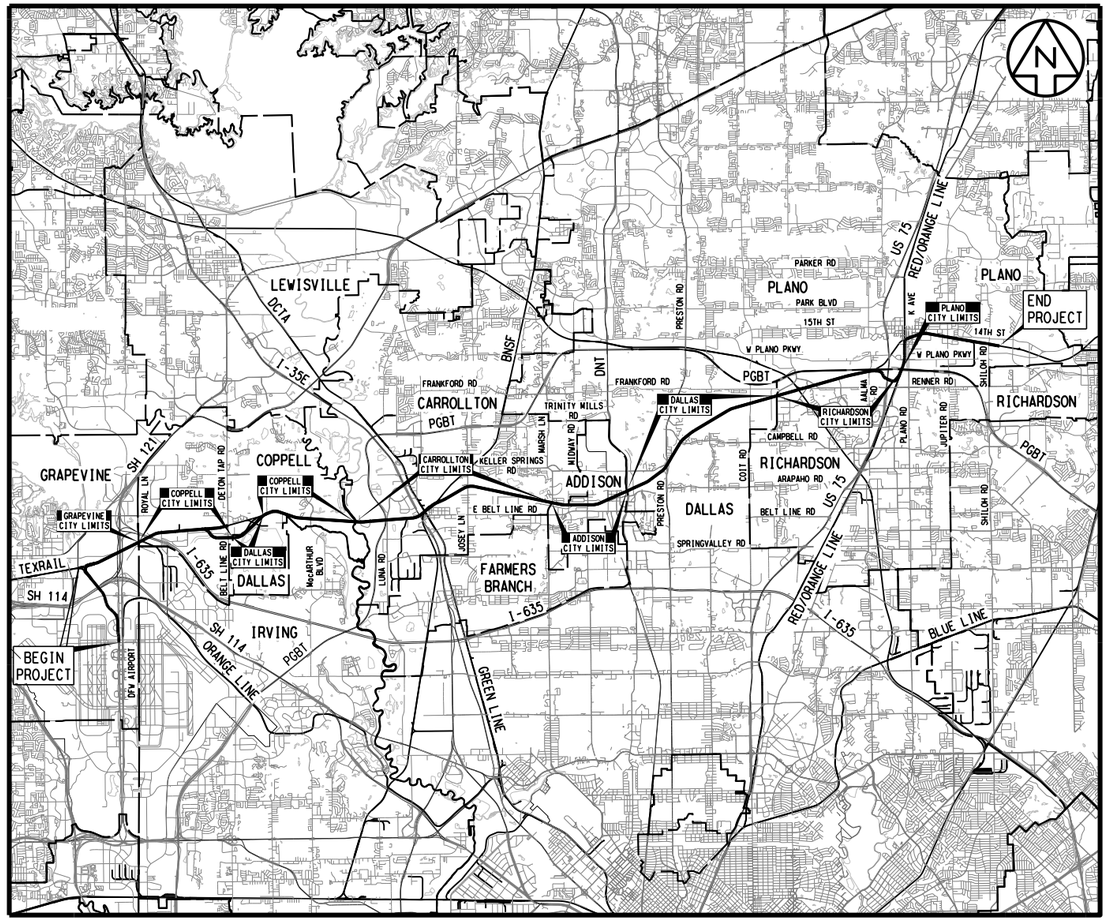
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DWG No. GC1-7502



VICINITY MAP
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KEY MAP
VELOWEB HIKE AND BIKE TRAIL
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COTTON BELT REGIONAL RAIL
VELOWEB HIKE AND BIKE TRAIL
TOWN OF ADDISON

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CONTRACT SHEET No. 2 OF 242

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COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

TOWN OF ADDISON
TITLE SHEET

CONTRACT	DWG No.	REV
C-2033270-01	GC1-7502	D

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DWG No. GC2-0101

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VELOWEB HIKE & BIKE TRAIL

TOWN OF ADDISON
INDEX OF DRAWINGS
SHEET 1 OF 4

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171	D	CC6-2753	TOWN OF ADDISON DRAINAGE CALCULATIONS SHEET 4 OF 4
172	D	CC6-2781	TOWN OF ADDISON DRAINAGE AREA MAP BEGIN TO STA 2336+00 SHEET 1 OF 3
173	D	CC6-2782	TOWN OF ADDISON DRAINAGE AREA MAP STA 2336+00 TO STA 2365+00 SHEET 2 OF 3
174	D	CC6-2783	TOWN OF ADDISON DRAINAGE AREA MAP STA 2365+00 TO END SHEET 3 OF 3
175	D	CC6-2809	TOWN OF ADDISON DRAINAGE PLAN BEGIN TO STA 2292+50 SHEET 1 OF 12
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178	D	CC6-2812	TOWN OF ADDISON DRAINAGE PLAN STA 2311+50 TO STA 2321+50 SHEET 4 OF 12
179	D	CC6-2813	TOWN OF ADDISON DRAINAGE PLAN STA 2321+50 TO STA 2331+50 SHEET 5 OF 12
180	D	CC6-2814	TOWN OF ADDISON DRAINAGE PLAN STA 2331+50 TO STA 2341+50 SHEET 6 OF 12
181	D	CC6-2815	TOWN OF ADDISON DRAINAGE PLAN STA 2341+50 TO STA 2350+50 SHEET 7 OF 12
182	D	CC6-2816	TOWN OF ADDISON DRAINAGE PLAN STA 2350+50 TO STA 2360+00 SHEET 8 OF 12
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184	D	CC6-2818	TOWN OF ADDISON DRAINAGE PLAN STA 2371+50 TO STA 2380+50 SHEET 10 OF 12
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188	D	CC6-2885	TOWN OF ADDISON DRAINAGE PROFILES SHEET 1 OF 4
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197	D	CC6-2965	REHAB DRAINAGE DETAILS
198	D	CC6-2966	INSERTA TEE DRAINAGE DETAILS
199	D	CC6-2967	MISCELLANEOUS SEWER DETAILS MSD
200	D	CC6-2968	RCP STORM SEWER PIPE BEDDING

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TOWN OF ADDISON
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CONTRACT	DWG No.	REV
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202	D	CC6-2970	CONCRETE HEADWALLS WITH PARALLEL WINGS FOR NON-SKEWED PIPE CULVERTS CH-PW-0
203	D	CC6-2971	PRECAST SLAB LID SHEET 1 OF 2
204	D	CC6-2972	PRECAST SLAB LID SHEET 2 OF 2
205	D	CC6-2973	PRECAST ROUND MANHOLE
206	D	CC6-2974	PRECAST SAFETY END TREATMENT TYPE II - PARALLEL DRAINAGE
207	D	CC6-2975	PRECAST SAFETY END TREATMENT TYPE II - CROSS DRAINAGE
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215	D	OC2-2813	TOWN OF ADDISON TEMPORARY EROSION CONTROL STA 2319+50 TO STA 2329+50 SHEET 4 OF 11
216	D	OC2-2814	TOWN OF ADDISON TEMPORARY EROSION CONTROL STA 2329+50 TO STA 2339+50 SHEET 5 OF 11
217	D	OC2-2815	TOWN OF ADDISON TEMPORARY EROSION CONTROL STA 2339+50 TO STA 2349+50 SHEET 6 OF 11
218	D	OC2-2816	TOWN OF ADDISON TEMPORARY EROSION CONTROL STA 2349+50 TO STA 2359+50 SHEET 7 OF 11
219	D	OC2-2817	TOWN OF ADDISON TEMPORARY EROSION CONTROL STA 2359+50 TO STA 2371+50 SHEET 8 OF 11
220	D	OC2-2818	TOWN OF ADDISON TEMPORARY EROSION CONTROL STA 2371+50 TO STA 2381+50 SHEET 9 OF 11
221	D	OC2-2819	TOWN OF ADDISON TEMPORARY EROSION CONTROL STA 2381+50 TO STA 2391+50 SHEET 10 OF 11
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CONTRACT	DWG No.	REV
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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
- + 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
- ⊖S CENTRAL ANGLE OF SPIRAL OR SPIRAL ANGLE
- ⊖aAC CENTRAL ANGLE OF COMPOUND SPIRAL OR COMPOUND ANGLE (CS1 TO CS2)
- ⊖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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VELOWEB HIKE & BIKE TRAIL

TOWN OF ADDISON
SYMBOLS

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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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CONTRACT SHEET No. 8 OF 242

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

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DESIGNED	M. JAHN
CHECKED	B. ALLDREDGE
IN CHARGE	K. MOYNAHAN
DATE	13 MAR 23

CAES

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

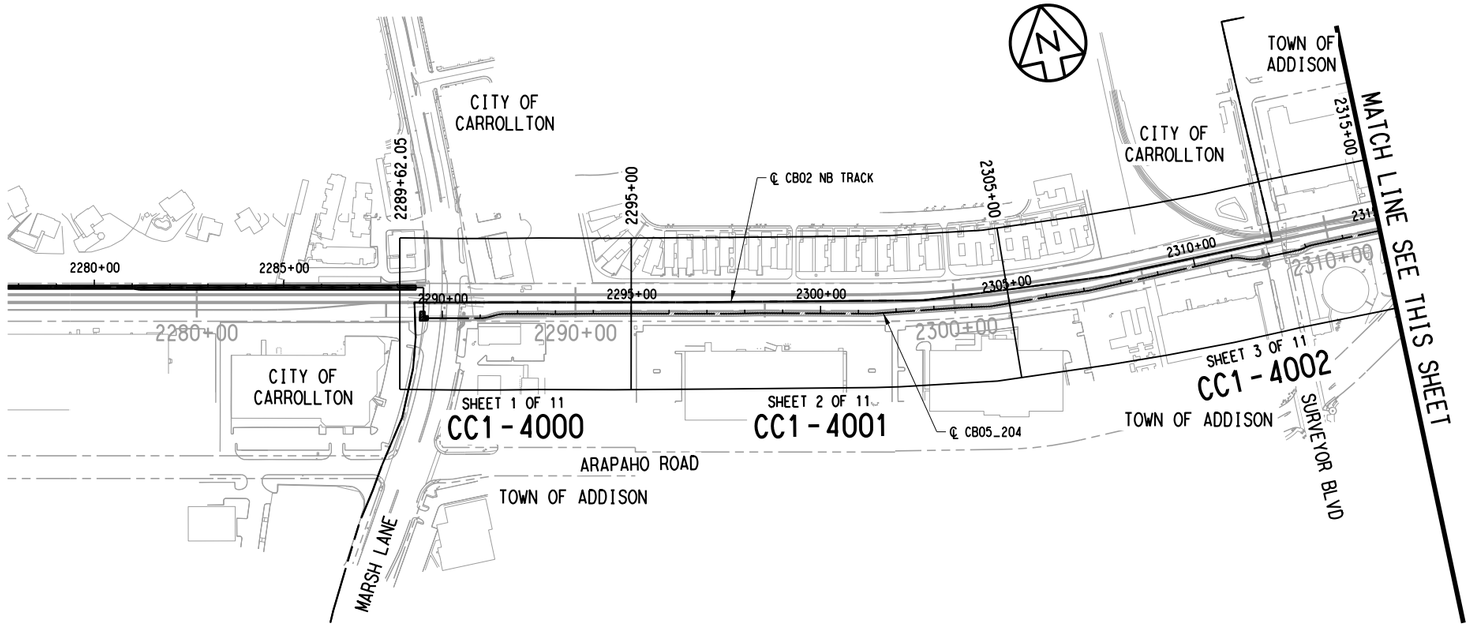
TOWN OF ADDISON
ABBREVIATIONS

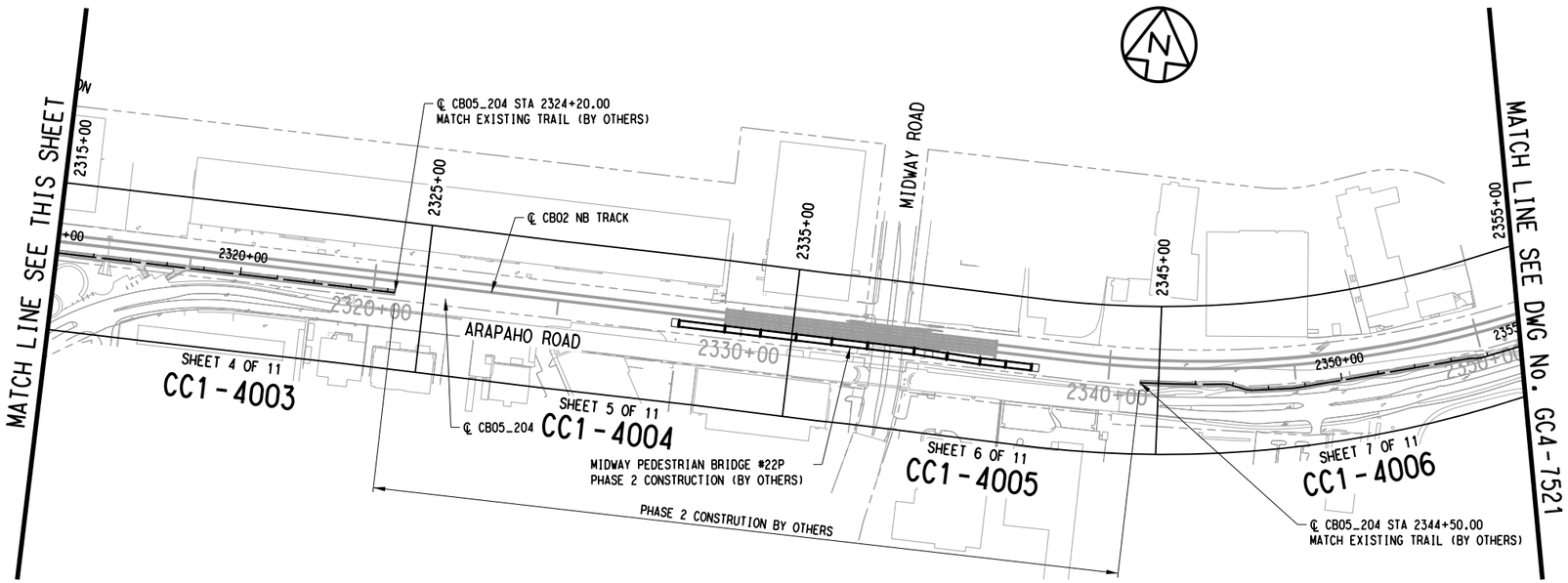
CONTRACT	DWG No.	REV
C-2033270-01	GC3-7504	D

CB05-GC3-7504.001

06-MAR-2023 10:31
CB05-GC3-7504.001
JEGSVCPW001
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DWG No. GC4-7520





SCALE (IN FEET)
0 100 200 400

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CHECKED	B. ALLDREDGE
IN CHARGE	B. ALLDREDGE
DATE	13 MAR 23

CAES

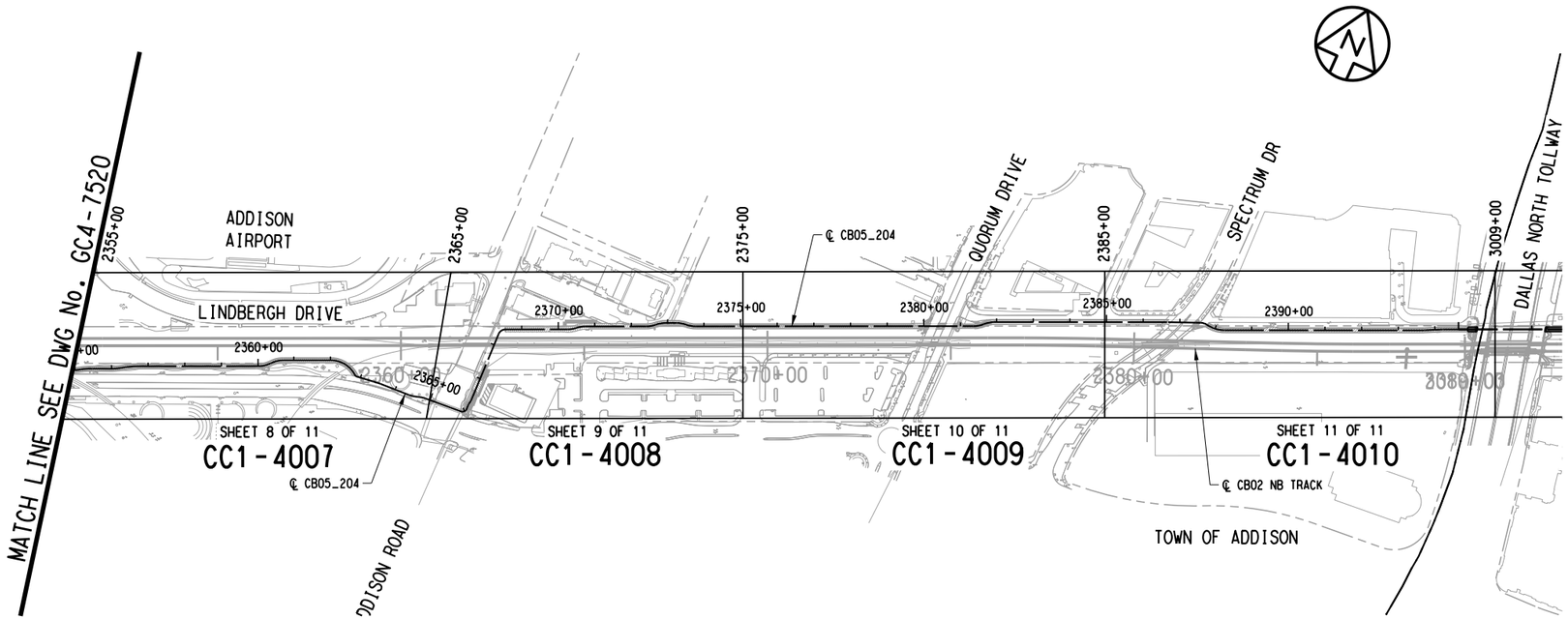
COTTON BELT REGIONAL RAIL VELOWEB HIKE & BIKE TRAIL

TOWN OF ADDISON PEDESTRIAN TRAIL KEY MAP SHEET 1 OF 2

CONTRACT	DWG No.	REV
C-2033270-01	GC4-7520	D

CB05-GC4-7520.200

DWG No. GC4-7521



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0 100 200 400

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CONTRACT SHEET No. 10 OF 242

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DESIGNED	A. ENSOR
CHECKED	B. ALLDREDGE
IN CHARGE	B. ALLDREDGE
DATE	13 MAR 23

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COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

TOWN OF ADDISON
PEDESTRIAN TRAIL KEY MAP
SHEET 2 OF 2

CONTRACT	DWG No.	REV
C-2033270-01	GC4-7521	D

CB05-GC4-7521.200

DWG No. GC5-7530

SUMMARY OF CIVIL ITEMS

			TXDOT ITEMS										
ITEM NUMBER			100	110	132	360	SEE NOTE 2	450	529	529	530	531	644
DESC. CODE			6002	6001	6007	6002		6103	6005	6007	6004	6001	6001
SHEET NO.	LOCATION		PREPARING ROW	EXCAVATION (ROADWAY)	EMBANKMENT (FINAL) (ORD COMP) (TY. D)	CONC PVMT (CONT REINF CRCP) (8")	BEDDING MATERIAL (VARIABLE)	RAIL (PR11)	CONC CURB (MONO) (TP II)	CURB & GUTTER	DRIVEWAYS (CONC)	CONC SIDEWALKS (4")	SMALL SIGN INSTALLATION
	STA	STA	STA LIMITS	CY	CY	SY	CY	LF	LF	LF	SY	SY	EA
CIVIL LAYOUTS													
1 OF 11	2289+62	2295+00	5.38	100	100	603	17		27	2		23	1
2 OF 11	2295+00	2305+00	10	100	100	1,333	37						
3 OF 11	2305+00	2315+00	10	100	100	1,270	35	22		1		13	2
4 OF 11	2315+00	2325+00	10	100	100	1,362	38	195					
5 OF 11	2325+00	2335+00	10	100	100								
6 OF 11	2335+00	2345+00	10	100	100	67	2						
7 OF 11	2345+00	2355+00	10	100	100	1,231	34						
8 OF 11	2355+00	2365+00	10	100	100	1,062	29	133					
9 OF 11	2365+00	2375+00	10	100	100	1,076	30	538		23	108		2
10 OF 11	2375+00	2385+00	10	100	100	802	22	44	98	2		38	2
11 OF 11	2385+00	2394+81	9.81	100	100	957	27	20		2		11	2
SUBTOTALS			105.19	1,100	1,100	9,763	271	953	124	30	108	85	9

NOTES:

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2. THIS ITEM IS FOR CONTRACTORS INFORMATION ONLY. PAYMENT IS SUBSIDIARY TO ITEM 360-6002.
3. THESE ITEMS ARE FOR CONTRACTORS INFORMATION ONLY. PAYMENT IS SUBSIDIARY TO ITEM 100-6002.

SUMMARY OF CIVIL ITEMS

ITEM NUMBER			666	658	2830	305.2	802.2						303.2
DESC. CODE			6170	6111									
SHEET NO.	LOCATION		REFL PAV MRK TY II (W) 4" (SLD)	ZEBRA CYCLE LANE SEPARATOR	CHAIN LINK FENCE	CURB RAMP	CONC SIDEWALK WALL	BOLLARD	ADJUST UTILITY VALVE/METER	ADJUST CONDUIT JUNCTION BOX	RELOCATE ELECTRIC TRANSFORMER BOX	RELOCATE POWER POLE	8" REINF CONC PAVEMENT
	STA	STA	LF	EA	LF	SY	LF	EA	EA	EA	EA	EA	SY
CIVIL LAYOUTS													
1 OF 11	2289+62	2295+00	270		257	8		2		1		1	
2 OF 11	2295+00	2305+00			999					3			
3 OF 11	2305+00	2315+00	164		716	18	22	2		1			
4 OF 11	2315+00	2325+00			920		52			4			
5 OF 11	2325+00	2335+00											
6 OF 11	2335+00	2345+00											
7 OF 11	2345+00	2355+00			371		133		1				
8 OF 11	2355+00	2365+00											
9 OF 11	2365+00	2375+00	570			41	538	4	7	1			26
10 OF 11	2375+00	2385+00	1247	69		22	44	3		2	1		
11 OF 11	2385+00	2394+81	762	33		20	20	1	1				
SUBTOTALS			3,013	102	3,264	110	811	12	9	12	1	1	26

SUMMARY OF REMOVAL ITEMS

			NCTCOG ITEMS			TXDOT ITEMS							
ITEM NUMBER			104	7266	104								
DESC. CODE			6031	6069	6002								
SHEET NO.	LOCATION		REMOVING CONC (HEADWALL)	REMOVE EXISTING MANHOLE	REMOVING CONC (RIPRAP)	REMOVE EXISTING SIDEWALK	REMOVE EXISTING PAVEMENT	REMOVE CURB & GUTTER	REMOVE EXIST LIGHT POLE	REMOVE EXIST SIGN	REMOVE EXIST TREE	REMOVE EXIST BOLLARD	REMOVE EXIST FENCE	REMOVE EXIST CONC BENCH
	STA	STA	EA	EA	SY	SY	SY	LF	EA	EA	EA	EA	LF	EA
REMOVAL LAYOUTS														
1 OF 6	2289+62	2305+00				32		49						
2 OF 6	2305+00	2325+00	1	1		30	360	34		2		2		
3 OF 6	2325+00	2345+00			18									
4 OF 6	2345+00	2365+00			285	1,112			17		1			3
5 OF 6	2365+00	2385+00			276	62	655	116	1	6			128	
6 OF 6	2385+00	2394+81					29			1				
SUBTOTALS			1	1	579	1,236	1,044	199	18	9	1	2	128	3

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CHECKED	B. ALLDREDGE
IN CHARGE	K. MOYNAHAN
DATE	13 MAR 23

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

TOWN OF ADDISON
BID ITEMS SUMMARY
SHEET 1 OF 2

CONTRACT	DWG No.	REV
C-2033270-01	GC5-7530	D

CB05-GC5-7530.010

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CB05-GC5-7530.010
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DWG No. GC5-7531

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SUMMARY OF DRAINAGE ITEMS

			NCTCOG ITEMS			TXDOT ITEMS									DART ITEMS		
ITEM NUMBER			502.12	502.01	502.01	464	464	465	465	466	467	467	465	462	2700	2700	2700
DESC. CODE			1001	1001	1001	6003	6005	6126	6127	6014	6357	6356	6602	6022	1001	1002	1005
SHEET NO.	LOCATION		ADDISON 2-GRATE INLET	ADDISON TYPE "A" STORM SEWER MANHOLE	ADDISON TYPE "B" STORM SEWER MANHOLE	RC PIPE (CL III) (18 IN)	RC PIPE (CL III) (24 IN)	INLET (COMPL) (PSL)(FG) (3FTX3FT-3FTX3FT)	INLET (COMPL) (PSL)(FG) (4FTX4FT-3FTX3FT)	HEADWALL (CH-PW-0) (DIA=66 IN)	SET (TY II) (18 IN) (RCP) (3:1)(P)	SET (TY II) (18 IN) (RCP) (3:1)(C)	PRM (48 IN)	CONC BOX CULV (8FTX7FT)	DART PIPE UNDERDRAINS (8")	DART PIPE UNDERDRAINS (10")	DART TERMINAL CLEANOUTS UNDERDRAINS
	STA	STA	EA	EA	EA	LF	LF	EA	EA	EA	EA	EA	EA	LF	LF	LF	EA
DRAINAGE LAYOUTS																	
1 OF 12	BEGIN	2292+50															
2 OF 12	2292+50	2302+00														18	1
3 OF 12	2302+00	2311+50				24		3			1				27		1
4 OF 12	2311+50	2321+50	1		1	16	517			1			2	20	101		2
5 OF 12	2321+50	2331+50	1				153						1				
6 OF 12	2331+50	2341+50															
7 OF 12	2341+50	2350+50				32						1					
8 OF 12	2350+50	2360+00															
9 OF 12	2360+00	2371+50	1	1		98					1						
10 OF 12	2371+50	2380+50	1				46										
11 OF 12	2380+50	2388+50															
12 OF 12	2388+50	END		1			90		1								
SUBTOTALS			4	2	1	170	806	3	1	1	2	1	3	20	128	18	4

SUMMARY OF TRAFFIC CONTROL ITEMS

			NCTCOG ITEMS				
ITEM NUMBER			801.1				
DESC. CODE							
SHEET NO.	LOCATION		TRAFFIC CONTROL				
	STA	STA	LS				
TCP LAYOUTS							
1 OF 7	2289+62	2290+42	-				
2 OF 7	2311+98	2312+38	-				
3 OF 7	2365+00	2365+90	-				
4 OF 7	2370+20	2373+00	-				
5 OF 7	2380+11	2380+78	-				
6 OF 7	2380+78	2386+80	-				
7 OF 7	2386+80	2387+39	-				
SUBTOTALS			1	0	0	0	0

SUMMARY OF SW3P ITEMS

			NCTCOG ITEMS			
ITEM NUMBER			202.5	202.9	202.11	202.14
DESC. CODE			1	1	1	1
SHEET NO.	LOCATION		SILT FENCE	CHECK DAM (ROCK)	STABILIZED CONSTRUCTION EXIT	INLET PROTECTION
	STA	STA	LF	CY	SY	EA
SW3P LAYOUTS						
1 OF 11	2288+50	2299+50	900	36	156	2
2 OF 11	2299+50	2309+50	1,017	18		
3 OF 11	2309+50	2319+50	872	18	312	2
4 OF 11	2319+50	2329+50	664			
5 OF 11	2329+50	2339+50				
6 OF 11	2339+50	2349+50	631	18		
7 OF 11	2349+50	2359+50	1,008	9		1
8 OF 11	2359+50	2371+50	949	27	312	5
9 OF 11	2371+50	2381+50	937	9	156	2
10 OF 11	2381+50	2391+50	397	9	156	
11 OF 11	2391+50	2395+00	308	18	156	1
SUBTOTALS			7,683	162	1,248	13

SUMMARY OF RETAINING WALL ITEMS

	TXDOT ITEMS		
*ITEM NUMBER	423	432	556
DESC. CODE	6001	6045	6006
WALL NO.	RETAINING WALL (MSE)	RIPRAP (MOW STRIP) (4 IN)	PIPE UNDERDRAINS (TY 6) (6")
	SF	CY	LF
RETAINING WALL LAYOUTS			
RW_T_R2316 1 OF 1	834	4	143
SUBTOTALS	834	4	143

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ARCHER WESTERN HERZOG

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DESIGNED	M. JAHN
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IN CHARGE	K. MOYNAHAN
DATE	13 MAR 23

CAES

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

TOWN OF ADDISON
BID ITEMS SUMMARY
SHEET 2 OF 2

CONTRACT	DWG No.	REV
C-2033270-01	GC5-7531	D

CBD5-GC5-7531.010

16-MAR-2023 10:51
CBD5-GC5-7531.010
ssoleh
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DWG No. CC1-2401

<* 1 Describe Chain 204

Chain 204 contains:
001 CUR 2041 CUR 2042 002 CUR 2043 CUR 2044 003 004 005 006 CUR 2045 007 CUR 2-
046 008 CUR 2047 009 CUR 2048 CUR 2049 CUR 20410 CUR 20411 010 011 CUR 20412 CU-
R 20413 012 013 CUR 20414 CUR 20415 014 CUR 20416 CUR 20417 CUR 20418 CUR 20419-
 CUR 20420 CUR 20421 CUR 20422 CUR 20423 CUR 20424 CUR 20425 CUR 20426 CUR 2042-
7 015 CUR 20428 016 CUR 20429 CUR 20430 CUR 20431 017 018 019 020 CUR 20432 CUR-
 20433 CUR 20434 CUR 20435 CUR 20436 CUR 20437 CUR 20438 CUR 20439 CUR 20440 02-
1 022 CUR 20441 CUR 20442 CUR 20443 CUR 20444 023 024

Beginning chain 204 description
==========

Point 001 N 7,036,177.34 E 2,473,643.06 Sta 2289+62.85

Course from 001 to PC 2041 S 78° 13' 43.90" E Dist 138.24

Curve Data

Curve 2041
P.I. Station 2291+10.83 N 7,036,147.15 E 2,473,787.93
Delta = 14° 47' 58.65" (LT)
Degree = 76° 23' 39.74"
Tangent = 9.74
Length = 19.37
Radius = 75.00
External = 0.63
Long Chord = 19.32
Mid. Ord. = 0.62
P.C. Station 2291+01.09 N 7,036,149.14 E 2,473,778.39
P.T. Station 2291+20.46 N 7,036,147.67 E 2,473,797.65
C.C. N 7,036,222.56 E 2,473,793.69
Back = S 78° 13' 43.90" E
Ahead = N 86° 58' 17.45" E
Chord Bear = S 85° 37' 43.22" E

Course from PT 2041 to PC 2042 N 86° 58' 17.45" E Dist 25.15

Curve Data

Curve 2042
P.I. Station 2291+55.35 N 7,036,149.51 E 2,473,832.50
Delta = 14° 47' 58.62" (RT)
Degree = 76° 23' 39.74"
Tangent = 9.74
Length = 19.37
Radius = 75.00
External = 0.63
Long Chord = 19.32
Mid. Ord. = 0.62
P.C. Station 2291+45.61 N 7,036,149.00 E 2,473,822.77
P.T. Station 2291+64.98 N 7,036,147.52 E 2,473,842.03
C.C. N 7,036,074.10 E 2,473,826.73
Back = N 86° 58' 17.45" E
Ahead = S 78° 13' 43.92" E
Chord Bear = S 85° 37' 43.23" E

Course from PT 2042 to 002 S 78° 13' 43.92" E Dist 35.01

Point 002 N 7,036,140.38 E 2,473,876.31 Sta 2292+00.00

Course from 002 to PC 2043 S 78° 19' 22.20" E Dist 73.10

Curve Data

Curve 2043
P.I. Station 2292+78.36 N 7,036,124.52 E 2,473,953.05
Delta = 3° 00' 34.17" (RT)
Degree = 28° 38' 52.40"
Tangent = 5.25
Length = 10.51
Radius = 200.00
External = 0.07
Long Chord = 10.50
Mid. Ord. = 0.07
P.C. Station 2292+73.10 N 7,036,125.59 E 2,473,947.90
P.T. Station 2292+83.61 N 7,036,123.19 E 2,473,958.13
C.C. N 7,035,929.72 E 2,473,907.42
Back = S 78° 19' 22.20" E
Ahead = S 75° 18' 48.03" E
Chord Bear = S 76° 49' 05.11" E

Course from PT 2043 to PC 2044 S 75° 18' 48.02" E Dist 3.04

Curve Data

Curve 2044
P.I. Station 2292+92.71 N 7,036,120.88 E 2,473,966.94
Delta = 3° 28' 27.60" (LT)
Degree = 28° 38' 52.40"
Tangent = 6.07
Length = 12.13
Radius = 200.00
External = 0.09
Long Chord = 12.13
Mid. Ord. = 0.09
P.C. Station 2292+86.65 N 7,036,122.42 E 2,473,961.07
P.T. Station 2292+98.77 N 7,036,119.70 E 2,473,972.89
C.C. N 7,036,315.88 E 2,474,011.78
Back = S 75° 18' 48.03" E
Ahead = S 78° 47' 15.62" E
Chord Bear = S 77° 03' 01.83" E

Course from PT 2044 to 003 S 78° 47' 15.62" E Dist 102.05

Point 003 N 7,036,099.86 E 2,474,072.99 Sta 2294+00.82

Course from 003 to 004 S 78° 22' 44.61" E Dist 91.21

Point 004 N 7,036,081.49 E 2,474,162.33 Sta 2294+92.04

Course from 004 to 005 S 78° 09' 53.64" E Dist 262.79

Point 005 N 7,036,027.59 E 2,474,419.54 Sta 2297+54.83

Course from 005 to 006 S 79° 21' 31.55" E Dist 82.84

Point 006 N 7,036,012.29 E 2,474,500.95 Sta 2298+37.67

Course from 006 to PC 2045 S 77° 57' 58.82" E Dist 297.48

Curve Data

Curve 2045
P.I. Station 2301+38.80 N 7,035,949.51 E 2,474,795.47
Delta = 4° 11' 09.10" (LT)
Degree = 57° 17' 44.81"
Tangent = 3.65
Length = 7.31
Radius = 100.00
External = 0.07
Long Chord = 7.30
Mid. Ord. = 0.07
P.C. Station 2301+35.15 N 7,035,950.27 E 2,474,791.89
P.T. Station 2301+42.45 N 7,035,949.01 E 2,474,799.09
C.C. N 7,036,048.07 E 2,474,812.74
Back = S 77° 57' 58.82" E
Ahead = S 82° 09' 07.92" E
Chord Bear = S 80° 03' 33.37" E

Course from PT 2045 to 007 S 82° 09' 07.92" E Dist 226.24

Point 007 N 7,035,918.12 E 2,475,023.21 Sta 2303+68.69

Course from 007 to PC 2046 S 80° 34' 27.93" E Dist 73.32

Curve Data

Curve 2046
P.I. Station 2304+48.18 N 7,035,905.10 E 2,475,101.63
Delta = 7° 04' 00.39" (LT)
Degree = 57° 17' 44.81"
Tangent = 6.17
Length = 12.33
Radius = 100.00
External = 0.19
Long Chord = 12.33
Mid. Ord. = 0.19
P.C. Station 2304+42.01 N 7,035,906.11 E 2,475,095.53
P.T. Station 2304+54.34 N 7,035,904.85 E 2,475,107.80
C.C. N 7,036,004.76 E 2,475,111.91
Back = S 80° 34' 27.93" E
Ahead = S 87° 38' 28.32" E
Chord Bear = S 84° 06' 28.13" E

Course from PT 2046 to 008 S 87° 38' 28.32" E Dist 176.88

Point 008 N 7,035,897.57 E 2,475,284.53 Sta 2306+31.22

Course from 008 to PC 2047 S 86° 33' 34.36" E Dist 68.71

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COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

TOWN OF ADDISON
HORIZONTAL ALIGNMENT DATA
SHEET 1 OF 6

CONTRACT	DWG No.	REV
C-2033270-01	CC1-2401	D

CB05-CC1-2401.001

DWG No. CC1-2402

Curve Data

Curve 2047
P.I. Station 2307+11.61 N 7,035,892.74 E 2,475,364.77
Delta = 4° 27′ 35.68" (LT)
Degree = 19° 05′ 54.94"
Tangent = 11.68
Length = 23.35
Radius = 300.00
External = 0.23
Long Chord = 23.35
Mid. Ord. = 0.23
P.C. Station 2306+99.93 N 7,035,893.44 E 2,475,353.11
P.T. Station 2307+23.28 N 7,035,892.95 E 2,475,376.45
C.C. N 7,036,192.90 E 2,475,371.11
Back = S 86° 33′ 34.36" E
Ahead = N 88° 58′ 49.96" E
Chord Bear = S 88° 47′ 22.20" E

Course from PT 2047 to 009 N 88° 58′ 49.96" E Dist 146.93

Point 009 N 7,035,895.56 E 2,475,523.36 Sta 2308+70.21

Course from 009 to PC 2048 N 88° 58′ 49.96" E Dist 224.80

Curve Data

Curve 2048
P.I. Station 2311+12.23 N 7,035,899.87 E 2,475,765.33
Delta = 24° 17′ 00.94" (RT)
Degree = 71° 37′ 11.01"
Tangent = 17.21
Length = 33.91
Radius = 80.00
External = 1.83
Long Chord = 33.65
Mid. Ord. = 1.79
P.C. Station 2310+95.02 N 7,035,899.56 E 2,475,748.13
P.T. Station 2311+28.92 N 7,035,893.07 E 2,475,781.15
C.C. N 7,035,819.58 E 2,475,749.55
Back = N 88° 58′ 49.96" E
Ahead = S 66° 44′ 09.10" E
Chord Bear = S 78° 52′ 39.57" E

Course from PT 2048 to PC 2049 S 66° 44′ 09.10" E Dist 6.72

Curve Data

Curve 2049
P.I. Station 2311+52.32 N 7,035,883.83 E 2,475,802.64
Delta = 23° 32′ 24.82" (LT)
Degree = 71° 37′ 11.01"
Tangent = 16.67
Length = 32.87
Radius = 80.00
External = 1.72
Long Chord = 32.64
Mid. Ord. = 1.68
P.C. Station 2311+35.65 N 7,035,890.42 E 2,475,787.32
P.T. Station 2311+68.51 N 7,035,883.91 E 2,475,819.31
C.C. N 7,035,963.91 E 2,475,818.92
Back = S 66° 44′ 09.10" E
Ahead = N 89° 43′ 26.08" E
Chord Bear = S 78° 30′ 21.51" E

Course from PT 2049 to PC 20410 N 89° 43′ 26.08" E Dist 107.44

Curve Data

Curve 20410
P.I. Station 2312+86.69 N 7,035,884.48 E 2,475,937.48
Delta = 15° 16′ 59.52" (LT)
Degree = 71° 37′ 11.01"
Tangent = 10.73
Length = 21.34
Radius = 80.00
External = 0.72
Long Chord = 21.28
Mid. Ord. = 0.71
P.C. Station 2312+75.95 N 7,035,884.43 E 2,475,926.75
P.T. Station 2312+97.29 N 7,035,887.36 E 2,475,947.82
C.C. N 7,035,964.43 E 2,475,926.36
Back = N 89° 43′ 26.08" E
Ahead = N 74° 26′ 26.57" E
Chord Bear = N 82° 04′ 56.32" E

Curve Data

Curve 20411
P.I. Station 2313+08.05 N 7,035,890.25 E 2,475,958.18
Delta = 15° 18′ 40.80" (RT)
Degree = 71° 37′ 11.01"
Tangent = 10.75
Length = 21.38
Radius = 80.00
External = 0.72
Long Chord = 21.32
Mid. Ord. = 0.71
P.C. Station 2312+97.29 N 7,035,887.36 E 2,475,947.82
P.T. Station 2313+18.67 N 7,035,890.29 E 2,475,968.93
C.C. N 7,035,810.29 E 2,475,969.28
Back = N 74° 26′ 26.57" E
Ahead = N 89° 45′ 07.37" E
Chord Bear = N 82° 05′ 46.97" E

Course from PT 20411 to 010 N 89° 45′ 07.37" E Dist 555.06

Point 010 N 7,035,892.70 E 2,476,523.99 Sta 2318+73.73

Course from 010 to 011 N 89° 45′ 07.37" E Dist 546.27

Point 011 N 7,035,895.06 E 2,477,070.25 Sta 2324+20.00

Course from 011 to PC 20412 N 89° 45′ 07.37" E Dist 579.13

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DESIGNED	S. SALEH
CHECKED	D. LUU
IN CHARGE	D. LUU
DATE	13 MAR 23

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

TOWN OF ADDISON
HORIZONTAL ALIGNMENT DATA
SHEET 2 OF 6

CONTRACT	DWG No.	REV
C-2033270-01	CC1-2402	D

CB05-CC1-2402.001

DWG No. CC1-2403

Curve Data

Curve 20416

P.I. Station	2345+86.57	N	7,035,908.92	E	2,479,235.27
Delta =	3° 27′ 41.31" (LT)				
Degree =	1° 57′ 27.13"				
Tangent =	88.44				
Length =	176.83				
Radius =	2,926.93				
External =	1.34				
Long Chord =	176.80				
Mid. Ord. =	1.34				
P.C. Station	2344+98.13	N	7,035,901.83	E	2,479,147.11
P.T. Station	2346+74.96	N	7,035,921.33	E	2,479,322.83
C.C.		N	7,038,819.33	E	2,478,912.35
Back = N	85° 23′ 58.43" E				
Ahead = N	81° 56′ 17.12" E				
Chord Bear = N	83° 40′ 07.78" E				

Curve Data

Curve 20417

P.I. Station	2346+86.77	N	7,035,922.98	E	2,479,334.52
Delta =	17° 53′ 16.93" (RT)				
Degree =	76° 23′ 39.74"				
Tangent =	11.80				
Length =	23.42				
Radius =	75.00				
External =	0.92				
Long Chord =	23.32				
Mid. Ord. =	0.91				
P.C. Station	2346+74.96	N	7,035,921.33	E	2,479,322.83
P.T. Station	2346+98.38	N	7,035,920.97	E	2,479,346.15
C.C.		N	7,035,847.07	E	2,479,333.35
Back = N	81° 56′ 17.12" E				
Ahead = S	80° 10′ 25.94" E				
Chord Bear = S	89° 07′ 04.41" E				

Course from PT 20417 to PC 20418 S 80° 10′ 25.94" E Dist 35.17

Curve Data

Curve 20418

P.I. Station	2347+46.54	N	7,035,912.75	E	2,479,393.60
Delta =	19° 39′ 20.82" (LT)				
Degree =	76° 23′ 39.74"				
Tangent =	12.99				
Length =	25.73				
Radius =	75.00				
External =	1.12				
Long Chord =	25.60				
Mid. Ord. =	1.10				
P.C. Station	2347+33.54	N	7,035,914.96	E	2,479,380.80
P.T. Station	2347+59.27	N	7,035,914.97	E	2,479,406.40
C.C.		N	7,035,988.86	E	2,479,393.60
Back = S	80° 10′ 25.94" E				
Ahead = N	80° 10′ 13.23" E				
Chord Bear = N	89° 59′ 53.64" E				

Course from PT 20418 to PC 20419 N 80° 10′ 13.23" E Dist 94.52

Curve Data

Curve 20419

P.I. Station	2348+71.61	N	7,035,934.14	E	2,479,517.09
Delta =	6° 47′ 44.91" (LT)				
Degree =	19° 05′ 54.94"				
Tangent =	17.81				
Length =	35.58				
Radius =	300.00				
External =	0.53				
Long Chord =	35.56				
Mid. Ord. =	0.53				
P.C. Station	2348+53.80	N	7,035,931.10	E	2,479,499.54
P.T. Station	2348+89.38	N	7,035,939.24	E	2,479,534.16
C.C.		N	7,036,226.70	E	2,479,448.32
Back = N	80° 10′ 13.23" E				
Ahead = N	73° 22′ 28.32" E				
Chord Bear = N	76° 46′ 20.78" E				

Course from PT 20419 to PC 20420 N 73° 22′ 28.32" E Dist 451.53

Curve Data

Curve 20420

P.I. Station	2353+50.15	N	7,036,071.07	E	2,479,975.67
Delta =	10° 33′ 37.58" (RT)				
Degree =	57° 17′ 44.81"				
Tangent =	9.24				
Length =	18.43				
Radius =	100.00				
External =	0.43				
Long Chord =	18.41				
Mid. Ord. =	0.42				
P.C. Station	2353+40.91	N	7,036,068.43	E	2,479,966.81
P.T. Station	2353+59.34	N	7,036,072.05	E	2,479,984.86
C.C.		N	7,035,972.61	E	2,479,995.42
Back = N	73° 22′ 28.32" E				
Ahead = N	83° 56′ 05.90" E				
Chord Bear = N	78° 39′ 17.11" E				

Curve Data

Curve 20421

P.I. Station	2353+74.74	N	7,036,073.68	E	2,480,000.17
Delta =	17° 30′ 29.05" (LT)				
Degree =	57° 17′ 44.81"				
Tangent =	15.40				
Length =	30.56				
Radius =	100.00				
External =	1.18				
Long Chord =	30.44				
Mid. Ord. =	1.16				
P.C. Station	2353+59.34	N	7,036,072.05	E	2,479,984.86
P.T. Station	2353+89.90	N	7,036,079.83	E	2,480,014.28
C.C.		N	7,036,171.49	E	2,479,974.29
Back = N	83° 56′ 05.90" E				
Ahead = N	66° 25′ 36.85" E				
Chord Bear = N	75° 10′ 51.38" E				

Course from PT 20421 to PC 20422 N 66° 25′ 36.85" E Dist 93.88

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CONTRACT SHEET No. 15 OF 242

SCALE	NO SCALE
DRAWN	S. SALEH
DESIGNED	S. SALEH
CHECKED	D. LUU
IN CHARGE	D. LUU
DATE	13 MAR 23

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

TOWN OF ADDISON
HORIZONTAL ALIGNMENT DATA
SHEET 3 OF 6

CONTRACT	DWG No.	REV
C-2033270-01	CC1-2403	D

CB05-CC1-2403.001

DWG No. CC1-2404

Curve Data

Curve 20422

P.I. Station	2354+99.94	N	7,036,123.84	E	2,480,115.14
Delta =	9° 14' 38.73"	(LT)			
Degree =	28° 38' 52.40"				
Tangent =	16.17				
Length =	32.27				
Radius =	200.00				
External =	0.65				
Long Chord =	32.23				
Mid. Ord. =	0.65				
P.C. Station	2354+83.77	N	7,036,117.38	E	2,480,100.32
P.T. Station	2355+16.04	N	7,036,132.61	E	2,480,128.73
C.C.		N	7,036,300.69	E	2,480,020.34
Back	= N 66° 25' 36.85" E				
Ahead	= N 57° 10' 58.12" E				
Chord Bear	= N 61° 48' 17.49" E				

Curve Data

Curve 20423

P.I. Station	2355+32.21	N	7,036,141.37	E	2,480,142.32
Delta =	9° 14' 38.73"	(RT)			
Degree =	28° 38' 52.40"				
Tangent =	16.17				
Length =	32.27				
Radius =	200.00				
External =	0.65				
Long Chord =	32.23				
Mid. Ord. =	0.65				
P.C. Station	2355+16.04	N	7,036,132.61	E	2,480,128.73
P.T. Station	2355+48.31	N	7,036,147.84	E	2,480,157.14
C.C.		N	7,035,964.53	E	2,480,237.12
Back	= N 57° 10' 58.12" E				
Ahead	= N 66° 25' 36.85" E				
Chord Bear	= N 61° 48' 17.49" E				

Course from PT 20423 to PC 20424 N 66° 25' 36.85" E Dist 44.07

Curve Data

Curve 20424

P.I. Station	2356+12.48	N	7,036,173.50	E	2,480,215.96
Delta =	11° 29' 00.52"	(LT)			
Degree =	28° 38' 52.40"				
Tangent =	20.11				
Length =	40.08				
Radius =	200.00				
External =	1.01				
Long Chord =	40.02				
Mid. Ord. =	1.00				
P.C. Station	2355+92.38	N	7,036,165.46	E	2,480,197.53
P.T. Station	2356+32.46	N	7,036,185.05	E	2,480,232.42
C.C.		N	7,036,348.77	E	2,480,117.55
Back	= N 66° 25' 36.85" E				
Ahead	= N 54° 56' 36.33" E				
Chord Bear	= N 60° 41' 06.59" E				

Curve Data

Curve 20425

P.I. Station	2356+51.35	N	7,036,195.90	E	2,480,247.89
Delta =	10° 47' 25.48"	(RT)			
Degree =	28° 38' 52.40"				
Tangent =	18.89				
Length =	37.67				
Radius =	200.00				
External =	0.89				
Long Chord =	37.61				
Mid. Ord. =	0.89				
P.C. Station	2356+32.46	N	7,036,185.05	E	2,480,232.42
P.T. Station	2356+70.13	N	7,036,203.66	E	2,480,265.11
C.C.		N	7,036,021.34	E	2,480,347.30
Back	= N 54° 56' 36.33" E				
Ahead	= N 65° 44' 01.81" E				
Chord Bear	= N 60° 20' 19.07" E				

Course from PT 20425 to PC 20426 N 65° 44' 01.81" E Dist 331.05

Curve Data

Curve 20426

P.I. Station	2360+18.41	N	7,036,346.80	E	2,480,582.62
Delta =	25° 53' 16.85"	(LT)			
Degree =	76° 23' 39.74"				
Tangent =	17.24				
Length =	33.89				
Radius =	75.00				
External =	1.96				
Long Chord =	33.60				
Mid. Ord. =	1.91				
P.C. Station	2360+01.17	N	7,036,339.72	E	2,480,566.91
P.T. Station	2360+35.06	N	7,036,360.04	E	2,480,593.66
C.C.		N	7,036,408.09	E	2,480,536.08
Back	= N 65° 44' 01.81" E				
Ahead	= N 39° 50' 44.96" E				
Chord Bear	= N 52° 47' 23.39" E				

Course from PT 20426 to PC 20427 N 39° 50' 44.95" E Dist 2.40

Curve Data

Curve 20427

P.I. Station	2360+54.73	N	7,036,375.13	E	2,480,606.26
Delta =	25° 55' 37.22"	(RT)			
Degree =	76° 23' 39.74"				
Tangent =	17.26				
Length =	33.94				
Radius =	75.00				
External =	1.96				
Long Chord =	33.65				
Mid. Ord. =	1.91				
P.C. Station	2360+37.46	N	7,036,361.88	E	2,480,595.20
P.T. Station	2360+71.40	N	7,036,382.22	E	2,480,622.01
C.C.		N	7,036,313.82	E	2,480,652.79
Back	= N 39° 50' 44.96" E				
Ahead	= N 65° 46' 22.18" E				
Chord Bear	= N 52° 48' 33.57" E				

Course from PT 20427 to 015 N 65° 46' 22.18" E Dist 96.57

Point 015 N 7,036,421.85 E 2,480,710.07 Sta 2361+67.97

Course from 015 to PC 20428 N 65° 37' 18.33" E Dist 32.17

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TOWN OF ADDISON
HORIZONTAL ALIGNMENT DATA
SHEET 4 OF 6

CONTRACT	DWG No.	REV
C-2033270-01	CC1-2404	D

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DWG No. CC1-2405

Curve Data

Curve 20428
P.I. Station 2362+48.48 N 7,036,455.08 E 2,480,783.41
Delta = 65° 36' 55.73" (RT)
Degree = 76° 23' 39.74"
Tangent = 48.35
Length = 85.89
Radius = 75.00
External = 14.23
Long Chord = 81.27
Mid. Ord. = 11.96
P.C. Station 2362+00.13 N 7,036,435.12 E 2,480,739.37
P.T. Station 2362+86.02 N 7,036,423.21 E 2,480,819.76
C.C. N 7,036,366.81 E 2,480,770.32
Back = N 65° 37' 18.33" E
Ahead = S 48° 45' 45.95" E
Chord Bear = S 81° 34' 13.81" E

Course from PT 20428 to 016 N 82° 27' 37.16" E Dist 48.91

Point 016 N 7,036,429.63 E 2,480,868.25 Sta 2363+34.93

Course from 016 to PC 20429 N 82° 27' 37.16" E Dist 14.03

Curve Data

Curve 20429
P.I. Station 2363+53.06 N 7,036,432.00 E 2,480,886.22
Delta = 4° 41' 56.12" (RT)
Degree = 57° 17' 44.81"
Tangent = 4.10
Length = 8.20
Radius = 100.00
External = 0.08
Long Chord = 8.20
Mid. Ord. = 0.08
P.C. Station 2363+48.96 N 7,036,431.47 E 2,480,882.16
P.T. Station 2363+57.16 N 7,036,432.21 E 2,480,890.32
C.C. N 7,036,332.33 E 2,480,895.28
Back = N 82° 27' 37.16" E
Ahead = N 87° 09' 33.28" E
Chord Bear = N 84° 48' 35.22" E

Course from PT 20429 to PC 20430 N 87° 09' 33.28" E Dist 82.36

Curve Data

Curve 20430
P.I. Station 2364+48.81 N 7,036,436.75 E 2,480,981.85
Delta = 14° 06' 41.18" (LT)
Degree = 76° 23' 39.74"
Tangent = 9.28
Length = 18.47
Radius = 75.00
External = 0.57
Long Chord = 18.43
Mid. Ord. = 0.57
P.C. Station 2364+39.52 N 7,036,436.29 E 2,480,972.58
P.T. Station 2364+58.00 N 7,036,439.46 E 2,480,990.73
C.C. N 7,036,511.20 E 2,480,968.87
Back = N 87° 09' 33.28" E
Ahead = N 73° 02' 52.10" E
Chord Bear = N 80° 06' 12.69" E

Course from PT 20430 to PC 20431 N 73° 02' 52.11" E Dist 12.70

Curve Data

Curve 20431
P.I. Station 2364+79.15 N 7,036,445.62 E 2,481,010.97
Delta = 12° 52' 10.89" (RT)
Degree = 76° 23' 39.74"
Tangent = 8.46
Length = 16.85
Radius = 75.00
External = 0.48
Long Chord = 16.81
Mid. Ord. = 0.47
P.C. Station 2364+70.69 N 7,036,443.16 E 2,481,002.88
P.T. Station 2364+87.54 N 7,036,446.23 E 2,481,019.41
C.C. N 7,036,371.42 E 2,481,024.75
Back = N 73° 02' 52.10" E
Ahead = N 85° 55' 02.99" E
Chord Bear = N 79° 28' 57.55" E

Course from PT 20431 to 017 N 85° 55' 02.99" E Dist 106.33

Point 017 N 7,036,453.80 E 2,481,125.47 Sta 2365+93.87

Course from 017 to 018 N 43° 35' 21.23" E Dist 10.60

Point 018 N 7,036,461.48 E 2,481,132.78 Sta 2366+04.47

Course from 018 to 019 N 1° 38' 36.04" W Dist 18.80

Point 019 N 7,036,480.27 E 2,481,132.24 Sta 2366+23.27

Course from 019 to 020 N 11° 00' 18.67" E Dist 11.33

Point 020 N 7,036,491.39 E 2,481,134.40 Sta 2366+34.61

Course from 020 to PC 20432 N 1° 48' 24.54" W Dist 197.40

Curve Data

Curve 20432
P.I. Station 2368+45.38 N 7,036,702.07 E 2,481,127.76
Delta = 67° 32' 25.13" (RT)
Degree = 286° 28' 44.03"
Tangent = 13.37
Length = 23.58
Radius = 20.00
External = 4.06
Long Chord = 22.23
Mid. Ord. = 3.37
P.C. Station 2368+32.01 N 7,036,688.70 E 2,481,128.18
P.T. Station 2368+55.59 N 7,036,707.56 E 2,481,139.95
C.C. N 7,036,689.33 E 2,481,148.17
Back = N 1° 48' 24.54" W
Ahead = N 65° 44' 00.58" E
Chord Bear = N 31° 57' 48.02" E

Course from PT 20432 to PC 20433 N 65° 44' 00.58" E Dist 169.65

Curve Data

Curve 20433
P.I. Station 2370+37.58 N 7,036,782.36 E 2,481,305.87
Delta = 18° 41' 50.21" (LT)
Degree = 76° 23' 39.74"
Tangent = 12.35
Length = 24.47
Radius = 75.00
External = 1.01
Long Chord = 24.37
Mid. Ord. = 1.00
P.C. Station 2370+25.24 N 7,036,777.29 E 2,481,294.61
P.T. Station 2370+49.71 N 7,036,790.78 E 2,481,314.90
C.C. N 7,036,845.66 E 2,481,263.79
Back = N 65° 44' 00.58" E
Ahead = N 47° 02' 10.38" E
Chord Bear = N 56° 23' 05.48" E

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CONTRACT	DWG No.	REV
C-2033270-01	CC1-2405	D

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DWG No. CC1-2406

Curve Data

Curve 20434
P.I. Station 2370+62.06 N 7,036,799.19 E 2,481,323.94
Delta = 18° 41' 50.23" (RT)
Degree = 76° 23' 39.74"
Tangent = 12.35
Length = 24.47
Radius = 75.00
External = 1.01
Long Chord = 24.37
Mid. Ord. = 1.00
P.C. Station 2370+49.71 N 7,036,790.78 E 2,481,314.90
P.T. Station 2370+74.19 N 7,036,804.27 E 2,481,335.20
C.C. N 7,036,735.89 E 2,481,366.02
Back = N 47° 02' 10.38" E
Ahead = N 65° 44' 00.60" E
Chord Bear = N 56° 23' 05.49" E

Course from PT 20434 to PC 20435 N 65° 44' 00.60" E Dist 166.20

Curve Data

Curve 20435
P.I. Station 2372+53.70 N 7,036,878.04 E 2,481,498.85
Delta = 20° 08' 03.17" (LT)
Degree = 76° 23' 39.74"
Tangent = 13.32
Length = 26.36
Radius = 75.00
External = 1.17
Long Chord = 26.22
Mid. Ord. = 1.15
P.C. Station 2372+40.38 N 7,036,872.57 E 2,481,486.71
P.T. Station 2372+66.74 N 7,036,887.36 E 2,481,508.36
C.C. N 7,036,940.94 E 2,481,455.88
Back = N 65° 44' 00.60" E
Ahead = N 45° 35' 57.43" E
Chord Bear = N 55° 39' 59.02" E

Curve Data

Curve 20436
P.I. Station 2372+80.06 N 7,036,896.67 E 2,481,517.87
Delta = 20° 08' 03.17" (RT)
Degree = 76° 23' 39.74"
Tangent = 13.32
Length = 26.36
Radius = 75.00
External = 1.17
Long Chord = 26.22
Mid. Ord. = 1.15
P.C. Station 2372+66.74 N 7,036,887.36 E 2,481,508.36
P.T. Station 2372+93.10 N 7,036,902.15 E 2,481,530.01
C.C. N 7,036,833.77 E 2,481,560.84
Back = N 45° 35' 57.43" E
Ahead = N 65° 44' 00.60" E
Chord Bear = N 55° 39' 59.02" E

Course from PT 20436 to PC 20437 N 65° 44' 00.60" E Dist 32.00

Curve Data

Curve 20437
P.I. Station 2373+38.41 N 7,036,920.77 E 2,481,571.32
Delta = 20° 08' 03.17" (RT)
Degree = 76° 23' 39.74"
Tangent = 13.32
Length = 26.36
Radius = 75.00
External = 1.17
Long Chord = 26.22
Mid. Ord. = 1.15
P.C. Station 2373+25.10 N 7,036,915.30 E 2,481,559.18
P.T. Station 2373+51.45 N 7,036,921.73 E 2,481,584.60
C.C. N 7,036,846.92 E 2,481,590.01
Back = N 65° 44' 00.60" E
Ahead = N 85° 52' 03.77" E
Chord Bear = N 75° 48' 02.19" E

Curve Data

Curve 20438
P.I. Station 2373+64.77 N 7,036,922.69 E 2,481,597.88
Delta = 20° 08' 03.17" (LT)
Degree = 76° 23' 39.74"
Tangent = 13.32
Length = 26.36
Radius = 75.00
External = 1.17
Long Chord = 26.22
Mid. Ord. = 1.15
P.C. Station 2373+51.45 N 7,036,921.73 E 2,481,584.60
P.T. Station 2373+77.81 N 7,036,928.16 E 2,481,610.02
C.C. N 7,036,996.53 E 2,481,579.20
Back = N 85° 52' 03.77" E
Ahead = N 65° 44' 00.60" E
Chord Bear = N 75° 48' 02.19" E

Course from PT 20438 to PC 20439 N 65° 44' 00.60" E Dist 757.66

Curve Data

Curve 20439
P.I. Station 2381+50.12 N 7,037,245.57 E 2,482,314.10
Delta = 22° 06' 47.13" (LT)
Degree = 76° 23' 39.74"
Tangent = 14.66
Length = 28.95
Radius = 75.00
External = 1.42
Long Chord = 28.77
Mid. Ord. = 1.39
P.C. Station 2381+35.46 N 7,037,239.54 E 2,482,300.74
P.T. Station 2381+64.41 N 7,037,256.18 E 2,482,324.21
C.C. N 7,037,307.92 E 2,482,269.91
Back = N 65° 44' 00.60" E
Ahead = N 43° 37' 13.47" E
Chord Bear = N 54° 40' 37.04" E

Curve Data

Curve 20440
P.I. Station 2381+79.12 N 7,037,266.82 E 2,482,334.35
Delta = 22° 11' 16.22" (RT)
Degree = 76° 23' 39.74"
Tangent = 14.71
Length = 29.04
Radius = 75.00
External = 1.43
Long Chord = 28.86
Mid. Ord. = 1.40
P.C. Station 2381+64.41 N 7,037,256.18 E 2,482,324.21
P.T. Station 2381+93.45 N 7,037,272.85 E 2,482,347.77
C.C. N 7,037,204.44 E 2,482,378.50
Back = N 43° 37' 13.47" E
Ahead = N 65° 48' 29.70" E
Chord Bear = N 54° 42' 51.58" E

Course from PT 20440 to 021 N 65° 48' 29.70" E Dist 475.04

Point 021 N 7,037,467.52 E 2,482,781.09 Sta 2386+68.50

Course from 021 to 022 N 66° 40' 21.30" E Dist 73.78

Point 022 N 7,037,496.73 E 2,482,848.84 Sta 2387+42.28

Course from 022 to PC 20441 N 67° 34' 40.07" E Dist 15.58

Curve Data

Curve 20441
P.I. Station 2387+66.63 N 7,037,506.02 E 2,482,871.35
Delta = 32° 35' 44.04" (RT)
Degree = 190° 59' 09.35"
Tangent = 8.77
Length = 17.07
Radius = 30.00
External = 1.26
Long Chord = 16.84
Mid. Ord. = 1.21
P.C. Station 2387+57.86 N 7,037,502.68 E 2,482,863.24
P.T. Station 2387+74.92 N 7,037,504.47 E 2,482,879.98
C.C. N 7,037,474.94 E 2,482,874.68
Back = N 67° 34' 40.07" E
Ahead = S 79° 49' 35.89" E
Chord Bear = N 83° 52' 32.09" E

Curve Data

Curve 20442
P.I. Station 2388+01.21 N 7,037,499.83 E 2,482,905.85
Delta = 34° 21' 54.42" (LT)
Degree = 67° 24' 24.48"
Tangent = 26.28
Length = 50.98
Radius = 85.00
External = 3.97
Long Chord = 50.22
Mid. Ord. = 3.79
P.C. Station 2387+74.92 N 7,037,504.47 E 2,482,879.98
P.T. Station 2388+25.90 N 7,037,510.60 E 2,482,929.83
C.C. N 7,037,588.14 E 2,482,895.00
Back = S 79° 49' 35.89" E
Ahead = N 65° 48' 29.70" E
Chord Bear = N 82° 59' 26.90" E

Course from PT 20442 to PC 20443 N 65° 48' 29.70" E Dist 536.50

Curve Data

Curve 20443
P.I. Station 2393+67.37 N 7,037,732.49 E 2,483,423.74
Delta = 2° 50' 31.94" (LT)
Degree = 28° 38' 52.40"
Tangent = 4.96
Length = 9.92
Radius = 200.00
External = 0.06
Long Chord = 9.92
Mid. Ord. = 0.06
P.C. Station 2393+62.41 N 7,037,730.45 E 2,483,419.21
P.T. Station 2393+72.33 N 7,037,734.74 E 2,483,428.16
C.C. N 7,037,912.89 E 2,483,337.26
Back = N 65° 48' 29.70" E
Ahead = N 62° 57' 57.75" E
Chord Bear = N 64° 23' 13.72" E

Course from PT 20443 to PC 20444 N 62° 57' 57.75" E Dist 40.42

Curve Data

Curve 20444
P.I. Station 2394+17.58 N 7,037,755.31 E 2,483,468.47
Delta = 2° 46' 04.06" (RT)
Degree = 28° 38' 52.40"
Tangent = 4.83
Length = 9.66
Radius = 200.00
External = 0.06
Long Chord = 9.66
Mid. Ord. = 0.06
P.C. Station 2394+12.75 N 7,037,753.11 E 2,483,464.16
P.T. Station 2394+22.41 N 7,037,757.30 E 2,483,472.87
C.C. N 7,037,574.97 E 2,483,555.07
Back = N 62° 57' 57.75" E
Ahead = N 65° 44' 01.81" E
Chord Bear = N 64° 20' 59.78" E

Course from PT 20444 to 023 N 65° 44' 01.81" E Dist 43.40

Point 023 N 7,037,775.13 E 2,483,512.43 Sta 2394+65.80

Course from 023 to 024 N 65° 44' 02.33" E Dist 24.03

Point 024 N 7,037,785.01 E 2,483,534.34 Sta 2394+89.83

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CHECKED	D. LUU
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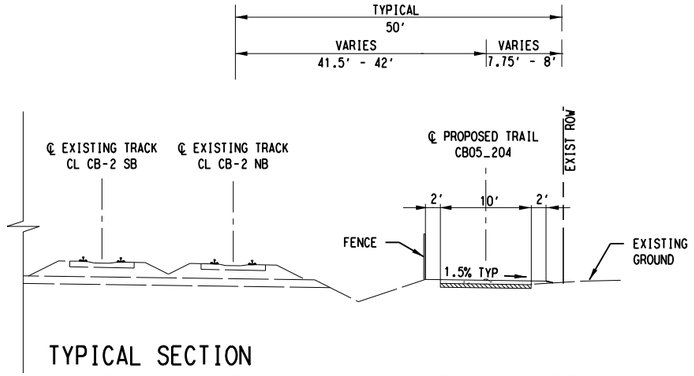
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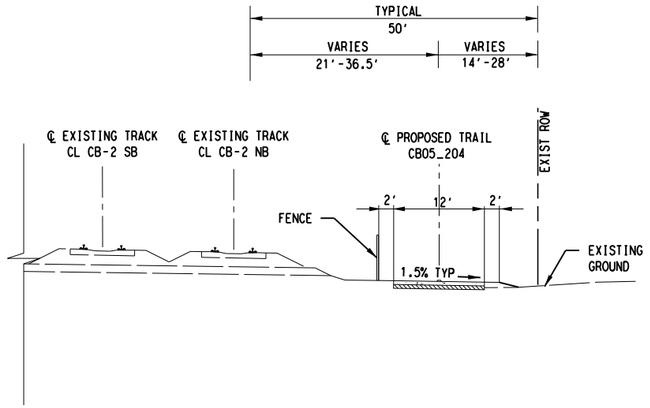
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TYPICAL SECTION
CL CB05_204 STA. 2289+62.84 TO 2291+35.42
CL CB05_204 STA. 2345+94.16 TO 2346+20.00
NO SCALE



TYPICAL SECTION
CL CB05_204 STA. 2291+35.42 TO 2313+18.66
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.

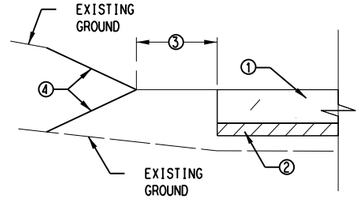
LEGEND

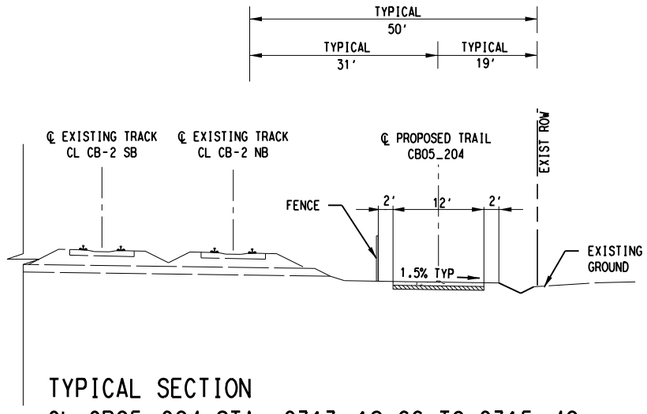
① 8" THICK REINFORCED CONCRETE TRAIL PAVEMENT; REFERENCE TXDOT STANDARD CRCP(1)-17

② 1" SAND CUSHION @ 95% STANDARD PROCTOR

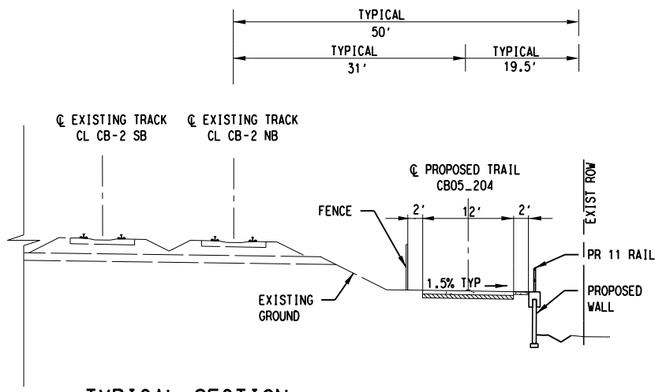
③ DISTANCE = 2' TYPICAL @ 1.5% OR 16.6% MAXIMUM

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





TYPICAL SECTION
CL CB05_204 STA. 2313+18.66 TO 2315+40
CL CB05_204 STA. 2317+05.34 TO 2324+50
NO SCALE



TYPICAL SECTION
CL CB05_204 STA. 2315+40 TO 2317+05.34
NO SCALE

NOT AN APPROVED DRAWING
FINAL 100% DESIGN

CONTRACT SHEET No. 19 OF 242

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

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ARCHER WESTERN HERZOG

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SCALE	NO SCALE
DRAWN	S. SALEH
DESIGNED	S. SALEH
CHECKED	D. LUU
IN CHARGE	D. LUU
DATE	13 MAR 23

CAES

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

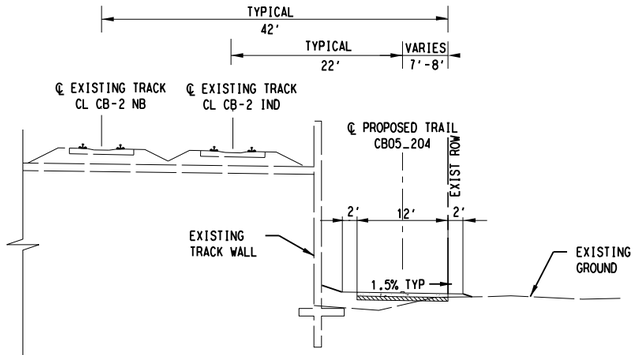
TOWN OF ADDISON
TYPICAL SECTIONS
SHEET 1 OF 5

CONTRACT	DWG No.	REV
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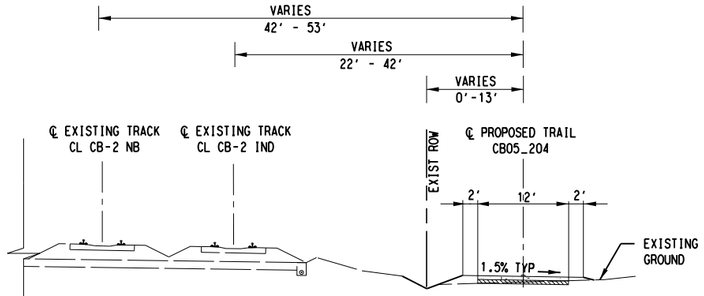
CB05-CC7-4020.010

08-MAR-2023 18:06
CB05-CC7-4020.010
ssaleh
Default

DWG No. CC7-4021



TYPICAL SECTION
CL CB05_204 STA. 2344+50 TO 2345+50
NO SCALE



TYPICAL SECTION
CL CB05_204 STA. 2346+20 TO 2354+50
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.

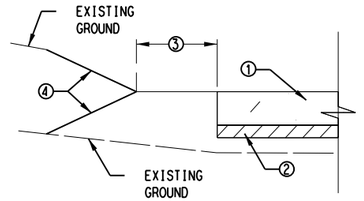
LEGEND

① 8" THICK REINFORCED CONCRETE TRAIL PAVEMENT; REFERENCE TXDOT STANDARD CRCP(1)-17

② 1" SAND CUSHION @ 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



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CONTRACT SHEET No. 20 OF 242

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DRAWN	S. SALEH
DESIGNED	S. SALEH
CHECKED	D. LUU
IN CHARGE	D. LUU
DATE	13 MAR 23

CAES

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

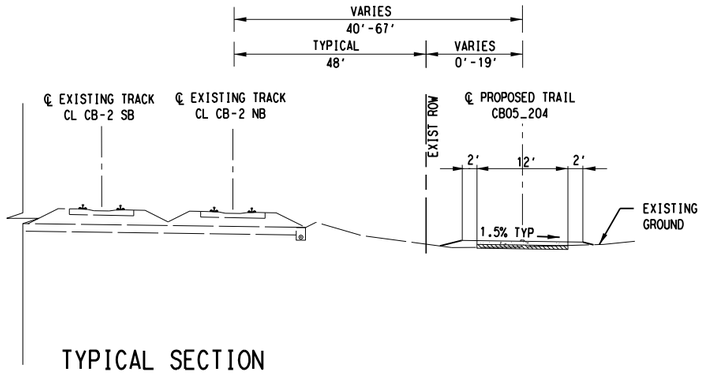
TOWN OF ADDISON
TYPICAL SECTIONS
SHEET 2 OF 5

CONTRACT	DWG No.	REV
C-2033270-01	CC7-4021	D

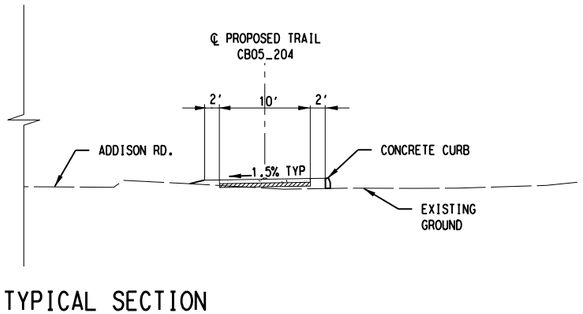
CB05-CC7-4021.010

08-MAR-2023 18:06
CB05-CC7-4021.010
ssaleh
Default

DWG No. CC7-4022



TYPICAL SECTION
CL CB05_204 STA. 2354+50 TO 2362+84.44
NO SCALE



TYPICAL SECTION
CL CB05_204 STA. 2365+11.35 TO 2368+30
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.

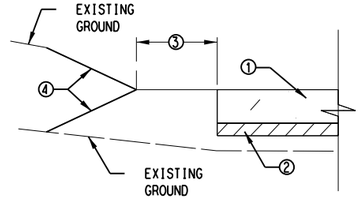
LEGEND

① 8" THICK REINFORCED CONCRETE TRAIL PAVEMENT; REFERENCE TXDOT STANDARD CRCP(1)-17

② 1" SAND CUSHION @ 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



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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	13 MAR 23

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

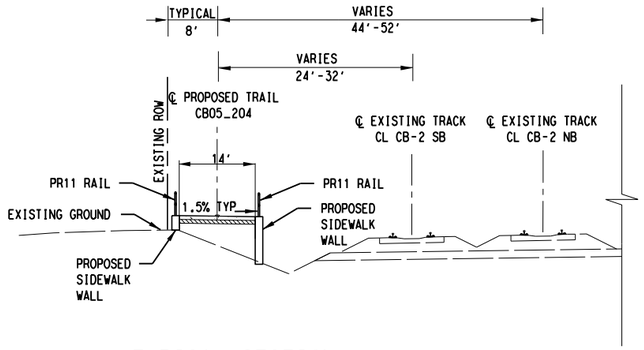
TOWN OF ADDISON
TYPICAL SECTIONS
SHEET 3 OF 5

CONTRACT	DWG No.	REV
C-2033270-01	CC7-4022	D

CB05-CC7-4022.010

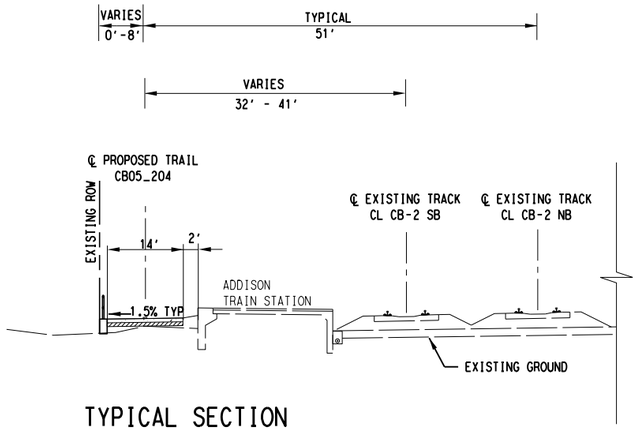
08-MAR-2023 18:06
CB05-CC7-4022.010
ssaleh
Default

DWG No. CC7-4023



TYPICAL SECTION
CL CB05_204 STA. 2368+30 TO 2370+15.24

NO SCALE



TYPICAL SECTION
CL CB05_204 STA. 2370+15.24 TO 2371+75

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.

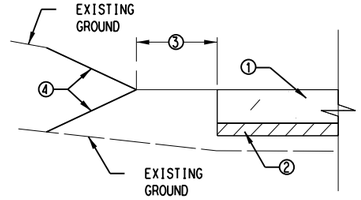
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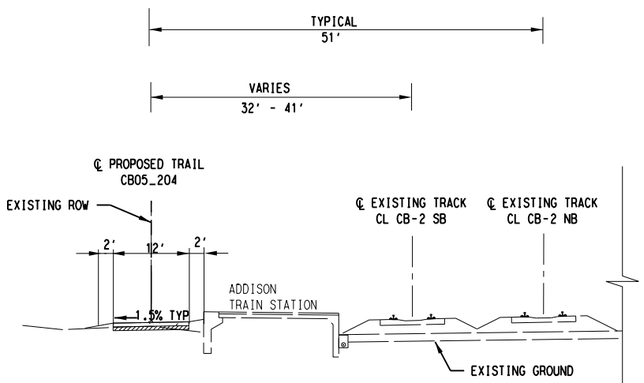
① 8" THICK REINFORCED CONCRETE TRAIL PAVEMENT; REFERENCE TXDOT STANDARD CRCP(1)-17

② 1" SAND CUSHION @ 95% STANDARD PROCTOR

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

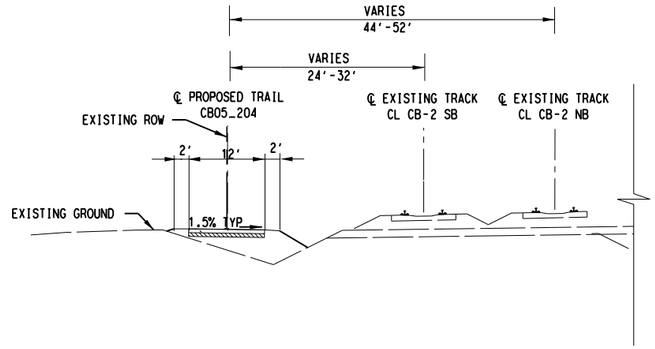
④ MATCH EXISTING GROUND AT 4:1 TYPICAL OR 3:1 MAXIMUM





TYPICAL SECTION
CL CB05_204 STA. 2371+75 TO 2375+43.18

NO SCALE



TYPICAL SECTION
CL CB05_204 STA. 2375+43.18 TO 2379+38.85

NO SCALE

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CONTRACT SHEET No. 22 OF 242

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

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CAES

SCALE	NO SCALE
DRAWN	S. SALEH
DESIGNED	S. SALEH
CHECKED	D. LUU
IN CHARGE	D. LUU
DATE	13 MAR 23

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

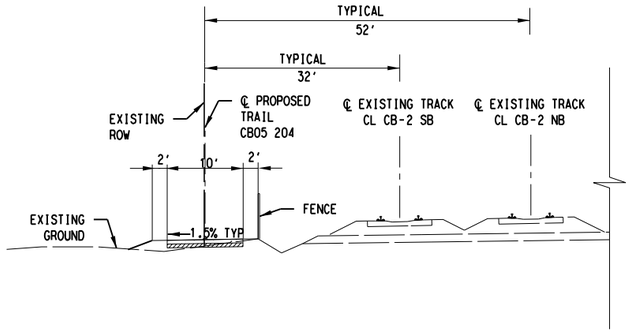
TOWN OF ADDISON
TYPICAL SECTIONS
SHEET 4 OF 5

CONTRACT	DWG No.	REV
C-2033270-01	CC7-4023	D

CB05-CC7-4023.010

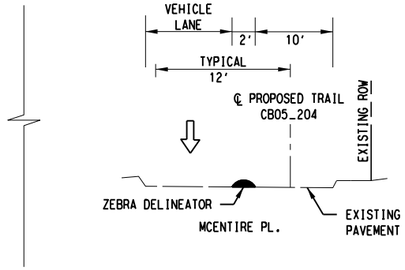
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CB05-CC7-4023.010
ssaleh
Default

DWG No. CC7-4024



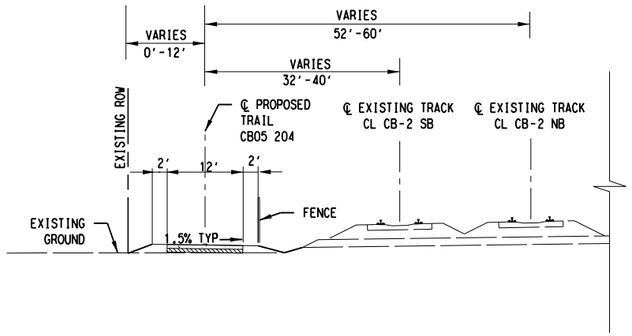
TYPICAL SECTION
CL CB05_204 STA. 2379+38.85 TO 2381+73.04

NO SCALE



TYPICAL SECTION
CL CB05_204 STA. 2381+73.04 TO 2387+76.80

NO SCALE



TYPICAL SECTION
CL CB05_204 STA. 2387+76.80 TO 2394+89.83

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.

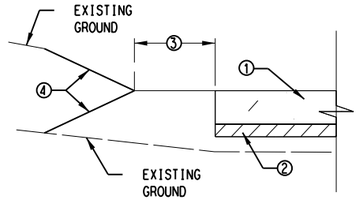
LEGEND

① 8" THICK REINFORCED CONCRETE TRAIL PAVEMENT; REFERENCE TXDOT STANDARD CRCP(1)-17

② 1" SAND CUSHION @ 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



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SCALE	NO SCALE
DRAWN	S. SALEH
DESIGNED	S. SALEH
CHECKED	D. LUU
IN CHARGE	D. LUU
DATE	13 MAR 23

CAES

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

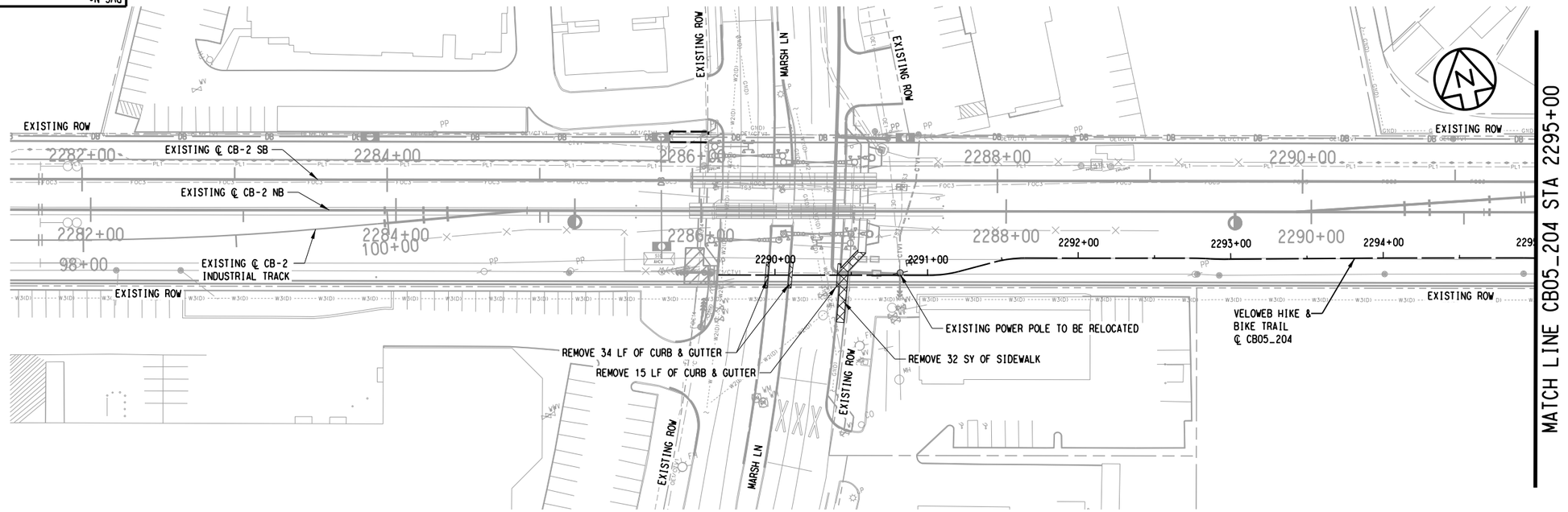
TOWN OF ADDISON
TYPICAL SECTIONS
SHEET 5 OF 5

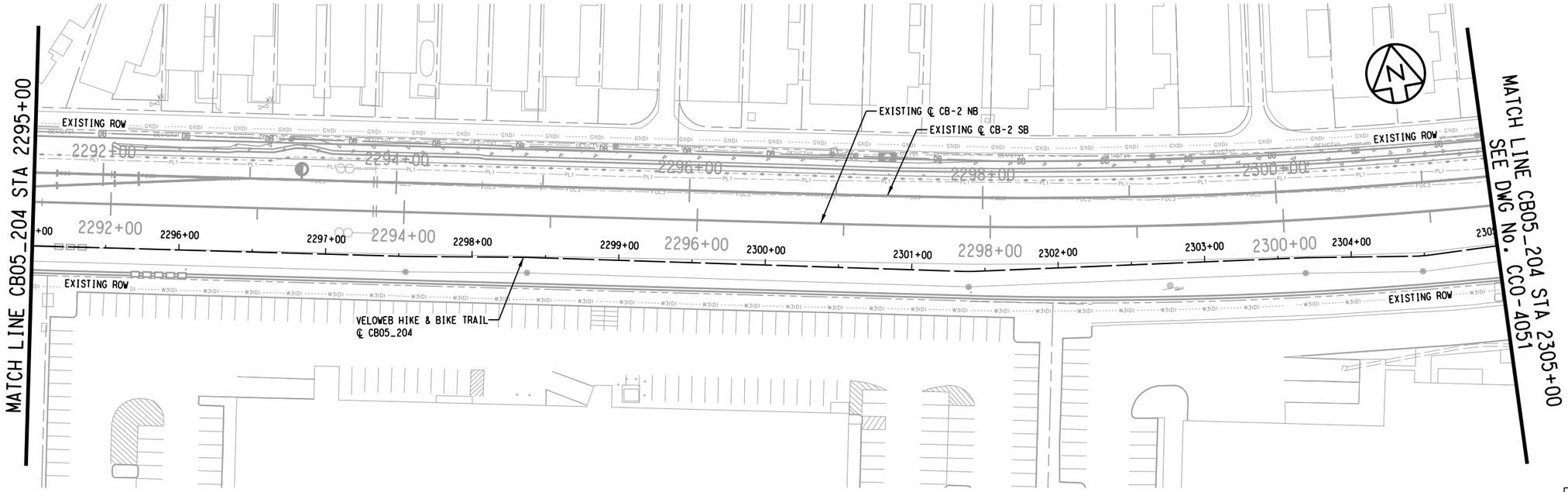
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C-2033270-01	CC7-4024	D

CB05-CC7-4024.010

08-MAR-2023 18:06
CB05-CC7-4024.010
ssaleh
Default

DWG No. CCO-4050





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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CONTRACT SHEET No. 24 OF 242

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

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SCALE	AS NOTED
DRAWN	C. BAGBY
DESIGNED	C. BAGBY
CHECKED	D. LUU
IN CHARGE	D. LUU
DATE	13 MAR 23

CAES

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
TOWN OF ADDISON
REMOVAL LAYOUT
STA 2289+62.05 TO STA 2305+00
SHEET 1 OF 6

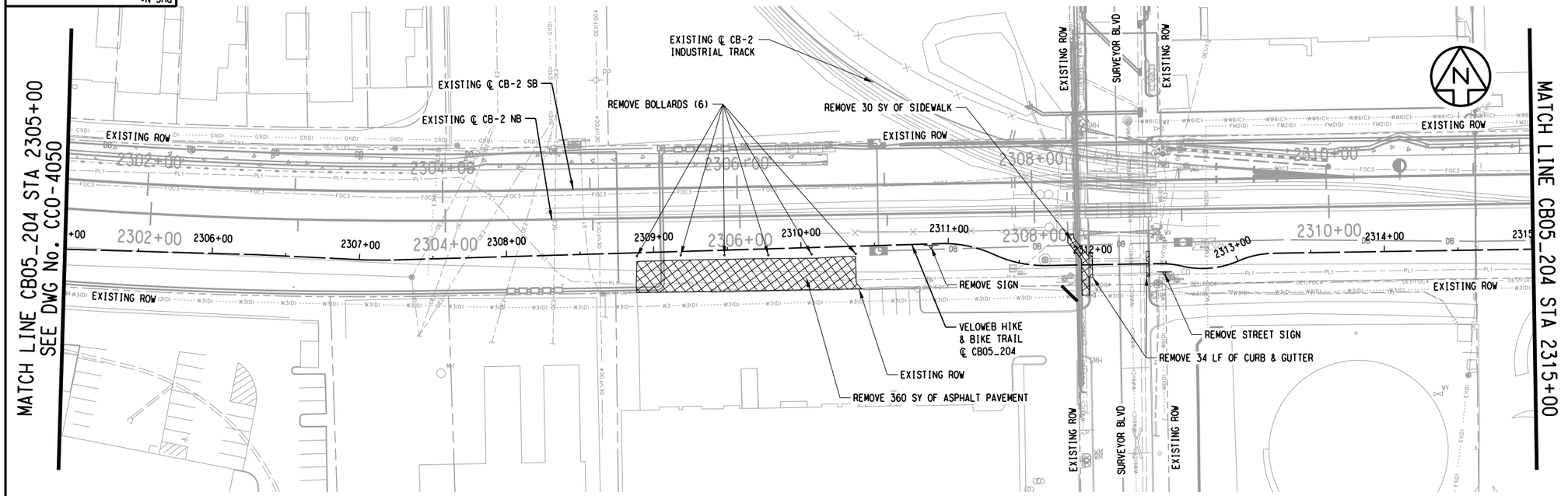
CONTRACT	DWG No.	REV
C-2033270-01	CCO-4050	D

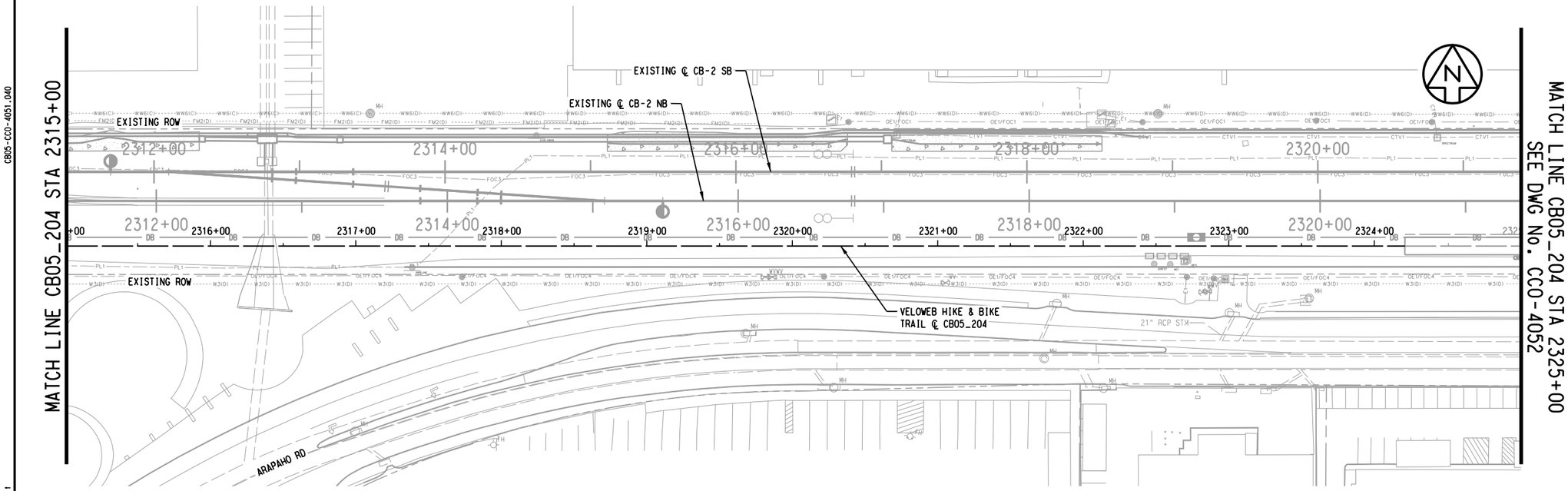
CB05-CCO-4050.040

08-MAR-2023 19:16
CB05-CCO-4050.040

ssoleh
Default

DWG No. CCO-4051





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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CONTRACT SHEET No. 25 OF 242

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

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SCALE	AS NOTED
DRAWN	C. BAGBY
DESIGNED	C. BAGBY
CHECKED	D. LUU
IN CHARGE	D. LUU
DATE	13 MAR 23

CAES

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
TOWN OF ADDISON
REMOVAL LAYOUT
STA 2305+00 TO STA 2325+00
SHEET 2 OF 6

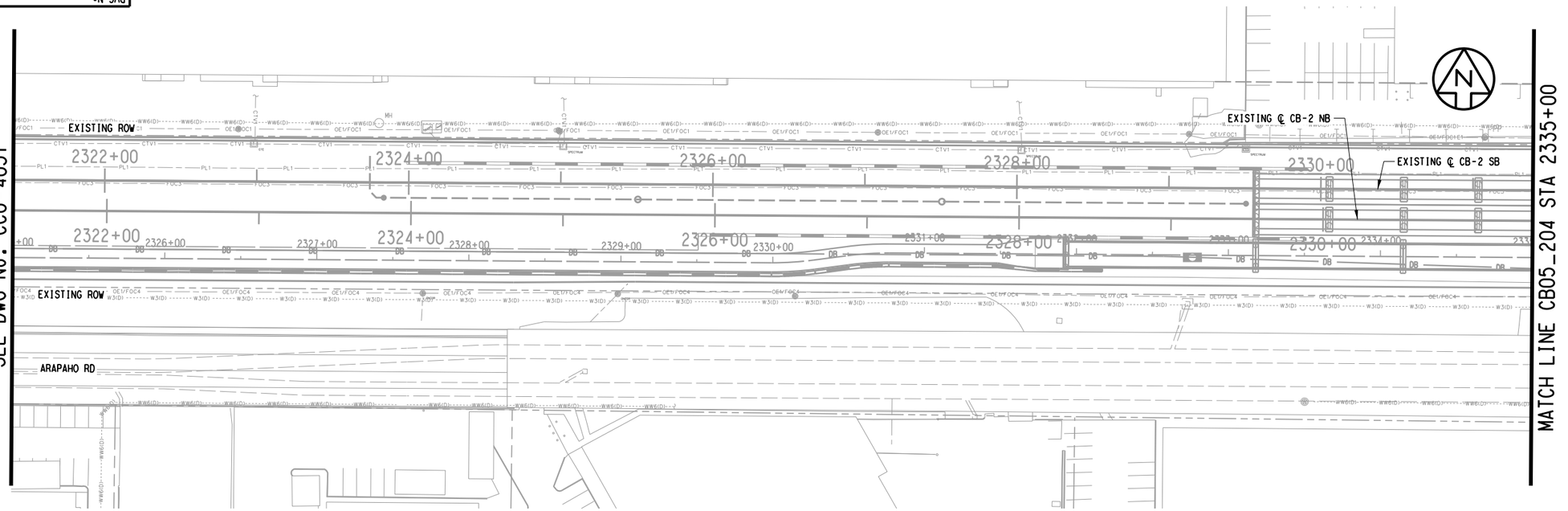
CONTRACT	DWG No.	REV
C-2033270-01	CCO-4051	D

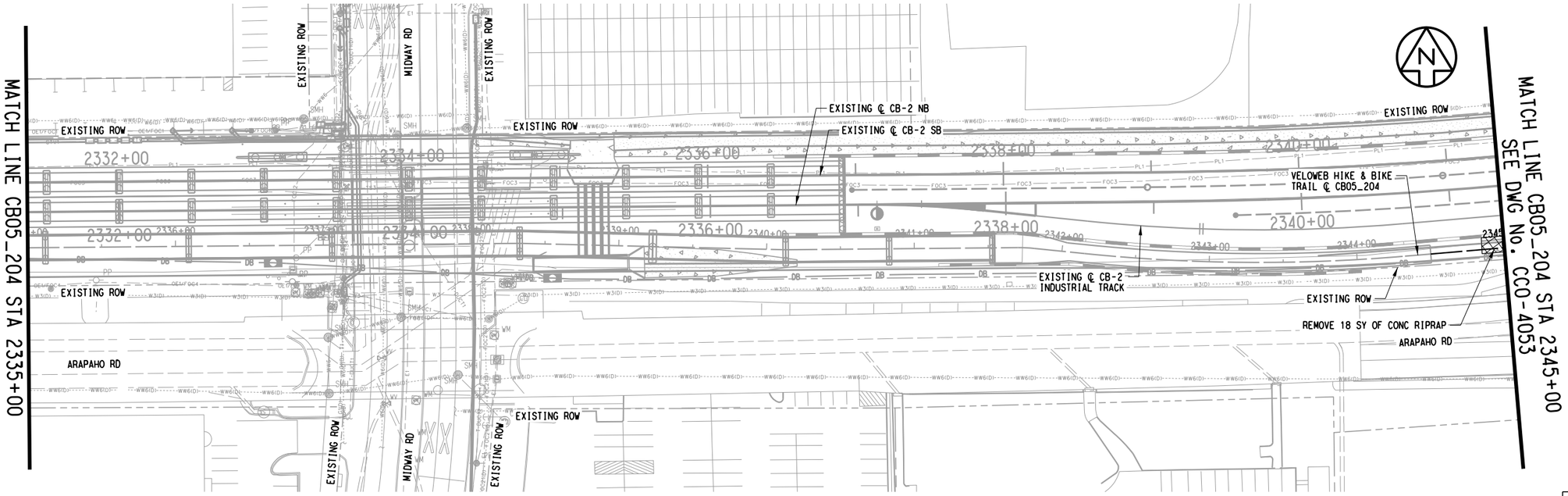
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CB05-CCO-4051.040

ssoleh
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DWG No. CCO-4052





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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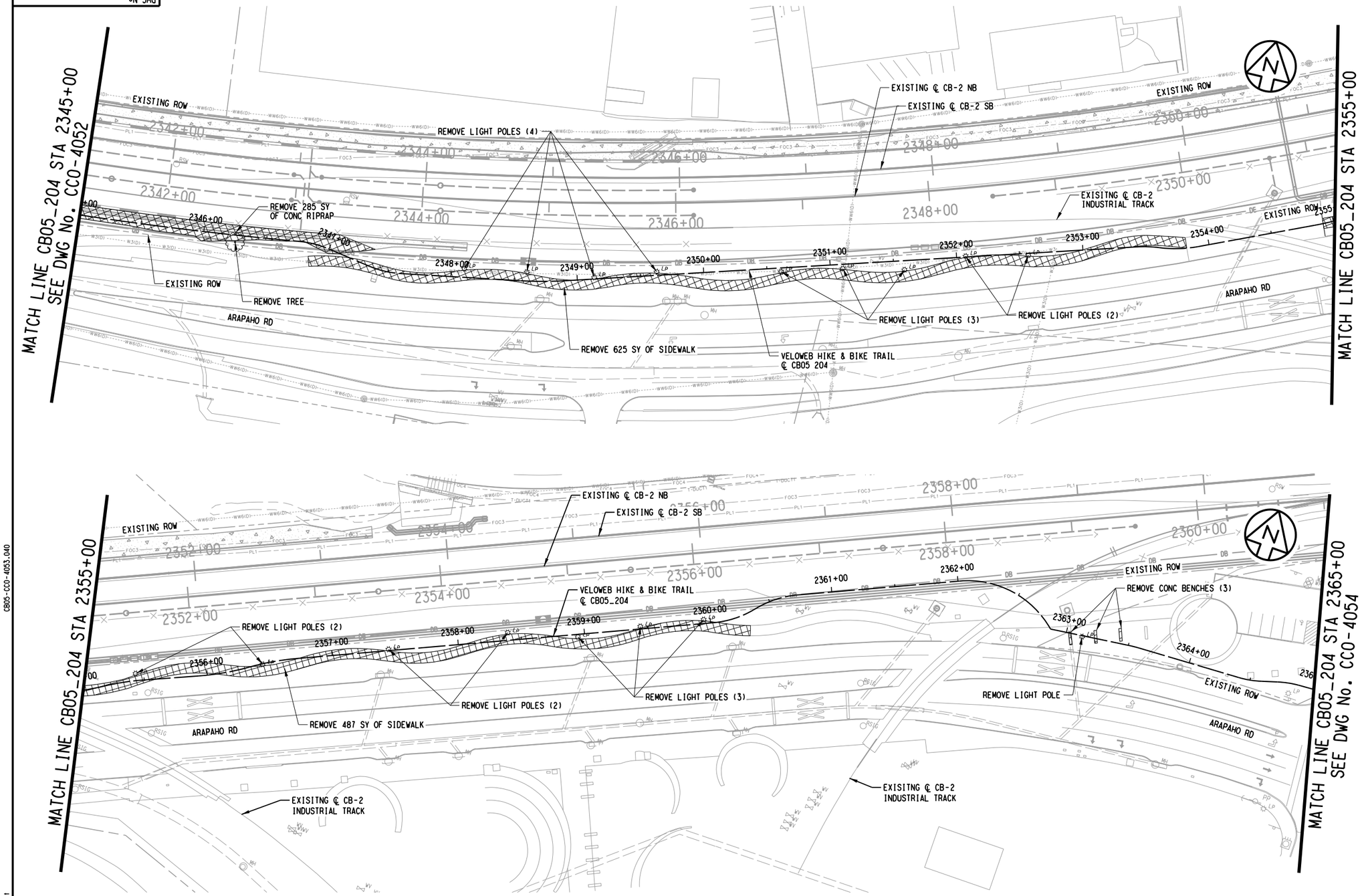
COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

TOWN OF ADDISON
REMOVAL LAYOUT
STA 2325+00 TO STA 2345+00
SHEET 3 OF 6

CONTRACT	DWG No.	REV
C-2033270-01	CCO-4052	D

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DWG No. CCO-4053



SCALE (IN FEET)
HORIZ 0 20 40 80

LEGEND:

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NOTES:

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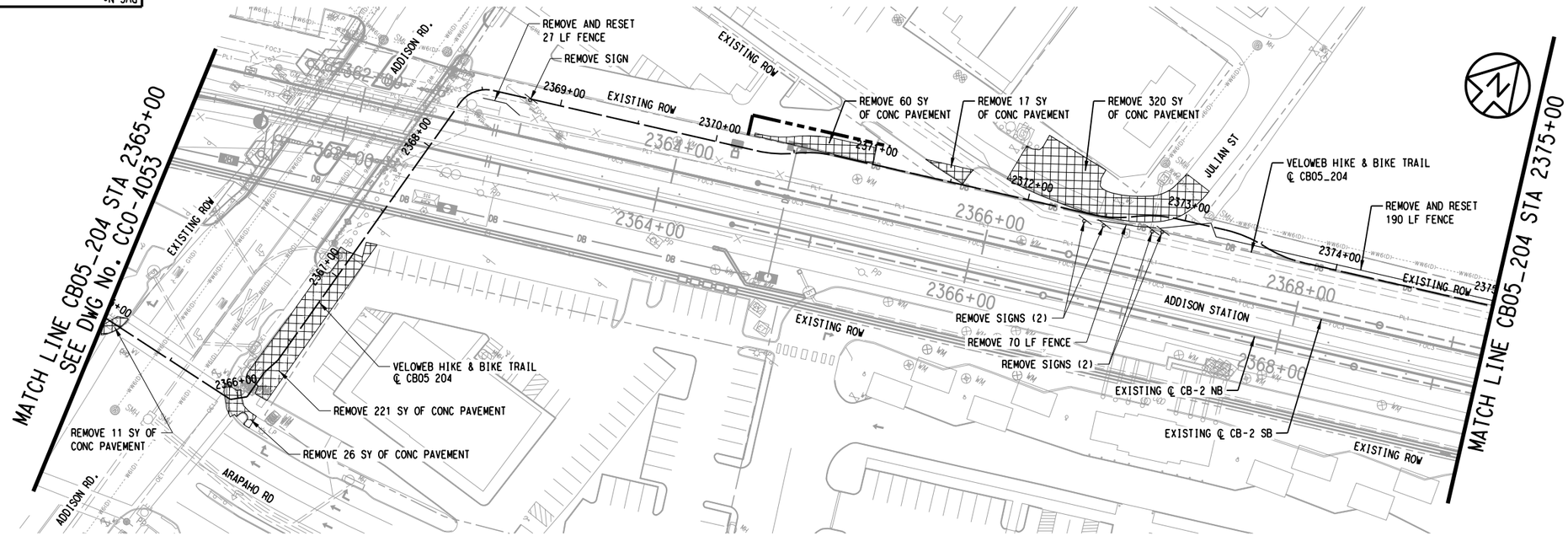
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VELOWEB HIKE & BIKE TRAIL

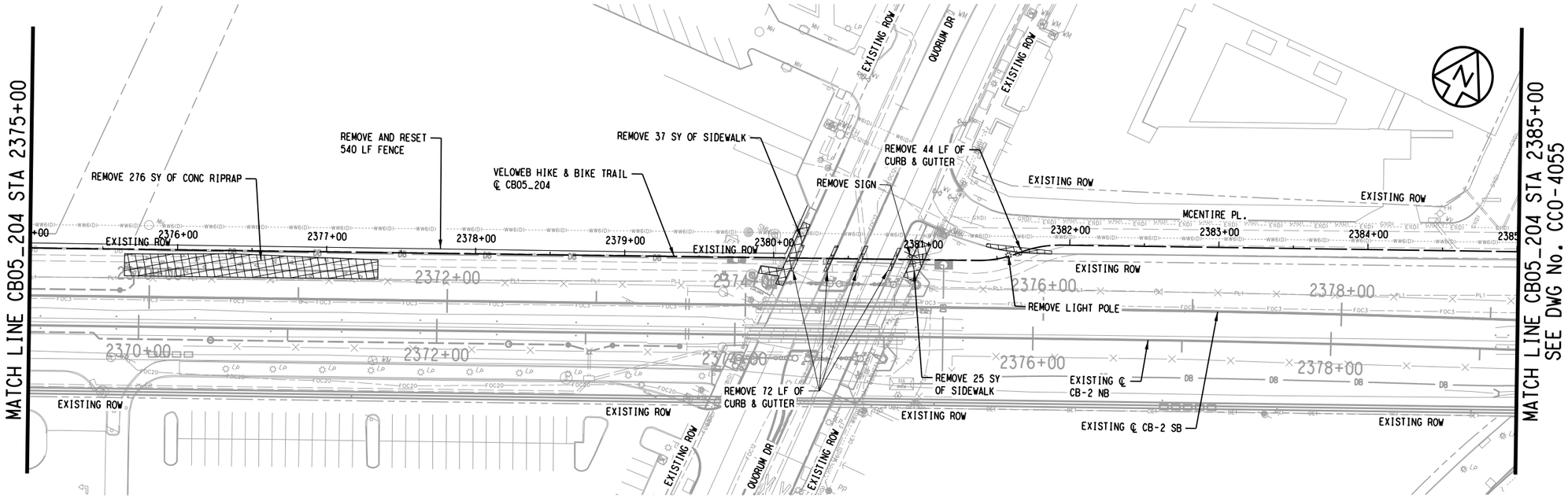
TOWN OF ADDISON
REMOVAL LAYOUT
STA 2345+00 TO STA 2365+00
SHEET 4 OF 6

CONTRACT	DWG No.	REV
C-2033270-01	CCO-4053	D

CB05-CCO-4053.040

DWG No. CCO-4054





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

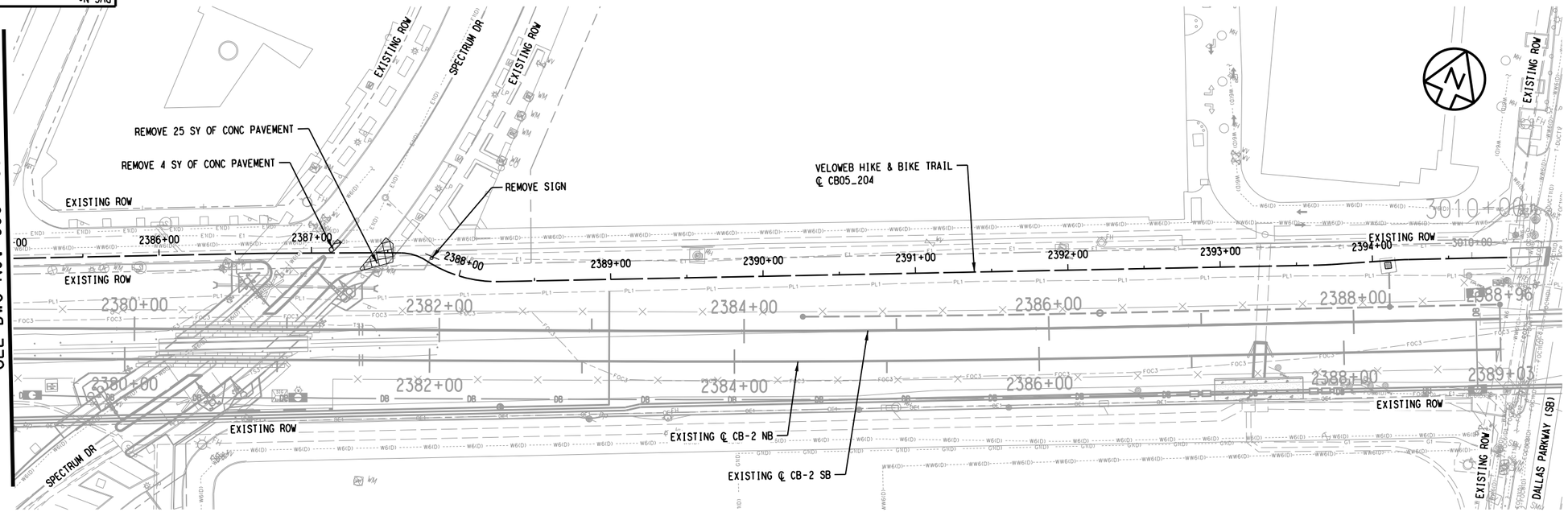
TOWN OF ADDISON
REMOVAL LAYOUT
STA 2365+00 TO STA 2385+00
SHEET 5 OF 6

CONTRACT	DWG No.	REV
C-2033270-01	CCO-4054	D

CB05-CCO-4054.040

DWG No. CCO-4055

MATCH LINE CB05_204 STA 2385+00
SEE DWG No. CCO-4054



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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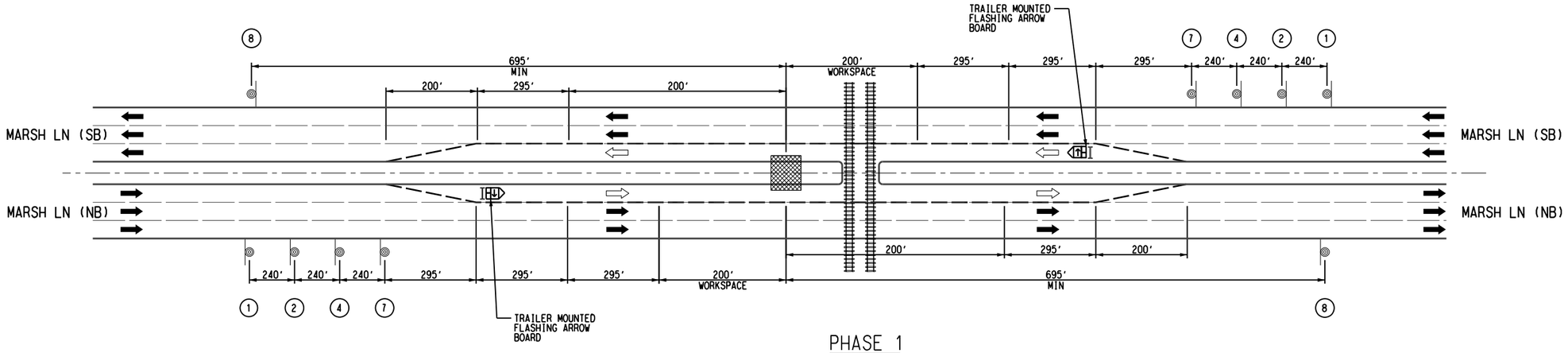
CONTRACT SHEET No. 29 OF 242

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
TOWN OF ADDISON
REMOVAL LAYOUT
STA 2385+00 TO STA 2394+83.19
SHEET 6 OF 6

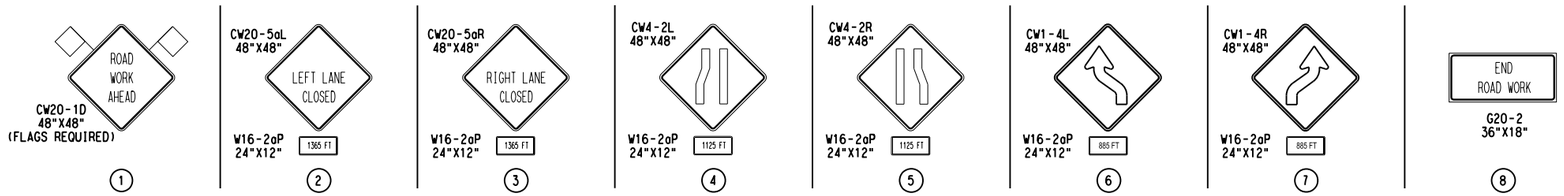
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C-2033270-01	CCO-4055	D

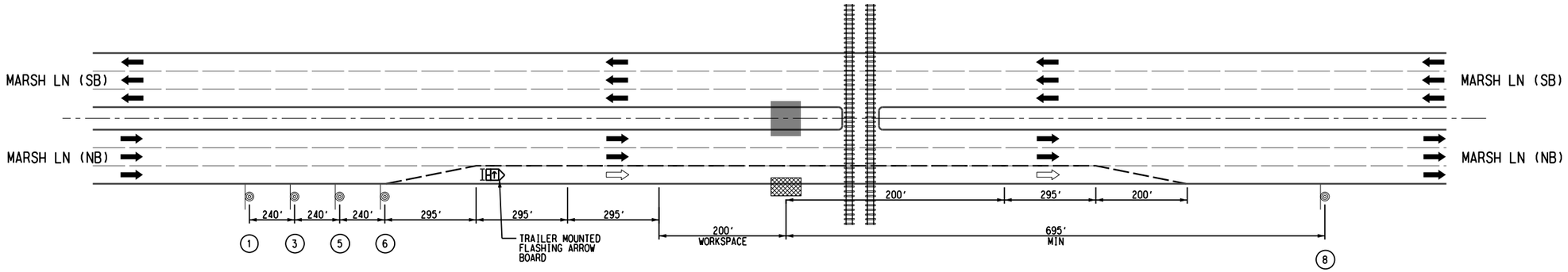
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DWG No. CC3-4030



PHASE 1





PHASE 2

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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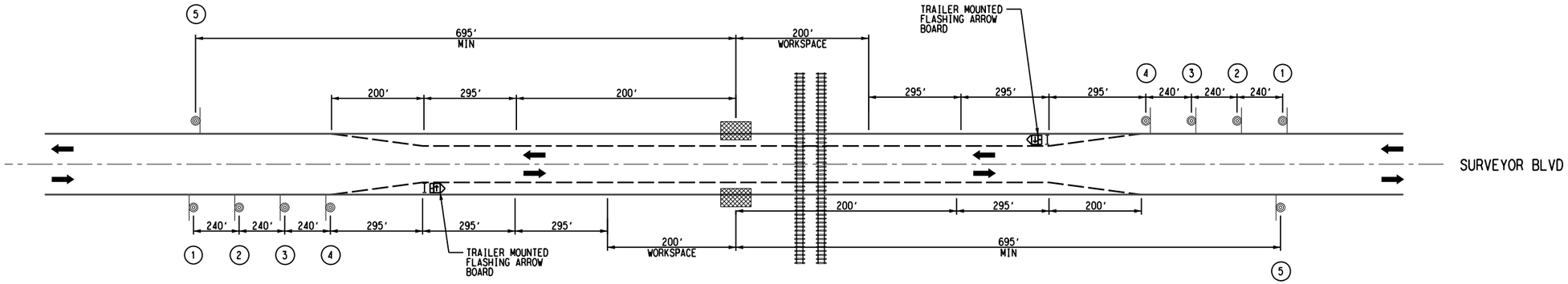
CAES

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
TOWN OF ADDISON
MARSH LANE
TRAFFIC CONTROL PLAN
SHEET 1 OF 7

CONTRACT	DWG No.	REV
C-2033270-01	CC3-4030	D

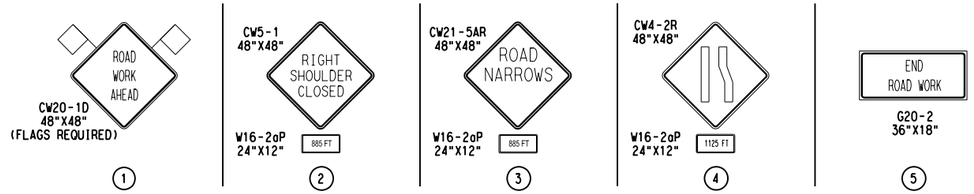
CB05-CC3-4030.001

DWG No. CC3-4031



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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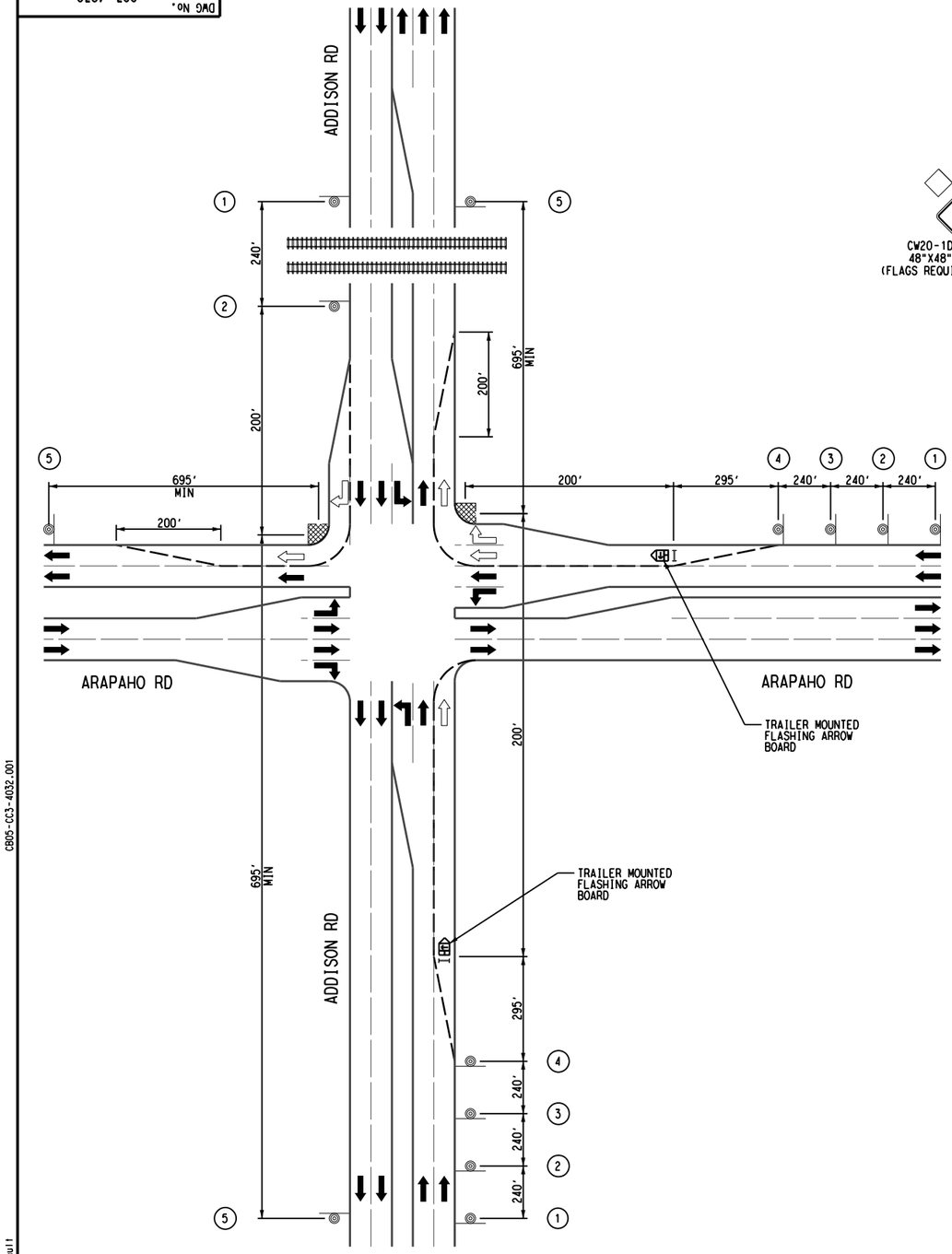
COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

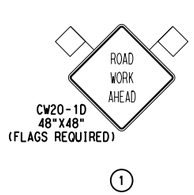
TOWN OF ADDISON
SURVEYOR BOULEVARD
TRAFFIC CONTROL PLAN
SHEET 2 OF 7

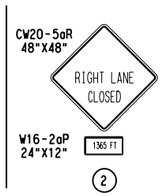
CONTRACT	DWG No.	REV
C-2033270-01	CC3-4031	D

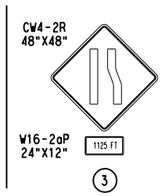
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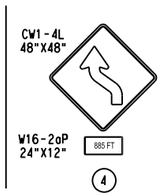
DWG No. CC3-4032















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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DESIGNED	C. BAGBY
CHECKED	D. LUU
IN CHARGE	D. LUU
DATE	13 MAR 23

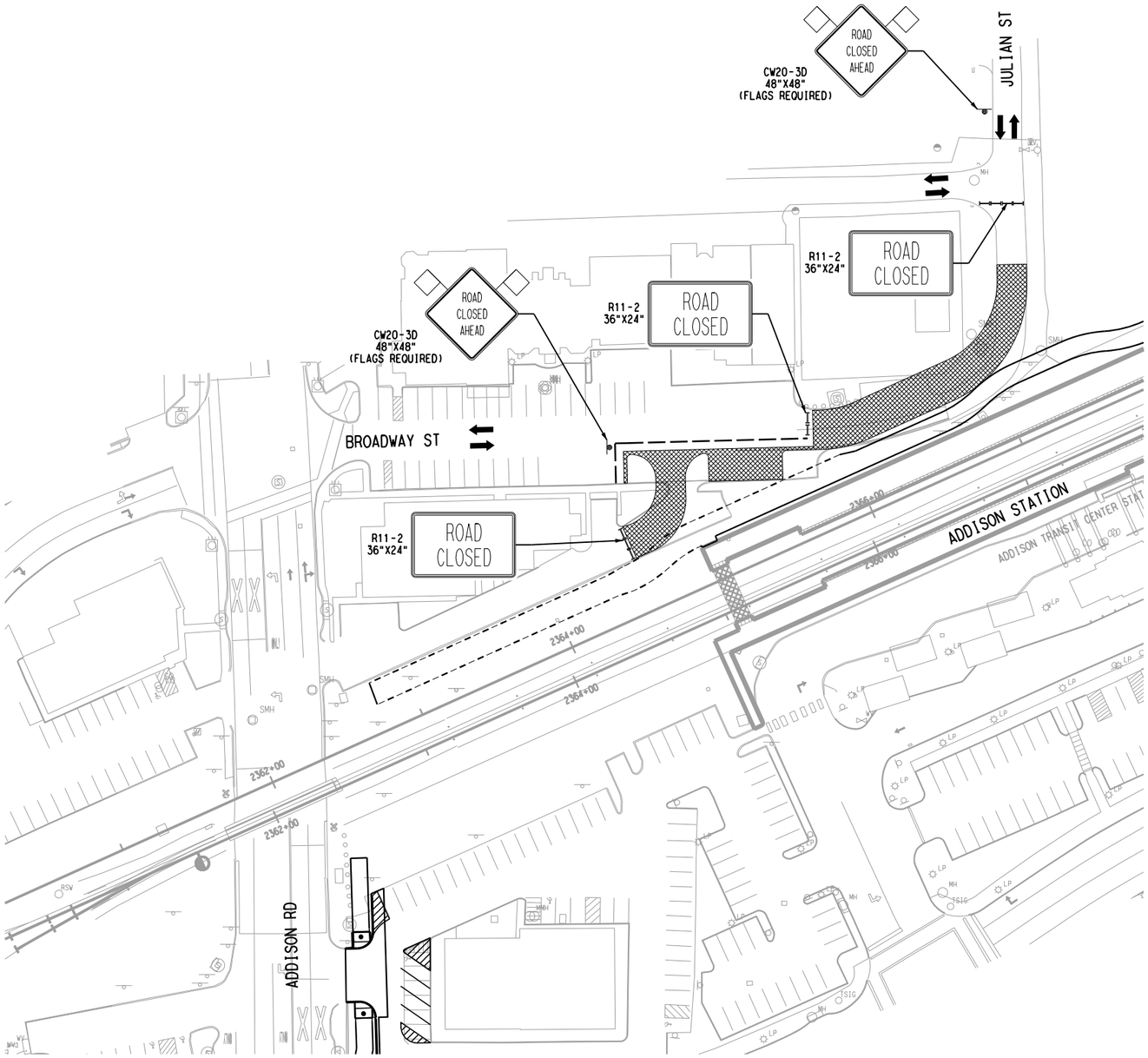
CAES

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
TOWN OF ADDISON
ADDISON ROAD
TRAFFIC CONTROL PLAN
SHEET 3 OF 7

CONTRACT	DWG No.	REV
C-2033270-01	CC3-4032	D

CB05-CC3-4032.001

DWG No. CC3-4033



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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REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

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DESIGNED	C. BAGBY
CHECKED	D. LUU
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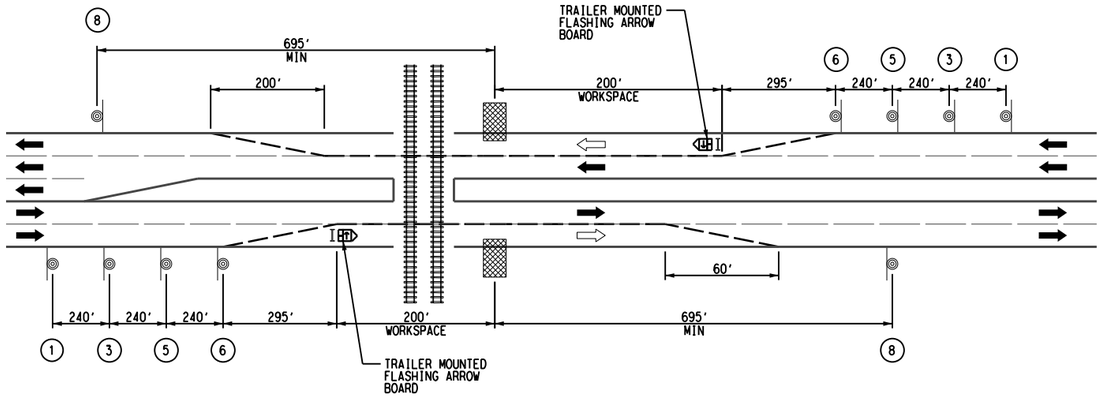
COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
TOWN OF ADDISON
JULIAN STREET / BROADWAY STREET
TRAFFIC CONTROL PLAN
SHEET 4 OF 7

CONTRACT	DWG No.	REV
C-2033270-01	CC3-4033	D

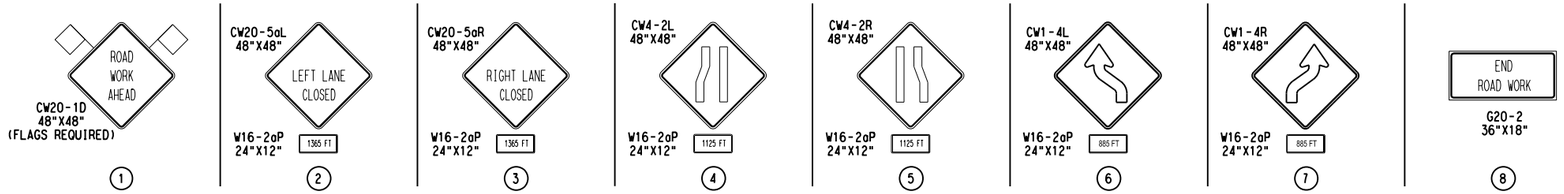
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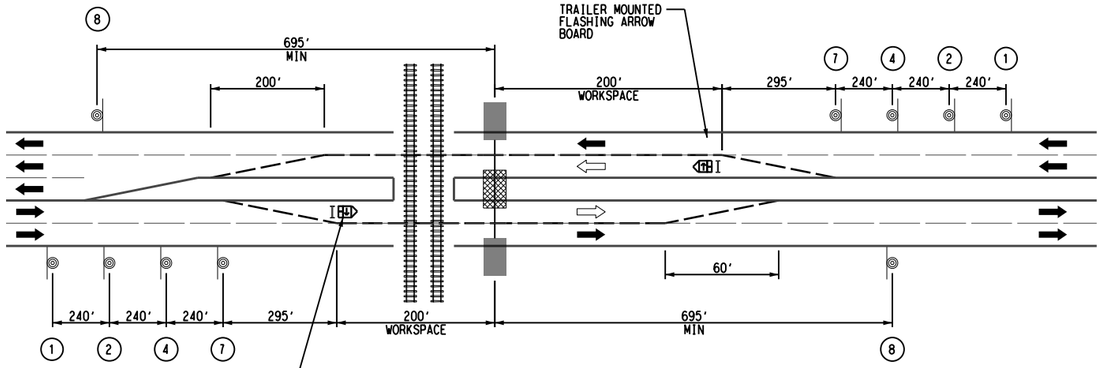
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DWG No. CC3-4034



PHASE 1





PHASE 2

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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FIRM NO. F-819

ARCHER WESTERN HERZOG

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SCALE	NO SCALE
DRAWN	C. BAGBY
DESIGNED	C. BAGBY
CHECKED	D. LUU
IN CHARGE	D. LUU
DATE	13 MAR 23

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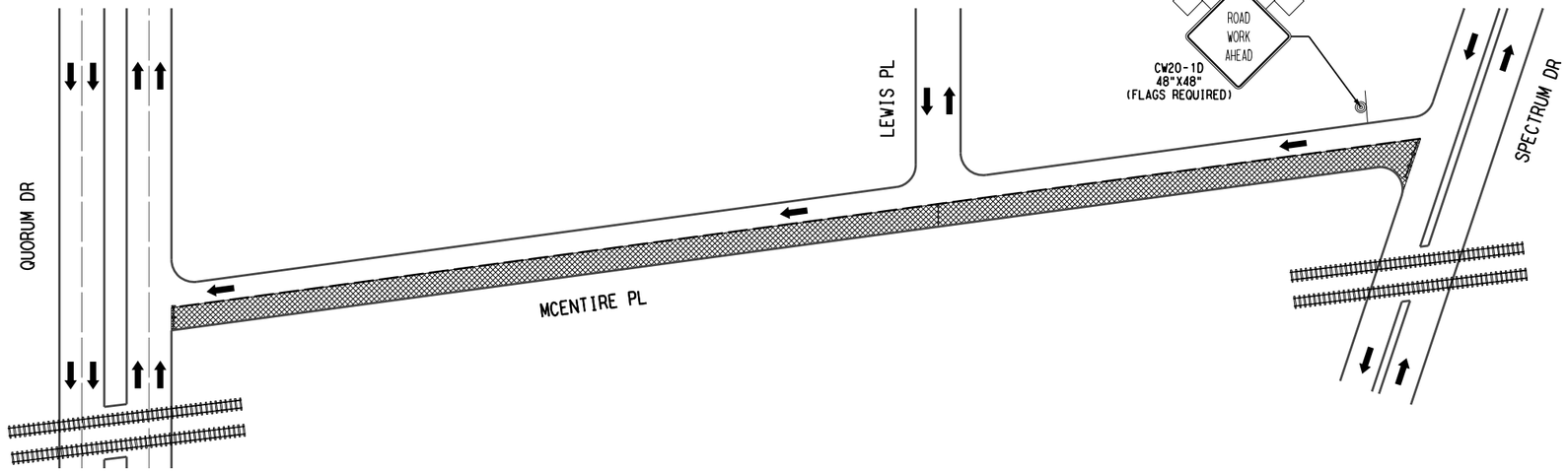
CONTRACT SHEET No. 34 OF 242

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
TOWN OF ADDISON
QUORUM DRIVE
TRAFFIC CONTROL PLAN
SHEET 5 OF 7

CONTRACT	DWG No.	REV
C-2033270-01	CC3-4034	D

CB05-CC3-4034.001

DWG No. CC3-4035



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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CB05-CC3-4035.001

ssaleh
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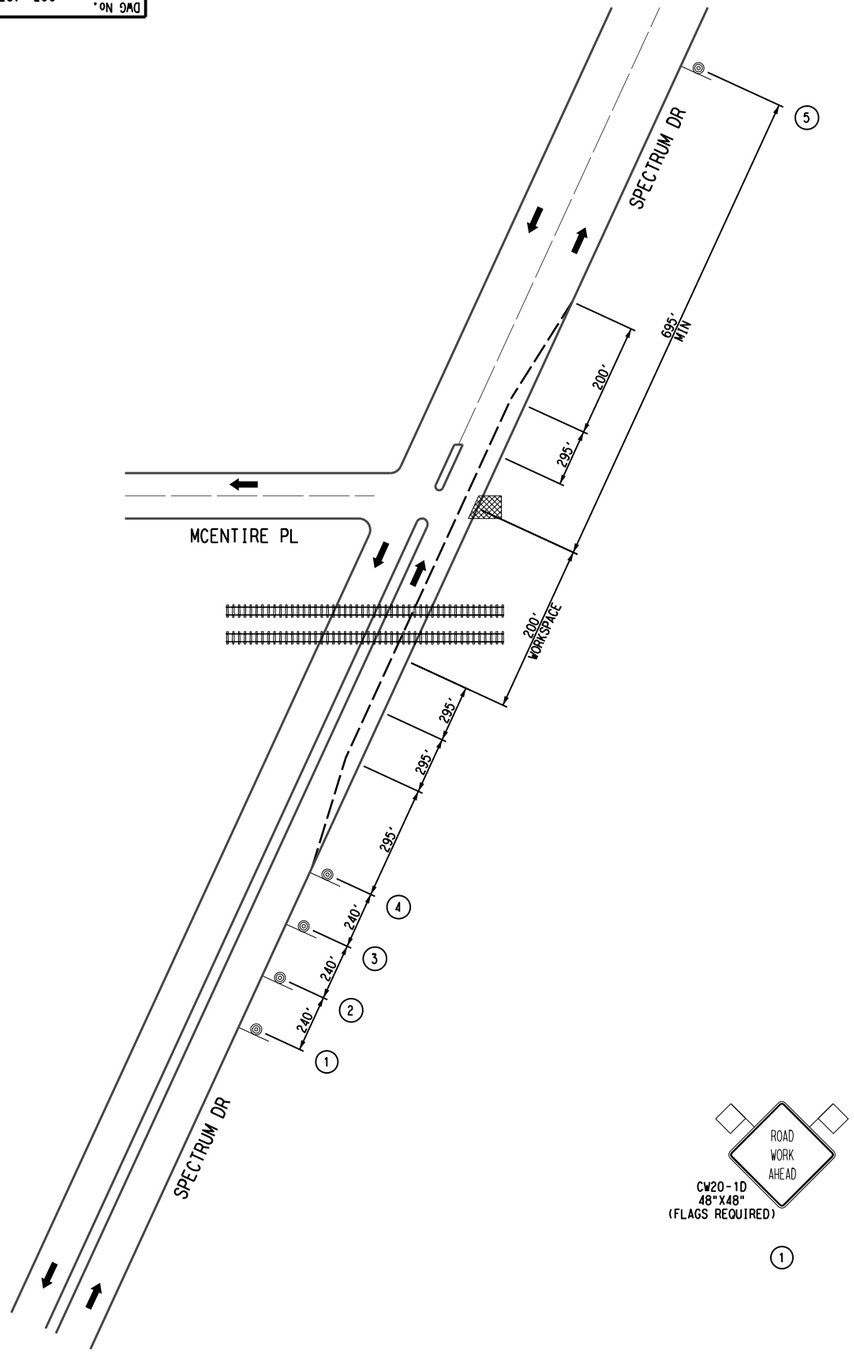
CAES

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
TOWN OF ADDISON
MCENTIRE PLACE
TRAFFIC CONTROL PLAN
SHEET 6 OF 7

CONTRACT	DWG No.	REV
C-2033270-01	CC3-4035	D

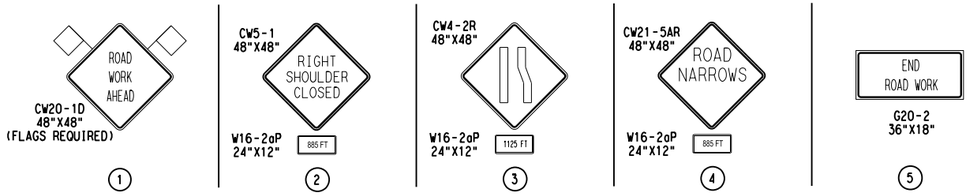
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DWG No. CC3-4036



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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CONTRACT SHEET No. 36 OF 242

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP
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DESIGNED	C. BAGBY
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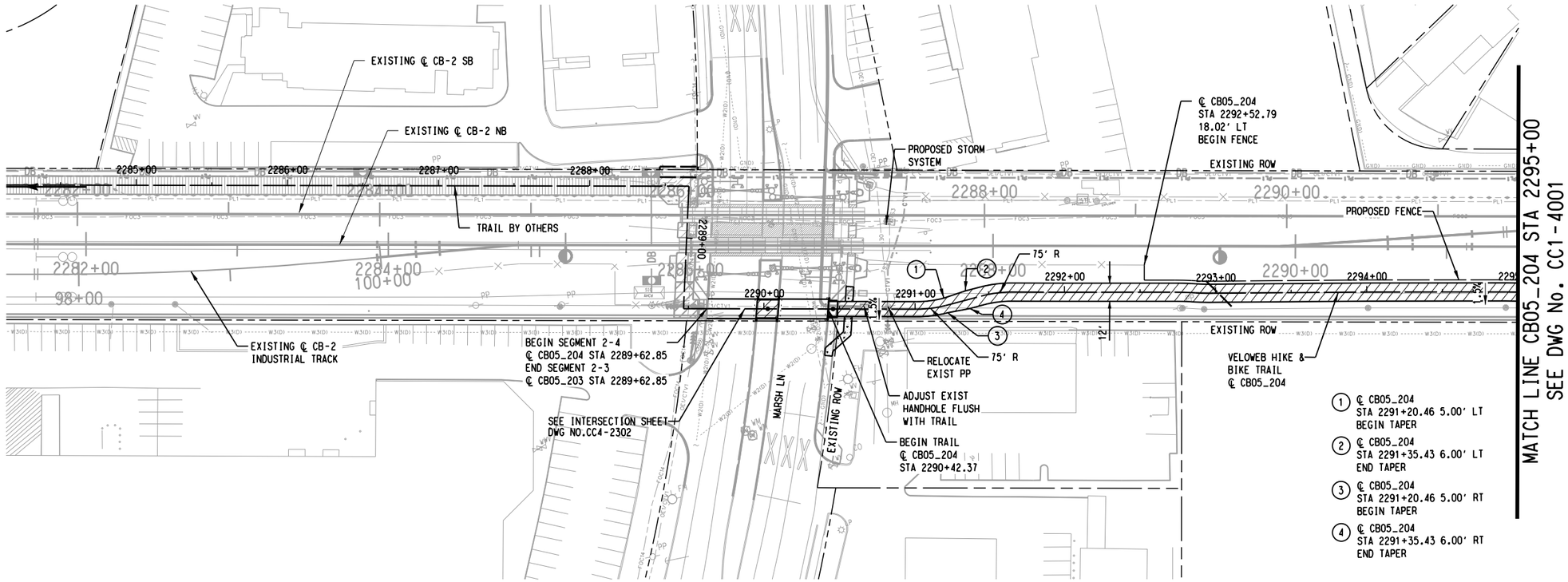
COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
TOWN OF ADDISON
SPECTRUM DRIVE
TRAFFIC CONTROL PLAN
SHEET 7 OF 7

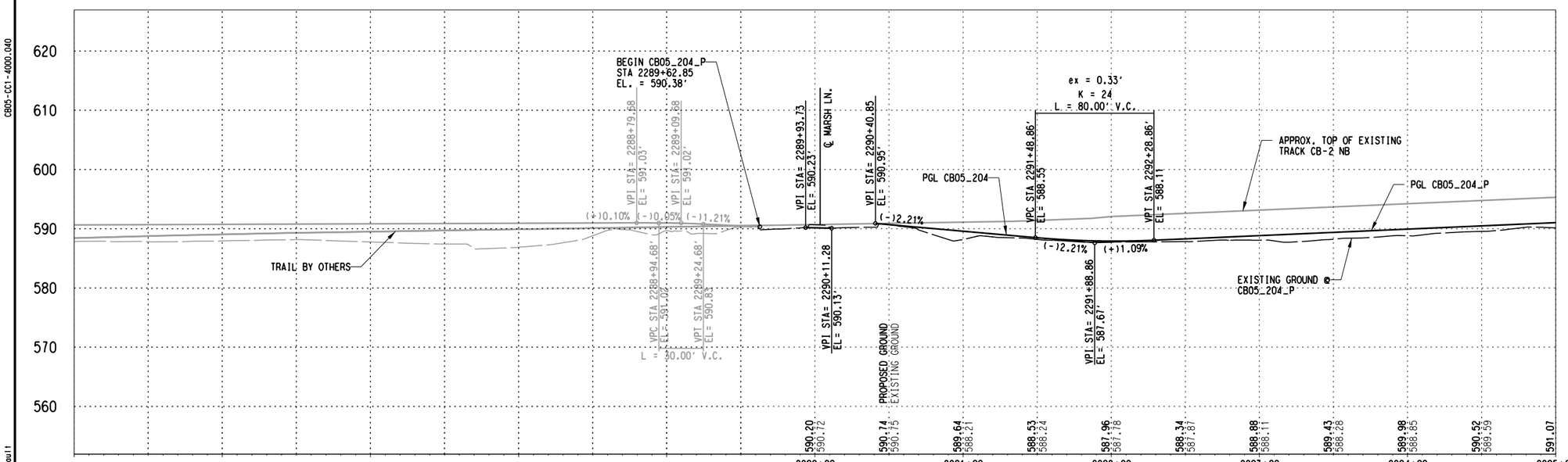
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C-2033270-01	CC3-4036	D

CB05-CC3-4036.001

08-MAR-2023 19:15
CB05-CC3-4036.001
ssaleh
Default

DWG No. CC1-4000





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

LEGEND:
- TRAIL PAVEMENT
- SIDEWALK PAVEMENT
- 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

NOT AN APPROVED DRAWING
FINAL 100% DESIGN

CONTRACT SHEET No. 37 OF 242

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

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CAES

SCALE	1"=40'
DRAWN	S. SALEH
DESIGNED	S. SALEH
CHECKED	D. LUU
IN CHARGE	D. LUU
DATE	13 MAR 23

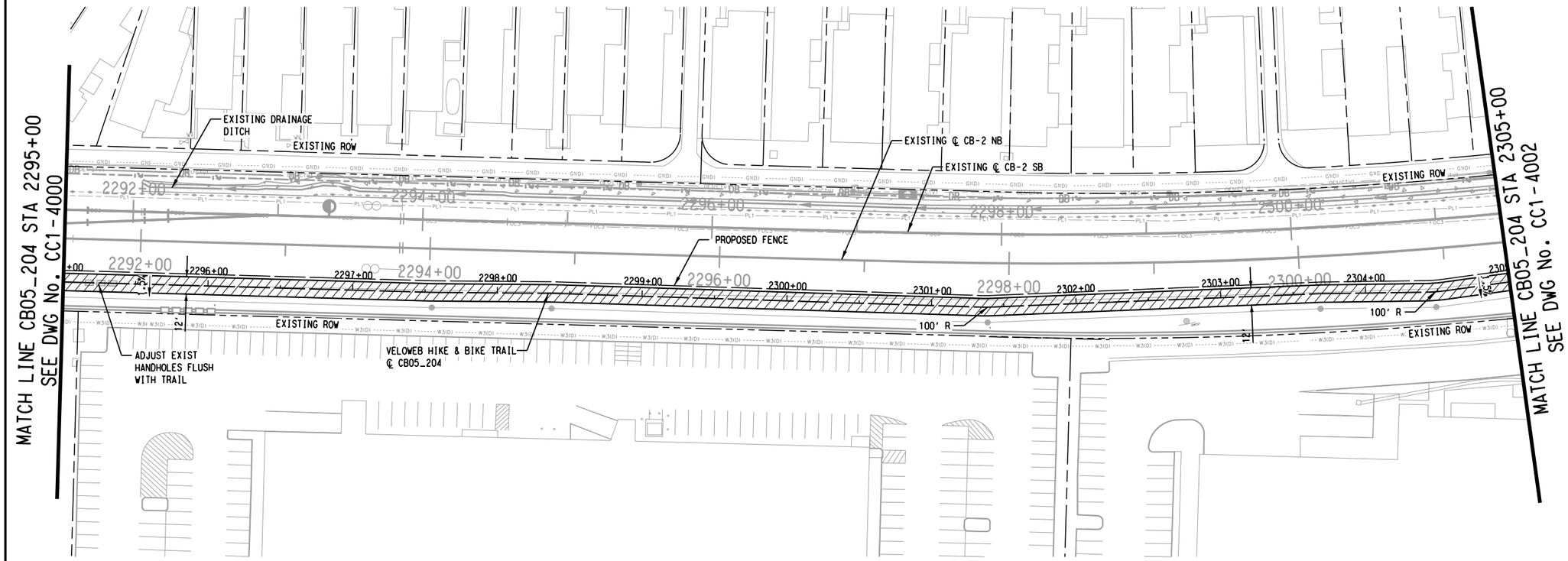
COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
TOWN OF ADDISON
PLAN & PROFILE
STA 2289+62.05 TO STA 2295+00
SHEET 1 OF 11

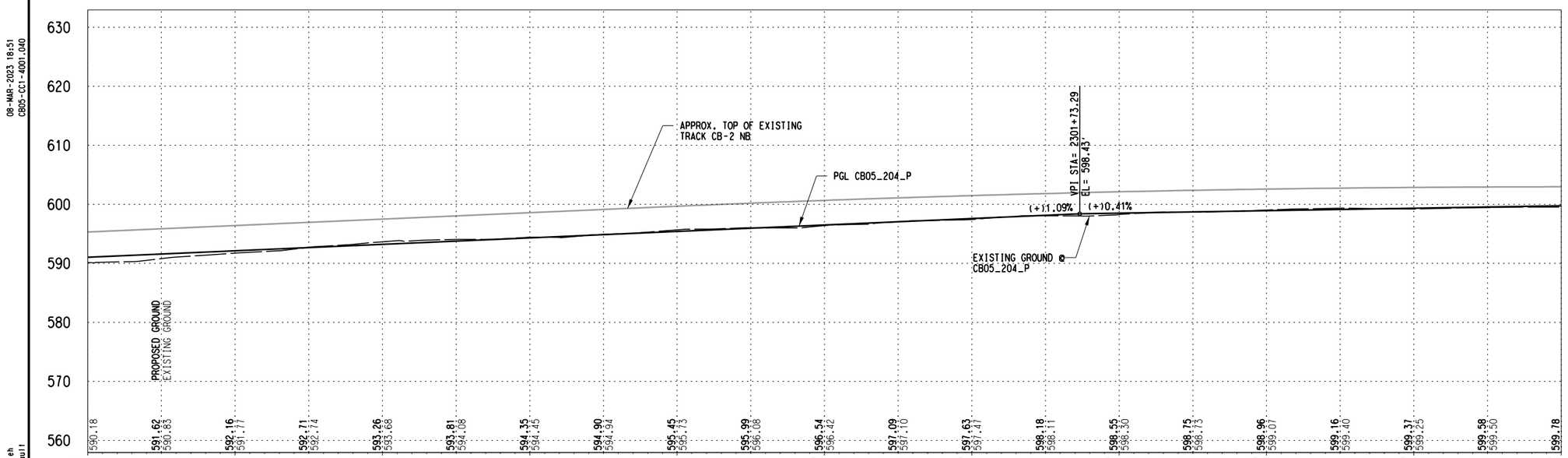
CONTRACT	DWG No.	REV
C-2033270-01	CC1-4000	D

CB05-CC1-4000.040

08-MAR-2023 18:51
CB05-CC1-4000.040
ssoleh
Default

DWG No. CC1-4001





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

LEGEND:

TRAIL PAVEMENT

SIDEWALK PAVEMENT

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

NOT AN APPROVED DRAWING
FINAL 100% DESIGN

CONTRACT SHEET No. 38 OF 242

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	13 MAR 23

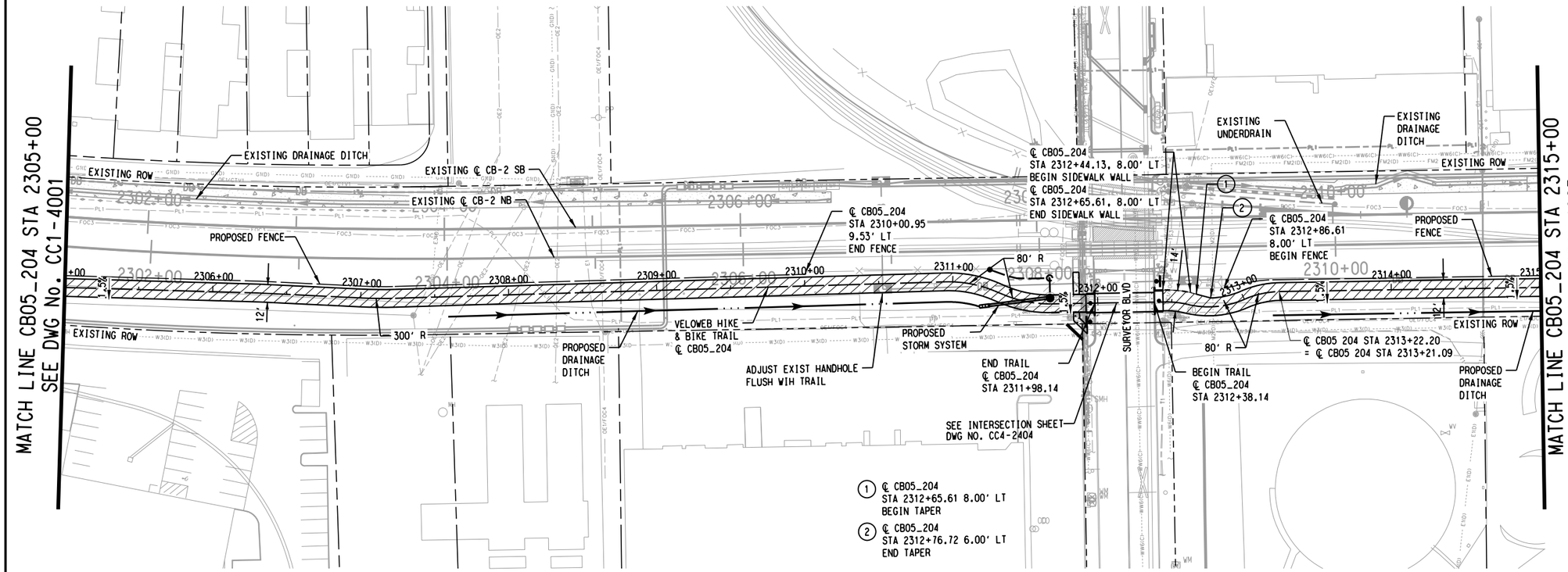
COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
TOWN OF ADDISON
PLAN & PROFILE
STA 2295+00 TO STA 2305+00
SHEET 2 OF 11

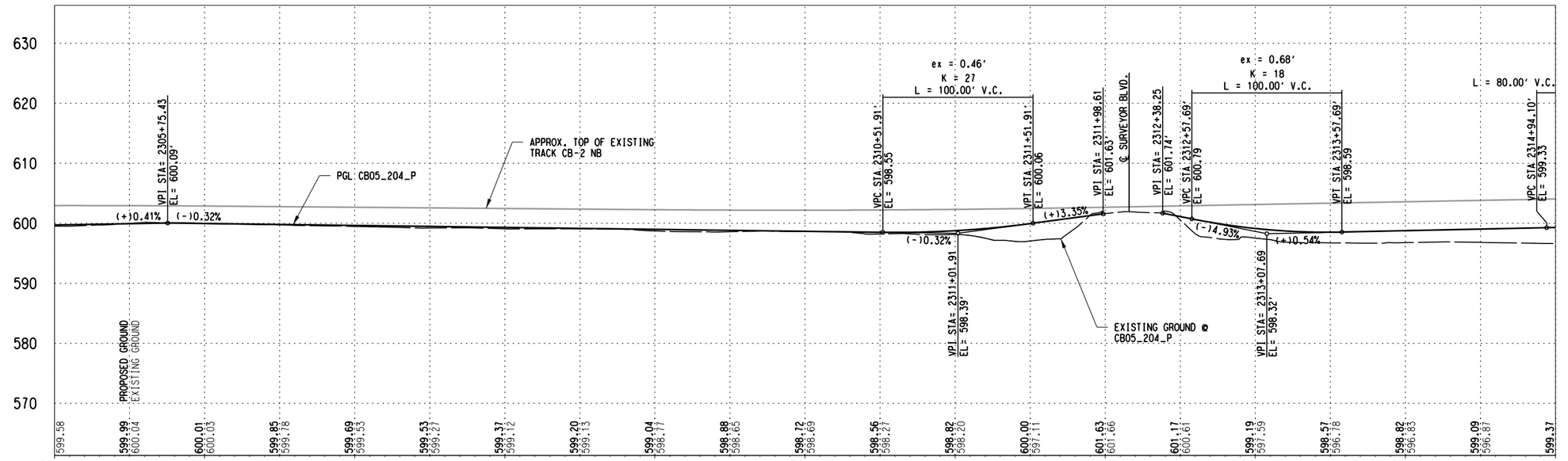
CONTRACT	DWG No.	REV
C-2033270-01	CC1-4001	D

CB05-CC1-4001.040

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CB05-CC1-4001.040
ssoleh
Default

DWG No. CC1-4002





LEGEND:

- TRAIL PAVEMENT
- SIDEWALK PAVEMENT
- 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

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DESIGNED	S. SALEH
CHECKED	D. LUU
IN CHARGE	D. LUU
DATE	13 MAR 23

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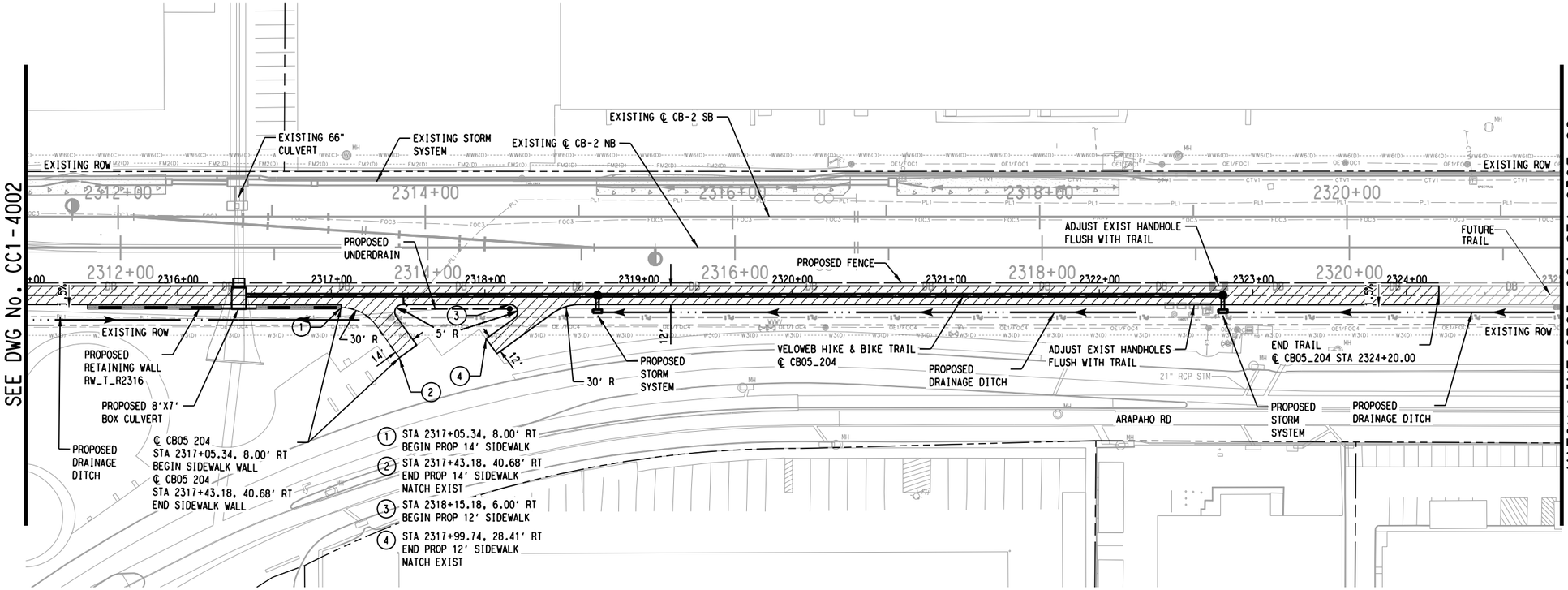
CONTRACT SHEET No. 39 OF 242

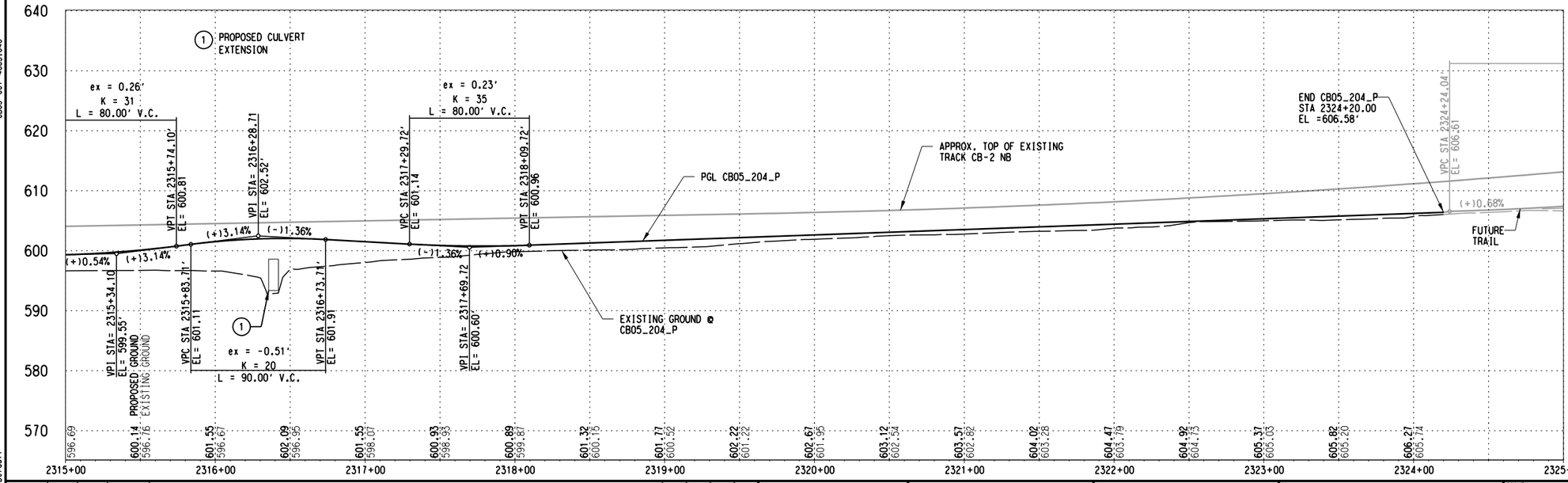
COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
TOWN OF ADDISON
PLAN & PROFILE
STA 2305+00 TO STA 2315+00
SHEET 3 OF 11

CONTRACT	DWG No.	REV
C-2033270-01	CC1-4002	D

CB05-CC1-4002.040

DWG No. CC1-4003







LEGEND:

- TRAIL PAVEMENT
- SIDEWALK PAVEMENT
- 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

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DESIGNED	S. SALEH
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DATE	13 MAR 23

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CONTRACT SHEET No. 40 OF 242

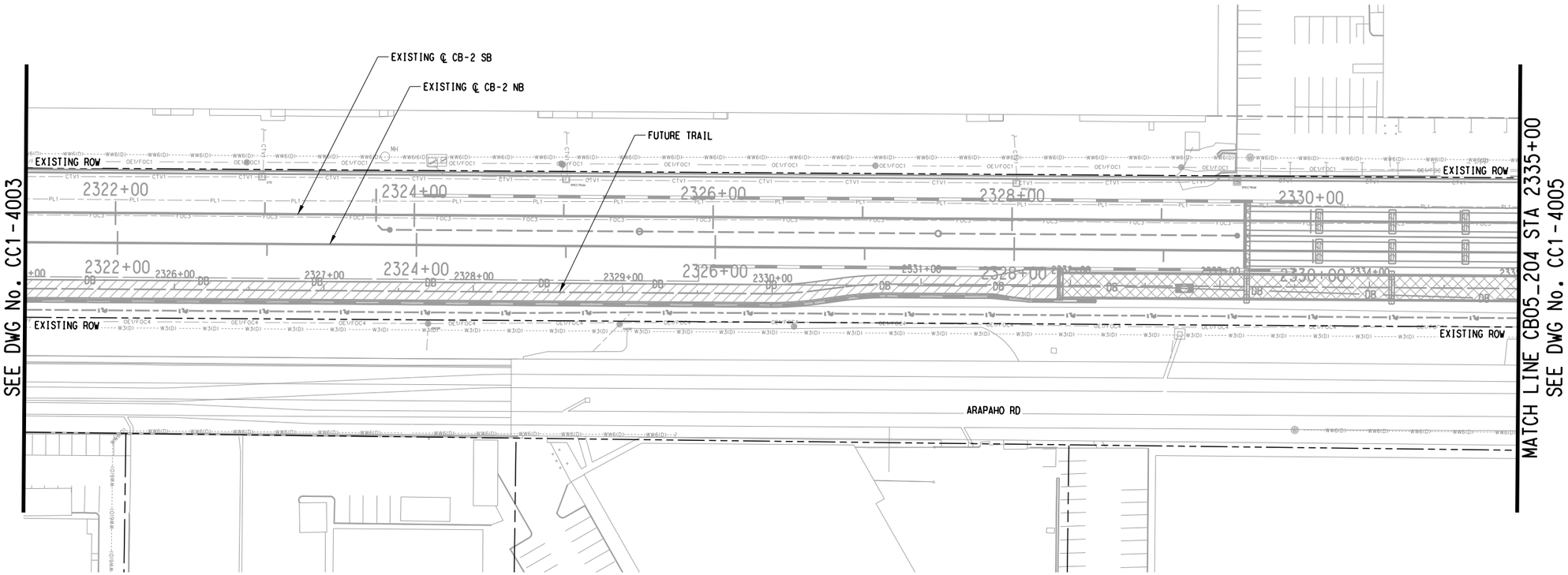
COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
TOWN OF ADDISON
PLAN & PROFILE
STA 2315+00 TO STA 2325+00
SHEET 4 OF 11

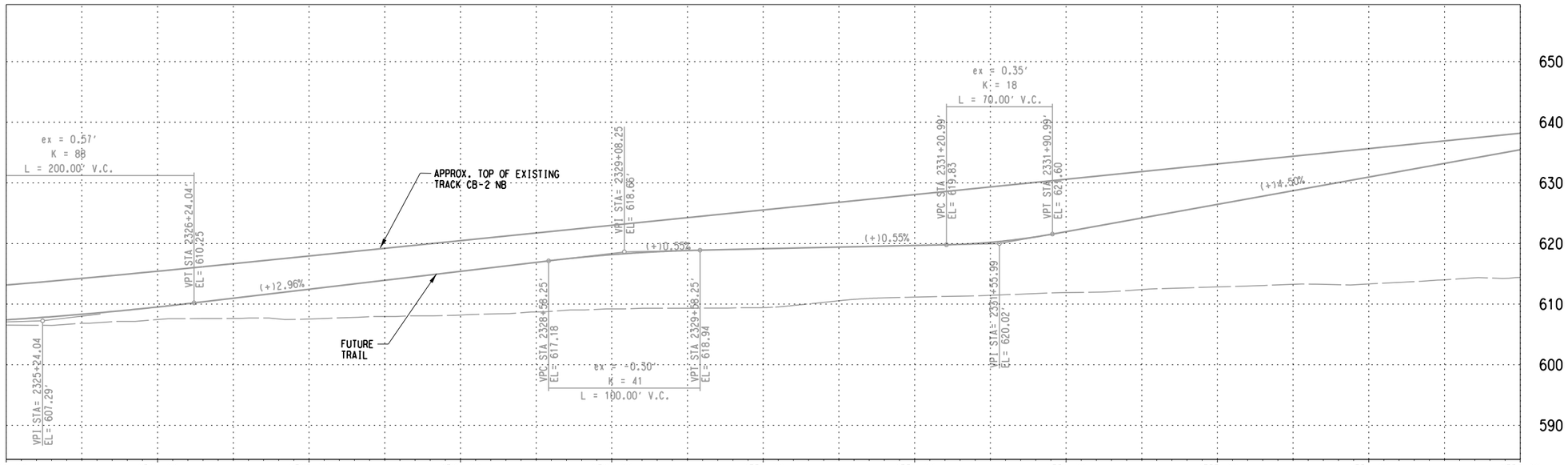
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C-2033270-01	CC1-4003	D

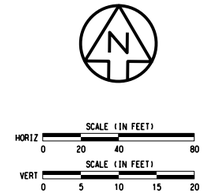
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ssoleh
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DWG No. CC1-4004







LEGEND:

- TRAIL PAVEMENT
- SIDEWALK PAVEMENT
- 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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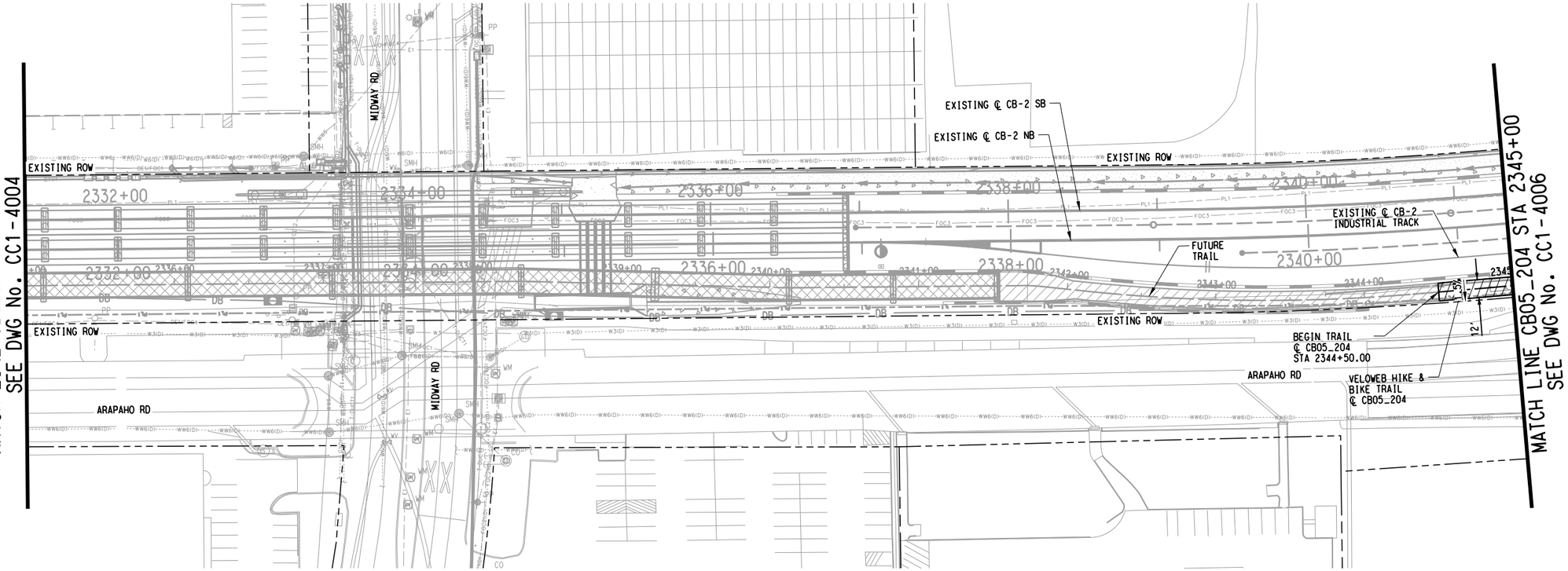
COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
TOWN OF ADDISON
PLAN & PROFILE
STA 2325+00 TO STA 2335+00
SHEET 5 OF 11

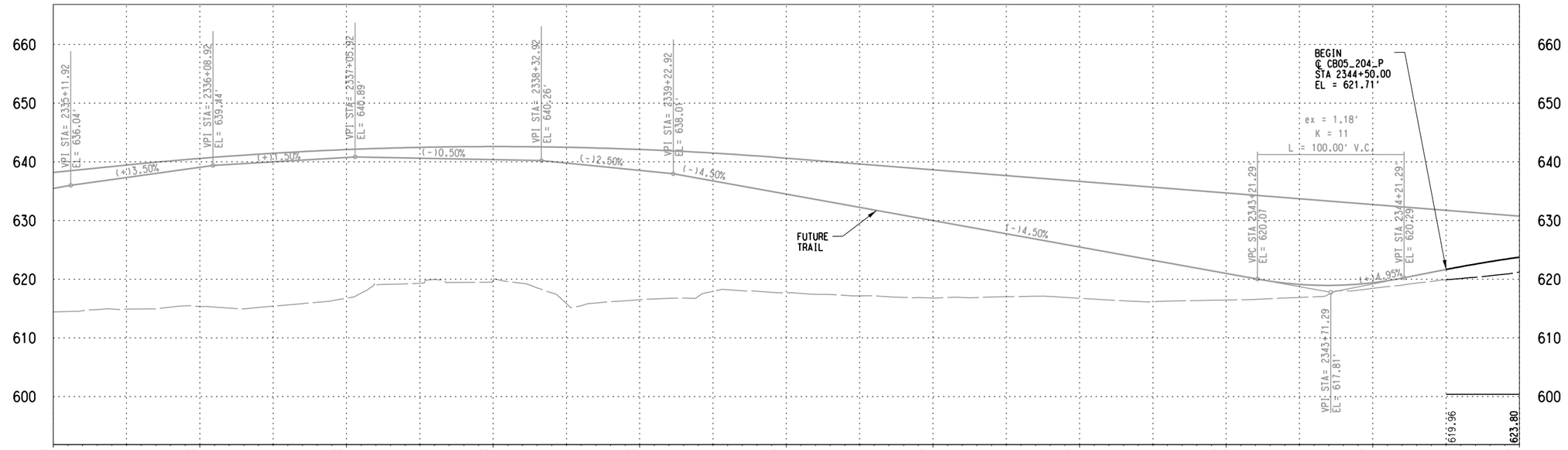
CONTRACT	DWG No.	REV
C-2033270-01	CC1-4004	D

CB05-CC1-4004.040

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CB05-CC1-4004.040
ssoleh
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DWG No. CC1-4005







LEGEND:

- TRAIL PAVEMENT
- SIDEWALK PAVEMENT
- 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

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REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

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FIRM NO. F-819

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SCALE	1"=40'
DRAWN	S. SALEH
DESIGNED	S. SALEH
CHECKED	D. LUU
IN CHARGE	D. LUU
DATE	13 MAR 23

CAES

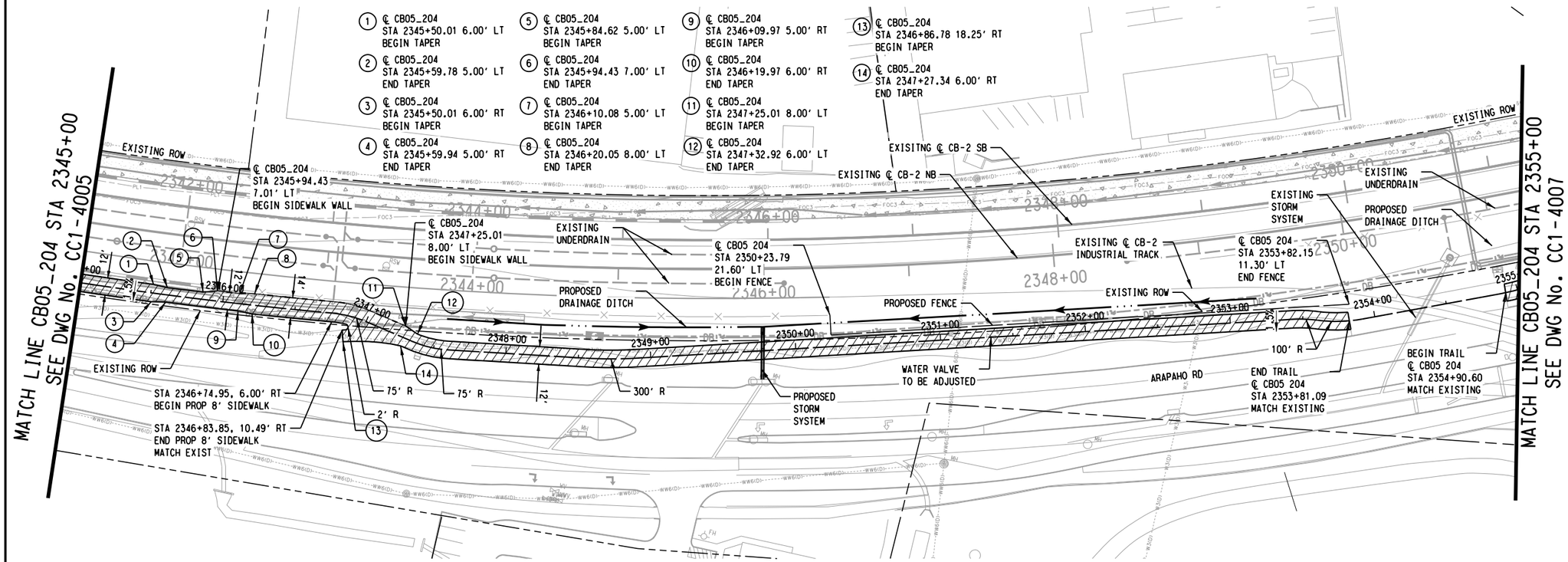
CONTRACT SHEET No. 42 OF 242

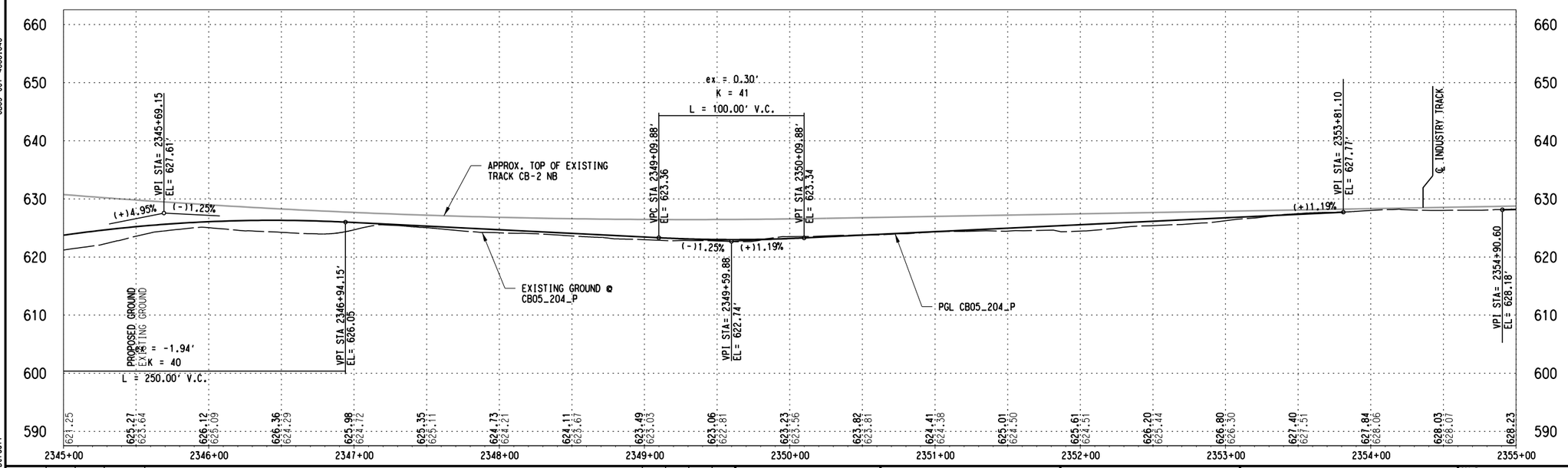
COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
TOWN OF ADDISON
PLAN & PROFILE
STA 2335+00 TO STA 2345+00
SHEET 6 OF 11

CONTRACT	DWG No.	REV
C-2033270-01	CC1-4005	D

CB05-CC1-4005.040

DWG No. CC1-4006





LEGEND:

- TRAIL PAVEMENT
- SIDEWALK PAVEMENT
- 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

NOT AN APPROVED DRAWING
FINAL 100% DESIGN

CONTRACT SHEET No. 43 OF 242

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

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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

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SCALE	1"=40'
DRAWN	S. SALEH
DESIGNED	S. SALEH
CHECKED	D. LUU
IN CHARGE	D. LUU
DATE	13 MAR 23

CAES

COTTON BELT REGIONAL RAIL VELOWEB HIKE & BIKE TRAIL

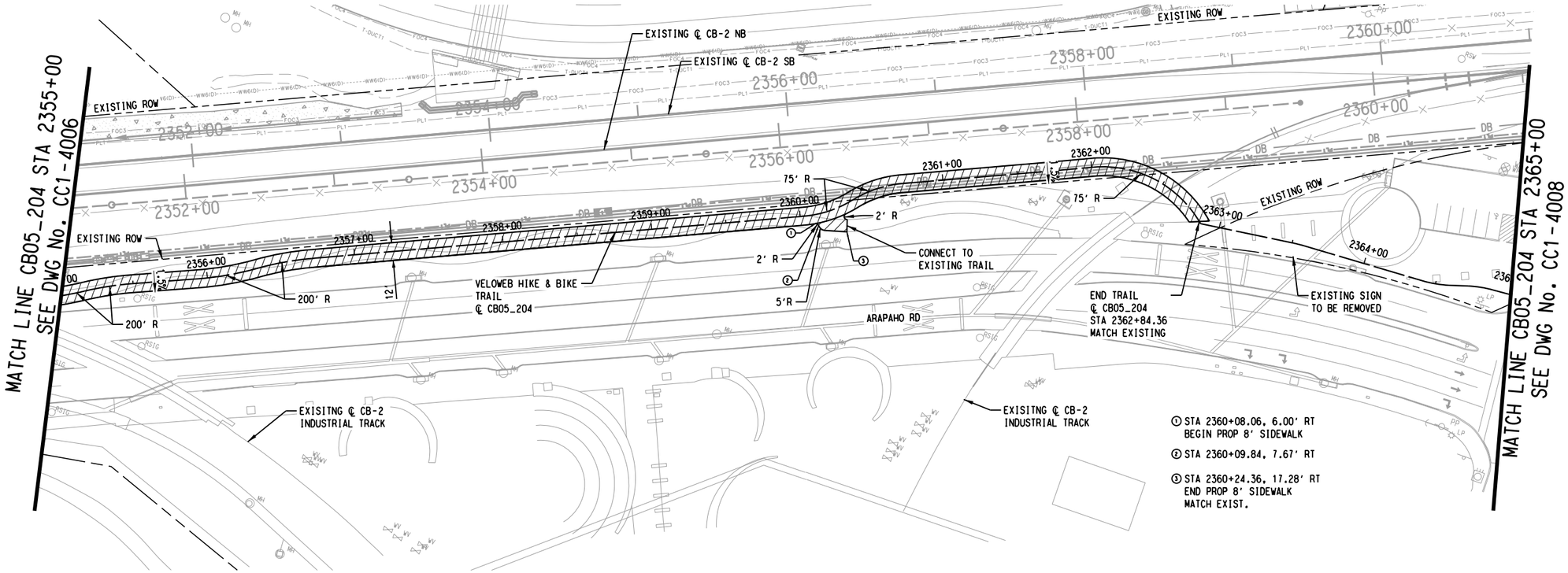
TOWN OF ADDISON
PLAN & PROFILE
STA 2345+00 TO STA 2355+00
SHEET 7 OF 11

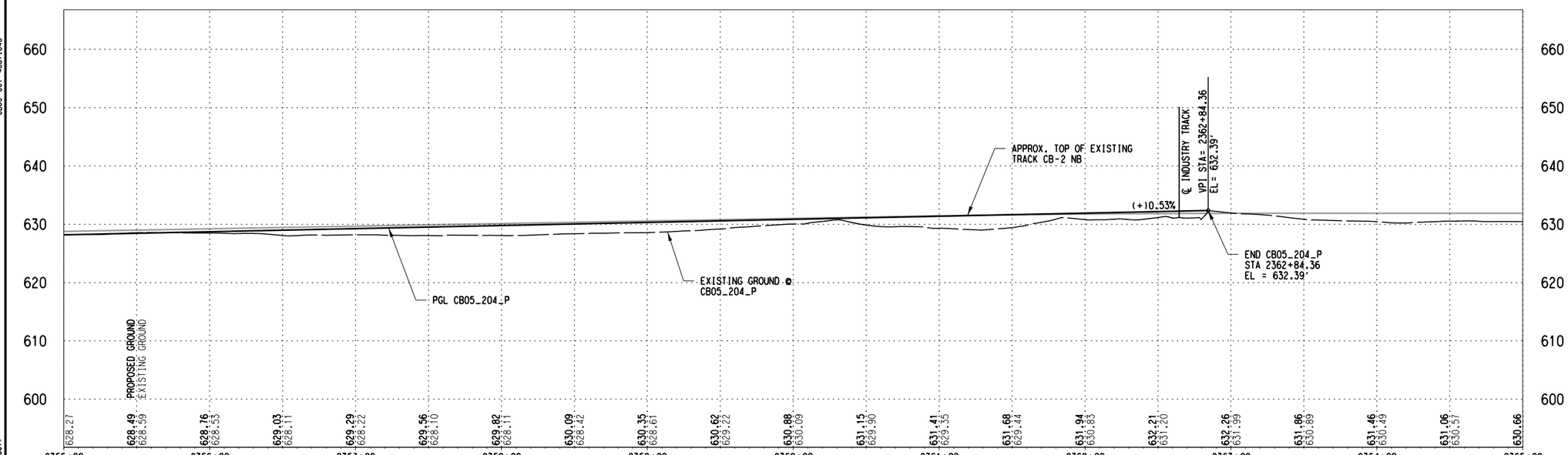
CONTRACT	DWG No.	REV
C-2033270-01	CC1-4006	D

CB05-CC1-4006.040

08-MAR-2023 18:52
CB05-CC1-4006.040
ssoleh
Default

DWG No. CC1-4007





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

LEGEND:

TRAIL PAVEMENT

SIDEWALK PAVEMENT

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

NOT AN APPROVED DRAWING
FINAL 100% DESIGN

08-MAR-2023 18:52
CB05-CC1-4007.040

ssoleh
Default

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
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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	13 MAR 23

CAES

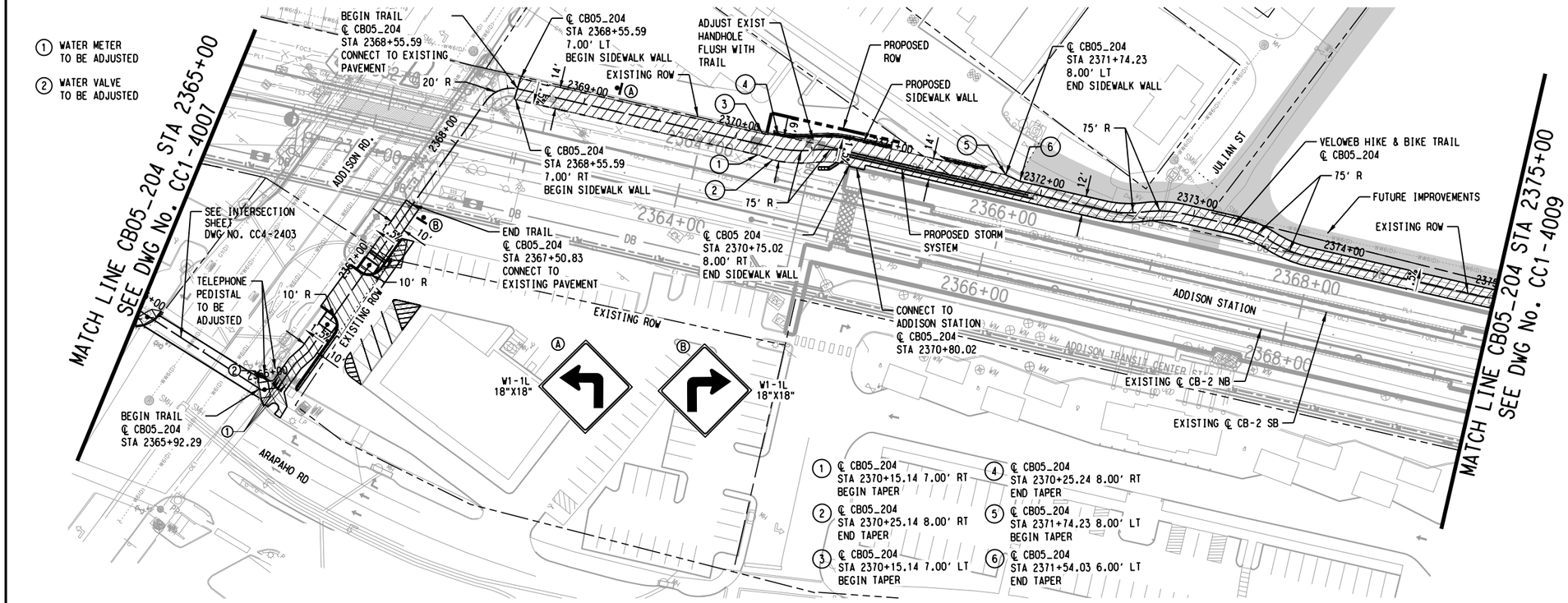
CONTRACT SHEET No. 44 OF 242

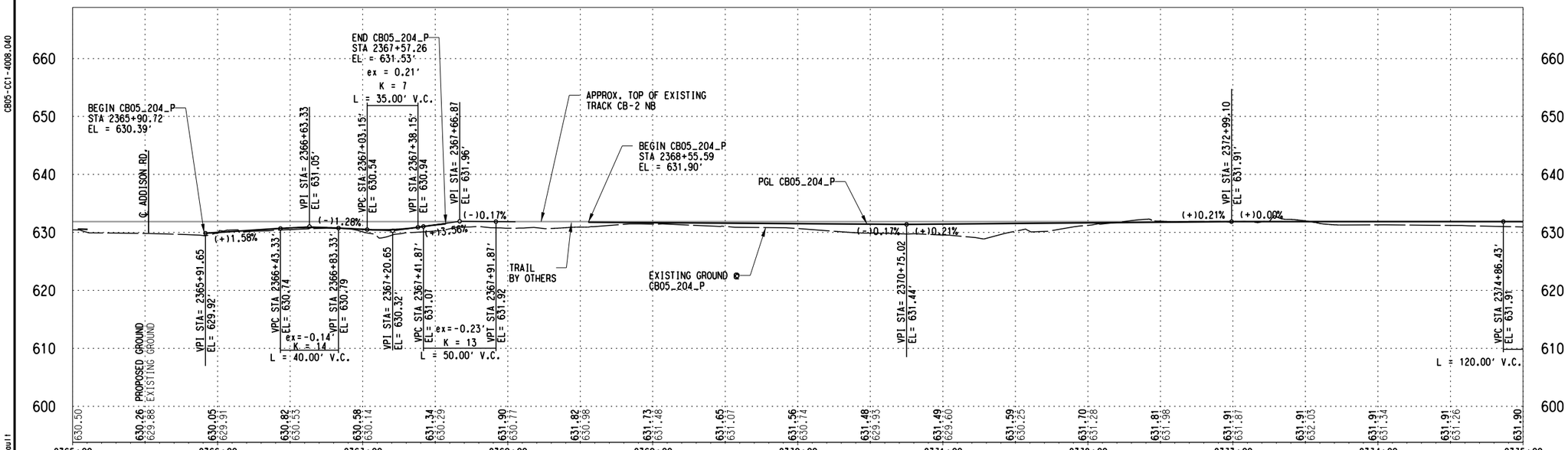
COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
TOWN OF ADDISON
PLAN & PROFILE
STA 2355+00 TO STA 2365+00
SHEET 8 OF 11

CONTRACT	DWG No.	REV
C-2033270-01	CC1-4007	D

CB05-CC1-4007.040

DWG No. CC1-4008





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

LEGEND:
- TRAIL PAVEMENT
- SIDEWALK PAVEMENT
- 1.50% TRAIL CROSS-SLOPE
- FUTURE PAVEMENT

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

NOT AN APPROVED DRAWING
FINAL 100% DESIGN

CONTRACT SHEET No. 45 OF 242

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

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	13 MAR 23

CAES

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
TOWN OF ADDISON
PLAN & PROFILE
STA 2365+00 TO STA 2375+00
SHEET 9 OF 11

CONTRACT	DWG No.	REV
C-2033270-01	CC1-4008	D

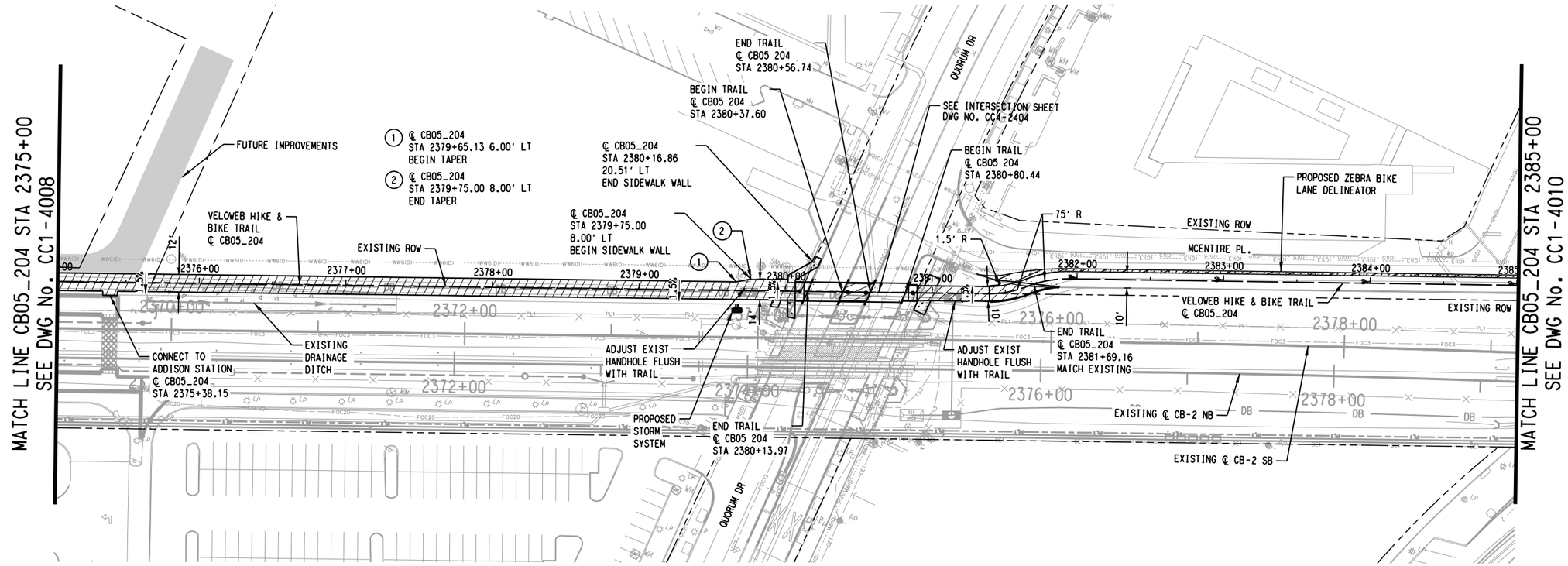
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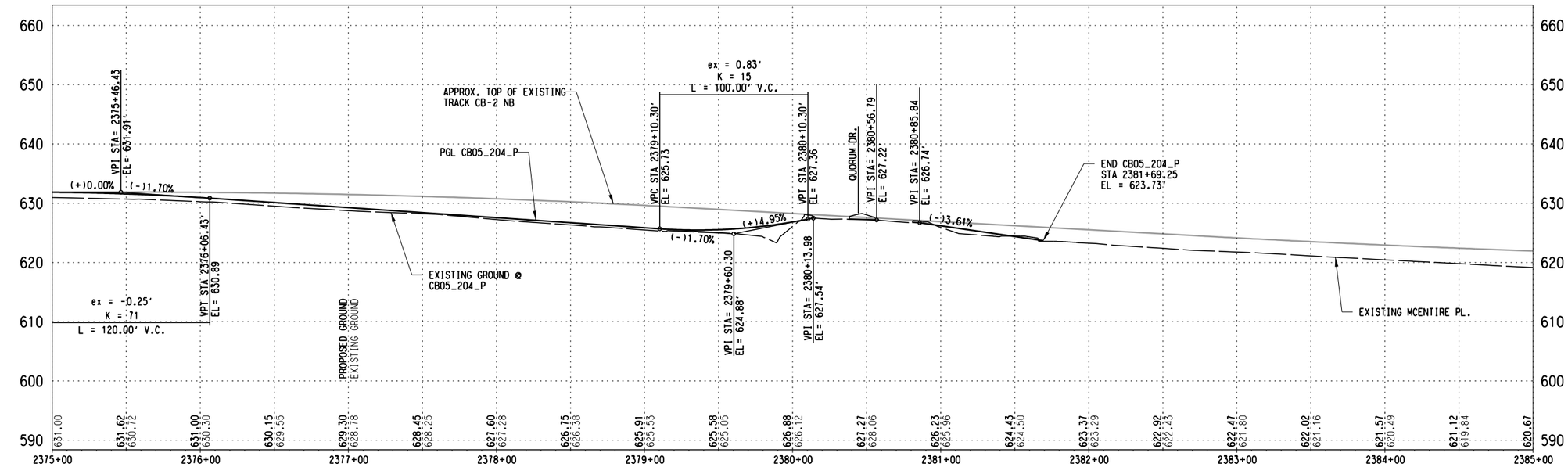
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CB05-CC1-4008.040
ssoleh
Default

DWG No. CC1-4009

MATCH LINE CB05_204 STA 2375+00
SEE DWG No. CC1-4008

MATCH LINE CB05_204 STA 2385+00
SEE DWG No. CC1-4010





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

LEGEND:

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

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

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FINAL 100% DESIGN

CONTRACT SHEET No. 46 OF 242

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

DART PROJECT

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SCALE	1"=40'
DRAWN	S. SALEH
DESIGNED	S. SALEH
CHECKED	D. LUU
IN CHARGE	D. LUU
DATE	13 MAR 23

CAES

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
TOWN OF ADDISON
PLAN & PROFILE
STA 2375+00 TO STA 2385+00
SHEET 10 OF 11

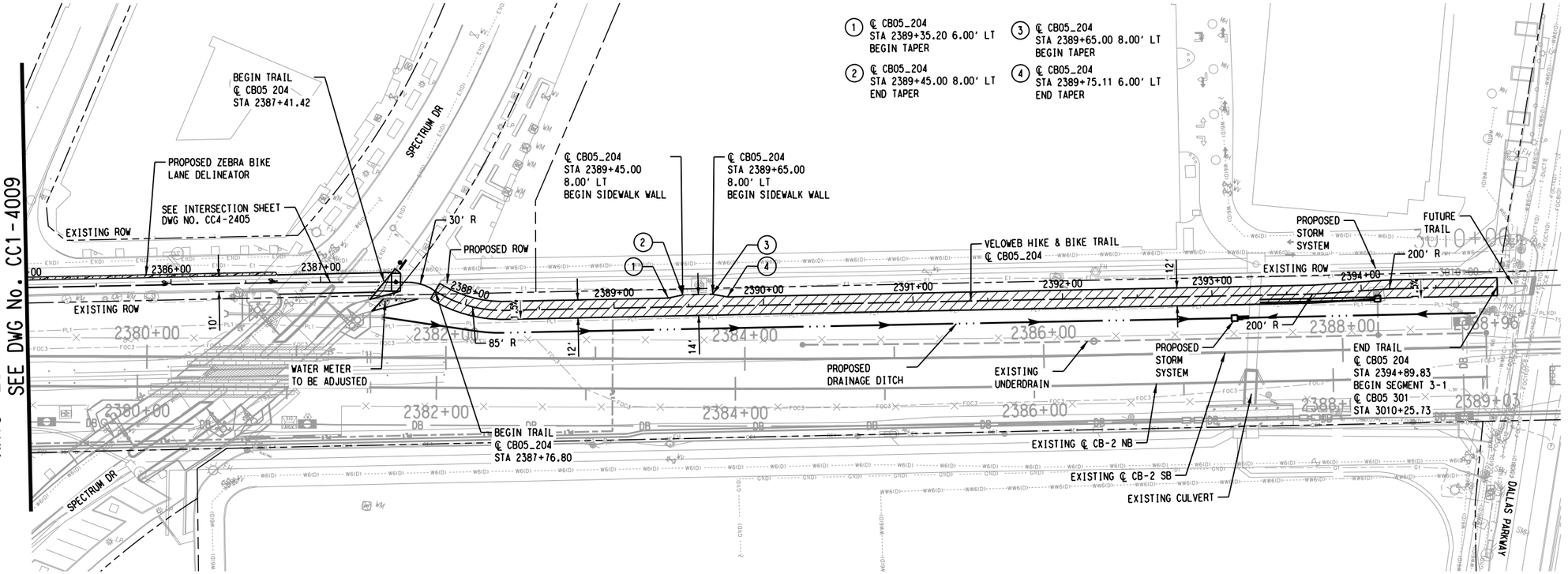
CONTRACT	DWG No.	REV
C-2033270-01	CC1-4009	D

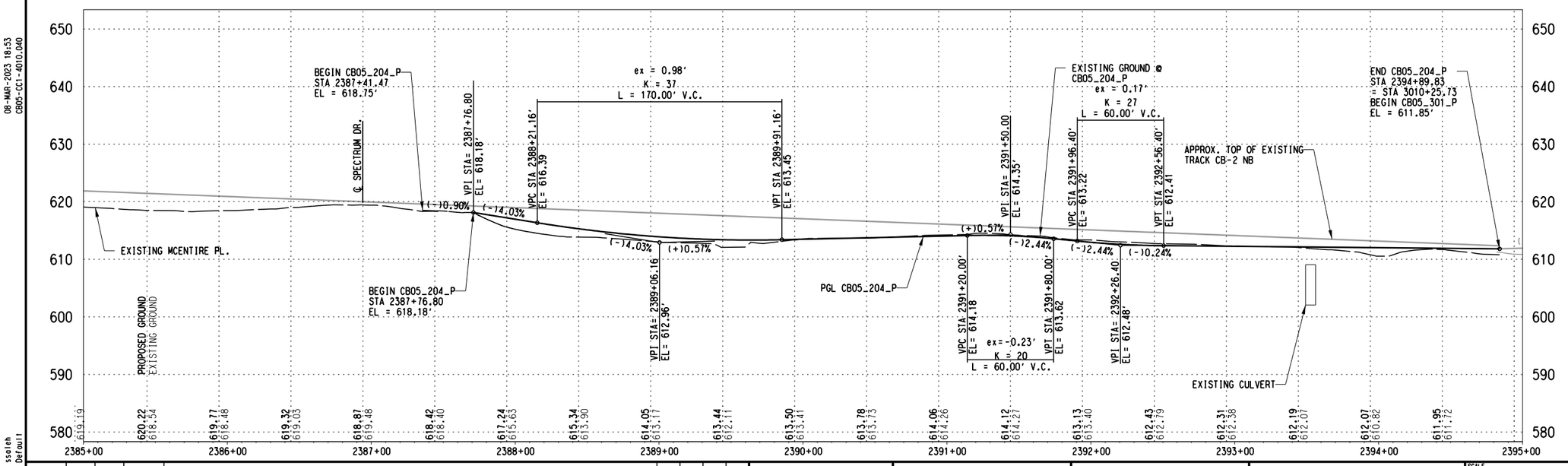
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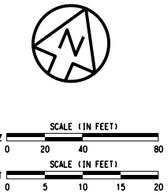
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CB05-CC1-4009.040
ssoleh
Default

DWG No. CC1-4010

MATCH LINE CB05_204 STA 2385+00
SEE DWG No. CC1-4009







LEGEND:

- TRAIL PAVEMENT
- SIDEWALK PAVEMENT
- 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

NOT AN APPROVED DRAWING
FINAL 100% DESIGN

CONTRACT SHEET No. 47 OF 242

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

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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	1"=40'
DRAWN	S. SALEH
DESIGNED	S. SALEH
CHECKED	D. LUU
IN CHARGE	D. LUU
DATE	13 MAR 23

CAES

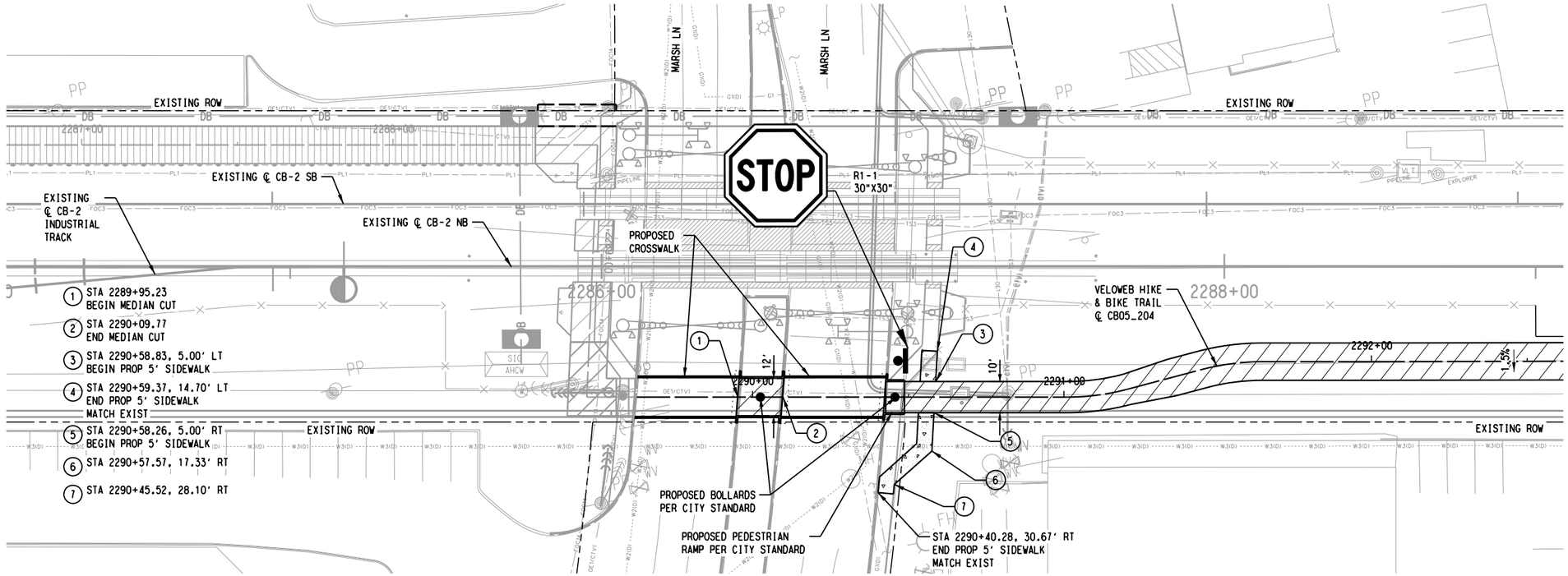
COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
TOWN OF ADDISON
PLAN & PROFILE
STA 2385+00 TO STA 2395+00
SHEET 11 OF 11

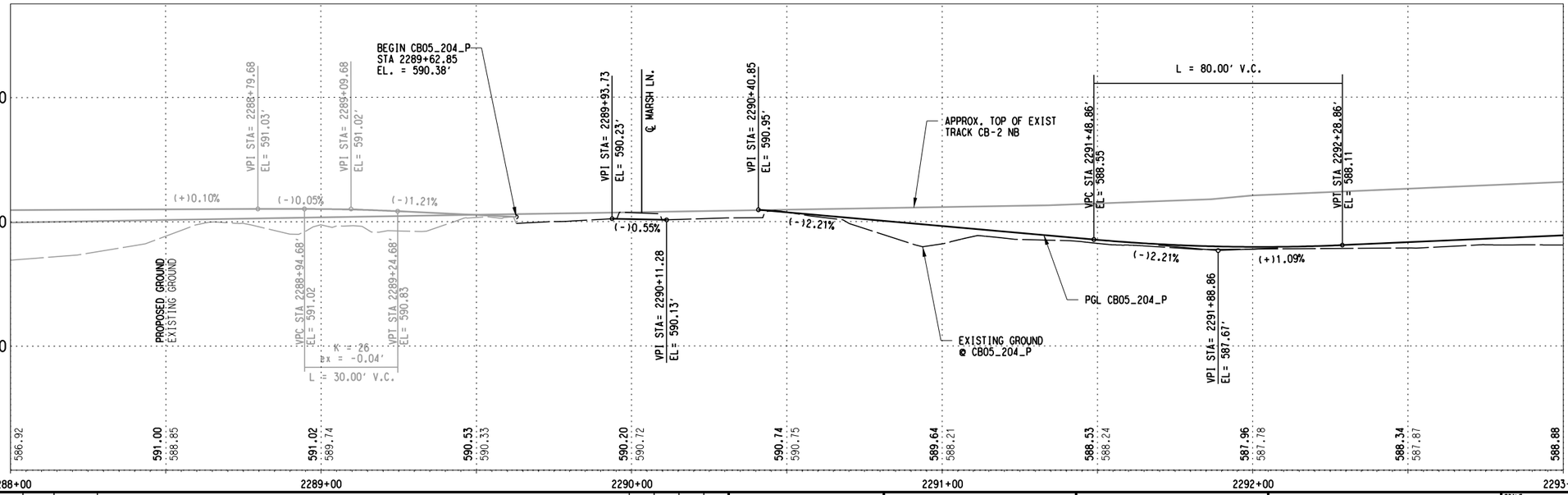
CONTRACT	DWG No.	REV
C-2033270-01	CC1-4010	D

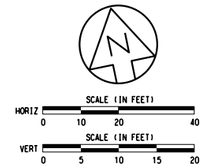
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08-MAR-2023 18:53
CB05-CC1-4010.040
ssoleh
Default

DWG No. CC4-2302







LEGEND:

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

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

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CB05-CC4-2302.0

cmcdorman
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REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

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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	1"=20'
DRAWN	C. BAGBY
DESIGNED	C. BAGBY
CHECKED	D. LUU
IN CHARGE	D. LUU
DATE	13 MAR 23

CAES

NOT AN APPROVED DRAWING
FINAL 100% DESIGN

CONTRACT SHEET No. 48 OF 242

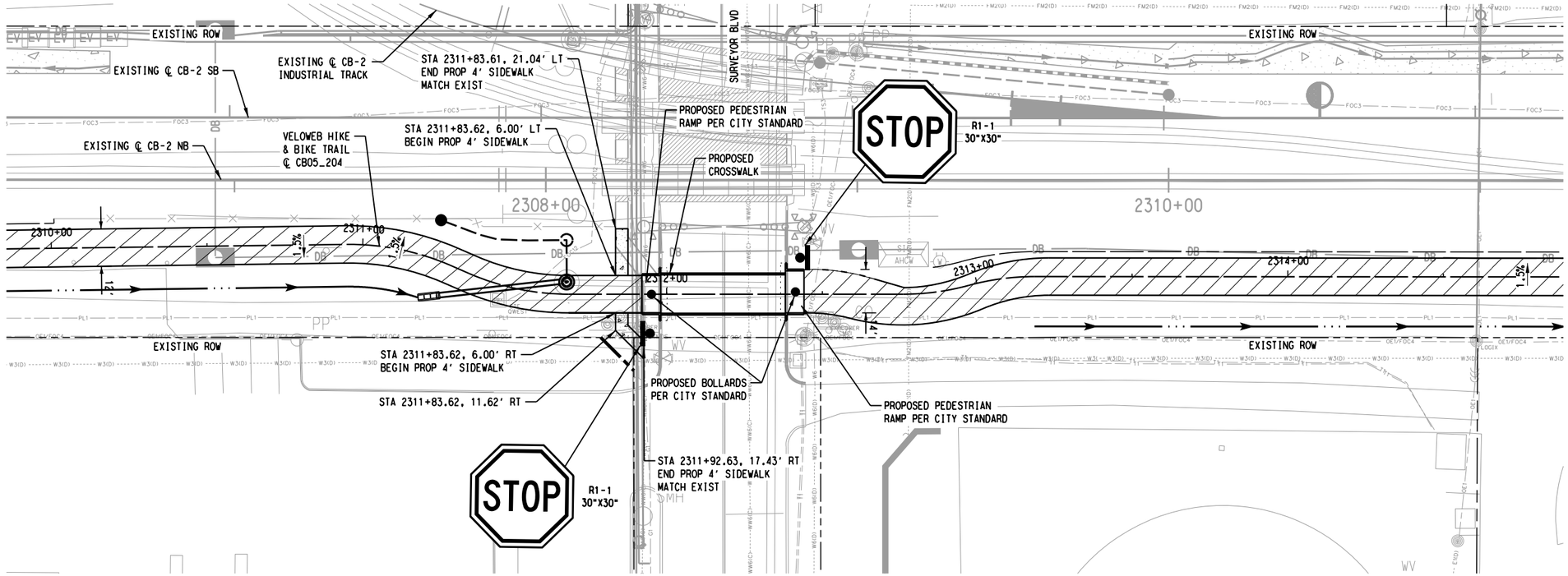
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VELOWEB HIKE & BIKE TRAIL

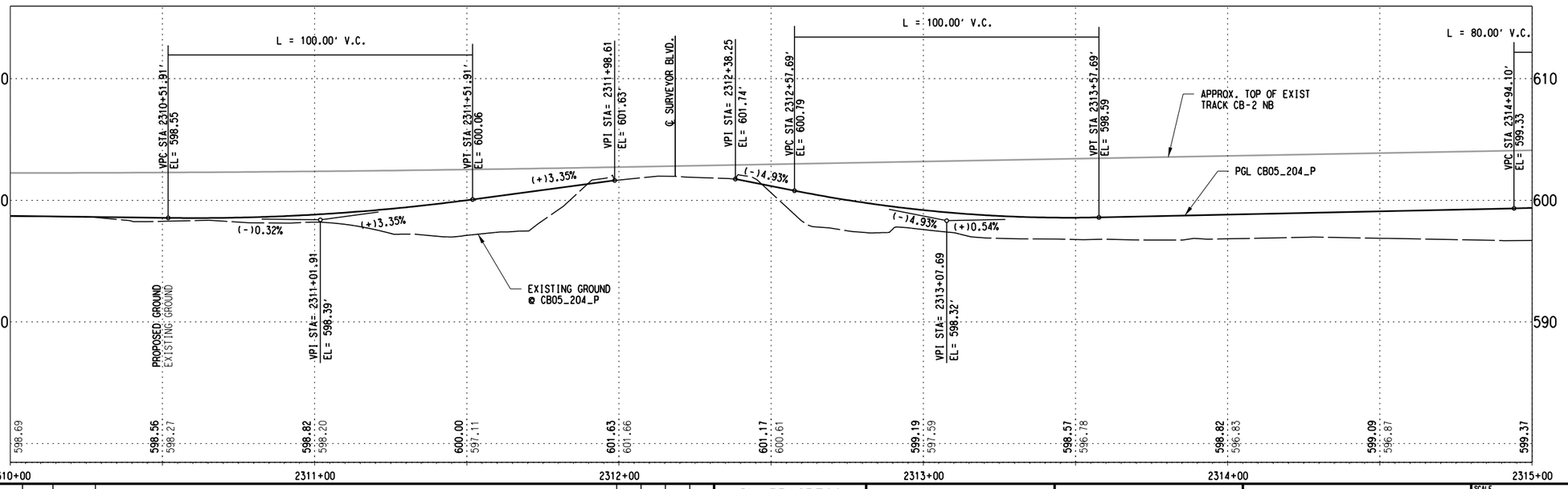
TOWN OF ADDISON
PLAN & PROFILE
MARSH LANE INTERSECTION

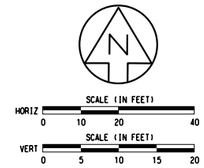
CONTRACT	DWG No.	REV
C-2033270-01	CC4-2302	D

CB05-CC4-2302.0

DWG No. CC4-2402







LEGEND:

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

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

NOT AN APPROVED DRAWING
FINAL 100% DESIGN

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CB05-CC4-2402.0
ssaleh
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REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

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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

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SCALE	1" = 40'
DRAWN	C. BAGBY
DESIGNED	C. BAGBY
CHECKED	D. LUU
IN CHARGE	D. LUU
DATE	13 MAR 23

CAES

CONTRACT SHEET No. 49 OF 242

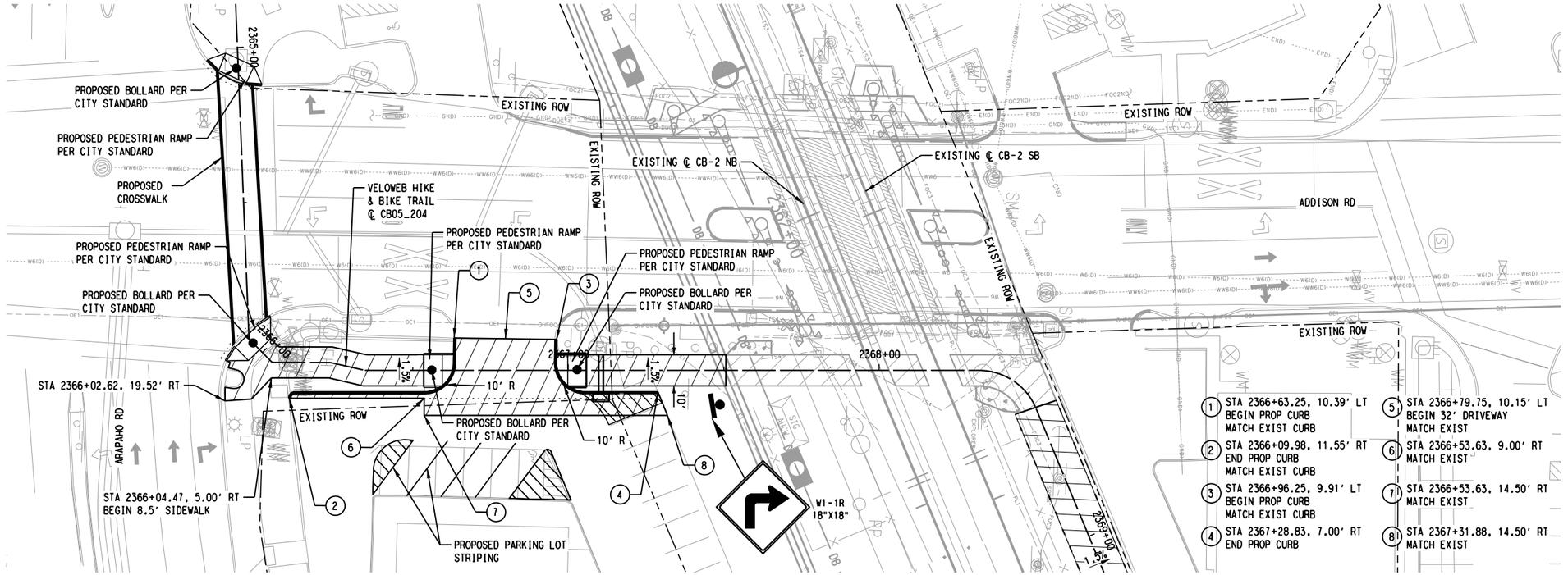
COTTON BELT REGIONAL RAIL VELOWEB HIKE & BIKE TRAIL

TOWN OF ADDISON
PLAN & PROFILE
SURVEYOR BOULEVARD INTERSECTION

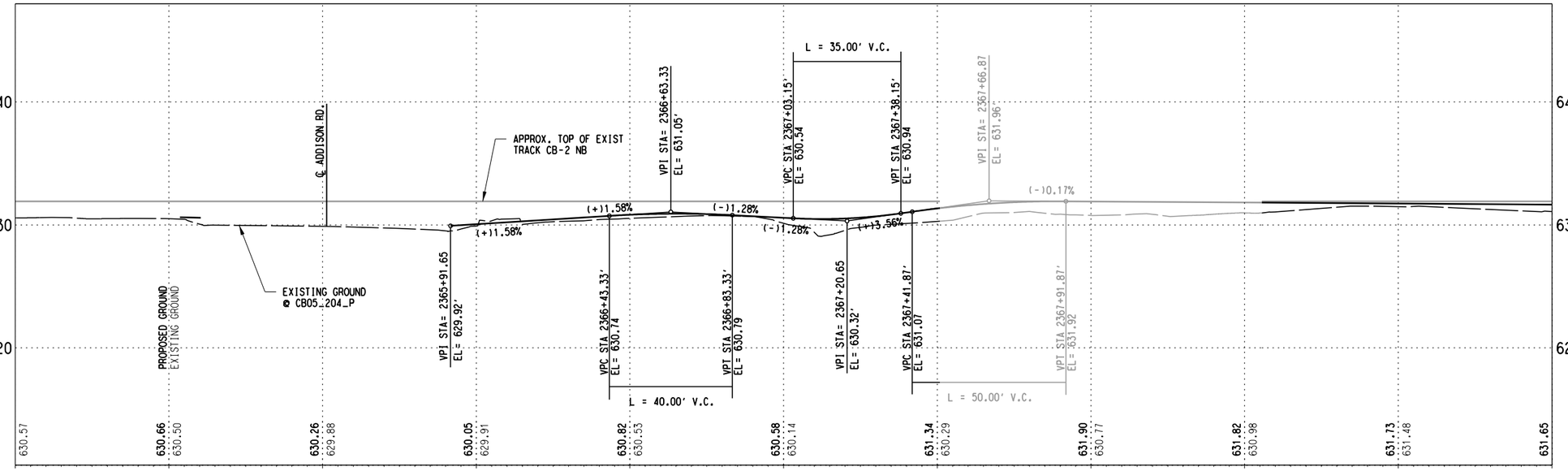
CONTRACT	DWG No.	REV
C-2033270-01	CC4-2402	D

CB05-CC4-2402.0

DWG No. CC4-2404



1. STA 2366+63.25, 10.39' LT BEGIN PROP CURB MATCH EXIST CURB
2. STA 2366+09.98, 11.55' RT END PROP CURB MATCH EXIST CURB
3. STA 2366+96.25, 9.91' LT BEGIN PROP CURB MATCH EXIST CURB
4. STA 2367+28.83, 7.00' RT END PROP CURB
5. STA 2366+79.75, 10.15' LT BEGIN 32' DRIVEWAY MATCH EXIST
6. STA 2366+53.63, 9.00' RT MATCH EXIST
7. STA 2366+53.63, 14.50' RT MATCH EXIST
8. STA 2367+31.88, 14.50' RT MATCH EXIST



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

LEGEND:

TRAIL PAVEMENT

1.50% TRAIL CROSS-SLOPE

SIDEWALK PAVEMENT

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

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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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SCALE	1" = 20'
DRAWN	C. BAGBY
DESIGNED	C. BAGBY
CHECKED	D. LUU
IN CHARGE	D. LUU
DATE	13 MAR 23

CAES

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FINAL 100% DESIGN

CONTRACT SHEET No. 50 OF 242

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

TOWN OF ADDISON
PLAN & PROFILE
ADDISON ROAD INTERSECTION

CONTRACT	DWG No.	REV
C-2033270-01	CC4-2404	D

CB05-CC4-2403.0

DWG No. CC4-2404

1. STA 2379+90.35, 6.00' RT
BEGIN 5.0' SIDEWALK

2. STA 2380+00.38, 17.45' RT
END 5.0' SIDEWALK
MATCH EXIST

3. STA 2380+00.38, 6.00' LT
BEGIN 5.0' SIDEWALK

4. STA 2380+00.38, 11.00' LT

5. STA 2380+16.86, 20.51' LT

6. STA 2380+18.47, 24.26' LT
END 5.0' SIDEWALK
MATCH EXIST

11. STA 2380+34.81, 8.50' RT
BEGIN PROP CURB
MATCH EXIST CURB

13. STA 2380+42.17, 8.50' LT
BEGIN PROP CURB
MATCH EXIST CURB

15. STA 2379+88.72, 10.46' RT
END 5.0' SIDEWALK
MATCH EXIST

16. STA 2380+00.38, 6.00' RT
BEGIN 5.0' SIDEWALK

7. STA 2380+86.32, 11.59' RT
END 8.0' SIDEWALK
MATCH EXIST

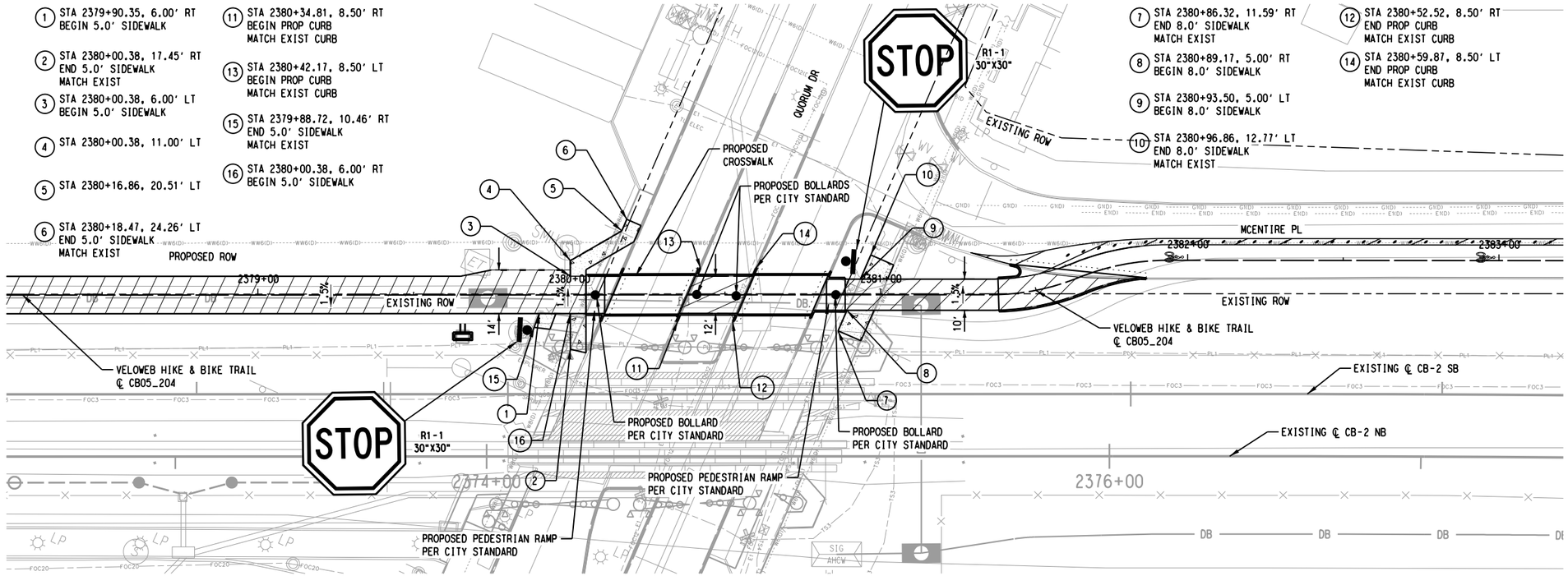
8. STA 2380+89.17, 5.00' RT
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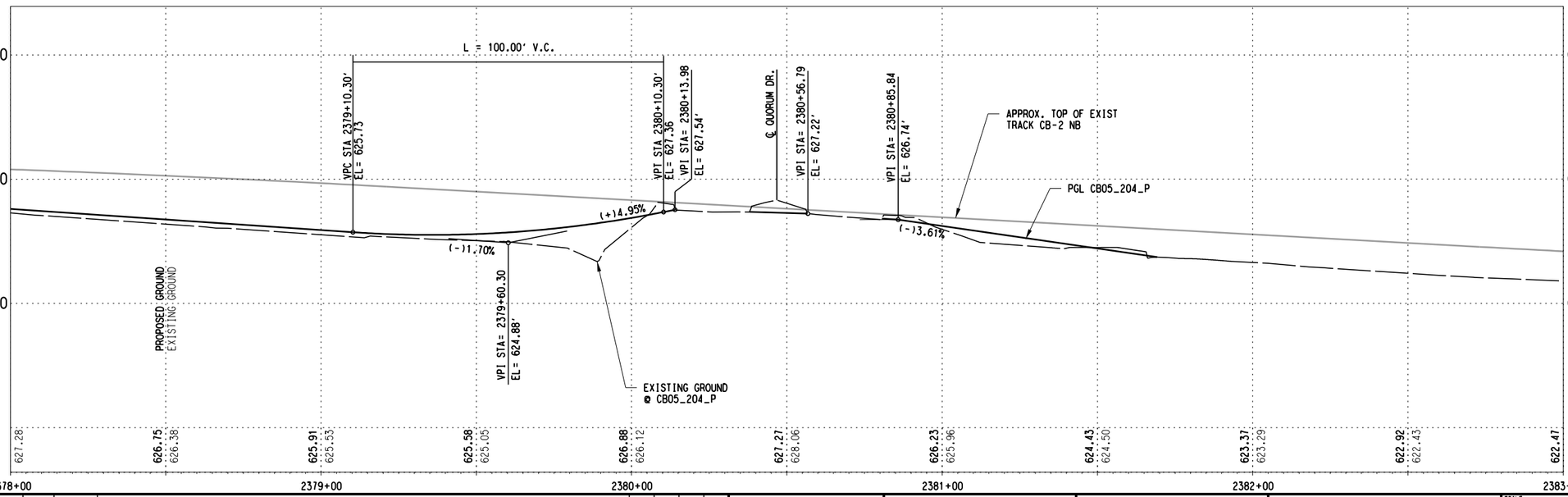
9. STA 2380+93.50, 5.00' LT
BEGIN 8.0' SIDEWALK

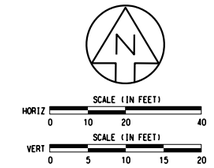
10. STA 2380+96.86, 12.77' LT
END 8.0' SIDEWALK
MATCH EXIST

12. STA 2380+52.52, 8.50' RT
END PROP CURB
MATCH EXIST CURB

14. STA 2380+59.87, 8.50' LT
END PROP CURB
MATCH EXIST CURB







LEGEND:

TRAIL PAVEMENT

1.50% TRAIL CROSS-SLOPE

SIDEWALK PAVEMENT

NOTES:

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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.
7. SIGN PLACEMENT SHALL BE AS PER CHAPTER 9 OF THE TMUTCD

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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	C. BAGBY
DESIGNED	C. BAGBY
CHECKED	D. LUU
IN CHARGE	D. LUU
DATE	13 MAR 23

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CONTRACT SHEET No. 51 OF 242

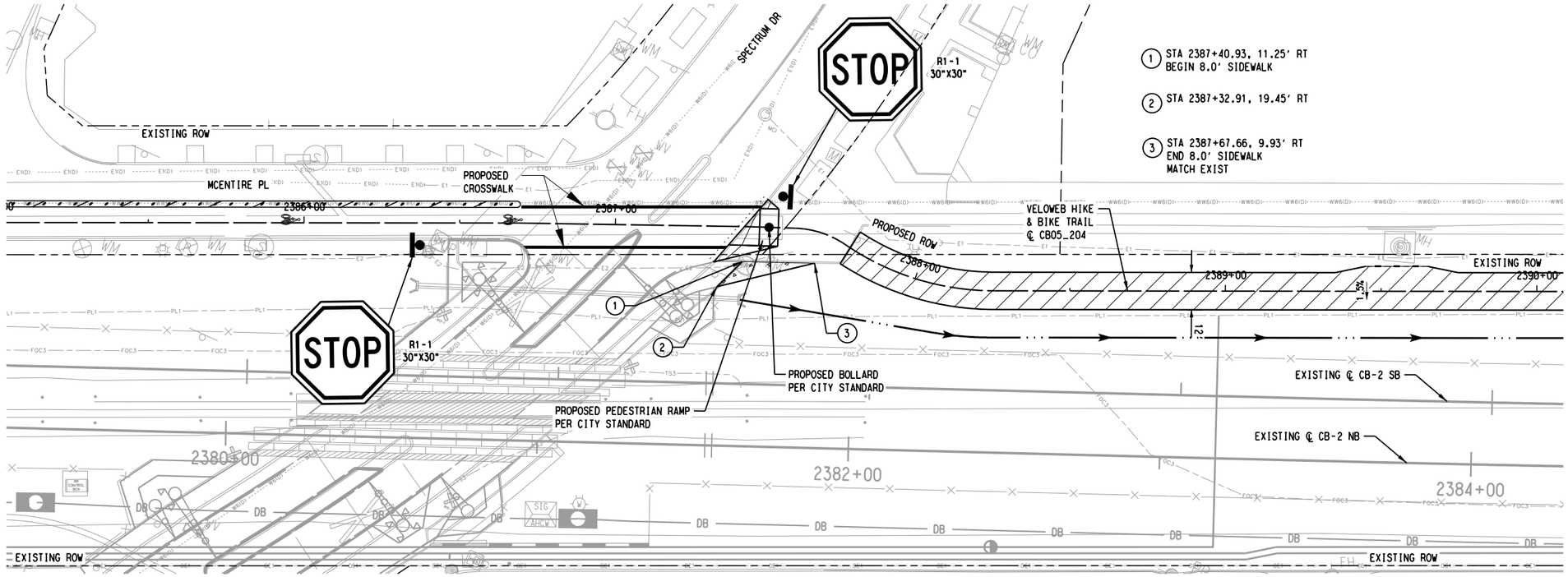
COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

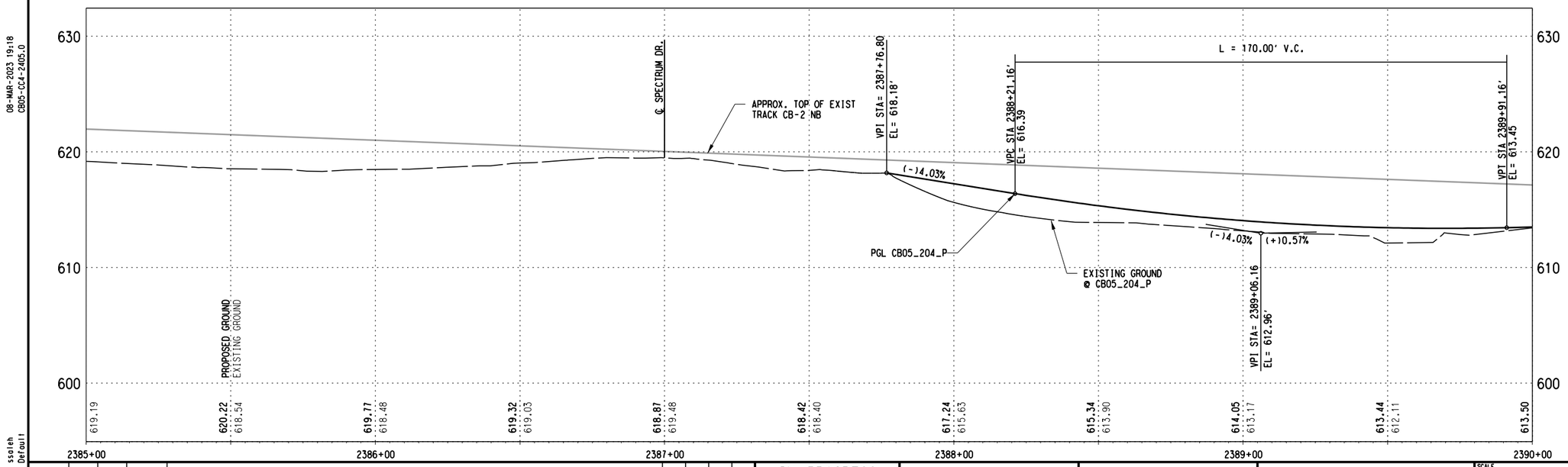
TOWN OF ADDISON
PLAN & PROFILE
QUORUM DRIVE INTERSECTION

CONTRACT	DWG No.	REV
C-2033270-01	CC4-2404	D

CB05-CC4-2404.0

DWG No. CC4-2405





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

LEGEND:

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

NOTES:

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ARCHER WESTERN HERZOG

DART PROJECT

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DESIGNED	C. BAGBY
CHECKED	D. LUU
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DATE	13 MAR 23

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CONTRACT SHEET No. 52 OF 242

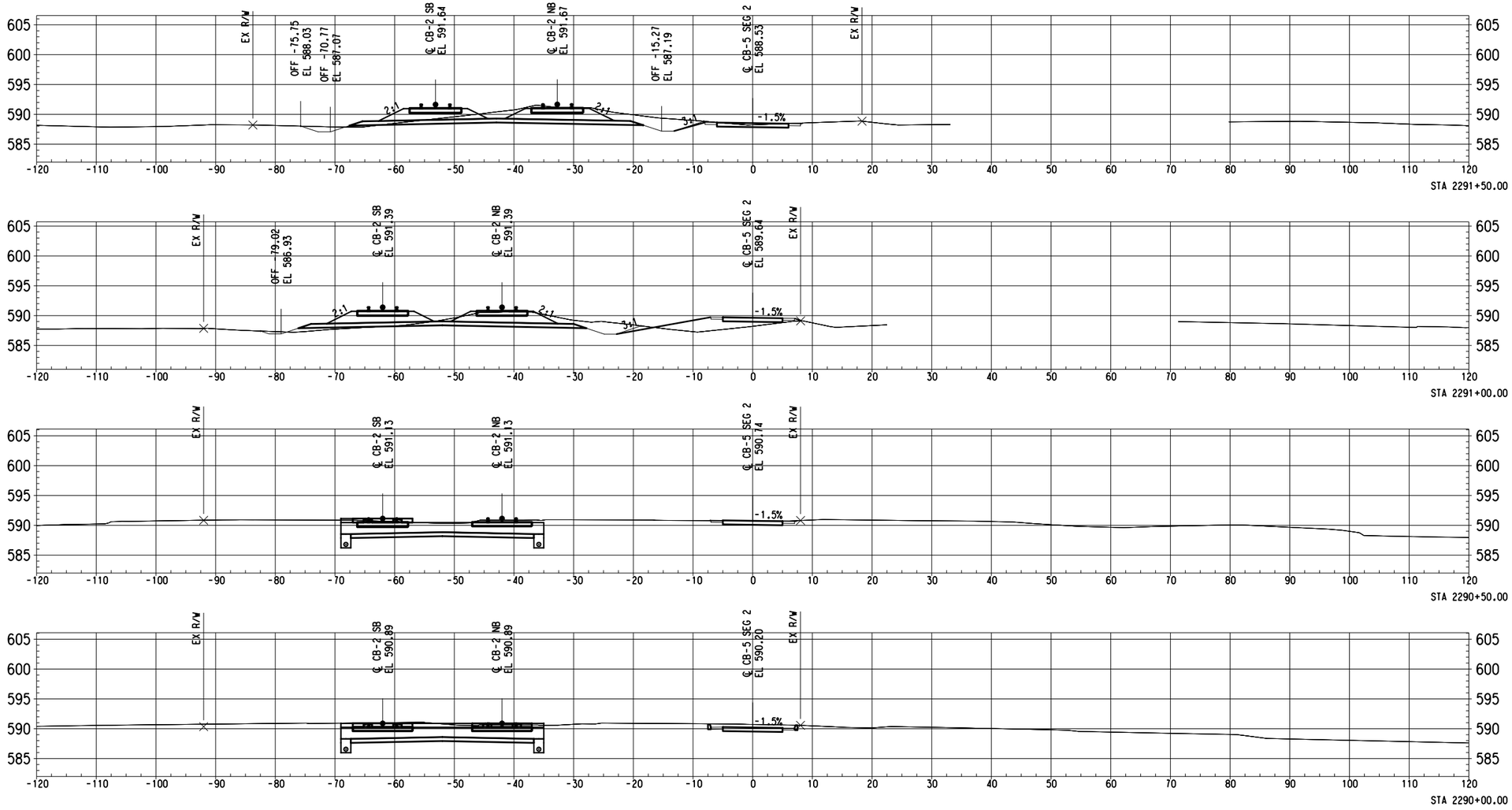
COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

TOWN OF ADDISON
PLAN & PROFILE
SPECTRUM DRIVE INTERSECTION

CONTRACT	DWG No.	REV
C-2033270-01	CC4-2405	D

CB05-CC4-2405.0

DWG No. CC1-6950



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 15 20

8-MAR-2023 16:38
CB05-CC1-6950.000

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204 - 2289+62.85

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

TOWN OF ADDISON
CROSS SECTIONS
SHEET 1 OF 43

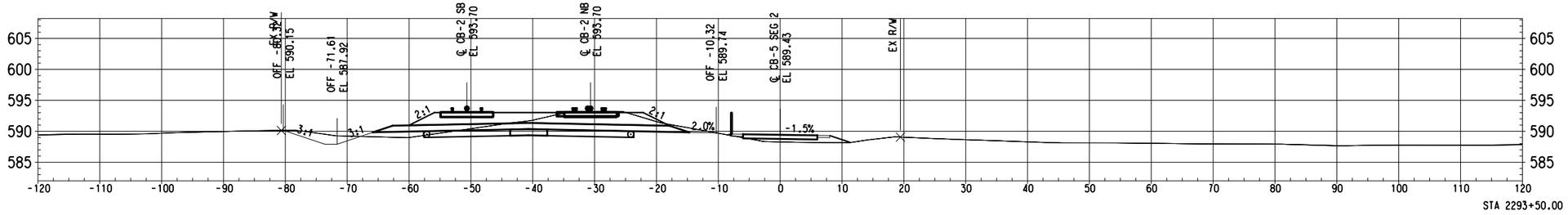
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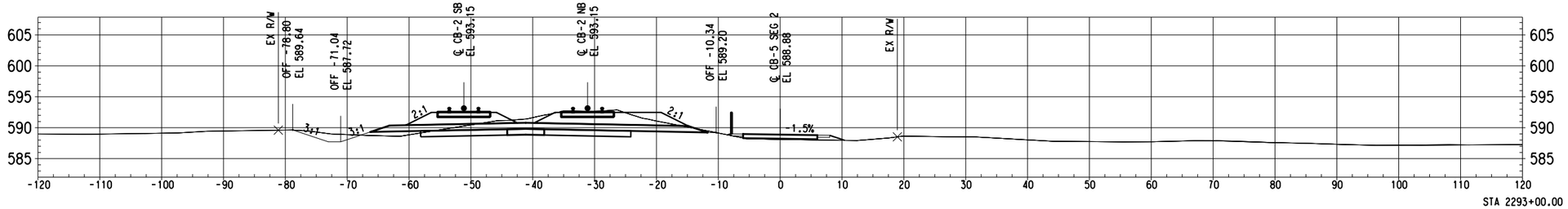
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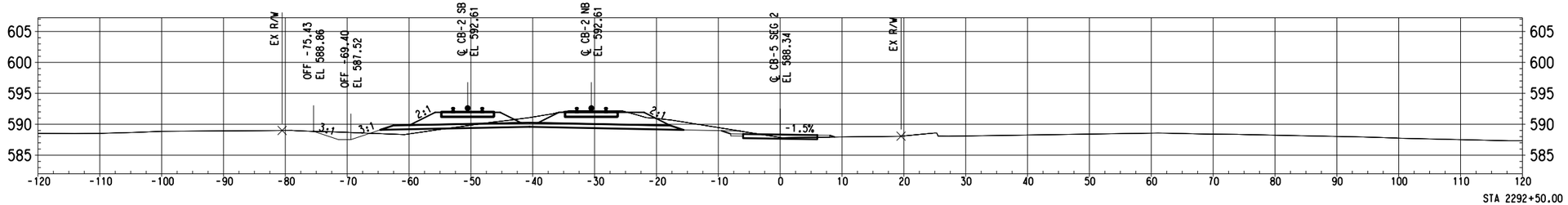
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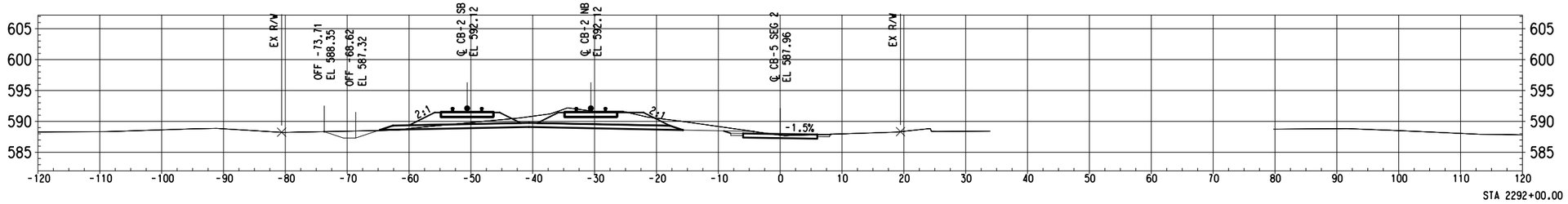
NOTE:
SEE PLAN AND PROFILE SHEETS FOR FENCE
AND RIP RAP LOCATIONS AND LIMITS

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









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SCALE	AS NOTED
DRAWN	S. SALEH
DESIGNED	S. SALEH
CHECKED	D. LUU
IN CHARGE	D. LUU
DATE	13 MAR 23

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COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

TOWN OF ADDISON
CROSS SECTIONS
SHEET 2 OF 43

CONTRACT	DWG No.	REV
C-2033270-01	CC1-6951	D

CB05-CC1-6951.000

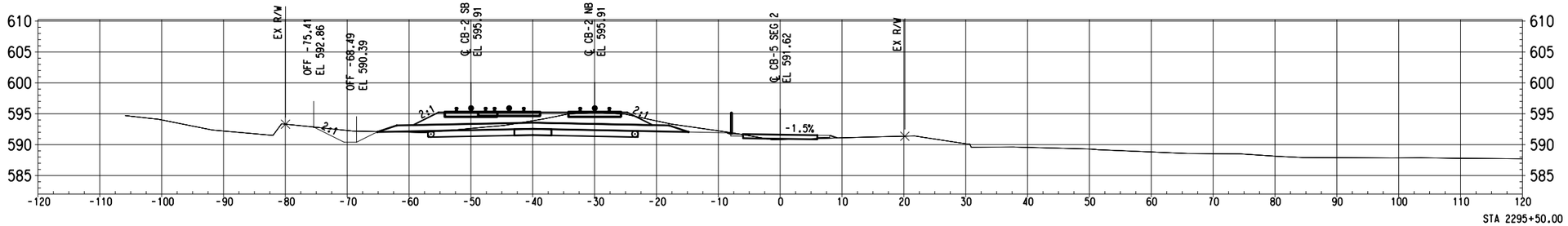
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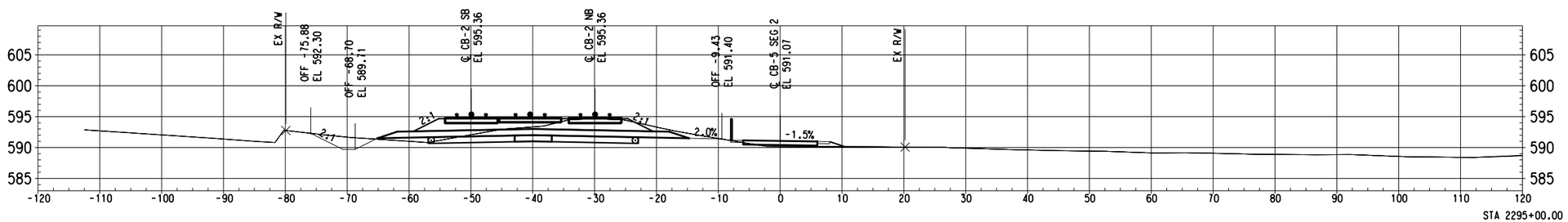
DWG No. CC1-6952

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

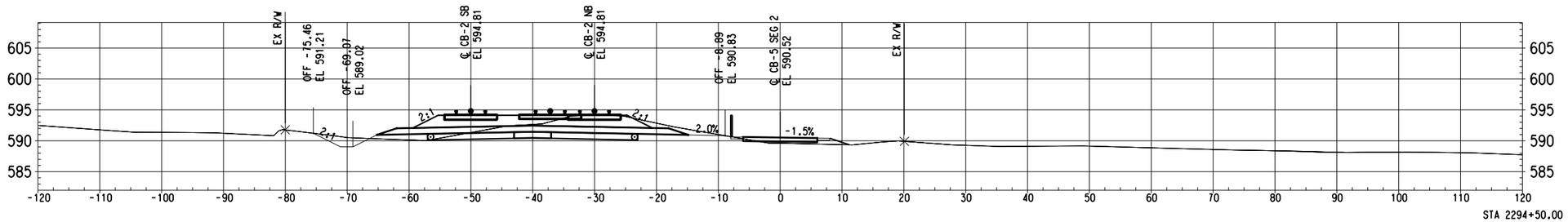
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VERT 0 5 10 15 20



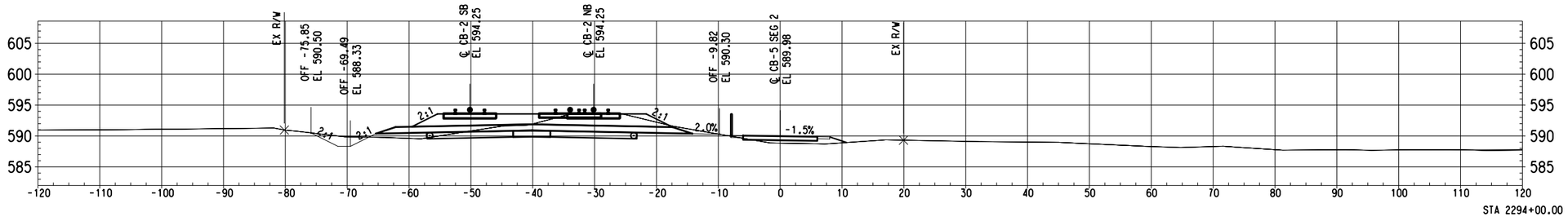
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STA 2295+00.00



STA 2294+50.00



STA 2294+00.00

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DESIGNED	S. SALEH
CHECKED	D. LUU
IN CHARGE	D. LUU
DATE	13 MAR 23

CONTRACT SHEET No. 55 OF 242

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

TOWN OF ADDISON
CROSS SECTIONS
SHEET 3 OF 43

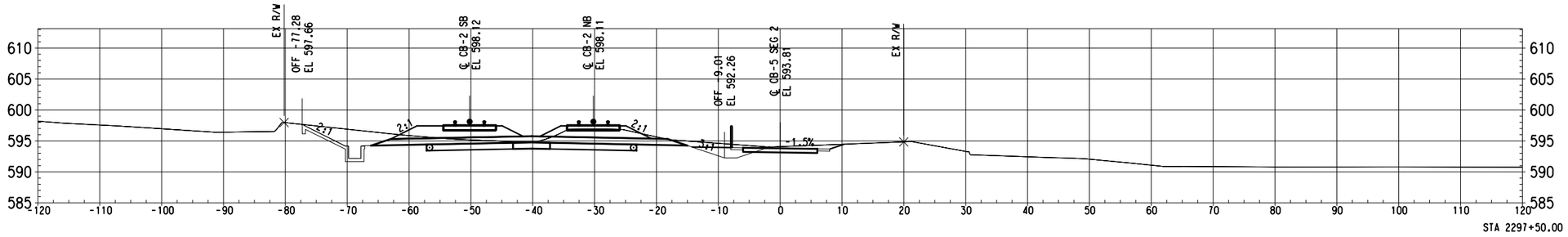
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C-2033270-01	CC1-6952	D

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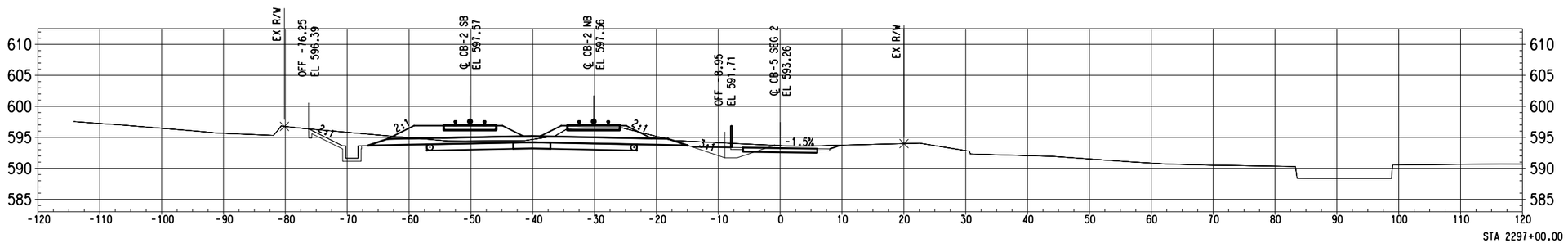
DWG No. CC1-6953

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

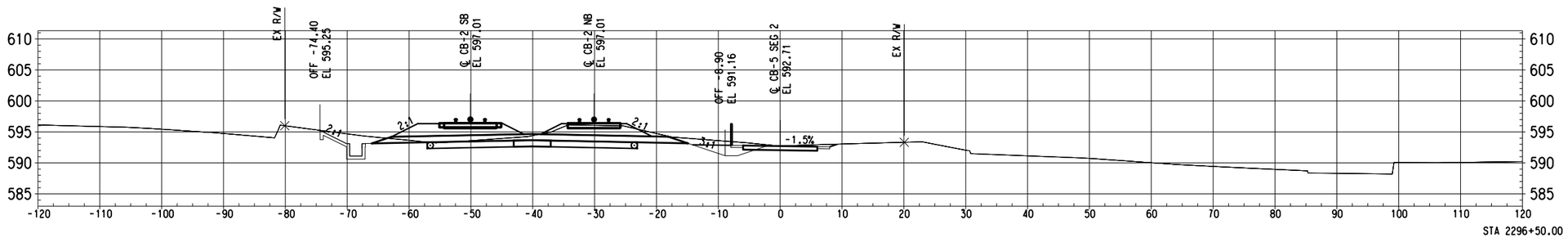
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HORIZ 0 5 10 20
SCALE (IN FEET)
VERT 0 5 10 15 20



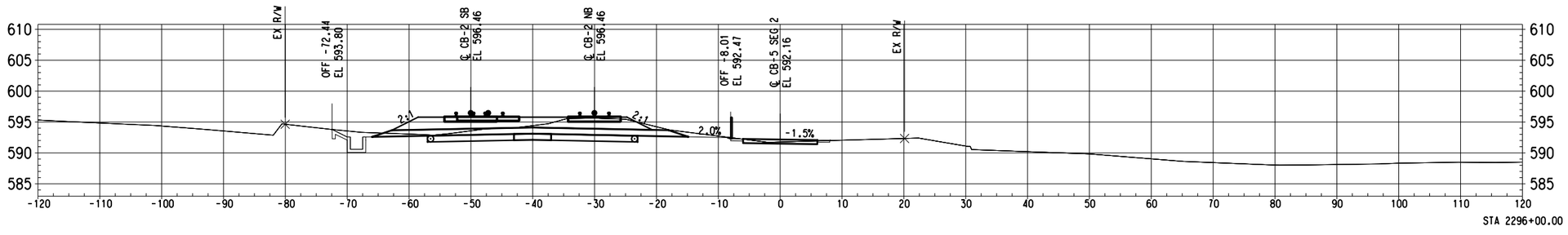
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STA 2297+00.00



STA 2296+50.00



STA 2296+00.00

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DESIGNED	S. SALEH
CHECKED	D. LUU
IN CHARGE	D. LUU
DATE	13 MAR 23

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CONTRACT SHEET No. 56 OF 242

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

TOWN OF ADDISON
CROSS SECTIONS
SHEET 4 OF 43

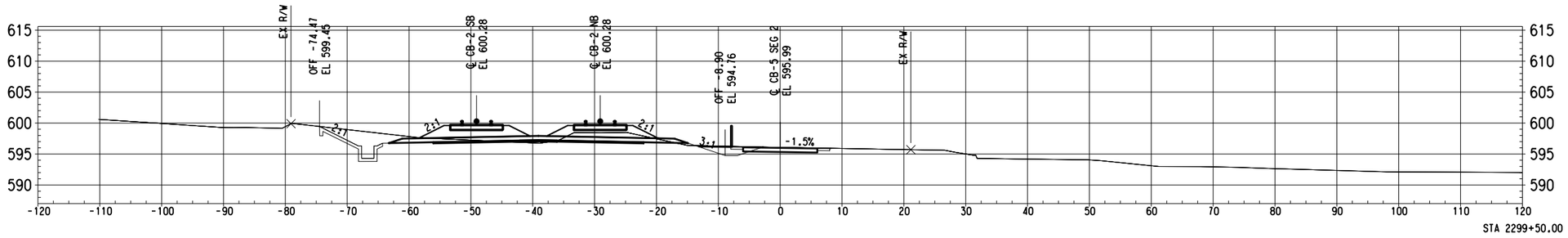
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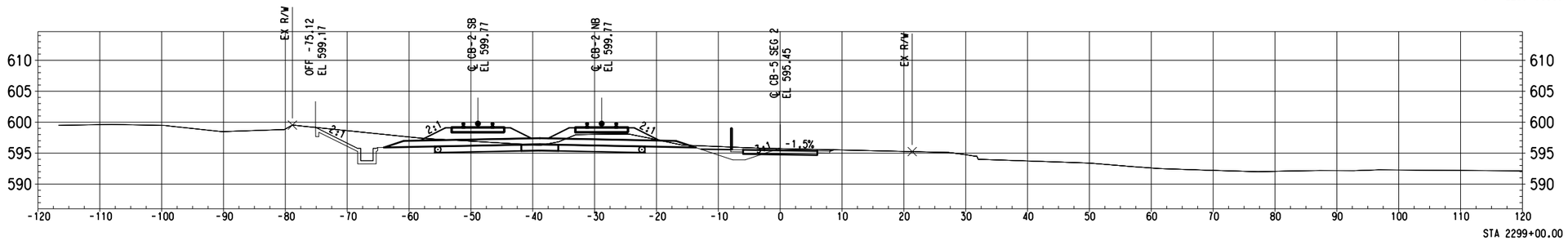
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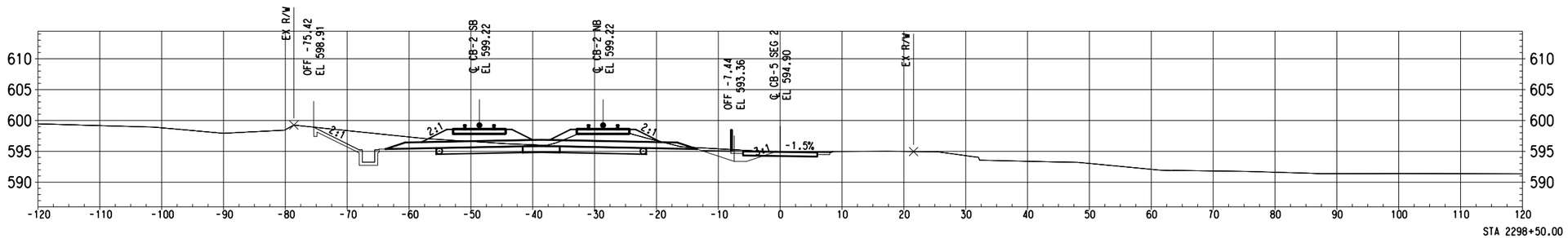
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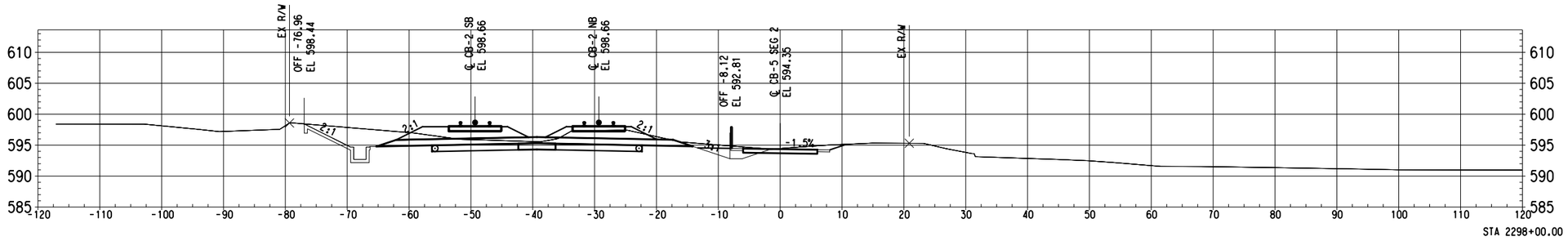
NOTE:
SEE PLAN AND PROFILE SHEETS FOR FENCE AND RIP RAP LOCATIONS AND LIMITS

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









8-MAR-2023 16:39
CB05-CC1-6954.000

JEGSVCPW001
204 - 2298+00.00

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

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CONTRACT SHEET No. 57 OF 242

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

TOWN OF ADDISON
CROSS SECTIONS
SHEET 5 OF 43

SCALE	AS NOTED
DRAWN	S. SALEH
DESIGNED	S. SALEH
CHECKED	D. LUU
IN CHARGE	D. LUU
DATE	13 MAR 23

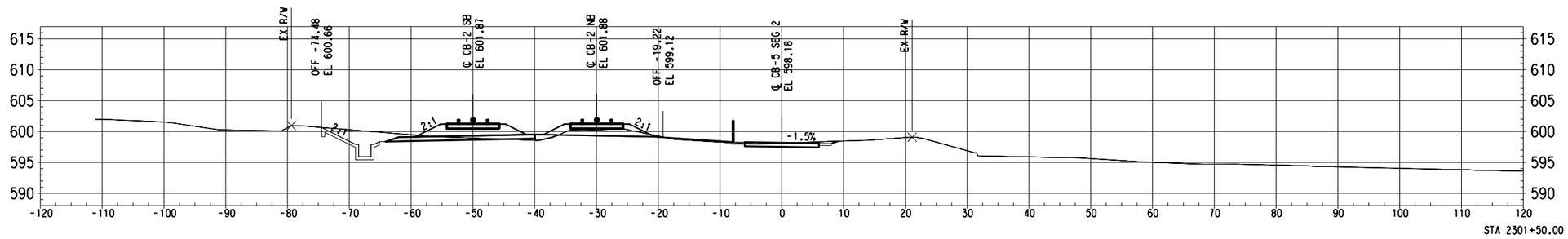
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C-2033270-01	CC1-6954	D

CB05-CC1-6954.000

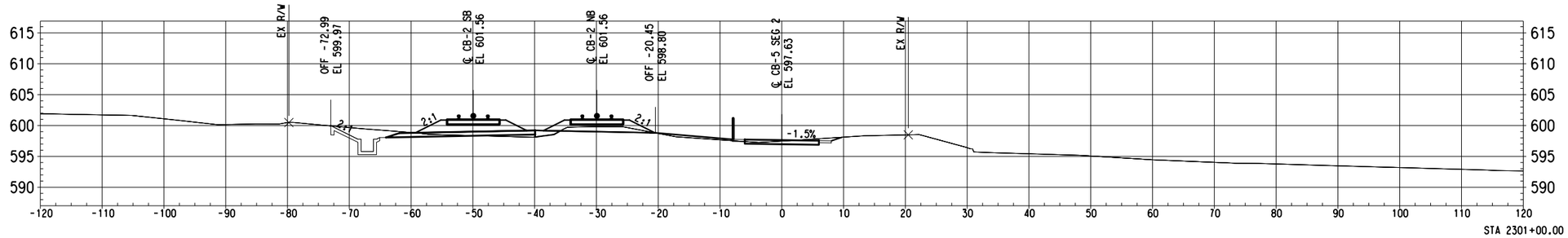
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NOTE:
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AND RIP RAP LOCATIONS AND LIMITS

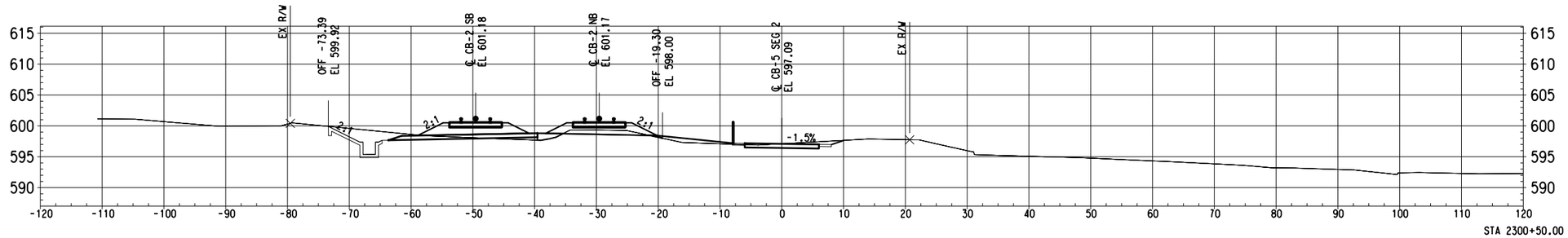
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VERT 0 5 10 15 20



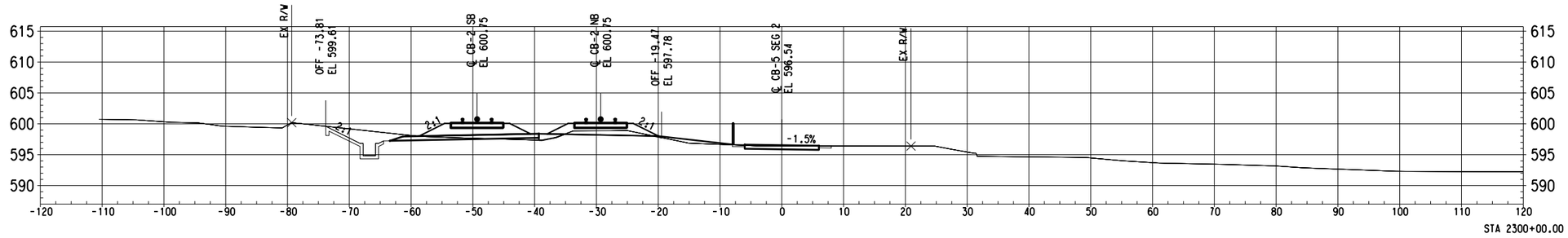
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STA 2301+00.00



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STA 2300+00.00

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CONTRACT SHEET No. 58 OF 242

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

TOWN OF ADDISON
CROSS SECTIONS
SHEET 6 OF 43

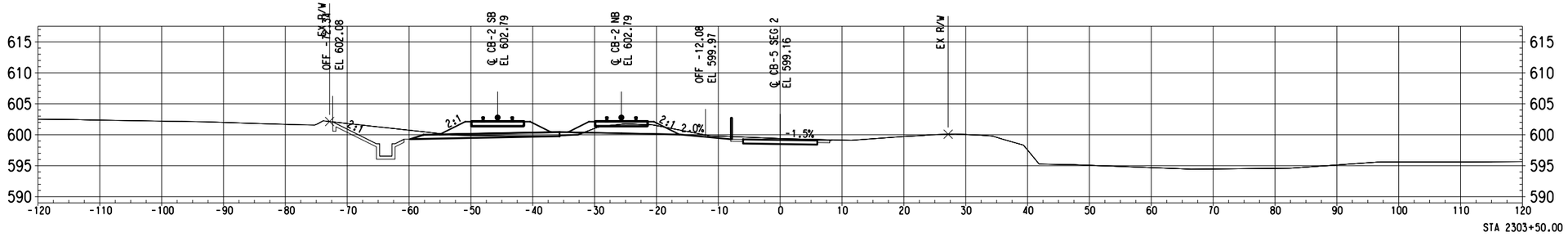
CONTRACT	DWG No.	REV
C-2033270-01	CC1-6955	D

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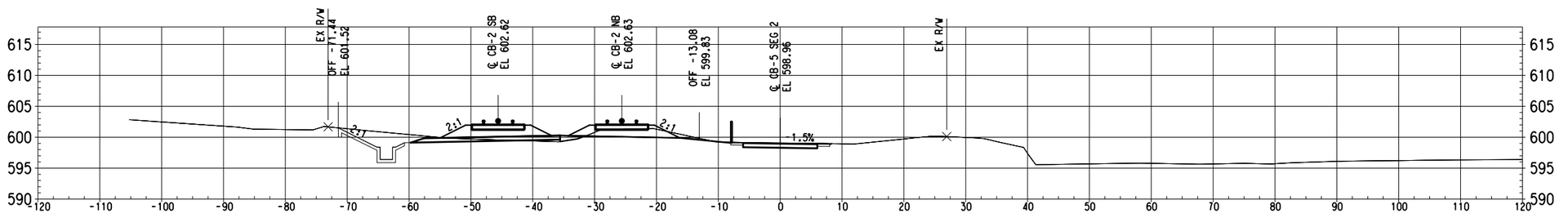
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NOTE:
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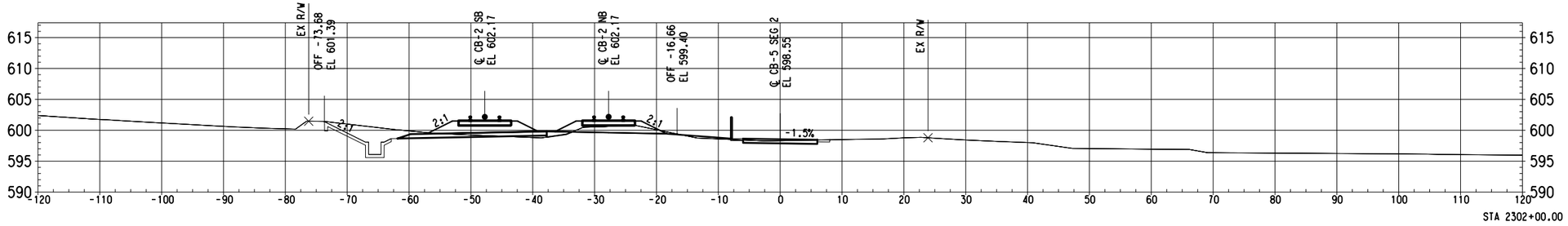
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CONTRACT SHEET No. 59 OF 242

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

TOWN OF ADDISON
CROSS SECTIONS
SHEET 7 OF 43

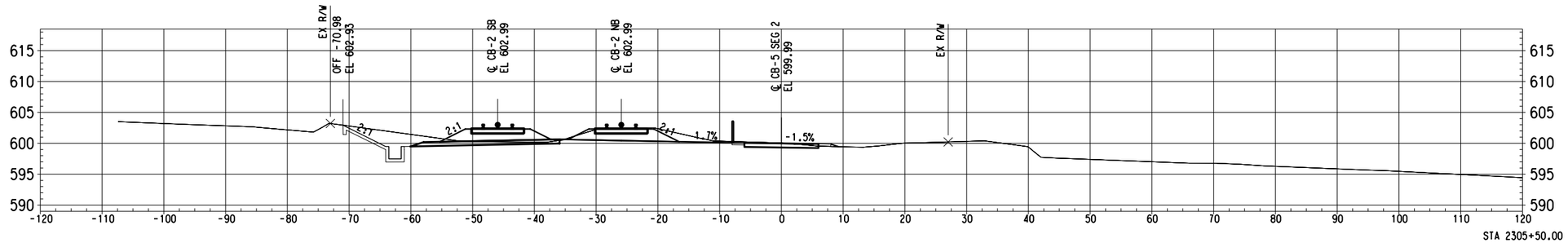
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C-2033270-01	CC1-6956	D

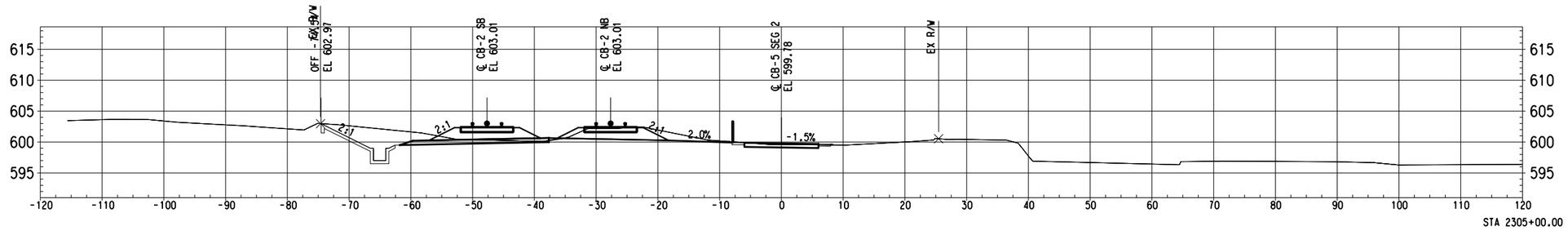
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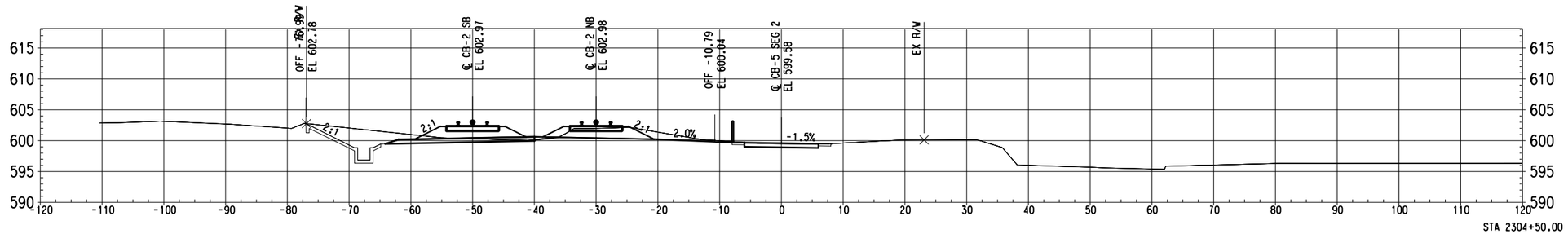
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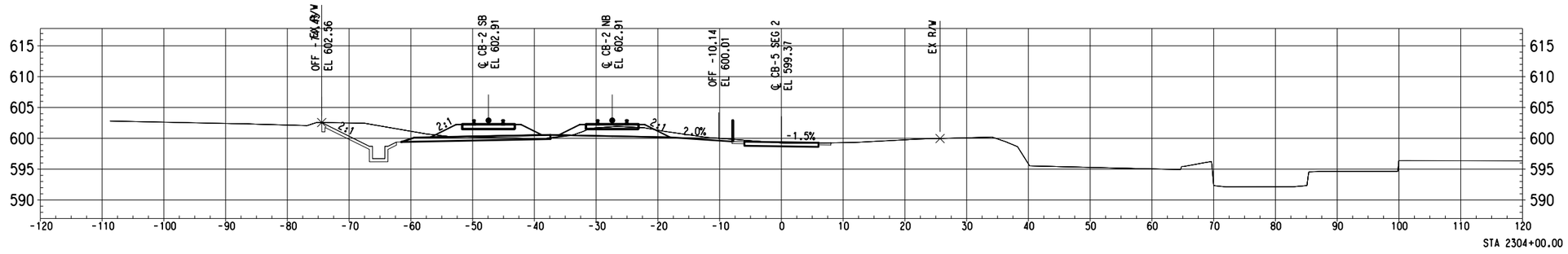
NOTE:
SEE PLAN AND PROFILE SHEETS FOR FENCE AND RIP RAP LOCATIONS AND LIMITS

SCALE (IN FEET)
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COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

TOWN OF ADDISON
CROSS SECTIONS
SHEET 8 OF 43

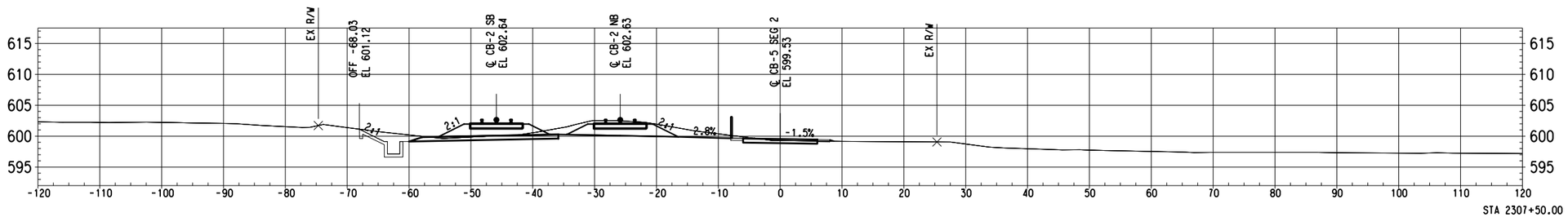
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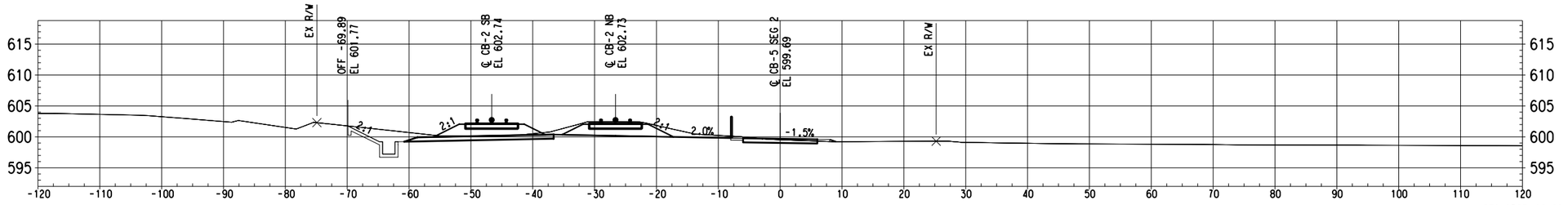
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NOTE:
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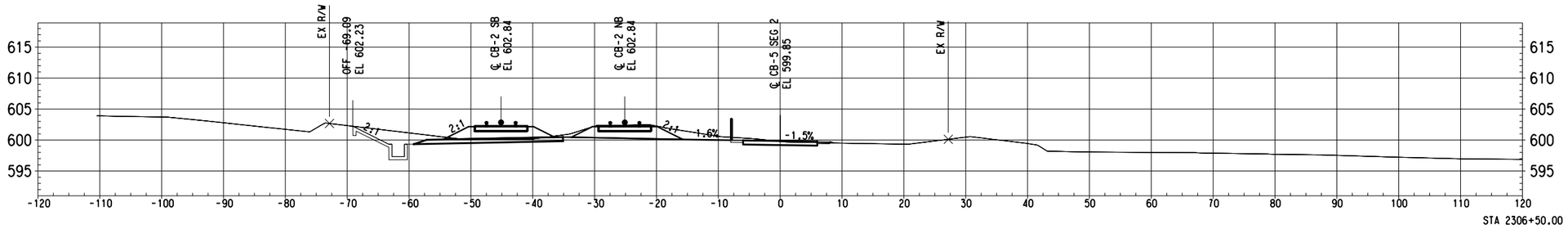
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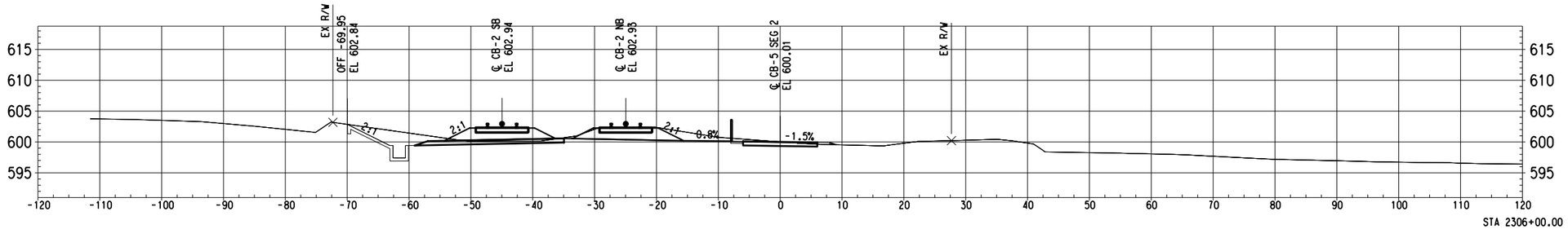
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CHECKED	D. LUU
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DATE	13 MAR 23

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COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

TOWN OF ADDISON
CROSS SECTIONS
SHEET 9 OF 43

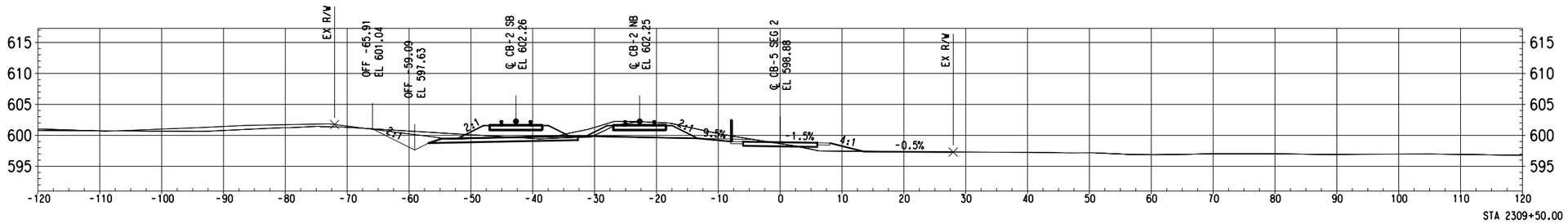
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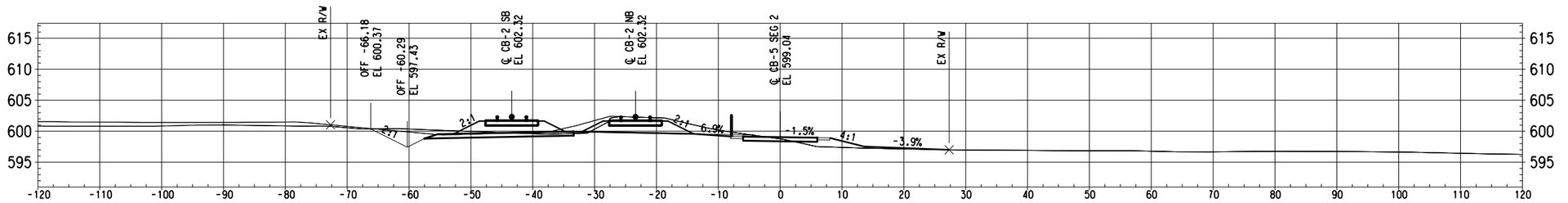
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NOTE:
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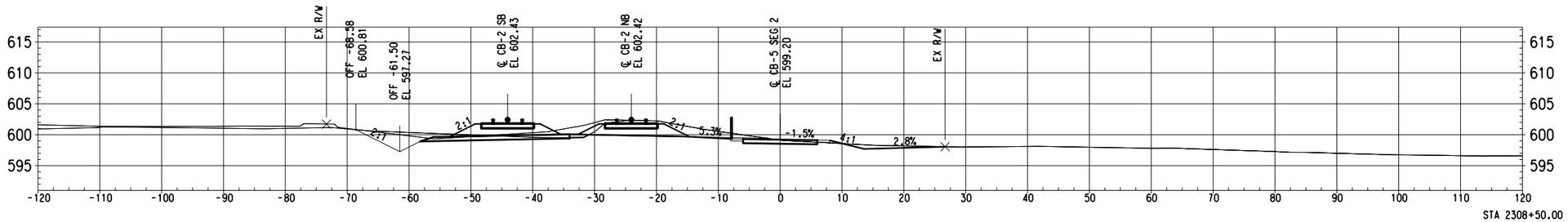
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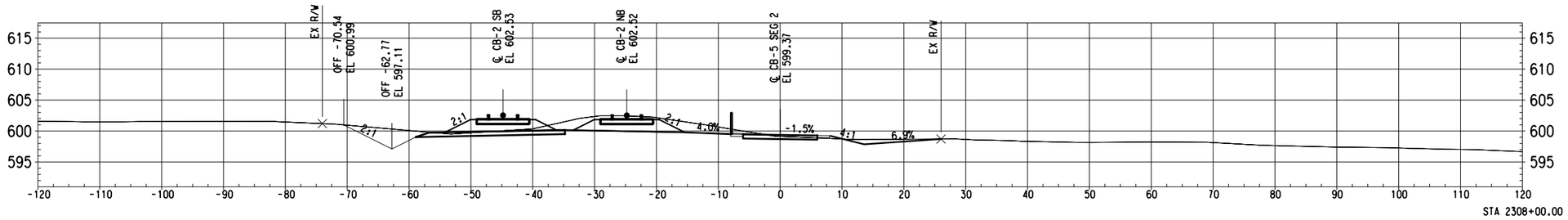
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COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

TOWN OF ADDISON
CROSS SECTIONS
SHEET 10 OF 43

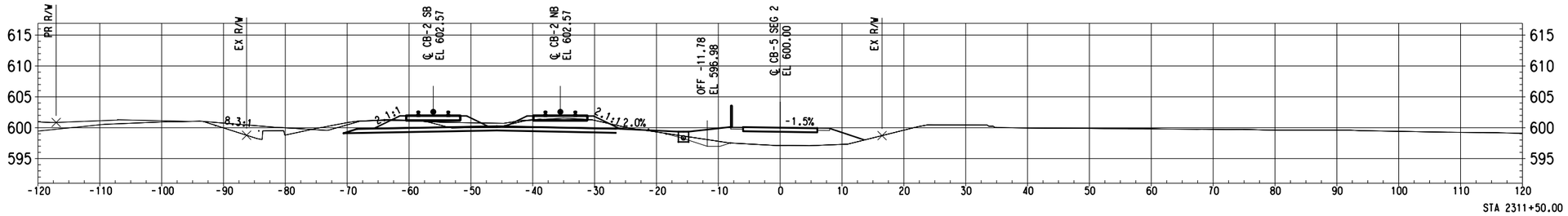
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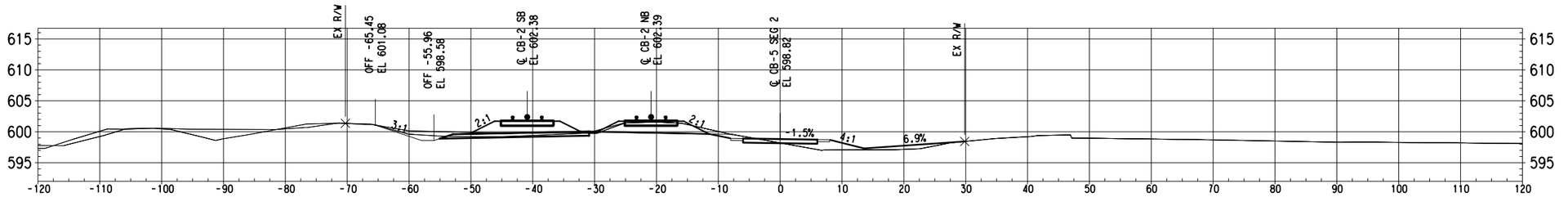
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NOTE:
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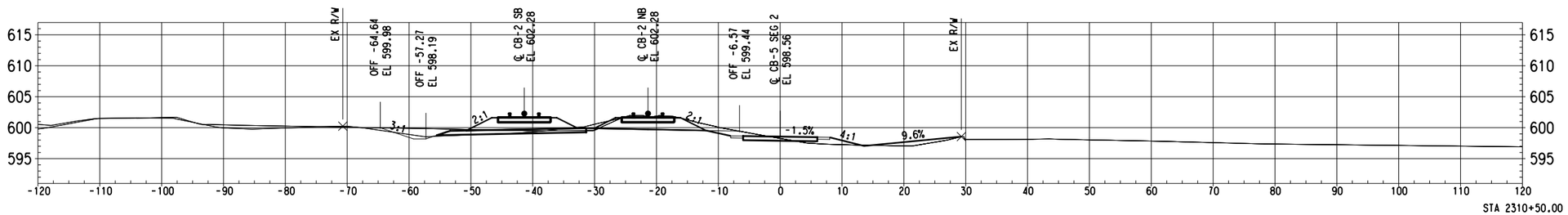
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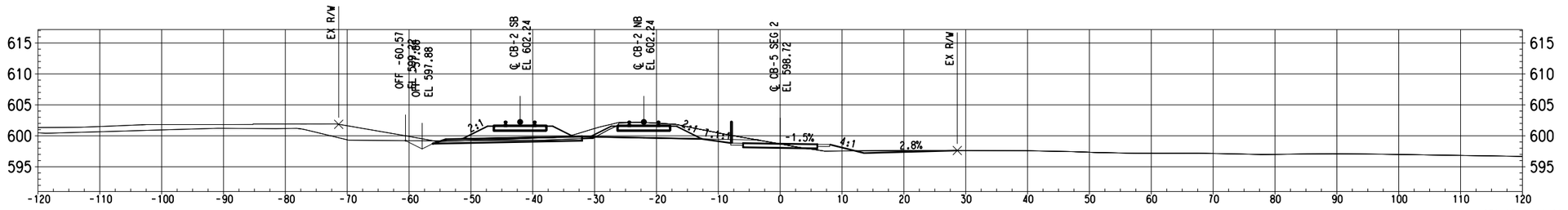
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IN CHARGE	D. LUU
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CONTRACT SHEET No. 63 OF 242

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

TOWN OF ADDISON
CROSS SECTIONS
SHEET 11 OF 43

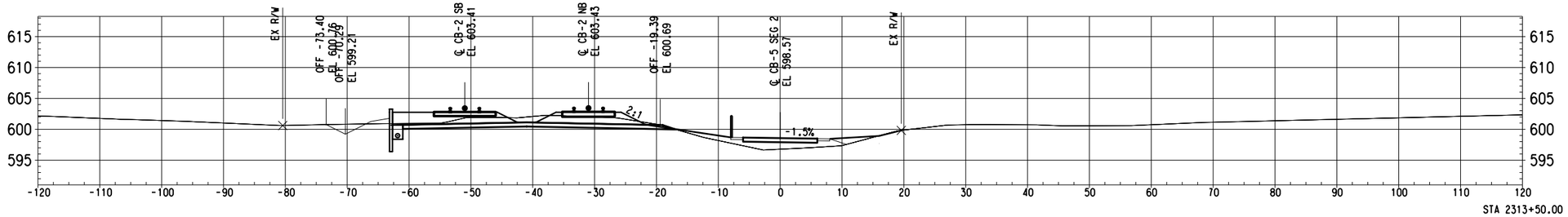
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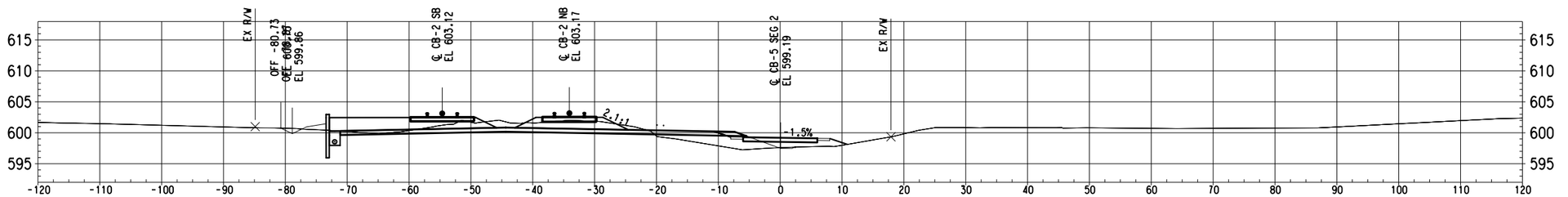
DWG No. CC1-6961

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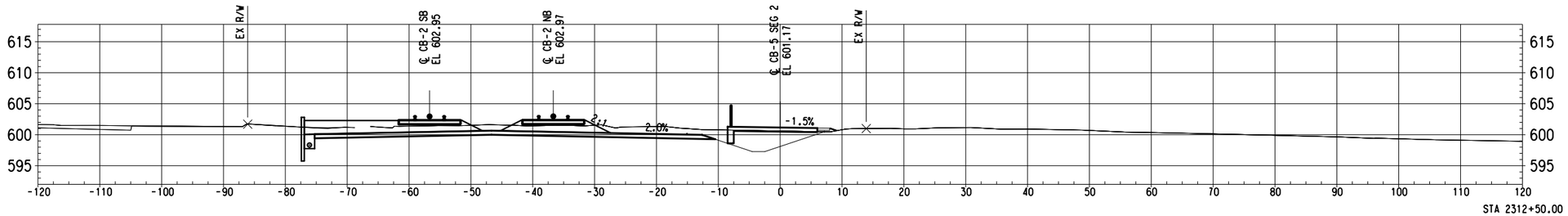
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SCALE (IN FEET)
VERT 0 5 10 15 20



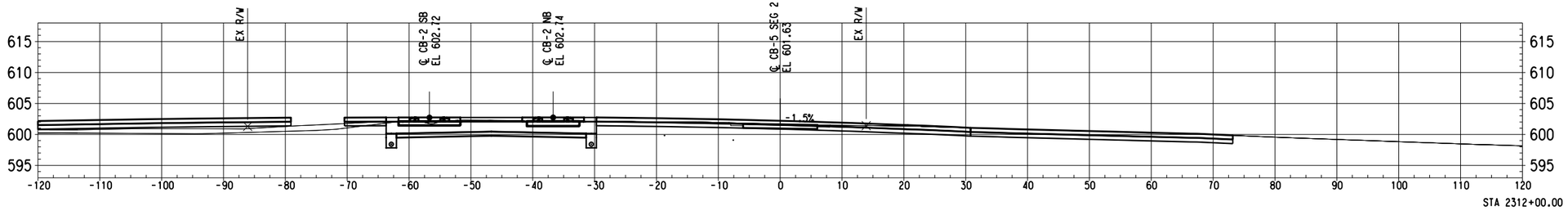
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DESIGNED	S. SALEH
CHECKED	D. LUU
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DATE	13 MAR 23

CAES

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

TOWN OF ADDISON
CROSS SECTIONS
SHEET 12 OF 43

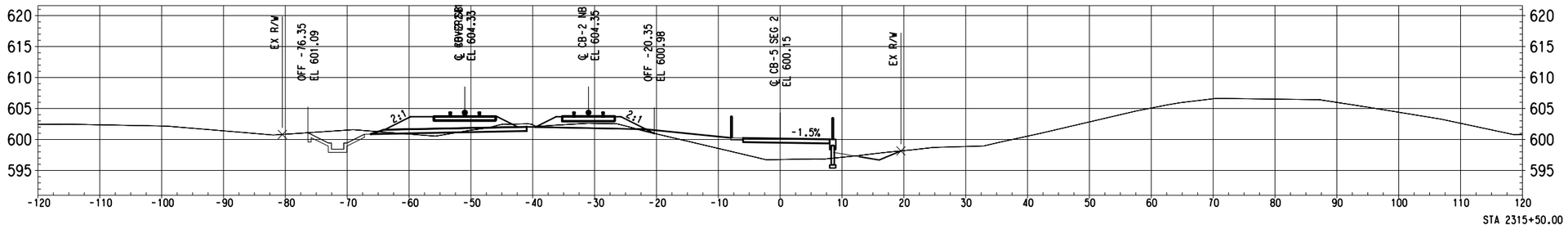
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CB05-CC1-6961.000

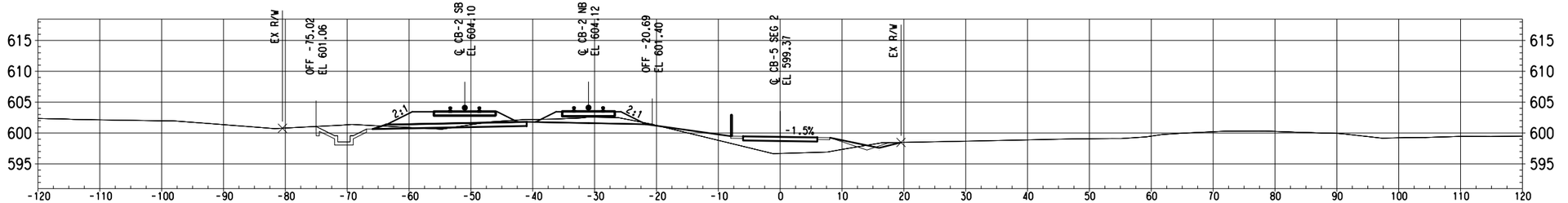
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NOTE:
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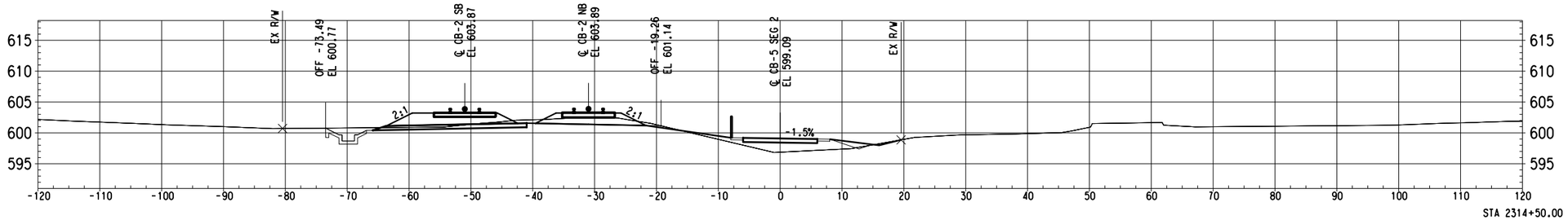
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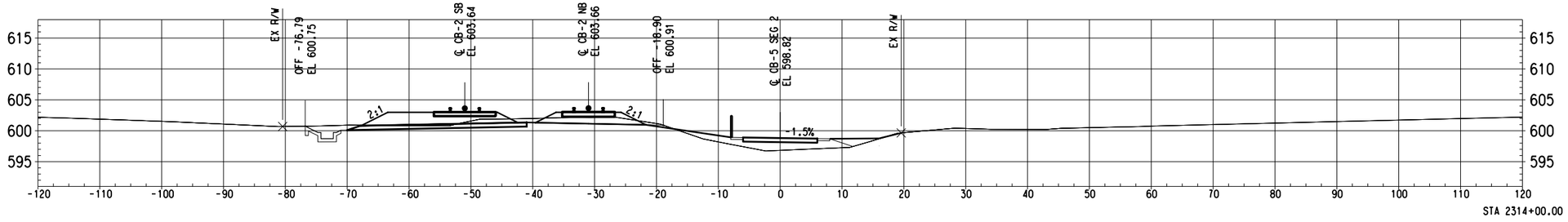
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CONTRACT SHEET No. 65 OF 242

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

TOWN OF ADDISON
CROSS SECTIONS
SHEET 13 OF 43

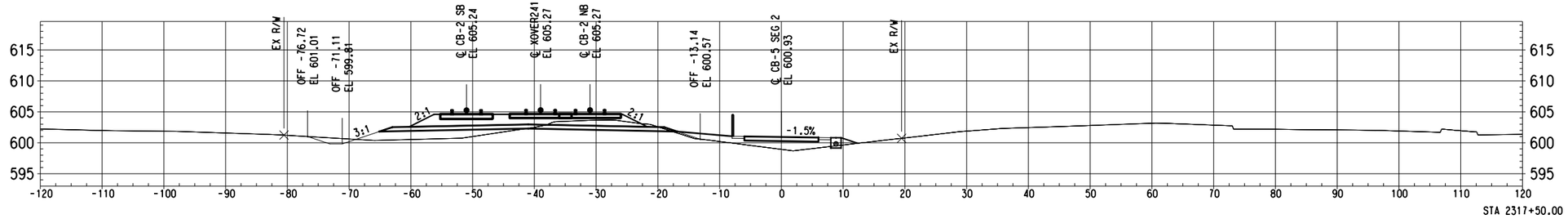
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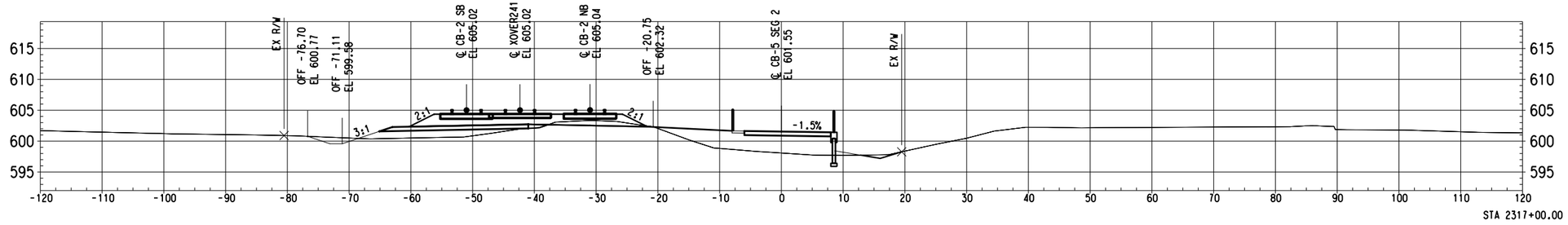
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NOTE:
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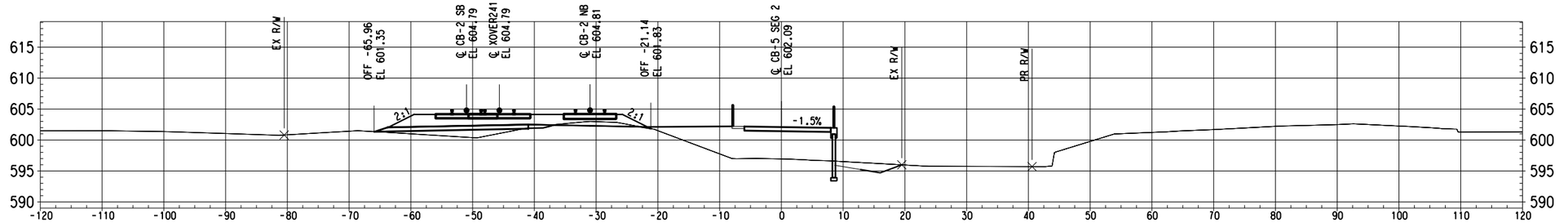
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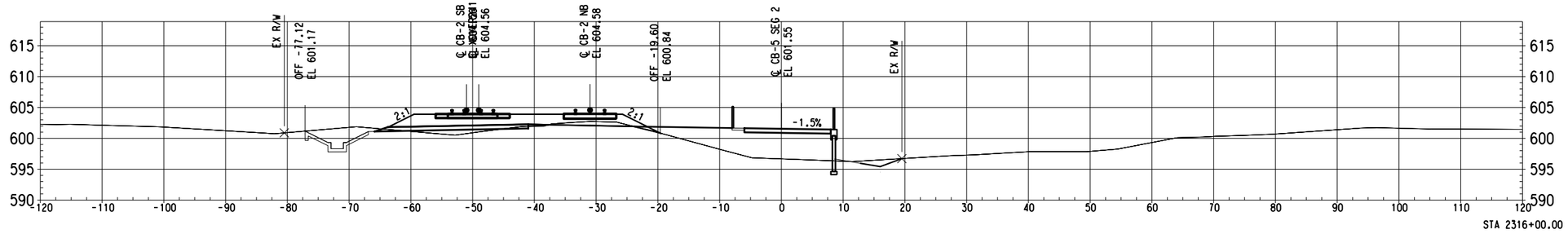
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CONTRACT SHEET No. 66 OF 242

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

TOWN OF ADDISON
CROSS SECTIONS
SHEET 14 OF 43

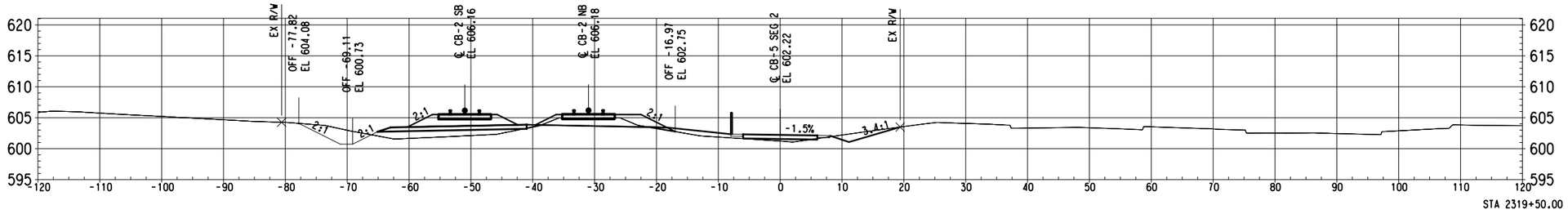
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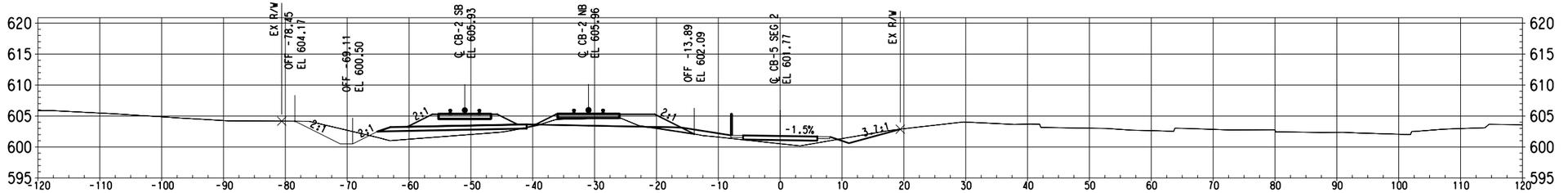
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NOTE:
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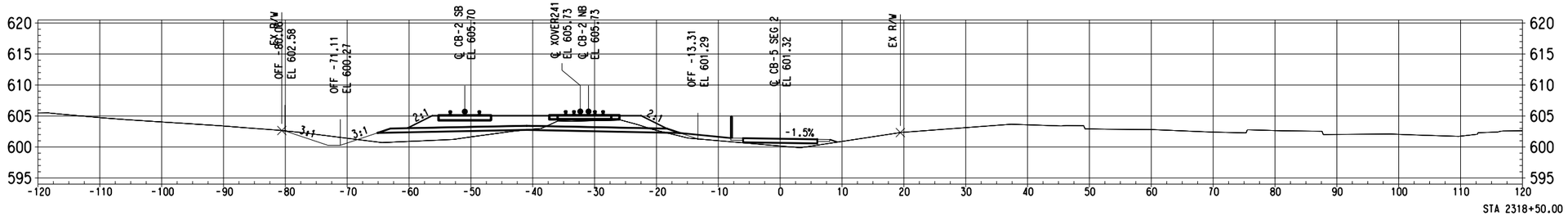
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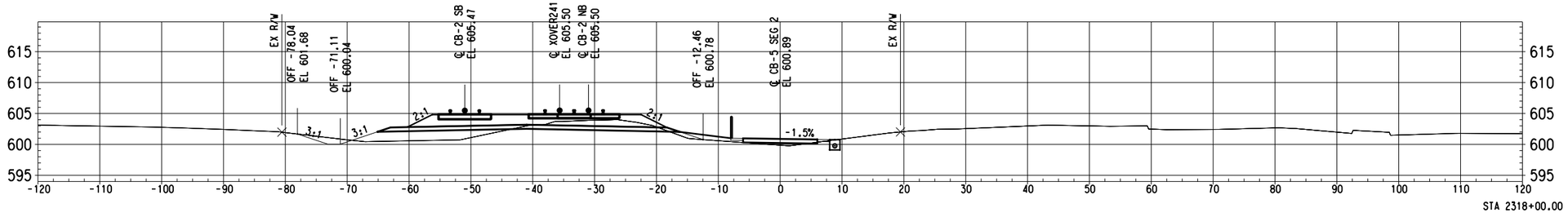
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CONTRACT SHEET No. 67 OF 242

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

TOWN OF ADDISON
CROSS SECTIONS
SHEET 15 OF 43

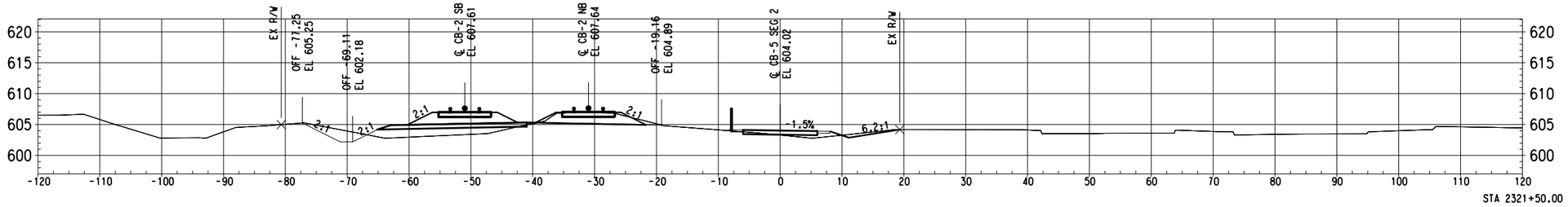
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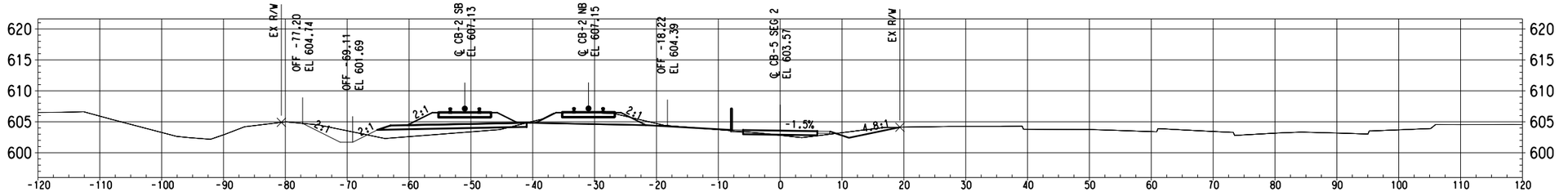
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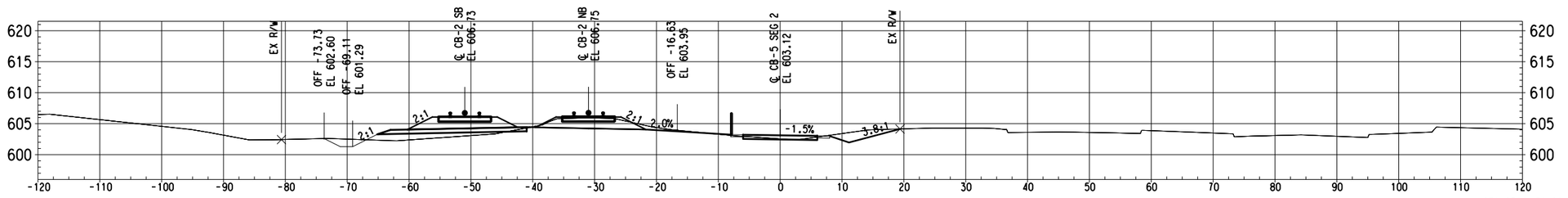
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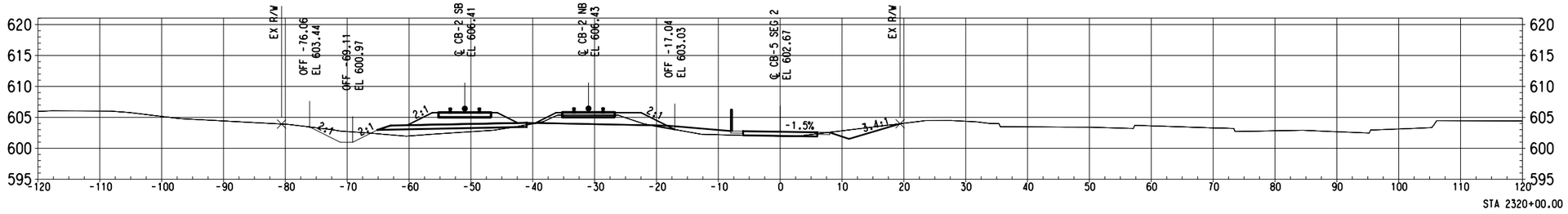
NOTE:
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SCALE (IN FEET)
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CONTRACT SHEET No. 68 OF 242

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

TOWN OF ADDISON
CROSS SECTIONS
SHEET 16 OF 43

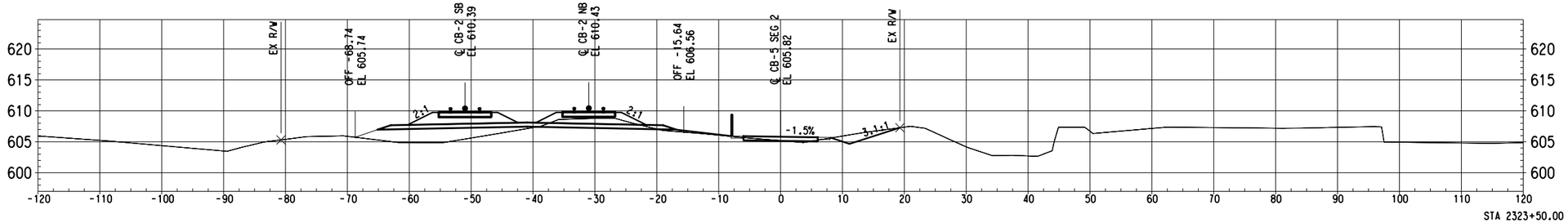
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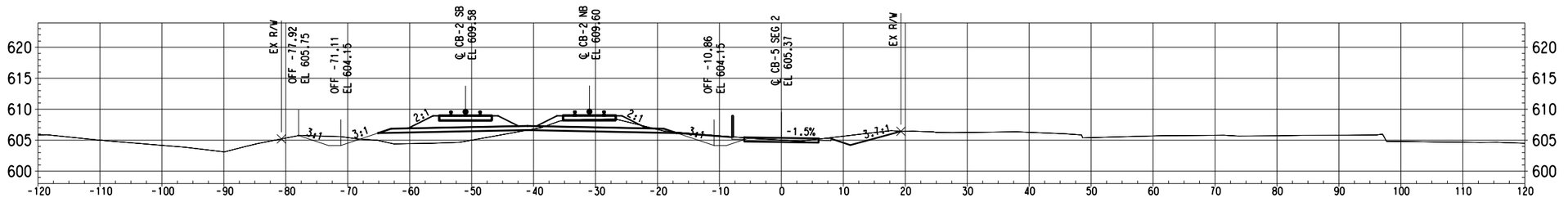
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NOTE:
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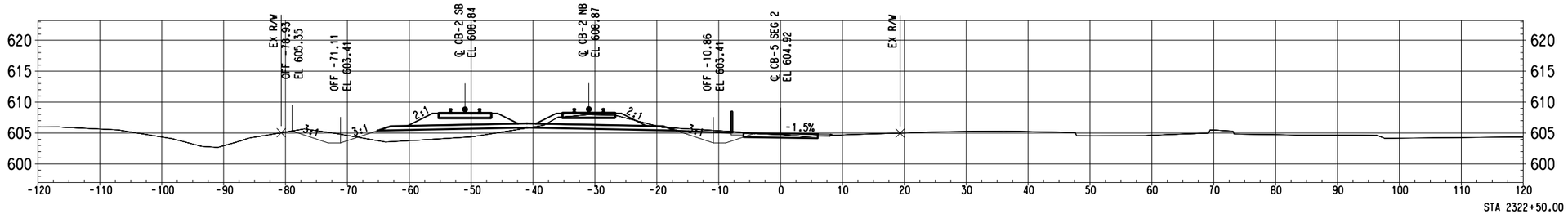
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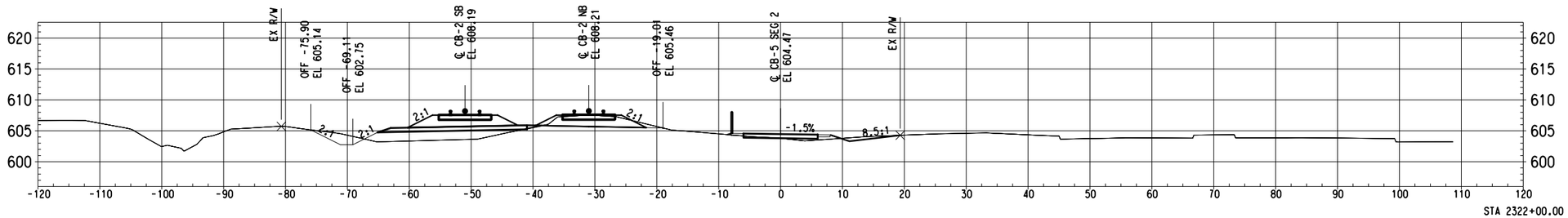
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COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

TOWN OF ADDISON
CROSS SECTIONS
SHEET 17 OF 43

CONTRACT	DWG No.	REV
C-2033270-01	CC1-6966	D

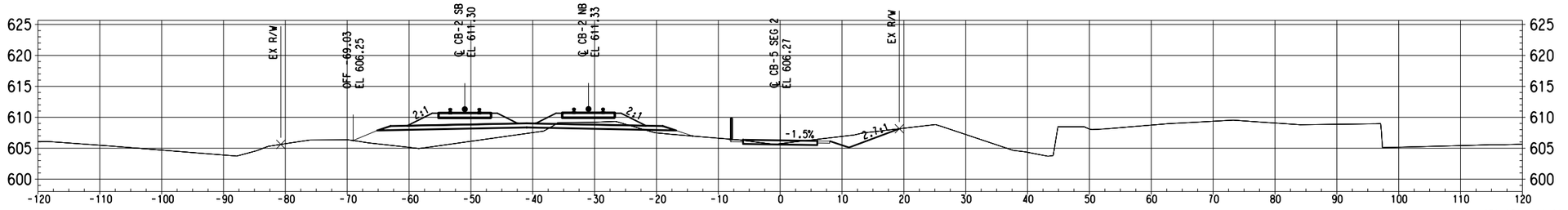
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DWG No. CC1-6967

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CONTRACT SHEET No. 70 OF 242

COTTON BELT REGIONAL RAIL
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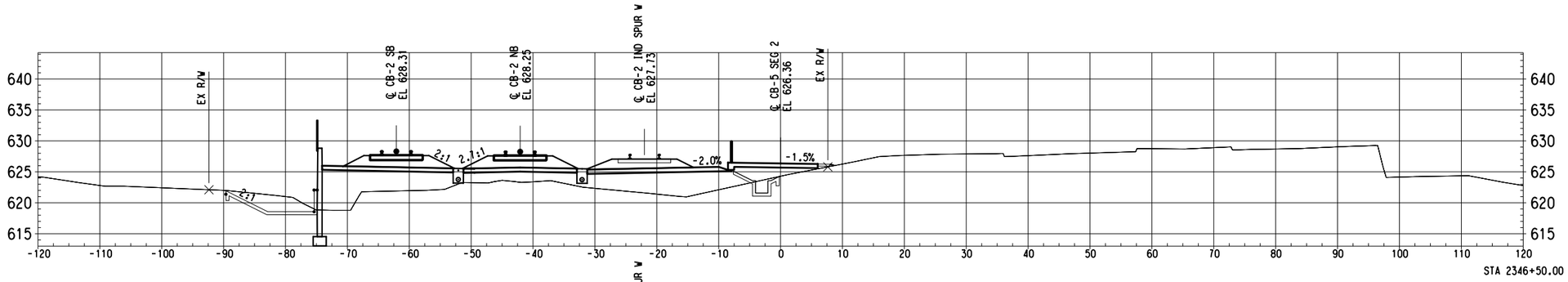
TOWN OF ADDISON
CROSS SECTIONS
SHEET 18 OF 43

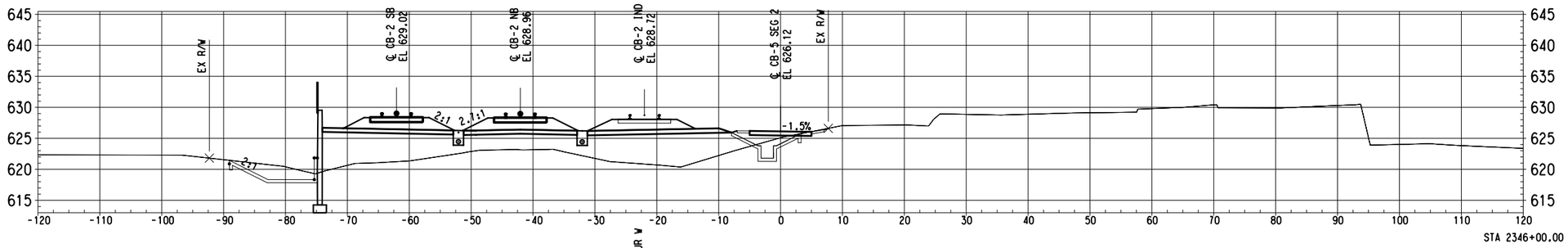
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DESIGNED	S. SALEH
CHECKED	D. LUU
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DATE	13 MAR 23

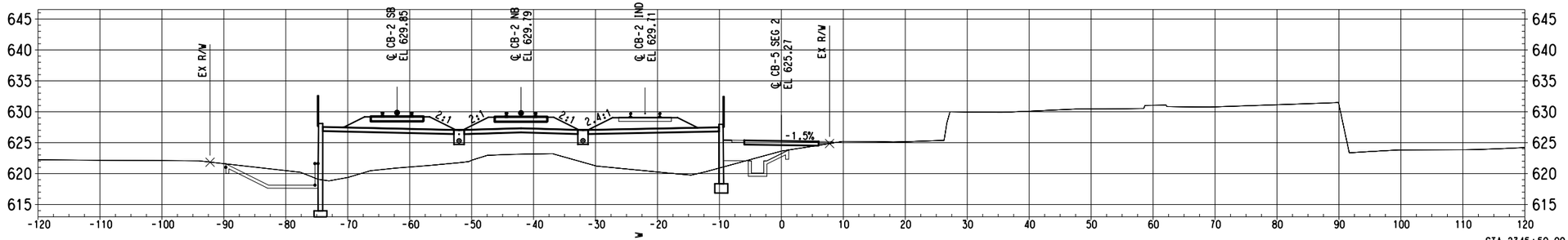
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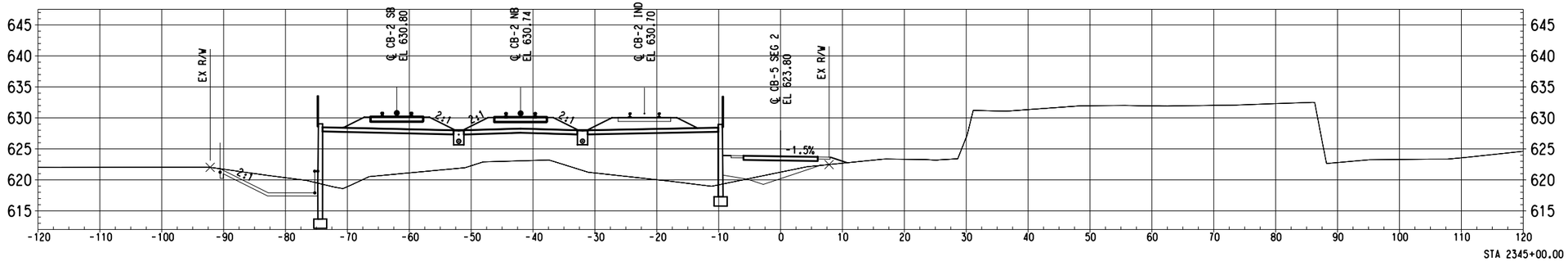
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DWG No. CC1-6968









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DATE	13 MAR 23

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CONTRACT SHEET No. 71 OF 242

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

TOWN OF ADDISON
CROSS SECTIONS
SHEET 19 OF 43

CONTRACT	DWG No.	REV
C-2033270-01	CC1-6968	D

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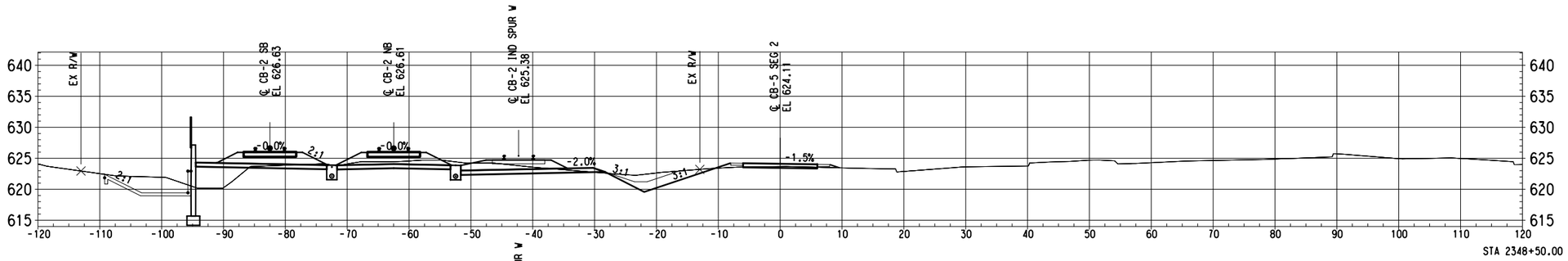
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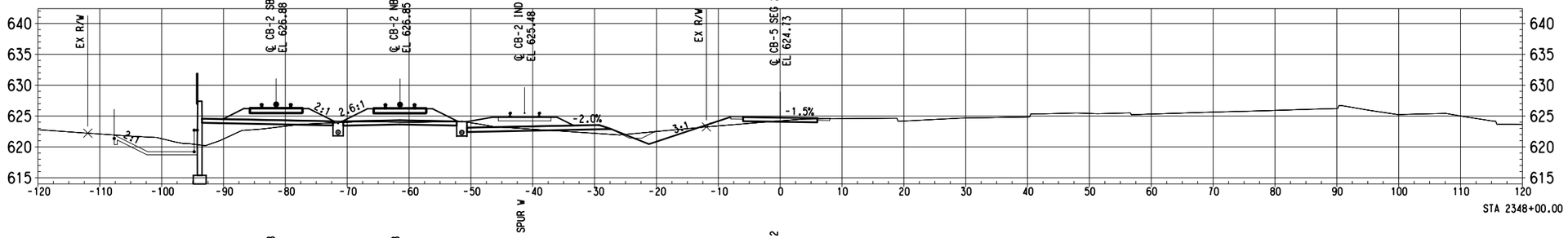
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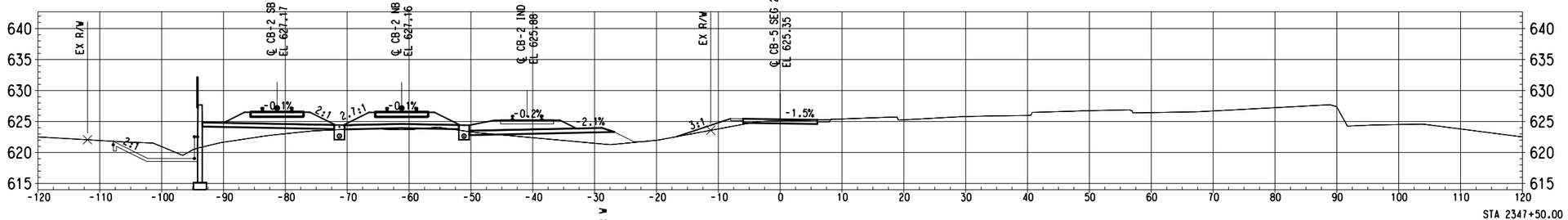
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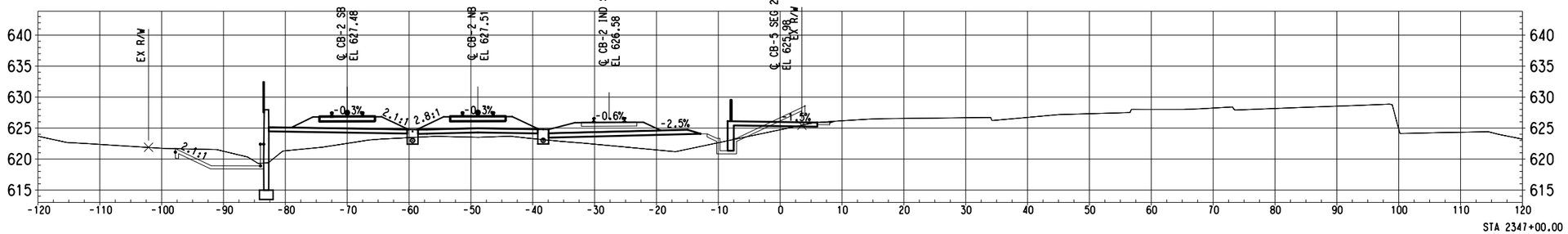
NOTE:
SEE PLAN AND PROFILE SHEETS FOR FENCE AND RIP RAP LOCATIONS AND LIMITS

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









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CONTRACT SHEET No. 72 OF 242

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

TOWN OF ADDISON
CROSS SECTIONS
SHEET 20 OF 43

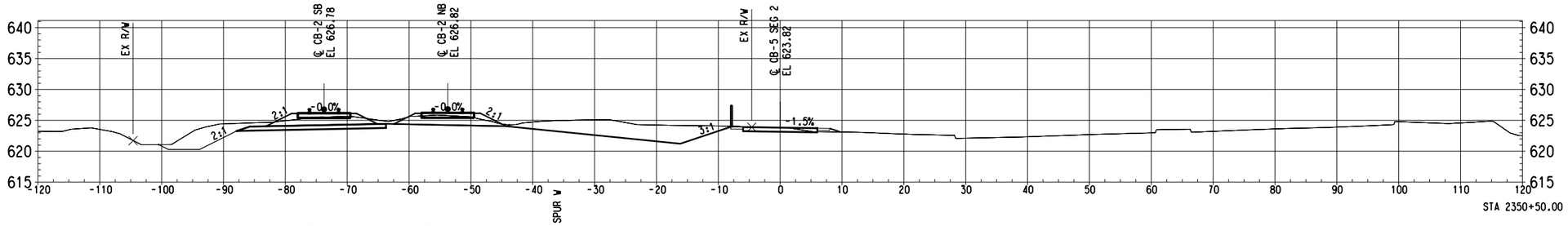
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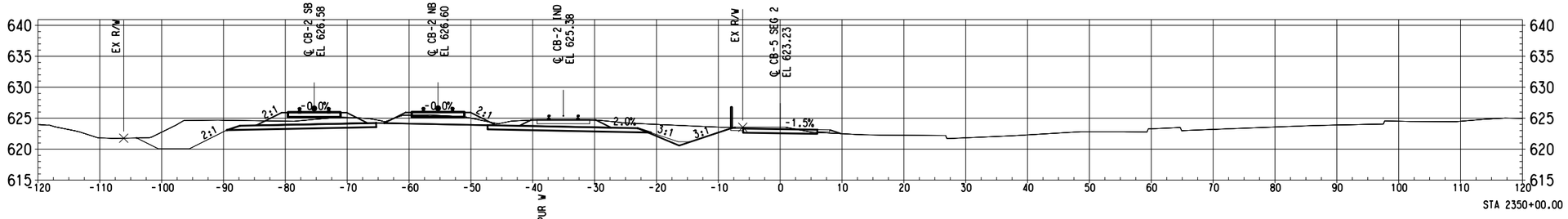
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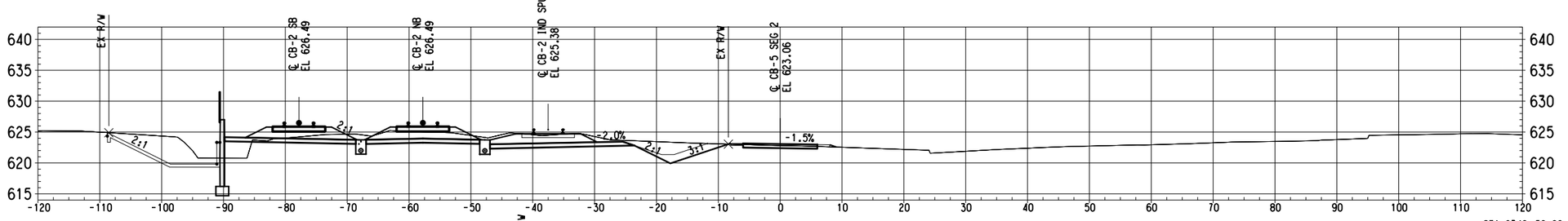
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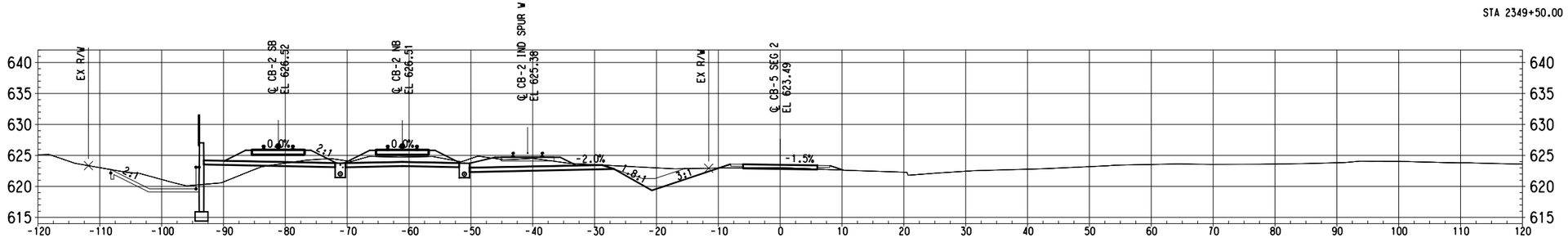
NOTE:
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SCALE (IN FEET)
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VERT 0 5 10 15 20









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CONTRACT SHEET No. 73 OF 242

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

TOWN OF ADDISON
CROSS SECTIONS
SHEET 21 OF 43

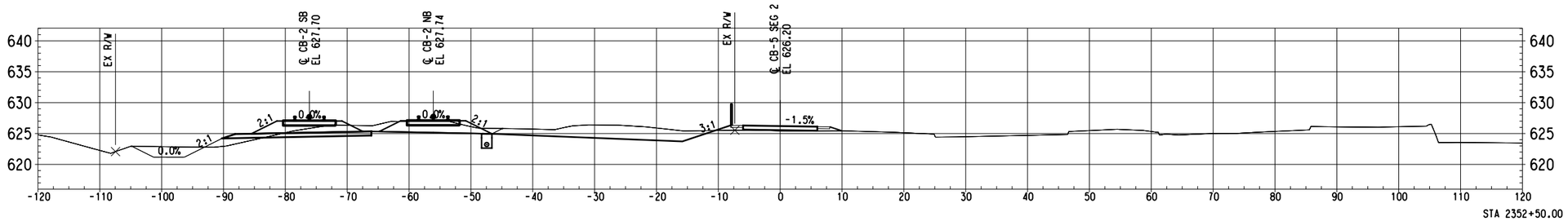
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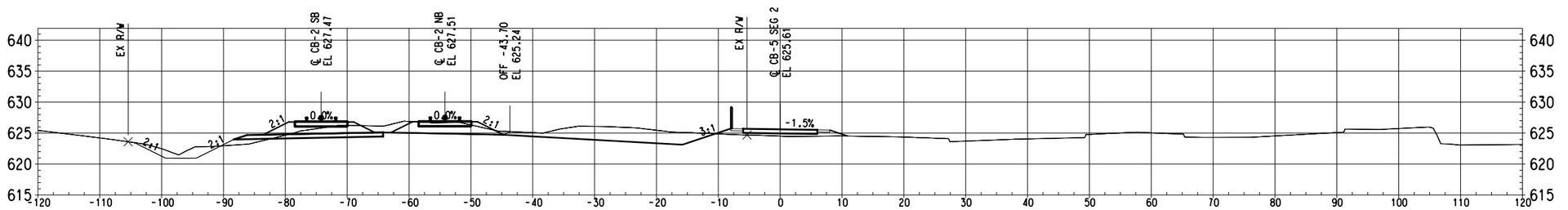
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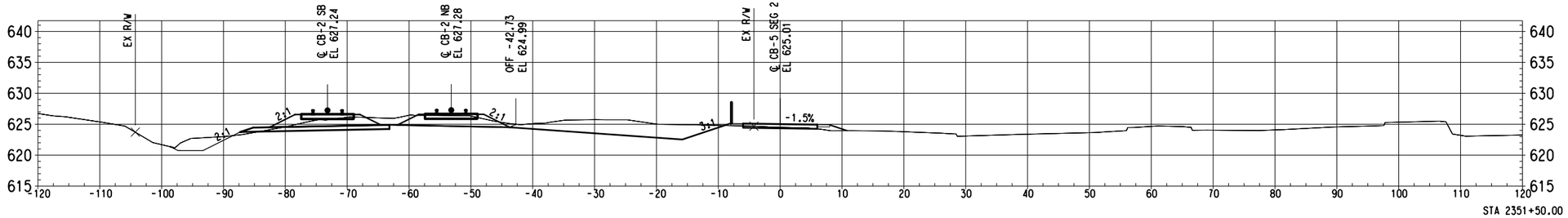
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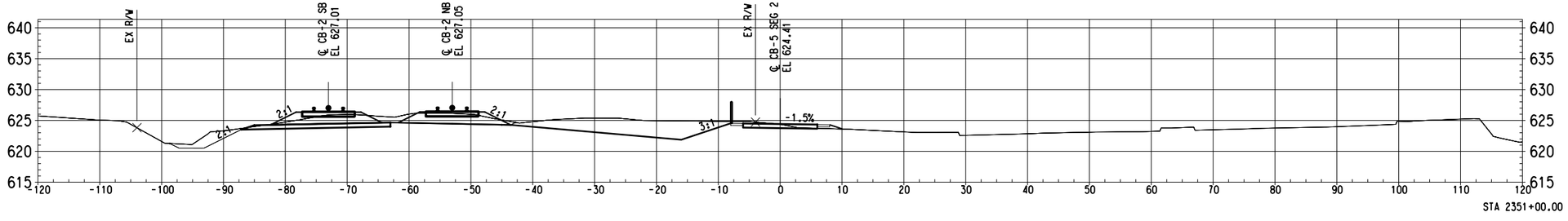
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COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

TOWN OF ADDISON
CROSS SECTIONS
SHEET 22 OF 43

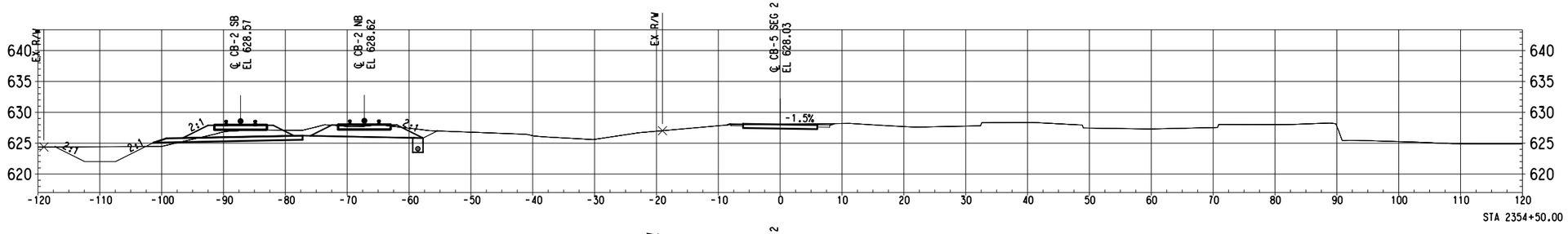
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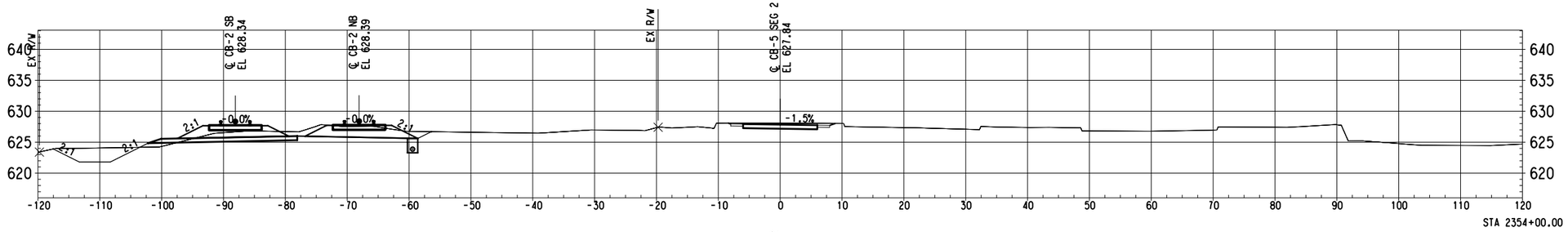
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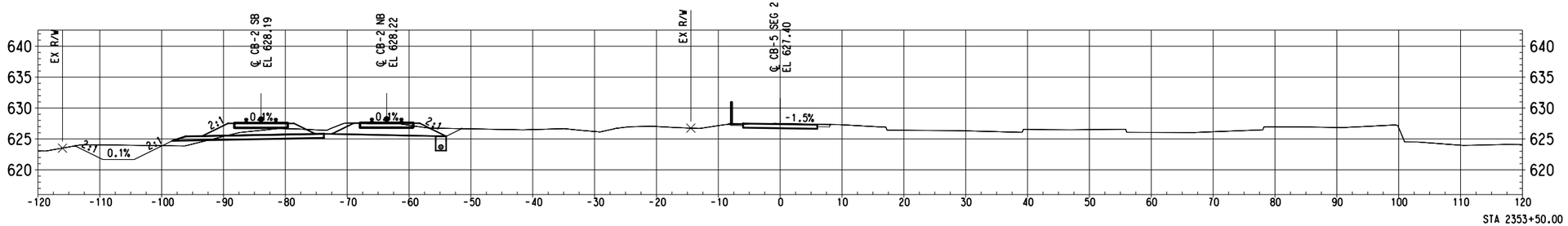
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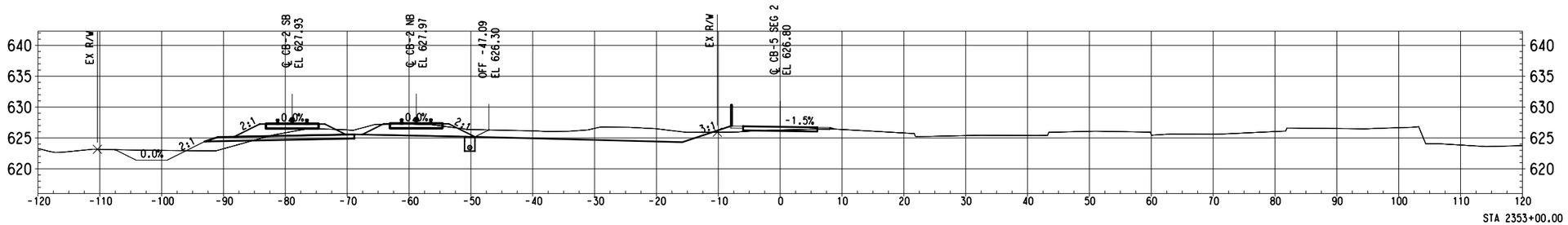
NOTE:
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SCALE (IN FEET)
VERT 0 5 10 15 20









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COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

TOWN OF ADDISON
CROSS SECTIONS
SHEET 23 OF 43

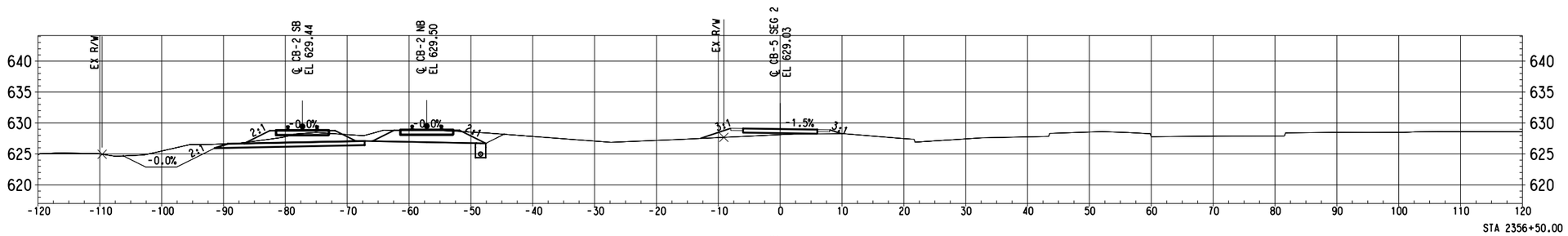
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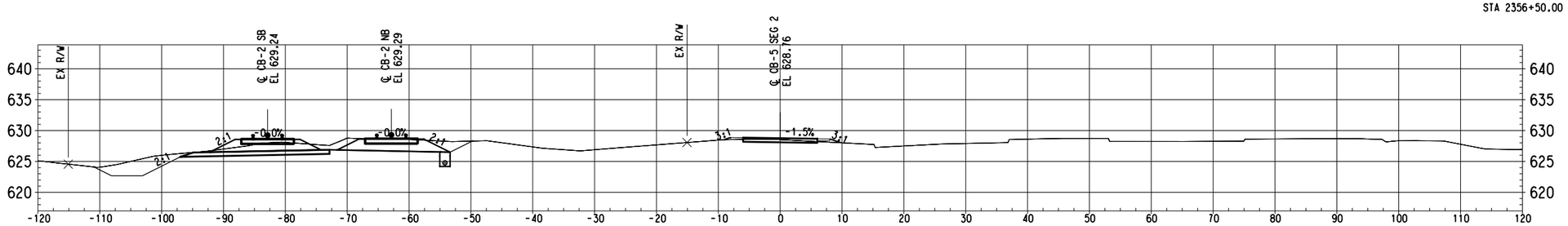
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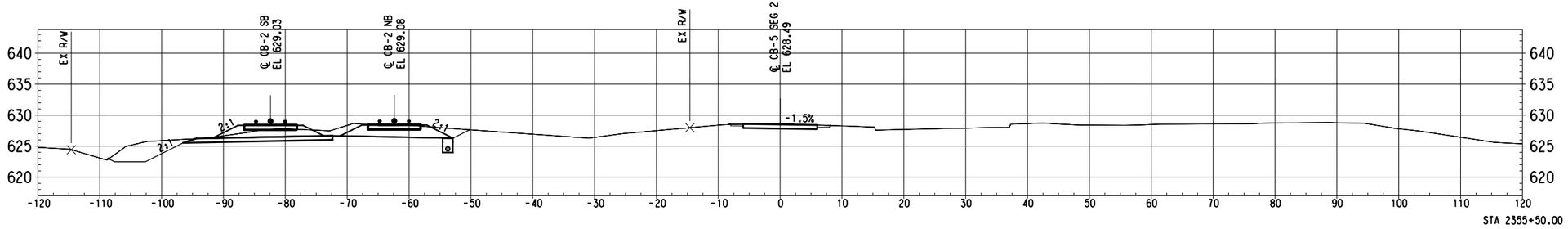
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VERT 0 5 10 15 20



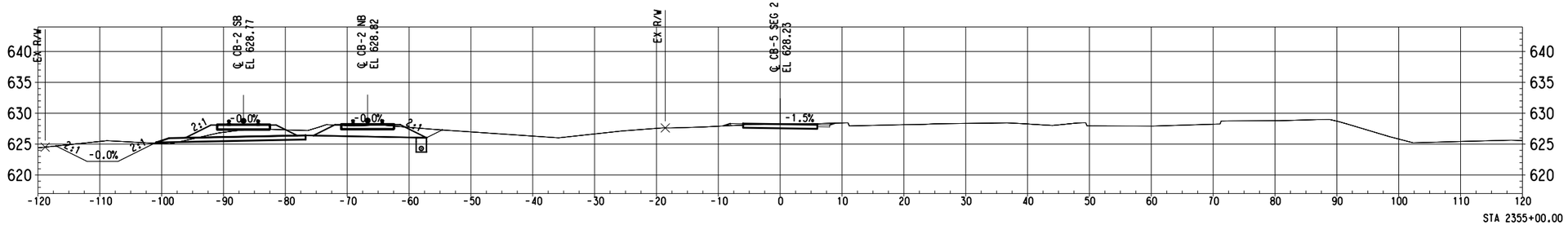
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CONTRACT SHEET No. 76 OF 242

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

TOWN OF ADDISON
CROSS SECTIONS
SHEET 24 OF 43

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DESIGNED	S. SALEH
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IN CHARGE	D. LUU
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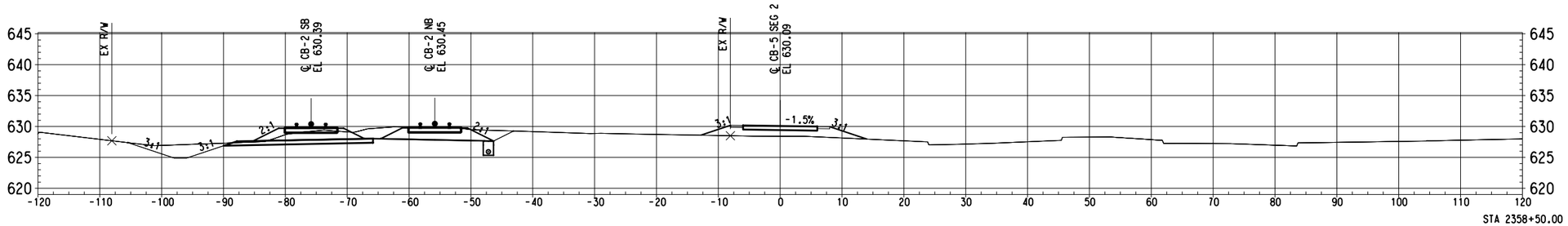
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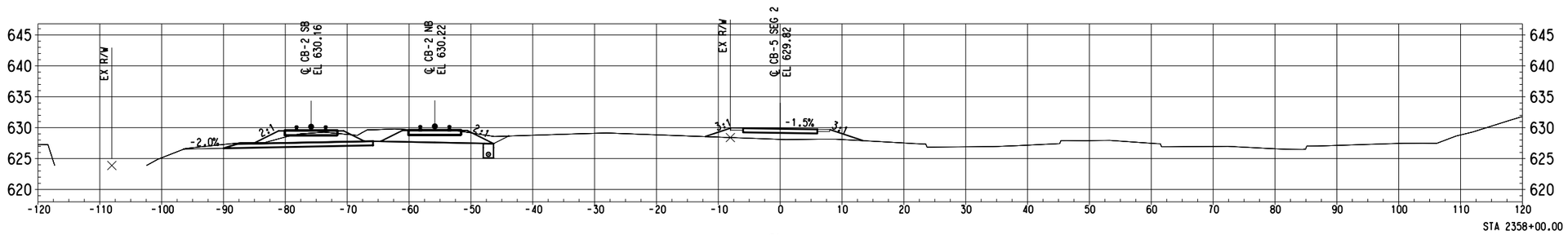
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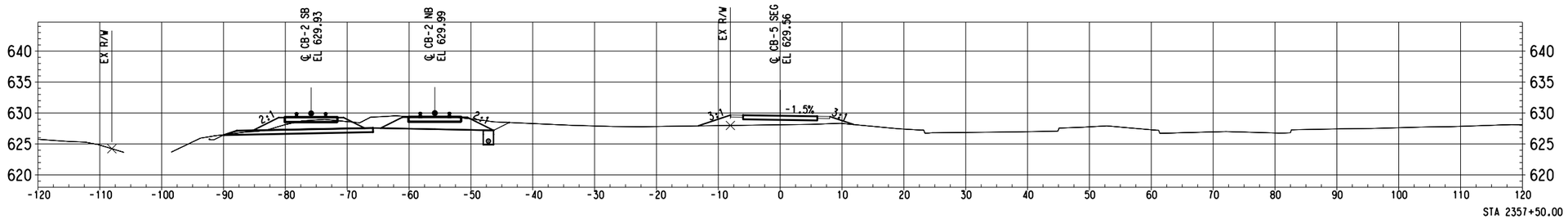
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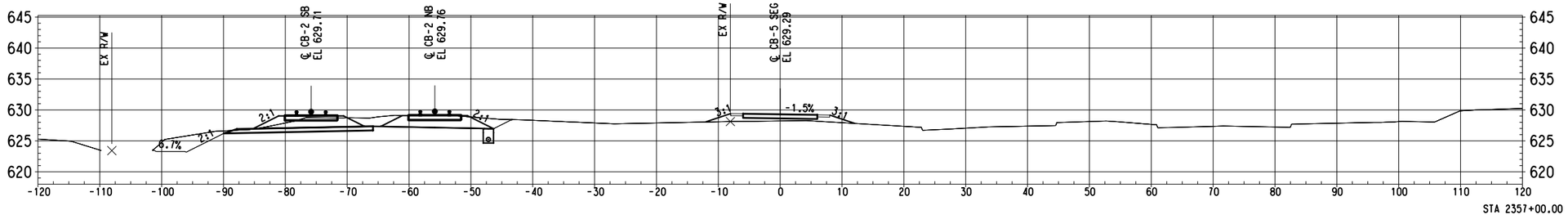
NOTE:
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SCALE (IN FEET)
HORIZ 0 5 10 20
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CONTRACT SHEET No. 77 OF 242

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

TOWN OF ADDISON
CROSS SECTIONS
SHEET 25 OF 43

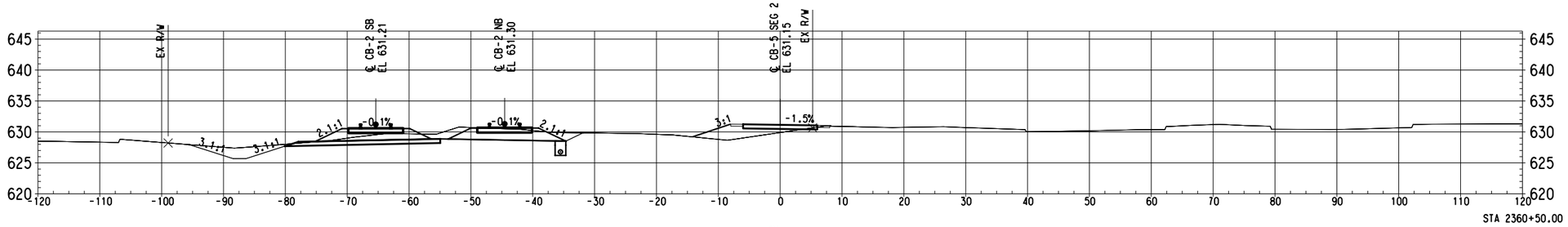
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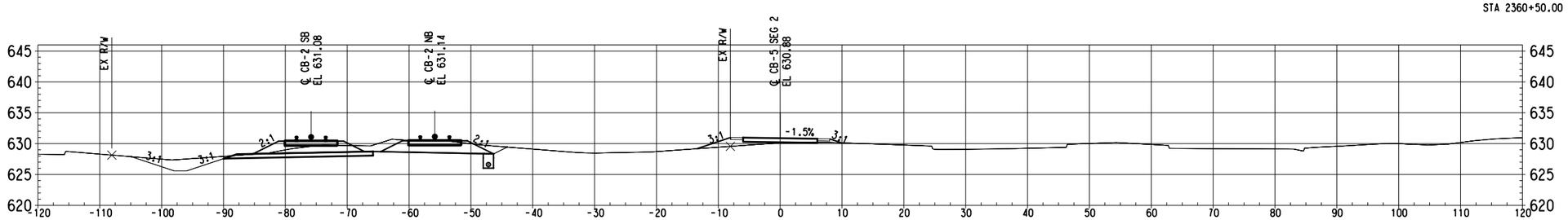
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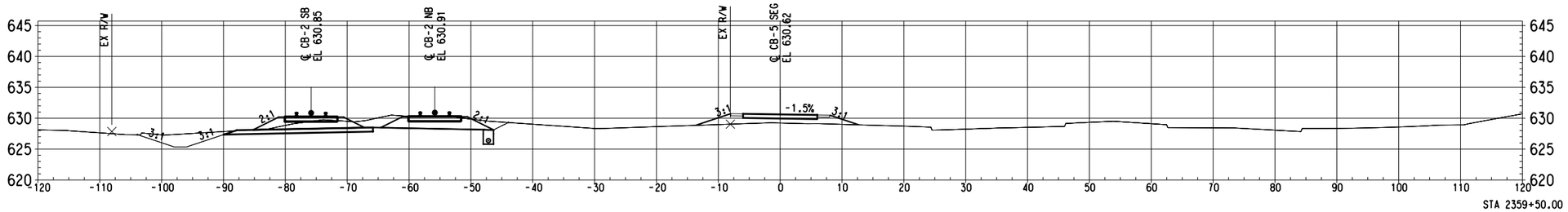
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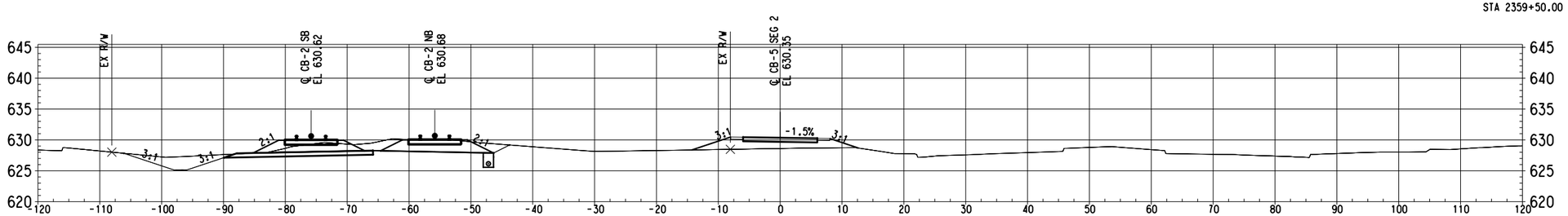
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SCALE (IN FEET)
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CONTRACT SHEET No. 78 OF 242

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

TOWN OF ADDISON
CROSS SECTIONS
SHEET 26 OF 43

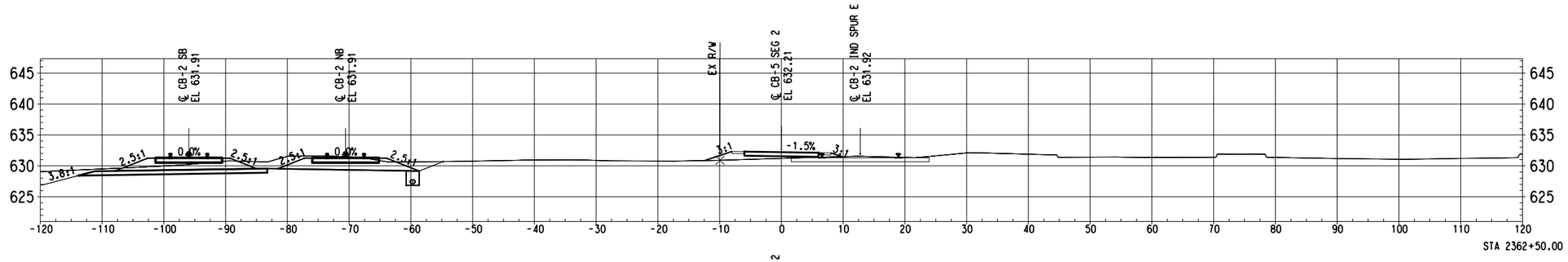
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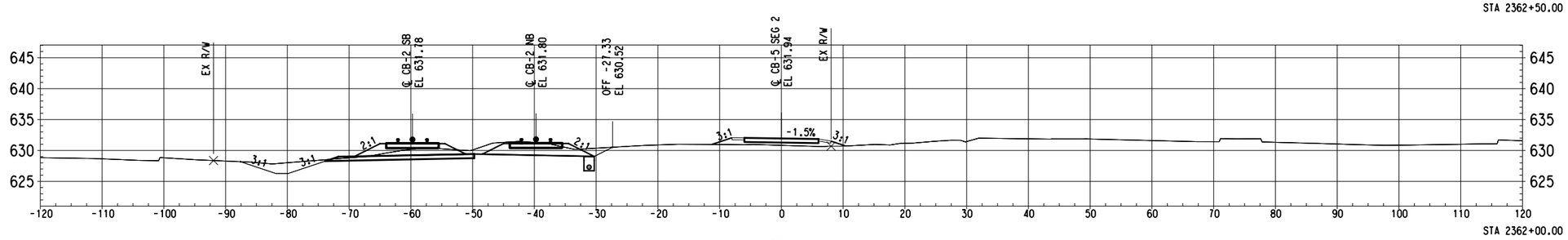
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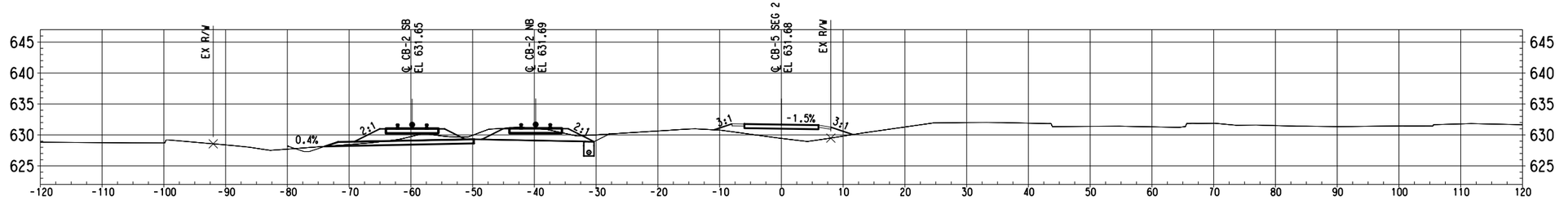
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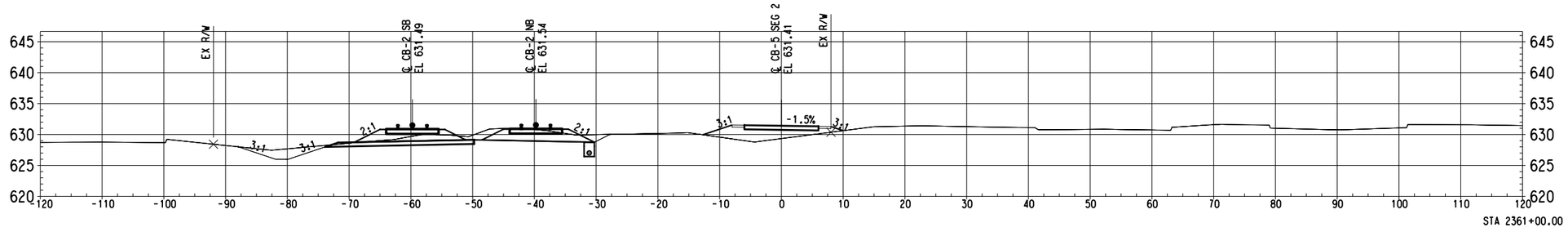
NOTE:
SEE PLAN AND PROFILE SHEETS FOR FENCE AND RIP RAP LOCATIONS AND LIMITS

SCALE (IN FEET)
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SCALE (IN FEET)
VERT 0 5 10 15 20









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COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

TOWN OF ADDISON
CROSS SECTIONS
SHEET 27 OF 43

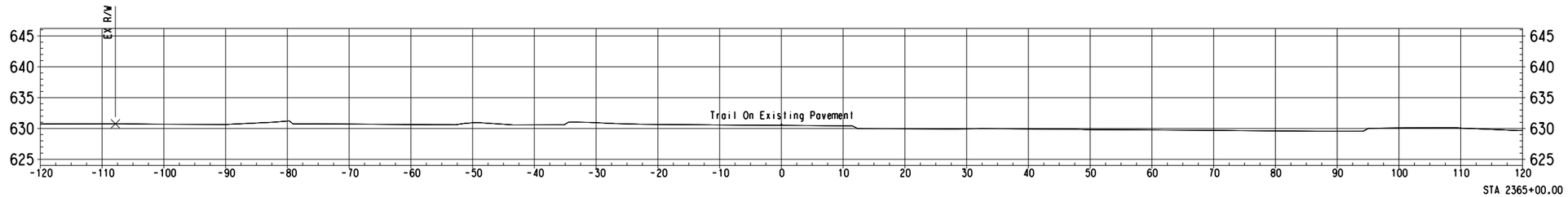
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DRAWN	S. SALEH
DESIGNED	S. SALEH
CHECKED	D. LUU
IN CHARGE	D. LUU
DATE	13 MAR 23

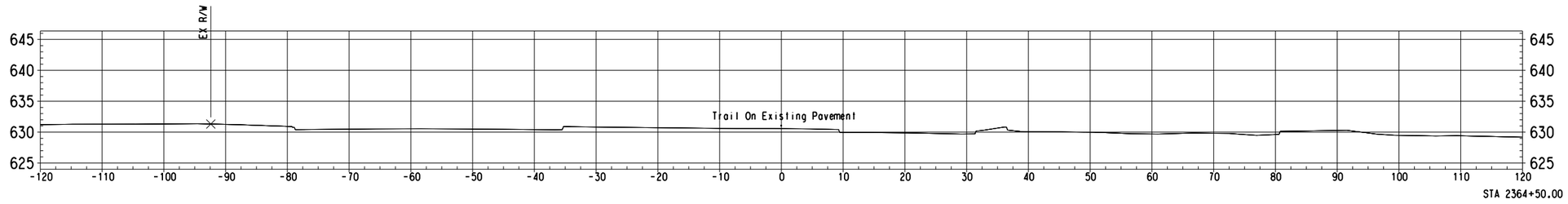
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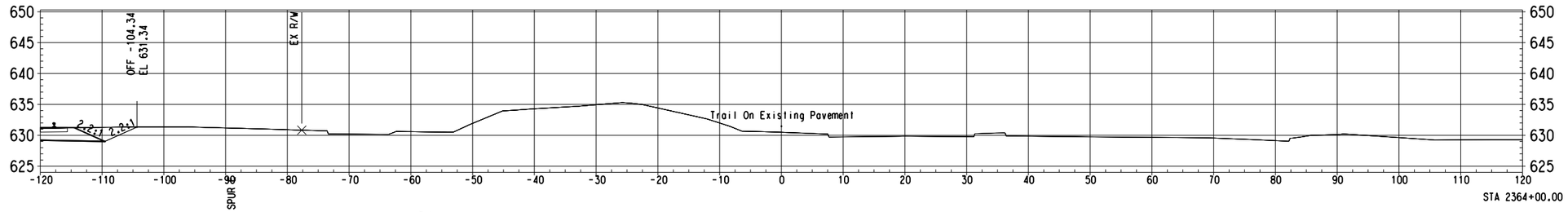
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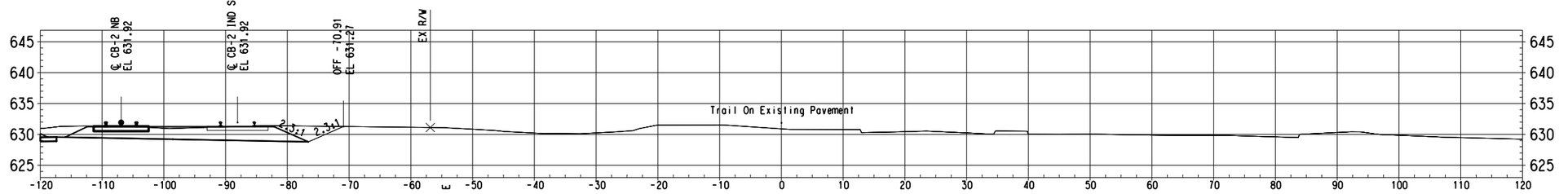
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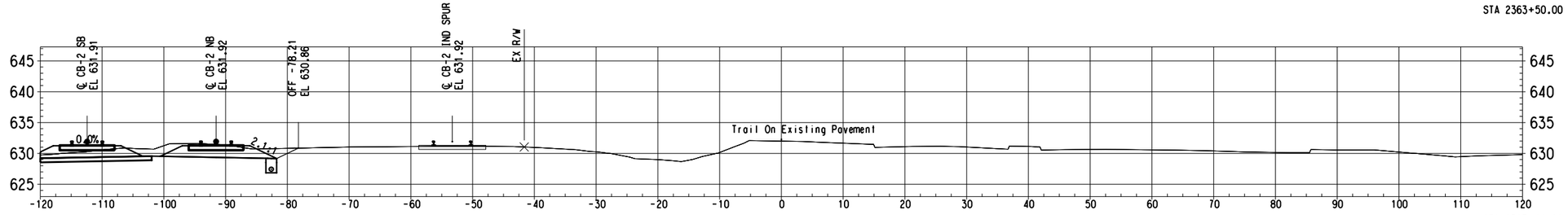
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NOTE:
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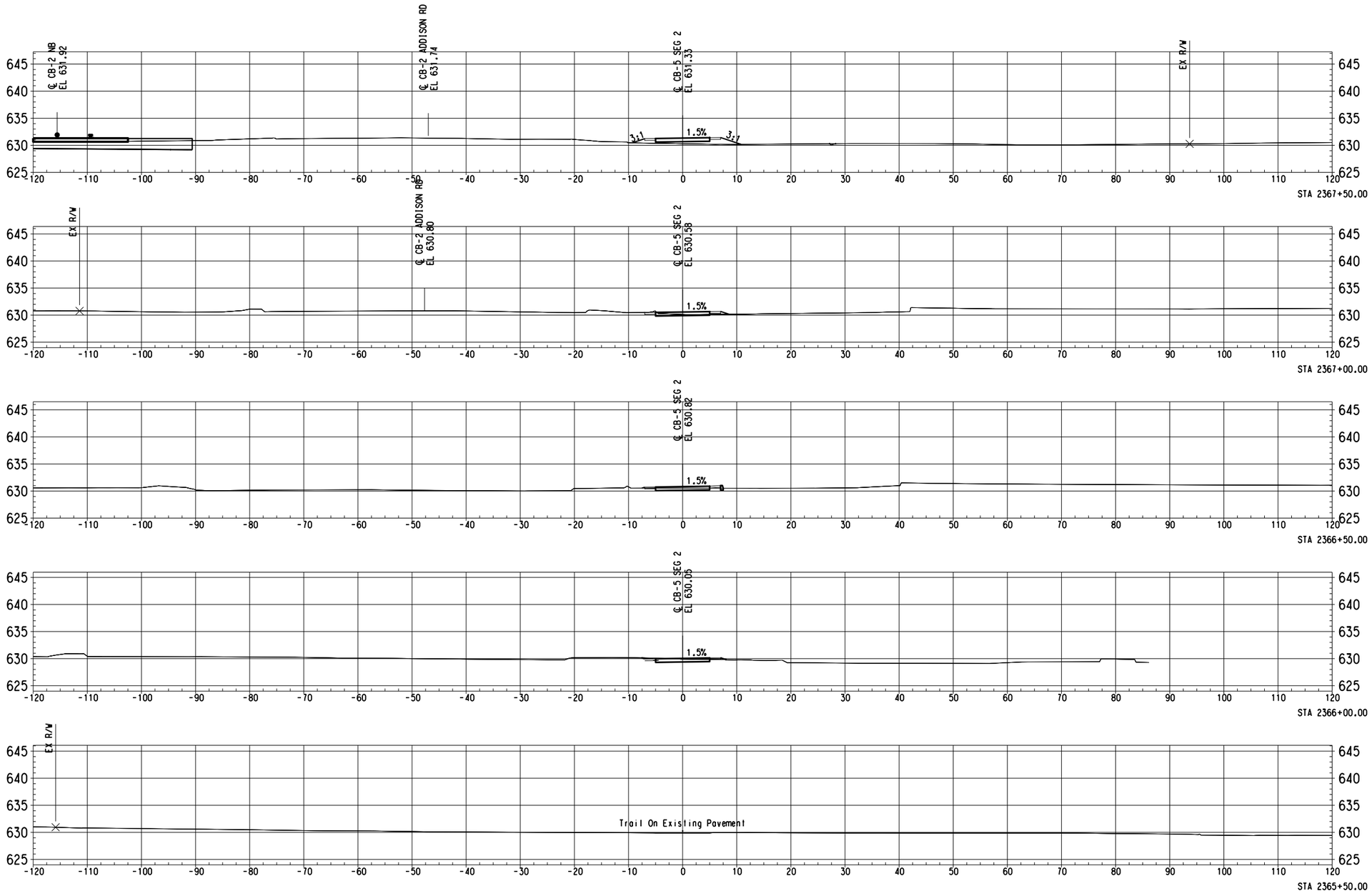
COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

TOWN OF ADDISON
CROSS SECTIONS
SHEET 28 OF 43

CONTRACT	DWG No.	REV
C-2033270-01	CC1-6977	D

CB05-CC1-6977.000

DWG No. CC1-6978



NOTE:
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CONTRACT SHEET No. 81 OF 242

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

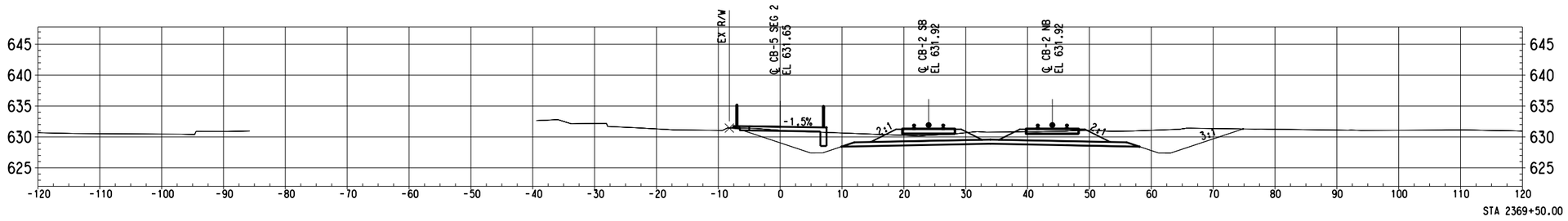
TOWN OF ADDISON
CROSS SECTIONS
SHEET 29 OF 43

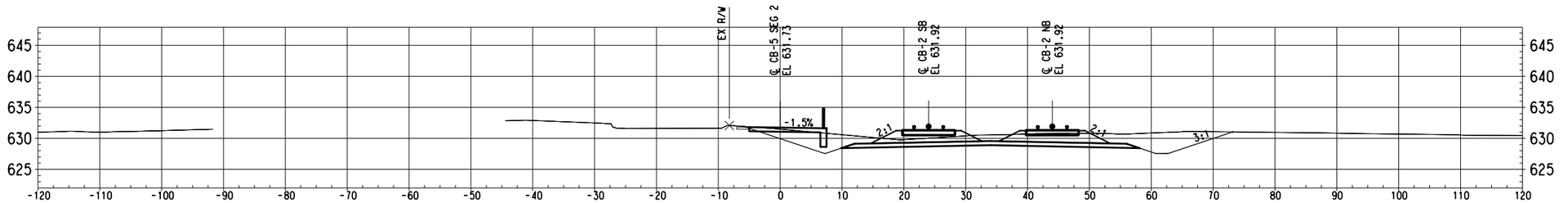
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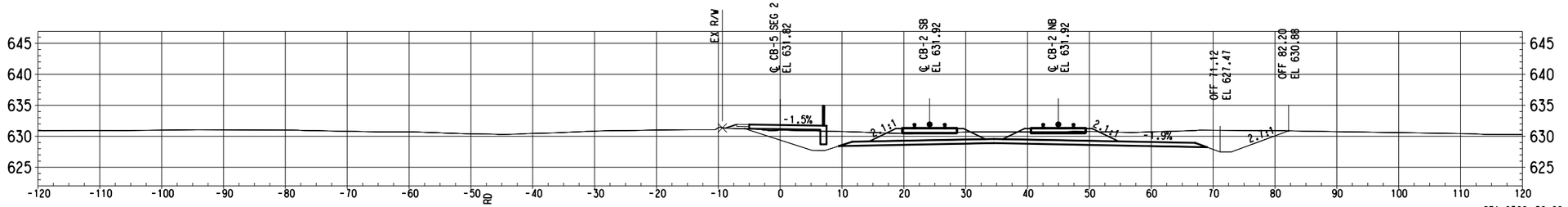
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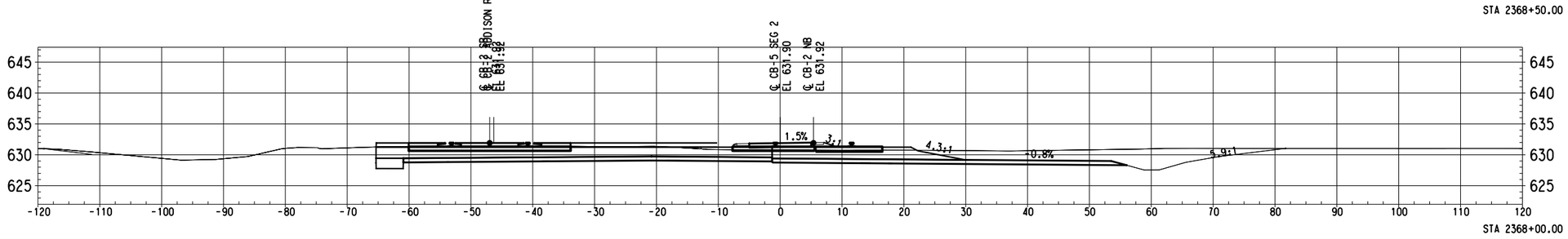
NOTE:
SEE PLAN AND PROFILE SHEETS FOR FENCE AND RIP RAP LOCATIONS AND LIMITS

SCALE (IN FEET)
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SCALE (IN FEET)
VERT 0 5 10 15 20









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DATE	13 MAR 23

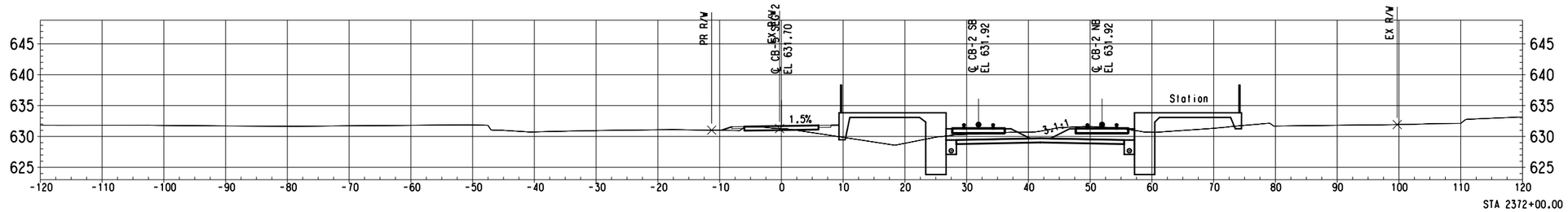
COTTON BELT REGIONAL RAIL VELOWEB HIKE & BIKE TRAIL

TOWN OF ADDISON
CROSS SECTIONS
SHEET 30 OF 43

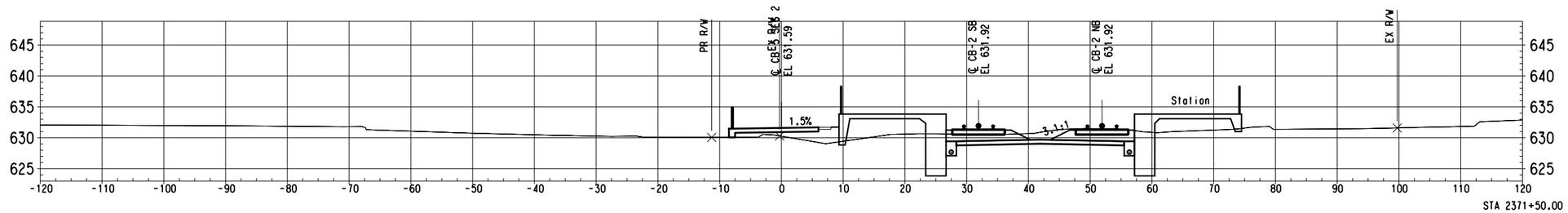
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C-2033270-01	CC1-6979	D

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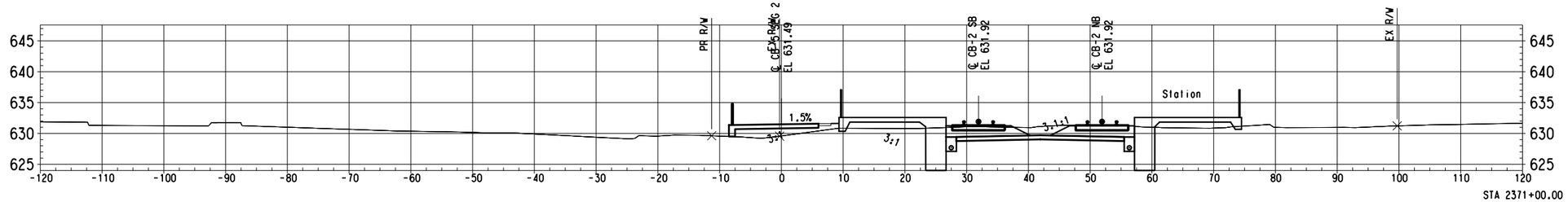
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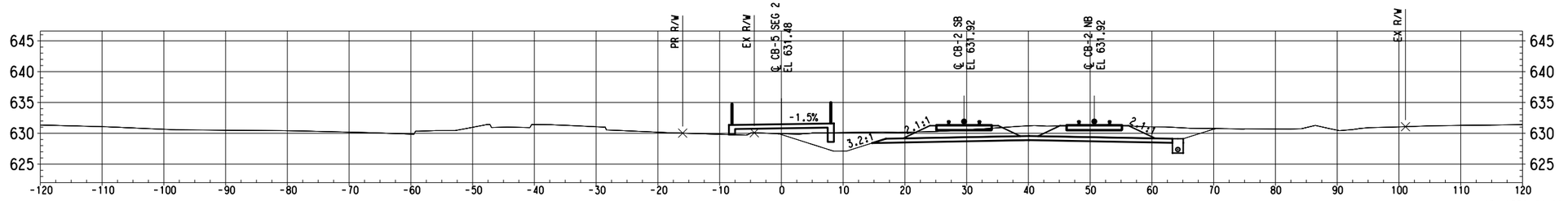
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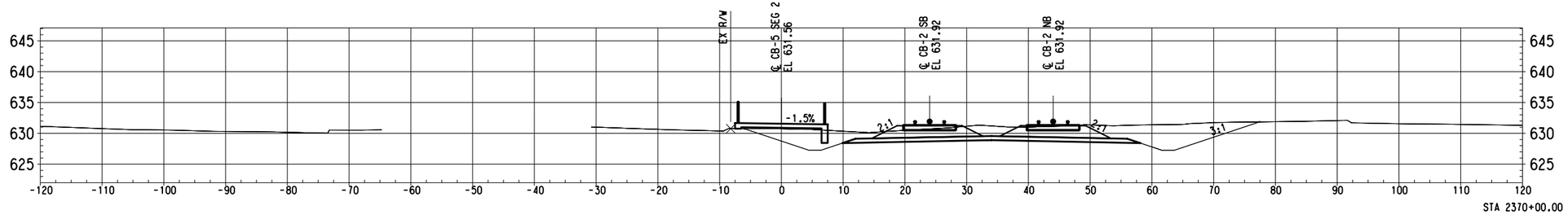
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STA 2371+00.00



STA 2370+50.00



STA 2370+00.00

NOTE:
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SCALE (IN FEET)
HORIZ 0 5 10 20
SCALE (IN FEET)
VERT 0 5 10 15 20

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COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

TOWN OF ADDISON
CROSS SECTIONS
SHEET 31 OF 43

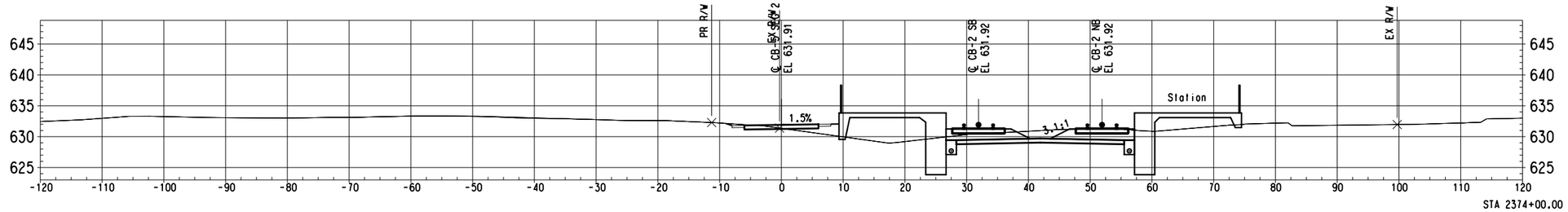
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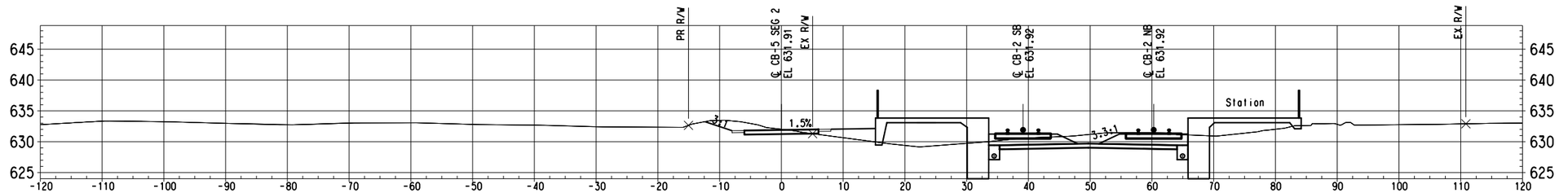
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NOTE:
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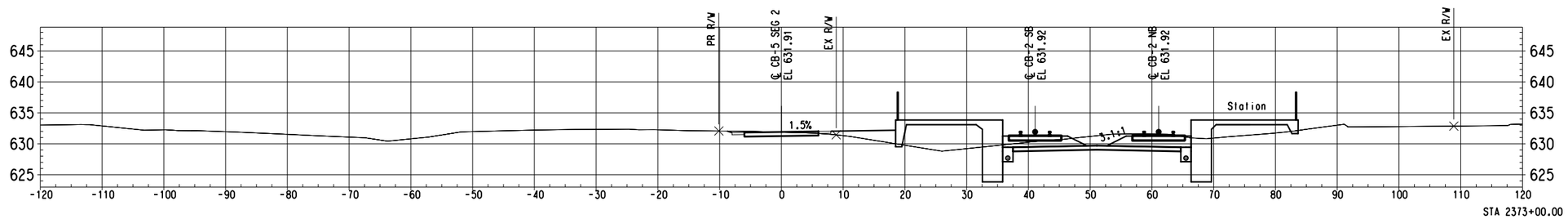
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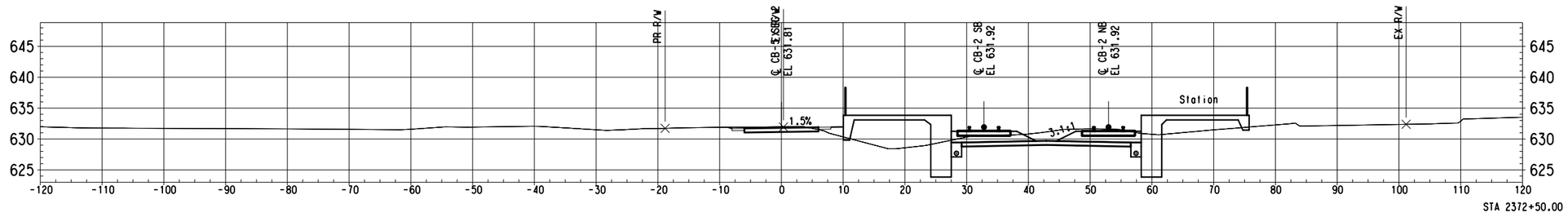
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TOWN OF ADDISON
CROSS SECTIONS
SHEET 32 OF 43

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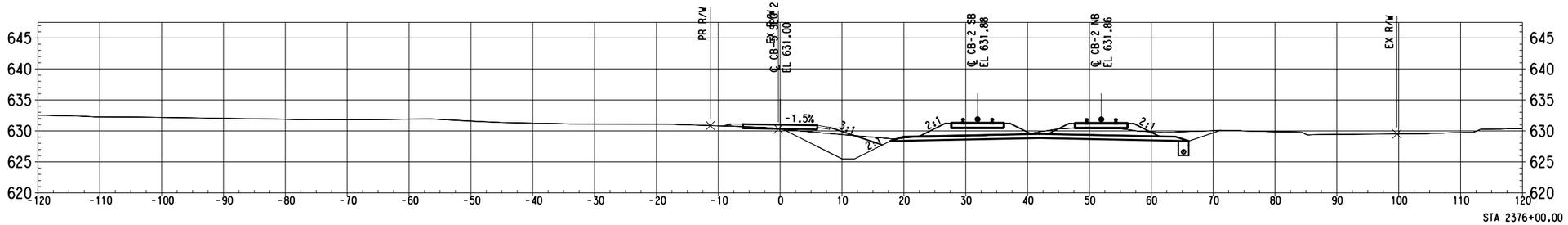
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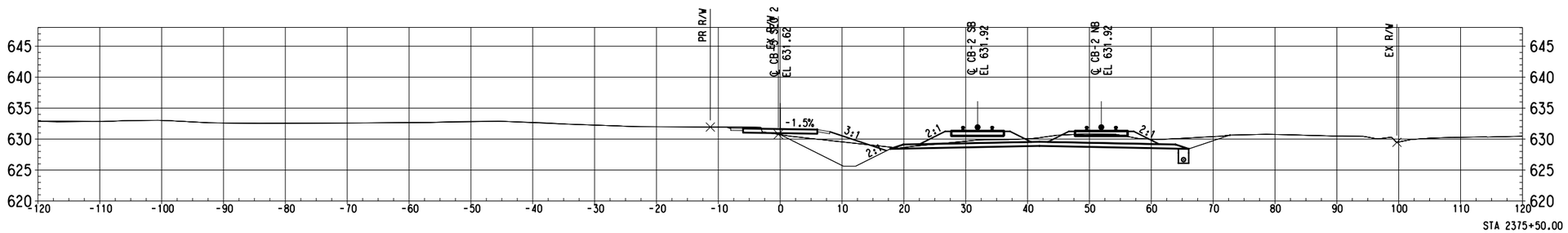
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NOTE:
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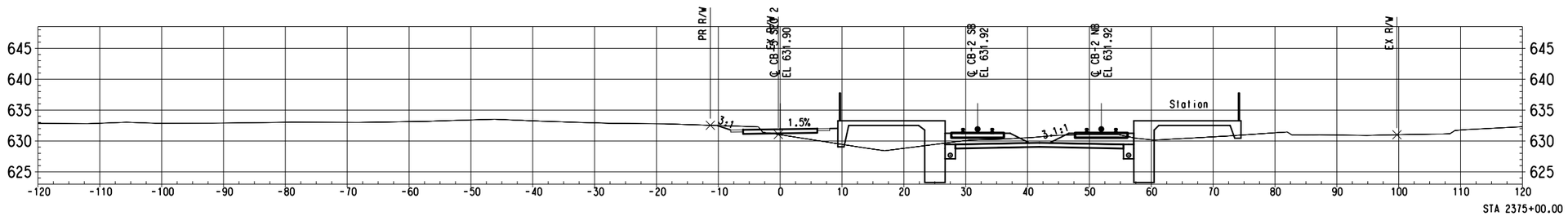
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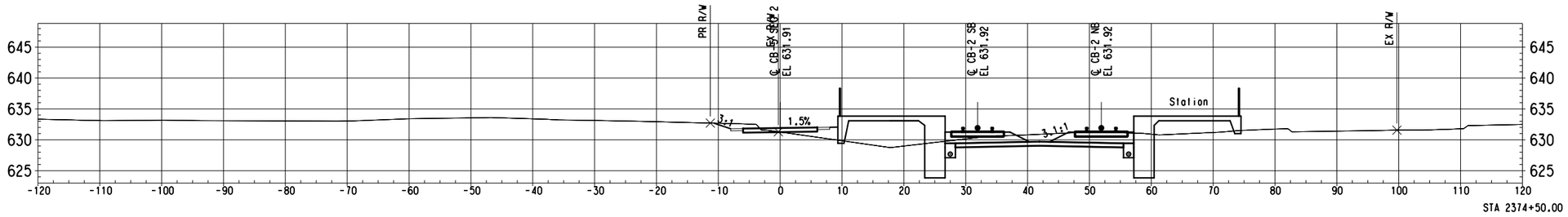
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COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

TOWN OF ADDISON
CROSS SECTIONS
SHEET 33 OF 43

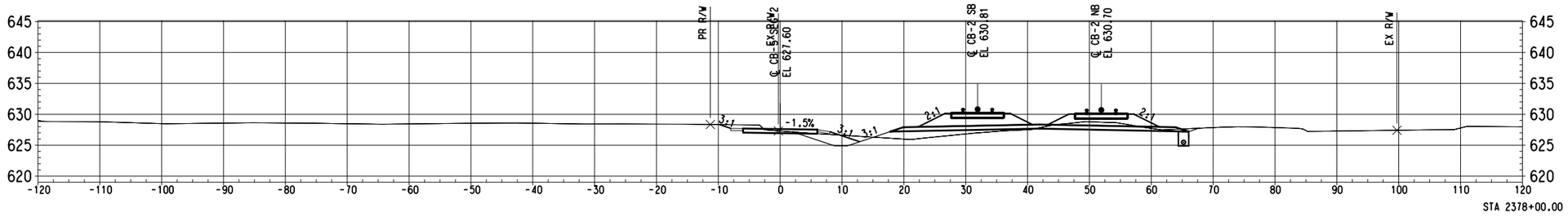
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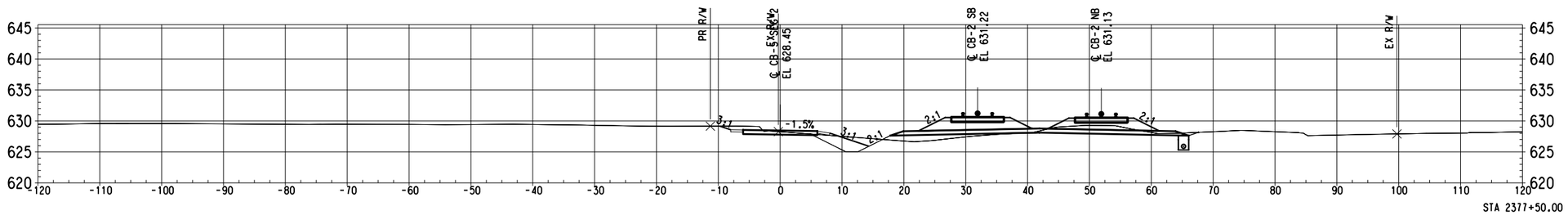
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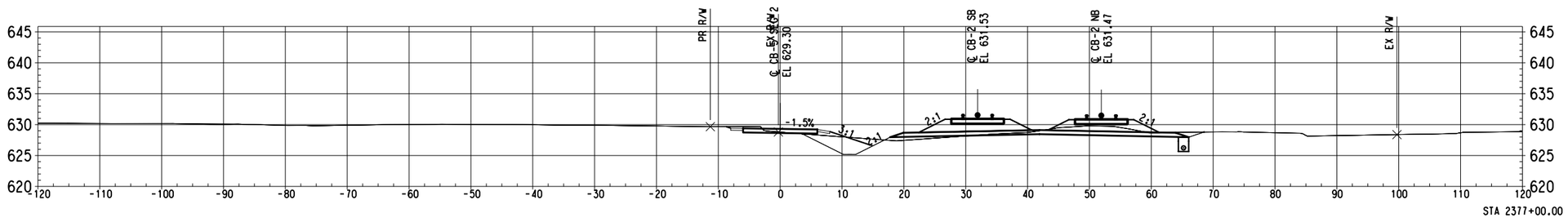
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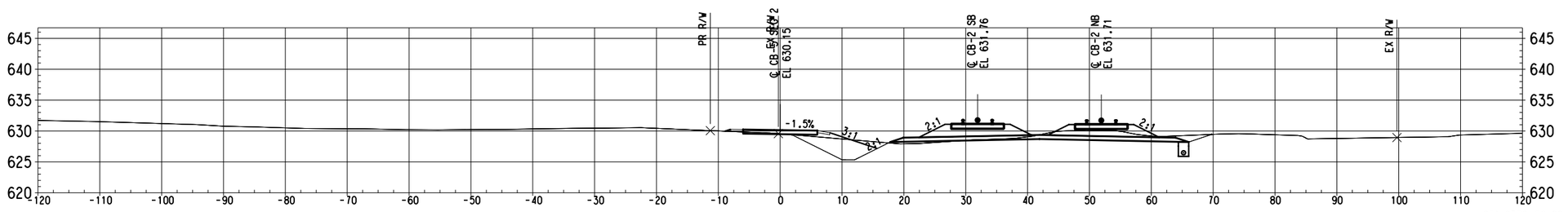
NOTE:
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SCALE (IN FEET)
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VERT 0 5 10 15 20









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DESIGNED	S. SALEH
CHECKED	D. LUU
IN CHARGE	D. LUU
DATE	13 MAR 23

CAES

CONTRACT SHEET No. 86 OF 242

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

TOWN OF ADDISON
CROSS SECTIONS
SHEET 34 OF 43

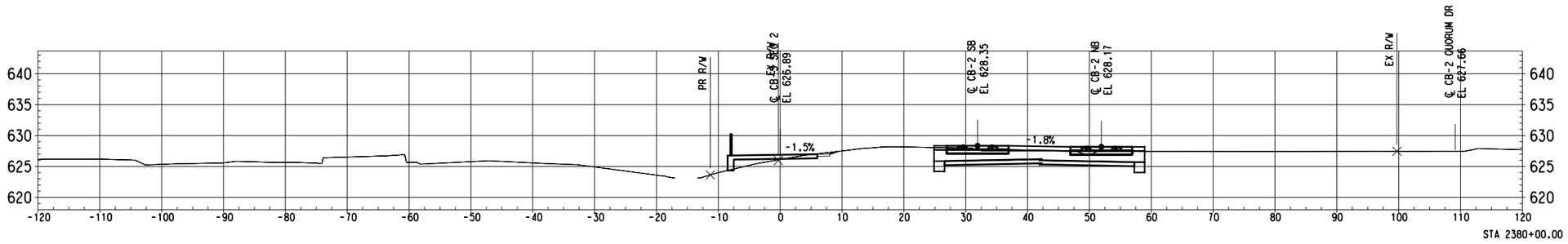
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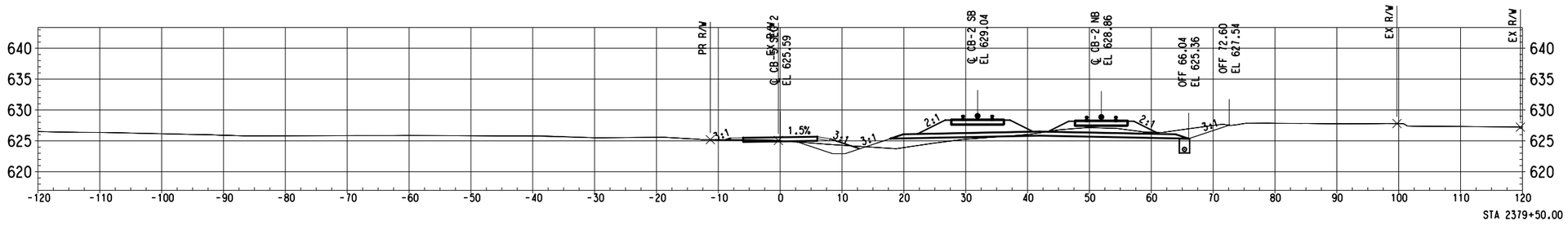
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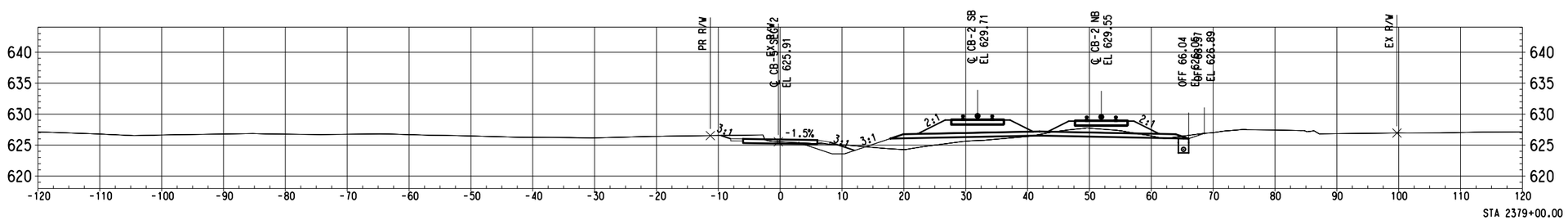
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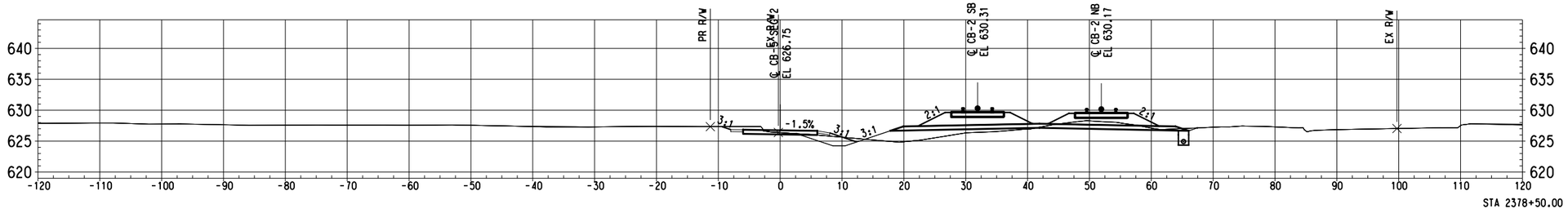
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SEE PLAN AND PROFILE SHEETS FOR FENCE AND RIP RAP LOCATIONS AND LIMITS

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COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

TOWN OF ADDISON
CROSS SECTIONS
SHEET 35 OF 43

SCALE	AS NOTED
DRAWN	S. SALEH
DESIGNED	S. SALEH
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IN CHARGE	D. LUU
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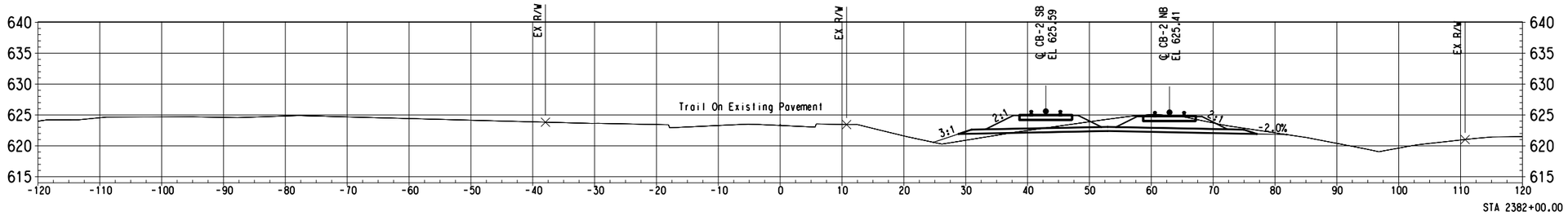
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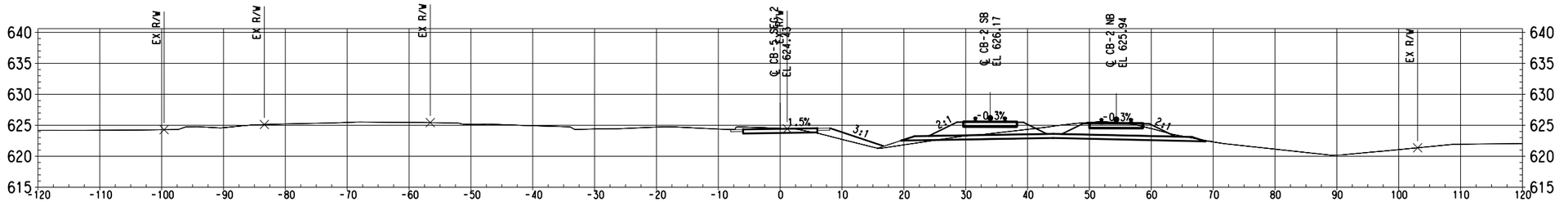
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NOTE:
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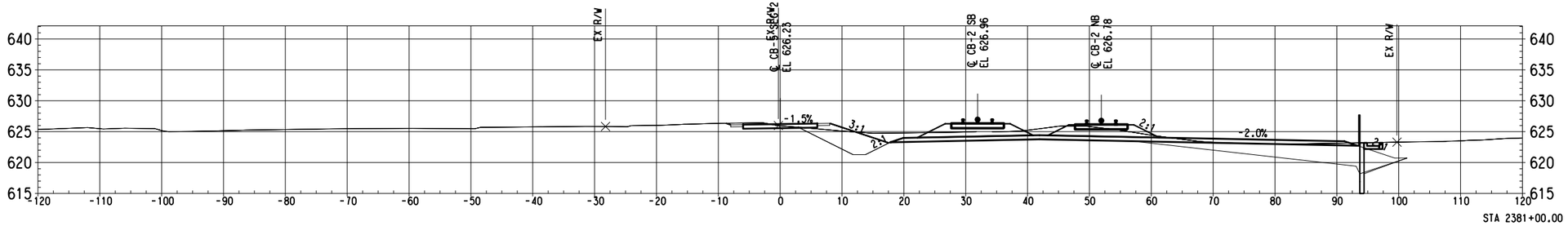
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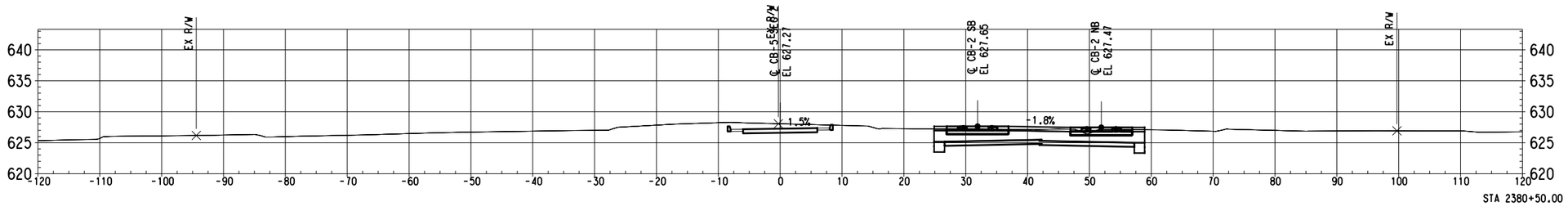
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COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

TOWN OF ADDISON
CROSS SECTIONS
SHEET 36 OF 43

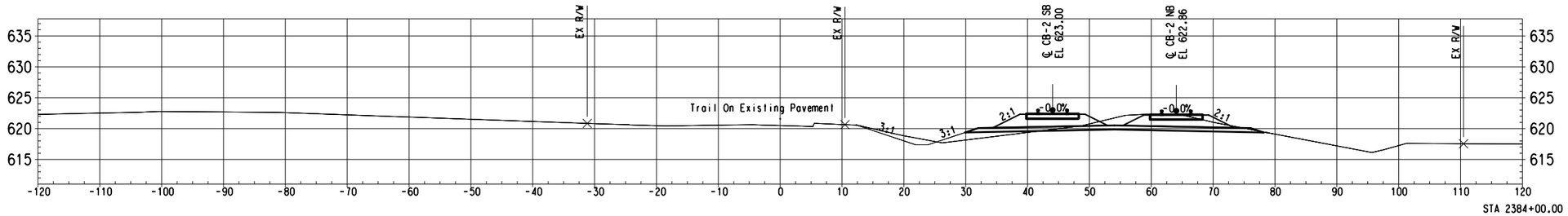
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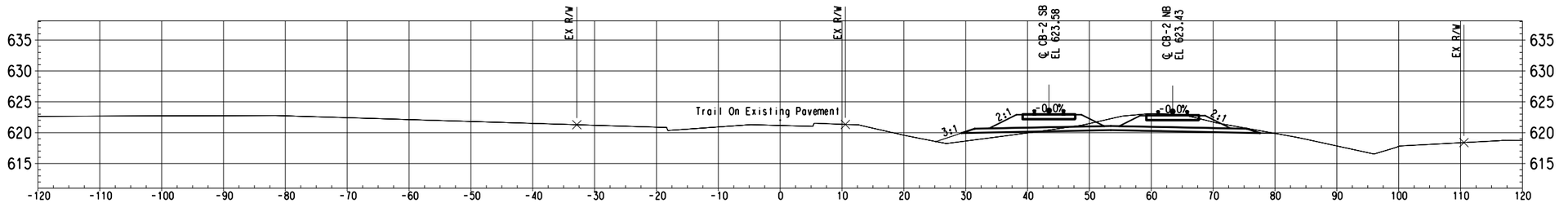
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NOTE:
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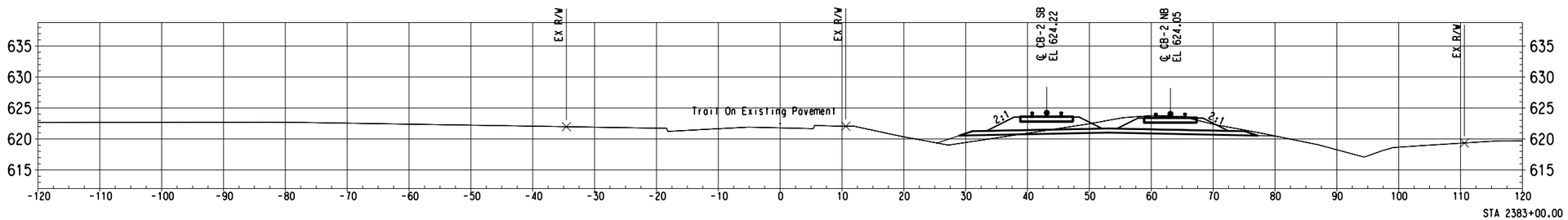
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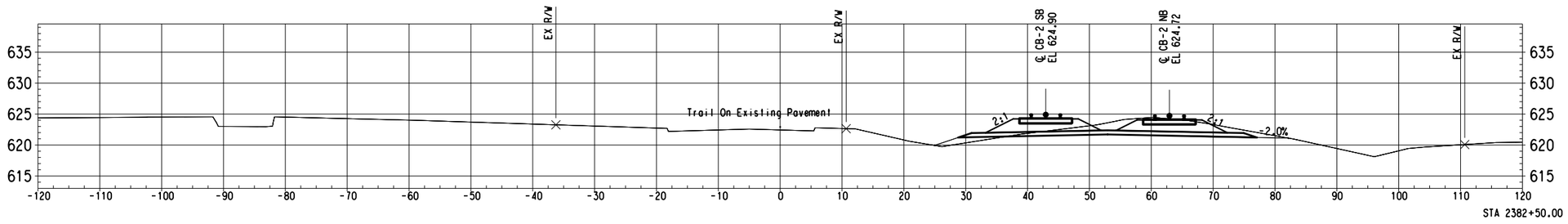
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CONTRACT SHEET No. 89 OF 242

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

TOWN OF ADDISON
CROSS SECTIONS
SHEET 37 OF 43

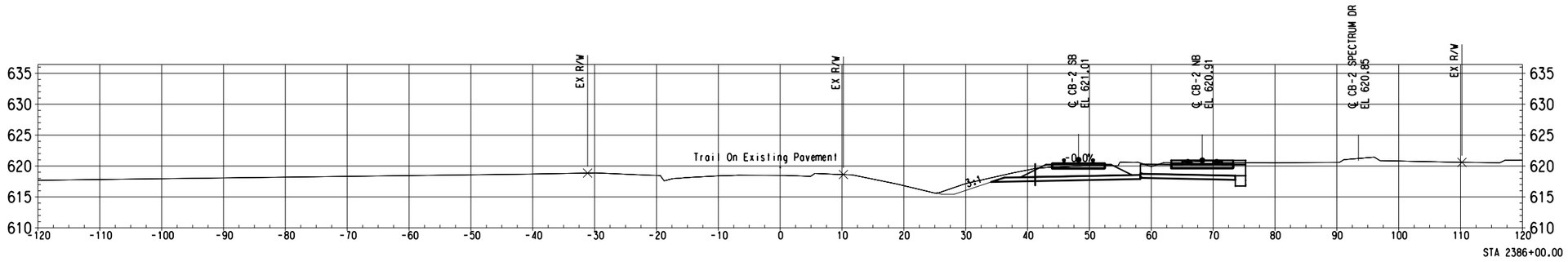
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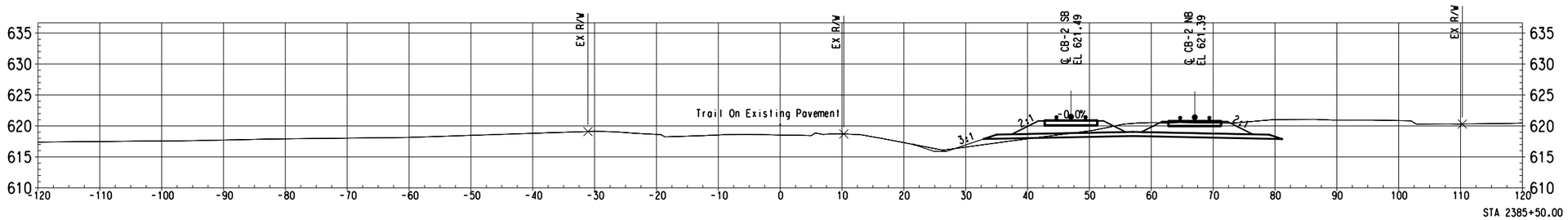
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NOTE:
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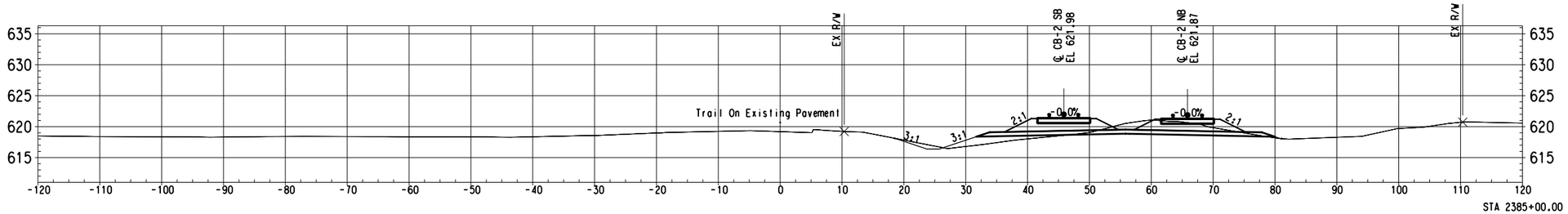
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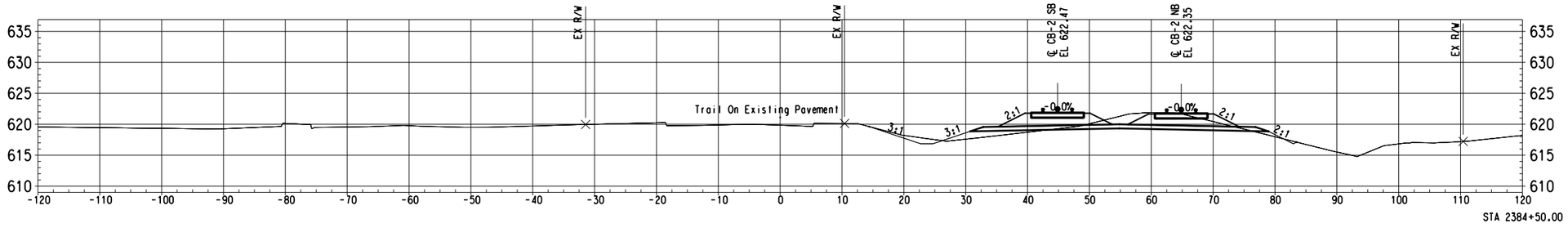
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CONTRACT SHEET No. 90 OF 242

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

TOWN OF ADDISON
CROSS SECTIONS
SHEET 38 OF 43

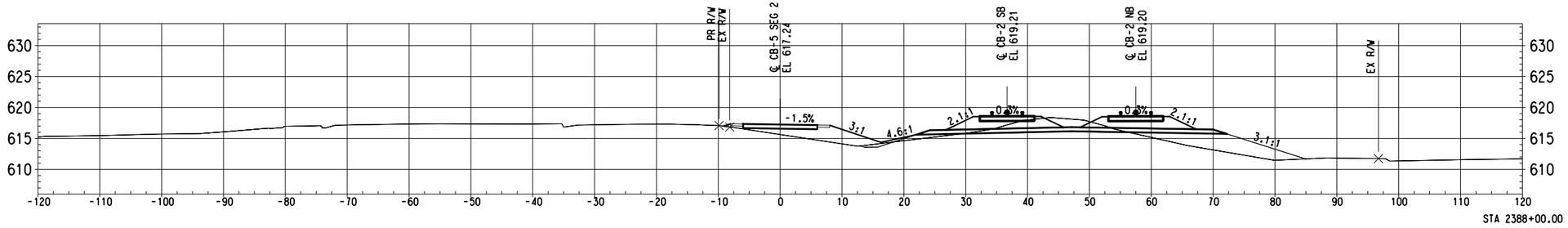
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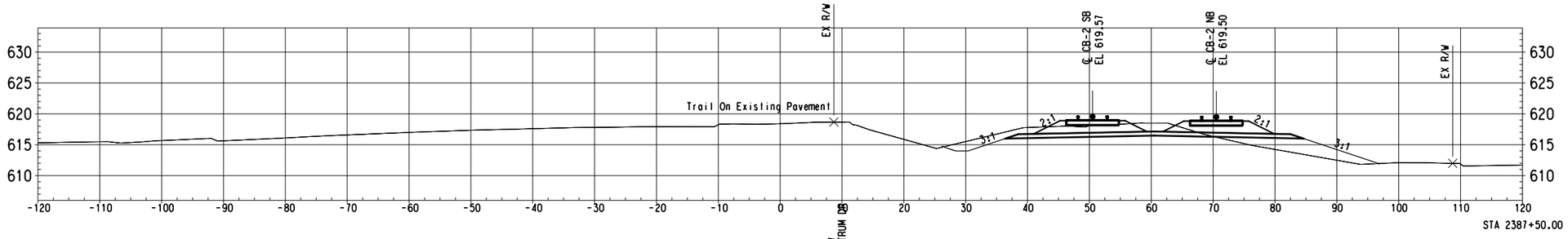
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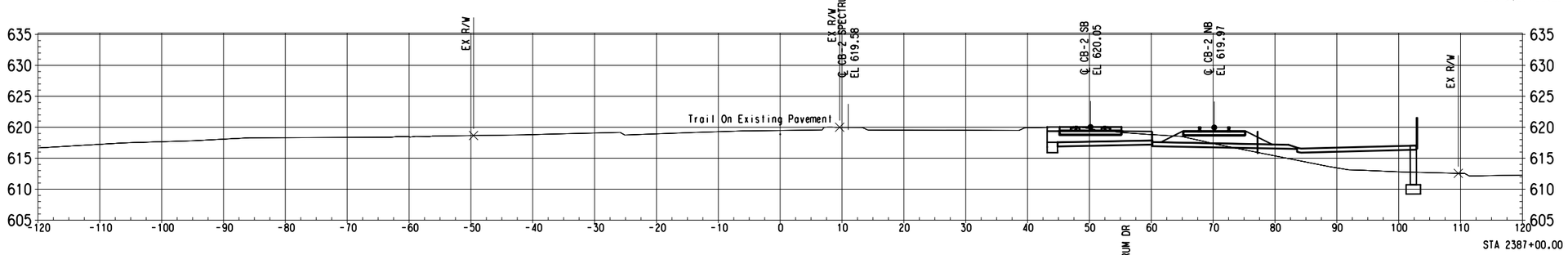
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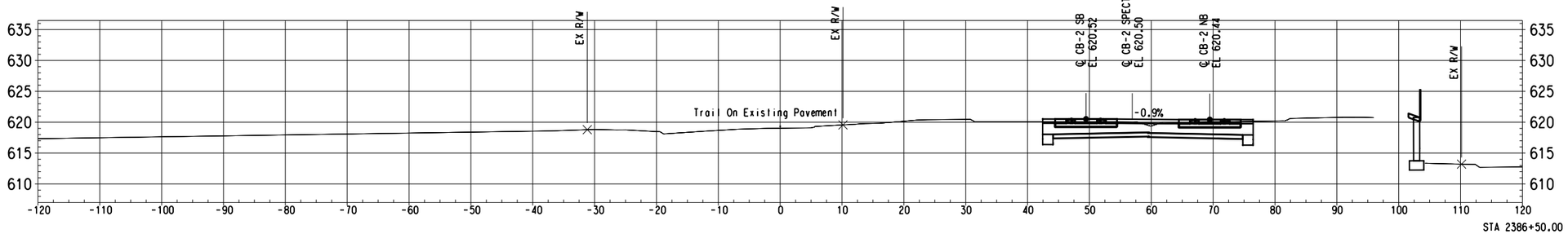
NOTE:
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DESIGNED	S. SALEH
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CONTRACT SHEET No. 91 OF 242

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

TOWN OF ADDISON
CROSS SECTIONS
SHEET 39 OF 43

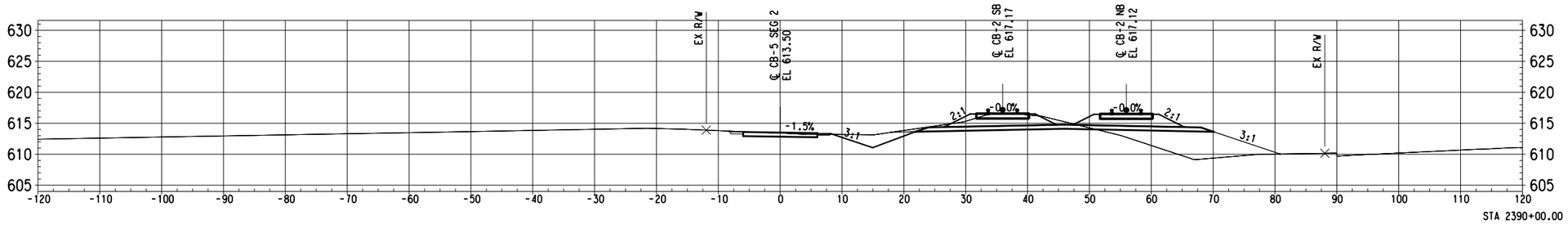
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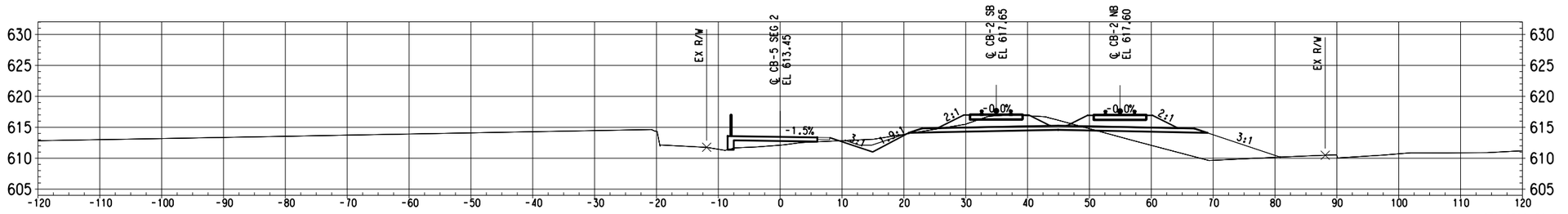
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NOTE:
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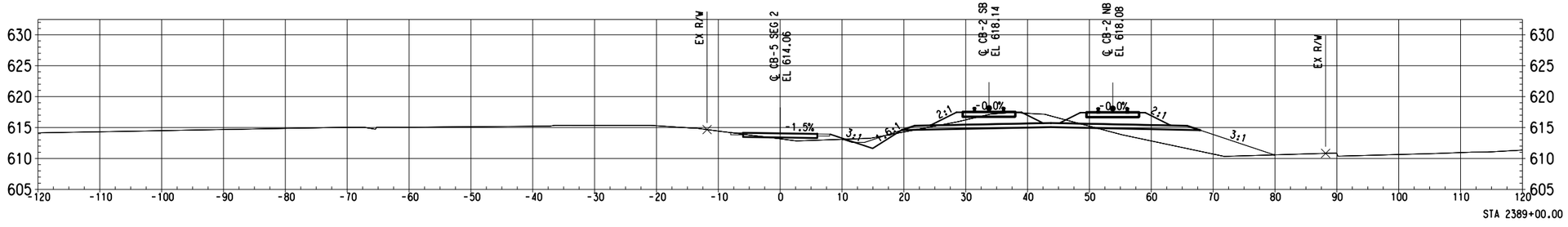
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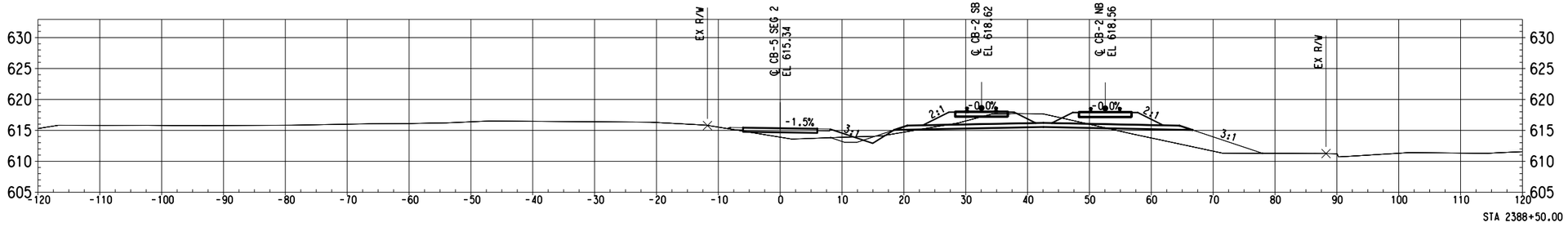
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IN CHARGE	D. LUU
DATE	13 MAR 23

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COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

TOWN OF ADDISON
CROSS SECTIONS
SHEET 40 OF 43

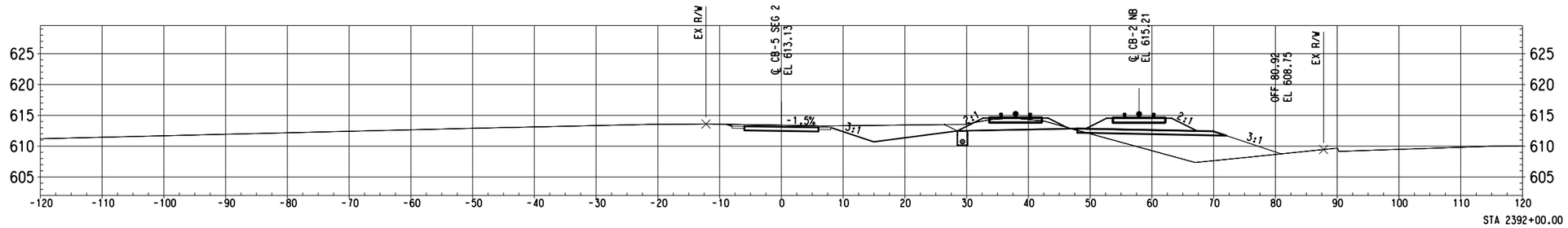
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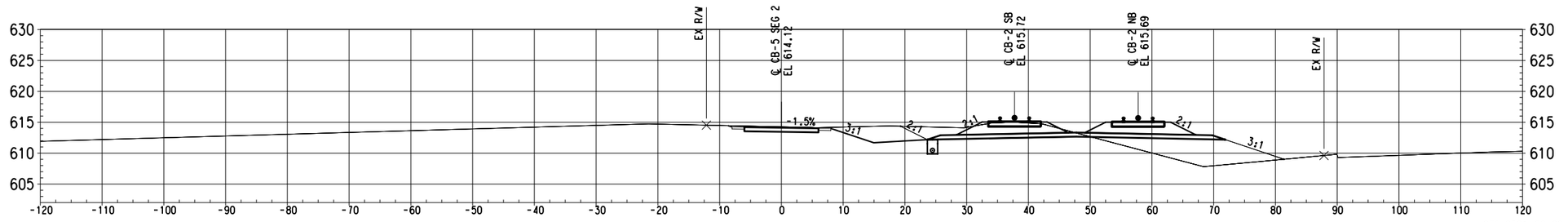
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NOTE:
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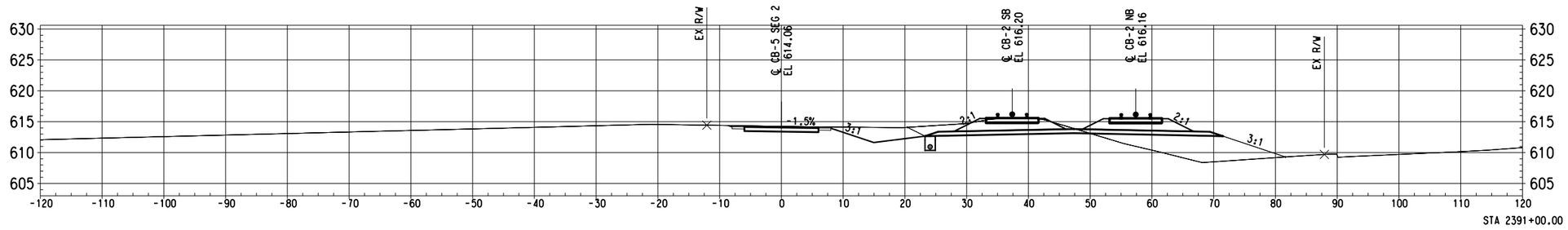
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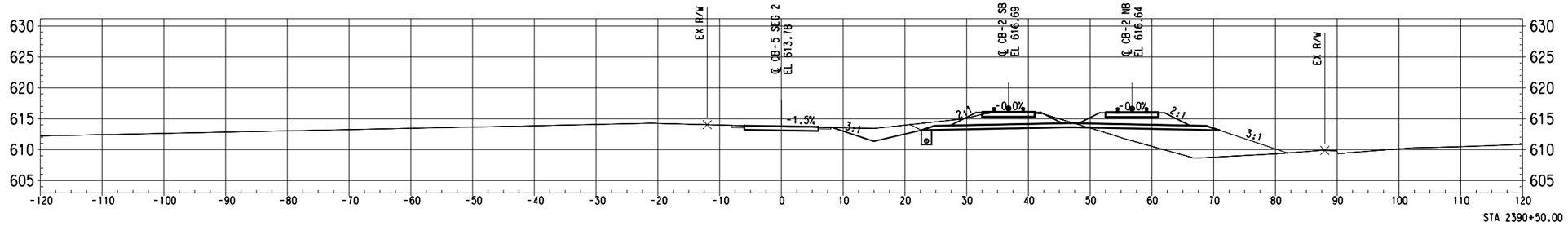
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CONTRACT SHEET No. 93 OF 242

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

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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	AS NOTED
DRAWN	S. SALEH
DESIGNED	S. SALEH
CHECKED	D. LUU
IN CHARGE	D. LUU
DATE	13 MAR 23

CAES

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

TOWN OF ADDISON
CROSS SECTIONS
SHEET 41 OF 43

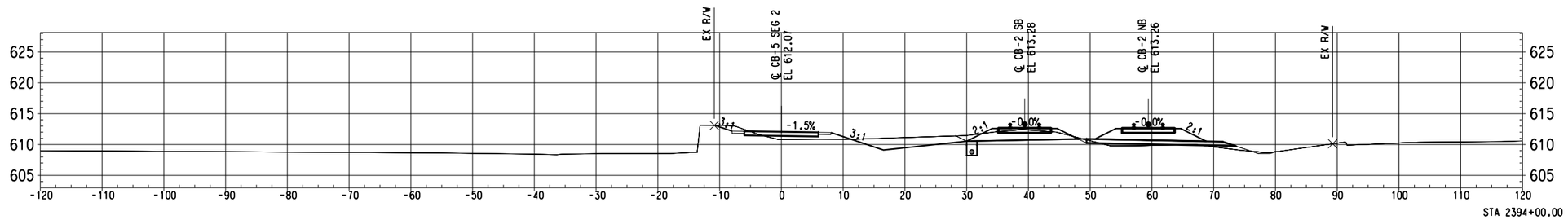
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C-2033270-01	CC1-6990	D

CB05-CC1-6990.000

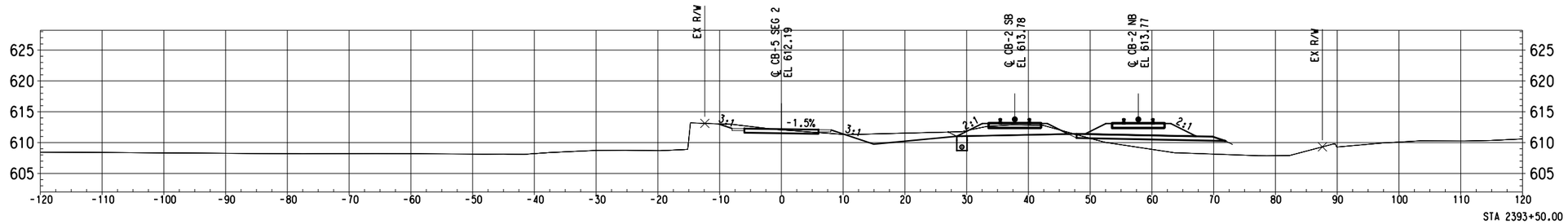
DWG No. CC1-6991

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

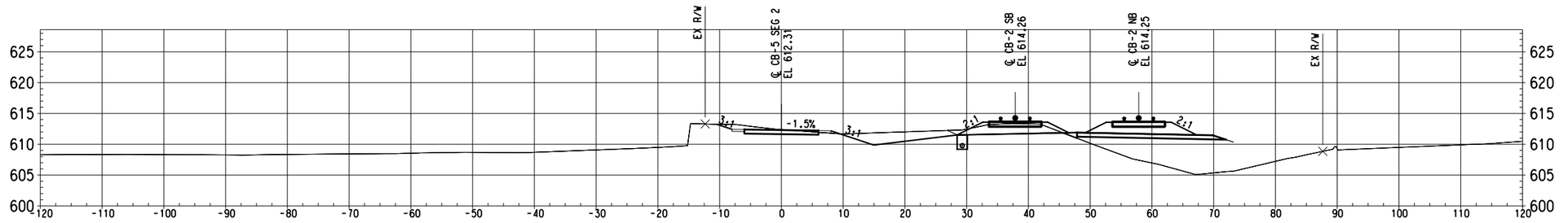
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SCALE (IN FEET)
VERT 0 5 10 15 20



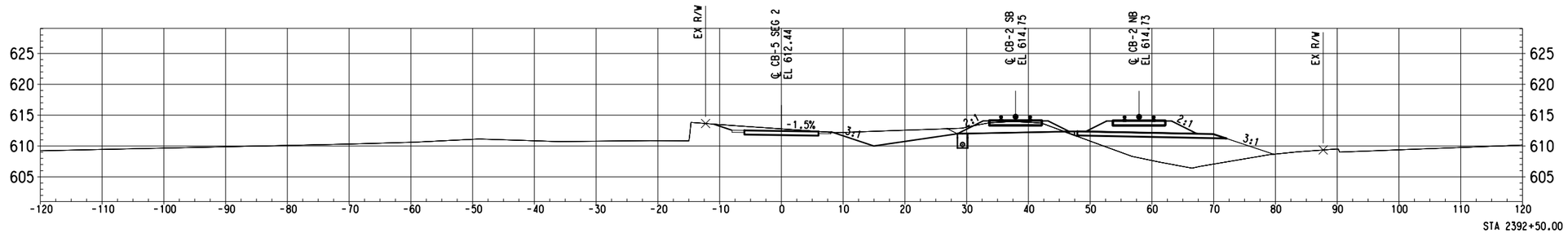
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STA 2393+50.00



STA 2393+00.00



STA 2392+50.00

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CB05-CC1-6991.000

JEGSVCPW001
204 - 2392+50.00

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SCALE	AS NOTED
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DESIGNED	S. SALEH
CHECKED	D. LUU
IN CHARGE	D. LUU
DATE	13 MAR 23

CAES

CONTRACT SHEET No. 94 OF 242

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

TOWN OF ADDISON
CROSS SECTIONS
SHEET 42 OF 43

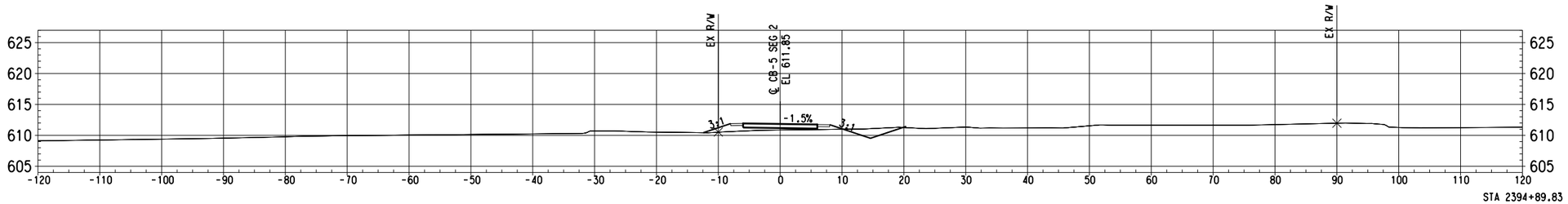
CONTRACT	DWG No.	REV
C-2033270-01	CC1-6991	D

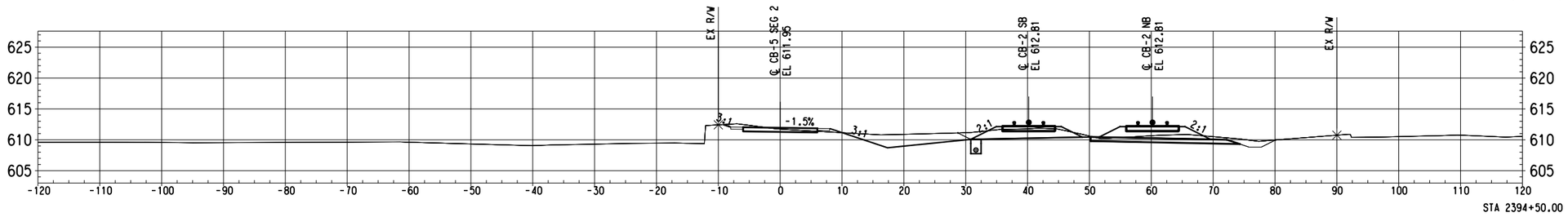
CB05-CC1-6991.000

DWG No. CC1-6992

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 15 20





8-MAR-2023 16:38
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204 - 2394+50.00

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

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CONTRACT SHEET No. 95 OF 242

COTTON BELT REGIONAL RAIL VELOWEB HIKE & BIKE TRAIL

TOWN OF ADDISON
CROSS SECTIONS
SHEET 43 OF 43

CONTRACT	DWG No.	REV
C-2033270-01	CC1-6992	D

CB05-CC1-6992.000

DWG No. WC4-2286

TYPE H3

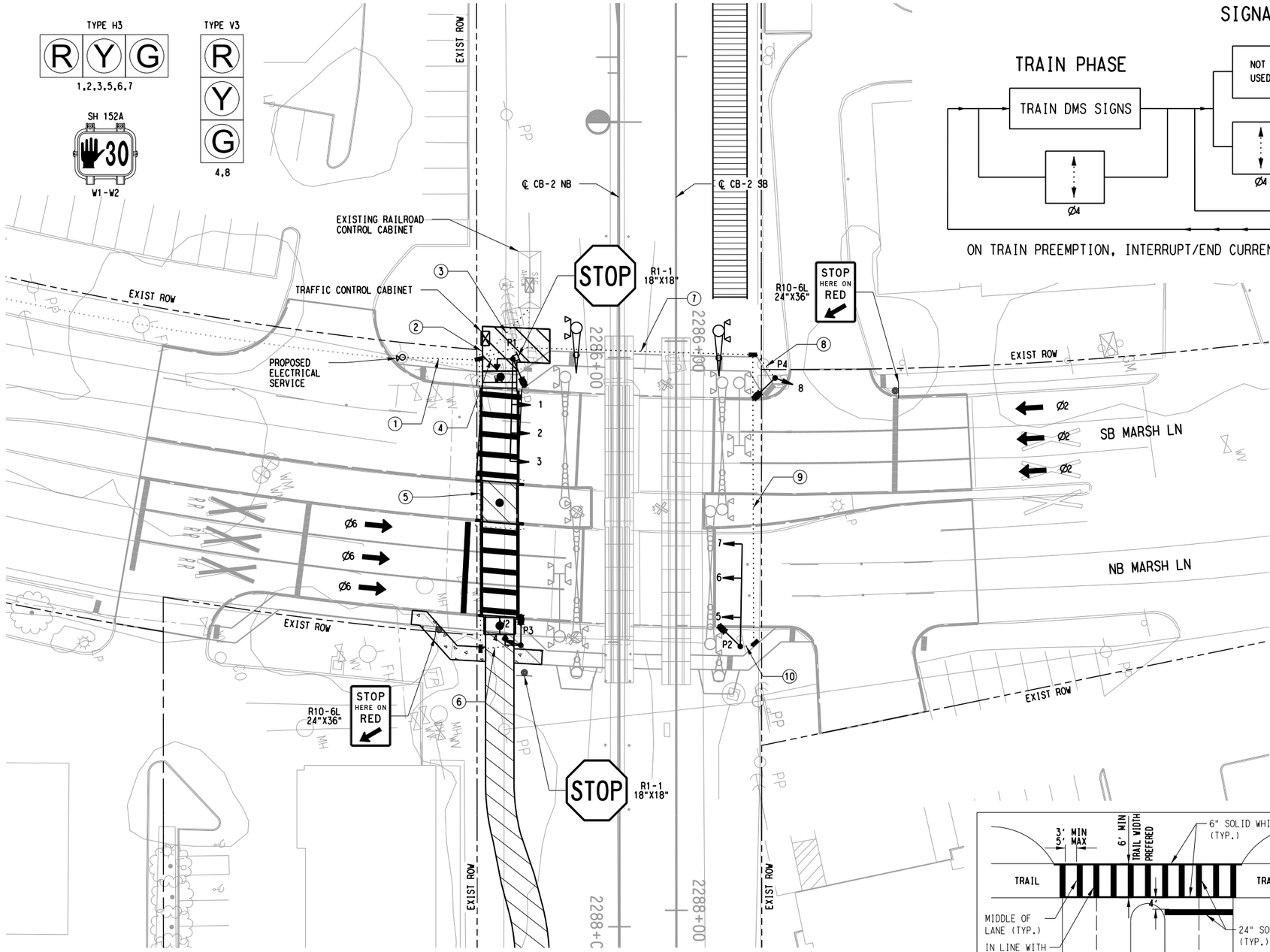
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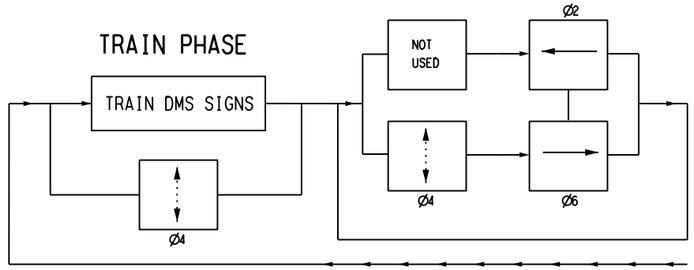
4,8

SH 152A

W1-W2



SIGNAL PHASE DIAGRAM



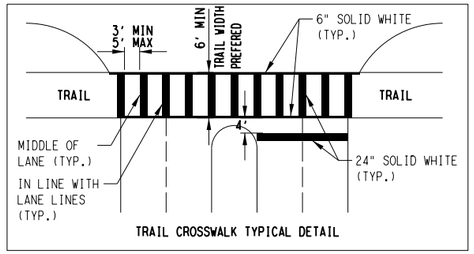
ON TRAIN PREEMPTION, INTERRUPT/END CURRENT PHASE AND RUN PHASE 4



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

1. THE CONTRACTOR SHALL ADJUST STRIPING IN ACCORDANCE WITH THE TRAIL CROSSING TYPICAL DETAIL.



TRAIL CROSSWALK TYPICAL DETAIL

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CONTRACT SHEET No. 96 OF 242

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

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CAES

SCALE	1"=20'
DRAWN	B. SCHAAP
DESIGNED	B. SCHAAP
CHECKED	E. PULTORAK
IN CHARGE	E. PULTORAK
DATE	13 MAR 23

COTTON BELT REGIONAL RAIL VELOWEB HIKE & BIKE TRAIL

SECTION 2-3 TRAFFIC SIGNAL LAYOUT MARSH LN

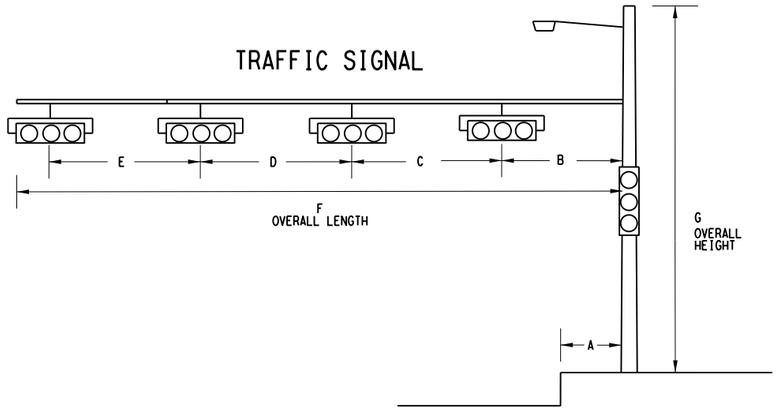
CONTRACT	DWG No.	REV
C-2033270-01	WC4-2286	D

CB05-WC4-2286.020

6-MAR-2023 10:29
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DWG No. WC4-2287

TRAFFIC SIGNAL



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	10	16	10	10		36	30	3			1	1	36-A	13
P2	6	10	14	12		36	30	3			1		36-A	13
P3	9	STREET LIGHT POLE					30		1		1	1	24-A	6
P4	4	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	30	1			1	2	1	2		
2	5	1			1	2			5	2
3	25	1			1				1	
4	15	1			1		1	2	1	1
5	100		1		1		1	2	1	1
6	15	1			1		1	2	1	1
7	100			2	1		1	2	2	
8	15	1			1		1	2	1	
9	100		1		1		1	2	1	
10	5	1			1		1	2	1	
TOTAL (LF)		110	200	200	410	70	380	760	500	140

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
1	BLACK	SPARE	SPARE	SPARE	SPARE
2	WHITE	SIG COMM	SIG COMM	SIG COMM	SIG COMM
3	RED	PH. 2 SH 1,2,3 RED BALL	PH. 6 SH 5,6,7 RED BALL	PH. 6 SH 4 RED BALL	PH. 2 SH 8 RED BALL
4	GREEN	PH. 2 SH 1,2,3 GREEN BALL	PH. 6 SH 5,6,7 GREEN BALL	PH. 6 SH 4 GREEN BALL	PH. 2 SH 8 GREEN BALL
5	ORANGE	PH. 2 SH 1,2,3 YELLOW BALL	PH. 6 SH 5,6,7 YELLOW BALL	PH. 6 SH 4 YELLOW BALL	PH. 2 SH 8 YELLOW BALL
6	BLUE	SH W1:W	SPARE	SH W2:W	SPARE
7	WHITE/BLACK	SH W1:DW	SPARE	SH W2:DW	SPARE
8	RED/BLACK	SPARE	SPARE	SPARE	SPARE
9	GREEN/BLACK	SPARE	SPARE	SPARE	SPARE
10	ORANGE/BLACK	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.

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CONTRACT SHEET No. 97 OF 242

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

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ARCHER WESTERN HERZOG

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DRAWN	B. SCHAAP
DESIGNED	B. SCHAAP
CHECKED	E. PULTORAK
IN CHARGE	E. PULTORAK
DATE	13 MAR 23

CAES

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

SECTION 2-3
TRAFFIC SIGNAL LAYOUT
MARSH LN

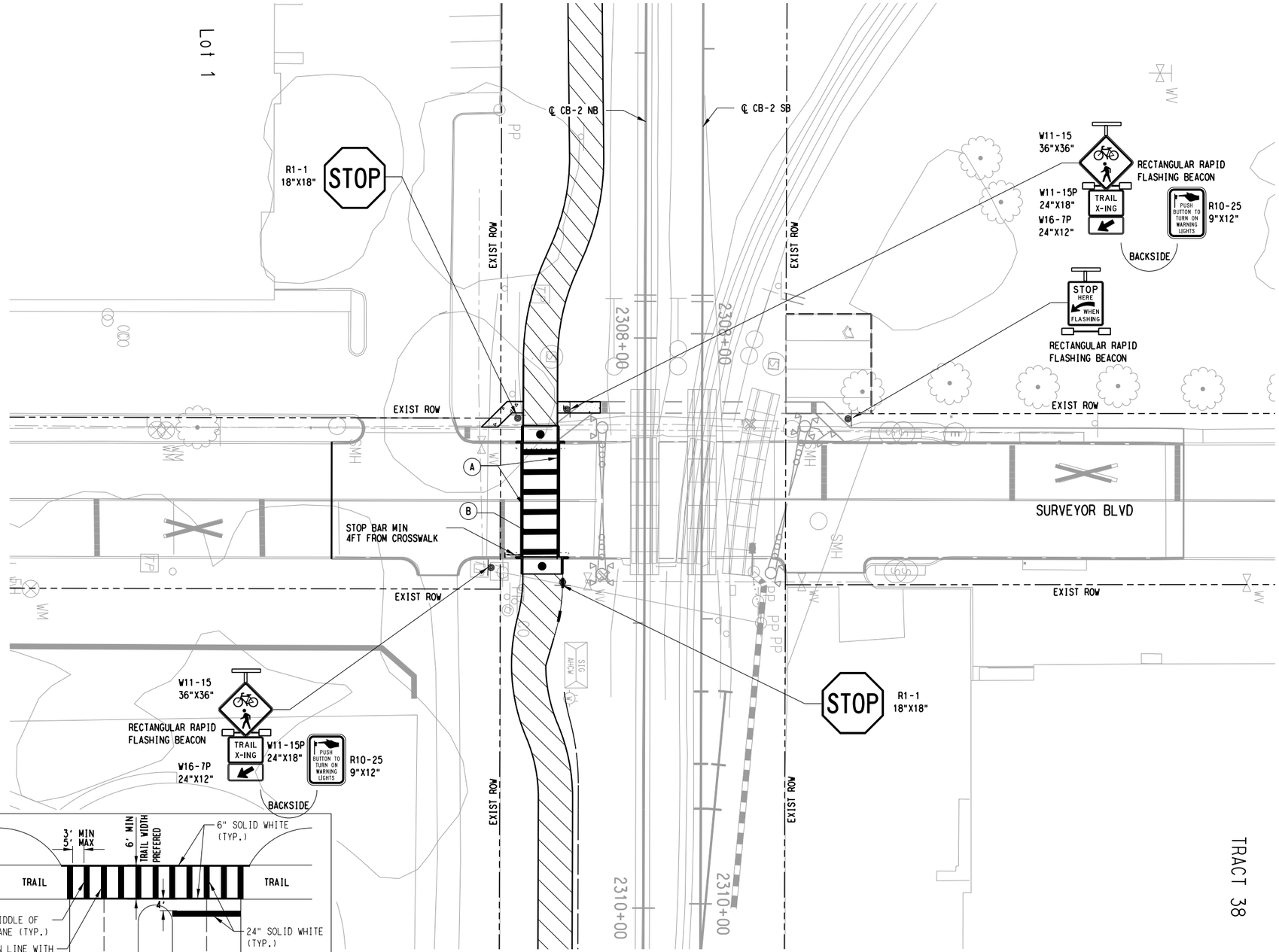
CONTRACT	DWG No.	REV
C-2033270-01	WC4-2287	D

CB05-WC4-2287.020

6-MAR-2023 10:27
CB05-WC4-2287.020

JEGSVCPW001
Default

DWG No. WC3-2308



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. THE CONTRACTOR SHALL CONNECT VIA WIRE OR WIRELESSLY ALL THE FLASHING BEACONS ASSOCIATED WITH THIS CROSSING. ALL BEACONS SHALL FLASH AT THE SAME TIME ONCE CALLED BY TRAIL USER FOR THE AMOUNT OF TIME IT TAKES TO SAFELY CROSS THE ROADWAY VIA THE TRAIL CROSSING.

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CONTRACT SHEET No. 98 OF 242

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

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DRAWN	B. SCHAAP
DESIGNED	B. SCHAAP
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IN CHARGE	E. PULTORAK
DATE	13 MAR 23

CAES

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

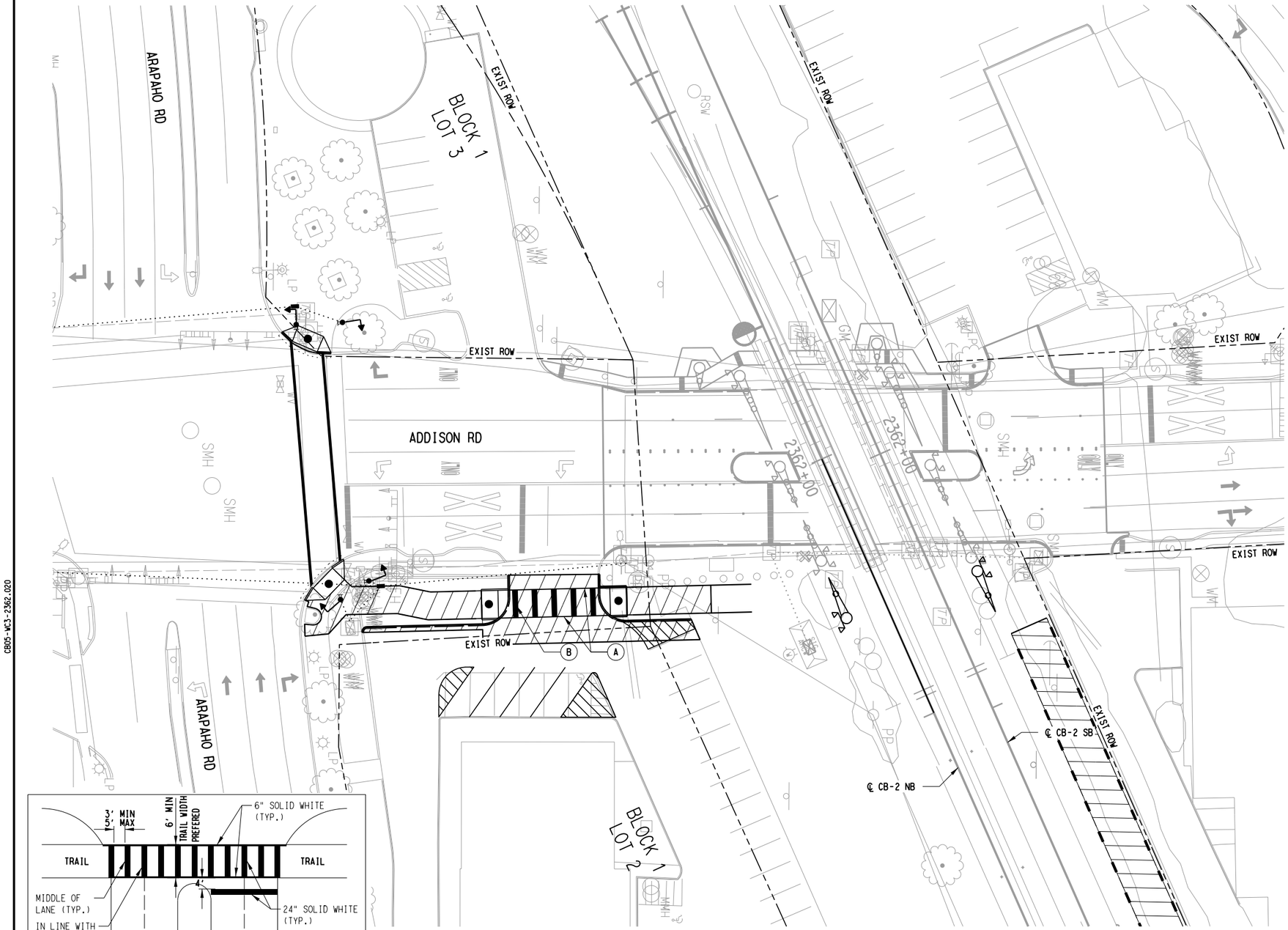
SECTION 2-4
SIGNING AND STRIPING LAYOUT
SURVEYOR BLVD

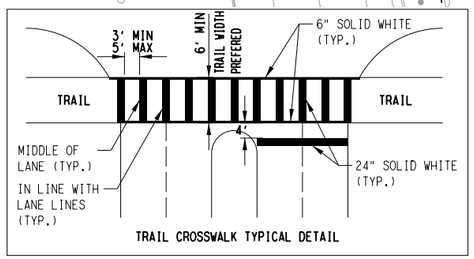
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C-2033270-01	WC3-2308	D

CB05-WC3-2308.020

6-MAR-2023 10:26
CB05-WC3-2308.020
JEGSVCPW001
Default

DWG No. WC3-2362





TRAIL CROSSWALK TYPICAL DETAIL

N

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

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SCALE	1"=20'
DRAWN	B. SCHAAP
DESIGNED	B. SCHAAP
CHECKED	E. PULTORAK
IN CHARGE	E. PULTORAK
DATE	13 MAR 23

CAES

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

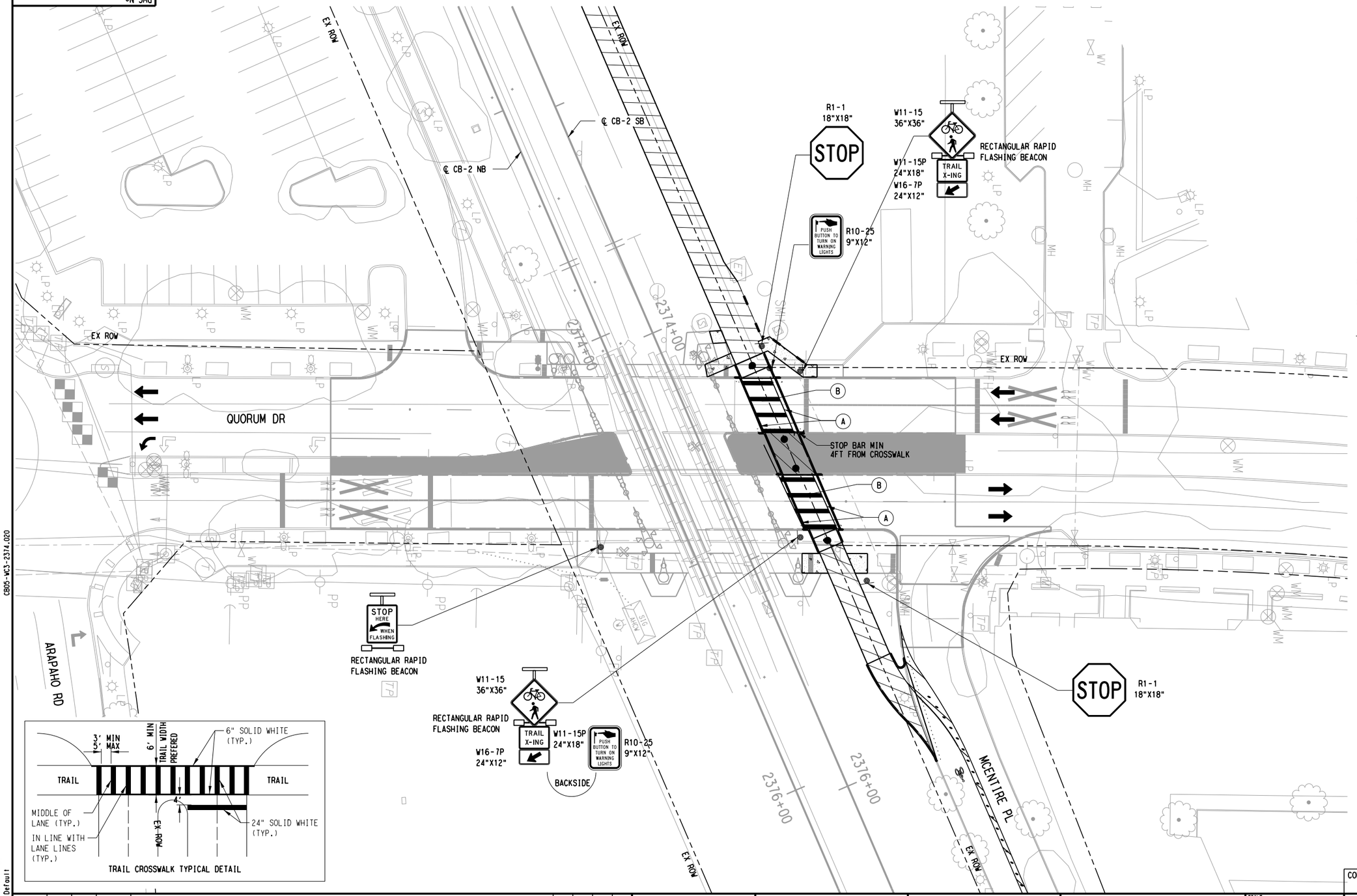
SECTION 2-4
CROSSING EXHIBIT
ADDISON RD

CONTRACT C-2033270-01 | DWG No. WC3-2362 | REV D

CB05-WC3-2362.020

6-MAR-2023 10:25
CB05-WC3-2362.020
JEGSVCPWU01
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DWG No. WC3-2374



TRAIL CROSSWALK TYPICAL DETAIL

SCALE (IN FEET)
0 10 20 40

LEGEND

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COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

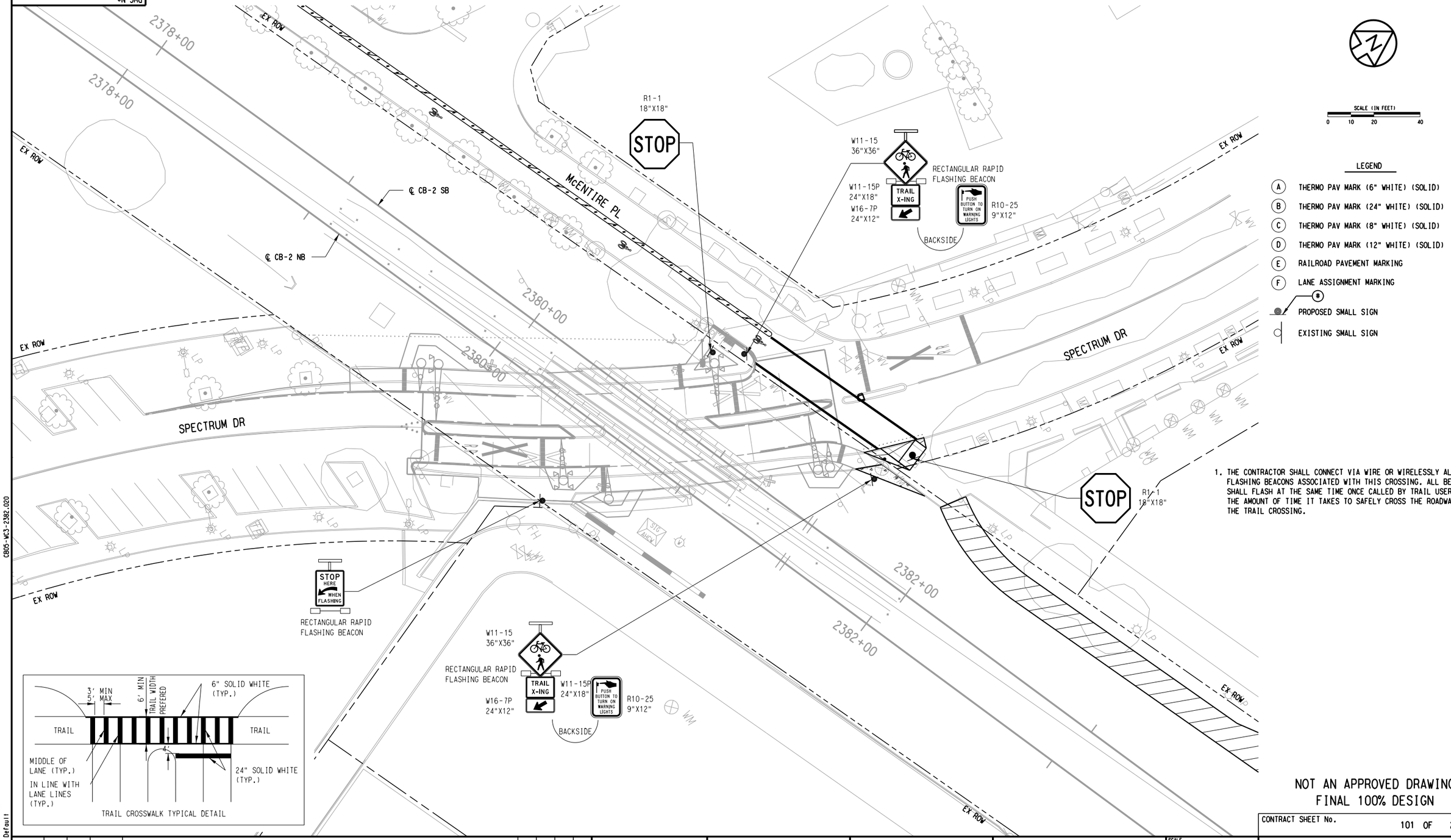
SECTION 2-4
SIGNING AND STRIPING LAYOUT
QUORUM DR

CONTRACT	DWG No.	REV
C-2033270-01	WC3-2374	D

CB05-WC3-2374.020

6-MAR-2023 10:25
CB05-WC3-2374.020
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DWG No. WC3-2382



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REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

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Phone: +1 (214) 638-0145
FIRM REGISTRATION No. F-2966

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	13 MAR 23

CAES

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

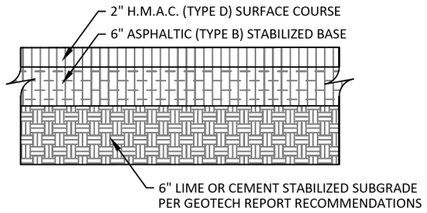
SECTION 2-4
SIGNING AND STRIPING LAYOUT
SPECTRUM DR

CONTRACT	DWG No.	REV
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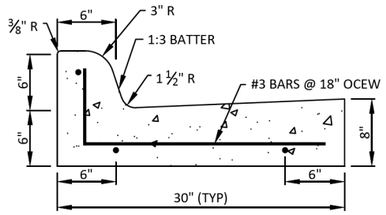
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DWG No. CC1 - 4050



ASPHALT PAVING CROSS SECTION



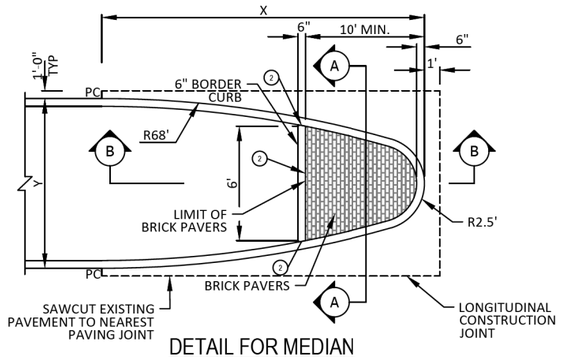
MONOLITHIC CURB
AND GUTTER

ADDISON PUBLIC WORKS & ENGINEERING SERVICES

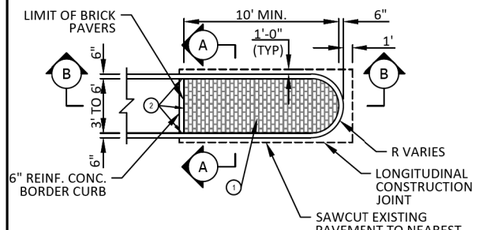
ASPHALT PAVING CROSS SECTION WITH CURB AND GUTTER

STANDARD CONSTRUCTION DETAILS
PAVING

DATE:	REV DATE:	SHEET:
JANUARY 2022	-	SD-P05



DETAIL FOR MEDIAN
WIDER THAN 6' (Y>6')
NTS



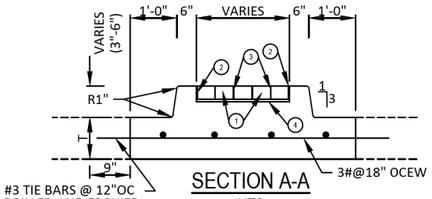
DETAIL FOR MEDIAN
3'-0" TO 6'-0"
NTS

DIMENSION OF MEDIAN NOSE

X = 13.90' Y = 7.0'	X = 28.80' Y = 16.0'
X = 16.44' Y = 8.0'	X = 29.89' Y = 17.0'
X = 18.08' Y = 9.0'	X = 30.90' Y = 18.0'
X = 20.42' Y = 10.0'	X = 32.93' Y = 20.0'
X = 26.36' Y = 14.0'	X = 36.47' Y = 24.0'
X = 27.60' Y = 15.0'	

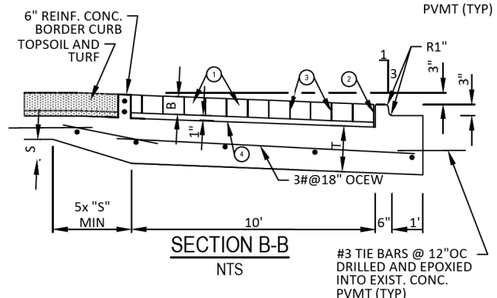
1. VEHICULAR BRICK PAVER
2. 1/2" BITUMINOUS EXPANSION JOINT MATERIAL SHALL BE SUFFICIENT TO PREVENT CONTACT BETWEEN WALK & CURB. STOP EXPANSION JOINT AT 1/4" BELOW TOP OF CURB AND FILL WITH CONC. GRAY SEALANT.
3. JOINT SAND COMPRISED OF CRUSHED GRANITE SAND CONFORMING TO ASTM C144 AND A DRY MIX POLYMER BASED JOINT SAND STABILIZER. JOINT SAND STABILIZER SHALL BE APPROVED BY PUBLIC WORKS & ENGINEERING SERVICES PRIOR TO INSTALLATION.
4. BEDDING SAND COMPRISED OF 90% NATURAL OR CRUSHED GRANITE SAND CONFORMING TO ASTM C33 AND 10% PORTLAND CEMENT.

T = PAVEMENT THICKNESS
B = BRICK PAVER THICKNESS



#3 TIE BARS @ 12"OC DRILLED AND EPOXIED INTO EXIST. CONC. PVMT (TYP)

SECTION A-A
NTS



SECTION B-B
NTS

NOTES:

1. BRICK PAVERS HALL BE VEHICULAR PAVERS CONFORMING TO ASTM C1272, TYPE R APPLICATION AND SHALL BE APPROVED BY PUBLIC & ENGINEERING SERVICES.
2. BRICK PAVERS SHALL BE WITHOUT FROGS OR CORES IN SURFACE EXPOSED TO VIEW IN THE COMPLETED WORKS.
3. MEDIAN PAVERS SHALL EXTEND TO A POINT WHERE MEDIAN IS AT LEAST 6' WIDE. IF MEDIAN IS 6' WIDE OR LESS, PAVERS SHALL EXTEND 10' FROM THE NOSE.
4. ALL DISTANCES ARE MINIMUM.
5. THE PORTION OF THE MEDIAN THAT IS 4' WIDE OF LESS SHOULD BE PAVED OR PLANTED WITH SOD/ GROUNDCOVER

ADDISON PUBLIC WORKS & ENGINEERING SERVICES

MEDIAN DETAILS

STANDARD CONSTRUCTION DETAILS
PAVING

DATE:	REV DATE:	SHEET:
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CONTRACT SHEET No. 102 OF 242

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ARCHER WESTERN HERZOG

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DESIGNED	C. BAGBY
CHECKED	C. BAGBY
IN CHARGE	D. LUU
DATE	13 MAR 23

CAES

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

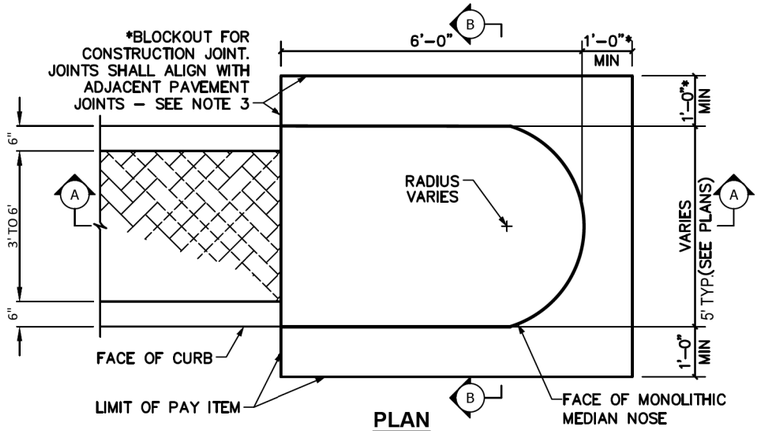
TOWN OF ADDISON
CITY STANDARDS - CIVIL
SHEET 1 OF 13

CONTRACT	DWG No.	REV
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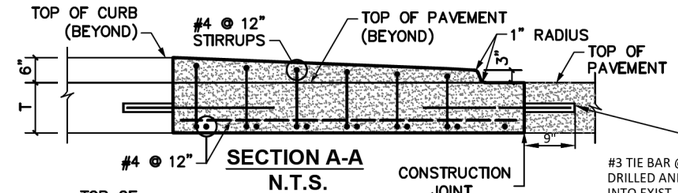
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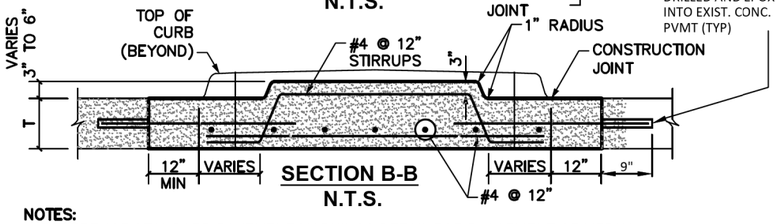
DWG No. CC1 - 4051



PLAN



SECTION A-A
N.T.S.

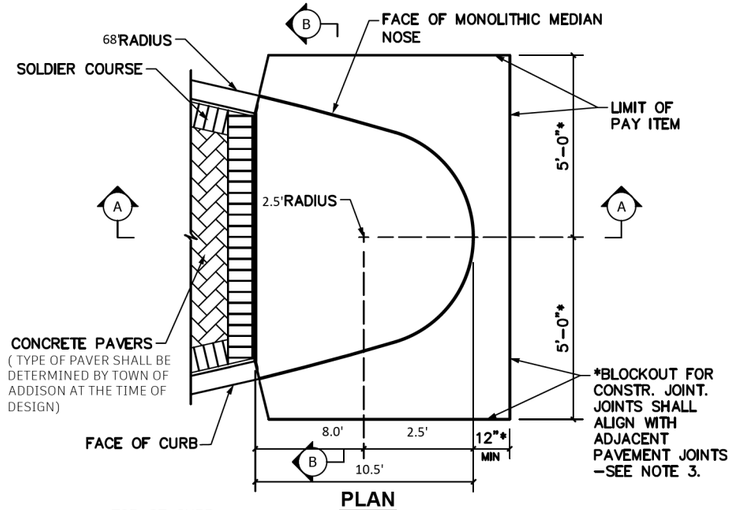


SECTION B-B
N.T.S.

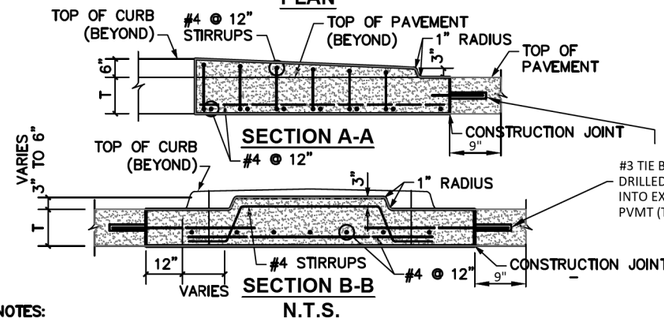
NOTES:
1. REFERENCE STANDARD PAVEMENT MARKINGS DETAIL FOR PLACEMENT OF MEDIAN NOSE PAVEMENT MARKERS.
2. PROVIDE TYPE 1 MONOLITHIC MEDIAN NOSE AT ALL MEDIANS 8' WIDE OR LESS.
3. CONSTRUCTION JOINT MAY BE AN EXPANSION JOINT WHEN INSTALLING MONOLITHIC MEDIAN NOSE ADJACENT TO EXISTING PAVEMENT AT DISCRETION OF ENGINEER.

MONOLITHIC MEDIAN NOSE TYPE 1
N.T.S.

ADDISON PUBLIC WORKS & ENGINEERING SERVICES	MONOLITHIC MEDIAN NOSE TYPE 1	STANDARD CONSTRUCTION DETAILS PAVING		
		DATE: JANUARY 2022	REV DATE: -	SHEET: SD-P14



PLAN



SECTION A-A

SECTION B-B
N.T.S.

NOTES:
1. REFERENCE STANDARD PAVEMENT MARKINGS DETAIL FOR PLACEMENT OF MEDIAN NOSE PAVEMENT MARKERS.
2. PROVIDE TYPE 2 MONOLITHIC MEDIAN NOSE AT ALL MEDIANS GREATER THAN 8' WIDE.
3. CONSTRUCTION JOINT MAY BE AN EXPANSION JOINT WHEN INSTALLING MONOLITHIC MEDIAN NOSE ADJACENT TO EXISTING PAVEMENT AT DISCRETION OF ENGINEER.

MONOLITHIC MEDIAN NOSE TYPE 2
N.T.S.

ADDISON PUBLIC WORKS & ENGINEERING SERVICES	MONOLITHIC MEDIAN NOSE TYPE 2	STANDARD CONSTRUCTION DETAILS PAVING		
		DATE: JANUARY 2022	REV DATE: -	SHEET: SD-P15

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FIRM NO. F-819

ARCHER WESTERN HERZOG

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SCALE	NO SCALE
DRAWN	C. BAGBY
DESIGNED	C. BAGBY
CHECKED	C. BAGBY
IN CHARGE	D. LUU
DATE	13 MAR 23

CAES

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CONTRACT SHEET No. 103 OF 242

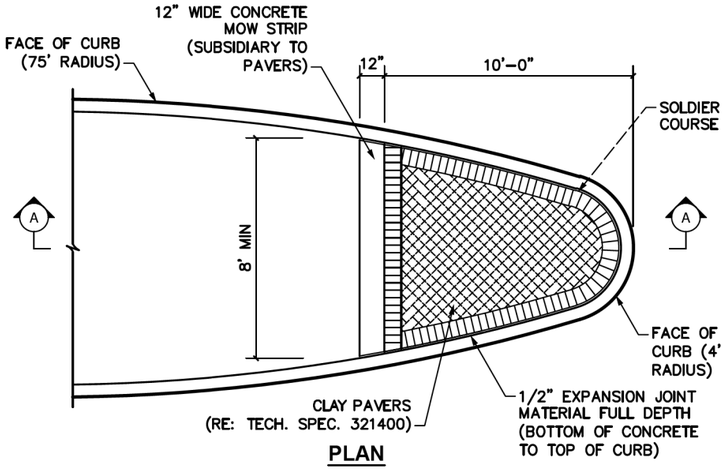
COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

TOWN OF ADDISON
CITY STANDARDS - CIVIL
SHEET 2 OF 13

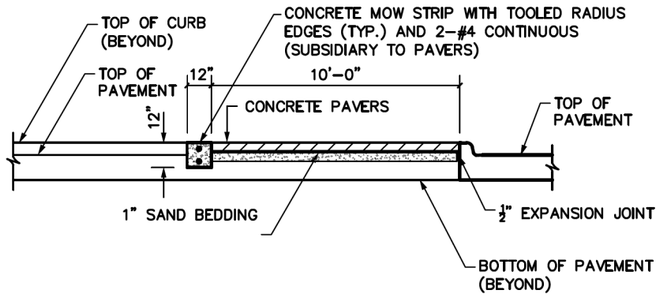
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CB05-CC1-4051.001

DWG No. CC1-4052



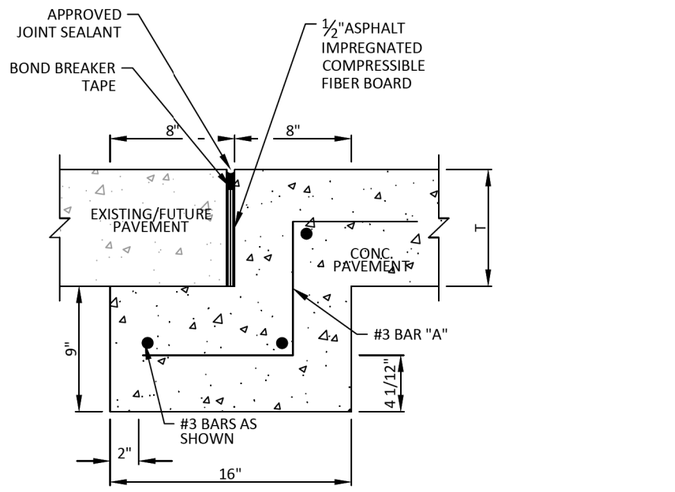
PLAN



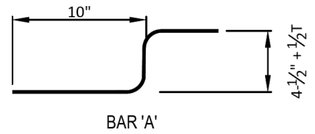
SECTION A-A
N.T.S.

MONOLITHIC MEDIAN NOSE TYPE 3

ADDISON PUBLIC WORKS & ENGINEERING SERVICES	MONOLITHIC MEDIAN NOSE TYPE 3	STANDARD CONSTRUCTION DETAILS PAVING		
		DATE: JANUARY 2022	REV DATE: -	SHEET: SD-P16



STREET HEADER
NTS



BAR 'A'

NOTES
1. PAVEMENT BARS TO BE BENT DOWN INTO HEADER.
2. HEADER AND PAVEMENT TO BE MONOLITHIC

T = PAVEMENT THICKNESS

ADDISON PUBLIC WORKS & ENGINEERING SERVICES	STREET HEADER	STANDARD CONSTRUCTION DETAILS PAVING		
		DATE: JANUARY 2022	REV DATE: -	SHEET: SD-P17

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CHECKED	C. BAGBY
IN CHARGE	D. LUU
DATE	13 MAR 23

CAES

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

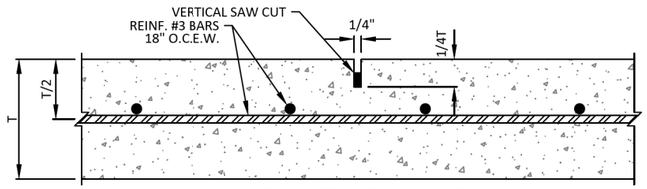
TOWN OF ADDISON
CITY STANDARDS - CIVIL
SHEET 3 OF 13

CONTRACT	DWG No.	REV
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CB05-CC1-4052.001

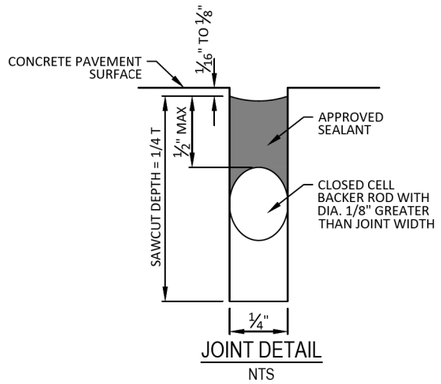
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DWG No. CC1 - 4053



SAWCUT CONTRACTION JOINT

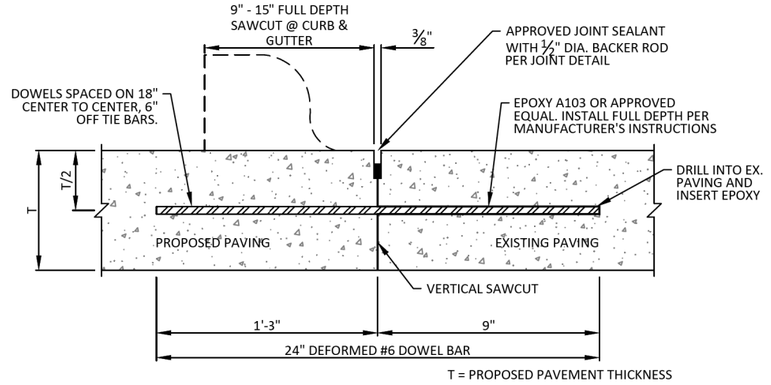
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JOINT DETAIL

NTS

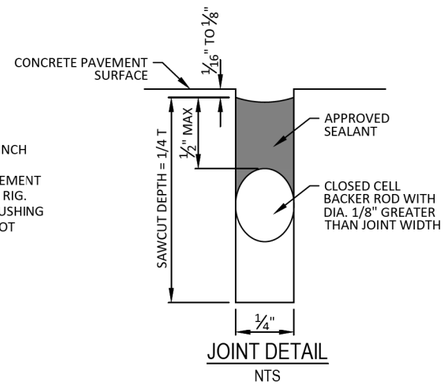
ADDISON PUBLIC WORKS & ENGINEERING SERVICES	SAWCUT CONTRACTION JOINT	STANDARD CONSTRUCTION DETAILS PAVING	
		DATE: JANUARY 2022	REV DATE: -	SHEET: SD-P19



T = PROPOSED PAVEMENT THICKNESS

LONGITUDINAL BUTT JOINT

NTS



JOINT DETAIL

NTS

NOTE:

1. NO. 5 DEFORMED BAR MAY BE USED IN 6 INCH PAVEMENT
2. DOWEL BARS SHALL BE DRILLED INTO PAVEMENT HORIZONTALLY BY USE OF A MECHANICAL RIG.
3. DRILLING BY HAND IS NOT ACCEPTABLE, PUSHING DOWEL BARS INTO GREEN CONCRETE IS NOT ACCEPTABLE.

ADDISON PUBLIC WORKS & ENGINEERING SERVICES	LONGITUDINAL BUTT JOINT	STANDARD CONSTRUCTION DETAILS PAVING	
		DATE: JANUARY 2022	REV DATE: -	SHEET: SD-P20

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COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

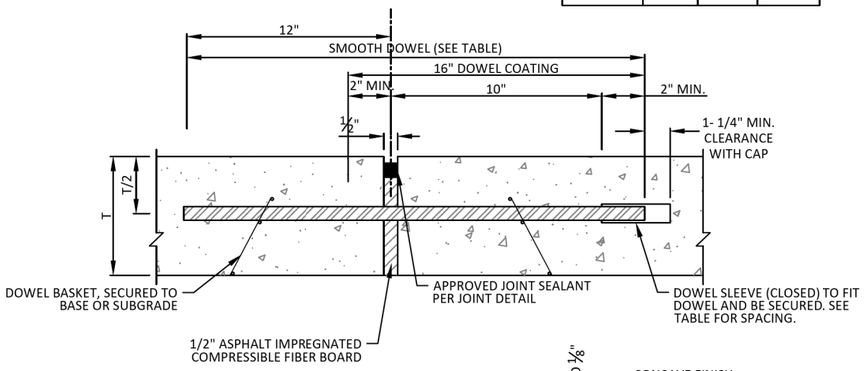
TOWN OF ADDISON
CITY STANDARDS - CIVIL
SHEET 4 OF 13

CONTRACT	DWG No.	REV
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CB05-CC1-4053.001

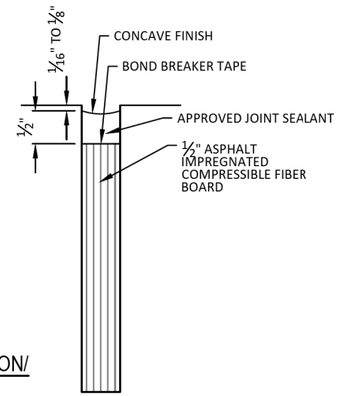
DWG No. CC1 - 4054

PAVEMENT THICKNESS	DOWEL DIA.	DOWEL LENGTH	DOWEL SPACING
6"	¾"	24"	12"
7"	1"	24"	12"
8"	1"	24"	12"



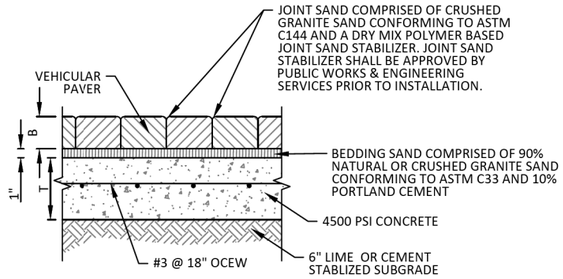
NOTES
1. DOWELS AND REINFORCING BARS SHALL BE SUPPORTED BY AN APPROVED DEVICE AND MUST BE TIED OR CHAIRED ON EACH SIDE.
2. DOWELS MUST BE PERPENDICULAR TO FACE OF CONCRETE.
3. NO. 5 SMOOTH DOWEL BARS MAY BE USED IN 6" PAVEMENT.
4. TRANSVERSE EXPANSION JOINTS SHALL BE LOCATED AT INTERSECTIONS.

TRANSVERSE ISOLATION/ EXPANSION JOINT
NTS

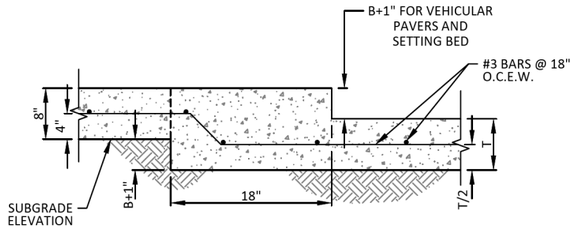


JOINT DETAIL
NTS

ADDISON PUBLIC WORKS & ENGINEERING SERVICES	TRANSVERSE EXPANSION JOINT	STANDARD CONSTRUCTION DETAILS PAVING		
		DATE: JANUARY 2022	REV DATE: -	SHEET: SD-P21



BRICK PAVER INSTALLATION IN VEHICULAR AREAS
NTS

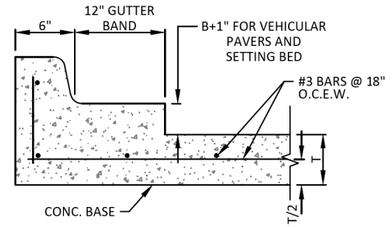


LONGITUDINAL SECTION AT DROP SLAB
NTS

* NO CURB AT BARRIER FREE RAMP

NOTES
1. VEHICULAR PAVERS SHALL BE HEAVY PAVING BRICK MEETING ASTM C1272, TYPE R, APPLICATION AND BE APPROVED BY PUBLIC WORKS & ENGINEERING SERVICES.
2. PROVIDE BRICK WITHOUT FROGS OR CORES IN SURFACES EXPOSED TO VIEW IN COMPLETED WORK.

T = PAVEMENT THICKNESS
B = BRICK PAVER THICKNESS



SECTION THRU CURB AT DROP SLAB
NTS

ADDISON PUBLIC WORKS & ENGINEERING SERVICES	BRICK PAVER INSTALLATION IN VEHICULAR AREAS	STANDARD CONSTRUCTION DETAILS PAVING		
		DATE: JANUARY 2022	REV DATE: -	SHEET: SD-P22

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CHECKED	C. BAGBY
IN CHARGE	D. LUU
DATE	13 MAR 23

CAES

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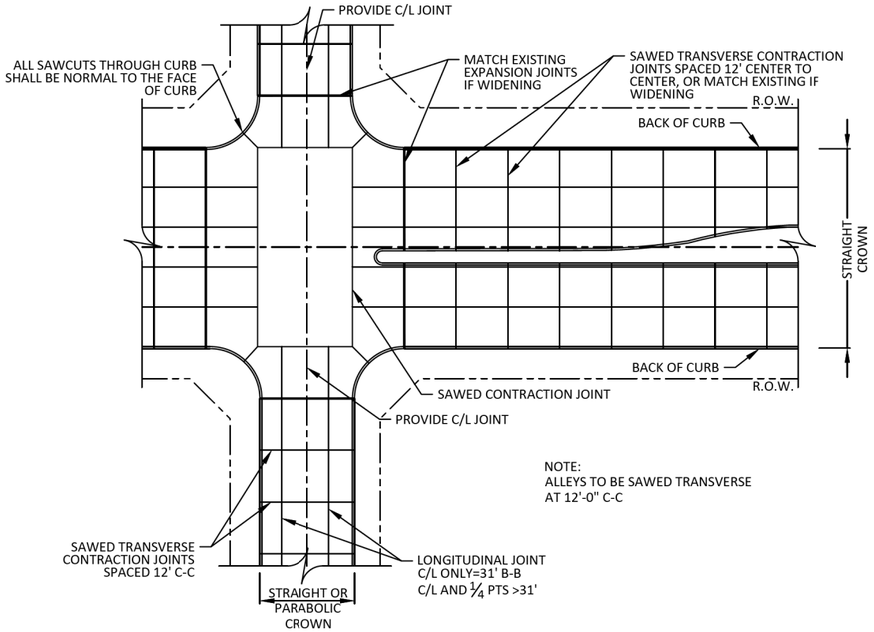
COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

TOWN OF ADDISON
CITY STANDARDS - CIVIL
SHEET 5 OF 13

CONTRACT	DWG No.	REV
C-2033270-01	CC1-4054	D

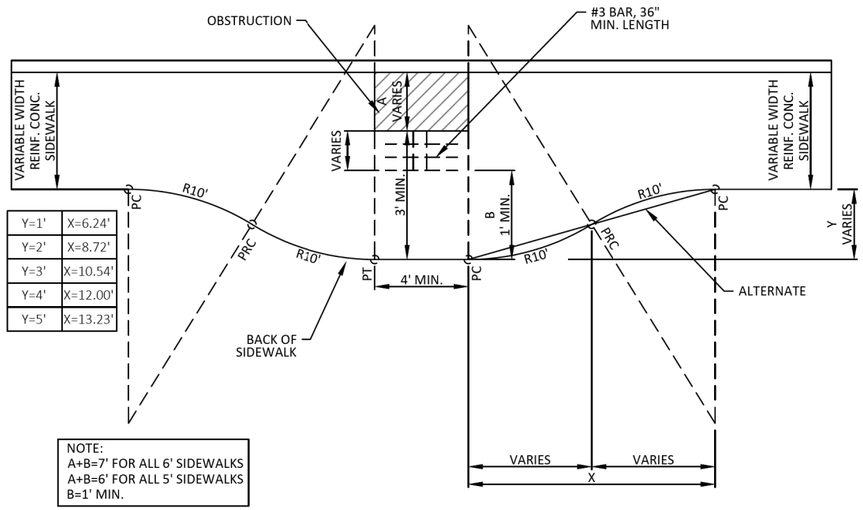
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DWG No. CC1 - 4055



SPACING DIAGRAM FOR TRANSVERSE JOINTS

NTS



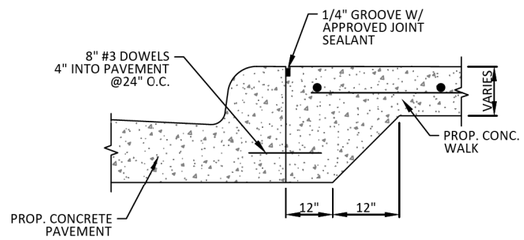
Y=1'	X=6.24'
Y=2'	X=8.72'
Y=3'	X=10.54'
Y=4'	X=12.00'
Y=5'	X=13.23'

NOTE:
A+B=7' FOR ALL 6' SIDEWALKS
A+B=6' FOR ALL 5' SIDEWALKS
B=1' MIN.

SIDEWALK WIDENING REQUIRED AROUND OBSTACLE IN SIDEWALK

NTS

NOTE:
BUFFER, SIDEWALK, AND PARKWAY WIDTHS SHALL BE PER THE MASTER TRANSPORTATION PLAN



JOINT DETAIL FOR SIDEWALKS ADJACENT TO CURB

NTS

ADDISON PUBLIC WORKS & ENGINEERING SERVICES	SPACING DIAGRAM FOR TRANSVERSE JOINTS	STANDARD CONSTRUCTION DETAILS PAVING	
		DATE: JANUARY 2022	REV DATE: -	SHEET: SD-P23

ADDISON PUBLIC WORKS & ENGINEERING SERVICES	SIDEWALK WIDENING & SIDEWALK ADJACENT TO CURB	STANDARD CONSTRUCTION DETAILS PAVING	
		DATE: JANUARY 2022	REV DATE: -	SHEET: SD-P25

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CONTRACT SHEET No. 107 OF 242

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

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DESIGNED	C. BAGBY
CHECKED	C. BAGBY
IN CHARGE	D. LUU
DATE	13 MAR 23

CAES

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

TOWN OF ADDISON
CITY STANDARDS - CIVIL
SHEET 6 OF 13

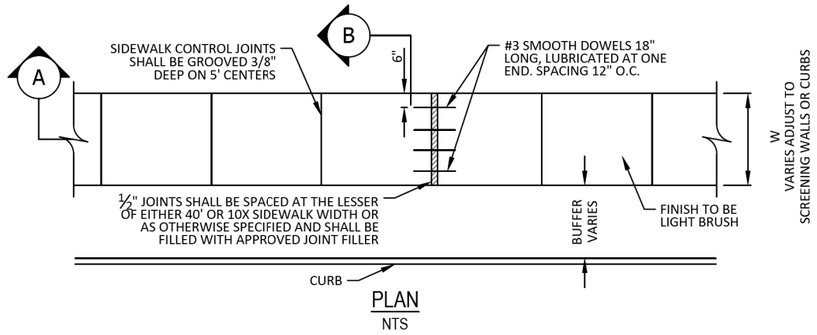
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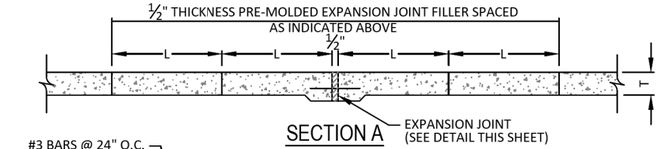
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ssaleh
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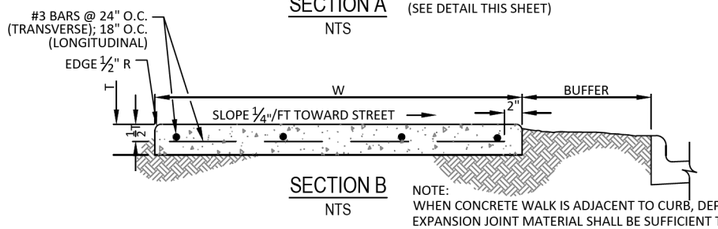
DWG No. CC1 - 4056



PLAN
NTS



SECTION A
NTS

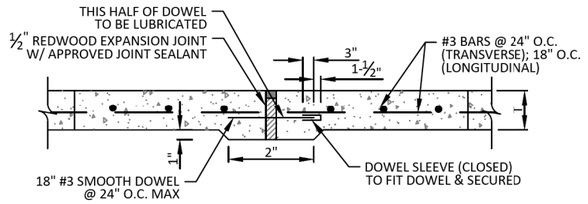


SECTION B
NTS

NOTE:
WHEN CONCRETE WALK IS ADJACENT TO CURB, DEPTH OF EXPANSION JOINT MATERIAL SHALL BE SUFFICIENT TO PREVENT CONCRETE TO CONCRETE CONTACT BETWEEN WALK AND CURB.

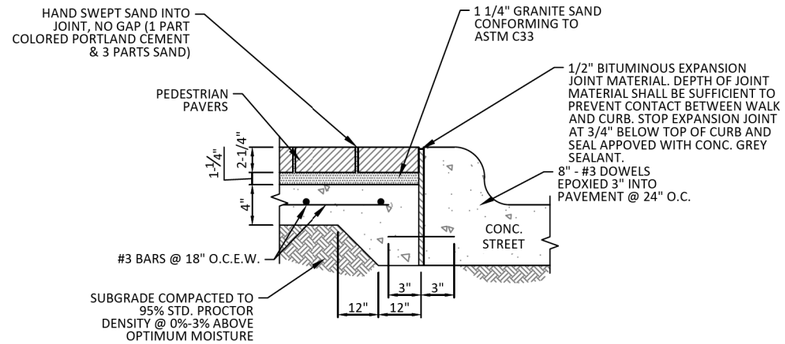
SIDEWALK WIDTH(W)	PANEL LENGTH(L)	SIDEWALK THICKNESS(T)
5'	5'	4"
6'	6'	5"
8'	8'	5"

NOTE:
BUFFER, SIDEWALK, AND PARKWAY WIDTHS SHALL BE PER THE MASTER TRANSPORTATION PLAN

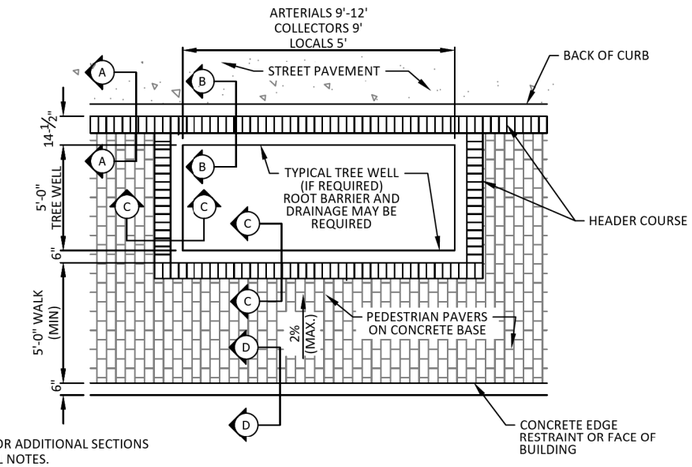


EXPANSION JOINT DETAIL
NTS

ADDISON PUBLIC WORKS & ENGINEERING SERVICES	CONCRETE SIDEWALK	STANDARD CONSTRUCTION DETAILS PAVING		
		DATE: JANUARY 2022	REV DATE: -	SHEET: SD-P26



SECTION A-A
NTS



NOTE:
1. SEE SD-P28 FOR ADDITIONAL SECTIONS AND GENERAL NOTES.
2. BUFFER, SIDEWALK, AND PARKWAY WIDTHS SHALL BE PER THE MASTER TRANSPORTATION PLAN.
3. REFER TO SUBSURFACE DRAINAGE (D-36) DETAIL IN STORM DRAIN DETAIL SET.

SIDEWALK PLAN: BRICK PAVERS
NTS

ADDISON PUBLIC WORKS & ENGINEERING SERVICES	SIDEWALK BRICK PAVERS	STANDARD CONSTRUCTION DETAILS PAVING		
		DATE: JANUARY 2022	REV DATE: -	SHEET: SD-P27

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

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CHECKED	C. BAGBY
IN CHARGE	D. LUU
DATE	13 MAR 23

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CONTRACT SHEET No. 108 OF 242

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

TOWN OF ADDISON
CITY STANDARDS - CIVIL
SHEET 7 OF 13

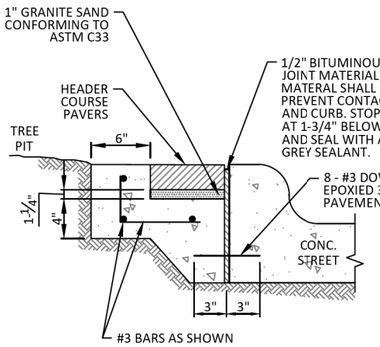
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CB05-CC1-4056.001

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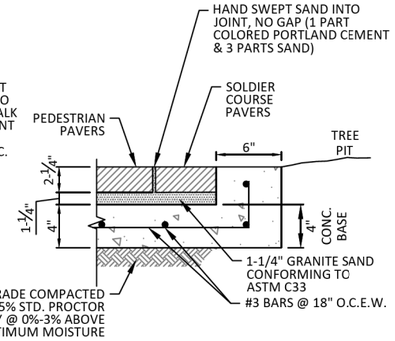
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DWG No. CC1 - 4057



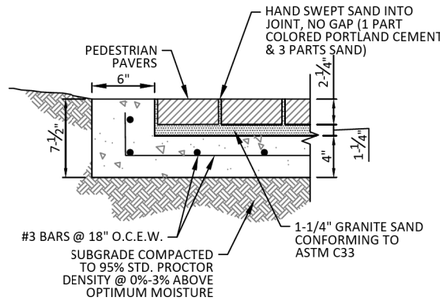
SECTION B-B

NTS



SECTION C-C

NTS



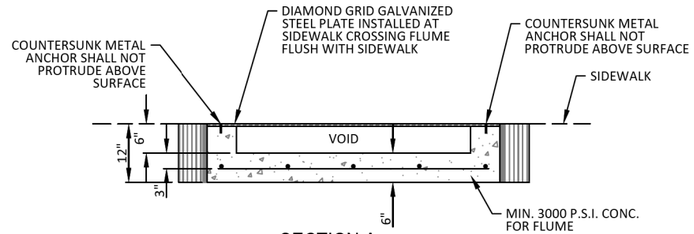
SECTION D-D

NTS

NOTES:

1. PEDESTRIAN PAVERS AND HEADER COURSE PAVERS SHALL BE LIGHT TRAFFIC PAVING BRICK MEETING ASTM C902, CLASS SX, TYPE II, APPLICATION PX, W/ DIMENSIONS (W)4"X(L)8"X(T)2-¼" IN BROWN CLASSIC COLOR.
2. PEDESTRIAN PAVERS SHALL BE APPROVED PUBLIC WORKS & ENGINEERING SERVICES.
3. PROVIDE BRICK WITHOUT FROGS OR CORES, IN SURFACES EXPOSED TO VIEW IN COMPLETED WORK.
4. BUFFER, SIDEWALK, AND PARKWAY WIDTHS SHALL BE PER THE MASTER TRANSPORTATION PLAN.

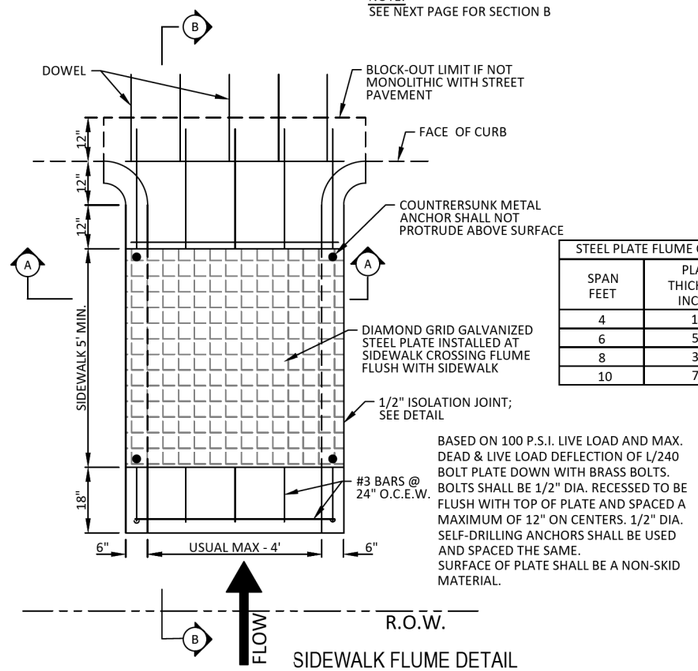
ADDISON PUBLIC WORKS & ENGINEERING SERVICES	SIDEWALK BRICK PAVERS SECTIONS	STANDARD CONSTRUCTION DETAILS PAVING		
		DATE: JANUARY 2022	REV DATE: -	SHEET: SD-P28



SECTION A

NTS

NOTE:
SEE NEXT PAGE FOR SECTION B



STEEL PLATE FLUME COVER	
SPAN FEET	PLATE THICKNESS INCHES
4	1/2"
6	5/8"
8	3/4"
10	7/8"

BASED ON 100 P.S.I. LIVE LOAD AND MAX. DEAD & LIVE LOAD DEFLECTION OF L/240 BOLT PLATE DOWN WITH BRASS BOLTS. BOLTS SHALL BE 1/2" DIA. RECESSED TO BE FLUSH WITH TOP OF PLATE AND SPACED A MAXIMUM OF 12" ON CENTERS. 1/2" DIA. SELF-DRILLING ANCHORS SHALL BE USED AND SPACED THE SAME.
SURFACE OF PLATE SHALL BE A NON-SKID MATERIAL.

SIDEWALK FLUME DETAIL

NTS

ADDISON PUBLIC WORKS & ENGINEERING SERVICES	SIDEWALK FLUME	STANDARD CONSTRUCTION DETAILS PAVING		
		DATE: JANUARY 2022	REV DATE: -	SHEET: SD-P29

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IN CHARGE	D. LUU
DATE	13 MAR 23

CAES

CONTRACT SHEET No. 109 OF 242

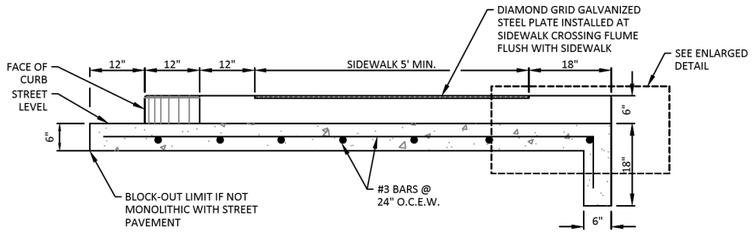
COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

TOWN OF ADDISON
CITY STANDARDS - CIVIL
SHEET 8 OF 13

CONTRACT	DWG No.	REV
C-2033270-01	CC1-4057	D

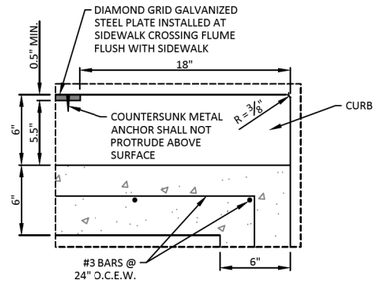
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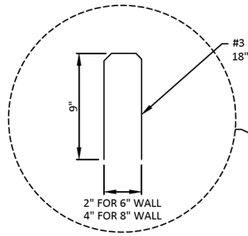


SECTION B
NTS

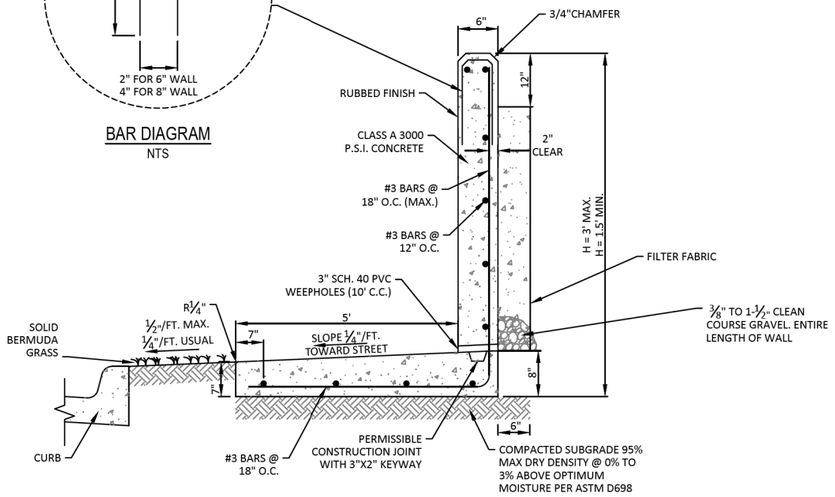
NOTE:
BUFFER, SIDEWALK, AND PARKWAY WIDTHS SHALL BE PER THE MASTER TRANSPORTATION PLAN



ENLARGED DETAIL
NTS



BAR DIAGRAM
NTS



SIDEWALK WITH INTEGRAL RETAINING WALL
NTS

NOTE:
1. PROVIDE VERTICAL EXPANSION JOINT WITH WATER STOPS IN WALL AT 25' MAX. SPACING.
2. BUFFER, SIDEWALK, AND PARKWAY WIDTHS SHALL BE PER THE MASTER TRANSPORTATION PLAN.

ADDISON PUBLIC WORKS & ENGINEERING SERVICES	SIDEWALK FLUME SECTION	STANDARD CONSTRUCTION DETAILS PAVING	
		DATE: JANUARY 2022	REV DATE: -	SHEET: SD-P30

ADDISON PUBLIC WORKS & ENGINEERING SERVICES	SIDEWALK WITH RETAINING WALL	STANDARD CONSTRUCTION DETAILS PAVING	
		DATE: JANUARY 2022	REV DATE: -	SHEET: SD-P31

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IN CHARGE	D. LUU
DATE	13 MAR 23

CAES

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

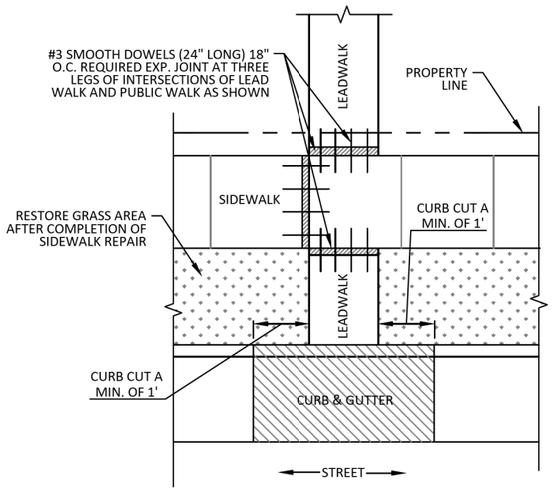
TOWN OF ADDISON
CITY STANDARDS - CIVIL
SHEET 9 OF 13

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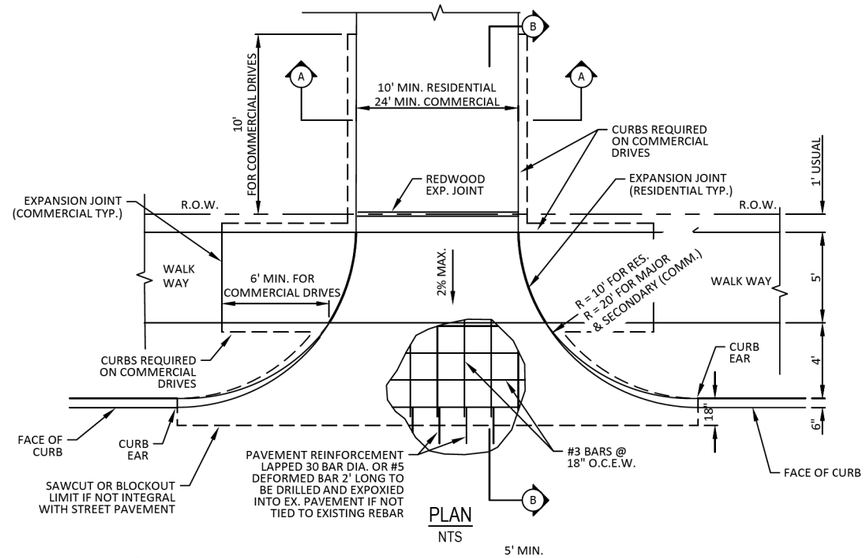
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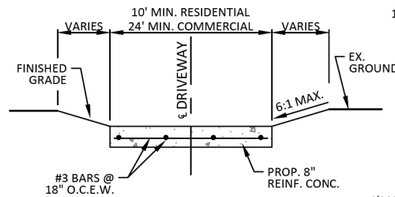
NOTES:

1. ALL SIDEWALK REINFORCEMENT SHALL BE #3 BARS @ 24" O.C.E.W. WITH #3 SMOOTH DOWELS AND SET UPON CHAIRS.
2. SUBGRADE COMPACTED TO 95% STANDARD PROCTOR DENSITY.
3. POURS SHALL REQUIRE A PRE-POUR INSPECTION FOR FORMWORK, REINFORCEMENT, AND GEOMETRY. VISUAL INSPECTIONS MAY BE MADE AFTER THE POUR TO ADDRESS TOOLED JOINTS, FINISH, ETC.
4. ENSURE THAT FLATWORK DOES NOT OBSCURE ABOVE-GROUND APPURTENANCES (I.E. VALVES, MH LIDS)
5. EXPOSED AGGREGATE CONCRETE IS NOT ACCEPTABLE FOR SIDEWALK WITHIN PUBLIC RIGHT-OF-WAY.
6. SIDEWALKS SHALL BE 5' WIDE (MIN.) WITH 42" (MIN.) UNOBSTRUCTED. SIDEWALKS ALONG ARTERIAL (THOROUGHFARE) ROADWAYS SHALL BE 6' MIN.
7. BUFFER, SIDEWALK, AND PARKWAY WIDTHS SHALL BE PER THE MASTER TRANSPORTATION PLAN.
8. FOR CURB DETAIL SEE CURB AND GUTTER & ASPHALT PAVING CROSS SECTION.

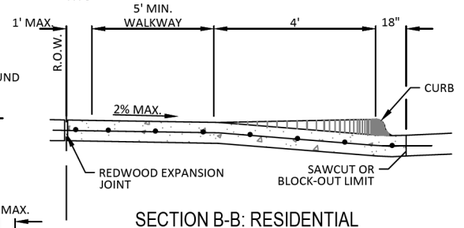
ADDISON PUBLIC WORKS & ENGINEERING SERVICES	CURB AND LEAD WALK REPAIR	STANDARD CONSTRUCTION DETAILS PAVING	
		DATE: JANUARY 2022	REV DATE: -	SHEET: SD-P32



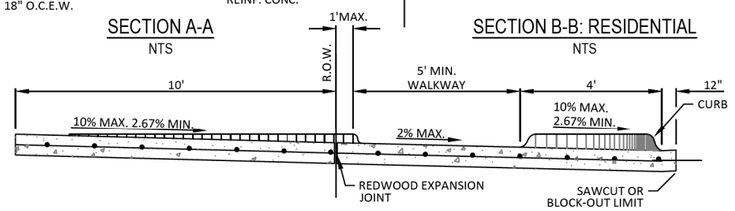
PLAN
NTS



SECTION A-A
NTS



SECTION B-B: RESIDENTIAL
NTS



SECTION B-B: COMMERCIAL
NTS

1. PROPERTY OWNER IS RESPONSIBLE FOR MAINTENANCE OF THE DRIVEWAY RETURN

ADDISON PUBLIC WORKS & ENGINEERING SERVICES	DRIVEWAY RETURN	STANDARD CONSTRUCTION DETAILS PAVING	
		DATE: JANUARY 2022	REV DATE: -	SHEET: SD-P33

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CONTRACT SHEET No. 111 OF 242

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CHECKED	C. BAGBY
IN CHARGE	D. LUU
DATE	13 MAR 23

CAES

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

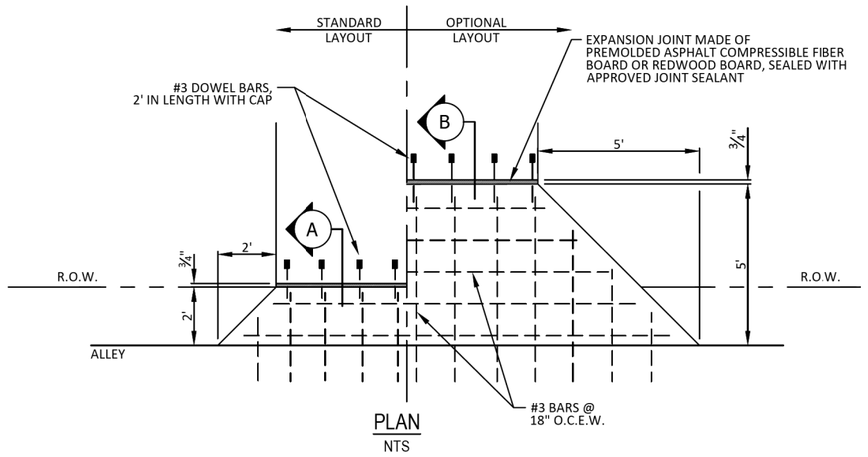
TOWN OF ADDISON
CITY STANDARDS - CIVIL
SHEET 10 OF 13

CONTRACT	DWG No.	REV
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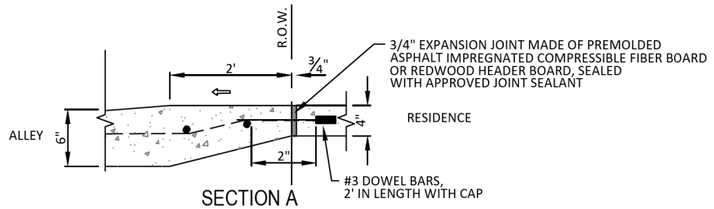
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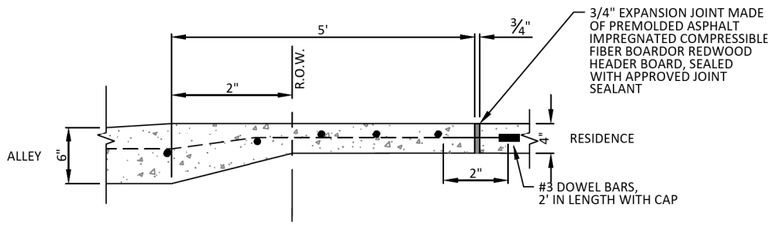
DWG No. CC1 - 4060



PLAN
NTS



SECTION A
NTS



SECTION B
NTS

1. PROPERTY OWNER IS RESPONSIBLE FOR MAINTENANCE OF THE DRIVEWAY RETURN

ADDISON PUBLIC WORKS & ENGINEERING SERVICES	DRIVEWAY RETURN FOR ALLEY	STANDARD CONSTRUCTION DETAILS PAVING		
		DATE: JANUARY 2022	REV DATE: -	SHEET: SD-P34

GENERAL NOTES FOR PEDESTRIAN FACILITIES

1. ALL SLOPES ARE MAXIMUM ALLOWABLE. THE LEAST POSSIBLE SLOPE THAT WILL STILL DRAIN PROPERLY SHOULD BE USED. ADJUST CURB RAMP LENGTH OR GRADE OF APPROACH SIDEWALKS AS DIRECTED.
2. LANDINGS SHALL BE 5'X5' MINIMUM WITH A MAXIMUM 2% SLOPE IN ANY DIRECTION.
3. MANEUVERING SPACE AT THE BOTTOM OF CURB RAMPS SHALL BE A MINIMUM OF 4'X4' WHOLLY CONTAINED WITHIN THE CROSSWALK AND WHOLLY OUTSIDE THE PARALLEL VEHICULAR TRAVEL PATH.
4. MAXIMUM ALLOWABLE CROSS SLOPE ON SIDEWALK AND CURB RAMP SURFACES IS 2%.
5. CURB RAMPS WITH RETURNED CURBS MAY BE USED ONLY WHERE PEDESTRIANS WOULD NOT NORMALLY WALK ACROSS THE RAMP, EITHER BECAUSE THE ADJACENT SURFACE IS PLANTING OR OTHER NON-WALKING SURFACE OR BECAUSE THE SIDE APPROACH IS SUBSTANTIALLY OBSTRUCTED. OTHERWISE, PROVIDE FLARED SIDES.
6. ADDITIONAL INFORMATION ON CURB RAMP LOCATION, DESIGN, LIGHT REFLECTIVE VALUE AND TEXTURE MAY BE FOUND IN THE CURRENT EDITION OF THE TEXAS ACCESSIBILITY STANDARDS (TAS) AND 16 TAC §8B.102.
7. CURB RAMPS SHALL BE ALIGNED WITH THEORETICAL CROSSWALKS, OR AS DIRECTED BY PUBLIC WORKS AND ENGINEERING SERVICES.
8. HANDRAILS ARE NOT REQUIRED ON CURB RAMPS. PROVIDE CURB RAMPS WHEREVER AN ACCESSIBLE ROUTE CROSSES (PENETRATES) A CURB.
9. FLARE SLOPE SHALL NOT EXCEED 10% MEASURED ALONG CURB LINE.
10. BARRIER FREE RAMPS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE CURRENT EDITION OF THE TEXAS ACCESSIBILITY STANDARDS (TAS).
11. ALL BARRIER FREE RAMPS MUST PASS AN INDEPENDENT INSPECTION PROVIDED BY THE TOWN'S REGISTERED ACCESSIBILITY SPECIALIST CONSULTANT. A LETTER OF COMPLIANCE ACCEPTANCE IS REQUIRED PRIOR TO FINAL ACCEPTANCE BY THE TOWN OF ADDISON.
12. STREETS ON STEEP GRADE WILL REQUIRE LONGER TRANSITION ON UPGRADE SIDE.
13. MAXIMUM SLOPE ON RAMP PORTION SHALL NOT EXCEED 1" PER FOOT AT ANY LOCATION. VERTICAL DISTANCE BETWEEN STREET AND RAMP SHALL NOT EXCEED 1/4".

GENERAL NOTES FOR DETECTABLE WARNINGS

1. CURB RAMPS MUST CONTAIN A DETECTABLE WARNING SURFACE THAT CONSISTS OF RAISED TRUNCATED DOMES COMPLYING WITH SECTION 4.29 OF THE TEXAS ACCESSIBILITY STANDARDS (TAS). THE SURFACE MUST CONTRAST VISUALLY WITH THE ADJOINING SURFACES, INCLUDING SIDE FLARES. FURNISH DARK RED COLORED DETECTABLE WARNING SURFACE ADJACENT TO UNCOLORED CONCRETE AND CREAM COLORED DETECTABLE WARNING SURFACE ADJACENT TO DARK RED COLORED BRICK PAVERS CONTRASTING COLOR APPROVED BY THE TOWN.
2. DETECTABLE WARNING SURFACES MUST BE SLIP RESISTANT AND NOT ALLOW WATER TO ACCUMULATE.
3. ALIGN TRUNCATED DOMES IN THE DIRECTION OF PEDESTRIAN TRAVEL WHEN ENTERING THE STREET.
4. DETECTABLE WARNING SURFACES SHALL BE A MINIMUM OF 24" IN LENGTH IN THE DIRECTION OF PEDESTRIAN TRAVEL AND EXTEND THE FULL WIDTH OF THE CURB RAMP OR LANDING WHERE THE PEDESTRIAN ACCESS ROUTE ENTERS THE STREET.
5. DETECTABLE WARNING SURFACES SHALL BE LOCATED SO THAT THE EDGE NEAREST THE CURB LINE IS A MINIMUM OF 6" AND A MAXIMUM OF B" FROM THE EXTENSION OF THE FACE OF CURB AND SHALL BE AN INTEGRAL PART OF THE WALKING SURFACE. DETECTABLE WARNING SURFACES MAY BE CURVED ALONG THE CORNER RADIUS.

GENERAL NOTES FOR DETECTABLE WARNING PAVER UNITS

1. DETECTABLE WARNING PAVER UNITS SHALL MEET OR EXCEED ALL REQUIREMENTS OF ASTM C936, C33, AND BE LAID IN A TWO BY TWO UNIT BASKET WEAVE PATTERN OR AS DIRECTED.
2. LAY FULL-SIZE UNITS FIRST FOLLOWED BY CLOSURE UNITS CONSISTING OF AT LEAST 25% OF A FULL UNIT. CUT DETECTABLE WARNING PAVER UNITS USING A POWER SAW.

ADDISON PUBLIC WORKS & ENGINEERING SERVICES	PEDESTRIAN FACILITIES GENERAL NOTES	STANDARD CONSTRUCTION DETAILS PAVING		
		DATE: JANUARY 2022	REV DATE: -	SHEET: SD-P35

15-MAR-2023 11:02
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ssoleh
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CONTRACT SHEET No. 112 OF 242

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

Jacobs
1999 BRYAN ST, SUITE 1200
DALLAS, TX 75201-3136
Phone: +1 (214) 638-0145
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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	NO SCALE
DRAWN	C. BAGBY
DESIGNED	C. BAGBY
CHECKED	C. BAGBY
IN CHARGE	D. LUU
DATE	13 MAR 23

CAES

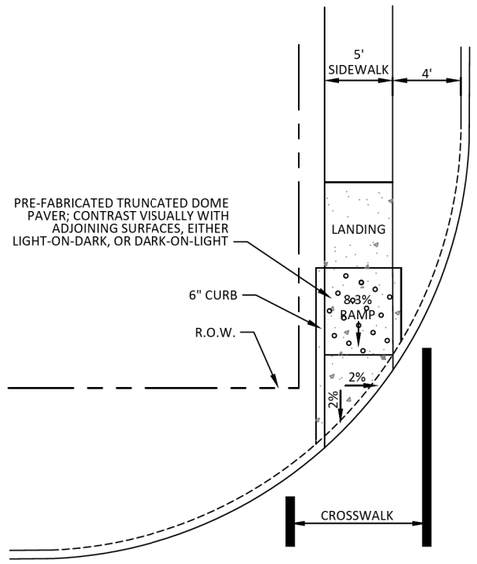
COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

TOWN OF ADDISON
CITY STANDARDS - CIVIL
SHEET 11 OF 13

CONTRACT	DWG No.	REV
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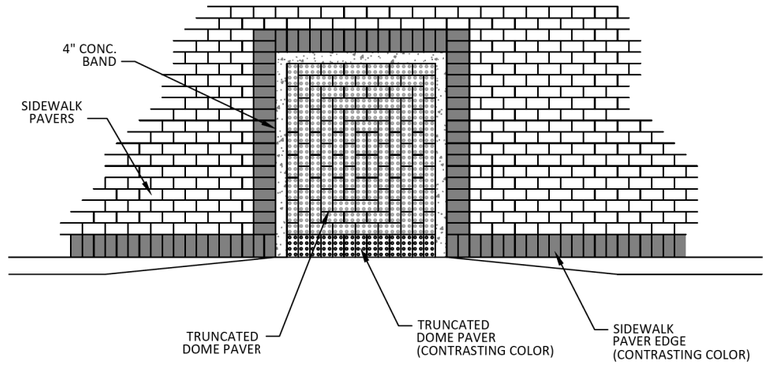
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DWG No. CC1 - 4061



DIRECTIONAL RAMP WITHIN RADIUS
NTS

ADDISON PUBLIC WORKS & ENGINEERING SERVICES	PEDESTRIAN RAMPS	STANDARD CONSTRUCTION DETAILS PAVING	
		DATE: JANUARY 2022	REV DATE: -	SHEET: SD-P36



NOTE:
ALL PAVER COLORS TO BE APPROVED BY ADDISON PUBLIC WORKS & ENGINEERING SERVICES

ADDISON PUBLIC WORKS & ENGINEERING SERVICES	TYPICAL PATTERN FOR PAVER SIDEWALK AND CURB RAMP	STANDARD CONSTRUCTION DETAILS PAVING	
		DATE: JANUARY 2022	REV DATE: -	SHEET: SD-P37

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CONTRACT SHEET No. 113 OF 242

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

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CHECKED	C. BAGBY
IN CHARGE	D. LUU
DATE	13 MAR 23

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COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

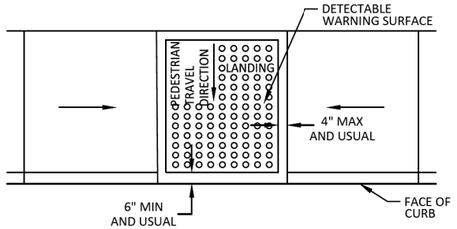
TOWN OF ADDISON
CITY STANDARDS - CIVIL
SHEET 12 OF 13

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CB05-CC1-4061.001

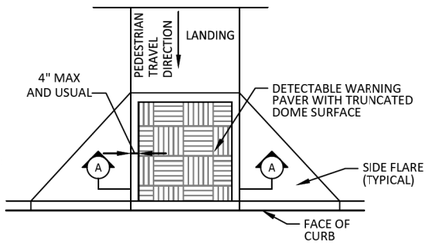
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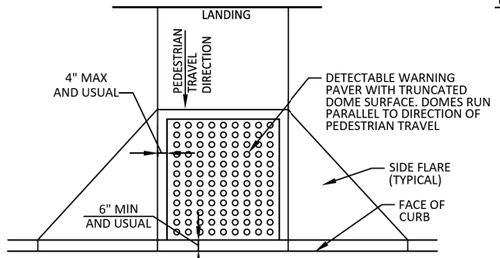
TYPICAL PLACEMENT OF DETECTABLE WARNING SURFACE ON LANDING AT STREET EDGE

NTS



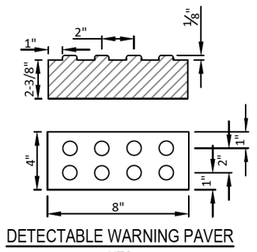
TRUNCATED DOME PATTERN CURB RAMP

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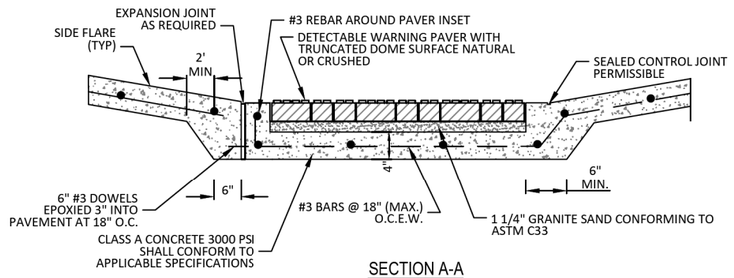
TYPICAL PLACEMENT OF DETECTABLE WARNING SURFACE ON SLOPING RAMP RUN

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DETECTABLE WARNING PAVER

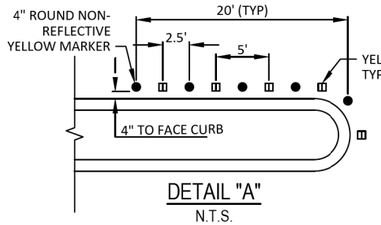
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SECTION A-A

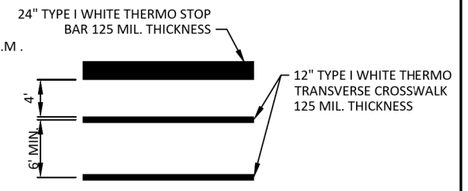
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ADDISON PUBLIC WORKS & ENGINEERING SERVICES	DETECTABLE WARNING PAVER	STANDARD CONSTRUCTION DETAILS PAVING		
		DATE: JANUARY 2022	REV DATE: -	SHEET: SD-P38



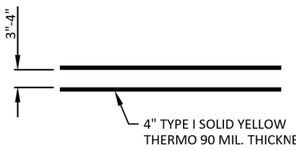
DETAIL "A"

N.T.S.



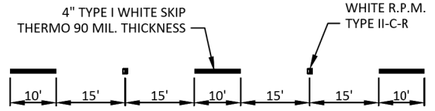
CROSSWALK STRIPING LAYOUT

N.T.S.



STANDARD DOUBLE YELLOW LINE

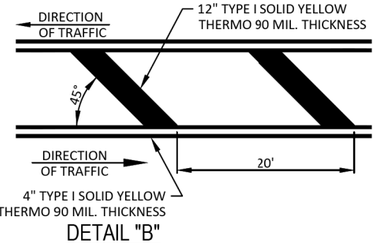
N.T.S.



DIRECTION OF TRAFFIC

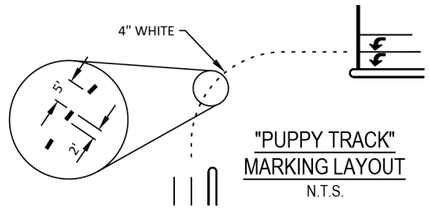
STANDARD DASHED LINE

N.T.S.



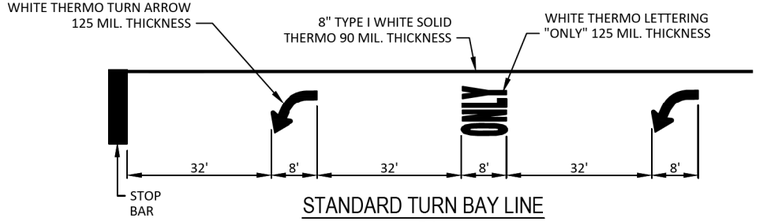
DETAIL "B"

N.T.S.



"PUPPY TRACK" MARKING LAYOUT

N.T.S.



STANDARD TURN BAY LINE

N.T.S.

ADDISON PUBLIC WORKS & ENGINEERING SERVICES	TYPICAL PAVEMENT MARKING DETAILS	STANDARD CONSTRUCTION DETAILS TRAFFIC		
		DATE: JANUARY 2022	REV DATE: -	SHEET: SD-T05

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CONTRACT SHEET No. 114 OF 242

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

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SCALE	NO SCALE
DRAWN	C. BAGBY
DESIGNED	C. BAGBY
CHECKED	C. BAGBY
IN CHARGE	D. LUU
DATE	13 MAR 23

CAES

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

TOWN OF ADDISON
CITY STANDARDS - CIVIL
SHEET 13 OF 13

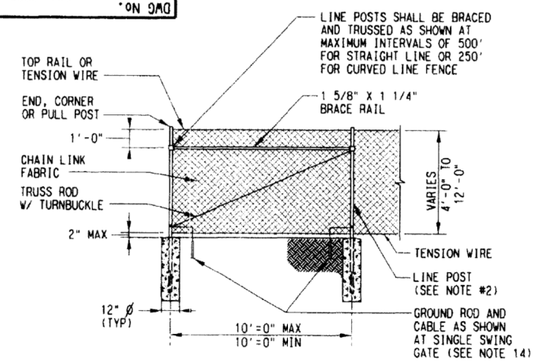
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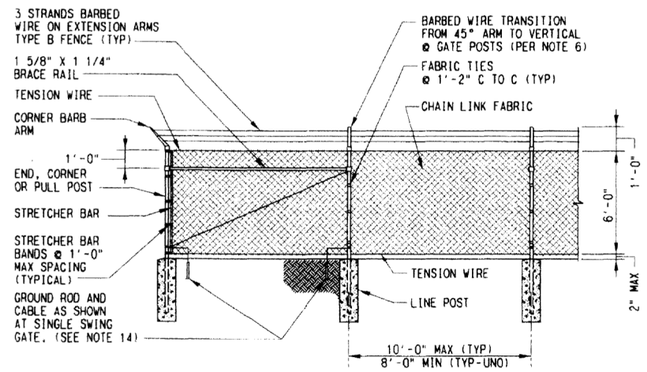
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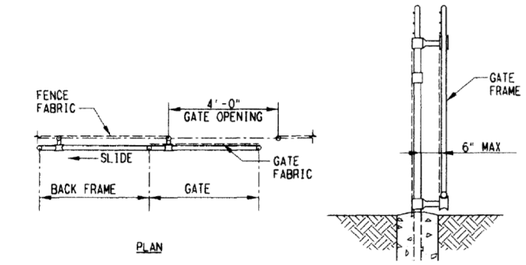
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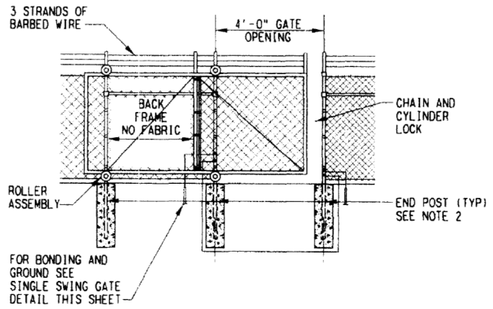
1 — TYPE A AND A-1 FENCE
NTS



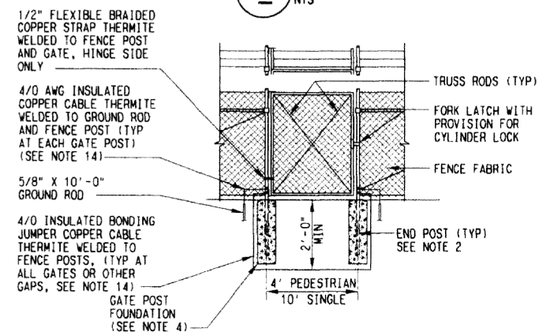
2 — TYPE B FENCE
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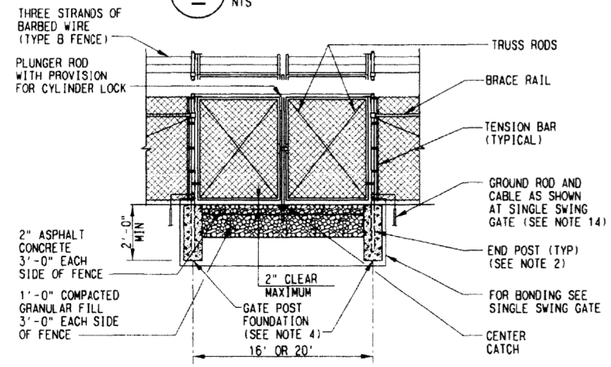
3 — SLIDING GATE
NTS



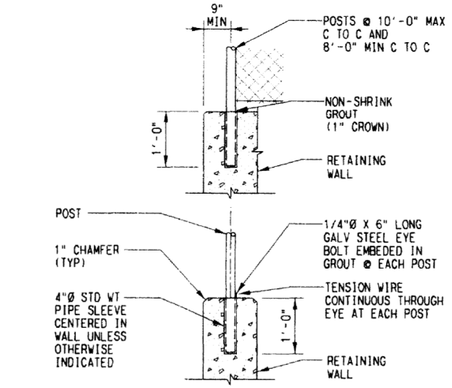
4 — SLIDING GATE ELEVATION
NTS



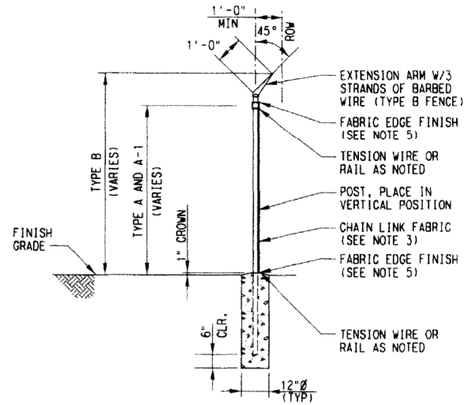
5 — SINGLE SWING GATE
NTS



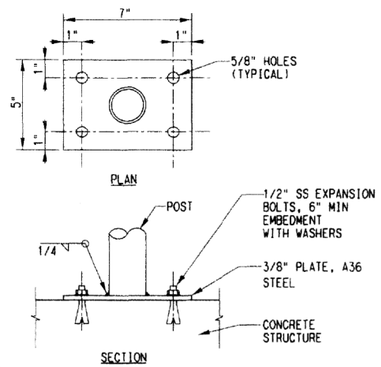
6 — DOUBLE SWING GATE
NTS



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. 115 OF 242
DWG NO. CS9-0105
CONTRACT NO.

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 CHIDAMANDA
58001
LICENSED PROFESSIONAL ENGINEER
12/23/05

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CARTER BURGESS
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SCALE	NOT TO SCALE
DRAWN	B. SKINNER
DESIGNED	T. WILLIAMS
CHECKED	G. CELERIER
IN CHARGE	B.N. REDDY CHIDAMANDA
DATE	30 NOV 05

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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DATE:
FILE:

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. 116 OF 242
DWG NO. WS9-4001
CONTRACT NO. C-2033270-01

Texas Department of Transportation

Traffic Operations Division Standard

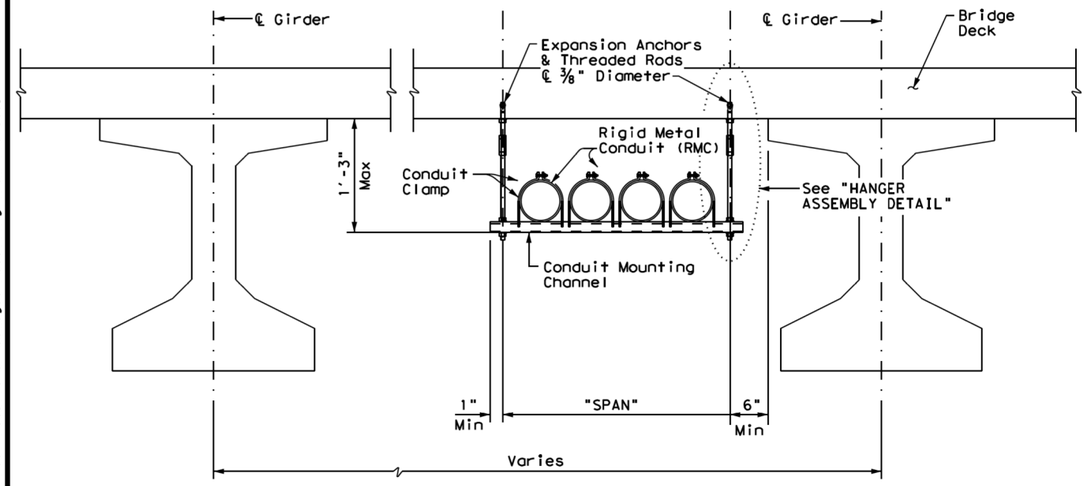
ELECTRICAL DETAILS CONDUITS & NOTES

ED(1)-14

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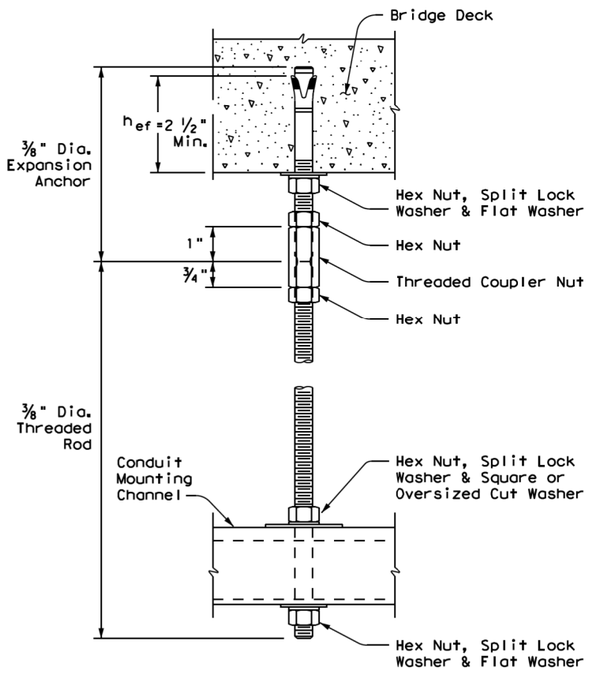
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CONDUIT HANGING DETAIL

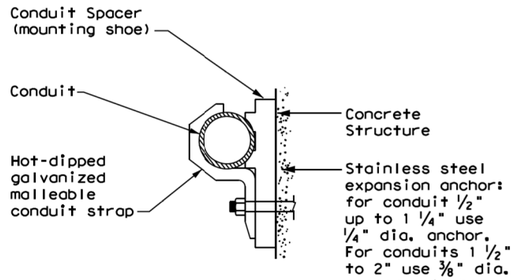
CONDUIT MOUNTING CHANNEL		
"SPAN"	"W" x "H"	"T"
less than 2'	1 5/8" x 1 3/8"	12 Ga.
2'-0" to 2'-6"	1 5/8" x 1 5/8"	12 Ga.
>2'-6" to 3'-0"	1 5/8" x 2 7/16"	12 Ga.

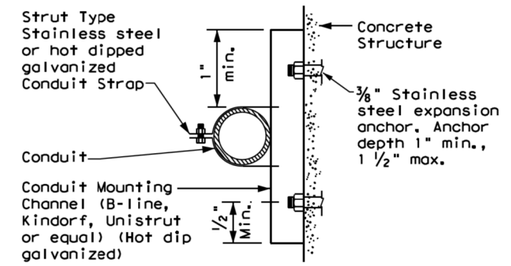
Channels with round or short slotted hole patterns are allowed, if the load carrying capacity is not reduced by more than 15%.



HANGER ASSEMBLY DETAIL

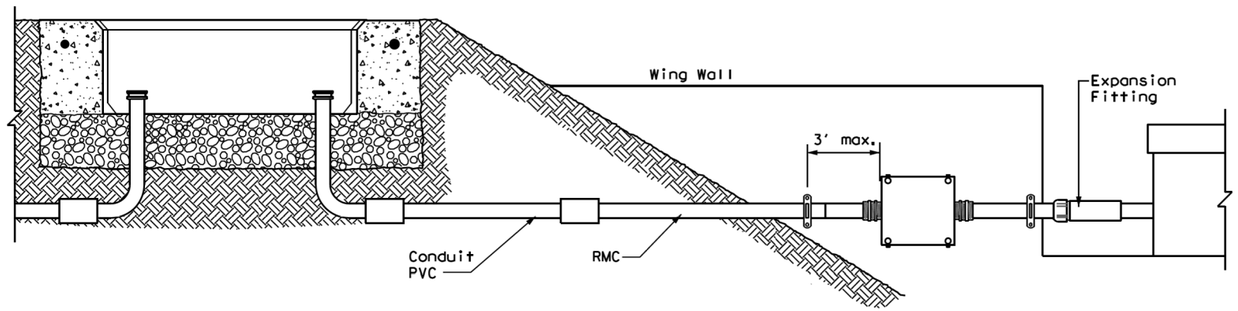
ELECTRIC CONDUIT TO BRIDGE DECK ATTACHMENT





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.

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VELOWEB HIKE & BIKE TRAIL
SHEET NO. 117 OF 242
DWG NO. WS9-4002
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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.

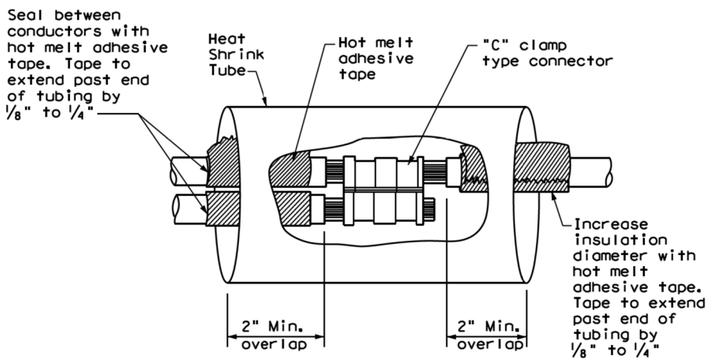
3. Install ground rods so the imprinted part number is at the upper end of the rod.

4. Remove all non-conductive coatings such as concrete splatter from the rod at the clamp location.

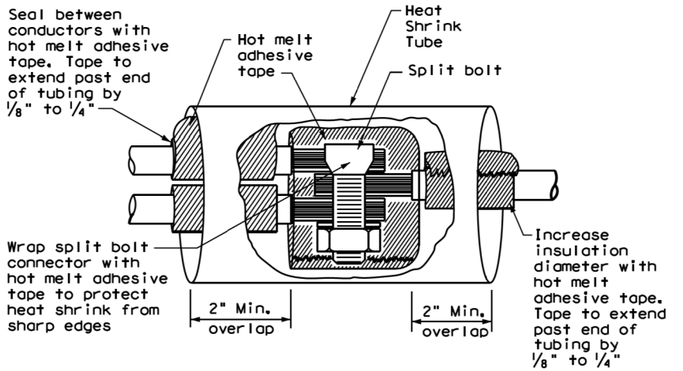
5. Route all conductors as short and straight as possible for connection to lightning protection ground rods. When a bend is required, ensure a minimum radius bend of four inches for these conductors.

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.

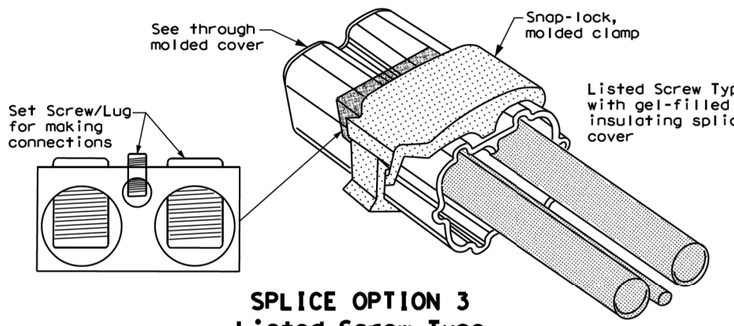
7. Written authorization is required before installing a ground rod in a horizontal trench for rocky soil or a solid rock bottom.



SPLICE OPTION 1
Compression Type



SPLICE OPTION 2
Split Bolt Type



SPLICE OPTION 3
Listed Screw Type

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ELECTRICAL DETAILS CONDUCTORS

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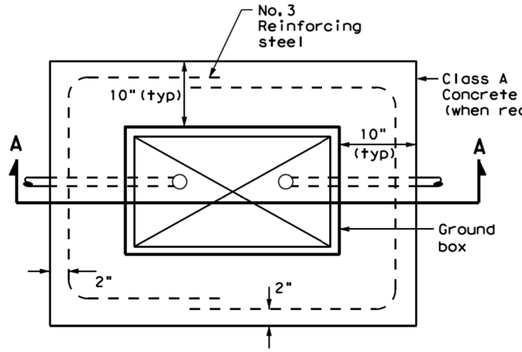
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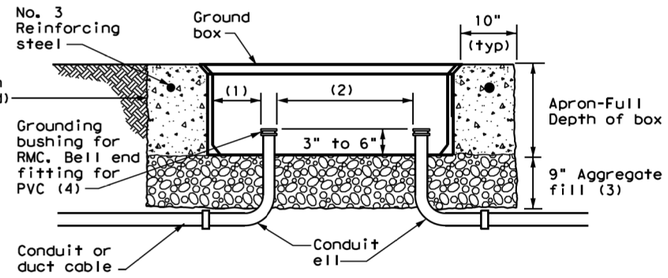
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PLAN VIEW



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.

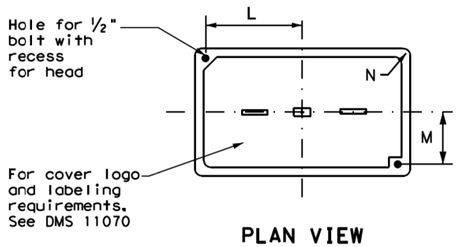
(2) Maintain sufficient space between conduits to allow for proper installation of bushing.

(3) Place aggregate under the box, not in the box. Aggregate should not encroach on the interior volume of the box.

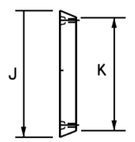
(4) Install a grounding bushing on the upper end of all RMC terminating in a ground box. Ground RMC elbows when any part of the elbow is less than 18 in. below the bottom of the ground box. Install a PVC bushing or bell end fitting on the upper end of all PVC conduits terminating in a ground box.

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

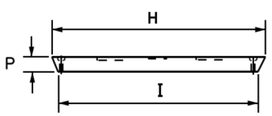
GROUND BOX COVER DIMENSIONS								
TYPE	DIMENSIONS (INCHES)							
	H	I	J	K	L	M	N	P
A, B & E	23 1/4	23	13 3/4	13 1/2	9 7/8	5 1/8	1 3/8	2
C & D	30 1/2	30 1/4	17 1/2	17 1/4	13 1/4	6 3/4	1 3/8	2



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.

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
SHEET NO. 119 OF 242
DWG NO. WS9-4004
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

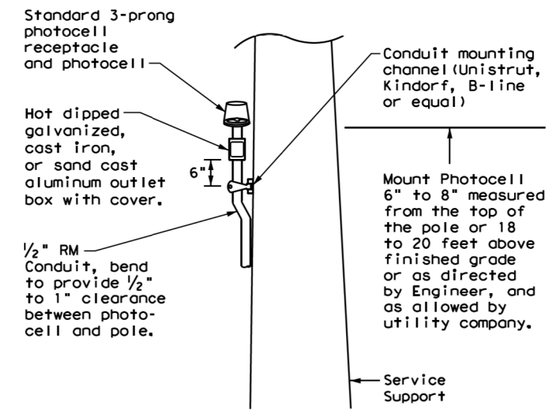
(SS)= Safety Switch Ahead of Meter-Check with Utility
(NS)= No safety Switch Ahead of Meter-Check with Utility

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.

Texas Department of Transportation

Traffic Operations Division Standard

ELECTRICAL DETAILS SERVICE NOTES & DATA

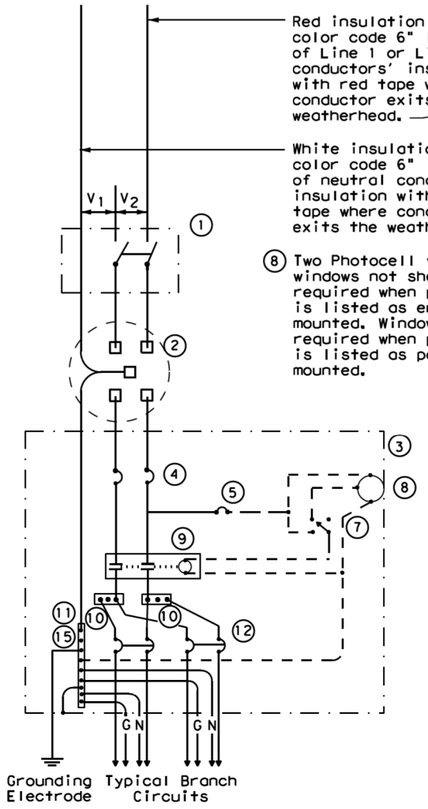
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CONTRACT NO. C-2033270-01

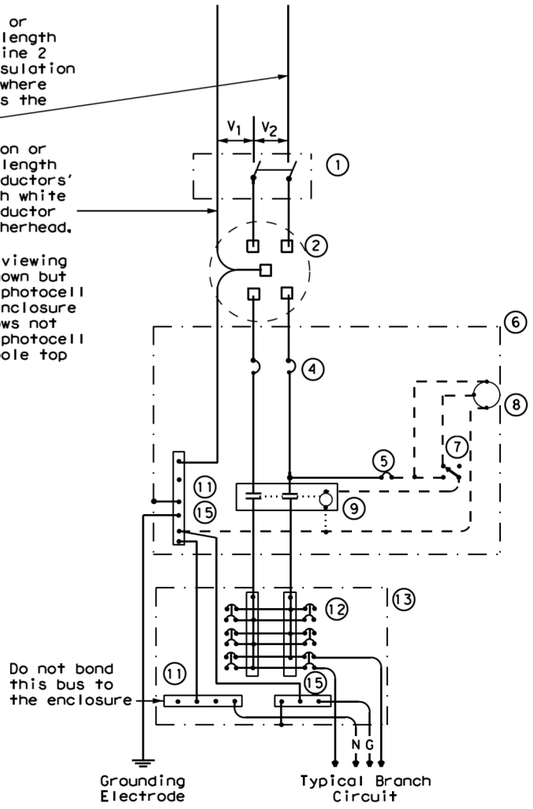
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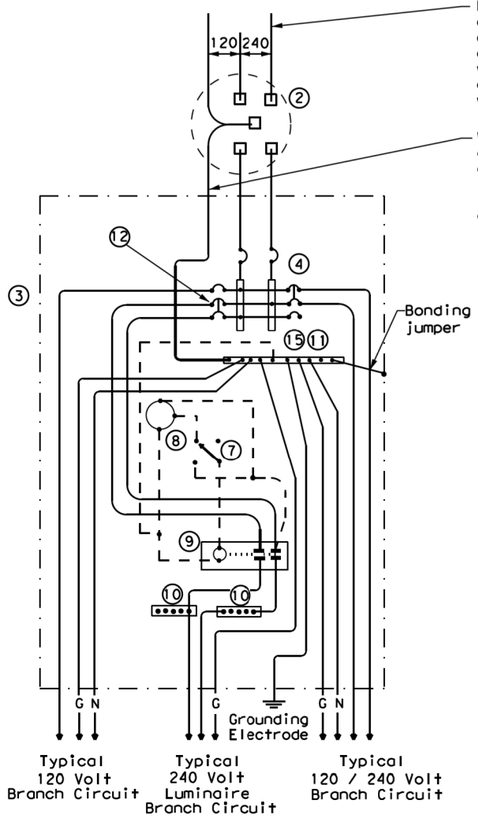
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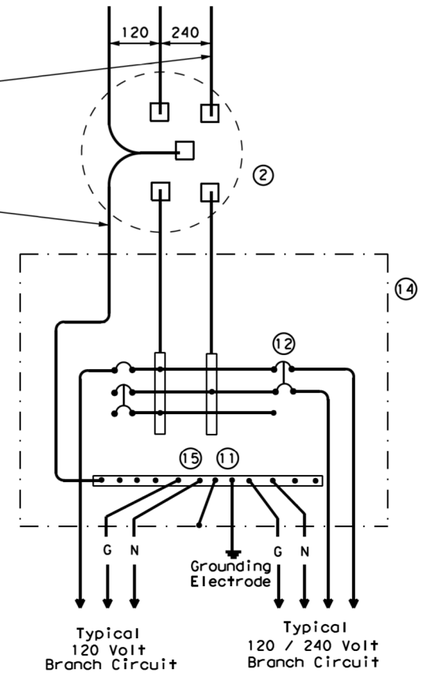
SCHEMATIC TYPE A
THREE WIRE



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

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Traffic Operations Division Standard

ELECTRICAL DETAILS SERVICE ENCLOSURE AND NOTES

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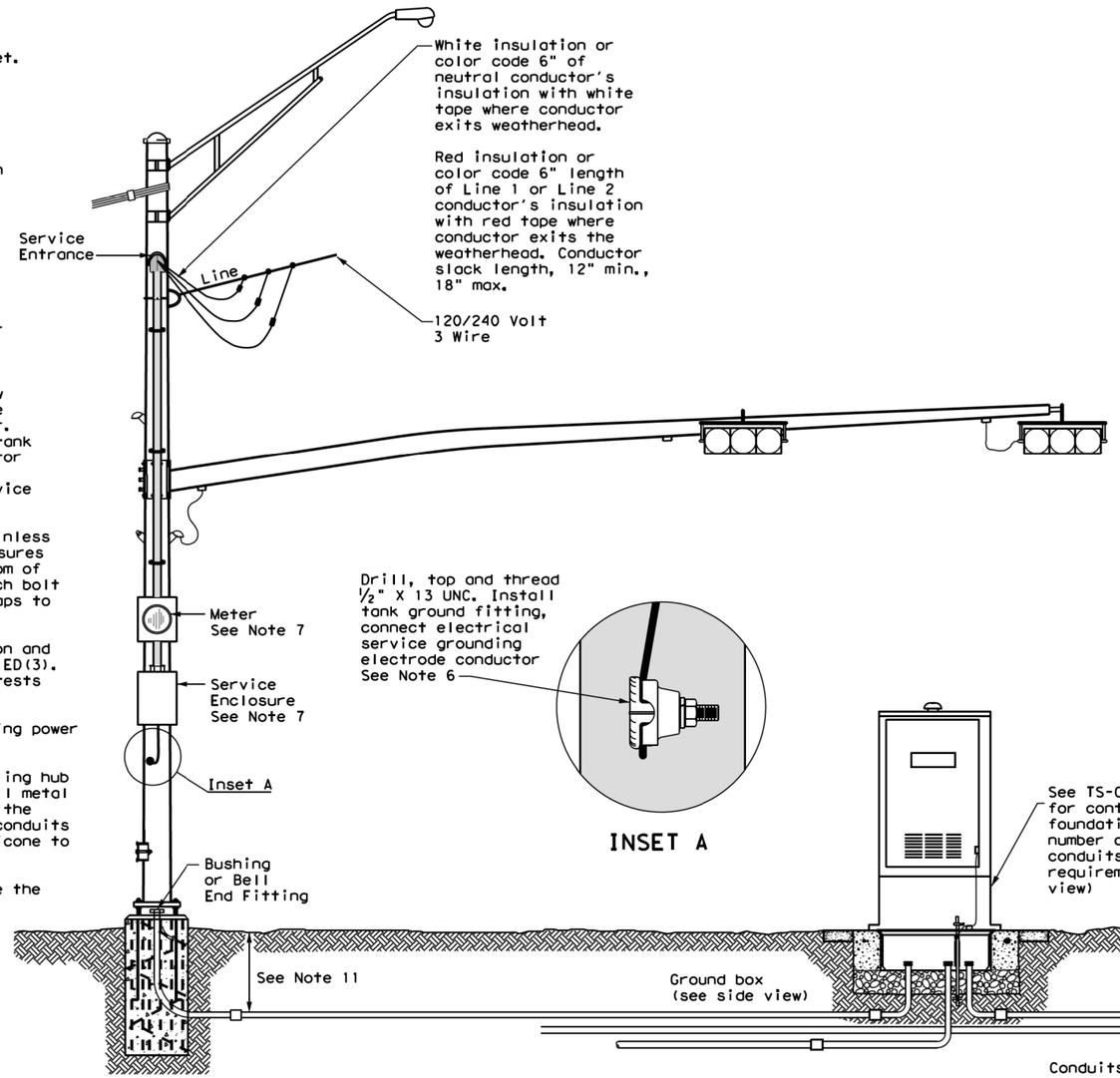
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TRAFFIC SIGNAL NOTES

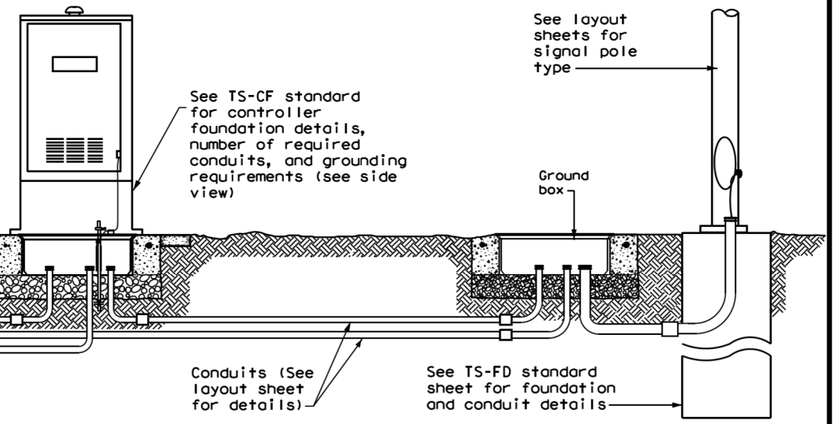
1. Do not pass luminaire conductors through the signal controller cabinet.
2. Include an equipment grounding conductor in all conduits throughout the electrical system. Bond all exposed metal parts to the grounding conductor.
3. Provide roadway luminaires, when required, in accordance with the material 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

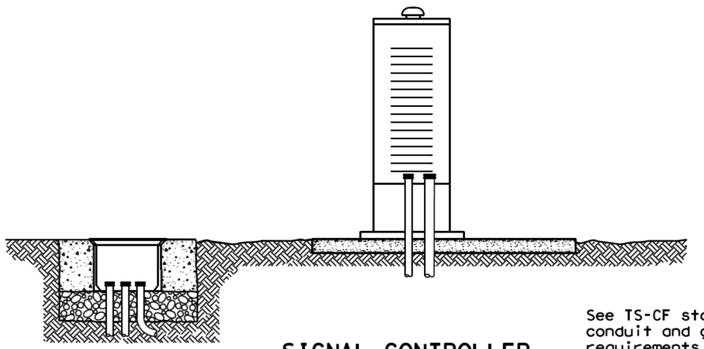
Type T electrical service mounted on signal pole shown as an example. See electrical details, layout sheets, and electrical service data chart for additional details.

INSET A



SIGNAL CONTROLLER FRONT VIEW

SIGNAL POLE



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.

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VELOWEB HIKE & BIKE TRAI
SHEET NO. 122 OF 242
DWG NO. WS9-4008
CONTRACT NO. C-2033270-01

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.

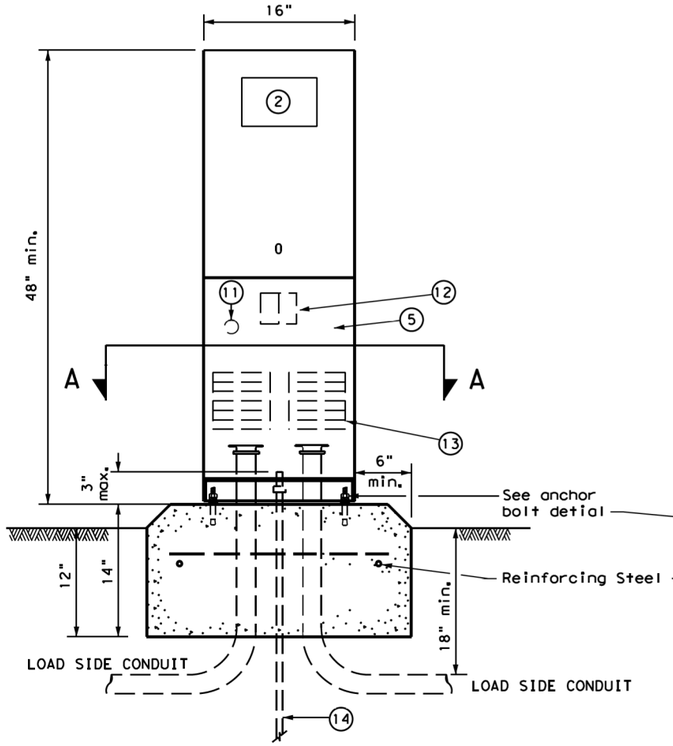
4. Provide #4 reinforcing steel for foundations in accordance with Item 440, "Reinforcement for Concrete."

5. Install ½ in. X 2 1/16 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.

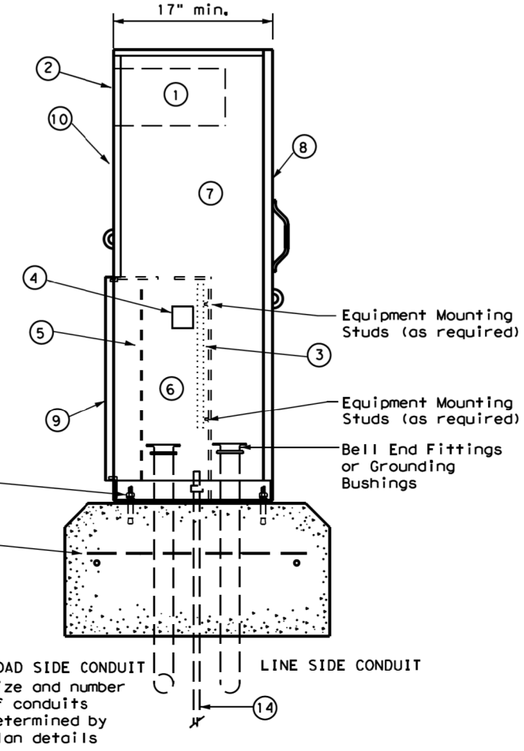
6. Finish top of concrete foundation in a neat and workmanlike manner. If leveling washers are used, ensure no more than ⅛ in. gap at any corner. Do not exceed a maximum dip or rise in the foundation of ⅛ in. per foot. When properly installed, ensure the top of the service enclosure is level front to 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.

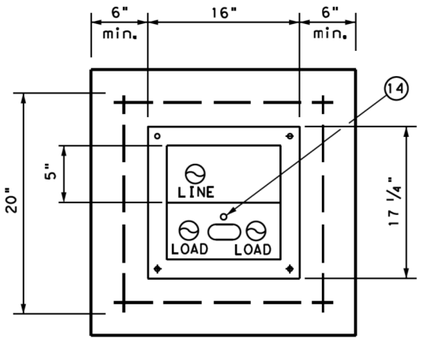


FRONT VIEW

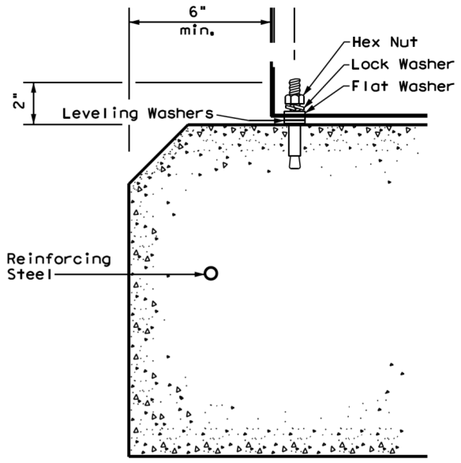


SIDE VIEW

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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VELOWEB HIKE & BIKE TRAI
SHEET NO. 123 OF 242
DWG NO. WS9-4009
CONTRACT NO. C-2033270-01

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.

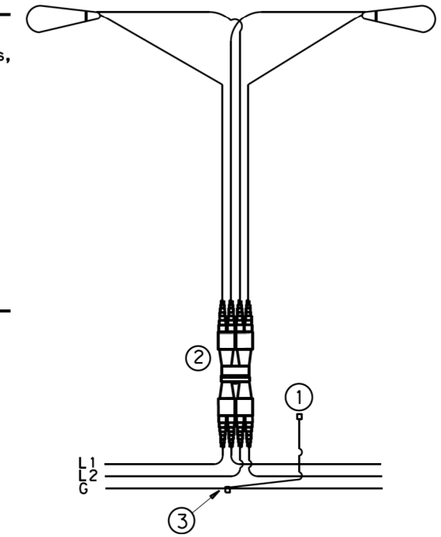
12. Orient luminaires perpendicular to the roadway intended to be lit unless otherwise shown on the plans.

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.

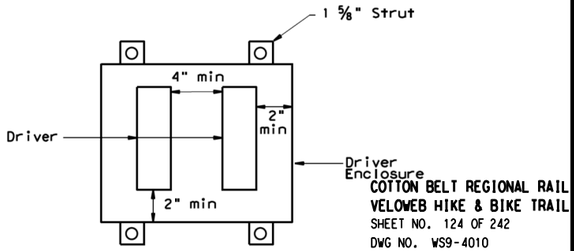
   c. Install drivers with at least 2 inches of space from enclosure walls.

   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

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
SHEET NO. 124 OF 242
DWG NO. WS9-4010
CONTRACT NO. C-2033270-01

Texas Department of Transportation

Traffic Safety Division Standard

ROADWAY ILLUMINATION DETAILS

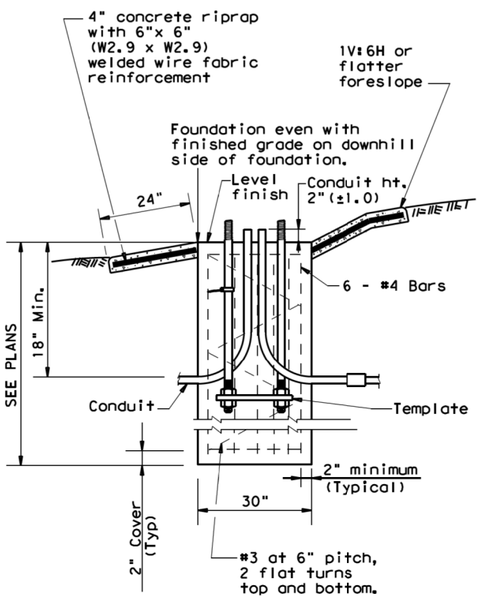
RID(1)-20

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7-17	DIST	COUNTY		SHEET NO.
12-20				

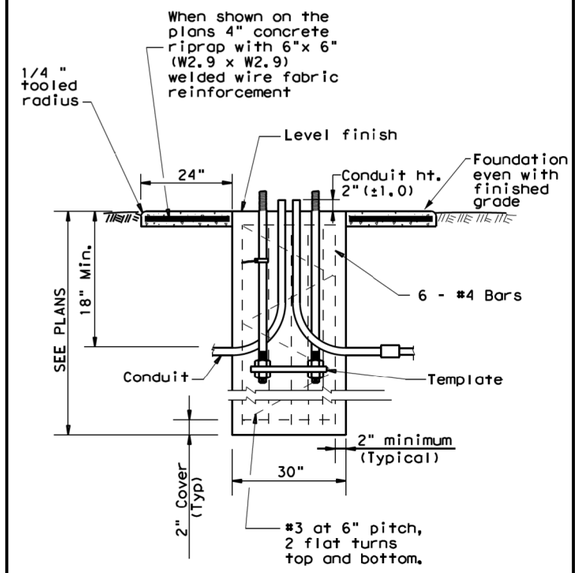
72A

DATE:
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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.

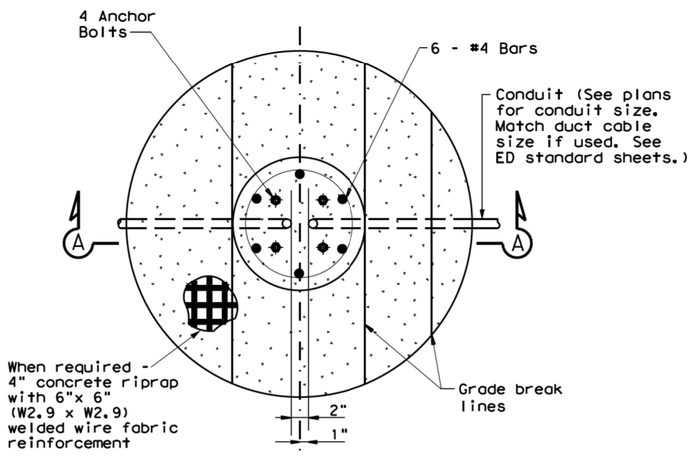
TABLE 4

BREAKAWAY POLE PLACEMENT (See note 6)

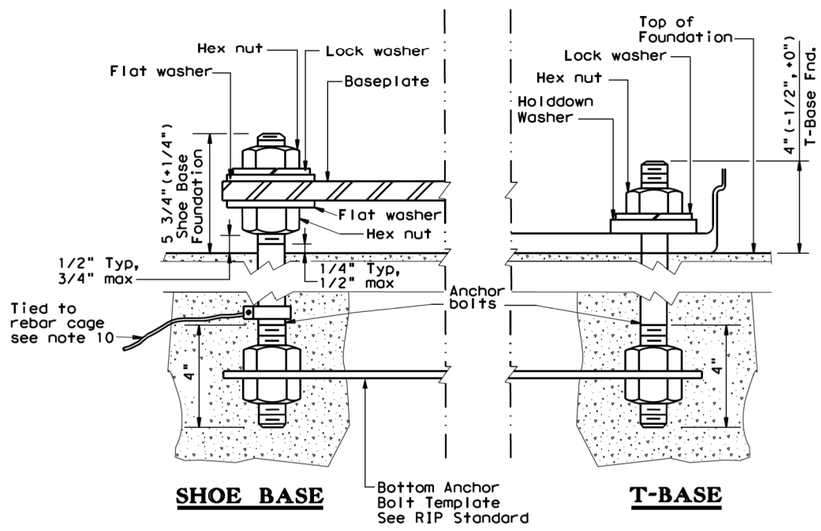
ROADWAY FUNCTIONAL CLASSIFICATION	** POLE OFFSET (DISTANCE TO FACE OF TRANSFORMER BASE)
Freeway Mainlanes (roadway with full control of access)	15 ft. (minimum and typical) from lane edge
All curbed, 45 mph or less design speed	2.5 ft. minimum (15 ft. desirable) from curb face
All others	10 ft. minimum*(15 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. 125 OF 242
DWG NO. WS9-4011
CONTRACT NO. C-2033270-01

Texas Department of Transportation

Traffic Safety Division Standard

ROADWAY ILLUMINATION DETAILS
(RDWY ILLUM FOUNDATIONS)
RID(2)-20

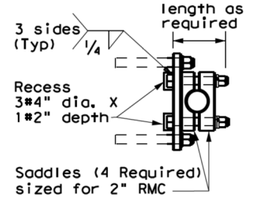
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REVISIONS 1-11 7-17 12-20	DIST	COUNTY		SHEET NO.

72B

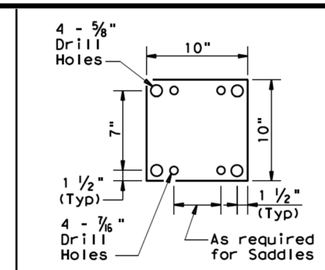
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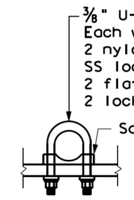
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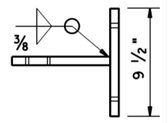
SECTION A-A



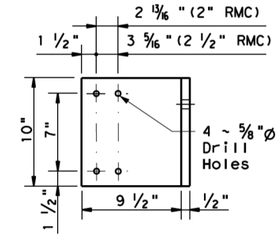
MOUNTING PLATE
(ASTM A-36 or better)



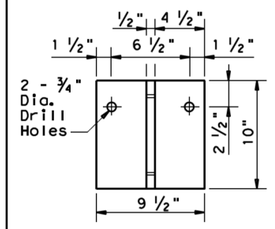
CLAMP DETAIL
(2 Req'd)



PLAN VIEW

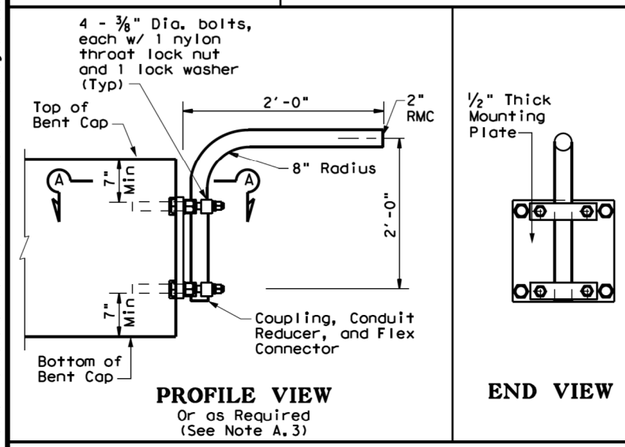


FRONT



SIDE

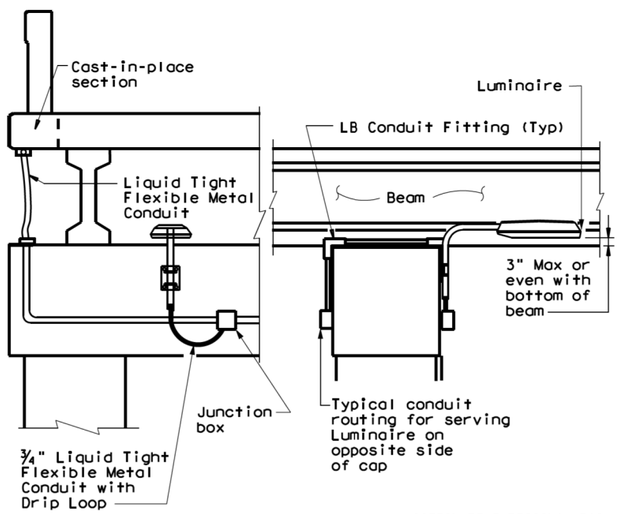
BRACKET DETAIL
Make from 1/2" plate (ASTM A-36 or better)



PROFILE VIEW
Or as Required
(See Note A.3)

END VIEW

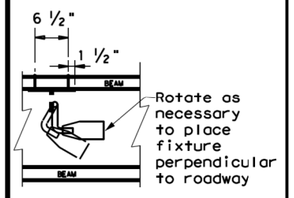
UNDERPASS LIGHTING ARM



COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
SHEET NO. 126 OF 242
DWG NO. WS9-4012
CONTRACT NO. C-2033270-01

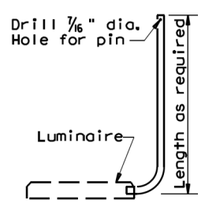
IN RD IL AM (U/P)(TY 1)
If bridge has pre-cast panels under deck, run circuit under deck edge.

UNDERPASS LIGHTING TYPE 1

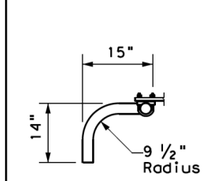


PLAN VIEW

FIXTURE ORIENTATION

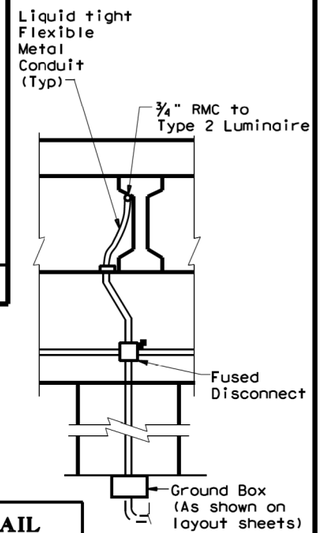


SIDE



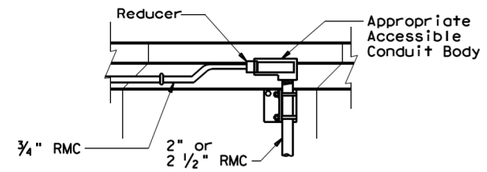
PLAN VIEW

ARM DETAIL

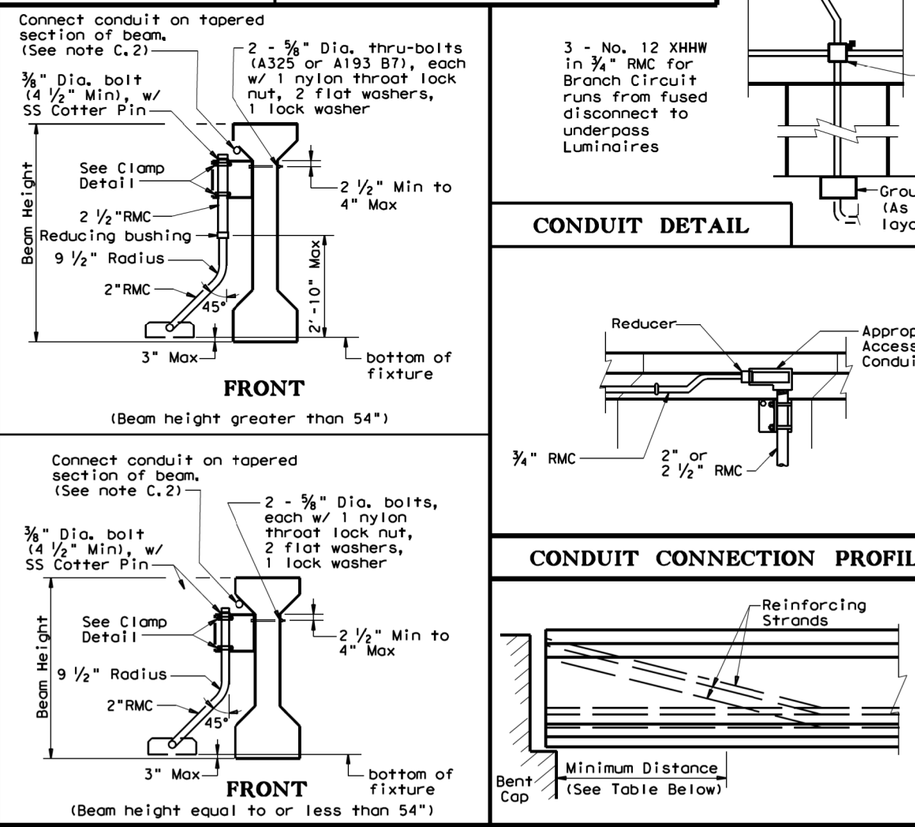


3 - No. 12 XHHW in 3/4" RMC for Branch Circuit runs from fused disconnect to underpass Luminaires

CONDUIT DETAIL



CONDUIT CONNECTION PROFILE



FRONT
(Beam height greater than 54")

FRONT
(Beam height equal to or less than 54")

IN RD IL AM (U/P)(TY 2)

UNDERPASS LIGHTING TYPE 2

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 BRACKET

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
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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	
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	(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)

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Texas Department of Transportation

Traffic Safety Division Standard

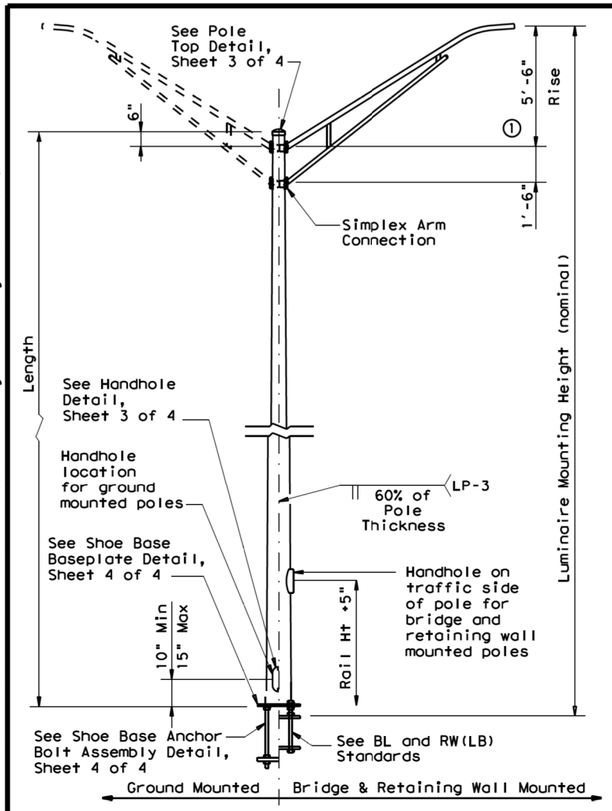
ROADWAY ILLUMINATION POLES

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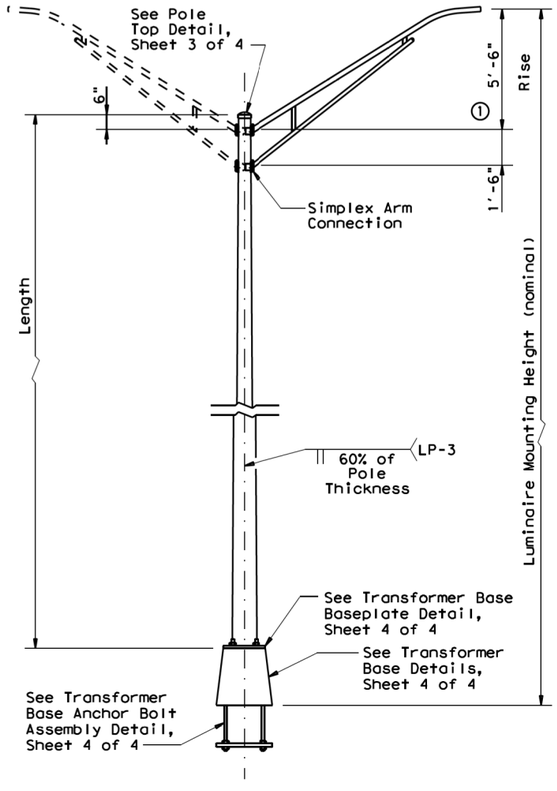
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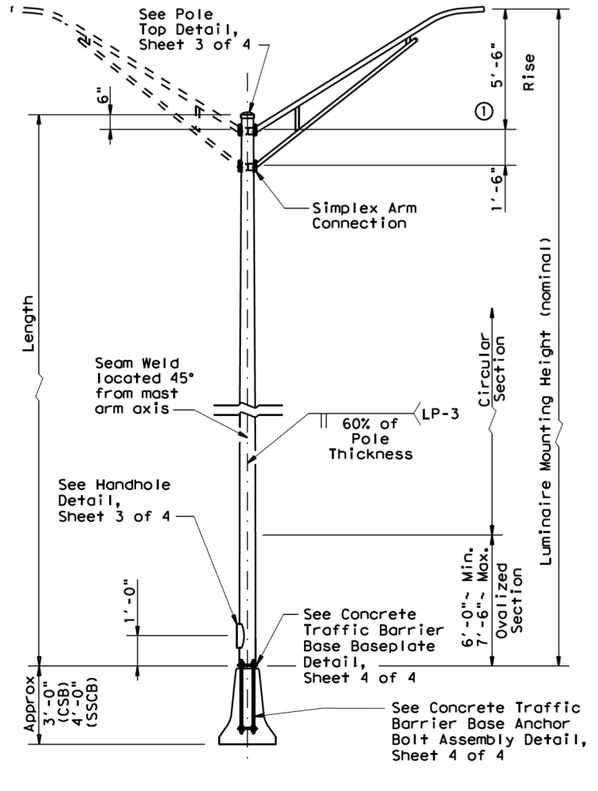
SHOE BASE POLE

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).

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VELOWEB HIKE & BIKE TRAIL
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CONTRACT NO. C-2033270-01

ROADWAY ILLUMINATION POLES

RIP(2)-19

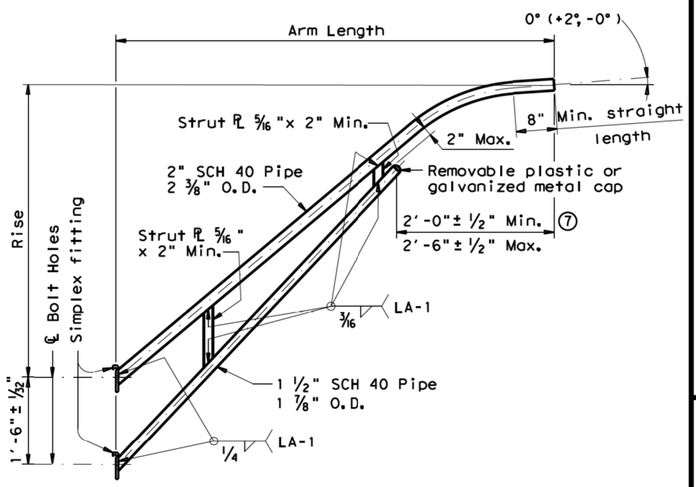
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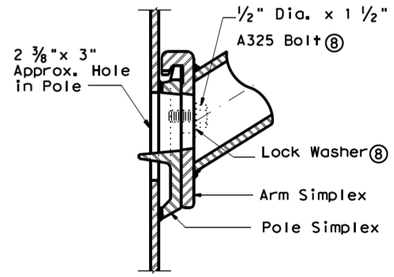
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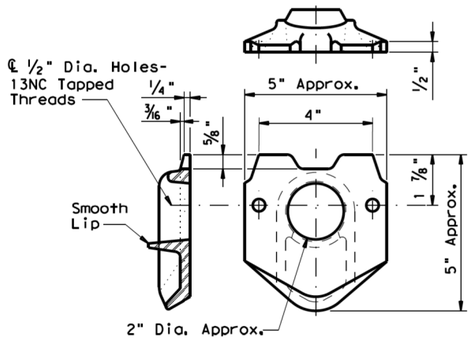
LUMINAIRE ARM

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"

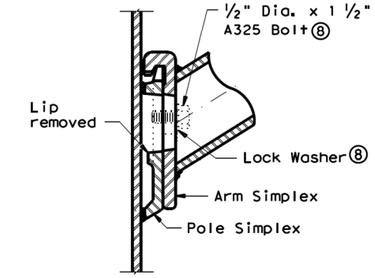
ARM ASSEMBLY FABRICATION TOLERANCES TABLE	
DIMENSION	TOLERANCE
Arm Length	±1"
Arm Rise	±1"
Deviation from flat	1/8" in 12"
Spacing between holes	±1/32"



UPPER SIMPLEX FITTING
(Gusset not shown for clarity)

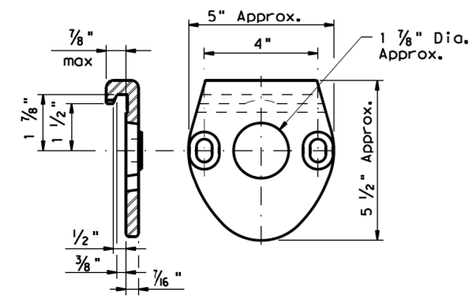


POLE SIMPLEX DETAIL ⑨



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.

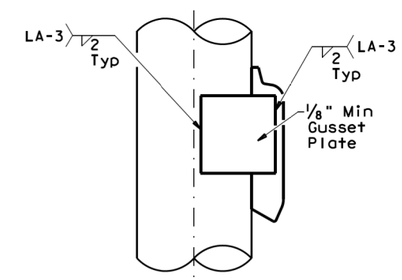
⑦ Dimensional limits are given to show acceptable variation in design. All of a Fabricator's production of a particular arm length shall have the same dimensions within specified tolerances.

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.

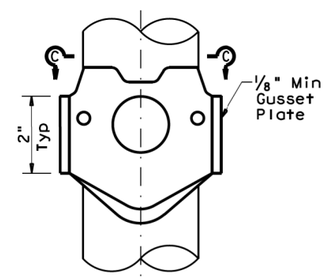
⑨ Proposed deviations in arm simplex dimensions or materials must be submitted to the Department for approval.

⑩ A welded handhole frame is permissible. Maximum of two (2) CJP weld splices is allowed.

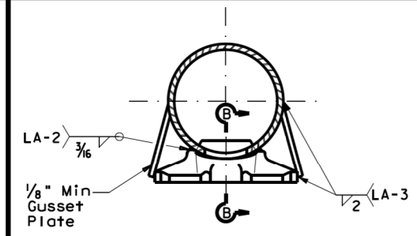
MATERIALS	
Pole or Arm Simplex	ASTM A27 Gr 65-35 or Gr 70-36, A148 Gr 80-50, A576 Gr 1021 ⑤, or A36 (Arm only)
Arm Pipes	ASTM A53 Gr A or B, A500 Gr B, A501, A 1008 HSLAS-F Gr 50 ⑥, or A1011 HSLAS-F Gr 50 ⑥
Arm Struts and Gusset Plates ④	ASTM A36, A572 Gr 50 ⑥, or A588
Misc.	ASTM designations as noted



SIDE

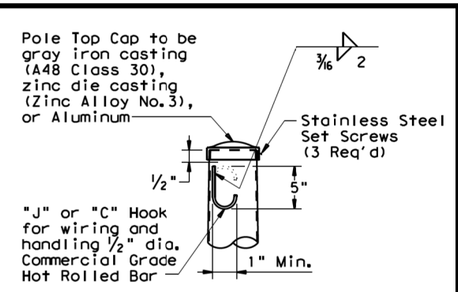


ELEVATION

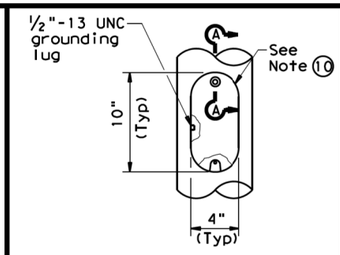


SECTION C-C

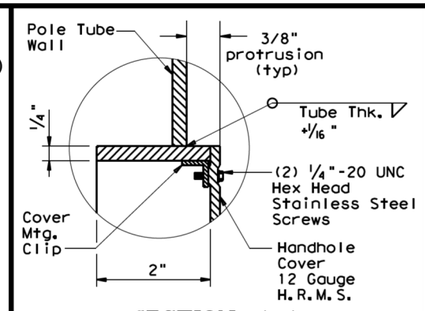
SIMPLEX ATTACHMENT DETAIL



POLE TOP



ELEVATION



SECTION A-A

HANDHOLE

COTTON BELT REGIONAL RAIL
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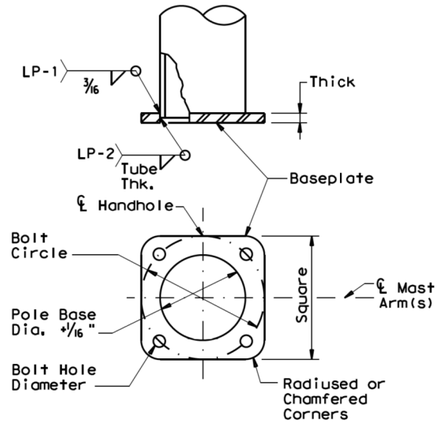
ROADWAY ILLUMINATION POLES

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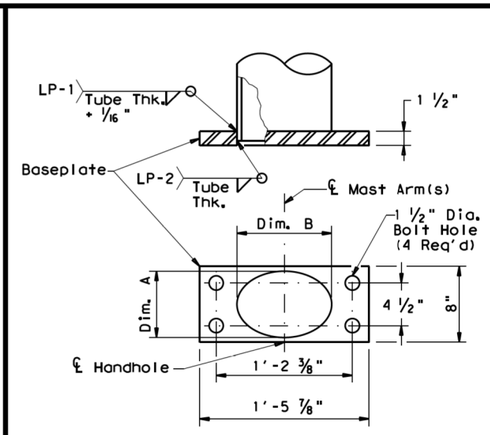
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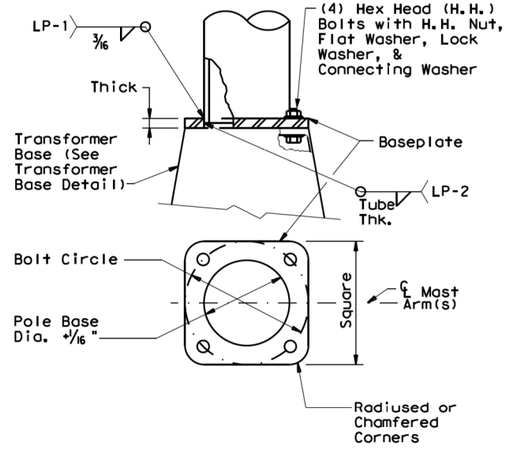
SHOE BASE BASEPLATE

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

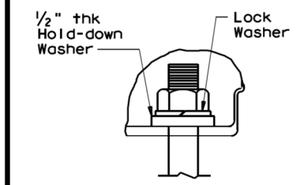
CONCRETE TRAFFIC BARRIER BASE BASEPLATE TABLE			
MOUNTING HEIGHTS (nominal)	POLE DIA.(12)	DIM. A	DIM. B
28' - 38'	9"	7"± 1/4"	10"± 1/4"
48'	10 1/2"	7"± 1/4"	13"± 1/4"



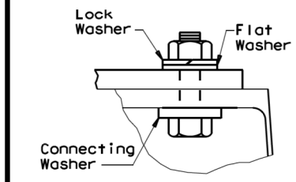
TRANSFORMER BASE BASEPLATE

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

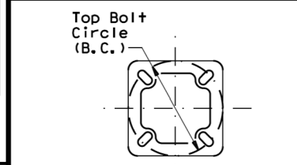
TRANSFORMER BASE TABLE		
TYPE	TOP B.C.	BTM. B.C.
A	13"	14"
B	15"	17 1/4"



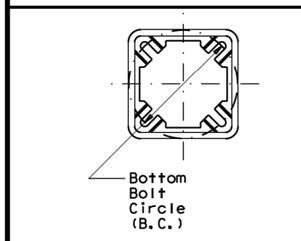
DETAIL A



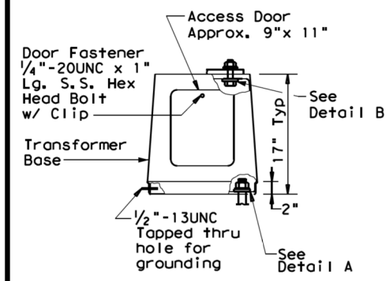
DETAIL B



TOP PLAN



BOTTOM PLAN



ELEVATION

TRANSFORMER BASE DETAILS

GENERAL NOTES:

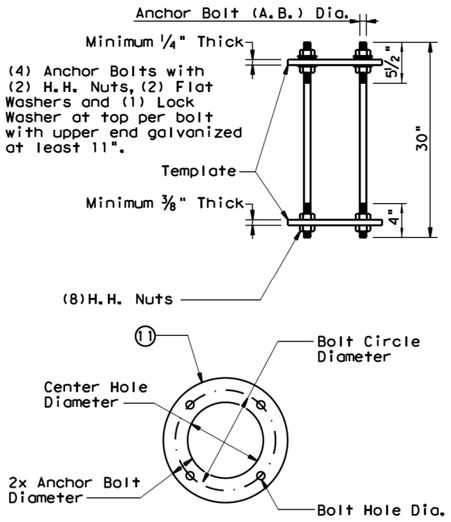
1. For mounting heights between those shown in the table, use the values in the table for the larger mounting height.
2. All breakaway bases shall meet the breakaway requirements of the AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals, 6th Edition (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.

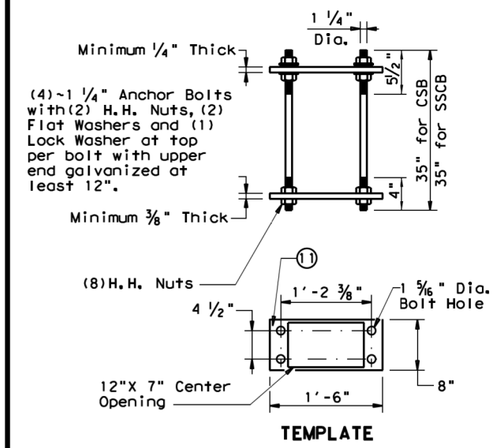
(12) Pole diameter before ovalized.

ANCHOR BOLT FABRICATION TOLERANCES TABLE	
DIMENSION	TOLERANCE
Length	± 1/2"
Threaded length	± 1/2"
Galvanized length (if required)	- 1/4"



SHOE BASE ANCHOR BOLT ASSEMBLY

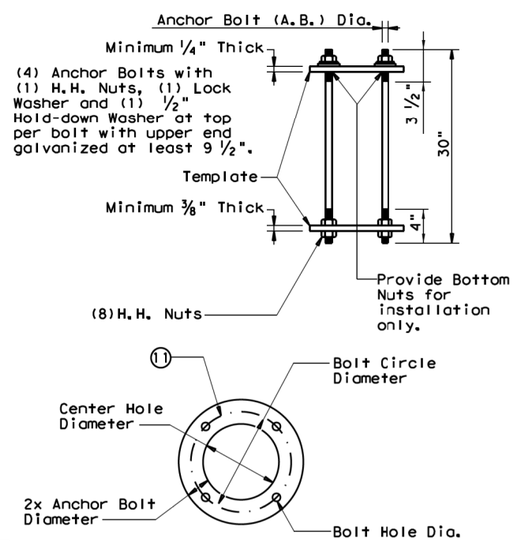
SHOE BASE ANCHOR BOLT ASSEMBLY TABLE				
MOUNTING HEIGHTS (nominal)	A.B. Dia.	BOLT CIRCLE DIAMETER	CTR. HOLE DIAMETER	BOLT HOLE DIAMETER
20'-39'	1"	13"	11"	1 1/16"
40'-50'	1 1/4"	15"	12 1/2"	1 5/16"



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

CONSTRUCTION OF RAIL VELOWEB HIKE & BIKE TRAIL
SHEET NO. 130 OF 242
DWG NO. WS9-4016
CONTRACT NO. C-2033270-01

SHEET 4 OF 4

Texas Department of Transportation

Traffic Safety Division Standard

ROADWAY ILLUMINATION POLES

RIP(4)-19

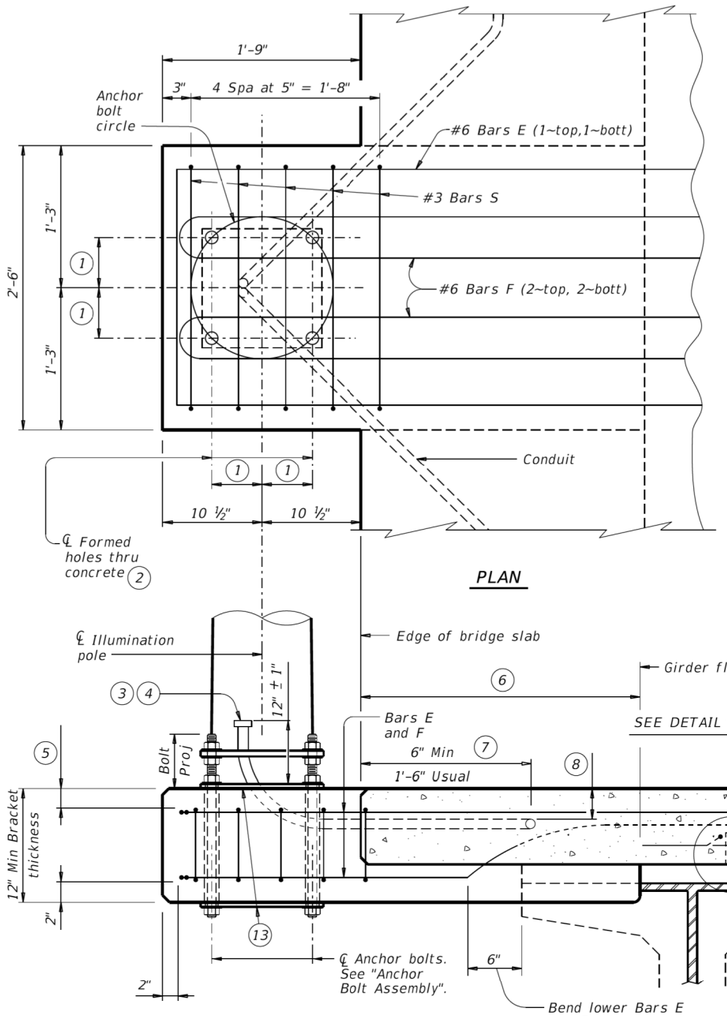
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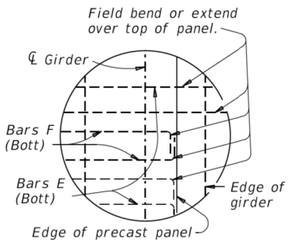
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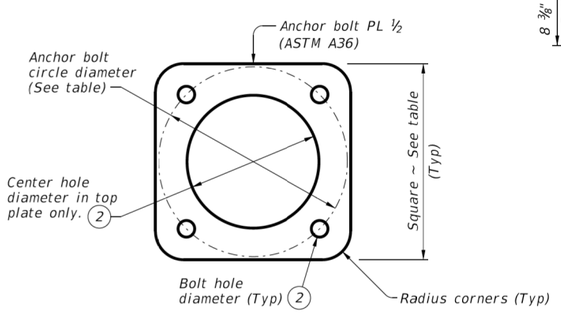
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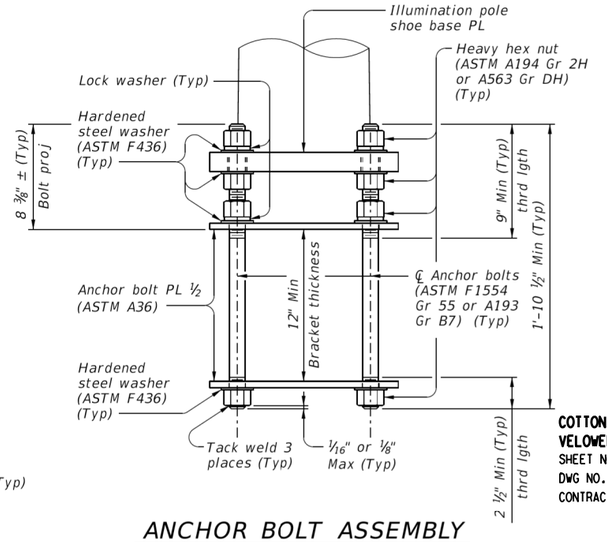
ILLUMINATION POLE BRACKET LOCATION AND REINFORCING



DETAIL "A"



ANCHOR BOLT PLATE



ANCHOR BOLT ASSEMBLY

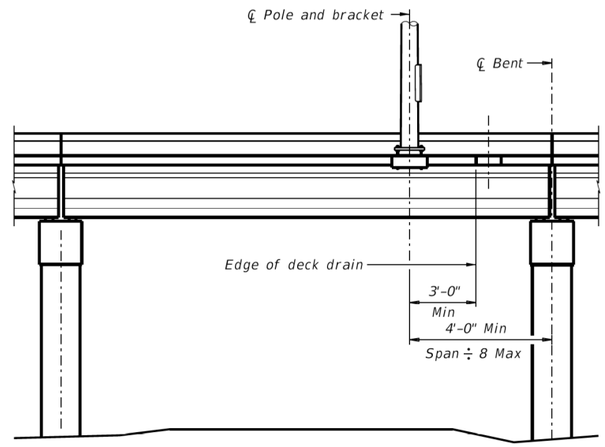
(See table for anchor bolt diameter)

TABLE OF ANCHOR BOLT AND ANCHOR BOLT PLATE INFORMATION

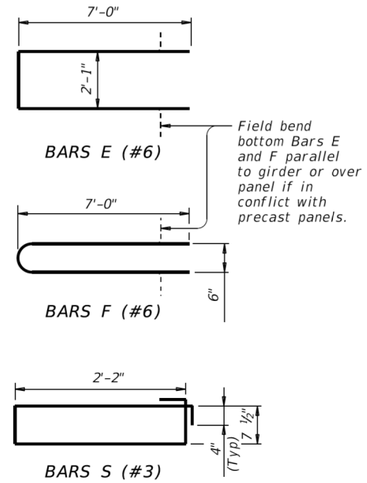
ANCHOR BOLT CIRCLE DIAMETER	ANCHOR BOLT OFFSET	ANCHOR BOLT DIAMETER	ANCHOR BOLT HOLE SIZE		TOP AND BOTTOM ANCHOR BOLT PLATE SIZE	CENTER HOLE DIAMETER IN TOP ANCHOR BOLT PLATE
			CONCRETE	STEEL		
IN	IN	IN	IN	IN	IN	IN
13	4 ⅝	1	1 ¼	1 ¼	PL ½ X 13 X 1'-1"	9 ½
15	5 5/16	1 ¼	1 ½	1 ½	PL ½ X 15 ½ X 1'-3 ½"	10 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.

SHEET 1 OF 2

Texas Department of Transportation

Bridge Division Standard

BRIDGE LIGHTING DETAILS

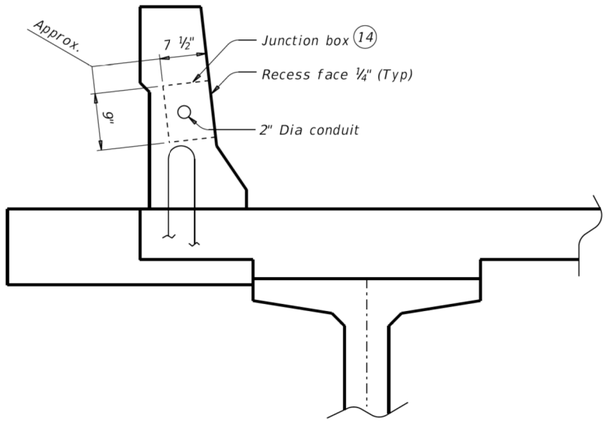
BL

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
SHEET NO. 131 OF 242
DWG NO. WS9-4017
CONTRACT NO. C-2033270-01

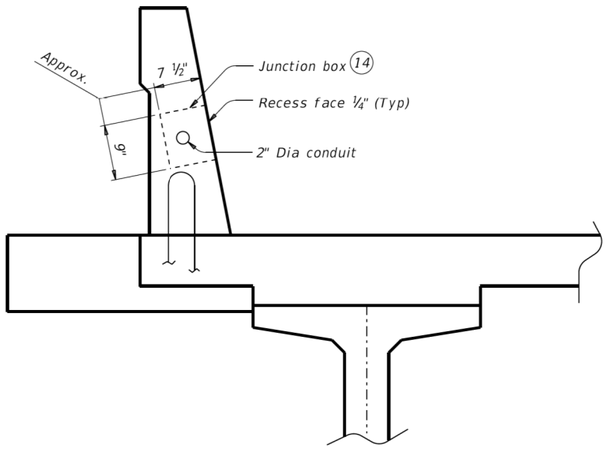
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	DIST	COUNTY		SHEET NO.

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SHOWING T551, T552, AND T80HT



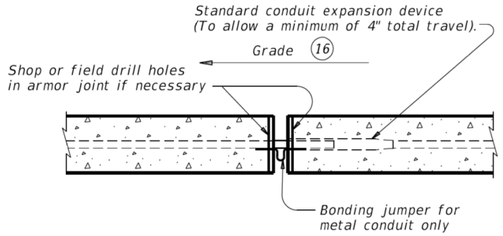
SHOWING SSTR AND T80SS

(4) Ream burrs and install bell ends or bushings on all conduit ends.

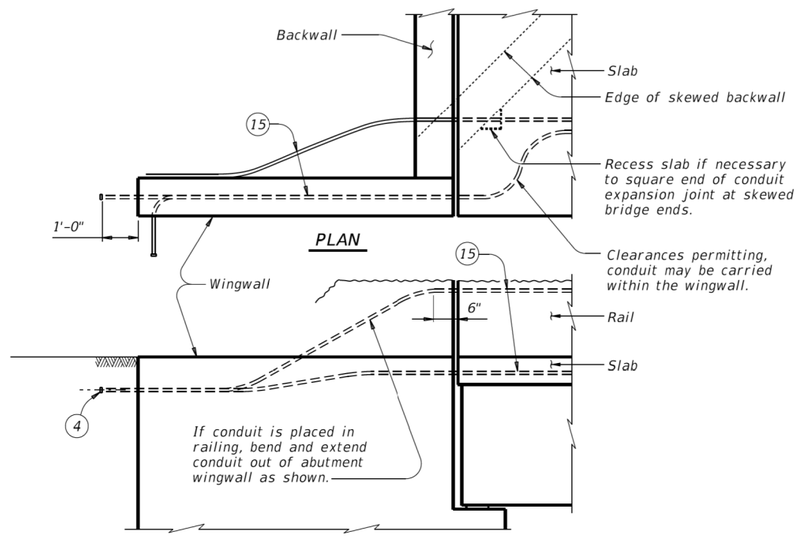
(14) Provide polymer concrete junction boxes meeting the requirements of DMS 11030.

(15) Position of conduit shown elsewhere on the plans or as directed by the Engineer.

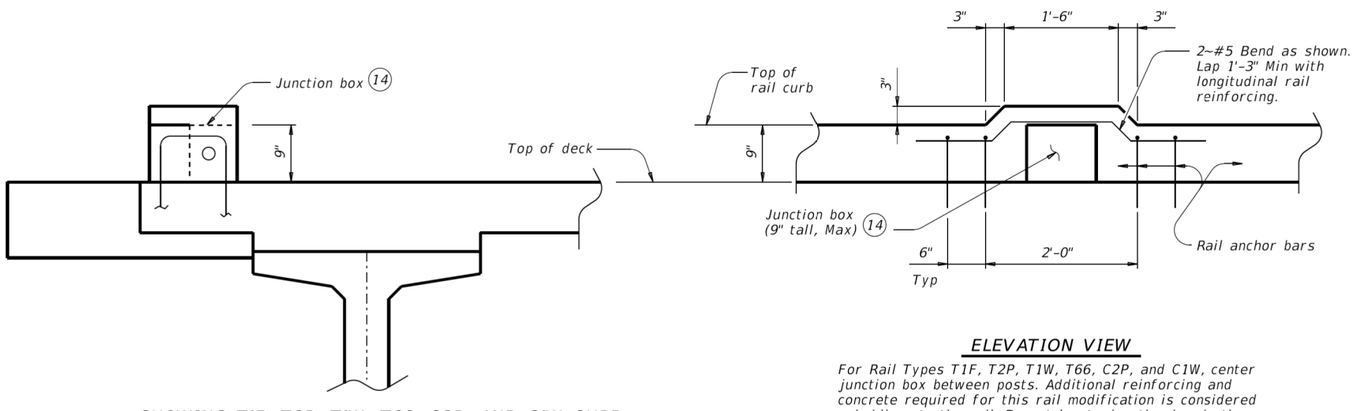
(16) Place conduit expansion device on high side of expansion joint.



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.

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
SHEET NO. 132 OF 242
DWG NO. WS9-4018
CONTRACT NO. C-2033270-01

Texas Department of Transportation

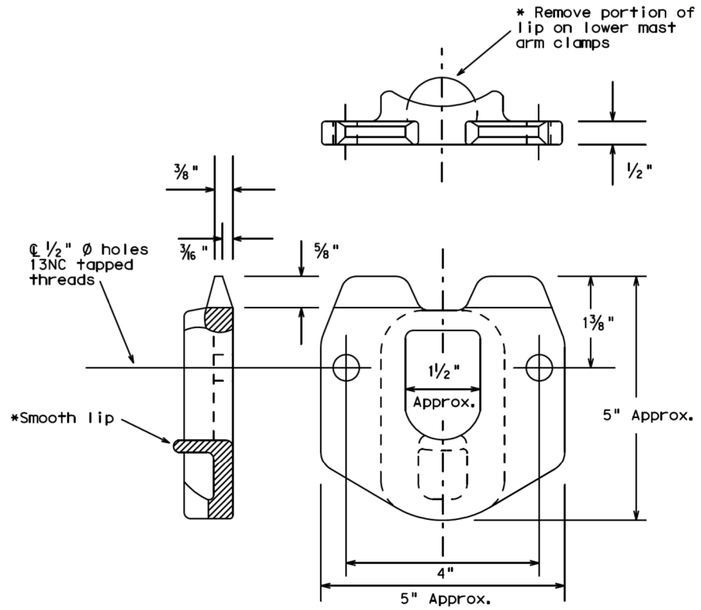
Bridge Division Standard

BRIDGE LIGHTING DETAILS

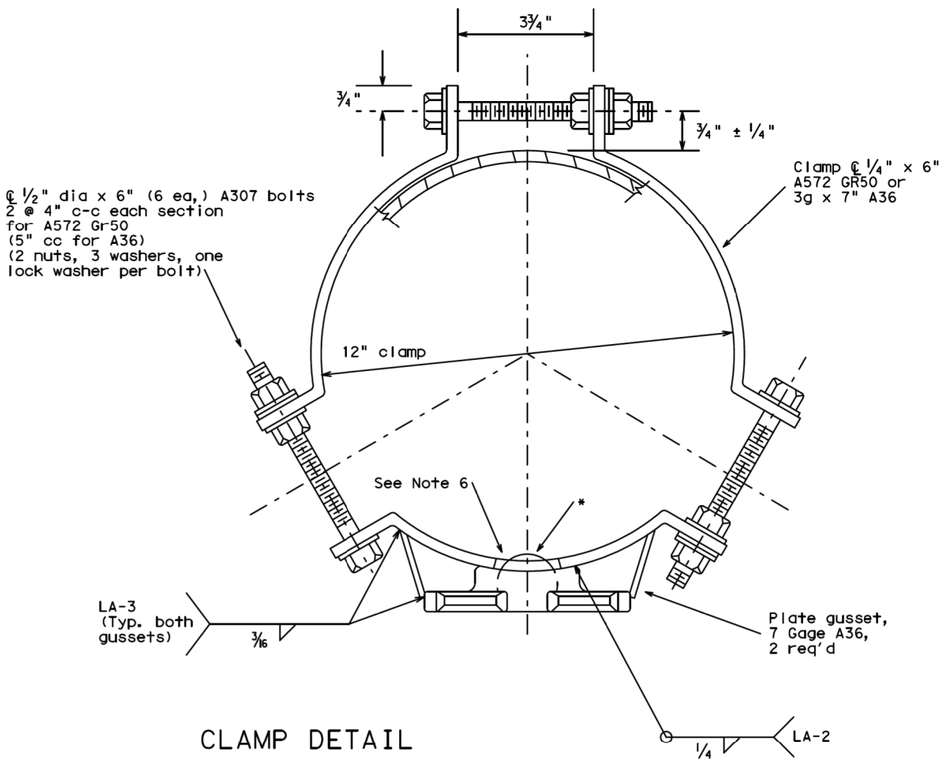
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POLE SIMPLEX DETAILS



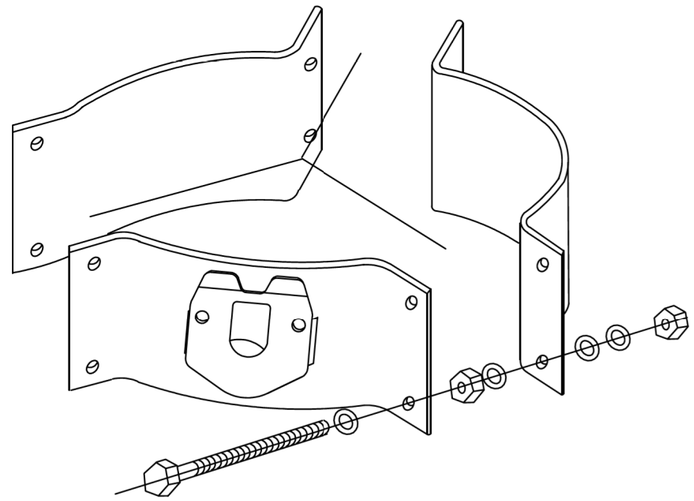
CLAMP DETAIL

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.



PROJECTION

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. 133 OF 242
DWG NO. WS9-4101
CONTRACT NO. C-2033270-01

Texas Department of Transportation
Traffic Operations Division

CLAMP ON FITTING ASSEMBLY FOR LUMINAIRE MAST ARM

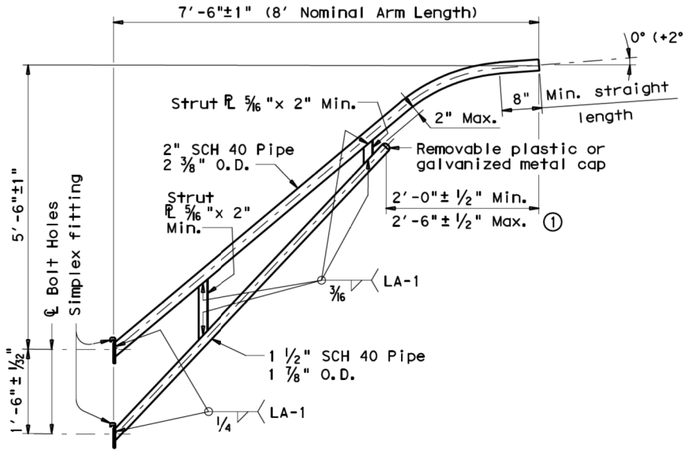
CFA-12

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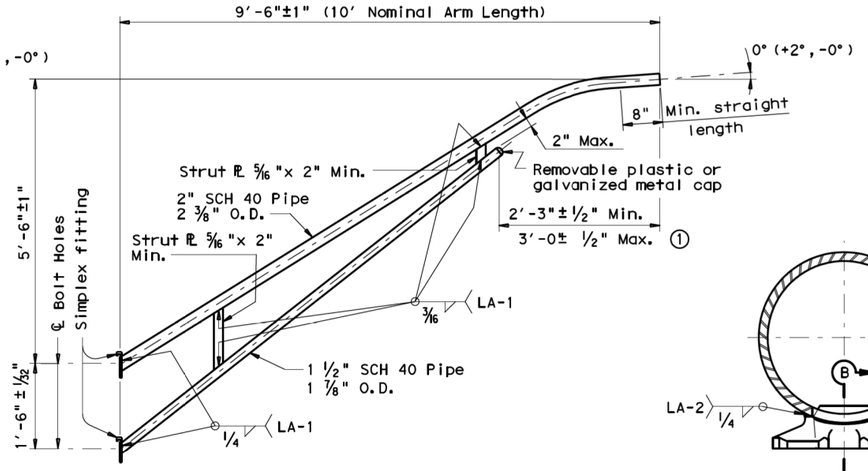
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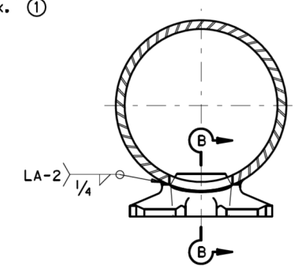
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8-FOOT LUMINAIRE ARM



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.

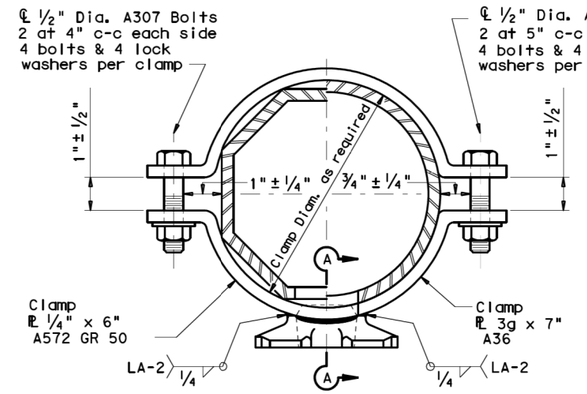
Materials and fabrication shall be in accordance with Item 686, "Traffic Signal Pole Assemblies (Steel)" and with the details, dimensions, and weld procedures shown herein. Weld references call for preapproved weld procedures which the Fabricator must obtain prior to fabrication. In the absense of specified 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.

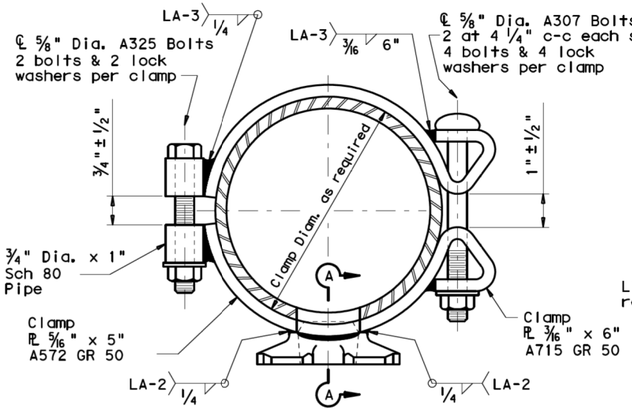
Each pole simplex fitting shall be supplied with 2 ASTM A325 bolts and 2 lock washers of the size specified. The bolts and lock washers shall be secured to the pole with the other hardware items called for in the plans. When clamp attachment is specified, the Fabricator shall ship the clamp assembly 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.



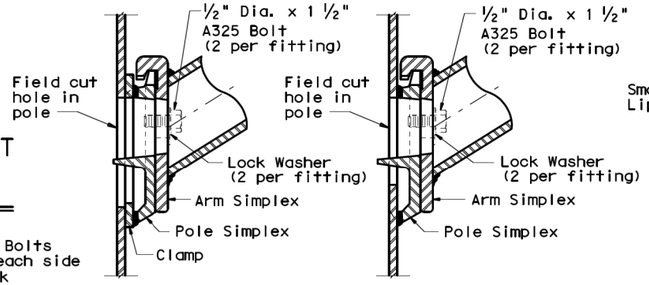
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CLAMP ATTACHMENT DETAIL NO. 2 (HALF SECTION)



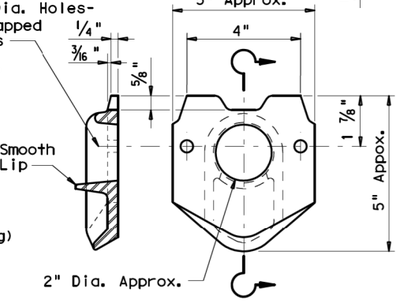
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CLAMP ATTACHMENT DETAIL NO. 4 (HALF SECTION)

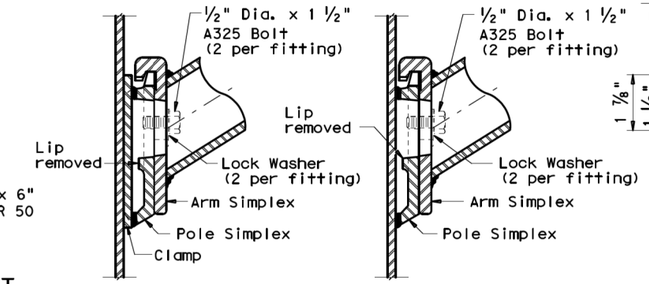


UPPER SIMPLEX FITTING

UPPER SIMPLEX FITTING



POLE SIMPLEX DETAIL

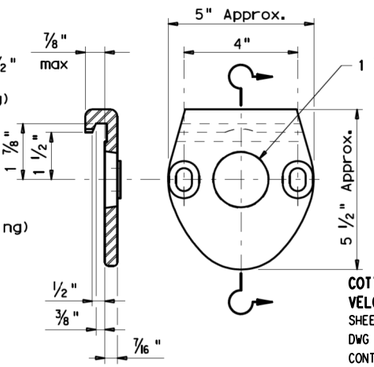


LOWER SIMPLEX FITTING

LOWER SIMPLEX FITTING

SECTON A-A

SECTON B-B



ARM SIMPLEX DETAIL

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
SHEET NO. 134 OF 242
DWG NO. WS9-4102
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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DN: LEH	CK: JSY	DW: LTT	CK: TEB

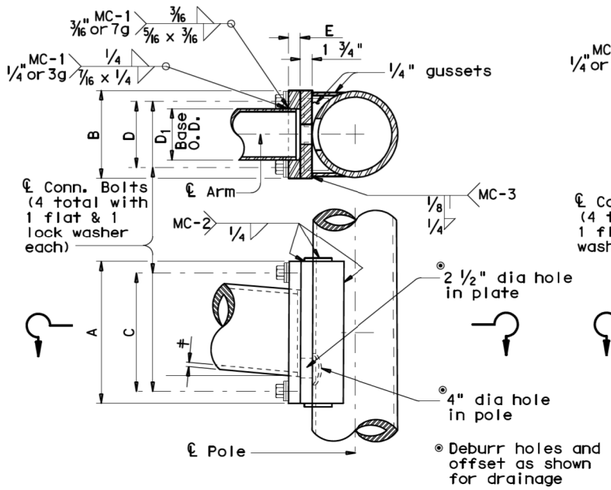
REVISIONS
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CONT	SECT	JOB	HIGHWAY
DIST	COUNTY		SHEET NO.

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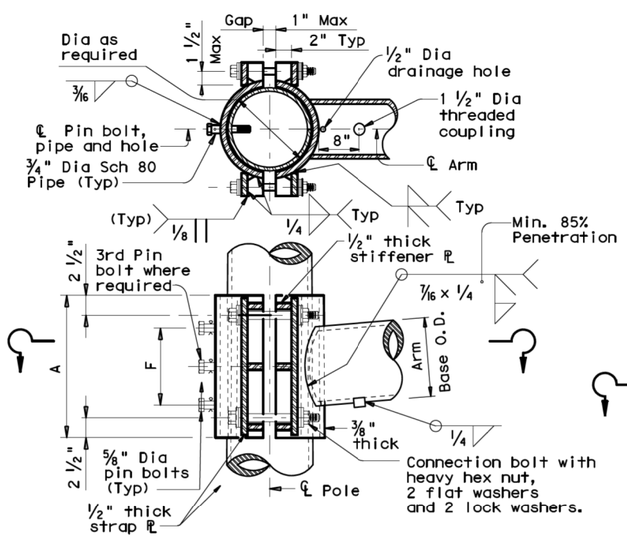
DATE:
FILE:

ARM SIZE D_1	ARM SIZE ℄	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



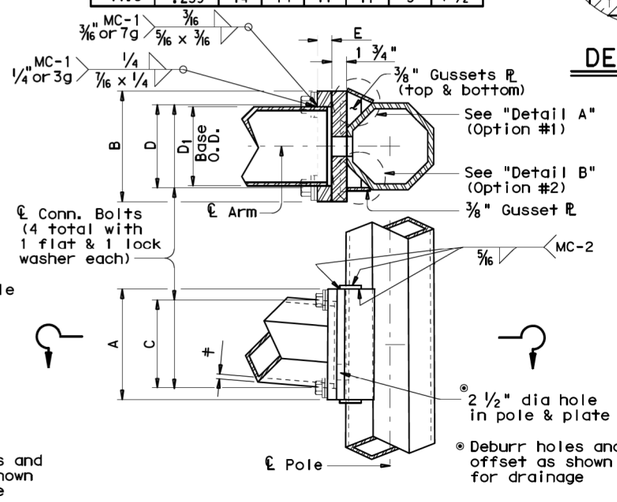
FIXED MOUNT DETAIL 1

ARM SIZE D_1	ARM SIZE ℄	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	⅝
7.5	.179	14	8	4	1	2	⅝
8.0	.179	14	8	4	1	2	⅝
9.0	.179	16	10	4	1	2	⅝
9.5	.179	18	12	4	1 ¼	3	⅝
9.5	.239	18	12	4	1 ¼	3	⅝
10.0	.239	18	12	4	1 ¼	3	⅝



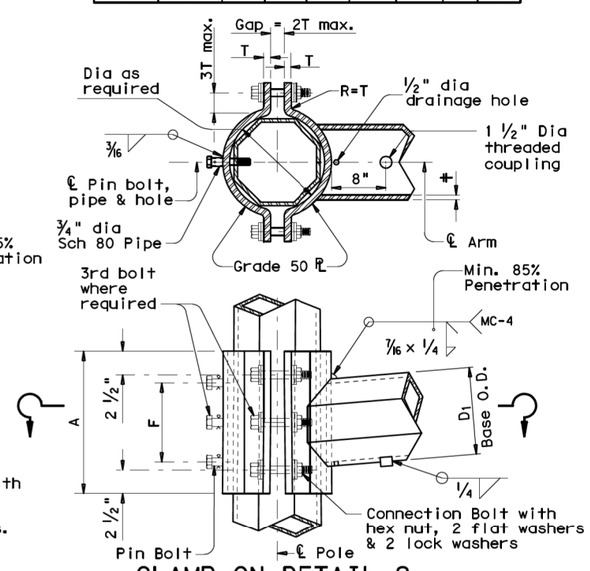
CLAMP-ON DETAIL 1

ARM SIZE D_1	ARM SIZE ℄	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



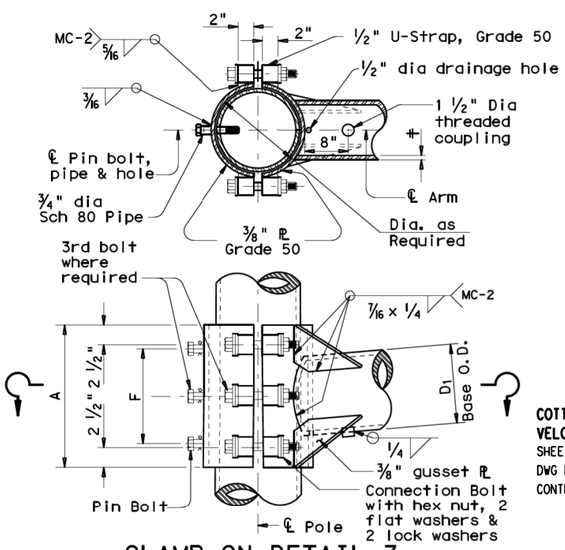
FIXED MOUNT DETAIL 2

ARM SIZE D_1	ARM SIZE ℄	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	⅝
7.5	.179	14	8	¾	4	¾	2	⅝
8.0	.179	14	8	¾	4	¾	2	⅝
9.0	.179	16	10	⅞	4	1	2	⅝
10.0	.179	18	10	⅞	4	1	2	⅝
9.5	.239	18	10	1	6	1	3	⅝
10.0	.239	18	10	1	6	1	3	⅝

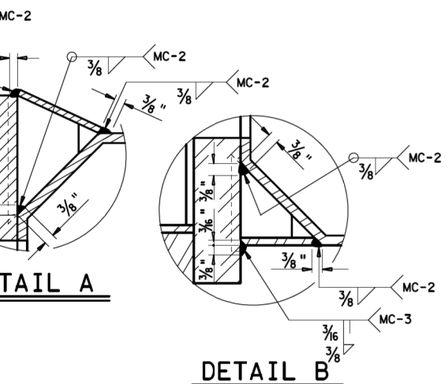


CLAMP-ON DETAIL 2

ARM SIZE D_1	ARM SIZE ℄	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	⅝
7.5	.179	14	8	4	1	2	⅝
8.0	.179	14	8	4	1	2	⅝
9.0	.179	16	10	4	1	2	⅝
9.5	.179	18	12	6	1	3	⅝
9.5	.239	18	12	6	1	3	⅝
10.0	.239	18	12	6	1	3	⅝

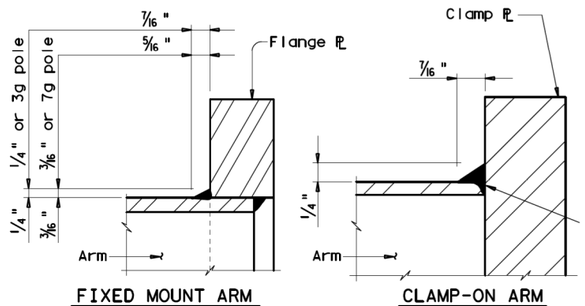


CLAMP-ON DETAIL 3



DETAIL A

DETAIL B



ARM BASE WELD DETAILS

FIXED MOUNT ARM — CLAMP-ON ARM

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 3/16" dia holes for a 1/8" 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. 135 OF 242
DWG NO. WS9-4103
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

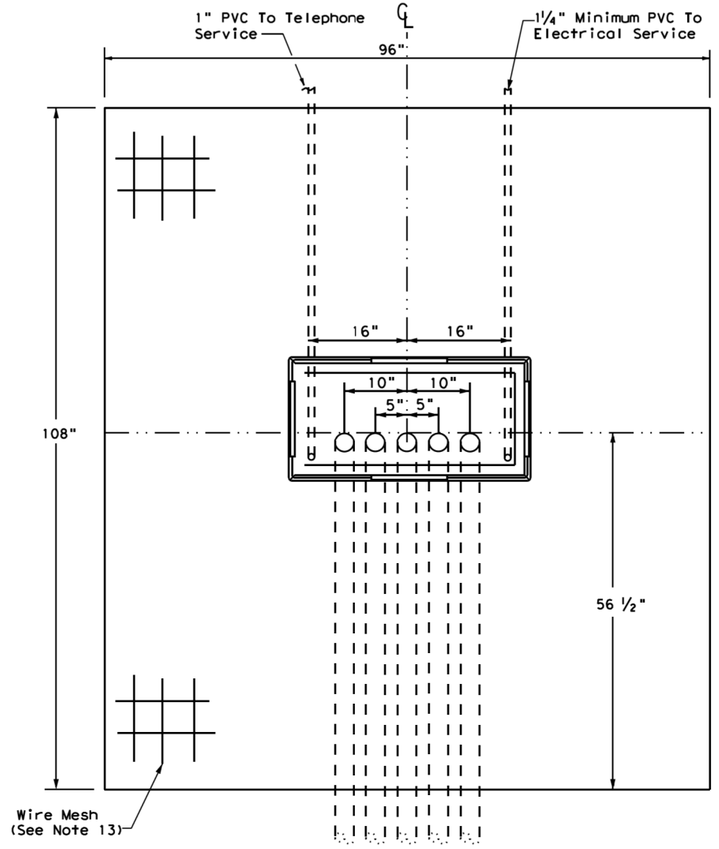
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DN: MS	CK: JSY	DW: MMF	CK: JSY
CONT	SECT	JOB	HIGHWAY
DIST	COUNTY		SHEET NO.

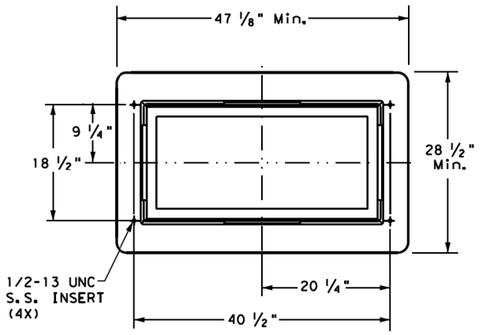
REVISIONS
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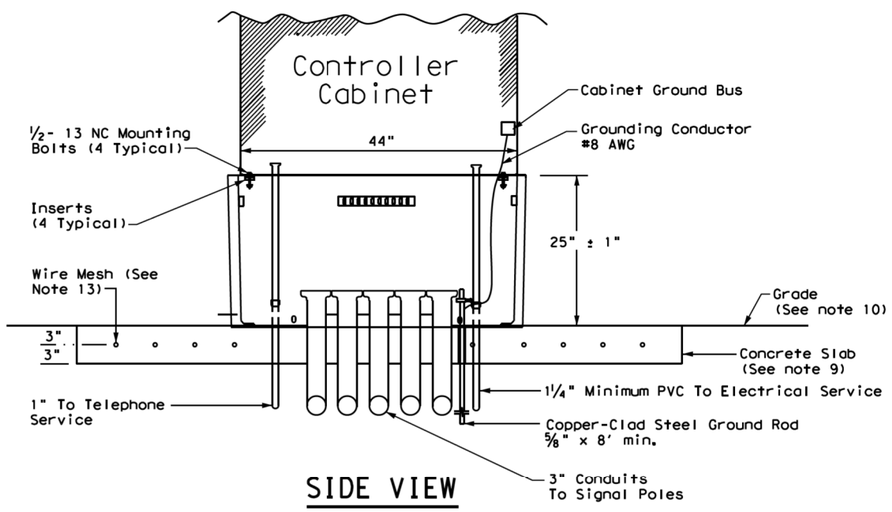
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TOP VIEW



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.

Texas Department of Transportation

Traffic Safety Division Standard

TRAFFIC SIGNAL CONTROLLER CABINET BASE AND PAD

TS-CF-21

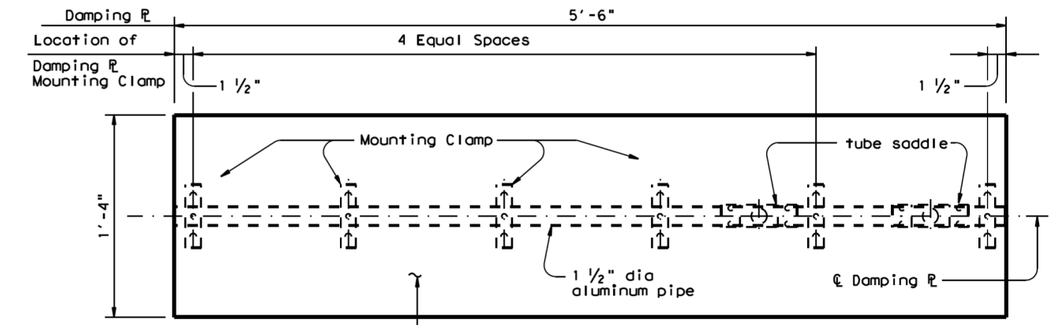
COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
SHEET NO. 136 OF 242
DWG NO. WS9-4104
CONTRACT NO. C-2033270-01

FILE: ts-cf-21.dgn	DN:	CK:	DW:	CK:
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REVISIONS				
12-04	DIST	COUNTY		SHEET NO.
2-21				

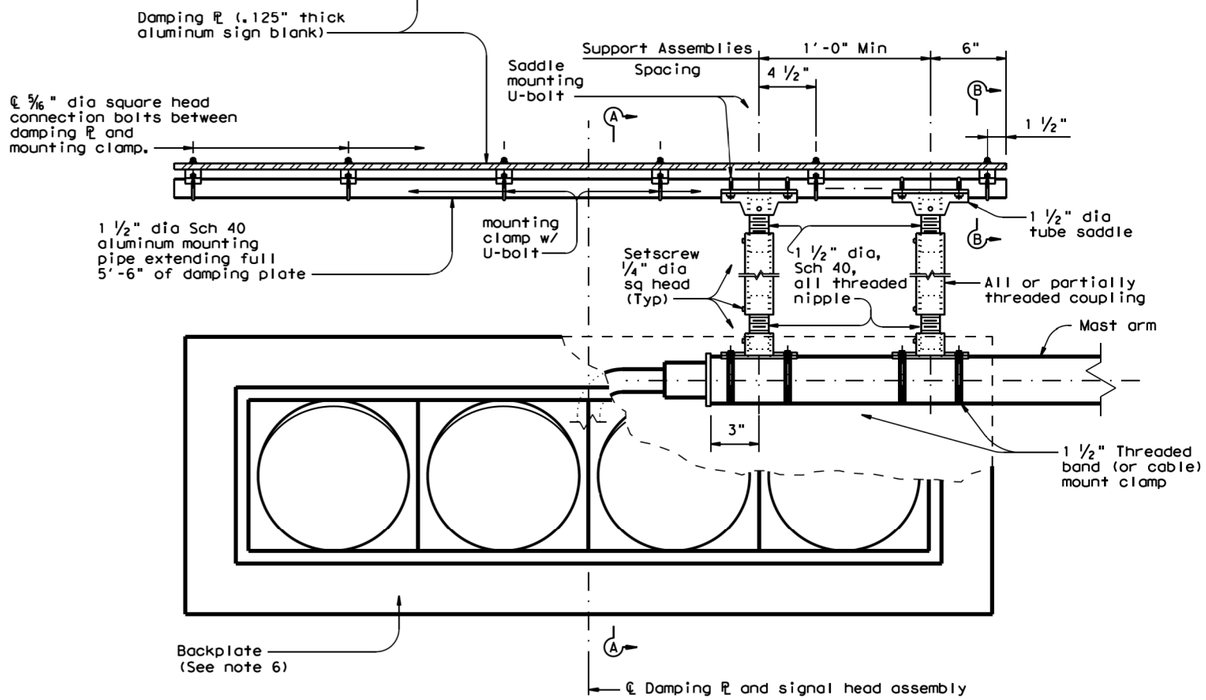
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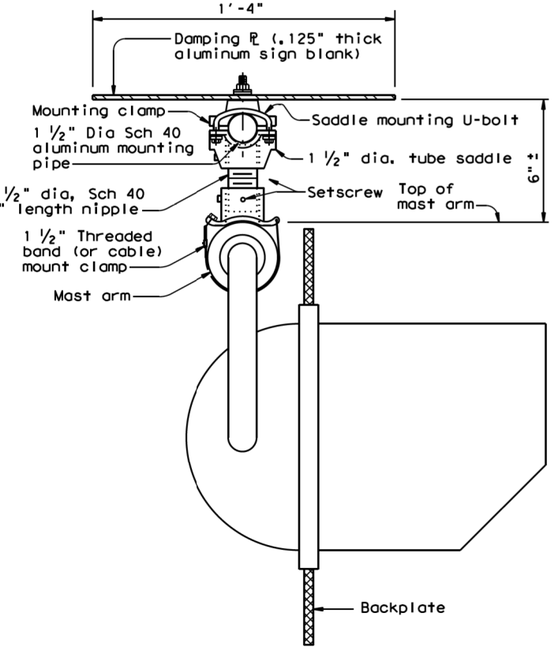
PLAN



ELEVATION

DAMPING PLATE MOUNTING DETAILS

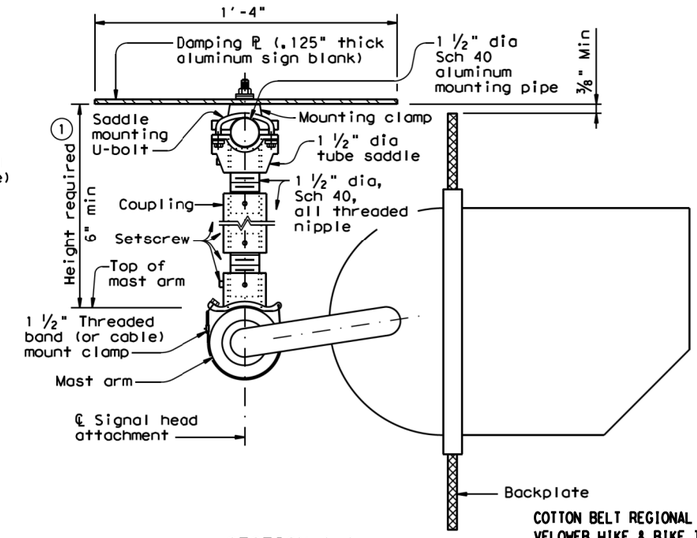
(Showing alternate placement of signal head)



SECTION A-A

(Showing standard placement of signal head)

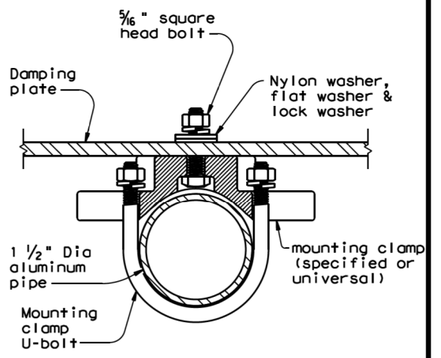
(Mounting clamp U-bolt is not shown for clarity)



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.

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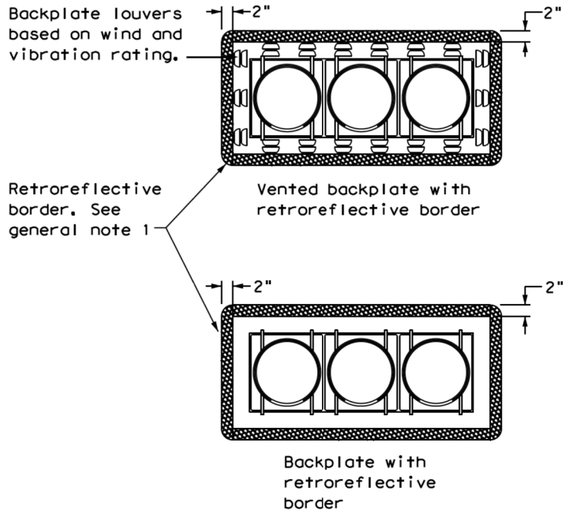
MAST ARM DAMPING PLATE DETAILS

MA-DPD-20

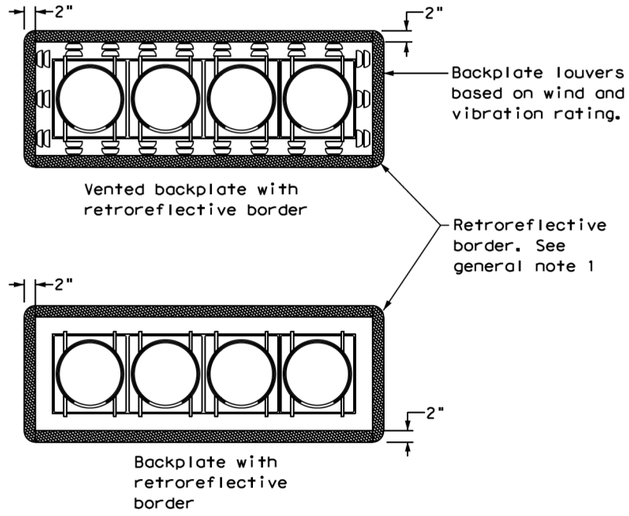
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REVISIONS 6-20	DIST	COUNTY		SHEET NO.

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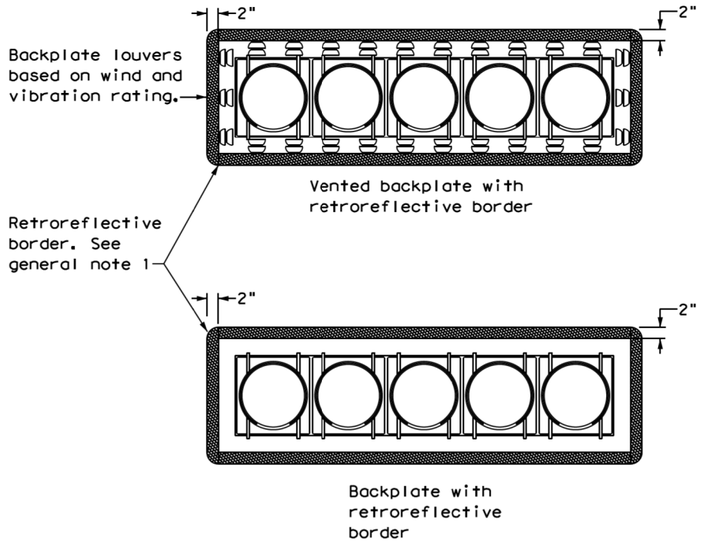
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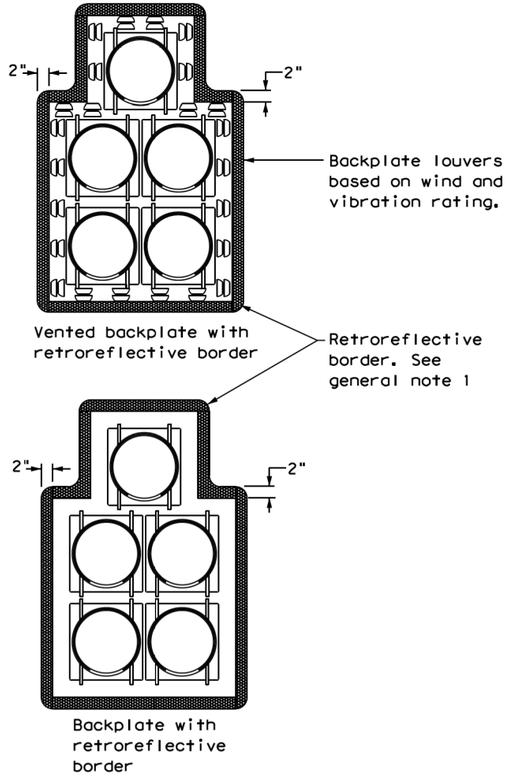
THREE-SECTION HEAD
HORIZONTAL OR VERTICAL



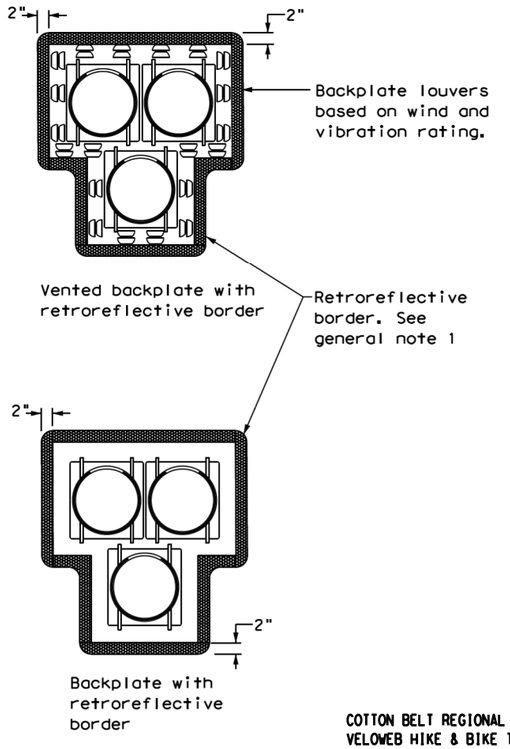
FOUR-SECTION HEAD
HORIZONTAL OR VERTICAL



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. 138 OF 242
DWG NO. WS9-4106
CONTRACT NO. C-2033270-0

FILE: ts-bp-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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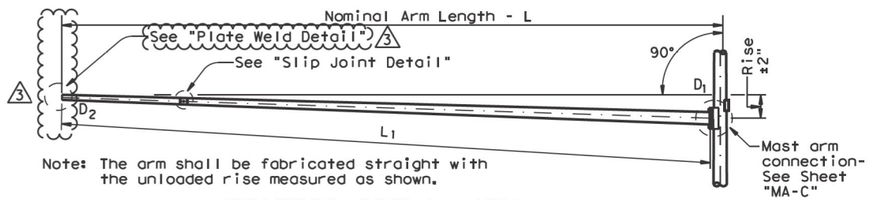
Arm Length	ROUND POLES					POLYGONAL POLES					Foundation Type
	D_B	D_{19}	D_{24}	D_{30}	① thk	D_B	D_{19}	D_{24}	D_{30}	① thk	
ft.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	
20	10.5	7.8	7.1	6.3	.179	11.5	8.5	7.7	6.8	.179	30-A
24	11.0	8.3	7.6	6.8	.179	12.0	9.0	8.2	7.3	.179	30-A
28	11.5	8.8	8.1	7.3	.179	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.

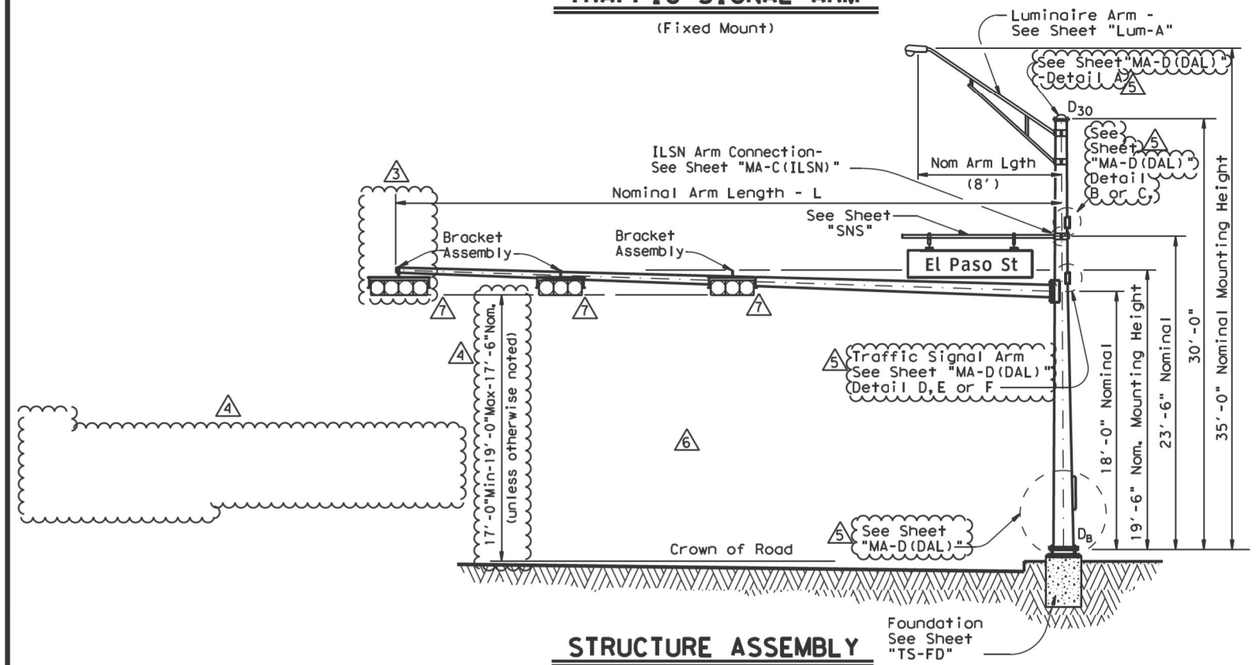
② D_2 may be increased by up to 1" for polygonal arms.



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 ½"	3'-4"	
1 ¾"	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)

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
SHEET NO. 139 OF 242
DWG NO. WS9-4107
CONTRACT NO. C-2033270-01

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)

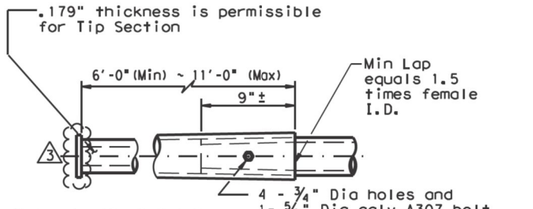
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REVISIONS
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DN: MS	CK: JSY	DW: MWF	CK: JSY
CONT	SECT	JOB	HIGHWAY
#CONT	#SECT	#JOB	#HWY
DIST	COUNTY		SHEET NO.
18	#CNTY		

122A

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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

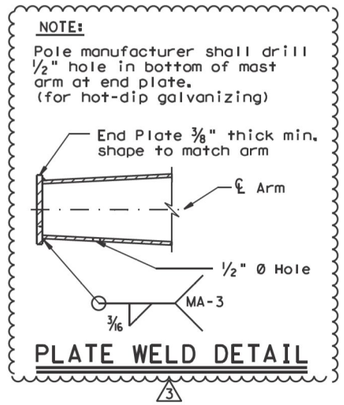


PLATE WELD DETAIL

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.

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

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.

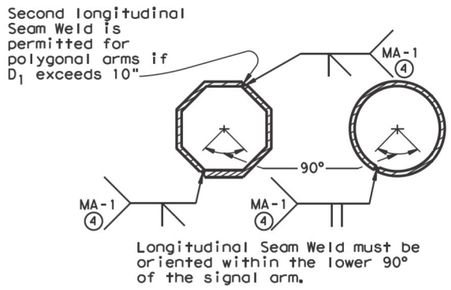
Poles are designed to support one 8'-0" luminaire arm, one 9'-0" internally lighted street name sign and one traffic signal arm with a length as tabulated. The specified luminaire load applied at the end of the luminaire arm equals 60 lbs vertical dead load plus the horizontal wind load on an effective 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)".

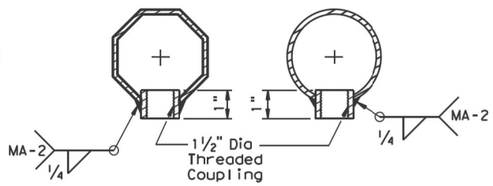
Unless otherwise noted, all parts shall be galvanized in accordance with Item 445, "Galvanizing", after fabrication.

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. 140 OF 242
DWG NO. WS9-4108
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)

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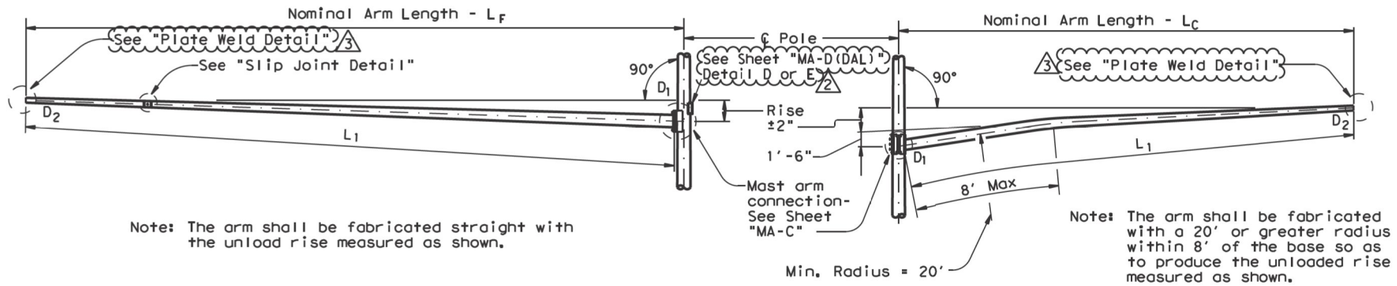
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CONT	SECT	JOB	HIGHWAY
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122B

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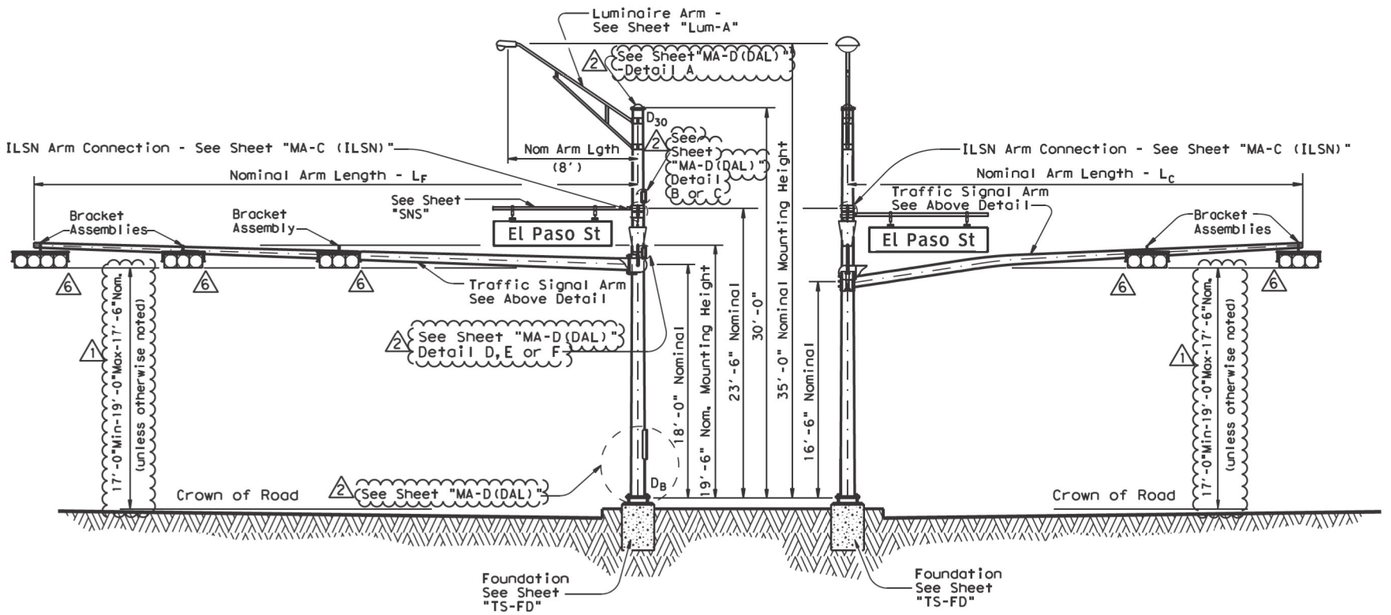


Note: The arm shall be fabricated straight with the unload rise measured as shown.

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.

Texas Department of Transportation

TRAFFIC SIGNAL SUPPORT STRUCTURES

DUAL MAST ARM ASSEMBLY

(80 MPH WIND ZONE)

DMA-80 (1)-12(DAL)

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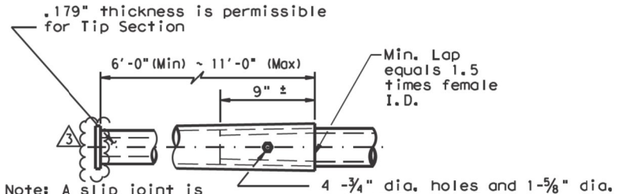
COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
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DWG NO. WS9-4109
CONTRACT NO. C-2033270-01

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SLIP JOINT DETAIL

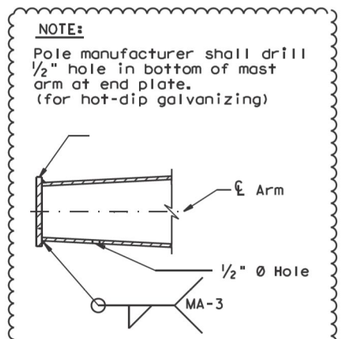
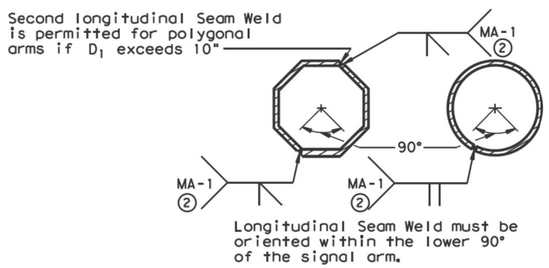


PLATE WELD DETAIL

3

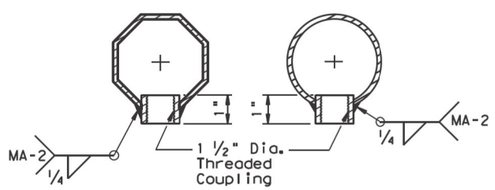
Stainless steel bands (or Cables) and cast bracket as in "Astro-Brac", "Sky Bracket" or "Easy Bracket" with 1 ½" Dia Threaded Coupling.

BRACKET ASSEMBLY



ARM WELD DETAIL

②60% Min. penetration 100% pemetration within 6" of circumferential base welds.



ARM COUPLING DETAILS

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.

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
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3 REPLACED TENON DETAIL WITH PLATE WELD DETAIL(2/12).

Texas Department of Transportation

TRAFFIC SIGNAL SUPPORT STRUCTURES

DUAL MAST ARM ASSEMBLY

(80 MPH WIND ZONE)

DMA-80 (2)-12(DAL)

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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)		(4)
	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		
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).

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
SHEET NO. 143 OF 242
DWG NO. WS9-4111
CONTRACT NO. C-2033270-01

Texas Department of Transportation

TRAFFIC SIGNAL SUPPORT STRUCTURES

DUAL MAST ARM ASSEMBLY

(80 MPH WIND ZONE)

DMA-80 (3)-12(DAL)

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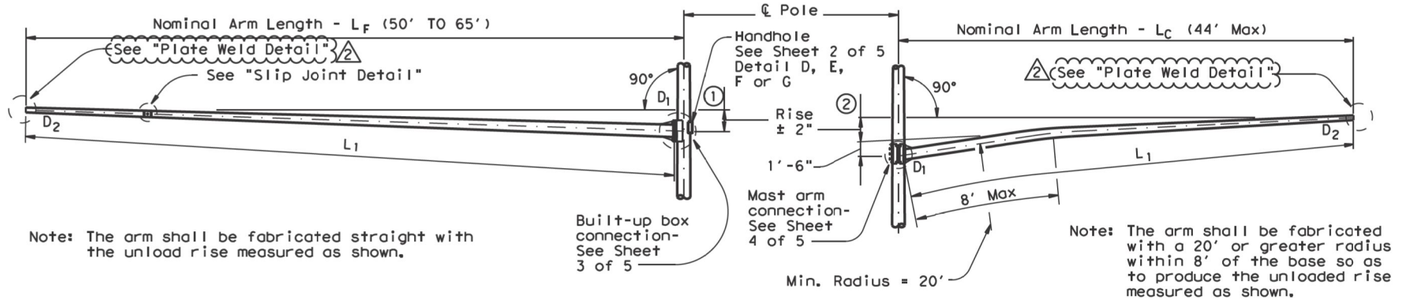
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REVISIONS
5-96
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CONT	SECT	JOB	HIGHWAY
#CONT	#SECT	#JOB	#HWY
DIST	COUNTY		SHEET NO.
18	#CNTY		

124C

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Note: The arm shall be fabricated straight with the unload rise measured as shown.

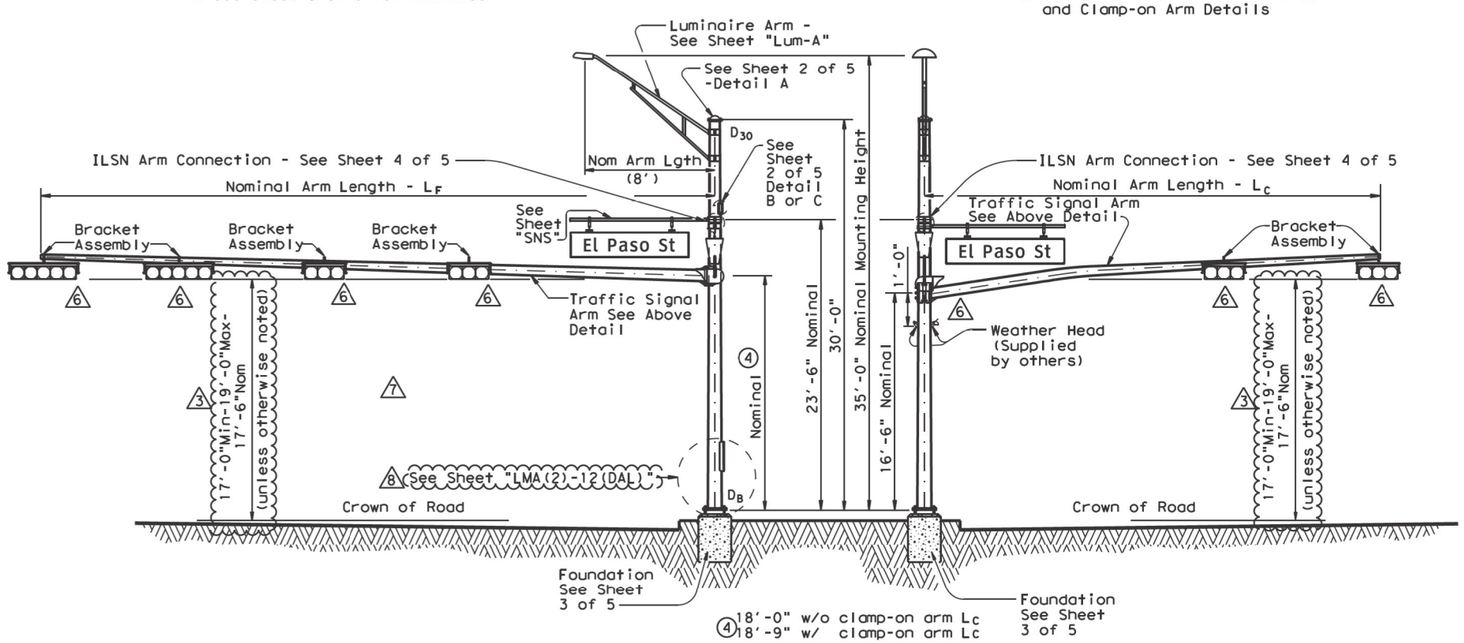
Note: The arm shall be fabricated with a 20' or greater radius within 8' of the base so as to produce the unloaded rise measured as shown.

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)

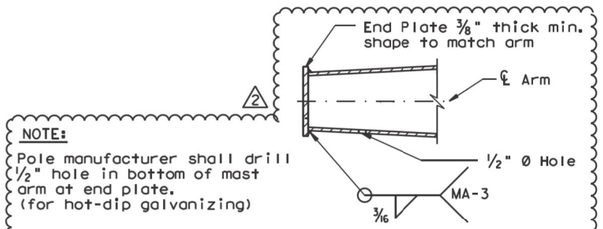
STRUCTURE ASSEMBLY

ELEVATION (Showing clamp-on arm)

MODIFICATIONS:

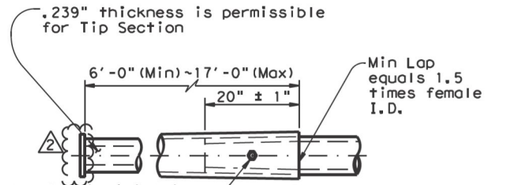
1. NOT USED
2. REPLACED TENON DETAIL WITH PLATE WELD DETAIL. (2/12)
3. REVISED MINIMUM SIGNAL HEIGHT. (3/12)
4. REMOVED "MA-D" REFERENCE. (2/12)
5. REMOVED TABLE OF DIMENSIONS "A". (2/12)
6. REMOVED CGB CONNECTORS. (2/12)
7. REMOVED THREADED COUPLING FOR CGB CONNECTOR. (2/12)
8. REVISED THE ELEVATION 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)

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 ⑤⑥
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.

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
SHEET NO. 144 OF 242
DWG NO. WS9-4112
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)

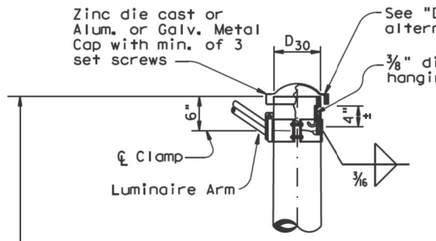
Sheet 1 of 5

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REVISIONS
4-20-01
1-12

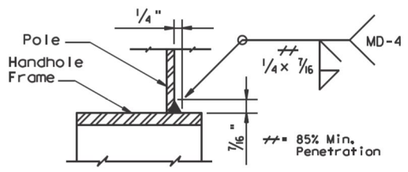
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CONT	SECT	JOB	HIGHWAY
#CONT	#SECT	#JOB	#HWY
DIST	COUNTY		SHEET NO.
18	#CNTY		

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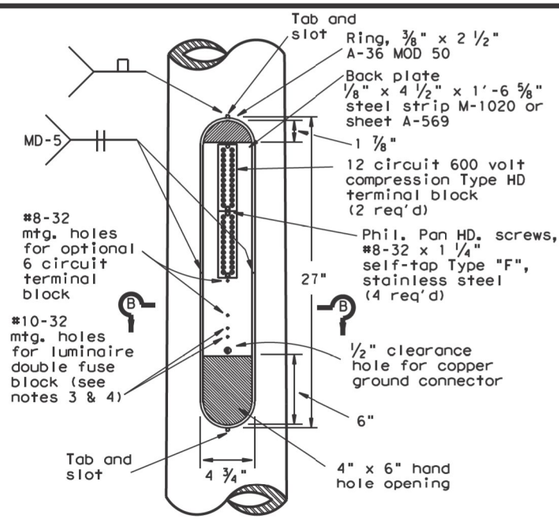


DETAIL A

(for pole with luminaire)



DETAIL H

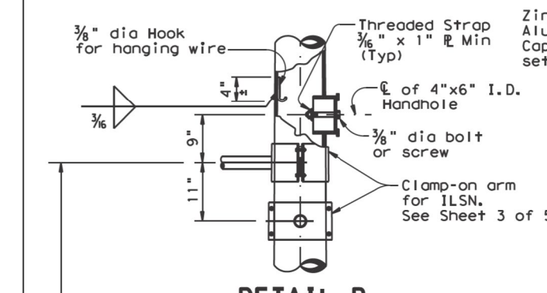


ACCESS COMPARTMENT

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

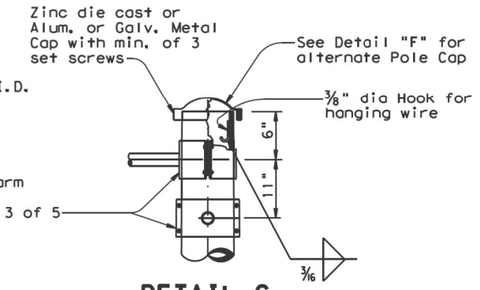
(7) ASTM A572, A1008 HSLAS, A1011 HSLAS, A1008 HSLAS-F, A1011 HSLAS-F, or A1011 SS may have higher yield strengths but shall not have less elongation than the grade indicated.

(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.

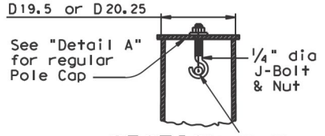


DETAIL B

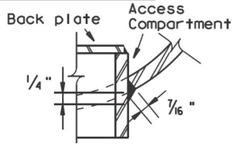
(If ILSN applied)



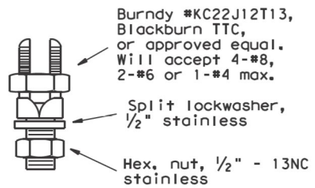
DETAIL C



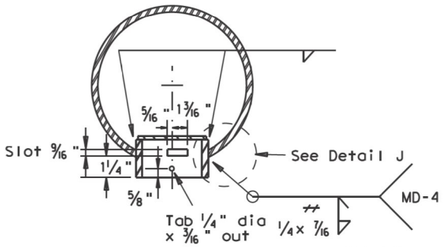
SECTION Y-Y



DETAIL J



COPPER GROUND CONNECTOR

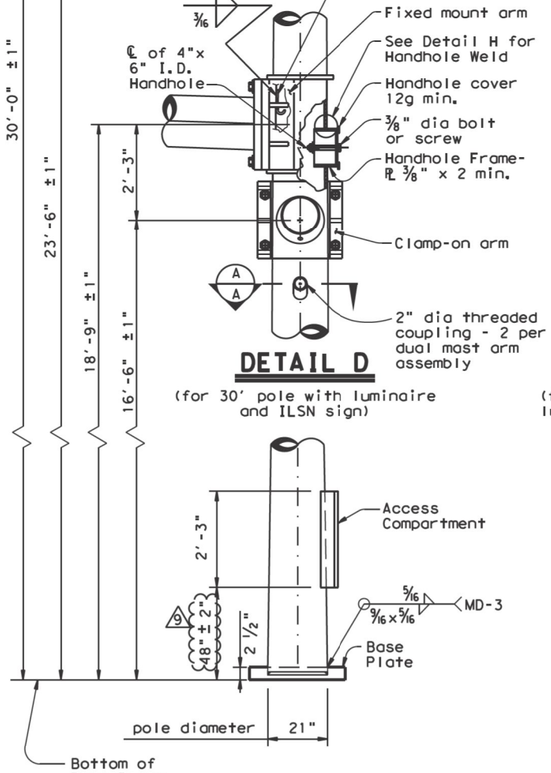


SECTION B-B

Opening for access compartment shall be no more than 1/16 inch wider than the access compartment itself.

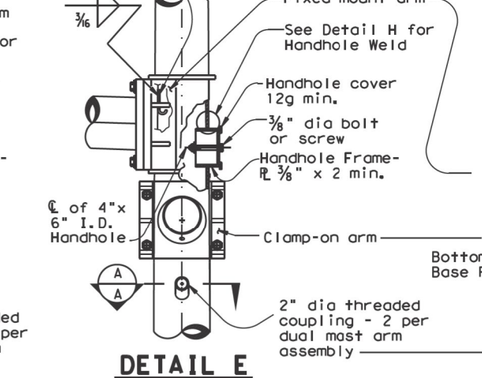
ACCESS COMPARTMENT NOTES:

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.



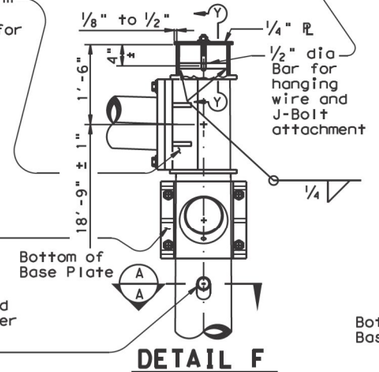
POLE ELEVATION

(for 30' pole with luminaire and ILSN sign)



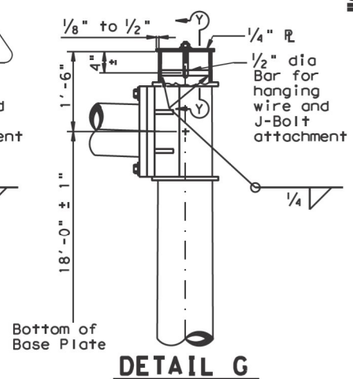
DETAIL E

(for 24' pole with ILSN sign and no luminaire, single or dual mast arm)



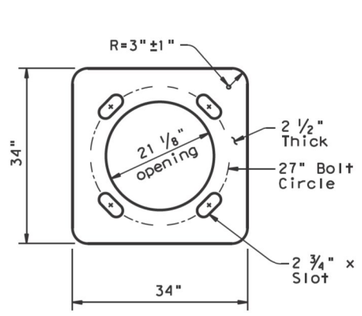
DETAIL F

(for 20.25' pole with no ILSN sign and no luminaire, dual mast arm)

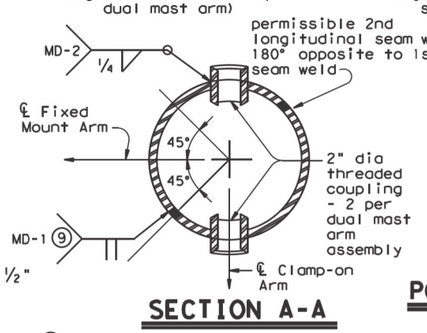


DETAIL G

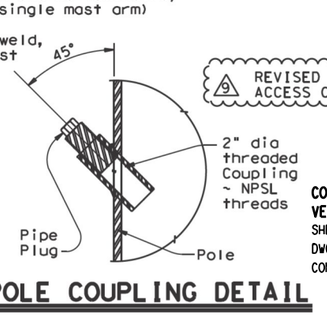
(for 19.5' pole with no ILSN sign and no luminaire, single mast arm)



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).

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
SHEET NO. 145 OF 242
DWG NO. WS9-4113
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)

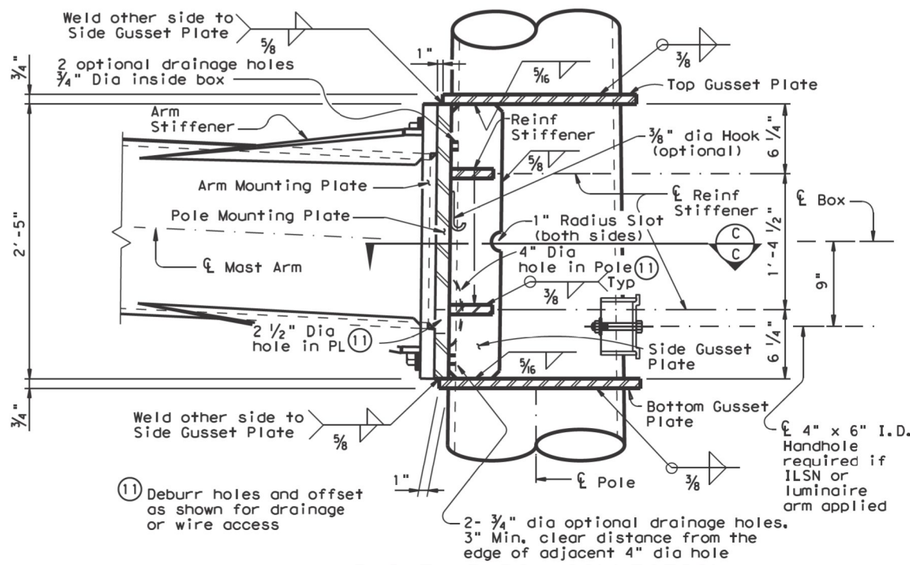
Sheet 2 of 5 — LMA(2)-12(DAL)

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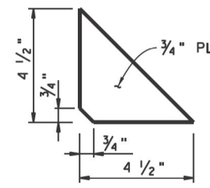
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REVISIONS	CONT	SECT	JOB	HIGHWAY
4-20-01 1-12	#CONT	#SECT	#JOB	#HWY
	DIST	COUNTY		SHEET NO.
	18	#CNTY		

131B

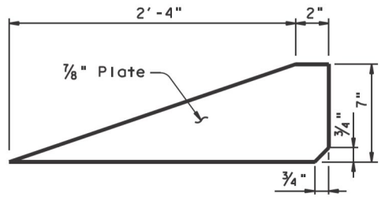
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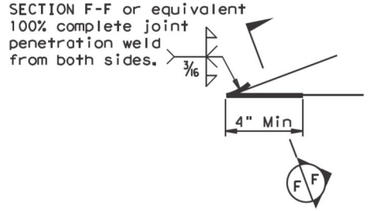
BUILT-UP BOX CONNECTION



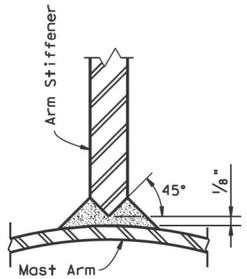
REINFORCING STIFFENER



ARM STIFFENER
(Cut to match arm inclination and taper)



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.

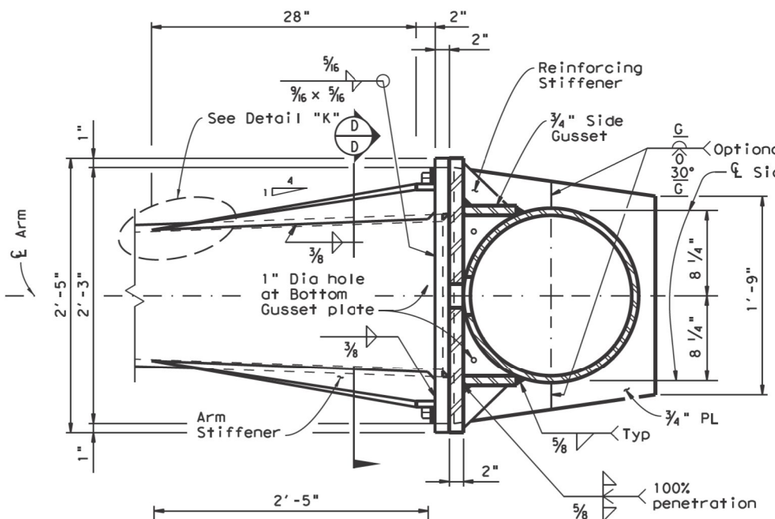
(13) Shaft profile 16-sided or 18-sided is considered to be equivalent to round section.

GENERAL NOTES:

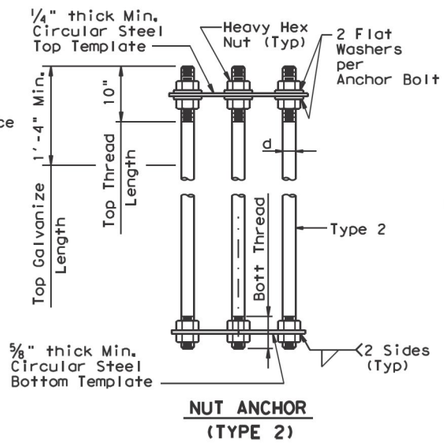
Built-up Box Connection: For the welded arm-to-pole connection as a build-up box configuration illustrated here is an example only, fabricators are required to submit a shop drawing of box connection for approval. The drawing shall specify the details of each box element, welds of arm-to-pole connection, 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.

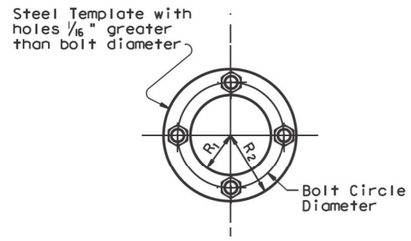
Fixed mount details are used for single mast arm assemblies and for the first arm on dual mast arm assemblies.



SECTION C-C

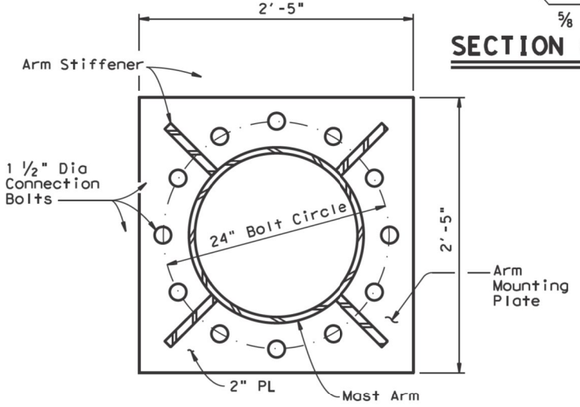


NUT ANCHOR
(TYPE 2)



TEMPLATE DETAIL

ANCHOR BOLT ASSEMBLY



SECTION D-D

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 Loods.

(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.

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.

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
SHEET NO. 146 OF 242
DWG NO. WS9-4114
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Texas Department of Transportation

TRAFFIC SIGNAL SUPPORT STRUCTURES
LONG MAST ARM ASSEMBLY (50 TO 65 FT) (80 AND 100 MPH WIND ZONE)

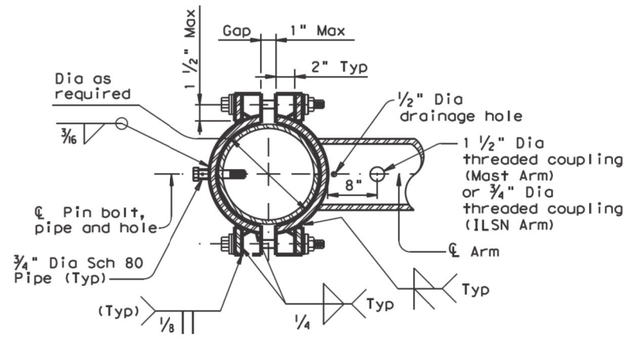
Sheet 3 of 5 LMA(3)-12

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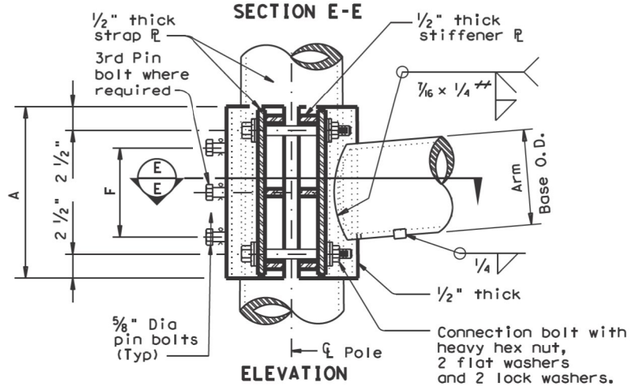
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4-20-01 1-12	CONT	SECT	JOB	HIGHWAY
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	DIST	COUNTY		SHEET NO.
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SECTION E-E



ELEVATION
(Mast Arm or ILSN Arm to pole)

= 85% Min. Penetration

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"

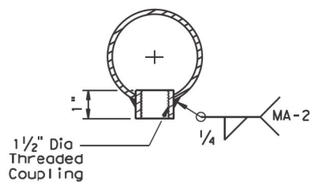
D1 = Arm Base O.D.
D2 = Arm End O.D.
L1 = Shaft Length
Lc = Clamp-on Arm Length

(12) Thickness shown is minimum, thicker materials may be used.

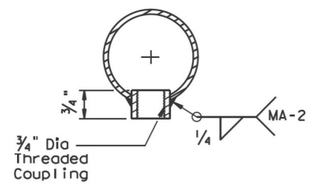
CLAMP-ON ARM CONNECTION

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



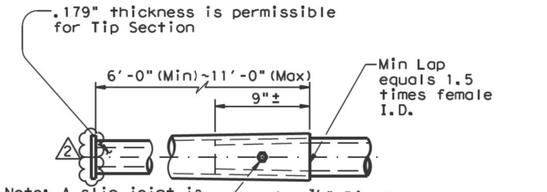
ILSN ARM COUPLING DETAIL

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.

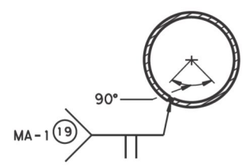
Pin bolts are required to prevent rotation of clamp-on arms under design wind forces. Pin bolts shall be ASTM A325 with threads excluded from the shear plane. Pin bolt and ¾" diameter pipe shall have 3/16" diameter holes for a 1/8" diameter galvanized cotter pin. Back clamp plate shall be furnished with 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.



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.

2 REPLACED TENON DETAIL WITH PLATE WELD DETAIL (2/12).

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
SHEET NO. 147 OF 242
DWG NO. WS9-4115
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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REVISIONS	DN: JK	CK: GRB	DW: FDN	CK: CAL
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	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: 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	
24	5024L		5024S		5024	
28	5028L		5028S		5028	
32	5032L		5032S		5032	
36	5036L		5036S		5036	
40	5040L		5040S		5040	
44	5044L		5044S		5044	
55 / 20	5520L		5520S		5520	
24	5524L		5524S		5524	
28	5528L		5528S		5528	
32	5532L		5532S		5532	
36	5536L		5536S		5536	
40	5540L		5540S		5540	
44	5544L		5544S		5544	
60 / 20	6020L		6020S		6020	
24	6024L		6024S		6024	
28	6028L		6028S		6028	
32	6032L		6032S		6032	
36	6036L		6036S		6036	
40	6040L		6040S		6040	
44	6044L		6044S		6044	
65 / 20	6520L		6520S		6520	
24	6524L		6524S		6524	
28	6528L		6528S		6528	
32	6532L		6532S		6532	
36	6536L		6536S		6536	
40	6540L		6540S		6540	
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	Type IV Arm (4 Signals) 1 4 Bracket Assemblies	
ft.	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 1	Type I Arm (1 Signal) 1 Bracket Assembly and 1clamp w/bolts and washers		Type II Arm (2 Signals) 2 Bracket Assemblies and 1clamp w/bolts and washers		Type III Arm (3 Signals) 3 Bracket Assemblies and 1clamp w/bolts and washers	
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					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 1	Type I Arm (1 Signal) 1 Bracket Assembly and 1clamp w/bolts and washers		Type II Arm (2 Signals) 2 Bracket Assemblies and 1clamp w/bolts and washers		Type III Arm (3 Signals) 3 Bracket Assemblies and 1clamp w/bolts and washers	
ft.	Designation	Quantity	Designation	Quantity	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. 148 OF 242
DWG NO. WS9-4116
CONTRACT NO. C-2033270-01

1 REPLACED CGB CONNECTOR WITH BRACKET ASSEMBLY(2/12).

Texas Department of Transportation

LONG MAST ARM ASSEMBLY PARTS LIST

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Sheet 5 of 5

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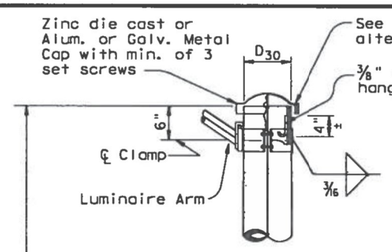
DN: JK	CK: GRB	DW: FDN	CK: CAL

REVISIONS
4-20-01
1-12

CONT	SECT	JOB	HIGHWAY
#CONT	#SECT	#JOB	#HWY
DIST	COUNTY		SHEET NO.
18	#CNTY		

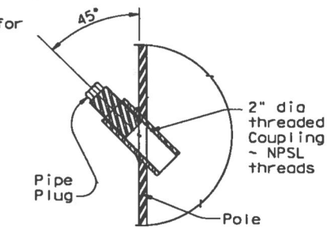
131E

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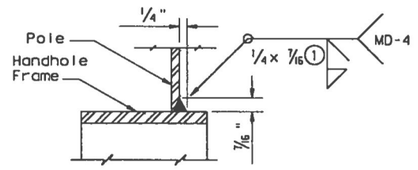


DETAIL A

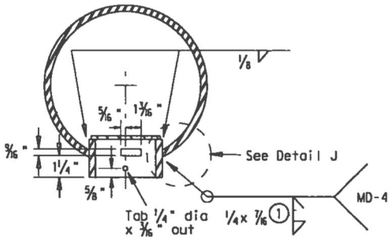
(for pole with luminaire)



POLE COUPLING DETAIL

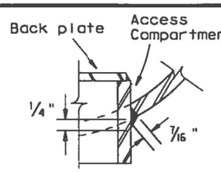


DETAIL G

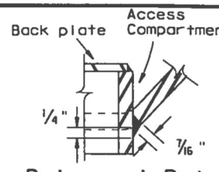


SECTION X-X

Opening for access compartment shall be no more than 1/16 inch wider than the access compartment itself.

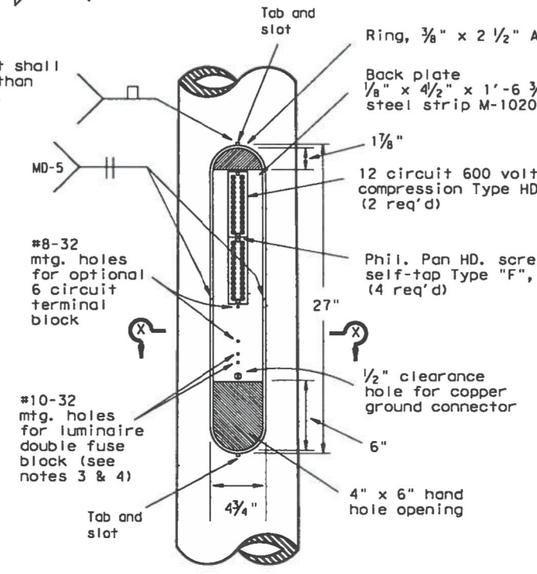


Round Pole

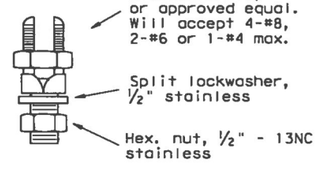


Polygonal Pole

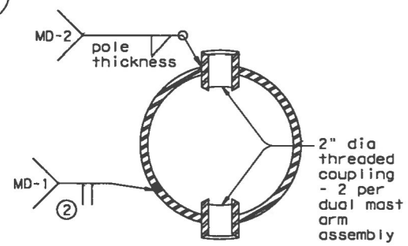
DETAIL J



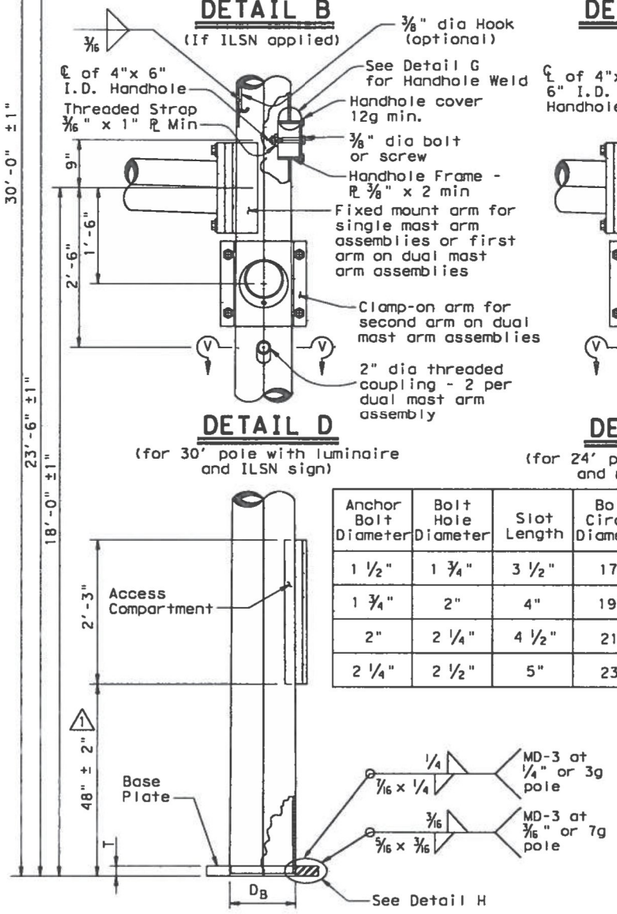
ACCESS COMPARTMENT



COPPER GROUND CONNECTOR

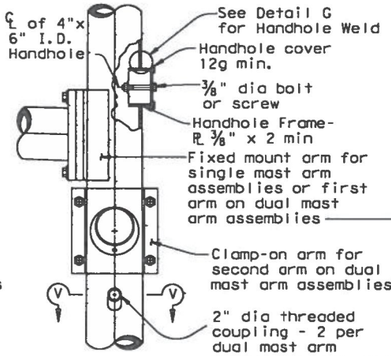


SECTION V-V



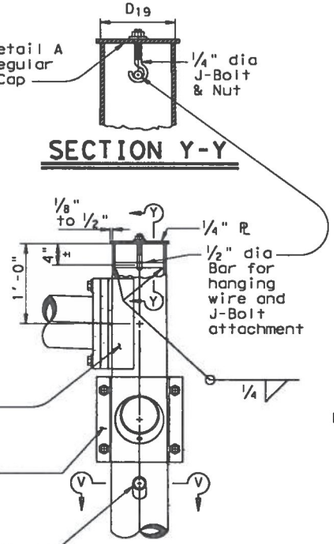
DETAIL D

(for 30' pole with luminaire and ILSN sign)



DETAIL E

(for 24' pole with ILSN sign and no luminaire)



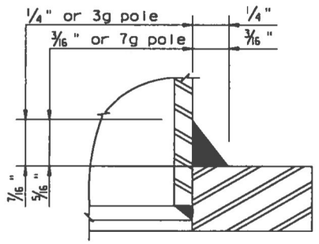
SECTION Y-Y

DETAIL F

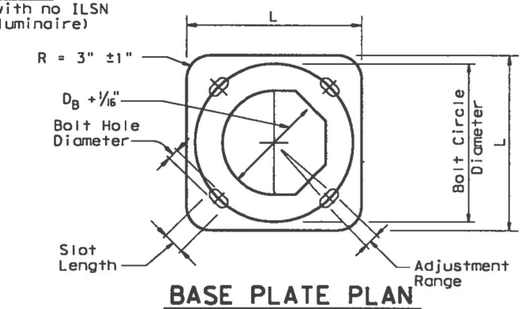
(for 19' pole with no ILSN sign and no luminaire)

POLE ELEVATION

Anchor Bolt Diameter	Bolt Hole Diameter	Slot Length	Bolt Circle Diameter	Base ℞ 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.

⚠1 REVISED THE ELEVATION OF ACCESS COMPARTMENT (2/12).

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
SHEET NO. 149 OF 242
DWG NO. WS9-4117
CONTRACT NO. C-2033270-01

Texas Department of Transportation

TRAFFIC SIGNAL SUPPORT STRUCTURES MAST ARM POLE DETAILS

MA-D-12(DAL)

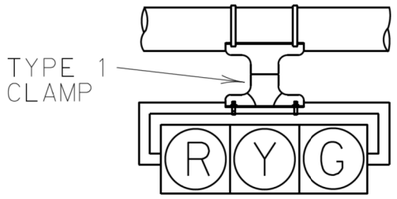
© TxDOT August 1995

DN: MS	CK: JSY	DW: FDN	CK: CAL

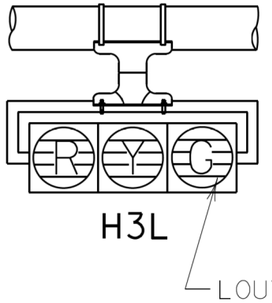
REVISIONS
8-99
1-12

CONT	SECT	JOB	HIGHWAY

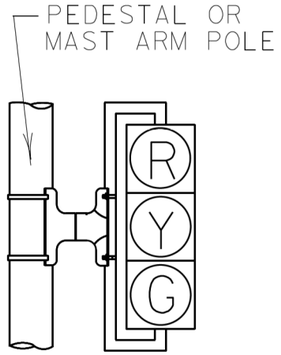
DIST	COUNTY	SHEET NO.
18		



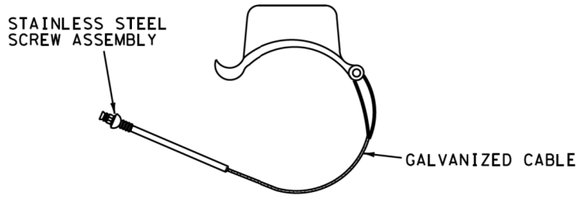
H3



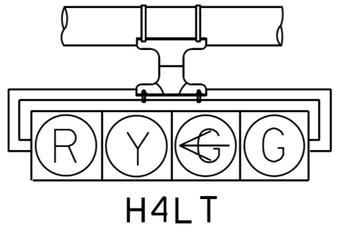
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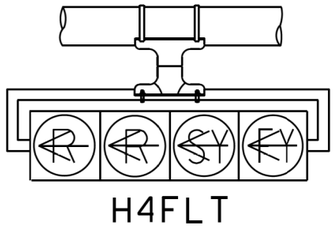
V3



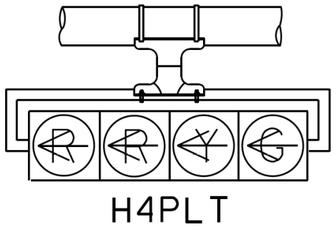
TYPE 1 AND 2 CLAMPS



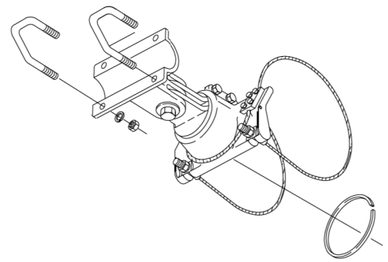
H4LT



H4FLT

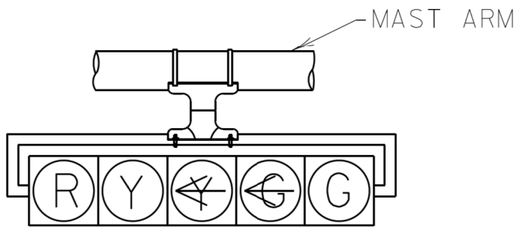


H4PLT

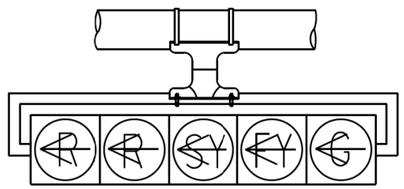


TYPE 2 CLAMP KIT

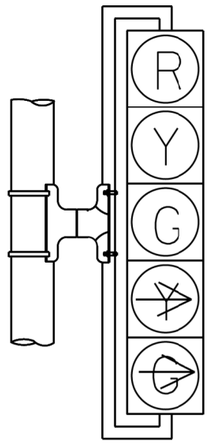
SHALL BE INSTALLED WHEN ROTATION ABOUT
THE HORIZONTAL AND VERTICAL AXES ARE NEEDED.



H5LT



H5FLT



V5RT

NOTES:

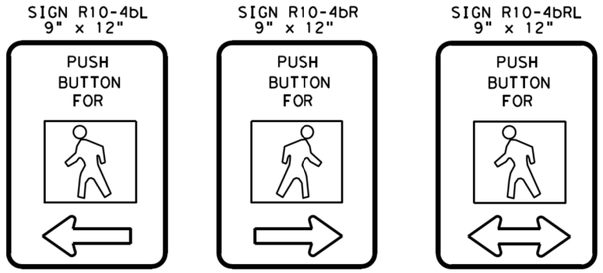
1. VEHICLE SIGNAL HEADS SHALL BE MOUNTED WITH TYPE 1 CLAMP AND APPROPRIATE TUBING.
2. ALL POLE MOUNTED VEHICLE HEADS SHALL BE INSTALLED ON THE AWAY-FROM-TRAFFIC SIDE OF THE PEDESTAL OR MAST ARM POLE.
3. THE SIGNAL HEADS SHOWN ARE NOT MEANT TO REFLECT ALL POSSIBLE SIGNAL HEADS, BUT ARE REPRESENTATIVE 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. 150 OF 242
DWG NO. WS9-4119
CONTRACT NO. C-2033270-01

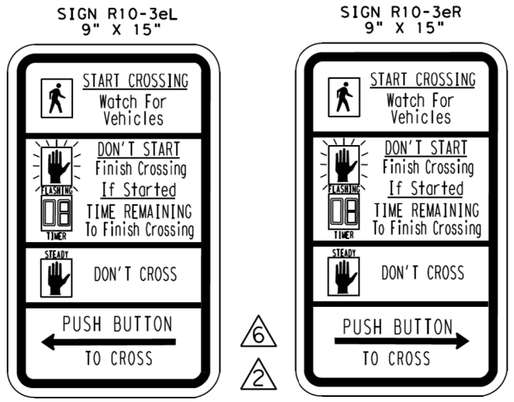
TRAFFIC SIGNAL HEAD DETAILS (DAL)

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DALLAS DISTRICT STANDARD

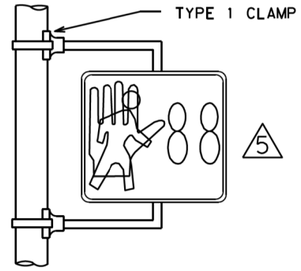
FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	(SEE TITLE SHEET)		101
STATE	STATE DIST.	COUNTY	
TEXAS	DALLAS	DENTON, ETC.	
CONT.	SECT.	JOB	HIGHWAY NO.
0081	03	081	US 377, ETC.



PEDESTRIAN PUSHBUTTON SIGN DETAILS

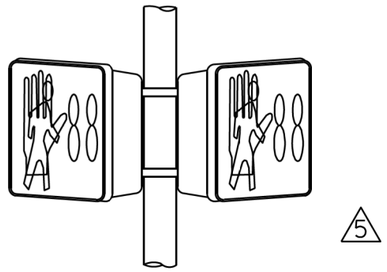


COUNTDOWN PEDESTRIAN PUSHBUTTON SIGN DETAILS



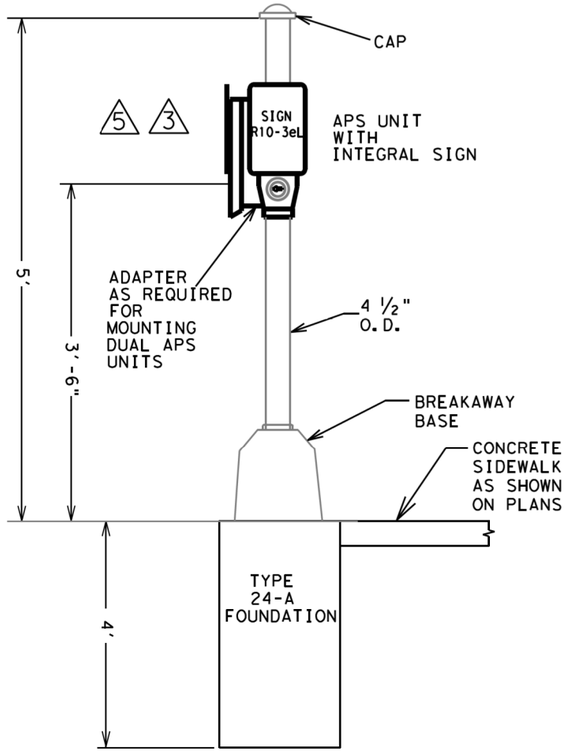
PEDESTRIAN SIGNAL HEAD MOUNTING FOR ONE PEDESTRIAN SIGNAL HEAD

152A

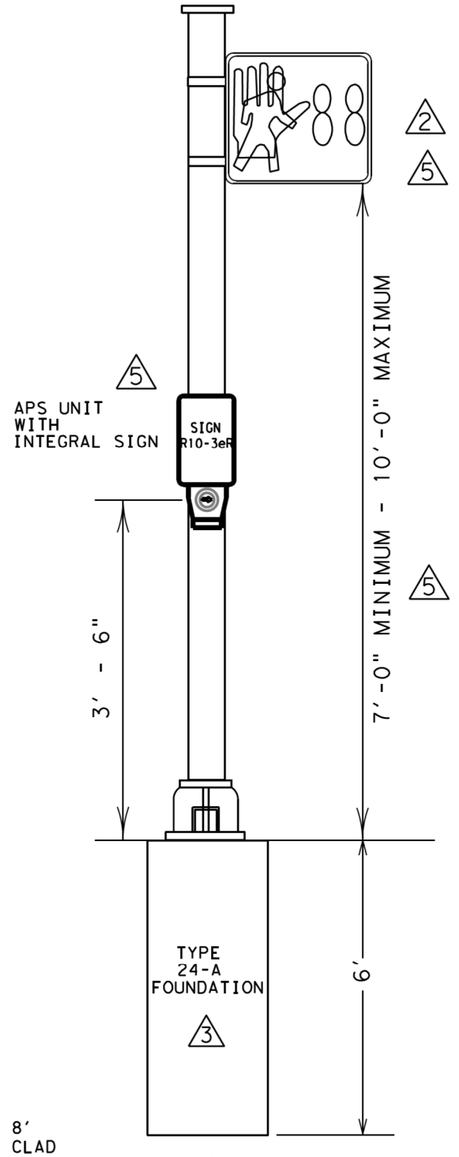


PEDESTRIAN SIGNAL HEAD MOUNTING FOR TWO PEDESTRIAN SIGNAL HEADS

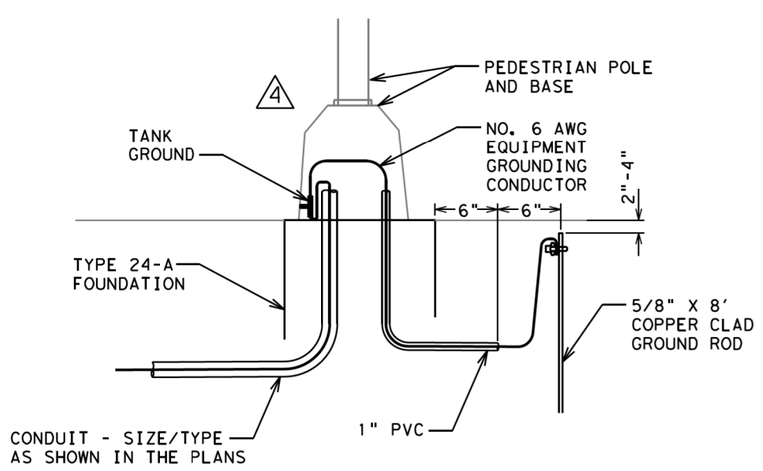
143C



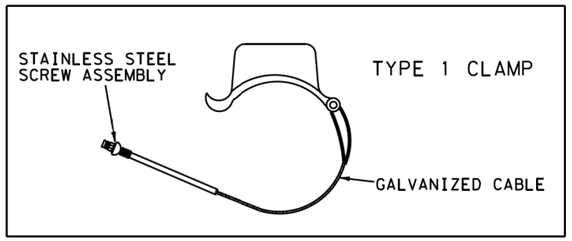
PEDESTRIAN PUSH BUTTON POLE



PEDESTAL POLE



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.

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.

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.

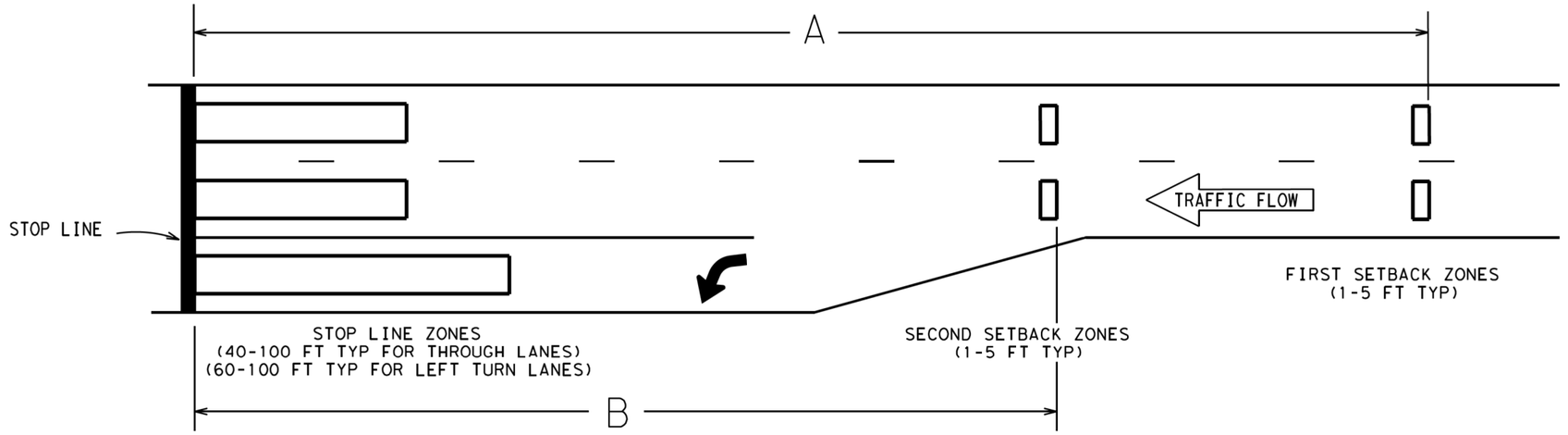
COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
SHEET NO. 151 OF 242
DWG NO. WS9-4120
CONTRACT NO. C-2033270-01

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DALLAS DISTRICT STANDARD

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

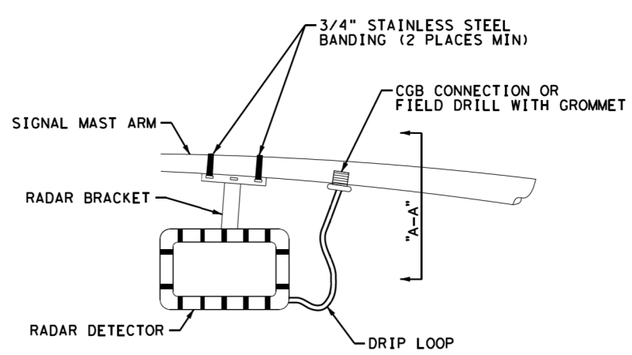
PEDESTRIAN SIGNAL HEAD DETAILS (DAL)

RADAR DETECTION ZONE LOCATIONS

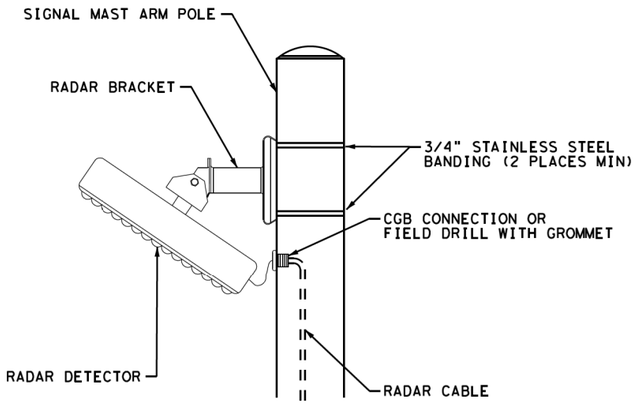


APPROACH SPEED LIMIT (MPH)	DISTANCE A (FT)	DISTANCE B (FT)	MINIMUM RANGE OF DETECTION (LF)
45	360	245	400
50	405	300	440
55	445	325	490
60	485	355	530
65	525	380	575
70	565	410	620

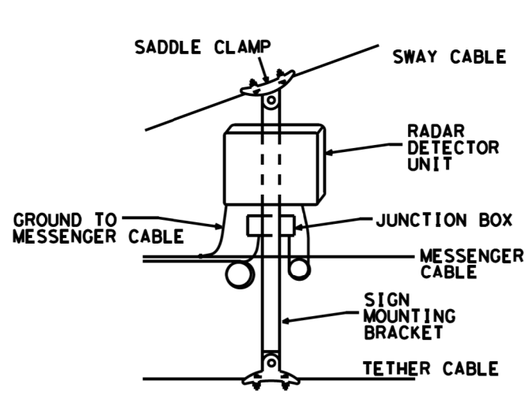
RADAR DETECTION INSTALLATION DETAILS



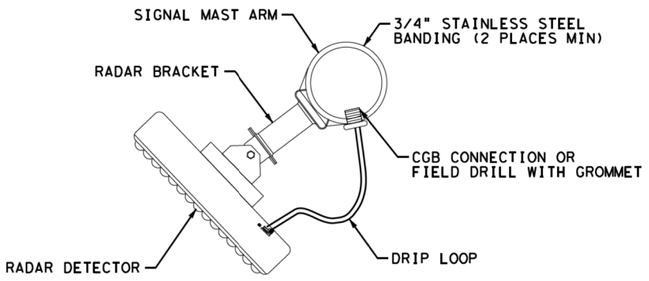
MAST ARM MOUNT



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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Dallas District

RADAR VEHICLE DETECTION SYSTEM
RVDS-18 (DAL)

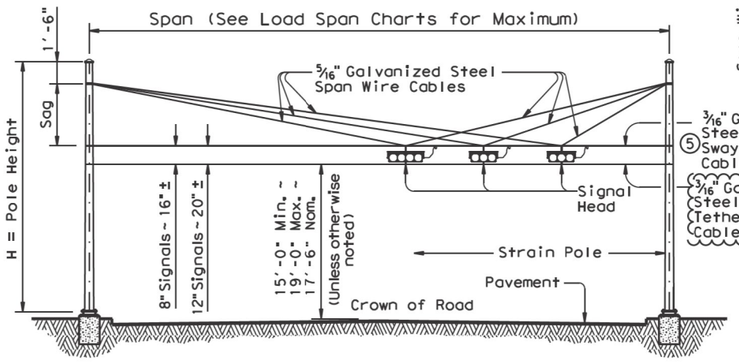
©TxDOT May 2018	DN: EF	CK: ---	DW: EF	CK: TRF-Aus.
REVISIONS	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
	6	(SEE TITLE SHEET)		$HWY
	STATE	DISTRICT	COUNTY	SHEET NO.
	TEXAS	18	$CNTY	
	CONTROL	SECTION	JOB	
	$CONT	$SECT	$JOB	

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
SHEET NO. 152 OF 242
DWG NO. WS9-4121
CONTRACT NO. C-203327C-01

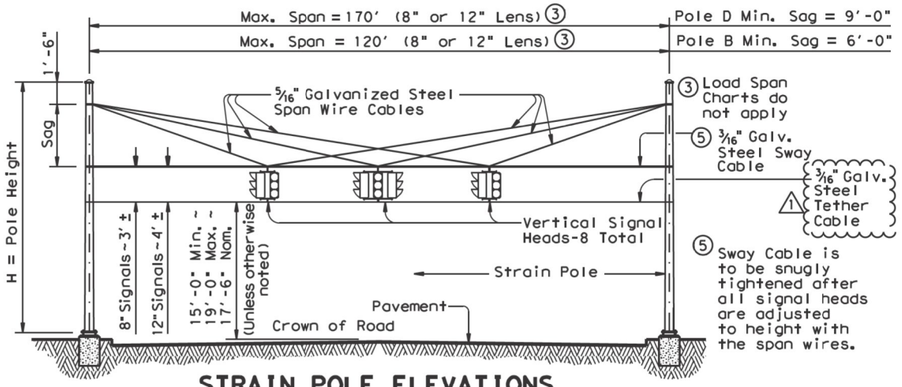
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STRAIN POLE DESCRIPTION	Pole Type	Foundation Type	Maximum Permissible Span Wire Load (lbs.)
26' Pole	A	36-A	5200
30' Pole	B	36-A	4600
30' Pole with Lum.	B	36-A	4400
30' Pole with 20' Mast Arm	C	36-B	5600
30' Pole with 24' Mast Arm	C	36-B	5500
30' Pole 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.

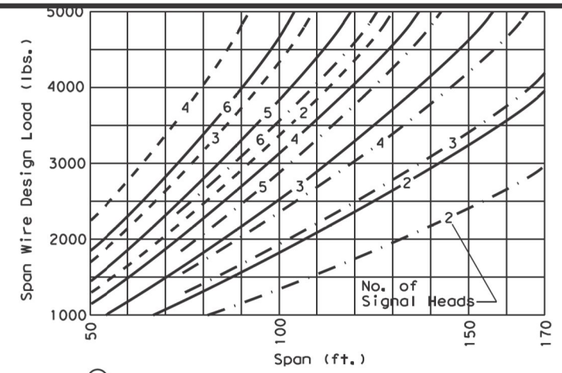


STRAIN POLE ELEVATIONS HORIZONTAL SIGNALS

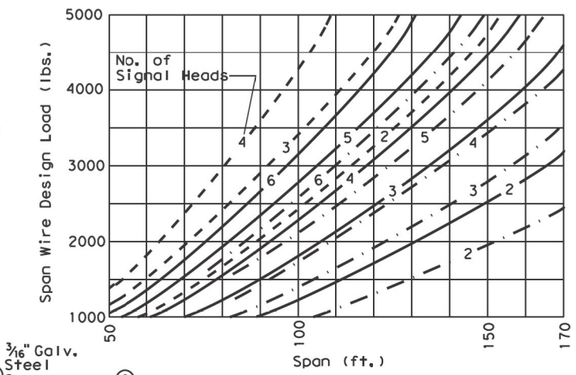


STRAIN POLE ELEVATIONS VERTICAL SIGNALS

(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)

Templates may be removed for shipment.

Anchor Bolt Diameter	Anchor Bolt Length	Quantity
1 ¾"	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. 153 OF 242
DWG NO. WS9-4125
CONTRACT NO. C-2033270-01

SHEET 1 OF 2

Texas Department of Transportation

TRAFFIC SIGNAL SUPPORT STRUCTURES STRAIN POLE ASSEMBLIES

(80 MPH WIND ZONE)

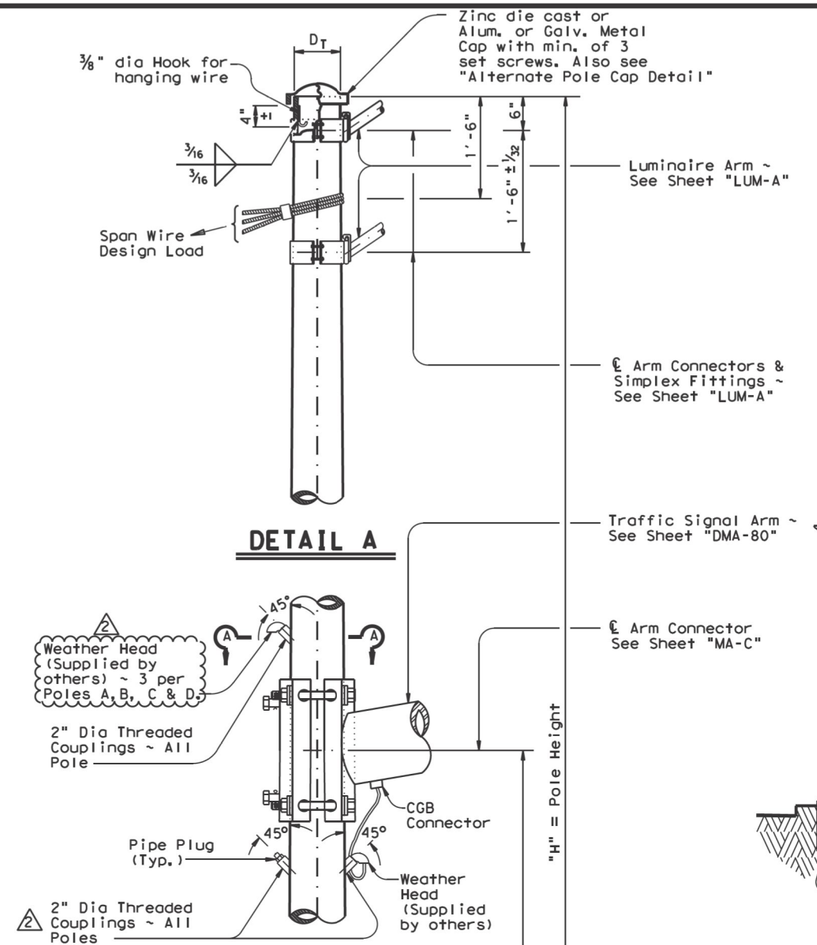
SP-80(1)-12(DAL)

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DN: MS	CK: JSY	DW: BR	CK: JSY
REVISIONS	CONT	SECT	JOB	HIGHWAY
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	DIST	COUNTY		SHEET NO.
	18	#CNTY		

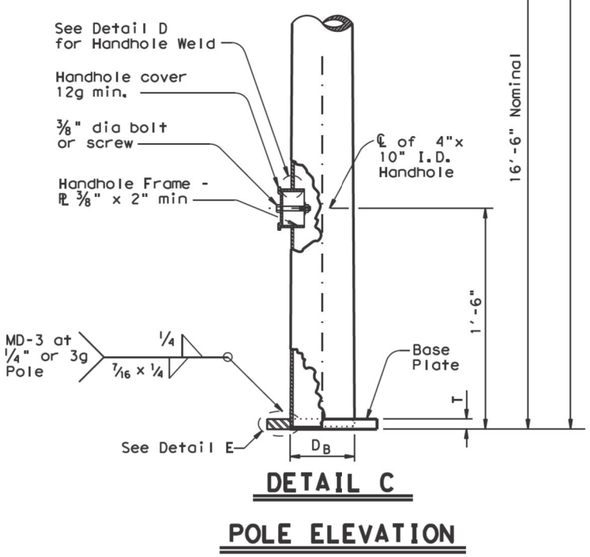
120A

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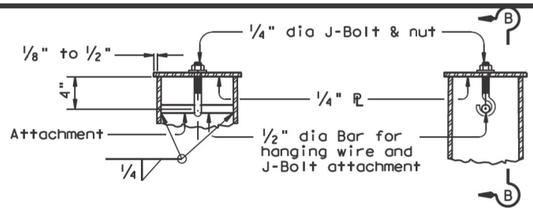
DETAIL A

DETAIL B



DETAIL C

POLE ELEVATION



SECTION B-B

ALTERNATE POLE CAP DETAIL

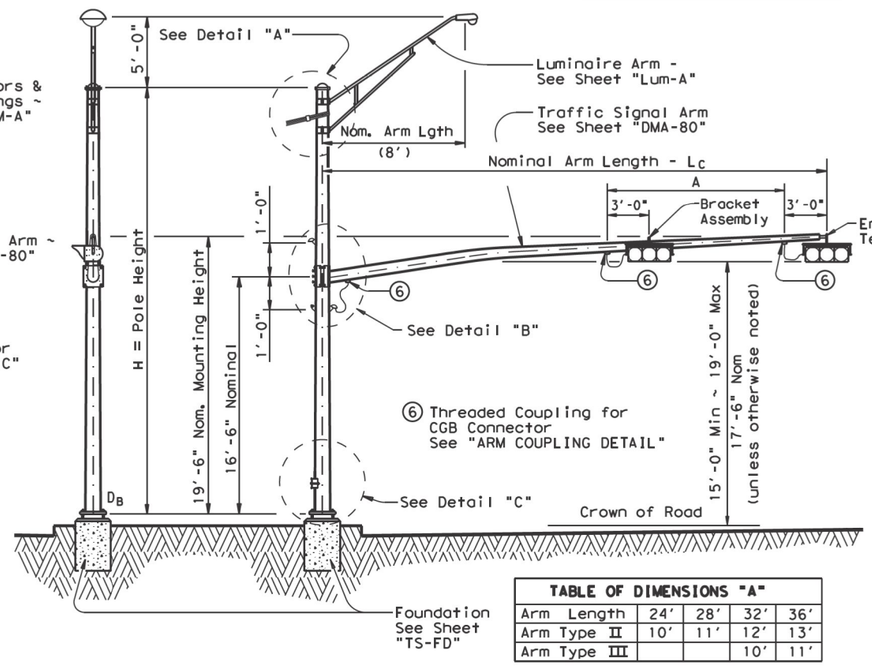
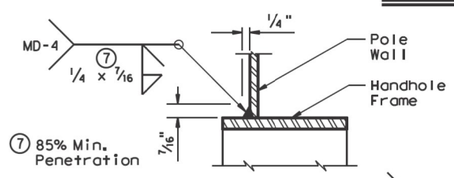
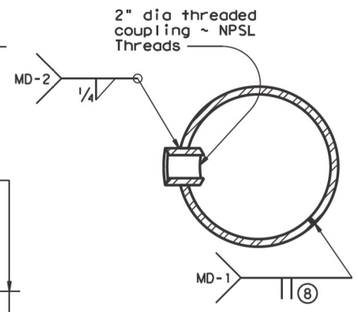


TABLE OF DIMENSIONS "A"				
Arm Length	24'	28'	32'	36'
Arm Type II	10'	11'	12'	13'
Arm Type III			10'	11'

STRUCTURE ASSEMBLY

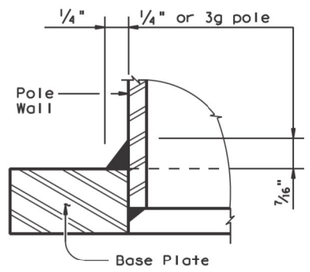


DETAIL D



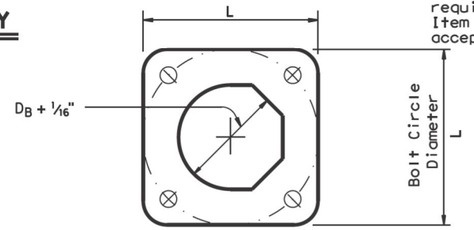
SECTION A-A

(Pole Coupling and Seam Weld Details)

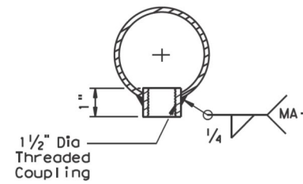


DETAIL E

8 60% Min. penetration, except 100% penetration within 6" of circumferential base welds.



BASE PLATE PLAN



ARM COUPLING DETAIL

2 CHANGED TO 3 WEATHERHEAD ACCESS POINTS FOR POLES A, B, C AND D(3/12).

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 PL 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. 154 OF 242
DWG NO. WS9-4126
CONTRACT NO. C-2033270-01

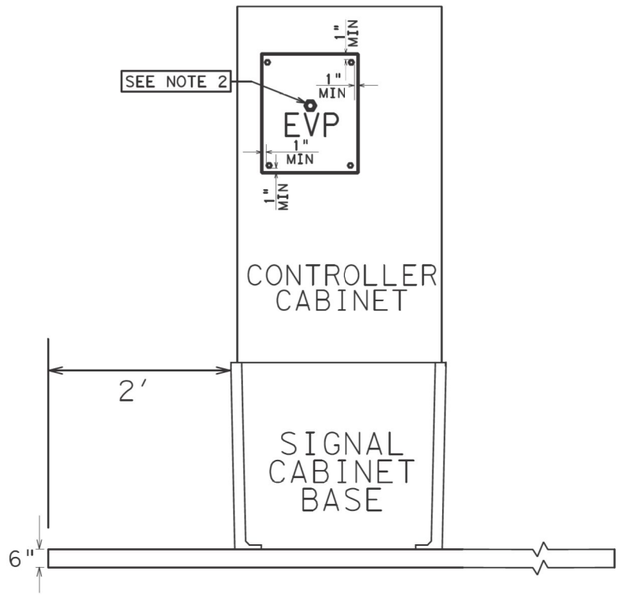
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REVISIONS	DN: MS	CK: JSY	DW: BR	CK: JSY
6-96	CONT	SECT	JOB	HIGHWAY
1-12	%CONT	%SECT	%JOB	%HWY
	DIST	COUNTY		SHEET NO.
	18	%CNTY		

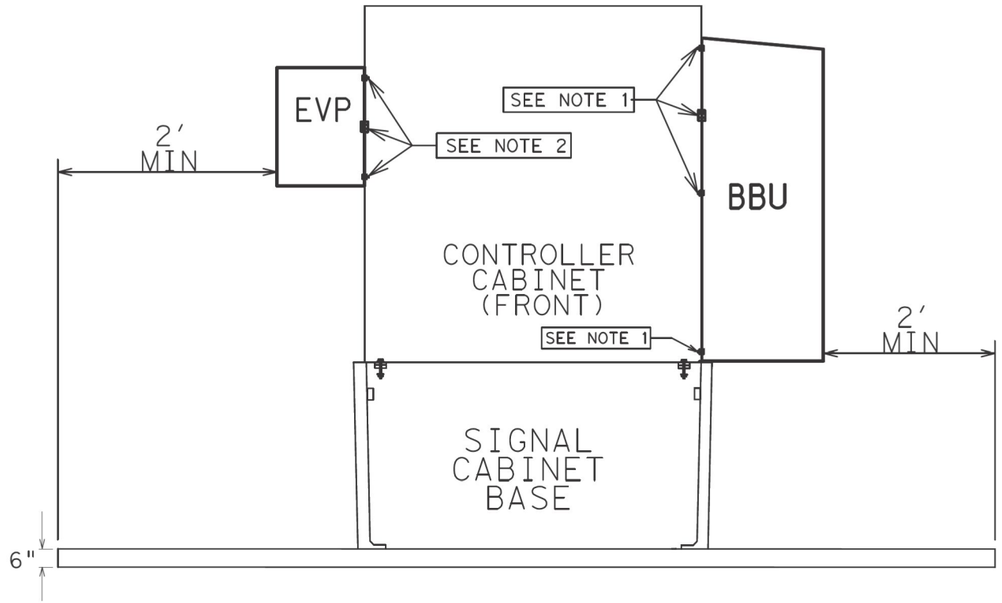
120B

NOTES:

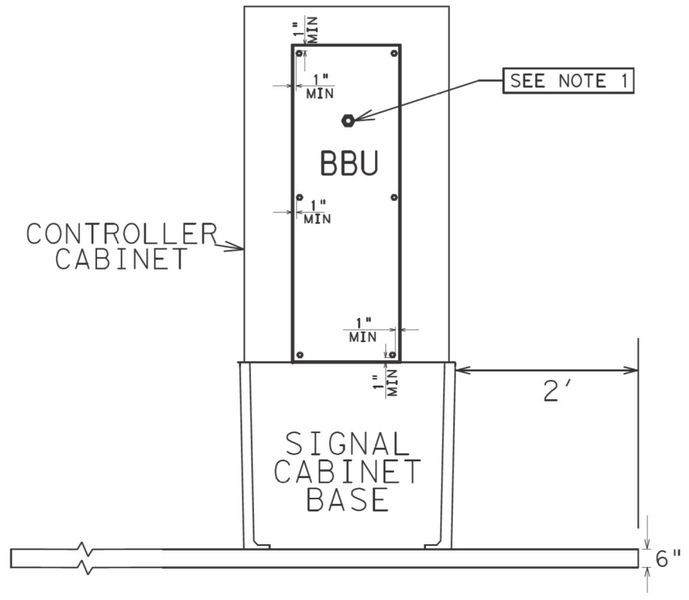
1. INSTALL 1½" ALL THREAD NIPPLE WITH BONDING BUSHINGS ON BOTH ENDS AND 6 EA OF ½" X 1½" 13 UNC MOUNTING BOLTS BETWEEN THE TWO CABINETS (SIGNAL AND BBU).
2. INSTALL 2 " FITTING FOR EVP CABLES/WIRES AND 4 EA OF ½" X 1½" 13 UNC MOUNTING BOLTS BETWEEN THE TWO CABINETS (SIGNAL AND EVP).
3. USE SILICON SEALANT 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

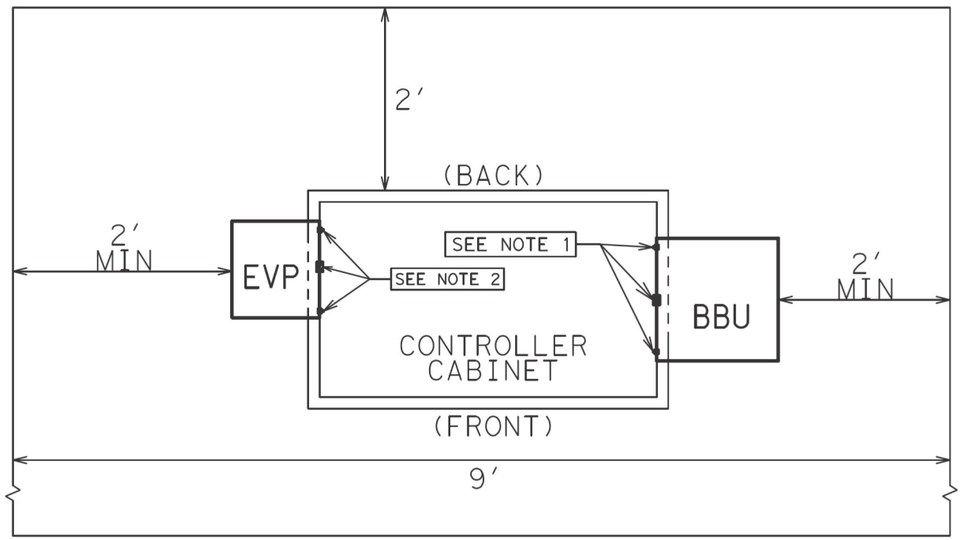


SIDE VIEW (BBU)

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. 155 OF 242
DWG NO. WS9-4127
CONTRACT NO. C-2033270-01

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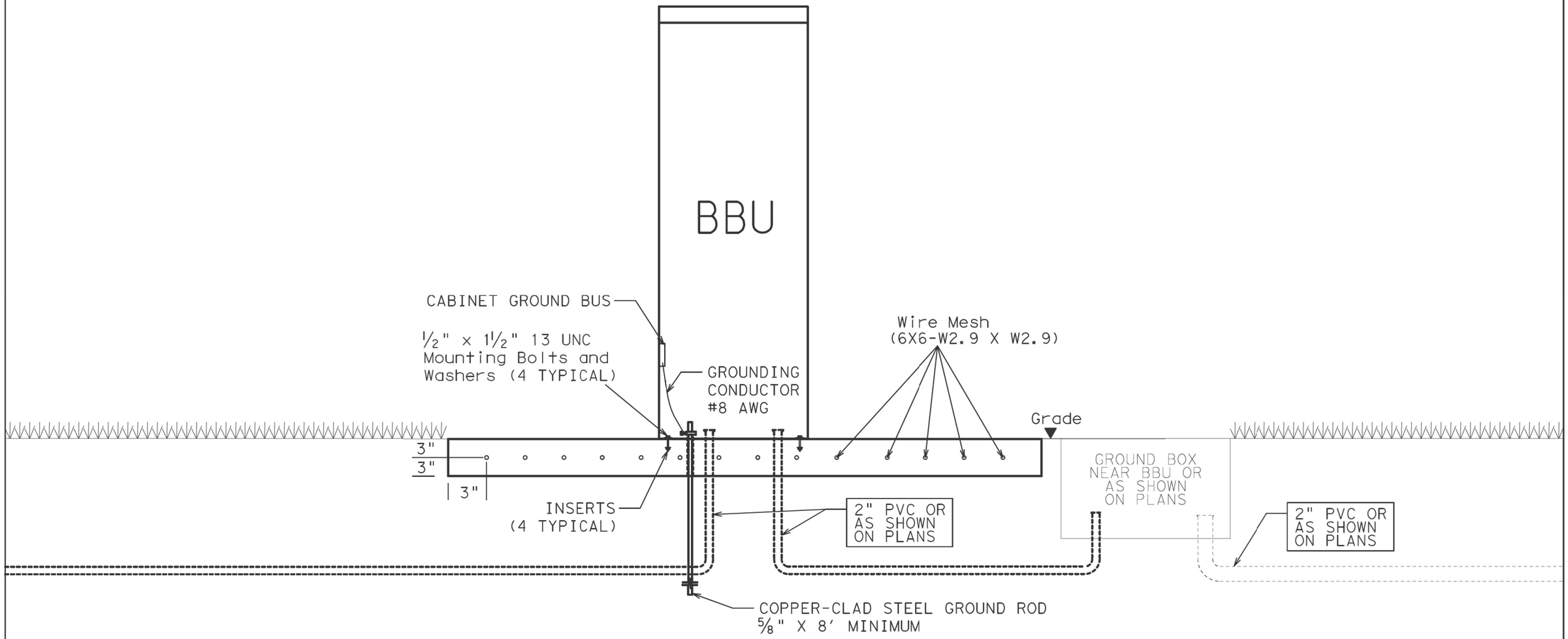
INSTALLATION OF BBU/EVP

EXTERNAL SIDE MOUNT CABINET INSTALLATION DETAILS

DALLAS DISTRICT STANDARD

N.T.S. SHEET 1 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	



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. 156 OF 242
DWG NO. WS9-4128
CONTRACT NO. C-2033270-01

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INSTALLATION OF BBU/EVP

STAND ALONE BBU CABINET (GROUND MOUNT)

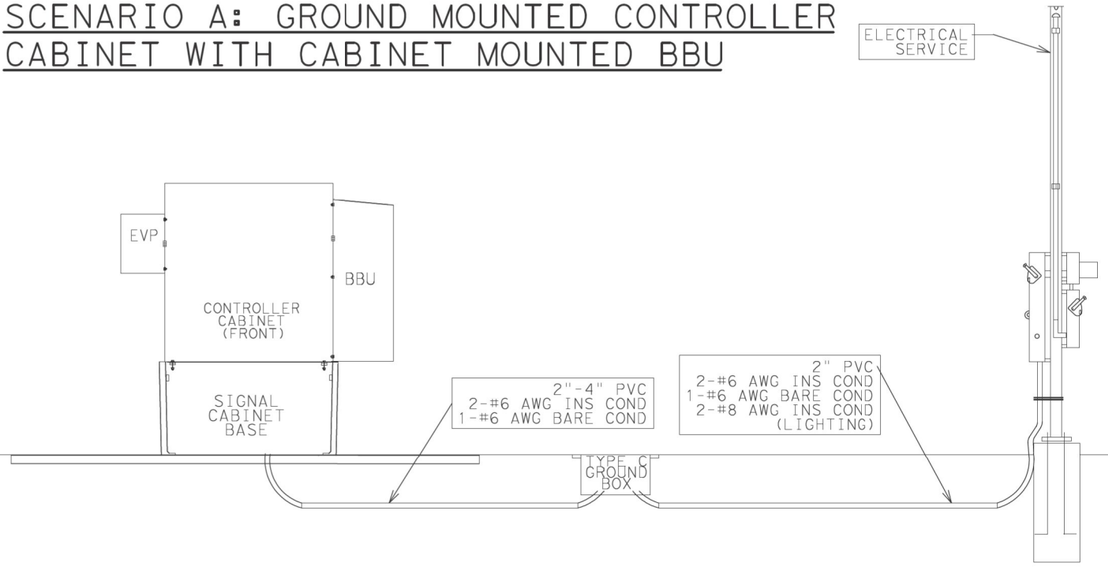
DALLAS DISTRICT STANDARD

N.T.S.

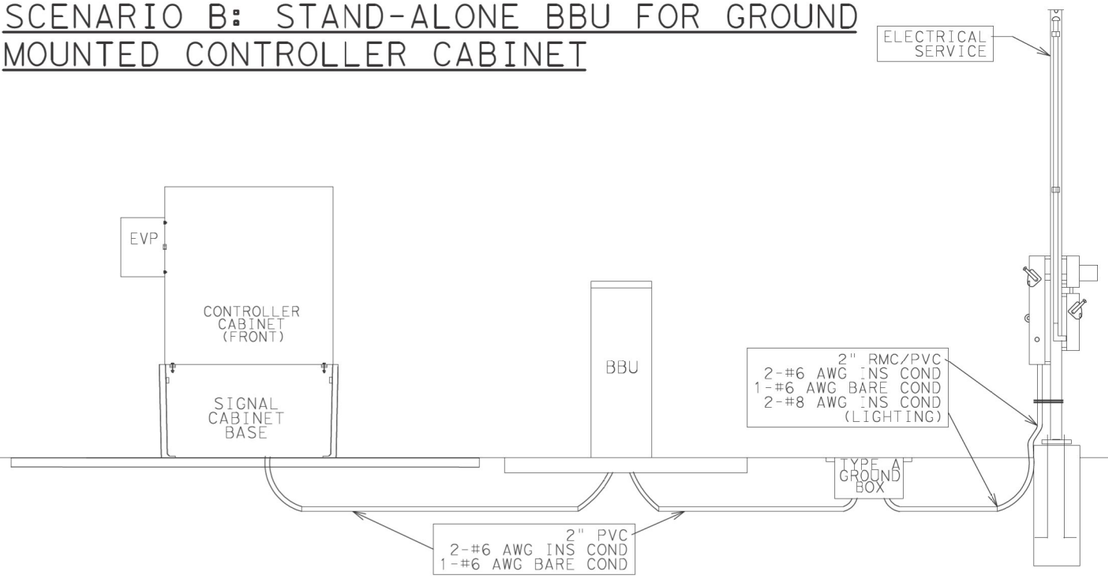
SHEET 2 OF 3

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
6	(SEE TITLE SHEET)		
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	DALLAS		
CONTROL	SECTION	JOB	

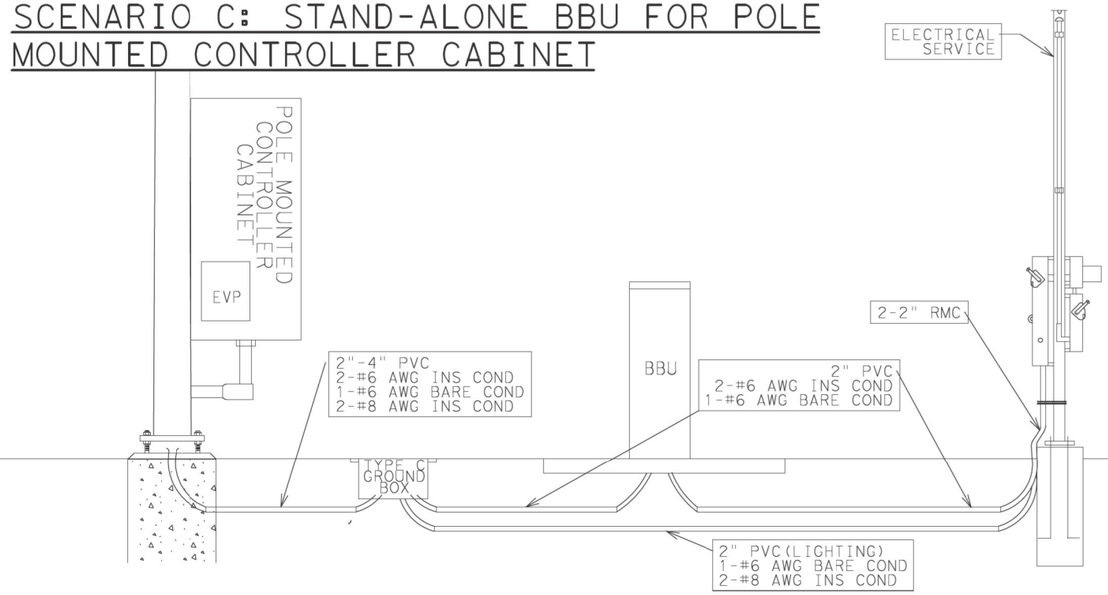
SCENARIO A: GROUND MOUNTED CONTROLLER CABINET WITH CABINET MOUNTED BBU



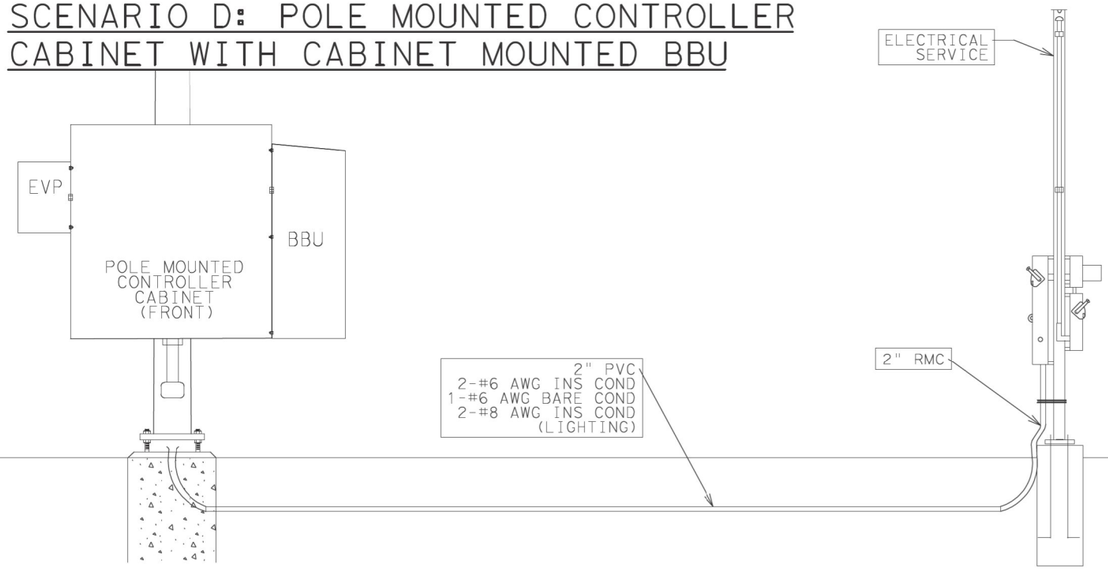
SCENARIO B: STAND-ALONE BBU FOR GROUND MOUNTED CONTROLLER CABINET



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. 157 OF 242
DWG NO. WS9-4129
CONTRACT NO. C-2033270-01

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INSTALLATION OF BBU/EVP

INSTALLATION SCENARIOS

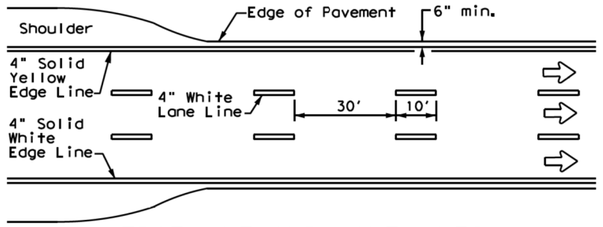
DALLAS DISTRICT STANDARD

N.T.S.

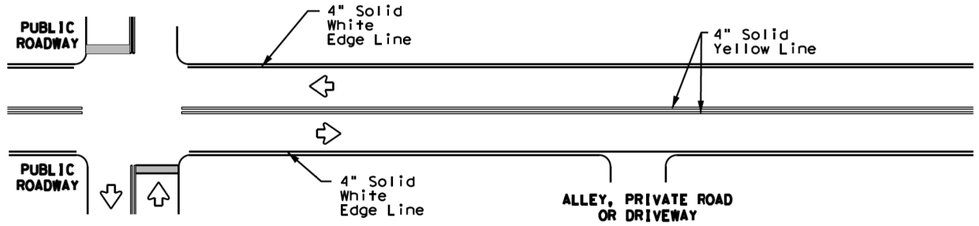
SHEET 3 OF 3

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
6	(SEE TITLE SHEET)		
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	DALLAS		
CONTROL	SECTION	JOB	

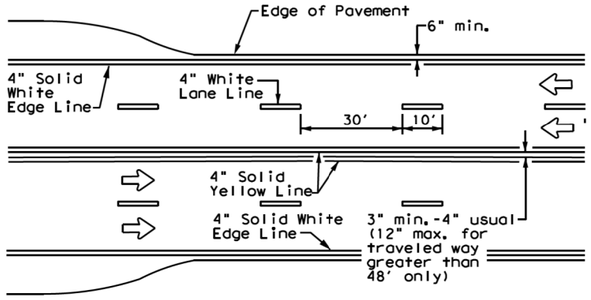
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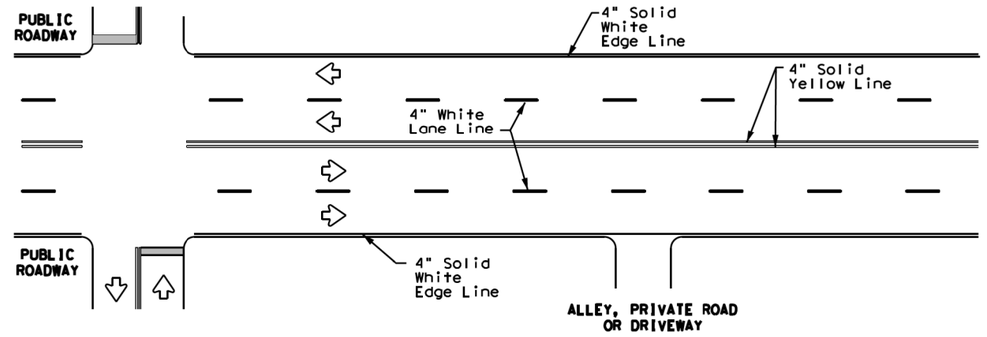
EDGE LINE AND LANE LINES ONE-WAY ROADWAY WITH OR WITHOUT SHOULDERS



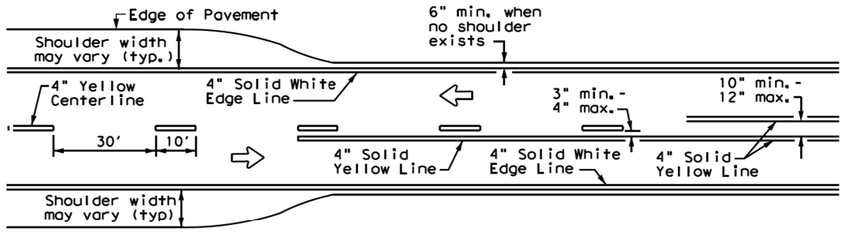
TYPICAL TWO-LANE, TWO-WAY PAVEMENT MARKINGS THROUGH INTERSECTIONS



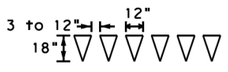
CENTERLINE AND LANE LINES FOUR LANE TWO-WAY ROADWAY WITH OR WITHOUT SHOULDERS



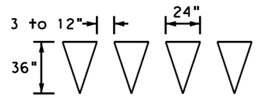
TYPICAL MULTI-LANE, TWO-WAY PAVEMENT MARKINGS THROUGH INTERSECTIONS



TWO LANE TWO-WAY ROADWAY WITH OR WITHOUT SHOULDERS

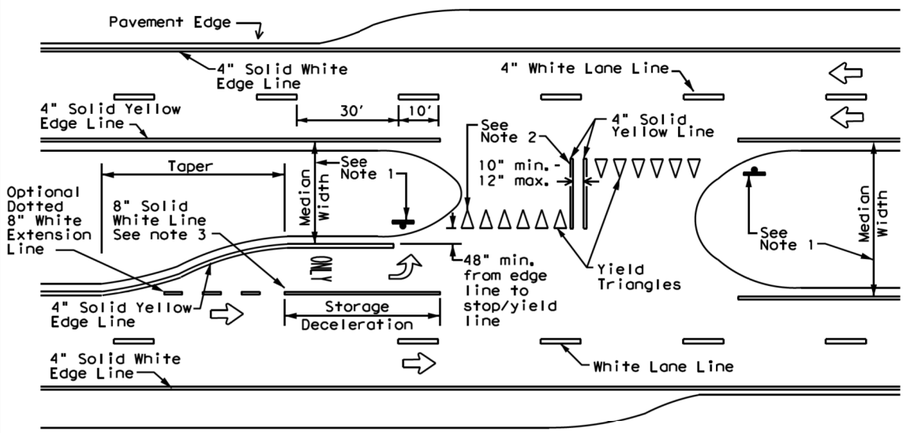


For posted speed on road being marked equal to or less than 40 MPH.



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.

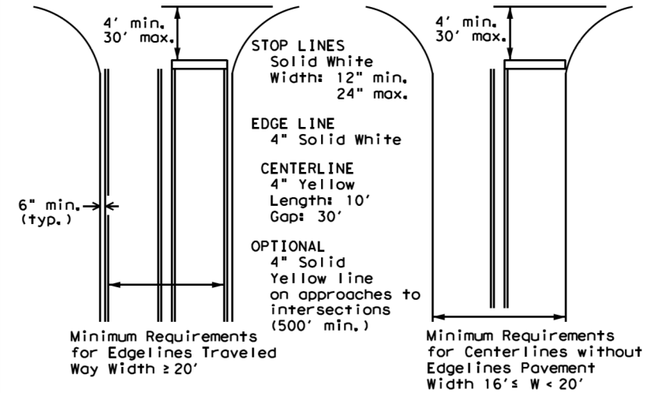
GENERAL NOTES

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. 158 OF 242
DWG NO. WS9-4210
CONTRACT NO. C-2033270-01

Texas Department of Transportation

Traffic Safety Division Standard

TYPICAL STANDARD PAVEMENT MARKINGS

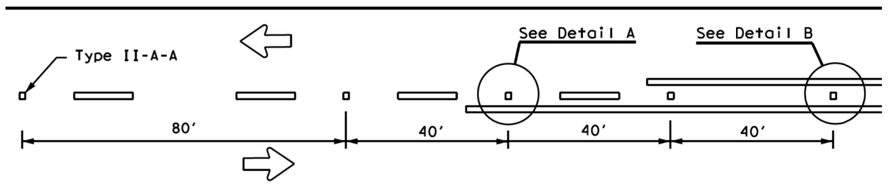
PM(1)-20

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				

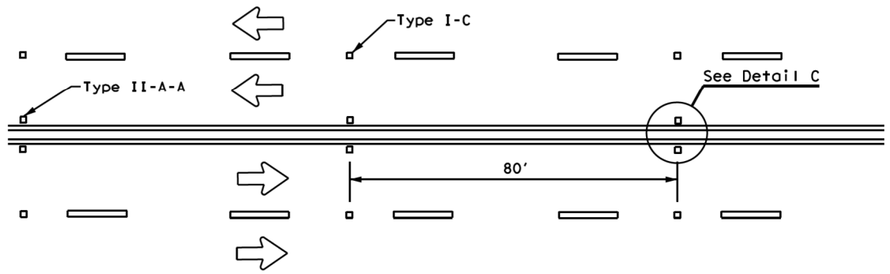
22A

DATE:
FILE:

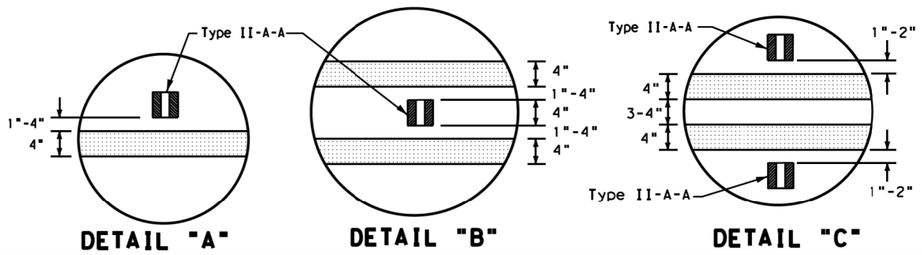
REFLECTIVE RAISED PAVEMENT MARKERS FOR VEHICLE POSITIONING GUIDANCE



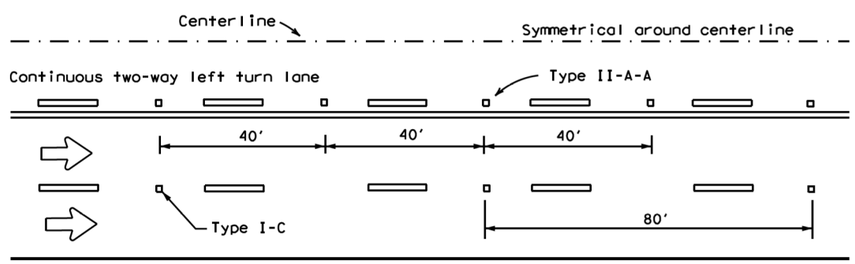
CENTERLINE FOR ALL TWO LANE ROADWAYS



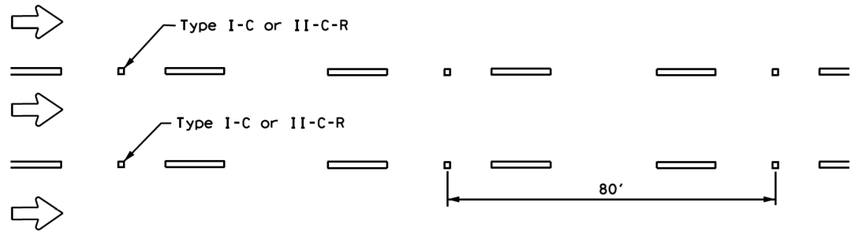
CENTERLINE & LANE LINES FOR FOUR LANE TWO-WAY HIGHWAYS



DETAIL "A" **DETAIL "B"** **DETAIL "C"**



CENTERLINE AND LANE LINES FOR TWO-WAY LEFT TURN LANE

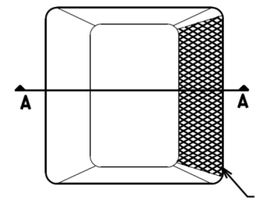


LANE LINES FOR ONE-WAY ROADWAY (NON-FREEWAY FACILITIES)

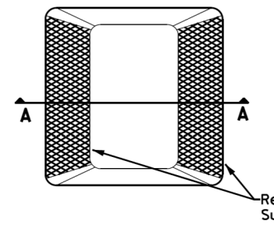
Raised pavement markers Type II-C-R shall have clear face toward normal traffic and red face toward wrong-way traffic.

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

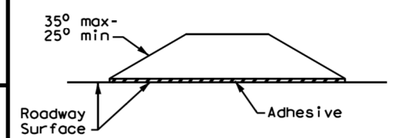
All pavement marking materials shall meet the required Departmental Material Specifications as specified by the plans.



Type I (Top View)

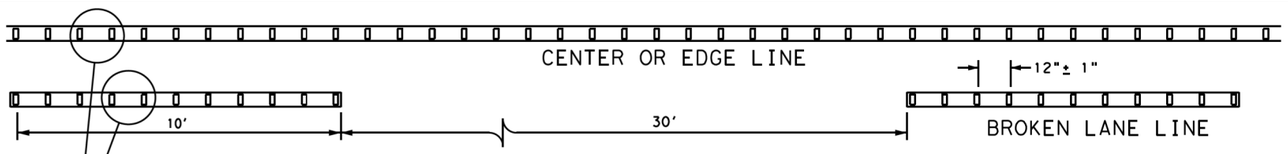


Type II (Top View)



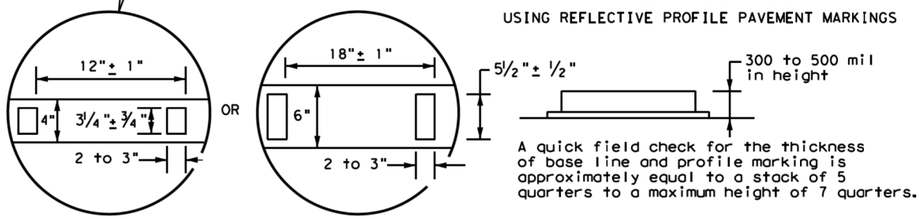
SECTION A

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. 159 OF 242
DWG NO. WS9-4211
CONTRACT NO. C-2033270-01

Texas Department of Transportation

Traffic Safety Division Standard

POSITION GUIDANCE USING RAISED MARKERS RELECTORIZED PROFILE MARKINGS PM(2)-20

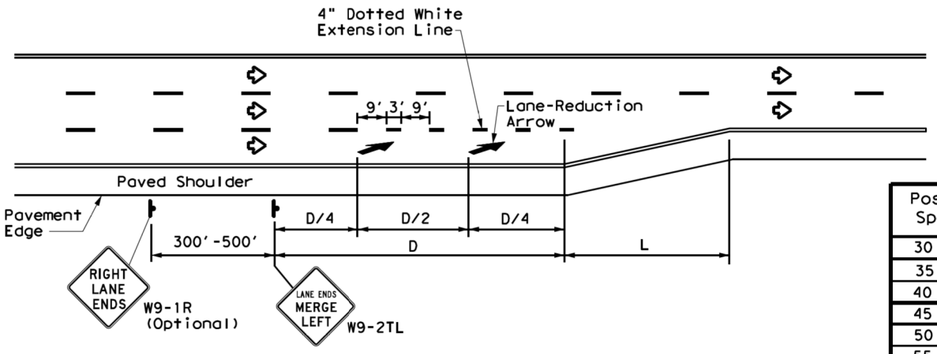
FILE: pm2-20.dgn	DN:	CK:	DW:	CK:
©TxDOT April 1977	CONT	SECT	JOB	HIGHWAY
REVISIONS 4-92 2-10 5-00 2-12 8-00 6-20	DIST	COUNTY		SHEET NO.

22B

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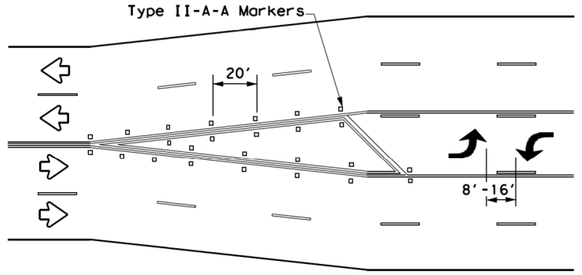


LANE REDUCTION

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.

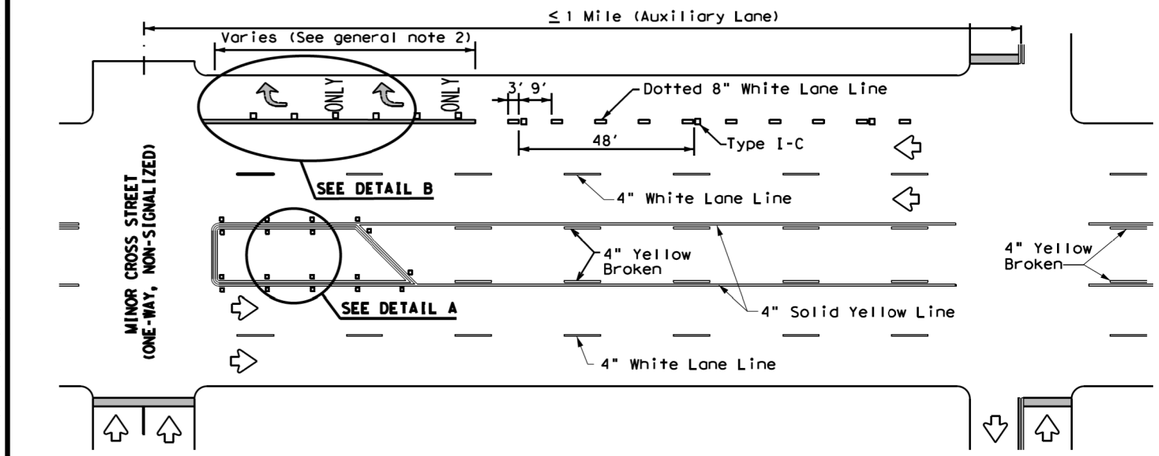
TYPICAL TRANSITION FOR TWLTL AND DIVIDED HIGHWAY

GENERAL NOTES

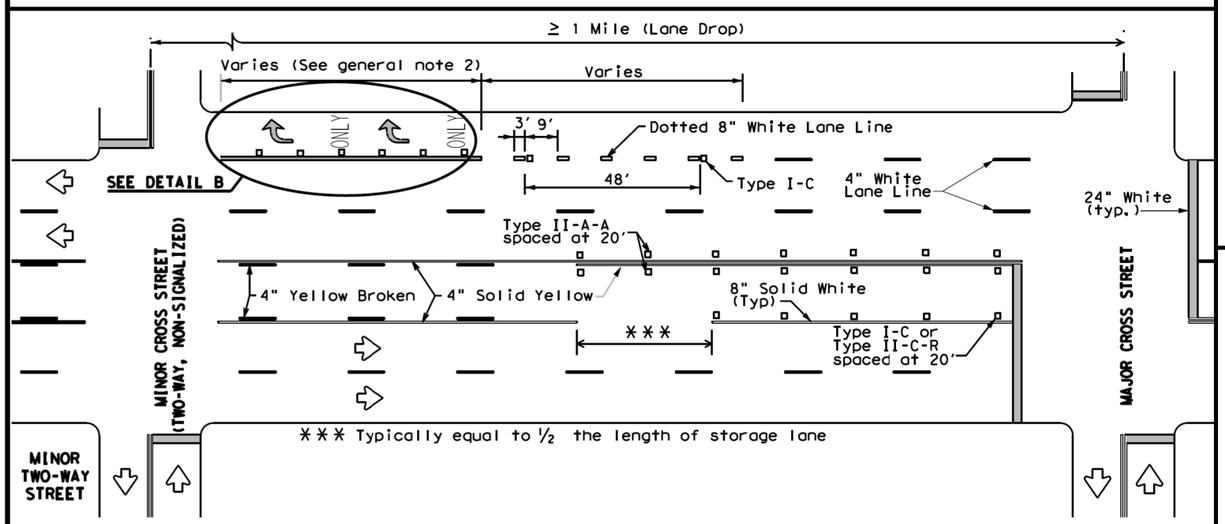
1. Lane use word and arrow markings shall be used where through lanes approaching an intersection become mandatory turn lanes. Lane use word and arrow markings should be used in auxiliary lanes of substantial length. Lane use arrow markings or word and arrow markings may be used in other lanes and turn 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

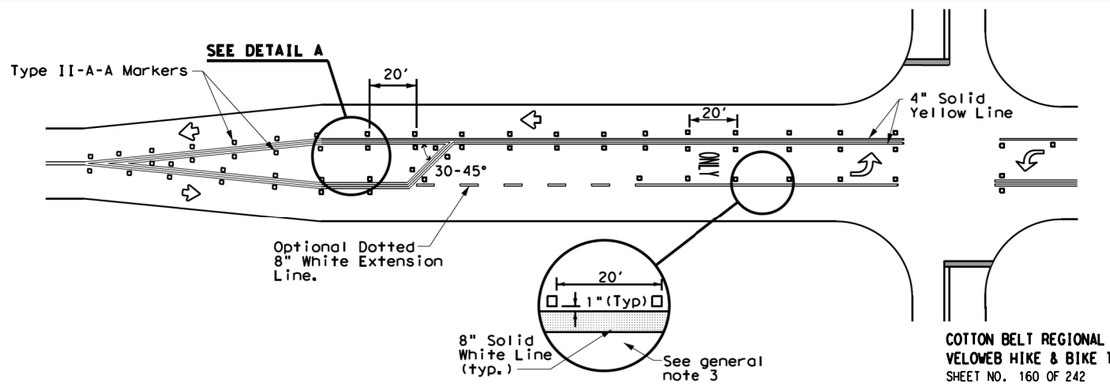
All pavement marking materials shall meet the required Departmental Material Specifications as specified by the plans.



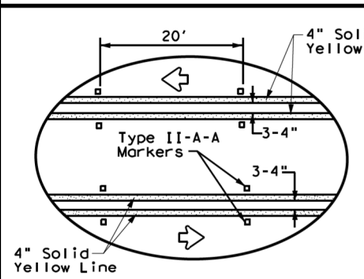
TYPICAL TWLTL AT ONE-WAY STREET AND RIGHT TURN AUXILIARY LANE



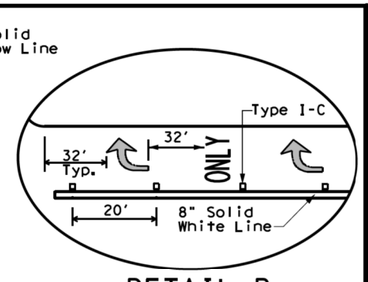
TYPICAL TWLTL AT TWO-WAY CROSS STREET AND RIGHT TURN LANE DROP



TYPICAL TWO-LANE HIGHWAY INTERSECTION WITH LEFT TURN BAYS



DETAIL A



DETAIL B

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:
©TxDOT April 1998	CONT	SECT	JOB	HIGHWAY
REVISIONS 5-00 2-10, 8-00 2-12, 3-03 6-20	DIST	COUNTY		SHEET NO.

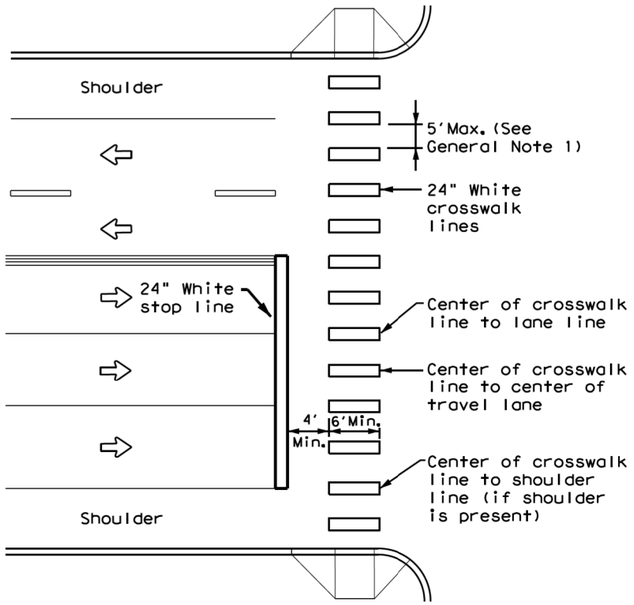
22C

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
SHEET NO. 160 OF 242
DWG NO. WS9-4212
CONTRACT NO. C-2033270-01

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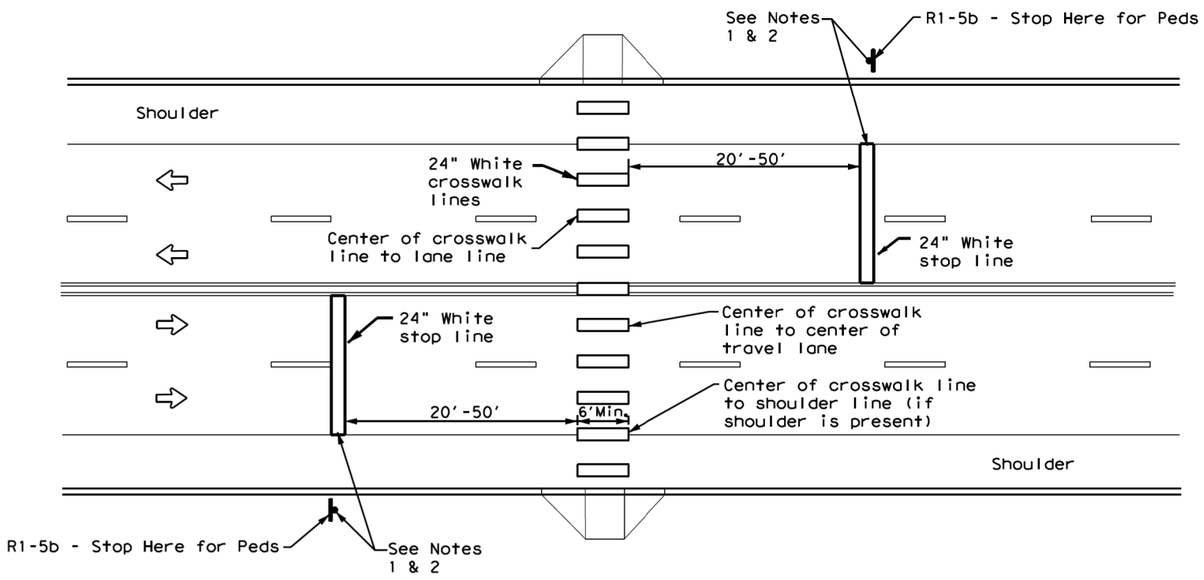
HIGH-VISIBILITY LONGITUDINAL CROSSWALK AT CONTROLLED APPROACH

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. 161 OF 242
DWG NO. WS9-4213
CONTRACT NO. C-2033270-01

Texas Department of Transportation

Traffic Safety Division Standard

CROSSWALK PAVEMENT MARKINGS

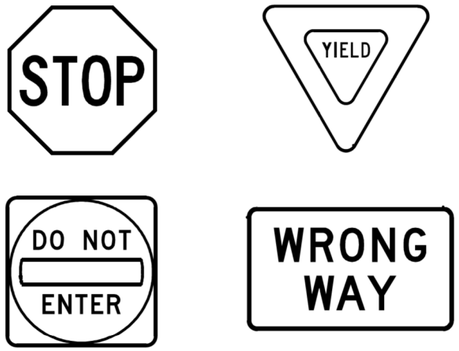
PM(4)-22

FILE: pm4-22.dgn	DN:	CK:	DW:	CK:
© TxDOT June 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS 3-22				
	DIST	COUNTY		SHEET NO.

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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

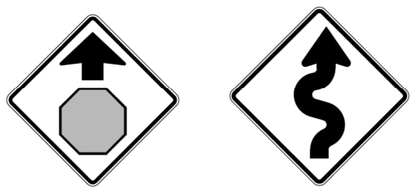
REQUIREMENTS FOR WHITE BACKGROUND REGULATORY SIGNS
(EXCLUDING STOP, YIELD, DO NOT ENTER AND WRONG WAY SIGNS)



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. 162 OF 242
DWG NO. WS9-4239
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
©TxDOT October 2003	CONT	SECT	JOB	HIGHWAY
REVISIONS				
12-03 7-13	DIST	COUNTY		SHEET NO.
9-08				

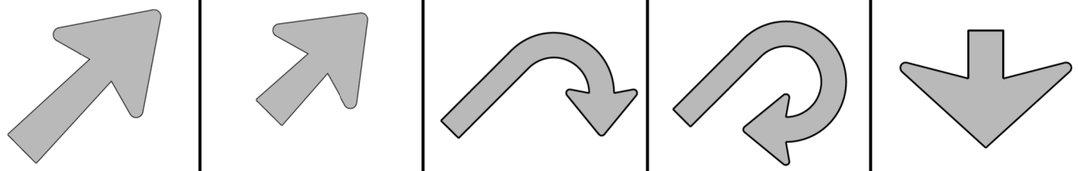
DATE:
FILE:

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FILE:

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

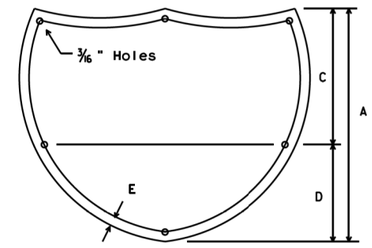
NOTE

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.

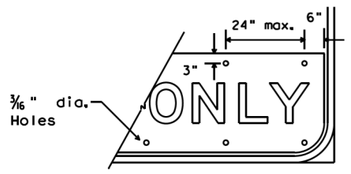
http://www.txdot.gov/

SIGN BLANK PUNCHING DETAILS FOR ATTACHMENTS WHEN SPECIFIED TO BE TYPE A ALUMINUM SIGNS (FOR MOUNTING TO GUIDE SIGN FACE)

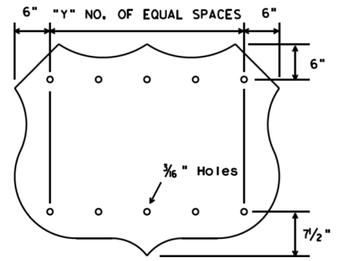


INTERSTATE ROUTE MARKERS

A	C	D	E
36	21	15	1 1/2
48	28	20	1 3/4

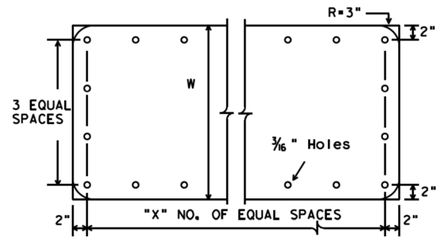


EXIT ONLY PANEL



U.S. ROUTE MARKERS

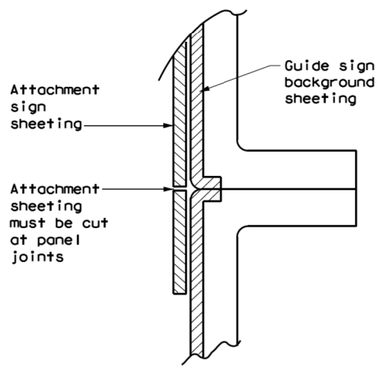
Sign Size	"Y"
24x24	2
30x24	3
36x36	3
45x36	4
48x48	4
60x48	5



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

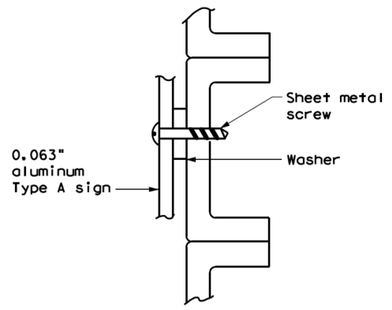
MOUNTING DETAILS OF ATTACHMENTS TO GUIDE SIGN FACE ("EXIT ONLY" AND "LEFT EXIT" PANELS, ROUTE MARKERS AND OTHER ATTACHMENTS)



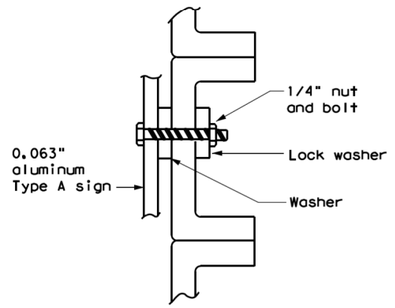
DIRECT APPLIED ATTACHMENT

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

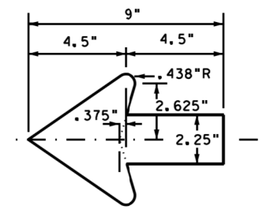
NOTE:

Furnish Type A aluminum sign attachments only when specified in the plans. These signs will be paid for under "Aluminum Signs".

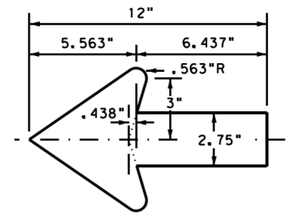
COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
SHEET NO. 163 OF 242
DWG NO. WS9-4240
CONTRACT NO. C-2033270-01

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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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)

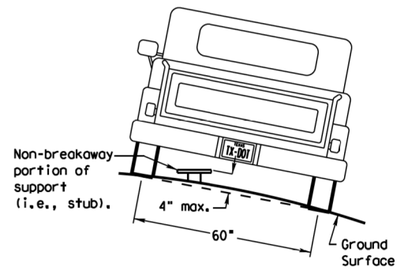
Anchor Type

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))

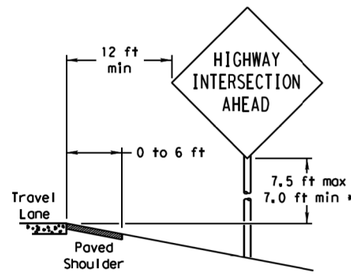
REQUIRED CLEARANCE FOR BREAKAWAY SUPPORT



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).

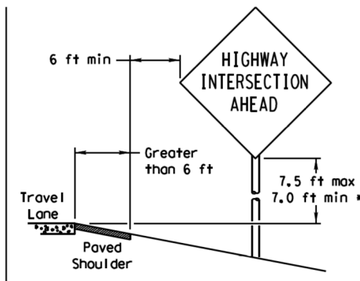
SIGN LOCATION

PAVED SHOULDERS



LESS THAN 6 FT. WIDE

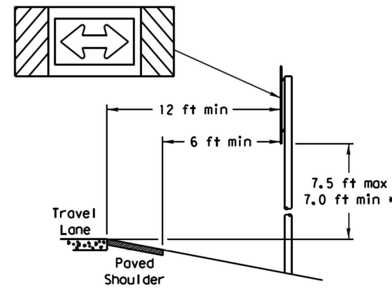
When the shoulder is 6 ft. or less in width, the sign must be placed at least 12 ft. from the edge of the travel lane.



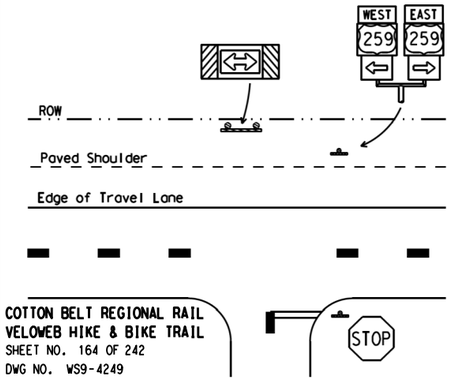
GREATER THAN 6 FT. WIDE

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.

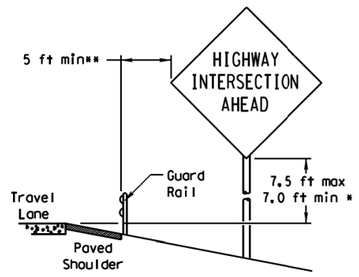
T-INTERSECTION



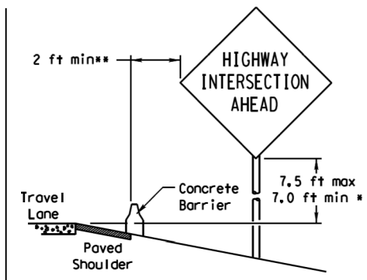
When this sign is needed at the end of a two-lane, two way roadway, the right edge of the sign should be in line with the centerline of the roadway. Place as close to ROW as practical.



BEHIND BARRIER



BEHIND GUARDRAIL



BEHIND CONCRETE BARRIER

**COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL**
SHEET NO. 164 OF 242
DWG NO. WS9-4249
CONTRACT NO. C-2033270-01

**BEHIND GUARDRAIL
**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

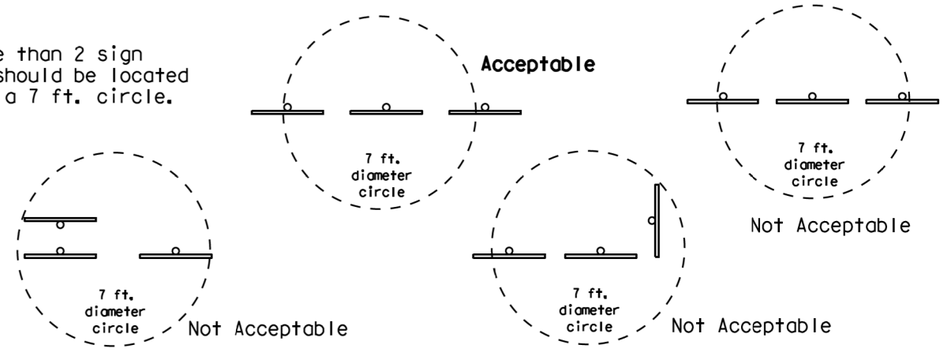
(2) a minimum of 7 to a maximum of 7.5 feet above the grade at the base of the support when sign is installed on the backslope.

The maximum values may be increased when directed by the Engineer.

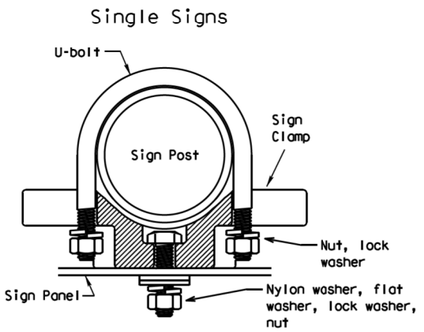
See the Traffic Operations Division website for detailed drawings of sign clamps, Triangular Slipbase System components and Wedge Anchor System components.

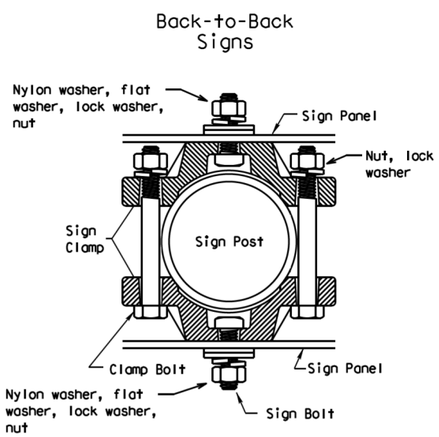
The website address is:
http://www.txdot.gov/publications/traffic.htm

No more than 2 sign posts should be located within a 7 ft. circle.



TYPICAL SIGN ATTACHMENT DETAIL





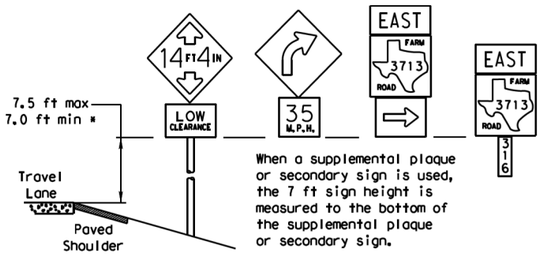
Bolts used to mount sign panels to the clamp are 5/16-18 UNC galvanized square head with nut, nylon washer, flat washer and lock washer. The bolt length is 1 inch for aluminum.

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.

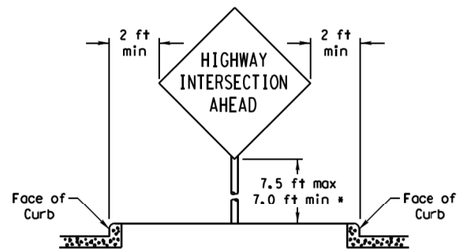
Pipe Diameter	Approximate Bolt Length	
	Specific Clamp	Universal Clamp
2" nominal	3"	3 or 3 1/2"
2 1/2" nominal	3 or 3 1/2"	3 1/2 or 4"
3" nominal	3 1/2 or 4"	4 1/2"

SIGNS WITH PLAQUES



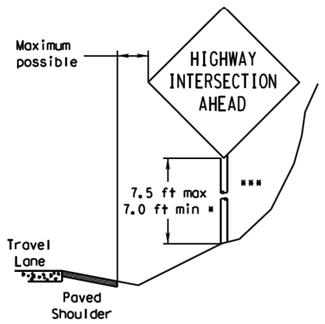
When a supplemental plaque or secondary sign is used, the 7 ft sign height is measured to the bottom of the supplemental plaque or secondary sign.

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.

Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS GENERAL NOTES & DETAILS

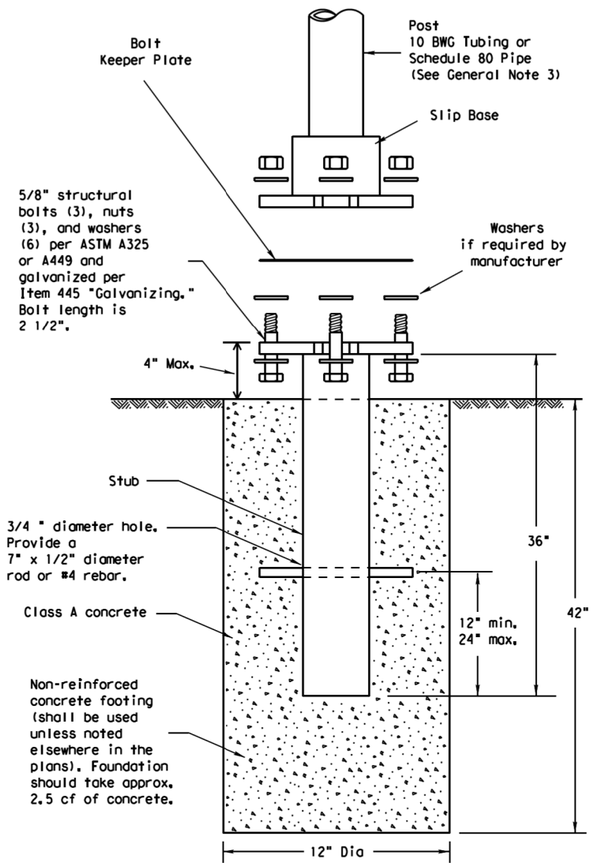
SMD(GEN)-08

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9-08 REVISIONS	CONT	SECT	JOB	HIGHWAY
	DIST	COUNTY		SHEET NO.

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FILE:

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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.

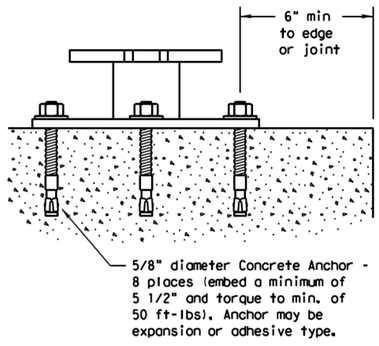
   Schedule 80 Pipe (2.875" outside diameter)
   - 0.276" nominal wall thickness
   - Steel tubing per ASTM A500 Gr C
   - Other seamless or electric-resistance welded steel tubing or pipe with equivalent outside diameter and wall thickness may be used if they meet the following:
     - 46,000 PSI minimum 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. 165 OF 242
DWG NO. WS9-4250
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

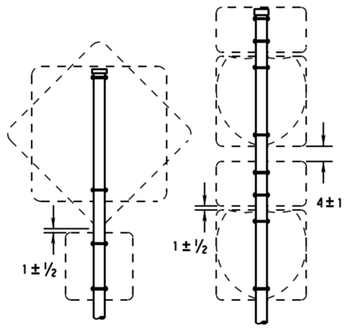
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CONT	SECT	JOB	HIGHWAY
DIST	COUNTY		SHEET NO.

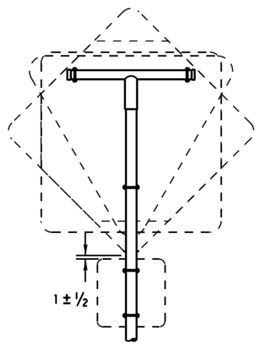
9-08 REVISIONS

DATE:
FILE:

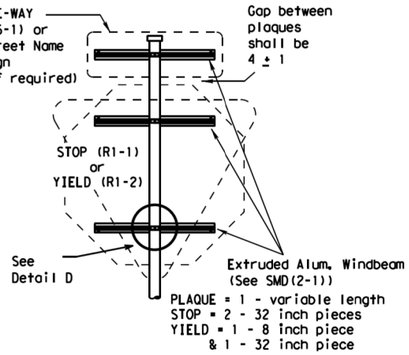
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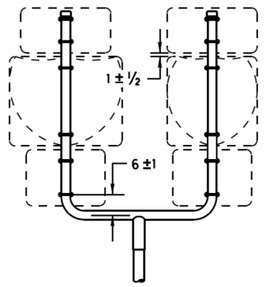
SM RD SGN ASSM TY XXXXX(1)XX(P)



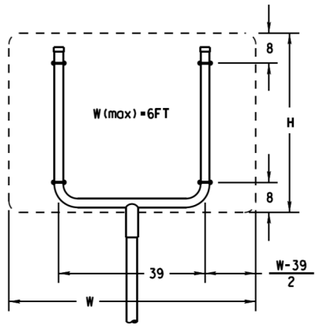
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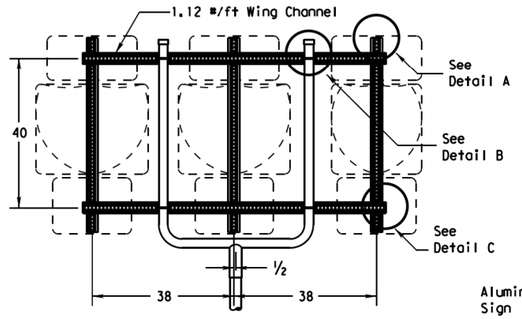
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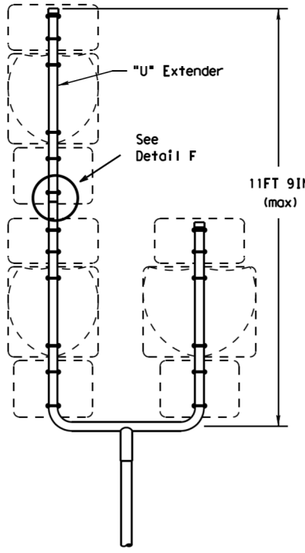
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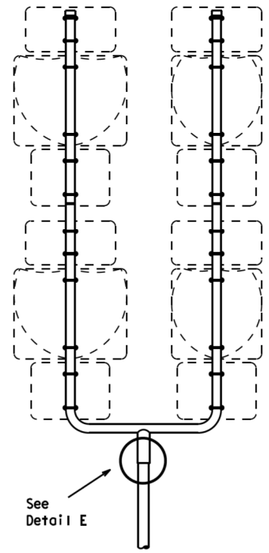
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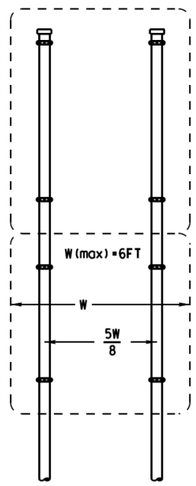
SM RD SGN ASSM TY XXXXX(1)XX(U-WC)
(See Note 11)



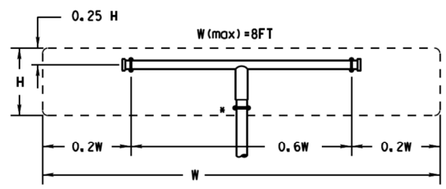
SM RD SGN ASSM TY S80(1)XX(U-1EXT)



SM RD SGN ASSM TY S80(1)XX(U-2EXT)

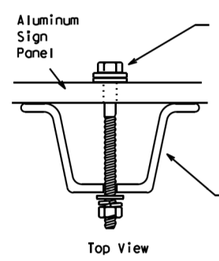


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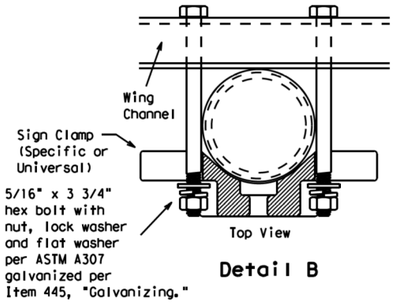
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(* - See Note 12)

All dimensions are in english unless detailed otherwise.



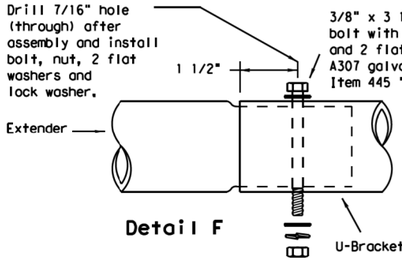
Top View

Detail A



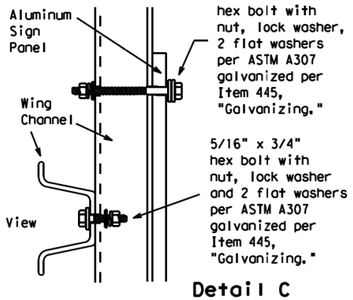
Top View

Detail B

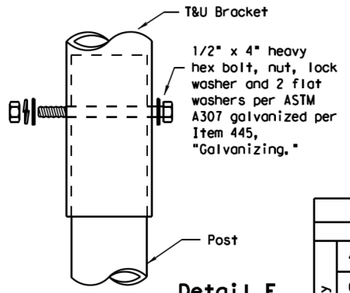


Detail F

Splices shall only be allowed behind the sign substrate.

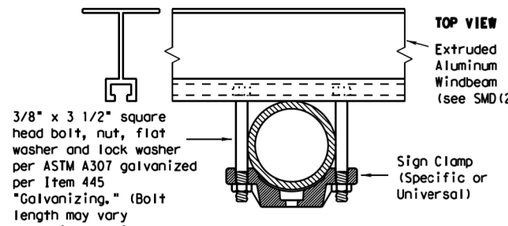


Detail C

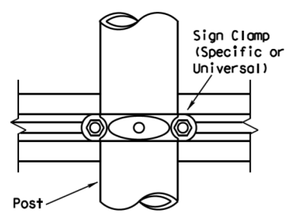


Detail E

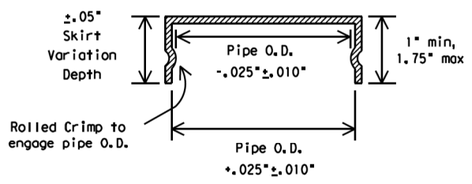
SIDE VIEW



Detail D



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.

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. Additional route markers may be added vertically, provided the total sign area does not exceed the maximum allowable amount per Note 1.
10. 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.
11. Post open ends shall be fitted with Friction Caps.
12. Sign blanks shall be the sizes and shapes shown on the plans.

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
SHEET NO. 166 OF 242
DWG NO. WS9-4251
CONTRACT NO. C-2033270-01

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)

Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS TRIANGULAR SLIPBASE SYSTEM

SMD(SLIP-2)-08

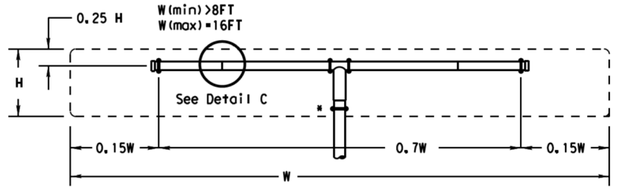
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DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
CONT	SECT	JOB	HIGHWAY
DIST	COUNTY		SHEET NO.

9-08 REVISIONS

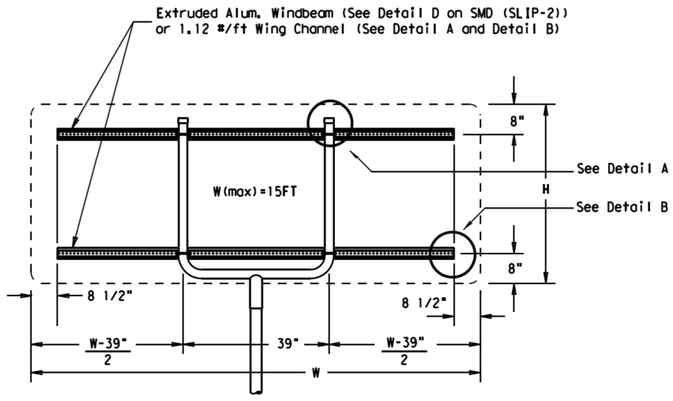
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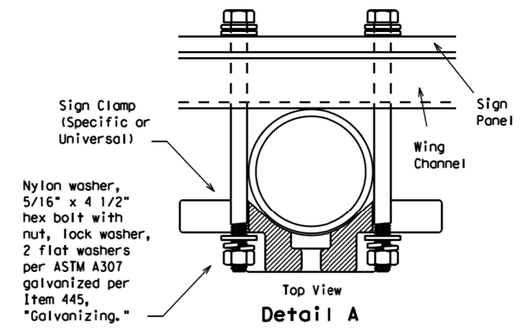


SM RD SGN ASSM TY XXXXX(1)XX(T-2EXT)

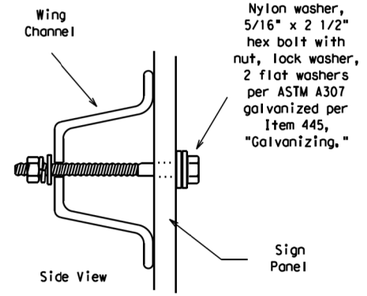
(* - See Note 12)



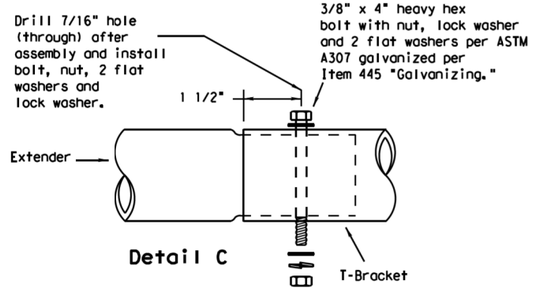
SM RD SGN ASSM TY XXXXX(1)XX(U-XX)



Detail A



Detail B



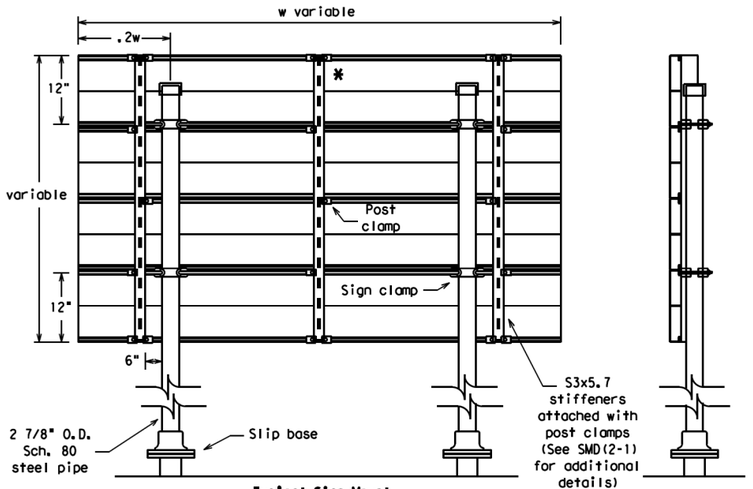
Detail C

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

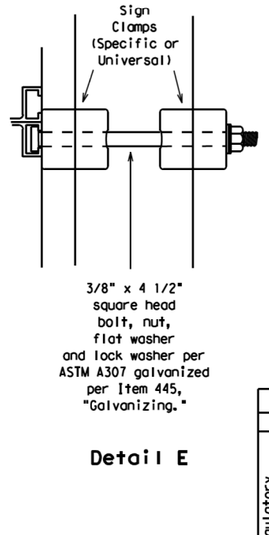
1. See table above.
2. The Engineer may require that a Schedule 80 post be used in place of a 10 BWG where a sign height is abnormally high due to a fill slope.
3. Sign supports shall not be spliced except where shown. Sign support posts shall not be spliced.
4. Aluminum sign blanks shall conform to 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. Sign blanks shall be the sizes and shapes shown on the plans.
11. 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.
12. Post open ends shall be fitted with Friction Caps.



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'.



DRAINAGE AREA CALCULATIONS (LESS THAN 200 ACRES)													
AREA NUMBER	AREA BY ZONING					RATIONAL METHOD Q=CIA							COMMENTS
	GRASS (ACRES) 0.40	INDUSTRIAL (ACRES) 0.90	PAVEMENT (ACRES) 0.90	BALLAST (ACRES) 0.90	COMMERCIAL (ACRES) 0.85	AREA (ACRES)	Tc (MIN)	RUNOFF "C"	INTENSITY_50 YR (IN/HR)	Q50 (CFS)	INTENSITY_100 YR (IN/HR)	Q100 (CFS)	
B-65	0.73		0.52	0.87		2.12	25.00	0.73	6.14	9.50	6.68	10.34	TO EXIST "Y' INLET OUTSIDE ROW
B-66a	0.31		0.17			0.48	22.00	0.58	6.38	1.78	6.94	1.93	TO PROP SET-SP ST STATION 2311+29.76
B-66b	0.04			0.38		0.42	10.00	0.85	8.16	2.92	8.88	3.17	TO PROP UNDERDRAIN
B-70	2.58	49.81				52.39	20.00	0.88	6.54	301.65	7.12	328.24	TO CUVLERT B1
B-71a	0.45	1.81		0.07		2.33	10.00	0.80	8.16	15.21	8.88	16.55	TO EXIST INLET B-71
B-71b	0.54	5.78				6.32	10.00	0.86	8.16	44.34	8.88	48.25	TO EXIST INLET B-71A
B-71c	2.51	9.51		0.32		12.34	10.00	0.80	8.16	80.53	8.88	87.63	TO EXIST INLET B-71B
B-72a	0.55			0.83		1.38	39.00	0.70	4.82	4.67	5.25	5.08	TO EXIST 66" RCP EXTENSION, CULVERT B-1
B-72b	2.35		0.34	0.22		2.91	78.00	0.50	3.27	4.76	3.56	5.18	TO EXIST 66" RCP EXTENSION, CULVERT B-1
B-73	1.25	6.40	0.34	1.07		9.07	10.00	0.83	8.16	61.41	8.88	66.83	TO EXIST CULVERT "A" AT 2335+20
B-74	0.26		0.01	0.34		0.61	10.00	0.69	8.16	3.42	8.88	3.72	TO PROP PSET-SC AT STARTION 2349+77.62
B-77	0.07		0.55		0.18	0.80	10.00	0.84	8.16	5.50	8.88	5.98	
B-78a	1.22		0.16		0.61	1.99	10.00	0.58	8.16	9.44	8.88	10.27	TO EXIST INLET AT BROADWAY ST
B-78b	0.04		0.05		0.13	0.22	10.00	0.77	8.16	1.37	8.88	1.49	TO PROP PSET-SP AT STATION 2370+53.17
B-81	0.90		0.25	0.62		1.77	10.00	0.65	8.16	9.39	8.88	10.22	OUTFALLIS TO EXIST INLET AT STATION 2350+69
B-82a	2.73		0.15			2.87	10.00	0.43	8.16	10.07	8.88	10.96	TO EXIST INLET
B-82b	0.10			0.27		0.38	10.00	0.76	8.16	2.34	8.88	2.55	TO PROP INLET B-82 @ STATION 2379+63.46
B-84	0.73		0.19	0.66	0.05	1.63	10.00	0.67	8.16	8.91	8.88	9.70	TO EXIST INLET B-84 AT STATION 2393+04.57

NOTES:

1. RUNOFF COMPUTATIONS HAVE BEEN PERFORMED ACCORDING TO DART DESIGN CRITERIA MANUAL, VOL. 1, DRAINAGE CRITERIA, CHAPTER 7, JANUARY 31, 2003 AND TOWN OF ADDISON DRAINAGE DESIGN MANUAL, DRAINAGE DESIGN STANDARDS, III, MARCH 2022.
2. INLET & PIPE COMPUTATIONS HAVE BEEN PERFORMED USING OPENROADS SUDA PROGRAM.
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.

06-MAR-2023 10:19
CB05-CC6-2750.010

JEGSVCPW001
Default

NOT AN APPROVED DRAWING
FINAL 100% DESIGN

CONTRACT SHEET No. 168 OF 242

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:
BRANDON J. OLIVER, P.E., 135838
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FIRM REGISTRATION No, F-2966

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ARCHER WESTERN HERZOG

DART PROJECT

DART®

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SCALE	NO SCALE
DRAWN	D. ESCALANTE
DESIGNED	J. RODRIGUEZ
CHECKED	B. OLIVER
IN CHARGE	B. OLIVER
DATE	13 MAR 23

CAES

COTTON BELT REGIONAL RAIL VELOWEB HIKE & BIKE TRAIL

TOWN OF ADDISON
DRAINAGE CALCULATIONS
SHEET 1 OF 4

CONTRACT	DWG No.	REV
C-2033270-01	CC6-2750	D

CB05-CC6-2750.010

DWG No. CC6-2751

NOTES:

1. MINOR CULVERT COMPUTATIONS HAVE BEEN PERFORMED WITH FHWA HY-8 PROGRAM.
2. 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 CALCULATIONS

CULVERT INPUT DATA (HY-8)

MINOR CULVERTS

STATION/ID	TRAIL OR TRACK	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
2312+79	TRACK	8X7 RCB CL H	B-70, B-71A, B-71B, B-71C, B-72A, B-72B	0.00	593.16	N/A	N/A	N/A	N/A	17.00	592.95	TW CONDITION SET TO RECTANGULAR CHANNEL WITH 15 FT WITDH, 0.80% CHANNEL SLOPE, MANNING N = 0.012.

CULVERT HYDRAULIC DATA

MINOR CULVERTS

STATION/ID	TRACK OR ROADWAY	DESCRIPTION	DRAINAGE AREA ID	ALLOWABLE HEADWATER (FT)	50 YEAR (DESIGN STORM FREQUENCY)							100 YEAR (DESIGN STORM FREQUENCY)							COMMENTS
					FLOW "Q" (CFS)	HW ELEV (FT)	HW DEPTH (FT)	TW ELEV (FT)	TW DEPTH (FT)	OUTLET VEL (FT/S)	TW VEL (FT/S)	FLOW "Q" (CFS)	HW ELEV (FT)	HW DEPTH (FT)	TW ELEV (FT)	TW DEPTH (FT)	OUTLET VEL (FT/S)	TW VEL (FT/S)	
2312+76.00	TRACK	8X7 RCB CL H	B-70, B-71A, B-71B, B-71C, B-72A, B-72B	602.66	451.16	601.05	7.89	597.07	4.12	13.96	7.29	495.48	601.65	8.49	597.35	4.40	14.34	7.50	50-YEAR DESIGN

INLET CALCULATIONS

INLET CALCULATIONS

INLET NO.	STATION/OFFSET				INLET TYPE	GRATE PERIMETER (FT)	GRATE AREA (SQ FT)	LONGITUDINAL SLOPE (%)	CROSS SLOPE (%)	DESIGN FREQ. (YRS)	DISCHARGE (CFS)	BYPASS FLOW (CFS)	BYPASS TO	INLET CURB LENGTH (FT)	ALLOWABLE PONDED WIDTH (FT)	ACTUAL PONDED WIDTH (FT)	PONDED DEPTH (FT)	ALLOWABLE DEPTH (FT)	NO. GRATES (EA)	REMARKS
B-72A	HIKE AND BIKE	2318+72.18	11.12'	RT	SINGLE GRATE INLET	12.00	9.00	-	33.00	100	2.86	-	-	-	7.00	4.00	0.29	0.29	1	
B-72B	HIKE AND BIKE	2322+81.35	11.12'	RT	SINGLE GRATE INLET	12.00	9.00	-	33.00	100	6.55	-	-	-	6.00	6.00	0.55	0.55	1	
B-77	HIKE AND BIKE	2367+10.53	8.75'	RT	TWO GRATE INLET	13.38	7.78	-	-	100	4.44	-	-	-	29.00	22.00	0.43	0.43	2	
B-82	HIKE AND BIKE	2379+65.78	13.29'	RT	TWO GRATE INLET	13.38	7.78	-	33.00	100	1.89	-	-	-	5.60	4.20	0.34	0.60	2	
B-84	HIKE AND BIKE	2393+04.57	12.02'	RT	SINGLE GRATE INLET	16.00	16.00	-	33.00	100	7.20	-	-	-	11.50	6.50	0.33	1.70	1	

PIPE CALCULATIONS

PIPE CALCULATIONS

PIPE ID.	FROM	TO	DESIGN FREQUENCY (YR)	CUMULATIVE DISCHARGE (CFS)	CAPACITY (CFS)	LENGTH (FT)	SIZE (IN)	UPSTREAM FL (FT)	DOWNSTREAM FL (FT)	MANNING'S N	PIPE SLOPE (%)	FRICTION SLOPE (%)	CRITICAL DEPTH (FT)	NORMAL DEPTH (FT)	ACTUAL DOWNSTREAM DEPTH (FT)	HGL UPSTREAM (FT)	HGL DOWNSTREAM (FT)	ACTUAL VELOCITY (FT/S)	NO. OF BARRELS	REMARKS
LINE B-66A	2311+29.76	2311+65.34	100	1.38	19.23	42.00	18.0	596.44	595.24	0.012	2.86	2.31	0.44	0.27	0.79	596.88	596.03	6.32	1	
LINE B-72A-1	2322+79.36		100	6.55	12.25	12.00	24.0	600.96	600.93	0.012	0.25	0.22	0.91	1.04	1.08	602.03	602.01	3.97	1	
LINE B-72A-2	2322+77.16	2318+74.39	100	13.09	25.68	408.00	24.0	600.93	596.45	0.012	1.10	1.06	0.91	0.69	1.25	601.84	597.70	6.83	1	
LINE B-72A-3	2318+72.19		100	2.86	25.51	12.00	24.0	596.58	596.45	0.012	1.08	0.03	0.59	0.45	1.25	597.70	597.70	5.37	1	
LINE B-72A-4	2318+69.99	2316+42.19	100	24.52	29.49	230.00	24.0	596.45	593.12	0.012	1.45	1.31	1.04	0.74	0.74	597.49	593.86	8.13	1	
LINE B-74	2349+74.84	2349+76.85	100	2.82	37.36	32.00	18.0	621.39	617.94	0.012	10.78	5.81	0.64	0.28	0.29	622.03	618.23	12.60	1	
LINE B-77	2367+10.53		100	4.44	12.11	15.00	18.0	626.05	625.88	0.012	1.13	0.83	0.81	0.66	0.69	626.86	626.57	5.96	1	
LINE B-78A	2370+60.54	2370+66.77	100	1.07	41.74	11.00	18.0	627.08	625.60	0.012	13.45	13.00	0.39	0.17	0.51	627.47	626.11	10.06	1	
LINE B-78B	2370+69.38	2371+93.28	100	1.07	4.99	130.00	18.0	625.60	625.35	0.012	0.19	0.21	0.39	0.47	0.39	626.07	625.74	2.25	1	
LINE B-82	2379+65.78		100	1.89	40.39	5.00	18.0	620.41	619.78	0.012	12.60	2.32	0.52	0.22	0.29	620.93	620.07	11.68	1	
LINE B-84A	2393+15.72	2393+23.39	100	7.20	101.34	10.00	24.0	604.54	602.83	0.012	17.10	3.26	0.95	0.38	0.49	605.49	603.32	17.64	1	
LINE B-84B	2394+09.44	2394+10.34	100	1.95	40.96	22.00	18.0	600.00	597.15	0.012	12.95	6.51	0.53	0.22	0.23	600.53	597.38	12.14	1	

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CONTRACT SHEET No. 169 OF 242

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IN CHARGE	B. OLIVER
DATE	13 MAR 23

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COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

TOWN OF ADDISON
DRAINAGE CALCULATIONS
SHEET 2 OF 4

CONTRACT	DWG No.	REV
C-2033270-01	CC6-2751	D

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DWG No. CC6-2752

UNDERDRAIN CALCULATIONS

UD2.4.001

STA 2292+93.38 TO STA 2293+11.38 RIGHT

UNDERDRAIN PIPE							
FROM		TO		LENGTH (FEET)	SIZE (INCHES)	SLOPE (FT/FT)	Q (CFS)
STA	FL	STA	FL				
2292+93.38	588.60	2293+11.38	587.94	26	10	0.025	4.55

END TREATMENTS			
ITEM	STA	CONNECTION FL	COMMENTS
TERMINAL CLEAN OUT	2292+93.38	588.60	
OUTFALL	2293+11.38	587.94	OUTFALLS TO EXISTING "Y" INLET

UD2.4.002

STA 2311+21.69 TO STA 2311+67.67 LEFT

UNDERDRAIN PIPE							
FROM		TO		LENGTH (FEET)	SIZE (INCHES)	SLOPE (FT/FT)	Q (CFS)
STA	FL	STA	FL				
2311+21.69	597.87	2311+67.67	597.43	42	8	0.010	1.47
2311+67.67	597.43	2315+40.00	595.74	12	8	0.141	5.37

END TREATMENTS			
ITEM	STA	CONNECTION FL	COMMENTS
TERMINAL CLEAN OUT	2311+21.69	597.87	
CLEAN OUT	2311+67.67	597.43	
OUTFALL	2315+40.00	595.74	OUTFALLS TO PROP MH-B-66

UD2.4.003

STA 2318+15.05 TO STA 2317+45.84 RIGHT

UNDERDRAIN PIPE							
FROM		TO		LENGTH (FEET)	SIZE (INCHES)	SLOPE (FT/FT)	Q (CFS)
STA	FL	STA	FL				
2318+15.05	598.83	2317+45.84	597.12	75	8	0.023	1.83

END TREATMENTS			
ITEM	STA	CONNECTION FL	COMMENTS
TERMINAL CLEAN OUT	2318+15.05	598.83	
OUTFALL	2317+45.84	597.12	OUTFALLS TO PROP LINE B-72A-3

NOTES:

1. RUNOFF COMPUTATIONS HAVE BEEN PERFORMED ACCORDING TO DART DESIGN CRITERIA MANUAL, VOL. 1, DRAINAGE CRITERIA, CHAPTER 7 JANUARY 31, 2003.
2. 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.

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IN CHARGE	B. OLIVER
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CONTRACT SHEET No. 170 OF 242

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

TOWN OF ADDISON
DRAINAGE CALCULATIONS
SHEET 3 OF 4

CONTRACT	DWG No.	REV
C-2033270-01	CC6-2752	D

CB05-CC6-2752.010

DWG No. CC6-2753

DITCH CALCULATIONS

DITCH B-66-1									
H&B TRAIL STATION		SLOPE (FT/FT)	Q100 (CFS)	MANNINGS 'n'	DITCH SECTION (FS)	DITCH SECTION (BW)	DITCH SECTION (BS)	VELOCITY (FT/S)	DEPTH OF FLOW (FT)
FROM	TO								
2307+59	2311+23	0.006	6.00	0.035	3.00	0.00	3.00	2.00	1.00

DITCH B-72-1									
H&B TRAIL STATION		SLOPE (FT/FT)	Q100 (CFS)	MANNINGS 'n'	DITCH SECTION (FS)	DITCH SECTION (BW)	DITCH SECTION (BS)	VELOCITY (FT/S)	DEPTH OF FLOW (FT)
FROM	TO								
2313+19	2316+38.70	0.013	10.84	0.035	3.00	0.00	3.00	5.68	0.68

DITCH B-72-2									
H&B TRAIL STATION		SLOPE (FT/FT)	Q100 (CFS)	MANNINGS 'n'	DITCH SECTION (FS)	DITCH SECTION (BW)	DITCH SECTION (BS)	VELOCITY (FT/S)	DEPTH OF FLOW (FT)
FROM	TO								
2317+17.34	2316+38.70	0.013	19.09	0.035	3.00	0.00	3.00	6.36	1.00

DITCH B-72-3									
H&B TRAIL STATION		SLOPE (FT/FT)	Q100 (CFS)	MANNINGS 'n'	DITCH SECTION (FS)	DITCH SECTION (BW)	DITCH SECTION (BS)	VELOCITY (FT/S)	DEPTH OF FLOW (FT)
FROM	TO								
2322+23	2318+74	0.009	8.65	0.035	3.00	0.00	4.00	2.47	1.00

DITCH B-72-4									
H&B TRAIL STATION		SLOPE (FT/FT)	Q100 (CFS)	MANNINGS 'n'	DITCH SECTION (FS)	DITCH SECTION (BW)	DITCH SECTION (BS)	VELOCITY (FT/S)	DEPTH OF FLOW (FT)
FROM	TO								
2324+95	2322+81	0.009	8.65	0.035	3.00	0.00	4.00	2.47	1.00

DITCH B-74-1									
H&B TRAIL STATION		SLOPE (FT/FT)	Q100 (CFS)	MANNINGS 'n'	DITCH SECTION (FS)	DITCH SECTION (BW)	DITCH SECTION (BS)	VELOCITY (FT/S)	DEPTH OF FLOW (FT)
FROM	TO								
2347+56	2349+72	0.002	7.79	0.035	3.00	0.00	3.00	2.60	1.00

DITCH B-74-2									
H&B TRAIL STATION		SLOPE (FT/FT)	Q100 (CFS)	MANNINGS 'n'	DITCH SECTION (FS)	DITCH SECTION (BW)	DITCH SECTION (BS)	VELOCITY (FT/S)	DEPTH OF FLOW (FT)
FROM	TO								
2353+18	2349+77	0.009	5.85	0.035	3.00	0.00	3.00	2.41	0.90

DITCH B-84-1									
H&B TRAIL STATION		SLOPE (FT/FT)	Q100 (CFS)	MANNINGS 'n'	DITCH SECTION (FS)	DITCH SECTION (BW)	DITCH SECTION (BS)	VELOCITY (FT/S)	DEPTH OF FLOW (FT)
FROM	TO								
2387+38	2393+05	0.010	9.70	0.035	3.00	0.00	3.00	2.73	1.11

DITCH B-84-2									
H&B TRAIL STATION		SLOPE (FT/FT)	Q100 (CFS)	MANNINGS 'n'	DITCH SECTION (FS)	DITCH SECTION (BW)	DITCH SECTION (BS)	VELOCITY (FT/S)	DEPTH OF FLOW (FT)
FROM	TO								
2394+73	2394+14	0.006	6.00	0.035	3.00	0.00	3.00	2.00	1.00

NOTES:

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2. 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.

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SCALE	NO SCALE
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IN CHARGE	B. OLIVER
DATE	13 MAR 23

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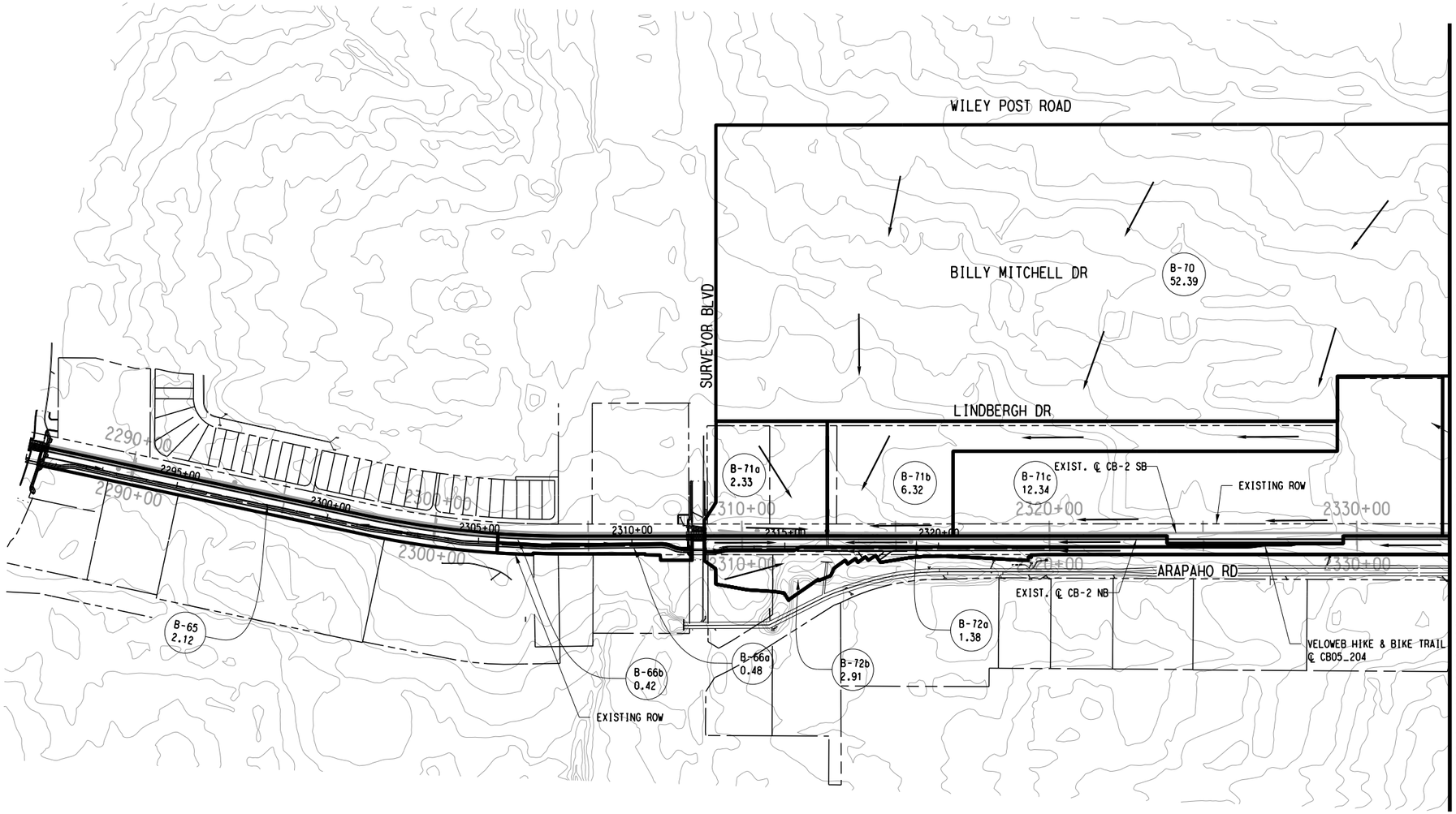
COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

TOWN OF ADDISON
DRAINAGE CALCULATIONS
SHEET 4 OF 4

CONTRACT	DWG No.	REV
C-2033270-01	CC6-2753	D

CB05-CC6-2753.010

DWG No. CC6-2781



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

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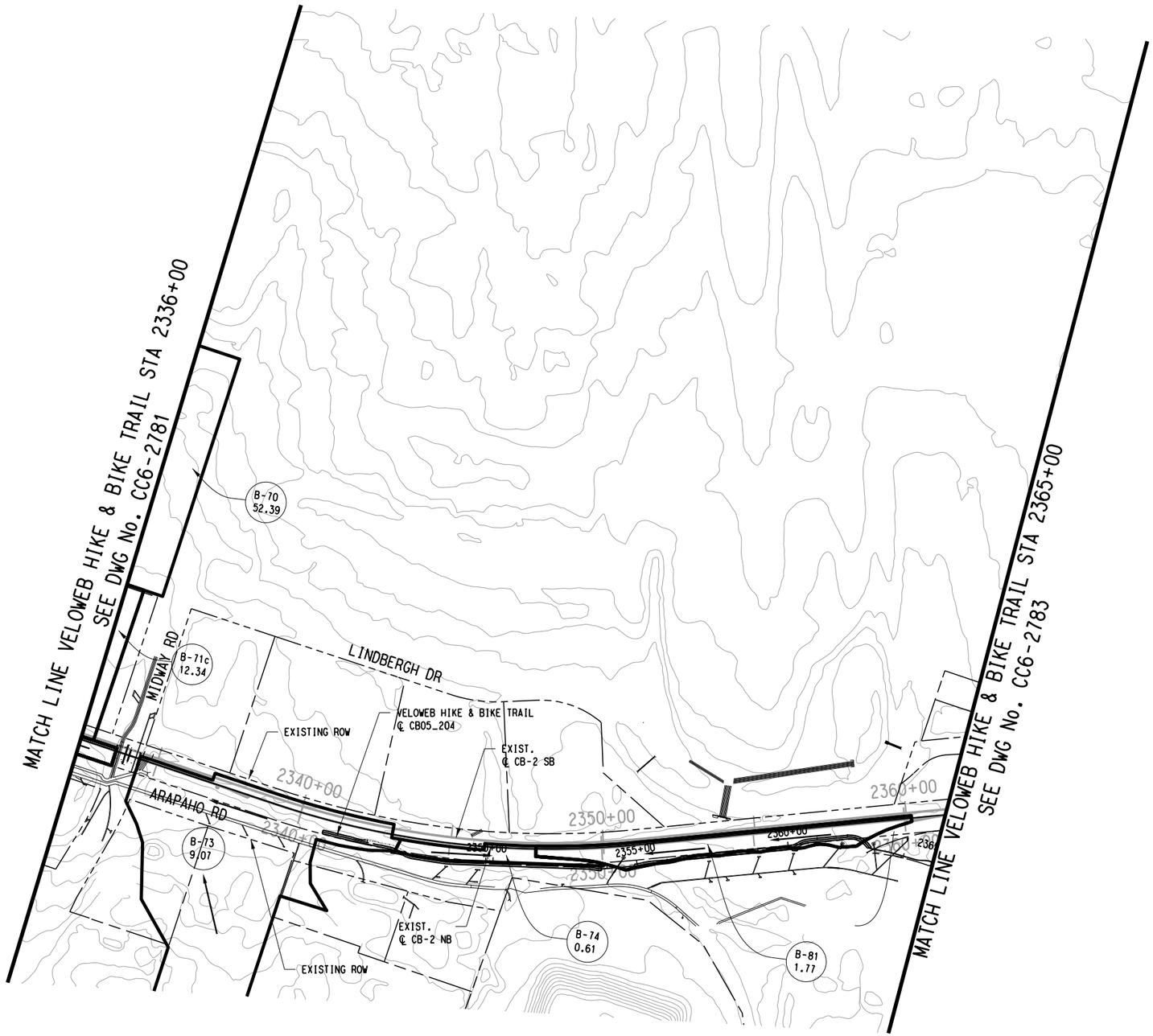
CAES

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
TOWN OF ADDISON
DRAINAGE AREA MAP
BEGIN TO STA 2336+00
SHEET 1 OF 3

CONTRACT	DWG No.	REV
C-2033270-01	CC6-2781	D

CB05-CC6-2781.200

DWG No. CC6-2782



N

SCALE (IN FEET)
0 100 200 400

LEGEND

- DRAINAGE AREA BOUNDARY
- PROPOSED CONTOUR
- DRAINAGE FLOW
- XX / XXX — DRAINAGE AREA NUMBERS / DRAINAGE AREA IN ACRES

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COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
TOWN OF ADDISON
DRAINAGE AREA MAP
STA 2336+00 TO STA 2365+00
SHEET 2 OF 3

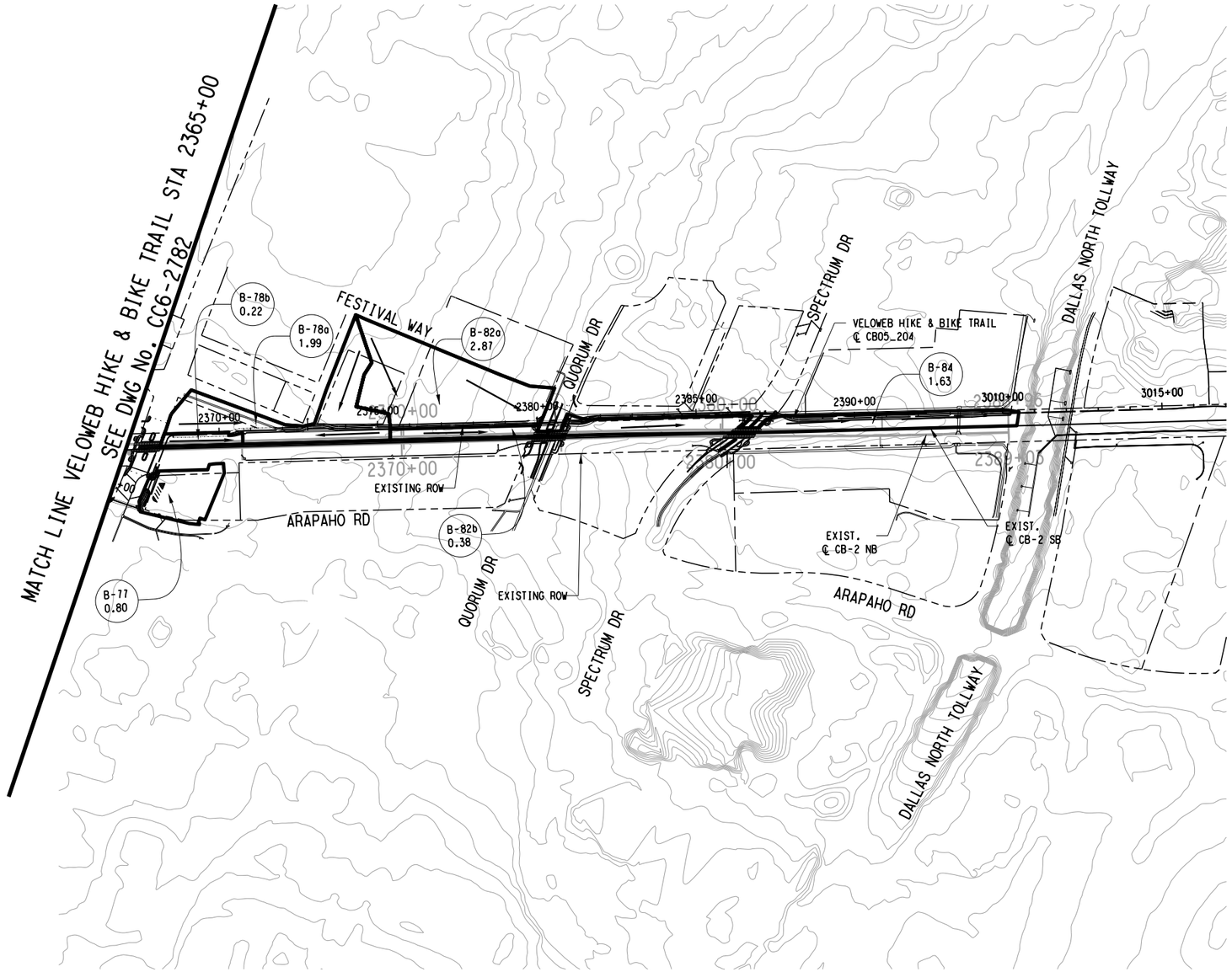
CONTRACT C-2033270-01 | DWG No. CC6-2782 | REV D

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DWG No. CC6-2783



SCALE (IN FEET)
0 100 200 400

LEGEND

- DRAINAGE AREA BOUNDARY
- PROPOSED CONTOUR
- DRAINAGE FLOW
- XX / XXX — DRAINAGE AREA NUMBERS / DRAINAGE AREA IN ACRES

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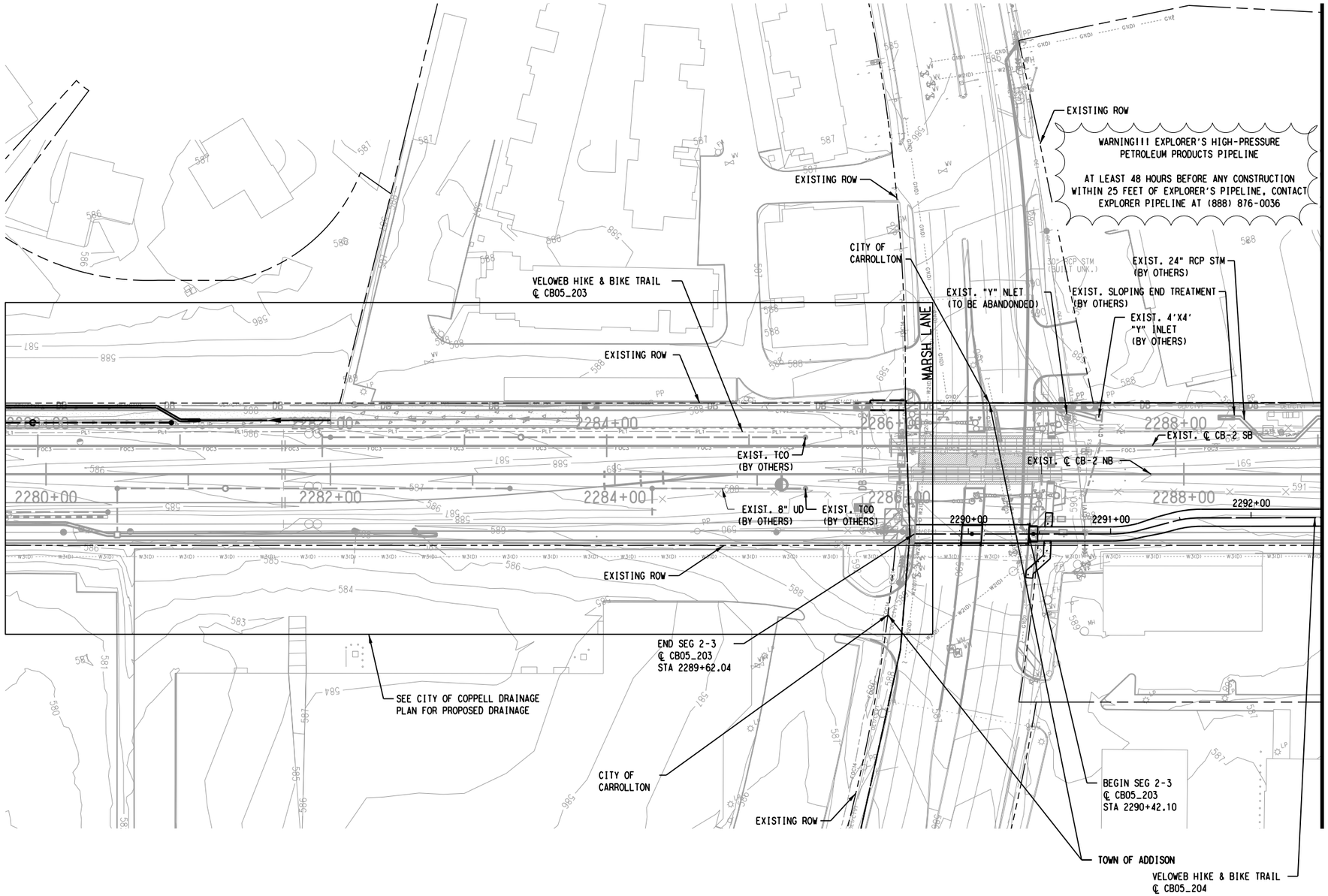
COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
TOWN OF ADDISON
DRAINAGE AREA MAP
STA 2365+00 TO END
SHEET 3 OF 3

CONTRACT	DWG No.	REV
C-2033270-01	CC6-2783	D

CB05-CC6-2783.200

06-MAR-2023 10:18
CB05-CC6-2783.200
JEGSVCPW01
Default

DWG No. CC6-2809



SCALE (IN FEET)
0 20 40 80

LEGEND

- CENTERLINE OF SPECIAL DITCH
- PROP FLUME
- PROP LIMITS OF CONCRETE LINED DITCH

NOTES:

1. ALL STATIONS CALLOUTS ARE IN REFERENCE 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.
6. SEE DART DWG. NO. CS6-0021 TO CSA-0024 FOR UNDERDRAIN DETAILS.

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DRAWN	D. ESCALANTE
DESIGNED	C.SEGURA
CHECKED	B. OLIVER
IN CHARGE	B. OLIVER
DATE	13 MAR 23

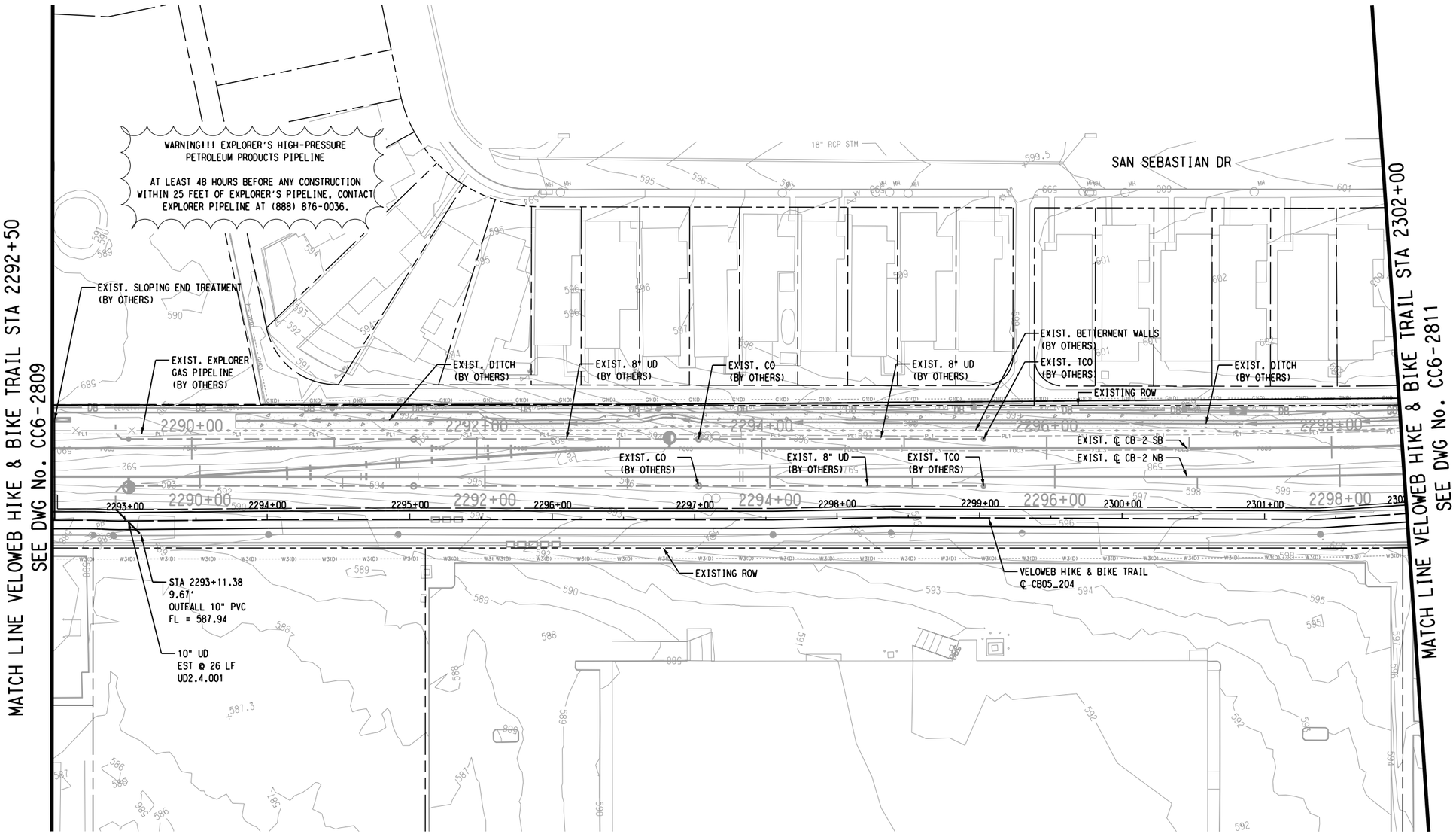
CAES

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
TOWN OF ADDISON
DRAINAGE PLAN
BEGIN TO STA 2292+50
SHEET 1 OF 12

CONTRACT	DWG No.	REV
C-2033270-01	CC6-2809	D

CB05-CC6-2809.040

DWG No. CC6-2810



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. 176 OF 242

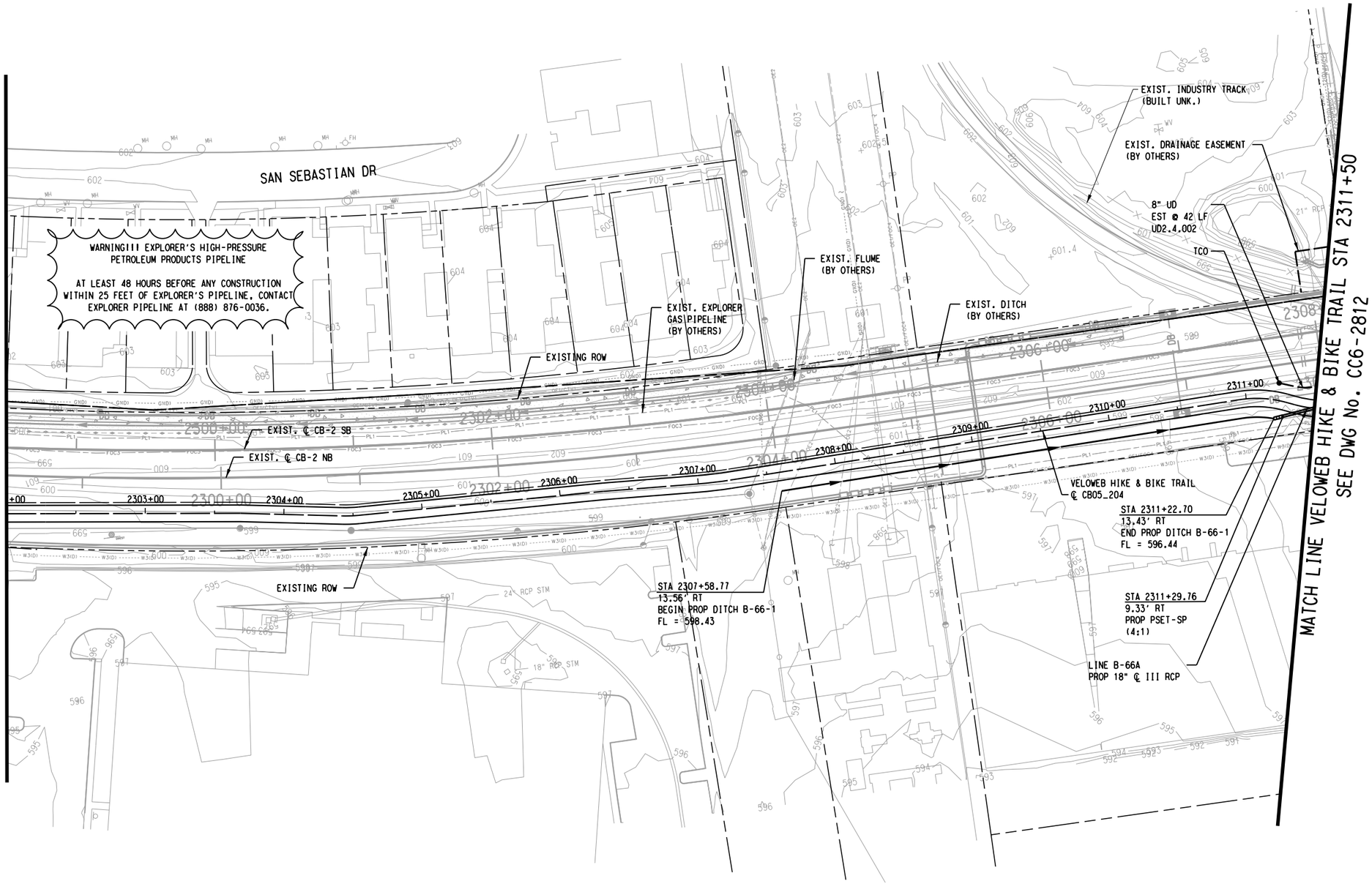
COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

TOWN OF ADDISON
DRAINAGE PLAN
STA 2292+50 TO STA 2302+00
SHEET 2 OF 12

CONTRACT	DWG No.	REV
C-2033270-01	CC6-2810	D

CB05-CC6-2810.040

DWG No. CC6-2811



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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COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
TOWN OF ADDISON
DRAINAGE PLAN
STA 2302+00 TO STA 2311+50
SHEET 3 OF 12

CONTRACT	DWG No.	REV
C-2033270-01	CC6-2811	D

CB05-CC6-2811.040

DWG No. CC6-2812

MATCH LINE VELOWEB HIKE & BIKE TRAIL STA 2311+50
SEE DWG No. CC6-2811

MATCH LINE VELOWEB HIKE & BIKE TRAIL STA 2321+50
SEE DWG No. CC6-2813

EXIST. 21" RCP STM (BY OTHERS)
EXIST. 24" RCP STM (BY OTHERS)
EXIST. 30" RCP STM (BY OTHERS)
EXIST. UD OUTFALL 8" HDPE (BY OTHERS)
EXIST. TCO (BY OTHERS)
EXIST. DITCH (BY OTHERS)
EXIST. 8" UD (BY OTHERS)
EXIST. DITCH (BY OTHERS)
EXISTING ROW
EXIST. TCO (BY OTHERS)
8" UD EST @ 42 LF UD2.4.002
CO
8" UD EST @ 12 LF UD2.4.002
SEE RETAINING WALL RW_T_R2316 SHEETS
EXIST. MH (BUILT UNK.)
STA 2311+18.52
3.92' LT
PROP MH TYPE A
STA 2313+18.66
16.00' RT
BEGIN PROP DITCH B-72-1
FL = 597.24
LINE B-66A
PROP 18" CL III RCP
SURVEYOR BLVD
EXIST. HEADWALL (BUILT UNK.) (TO BE REMOVED)
STA 2316+38.65
08.63' RT
PROP HEADWALL
CH-PW-1
EXIST. GRATE/JUNCTION BOX (BY OTHERS)
EXIST. 30" RCP STM (BY OTHERS)
EXIST. 66" RCP STM (BUILT UNK.)
EXIST. 4'X4' "Y" INLET (BY OTHERS)
EXIST. 42" RCP STM (BY OTHERS)
PROP ADDISON MH TYPE "B" (FOR 66" RCP) (CONNECT TO EXIST 66" RCP)
EXIST. 4'X4' "Y" INLET (BY OTHERS)
STA 2317+45.85
1.00' RT
OUTFALL 8" PVC
CONNECTION POINT
FL = 597.12
EXIST. DITCH (BY OTHERS)
STA 2318+72.18
0.00' RT
PROP MH TYPE A
STA 2318+73.18
9.12' RT
18" RCP
EXIST. DITCH (BY OTHERS)
EXIST. 5'X5' PROP GRATE INLET (BY OTHERS)
EXIST. ℄ CB-2 SB
EXIST. ℄ CB-2 NB
TCO
LINE B-72A-3
PROP 24" CL III RCP
CONNECT TO EXISTING PAVEMENT
8" UD EST @ 75 LF UD2.4.003
STA 2317+17.34
16.00' RT
BEGIN PROP DITCH B-72-2
FL = 597.72
PROP CULVERT B-1
66" RCP (℄ III)
STA 2316+38.70
16.00' RT
END PROP DITCH B-72-1
END PROP DITCH B-72-2
FL = 592.95
ARAPAHO RD
9'X5' RCB STM (BUILT 1981)
EXISTING ROW
VELOWEB HIKE & BIKE TRAIL ℄ CB05_204
LINE B-72A-1
PROP 24" CL III RCP
LINE B-72A-2
PROP 24" CL III RCP
STA 2318+74.18
11.12' RT
END PROP DITCH B-72-3
FL = 599.83
STA 2318+72.18
11.12' RT
PROP ADDISON TWO GRATE INLET

SCALE (IN FEET)
0 20 40 80

LEGEND
- CENTERLINE OF SPECIAL DITCH
- PROP FLUME
- PROP LIMITS OF CONCRETE LINED DITCH

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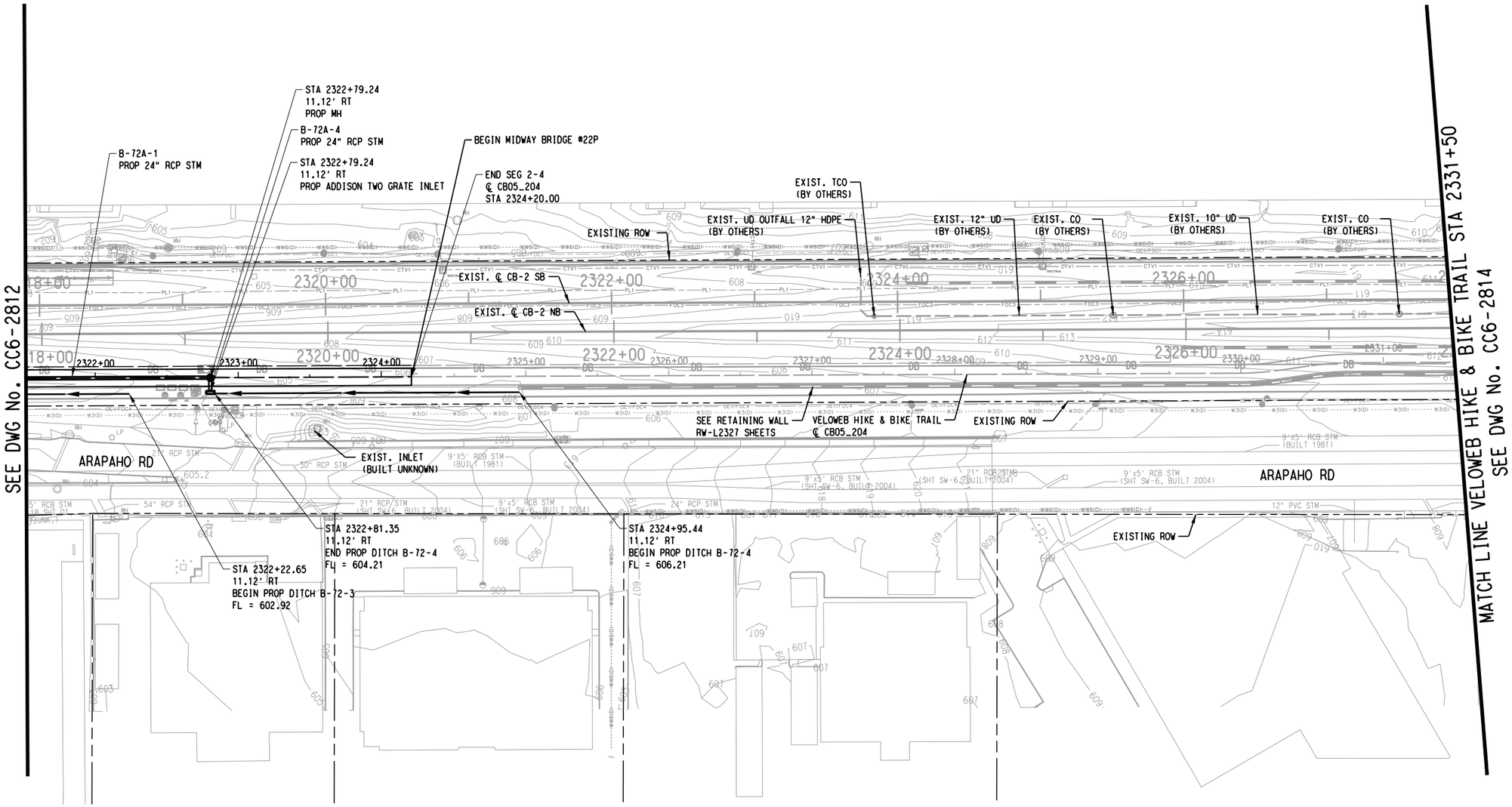
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DESIGNED	J. RODRIGUEZ
CHECKED	B. OLIVER
IN CHARGE	B. OLIVER
DATE	13 MAR 23

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
TOWN OF ADDISON
DRAINAGE PLAN
STA 2311+50 TO STA 2321+50
SHEET 4 OF 12

CONTRACT	DWG No.	REV
C-2033270-01	CC6-2812	D

CB05-CC6-2812.040

DWG No. CC6-2813



SCALE (IN FEET)
0 20 40 80

LEGEND

- CENTERLINE OF SPECIAL DITCH
- PROP FLUME
- PROP LIMITS OF CONCRETE LINED DITCH

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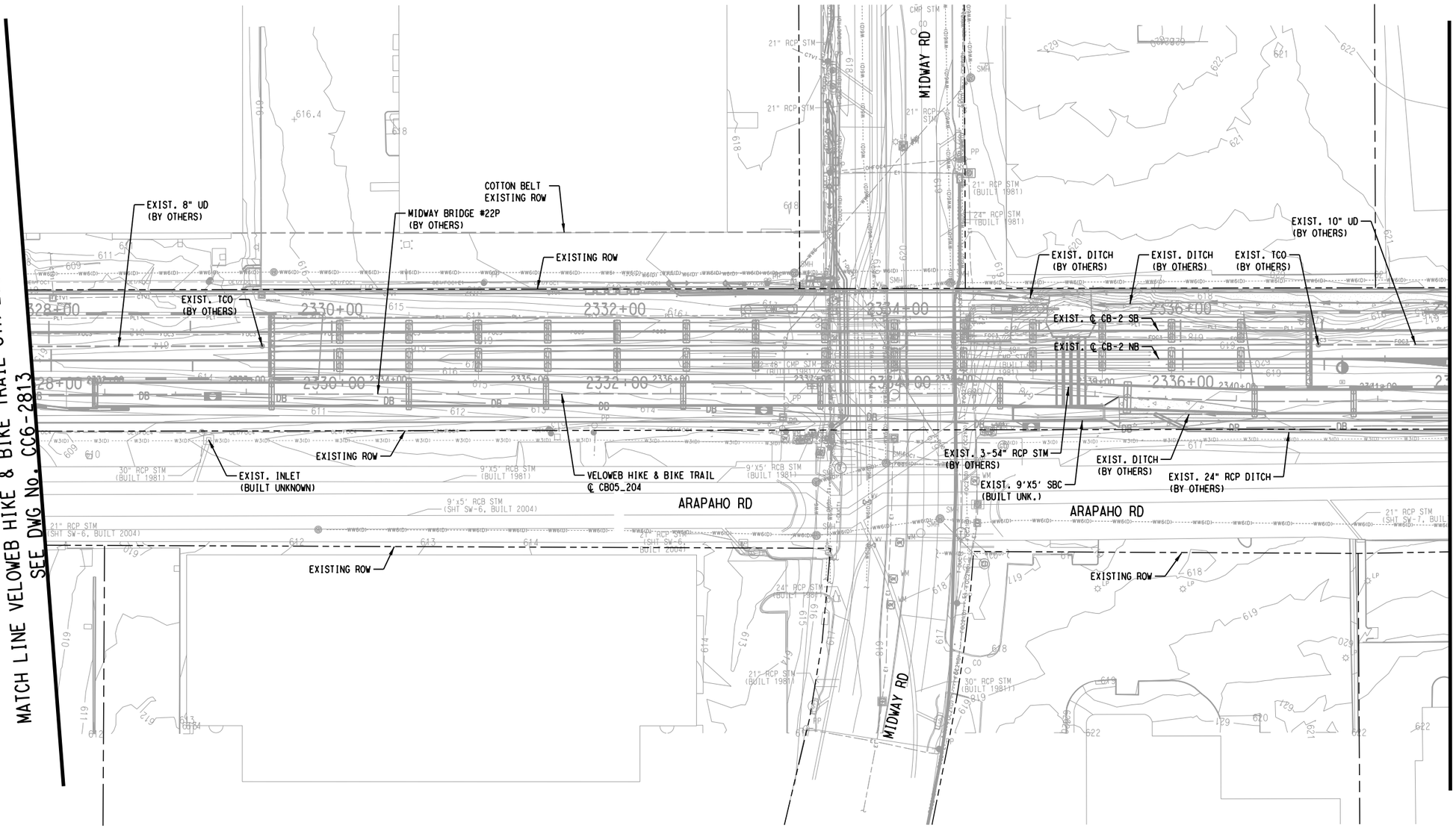
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COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
TOWN OF ADDISON
DRAINAGE PLAN
STA 2321+50 TO STA 2331+50
SHEET 5 OF 12

CONTRACT	DWG No.	REV
C-2033270-01	CC6-2813	D

CB05-CC6-2813.040

DWG No. CC6-2814



SCALE (IN FEET)
0 20 40 80

LEGEND

- CENTERLINE OF SPECIAL DITCH
- PROP FLUME
- PROP LIMITS OF CONCRETE LINED DITCH

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COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
TOWN OF ADDISON
DRAINAGE PLAN
STA 2331+50 TO STA 2341+50
SHEET 6 OF 12

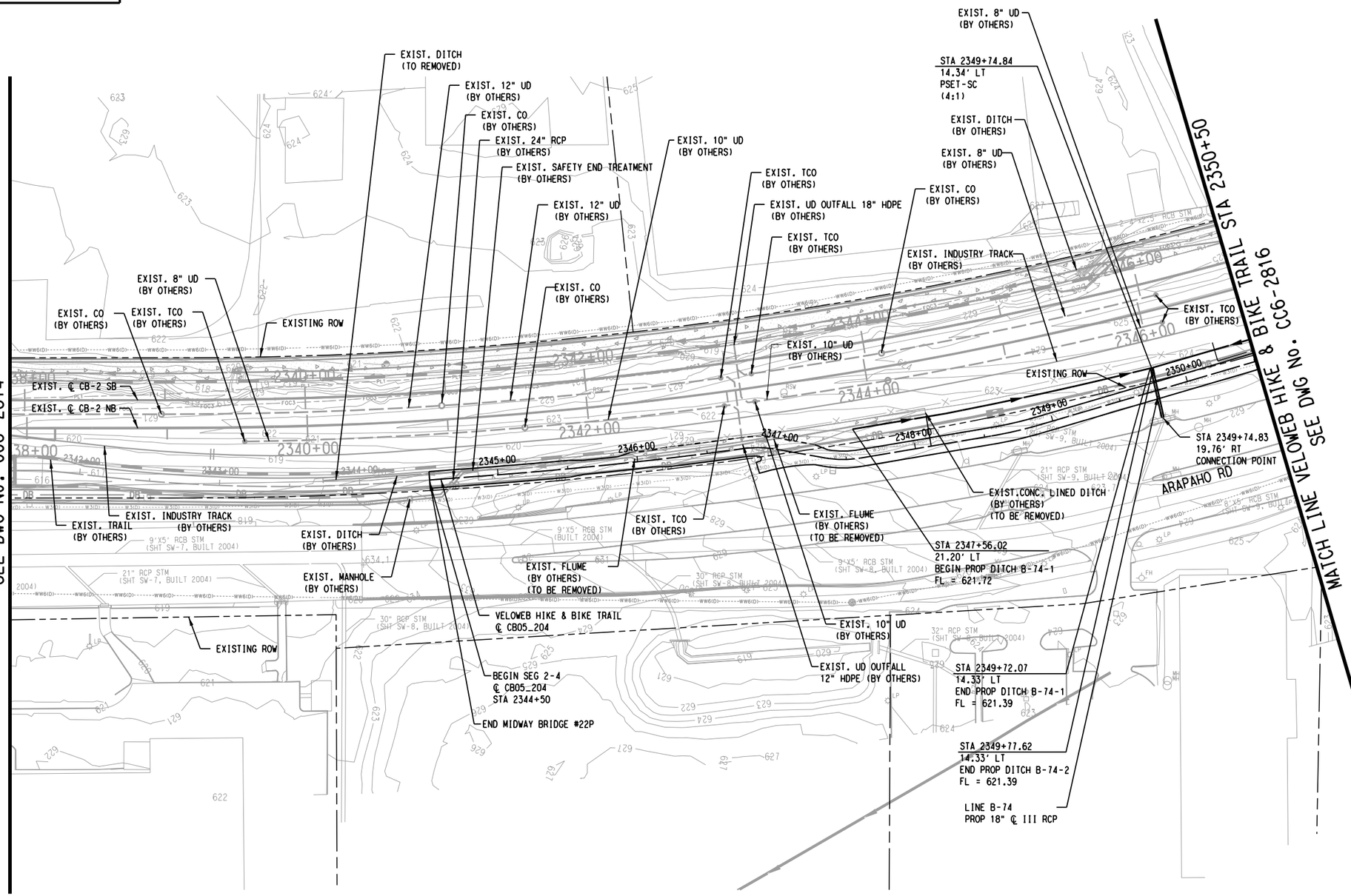
CONTRACT	DWG No.	REV
C-2033270-01	CC6-2814	D

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DWG No. CC6-2815

MATCH LINE VELOWEB HIKE & BIKE TRAIL STA 2341+50
SEE DWG No. CC6-2814

MATCH LINE VELOWEB HIKE & BIKE TRAIL STA 2350+50
SEE DWG No. CC6-2816



SCALE (IN FEET)
0 20 40 80

LEGEND

- CENTERLINE OF SPECIAL DITCH
- PROP FLUME
- PROP LIMITS OF CONCRETE LINED DITCH

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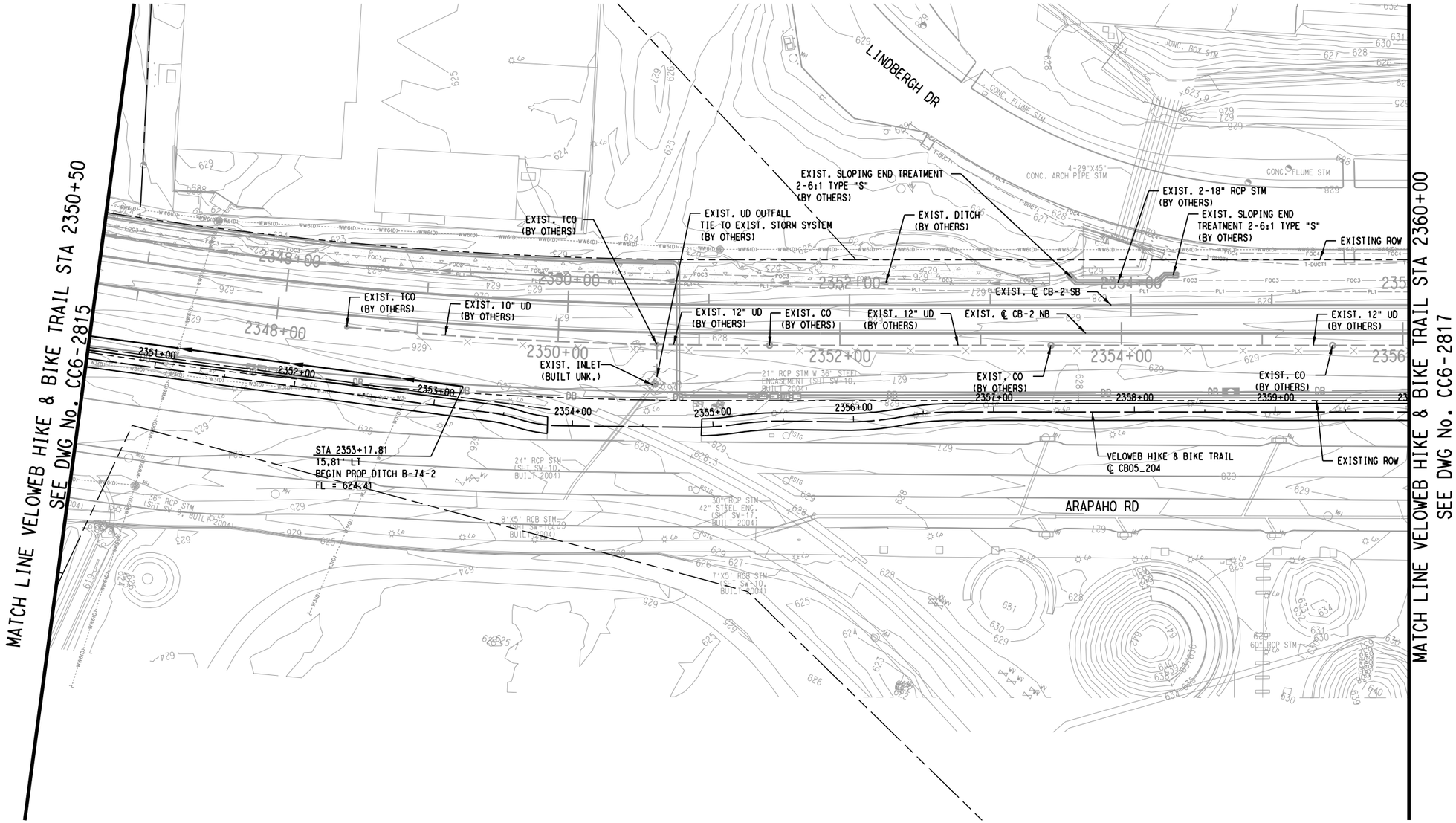
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COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
TOWN OF ADDISON
DRAINAGE PLAN
STA 2341+50 TO STA 2350+50
SHEET 7 OF 12

CONTRACT	DWG No.	REV
C-2033270-01	CC6-2815	D

CB05-CC6-2815.040

DWG No. CC6-2816



SCALE (IN FEET)
0 20 40 80

LEGEND

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- PROP FLUME
- PROP LIMITS OF CONCRETE LINED DITCH

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DESIGNED	J. RODRIGUEZ
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DATE	13 MAR 23

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COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
TOWN OF ADDISON
DRAINAGE PLAN
STA 2350+50 TO STA 2360+00
SHEET 8 OF 12

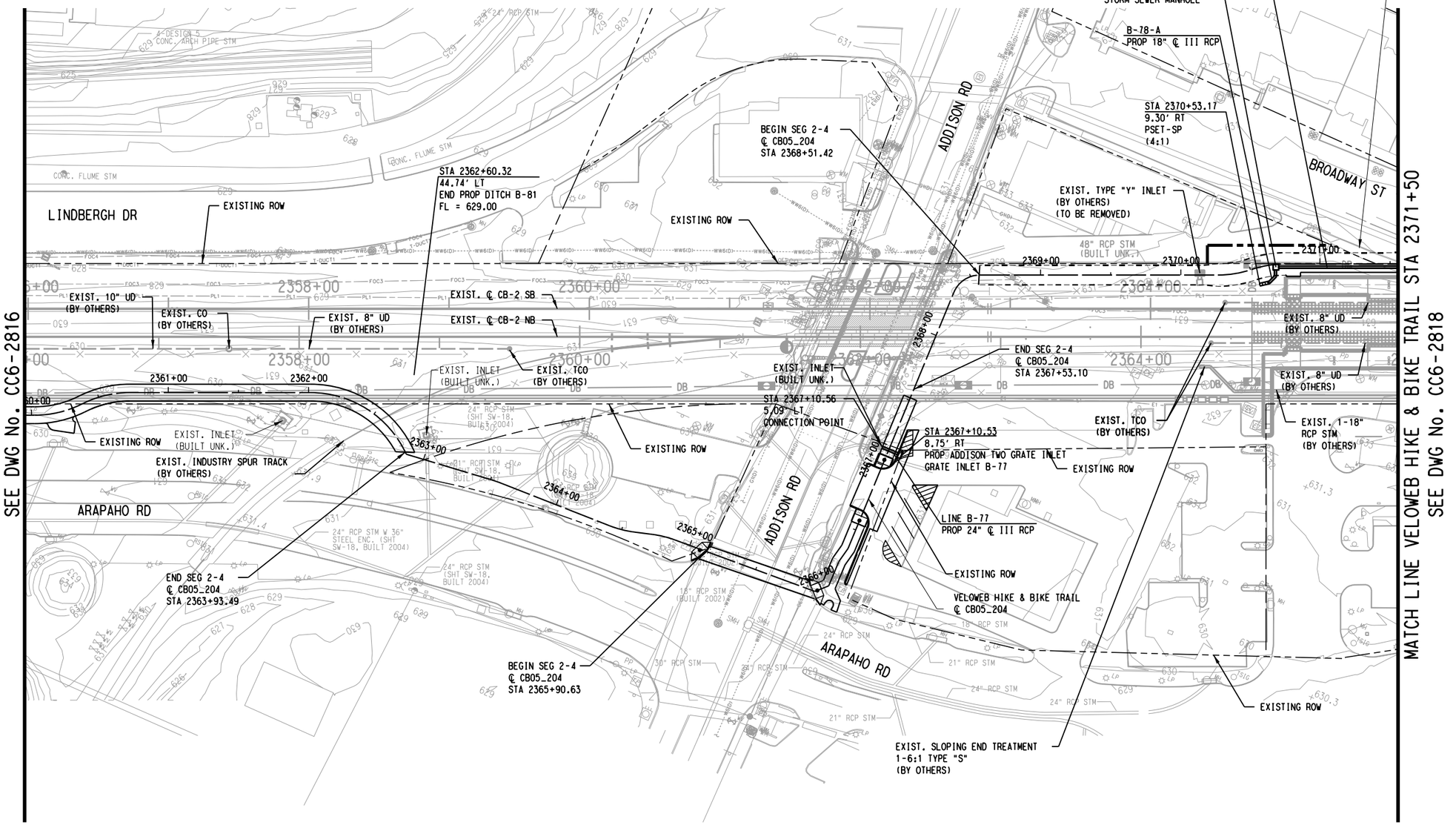
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DWG No. CC6-2817



SCALE (IN FEET)
0 20 40 80

LEGEND

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- PROP FLUME
- PROP LIMITS OF CONCRETE LINED DITCH

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Phone: +1 (214) 638-0145
FIRM REGISTRATION No, F-2966

IEA
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DALLAS, TX 75252
Phone: +1 (214) 884-4253
Firm Registration: F-10161

ARCHER WESTERN HERZOG

DART PROJECT

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SCALE	1"=40'
DRAWN	D. ESCALANTE
DESIGNED	J. RODRIGUEZ
CHECKED	B. OLIVER
IN CHARGE	B. OLIVER
DATE	13 MAR 23

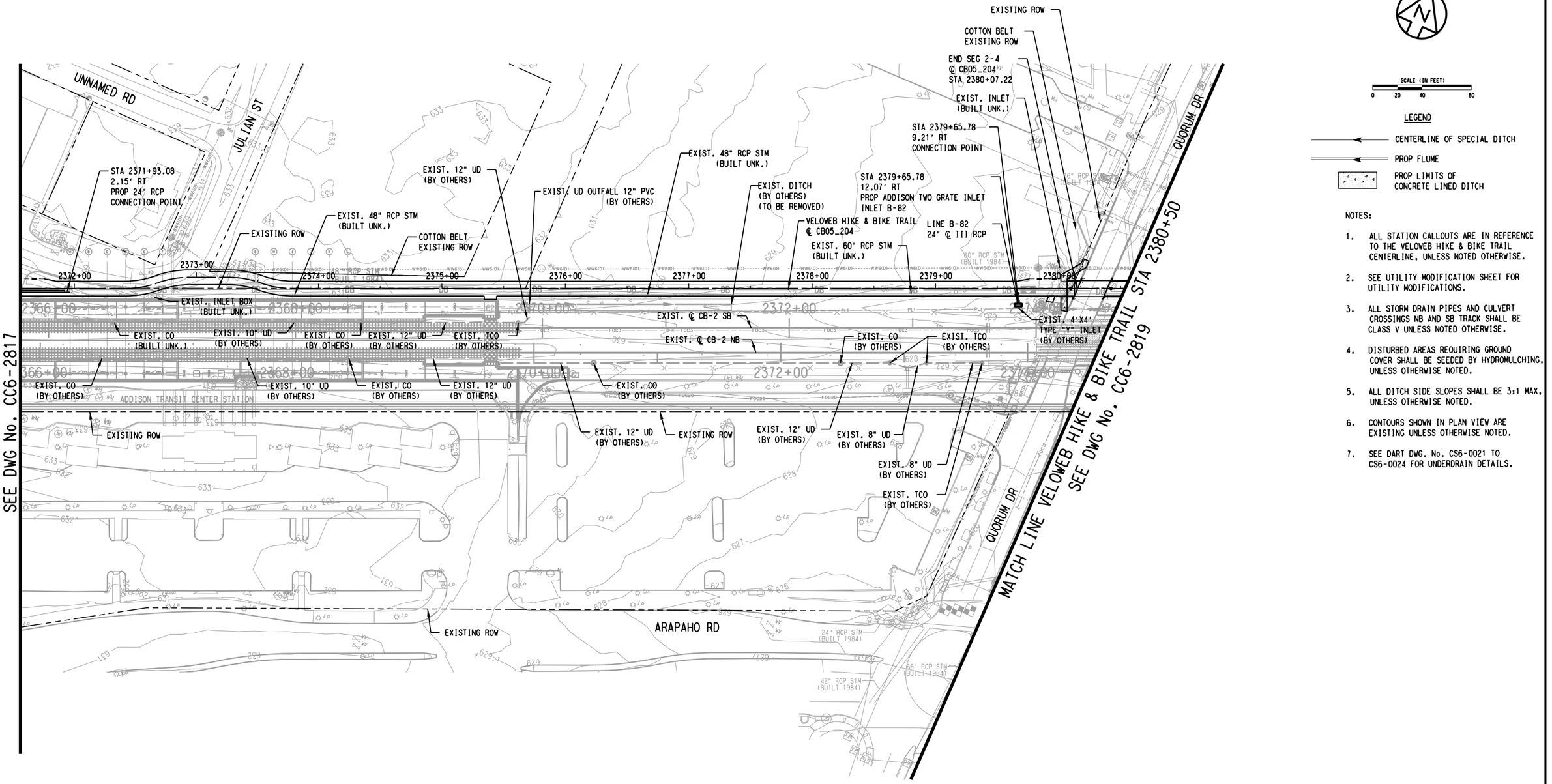
CAES

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
TOWN OF ADDISON
DRAINAGE PLAN
STA 2360+00 TO STA 2371+50
SHEET 9 OF 12

CONTRACT	DWG No.	REV
C-2033270-01	CC6-2817	D

CB05-CC6-2817.040

DWG No. CC6-2818



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 REFERENCE 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 EXISTING UNLESS OTHERWISE NOTED.
7. SEE DART DWG. No. CS6-0021 TO CS6-0024 FOR UNDERDRAIN DETAILS.

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CB05-CC6-2818.040

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CONTRACT SHEET No. 184 OF 242

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

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DRAWN	D. ESCALANTE
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DATE	13 MAR 23

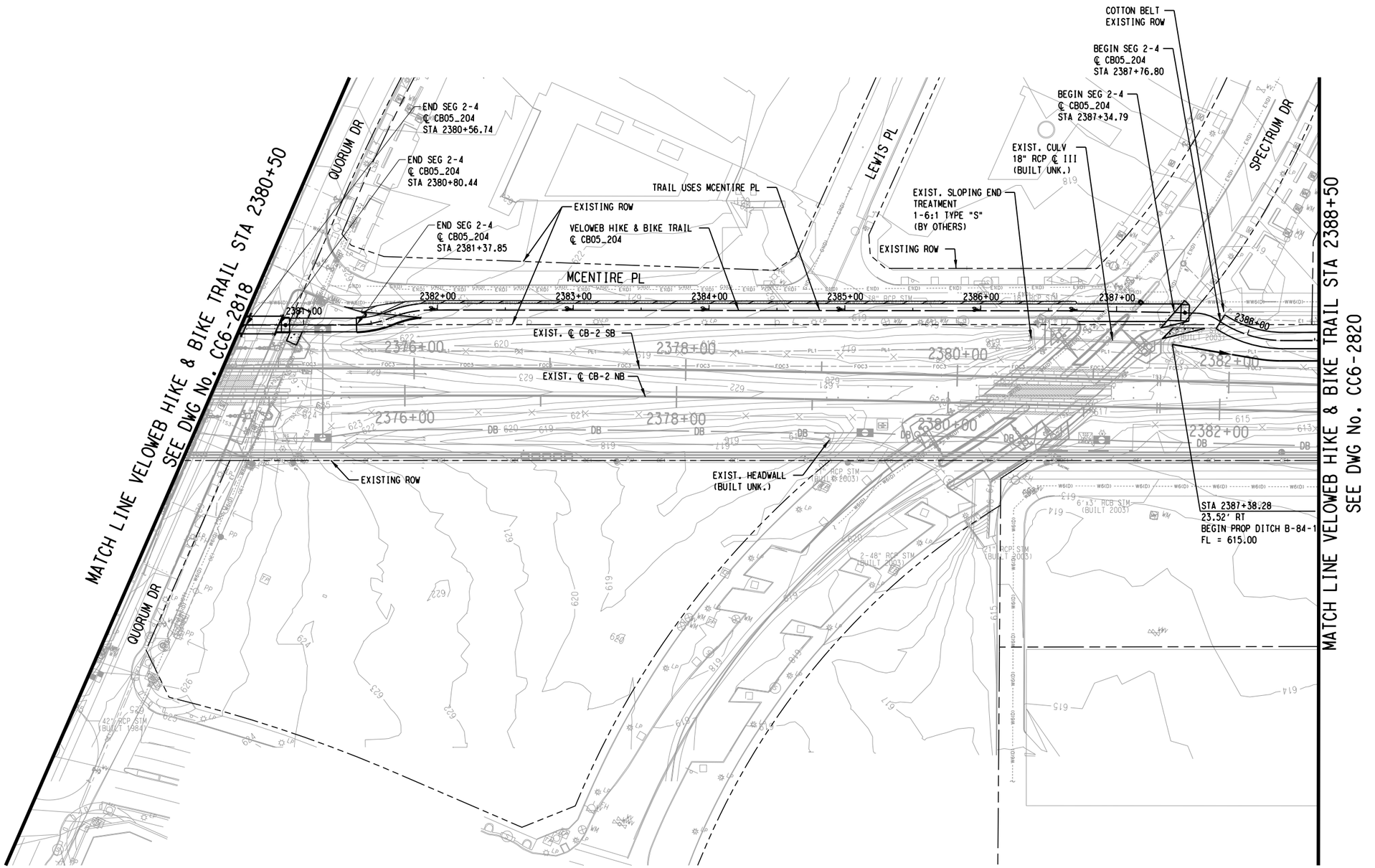
CAES

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
TOWN OF ADDISON
DRAINAGE PLAN
STA 2371+50 TO STA 2380+50
SHEET 10 OF 12

CONTRACT	DWG No.	REV
C-2033270-01	CC6-2818	D

CB05-CC6-2818.040

DWG No. CC6-2819





LEGEND

- CENTERLINE OF SPECIAL DITCH
- PROP FLUME
- PROP LIMITS OF CONCRETE LINED DITCH

NOTES:

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5. ALL DITCH SIDE SLOPES SHALL BE 3:1 MAX, UNLESS OTHERWISE NOTED.
6. CONTOURS SHOWN IN PLAN VIEW ARE EXISTING UNLESS OTHERWISE NOTED.

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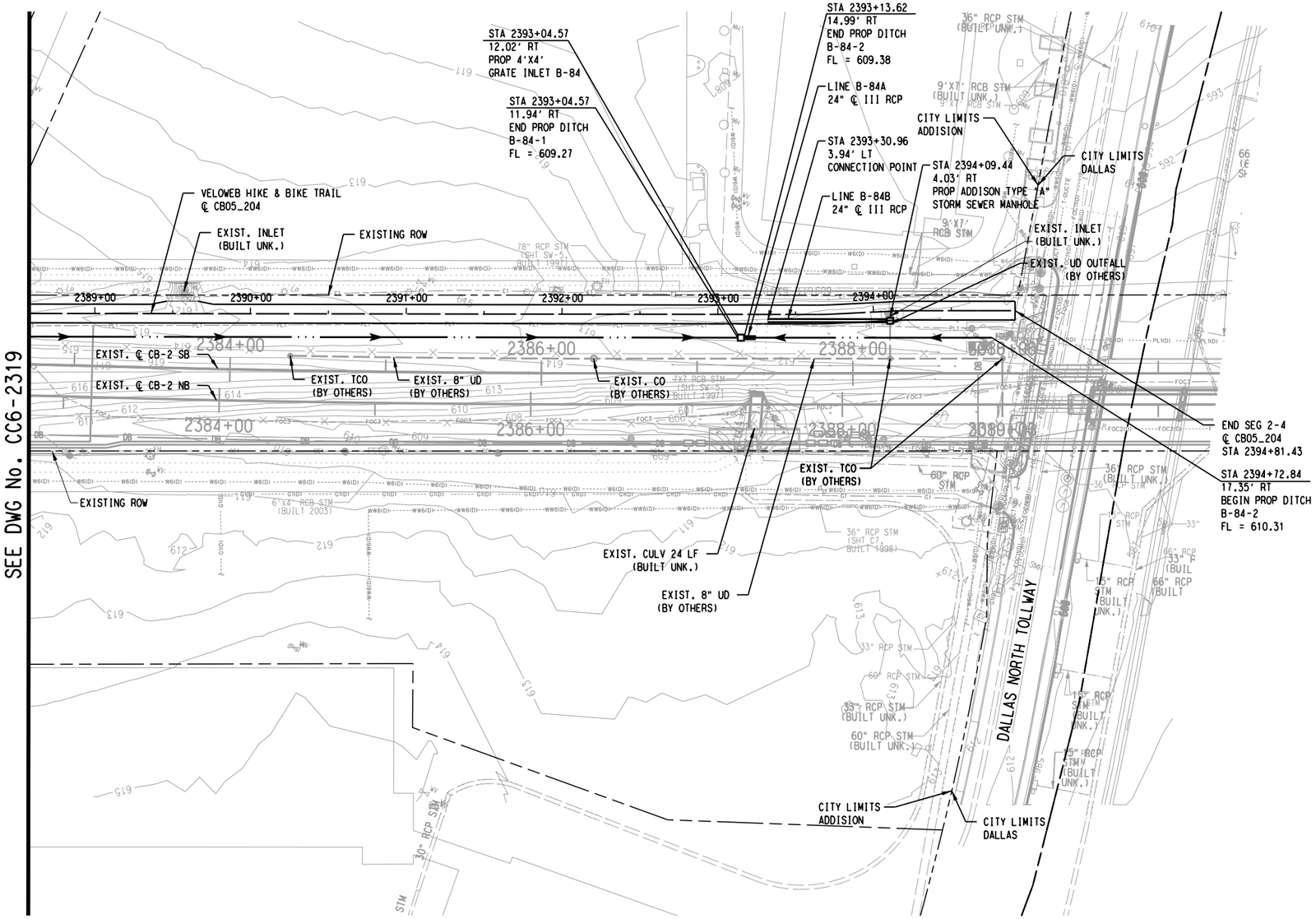
SCALE	1"=40'
DRAWN	D. ESCALANTE
DESIGNED	J. RODRIGUEZ
CHECKED	B. OLIVER
IN CHARGE	B. OLIVER
DATE	13 MAR 23

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
TOWN OF ADDISON
DRAINAGE PLAN
STA 2380+50 TO STA 2388+50
SHEET 11 OF 12

CONTRACT	DWG No.	REV
C-2033270-01	CC6-2819	D

CB05-CC6-2819.040

DWG No. CC6-2820



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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5. ALL DITCH SIDE SLOPES SHALL BE 3:1 MAX, UNLESS OTHERWISE NOTED.
6. CONTOURS SHOWN IN PLAN VIEW ARE EXISTING UNLESS OTHERWISE NOTED.

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CONTRACT SHEET No. 186 OF 242

SCALE	1"=40'
DRAWN	D. ESCALANTE
DESIGNED	J. RODRIGUEZ
CHECKED	B. OLIVER
IN CHARGE	B. OLIVER
DATE	13 MAR 23

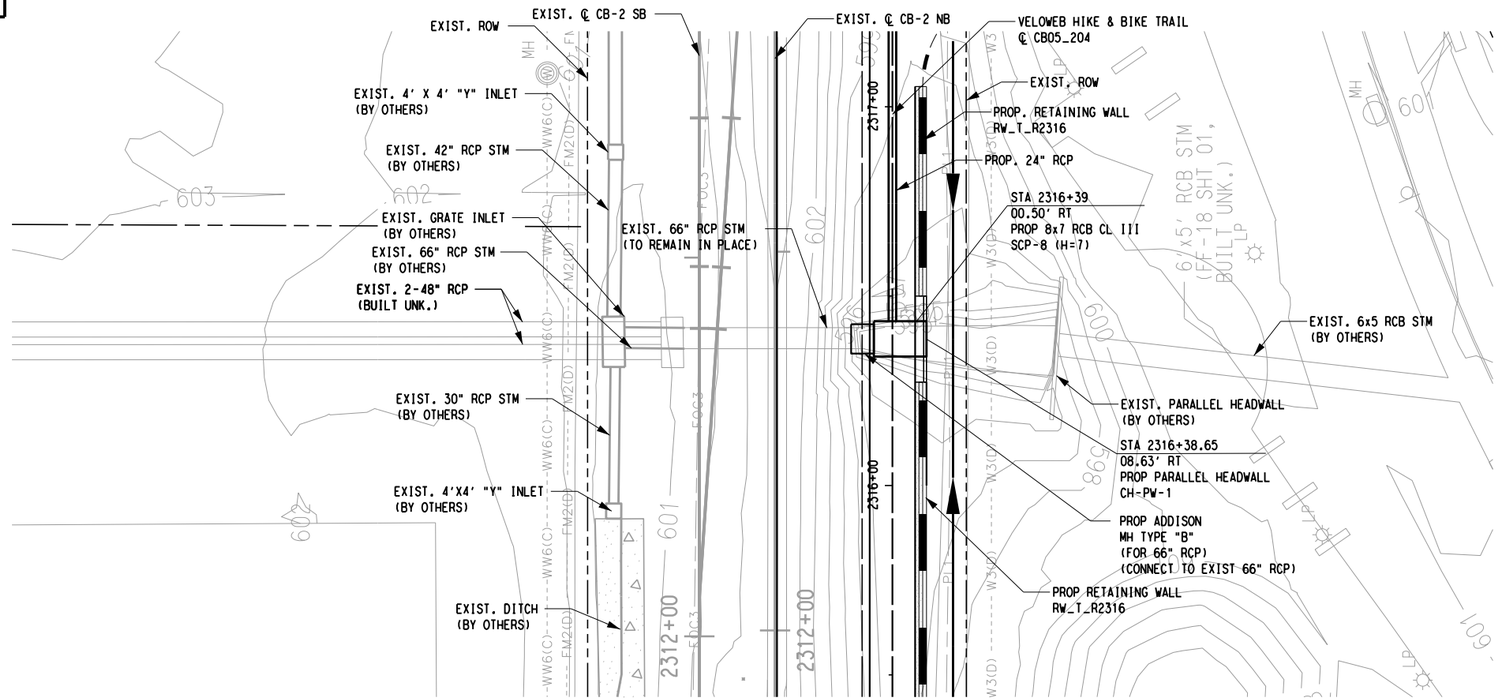
CAES

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
TOWN OF ADDISON
DRAINAGE PLAN
STA 2388+50 TO END
SHEET 12 OF 12

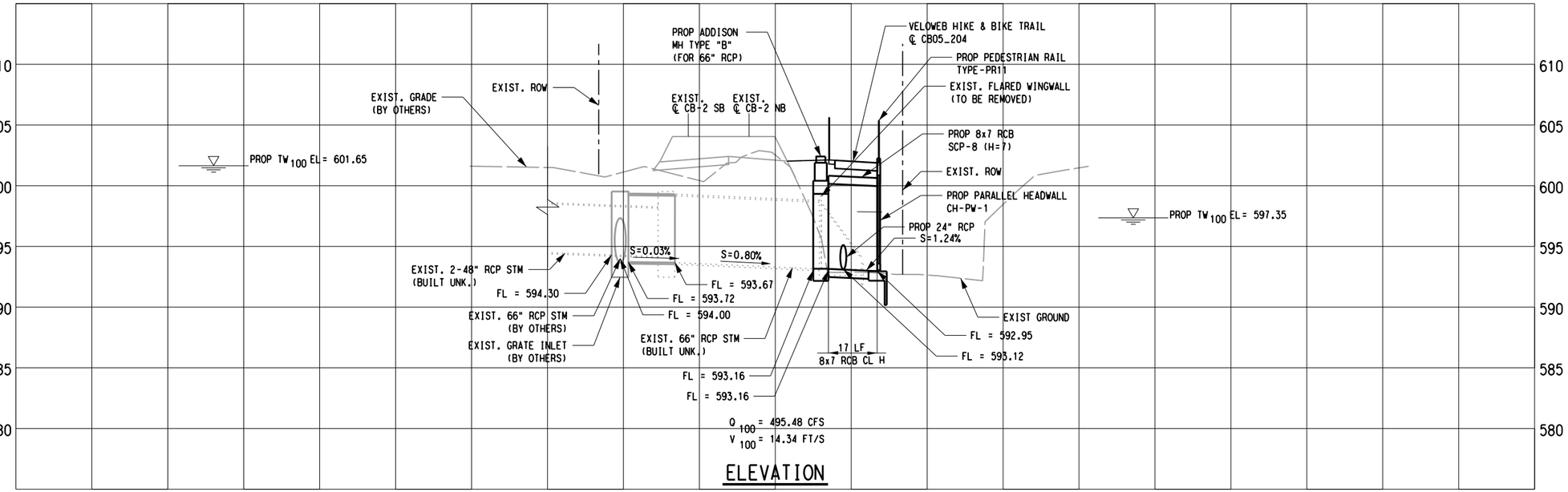
CONTRACT	DWG No.	REV
C-2033270-01	CC6-2820	D

CB05-CC6-2820.040

DWG No. CC6-2880



PLAN



ELEVATION



NOTES:

1. ALL STATIONS 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.
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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.

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SCALE	AS NOTED
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DESIGNED	C. SEGURA
CHECKED	B. OLIVER
IN CHARGE	B. OLIVER
DATE	13 MAR 23

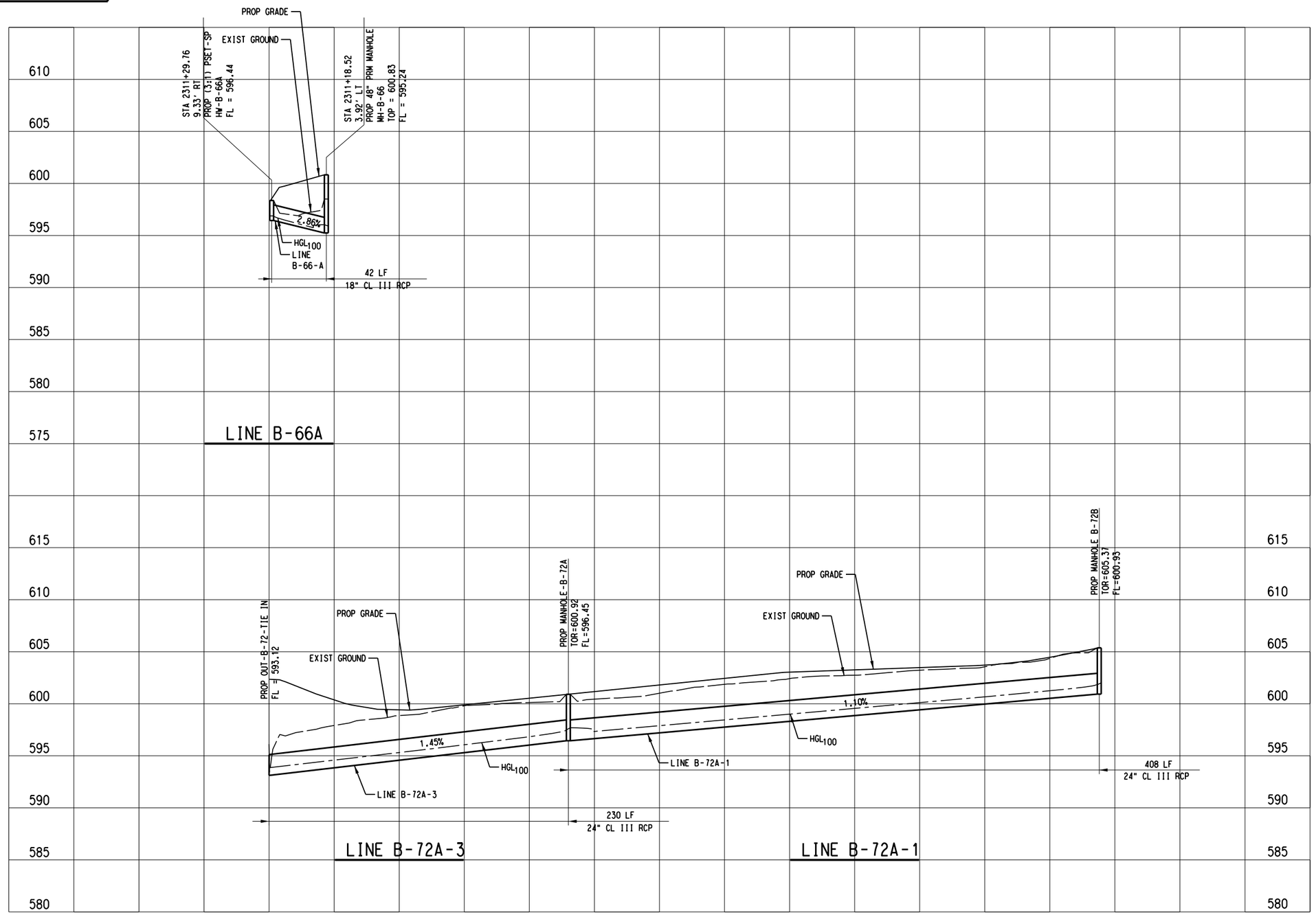
COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

TOWN OF ADDISON
CULVERT AT CB-2 NB STA 2312+79
PLAN & PROFILE

CONTRACT	DWG No.	REV
C-2033270-01	CC6-2880	D

CB05-CC6-2880.020

DWG No. CC6-2885



SCALE (IN FEET)
HORIZ 0 20 40 80

SCALE (IN FEET)
VERT 0 2.5 5 7.5 10

NOTES:

1. ALL STATION CALLOUTS ARE IN REFERENCE 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 III, UNLESS H&B DRAINAGE IMPROVEMENTS ARE SUBJECTED TO E80 LOADING ENVELOP.
3. DISTURBED AREAS REQUIRING GROUND COVER SHALL BE SEEDED BY HYDROMULCHING, UNLESS NOTED OTHERWISE.
4. CONTOURS SHOWN IN PLAN VIEW ARE EXISTING, UNLESS NOTED OTHERWISE.

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SCALE	AS NOTED
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DESIGNED	J. RODRIGUEZ
CHECKED	B. OLIVER
IN CHARGE	B. OLIVER
DATE	13 MAR 23

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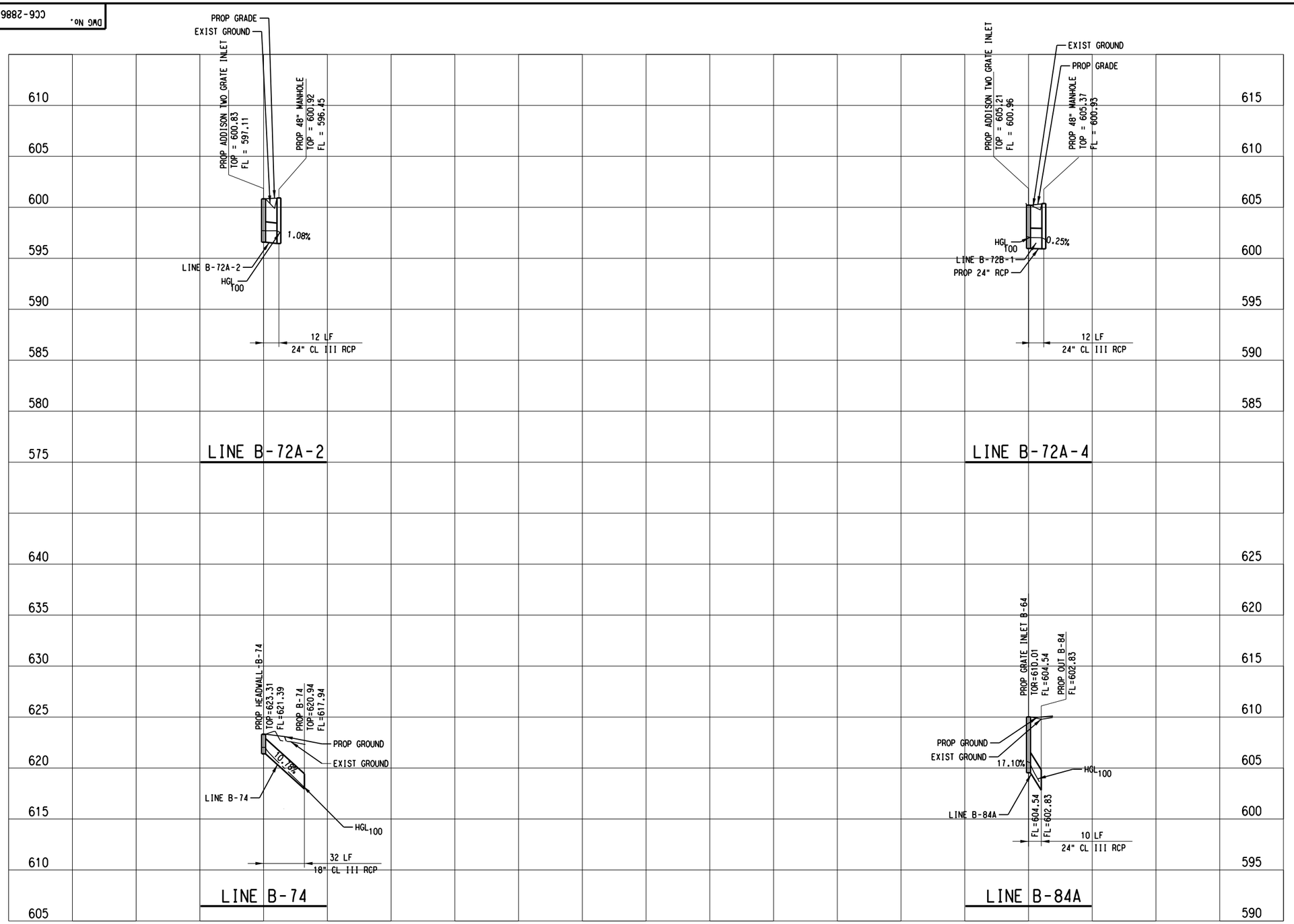
COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

TOWN OF ADDISON
DRAINAGE PROFILES
SHEET 1 OF 4

CONTRACT	DWG No.	REV
C-2033270-01	CC6-2885	D

CB05-CC6-2885.040

DWG No. CC6-2886



SCALE (IN FEET)
HORIZ 0 20 40 80

SCALE (IN FEET)
VERT 0 2.5 5 7.5 10

NOTES:

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COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

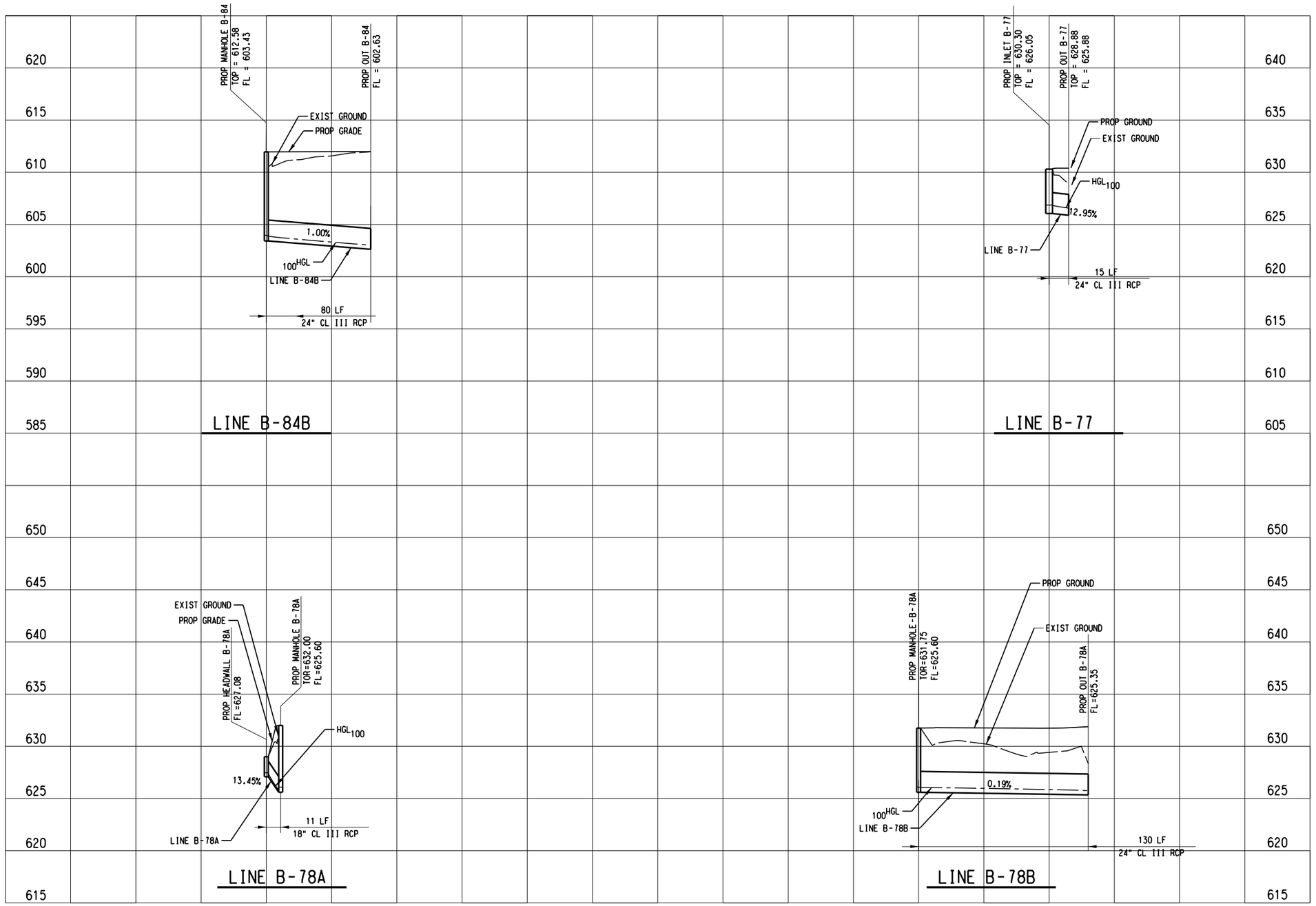
TOWN OF ADDISON
DRAINAGE PROFILES
SHEET 2 OF 4

SCALE	AS NOTED
DRAWN	D. ESCALANTE
DESIGNED	J. RODRIGUEZ
CHECKED	B. OLIVER
IN CHARGE	B. OLIVER
DATE	13 MAR 23

CONTRACT	DWG No.	REV
C-2033270-01	CC6-2886	D

CB05-CC6-2886.040

DWG No. CC6-2887



SCALE (IN FEET)
HORIZ 0 20 40 80

SCALE (IN FEET)
VERT 0 2.5 5 7.5 10

NOTES:

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SCALE	AS NOTED
DRAWN	D. ESCALANTE
DESIGNED	J. RODRIGUEZ
CHECKED	B. OLIVER
IN CHARGE	B. OLIVER
DATE	13 MAR 23

CAES

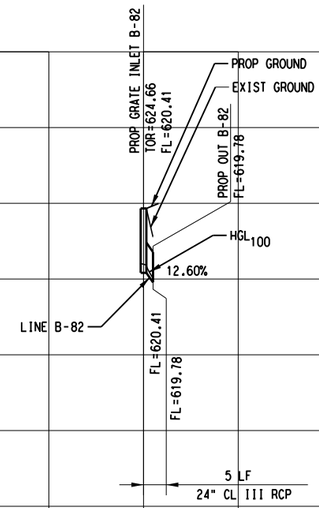
COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

TOWN OF ADDISON
DRAINAGE PROFILES
SHEET 3 OF 4

CONTRACT	DWG No.	REV
C-2033270-01	CC6-2887	D

CB05-CC6-2887.040

DWG No. CC6-2888



LINE B-82

630 625 620 615 610 605 600 595

635 630 625 620 615 610 605 600

640 635 630 625 620 615 610 605

HORIZ SCALE (IN FEET) 0 20 40 80

VERT SCALE (IN FEET) 0 2.5 5 7.5 10

NOTES:

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DESIGNED	J. RODRIGUEZ
CHECKED	B. OLIVER
IN CHARGE	B. OLIVER
DATE	13 MAR 23

CAES

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

TOWN OF ADDISON
DRAINAGE PROFILES
SHEET 4 OF 4

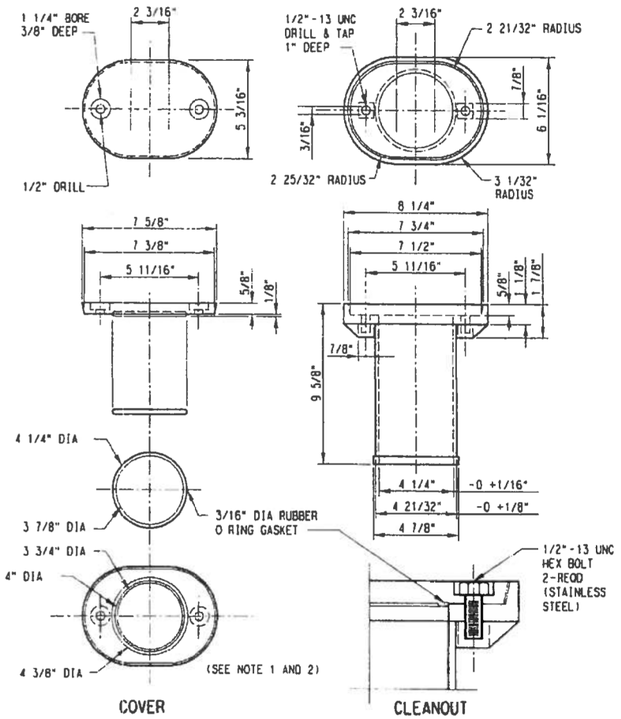
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CB05-CC6-2888.040

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CB05-CC6-2888.040

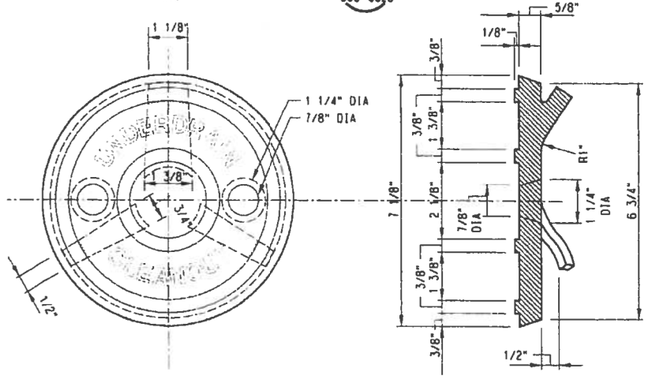
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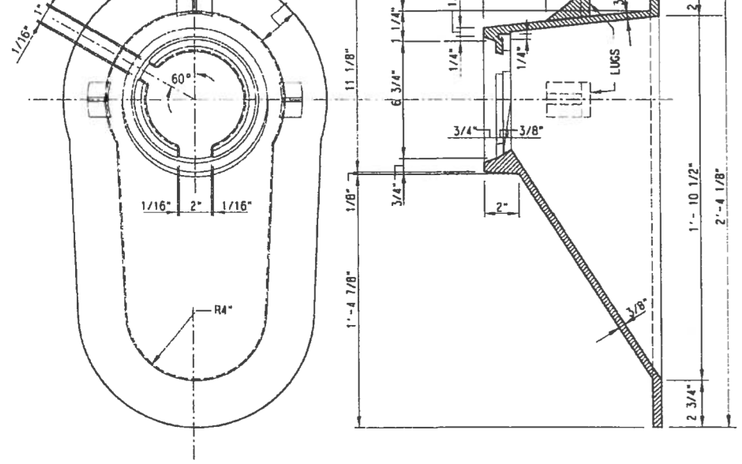
DWG NO. CS6-0021



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. 192 OF 242
DWG NO. CC6-2960
CONTRACT NO. C-2033270-01

CONTRACT SHEET No. 35 OF 307

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

B. N. REDDY CHIDAMANDI 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 CHIDAMANDI
DATE	30 NOV 05

CAES

CIVIL STANDARD

UNDERDRAIN DETAILS
SHEET 1 OF 4

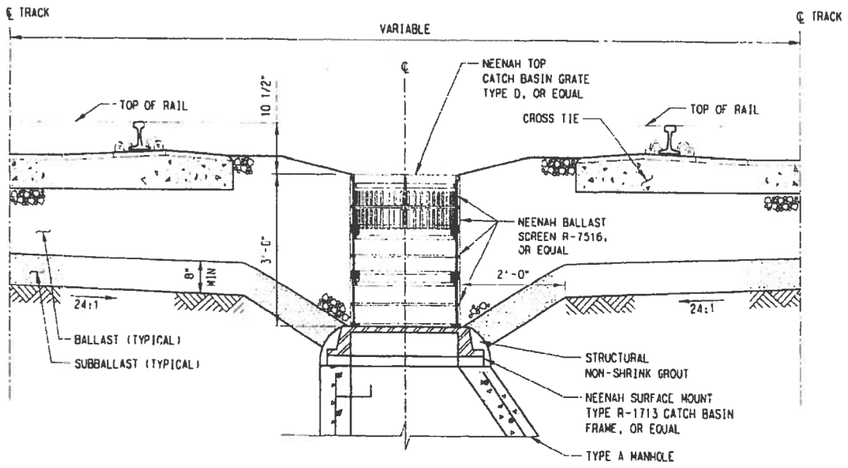
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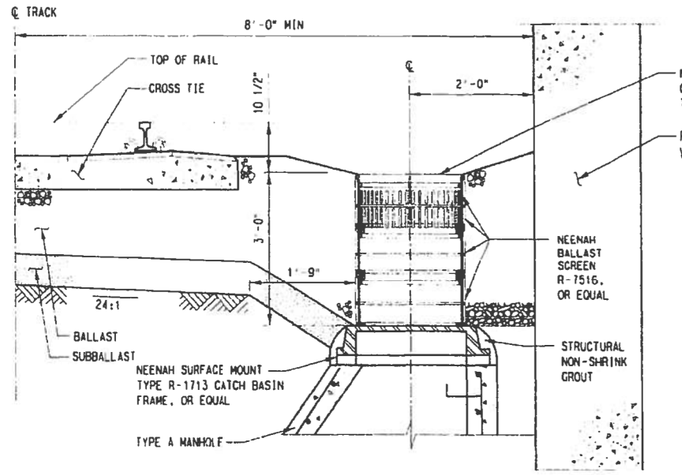
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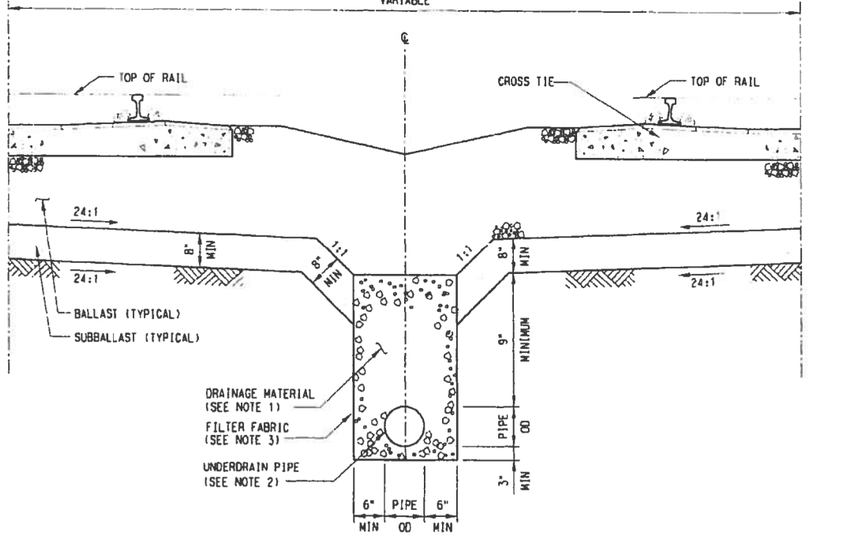
BETWEEN TRACK
BALLAST SCREEN DETAILS 1



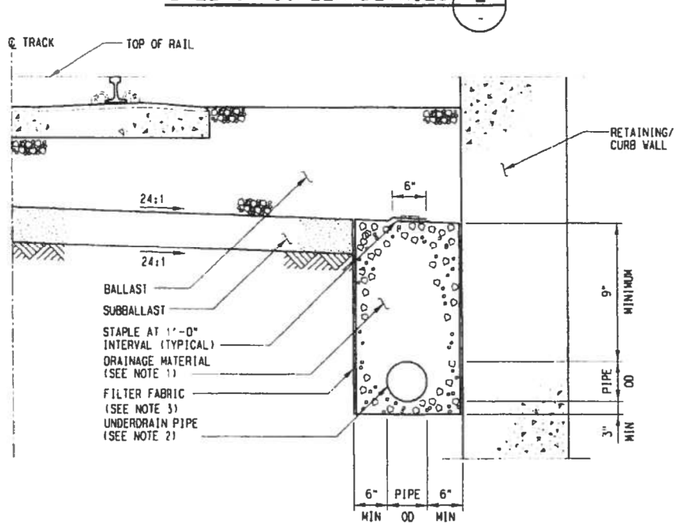
ADJACENT TO WALL
BALLAST SCREEN DETAILS 2

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

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
SHEET NO. 193 OF 242
DWG NO. CC6-2961
CONTRACT NO. C-2033270-01

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

CONTRACT SHEET No. 36 OF 307

CIVIL STANDARD

UNDERDRAIN DETAILS
SHEET 2 OF 4

CONTRACT	DWG No.	REV
	CS6-0022	0

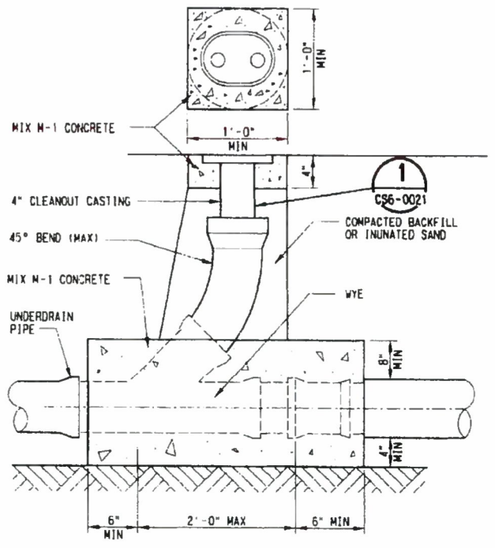
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DWG No. CS6-0023

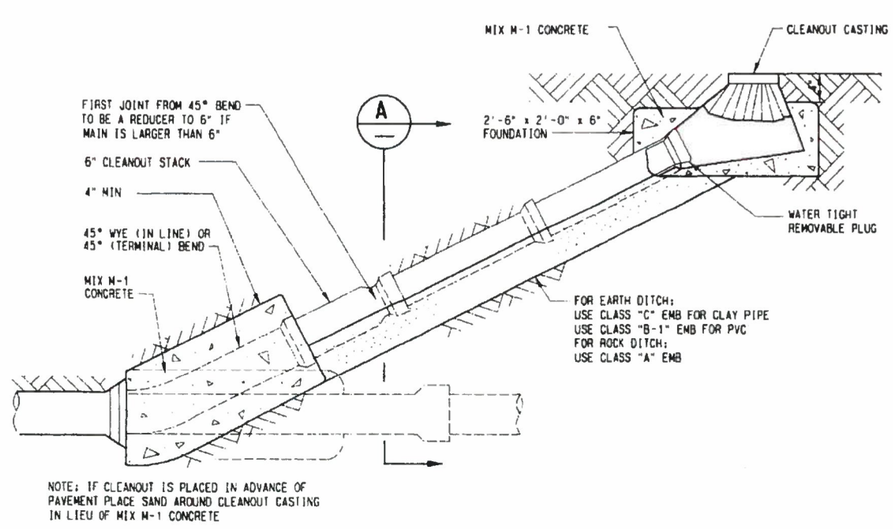
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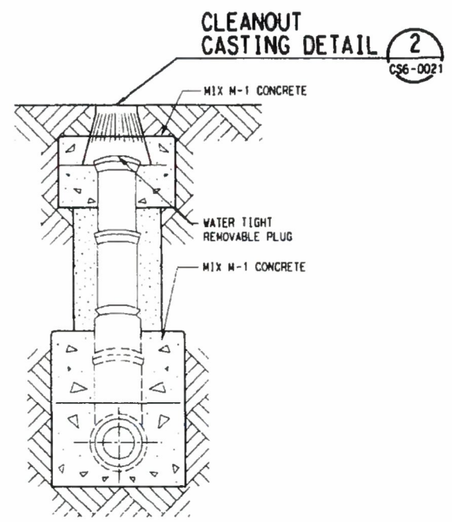
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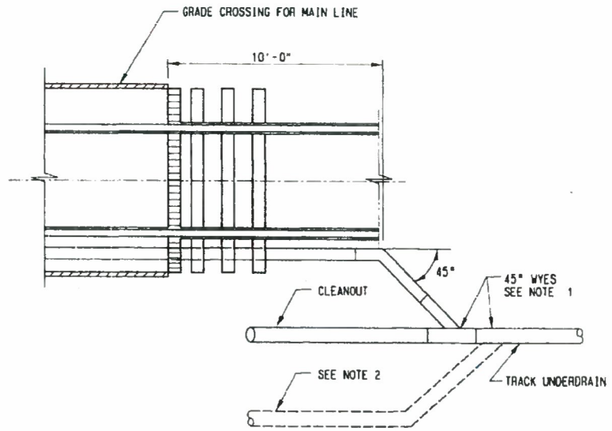
UNDERDRAIN CLEANOUT VERTICAL RISER DETAIL 1
NTS



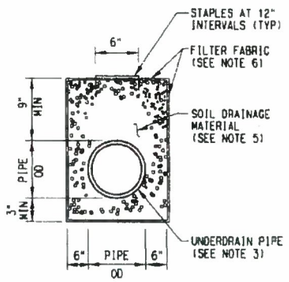
UNDERDRAIN CLEANOUT IN-LINE AND TERMINAL DETAIL 2
NTS



SECTION A
NTS



GRADE CROSING UNDERDRAIN TIE TO TRACK UNDERDRAIN 3
NTS



UNDERDRAIN DETAIL 4
NTS
(SEE NOTE 4)

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. 194 OF 242
DWG NO. CC6-2962
CONTRACT NO. C-2033270-01

REV	AMEND	CR	DATE	DESCRIPTION	BY	CHG	CHK	APP
0								

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

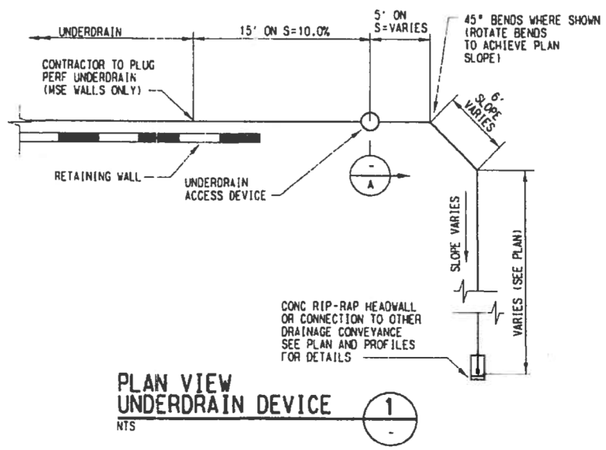
CONTRACT SHEET No. 37 OF 307

CIVIL STANDARD

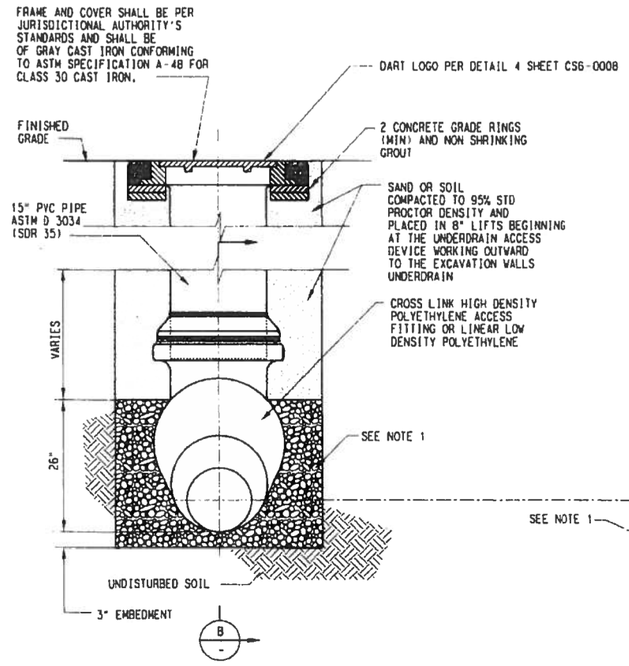
UNDERDRAIN DETAILS
SHEET 3 OF 4

CONTRACT	DWG No.	REV
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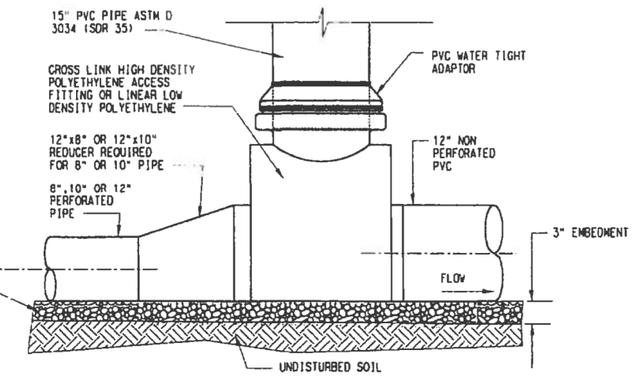
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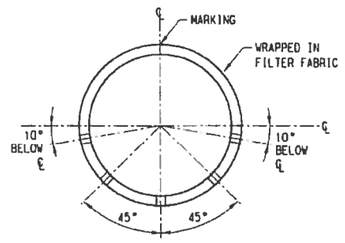
PLAN VIEW
UNDERDRAIN DEVICE 1
NTS



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	1/8	3
15	6	1/8	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. 195 OF 242
DWG NO. CC6-2963
CONTRACT NO. C-2033270-01

CONTRACT SHEET No. 38 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

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

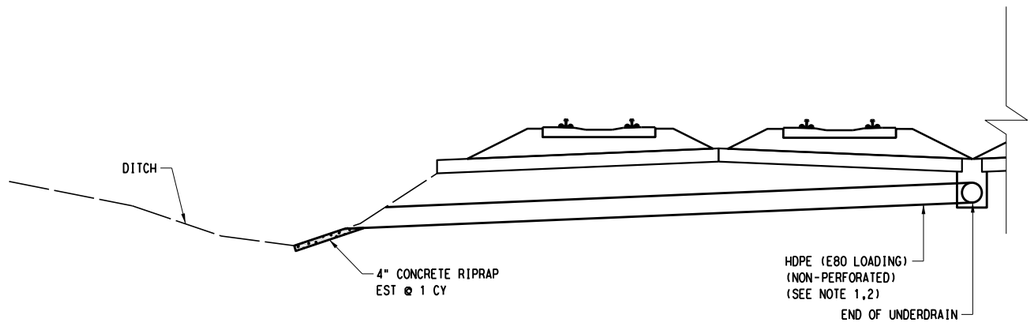
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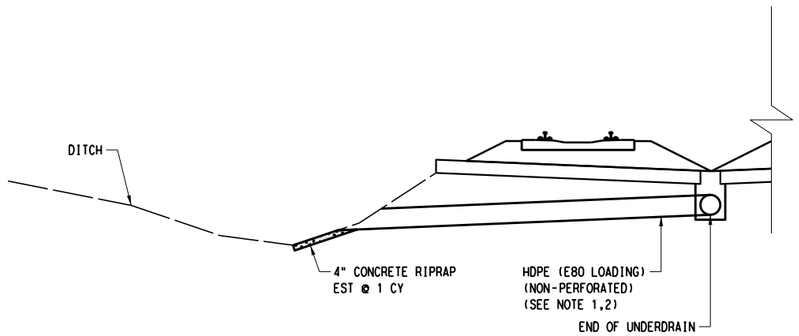
DWG No. CC6-2964



DETAIL A
TYPICAL UNDERDRAIN OUTFALL AT DOUBLE TRACK CROSSING
NO SCALE

NOTES:

1. UTILIZE HDPE PIPES WITH A SMOOTH INTERIOR WALL
2. REFER TO UNDERDRAIN TABLES FOR SIZE AND TYPE OF OUTFALL



DETAIL B
TYPICAL UNDERDRAIN OUTFALL AT SINGLE TRACK/INDUSTRY CROSSING
NO SCALE

06-MAR-2023 10:21
CB05-CC6-2964.010

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CONTRACT SHEET No. 196 OF 242

REV	AMEND	CR	MM/DD/YY	DESCRIPTION	BY	ENG	CHK	APP
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

IEA
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DALLAS, TX 75252
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Firm Registration: F-10161

ARCHER WESTERN HERZOG

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SCALE	NO SCALE
DRAWN	D. ESCALANTE
DESIGNED	C. SEGURA
CHECKED	B. OLIVER
IN CHARGE	B. OLIVER
DATE	13 MAR 23

CAES

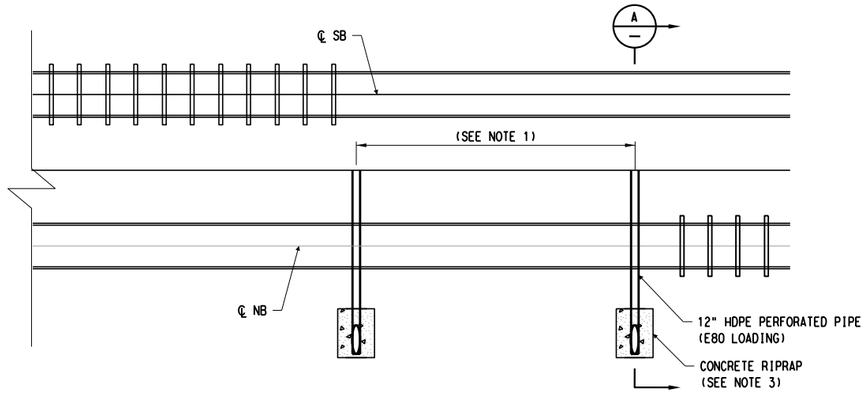
COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

MISC. DRAINAGE DETAILS

CONTRACT	DWG No.	REV
C-2033270-01	CC6-2964	D

CB05-CC6-2964.010

DWG No. CC6-2965



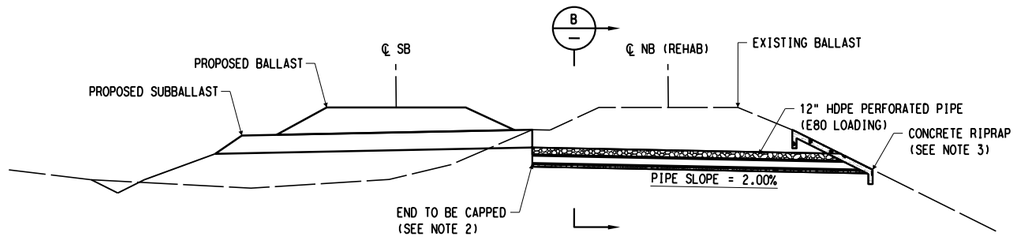
PLAN VIEW
NO SCALE

NOTES:

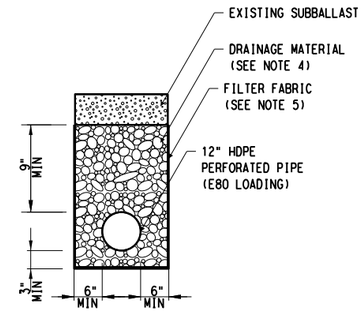
1. REHAB TRACK OUTFALL DRAINAGE CRITERIA:

TRACK PROFILE	SPACING (FT)
S < 1.0%	400
1.0% < S < 1.5%	500
1.5% < S < 2.0%	600
S > 2.0%	700

2. UPSTREAM SIDE OF 12" HDPE TO BE PLACED BELOW NEW TRACK SUBBALLAST LEVEL.
3. SEE DWG No. CS6-0014 FOR DART STANDARD CONCRETE RIPRAP HEADWALL DETAILS.
4. 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.
5. NON-WOVEN FILTER FABRIC SEE SECTION 02700 OF THE STANDARD SPECIFICATIONS.



SECTION A-A
TYPICAL SECTION
NO SCALE — CC6-1692



SECTION B-B
TYPICAL SECTION
NO SCALE — CC6-1692

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CONTRACT SHEET No. 197 OF 242

REV	AMEND	CR	MM/DD/YY	DESCRIPTION	BY	ENG	CHK	APP
REV △	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

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FIRM REGISTRATION No. F-2966

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ARCHER WESTERN HERZOG

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SCALE	NO SCALE
DRAWN	D. ESCALANTE
DESIGNED	C. SEGURA
CHECKED	B. OLIVER
IN CHARGE	B. OLIVER
DATE	13 MAR 23

CAES

COTTON BELT REGIONAL RAIL VELOWEB HIKE & BIKE TRAIL

REHAB DRAINAGE DETAILS

CONTRACT	DWG No.	REV
C-2033270-01	CC6-2965	D

CB05-CC6-2965.010

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DWG No. CC6-2966

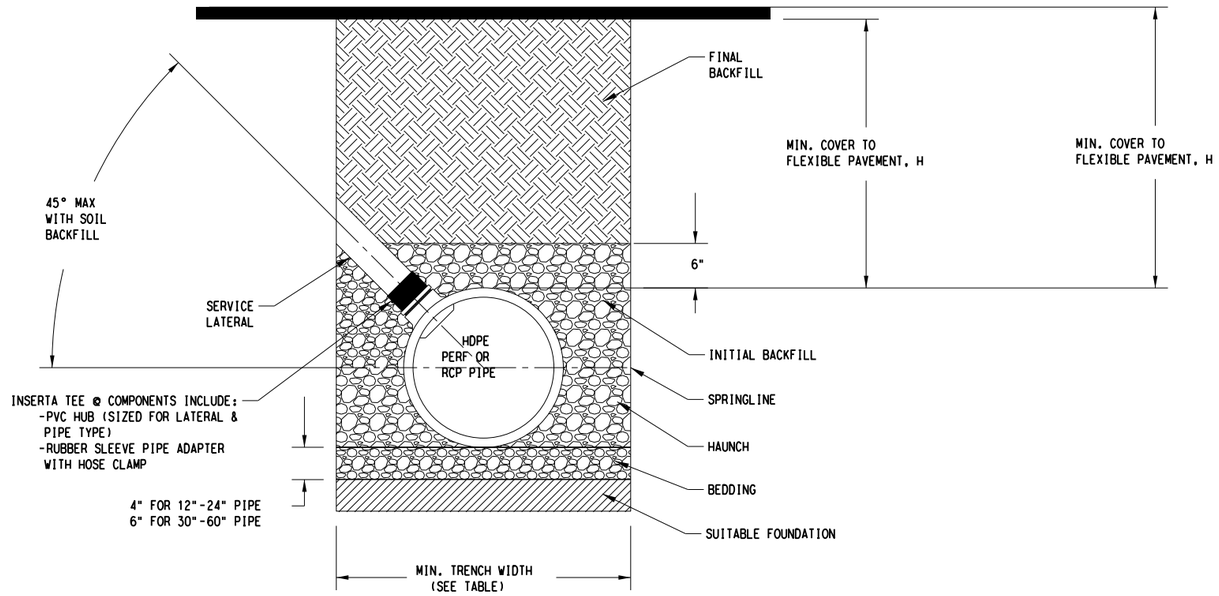


TABLE OF STANDARD EXCAVATION	
PIPE DIA	MIN TRENCH WIDTH
4"	21"
6"	23"
8"	26"
10"	28"
12"	30"
15"	34"
18"	39"
24"	48"
30"	56"
36"	64"
42"	72"
48"	80"
54"	88"
54"	96"

NOTES:

1. 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

2. MEASURES SHOULD BE TAKEN TO PREVENT MIGRATION OF NATIVE FINES INTO BACKFILL MATERIAL, WHEN REQUIRED.

3. 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.

4. 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.

5. 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".

6. 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.

7. 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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CONTRACT SHEET No. 198 OF 242

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

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DALLAS, TX 75201-3136
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ARCHER WESTERN HERZOG

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SCALE	NO SCALE
DRAWN	D. ESCALANTE
DESIGNED	C. SEGURA
CHECKED	B. OLIVER
IN CHARGE	B. OLIVER
DATE	13 MAR 23

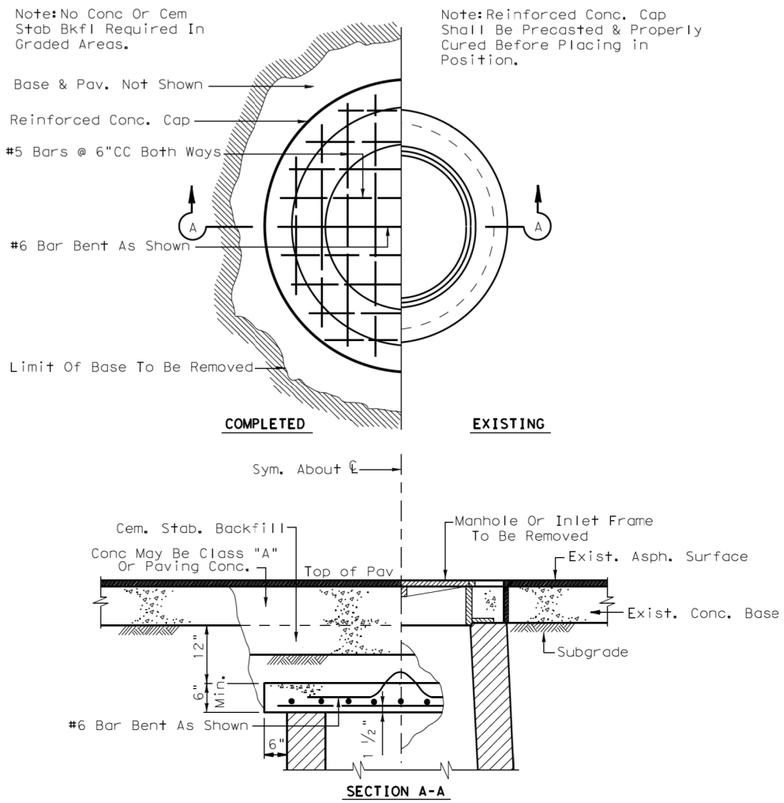
CAES

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

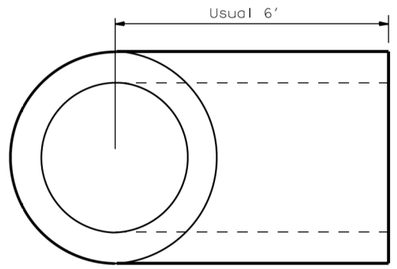
INSERTA TEE DRAINAGE DETAILS

CONTRACT	DWG No.	REV
C-2033270-01	CC6-2966	D

CB05-CC6-2966.010

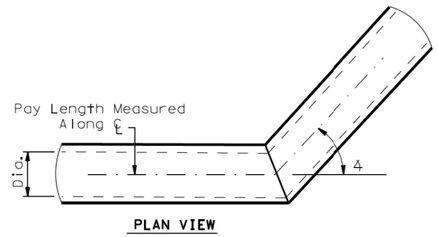


DETAIL SHOWING METHOD OF CAPPING ABANDONED MANHOLES OR INLETS (GRADED OR PAVED AREAS)



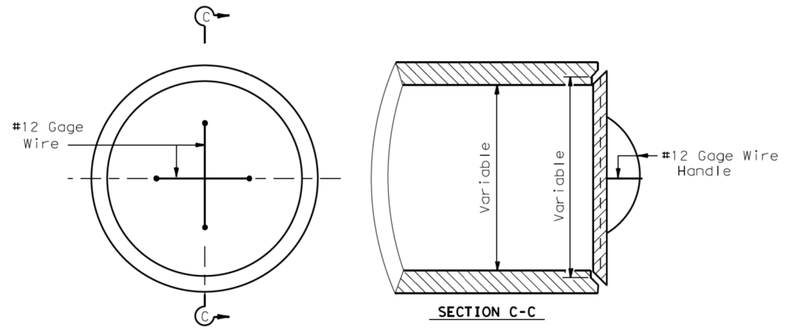
Note: Jointing Material Shall Conform To Requirements Of Item "Reinforced Concrete Pipe." Material For Tees Shall Conform To Requirements Of Item "Reinforced Concrete Pipe." Payment For Tee To Be In Accordance With Item "Reinforced Concrete Pipe."

PRECAST STORM SEWER TEE



BENDING DETAIL

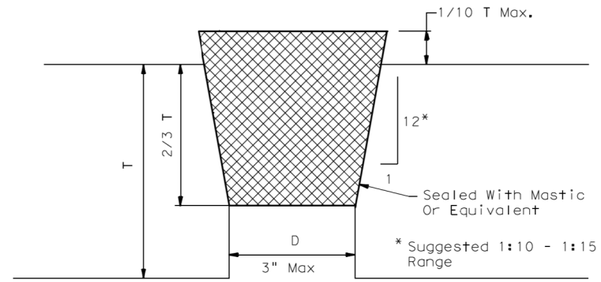
Note: Bending Of Proposed Pipe Sewer Or RCP In A Vertical & /Or Horizontal Plane Shall Be Accomplished By The Use Of A "Pipe Collar" Or A "Precast Elbow", As Approved By The Engineer. Price Of "Pipe Collar" Or, "Precast Elbow" Shall Be Subsidiary To The Unit Prices Bid For Item Reinforced Concrete Pipe. Pay Length Measurement To Be Along Horizontal ℄ & 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

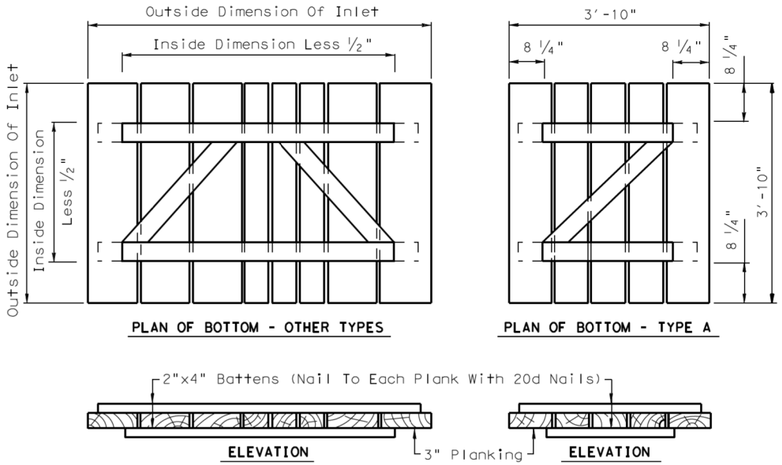


T = Wall Thickness On Top Of Box Or Pipe
D = Diameter Of Lifting Hole

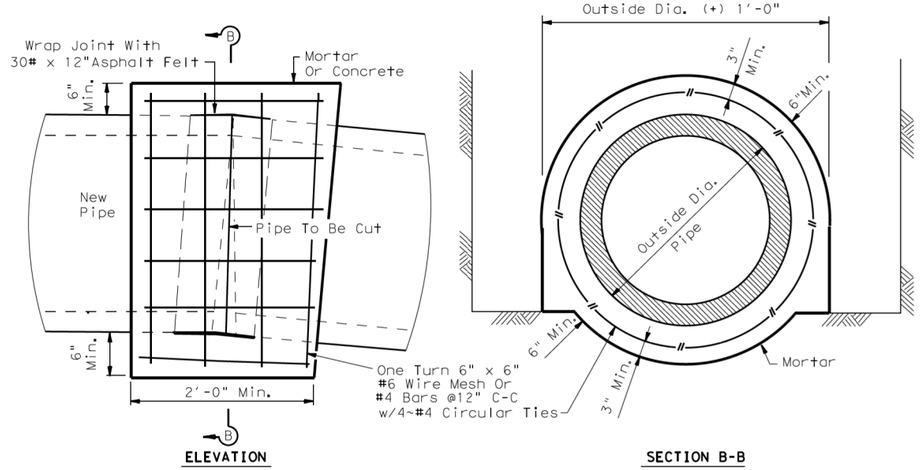
Minimum Length Of Plug Is 2/3 T +/-
Minimum Diameter At Bottom Of Plug = D - ⅛"
Maximum 1/10 T Of Plug Not Seated In Lifting Hole

Note: The Plug Shall Be Cast With The Same Taper As The Lifting Hole.

DETAIL OF PLUG FOR LIFTING HOLES IN RCB AND RCP



TEMPORARY COVERS FOR ALL TYPES OF INLETS



PIPE COLLAR DETAIL

For Horizontal Or Vertical Placement

d = Diameter
R = Radius

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
SHEET NO. 199 OF 242
DWG NO. CC6-2967
CONTRACT NO. C-2033270-01

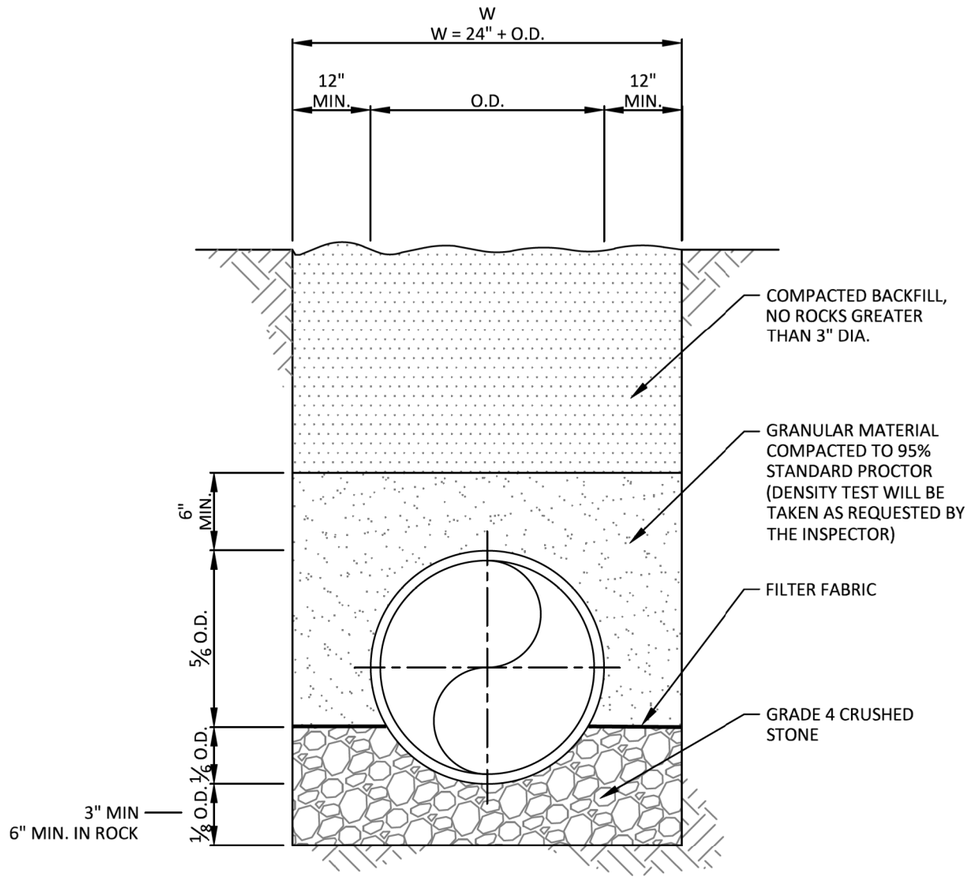
Texas Department of Transportation
Houston District (Bridge)

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



RCP STORM DRAIN PIPE BEDDING

N.T.S.

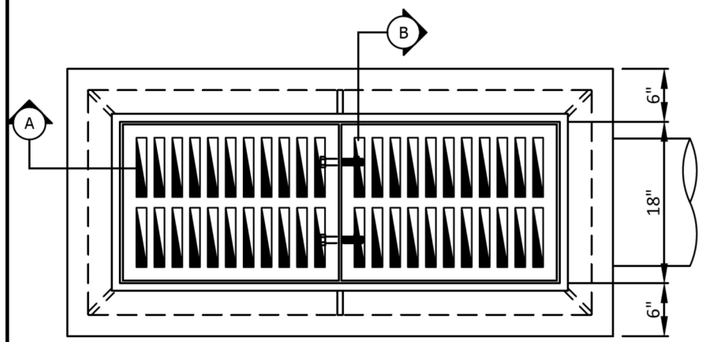
NOTE

1. THE DEPTH OF TRENCH BELOW THE PROPOSED CONDUIT SHALL BE AS FOLLOWS:

- 3" MIN. FOR 27" PIPE & SMALLER.
- 4" MIN. FOR 30 " TO 60" PIPE.
- 6" MIN. FOR 66" PIPE OR LARGER.

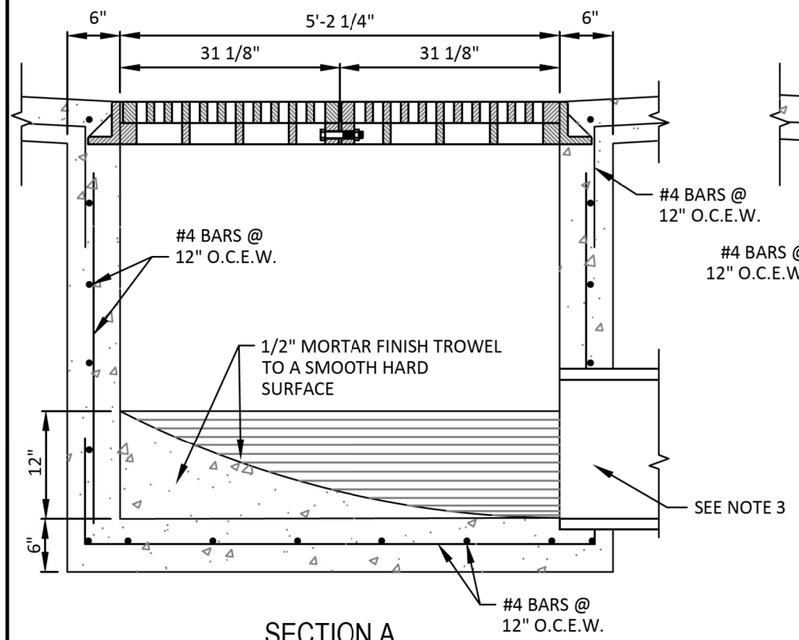
ADDISON PUBLIC WORKS & ENGINEERING SERVICES	RCP STORM DRAIN PIPE BEDDING	STANDARD CONSTRUCTION DETAILS STORM DRAINAGE		
		DATE: JANUARY 2022	REV DATE: -	SHEET: SD-D02

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
SHEET NO. 200 OF 242
DWG NO. CC6-2968
CONTRACT NO. C-2033270-01

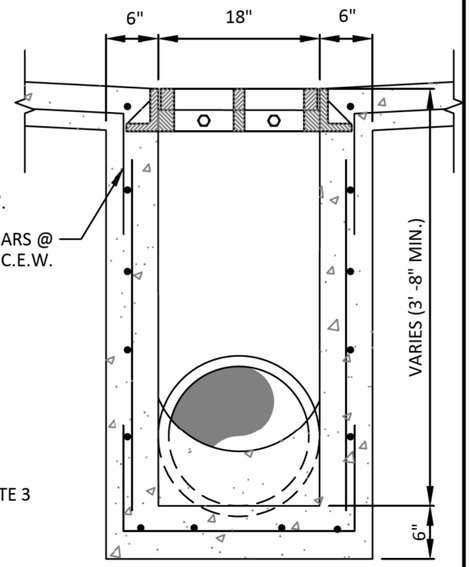


PLAN
N.T.S.

NOTES:
1. ALL LAPS AND EXTENSION OF REINFORCING BARS SHALL BE 36 BAR DIAMETERS UNLESS NOTED OTHERWISE.
2. TACK WELD GRATES IN PLACE.
3. PIPE MAY BE PLACED IN ANY WALL, BUT SHALL NOT ENTER ANY CORNER OR BOTTOM.
4. ALL CAST IRON FITTINGS SHALL BE DOMESTIC.
5. ALL FASTENERS SHALL BE GALVANIZED.



SECTION A
N.T.S.



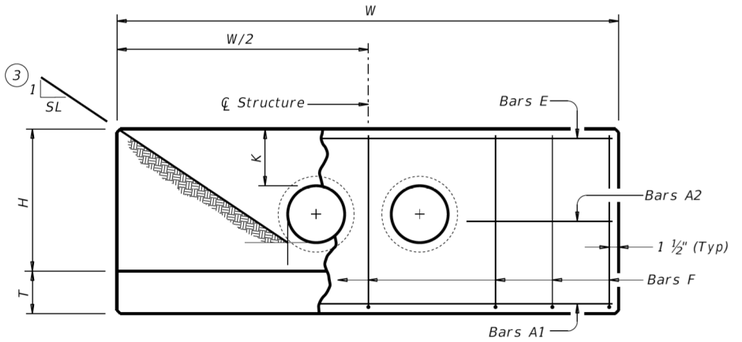
SECTION B
N.T.S.

ADDISON PUBLIC WORKS & ENGINEERING SERVICES	TWO GRATE INLET	STANDARD CONSTRUCTION DETAILS STORM DRAINAGE		
		DATE: JANUARY 2022	REV DATE: -	SHEET: SD-D29

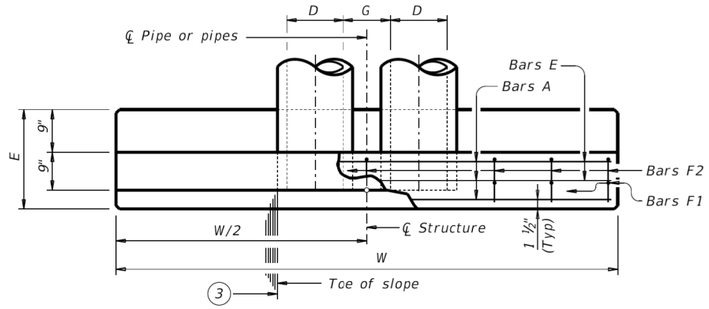
COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
SHEET NO. 201 OF 242
DWG NO. CC6-2969
CONTRACT NO. C-2033270-01

TABLE OF VARIABLE DIMENSIONS AND QUANTITIES FOR ONE HEADWALL (5)

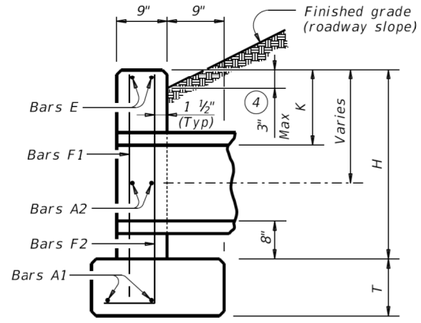
Slope	Dia of Pipe (D)	Values for One Pipe			Values To Be Added for Each Addt'l Pipe		
		W	Reinf (Lbs) (1)	Conc (CY) (2)	W	Reinf (Lbs) (1)	Conc (CY) (2)
2:1	12"	9' – 0"	122	1.1	1' – 9"	15	0.2
	15"	10' – 3"	136	1.3	2' – 2"	16	0.2
	18"	11' – 6"	163	1.5	2' – 8"	19	0.3
	21"	12' – 9"	200	1.8	3' – 1"	31	0.4
	24"	14' – 0"	217	2.1	3' – 7"	34	0.4
	27"	15' – 3"	254	2.4	3' – 11"	37	0.5
	30"	16' – 6"	272	2.7	4' – 4"	40	0.6
	33"	17' – 9"	314	3.1	4' – 8"	43	0.6
	36"	19' – 0"	371	3.9	5' – 1"	46	0.8
	42"	21' – 6"	442	4.9	5' – 10"	52	1.0
	48"	25' – 0"	569	6.4	6' – 7"	59	1.3
	54"	27' – 6"	701	7.5	7' – 6"	82	1.6
	60"	30' – 0"	794	8.8	8' – 3"	90	1.8
	66"	32' – 6"	894	10.2	8' – 9"	96	2.0
	72"	35' – 0"	1,055	11.7	9' – 4"	103	2.3
3:1	12"	13' – 0"	175	1.6	1' – 9"	14	0.2
	15"	14' – 9"	193	1.9	2' – 2"	17	0.2
	18"	16' – 6"	228	2.2	2' – 8"	19	0.3
	21"	18' – 3"	299	2.6	3' – 1"	31	0.4
	24"	20' – 0"	323	3.0	3' – 7"	33	0.4
	27"	21' – 9"	371	3.5	3' – 11"	37	0.5
	30"	23' – 6"	415	4.0	4' – 4"	40	0.5
	33"	25' – 3"	469	4.6	4' – 8"	43	0.6
	36"	27' – 0"	556	5.7	5' – 1"	46	0.8
	42"	30' – 6"	675	7.1	5' – 10"	52	1.0
	48"	35' – 6"	837	9.2	6' – 7"	59	1.3
	54"	39' – 0"	1,015	11.0	7' – 6"	84	1.6
	60"	42' – 6"	1,171	12.9	8' – 3"	91	1.8
	66"	46' – 0"	1,298	14.9	8' – 9"	98	2.0
	72"	49' – 6"	1,561	17.1	9' – 4"	103	2.3
4:1	12"	17' – 0"	229	2.0	1' – 9"	15	0.2
	15"	19' – 3"	266	2.4	2' – 2"	17	0.2
	18"	21' – 6"	308	2.9	2' – 8"	19	0.3
	21"	23' – 9"	382	3.5	3' – 1"	31	0.3
	24"	26' – 0"	430	3.9	3' – 7"	34	0.4
	27"	28' – 3"	486	4.7	3' – 11"	37	0.5
	30"	30' – 6"	539	5.2	4' – 4"	40	0.6
	33"	32' – 9"	603	6.0	4' – 8"	42	0.6
	36"	35' – 0"	738	7.5	5' – 1"	47	0.8
	42"	39' – 6"	881	9.3	5' – 10"	52	1.0
	48"	46' – 0"	1,102	12.1	6' – 7"	61	1.3
	54"	50' – 6"	1,364	14.4	7' – 6"	84	1.6
	60"	55' – 0"	1,547	16.9	8' – 3"	91	1.8
	66"	59' – 6"	1,741	19.5	8' – 9"	98	2.0
	72"	64' – 0"	2,077	22.4	9' – 4"	102	2.3
6:1	12"	25' – 0"	336	3.0	1' – 9"	14	0.2
	15"	28' – 3"	384	3.6	2' – 2"	17	0.2
	18"	31' – 6"	452	4.2	2' – 8"	19	0.3
	21"	34' – 9"	581	5.1	3' – 1"	31	0.4
	24"	38' – 0"	644	5.8	3' – 7"	34	0.4
	27"	41' – 3"	737	6.9	3' – 11"	37	0.5
	30"	44' – 6"	807	7.7	4' – 4"	39	0.6
	33"	47' – 9"	912	8.9	4' – 8"	44	0.6
	36"	51' – 0"	1,108	11.0	5' – 1"	48	0.8
	42"	57' – 6"	1,318	13.7	5' – 10"	54	1.0
	48"	67' – 0"	1,682	17.9	6' – 7"	59	1.3
	54"	73' – 6"	2,072	21.3	7' – 6"	83	1.6
	60"	80' – 0"	2,351	24.9	8' – 3"	89	1.8
	66"	86' – 6"	2,643	28.9	8' – 9"	96	2.0
	72"	93' – 0"	3,121	33.1	9' – 4"	101	2.3



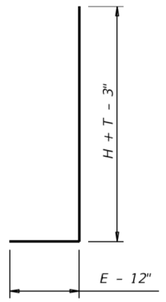
ELEVATION



PLAN OF NON-SKEWED PIPES



SECTION AT CENTER OF PIPE



BARS F2

(1) Total quantities include one 3'–1" lap for bars over 60' in length.

(2) Quantities shown are for concrete pipe and will increase slightly for metal pipe installations.

(3) Indicated slope is perpendicular to centerline pipe or pipes.

(4) For vehicle safety, construct curbs no more than 3" above finished grade. Reduce curb heights, if necessary, to meet these requirements. No changes will be made in quantities and no additional compensation will be allowed for this work.

(5) Dimensions shown are usual and maximum.

(6) Quantities shown are for one structure end only (one headwall).

TABLE OF CONSTANT DIMENSIONS

Dia of Pipe (D)	G	K (5)	H	T	E
12"	0' – 9"	1' – 0"	2' – 8"	0' – 9"	1' – 9"
15"	0' – 11"	1' – 0"	2' – 11"	0' – 9"	1' – 9"
18"	1' – 2"	1' – 0"	3' – 2"	0' – 9"	1' – 9"
21"	1' – 4"	1' – 0"	3' – 5"	0' – 9"	2' – 0"
24"	1' – 7"	1' – 0"	3' – 8"	0' – 9"	2' – 0"
27"	1' – 8"	1' – 0"	3' – 11"	0' – 9"	2' – 3"
30"	1' – 10"	1' – 0"	4' – 2"	0' – 9"	2' – 3"
33"	1' – 11"	1' – 0"	4' – 5"	0' – 9"	2' – 6"
36"	2' – 1"	1' – 0"	4' – 8"	1' – 0"	2' – 6"
42"	2' – 4"	1' – 0"	5' – 2"	1' – 0"	2' – 9"
48"	2' – 7"	1' – 3"	5' – 11"	1' – 0"	3' – 0"
54"	3' – 0"	1' – 3"	6' – 5"	1' – 0"	3' – 3"
60"	3' – 3"	1' – 3"	6' – 11"	1' – 0"	3' – 6"
66"	3' – 3"	1' – 3"	7' – 5"	1' – 0"	3' – 9"
72"	3' – 4"	1' – 3"	7' – 11"	1' – 0"	4' – 0"

TABLE OF REINFORCING STEEL (6)

Bar	Size	Spa	No.
A1	#5	~	2
A2	#5	1' – 6"	~
E	#5	~	2
F	#5	1' – 0"	~

MATERIAL NOTES:
Provide Grade 60 reinforcing steel.
Provide Class C concrete (f'c = 3,600 psi).

GENERAL NOTES:
Designed according to AASHTO LRFD Bridge Design Specifications.
Do not mount bridge rails of any type directly to these culvert headwalls.
This standard may not be used for wall heights, H, exceeding the values shown.

Cover dimensions are clear dimensions, unless noted otherwise. Reinforcing dimensions are out-to-out of bars.

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
SHEET NO. 202 OF 242
DWG NO. CC6-2970
CONTRACT NO. C-2033270-01

Texas Department of Transportation

Bridge Division Standard

CONCRETE HEADWALLS WITH PARALLEL WINGS FOR NON-SKEWED PIPE CULVERTS

CH-PW-0

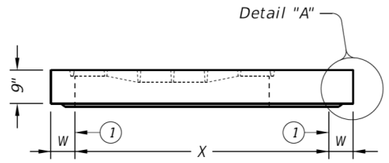
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©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS				
	DIST	COUNTY		SHEET NO.

DISCLAIMER:
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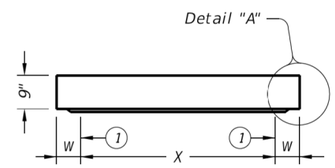
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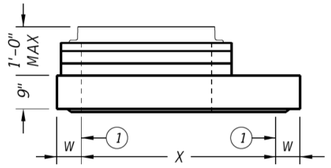
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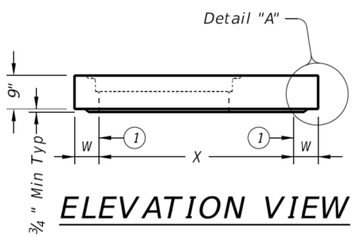
STYLE 'FG'



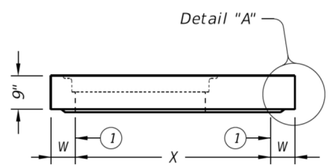
ELEVATION VIEW



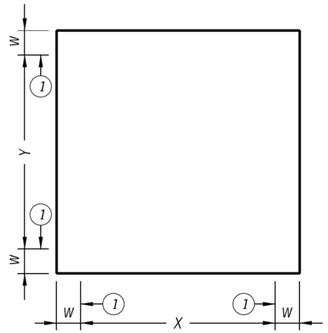
ELEVATION VIEW



ELEVATION VIEW



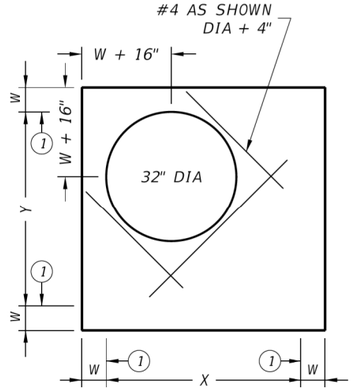
ELEVATION VIEW



PLAN VIEW

NO OPENINGS

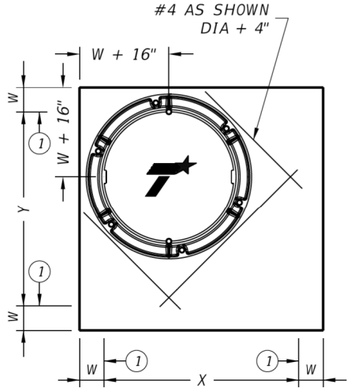
STYLE 'SL'



PLAN VIEW

SHIP LOOSE RING & COVER

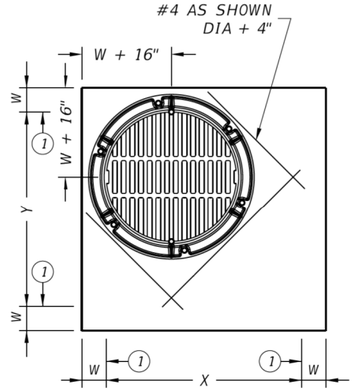
STYLE 'RH'



PLAN VIEW

32" DIA CAST-IN RING & COVER

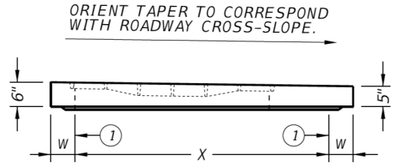
STYLE 'RC'



PLAN VIEW

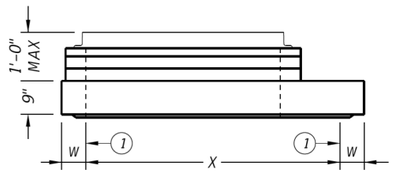
32" DIA CAST-IN RING & GRATE

STYLE 'RG'

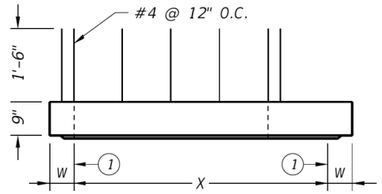


STYLE 'SFG'

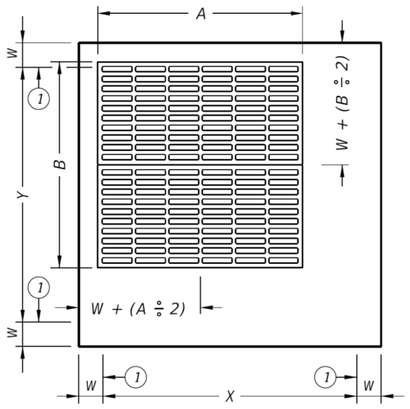
ELEVATION VIEW



ELEVATION VIEW



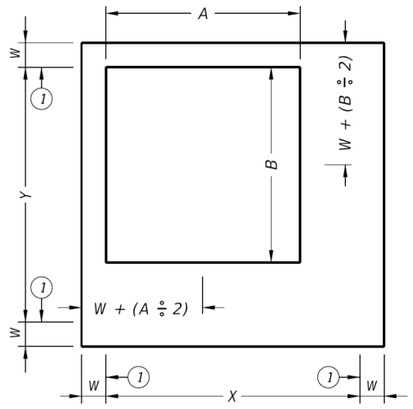
ELEVATION VIEW



PLAN VIEW

CAST-IN FRAME & GRATE

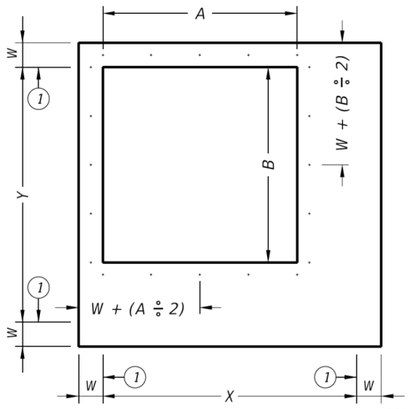
STYLES 'FG' & 'SFG'



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

Texas Department of Transportation

Bridge Division Standard

PRECAST SLAB LID

PSL

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COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
SHEET NO. 203 OF 242
DWG NO. CC6-2971
CONTRACT NO. C-2033270-01

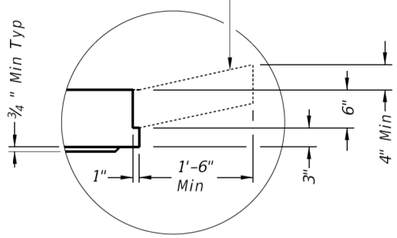
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Style	Size (X x Y)	W (2)	A x B (nominal)	Short Span Reinf Steel Area	Long Span Reinf Steel Area
SL	3'x3'	6"	n/a	0.37 in²/ft	0.37 in²/ft
RH,RC,RG,SH,S1,FG	3'x3'	6"	3'x3' or 32" Dia	0.37 in²/ft	0.37 in²/ft
SFG	3'x3'	6"	3'x3'	0.32 in²/ft	0.32 in²/ft
SL	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.

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
SHEET NO. 204 OF 242
DWG NO. CC6-2972
CONTRACT NO. C-2033270-01

HL93 LOADING SHEET 2 OF 2

Texas Department of Transportation

Bridge Division Standard

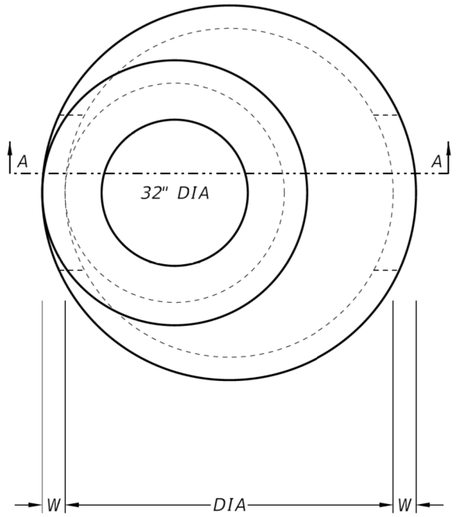
PRECAST SLAB LID

PSL

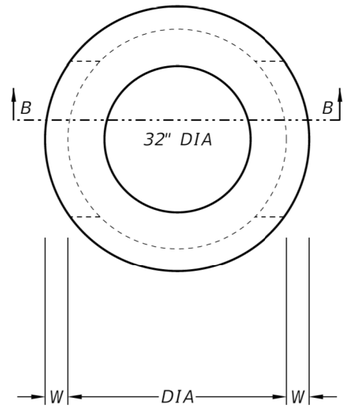
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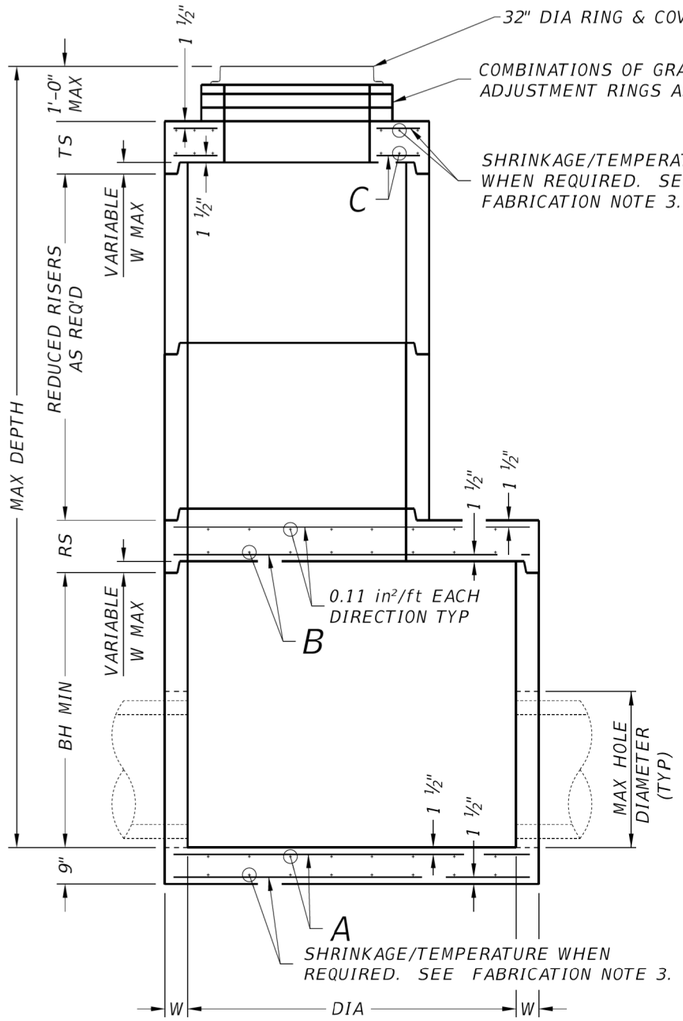
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PLAN VIEW "A"

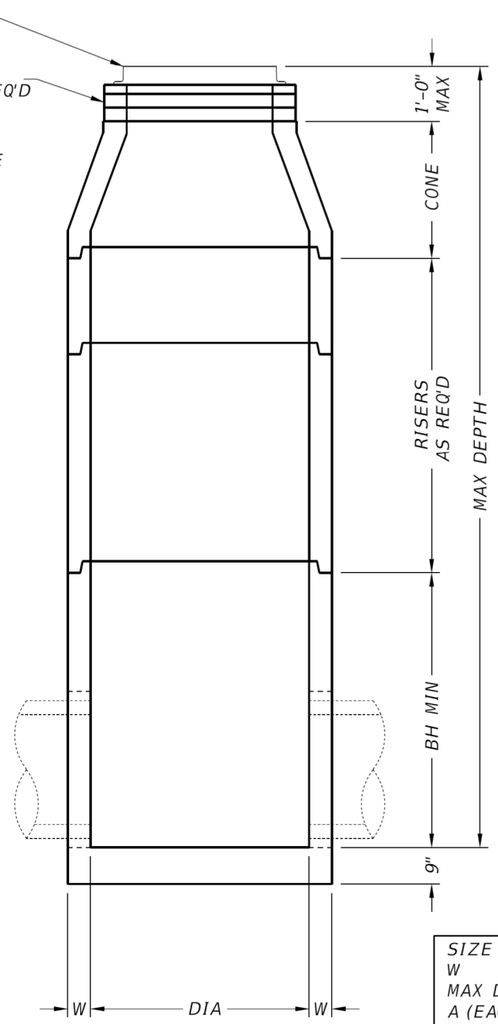


PLAN VIEW "B"



SECTION A-A

ROUND REDUCED RISER OPTION
SHOWING FLAT SLAB TOP



SECTION B-B

ROUND RISER OPTION
SHOWING CONE

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. Provide circumferential reinforcing steel in vertical walls of base, riser and cone in accordance with ASTM C478.
3. Slabs with a thickness of 8" or greater require shrinkage and temperature reinforcing steel. Provide steel area = 0.11 in²/ft each way.
4. Manufacture base and risers to nearest 3" increment.
5. Design tongue and groove joints for full closure on both shoulders. Minimum spigot depth is ¾".
6. Provide lifting devices in conformance with Manufacturer's recommendations.
7. Provide cast iron solid cover, unless noted otherwise elsewhere in the plans.

INSTALLATION NOTES:

1. Cones may be concentric or eccentric. Reduction cones are acceptable. See Manufacturer for cone dimensions.
2. Inverts (benching) to be provided by Contractor. Concrete or mortar used for invert is subsidiary to this item.
3. 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.
4. Do not grout rubber gasket joints without Manufacturer's recommendation.
5. Initial installation of grade adjustment rings is limited to 1'-0" Max as shown.
6. Grade adjustment rings 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 may be made up to the Max depth shown. Structure must be evaluated if Max depth will be exceeded.

GENERAL NOTES:

1. Designed according to ASTM C478.
2. Payment for manhole is per Item 465, "Junction Boxes, Manholes, and Inlets" by type and size.
3. Pipe OD + placement tolerance must be equal or less than Max hole diameter. For rigid pipe, placement tolerance is 4" Max, 2" Min. For flexible pipe, consult boot/seal manufacturer's specification for placement tolerance.

Cover dimensions are clear dimensions, unless noted otherwise.

SIZE (DIA)	48 in	60 in	72 in
W	5 in	6 in	7 in
MAX DEPTH	25 ft	25 ft	25 ft
A (EACH WAY)	0.22 in²/ft	0.30 in²/ft	0.45 in²/ft
B (EACH WAY)	N/A	0.37 in²/ft	0.62 in²/ft
C (EACH WAY)	0.24 in²/ft	0.46 in²/ft	0.46 in²/ft
BH MIN	12 in	36 in	36 in
TS	9 in	9 in	9 in
RS	N/A	9 in	12 in
REDUCED RISER DIA	N/A	48 in	48/60 in
MAX HOLE DIA	32 in	40 in	54 in

HL93 LOADING

Texas Department of Transportation

Bridge Division Standard

PRECAST ROUND MANHOLE

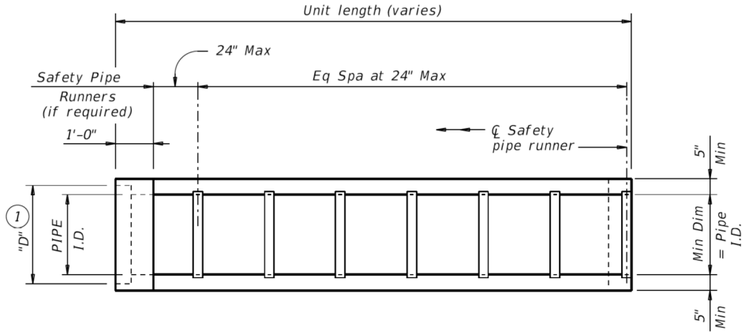
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COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
SHEET NO. 205 OF 242
DWG NO. CC6-2973
CONTRACT NO. C-2033270-01

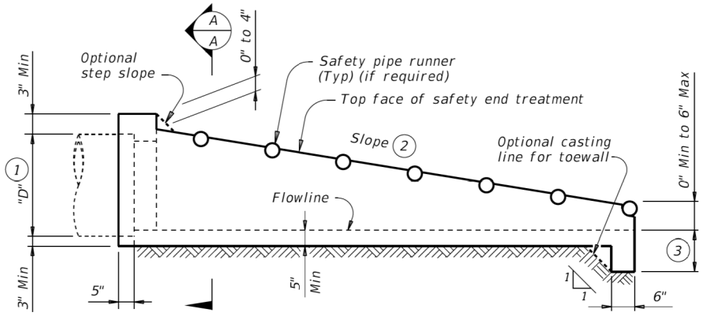
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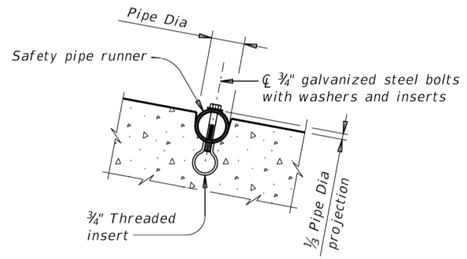
PLAN

(Showing bell end connection.)



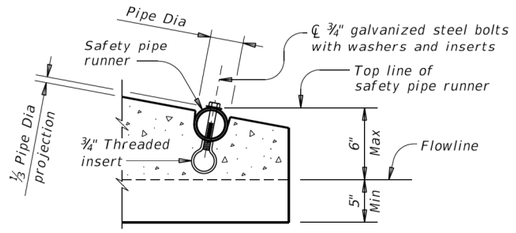
LONGITUDINAL ELEVATION

(Showing bell end connection.)

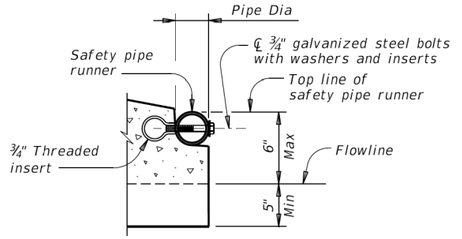


INSTALLATION DETAIL FOR SAFETY PIPE RUNNERS

(If required)



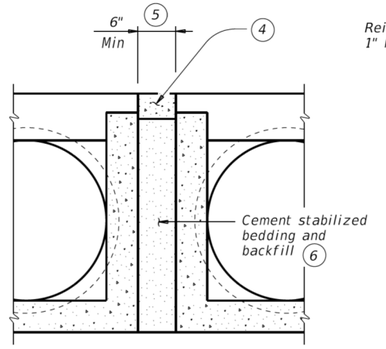
OPTION A



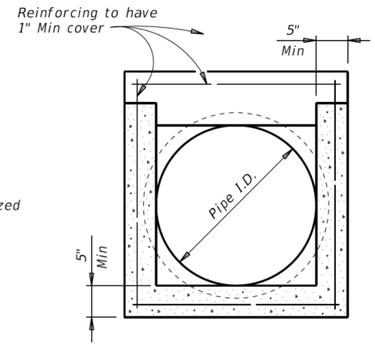
OPTION B

END DETAILS FOR INSTALLATION OF SAFETY PIPE RUNNERS

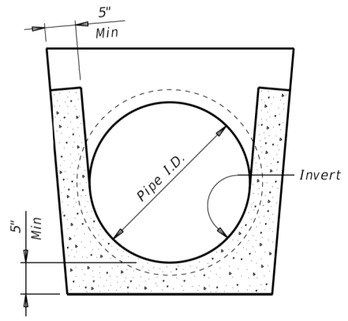
(If required)



MULTIPLE PIPE INSTALLATION

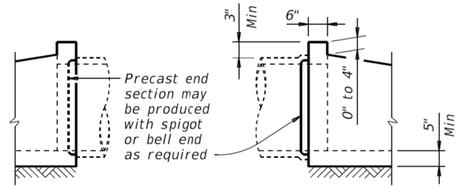


OPTION WITH SQUARE BOTTOM



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. 206 OF 242
DWG NO. CC6-2974
CONTRACT NO. C-2033270-01

Texas Department of Transportation

Bridge Division Standard

PRECAST SAFETY END TREATMENT

TYPE II ~ PARALLEL DRAINAGE

PSET-SP

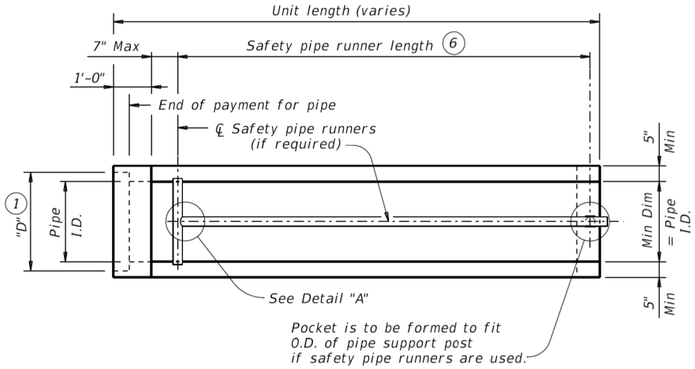
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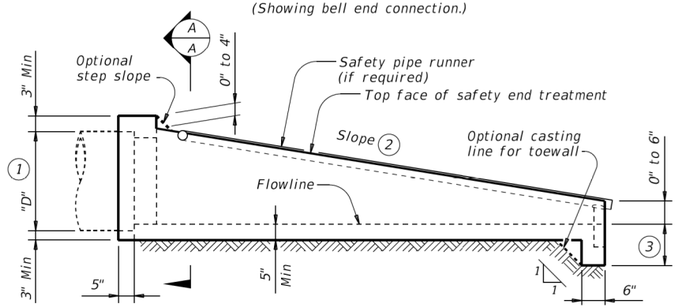
REQUIREMENTS FOR CULVERT PIPES AND SAFETY PIPE RUNNERS

Pipe I.D.	RCP Wall "B" Thickness	TP Wall Thickness (8)	"D" (1)	Slope	Min Length of Unit	Single Pipe		Multiple Pipes	
						Skew	Pipe Runners Required	Skew	Pipe Runners Required
12"	2"	1.15"	17.00"	3:1	2' – 11"	≤ 45°	No	≤ 45°	No
				4:1	3' – 6"				
				6:1	4' – 9"				
15"	2 ¼"	1.30"	20.50"	3:1	3' – 8"	≤ 45°	No	≤ 45°	No
				4:1	4' – 7"				
				6:1	6' – 5"				
18"	2 ½"	1.60"	24.00"	3:1	4' – 6"	≤ 45°	No	≤ 45°	No
				4:1	5' – 8"				
				6:1	8' – 0"				
24"	3"	1.95"	31.00"	3:1	6' – 2"	≤ 45°	No	= 30°	No
				4:1	7' – 10"			> 30°	Yes
				6:1	11' – 3"				
30"	3 ½"	2.65"	38.50"	3:1	7' – 10"	= 15°	No	= 15°	No
				4:1	10' – 1"	> 15°	Yes	> 15°	Yes
				6:1	14' – 8"				
36"	4"	2.75"	45.50"	3:1	9' – 5"	= 0°	No	≥ 0°	Yes
				4:1	12' – 3"	> 0°	Yes		
				6:1	17' – 11"				
42"	4 ½"	2.7"	52.50"	3:1	11' – 1"	≥ 0°	Yes	≥ 0°	Yes
				4:1	14' – 5"				
				6:1	21' – 2"				



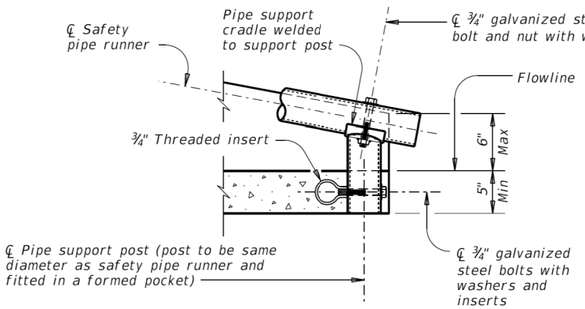
PLAN

(Showing bell end connection.)



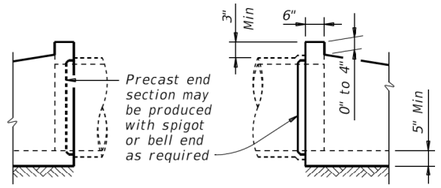
LONGITUDINAL ELEVATION

(Showing bell end connection.)



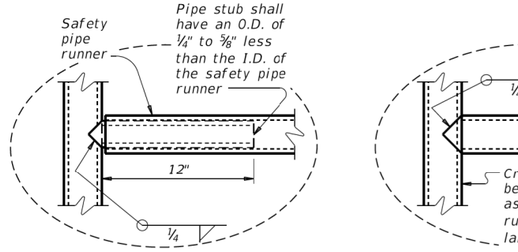
END DETAIL FOR INSTALLATION OF SAFETY PIPE RUNNERS

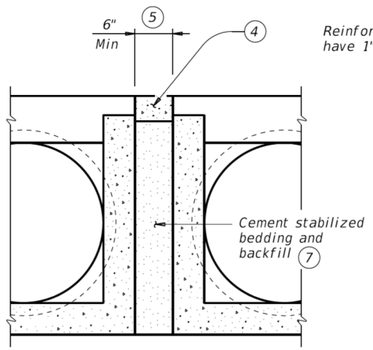
(If required)



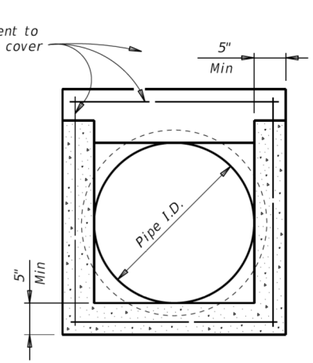
OPTIONAL JOINT FOR RCP

(Showing joint between RCP and precast safety end treatment)

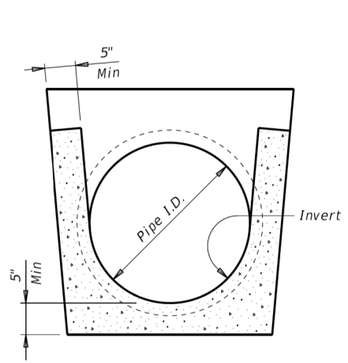




MULTIPLE PIPE INSTALLATION

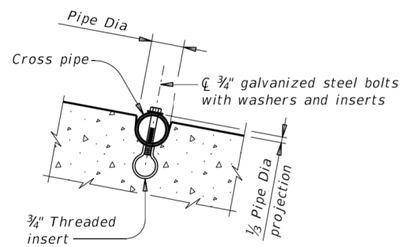


OPTION WITH SQUARE BOTTOM



OPTION WITH INVERT BOTTOM

SECTION A-A



INSTALLATION DETAIL FOR SAFETY PIPE RUNNERS

(If required)

SAFETY PIPE RUNNER DIMENSIONS

Max Safety Pipe Runner Length	Required Pipe Runner Size		
	Pipe Size	Pipe O.D.	Pipe I.D.
11' – 2"	3" STD	3.500"	3.068"
15' – 6"	3 ½" STD	4.000"	3.548"
20' – 10"	4" STD	4.500"	4.026"
35' – 4"	5" STD	5.563"	5.047"

(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 plans. Slope of 3:1 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) Measured along slope.

(7) 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.

(8) 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 1,800 Lbs at yield as recommended by Research Report 280-1, "Safety Treatment of Roadside Cross-Drainage Structures", Texas Transportation Institute, March 1981.

Provide safety pipe runners, cross pipes, pipe support posts, and pipe stubs 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. 207 OF 242
DWG NO. CC6-2975
CONTRACT NO. C-2033270-01

Texas Department of Transportation

Bridge Division Standard

PRECAST SAFETY END TREATMENT

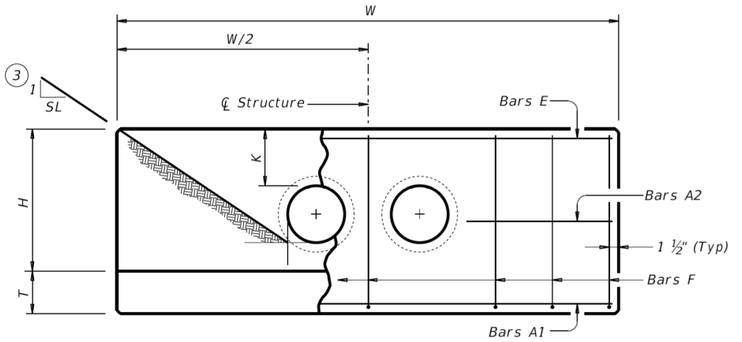
TYPE II ~ CROSS DRAINAGE

PSET-SC

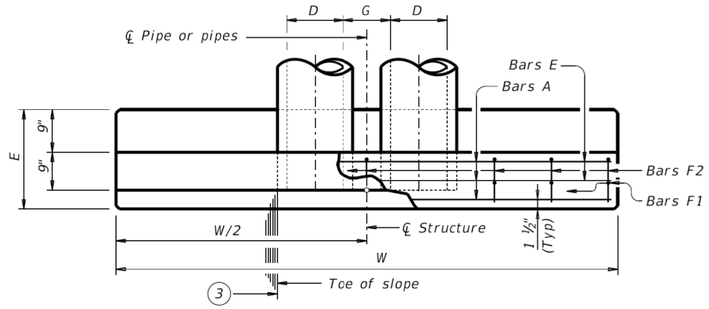
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©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS 12-21: Added 42" TP	DIST	COUNTY		SHEET NO.

TABLE OF VARIABLE DIMENSIONS AND QUANTITIES FOR ONE HEADWALL (5)

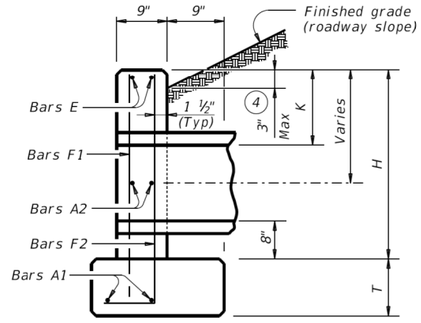
Slope	Dia of Pipe (D)	Values for One Pipe			Values To Be Added for Each Addt'l Pipe		
		W	Reinf (Lbs) (1)	Conc (CY) (2)	W	Reinf (Lbs) (1)	Conc (CY) (2)
2:1	12"	9' – 0"	122	1.1	1' – 9"	15	0.2
	15"	10' – 3"	136	1.3	2' – 2"	16	0.2
	18"	11' – 6"	163	1.5	2' – 8"	19	0.3
	21"	12' – 9"	200	1.8	3' – 1"	31	0.4
	24"	14' – 0"	217	2.1	3' – 7"	34	0.4
	27"	15' – 3"	254	2.4	3' – 11"	37	0.5
	30"	16' – 6"	272	2.7	4' – 4"	40	0.6
	33"	17' – 9"	314	3.1	4' – 8"	43	0.6
	36"	19' – 0"	371	3.9	5' – 1"	46	0.8
	42"	21' – 6"	442	4.9	5' – 10"	52	1.0
	48"	25' – 0"	569	6.4	6' – 7"	59	1.3
	54"	27' – 6"	701	7.5	7' – 6"	82	1.6
	60"	30' – 0"	794	8.8	8' – 3"	90	1.8
	66"	32' – 6"	894	10.2	8' – 9"	96	2.0
	72"	35' – 0"	1,055	11.7	9' – 4"	103	2.3
3:1	12"	13' – 0"	175	1.6	1' – 9"	14	0.2
	15"	14' – 9"	193	1.9	2' – 2"	17	0.2
	18"	16' – 6"	228	2.2	2' – 8"	19	0.3
	21"	18' – 3"	299	2.6	3' – 1"	31	0.4
	24"	20' – 0"	323	3.0	3' – 7"	33	0.4
	27"	21' – 9"	371	3.5	3' – 11"	37	0.5
	30"	23' – 6"	415	4.0	4' – 4"	40	0.5
	33"	25' – 3"	469	4.6	4' – 8"	43	0.6
	36"	27' – 0"	556	5.7	5' – 1"	46	0.8
	42"	30' – 6"	675	7.1	5' – 10"	52	1.0
	48"	35' – 6"	837	9.2	6' – 7"	59	1.3
	54"	39' – 0"	1,015	11.0	7' – 6"	84	1.6
	60"	42' – 6"	1,171	12.9	8' – 3"	91	1.8
	66"	46' – 0"	1,298	14.9	8' – 9"	98	2.0
	72"	49' – 6"	1,561	17.1	9' – 4"	103	2.3
4:1	12"	17' – 0"	229	2.0	1' – 9"	15	0.2
	15"	19' – 3"	266	2.4	2' – 2"	17	0.2
	18"	21' – 6"	308	2.9	2' – 8"	19	0.3
	21"	23' – 9"	382	3.5	3' – 1"	31	0.3
	24"	26' – 0"	430	3.9	3' – 7"	34	0.4
	27"	28' – 3"	486	4.7	3' – 11"	37	0.5
	30"	30' – 6"	539	5.2	4' – 4"	40	0.6
	33"	32' – 9"	603	6.0	4' – 8"	42	0.6
	36"	35' – 0"	738	7.5	5' – 1"	47	0.8
	42"	39' – 6"	881	9.3	5' – 10"	52	1.0
	48"	46' – 0"	1,102	12.1	6' – 7"	61	1.3
	54"	50' – 6"	1,364	14.4	7' – 6"	84	1.6
	60"	55' – 0"	1,547	16.9	8' – 3"	91	1.8
	66"	59' – 6"	1,741	19.5	8' – 9"	98	2.0
	72"	64' – 0"	2,077	22.4	9' – 4"	102	2.3
6:1	12"	25' – 0"	336	3.0	1' – 9"	14	0.2
	15"	28' – 3"	384	3.6	2' – 2"	17	0.2
	18"	31' – 6"	452	4.2	2' – 8"	19	0.3
	21"	34' – 9"	581	5.1	3' – 1"	31	0.4
	24"	38' – 0"	644	5.8	3' – 7"	34	0.4
	27"	41' – 3"	737	6.9	3' – 11"	37	0.5
	30"	44' – 6"	807	7.7	4' – 4"	39	0.6
	33"	47' – 9"	912	8.9	4' – 8"	44	0.6
	36"	51' – 0"	1,108	11.0	5' – 1"	48	0.8
	42"	57' – 6"	1,318	13.7	5' – 10"	54	1.0
	48"	67' – 0"	1,682	17.9	6' – 7"	59	1.3
	54"	73' – 6"	2,072	21.3	7' – 6"	83	1.6
	60"	80' – 0"	2,351	24.9	8' – 3"	89	1.8
	66"	86' – 6"	2,643	28.9	8' – 9"	96	2.0
	72"	93' – 0"	3,121	33.1	9' – 4"	101	2.3



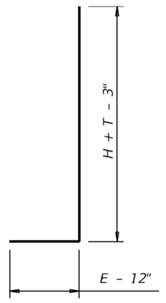
ELEVATION



PLAN OF NON-SKEWED PIPES



SECTION AT CENTER OF PIPE



BARS F2

(1) Total quantities include one 3'–1" lap for bars over 60' in length.

(2) Quantities shown are for concrete pipe and will increase slightly for metal pipe installations.

(3) Indicated slope is perpendicular to centerline pipe or pipes.

(4) For vehicle safety, construct curbs no more than 3" above finished grade. Reduce curb heights, if necessary, to meet these requirements. No changes will be made in quantities and no additional compensation will be allowed for this work.

(5) Dimensions shown are usual and maximum.

(6) Quantities shown are for one structure end only (one headwall).

TABLE OF CONSTANT DIMENSIONS

Dia of Pipe (D)	G	K (5)	H	T	E
12"	0' – 9"	1' – 0"	2' – 8"	0' – 9"	1' – 9"
15"	0' – 11"	1' – 0"	2' – 11"	0' – 9"	1' – 9"
18"	1' – 2"	1' – 0"	3' – 2"	0' – 9"	1' – 9"
21"	1' – 4"	1' – 0"	3' – 5"	0' – 9"	2' – 0"
24"	1' – 7"	1' – 0"	3' – 8"	0' – 9"	2' – 0"
27"	1' – 8"	1' – 0"	3' – 11"	0' – 9"	2' – 3"
30"	1' – 10"	1' – 0"	4' – 2"	0' – 9"	2' – 3"
33"	1' – 11"	1' – 0"	4' – 5"	0' – 9"	2' – 6"
36"	2' – 1"	1' – 0"	4' – 8"	1' – 0"	2' – 6"
42"	2' – 4"	1' – 0"	5' – 2"	1' – 0"	2' – 9"
48"	2' – 7"	1' – 3"	5' – 11"	1' – 0"	3' – 0"
54"	3' – 0"	1' – 3"	6' – 5"	1' – 0"	3' – 3"
60"	3' – 3"	1' – 3"	6' – 11"	1' – 0"	3' – 6"
66"	3' – 3"	1' – 3"	7' – 5"	1' – 0"	3' – 9"
72"	3' – 4"	1' – 3"	7' – 11"	1' – 0"	4' – 0"

TABLE OF REINFORCING STEEL (6)

Bar	Size	Spa	No.
A1	#5	~	2
A2	#5	1' – 6"	~
E	#5	~	2
F	#5	1' – 0"	~

MATERIAL NOTES:
Provide Grade 60 reinforcing steel.
Provide Class C concrete (f'c = 3,600 psi).

GENERAL NOTES:
Designed according to AASHTO LRFD Bridge Design Specifications.
Do not mount bridge rails of any type directly to these culvert headwalls.
This standard may not be used for wall heights, H, exceeding the values shown.

Cover dimensions are clear dimensions, unless noted otherwise. Reinforcing dimensions are out-to-out of bars.

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
SHEET NO. 208 OF 242
DWG NO. CC6-2976
CONTRACT NO. C-2033270-01

Texas Department of Transportation

Bridge Division Standard

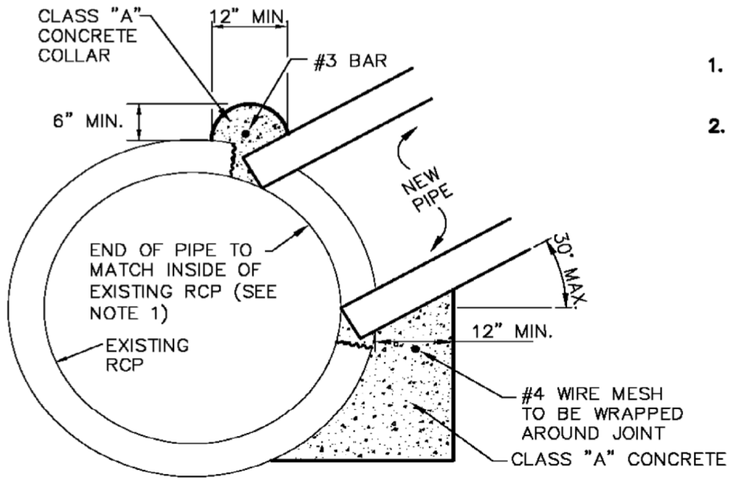
CONCRETE HEADWALLS WITH PARALLEL WINGS FOR NON-SKEWED PIPE CULVERTS

CH-PW-0

FILE: chpw0ste-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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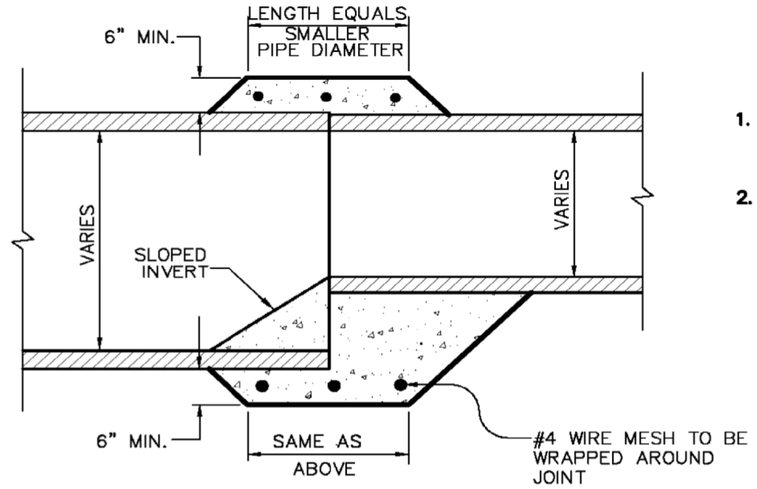
NOTES:

1. MAXIMUM DIAMETER OF NEW PIPE EQUALS ONE HALF OF EXISTING PIPE'S DIAMETER.
2. REMOVAL OF PLUG FROM EXISTING RCP TO BE ACCOMPLISHED BY USING A MASONRY DRILL AT A SPACING EQUAL TO THE DRILL BIT DIAMETER IN A CIRCULAR PATTERN OR A MASONRY SAW IN AN OCTAGONAL PATTERN PER DETAIL.



CONNECTION TO EXISTING RCP STORM DRAIN

NTS



NOTES:

1. THIS PROCEDURE/DETAIL WILL ONLY BE USED WHEN A PREFAB REDUCTION IS NOT POSSIBLE.
2. CONCRETE SHALL BE CLASS A.

PIPE COLLAR

NTS

Addison!! PUBLIC WORKS DEPARTMENT	CONNECTION TO EXISTING RCP STORM DRAIN PIPE COLLAR	STANDARD CONSTRUCTION DETAILS STORM DRAINAGE		
		DATE: AUGUST, 2010	REV DATE: –	SHEET : SD-D05

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
SHEET NO. 209 OF 242
DWG NO. CC6-2977
CONTRACT NO. C-2033270-01

7/17/2019 8:25:00 AM
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DWG No. OC1-2551

STORM WATER POLLUTION PREVENTION PLAN

COTTON BELT REGIONAL RAIL DESIGN BUILD VELOWEB HIKE AND BIKE TRAIL TOWN OF ADDISON 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.

TOWN OF ADDISON LIMITS: East of Surveyor Blvd to West of Dallas North Tollway

LATITUDE: 32°57'24" LONGITUDE: 96°50'03"

The Standard industrial classification for this project is: 1629.

NATURE OF THE CONSTRUCTION ACTIVITY:
FOR SUB SEGEMENT: Construction of approximately 1.44 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. Reference appendix 19 of the approved AWH NOI SW3P document for details related to Containment of Chemical Storage and Spill Response Plan.

INTENDED SEQUENCE OF MAJOR SITE ACTIVITIES: See approved AWH NOI SW3P document Section 1.3 for detailed sequence of activities.

NOTE: Contractor will attach its construction schedule if its activities differ in order or scope from those provided above.

TOWN OF ADDISON @ TOTAL PROJECT AREA:

Overall site: (East of Surveyor Blvd to West of Dallas North Tollway) – 6.01 ACRES

SOILS LIKELY TO BE ENCOUNTERED DURING CONSTRUCTION: ERODIBILITY ("K") FACTORS

Dalco-Urban Land Complex	0.24
Dalco Clay	0.24

RUNOFF COEFFICIENT: Before Construction ~0.59 After Construction ~ 0.62

NAME OF RECEIVING WATERS: Rawhide Creek

NAME OF ADJACENT WETLANDS: Rawhide Creek

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;
- X Use of Gabions;
- X Installation of Geotextile fabrics;
- X Grass/native vegetation;
- X 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. Per Appendix 18 of the approved AWH NOI SW3P document, the SDS database is maintained by AWH safety.

SPILLS: See appendix 19 of the approved AWH NOI SW3P document for Containment of Chemical Storage and Spill Response. 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.

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SW3P NOTES AND NOI
SHEET 1 OF 2

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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

Reference section 6.1 of the approved AWH NOI SW3P document for BMP maintenance requirements. 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.

HISTORIC PROPERTIES INFORMATION

The Texas Historical Commission has review and approved the plans for this project.

VIII. BASELINE PLAN

See approved AWH NOI SW3P document for BMP for details related to the baseline plan

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. This certification is valid only for the baseline plan documents listed in PART IX above or as otherwise revised by DART.

TPDES Stormwater Construction General Permit Number: TXR15753W; Coverage Effective Date: April 15, 2019.

"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

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SW3P NOTES AND NOI
SHEET 2 OF 2

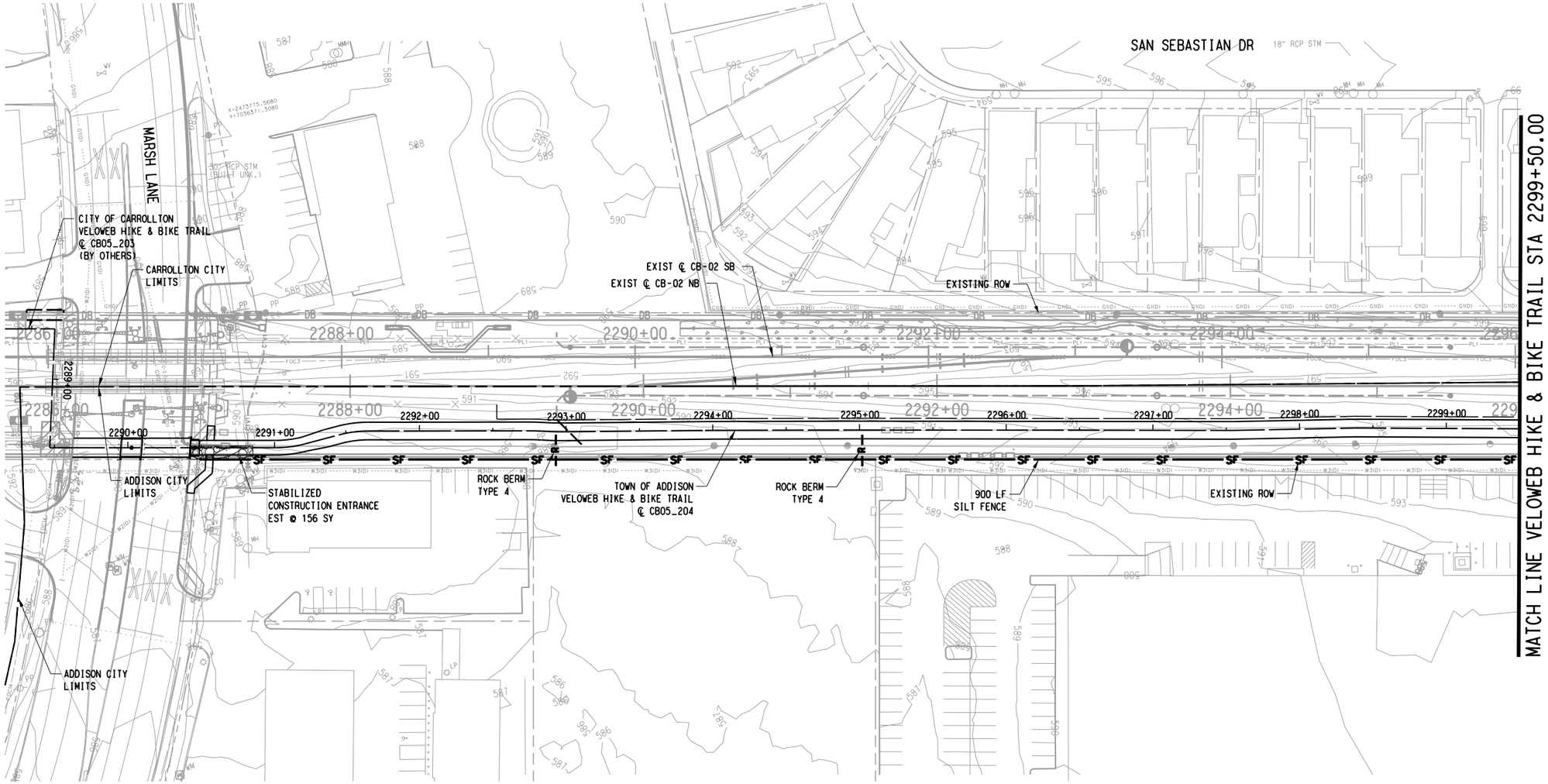
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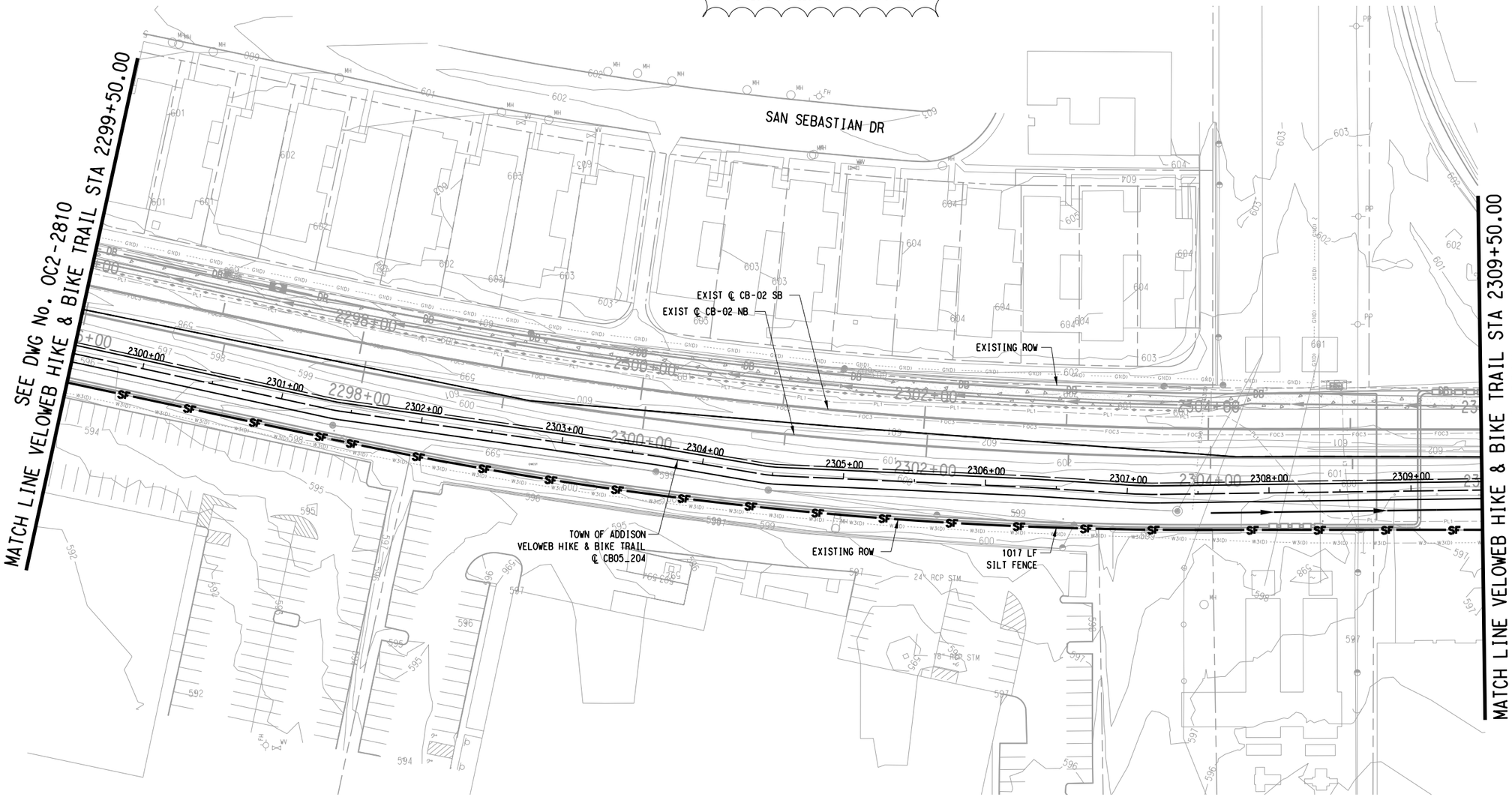
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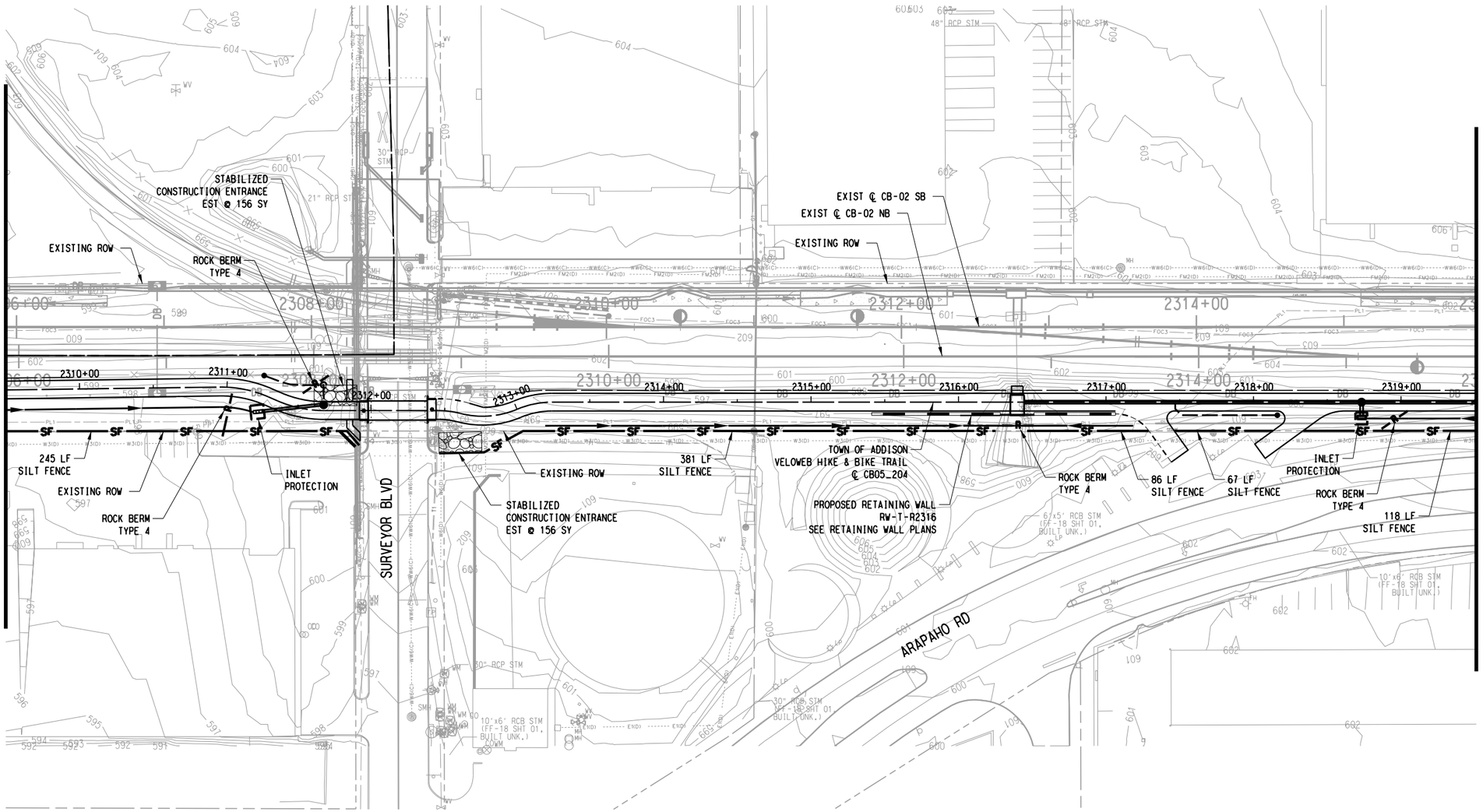
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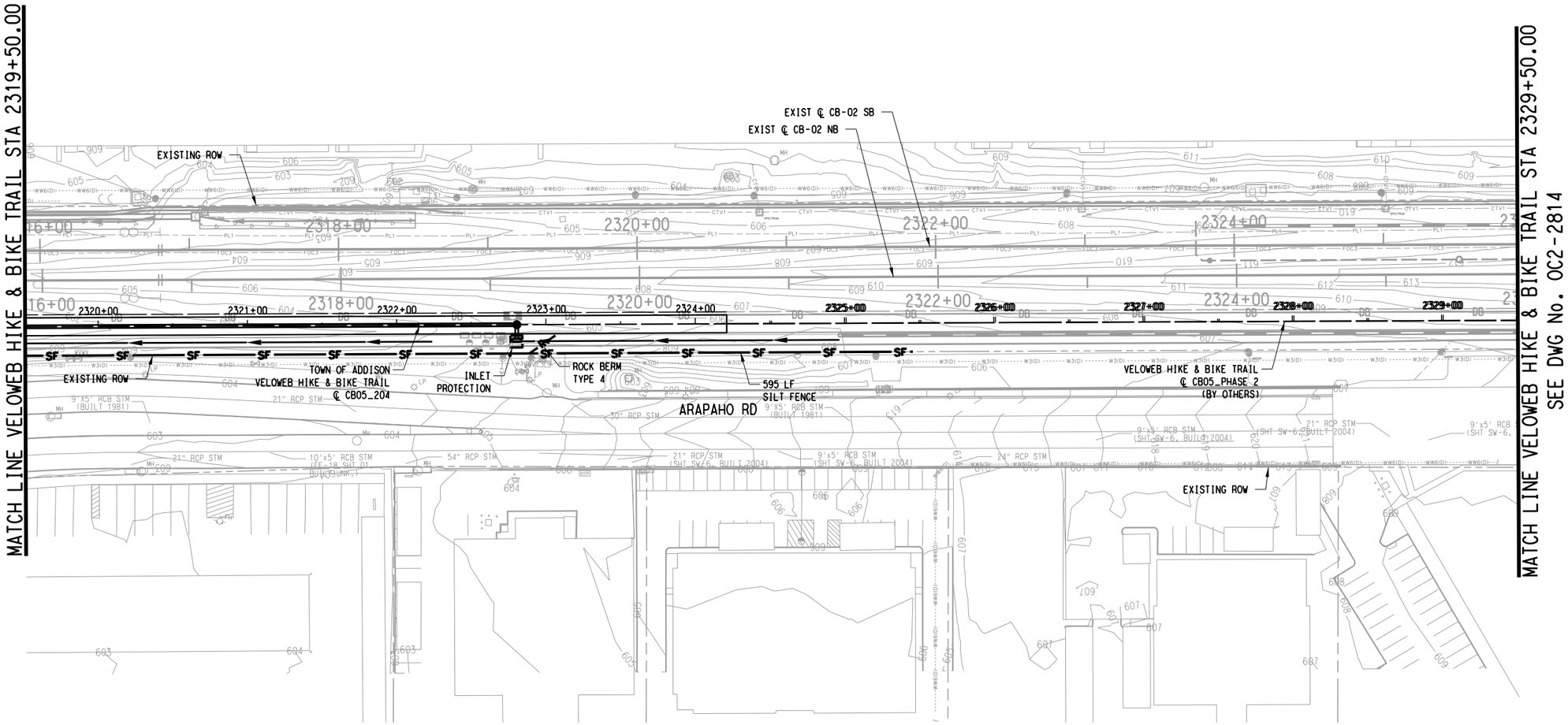
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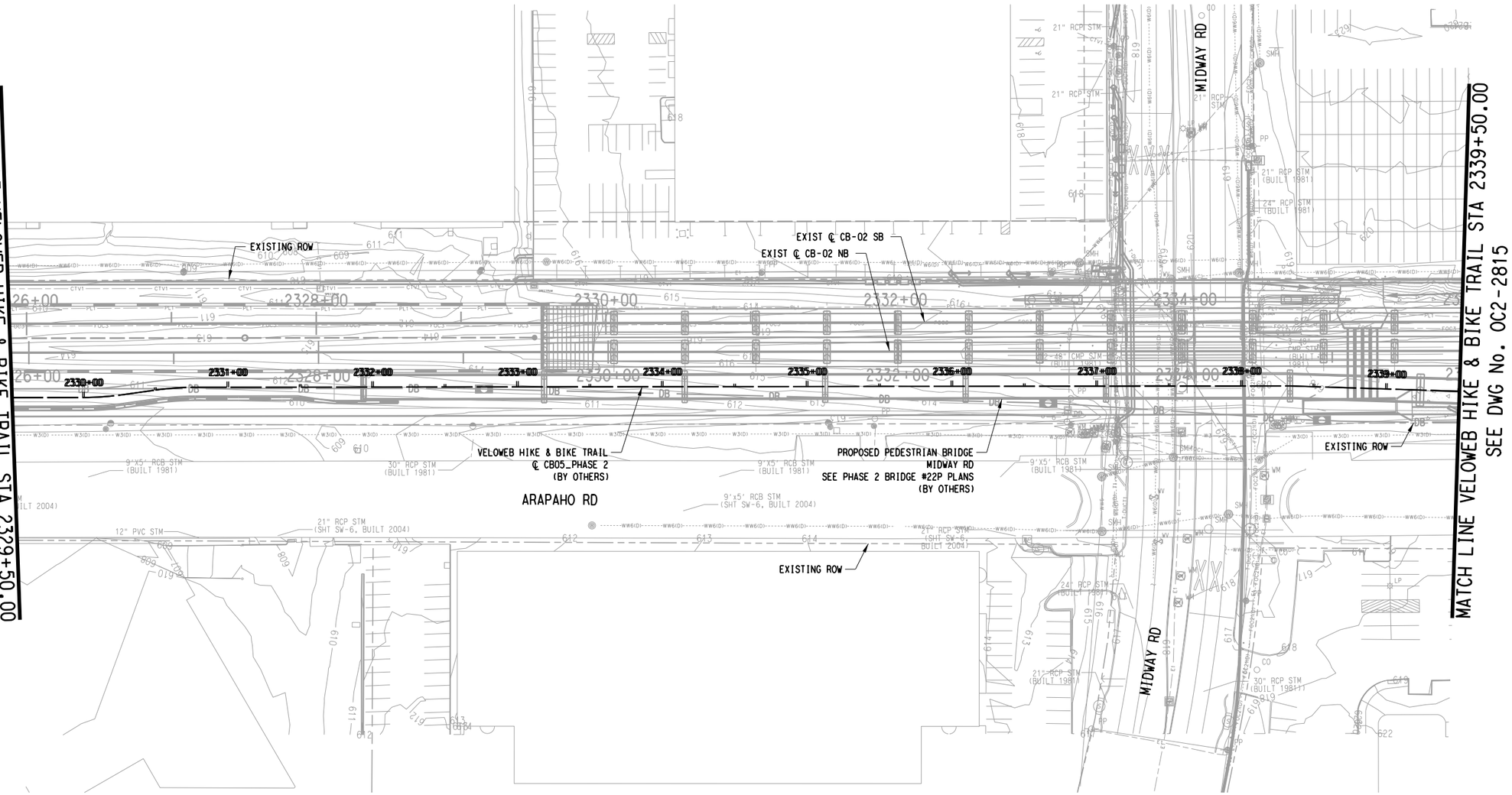
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TOWN OF ADDISON
TEMPORARY EROSION CONTROL
STA 2319+50 TO STA 2329+50
SHEET 4 OF 11

CONTRACT	DWG No.	REV
C-2033270-01	OC2-2813	D

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DWG No. OC2-2814



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.
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6. REFERENCE EROSION AND SEDIMENT CONTROL STANDARD DETAIL DRAWINGS INCLUDED IN THIS PACKAGE.

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REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

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DATE	13 MAR 23

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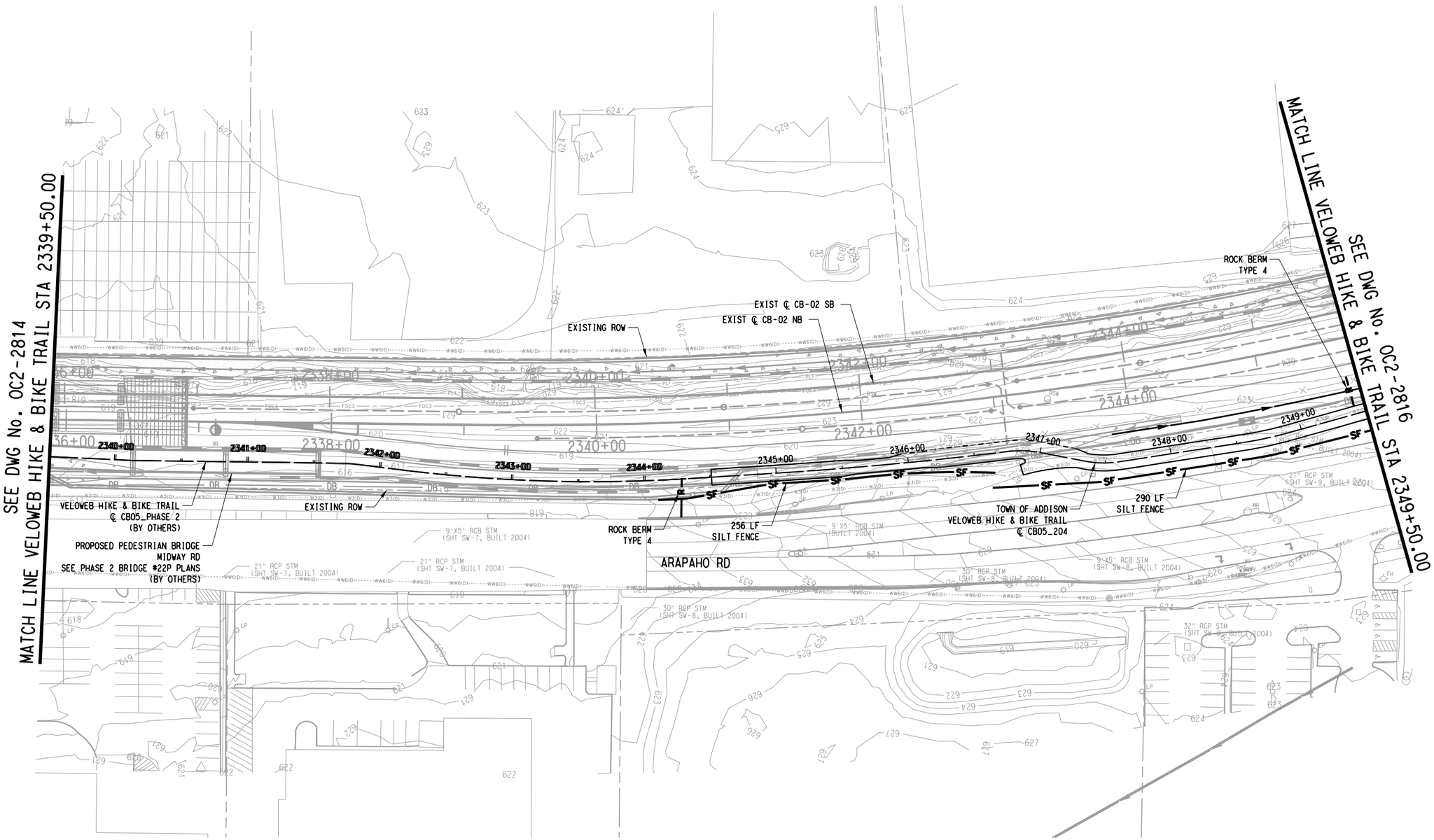
COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
TOWN OF ADDISON
TEMPORARY EROSION CONTROL
STA 2329+50 TO STA 2339+50
SHEET 5 OF 11

CONTRACT	DWG No.	REV
C-2033270-01	OC2-2814	D

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SCALE (IN FEET)
0 20 40 80

LEGEND

- SF — SILT FENCE
- R — ROCK BERM
- DITCH CHECK
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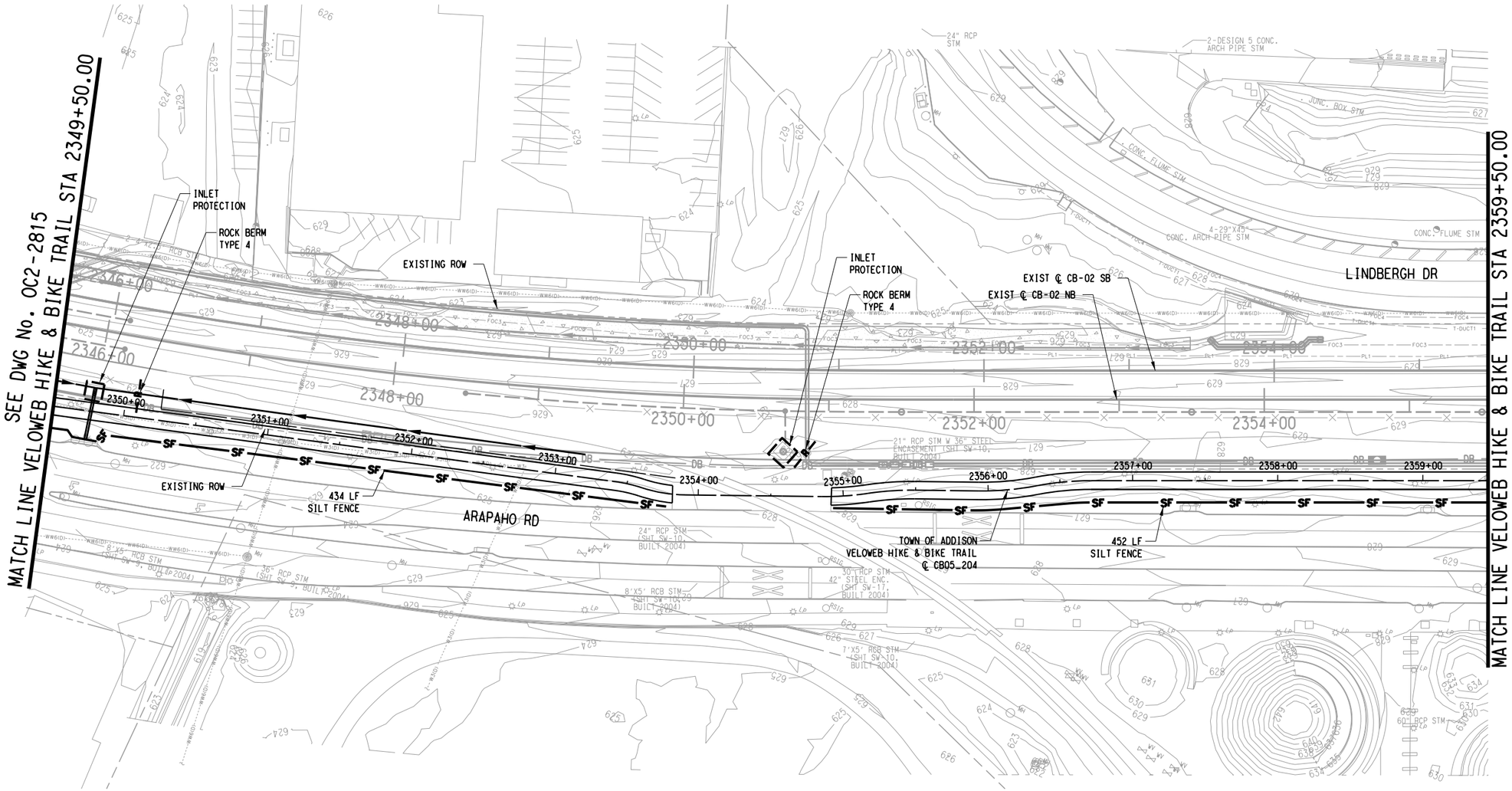
COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
TOWN OF ADDISON
TEMPORARY EROSION CONTROL
STA 2339+50 TO STA 2349+50
SHEET 6 OF 11

CONTRACT	DWG No.	REV
C-2033270-01	OC2-2815	D

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DWG No. OC2-2816



SCALE (IN FEET)
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LEGEND

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- R — ROCK BERM
- DITCH CHECK
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TOWN OF ADDISON
TEMPORARY EROSION CONTROL
STA 2349+50 TO STA 2359+50
SHEET 7 OF 11

CONTRACT	DWG No.	REV
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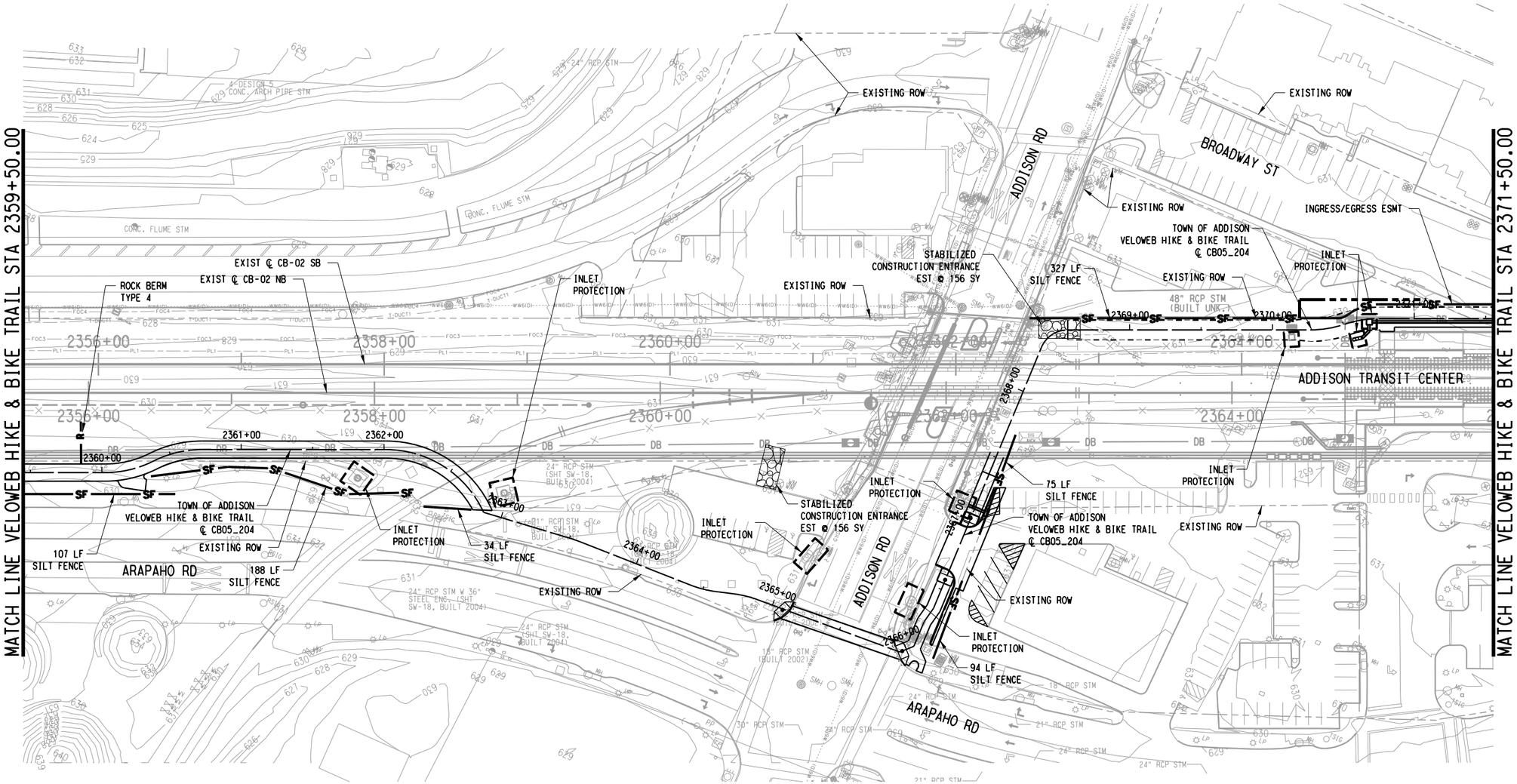
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DWG No. OC2-2817

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SCALE (IN FEET)
0 20 40 80

LEGEND

- SF — SILT FENCE
- R — ROCK BERM
- DITCH CHECK
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IN CHARGE	J. TOONE
DATE	13 MAR 23

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TOWN OF ADDISON
TEMPORARY EROSION CONTROL
STA 2359+50 TO STA 2371+50
SHEET 8 OF 11

CONTRACT	DWG No.	REV
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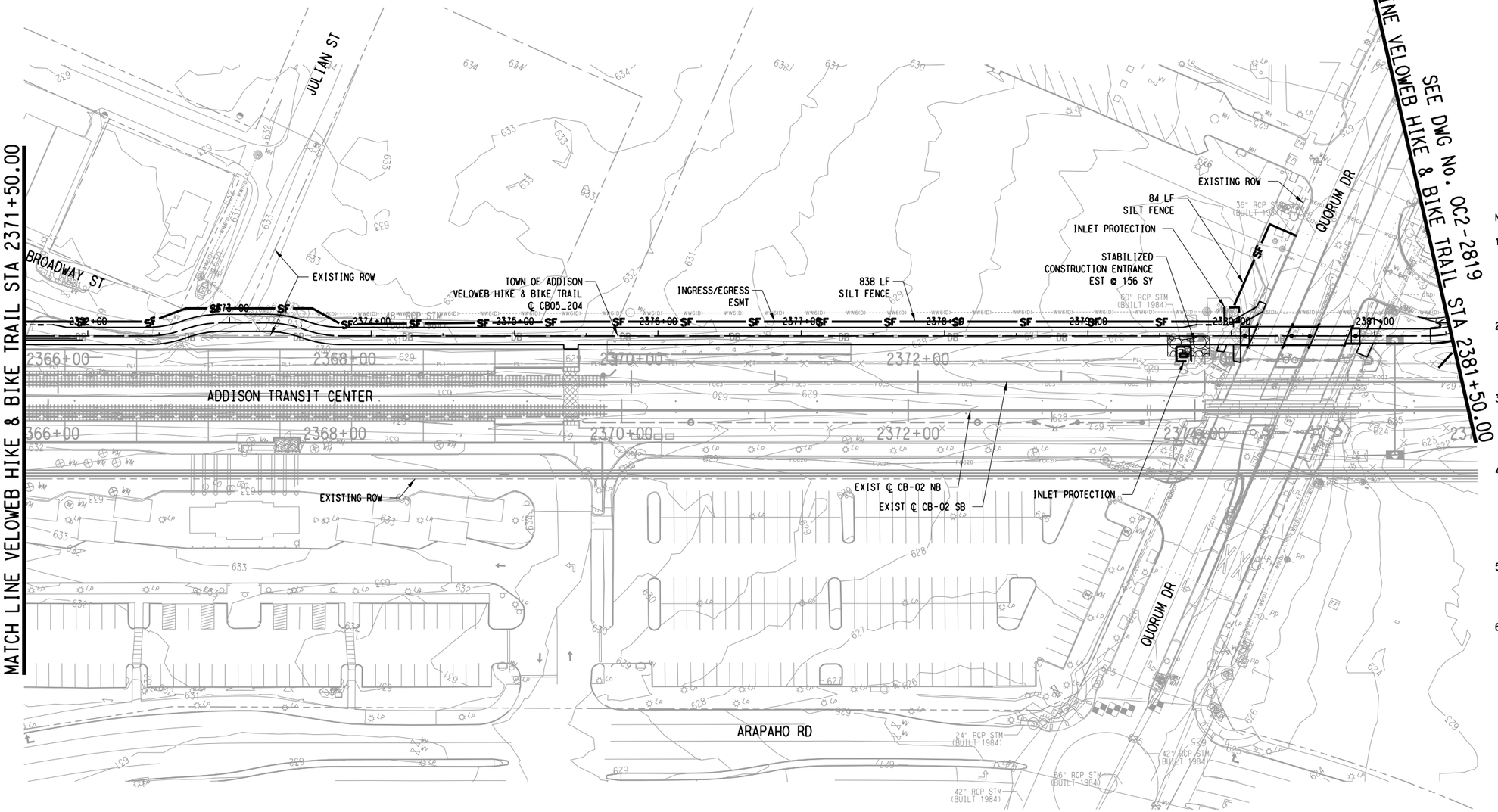
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DWG No. OC2-2818

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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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VELOWEB HIKE & BIKE TRAIL
TOWN OF ADDISON
TEMPORARY EROSION CONTROL
STA 2371+50 TO STA 2381+50
SHEET 9 OF 11

CONTRACT	DWG No.	REV
C-2033270-01	OC2-2818	D

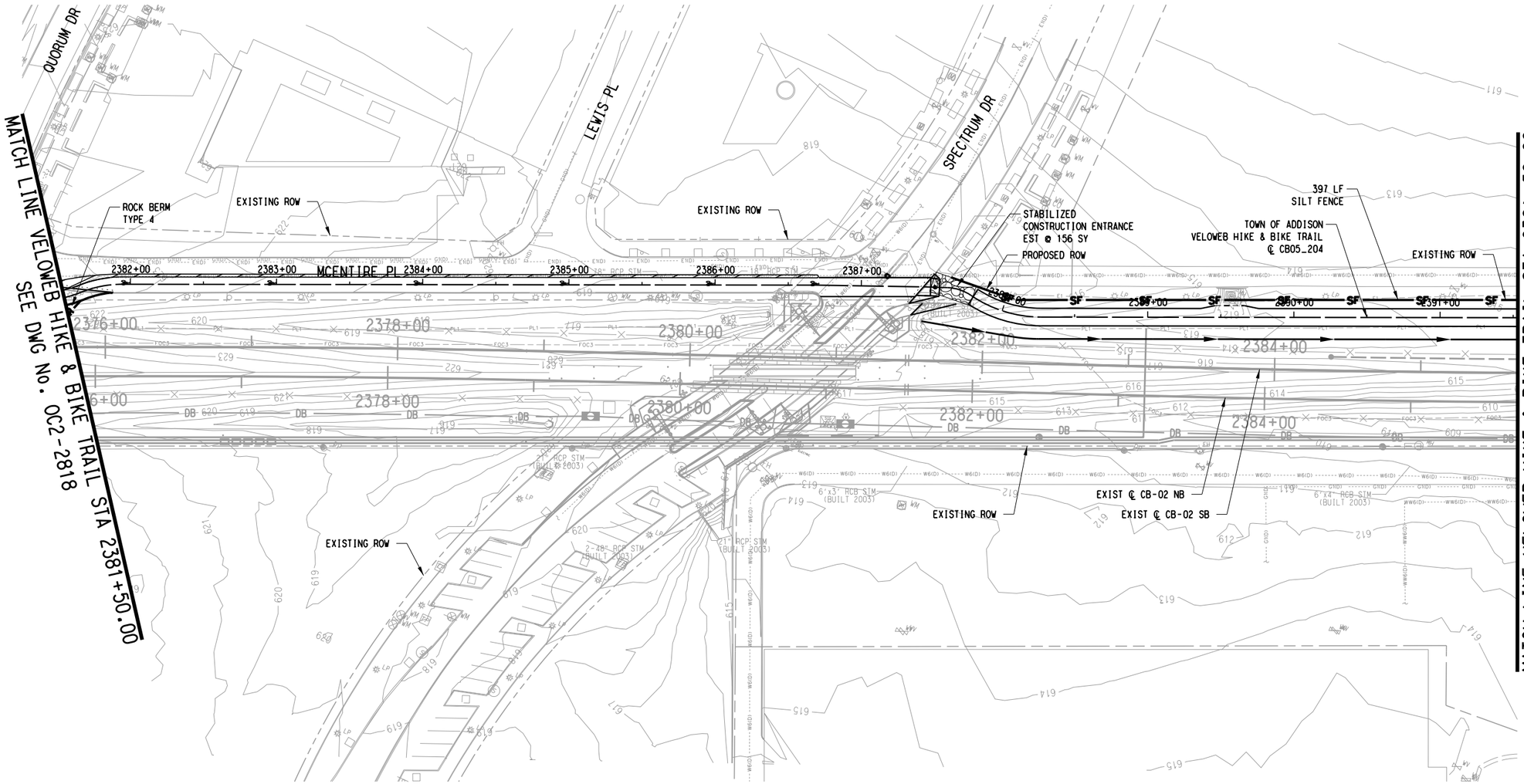
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LEGEND

- SF — SILT FENCE
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TOWN OF ADDISON
TEMPORARY EROSION CONTROL
STA 2381+50 TO STA 2391+50
SHEET 10 OF 11

CONTRACT	DWG No.	REV
C-2033270-01	OC2-2819	D

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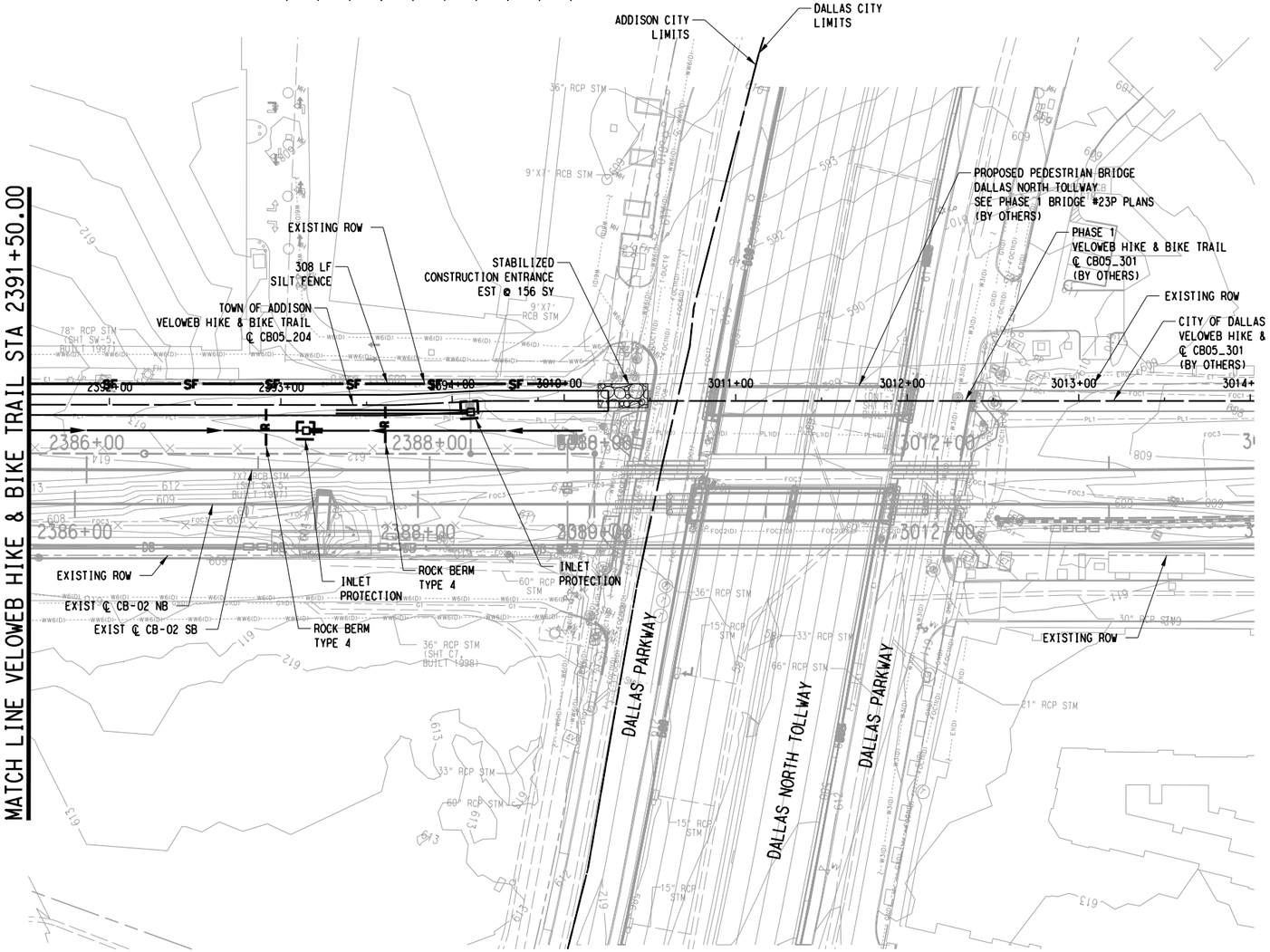
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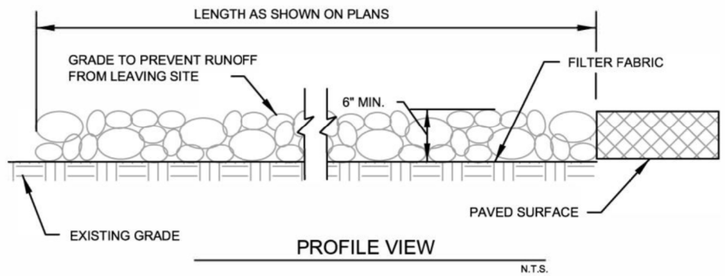
CAES

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
TOWN OF ADDISON
TEMPORARY EROSION CONTROL
STA 2391+50 TO STA 3010+25.72
SHEET 11 OF 11

CONTRACT	DWG No.	REV
C-2033270-01	OC2-2820	D

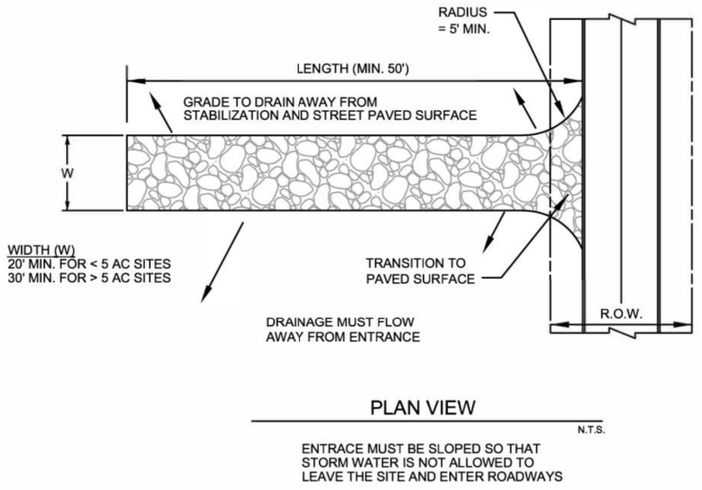
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PROFILE VIEW

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

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Figure 3.32 Schematics of Stabilized Construction Exit

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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.

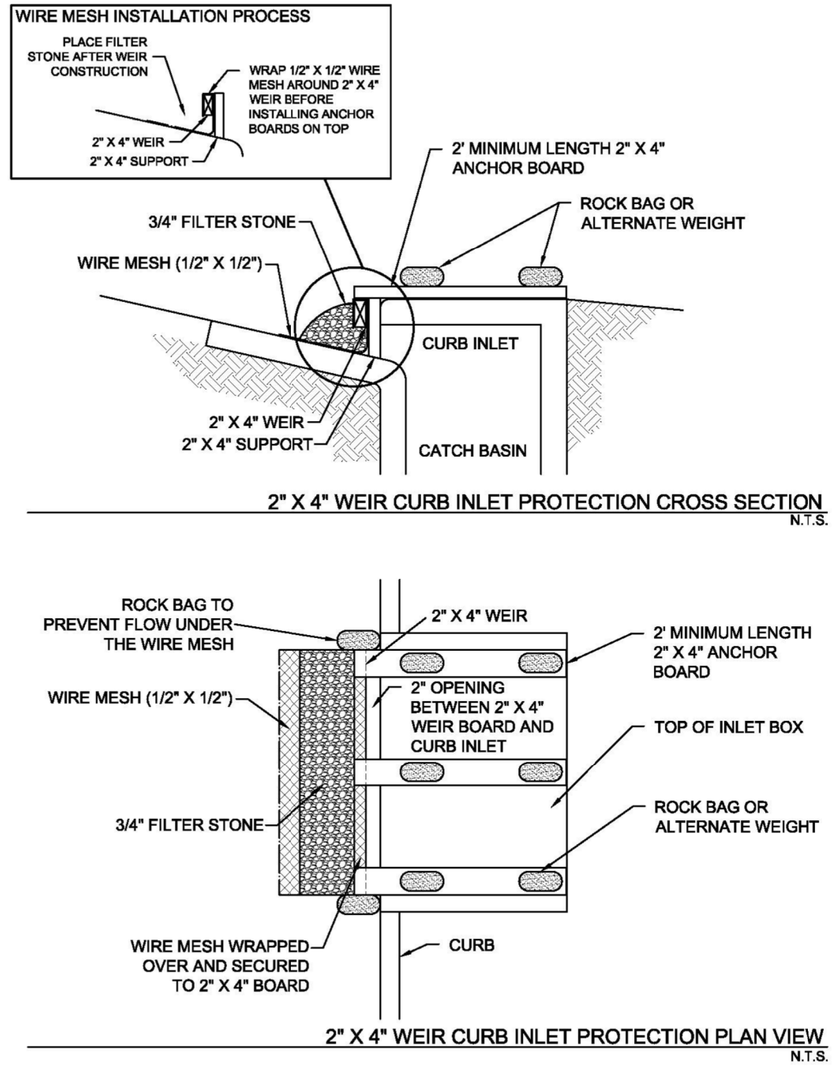
9. INSPECTION SHALL BE SPECIFIED IN THE SWPPP.

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Figure 3.33 Stabilized Construction Entrance General Notes

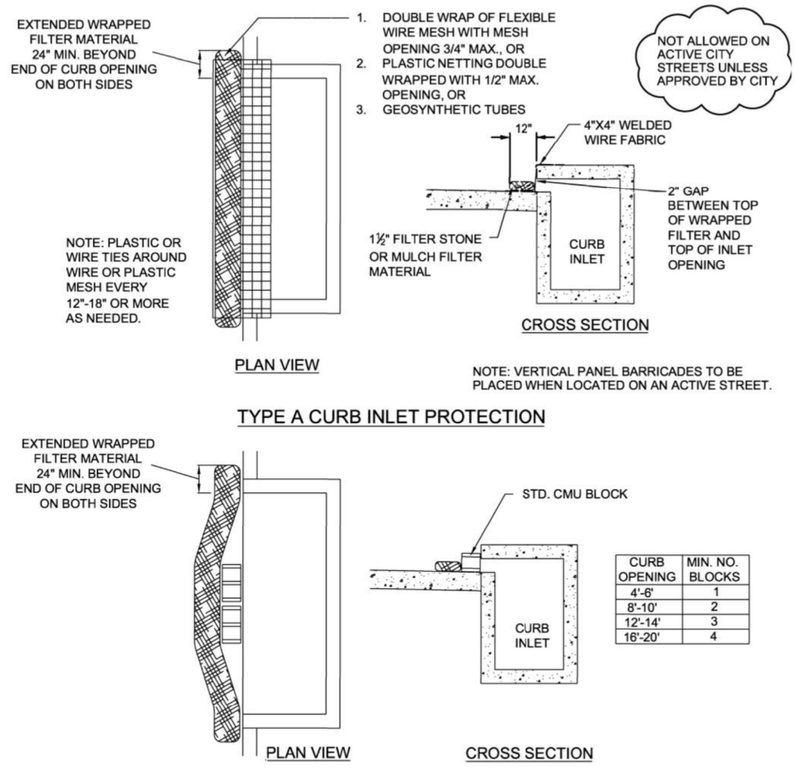
COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
SHEET NO. 223 OF 242
DWG NO. 0C9-2821
CONTRACT NO. C-2033270-01

STD5-0C9-2821.001



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)



CURB OPENING	MIN. NO. BLOCKS
4'-6'	1
8'-10'	2
12'-14'	3
16'-20'	4

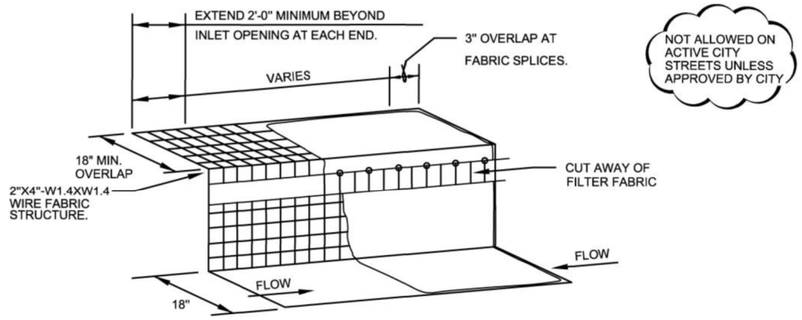
NOTE: SEE NCTCOG STANDARD SPECIFICATIONS (2017), SECTION 202.14 AND 202.18

ALTERNATIVE FORM FOR TYPE A CURB INLET PROTECTION

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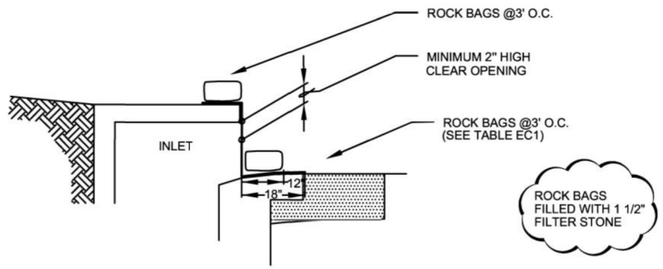
Figure 3.6 Schematics of Organic Filter Tube Curb Inlet Protection
(Source: Modified from City of Plano BMP SP-4)

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
SHEET NO. 224 OF 242
DWG NO. 0C9-2822
CONTRACT NO. C-2033270-01



HOG WIRE WEIR CURB INLET PROTECTION ISOMETRIC VIEW

N.T.S.



HOG WIRE WEIR CURB INLET PROTECTION CROSS SECTION

N.T.S.

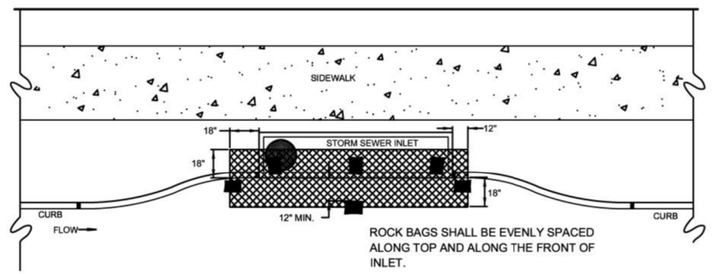
NOTE: THIS CONTROL WILL DECREASE THE CAPACITY OF THE INLET. IT SHALL ONLY BE USED WHEN AN ENGINEER HAS DETERMINED THERE IS ADEQUATE STORAGE OR POSITIVE OVERFLOW.

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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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

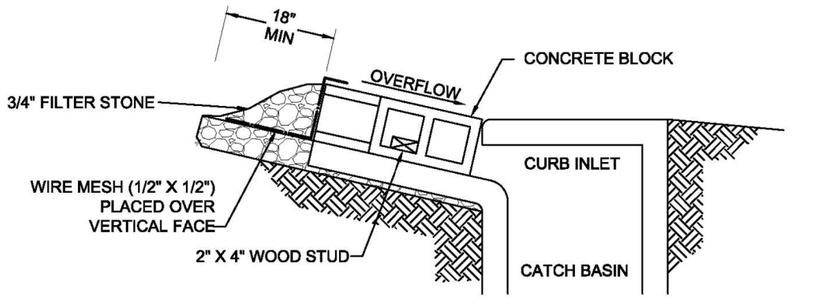
NOTES:
1. A SECTION OF FILTER FABRIC SHALL BE REMOVED AS SHOWN ON THIS DETAIL TO PROVIDE A 2" MINIMUM CLEAR OPENING. FABRIC MUST BE SECURED TO WIRE BACKING WITH CLIPS OR HOG RINGS AT THIS LOCATION.
2. INSPECTION SHALL BE MADE BY THE CONTRACTOR AND SILT ACCUMULATION MUST BE REMOVED WHEN DEPTH REACHES 2".
3. INLET PROTECTIONS SHALL BE REMOVED AS SOON AS THE SOURCE OF SEDIMENT IS STABILIZED.

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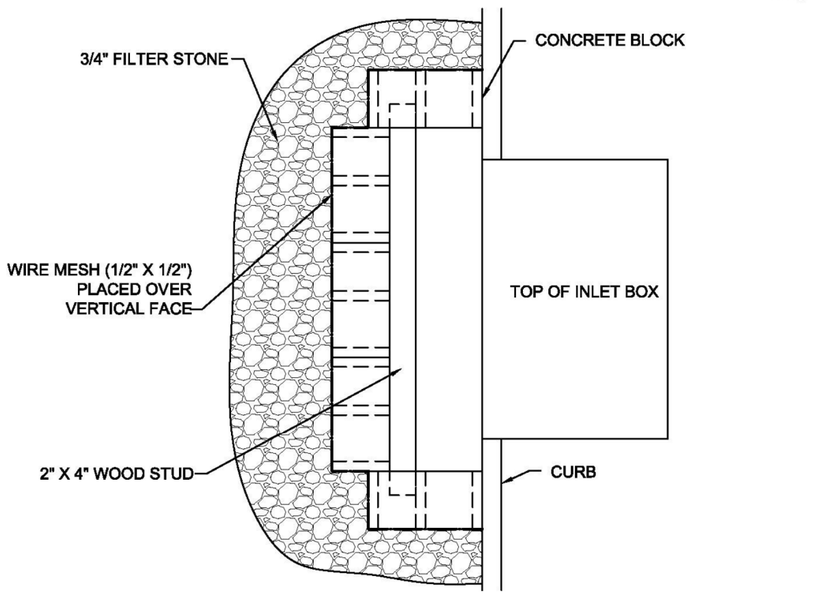
Figure 3.8 Hog Wire Weir Curb Inlet Protection

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
SHEET NO. 225 OF 242
DWG NO. 0C9-2823
CONTRACT NO. C-2033270-01

STD5-0C9-2823.001



BLOCK AND GRAVEL FILTER CURB INLET PROTECTION CROSS SECTION
N.T.S.



BLOCK AND GRAVEL FILTER CURB INLET PROTECTION PLAN VIEW
N.T.S.

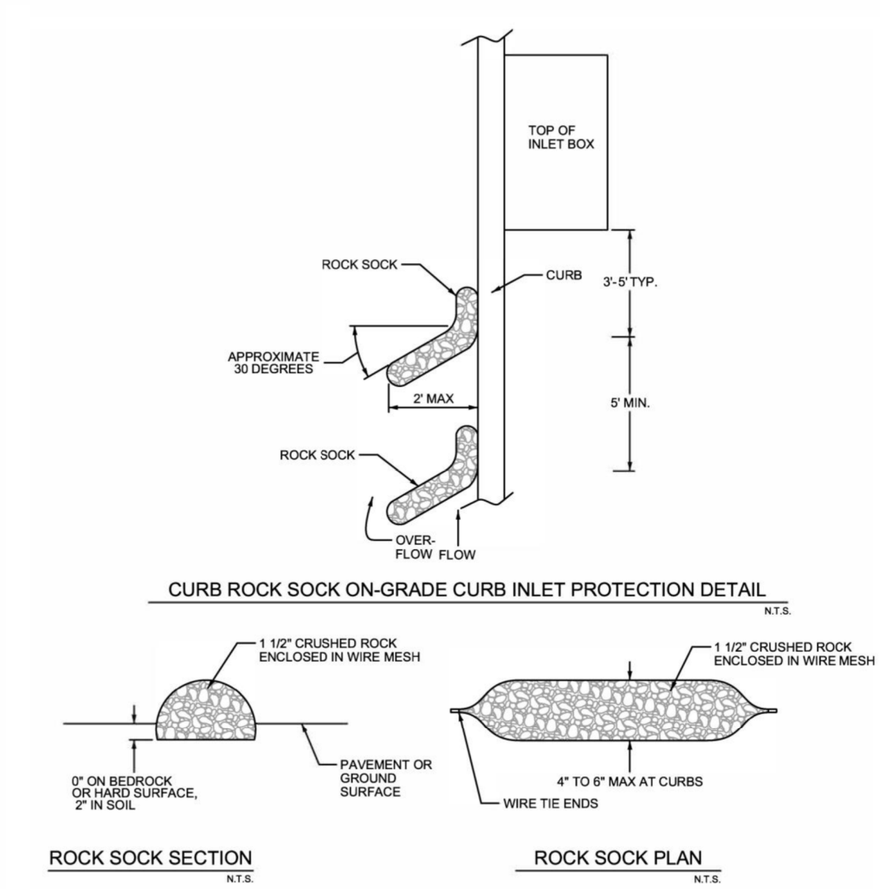
NOTES:
1. DO NOT INSTALL ON INLETS IN A PUBLIC STREET OR OTHER ACTIVE TRAVEL LANE. BLOCK AND GRAVEL FILTER IS INTENDED FOR USE ON LOW POINT (SUMP) INLETS IN PARKING LOTS AND OTHER PAVEMENT THAT IS NOT AN ACTIVE TRAVEL LANE. THIS INLET PROTECTION METHOD ALLOWS FOR FULL USE OF THE INLET DESIGN CAPACITY.
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

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COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
SHEET NO. 226 OF 242
DWG NO. OC9-2824
CONTRACT NO. C-2033270-01

STD5-OC9-2824.001



CURB ROCK SOCK ON-GRADE CURB INLET PROTECTION DETAIL
N.T.S.

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Figure 3.10 Schematic of Organic Filter Tube On-Grade Curb Inlet Protection

CURB ROCK SOCK ON-GRADE CURB INLET PROTECTION GENERAL NOTES:

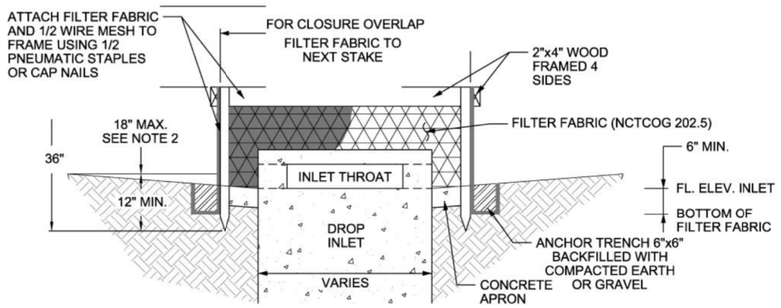
1. THIS DETAIL IS INTENDED FOR USE WITH ON-GRADE INLETS (NOT A LOW POINT) TO TRAP SEDIMENT.
2. DO NOT INSTALL ON INLETS WHERE THE ROCK SOCKS WOULD EXTEND INTO AN ACTIVE TRAVEL LANE.
3. ROCK SOCKS MAY BE USED ON PAVED OR UNPAVED SURFACES.
4. MAXIMUM ROCK SOCK DIAMETER 4" TO 6".
5. MINIMUM OF 2 CURB ROCK SOCKS.

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Figure 3.11 Organic Filter Tube On-Grade Curb Inlet Protection General Notes

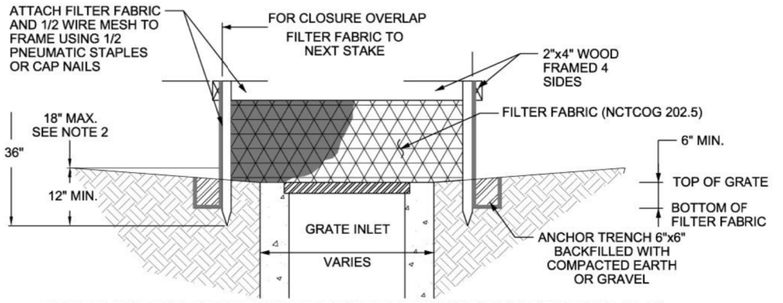
COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
SHEET NO. 227 OF 242
DWG NO. OC9-2825
CONTRACT NO. C-2033270-01

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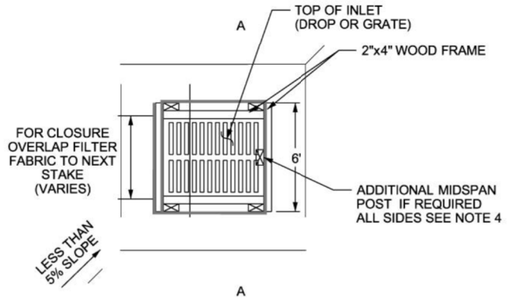
FILTER FABRIC DROP INLET PROTECTION CROSS SECTION (A-A)

N.T.S.



FILTER FABRIC GRATE INLET PROTECTION CROSS SECTION (A-A)

N.T.S.



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

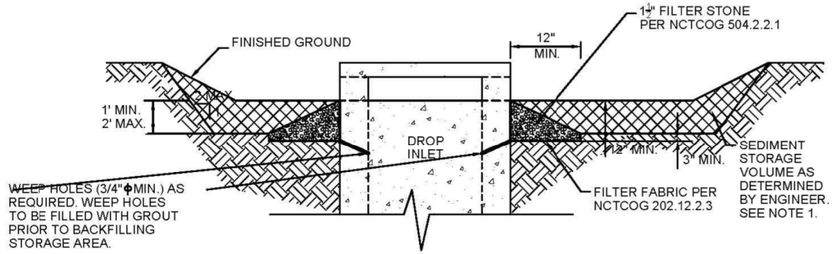
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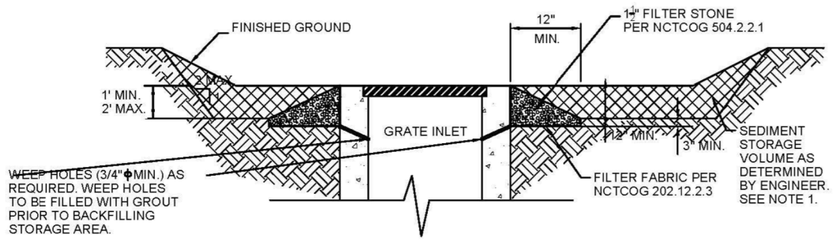
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Figure 3.12 Schematics of Filter Fabric Area Inlet Protection
(Source: City of Plano BMP SP-4)



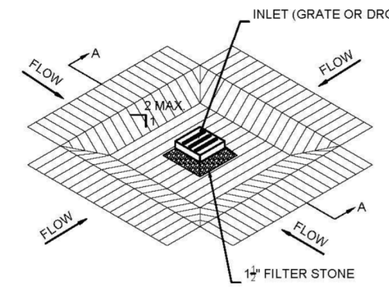
EXCAVATED INLET PROTECTION "Y" INLET SECTION A-A

N.T.S.



EXCAVATED INLET PROTECTION GRATE INLET SECTION A-A

N.T.S.



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

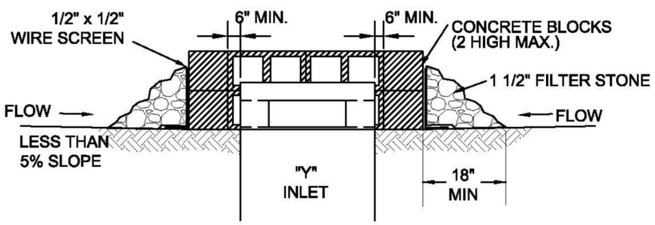
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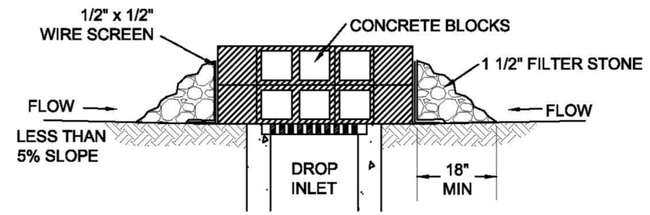
Figure 3.13 Schematics of Excavated Impoundment Area Inlet Protection

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
SHEET NO. 228 OF 242
DWG NO. 0C9-2826
CONTRACT NO. C-2033270-01

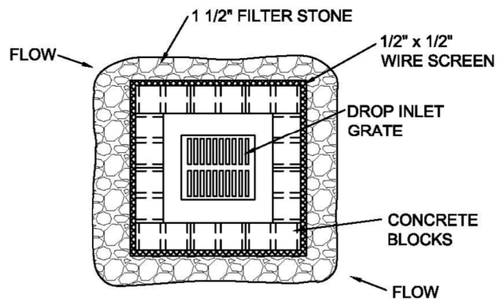
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BLOCK AND GRAVEL "Y" INLET PROTECTION CROSS SECTION
N.T.S.



BLOCK AND GRAVEL DROP INLET PROTECTION CROSS SECTION
N.T.S.

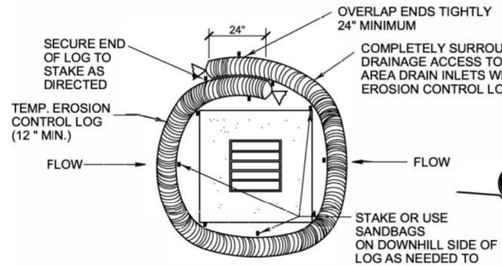


BLOCK AND GRAVEL AREA INLET PROTECTION PLAN VIEW
N.T.S.

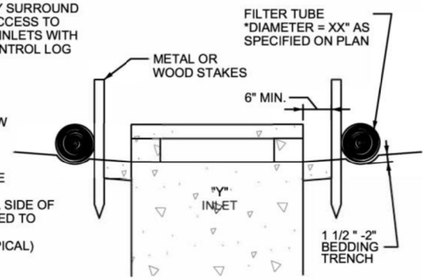
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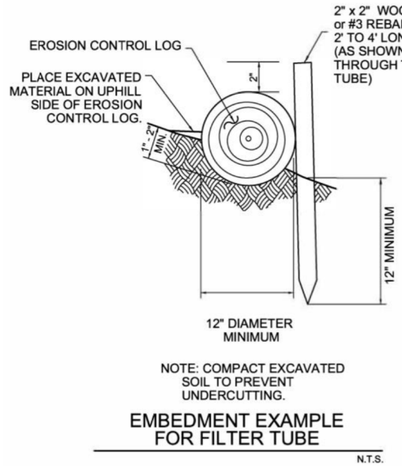
Figure 3.14 Schematics of Block and Gravel Area Inlet Protection
(Source: Modified from City of Plano BMP SP-4)



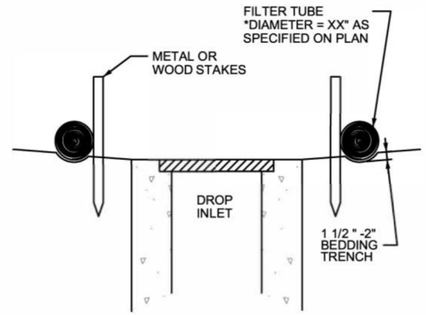
FILTER TUBE AREA
INLET PROTECTION PLAN VIEW
N.T.S.



FILTER TUBE "Y" INLET
PROTECTION CROSS SECTION
N.T.S.



EMBEDMENT EXAMPLE
FOR FILTER TUBE
N.T.S.



FILTER TUBE DROP INLET
PROTECTION CROSS SECTION
N.T.S.

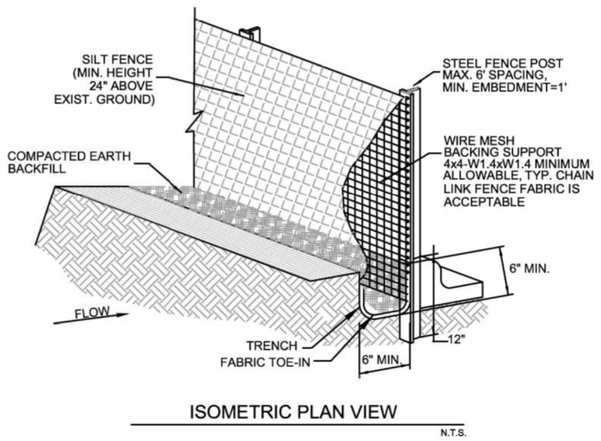
NOTE: SEE NCTCOG STANDARD SPECIFICATIONS (2017), SECTION 202.18

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Figure 3.15 Schematics of Organic Filter Tube Area Inlet Protection

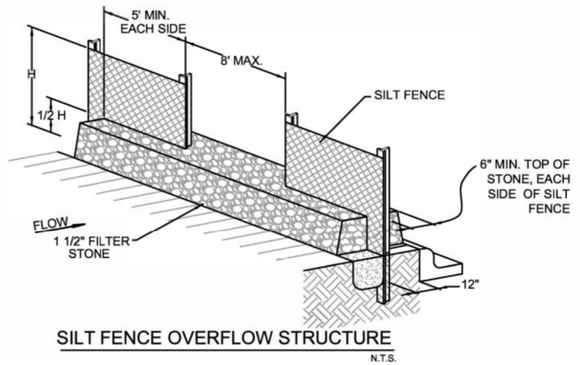
COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
SHEET NO. 229 OF 242
DWG NO. OC9-2813
CONTRACT NO. C-2033270-01

CB05-OC2-2813.001



ISOMETRIC PLAN VIEW

N.T.S.



SILT FENCE OVERFLOW STRUCTURE

N.T.S.

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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.

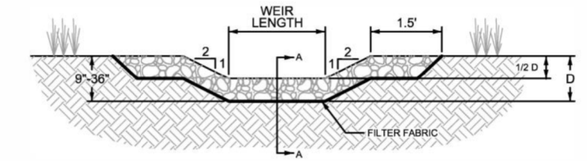
10. SEE NCTCOG STANDARD SPECIFICATIONS (2017), SECTION 202.5

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Figure 3.31 Silt Fence General Notes

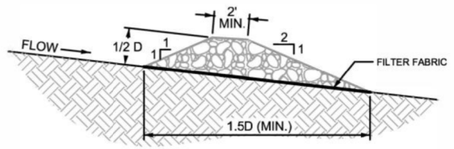
COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
SHEET NO. 230 OF 242
DWG NO. 0C9-2828
CONTRACT NO. C-2033270-01

STD5-0C9-2828.001



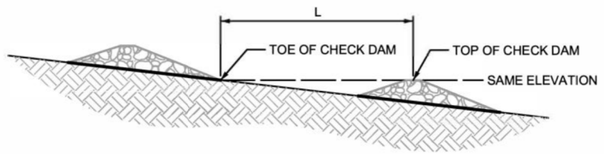
ROCK CHECK DAM VIEW LOOKING UPSTREAM

N.T.S.



CROSS SECTION A-A

N.T.S.



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

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Figure 2.1 Schematics of Rock Check Dams
(Source: Modified from Stormwater Management Manual for Western Washington)

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.

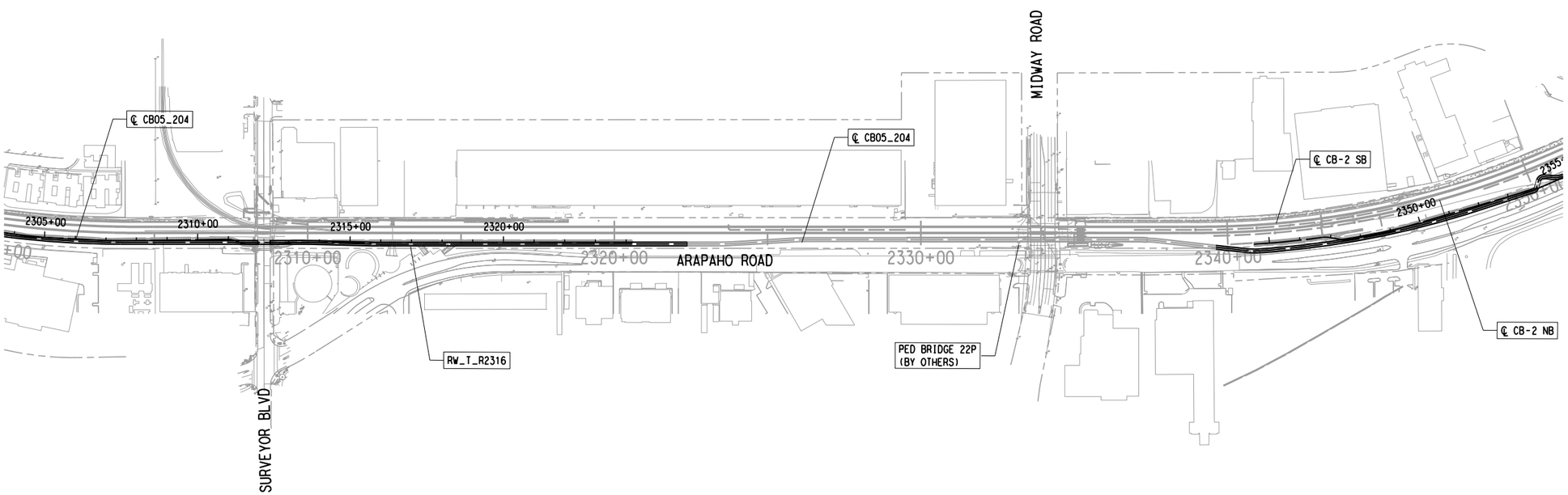
5. WHEN THE SITE HAS ACHIEVED FINAL STABILIZATION OR ANOTHER EROSION OR SEDIMENT CONTROL DEVICE IS EMPLOYED, THE CHECK DAM AND ACCUMULATED SILT SHALL BE REMOVED AND DISPOSED OF IN AN APPROVED MANNER.

Revised 2019

Figure 2.2 Rock Check Dams Schematic General Notes
(Source: Modified from Stormwater Management Manual for Western Washington)

06-MAR-2023 10:21
STD5-0C9-2829.001
JEGSVCPW001
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COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
SHEET NO. 231 OF 242
DWG NO. 0C9-2829
CONTRACT NO. C-2033270-01
STD5-0C9-2829.001

DWG No. CC4-9129



SCALE (IN FEET)
0 100 200 400

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CB05-CC4-9129.200

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ARCHER WESTERN HERZOG

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DESIGNED	J. SHEPHERD
CHECKED	B. ALLDREDGE
IN CHARGE	J. SHEPHERD
DATE	13 MAR 23

CAES

COTTON BELT REGIONAL RAIL VELOWEB HIKE & BIKE TRAIL

TOWN OF ADDISON RETAINING WALL KEY MAP

CONTRACT	DWG No.	REV
C-2033270-01	CC4-9129	D

CB05-CC4-9129.200

DWG No. SC5-2351

CHAIN RW_T_R2316 (HIKE & BIKE TRAIL)

Chain RW_T_R2316 contains:
2097 2098

Beginning chain RW_T_R2316 description
==========

Point 2097 N 7,035,882.0779 E 2,476,150.2948 Sta
10+00.00

Course from 2097 to 2098 N 89° 45' 07.37" E Dist 205.3367

Point 2098 N 7,035,882.9665 E 2,476,355.6296 Sta
12+05.34

==========
Ending chain RW_T_R2316 description

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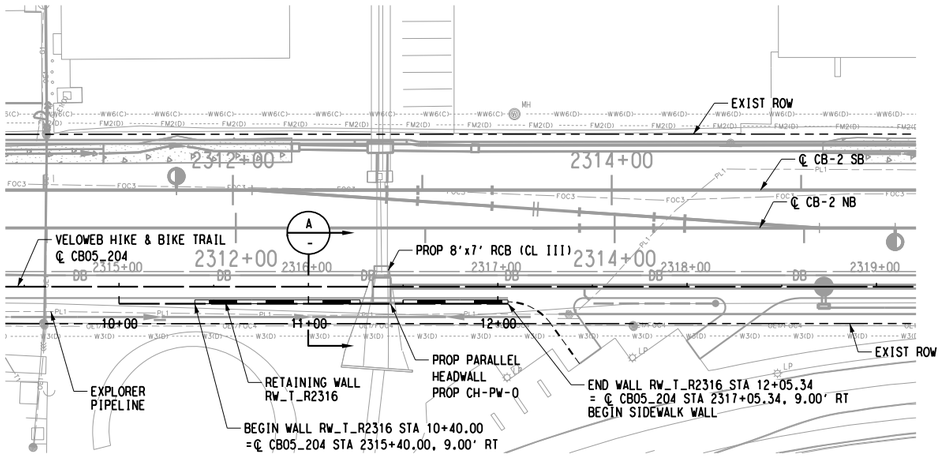
COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

TOWN OF ADDISON
RETAINING WALL RW_T_2316
HORIZONTAL ALIGNMENT DATA

CONTRACT	DWG No.	REV
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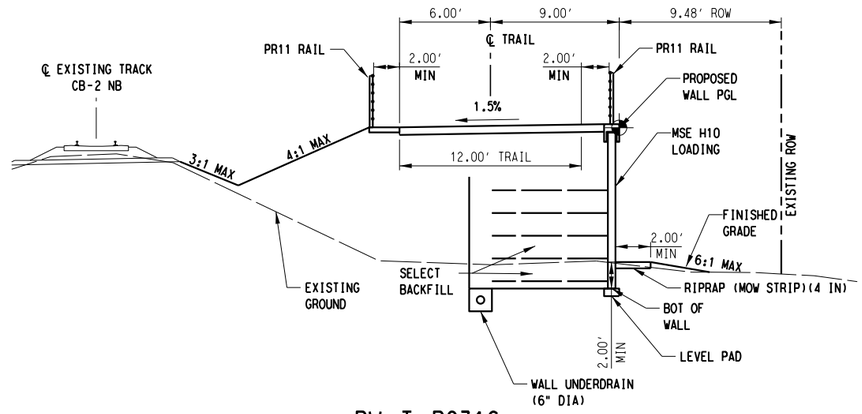
CB05-SC5-2351.001

DWG No. SC1-2350



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

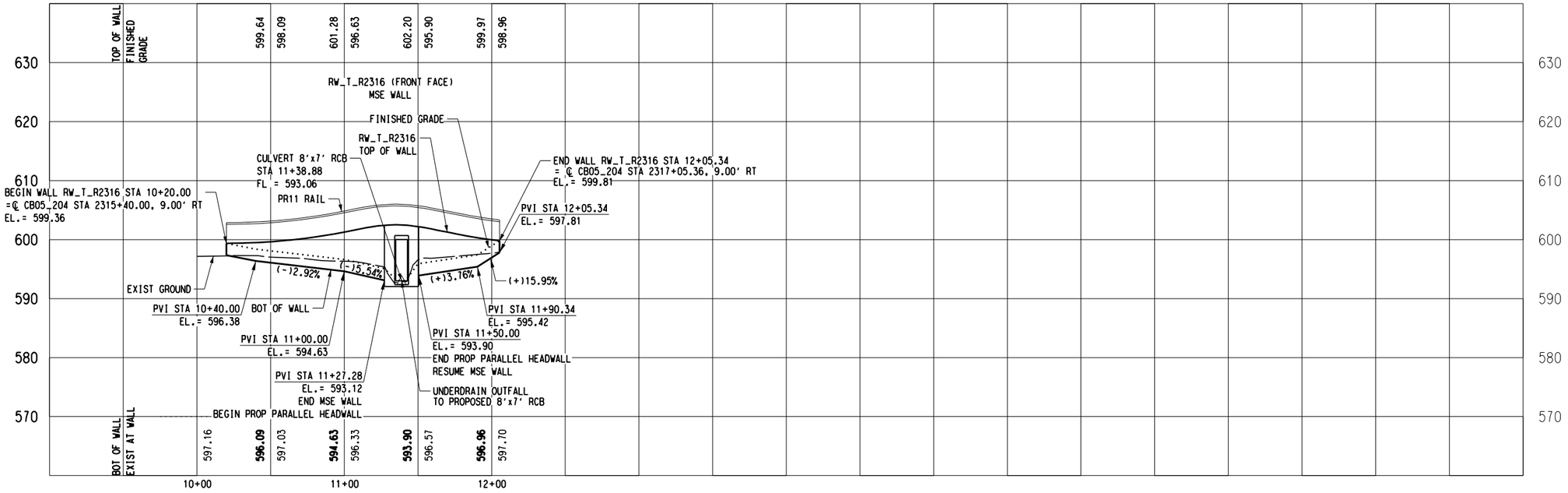
AT LEAST 48 HOURS BEFORE ANY CONSTRUCTION WITHIN 25 FEET OF EXPLORER'S PIPELINE, CONTACT EXPLORER PIPELINE AT (888) 876-3600

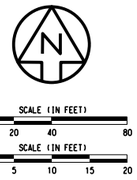


RW_T_R2316
SECTION A

RW_T_L3080 STA 11+00.00
NO SCALE

A





NOTES:

1. SEE TXDOT STANDARDS RW(MSE)DD, RW(MSE), RW(EM) AND RW(TRF) FOR MSE WALL REQUIREMENTS. (CS9-0956, CS9-0957, CS9-0975, CS9-0976, CS9-0977).
2. SEE RETAINING WALL HORIZONTAL ALIGNMENT DATA SHEET (SC5-2351).
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. 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): RW_T_2316 DART VELOWEB HIKE & BIKE TRAIL
11. SEE SC5-5917 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. 234 OF 242

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VELOWEB HIKE & BIKE TRAIL

TOWN OF ADDISON
RETAINING WALL RW_T_R2316
LAYOUT

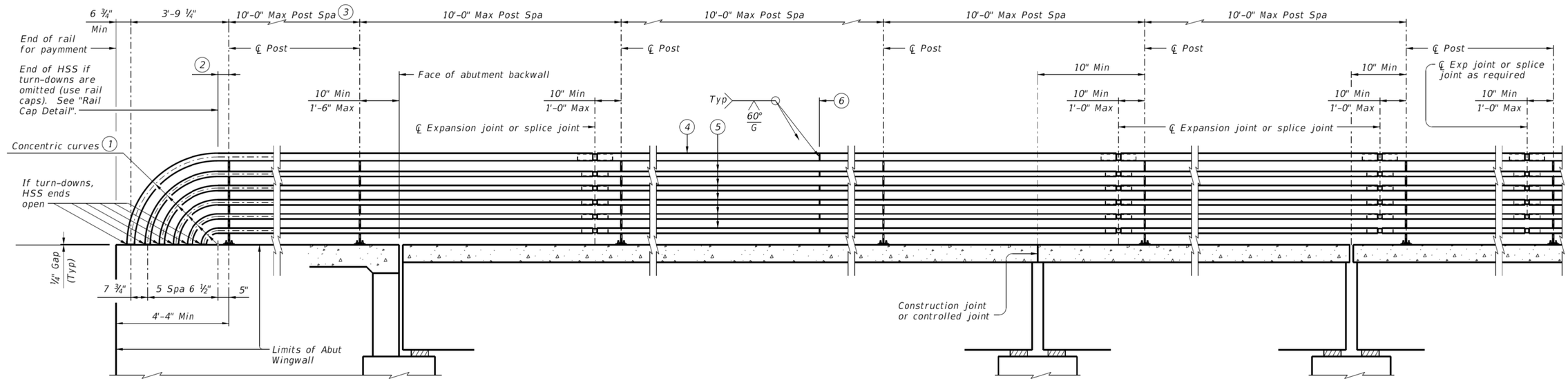
CONTRACT	DWG No.	REV
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CB05-SC1-2350.040

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RW Plan 6

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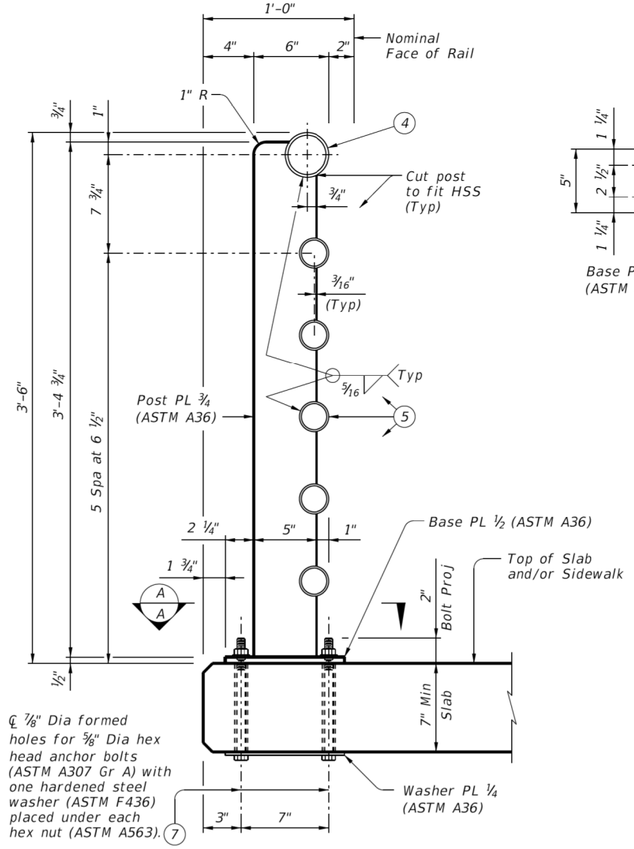


AT ABUTMENTS

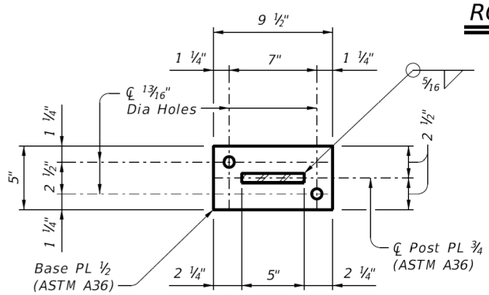
AT BENTS WITHOUT SLAB EXP JOINTS

AT BENTS WITH SLAB EXP JOINTS

ROADWAY ELEVATION OF RAIL

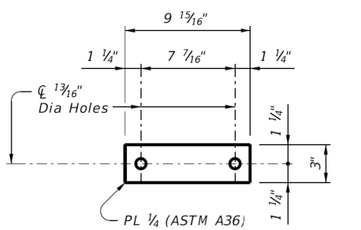


ON BRIDGE SLAB

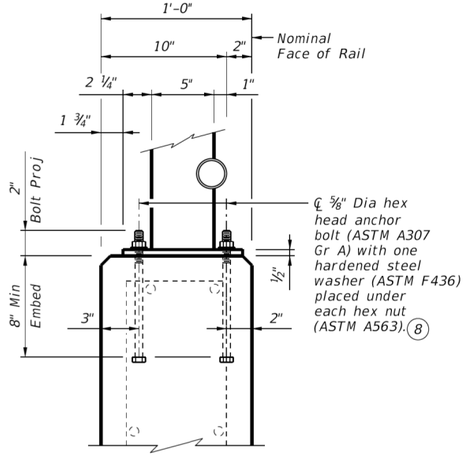


SECTION A-A

Showing base plate detail.

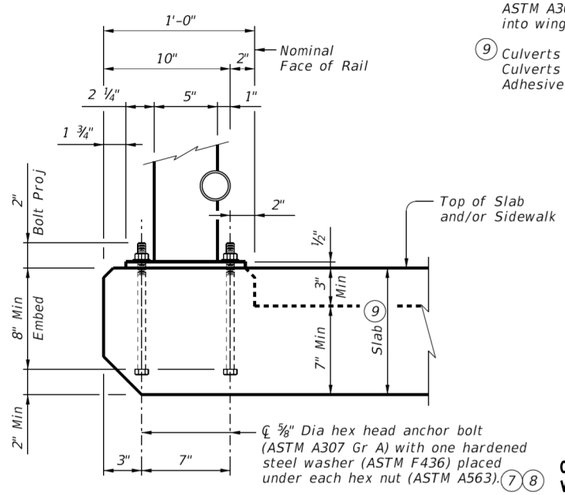


WASHER PLATE DETAIL



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.

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
SHEET NO. 235 OF 242
DWG NO. CS9-0965
CONTRACT NO. C-2033270-01

SHEET 1 OF 2

Texas Department of Transportation

Bridge Division Standard

PEDESTRIAN RAIL

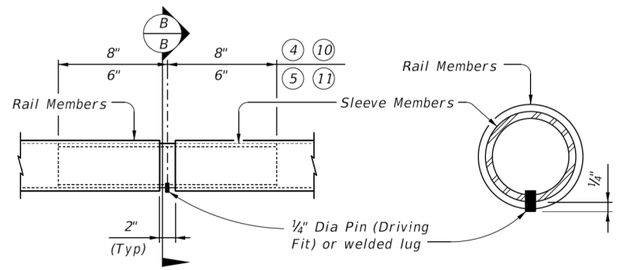
TYPE PR11

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STD5-CS9-0965.001

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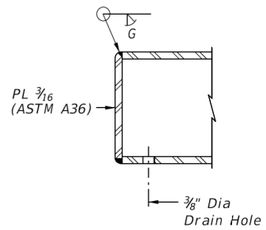
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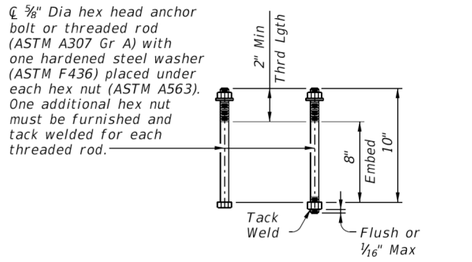
AT SPLICES OR EXP JTS

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 5/8" 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 5/8" 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. 236 OF 242
DWG NO. CS9-0966
CONTRACT NO. C-2033270-01

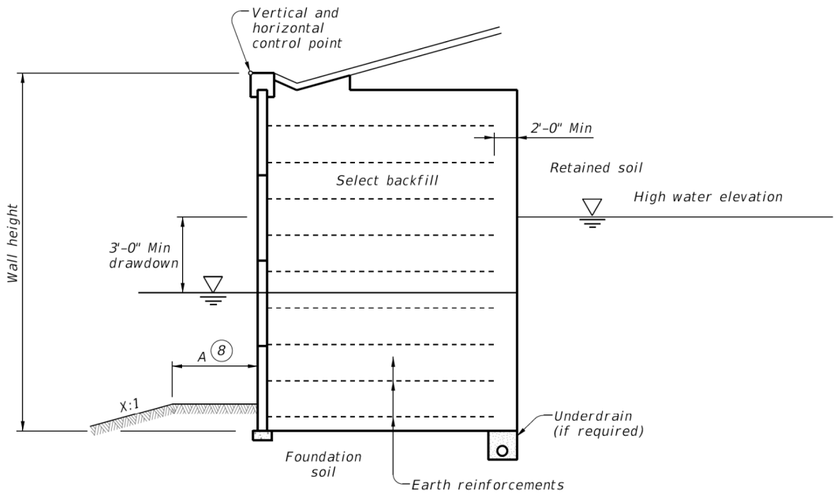
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WALL SUMMARY

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_R2316	10+40.00	12+05.34	26	25	NO	9'	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.

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COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
SHEET NO. 237 OF 242
DWG NO. CS9-0957
CONTRACT NO. C-2033270-01

Texas Department of Transportation

Bridge Division Standard

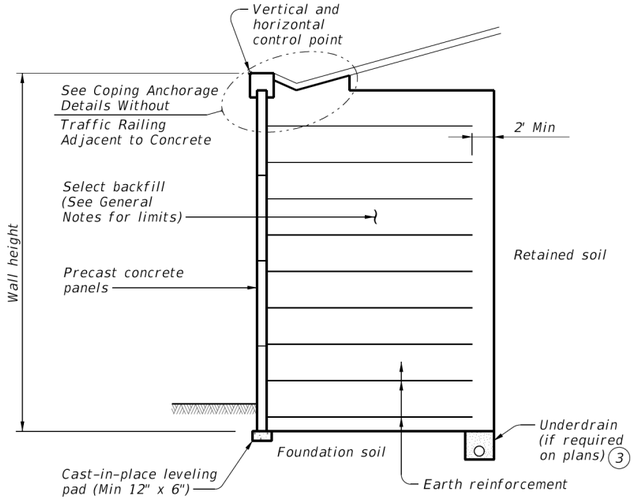
MECHANICALLY STABILIZED EARTH RETAINING WALL DESIGN DATA

RW(MSE)DD

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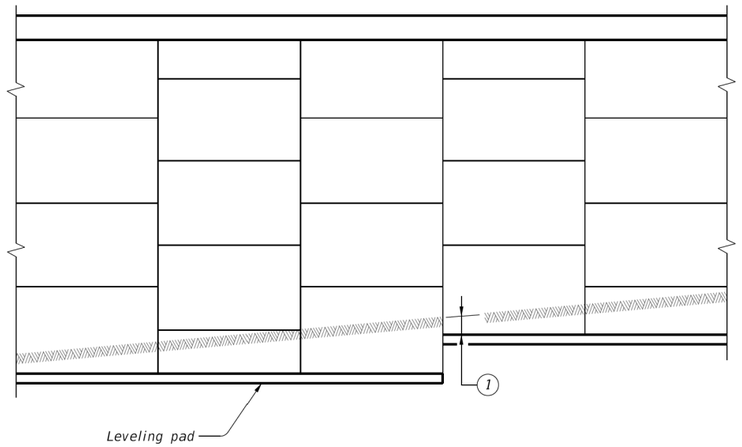
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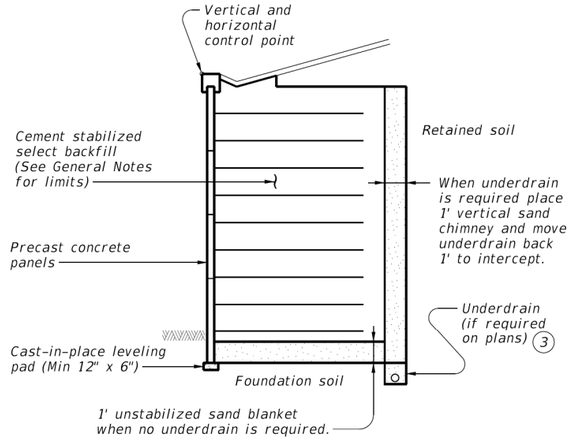
TYPICAL SECTION

(Wall at bottom of slope.)



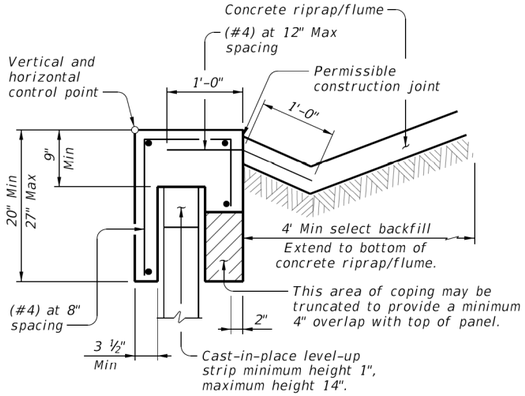
ELEVATION

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."



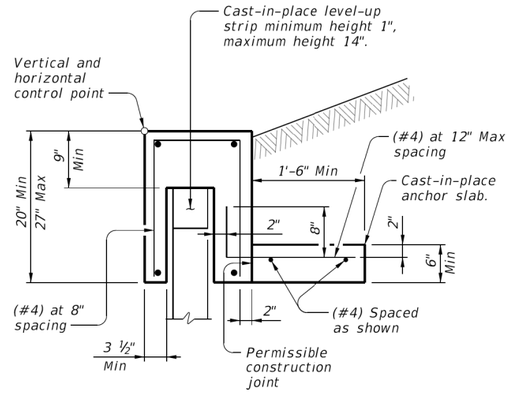
SPECIAL DRAINAGE PROVISIONS

(When cement stabilized backfill is used.)



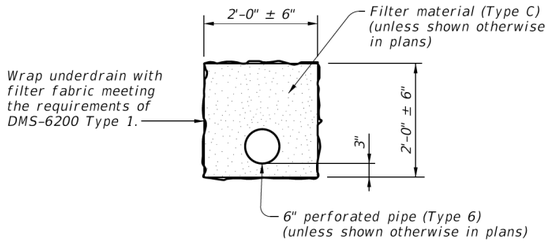
ADJACENT TO CONCRETE

(Excluding concrete pavement)

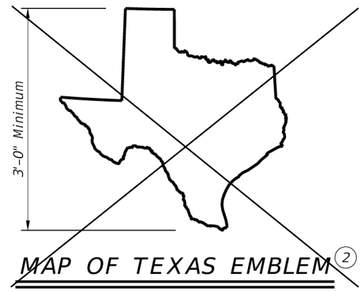


ADJACENT TO SOIL

COPING ANCHORAGE DETAILS WITHOUT TRAFFIC RAILING 4



UNDERDRAIN DETAIL 3



MAP OF TEXAS EMBLEM 2

IN-PROGRESS REVIEW

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JOHN R. SHEPHERD, P.E., 116040
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COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
SHEET NO. 238 OF 242
DWG NO. CS9-0975
CONTRACT NO. C-2033270-01

Texas Department of Transportation — Bridge Division Standard

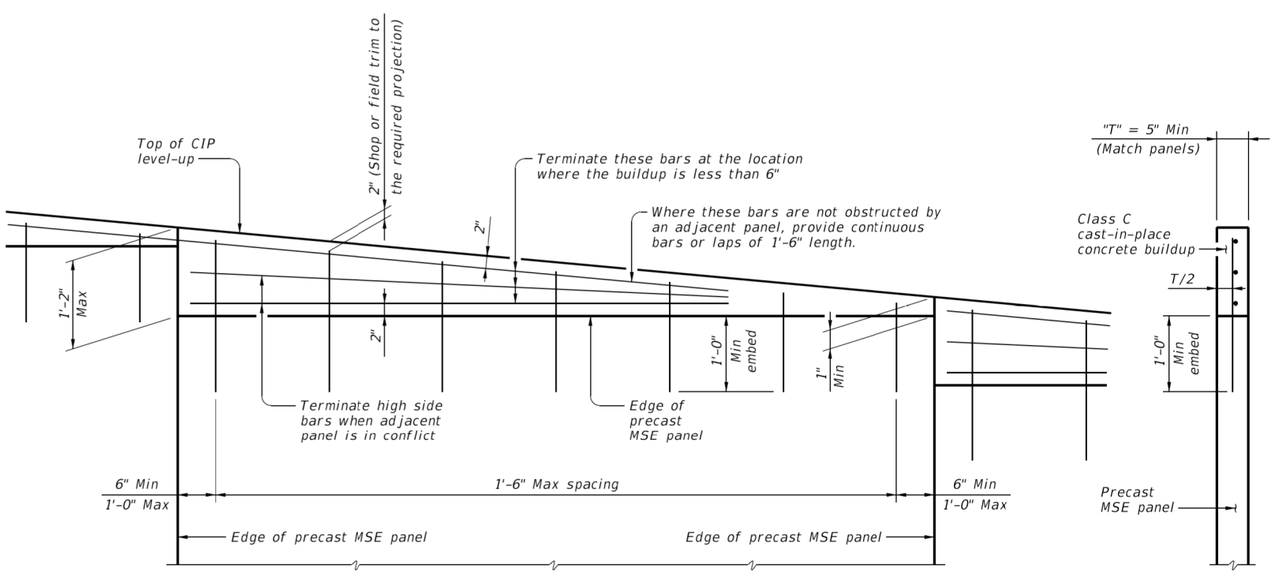
MECHANICALLY STABILIZED EARTH RETAINING WALL

RW(MSE) (MOD)

FILE: RW-MSE-22.dgn	DN: TxDOT	CK: TxDOT	DW: JER	CK: RLE
©TxDOT June 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS 07-22: Omitted "Map of Texas" emblem detail and note.	DIST	COUNTY		SHEET NO.

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ELEVATION SECTION

LEVEL UP DETAIL (5)

(5) Cast vertical bars into the top of panels. At Contractor's option vertical bars may be embedded 4 inches with a Type III Class C epoxy anchorage system. Follow manufacturer's directions for installing the epoxy vertical bars.

(6) Soil design parameters must be based on long term soil strength. Design parameters must be listed on the RW(MSE)DD standard.

(7)

SELECT BACKFILL UNIT WEIGHT			
Type AS, BS & DS	Unit Weight	Internal Stability	External Stability
	105 PCF	Pullout	Sliding, Overturning, Eccentricity
	125 PCF	Rupture	Bearing

DESIGN CRITERIA NOTES:

Design Parameters:

Base design of retaining walls on the following design parameters unless stated elsewhere in the plans:

Retained Soil	Unit Weight = 125 pcf ϕ = (6) C = 0 psf
Foundation Soil	ϕ = (6) C = 0 psf
Select Backfill	Unit Weight = See Table (7) ϕ = 34° C = 0 psf
Cement Stabilized Select Backfill	Unit Weight = 125 pcf ϕ = 45° C = 0 psf

Limit stress in steel and concrete in accordance with current AASHTO Standard Specifications for Highway Bridges and Interim Specifications.

The minimum length of earth reinforcement are as shown on the Mechanically Stabilized Earth Retaining Wall Design Data (RW[MSE]DD) standard.

Stability Criteria:

Stability criteria applies to both dry and drawdown analysis. Base design on the following factors of safety.

Sliding along the base of the structure	Factor of Safety ≥ 1.5
Overturning	Factor of Safety ≥ 2.0
Pullout of Earth Reinforcement at each level	Factor of Safety ≥ 1.5

Design the wall such that the base pressure resultant falls within the middle third of the retaining wall.

Determine pullout resistance from test data evaluated at ¾ inch strain.

Corrosion Criteria:

Design the earth reinforcement elements to have a minimum design life of 75 years, using current AASHTO corrosion rates.

Perform stress calculations (rupture) 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. Provide precast coping in 10-foot minimum lengths (typical.) To optimize coping lengths at radiuses, ends 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 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.

EARTH REINFORCEMENT:

Place the uppermost earth reinforcement no more than 3 feet below the top of wall.

Place the lowest level of earth reinforcement no more than 2 feet above the top of the leveling pad.

Provide earth reinforcement with a minimum wire size of W7.0. If different longitudinal and cross wires are used in an earth reinforcement mesh, the smaller wire must be 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. Provide unique transverse bar spacing for each mesh configuration, differing from other configurations by a minimum of 3 inches. Step earth reinforcement lengths in increments no finer than 12 inches.

PANELS:

Fabricate standard precast concrete panels to a maximum height of 6 feet 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 must not exceed 7 ft.-6 in. Provide a minimum panel thickness of 5 inches. Arrange panels to provide offset horizontal joints.

Provide an open joint around the perimeter of the concrete panels. Configure joints 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".

Provide a one-piece corner panel for wall angle changes of greater than 30 degrees. Butting of chamfered panels will be allowed for angle changes of 30 degrees or less.

MATERIAL NOTES:

Provide Class C concrete for reinforced concrete and precast coping.
Provide Class H concrete for precast concrete panels.
Provide Class A concrete for unreinforced concrete.
Provide Grade 60 reinforcing steel.

GENERAL NOTES:

Section and elevation shown is for informational purposes only. Determine specific geometry based on wall layouts and other plan information.

Extend select backfill specified for use within the mechanically stabilized earth volume horizontally from the back of the panels a minimum 2 feet beyond the end of the earth reinforcement. Extend select backfill vertically to the top of the panels from either the top of the leveling pad, or from 4 inches below the lowest earth reinforcement, whichever is lower.

Provide concrete coping along the top of wall, at the vertical steps at bridge backwalls, and at other vertical steps along the top of wall.

Provide details and calculations that establish support for panels that are affected when obstructions (inlets, drilled shafts, piling, etc.) prevent placement of soil reinforcement in their normal locations. Furnish the same earth reinforcement coverage as that required in the absence of the obstruction. For skewed (rotated) earth reinforcement, no adjustment in length is needed for skew angles less than or equal to 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 when skew angles are greater than 10 degrees. Provide calculations that justify any alterations made to the soil reinforcement or modifications to their normal placement. Do not use panels without any soil reinforcement connected to them unless they are connected with galvanized hardware to adjacent panels which do have supporting soil reinforcement attached to them and as approved by the Engineer.

Coping and anchor slabs are considered subsidiary to the Item 423, "Retaining Walls."

Use these details in conjunction with the retaining wall layout, the Mechanically Stabilized Earth Retaining Wall Design Data (RW[MSE]DD) standard and other applicable standards.

Cover dimensions are clear dimensions, unless noted otherwise.

Texas Department of Transportation

Bridge Division Standard

MECHANICALLY STABILIZED EARTH RETAINING WALL

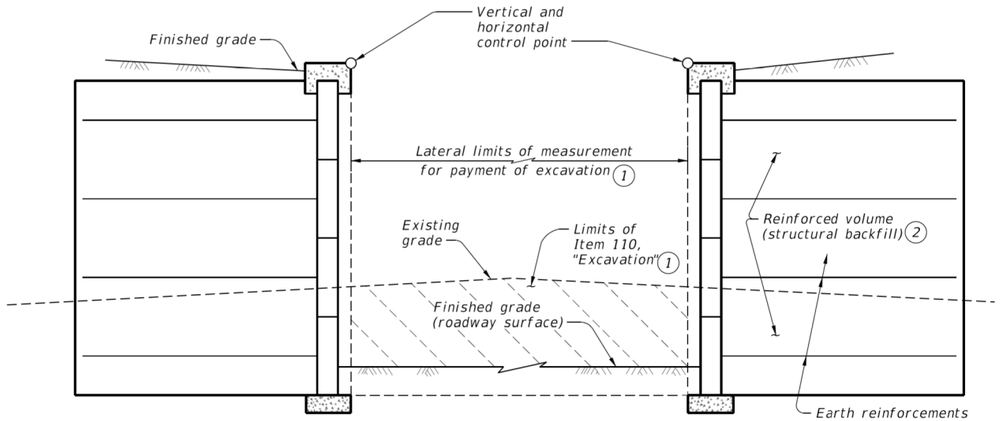
RW(MSE)

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
SHEET NO. 239 OF 242
DWG NO. CS9-0976
CONTRACT NO. C-2033270-01

FILE: RW-MSE-22.dgn	DN: TxDOT	CK: TxDOT	DW: JER	CK: RLE
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REVISIONS				
	DIST	COUNTY		SHEET NO.

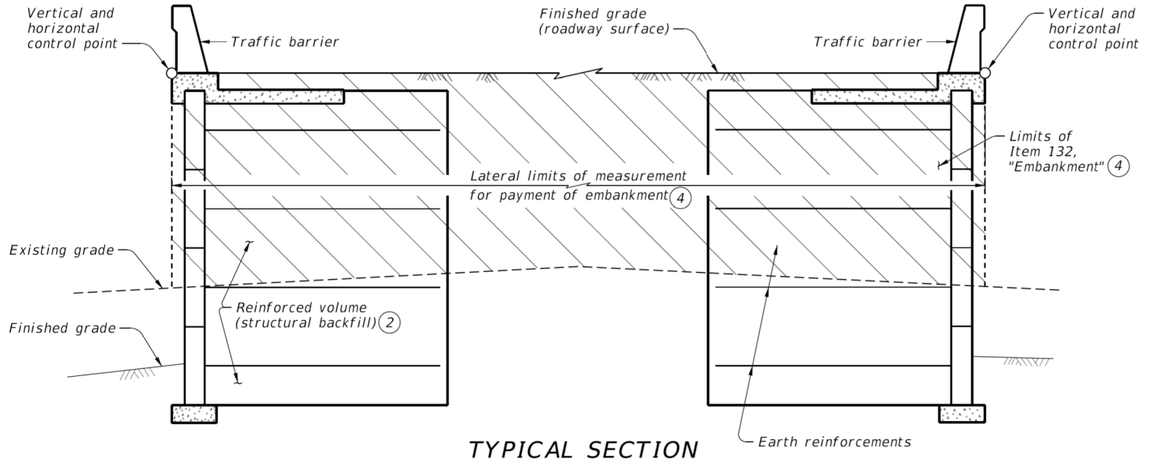
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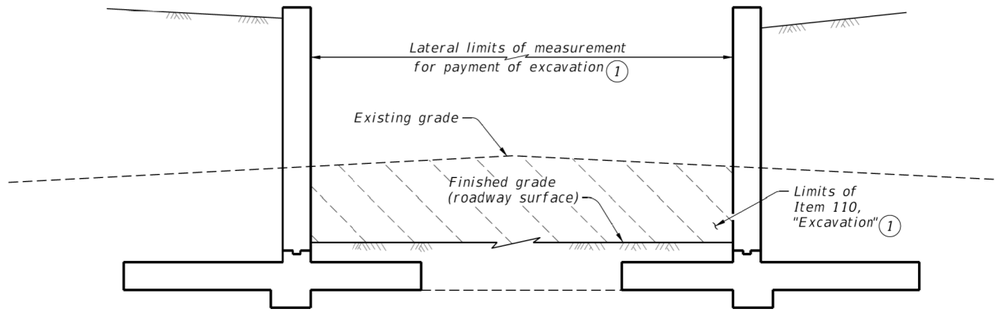
TYPICAL SECTION

(Excavation between MSE retaining walls.) (3)



TYPICAL SECTION

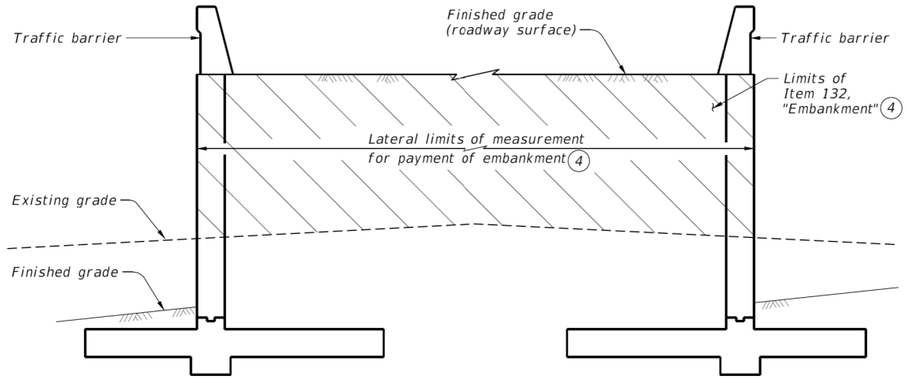
(Embankment between MSE retaining walls.) (3)



TYPICAL SECTION

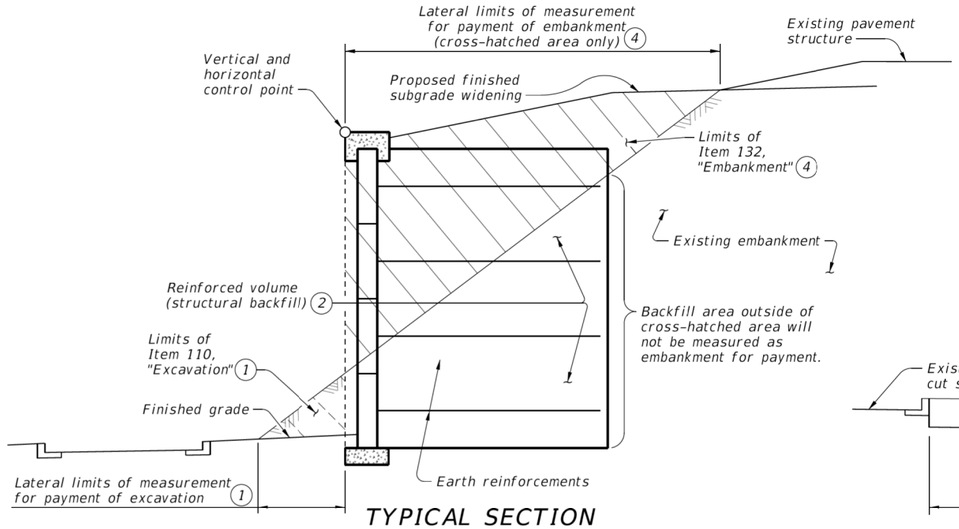
(Excavation between conventional retaining walls.)

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.



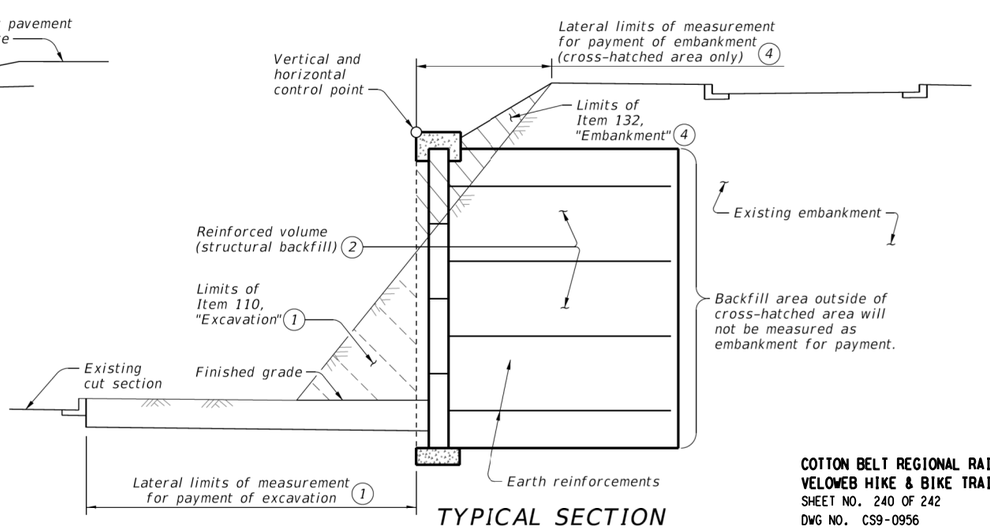
TYPICAL SECTION

(Embankment between conventional retaining walls.)



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. 240 OF 242
DWG NO. CS9-0956
CONTRACT NO. C-2033270-01

Texas Department of Transportation

Bridge Division Standard

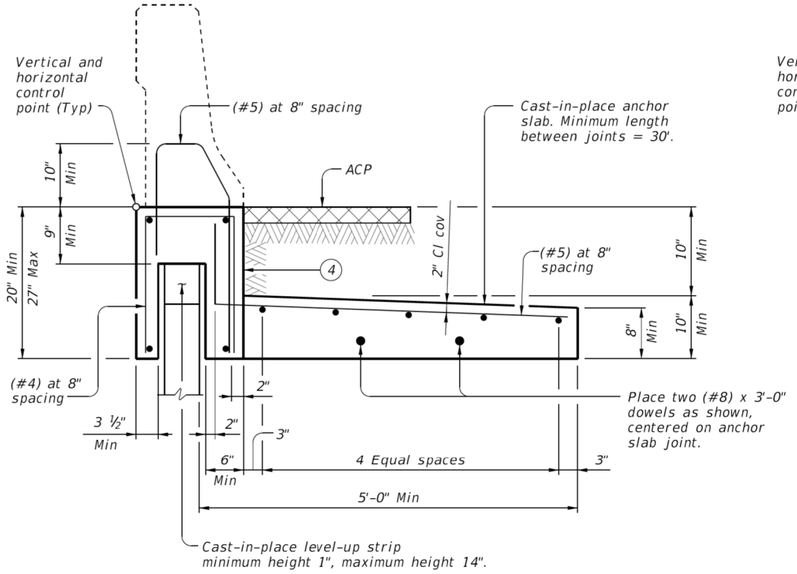
EARTHWORK MEASUREMENT AT RETAINING WALL

RW(EM)

FILE: RW-EM-22.dgn	DN: TxDOT	CK: TxDOT	DW: JER	CK: RLE
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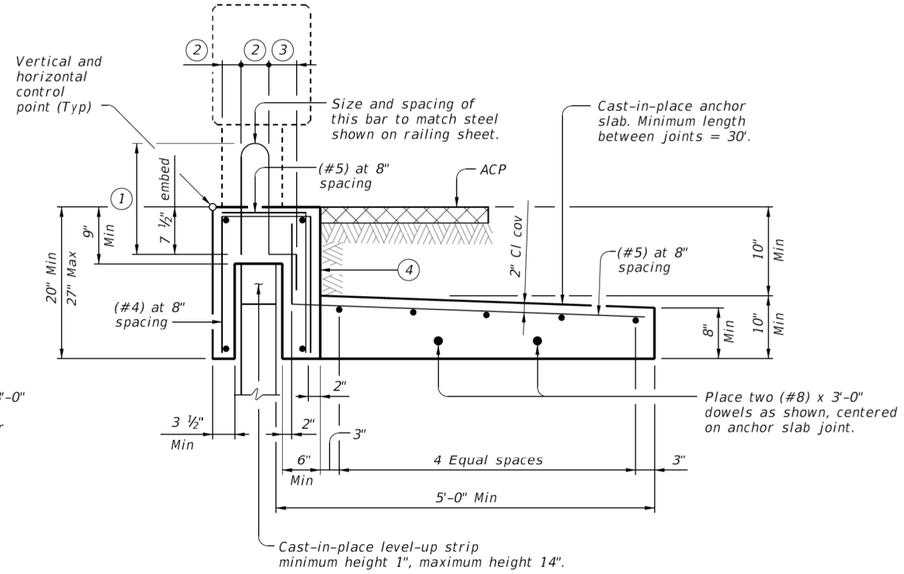
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"WIDE BASED" ADJACENT TO ACP

(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."

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.

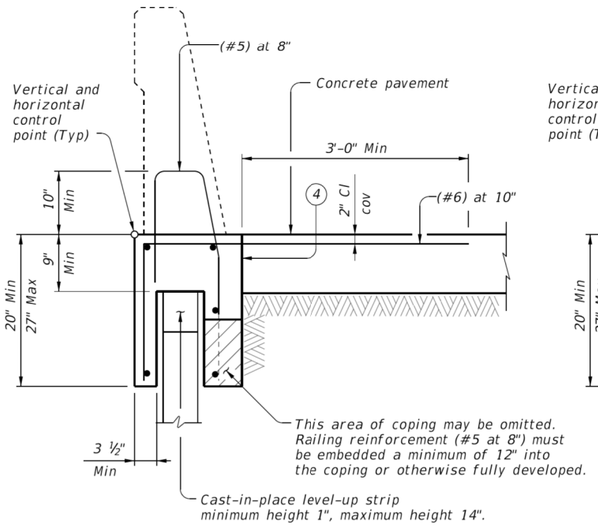
Submit shop drawings for the traffic railing foundations to the Engineer in accordance with Item 423, "Retaining Walls." The shop drawings must include bar bending details.

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.

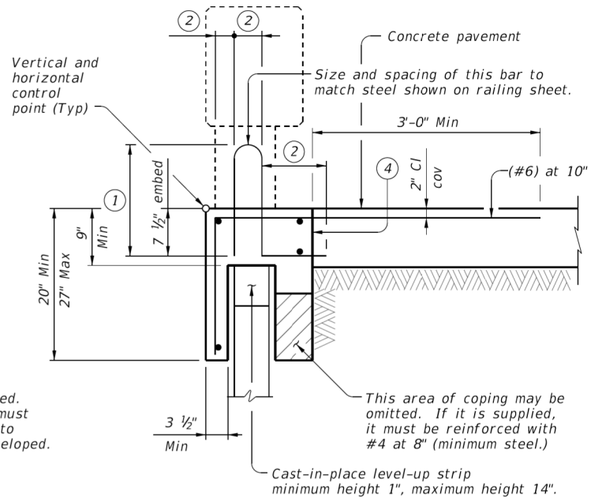
Coping and anchor slabs are considered subsidiary to Item 423, "Retaining Walls." Payment for traffic railing is per the linear foot for the appropriate railing type.

Cover dimensions are clear dimensions, unless noted otherwise.



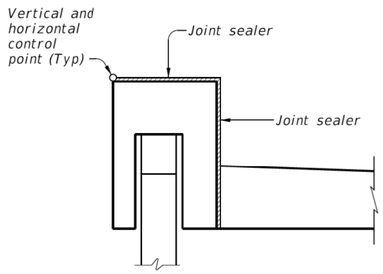
"WIDE BASED" ADJACENT TO CONCRETE PAVEMENT

(Showing SSTR Rail, other rails listed similar.)

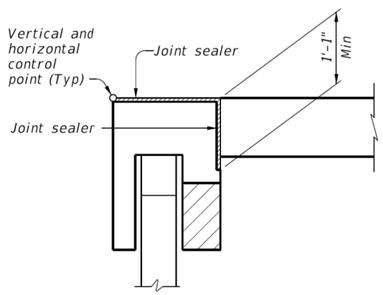


"NARROW BASED" ADJACENT TO CONCRETE PAVEMENT

(Showing T223 Rail, other rails listed similar.)



ADJACENT TO ACP



ADJACENT TO CONCRETE PAVEMENT

COPING JOINT SEALER DETAILS

(Reinforcing steel not shown for clarity.)

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL
SHEET NO. 241 OF 242
DWG NO. CS9-0977
CONTRACT NO. C-2033270-01

Texas Department of Transportation — Bridge Division Standard

RETAINING WALL TRAFFIC RAILING FOUNDATIONS

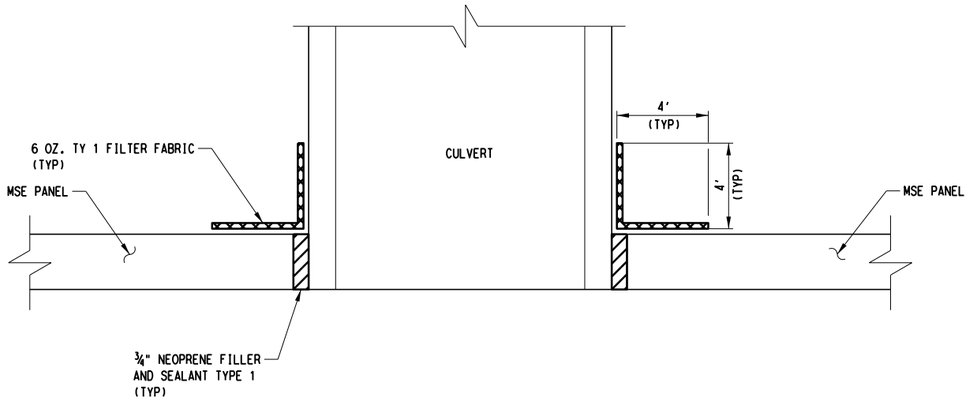
RW(TRF)

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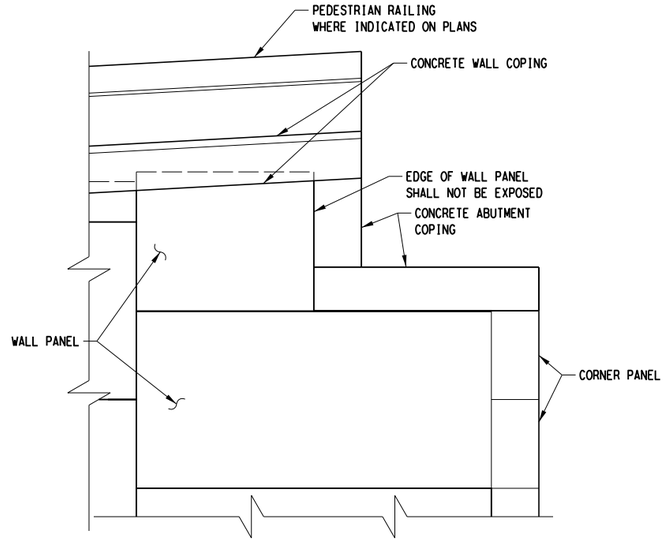
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FILE: STD5-CS9-0977.001

STD5-CS9-0977.001

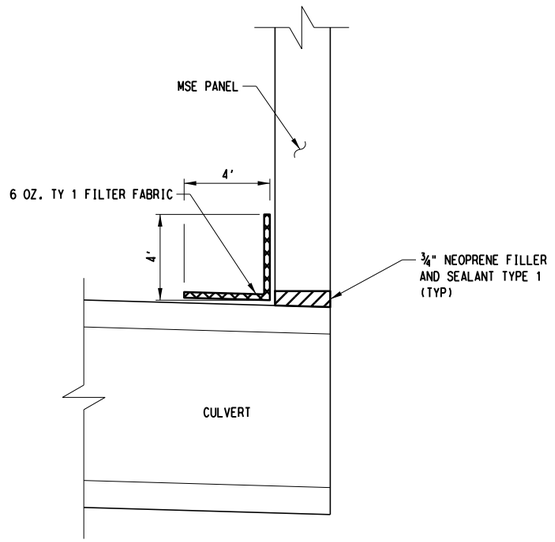
DWG No. SC5-5917



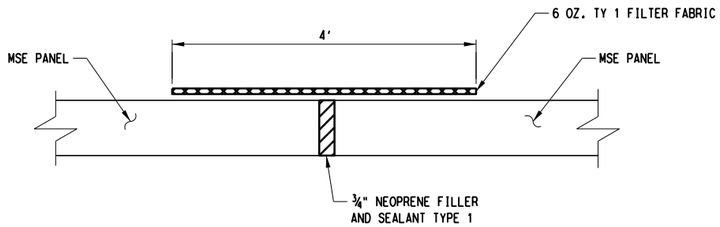
WALL / SIDES OF CULVERT JOINT DETAIL
NO SCALE



ABUTMENT COPING DETAIL
NO SCALE



WALL / TOP OF CULVERT JOINT DETAIL
NO SCALE



SLIP JOINT DETAIL
NO SCALE

NOT AN APPROVED DRAWING
FINAL 100% DESIGN

CONTRACT SHEET No. 242 OF 242

REV	AMEND	CR	DATE	DESCRIPTION	BY	ENG	CHK	APP

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ARCHER WESTERN HERZOG

DART PROJECT

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SCALE	NO SCALE
DRAWN	J. RAPIER
DESIGNED	J. SHEPHERD
CHECKED	B. ALLDREDGE
IN CHARGE	J. SHEPHERD
DATE	13 MAR 23

CAES

COTTON BELT REGIONAL RAIL
VELOWEB HIKE & BIKE TRAIL

TOWN OF ADDISON
RETAINING WALL
MISCELLANEOUS DETAILS

CONTRACT	DWG No.	REV
C-2033270-01	SC5-5917	D

CB05-SC5-5917.040

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