

TOWN OF FAIRVIEW, TEXAS

EAST STACY ROAD IMPROVEMENTS

MARCH 2017

APPROVED BY:
TOWN OF FAIRVIEW, TEXAS

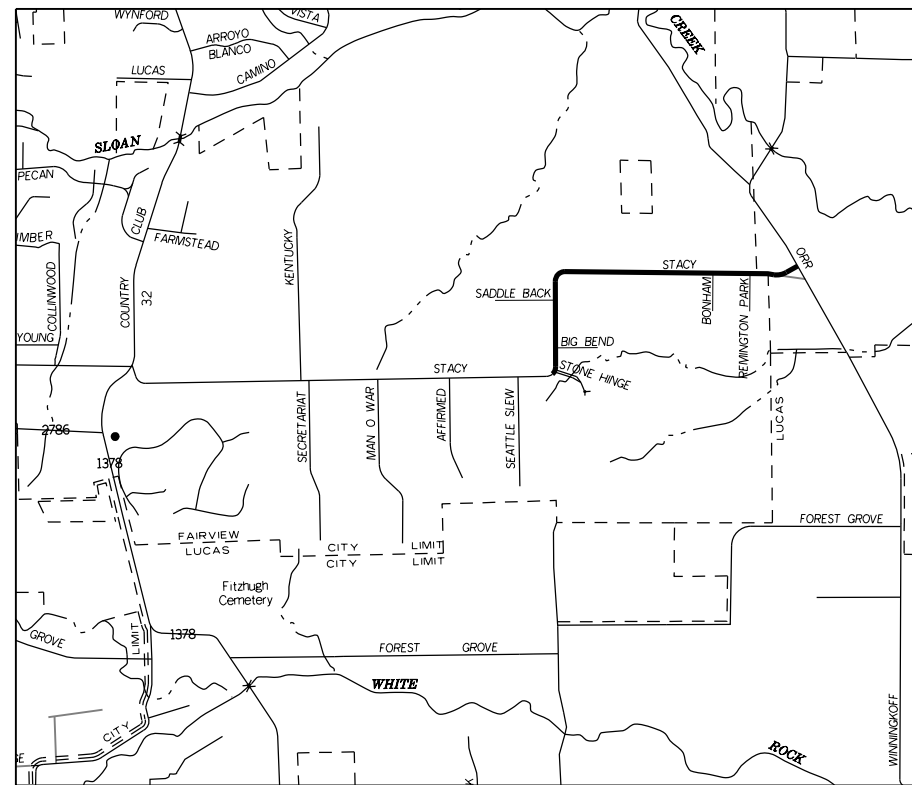
SUBMITTED BY:
HUITT-ZOLLARS, INC.

JULIE COUCH
TOWN MANAGER

DATE

JAMES CHANCELLOR, PE
TOWN ENGINEER

DATE



STEPHEN C. WOODRUFF, PE

DATE

HUITT-ZOLLARS
HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING
1717 MCKINNEY AVE., SUITE 1400 DALLAS, TEXAS 75202
Firm No. F-761

ROADWAY: 5345.22 FT
BRIDGE: 0.0 FT
RAILROAD CROSSINGS: NONE
NO STATION EQUATIONS

PROJECT VICINITY MAP

90% SUBMITTAL

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SHEET NO.	SHEET TITLE	SHEET	SHEET NO.	SHEET TITLE	SHEET	SHEET NO.	SHEET TITLE	SHEET
GENERAL SHEETS			ROADWAY PLANS			DRAINAGE PLANS		
1	TITLE SHEET	1 of 1	48	REMOVAL PLAN	1 of 7	83	DRAINAGE AREA MAP	1 of 1
2	INDEX OF SHEETS	1 of 1	49	REMOVAL PLAN	2 of 7	84	RUNOFF TABLE	1 of 1
3	TYPICAL SECTIONS	1 of 2	50	REMOVAL PLAN	3 of 7	85	DRAINAGE INLET CALCULATIONS	1 of 3
4	GENERAL & TECHNICAL NOTES	1 of 1	51	REMOVAL PLAN	4 of 7	86	DRAINAGE INLET CALCULATIONS	2 of 3
5	HORIZONTAL ALIGNMENT & PROJECT CONTROL	1 of 4	52	REMOVAL PLAN	5 of 7	87	DRAINAGE INLET CALCULATIONS	3 of 3
6	HORIZONTAL ALIGNMENT & PROJECT CONTROL	2 of 4	53	REMOVAL PLAN	6 of 7	88	DRAINAGE HYDRAULIC CALCULATIONS	1 of 4
7	HORIZONTAL ALIGNMENT & PROJECT CONTROL	3 of 4	54	REMOVAL PLAN	7 of 7	89	DRAINAGE HYDRAULIC CALCULATIONS	2 of 4
8	HORIZONTAL ALIGNMENT & PROJECT CONTROL	4 of 4	55	HORIZONTAL ALIGNMENT DATA - STACY RD	1 of 1	91	DRAINAGE HYDRAULIC CALCULATIONS	4 of 4
TRAFFIC CONTROL PLAN			56	STACY RD. PLAN & PROFILE	1 of 13	92	STORM DRAIN PLAN & PROFILE	1 of 10
9	TRAFFIC CONTROL TYPICAL SECTIONS	1 of 2	57	STACY RD. PLAN & PROFILE	2 of 13	93	STORM DRAIN PLAN & PROFILE	2 of 10
10	TRAFFIC CONTROL TYPICAL SECTIONS	2 of 2	58	STACY RD. PLAN & PROFILE	3 of 13	94	STORM DRAIN PLAN & PROFILE	3 of 10
11	TRAFFIC CONTROL DETOUR ALIGNMENT	1 of 1	59	STACY RD. PLAN & PROFILE	4 of 13	95	STORM DRAIN PLAN & PROFILE	4 of 10
12	TRAFFIC CONTROL PLAN - PHASE 1	1 of 3	60	STACY RD. PLAN & PROFILE	5 of 13	96	STORM DRAIN PLAN & PROFILE	5 of 10
13	TRAFFIC CONTROL PLAN - PHASE 1	2 of 3	61	STACY RD. PLAN & PROFILE	6 of 13	97	STORM DRAIN PLAN & PROFILE	6 of 10
14	TRAFFIC CONTROL PLAN - PHASE 1	3 of 3	62	STACY RD. PLAN & PROFILE	7 of 13	98	STORM DRAIN PLAN & PROFILE	7 of 10
15	TRAFFIC CONTROL PLAN - PHASE 2	1 of 3	63	STACY RD. PLAN & PROFILE	8 of 13	99	STORM DRAIN PLAN & PROFILE	8 of 10
16	TRAFFIC CONTROL PLAN - PHASE 2	2 of 3	64	STACY RD. PLAN & PROFILE	9 of 13	101	STORM DRAIN PLAN & PROFILE	10 of 10
17	TRAFFIC CONTROL PLAN - PHASE 2	3 of 3	65	STACY RD. PLAN & PROFILE	10 of 13	102	STORM DRAIN NETWORK 1 LATERALS	1 of 1
18	TRAFFIC CONTROL PLAN - PHASE 3	1 of 4	66	STACY RD. PLAN & PROFILE	11 of 13	103	STORM DRAIN NETWORK 2 LATERALS	1 of 2
19	TRAFFIC CONTROL PLAN - PHASE 3	2 of 4	67	STACY RD. PLAN & PROFILE	12 of 13	104	STORM DRAIN NETWORK 2 LATERALS	2 of 2
20	TRAFFIC CONTROL PLAN - PHASE 3A	2 of 4	68	STACY RD. PLAN & PROFILE	13 of 13	105	NETWORK 1 CULVERT	1 of 1
21	TRAFFIC CONTROL PLAN - PHASE 3B	4 of 4	69	DRIVEWAY PLAN & PROFILE STA. 109+25	1 of 1	DRAINAGE STANDARDS		
22	DETOUR PLAN & PROFILE	1 of 12	70	JOINT LAYOUT	1 of 3	106 - 108	NCTCOG DRAINAGE STANDARDS	
23	DETOUR PLAN & PROFILE	2 of 12	71	JOINT LAYOUT	2 of 3	109 - 111	CONCRETE WINGWALLS	
24	DETOUR PLAN & PROFILE	3 of 12	72	JOINT LAYOUT	3 of 3	112 - 117	CAST-IN-PLACE BOX CULVERTS	
25	DETOUR PLAN & PROFILE	4 of 12	73	PAVING DETAILS	1 of 1	118 - 120	PRE-CAST BOX CULVERTS	
26	DETOUR PLAN & PROFILE	5 of 12	EROSION CONTROL PLANS			121	SAFETY END TREATMENTS	
27	DETOUR PLAN & PROFILE	6 of 12	74	EROSION CONTROL PLAN-PHASE 1	1 of 3	PAVEMENT MARKING STANDARDS		
28	DETOUR PLAN & PROFILE	7 of 12	75	EROSION CONTROL PLAN-PHASE 1	2 of 3	123	STANDARD PAVEMENT MARKINGS	
29	DETOUR PLAN & PROFILE	8 of 12	76	EROSION CONTROL PLAN-PHASE 1	3 of 3	124	BICYCLE LANE PAVEMENT MARKINGS	
30	DETOUR PLAN & PROFILE	9 of 12	77	EROSION CONTROL PLAN-PHASE 2	1 of 3	CROSS SECTIONS		
31	DETOUR PLAN & PROFILE	10 of 12	78	EROSION CONTROL PLAN-PHASE 2	2 of 3	125-180	PROPOSED CROSS SECTIONS	1 - 56
32	DETOUR PLAN & PROFILE	11 of 12	79	EROSION CONTROL PLAN-PHASE 2	3 of 3			
33	DETOUR PLAN & PROFILE	12 of 12	TRAFFIC CONTROL STANDARDS					
34 - 45	TXDOT BARRICADE & CONSTRUCTION STANDARDS		80 - 82	EROSION CONTROL STANDARDS				
46 - 47	LOW PROFILE CONCRETE BARRIER STANDARD (TXDOT)							

THE STANDARD SHEETS IDENTIFIED ON THIS SHEET WITH A "*" HAVE BEEN SELECTED BY ME OR UNDER MY RESPONSIBLE SUPERVISION AS BEING APPLICABLE TO THIS PROJECT.

CHRISTIAN L. MOORMAN, P.E. DATE
 TEXAS PE #: 93828

THE STANDARD SHEETS IDENTIFIED ON THIS SHEET WITH A "***" HAVE BEEN SELECTED BY ME OR UNDER MY RESPONSIBLE SUPERVISION AS BEING APPLICABLE TO THIS PROJECT.

HAMILTON DALLAGASPERINA, P.E. DATE
 TEXAS PE #: 91748

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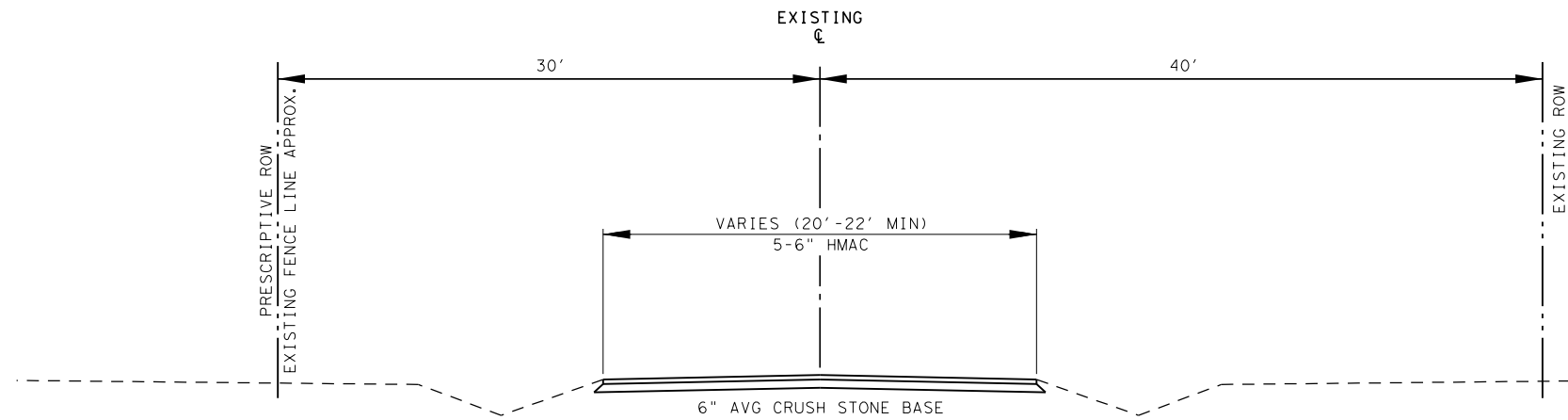
HUITT-ZOLLARS
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 Firm No. F-761

 TOWN OF FAIRVIEW, TEXAS
 372 TOWN PLACE
 FAIRVIEW, TX 75069
 972-562-0522

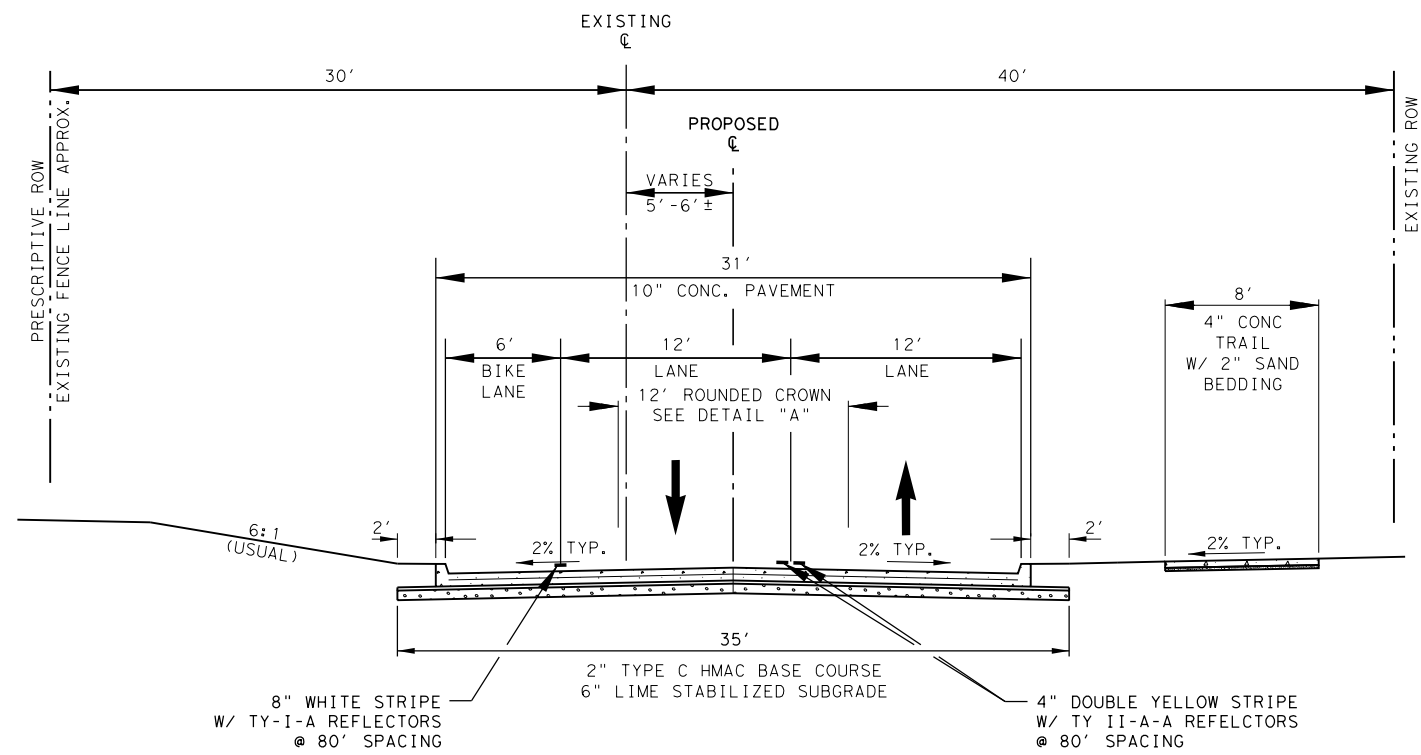
E. STACY ROAD IMPROVEMENTS
INDEX OF SHEETS

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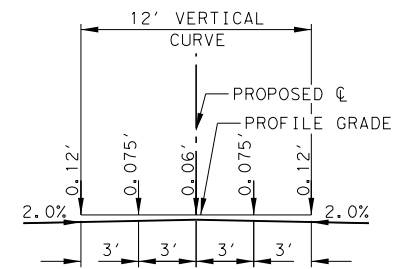
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**EXISTING TYPICAL SECTION
 E. STACY ROAD**



**PROPOSED TYPICAL SECTION
 E. STACY ROAD**



**DETAIL "A"
 ROUNDED CROWN DETAIL**

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 BIDDING, OR PERMIT PURPOSES.

 HUITT-ZOLLARS, INC.
 Christian L. Moorman, P.E. #93828
 Date: 3/17/2017

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**E. STACY ROAD IMPROVEMENTS
 TYPICAL SECTIONS**

SCALE: NONE		SHEET 1 OF 1	
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SHEET NO.

GENERAL NOTES:

- UNLESS OTHERWISE NOTED, THE CONTRACTOR SHALL REPAIR EXISTING DRIVEWAYS TO SAME OR BETTER CONDITION. STREET SIGNS, REFLECTORS, AND PLANTER BOXES SHALL BE REPLACED OR REPAIRED TO SAME OR BETTER CONDITION BY THE CONTRACTOR.
- MAILBOXES IN CONSTRUCTION AREAS ARE TO BE TEMPORARILY RELOCATED TO THE CLOSEST LOCATION OUT OF THE RECONSTRUCTION AREA. THEY ARE TO REMAIN IN SERVICE AT ALL TIMES. UPON COMPLETION OF CONSTRUCTION, MAILBOXES ARE TO BE REINSTALLED AT THE LOCATION SPECIFIED ON THE PLANS IN THE SAME OR BETTER CONDITION.
- THE INFORMATION SHOWN IN THE PLANS CONCERNING TYPE AND LOCATION OF UNDERGROUND UTILITIES IS NOT GUARANTEED TO BE ACCURATE OR ALL INCLUSIVE. THE CONTRACTOR IS RESPONSIBLE FOR MAKING HIS OWN DETERMINATIONS AS TO TYPE AND LOCATION OF UNDERGROUND PIPELINES, CONDUITS AND STRUCTURES BY CONTACTING OWNERS OF UNDERGROUND UTILITIES AND BY PROSPECTING IN ADVANCE OF EXCAVATION OPERATIONS.
- THE CONSTRUCTION, OPERATION AND MAINTENANCE OF THIS PROPOSED PROJECT SHALL BE CONSISTENT WITH THE STATE IMPLEMENTATION PLANS AS PREPARED BY THE TEXAS COMMISSION ON ENVIRONMENTAL QUALITY.
- CONTRACTOR SHALL PROVIDE TRASH PICKUP IF EXISTING TRASH PICKUP IS INTERRUPTED BY CONSTRUCTION.
- THE CONTRACTOR SHALL MINIMIZE TURBIDITY IN WATERWAYS DURING ALL PHASES OF THE PROJECT. THE CONTRACTOR SHALL EMPLOY ADEQUATE METHODS TO ENSURE MINIMUM TURBIDITY FROM NEAR AND LONG TERM EROSION FOR FILL, SPOIL, AND/OR DEVEGETATED AREAS DURING AND FOLLOWING CONSTRUCTION. THE CONTRACTOR SHALL COMPLY WITH ALL APPLICABLE LAWS AND REGULATIONS CONCERNING WATER POLLUTION AND CONTROL OF EROSION.
- THE CONTRACTOR SHALL PROVIDE AND MAINTAIN ALL HORIZONTAL AND VERTICAL CONSTRUCTION STAKING AS REQUIRED FOR THE PROJECT DEVELOPMENT. ENGINEER HAS ESTABLISHED INITIAL CONTROL STAKING FOR PROJECT, BUT CONTRACTOR WILL BE RESPONSIBLE FOR ESTABLISHING ALL LINES AND GRADES TO CONSTRUCT PROJECT.
- THE LOCATIONS OF THE FILTER FABRIC FENCE SHOWN ON THE PLANS ARE APPROXIMATE ONLY. THE EXACT LOCATION(S) OF FILTER FABRIC FENCE SHALL BE DETERMINED BY THE ENGINEER OR THE ENGINEER'S RESIDENT PROJECT REPRESENTATIVE. THE FILTER FABRIC FENCE SHALL BE INSTALLED AND MAINTAINED AS SPECIFIED. PAYMENT SHALL BE MADE BASED ON THE UNIT PRICE AS LISTED IN THE BID PROPOSAL AND THE ORIGINAL LENGTH OF MATERIAL INSTALLED. PAYMENT SHALL NOT BE MADE FOR REPLACEMENT FENCE REQUIRED FOR REPAIR OR MAINTENANCE. THE COST OF REPAIRING THE FILTER FABRIC FENCE SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.
- ALL WASTE MATERIAL SHALL BE DISPOSED OF OFF-SITE. COPIES OF AGREEMENTS BETWEEN THE CONTRACTOR AND PROPERTY OWNER OF DISPOSAL SITES SHALL BE FURNISHED TO THE TOWN OF FAIRVIEW.
- EXCAVATED MATERIALS NOT MEETING SPECIFICATIONS SHALL BE CONSIDERED WASTE AND SHALL BE DISPOSED OF OFF SITE AT THE CONTRACTOR'S EXPENSE.
- ALL EXISTING PAVEMENT SHALL BE SAWCUT TO ENSURE A STRAIGHT SMOOTH SURFACE (NO DIRECT PAYMENT).
- CONTRACTOR SHALL KEEP DIRT, MUD AND DEBRIS OFF OF PUBLIC STREETS AROUND PROJECT. CONTRACTOR SHALL IMMEDIATELY CLEAN DIRT, MUD AND DEBRIS FROM PUBLIC STREETS AS SOON AS IT IS NOTICED BY THE CONTRACTOR OR NOTIFIED BY THE CITY, ENGINEER OR PROPERTY OWNERS.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR RE-ESTABLISHING ANY PROPERTY CORNERS, BENCHMARKS, OR CONTROL POINTS DISTURBED BY HIS CONSTRUCTION OPERATIONS. DISTURBED PROPERTY CORNERS SHALL BE RE-SET BY A LICENSED PROFESSIONAL LAND SURVEYOR.
- NO ADJUSTMENT FACTORS WERE USED IN DETERMINATION OF EXCAVATION OR EMBANKMENT QUANTITIES. PLAN QUANTITIES ARE ACTUAL IN PLACE VALUES. THIS IS A PLAN QUANTITY MEASUREMENT ITEM. THE QUANTITY TO BE PAID IS THE QUANTITY SHOWN IN THE PROPOSAL.

TRAFFIC CONTROL AND CONSTRUCTION SEQUENCE NARRATIVE

PHASE 1

- PLACE ADVANCED WARNING SIGNS, PERTINENT BARRICADES AND EROSION CONTROL MEASURES NECESSARY FOR OPEN CUT CULVERT INSTALLATION AT STA. 70+69. CONTRACTOR SHALL COORDINATE WITH THE TOWN AND ADJACENT NEIGHBORHOOD ASSOCIATIONS FOR THE TEMPORARY SHUT DOWN OF STACY ROAD FOR THE INSTALLATION OF THE CULVERT AT STA. 70+69. CULVERT INSTALLATION MAY TAKE PLACE OVER MULTIPLE DAYS/NIGHTS. A CONSTRUCTION SEQUENCE SHALL BE APPROVED IN WRITING BY THE ENGINEER PRIOR TO ANY CLOSING OF STACY ROAD. STACY ROAD SHUT DOWNS SHALL NOT OCCUR DURING PEAK HOUR TIMES.
- DURING THE CULVERT INSTALLATION AT STA. 70+69, DRAINAGE INSTALLATION AS SHOWN IN PHASE 1, MAY COMMENCE CONCURRENTLY.
- PLACE NECESSARY TEMPORARY DRAINAGE FEATURES AS SHOWN IN THE PLANS. PLACE REMAINING EROSION CONTROL MEASURES AS SHOWN IN THE PLANS.
- UPON COMPLETION OF ALL DRAINAGE FEATURES SHOWN FOR PHASE 1, PROPOSED DETOUR CONSTRUCTION MAY BEGIN.

PHASE 2

- UPON COMPLETION OF THE TEMPORARY DETOUR SHOWN IN PHASE 1, PLACE THE BARRICADES AND SIGNS AS SHOWN FOR THE TRAFFIC SWITCH.
- SWITCH NORTHBOUND AND EASTBOUND TRAFFIC AS SHOWN IN PHASE 2 TO THE TEMPORARY PAVEMENT.
- BEGIN CONSTRUCTION ON THE PROPOSED NORTHBOUND/EASTBOUND LANES AND DRAINAGE FEATURES AS SHOWN IN THE PLANS.

PHASE 3

- UPON COMPLETION OF THE HALF ROADWAY AND DRAINAGE FEATURES IN PHASE 2, PLACE THE BARRICADES AND SIGNS AS SHOWN FOR THE TRAFFIC SWITCH.
- SWITCH SOUTHBOUND/WESTBOUND TRAFFIC TO THE PROPOSED PAVEMENT CONSTRUCTED IN PHASE 2.
- BEGIN CONSTRUCTION ON THE PROPOSED SOUTHBOUND/WESTBOUND LANES AND DRAINAGE FEATURES AS SHOWN IN THE PLANS.

PHASE 4

- UPON COMPLETION OF THE ROADWAY AND DRAINAGE FEATURES IN PHASE 3, BARRICADES AND CHANNELIZING DEVICES MAY BE REMOVED. ADVANCE WARNING SIGNS SHALL REMAIN IN PLACE UNTIL THE PROJECT IS COMPLETE.
- CONSTRUCT THE 8' MEANDERING PATH AS DIRECTED BY THE ENGINEER.
- PERFORM PROJECT CLEAN UP AND REMOVE ALL TEMPORARY TRAFFIC CONTROL DEVICES AND APPLICABLE EROSION CONTROL MEASURES AS DIRECTED BY THE ENGINEER.

TRAFFIC CONTROL NOTES:

- ALL BARRICADES AND WARNING SIGNS SHALL HAVE TYPE C, HIGH SPECIFIC INTENSITY SHEETS.
- THE CONTRACTOR SHALL PROVIDE ADVANCE WARNING AND TRAFFIC CONTROL FOR THIS PROJECT AS SHOWN IN THE PLANS AND AS PROVIDED FOR IN THE CURRENT EDITION OF THE TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS (TMUTCD).
- BARRICADES AND WARNING SIGNS, AS APPROPRIATE, SHALL BE PLACED AT STOCKPILES TO ADEQUATELY WARN MOTORISTS. AT ALL STOCKPILE SITES THAT ARE LESS THAN 30 FEET FROM THE EDGE OF ANY TRAVELED LANE, A TYPE III BARRICADE SHALL BE ERECTED IMMEDIATELY IN FRONT OF AND AT EACH END OF THE STOCKPILE IF REQUIRED BY THE ENGINEER. WHEN A STOCKPILE SITE EQUALS OR EXCEEDS 100 FEET IN LENGTH, ONE OBJECT MARKER (OM2HP) PER 100 FEET SHALL BE PLACED ALONGSIDE THE STOCKPILE.
- THE CONTRACTOR SHALL PLAN WORK SEQUENCE IN A MANNER THAT WILL CAUSE MINIMUM INTERFERENCE WITH TRAFFIC DURING CONSTRUCTION OPERATIONS. BEFORE BEGINNING THE WORK ON THIS PROJECT, THE CONTRACTOR SHALL SUBMIT, FOR APPROVAL BY THE ENGINEER, A PLAN OF CONSTRUCTION OPERATIONS OUTLINING IN DETAIL A SEQUENCE OF WORK TO BE FOLLOWED AND SETTING OUT THE METHOD OF HANDLING TRAFFIC ALONG, ACROSS AND ADJACENT TO WORK.
- IF, AT ANY TIME DURING CONSTRUCTION, THE CONTRACTOR'S PROPOSED PLAN OF OPERATION FOR HANDLING TRAFFIC DOES NOT PROVIDE FOR SAFE, COMFORTABLE MOVEMENT, THE CONTRACTOR SHALL IMMEDIATELY CHANGE THE OPERATIONS TO CORRECT THE UNSATISFACTORY CONDITION. THE SEQUENCE OF WORK AS OUTLINED ON THE PLANS IS A GUIDE ONLY AND MAY BE REVISED BY THE CONTRACTOR WITH APPROVAL OF THE ENGINEER.
- SUBJECT TO THE APPROVAL OF THE ENGINEER, PORTIONS OF THIS PROJECT WHICH ARE NOT AFFECTED BY OR IN CONFLICT WITH THE PROPOSED METHOD OF HANDLING TRAFFIC OR UTILITY ADJUSTMENTS CAN BE CONSTRUCTED DURING ANY PHASE.
- DURING CONSTRUCTION, THE CONTRACTOR SHALL FURNISH, PLACE AND MAINTAIN VERTICAL PANELS ALONG THE EDGE OF PAVEMENTS AND FILLS IN ACCORDANCE WITH THE LATEST VERSION OF THE TMUTCD. BARRICADES AND SIGNS SHALL BE PLACED IN SUCH A MANNER AS TO NOT INTERFERE WITH THE SIGHT DISTANCE OF DRIVERS ENTERING THE STREET FROM DRIVEWAYS OR SIDE STREETS.
- THE CONTRACTOR SHALL PROVIDE AND MAINTAIN FLAGGERS AT SUCH POINTS FOR SUCH PERIODS OF TIME AS MAY BE REQUIRED TO PROVIDE FOR THE SAFETY AND CONVENIENCE OF THE TRAVELING PUBLIC AND CONTRACTOR'S PERSONNEL, AND AS SHOWN ON THE PLANS OR AS DIRECTED BY THE ENGINEER. THESE FLAGGERS SHALL BE LOCATED AT EACH END OF ANY LANE CLOSURE AND SHALL BE PROPERLY ATTIRED. THESE TWO FLAGGERS SHALL BE IN TWO WAY RADIO CONTACT WITH EACH OTHER AT ALL TIMES. PADDLES MAY BE REQUIRED FOR THE PROJECT.
- THE CONTRACTOR WILL NOT BE PERMITTED TO COMMENCE WORK ON THE ROAD BEFORE SUNRISE AND SHALL ARRANGE THE WORK SO THAT NO MACHINERY OR EQUIPMENT SHALL BE CLOSER THAN 10 FEET TO THE TRAVELED ROADWAY AFTER SUNSET EXCEPT AS AUTHORIZED BY THE ENGINEER.
- THE CONTRACTOR SHALL KEEP TRAVELED SURFACES USED IN THE HAULING OPERATION CLEAR AND FREE OF DIRT OR OTHER MATERIALS.
- THE USE OF RUBBER-TIRED EQUIPMENT WILL BE REQUIRED FOR MOVING DIRT AND OTHER MATERIALS ALONG OR ACROSS PAVED SURFACES.
- WHERE THE CONTRACTOR DESIRES TO MOVE ANY EQUIPMENT NOT LICENSED FOR OPERATION ON PUBLIC STREET OR ACROSS ANY PAVEMENT, THE CONTRACTOR SHALL PROTECT THE PAVEMENT FROM ALL DAMAGE AS DIRECTED BY THE ENGINEER.
- TEMPORARY RAMPS FOR ACCESS DURING CONSTRUCTION SHALL CONSIST OF FLEXIBLE BASE OR OTHER ALL-WEATHER AGGREGATE MATERIAL. COST TO PROVIDE MATERIAL AND CONSTRUCT RAMPS SHALL BE INCLUDED IN THE PRICE BID FOR TRAFFIC CONTROL.
- ACCESS SHALL BE MAINTAINED TO ALL DRIVEWAYS AND SIDE STREETS AT ALL TIMES DURING ALL PHASES OF CONSTRUCTION.

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HUITT-ZOLLARS, INC.
Christian L. Moorman, P.E. #93828
Date: 3/17/2017

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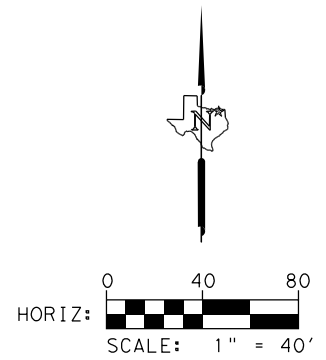
E. STACY ROAD IMPROVEMENTS

GENERAL & TECHNICAL NOTES

SCALE: NONE		SHEET 1 OF 1		SHEET NO. 4
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NOTES:

LEGEND

- 1. THE INFORMATION SHOWN ON THIS DRAWING
- CONTROL POINT
- TRAFFIC FLOW

NOTE: 1. SEE HORIZONTAL ALIGNMENT DATA SHEET FOR INFORMATION NOT SHOWN HERE.

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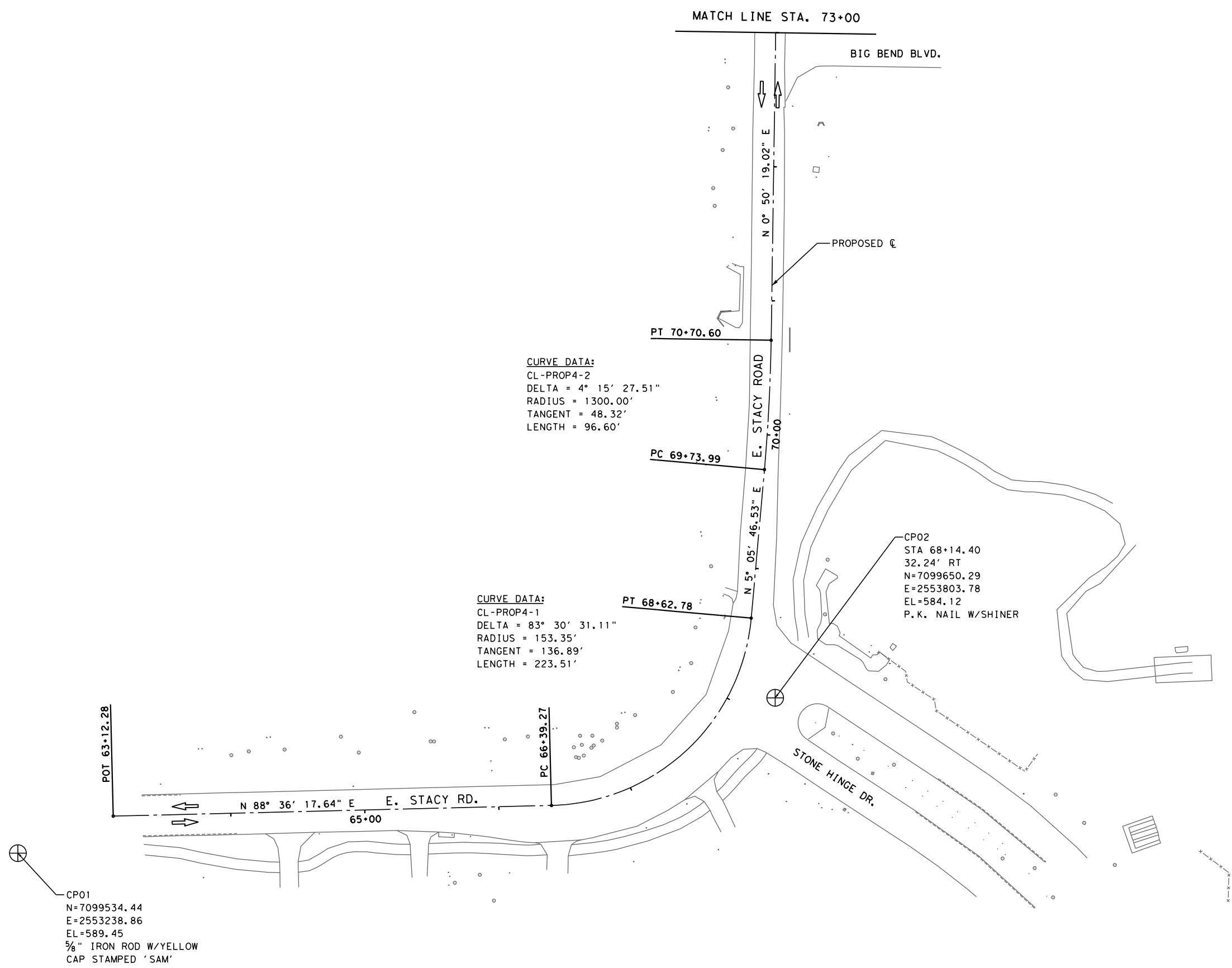
**HORIZONTAL ALIGNMENT
 AND PROJECT CONTROL**

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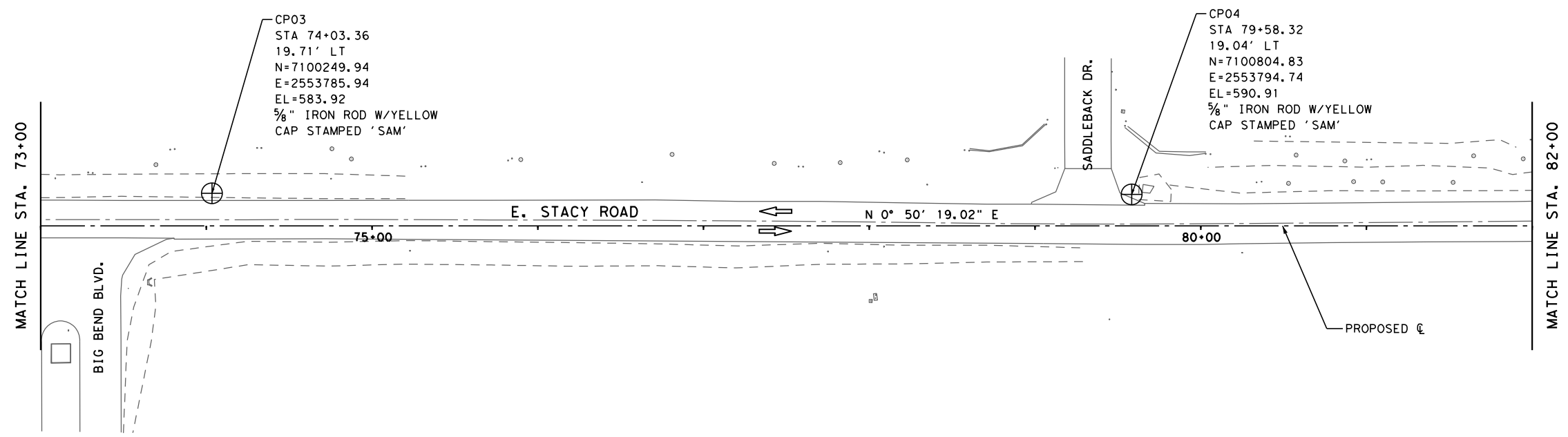
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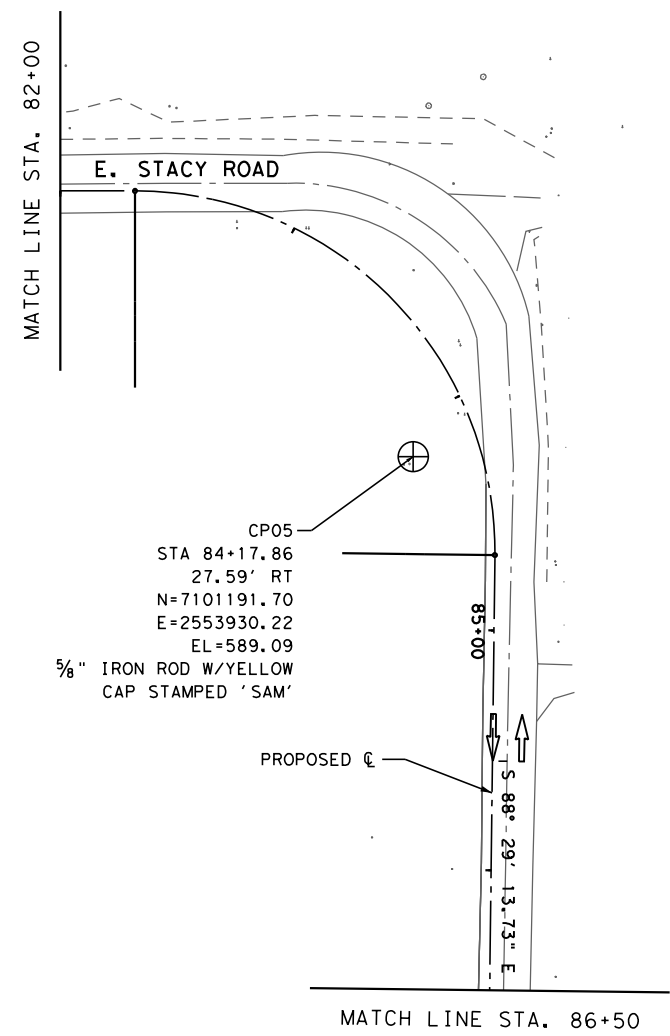
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NOTES:
 THE INFORMATION SHOWN ON THIS DRAWING IS FOR INFORMATION ONLY.
LEGEND
 ⊕ CONTROL POINT
 → TRAFFIC FLOW



CURVE DATA:
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 RADIUS = 150.00'
 TANGENT = 151.78'
 LENGTH = 237.38'

NOTE: 1. SEE HORIZONTAL ALIGNMENT DATA SHEET FOR INFORMATION NOT SHOWN HERE.

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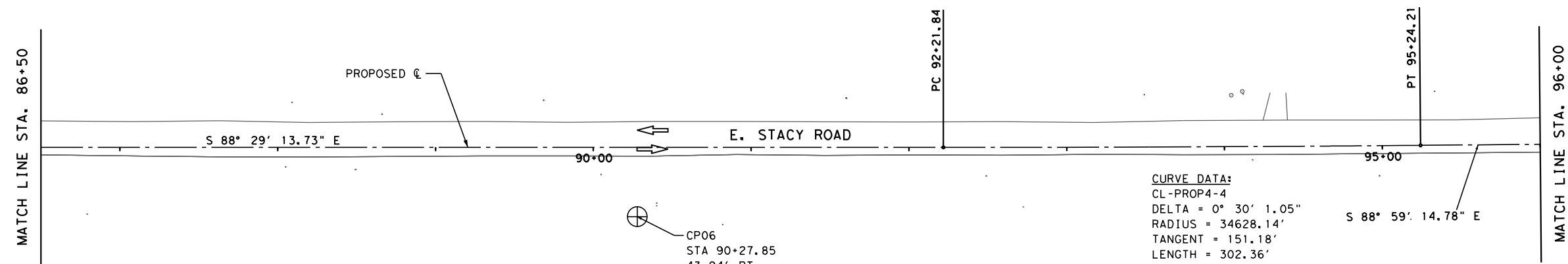
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E. STACY ROAD IMPROVEMENTS
HORIZONTAL ALIGNMENT AND PROJECT CONTROL
 STA. 73+00 TO STA. 86+50

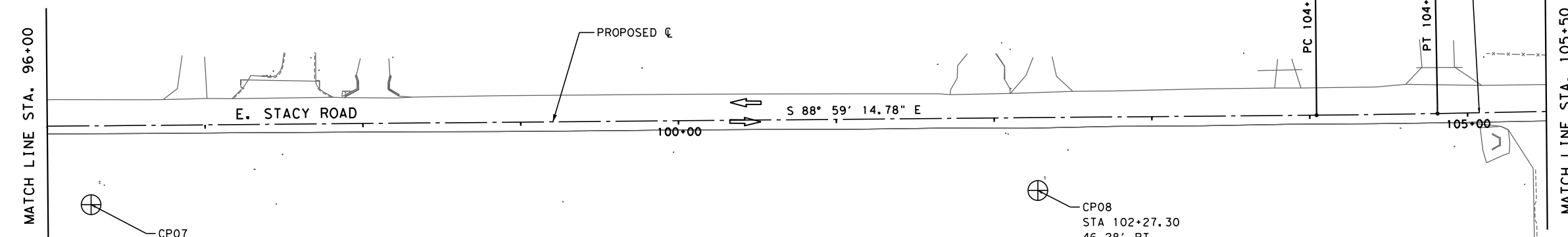
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DESIGNED BY:	DRAWN BY:	CHECKED BY:		6
CLM	RAW			

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CURVE DATA:
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 TANGENT = 151.18'
 LENGTH = 302.36'

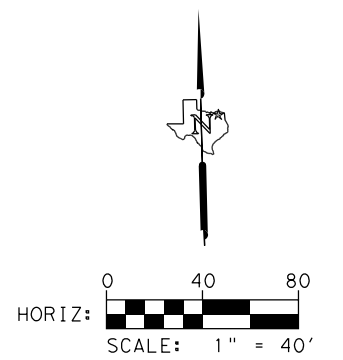
CP06
 STA 90+27.85
 43.94' RT
 N=7101166.44
 E=2554529.64
 EL=586.47
 5/8" IRON ROD W/YELLOW
 CAP STAMPED 'SAM'



CURVE DATA:
 CL-PROP4-5
 DELTA = 0° 33' 27.47"
 RADIUS = 7875.29'
 TANGENT = 38.32'
 LENGTH = 76.65'

CP07
 STA 96+27.33
 50.04' RT
 N=7101146.73
 E=2555129.24
 EL=578.85
 5/8" IRON ROD W/YELLOW
 CAP STAMPED 'SAM'

CP08
 STA 102+27.30
 46.28' RT
 N=7101139.89
 E=2555729.18
 EL=564.73
 5/8" IRON ROD W/YELLOW
 CAP STAMPED 'SAM'



NOTES:



NOTE: 1. SEE HORIZONTAL ALIGNMENT DATA SHEET FOR INFORMATION NOT SHOWN HERE.

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HUITT-ZOLLARS, INC.
 Christian L. Moorman, P.E. #93828
 Date: 3/17/2017

HUITT-ZOLLARS

HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING
 1717 MCKINNEY AVE., SUITE 1400 DALLAS, TEXAS 75202
 Firm No. F-761

TOWN OF FAIRVIEW TEXAS

TOWN OF FAIRVIEW, TEXAS
 372 TOWN PLACE
 FAIRVIEW, TX 75069
 972-562-0522

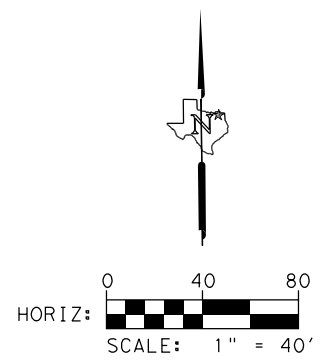
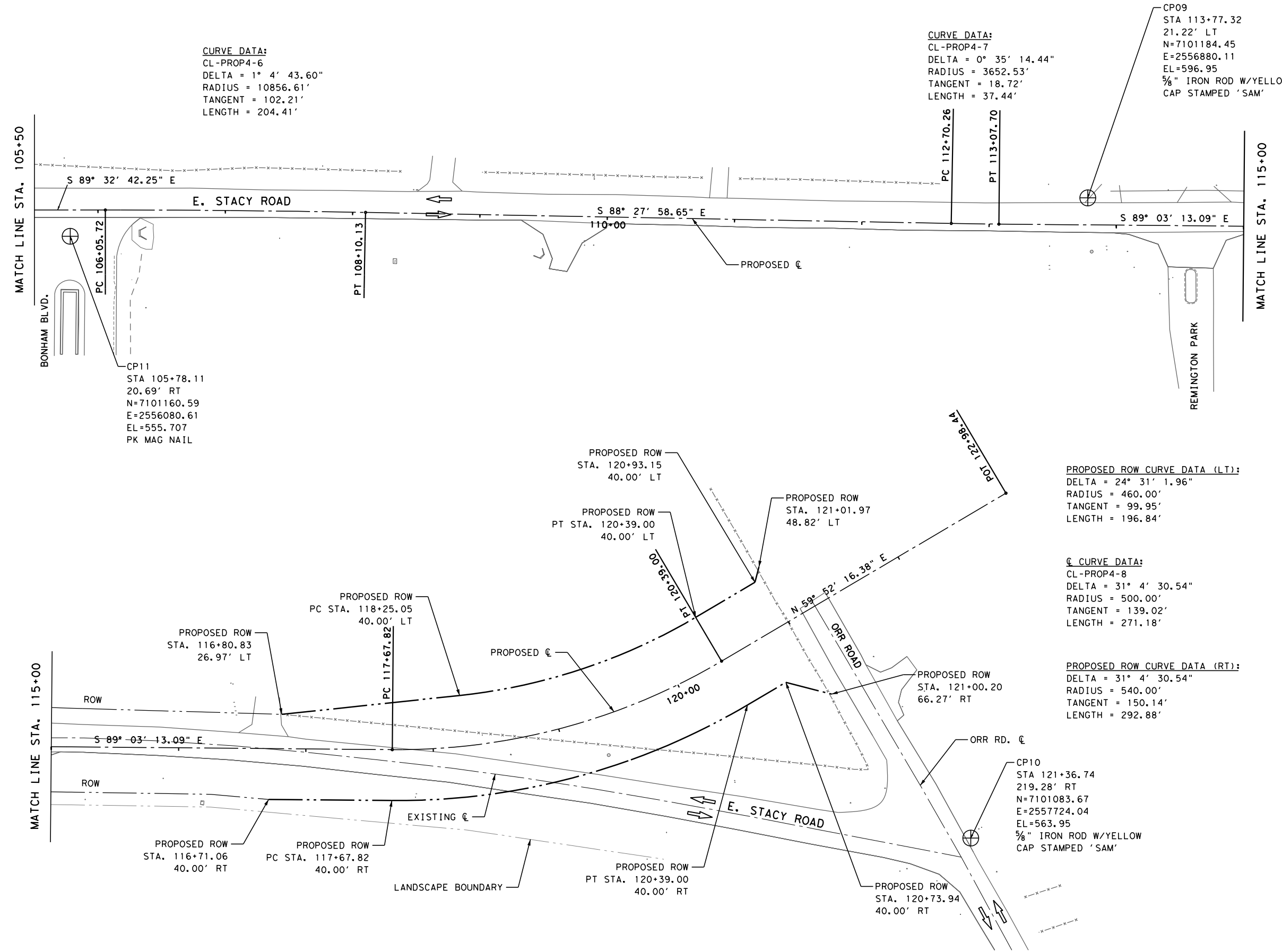
E. STACY ROAD IMPROVEMENTS

HORIZONTAL ALIGNMENT AND PROJECT CONTROL

STA. 68+50 TO STA. 105+50

SCALE: H: 1" = 40'		SHEET 3 OF 4		SHEET NO. 7
DESIGNED BY:	DRAWN BY:	CHECKED BY:		
CLM	RAW			

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NOTES:
 1 THE INFORMATION SHOWN ON THIS DRAWING IS FOR INFORMATION ONLY.
LEGEND
 ⊕ CONTROL POINT
 ⇨ TRAFFIC FLOW

NOTE: 1. SEE HORIZONTAL ALIGNMENT DATA SHEET FOR INFORMATION NOT SHOWN HERE.

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 Firm No. F-761

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 TOWN OF FAIRVIEW, TEXAS
 372 TOWN PLACE
 FAIRVIEW, TX 75069
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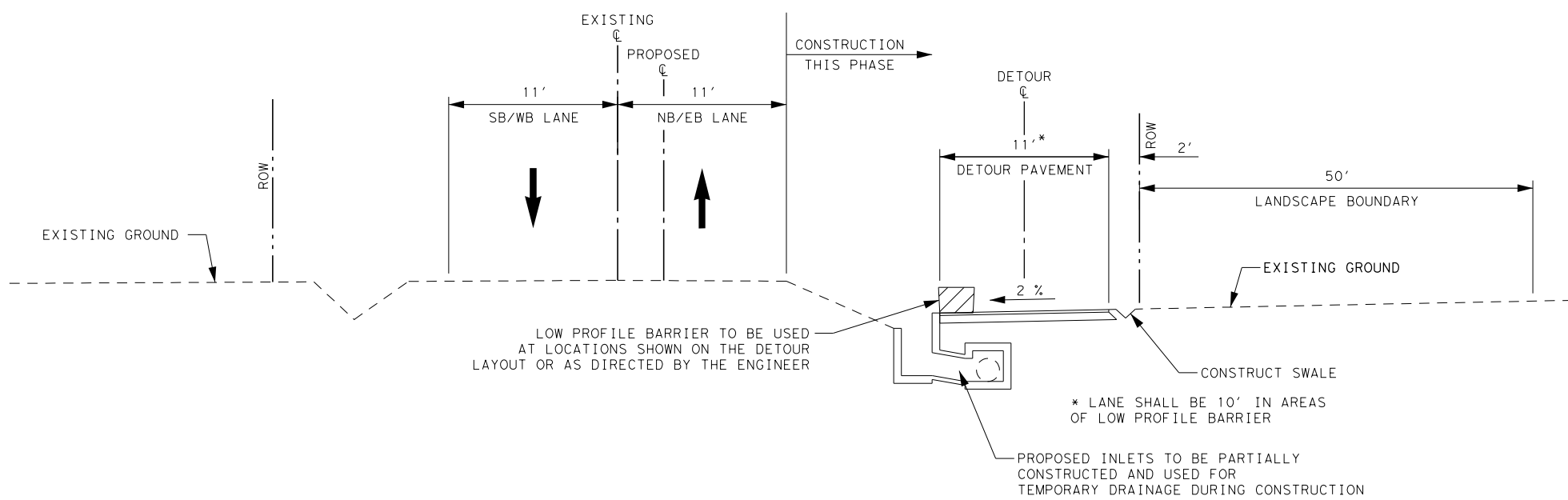
E. STACY ROAD IMPROVEMENTS
HORIZONTAL ALIGNMENT
AND PROJECT CONTROL

STA. 105+50 TO END

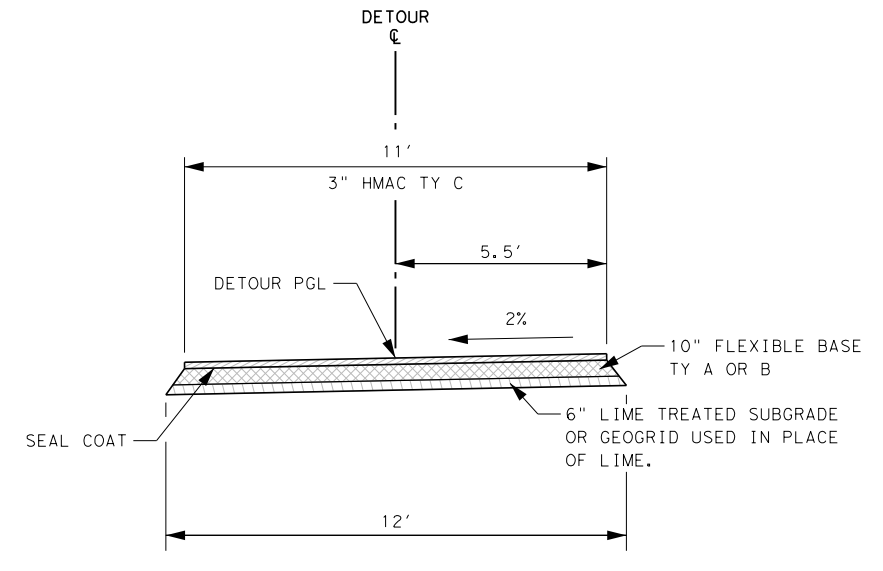
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DESIGNED BY:	DRAWN BY:	CHECKED BY:	8
CLM	RAW		

SHEET NO.

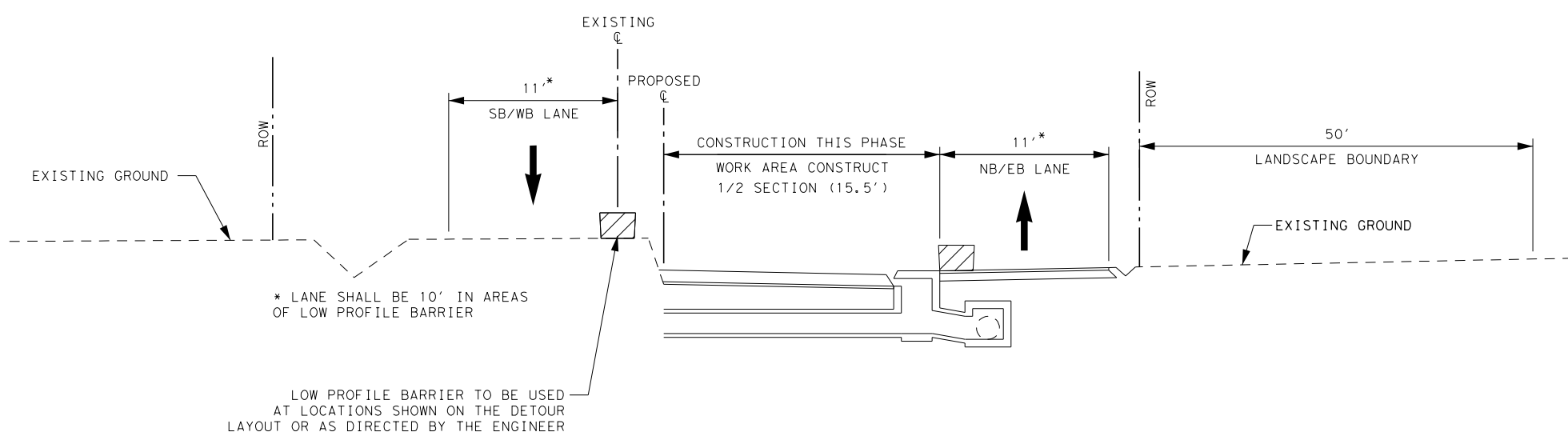
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**TRAFFIC CONTROL PLAN
 TYPICAL SECTION
 PHASE 1**



**TEMPORARY PAVEMENT
 TYPICAL SECTION
 FOR CONTRACTOR INFORMATION ONLY**



**TRAFFIC CONTROL PLAN
 TYPICAL SECTION
 PHASE 2**

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 Date: 3/17/2017

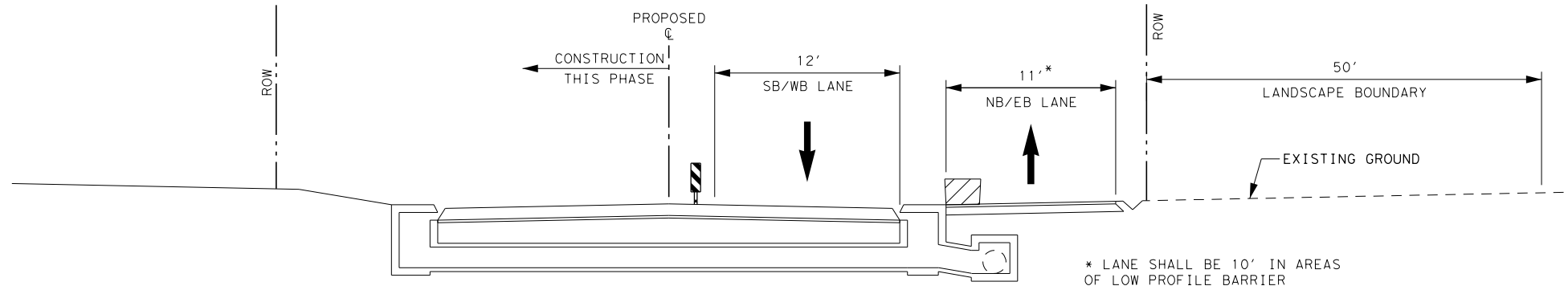
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 FAIRVIEW, TX 75069
 972-562-0522

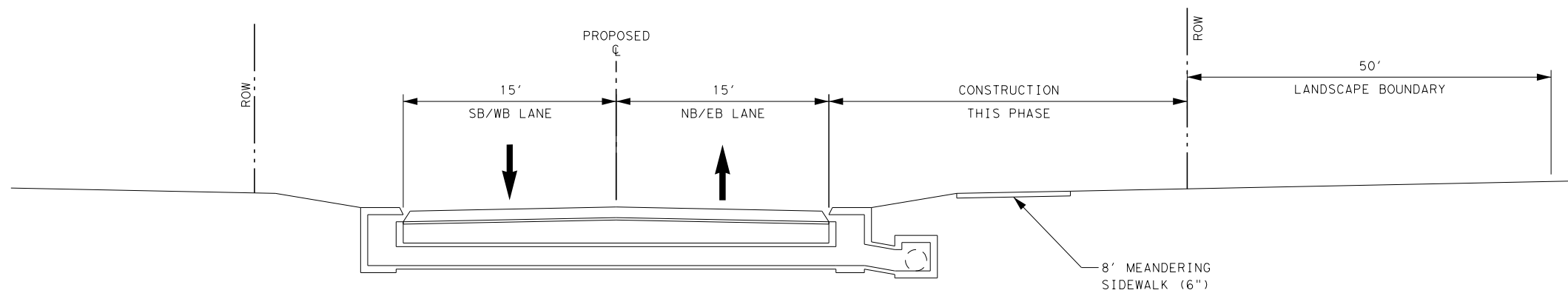
E. STACY ROAD IMPROVEMENTS
**TRAFFIC CONTROL PLAN
 TYPICAL SECTIONS**

SCALE: NONE		SHEET 1 OF 2		SHEET NO. 9
DESIGNED BY:	DRAWN BY:	CHECKED BY:		
SCW	RAW	CLM		

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TRAFFIC CONTROL PLAN
 TYPICAL SECTION
 PHASE 3



TRAFFIC CONTROL PLAN
 TYPICAL SECTION
 PHASE 4

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 Firm No. F-761

 TOWN OF FAIRVIEW, TEXAS
 372 TOWN PLACE
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E. STACY ROAD IMPROVEMENTS

**TRAFFIC CONTROL PLAN
 TYPICAL SECTIONS**

SCALE: NONE		SHEET 2 OF 2		SHEET NO.
DESIGNED BY:	DRAWN BY:	CHECKED BY:		10
SCW	RAW	CLM		

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Beginning chain TCP-01 description
 =====

Point 501 N 7,099,559.7084 E 2,553,537.3263 Sta 300+00.00

Course from 501 to PC TCP-01-1 N 88° 31' 45.97" E Dist 100.0000

Curve Data

Curve TCP-01-1
 P.I. Station 301+71.62 N 7,099,564.1128 E 2,553,708.8913
 Delta = 47° 56' 17.42" (LT)
 Degree = 35° 33' 56.49"
 Tangent = 71.6215
 Length = 134.7877
 Radius = 161.0985
 External = 15.2034
 Long Chord = 130.8905
 Mid. Ord. = 13.8924
 P.C. Station 302+34.79 N 7,099,562.2748 E 2,553,637.2934
 P.T. Station 301+00.00 N 7,099,618.5001 E 2,553,755.4925
 C.C. N 7,099,723.3201 E 2,553,633.1591
 Back = N 88° 31' 45.97" E
 Ahead = N 40° 35' 28.55" E
 Chord Bear = N 64° 33' 37.26" E

Curve Data

Curve TCP-01-2
 P.I. Station 303+33.96 N 7,099,693.8100 E 2,553,820.0210
 Delta = 39° 36' 36.81" (LT)
 Degree = 20° 48' 19.24"
 Tangent = 99.1742
 Length = 190.3849
 Radius = 275.3897
 External = 17.3132
 Long Chord = 186.6161
 Mid. Ord. = 16.2892
 P.C. Station 302+34.79 N 7,099,618.5001 E 2,553,755.4925
 P.T. Station 304+25.17 N 7,099,792.9696 E 2,553,821.7190
 C.C. N 7,099,797.6847 E 2,553,546.3696
 Back = N 40° 35' 28.55" E
 Ahead = N 0° 58' 51.74" E
 Chord Bear = N 20° 47' 10.14" E

Course from PT TCP-01-2 to PC TCP-01-3 N 0° 58' 51.74" E Dist 630.7541

Curve Data

Curve TCP-01-3
 P.I. Station 310+80.46 N 7,100,448.1584 E 2,553,832.9385
 Delta = 5° 37' 03.01" (RT)
 Degree = 11° 27' 32.96"
 Tangent = 24.5306
 Length = 49.0219
 Radius = 500.0000
 External = 0.6014
 Long Chord = 49.0023
 Mid. Ord. = 0.6007
 P.C. Station 310+55.93 N 7,100,423.6313 E 2,553,832.5185
 P.T. Station 311+04.95 N 7,100,472.5265 E 2,553,835.7573
 C.C. N 7,100,415.0706 E 2,554,332.4452
 Back = N 0° 58' 51.74" E
 Ahead = N 6° 35' 54.75" E
 Chord Bear = N 3° 47' 23.24" E

Curve Data

Curve TCP-01-4
 P.I. Station 311+29.48 N 7,100,496.8946 E 2,553,838.5762
 Delta = 5° 37' 03.01" (LT)
 Degree = 11° 27' 32.96"
 Tangent = 24.5306
 Length = 49.0219
 Radius = 500.0000
 External = 0.6014
 Long Chord = 49.0023
 Mid. Ord. = 0.6007
 P.C. Station 311+04.95 N 7,100,472.5265 E 2,553,835.7573
 P.T. Station 311+53.97 N 7,100,521.9824 E 2,553,838.9962
 C.C. N 7,100,529.9824 E 2,553,339.0695
 Back = N 6° 35' 54.75" E
 Ahead = N 0° 58' 51.74" E
 Chord Bear = N 3° 47' 23.24" E

Course from PT TCP-01-4 to PC TCP-01-5 N 0° 58' 51.74" E Dist 502.1131

Curve Data

Curve TCP-01-5
 P.I. Station 318+32.80 N 7,101,200.1519 E 2,553,850.6188
 Delta = 90° 23' 44.91" (RT)
 Degree = 32° 38' 49.80"
 Tangent = 176.7166
 Length = 276.8871
 Radius = 175.5000
 External = 73.5562
 Long Chord = 249.0503
 Mid. Ord. = 51.8321
 P.C. Station 316+56.08 N 7,101,023.4612 E 2,553,847.5931
 P.T. Station 319+32.97 N 7,101,195.9057 E 2,554,027.2844
 C.C. N 7,101,020.4563 E 2,554,023.0674
 Back = N 0° 58' 51.74" E
 Ahead = S 88° 37' 23.35" E
 Chord Bear = N 46° 10' 44.19" E

Course from PT TCP-01-5 to 502 S 88° 37' 23.35" E Dist 509.2854

Point 502 N 7,101,183.6685 E 2,554,536.4227 Sta 324+42.26

Course from 502 to 503 S 88° 42' 11.17" E Dist 626.8474

Point 503 N 7,101,169.4809 E 2,555,163.1095 Sta 330+69.10

Course from 503 to 504 S 88° 59' 28.13" E Dist 815.5144

Point 504 N 7,101,155.1222 E 2,555,978.4975 Sta 338+84.62

Course from 504 to 505 S 88° 53' 14.94" E Dist 564.7886

Point 505 N 7,101,144.1564 E 2,556,543.1796 Sta 344+49.41

Course from 505 to PC TCP-01-6 S 88° 38' 30.35" E Dist 707.2977

Curve Data

Curve TCP-01-6
 P.I. Station 353+07.86 N 7,101,123.8081 E 2,557,401.3883
 Delta = 8° 22' 16.21" (RT)
 Degree = 2° 46' 26.60"
 Tangent = 151.1522
 Length = 301.7665
 Radius = 2,065.4154
 External = 5.5235
 Long Chord = 301.4981
 Mid. Ord. = 5.5087
 P.C. Station 351+56.70 N 7,101,127.3910 E 2,557,250.2786
 P.T. Station 354+58.47 N 7,101,098.2641 E 2,557,550.3665
 C.C. N 7,099,062.5559 E 2,557,201.3211
 Back = S 88° 38' 30.35" E
 Ahead = S 80° 16' 14.14" E
 Chord Bear = S 84° 27' 22.24" E

Course from PT TCP-01-6 to 506 S 80° 16' 14.14" E Dist 155.2354

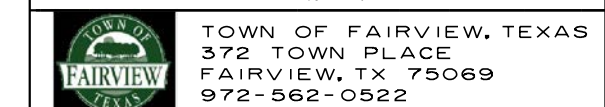
Point 506 N 7,101,072.0301 E 2,557,703.3691 Sta 356+13.71

Ending chain TCP-01 description
 =====

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 HUITT-ZOLLARS, INC.
 Christian L. Moorman, P.E. #93828
 Date: 3/17/2017

HUITT-ZOLLARS
 HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING
 1717 MCKINNEY AVE., SUITE 1400 DALLAS, TEXAS 75202
 Firm No. F-761

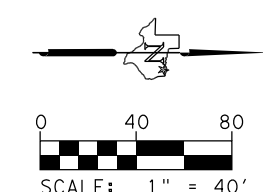
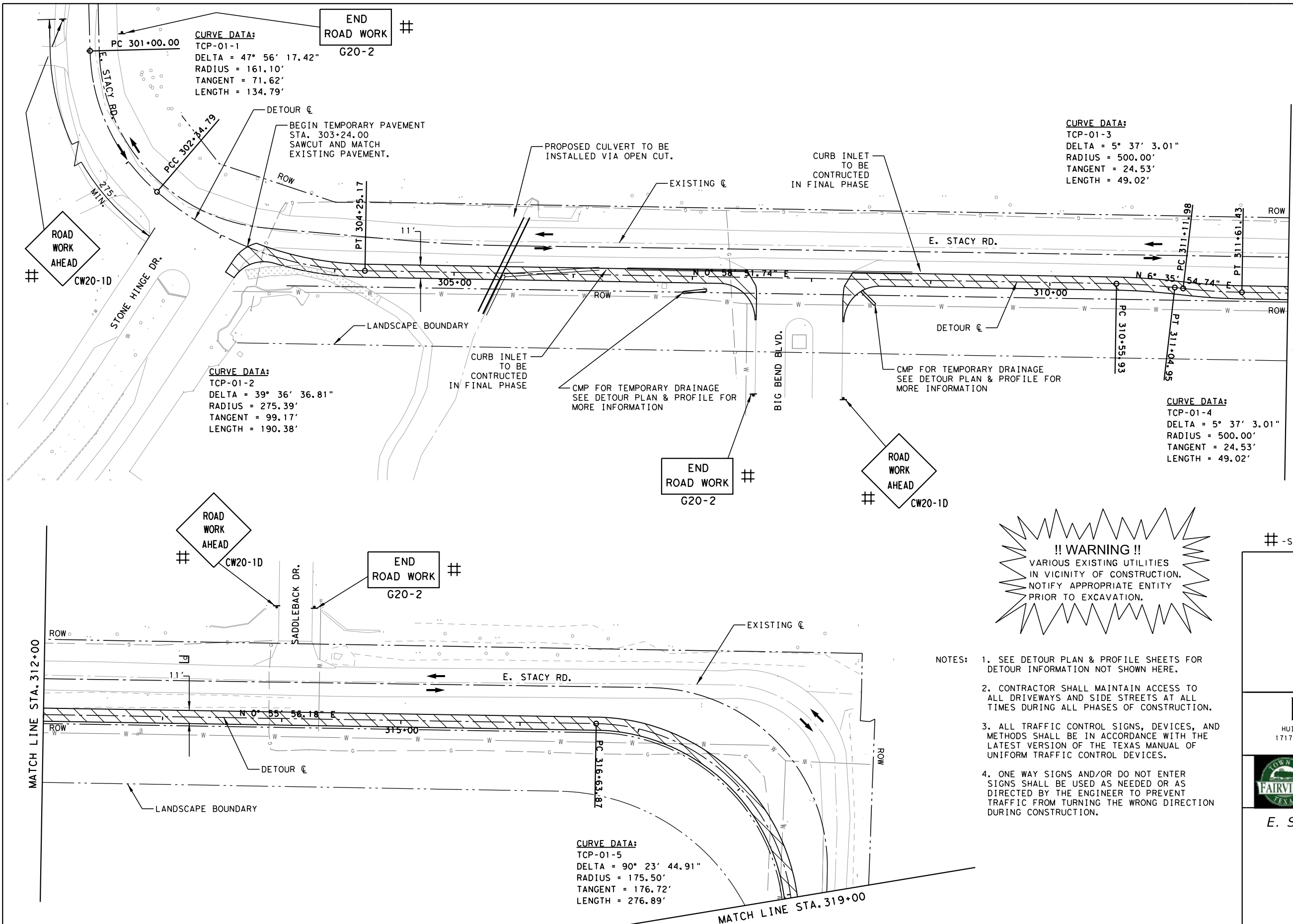


E. STACY ROAD IMPROVEMENTS

**TRAFFIC CONTROL PLAN
 DETOUR ALIGNMENT DATA**

 SCALE: NONE SHEET 1 OF 1
 DESIGNED BY: CLM DRAWN BY: CLM CHECKED BY: CLM
 SHEET NO. 11

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- LEGEND**
- TRAFFIC FLOW
 - DETOUR CONSTRUCTION THIS PHASE
 - CONCRETE REMOVAL SEE REMOVAL PLANS
 - APPROXIMATE SIGN PLACEMENT
 - TYPE III BARRICADE

!! WARNING !!
 VARIOUS EXISTING UTILITIES
 IN VICINITY OF CONSTRUCTION.
 NOTIFY APPROPRIATE ENTITY
 PRIOR TO EXCAVATION.

- NOTES:
1. SEE DETOUR PLAN & PROFILE SHEETS FOR DETOUR INFORMATION NOT SHOWN HERE.
 2. CONTRACTOR SHALL MAINTAIN ACCESS TO ALL DRIVEWAYS AND SIDE STREETS AT ALL TIMES DURING ALL PHASES OF CONSTRUCTION.
 3. ALL TRAFFIC CONTROL SIGNS, DEVICES, AND METHODS SHALL BE IN ACCORDANCE WITH THE LATEST VERSION OF THE TEXAS MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES.
 4. ONE WAY SIGNS AND/OR DO NOT ENTER SIGNS SHALL BE USED AS NEEDED OR AS DIRECTED BY THE ENGINEER TO PREVENT TRAFFIC FROM TURNING THE WRONG DIRECTION DURING CONSTRUCTION.

-SIGNS TO REMAIN THROUGHOUT CONSTRUCTION.

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 Firm No. F-761

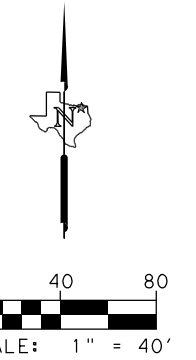
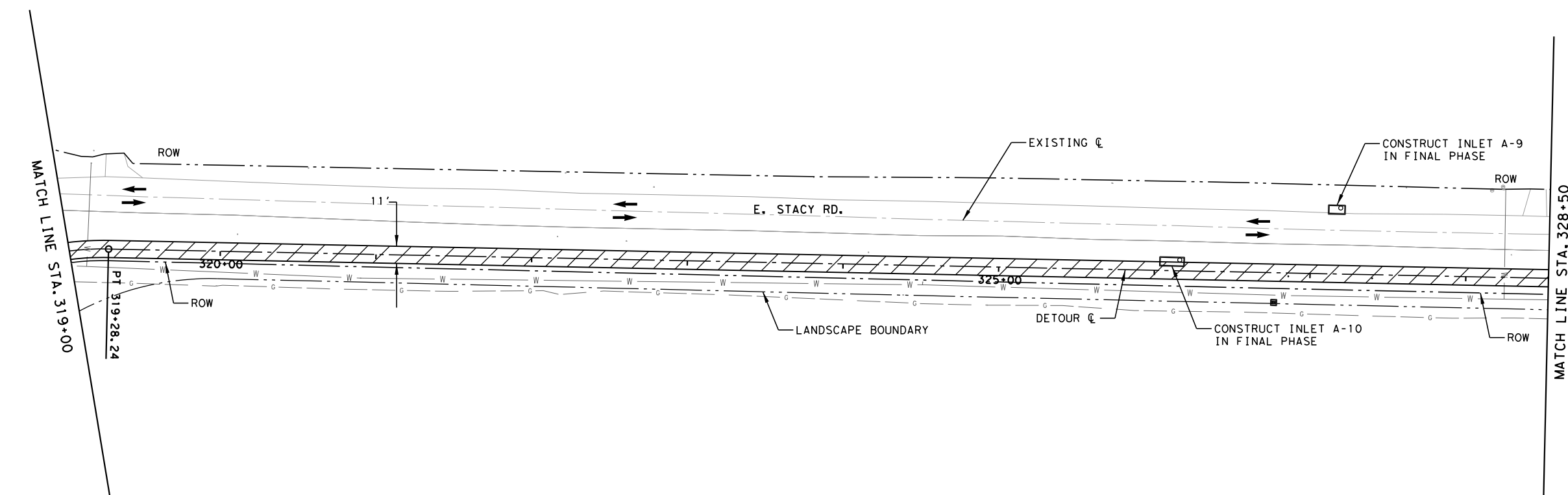
TOWN OF FAIRVIEW, TEXAS
 372 TOWN PLACE
 FAIRVIEW, TX 75069
 972-562-0522

E. STACY ROAD IMPROVEMENTS
TRAFFIC CONTROL PLAN
PHASE 1
 BEGIN TO STA. 319+00

SCALE: 1" = 40'		SHEET 1 OF 3	
DESIGNED BY:	DRAWN BY:	CHECKED BY:	12
CLM	CLM		

SHEET NO.

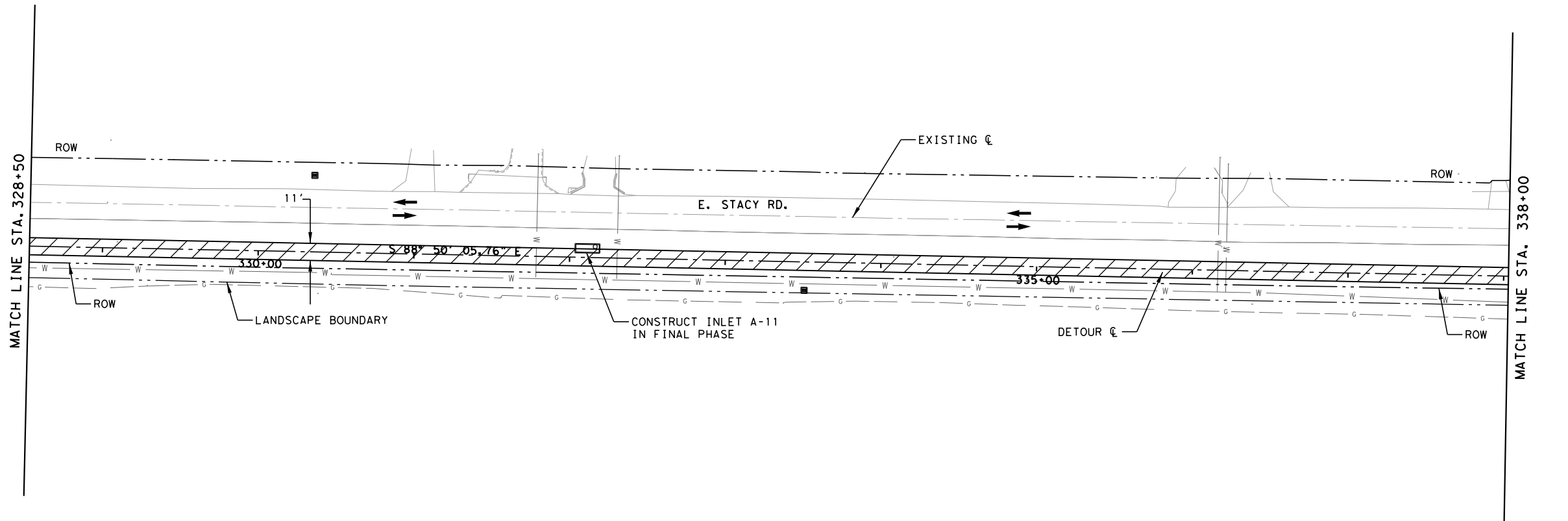
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 rwalker



- LEGEND**
- TRAFFIC FLOW
 - DETOUR CONSTRUCTION THIS PHASE
 - APPROXIMATE SIGN PLACEMENT
 - I TYPE III BARRICADE

- NOTES:**
1. SEE DETOUR PLAN & PROFILE SHEETS FOR DETOUR INFORMATION NOT SHOWN HERE.
 2. CONTRACTOR SHALL MAINTAIN ACCESS TO ALL DRIVEWAYS AND SIDE STREETS AT ALL TIMES DURING ALL PHASES OF CONSTRUCTION.
 3. ALL TRAFFIC CONTROL SIGNS, DEVICES, AND METHODS SHALL BE IN ACCORDANCE WITH THE LATEST VERSION OF THE TEXAS MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES.
 4. ONE WAY SIGNS AND/OR DO NOT ENTER SIGNS SHALL BE USED AS NECESSARY TO PREVENT TRAFFIC FROM TURNING THE WRONG DIRECTION DURING CONSTRUCTION.

!! WARNING !!
 VARIOUS EXISTING UTILITIES
 IN VICINITY OF CONSTRUCTION.
 NOTIFY APPROPRIATE ENTITY
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 Firm No. F-761

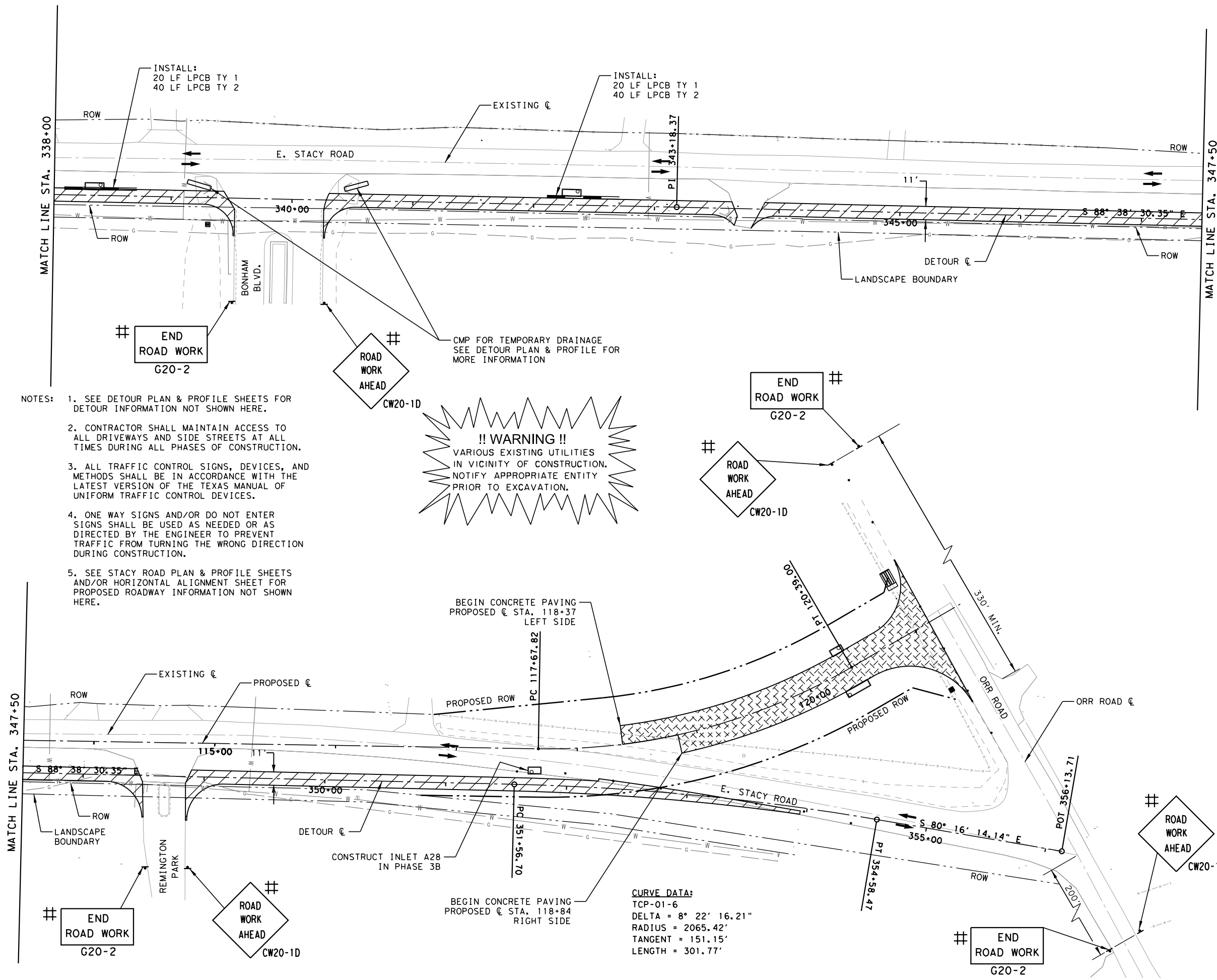
TOWN OF FAIRVIEW, TEXAS
 372 TOWN PLACE
 FAIRVIEW, TX 75069
 972-562-0522

E. STACY ROAD IMPROVEMENTS
TRAFFIC CONTROL PLAN
PHASE 1
 STA. 319+00 TO STA. 338+00

SCALE: 1" = 40'		SHEET 2 OF 3	
DESIGNED BY:	DRAWN BY:	CHECKED BY:	13
CLM	CLM		

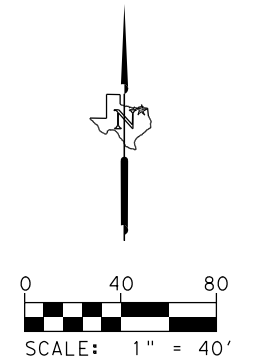
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- NOTES:
1. SEE DETOUR PLAN & PROFILE SHEETS FOR DETOUR INFORMATION NOT SHOWN HERE.
 2. CONTRACTOR SHALL MAINTAIN ACCESS TO ALL DRIVEWAYS AND SIDE STREETS AT ALL TIMES DURING ALL PHASES OF CONSTRUCTION.
 3. ALL TRAFFIC CONTROL SIGNS, DEVICES, AND METHODS SHALL BE IN ACCORDANCE WITH THE LATEST VERSION OF THE TEXAS MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES.
 4. ONE WAY SIGNS AND/OR DO NOT ENTER SIGNS SHALL BE USED AS NEEDED OR AS DIRECTED BY THE ENGINEER TO PREVENT TRAFFIC FROM TURNING THE WRONG DIRECTION DURING CONSTRUCTION.
 5. SEE HORIZONTAL ALIGNMENT & PROFILE SHEETS AND/OR HORIZONTAL ALIGNMENT SHEET FOR PROPOSED ROADWAY INFORMATION NOT SHOWN HERE.

!! WARNING !!
 VARIOUS EXISTING UTILITIES
 IN VICINITY OF CONSTRUCTION.
 NOTIFY APPROPRIATE ENTITY
 PRIOR TO EXCAVATION.



- LEGEND**
- TRAFFIC FLOW
 - [Hatched Box] DETOUR CONSTRUCTION THIS PHASE
 - [Cross-hatched Box] PERMANENT CONSTRUCTION THIS PHASE
 - [Sign Symbol] APPROXIMATE SIGN PLACEMENT
 - [Barricade Symbol] TYPE III BARRICADE

#-SIGNS TO REMAIN THROUGHOUT CONSTRUCTION.

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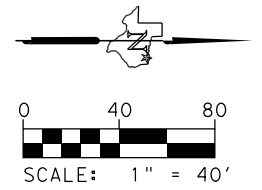
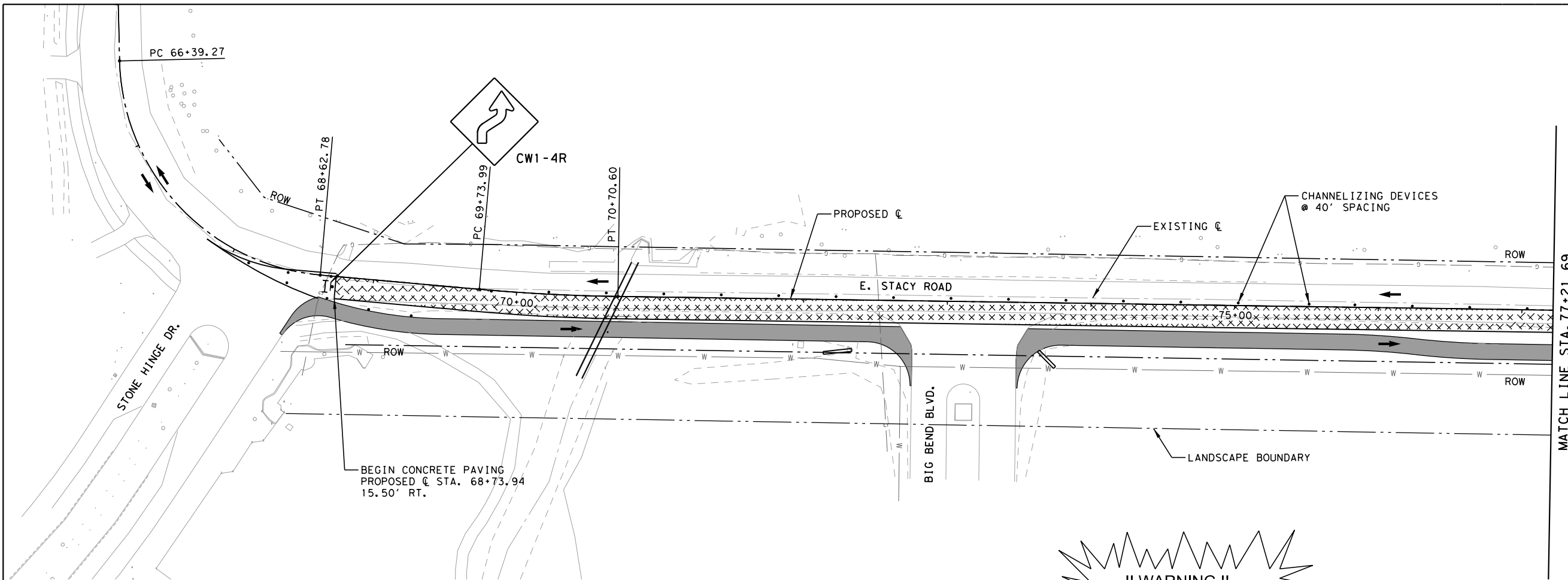
TOWN OF FAIRVIEW TEXAS
 TOWN OF FAIRVIEW, TEXAS
 372 TOWN PLACE
 FAIRVIEW, TX 75069
 972-562-0522

E. STACY ROAD IMPROVEMENTS
TRAFFIC CONTROL PLAN
PHASE 1
 STA. 338+00 TO END

SCALE: 1" = 40'	SHEET 3 OF 3	SHEET NO.
DESIGNED BY: CLM	DRAWN BY: CLM	CHECKED BY: CLM
		14

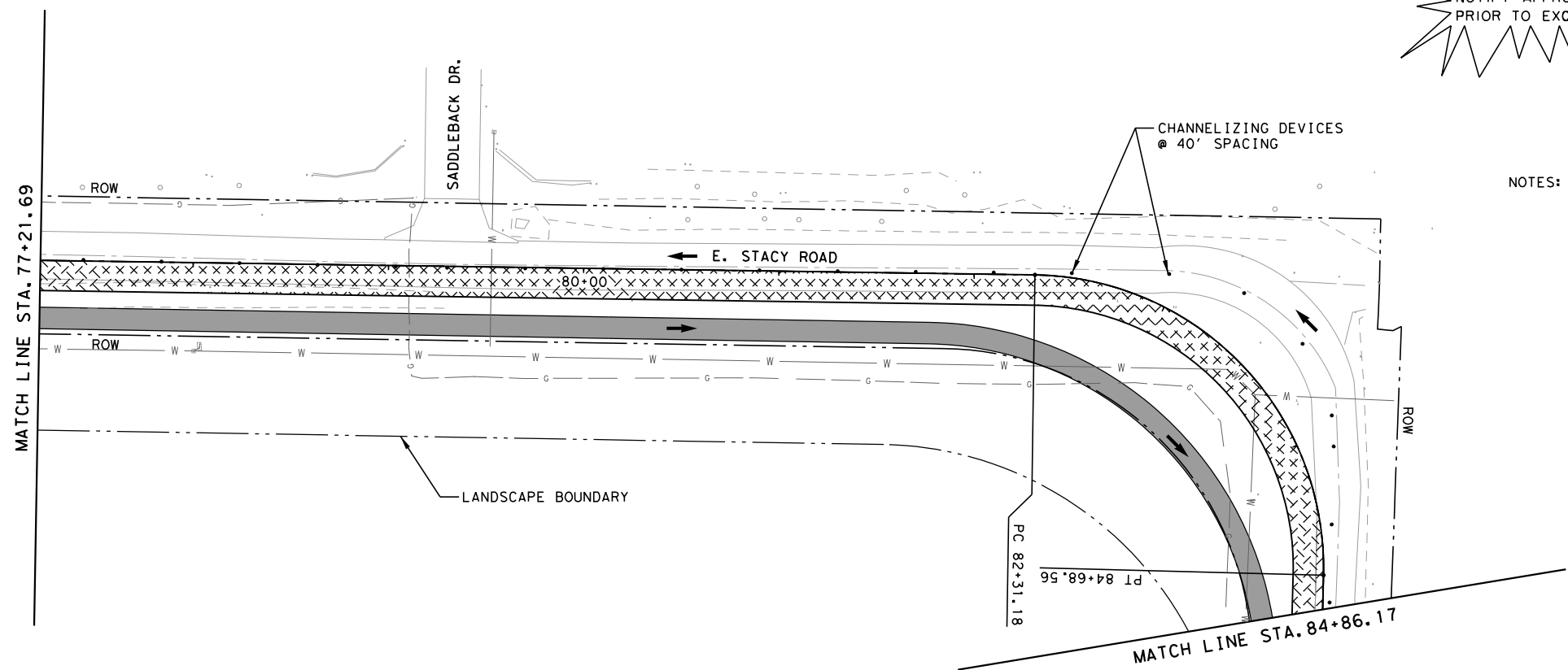
CURVE DATA:
 TCP-01-6
 DELTA = 8° 22' 16.21"
 RADIUS = 2065.42'
 TANGENT = 151.15'
 LENGTH = 301.77'

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- LEGEND**
- TRAFFIC FLOW
 - PERMANENT CONSTRUCTION THIS PHASE
 - DETOUR CONSTRUCTION PREVIOUS PHASE
 - APPROXIMATE SIGN PLACEMENT
 - TYPE III BARRICADE

!! WARNING !!
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 IN VICINITY OF CONSTRUCTION.
 NOTIFY APPROPRIATE ENTITY
 PRIOR TO EXCAVATION.



- NOTES:
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 Christian L. Moorman, P.E. #93828
 Date: 3/17/2017

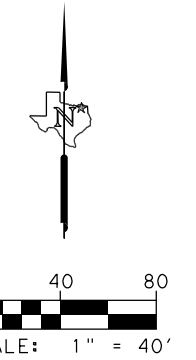
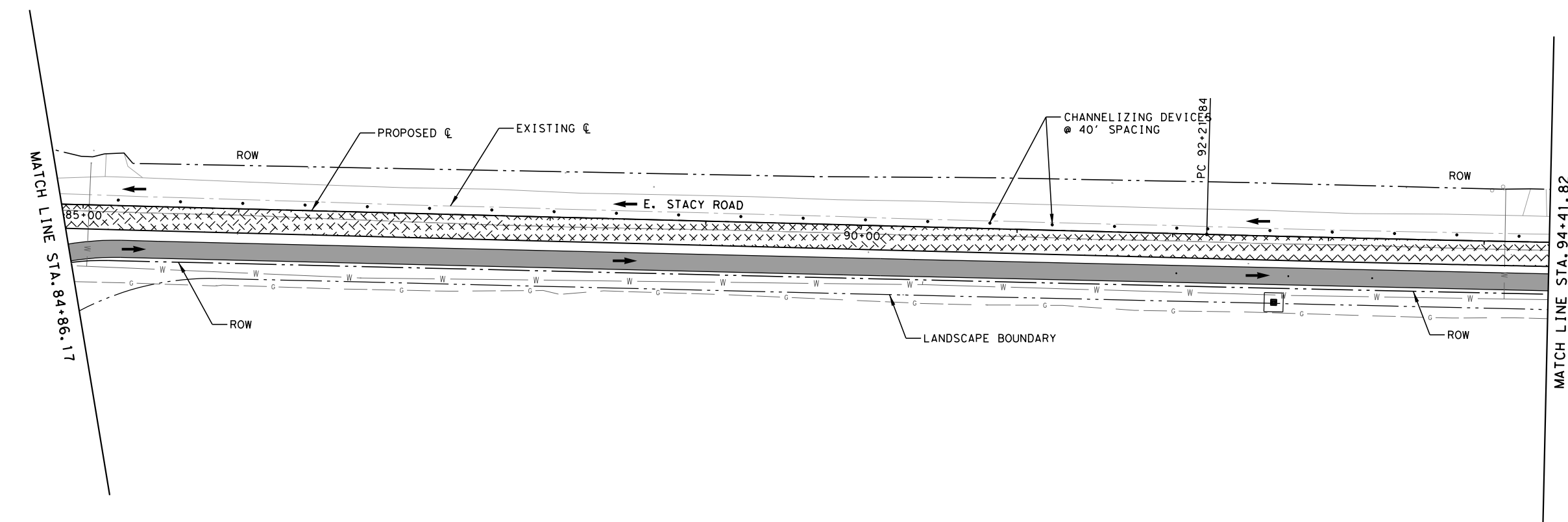
HUITT-ZOLLARS
 HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING
 1717 MCKINNEY AVE., SUITE 1400 DALLAS, TEXAS 75202
 Firm No. F-761

TOWN OF FAIRVIEW, TEXAS
 372 TOWN PLACE
 FAIRVIEW, TX 75069
 972-562-0522

E. STACY ROAD IMPROVEMENTS
TRAFFIC CONTROL PLAN
PHASE 2
 BEGIN TO STA. 84+86

SCALE: 1" = 40'		SHEET 1 OF 3		SHEET NO. 15
DESIGNED BY:	DRAWN BY:	CHECKED BY:		
CLM	CLM			

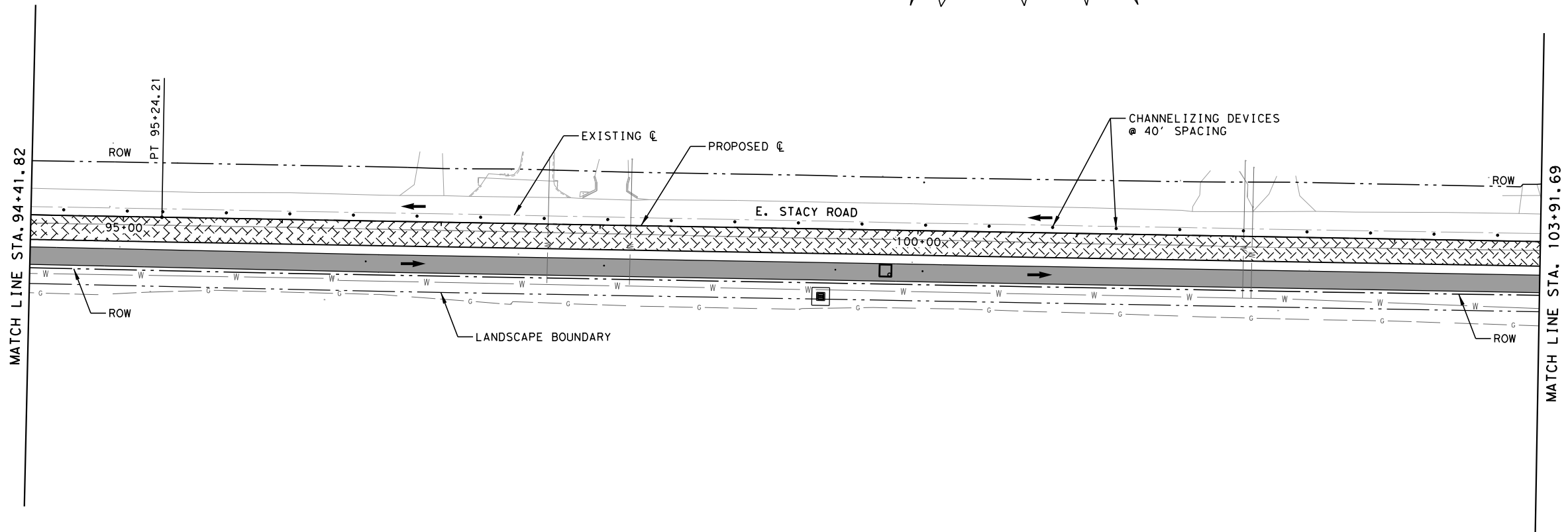
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 5/17/2017
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 rwalker



- LEGEND**
- TRAFFIC FLOW
 - PERMANENT CONSTRUCTION THIS PHASE
 - DETOUR CONSTRUCTION PREVIOUS PHASE
 - APPROXIMATE SIGN PLACEMENT
 - TYPE III BARRICADE

- NOTES:
- CONTRACTOR SHALL MAINTAIN ACCESS TO ALL DRIVEWAYS AND SIDE STREETS AT ALL TIMES DURING ALL PHASES OF CONSTRUCTION.
 - ALL TRAFFIC CONTROL SIGNS, DEVICES, AND METHODS SHALL BE IN ACCORDANCE WITH THE LATEST VERSION OF THE TEXAS MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES.
 - ONE WAY SIGNS AND/OR DO NOT ENTER SIGNS SHALL BE USED AS NEEDED OR AS DIRECTED BY THE ENGINEER TO PREVENT TRAFFIC FROM TURNING THE WRONG DIRECTION DURING CONSTRUCTION.

!! WARNING !!
 VARIOUS EXISTING UTILITIES
 IN VICINITY OF CONSTRUCTION.
 NOTIFY APPROPRIATE ENTITY
 PRIOR TO EXCAVATION.



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 HUITT-ZOLLARS, INC.
 Christian L. Moorman, P.E. #93828
 Date: 3/17/2017

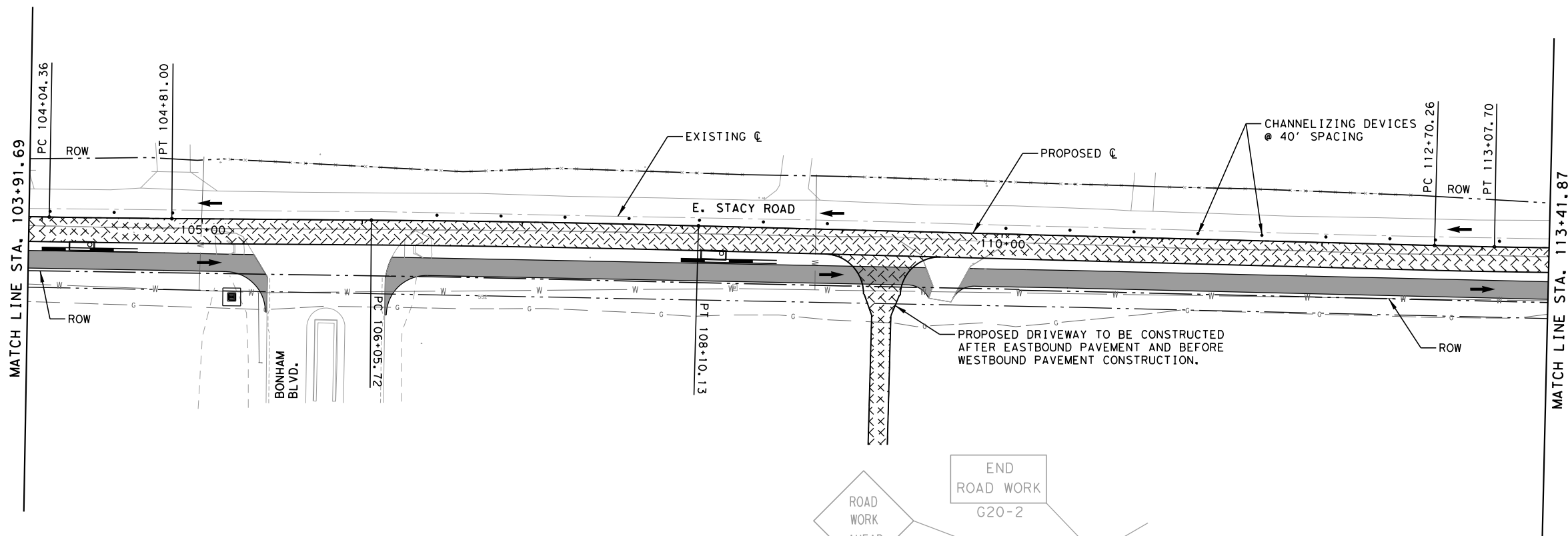
HUITT-ZOLLARS
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 1717 MCKINNEY AVE., SUITE 1400 DALLAS, TEXAS 75202
 Firm No. F-761

TOWN OF FAIRVIEW, TEXAS
 372 TOWN PLACE
 FAIRVIEW, TX 75069
 972-562-0522

E. STACY ROAD IMPROVEMENTS
TRAFFIC CONTROL PLAN
PHASE 2
 STA. 84+86 TO STA. 103+91

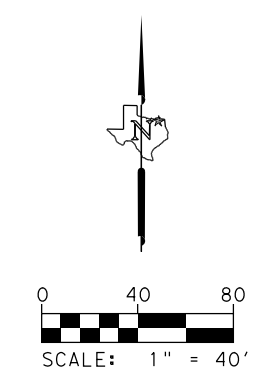
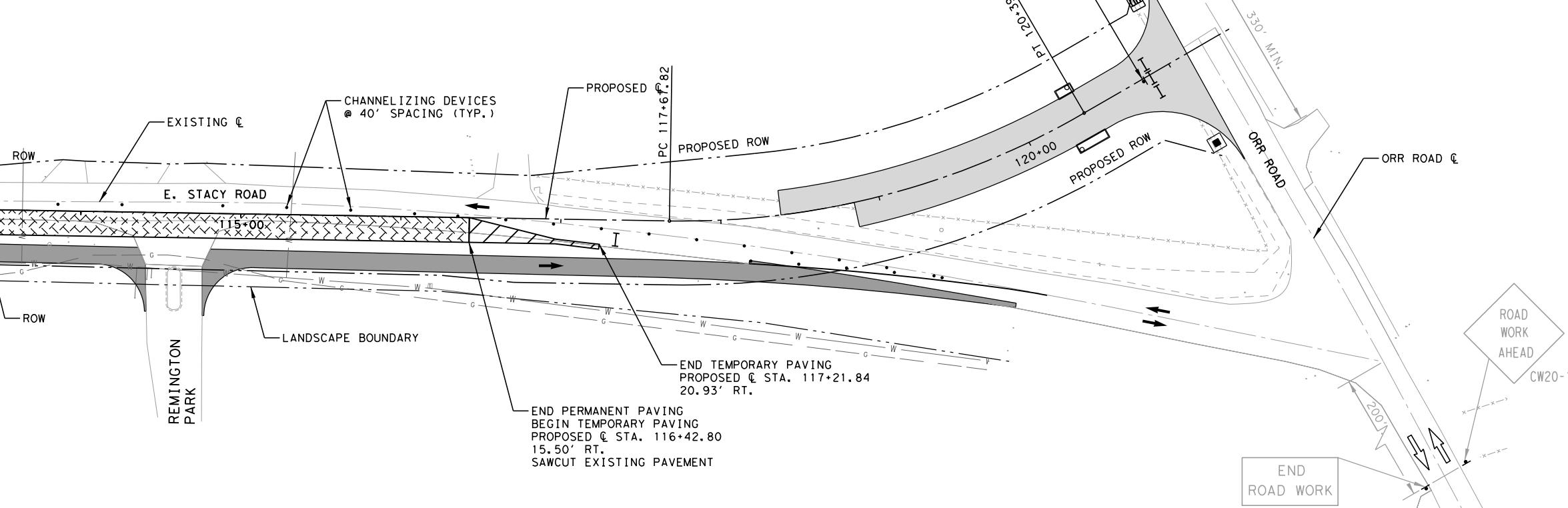
SCALE: 1" = 40'		SHEET 2 OF 3	SHEET NO.
DESIGNED BY:	DRAWN BY:	CHECKED BY:	16
CLM	CLM		

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 5/17/2017 2:31:22 PM rwalker



- NOTES:
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 NOTIFY APPROPRIATE ENTITY
 PRIOR TO EXCAVATION.



- LEGEND**
- TRAFFIC FLOW
 - PERMANENT CONSTRUCTION THIS PHASE
 - DETOUR CONSTRUCTION PREVIOUS PHASE
 - PERMANENT CONSTRUCTION PREVIOUS PHASE
 - APPROXIMATE SIGN PLACEMENT
 - TYPE III BARRICADE

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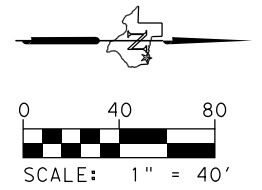
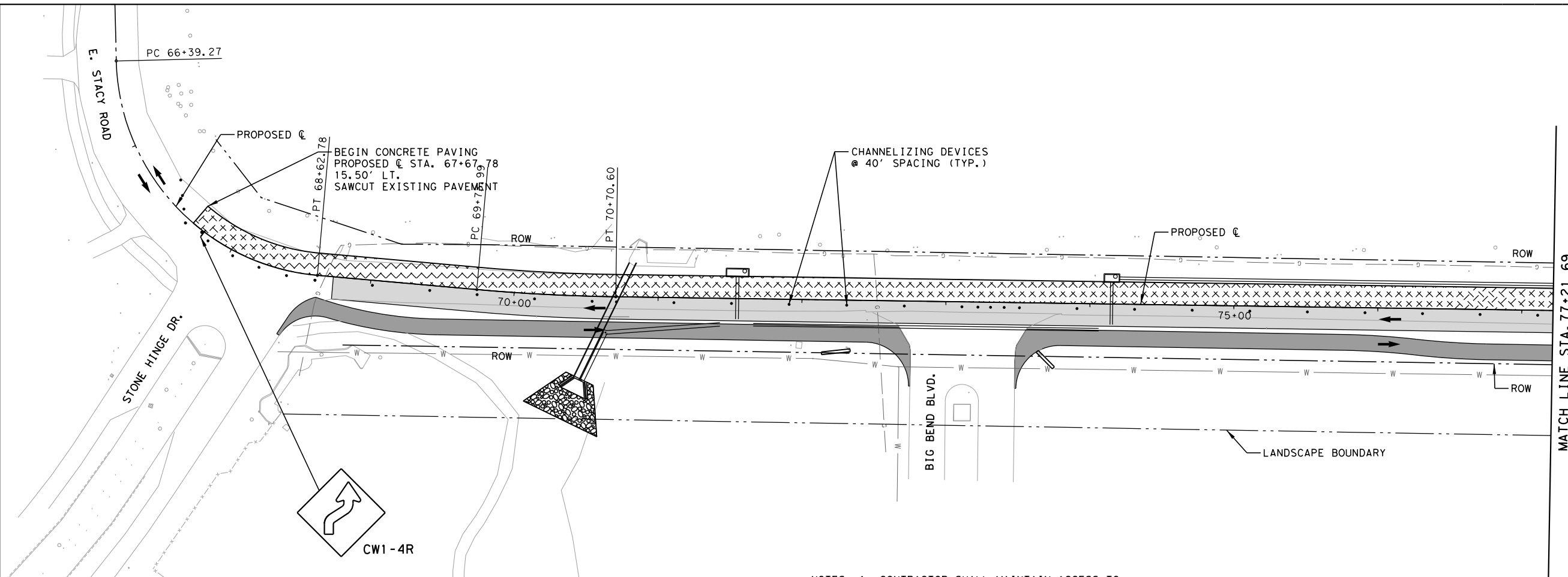
TOWN OF FAIRVIEW, TEXAS
 372 TOWN PLACE
 FAIRVIEW, TX 75069
 972-562-0522

E. STACY ROAD IMPROVEMENTS
TRAFFIC CONTROL PLAN
PHASE 2
 STA. 103+91 TO END

SCALE: 1" = 40'		SHEET 3 OF 3	
DESIGNED BY:	DRAWN BY:	CHECKED BY:	17
CLM	CLM		

SHEET NO.

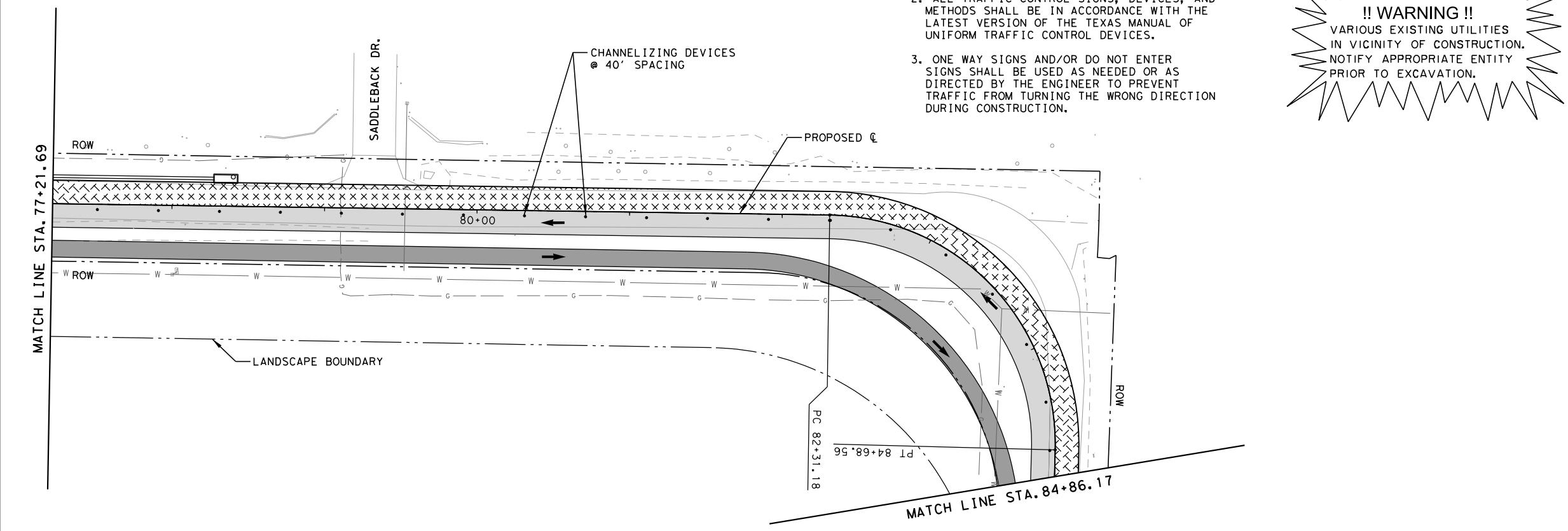
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- LEGEND**
- ➔ TRAFFIC FLOW
 - PERMANENT CONSTRUCTION THIS PHASE
 - DETOUR CONSTRUCTION PREVIOUS PHASE
 - PERMANENT CONSTRUCTION PREVIOUS PHASE
 - APPROXIMATE SIGN PLACEMENT
 - TYPE III BARRICADE

- NOTES: 1. CONTRACTOR SHALL MAINTAIN ACCESS TO ALL DRIVEWAYS AND SIDE STREETS AT ALL TIMES DURING ALL PHASES OF CONSTRUCTION.
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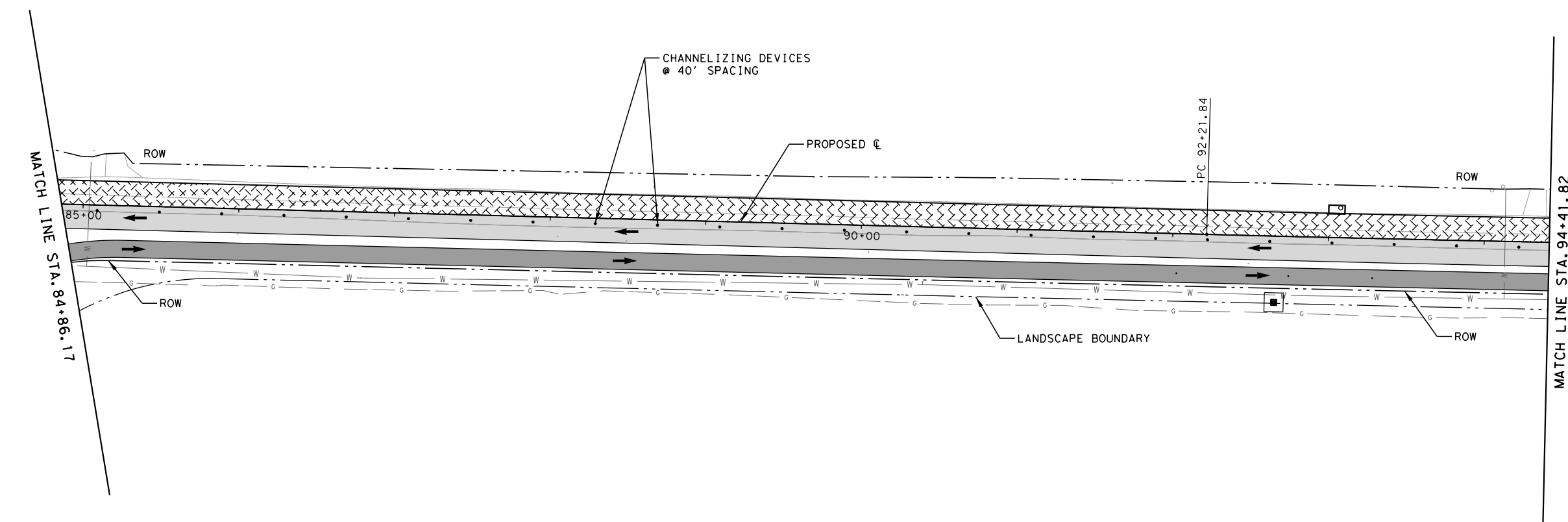
HUITT-ZOLLARS
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 Firm No. F-761

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 372 TOWN PLACE
 FAIRVIEW, TX 75069
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E. STACY ROAD IMPROVEMENTS
TRAFFIC CONTROL PLAN
PHASE 3
 BEGIN TO STA. 84+86

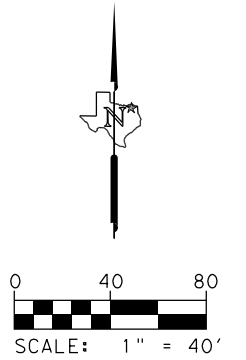
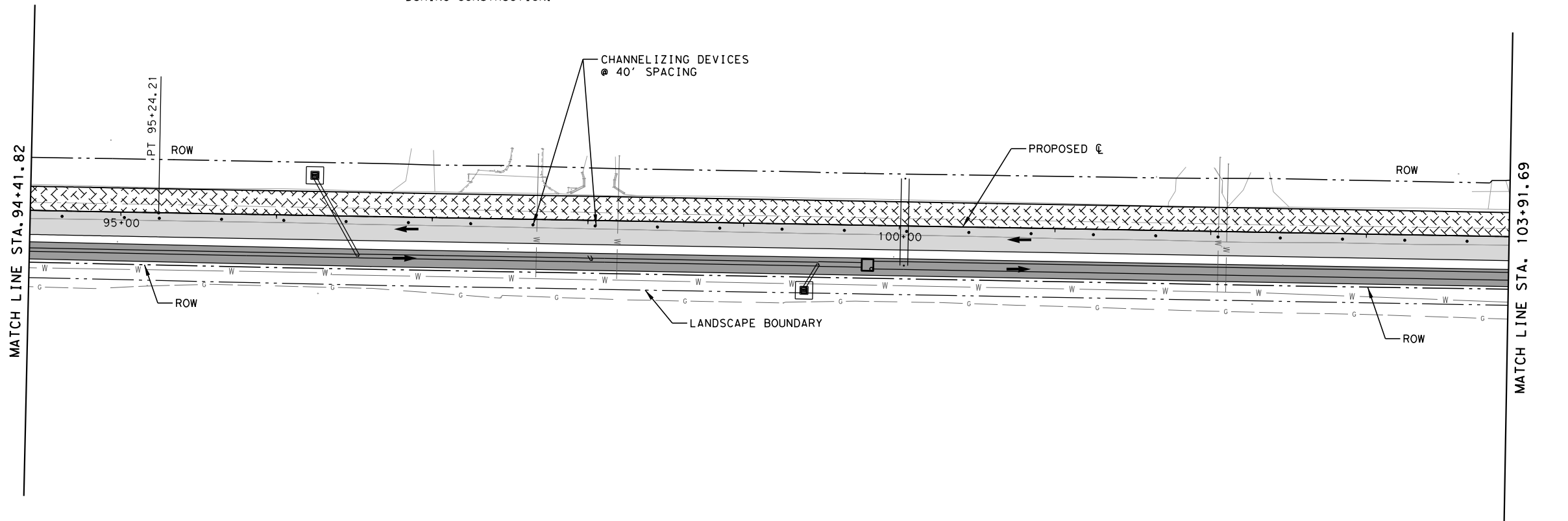
SCALE: 1" = 40'		SHEET 1 OF 4	SHEET NO.
DESIGNED BY:	DRAWN BY:	CHECKED BY:	18
CLM	CLM		

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 IN VICINITY OF CONSTRUCTION.
 NOTIFY APPROPRIATE ENTITY
 PRIOR TO EXCAVATION.



- LEGEND**
- TRAFFIC FLOW
 - PERMANENT CONSTRUCTION THIS PHASE
 - DETOUR CONSTRUCTION PREVIOUS PHASE
 - PERMANENT CONSTRUCTION PREVIOUS PHASE
 - APPROXIMATE SIGN PLACEMENT
 - TYPE III BARRICADE

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 Firm No. F-761

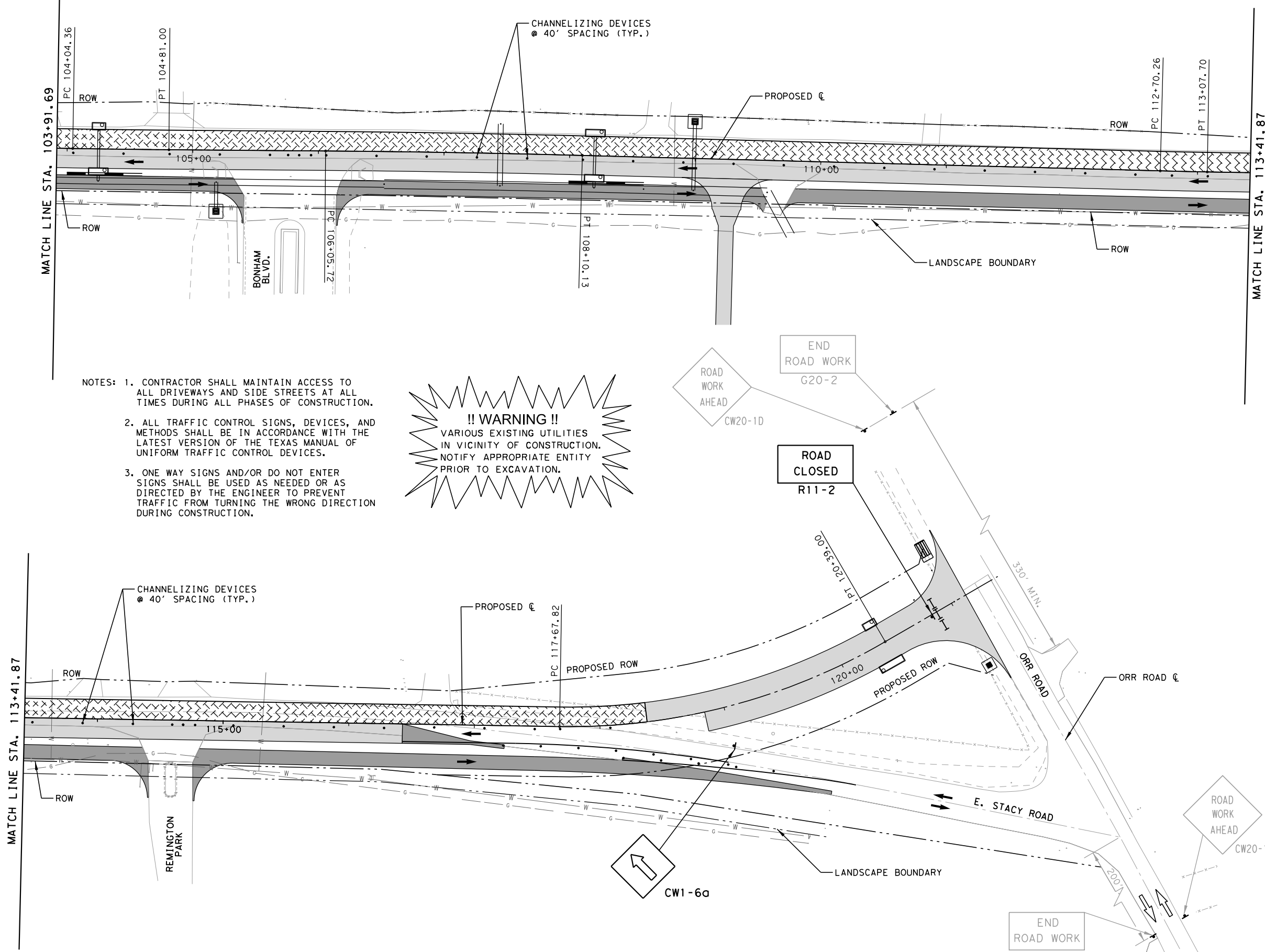
TOWN OF FAIRVIEW, TEXAS
 372 TOWN PLACE
 FAIRVIEW, TX 75069
 972-562-0522

E. STACY ROAD IMPROVEMENTS
TRAFFIC CONTROL PLAN
PHASE 3
 STA. 84+86 TO STA. 103+91

SCALE: 1" = 40'		SHEET 2 OF 4	
DESIGNED BY:	DRAWN BY:	CHECKED BY:	19
CLM	CLM		

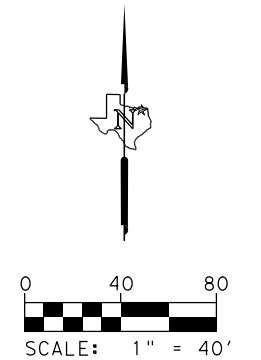
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- NOTES:
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 VARIOUS EXISTING UTILITIES
 IN VICINITY OF CONSTRUCTION.
 NOTIFY APPROPRIATE ENTITY
 PRIOR TO EXCAVATION.



- LEGEND**
- TRAFFIC FLOW
 - [Cross-hatched box] PERMANENT CONSTRUCTION THIS PHASE
 - [Dark grey box] DETOUR CONSTRUCTION PREVIOUS PHASE
 - [Light grey box] PERMANENT CONSTRUCTION PREVIOUS PHASE
 - APPROXIMATE SIGN PLACEMENT
 - [Vertical bar symbol] TYPE III BARRICADE

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 Firm No. F-761

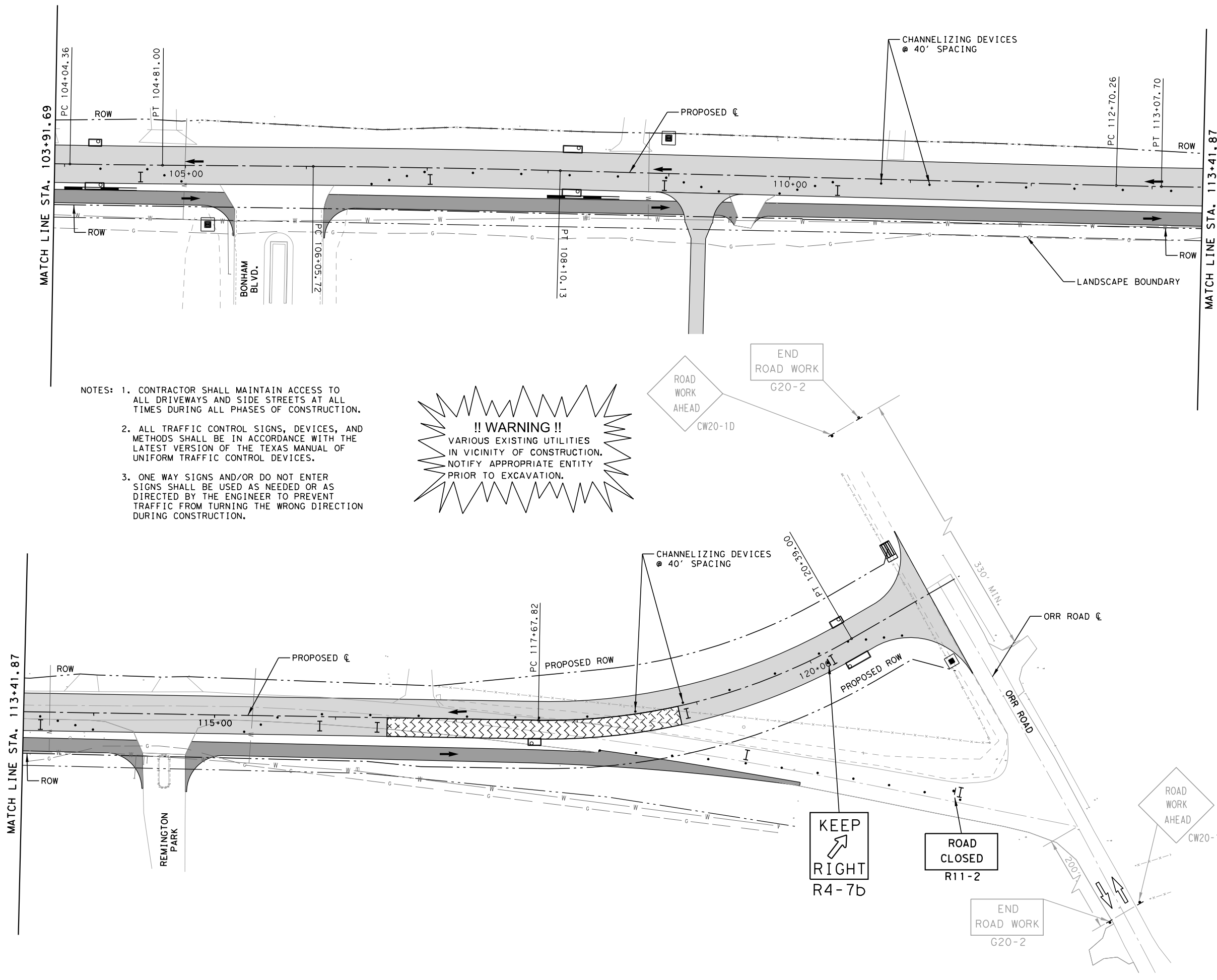
TOWN OF FAIRVIEW, TEXAS
 372 TOWN PLACE
 FAIRVIEW, TX 75069
 972-562-0522

E. STACY ROAD IMPROVEMENTS
TRAFFIC CONTROL PLAN
PHASE 3A
 STA. 103+91 TO END

SCALE: 1" = 40'		SHEET 3 OF 4	
DESIGNED BY:	DRAWN BY:	CHECKED BY:	20
CLM	CLM		

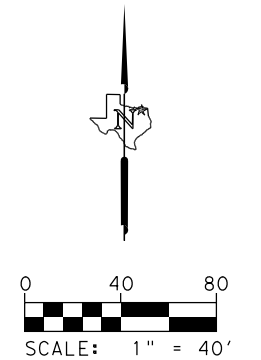
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 PRIOR TO EXCAVATION.



- LEGEND**
- TRAFFIC FLOW
 - PERMANENT CONSTRUCTION THIS PHASE
 - DETOUR CONSTRUCTION PREVIOUS PHASE
 - PERMANENT CONSTRUCTION PREVIOUS PHASE
 - APPROXIMATE SIGN PLACEMENT
 - TYPE III BARRICADE

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 HUITT-ZOLLARS, INC.
 Christian L. Moorman, P.E. #93828
 Date: 3/17/2017

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 HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING
 1717 MCKINNEY AVE., SUITE 1400 DALLAS, TEXAS 75202
 Firm No. F-761

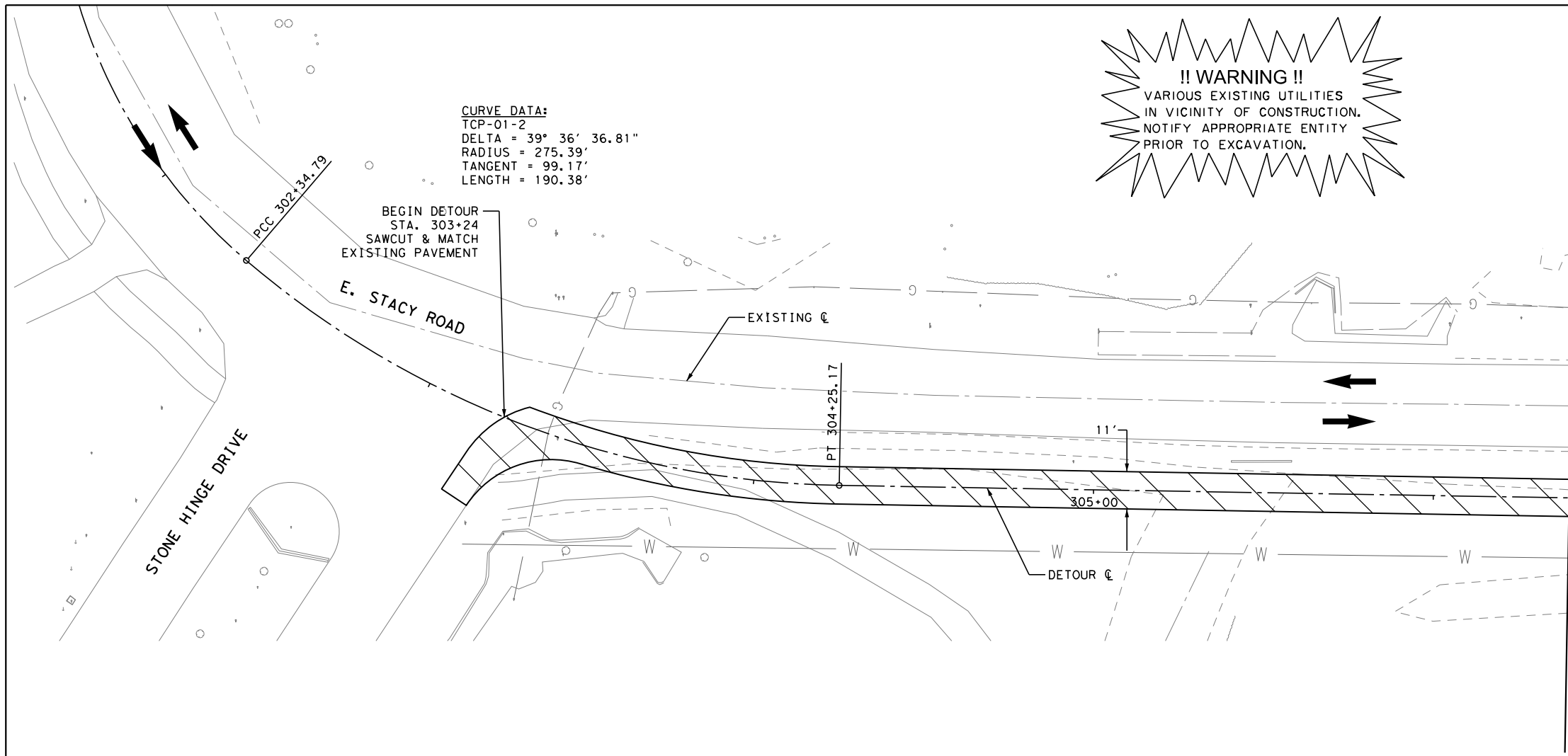
TOWN OF FAIRVIEW, TEXAS
 372 TOWN PLACE
 FAIRVIEW, TX 75069
 972-562-0522

E. STACY ROAD IMPROVEMENTS
TRAFFIC CONTROL PLAN
PHASE 3B
 STA. 103+91 TO END

SCALE: 1" = 40'		SHEET 4 OF 4	
DESIGNED BY:	DRAWN BY:	CHECKED BY:	21
CLM	CLM		

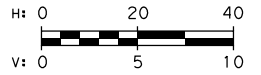
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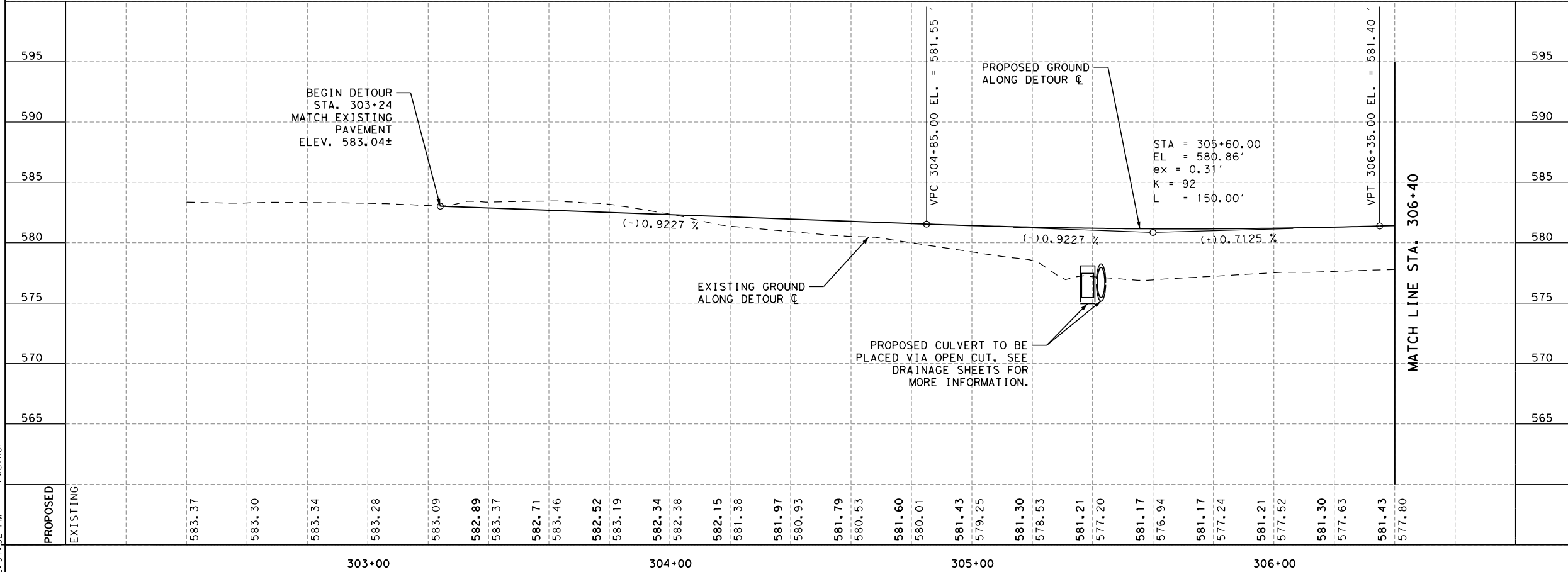
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 RADIUS = 275.39'
 TANGENT = 99.17'
 LENGTH = 190.38'

!! WARNING !!
 VARIOUS EXISTING UTILITIES
 IN VICINITY OF CONSTRUCTIONS.
 NOTIFY APPROPRIATE ENTITY
 PRIOR TO EXCAVATION.



LEGEND
 TRAFFIC FLOW
 TEMP DETOUR PAVEMENT

- NOTES:**
1. CONSTRUCT DRAINAGE FEATURES OUTSIDE THE PROPOSED ROADWAY PRIOR TO CONSTRUCTING DETOUR PAVEMENT.
 2. THE INFORMATION SHOWN ON THIS DRAWING CONCERNING TYPE AND LOCATION OF UNDERGROUND UTILITIES IS NOT GUARANTEED TO BE ACCURATE OR ALL INCLUSIVE. THE CONTRACTOR IS RESPONSIBLE FOR MAKING HIS OWN DETERMINATION AS TO TYPE AND LOCATION OF UNDERGROUND UTILITIES AS MAY BE NECESSARY TO AVOID DAMAGE THERETO. THE CONTRACTOR SHALL VERIFY LOCATION OF UNDERGROUND PIPELINES, CONDUITS, AND STRUCTURES BY CONTACTING OWNERS OF UNDERGROUND UTILITIES AND BY PROSPECTING IN ADVANCE OF EXCAVATION OPERATIONS.



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 Date: 3/17/2017

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 Firm No. F-761

TOWN OF FAIRVIEW, TEXAS
 372 TOWN PLACE
 FAIRVIEW, TX 75069
 972-562-0522

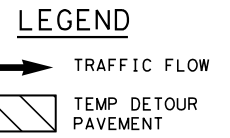
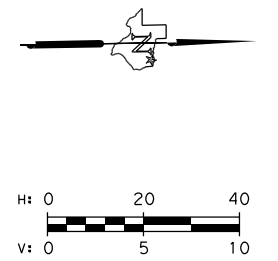
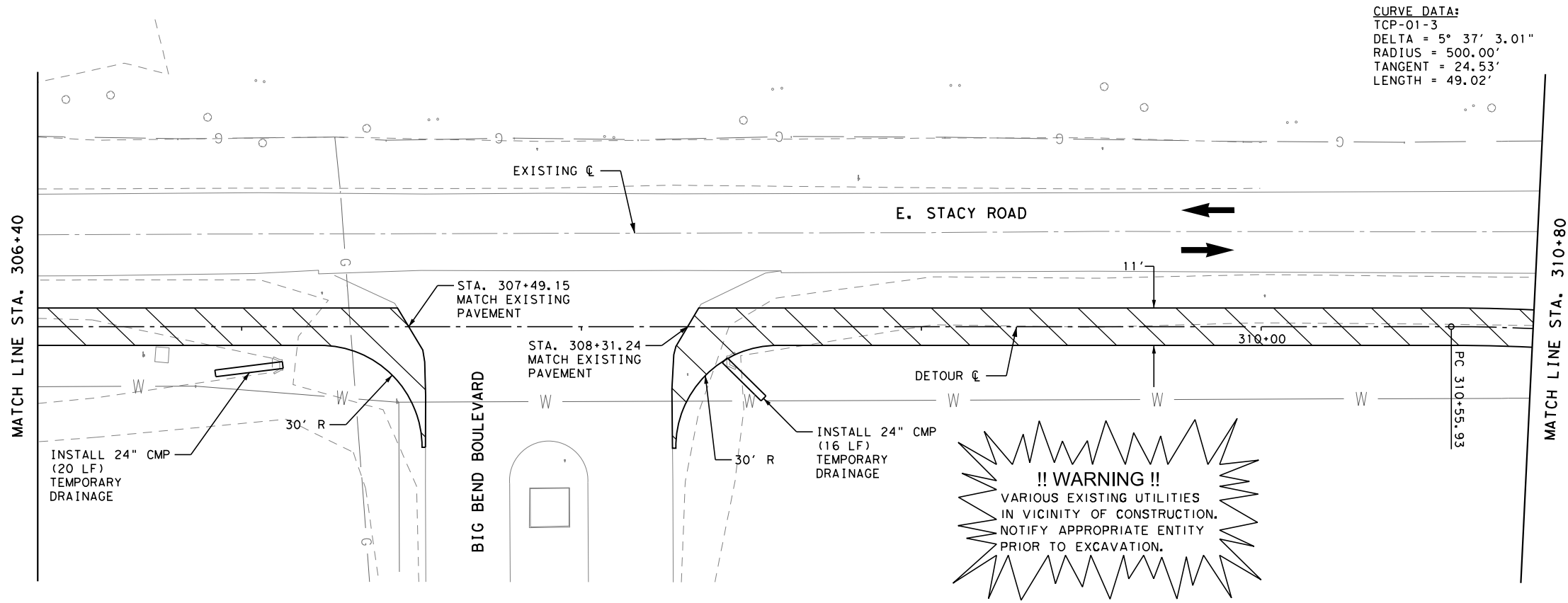
E. STACY ROAD IMPROVEMENTS
DETOUR PLAN & PROFILE
 BEGIN TO STA. 306+40

SCALE: H: 1" = 20'
 V: 1" = 5'

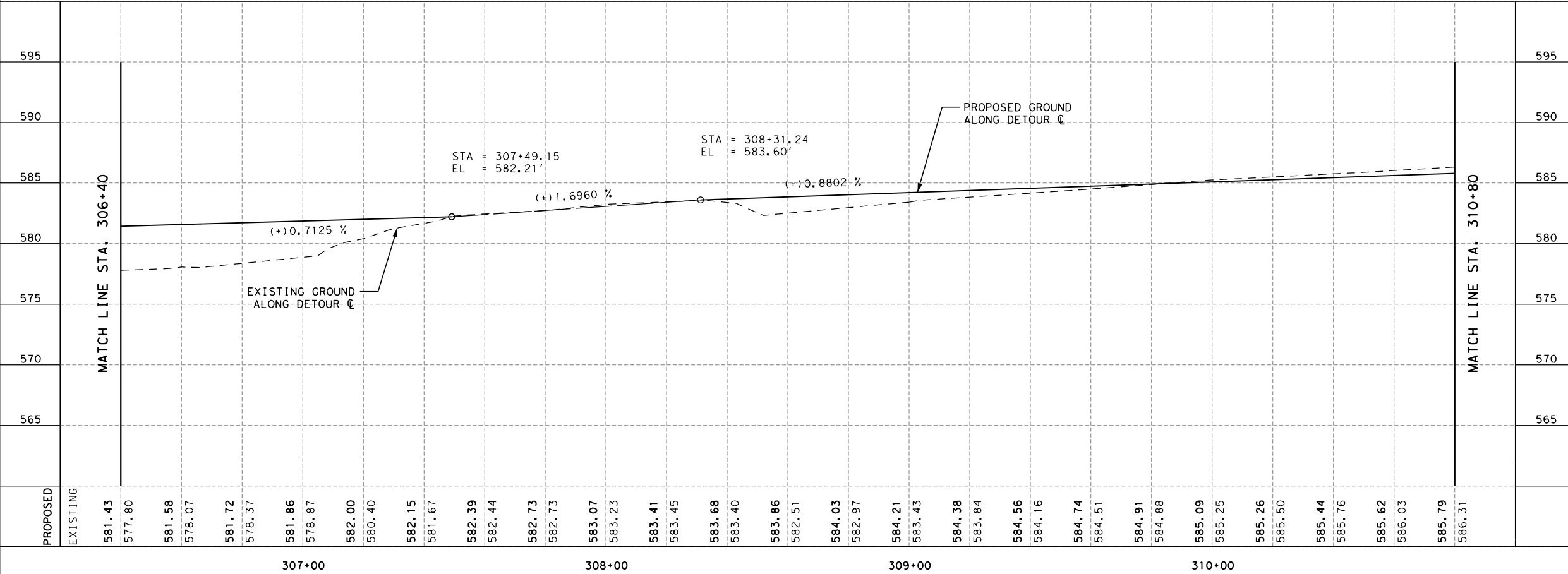
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SHEET 1 OF 12
 SHEET NO. 22

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 Firm No. F-761

TOWN OF FAIRVIEW TEXAS
 TOWN OF FAIRVIEW, TEXAS
 372 TOWN PLACE
 FAIRVIEW, TX 75069
 972-562-0522

E. STACY ROAD IMPROVEMENTS

**DETOUR
 PLAN & PROFILE**

STA. 306+40 TO STA. 310+80

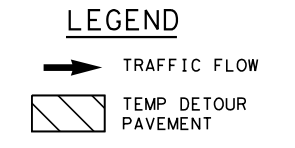
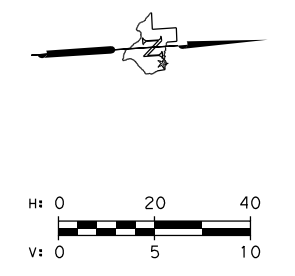
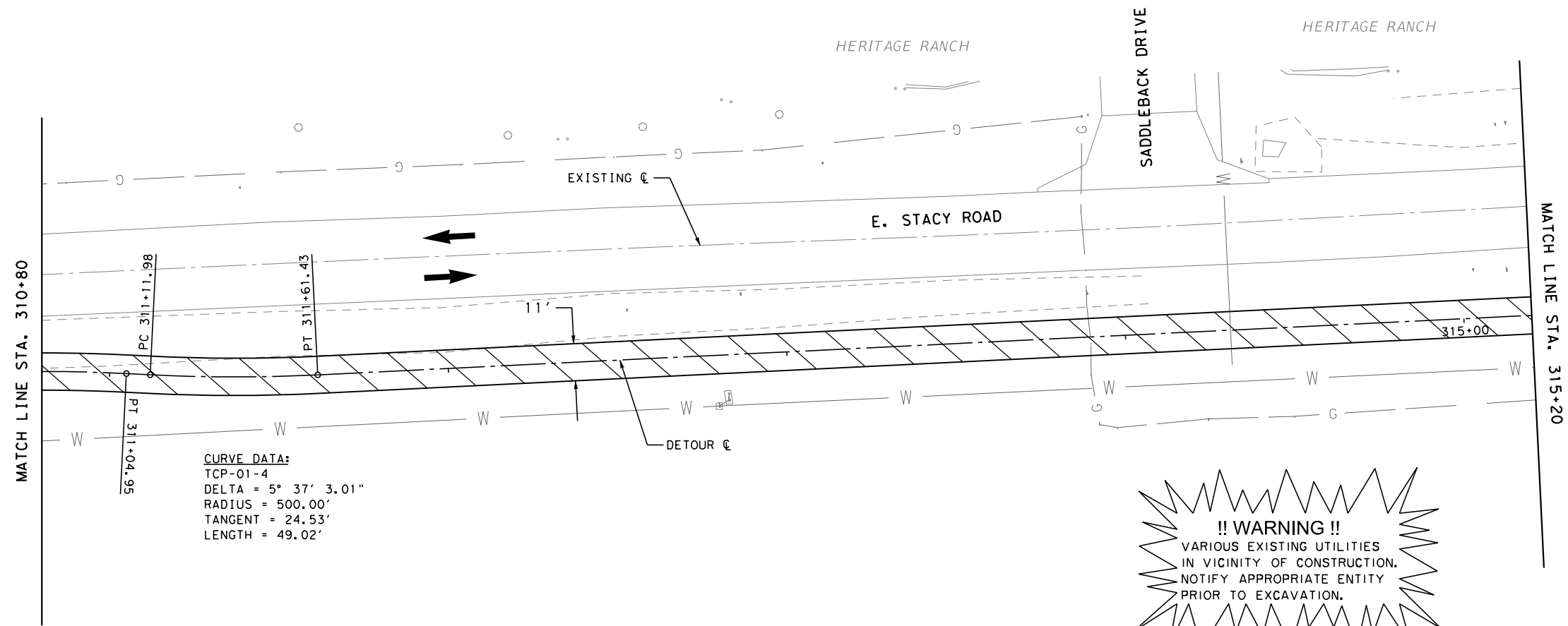
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 V: 1" = 5'

DESIGNED BY: CLM
 DRAWN BY: RAW
 CHECKED BY:

SHEET NO. 23

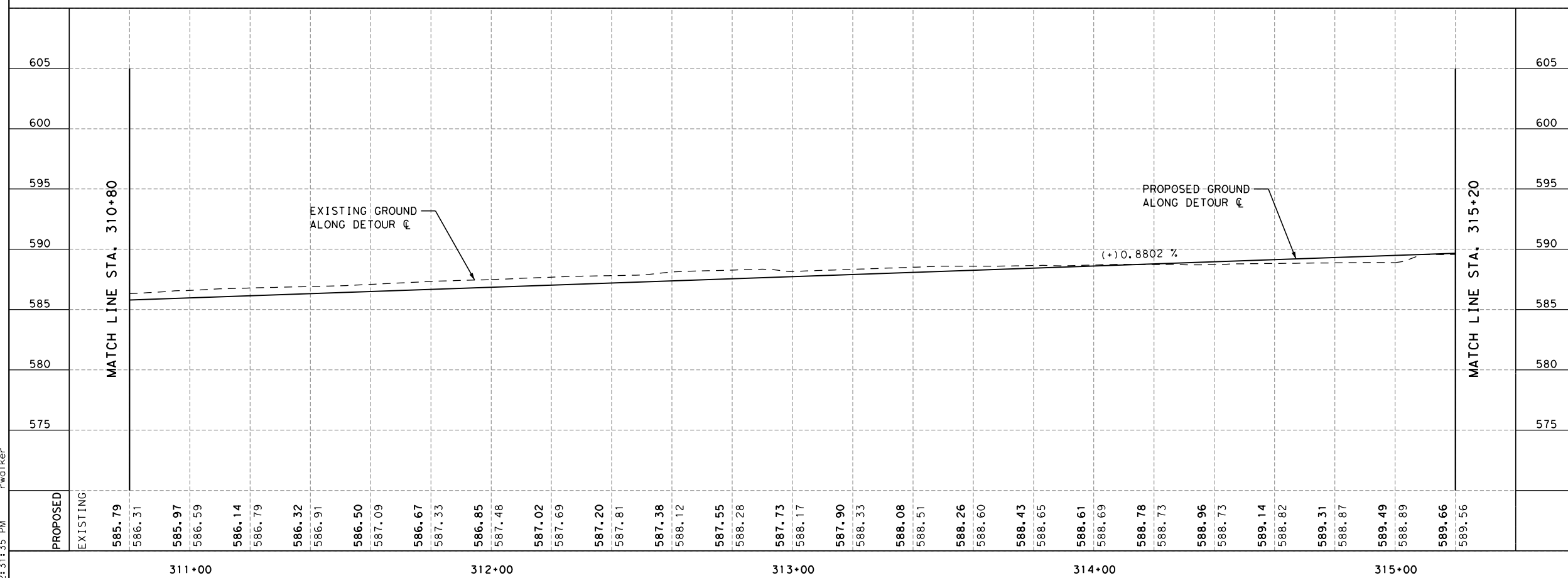
SHEET 2 OF 12

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 5/17/2017 2:31:35 PM rwalker



- NOTES:
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 Firm No. F-761

TOWN OF FAIRVIEW TEXAS
 TOWN OF FAIRVIEW, TEXAS
 372 TOWN PLACE
 FAIRVIEW, TX 75069
 972-562-0522

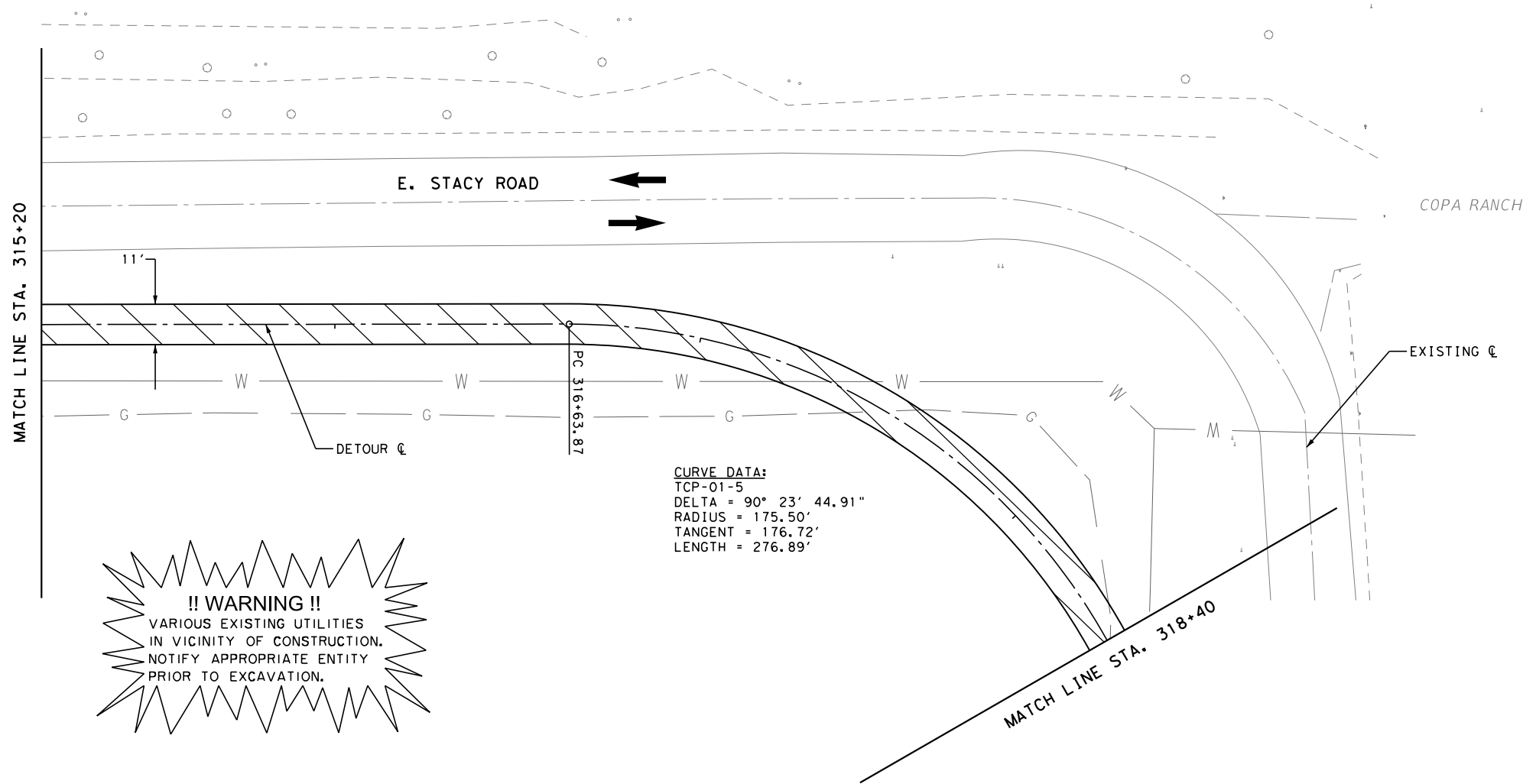
E. STACY ROAD IMPROVEMENTS
DETOUR PLAN & PROFILE
 STA. 310+80 TO STA. 315+20

SCALE: H: 1" = 20'
 V: 1" = 5'

DESIGNED BY: CLM DRAWN BY: RAW CHECKED BY: SHEET NO. 24

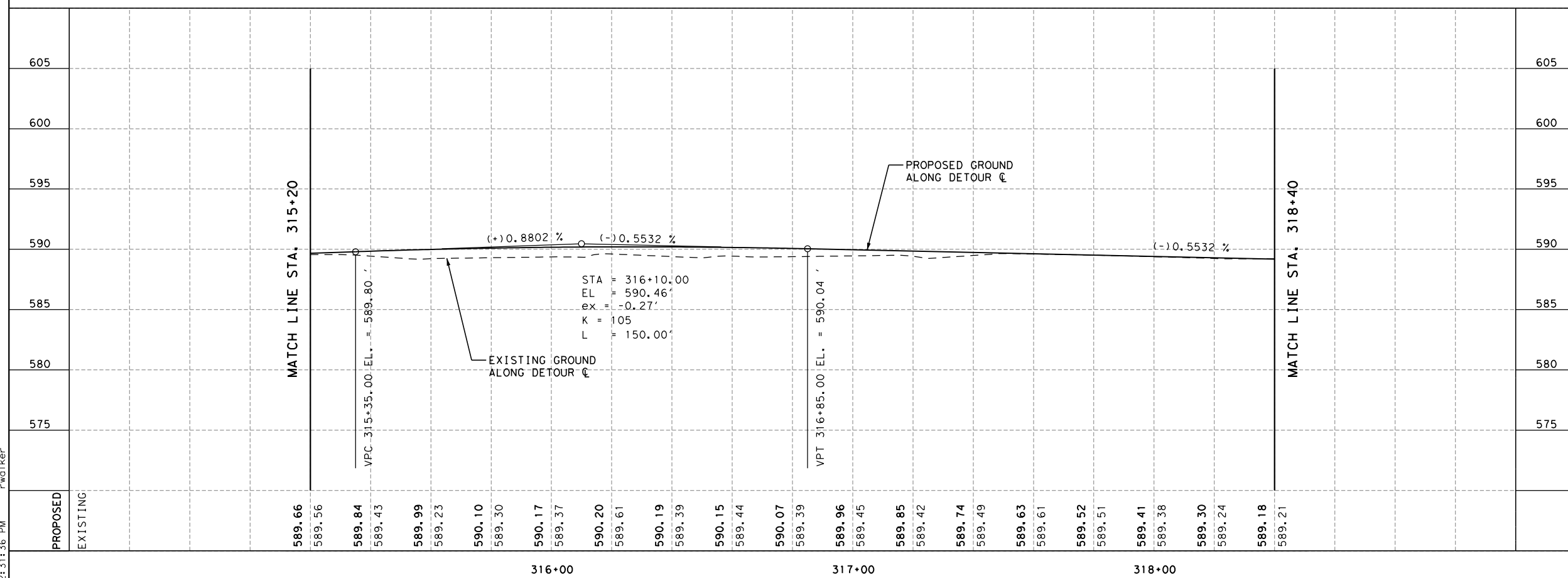
SHEET 3 OF 12

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!! WARNING !!
 VARIOUS EXISTING UTILITIES
 IN VICINITY OF CONSTRUCTION.
 NOTIFY APPROPRIATE ENTITY
 PRIOR TO EXCAVATION.

- NOTES:
1. CONSTRUCT DRAINAGE FEATURES OUTSIDE THE PROPOSED ROADWAY PRIOR TO CONSTRUCTING DETOUR PAVEMENT.
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 HUITT-ZOLLARS, INC.
 Christian L. Moorman, P.E. #93828
 Date: 3/17/2017

HUITT-ZOLLARS
 HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING
 1717 MCKINNEY AVE., SUITE 1400 DALLAS, TEXAS 75202
 Firm No. F-761

TOWN OF FAIRVIEW TEXAS
 TOWN OF FAIRVIEW, TEXAS
 372 TOWN PLACE
 FAIRVIEW, TX 75069
 972-562-0522

E. STACY ROAD IMPROVEMENTS
DETOUR
PLAN & PROFILE
 STA. 315+20 TO STA. 318+40

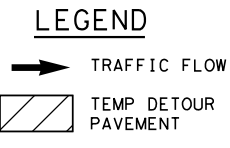
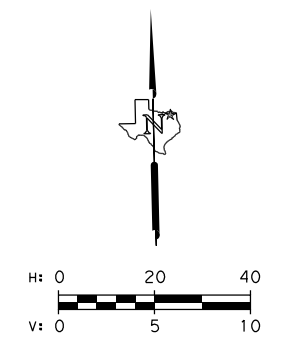
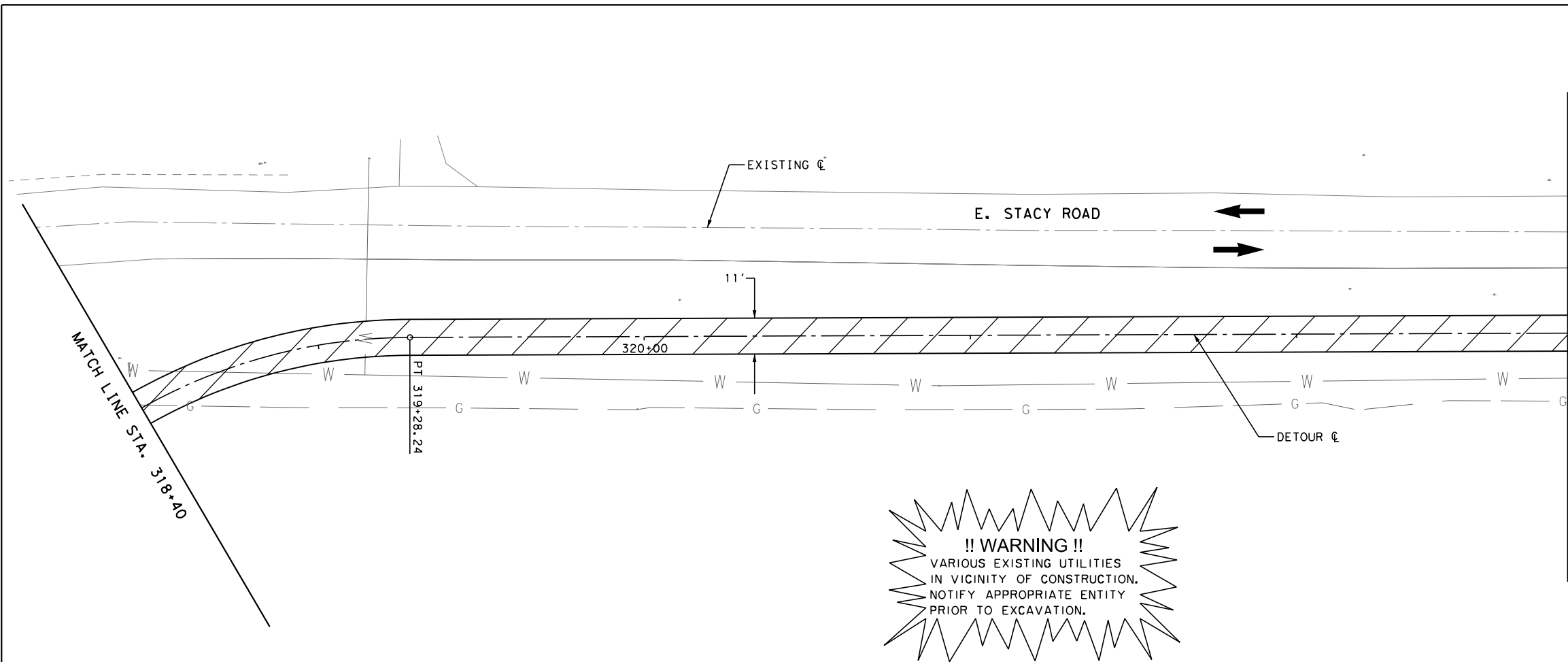
SCALE: H: 1" = 20'
 V: 1" = 5'

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SHEET NO. 25

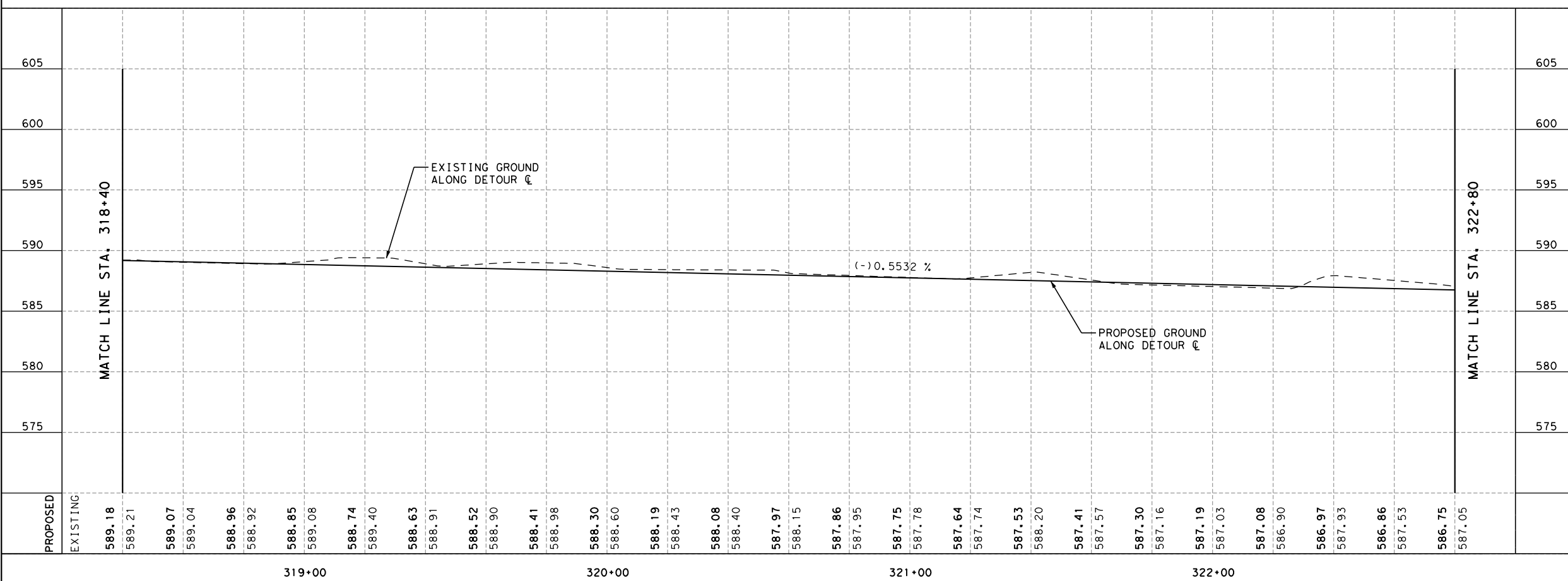
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 Firm No. F-761

TOWN OF FAIRVIEW TEXAS
 TOWN OF FAIRVIEW, TEXAS
 372 TOWN PLACE
 FAIRVIEW, TX 75069
 972-562-0522

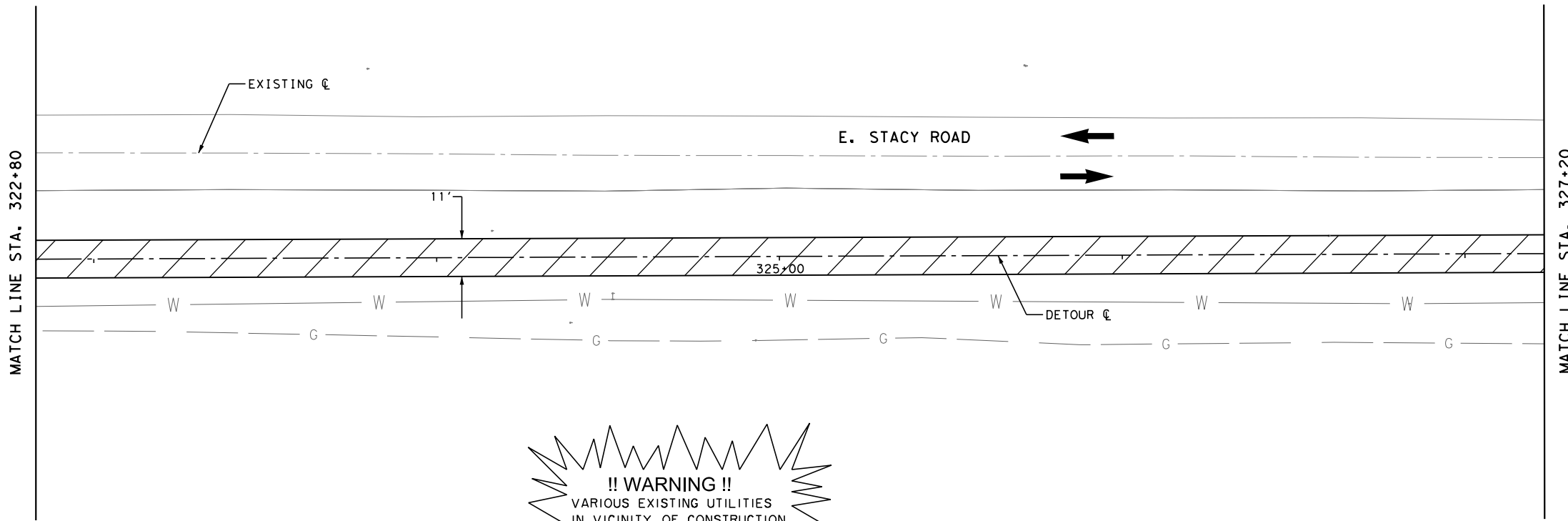
E. STACY ROAD IMPROVEMENTS
DETOUR
PLAN & PROFILE
 STA. 318+40 TO STA. 322+80

SCALE: H: 1" = 20'
 V: 1" = 5'

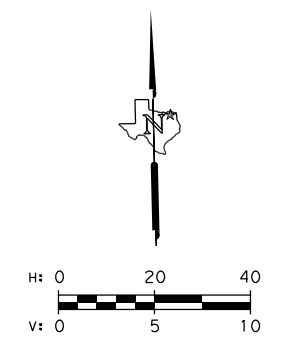
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 DRAWN BY: RAW
 CHECKED BY:

SHEET NO. 26
 SHEET 5 OF 12

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 VARIOUS EXISTING UTILITIES
 IN VICINITY OF CONSTRUCTION.
 NOTIFY APPROPRIATE ENTITY
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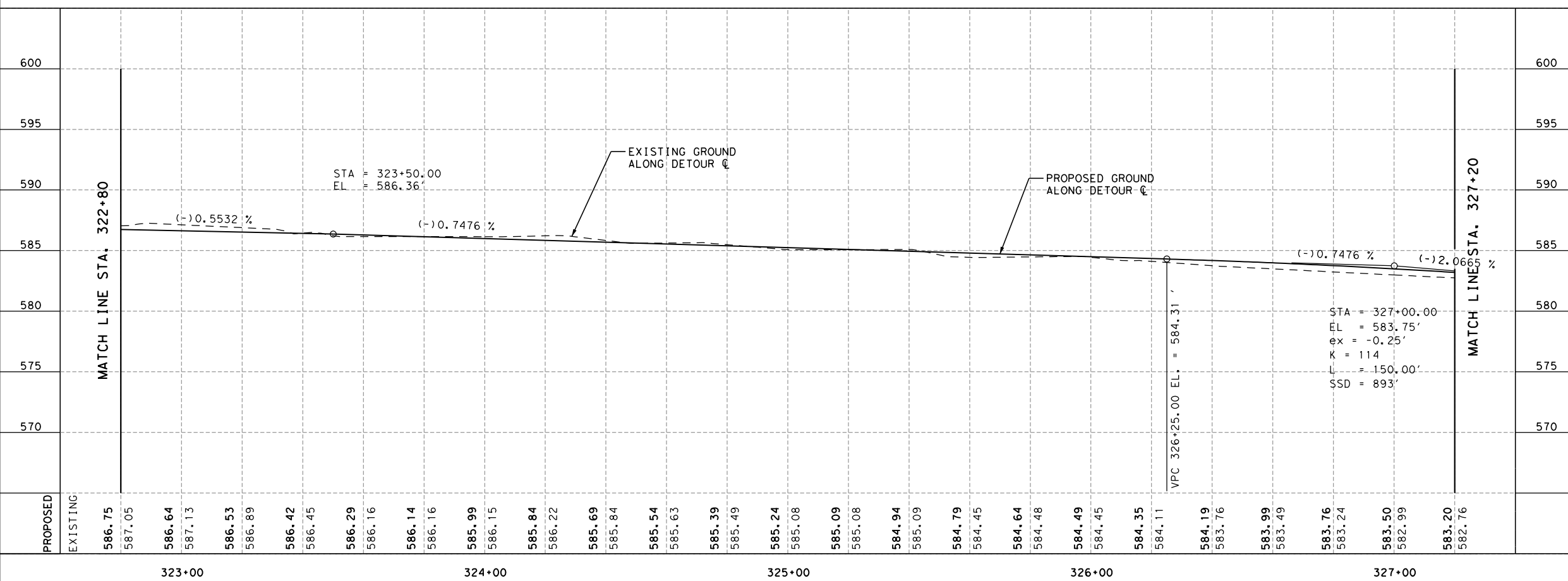


LEGEND

→ TRAFFIC FLOW

▨ TEMP DETOUR PAVEMENT

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TOWN OF FAIRVIEW TEXAS
 TOWN OF FAIRVIEW, TEXAS
 372 TOWN PLACE
 FAIRVIEW, TX 75069
 972-562-0522

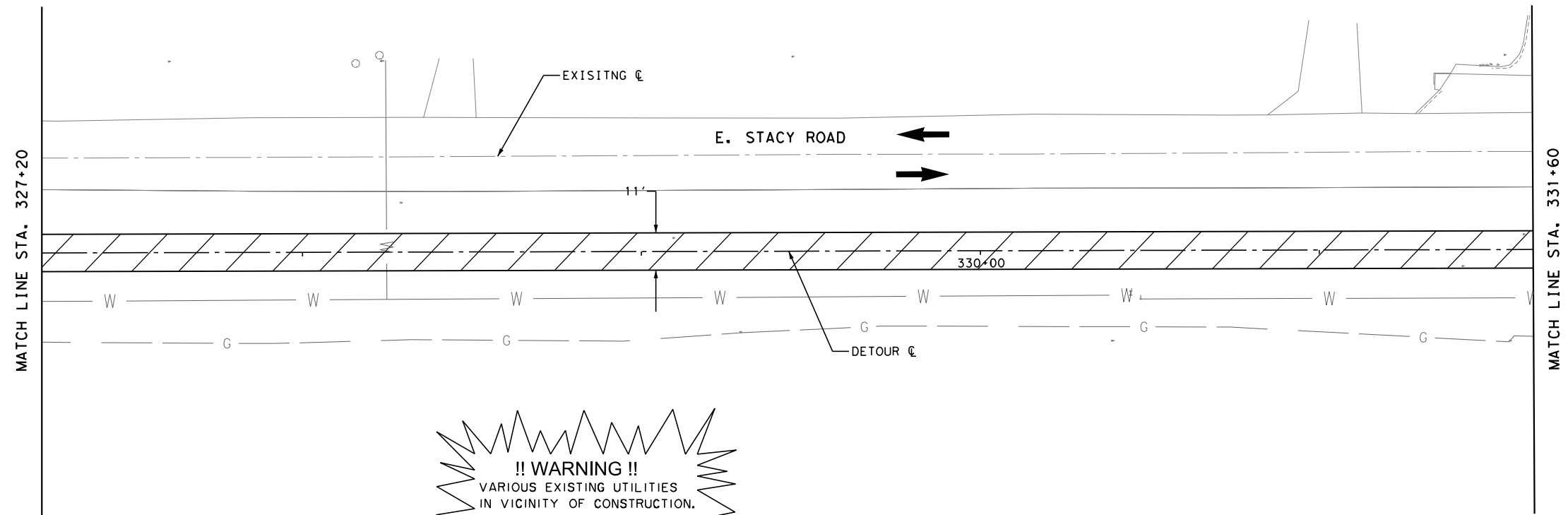
E. STACY ROAD IMPROVEMENTS
DETOUR PLAN & PROFILE
 STA. 322+80 TO STA. 327+20

SCALE: H: 1" = 20'
 V: 1" = 5'

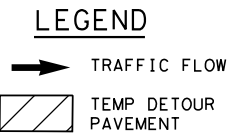
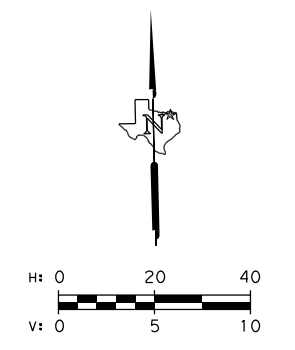
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SHEET 6 OF 12

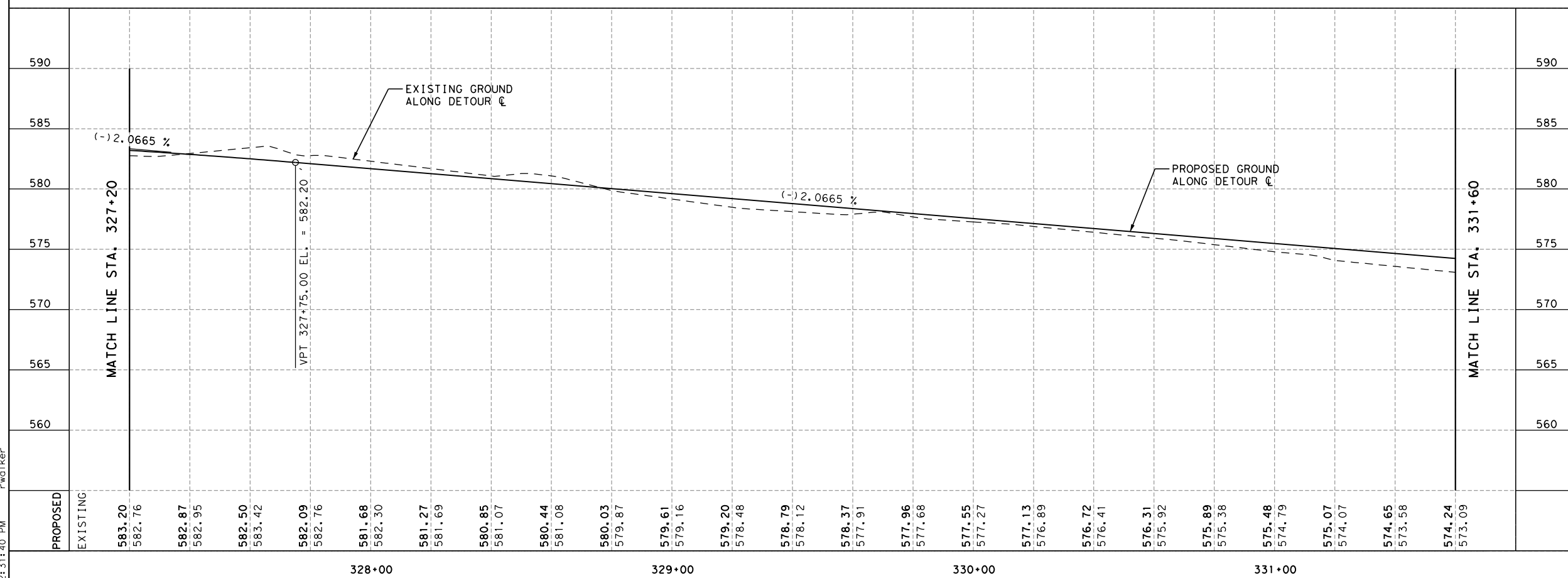
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!! WARNING !!
 VARIOUS EXISTING UTILITIES
 IN VICINITY OF CONSTRUCTION.
 NOTIFY APPROPRIATE ENTITY
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TOWN OF FAIRVIEW, TEXAS
 372 TOWN PLACE
 FAIRVIEW, TX 75069
 972-562-0522

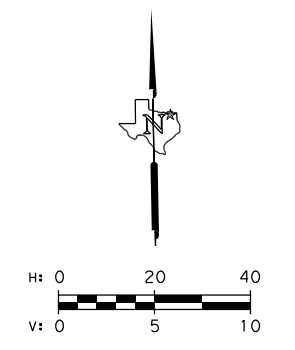
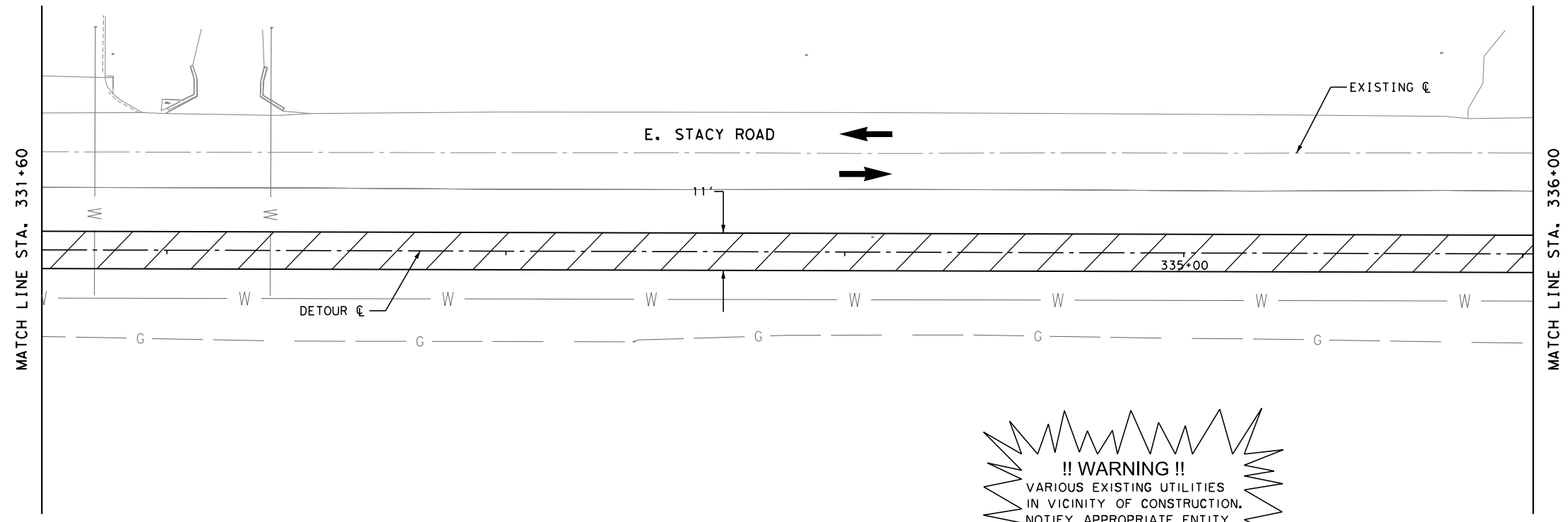
E. STACY ROAD IMPROVEMENTS

DETOUR PLAN & PROFILE

STA. 327+20 TO STA. 331+60

SCALE: H: 1" = 20'		SHEET NO. 28
V: 1" = 5'		
DESIGNED BY: CLM	DRAWN BY: RAW	CHECKED BY:

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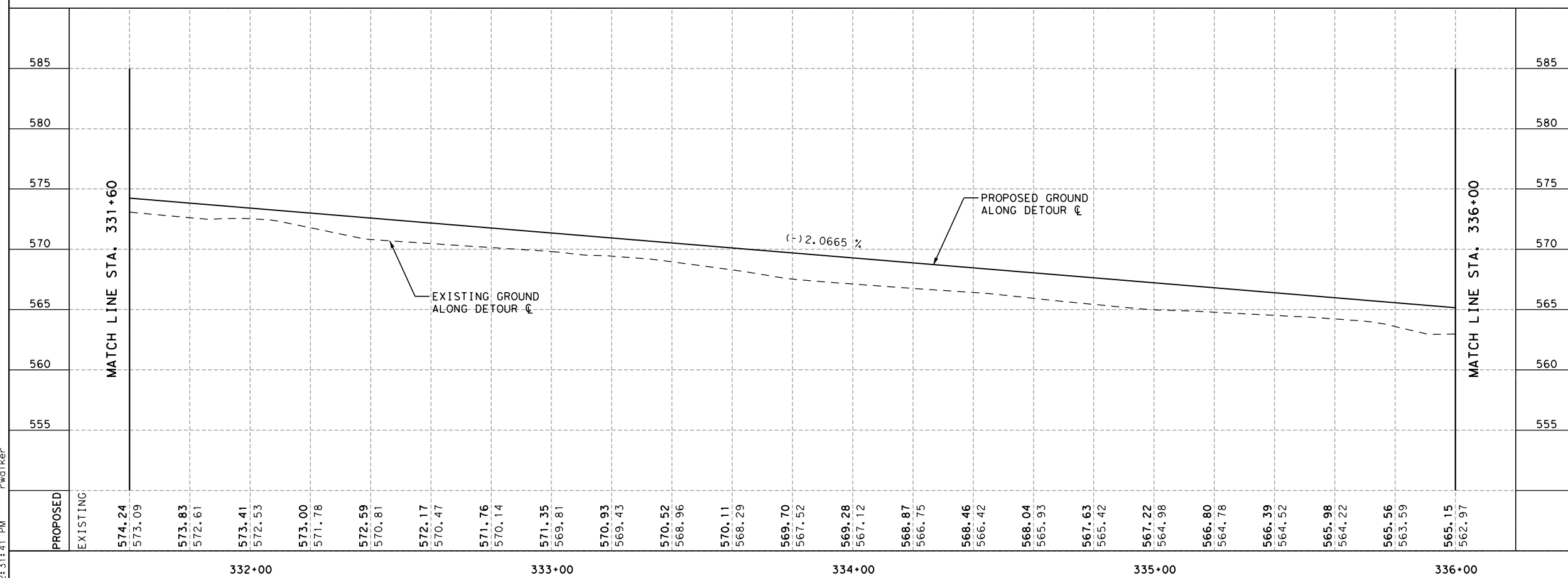
LEGEND

→ TRAFFIC FLOW

▨ TEMP DETOUR PAVEMENT

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 372 TOWN PLACE
 FAIRVIEW, TX 75069
 972-562-0522

E. STACY ROAD IMPROVEMENTS

**DETOUR
 PLAN & PROFILE**

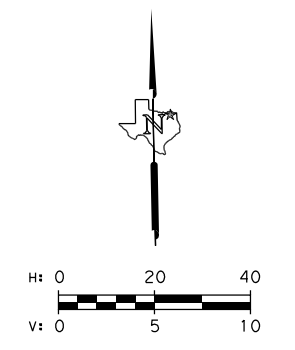
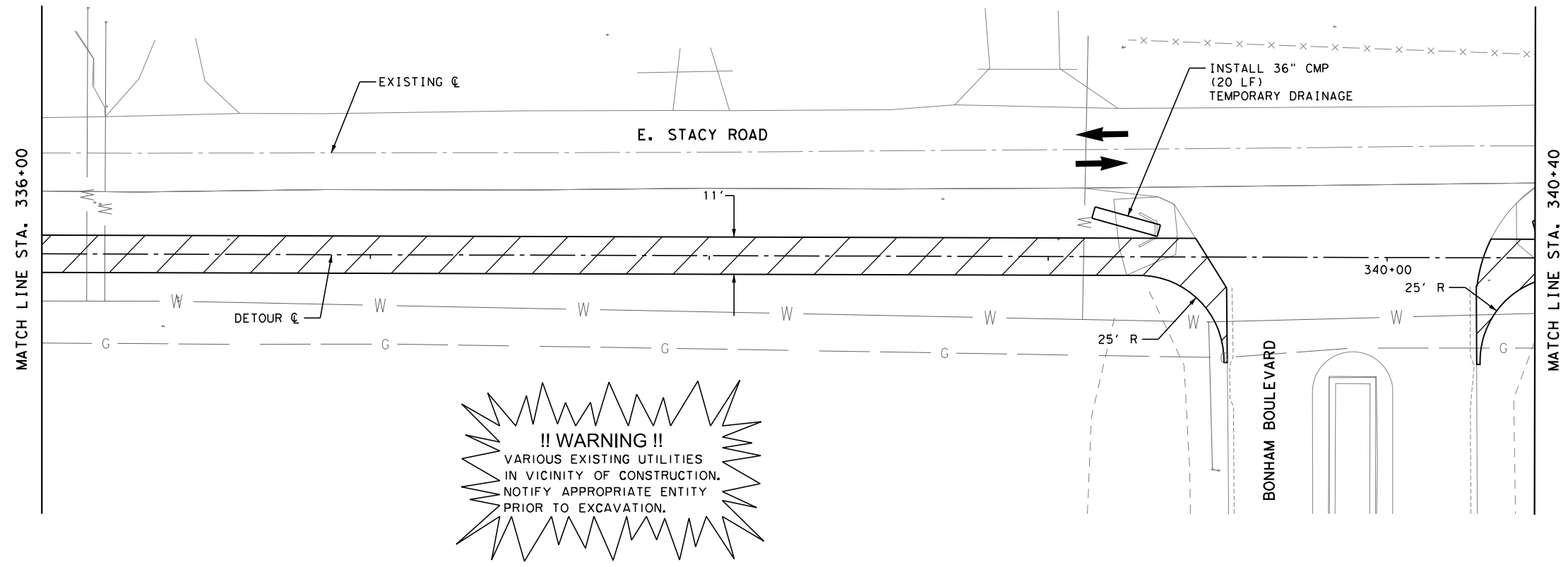
STA. 331+60 TO STA. 336+00

SCALE: H: 1" = 20'
 V: 1" = 5'

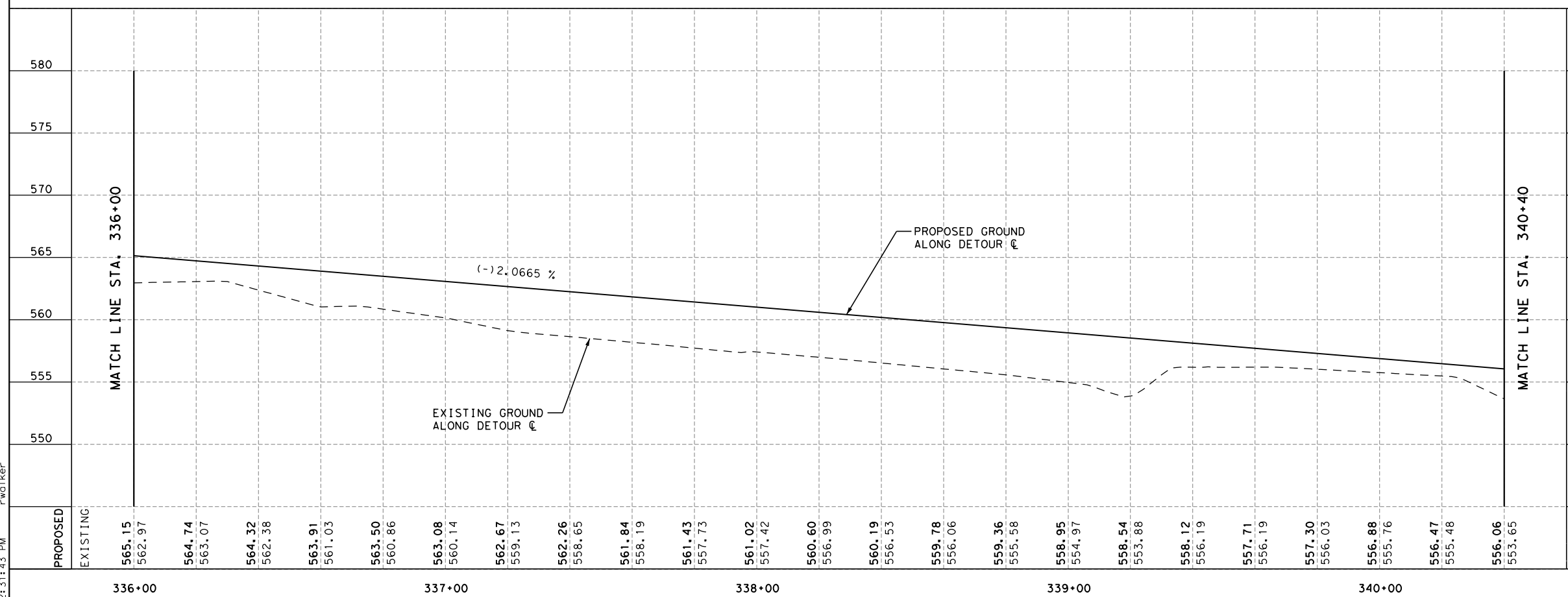
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SHEET NO. 29

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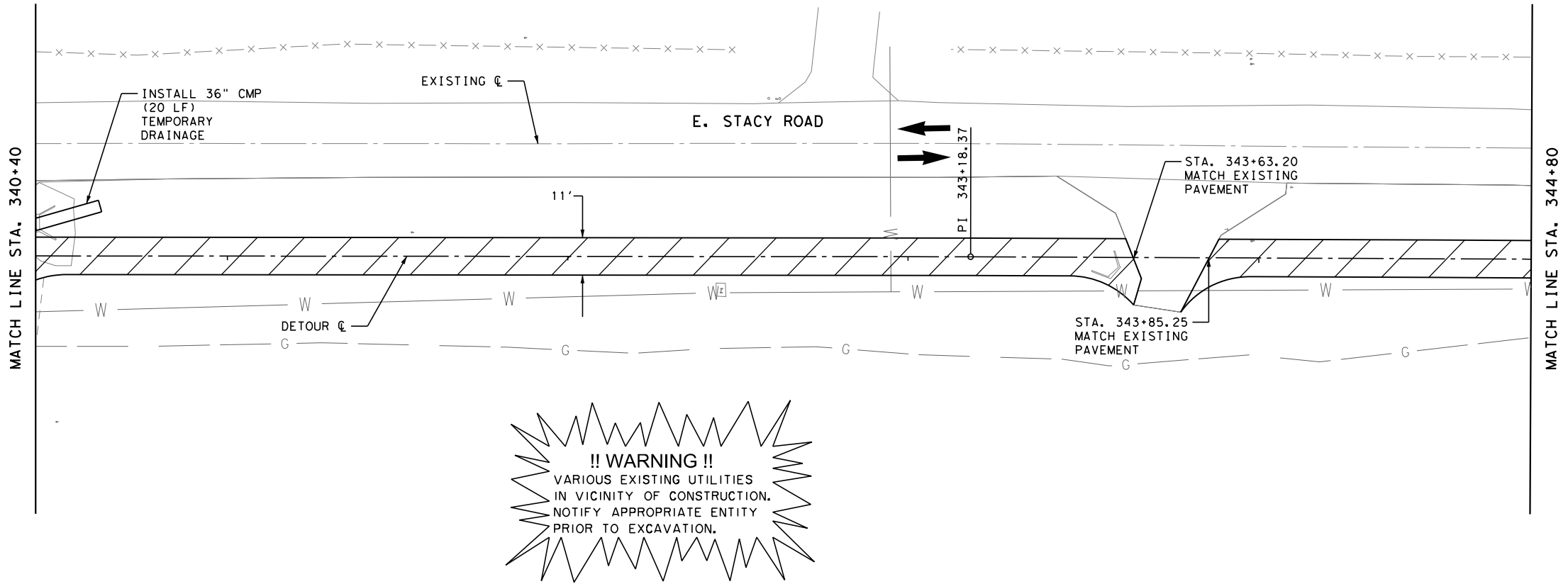
HUITT-ZOLLARS
 HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING
 1717 MCKINNEY AVE., SUITE 1400 DALLAS, TEXAS 75202
 Firm No. F-761

TOWN OF FAIRVIEW TEXAS
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 372 TOWN PLACE
 FAIRVIEW, TX 75069
 972-562-0522

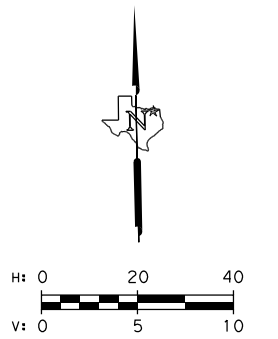
E. STACY ROAD IMPROVEMENTS
DETOUR
PLAN & PROFILE
 STA. 336+00 TO STA. 340+40

SCALE: H: 1" = 20'	SHEET NO. 30
V: 1" = 5'	
DESIGNED BY: CLM	SHEET 9 OF 12
DRAWN BY: RAW	
CHECKED BY:	

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!! WARNING !!
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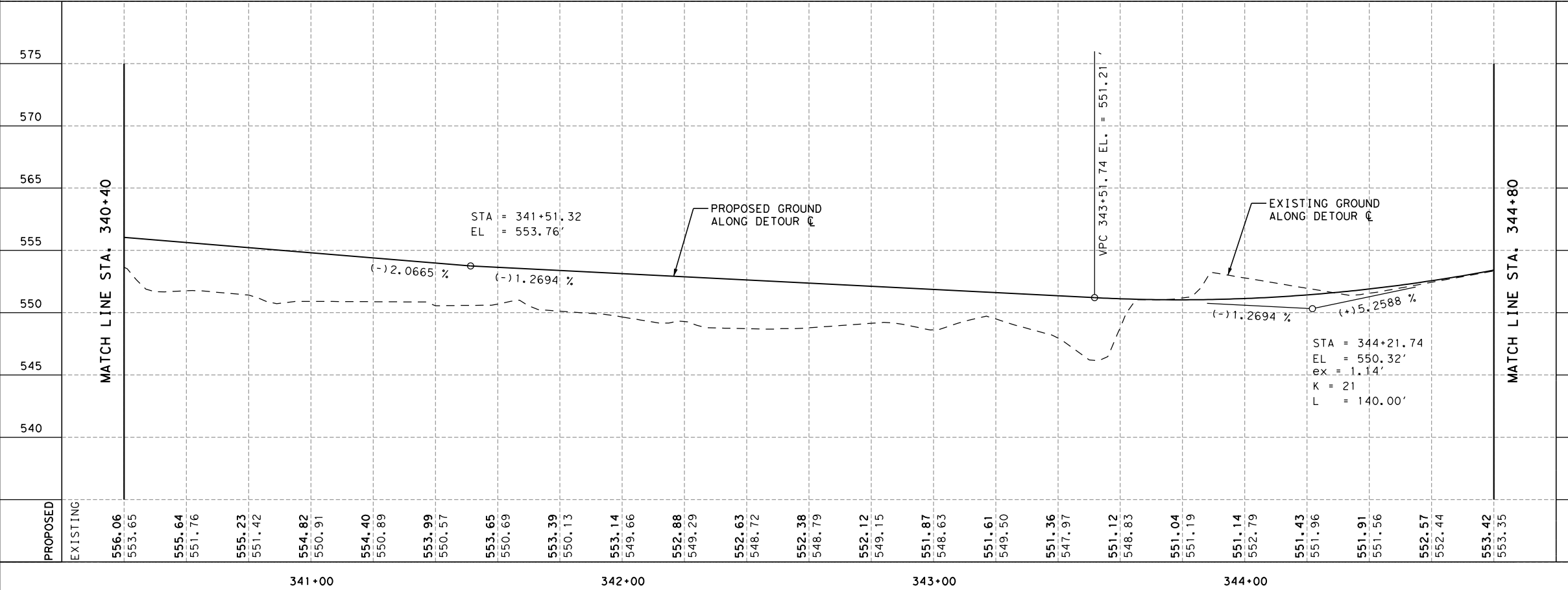


LEGEND

→ TRAFFIC FLOW

▨ TEMP DETOUR PAVEMENT

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E. STACY ROAD IMPROVEMENTS

DETOUR PLAN & PROFILE

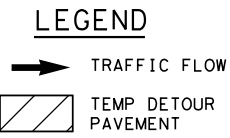
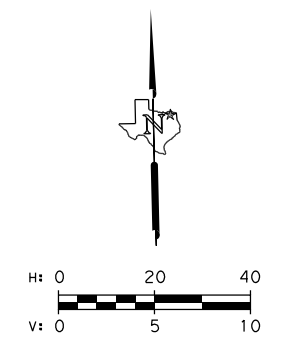
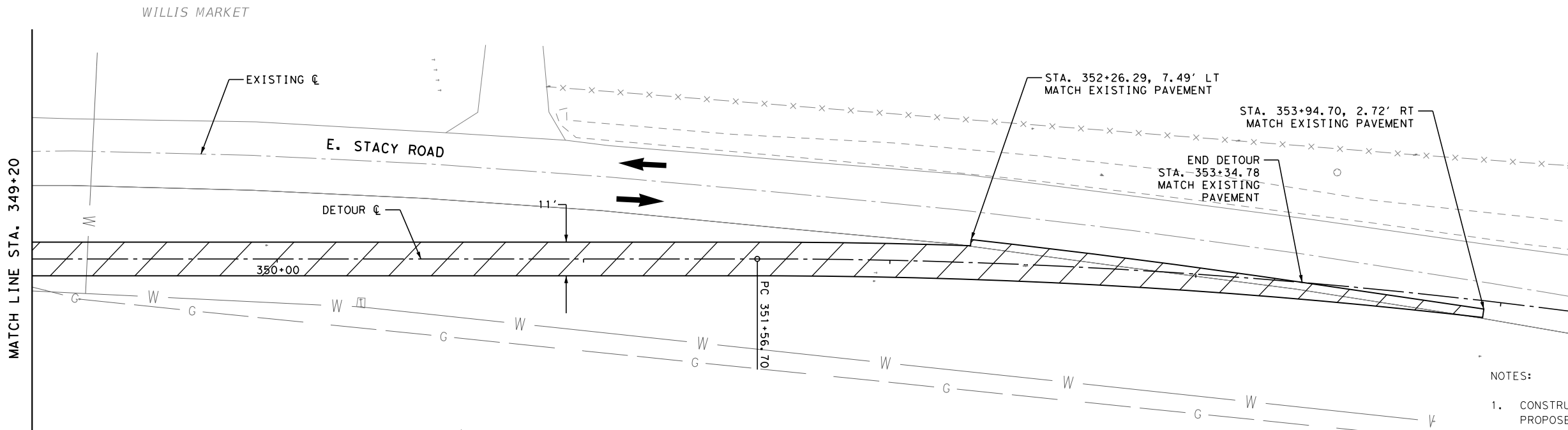
STA. 340+40 TO STA. 344+80

SCALE: H: 1" = 20'
 V: 1" = 5'

DESIGNED BY: CLM DRAWN BY: RAW CHECKED BY: SHEET NO. 31

SHEET 10 OF 12

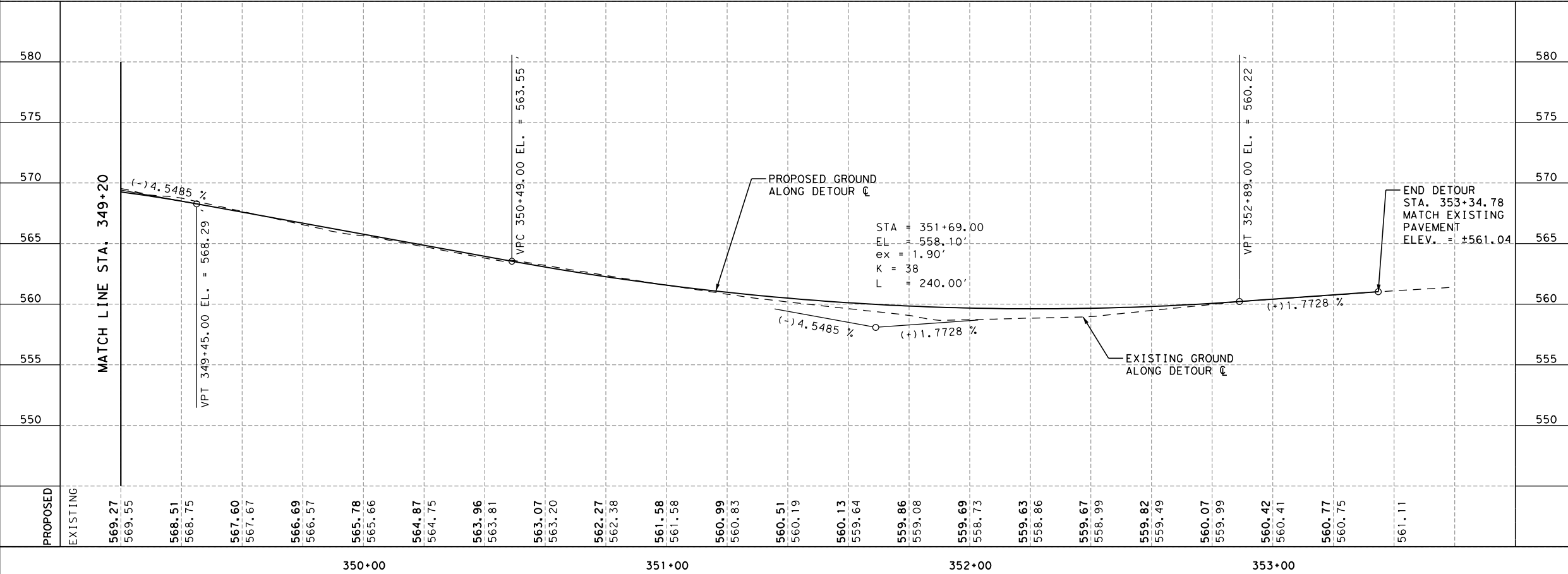
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 5/17/2017 2:31:47 PM rwalker



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 VARIOUS EXISTING UTILITIES
 IN VICINITY OF CONSTRUCTION.
 NOTIFY APPROPRIATE ENTITY
 PRIOR TO EXCAVATION.

CURVE DATA:
 TCP-01-6
 DELTA = 8° 22' 16.21"
 RADIUS = 2065.42'
 TANGENT = 151.15'
 LENGTH = 301.77'


- NOTES:**
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 Firm No. F-761

 **TOWN OF FAIRVIEW, TEXAS**
 372 TOWN PLACE
 FAIRVIEW, TX 75069
 972-562-0522

E. STACY ROAD IMPROVEMENTS
DETOUR PLAN & PROFILE
 STA. 349+20 TO END

SCALE: H: 1" = 20'
 V: 1" = 5'

DESIGNED BY: CLM DRAWN BY: RAW CHECKED BY: []

SHEET NO. 33

SHEET 12 OF 12

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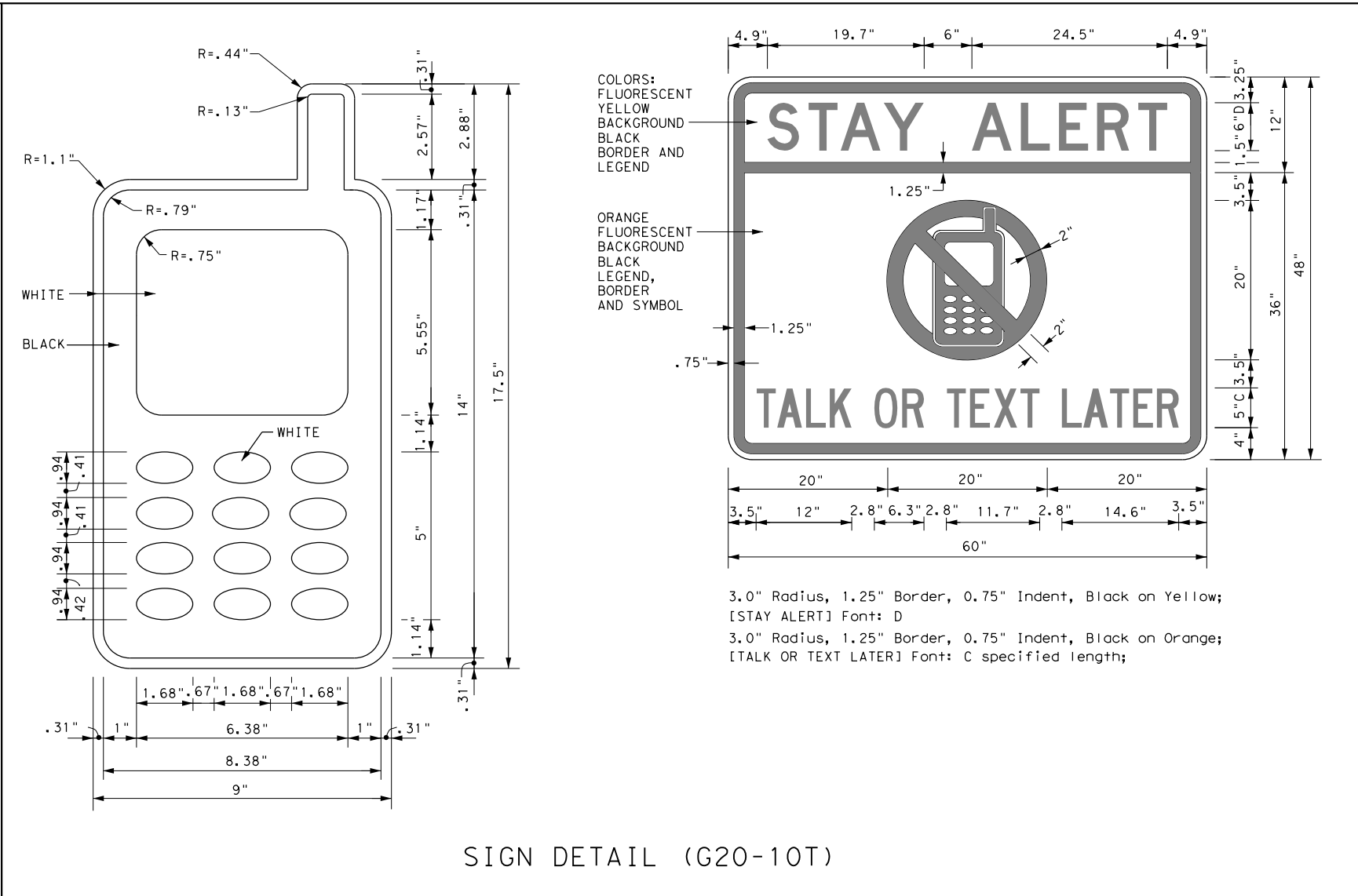
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BARRICADE AND CONSTRUCTION (BC) STANDARD SHEETS GENERAL NOTES:

- The Barricade and Construction Standard Sheets (BC sheets) are intended to show typical examples for placement of temporary traffic control devices, construction pavement markings, and typical work zone signs. The information contained in these sheets meet or exceed the requirements shown in the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD).
- The development and design of the Traffic Control Plan (TCP) is the responsibility of the Engineer.
- The Contractor may propose changes to the TCP that are signed and sealed by a licensed professional engineer for approval. The Engineer may develop, sign and seal Contractor proposed changes.
- The Contractor is responsible for installing and maintaining the traffic control devices as shown in the plans. The Contractor may not move or change the approximate location of any device without the approval of the Engineer.
- Geometric design of lane shifts and detours should, when possible, meet the applicable design criteria contained in manuals such as the American Association of State Highway and Transportation Officials (AASHTO), "A Policy on Geometric Design of Highways and Streets," the TxDOT "Roadway Design Manual" or engineering judgment.
- When projects abut, the Engineer(s) may omit the END ROAD WORK, TRAFFIC FINES DOUBLE, and other advance warning signs if the signing would be redundant and the work areas appear continuous to the motorists. If the adjacent project is completed first, the Contractor shall erect the necessary warning signs as shown on these sheets, the TCP sheets or as directed by the Engineer. The BEGIN ROAD WORK NEXT X MILES sign shall be revised to show appropriate work zone distance.
- The Engineer may require duplicate warning signs on the median side of divided highways where median width will permit and traffic volumes justify the signing.
- All signs shall be constructed in accordance with the details found in the "Standard Highway Sign Designs for Texas," latest edition. Sign details not shown in this manual shall be shown in the plans or the Engineer shall provide a detail to the Contractor before the sign is manufactured.
- The temporary traffic control devices shown in the illustrations of the BC sheets are examples. As necessary, the Engineer will determine the most appropriate traffic control devices to be used.
- As shown on BC(2), the OBEY WARNING SIGNS STATE LAW sign, STAY ALERT TALK OR TEXT LATER (see Sign Detail G20-10T) and the WORK ZONE TRAFFIC FINES DOUBLE sign with plaque shall be erected in advance of the CSJ limits. However, the TRAFFIC FINES DOUBLE sign will not be required on projects consisting solely of mobile operation work, such as striping or milling edgeline rumble strips. The BEGIN ROAD WORK NEXT X MILES, CONTRACTOR and END ROAD WORK signs shall be erected at or near the CSJ limits.
- Except for devices required by Note 10, traffic control devices should be in place only while work is actually in progress or a definite need exists.
- The Engineer has the final decision on the location of all traffic control devices.
- Inactive equipment and work vehicles, including workers' private vehicles must be parked away from travel lanes. They should be as close to the right-of-way line as possible, or located behind a barrier or guardrail, or as approved by the Engineer.

WORKER SAFETY APPAREL NOTES:

- Workers on foot who are exposed to traffic or to construction equipment within the right-of-way shall wear high-visibility safety apparel meeting the requirements of ISEA "American National Standard for High-Visibility Apparel," or equivalent revisions, and labeled as ANSI 107-2004 standard performance for Class 2 or 3 risk exposure. Class 3 garments should be considered for high traffic volume work areas or night time work.



Only pre-qualified products shall be used. The "Compliant Work Zone Traffic Control Devices List" (CWZTCD) describes pre-qualified products and their sources and may be found on-line at the web address given below or by contacting:

Texas Department of Transportation
 Traffic Operations Division - TE
 Phone (512) 416-3118

THE DOCUMENTS BELOW CAN BE FOUND ON-LINE AT http://www.txdot.gov
COMPLIANT WORK ZONE TRAFFIC CONTROL DEVICES LIST (CWZTCD)
DEPARTMENTAL MATERIAL SPECIFICATIONS (DMS)
MATERIAL PRODUCER LIST (MPL)
ROADWAY DESIGN MANUAL - SEE "MANUALS (ONLINE MANUALS)"
STANDARD HIGHWAY SIGN DESIGNS FOR TEXAS (SHSD)
TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (TMUTCD)
TRAFFIC ENGINEERING STANDARD SHEETS

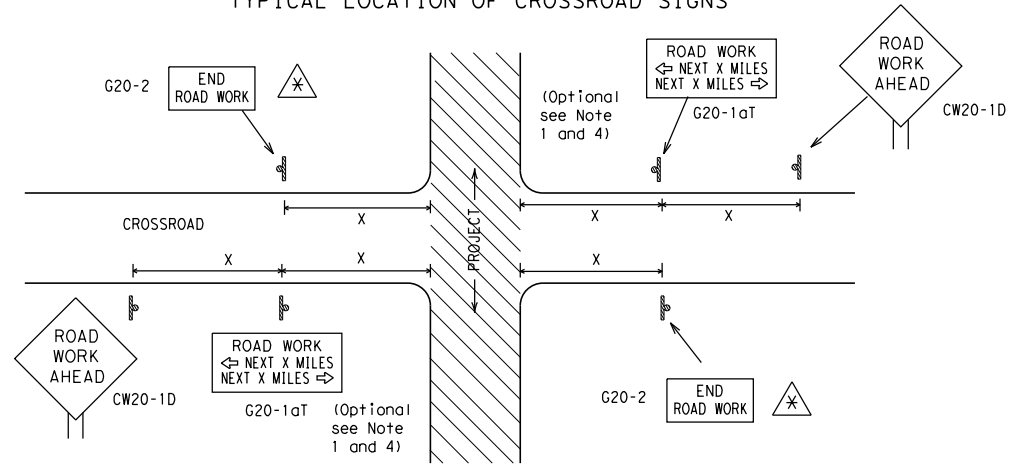
SHEET 1 OF 12

		Traffic Operations Division Standard	
BARRICADE AND CONSTRUCTION GENERAL NOTES AND REQUIREMENTS			
BC (1) - 14			
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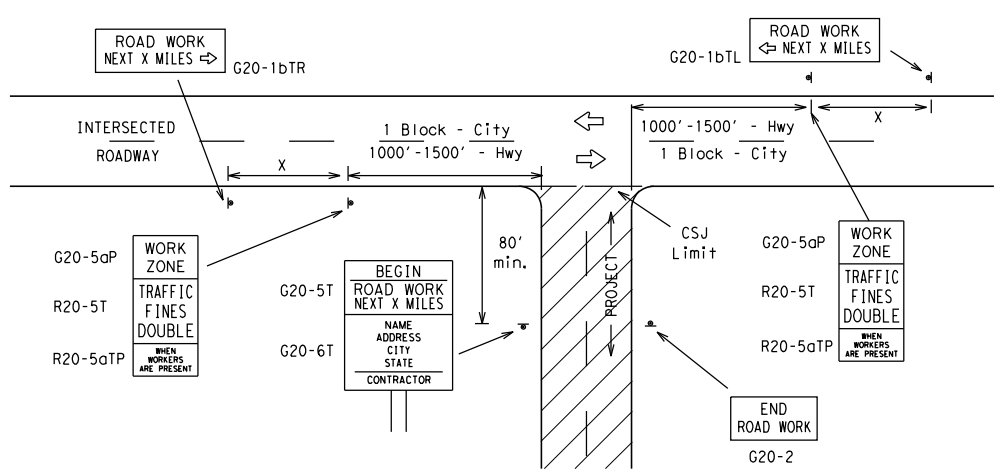
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TYPICAL LOCATION OF CROSSROAD SIGNS



- ⚠ May be mounted on back of "ROAD WORK AHEAD" (CW20-1D) sign with approval of Engineer. (See note 2 below)
- The typical minimum signing on a crossroad approach should be a "ROAD WORK AHEAD" (CW20-1D) sign and a (G20-2) "END ROAD WORK" sign, unless noted otherwise in plans.
 - The Engineer may use the reduced size 36" x 36" ROAD WORK AHEAD (CW20-1D) sign mounted back to back with the reduced size 36" x 18" "END ROAD WORK" (G20-2) sign on low volume crossroads (see Note 4 under "Typical Construction Warning Sign Size and Spacing"). See the "Standard Highway Sign Designs for Texas" manual for sign details. The Engineer may omit the advance warning signs on low volume crossroads. The Engineer will determine whether a road is low volume. This information shall be shown in the plans.
 - Based on existing field conditions, the Engineer/Inspector may require additional signs such as FLAGGER AHEAD, LOOSE GRAVEL, or other appropriate signs. When additional signs are required, these signs will be considered part of the minimum requirements. The Engineer/Inspector will determine the proper location and spacing of any sign not shown on the BC sheets, Traffic Control Plan sheets or the Work Zone Standard Sheets.
 - The "ROAD WORK NEXT X MILES" (G20-1aT) sign shall be required at high volume crossroads to advise motorists of the length of construction in either direction from the intersection. The Engineer will determine whether a roadway is considered high volume.
 - Additional traffic control devices may be shown elsewhere in the plans for higher volume crossroads.
 - When work occurs in the intersection area, appropriate traffic control devices, as shown elsewhere in the plans or as determined by the Engineer/Inspector, shall be in place.

T-INTERSECTION



CSJ LIMITS AT T-INTERSECTION

- The Engineer will determine the types and location of any additional traffic control devices, such as a flagger and accompanying signs, or other signs, that should be used when work is being performed at or near an intersection.
- If construction closes the road at a T-intersection the Contractor shall place the "CONTRACTOR NAME" (G20-6T) sign behind the Type 3 Barricades for the road closure (see BC(10) also). The "ROAD WORK NEXT X MILES" left arrow (G20-1bTL) and "ROAD WORK NEXT X MILES" right arrow (G20-1bTR) signs shall be replaced by the detour signing called for in the plans.

TYPICAL CONSTRUCTION WARNING SIGN SIZE AND SPACING^{1,5,6}

Sign Number or Series	SIZE		SPACING	
	Conventional Road	Expressway/Freeway	Posted Speed MPH	Sign Spacing "X" Feet (Approx.)
CW20 ⁴	48" x 48"	48" x 48"	30	120
CW21			35	160
CW22			40	240
CW23			45	320
CW25			50	400
CW1, CW2, CW7, CW8, CW9, CW11, CW14	36" x 36"	48" x 48"	55	500 ²
CW3, CW4, CW5, CW6, CW8-3, CW10, CW12	48" x 48"	48" x 48"	60	600 ²
			65	700 ²
			70	800 ²
			75	900 ²
			80	1000 ²
			*	* ³

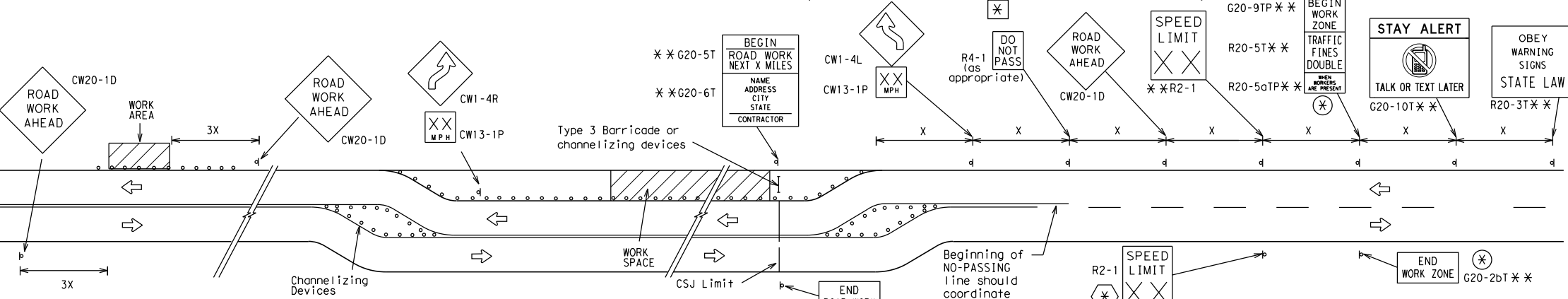
* For typical sign spacings on divided highways, expressways and freeways, see Part 6 of the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD) typical application diagrams or TCP Standard Sheets.

Δ Minimum distance from work area to first Advance Warning sign nearest the work area and/or distance between each additional sign.

GENERAL NOTES

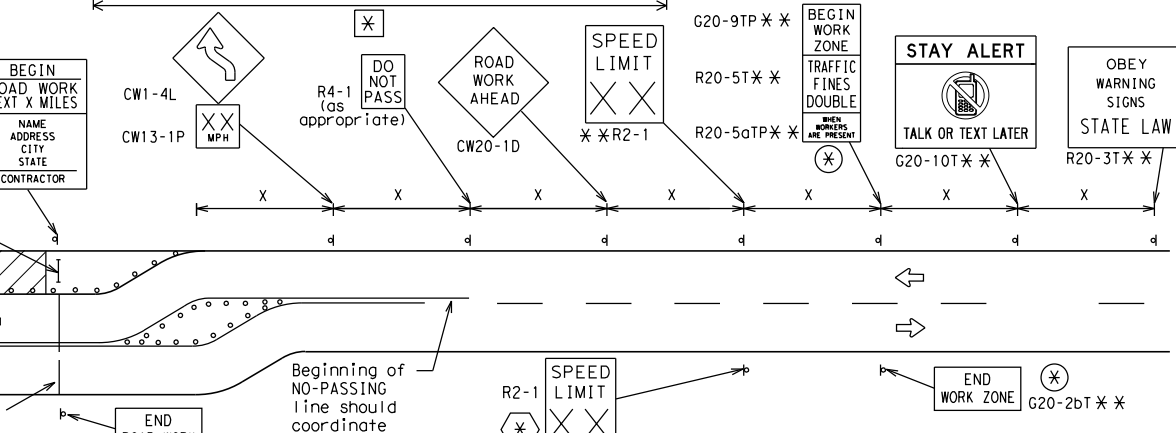
- Special or larger size signs may be used as necessary.
- Distance between signs should be increased as required to have 1500 feet advance warning.
- Distance between signs should be increased as required to have 1/2 mile or more advance warning.
- 36" x 36" "ROAD WORK AHEAD" (CW20-1D) signs may be used on low volume crossroads at the discretion of the Engineer. See Note 2 under "Typical Location of Crossroad Signs".
- Only diamond shaped warning sign sizes are indicated.
- See sign size listing in "TMUTCD", Sign Appendix or the "Standard Highway Sign Designs for Texas" manual for complete list of available sign design sizes.

WORK AREAS IN MULTIPLE LOCATIONS WITHIN CSJ LIMITS

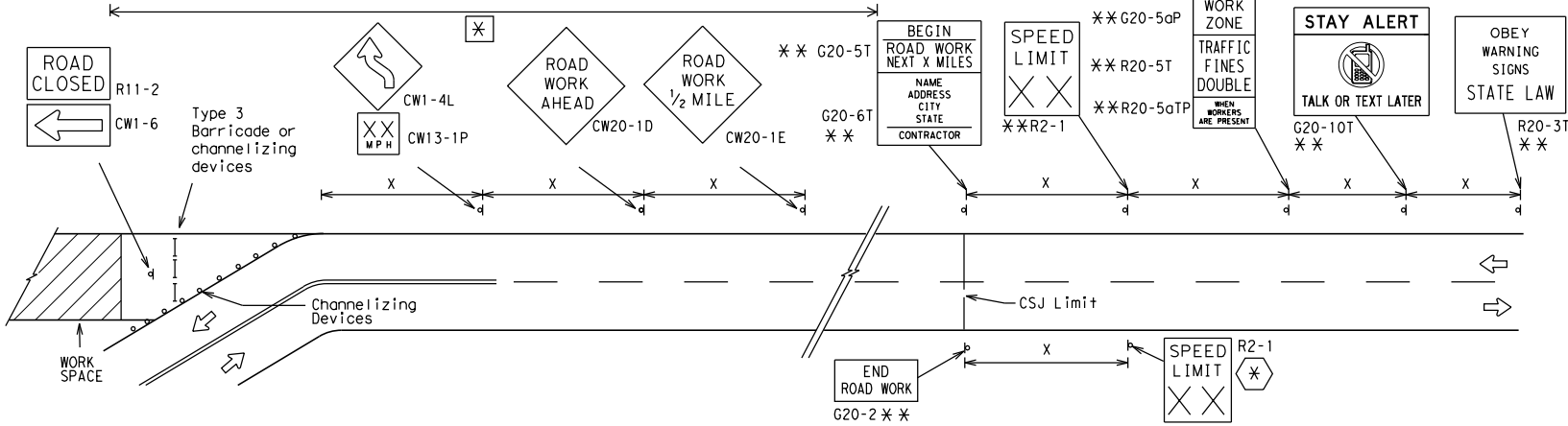


When extended distances occur between minimal work spaces, the Engineer/Inspector should ensure additional "ROAD WORK AHEAD" (CW20-1D) signs are placed in advance of these work areas to remind drivers they are still within the project limits. See the applicable TCP sheets for exact location and spacing of signs and channelizing devices.

SAMPLE LAYOUT OF SIGNING FOR WORK BEGINNING AT THE CSJ LIMITS



SAMPLE LAYOUT OF SIGNING FOR WORK BEGINNING DOWNSTREAM OF THE CSJ LIMITS



NOTES

- The Contractor shall determine the appropriate distance to be placed on the G20-1 series signs and "BEGIN ROAD WORK NEXT X MILES" (G20-5T) sign for each specific project. This distance shall replace the "X" and shall be rounded to the nearest whole mile with the approval of the Engineer. No decimals shall be used.
- ⊗ The "BEGIN WORK ZONE" (G20-9TP) and "END WORK ZONE" (G20-2bT) shall be used as shown on the sample layout when advance signs are required outside the CSJ Limits. They inform the motorist of entering or leaving a part of the work zone lying outside the CSJ Limits where traffic fines may double if workers are present.
- ** Required CSJ Limit signing. See Note 10 on BC(1). TRAFFIC FINES DOUBLE signs will not be required on projects consisting solely of mobile operations work.
- ⊗ Area for placement of "ROAD WORK AHEAD" (CW20-1D) sign and other signs or devices as called for on the Traffic Control Plan.
- ⊗ Contractor will install a regulatory speed limit sign at the end of the work zone.

LEGEND

—	Type 3 Barricade
○ ○ ○	Channelizing Devices
⊗	Sign
X	See Typical Construction Warning Sign Size and Spacing chart or the TMUTCD for sign spacing requirements.

SHEET 2 OF 12



BARRICADE AND CONSTRUCTION PROJECT LIMIT

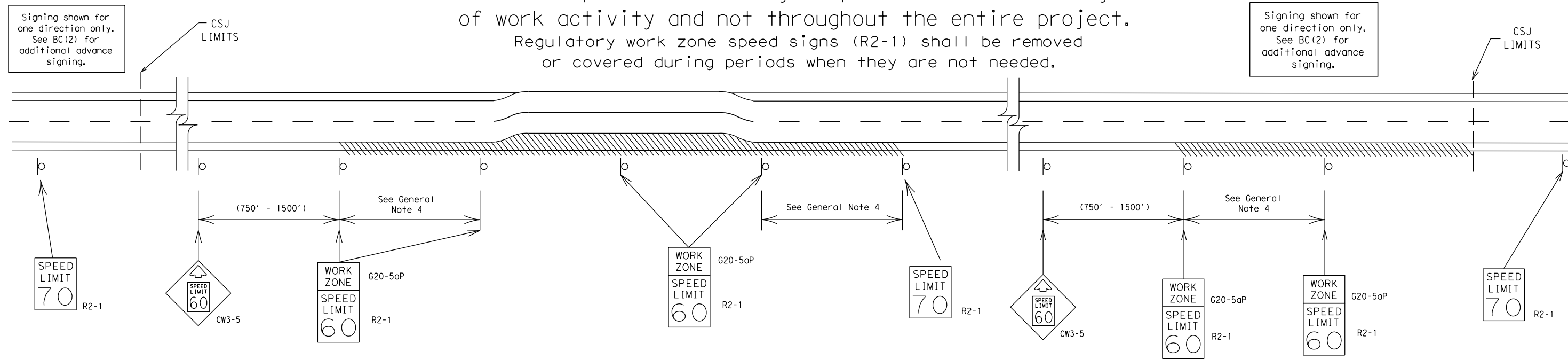
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TYPICAL APPLICATION OF WORK ZONE SPEED LIMIT SIGNS

Work zone speed limits shall be regulatory, established in accordance with the "Procedures for Establishing Speed Zones," and approved by the Texas Transportation Commission, or by City Ordinance when within Incorporated City Limits.

Reduced speeds should only be posted in the vicinity of work activity and not throughout the entire project. Regulatory work zone speed signs (R2-1) shall be removed or covered during periods when they are not needed.



GUIDANCE FOR USE:

LONG/INTERMEDIATE TERM WORK ZONE SPEED LIMITS

This type of work zone speed limit should be included on the design of the traffic control plans when restricted geometrics with a lower design speed are present in the work zone and modification of the geometrics to a higher design speed is not feasible.

Long/Intermediate Term Work Zone Speed Limit signs, when approved as described above, should be posted and visible to the motorist when work activity is present.

Work activity may also be defined as a change in the roadway that requires a reduced speed for motorists to safely negotiate the work area, including:

- rough road or damaged pavement surface
- substantial alteration of roadway geometrics (diversions)
- construction detours
- grade
- width
- other conditions readily apparent to the driver

As long as any of these conditions exist, the work zone speed limit signs should remain in place.

SHORT TERM WORK ZONE SPEED LIMITS

This type of work zone speed limit may be included on the design of the traffic control plans when workers or equipment are not behind concrete barrier, when work activity is within 10 feet of the traveled way or actually in the travelled way.

Short Term Work Zone Speed Limit signs should be posted and visible to the motorists only when work activity is present. When work activity is not present, signs shall be removed or covered. (See Removing or Covering on BC(4)).

GENERAL NOTES

- Regulatory work zone speed limits should be used only for sections of construction projects where speed control is of major importance.
- Regulatory work zone speed limit signs shall be placed on supports at a 7 foot minimum mounting height.
- Speed zone signs are illustrated for one direction of travel and are normally posted for each direction of travel.
- Frequency of work zone speed limit signs should be:

40 mph and greater	0.2 to 2 miles
35 mph and less	0.2 to 1 mile
- Regulatory speed limit signs shall have black legend and border on a white reflective background (See "Reflective Sheeting" on BC(4)).
- Fabrication, erection and maintenance of the "ADVANCE SPEED LIMIT" (CW3-5) sign, "WORK ZONE" (G20-5aP) plaque and the "SPEED LIMIT" (R2-1) signs shall not be paid for directly, but shall be considered subsidiary to Item 502.
- Turning signs from view, laying signs over or down will not be allowed, unless as otherwise noted under "REMOVING OR COVERING" on BC(4).
- Techniques that may help reduce traffic speeds include but are not limited to:
 - Law enforcement.
 - Flagger stationed next to sign.
 - Portable changeable message sign (PCMS).
 - Low-power (drone) radar transmitter.
 - Speed monitor trailers or signs.
- Speeds shown on details above are for illustration only. Work Zone Speed Limits should only be posted as approved for each project.
- For more specific guidance concerning the type of work, work zone conditions and factors impacting allowable regulatory construction speed zone reduction see TxDOT form #1204 in the TxDOT e-form system.

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SHEET 3 OF 12



BARRICADE AND CONSTRUCTION WORK ZONE SPEED LIMIT

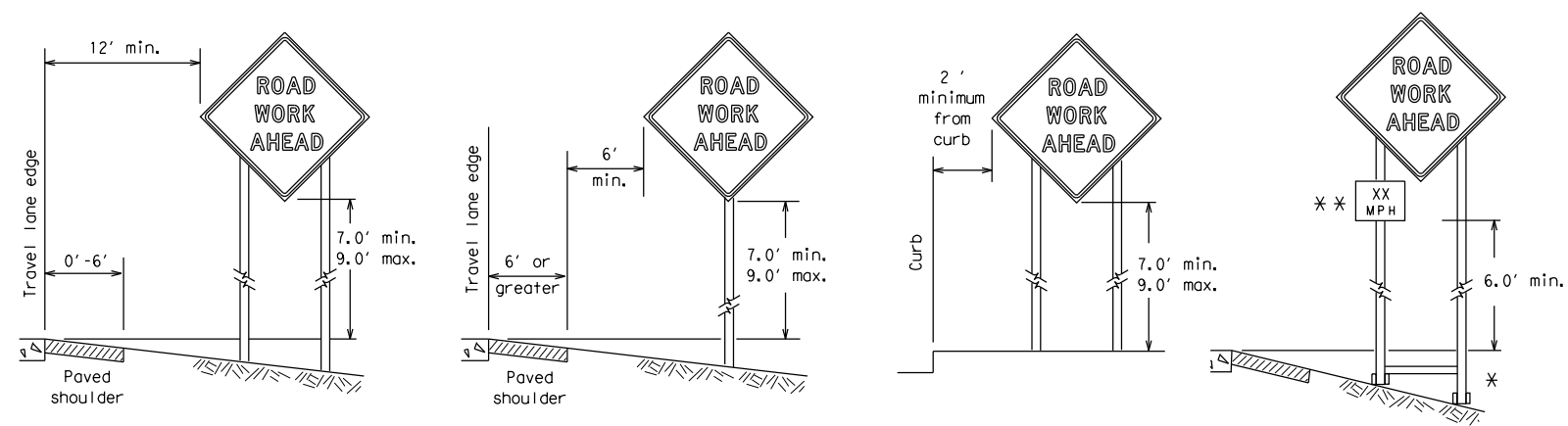
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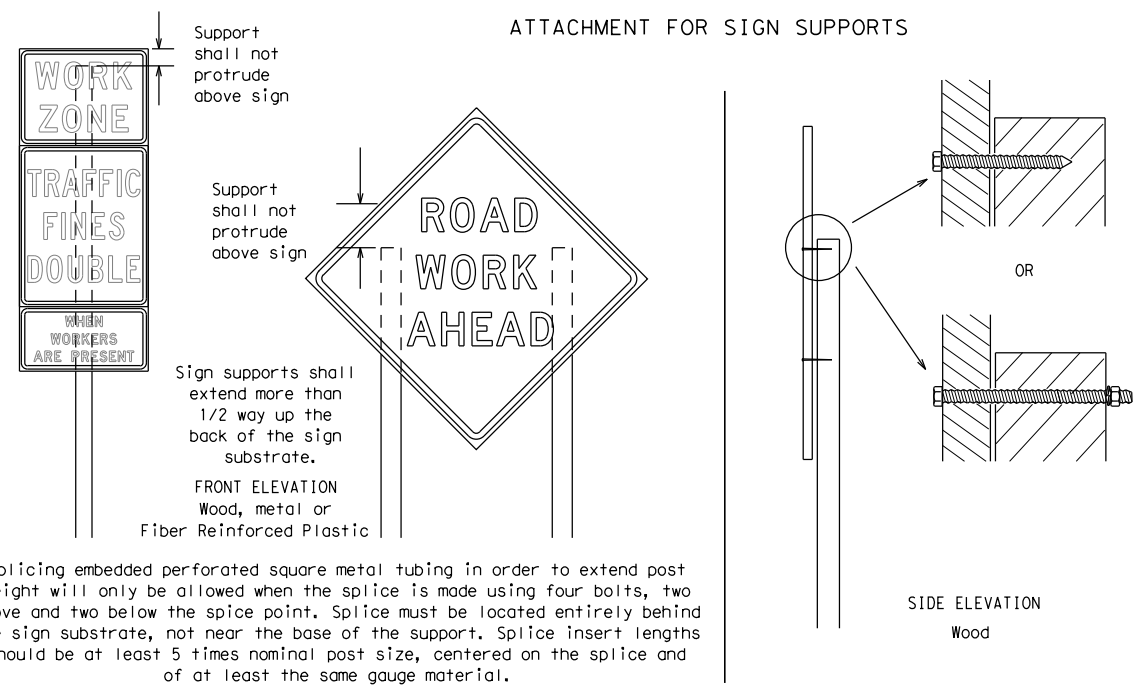
TYPICAL MINIMUM CLEARANCES FOR LONG TERM AND INTERMEDIATE TERM SIGNS



* When placing skid supports on unlevel ground, the leg post lengths must be adjusted so the sign appears straight and plumb. Objects shall NOT be placed under skids as a means of leveling.

** When plaques are placed on dual-leg supports, they should be attached to the upright nearest the travel lane. Supplemental plaques (advisory or distance) should not cover the surface of the parent sign.

ATTACHMENT FOR SIGN SUPPORTS



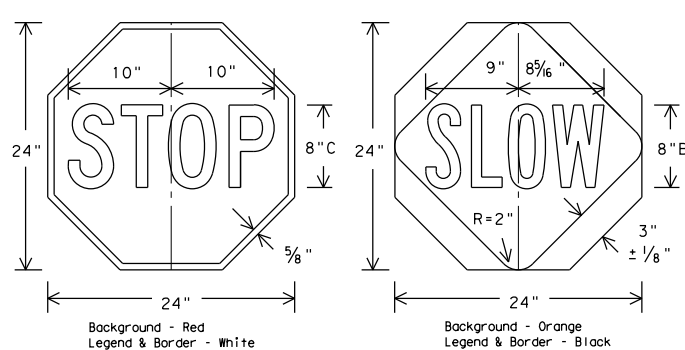
Attachment to wooden supports will be by bolts and nuts or screws. Use TxDOT's or manufacturer's recommended procedures for attaching sign substrates to other types of sign supports

Nails shall NOT be allowed. Each sign shall be attached directly to the sign support. Multiple signs shall not be joined or spliced by any means. Wood supports shall not be extended or repaired by splicing or other means.

Splicing embedded perforated square metal tubing in order to extend post height will only be allowed when the splice is made using four bolts, two above and two below the splice point. Splice must be located entirely behind the sign substrate, not near the base of the support. Splice insert lengths should be at least 5 times nominal post size, centered on the splice and of at least the same gauge material.

STOP/SLOW PADDLES

- STOP/SLOW paddles are the primary method to control traffic by flaggers. The STOP/SLOW paddle size should be 24" x 24" as detailed below.
- When used at night, the STOP/SLOW paddle shall be retroreflectORIZED.
- STOP/SLOW paddles may be attached to a staff with a minimum length of 6' to the bottom of the sign.
- Any lights incorporated into the STOP or SLOW paddle faces shall only be as specifically described in Section 6E.03 Hand Signaling Devices in the TMUTCD.



CONTRACTOR REQUIREMENTS FOR MAINTAINING PERMANENT SIGNS WITHIN THE PROJECT LIMITS

- Permanent signs are used to give notice of traffic laws or regulations, call attention to conditions that are potentially hazardous to traffic operations, show route designations, destinations, directions, distances, services, points of interest, and other geographical, recreational, or cultural information. Drivers proceeding through a work zone need the same, if not better route guidance as normally installed on a roadway without construction.
- When permanent regulatory or warning signs conflict with work zone conditions, remove or cover the permanent signs until the permanent sign message matches the roadway condition.
- When existing permanent signs are moved and relocated due to construction purposes, they shall be visible to motorists at all times.
- If existing signs are to be relocated on their original supports, they shall be installed on crashworthy bases as shown on the SMD Standard sheets. The signs shall meet the required mounting heights shown on the BC Sheets or the SMD Standards. This work should be paid for under the appropriate pay item for relocating existing signs.
- If permanent signs are to be removed and relocated using temporary supports, the Contractor shall use crashworthy supports as shown on the BC sheets or the CWZTCD. The signs shall meet the required mounting heights shown on the BC Sheets or the SMD Standards during construction. This work should be paid for under the appropriate pay item for relocating existing signs.
- Any sign or traffic control device that is struck or damaged by the Contractor or his/her construction equipment shall be replaced as soon as possible by the Contractor to ensure proper guidance for the motorists. This will be subsidiary to Item 502.

GENERAL NOTES FOR WORK ZONE SIGNS

- Contractor shall install and maintain signs in a straight and plumb condition and/or as directed by the Engineer.
 - Wooden sign posts shall be painted white.
 - Barricades shall NOT be used as sign supports.
 - All signs shall be installed in accordance with the plans or as directed by the Engineer. Signs shall be used to regulate, warn, and guide the traveling public safely through the work zone.
 - The Contractor may furnish either the sign design shown in the plans or in the "Standard Highway Sign Designs for Texas" (SHSD). The Engineer/Inspector may require the Contractor to furnish other work zone signs that are shown in the TMUTCD but may have been omitted from the plans. Any variation in the plans shall be documented by written agreement between the Engineer and the Contractor's Responsible Person. All changes must be documented in writing before being implemented. This can include documenting the changes in the Inspector's TxDOT diary and having both the Inspector and Contractor initial and date the agreed upon changes.
 - The Contractor shall furnish sign supports listed in the "Compliant Work Zone Traffic Control Device List" (CWZTCD). The Contractor shall install the sign support in accordance with the manufacturer's recommendations. If there is a question regarding installation procedures, the Contractor shall furnish the Engineer a copy of the manufacturer's installation recommendations so the Engineer can verify the correct procedures are being followed.
 - The Contractor is responsible for installing signs on approved supports and replacing signs with damaged or cracked substrates and/or damaged or marred reflective sheeting as directed by the Engineer/Inspector.
 - Identification markings may be shown only on the back of the sign substrate. The maximum height of letters and/or company logos used for identification shall be 1 inch.
 - The Contractor shall replace damaged wood posts. New or damaged wood sign posts shall not be spliced.
- DURATION OF WORK (as defined by the "Texas Manual on Uniform Traffic Control Devices" Part 6)**
- The types of sign supports, sign mounting height, the size of signs, and the type of sign substrates can vary based on the type of work being performed. The Engineer is responsible for selecting the appropriate size sign for the type of work being performed. The Contractor is responsible for ensuring the sign support, sign mounting height and substrate meets manufacturer's recommendations in regard to crashworthiness and duration of work requirements.
 - Long-term stationary - work that occupies a location more than 3 days.
 - Intermediate-term stationary - work that occupies a location more than one daylight period up to 3 days, or nighttime work lasting more than one hour.
 - Short-term stationary - daytime work that occupies a location for more than 1 hour in a single daylight period.
 - Short, duration - work that occupies a location up to 1 hour.
 - Mobile - work that moves continuously or intermittently (stopping for up to approximately 15 minutes.)

SIGN MOUNTING HEIGHT

- The bottom of Long-term/Intermediate-term signs shall be at least 7 feet, but not more than 9 feet, above the paved surface, except as shown for supplemental plaques mounted below other signs.
- The bottom of Short-term/Short Duration signs shall be a minimum of 1 foot above the pavement surface but no more than 2 feet above the ground.
- Long-term/Intermediate-term Signs may be used in lieu of Short-term/Short Duration signing.
- Short-term/Short Duration signs shall be used only during daylight and shall be removed at the end of the workday or raised to appropriate Long-term/Intermediate sign height.
- Regulatory signs shall be mounted at least 7 feet, but not more than 9 feet, above the paved surface regardless of work duration.

SIZE OF SIGNS

- The Contractor shall furnish the sign sizes shown on BC (2) unless otherwise shown in the plans or as directed by the Engineer.

SIGN SUBSTRATES

- The Contractor shall ensure the sign substrate is installed in accordance with the manufacturer's recommendations for the type of sign support that is being used. The CWZTCD lists each substrate that can be used on the different types and models of sign supports.
- "Mesh" type materials are NOT an approved sign substrate, regardless of the tightness of the weave.
- All wooden individual sign panels fabricated from 2 or more pieces shall have one or more plywood cleat, 1/2" thick by 6" wide, fastened to the back of the sign and extending fully across the sign. The cleat shall be attached to the back of the sign using wood screws that do not penetrate the face of the sign panel. The screws shall be placed on both sides of the splice and spaced at 6" centers. The Engineer may approve other methods of splicing the sign face.

REFLECTIVE SHEETING

- All signs shall be retroreflective and constructed of sheeting meeting the color and retro-reflectivity requirements of DMS-8300 for rigid signs or DMS-8310 for roll-up signs. The web address for DMS specifications is shown on BC(1).
- White sheeting, meeting the requirements of DMS-8300 Type A, shall be used for signs with a white background.
- Orange sheeting, meeting the requirements of DMS-8300 Type B_{FL} or Type C_{FL}, shall be used for rigid signs with orange backgrounds.

SIGN LETTERS

- All sign letters and numbers shall be clear, and open rounded type uppercase alphabet letters as approved by the Federal Highway Administration (FHWA) and as published in the "Standard Highway Sign Design for Texas" manual. Signs, letters and numbers shall be of first class workmanship in accordance with Department Standards and Specifications.

REMOVING OR COVERING

- When sign messages may be confusing or do not apply, the signs shall be removed or completely covered.
- Long-term stationary or intermediate stationary signs installed on square metal tubing may be turned away from traffic 90 degrees when the sign message is not applicable. This technique may not be used for signs installed in the median of divided highways or near any intersections where the sign may be seen from approaching traffic.
- Signs installed on wooden skids shall not be turned at 90 degree angles to the roadway. These signs should be removed or completely covered when not required.
- When signs are covered, the material used shall be opaque, such as heavy mil black plastic, or other materials which will cover the entire sign face and maintain their opaque properties under automobile headlights at night, without damaging the sign sheeting.
- Burlap shall NOT be used to cover signs.
- Duct tape or other adhesive material shall NOT be affixed to a sign face.
- Signs and anchor stubs shall be removed and holes backfilled upon completion of work.

SIGN SUPPORT WEIGHTS

- Where sign supports require the use of weights to keep from turning over, the use of sandbags with dry, cohesionless sand should be used.
- The sandbags will be tied shut to keep the sand from spilling and to maintain a constant weight.
- Rock, concrete, iron, steel or other solid objects shall not be permitted for use as sign support weights.
- Sandbags should weigh a minimum of 35 lbs and a maximum of 50 lbs.
- Sandbags shall be made of a durable material that tears upon vehicular impact. Rubber (such as tire inner tubes) shall NOT be used.
- Rubber ballasts designed for channelizing devices should not be used for ballast on portable sign supports. Sign supports designed and manufactured with rubber bases may be used when shown on the CWZTCD list.
- Sandbags shall only be placed along or laid over the base supports of the traffic control device and shall not be suspended above ground level or hung with rope, wire, chains or other fasteners. Sandbags shall be placed along the length of the skids to weigh down the sign support.
- Sandbags shall NOT be placed under the skid and shall not be used to level sign supports placed on slopes.

FLAGS ON SIGNS

- Flags may be used to draw attention to warning signs. When used the flag shall be 16 inches square or larger and shall be orange or fluorescent red-orange in color. Flags shall not be allowed to cover any portion of the sign face.



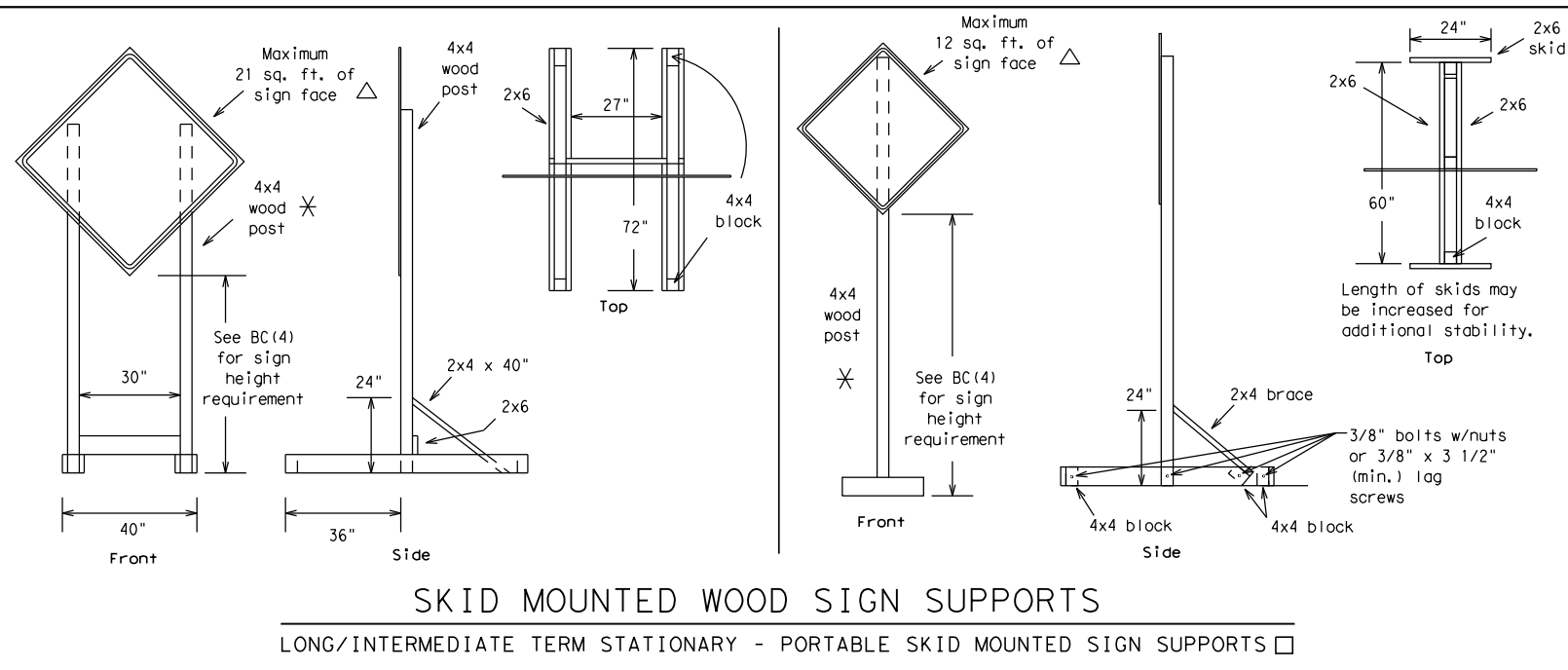
BARRICADE AND CONSTRUCTION TEMPORARY SIGN NOTES

BC (4) - 14

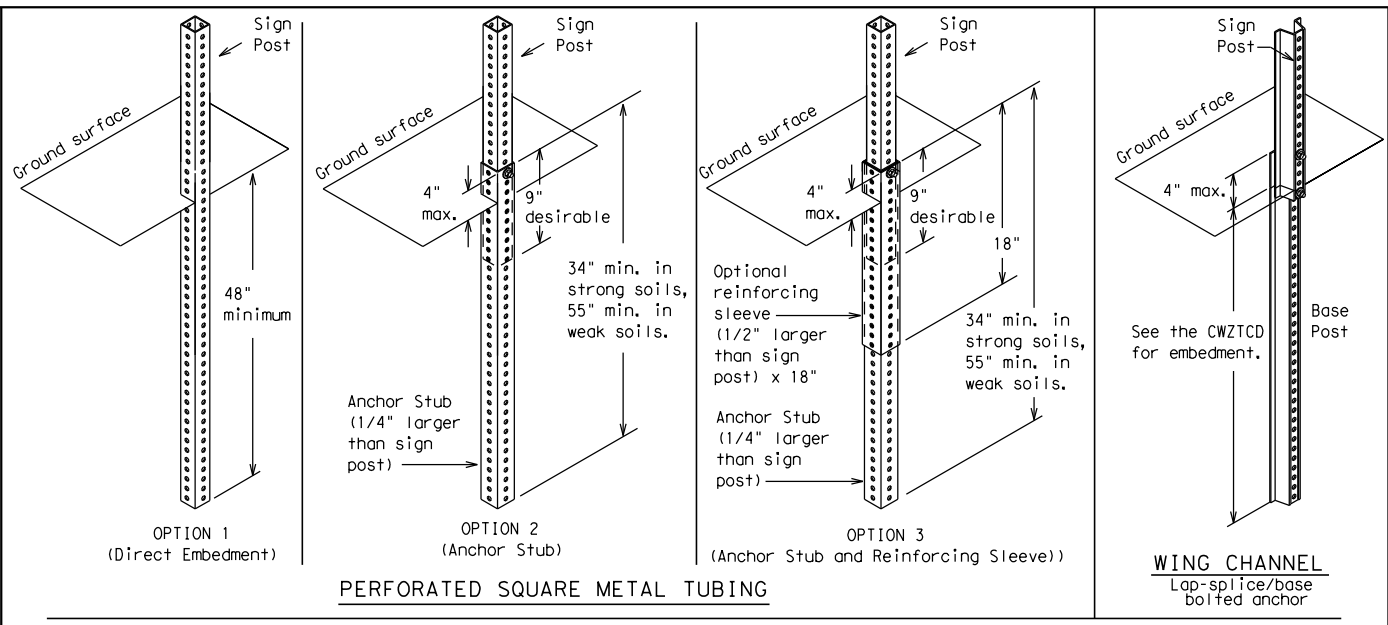
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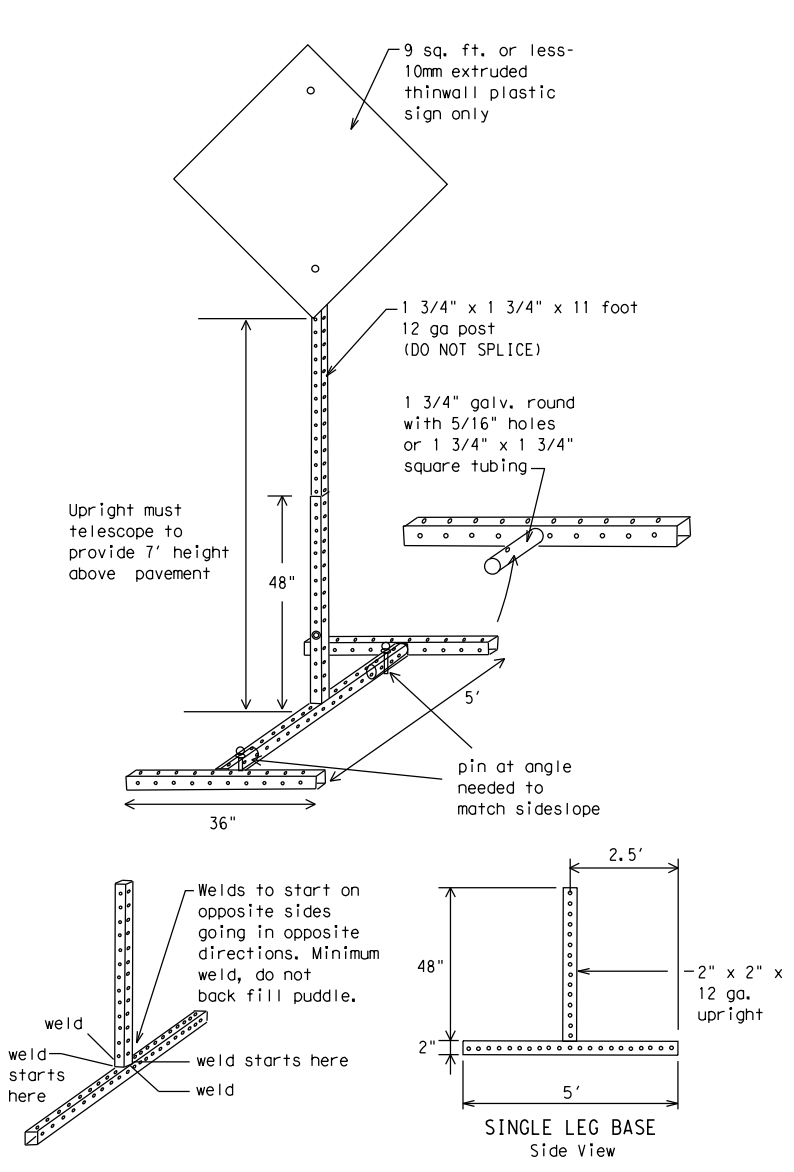
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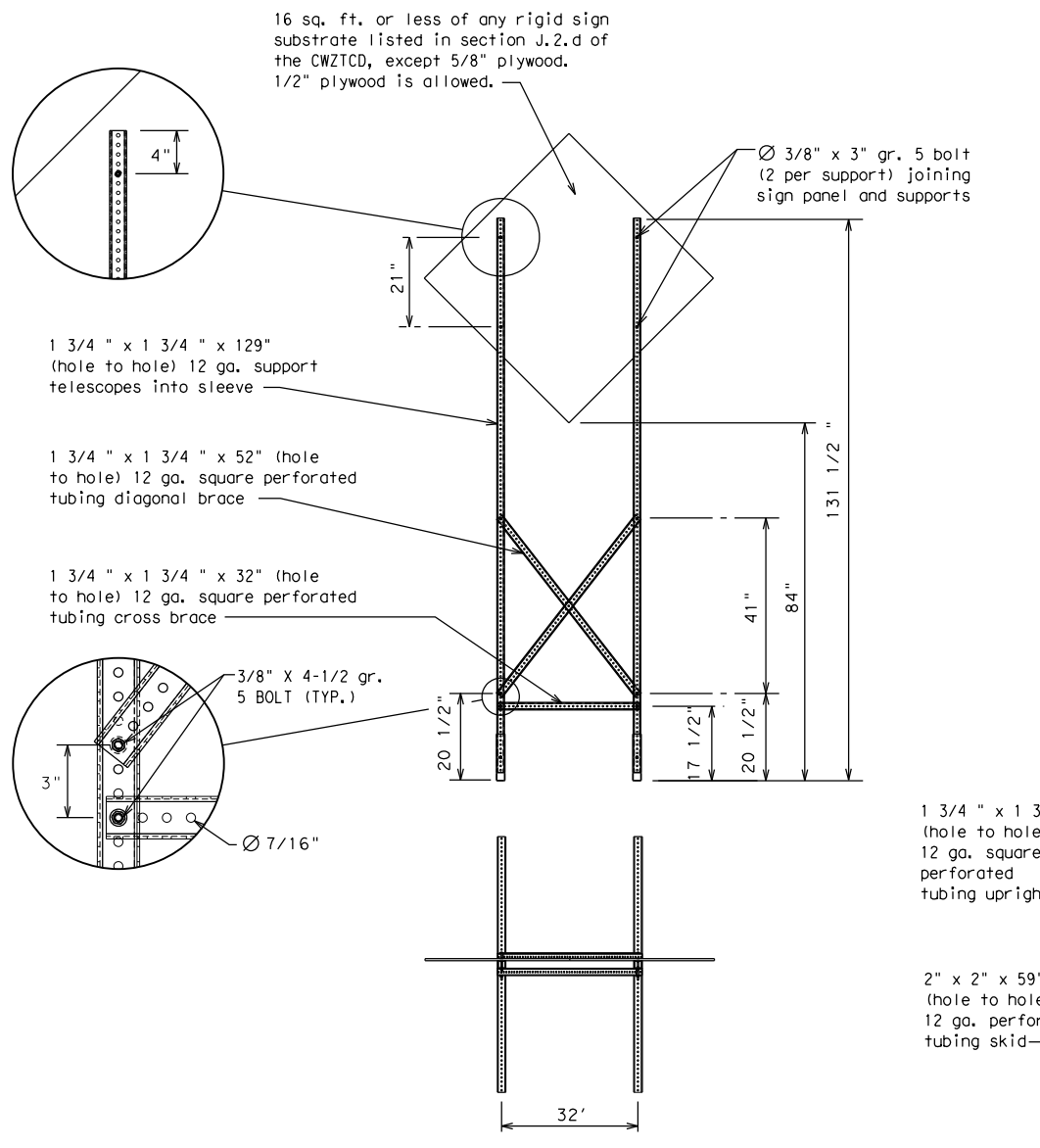
SKID MOUNTED WOOD SIGN SUPPORTS
 LONG/INTERMEDIATE TERM STATIONARY - PORTABLE SKID MOUNTED SIGN SUPPORTS □



GROUND MOUNTED SIGN SUPPORTS
 Refer to the CWZTCD and the manufacturer's installation procedure for each type sign support. The maximum sign square footage shall adhere to the manufacturer's recommendation. Two post installations can be used for larger signs.

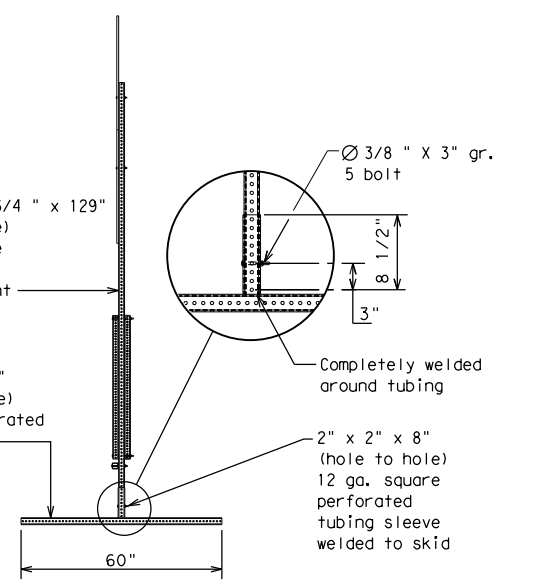


SKID MOUNTED PERFORATED SQUARE STEEL TUBING SIGN SUPPORTS



WOOD POST SYSTEM FOR GROUND MOUNTED SIGN SUPPORTS

Nominal Post Size	Number of Posts	Maximum Sq. feet of Sign Face	Minimum Soil Embedment	Drilled Hole(s) Required
4 x 4	1	12	36"	NO
4 x 4	2	21	36"	NO
4 x 6	1	21	36"	YES
4 x 6	2	36	36"	YES



WEDGE ANCHORS
 Both steel and plastic Wedge Anchor Systems as shown on the SMD Standard Sheets may be used as temporary sign supports for signs up to 10 square feet of sign face. They may be set in concrete or in sturdy soils if approved by the Engineer. (See web address for "Traffic Engineering Standard Sheets" on BC(1)).

OTHER DESIGNS
 MORE DETAILS OF APPROVED LONG/INTERMEDIATE AND SHORT TERM SUPPORTS CAN BE FOUND ON THE CWZTCD LIST. SEE BC(1) FOR WEBSITE LOCATION.

- GENERAL NOTES**
- Nails may be used in the assembly of wooden sign supports, but 3/8" bolts with nuts or 3/8" x 3 1/2" lag screws must be used on every joint for final connection.
 - No more than 2 sign posts shall be placed within a 7 ft. circle, except for specific materials noted on the CWZTCD List.
 - When project is completed, all sign supports and foundations shall be removed from the project site. This will be considered subsidiary to Item 502.

- See BC(4) for definition of "Work Duration."
- ✱ Wood sign posts MUST be one piece. Splicing will NOT be allowed. Posts shall be painted white.
- △ See the CWZTCD for the type of sign substrate that can be used for each approved sign support.

WHEN NOT IN USE, REMOVE THE PCMS FROM THE RIGHT-OF-WAY OR PLACE THE PCMS BEHIND BARRIER OR GUARDRAIL WITH SIGN PANEL TURNED PARALLEL TO TRAFFIC

PORTABLE CHANGEABLE MESSAGE SIGNS

- The Engineer/Inspector shall approve all messages used on portable changeable message signs (PCMS).
- Messages on PCMS should contain no more than 8 words (about four to eight characters per word), not including simple words such as "TO," "FOR," "AT," etc.
- Messages should consist of a single phase, or two phases that alternate. Three-phase messages are not allowed. Each phase of the message should convey a single thought, and must be understood by itself.
- Use the word "EXIT" to refer to an exit ramp on a freeway; i.e., "EXIT CLOSED." Do not use the term "RAMP."
- Always use the route or interstate designation (IH, US, SH, FM) along with the number when referring to a roadway.
- When in use the bottom of a stationary PCMS message panel should be a minimum 7 feet above the roadway, where possible.
- The message term "WEEKEND" should be used only if the work is to start on Saturday morning and end by Sunday evening at midnight. Actual days and hours of work should be displayed on the PCMS if work is to begin on Friday evening and/or continue into Monday morning.
- The Engineer/Inspector may select one of two options which are available for displaying a two-phase message on a PCMS. Each phase may be displayed for either four seconds each or for three seconds each.
- Do not "flash" messages or words included in a message. The message should be steady burn or continuous while displayed.
- Do not present redundant information on a two-phase message; i.e., keeping two lines of the message the same and changing the third line.
- Do not use the word "Danger" in message.
- Do not display the message "LANES SHIFT LEFT" or "LANES SHIFT RIGHT" on a PCMS. Drivers do not understand the message.
- Do not display messages that scroll horizontally or vertically across the face of the sign.
- The following table lists abbreviated words and two-word phrases that are acceptable for use on a PCMS. Both words in a phrase must be displayed together. Words or phrases not on this list should not be abbreviated, unless shown in the TMUTCD.
- PCMS character height should be at least 18 inches for trailer mounted units. They should be visible from at least 1/2 (.5) mile and the text should be legible from at least 600 feet at night and 800 feet in daylight. Truck mounted units must have a character height of 10 inches and must be legible from at least 400 feet.
- Each line of text should be centered on the message board rather than left or right justified.
- If disabled, the PCMS should default to an illegible display that will not alarm motorists and will only be used to alert workers that the PCMS has malfunctioned. A pattern such as a series of horizontal solid bars is appropriate.

WORD OR PHRASE	ABBREVIATION	WORD OR PHRASE	ABBREVIATION
Access Road	ACCS RD	Major	MAJ
Alternate	ALT	Miles	MI
Avenue	AVE	Miles Per Hour	MPH
Best Route	BEST RTE	Minor	MNR
Boulevard	BLVD	Monday	MON
Bridge	BRDG	Normal	NORM
Canot	CANT	North	N
Center	CTR	Northbound	(route) N
Construction Ahead	CONST AHD	Parking	PKING
CROSSING	XING	Road	RD
Detour Route	DETOUR RTE	Right Lane	RT LN
Do Not	DONT	Saturday	SAT
East	E	Service Road	SERV RD
Eastbound	(route) E	Shoulder	SHLDR
Emergency	EMER	Slippery	SLIP
Emergency Vehicle	EMER VEH	South	S
Entrance, Enter	ENT	Southbound	(route) S
Express Lane	EXP LN	Speed	SPD
Expressway	EXPWY	Street	ST
XXXX Feet	XXXX FT	Sunday	SUN
Fog Ahead	FOG AHD	Telephone	PHONE
Freeway	FRWY, FWY	Temporary	TEMP
Freeway Blocked	FWY BLKD	Thursday	THURS
Friday	FRI	To Downtown	TO DWNTN
Hazardous Driving	HAZ DRIVING	Traffic	TRAF
Hazardous Material	HAZMAT	Travelers	TRVLR
High-Occupancy	HOV	Tuesday	TUES
Vehicle	HWY	Time Minutes	TIME MIN
Highway	HR, HRS	Upper Level	UPR LEVEL
Hour(s)	HR, HRS	Vehicles (s)	VEH, VEHS
Information	INFO	Warning	WARN
It Is	ITS	Wednesday	WED
Junction	JCT	Weight Limit	WT LIMIT
Left	LFT	West	W
Left Lane	LFT LN	Westbound	(route) W
Lane Closed	LN CLOSED	Wet Pavement	WET PVMT
Lower Level	LWR LEVEL	Will Not	WONT
Maintenance	MAINT		

Roadway designation # IH-number, US-number, SH-number, FM-number

RECOMMENDED PHASES AND FORMATS FOR PCMS MESSAGES DURING ROADWORK ACTIVITIES

(The Engineer may approve other messages not specifically covered here.)

Phase 1: Condition Lists

Road/Lane/Ramp Closure List

FREEWAY CLOSED X MILE
ROAD CLOSED AT SH XXX
ROAD CLSD AT FM XXXX
RIGHT X LANES CLOSED
CENTER LANE CLOSED
NIGHT LANE CLOSURES
VARIOUS LANES CLOSED
EXIT CLOSED
MALL DRIVEWAY CLOSED
XXXXXXXX BLVD CLOSED

Other Condition List

FRONTAGE ROAD CLOSED
SHOULDER CLOSED XXX FT
RIGHT LN CLOSED XXX FT
RIGHT X LANES OPEN
DAYTIME LANE CLOSURES
I-XX SOUTH EXIT CLOSED
EXIT XXX CLOSED X MILE
RIGHT LN TO BE CLOSED
X LANES CLOSED TUE - FRI

ROADWORK XXX FT
FLAGGER XXXX FT
RIGHT LN NARROWS XXXX FT
MERGING TRAFFIC XXXX FT
LOOSE GRAVEL XXXX FT
DETOUR X MILE
ROADWORK PAST SH XXXX
BUMP XXXX FT
TRAFFIC SIGNAL XXXX FT

ROAD REPAIRS XXXX FT
LANE NARROWS XXXX FT
TWO-WAY TRAFFIC XX MILE
CONST TRAFFIC XXX FT
UNEVEN LANES XXXX FT
ROUGH ROAD XXXX FT
ROADWORK NEXT FRI-SUN
US XXX EXIT X MILES
LANES SHIFT *

* LANES SHIFT in Phase 1 must be used with STAY IN LANE in Phase 2.

Phase 2: Possible Component Lists

Action to Take/Effect on Travel List

MERGE RIGHT
DETOUR NEXT X EXITS
USE EXIT XXX
STAY ON US XXX SOUTH
TRUCKS USE US XXX N
WATCH FOR TRUCKS
EXPECT DELAYS
REDUCE SPEED XXX FT
USE OTHER ROUTES
STAY IN LANE *

Location List

AT FM XXXX
BEFORE RAILROAD CROSSING
NEXT X MILES
PAST US XXX EXIT
XXXXXXXX TO XXXXXXX
US XXX TO FM XXXX

Warning List

SPEED LIMIT XX MPH
MAXIMUM SPEED XX MPH
MINIMUM SPEED XX MPH
ADVISORY SPEED XX MPH
RIGHT LANE EXIT
USE CAUTION
DRIVE SAFELY
DRIVE WITH CARE

**** Advance Notice List**

TUE-FRI XX AM-X PM
APR XX-XX X PM-X AM
BEGINS MONDAY
BEGINS MAY XX
MAY X-X XX PM - XX AM
NEXT FRI-SUN
XX AM TO XX PM
NEXT TUE AUG XX
TONIGHT XX PM-XX AM

** See Application Guidelines Note 6.

APPLICATION GUIDELINES

- Only 1 or 2 phases are to be used on a PCMS.
- The 1st phase (or both) should be selected from the "Road/Lane/Ramp Closure List" and the "Other Condition List".
- A 2nd phase can be selected from the "Action to Take/Effect on Travel, Location, General Warning, or Advance Notice Phase Lists".
- A Location Phase is necessary only if a distance or location is not included in the first phase selected.
- If two PCMS are used in sequence, they must be separated by a minimum of 1000 ft. Each PCMS shall be limited to two phases, and should be understandable by themselves.
- For advance notice, when the current date is within seven days of the actual work date, calendar days should be replaced with days of the week. Advance notification should typically be for no more than one week prior to the work.

WORDING ALTERNATIVES

- The words RIGHT, LEFT and ALL can be interchanged as appropriate.
- Roadway designations IH, US, SH, FM and LP can be interchanged as appropriate.
- EAST, WEST, NORTH and SOUTH (or abbreviations E, W, N and S) can be interchanged as appropriate.
- Highway names and numbers replaced as appropriate.
- ROAD, HIGHWAY and FREEWAY can be interchanged as needed.
- AHEAD may be used instead of distances if necessary.
- FT and MI, MILE and MILES interchanged as appropriate.
- AT, BEFORE and PAST interchanged as needed.
- Distances or AHEAD can be eliminated from the message if a location phase is used.

PCMS SIGNS WITHIN THE R.O.W. SHALL BE BEHIND GUARDRAIL OR CONCRETE BARRIER OR SHALL HAVE A MINIMUM OF FOUR (4) PLASTIC DRUMS PLACED PERPENDICULAR TO TRAFFIC ON THE UPSTREAM SIDE OF THE PCMS, WHEN EXPOSED TO ONE DIRECTION OF TRAFFIC. WHEN EXPOSED TO TWO WAY TRAFFIC, THE FOUR DRUMS SHOULD BE PLACED WITH ONE DRUM AT EACH OF THE FOUR CORNERS OF THE UNIT.

FULL MATRIX PCMS SIGNS

- When Full Matrix PCMS signs are used, the character height and legibility/visibility requirements shall be maintained as listed in Note 15 under "PORTABLE CHANGEABLE MESSAGE SIGNS" above.
- When symbol signs, such as the "Flagger Symbol" (CW20-7) are represented graphically on the Full Matrix PCMS sign and, with the approval of the Engineer, it shall maintain the legibility/visibility requirement listed above.
- When symbol signs are represented graphically on the Full Matrix PCMS, they shall only supplement the use of the static sign represented, and shall not substitute for, or replace that sign.
- A full matrix PCMS may be used to simulate a flashing arrow board provided it meets the visibility, flash rate and dimming requirements on BC(7), for the same size arrow.

SHEET 6 OF 12



BARRICADE AND CONSTRUCTION PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)

BC (6) - 14

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© TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS				
9-07	8-14	DIST	COUNTY	SHEET NO.
7-13			COLLIN	39

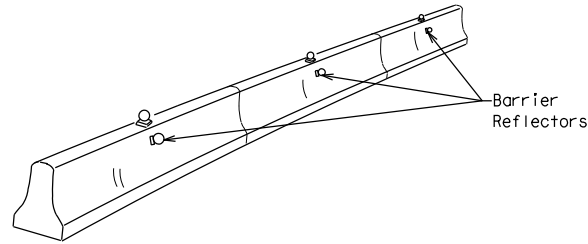
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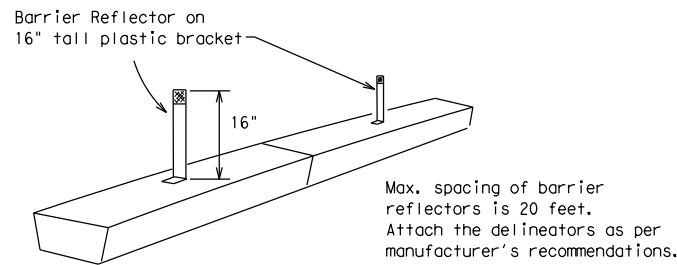
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- Barrier Reflectors shall be pre-qualified, and conform to the color and reflectivity requirements of DMS-8600. A list of prequalified Barrier Reflectors can be found at the Material Producer List web address shown on BC(1).
- Color of Barrier Reflectors shall be as specified in the TMUTCD. The cost of the reflectors shall be considered subsidiary to Item 512.

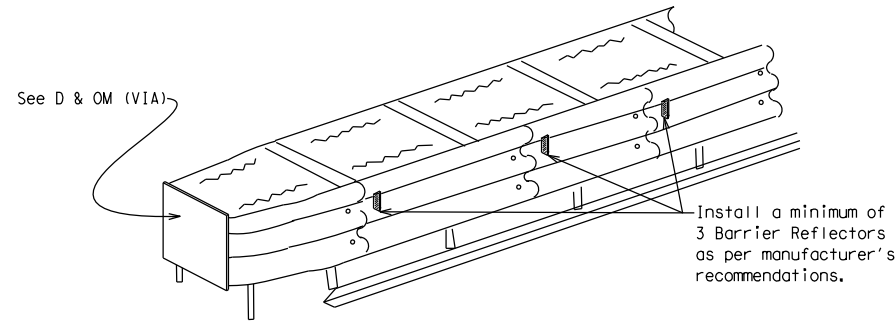


CONCRETE TRAFFIC BARRIER (CTB)



LOW PROFILE CONCRETE BARRIER (LPCB)

- Where traffic is on one side of the CTB, two (2) Barrier Reflectors shall be mounted in approximately the midsection of each section of CTB. An alternate mounting location is uniformly spaced at one end of each CTB. This will allow for attachment of a barrier grapple without damaging the reflector. The Barrier Reflector mounted on the side of the CTB shall be located directly below the reflector mounted on top of the barrier, as shown in the detail above.
- Where CTB separates two-way traffic, three barrier reflectors shall be mounted on each section of CTB. The reflector unit on top shall have two yellow reflective faces (Bi-Directional) while the reflectors on each side of the barrier shall have one yellow reflective face, as shown in the detail above.
- When CTB separates traffic traveling in the same direction, no barrier reflectors will be required on top of the CTB.
- Barrier Reflector units shall be yellow or white in color to match the edgeline being supplemented.
- Maximum spacing of Barrier Reflectors is forty (40) feet.
- Pavement markers or temporary flexible-reflective roadway marker tabs shall NOT be used as CTB delineation.
- Attachment of Barrier Reflectors to CTB shall be per manufacturer's recommendations.
- Missing or damaged Barrier Reflectors shall be replaced as directed by the Engineer.
- Single slope barriers shall be delineated as shown on the above detail.



DELINEATION OF END TREATMENTS

END TREATMENTS FOR CTB'S USED IN WORK ZONES

End treatments used on CTB's in work zones shall meet crashworthy standards as defined in the National Cooperative Highway Research Report 350. Refer to the CWZTCD List for approved end treatments and manufacturers.

BARRIER REFLECTORS FOR CONCRETE TRAFFIC BARRIER AND ATTENUATORS

WARNING LIGHTS

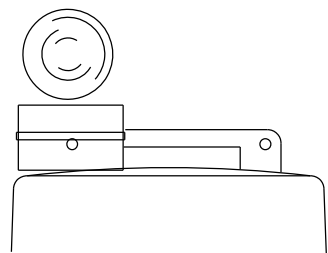
- Warning lights shall meet the requirements of the TMUTCD.
- Warning lights shall NOT be installed on barricades.
- Type A-Low Intensity Flashing Warning Lights are commonly used with drums. They are intended to warn of or mark a potentially hazardous area. Their use shall be as indicated on this sheet and/or other sheets of the plans by the designation "FL". The Type A Warning Lights shall not be used with signs manufactured with Type B_{FL} or C_{FL} Sheeting meeting the requirements of Departmental Material Specification DMS-8300.
- Type-C and Type D 360 degree Steady Burn Lights are intended to be used in a series for delineation to supplement other traffic control devices. Their use shall be as indicated on this sheet and/or other sheets of the plans by the designation "SB".
- The Engineer/Inspector or the plans shall specify the location and type of warning lights to be installed on the traffic control devices.
- When required by the Engineer, the Contractor shall furnish a copy of the warning lights certification. The warning light manufacturer will certify the warning lights meet the requirements of the latest ITE Purchase Specifications for Flashing and Steady-Burn Warning Lights.
- When used to delineate curves, Type-C and Type D Steady Burn Lights should only be placed on the outside of the curve, not the inside.
- The location of warning lights and warning reflectors on drums shall be as shown elsewhere in the plans.

WARNING LIGHTS MOUNTED ON PLASTIC DRUMS

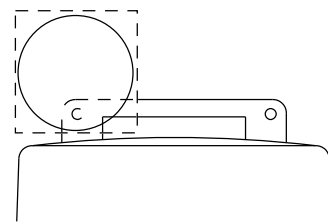
- Type A flashing warning lights are intended to warn drivers that they are approaching or are in a potentially hazardous area.
- Type A random flashing warning lights are not intended for delineation and shall not be used in a series.
- A series of sequential flashing warning lights placed on channelizing devices to form a merging taper may be used for delineation. If used, the successive flashing of the sequential warning lights should occur from the beginning of the taper to the end of the merging taper in order to identify the desired vehicle path. The rate of flashing for each light shall be 65 flashes per minute, plus or minus 10 flashes.
- Type C and D steady-burn warning lights are intended to be used in a series to delineate the edge of the travel lane on detours, on lane changes, on lane closures, and on other similar conditions.
- Type A, Type C and Type D warning lights shall be installed at locations as detailed on other sheets in the plans.
- Warning lights shall not be installed on a drum that has a sign, chevron or vertical panel.
- The maximum spacing for warning lights on drums should be identical to the channelizing device spacing.

WARNING REFLECTORS MOUNTED ON PLASTIC DRUMS AS A SUBSTITUTE FOR TYPE C (STEADY BURN) WARNING LIGHTS

- A warning reflector or approved substitute may be mounted on a plastic drum as a substitute for a Type C, steady burn warning light at the discretion of the Contractor unless otherwise noted in the plans.
- The warning reflector shall be yellow in color and shall be manufactured using a sign substrate approved for use with plastic drums listed on the CWZTCD.
- The warning reflector shall have a minimum retroreflective surface area (one-side) of 30 square inches.
- Round reflectors shall be fully reflectorized, including the area where attached to the drum.
- Square substrates must have a minimum of 30 square inches of reflectorized sheeting. They do not have to be reflectorized where it attaches to the drum.
- The side of the warning reflector facing approaching traffic shall have sheeting meeting the color and retroreflectivity requirements for DMS 8300-Type B or Type C.
- When used near two-way traffic, both sides of the warning reflector shall be reflectorized.
- The warning reflector should be mounted on the side of the handle nearest approaching traffic.
- The maximum spacing for warning reflectors should be identical to the channelizing device spacing requirements.



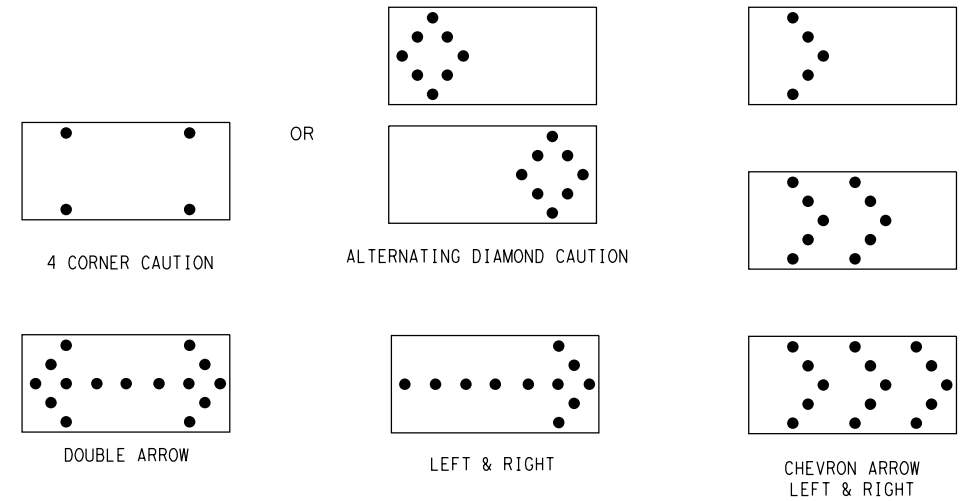
Type C Warning Light or approved substitute mounted on a drum adjacent to the travel way.



Warning reflector may be round or square. Must have a yellow reflective surface area of at least 30 square inches

Arrow Boards may be located behind channelizing devices in place for a shoulder taper or merging taper, otherwise they shall be delineated with four (4) channelizing devices placed perpendicular to traffic on the upstream side of traffic.

- The Flashing Arrow Board should be used for all lane closures on multi-lane roadways, or slow moving maintenance or construction activities on the travel lanes.
- Flashing Arrow Boards should not be used on two-lane, two-way roadways, detours, diversions or work on shoulders unless the "CAUTION" display (see detail below) is used.
- The Engineer/Inspector shall choose all appropriate signs, barricades and/or other traffic control devices that should be used in conjunction with the Flashing Arrow Board.
- The Flashing Arrow Board should be able to display the following symbols:



- The "CAUTION" display consists of four corner lamps flashing simultaneously, or the Alternating Diamond Caution mode as shown.
- The straight line caution display is NOT ALLOWED.
- The Flashing Arrow Board shall be capable of minimum 50 percent dimming from rated lamp voltage. The flashing rate of the lamps shall not be less than 25 nor more than 40 flashes per minute.
- Minimum lamp "on time" shall be approximately 50 percent for the flashing arrow and equal intervals of 25 percent for each sequential phase of the flashing chevron.
- The sequential arrow display is NOT ALLOWED.
- The flashing arrow display is the TxDOT standard; however, the sequential Chevron display may be used during daylight operations.
- The Flashing Arrow Board shall be mounted on a vehicle, trailer or other suitable support.
- A Flashing Arrow Board SHALL NOT BE USED to laterally shift traffic.
- A full matrix PCMS may be used to simulate a Flashing Arrow Board provided it meets visibility, flash rate and dimming requirements on this sheet for the same size arrow.
- Minimum mounting height of trailer mounted Arrow Boards should be 7 feet from roadway to bottom of panel.

REQUIREMENTS			
TYPE	MINIMUM SIZE	MINIMUM NUMBER OF PANEL LAMPS	MINIMUM VISIBILITY DISTANCE
B	30 x 60	13	3/4 mile
C	48 x 96	15	1 mile

ATTENTION
 Flashing Arrow Boards shall be equipped with automatic dimming devices.

WHEN NOT IN USE, REMOVE THE ARROW BOARD FROM THE RIGHT-OF-WAY OR PLACE THE ARROW BOARD BEHIND CONCRETE TRAFFIC BARRIER OR GUARDRAIL.

FLASHING ARROW BOARDS

TRUCK-MOUNTED ATTENUATORS

- Truck-mounted attenuators (TMA) used on TxDOT facilities must meet the requirements outlined in the National Cooperative Highway Research Report No. 350 (NCHRP 350) or the Manual for Assessing Safety Hardware (MASH).
- Refer to the CWZTCD for the requirements of Level 2 or Level 3 TMAs.
- Refer to the CWZTCD for a list of approved TMAs.
- TMAs are required on freeways unless otherwise noted in the plans.
- A TMA should be used anytime that it can be positioned 30 to 100 feet in advance of the area of crew exposure without adversely affecting the work performance.
- The only reason a TMA should not be required is when a work area is spread down the roadway and the work crew is an extended distance from the TMA.

BARRICADE AND CONSTRUCTION ARROW PANEL, REFLECTORS, WARNING LIGHTS & ATTENUATOR

BC (7) - 14

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7-13				COLLIN		40			

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GENERAL NOTES

- For long term stationary work zones on freeways, drums shall be used as the primary channelizing device.
- For intermediate term stationary work zones on freeways, drums should be used as the primary channelizing device but may be replaced in tangent sections by vertical panels, or 42" two-piece cones. In tangent sections one-piece cones may be used with the approval of the Engineer but only if personnel are present on the project at all times to maintain the cones in proper position and location.
- For short term stationary work zones on freeways, drums are the preferred channelizing device but may be replaced in tapers, transitions and tangent sections by vertical panels, two-piece cones or one-piece cones as approved by the Engineer.
- Drums and all related items shall comply with the requirements of the current version of the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD) and the "Compliant Work Zone Traffic Control Devices List" (CWZTCD).
- Drums, bases, and related materials shall exhibit good workmanship and shall be free from objectionable marks or defects that would adversely affect their appearance or serviceability.
- The Contractor shall have a maximum of 24 hours to replace any plastic drums identified for replacement by the Engineer/Inspector. The replacement device must be an approved device.

GENERAL DESIGN REQUIREMENTS

Pre-qualified plastic drums shall meet the following requirements:

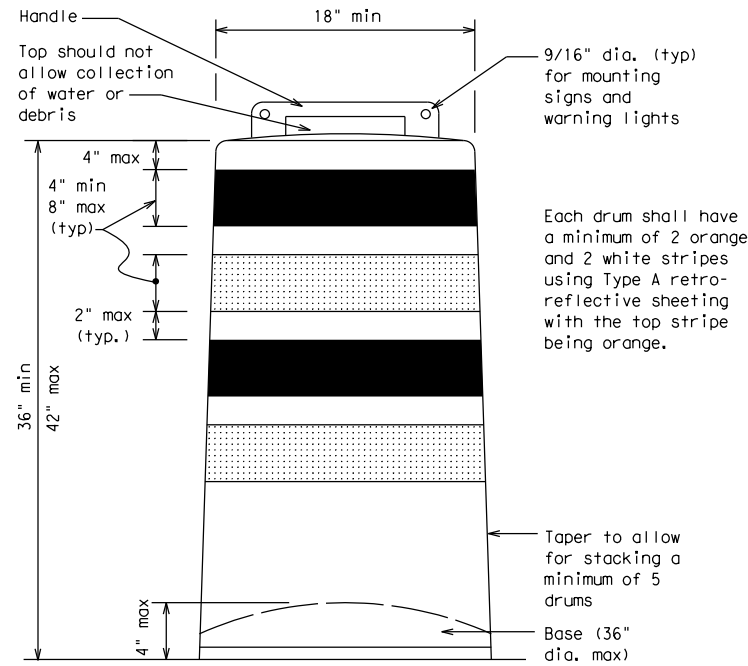
- Plastic drums shall be a two-piece design; the "body" of the drum shall be the top portion and the "base" shall be the bottom.
- The body and base shall lock together in such a manner that the body separates from the base when impacted by a vehicle traveling at a speed of 20 MPH or greater but prevents accidental separation due to normal handling and/or air turbulence created by passing vehicles.
- Plastic drums shall be constructed of lightweight flexible, and deformable materials. The Contractor shall NOT use metal drums or single piece plastic drums as channelization devices or sign supports.
- Drums shall present a profile that is a minimum of 18 inches in width at the 36 inch height when viewed from any direction. The height of drum unit (body installed on base) shall be a minimum of 36 inches and a maximum of 42 inches.
- The top of the drum shall have a built-in handle for easy pickup and shall be designed to drain water and not collect debris. The handle shall have a minimum of two widely spaced 9/16 inch diameter holes to allow attachment of a warning light, warning reflector unit or approved compliant sign.
- The exterior of the drum body shall have a minimum of four alternating orange and white retroreflective circumferential stripes not less than 4 inches nor greater than 8 inches in width. Any non-reflectORIZED space between any two adjacent stripes shall not exceed 2 inches in width.
- Bases shall have a maximum width of 36 inches, a maximum height of 4 inches, and a minimum of two footholds of sufficient size to allow base to be held down while separating the drum body from the base.
- Plastic drums shall be constructed of ultra-violet stabilized, orange, high-density polyethylene (HDPE) or other approved material.
- Drum body shall have a maximum unballasted weight of 11 lbs.
- Drum and base shall be marked with manufacturer's name and model number.

RETROREFLECTIVE SHEETING

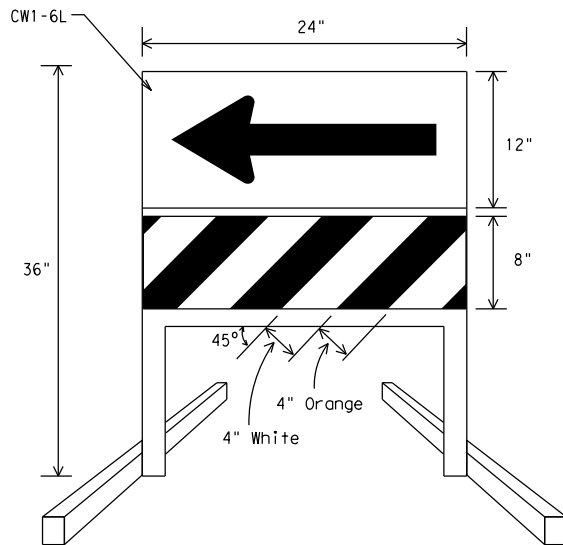
- The stripes used on drums shall be constructed of sheeting meeting the color and retroreflectivity requirements of Departmental Materials Specification DMS-8300, "Sign Face Materials." Type A reflective sheeting shall be supplied unless otherwise specified in the plans.
- The sheeting shall be suitable for use on and shall adhere to the drum surface such that, upon vehicular impact, the sheeting shall remain adhered in-place and exhibit no delaminating, cracking, or loss of retroreflectivity other than that loss due to abrasion of the sheeting surface.

BALLAST

- Unballasted bases shall be large enough to hold up to 50 lbs. of sand. This base, when filled with the ballast material, should weigh between 35 lbs (minimum) and 50 lbs (maximum). The ballast may be sand in one to three sandbags separate from the base, sand in a sand-filled plastic base, or other ballasting devices as approved by the Engineer. Stacking of sandbags will be allowed, however height of sandbags above pavement surface may not exceed 12 inches.
- Bases with built-in ballast shall weigh between 40 lbs. and 50 lbs. Built-in ballast can be constructed of an integral crumb rubber base or a solid rubber base.
- Recycled truck tire sidewalls may be used for ballast on drums approved for this type of ballast on the CWZTCD list.
- The ballast shall not be heavy objects, water, or any material that would become hazardous to motorists, pedestrians, or workers when the drum is struck by a vehicle.
- When used in regions susceptible to freezing, drums shall have drainage holes in the bottoms so that water will not collect and freeze becoming a hazard when struck by a vehicle.
- Ballast shall not be placed on top of drums.
- Adhesives may be used to secure base of drums to pavement.



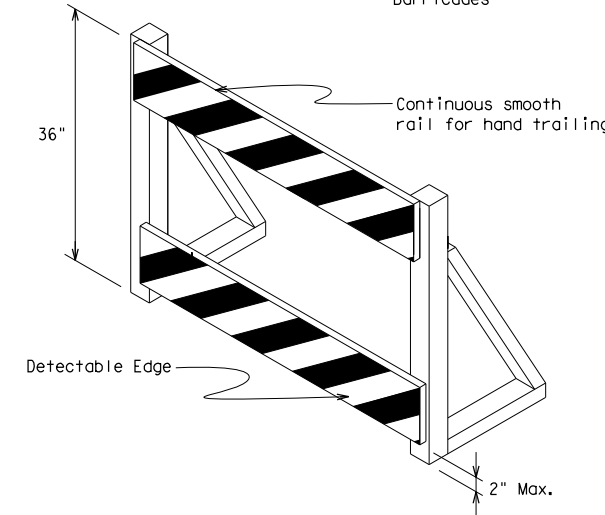
Each drum shall have a minimum of 2 orange and 2 white stripes using Type A retro-reflective sheeting with the top stripe being orange.



DIRECTION INDICATOR BARRICADE

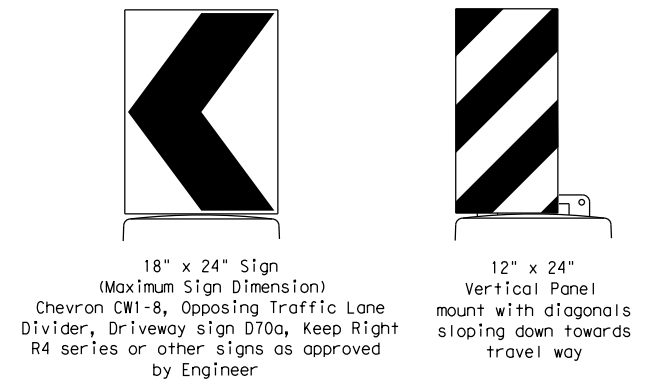
- The Direction Indicator Barricade may be used in tapers, transitions, and other areas where specific directional guidance to drivers is necessary.
- If used, the Direction Indicator Barricade should be used in series to direct the driver through the transition and into the intended travel lane.
- The Direction Indicator Barricade shall consist of One-Direction Large Arrow (CWI-6) sign in the size shown with a black arrow on a background of Type B_{FL} or Type C_{FL} Orange retroreflective sheeting above a rail with Type A retroreflective sheeting in alternating 4" white and orange stripes sloping downward at an angle of 45 degrees in the direction road users are to pass. Sheetting types shall be as per DMS 8300.
- Double arrows on the Direction Indicator Barricade will not be allowed.
- Approved manufacturers are shown on the CWZTCD List. Ballast shall be as approved by the manufacturers instructions.

This detail is not intended for fabrication. See note 3 and the CWZTCD list for providers of approved Detectable Pedestrian Barricades



DETECTABLE PEDESTRIAN BARRICADES

- When existing pedestrian facilities are disrupted, closed, or relocated in a TTC zone, the temporary facilities shall be detectable and include accessibility features consistent with the features present in the existing pedestrian facility.
- Where pedestrians with visual disabilities normally use the closed sidewalk, a device that is detectable by a person with a visual disability traveling with the aid of a long cane shall be placed across the full width of the closed sidewalk.
- Detectable pedestrian barricades similar to the one pictured above, longitudinal channelizing devices, some concrete barriers, and wood or chain link fencing with a continuous detectable edging can satisfactorily delineate a pedestrian path.
- Tape, rope, or plastic chain strung between devices are not detectable, do not comply with the design standards in the "Americans with Disabilities Act Accessibility Guidelines for Buildings and Facilities (ADAAG)" and should not be used as a control for pedestrian movements.
- Warning lights shall not be attached to detectable pedestrian barricades.
- Detectable pedestrian barricades may use 8" nominal barricade rails as shown on BC(10) provided that the top rail provides a smooth continuous rail suitable for hand trailing with no splinters, burrs, or sharp edges.



Plywood, Aluminum or Metal sign substrates shall NOT be used on plastic drums

SIGNS, CHEVRONS, AND VERTICAL PANELS MOUNTED ON PLASTIC DRUMS

- Signs used on plastic drums shall be manufactured using substrates listed on the CWZTCD.
- Chevrons and other work zone signs with an orange background shall be manufactured with Type B_{FL} or Type C_{FL} Orange sheeting meeting the color and retroreflectivity requirements of DMS-8300, "Sign Face Material," unless otherwise specified in the plans.
- Vertical Panels shall be manufactured with orange and white sheeting meeting the requirements of DMS-8300 Type A Diagonal stripes on Vertical Panels shall slope down toward the intended traveled lane.
- Other sign messages (text or symbolic) may be used as approved by the Engineer. Sign dimensions shall not exceed 18 inches in width or 24 inches in height, except for the R9 series signs discussed in note 8 below.
- Signs shall be installed using a 1/2 inch bolt (nominal) and nut, two washers, and one locking washer for each connection.
- Mounting bolts and nuts shall be fully engaged and adequately torqued. Bolts should not extend more than 1/2 inch beyond nuts.
- Chevrons may be placed on drums on the outside of curves, on merging tapers or on shifting tapers. When used in these locations they may be placed on every drum or spaced not more than on every third drum. A minimum of three (3) should be used at each location called for in the plans.
- R9-9, R9-10, R9-11 and R9-11a Sidewalk Closed signs which are 24 inches wide may be mounted on plastic drums, with approval of the Engineer.

SHEET 8 OF 12



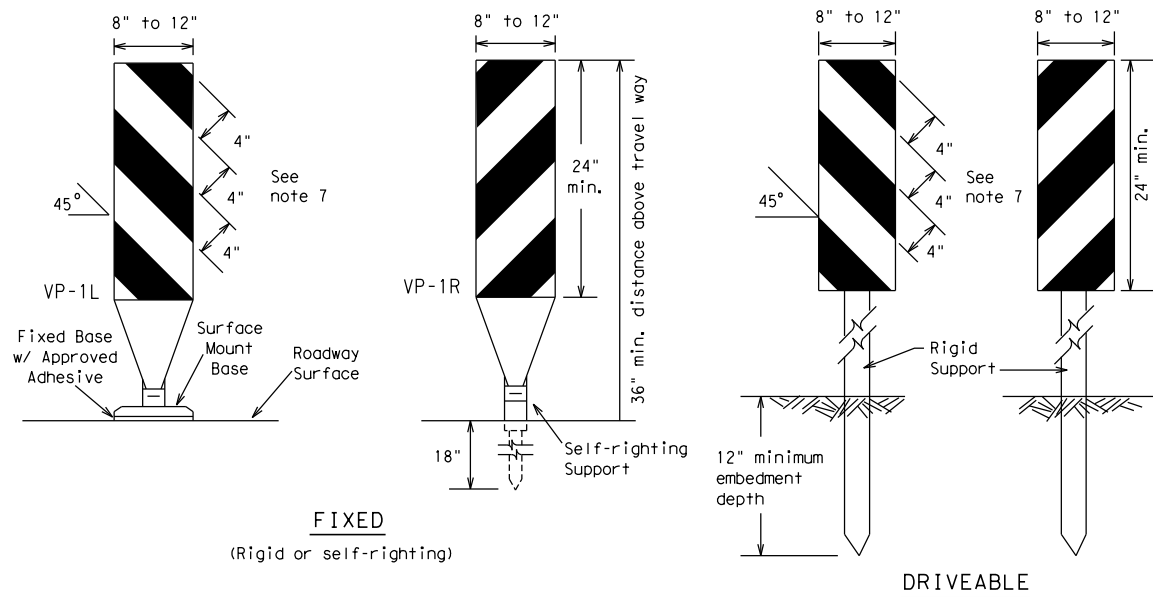
BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC (8) - 14

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4-03	7-13	DIST	COUNTY	SHEET NO.					
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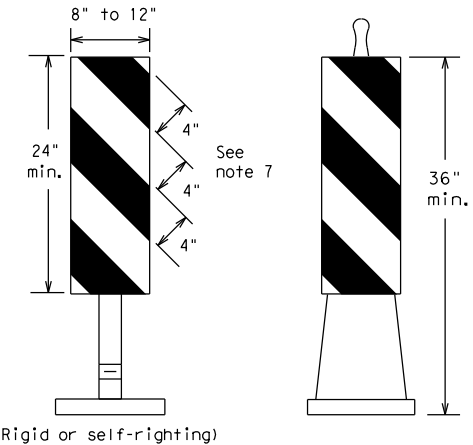
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FIXED
(Rigid or self-righting)

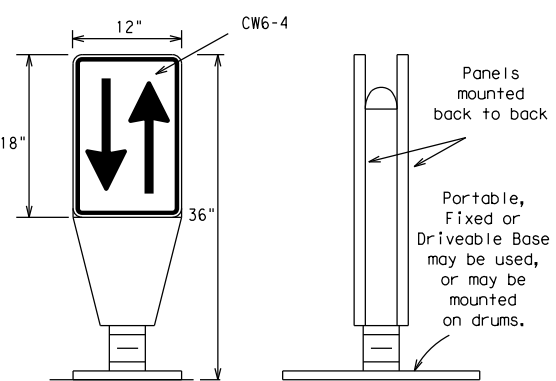
DRIVEABLE



PORTABLE

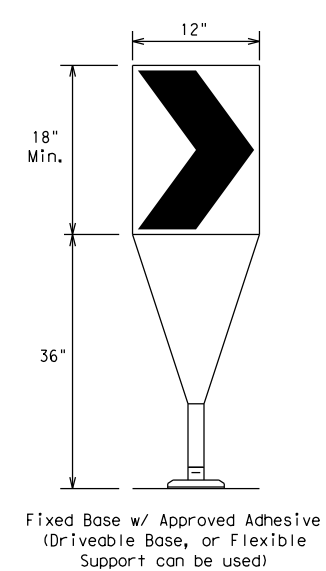
VERTICAL PANELS (VPs)

- Vertical Panels (VP's) are normally used to channelize traffic or divide opposing lanes of traffic.
- VP's may be used in daytime or nighttime situations. They may be used at the edge of shoulder drop-offs and other areas such as lane transitions where positive daytime and nighttime delineation is required. The Engineer/Inspector shall refer to the Roadway Design Manual Appendix B "Treatment of Pavement Drop-offs in Work Zones" for additional guidelines on the use of VP's for drop-offs.
- VP's should be mounted back to back if used at the edge of cuts adjacent to two-way two lane roadways. Stripes are to be reflective orange and reflective white and should always slope downward toward the travel lane.
- VP's used on expressways and freeways or other high speed roadways, may have more than 270 square inches of retroreflective area facing traffic.
- Self-righting supports are available with portable base. See "Compliant Work Zone Traffic Control Devices List" (CWZTCD).
- Sheeting for the VP's shall be retroreflective Type A conforming to Departmental Material Specification DMS-8300, unless noted otherwise.
- Where the height of reflective material on the vertical panel is 36 inches or greater, a panel stripe of 6 inches shall be used.



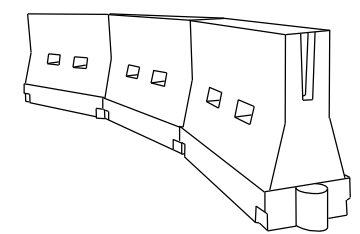
OPPOSING TRAFFIC LANE DIVIDERS (OTLD)

- Opposing Traffic Lane Dividers (OTLD) are delineation devices designed to convert a normal one-way roadway section to two-way operation. OTLD's are used on temporary centerlines. The upward and downward arrows on the sign's face indicate the direction of traffic on either side of the divider. The base is secured to the pavement with an adhesive or rubber weight to minimize movement caused by a vehicle impact or wind gust.
- The OTLD may be used in combination with 42" cones or VPs.
- Spacing between the OTLD shall not exceed 500 feet. 42" cones or VPs placed between the OTLD's should not exceed 100 foot spacing.
- The OTLD shall be orange with a black non-reflective legend. Sheeting for the OTLD shall be retroreflective Type B_{FL} or Type C_{FL} conforming to Departmental Material Specification DMS-8300, unless noted otherwise. The legend shall meet the requirements of DMS-8300.



- The chevron shall be a vertical rectangle with a minimum size of 12 by 18 inches.
- Chevrons are intended to give notice of a sharp change of alignment with the direction of travel and provide additional emphasis and guidance for vehicle operators with regard to changes in horizontal alignment of the roadway.
- Chevrons, when used, shall be erected on the outside of a sharp curve or turn, or on the far side of an intersection. They shall be in line with and at right angles to approaching traffic. Spacing should be such that the motorist always has three in view, until the change in alignment eliminates its need.
- To be effective, the chevron should be visible for at least 500 feet.
- Chevrons shall be orange with a black nonreflective legend. Sheeting for the chevron shall be retroreflective Type B_{FL} or Type C_{FL} conforming to Departmental Material Specification DMS-8300, unless noted otherwise. The legend shall meet the requirements of DMS-8300.
- For Long Term Stationary use on tapers or transitions on freeways and divided highways self-righting chevrons may be used to supplement plastic drums but not to replace plastic drums.

CHEVRONS



LONGITUDINAL CHANNELIZING DEVICES (LCD)

- LCDs are crashworthy, lightweight, deformable devices that are highly visible, have good target value and can be connected together. They are not designed to contain or redirect a vehicle on impact.
- LCDs may be used instead of a line of cones or drums.
- LCDs shall be placed in accordance to application and installation requirements specific to the device, and used only when shown on the CWZTCD list.
- LCDs should not be used to provide positive protection for obstacles, pedestrians or workers.
- LCDs shall be supplemented with retroreflective delineation as required for temporary barriers on BC(7) when placed roughly parallel to the travel lanes.
- LCDs used as barricades placed perpendicular to traffic should have at least one row of reflective sheeting meeting the requirements for barricade rails as shown on BC(10) placed near the top of the LCD along the full length of the device.

WATER BALLASTED SYSTEMS USED AS BARRIERS

- Water ballasted systems used as barriers shall not be used solely to channelize road users, but also to protect the work space per the appropriate NCHRP 350 crashworthiness requirements based on roadway speed and barrier application.
- Water ballasted systems used to channelize vehicular traffic shall be supplemented with retroreflective delineation or channelizing devices to improve daytime/nighttime visibility. They may also be supplemented with pavement markings.
- Water ballasted systems used as barriers shall be placed in accordance to application and installation requirements specific to the device, and used only when shown on the CWZTCD list.
- Water ballasted systems used as barriers should not be used for a merging taper except in low speed (less than 45 MPH) urban areas. When used on a taper in a low speed urban area, the taper shall be delineated and the taper length should be designed to optimize road user operations considering the available geometric conditions.
- When water ballasted systems used as barriers have blunt ends exposed to traffic, they should be attenuated as per manufacturer recommendations or flared to a point outside the clear zone.

If used to channelize pedestrians, longitudinal channelizing devices or water ballasted systems must have a continuous detectable bottom for users of long canes and the top of the unit shall not be less than 32 inches in height.

HOLLOW OR WATER BALLASTED SYSTEMS USED AS LONGITUDINAL CHANNELIZING DEVICES OR BARRIERS

GENERAL NOTES

- Work Zone channelizing devices illustrated on this sheet may be installed in close proximity to traffic and are suitable for use on high or low speed roadways. The Engineer/Inspector shall ensure that spacing and placement is uniform and in accordance with the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD).
- Channelizing devices shown on this sheet may have a driveable, fixed or portable base. The requirement for self-righting channelizing devices must be specified in the General Notes or other plan sheets.
- Channelizing devices on self-righting supports should be used in work zone areas where channelizing devices are frequently impacted by errant vehicles or vehicle related wind gusts making alignment of the channelizing devices difficult to maintain. Locations of these devices shall be detailed elsewhere in the plans. These devices shall conform to the TMUTCD and the "Compliant Work Zone Traffic Control Devices List" (CWZTCD).
- The Contractor shall maintain devices in a clean condition and replace damaged, nonreflective, faded, or broken devices and bases as required by the Engineer/Inspector. The Contractor shall be required to maintain proper device spacing and alignment.
- Portable bases shall be fabricated from virgin and/or recycled rubber. The portable bases shall weigh a minimum of 30 lbs.
- Pavement surfaces shall be prepared in a manner that ensures proper bonding between the adhesives, the fixed mount bases and the pavement surface. Adhesives shall be prepared and applied according to the manufacturer's recommendations.
- The installation and removal of channelizing devices shall not cause detrimental effects to the final pavement surfaces, including pavement surface discoloration or surface integrity. Driveable bases shall not be permitted on final pavement surfaces. The Engineer/Inspector shall approve all application and removal procedures of fixed bases.

Posted Speed *	Formula	Minimum Desirable Taper Lengths **			Suggested Maximum Spacing of Channelizing Devices	
		10' Offset	11' Offset	12' Offset	On a Taper	On a Tangent
30	L = WS ² / 60	150'	165'	180'	30'	60'
35		205'	225'	245'	35'	70'
40		265'	295'	320'	40'	80'
45	L = WS	450'	495'	540'	45'	90'
50		500'	550'	600'	50'	100'
55		550'	605'	660'	55'	110'
60		600'	660'	720'	60'	120'
65		650'	715'	780'	65'	130'
70		700'	770'	840'	70'	140'
75		750'	825'	900'	75'	150'
80		800'	880'	960'	80'	160'

**Taper lengths have been rounded off.
 L=Length of Taper (FT.) W=Width of Offset (FT.)
 S=Posted Speed (MPH)

SUGGESTED MAXIMUM SPACING OF CHANNELIZING DEVICES AND MINIMUM DESIRABLE TAPER LENGTHS

SHEET 9 OF 12



BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC (9) - 14

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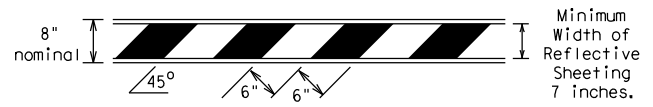
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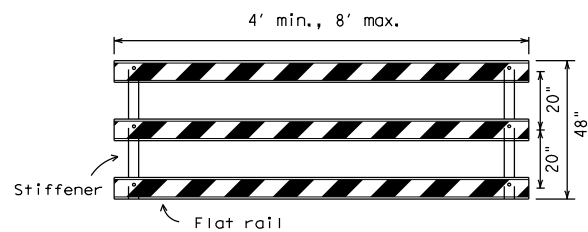
TYPE 3 BARRICADES

1. Refer to the Compliant Work Zone Traffic Control Devices List (CWZTCD) for details of the Type 3 Barricades and a list of all materials used in the construction of Type 3 Barricades.
2. Type 3 Barricades shall be used at each end of construction projects closed to all traffic.
3. Barricades extending across a roadway should have stripes that slope downward in the direction toward which traffic must turn in detouring. When both right and left turns are provided, the chevron striping may slope downward in both directions from the center of the barricade. Where no turns are provided at a closed road striping should slope downward in both directions toward the center of roadway.
4. Striping of rails, for the right side of the roadway, should slope downward to the left. For the left side of the roadway, striping should slope downward to the right.
5. Identification markings may be shown only on the back of the barricade rails. The maximum height of letters and/or company logos used for identification shall be 1".
6. Barricades shall not be placed parallel to traffic unless an adequate clear zone is provided.
7. Warning lights shall NOT be installed on barricades.
8. Where barricades require the use of weights to keep from turning over, the use of sandbags with dry, cohesionless sand is recommended. The sandbags will be tied shut to keep the sand from spilling and to maintain a constant weight. Sand bags shall not be stacked in a manner that covers any portion of a barricade rails reflective sheeting. Rock, concrete, iron, steel or other solid objects will NOT be permitted. Sandbags should weigh a minimum of 35 lbs and a maximum of 50 lbs. Sandbags shall be made of a durable material that tears upon vehicular impact. Rubber (such as tire inner tubes) shall not be used for sandbags. Sandbags shall only be placed along or upon the base supports of the device and shall not be suspended above ground level or hung with rope, wire, chains or other fasteners.
9. Sheeting for barricades shall be retroreflective Type A conforming to Departmental Material Specification DMS-8300 unless otherwise noted.

Barricades shall NOT be used as a sign support.

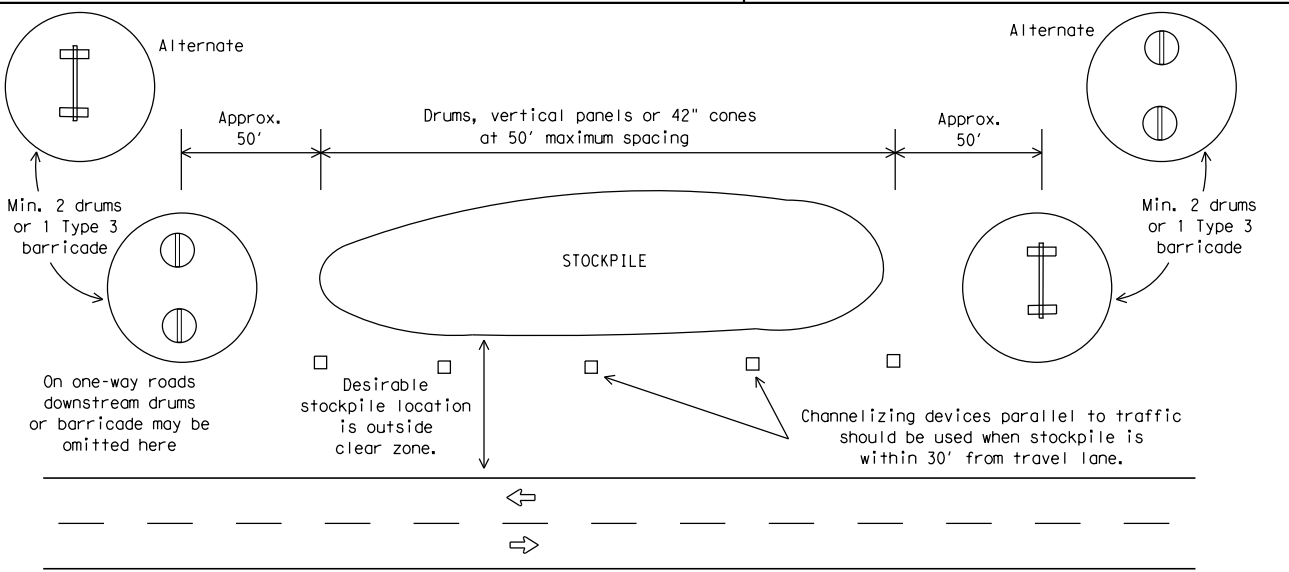


TYPICAL STRIPING DETAIL FOR BARRICADE RAIL



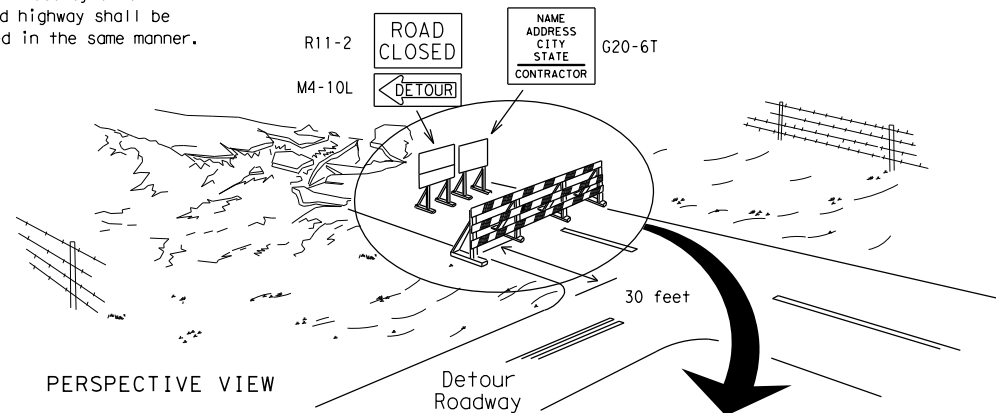
Stiffener may be inside or outside of support, but no more than 2 stiffeners shall be allowed on one barricade.

TYPICAL PANEL DETAIL FOR SKID OR POST TYPE BARRICADES



TRAFFIC CONTROL FOR MATERIAL STOCKPILES

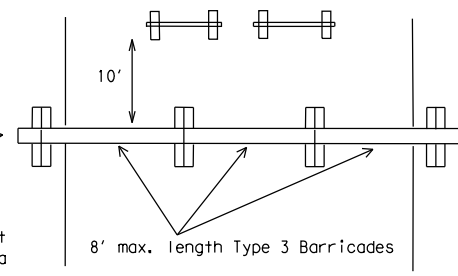
Each roadway of a divided highway shall be barricaded in the same manner.



PERSPECTIVE VIEW

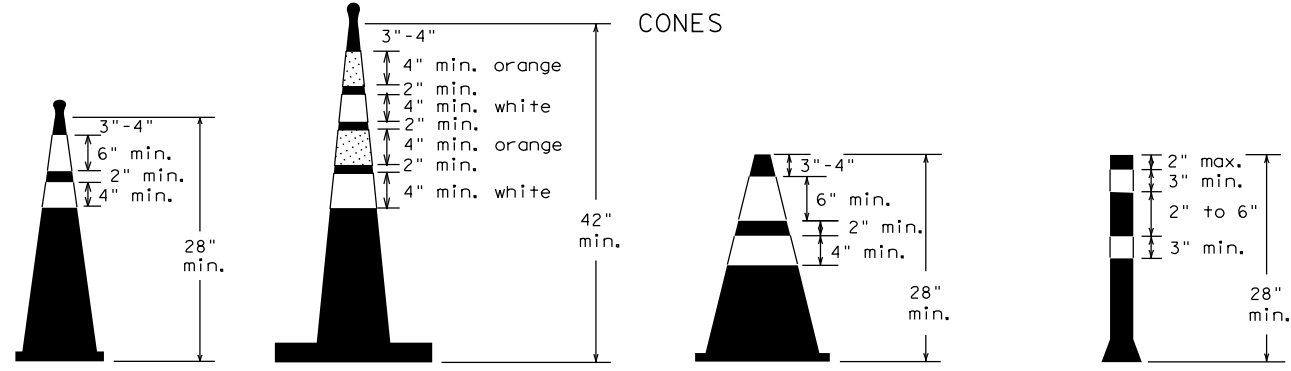
The three rails on Type 3 barricades shall be reflectorized orange and reflective white stripes on one side facing one-way traffic and both sides for two-way traffic. Barricade striping should slant downward in the direction of detour.

1. Signs should be mounted on independent supports at a 7 foot mounting height in center of roadway. The signs should be a minimum of 10 feet behind Type 3 Barricades.
2. Advance signing shall be as specified elsewhere in the plans.



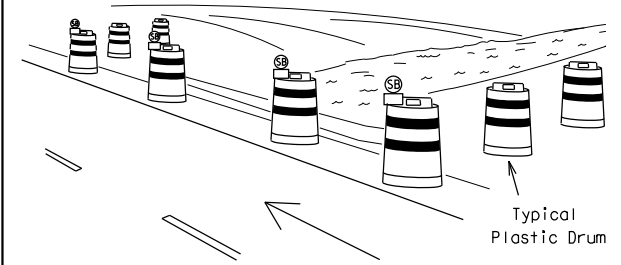
PLAN VIEW

TYPE 3 BARRICADE (POST AND SKID) TYPICAL APPLICATION

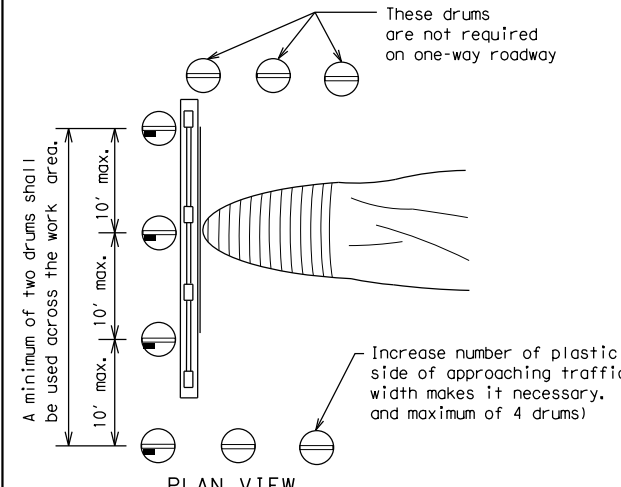


28" Cones shall have a minimum weight of 9 1/2 lbs.
 42" 2-piece cones shall have a minimum weight of 30 lbs. including base.

1. Traffic cones and tubular markers shall be predominantly orange, and meet the height and weight requirements shown above.
2. One-piece cones have the body and base of the cone molded in one consolidated unit. Two-piece cones have a cone shaped body and a separate rubber base, or ballast, that is added to keep the device upright and in place.
3. Two-piece cones may have a handle or loop extending up to 8" above the minimum height shown, in order to aid in retrieving the device.
4. Cones or tubular markers used at night shall have white or white and orange reflective bands as shown above. The reflective bands shall have a smooth, sealed outer surface and meet the requirements of Departmental Material Specification DMS-8300 Type A.
5. 28" cones and tubular markers are generally suitable for short duration and short-term stationary work as defined on BC(4). These should not be used for intermediate-term or long-term stationary work unless personnel is on-site to maintain them in their proper upright position.
6. 42" two-piece cones, vertical panels or drums are suitable for all work zone durations.
7. Cones or tubular markers used on each project should be of the same size and shape.



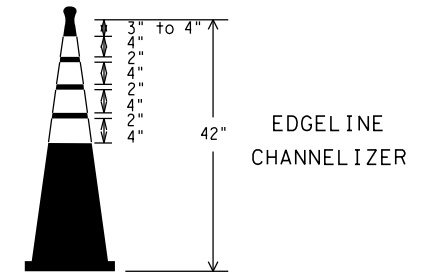
PERSPECTIVE VIEW



CULVERT WIDENING OR OTHER ISOLATED WORK WITHIN THE PROJECT LIMITS

LEGEND	
	Plastic drum
	Plastic drum with steady burn light or yellow warning reflector
	Steady burn warning light or yellow warning reflector

THIS DEVICE SHALL NOT BE USED ON PROJECTS LET AFTER MARCH 2014.



EDGE LINE CHANNELIZER

1. This device is intended only for use in place of a vertical panel to channelize traffic by indicating the edge of the travel lane. It is not intended to be used in transitions or tapers.
2. This device shall not be used to separate lanes of traffic (opposing or otherwise) or warn of objects.
3. This device is based on a 42 inch, two-piece cone with an alternate striping pattern: four 4 inch retroreflective bands, with an approximate 2 inch gap between bands. The color of the band should correspond to the color of the edgeline (yellow for left edgeline, white for right edgeline) for which the device is substituted or for which it supplements. The reflectorized bands shall be retroreflective Type A conforming to Departmental Material Specification DMS-8300, unless otherwise noted.
4. The base must weigh a minimum of 30 lbs.

SHEET 10 OF 12



BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC (10) - 14

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WORK ZONE PAVEMENT MARKINGS

GENERAL

- The Contractor shall be responsible for maintaining work zone and existing pavement markings, in accordance with the standard specifications and special provisions, on all roadways open to traffic within the CSJ limits unless otherwise stated in the plans.
- Color, patterns and dimensions shall be in conformance with the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD).
- Additional supplemental pavement marking details may be found in the plans or specifications.
- Pavement markings shall be installed in accordance with the TMUTCD and as shown on the plans.
- When short term markings are required on the plans, short term markings shall conform with the TMUTCD, the plans and details as shown on the Standard Plan Sheet WZ(STPM).
- When standard pavement markings are not in place and the roadway is opened to traffic, DO NOT PASS signs shall be erected to mark the beginning of the sections where passing is prohibited and PASS WITH CARE signs at the beginning of sections where passing is permitted.
- All work zone pavement markings shall be installed in accordance with Item 662, "Work Zone Pavement Markings."

RAISED PAVEMENT MARKERS

- Raised pavement markers are to be placed according to the patterns on BC(12).
- All raised pavement markers used for work zone markings shall meet the requirements of Item 672, "RAISED PAVEMENT MARKERS" and Departmental Material Specification DMS-4200 or DMS-4300.

PREFABRICATED PAVEMENT MARKINGS

- Removable prefabricated pavement markings shall meet the requirements of DMS-8241.
- Non-removable prefabricated pavement markings (foil back) shall meet the requirements of DMS-8240.

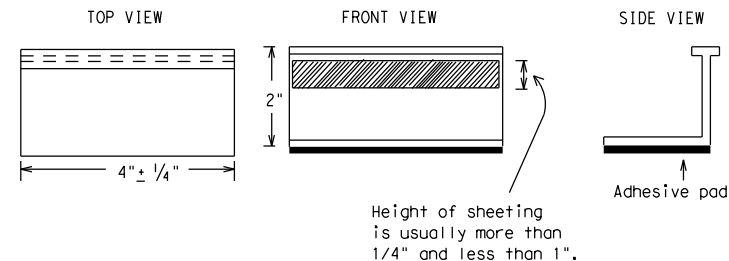
MAINTAINING WORK ZONE PAVEMENT MARKINGS

- The Contractor will be responsible for maintaining work zone pavement markings within the work limits.
- Work zone pavement markings shall be inspected in accordance with the frequency and reporting requirements of work zone traffic control device inspections as required by Form 599.
- The markings should provide a visible reference for a minimum distance of 300 feet during normal daylight hours and 160 feet when illuminated by automobile low-beam headlights at night, unless sight distance is restricted by roadway geometrics.
- Markings failing to meet this criteria within the first 30 days after placement shall be replaced at the expense of the Contractor as per Specification Item 662.

REMOVAL OF PAVEMENT MARKINGS

- Pavement markings that are no longer applicable, could create confusion or direct a motorist toward or into the closed portion of the roadway shall be removed or obliterated before the roadway is opened to traffic.
- The above shall not apply to detours in place for less than three days, where flaggers and/or sufficient channelizing devices are used in lieu of markings to outline the detour route.
- Pavement markings shall be removed to the fullest extent possible, so as not to leave a discernable marking. This shall be by any method approved by TxDOT Specification Item 677 for "Eliminating Existing Pavement Markings and Markers".
- The removal of pavement markings may require resurfacing or seal coating portions of the roadway as described in Item 677.
- Subject to the approval of the Engineer, any method that proves to be successful on a particular type pavement may be used.
- Blast cleaning may be used but will not be required unless specifically shown in the plans.
- Over-painting of the markings SHALL NOT BE permitted.
- Removal of raised pavement markers shall be as directed by the Engineer.
- Removal of existing pavement markings and markers will be paid for directly in accordance with Item 677, "ELIMINATING EXISTING PAVEMENT MARKINGS AND MARKERS," unless otherwise stated in the plans.
- Black-out marking tape may be used to cover conflicting existing markings for periods less than two weeks when approved by the Engineer.

Temporary Flexible-Reflective Roadway Marker Tabs



STAPLES OR NAILS SHALL NOT BE USED TO SECURE
TEMPORARY FLEXIBLE-REFLECTIVE ROADWAY MARKER
TABS TO THE PAVEMENT SURFACE

- Temporary flexible-reflective roadway marker tabs used as guidemarks shall meet the requirements of DMS-8242.
- Tabs detailed on this sheet are to be inspected and accepted by the Engineer or designated representative. Sampling and testing is not normally required, however at the option of the Engineer, either "A" or "B" below may be imposed to assure quality before placement on the roadway.
 - Select five (5) or more tabs at random from each lot or shipment and submit to the Construction Division, Materials and Pavement Section to determine specification compliance.
 - Select five (5) tabs and perform the following test. Affix five (5) tabs at 24 inch intervals on an asphaltic pavement in a straight line. Using a medium size passenger vehicle or pickup, run over the markers with the front and rear tires at a speed of 35 to 40 miles per hour, four (4) times in each direction. No more than one (1) out of the five (5) reflective surfaces shall be lost or displaced as a result of this test.
- Small design variances may be noted between tab manufacturers.
- See Standard Sheet WZ(STPM) for tab placement on new pavements. See Standard Sheet TCP(7-1) for tab placement on seal coat work.

RAISED PAVEMENT MARKERS USED AS GUIDEMARKS

- Raised pavement markers used as guidemarks shall be from the approved product list, and meet the requirements of DMS-4200.
- All temporary construction raised pavement markers provided on a project shall be of the same manufacturer.
- Adhesive for guidemarks shall be bituminous material hot applied or butyl rubber pad for all surfaces, or thermoplastic for concrete surfaces.

Guidemarks shall be designated as:
 YELLOW - (two amber reflective surfaces with yellow body).
 WHITE - (one silver reflective surface with white body).

DEPARTMENTAL MATERIAL SPECIFICATIONS	
PAVEMENT MARKERS (REFLECTORIZED)	DMS-4200
TRAFFIC BUTTONS	DMS-4300
EPOXY AND ADHESIVES	DMS-6100
BITUMINOUS ADHESIVE FOR PAVEMENT MARKERS	DMS-6130
PERMANENT PREFABRICATED PAVEMENT MARKINGS	DMS-8240
TEMPORARY REMOVABLE, PREFABRICATED PAVEMENT MARKINGS	DMS-8241
TEMPORARY FLEXIBLE, REFLECTIVE ROADWAY MARKER TABS	DMS-8242

A list of prequalified reflective raised pavement markers, non-reflective traffic buttons, roadway marker tabs and other pavement markings can be found at the Material Producer List web address shown on BC(1).

SHEET 11 OF 12



BARRICADE AND CONSTRUCTION PAVEMENT MARKINGS

BC(11) - 14

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1-02 7-13	DIST	COUNTY		SHEET NO.
11-02 8-14	COLLIN			44

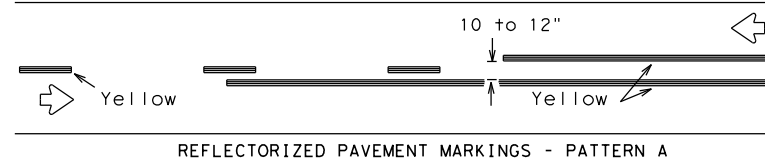
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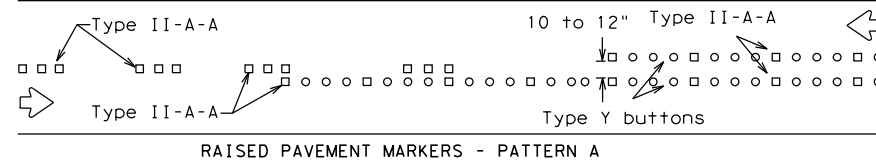
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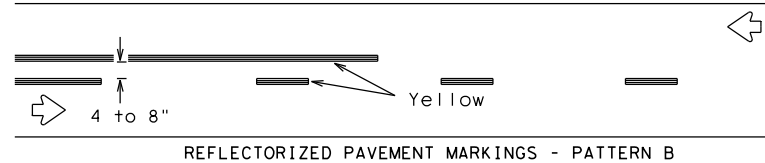
PAVEMENT MARKING PATTERNS



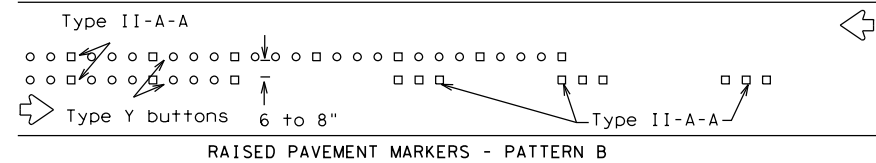
REFLECTORIZED PAVEMENT MARKINGS - PATTERN A



RAISED PAVEMENT MARKERS - PATTERN A



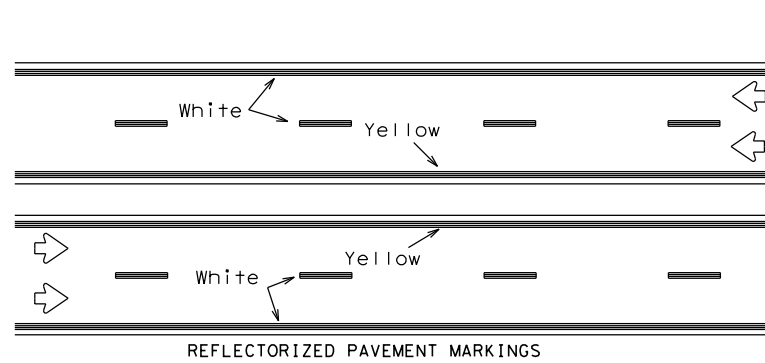
REFLECTORIZED PAVEMENT MARKINGS - PATTERN B



RAISED PAVEMENT MARKERS - PATTERN B

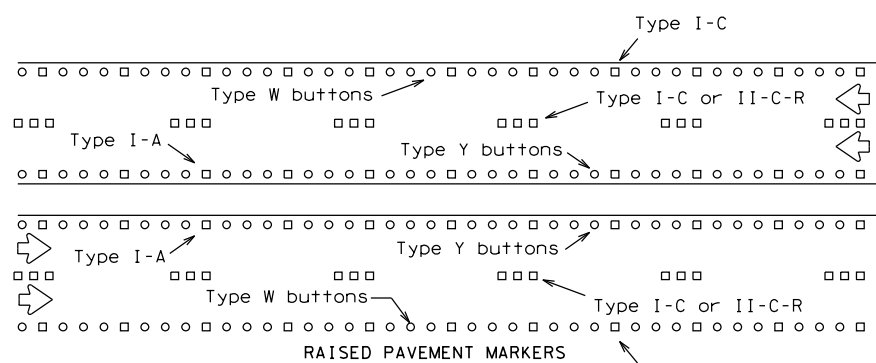
Pattern A is the TxDOT Standard, however Pattern B may be used if approved by the Engineer. Prefabricated markings may be substituted for reflectorized pavement markings.

CENTER LINE & NO-PASSING ZONE BARRIER LINES FOR TWO-LANE, TWO-WAY HIGHWAYS



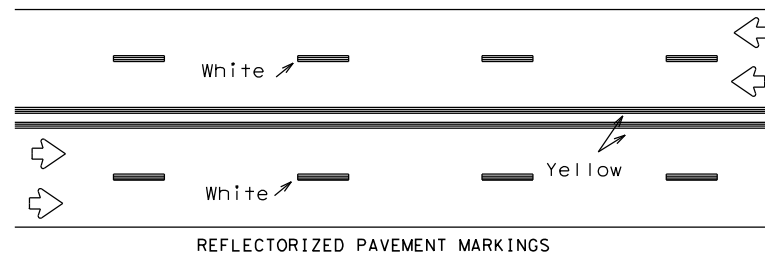
REFLECTORIZED PAVEMENT MARKINGS

Prefabricated markings may be substituted for reflectorized pavement markings.



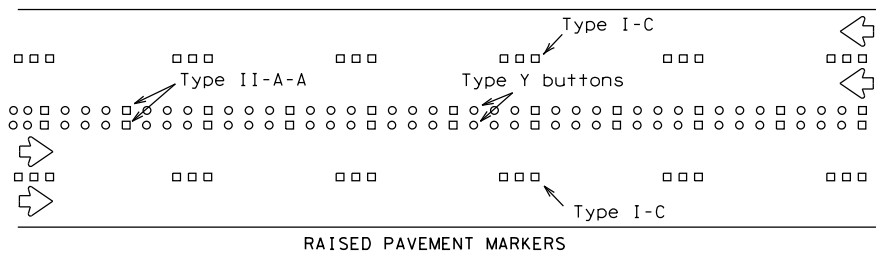
RAISED PAVEMENT MARKERS

EDGE & LANE LINES FOR DIVIDED HIGHWAY



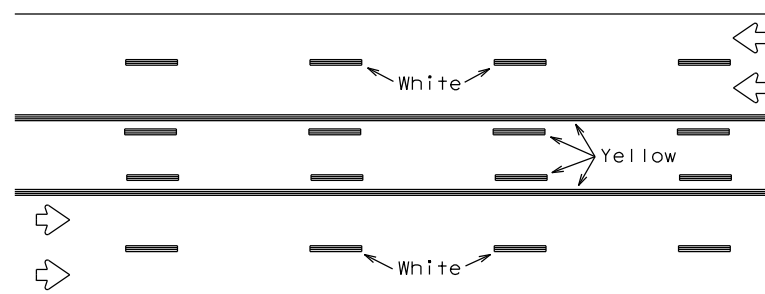
REFLECTORIZED PAVEMENT MARKINGS

Prefabricated markings may be substituted for reflectorized pavement markings.



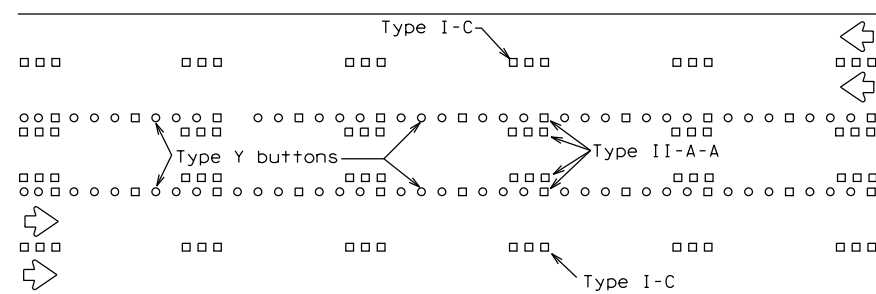
RAISED PAVEMENT MARKERS

LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS



REFLECTORIZED PAVEMENT MARKINGS

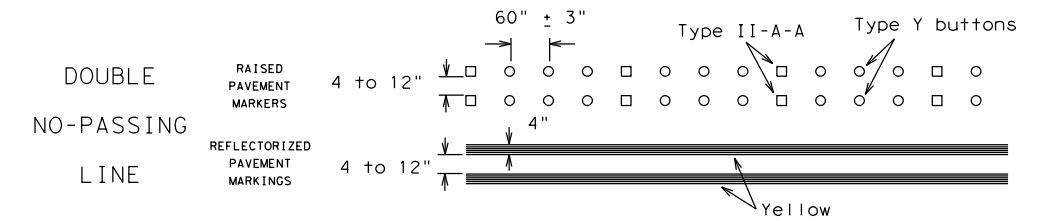
Prefabricated markings may be substituted for reflectorized pavement markings.



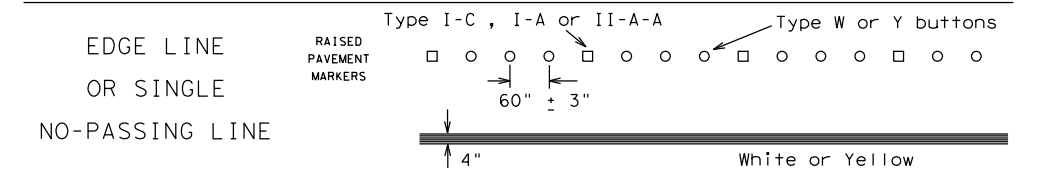
RAISED PAVEMENT MARKERS

TWO-WAY LEFT TURN LANE

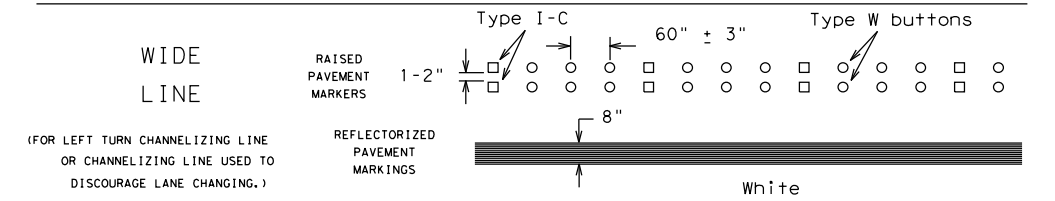
STANDARD WORK ZONE PAVEMENT MARKINGS DETAILS



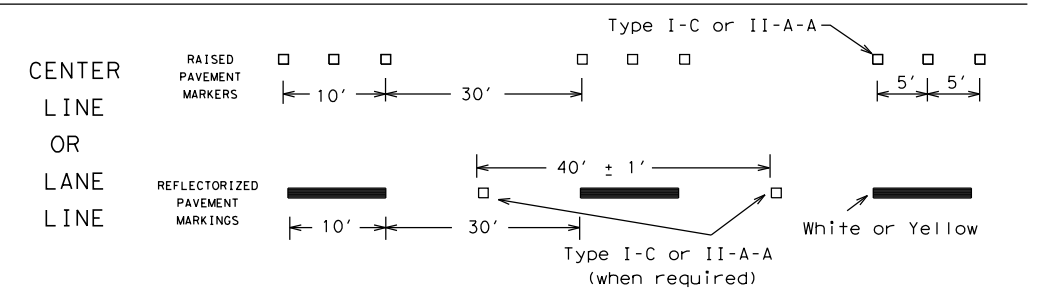
SOLID LINES



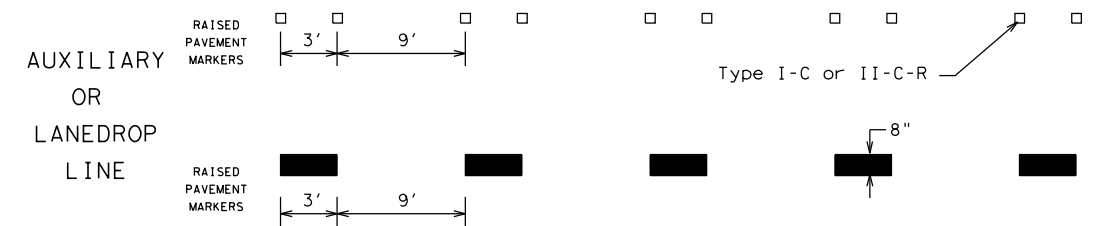
WIDE LINE



(FOR LEFT TURN CHANNELIZING LINE OR CHANNELIZING LINE USED TO DISCOURAGE LANE CHANGING.)

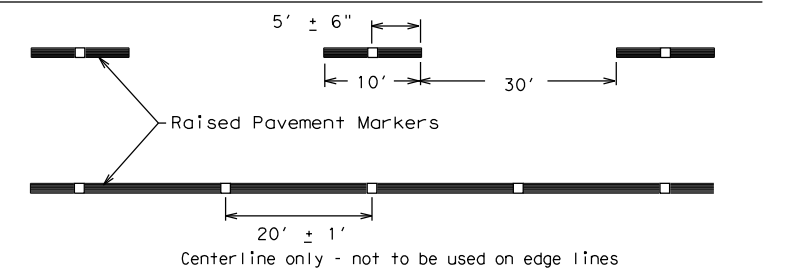


BROKEN LINES



REMOVABLE MARKINGS WITH RAISED PAVEMENT MARKERS

If raised pavement markers are used to supplement REMOVABLE markings, the markers shall be applied to the top of the tape at the approximate mid length of tape used for broken lines or at 20 foot spacing for solid lines. This allows an easier removal of raised pavement markers and tape.



SHEET 12 OF 12

Raised pavement markers used as standard pavement markings shall be from the approved products list and meet the requirements of Item 672 "RAISED PAVEMENT MARKERS."



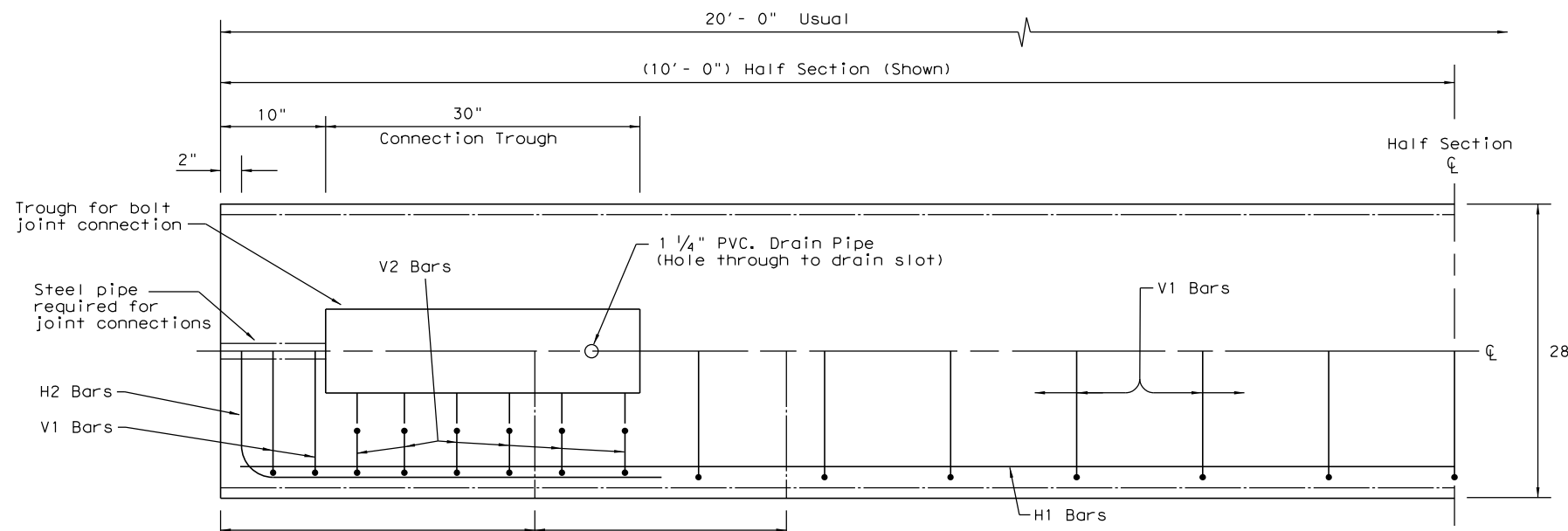
BARRICADE AND CONSTRUCTION PAVEMENT MARKING PATTERNS

BC (12) - 14

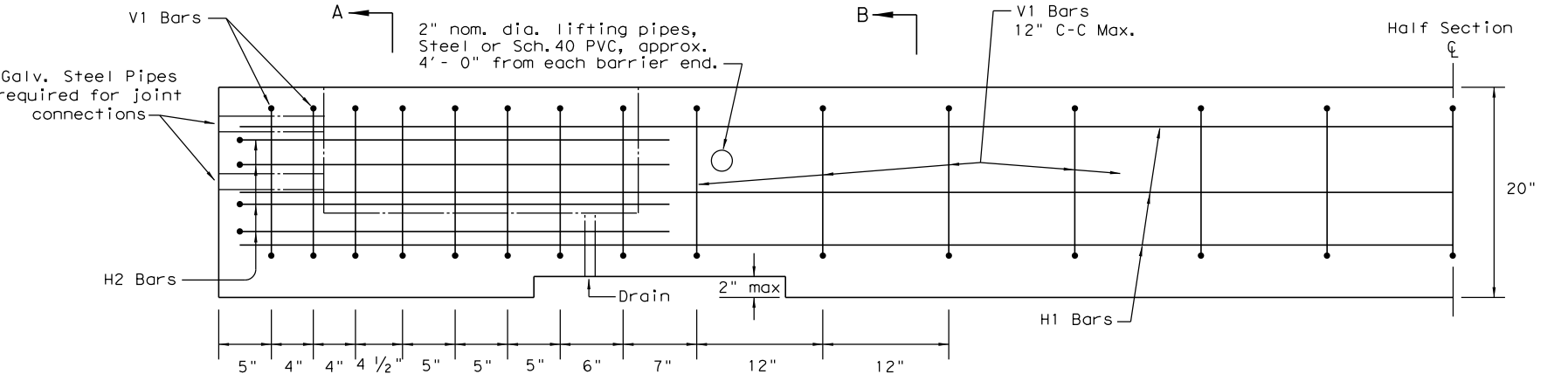
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© TxDOT February 1998	CONT	SECT	JOB	HIGHWAY
REVISIONS				
1-97 9-07				STACY ROAD
2-98 7-13				
11-02 8-14				
	DIST	COUNTY	SHEET NO.	
		COLLIN	45	

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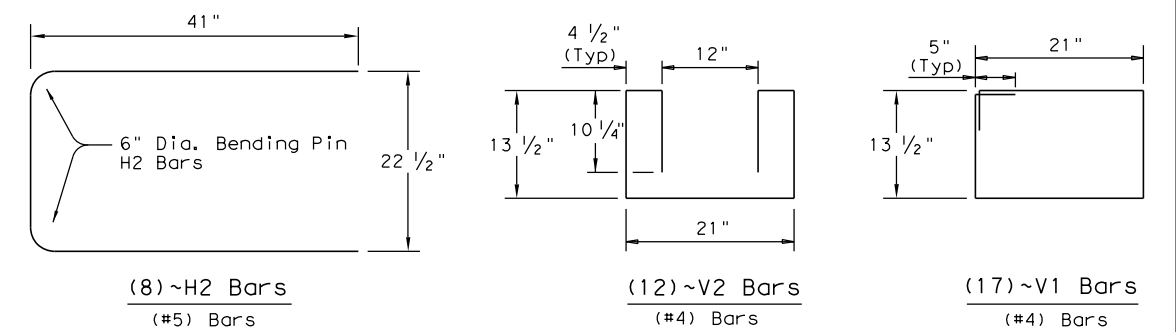
DATE: 3/17/2017 2:31:51 PM
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PLAN
 (TYPE 1) BARRIER SEGMENT
 (SYMMETRICAL ABOUT CENTER LINES)

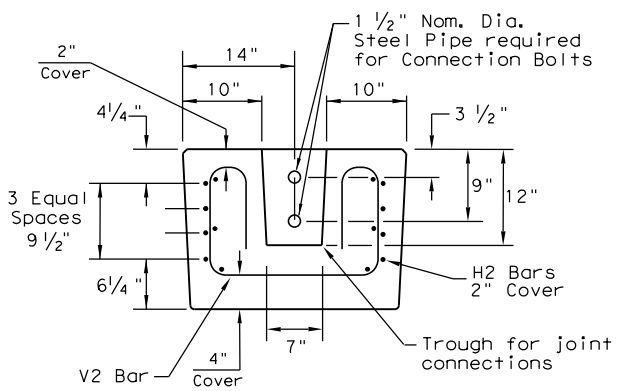


ELEVATION
 (TYPE 1) BARRIER SEGMENT
 (SYMMETRICAL ABOUT CENTER LINES)

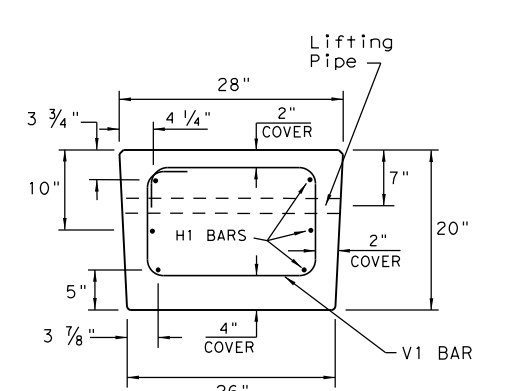


REINFORCING STEEL DETAILS
 TYPE 1 - BARRIER SEGMENT

Note: Use 2" Dia. Bending Pin, unless otherwise shown



SECTION A-A



SECTION B-B

GENERAL NOTES

1. Low Profile Concrete Barrier (LPCB), is approved for use in temporary work zone locations, where the posted speed is 45 mph, or less.
2. Concrete shall be Class H for precast barrier with a minimum compressive strength of 3,600 psi.
3. Where used, rebar reinforcement shall be Grade 60 and conform to ASTM A615.
4. Precast LPCB barrier length shall be 20 ft.
5. All barrier edges shall have 3/4" chamfer or a tooled radius.
6. Joint connection hardware shall be in accordance with Item 449, "Anchor Bolts." and is considered subsidiary.
7. Steel pipe required for joint connection bolts shall be galvanized in accordance with Item 445, "Galvanizing."
8. Welded wire reinforcement (WWR) may be used in lieu of conventional reinforcement for Type 1 barrier, and shall meet the requirements shown.

FOR CONTRACTORS INFORMATION ONLY

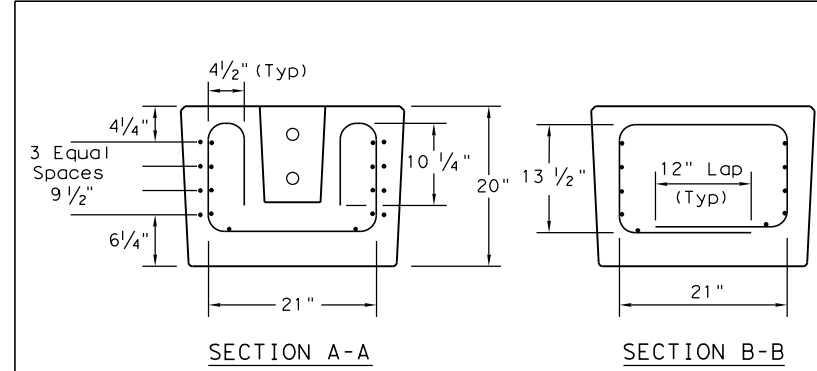
(TYPE 1) APPROX. QUANTITIES 20 FT. SECTION		
CONCRETE	CY	2.6
REINFORCING STEEL	LBS	330
TOTAL BARRIER WT.	LBS	11000

(WWR) GENERAL NOTES

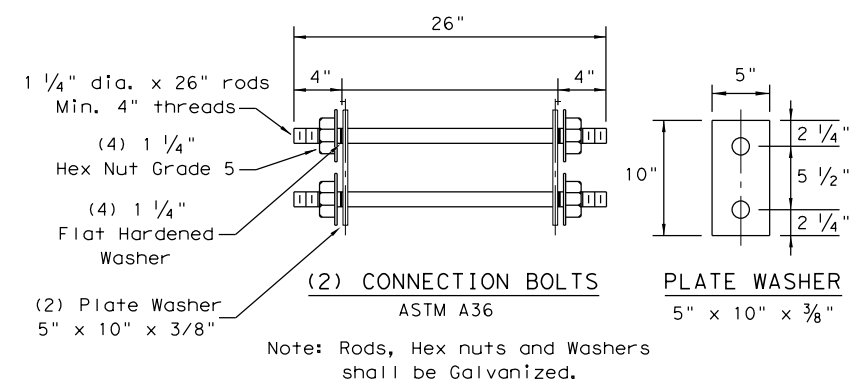
1. Deformed Welded Wire Reinforcement shall conform to ASTM A497.
2. Welded wire cage may be cut or bent, if necessary, but must be approved by the Engineer.
3. Combinations of reinforcing steel and WWR are permitted, as directed by the Engineer. The dimensions from the end of the barrier section to the first wire shall not exceed 3".

REQUIRED (WWR) WIRE DESIGN

- 8 ~ (D31) Horizontal Wires (Equally spaced)
- 10 ~ (D20) Horizontal Wires (Equally spaced)
- 29 ~ (D20) Vertical Wires (Spaced as shown in Elevation View)



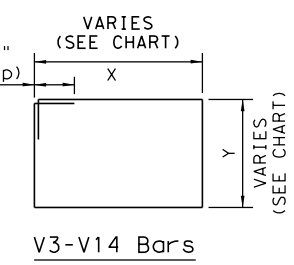
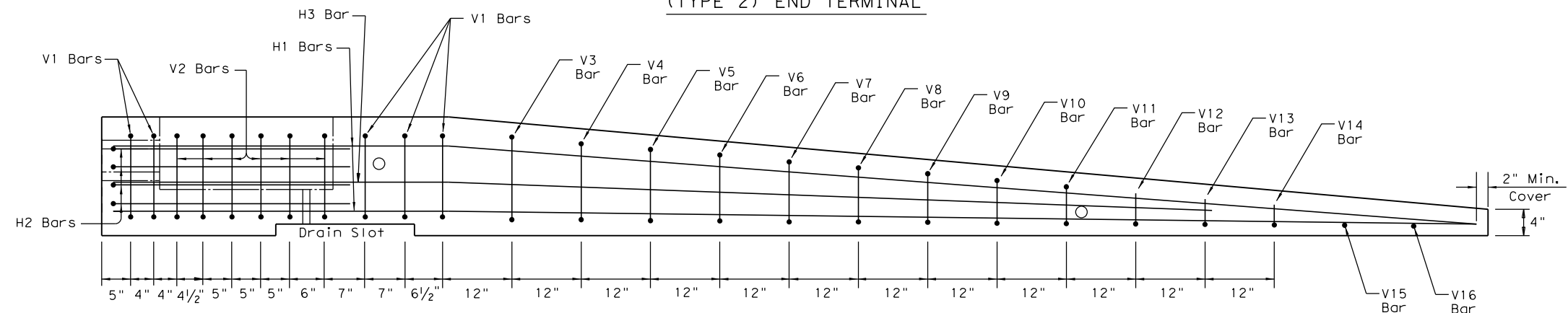
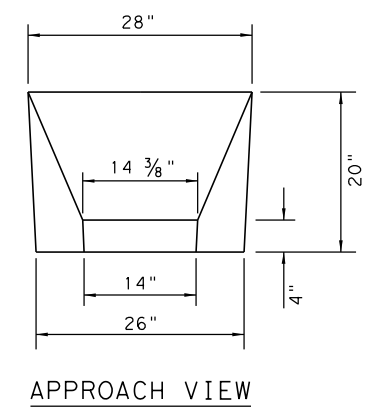
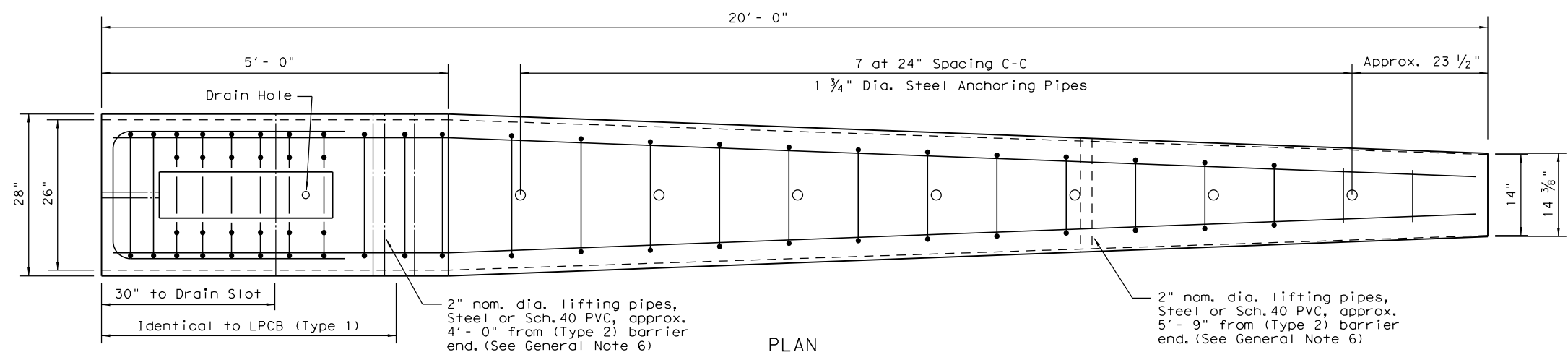
WELDED WIRE REINFORCEMENT (WWR) - OPTIONAL REINFORCING



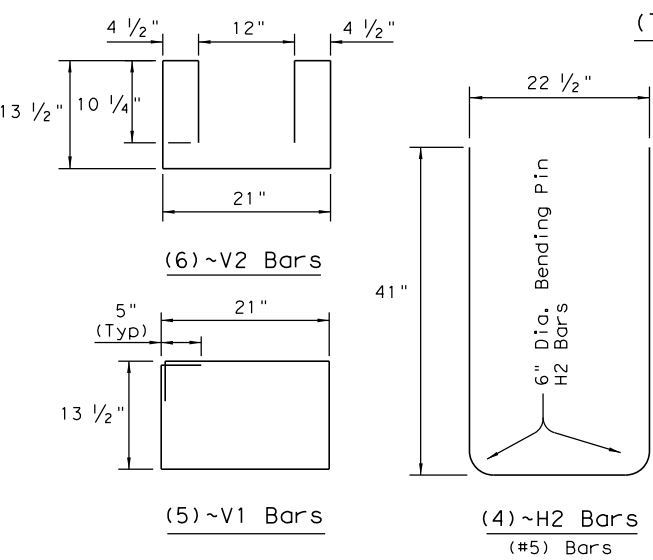
Note: Rods, Hex nuts and Washers shall be Galvanized.

		Design Division Standard	
<h3>LOW PROFILE CONCRETE BARRIER PRECAST BARRIER (TYPE 1) LPCB-13</h3>			
FILE: lpcb13.dgn	DN: TxDOT	CK: AM	DW: VP
© TxDOT December 2010	CONT	SECT	JOB
REVISIONS		HIGHWAY	
		STACY ROAD	
DIST		COUNTY	SHEET NO.
		COLLIN	46

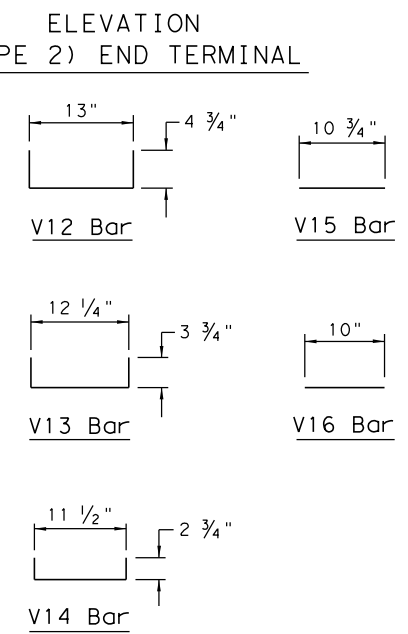
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 DATE: 3/17/2017 2:31:52 PM
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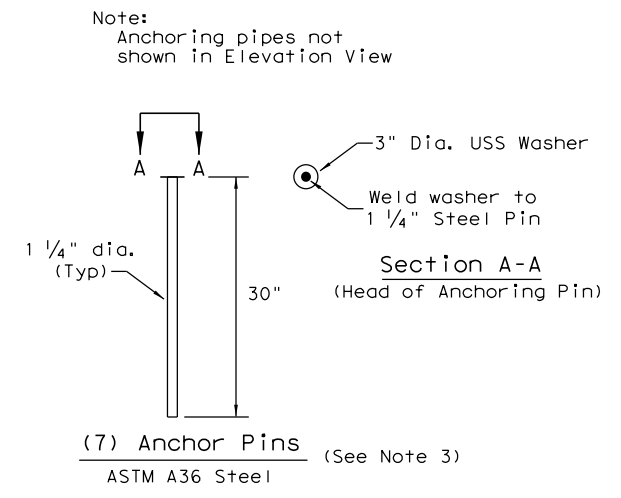
BAR (#4)	X (IN.)	Y (IN.)
V3 BAR	20 1/4	14 1/2
V4 BAR	19 1/2	13 1/2
V5 BAR	18 1/2	12 1/4
V6 BAR	17 1/2	11 1/4
V7 BAR	17	10 1/4
V8 BAR	16 1/4	9
V9 BAR	15 1/2	8
V10 BAR	14 1/2	7
V11 BAR	13 3/4	6



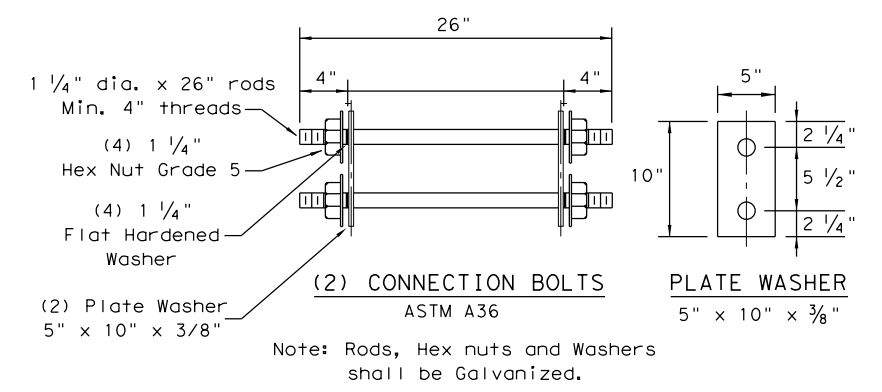
REINFORCING STEEL DETAILS
TYPE 2 - END TERMINAL



Note: All V Bars are (#4)



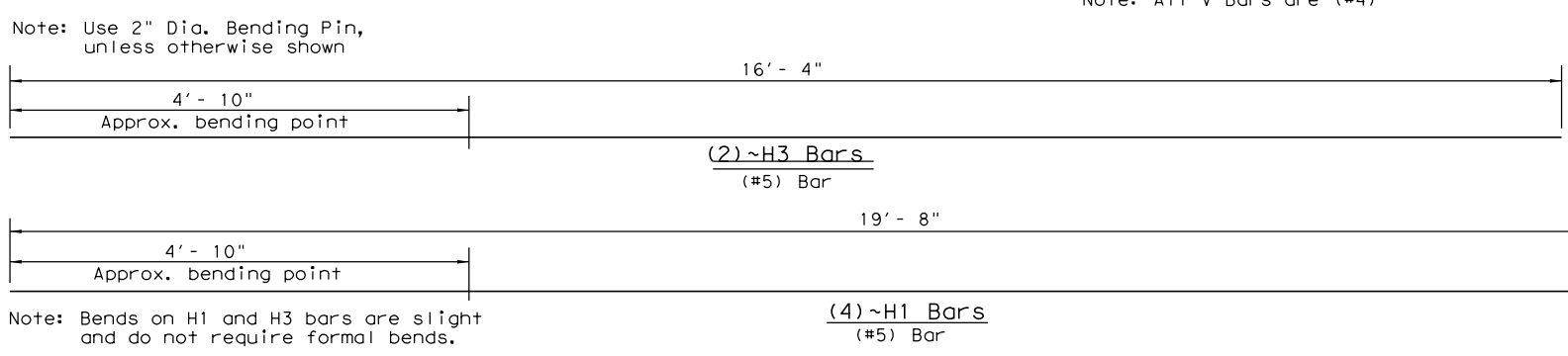
(7) Anchor Pins
ASTM A36 Steel



Note: Rods, Hex nuts and Washers shall be Galvanized.

FOR CONTRACTORS INFORMATION ONLY

(TYPE 2) APPROX. QUANTITIES 20 FT. SECTION		
CONCRETE	CY	1.65
REINFORCING STEEL	LBS	240
TOTAL BARRIER WT.	LBS	7000



Note: Bends on H1 and H3 bars are slight and do not require formal bends.

TYPE 2 - NOTES

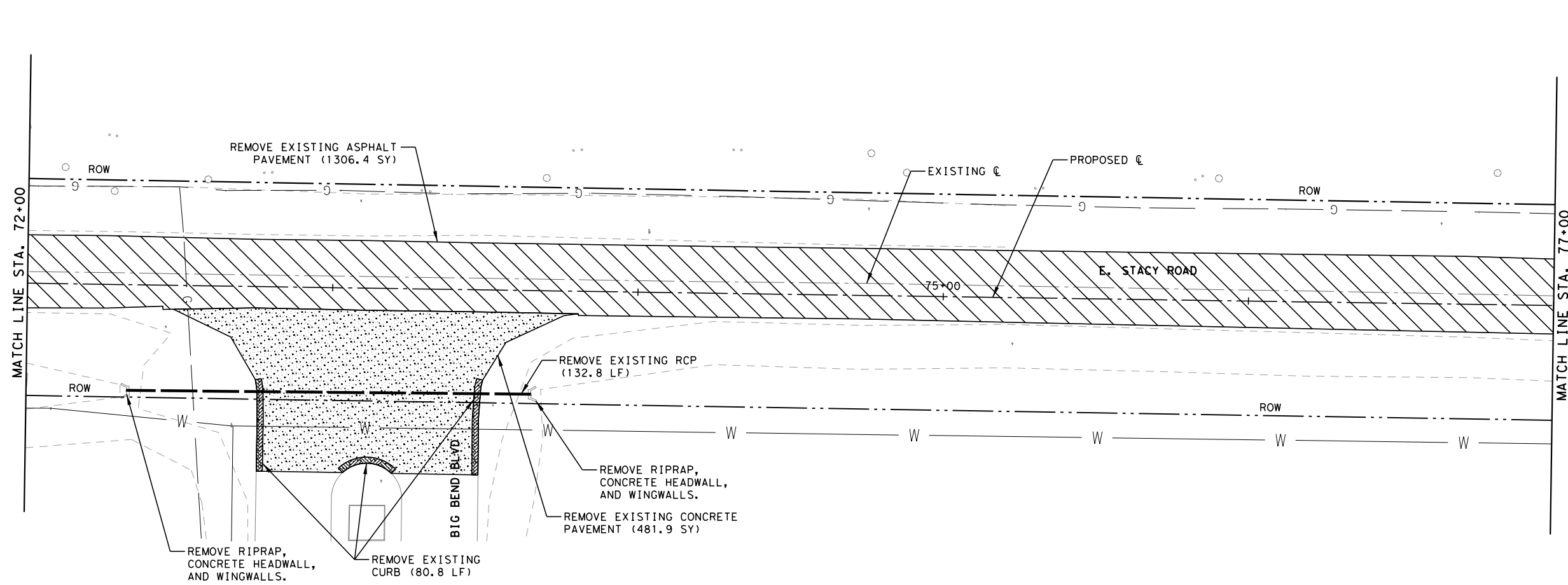
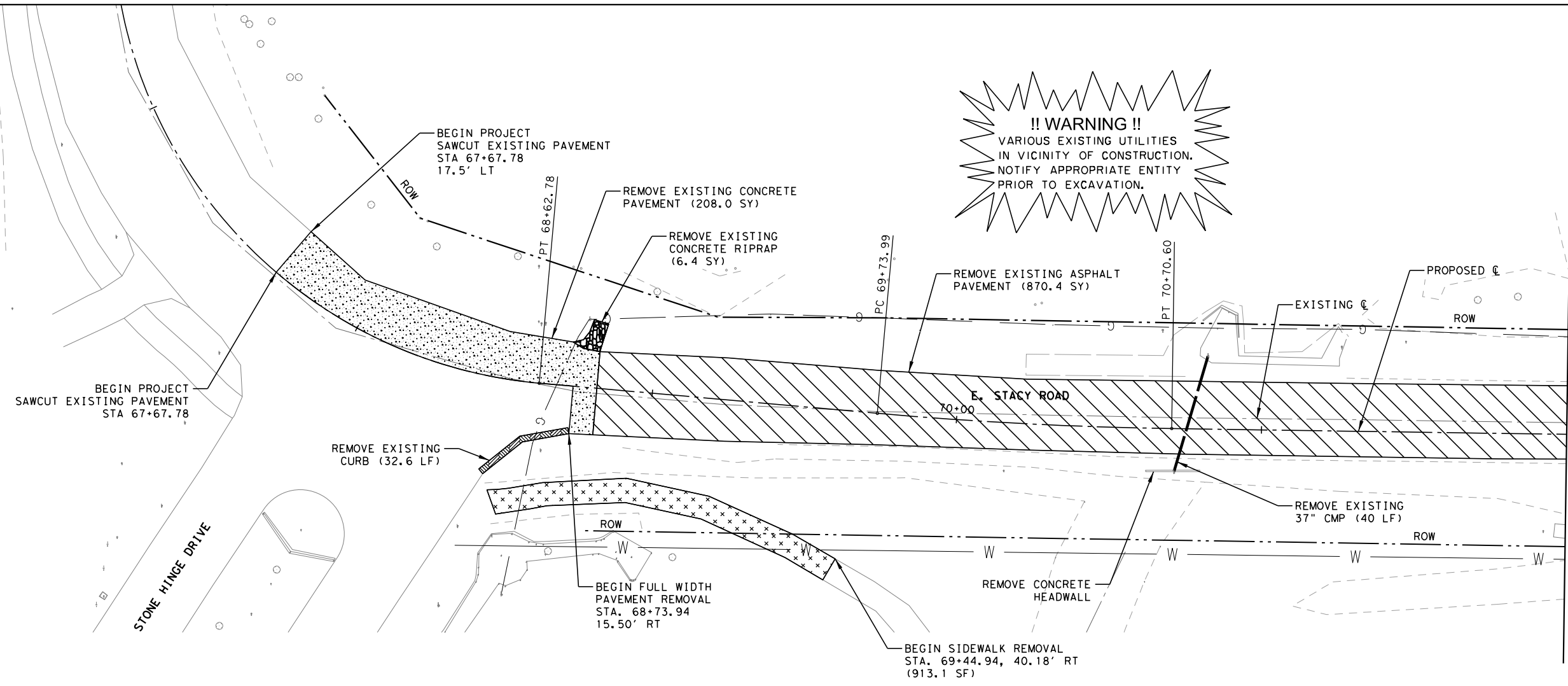
1. Welded wire reinforcement (WWR) is "not" an option for Type 2 Barrier.
2. Type 2 Barrier shall be used as an end treatment for the Type 1 barrier segments, when applicable.
3. The end treatment can be used without the anchor pins in locations that can accommodate approximately 4 ft. of lateral displacement of the end treatment. The use of non-pinned end treatment does not affect the performance or the deflection of the Low-Profile barrier system.
4. The anchor pins are all the same length and are to be driven flush with the top of the (Type 2) barrier surface.
5. The bends in the H3 and H1 bars are slight, no formal bend is necessary.
6. The Type 2 barrier segment must be lifted from the rear first, to prevent cracking of sloped section.
7. See LPCB sheet 1 for additional information.

Design Division Standard

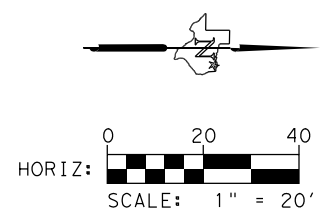
LOW PROFILE CONCRETE BARRIER PRECAST BARRIER (TYPE 2) LPCB-13

FILE: lpcb13.dgn	DN: TxDOT	CK: AM	DW: VP	CK:
© TxDOT December 2010	CONT	SECT	JOB	HIGHWAY
REVISIONS		STACY ROAD		
DIST	COUNTY	SHEET NO.		
	COLLIN	47		

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 5/17/2017 2:32:20 PM rwalker



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- LEGEND**
- REMOVE CONCRETE RIPRAP
 - REMOVE CURB
 - REMOVE ASPHALT PAVEMENT
 - REMOVE GRAVEL DRIVEWAYS
 - REMOVE ASPHALT DRIVEWAYS
 - REMOVE CONCRETE PAVEMENT
 - REMOVE CONCRETE SIDEWALK

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 HUITT-ZOLLARS, INC.
 Christian L. Moorman, P.E. #93828
 Date: 3/17/2017

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 1717 MCKINNEY AVE., SUITE 1400 DALLAS, TEXAS 75202
 Firm No. F-761

TOWN OF FAIRVIEW, TEXAS
 372 TOWN PLACE
 FAIRVIEW, TX 75069
 972-562-0522

**E. STACY ROAD IMPROVEMENTS
 REMOVAL PLAN**

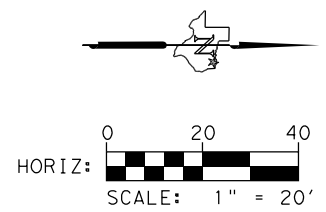
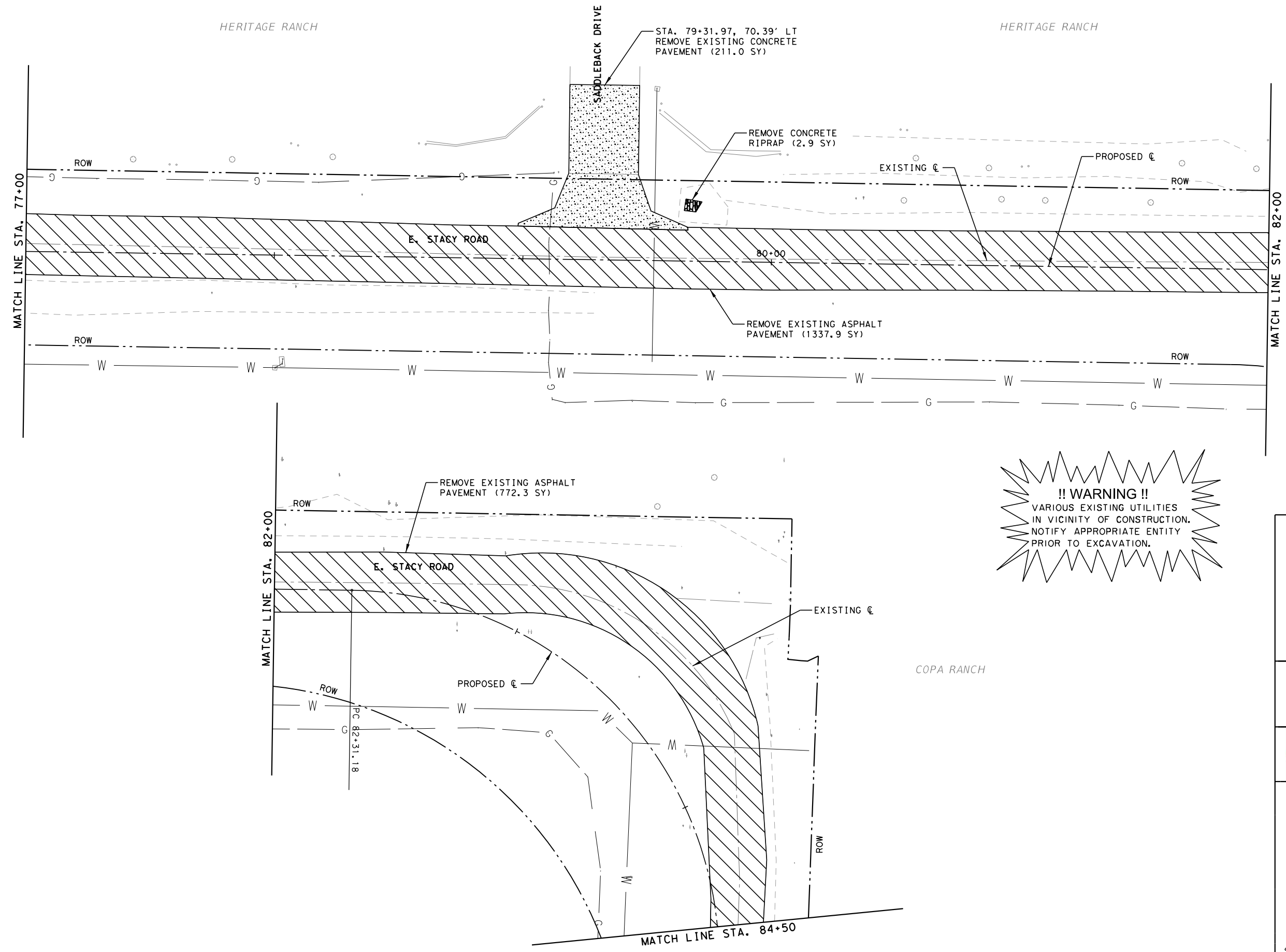
BEGIN TO STA. 77+00

SCALE: H: 1" = 20' SHEET 1 OF 7







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SHEET NO. 48

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LEGEND

-  REMOVE CONCRETE RIPRAP
-  REMOVE CURB
-  REMOVE ASPHALT PAVEMENT
-  REMOVE GRAVEL DRIVEWAYS
-  REMOVE ASPHALT DRIVEWAYS
-  REMOVE CONCRETE PAVEMENT

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 Firm No. F-761

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 372 TOWN PLACE
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**E. STACY ROAD IMPROVEMENTS
 REMOVAL PLAN**

STA. 77+00 TO STA. 84+50

SCALE: H: 1" = 20' SHEET 2 OF 7







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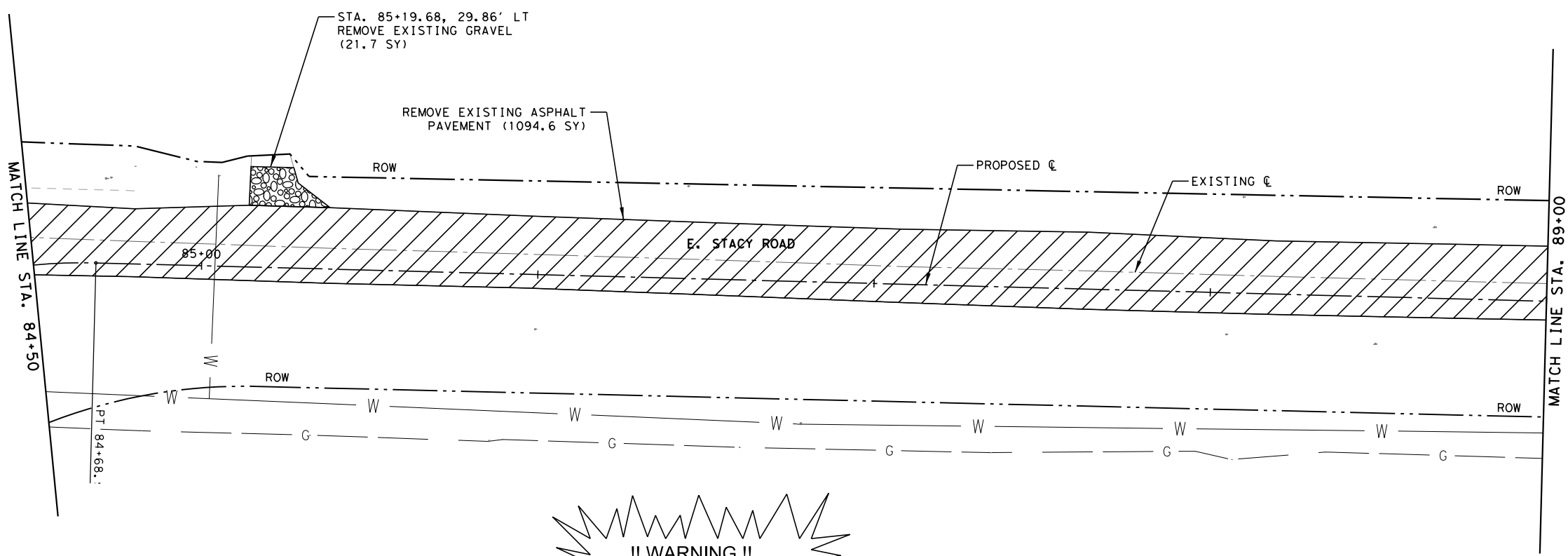
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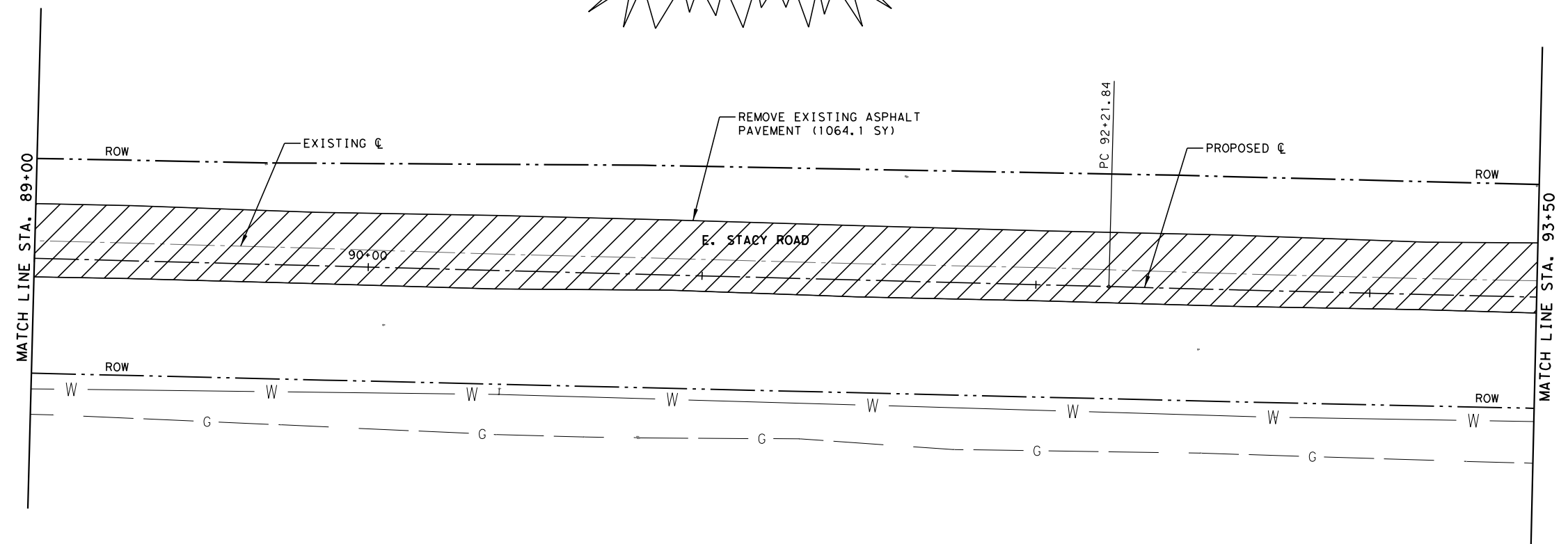


LEGEND

-  REMOVE CONCRETE RIPRAP
-  REMOVE CURB
-  REMOVE ASPHALT PAVEMENT
-  REMOVE GRAVEL DRIVEWAYS
-  REMOVE ASPHALT DRIVEWAYS
-  REMOVE CONCRETE DRIVEWAYS




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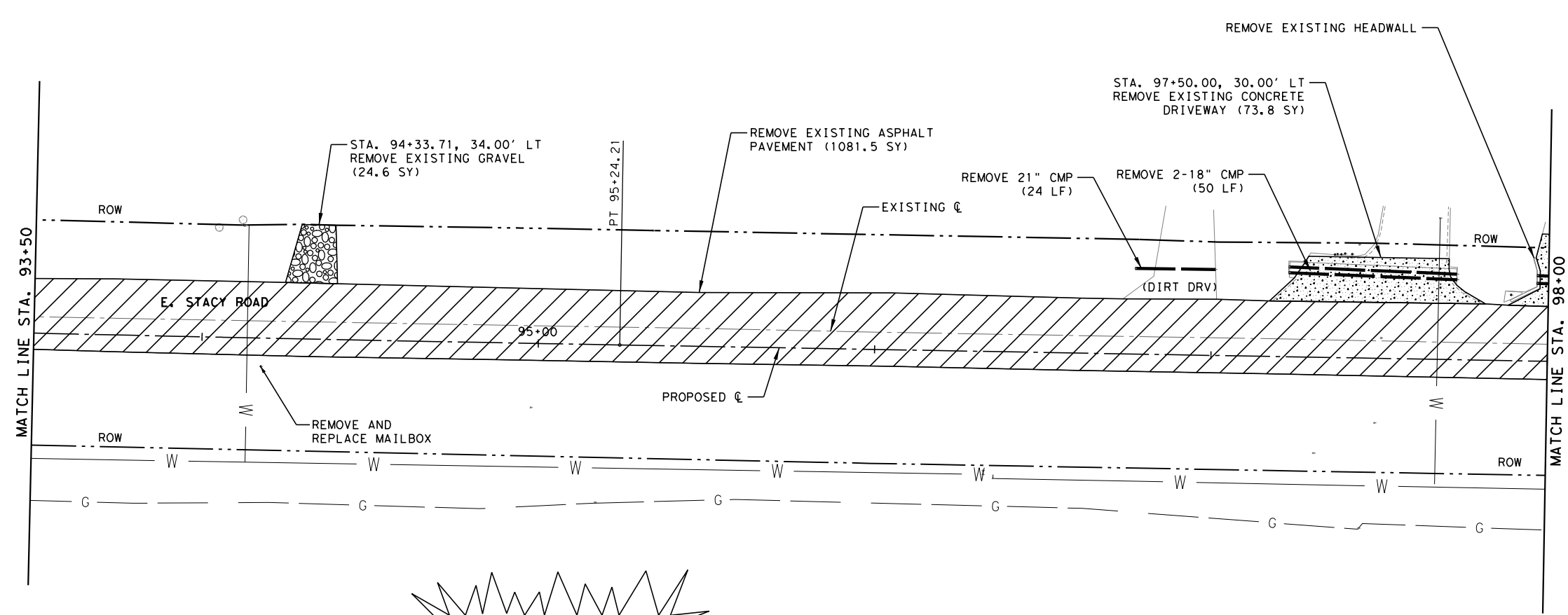
**E. STACY ROAD IMPROVEMENTS
 REMOVAL PLAN**

STA. 84+50 TO STA. 93+50

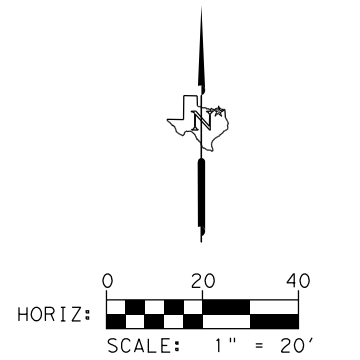
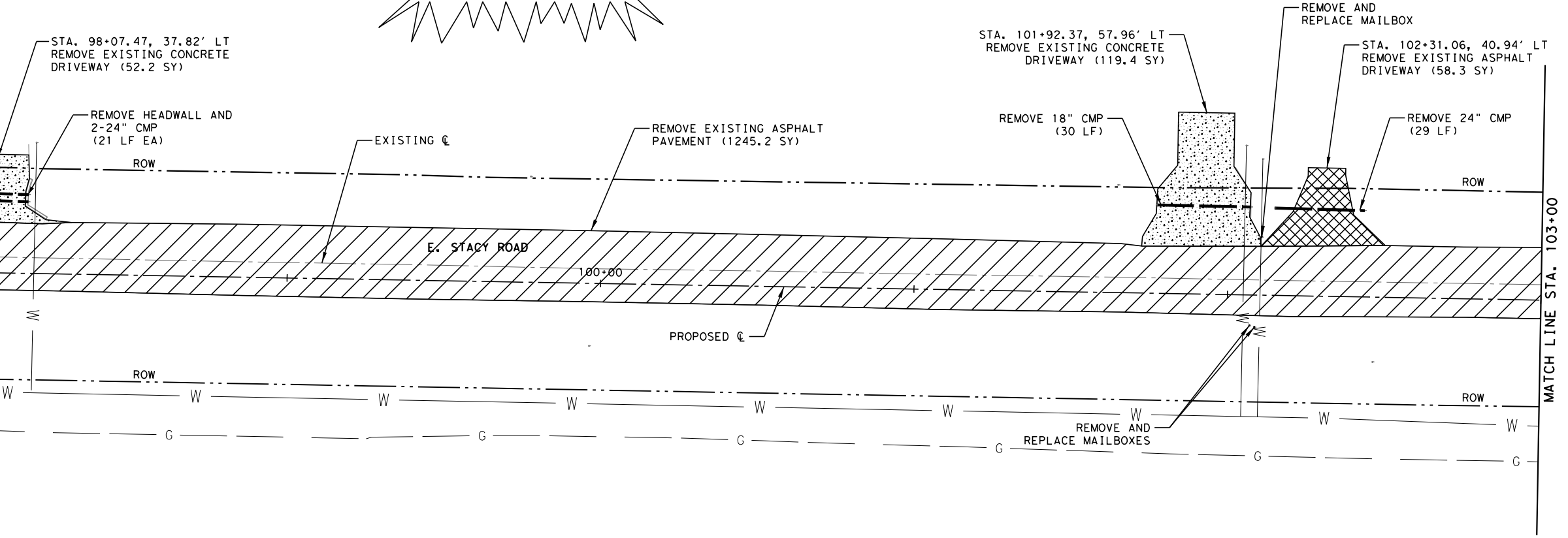
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SHEET NO.
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- LEGEND**
- REMOVE CONCRETE RIPRAP
 - REMOVE CURB
 - REMOVE ASPHALT PAVEMENT
 - REMOVE GRAVEL DRIVEWAYS
 - REMOVE ASPHALT DRIVEWAYS
 - REMOVE CONCRETE DRIVEWAYS

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 Firm No. F-761

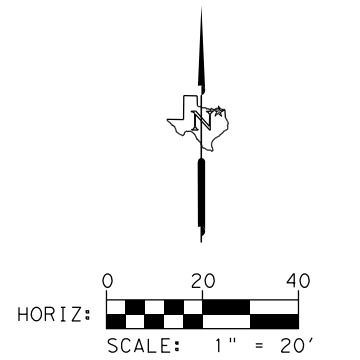
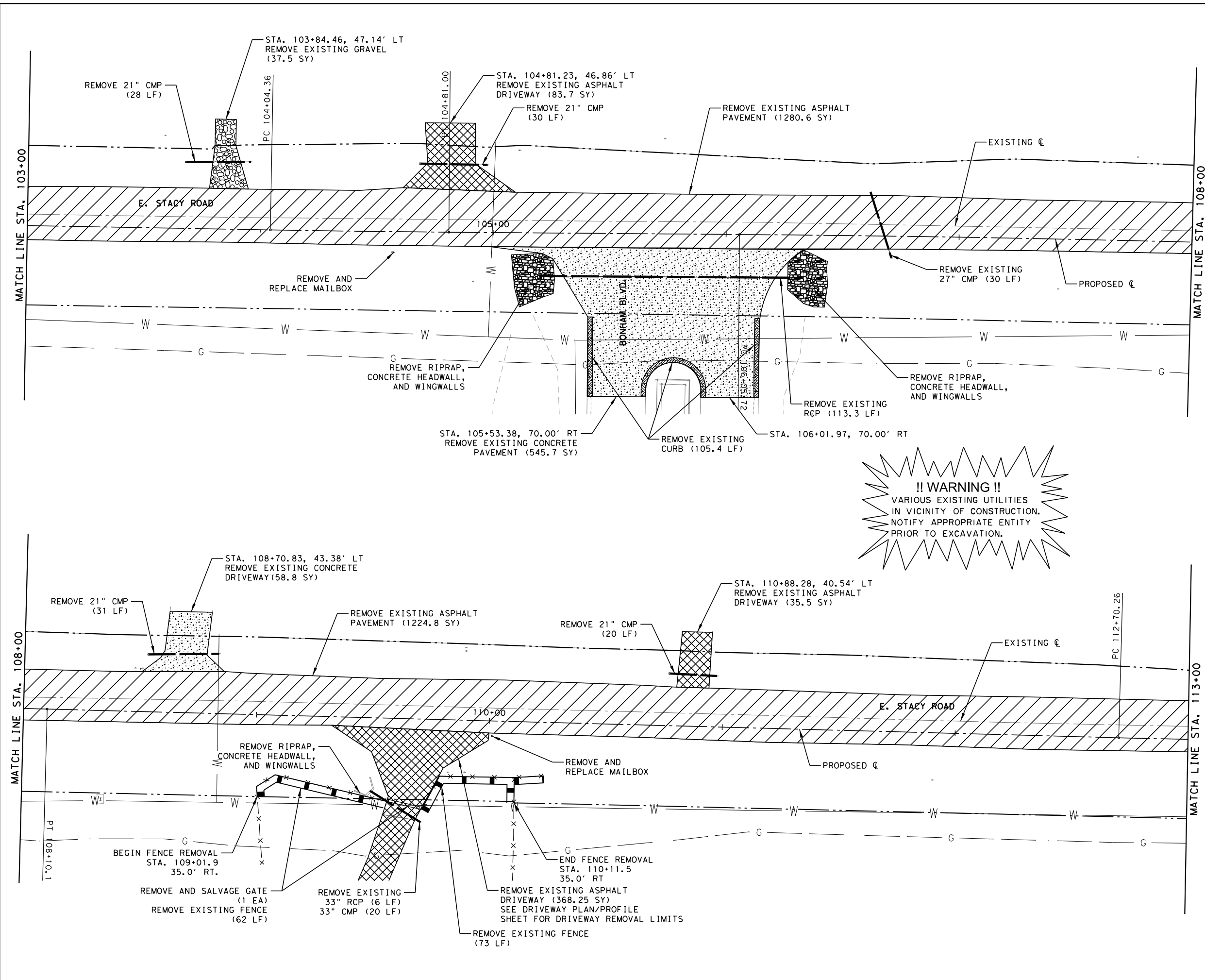
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 FAIRVIEW, TX 75069
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**E. STACY ROAD IMPROVEMENTS
 REMOVAL PLAN**

STA. 93+50 TO STA. 103+00

SCALE: H: 1" = 20'		SHEET 4 OF 7		SHEET NO. 51
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CLM	RAW			

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- LEGEND**
- REMOVE CONCRETE RIPRAP
 - REMOVE CURB
 - REMOVE ASPHALT PAVEMENT
 - REMOVE CONCRETE PAVEMENT
 - REMOVE GRAVEL DRIVEWAYS
 - REMOVE ASPHALT DRIVEWAYS
 - REMOVE CONCRETE DRIVEWAYS
 - REMOVE EXISTING FENCE

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 1717 MCKINNEY AVE., SUITE 1400 DALLAS, TEXAS 75202
 Firm No. F-761

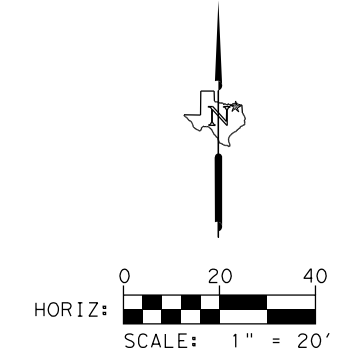
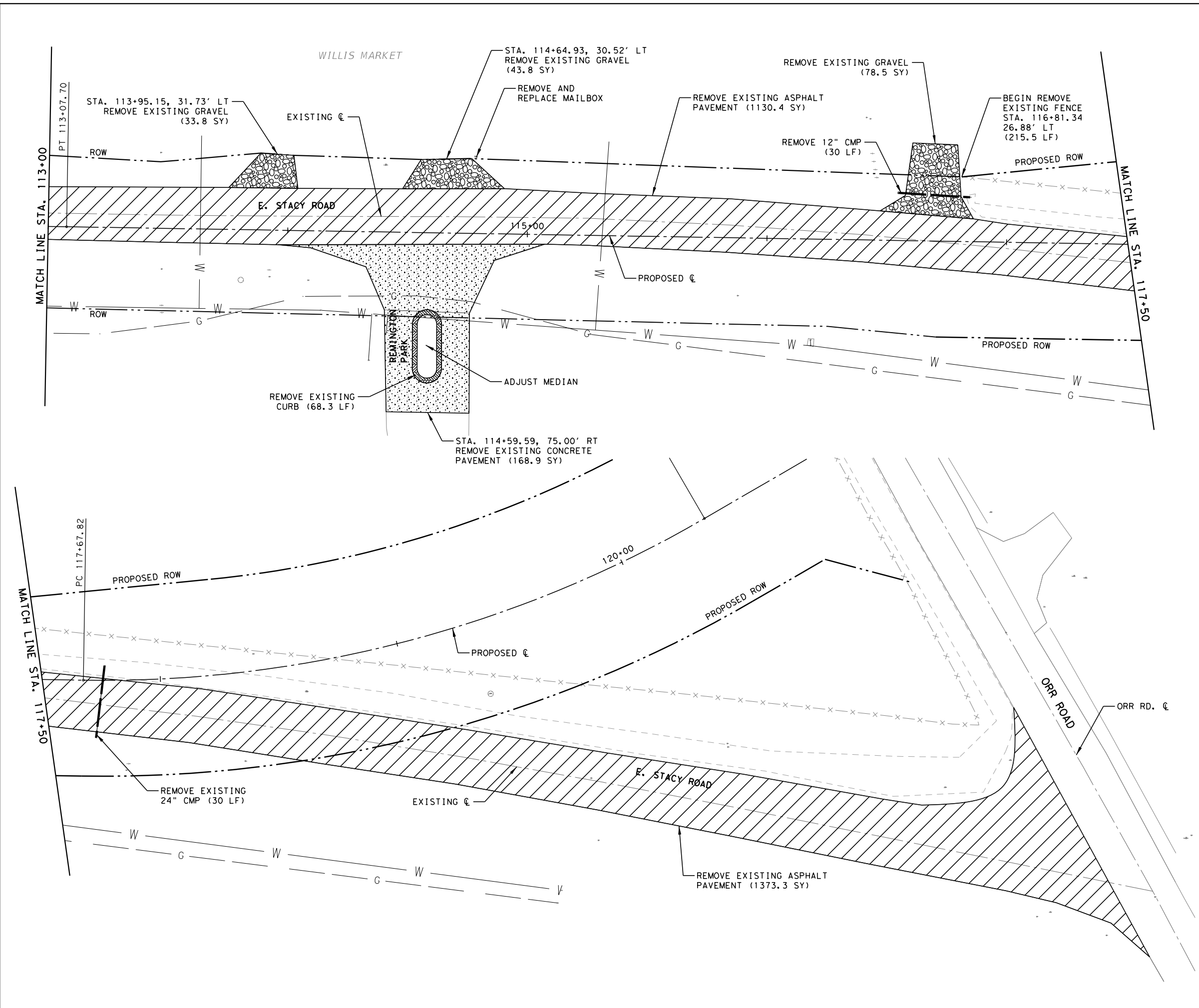
TOWN OF FAIRVIEW, TEXAS
 372 TOWN PLACE
 FAIRVIEW, TX 75069
 972-562-0522

**E. STACY ROAD IMPROVEMENTS
 REMOVAL PLAN**

STA. 103+00 TO STA. 113+00

SCALE: H: 1" = 20'		SHEET 5 OF 7	
DESIGNED BY:	DRAWN BY:	CHECKED BY:	52
CLM	RAW		

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 rwalker



LEGEND

- REMOVE CURB
- REMOVE ASPHALT PAVEMENT
- REMOVE CONCRETE PAVEMENT
- REMOVE GRAVEL DRIVEWAYS

!! WARNING !!
 VARIOUS EXISTING UTILITIES
 IN VICINITY OF CONSTRUCTION.
 NOTIFY APPROPRIATE ENTITY
 PRIOR TO EXCAVATION.

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 HUITT-ZOLLARS, INC.
 Christian L. Moorman, P.E. #93828
 Date: 3/17/2017

HUITT-ZOLLARS
 HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING
 1717 MCKINNEY AVE., SUITE 1400 DALLAS, TEXAS 75202
 Firm No. F-761

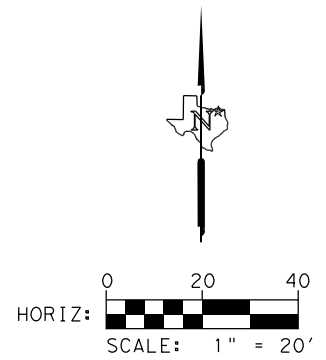
TOWN OF FAIRVIEW, TEXAS
 372 TOWN PLACE
 FAIRVIEW, TX 75069
 972-562-0522

**E. STACY ROAD IMPROVEMENTS
 REMOVAL PLAN**
 STA. 113+00 TO END





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DESIGNED BY:	DRAWN BY:	CHECKED BY:
CLM	RAW	
		53

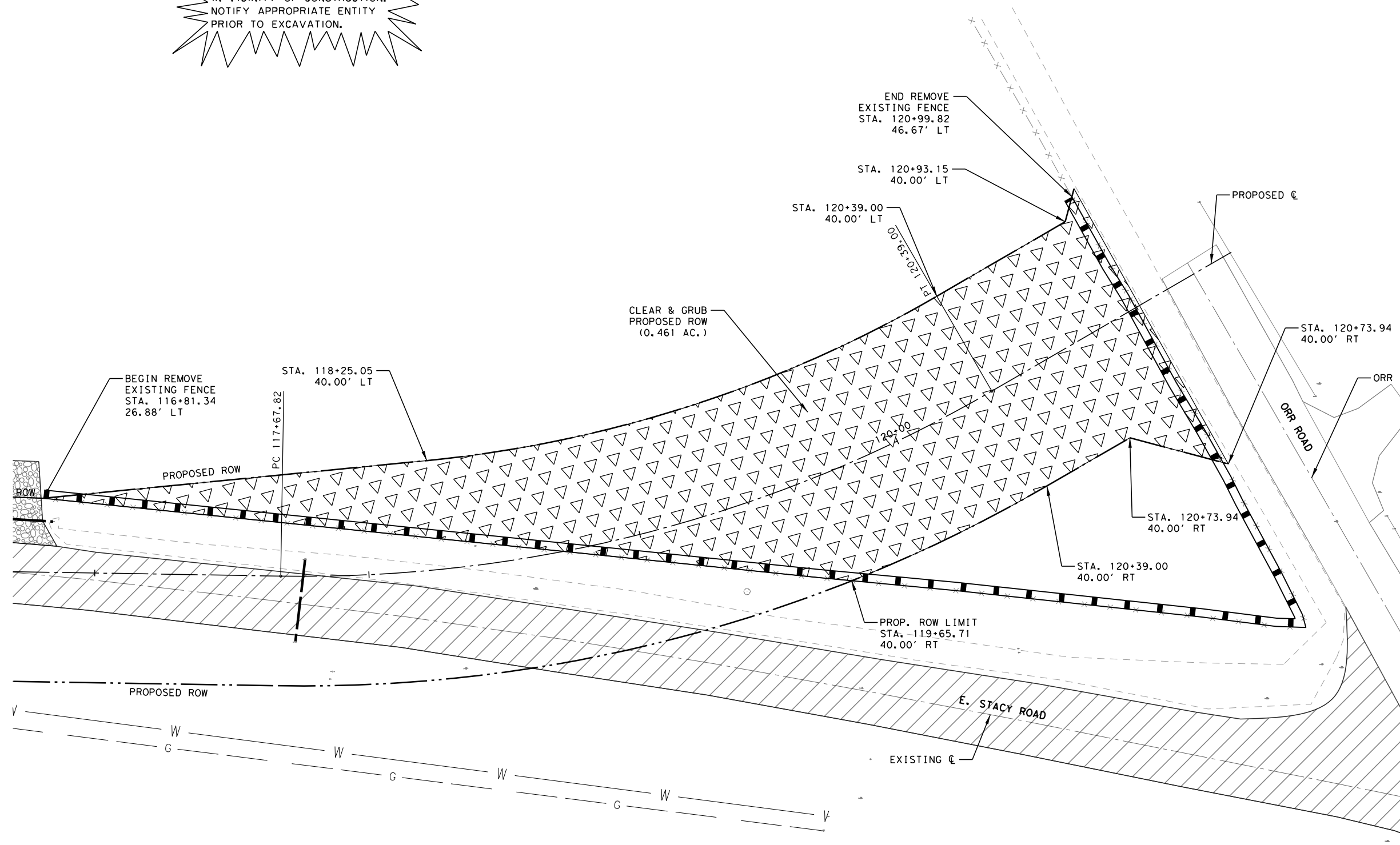
SHEET NO.

!! WARNING !!
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LEGEND

-  REMOVE ASPHALT PAVEMENT
-  REMOVE GRAVEL DRIVEWAYS
-  CLEAR AND GRUB PROPOSED ROW
-  REMOVE EXISTING FENCE



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 TOWN OF FAIRVIEW, TEXAS
 372 TOWN PLACE
 FAIRVIEW, TX 75069
 972-562-0522

**E. STACY ROAD IMPROVEMENTS
 REMOVAL PLAN**
 PROPOSED RIGHT OF WAY

SCALE: H: 1" = 20'		SHEET 7 OF 7		SHEET NO.
DESIGNED BY:	DRAWN BY:	CHECKED BY:	54	
CLM	CLM			

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STACY ROAD ALIGNMENT DATA

Beginning chain CL-PROP4 description

=====

Point 303 N 7,099,562.0560 E 2,553,309.9987 Sta 63+12.28

Course from 303 to PC CL-PROP4-1 N 88° 36' 17.64" E Dist 326.9908

Curve Data

Curve CL-PROP4-1
P.I. Station 67+76.16 N 7,099,573.3500 E 2,553,773.7415
Delta = 83° 30' 31.11" (LT)
Degree = 37° 21' 47.26"
Tangent = 136.8895
Length = 223.5055
Radius = 153.3485
External = 52.2105
Long Chord = 204.2411
Mid. Ord. = 38.9494
P.C. Station 66+39.27 N 7,099,570.0171 E 2,553,636.8926
P.T. Station 68+62.78 N 7,099,709.6983 E 2,553,785.9013
C.C. = N 7,099,723.3201 E 2,553,633.1591
Back = N 88° 36' 17.64" E
Ahead = N 5° 05' 46.53" E
Chord Bear = N 46° 51' 02.09" E

Course from PT CL-PROP4-1 to PC CL-PROP4-2 N 5° 05' 46.53" E Dist 111.2137

Curve Data

Curve CL-PROP4-2
P.I. Station 70+22.32 N 7,099,868.6050 E 2,553,800.0729
Delta = 4° 15' 27.51" (LT)
Degree = 4° 24' 26.52"
Tangent = 48.3237
Length = 96.6028
Radius = 1,300.0000
External = 0.8978
Long Chord = 96.5806
Mid. Ord. = 0.8972
P.C. Station 69+73.99 N 7,099,820.4724 E 2,553,795.7804
P.T. Station 70+70.60 N 7,099,916.9235 E 2,553,800.7802
C.C. = N 7,099,935.9504 E 2,552,500.9194
Back = N 5° 05' 46.53" E
Ahead = N 0° 50' 19.02" E
Chord Bear = N 2° 58' 02.77" E

Course from PT CL-PROP4-2 to PC CL-PROP4-3 N 0° 50' 19.02" E Dist 1,160.5830

Curve Data

Curve CL-PROP4-3
P.I. Station 83+82.96 N 7,101,229.1416 E 2,553,819.9880
Delta = 90° 40' 27.25" (RT)
Degree = 38° 11' 49.87"
Tangent = 151.7756
Length = 237.3846
Radius = 150.0000
External = 63.3913
Long Chord = 213.3765
Mid. Ord. = 44.5599
P.C. Station 82+31.18 N 7,101,077.3822 E 2,553,817.7666
P.T. Station 84+68.56 N 7,101,225.1345 E 2,553,971.7107
C.C. = N 7,101,075.1868 E 2,553,967.7505
Back = N 0° 50' 19.02" E
Ahead = S 88° 29' 13.73" E
Chord Bear = N 46° 10' 32.64" E

Course from PT CL-PROP4-3 to PC CL-PROP4-4 S 88° 29' 13.73" E Dist 753.2778

STACY ROAD ALIGNMENT DATA (CONT.)

Curve Data

Curve CL-PROP4-4
P.I. Station 93+73.02 N 7,101,201.2557 E 2,554,875.8560
Delta = 0° 30' 01.05" (LT)
Degree = 0° 09' 55.66"
Tangent = 151.1827
Length = 302.3635
Radius = 34,628.1420
External = 0.3300
Long Chord = 302.3625
Mid. Ord. = 0.3300
P.C. Station 92+21.84 N 7,101,205.2471 E 2,554,724.7259
P.T. Station 95+24.21 N 7,101,198.5840 E 2,555,027.0151
C.C. = N 7,135,821.3186 E 2,555,638.9498
Back = S 88° 29' 13.73" E
Ahead = S 88° 59' 14.28" E
Chord Bear = S 88° 44' 14.26" E

Course from PT CL-PROP4-4 to PC CL-PROP4-5 S 88° 59' 14.28" E Dist 880.1511

Curve Data

Curve CL-PROP4-5
P.I. Station 104+42.68 N 7,101,182.3531 E 2,555,945.3462
Delta = 0° 33' 27.47" (LT)
Degree = 0° 43' 39.14"
Tangent = 38.3234
Length = 76.6462
Radius = 7,875.2940
External = 0.0932
Long Chord = 76.6459
Mid. Ord. = 0.0932
P.C. Station 104+04.36 N 7,101,183.0304 E 2,555,907.0288
P.T. Station 104+81.00 N 7,101,182.0488 E 2,555,983.6684
C.C. = N 7,109,057.0946 E 2,556,046.1978
Back = S 88° 59' 14.78" E
Ahead = S 89° 32' 42.25" E
Chord Bear = S 89° 15' 58.52" E

Course from PT CL-PROP4-5 to PC CL-PROP4-6 S 89° 32' 42.25" E Dist 124.7187

Curve Data

Curve CL-PROP4-6
P.I. Station 107+07.93 N 7,101,180.2471 E 2,556,210.5882
Delta = 1° 04' 43.60" (RT)
Degree = 0° 31' 39.90"
Tangent = 102.2083
Length = 204.4106
Radius = 10,856.6082
External = 0.4811
Long Chord = 204.4076
Mid. Ord. = 0.4811
P.C. Station 106+05.72 N 7,101,181.0586 E 2,556,108.3831
P.T. Station 108+10.13 N 7,101,177.5114 E 2,556,312.7599
C.C. = N 7,090,324.7926 E 2,556,022.1822
Back = S 89° 32' 42.25" E
Ahead = S 88° 27' 58.65" E
Chord Bear = S 89° 00' 20.45" E

Course from PT CL-PROP4-6 to PC CL-PROP4-7 S 88° 27' 58.65" E Dist 460.1272

Curve Data

Curve CL-PROP4-7
P.I. Station 112+88.98 N 7,101,164.6950 E 2,556,791.4370
Delta = 0° 35' 14.44" (LT)
Degree = 1° 34' 07.17"
Tangent = 18.7214
Length = 37.4424
Radius = 3,652.5336
External = 0.0480
Long Chord = 37.4422
Mid. Ord. = 0.0480
P.C. Station 112+70.26 N 7,101,165.1961 E 2,556,772.7223
P.T. Station 113+07.70 N 7,101,164.3858 E 2,556,810.1558
C.C. = N 7,104,816.4212 E 2,556,870.4826
Back = S 88° 27' 58.65" E
Ahead = S 89° 03' 13.09" E
Chord Bear = S 88° 45' 35.87" E

Course from PT CL-PROP4-7 to PC CL-PROP4-8 S 89° 03' 13.09" E Dist 460.1209

STACY ROAD ALIGNMENT DATA (CONT.)

Curve Data

Curve CL-PROP4-8
P.I. Station 119+06.84 N 7,101,154.4902 E 2,557,409.2104
Delta = 31° 04' 30.54" (LT)
Degree = 11° 27' 32.96"
Tangent = 139.0155
Length = 271.1818
Radius = 500.0000
External = 18.9656
Long Chord = 267.8703
Mid. Ord. = 18.2725
P.C. Station 117+67.82 N 7,101,156.7863 E 2,557,270.2139
P.T. Station 120+39.00 N 7,101,124.2684 E 2,557,529.4448
C.C. = N 7,101,656.7181 E 2,557,278.4721
Back = S 89° 03' 13.09" E
Ahead = N 75° 52' 31.65" E
Chord Bear = N 59° 24' 16.38" E

Course from PT CL-PROP4-8 to 304 N 59° 52' 16.38" E Dist 259.4344

Point 304 N 7,101,354.4902 E 2,557,753.8294 Sta 122+98.44

Ending chain CL-PROP4 description

DRIVEWAY 109+25 ALIGNMENT DATA

Beginning chain DRV-10925 description

=====

Point 64 N 7,101,174.4154 E 2,556,428.3933 Sta 10+00.00

Course from 64 to 74 S 1° 32' 01.35" W Dist 185.6443

Point 74 N 7,100,988.8376 E 2,556,423.4246 Sta 11+85.64

Course from 74 to 75 S 4° 09' 27.34" E Dist 75.4585

Point 75 N 7,100,913.5777 E 2,556,428.8953 Sta 12+61.10

Ending chain DRV-10925 description

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HUITT-ZOLLARS, INC.

Christian L. Moorman, P.E. #93828
Date: 3/17/2017

HUITT-ZOLLARS

HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING
1717 MCKINNEY AVE., SUITE 1400 DALLAS, TEXAS 75202
Firm No. F-761



TOWN OF FAIRVIEW, TEXAS
372 TOWN PLACE
FAIRVIEW, TX 75069
972-562-0522

E. STACY ROAD IMPROVEMENTS

HORIZONTAL ALIGNMENT DATA

STACY ROAD & DRIVEWAY 109+25

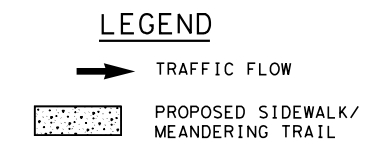
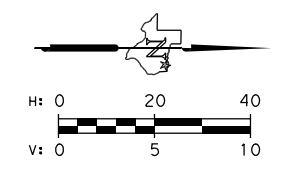
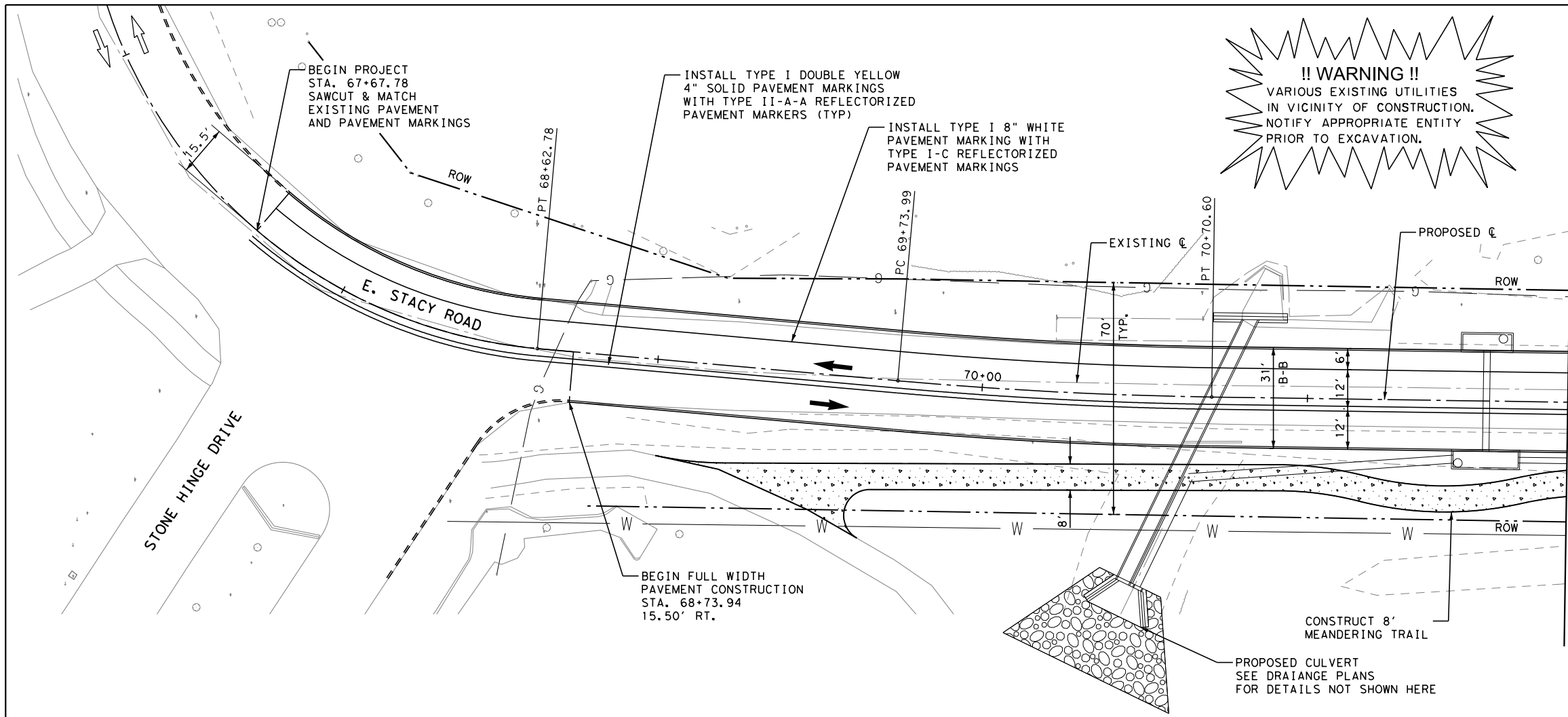
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DESIGNED BY: CLM DRAWN BY: CLM CHECKED BY:

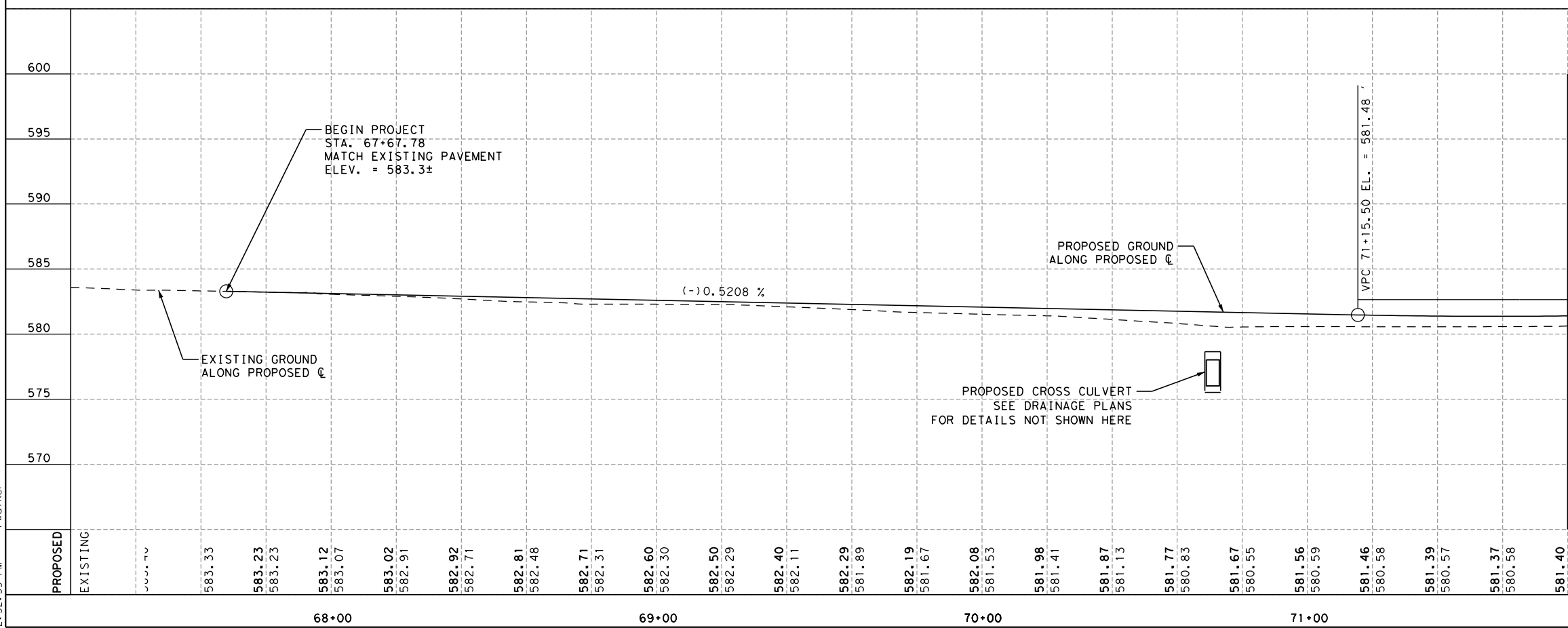
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- NOTES:
1. THE INFORMATION SHOWN ON THIS DRAWING CONCERNING TYPE AND LOCATION OF UNDERGROUND UTILITIES IS NOT GUARANTEED TO BE ACCURATE OR ALL INCLUSIVE. THE CONTRACTOR IS RESPONSIBLE FOR MAKING HIS OWN DETERMINATION AS TO TYPE AND LOCATION OF UNDERGROUND UTILITIES AS MAY BE NECESSARY TO AVOID DAMAGE THERETO. THE CONTRACTOR SHALL VERIFY LOCATION OF UNDERGROUND PIPELINES, CONDUITS, AND STRUCTURES BY CONTACTING OWNERS OF UNDERGROUND UTILITIES AND BY PROSPECTING IN ADVANCE OF EXCAVATION OPERATIONS.
 2. THE LOCATION OF THE TRAIL IS SHOWN FOR REFERENCE PURPOSES ONLY. THE EXACT LOCATION WILL BE DETERMINED IN THE FIELD BY THE ENGINEER.
 3. DRIVEWAY RADII SHALL BE 10' UNLESS NOTED OTHERWISE.
 4. SEE PAVING DETAILS SHEET FOR DRIVEWAY DETAILS NOT SHOWN HERE.




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Christian L. Moorman, P.E. #93828
Date: 3/17/2017

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1717 MCKINNEY AVE., SUITE 1400 DALLAS, TEXAS 75202
Firm No. F-761

 TOWN OF FAIRVIEW, TEXAS
372 TOWN PLACE
FAIRVIEW, TX 75069
972-562-0522

E. STACY ROAD IMPROVEMENTS

PLAN & PROFILE

BEGIN TO STA. 71+80

SCALE: H: 1" = 20'
V: 1" = 5'

DESIGNED BY: CLM DRAWN BY: RAW CHECKED BY: SHEET NO. 56

SHEET 1 OF 13

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INSTALL TYPE I 8" WHITE PAVEMENT MARKING WITH TYPE I-C REFLECTORIZED PAVEMENT MARKINGS

INSTALL TYPE I DOUBLE YELLOW 4" SOLID PAVEMENT MARKINGS WITH TYPE II-A-A REFLECTORIZED PAVEMENT MARKERS (TYP)

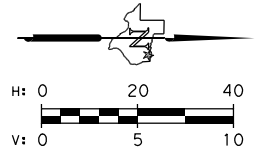
INSTALL TYPE I WHITE BICYCLE PAVEMENT MARKINGS

HERITAGE RANCH

HERITAGE RANCH

SADDLEBACK DR.

CONCRETE PAVING LIMIT
 STA. 79+31.97
 70.39' LT
 MATCH EXISTING PAVEMENT

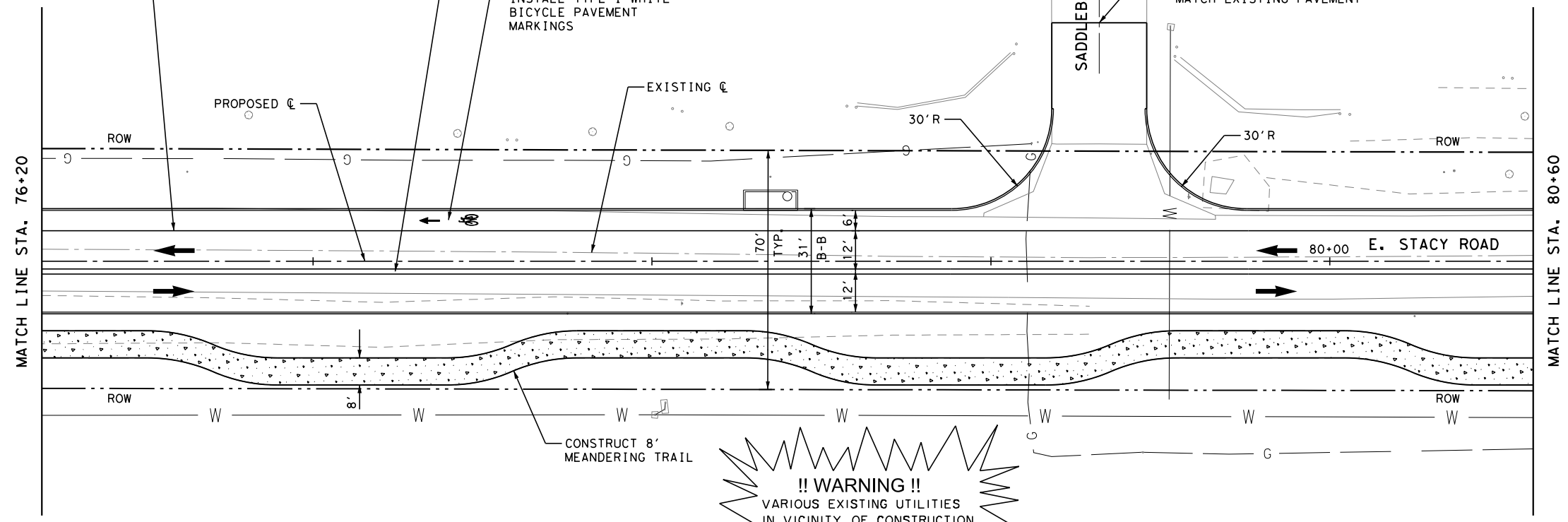


LEGEND

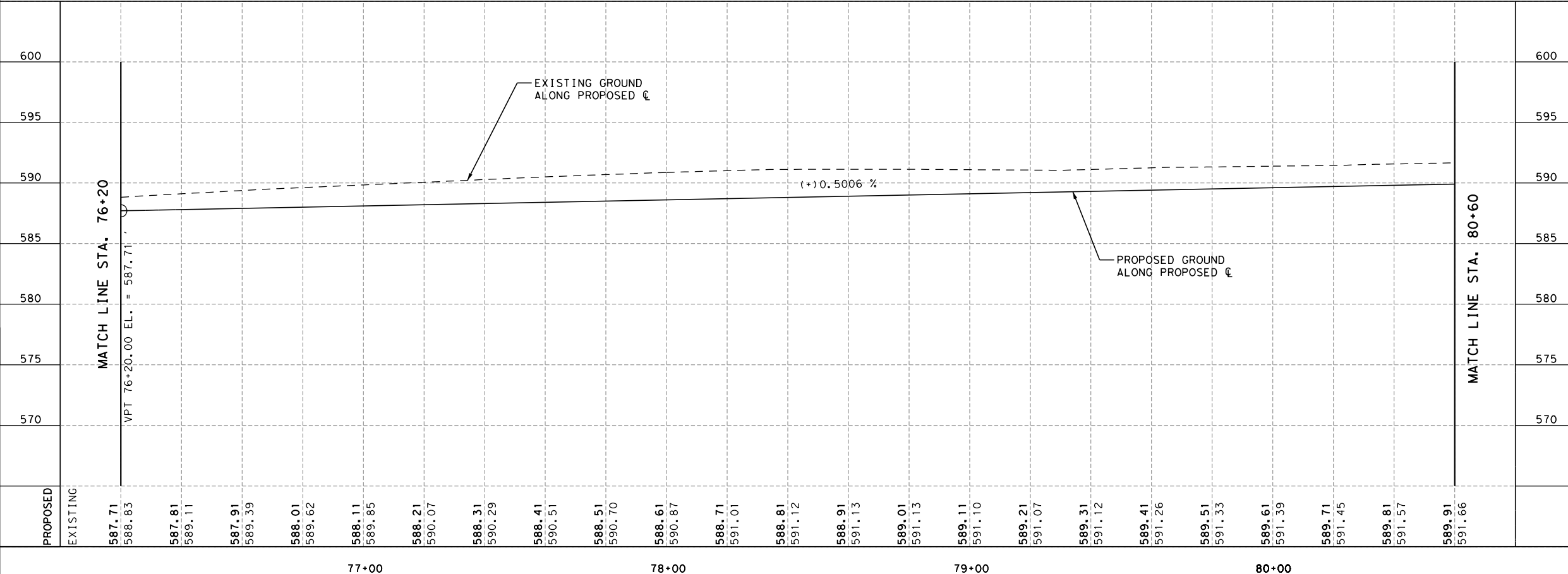
- TRAFFIC FLOW
- PROPOSED SIDEWALK/ MEANDERING TRAIL

NOTES:

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3. DRIVEWAY RADII SHALL BE 10' UNLESS NOTED OTHERWISE.
4. SEE PAVING DETAILS SHEET FOR DRIVEWAY DETAILS NOT SHOWN HERE.



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TOWN OF FAIRVIEW, TEXAS
 372 TOWN PLACE
 FAIRVIEW, TX 75069
 972-562-0522

E. STACY ROAD IMPROVEMENTS
PLAN & PROFILE
 STA. 76+20 TO STA. 80+60

SCALE: H: 1" = 20'
 V: 1" = 5'

DESIGNED BY: CLM DRAWN BY: RAW CHECKED BY: SHEET NO. 58

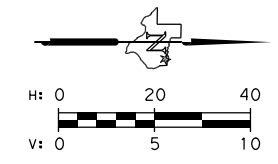
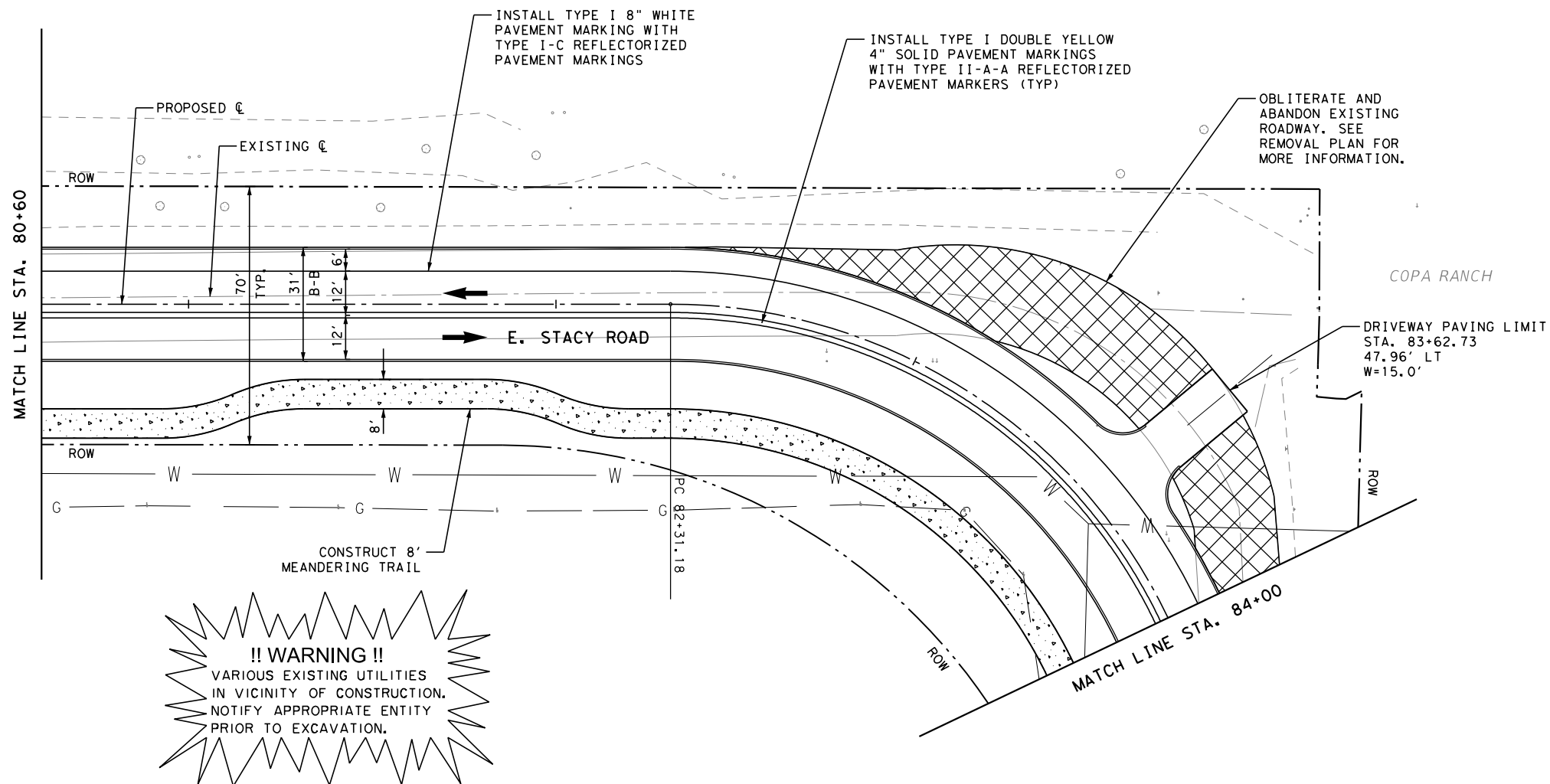
77+00

78+00

79+00

80+00

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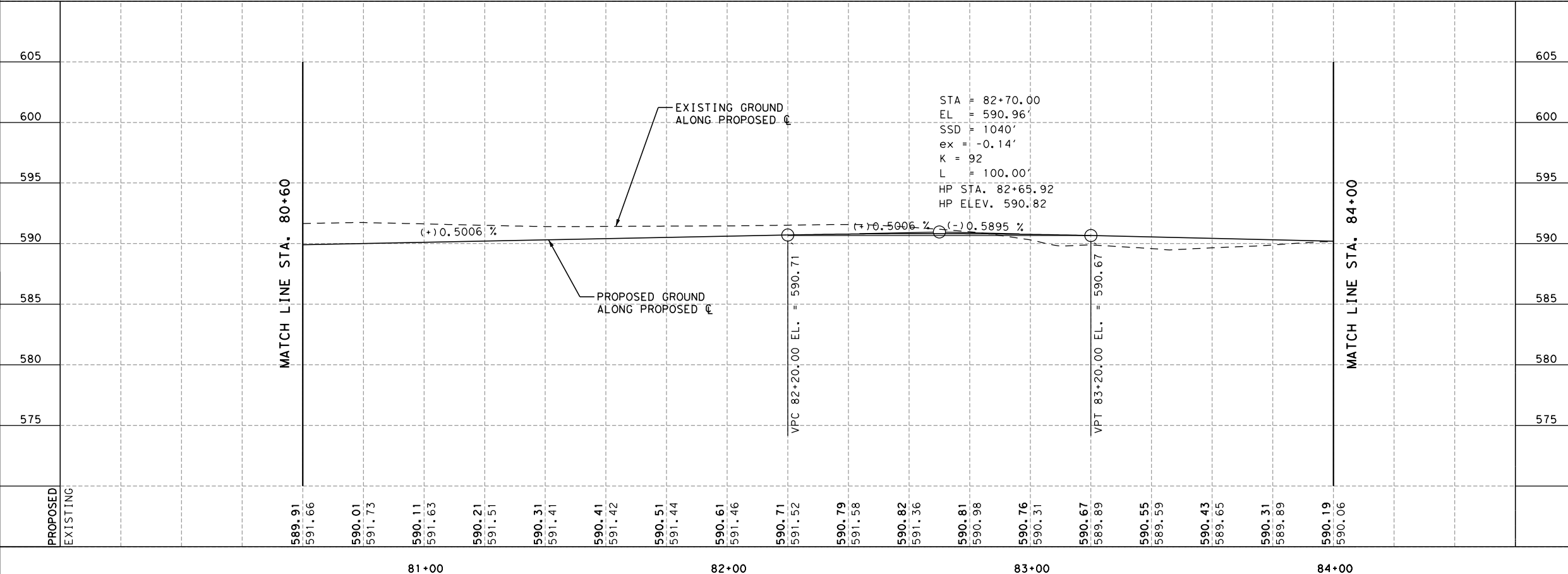


LEGEND

- ➔ TRAFFIC FLOW
- PROPOSED SIDEWALK/ MEANDERING TRAIL
- EXISTING ROADWAY TO BE ABANDONED

- NOTES:
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 4. SEE PAVING DETAILS SHEET FOR DRIVEWAY DETAILS NOT SHOWN HERE.

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TOWN OF FAIRVIEW, TEXAS
 372 TOWN PLACE
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E. STACY ROAD IMPROVEMENTS
PLAN & PROFILE
 STA. 80+60 TO STA. 84+00

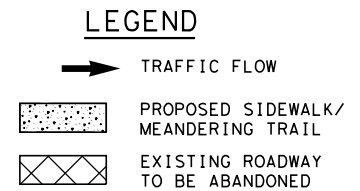
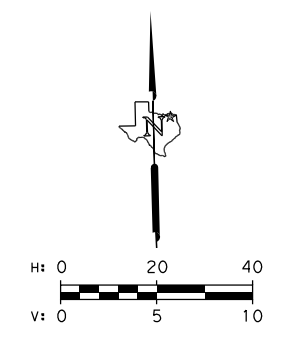
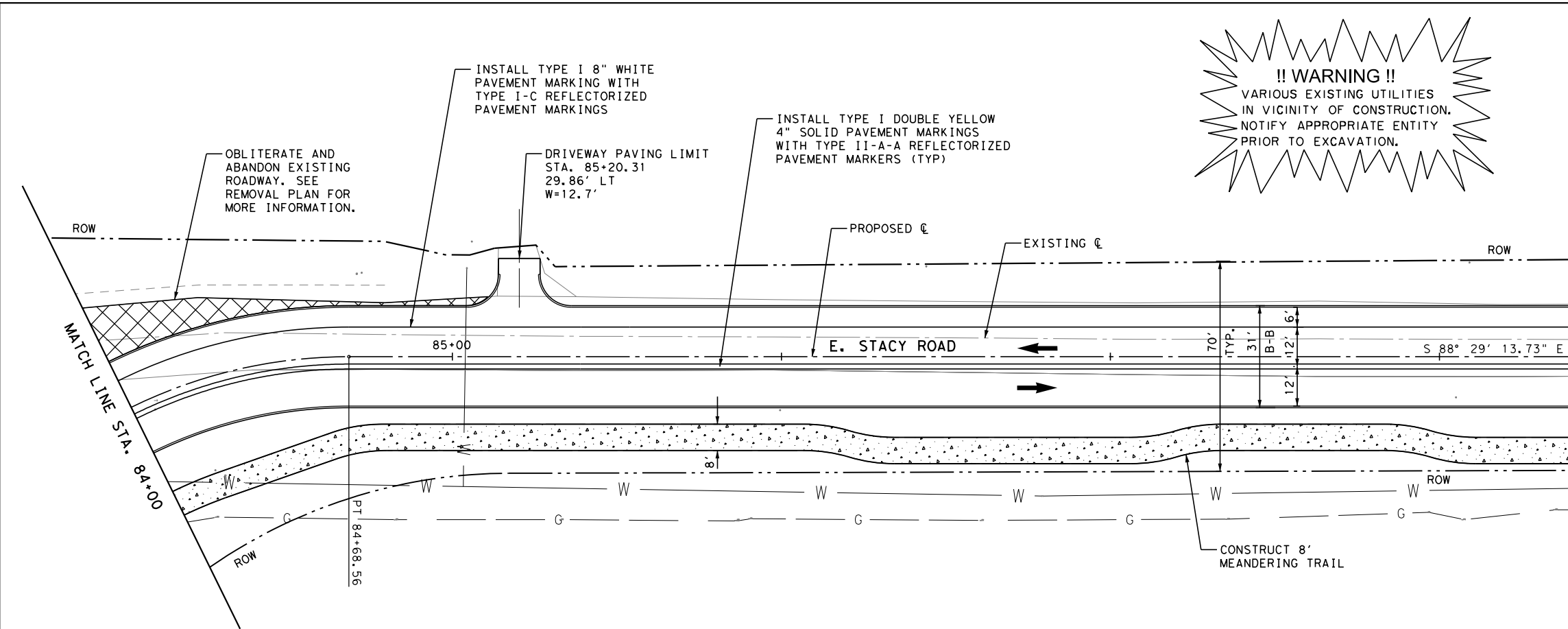
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 V: 1" = 5'

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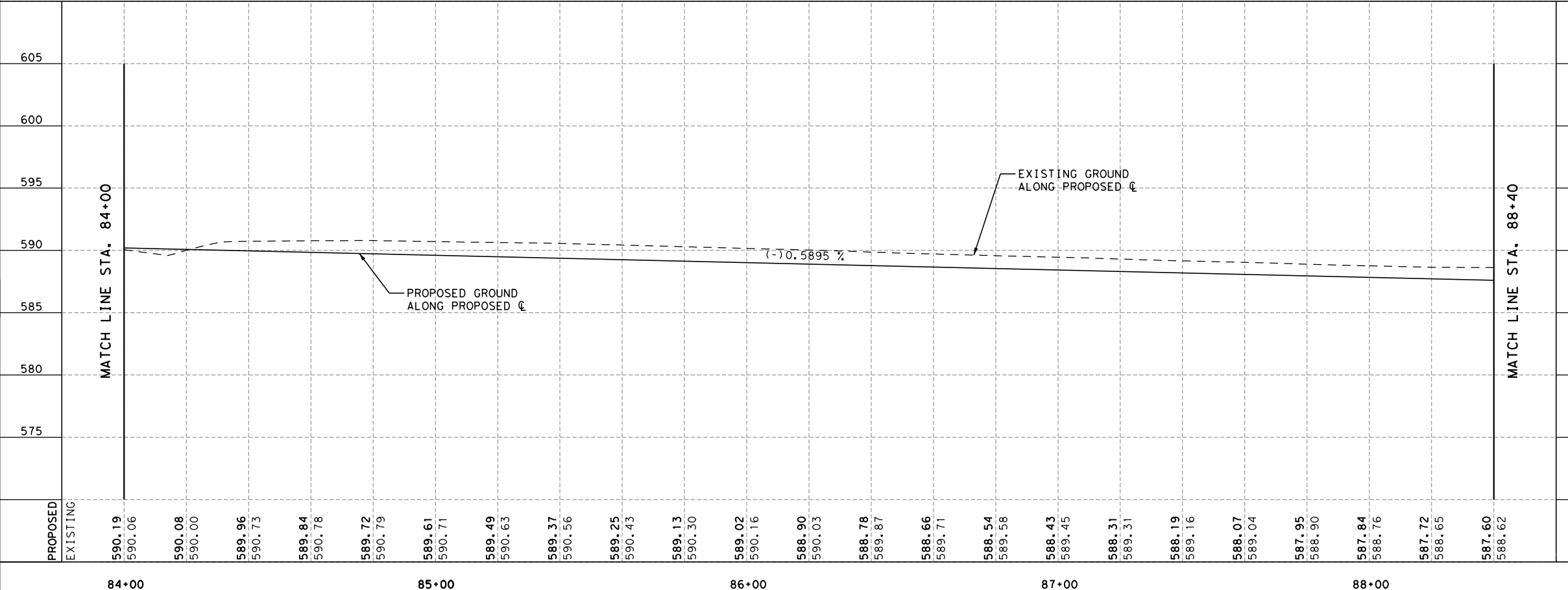
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SHEET 4 OF 13

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 HUITT-ZOLLARS, INC.
 Christian L. Moorman, P.E. #93828
 Date: 3/17/2017

HUITT-ZOLLARS
 HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING
 1717 MCKINNEY AVE., SUITE 1400 DALLAS, TEXAS 75202
 Firm No. F-761

TOWN OF FAIRVIEW, TEXAS
 372 TOWN PLACE
 FAIRVIEW, TX 75069
 972-562-0522

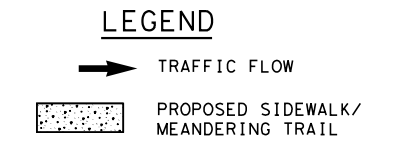
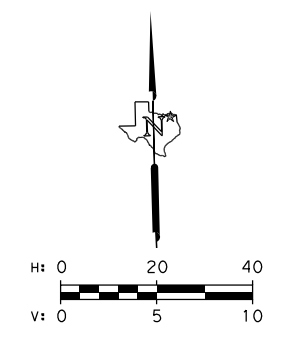
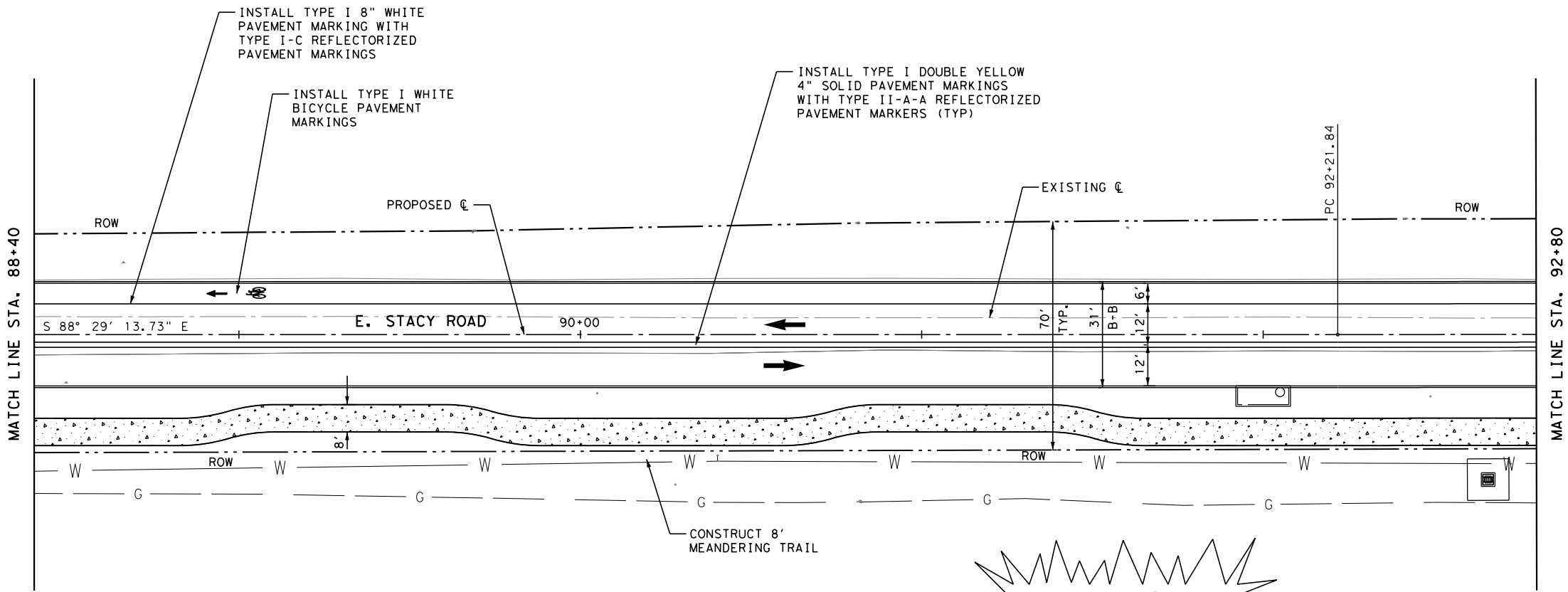
E. STACY ROAD IMPROVEMENTS
PLAN & PROFILE
 STA. 84+00 TO STA. 88+40

SCALE: H: 1" = 20'
 V: 1" = 5'

DESIGNED BY: CLM DRAWN BY: RAW CHECKED BY: []

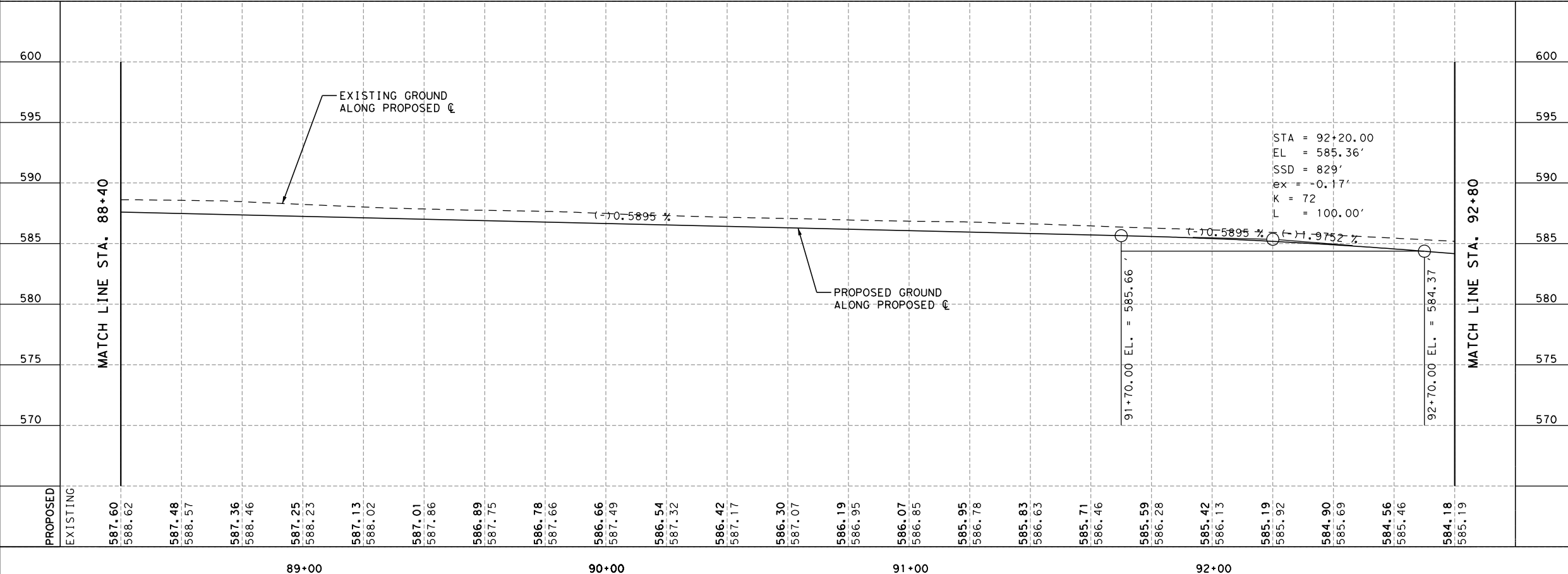
SHEET NO. 60
 SHEET 5 OF 13

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 372 TOWN PLACE
 FAIRVIEW, TX 75069
 972-562-0522

E. STACY ROAD IMPROVEMENTS

PLAN & PROFILE

STA. 88+40 TO STA. 92+80

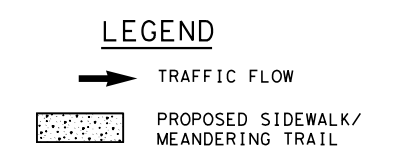
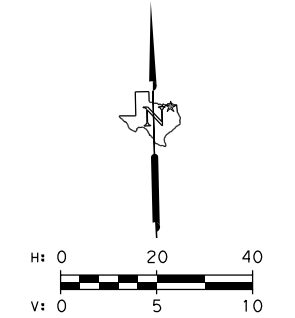
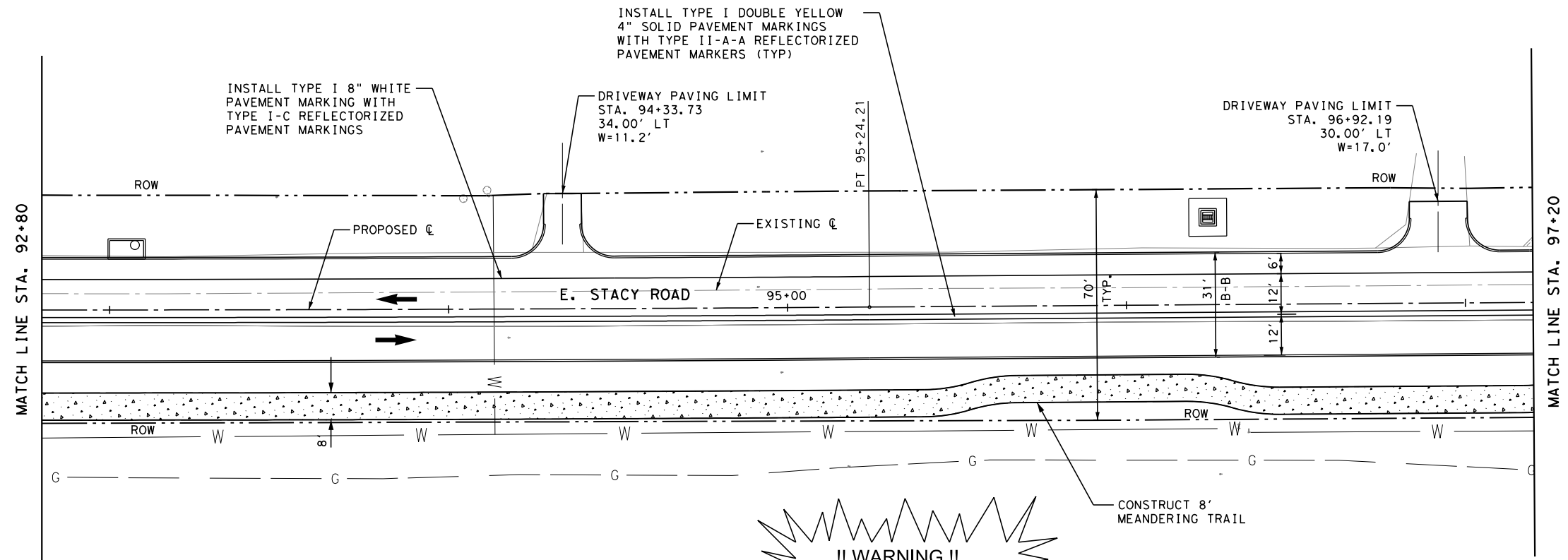
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 V: 1" = 5'

DESIGNED BY: CLM DRAWN BY: RAW CHECKED BY: []

SHEET NO. 61

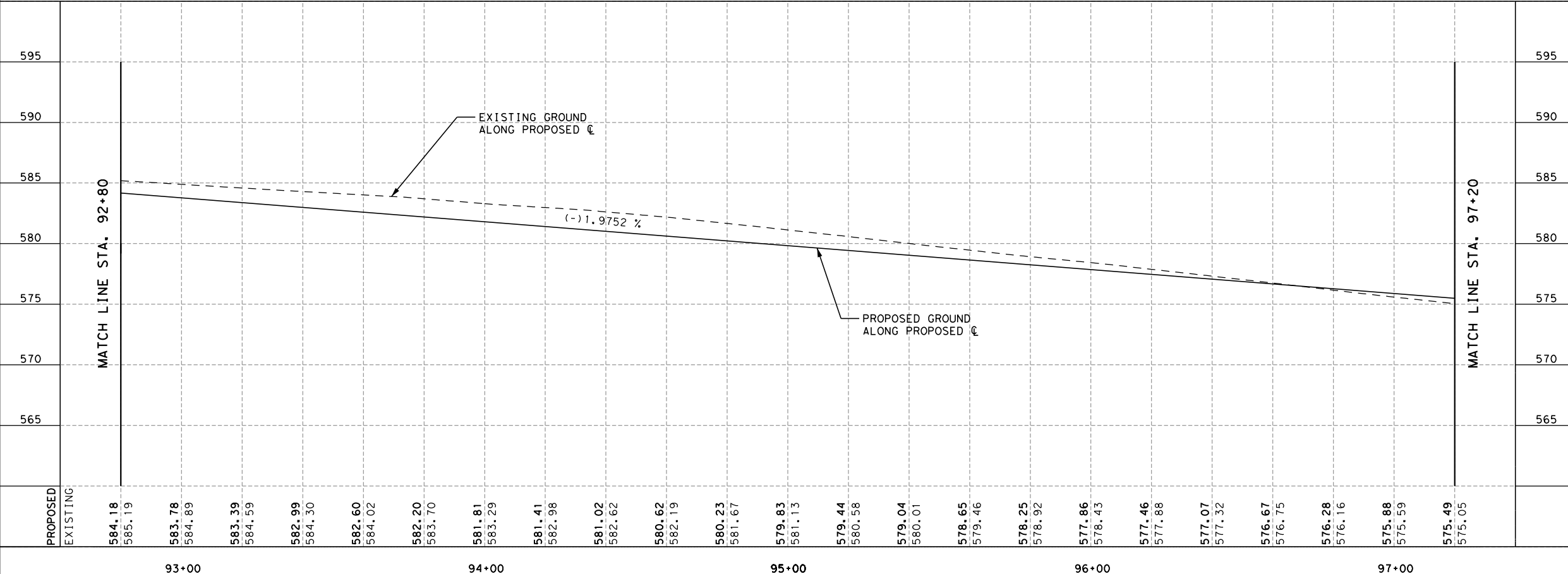
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 Firm No. F-761

 TOWN OF FAIRVIEW, TEXAS
 372 TOWN PLACE
 FAIRVIEW, TX 75069
 972-562-0522

E. STACY ROAD IMPROVEMENTS

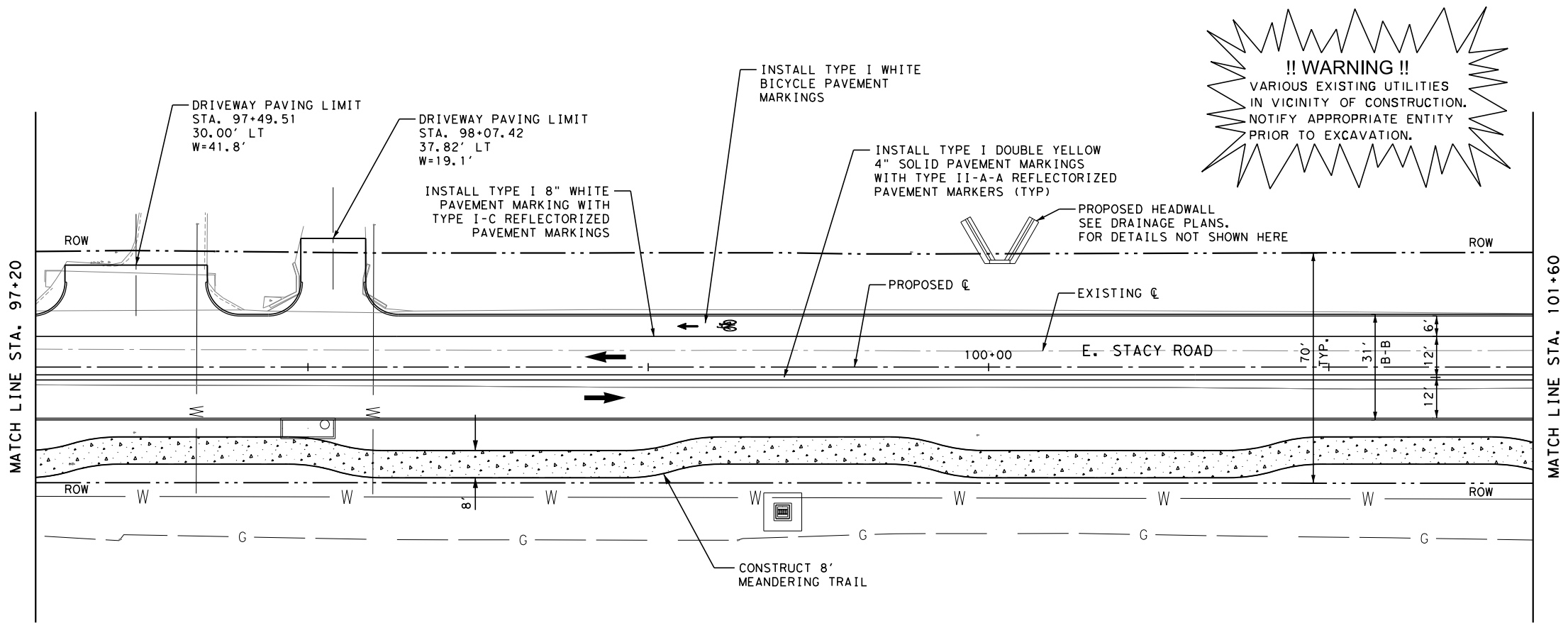
PLAN & PROFILE

STA. 92+80 TO STA. 97+20

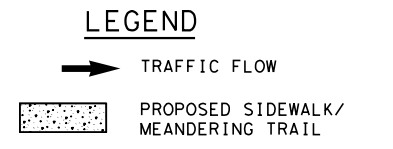
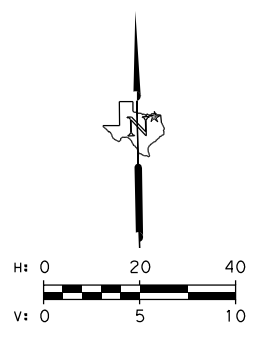
SCALE: H: 1" = 20'
 V: 1" = 5'

DESIGNED BY: CLM DRAWN BY: RAW CHECKED BY: SHEET NO. 62

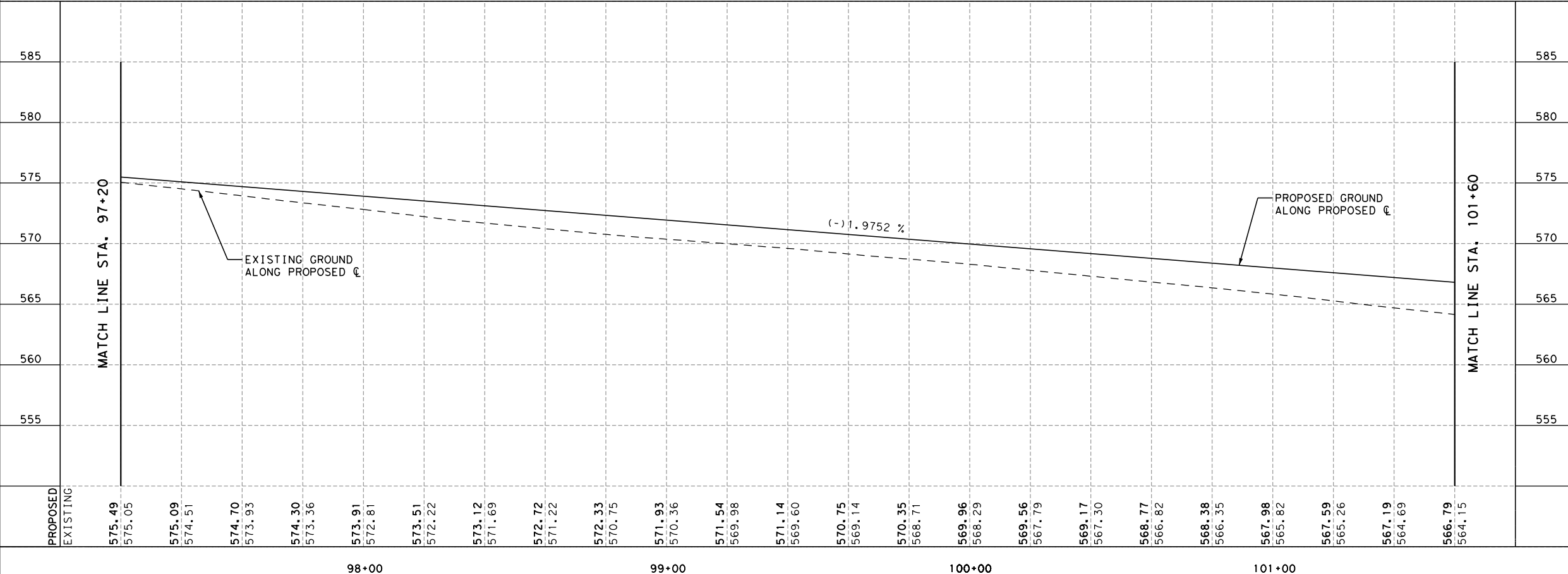
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Firm No. F-761

 TOWN OF FAIRVIEW, TEXAS
372 TOWN PLACE
FAIRVIEW, TX 75069
972-562-0522

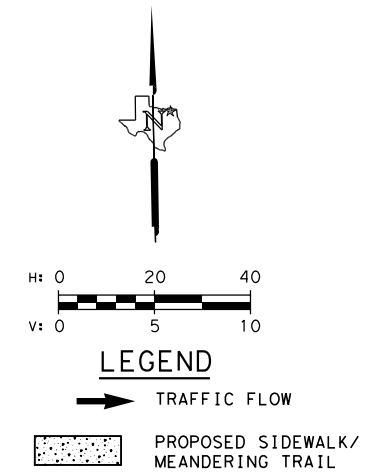
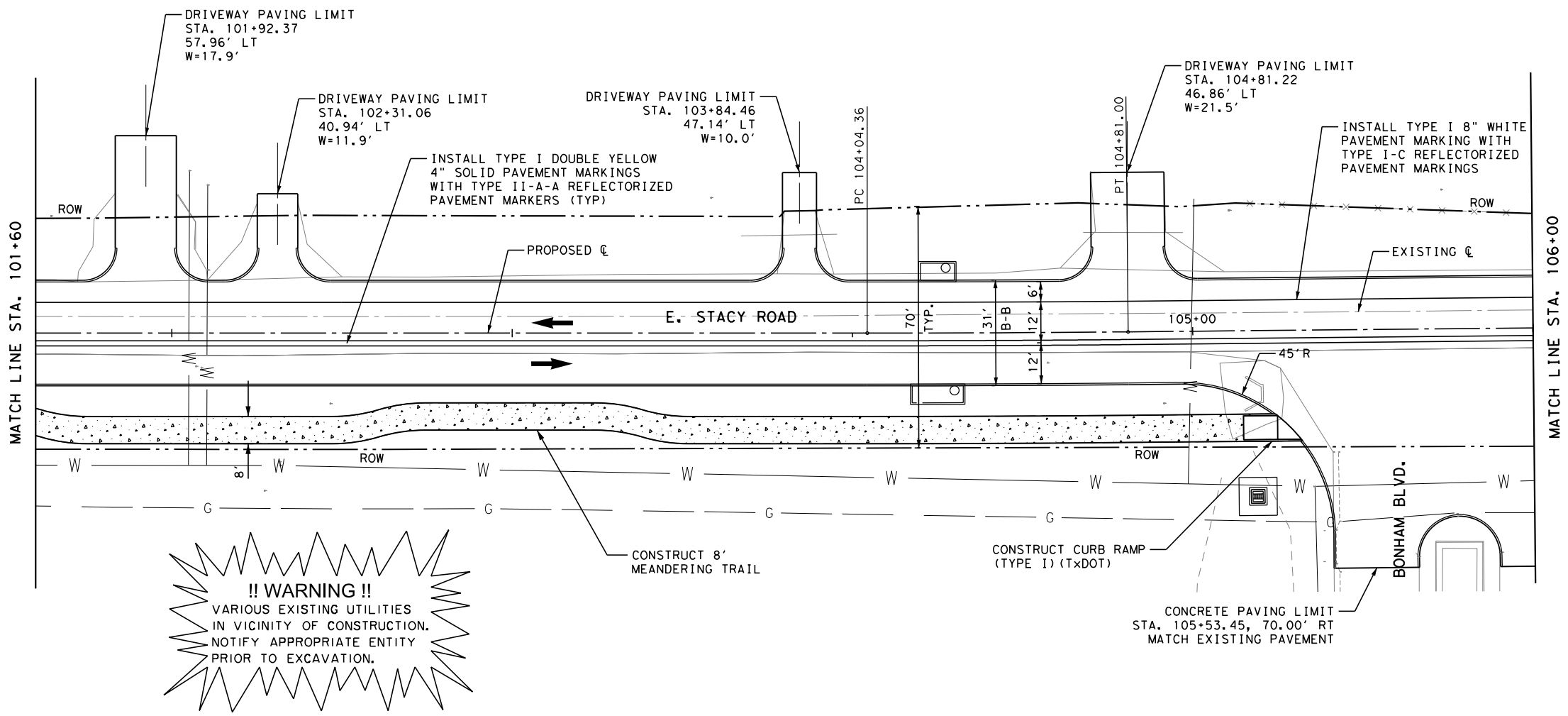
E. STACY ROAD IMPROVEMENTS

PLAN & PROFILE

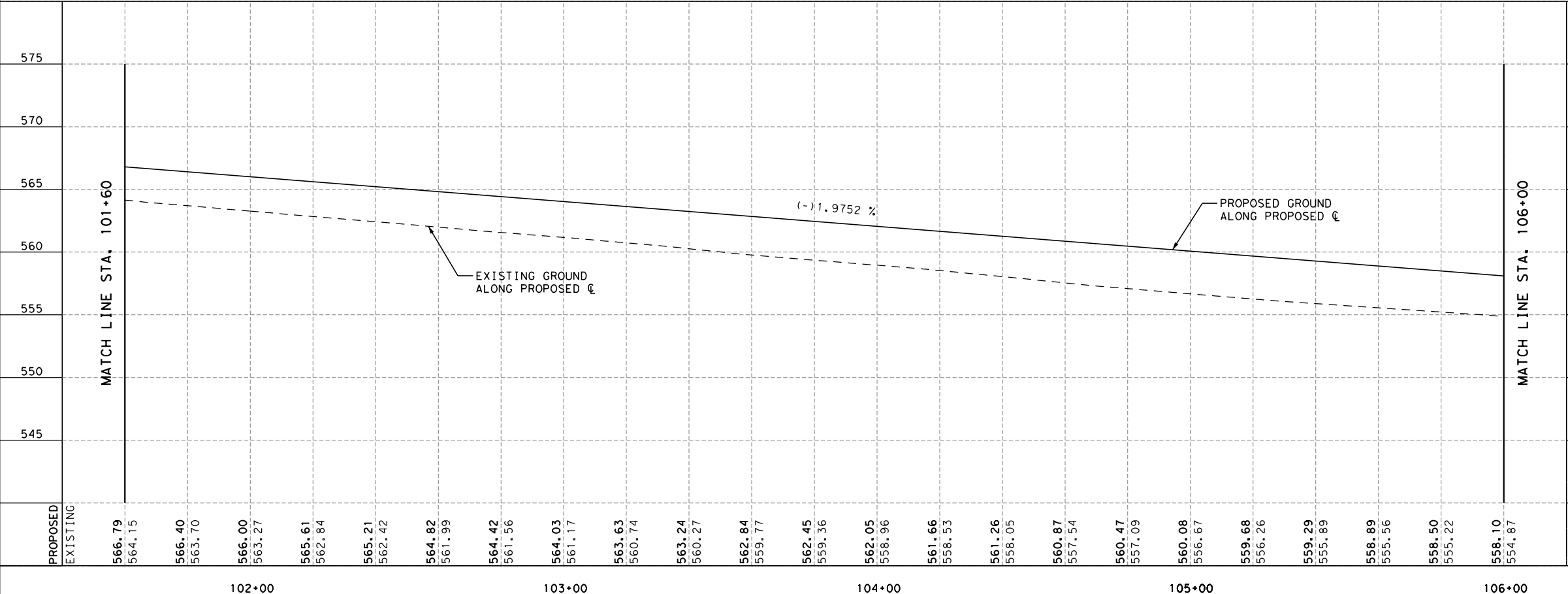
STA. 97+20 TO STA. 101+60

SCALE: H: 1" = 20'	SHEET NO. 63	SHEET 8 OF 13
DESIGNED BY: CLM	DRAWN BY: RAW	CHECKED BY:

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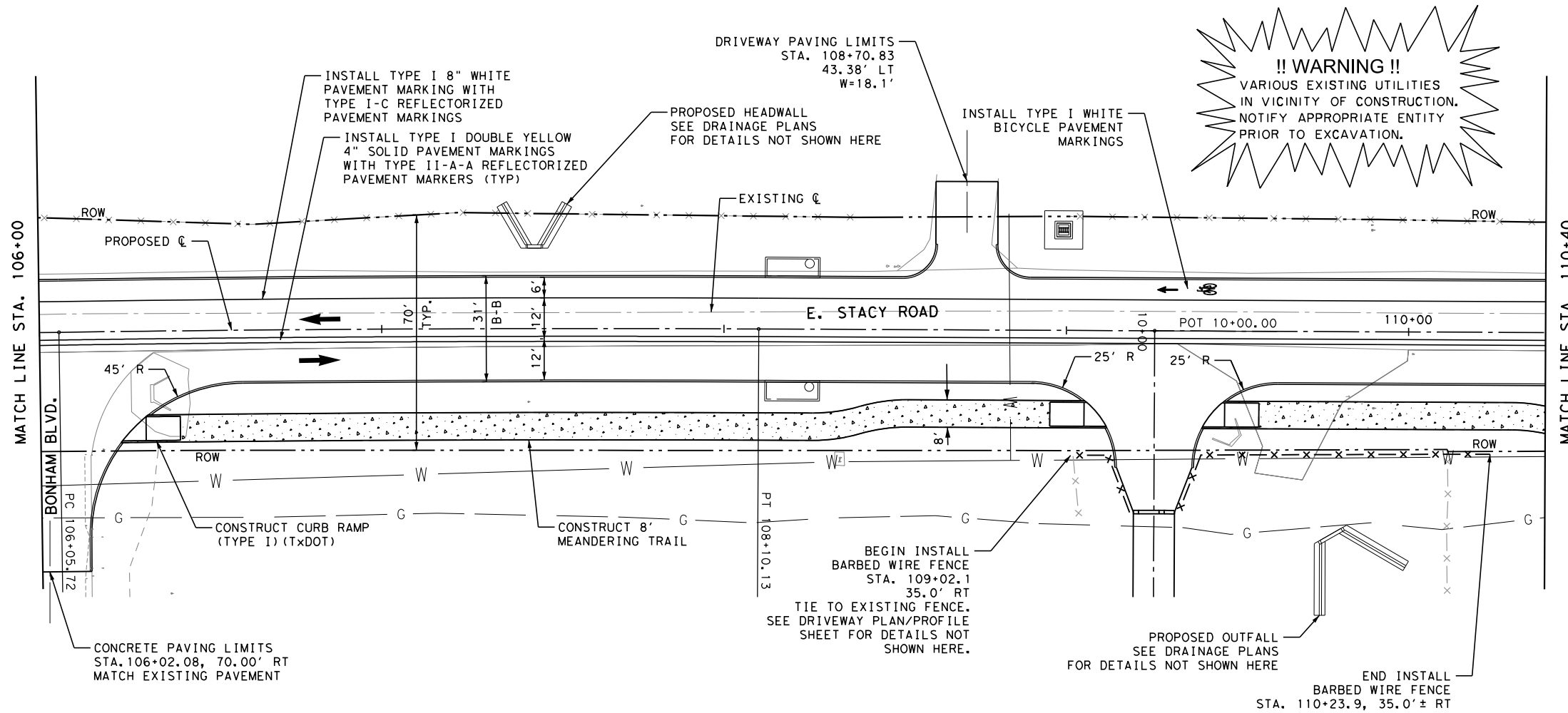
E. STACY ROAD IMPROVEMENTS
PLAN & PROFILE
 STA. 101+60 TO STA. 106+00

SCALE: H: 1" = 20'
 V: 1" = 5'

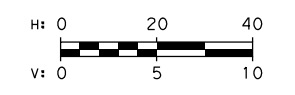
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SHEET 9 OF 13

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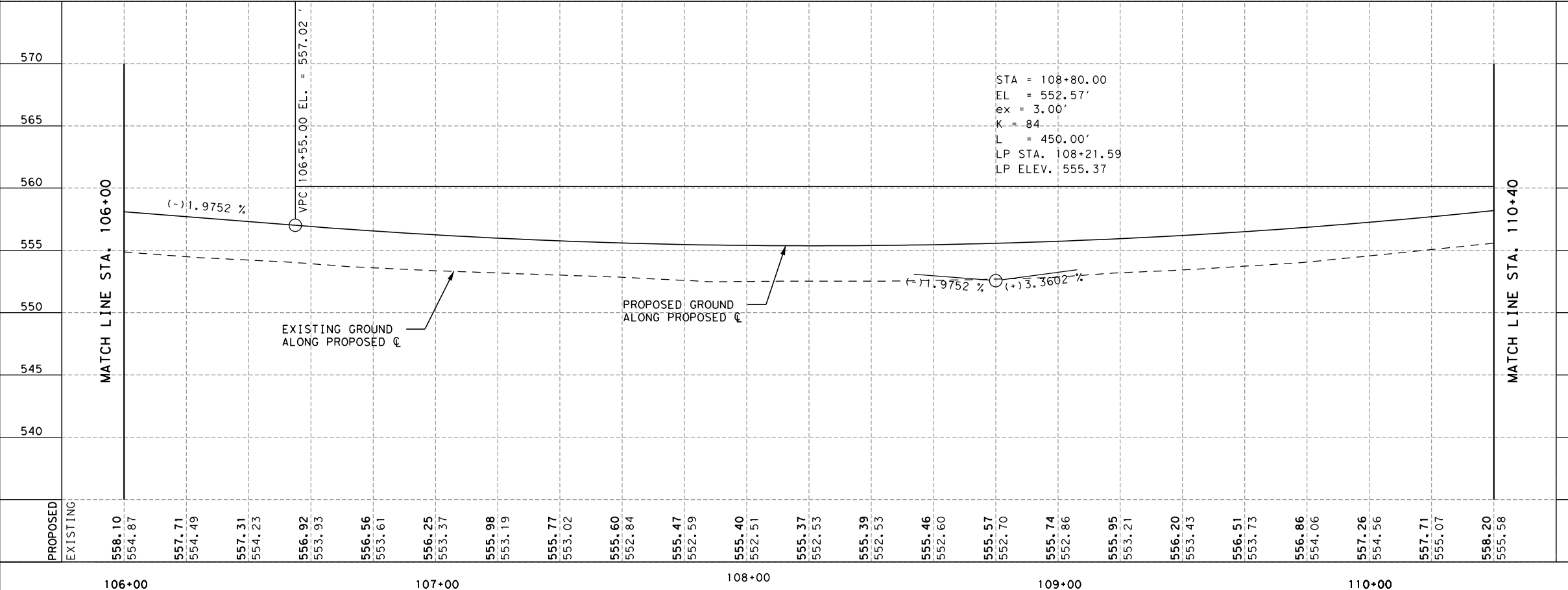
!! WARNING !!
 VARIOUS EXISTING UTILITIES
 IN VICINITY OF CONSTRUCTION.
 NOTIFY APPROPRIATE ENTITY
 PRIOR TO EXCAVATION.



LEGEND

- TRAFFIC FLOW
- PROPOSED SIDEWALK/ MEANDERING TRAIL

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 Firm No. F-761

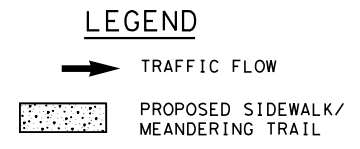
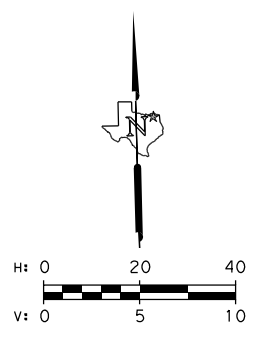
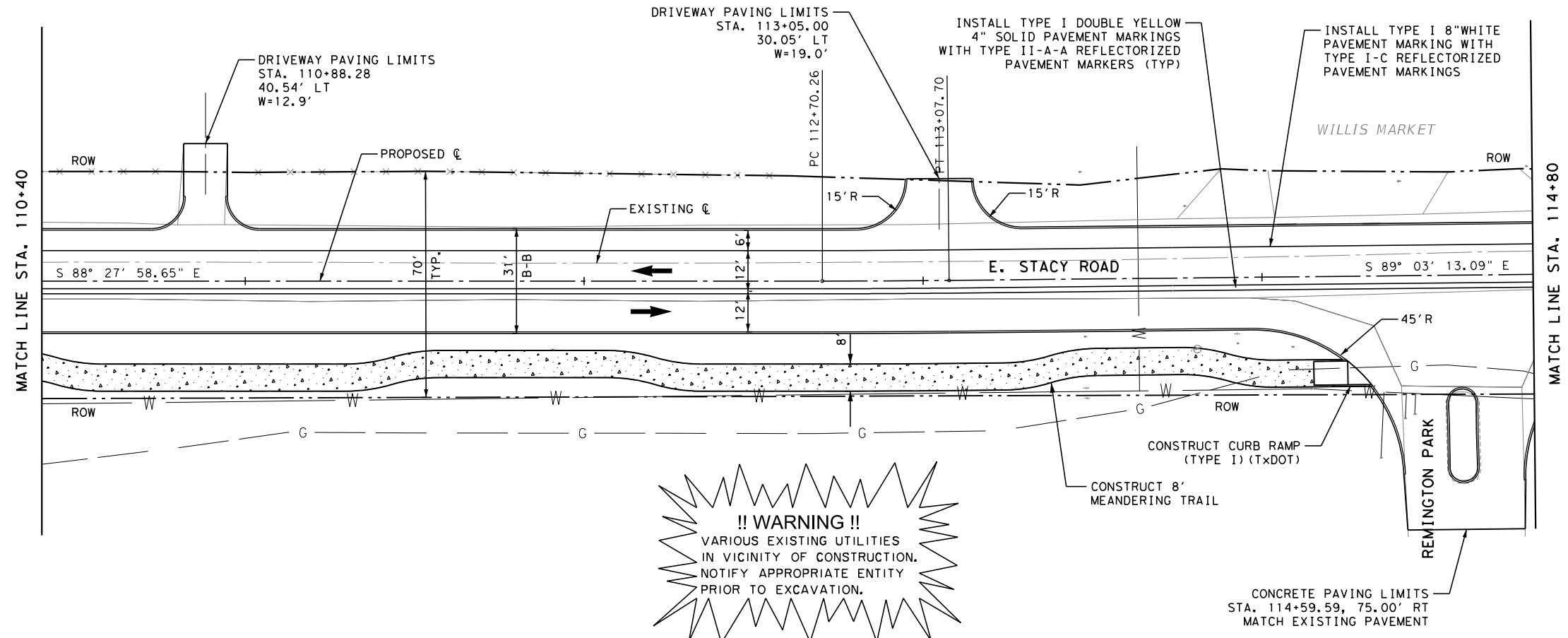
TOWN OF FAIRVIEW, TEXAS
 372 TOWN PLACE
 FAIRVIEW, TX 75069
 972-562-0522

E. STACY ROAD IMPROVEMENTS
PLAN & PROFILE
 STA. 106+00 TO STA. 110+40

SCALE: H: 1" = 20'
 V: 1" = 5'

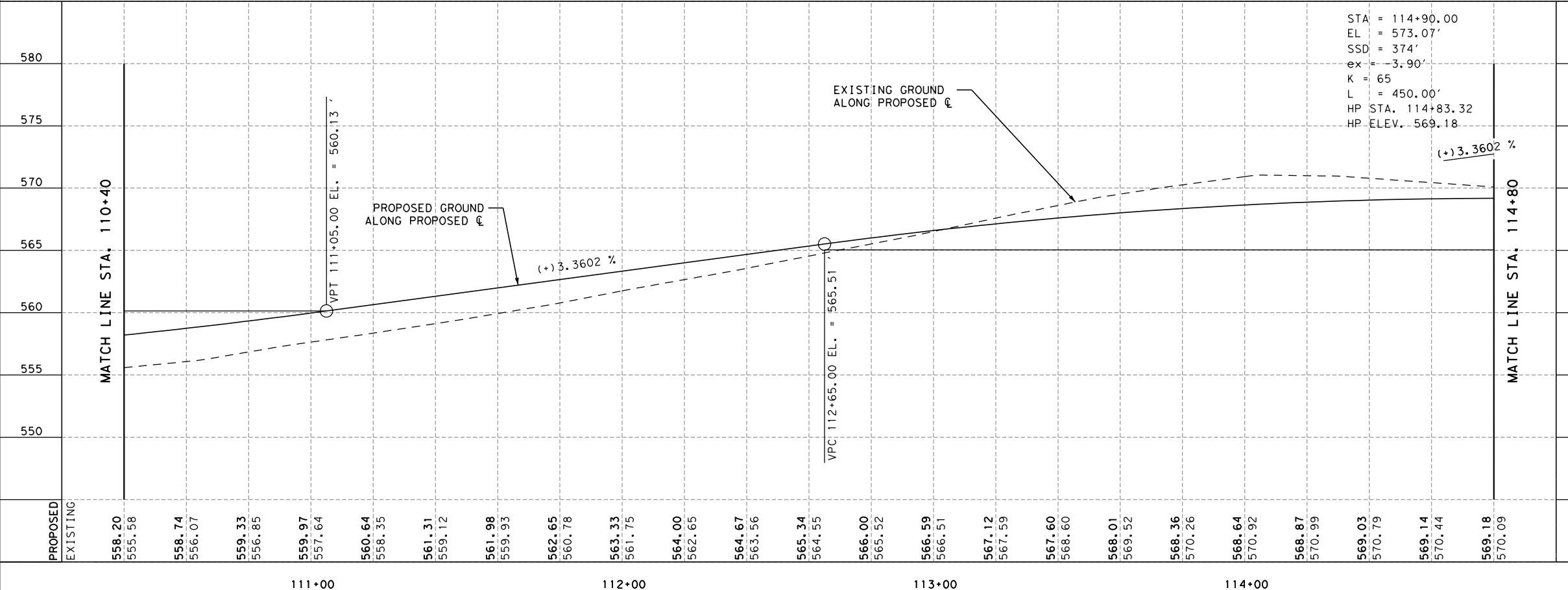
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 3/17/2017 2:32:50 PM rwalker



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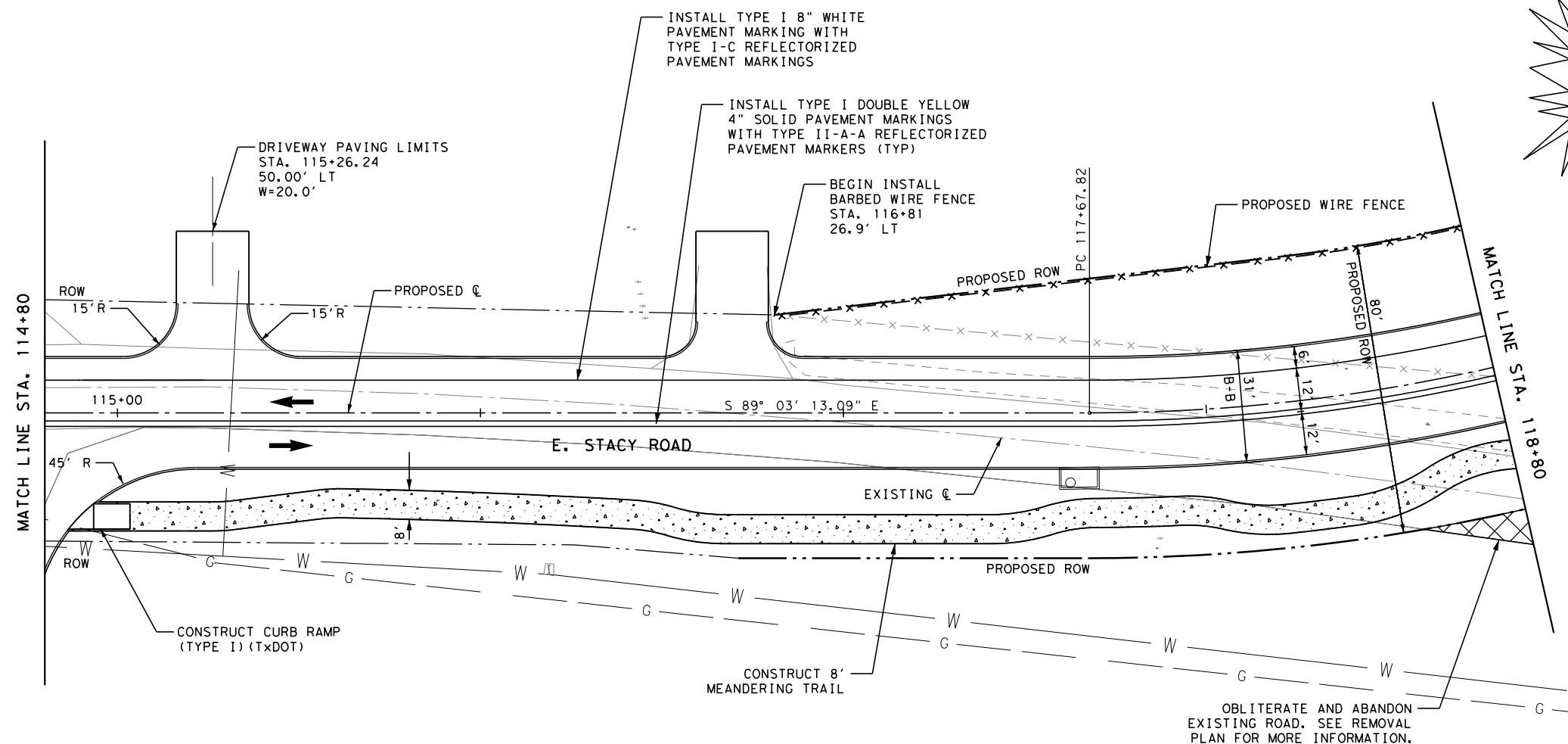
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TOWN OF FAIRVIEW TEXAS
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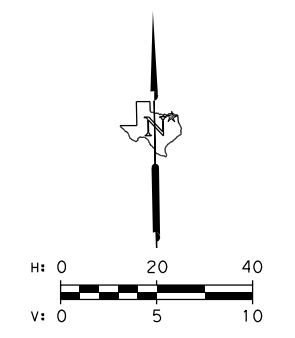
E. STACY ROAD IMPROVEMENTS
PLAN & PROFILE
 STA. 110+40 TO STA. 114+80

SCALE: H: 1" = 20'	SHEET NO. 66
V: 1" = 5'	
DESIGNED BY: CLM	SHEET 11 OF 13
DRAWN BY: RAW	
CHECKED BY:	

I:\Projects\305245.01 - Town of Fairview Stacy Road Improvements\10 CADD & BIM\10.6 MicroStation\10.6.5 Sheet\03 RDWY\305245-stacy p1Dr-f-12.dgn
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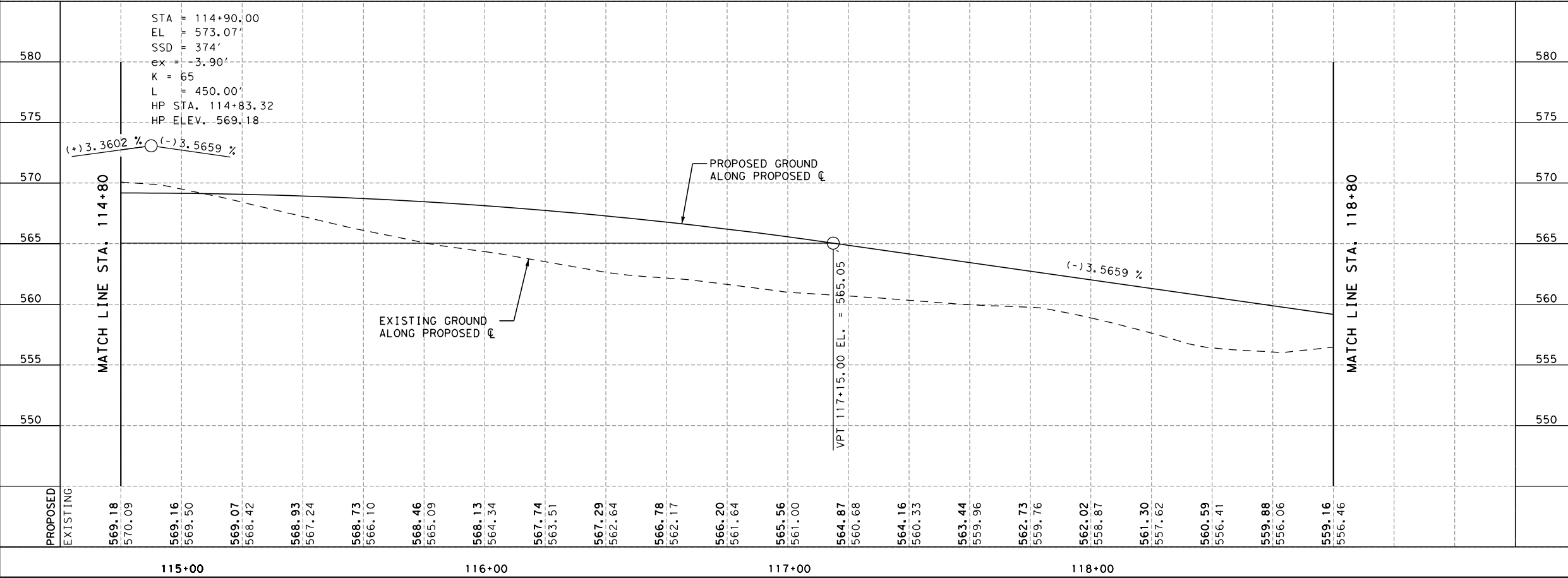
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LEGEND

- ➔ TRAFFIC FLOW
- PROPOSED SIDEWALK/ MEANDERING TRAIL
- EXISTING ROADWAY TO BE ABANDONED

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E. STACY ROAD IMPROVEMENTS
PLAN & PROFILE
 STA. 114+80 TO STA. 118+80

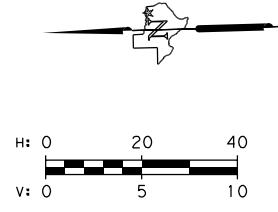
SCALE: H: 1" = 20'
 V: 1" = 5'

DESIGNED BY: CLM DRAWN BY: RAW CHECKED BY: []

SHEET NO. 67

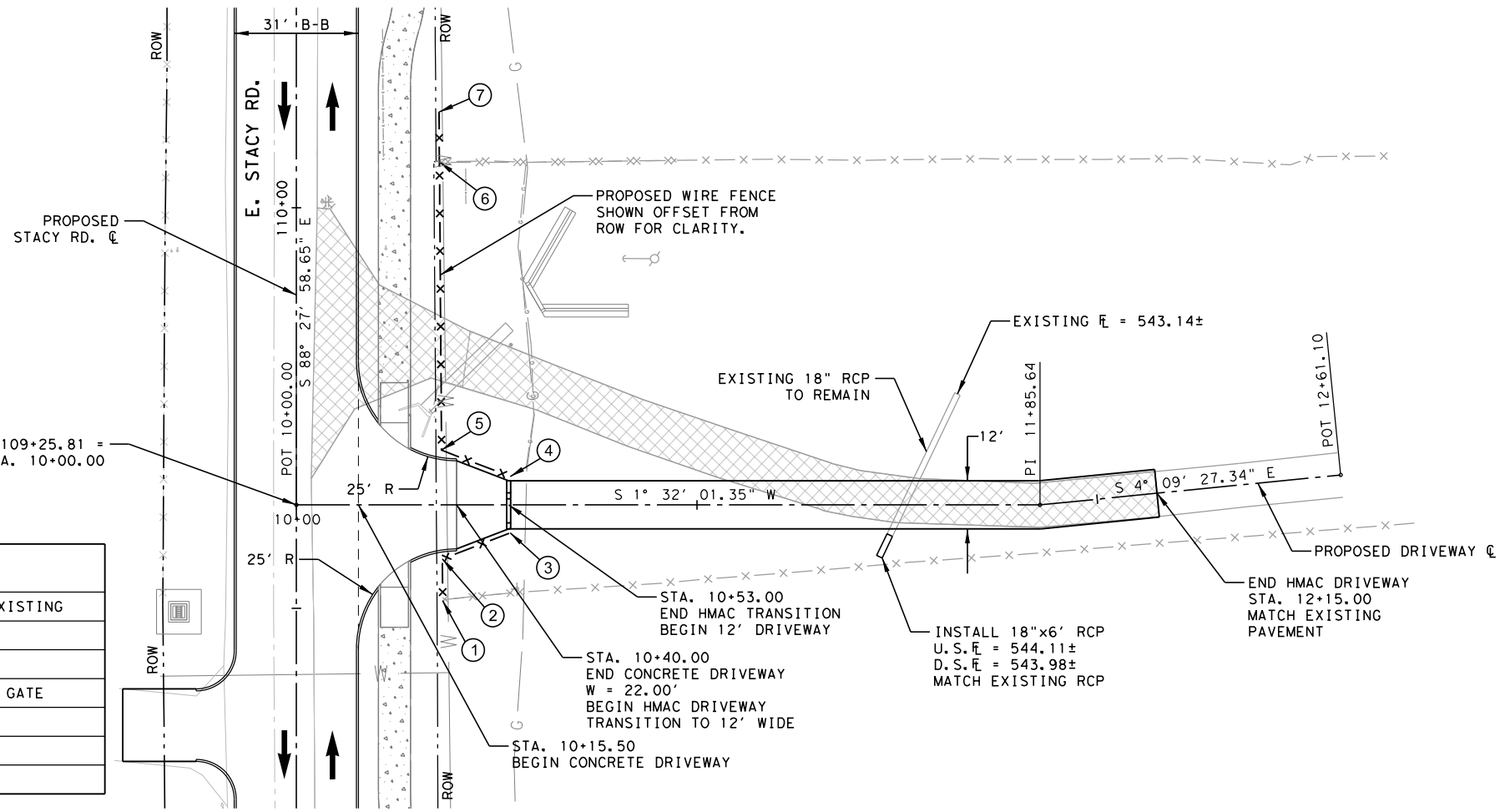
SHEET 12 OF 13

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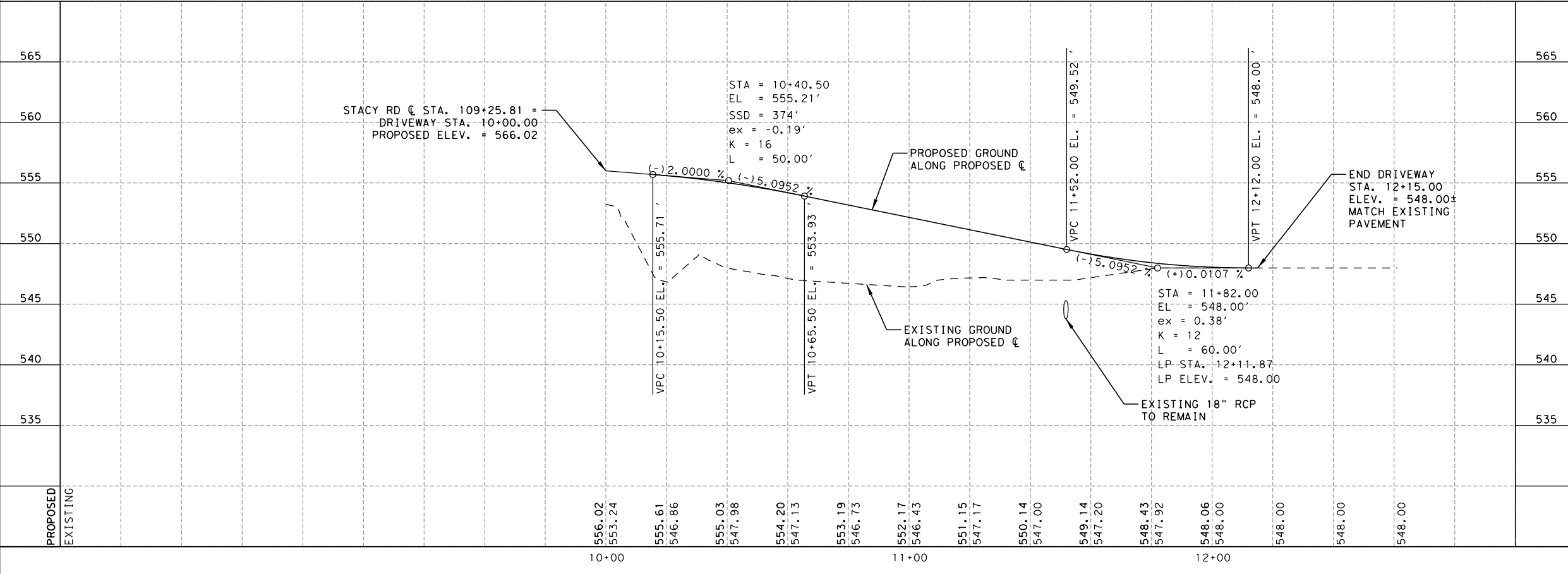
LEGEND

- TRAFFIC FLOW
- ASPHALT DRIVEWAY REMOVAL
- PROPOSED SIDEWALK/ MEANDERING TRAIL



POINT NO.	STACY RD. ϕ STA.	OFFSET	COMMENT
1	109+02.1	35.0' RT	BEGIN FENCE, TIE TO EXISTING
2	109+12.3	35.0' RT	FENCE CORNER
3	109+18.8	53.4' RT	END FENCE
4	109+32.9	53.4' RT	RESUME FENCE, INSTALL GATE
5	109+39.5	35.0' RT	FENCE CORNER
6	110+11.5	35.0' RT	TIE TO EXISTING FENCE
7	110+23.9	35.0' RT	END FENCE

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E. STACY ROAD IMPROVEMENTS
DRIVEWAY PLAN & PROFILE
 STA. 109+25

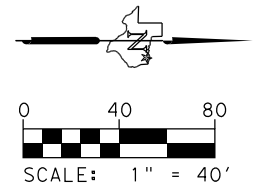
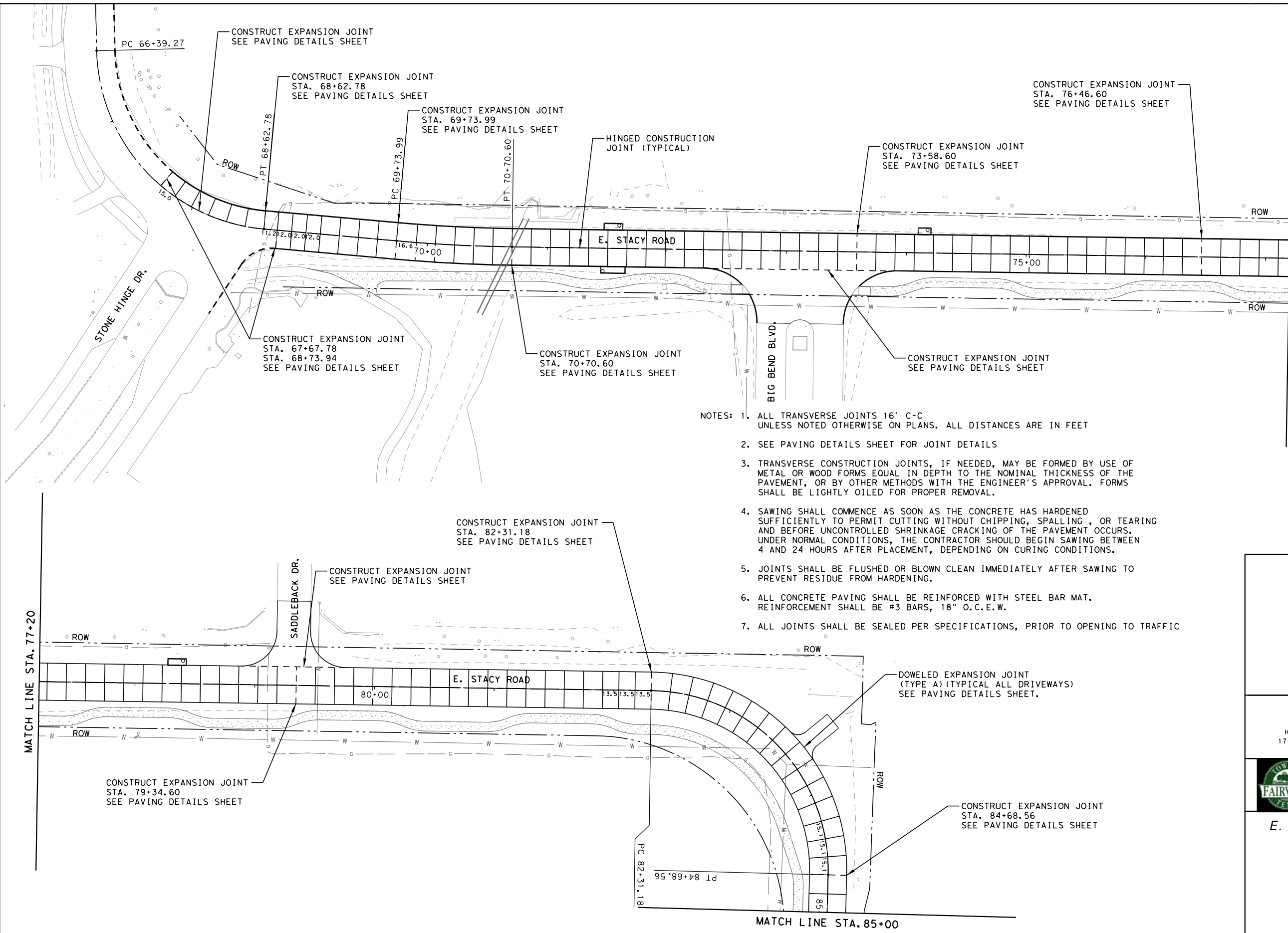
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 V: 1" = 5'

DESIGNED BY: CLM DRAWN BY: CLM CHECKED BY: CLM

SHEET NO. 69

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 5/17/2017 2:32:57 PM rwalker



- NOTES:
1. ALL TRANSVERSE JOINTS 16' C-C UNLESS NOTED OTHERWISE ON PLANS. ALL DISTANCES ARE IN FEET
 2. SEE PAVING DETAILS SHEET FOR JOINT DETAILS
 3. TRANSVERSE CONSTRUCTION JOINTS, IF NEEDED, MAY BE FORMED BY USE OF METAL OR WOOD FORMS EQUAL IN DEPTH TO THE NOMINAL THICKNESS OF THE PAVEMENT, OR BY OTHER METHODS WITH THE ENGINEER'S APPROVAL. FORMS SHALL BE LIGHTLY OILED FOR PROPER REMOVAL.
 4. SAWING SHALL COMMENCE AS SOON AS THE CONCRETE HAS HARDENED SUFFICIENTLY TO PERMIT CUTTING WITHOUT CHIPPING, SPALLING, OR TEARING AND BEFORE UNCONTROLLED SHRINKAGE CRACKING OF THE PAVEMENT OCCURS. UNDER NORMAL CONDITIONS, THE CONTRACTOR SHOULD BEGIN SAWING BETWEEN 4 AND 24 HOURS AFTER PLACEMENT, DEPENDING ON CURING CONDITIONS.
 5. JOINTS SHALL BE FRESH OR BLOWN CLEAN IMMEDIATELY AFTER SAWING TO PREVENT RESIDUE FROM HARDENING.
 6. ALL CONCRETE PAVING SHALL BE REINFORCED WITH STEEL BAR MAT. REINFORCEMENT SHALL BE #3 BARS, 18" O.C.E.W.
 7. ALL JOINTS SHALL BE SEALED PER SPECIFICATIONS, PRIOR TO OPENING TO TRAFFIC

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 HUITT-ZOLLARS, INC.
 Christian L. Moorman, P.E. #93828
 Date: 3/17/2017

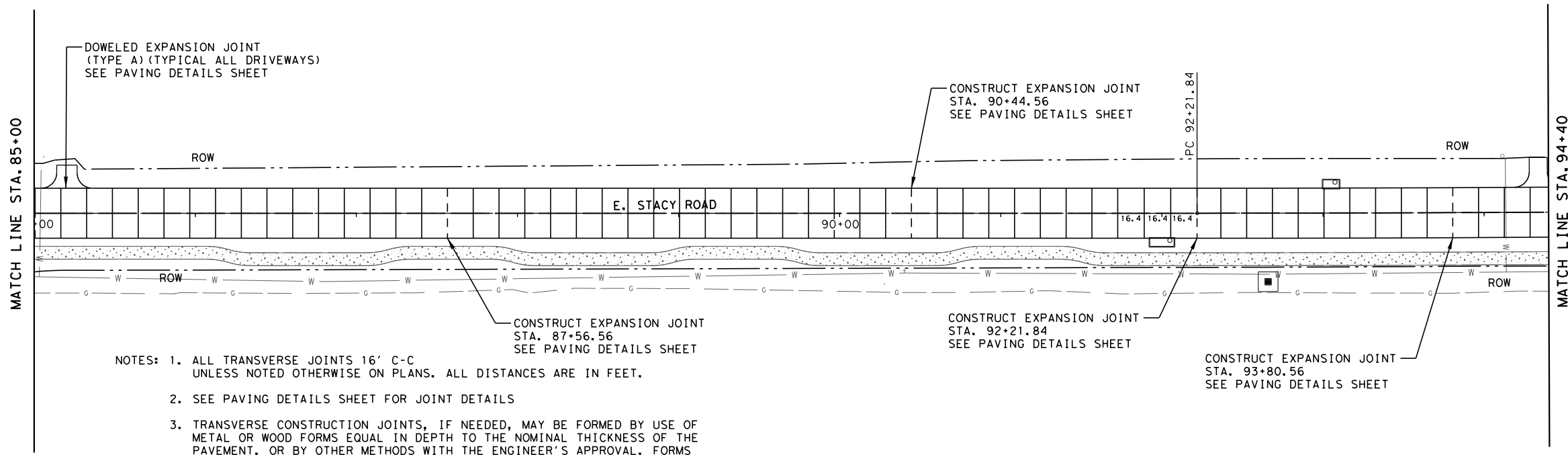
HUITT-ZOLLARS
 HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING
 1717 MCKINNEY AVE., SUITE 1400 DALLAS, TEXAS 75202
 Firm No. F-761

 TOWN OF FAIRVIEW, TEXAS
 372 TOWN PLACE
 FAIRVIEW, TX 75069
 972-562-0522

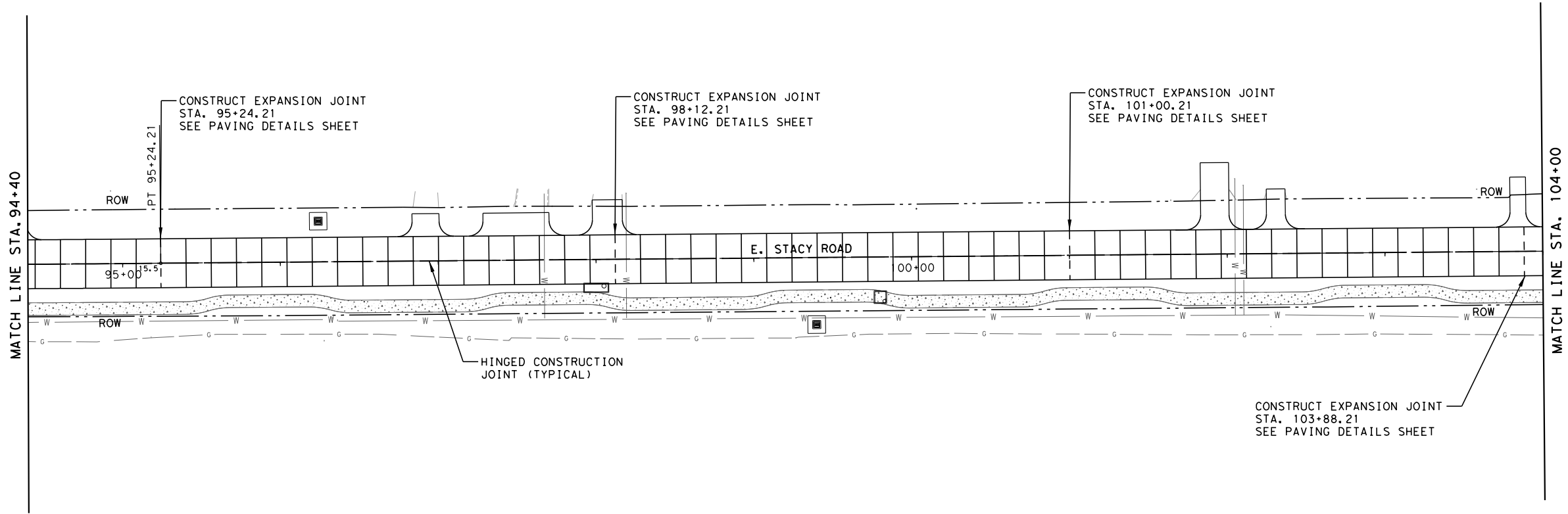
E. STACY ROAD IMPROVEMENTS
JOINT LAYOUT
 BEGIN TO STA. 85+00

SCALE: 1" = 40'		SHEET 1 OF 3		SHEET NO. 70
DESIGNED BY:	DRAWN BY:	CHECKED BY:		
CLM	SR			

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 2. SEE PAVING DETAILS SHEET FOR JOINT DETAILS
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 5. JOINTS SHALL BE FLUSHED OR BLOWN CLEAN IMMEDIATELY AFTER SAWING TO PREVENT RESIDUE FROM HARDENING.
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 7. ALL JOINTS SHALL BE SEALED PER SPECIFICATIONS, PRIOR TO OPENING TO TRAFFIC



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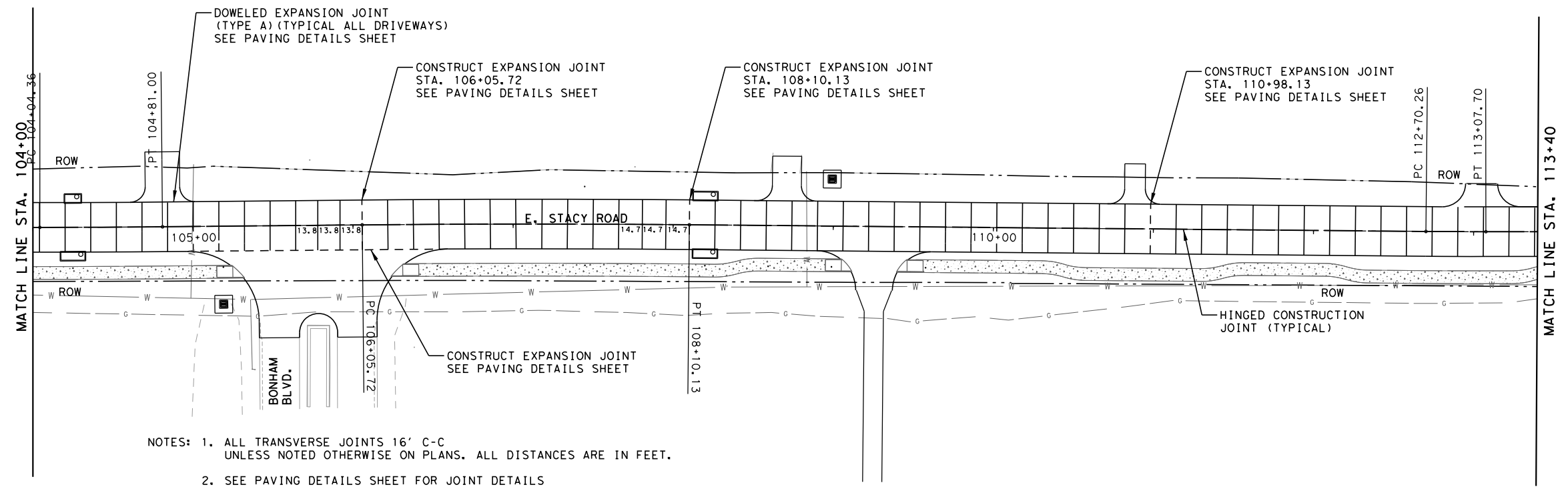
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 FAIRVIEW, TX 75069
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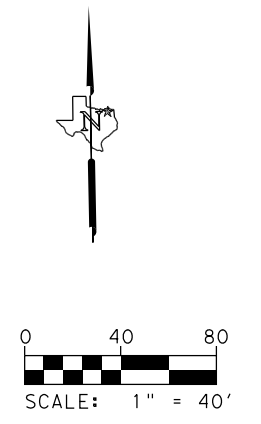
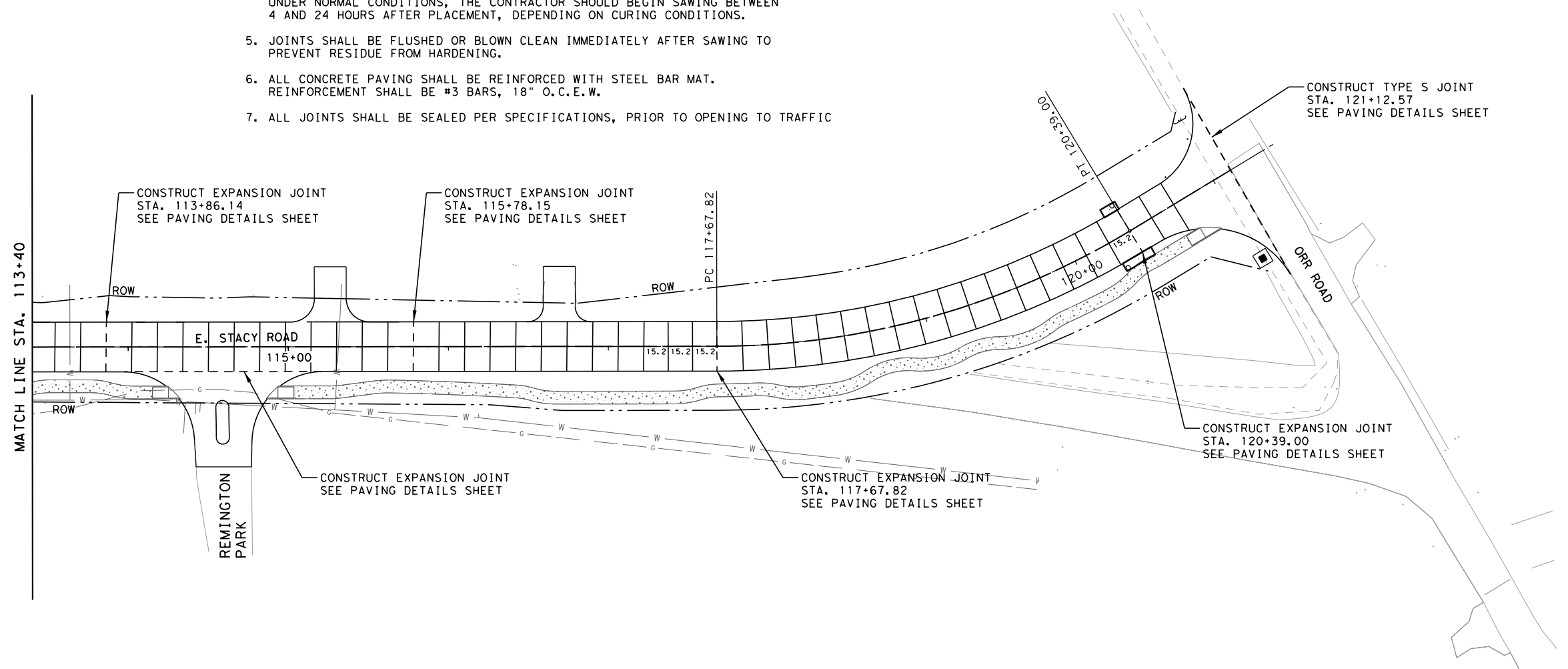
E. STACY ROAD IMPROVEMENTS
JOINT LAYOUT
 STA. 85+00 TO STA. 104+00

SCALE: 1" = 40'		SHEET 2 OF 3		SHEET NO.
DESIGNED BY:	DRAWN BY:	CHECKED BY:	71	
CLM	SR			

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- NOTES:
1. ALL TRANSVERSE JOINTS 16' C-C UNLESS NOTED OTHERWISE ON PLANS. ALL DISTANCES ARE IN FEET.
 2. SEE PAVING DETAILS SHEET FOR JOINT DETAILS
 3. TRANSVERSE CONSTRUCTION JOINTS, IF NEEDED, MAY BE FORMED BY USE OF METAL OR WOOD FORMS EQUAL IN DEPTH TO THE NOMINAL THICKNESS OF THE PAVEMENT, OR BY OTHER METHODS WITH THE ENGINEER'S APPROVAL. FORMS SHALL BE LIGHTLY OILED FOR PROPER REMOVAL.
 4. SAWING SHALL COMMENCE AS SOON AS THE CONCRETE HAS HARDENED SUFFICIENTLY TO PERMIT CUTTING WITHOUT CHIPPING, SPALLING, OR TEARING AND BEFORE UNCONTROLLED SHRINKAGE CRACKING OF THE PAVEMENT OCCURS. UNDER NORMAL CONDITIONS, THE CONTRACTOR SHOULD BEGIN SAWING BETWEEN 4 AND 24 HOURS AFTER PLACEMENT, DEPENDING ON CURING CONDITIONS.
 5. JOINTS SHALL BE FLUSHED OR BLOWN CLEAN IMMEDIATELY AFTER SAWING TO PREVENT RESIDUE FROM HARDENING.
 6. ALL CONCRETE PAVING SHALL BE REINFORCED WITH STEEL BAR MAT. REINFORCEMENT SHALL BE #3 BARS, 18" O.C.E.W.
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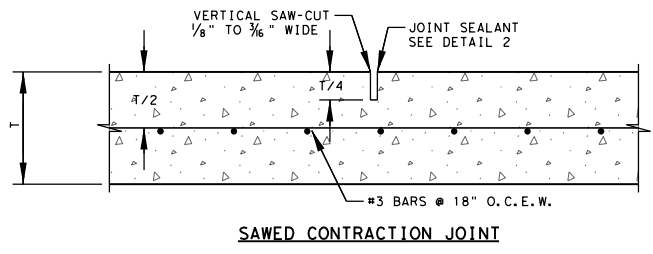
 TOWN OF FAIRVIEW, TEXAS
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 FAIRVIEW, TX 75069
 972-562-0522

E. STACY ROAD IMPROVEMENTS
JOINT LAYOUT
 STA. 104+00 TO END

SCALE: 1" = 40'		SHEET 3 OF 3	
DESIGNED BY:	DRAWN BY:	CHECKED BY:	72
CLM	SR		

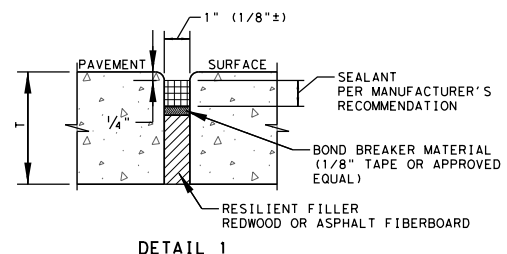
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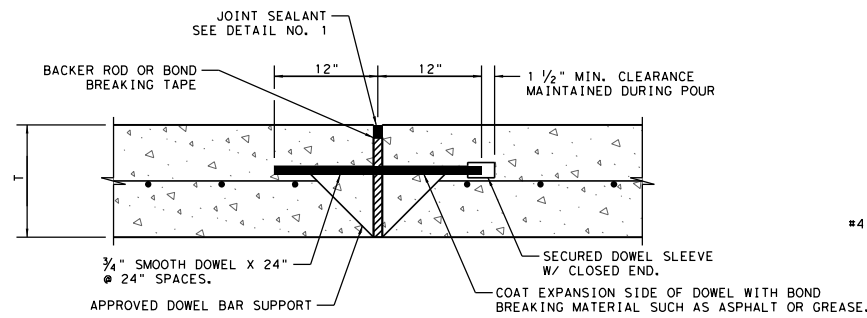


SAWED CONTRACTION JOINT

NOTE:
 1. TRANSVERSE SAWED CONTRACTION JOINTS WILL BE SPACED A MAXIMUM OF 12' UNLESS OTHERWISE SHOWN ON THE PLANS.

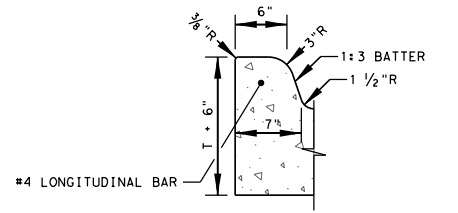


DETAIL 1

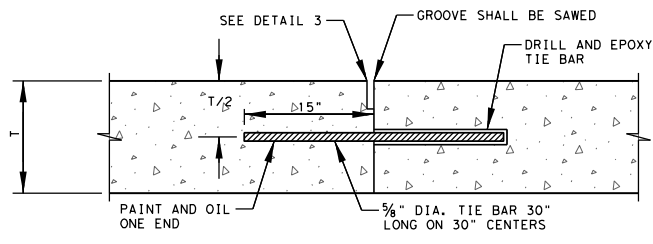


DOWELED EXPANSION JOINT (TYPE A)

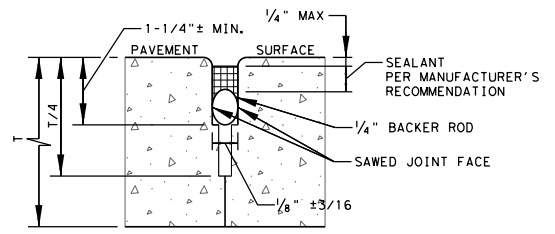
NOTES:
 1. EXPANSION JOINT FILLER MATERIAL SHALL BE ACCURATELY NOTCHED OR HOLED TO RECEIVE EACH DOWEL.
 2. DOWEL BARS SHALL BE ACCURATELY INSTALLED PARALLEL WITH PAVEMENT SURFACE. EACH DOWEL AND REBAR SHALL BE SECURED AGAINST DISPLACEMENT DURING PLACEMENT OF CONCRETE. DOWELS SHALL BE CLEAN AND FREE OF RUST WHEN INSTALLED.
 3. COST OF DOWELED JOINTS AND CONSTRUCTION JOINTS SHALL BE SUBSIDIARY TO THE UNIT PRICE BID FOR REINFORCED CONCRETE PAVEMENT.
 4. DOWEL BARS SHALL BE COATED WITH ASPHALT, GREASE OR OTHER APPROVED COATING FOR 1/2 OF THE LENGTH.



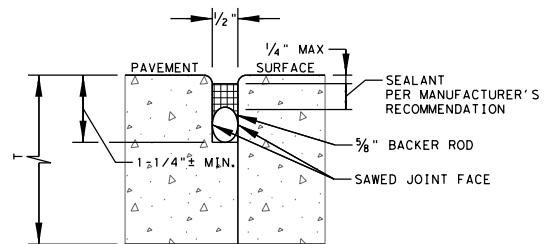
CONCRETE INTEGRAL CURB DETAIL



HINGED CONSTRUCTION JOINT

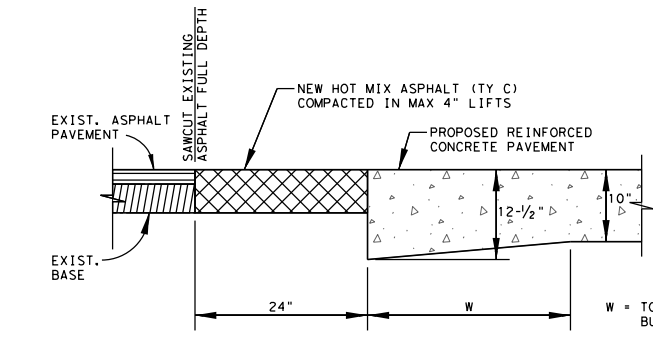


DETAIL 2



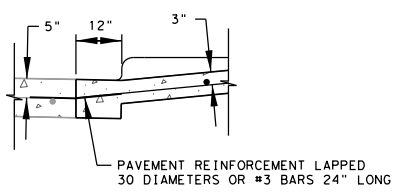
DETAIL 3

NOTE:
 1. JOINT SEALANT SHALL BE SINGLE COMPONENT, CHEMICALLY CURING, SELF-LEVELING SILICONE SEALANT, SUCH AS DOW-CORNING SL-890 OR CRAFCO ROAD SL, OR APPROVED EQUAL AND MEETING THE REQUIREMENTS OF ASTM-5893.

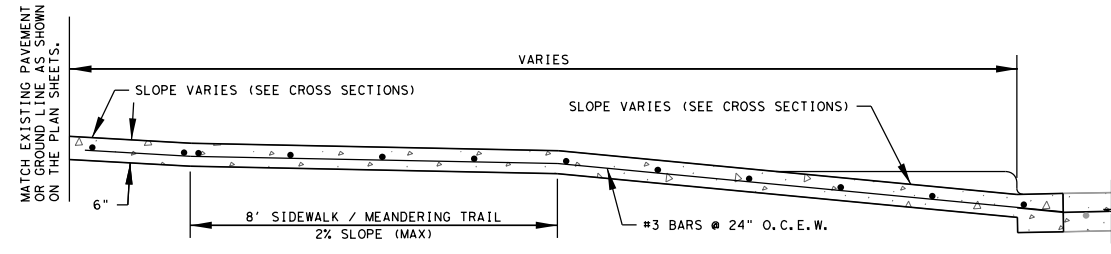


TYPE S - THICKENED EDGE JOINT

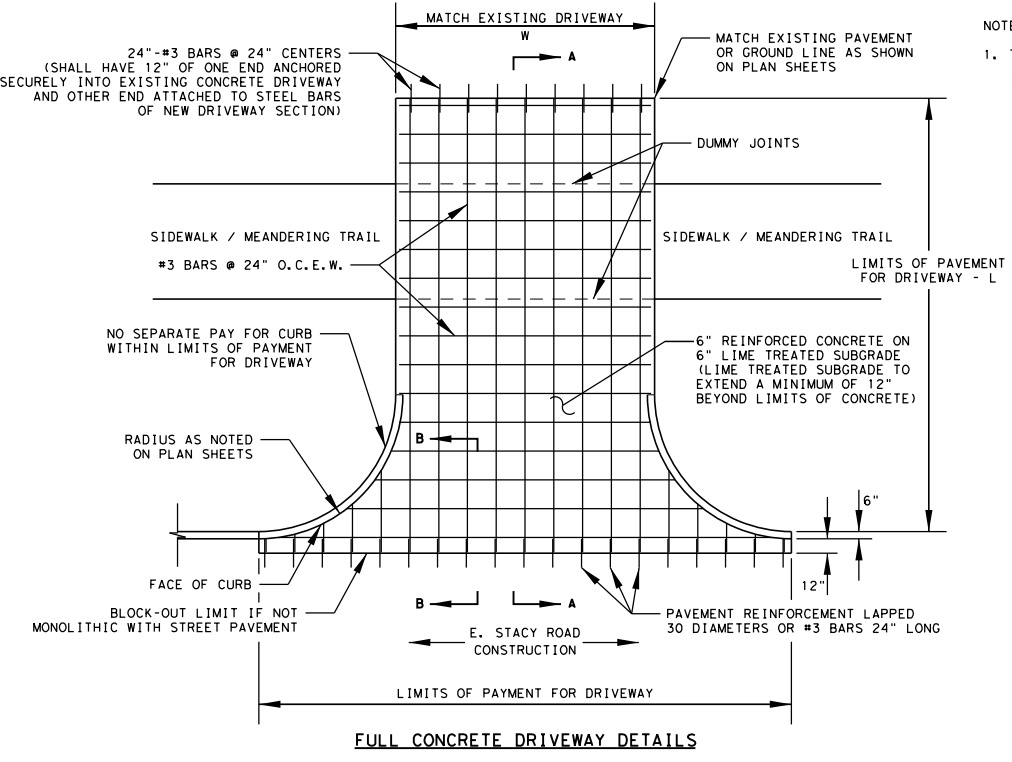
NOTES:
 1. CONTRACTOR SHALL REPAIR DAMAGE TO EXISTING ASPHALT PAVEMENT WITH FULL DEPTH HMA REPAIR TO BOTTOM OF EXISTING BASE.
 2. COST OF THICKENED EDGE JOINTS INCLUDING 2' WID TH OF NEW HOT MIX ASPHALT SHALL BE SUBSIDIARY TO UNIT BID PRICE FOR REINFORCED CONCRETE PAVEMENT.
 3. REMOVAL OF EXISTING ASPHALT PAVEMENT SHALL BE SUBSIDIARY TO THE UNIT PRICE BID FOR REINFORCED CONCRETE PAVEMENT.



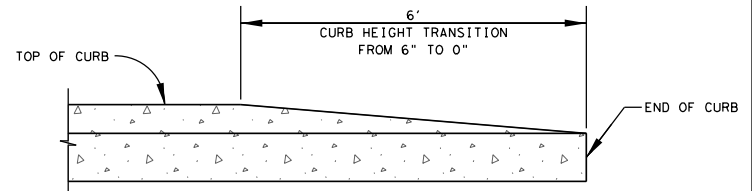
SECTION B-B



SECTION A-A



NOTE:
 FOR PAYMENT FOR CONCRETE DRIVEWAYS BY THE SQUARE YARD WITHIN THE LIMITS FOR PAYMENT AS SHOWN IN THE ABOVE DETAIL SHALL INCLUDE EARTHWORK REQUIRED FOR SUBGRADE PREPARATION, LIME TREATMENT FOR SUBGRADE, LIME FOR TREATMENT, CONCRETE CURB, AND REINFORCED CONCRETE FOR DRIVEWAY PAVEMENT. NO SEPARATE PAY SHALL BE MADE FOR THESE ITEMS WITHIN THE LIMITS OF PAYMENT FOR CONCRETE DRIVEWAYS.



CURB TAPER

NOTE:
 1. TAPER SHALL BE USED ON ALL TERMINI OF CURBS (E.G. AT INTERSECTIONS) UNLESS OTHERWISE NOTED IN THE PLANS.

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 HUITT-ZOLLARS, INC.
 Christian L. Moorman, P.E. #93828
 Date: 3/17/2017

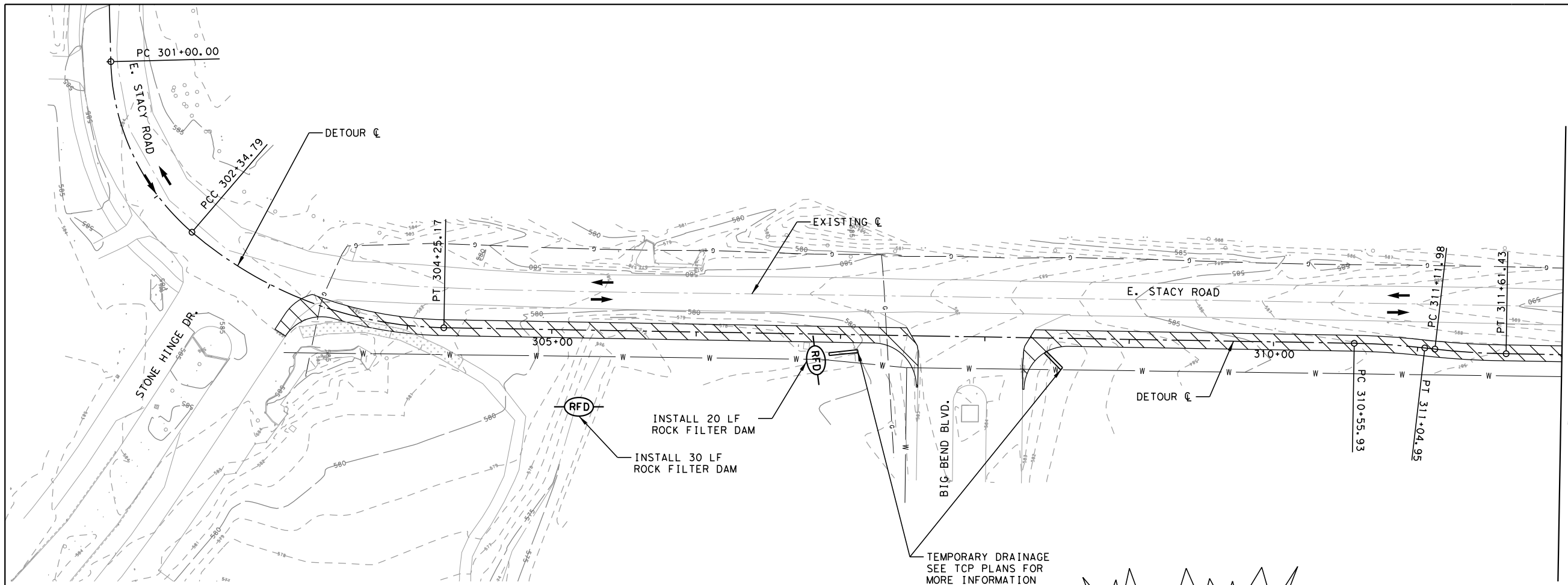
HUITT-ZOLLARS
 HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING
 1717 MCKINNEY AVE., SUITE 1400 DALLAS, TEXAS 75202
 Firm No. F-761

 **TOWN OF FAIRVIEW, TEXAS**
 372 TOWN PLACE
 FAIRVIEW, TX 75069
 972-562-0522

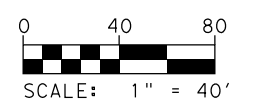
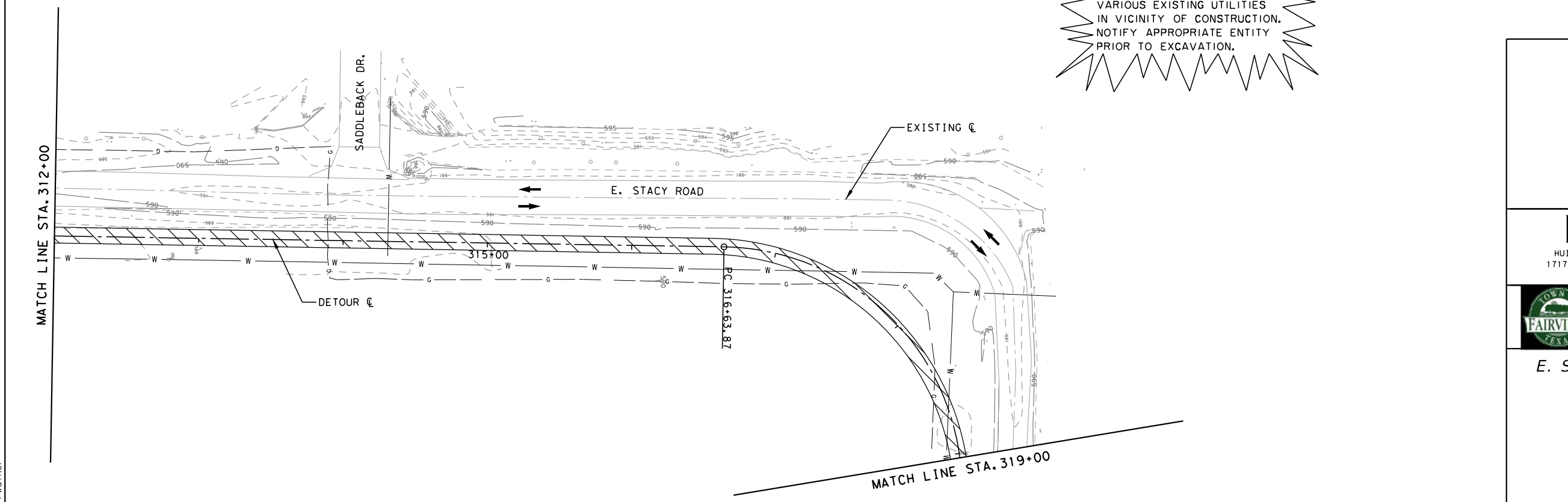
E. STACY ROAD IMPROVEMENTS
PAVING DETAILS

SCALE: NONE		SHEET 1 OF 2		73
DESIGNED BY:	DRAWN BY:	CHECKED BY:		
	CLM	X		

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!! WARNING !!
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LEGEND

- TRAFFIC FLOW
- DETOUR CONSTRUCTION THIS PHASE
- CONCRETE REMOVAL SEE REMOVAL PLANS
- RFD ROCK FILTER DAM
- SCF SILT FENCE

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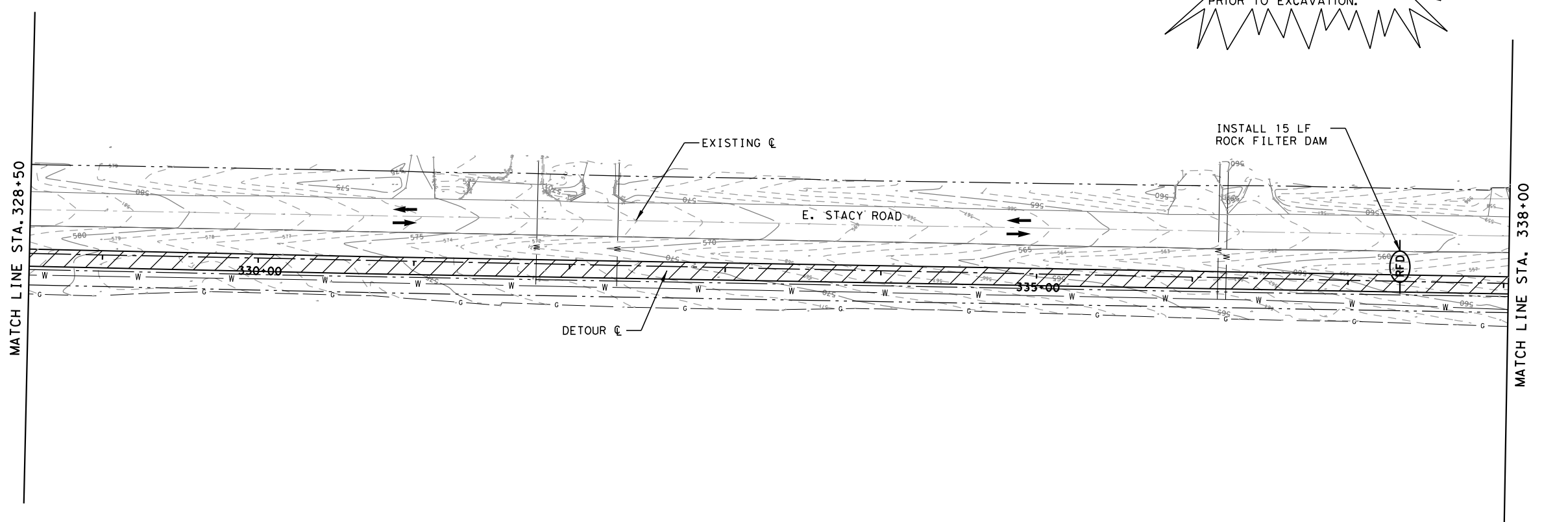
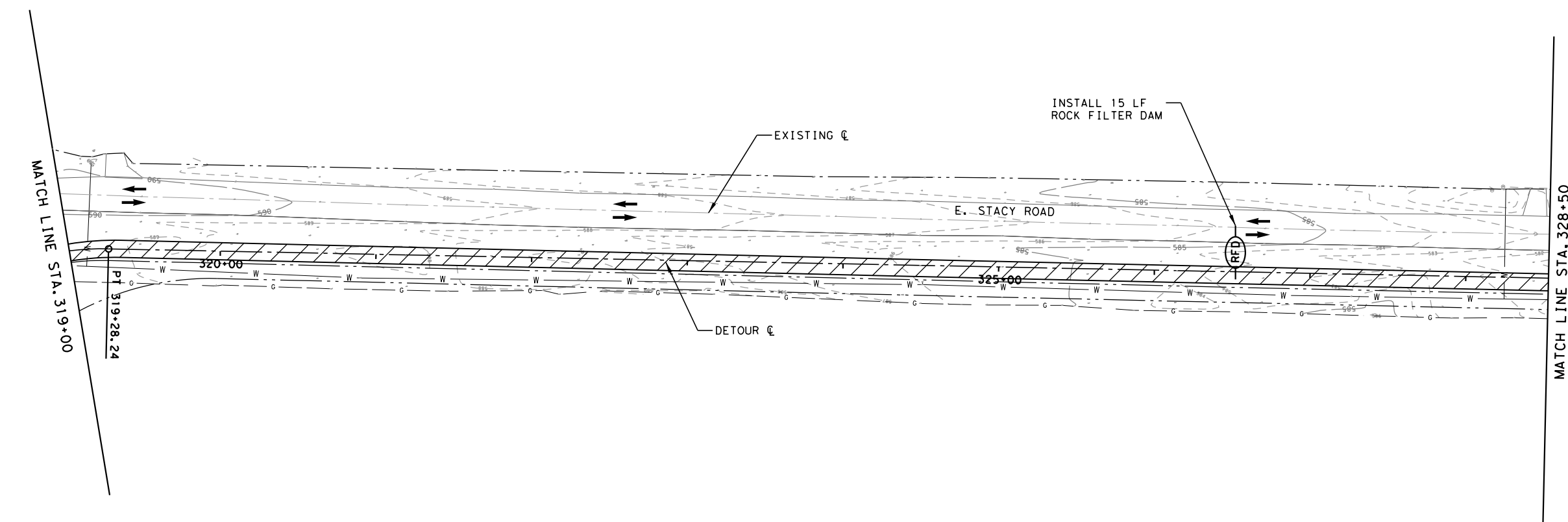
TOWN OF FAIRVIEW, TEXAS
 372 TOWN PLACE
 FAIRVIEW, TX 75069
 972-562-0522

E. STACY ROAD IMPROVEMENTS
EROSION CONTROL PLAN
PHASE 1
 BEGIN TO STA. 319+00

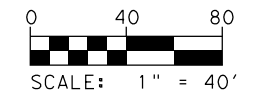
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DESIGNED BY:	DRAWN BY:	CHECKED BY:	74
CLM	CLM		

SHEET NO.

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LEGEND

- TRAFFIC FLOW
- DETOUR CONSTRUCTION THIS PHASE
- CONCRETE REMOVAL SEE REMOVAL PLANS
- ROCK FILTER DAM
- SILT FENCE

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 1717 MCKINNEY AVE., SUITE 1400 DALLAS, TEXAS 75202
 Firm No. F-761

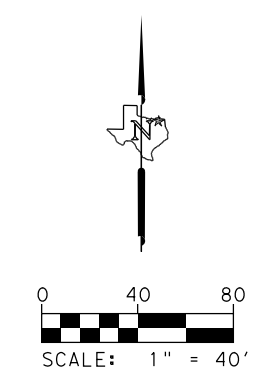
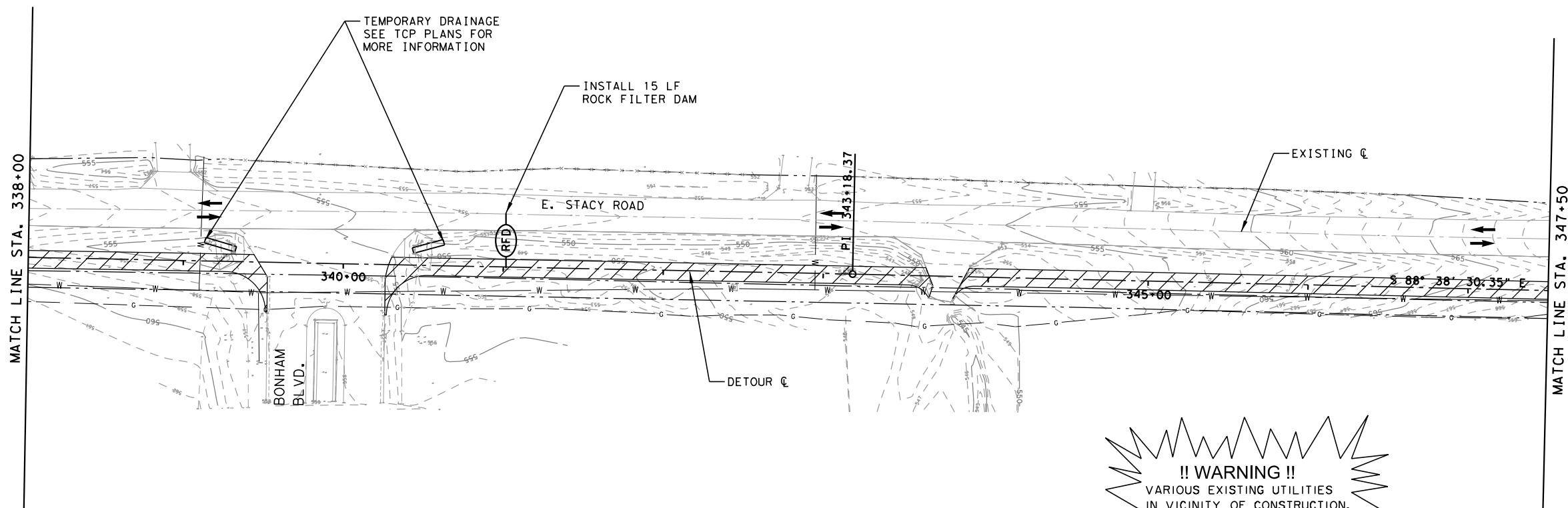


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 372 TOWN PLACE
 FAIRVIEW, TX 75069
 972-562-0522

E. STACY ROAD IMPROVEMENTS
EROSION CONTROL PLAN
PHASE 1
 STA. 319+00 TO STA. 338+00

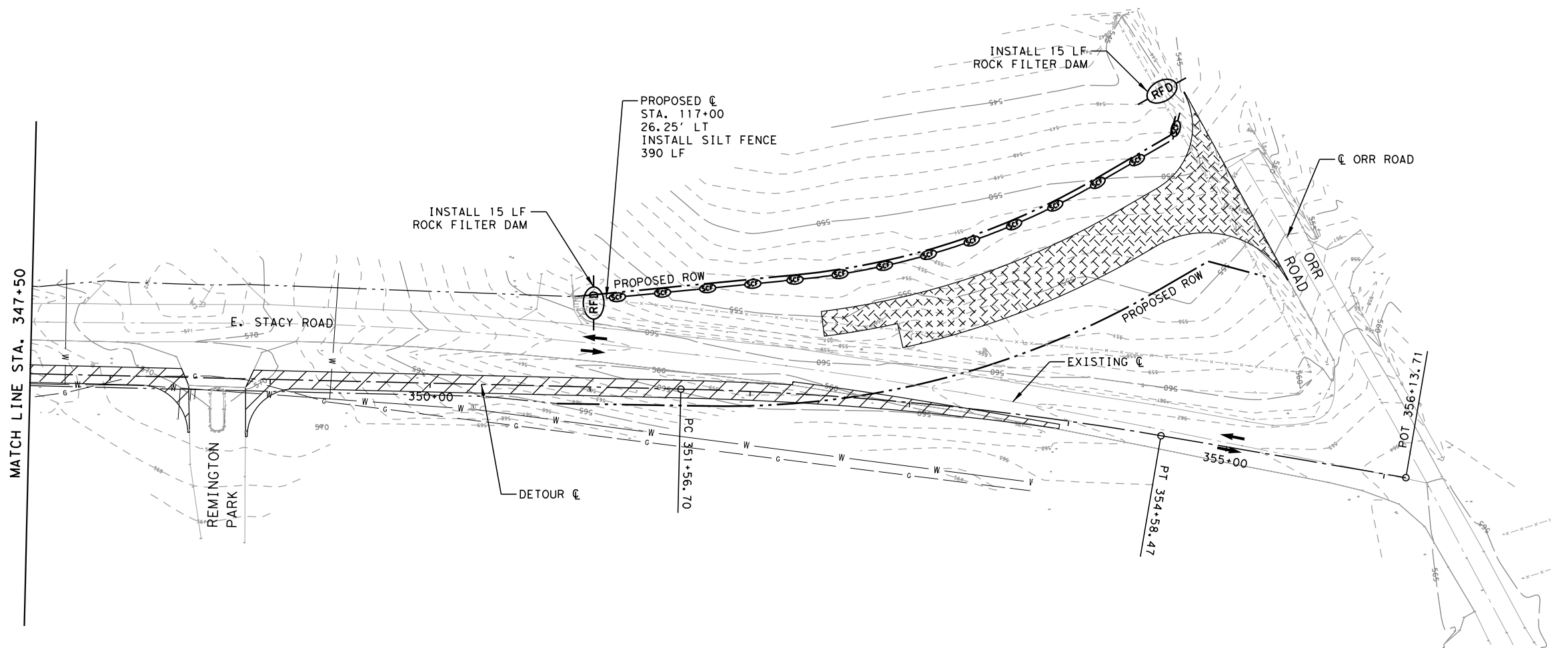
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DESIGNED BY:	DRAWN BY:	CHECKED BY:		
CLM	CLM			

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- LEGEND**
- TRAFFIC FLOW
 - [Hatched Box] DETOUR CONSTRUCTION THIS PHASE
 - [Cross-hatched Box] CONCRETE REMOVAL SEE REMOVAL PLANS
 - (RFD) ROCK FILTER DAM
 - (SCF) SILT FENCE

!! WARNING !!
 VARIOUS EXISTING UTILITIES
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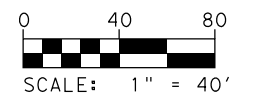
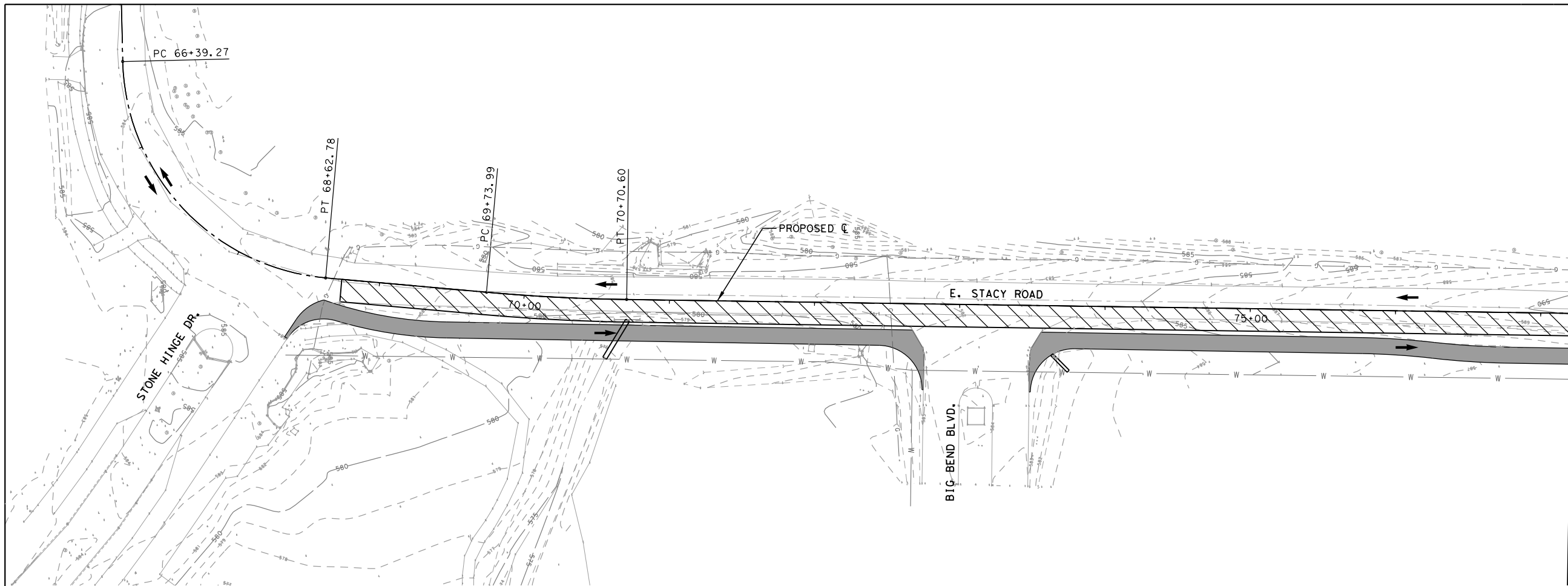
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 372 TOWN PLACE
 FAIRVIEW, TX 75069
 972-562-0522

E. STACY ROAD IMPROVEMENTS
EROSION CONTROL PLAN
PHASE 1
 STA. 338+00 TO END

SCALE: 1" = 40'		SHEET 3 OF 3	
DESIGNED BY:	DRAWN BY:	CHECKED BY:	76
CLM	CLM		

SHEET NO.

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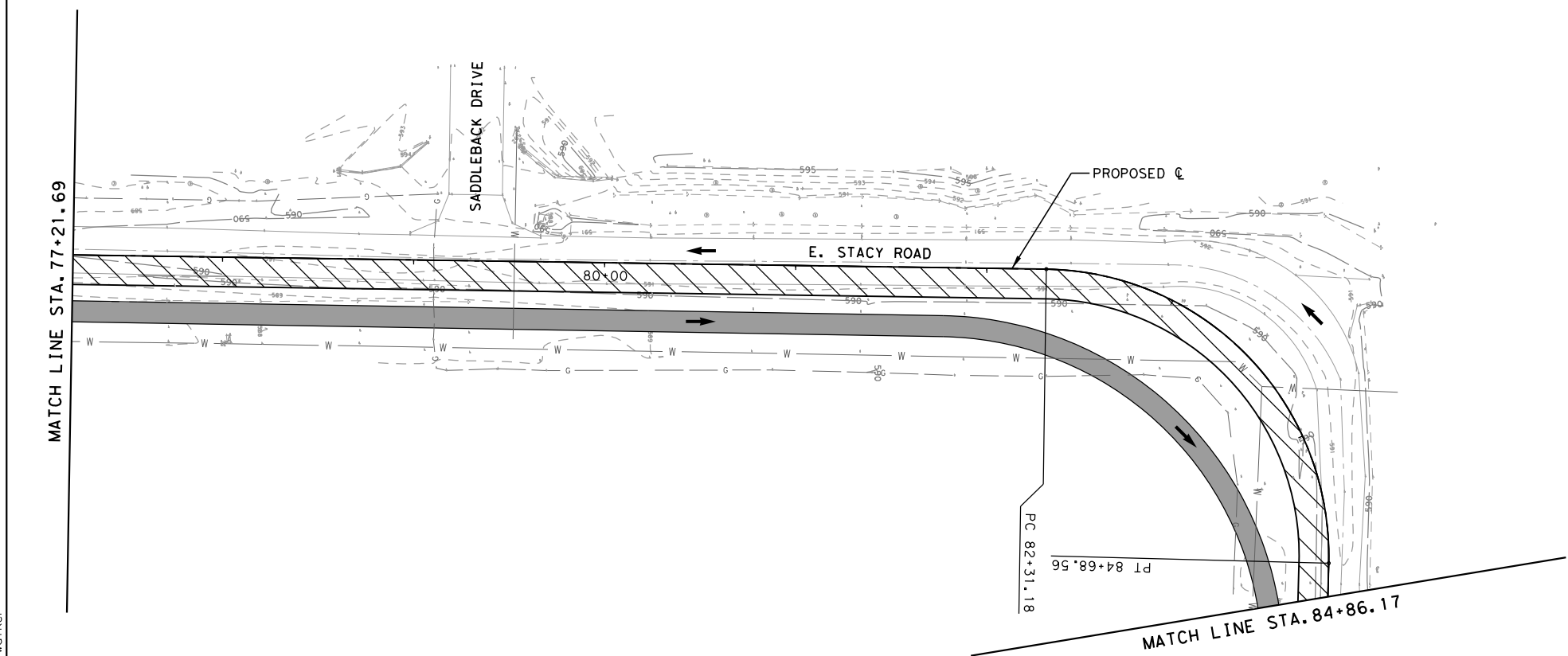


LEGEND

- TRAFFIC FLOW
- DETOUR CONSTRUCTION THIS PHASE
- CONCRETE REMOVAL SEE REMOVAL PLANS
- APPROXIMATE SIGN PLACEMENT
- TYPE III BARRICADE

MATCH LINE STA. 77+21.69

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MATCH LINE STA. 77+21.69

MATCH LINE STA. 84+86.17

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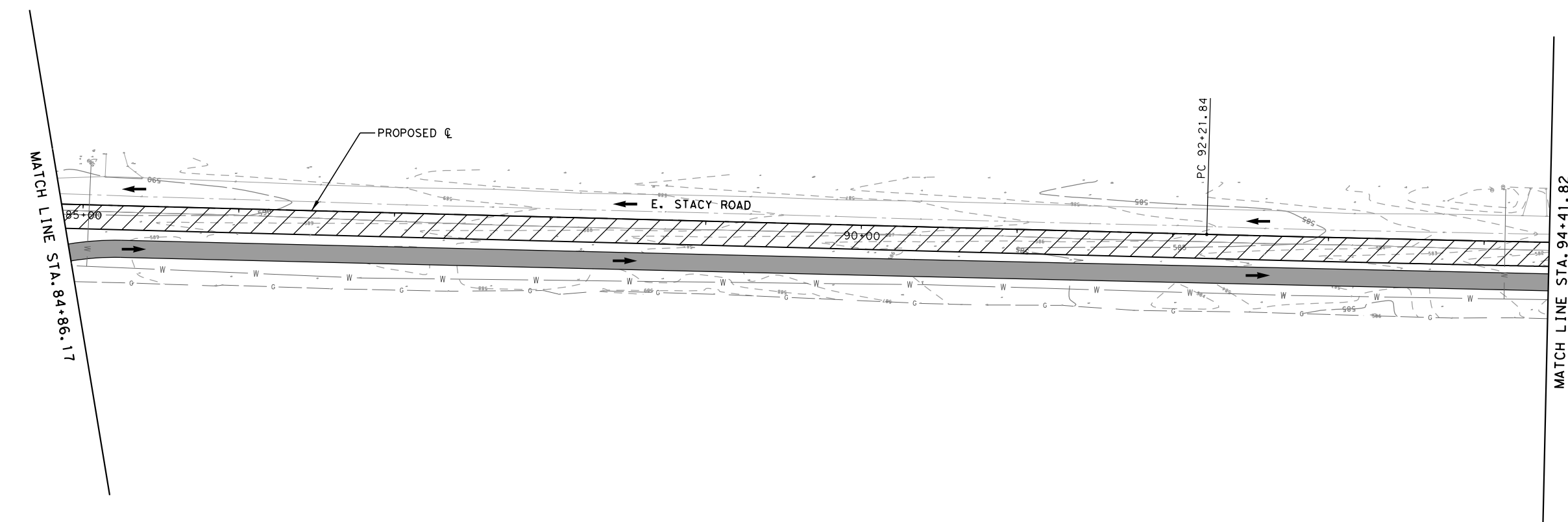
TOWN OF FAIRVIEW, TEXAS
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 FAIRVIEW, TX 75069
 972-562-0522

E. STACY ROAD IMPROVEMENTS
EROSION CONTROL PLAN
PHASE 2
 BEGIN TO STA. 84+86

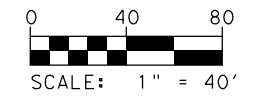
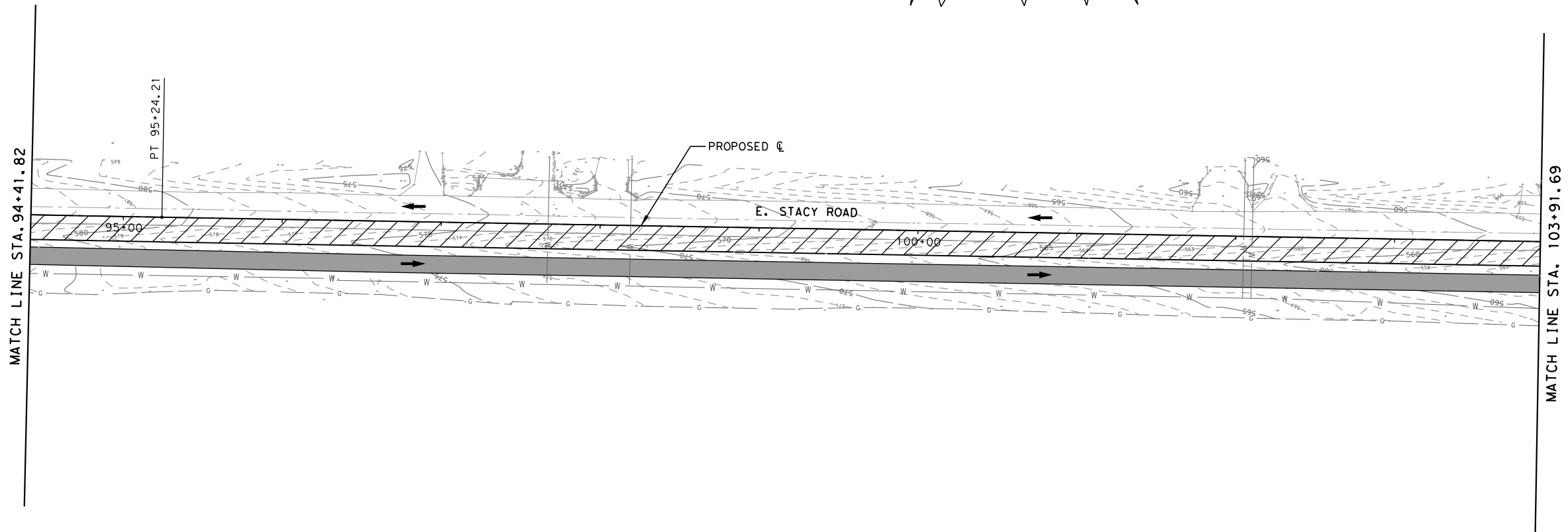
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DESIGNED BY:	DRAWN BY:	CHECKED BY:	77
CLM	CLM		

SHEET NO.

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 IN VICINITY OF CONSTRUCTION.
 NOTIFY APPROPRIATE ENTITY
 PRIOR TO EXCAVATION.



- LEGEND**
- TRAFFIC FLOW
 - PERMANENT CONSTRUCTION THIS PHASE
 - DETOUR CONSTRUCTION PREVIOUS PHASE
 - APPROXIMATE SIGN PLACEMENT
 - TYPE III BARRICADE

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 HUITT-ZOLLARS, INC.
 Christian L. Moorman, P.E. #93828
 Date: 3/17/2017

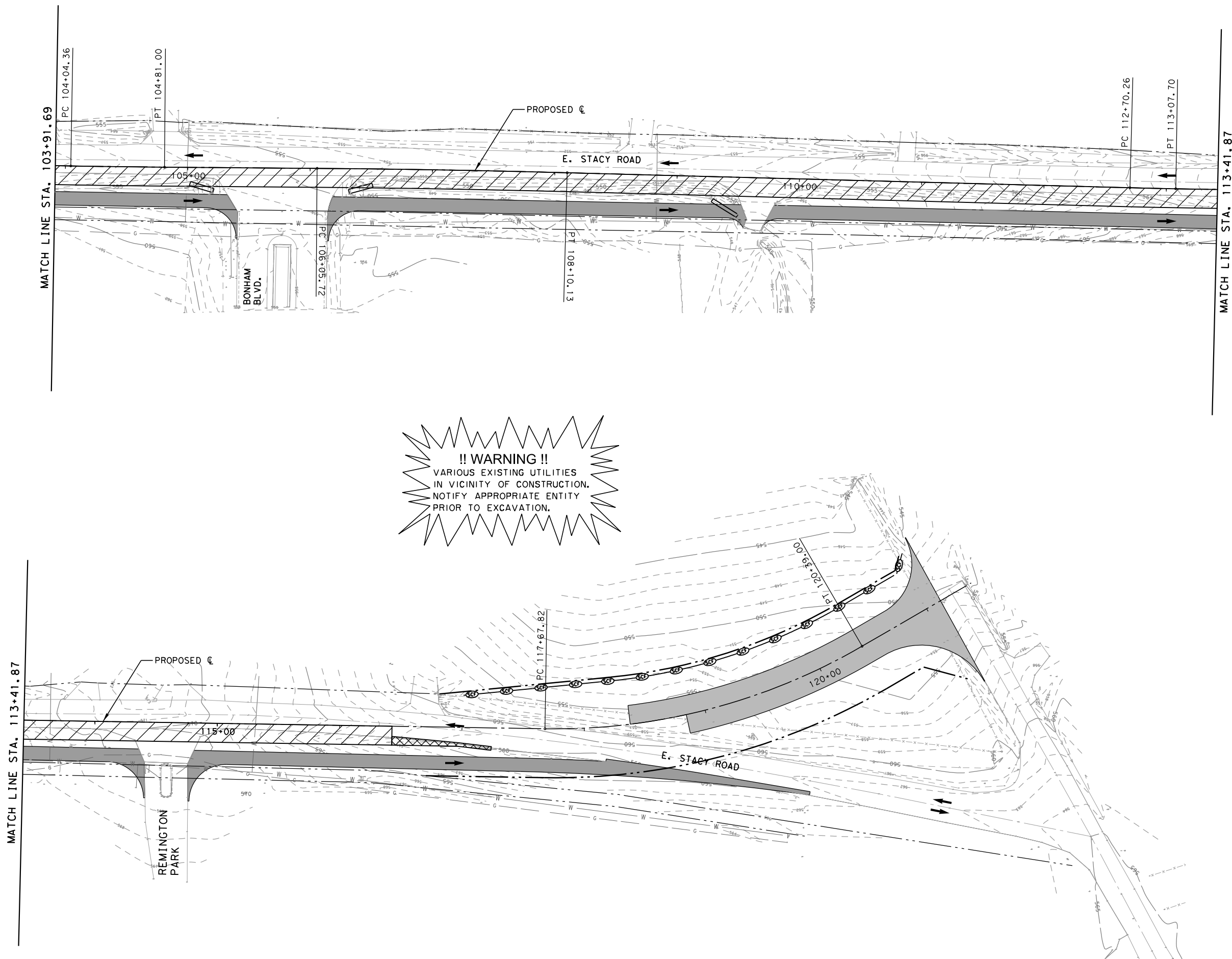
HUITT-ZOLLARS
 HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING
 1717 MCKINNEY AVE., SUITE 1400 DALLAS, TEXAS 75202
 Firm No. F-761

TOWN OF FAIRVIEW, TEXAS
 372 TOWN PLACE
 FAIRVIEW, TX 75069
 972-562-0522

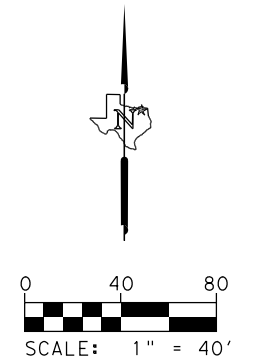
E. STACY ROAD IMPROVEMENTS
EROSION CONTROL PLAN
PHASE 2
 STA. 84+86 TO STA. 103+91

SCALE: 1" = 40'		SHEET 2 OF 3		SHEET NO. 78
DESIGNED BY:	DRAWN BY:	CHECKED BY:		
CLM	CLM			

I:\projects\305245.01 - Town of Fairview Stacy Road Improvements\10 CADD & BIM\10.6 MicroStation\10.6.5 Sheet\09 ENVIR\305245-SW3P-02-03.dgn
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 Firm No. F-761

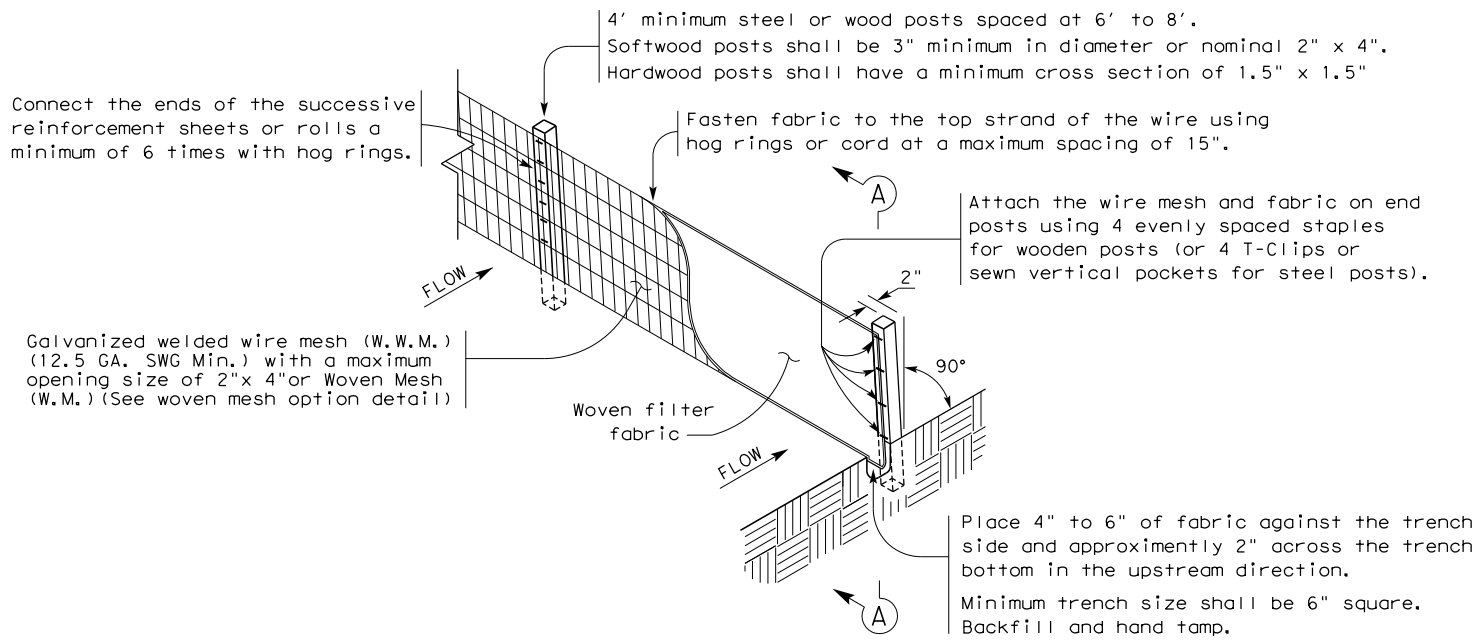
 TOWN OF FAIRVIEW, TEXAS
 372 TOWN PLACE
 FAIRVIEW, TX 75069
 972-562-0522

E. STACY ROAD IMPROVEMENTS
EROSION CONTROL PLAN
PHASE 2
 STA. 103+91 TO END

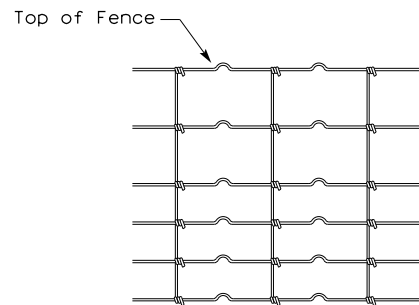
SCALE: 1" = 40'		SHEET 3 OF 3		SHEET NO. 79
DESIGNED BY:	DRAWN BY:	CHECKED BY:		
CLM	CLM			

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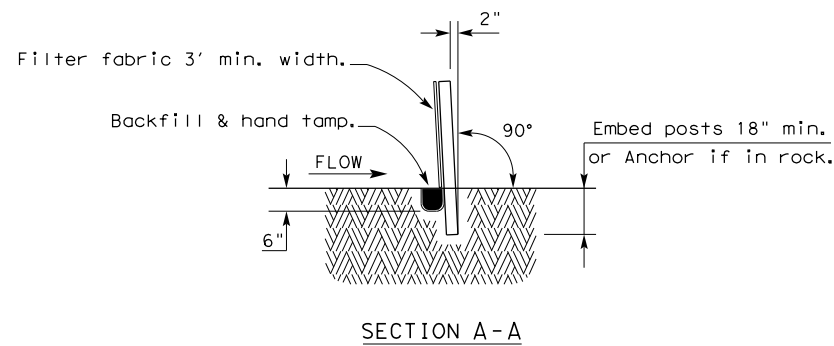


TEMPORARY SEDIMENT CONTROL FENCE



HINGE JOINT KNOT WOVEN MESH (OPTION) DETAIL

Galvanized hinge joint knot woven mesh (12.5 GA. SWG Min.) requires a minimum of five horizontal wires spaced at a maximum of 12 inches apart and all vertical wires spaced at a maximum of 12 inches apart.



SEDIMENT CONTROL FENCE USAGE GUIDELINES

A sediment control fence may be constructed near the downstream perimeter of a disturbed area along a contour to intercept sediment from overland runoff. A 2 year storm frequency may be used to calculate the flow rate to be filtered.

Sediment control fence should be sized to filter a maximum flow through rate of 100 GPM/FT². Sediment control fence is not recommended to control erosion from a drainage area larger than 2 acres.

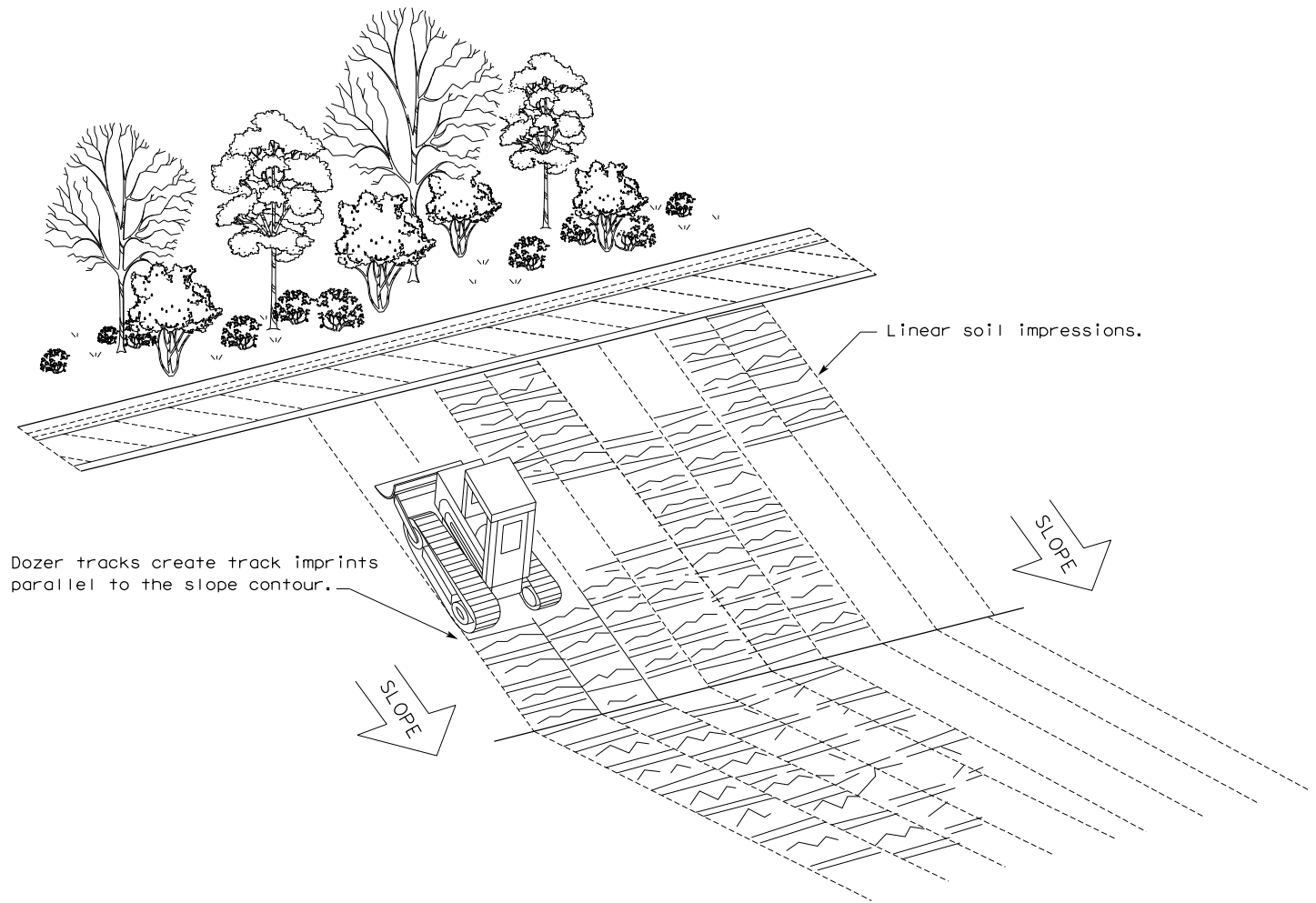
LEGEND

Sediment Control Fence



GENERAL NOTES

1. Vertical tracking is required on projects where soil distributing activities have occurred unless otherwise approved.
2. Perform vertical tracking on slopes to temporarily stabilize soil.
3. Provide equipment with a track undercarriage capable of producing linear soil impressions measuring a minimum of 12" in length by 2" to 4" in width by 1/2" to 2" in depth.
4. Do not exceed 12" between track impressions.
5. Install continuous linear track impressions where the minimum 12" length impressions are perpendicular to the slope or direction of water flow.

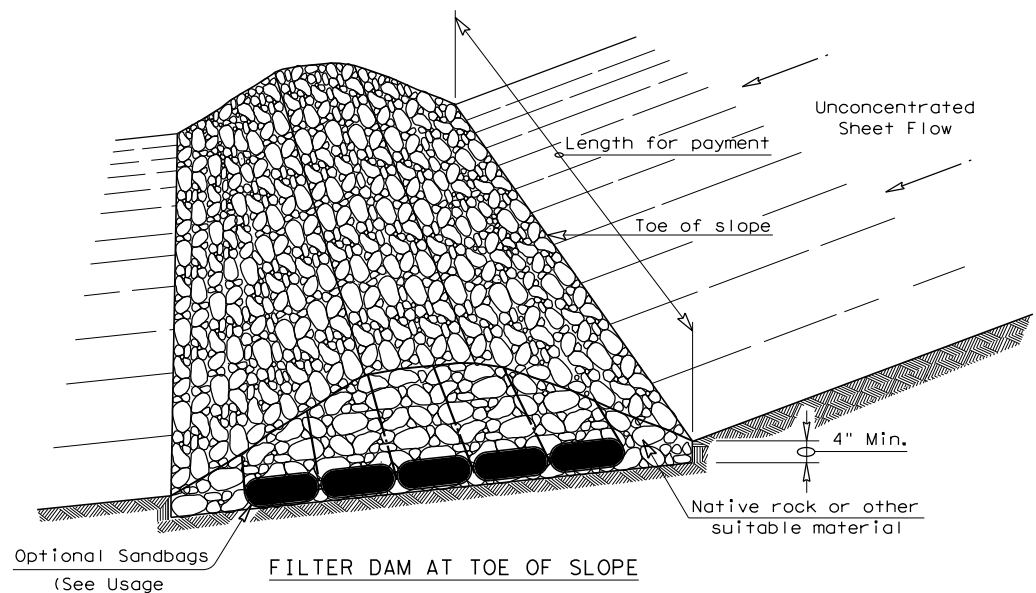


VERTICAL TRACKING

				Design Division Standard	
TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES FENCE & VERTICAL TRACKING EC(1) - 16					
FILE: ec116	DN: TxDOT	CK: KM	DW: VP	DN/CK: LS	
© TxDOT: JULY 2016	CONT	SECT	JOB	HIGHWAY	
REVISIONS			STACY ROAD		
	DIST	COUNTY	SHEET NO.		
	COLLIN		80		

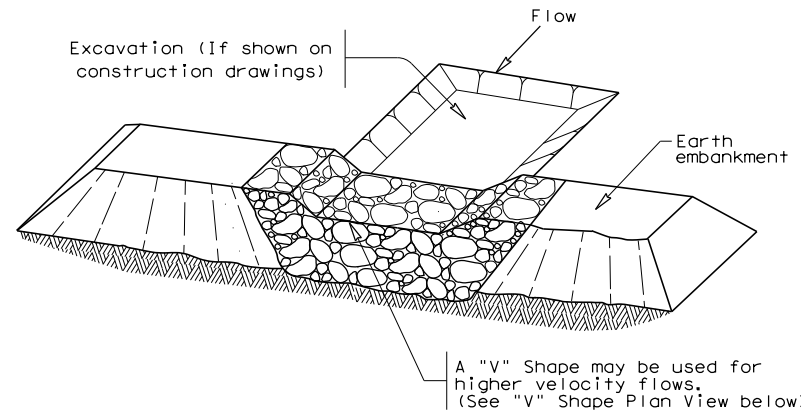
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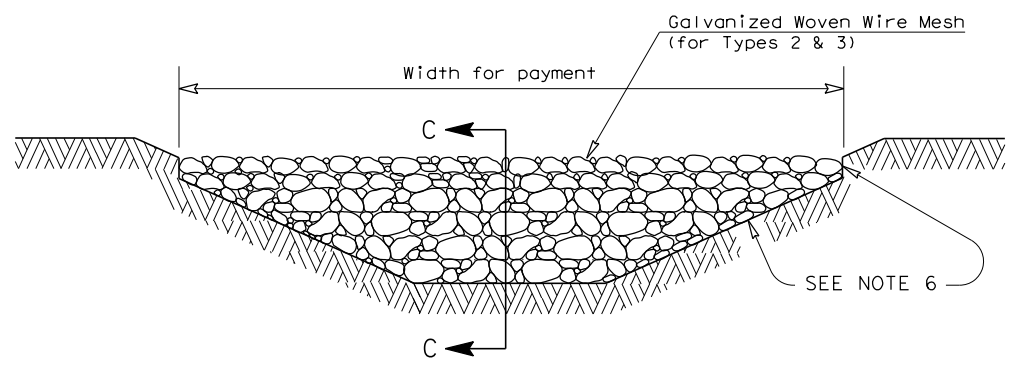
FILTER DAM AT TOE OF SLOPE

(RFD1)



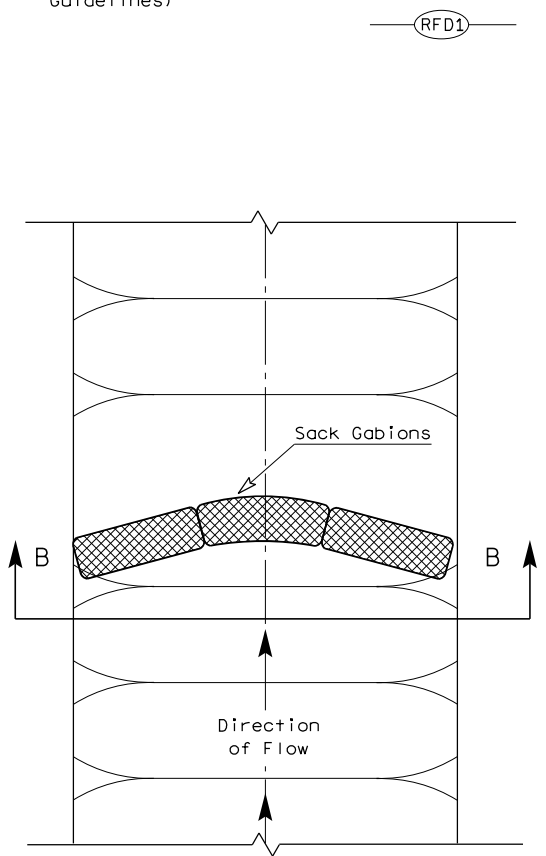
FILTER DAM AT SEDIMENT TRAP

(RFD1) OR (RFD2)

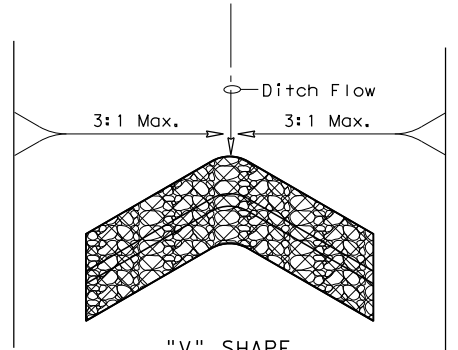


FILTER DAM AT CHANNEL SECTIONS

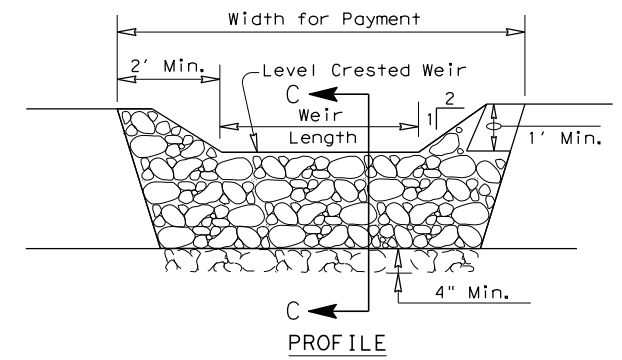
(RFD1) OR (RFD2) OR (RFD3)



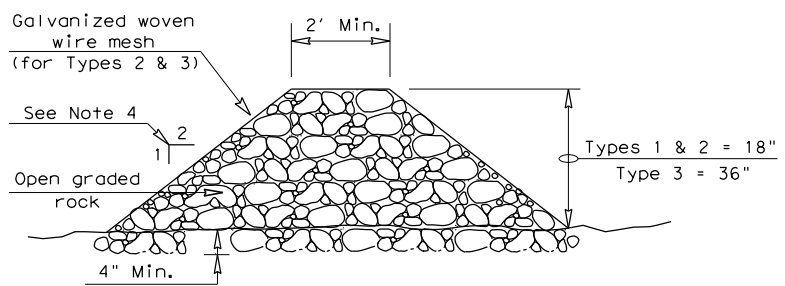
PLAN VIEW



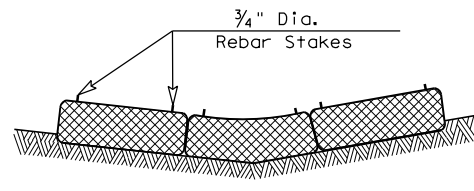
"V" SHAPE PLAN VIEW



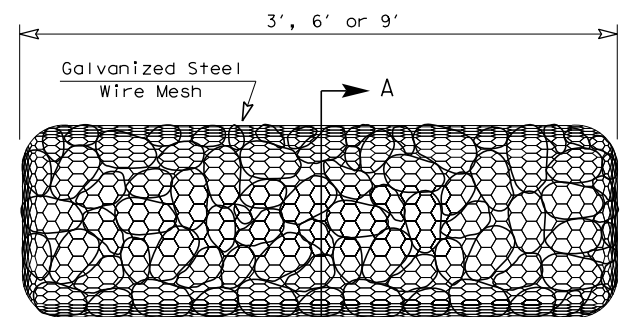
PROFILE



SECTION C-C

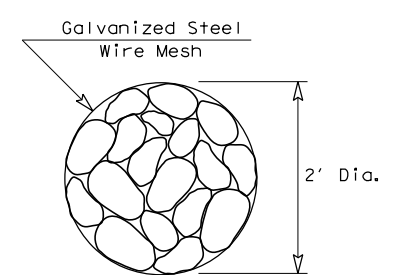


SECTION B-B



TYPE 4 (SACK GABIONS)

(RFD4)



SECTION A-A

ROCK FILTER DAM USAGE GUIDELINES

Rock Filter Dams should be constructed downstream from disturbed areas to intercept sediment from overland runoff and/or concentrated flow. The dams should be sized to filter a maximum flow through rate of 60 GPM/FT² of cross sectional area. A 2 year storm frequency may be used to calculate the flow rate.

Type 1 (18" high with no wire mesh) (3" to 6" aggregate): Type 1 may be used at the toe of slopes, around inlets, in small ditches, and at dike or swale outlets. This type of dam is recommended to control erosion from a drainage area of 5 acres or less. Type 1 may not be used in concentrated high velocity flows (approximately 8 Ft/Sec or more) in which aggregate wash out may occur. Sandbags may be used at the embedded foundation (4" deep min.) for better filtering efficiency of low flows if called for on the plans or directed by the Engineer.

Type 2 (18" high with wire mesh) (3" to 6" aggregate): Type 2 may be used in ditches and at dike or swale outlets.

Type 3 (36" high with wire mesh) (4" to 8" aggregate): Type 3 may be used in stream flow and should be secured to the stream bed.

Type 4 (Sack gabions) (3" to 6" aggregate): Type 4 May be used in ditches and smaller channels to form an erosion control dam.

Type 5: Provide rock filter dams as shown on plans.

GENERAL NOTES

1. If shown on the plans or directed by the Engineer, filter dams should be placed near the toe of slopes where erosion is anticipated, upstream and/or downstream at drainage structures, and in roadway ditches and channels to collect sediment.
2. Materials (aggregate, wire mesh, sandbags, etc.) shall be as indicated by the specification for "Rock Filter Dams for Erosion and Sedimentation Control".
3. The rock filter dam dimensions shall be as indicated on the SW3P plans.
4. Side slopes should be 2:1 or flatter. Dams within the safety zone shall have sideslopes of 6:1 or flatter.
5. Maintain a minimum of 1' between top of rock filter dam weir and top of embankment for filter dams at sediment traps.
6. Filter dams should be embedded a minimum of 4" into existing ground.
7. The sediment trap for ponding of sediment laden runoff shall be of the dimensions shown on the plans.
8. Rock filter dam types 2 & 3 shall be secured with 20 gauge galvanized woven wire mesh with 1" diameter hexagonal openings. The aggregate shall be placed on the mesh to the height & slopes specified. The mesh shall be folded at the upstream side over the aggregate and tightly secured to itself on the downstream side using wire ties or hog rings. For in stream use, the mesh should be secured or staked to the stream bed prior to aggregate placement.
9. Sack Gabions should be staked down with 3/4" dia. rebar stakes, and have a double-twisted hexagonal weave with a nominal mesh opening of 2 1/2" x 3 1/4".
10. Flow outlet should be onto a stabilized area (vegetation, rock, etc.).
11. The guidelines shown hereon are suggestions only and may be modified by the Engineer.

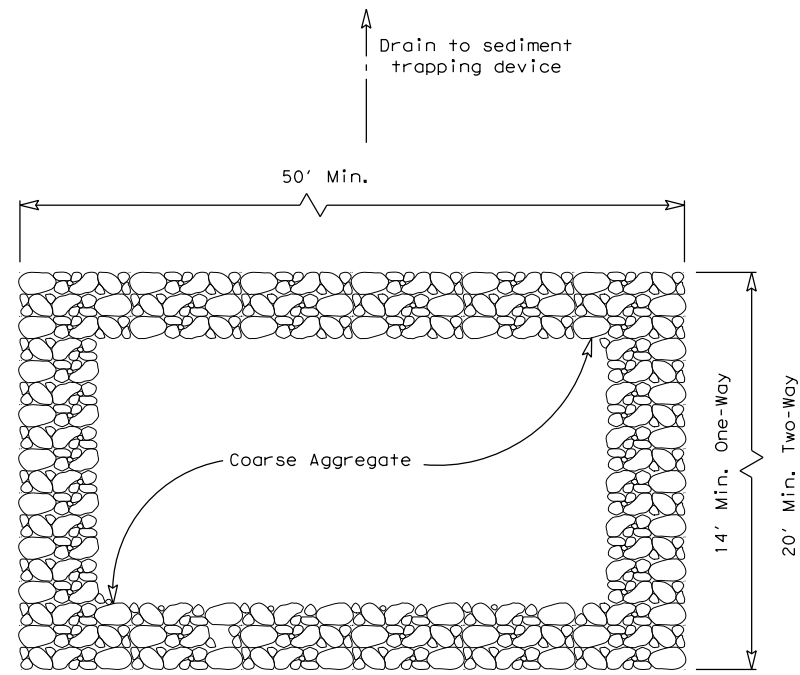
PLAN SHEET LEGEND

- Type 1 Rock Filter Dam (RFD1)
- Type 2 Rock Filter Dam (RFD2)
- Type 3 Rock Filter Dam (RFD3)
- Type 4 Rock Filter Dam (RFD4)

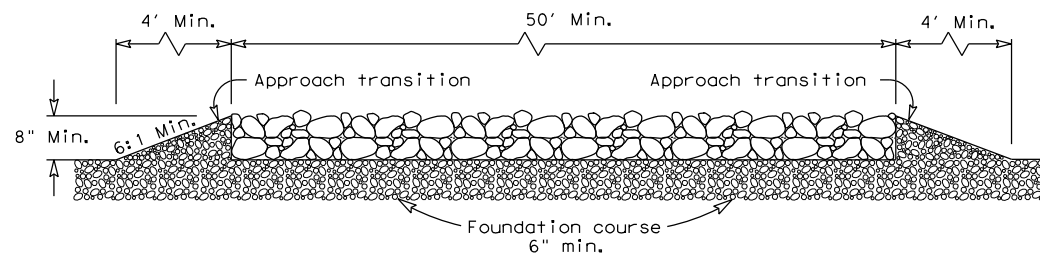
		Design Division Standard	
TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES ROCK FILTER DAMS EC(2) - 16			
FILE: ec216	DN: TxDOT	CK: KM	DW: VP
© TxDOT: JULY 2016	CONT	SECT	JOB
REVISIONS		HIGHWAY	
		DIST	COUNTY
		COLLIN	
			SHEET NO.
			81

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PLAN VIEW

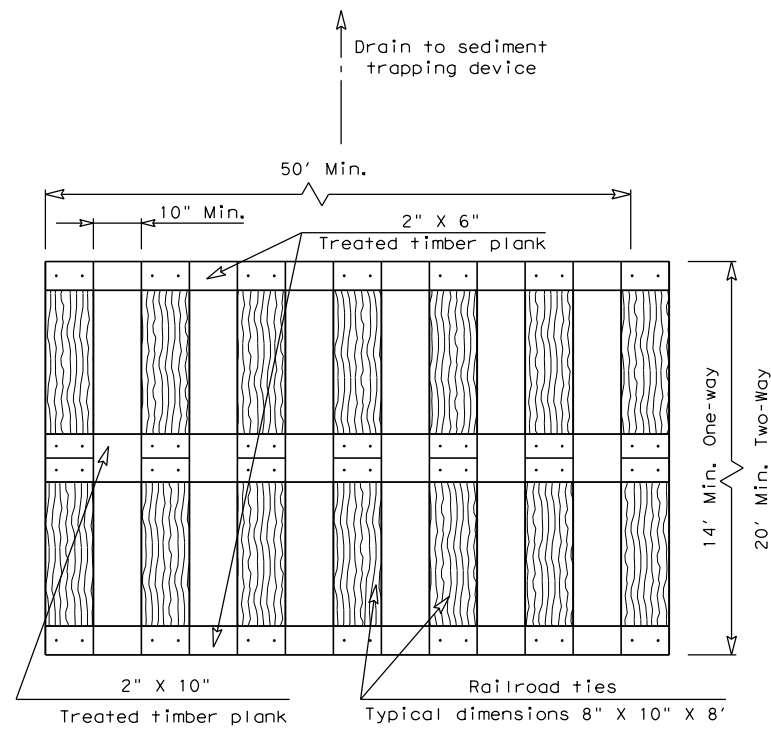


ELEVATION VIEW

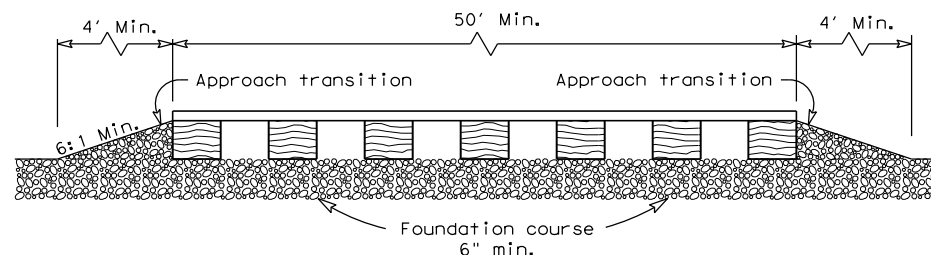
CONSTRUCTION EXIT (TYPE 1)
 ROCK CONSTRUCTION (LONG TERM)

GENERAL NOTES (TYPE 1)

1. The length of the type 1 construction exit shall be as indicated on the plans, but not less than 50'.
2. The coarse aggregate should be open graded with a size of 4" to 8".
3. The approach transitions should be no steeper than 6:1 and constructed as directed by the Engineer.
4. The construction exit foundation course shall be flexible base, bituminous concrete, portland cement concrete or other materials approved by the Engineer.
5. The construction exit shall be graded to allow drainage to a sediment trapping device.
6. The guidelines shown hereon are suggestions only and may be modified by the Engineer.
7. Construct exits with a width of at least 14 ft. for one-way and 20 ft. for two-way traffic for the full width of the exit, or as directed by the engineer.



PLAN VIEW

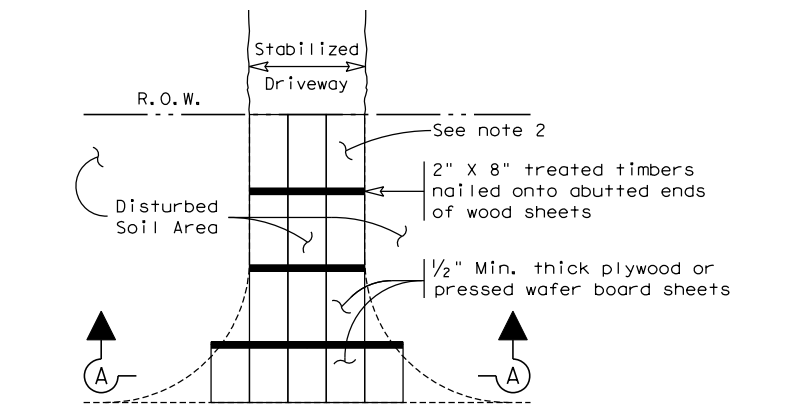


ELEVATION VIEW

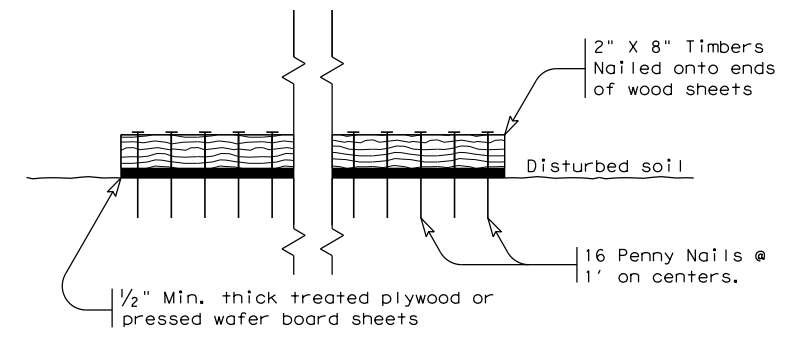
CONSTRUCTION EXIT (TYPE 2)
 TIMBER CONSTRUCTION (LONG TERM)

GENERAL NOTES (TYPE 2)

1. The length of the type 2 construction exit shall be as indicated on the plans, but not less than 50'.
2. The treated timber planks shall be attached to the railroad ties with 1/2" x 6" min. lag bolts. Other fasteners may be used as approved by the Engineer.
3. The treated timber planks shall be #2 grade min., and should be free from large and loose knots.
4. The approach transitions shall be no steeper than 6:1 and constructed as directed by the Engineer.
5. The construction exit foundation course shall be flexible base, bituminous concrete, portland cement concrete or other material as approved by the Engineer.
6. The construction exit should be graded to allow drainage to a sediment trapping device.
7. The guidelines shown hereon are suggestions only and may be modified by the Engineer.
8. Construct exits with a width of at least 14 ft. for one-way and 20 ft. for two-way traffic for the full width of the exit, or as directed by the engineer.



PLAN VIEW



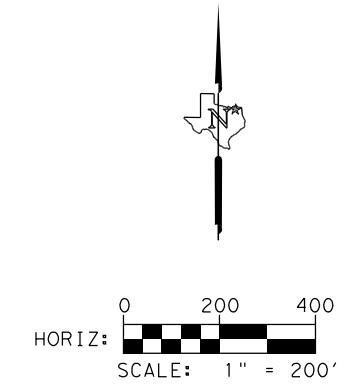
SECTION A-A
 CONSTRUCTION EXIT (TYPE 3)
 SHORT TERM

GENERAL NOTES (TYPE 3)

1. The length of the type 3 construction exit shall be as shown on the plans, or as directed by the Engineer.
2. The type 3 construction exit may be constructed from open graded crushed stone with a size of two to four inches spread a min. of 4" thick to the limits shown on the plans.
3. The treated timber planks shall be #2 grade min., and should be free from large and loose knots.
4. The guidelines shown hereon are suggestions only and may be modified by the Engineer.

		Design Division Standard	
TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES CONSTRUCTION EXITS EC(3)-16			
FILE: ec316	DN: TxDOT	CK: KM	DW: VP
© TxDOT: JULY 2016	CONT	SECT	JOB
REVISIONS			HIGHWAY
DIST		COUNTY	SHEET NO.
		COLLIN	82

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- LEGEND**
- AZ → DRAINAGE AREA ID
 - XXX → DRAINAGE AREA IN ACRES
 - XXX → FLOW (CFS)
 - MAJOR DRAINAGE BOUNDARY
 - - - MINOR DRAINAGE BOUNDARY

- GENERAL NOTES**
1. AREAS A3, A12, A16, & A18 ARE BASED ON PARKSIDE (BY DOWDEY, ANDERSOND & ASSOCIATES, INC. DATED 6-8-15) & REMINGTON (BY CRANELL, CRANNEL, & MARTIN (4-1-13) ENGINEERING PLANS.
 2. AREA A1 FLOW BASED ON OUTFALL FROM HERITAGE DEVELOPMENT (BY KACY R. FLEMMS DATED 3-5-02)

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HUITT-ZOLLARS, INC.
Hamilton Dallagasperina, P.E. #91748
Date: 3/17/2017

HUITT-ZOLLARS

HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING
1717 MCKINNEY AVE., SUITE 1400 DALLAS, TEXAS 75202
Firm No. F-761

TOWN OF FAIRVIEW, TEXAS
372 TOWN PLACE
FAIRVIEW, TX 75069
972-562-0522

**E. STACY ROAD IMPROVEMENTS
DRAINAGE AREA MAP**

SCALE: H: 1" = 200'		SHEET 1 OF 1	SHEET NO.
DESIGNED BY:	DRAWN BY:	CHECKED BY:	83
RAW	RAW		

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TOWN OF FAIRVIEW - EAST STACY ROAD -										
RATIONAL METHOD RUNOFF CALCULATIONS										
Structure Name	AREA NAME	AREA (ac.)	Tc	"C"	C*A	C100	C100*A	I100 (in/hr)	Q100 (cfs)	COMMENTS
STREET EAST STACY ROAD										
A1	A1	-			-	-	-	-	62.20	BASED ON HERITAGE RANCH ENGINEERING PLAN
A2	A2	1.19	15.00	0.69	0.82	0.69	0.82	7.52	6.19	
A3	A3	1.51	15.00	0.74	1.11	0.74	1.11	7.52	8.38	
A4	A4	0.96	15.00	0.55	0.53	0.55	0.53	7.52	3.96	
A5	A5	0.17	15.00	0.90	0.15	0.90	0.15	7.52	1.15	
A6	A6	0.74	15.00	0.90	0.67	0.90	0.67	7.52	5.02	
A7	A7	1.38	15.00	0.59	0.82	0.59	0.82	7.52	6.17	
A8	A8	5.78	15.00	0.45	2.60	0.45	2.60	7.52	19.55	
A9	A9	0.42	15.00	0.90	0.38	0.90	0.38	7.52	2.86	
A10	A10	1.18	15.00	0.79	0.93	0.79	0.93	7.52	6.97	
A11	A11	0.58	15.00	0.87	0.50	0.87	0.50	7.52	3.76	
A12	A12	2.72	15.00	0.55	1.50	0.55	1.50	7.52	11.26	
A16	A16	3.63	15.00	0.55	2.00	0.55	2.00	7.52	15.03	
A17	A17	28.06	15.00	0.45	12.63	0.45	12.63	7.52	94.97	
A18	A18	3.49	15.00	0.55	1.92	0.55	1.92	7.52	14.44	
A19	A19	0.45	15.00	0.90	0.41	0.90	0.41	7.52	3.05	
A20	A20	0.54	15.00	0.90	0.49	0.90	0.49	7.52	3.68	
A21	A21	0.47	15.00	0.88	0.41	0.88	0.41	7.52	3.10	
A22	A22	13.64	15.00	0.45	6.14	0.45	6.14	7.52	46.17	
A23	A23	4.33	15.00	0.45	1.95	0.45	1.95	7.52	14.65	
A24	A24	0.92	15.00	0.84	0.78	0.84	0.78	7.52	5.84	
A25	A25	0.33	15.00	0.45	0.15	0.45	0.15	7.52	1.10	
A26	A26	0.23	15.00	0.90	0.21	0.90	0.21	7.52	1.55	
A27	A27	2.88	15.00	0.49	1.41	0.49	1.41	7.52	10.64	
A28	A28	0.25	15.00	0.90	0.22	0.90	0.22	7.52	1.68	

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 Firm No. F-761

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 372 TOWN PLACE
 FAIRVIEW, TX 75069
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E. STACY ROAD IMPROVEMENTS
RUNOFF CALCULATIONS

DESIGNED BY: RAW	DRAWN BY: RAW	CHECKED BY:
SHEET 1 OF 1		SHEET NO. 84

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TOWN OF FAIRVIEW - EAST STACY ROAD - COMPUTATION SHEET FOR DETERMINING CAPACITY OF CURB OPENING INLET ON GRADE (DEPRESSED)																													
INLET DESIGN POINT	INLET NO.	STATION	DRAINAGE AREA				LONG. SLOPE S (FT/FT)	STREET SECTION (TYPE)	MANNING'S COEFFICIENT PAVEMENT "n"	CROSS SLOPE OF PAVEMENT Sx (FT/FT)	CROSS SLOPE OF GUTTER S'x (FT/FT)	100 YEAR INTENSITY (IN/HR)	100 YEAR RUNOFF (CFS)	100 YEAR CARRYOVER (CFS)	100 YEAR TOTAL GUTTER Q (CFS)	DEPTH OF FLOW Y _o , 100 YR (FT)	SPREAD OF FLOW T, 100 YR (FT)	EQUIVALENT CROSS SLOPE S _e , 100 YR (FT/FT)	RIGHT-OF-WAY CAPACITY (CFS)	DESIGN STORM***	LENGTH REQUIRED LT, 100 YR (FT)	ACTUAL PROVIDED LENGTH, L (FT)	100 YEAR L/L	100 YEAR EFFICIENCY "E"	INLET CAPACITY Q _i , 100 YR (CFS)	100 YEAR CARRYOVER FLOW "q" (CFS)	COMMENTS		
			Area ID		AREA (ACRES)	RUNOFF COEFF. "c"																						CONC. TIME (MIN)	
			Name	%																									
A5	A5	78+25.00	A5	100%	0.17	0.90	15.00	0.0178	ROOFTOP CROWN	0.012	0.020	0.17	7.52	1.15	0.00	1.15	0.123	6.13	0.152		100-YEAR	3.77	10.00	1.00	1.00	1.00	5.02	0.00	
A6	A6	74+15.00	A6	100%	0.74	0.90	15.00	0.0178	ROOFTOP CROWN	0.012	0.020	0.17	7.52	5.02	0.00	5.02	0.213	10.65	0.106		100-YEAR	13.33	15.00	1.00	1.00	1.00	1.15	0.00	
A7	A7	87+95.00	A7	100%	1.38	0.59	15.00	0.0050	ROOFTOP CROWN	0.012	0.020	0.17	7.52	6.17	0.00	6.17	0.292	14.60	0.082		100-YEAR	13.91	15.00	1.00	1.00	6.17	0.00		

TOWN OF FAIRVIEW - EAST STACY ROAD - COMPUTATION SHEET FOR DETERMINING CAPACITY OF CURB INLETS IN SUMPS																				
INLET NO (Sump I.D.)	GUTTER SLOPE S _o FT./FT.	CROWN SLOPE OF PVMT. θ _o FT./FT.	CLOGGING FACTOR (%)	CONTRIBUTING AREAS			100 YEAR FLOW Q _o C.F.S.	100 YEAR DEPTH OF FLOW IN GUTTER Y _o FT.	100 YEAR SPREAD OF FLOW "T" (FT)	100 YEAR SPREAD OF FLOW W/IN REQ'D WIDTH (YES/NO)	WIDTH OF RDWY W _r (FT)	MAX WIDTH ALLOWED (FT)	DEPTH OF DEPRESSION a FT.	100 YEAR DEPTH OF FLOW AT SUMP Y FT.	CAPACITY OF SUMP PER FOOT OF LENGTH Q/L C.F.S./FT.	LENGTH OF SUMP OPENING L OR P FT.	INLET CAPACITY C.F.S.	OVERFLOW C.F.S.	PERCENT Q100 CAPTURED BY SUMP	NOTES
				AREA 1	%	AREA (ACRES)														
				1	%	(ACRES)														
A2	0.0050	0.02	50%	A2	100%	1.19	6.19	0.29	14.60	YES	30.00	15.00	0.25	0.42	0.41	15.00	6.21	0.00	1.00	
A3	0.0050	0.02	50%	A3	100%	1.51	8.38	0.33	16.35	NO	30.00	15.00	0.25	0.43	0.42	20.00	8.40	0.00	1.00	

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 HUITT-ZOLLARS, INC.
 Hamilton Dallagasperina, P.E. #91748
 Date: 3/17/2017

HUITT-ZOLLARS
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 1717 MCKINNEY AVE., SUITE 1400 DALLAS, TEXAS 75202
 Firm No. F-761


 TOWN OF FAIRVIEW, TEXAS
 372 TOWN PLACE
 FAIRVIEW, TX 75069
 972-562-0522

**E. STACY ROAD IMPROVEMENTS
 DRAINAGE INLET CALCULATIONS**

NETWORK 1

DESIGNED BY: RAW	DRAWN BY: RAW	CHECKED BY:	SHEET NO. 85
SHEET 1 OF 3			

I:\projects\305245.01 - Town of Fairview Stacy Road Improvements\10 CADD & BIM\10.6 MicroStation\10.6.5 Sheet\04 DRAINAGE\305245-NETWORK2\INLETS.dgn
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TOWN OF FAIRVIEW - EAST STACY ROAD - COMPUTATION SHEET FOR DETERMINING CAPACITY OF CURB OPENING INLET ON GRADE (DEPRESSED)																												
INLET DESIGN POINT	INLET NO.	STATION	DRAINAGE AREA				CONC. TIME (MIN)	LONG. SLOPE (FT/FT)	STREET SECTION (TYPE)	MANNING'S COEFFICIENT PAVEMENT "n"	CROSS SLOPE OF PAVEMENT Sx (FT/FT)	CROSS SLOPE OF GUTTER S'x (FT/FT)	100 YEAR INTENSITY (IN/HR)	100 YEAR RUNOFF (CFS)	100 YEAR CARRYOVER FLOW (CFS)	100 YEAR TOTAL GUTTER Q (CFS)	DEPTH OF FLOW Y ₀ , 100 YR (FT)	SPREAD OF FLOW T, 100 YR (FT)	EQUIVALENT CROSS SLOPE S _e , 100 YR (FT/FT)	RIGHT-OF-WAY CAPACITY (CFS)	DESIGN STORM***	LENGTH REQUIRED LT, 100 YR (FT)	ACTUAL PROVIDED LENGTH, L (FT)	100 YEAR L/L	100 YEAR EFFICIENCY "E"	INLET CAPACITY Q _i , 100 YR (CFS)	100 YEAR CARRYOVER FLOW "q" (CFS)	COMMENTS
			Area ID		AREA (ACRES)	RUNOFF COEFF. "c"																						
			Name	%																								
A9	A9	87+95.00	A9	100%	0.42	0.90	15.00	0.0198	ROOFTOP CROWN	0.012	0.020	0.17	7.52	2.86	0.00	2.86	0.169	8.46	0.126		100-YEAR	8.38	10.00	0.91	1.00	2.86	0.00	
A10	A10	98+45.00	A9	100%	1.18	0.79	15.00	0.0100	ROOFTOP CROWN	0.012	0.020	0.17	7.52	6.97	0.00	6.97	0.268	13.42	0.088		100-YEAR	16.47	15.00	1.00	1.00	6.88	0.09	
A11	A11	98+45.00	A11	100%	0.58	0.87	15.00	0.0198	ROOFTOP CROWN	0.012	0.020	0.17	7.52	3.76	0.09	3.85	0.189	9.46	0.116		100-YEAR	10.78	15.00	1.00	1.00	3.85	0.00	
A19	A19	111+35.00	A19	100%	0.45	0.90	15.00	0.0198	ROOFTOP CROWN	0.012	0.020	0.17	7.52	3.05	0.00	3.05	0.173	8.67	0.124		100-YEAR	8.85	10.00	1.00	1.00	3.05	0.00	
A20	A20	111+35.00	A20	100%	0.54	0.90	15.00	0.0198	ROOFTOP CROWN	0.012	0.020	0.17	7.52	3.68	0.00	3.68	0.186	9.30	0.118		100-YEAR	10.37	15.00	1.00	1.00	3.68	0.00	

TOWN OF FAIRVIEW - EAST STACY ROAD - COMPUTATION SHEET FOR DETERMINING CAPACITY OF CURB INLETS IN SUMPS																				
INLET NO (Sump I.D.)	GUTTER SLOPE S _o FT./FT.	CROWN SLOPE OF PVMT. S _o FT./FT.	CLOGGING FACTOR (%)	CONTRIBUTING AREAS			100 YEAR FLOW Q _o C.F.S.	100 YEAR DEPTH OF FLOW IN GUTTER Y _o FT.	100 YEAR SPREAD OF FLOW (FT)	100 YEAR SPREAD OF FLOW W/W REQ'D WIDTH (YES/NO)	WIDTH OF RDWY W _r (FT)	MAX WIDTH PONDING ALLOWED (FT)	DEPTH OF DEPRESSION a FT.	100 YEAR DEPTH OF FLOW AT SUMP Y FT.	CAPACITY OF SUMP PER FOOT OF LENGTH Q _L C.F.S/FT.	LENGTH OF SUMP OPENING L OR P FT.	INLET CAPACITY C.F.S.	100 YEAR OVERFLOW C.F.S.	PERCENT Q100 CAPTURED BY SUMP	NOTES
				AREA 1	AREA 2	AREA 3														
				1	%	(ACRES)														
A21	0.0050	0.02	50%	A21	100%	0.47	3.10	0.23	11.26	YES	30.00	15.00	0.25	0.42	0.39	15.00	6.23	0.00	1.00	
A24	0.0050	0.02	50%	A24	100%	0.92	5.84	0.29	14.28	YES	30.00	15.00	0.25	0.41	0.39	15.00	5.84	0.00	1.00	

TOWN OF FAIRVIEW - EAST STACY ROAD - COMPUTATION SHEET FOR DETERMINING CAPACITY OF DROP INLETS									
INLET	DRAINAGE AREA (CFS)	TYPE	Q100 (CFS)	HEAD (FT)	THROAT WIDTH (FT)	THROAT HEIGHT (FT)	ORIFICE COEFFICIENT	CLOGGING FACTOR (%)	CAPACITY (CFS)
A12	A12	2x2	11.27	1.5	2	0.5	0.67	0.5	13.17
A8	A8	4x4	19.55	1	4	0.5	0.67	0.5	21.51
A16	A16	4x4	15.03	1	4	0.5	0.67	0.5	21.51
A18	A18	4x4	14.44	1	4	0.5	0.67	0.5	21.51
A23	A23	4x4	14.65	1	4	0.5	0.67	0.5	21.51

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 Hamilton Dallagasperina, P.E. #91748
 Date: 3/17/2017

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 1717 MCKINNEY AVE., SUITE 1400 DALLAS, TEXAS 75202
 Firm No. F-761


 TOWN OF FAIRVIEW, TEXAS
 372 TOWN PLACE
 FAIRVIEW, TX 75069
 972-562-0522

**E. STACY ROAD IMPROVEMENTS
 DRAINAGE INLET CALCULATIONS**

NETWORK 2

DESIGNED BY: <i>RAW</i>	DRAWN BY: <i>RAW</i>	CHECKED BY:
SHEET NO. 86		SHEET 2 OF 3

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TOWN OF FAIRVIEW - EAST STACY ROAD - COMPUTATION SHEET FOR DETERMINING CAPACITY OF CURB OPENING INLET ON GRADE (DEPRESSED)																												
INLET DESIGN POINT	INLET NO.	STATION	DRAINAGE AREA				LONG. SLOPE S (FT/FT)	STREET SECTION (TYPE)	MANNING'S COEFFICIENT PAVEMENT "n"	CROSS SLOPE OF PAVEMENT Sx (FT/FT)	CROSS SLOPE OF GUTTER S'x (FT/FT)	100 YEAR INTENSITY (IN/HR)	100 YEAR RUNOFF (CFS)	100 YEAR CARRYOVER FLOW (CFS)	100 YEAR TOTAL GUTTER Q (CFS)	DEPTH OF FLOW Y ₀ , 100 YR (FT)	SPREAD OF FLOW T, 100 YR (FT)	EQUIVALENT CROSS SLOPE S _e , 100 YR (FT/FT)	RIGHT-OF-WAY CAPACITY (CFS)	DESIGN STORM****	LENGTH REQUIRED LT, 100 YR (FT)	ACTUAL PROVIDED LENGTH, L (FT)	100 YEAR L/L	100 YEAR EFFICIENCY "E"	INLET CAPACITY Q _i , 100 YR (CFS)	100 YEAR CARRYOVER FLOW "q" (CFS)	COMMENTS	
			Area ID		AREA (ACRES)	RUNOFF COEFF. "c"																						CONC. TIME (MIN)
			Name	%																								
A26	A26	120+45.00	A26	100%	0.23	0.90	15.00	0.0357	ROOFTOP CROWN	0.012	0.020	0.17	7.52	1.55	0.00	1.55	0.120	6.02	0.153		100-YEAR	5.10	10.00	1.00	1.00	1.55	0.80	
A27	A27	120+45.00	A27	100%	2.88	0.49	15.00	0.0357	ROOFTOP CROWN	0.012	0.020	0.17	7.52	10.64	0.00	10.64	0.248	12.40	0.094		100-YEAR	26.22	20.00	0.76	0.92	9.84	0.80	
A28	A28	120+45.00	A28	100%	0.25	0.90	15.00	0.0357	ROOFTOP CROWN	0.012	0.020	0.17	7.52	1.68	0.00	1.68	0.124	6.20	0.151		100-YEAR	5.48	10.00	1.00	1.00	1.68	0.00	


TOWN OF FAIRVIEW - EAST STACY ROAD - COMPUTATION SHEET FOR DETERMINING CAPACITY OF DROP INLETS										
INLET	DRAINAGE AREA	TYPE	Q100 (CFS)	HEAD (FT)	THROAT WIDTH (FT)	THROAT HEIGHT (FT)	ORIFICE COEFFICIENT	CLOGGING FACTOR (%)	CAPACITY (CFS)	
A25	A25	2x2	1.10	1	2	0.5	0.67	0.5	10.75	

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HUITT-ZOLLARS, INC.
Hamilton Dallagasperina, P.E. #91748
Date: 3/17/2017

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HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING
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Firm No. F-761

 TOWN OF FAIRVIEW, TEXAS
372 TOWN PLACE
FAIRVIEW, TX 75069
972-562-0522

**E. STACY ROAD IMPROVEMENTS
DRAINAGE INLET CALCULATIONS**

NETWORK 3

DESIGNED BY: RAW	DRAWN BY: RAW	CHECKED BY:
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SHEET NO. **87**

SHEET 3 OF 3


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TOWN OF FAIRVIEW - EAST STACY ROAD - COMPUTATION SHEET - HYDRAULIC COMPUTATIONS FOR STORM DRAINS - STORM DRAIN HYDRAULIC CALCULATIONS TABLE																																								
FROM (UPSTREAM)	PIPE	TO (DOWNSTREAM)	PIPE LENGTH	DRAINAGE AREA		25 YEAR AND 100 YEAR DISCHARGE														HYDRAULIC CALCULATIONS										COMMENTS										
						INCREMENTAL		AREA	TOTAL AREA	C	INCREMENT C*A		TIME OF CONCENTRATION																											
						Area 1	%	Area 2	%	(ac)	(ac)		INLET TIME	Travel	TOTAL	I100, INTENSITY	Q100, RUNOFF	25 YR INLET BYPASS	100 YR INLET BYPASS	Q25 PIPE	Q100 PIPE	PIPE D	BOX CULV	n	Sf	D/S	U/S	Hj	V ^{1/2} g		Kj	Kb	Design	DESIGN	FROM	TO	OR RIM			
DESIGN POINT	PIPE		FEET																																					
NETWORK1 TRUNK																																								
08+44.25	A7	04+24.25	420.00	A7	100%	X	0%	1.38	1.38	0.59	0.82	0.82	15.0	0.0	15.0	7.52	6.17	0.00	0.00	0.00	5.27	6.26	21				0.013	0.001562	581.40	586.50	0.00	0.000	1.00		100 YR	587.30	585.82	579.52	588.98	
04+24.25	A5	03+88.25	36.00	A5	100%	X	0%	0.17	1.55	0.90	0.15	0.97	15.0	2.9	17.9	7.52	7.32	0.00	0.00	0.00	5.77	7.41	21				0.013	0.002188	581.07	581.30	0.00	0.796	0.55		100 YR	581.40	579.55	579.01	584.89	
03+88.25	A6	01+28.25	260.00	A6	100%	X	0%	0.74	2.29	0.90	0.67	1.64	15.0	3.2	18.2	7.52	12.34	0.00	0.00	0.00	9.66	12.43	21				0.013	0.006158	579.24	580.85	0.00	0.147	0.55		100 YR	581.07	579.09	576.49	584.89	
01+28.25	A3	00+36.79	91.45	A3	100%	A2	100%	2.71	5.00	0.72	1.94	3.58	15.0	5.0	20.0	7.52	26.92	0.00	0.00	0.00	20.13	27.01	30				0.013	0.004336	578.48	578.88	0.00	0.415	0.25		100 YR	579.24	575.75	575.66	581.57	
00+36.79	Y1	00+00.00	36.79	X	100%	X	0%	0.00	5.00	0.00	0.00	3.58	15.0	5.0	20.0	7.52	26.92	0.00	0.00	0.00	20.13	27.01	30				0.013	0.004336	578.12	578.28	0.00	0.470	0.43		100 YR	578.48	575.66	575.62	577.76	Starting HGL
A2 to A3																																								
00+36.00	A2	00+00.00	36.00	A2	100%	X	0%	1.19	1.19	0.69	0.82	0.82	15.0	0.0	15.0	7.52	6.19	0.00	0.00	0.00	5.29	6.19	24				0.013	0.000750	579.24	579.27	0.00	0.00	1.00		100 YR	579.37	576.60	576.24	581.57	Starting HGL

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 Hamilton Dallagasperina, P.E. #91748
 Date: 3/17/2017

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**E. STACY ROAD IMPROVEMENTS
DRAINAGE HYDRAULIC CALCULATIONS**

NETWORK 1

DESIGNED BY: RAW	DRAWN BY: RAW	CHECKED BY:	SHEET NO. 88
SHEET 1 OF 4			


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TOWN OF FAIRVIEW - EAST STACY ROAD - COMPUTATION SHEET - HYDRAULIC COMPUTATIONS FOR STORM DRAINS - STORM DRAIN HYDRAULIC CALCULATIONS TABLE																																							
FROM (UPSTREAM)	PIPE	TO (DOWNSTREAM)	PIPE LENGTH FEET	DRAINAGE AREA				25 YEAR AND 100 YEAR DISCHARGE										HYDRAULIC CALCULATIONS																					
				INCREMENTAL		AREA	TOTAL AREA	RATIONAL C*A			TIME OF CONCENTRATION				Q100, RUNOFF		25 YR INLET BYPASS		100 YR INLET BYPASS		Q25 PIPE		Q100 PIPE		PIPE D			PIPE HGL			DESIGN			COMMENTS					
				Area 1	%	Area 2	%	(ac)	(ac)	C	INCREMENT C*A	TOTAL C*A	INLET TIME	Travel	TOTAL	I100, INTENSITY	Q100, CFS	25 YR CFS	100 YR CFS	Q25 CFS	Q100 CFS	IN	B, FT	D, FT	n	FT/FT	D/S	U/S	Hj	Vf/2g	Kj	Kb	Storm		DESIGN HGL	FROM	TO	OR ELEV	
NETWORK 2 TRUNK																																							
18+02.30	A10	17+94.02	8.28	A10	100%	X	0%	1.18	1.18	0.79	0.93	0.93	15.0	0.0	15.0	7.52	6.97	0.00	0.09	5.95	6.88	21			0.013	0.001884	582.92	583.02	0.00	0.000	1.00				100 YR	583.15	581.27	581.07	585.62
17+94.02	Y3	17+22.07	71.95	X	100%	X	0%	0.00	1.18	0.00	0.00	0.93	15.0	0.0	15.0	7.52	6.97	0.00	0.00	5.95	6.88	21			0.013	0.001884	581.29	582.82	0.00	0.127	0.43				100 YR	582.92	581.27	579.27	582.61
17+22.07	Y19	16+68.20	53.87	A12	100%	X	0%	2.72	3.90	0.55	1.50	2.42	15.0	0.6	15.0	7.52	18.23	0.00	0.00	15.57	18.14	27			0.013	0.003432	579.99	581.02	0.00	0.127	0.35				100 YR	581.29	578.77	577.42	581.14
16+68.20	Y5	13+43.80	324.40	A9	100%	X	0%	0.42	4.33	0.90	0.38	2.80	15.0	0.8	15.0	7.52	21.09	0.00	0.00	18.01	21.00	27			0.013	0.004599	572.47	579.67	0.00	0.323	0.35				100 YR	579.99	577.42	569.31	579.78
13+43.80	Y16	11+93.81	149.99	A8	100%	X	0%	5.78	10.10	0.45	2.60	5.40	15.0	2.1	15.0	7.52	40.64	0.00	0.00	34.70	40.55	30			0.013	0.009774	568.71	571.56	0.00	0.433	0.35				100 YR	572.47	569.06	565.31	572.63
11+93.81	Y29	10+48.25	145.56	A11	100%	X	0%	0.58	10.68	0.87	0.50	5.90	15.0	2.7	15.0	7.52	44.40	0.00	-0.09	37.91	44.40	30			0.013	0.011718	564.99	567.81	0.00	1.060	0.35				100 YR	568.71	565.06	561.67	569.11
10+48.25	Y14	10+16.70	31.55	A16	100%	X	0%	3.63	14.31	0.55	2.00	7.90	15.0	3.1	15.0	7.52	59.43	0.00	0.00	50.74	59.43	36			0.013	0.007938	564.09	564.34	0.00	1.270	0.35				100 YR	564.99	561.17	560.38	571.15
10+16.70	Y21	09+93.38	23.32	X	0%	X	0%	0.00	14.31	0.00	0.00	7.90	15.0	3.1	15.0	7.52	59.43	0.00	0.00	50.74	59.43		5	4	0.013	0.00587	563.98	563.99	0.00	1.098	1.00				100 YR	564.09	559.43	559.08	570.73
09+93.38	Y20	05+71.64	421.74	A17	100%	X	0%	28.06	42.37	0.45	12.63	20.53	15.0	3.2	15.0	7.52	154.39	0.00	0.00	131.83	154.39		5	4	0.013	0.003963	557.53	563.08	0.00	0.137	0.25				100 YR	563.98	559.08	552.76	564.46
05+71.64	Y7	04+77.65	94.00	A19	100%	A20	100%	0.99	43.37	0.90	0.90	21.43	15.0	3.6	15.0	7.52	161.12	0.00	0.00	137.58	161.12		5	4	0.013	0.004316	556.29	556.76	0.00	0.925	0.25				100 YR	557.53	552.76	551.35	557.35
04+77.65	Y13	03+43.93	133.71	A18	100%	X	0%	3.49	46.86	0.55	1.92	23.35	15.0	3.7	15.0	7.52	175.56	0.00	0.00	149.90	175.56		5	4	0.013	0.005124	553.54	555.35	0.00	1.008	0.25				100 YR	556.29	551.35	549.34	555.48
03+43.93	Y33	02+51.82	92.11	X	0%	X	0%	0.00	46.86	0.00	0.00	23.35	15.0	3.7	15.0	7.52	175.56	0.00	0.00	149.90	175.56		7	4	0.013	0.002181	553.24	553.44	0.00	1.196	1.00				100 YR	553.54	549.34	547.96	553.71
02+51.82	Y12	01+76.94	74.88	A22	100%	X	0%	13.64	60.50	0.45	6.14	29.48	15.0	3.8	15.0	7.52	221.73	0.00	0.00	189.32	221.73		7	4	0.013	0.003480	552.16	552.42	0.00	0.610	0.25				100 YR	553.24	547.96	546.84	551.60
01+76.94	Y9	01+37.38	39.56	A21	100%	A24	100%	1.39	61.89	0.86	1.19	30.67	15.0	3.9	15.0	7.52	230.66	0.00	0.00	196.95	230.66		7	4	0.013	0.003766	551.20	551.35	0.00	0.974	0.25				100 YR	552.16	546.84	546.24	550.44
01+37.38	Y34	00+97.82	39.56	X	0%	X	0%	0.00	61.89	0.00	0.00	30.67	15.0	3.9	15.0	7.52	230.66	0.00	0.00	196.95	230.66		7	4	0.013	0.003766	550.95	551.10	0.00	1.054	1.00				100 YR	551.20	546.24	545.85	550.02
00+97.82	Y11	00+39.01	58.82	A23	100%	X	0%	4.33	66.22	0.45	1.95	32.62	15.0	3.9	15.0	7.52	245.31	0.00	0.00	209.46	245.31		7	4	0.013	0.004259	549.77	550.02	0.00	1.054	0.25				100 YR	550.95	545.85	545.26	549.60
00+39.01	Y8	00+00.00	39.01	X	0%	X	0%	0.00	66.22	0.00	0.00	32.62	15.0	3.9	15.0	7.52	245.31	0.00	0.00	209.46	245.31		7	4	0.013	0.004259	548.87	549.26	0.00	1.192	0.43				100 YR	549.77	545.26	544.87	549.26
A12 to Y19																																							
00+19.40	A12	00+00.00	19.40	A12	100%	X	0%	2.72	2.72	0.55	1.50	1.50	15.0	0.0	15.0	7.52	11.26	0.00	0.00	9.62	11.26	21			0.013	0.005054	581.29	581.39	0.00	0.000	1.00				100 YR	581.73	579.61	579.27	583.60
A9 to Y5																																							
00+49.83	A9	00+00.00	49.83	A9	100%	X	0%	0.42	0.42	0.90	0.38	0.38	15.0	0.0	15.0	7.52	2.86	0.00	0.00	2.44	2.86	21			0.013	0.000326	579.99	580.17	0.00	0.00	1.00				100 YR	580.27	578.42	577.92	583.88
A8 to Y16																																							
00+59.00	A8	00+00.00	59.00	A8	100%	X	0%	5.78	5.78	0.45	2.60	2.60	15.0	0.0	15.0	7.52	19.55	0.00	0.00	16.69	19.55	24			0.013	0.007467	572.47	572.91	0.00	0.00	1.00				100 YR	573.51	570.44	569.56	574.85
A11 to Y29																																							
00+08.27	A11	00+00.00	8.27	A11	100%	X	0%	0.58	0.58	0.87	0.50	0.50	15.0	0.0	15.0	7.52	3.76	0.00	-0.09	3.21	3.85	21			0.013	0.000591	568.71	568.71	0.00	0.00	1.00				100 YR	568.81	566.22	566.06	574.11
A16 to Y14																																							
00+19.40	A16	00+00.00	19.40	A16	100%	X	0%	3.63	3.63	0.55	2.00	2.00	15.0	0.0	15.0	7.52	15.03	0.00	0.00	12.83	15.03	21			0.013	0.008992	564.99	565.17	0.00	0.00	1.00				100 YR	565.77	562.81	562.42	570.64
Starting HGL																																							

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 HUITT-ZOLLARS, INC.
 Hamilton Dallagasperina, P.E. #91748
 Date: 3/17/2017

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 HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING
 1717 MCKINNEY AVE., SUITE 1400 DALLAS, TEXAS 75202
 Firm No. F-761


TOWN OF FAIRVIEW, TEXAS
 372 TOWN PLACE
 FAIRVIEW, TX 75069
 972-562-0522

**E. STACY ROAD IMPROVEMENTS
 DRAINAGE HYDRAULIC CALCULATIONS**

NETWORK 2

DESIGNED BY: <i>RAW</i>	DRAWN BY: <i>RAW</i>	CHECKED BY:
SHEET NO. 89		SHEET 2 OF 4


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TOWN OF FAIRVIEW - EAST STACY ROAD - COMPUTATION SHEET - HYDRAULIC COMPUTATIONS FOR STORM DRAINS - STORM DRAIN HYDRAULIC CALCULATIONS TABLE																																					
FROM (UPSTREAM)	PIPE	TO (DOWNSTREAM)	PIPE LENGTH FEET	DRAINAGE AREA		25 YEAR AND 100 YEAR DISCHARGE												HYDRAULIC CALCULATIONS																			
						INCREMENTAL		AREA	TOTAL AREA	RATIONAL C*A			TIME OF CONCENTRATION			100, INTENSITY			Q100, RUNOFF	25 YR INLET BYPASS	100 YR INLET BYPASS	Q25 PIPE	Q100 PIPE	PIPE D	BOX CULV	n	PIPE HGL				Design	DESIGN	FROM	TO	OR RIM	COMMENTS	
						Area 1	%	Area 2	%	(ac)	(ac)	C	INCREMENT C*A	TOTAL C*A	INLET TIME	Travel	TOTAL	I100, INTENSITY	Q100, RUNOFF	25 YR INLET BYPASS	100 YR INLET BYPASS	Q25 PIPE	Q100 PIPE	IN	B, FT	D, FT		Sf	D/S	U/S	Hj	V ^{1/2} g	Kj	Kb	Storm		ELEV
A17 to Y20																																					
00+55.90	A17	00+00.00	55.90	A17	100%	X	0%	28.06	28.06	0.45	12.63	12.63	15.0	0.0	15.0	7.52	94.97	0.00	0.00	81.09	94.97		5	3	0.013	0.003343	563.98	567.48	0.00	0.00	1.00	100 YR	568.10	564.48	560.01	565.80	Starting HGL
A19 to Y7																																					
00+43.50	A19	00+07.50	36.00	A19	100%	X	0%	0.45	0.45	0.90	0.41	0.41	15.0	0.0	15.0	7.52	3.05	0.00	0.00	2.61	3.05	21			0.013	0.000371	557.65	557.66	0.00	0.00	1.00	100 YR	557.76	555.62	555.08	561.76	
00+07.50	A20	00+00.00	7.50	A20	100%	X	0%	0.54	0.99	0.90	0.49	0.90	15.0	0.2	15.2	7.52	6.73	0.00	0.00	5.71	6.73	21			0.013	0.001805	557.53	557.55	0.00	0.03	0.55	100 YR	557.65	555.12	555.01	561.76	Starting HGL
A18 to Y13																																					
00+23.20	A18	00+00.00	23.20	A18	100%	X	0%	3.49	3.49	0.55	1.92	1.92	15.0	0.0	15.0	7.52	14.44	0.00	0.00	12.33	14.44	30			0.013	0.001239	556.29	556.32	0.00	0.00	1.00	100 YR	556.46	552.33	552.10	556.77	Starting HGL
A22 to Y12																																					
00+49.26	A22	00+00.00	49.26	A22	100%	X	0%	13.64	13.64	0.45	6.14	6.14	15.0	0.0	15.0	7.52	46.17	0.00	0.00	39.42	46.17		4	3	0.013	0.001391	553.24	554.15	0.00	0.00	1.00	100 YR	554.54	551.15	548.44	551.08	Starting HGL
A21 to Y9																																					
00+43.50	A21	00+07.50	36.00	A21	100%	X	0%	0.47	0.47	0.88	0.41	0.41	15.0	0.0	15.0	7.52	3.10	0.00	0.00	2.64	3.10	21			0.013	0.000382	552.30	552.32	0.00	0.00	1.00	100 YR	552.42	549.70	549.16	555.57	
00+07.50	A24	00+00.00	7.50	A24	100%	X	0%	0.92	1.39	0.84	0.78	1.19	15.0	0.2	15.2	7.52	8.94	0.00	0.00	7.58	8.94	21			0.013	0.003182	552.16	552.18	0.00	0.03	0.55	100 YR	552.30	549.20	549.09	555.57	Starting HGL
A23 to Y11																																					
00+54.84	A23	00+00.00	54.84	A23	100%	X	0%	4.33	4.33	0.45	1.95	1.95	15.0	0.0	15.0	7.52	14.65	0.00	0.00	12.51	14.65	30			0.013	0.001275	550.95	551.02	0.00	0.00	1.00	100 YR	551.16	547.15	546.60	552.05	Starting HGL

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 Hamilton Dallagasperina, P.E. #91748
 Date: 3/17/2017

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 1717 MCKINNEY AVE., SUITE 1400 DALLAS, TEXAS 75202
 Firm No. F-761


TOWN OF FAIRVIEW, TEXAS
 372 TOWN PLACE
 FAIRVIEW, TX 75069
 972-562-0522

**E. STACY ROAD IMPROVEMENTS
 DRAINAGE HYDRAULIC CALCULATIONS**

NETWORK 2

DESIGNED BY: RAW	DRAWN BY: RAW	CHECKED BY:
		SHEET NO. 90


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 rwalker

TOWN OF FAIRVIEW - EAST STACY ROAD - COMPUTATION SHEET - HYDRAULIC COMPUTATIONS FOR STORM DRAINS - STORM DRAIN HYDRAULIC CALCULATIONS TABLE																																							
FROM (UPSTREAM)	PIPE	TO (DOWNSTREAM)	PIPE LENGTH FEET	DRAINAGE AREA		25 YEAR AND 100 YEAR DISCHARGE															HYDRAULIC CALCULATIONS																		
						RATIONAL C*A			TIME OF CONCENTRATION			100, INTENSITY			Q100, RUNOFF			25 YR INLET BYPASS			100 YR INLET BYPASS			Q25 PIPE			Q100 PIPE			PIPE HGL			Design	DESIGN	FROM	TO	OR RIM	COMMENTS	
						INCREMENTAL	AREA	TOTAL AREA	C	INCREMENT C*A	TOTAL C*A	INLET TIME	Travel	TOTAL	I100, INTENSITY	Q100, RUNOFF	25 YR INLET BYPASS	100 YR INLET BYPASS	Q25 PIPE	Q100 PIPE	PIPE D	BOX CULV	n	Sf	D/S	U/S	Hj	Vf/2g	Kj	Kb	Storm	ELEV							FT
DESIGN POINT	PIPE		FEET	Area 1	%	Area 2	%	(ac)	(ac)																														
NETWORK3 TRUNK																																							
03+92.63	A28	01+15.88	276.76	A28	100%	X	0%	0.25	0.25	0.90	0.22	0.22	15.0	0.0	15.0	7.52	1.68	0.00	0.00	1.43	1.77	21				0.013	0.000125	550.71	560.09	0.00	0.000	1.00		100 YR	560.19	558.34	547.96	563.46	
01+15.88	A27	00+79.88	36.00	A27	100%	X	0%	2.88	3.13	0.49	1.41	1.64	15.0	1.9	16.9	7.52	12.32	0.00	0.00	9.96	12.41	21				0.013	0.006131	550.26	550.48	0.00	0.008	0.55		100 YR	550.71	548.00	547.46	553.84	
00+79.88	A26	00+39.52	40.36	A26	100%	X	0%	0.23	3.36	0.90	0.21	1.84	15.0	2.2	17.2	7.52	13.87	0.00	0.00	11.14	13.96	21				0.013	0.007762	549.66	549.97	0.00	0.413	0.55		100 YR	550.26	547.48	547.28	553.84	
00+39.52	Y31	00+12.00	27.51	X	0%	X	0%	0.00	3.36	0.00	0.00	1.84	15.0	2.2	17.2	7.52	13.87	0.00	0.00	11.14	13.96	21				0.013	0.007762	549.18	549.40	0.00	0.523	0.50		100 YR	549.66	547.28	547.14	549.35	
00+12.00	Y35	00+00.00	12.00						3.36	0.00	0.00	1.84	15.0	2.2	17.2	7.52	13.87	0.00	0.00	11.14	13.96	21				0.013	0.007762	548.83	548.92	0.00	0.523	0.50		100 YR	549.18	547.14	547.08	550.02	
A28 to OUT3A																																							
01+00.11	A25	00+42.44	57.67	A25	100%	X	0%	0.33	0.33	0.45	0.15	0.15	15.0	0.0	15.0	7.52	1.10	0.00	0.00	0.94	1.10	21				0.013	0.000048	549.14	549.33	0.00	0.00	1.00		100 YR	549.43	547.58	547.29	556.17	
00+42.44	Y32	00+00.00	42.44	X	0%	X	0%	0.00	0.33	0.00	0.00	0.15	15.0	0.0	15.0	7.52	1.10	0.00	0.00	0.94	1.10	21				0.013	0.000048	548.83	549.04	0.00	0.00	1.00		100 YR	549.14	547.29	547.08	549.18	
Starting HGL																																							

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 Hamilton Dallagasperina, P.E. #91748
 Date: 3/17/2017

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 Firm No. F-761


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 372 TOWN PLACE
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 972-562-0522

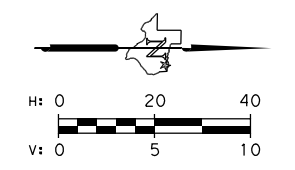
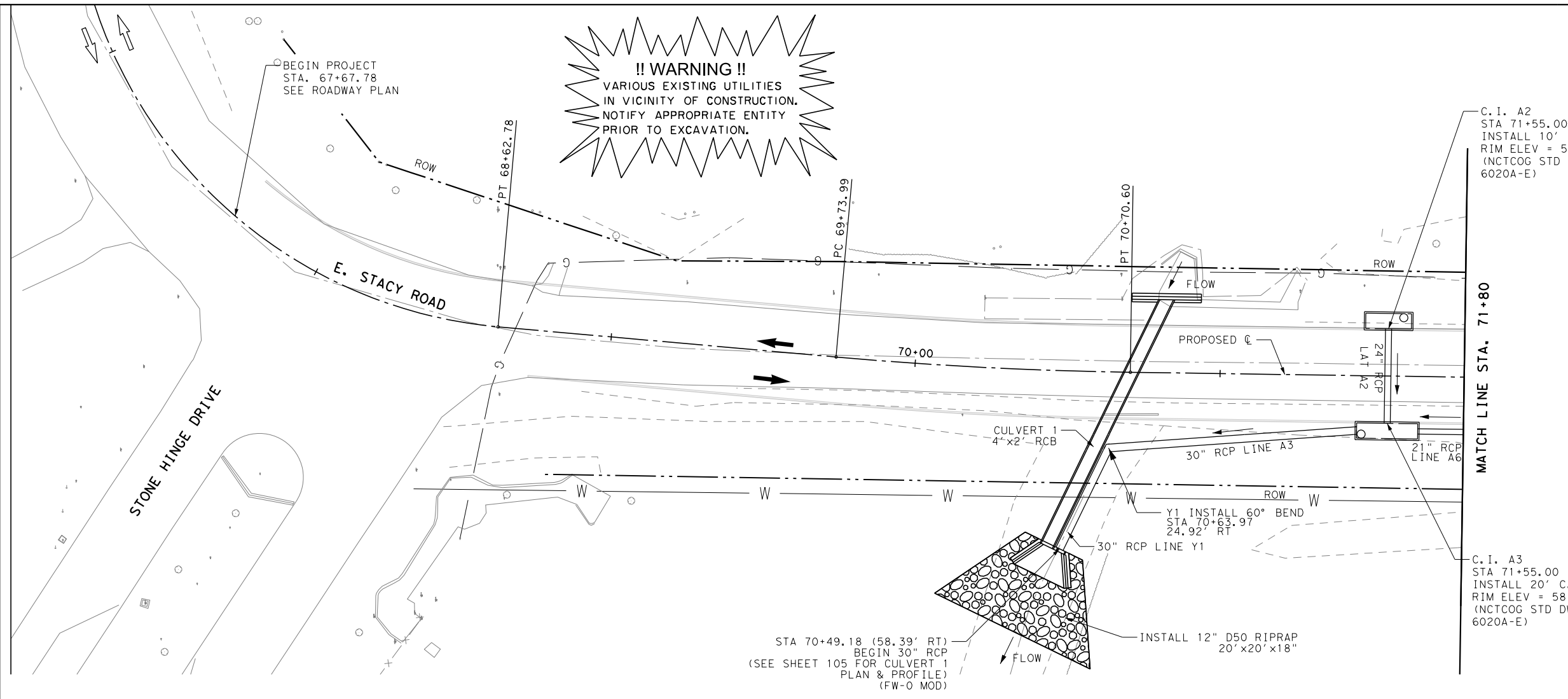
E. STACY ROAD IMPROVEMENTS
DRAINAGE HYDRAULIC CALCULATIONS

NETWORK 3

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SHEET NO. 91
RAW	RAW		

SHEET 4 OF 4

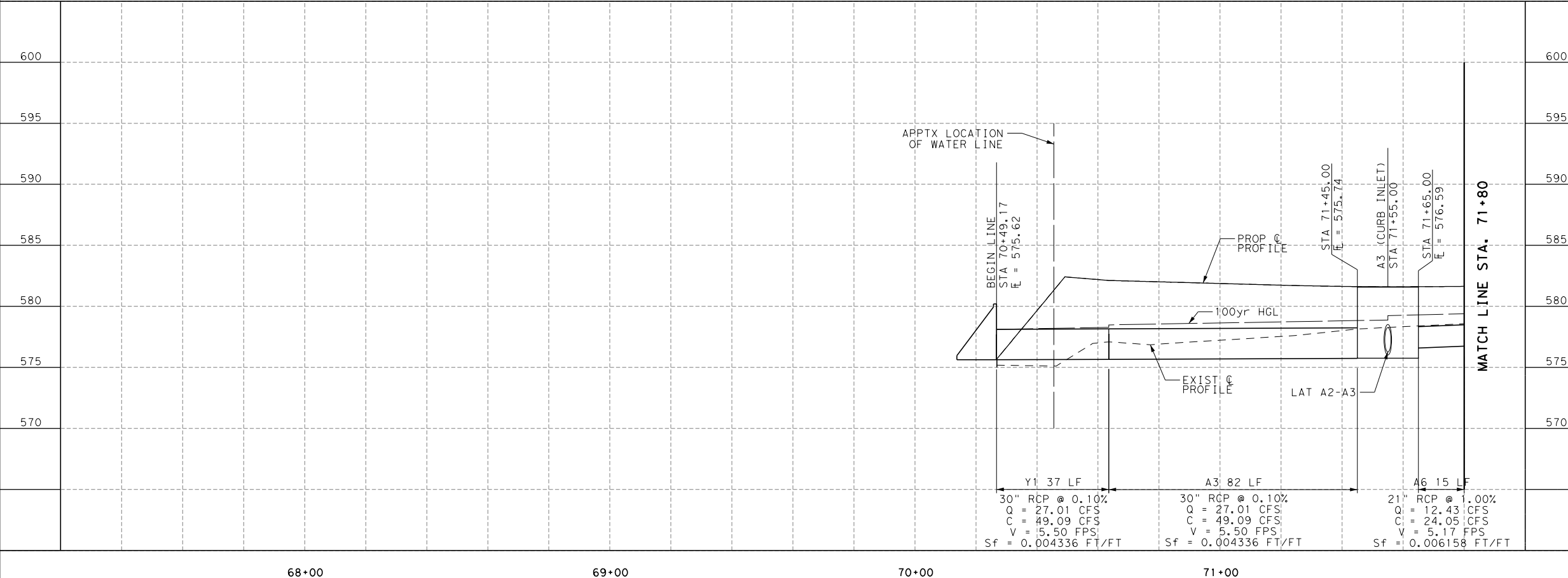
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- LEGEND**
- ➔ TRAFFIC FLOW
 - ◻ PROPOSED DRAINAGE INLET
 - PROPOSED STORM DRAIN
 - W— EXISTING WATER LINE
 - G— EXISTING GAS LINE

GENERAL NOTES

1. CURB INLET STATION AND OFFSET ARE MEASURED TO THE MIDPOINT OF THE FACE OF THE MAIN INLET



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 Firm No. F-761



E. STACY ROAD IMPROVEMENTS

**NETWORK 1 STORM DRAIN
 PLAN & PROFILE**

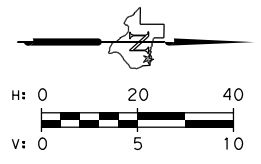
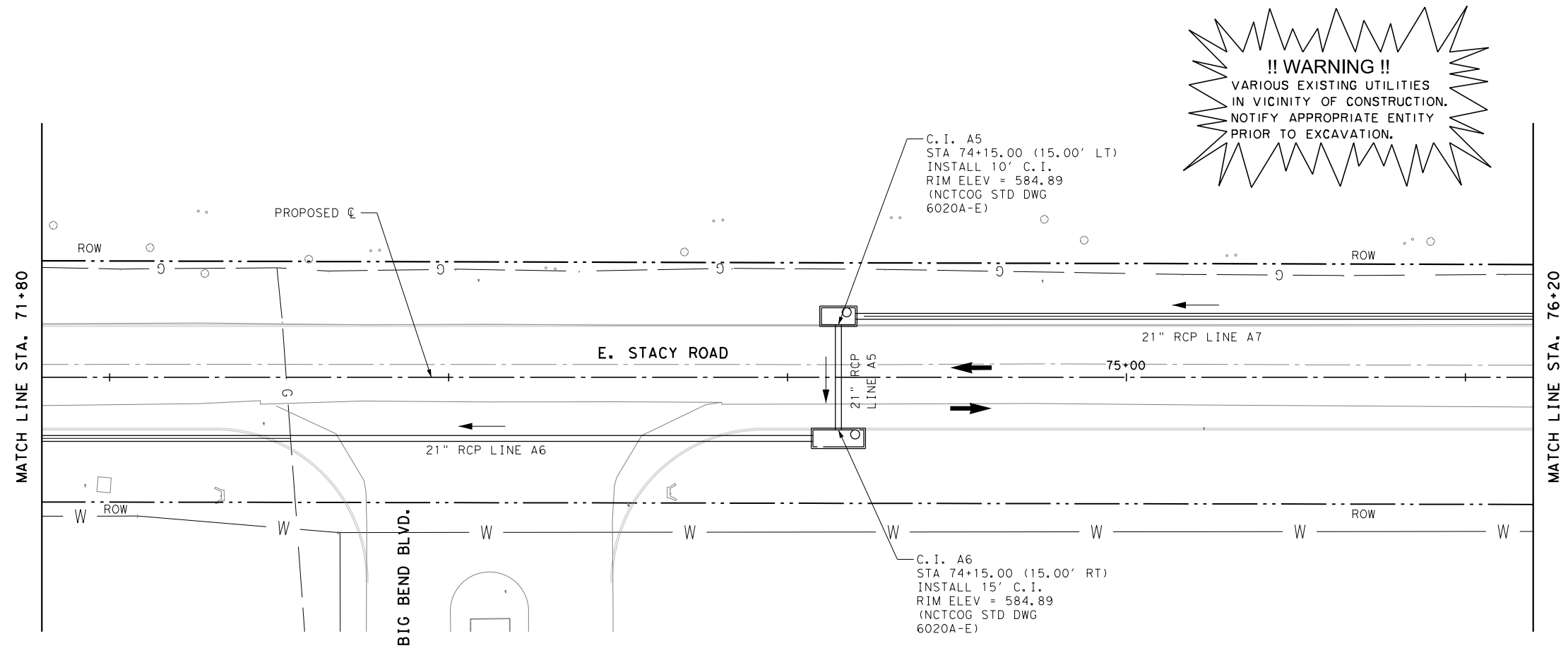
BEGIN TO STA. 71+80

SCALE: H: 1" = 20'
 V: 1" = 5'

DESIGNED BY: RAW DRAWN BY: RAW CHECKED BY: SHEET NO. 92

SHEET 1 OF 10

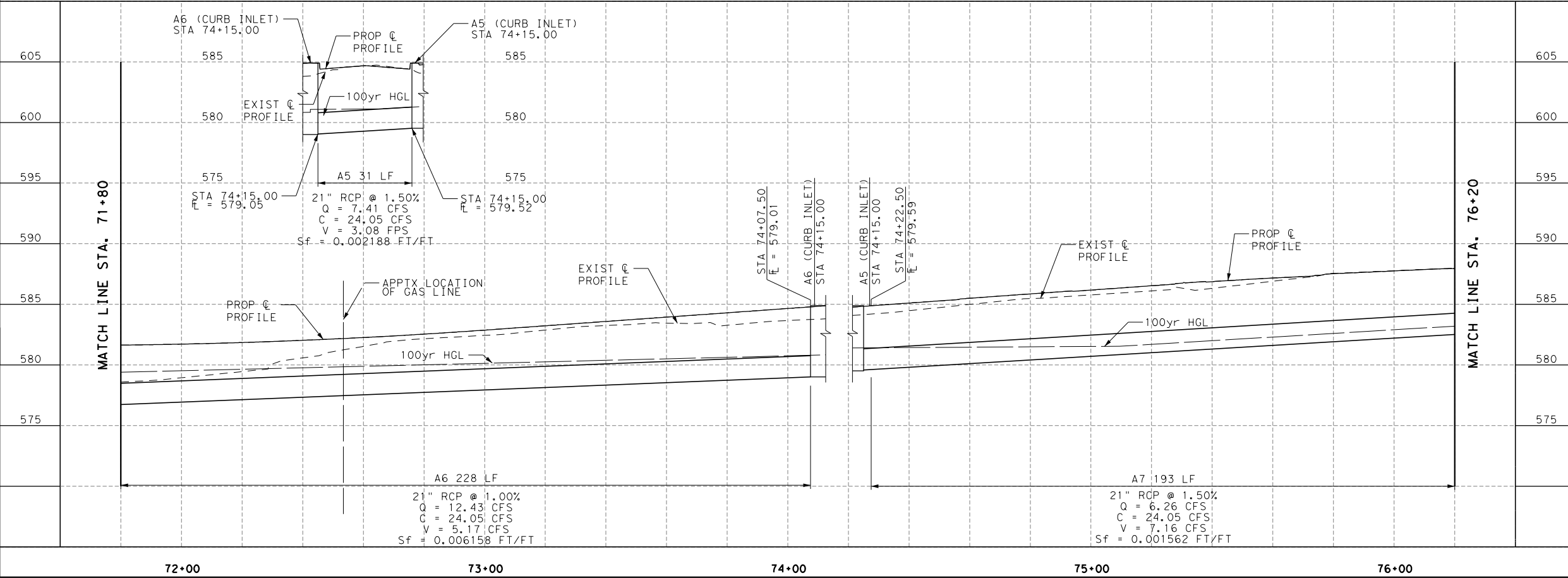
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- LEGEND**
- TRAFFIC FLOW
 - PROPOSED DRAINAGE INLET
 - PROPOSED STORM DRAIN
 - W— EXISTING WATER LINE
 - G— EXISTING GAS LINE

GENERAL NOTES

1. CURB INLET AND OFFSET ARE MEASURED TO THE MIDPOINT OF THE FACE OF THE MAIN INLET



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TOWN OF FAIRVIEW, TEXAS
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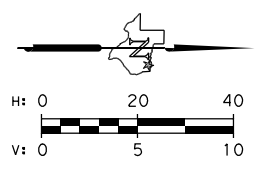
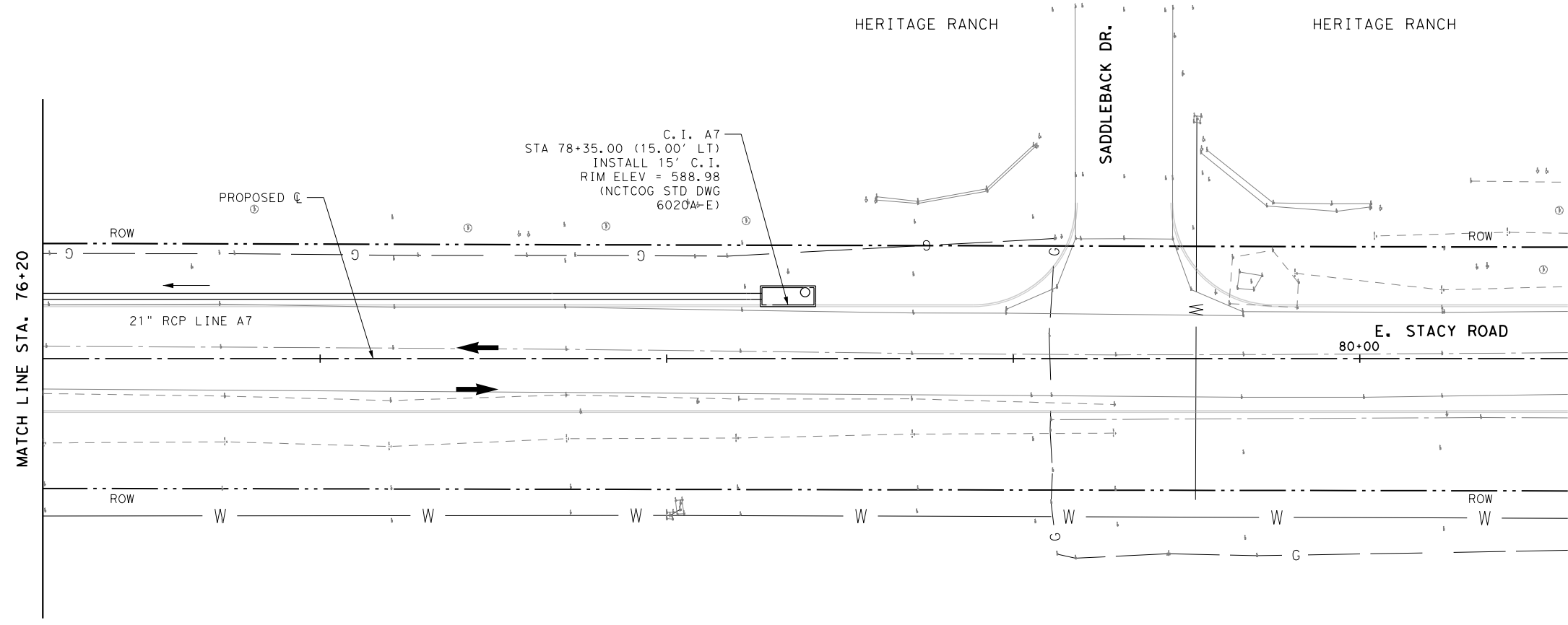
E. STACY ROAD IMPROVEMENTS
NETWORK 1 STORM DRAIN PLAN & PROFILE
 STA. 71+80 TO STA. 76+20

SCALE: H: 1" = 20'
 V: 1" = 5'

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SHEET 2 OF 10

I:\Projects\305245.01 - Town of Fairview Stacy Road Improvements\10 CADD & BIM\10.6 MicroStation\10.6.5 Sheet\04 DRAINAGE\305245-drainage.plt\rf-03.dgn
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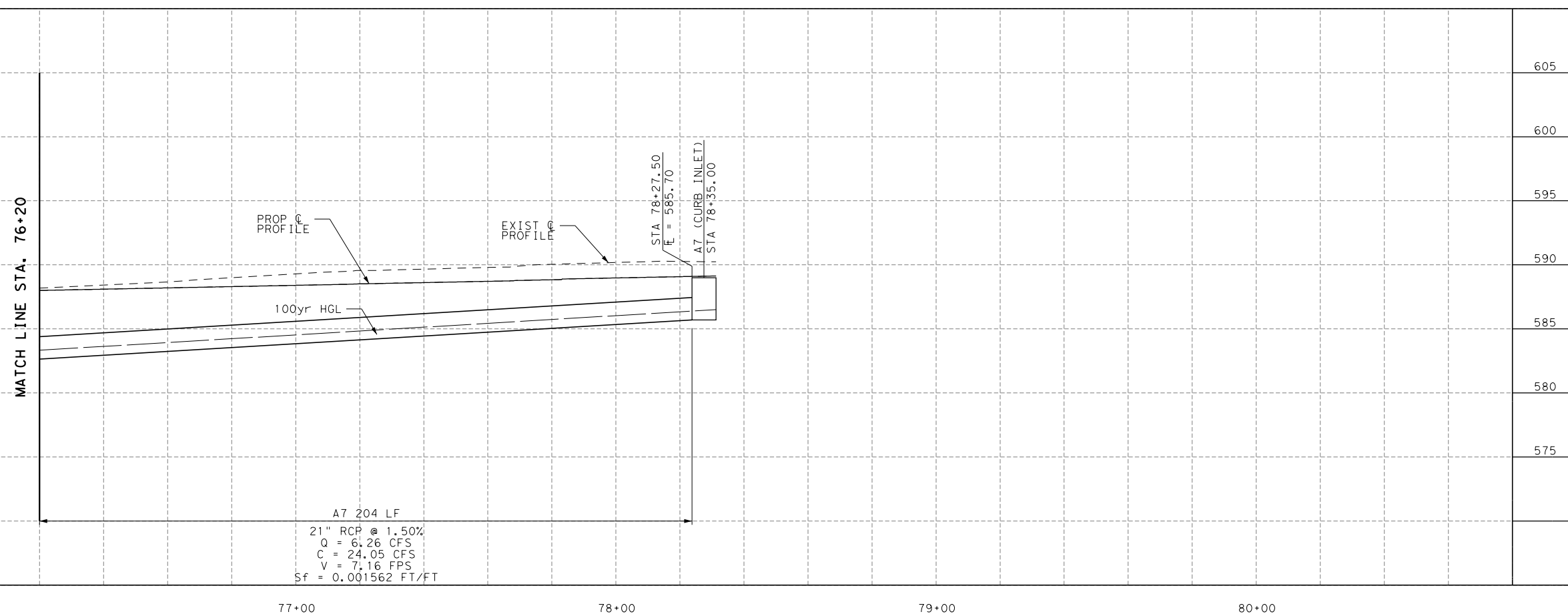


- LEGEND**
- ➔ TRAFFIC FLOW
 - ◻ PROPOSED DRAINAGE INLET
 - PROPOSED STORM DRAIN
 - W— EXISTING WATER LINE
 - G— EXISTING GAS LINE

GENERAL NOTES

1. CURB INLET STATION AND OFFSET ARE MEASURED TO THE MIDPOINT OF THE FACE OF THE MAIN INLET

!! WARNING !!
 VARIOUS EXISTING UTILITIES
 IN VICINITY OF CONSTRUCTION.
 NOTIFY APPROPRIATE ENTITY
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 372 TOWN PLACE
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E. STACY ROAD IMPROVEMENTS

**NETWORK 1 STORM DRAIN
 PLAN & PROFILE**

STA. 76+20 TO STA. 80+60

SCALE: H: 1" = 20'
 V: 1" = 5'

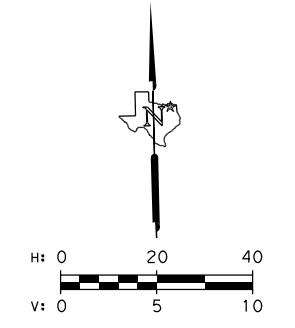
DESIGNED BY: RAW DRAWN BY: RAW CHECKED BY: SHEET NO. 94

SHEET 3 OF 10

A7 204 LF
 21" RCP @ 1.50%
 Q = 6.26 CFS
 C = 24.05 CFS
 V = 7.16 FPS
 Sf = 0.001562 FT/FT

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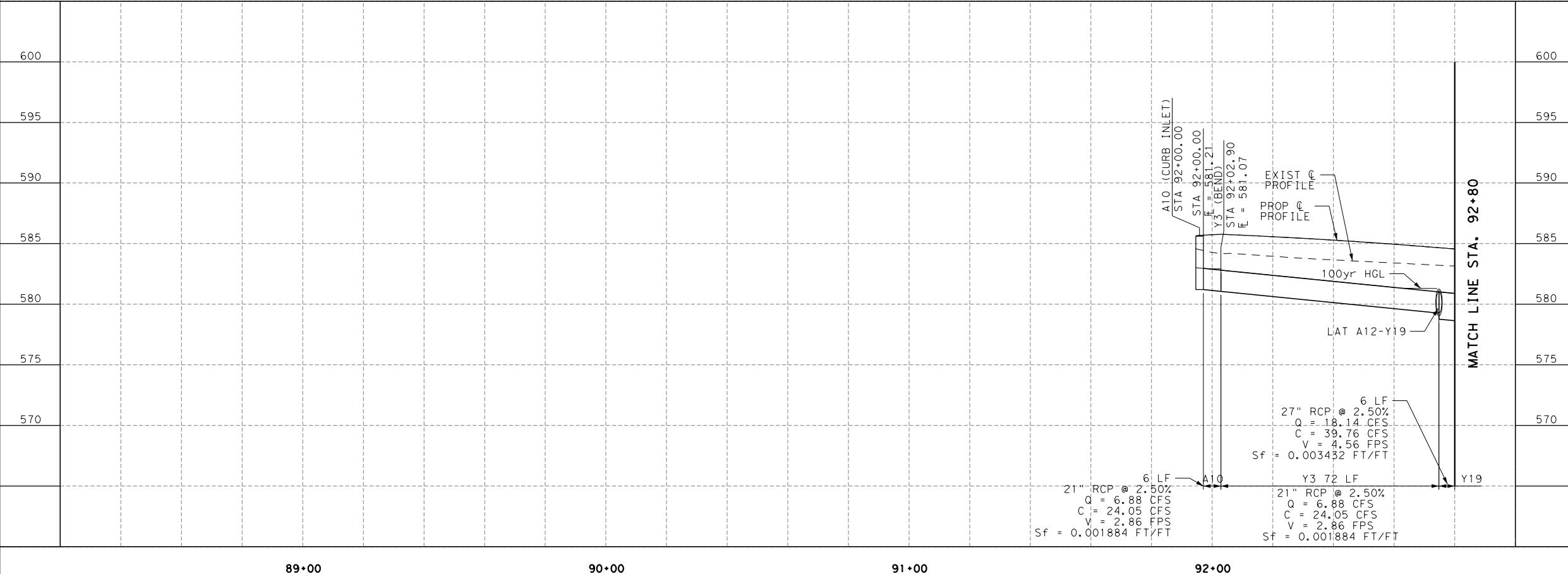
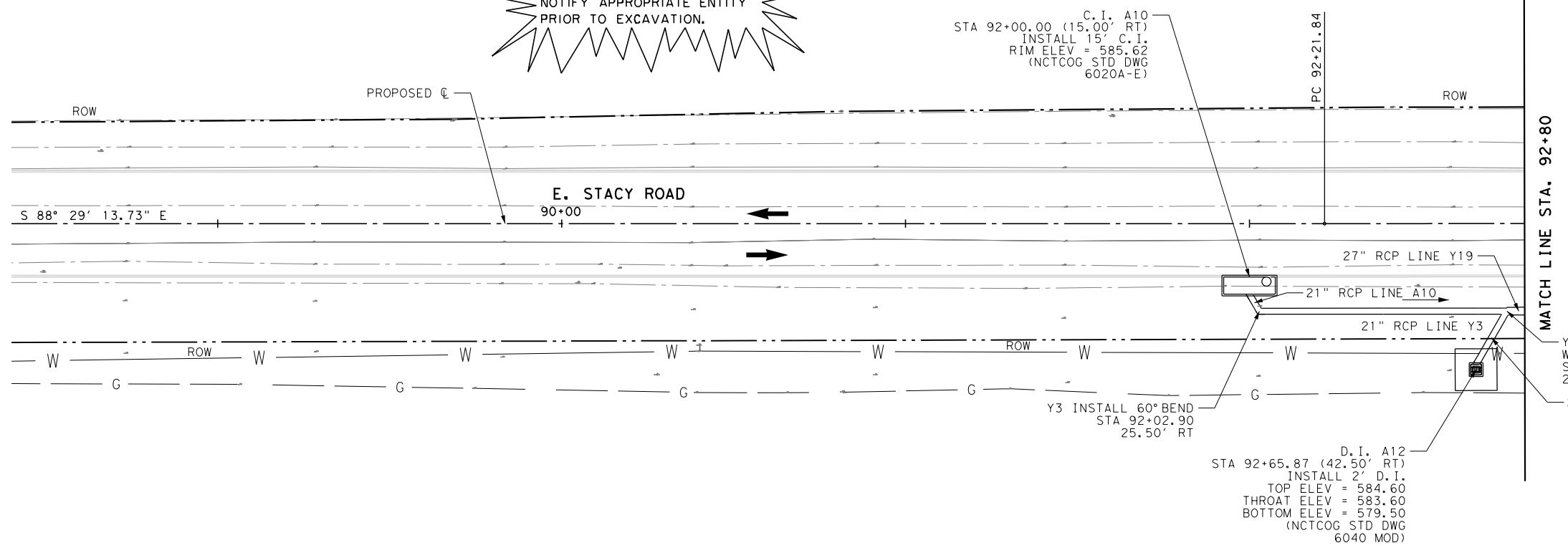


LEGEND

- TRAFFIC FLOW
- PROPOSED DRAINAGE INLET
- PROPOSED STORM DRAIN
- EXISTING WATER LINE
- EXISTING GAS LINE

GENERAL NOTES

1. CURB INLET STATION AND OFFSET ARE MEASURED TO THE MIDPOINT OF THE FACE OF THE MAIN INLET. DROP INLET STATION MEASURED TO CENTER.



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HUITT-ZOLLARS, INC.
 Hamilton Dallagasperina, P.E. #91748
 Date: 3/17/2017

HUITT-ZOLLARS
 HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING
 1717 MCKINNEY AVE., SUITE 1400 DALLAS, TEXAS 75202
 Firm No. F-761

TOWN OF FAIRVIEW, TEXAS
 372 TOWN PLACE
 FAIRVIEW, TX 75069
 972-562-0522

E. STACY ROAD IMPROVEMENTS

NETWORK 2 STORM DRAIN PLAN & PROFILE

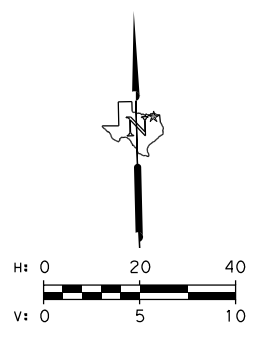
STA. 88+40 TO STA. 92+80

SCALE: H: 1" = 20'
 V: 1" = 5'

DESIGNED BY: RAW DRAWN BY: RAW CHECKED BY: RAW

SHEET NO. **95**
 SHEET 4 OF 10

!! WARNING !!
 VARIOUS EXISTING UTILITIES
 IN VICINITY OF CONSTRUCTION.
 NOTIFY APPROPRIATE ENTITY
 PRIOR TO EXCAVATION.

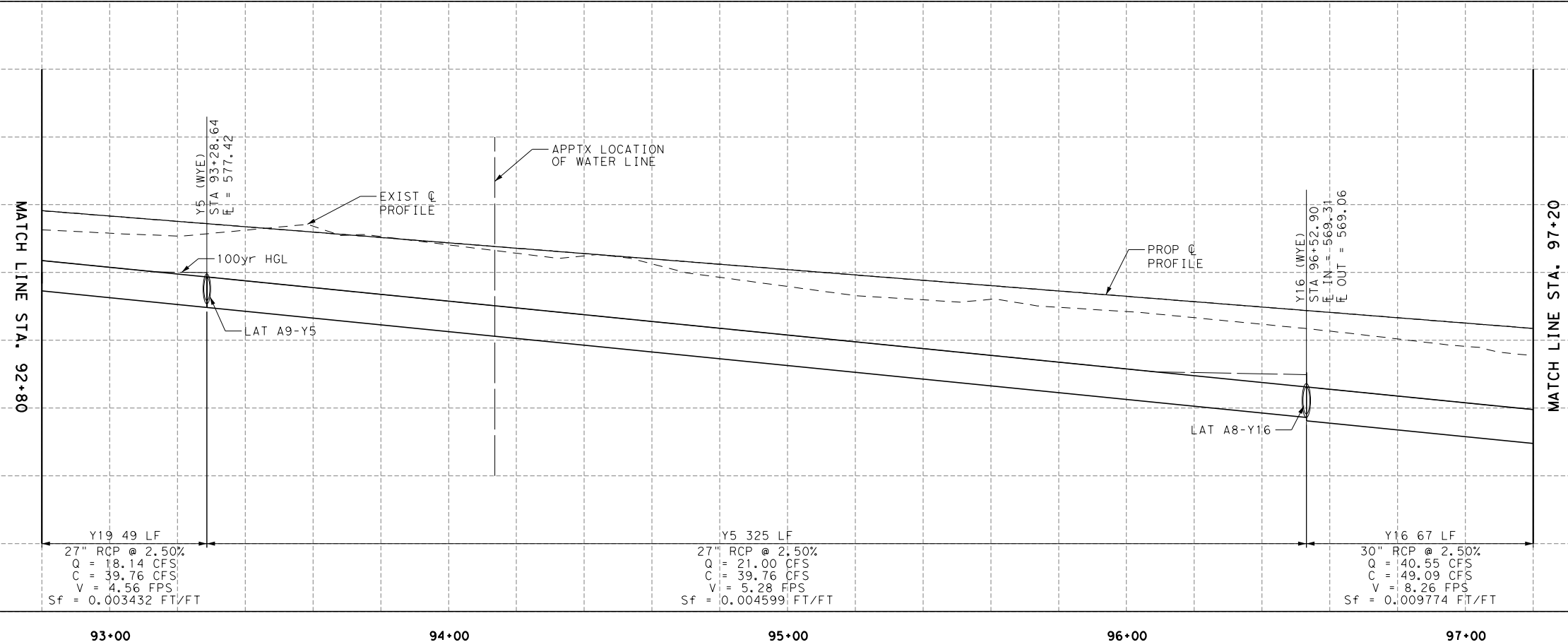
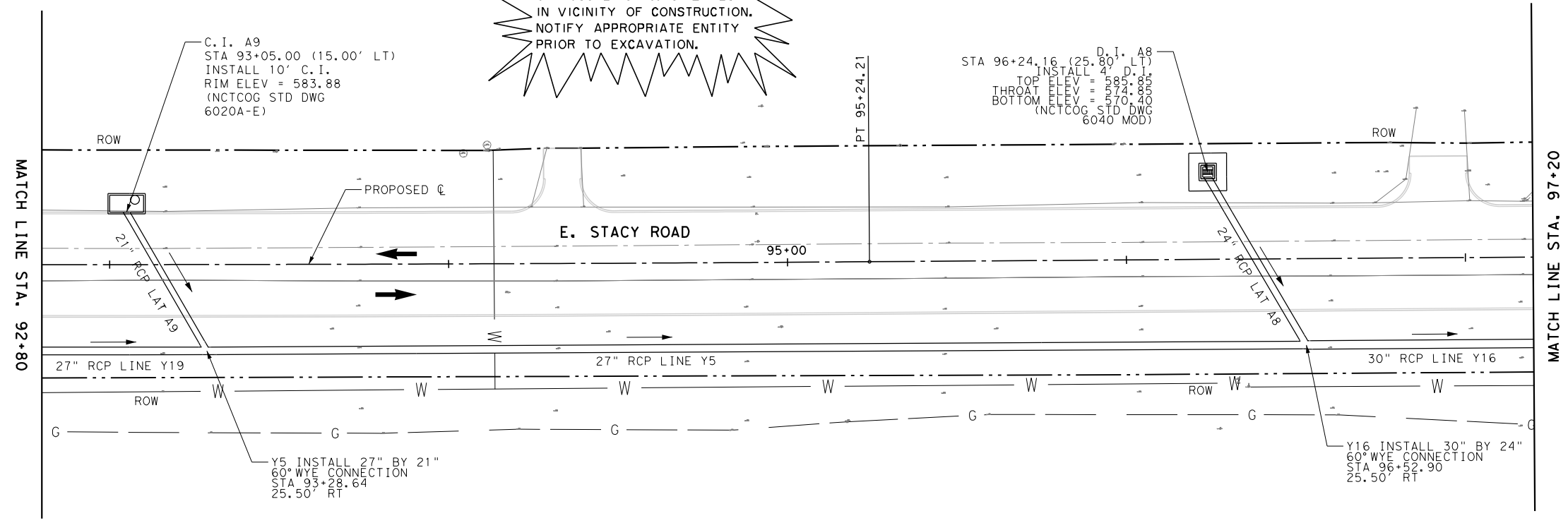


LEGEND

- TRAFFIC FLOW
- PROPOSED DRAINAGE INLET
- PROPOSED STORM DRAIN
- EXISTING WATER LINE
- EXISTING GAS LINE

GENERAL NOTES

1. CURB INLET STATION AND OFFSET ARE MEASURED TO THE MIDPOINT OF THE FACE OF THE MAIN INLET. DROP INLET STATION MEASURED TO CENTER.



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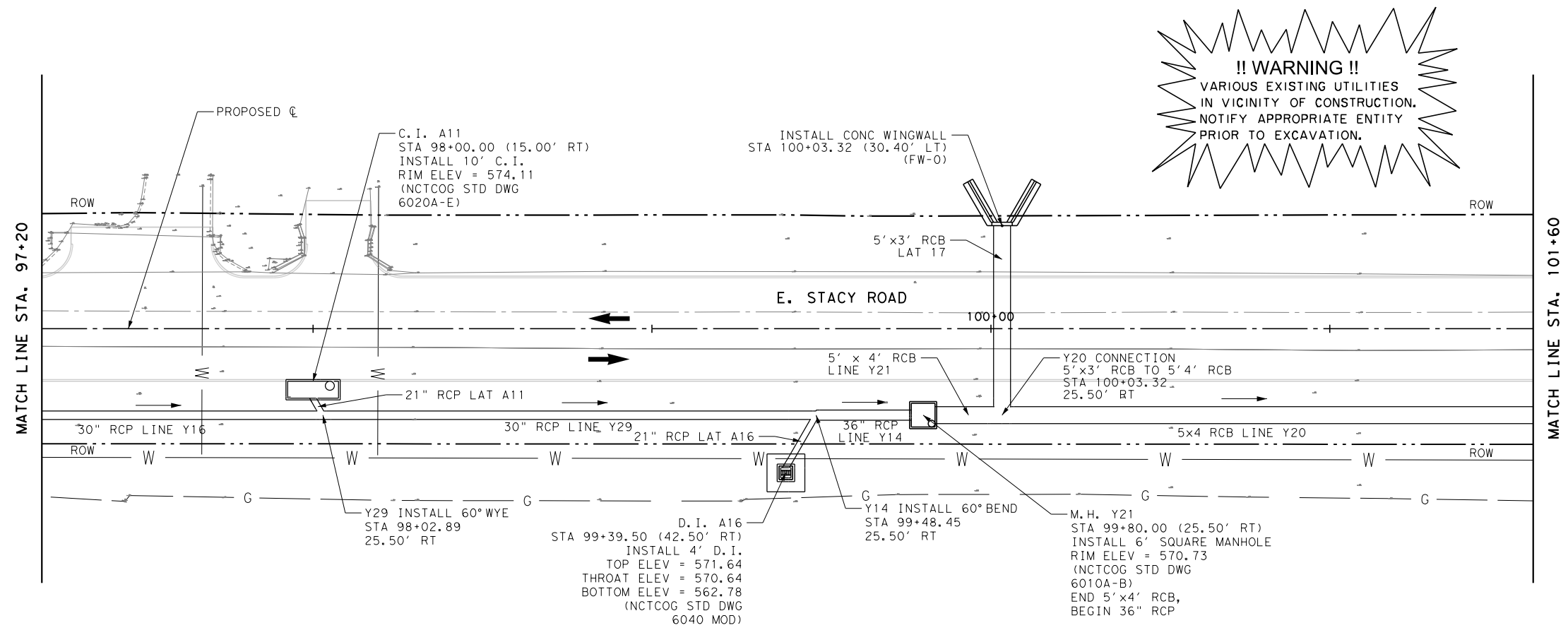
TOWN OF FAIRVIEW, TEXAS
 372 TOWN PLACE
 FAIRVIEW, TX 75069
 972-562-0522

E. STACY ROAD IMPROVEMENTS
NETWORK 2 STORM DRAIN
PLAN & PROFILE
 STA. 92+80 TO STA. 97+20

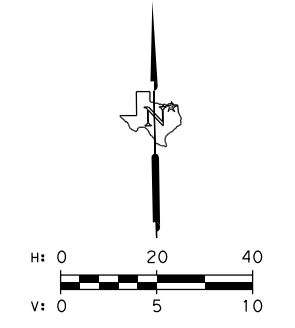
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 V: 1" = 5'
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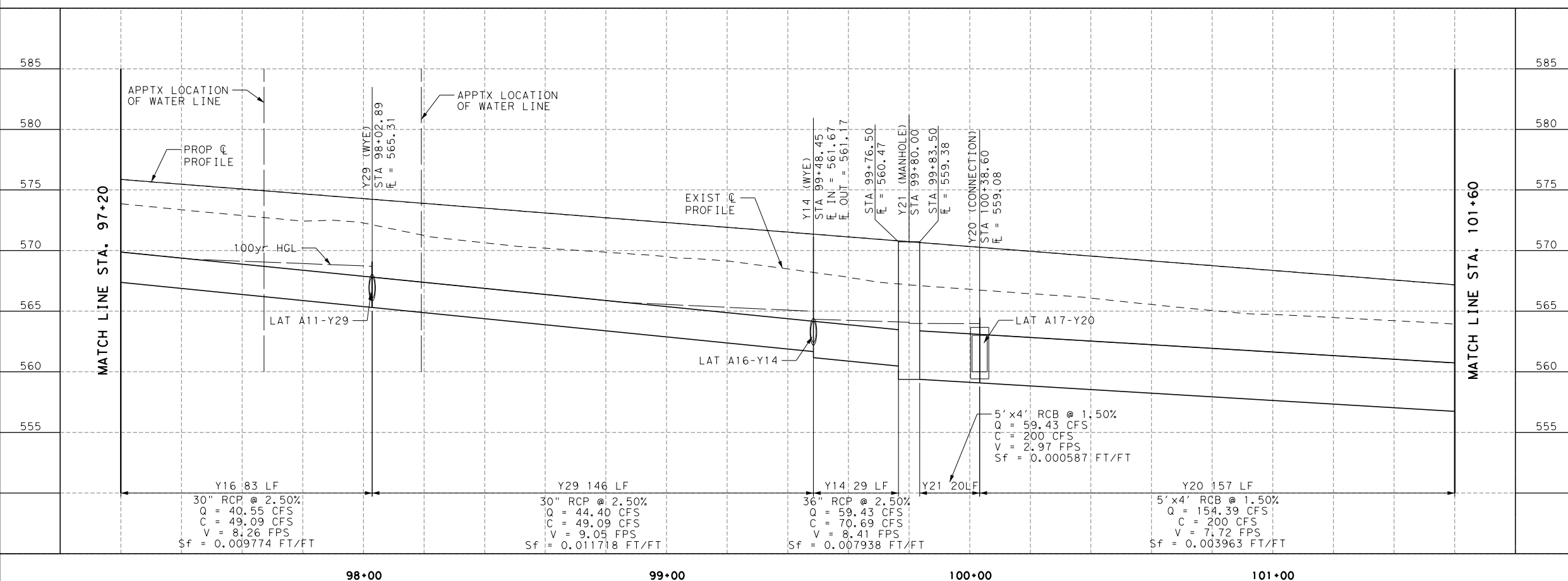
!! WARNING !!
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 IN VICINITY OF CONSTRUCTION.
 NOTIFY APPROPRIATE ENTITY
 PRIOR TO EXCAVATION.



- LEGEND**
- ➔ TRAFFIC FLOW
 - ◻ PROPOSED DRAINAGE INLET
 - PROPOSED STORM DRAIN
 - W — EXISTING WATER LINE
 - G — EXISTING GAS LINE

GENERAL NOTES

1. CURB INLET STATION AND OFFSET ARE MEASURED TO THE MIDPOINT OF THE FACE OF THE MAIN INLET. DROP INLET STATION MEASURED TO CENTER.



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 **TOWN OF FAIRVIEW, TEXAS**
 372 TOWN PLACE
 FAIRVIEW, TX 75069
 972-562-0522

E. STACY ROAD IMPROVEMENTS

NETWORK 2 STORM DRAIN PLAN & PROFILE

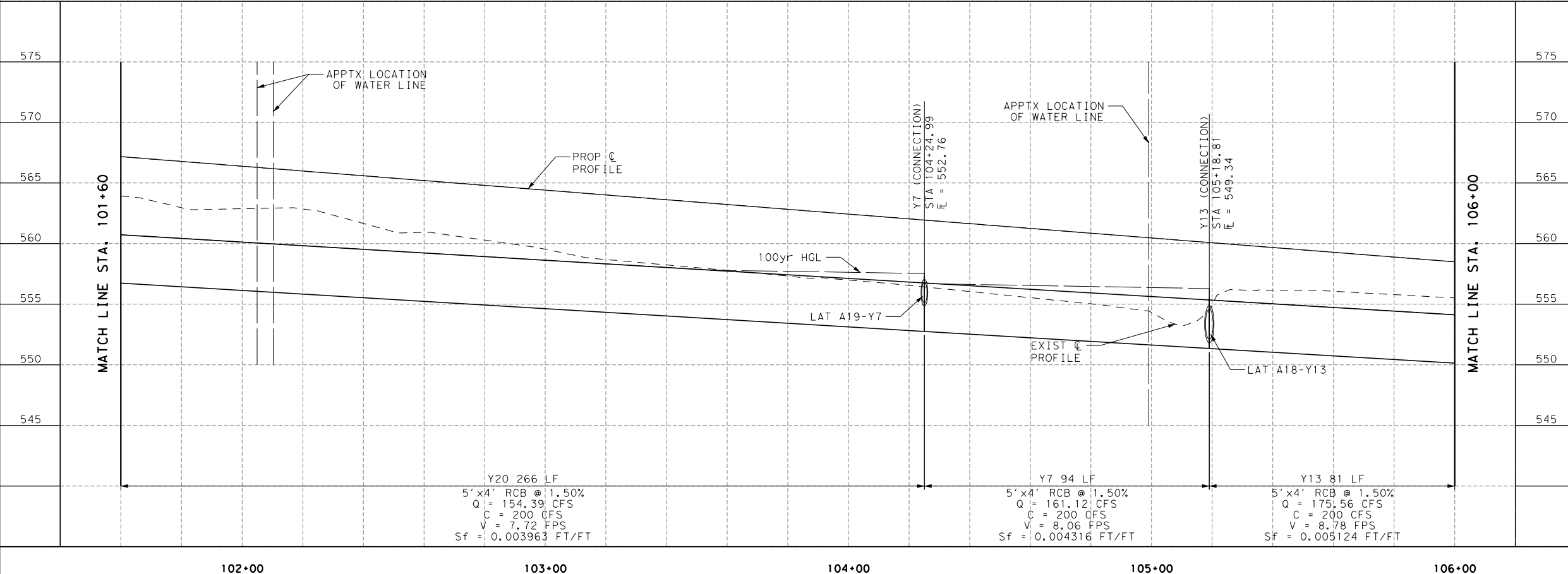
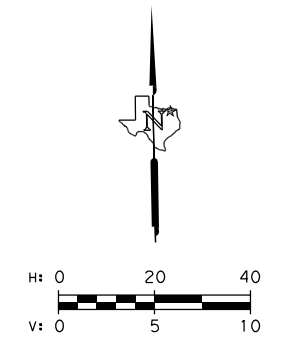
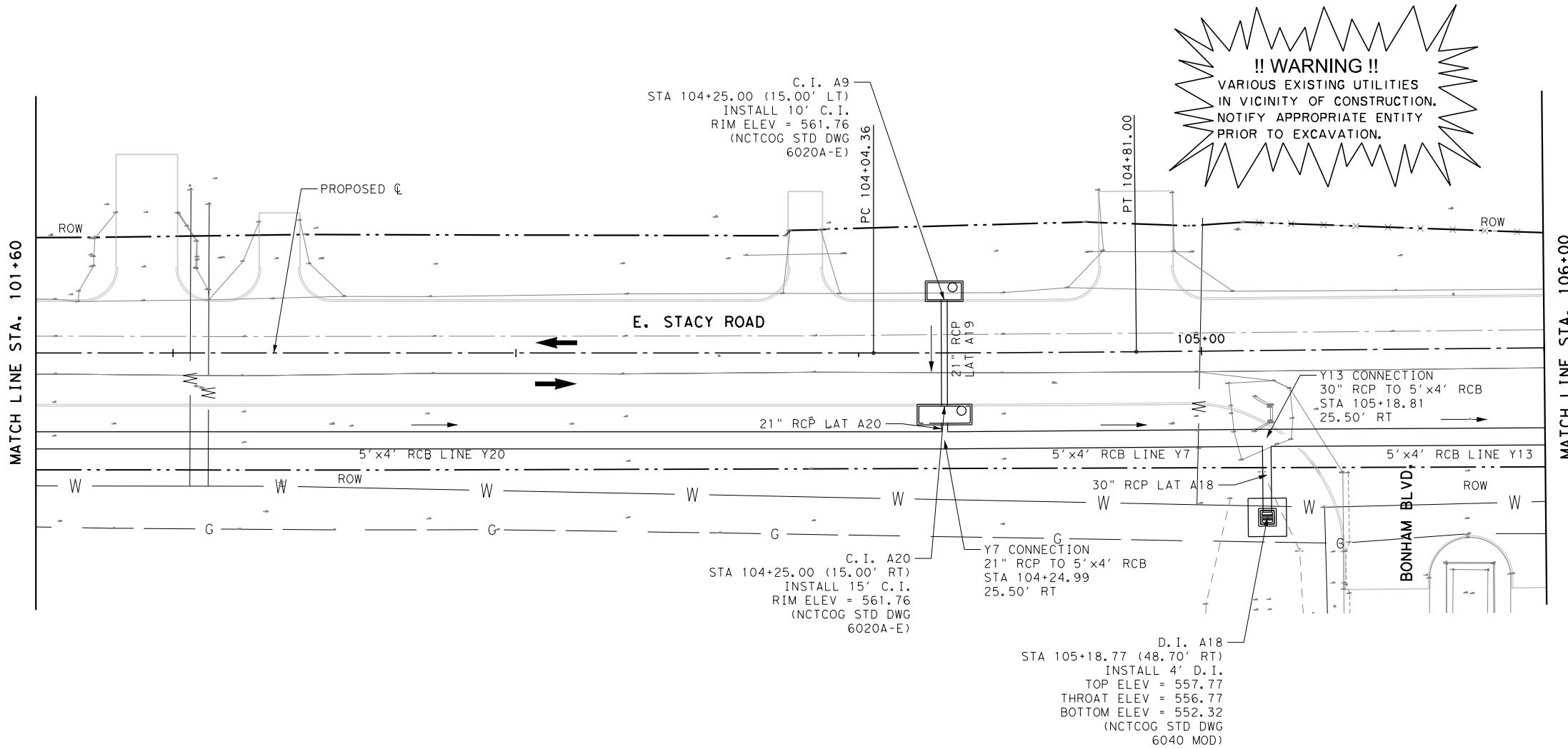
STA. 97+20 TO STA. 101+60

SCALE: H: 1" = 20'
 V: 1" = 5'

DESIGNED BY: RAW DRAWN BY: RAW CHECKED BY: SHEET NO. 97

SHEET 6 OF 10

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 Firm No. F-761

TOWN OF FAIRVIEW TEXAS
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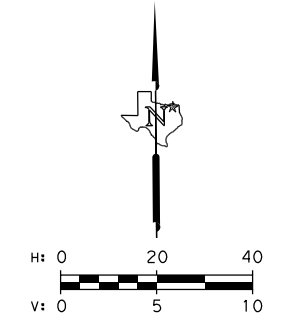
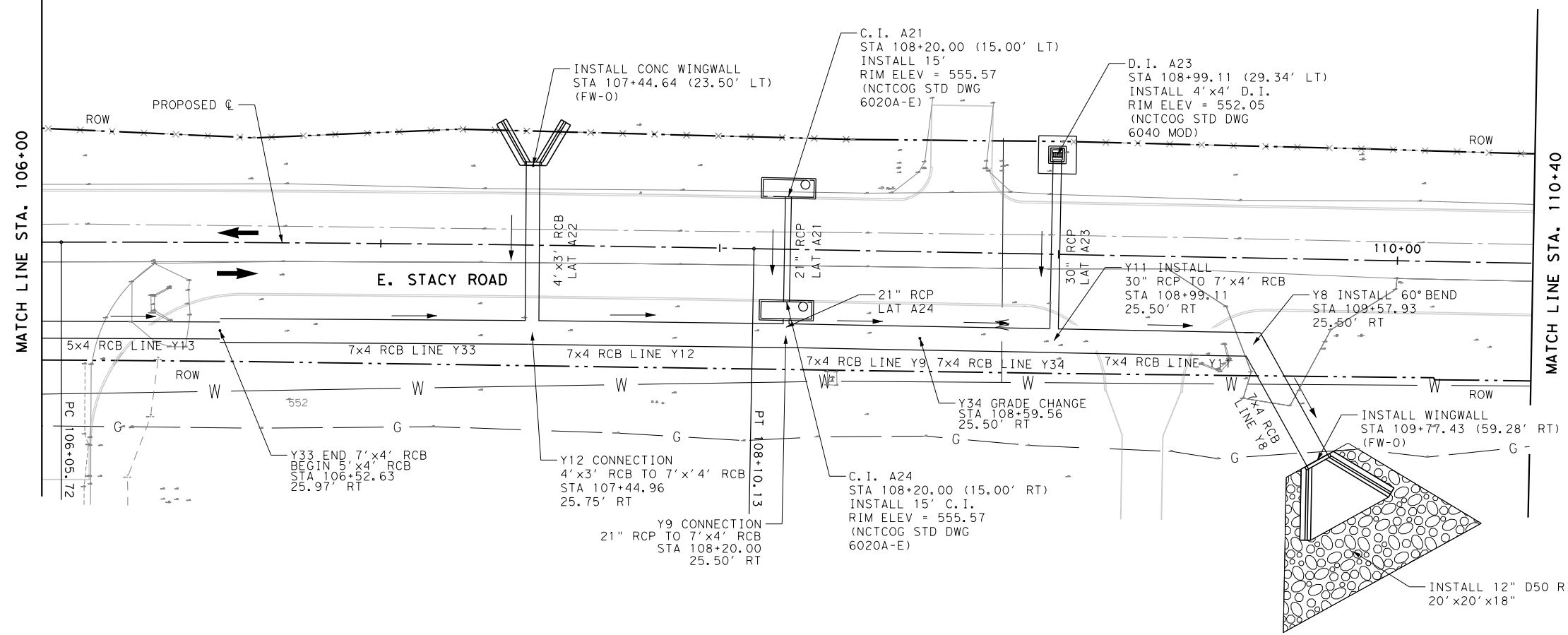
E. STACY ROAD IMPROVEMENTS
NETWORK 2 STORM DRAIN
PLAN & PROFILE
 STA. 101+60 TO STA. 106+00

SCALE: H: 1" = 20'
 V: 1" = 5'

DESIGNED BY: RAW
 DRAWN BY: RAW
 CHECKED BY:

SHEET NO. 98
 SHEET 7 OF 10

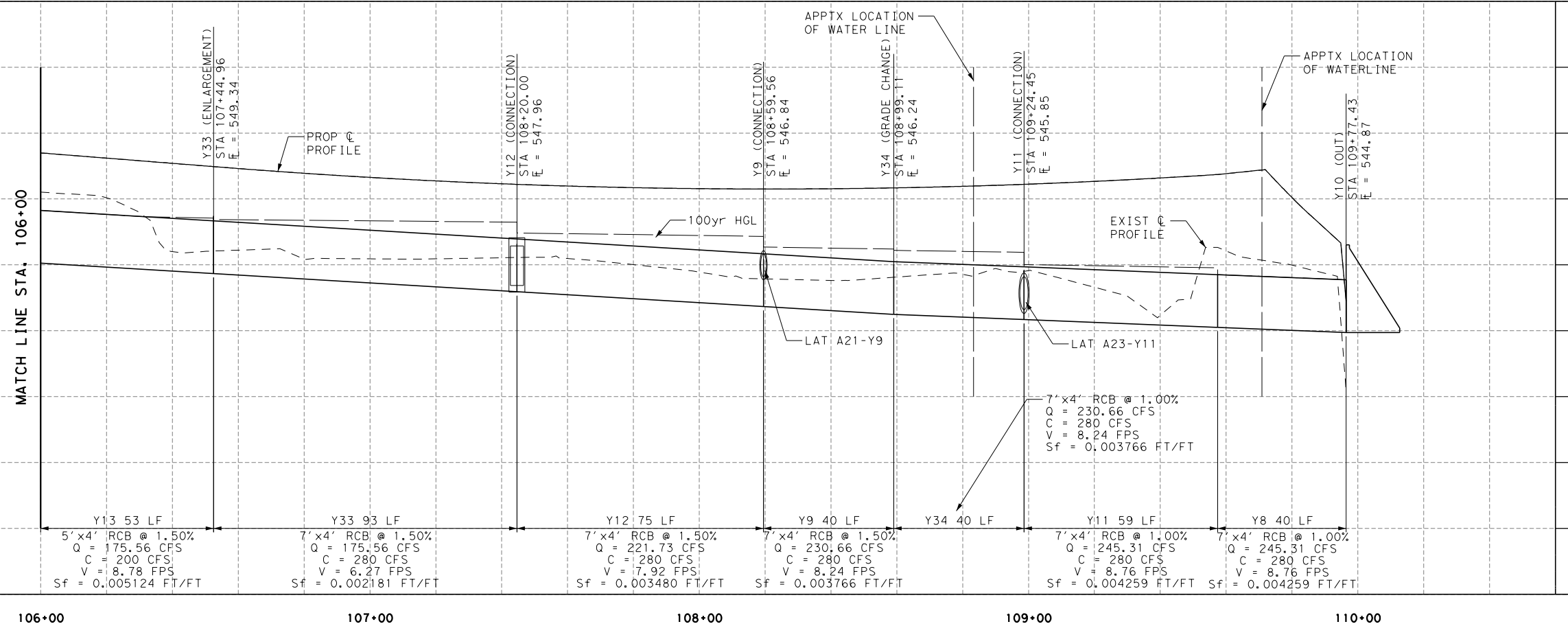
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- LEGEND**
- ➔ TRAFFIC FLOW
 - PROPOSED DRAINAGE INLET
 - PROPOSED STORM DRAIN
 - W — EXISTING WATER LINE
 - G — EXISTING GAS LINE

GENERAL NOTES

1. CURB INLET STATION AND OFFSET ARE MEASURED TO THE MIDPOINT OF THE FACE OF THE MAIN INLET. DROP INLET STATION MEASURED TO CENTER.



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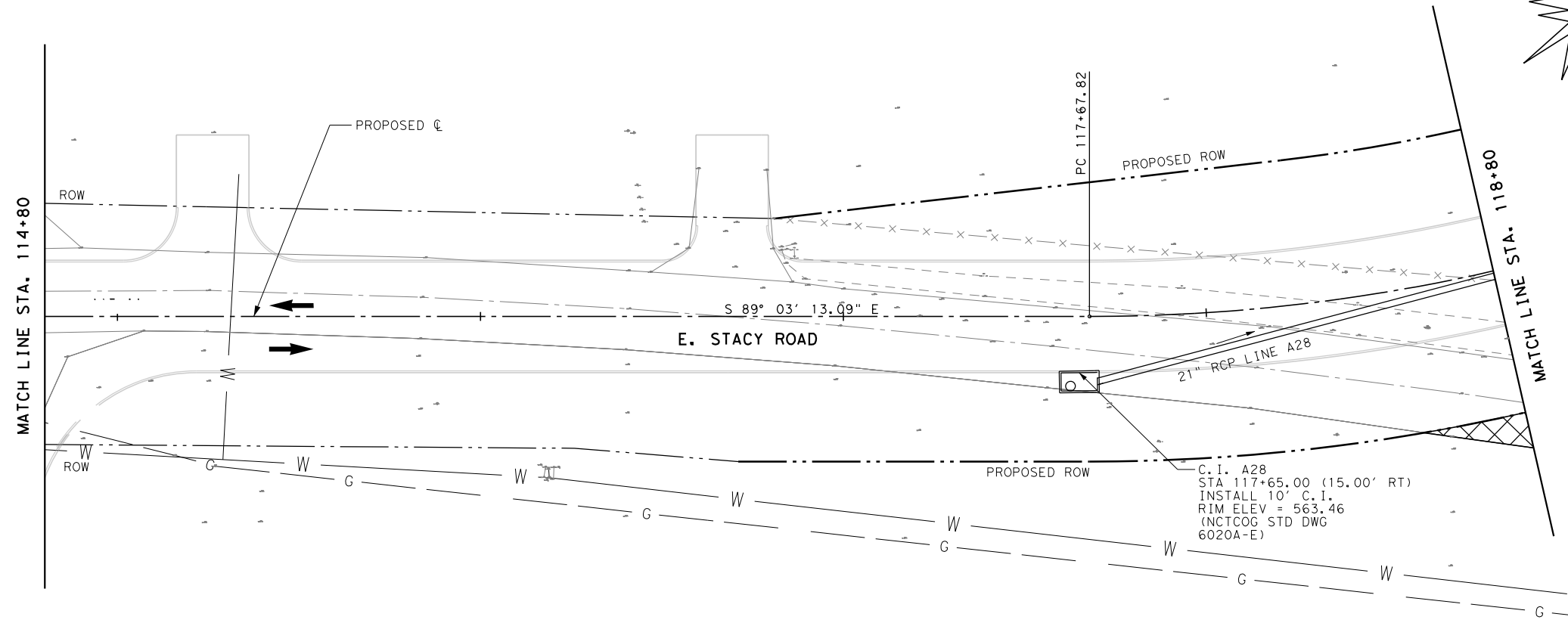
E. STACY ROAD IMPROVEMENTS
NETWORK 2 STORM DRAIN
PLAN & PROFILE
 STA. 106+00 TO STA. 110+40

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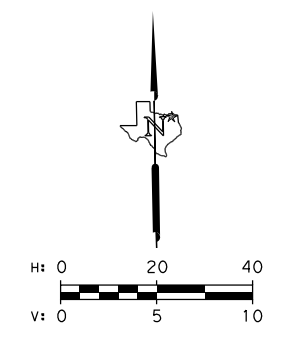
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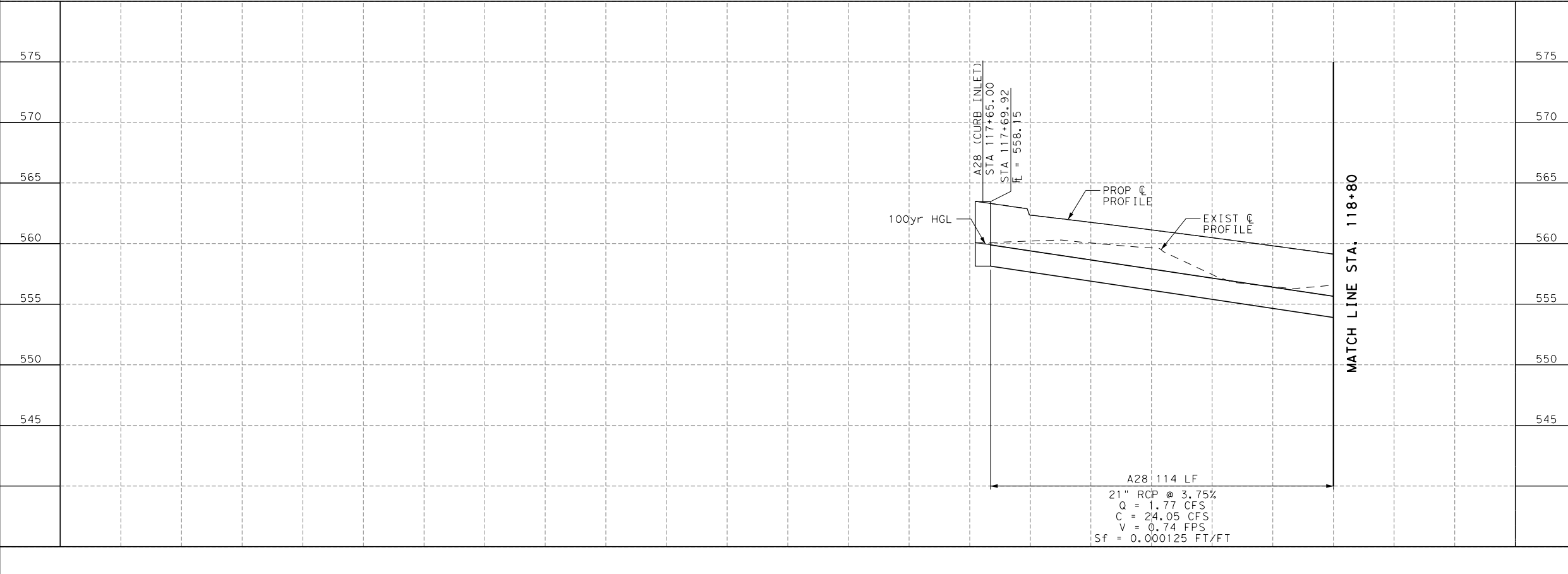
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 IN VICINITY OF CONSTRUCTION.
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 PRIOR TO EXCAVATION.



- LEGEND**
- ➔ TRAFFIC FLOW
 - PROPOSED DRAINAGE INLET
 - PROPOSED STORM DRAIN
 - W— EXISTING WATER LINE
 - G— EXISTING GAS LINE

GENERAL NOTES

1. CURB INLET STATION AND OFFSET ARE MEASURED TO THE MIDPOINT OF THE FACE OF THE MAIN INLET



A28 114 LF
 21" RCP @ 3.75%
 Q = 1.77 CFS
 C = 24.05 CFS
 V = 0.74 FPS
 Sf = 0.000125 FT/FT

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TOWN OF FAIRVIEW TEXAS
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 FAIRVIEW, TX 75069
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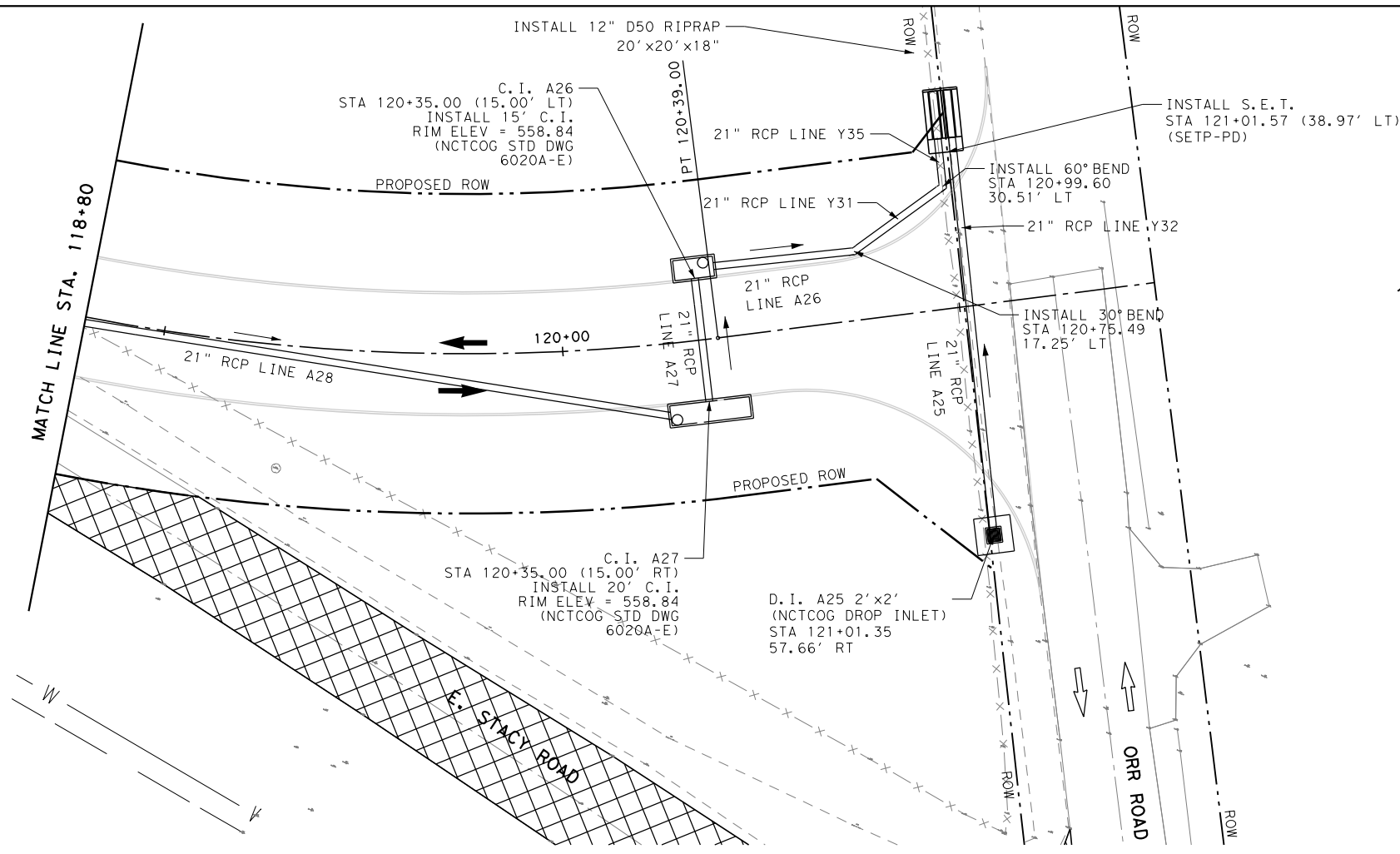
E. STACY ROAD IMPROVEMENTS
NETWORK 3 STORM DRAIN
PLAN & PROFILE
 STA. 114+80 TO STA. 118+80

SCALE: H: 1" = 20'
 V: 1" = 5'

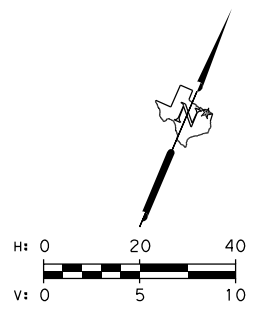
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SHEET 9 OF 10

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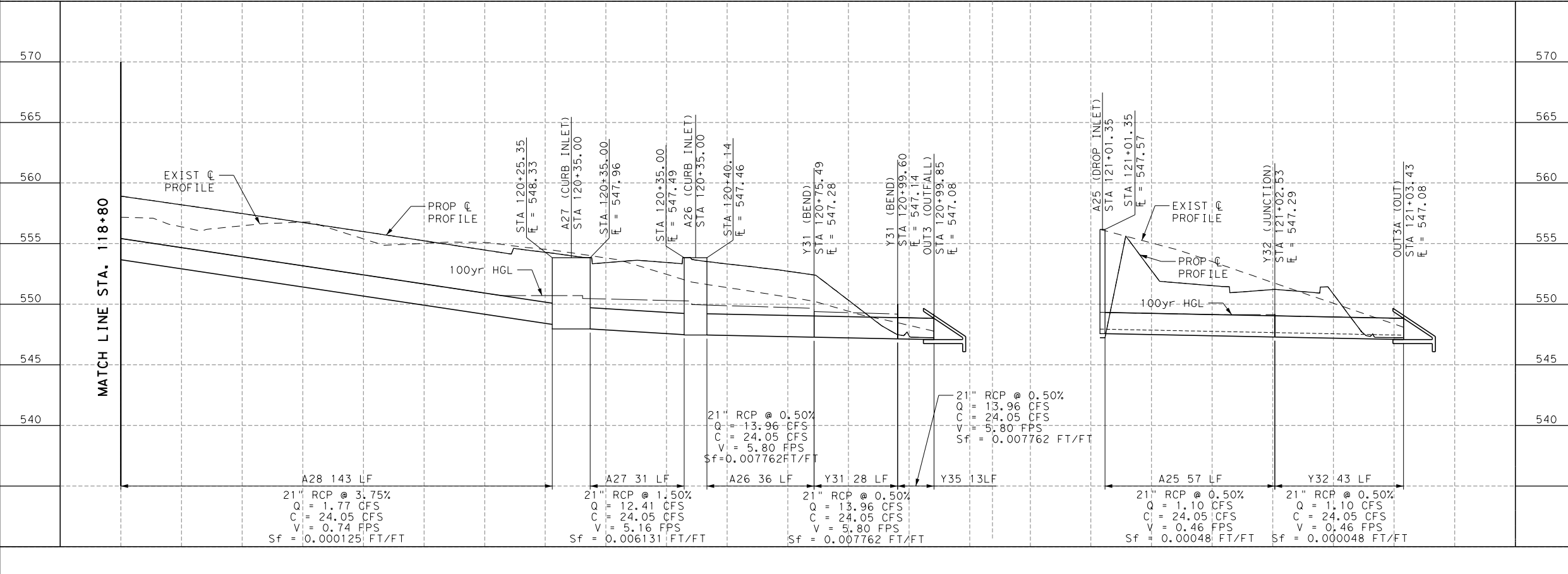


LEGEND

- TRAFFIC FLOW
- PROPOSED DRAINAGE INLET
- PROPOSED STORM DRAIN
- EXISTING WATER LINE
- EXISTING GAS LINE

GENERAL NOTES

1. CURB INLET STATION AND OFFSET ARE MEASURED TO THE MIDPOINT OF THE FACE OF THE MAIN INLET



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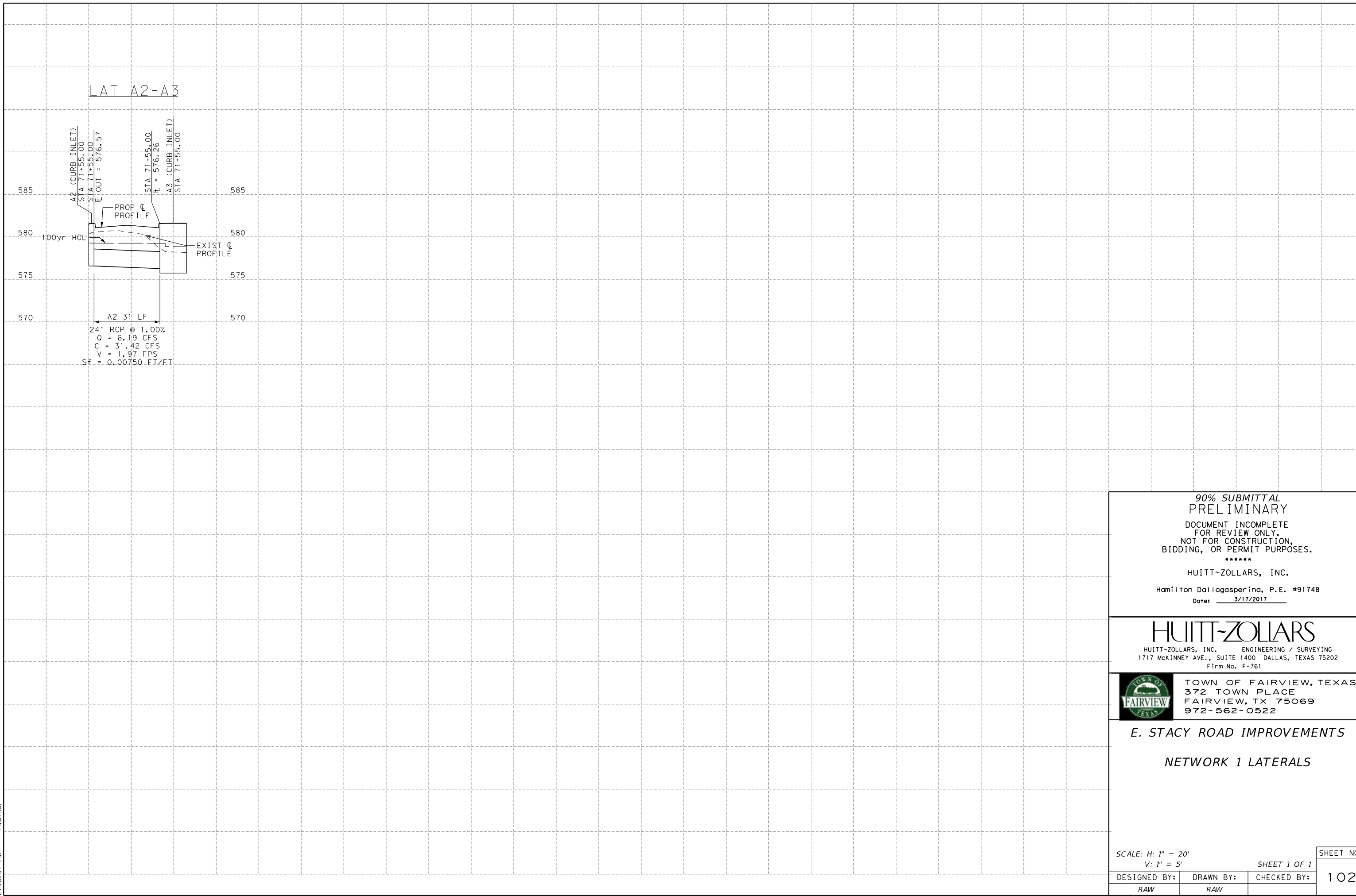
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 Firm No. F-761



E. STACY ROAD IMPROVEMENTS
NETWORK 3 STORM DRAIN PLAN & PROFILE
 STA. 118+80 TO END

SCALE: H: 1" = 20'
 V: 1" = 5'
 DESIGNED BY: RAW DRAWN BY: RAW CHECKED BY: []
 SHEET NO. 101
 SHEET 10 OF 10

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Firm No. F-761

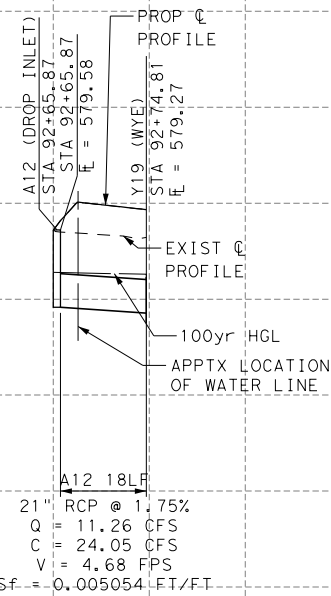
 TOWN OF FAIRVIEW, TEXAS
372 TOWN PLACE
FAIRVIEW, TX 75069
972-562-0522

E. STACY ROAD IMPROVEMENTS
NETWORK 1 LATERALS

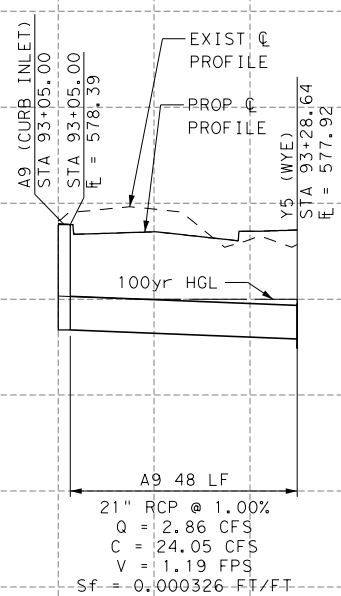
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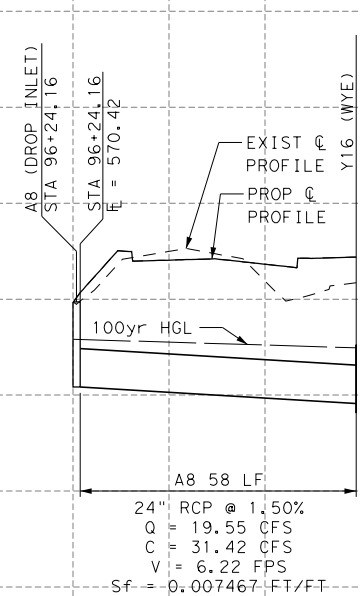
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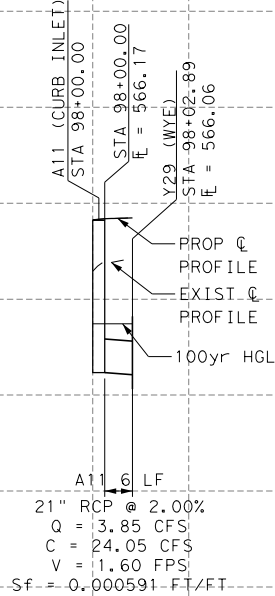
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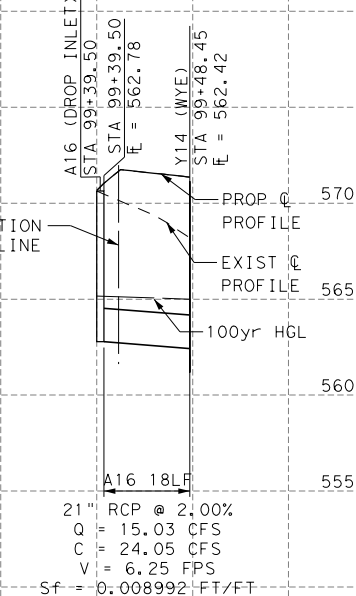
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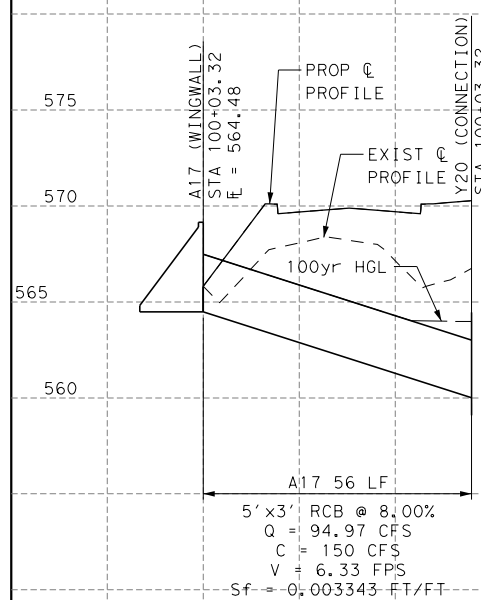
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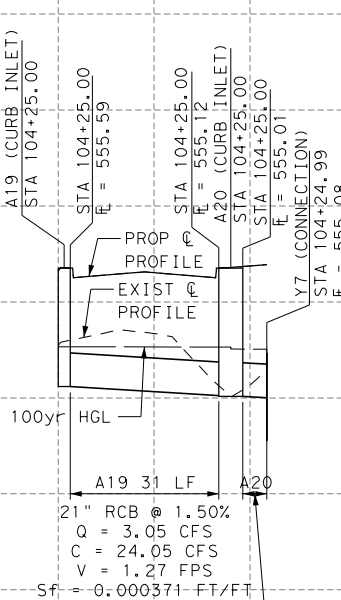
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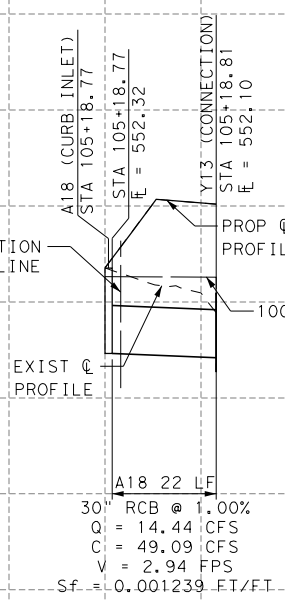
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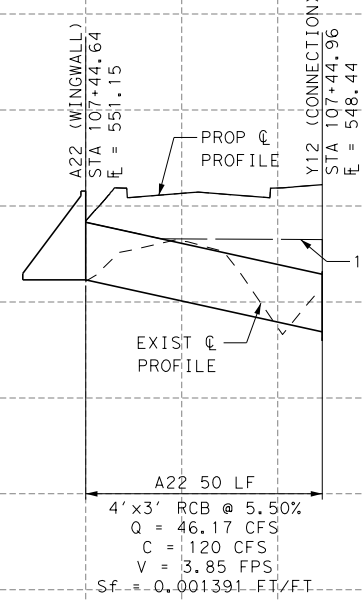
LAT A19-Y7



LAT A18-Y13



LAT A22-Y12




5 LF
 21" RCB @ 1.50%
 Q = 6.73 CFS
 C = 24.05 CFS
 V = 2.80 FPS
 Sf = 0.001805 FT/FT

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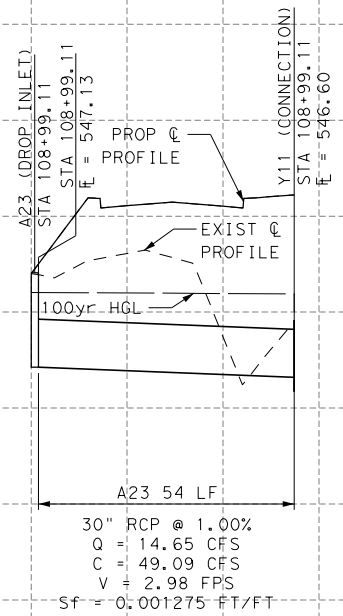
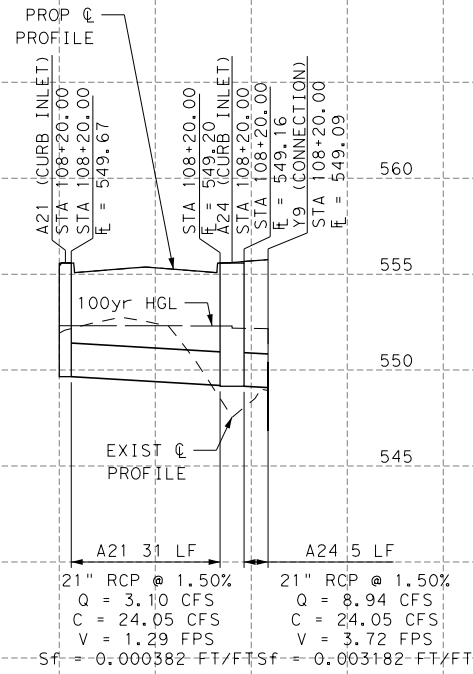
E. STACY ROAD IMPROVEMENTS
NETWORK 2 LATERALS

SCALE: H: 1" = 20'		SHEET NO. 103
V: 1" = 5'		
DESIGNED BY: RAW	DRAWN BY: RAW	CHECKED BY: SHEET 1 OF 2

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LAT A21-Y9

LAT A23-Y11



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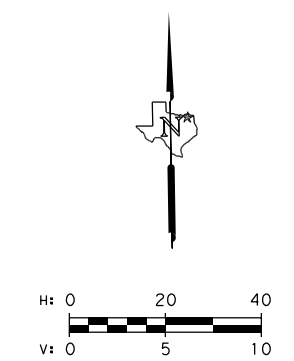
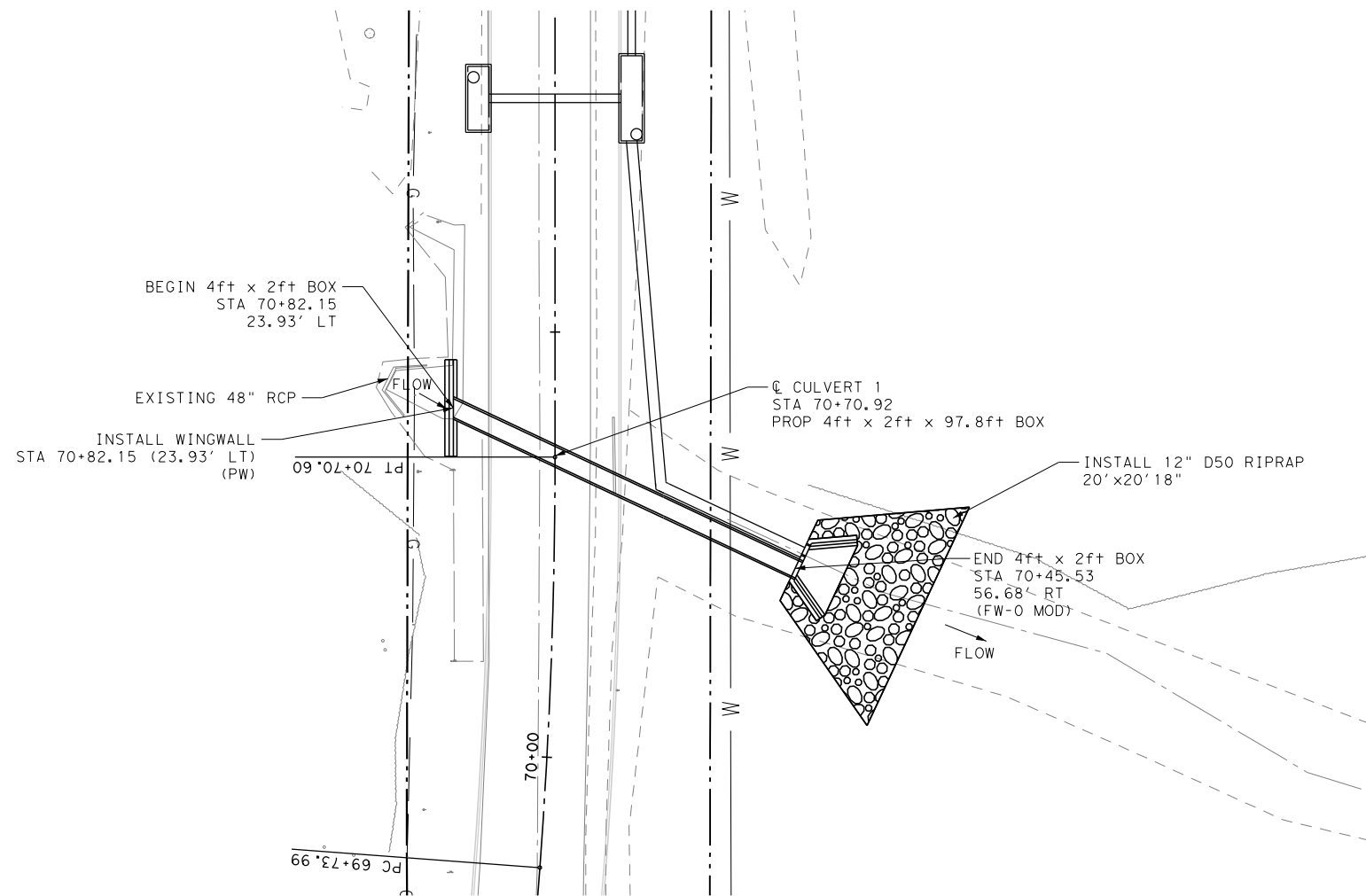
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E. STACY ROAD IMPROVEMENTS
NETWORK 2 LATERALS

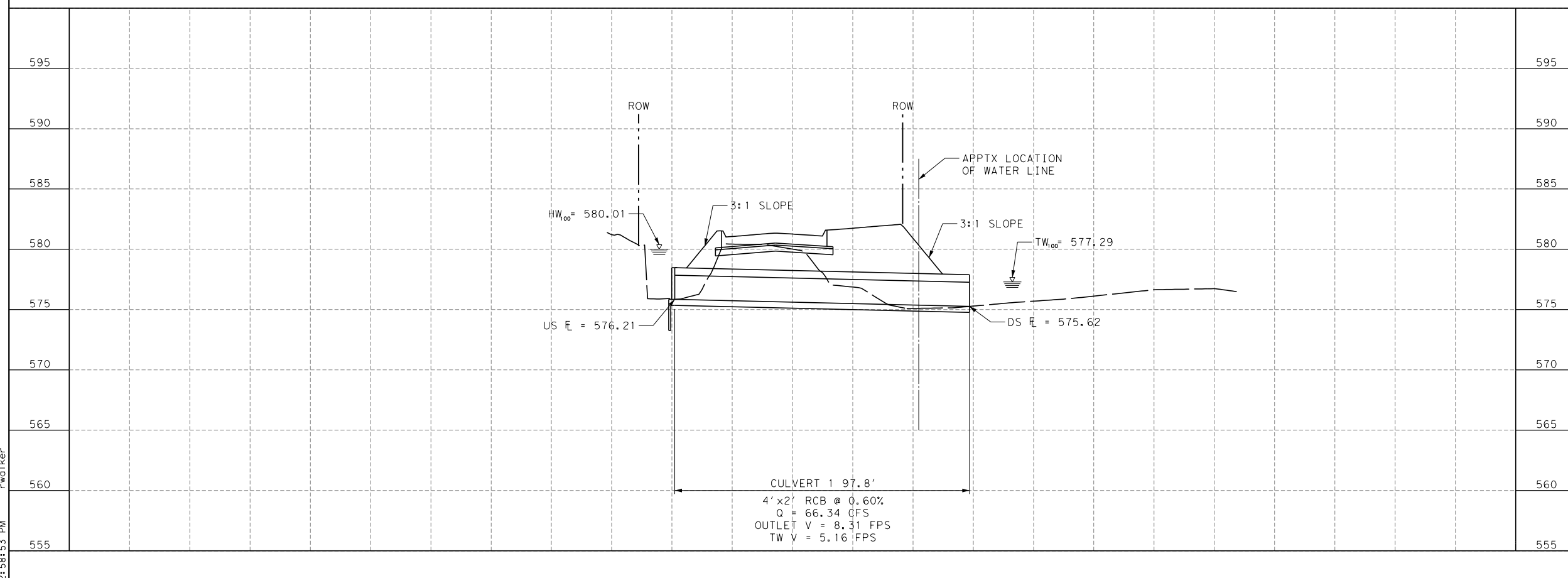
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 V: 1" = 5'
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 CHECKED BY:
 SHEET NO. 104

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 3/17/2017 2:58:53 PM rwalker



LEGEND

- W — EXISTING WATER LINE
- G — EXISTING GAS LINE



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 Firm No. F-761

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 372 TOWN PLACE
 FAIRVIEW, TX 75069
 972-562-0522

E. STACY ROAD IMPROVEMENTS
NETWORK 1
CULVERT 1

SCALE: H: 1" = 20'	SHEET NO. 105
V: 1" = 5'	
DESIGNED BY: RAW	DRAWN BY: RAW
CHECKED BY:	
SHEET 1 OF 1	

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 5/17/2017 2:58:35 PM rwalker

PLAN
N.T.S.

3-#4 BARS (4' & 5'M.H.) OR #5 BARS (6' M.H.) AT OPENING AS SHOWN.

TABLE OF DIMENSIONS
N.T.S.

M.H. SIZE(W)	V	T	E	F	G	H
4'	5'-4"	8"	6"	9"	6"	1'-3"
5'	6'-4"	8"	6"	12"	8"	1'-8"
6'	7'-6"	9"	9"	16"	10"	2'-2"

SECTION B-B
N.T.S.

STANDARD M.H. FRAME AND COVER AS SPECIFIED BY OWNER.
 PRECAST CONCRETE GRADE RINGS TO TOP SLAB.
 NON SHRINK GROUT 1:2.
 USE PRECAST CONCRETE GRADE RINGS AS REQUIRED TO RAISE TO GRADE.
 #4 BARS AT 18" C-C.
 CLASS "A" CONCRETE.
 HORIZONTAL BARS #4 BARS AT 18" C-C INSIDE FACE OR #4 BARS AT 15" (4' M.H.) OR 9" (5' & 6' M.H.) C-C.
 TOP OF PIPE.
 2" X 4" KEYWAY OR #4 BARS AT 8" C-C (4' & 5' M.H.) OR #5 BARS AT 8" C-C (6' M.H.) IN LIEU OF KEYWAY.
 PRECAST CONCRETE GRADE RINGS TO TOP SLAB.
 PAVING SURFACE.
 #4 BARS AT 18" C-C.
 #4 BARS AT 6" C-C (4' M.H.), OR #5 BARS AT 8" C-C (5' & 6' M.H.) EACH WAY.
 VERTICAL BARS #4 BARS AT 18" (IF WALL HEIGHT IS OVER 4'(4' & 5' M.H.), OR 6'(6' M.H.) USE STEEL REBAR SPACERS).
 STEEL TROWEL FINISH.
 #4 BARS AT 6" C-C (4' M.H.) OR #5 BARS AT 8" C-C (5' & 6' M.H.) EACH WAY.
 SLOPE 3/8" TO DRAIN.

STANDARD SPECIFICATION REFERENCE
502.1
DATE: OCT. '04
STANDARD DRAWING NO.: 6010A

SECTION A-A
N.T.S.

#4 BARS AT 6" C-C (4' M.H.), OR #5 BARS AT 8" C-C (5' & 6' M.H.) EACH WAY HOOKED EACH END.
 #4 BARS AT 18" OUTSIDE FACE.
 #4 BARS AT 15" (4' M.H.) OR 9" (5' & 6' M.H.) INSIDE FACE.
 #4 BARS AT 18" OUTSIDE FACE.
 #4 BARS AT 6" C-C (4' M.H.), OR #5 BARS AT 8" C-C (5' & 6' M.H.) EACH WAY.
 #4 BARS AT 18" INSIDE FACE.
 #4 DOWELS AT 18" ALL AROUND EXCEPT IN WAY OF PIPE.
 5" MIN.
 #4 BARS AT 6" C-C (4' M.H.), OR #5 BARS AT 8" C-C (5' & 6' M.H.) EACH WAY.

CORNER DETAIL PLAN VIEW
N.T.S.

NOTES:
 1. SLOPE INVERT OF MANHOLE AS INDICATED ON PLAN-PROFILE SHEET.
 2. LAYERS OF REINFORCING STEEL NEAREST THE INTERIOR AND EXTERIOR SURFACE SHALL HAVE A COVER OF 2" TO THE CENTER OF BARS, UNLESS OTHERWISE NOTED.
 3. CONCRETE SHALL BE CLASS "A".

STANDARD SPECIFICATION REFERENCE
502.1
DATE: OCT. '04
STANDARD DRAWING NO.: 6010B

TRANSVERSE BEAM DETAIL
(FOR USE WITH 15' & 20' INLETS)
N.T.S.

TOP VIEW
N.T.S.

SIDE SECTION
N.T.S.

END VIEW
N.T.S.

PLAN
N.T.S.

NOTES:
 1. LOCATION OF MANHOLE OPENING TO BE AT OUTFALL END, UNLESS OTHERWISE DIRECTED BY THE OWNER.
 2. INLETS OVER 10' IN WIDTH SHALL HAVE A MANHOLE OPENING AT EACH END.

STANDARD SPECIFICATION REFERENCE
702
DATE: OCT. '04
STANDARD DRAWING NO.: 6020A

SECTION "B-B"
N.T.S.

SECTION "X-X"
N.T.S.

SECTION "A-A"
N.T.S.

GENERAL NOTES:
 1. ALL CONCRETE SHALL BE CLASS "A" CONCRETE.
 2. REINFORCING BARS SHALL BE STANDARD GRADE STEEL, DEFORMED REINFORCING BARS OF A DIAMETER AND LENGTH AS SHOWN.
 3. CHAMFER ALL EXPOSED CORNERS 3/4" EXCEPT WHERE OTHERWISE NOTED.
 4. DIMENSIONS RELATING TO REINFORCING STEEL ARE TO CENTERS OF BARS.
 5. FIELD CUT AND BEND BARS AS NECESSARY TO ACCOMMODATE STORM SEWER PIPE.
 6. RING AND COVER SHALL BE APPROVED BY THE OWNER AND INSTALLED BY THE CONTRACTOR.

STANDARD SPECIFICATION REFERENCE
702
DATE: OCT. '04
STANDARD DRAWING NO.: 6020B

REBAR & M.H. FRAME & COVER
N.T.S.

CAST IRON FRAME AND COVER
N.T.S.

STANDARD SPECIFICATION REFERENCE
702
DATE: OCT. '04
STANDARD DRAWING NO.: 6020C

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 HUITT-ZOLLARS, INC.
 Hamilton Dallagasperina, P.E. #91748
 Date: 3/17/2017

HUITT-ZOLLARS
 HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING
 1717 MCKINNEY AVE., SUITE 1400 DALLAS, TEXAS 75202
 Firm No. F-761

TOWN OF FAIRVIEW TEXAS
 TOWN OF FAIRVIEW, TEXAS
 3722 TOWN PLACE
 FAIRVIEW, TX 75069
 972-562-0522

E. STACY ROAD IMPROVEMENTS
NCTCOG DRAINAGE STANDARDS

SCALE: NTS
 SHEET 1 OF 2

DESIGNED BY:	DRAWN BY:	CHECKED BY:	106
RAW	RAW		

SHEET NO.

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Table: BILL OF REINFORCING STEEL. Columns include DEPTH 'D', ALL WIDTHS AND LENGTHS, and OPENING LENGTH 'L' for various widths (5ft, 10ft, 15ft, 20ft). Rows list depths from 3'-6" to 10'-0" and various bar configurations.

NOTE: FOR CONVENIENCE, DEPTHS OF INLETS SHOWN IN ABOVE TABLES ARE IN INCREMENTS OF 3 INCHES BUT ANY DEPTHS OTHER THAN THOSE SHOWN ABOVE MAY BE USED WHEREVER DEEMED NECESSARY. QUANTITIES FOR OTHER DEPTHS FALLING WITHIN THE LIMITS OF THE TABLE MAY BE FOUND BY INTERPOLATION.

6020D CURB INLET BILL OF REINFORCING STEEL. North Central Texas Council of Governments. STANDARD SPECIFICATION REFERENCE 702. DATE OCT. '04. STANDARD DRAWING NO. 6020D.

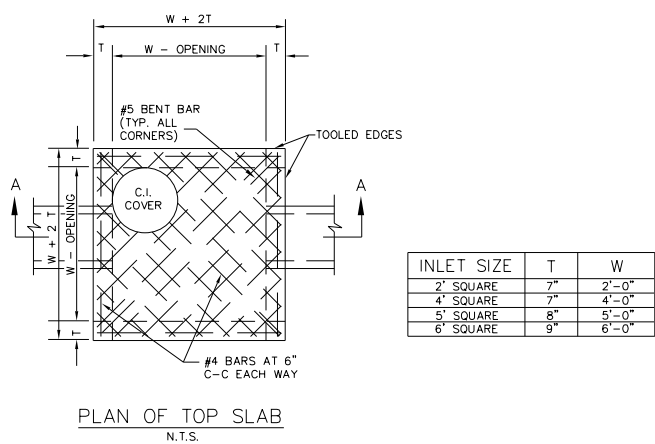
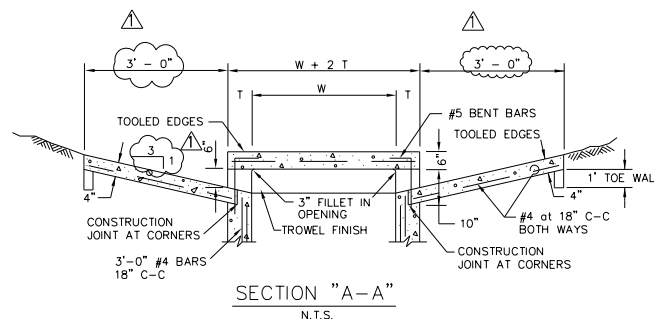
Table: SUMMARY OF QUANTITIES FOR CURB INLETS. Columns include DEPTH 'D', 5'-0" OPENING, 10'-0" OPENING, 15'-0" OPENING, and 20'-0" OPENING. Rows list depths from 3'-6" to 10'-0" and material quantities for concrete and steel.

NOTE: FOR CONVENIENCE, DEPTHS OF INLETS SHOWN IN ABOVE TABLES ARE IN INCREMENTS OF 3 INCHES BUT ANY DEPTHS OTHER THAN THOSE SHOWN ABOVE MAY BE USED WHEREVER DEEMED NECESSARY. QUANTITIES FOR OTHER DEPTHS FALLING WITHIN THE LIMITS OF THE TABLE MAY BE FOUND BY INTERPOLATION.

6020E CURB INLET SUMMARY OF QUANTITIES. North Central Texas Council of Governments. STANDARD SPECIFICATION REFERENCE 702. DATE OCT. '04. STANDARD DRAWING NO. 6020E.

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INLET SIZE	T	W
2' SQUARE	7"	2'-0"
4' SQUARE	7"	4'-0"
5' SQUARE	8"	5'-0"
6' SQUARE	9"	6'-0"

- NOTES:
1. MATERIAL AND WORKMANSHIP SHALL CONFORM WITH THE REQUIREMENTS OF NCTCOG STANDARD SPECIFICATIONS FOR STANDARD CONCRETE MANHOLES. MINIMUM CLASS "A" CONCRETE.
 2. LAYERS OF REINFORCING STEEL NEAREST THE INTERIOR AND EXTERIOR SURFACES SHALL HAVE A COVER OF 2" TO THE CENTER OF BARS, UNLESS OTHERWISE NOTED.
 3. FOR DETAILS OF REINFORCING OF LOWER PORTIONS OF INLET SEE APPROPRIATE SQUARE MANHOLE DETAILS.
 4. DEPTH OF DROP INLET FROM FINISHED GRADE TO FLOW LINE OF INLET IS VARIABLE. APPROXIMATE DEPTH WILL BE SHOWN ON PLANS AT LOCATION OF INLET.
 5. ALL STANDARD DROP INLETS SHALL HAVE ONE OPENING ON EACH SIDE UNLESS OTHERWISE SHOWN ON PLANS.
 6. DECK MAY BE REINFORCED SAME AS 4' SQUARE MANHOLE.

△ CHANGED APRON SLOPE FROM 4:1 TO 3:1

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 HUITT-ZOLLARS, INC.
 Hamilton Dallagasperina, P.E. #91748
 Date: 3/17/2017

HUITT-ZOLLARS
 HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING
 1717 MCKINNEY AVE., SUITE 1400 DALLAS, TEXAS 75202
 Firm No. F-761



TOWN OF FAIRVIEW, TEXAS
 372 TOWN PLACE
 FAIRVIEW, TX 75069
 972-562-0522

E. STACY ROAD IMPROVEMENTS
 NCTCOG MODIFIED
 DRAINAGE STANDARDS

SCALE: NTS		SHEET 1 OF 1		SHEET NO.
DESIGNED BY:	DRAWN BY:	CHECKED BY:		108
RAW	RAW			

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TABLE OF DIMENSIONS & REINFORCING STEEL
 (Wings for One Structure End)

Maximum Wingwall Height Hw	Dimensions				Variable Reinforcing				Estimated Quantities per ft of wing length (2-Wings)	
	W	X	Y	Z	Bars J1		Bars J2		Reinf (Lb/Ft)	Conc (CY/Ft)
2'-6"	2'-5"	1'-0"	9"	7"	#4	1'-0"	#4	1'-0"	33.73	0.248
3'-0"	2'-5"	1'-0"	9"	7"	#4	1'-0"	#4	1'-0"	37.07	0.261
3'-6"	2'-5"	1'-0"	9"	7"	#4	1'-0"	#4	1'-0"	37.74	0.273
4'-0"	2'-5"	1'-0"	9"	7"	#4	1'-0"	#4	1'-0"	38.41	0.285
4'-6"	3'-2"	1'-6"	1'-0"	7"	#4	1'-0"	#4	1'-0"	41.75	0.330
5'-0"	3'-2"	1'-6"	1'-0"	7"	#4	1'-0"	#4	1'-0"	45.09	0.343
5'-6"	3'-2"	1'-6"	1'-0"	7"	#4	1'-0"	#4	1'-0"	45.75	0.355
6'-0"	3'-2"	1'-6"	1'-0"	7"	#4	1'-0"	#4	1'-0"	46.42	0.367
7'-0"	3'-8"	1'-9"	1'-3"	7"	#4	1'-0"	#4	1'-0"	52.77	0.414
8'-0"	4'-2"	2'-0"	1'-6"	8"	#5	1'-0"	#4	1'-0"	60.19	0.486
9'-0"	4'-8"	2'-3"	1'-9"	8"	#4	6"	#4	6"	81.49	0.535
10'-0"	5'-2"	2'-6"	2'-0"	8"	#5	6"	#4	6"	97.25	0.584
11'-0"	5'-8"	2'-9"	2'-3"	8"	#4	6"	#5	6"	133.65	0.634
12'-0"	6'-2"	3'-0"	2'-6"	9"	#7	6"	#5	6"	162.29	0.721
13'-0"	6'-8"	3'-3"	2'-9"	11"	#7	6"	#5	6"	178.80	0.856
14'-0"	7'-2"	3'-6"	3'-0"	1'-0"	#8	6"	#5	6"	216.78	0.959
15'-0"	7'-8"	4'-0"	3'-0"	1'-1"	#9	6"	#6	6"	283.06	1.068
16'-0"	8'-2"	4'-6"	3'-0"	1'-3"	#9	6"	#6	6"	297.02	1.234

TABLE OF WINGWALL REINFORCING (2-Wings)

Bar	Size	No.	Spa
D	#5	~	1'-0"
E	#4	~	1'-0"
F	#4	~	1'-0"
G	#6	4	~
M	#4	4	~
P	#4	~	1'-0"
R	#5	6	~
V	#4	~	1'-0"

TABLE OF ESTIMATED CULVERT TOEWALL QUANTITIES

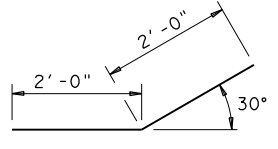
Bar	Size	No.	Spa
L	#4	~	1'-6"
Q	#4	1	~
Reinf (Lb/Ft)	2.45		
Conc (CY/Ft)	0.037		

WING DIMENSION CALCULATIONS:

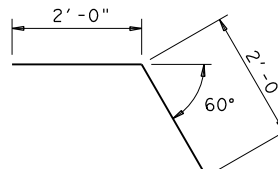
Formulas: (All values are in Feet)
 $H_w = H + T + C - 0.250'$
 $A = (H_w - 0.333')$ (SL)
 $B = (A) \text{ Tangent } (30^\circ)$
 $L_w = (A) \div \text{Cosine } (30^\circ)$
 For Cast-in-place culverts:
 $L_{tw} = (N) (S) + (N+1) (U)$
 For Precast culverts:
 $L_{tw} = (N) (2U+S) + (N-1) (0.500')$
 Total Wingwall Area (Two Wings ~ S.F.) = $(H_w + 0.333') (L_w)$

H_w = Height of Wingwall
 $SL:1$ = Side Slope Ratio (Horizontal:1 Vertical)
 L_w = Length of Wingwall
 L_{tw} = Culvert Toewall Length
 N = Number of Culvert Spans

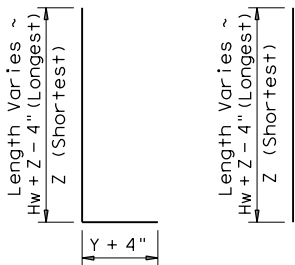
See applicable box culvert standard for H, S, T, and U values.



BARS D

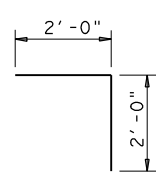


BARS R

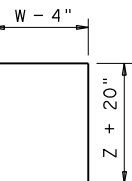


BARS J1

BARS V



BARS L

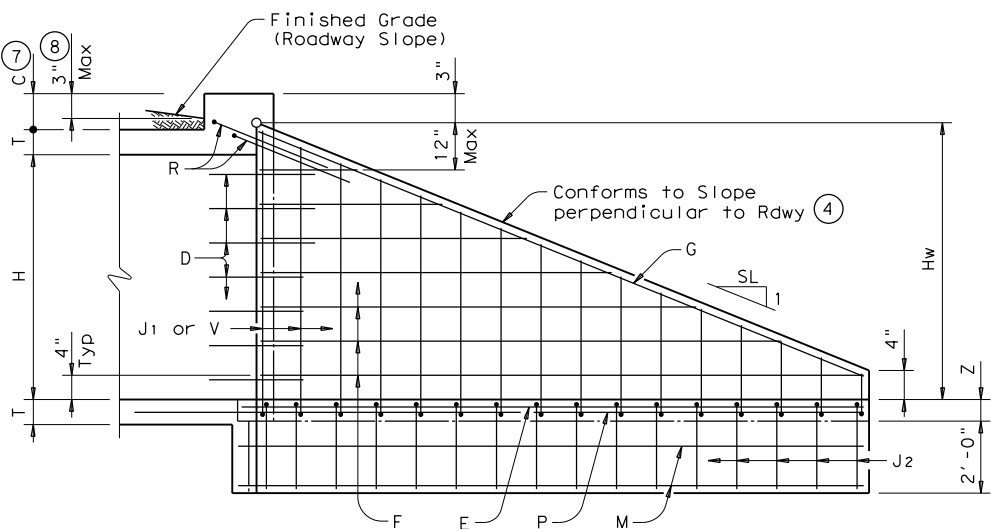


BARS J2

- Extend Bars P 3'-0" minimum into bottom slab of Box Culvert.
- Adjust to fit as necessary to maintain 1 1/4" clear cover and 4" minimum between bars.
- Quantities shown are based on an average wing height for two wings (one structure end). To determine total quantities for two wings multiply the tabulated values by Lw.
- Recommended values of Slope are: 2:1, 3:1, 4:1, & 6:1.
- When shown elsewhere on the plans, a 5" deep concrete riprap shall be constructed. Payment for riprap shall be as required by Item 432, "Riprap". Unless otherwise shown on the plans or directed by the Engineer, the riprap shall have a 6" wide by 1'-6" deep reinforced concrete toewall along all edges adjacent to natural ground; the toewall shall be reinforced by extending typical riprap reinforcing into the toewall; construction joints or grooved joints, oriented in the direction of flow, shall extend across the full distance of the riprap, at intervals of approximately 20'. When such riprap is provided, the culvert toewall shown in SECTION B-B will not be required.
- At Contractor's option, Culvert Toewall may be ended flush with Wingwall Toewall. Adjust reinforcing from that shown as necessary.
- 0" min to 5'-0" max. Estimated curb heights are shown elsewhere in the plans. For structures with pedestrian rail, bicycle rail or curbs taller than 1'-0", refer to ECD standard. For structures with T6 bridge rail, refer to T6-CM standard. For structures with traffic rail, other than T6, refer to RAC standard.
- For vehicle safety, curb heights and wall heights shall be reduced, if necessary, to provide a maximum 3" projection above finished grade. No changes will be made in quantities and no additional compensation will be allowed for this work.

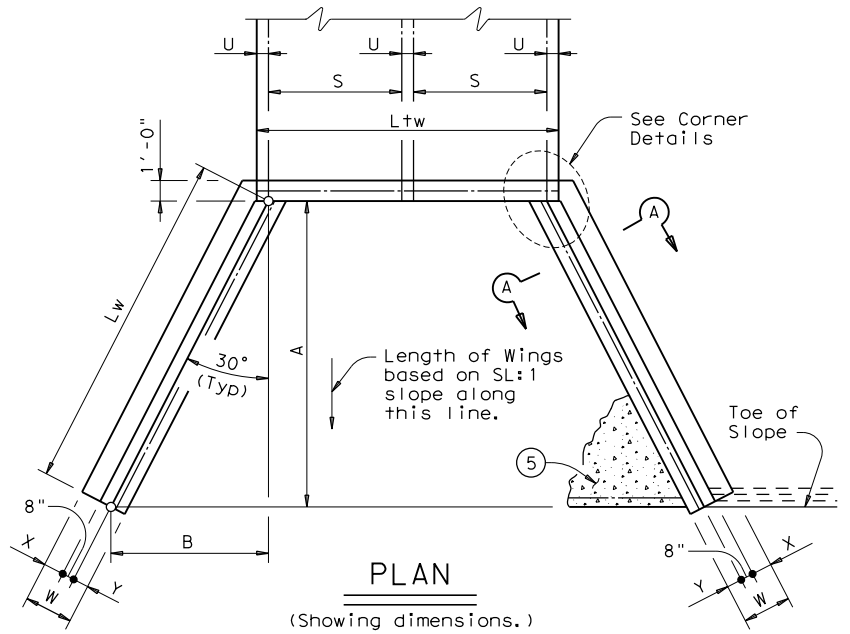
GENERAL NOTES:

Designed according to AASHTO LRFD Specifications. All reinforcing steel shall be Grade 60. 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. All concrete shall be Class "C" and shall have a minimum compressive strength of 3600 psi. All reinforcing bars shall be adjusted to provide a minimum of 1 1/4" clear cover. When structure is founded on solid rock, depth of toewalls for culverts and wingwalls may be reduced or eliminated as directed by the Engineer. See BCS sheet for additional dimensions and information. The quantities for concrete and reinforcing steel resulting from the formulas given on this sheet are for Contractor's information only.



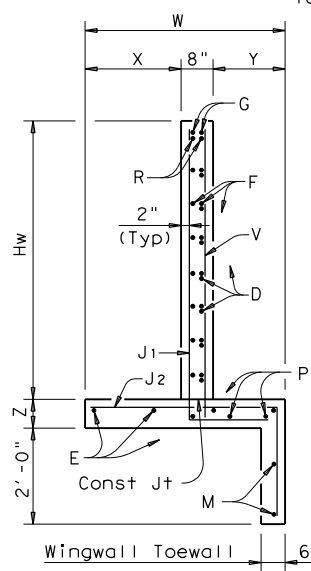
INSIDE ELEVATION

(Showing reinforcing. Culvert and Culvert Toewall reinforcing not shown for clarity.)

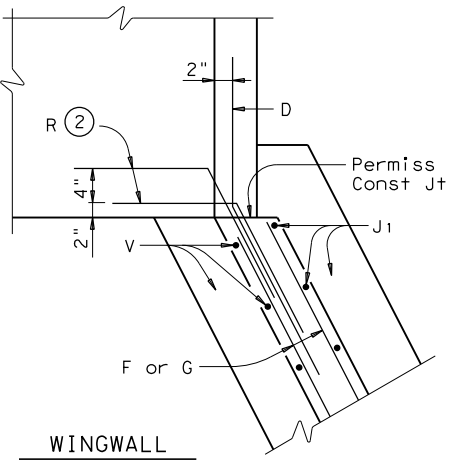


PLAN

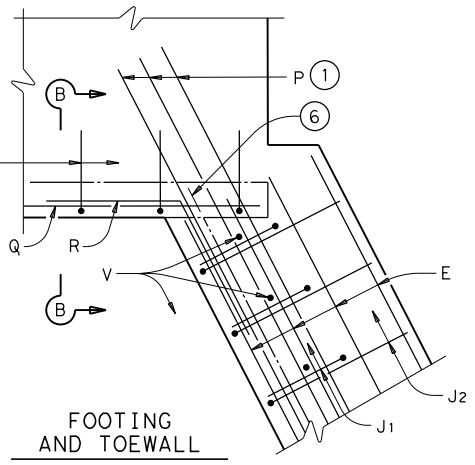
(Showing dimensions.)



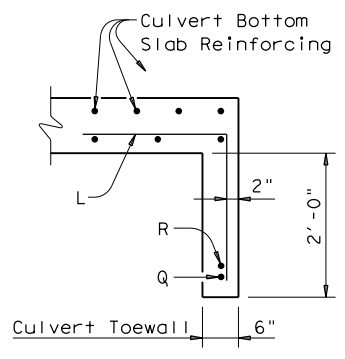
SECTION A-A



WINGWALL



FOOTING AND TOEWALL



SECTION B-B

CORNER DETAILS

(Culvert and Culvert Toewall reinforcing not shown for clarity.)

Texas Department of Transportation Bridge Division Standard

CONCRETE WINGWALLS WITH FLARED WINGS FOR 0° SKEW BOX CULVERTS

FW-0

FILE: fw-0std.dgn	DN: GAF	CK: CAT	DW: TxDOT	CK: GAF
©TxDOT February 2010	CONT	SECT	JOB	HIGHWAY
REVISIONS				STACY ROAD
11-10: Add note for synthetic fibers.	DIST	COUNTY	SHEET NO.	
	COLLIN			109

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TABLE OF DIMENSIONS & REINFORCING STEEL
 (Wings for One Structure End)

Maximum Wingwall Height Hw	Dimensions				Variable Reinforcing				Estimated Quantities per ft of wing length (2-Wings)	
	W	X	Y	Z	Bars J1		Bars J2		Reinf (Lb/Ft)	Conc (CY/Ft)
2'-6"	2'-5"	1'-0"	9"	7"	#4	1'-0"	#4	1'-0"	33.73	0.248
3'-0"	2'-5"	1'-0"	9"	7"	#4	1'-0"	#4	1'-0"	37.07	0.261
3'-6"	2'-5"	1'-0"	9"	7"	#4	1'-0"	#4	1'-0"	37.74	0.273
4'-0"	2'-5"	1'-0"	9"	7"	#4	1'-0"	#4	1'-0"	38.41	0.285
4'-6"	3'-2"	1'-6"	1'-0"	7"	#4	1'-0"	#4	1'-0"	41.75	0.330
5'-0"	3'-2"	1'-6"	1'-0"	7"	#4	1'-0"	#4	1'-0"	45.09	0.343
5'-6"	3'-2"	1'-6"	1'-0"	7"	#4	1'-0"	#4	1'-0"	45.75	0.355
6'-0"	3'-2"	1'-6"	1'-0"	7"	#4	1'-0"	#4	1'-0"	46.42	0.367
7'-0"	3'-8"	1'-9"	1'-3"	7"	#4	1'-0"	#4	1'-0"	52.77	0.414
8'-0"	4'-2"	2'-0"	1'-6"	8"	#5	1'-0"	#4	1'-0"	60.19	0.486
9'-0"	4'-8"	2'-3"	1'-9"	8"	#4	6"	#4	6"	81.49	0.535
10'-0"	5'-2"	2'-6"	2'-0"	8"	#5	6"	#4	6"	97.25	0.584
11'-0"	5'-8"	2'-9"	2'-3"	8"	#4	6"	#5	6"	133.65	0.634
12'-0"	6'-2"	3'-0"	2'-6"	9"	#7	6"	#5	6"	162.29	0.721
13'-0"	6'-8"	3'-3"	2'-9"	11"	#7	6"	#5	6"	178.80	0.856
14'-0"	7'-2"	3'-6"	3'-0"	1'-0"	#8	6"	#5	6"	216.78	0.959
15'-0"	7'-8"	4'-0"	3'-0"	1'-1"	#9	6"	#6	6"	283.06	1.068
16'-0"	8'-2"	4'-6"	3'-0"	1'-3"	#9	6"	#6	6"	297.02	1.234

TABLE OF WINGWALL REINFORCING
 (2-Wings)

Bar	Size	No.	Spa
D	#5	~	1'-0"
E	#4	~	1'-0"
F	#4	~	1'-0"
G	#6	4	~
M	#4	4	~
P	#4	~	1'-0"
R	#5	6	~
V	#4	~	1'-0"

TABLE OF ESTIMATED CULVERT TOEWALL QUANTITIES

Bar	Size	No.	Spa
L	#4	~	1'-6"
Q	#4	1	~
Reinf (Lb/Ft)	2.45		
Conc (CY/Ft)	0.037		

TABLE OF HEADWALL REINFORCING

Bar	Size	No.	Spa
C	#4	~	1'-0"
EH	#5	6	~
FH	#5	6	~
LH	#4	~	1'-0"

WING DIMENSION CALCULATIONS:

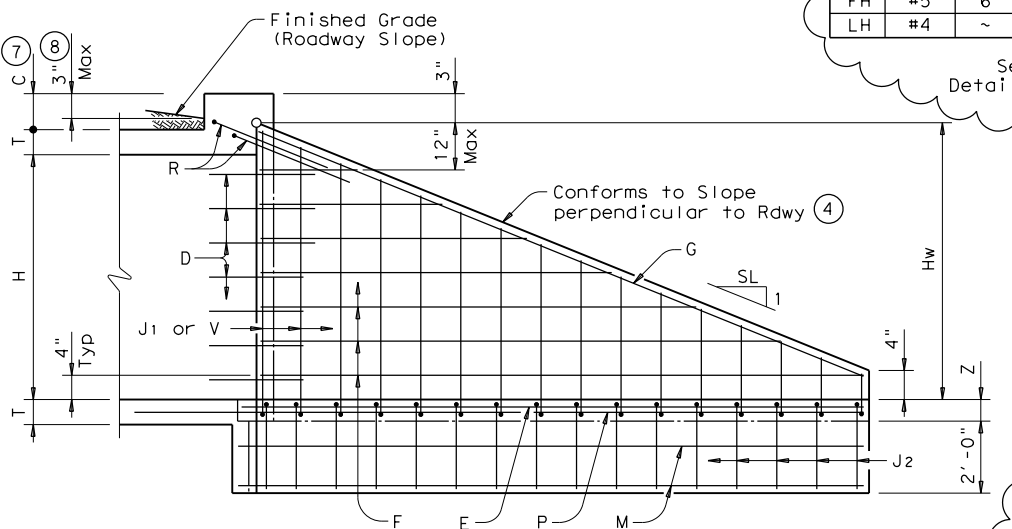
Formulas: (All values are in Feet)
 $H_w = H + T + C - 0.250'$
 $A = (H_w - 0.333')$ (SL)
 $B = (A)$ Tangent (30°)
 $L_w = (A) \div \text{Cosine } (30^\circ)$
 For Cast-in-place culverts:
 $L_{tw} = (N) (S) + (N+1) (U)$
 For Precast culverts:
 $L_{tw} = (N) (2U+S) + (N-1) (0.500')$
 Total Wingwall Area (Two Wings ~ S.F.) = $(H_w + 0.333') (L_w)$

H_w = Height of Wingwall
 $SL:1$ = Side Slope Ratio (Horizontal:1 Vertical)
 L_w = Length of Wingwall
 L_{tw} = Culvert Toewall Length
 N = Number of Culvert Spans
 See applicable box culvert standard for H, S, T, and U values.

- Extend Bars P & EH 3'-0" minimum into bottom slab of Box Culvert.
- Adjust to fit as necessary to maintain 1 1/4" clear cover and 4" minimum between bars.
- Quantities shown are based on an average wing height for two wings (one structure end). To determine total quantities for two wings multiply the tabulated values by Lw.
- Recommended values of Slope are: 2:1, 3:1, 4:1, & 6:1.
- When shown elsewhere on the plans, a 5" deep concrete riprap shall be constructed. Payment for riprap shall be as required by Item 432, "Riprap". Unless otherwise shown on the plans or directed by the Engineer, the riprap shall have a 6" wide by 1'-6" deep reinforced concrete toewall along all edges adjacent to natural ground; the toewall shall be reinforced by extending typical riprap reinforcing into the toewall; construction joints or grooved joints, oriented in the direction of flow, shall extend across the full distance of the riprap, at intervals of approximately 20'.
- At Contractor's option, Culvert Toewall may be ended flush with Wingwall Toewall. Adjust reinforcing from that shown as necessary.
- 0" min to 5'-0" max. Estimated curb heights are shown elsewhere in the plans.
- For vehicle safety, curb heights and wall heights shall be reduced, if necessary, to provide a maximum 3" projection above finished grade. No changes will be made in quantities and no additional compensation will be allowed for this work.
- Match thickness of culvert bottom slab.

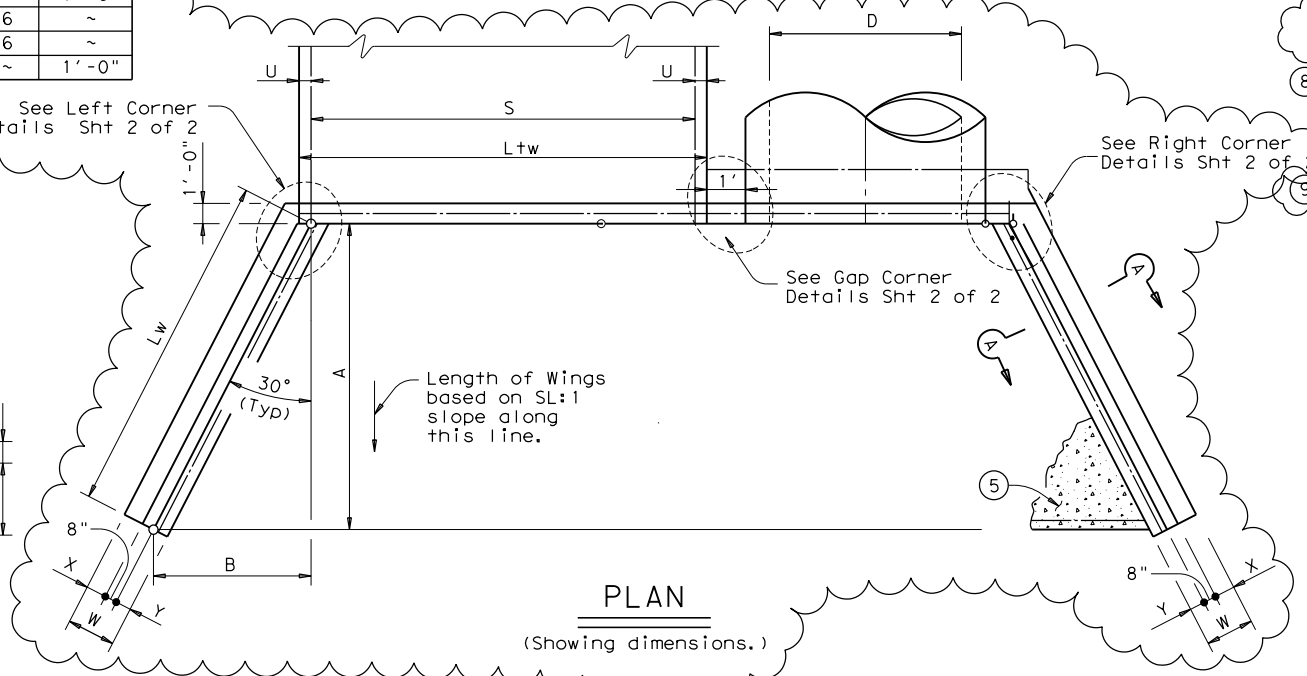
GENERAL NOTES:

Designed according to AASHTO LRFD Specifications. All reinforcing steel shall be Grade 60. 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. All concrete shall be Class "C" and shall have a minimum compressive strength of 3600 psi. All reinforcing bars shall be adjusted to provide a minimum of 1 1/4" clear cover. When structure is founded on solid rock, depth of toewalls for culverts and wingwalls may be reduced or eliminated as directed by the Engineer. See BCS sheet for additional dimensions and information. The quantities for concrete and reinforcing steel resulting from the formulas given on this sheet are for Contractor's information only. Shop drawings will not be required in areas of conflict between reinforcing steel, blockouts, pipes, anchor bolts or other reinforcing steel, the reinforcement shall be bent or adjusted to clear as directed by the engineer. No bridge rails of any type may be mounted directly to these culvert headwalls.



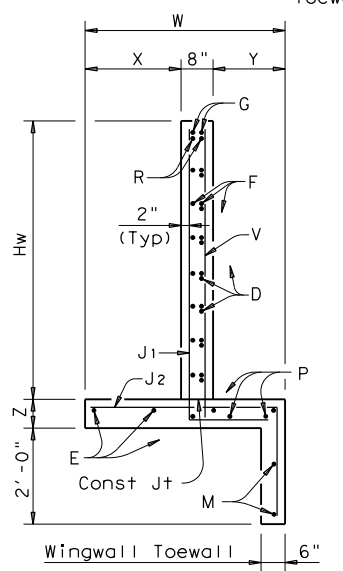
INSIDE ELEVATION

(Showing reinforcing. Culvert and Culvert Toewall reinforcing not shown for clarity.)



PLAN

(Showing dimensions.)



SECTION A-A

SHEET 1 OF 2

Texas Department of Transportation
 Bridge Division Standard

CONCRETE WINGWALLS WITH FLARED WINGS FOR 0° SKEW BOX CULVERTS

FW-0 (MOD)

FILE: fw-0std.dgn	DN: GAF	CK: CAT	DW: TxDOT	CK: GAF
©TxDOT February 2010	CONT	SECT	JOB	HIGHWAY
REVISIONS	STACY ROAD			
11-10: Add note for synthetic fibers.	DIST	COUNTY	SHEET NO.	
	COLLIN		110	

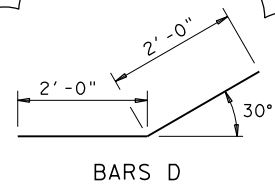
DOCUMENT INCOMPLETE FOR REVIEW ONLY. NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES.

HUITT-ZOLLARS, INC.
 DAVID THOMPSON, P.E. #118979
 Date: 3/17/2017

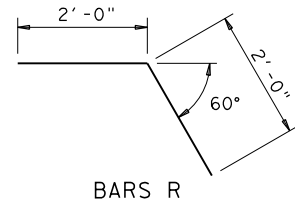
MODIFIED WINGWALL FOR SITUATION OF BOX AND ADJACENT PIPE

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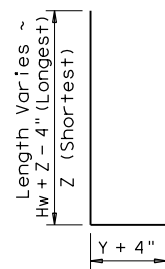
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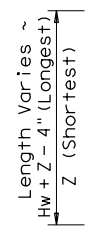
BARS D



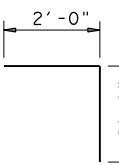
BARS R



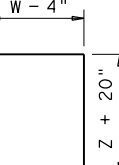
BARS J1



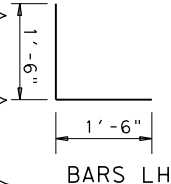
BARS V



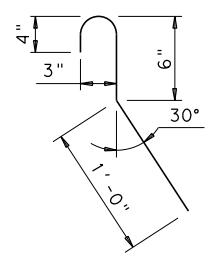
BARS L



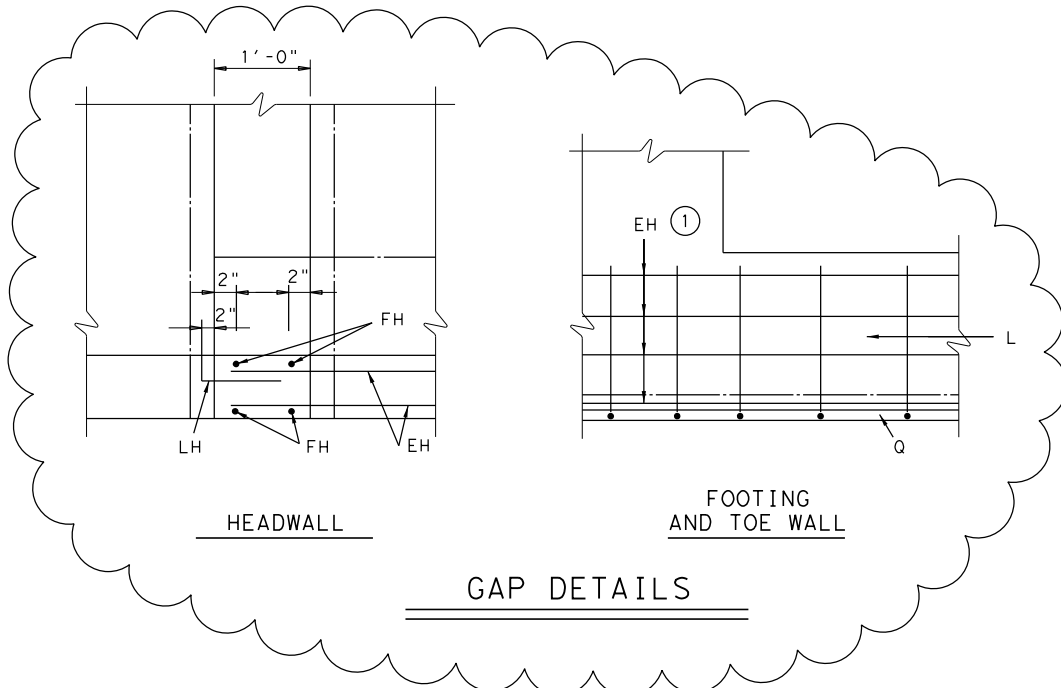
BARS J2



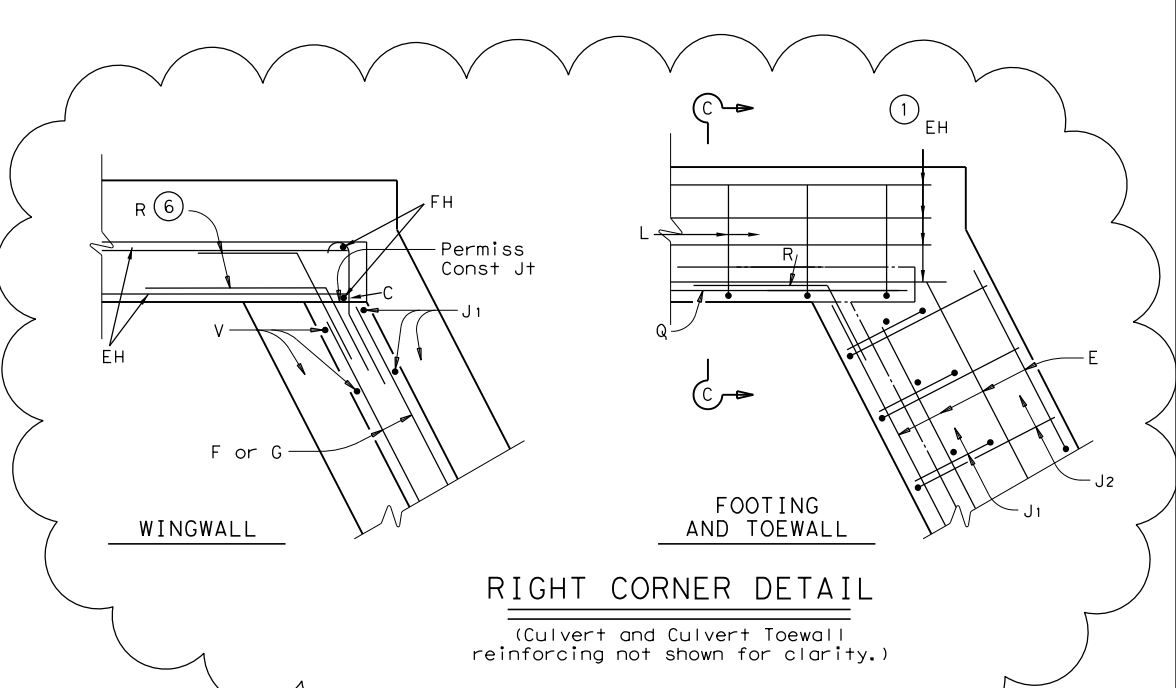
BARS LH



BARS C
(2'-0" long)

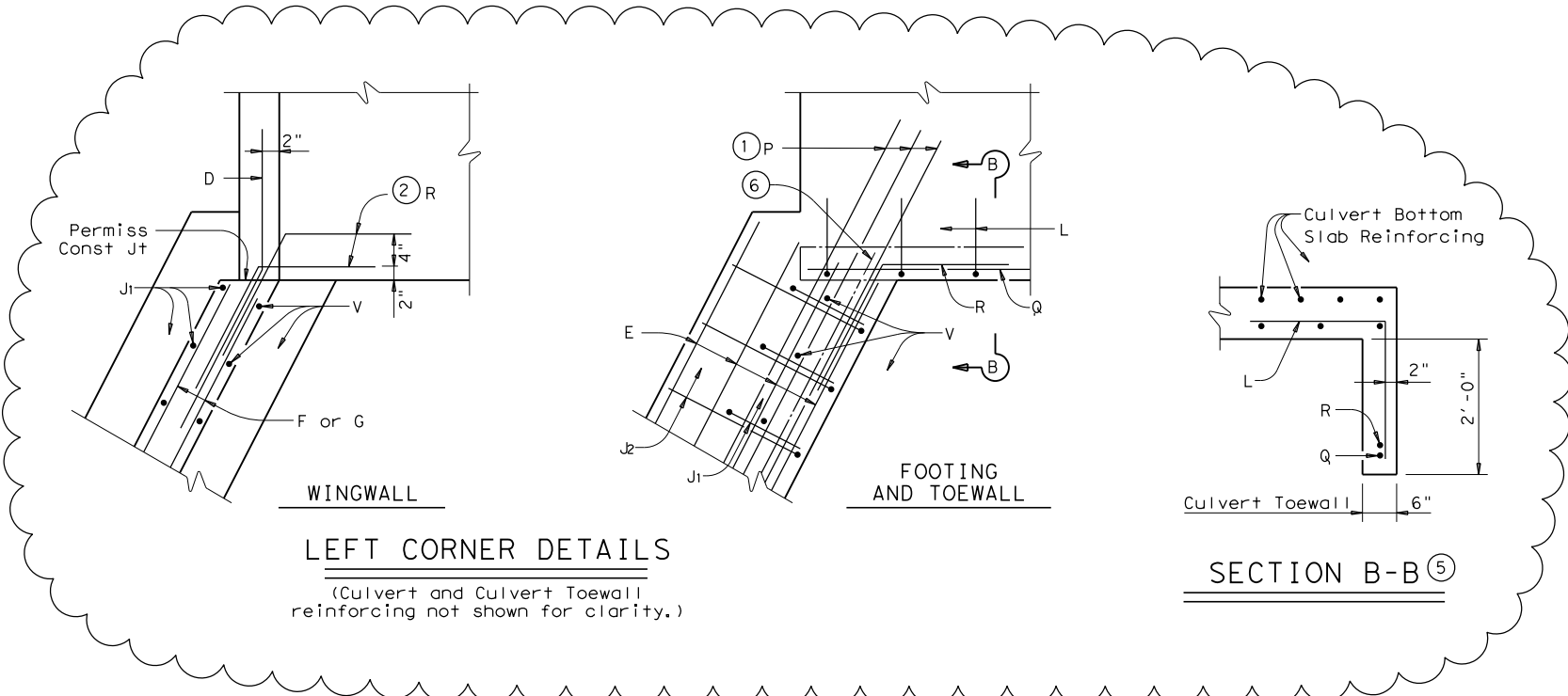


GAP DETAILS



RIGHT CORNER DETAIL

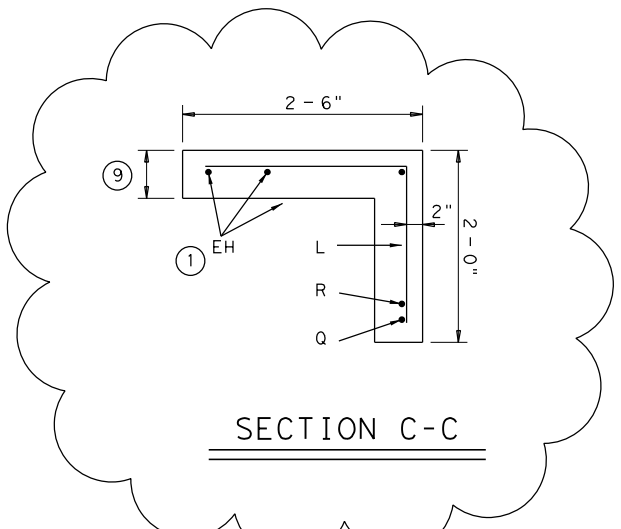
(Culvert and Culvert Toewall reinforcing not shown for clarity.)



LEFT CORNER DETAILS

(Culvert and Culvert Toewall reinforcing not shown for clarity.)

SECTION B-B



SECTION C-C

DOCUMENT INCOMPLETE FOR REVIEW ONLY. NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES.

HUITT-ZOLLARS, INC.

DAVID THOMPSON, P.E. #118979
 Date: 3/17/2017

SHEET 2 OF 2



CONCRETE WINGWALLS WITH FLARED WINGS FOR 0° SKEW BOX CULVERTS

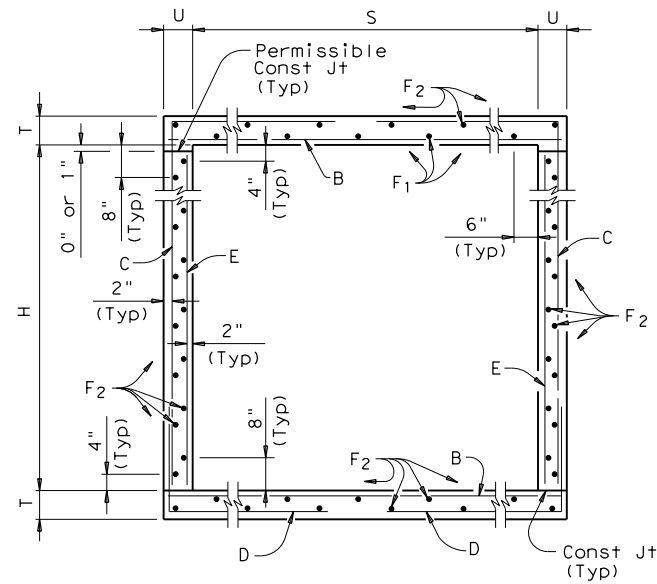
FW-0 (MOD)

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©TxDOT February 2010	CONF	SECT	JOB	HIGHWAY
REVISIONS				STACY ROAD
11-10: Add note for synthetic fibers.	DIST	COUNTY	SHEET NO.	
		COLLIN	111	

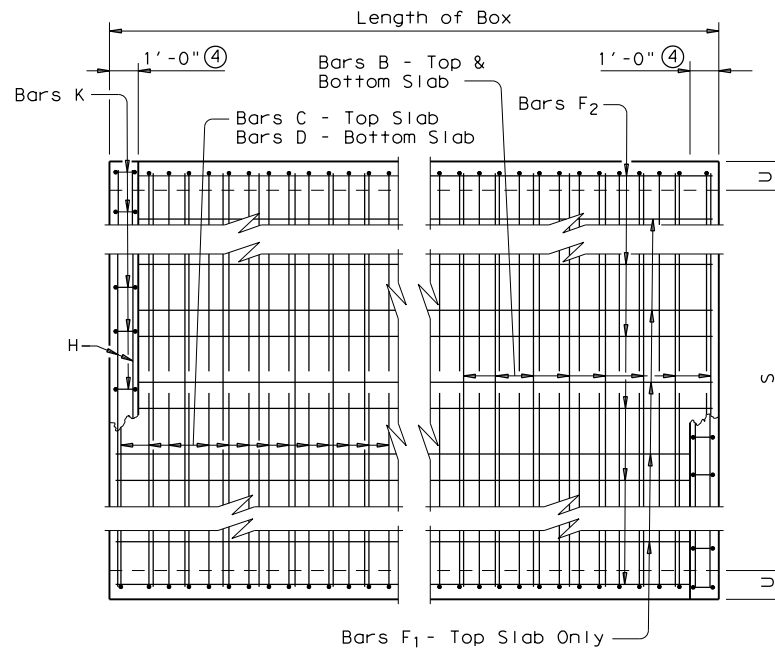
MODIFIED WINGWALL FOR SITUATION OF BOX AND ADJACENT PIPE

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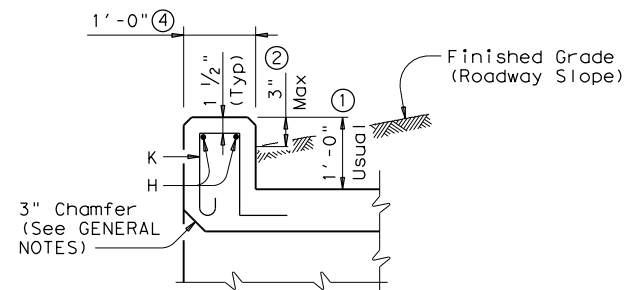
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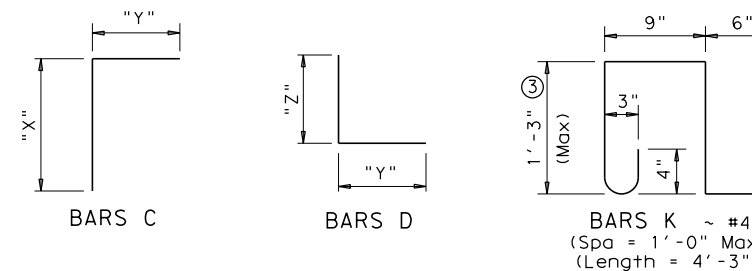
TYPICAL SECTION



PLAN OF REINF STEEL



SECTION THRU CURB



- ① 0" min to 5'-0" max. Estimated curb heights are shown elsewhere in the plans. For structures with pedestrian rail, bicycle rail or curbs taller than 1'-0", refer to ECD standard. For structures with T6 bridge rail, refer to T6-CM standard. For structures with traffic rail, other than T6, refer to RAC standard.
- ② For vehicle safety, the following requirements must be met:
 - For structures without bridge rail, curbs shall project no more than 3" above finished grade.
 - For structures with bridge rail, curbs shall be flush with finished grade.
 Curb heights shall be reduced, if necessary, to meet the above requirements. No changes will be made in quantities and no additional compensation will be allowed for this work.
- ③ For curbs less than 1'-0" high, tilt bars K or reduce bar height as necessary to maintain cover. For curbs less than 3" high, bars K may be omitted.
- ④ 1'-0" typical. 2'-0" when RAC standard is referred to elsewhere in the plans.

Deformed welded wire reinforcement (WWR) meeting the requirements of ASTM A1064 may be used to replace conventional reinforcement shown at the Contractor's option. The area of required reinforcement may be reduced by the ratio of 60 ksi / 70 ksi. Spacing of WWR is limited to 4" Min and 18" Max. When required, provide lap splices in the WWR of the same length required for the equivalent bar size, rounded up for wire sizes between conventional bar sizes.

Example Conversion: Replacement of No. 6 Gr 60 at 6" Spacing with WWR.
 $WWR \text{ required} = (0.44 \text{ sq in} / 0.5') \times (60 \text{ ksi} / 70 \text{ ksi}) = 0.754 \text{ sq in/ft}$
 If D30.6 wire is used to meet the 0.754 sq in/ft requirement in this example, the required spacing = $(0.306 \text{ sq in} / 0.754 \text{ sq in/ft}) \times 12 \text{ in/ft} = 4.87" \text{ Max spacing}$.
 Required lap length for the provided D30.6 wire is 2'-2" (Lap required for uncoated No. 5 bars, as shown in Item 440).

GENERAL NOTES:

Designed according to AASHTO LRFD Specifications.
 Designed to the maximum fill height shown.
 All reinforcing steel shall be Grade 60.
 All concrete shall be Class "C" with these exceptions: use Class "S" for top slabs of culverts with overlay, with 1-to-2 course surface treatment, or with the top slab as the final riding surface.
 Class "C" concrete shall have a minimum compressive strength of 3,600 psi. Class "S" concrete shall have a minimum compressive strength of 4,000 psi.
 The use of permanent forms is not allowed.
 The bottom edge of the top slab shall be chamfered 3" at the entrance.
 Reinforcing bars shall be adjusted to provide a minimum of 1 1/4" clear cover.
 Construction joints shown at the flow line may be raised a maximum of 6" at the Contractor's option. If this option is used, Bars E may be cut off or raised, and Bars C and D may be reversed.
 See standard SCC-MD for skewed ends, angle sections and lengthening details.

HL93 LOADING SHEET 1 OF 2



**SINGLE BOX CULVERTS
CAST-IN-PLACE
0' TO 30' FILL**

SCC-3 & 4

FILE: scc34ste.dgn	DN: GAF	CK: LMW	DW: BWH/TxDOT	CK: GAF
©TxDOT February 2010	CONT	SECT	JOB	HIGHWAY
REVISIONS				STACY ROAD
10-12: Added WWR	DIST	COUNTY		SHEET NO.
		COLLIN		112

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SECTION DIMENSIONS				FILL HEIGHT	BILLS OF REINFORCING STEEL (For Box Length = 40 feet)																								QUANTITIES														
					Bars B					Bars C					Bars D					Bars E~#4 at 18" Max			Bars F1~#4			Bars F2~#4 at 18" Max			Bars H 4~#4		Bars K		Per foot of Barrel		Curb		Total						
					No.	Size	Spa	Length	Weight	No.	Size	Spa	Length	Weight	"X"	"Y"	No.	Size	Spa	Length	Weight	"Y"	"Z"	No.	Length	Wt	No.	Spa	Length	Wt	No.	Length	Wt	Length	Wt	No.	Wt	Conc (CY)	Reinf (Lb)	Conc (CY)	Reinf (Lb)	Conc (CY)	Reinf (Lb)
3'-0"	2'-0"	7"	7"	30'	138	#4	7"	3'-11"	361	98	#4	10"	4'-2"	273	2'-5"	1'-9"	98	#4	10"	3'-11"	256	1'-9"	2'-2"	56	2'-0"	75	3	13"	39'-9"	80	19	39'-9"	505	3'-11"	10	10	28	0.266	38.8	0.3	38	10.9	1,588
3'-0"	3'-0"	7"	7"	30'	162	#4	6"	3'-11"	424	98	#4	10"	5'-2"	338	3'-5"	1'-9"	98	#4	10"	3'-11"	256	1'-9"	2'-2"	56	3'-0"	112	3	12"	39'-9"	80	23	39'-9"	611	3'-11"	10	10	28	0.310	45.5	0.3	38	12.7	1,859
4'-0"	2'-0"	7"	7"	30'	194	#4	5"	4'-11"	637	162	#4	6"	4'-8"	505	2'-5"	2'-3"	162	#4	6"	4'-5"	478	2'-3"	2'-2"	56	2'-0"	75	5	10"	39'-9"	133	21	39'-9"	558	4'-11"	13	12	34	0.310	59.7	0.4	47	12.8	2,433
4'-0"	3'-0"	7"	7"	30'	162	#5	6"	4'-11"	831	162	#4	6"	5'-8"	613	3'-5"	2'-3"	162	#4	6"	4'-5"	478	2'-3"	2'-2"	56	3'-0"	112	6	8"	39'-9"	159	25	39'-9"	664	4'-11"	13	12	34	0.353	71.4	0.4	47	14.5	2,904
4'-0"	4'-0"	7"	7"	30'	162	#5	6"	4'-11"	831	162	#4	6"	6'-8"	721	4'-5"	2'-3"	162	#4	6"	4'-5"	478	2'-3"	2'-2"	56	4'-0"	150	6	8"	39'-9"	159	25	39'-9"	664	4'-11"	13	12	34	0.396	75.1	0.4	47	16.2	3,050

Deformed welded wire reinforcement (WWR) meeting the requirements of ASTM A1064 may be used to replace conventional reinforcement shown at the Contractor's option. The area of required reinforcement may be reduced by the ratio of 60 ksi / 70 ksi. Spacing of WWR is limited to 4" Min and 18" Max. When required, provide lap splices in the WWR of the same length required for the equivalent bar size, rounded up for wire sizes between conventional bar sizes.

Example Conversion: Replacement of No. 6 Gr 60 at 6" Spacing with WWR.
 WWR required = (0.44 sq in/ 0.5') x (60 ksi/70 ksi) = 0.754 sq in/ft.
 If D30.6 wire is used to meet the 0.754 sq in/ft requirement in this example, the required spacing = (0.306 sq in/ 0.754 sq in/ft) x 12 in/ft = 4.87" Max spacing.
 Required lap length for the provided D30.6 wire is 2'-2" (Lap required for uncoated No. 5 bars, as shown in Item 440).



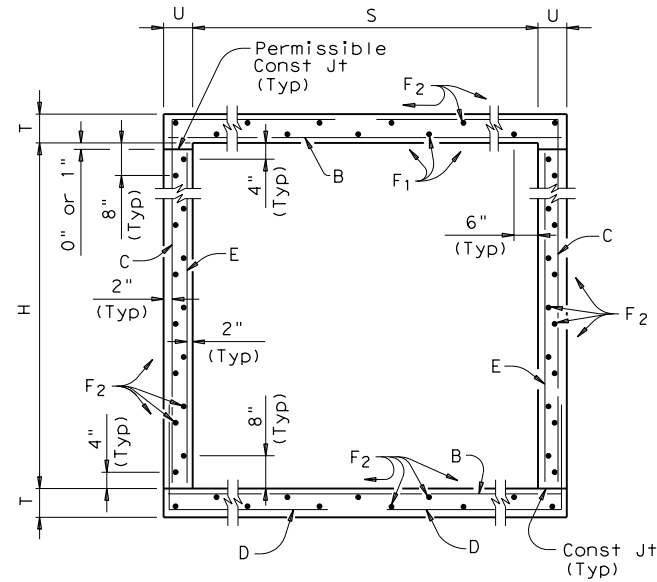
**SINGLE BOX CULVERTS
 CAST-IN-PLACE
 0' TO 30' FILL**

SCC-3 & 4

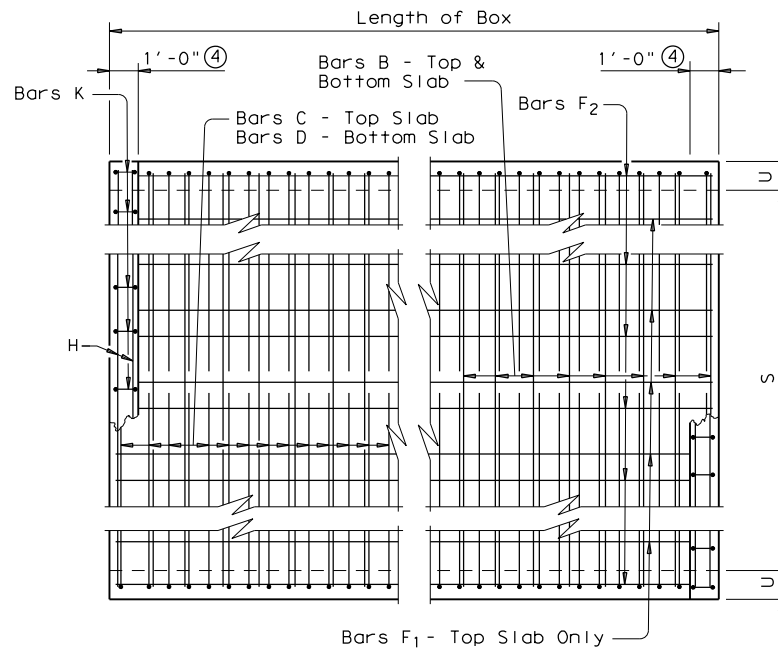
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©TxDOT February 2010	CONT	SECT	JOB	HIGHWAY
REVISIONS	STACY ROAD			
10-12: Added WWR	DIST	COUNTY	SHEET NO.	
	COLLIN			113

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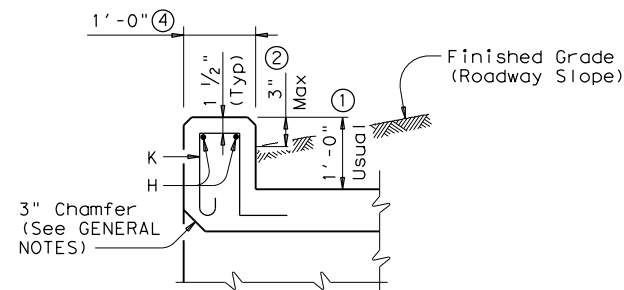
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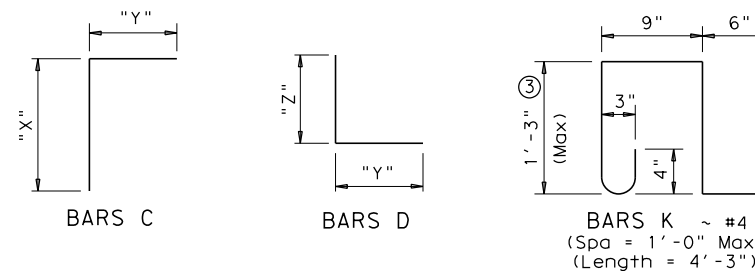
TYPICAL SECTION



PLAN OF REINF STEEL



SECTION THRU CURB



- ① 0" min to 5'-0" max. Estimated curb heights are shown elsewhere in the plans. For structures with pedestrian rail, bicycle rail or curbs taller than 1'-0", refer to ECD standard. For structures with T6 bridge rail, refer to T6-CM standard. For structures with traffic rail, other than T6, refer to RAC standard.
- ② For vehicle safety, the following requirements must be met:
 - For structures without bridge rail, curbs shall project no more than 3" above finished grade.
 - For structures with bridge rail, curbs shall be flush with finished grade.
 Curb heights shall be reduced, if necessary, to meet the above requirements. No changes will be made in quantities and no additional compensation will be allowed for this work.
- ③ For curbs less than 1'-0" high, tilt bars K or reduce bar height as necessary to maintain cover. For curbs less than 3" high, bars K may be omitted.
- ④ 1'-0" typical. 2'-0" when RAC standard is referred to elsewhere in the plans.

Deformed welded wire reinforcement (WWR) meeting the requirements of ASTM A1064 may be used to replace conventional reinforcement shown at the Contractor's option. The area of required reinforcement may be reduced by the ratio of 60 ksi / 70 ksi. Spacing of WWR is limited to 4" Min and 18" Max. When required, provide lap splices in the WWR of the same length required for the equivalent bar size, rounded up for wire sizes between conventional bar sizes.

Example Conversion: Replacement of No. 6 Gr 60 at 6" Spacing with WWR.
 $WWR \text{ required} = (0.44 \text{ sq in} / 0.5') \times (60 \text{ ksi} / 70 \text{ ksi}) = 0.754 \text{ sq in/ft}$
 If D30.6 wire is used to meet the 0.754 sq in/ft requirement in this example, the required spacing = $(0.306 \text{ sq in} / 0.754 \text{ sq in/ft}) \times 12 \text{ in/ft} = 4.87" \text{ Max spacing}$.
 Required lap length for the provided D30.6 wire is 2'-2" (Lap required for uncoated No. 5 bars, as shown in Item 440).

GENERAL NOTES:

Designed according to AASHTO LRFD Specifications.
 Designed to the maximum fill height shown.
 All reinforcing steel shall be Grade 60.
 All concrete shall be Class "C" with these exceptions: use Class "S" for top slabs of culverts with overlay, with 1-to-2 course surface treatment, or with the top slab as the final riding surface.
 Class "C" concrete shall have a minimum compressive strength of 3,600 psi. Class "S" concrete shall have a minimum compressive strength of 4,000 psi.
 The use of permanent forms is not allowed.
 The bottom edge of the top slab shall be chamfered 3" at the entrance.
 Reinforcing bars shall be adjusted to provide a minimum of 1 1/4" clear cover.
 Construction joints shown at the flow line may be raised a maximum of 6" at the Contractor's option. If this option is used, Bars E may be cut off or raised, and Bars C and D may be reversed.
 See standard SCC-MD for skewed ends, angle sections and lengthening details.

HL93 LOADING

SHEET 1 OF 2



**SINGLE BOX CULVERTS
 CAST-IN-PLACE
 0' TO 30' FILL**

SCC-5 & 6

FILE: scc56ste.dgn	DN: GAF	CK: LMW	DW: BWH/TxDOT	CK: GAF
©TxDOT February 2010	CONT	SECT	JOB	HIGHWAY
10-12: Added WWR	DIST	COUNTY	STACY ROAD	
		COLLIN	SHEET NO. 114	

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SECTION DIMENSIONS				FILL HEIGHT ⑤	BILLS OF REINFORCING STEEL (For Box Length = 40 feet)																								QUANTITIES														
					Bars B					Bars C					Bars D					Bars E~#4 at 18" Max			Bars F1~#4			Bars F2~#4 at 18" Max			Bars H 4~#4		Bars K		Per foot of Barrel		Curb		Total						
S	H	T	U	No.	Size	Spa	Length	Weight	No.	Size	Spa	Length	Weight	"X"	"Y"	No.	Size	Spa	Length	Weight	"Y"	"Z"	No.	Length	Wt	No.	Spa	Length	Wt	No.	Length	Wt	Length	Wt	No.	Wt	Conc (CY)	Reinf (Lb)	Conc (CY)	Reinf (Lb)	Conc (CY)	Reinf (Lb)	
5'-0"	2'-0"	7"	7"	26'	194	#5	5"	5'-11"	1,197	162	#5	6"	5'-2"	873	2'-5"	2'-9"	162	#5	6"	5'-4"	901	2'-9"	2'-7"	56	2'-0"	75	8	7"	39'-9"	212	22	39'-9"	584	5'-11"	16	14	40	0.353	96.1	0.5	56	14.6	3,898
5'-0"	2'-0"	8"	7"	30'	194	#5	5"	5'-11"	1,197	194	#4	5"	5'-0"	648	2'-6"	2'-6"	194	#4	5"	4'-9"	616	2'-6"	2'-3"	56	2'-0"	75	4	18"	39'-9"	106	22	39'-9"	584	5'-11"	16	14	40	0.391	80.7	0.5	56	16.1	3,282
5'-0"	3'-0"	7"	7"	26'	194	#5	5"	5'-11"	1,197	194	#4	5"	5'-11"	767	3'-5"	2'-6"	194	#4	5"	4'-8"	605	2'-6"	2'-2"	56	3'-0"	112	8	7"	39'-9"	212	26	39'-9"	690	5'-11"	16	14	40	0.396	89.6	0.5	56	16.3	3,639
5'-0"	3'-0"	8"	7"	30'	194	#5	5"	5'-11"	1,197	194	#4	5"	6'-0"	778	3'-6"	2'-6"	194	#4	5"	4'-9"	616	2'-6"	2'-3"	56	3'-0"	112	4	18"	39'-9"	106	26	39'-9"	690	5'-11"	16	14	40	0.434	87.5	0.5	56	17.9	3,555
5'-0"	4'-0"	7"	7"	26'	194	#5	5"	5'-11"	1,197	194	#4	5"	6'-11"	896	4'-5"	2'-6"	194	#4	5"	4'-8"	605	2'-6"	2'-2"	56	4'-0"	150	8	7"	39'-9"	212	26	39'-9"	690	5'-11"	16	14	40	0.439	93.8	0.5	56	18.1	3,806
5'-0"	4'-0"	8"	7"	30'	194	#5	5"	5'-11"	1,197	194	#4	5"	7'-0"	907	4'-6"	2'-6"	194	#4	5"	4'-9"	616	2'-6"	2'-3"	56	4'-0"	150	4	18"	39'-9"	106	26	39'-9"	690	5'-11"	16	14	40	0.477	91.7	0.5	56	19.6	3,722
5'-0"	5'-0"	7"	7"	26'	194	#5	5"	5'-11"	1,197	194	#4	5"	7'-11"	1,026	5'-5"	2'-6"	194	#4	5"	4'-8"	605	2'-6"	2'-2"	56	5'-0"	187	8	7"	39'-9"	212	30	39'-9"	797	5'-11"	16	14	40	0.483	100.6	0.5	56	19.8	4,080
5'-0"	5'-0"	8"	7"	30'	194	#5	5"	5'-11"	1,197	194	#4	5"	8'-0"	1,037	5'-6"	2'-6"	194	#4	5"	4'-9"	616	2'-6"	2'-3"	56	5'-0"	187	4	18"	39'-9"	106	30	39'-9"	797	5'-11"	16	14	40	0.521	98.5	0.5	56	21.3	3,996
6'-0"	3'-0"	7"	7"	20'	194	#5	5"	6'-11"	1,400	162	#5	6"	6'-6"	1,098	3'-5"	3'-1"	162	#5	6"	5'-8"	957	3'-1"	2'-7"	56	3'-0"	112	10	7"	39'-9"	266	29	39'-9"	770	6'-11"	18	16	45	0.439	115.1	0.5	63	18.1	4,666
6'-0"	3'-0"	8"	7"	26'	162	#6	6"	6'-11"	1,683	162	#5	6"	6'-7"	1,112	3'-6"	3'-1"	162	#5	6"	5'-9"	972	3'-1"	2'-8"	56	3'-0"	112	5	18"	39'-9"	133	29	39'-9"	770	6'-11"	18	16	45	0.484	119.6	0.5	63	19.9	4,845
6'-0"	3'-0"	9"	8"	30'	162	#6	6"	7'-1"	1,724	162	#5	6"	6'-8"	1,126	3'-7"	3'-1"	162	#5	6"	5'-10"	986	3'-1"	2'-9"	56	3'-0"	112	5	18"	39'-9"	133	29	39'-9"	770	7'-1"	19	18	51	0.556	121.3	0.5	70	22.7	4,921
6'-0"	4'-0"	7"	7"	20'	194	#5	5"	6'-11"	1,400	194	#4	5"	7'-3"	940	4'-5"	2'-10"	194	#4	5"	5'-0"	648	2'-10"	2'-2"	56	4'-0"	150	10	7"	39'-9"	266	29	39'-9"	770	6'-11"	18	16	45	0.483	104.4	0.5	63	19.8	4,237
6'-0"	4'-0"	8"	7"	26'	194	#6	5"	6'-11"	2,015	162	#5	6"	7'-7"	1,281	4'-6"	3'-1"	162	#5	6"	5'-9"	972	3'-1"	2'-8"	56	4'-0"	150	5	18"	39'-9"	133	29	39'-9"	770	6'-11"	18	16	45	0.527	133.0	0.5	63	21.6	5,384
6'-0"	4'-0"	9"	8"	30'	162	#6	6"	7'-1"	1,724	162	#5	6"	7'-8"	1,295	4'-7"	3'-1"	162	#5	6"	5'-10"	986	3'-1"	2'-9"	56	4'-0"	150	5	18"	39'-9"	133	29	39'-9"	770	7'-1"	19	18	51	0.605	126.5	0.5	70	24.7	5,128
6'-0"	5'-0"	7"	7"	20'	194	#5	5"	6'-11"	1,400	194	#4	5"	8'-3"	1,069	5'-5"	2'-10"	194	#4	5"	5'-0"	648	2'-10"	2'-2"	56	5'-0"	187	10	7"	39'-9"	266	33	39'-9"	876	6'-11"	18	16	45	0.526	111.2	0.5	63	21.5	4,509
6'-0"	5'-0"	8"	7"	26'	194	#6	5"	6'-11"	2,015	162	#5	6"	8'-7"	1,450	5'-6"	3'-1"	162	#5	6"	5'-9"	972	3'-1"	2'-8"	56	5'-0"	187	5	18"	39'-9"	133	33	39'-9"	876	6'-11"	18	16	45	0.570	140.8	0.5	63	23.3	5,696
6'-0"	5'-0"	9"	8"	30'	194	#6	5"	7'-1"	2,064	162	#5	6"	8'-8"	1,464	5'-7"	3'-1"	162	#5	6"	5'-10"	986	3'-1"	2'-9"	56	5'-0"	187	5	18"	39'-9"	133	33	39'-9"	876	7'-1"	19	18	51	0.654	142.8	0.5	70	26.7	5,780
6'-0"	6'-0"	7"	7"	20'	194	#5	5"	6'-11"	1,400	194	#4	5"	9'-3"	1,199	6'-5"	2'-10"	194	#4	5"	5'-0"	648	2'-10"	2'-2"	56	6'-0"	224	10	7"	39'-9"	266	37	39'-9"	982	6'-11"	18	16	45	0.569	118.0	0.5	63	23.3	4,782
6'-0"	6'-0"	8"	7"	26'	194	#6	5"	6'-11"	2,015	162	#5	6"	9'-7"	1,619	6'-6"	3'-1"	162	#5	6"	5'-9"	972	3'-1"	2'-8"	56	6'-0"	224	5	18"	39'-9"	133	37	39'-9"	982	6'-11"	18	16	45	0.613	148.6	0.5	63	25.0	6,008
6'-0"	6'-0"	9"	8"	30'	194	#6	5"	7'-1"	2,064	162	#5	6"	9'-8"	1,633	6'-7"	3'-1"	162	#5	6"	5'-10"	986	3'-1"	2'-9"	56	6'-0"	224	5	18"	39'-9"	133	37	39'-9"	982	7'-1"	19	18	51	0.704	150.6	0.5	70	28.7	6,092

⑤ For each box size, minimum fill height shown shall be used for all culverts with less than 2'-0" of fill.

Deformed welded wire reinforcement (WWR) meeting the requirements of ASTM A1064 may be used to replace conventional reinforcement shown at the Contractor's option. The area of required reinforcement may be reduced by the ratio of 60 ksi / 70 ksi. Spacing of WWR is limited to 4" Min and 18" Max. When required, provide lap splices in the WWR of the same length required for the equivalent bar size, rounded up for wire sizes between conventional bar sizes.

Example Conversion: Replacement of No. 6 Gr 60 at 6" Spacing with WWR.
 WWR required = (0.44 sq in/ 0.5') x (60 ksi/70 ksi) = 0.754 sq in/ft.
 If D30.6 wire is used to meet the 0.754 sq in/ft requirement in this example, the required spacing = (0.306 sq in/ 0.754 sq in/ft) x 12 in/ft = 4.87" Max spacing.
 Required lap length for the provided D30.6 wire is 2'-2" (Lap required for uncoated No. 5 bars, as shown in Item 440).



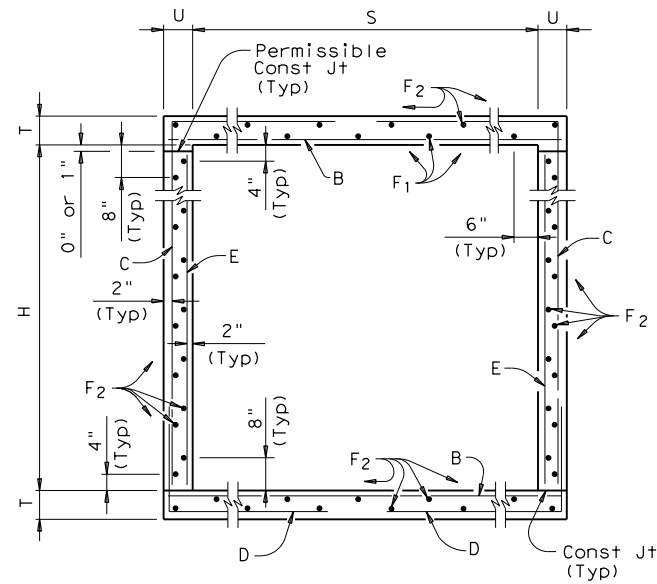
**SINGLE BOX CULVERTS
 CAST-IN-PLACE
 0' TO 30' FILL**

SCC-5 & 6

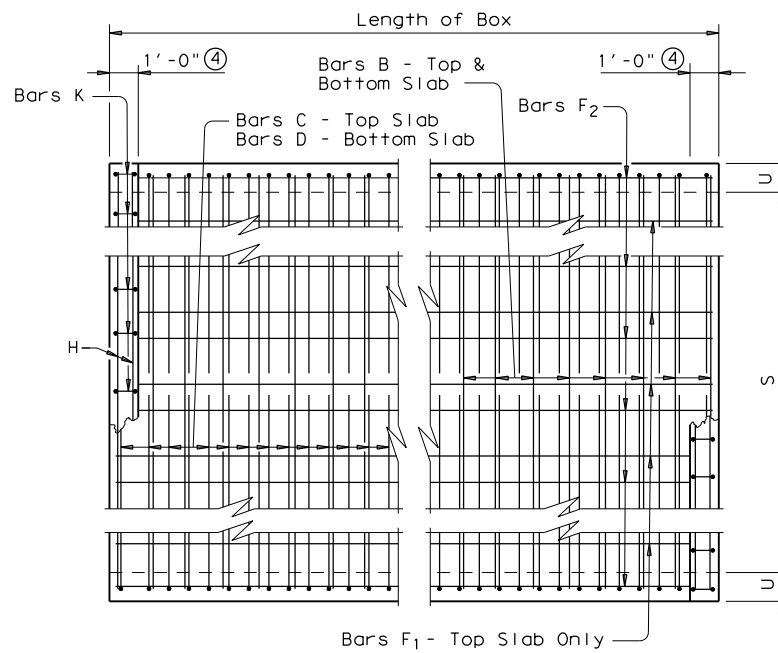
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©TxDOT February 2010	CONT	SECT	JOB	HIGHWAY
10-12: Added WWR	DIST	COUNTY	SHEET NO.	
		COLLIN	115	

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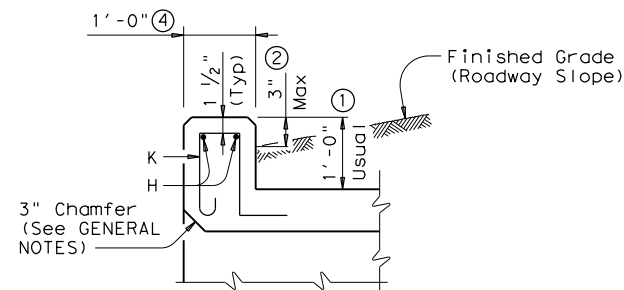
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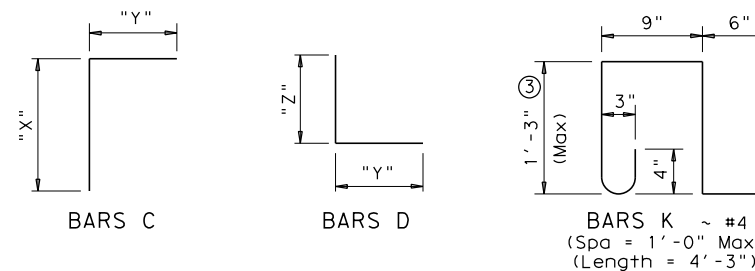
TYPICAL SECTION



PLAN OF REINF STEEL



SECTION THRU CURB



- ① 0" min to 5'-0" max. Estimated curb heights are shown elsewhere in the plans. For structures with pedestrian rail, bicycle rail or curbs taller than 1'-0", refer to ECD standard. For structures with T6 bridge rail, refer to T6-CM standard. For structures with traffic rail, other than T6, refer to RAC standard.
- ② For vehicle safety, the following requirements must be met:
 - For structures without bridge rail, curbs shall project no more than 3" above finished grade.
 - For structures with bridge rail, curbs shall be flush with finished grade.
 Curb heights shall be reduced, if necessary, to meet the above requirements. No changes will be made in quantities and no additional compensation will be allowed for this work.
- ③ For curbs less than 1'-0" high, tilt bars K or reduce bar height as necessary to maintain cover. For curbs less than 3" high, bars K may be omitted.
- ④ 1'-0" typical. 2'-0" when RAC standard is referred to elsewhere in the plans.

Deformed welded wire reinforcement (WWR) meeting the requirements of ASTM A1064 may be used to replace conventional reinforcement shown at the Contractor's option. The area of required reinforcement may be reduced by the ratio of 60 ksi / 70 ksi. Spacing of WWR is limited to 4" Min and 18" Max. When required, provide lap splices in the WWR of the same length required for the equivalent bar size, rounded up for wire sizes between conventional bar sizes.

Example Conversion: Replacement of No. 6 Gr 60 at 6" Spacing with WWR.
 $WWR \text{ required} = (0.44 \text{ sq in} / 0.5') \times (60 \text{ ksi} / 70 \text{ ksi}) = 0.754 \text{ sq in/ft}$
 If D30.6 wire is used to meet the 0.754 sq in/ft requirement in this example, the required spacing = $(0.306 \text{ sq in} / 0.754 \text{ sq in/ft}) \times 12 \text{ in/ft} = 4.87" \text{ Max spacing}$.
 Required lap length for the provided D30.6 wire is 2'-2" (Lap required for uncoated No. 5 bars, as shown in Item 440).

GENERAL NOTES:

Designed according to AASHTO LRFD Specifications.
 Designed to the maximum fill height shown.
 All reinforcing steel shall be Grade 60.
 All concrete shall be Class "C" with these exceptions: use Class "S" for top slabs of culverts with overlay, with 1-to-2 course surface treatment, or with the top slab as the final riding surface.
 Class "C" concrete shall have a minimum compressive strength of 3,600 psi. Class "S" concrete shall have a minimum compressive strength of 4,000 psi.
 The use of permanent forms is not allowed.
 The bottom edge of the top slab shall be chamfered 3" at the entrance.
 Reinforcing bars shall be adjusted to provide a minimum of 1 1/4" clear cover.
 Construction joints shown at the flow line may be raised a maximum of 6" at the Contractor's option. If this option is used, Bars E may be cut off or raised, and Bars C and D may be reversed.
 See standard SCC-MD for skewed ends, angle sections and lengthening details.

HL93 LOADING

SHEET 1 OF 2



**SINGLE BOX CULVERTS
CAST-IN-PLACE
0' TO 30' FILL**

SCC-7

FILE: scc07ste.dgn	DN: GAF	CK: LMW	DW: BWH/TxDOT	CK: GAF
©TxDOT February 2010	CONT	SECT	JOB	HIGHWAY
10-12: Added WWR	DIST	COUNTY	STACY ROAD	
		COLLIN	SHEET NO. 116	

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DATE: 3/17/2017 2:58:58 PM
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SECTION DIMENSIONS				FILL HEIGHT ⑤	BILLS OF REINFORCING STEEL (For Box Length = 40 feet)																								QUANTITIES														
					Bars B					Bars C					Bars D					Bars E~#4 at 18" Max			Bars F1~#4			Bars F2~#4 at 18" Max		Bars H 4~#4		Bars K		Per foot of Barrel		Curb		Total							
S	H	T	U	No.	Size	Spa	Length	Weight	No.	Size	Spa	Length	Weight	"X"	"Y"	No.	Size	Spa	Length	Weight	"Y"	"Z"	No.	Length	Wt	No.	Spa	Length	Wt	No.	Length	Wt	Length	Wt	No.	Wt	Conc (CY)	Reinf (Lb)	Conc (CY)	Reinf (Lb)	Conc (CY)	Reinf (Lb)	
7'-0"	3'-0"	7"	7"	16'	162	#6	6"	7'-11"	1,926	194	#5	5"	6'-11"	1,400	3'-5"	3'-6"	194	#5	5"	6'-1"	1,231	3'-6"	2'-7"	56	3'-0"	112	12	7"	39'-9"	319	31	39'-9"	823	7'-11"	21	18	51	0.483	145.3	0.6	72	19.9	5,883
7'-0"	3'-0"	8"	7"	20'	162	#6	6"	7'-11"	1,926	194	#5	5"	7'-0"	1,416	3'-6"	3'-6"	194	#5	5"	6'-2"	1,248	3'-6"	2'-8"	56	3'-0"	112	5	18"	39'-9"	133	31	39'-9"	823	7'-11"	21	18	51	0.533	141.5	0.6	72	21.9	5,730
7'-0"	3'-0"	9"	8"	23'	162	#6	6"	8'-1"	1,967	194	#5	5"	7'-1"	1,433	3'-7"	3'-6"	194	#5	5"	6'-3"	1,265	3'-6"	2'-9"	56	3'-0"	112	5	18"	39'-9"	133	31	39'-9"	823	8'-1"	22	20	57	0.611	143.3	0.6	79	25.0	5,812
7'-0"	3'-0"	10"	8"	30'	194	#6	5"	8'-1"	2,355	194	#5	5"	7'-2"	1,450	3'-8"	3'-6"	194	#5	5"	6'-4"	1,281	3'-6"	2'-10"	56	3'-0"	112	5	18"	39'-9"	133	31	39'-9"	823	8'-1"	22	20	57	0.663	153.9	0.6	79	27.1	6,233
7'-0"	4'-0"	7"	7"	16'	162	#6	6"	7'-11"	1,926	162	#5	6"	7'-11"	1,338	4'-5"	3'-6"	162	#5	6"	6'-1"	1,028	3'-6"	2'-7"	56	4'-0"	150	12	7"	39'-9"	319	31	39'-9"	823	7'-11"	21	18	51	0.526	139.6	0.6	72	21.6	5,656
7'-0"	4'-0"	8"	7"	20'	194	#6	5"	7'-11"	2,307	162	#5	6"	8'-0"	1,352	4'-6"	3'-6"	162	#5	6"	6'-2"	1,042	3'-6"	2'-8"	56	4'-0"	150	5	18"	39'-9"	133	31	39'-9"	823	7'-11"	21	18	51	0.576	145.2	0.6	72	23.6	5,879
7'-0"	4'-0"	9"	8"	23'	194	#6	5"	8'-1"	2,355	162	#5	6"	8'-1"	1,366	4'-7"	3'-6"	162	#5	6"	6'-3"	1,056	3'-6"	2'-9"	56	4'-0"	150	5	18"	39'-9"	133	31	39'-9"	823	8'-1"	22	20	57	0.660	147.1	0.6	79	27.0	5,962
7'-0"	4'-0"	10"	8"	30'	194	#6	5"	8'-1"	2,355	194	#5	5"	8'-2"	1,652	4'-8"	3'-6"	194	#5	5"	6'-4"	1,281	3'-6"	2'-10"	56	4'-0"	150	5	18"	39'-9"	133	31	39'-9"	823	8'-1"	22	20	57	0.712	159.9	0.6	79	29.1	6,473
7'-0"	5'-0"	7"	7"	16'	162	#6	6"	7'-11"	1,926	162	#5	6"	8'-11"	1,507	5'-5"	3'-6"	162	#5	6"	6'-1"	1,028	3'-6"	2'-7"	56	5'-0"	187	12	7"	39'-9"	319	35	39'-9"	929	7'-11"	21	18	51	0.569	147.4	0.6	72	23.4	5,968
7'-0"	5'-0"	8"	7"	20'	194	#6	5"	7'-11"	2,307	162	#5	6"	9'-0"	1,521	5'-6"	3'-6"	162	#5	6"	6'-2"	1,042	3'-6"	2'-8"	56	5'-0"	187	5	18"	39'-9"	133	35	39'-9"	929	7'-11"	21	18	51	0.619	153.0	0.6	72	25.4	6,191
7'-0"	5'-0"	9"	8"	23'	194	#6	5"	8'-1"	2,355	162	#5	6"	9'-1"	1,535	5'-7"	3'-6"	162	#5	6"	6'-3"	1,056	3'-6"	2'-9"	56	5'-0"	187	5	18"	39'-9"	133	35	39'-9"	929	8'-1"	22	20	57	0.710	154.9	0.6	79	29.0	6,274
7'-0"	5'-0"	10"	8"	30'	194	#6	5"	8'-1"	2,355	194	#5	5"	9'-2"	1,855	5'-8"	3'-6"	194	#5	5"	6'-4"	1,281	3'-6"	2'-10"	56	5'-0"	187	5	18"	39'-9"	133	35	39'-9"	929	8'-1"	22	20	57	0.761	168.5	0.6	79	31.0	6,819
7'-0"	6'-0"	7"	7"	16'	194	#6	5"	7'-11"	2,307	162	#5	6"	9'-11"	1,676	6'-5"	3'-6"	162	#5	6"	6'-1"	1,028	3'-6"	2'-7"	56	6'-0"	224	12	7"	39'-9"	319	39	39'-9"	1,036	7'-11"	21	18	51	0.612	164.8	0.6	72	25.1	6,662
7'-0"	6'-0"	8"	7"	20'	194	#6	5"	7'-11"	2,307	162	#5	6"	10'-0"	1,690	6'-6"	3'-6"	162	#5	6"	6'-2"	1,042	3'-6"	2'-8"	56	6'-0"	224	5	18"	39'-9"	133	39	39'-9"	1,036	7'-11"	21	18	51	0.663	160.8	0.6	72	27.1	6,504
7'-0"	6'-0"	9"	8"	23'	194	#6	5"	8'-1"	2,355	162	#5	6"	10'-1"	1,704	6'-7"	3'-6"	162	#5	6"	6'-3"	1,056	3'-6"	2'-9"	56	6'-0"	224	5	18"	39'-9"	133	39	39'-9"	1,036	8'-1"	22	20	57	0.759	162.7	0.6	79	31.0	6,587
7'-0"	6'-0"	10"	8"	30'	194	#6	5"	8'-1"	2,355	194	#5	5"	10'-2"	2,057	6'-8"	3'-6"	194	#5	5"	6'-4"	1,281	3'-6"	2'-10"	56	6'-0"	224	5	18"	39'-9"	133	39	39'-9"	1,036	8'-1"	22	20	57	0.811	177.2	0.6	79	33.0	7,165
7'-0"	7'-0"	7"	7"	16'	194	#6	5"	7'-11"	2,307	162	#5	6"	10'-11"	1,845	7'-5"	3'-6"	162	#5	6"	6'-1"	1,028	3'-6"	2'-7"	56	7'-0"	262	12	7"	39'-9"	319	39	39'-9"	1,036	7'-11"	21	18	51	0.655	169.9	0.6	72	26.8	6,869
7'-0"	7'-0"	8"	7"	20'	194	#6	5"	7'-11"	2,307	194	#5	5"	11'-0"	2,226	7'-6"	3'-6"	194	#5	5"	6'-2"	1,248	3'-6"	2'-8"	56	7'-0"	262	5	18"	39'-9"	133	39	39'-9"	1,036	7'-11"	21	18	51	0.706	180.3	0.6	72	28.8	7,284
7'-0"	7'-0"	9"	8"	23'	194	#6	5"	8'-1"	2,355	162	#5	6"	11'-1"	1,873	7'-7"	3'-6"	162	#5	6"	6'-3"	1,056	3'-6"	2'-9"	56	7'-0"	262	5	18"	39'-9"	133	39	39'-9"	1,036	8'-1"	22	20	57	0.809	167.9	0.6	79	33.0	6,794
7'-0"	7'-0"	10"	8"	30'	194	#6	5"	8'-1"	2,355	194	#5	5"	11'-2"	2,259	7'-8"	3'-6"	194	#5	5"	6'-4"	1,281	3'-6"	2'-10"	56	7'-0"	262	5	18"	39'-9"	133	39	39'-9"	1,036	8'-1"	22	20	57	0.860	183.2	0.6	79	35.0	7,405

⑤ For each box size, minimum fill height shown shall be used for all culverts with less than 2'-0" of fill.

Deformed welded wire reinforcement (WWR) meeting the requirements of ASTM A1064 may be used to replace conventional reinforcement shown at the Contractor's option. The area of required reinforcement may be reduced by the ratio of 60 ksi / 70 ksi. Spacing of WWR is limited to 4" Min and 18" Max. When required, provide lap splices in the WWR of the same length required for the equivalent bar size, rounded up for wire sizes between conventional bar sizes.

Example Conversion: Replacement of No. 6 Gr 60 at 6" Spacing with WWR.
 WWR required = (0.44 sq in/ 0.5') x (60 ksi/70 ksi) = 0.754 sq in/ft.
 If D30.6 wire is used to meet the 0.754 sq in/ft requirement in this example, the required spacing = (0.306 sq in/ 0.754 sq in/ft) x 12 in/ft = 4.87" Max spacing.
 Required lap length for the provided D30.6 wire is 2'-2" (Lap required for uncoated No. 5 bars, as shown in Item 440).



**SINGLE BOX CULVERTS
 CAST-IN-PLACE
 0' TO 30' FILL**

SCC-7

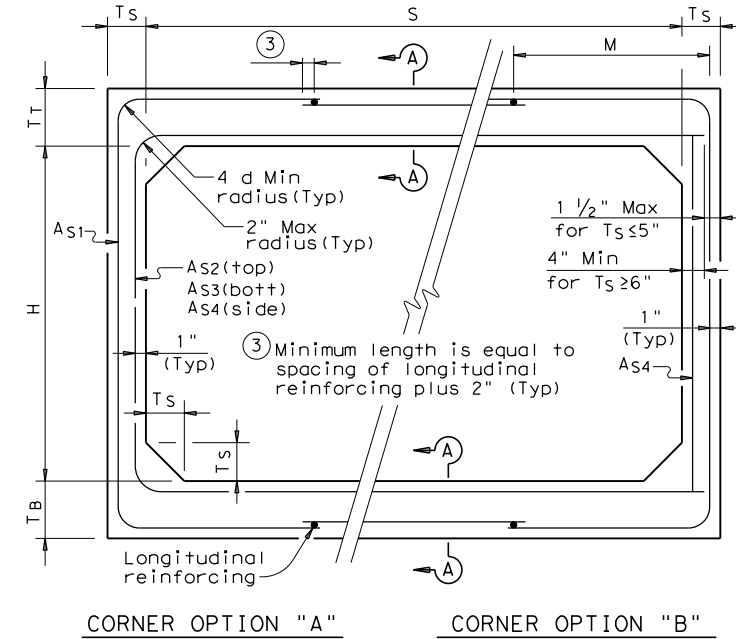
FILE: scc07ste.dgn	DN: GAF	CK: LMW	DW: BWH/TxDOT	CK: GAF
©TxDOT February 2010	CONT	SECT	JOB	HIGHWAY
REVISIONS				
10-12: Added WWR	DIST	COUNTY	SHEET NO.	
	COLLIN			117

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DATE: 3/17/2017 2:58:59 PM
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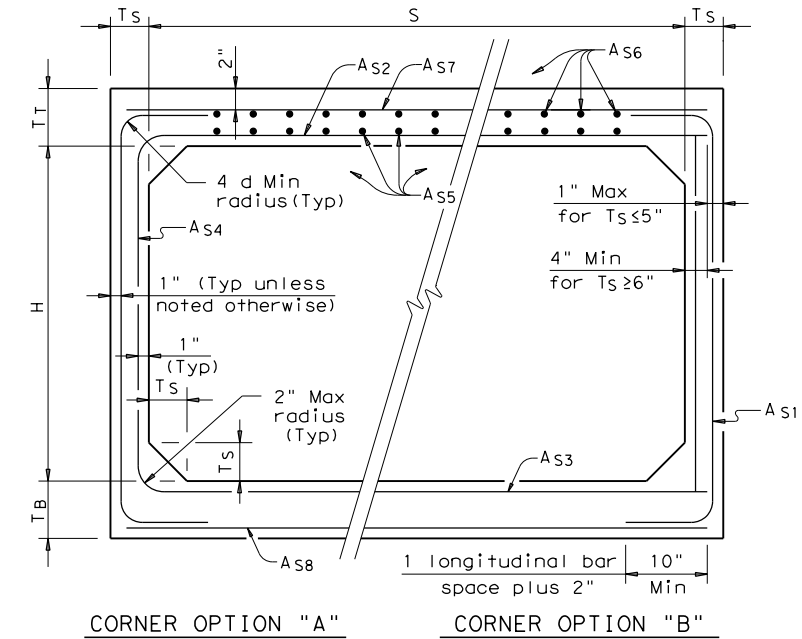
BOX DATA

SECTION DIMENSIONS					Fill Height (ft)	M (in)	REINFORCING (in ² /ft) ②								Lift Weight (Tons) ①
S (ft)	H (ft)	T _T (in)	T _B (in)	T _S (in)			A _{S1}	A _{S2}	A _{S3}	A _{S4}	A _{S5}	A _{S6}	A _{S7}	A _{S8}	
4	2	7.5	6	5	<2	-	0.18	0.27	0.15	0.12	0.18	0.18	0.18	0.14	4.5
4	2	5	5	5	2<3	38	0.18	0.19	0.17	0.12	-	-	-	-	3.6
4	2	5	5	5	3-5	38	0.13	0.13	0.13	0.12	-	-	-	-	3.6
4	2	5	5	5	10	38	0.12	0.12	0.12	0.12	-	-	-	-	3.6
4	2	5	5	5	15	38	0.14	0.16	0.16	0.12	-	-	-	-	3.6
4	2	5	5	5	20	38	0.18	0.20	0.21	0.12	-	-	-	-	3.6
4	2	5	5	5	25	38	0.23	0.25	0.25	0.12	-	-	-	-	3.6
4	2	5	5	5	30	38	0.28	0.30	0.30	0.12	-	-	-	-	3.6
4	3	7.5	6	5	<2	-	0.18	0.31	0.18	0.12	0.18	0.18	0.18	0.14	5.0
4	3	5	5	5	2<3	38	0.15	0.23	0.20	0.12	-	-	-	-	4.1
4	3	5	5	5	3-5	38	0.12	0.16	0.16	0.12	-	-	-	-	4.1
4	3	5	5	5	10	38	0.12	0.14	0.14	0.12	-	-	-	-	4.1
4	3	5	5	5	15	38	0.12	0.18	0.18	0.12	-	-	-	-	4.1
4	3	5	5	5	20	38	0.14	0.23	0.24	0.12	-	-	-	-	4.1
4	3	5	5	5	25	38	0.17	0.29	0.29	0.12	-	-	-	-	4.1
4	3	5	5	5	30	38	0.21	0.35	0.35	0.12	-	-	-	-	4.1
4	4	7.5	6	5	<2	-	0.18	0.33	0.20	0.12	0.18	0.18	0.18	0.14	5.5
4	4	5	5	5	2<3	38	0.12	0.26	0.23	0.12	-	-	-	-	4.6
4	4	5	5	5	3-5	38	0.12	0.18	0.18	0.12	-	-	-	-	4.6
4	4	5	5	5	10	38	0.12	0.15	0.15	0.12	-	-	-	-	4.6
4	4	5	5	5	15	38	0.12	0.19	0.20	0.12	-	-	-	-	4.6
4	4	5	5	5	20	38	0.12	0.25	0.25	0.12	-	-	-	-	4.6
4	4	5	5	5	25	38	0.14	0.31	0.31	0.12	-	-	-	-	4.6
4	4	5	5	5	30	38	0.17	0.37	0.37	0.12	-	-	-	-	4.6



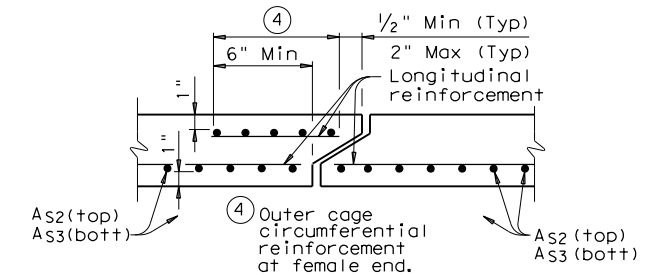
CORNER OPTION "A" CORNER OPTION "B"

FILL HEIGHT 2 FT AND GREATER



CORNER OPTION "A" CORNER OPTION "B"

FILL HEIGHT LESS THAN 2 FT



SECTION A-A
(TOP AND BOTTOM SLAB JOINT REINFORCEMENT)

GENERAL NOTES:
 Designs shown conform to ASTM C1577. Refer to ASTM C1577 for information or details not shown.
 All concrete shall be Class "H" Concrete with a minimum compressive strength of 5,000 psi.
 See SCP-MD standard sheet for miscellaneous details and notes not shown.
 In lieu of furnishing the designs shown on this sheet, the contractor may furnish an alternate design that is equal to or exceeds the box design for the design fill height in the table. Shop plans for alternate designs shall be submitted in accordance with Item "Precast Concrete Structural Members (Fabrication)".

① For Box Length = 8'-0"
 ② AS1 thru AS4, AS7 and AS8 are minimum required areas of reinforcement per linear foot of box length. AS6 and AS5 are minimum required areas of reinforcement per linear foot of box width.

HL93 LOADING

Texas Department of Transportation
 Bridge Division Standard

**SINGLE BOX CULVERTS
 PRECAST
 4'-0" SPAN**

SCP-4

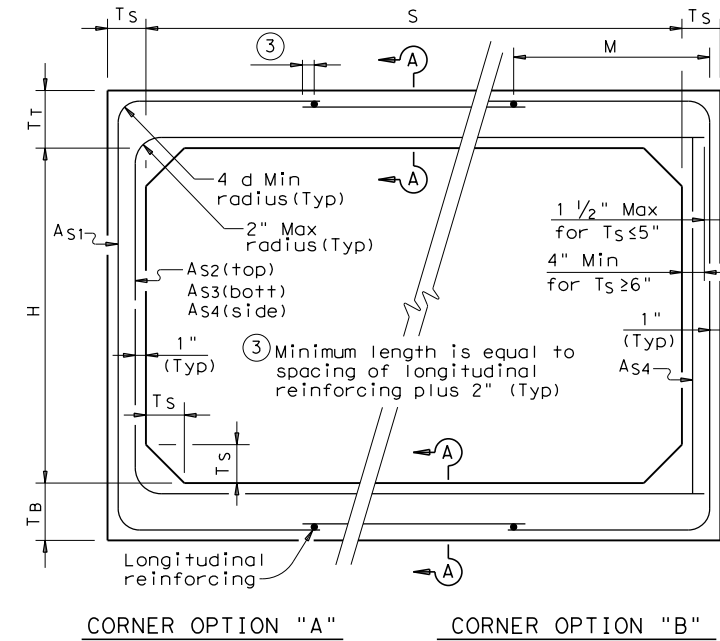
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©TxDOT February 2010	CONT	SECT	JOB	HIGHWAY
REVISIONS				STACY ROAD
	DIST	COUNTY		SHEET NO.
		COLLIN		118

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DATE: 3/17/2017 2:58:59 PM
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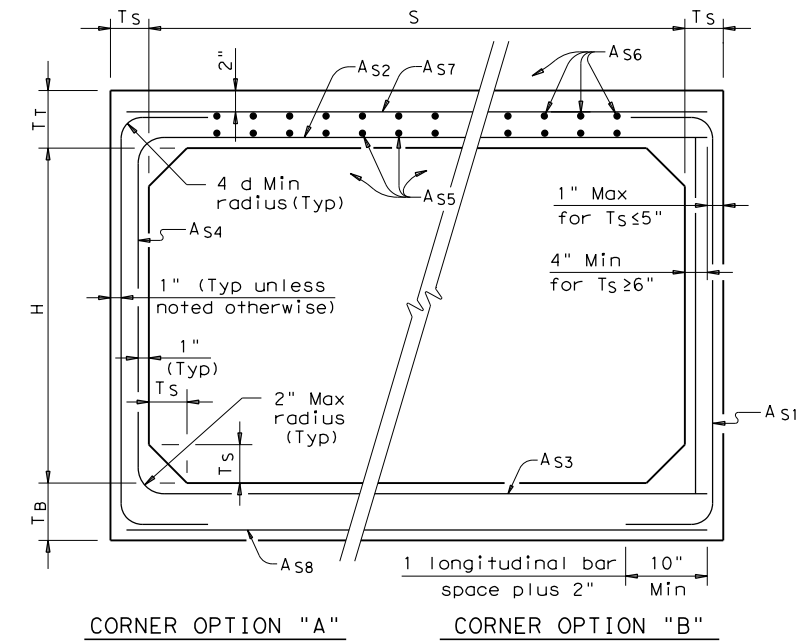
BOX DATA

SECTION DIMENSIONS					Fill Height (ft)	M (in)	REINFORCING (in ² /ft) ②								Lift Weight (Tons) ①
S (ft)	H (ft)	T _T (in)	T _B (in)	T _S (in)			A _{S1}	A _{S2}	A _{S3}	A _{S4}	A _{S5}	A _{S6}	A _{S7}	A _{S8}	
5	3	8	7	6	<2	-	0.19	0.31	0.21	0.14	0.19	0.19	0.19	0.17	6.6
5	3	6	6	6	2<3	45	0.18	0.24	0.19	0.14	-	-	-	-	5.7
5	3	6	6	6	3-5	36	0.14	0.17	0.16	0.14	-	-	-	-	5.7
5	3	6	6	6	10	36	0.14	0.16	0.17	0.14	-	-	-	-	5.7
5	3	6	6	6	15	35	0.16	0.21	0.22	0.14	-	-	-	-	5.7
5	3	6	6	6	20	35	0.21	0.27	0.28	0.14	-	-	-	-	5.7
5	3	6	6	6	25	35	0.26	0.34	0.34	0.14	-	-	-	-	5.7
5	3	6	6	6	30	35	0.31	0.41	0.41	0.14	-	-	-	-	5.7
5	4	8	7	6	<2	-	0.19	0.33	0.24	0.14	0.19	0.19	0.19	0.17	7.2
5	4	6	6	6	2<3	45	0.16	0.27	0.22	0.14	-	-	-	-	6.3
5	4	6	6	6	3-5	45	0.14	0.19	0.18	0.14	-	-	-	-	6.3
5	4	6	6	6	10	36	0.14	0.18	0.18	0.14	-	-	-	-	6.3
5	4	6	6	6	15	35	0.14	0.23	0.24	0.14	-	-	-	-	6.3
5	4	6	6	6	20	35	0.17	0.30	0.31	0.14	-	-	-	-	6.3
5	4	6	6	6	25	35	0.21	0.37	0.38	0.14	-	-	-	-	6.3
5	4	6	6	6	30	35	0.25	0.44	0.45	0.14	-	-	-	-	6.3
5	5	8	7	6	<2	-	0.19	0.35	0.26	0.14	0.19	0.19	0.19	0.17	7.8
5	5	6	6	6	2<3	45	0.14	0.29	0.24	0.14	-	-	-	-	6.9
5	5	6	6	6	3-5	45	0.14	0.21	0.20	0.14	-	-	-	-	6.9
5	5	6	6	6	10	45	0.14	0.19	0.20	0.14	-	-	-	-	6.9
5	5	6	6	6	15	36	0.14	0.24	0.25	0.14	-	-	-	-	6.9
5	5	6	6	6	20	35	0.15	0.31	0.32	0.14	-	-	-	-	6.9
5	5	6	6	6	25	35	0.18	0.38	0.39	0.14	-	-	-	-	6.9
5	5	6	6	6	30	35	0.21	0.46	0.47	0.14	-	-	-	-	6.9
5	2	8	7	6	<2	-	0.20	0.31	0.20	0.14	0.22	0.19	0.19	0.17	6.0
5	2	6	6	6	30	44	0.39	0.33	0.34	0.14	-	-	-	-	5.1



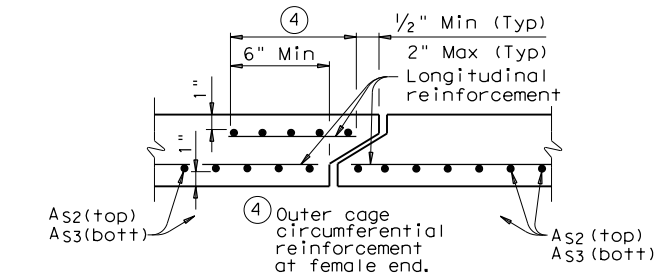
CORNER OPTION "A" CORNER OPTION "B"

FILL HEIGHT 2 FT AND GREATER



CORNER OPTION "A" CORNER OPTION "B"

FILL HEIGHT LESS THAN 2 FT



SECTION A-A

(TOP AND BOTTOM SLAB JOINT REINFORCEMENT)

GENERAL NOTES:
 Designs shown conform to ASTM C1577. Refer to ASTM C1577 for information or details not shown.
 All concrete shall be Class "H" Concrete with a minimum compressive strength of 5,000 psi.
 See SCP-MD standard sheet for miscellaneous details and notes not shown.
 In lieu of furnishing the designs shown on this sheet, the contractor may furnish an alternate design that is equal to or exceeds the box design for the design fill height in the table. Shop plans for alternate designs shall be submitted in accordance with Item "Precast Concrete Structural Members (Fabrication)".

① For Box Length = 8'-0"
 ② A_{s1} thru A_{s4}, A_{s7} and A_{s8} are minimum required areas of reinforcement per linear foot of box length. A_{s6} and A_{s5} are minimum required areas of reinforcement per linear foot of box width.
 ⑤ These designs were created by TxDOT and are not shown in the ASTM Specifications.

HL93 LOADING

Texas Department of Transportation
 Bridge Division Standard

**SINGLE BOX CULVERTS
 PRECAST
 5'-0" SPAN**

SCP-5

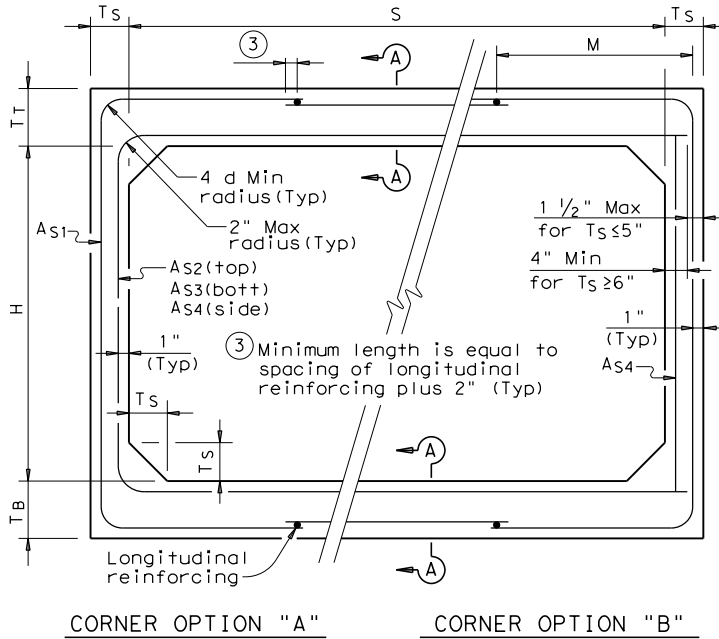
FILE: 119	DN: GAF	CK: LMW	DW: BWH/TxDOT	CK: GAF
©TxDOT February 2010	CONT	SECT	JOB	HIGHWAY
REVISIONS				STACY ROAD
	DIST	COUNTY		SHEET NO.
		COLLIN		119

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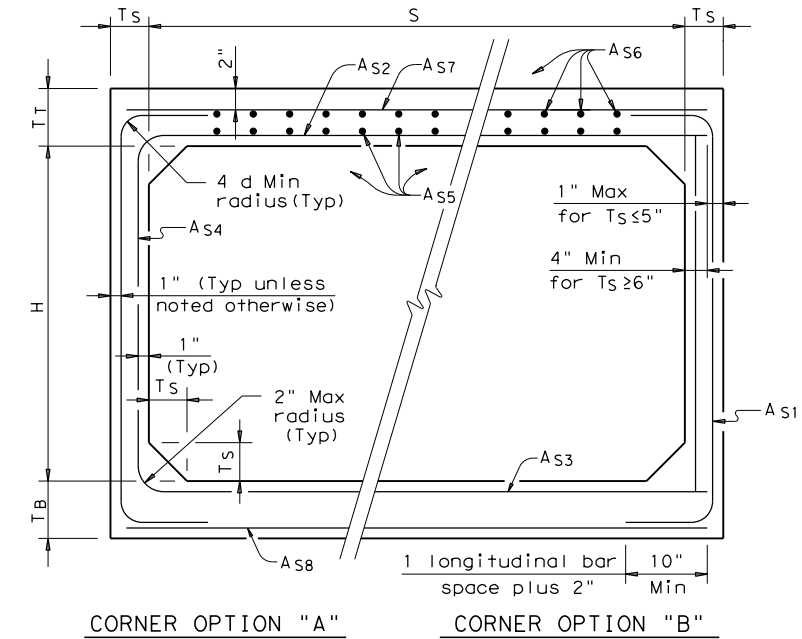
BOX DATA

SECTION DIMENSIONS					Fill Height (ft)	M (in)	REINFORCING (in ² /ft) ②								Lift Weight (Tons) ①
S (ft)	H (ft)	T _T (in)	T _B (in)	T _S (in)			A _{S1}	A _{S2}	A _{S3}	A _{S4}	A _{S5}	A _{S6}	A _{S7}	A _{S8}	
7	4	8	8	8	<2	-	0.21	0.34	0.25	0.19	0.19	0.19	0.19	10.4	
7	4	8	8	8	2<3	43	0.23	0.28	0.28	0.19	-	-	-	10.4	
7	4	8	8	8	3-5	43	0.19	0.22	0.19	0.19	-	-	-	10.4	
7	4	8	8	8	10	43	0.19	0.23	0.23	0.19	-	-	-	10.4	
7	4	8	8	8	15	41	0.24	0.30	0.30	0.19	-	-	-	10.4	
7	4	8	8	8	20	41	0.31	0.38	0.39	0.19	-	-	-	10.4	
7	4	8	8	8	25	41	0.38	0.47	0.48	0.19	-	-	-	10.4	
7	4	8	8	8	30	41	0.46	0.57	0.57	0.19	-	-	-	10.4	
7	5	8	8	8	<2	-	0.19	0.36	0.27	0.19	0.19	0.19	0.19	11.2	
7	5	8	8	8	2<3	47	0.21	0.31	0.31	0.19	-	-	-	11.2	
7	5	8	8	8	3-5	43	0.19	0.24	0.21	0.19	-	-	-	11.2	
7	5	8	8	8	10	43	0.19	0.25	0.26	0.19	-	-	-	11.2	
7	5	8	8	8	15	41	0.21	0.32	0.33	0.19	-	-	-	11.2	
7	5	8	8	8	20	41	0.27	0.41	0.42	0.19	-	-	-	11.2	
7	5	8	8	8	25	41	0.33	0.51	0.52	0.19	-	-	-	11.2	
7	5	8	8	8	30	41	0.40	0.61	0.62	0.19	-	-	-	11.2	
7	6	8	8	8	<2	-	0.19	0.38	0.30	0.19	0.19	0.19	0.19	12.0	
7	6	8	8	8	2<3	59	0.19	0.33	0.34	0.19	-	-	-	12.0	
7	6	8	8	8	3-5	47	0.19	0.25	0.23	0.19	-	-	-	12.0	
7	6	8	8	8	10	43	0.19	0.26	0.27	0.19	-	-	-	12.0	
7	6	8	8	8	15	41	0.19	0.34	0.35	0.19	-	-	-	12.0	
7	6	8	8	8	20	41	0.24	0.43	0.45	0.19	-	-	-	12.0	
7	6	8	8	8	25	41	0.29	0.53	0.55	0.19	-	-	-	12.0	
7	6	8	8	8	30	41	0.35	0.64	0.65	0.19	-	-	-	12.0	
7	7	8	8	8	<2	-	0.19	0.40	0.33	0.19	0.19	0.19	0.19	12.8	
7	7	8	8	8	2<3	59	0.19	0.36	0.37	0.19	-	-	-	12.8	
7	7	8	8	8	3-5	59	0.19	0.27	0.25	0.19	-	-	-	12.8	
7	7	8	8	8	10	47	0.19	0.27	0.29	0.19	-	-	-	12.8	
7	7	8	8	8	15	43	0.19	0.35	0.37	0.19	-	-	-	12.8	
7	7	8	8	8	20	43	0.22	0.44	0.46	0.19	-	-	-	12.8	
7	7	8	8	8	25	43	0.27	0.54	0.57	0.19	-	-	-	12.8	
7	7	8	8	8	30	41	0.32	0.65	0.67	0.19	-	-	-	12.8	
7	3	8	8	8	<2	-	0.28	0.36	0.24	0.19	0.21	0.19	0.19	9.6	
7	3	8	8	8	30	58	0.53	0.49	0.50	0.19	-	-	-	9.6	



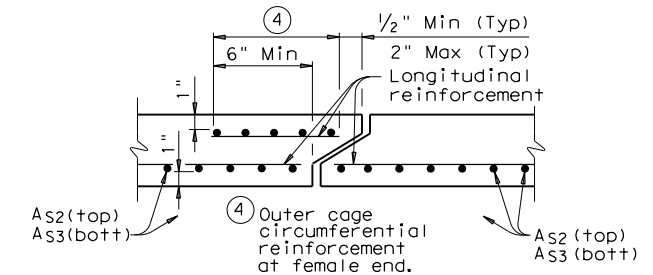
CORNER OPTION "A" CORNER OPTION "B"

FILL HEIGHT 2 FT AND GREATER



CORNER OPTION "A" CORNER OPTION "B"

FILL HEIGHT LESS THAN 2 FT



SECTION A-A

(TOP AND BOTTOM SLAB JOINT REINFORCEMENT)

GENERAL NOTES:
 Designs shown conform to ASTM C1577. Refer to ASTM C1577 for information or details not shown.
 All concrete shall be Class "H" Concrete with a minimum compressive strength of 5,000 psi.
 See SCP-MD standard sheet for miscellaneous details and notes not shown.
 In lieu of furnishing the designs shown on this sheet, the contractor may furnish an alternate design that is equal to or exceeds the box design for the design fill height in the table. Shop plans for alternate designs shall be submitted in accordance with Item "Precast Concrete Structural Members (Fabrication)".

① For Box Length = 8'-0"
 ② AS1 thru AS4, AS7 and AS8 are minimum required areas of reinforcement per linear foot of box length. AS6 and AS5 are minimum required areas of reinforcement per linear foot of box width.
 ⑤ These designs were created by TxDOT and are not shown in the ASTM Specifications.

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Texas Department of Transportation
 Bridge Division Standard

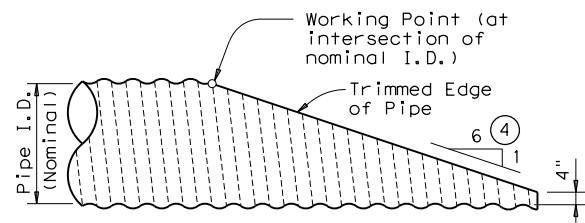
**SINGLE BOX CULVERTS
 PRECAST
 7'-0" SPAN**

SCP-7

FILE: 120	DN: GAF	CK: LMW	DW: BWH/TxDOT	CK: GAF
©TxDOT February 2010	CONT	SECT	JOB	HIGHWAY
REVISIONS				STACY ROAD
	DIST	COUNTY		SHEET NO.
		COLLIN		120

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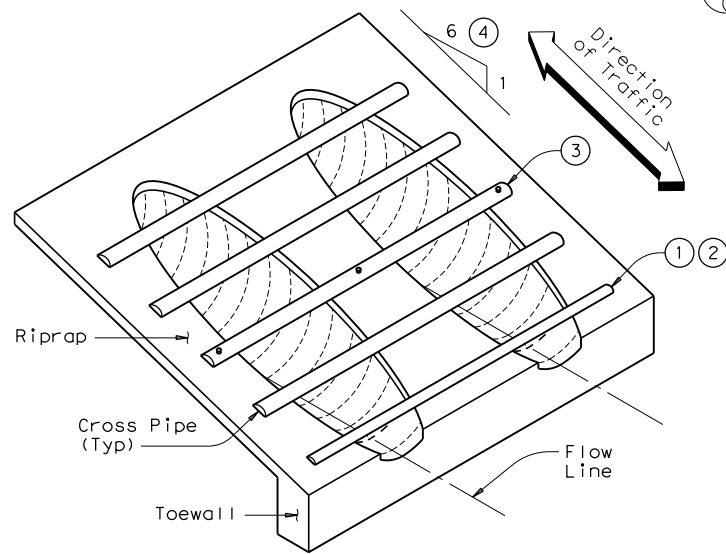
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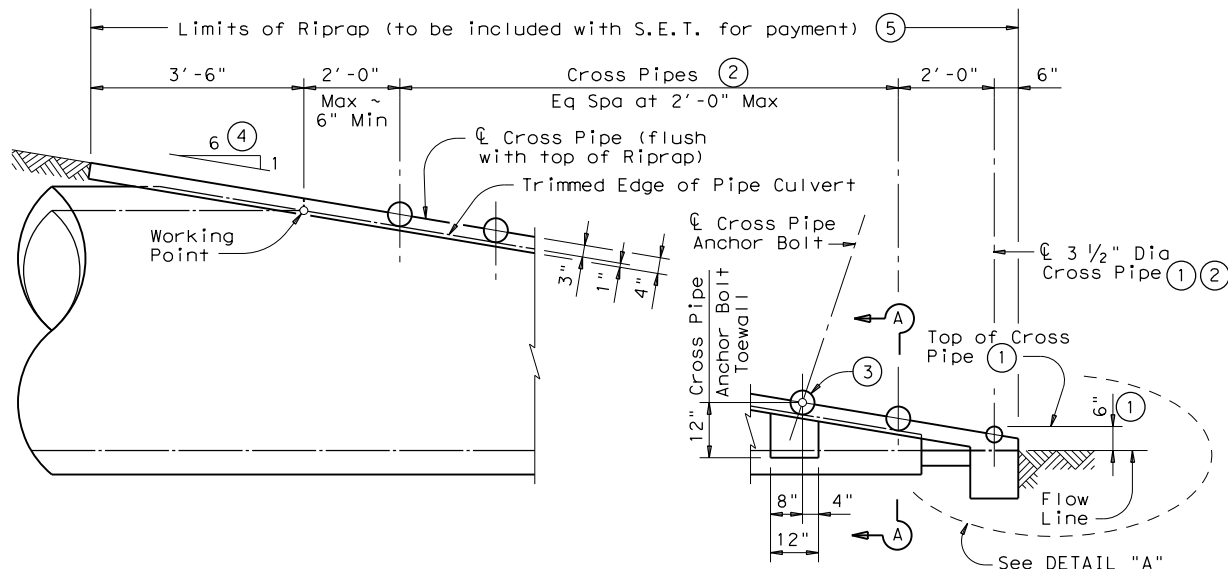
NOTE: All Cross Pipes, calculations, and dimensions are based on the pipe culverts mitered as shown in this detail. Alternate styles of mitered ends will require that appropriate adjustments be made to the values presented on this standard.

SIDE ELEVATION OF TYPICAL PIPE CULVERT MITER

(Showing Corrugated Metal Pipe Culvert.)
 (Details at Concrete Pipe Culvert are similar.)

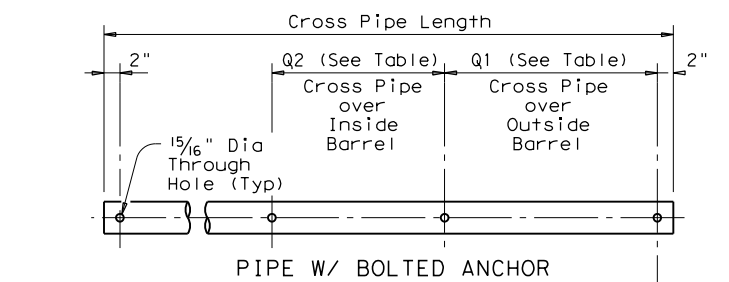


ISOMETRIC VIEW OF TYPICAL INSTALLATION

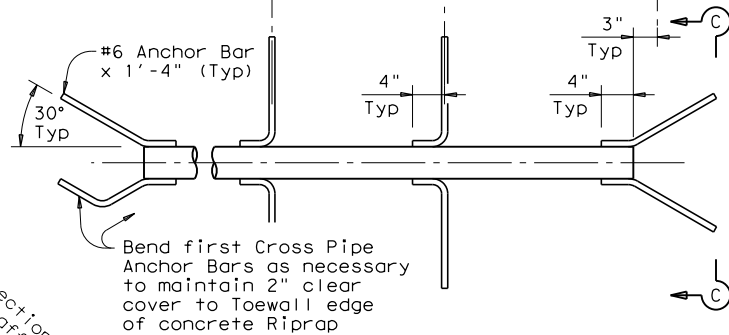


SIDE ELEVATION OF CAST-IN-PLACE CONCRETE

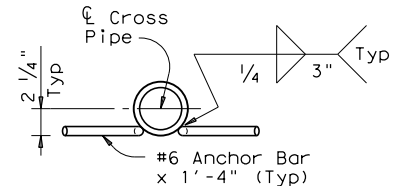
(Showing Concrete Pipe Culvert.)
 (Details at Corrugated Metal Pipe Culvert are similar.)



PIPE W/ BOLTED ANCHOR

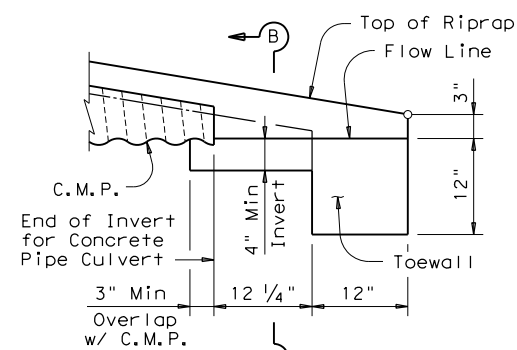


PIPE W/ ANCHOR BARS



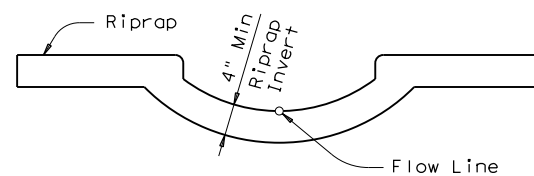
SECTION C-C

CROSS PIPE DETAILS



DETAIL "A"

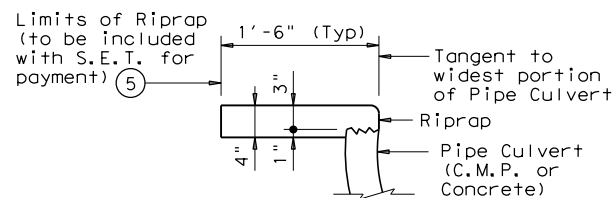
(Showing Invert with Corrugated Metal Pipe Culvert. Concrete Pipe Culvert details are similar. Cross Pipes not shown for clarity.)



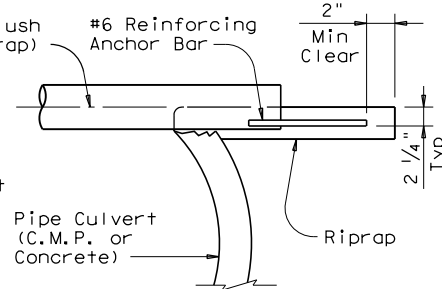
SECTION B-B

(Cross Pipes not shown for clarity.)

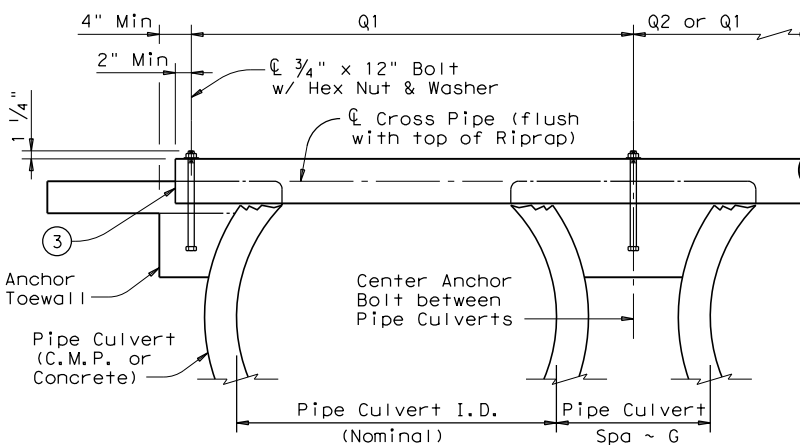
Limits of Riprap (to be included with S.E.T. for payment) ⑤



SHOWING TYPICAL PIPE CULVERT & RIPRAP



SHOWING CROSS PIPE WITH ANCHOR BAR



SHOWING CROSS PIPE WITH BOLTED ANCHOR

SECTION A-A

CROSS PIPE LENGTHS, REQUIRED PIPE SIZES, & RIPRAP QUANTITIES ②

Nominal Culvert I.D.	Conc Riprap (CY) ⑥	Pipe Culvert Spa ~ G	Single Barrel ~ Q1	Multi-Barrel ~ Q1	Q2	Conditions for use of Cross Pipes	Cross Pipe Size
12"	0.6	9"	N/A	2' - 1"	1' - 9"	3 or more Pipe Culverts	3" Std (3.500" O.D.)
15"	0.7	11"	N/A	2' - 5"	2' - 2"		
18"	0.8	1' - 2"	N/A	2' - 10"	2' - 8"		
21"	0.9	1' - 4"	N/A	3' - 2"	3' - 1"		
24"	0.9	1' - 7"	N/A	3' - 6"	3' - 7"	3 or more Pipe Culverts	3 1/2" Std (4.000" O.D.)
27"	1.0	1' - 8"	N/A	3' - 10"	3' - 11"		
30"	1.1	1' - 10"	N/A	4' - 2"	4' - 4"	2 or more Pipe Culverts	3 1/2" Std (4.000" O.D.)
33"	1.2	1' - 11"	4' - 2"	4' - 5"	4' - 8"	All Pipe Culverts	
36"	1.3	2' - 1"	4' - 5"	4' - 9"	5' - 1"	All Pipe Culverts	4" Std (4.500" O.D.)
42"	1.5	2' - 4"	4' - 11"	5' - 5"	5' - 10"		
48"	1.7	2' - 7"	5' - 5"	6' - 0"	6' - 7"	All Pipe Culverts	5" Std (5.563" O.D.)
54"	2.0	3' - 0"	5' - 11"	6' - 9"	7' - 6"		
60"	2.2	3' - 3"	6' - 5"	7' - 4"	8' - 3"		
66"	2.4	3' - 3"	6' - 11"	7' - 10"	8' - 9"		
72"	2.7	3' - 4"	7' - 5"	8' - 5"	9' - 4"		

- ① The proper installation of the first Cross Pipe is critical for vehicle safety. The top of the first Cross Pipe must be placed at no more than 6" above the flow line.
- ② Size of Cross Pipes, except the first bottom pipe, shall be as shown in the PIPE SIZE table. The first bottom pipe shall be 3 1/2" Standard Pipe (4" O.D.).
- ③ The third Cross Pipe from the bottom of the Culvert shall always be installed using a bolted connection. Care shall be taken to ensure that Riprap concrete does not flow into the Cross Pipe so as to permit disassembly of the bolted connection to allow cleanout access. At the Contractor's option, all other Cross Pipes may also be installed using the bolted connection details.
- ④ Match Cross Slope as shown elsewhere in the plans. Cross Slope of 6:1 or flatter is required for vehicle safety.
- ⑤ Riprap placed beyond the limits shown will be paid as Concrete Riprap in accordance with Item 432, "Riprap".
- ⑥ Quantities shown are for one end of one reinforced Concrete Pipe Culvert. For multiple pipe culverts or for Corrugated Metal Pipe Culverts, quantities will need to be adjusted. Riprap quantities are for Contractor's information only.

GENERAL NOTES:

Cross Pipes are designed for a traversing load of 10,000 pounds at yield as recommended by Research Report 280-2F, "Safety Treatment of Roadside Parallel-Drainage Structures", Texas Transportation Institute, March 1981.

Safety End Treatments shown herein are intended for use in those installations where out of control vehicles are likely to traverse the openings approximately perpendicular to the Cross Pipes.

Riprap and all necessary inverts shall be Concrete Riprap conforming to the requirements of Item 432, "Riprap".

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.

Payment for riprap and toewall is included in the Price Bid for each Safety End Treatment.

Cross Pipes shall conform to the requirements of ASTM A53 (Type E or S, Grade B), ASTM A500 (Grade B), or API 5LX52. Bolts and nuts shall conform to ASTM A307.

All steel components, except concrete reinforcing, shall be galvanized after fabrication. Galvanizing damaged during transport or construction shall be repaired in accordance with the specifications.

		Bridge Division Standard	
SAFETY END TREATMENT FOR 12" DIA TO 72" DIA PIPE CULVERTS TYPE II ~ PARALLEL DRAINAGE			
SETP-PD			
FILE: setppdse.dgn	DN: GAF	CK: CAT	DW: JRP
CON: GAF	SECT: STACY ROAD	JOB: STACY ROAD	HIGHWAY: STACY ROAD
11-10: Add note for synthetic fibers.		COUNTY: COLLIN	SHEET NO: 121

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DATE: 3/17/2017 2:59:00 PM
 FILE: I:\proj\NR305245.01 - Town of Fairview Stacy Road Improvements\10_CADD & BIM\10.6 MicroStation\10.6.5 Sheet\12 STANDARDS\Drainage\pwstde01.dgn

TABLE OF DIMENSIONS & REINFORCING STEEL
 (Wings for One Structure End)

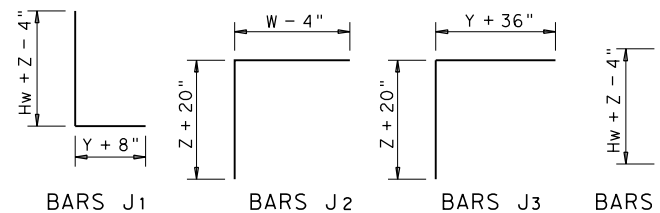
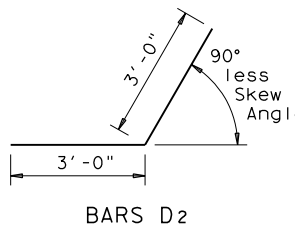
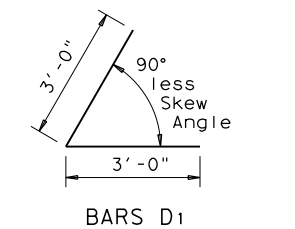
Maximum Wingwall Height Hw	Dimensions				Variable Reinforcing				Estimated Quantities per ft of wing (2-Wings)		Estimated Quantities per ft of Toewall (1-Toewall)	
	W	X	Y	Z	Bars J1	Bars J2	Size	Spa	Reinf (Lb/Ft)	Conc (CY/Ft)	Reinf (Lb/Ft)	Conc (CY/Ft)
2'-6"	2'-10"	10"	1'-0"	7"	#4	1'-0"	#4	1'-0"	48.64	0.406	6.85	0.071
2'-9"	2'-10"	10"	1'-0"	7"	#4	1'-0"	#4	1'-0"	49.31	0.424	6.85	0.071
3'-0"	2'-10"	10"	1'-0"	7"	#4	1'-0"	#4	1'-0"	49.98	0.444	6.85	0.071
3'-3"	2'-10"	10"	1'-0"	7"	#4	1'-0"	#4	1'-0"	53.32	0.462	6.85	0.071
3'-6"	2'-10"	10"	1'-0"	7"	#4	1'-0"	#4	1'-0"	53.98	0.480	6.85	0.071
4'-0"	3'-2"	1'-2"	1'-0"	7"	#4	1'-0"	#4	1'-0"	55.77	0.532	6.85	0.071
4'-6"	3'-2"	1'-2"	1'-0"	7"	#4	1'-0"	#4	1'-0"	59.77	0.568	6.85	0.071
5'-0"	3'-9"	1'-7"	1'-2"	7"	#4	1'-0"	#4	1'-0"	63.45	0.632	6.96	0.075
5'-6"	3'-9"	1'-7"	1'-2"	7"	#4	1'-0"	#4	1'-0"	67.46	0.668	6.96	0.075
6'-0"	4'-4"	2'-0"	1'-4"	7"	#5	1'-0"	#5	1'-0"	80.67	0.730	7.07	0.078
6'-6"	4'-4"	2'-0"	1'-4"	7"	#5	1'-0"	#5	1'-0"	85.05	0.768	7.07	0.078
7'-0"	5'-0"	2'-3"	1'-9"	8"	#5	1'-0"	#5	1'-0"	92.15	0.864	8.07	0.093
7'-6"	5'-0"	2'-3"	1'-9"	8"	#5	1'-0"	#5	1'-0"	96.54	0.902	8.07	0.093
8'-0"	5'-6"	2'-8"	1'-10"	8"	#5	6"	#5	6"	139.04	0.962	8.13	0.095
8'-6"	5'-6"	2'-8"	1'-10"	8"	#5	6"	#5	6"	144.47	1.000	8.13	0.095
9'-6"	6'-0"	2'-10"	2'-2"	9"	#5	6"	#5	6"	156.93	1.136	8.41	0.110
10'-6"	6'-5"	3'-0"	2'-5"	9"	#6	6"	#5	6"	196.27	1.234	8.57	0.117
11'-6"	7'-2"	3'-6"	2'-8"	11"	#6	6"	#6	6"	230.13	1.438	9.52	0.140
12'-6"	7'-8"	3'-8"	2'-11"	1'-0"	#7	6"	#6	6"	283.41	1.592	9.74	0.157
13'-6"	8'-2"	4'-0"	3'-2"	1'-2"	#8	6"	#6	6"	348.72	1.804	10.02	0.186
14'-6"	8'-10"	4'-5"	3'-5"	1'-4"	#9	6"	#6	6"	432.94	2.046	10.30	0.218
15'-6"	9'-6"	4'-10"	3'-8"	1'-6"	#9	6"	#7	6"	489.52	2.302	11.24	0.253
16'-0"	9'-11"	5'-0"	3'-11"	1'-7"	#9	6"	#7	6"	505.72	2.448	11.47	0.279

TABLE OF WINGWALL REINFORCING (2-Wings)

Bar	Size	No.	Spa
D1	#6	~	1'-0"
D2	#6	~	1'-0"
E1	#4	~	1'-0"
F	#4	~	1'-0"
G	#6	~	8"
M1	#4	4	~
P	#4	~	1'-0"
V	#4	~	1'-0"

TABLE OF TOEWALL REINFORCING

Bar	Size	No.	Spa
J3	#4	~	1'-0"
M2	#4	2	~
E2	#4	~	1'-0"



WING DIMENSION CALCULATIONS:

Formulas: (All values are in Feet)

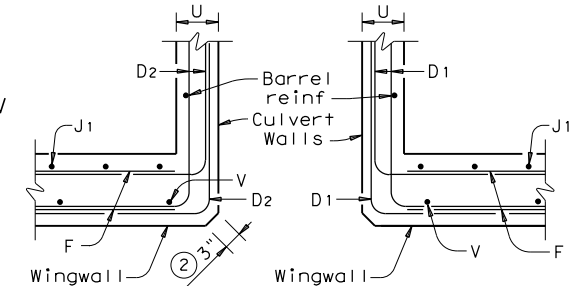
$H_w = H + T + C$
 $L_w = (H_w) (SL) \div \text{Cosine } \theta$ for Ty PW-1
 $L_w = (H_w - 1') (SL) \div \text{Cosine } \theta$ for Ty PW-2 and $H_w \geq 4'$
 $L_w = (H_w - 0.5') (SL) \div \text{Cosine } \theta$ for Ty PW-2 and $H_w < 4'$

For Cast-in-place culverts:
 $L_{tw} = [(N) (S) + (N + 1) (U)] \div \text{Cosine } \theta$

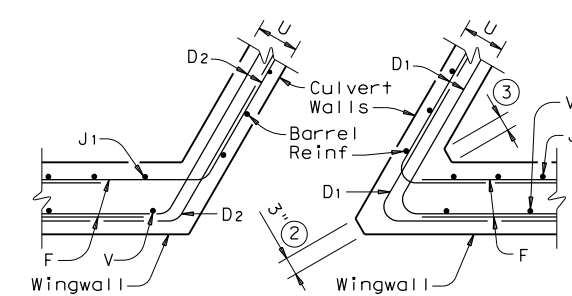
For Precast culverts:
 $L_{tw} = [(N) (2U + S) + (N - 1) (0.5')] \div \text{Cosine } \theta$
 Total Wingwall Area (Two Wings ~ SF)
 $= (2) (H_w) (L_w)$ for Ty PW-1
 $= (2) (H_w) (L_w) - 6 \text{ SF}$ for Ty PW-2 and $H_w \geq 4'$
 $= (2) (H_w) (L_w) - 1.5 \text{ SF}$ for Ty PW-2 and $H_w < 4'$

H_w = Height of Wingwall
 L_w = Length of Wingwall
 L_{tw} = Culvert Toewall Length
 N = Number of Culvert Spans
 $SL:1$ = Channel Slope ratio. (Horizontal: 1 Vertical, Usual value is 2:1)
 θ = Culvert Skew

See applicable box culvert standard for S, H, T and U values.



SECTION C-C



SECTION C-C

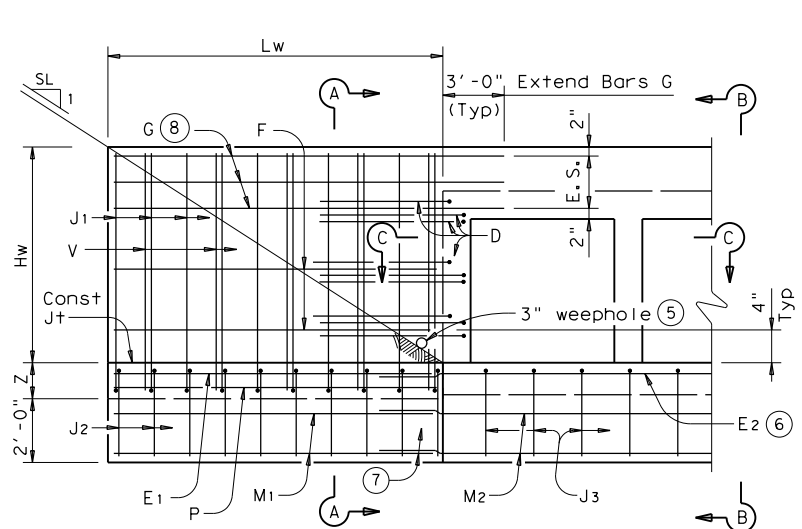
- Skew Angle = 0°
- At discharge end, chamfer may be 3/4".
- For 15° Skew ~ 1"
For 30° Skew ~ 2"
For 45° Skew ~ 3"
- Quantities shown are for two Type PW-1 wings. Adjust concrete volume for Type PW-2 wings. To determine estimated quantities for two wings, multiply the tabulated values by Lw. Quantities shown do not include weight of Bars D.
- Provide weepholes for Hw = 5'-0" and greater. Fill around weepholes with coarse gravel.
- Extend Bars E2 1'-6" minimum into the wingwall footing.
- Lap Bars M1 1'-6" minimum with Bars M2.
- Bars G equally spaced at 8" maximum, place as shown. Provide at least two pair Bars G per wing.
- 0" min to 5'-0" max. Estimated curb heights are shown elsewhere in the plans. For structures with pedestrian rail, bicycle rail or curbs taller than 1'-0", refer to ECD standard. For structures with T6 bridge rail, refer to T6-CM standard. For structures with traffic rail, other than T6, refer to RAC standard.
- For vehicle safety, the following requirements must be met:
 - For structures without bridge rail, curbs cannot project more than 3" above finished grade.
 - For structures with bridge rail, build curbs flush with finished grade.
 Reduce curb heights, if necessary, to meet the above requirements. No changes will be made in quantities and no additional compensation will be allowed for this work.
- 1'-0" typical. 2'-0" typical when RAC standard is referenced elsewhere in the plans.
- 3'-0" for Hw < 4'.
- 6" for Hw < 4'.

GENERAL NOTES:

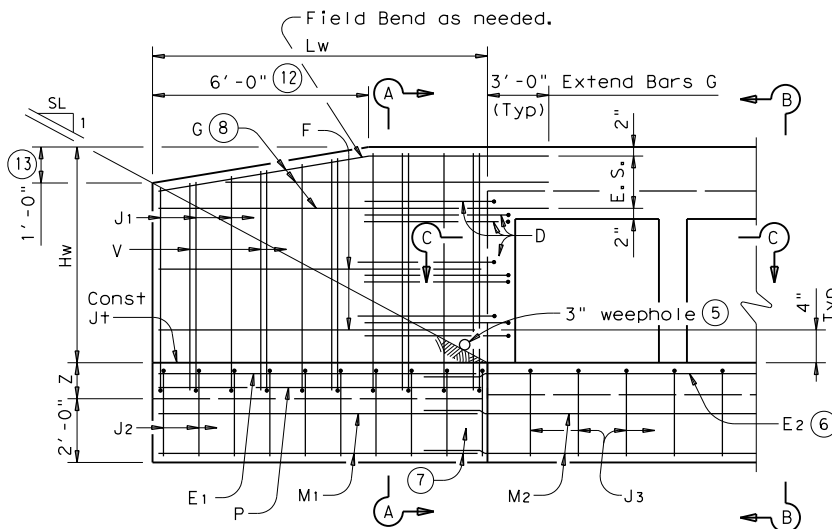
Designed in accordance with AASHTO LRFD Bridge Design Specifications.
 Provide Class "C" Concrete (f'c = 3,600 psi Min) and Grade 60 reinforcing steel.
 Provide 1/4" Min clear cover to reinforcing steel. Depth of toewalls for wingwalls and culverts may be reduced or eliminated when founded on solid rock, when directed by the Engineer.
 See BCS sheet for wingwall type and additional dimensions and information.
 The quantities for concrete and reinforcing steel resulting from the formulas given on this sheet are for the Contractor's information only.

DESIGNER NOTES:

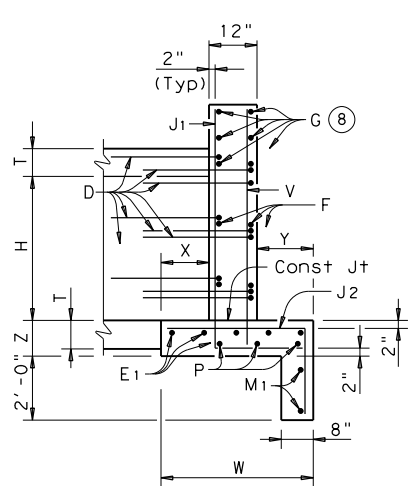
Type PW-1 can be used for all applications and must be used if railing is to be mounted to the wingwall.
 Type PW-2 can only be used for applications without a railing mounted to the wingwall.



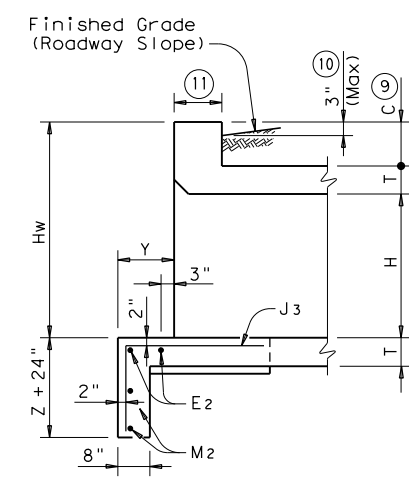
PARTIAL ELEVATION - PW-1



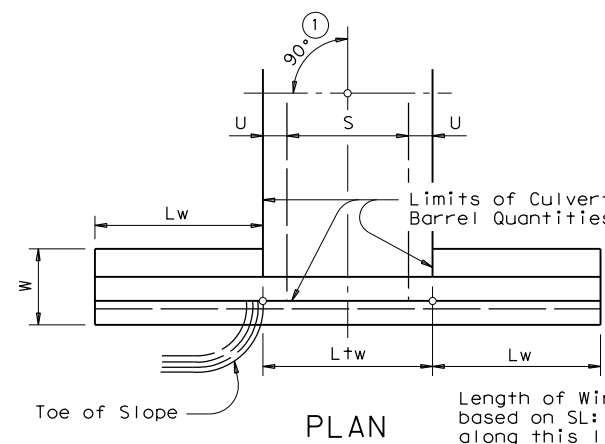
PARTIAL ELEVATION - PW-2



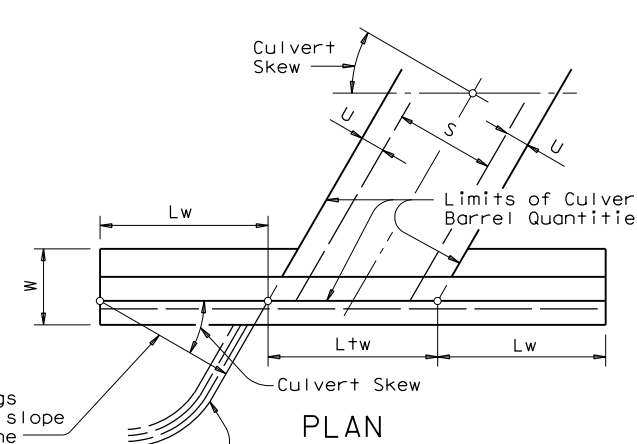
SECTION A-A
 (Showing Wing Reinf)



SECTION B-B
 (Showing Wing Reinf)



DETAILS FOR NON-SKEWED BOX CULVERTS



DETAILS FOR SKEWED BOX CULVERTS
 (Showing 30° Skew)

Texas Department of Transportation
 Bridge Division Standard

CONCRETE WINGWALLS WITH PARALLEL WINGS FOR BOX CULVERTS TYPES PW-1 AND PW-2

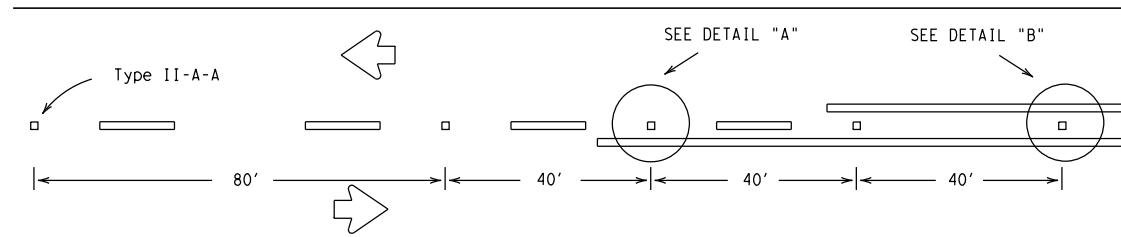
PW

FILE: pwstde01.dgn	DN: GAF	CK: CAT	DW: TxDOT	CK: GAF
©TxDOT February 2010	CONT	SECT	JOB	HIGHWAY
REVISIONS	STACY ROAD			
11-10: Reinforcing Quantities	DIST	COUNTY	SHEET NO.	
01-12: PW-1 & PW-2	COLLIN		122	

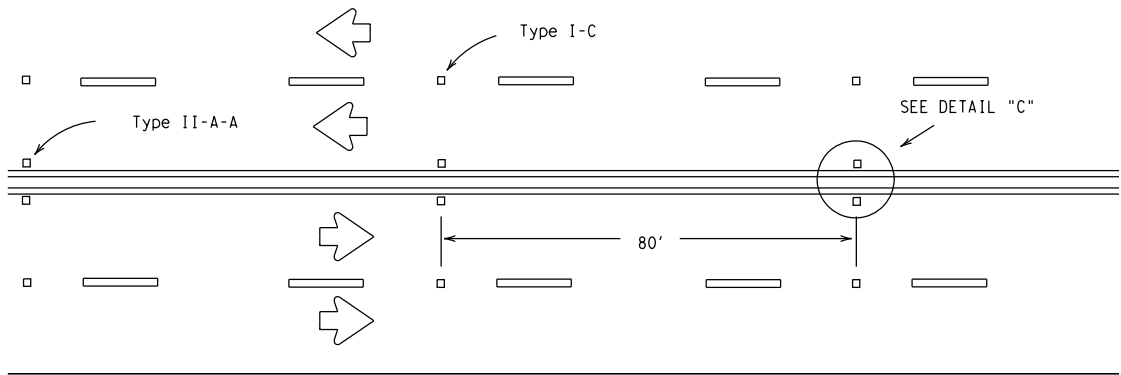
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DATE: 3/17/2017 2:35:57 PM
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REFLECTIVE RAISED PAVEMENT MARKERS FOR VEHICLE POSITIONING GUIDANCE

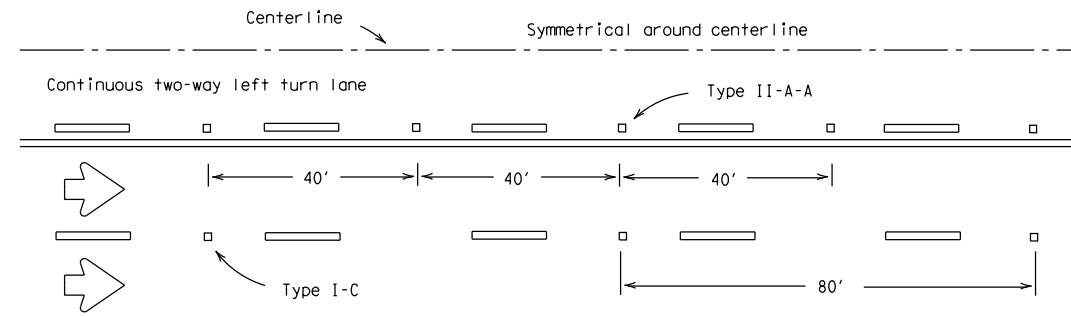


CENTERLINE FOR ALL TWO LANE ROADWAYS

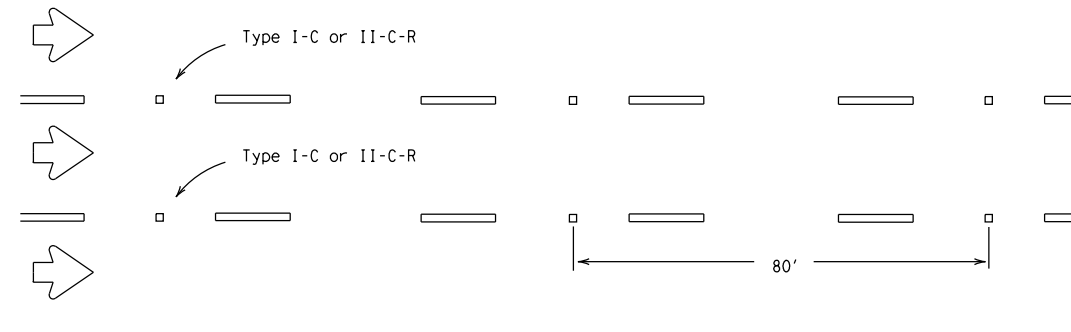


CENTERLINE & LANE LINES FOR FOUR LANE TWO-WAY HIGHWAYS

Raised pavement marker Type I-C, clear face toward normal traffic, shall be placed on 80-foot centers.

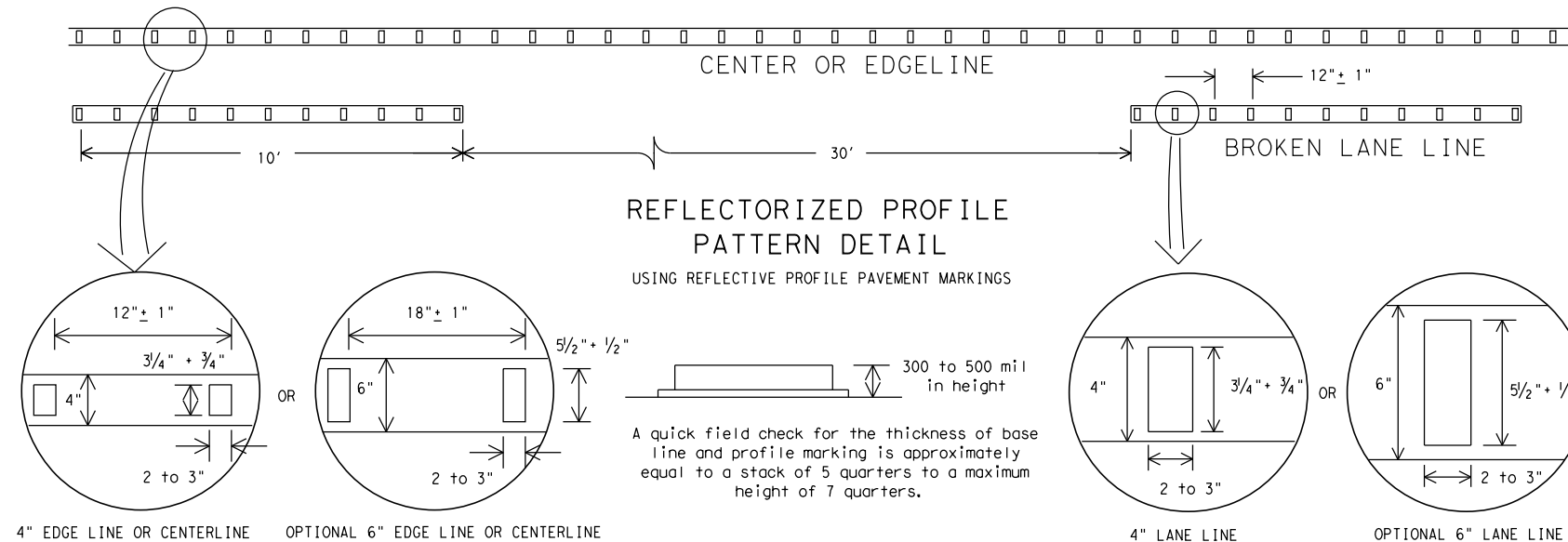
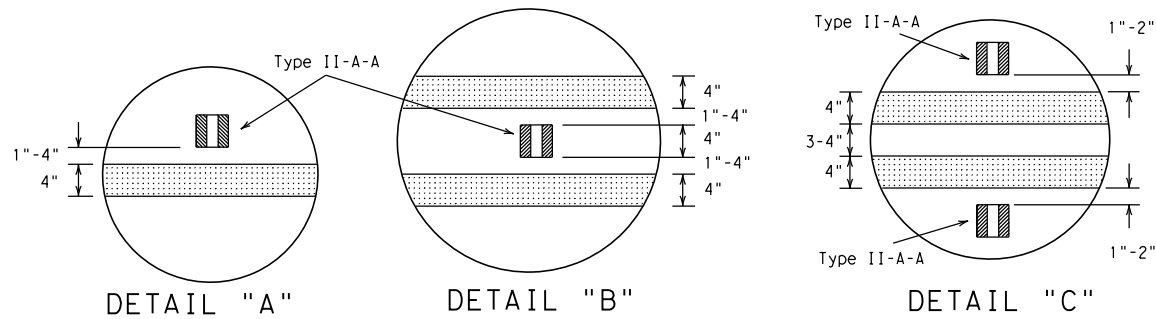


CENTERLINE AND LANE LINES FOR TWO-WAY LEFT TURN LANE



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.



REFLECTORIZED PROFILE PATTERN DETAIL USING REFLECTIVE PROFILE PAVEMENT MARKINGS

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.

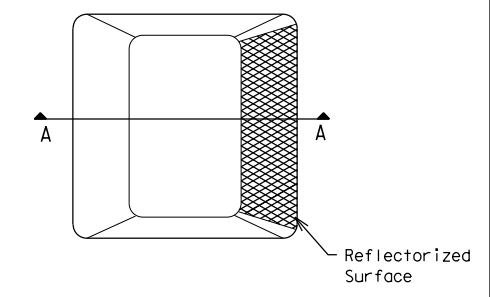
NOTE: Profile markings shall not be placed on roadways with a posted speed limit of 45 MPH or less.

GENERAL NOTES

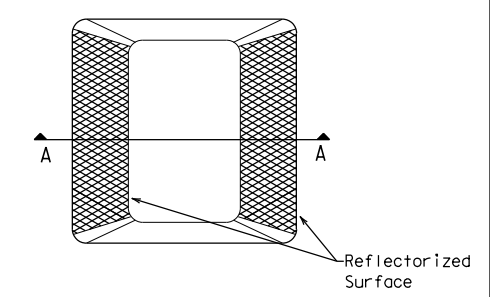
- All raised pavement markers placed in broken lines shall be placed in line with and midway between the stripes.
- On concrete pavements the raised pavement markers should be placed to one side of the longitudinal joints.

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

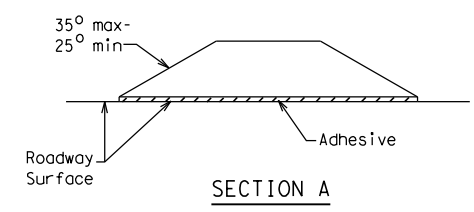
All pavement marking materials shall meet the required Departmental Material Specifications as specified by the plans.



Type I (Top View)



Type II (Top View)



SECTION A

RAISED PAVEMENT MARKERS



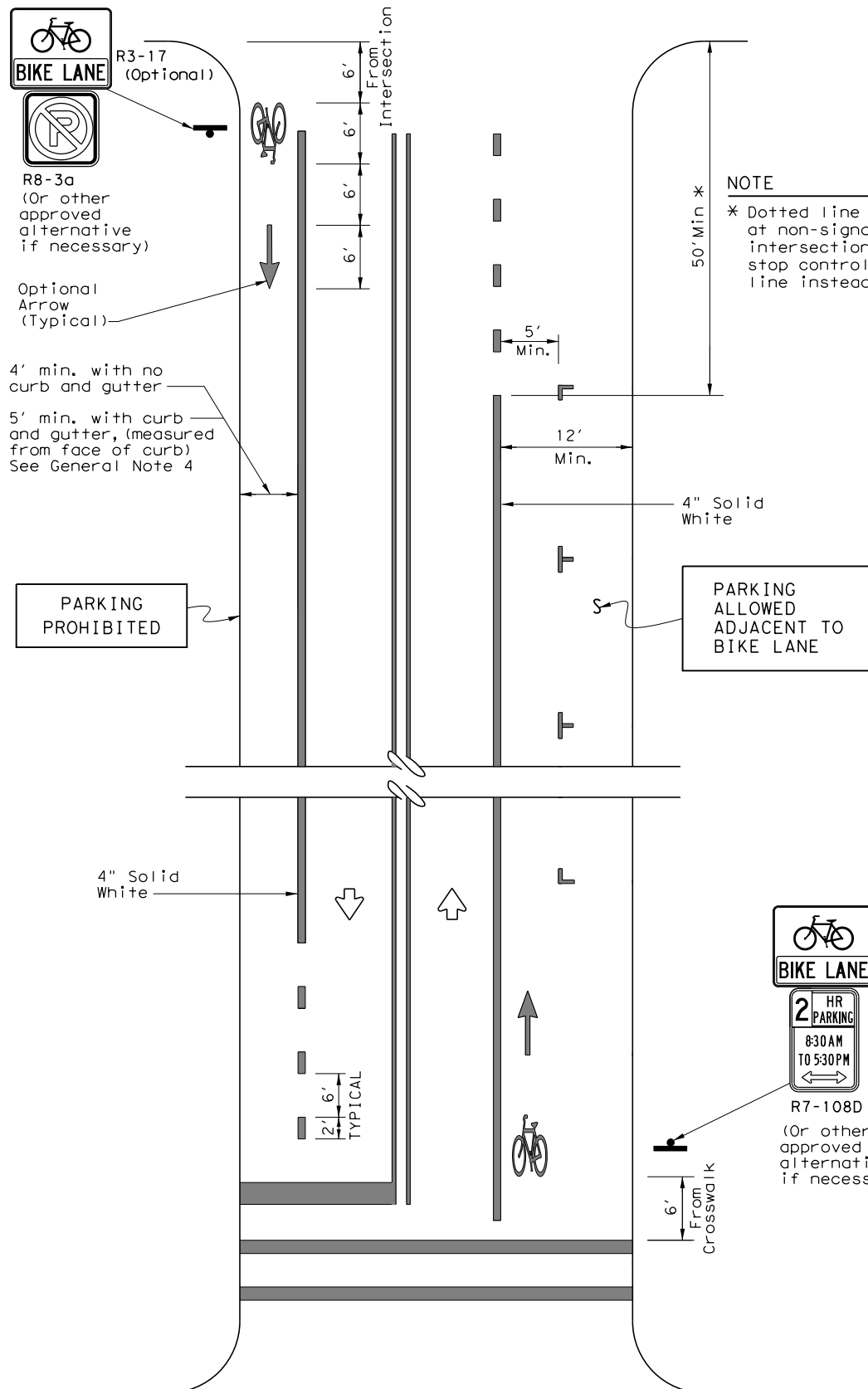
POSITION GUIDANCE USING RAISED MARKERS REFLECTORIZED PROFILE MARKINGS

PM(2) - 12

© TxDOT April 1977		DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
REVISIONS		CONT	SECT	JOB	HIGHWAY
4-92	2-10				STACY ROAD
5-00	2-12				
8-00		DIST	COUNTY		SHEET NO.
2-08			COLLIN		123
22B					

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DATE: 3/17/2017 2:35:57 PM
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NOTES

1. Bicycle lane pavement markings typically repeated after each intersection or signalized driveway.
2. On uninterrupted sections of roadway, bicycle lane pavement markings typically repeated as follows:
 -1200' for 45 MPH or less roads
 -2500' for 50 MPH and greater roads.

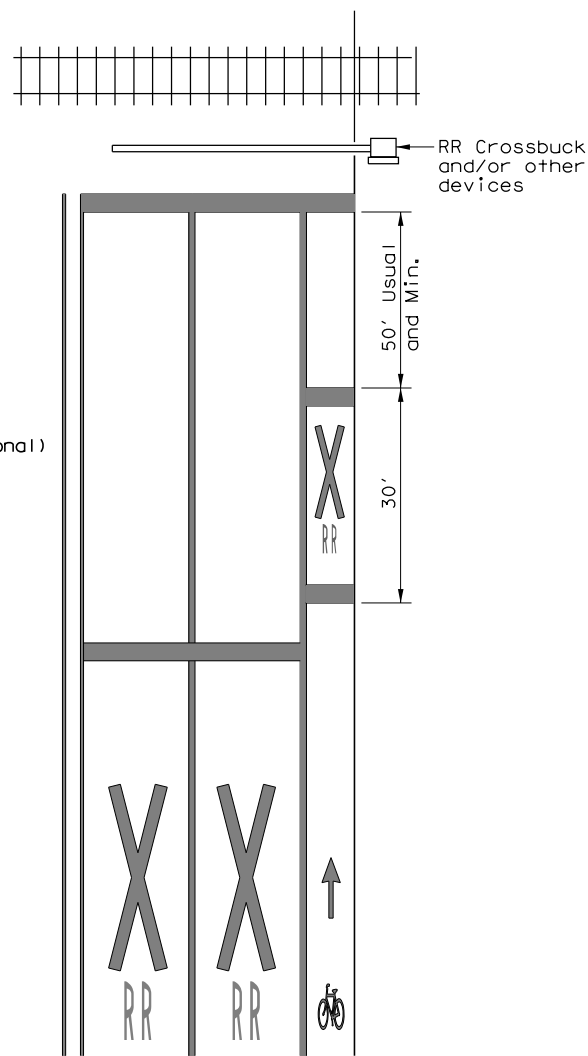
TWO-WAY STREET

GENERAL NOTES

1. All bicycle lane pavement markings shall be white unless otherwise noted.
2. All pavement marking materials shall meet the required Department Material Specifications as specified by the plans.
3. Exact sign placement and details are shown elsewhere in the plans.
4. The current edition of AASHTO'S Guide for the Development of Bicycle Facilities should be referenced for variations in design, other geometric conditions, and lane width options.
5. Other bicycle lane symbol or word markings as shown in the Texas Manual on Uniform Traffic Control Devices may be used. Details for words, arrows and symbols as shown in the Standard Highway Sign Designs for Texas.
6. The "BIKE LANE" (R3-17) sign with the "AHEAD" (R3-17a) sign mounted directly below should be installed in advance of the beginning of a marked bike lane.
7. The "BIKE LANE" (R3-17) sign with the "END" (R3-17b) sign mounted directly below should be installed at the end of marked bicycle lane.

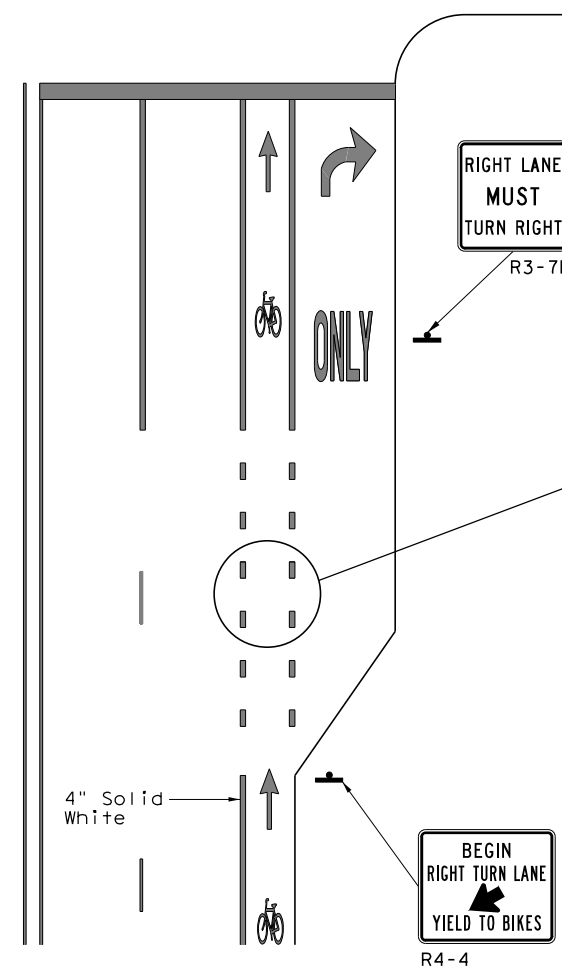
NOTE

* Dotted line not necessary at non-signalized minor intersections with no stop controls; Use solid line instead.



(See RCPM Standard for travel lane details)

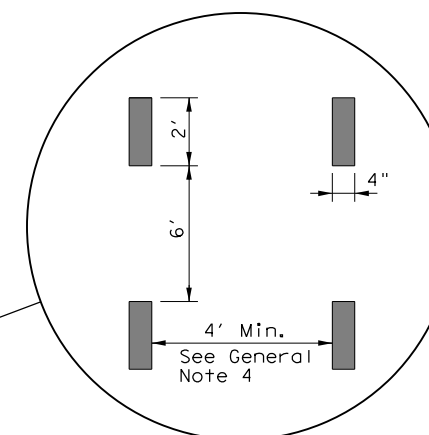
RAILROAD CROSSING APPROACH



RIGHT TURN ONLY LANE

LEGEND	
	Sign
	Traffic Flow

SPECIFICATION REFERENCE TABLE	
Traffic Paint	DMS-8200
Hot Applied Thermoplastic	DMS-8220
Permanent Prefabricated Pavement Markings	DMS-8240
Glass Traffic Beads	DMS-8290



DETAIL "A"

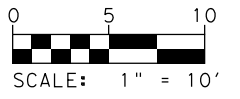
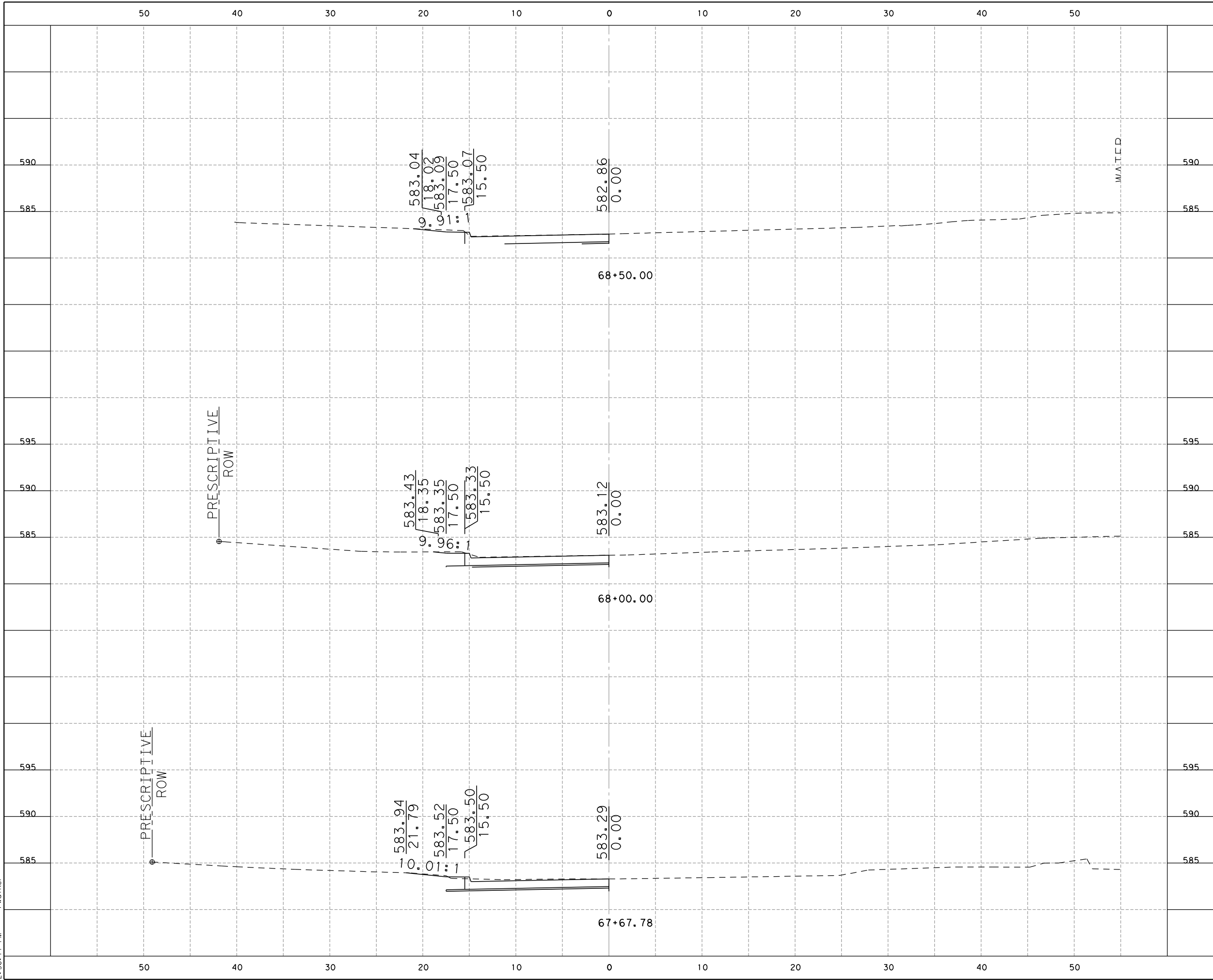
Texas Department of Transportation
 Traffic Operations Division

**BICYCLE LANE
 PAVEMENT MARKINGS**

BLPM-10

© TxDOT	May 2010	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
REVISIONS		CONT	SECT	JOB	HIGHWAY
		DIST	COUNTY	SHEET NO.	
		COLLIN		124	

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 Firm No. F-761



TOWN OF FAIRVIEW, TEXAS
 372 TOWN PLACE
 FAIRVIEW, TX 75069
 972-562-0522

E. STACY ROAD IMPROVEMENTS

CROSS SECTIONS

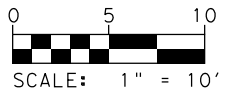
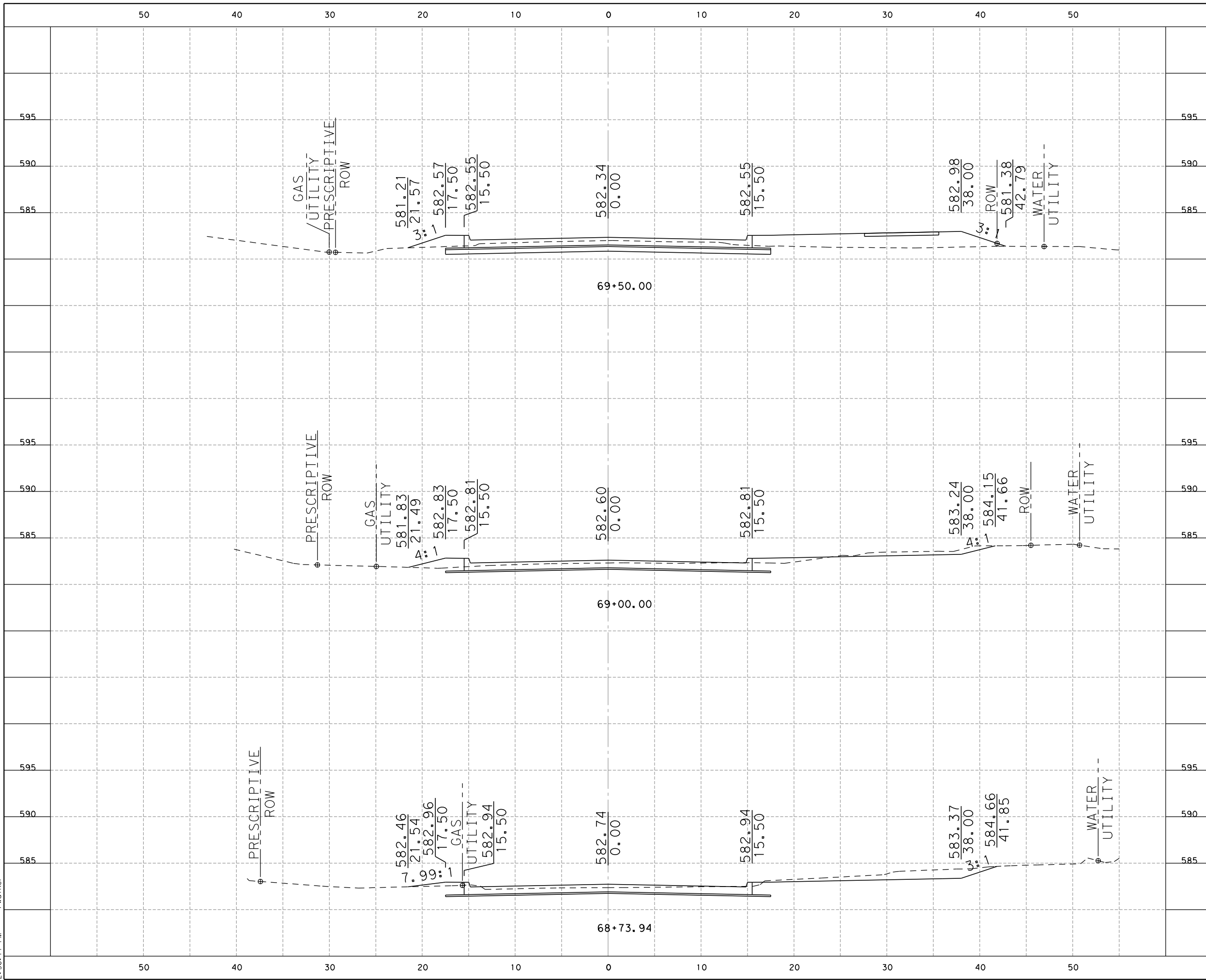
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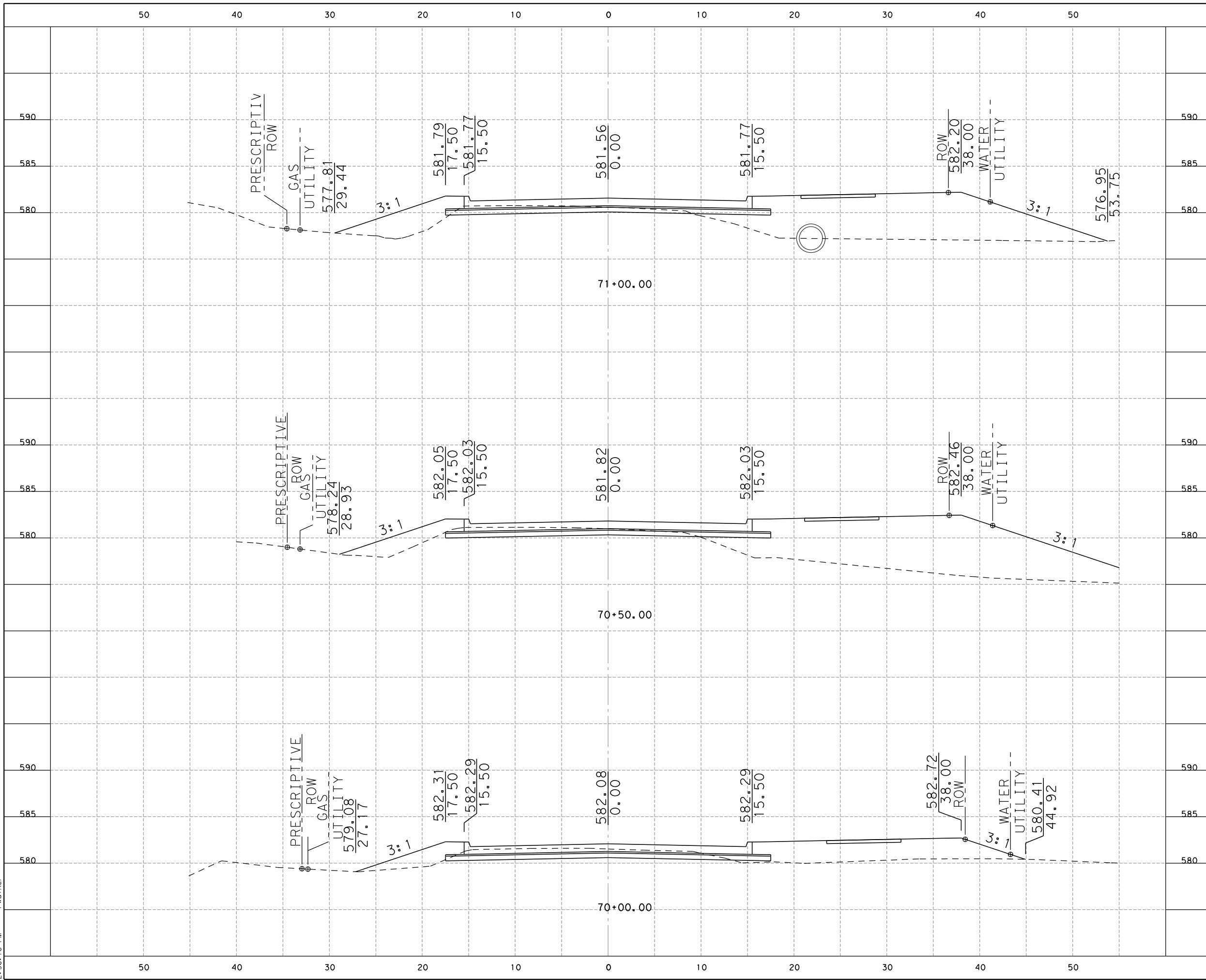
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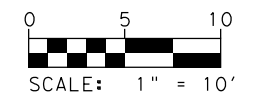
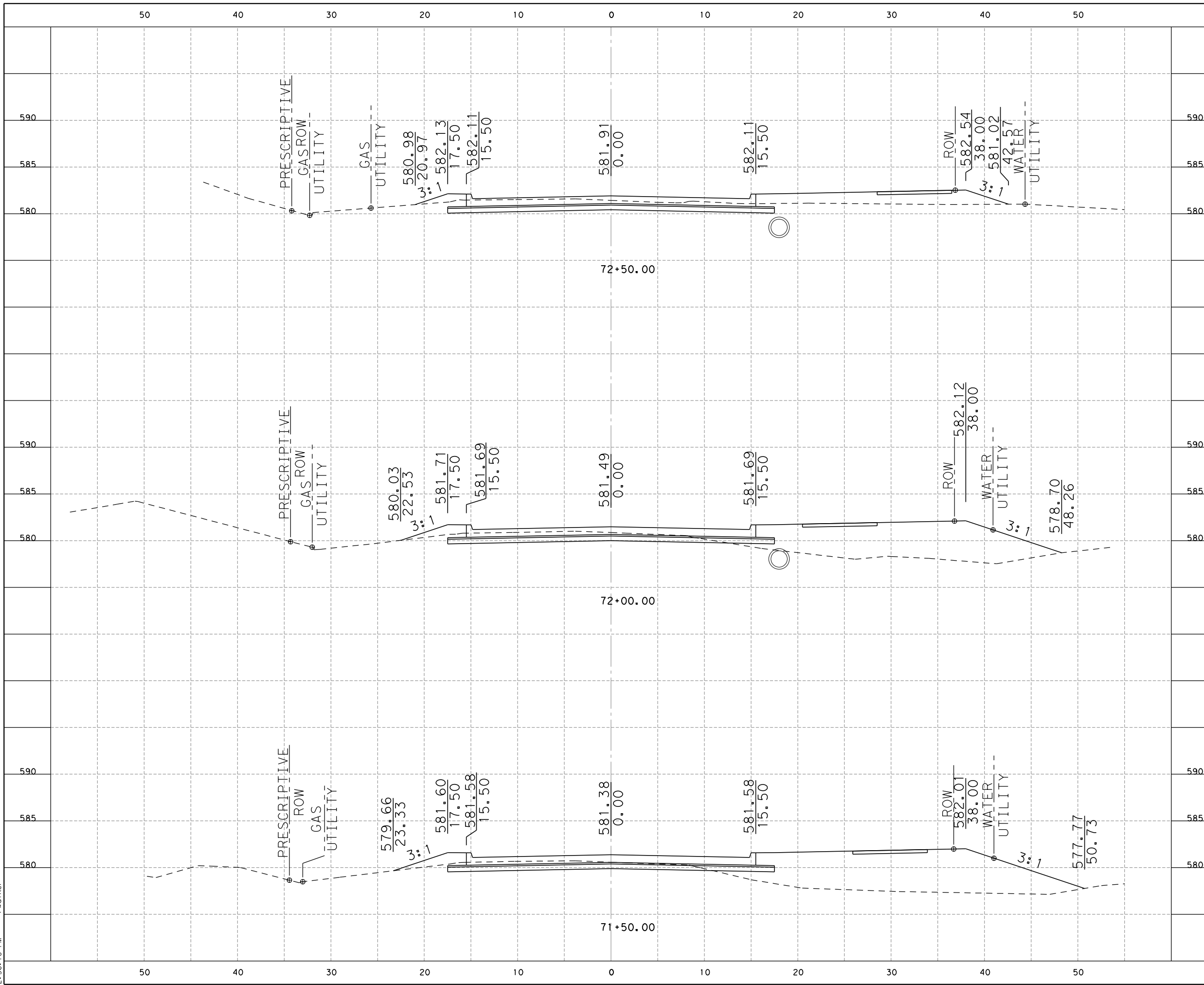
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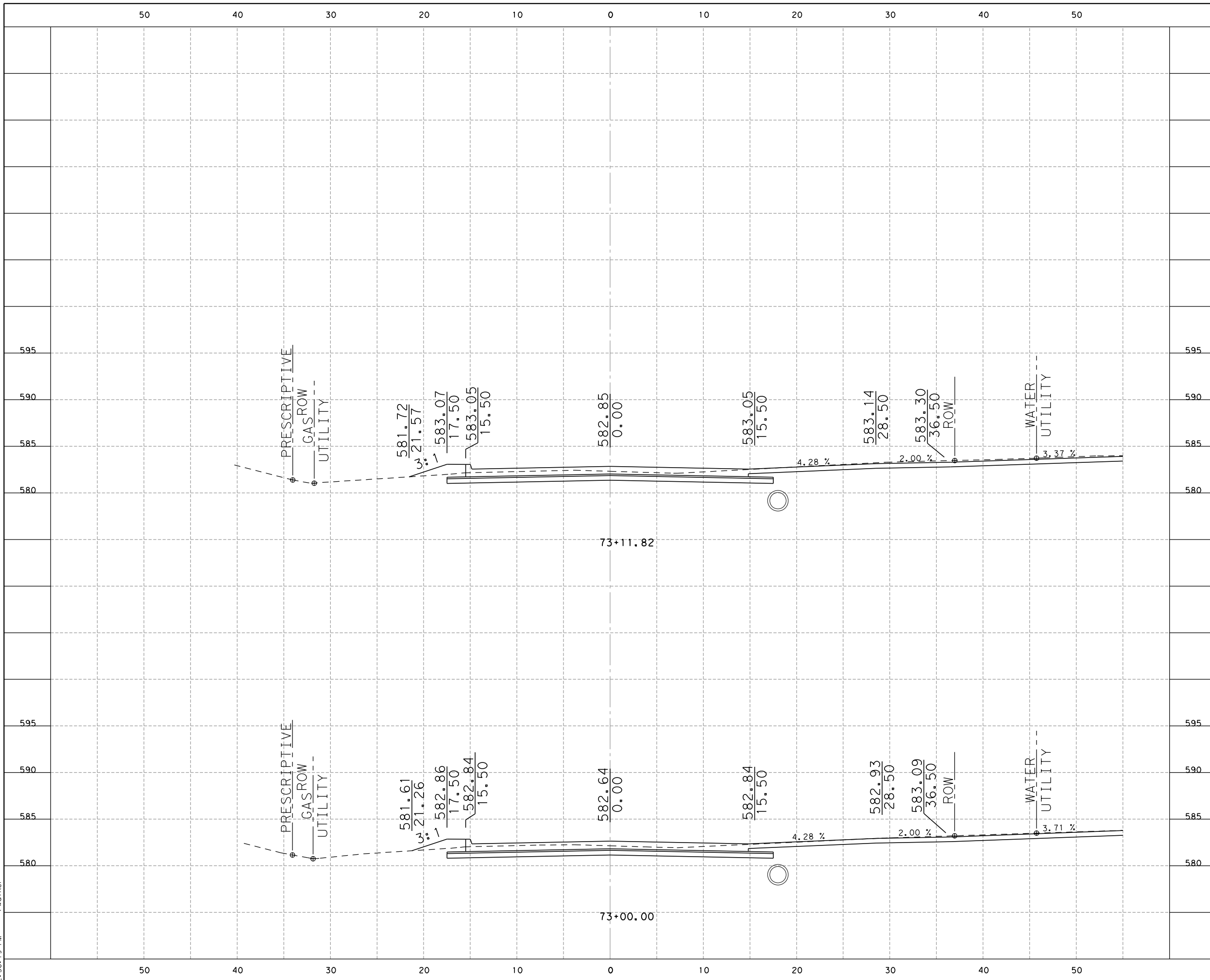
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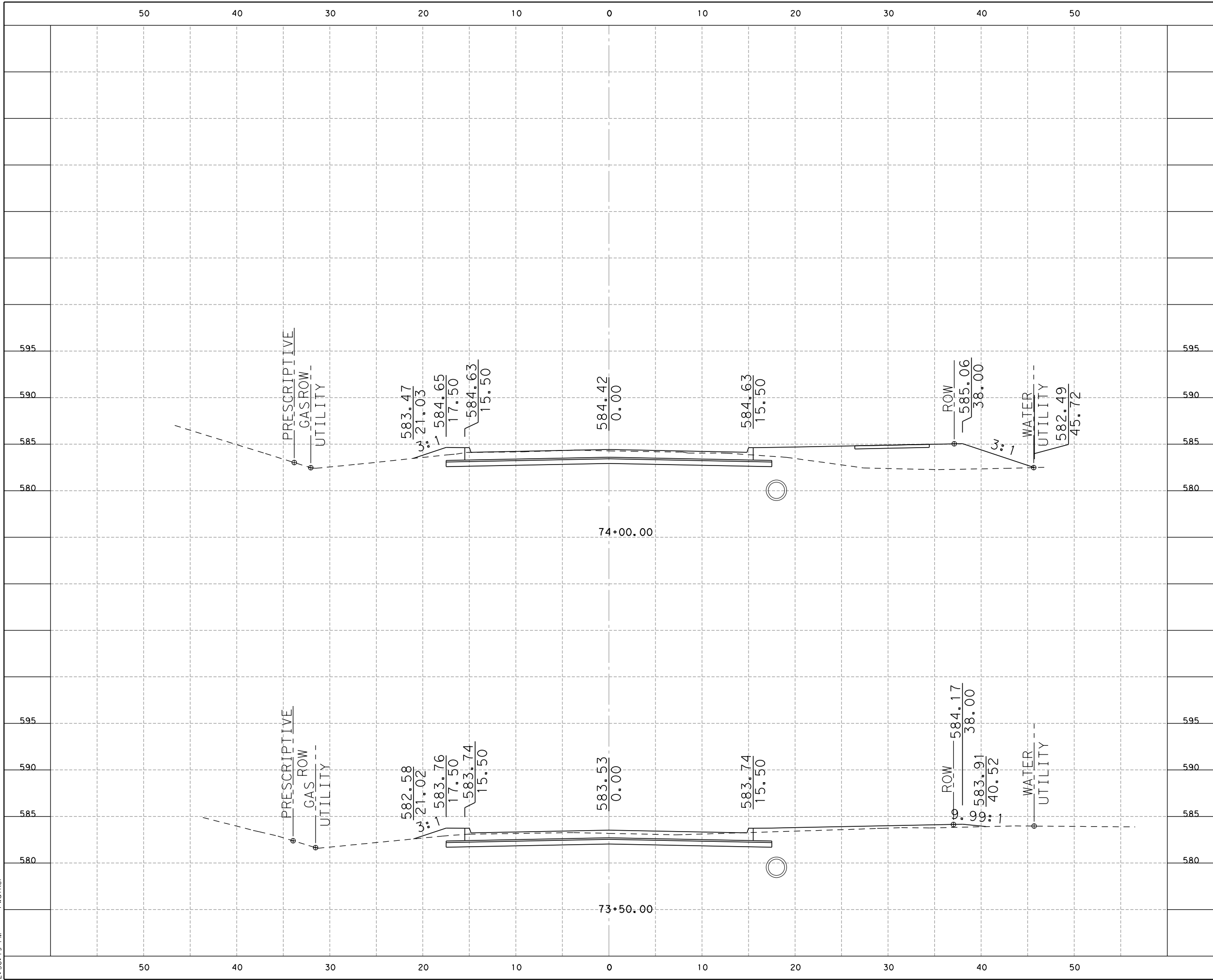
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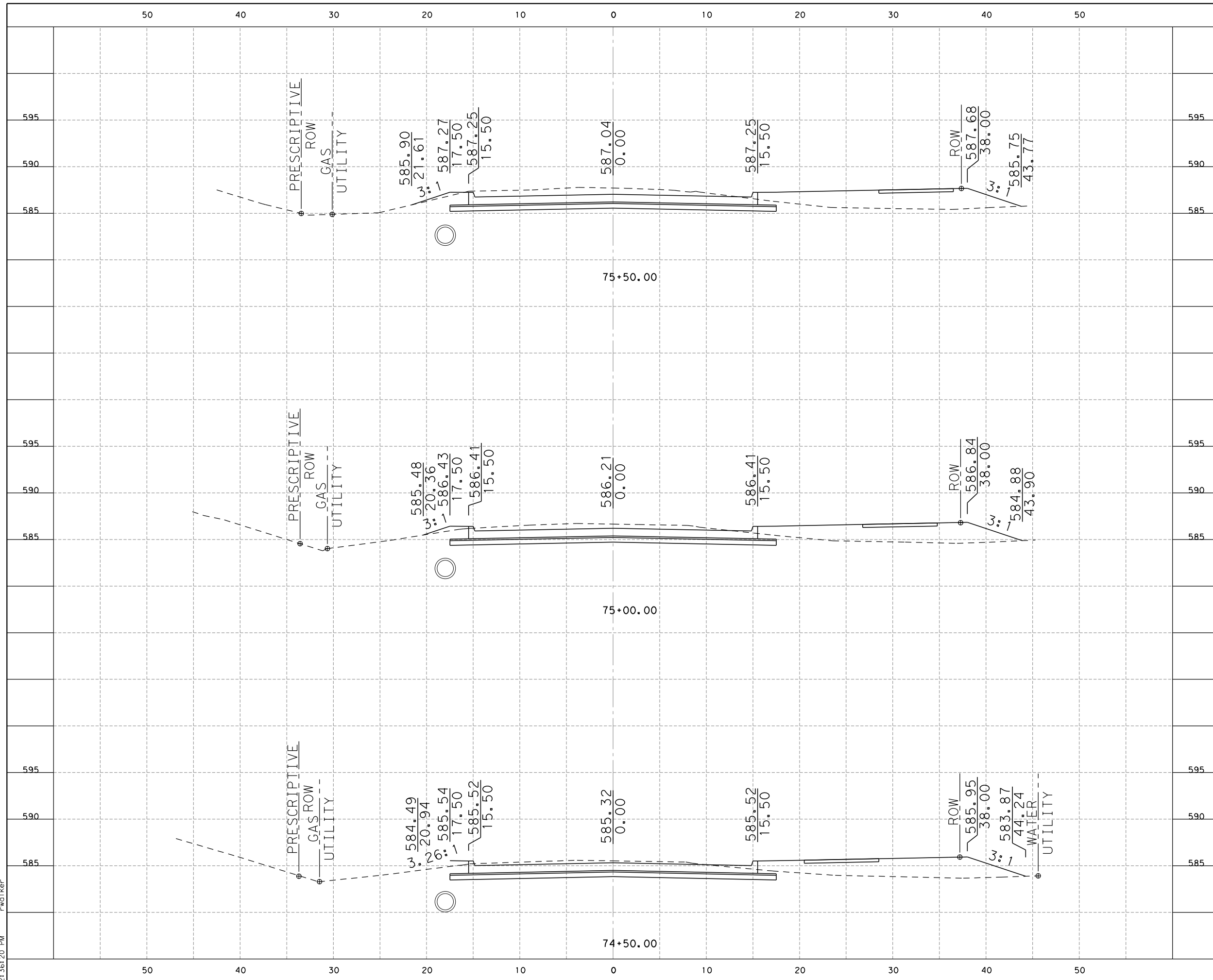
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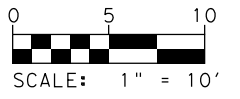
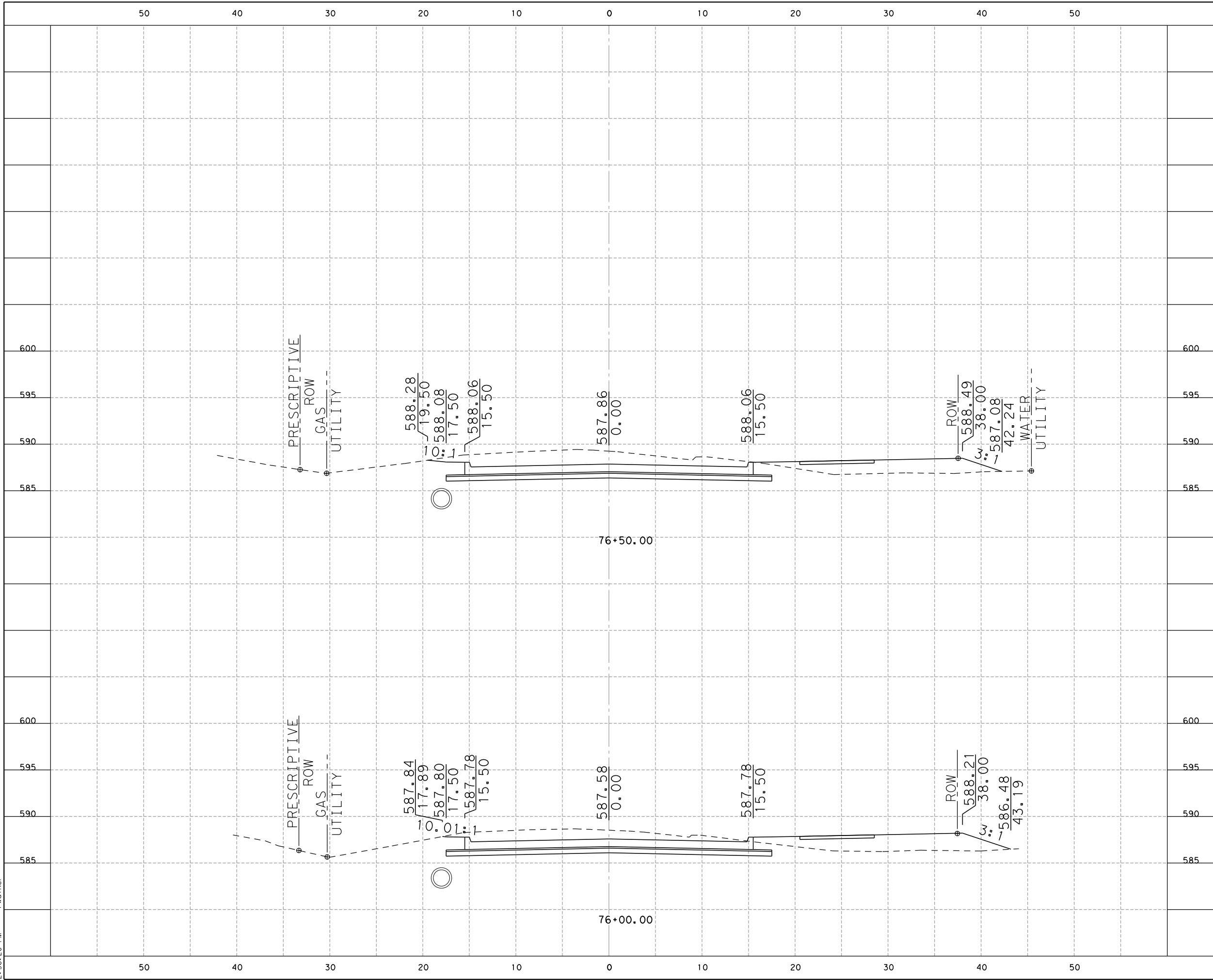
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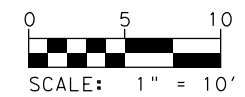
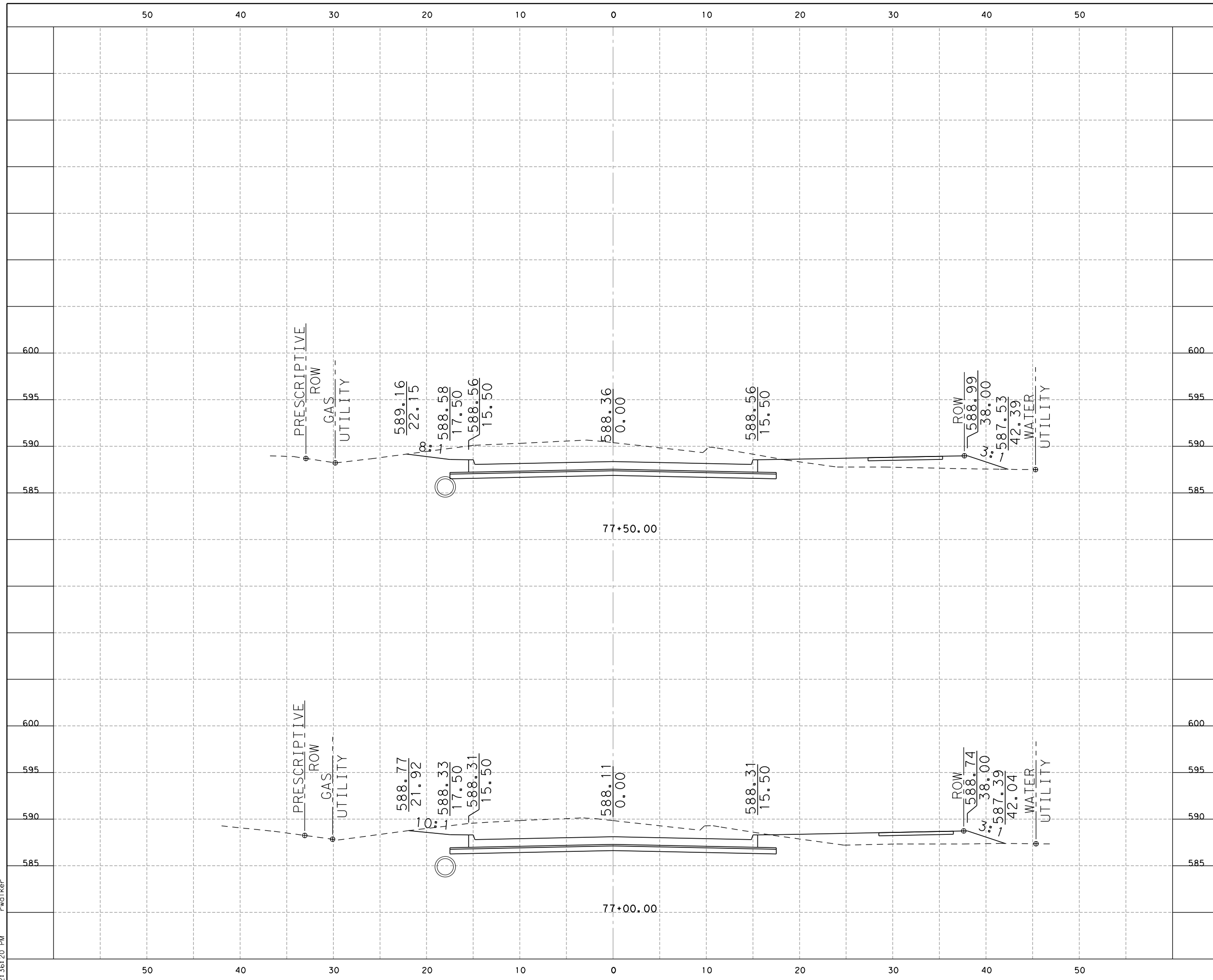
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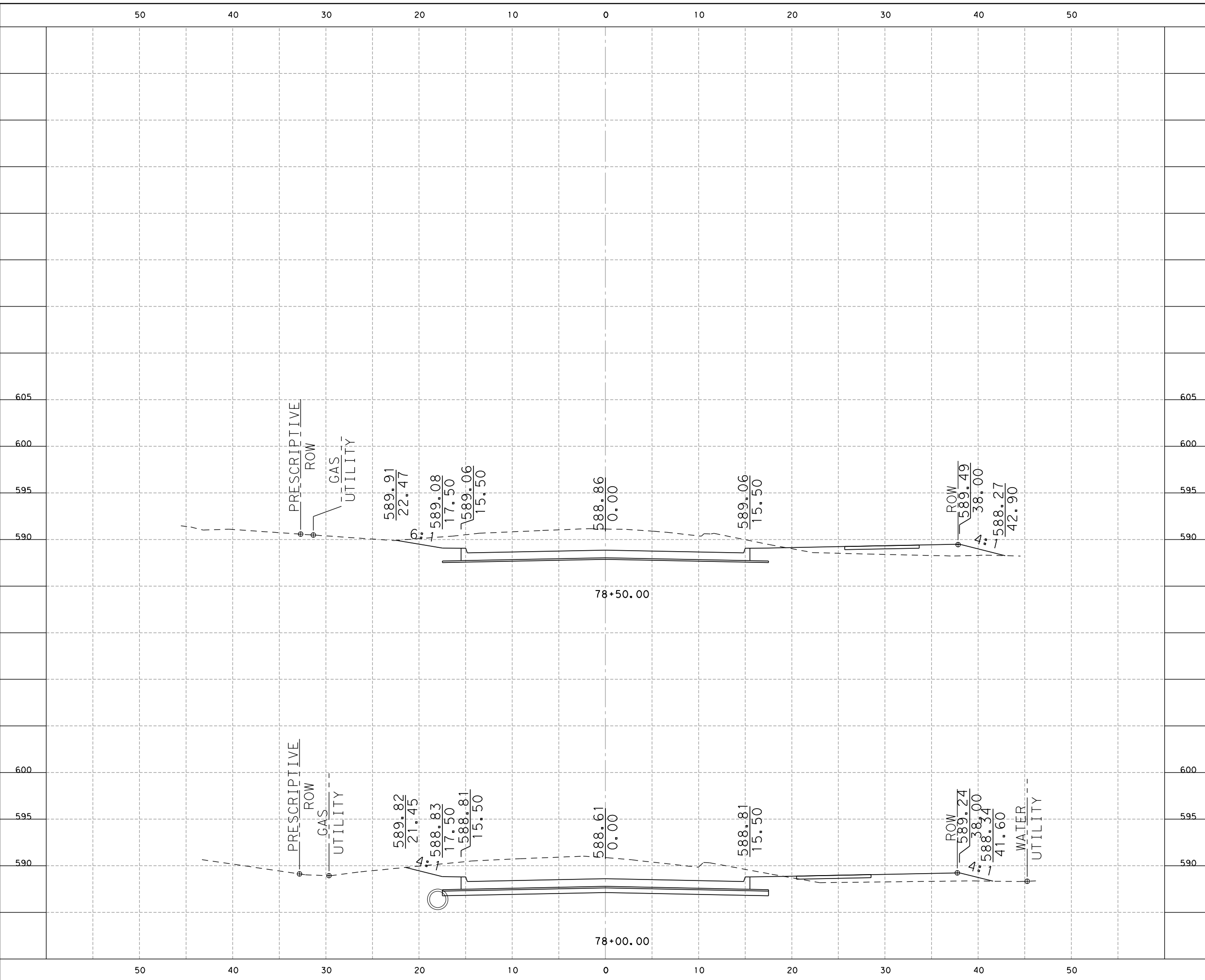
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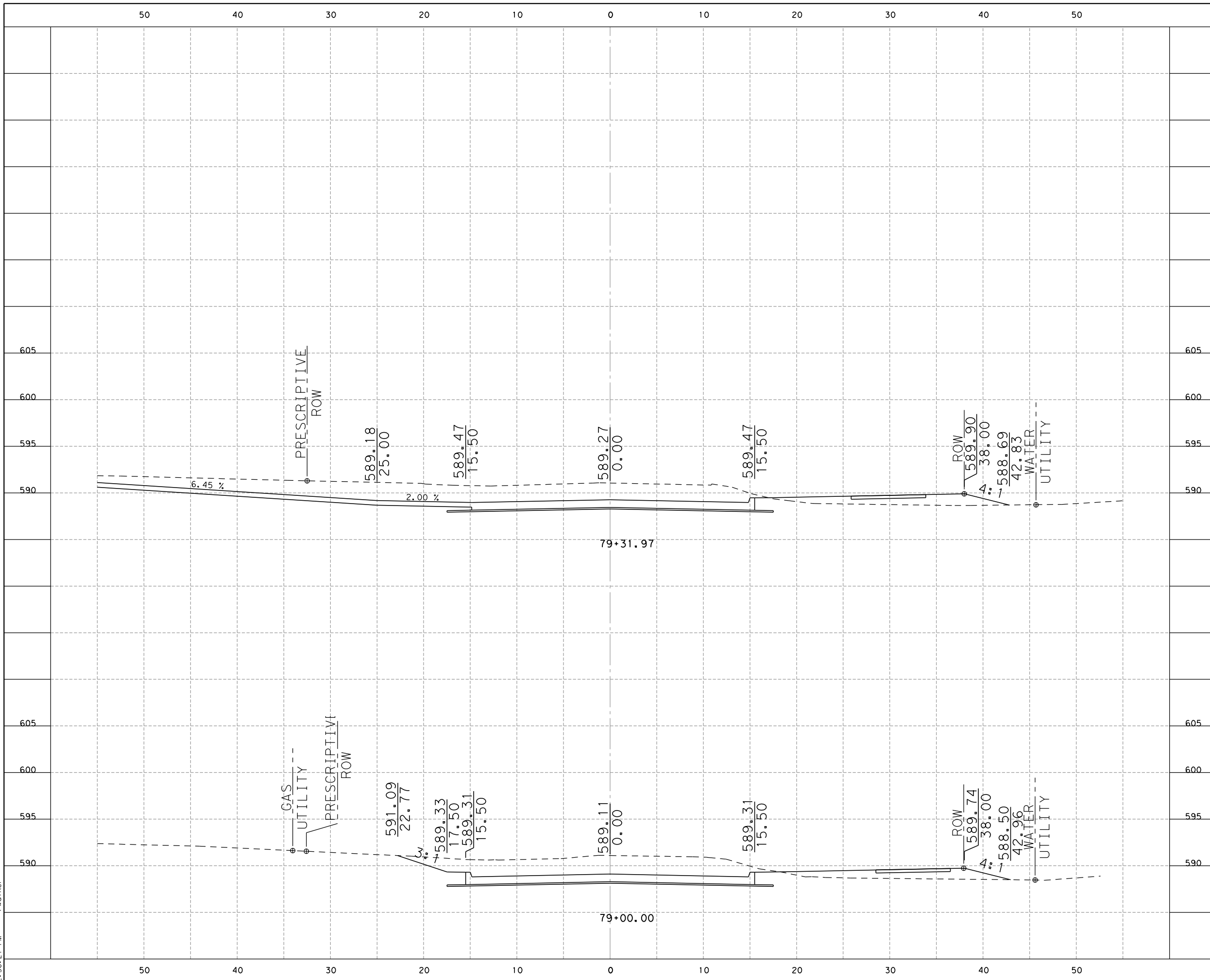
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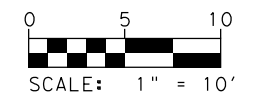
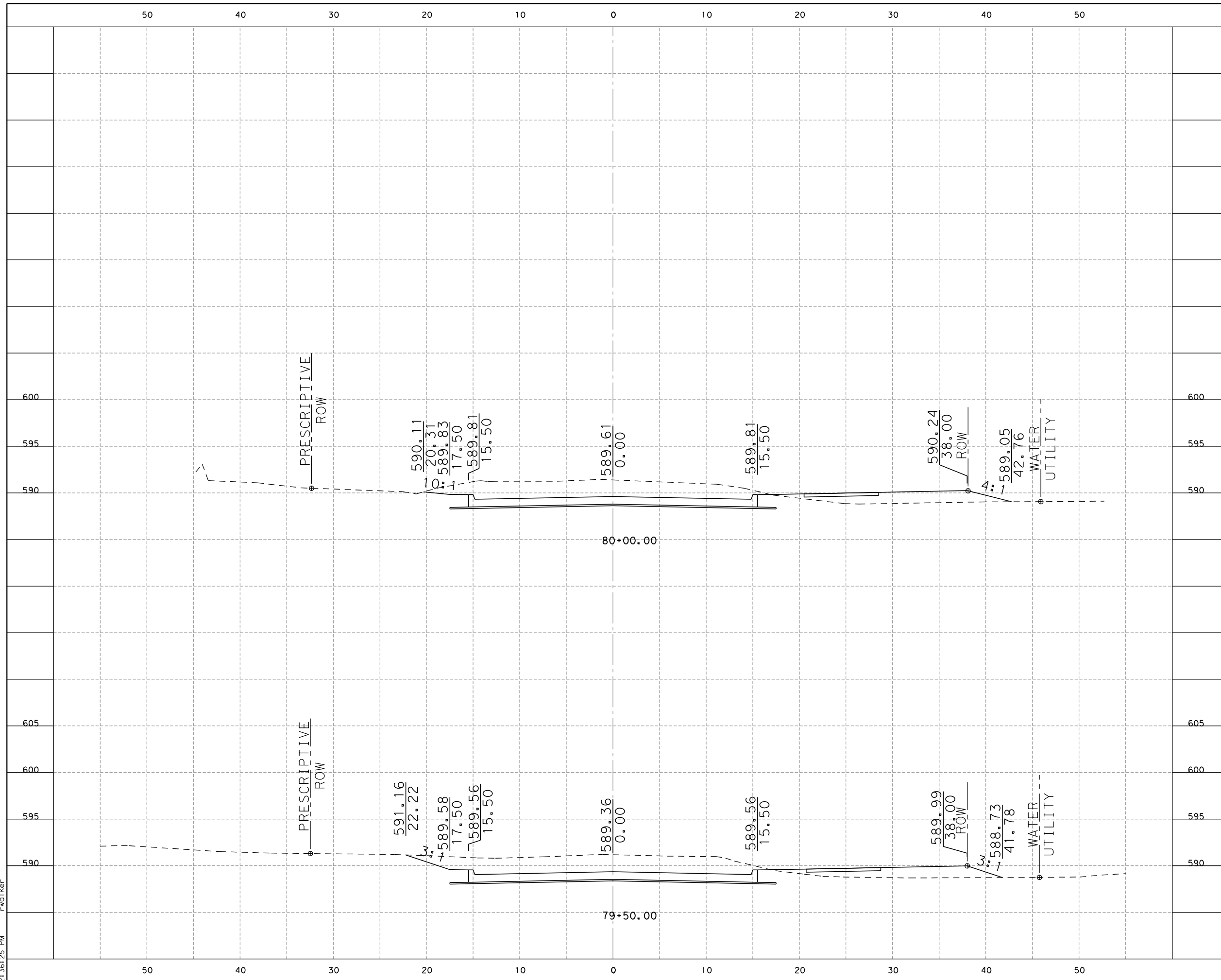
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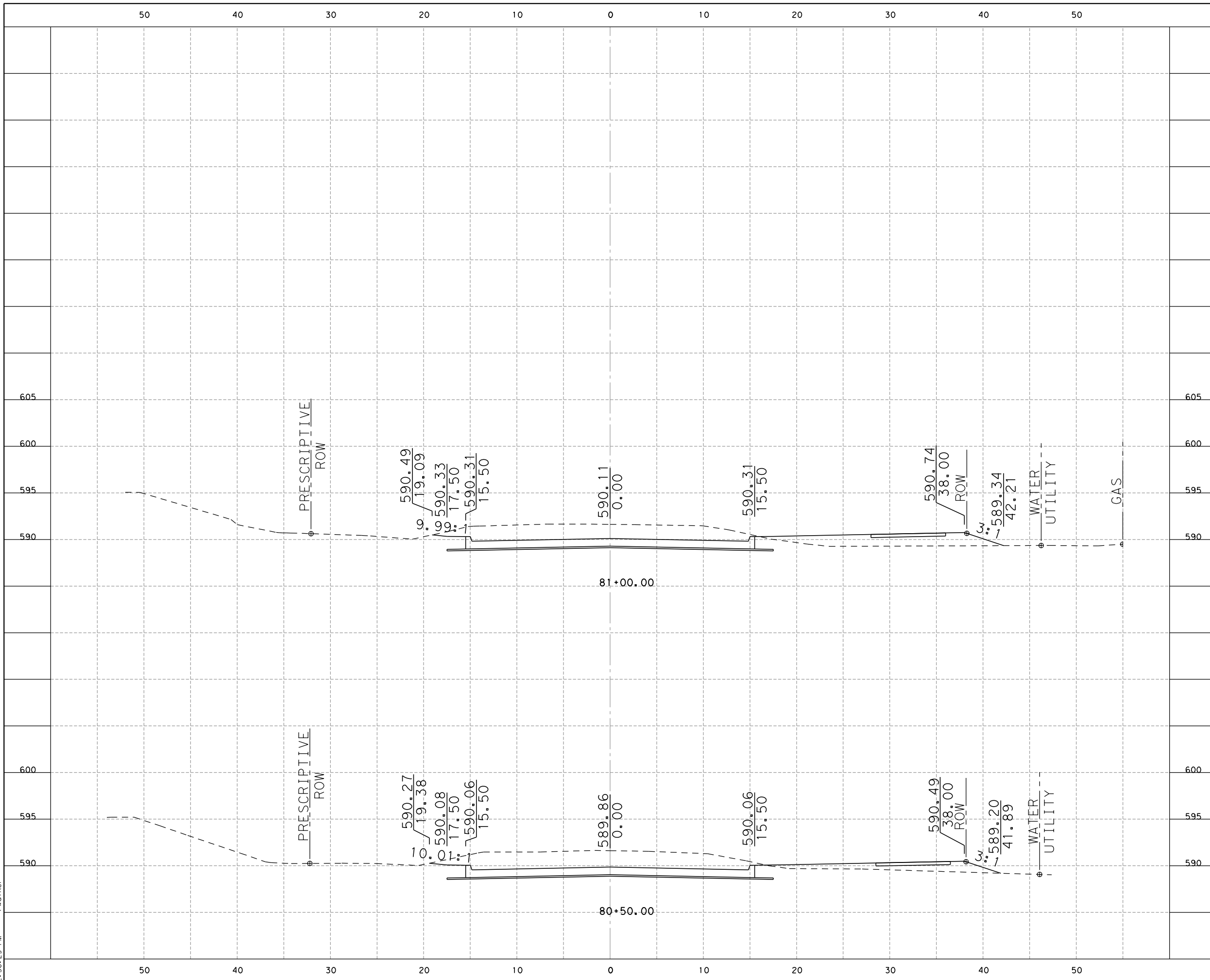
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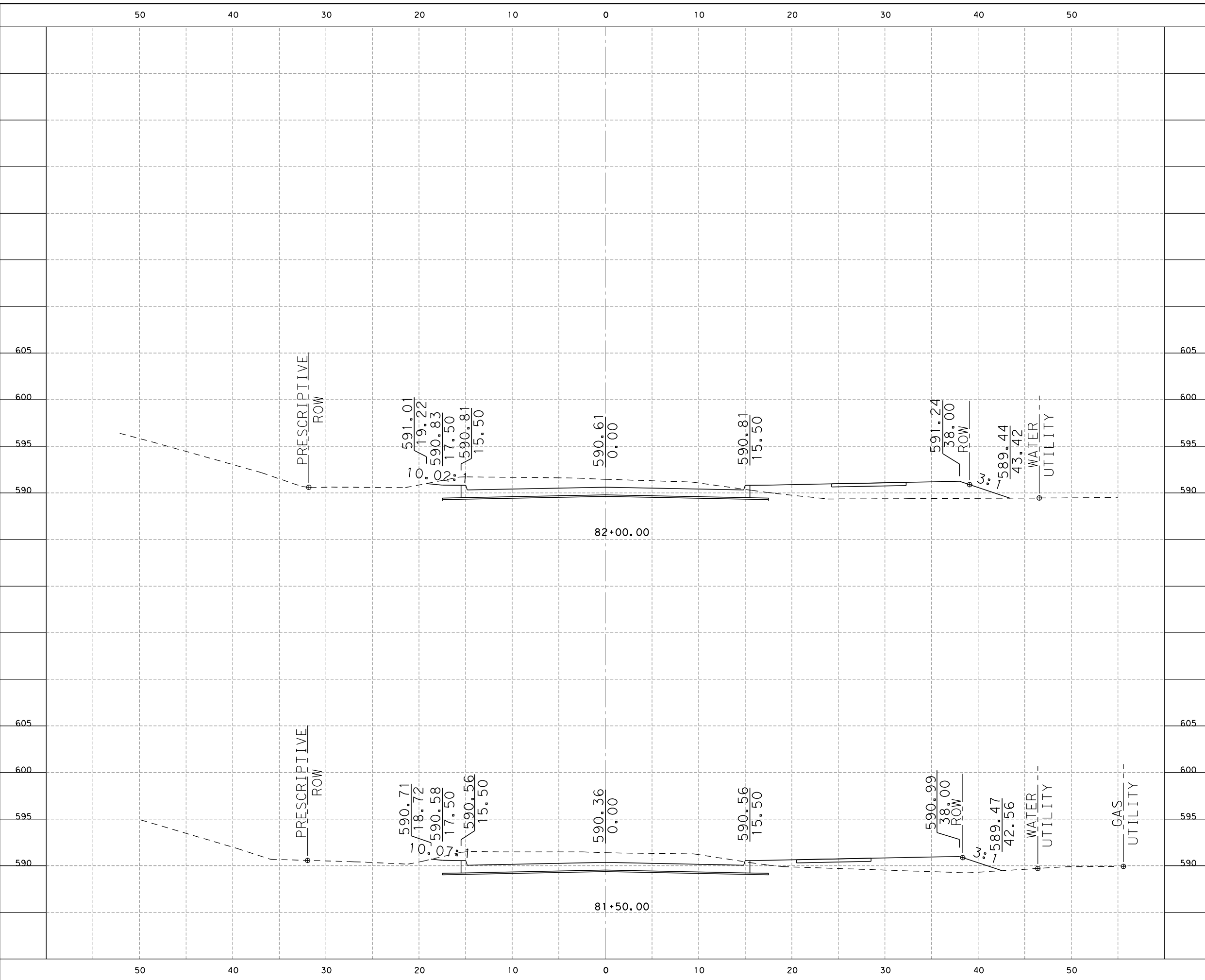
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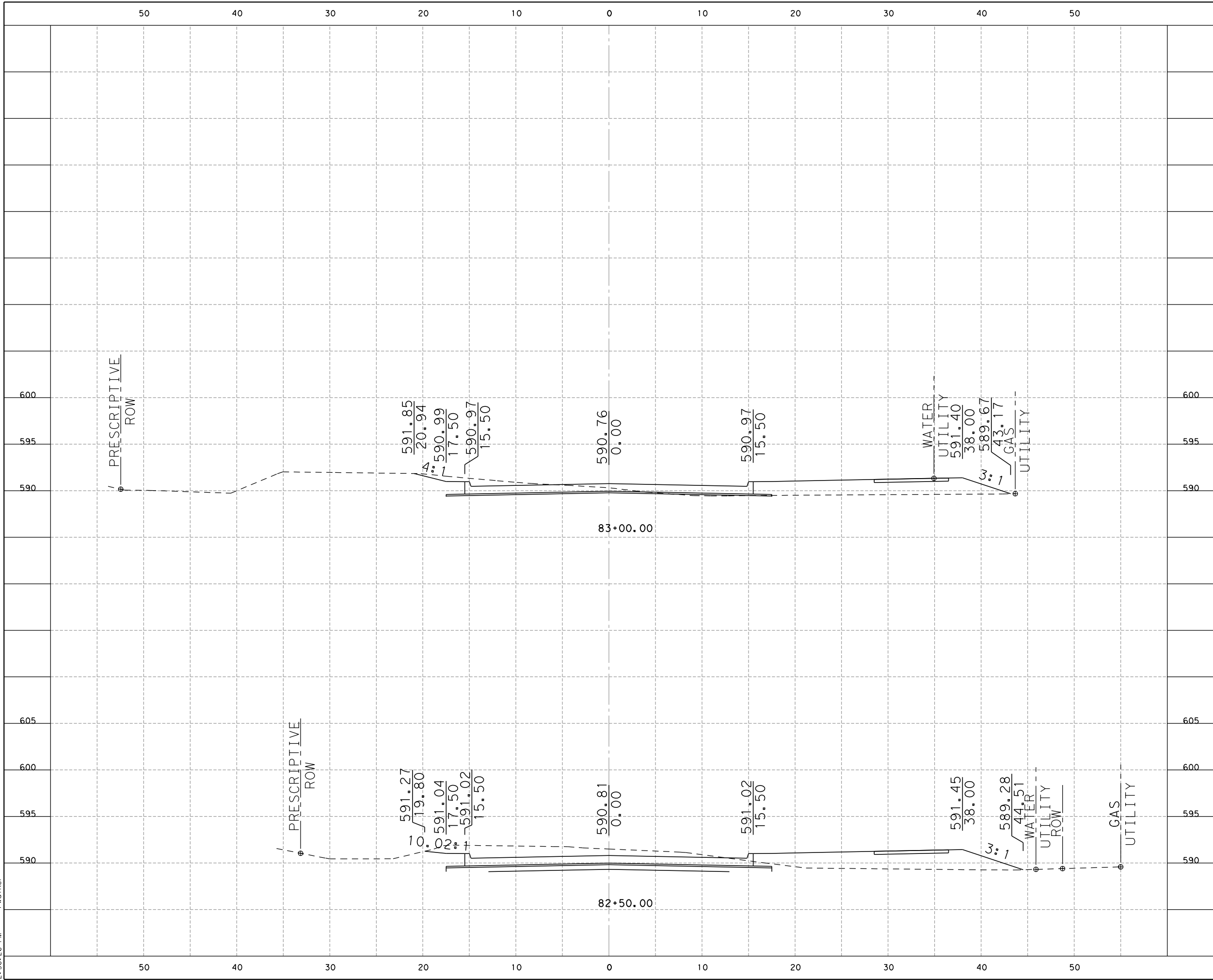
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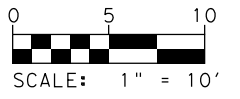
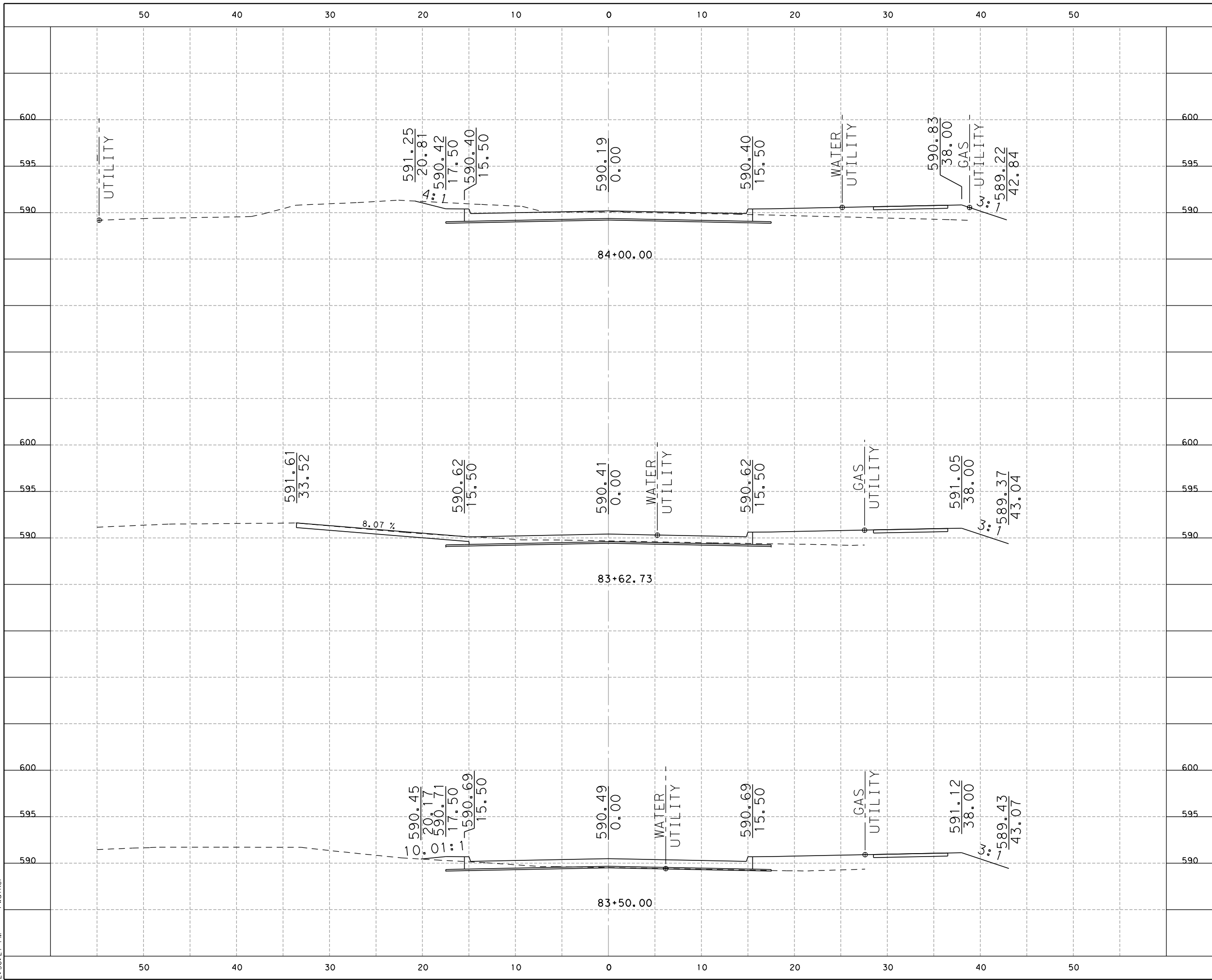
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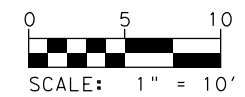
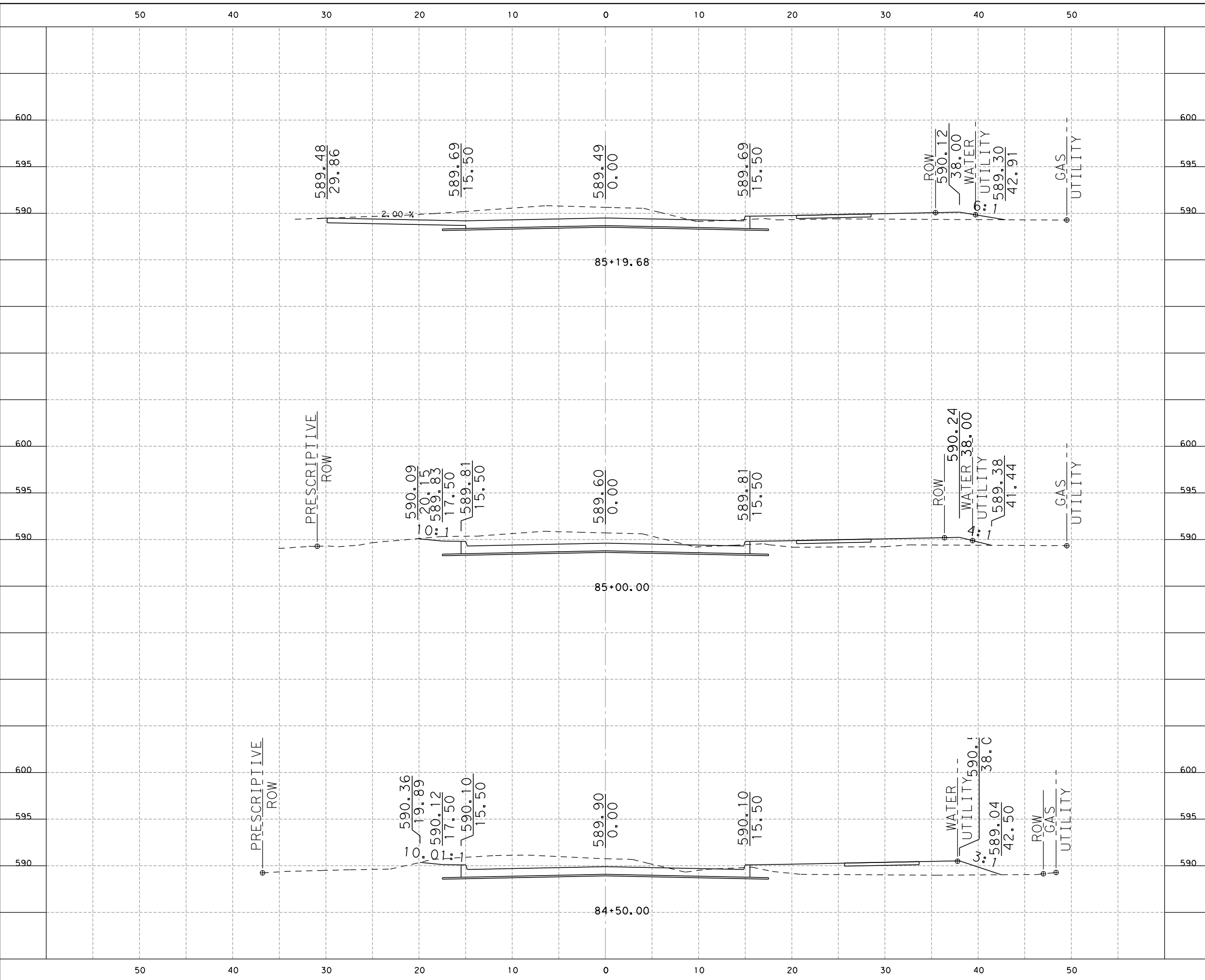
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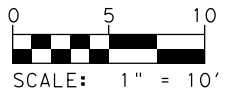
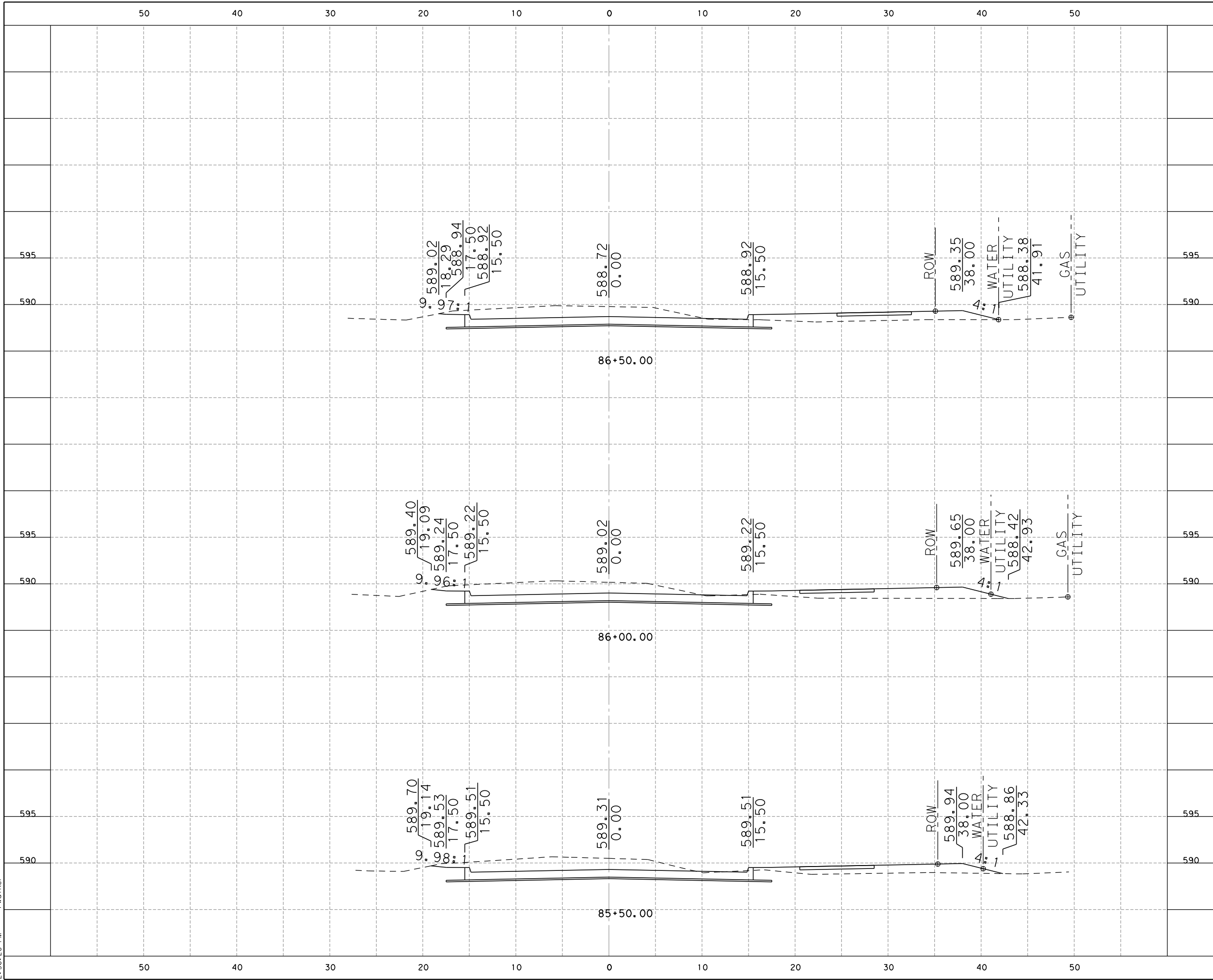
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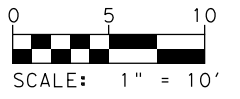
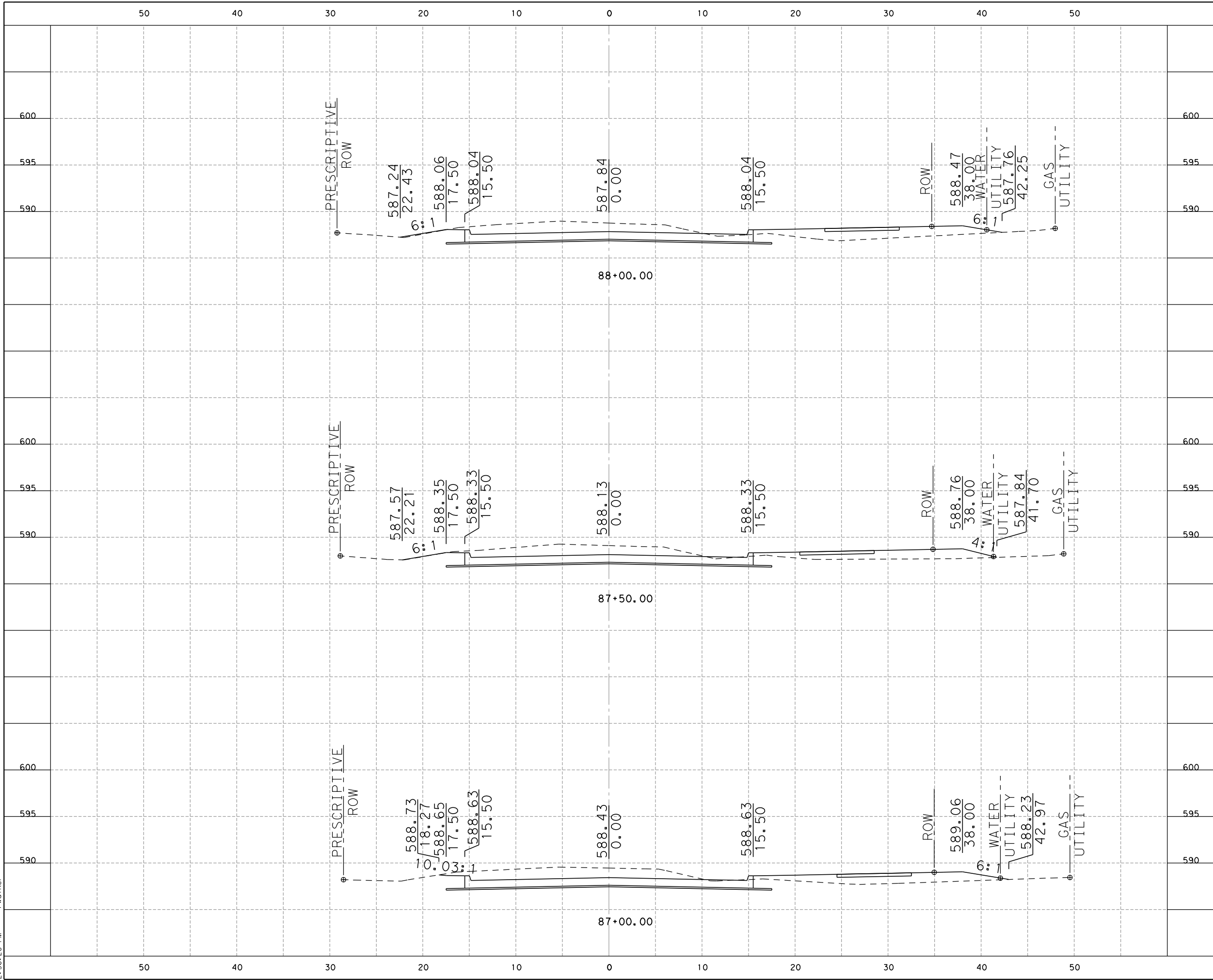
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 142

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 Firm No. F-761



TOWN OF FAIRVIEW, TEXAS
 372 TOWN PLACE
 FAIRVIEW, TX 75069
 972-562-0522

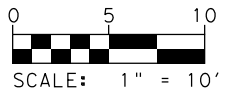
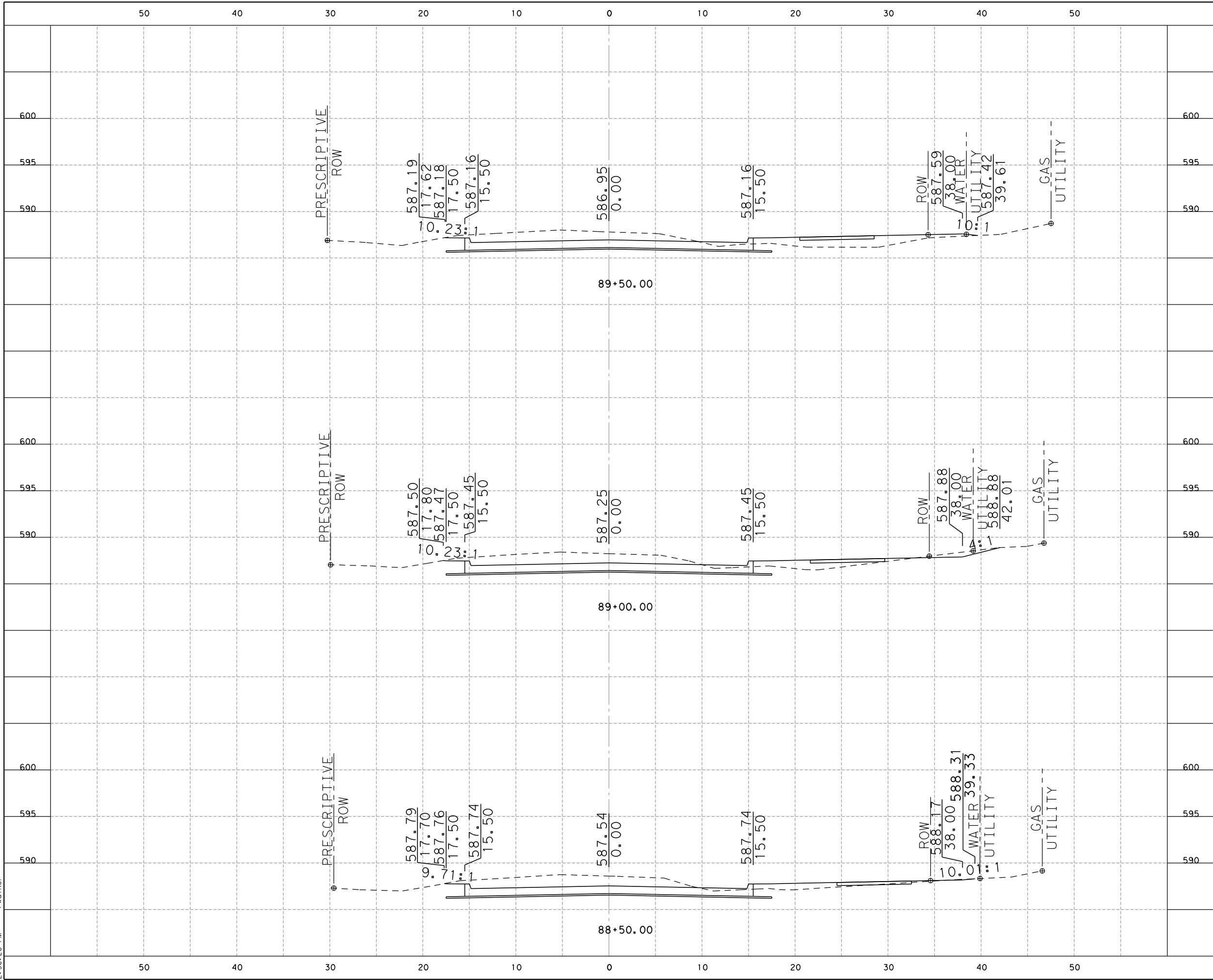
E. STACY ROAD IMPROVEMENTS
CROSS SECTIONS

SCALE: H: 1" = 10'
 V: 1" = 10'

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SHEET NO.
 143

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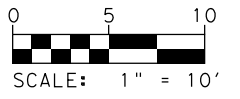
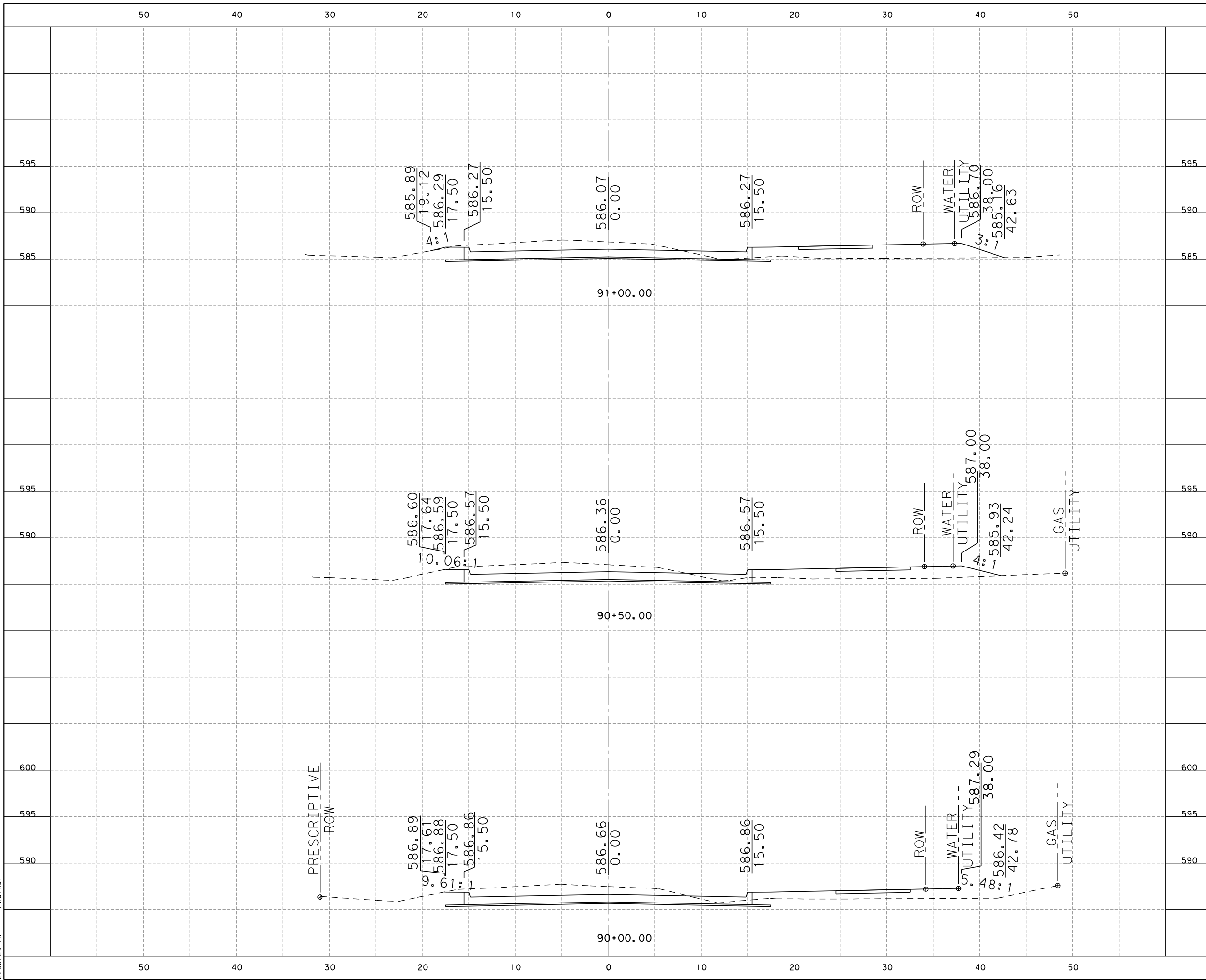
E. STACY ROAD IMPROVEMENTS
CROSS SECTIONS

SCALE: H: 1" = 10'
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SHEET NO.
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E. STACY ROAD IMPROVEMENTS
CROSS SECTIONS

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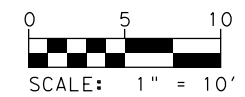
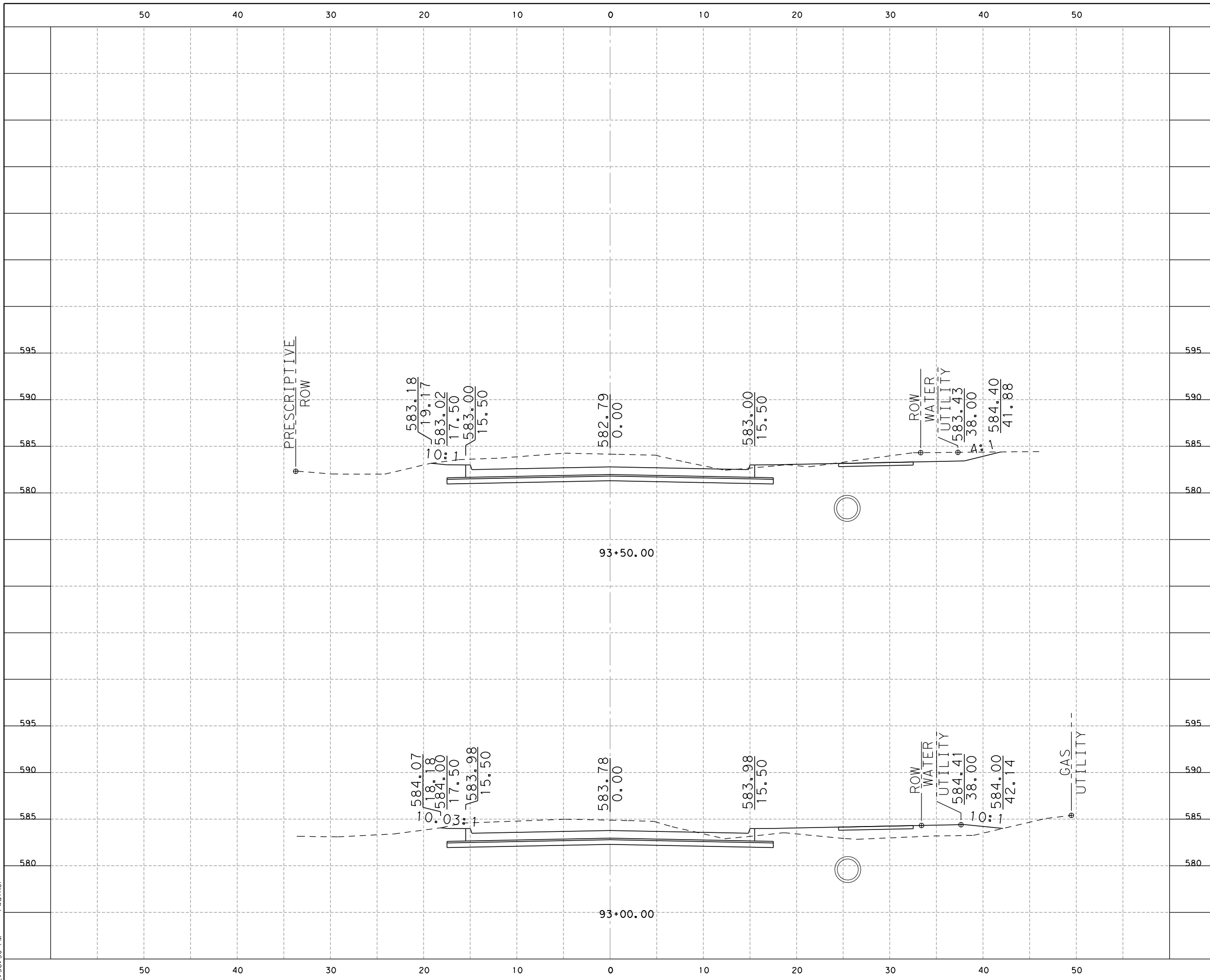
E. STACY ROAD IMPROVEMENTS
CROSS SECTIONS

SCALE: H: 1" = 10'
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SHEET NO.
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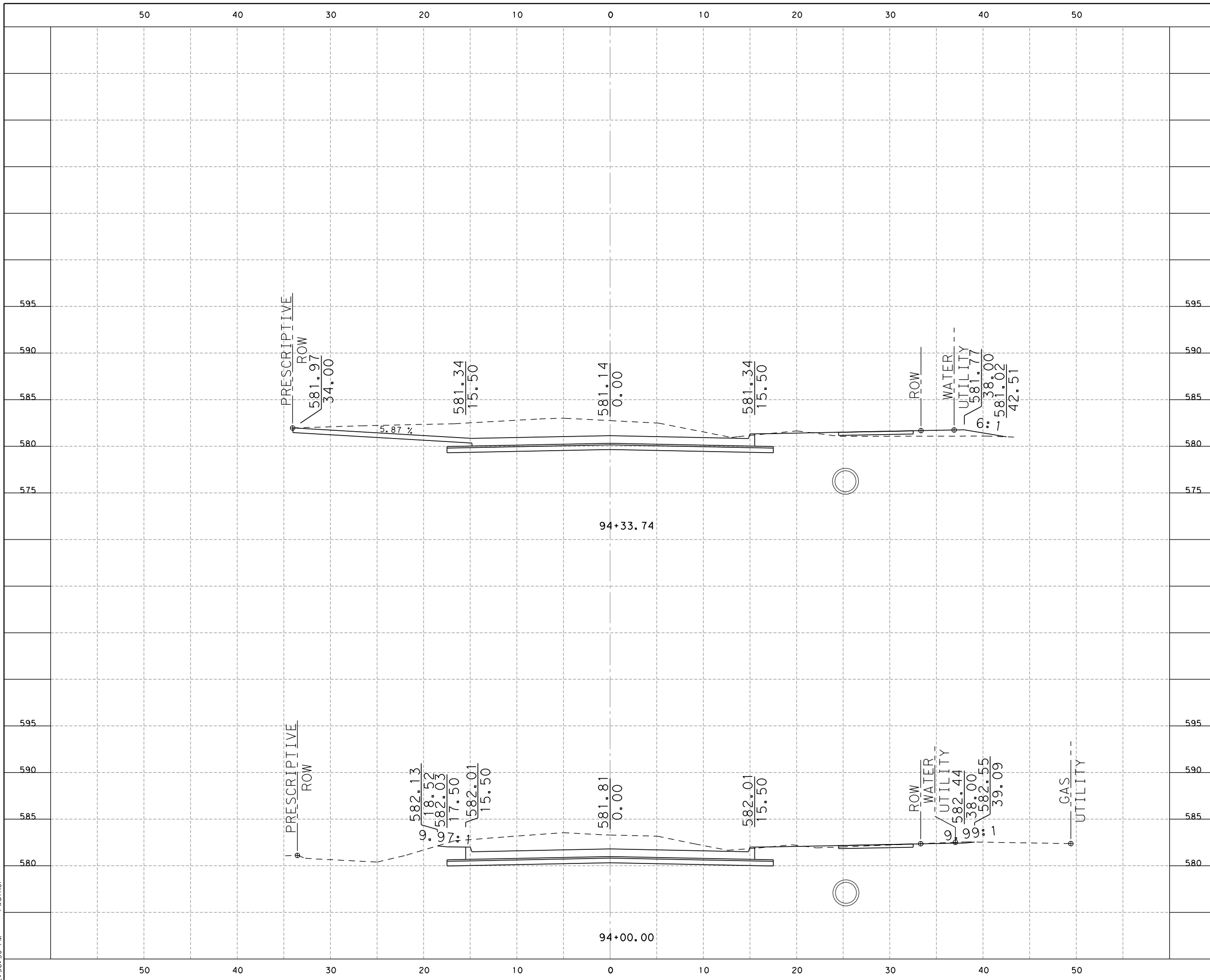
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CROSS SECTIONS

SCALE: H: 1" = 10'			SHEET NO.
V: 1" = 10'			
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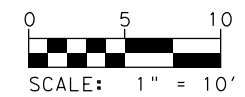
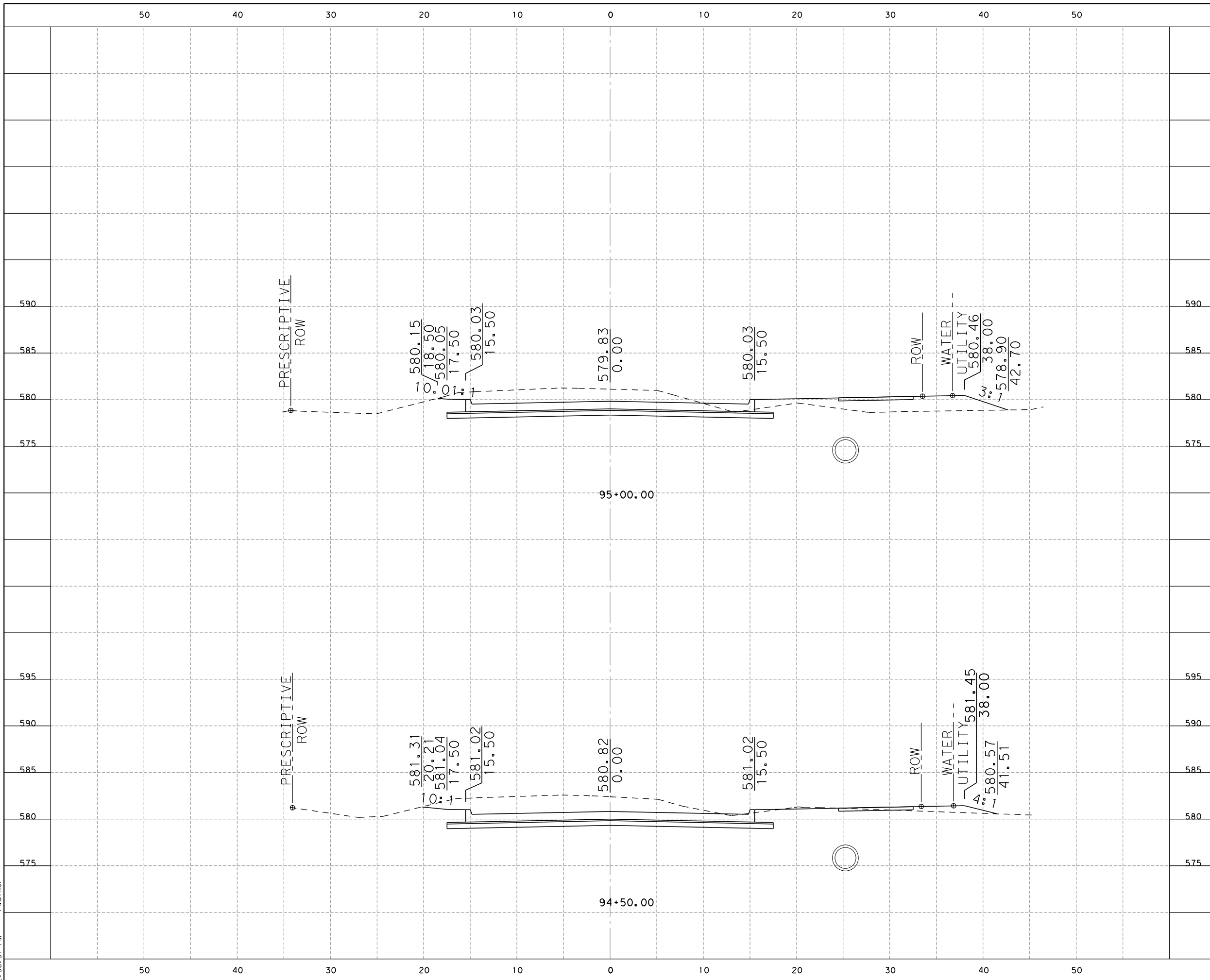
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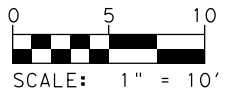
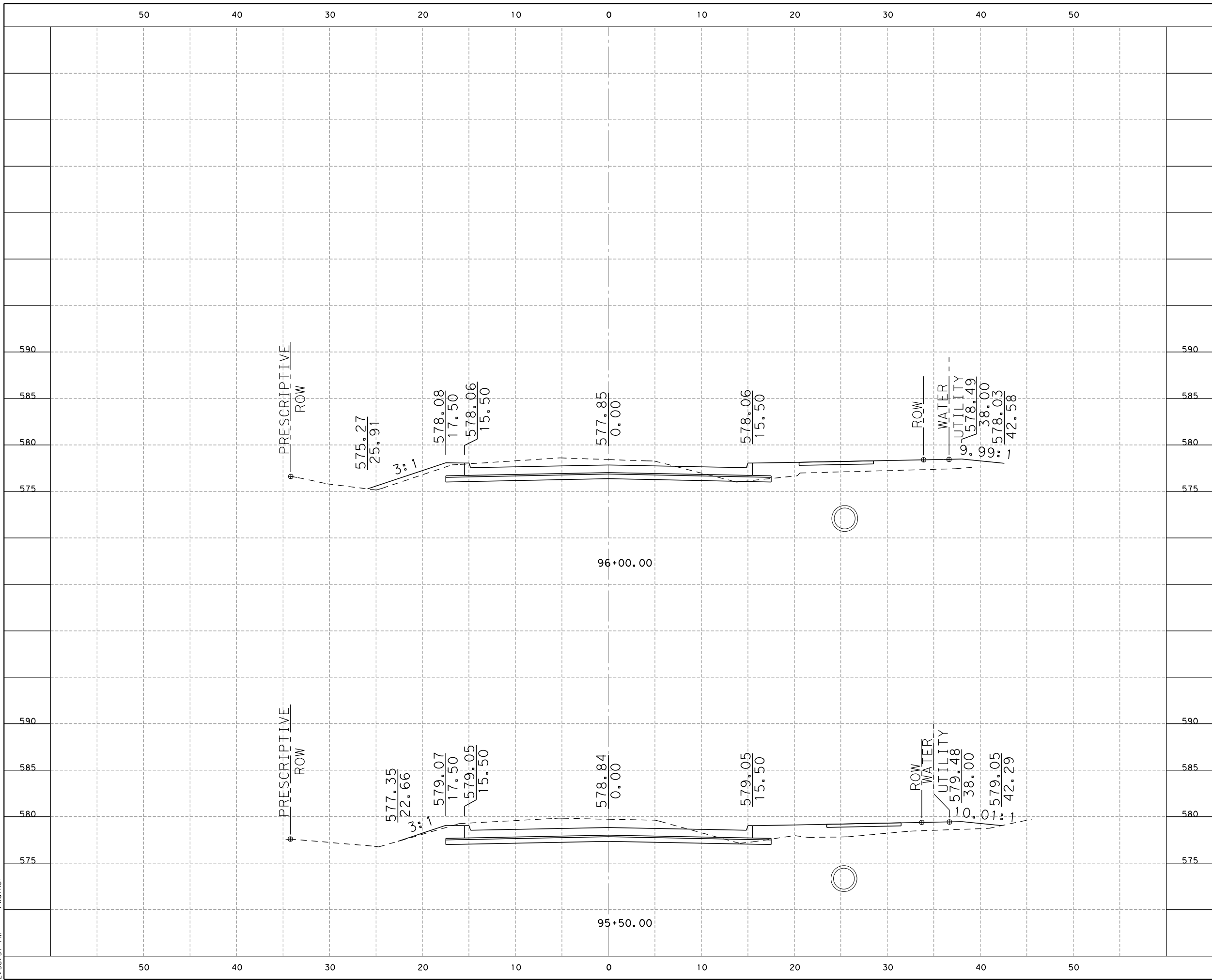
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CROSS SECTIONS

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 FAIRVIEW, TX 75069
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E. STACY ROAD IMPROVEMENTS

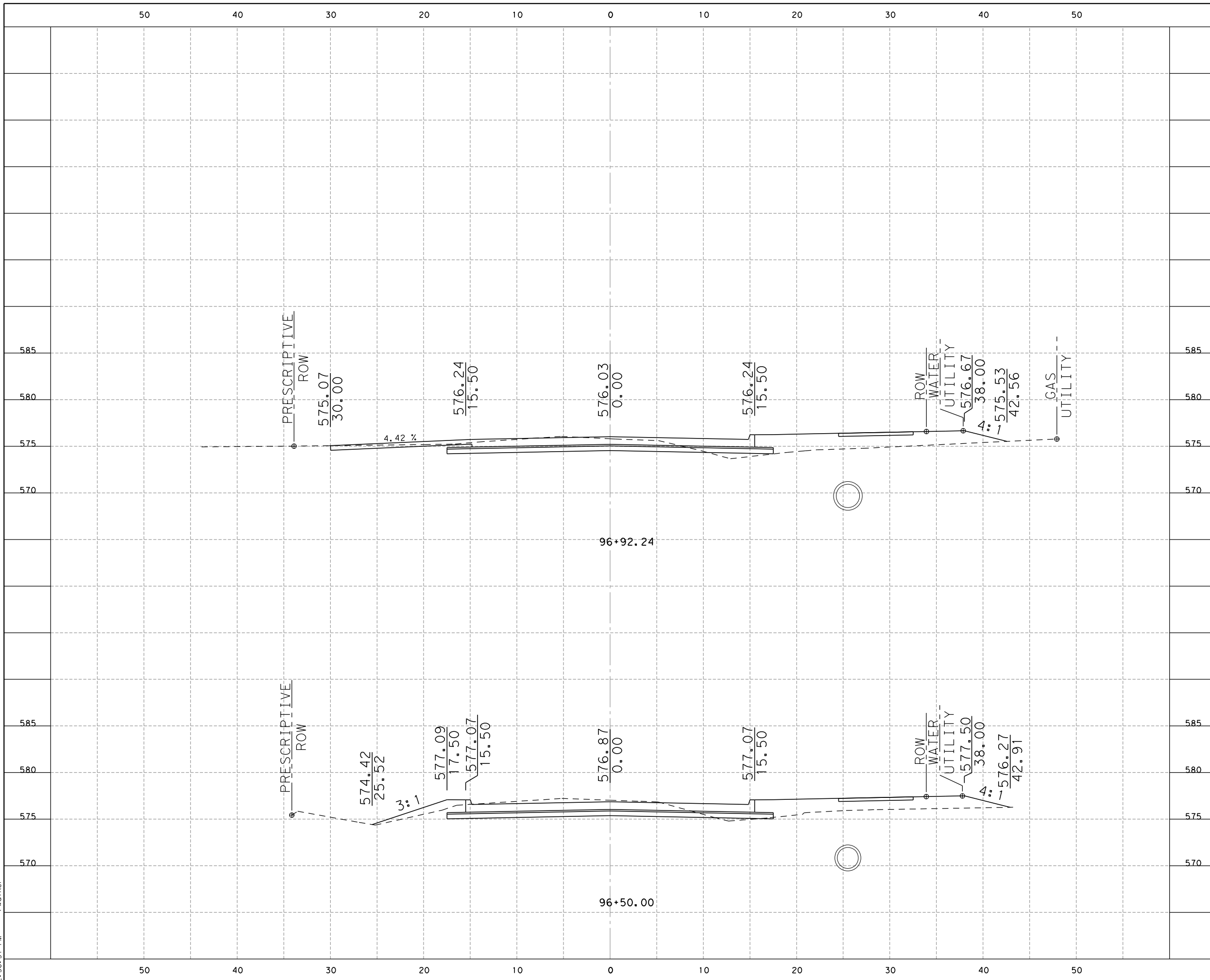
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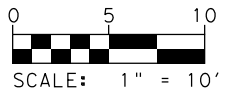
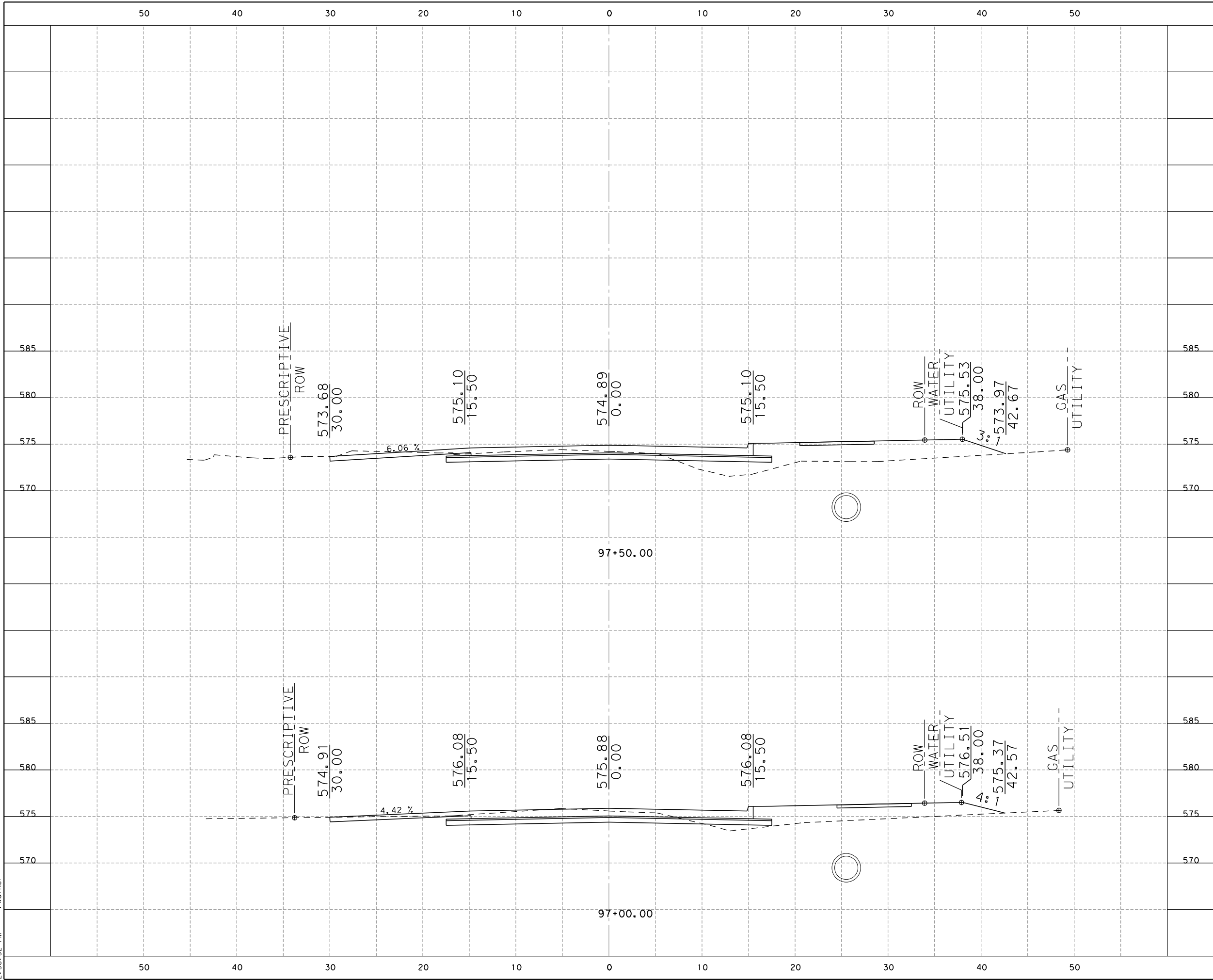
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E. STACY ROAD IMPROVEMENTS
CROSS SECTIONS

SCALE: H: 1" = 10'			SHEET NO. 151
V: 1" = 10'			
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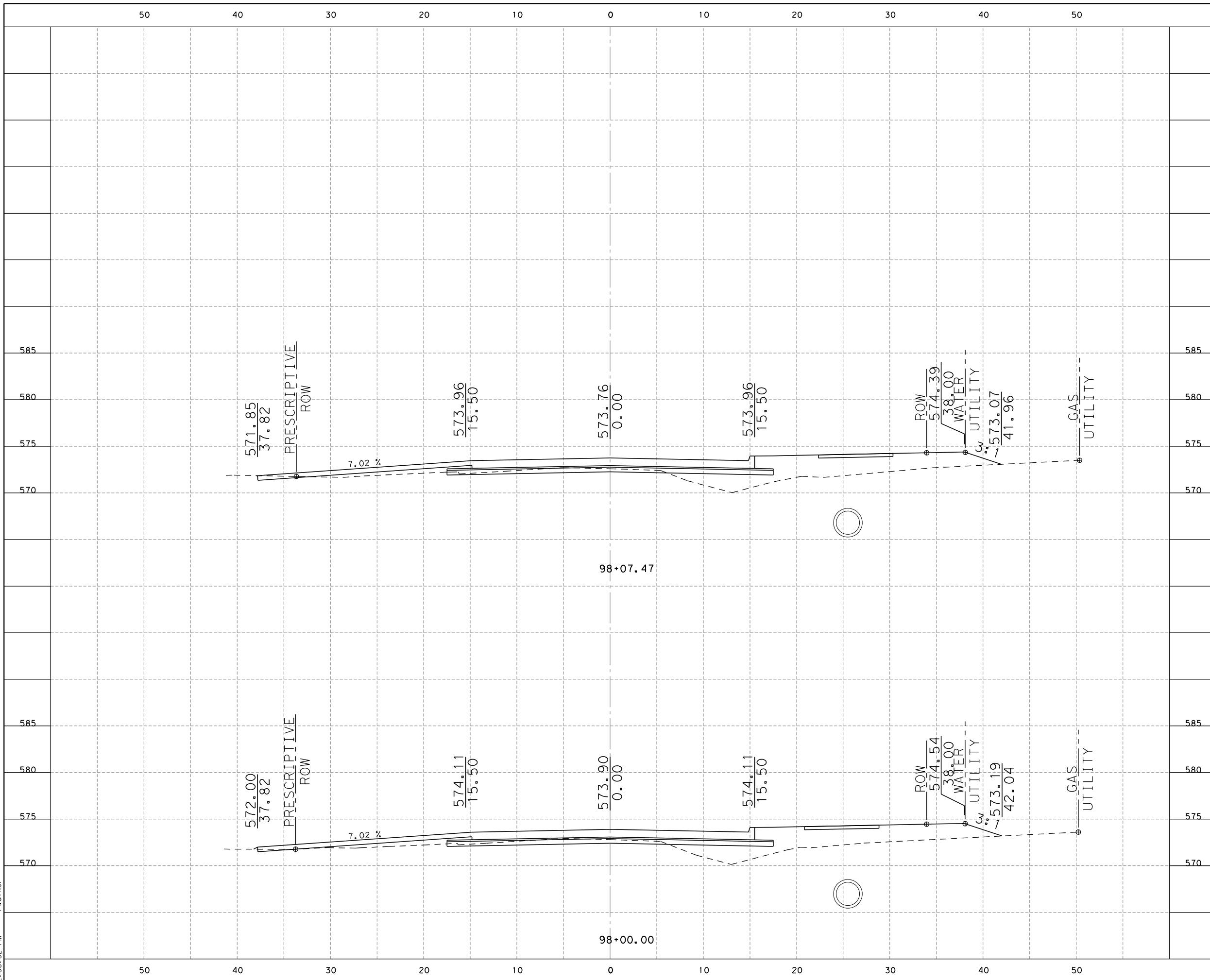
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SHEET NO.
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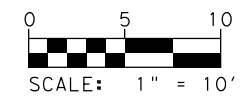
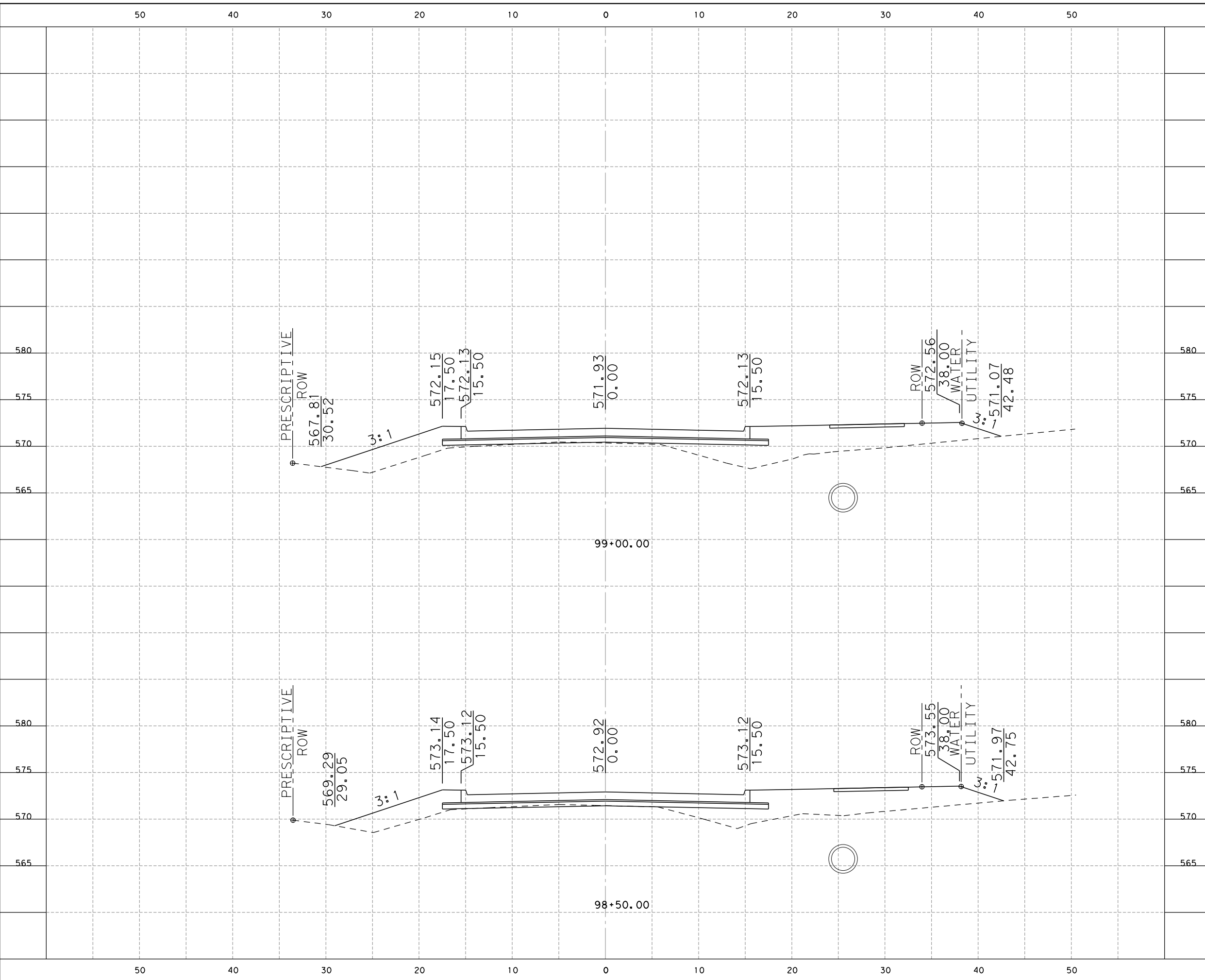
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E. STACY ROAD IMPROVEMENTS
CROSS SECTIONS

SCALE: H: 1" = 10'			SHEET NO. 153
V: 1" = 10'			
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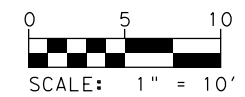
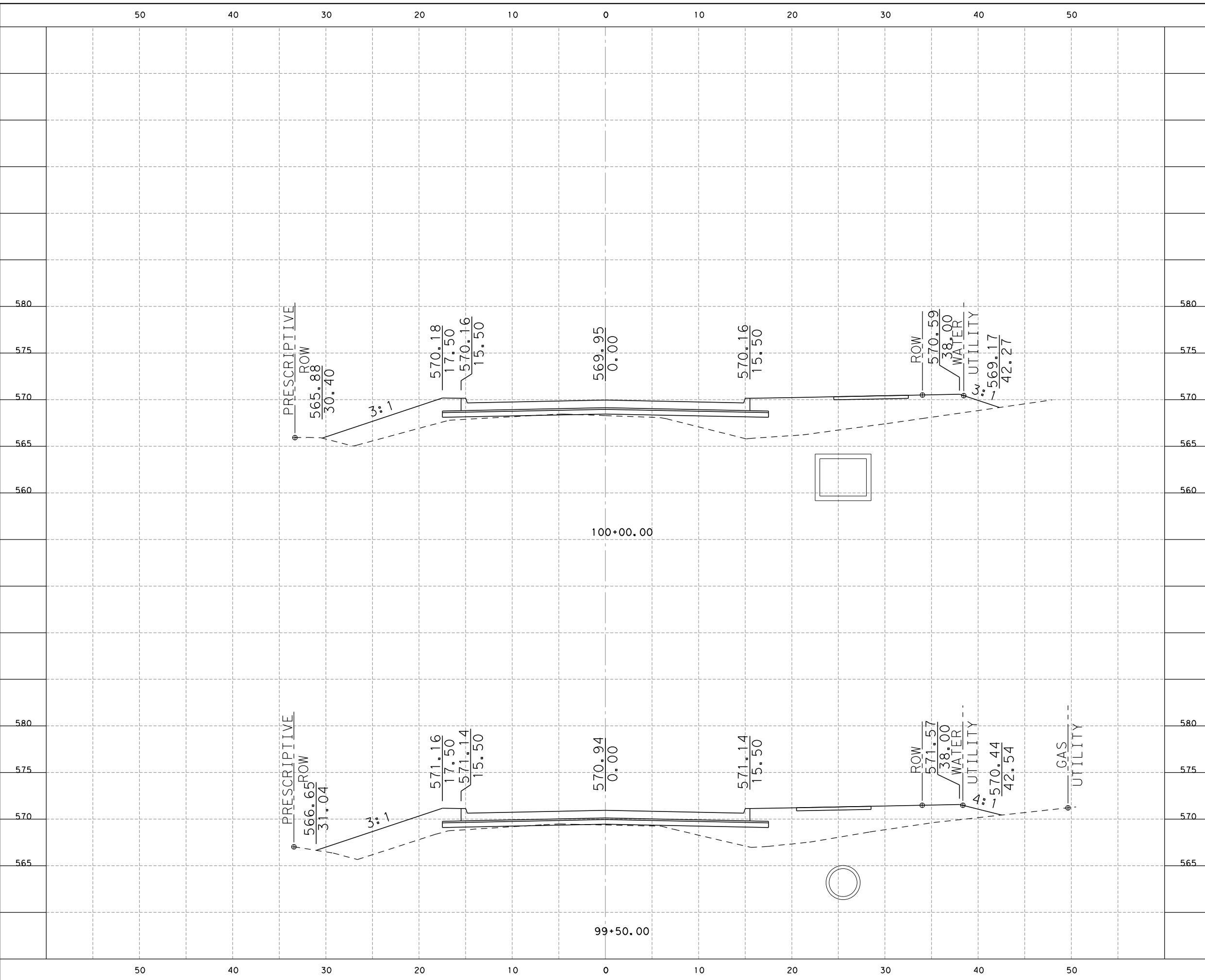
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E. STACY ROAD IMPROVEMENTS
CROSS SECTIONS

SCALE: H: 1" = 10'			SHEET NO. 154
V: 1" = 10'			
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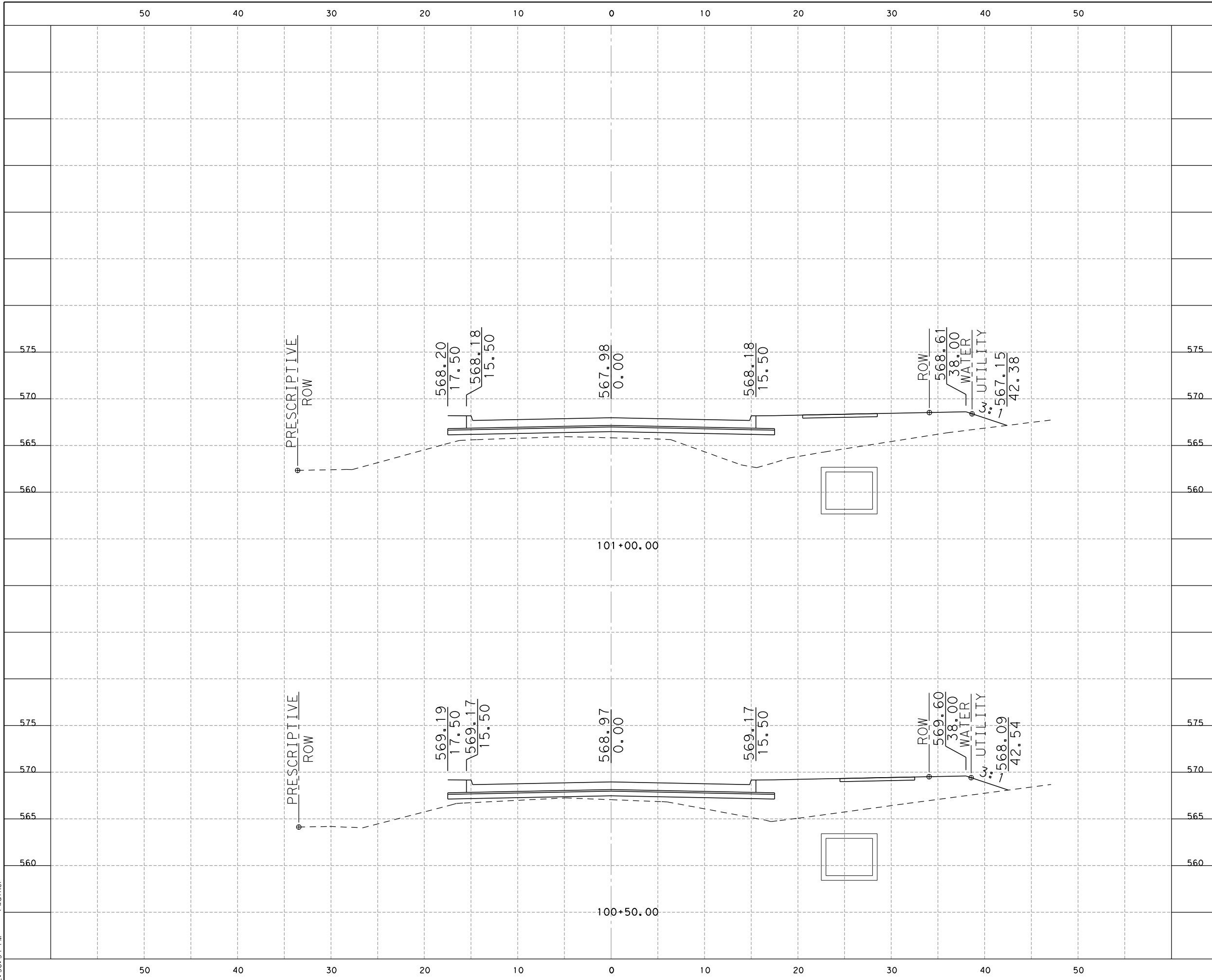
E. STACY ROAD IMPROVEMENTS
CROSS SECTIONS

SCALE: H: 1" = 10'
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SHEET NO.
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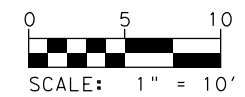
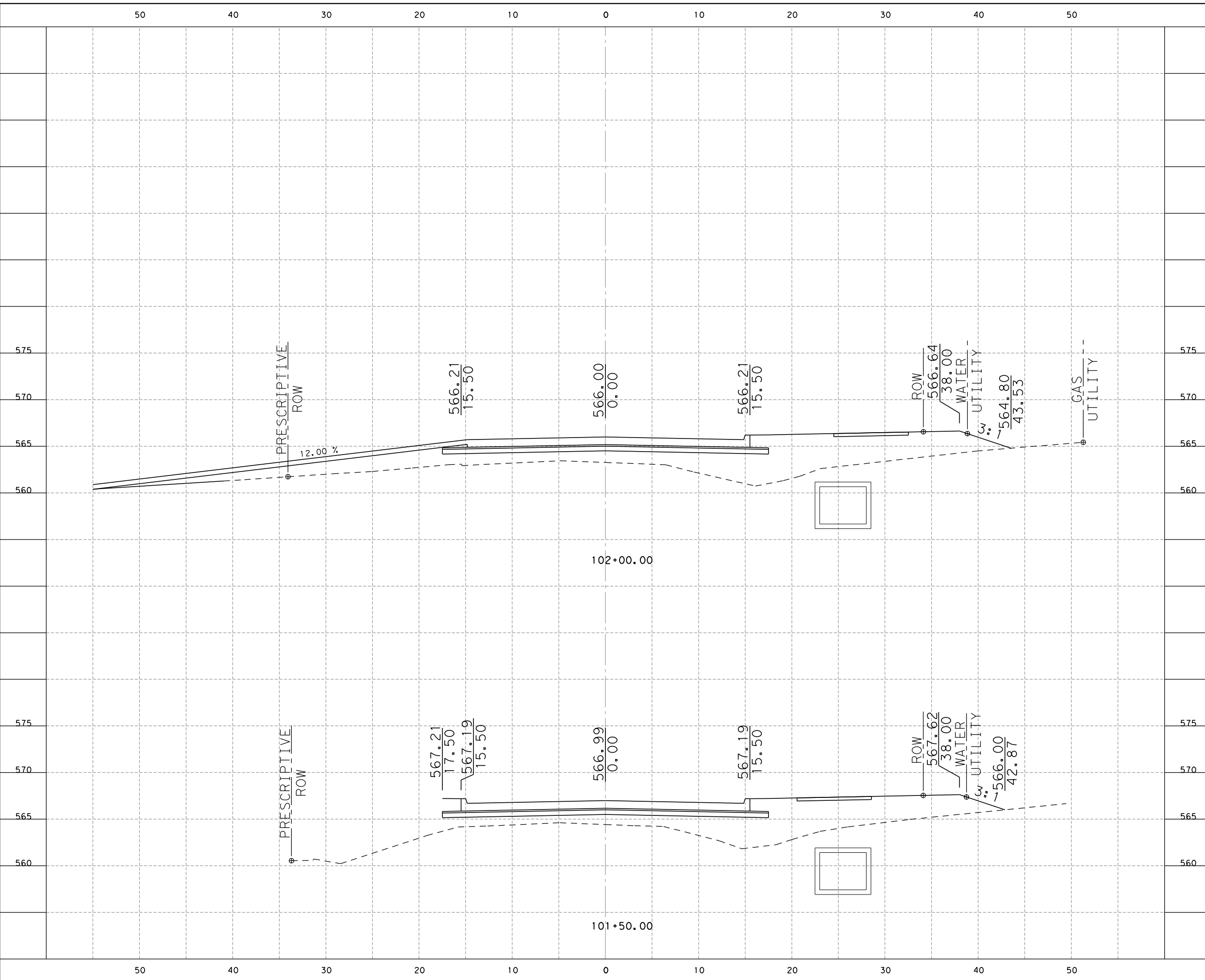
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E. STACY ROAD IMPROVEMENTS
CROSS SECTIONS

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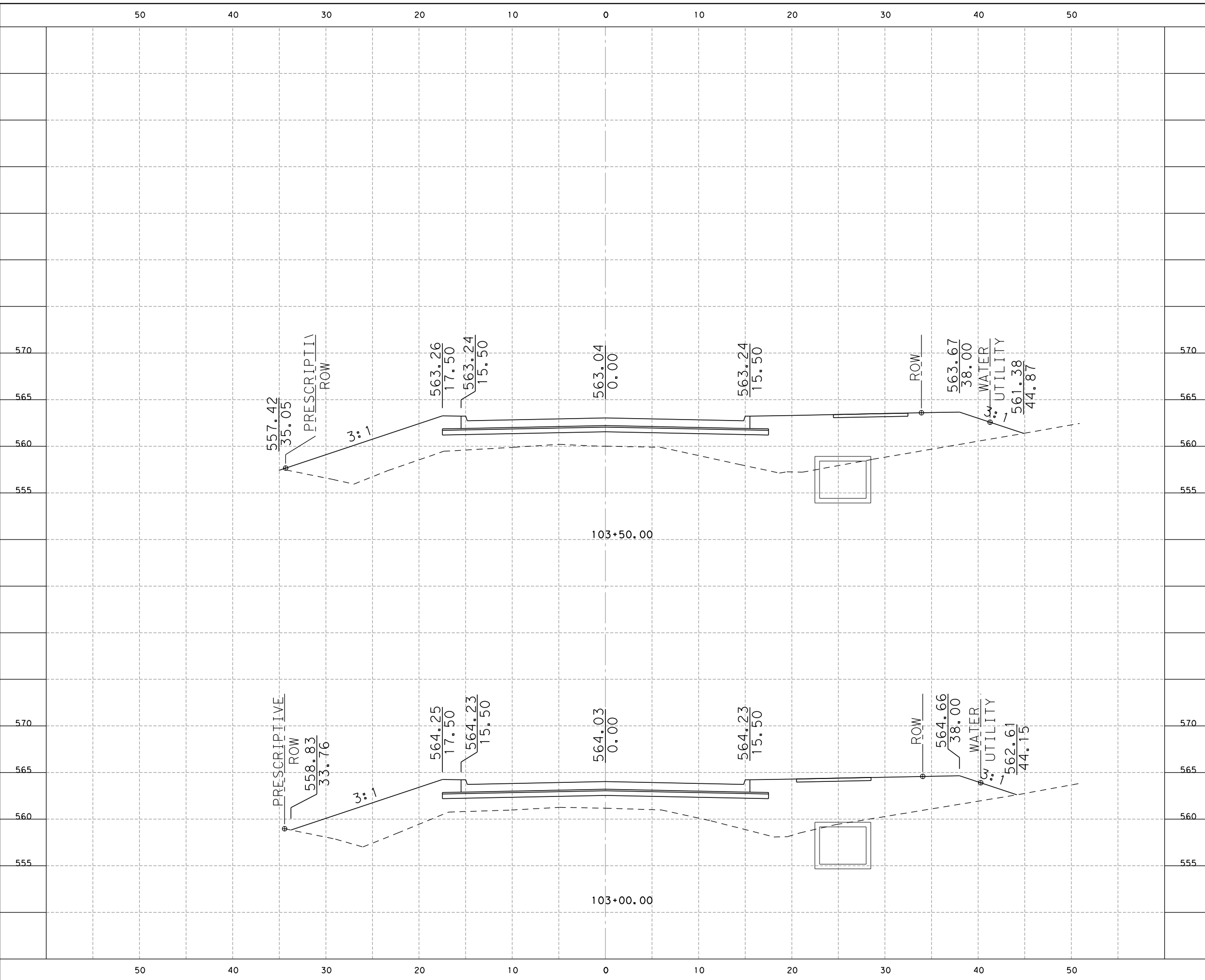
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E. STACY ROAD IMPROVEMENTS
CROSS SECTIONS

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V: 1" = 10'			
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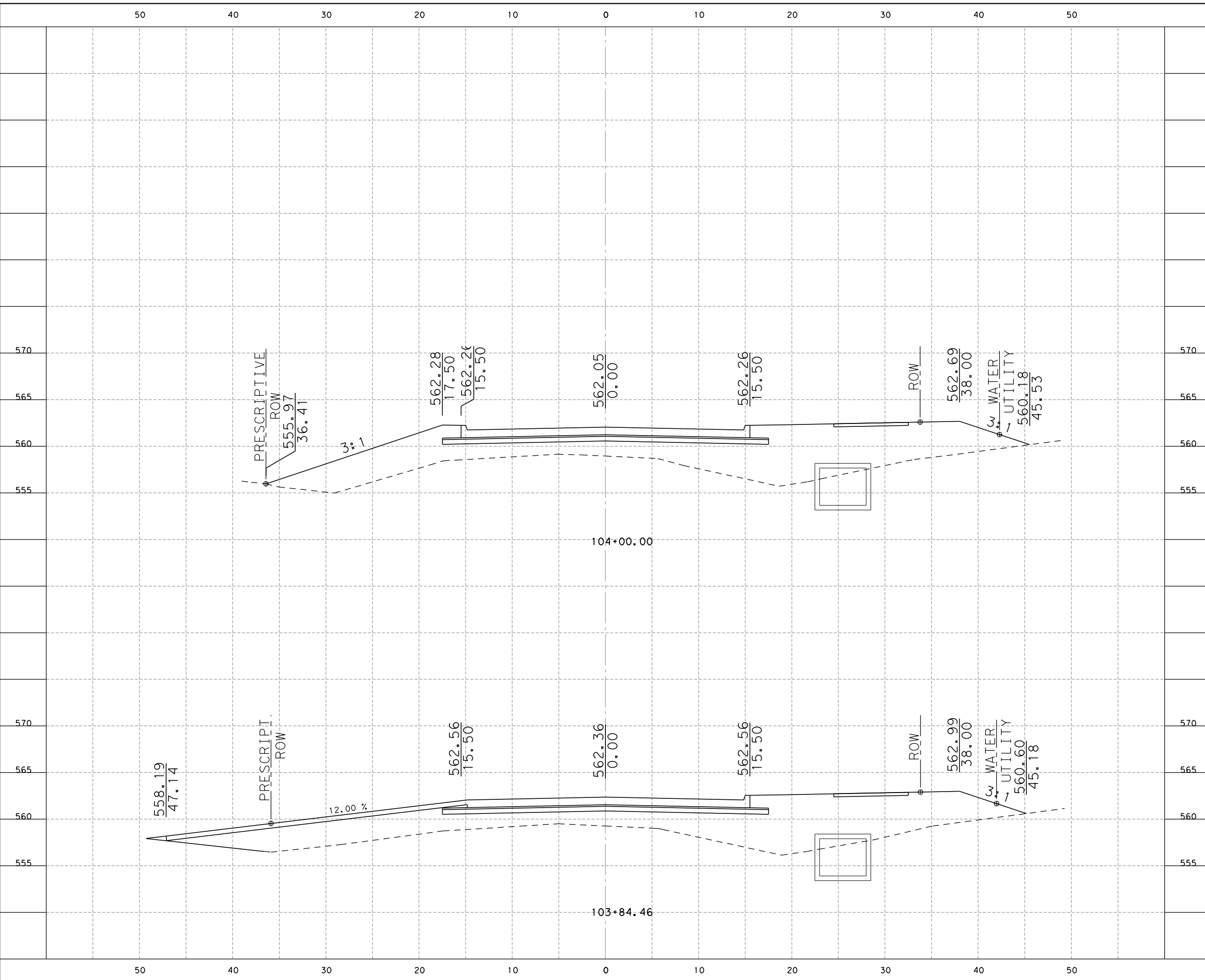
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V: 1" = 10'			
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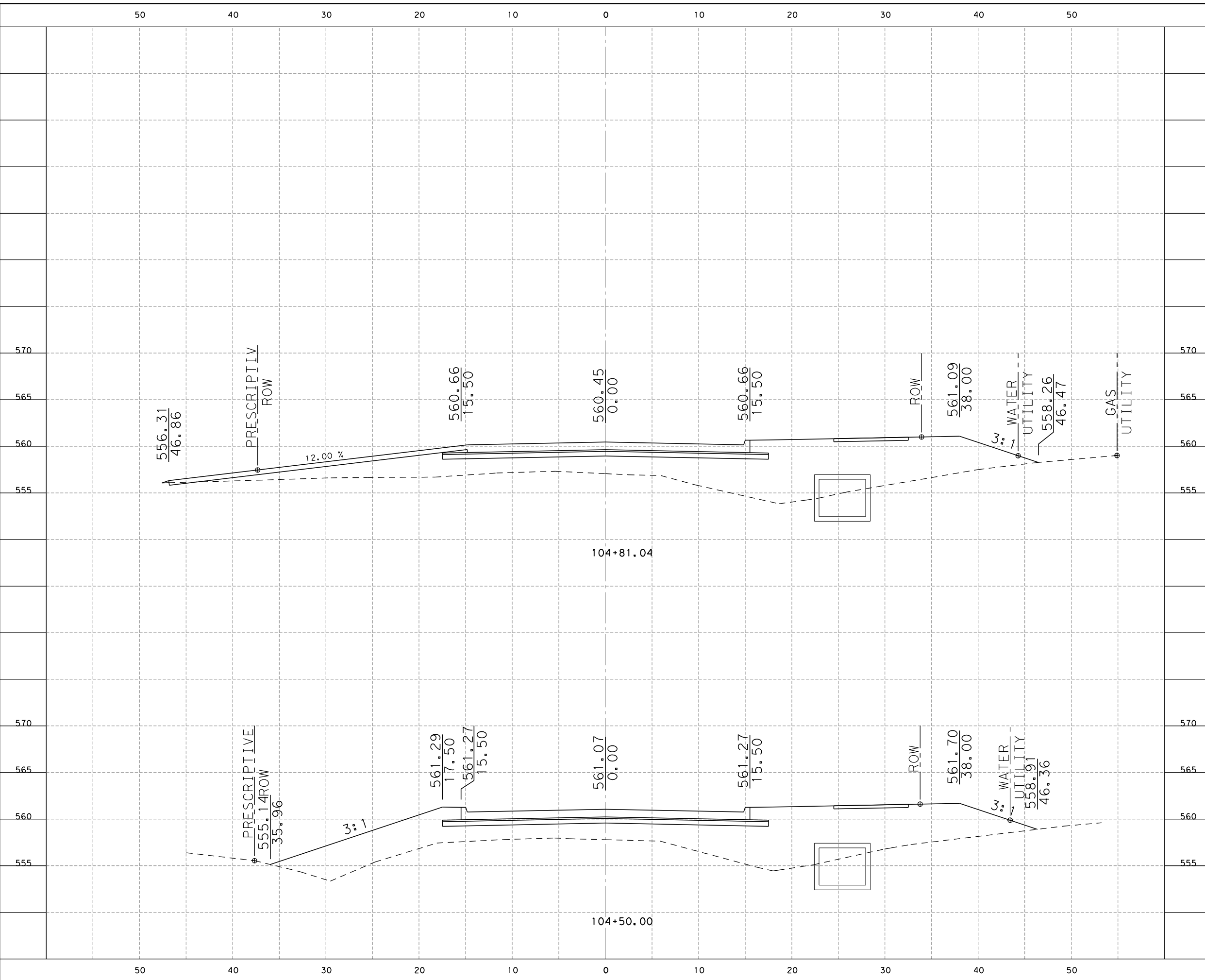
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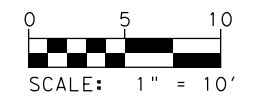
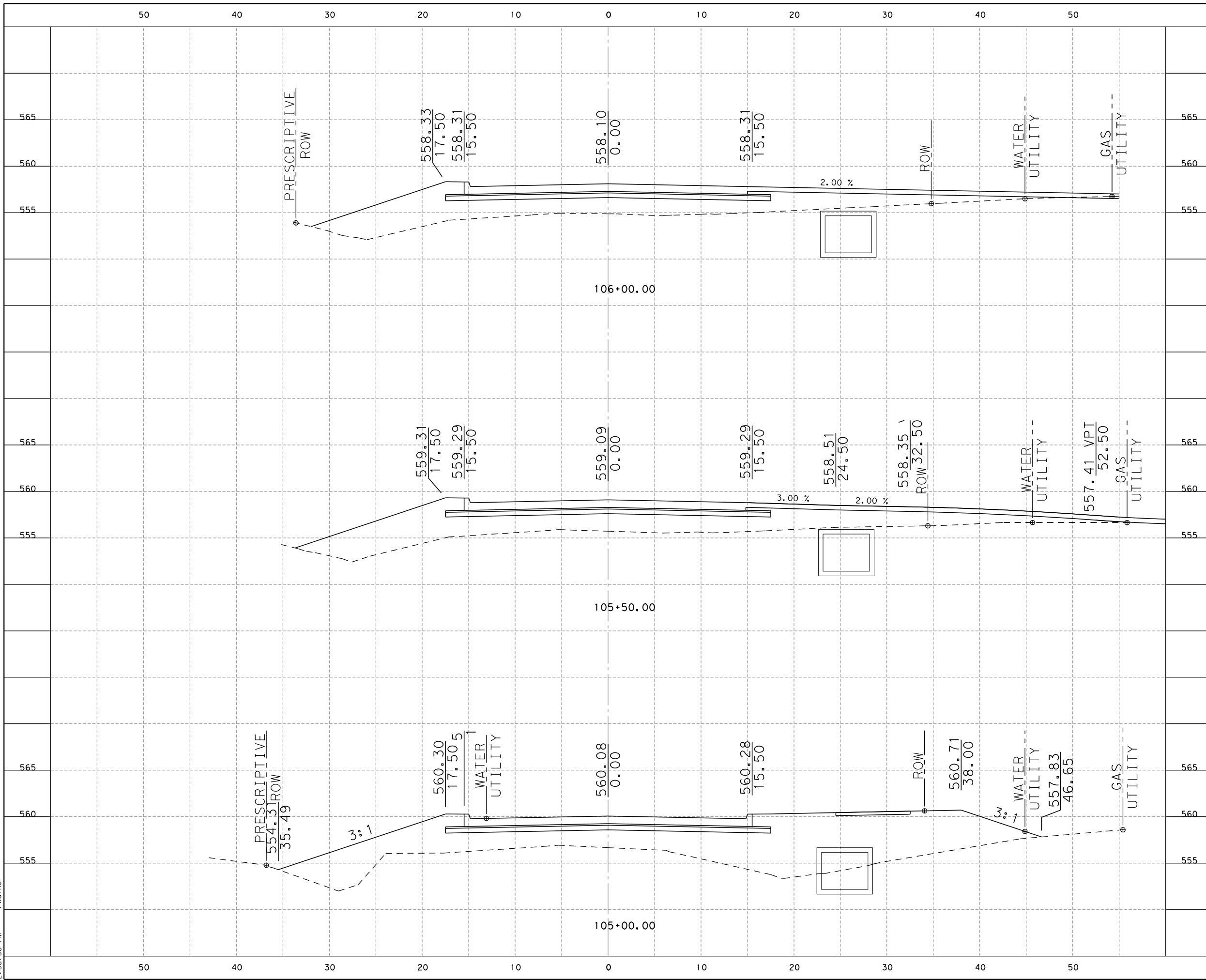
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SCALE: H: 1" = 10'
 V: 1" = 10'

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SHEET NO.
161


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 1717 MCKINNEY AVE., SUITE 1400 DALLAS, TEXAS 75202
 Firm No. F-761

 TOWN OF FAIRVIEW, TEXAS
 372 TOWN PLACE
 FAIRVIEW, TX 75069
 972-562-0522

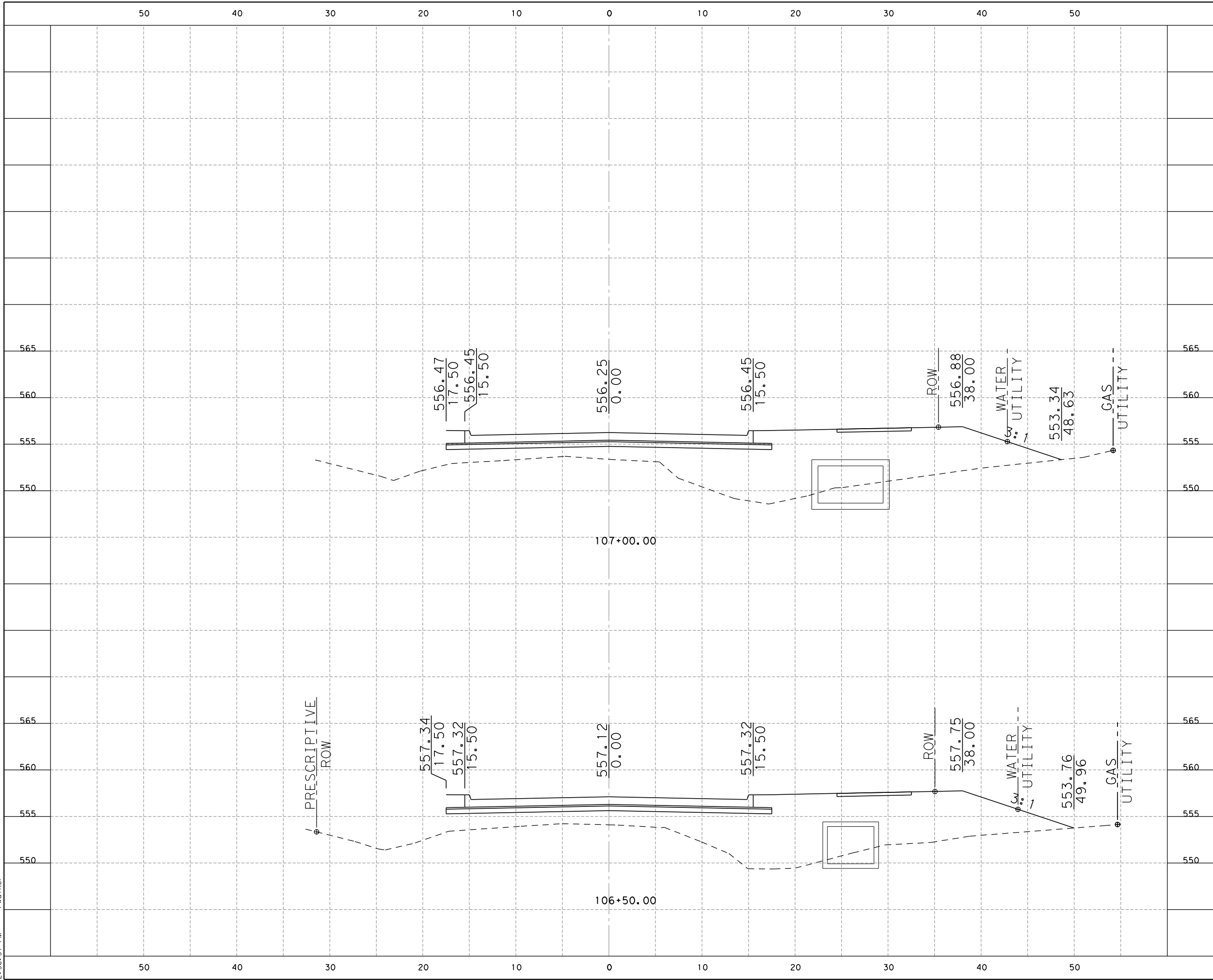
E. STACY ROAD IMPROVEMENTS
CROSS SECTIONS

SCALE: H: 1" = 10'
 V: 1" = 10'

DESIGNED BY: CLM	DRAWN BY: RAW	CHECKED BY:
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SHEET NO.
162

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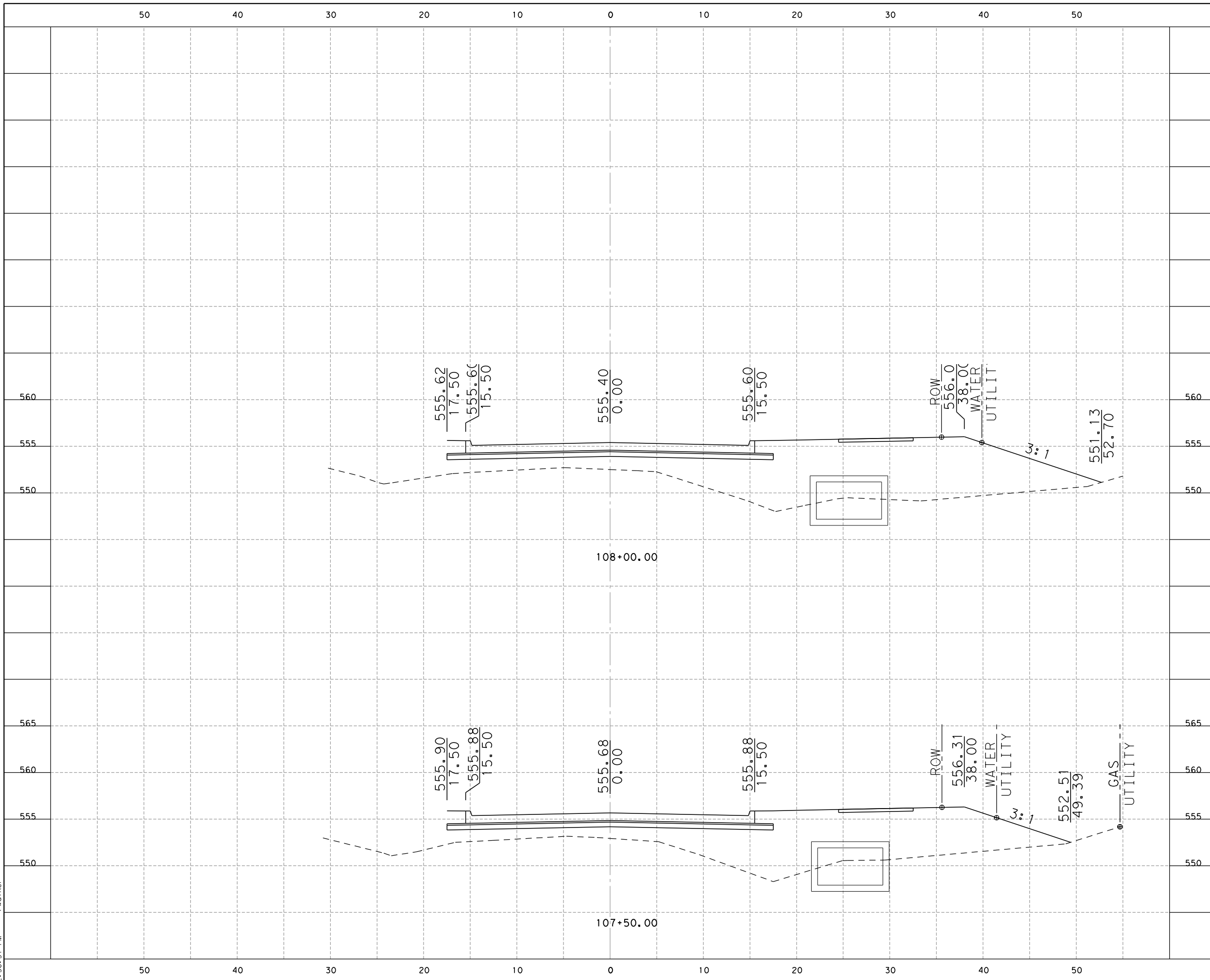
E. STACY ROAD IMPROVEMENTS
CROSS SECTIONS

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 V: 1" = 10'

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SHEET NO.
163

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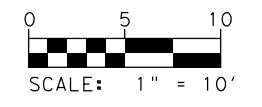
E. STACY ROAD IMPROVEMENTS
CROSS SECTIONS

SCALE: H: 1" = 10'
 V: 1" = 10'

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164


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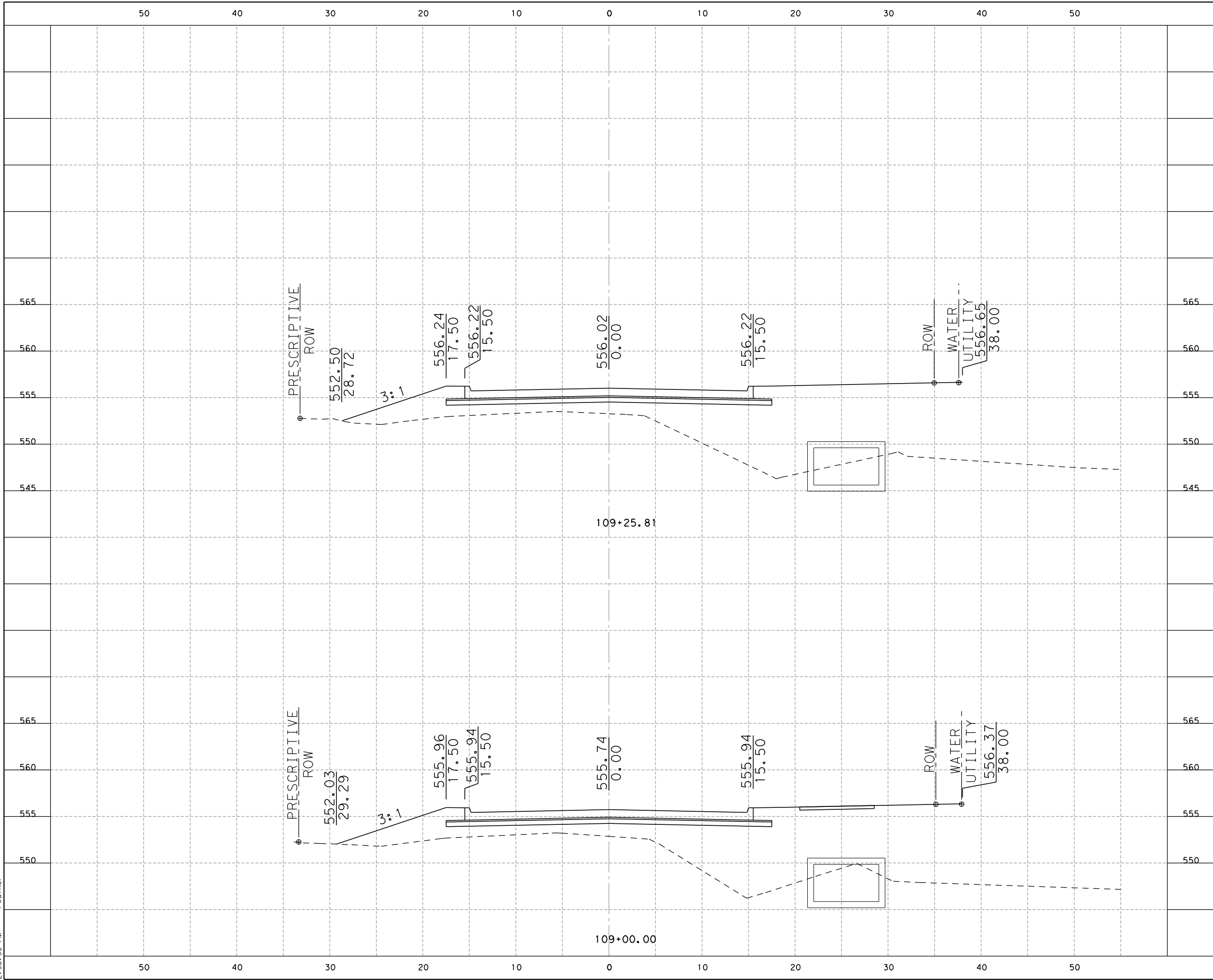
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E. STACY ROAD IMPROVEMENTS
CROSS SECTIONS

SCALE: H: 1" = 10'			SHEET NO. 165
V: 1" = 10'			
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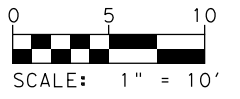
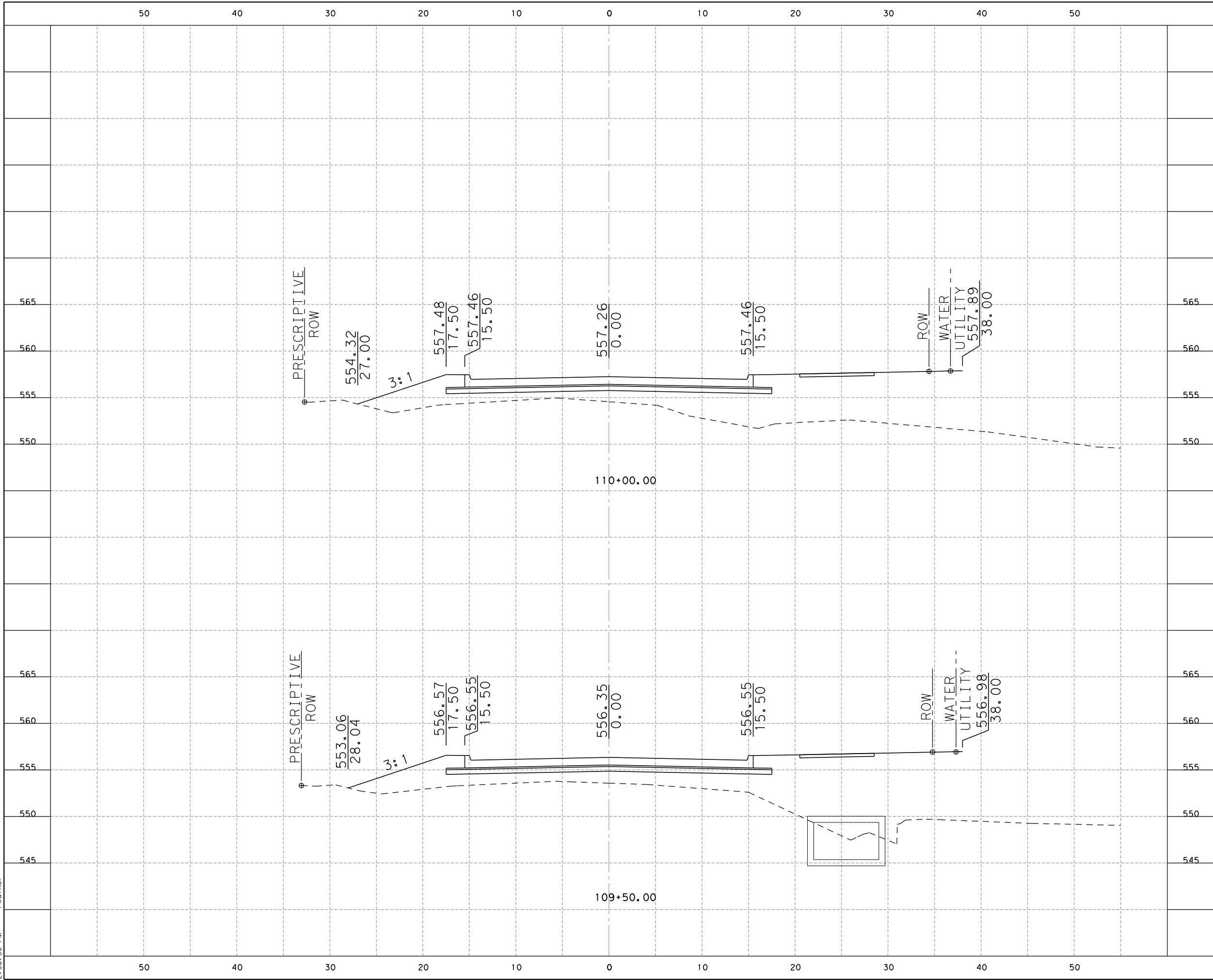
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SHEET NO.
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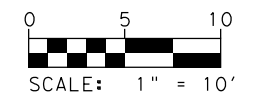
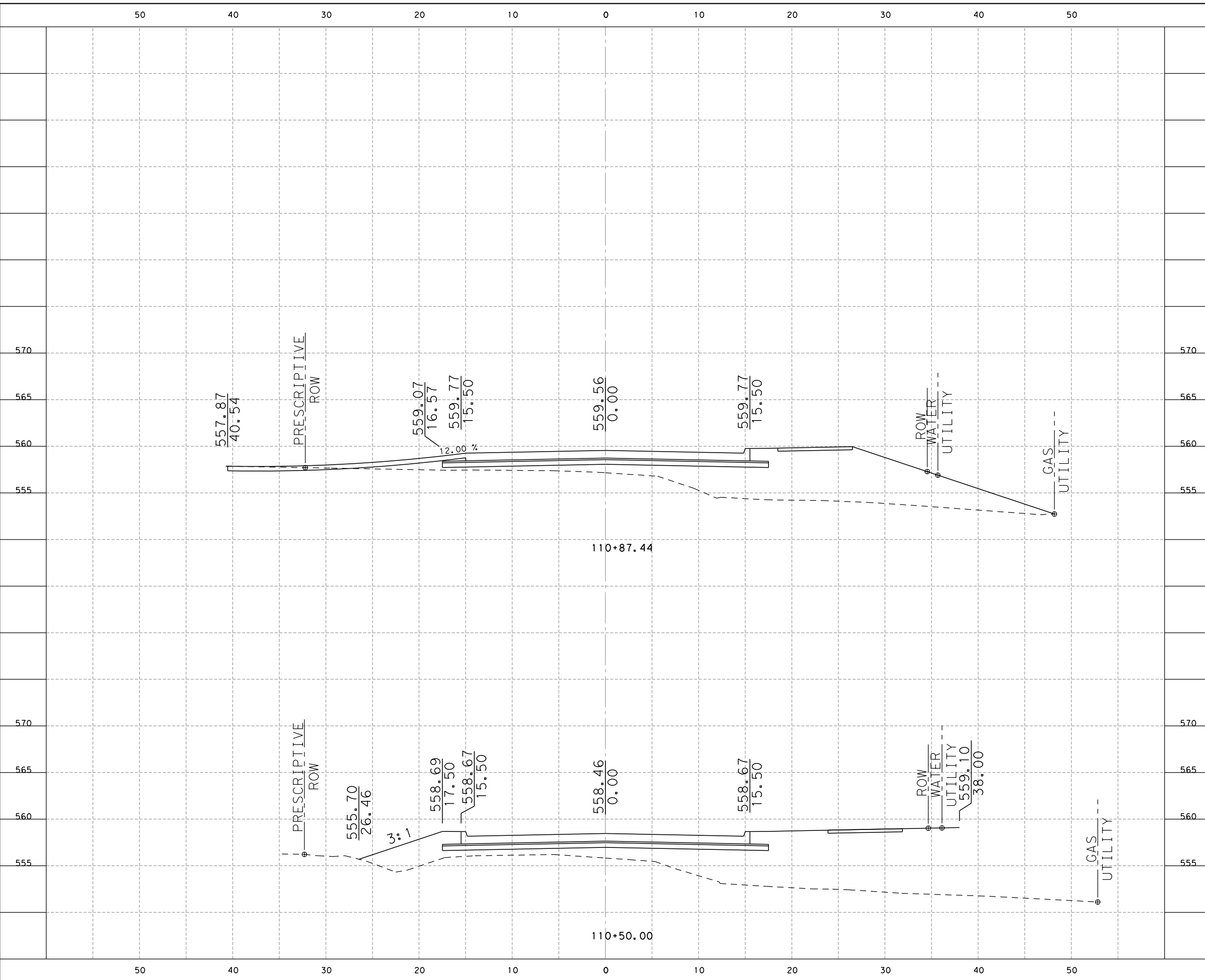
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CROSS SECTIONS

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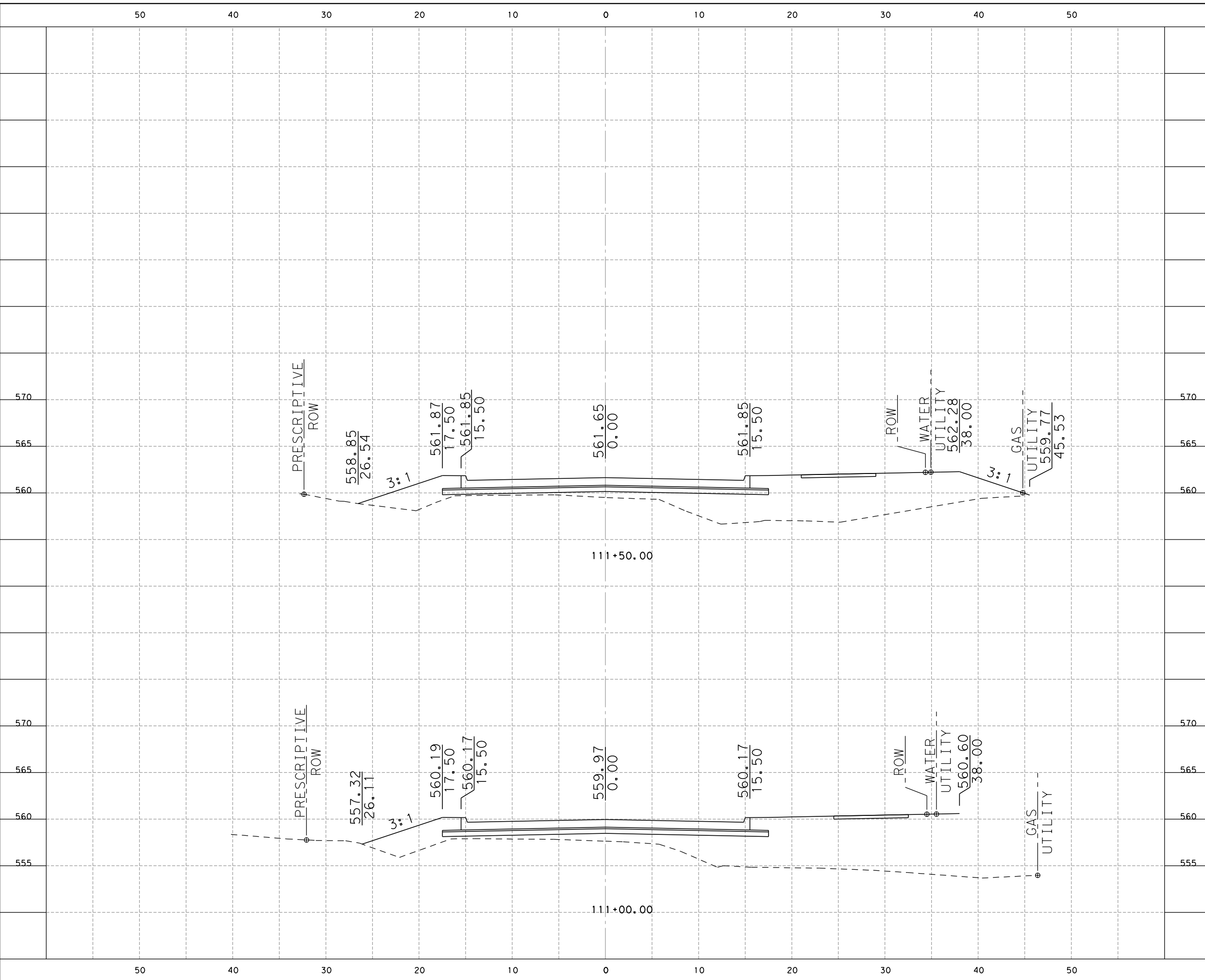
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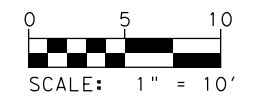
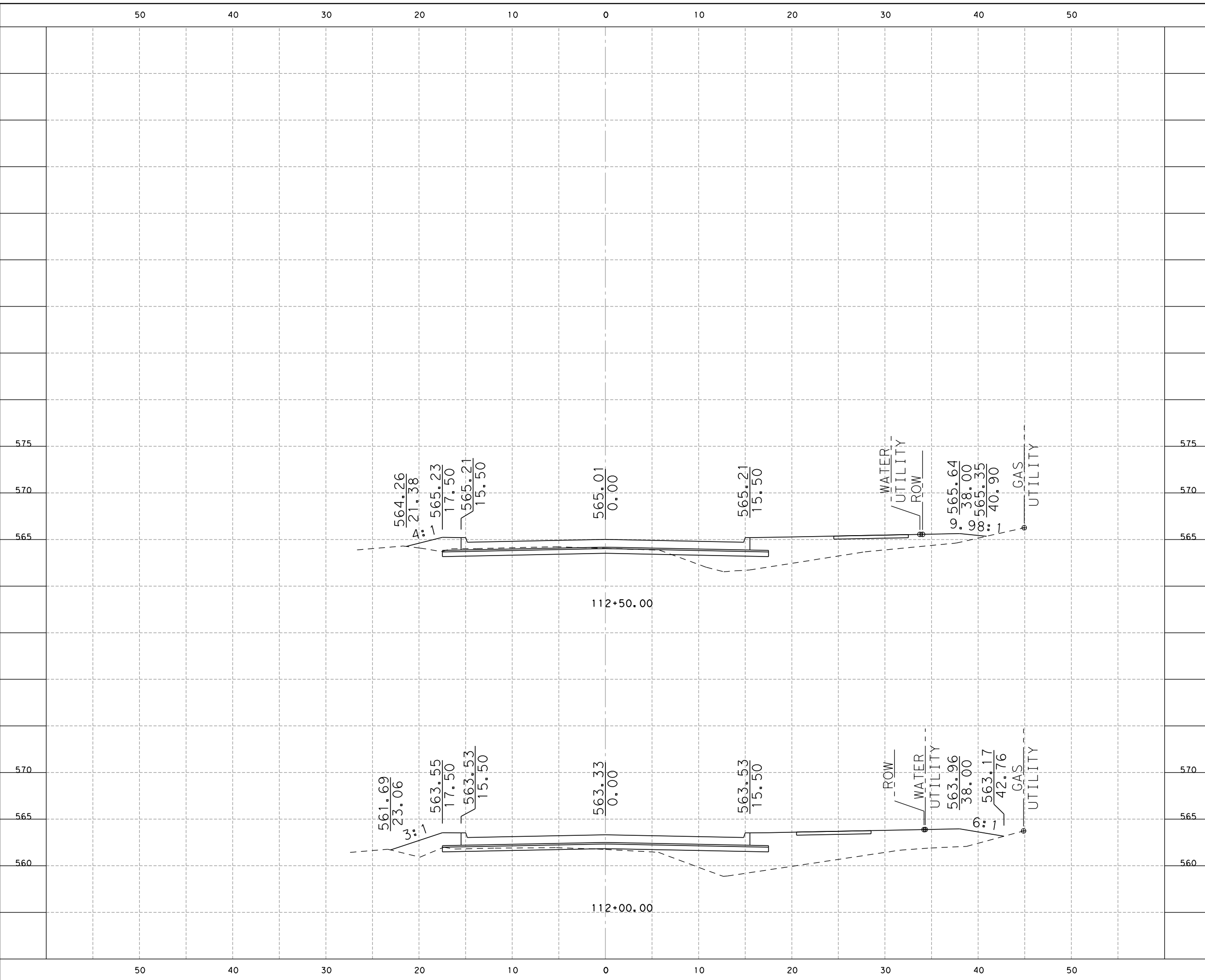
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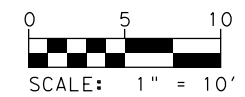
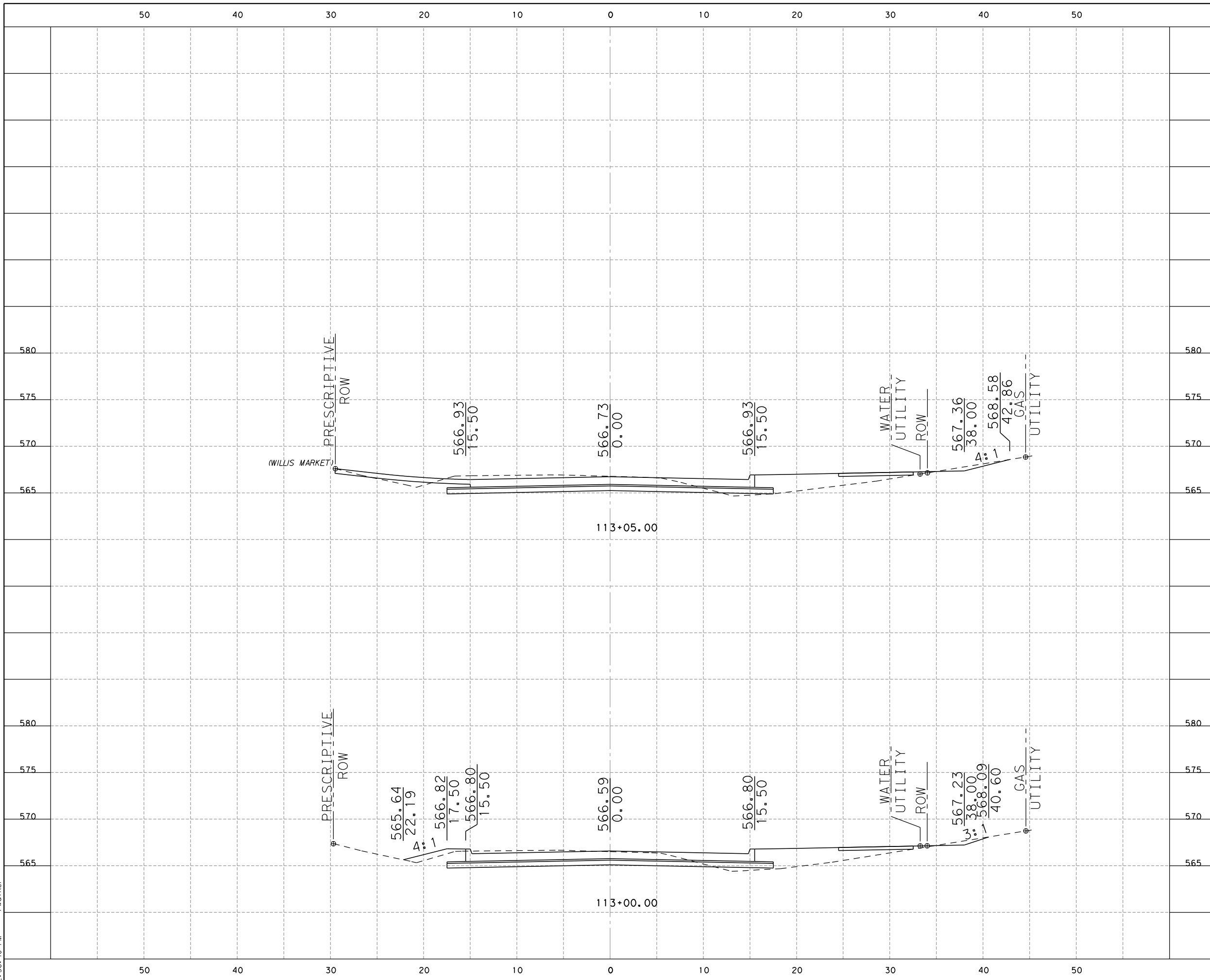
E. STACY ROAD IMPROVEMENTS
CROSS SECTIONS

SCALE: H: 1" = 10'
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SHEET NO.
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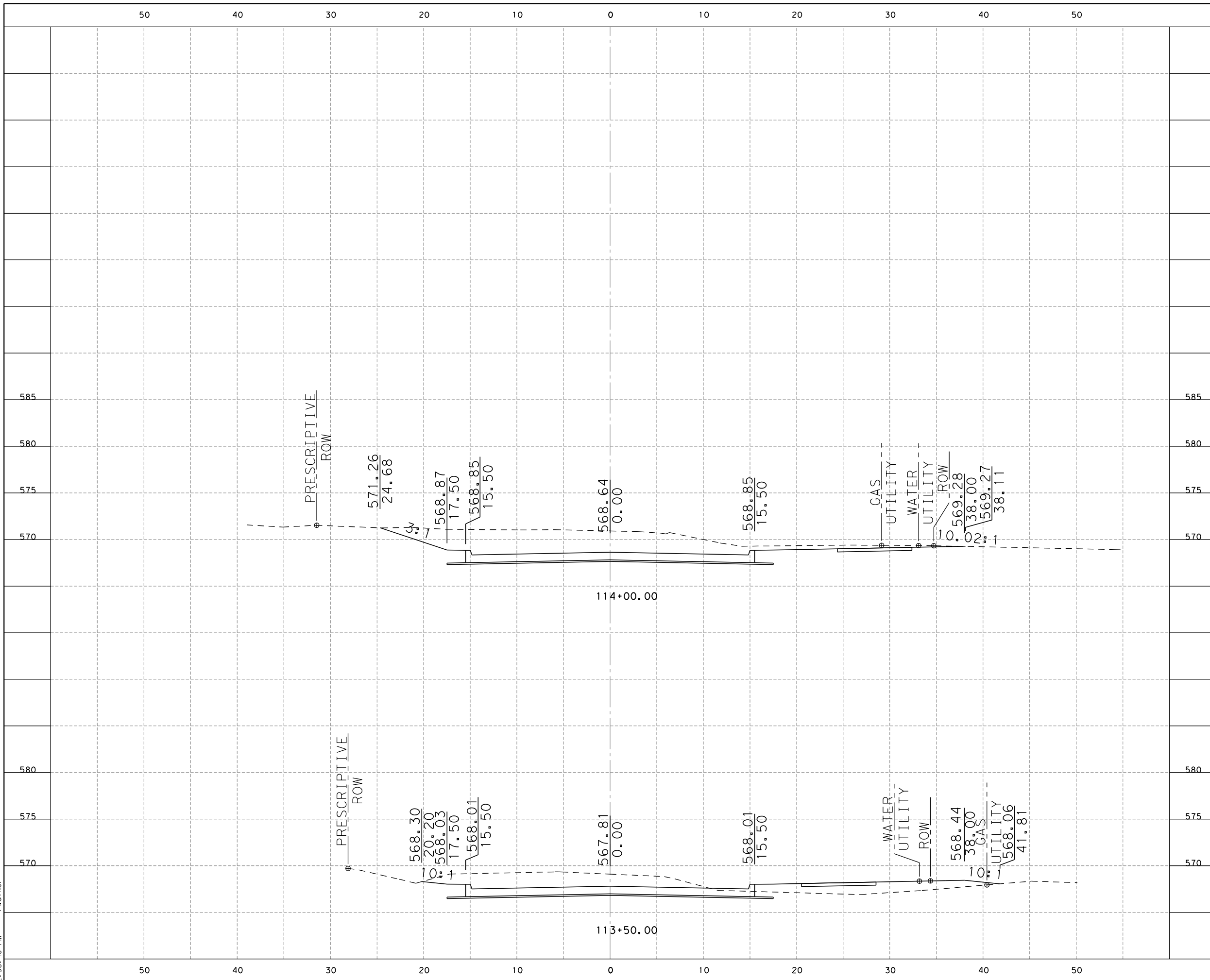
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 FAIRVIEW, TX 75069
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E. STACY ROAD IMPROVEMENTS
CROSS SECTIONS

SCALE: H: 1" = 10'			SHEET NO.
V: 1" = 10'			
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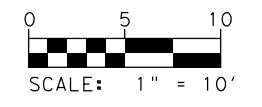
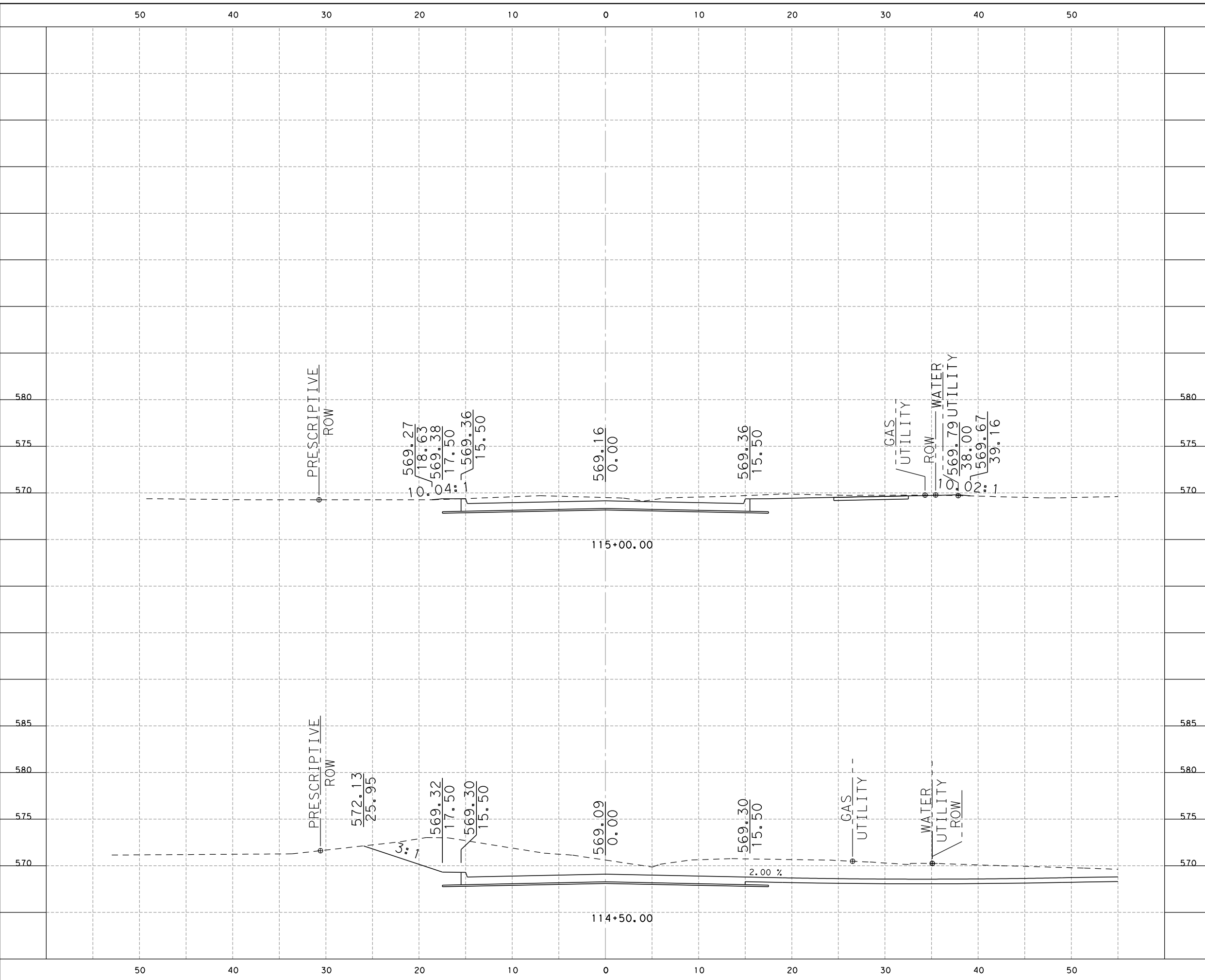
 TOWN OF FAIRVIEW, TEXAS
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E. STACY ROAD IMPROVEMENTS
CROSS SECTIONS

SCALE: H: 1" = 10'
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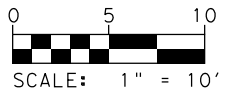
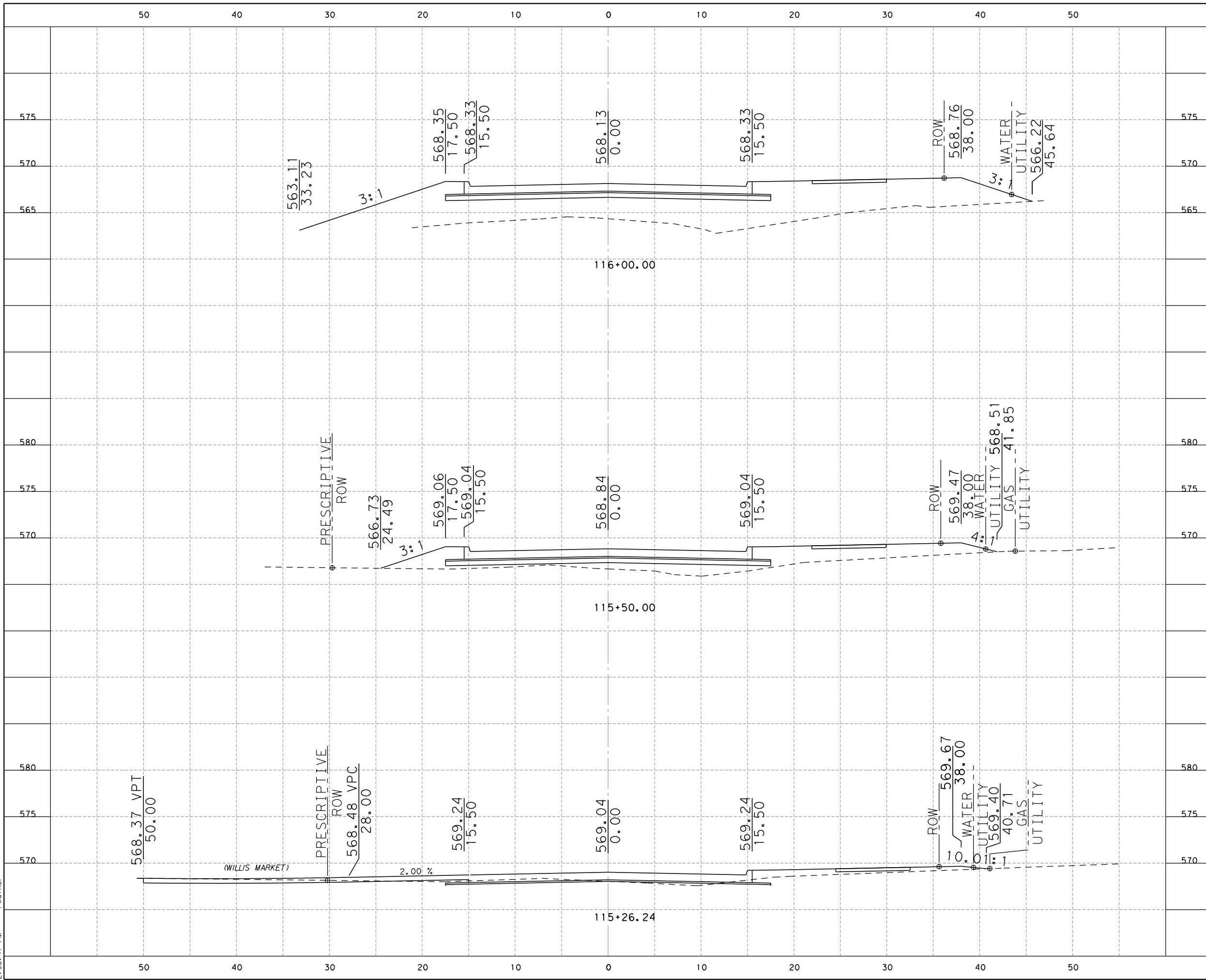
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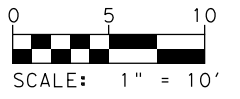
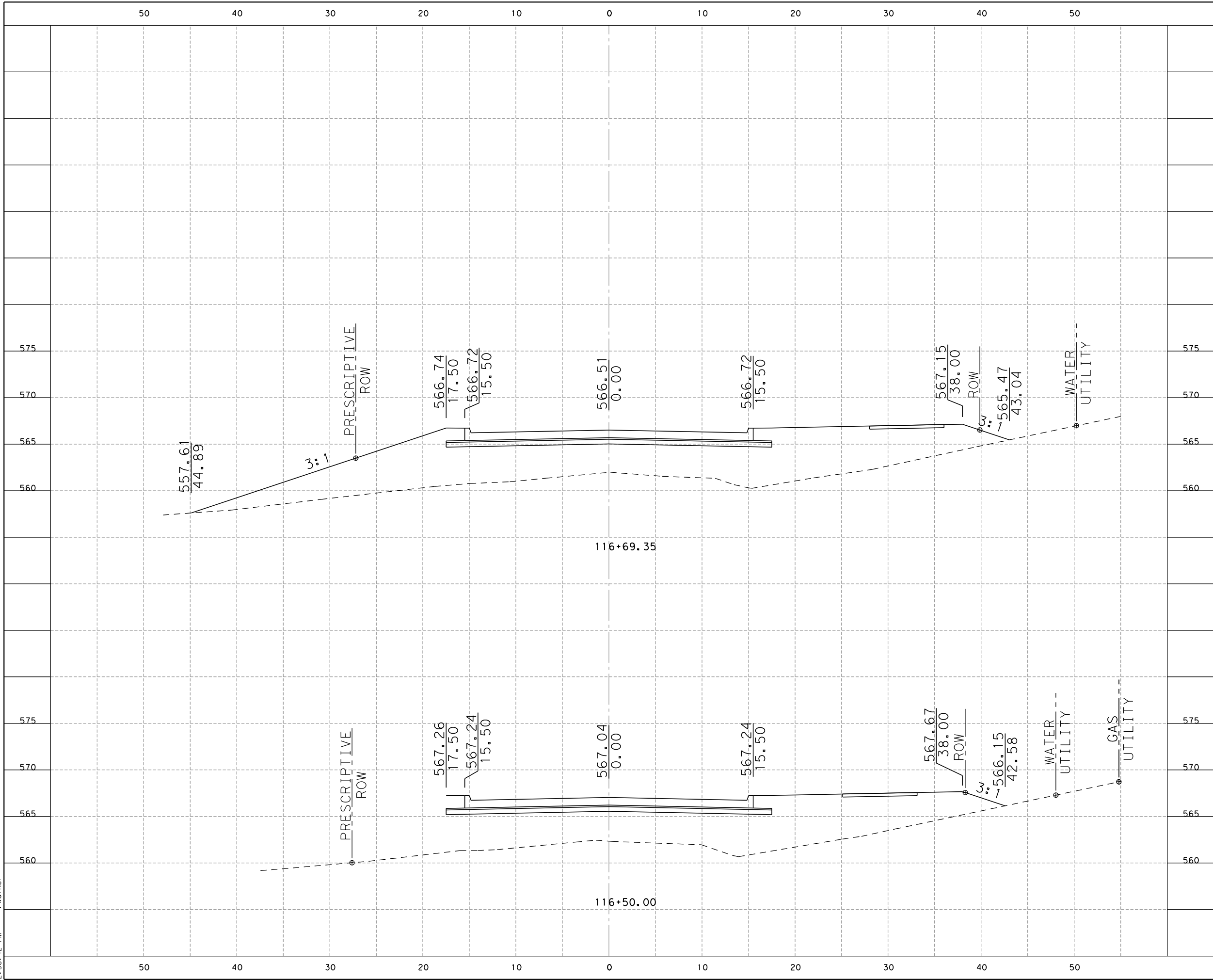
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 174

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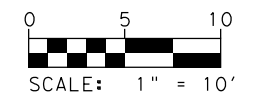
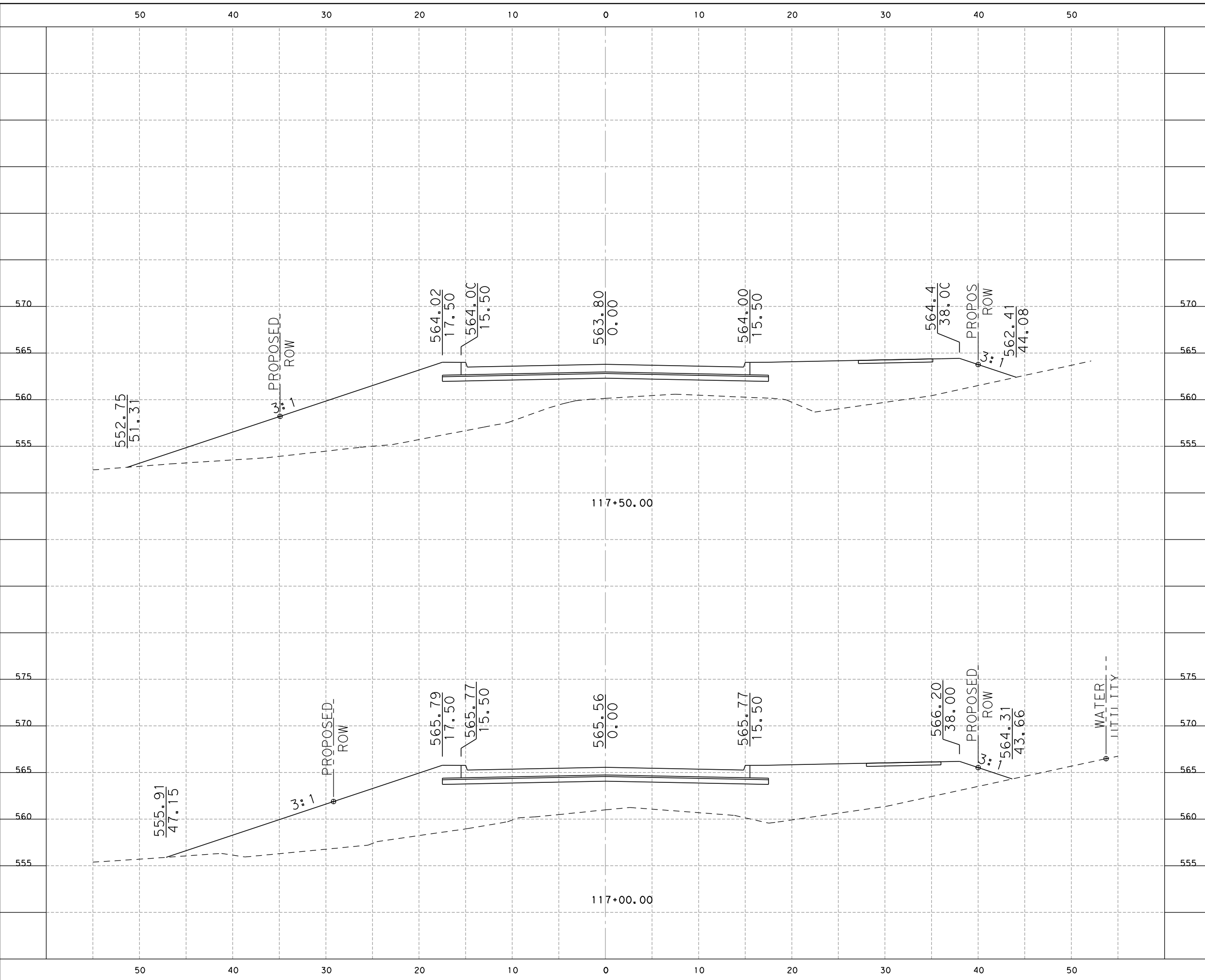
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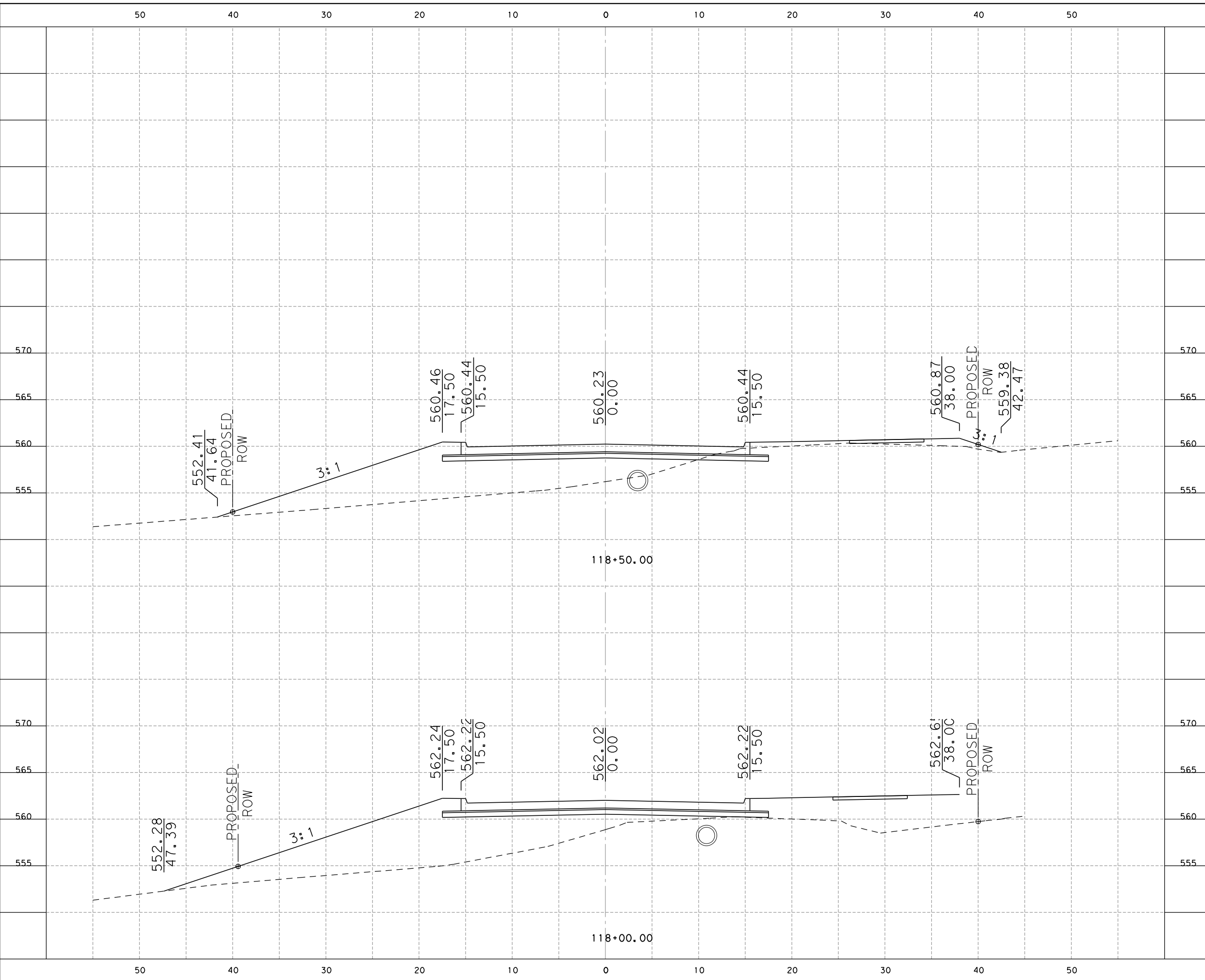
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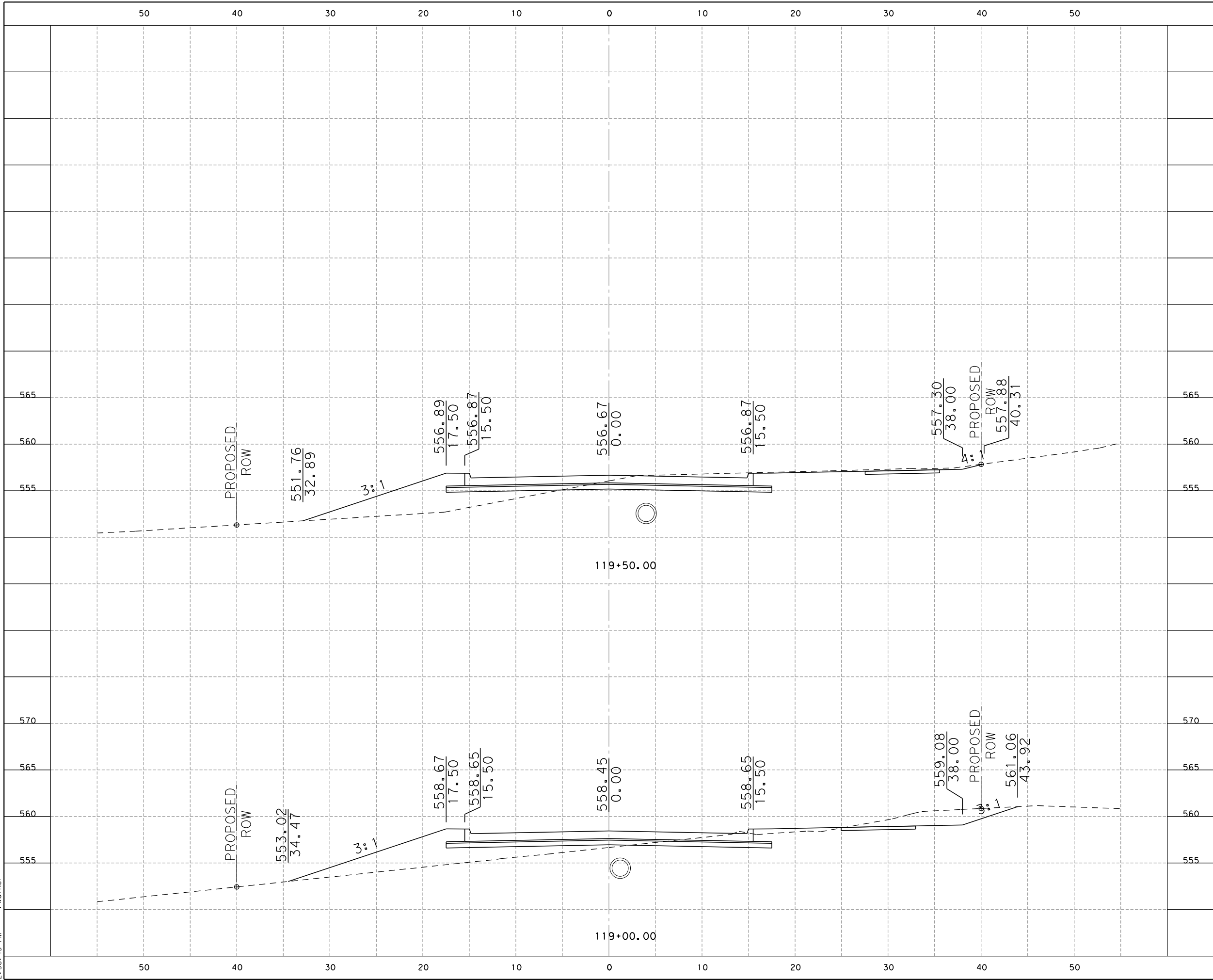
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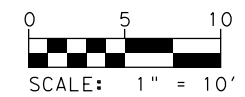
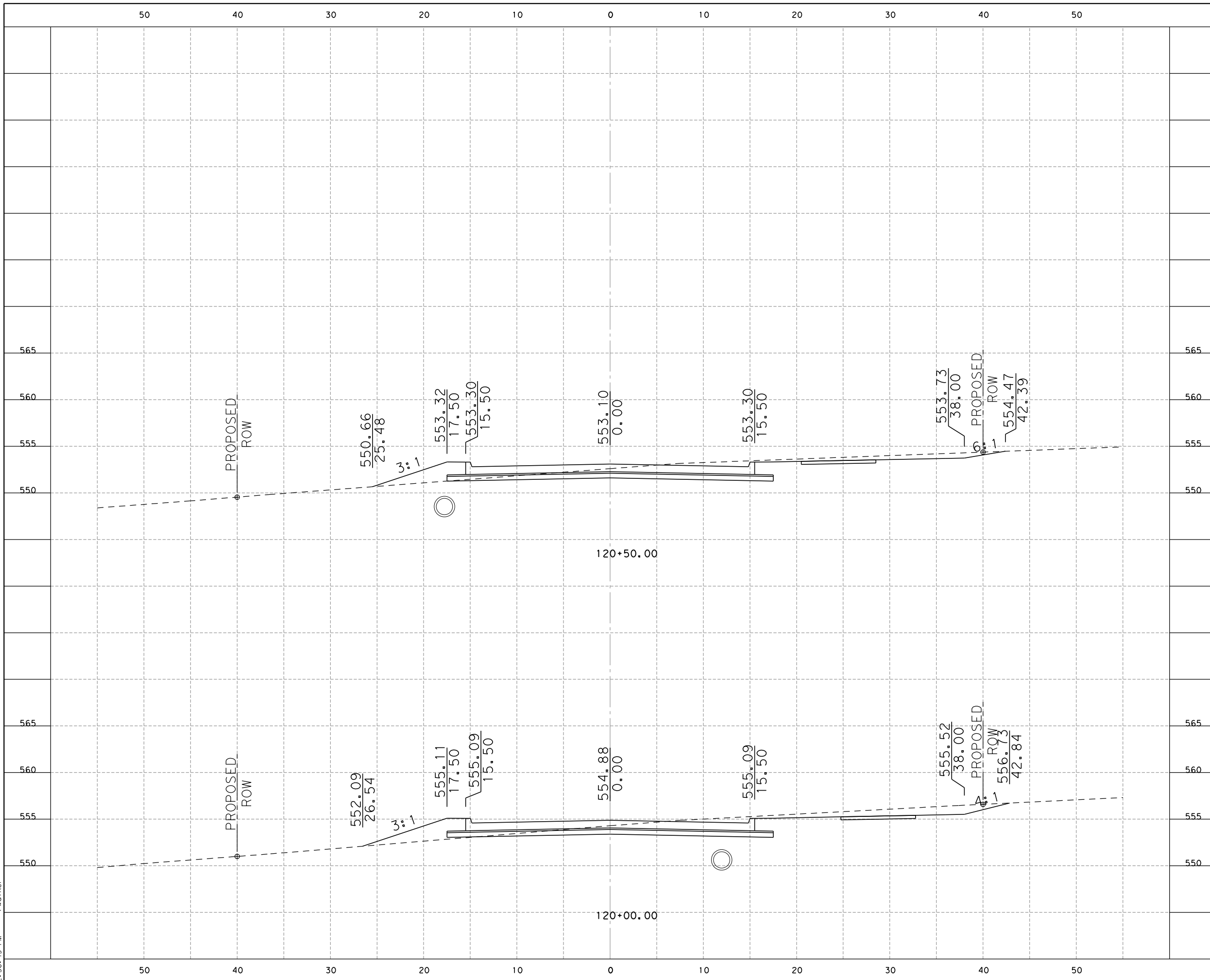
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SCALE: H: 1" = 10'			SHEET NO. 178
V: 1" = 10'			
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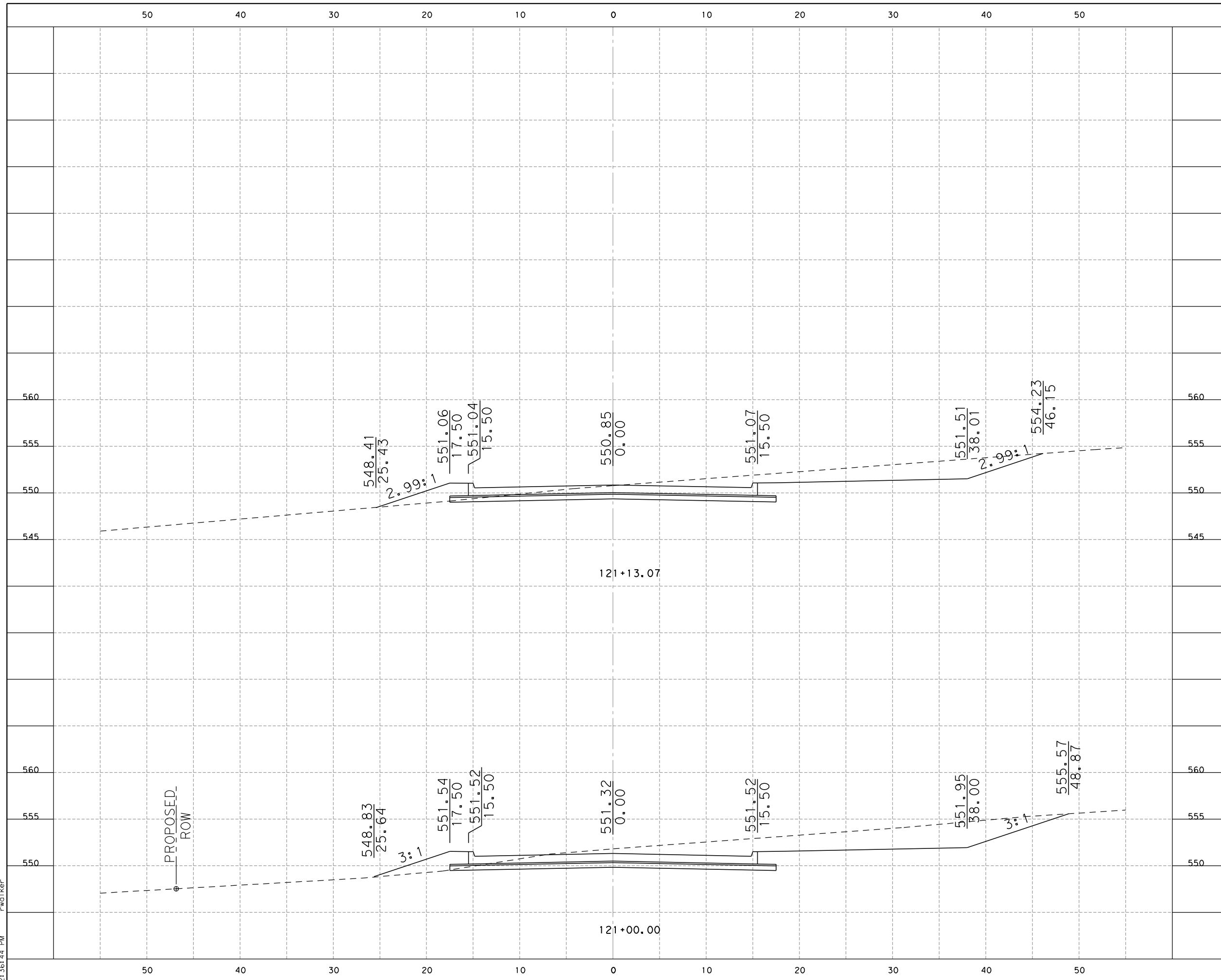
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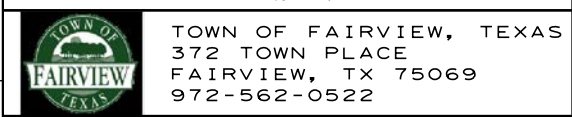
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 BIDDING, OR PERMIT PURPOSES.

 HUITT-ZOLLARS, INC.
 Date: 3/17/2017

HUITT-ZOLLARS
 HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING
 1717 MCKINNEY AVE., SUITE 1400 DALLAS, TEXAS 75202
 Firm No. F-761



E. STACY ROAD IMPROVEMENTS
CROSS SECTIONS

SCALE: H: 1" = 10'
 V: 1" = 10'

DESIGNED BY: CLM	DRAWN BY: RAW	CHECKED BY:	SHEET NO. 180
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