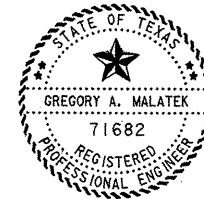


INDEX OF SHEETS

SHEET NO.

DESCRIPTION

1-1A	TITLE SHEET
2-7	PROJECT LAYOUTS
8	BARRICADE SUMMARY SHEET
9-36, 17A, 29A, 29B	DETOUR & BARRICADE LAYOUTS
37-62	STORM SEWER & UTILITY LAYOUTS
63	TYPICAL SECTIONS
64-66	SPECIFICATION DATA
67-67A	GRADING SUMMARY & SSCB SUMMARY SHEETS
68	STRUCTURE SUMMARY SHEET
69	STORM SEWER SUMMARY SHEET
70	BARRICADE & DETOUR SUMMARY
71	ELECTRICAL / SERVICE POLE SUMMARY
72	SIGN REMOVAL SUMMARY
73-75, 75A	ESTIMATE & QUANTITY
76-101	PLAN SHEETS
102-127	MAIN PLAN PROFILE
128-152	RAMP PLAN PROFILE
153-178	ILLUMINATION SHEET (OMITTED SHT. NO. 178)
179-204	TOPSOIL LAYOUTS
205-211	DRAINAGE AREA MAPS
212-213	HYDRAULIC DATA SHEETS
214-216	STORM SEWER COMPUTATIONS
217	INLET COMPUTATIONS
218-232	CULVERT LAYOUTS
233-262	STORM SEWER SECTIONS
263-265	BRIDGE LAYOUTS
266-269	WATER MAIN LAYOUTS
270-274	CURB INLET DETAILS
275	TRAFFIC INLET (SPL)
276	DROP INLET "TYPE 3" GRATE "TYPE 2" DIST STANDARD
277	DROP INLET "TYPE Y-1" DIST STANDARD
278	DROP INLET "TYPE Y-2 THRU TYPE Y-5" DIST STANDARD
279	DROP INLET "TYPE W-1" DIST STANDARD
280	DROP INLET "TYPE W-2 THRU TYPE W-5" DIST STANDARD
281	TYPE 3 & TYPE 4 GRATE DIST STANDARD
282	MH-M
283	SCL 45°
284	SC-NA
285	SCL
286	FW-N
287	MC 5-2
288	MC 6-1
289	MC 6-2
290	MC 6-1 (MOD)
291	MC 6-1 (SPL)
292	SCNA (MOD)
293-294	MC (SPL)
295	MCW-P
296	MCW-P-45
297	MCW-FI
298	MCW-FI-45
299	CH-11-B-15
300	PD-SPR
301	PC-1
302	PC-3
303	PC-7
304-305	CAST IN PLACE ENDS FOR PRECAST BOX CULVERTS
306	BOX CULVERT REPAIR DETAILS
307-307A	RIPRAP DETAILS & RING AND COVER DETAILS
308, 308A	VDW (BC)
309	VIA ASSEMBLY
310	TRAILER MOUNTED MESSAGE BOARD
311-313	SSCB(2)-92(MOD), SSCB(3)-92(MOD) & SSCB(4)-92
314	MBCF-94
315-316, 316A	SGT (1) & (2)-95
317	SW-3P
318	BED-91
319	GREAT-94
320-322	EC(1), (2) & (3)-93
323-325	ED(1), (2) & (3)-93
326	ED(4)-93 DIST STANDARD
327-331	RID (1), (2), (3) & (4)-93 (OMITTED SHT. NO. 331)
332-335	SRB (1), (2), (3) & (8)-93
336	D&OM (1)-92
337	D&OM (VIA)-92
338	RPM (1)-92
339-347	BC(1) - BC(9)-94
348	WZ(STPM)-92
349	WZ(BD)-92
350	WZ(CD)-94
351	TCP NOTES-94
352	TCP (3-2)-94
353	TCP (3-3)-94
354	TCP
355-355A	SD
356	TY 50IR



THE STANDARD SHEETS SPECIFICALLY IDENTIFIED ABOVE HAVE BEEN SELECTED BY ME OR UNDER MY RESPONSIBLE SUPERVISION AS BEING APPLICABLE TO THIS PROJECT.

Gregory A. Malatek, PE 4/13/95
DATE

STATE OF TEXAS DEPARTMENT OF TRANSPORTATION

PLANS OF PROPOSED STATE HIGHWAY IMPROVEMENT

FEDERAL AID PROJECT.

COMAL COUNTY - I.H. 35

PROJECT NO. MANH95 (40) IM

CONTROL NO. 0016-05-087

FROM: 0.1 MI. N. OF FM 482 (FM 2252), N

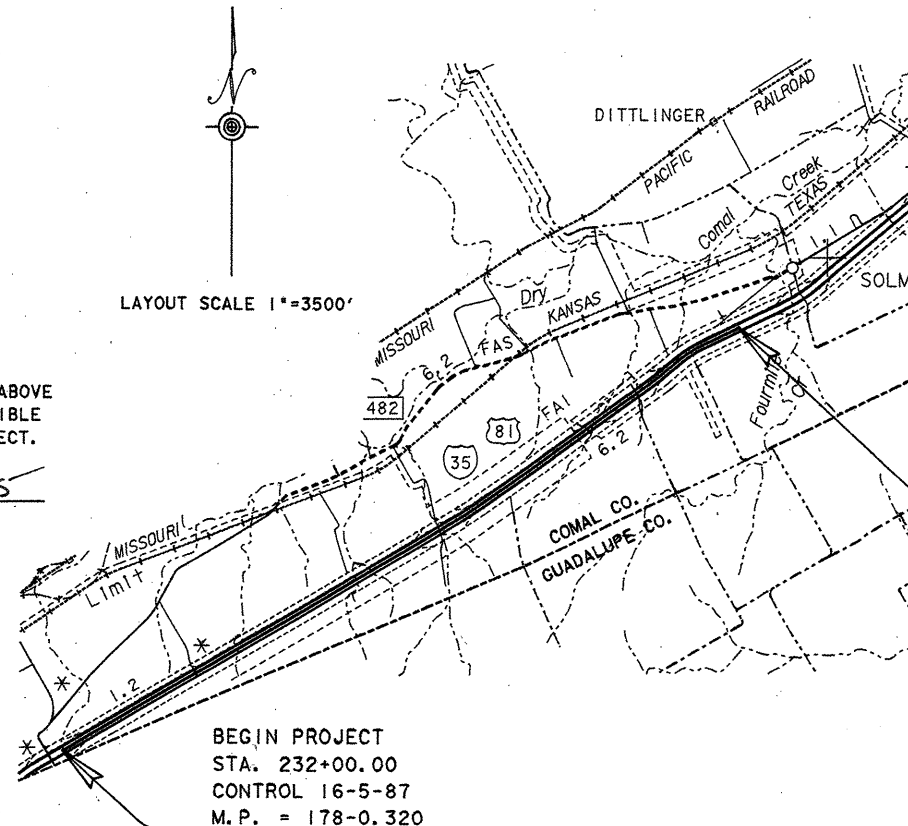
TO: 0.5 MI. S. OF SOLMS RD.

ROADWAY LENGTH = 29,223.59 FT = 5.534 MI.

BRIDGE LENGTH = 76.41 FT = 0.014 MI.

TOTAL LENGTH = 29,300.00 FT = 5.548 MI.

FOR THE CONSTRUCTION OF THE WIDENING OF A FREEWAY FACILITY
CONSISTING OF GRADING, STRUCTURES, BASE, & SURFACING



BEGIN PROJECT
STA. 232+00.00
CONTROL 16-5-87
M.P. = 178-0.320
= STA. 232+00.00 ON OLD
PROJECT NO. 135-2(43)176
CONTROL 16-5-35

NO EXCEPTIONS

NO EQUATIONS

NO RAILROAD CROSSINGS

SPECIFICATIONS ADOPTED BY THE TEXAS DEPARTMENT OF TRANSPORTATION, MARCH 1, 1993 AND SPECIFICATION ITEMS LISTED AND DATED AS FOLLOWS, SHALL GOVERN ON THIS PROJECT. REQUIRED CONTRACT PROVISIONS FOR ALL FEDERAL-AID CONSTRUCTION CONTRACTS (FORM FHWA 1273, DECEMBER, 1993).

DESIGN	MTF	FED. AID PROJECT NO.	SHEET NO.
GRAPHICS	MTF	6 MANH 95 (40) IM	1
CHECKED	MTF	STATE	COUNTY
CHECKED	TEXAS	15	COMAL
CHECKED	CONT.	SECT.	JOB
	0016	05	087
			1H 35

DESIGN SPEED = 65 MPH

AREA OF DISTURBED SOIL = 124.79 Ac.

FINAL PLANS

DATE CONTRACTOR BEGAN WORK: Feb. 12, 1996
DATE WORK WAS COMPLETED & ACCEPTED: Jan. 31, 2000
FINAL CONTRACT COST: \$ 16,924,128.72
LETTING DATE: Sept. 1995
CONTRACTOR'S NAME: Dean Ward Co.

CITY OF SCHERTZ UTILITIES & GREEN VALLEY

PROJECT NO. NH 94 (11) IM CONTROL NO. 16-5-85
R.O.W. ACCOUNT NO. 9115-21-1

FOR WATER MAIN CONSTRUCTION

CITY OF SCHERTZ

"Attachment No. 2 to special AGREEMENT FOR CONSTRUCTION, MAINTENANCE AND OPERATION OF SAFETY LIGHTING SYSTEMS WITHIN MUNICIPALITY, dated September 5, 1989."

The City-State construction, maintenance and operation responsibilities shall be as heretofore agreed to, accepted, and specified in the Agreement to which these plans are made a part."

CITY OF NEW BRAUNFELS

"Attachment No. 2 to special AGREEMENT FOR CONSTRUCTION, MAINTENANCE AND OPERATION OF SAFETY LIGHTING SYSTEMS WITHIN MUNICIPALITY, dated June 14, 1976."

The City-State construction, maintenance and operation responsibilities shall be as heretofore agreed to, accepted, and specified in the Agreement to which these plans are made a part."



END PROJECT
STA. 525+00.00
CONTROL 16-5-87
M.P. = 183+0.226
= STA. 525+00.00 ON OLD
PROJECT I.N. 66 (13)
CONTROL 16-5-22

PROJECT WAS BUILT ACCORDING TO THE PLANS & SPECIFICATIONS. THESE FINAL PLANS REFLECT THE WORK DONE & THE QUANTITIES SHOWN THEREON & ON THE FINAL ESTIMATE ARE FINAL QUANTITIES.

Gregory A. Malatek, PE 10/10/02
AREA ENGINEER

TEXAS DEPARTMENT OF TRANSPORTATION

RECOMMENDED FOR LETTING: April 13, 1995

D. L. C. Roper, P.E.
AREA ENGINEER

RECOMMENDED FOR LETTING: June 12, 1995

Julia M. Brown, P.E.
DIRECTOR OF TRANSPORTATION PLANNING & DEVELOPMENT

RECOMMENDED FOR LETTING: June 12, 1995

John P. Kelly, P.E.
DISTRICT ENGINEER

APPROVED FOR LETTING:

[Signature]
DIRECTOR, TRAFFIC OPERATIONS DIVISION

APPROVED FOR LETTING:

[Signature]
DIRECTOR, DESIGN DIVISION

APPROVED FOR LETTING: 6/16/95

Robert R. Korman, P.E.
DIRECTOR, DESIGN DIVISION

U.S. DEPARTMENT OF TRANSPORTATION FEDERAL HIGHWAY ADMINISTRATION

APPROVED:

DIVISION ADMINISTRATOR DATE

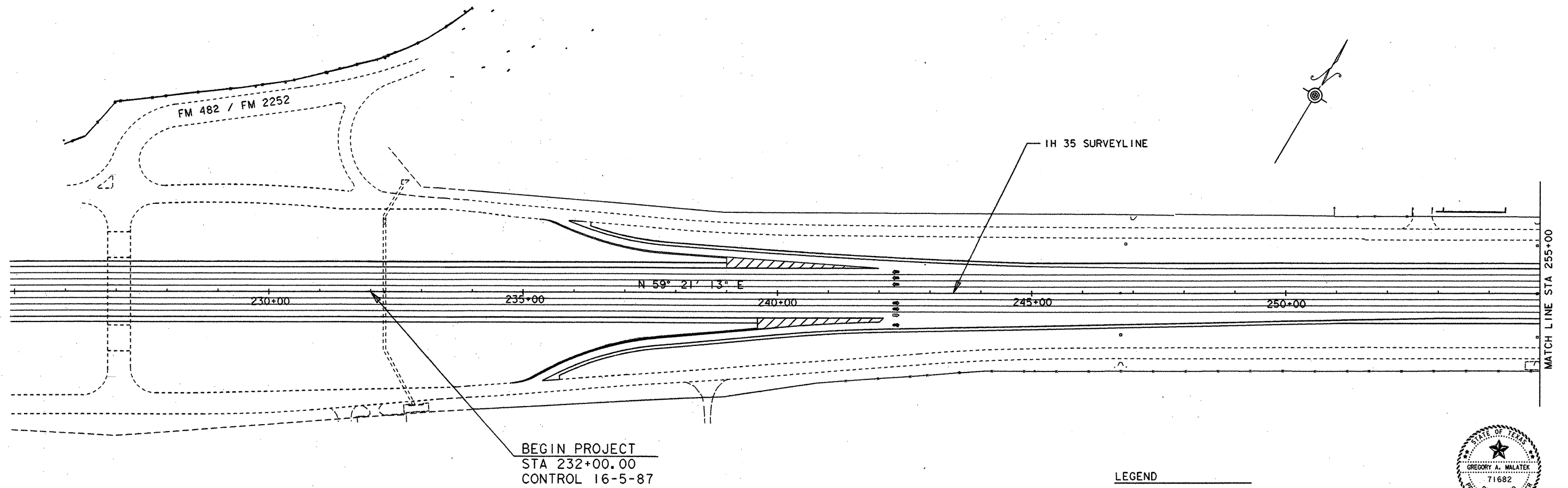
CONO

DESCRIPTION

- 1 Add surveying under "State Force Account Work"
- 2 Change quantities for Items 402 "Trench Excavation", 464 "RCP 24" and 30" and 676 "Jack and Bore"
- 3 Replace Items 514-544 "Perm Conc Traf Barrier Sgl Slp (TY 2) (Mod)" and 514-545 "Perm Conc Traf Barrier Sgl Slp (TY 3) (Mod)" with Items 514-517 "Perm Conc Traf Barrier Sgl Slp (TY 2)" and 514-521 "Perm Conc Traf Barrier Sgl Slp (TY 3)". Also add Item 514-522 "Perm Conc Traf Barrier Sgl Slp (TY 4)"
- 4 Revision to Phase I typical sections, increase outside shoulder width 2 feet. Increase quantities for aggregate, asphalt and ACP
- 5 Add water base striping to SB Phase I detour
- 6 Change Construction Exits from Type 2 to Type 1
- 7 Pay contractor to make "drop-in" grids for the concrete traffic barrier
- 8 Change the wet bore process on Line Q to a dry bore with casing
- 9 Add an additional 200 lb. VIA barrel to the assembly due to the increase in the speed limit to 70 MPH
- 10 Repair guardrail and guardrail extruder
- 11 Repair guardrail and guardrail extruder
- 12 Repair guardrail and guardrail extruder
- 13 Increase the quantities for the single sloped concrete barrier
- 14 Allow the use of SS-1 or MS-2 emulsified asphalt for the treatment of the flexible base at the contractor's request
- 15 Repair TxDOT owned concrete traffic barrier to be used in various phases of construction
- 16 Repair TxDOT owned concrete traffic barrier to be used in various phases of construction
- 17 Add additional water line adjustments
- 18 Payment for grout used to repair CTB in Change Order Nos. 15 and 16
- 19 Add SGT-Modifier Extruder Terminal (SGT(3)-96) option
- 20 Repair guardrail and guardrail extruder
- 21 Add additional item for Construct Detour in order to tie to adjacent project. Time Extension No. 1, add 4 days
- 22 Add 18" slotted drain and slotted drain outfall to storm sewer Line T. Also increases the slotted drain quantity for temporary drainage during Phase II construction
- 23 Change the surveying under "State Force Account Work" to Function 340 to allow the use of contract surveyors
- 24 Add State Force Account Work for signs
- 25 Increases the quantities for Items 649-501 "Remov Large Rdsg Sgn Assms" and 649-502 "Remov Small Rdsg Sgn Assms"
- 26 Add items for spot level up and seal coat of the frontage roads. Time Extension No. 2, add 5 days
- 27 SKIPPED
- 28 Add multiduct and manholes for future traffic management system. Time Extension No. 3, add 33 days
- 29 Remove existing cement stabilized subgrade not identified in the plans. Time Extension No. 4, add 4 days
- 30 Repair guardrail and guardrail extruder
- 31 Repair guardrail and guardrail extruder
- 32 Temporary plugging and removal of existing drain at SB exit ramp to FM 2252/FM 482
- 33 Temporarily relocate barricades on the SBML at the north end of the project
- 34 Repair guardrail and guardrail extruder
- 35 Repair guardrail and guardrail extruder
- 36 Adds Item 3063-502-999 "Hot Mix Asph (TY C) (Surf) for test section under TxDOT in-house Research Project 7-3994
- 37 Add Item 9137-037 "Temporary Sign Installation". The plans did not provide for the relocation or temporary installation of roadway signs to accommodate a traffic switch
- 38 Adds Item 5005-504 "Rock Filter Dams (TY 2)" and the corresponding remove and replace and removal items
- 39 Adds Item 662-546 "Wrk Zn Pav Mrk Remov (CL C) TY Y" and increases the quantities for Item 662-541 "Wrk Zn Pav Mrk Remov (CL B) TY I-A" to delineate the inside edge line on NBML
- 40 Adds Items 618-539 "Conduit(PVC)(Sch 80)(2")(Bore)", 620-515 "Elec Conductor (No.3/0)Insulated" and 628-623 "Elec Serv (Spl)". Also increases the quantities for Items 618-518 "Conduit(PVC)(Sch 80)(2)" and 624-501 "Ground Box TY A(122311)w/Apron. These items were used to replace the electrical service to the rest area on the NBML
- 41 Add Item 9141-041 "Silicone Sealed Bridge Jt w/Header" to be used to seal the expansion joints on the Schwab and Engle Road bridges
- 42 Add Item 9142-042 "Rock Saw Rental" used to place traffic management conduit across the ramps to minimize damage to existing roadway
- 43 Add the necessary items to repair existing pavement, seal and overlay the frontage roads
- 44 Add additional months of barricades as compensation for additional time added by Time Extension Nos. 1-12
- 45 Payment for the removal of graffiti on concrete structures
- 46 Payment for the work to transition from the newly constructed pavement in Phase II and Phase III to the SBML exit ramp to FM 2252/FM 482. Temporary ramps tie-ins were installed to keep the exit ramp open
- 47 Payment for the installation of twelve temporary drains during the various phases of construction. Time Extension No. 11, add 12 days
- 48 Payment for the labor, material and equipment to reconstruct the roadway in the areas of the temporary drains added by Change Order No. 47.
- 49 Reduces the mobilization item added by Change Order No. 26 since the seal coat work was not performed. This equipment was not mobilized
- 50 Payment for the labor, material and equipment to rework ditches in the center median to maintain positive drainage to the temporary drains and provide slope protection along steep ditches. Time Extension No. 12, add 6 days
- 51 Payment for additional paint material to provide a wider stripe to cover existing striping when traffic flow was reversed. This was done instead of eliminating the existing markings

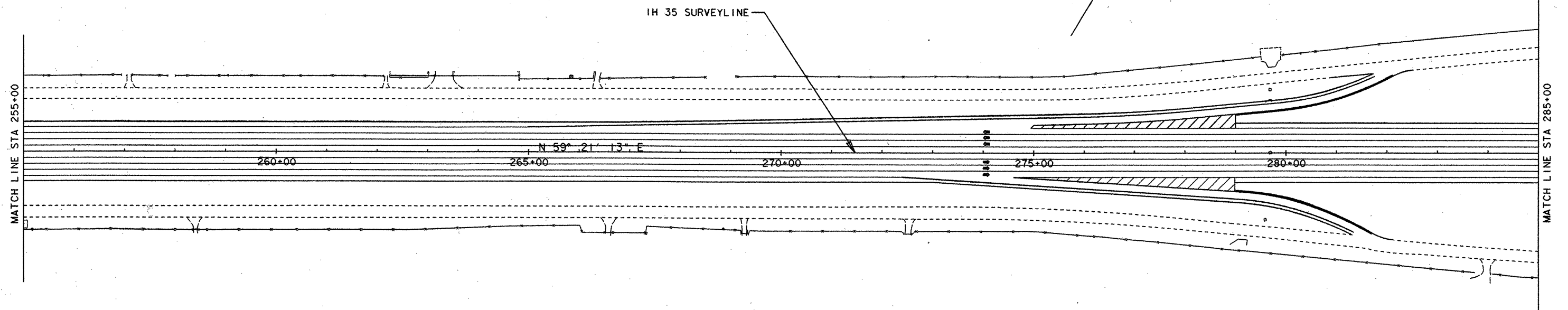
CHANGE ORDERS

© 2001 Texas Department of Transportation			
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FED. RD. DIST. NO.	FEDERAL AID PROJECT NO.	SHEET NO.	
6	MANH 95(40)IM	1A	
STATE	STATE DIST. NO.	COUNTY	
TEXAS	SAT	COMAL	
CONT.	SECT.	JOB	HIGHWAY NO.
0016	05	087	IH 35



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Gregory A. Malatek, P.E.

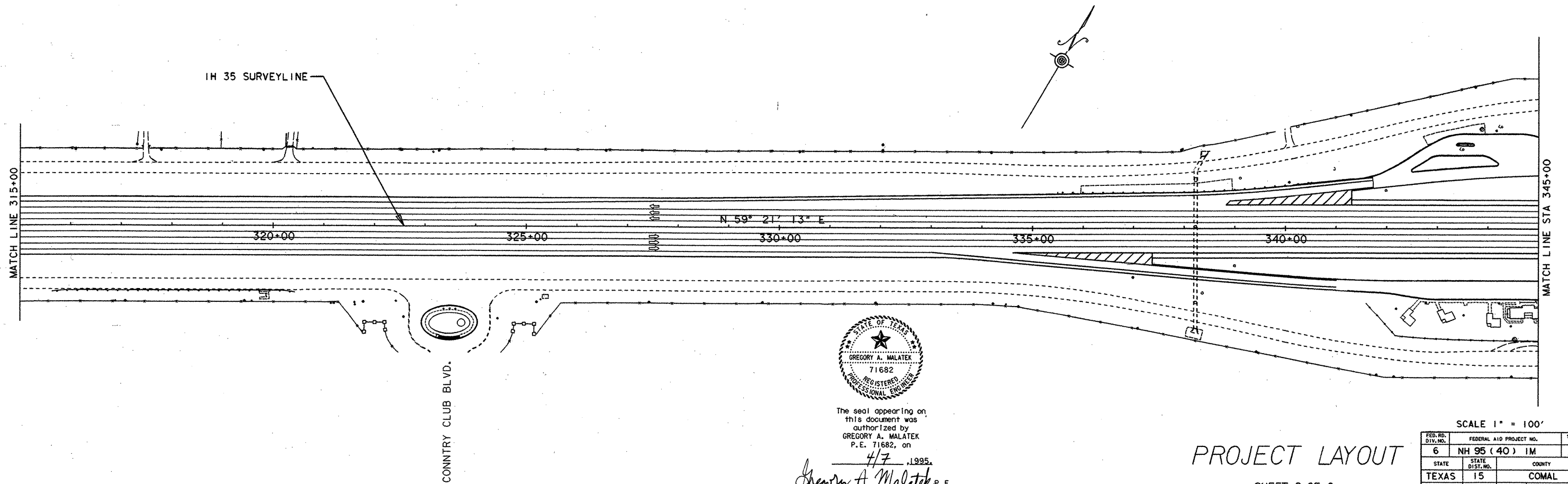
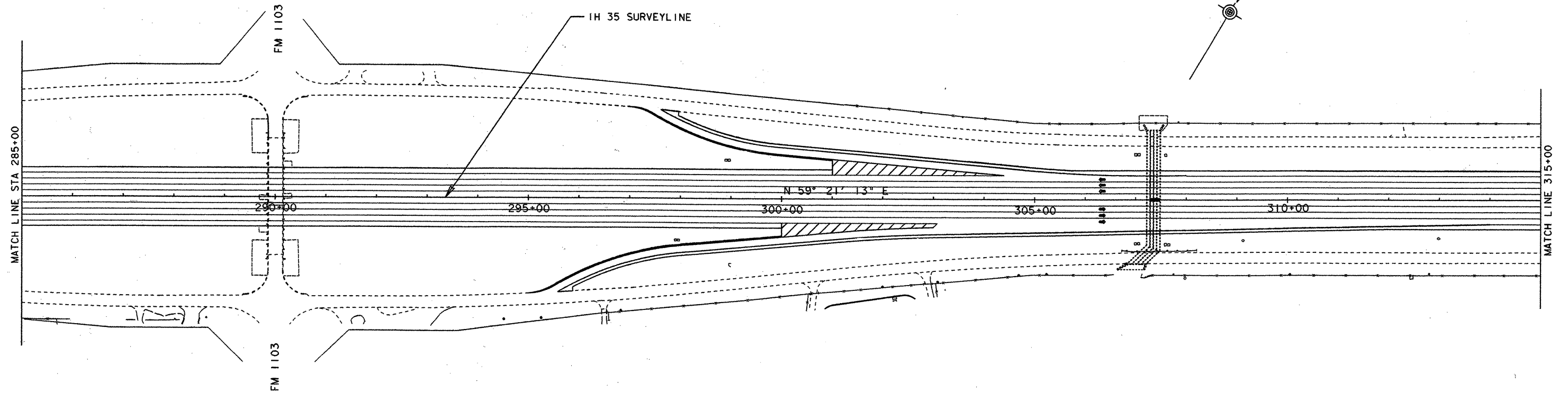


SCALE 1" = 100'

PROJECT LAYOUT

SHEET 1 OF 6

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.
6	NH 95 (40) IM	2
STATE	STATE DIST. NO.	COUNTY
TEXAS	15	COMAL
CONT.	SECT.	JOB
0016	05	087
		1H 35



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4/7, 1995.

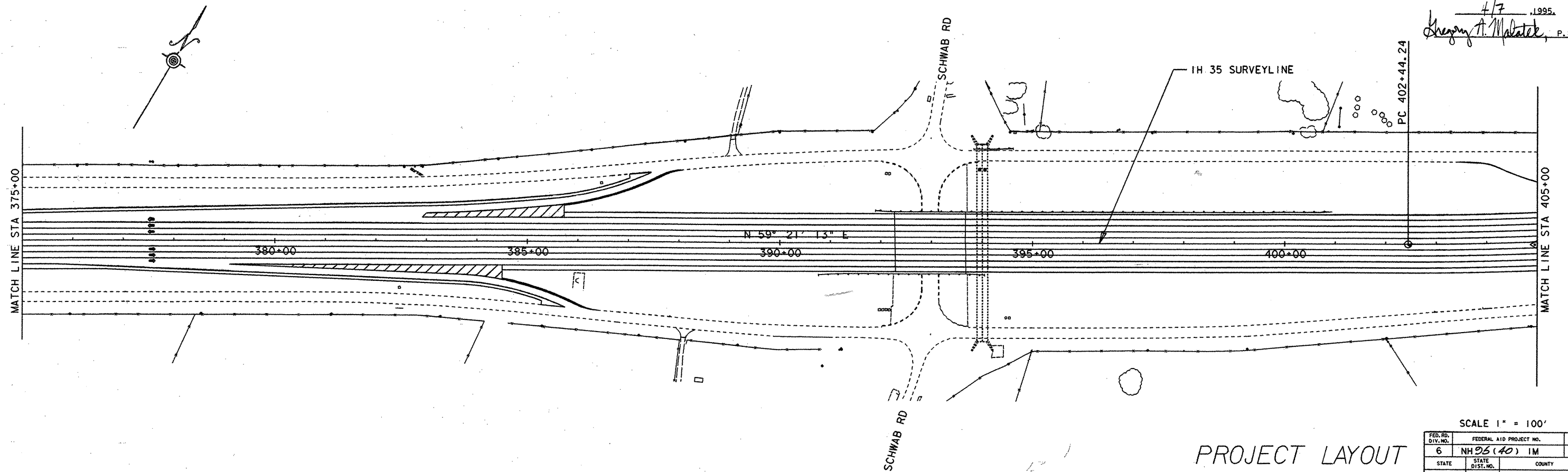
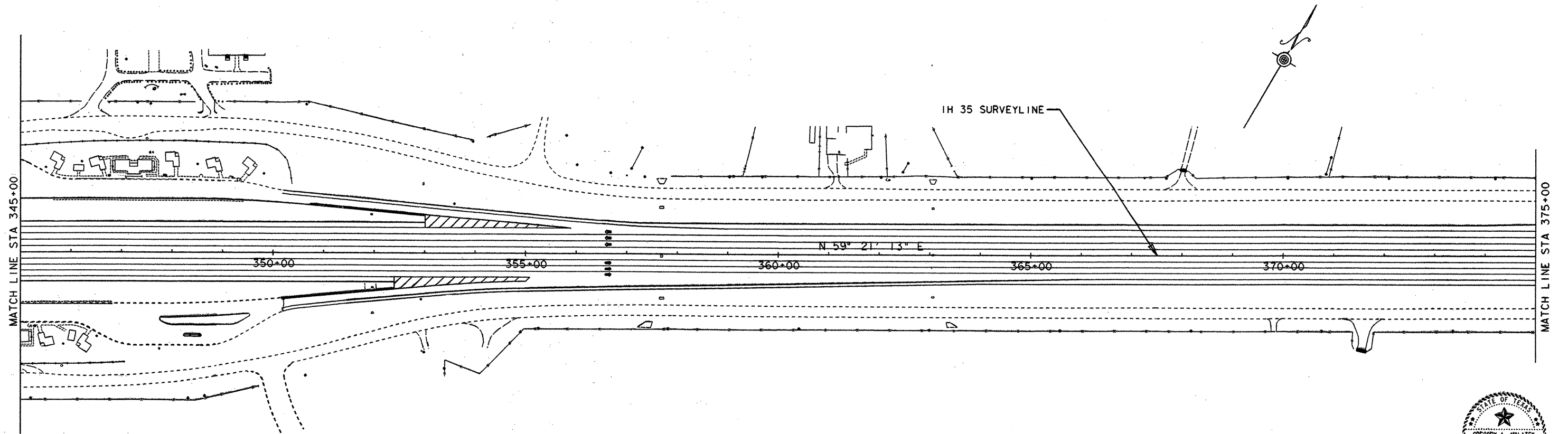
Gregory A. Malatek, P.E.

PROJECT LAYOUT

SHEET 2 OF 6

SCALE 1" = 100'

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.			SHEET NO.
6	NH 95 (40) IM			3
STATE	STATE DIST. NO.	COUNTY		
TEXAS	15	COMAL		
CONT.	SECT.	JOB	HIGHWAY NO.	
0016	05	087	IH 35	



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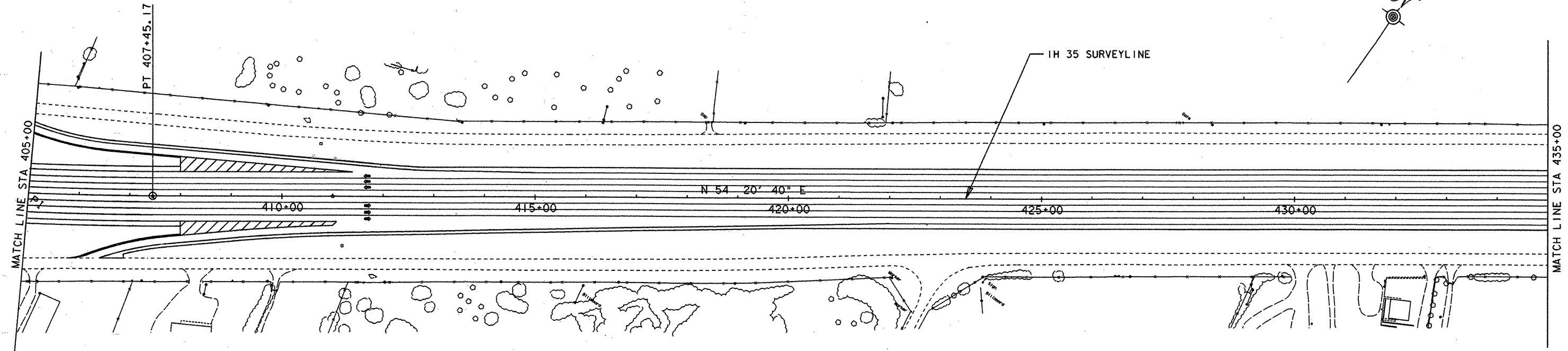
4/7, 1995.
Gregory A. Malatek, P.E.

PROJECT LAYOUT

SHEET 3 OF 6

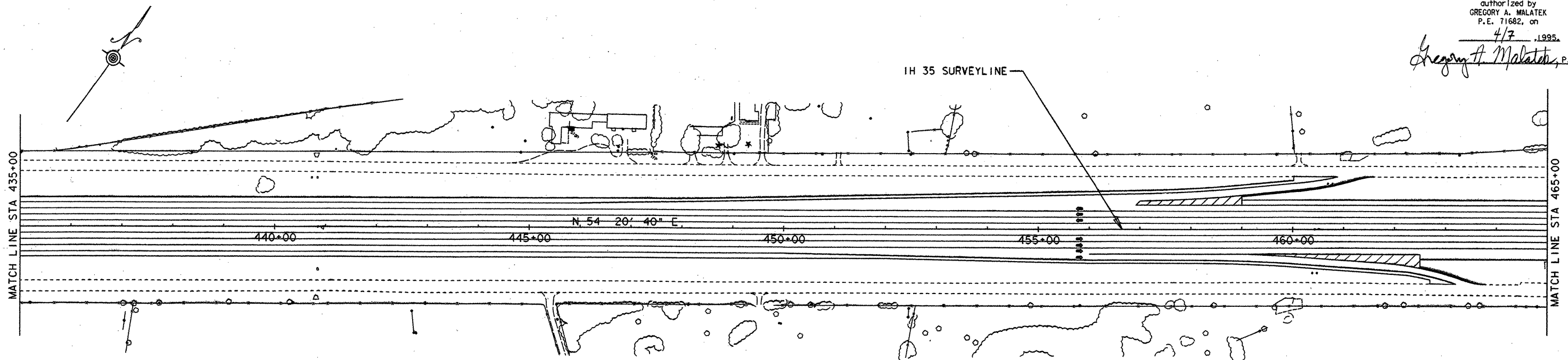
SCALE 1" = 100'

FED. RD. DIST. NO.	FEDERAL AID PROJECT NO.	SHEET NO.
6	NH 95 (40) IM	4
STATE	STATE DIST. NO.	COUNTY
TEXAS	15	COMAL
CONT.	SECT.	JOB
0016	05	087
		HIGHWAY NO.
		IH 35



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Gregory A. Malatek, P.E.

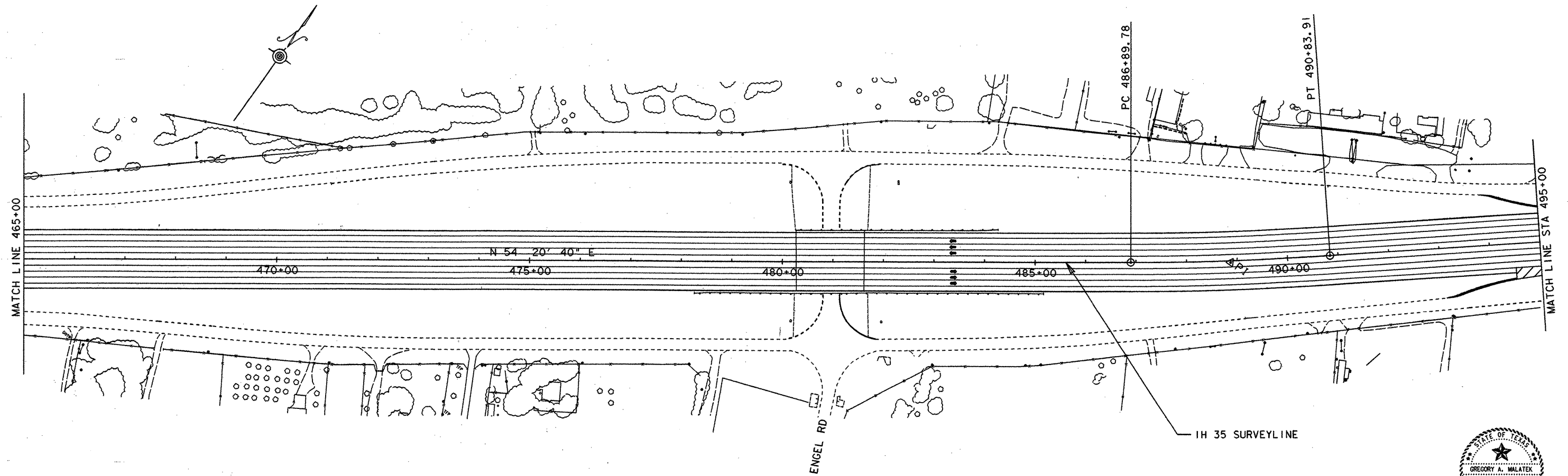


SCALE 1" = 100'

PROJECT LAYOUT

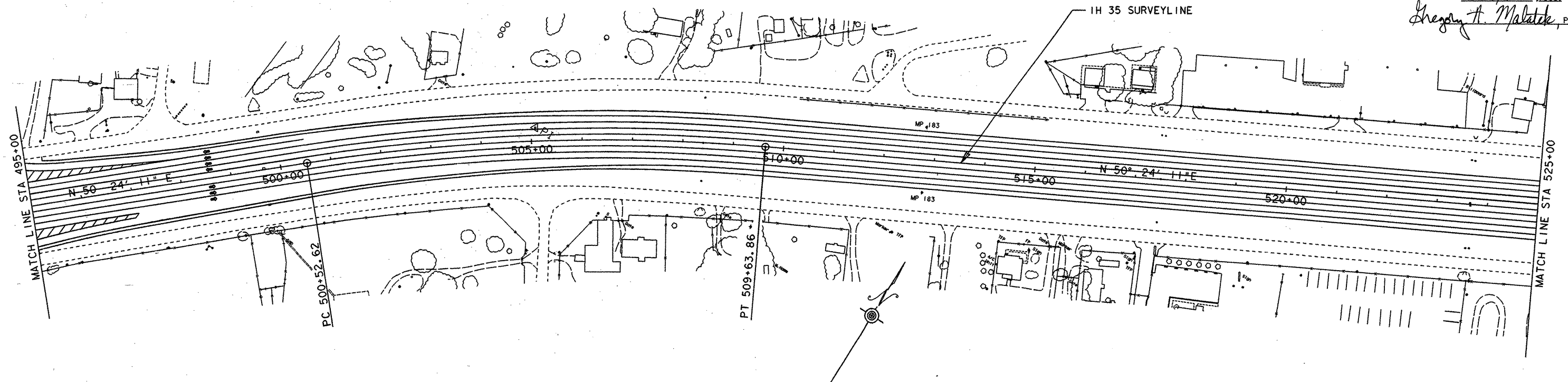
SHEET 4 OF 6

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	NH 95 (40)	IM	5
STATE	STATE DIST. NO.	COUNTY	
TEXAS	15	COMAL	
CONT.	SECT.	JOB	HIGHWAY NO.
0016	05	087	IH 35



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4/7, 1995.
Gregory A. Malatek, P.E.

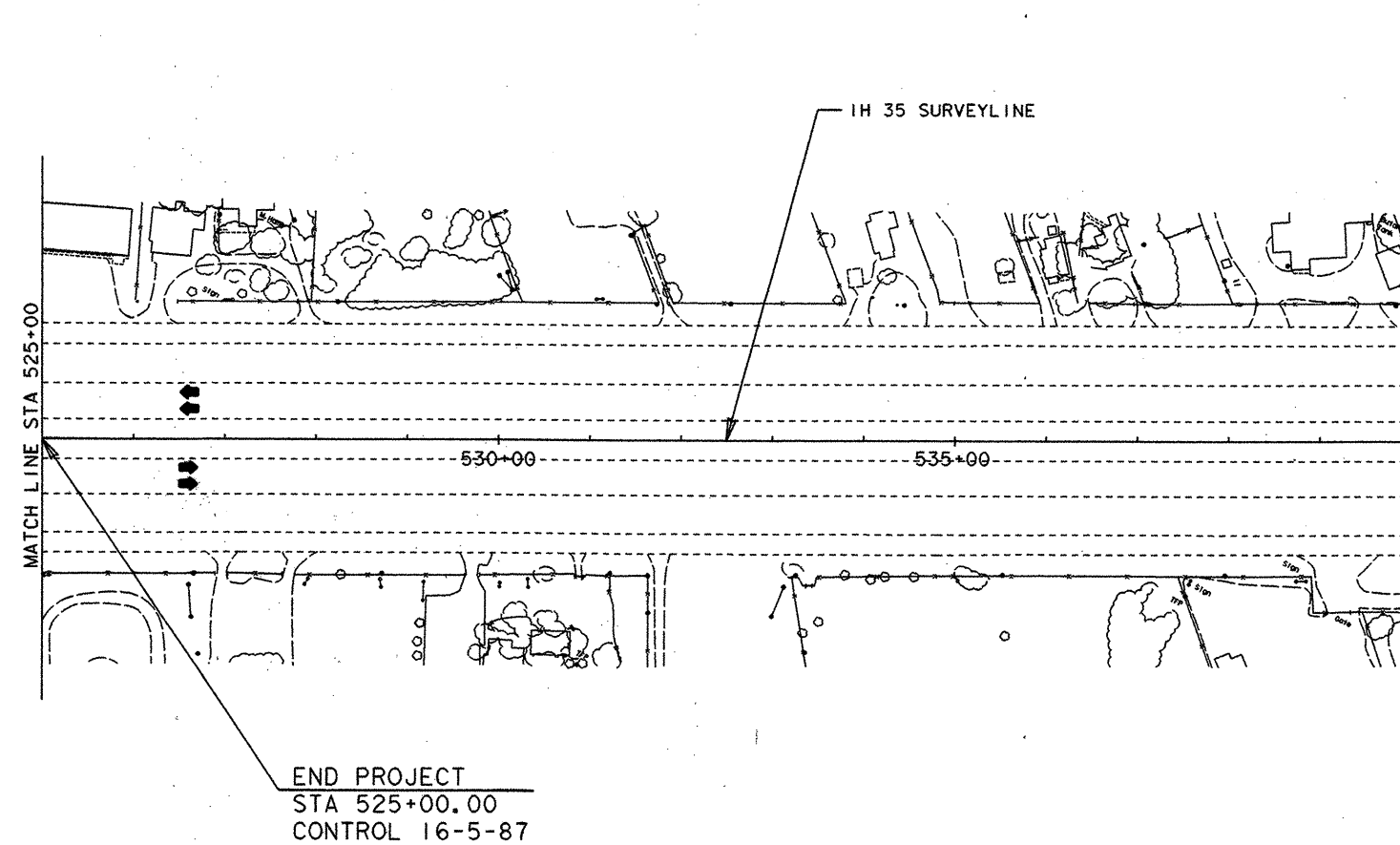


SCALE 1" = 100'

PROJECT LAYOUT

SHEET 5 OF 6

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	NH 25 (40) IM		6
STATE	STATE DIST. NO.	COUNTY	
TEXAS	15	COMAL	
CONT.	SECT.	JOB	HIGHWAY NO.
0016	05	087	IH 35



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Gregory A. Malatek P.E.

SCALE 1" = 100'

PROJECT LAYOUT

SHEET 6 OF 6

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	NH 05 (40) 1M		7
STATE	STATE DIST. NO.	COUNTY	
TEXAS	15	COMAL	
CONT.	SECT.	JOB	HIGHWAY NO.
0016	05	087	1H 35

[illegible]

① BARRICADES TO BE PLACED BEFORE BEGINNING CONSTRUCTION OPERATIONS AND SHALL REMAIN FOR THE DURATION OF THE PROJECT.
 ② THIS SETUP TO BE USED DURING FRONTAGE ROAD CONSTRUCTION. TO REMAIN IN PLACE DAY AND NIGHT.
 ③ THIS SETUP TO BE USED FOR MAIN LANE CLOSURES.
 CONTRACTOR SHALL SUPPLY 4 TRAILER MOUNTED MESSAGE BOARDS.
 ANY SIGNS LISTED ON THIS SHEET AND ANY ADDITIONAL SIGNS REQUESTED BY THE ENGINEER SHALL BE SUPPLIED BY THE CONTRACTOR.
 OBJ.MKRS. REQUIRED FOR DELINEATION OF GREATS SHALL BE SUPPLIED AND PLACED IN ITS PROPER LOCATION BY THE CONTRACTOR.
 PAYMENT FOR THE OBJ.MKRS.SHALL BE CONSIDERED PART OF THE PRICE BID FOR ITEM 502 "BARRICADES,SIGNS AND TRAFFIC HANDLING".
 ④ TO BE USED AS DIRECTED BY THE ENGINEER.

[illegible]

A circular professional engineer seal for the State of Texas. The outer ring contains the text "STATE OF TEXAS" at the top and "REGISTERED PROFESSIONAL ENGINEER" at the bottom, separated by stars. In the center, there is a five-pointed star above the name "GREGORY A. MALATEK" and the number "71682".

BARRICADE SUMMARY SHEET

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.			SHEET NO.
6	NH 95 (40) 1M			8
STATE	STATE DIST. NO.	COUNTY		
TEXAS	15	COMAL		
CONT.	SECT.	JOB	HIGHWAY NO.	
0016	05	087	1H 35	

DETOUR STRIPING LOCATION

SBL STA. 227+00 TO 532+00	WRK ZN PAV MRK NON-REMOV (W) (4") (SLD) EST @ 30,500 L.F.
	WRK ZN PAV MRK NON-REMOV (W) (4") (BRK) EST @ 7,630 L.F.
	WRK ZN PAV MRK NON-REMOV (Y) (4") (SLD) EST @ 30,500 L.F.
	WRK ZN PAV MRK SH TRM REMOV (W) (4") EST @ 3,052 L.F.
SBL RAMPS	WRK ZN PAV MRK NON-REMOV (W) (ENTR. GORE) EST @ 4 EA.
	WRK ZN PAV MRK NON-REMOV (W) (EXIT GORE) EST @ 5 EA.
SBL STA. 227+00 TO 530+00	ELIM. EXT. PAV MRK & MRKR (4") EST. @ 1,125 L.F.
	525+00 TO 530+00 ELIM. EXT. PAV MRK & MRKR (4") EST. @ 1,125 L.F.

DETOUR BUTTON LOCATION

SBL STA. 227+00 TO 532+00	WRK ZN PAV MRK REMOV (CL B) TY I-A EST @ 763 EA.
	WRK ZN PAV MRK REMOV (CL B) TY I-C EST @ 763 EA.
	WRK ZN PAV MRK REMOV (CL B) TY II C-R EST @ 763 EA.
	WRK ZN PAV MRK REMOV (CL C) TY W EST @ 3,052 EA.

G.R.E.A.T.S.

NBL & SBL VARIOUS LOCATIONS GD RAIL EN ABS TERM (2.5') (6 BAY) TY CZ EST @ 6 EA.
TO BE PLACED IN THE FIELD WHERE CONTRACTOR CAN GET MAXIMUM BENEFIT AND SAFETY.

ESTIMATED QUANTITIES

DESCRIPTION	PLAN	FINAL	UNIT
PORT CONC TRAF BAR (STKPL, INSTL & RETURN)	58,260		L.F.
WRK ZN PAV MRK REMOV (CL B) TY I-A	763		EA.
WRK ZN PAV MRK REMOV (CL B) TY I-C	763		EA.
WRK ZN PAV MRK REMOV (CL B) TY II C-R	763		EA.
WRK ZN PAV MRK REMOV (CL C) TY W	3,052		EA.
WRK ZN PAV MRK NON-REMOV (W) (4") (SLD)	30,500		L.F.
WRK ZN PAV MRK NON-REMOV (W) (4") (BRK)	7,630		L.F.
WRK ZN PAV MRK NON-REMOV (W) (ENTR GORE)	4		EA.
WRK ZN PAV MRK NON-REMOV (W) (EXIT GORE)	5		EA.
WRK ZN PAV MRK NON-REMOV (Y) (4") (SLD)	30,500		L.F.
WRK ZN PAV MRK SH TRM REMOV (W) (4")	3,052		L.F.
WRK ZN PAV MRK GDMRK (W)	763		EA.
GD RAIL EN ABS TERM (2.5') (6 BAY) TY CZ	6		EA.
ELIM. EXT PAV. MRK	2,250		L.F.
ROCK FILTER DAMS (TY I)	550		LF.
* CONST. EXIT (TY 2)	660		SY.
METAL BEAM GD FEN (12 GA) (TIM POST)	200		L.F.
TERM ANCHOR SECT (12 GA)	1		EA.
SINGLE GUARDRAIL TERMINALS	1		EA.
CONSTR DETOUR (CL 2)	3		EA.
SOIL RETENTION BLANKET (CL 2)(TY F)	527		SY.

SEQUENCE OF WORK^s
PHASE I

- 1.) REPAIR 10' SHOULDER AND CONSTRUCT ACCELERATION LANES AT THE ENTRANCE RAMPS ON THE SOUTHBOUND LANE.
- 2.) OVERLAY OUTSIDE 26'S OF SOUTHBOUND LANE.
- 3.) MOVE SOUTHBOUND TRAFFIC TO OUTSIDE 26'S. PLACE PCTB ON INSIDE OF NORTHBOUND AND SOUTHBOUND LANES, LEAVING OPENINGS WITH GREAT (TY CZ) AT VARIOUS LOCATIONS (6) TO BE USED FOR CONTRACTOR'S ACCESS TO CENTER MEDIAN.
- 4.) CONSTRUCT CENTER SECTION THROUGH ACP(TY C). CONSTRUCT PARALLEL AND CROSS DRAINAGE STRUCTURES IN THE CENTER SECTION. SET UP TEMPORARY INLETS TO MAINTAIN DRAINAGE.



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P.E. 71682, on

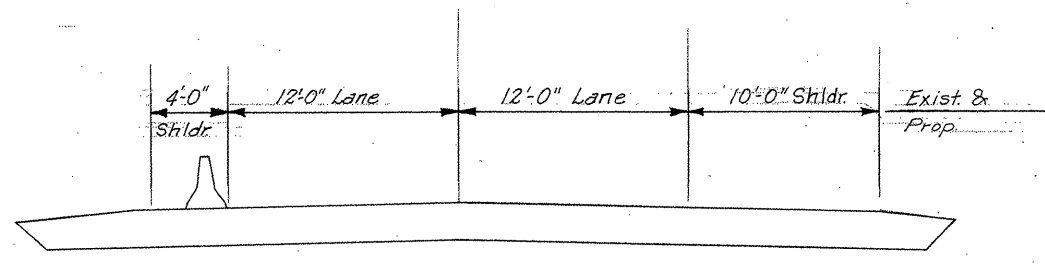
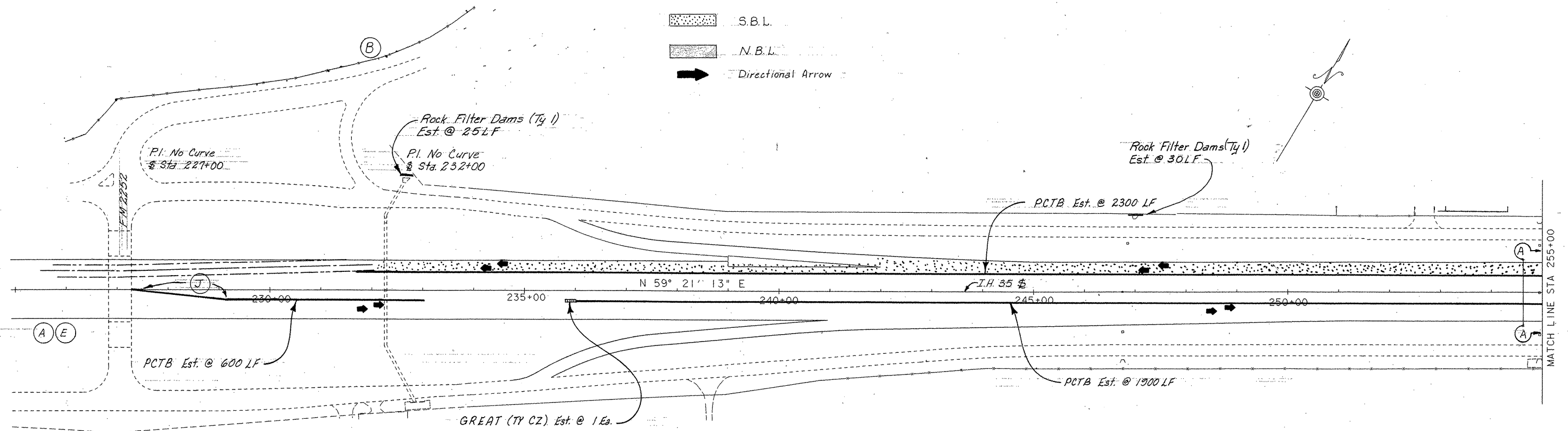
6/9, 1995.
Gregory A. Malatek, P.E.

§ CHANGE ORDER NO. 4
PHASE I
BARRICADE & DETOUR LAYOUT

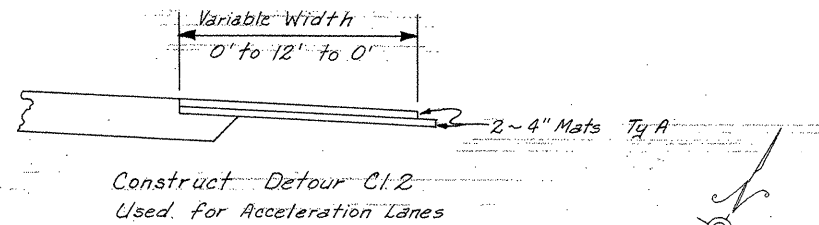
* PLACEMENT OF CONSTRUCTION EXITS TO BE DETERMINED IN THE FIELD OR AS DIRECTED BY THE ENGINEER.

SHEET 1 OF 7			
ED. NO.	FEDERAL AID PROJECT NO.	SHEET NO.	
DIV. NO.			
6	NH 95 (40) IM	9	
STATE	STATE DIST. NO.	COUNTY	
TEXAS	15	COMAL	
CONT.	SECT.	JOB	HIGHWAY NO.
0016	05	087	1H 35

S.B.L.
N.B.L.
Directional Arrow

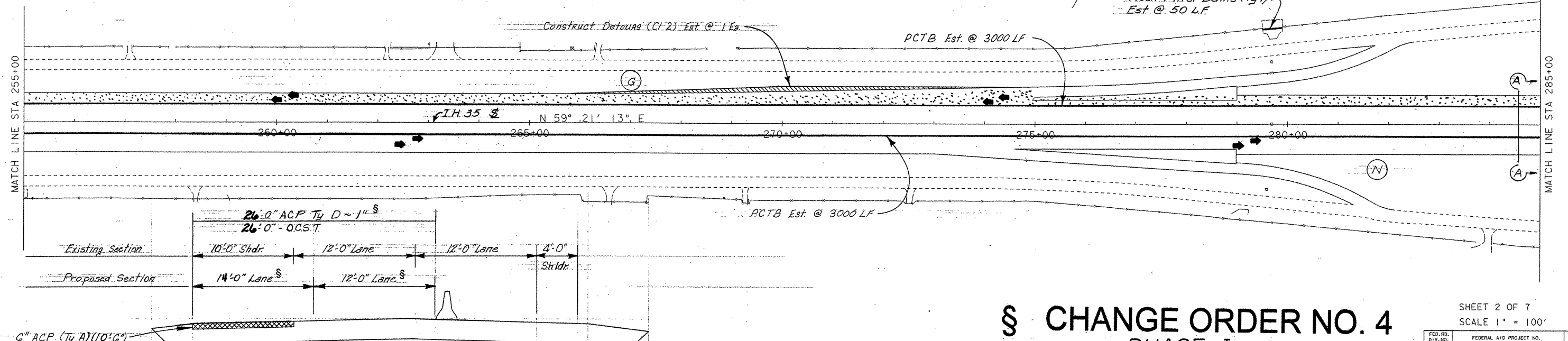


Typical Section (N.B.L.) A-A
Detour Phase I



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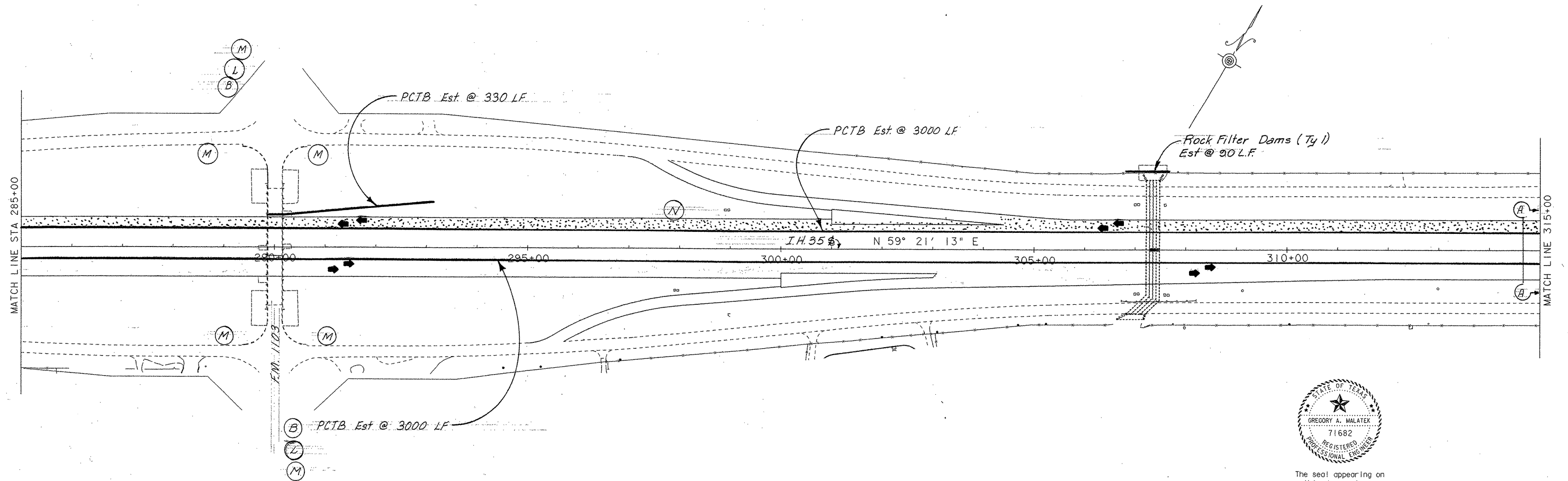


Typical Section (S.B.L.) A-A
Detour Phase I

§ CHANGE ORDER NO. 4 PHASE I DETOUR & BARRICADE LAYOUT

SHEET 2 OF 7
SCALE 1" = 100'

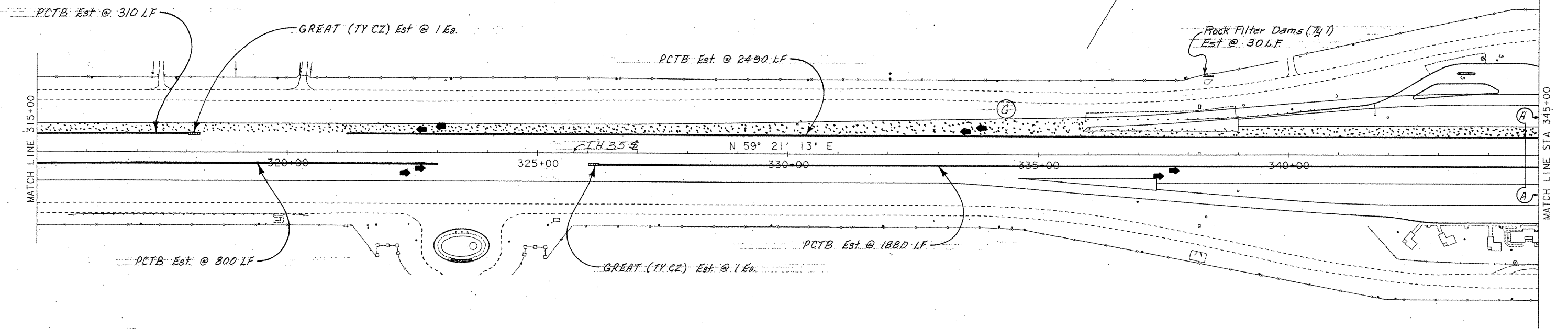
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6	NH 95 (40) IM	10
STATE	COUNTY	
TEXAS	COMAL	
CONT.	SECT.	JOB
0016	05	087
	HI	35



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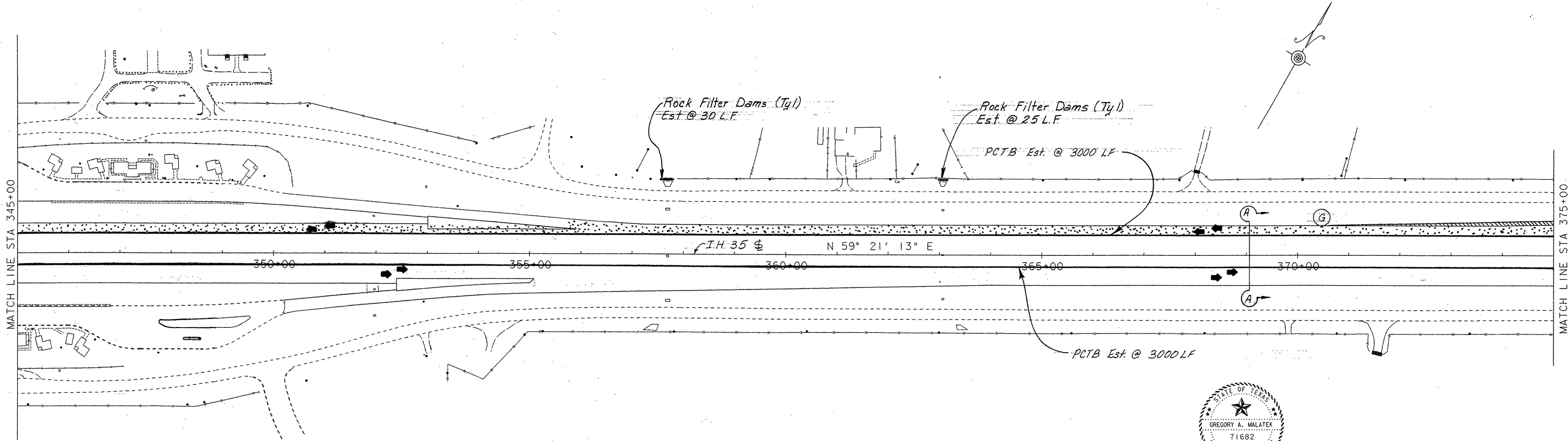
PHASE I DETOUR & BARRICADE LAYOUT

SHEET 3 OF 7
SCALE 1" = 100'

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	NH 25 (40) IM		11
STATE	STATE DIST. NO.	COUNTY	
TEXAS	15	COMAL	
CONT.	SECT.	JOB	HIGHWAY NO.
0016	05	087	IH 35

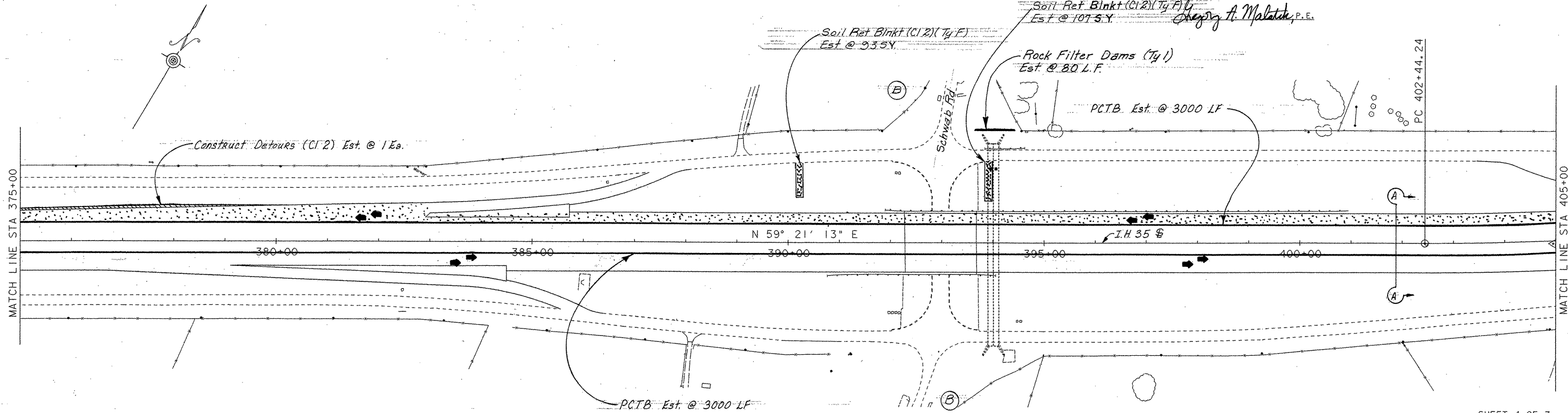
MATCH LINE STA 345+00

MATCH LINE STA 375+00



MATCH LINE STA 375+00

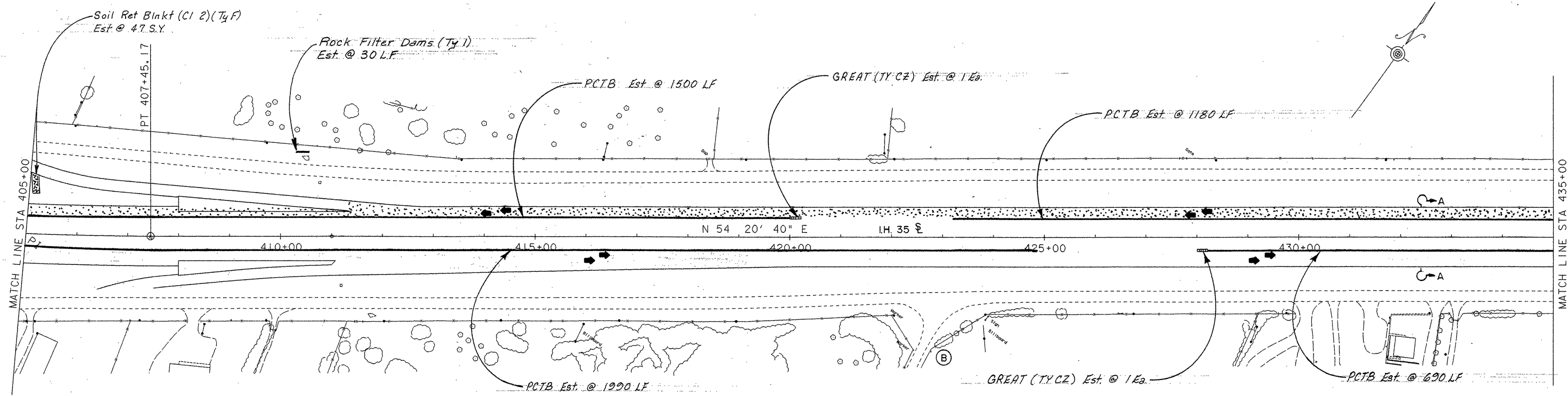
MATCH LINE STA 405+00



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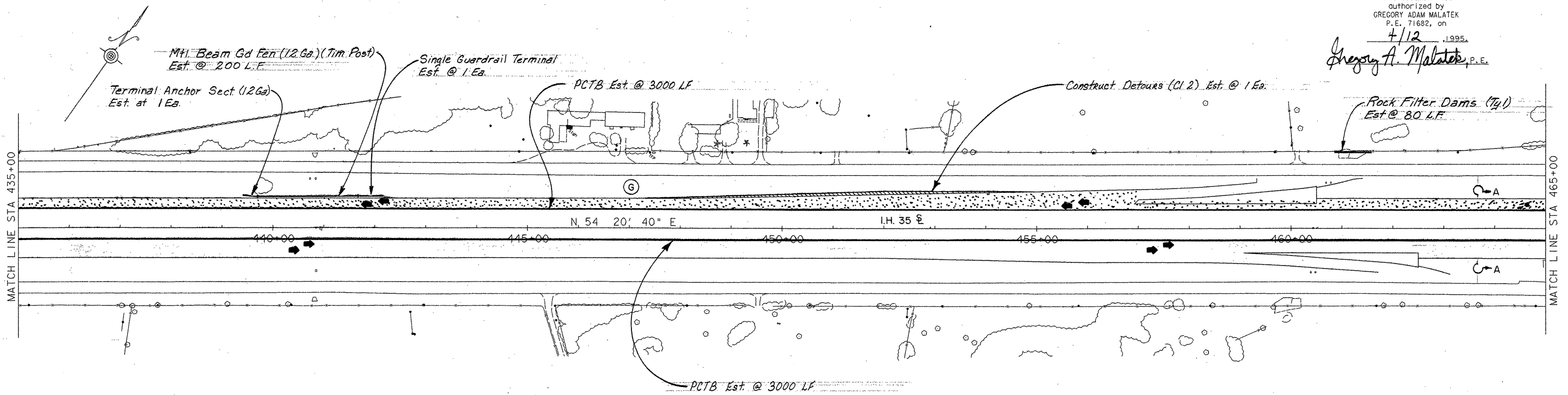
PHASE I DETOUR & BARRICADE LAYOUT

SHEET 4 OF 7		SCALE 1" = 100'	
FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	STATE	SHEET NO.
6	NH 95 (40) IM	TEXAS	12
STATE DIST. NO.	COUNTY	CONT.	HIGHWAY NO.
15	COMAL	0016	05
SECT.	JOB	087	IH 35



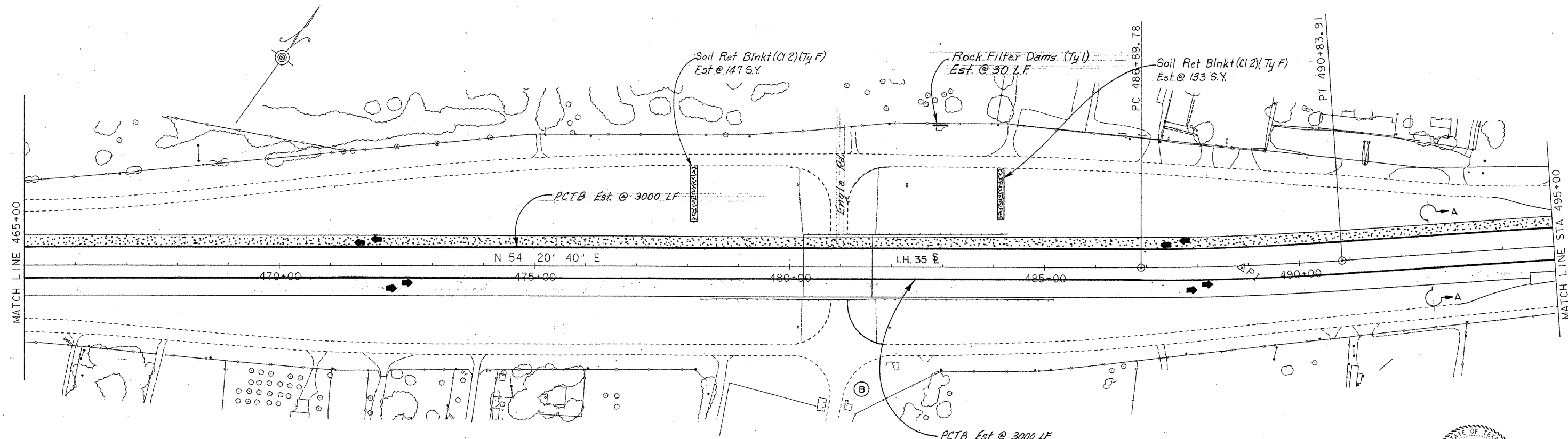
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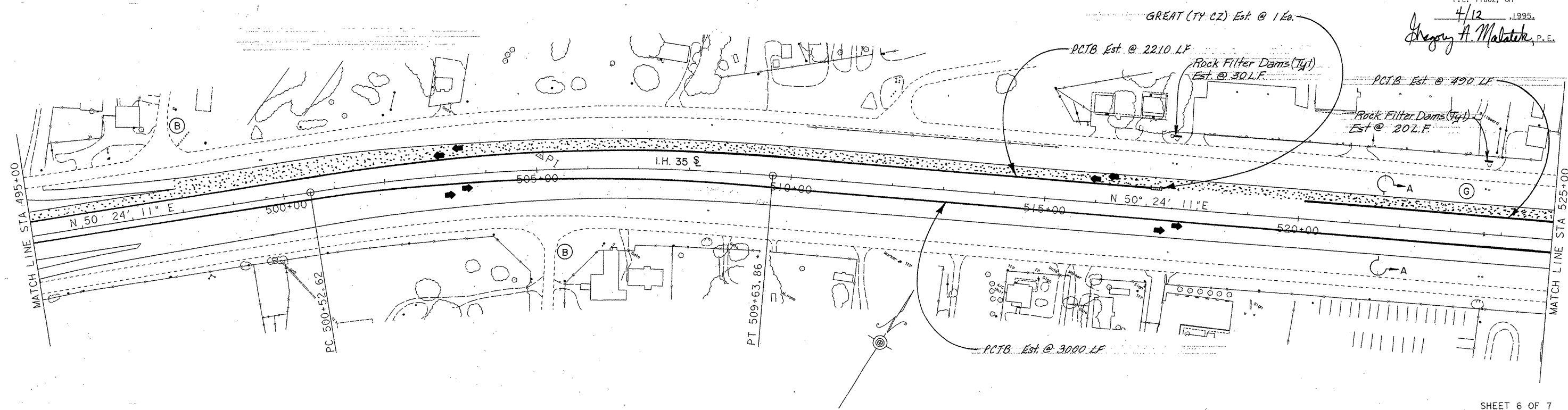
PHASE I DETOUR & BARRICADE LAYOUT

SHEET 5 OF 7			
SCALE 1" = 100'			
FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.	
6	NH 05 (40) IM	13	
STATE	STATE DIST. NO.	COUNTY	
TEXAS	15	COMAL	
CONT.	SECT.	JOB	HIGHWAY NO.
0016	05	087	IH 35



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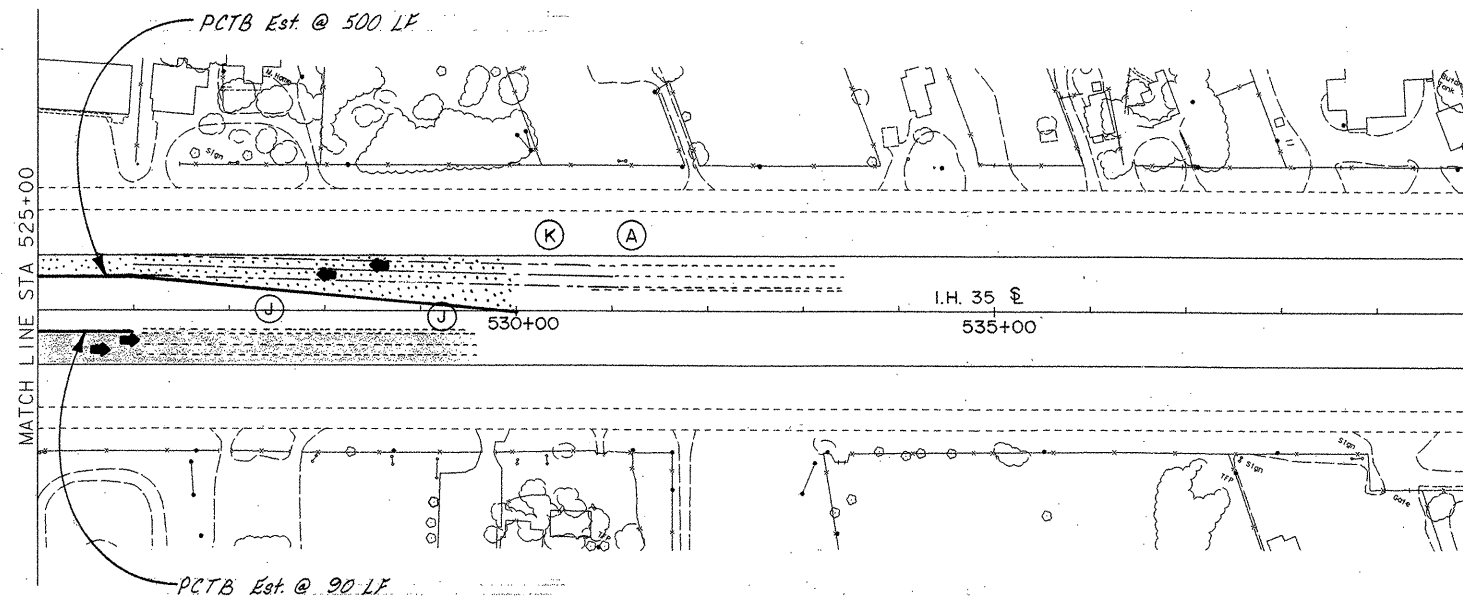
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PHASE I DETOUR & BARRICADE LAYOUT

SHEET 6 OF 7
 SCALE 1" = 100'

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.
6	NH 95 (40) IM	14
STATE	STATE DIST. NO.	COUNTY
TEXAS	15	COMAL
CONT.	SECT.	JOB
0016	05	087
		HI 35



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PHASE I DETOUR & BARRICADE LAYOUT

SHEET 7 OF 7
SCALE 1" = 100'

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.			SHEET NO.
6	NH 95 (40)	IM		15
STATE	STATE DIST. NO.	COUNTY		
TEXAS	15	COMAL		
CONT.	SECT.	JOB	HIGHWAY NO.	
0016	05	087	IH 35	

DETOUR STRIPING LOCATION

SBL STA. 227+00 TO 532+00 WRK ZN PAV MRK NON-REMOV (W) (4") (SLD) EST @ 30,300 L.F.
WRK ZN PAV MRK NON-REMOV (W) (4") (BRK) EST @ 7,580 L.F.
WRK ZN PAV MRK NON-REMOV (Y) (4") (SLD) EST @ 30,300 L.F.

SBL RAMPs WRK ZN PAV MRK NON-REMOV (W) (ENTR. GORE) EST @ 7 EA.
WRK ZN PAV MRK NON-REMOV (W) (EXIT GORE) EST @ 9 EA.

DETOUR BUTTON LOCATION

SBL STA. 227+00 TO 530+00 WRK ZN PAV MRK REMOV (CL B) TY I-A EST @ 758 EA.
WRK ZN PAV MRK REMOV (CL B) TY I-C EST @ 869 EA.
WRK ZN PAV MRK REMOV (CL B) TY II C-R EST @ 758 EA.
WRK ZN PAV MRK REMOV (CL C) TY W EST @ 3,032 EA.

G.R.E.A.T.S.

SBL EXIT RAMPs GD RAIL EN ABS TERM (MOVE & RESET) TY CZ EST @ 5 EA.

NOTE: TO BE PLACED AS RAMPs ARE CONSTRUCTED
AND OPENED UP TO TRAFFIC

* PLACEMENT OF CONSTRUCTION EXITS TO BE
DETERMINED IN THE FIELD OR AS DIRECTED
BY THE ENGINEER.

ESTIMATED QUANTITIES			
DESCRIPTION	PLAN	FINAL	UNIT
PORT CONC TRAF BAR (STKPL, INSTL & RETURN)	6,780		L.F.
WRK ZN PAV MRK REMOV (CL B) TY I-A	758		EA.
WRK ZN PAV MRK REMOV (CL B) TY I-C	869		EA.
WRK ZN PAV MRK REMOV (CL B) TY II C-R	758		EA.
WRK ZN PAV MRK REMOV (CL C) TY W	3,032		EA.
WRK ZN PAV MRK NON-REMOV (W) (4") (SLD)	30,300		L.F.
WRK ZN PAV MRK NON-REMOV (W) (4") (BRK)	7,580		L.F.
WRK ZN PAV MRK NON-REMOV (W) (ENTR GORE)	7		EA.
WRK ZN PAV MRK NON-REMOV (W) (EXIT GORE)	9		EA.
WRK ZN PAV MRK NON-REMOV (Y) (4") (SLD)	30,300		L.F.
PORT CONC TRAF BAR (MOVE & RESET)	34,740		L.F.
GD RAIL EN ABS TERM (TY CZ) (M&R)	7		EA.
CONST DETOUR CL 2	2		EA.
ROCK FILTER DAMS (TY 5)	1,365		L.F.
* CONSTRUCT EXIT	220		S.Y.
ELIM EXT PAV MRK & MRKR (4")	2,600		L.F.
MODULAR GLARE SCREEN	800		L.F.
PORT CONC TRAF BAR (FURN & INST)	23,840		L.F.
GABION MATT (12")(GALV)	272		S.Y.

SEQUENCE OF WORK
PHASE II

- 1.) PLACE PCTB ON RIGHT SIDE OF CONSTRUCTED CENTER SECTION AS SHOWN ON THE BARRICADE AND DETOUR LAYOUTS. CONSTRUCT DETOURS AT BEGINNING & END PROJECT.
- 2.) MOVE SOUTHBOUND TRAFFIC TO CENTER SECTION AS SHOWN ON THE BARRICADE AND DETOUR LAYOUTS. PLACE PCTB ON OUTSIDE OF SOUTHBOUND LANE.
- 3.) CONSTRUCT OUTSIDE OF SOUTHBOUND LANE THROUGH ACP TY C. CONSTRUCT PARALLEL AND CROSS DRAINAGE STRUCTURES TO THE LEFT OF SURVEY LINE.
- 4.) OPEN RAMPs ON SOUTHBOUND LANES AS THEY ARE COMPLETED.



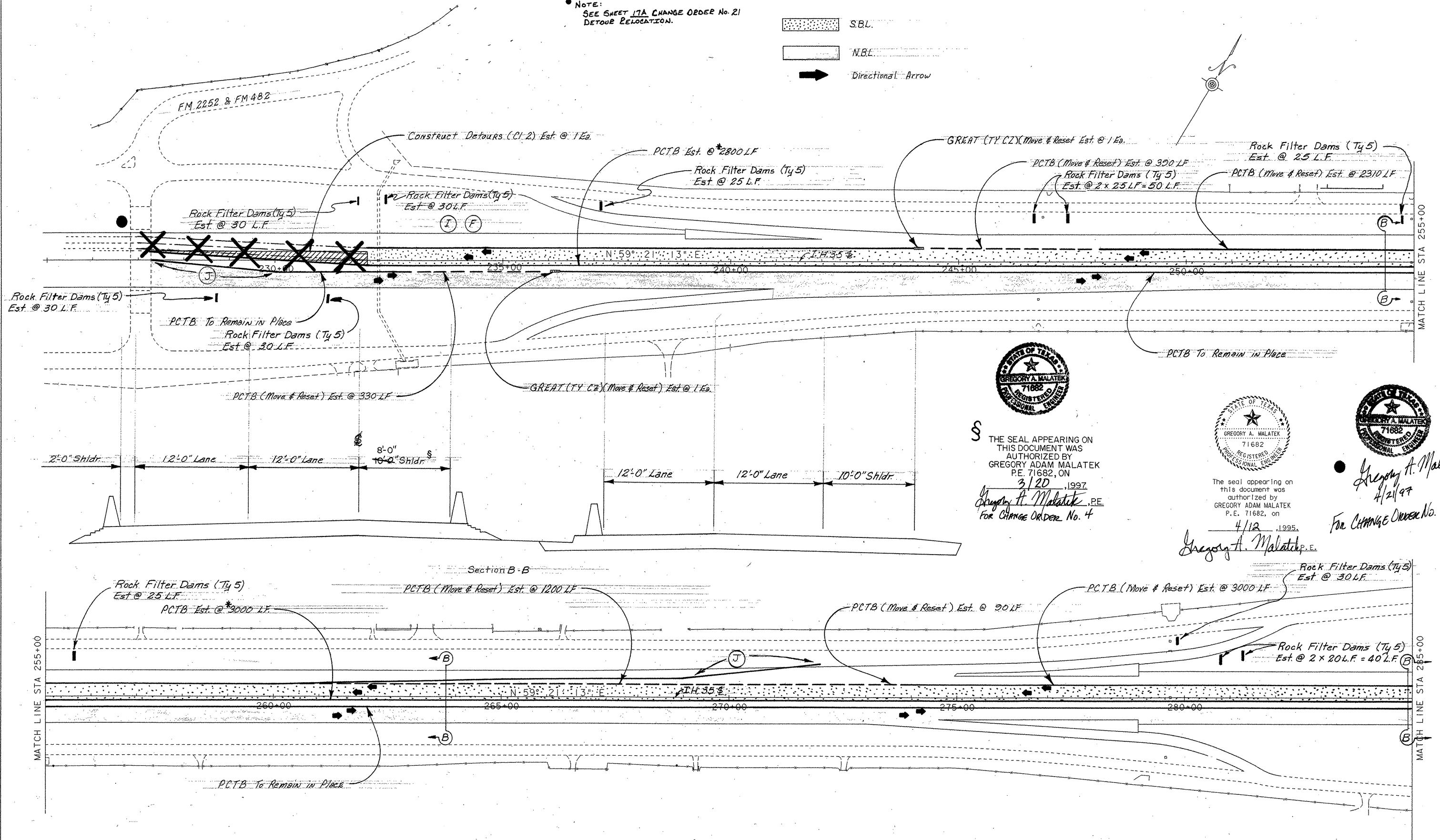
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PHASE II
BARRICADE & DETOUR LAYOUT

SHEET 1 OF 7			
ED. NO.	FEDERAL AID PROJECT NO.	SHEET NO.	
6	NH 95 (40) IM	16	
STATE	STATE DIST. NO.	COUNTY	
TEXAS	15	COMAL	
CONT.	SECT.	JOB	HIGHWAY NO.
0016	05	087	1H 35

NOTE:
SEE SHEET 17A CHANGE ORDER NO. 21
DETOUR RELOCATION.

SBL
NBL
Directional Arrow

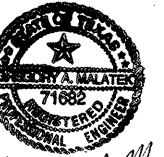


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Gregory A. Malatek, P.E. 4/2/97 FOR CHANGE ORDER NO. 21

CHANGE ORDER NO. 21
DETOUR RELOCATION

§ CHANGE ORDER NO. 4
PHASE II
DETOUR & BARRICADE LAYOUT

SHEET 2 OF 7
SCALE 1" = 100'

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.
6	NH 25(40) IM	17
STATE	STATE DIST. NO.	COUNTY
TEXAS	15	COMAL
CONT.	SECT.	JOB
0016	05	087
CONTRACT	SECTION	HIGHWAY NO.
0016	05	1H 35

• DETOUR CURVE DATA
23.50' P.T. & STA. 227+50
P.I. STA. 10+00

• DETOUR CURVE DATA
23.50' P.T. & STA. 229+00
P.I. STA. 11+50
L = 8°4'55.09" LT.
T = 85.1987'
L = 170.1147'
R = 1206.0000

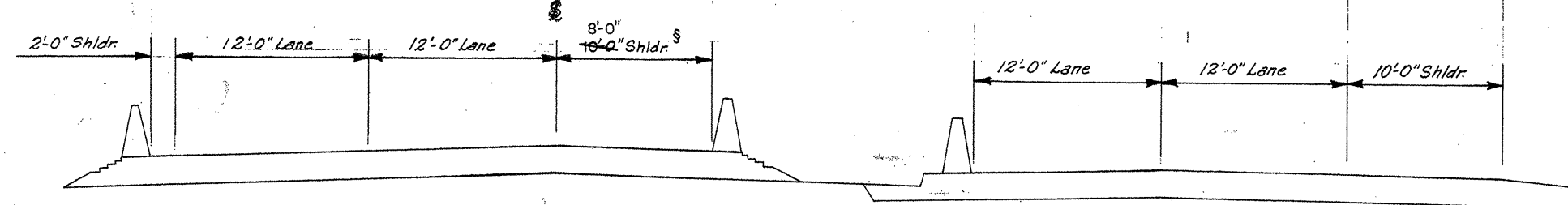
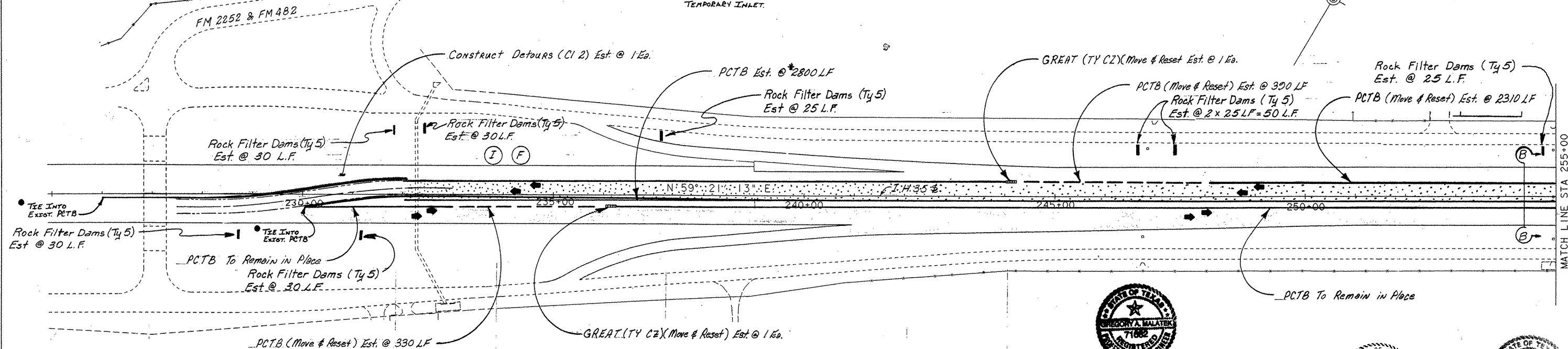
• DETOUR CURVE DATA
12.00' L.T. & STA. 231+50
P.I. STA. 14+02.2253
L = 8°4'55.09" P.T.
T = 85.1987'
L = 170.1147'
R = 1206.0000

• DETOUR CURVE DATA
12.00' L.T. & STA. 233+00
P.I. STA. 15+51.9427

S.B.L.
N.B.L.

Directional Arrow

NOTE:
AT STA. 230+00± SLOPE EXISTING
DITCH TO DRAIN INTO EXISTING
TEMPORARY INLET.



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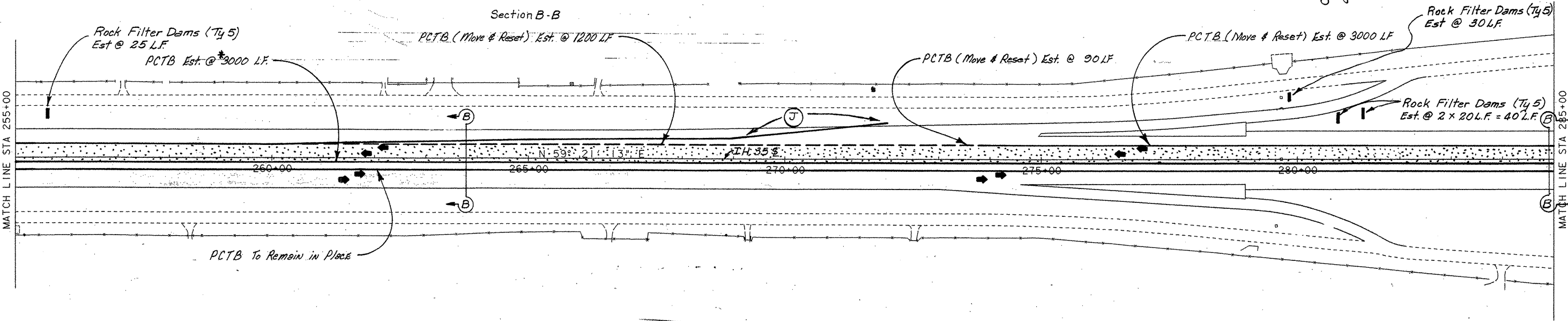


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4/21/97
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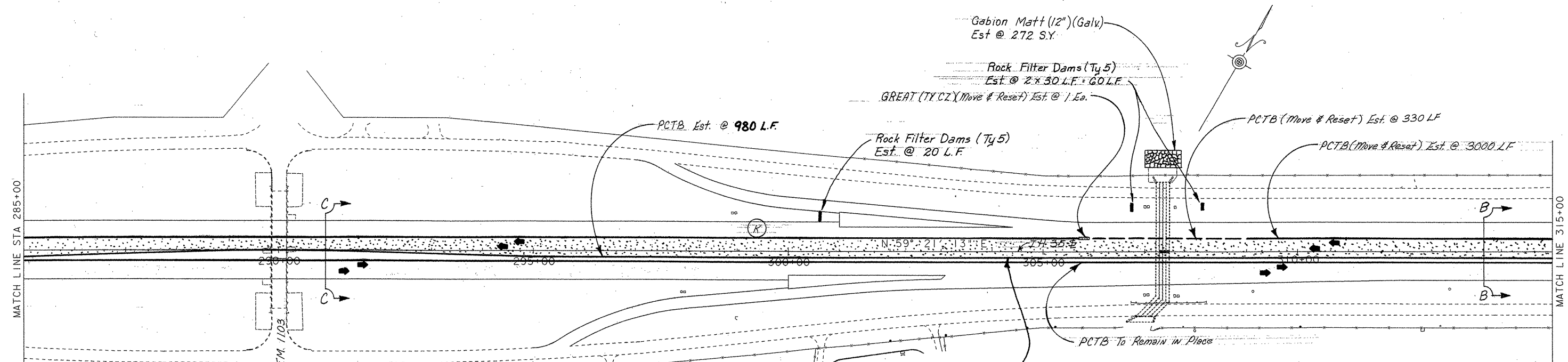


• CHANGE ORDER NO. 21
DETOUR RELOCATION

§ CHANGE ORDER NO. 4
PHASE II
DETOUR & BARRICADE LAYOUT

SHEET 2 OF 7
SCALE 1" = 100'

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.
6	NH 95 (40) IM	17A
STATE	STATE DIST. NO.	COUNTY
TEXAS	15	COMAL
CONT.	SECT.	JOB
0016	05	087
		HI 35



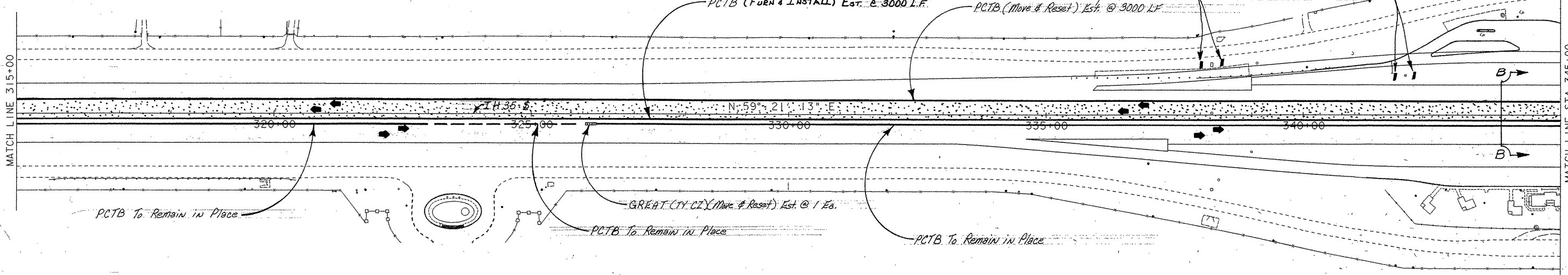
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11'-10" Lane 11'-10" Lane

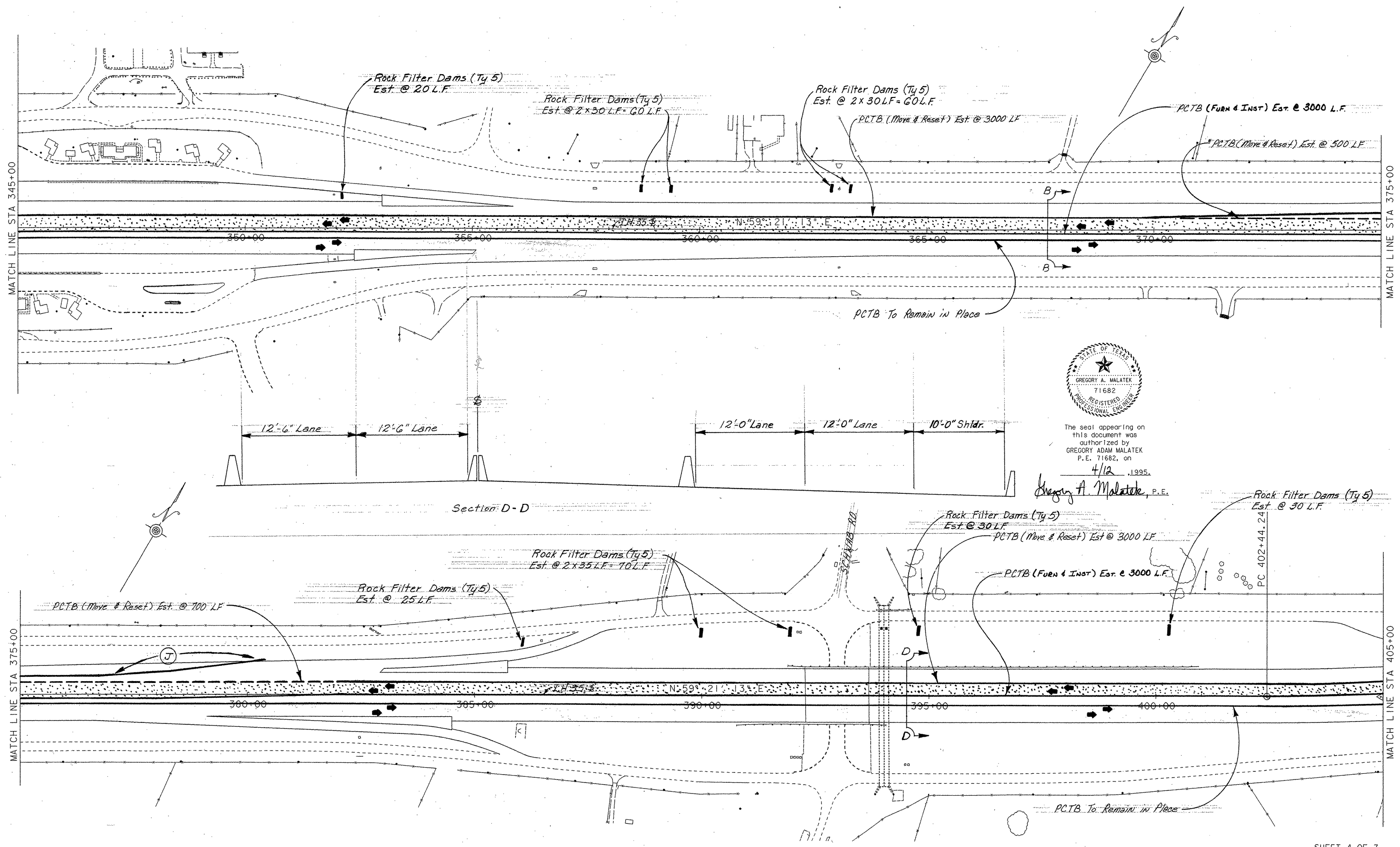
12'-0" Lane 12'-0" Lane 10'-0" Shoulder

Section C-C



PHASE II DETOUR & BARRICADE LAYOUT

SHEET 3 OF 7			
SCALE 1" = 100'			
FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	NH 95(40) IM		18
STATE	STATE DIST. NO.	COUNTY	
TEXAS	15	COMAL	
CONT.	SECT.	JOB	HIGHWAY NO.
0016	05	087	1H 35



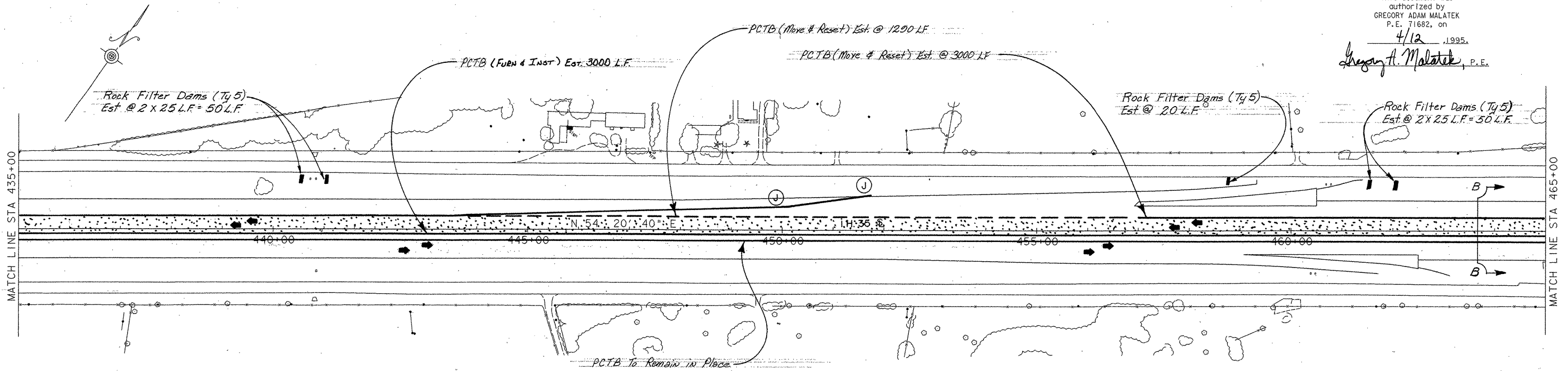
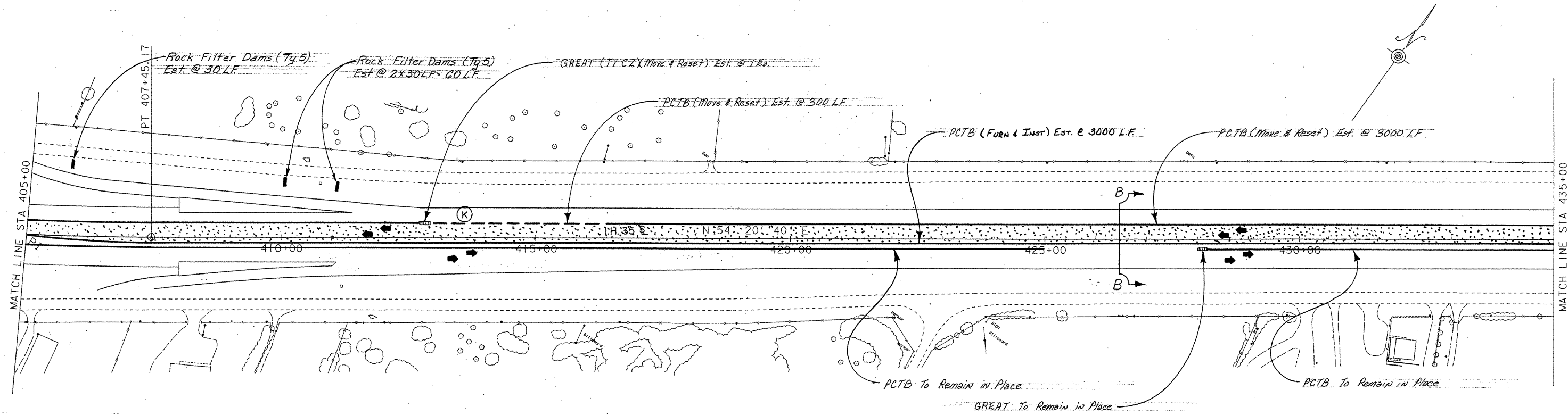
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PHASE II DETOUR & BARRICADE LAYOUT

SHEET 4 OF 7
SCALE 1" = 100'

FED. RD. DIV. NO.	6	FEDERAL AID PROJECT NO.	NH 25(40) IM	SHEET NO.	19
STATE	TEXAS	STATE DIST. NO.	15	COUNTY	COMAL
CONT.	0016	SECT.	05	JOB	087
				HIGHWAY NO.	1H 35



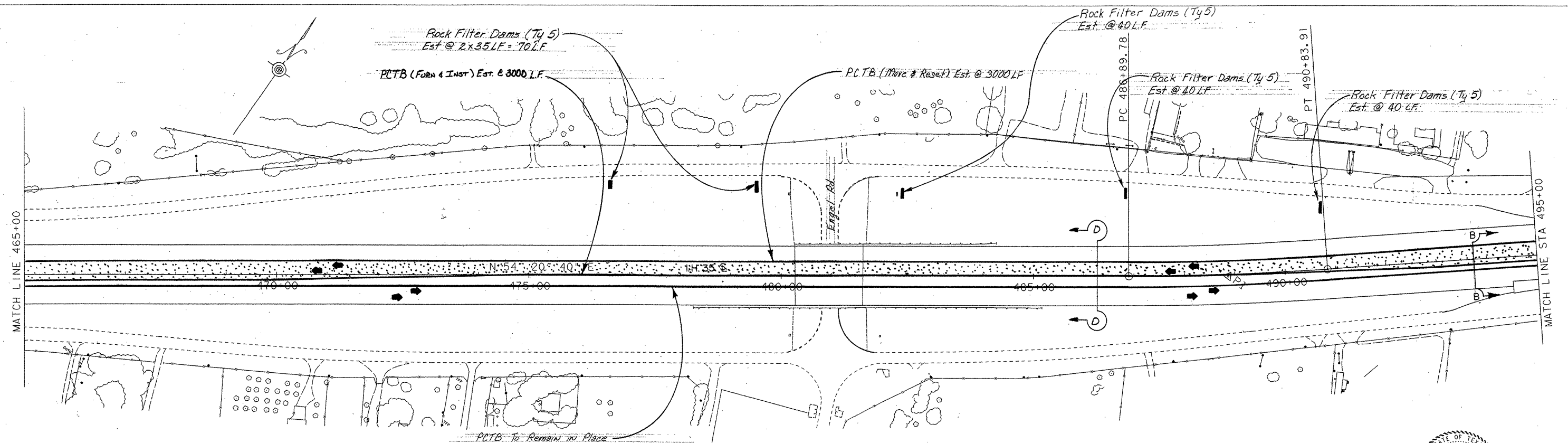
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PHASE II DETOUR & BARRICADE LAYOUT

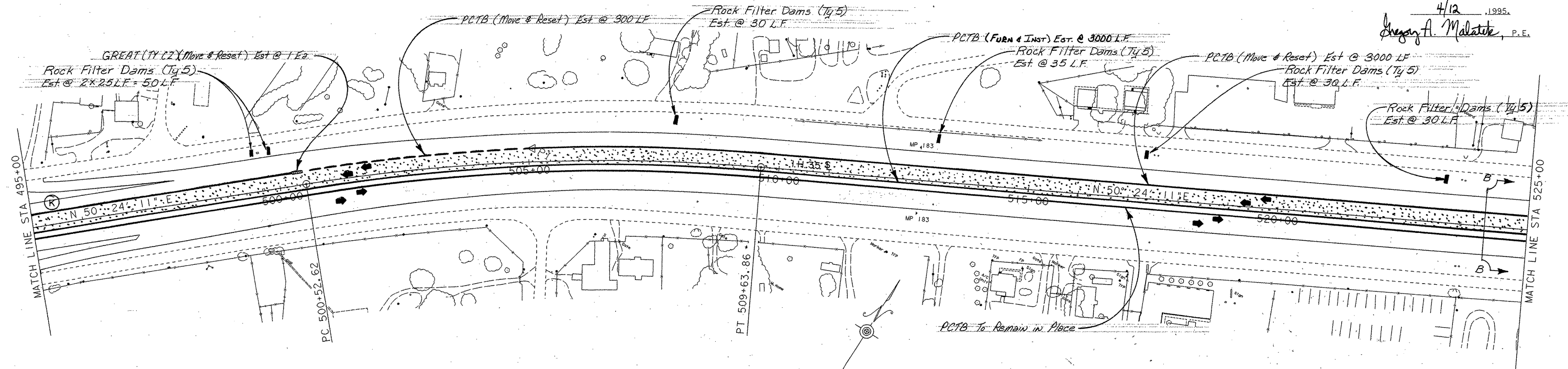
SHEET 5 OF 7
SCALE 1" = 100'

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	NH 95(40) IM		20
STATE	STATE DIST. NO.	COUNTY	
TEXAS	15	COMAL	
CONT.	SECT.	JOB	HIGHWAY NO.
0016	05	087	1H 35



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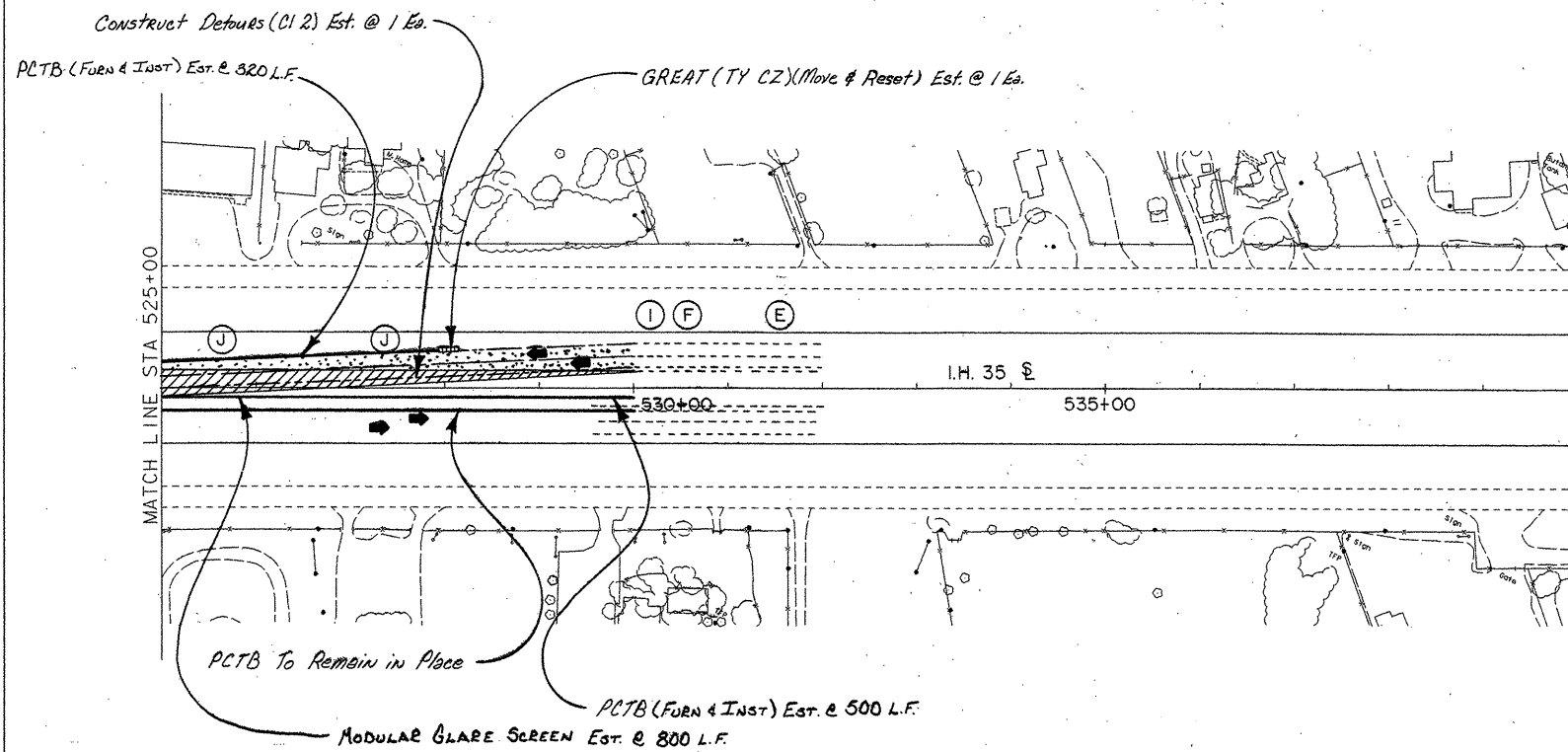
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PHASE II DETOUR & BARRICADE LAYOUT

SHEET 6 OF 7
SCALE 1" = 100'

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.
6	NH 25 (40) IM	21
STATE	COUNTY	
TEXAS	COMAL	
CONT.	SECT.	JOB
0016	05	087
		HIGHWAY NO.
		1H 35



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PHASE II DETOUR & BARRICADE LAYOUT

SHEET 7 OF 7
SCALE 1" = 100'

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.			SHEET NO.
6	NH 95 (40) IM			22
STATE	STATE DIST. NO.	COUNTY		
TEXAS	15	COMAL		
CONT.	SECT.	JOB	HIGHWAY NO.	
0016	05	087	IH 35.	

DETOUR STRIPING LOCATION

SBL STA. 227+00 TO 530+00 WRK ZN PAV MRK NON-REMOV (W) (4") (SLD) EST @ 30,300 L.F.
WRK ZN PAV MRK NON-REMOV (W) (4") (BRK) EST @ 7,580 L.F.
WRK ZN PAV MRK NON-REMOV (Y) (4") (SLD) EST @ 30,300 L.F.

*SBL (CENTER) STA. 227+00 to 532+00 ELIM ET PAV MRK & MRKER (4") EST. @ 61,000 L.F.

NBL STA. 227+00 TO 532+00 WRK ZN PAV MRK NON-REMOV (W) (4") (SLD) EST @ 30,500 L.F.
WRK ZN PAV MRK NON-REMOV (y) (4") (sid) EST @ 30,500 L.F.

SBL RAMPS WRK ZN PAV MRK NON-REMOV (W) (ENTR. GORE) EST @ 4 EA.
WRK ZN PAV MRK NON-REMOV (W) (EXIT GORE) EST @ 5 EA.

NBL RAMPS WRK ZN PAV MRK NON-REMOV (W) (ENTR. GORE) EST @ 9 EA.
WRK ZN PAV MRK NON-REMOV (W) (EXIT GORE) EST @ 7 EA.

DETOUR BUTTON LOCATION

SBL STA. 227+00 TO 530+00 WRK ZN PAV MRK REMOV (CL B) TY I-A EST @ 758 EA.
WRK ZN PAV MRK REMOV (CL B) TY I-C EST @ 868 EA.
WRK ZN PAV MRK REMOV (CL B) TY II C-R EST @ 758 EA.
WRK ZN PAV MRK REMOV (CL C) TY W EST @ 3,032 EA.

NBL STA. 227+00 TO 532+00 WRK ZN PAV MRK REMOV (CL B) TY I-A EST @ 763 EA.
WRK ZN PAV MRK REMOV (CL B) TY I-C EST @ 763 EA.
WRK ZN PAV MRK REMOV (CL B) TY II C-R EST @ 763 EA.

G.R.E.A.T.S.

NBL EXIT RAMPS GD RAIL EN ABS TERM (MOVE & RESET) TY CZ EST @ 4 EA.

NOTE: TO BE PLACED AS RAMPS ARE CONSTRUCTED
AND OPENED UP TO TRAFFIC

* PLACEMENT OF CONSTRUCTION EXITS TO BE
DETERMINED IN THE FIELD OR AS DIRECTED
BY THE ENGINEER.

ESTIMATED QUANTITIES

DESCRIPTION	PLAN	FINAL	UNIT
WRK ZN PAV MRK REMOV (CL B) TY I-A	1,521		EA.
WRK ZN PAV MRK REMOV (CL B) TY I-C	1,631		EA.
WRK ZN PAV MRK REMOV (CL B) TY II C-R	1,521		EA.
WRK ZN PAV MRK REMOV (CL C) TY W	3,032		EA.
WRK ZN PAV MRK NON-REMOV (W) (4") (SLD)	60,800		L.F.
WRK ZN PAV MRK NON-REMOV (W) (4") (BRK)	7,580		L.F.
WRK ZN PAV MRK NON-REMOV (W) (ENTR GORE)	13		EA.
WRK ZN PAV MRK NON-REMOV (W) (EXIT GORE)	12		EA.
WRK ZN PAV MRK NON-REMOV (Y) (4") (SLD)	60,800		L.F.
PORT CONC TRAF BAR (MOVE & RESET)	11,310		L.F.
GD RAIL EN ABS TERM (TY CZ) (M&R)	7		EA.
CONST DETOURS (CL 2)	2		EA.
ROCK FILTER DAMS (TY 5)	820		L.F.
* CONSTRUCT EXIT	220		S.Y.
ELIM EXT PAV MRK	61,000		L.F.
MODULAR GLARE SCREEN (MOVE & RESET)	1,600		L.F.

SEQUENCE OF WORK
PHASE III

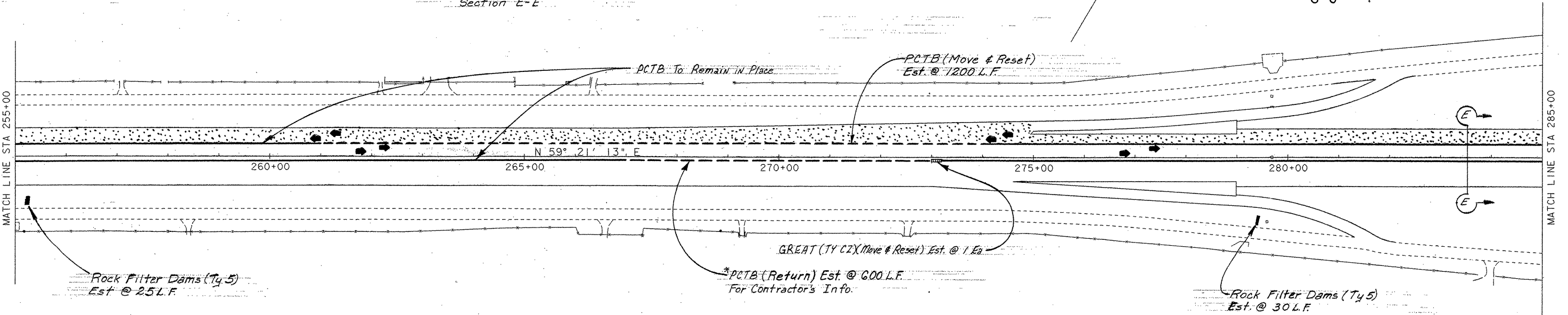
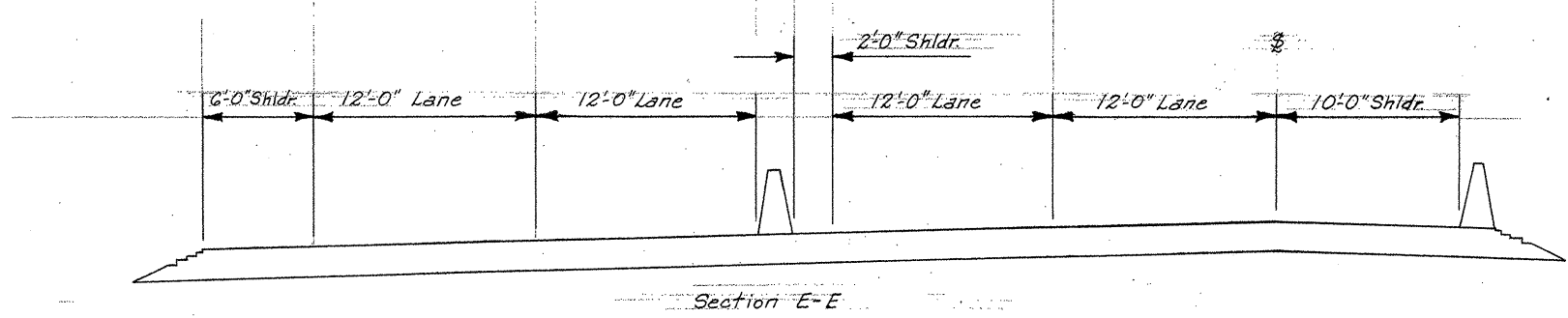
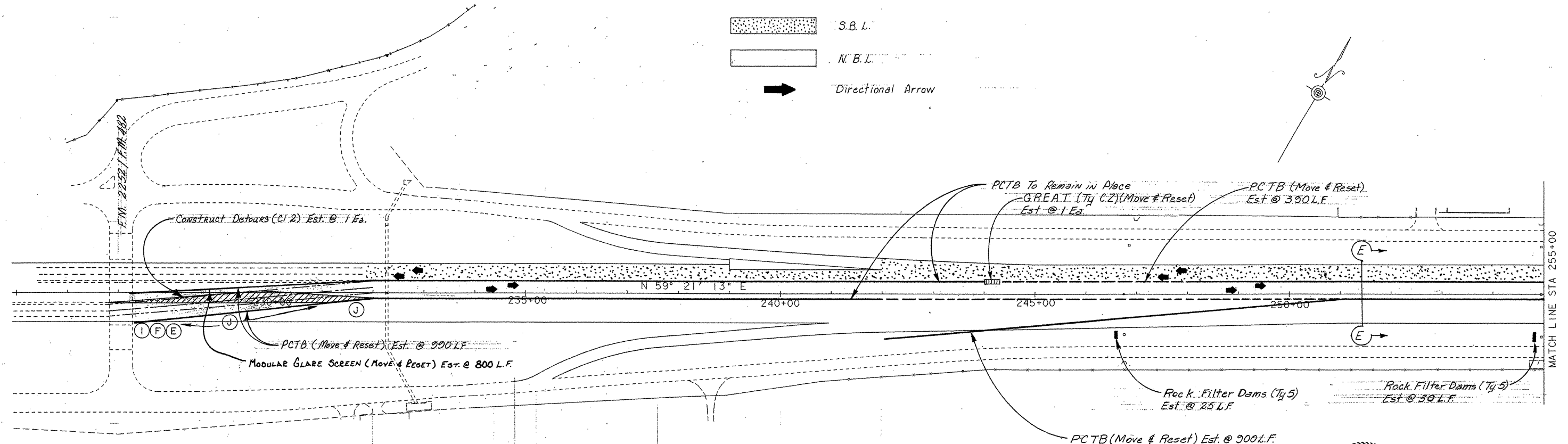
- 1.) BUILD DETOURS BEGINNING AND END PROJECT.
- 2.) CLOSE RAMPS ON THE SOUTHBOUND LANES AND REPLACE PCTB.
- 3.) MOVE SOUTHBOUND TRAFFIC LANE TO COMPLETED OUTSIDE SECTION.
- 4.) BUILD DETOURS BEGINNING AND END PROJECTS.
- 5.) RESTRIPE CENTER SECTION AND MOVE NORTHBOUND TRAFFIC AS SHOWN ON THE BARRICADE AND DETOUR LAYOUTS.
- 6.) CONSTRUCT NORTHBOUND LANES AND RAMPS THROUGH ACP TY C. COMPLETE PARALLEL AND CROSS DRAINAGE STRUCTURES. OPEN RAMP AS SOON AS POSSIBLE WHEN COMPLETE.



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PHASE III
BARRICADE & DETOUR LAYOUT

ED. RD. DIV. NO.		FEDERAL AID PROJECT NO.		SHEET NO.
6		NH 95 (40) IM		23
STATE	STATE DIST. NO.	COUNTY		
TEXAS	15	COMAL		
COT.	SECT.	JOB	HIGHWAY NO.	
0016	05	087	1H35	



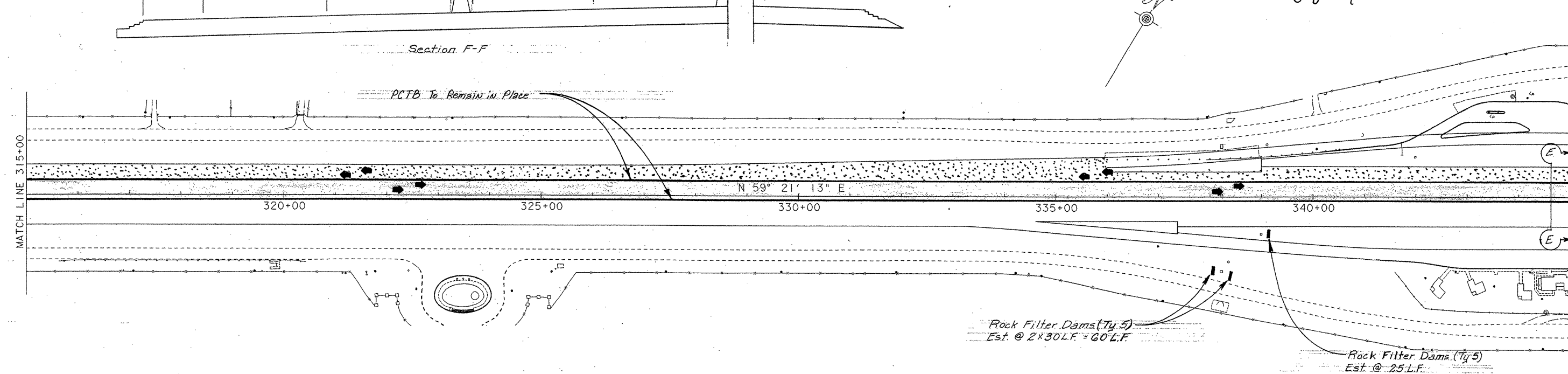
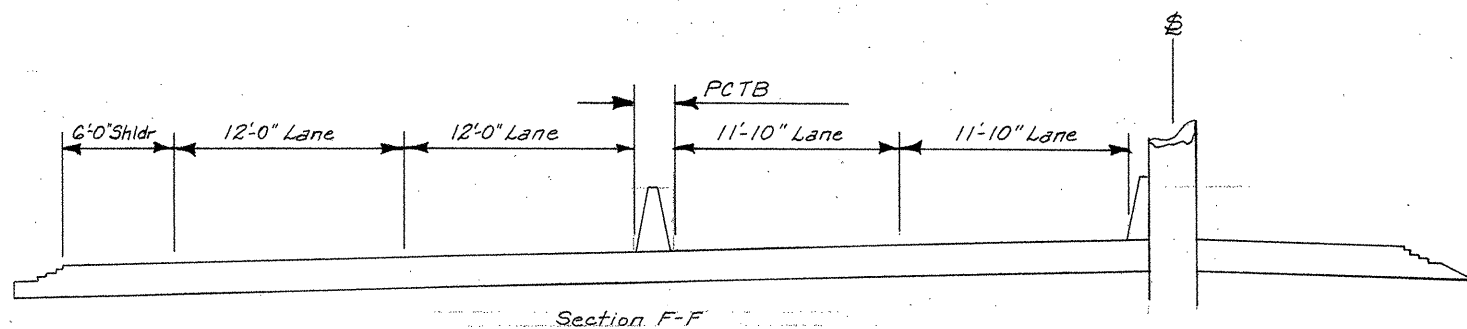
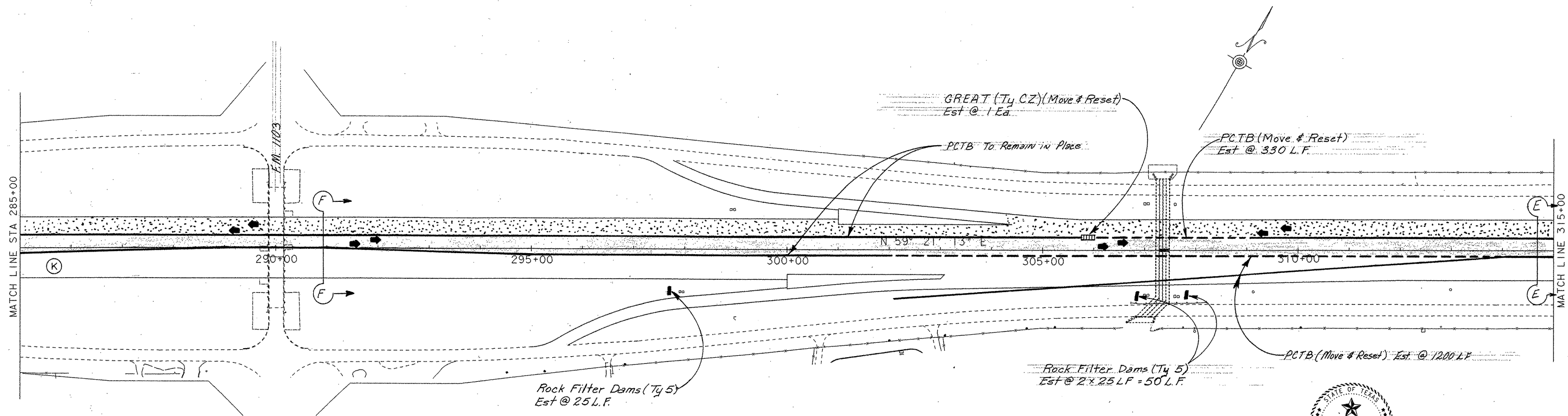
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PHASE III DETOUR & BARRICADE LAYOUT

SHEET 2 OF 7
SCALE 1" = 100'

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	NH 95(40)	IM	2A
STATE	STATE DIST. NO.	COUNTY	
TEXAS	15	COMAL	
CON.	SECT.	JOB	HIGHWAY NO.
0016	05	087	1H 35



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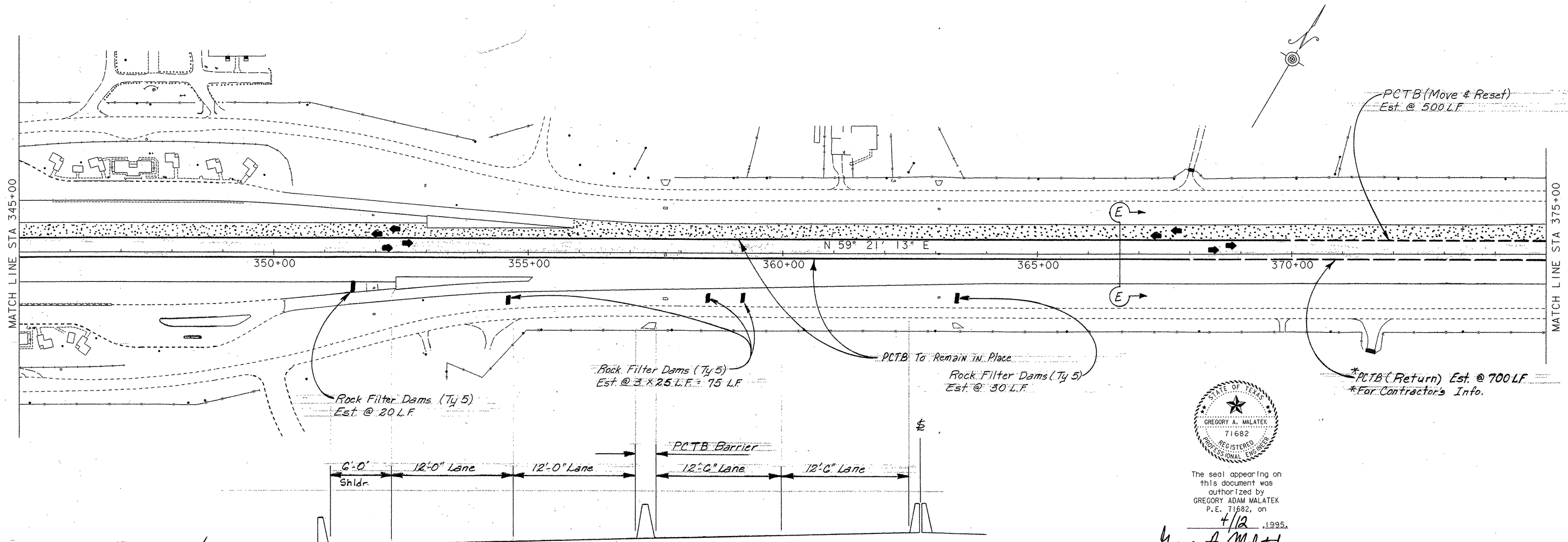
4/12, 1995.

Gregory A. Malatek, P.E.

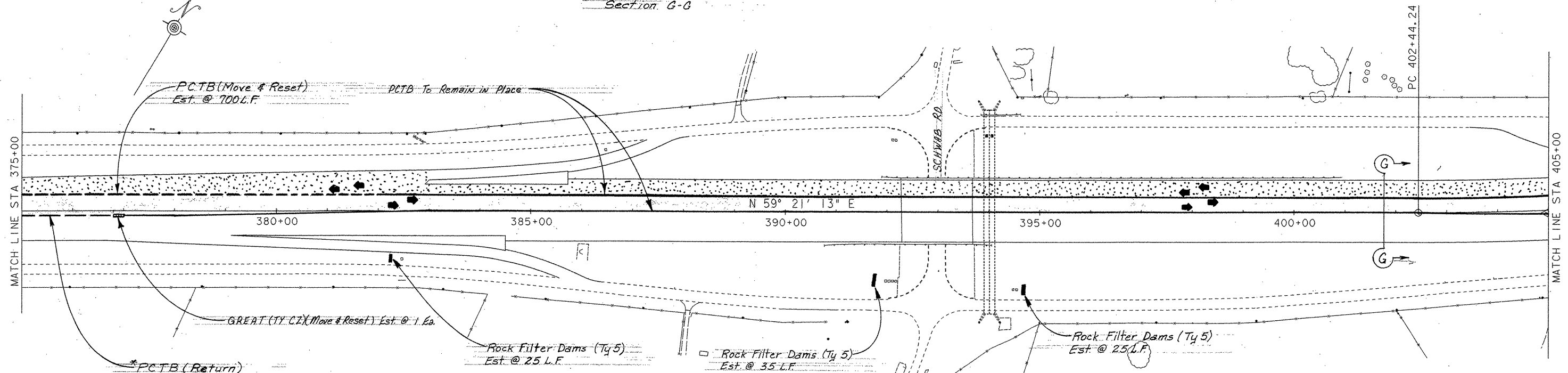
SHEET 3 OF 7
SCALE 1" = 100'

PHASE III DETOUR & BARRICADE LAYOUT

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	NH 95 (40) IM		25
STATE	STATE DIST. NO.	COUNTY	
TEXAS	15	COMAL	
CONT.	SECT.	JOB	HIGHWAY NO.
0016	05	087	1H 35

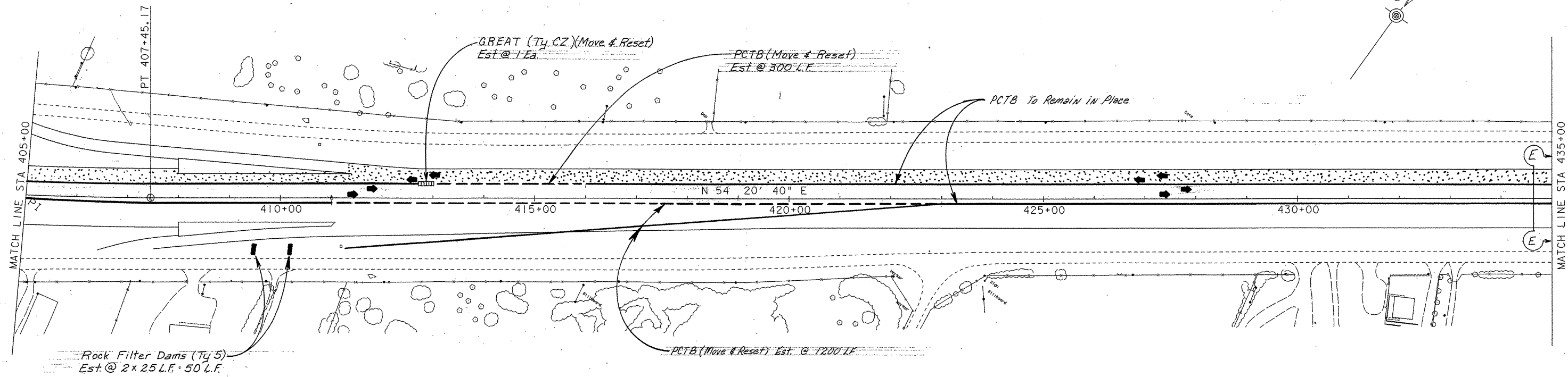


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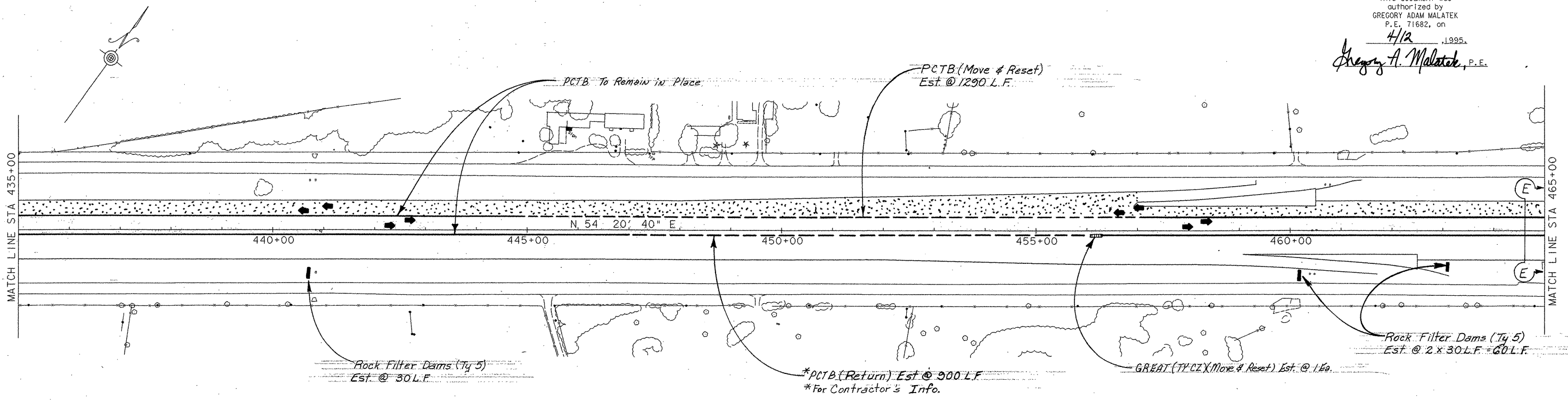
PHASE III DETOUR & BARRICADE LAYOUT

SHEET 4 OF 7		SCALE 1" = 100'	
FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	STATE DIST. NO.	SHEET NO.
6	NH 95 (40) IM	15	26
STATE	COUNTY	CONTRACT	SECTION
TEXAS	COMAL	0016	05
JOB	HIGHWAY NO.	087	1H 35



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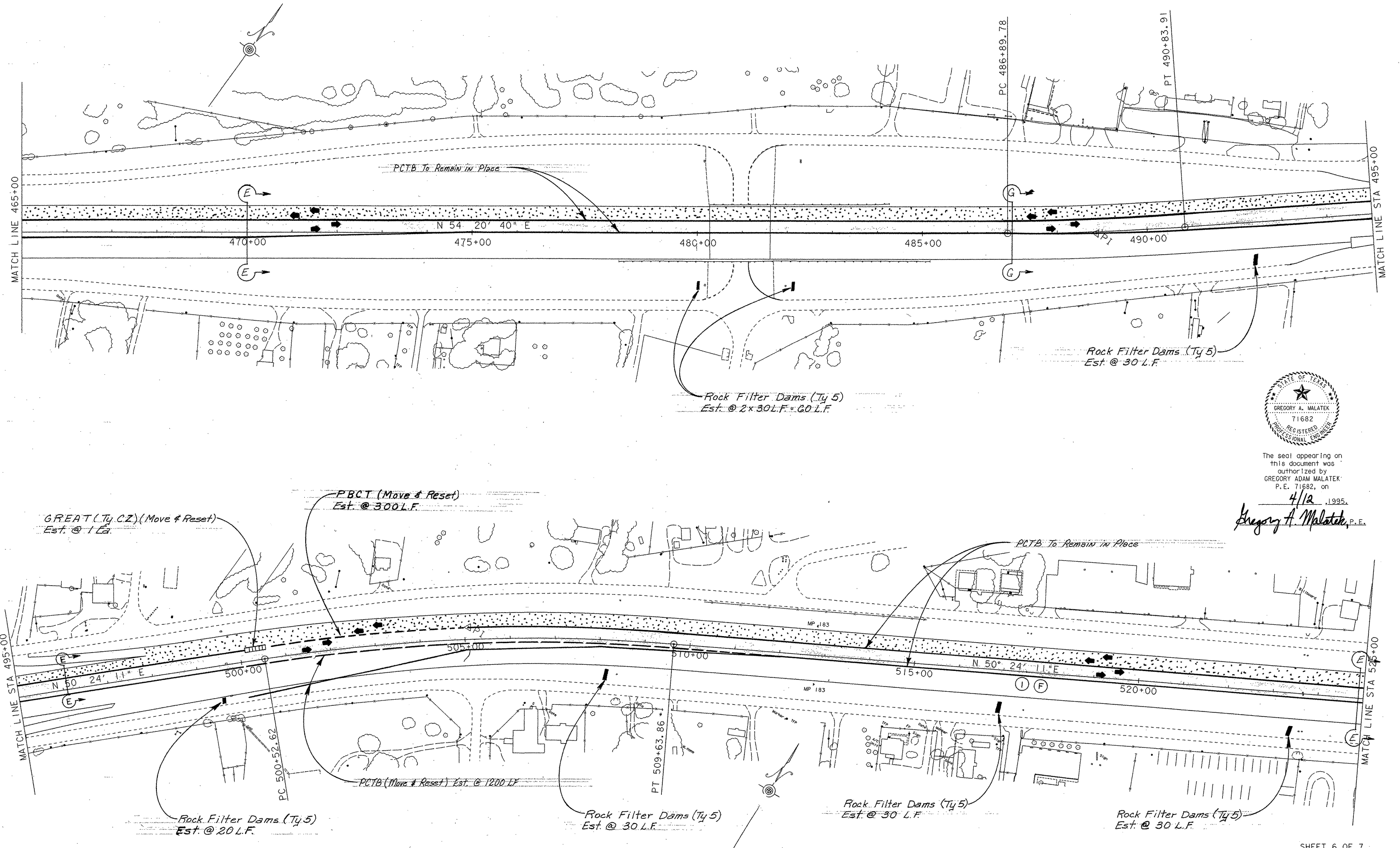
Gregory A. Malatek, P.E.



PHASE III DETOUR & BARRICADE LAYOUT

SHEET 5 OF 7
SCALE 1" = 100'

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.			SHEET NO.
6	NH 05 (40) IM			27
STATE	STATE DIST. NO.	COUNTY		
TEXAS	15	COMAL		
CONT.	SECT.	JOB	HIGHWAY NO.	
0016	05	087	1H 35	



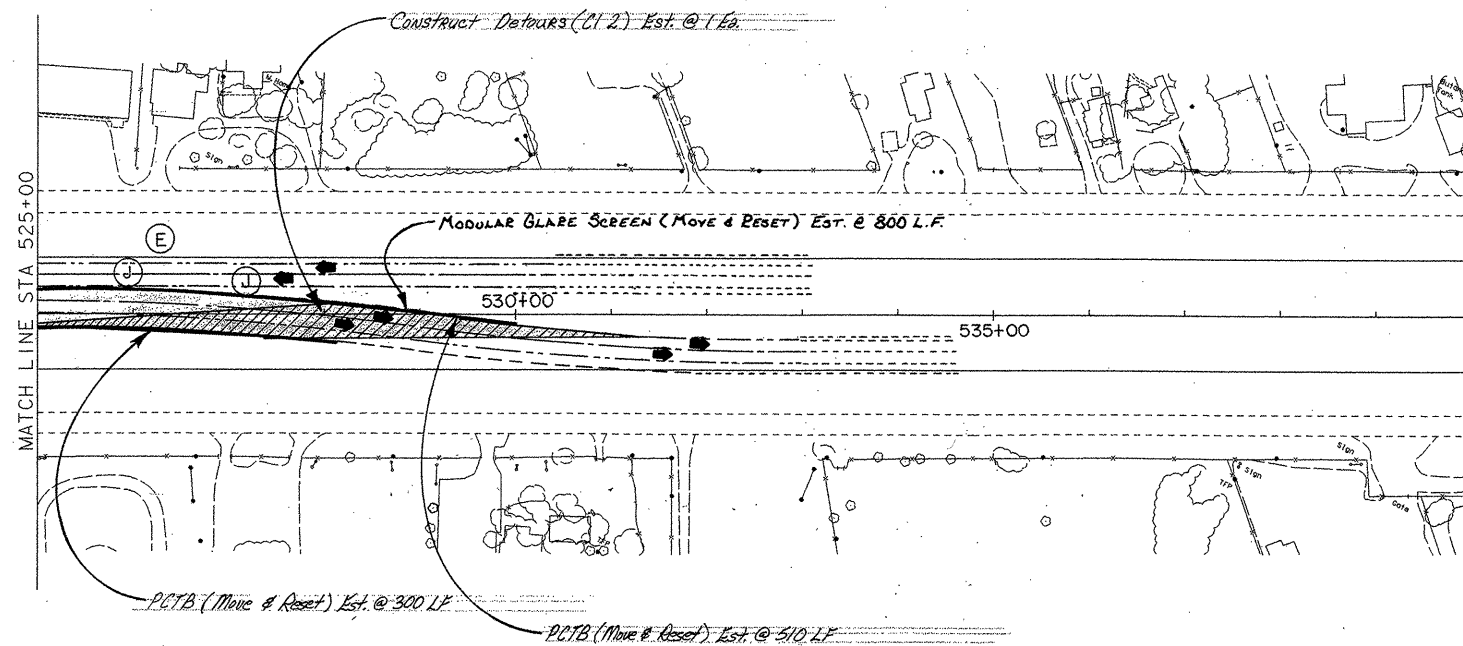
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PHASE III DETOUR & BARRICADE LAYOUT

SHEET 6 OF 7
SCALE 1" = 100'

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.
6	NH 95 (40) IM	28
STATE	STATE DIST. NO.	COUNTY
TEXAS	15	COMAL
CONT.	SECT.	JOB
0016	05	087
		HIGHWAY NO.
		1H 35



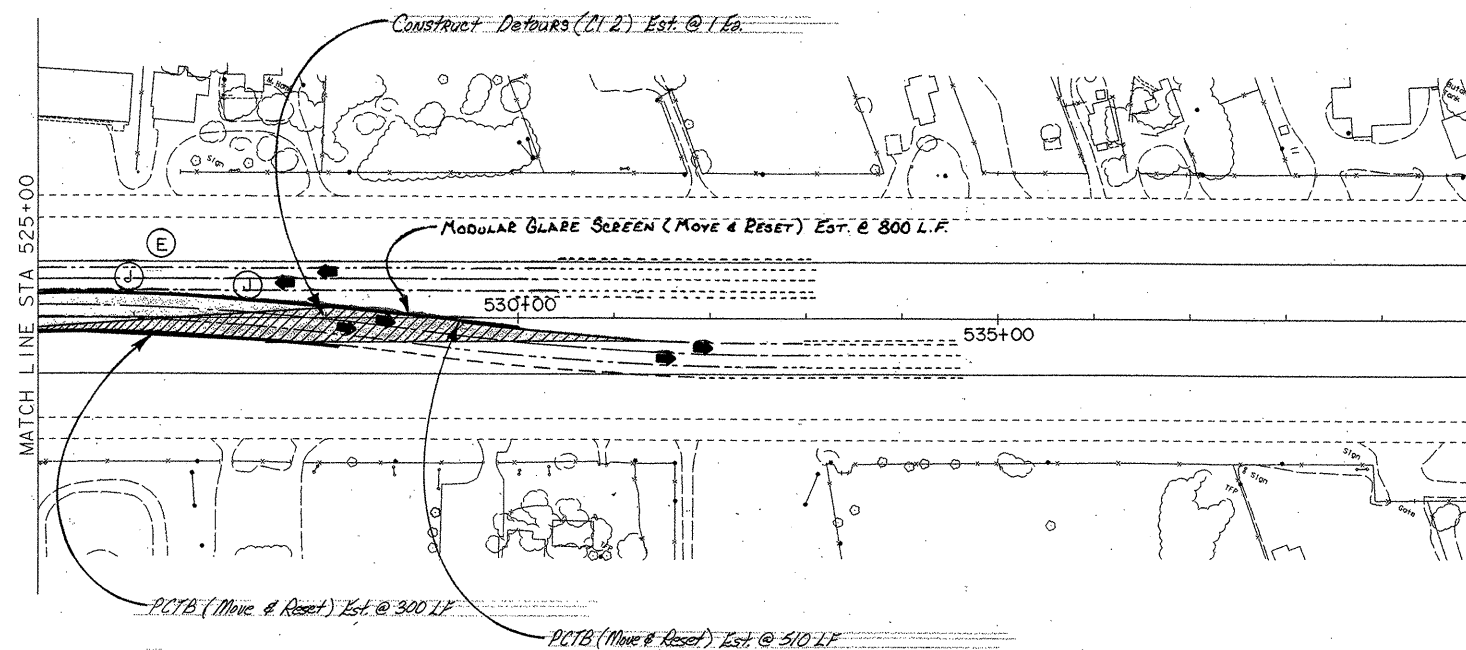
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PHASE III DETOUR & BARRICADE LAYOUT

SHEET 7 OF 7
SCALE 1" = 100'

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	NH 95 (40) IM		29
STATE	STATE DIST. NO.	COUNTY	
TEXAS	15	COMAL	
CONT.	SECT.	JOB	HIGHWAY NO.
0016	05	087	1H 35



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PHASE III DETOUR & BARRICADE LAYOUT

SHEET 7 OF 7
SCALE 1" = 100'

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.
6	NH 95 (40) IM	29
STATE	STATE DIST. NO.	COUNTY
TEXAS	15	COMAL
CONT.	SECT.	JOB
0016	05	087
		1H 35

DETOUR STRIPING LOCATION

SBL STA. 227+00 TO 532+00 WRK ZN PAV MRK NON-REMOV (W) (4") (SLD) EST @ 30,300 L.F.
WRK ZN PAV MRK NON-REMOV (W) (4") (BRK) EST @ 7,580 L.F.
WRK ZN PAV MRK NON-REMOV (Y) (4") (SLD) EST @ 30,300 L.F.

DETOUR BUTTON LOCATION

NBL STA. 227+00 TO 532+00 WRK ZN PAV MRK REMOV (CL B) TY I-A EST @ 763 EA.
WRK ZN PAV MRK REMOV (CL B) TY I-C EST @ 763 EA.
WRK ZN PAV MRK REMOV (CL B) TY II C-R EST @ 763 EA.
WRK ZN PAV MRK REMOV (CL C) TY W EST @ 3,052 EA.

ESTIMATED QUANTITIES

DESCRIPTION	PLAN	FINAL	UNIT
WRK ZN PAV MRK REMOV (CL B) TY I-A	763		EA.
WRK ZN PAV MRK REMOV (CL B) TY I-C	763		EA.
WRK ZN PAV MRK REMOV (CL B) TY II C-R	763		EA.
WRK ZN PAV MRK REMOV (CL C) TY W	3,052		EA.
WRK ZN PAV MRK NON-REMOV (W) (4") (SLD)	30,300		L. F.
WRK ZN PAV MRK NON-REMOV (W) (4") (BRK)	7,580		L. F.
WRK ZN PAV MRK NON-REMOV (Y) (4") (SLD)	30,300		L. F.
PORT CONC TRAF BAR (MOVE & RESET)	11,210		L. F.
GD RAIL EN ABS TERM (TY CZ) (M&R)	3		EA.
GD RAIL EN ABS TERM (TY CZ) (REMOVE)	6		EA.
WRK ZN PAV MRK GDMRK (W)	3,050		EA.
WRK ZN PAV MRK SH TRM REMOV (W) (4")	12,200		L. F.
REMOV METAL BEAM GUARD FENCE	200		EA.
REMOV TERMINAL-ANCHOR SECTION	1		EA.
SINGLE GUARDRAIL TERMINALS (REMOV)	1		EA.
ELIM EXT PAV MARK	1,950		L. F.

SEQUENCE OF WORK
PHASE IV

- 1.) WHEN NORTHBOUND LANES AND RAMPS ARE COMPLETE THROUGH ACP TY C, MOVE NBL TRAFFIC TO THE OUTSIDE AS SHOWN ON THE BARRICADE DETOUR LAYOUTS.
- 2.) RECONSTRUCT CENTERLINE CURB INLETS.
- 3.) CONSTRUCT PERMANENT BARRIER, ILLUMINATION, ETC.
- 4.) PLACE ACP TY C (SURF).



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* PLACEMENT OF CONSTRUCTION EXITS TO BE DETERMINED IN THE FIELD OR AS DIRECTED BY THE ENGINEER.

PHASE IV
BARRICADE & DETOUR LAYOUT

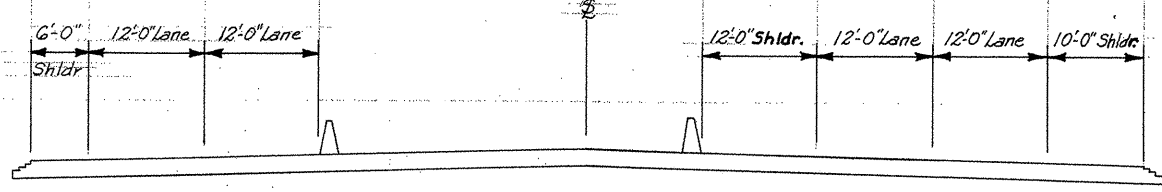
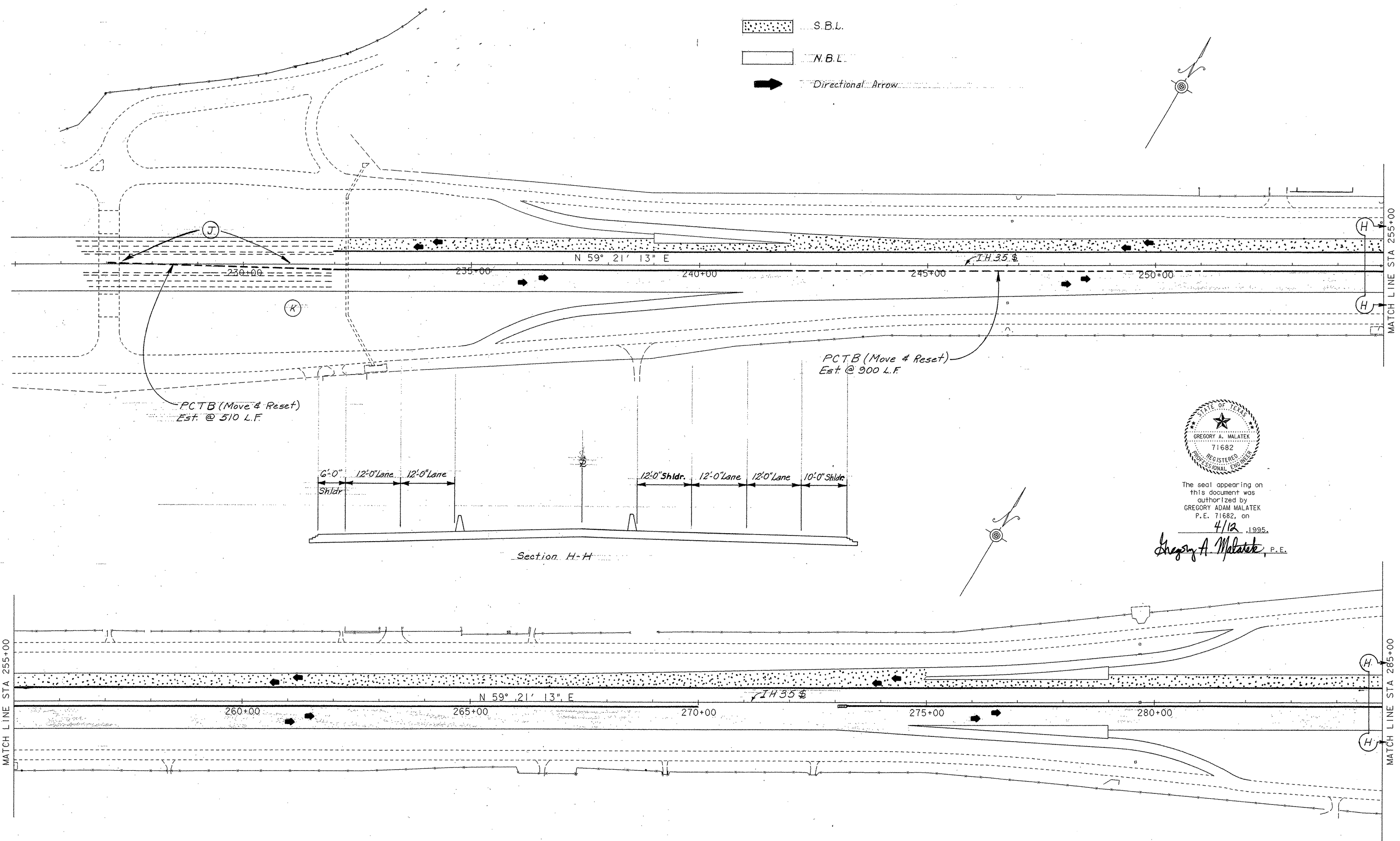
SHEET 1 OF 7

ED. RD. DIV. NO.	FEDERAL AID PROJECT NO.			SHEET NO.
6	NH 95 (40) IM			30
STATE	STATE DIST. NO.	COUNTY		
TEXAS	15	COMAL		
CONT.	SECT.	JOB	HIGHWAY NO.	
0016	05	087	1H 35	

S.B.L.

N.B.L.

Directional Arrow

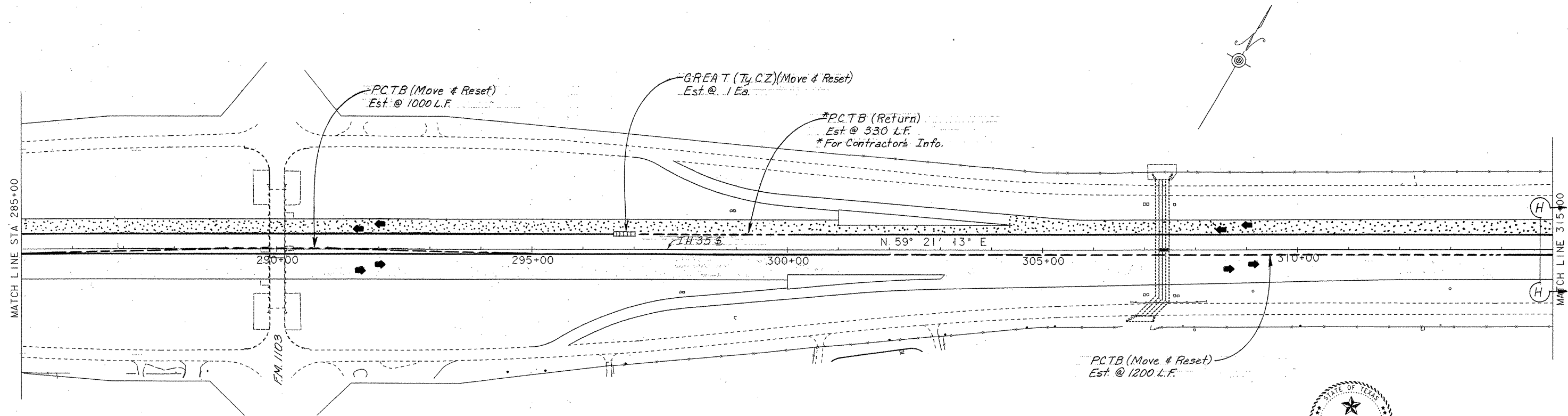


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PHASE IV DETOUR & BARRICADE LAYOUT

SHEET 2 OF 7
SCALE 1" = 100'

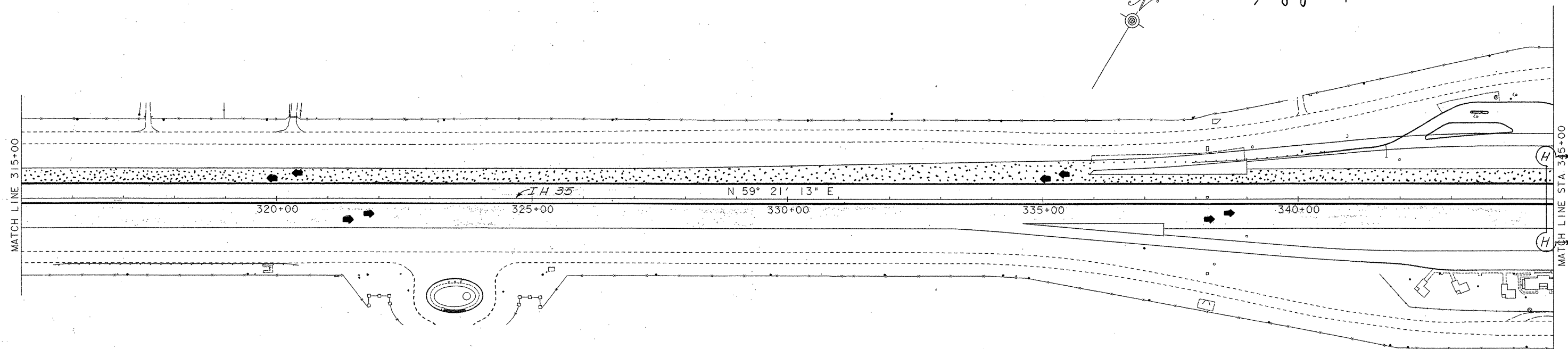
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6	NH 05 (40) IM			31
STATE	STATE DIST. NO.	COUNTY		
TEXAS	15	COMAL		
CONT.	SECT.	JOB	HIGHWAY NO.	
0016	05	087	IH 35	



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SHEET 3 OF 7
SCALE 1" = 100'

PHASE IV DETOUR & BARRICADE LAYOUT

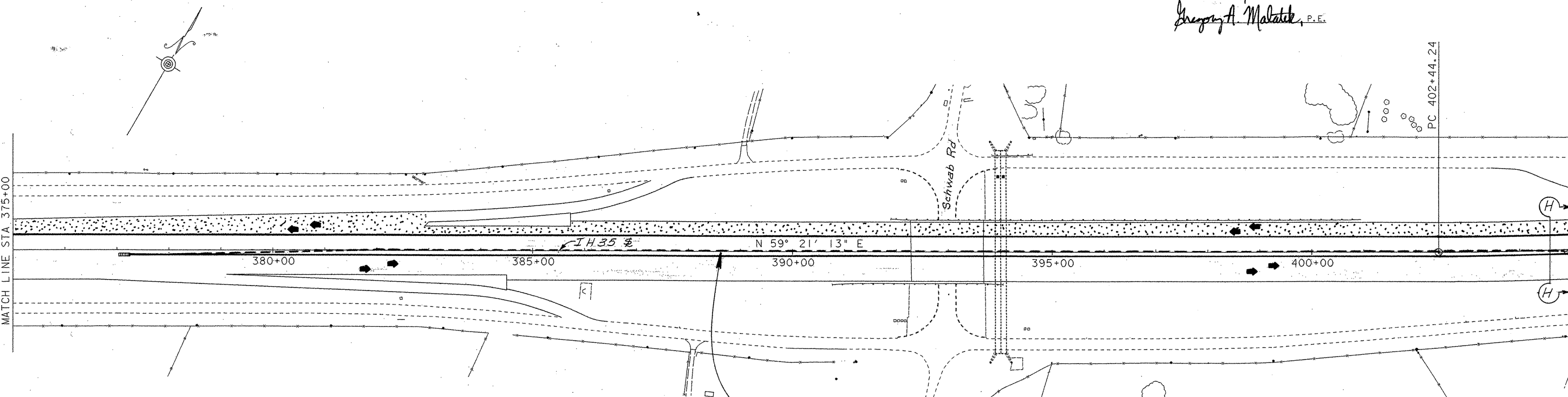
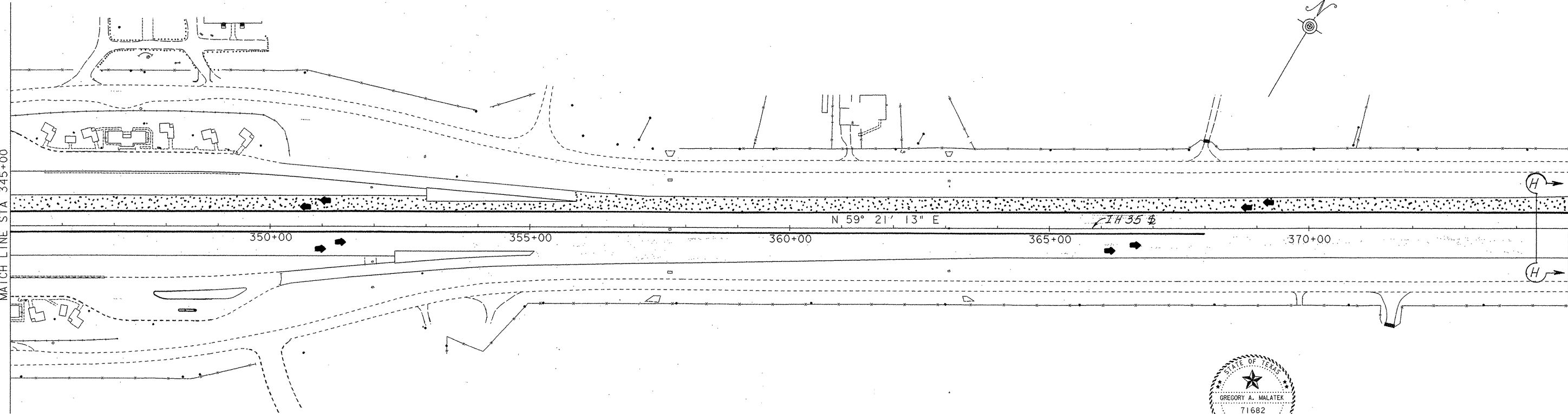
FED. RD. DIV. NO.	STATE	STATE DIST. NO.	FEDERAL AID PROJECT NO.	COUNTY	SHEET NO.
6	TEXAS	15	NH 95(40) IM	COMAL	32
0016	05	087	IH 35		

MATCH LINE STA 345+00

MATCH LINE STA 375+00

MATCH LINE STA 375+00

MATCH LINE STA 405+00



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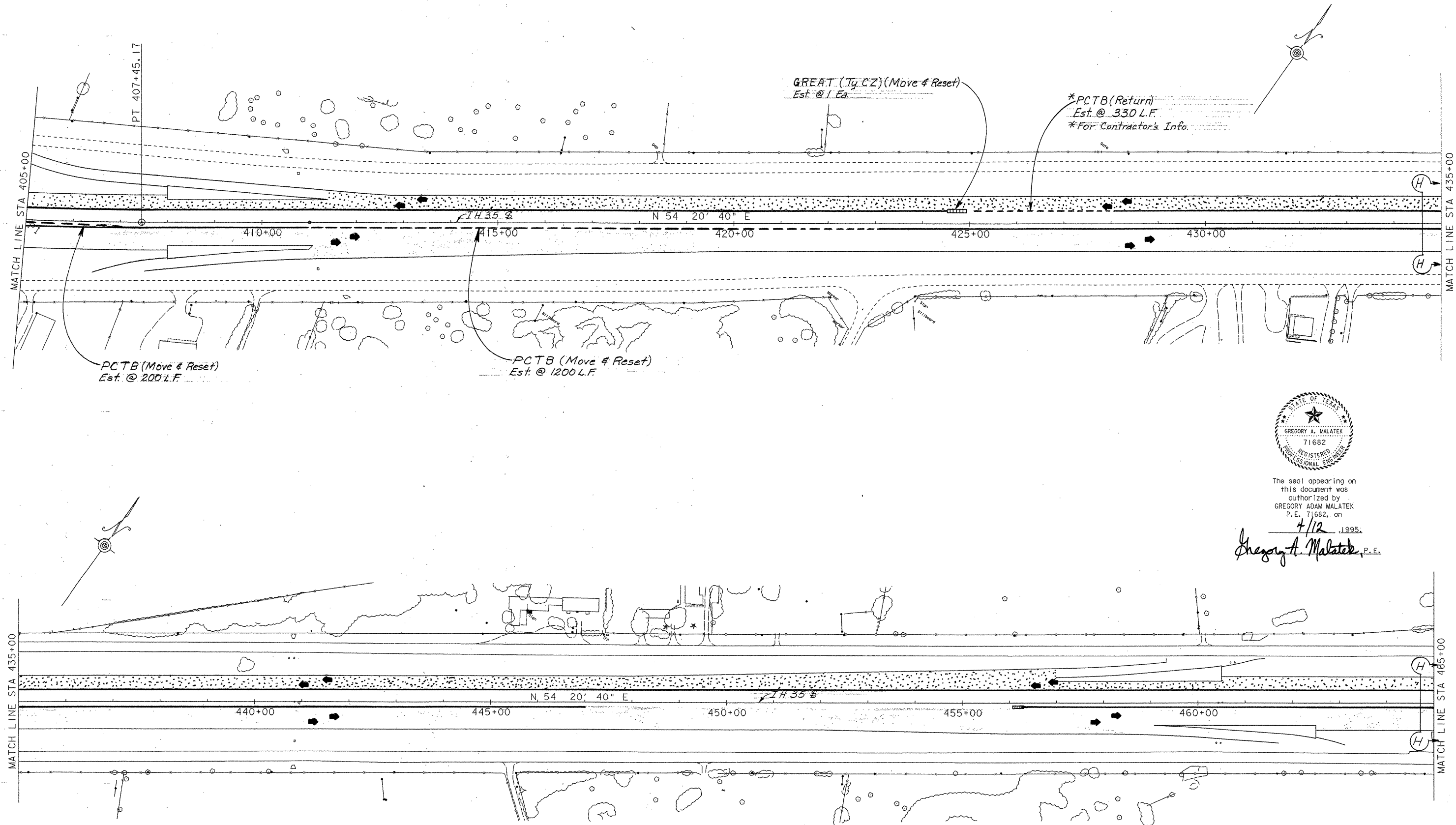
4/12, 1995.
Gregory A. Malatek, P.E.

PCTB (Move & Reset)
Est. @ 2700 L.F.

PHASE IV DETOUR & BARRICADE LAYOUT

SHEET 4 OF 7
SCALE 1" = 100'

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.			SHEET NO.
6	NH 95(40) IM			33
STATE	STATE DIST. NO.	COUNTY		
TEXAS	15	COMAL		
CONT.	SECT.	JOB	HIGHWAY NO.	
0016	05	087	IH 35	



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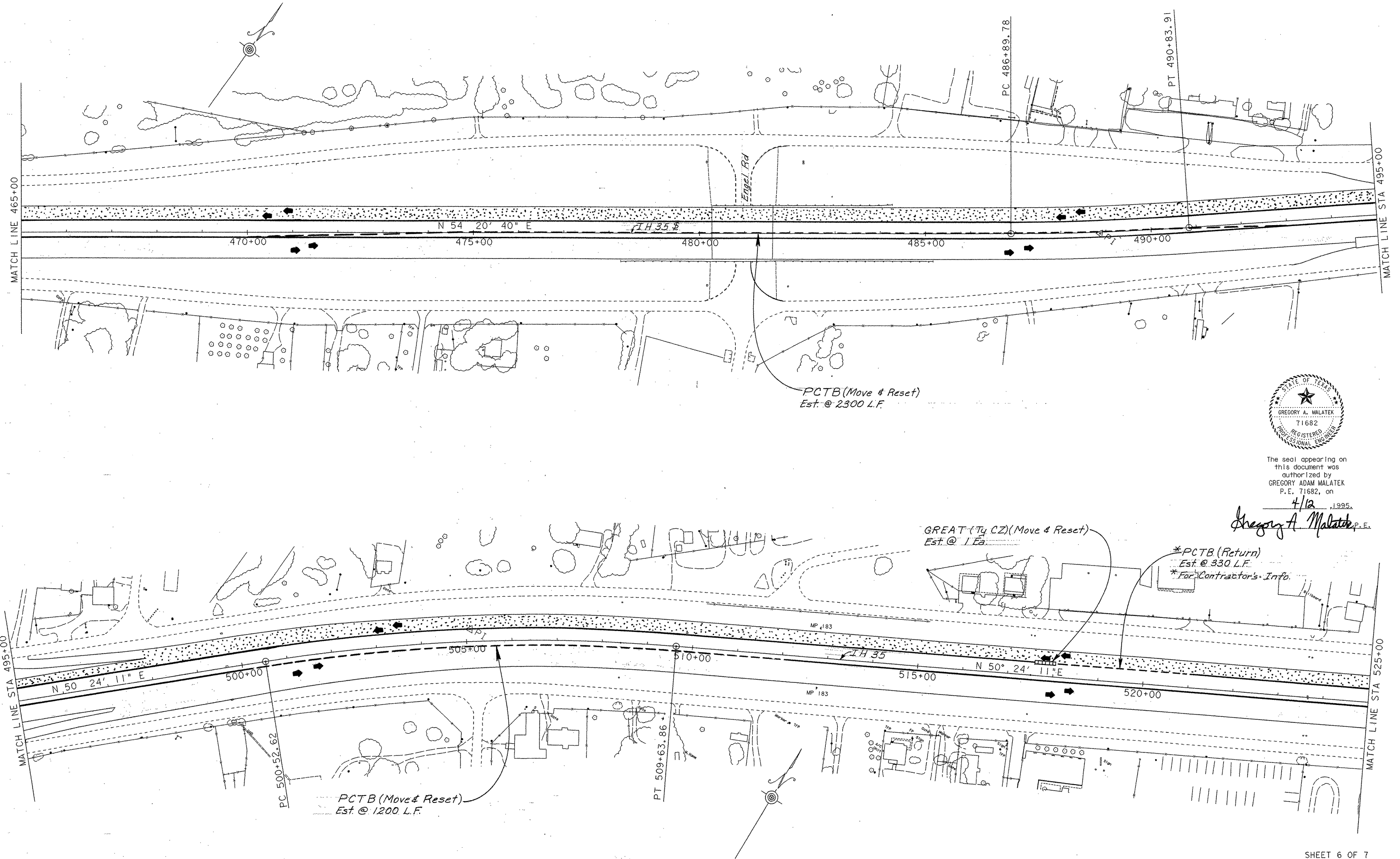
4/12, 1995.

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PHASE IV DETOUR & BARRICADE LAYOUT

SHEET 5 OF 7
SCALE 1" = 100'

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.
6	NH 95(40) IM	34
STATE	STATE DIST. NO.	COUNTY
TEXAS	15	COMAL
CONT.	SECT.	JOB
0016	05	087
		HIGHWAY NO.
		IH 35

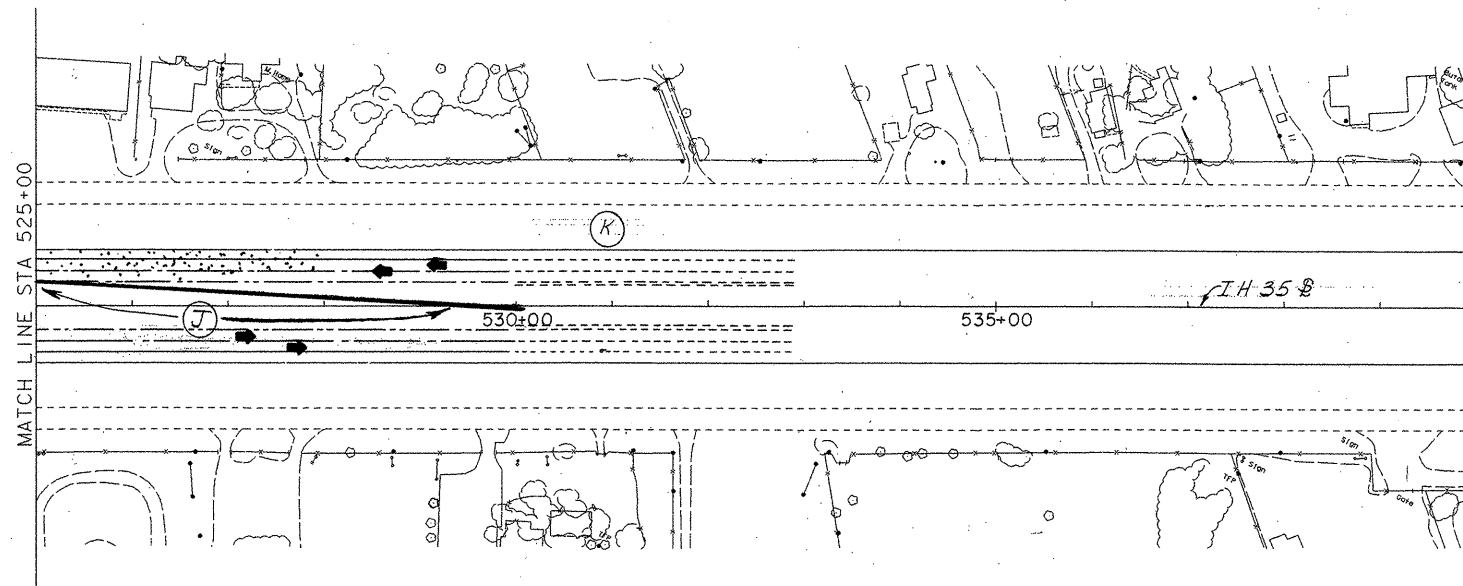


PHASE IV DETOUR & BARRICADE LAYOUT

SHEET 6 OF 7

SCALE 1" = 100'

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.
6	NH 05 (40) IM	35
STATE	STATE DIST. NO.	COUNTY
TEXAS	15	COMAL
CONT.	SECT.	JOB
0016	05	087
		HIGHWAY NO.
		1H 35



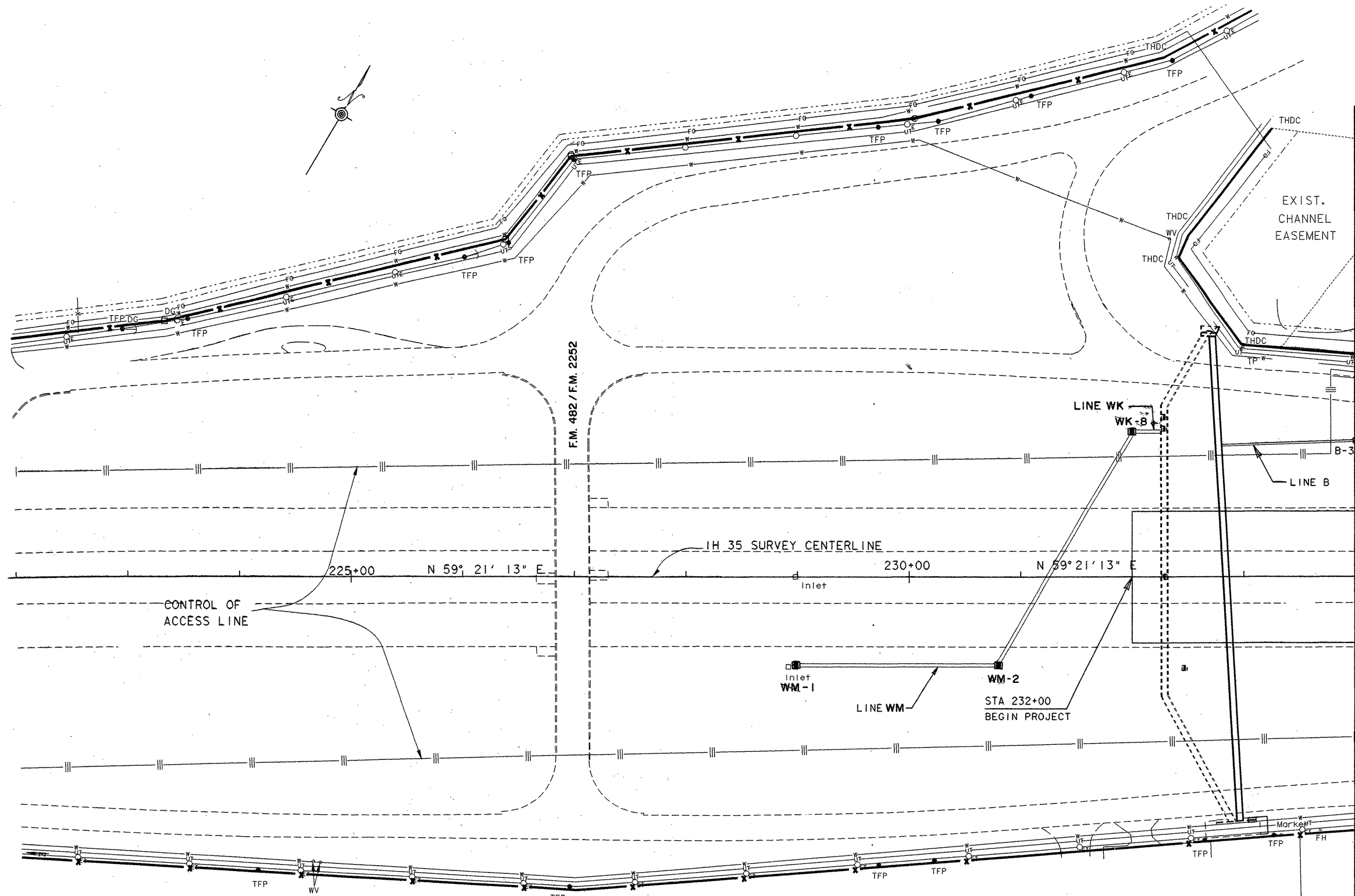
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PHASE IV DETOUR & BARRICADE LAYOUT

SHEET 7 OF 7
SCALE 1" = 100'

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	NH 05(40)	IM	36
STATE	STATE DIST. NO.	COUNTY	
TEXAS	15	COMAL	
CONT.	SECT.	JOB	HIGHWAY NO.
0016	05	087	IH 35



- OVERHEAD UTILITIES**
- POWER.....—○—
 - TELEPHONE.....—○—
 - CABLE.....—○—
- UNDERGROUND UTILITIES**
- GAS.....—G—
 - WATER.....—W—
 - SANITARY SEWER.....—S—
 - STORM SEWER.....—SD—
 - POWER.....—P—
 - TELEPHONE.....—T—
 - CABLE.....—C—
 - FIBER OPTICS.....—FO—
 - OIL.....—O—
 - PIPELINE.....—PL—
- MISC. SYMBOLS**
- ROW/FENCE.....—X—
 - ROW.....—

STORMSEWER & UTILITY LAYOUT

SHEET 10F 26

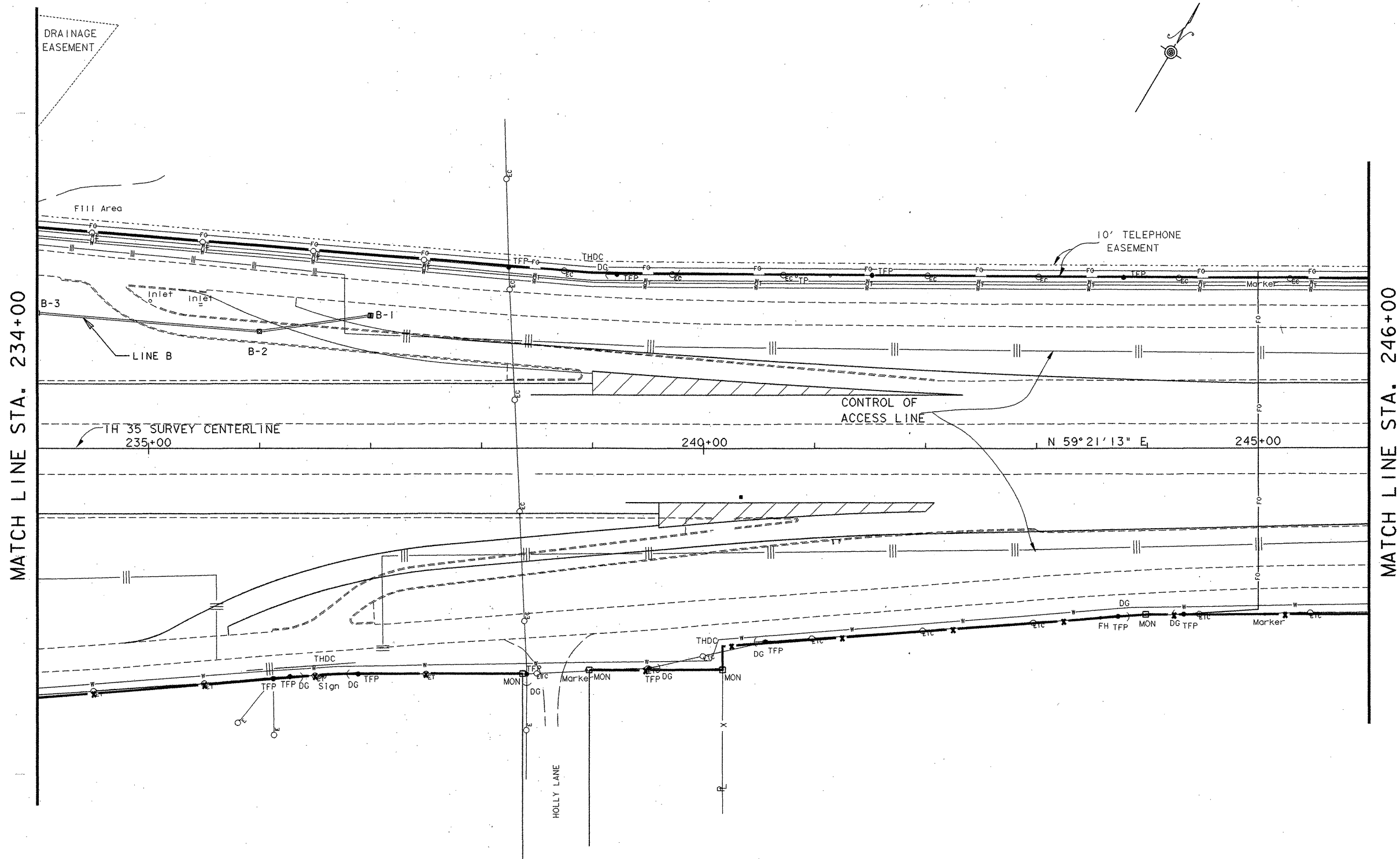
MATCH LINE STA. 234+00



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SCALE 1" = 50'

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.
6	NH 95 (40) IM	37
STATE	STATE DIST. NO.	COUNTY
TEXAS	15	COMAL
CONT.	SECT.	JOB
0016	05	087
		HIGHWAY NO.
		1H 35



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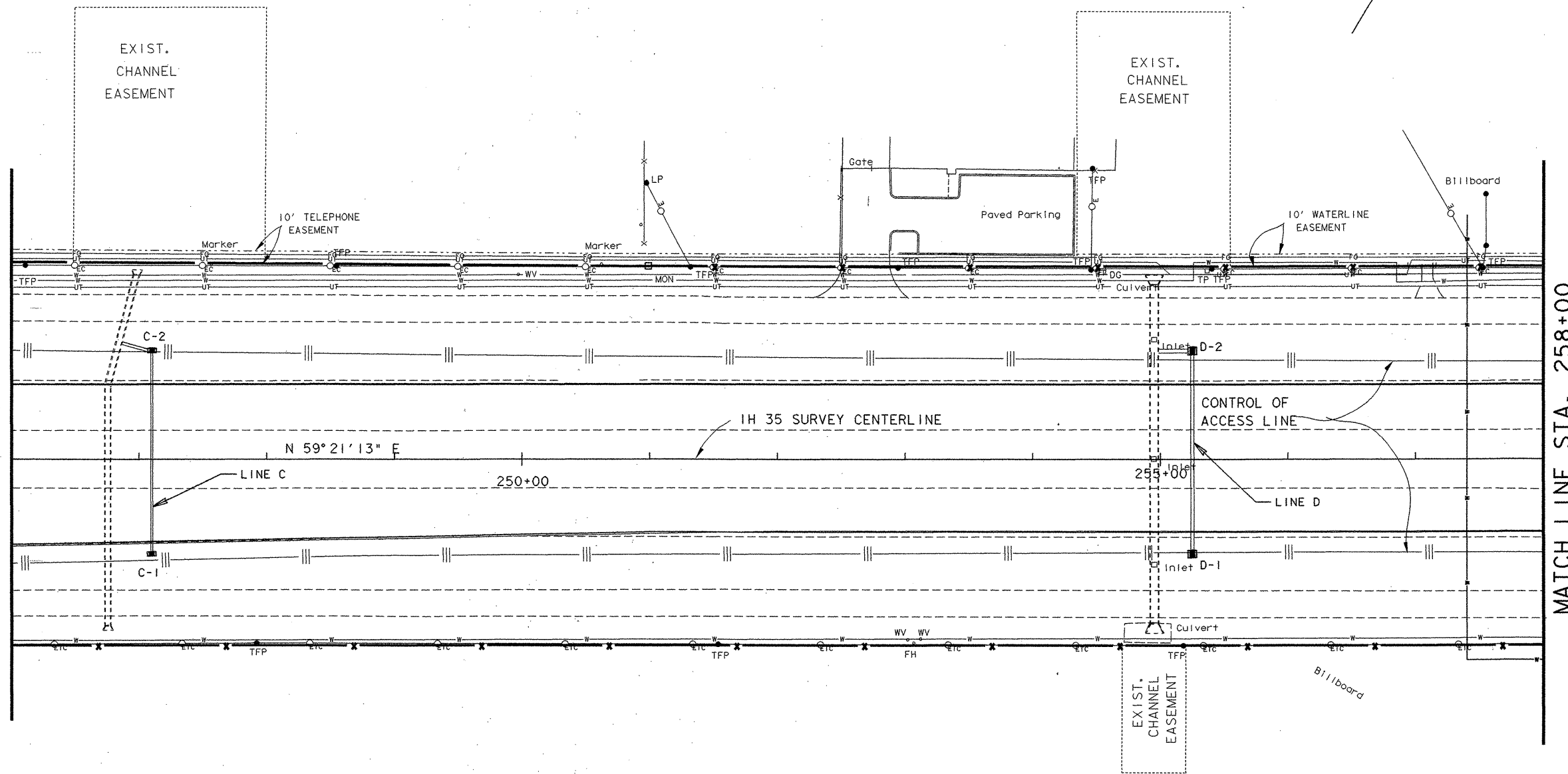
STORMSEWER & UTILITY LAYOUT

SHEET 2 OF 26

SCALE 1" = 50'

FED. RD. DIST. NO.	FEDERAL AID PROJECT NO.	SHEET NO.
6	NH 95 (40) IM	38
STATE	STATE DIST. NO.	COUNTY
TEXAS	15	COMAL
CONT.	SECT.	JOB
0016	05	087
		HIGHWAY NO.
		IH 35

MATCH LINE STA. 246+00



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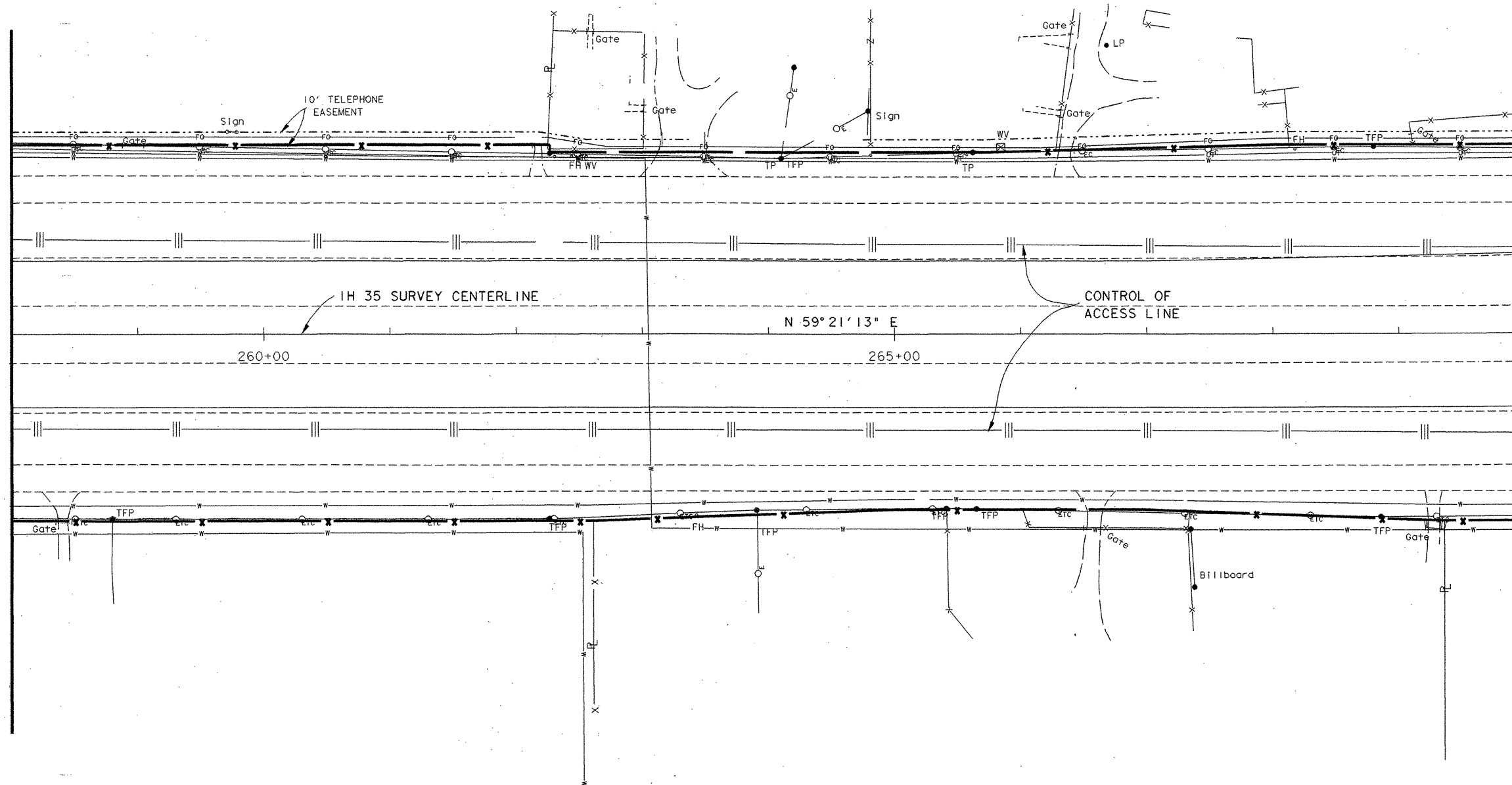
SHEET 3 OF 26

SCALE 1" = 50'

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.			SHEET NO.
6	NH 95 (40) IM			39
STATE	STATE DIST. NO.	COUNTY		
TEXAS	15	COMAL		
CONT.	SECT.	JOB	HIGHWAY NO.	
0016	05	087	IH 35	

MATCH LINE STA. 258+00

MATCH LINE STA. 270+00



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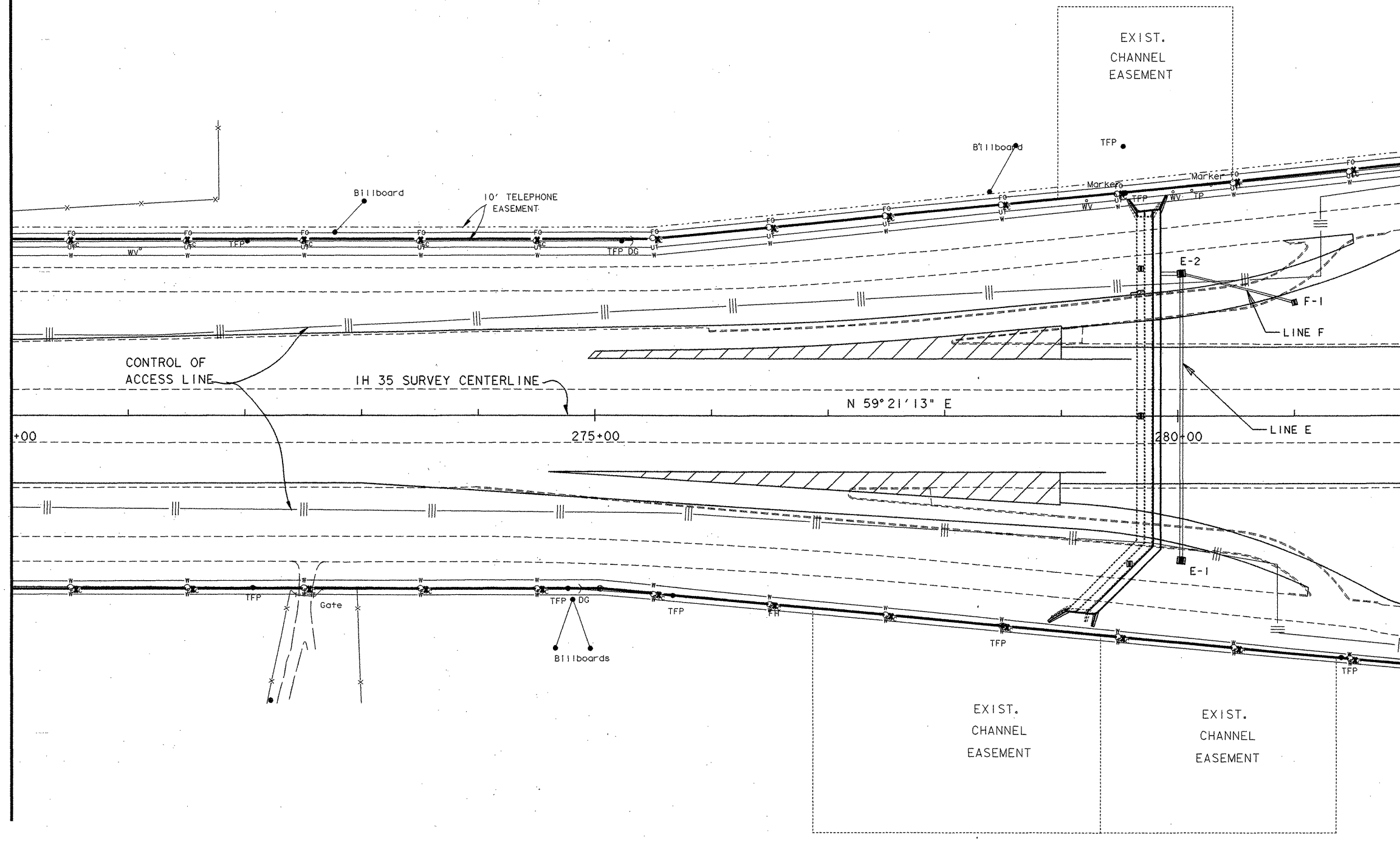
STORMSEWER & UTILITY LAYOUT

SHEET 4 OF 26

SCALE 1" = 50'

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.
6	NH95 (40) IM	40
STATE	STATE DIST. NO.	COUNTY
TEXAS	15	COMAL
CONT.	SECT.	JOB
0016	05	087
		HIGHWAY NO.
		1H 35

MATCH LINE STA. 270+00



MATCH LINE STA. 282+00



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STORMSEWER & UTILITY LAYOUT

SHEET 5 OF 26

SCALE 1" = 50'

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.
6	NH95 (40) IM	41
STATE	STATE DIST. NO.	COUNTY
TEXAS	15	COMAL
CONT.	SECT.	JOB
0016	05	087
		HIGHWAY NO.
		IH 35

MATCH LINE STA. 282+00

MATCH LINE STA. 294+00

CONTROL OF
ACCESS LINE

IH 35 SURVEY CENTERLINE

N 59° 21' 13" E

285+00

290+00

FM 1103

FM 1103

HUBERTUS RD.



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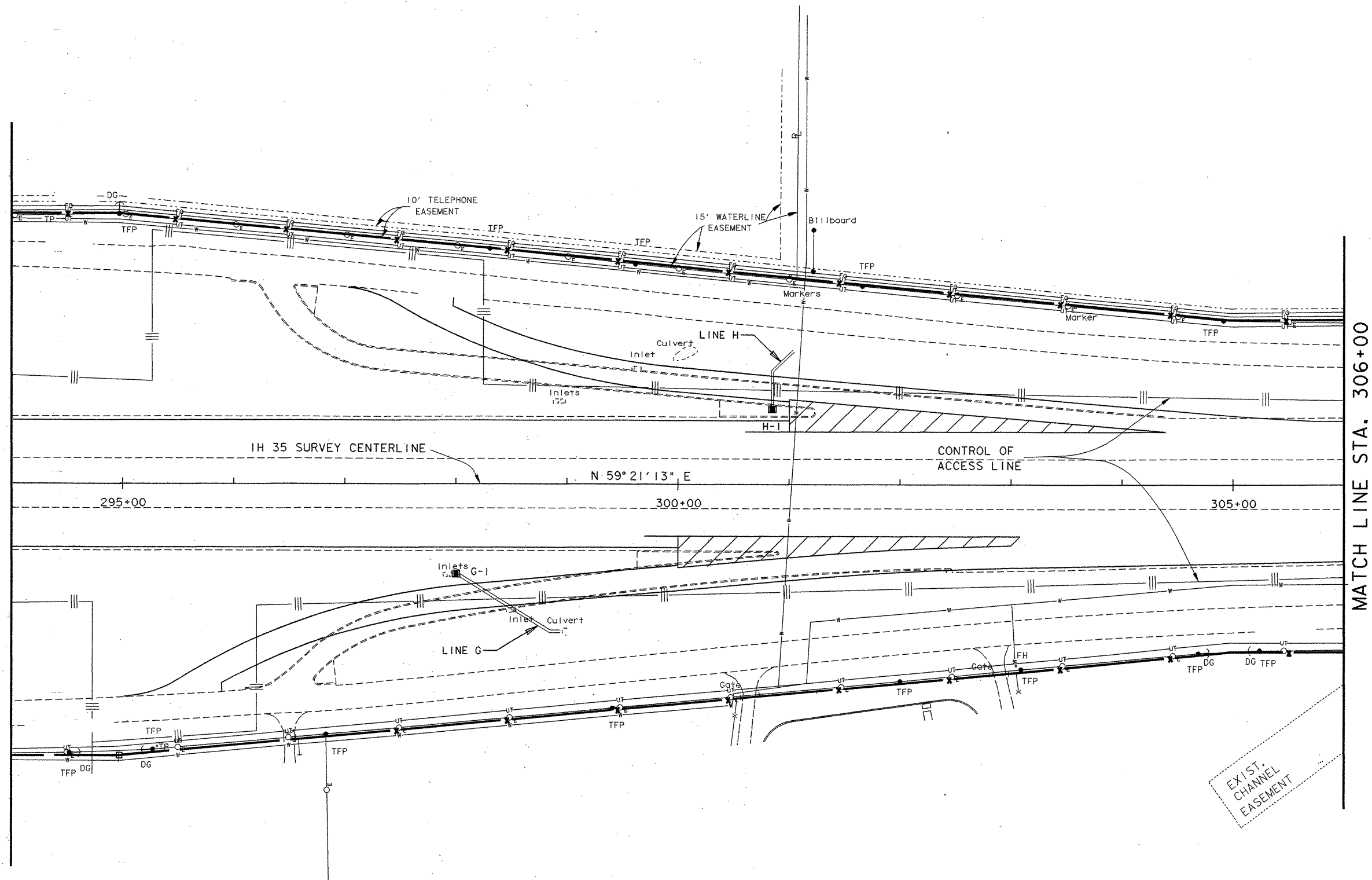
STORMSEWER & UTILITY LAYOUT

SHEET 6 OF 26

SCALE 1" = 50'

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.
6	NH 95 (40) IM	42
STATE	STATE DIST. NO.	COUNTY
TEXAS	15	COMAL
CONT.	SECT.	JOB
0016	05	087
		IH 35

MATCH LINE STA. 294+00



MATCH LINE STA. 306+00

EXIST. CHANNEL EASEMENT



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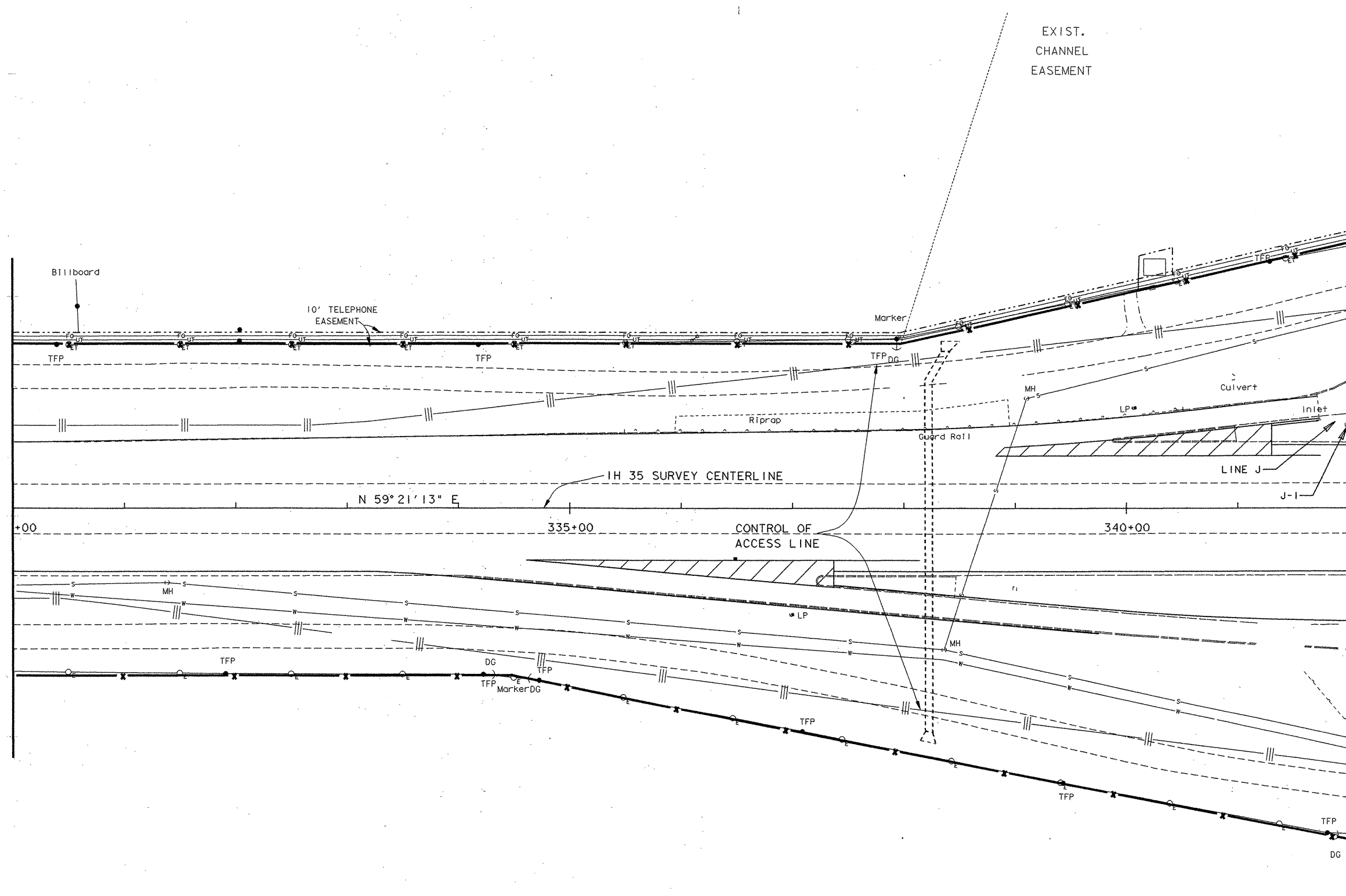
STORMSEWER & UTILITY LAYOUT

SHEET 7 OF 26

SCALE 1" = 50'

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	NH 95 (40) IM		43
STATE	STATE DIST. NO.	COUNTY	
TEXAS	15	COMAL	
CONT.	SECT.	JOB	HIGHWAY NO.
0016	05	087	1H 35

MATCH LINE STA. 330+00



MATCH LINE STA. 342+00



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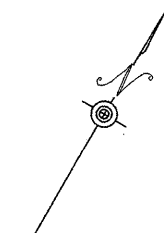
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STORMSEWER & UTILITY SHEET

SHEET 10 OF 26

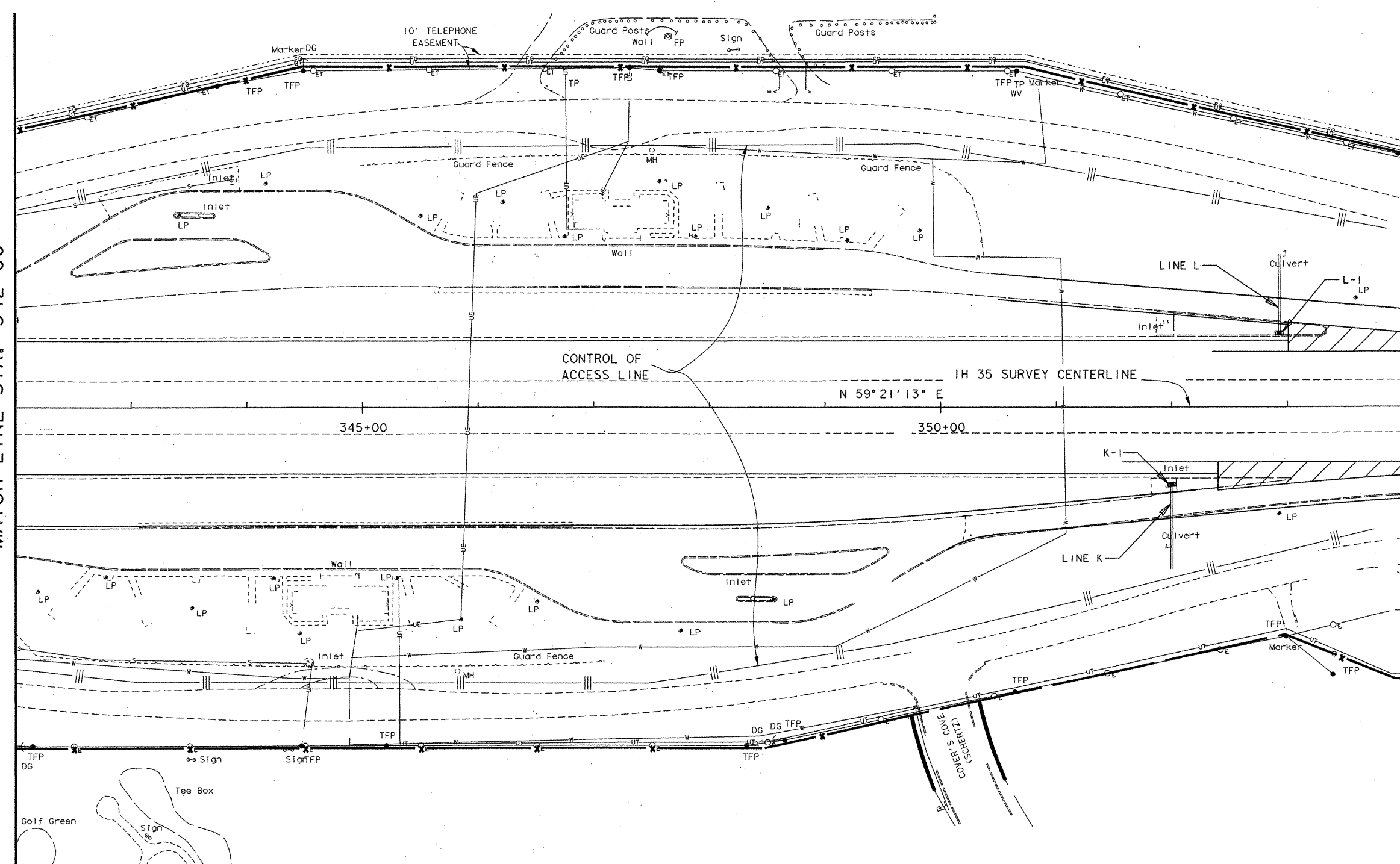
SCALE 1" = 50'

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.
6	NH 95 (40) IM	46
STATE	STATE DIST. NO.	COUNTY
TEXAS	15	COMAL
CONT.	SECT.	JOB
0016	05	087
		HIGHWAY NO.
		IH 35



MATCH LINE STA. 342+00

MATCH LINE STA. 354+00



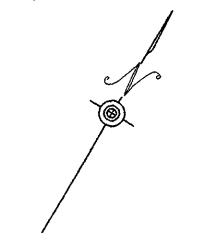
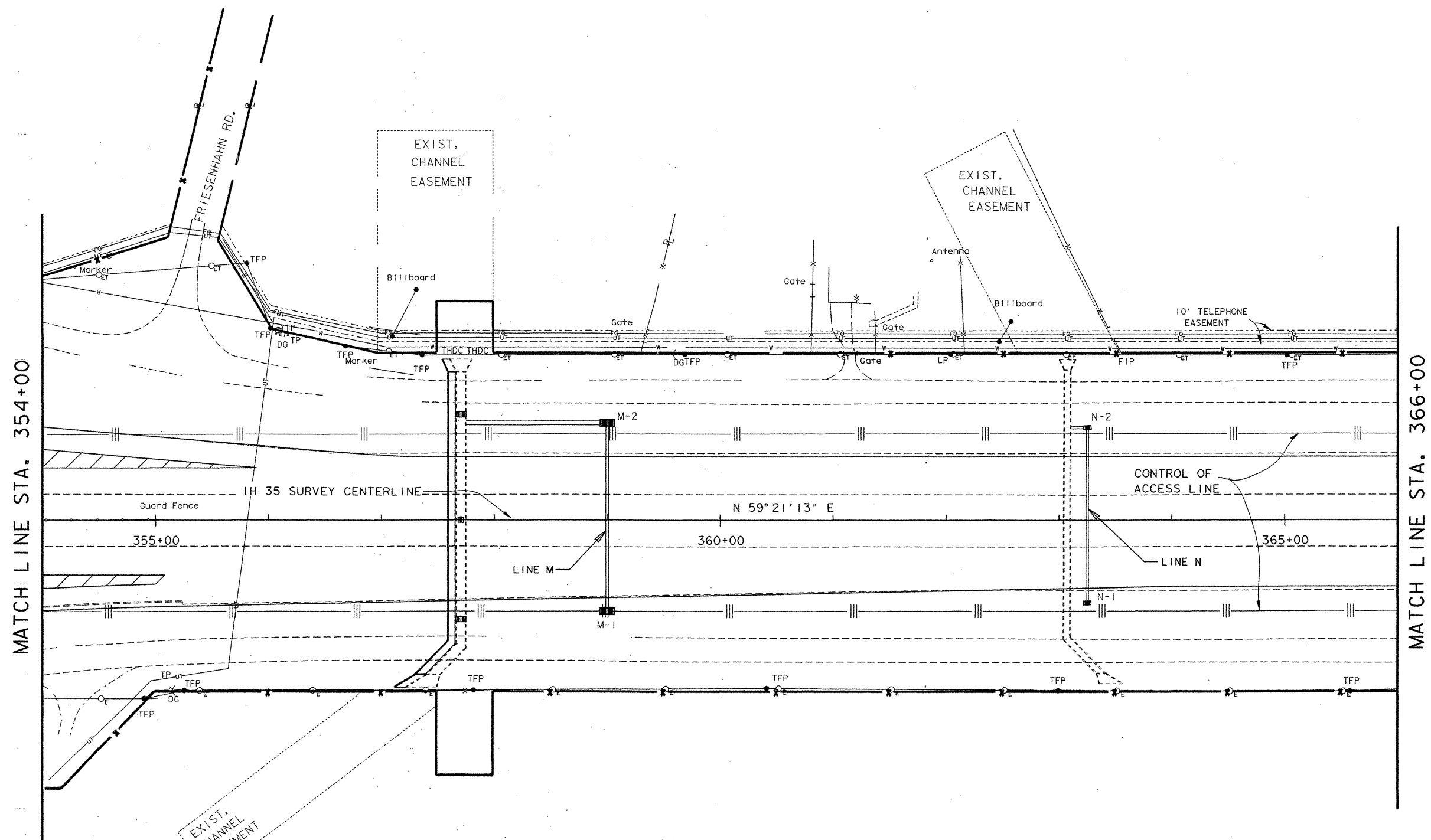
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STORMSEWER & UTILITY LAYOUT

SHEET 11 OF 26

SCALE 1" = 50'		SHEET NO.	
FED. RD. DIST. NO.	FEDERAL AID PROJECT NO.	6	47
STATE	STATE DIST. NO.	TEXAS	15
CONT.	SECT.	0016	05
	JOB	087	
	HIGHWAY NO.		IH 35



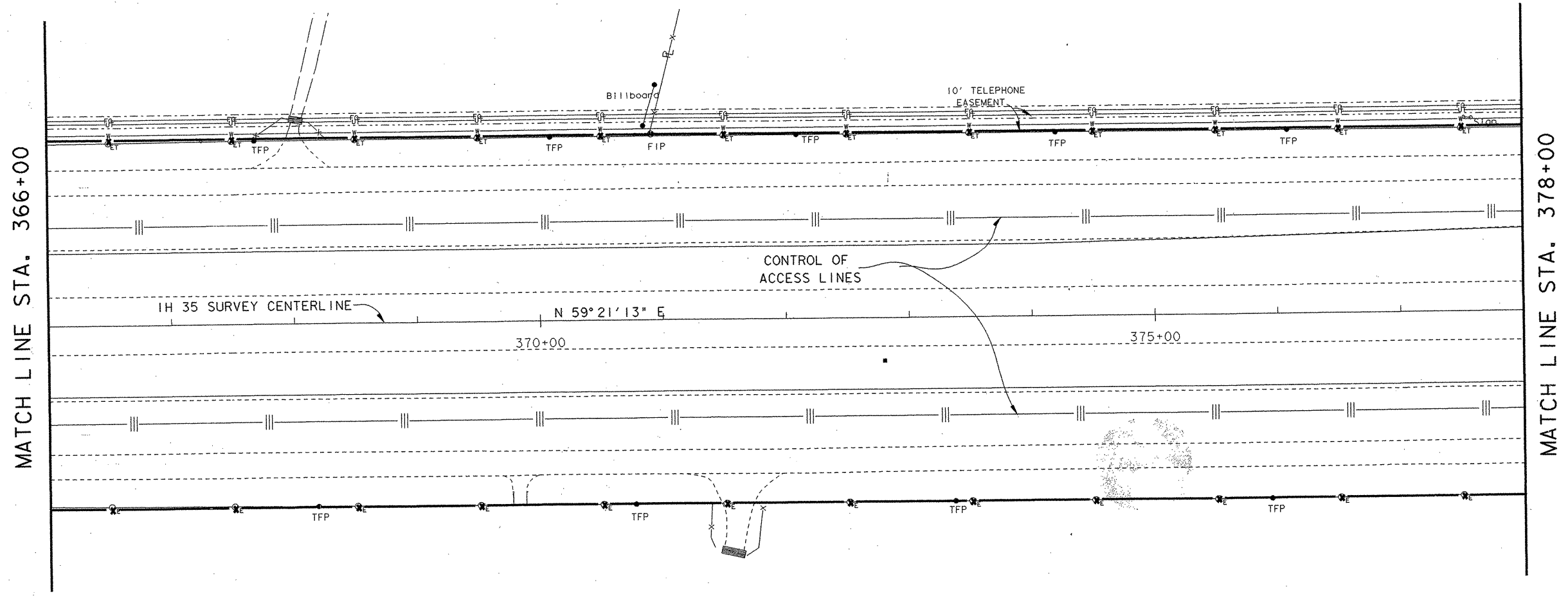
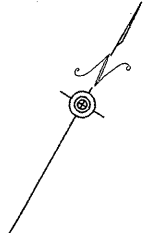
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STORMSEWER & UTILITY LAYOUT

SHEET 12 OF 26

SCALE 1" = 50'

FED. RD. DIST. NO.	FEDERAL AID PROJECT NO.	SHEET NO.
6	NH95 (40) IM	48
STATE	COUNTY	
TEXAS	COMAL	
CONT.	SECT.	JOB
0016	05	087
		IH 35



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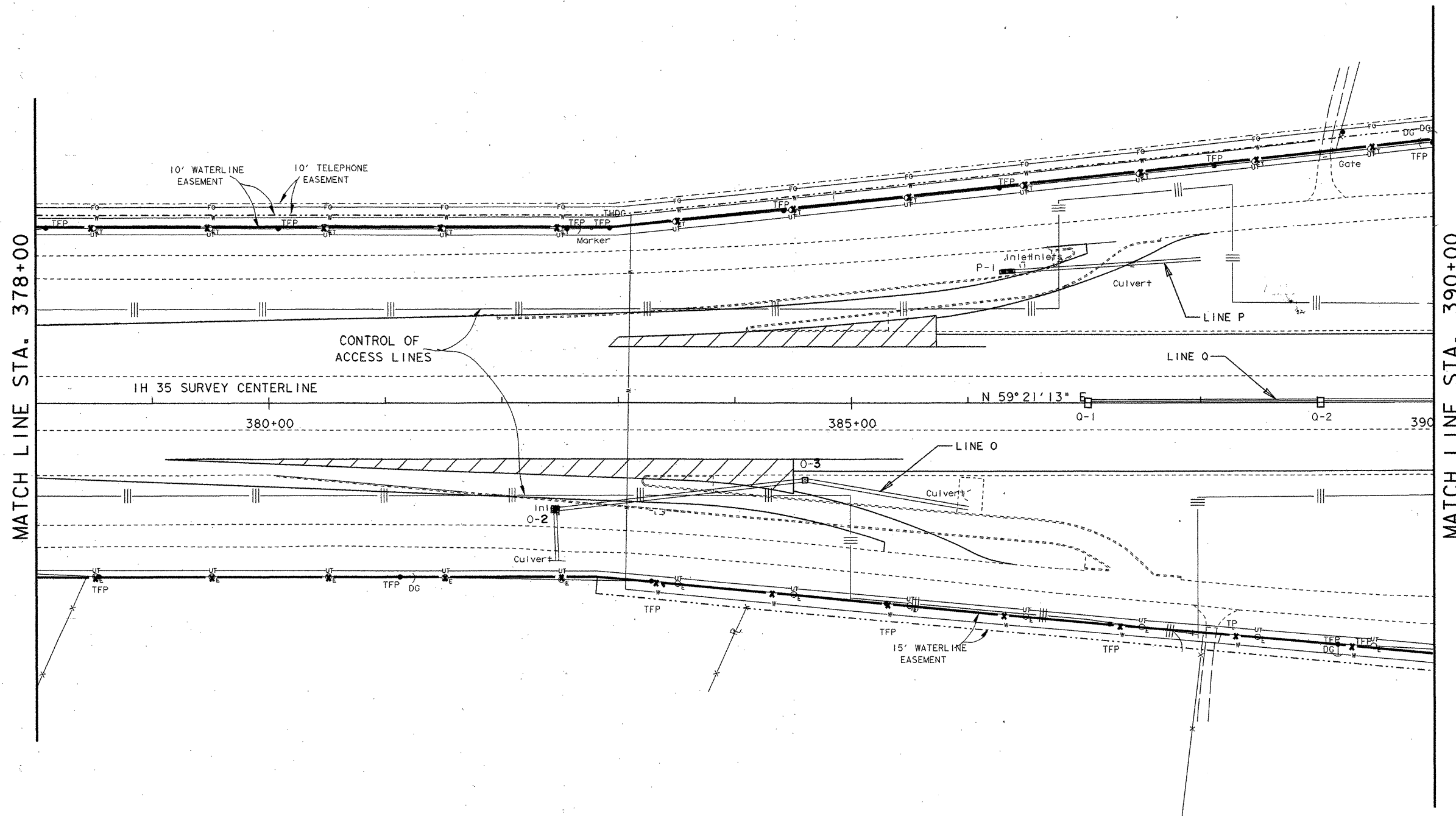
4/7, 1995.
Gregory A. Malatek, P.E.

STORMSEWER & UTILITY LAYOUT

SHEET 13 OF 26

SCALE 1" = 50'

FED. RD. DIV. NO.	6	FEDERAL AID PROJECT NO.	NH 95 (40) IM	SHEET NO.	49
STATE	TEXAS	STATE DIST. NO.	15	COUNTY	COMAL
CONT.	0016	SECT.	05	JOB	087
				HIGHWAY NO.	IH 35



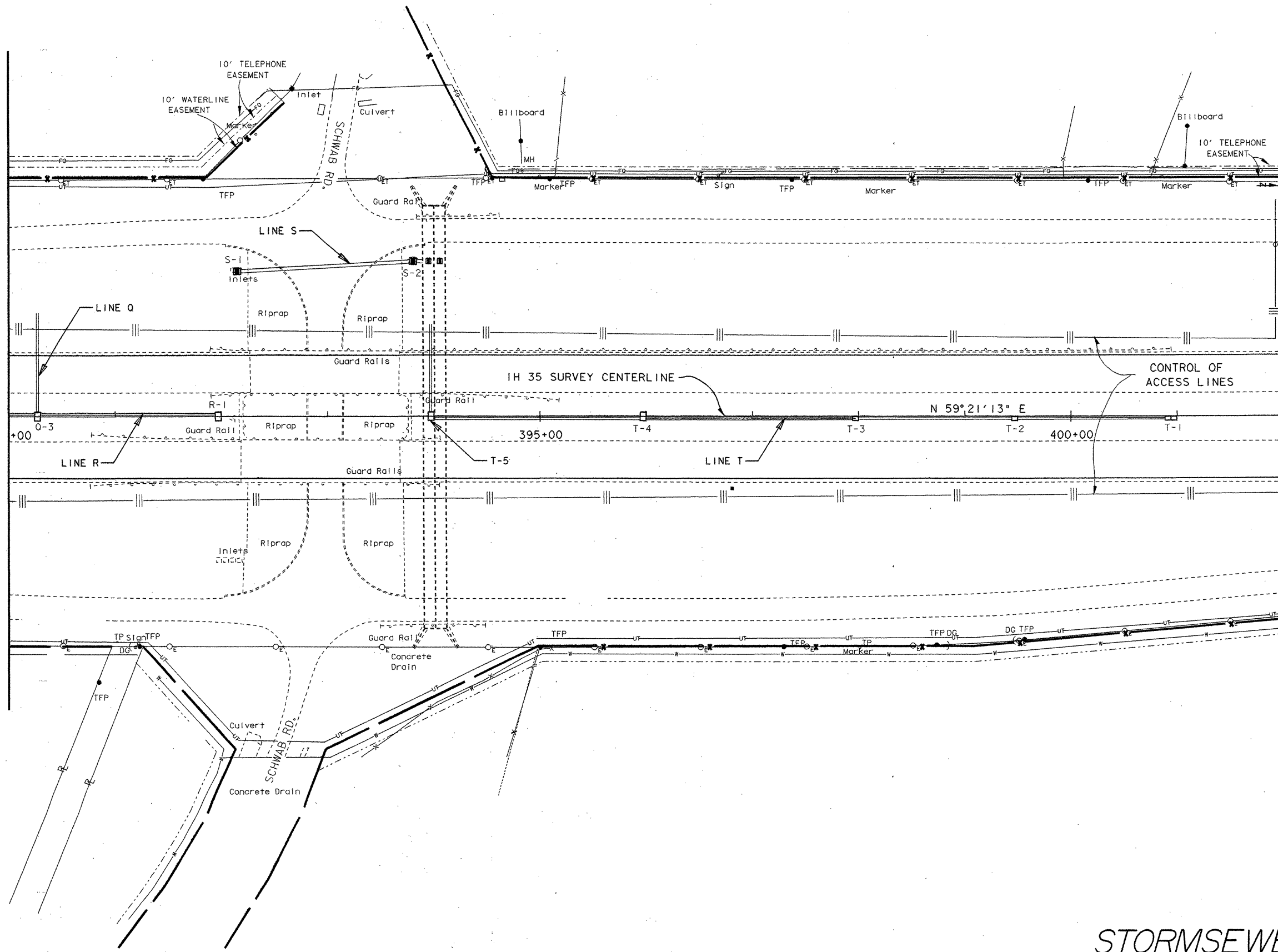
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STORMSEWER & UTILITY LAYOUT

SHEET 14 OF 26

FED. RD. DIV. NO.		FEDERAL AID PROJECT NO.		SHEET NO.
6		NH 95 (40) IM		50
STATE	STATE DIST. NO.	COUNTY		
TEXAS	15	COMAL		
CONT.	SECT.	JOB	HIGHWAY NO.	

MATCH LINE STA. 390+00



MATCH LINE STA. 402+00



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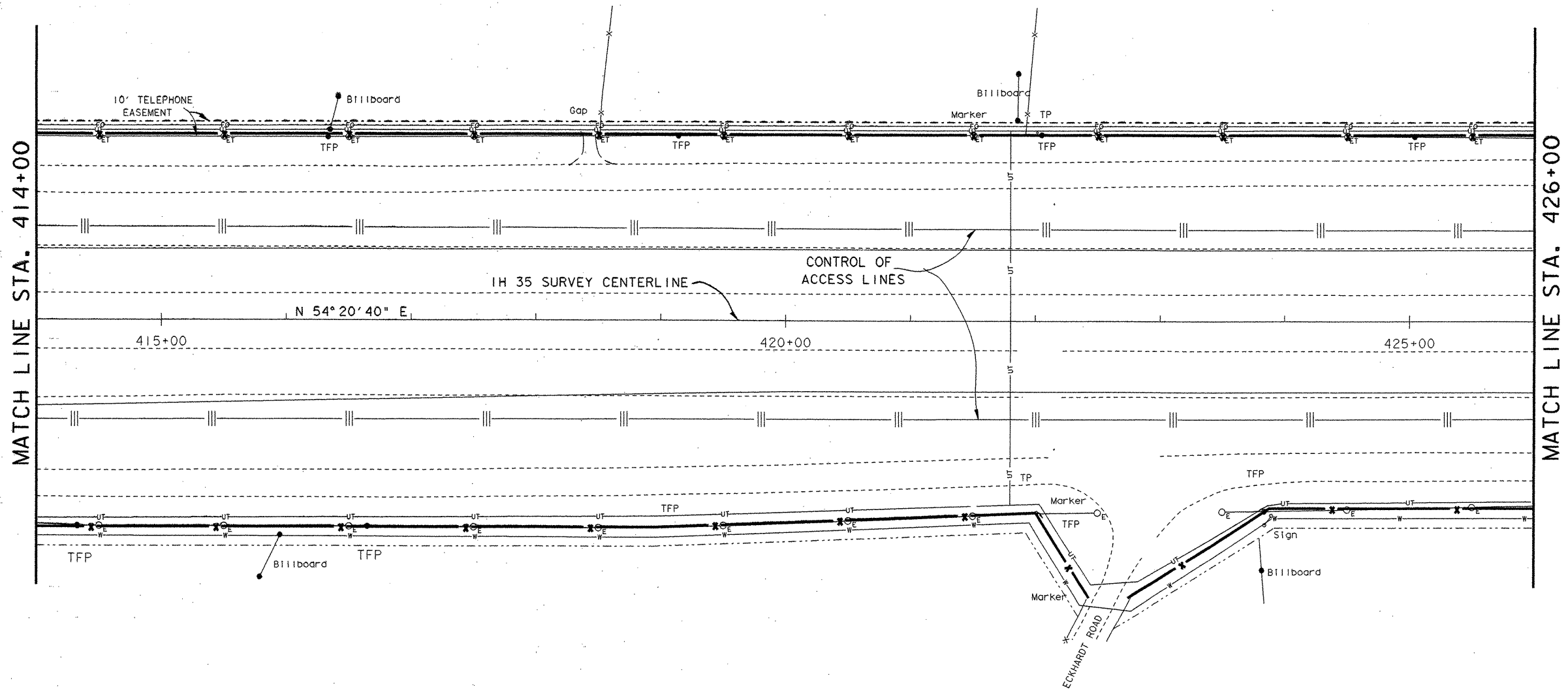
4/7, 1995.
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STORMSEWER & UTILITY LAYOUT

SHEET 15 OF 26

SCALE 1" = 50'

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.
6	NH 95 (40) IM	51
STATE	STATE DIST. NO.	COUNTY
TEXAS	15	COMAL
CONT.	SECT.	JOB
0016	05	087
		HIGHWAY NO.
		IH 35



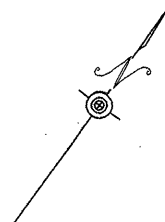
The seal appearing on this document was authorized by GREGORY A. MALATEK P.E. 71682, on

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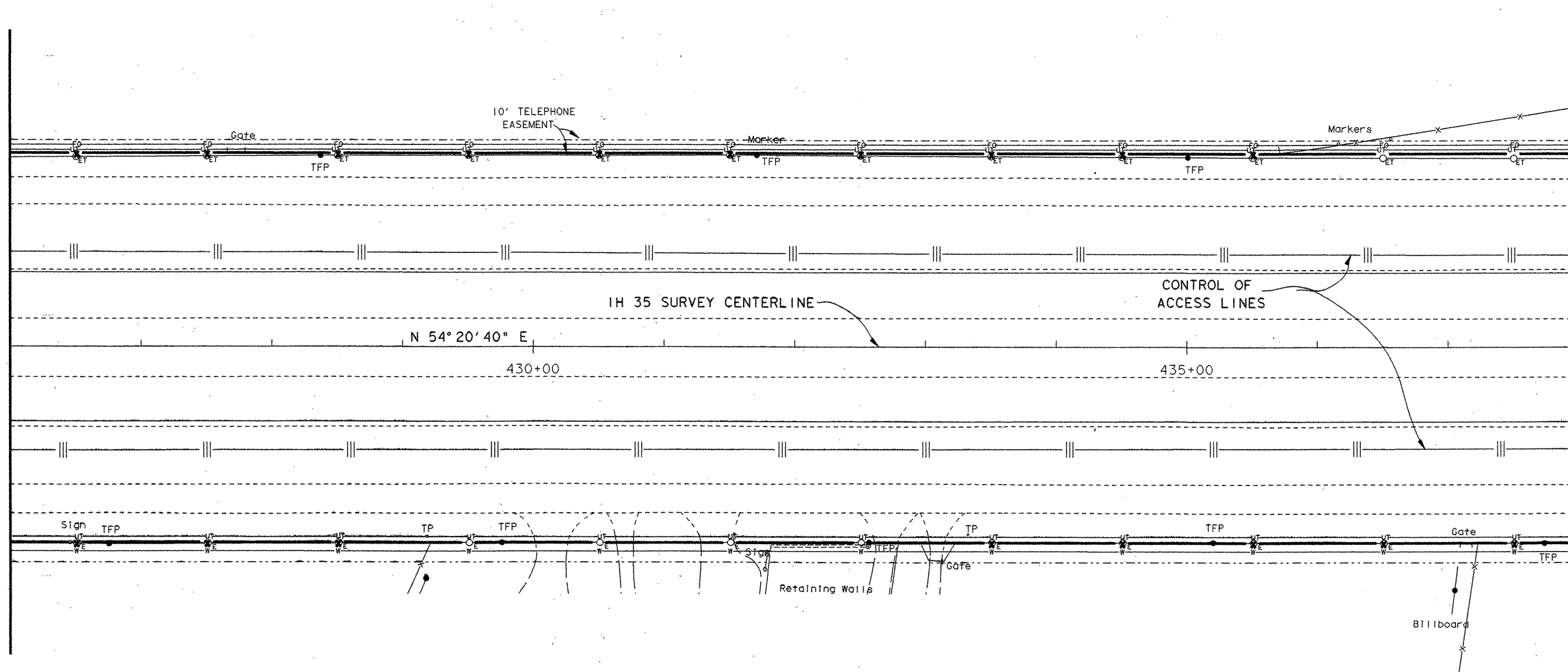
STORMSEWER & UTILITY LAYOUT

SHEET 17 OF 26

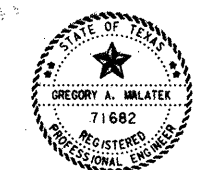
SCALE 1" = 50'			
FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.	
6	NH 95 (40) IM	53	
STATE	STATE DIST. NO.	COUNTY	
TEXAS	15	COMAL	
CONT.	SECT.	JOB	HIGHWAY NO.
0016	05	087	IH 35



MATCH LINE STA. 426+00



MATCH LINE STA. 438+00



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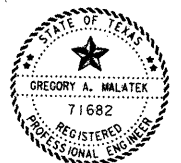
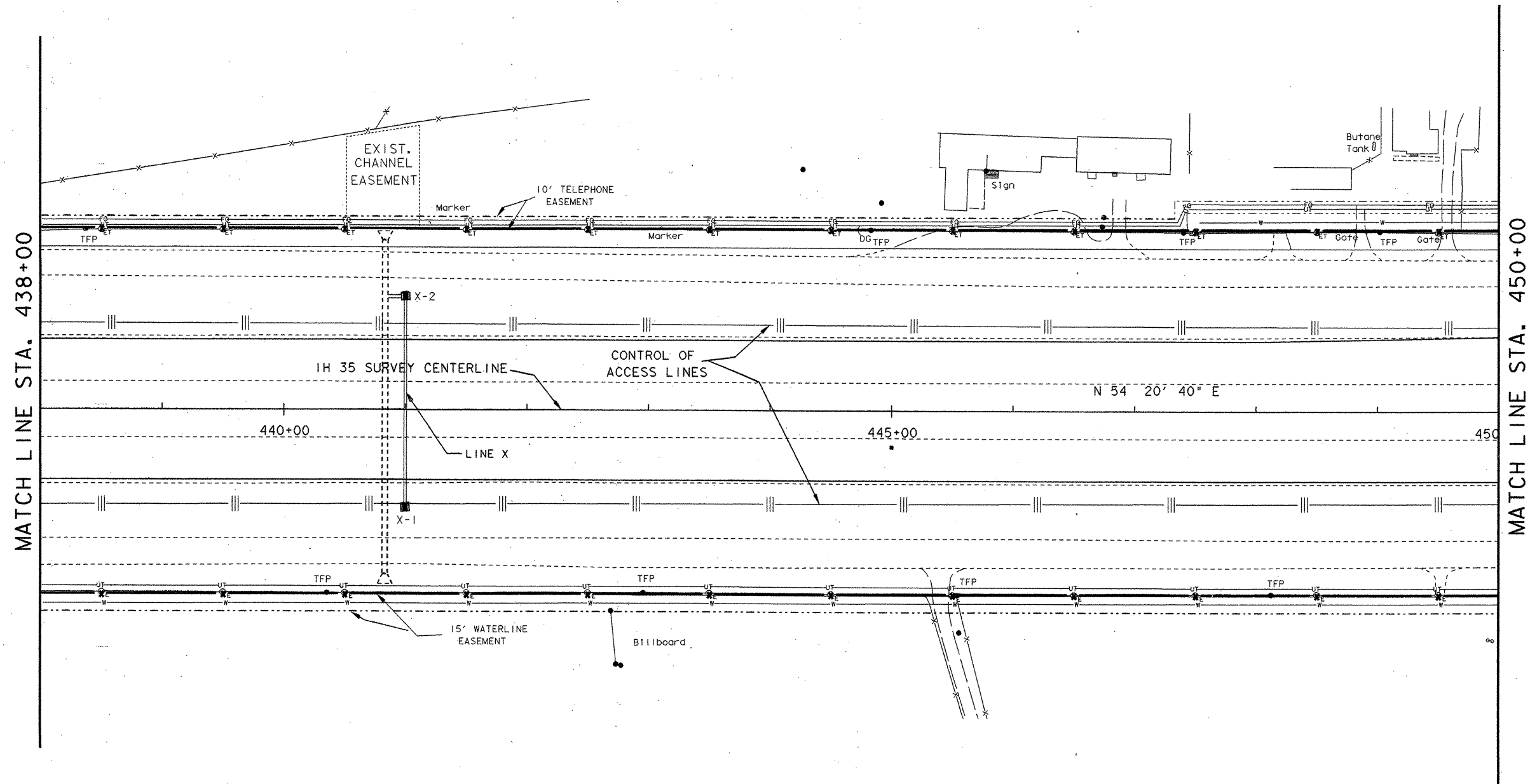
4/7, 1995.
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STORMSEWER & UTILITY LAYOUT

SHEET 18 OF 26

SCALE 1" = 50'

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.			SHEET NO.
6	NH 95 (40) IM			54
STATE	STATE DIST. NO.	COUNTY		
TEXAS	15	COMAL		
CONT.	SECT.	JOB	HIGHWAY NO.	
0016	05	087	IH 35	



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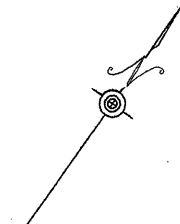
4/7/1995
Gregory A. Malatek, P.E.

STORMSEWER & UTILITY LAYOUT

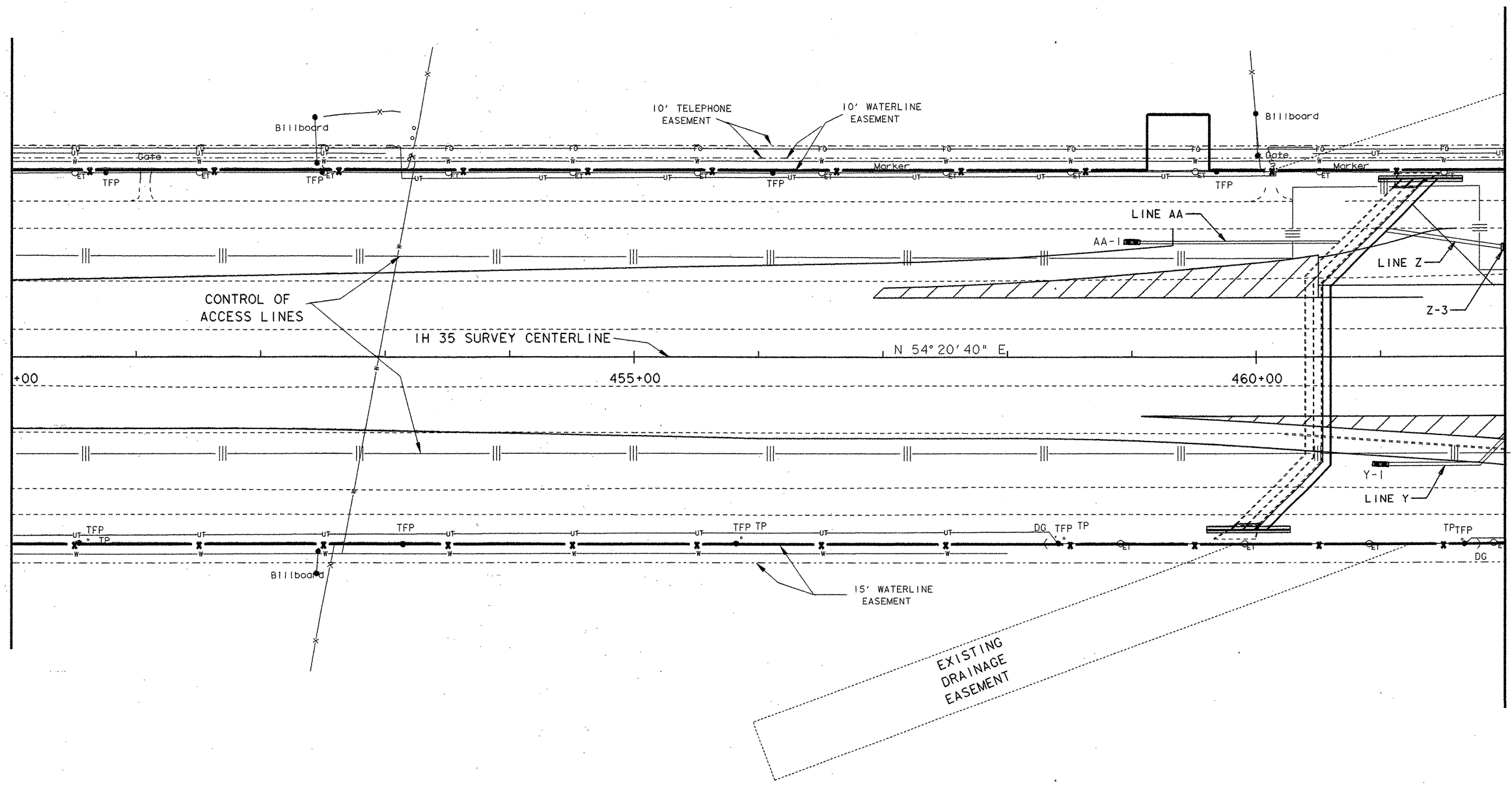
SHEET 19 OF 26

SCALE 1" = 50'

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	NH 95 (40) IM		55
STATE	STATE DIST. NO.	COUNTY	
TEXAS	15	COMAL	
CONT.	SECT.	JOB	HIGHWAY NO.
0016	05	087	IH 35



MATCH LINE STA. 450+00



MATCH LINE STA. 462+00



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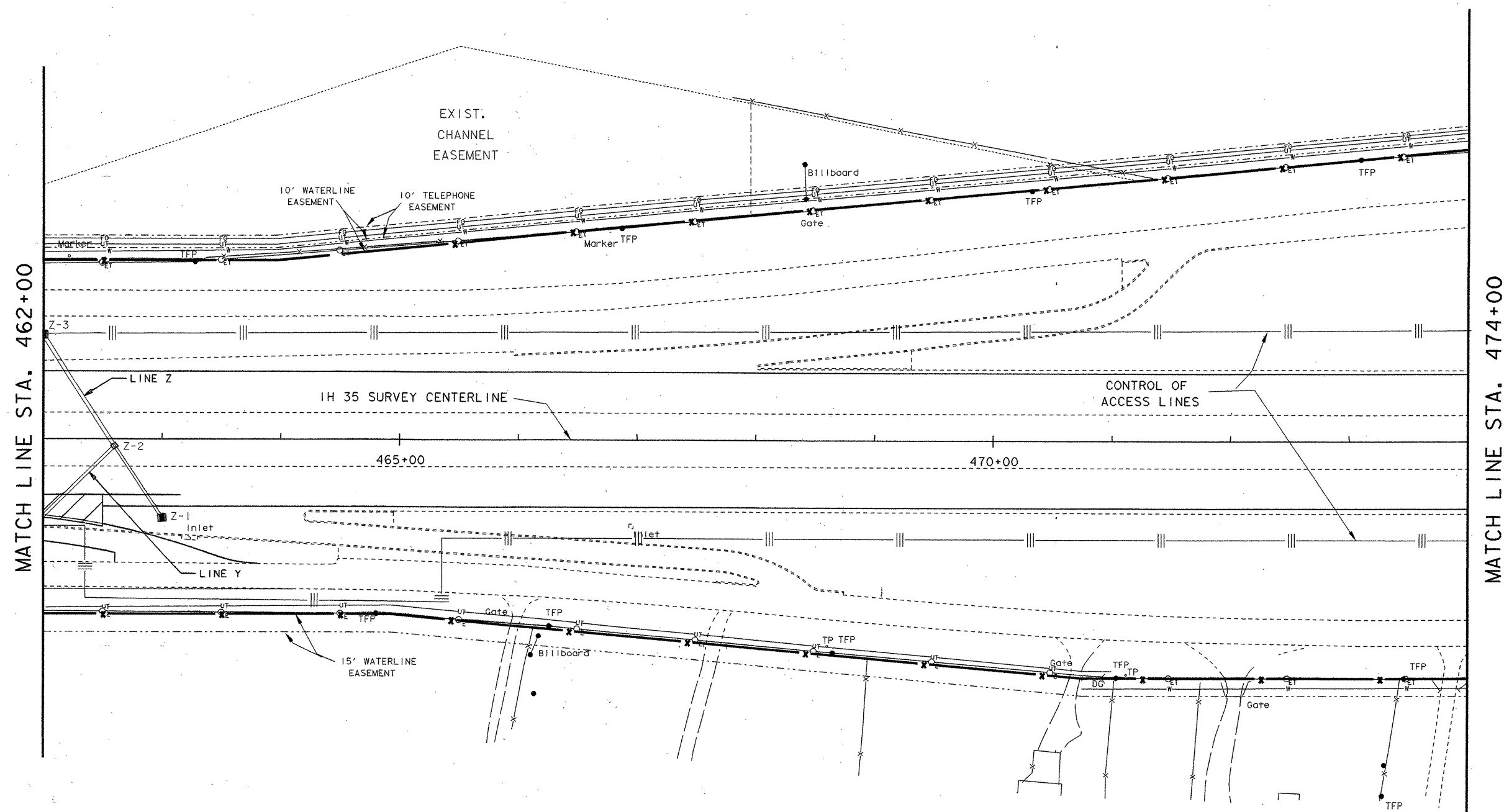
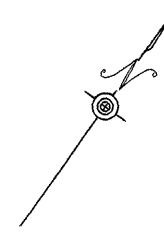
4/7, 1995.
Gregory A. Malatek

STORMSEWER & UTILITY LAYOUT

SHEET 20 OF 26

SCALE 1" = 50'

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.
6	NH 95 (40) IM	56
STATE	STATE DIST. NO.	COUNTY
TEXAS	15	COMAL
CONT.	SECT.	JOB
0016	05	087
		HIGHWAY NO.
		IH 35



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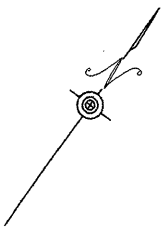
4/7, 1995
Gregory A. Malatek, P.E.

STORMSEWER & UTILITY LAYOUT

SCALE 1" = 50'

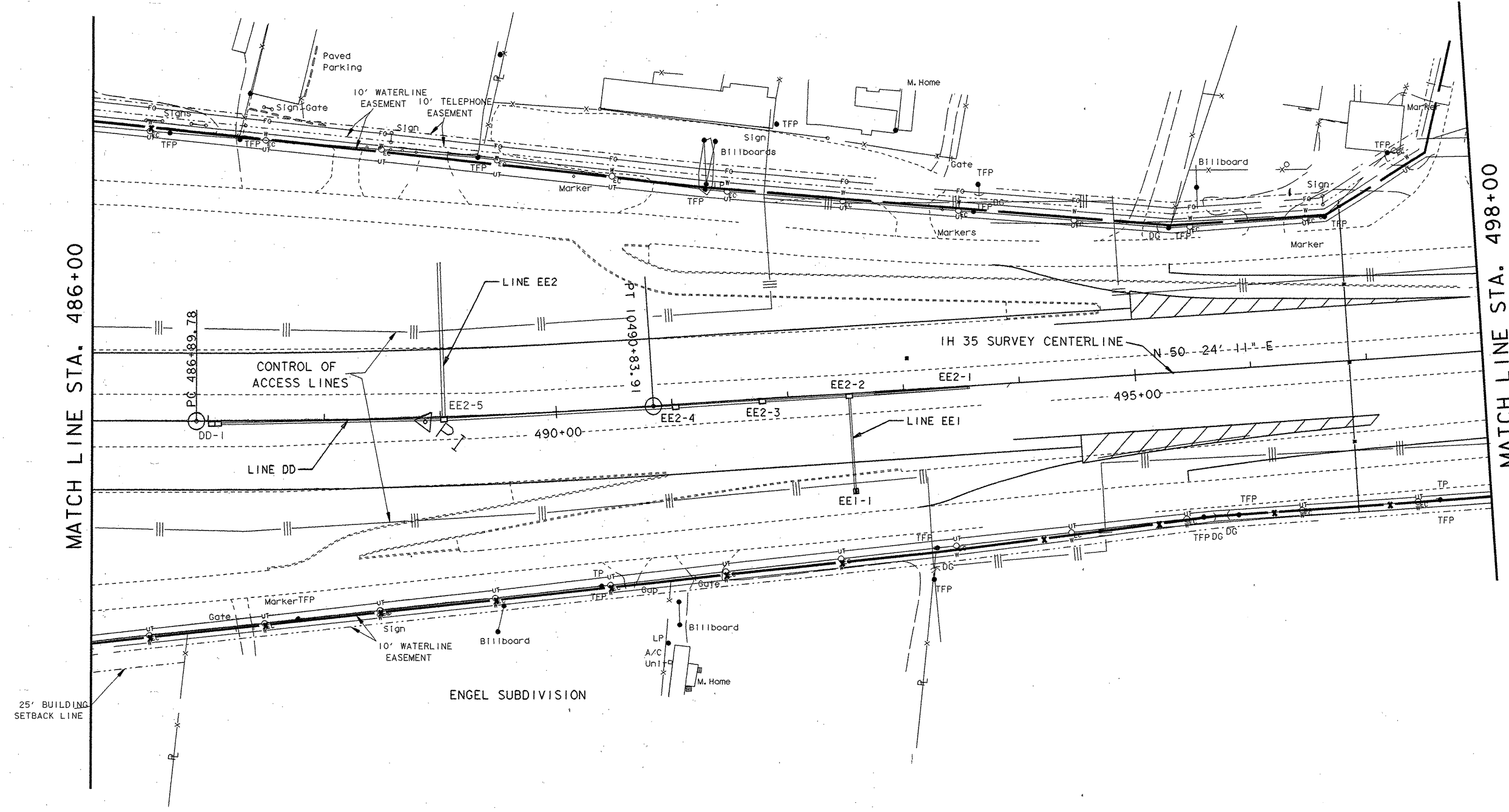
SHEET 21 OF 26

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.
6	NH 95 (40) IM	57
STATE	STATE DIST. NO.	COUNTY
TEXAS	15	COMAL
CONT.	SECT.	JOB HIGHWAY NO.
0016	05	087 IH 35



MATCH LINE STA. 486+00

MATCH LINE STA. 498+00



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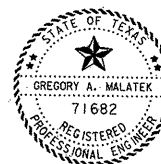
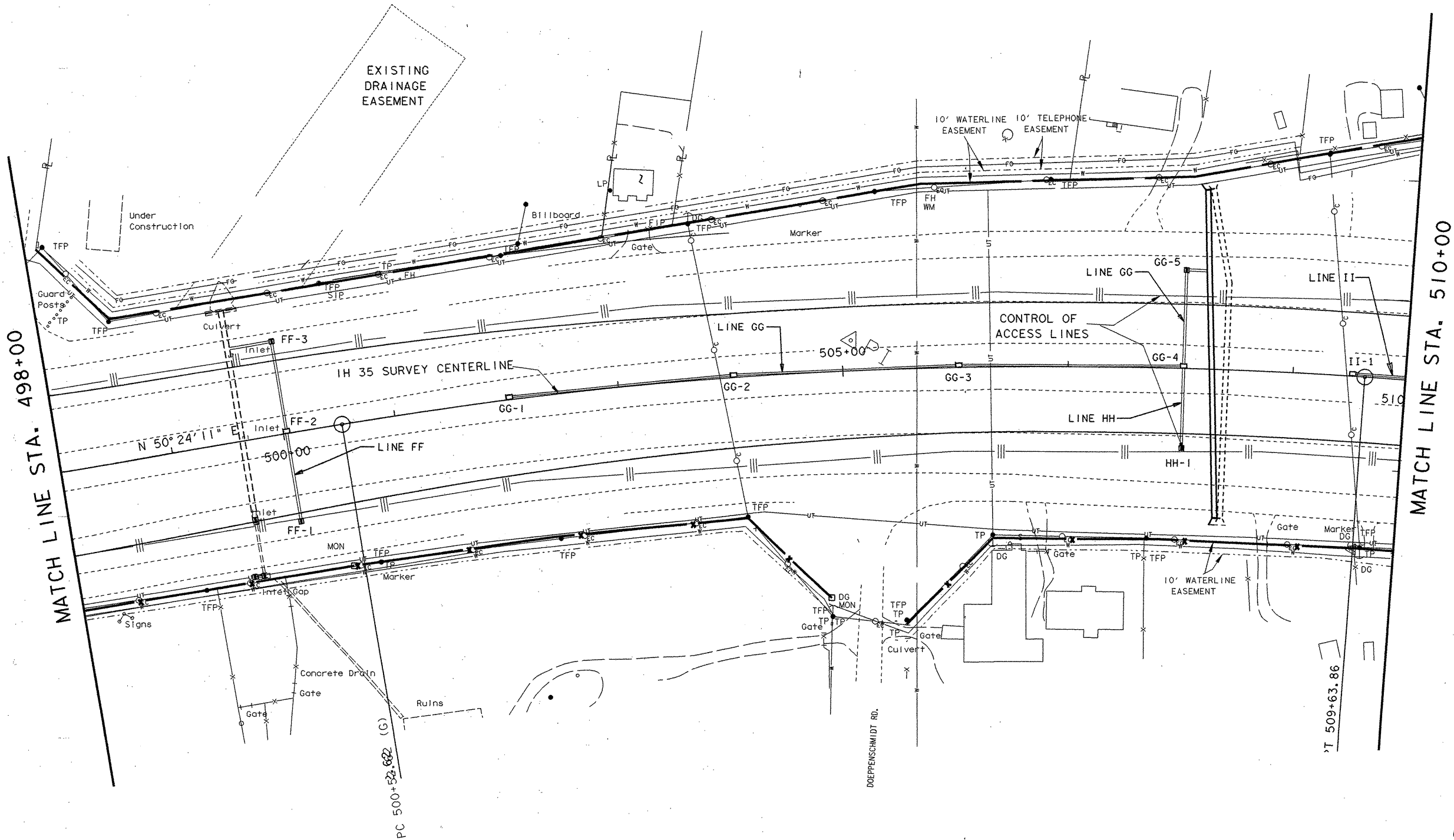
4/7/1995
Gregory A. Malatek, P.E.

STORMSEWER & UTILITY LAYOUT

SHEET 23 OF 26

SCALE 1" = 50'

FED. RD. DIST. NO.	FEDERAL AID PROJECT NO.	SHEET NO.
6	NH 95 (40) IM	59
STATE	COUNTY	
TEXAS	COMAL	
CONT.	SECT.	JOB
0016	05	087
		IH 35



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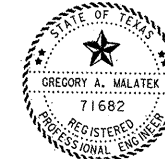
4/7 1995.
Gregory A. Malatek, P.E.

STORMSEWER & UTILITY LAYOUT

SHEET 24 OF 26

SCALE 1" = 50'

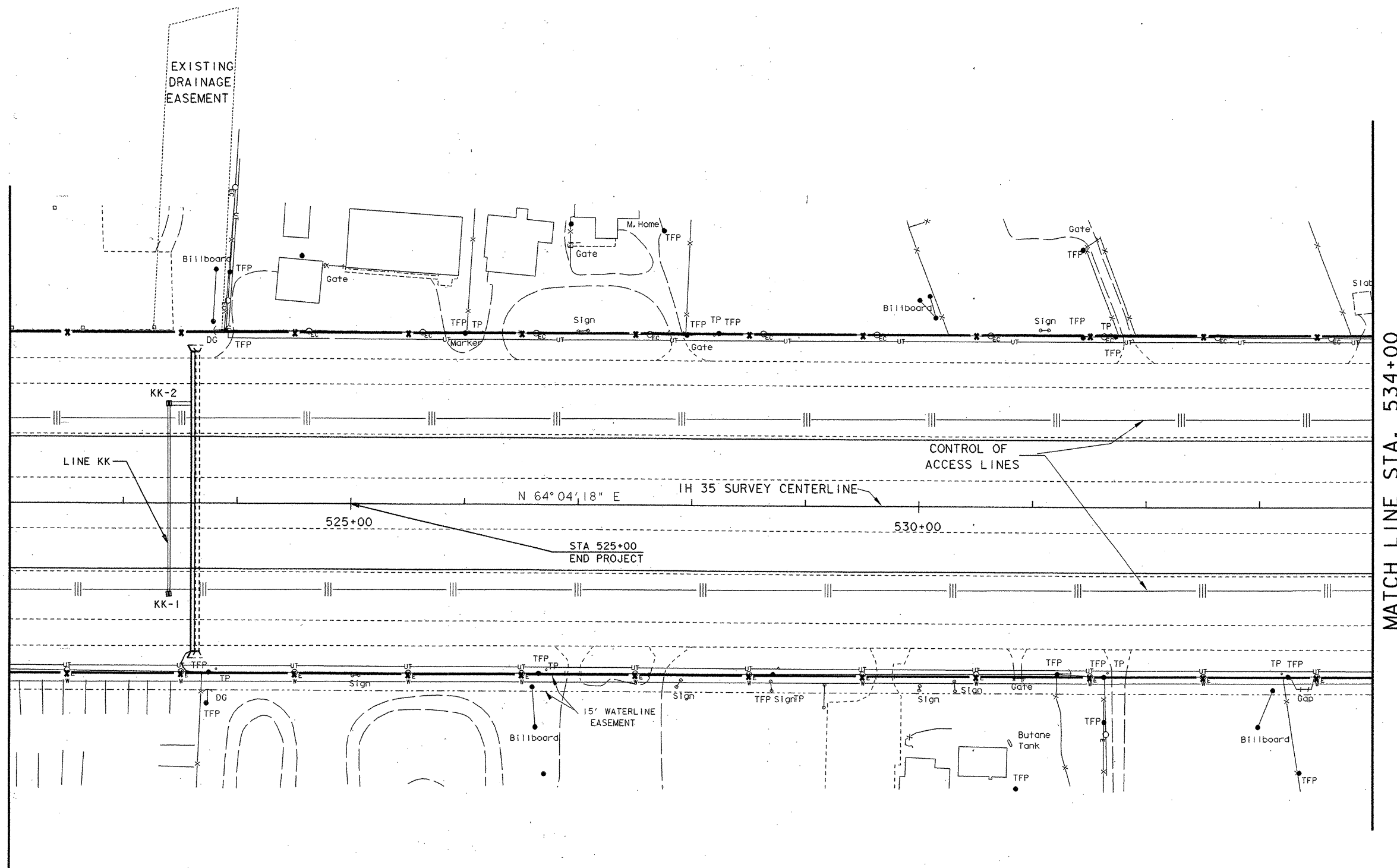
FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	NH 95 (40) IM		60
STATE	STATE DIST. NO.	COUNTY	
TEXAS	15	COMAL	
CONT.	SECT.	JOB	HIGHWAY NO.
0016	05	087	IH 35



P.E. 71682, on
4/7, 1995.
Gregory A. Malach, P.E.

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.			SHEET NO.
6	NH 95 (40) IM			6
STATE	STATE DIST. NO.	COUNTY		
TEXAS	15	COMAL		
CONT.	SECT.	JOB	HIGHWAY NO.	
0016	05	087	1H 35	

MATCH LINE STA. 522+00



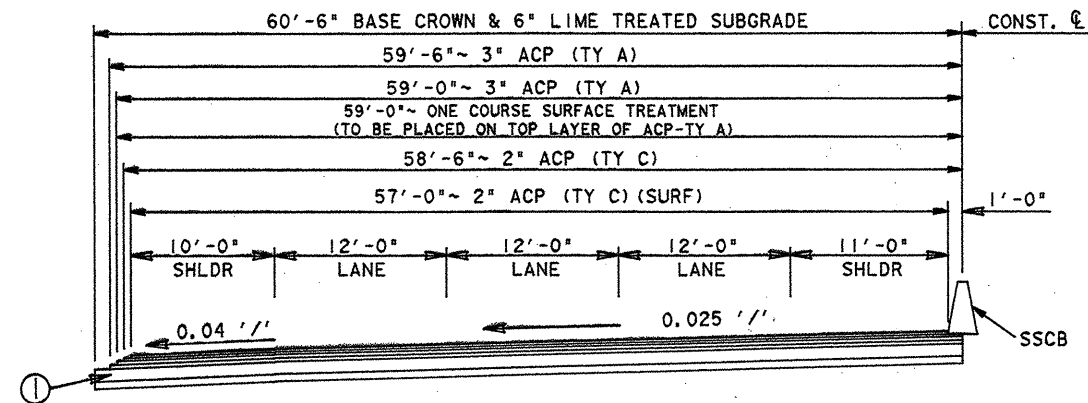
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STORMSEWER & UTILITY LAYOUT

SHEET 26 OF 26

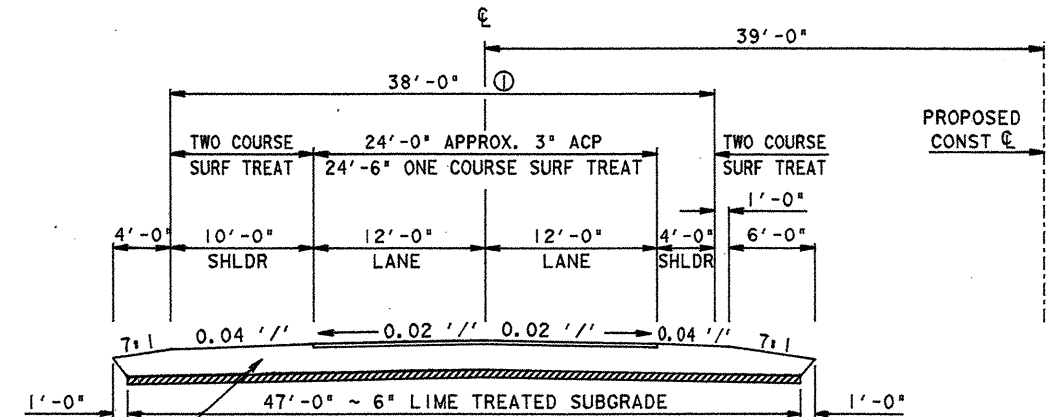
SCALE 1" = 50'			
FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.	
6	NH 95 (40) IM	62	
STATE	STATE DIST. NO.	COUNTY	
TEXAS	15	COMAL	
CONT.	SECT.	JOB	HIGHWAY NO.
0016	05	087	IH 35



I.H. 35
HALF WIDTH GRADE REVISION
FINISHED TYPICAL SECTION OF
THE NORTHBOUND & SOUTHBOUND LANES
TO BE USED APPROX. 430.00 STA. *

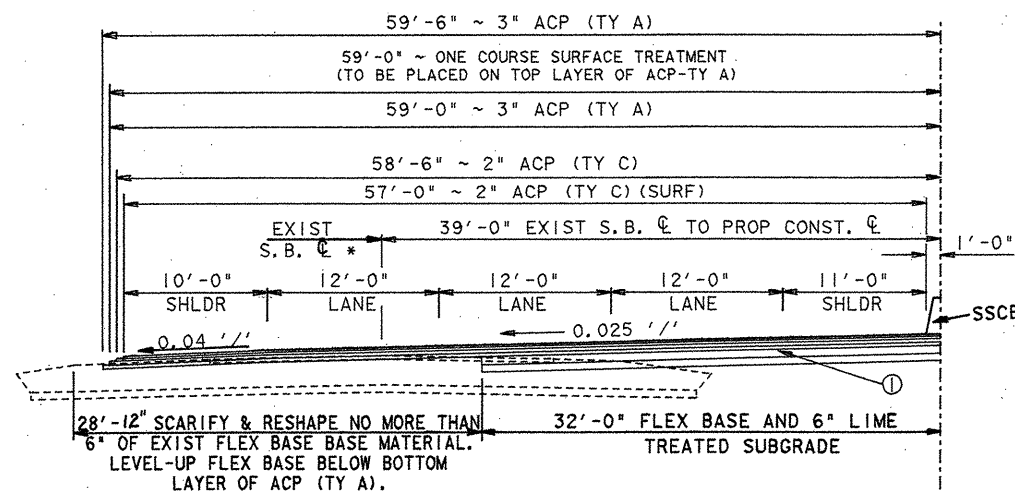
- ① FLEX BASE (COMP IN PLACE) (TY A, GR 6, CL 4):
-10" COMP. DEPTH (APPROX STA 232+00 TO 510+00)
TO BE PLACED IN APPROX. 2 EQUAL LIFTS.
-14" COMP. DEPTH (APPROX STA 510+00 TO 525+00)
TO BE PLACED IN APPROX. 3 EQUAL LIFTS.
FLEX BASE SHALL BE TREATED WITH EMULSIFIED ASPHALT.

* LANE	STA	TO	STA
NBL	232+00	525+00	
SBL	274+00	295+00	
SBL	327+00	364+00	
SBL	390+00	408+00	
SBL	464+00	525+00	



I.H. 35
EXISTING TYPICAL SECTION
FOR SOUTHBOUND LANES

- ① OVERLAY DEPTHS:
STA 232+00 TO STA 285+00 = 1.25"
STA 285+00 TO STA 481+60 = 1.5"
STA 481+60 TO STA 500+00 = 1.0"
STA 500+00 TO STA 525+00 = 2.5"

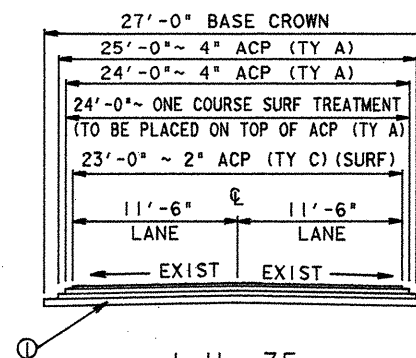


I.H. 35
FINISHED TYPICAL SECTION
OF SOUTHBOUND LANES
FOR NON-GRADE REVISION AREAS
TO BE USED APPROX. 156.00 STA. *

* NOTE:
FOR EXIST. S.B. LANE DETAIL,
SEE EXIST. TYPICAL SECTION
FOR S.B. LANES.

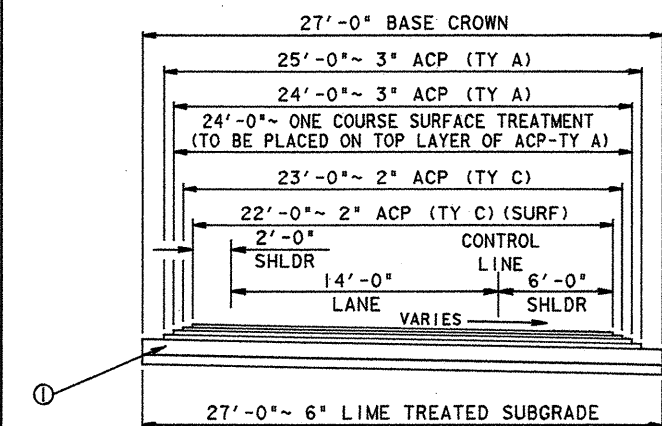
- ① FLEX BASE (COMP IN PLACE) (TY A, GR 6, CL 4):
-10" COMP. DEPTH (APPROX STA 232+00 TO 510+00)
TO BE PLACED IN APPROX. 2 EQUAL LIFTS.
-14" COMP. DEPTH (APPROX STA 510+00 TO 525+00)
TO BE PLACED IN APPROX. 3 EQUAL LIFTS.
NEW & EXIST. FLEX BASE SHALL BE TREATED WITH EMULSIFIED ASPHALT.

* STA	TO	STA
232+00	274+00	
295+00	327+00	
364+00	390+00	
408+00	464+00	



I.H. 35
FRONTAGE ROAD REPAIR
TYPICAL SECTION
IN CULVERT IMPROVEMENT AREAS

- ① SALVAGED FLEX BASE
(DEN. CONT.) (TY B CL 5) (6")
FLEX BASE SHALL BE TREATED
WITH EMULSIFIED ASPHALT.
② SUBSIDIARY TO THE VARIOUS
BID. ITEMS.



I.H. 35
PROP. TYPICAL SECTION
ENTRANCE & EXIT RAMP

- ① FLEX BASE (COMP IN PLACE)
(TY A GR. 6 CL. 4)
10" COMP. DEPTH TO BE PLACED
IN 2 EQUAL LIFTS.
FLEX BASE SHALL BE TREATED
WITH EMULSIFIED ASPHALT.



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4/7, 1995.

Gregory A. Malatek, P.E.

TYPICAL SECTIONS

SHEET 10F 1

ED. NO.	FEDERAL AID PROJECT NO.	SHEET NO.
6	NH 95 (40) IM	63
STATE	STATE DIST. NO.	COUNTY
TEXAS	15	COMAL
CONTRACT	SECTION	HIGHWAY NO.
0016	05	087 1H 35

F.R. DIV.6	TEXAS	MANH 95(40)IM	.ETC	SHEET	64
COMAL	COUNTY	HWY IH 35	CONT 0016-5-87,ETC		

GENERAL NOTES AND SPECIFICATION DATA--

GRADING REQUIREMENTS FOR:
ITEM 247 FLEX BASE (TY A GR 6)

1-3/4"	1-1/4"	7/8"	3/8"	NO. 4	NO. 40	SOIL LL	CONSTANTS PI	PI	WET BALL MILL
						MAX	MAX	MIN	MAX

PERCENT RETAINED ON EACH SIEVE
(247) 0-10 45-75 65-85 45 15 * 55

* THE MAXIMUM INCREASE IN MATERIAL PASSING THE NO. 40 SIEVE SHALL NOT EXCEED 20.

***** COMPACTION REQUIREMENTS *****

ITEM	MATERIAL	COURSE	DENSITY
247	FLEX BSE	ALL	98 % MINIMUM

***** BASIS OF ESTIMATE *****

ITEM	DESCRIPTION	RATE	QUANT	UNIT
260	LIME (TY C) (DRY)	18 LB/SY	3493.84	TON
314	EMUL ASPH	0.2 GAL/SY	86,867	GAL

THE FOLLOWING IS FOR CONTRACTOR'S INFORMATION ONLY- NON PAY

204	SPRINK (EMBANK)	20 GAL/CY		
211	ROLL (TAMP) (EMBANK)	1 HR/300 CY		
213	ROLL (MED-B) (EMBANK)	1 HR/300 SY		
166	FERT	1/16 LB/SY	13.78	TON

***** ASPHALTIC CONCRETE PAVEMENT *****

TYPE	LOCATION	DEPTH	RATE	AREA-SY	QUANT-TON
ACP-SURF	MAIN LN	2"	220 LB/SY	371,133	40,825
ACP-SURF	RAMPS	2"	220 LB/SY	36,747	4,042
			TOTAL ACP-SURF =		44,867
ACP-TV C	MAIN LN	2"	220 LB/SY	380,900	41,899
ACP-TV C	RAMPS	2"	220 LB/SY	38,128	4,194
			TOTAL ACP-TV C =		46,093
ACP-TV A	MAIN LN	3"	330 LB/SY	771,567	127,309
ACP-TV A	RAMPS	3"	330 LB/SY	80,515	13,285
			TOTAL ACP-TV A =		140,594
ACP-TV D	PHASE I	1"	110 LB/SY	78,134	4,297

SPECIFICATION DATA

Rev. 07/26 SHEET A

F.R. DIV.6	TEXAS	MANH 95(40)IM	.ETC	SHEET	64
COMAL	COUNTY	HWY IH 35	CONT 0016-5-87,ETC		

GENERAL NOTES AND SPECIFICATION DATA--

***** SURFACE TREATMENT DATA *****

ASPH--TYPE	ONE COURSE	SEE GEN NOTES
ASPH--RATE (GAL/SY)		.30 GAL/SY
AGGR--TYPE/GR		TY PB GR 4
AGGR--RATE (CV/SY)		1:115

LOCATION	AREA-SY	ASPH-GAL	AGGR-CY
MAINLANE	384,156	115,250	3,340
RAMPS	39,507	11,852	344
PHASE I	78,134	23,440	680
TOTALS=	501,797	150,542	4,364

THE FOLLOWING STANDARD DETAIL SHEETS HAVE BEEN MODIFIED:
MC6-1, SC-NA, SSCB(2)-92, SSCB(3)-92 (DIST STD), SSCB(4)-92.

ALL PAVEMENT MARKINGS SHALL BE IN ACCORDANCE WITH THE TEXAS MUTCD.

IN THOSE INSTANCES WHERE FIXED FEATURES REQUIRE, THE GOVERNING SLOPES FOR THE PROJECT MAY BE VARIED FROM BETWEEN THE LIMITS AND TO THE EXTENT DETERMINED BY THE ENGINEER.

THE LOCATION OF UTILITIES, EITHER UNDERGROUND OR OVERHEAD, SHOWN WITHIN THE RIGHT OF WAY ARE APPROXIMATE AND SHALL BE VERIFIED BY THE CONTRACTOR BEFORE BEGINNING CONSTRUCTION OPERATIONS.

THE FOLLOWING IS A LIST OF THE TELEPHONE NUMBERS OF THE UTILITY LOCATORS FOR THE VARIOUS UTILITIES THAT MAY BE ENCOUNTERED.

CITY PUBLIC SERVICE (GAS & ELECTRIC)	978-3500
S.W. BELL TELEPHONE	954-4102
NBU (WATER, SEWER AND ELECTRIC)	1-210-625-5582
CITY OF SCHERTZ (WATER)	658-7477
GREEN VALLEY WATER	914-2330
GUADCO MUT (WATER)	656-1310
AT & T	1-800-252-1133
CITY OF MARION (WATER)	420-4527

ALL EXISTING RAISED PAVEMENT MARKINGS SHALL BE REMOVED BY THE CONTRACTOR DAILY, AS THE WORK PROGRESSES AND AS APPROVED BY THE ENGINEER. THIS WORK WILL NOT BE PAID FOR SEPARATELY BUT SHALL BE CONSIDERED SUBSIDIARY TO THE VARIOUS BID ITEMS. MATERIAL REMOVED SHALL BECOME THE PROPERTY OF THE CONTRACTOR.

SPECIFICATION DATA

Rev. 07/26 SHEET B

F.R. DIV.6	TEXAS	MANH 95(40)IM	.ETC	SHEET	64
COMAL	COUNTY	HWY IH 35	CONT 0016-5-87,ETC		

GENERAL NOTES AND SPECIFICATION DATA--

IF WASTE AREAS OR MATERIAL SOURCES ARE REQUIRED FOR THE COMPLETION OF THIS PROJECT, SUCH AREAS SHALL NOT BE VISIBLE FROM ANY HIGHWAY ON THE TEXAS HIGHWAY SYSTEM UNLESS APPROVED IN WRITING BY THE ENGINEER.

MATERIALS LARGER THAN 4 INCHES IN SIZE WITHIN THE LIMITS OF THE RIGHT OF WAY AND NOT INCORPORATED IN THE FINISHED ROADWAY SECTION SHALL BE REMOVED FROM THE RIGHT OF WAY AND DISPOSED OF IN A MANNER SUITABLE TO THE ENGINEER AT THE ENTIRE EXPENSE OF THE CONTRACTOR.

A PROJECT COVERING INTERSTATE SIGNING AND DELINEATION WILL BE LET PRIOR TO THE COMPLETION OF THIS PROJECT. THE CONTRACTOR WILL BE REQUIRED TO COORDINATE HIS WORK WITH THAT OF THE SIGNING AND DELINEATION CONTRACTOR. NO ADDITIONAL COMPENSATION WILL BE ALLOWED FOR ANY HINDRANCE OR DELAYS IN CONSTRUCTION OPERATIONS THAT MAY BE ATTRIBUTED TO OBSERVANCE OF THIS REQUIREMENT.

THE CONTRACTOR SHALL MAINTAIN THE RIGHT OF WAY IN A SATISFACTORY APPEARANCE AS DETERMINED BY THE ENGINEER. HE WILL BE REQUIRED TO MOW THE RIGHT OF WAY; PICK UP LITTER AND/OR SWEEP THE ROADWAY IN ACCORDANCE WITH THE ITEM "PROJECT MAINTENANCE" WHEN CALLED FOR IN THE PLANS.

ANY MATERIALS (OLD SIGNS, TEXT, BORDERS, ARROWS, SHIELDS, HARDWARE, ETC.) REMOVED AND NOT REUSED ON THIS PROJECT AND DETERMINED TO BE SALVAGABLE MATERIAL BY THE ENGINEER SHALL BE RETAINED BY THE STATE AND SHALL BE STORED WITHIN THE PROJECT LIMITS IN A SECURE LOCATION OR DELIVERED UNDAMAGED TO THE STATE'S NEW BRAUNFELS MAINTENANCE YARD AS DIRECTED BY THE ENGINEER. MATERIALS NOT TO BE SALVAGABLE BY THE ENGINEER SHALL BECOME THE PROPERTY OF THE CONTRACTOR FOR PROPER DISPOSAL AT THEIR EXPENSE.

IN PREPARING HOLES FOR POSTS AND/OR FOUNDATIONS, CARE SHALL BE TAKEN SO AS NOT TO RUPTURE EXISTING DRAINAGE STRUCTURES, SPRINKLER SYSTEMS, ELECTRICAL CONDUITS AND PUBLIC UTILITIES.

ANY SIGN PANELS THAT ARE TO BE ADJUSTED AND/OR REMOVED AND REPLACED, SHALL BE DONE IN THE SAME WORKDAY UNLESS OTHERWISE APPROVED BY THE ENGINEER.

EXISTING SIGNS, WHERE IN CONFLICT WITH TRAFFIC MOVEMENTS, SHALL BE REMOVED OR COVERED WITH A BURLAP OR POLYETHYLENE TYPE COVERING OR OTHER MATERIAL AS APPROVED BY THE ENGINEER.

SMALL SIGNS ON RAMPS AND FRONTAGE ROADS SHALL BE PLACED AT A LATERAL CLEARANCE OF 8 TO 12 FEET FROM THE EDGE OF PAVEMENT OR AS DIRECTED BY THE ENGINEER.

SPECIFICATION DATA

Rev. 07/26 SHEET C

F.R. DIV.6	TEXAS	MANH 95(40)IM	.ETC	SHEET	64
COMAL	COUNTY	HWY IH 35	CONT 0016-5-87,ETC		

GENERAL NOTES AND SPECIFICATION DATA--

SIGN TYPES FOR WHICH DESIGN DETAILS ARE NOT SHOWN IN THESE PLANS SHALL CONFORM WITH THE "TEXAS M.U.T.C.D."

--ITEM 2--
THE PARTICULAR ATTENTION OF THE BIDDER IS DIRECTED TO THE FIRST PARAGRAPH OF ARTICLE 2.3 OF THE STANDARD SPECIFICATIONS. IN VIEW OF THE COMPLEX NATURE OF THE WORK, THE NEED FOR CLOSE COORDINATION WITH VARIOUS UTILITIES, TRAFFIC CONTROL CONSIDERATIONS, AND OTHER FACTORS INFLUENCING THE PROSECUTION OF THE WORK, IT IS STRONGLY RECOMMENDED THAT PROSPECTIVE BIDDERS EXAMINE THE SITE OF THE WORK IN COMPANY WITH THE ENGINEER.

--ITEM 8--
FOR THIS PROJECT, A CRITICAL PATH METHOD (CPM) SHALL BE USED IN LIEU OF A BAR CHART AS COVERED BY SPECIAL PROVISION 008---070. THE SOFTWARE REQUIRED WILL BE SURETRAK PROJECT SCHEDULER OR AS APPROVED OR AT THE DISCRETION OF THE ENGINEER.

--ITEM 9--
THE CONTRACTOR SHALL PROVIDE TWO (2) UNIFORMED, OFF-DUTY PEACE OFFICERS WITH TWO (2) PATROL CRUISERS DURING ANY WORK THAT REQUIRES A LANE TO BE CLOSED. THESE OFFICERS IN THE PATROL CRUISERS SHALL BE LOCATED AS APPROVED BY THE ENGINEER. AT LEAST ONE OFFICER AND CRUISER WILL BE REQUIRED TO MOVE WITH AND MONITOR THE QUEUE DURING THE LANE CLOSURE. ADDITIONAL OFFICERS AND CRUISERS MAY BE REQUIRED AT THE DISCRETION OF THE ENGINEER. THE OFFICERS WITH PATROL CRUISERS WILL BE PAID FOR THROUGH THE FORCE ACCOUNT PROCEDURES COVERED BY SPECIAL PROVISION TO ITEM 9, 009---014.

THE CONTRACTOR SHALL FURNISH AND OPERATE A "COURTESY PATROL" VEHICLE ON THIS PROJECT. THE VEHICLE SHALL OPERATE DURING NON-WORKING HOURS, 5:30 PM TO 7:00 AM, TO AID THE TRAVELING PUBLIC AND TO HELP INSURE THE SAFE PASSAGE OF THE TRAVELING PUBLIC THROUGH THE PROJECT. THE "COURTESY PATROL" VEHICLE SHALL HAVE COMPARABLE EQUIPMENT AND SUPPLIES TO THE TXDOT, SAN ANTONIO DISTRICT'S "COURTESY PATROL" VEHICLES SUCH AS CELLULAR PHONE, WATER AND FUEL CANS, JACKS FOR CHANGING FLAT TIRES, JUMPER CABLES, AIR COMPRESSOR, ETC., AND/OR AS DIRECTED/APPROVED BY THE ENGINEER. THE VEHICLE SHALL HAVE THE ABILITY TO PUSH OR PULL VEHICLES OFF THE TRAVEL LANES. SHALL BE LABELED ON THE OUTSIDE AS "COURTESY PATROL" AND SHALL BE EQUIPPED WITH HAZARD TYPE FLASHING BAR LIGHT. THE VEHICLE SHALL BE IN OPERATION DURING PHASE II AND PHASE III OF THE

SPECIFICATION DATA

Rev. 07/26 SHEET D

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GENERAL NOTES AND SPECIFICATION DATA--

--ITEM 9--
CONT'D
"SEQUENCE OF WORK" ON THE PLANS OR AS DEEMED NECESSARY BY THE ENGINEER. THE VEHICLE AND OPERATOR WILL BE PAID FOR BY FORCE ACCOUNT AT A RATE OF 5 PERCENT OVER INVOICE PRICE AS COVERED BY THE SPECIAL PROVISION TO ITEM 9, 009---014.

--ITEM 100--
THE CONTRACTOR SHALL NOT BEGIN ANY CLEARING OPERATIONS BEFORE THE ENGINEER HAS ESTABLISHED AND DEFINED THE TREES AND AREAS OF VEGETATION THAT SHALL NOT BE REMOVED OR DISTURBED BY CONSTRUCTION ACTIVITIES. ALL CLEARING OPERATIONS WILL BE COORDINATED WITH THE PROJECT'S SW3P.

--ITEM 110--
THE EARTHWORK FOR THIS PROJECT WAS NOT DEVELOPED WITH THE USE OF COMPUTERS; THEREFORE, A COMPUTER DISKETTE WITH THE EARTHWORK INFORMATION CAN NOT BE PROVIDED. PRIOR TO CONTRACT LETTING, REPRODUCIBLE EARTHWORK CROSS-SECTIONS WILL BE AVAILABLE AT THE ENGINEER'S OFFICE FOR BORROWING BY COPYING-SERVICE COMPANIES FOR THE PURPOSE OF MAKING COPIES FOR THE PROSPECTIVE BIDDER AT THE BIDDER'S EXPENSE.

WHERE EXCAVATION (CHANNEL) EXTENDS BEYOND THE RIGHT OF WAY FENCE THE CONTRACTOR SHALL REMOVE AND REPLACE THE FENCE TO A CONDITION COMPARABLE TO THAT AT REMOVAL AT HIS OWN EXPENSE.

--ITEM 164--
THE PLANTING SEASON FOR PERMANENT SEEDING SHALL BE EXTENDED TO INCLUDE THE PERIOD FROM MAY 1 TO SEPTEMBER 1. SUBSEQUENT TO SEEDING DURING THE PLANTING DATES FROM MAY 1 TO SEPTEMBER 1, THE SEEDING AREA SHALL BE WATERED AT A RATE OF 3 GALLONS PER SQUARE YARD, PER DAY, FOR A PERIOD OF TWO DAYS. AFTER THE FIRST TWO DAYS, WATERING MAY BE REDUCED TO ONE TIME PER WEEK FOR A PERIOD OF FOUR WEEKS OR AS DIRECTED BY THE ENGINEER.

SUBSEQUENT TO SEEDING DURING THE OTHER PLANTING SEASONS, THE SEEDING AREA SHALL BE WATERED AT A RATE OF 3 GALLONS PER SQUARE YARD PER MONTH FOR A PERIOD OF THREE MONTHS, OR AS DIRECTED BY THE ENGINEER.

--ITEM 247--
FLEXIBLE BASE MATERIAL SHALL COME FROM A SOURCE APPROVED BY THE ENGINEER. IF THE FLEXIBLE BASE COMES FROM A STOCKPILE, THE STOCKPILE SHALL BE TESTED BEFORE DELIVERY ON THE ROAD. THE STOCKPILE SHALL BE

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GENERAL NOTES AND SPECIFICATION DATA--

--ITEM 247--
CONT'D
BUILT IN LIFTS NOT TO EXCEED 2 FEET AND IN A MANNER AS TO OBTAIN A MINIMUM WORKING FACE OF NOT LESS THAN 10 FEET AND A MAXIMUM WORKING FACE OF NOT MORE THAN 20 FEET. FINAL ACCEPTANCE OF FLEXIBLE BASE MATERIAL WILL BE FROM TESTS MADE FROM WINDROW SAMPLES AND/OR THE STOCKPILE.

--ITEM 251--
THE EXISTING ASPHALTIC CONCRETE PAVEMENT MATERIAL IN THE AREAS TO BE SCARIFIED AND RESHAPED SHALL BE COMBINED WITH THE BASE MATERIAL.

--ITEM 260--
A MINIMUM OF 5% OF THE LIME TRUCKS RECEIVED ON THE PROJECT MAY BE RANDOMLY SELECTED AND REWEIGHED AT EITHER THE CONTRACTOR'S SCALES OR AT PUBLIC SCALES. IF THE WEIGHT VARIES BY MORE THAN 2%, THE PAYMENT FOR THE LIME FROM THESE TRUCKS WILL BE BASED ON THE WEIGHTS MEASURED ON THESE SCALES.

--ITEM 302--
PREVIOUSLY TESTED AGGREGATES DELIVERED TO THE PROJECT, WHICH ARE FOUND TO CONTAIN EXCESSIVE QUANTITIES OF DUST (MORE THAN 0.5 PERCENT PASSING THE NO. 40 SIEVE) DUE TO DEGRADATION DURING PRECOATING, STOCKPILING OR HAULING OPERATIONS, MAY BE REJECTED BY THE ENGINEER. TEST METHOD TEX-200-F, PART I SHALL BE USED FOR TESTING.

--ITEMS 305, 351 & 3063--
THE SALVAGED ASPHALTIC CONCRETE PAVEMENT REMOVED FROM THIS PROJECT UNDER ITEMS 305 AND 351 MAY BE USED BY THE CONTRACTOR UNDER ITEM 3063 IN THE PRODUCTION OF ACP (TY A) AND ACP (TY C), AS DIRECTED BY THE ENGINEER, BUT NO SALVAGED ASPHALTIC CONCRETE PAVEMENT MATERIAL WILL BE ALLOWED IN THE SURFACE COURSE.

IF THE SALVAGED ASPHALTIC CONCRETE PAVEMENT MATERIAL IS NOT USED FOR ACP, IT SHALL BE STOCKPILED AT LOCATION(S) AS DIRECTED/APPROVED BY THE ENGINEER.

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GENERAL NOTES AND SPECIFICATION DATA--

--ITEM 305--
THE SALVAGED ASPHALTIC CONCRETE PAVEMENT FROM THE FOLLOWING LOCATIONS:

EXISTING NBL - STA 292+00 TO STA 525+00
EXISTING SBL - STA 274+00 TO STA 295+00
- STA 327+00 TO STA 364+00
- STA 390+00 TO STA 408+00
- STA 464+00 TO STA 525+00

THE EXISTING SALVAGED ASPHALTIC CONCRETE PAVEMENT FROM THE ABOVE LISTED LOCATIONS HAVE THE FOLLOWING PROPERTIES:

SIEVE SIZE	PERCENT PASSING
7/8"	100
5/8"	100
1/2"	90.8
3/8"	76.4
NO. 4	52.5
NO. 10	34.9
NO. 40	19.2
NO. 80	3.3
NO. 200	2.5

Z ASPHALT = 4.7
PENETRATION @ 77 DEGREES F - 18

THE CONTRACTOR SHALL TAKE EXTREME PRECAUTION TO AVOID DAMAGE TO EXISTING BRIDGE DECKS AND ARMOR JOINTS DURING THE REMOVAL OF THE ASPHALTIC CONCRETE PAVEMENT OPERATION. ANY DAMAGE TO BRIDGE DECK SLAB SHALL BE REPAIRED AT THE EXPENSE OF THE CONTRACTOR BY A PROCEDURE APPROVED BY THE ENGINEER. ANY DAMAGE TO ARMOR JOINTS SHALL BE REPAIRED AND/OR REPLACED AT THE EXPENSE OF THE CONTRACTOR AS APPROVED BY THE ENGINEER.

--ITEM 314--
EMULSIFIED ASPHALT SHALL BE USED TO PROCESS APPROXIMATELY 2 INCHES OF THE FINAL LIFT AND TO FINISH THE FLEXIBLE BASE. THE AMOUNT USED SHALL BE WITHIN THE PERCENTILE LIMITS DETERMINED BY THE ENGINEER AND SHALL NOT BE LESS THAN 2 PERCENT OF THE TOTAL MIXTURE.

--ITEM 316--
IT IS THE INTENT TO USE (AC-5, AC-10 OR MC-2400) LATEX, CRS-1P, CRS-2P OR HFRS-2P. MATERIAL RATES SHOWN ARE BASED ON AC AND MAY BE ADJUSTED BY THE ENGINEER DEPENDING ON THE MATERIAL USED. IN THE EVENT EMULSIONS

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GENERAL NOTES AND SPECIFICATION DATA--

--ITEM 316--
CONT'D
ARE USED, A MINIMUM 24 HOUR CURING PERIOD SHALL ELAPSE BEFORE PLACING ANY SUBSEQUENT ASPHALT COURSES. BECAUSE OF THE REQUIRED CURING PERIOD, THE CONTRACTOR SHALL OBTAIN APPROVAL FROM THE ENGINEER BEFORE USING EMULSIONS.

WHEN USING LATEX ASPHALT, THE CONTRACTOR SHALL TAKE PRECAUTIONARY MEASURES TO AVOID DRIFTING OF ASPHALT ONTO TRAFFIC AND ADJACENT PROPERTIES.

THE CONTRACTOR WILL BE REQUIRED TO SET A STRING LINE FOR ALL SURFACE TREATMENT OPERATIONS UNLESS OTHERWISE DIRECTED BY THE ENGINEER.

THE LOCATION OF AGGREGATE STOCKPILES SHALL BE APPROVED BY THE ENGINEER. THE AGGREGATE SHALL BE FREE OF EXCESS SURFACE MOISTURE, AS DETERMINED BY THE ENGINEER, BEFORE APPLICATION.

THE MINIMUM POLISH VALUE FOR THE AGGREGATES SHALL BE 32.

PRECOATED AGGREGATES, OTHER THAN LRA, MAY BE PRECOATED WITH AC-10, AC-20, MS-2, CSS-1 OR PRECOAT OIL. FLUX OIL OR EMULSIONS MAY BE USED FOR PRECOATING LRA. THE TYPE AND AMOUNT OF PRECOAT MATERIAL WILL BE APPROVED BY THE ENGINEER PRIOR TO PRODUCTION. WHEN EMULSIONS ARE USED AS THE PRECOAT MATERIAL, THE PRECOATED AGGREGATE SHALL BE ADEQUATELY DRIED TO THE SATISFACTION OF THE ENGINEER. IT WILL BE THE RESPONSIBILITY OF THE CONTRACTOR/PRODUCER TO PROVIDE ADEQUATE DRYING AND CURING PERIODS BEFORE DELIVERY OF THE AGGREGATES. THE ENGINEER RESERVES THE RIGHT TO REJECT ANY PRECOATED AGGREGATE WHICH IS IMPROPERLY COATED OR OTHERWISE UNSATISFACTORY FOR USE.

IF THE AGGREGATES TO BE PRECOATED ARE FOUND TO HAVE STRIPPING CHARACTERISTICS, THE ENGINEER MAY REQUIRE THE ADDITION OF A LIME SLURRY. LIME MEETING THE REQUIREMENTS OF ITEM 264 SHALL BE ADDED TO THE AGGREGATE AT THE RATE OF 1% HYDRATED LIME BY WEIGHT OF AGGREGATE. THE LIME SHALL BE ADDED TO THE AGGREGATE IN SLURRY FORM AT THE COLD FEED. THE COST OF THE LIME SHALL BE CONSIDERED SUBSIDIARY TO THIS ITEM AND WILL NOT BE PAID FOR DIRECTLY. IF APPROVED BY THE ENGINEER, THE LIME SLURRY MAY BE ADDED AT THE STOCKPILE BUT NOT MORE THAN 24 HOURS IN ADVANCE OF USE.

THE ADDITION OF BAGHOUSE FINES WILL NOT BE PERMITTED IN THE PRODUCTION OF PRECOATED MATERIAL.

MIXES THAT DO NOT MAINTAIN FLOW QUALITIES WHERE THE PRECOATED AGGREGATE CAN NOT BE SATISFACTORILY SPREAD BY APPROVED MECHANICAL SPREADING DEVICES WILL NOT BE ACCEPTABLE.

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GENERAL NOTES AND SPECIFICATION DATA--

--ITEM 316--
CONT'D

WARNING TO CONTRACTOR'S: STOCKPILES OF AGGREGATE PRECOATED WITH AC MAY GENERATE EXCESSIVE HEAT BUILD-UP RESULTING IN DAMAGE TO THE ASPHALT AND/OR AGGREGATES IF ADEQUATE COOLING HAS NOT BEEN INITIALLY PROVIDED. STOCKPILES SHOWING EVIDENCE OF EXCESSIVE HEAT BUILD-UP CAN BE REJECTED BY THE ENGINEER.

ALL ROLLING SHALL BE IN ACCORDANCE WITH ITEM 213 (MEDIUM, TYPE B) AT THE APPROXIMATE RATE OF 1 HR/3000 SY OR AS DIRECTED BY THE ENGINEER. THE LIGHT PNEUMATIC ROLLER WILL BE ACCEPTABLE AT THE APPROXIMATE RATE OF 1 HOUR/2000 SY. THE TIRE PRESSURE AND BALLAST OF ALL PNEUMATIC ROLLERS WILL BE AN ITEM OF CONTINUING INTEREST BY THE ENGINEER, AND WILL BE IN ACCORDANCE WITH ITEM 213.

--ITEM 420--
BENT CONCRETE WILL BE MEASURED FOR PAYMENT AS PLAN QUANTITY.

--ITEMS 421 & 427--
ALL CONCRETE STRUCTURES SHALL RECEIVE A SURFACE AREA II, CLASS A, B (TY I), OR C FINISH, EXCEPT SINGLE SLOPE CONCRETE TRAFFIC BARRIER SHALL RECIEVE A CLASS D FINISH.

--ITEMS 421 & 520--
AFTER CONCRETE PRODUCER CONTACTS THE DISTRICT CONCRETE LABORATORY OR THE AREA ENGINEER (WHEN OUTSIDE THE SAN ANTONIO AREA) TO REQUEST A TXDOT INSPECTOR AT THEIR CONCRETE BATCH PLANT, TXDOT WILL DETERMINE IF AN INSPECTOR CAN BE SCHEDULED. IF AN INSPECTOR IS NOT AVAILABLE, TXDOT WILL NOTIFY THE PRODUCER. AT THAT TIME, IF THE CONCRETE PRODUCER HAS A TXDOT APPROVED CONCRETE BATCH TICKET FORM AND THE CONCRETE REQUESTED BY THE CONTRACTOR IS NOT FOR A BRIDGE DECK OR TOP SLAB OF A DIRECT TRAFFIC CULVERT, THE PRODUCER WILL BE ALLOWED TO BATCH THE CONCRETE WITHOUT A TXDOT INSPECTOR BEING PRESENT.

THE CONCRETE PRODUCERS WILL BE REQUIRED TO DEVELOP A CONCRETE BATCH TICKET FORM THAT WILL CONTAIN THE SAME INFORMATION AS TXDOT'S CONCRETE BATCH TICKET (FORM 596-REV.9-88). THE PRODUCER'S TICKET CAN BE A PRE-PRINTED FORM WHERE THE BATCH INFORMATION IS ENTERED BY HAND, LEGIBLY, OR A COMPUTER PRINTOUT. THE PRODUCER'S TICKET SHALL BE SUBMITTED TO TXDOT FOR APPROVAL PRIOR TO USE. IT WILL BE THE CONTRACTOR'S RESPONSIBILITY TO INFORM THEIR CONCRETE PRODUCER OF THIS TICKET REQUIREMENT.

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GENERAL NOTES AND SPECIFICATION DATA--

--ITEMS 421 & 520--
CONT'D
USE OF THE APPROVED TICKET IS RECOMMENDED BUT NOT REQUIRED FOR BATCHING MISCELLANEOUS CONCRETE. CONCRETE FOR BRIDGE DECKS OR TOP SLABS OF DIRECT TRAFFIC CULVERTS SHALL BE BATCHED IN THE PRESENCE OF A TXDOT INSPECTOR TO ISSUE TXDOT'S CONCRETE BATCH TICKET (FORM 596-REV.9-88).

--ITEM 427--
TO INSURE THAT THE CLASS B (PAINT TYPE) CONCRETE FINISH MEETS ALL SPECIFIED REQUIREMENTS, RANDOM TEST SAMPLES MAY BE TAKEN DURING ACTUAL APPLICATION AND FORWARDED TO TXDOT'S MATERIALS AND TESTS DIVISION FOR TEST CONFIRMATION.

THE CLASS OF FINISH APPLIED TO THE EXISTING CONCRETE SURFACE SHALL BE THE SAME AS THAT APPLIED TO THE ADJOINING NEW CONCRETE SURFACE.

--ITEM 432--
IN ALL RIPRAP SLOPES, 3 INCH DIAMETER WEEP HOLES SHALL BE PROVIDED AT 10 FOOT MAXIMUM SPACING AND BACKED WITH LOOSE GRADED GRAVEL OR CRUSHED STONE AND GALVANIZED HARDWARE CLOTH AS DIRECTED BY THE ENGINEER.

IN AREAS WHERE GUARD FENCE POSTS ARE TO BE PLACED IN RIPRAP, THE RIPRAP SHALL HAVE A BLOCKED OUT AREA AT LEAST 12 INCHES LARGER THAN THE POST.

--ITEM 452--
RAIL ELEMENTS AND HARDWARE WILL REMAIN THE PROPERTY OF THE STATE. THE CONTRACTOR WILL STOCKPILE THE MATERIAL IN A SAFE PLACE ON THE RIGHT OF WAY, AS DIRECTED/APPROVED BY THE ENGINEER. TXDOT MAINTENANCE FORCES WILL REMOVE THE RAIL ELEMENTS AND HARDWARE FROM THE PROJECT.

--ITEM 462--
IF PRECAST UNITS ARE USED, THE CEMENT STABILIZED BACKFILL BETWEEN THE BOXES SHALL CONSIST OF CONCRETE AGGREGATE AND TWO SACKS OF PORTLAND CEMENT PER CUBIC YARD (TWO SACK CONCRETE).

THE PRECAST CULVERT END UNITS SHALL BE TIED TO THE CAST-IN-PLACE WINGS AS SHOWN ON THE PLANS OR IN A MANNER ACCEPTABLE TO THE ENGINEER.

WHERE STRUCTURES CROSS THE FRONTAGE ROADS THE PAVEMENT SHALL BE CUT STRAIGHT AND THE PAVEMENT STRUCTURE REPLACED USING THE TYPICAL SECTION AS SHOWN ON THE PLANS OR AS DIRECTED BY THE ENGINEER. THIS WORK SHALL NOT BE PAID FOR SEPARATELY BUT SHALL BE CONSIDERED SUBSIDIARY TO THIS ITEM.

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GENERAL NOTES AND SPECIFICATION DATA--

--ITEM 500--
"MATERIALS ON HAND" PAYMENTS WILL NOT BE CONSIDERED IN DETERMINING PERCENTAGES USED TO COMPUTE PAYMENT FOR ITEM "MOBILIZATION".

--ITEM 502--
WHEN ADVANCED WARNING FLASHING ARROW PANEL(S) IS SPECIFIED FOR THE CLOSING OF TRAFFIC LANES, THE CONTRACTOR SHALL BE REQUIRED TO FURNISH ONE STANDBY UNIT IN GOOD CONDITION AT THE JOB SITE READY FOR IMMEDIATE USE.

CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT VERTICAL PANELS AND CHEVRONS ON FLEXIBLE SUPPORTS SHALL BE USED TO DELINEATE TRAFFIC AS SHOWN ON THE BARRICADE AND DETOUR LAYOUTS AND AS DIRECTED BY THE ENGINEER. THESE ITEMS SHALL NOT BE PAID FOR DIRECTLY BUT SHALL BE CONSIDERED SUBSIDIARY TO THIS ITEM.

THE CONTRACTOR WILL BE REQUIRED TO FURNISH 4 PORTABLE TRAILER MOUNTED MESSAGE BOARDS, AS DETAILED ON THE PLANS, FOR USE ON THIS PROJECT. THE MESSAGES TO APPEAR ON THE BOARDS SHALL BE AS DIRECTED BY THE ENGINEER. THE FURNISHING OF THE MESSAGE BOARDS WILL NOT BE PAID FOR SEPARATELY, BUT SHALL BE CONSIDERED PART OF THE ITEM, "BARRICADES, SIGNS AND TRAFFIC HANDLING".

ALL MAINLANE CLOSURES SHALL BE RESTRICTED TO BE BETWEEN THE HOURS OF 8:30 AM AND 4:00 PM MONDAY THRU THURSDAY. ANY EXTENSION OF THE LANE CLOSURE PAST THE ALLOTTED TIME SHALL BE AT THE DISCRETION OF THE ENGINEER.

--ITEM 504--
THE CONTRACTOR WILL BE REQUIRED TO FURNISH ONE FIELD LABORATORY TYPE E AND ONE FIELD OFFICE TYPE C.

THE FIELD LABORATORY TY E SHALL BE AT LEAST 200 SQUARE FEET IN SIZE, SHALL HAVE ADEQUATE WINDOWS AND DOORS, SHALL BE PROVIDED WITH THE NECESSARY PLAN TABLES, SHELVES, AND LOCKERS REQUIRED AND CONSTRUCTED AS DIRECTED BY THE ENGINEER.

THE CONTRACTOR WILL BE RESPONSIBLE FOR PROVIDING THE NECESSARY OFFICE FURNITURE CONSISTING OF DESKS, CHAIRS FILING CABINETS, ETC., AS DIRECTED BY THE ENGINEER.

THE CONTRACTOR WILL BE REQUIRED TO CLEAN THE FIELD OFFICE AS NEEDED BUT NO LESS THAN ONCE A WEEK. THIS WILL INCLUDE, BUT NOT LIMITED TO SWEEPING AND MOPPING FLOORS, CLEANING THE TOILET AND LAVATORY, AND

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GENERAL NOTES AND SPECIFICATION DATA--

--ITEM 504--
CONT'D
EMPTYING WASTEBASKETS.

THE FIELD OFFICE PARKING AREA SHALL BE OF ADAQUATE MATERIAL, SHAPE AND SIZE TO ACCOMMODATE FIVE VEHICLES AS APPROVED BY THE ENGINEER. WHEN DIRECTED BY THE ENGINEER (DEPENDING ON THE LOCATION), THE FIELD OFFICE AND THE PARKING AREA SHALL BE ENCLOSED WITH A FENCE AS DESCRIBED IN ITEM 504.

THE STATE WILL FURNISH THEIR OWN TELEPHONE BUT THE CONTRACTOR WILL BE RESPONSIBLE FOR THE PHONE LINE(S) TO THE FIELD OFFICE. AN EXTRA TELEPHONE LINE IS REQUIRED FOR A FAX MACHINE; COMPUTER LINE, ETC. IF PRIOR APPROVAL IS OBTAINED FROM THE ENGINEER, THE CONTRACTOR MAY PROVIDE A CELLULAR PHONE INSTEAD OF AERIAL/GROUND PHONE LINES TO THE FIELD OFFICE.

IF THE CONTRACTOR OBTAINS THE ASPHALTIC MATERIAL FROM A SOURCE OTHER THAN A COMMERCIAL SOURCE PRESENTLY INSPECTED BY TXDOT, HE/SHE WILL BE REQUIRED TO FURNISH A TYPE D STRUCTURE MEETING THE DIMENSIONAL REQUIREMENTS OF A TYPE A STRUCTURE TO RUN THE ASPHALTIC MIX QUALITY CONTROL TESTS. THE STATE WILL PROVIDE THEIR OWN TELEPHONE BUT THE CONTRACTOR WILL BE RESPONSIBLE FOR THE PHONE LINE(S) TO THE FIELD OFFICE SITE. IF PRIOR APPROVAL IS OBTAINED FROM THE ENGINEER, THE CONTRACTOR MAY PROVIDE A CELLULAR PHONE INSTEAD OF AERIAL/GROUND PHONE LINES TO THE FIELD OFFICE. AN EXTRA TELEPHONE LINE IS REQUIRED FOR A FAX MACHINE, COMPUTER LINE, ETC.

--ITEM 512--
APPROXIMATELY 65,040 LF OF PORTABLE CONCRETE TRAFFIC BARRIER WILL BE FURNISHED BY THE STATE. THE CONTRACTOR SHALL PICK UP THE BARRIERS AT A STORAGE SITE LOCATED AT VARIOUS LOCATIONS ON LOOP 337 IN NEW BRAUNFELS AND TRANSPORT THEM TO THE PROJECT LOCATION.

THE 23,840 LF OF CTB THAT IS GOING TO BE FURNISHED BY THE CONTRACTOR SHALL BE IN ACCORDANCE WITH THE DETAILS SHOWN ON THE PLANS FOR 42 INCH SSCB TYPE 2 (MOD).

WHEN THE BARRIERS FURNISHED BY THE STATE AND BY THE CONTRACTOR UNDER THIS ITEM ARE NO LONGER NEEDED ON THE PROJECT, THE CONTRACTOR SHALL REMOVE THE BARRIERS AND RETURN THEM TO A STORAGE SITE LOCATED AT VARIOUS LOCATIONS ON LOOP 337 IN NEW BRAUNFELS AS DIRECTED BY THE ENGINEER.

WHEN THE PORTABLE CTB IS FURNISHED BY THE STATE, A SUFFICIENT NUMBER OF "DROP-IN" TYPE REBAR CONNECTORS WILL BE FURNISHED BY THE STATE. UPON

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GENERAL NOTES AND SPECIFICATION DATA--

--ITEM 512--. CONT'D
COMPLETION OF THEIR USE. THEY SHALL BE RETURNED TO THE STATE. ANY
REBAR CONNECTORS LOST OR DAMAGED BY THE CONTRACTOR SHALL BE REPLACED BY
HIM AT HIS EXPENSE.

THE CTB FURNISHED BY THE STATE COULD HAVE DIFFERENT TYPES OF LIFTING
METHODS. THE TYPE PROVIDED FOR THIS PROJECT DEPENDS ON WHAT IS
AVAILABLE AT THE DESIGNATED STOCKPILE. IT WILL BE THE RESPONSIBILITY
OF THE CONTRACTOR TO MODIFY HIS LIFTING EQUIPMENT OR THE BARRIER IF THE
EQUIPMENT AND BARRIER METHODS ARE NOT COMPATABLE.

THE CONTRACTOR WILL BE RESPONSIBLE FOR THE PORTABLE CTB FURNISHED BY
THE STATE FROM THE TIME THEY ARE LOADED AT THE STATE'S STORAGE SITE TO
TRANSPORT TO THE PROJECT UNTIL THEY ARE RETURNED TO STORAGE. CTB
DAMAGED DURING LOADING, UNLOADING AND USE ON THE PROJECT SHALL BE
REPAIRED OR REPLACED AS DIRECTED BY THE ENGINEER. THE REPAIRS OR
REPLACEMENTS SHALL BE MADE BY THE CONTRACTOR AT THE CONTRACTOR'S
EXPENSE; THEREFORE, ANY EXISTING DEFECTS TO THE CTB'S HAVE TO BE
REPORTED BY THE CONTRACTOR TO THE ENGINEER TO DOCUMENT THE BARRIER'S
CONDITION AT THE TIME OF LOADING.

COMMERCIALY PRODUCED REFLECTOR TABS APPROVED BY THE ENGINEER SHALL BE
PLACED ON TOP OF THE CTB'S AT 30 FOOT INTERVALS. COST IS TO BE
CONSIDERED SUBSIDIARY TO THIS ITEM.

--ITEM 514--
ALL SINGLE SLOPE CONCRETE BARRIER SHALL RECIEVE A SURFACE AREA II,
CLASS D FINISH.

--ITEM 540--
TIMBER POSTS SHALL HAVE BEVELED TOPS AND SHALL NOT BE PAINTED.

GUARD FENCE POSTS TO BE PLACED IN AREAS OF RIPRAP SHALL HAVE A BLOCKED
OUT AREA AT LEAST 12 INCHES LARGER THAN THE POST SIZE. AFTER THE GUARD
FENCE IS INSTALLED, THE BLOCKED OUT AREA AROUND THE POST SHALL BE
BACKFILLED WITH AN ASPHALTIC MIXTURE, APPROVED BY THE ENGINEER, FOR A
DEPTH OF 4 INCHES.

--ITEM 542--
RAIL ELEMENTS, SALVAGED FROM THIS PROJECT AND APPROVED BY THE ENGINEER,
MAY BE REUSED ON THIS PROJECT FOR ITEM 540.

--ITEM 556--
FILTER MATERIAL SHALL BE TYPE E.

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GENERAL NOTES AND SPECIFICATION DATA--

--ITEM 610--
ALL THREADED ENDS OF ANCHOR BOLTS SHALL BE FREE FROM NICKS, BURRS, FLAT
SPOTS, CONCRETE, ETC.

ALL THREADED ENDS OF ANCHOR BOLTS THAT WILL NOT ACCEPT THE NUT FOR THE
FULL 6" AND/OR 4" PROJECTION SHALL BE RETHREADED AND REGALVANIZED (SEE
RID(1)-93 "MINOR DAMAGE REPAIR") AT THE ENTIRE EXPENSE OF THE
CONTRACTOR.

ANCHOR BOLT TIGHTENING SHALL BE THE TURN-OF-THE-NUT METHOD AS PER ITEM
447.

ALL JUNCTION BOXES SHALL HAVE RAIN TIGHT COVERS.

IN ORDER TO ACHIEVE OPTIMUM LIGHTING, LIGHTS SHALL BE ADJUSTED IN THE
FIELD AS DIRECTED BY THE ENGINEER.

ALL ILLUMINATION ASSEMBLIES ATTACHED TO SSCB SHALL HAVE LEVELING NUTS,
PROPER BOLT PROJECTION, AND SHALL BE IN ACCORDANCE WITH DETAILS AS
SHOWN ON SSCB(41)-92(MOD).

--ITEM 618--
CONDUIT PLACED IN THE SSCB FOR FUTURE USE SHALL HAVE A NO. 10 PULL
WIRE. THE PULL WIRE SHALL BE CONSIDERED SUBSIDIARY TO ITEM 618.

ALL CONDUIT TO BE PLACED UNDER ROADWAYS CARRYING TRAFFIC SHALL BE
JACKED OR BORED.

ALL UNDERGROUND CONDUIT BENDS 45 DEGREES OR MORE IN PVC CONDUIT
SYSTEMS, INCLUDING BENDS INTO GROUND BOXES, SHALL BE MADE WITH PVC
COATED RIGID METAL CONDUIT. WHERE THE RIGID METAL CONDUIT IS EXPOSED
AT ANY POINT AND WHERE RIGID METAL CONDUIT EXTENDS INTO GROUND BOXES,
THE METAL CONDUIT SHALL BE BONDED TO THE GROUNDING CONDUCTOR WITH
GROUNDING TYPE BUSHINGS OR BY OTHER UL LISTED GROUNDING CONNECTORS
APPROVED BY THE ENGINEER. RIGID METAL BENDS SHALL NOT BE PAID FOR
SEPARATELY BUT SHALL BE INCIDENTAL TO THE PVC CONDUIT SYSTEM.

--ITEM 620--
PRIOR TO ACCEPTANCE OF CONDUCTOR PLACEMENT, THE CONDUCTOR SHALL BE
PULLED A MINIMUM OF 18" FROM EACH END TO INSURE THAT THERE ARE NO
KINKS, BREAKS, ETC.

ALL ELECTRICAL CONNECTORS FOR BREAKAWAY POLES SHALL BE BREAKAWAY
(BUSSMANN HEBW OR EQUAL) IN ACCORDANCE WITH RID(2)-93. ALL ELECTRICAL

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GENERAL NOTES AND SPECIFICATION DATA--

--ITEM 620--. CONT'D
CONNECTIONS FOR NEUTRALS SHALL BE BREAKAWAY AND SHALL HAVE A WHITE
COLOR MARKING AND A PERMANENTLY INSTALLED SOLID NEUTRAL (BUSSMANN HET
OR EQUAL).

--ITEM 624--
GROUND BOXES SHALL BE SET A MINIMUM OF 5' FROM THE EDGE OF PAVEMENT
WITH CONDUIT FROM BOX TO BOX WHERE REQUIRED.

--ITEM 628--
ARRANGEMENTS FOR THE PLACEMENT OF TRANSFORMERS AND ELECTRICAL SERVICES
FOR THE ILLUMINATION SYSTEM SHALL BE MADE THROUGH THE FOLLOWING:

CITY PUBLIC SERVICE JIM KOENIG 210-978-2700
NEW BRAUNFELS UTILITIES RUMALDO RODRIGUEZ 210-629-8421

THE PHOTO ELECTRIC CONTROL SHALL BE PLACED ON THE NORTH SIDE OF THE
SERVICE POLE. IF, IN THE NORTH POSITION, STRAY AMBIENT LIGHT CAUSES
ERRATIC OR FALSE OPERATION OF THE CONTROL, THE CONTRACTOR SHALL ADJUST
THE CONTROL POSITION, KEEPING THE CONTROL IN THE NORTH WEST QUADRANT OF
THE POLE.

ED(3)-93 REQUIRES THAT THE ENCLOSURE AND DISCONNECT COMBINATION BE
RATED AS SERVICE ENTRANCE EQUIPMENT. THE MERE ASSEMBLAGE OF UL LISTED
COMPONENTS DOES NOT MEET THIS SPECIFICATION AND WILL NOT BE ACCEPTED.
THE ENCLOSURE AND DISCONNECT COMBINATION MUST HAVE A UL LABEL STATING
"ENCLOSED INDUSTRIAL CONTROL PANEL" OR OTHER WORDING INDICATING THAT
THE PANEL ASSEMBLY IS UL LISTED.

THE PROPOSED SERVICE POLES SHALL BE CONSTRUCTED AS SHOWN ON STANDARD
SHEETS ED(1) THRU (3)-93, AND SAN ANTONIO DISTRICT STANDARD SHEET
ED(4)-93 AND AS SHOWN IN THE SERVICE POLE SUMMARY. THE CONTRACTOR IS
RESPONSIBLE FOR MAKING ALL THE ARRANGEMENTS FOR ELECTRICAL SERVICE AND
TO BE IN COMPLIANCE WITH THE LOCAL STANDARDS AND PRACTICES FOR PROPER
INSTALLATION.

--ITEM 662--
WORK ZONE MARKER TABS OR GUIDEMARKS PLACED PRIOR TO THE FINAL COURSE OF
ASPHALTIC CONCRETE PAVEMENT SHALL BE REMOVED DAILY BY THE CONTRACTOR AS
THE ACP OPERATIONS PROGRESS. THIS REMOVAL SHALL BE CONSIDERED
SUBSIDIARY TO THIS ITEM.

FOR ALL MAINLANE TRAFFIC HANDLING PHASES DURING CONSTRUCTION, A FULL
COMPLIMENT OF RAISED MARKINGS SHALL BE PLACED TO SUPPLEMENT THE WORK
ZONE PAVEMENT MARKINGS WHICH WILL INCLUDE BUT NOT BE LIMITED TO FOUR
(4) TRAFFIC BUTTONS PER DASHED STRIPE, REFLECTORS AT FORTY (40) FOOT

SPECIFICATION DATA

REV. 07/26 SHEET O

F.R. DIV.6	TEXAS	MANH 95(40)IM	.ETC	SHEET 66
COMAL	COUNTY	HWY IH 35	CONT 0016-5-87,ETC	

GENERAL NOTES AND SPECIFICATION DATA--

--ITEM 662--. CONT'D
SPACING ON CENTER LINES, REFLECTORS OF APPROPRIATE COLOR ON EDGE LINES
IMMEDIATELY ADJACENT TO CONCRETE TRAFFIC BARRIER TYPICALLY SPACED AT
FORTY (40) FEET. PAVEMENT MARKINGS SHALL BE PLACED AS DIRECTED BY THE
ENGINEER AND SHALL BE PAID FOR UNDER THE PERTINENT BID ITEMS.

THE THERMOPLASTIC MATERIAL SHALL BE "TYPE B-ALKYD" AS SPECIFIED IN
DEPARTMENT SPECIFICATION D-9-8220.

--ITEM 3063--
SURFACE TEST TYPE B (PROFILOGRAPH) SHALL BE USED ON THIS PROJECT.

ONLY AC-20 SHALL BE USED.

THE COARSE AGGREGATE USED IN THE SURFACE OR FINISHED COURSE SHALL HAVE
A MINIMUM POLISH VALUE OF 32.

CRUSHED LIMESTONE OR CRUSHED DOLOMITE MAY NOT BE USED AS THE AGGREGATE
FOR THE SURFACE OR FINISHED COURSE.

THE STRIPPING CHARACTERISTIC OF THE HOT MIX ASPHALTIC CONCRETE WILL BE
TESTED ACCORDING TO TEST METHOD TEX-530-C, (BOIL TEST). THE MAXIMUM
STRIPPING IN THE PRODUCED MIXTURE WILL BE ZERO PERCENT UNLESS OTHERWISE
APPROVED BY THE ENGINEER.

THE LONGITUDINAL JOINTS IN ONE LAYER SHALL BE OFFSET FROM THE PREVIOUS
LAYER BY APPROXIMATELY 3 INCHES OR MORE; HOWEVER, THE JOINTS IN THE TOP
SHALL BE AT THE LANE LINES OR AS DIRECTED BY THE ENGINEER.

THE ASPHALT PLANT SHALL BE EQUIPPED WITH TRUCK SCALES AS DEFINED IN
SUBARTICLE 520.3.(1) OF THE STANDARD SPECIFICATIONS. THREE WEIGHT
TICKETS BEARING THE DATE, THE TRUCK NUMBER AND THE GROSS, NET AND TARE
WEIGHTS SHALL BE GIVEN TO THE TRUCK DRIVER BY THE CONTRACTOR'S OR
ASPHALT PLANT PERSONNEL, AND THEN GIVEN TO THE STATE INSPECTOR AT THE
SPREADING AND FINISHING MACHINE. THE CONTRACTOR MAY BE REQUIRED TO
WEIGH LOADS OF ASPHALTIC CONCRETE ON PUBLIC SCALES OR PORTABLE PLATFORM
SCALES TO INSURE THE PROPER WEIGHT OF MATERIAL.

--ITEM 5005--
ROCK FILTER DAM (TY 5) SHALL BE CONSTRUCTED AS FOLLOWS:
HEIGHT - 6 INCHES TO 12 INCHES, MEASURED VERTICALLY FROM
EXISTING GROUND TO TOP OF THE FILTER DAM.
TOP WIDTH - 2 FEET MINIMUM
SLOPES - 2:1 MAXIMUM

SPECIFICATION DATA

REV. 07/26 SHEET P

F.R. DIV.6	TEXAS	MANH 95(40)IM	.ETC	SHEET 66
COMAL	COUNTY	HWY IH 35	CONT 0016-5-87,ETC	

GENERAL NOTES AND SPECIFICATION DATA--

--ITEM 5086--
FOR THIS PROJECT, THE CONTRACTOR WILL SUPPLY THE FOLLOWING BARRIER END
TREATMENT FOR TEMPORARY USE DURING THE CONSTRUCTION PHASES:

1) GUARD RAIL ENERGY ABSORBING TERMINAL (2.5')(6 BAY)(TY CZ)

IN ORDER TO FACILITATE IMMEDIATE REPAIR OR REPLACEMENT IN THE EVENT THE
END TREATMENT IS DAMAGED, THE CONTRACTOR WILL BE REQUIRED TO HAVE A
SUFFICIENT SUPPLY OF REPLACEMENT PARTS AVAILABLE.

--ITEMS 5165 & 5219--
IN ORDER TO FACILITATE IMMEDIATE REPAIR OR REPLACEMENT IN THE EVENT A
SINGLE GUARDRAIL TERMINAL (S.G.T.) IS DAMAGED, THE CONTRACTOR WILL BE
REQUIRED TO HAVE A SUFFICIENT SUPPLY OF REPLACEMENT PARTS AVAILABLE.

THERE ARE 4 G.E.T.'S INSTALLED BY A PREVIOUS PROJECT THAT HAVE TO BE
MOVED TO THEIR ULTIMATE LOCATION BY THIS PROJECT. THE MATERIALS FROM
THESE EXISTING INSTALLATIONS MAY BE REUSED FOR PERMANENT INSTALLATIONS.
REMOVAL WILL BE PAID FOR BY SPECIAL SPECIFICATION ITEM 5219, "REMOVING
SINGLE GUARDRAIL TERMINALS", AND THE INSTALLATION WILL BE PAID FOR BY
SPECIAL SPECIFICATION ITEM 5165, "SINGLE GUARDRAIL TERMINALS".

--ITEM 5218--
APPROXIMATELY 1600 LF OF MODULAR SCREENS AND HARDWARE FOR HEADLIGHT
BARRIER WILL BE FURNISHED BY THE STATE. THE CONTRACTOR SHALL PICK UP
THE MODULAR SCREENS AT A STORAGE SITE LOCATED AT THE STATE'S NEW
BRAUNFELS MAINTENANCE YARD AND TRANSPORT THEM TO THE PROJECT LOCATION.
UPON COMPLETION OF THEIR USE THEY SHALL BE DELIVERED TO THE STATE'S NEW
BRAUNFELS MAINTENANCE YARD AS DIRECTED BY THE ENGINEER.

THE CONTRACTOR WILL BE RESPONSIBLE FOR THE MODULAR SCREENS FURNISHED BY
THE STATE FROM THE TIME THEY ARE LOADED AT THE STATE'S STORAGE SITE TO
TRANSPROT TO THE PROJECT UNTIL THEY ARE RETURNED TO STORAGE. MODULAR
SCREENS DAMAGED DURING LOADING, UNLOADING AND USE ON THE PROJECT SHALL
BE REPAIRED OR REPLACED AS DIRECTED BY THE ENGINEER. THE REPAIRS OR
REPLACEMENTS SHALL BE MADE BY THE CONTRACTOR AT THE CONTRACTOR'S
EXPENSE; THEREFORE, ANY EXISTING DEFECTS TO THE MODULAR SCREENS HAVE TO
BE REPORTED BY THE CONTRACTOR TO THE ENGINEER TO DOCUMENT THE MODULAR
SCREENS CONDITION AT THE TIME OF LOADING. THE CONTRACTOR WILL BE
RESPONSIBLE FOR FURNISHING ALL CONNECTING HARDWARE AND BRACKETS.

SPECIFICATION DATA

REV. 07/26 SHEET Q

LOCATION	TYPE OF SSCB			
	TY 2 (MOD) LF		TY 3 (MOD) LF	
	PLAN	FINAL	PLAN	FINAL
STA 232+00.00 TO STA 241+00.00	900			
STA 241+00.00 TO STA 243+12.00			212	
STA 243+12.00 TO STA 273+58.00	3,046			
STA 273+58.00 TO STA 275+70.00			212	
STA 275+70.00 TO STA 288+78.00	1,308			
STA 288+78.00 TO STA 291+24.00			246	
STA 291+24.00 TO STA 303+34.00	1,210			
STA 303+34.00 TO STA 305+46.00			212	
STA 305+46.00 TO STA 378+02.00	7,256			
STA 378+02.00 TO STA 380+14.00			212	
STA 380+14.00 TO STA 392+27.00	1,213			
STA 392+27.00 TO STA 392+37.60			10.6	
* STA 392+37.60 TO STA 393+57.60				
STA 393+57.60 TO STA 393+76.00			18.4	
STA 393+76.00 TO STA 410+36.00	1,660			
STA 410+36.00 TO STA 412+46.00			210	
STA 412+46.00 TO STA 458+14.00	4,568			
STA 458+14.00 TO STA 460+26.00			212	
STA 460+26.00 TO STA 480+28.00	2,002			
STA 480+28.00 TO STA 480+35.88			7.88	
* STA 480+35.88 TO STA 481+55.88				
STA 481+55.88 TO STA 481+85.00			29.12	
STA 481+85.00 TO STA 496+89.00	1,504			
STA 496+89.00 TO STA 499+01.00			212	
STA 499+01.00 TO STA 525+06.00	2,605			
	27,272		1,794	

* BRIDGE RAIL CONSTRUCTED ON ANOTHER PROJECT

Gregory A. Malatek P.E. 1/19, 1996
GREGORY A. MALATEK DATE
FOR CHANGE ORDER NO. 3



VOIDED

CHANGE ORDER NO. 3

SSCB SUMMARY

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	NH 95 (40)	IM	67A
STATE	COUNTY		
TEXAS	COMAL		
CONT.	J. S.	WAY NO.	
0016	05	087	1H 35

LARGE STRUCTURE SUMMARY

DESCRIPTION			IH 35 UNDERPASS AT FM 1103	EXIST 4-6'x6'x272'- 1 5/8" -CONC CULV TO BE EXTENDED & LENGTHENED TO 8-6'x6'x280'-1 3/8" - CONC CULVERT	EXIST 2-10'x10'x400'-0 3/8" - CONC CULVERT	TOTALS					
	PERMANENT STRUCTURE NUMBER		15-046-0016-05-137	15-046-0016-05-020	15-046-0016-05-019						
	BEGIN BRIDGE STATION		8+85	306+99.42	393+89.93						
	END BRIDGE STATION		11+15	307+53.83	394+11.93						
	LENGTH (FEET)		230.00	54.41	22.00						
	LAYOUT SHEET NUMBER										
ITEM- CODE	ITEM	UNIT									
104-538	REMOV CONC (CONC DEFL WALL)	LF	27.00			27.00					
400-501	STRUCT EXCAV	CY		3,180.00		3,180.00					
402-501	TRENCH EXCAV PROTECTION	LF		595.12		595.12					
420-501	CL A CONC (CULV)	CY		10.00		10.00					
420-524	CL A CONC (VEH DEFL WALL)	CY	3.64			3.64					
432-501	RIPRAP (CONC) (CL B)	CY		56.60	23.00	79.60					
450-509	RAIL (TY 501) (RETROFIT)	LF	460.00			460.00					
452-501	REMOV RAIL (METAL RAIL ELEMENTS ONLY)	LF	460.00			460.00					
462-516	CONC BOX CULV (6FT x 6FT)	LF		1,089.39		1,089.39					
462-594	CONC BOX CULV (SPL) (6FT x 7FT)	LF		80.00		80.00					
462-595	CONC BOX CULV (6FT x 8FT) (SPL)	LF		56.00		56.00					
466-588	WINGWALL (MCW-P) (H=6FT)	EA		1.00		1.00					
466-617	WINGWALL (MCW-P-45°) (H=8FT)	EA		1.00		1.00					

~~X~~ FOR CONTRACTOR'S INFORMATION ONLY

SMALL STRUCTURE SUMMARY

SHT. NO.		LOCATION	DESCRIPTION	REMOV	* STR	TRENCH	RIPRAP	CONC BOX CULV					INLET	WINGWALL						REMOV	REMOV	INLET (COMPL)						
PLAN	LAYOUT			(WINGWALL)	EXCAV	PROTECTION	(CONC)	3FTx3FT	4FTx3FT	4FTx4FT	5FTx5FT	6FTx6FT	(COMPL)	(FW-N)	(MCW-P)	(MCW-P-45°)	(MCW-F1)	(MCW-F1)	(MCW-F1-45°)	OLD STR	OLD STR	(GRATE) (DRWY)						
							(CL. B)						(TY W-2)	(H=5FT)	(H=5FT)	(H=6FT)	(H=3FT)	(H=6FT)	(H=6FT)	(SMALL)	(PIPE)	(DRN)						
				CY	CY	LF	CY	LF	LF	LF	LF	LF	EA	EA	EA	EA	EA	EA	EA	EA	EA	LF	EA					

76	218	STA 232+83.00	1-5' x5' CONC CULVERT		1,302	433	14.00				432.48					1	1										
77	219	STA 246+75.61	1-4' x3' CONC CULVERT (NO WORK PROPOSED)																								
78	220	STA 245+95.25	1-6' x4' CONC CULVERT (NO WORK PROPOSED)																								
80	221	STA 279+74.72	2-6' x6' CONC CULVERT		1,380	362	29.00				371.20						1	1									
85	222	STA 338+22.48	1-6' x6' CONC CULVERT (NO WORK PROPOSED)																								
86	223	STA 357+65.91	1-8' x6' CONC CULVERT	14.7	1,022	279	10.00				278.88						1	1									
87	224	STA 363+07.14	1-5' x5' CONC CULVERT (NO WORK PROPOSED)																								
91	225	STA 410+99.32	1-4' x4' CONC CULVERT (NO WORK PROPOSED)																								
93	226	STA 440+83.26	1-4' x4' CONC CULVERT (NO WORK PROPOSED)																								
95	227	STA 460+48.97	2-6' x6' CONC CULVERT		1,127	325	35.90				374.60				2												
97	228	STA 481+95.83	1-8' x4' CONC CULVERT (NO WORK PROPOSED)																								
98	229	STA 499+65.00	1-4' x4' CONC CULVERT		105	55				54.50		1						1	44								
99	230	STA 508+27.74	1-4' x3' CONC CULVERT	3.2	729	292	9.00			291.21																	
100	231	STA 517+52.61	1-3' x3' CONC CULVERT		293	188	1.00	263.45										1			1						
100	232	STA 523+63.20	1-3' x3' CONC CULVERT	3.0	299	195	7.00	264.33										2									
				20.9	6,257	2,129	105.90	527.78	219.21	54.50	432.48	1,024.68	1	1	1	2	5	2	2	1	44	1					

SHEET 1 OF 1 SHEETS

FED. RD. DIV. NO.		FEDERAL AID PROJECT NO.		SHEET NO.
6		NH 95(40) IM		68
STATE	STATE DIST. NO.	COUNTY		
TEXAS	15	COMAL		
CONT.	SECT.	JOB	HIGHWAY NO.	
0016	05	087	IH 35	

STRUCTURE SUMMARY

LOCATION	* STRUCT EXCAV	TRENCH EXCAV PROTECTION	CONC BOX CULV (4FTX3FT)	CONC BOX CULV (3FTX2FT)	RC PIPE (CL III) (18")	RC PIPE (CL III) (24")	RC PIPE (CL III) (30")	RC PIPE (CL III) (36")	RC PIPE (CL III) (42")	RC PIPE (CL III) (48")	MANH (COMPL) (TY M)	INLET (COMPL) (TY Y-1)	INLET (COMPL) (TY W-1)	INLET (COMPL) (DROP) (TY 3)	INLET (COMPL) (DROP) (TY Y-2)	INLET (COMPL) (TY W-2)	INLET (CURB) (TY C) (SPL) (STAGE 1)	INLET (COMPL) (CURB) (TY F-1)	INLET (CURB) (TY G-1) (STAGE 1)	INLET (COMPL) (CURB) (TY F-2)	INLET (CURB) (TY C) (SPL) (STAGE 2)	JACK OR BOR PIPE (24") (RC) (CL III)	SLOTTED DRAIN (18") (TY A)	SLOTTED DRAIN OUTFALL (18")	JACK OR BOR PIPE (18") (RC) (CL III)	HEADWALL (CH-11B-15 DEG) (H = 30 IN)	JACK OR BOR PIPE (36") (RC) (CL III)	INLET (CURB) (TY G-1) (STAGE 2)	SAFETY END TREAT (TY II) (36 IN) (RCP) (P)
	CY	LF	LF	LF	LF	LF	LF	LF	LF	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	LF	LF	LF	LF	EA	LF	EA	EA
LINE WM	614.00	410.00					412.40						2														150.00		
LINE B	176.00				415.07					2				1															
LINE C	236.00	159.00			160.00		21.08					2																	
LINE D	310.00	156.00					157.00	23.75					2																
LINE E	354.00	240.00					240.60	15.12					2																
LINE F	58.00	80.00			95.58									1															
LINE G	95.00	73.00					122.00						1																
LINE H	48.00	33.00				59.00							1																
LINE I	409.00	193.00							154.00	40.75						2													
LINE J														1															
LINE K	34.00	25.00				65.75						1																	
LINE L	26.00	44.00			66.25							1																	
LINE M	403.00	281.00					163.00		119.59							2													
LINE N	241.00	165.00				166.36						2																	
LINE O	405.00	322.00						334.56		1		1																	
LINE P	92.00	40.00					160.30							1															
LINE Q	137.00				314.00	94.75											3				3	53.00							
LINE R	67.00				165.00												1				1								
LINE S	226.00	159.00						166.88					2																
LINE T	487.00	11.00			284.50	473.75											2	2		1	2	53.00							
LINE U	27.00				120.00									1															
LINE V	48.00				96.00														1			53.00							
LINE W	317.00	225.00				202.52	49.00					1	1													1			
LINE X	187.00	166.00				169.00	11.74						2																
LINE Y	165.00	82.00					185.84			1					1														
LINE Z	297.00	251.00				69.11		188.29		1			2																
LINE AA	149.00	160.00				160.58									1														
LINE BB1	176.00				320.25					1							2				2		40.00	20.00	53.00				
LINE BB2	245.00	215.00					191.00	22.85		1			2																
LINE CC	143.00	15.00			240.75					1							2				2		40.00	20.00	53.00				
LINE DD	104.00				189.50															1									
LINE EE1	50.00	52.00			76.75									1															
LINE FF	194.00	146.00				191.14								2					1										1
LINE GG	458.00	79.00			585.00	114.68								1					4										4
LINE HH	66.00	69.00				69.50								1															
LINE II	391.00	68.00		21.36	747.25	121.75				4				2					2				60.00	20.00					2
LINE JJ	140.00	132.00				168.84						1																	
LINE KK	139.00	92.00		21.96		163.50								2															
LINE E-A																													
LINE E-B																													
LINE E-C																													
LINE E-D																													
LINE EE-2	492.00	223.00			335.00		133.50											4					80.00	106.50					
LINE WK	33.00	20.00	21.30										1																
TOTALS	8239.00	4386.00	21.30	43.32	4210.90	2290.23	1435.06	1163.85	273.59	40.75	12	8	19	13	3	4	10	6	7	3	10	159.00	220.00	166.50	106.00	1	150.00	7	1

* FOR CONTRACTORS INFORMATION ONLY.

STORM SEWER SUMMARY

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	NH 95 (40) IM		69
STATE	STATE DIST. NO.	COUNTY	
TEXAS	SAT	COMAL	
CONT.	SECT.	JOB	HIGHWAY NO.
0016	05	087	IH 35

DESCRIPTION	UNITS	PHASE 1	PHASE 2	PHASE 3	PHASE 4	TOTALS
SOIL RENT BLNKT (CL 2) (TY F)	SY	527.00				527.00
CONSTRUCT DETOURS (CL 2)	EA	3.00	2.00	2.00		7.00
PORT CONC TRAF BAR (STKPL, INSTL & RETRN)	LF	58,260.00	6,780.00			65,040.00
PORT CONC TRAF BAR (MOVE & RESET)	LF		34,740.00	11,310.00	11,210.00	57,260.00
TERM ANCHOR SECT (12 GA.)	EA	1.00				1.00
MTL BEAM GD FEN (12 GA.) (TIM POST)	LF	200.00				200.00
REMOV METAL BEAM GUARD FENCE	LF				200.00	200.00
REMOV TERMINAL-ANCHOR SECTION	EA				1.00	1.00
WRK ZN PAV MRK REMOV (CL B) TY I-A	EA	763.00	758.00	1,521.00	763.00	3,805.00
WRK ZN PAV MRK REMOV (CL B) TY I-C	EA	763.00	869.00	1,631.00	763.00	4,026.00
WRK ZN PAV MRK REMOV (CL B) TY IIC-R	EA	763.00	758.00	1,521.00	763.00	3,805.00
WRK ZN PAV MRK REMOV (CL C) TY W	EA	3,052.00	3,032.00	3,032.00	3,052.00	12,168.00
WRK ZN PAV MRK NON-REMOV (W) (4") (SLD)	LF	30,500.00	30,300.00	60,800.00	30,300.00	151,900.00
WRK ZN PAV MRK NON-REMOV (W) (4") (BRK)	LF	7,630.00	7,580.00	7,580.00	7,580.00	30,370.00
WRK ZN PAV MRK NON-REMOV (W) (ENT GORE)	EA	4.00	7.00	13.00		24.00
WRK ZN PAV MRK NON-REMOV (W) (EXIT GORE)	EA	5.00	9.00	12.00		26.00
WRK ZN PAV MRK NON-REMOV (Y) (4") (SLD)	LF	30,500.00	30,300.00	60,800.00	30,300.00	151,900.00
WRK ZN PAV MRK GDMRK (W)	EA	763.00			3,050.00	3,813.00
WRK ZN PAV MRK SH TRM (W) (4")	LF	3,052.00			12,200.00	15,252.00
ELIM EXT PAV MRK & MRKR (4")	LF	2,250.00	2,600.00	61,000.00	1,950.00	67,800.00
GD RAIL EN ABS TERM (REMOV)	EA				6.00	6.00
GD RAIL EN ABS TERM (MOVE & RESET)	EA		7.00	7.00	3.00	17.00
GD RAIL EN ABS TERM (2.5') (6 BAY) TY CZ	EA	6.00				6.00
ROCK FILTER DAMS (TY 1)	LF	550.00				550.00
ROCK FILTER DAMS (REMOV & REPLAC) (TY 1)	LF		550.00			550.00
ROCK FILTER DAMS (REMOV) (TY 1)	LF				550.00	550.00
ROCK FILTER DAMS (TY 5)	LF		1,365.00	820.00		2,185.00
ROCK FILTER DAMS (REMOV & REPLAC) (TY 5)	LF			1,365.00	820.00	2,185.00
ROCK FILTER DAMS (REMOV) (TY 5)	LF				2,185.00	2,185.00
CONSTRUCT EXIT (TY 2)	SY	660.00	220.00	220.00		1,100.00
CONSTRUCT EXIT (REMOV & REPLAC) (TY 2)	SY	660.00	220.00	220.00		1,100.00
CONSTRUCT EXIT (REMOV) (TY 2)	SY	660.00	220.00	220.00		1,100.00
FRNT END LDR WORK (EROSN CONT) (CL1)	HR	20.00	20.00	20.00		60.00
REMOVE SINGLE GUARDRAIL TERMINALS	EA				1.00	1.00
SINGLE GUARDRAIL TERMINALS	EA	1.00				1.00
*TEMP SEDMT CONT FENCE	LF					2,000.00
*TEMP SEDMT CONT FENCE (REMOV & REPLAC)	LF					1,500.00
*TEMP SEDMT CONT FENCE (REMOV)	LF					2,000.00
GABION MATT (9") (GALV)	SY		272.00			272.00
MODULAR GLARE SCREEN (MOVE & RESET)	LF		800.00	1,600.00		2,400.00
MODULAR GLARE SCREEN (REMOVE)	LF					1,600.00
PORT CONC TRAF BAR (FURN & INST)	LF		23,840.00			23,840.00
PORT CONC TRAF BAR (REMOV)	LF					23,840.00

* TO BE USED AROUND STOCKPILE AREAS

BARRICADE & DETOUR SUMMARY

SHEET 1 OF 1 SHEETS				
FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.			SHEET NO.
6	NH 95 (40) IM			70
STATE	STATE DIST. NO.	COUNTY		
TEXAS	15	COMAL		
CONTRACT	SECT.	JOB	HIGHWAY NO.	
0016	05	087	IH 35	

ELECTRICAL SERVICE DATA SHEET

SERVICE POLE NO.	SHEET NO.	SERVICE POLE DESCRIPTION (SEE ED(3)-93)	SERVICE CONDUIT SIZE	SERVICE CONDUCTORS NO./SIZE	SAFETY SWITCH AMPS	MAIN DISCONNECT		TWO-POLE CONTACTOR AMPS	PANELBD/ LOADCENTER AMP RATING	CIRCUIT NO.	BRANCH CLT. BKR. POLE/AMPS	KVA LOAD
						SWITCH AMP/FUSE	CKT. BLR. POLE/AMP					
1	1	SERV POLE TY S(240/480) 060(NS)GS(T)TP(O)	2"	3/#4	N/A	60/35		20	N/A	129	2P/20	5.4
2	4	SERV POLE TY S(240/480) 060(NS)GS(T)TP(O)	2"	3/#4	N/A	60/35		20	N/A	130	2P/20	5.4
3	7	SERV POLE TY S(240/480) 060(NS)GS(T)TP(O)	2"	3/#4	N/A	60/35		20	N/A	131	2P/20	4.2
4	11	SERV POLE TY S(240/480) 060(NS)GS(T)TP(O)	2"	3/#4	N/A	60/35		20	N/A	132	2P/20	5.8
								20		133	2P/20	3.5
5	15	SERV POLE TY S(240/480) 060(NS)GS(T)TP(O)	2"	3/#4	N/A	60/35		20	N/A	134	2P/20	5.4
								20		135	2P/20	5.4
6	18	SERV POLE TY S(240/480) 060(NS)GS(T)TP(O)	2"	3/#4	N/A	60/35		20	N/A	136	2P/20	6.5
7	22	SERV POLE TY S(240/480) 060(NS)GS(T)TP(O)	2"	3/#4	N/A	60/35		20	N/A	137	2P/20	5.4

ELECTRICAL LAYOUT SUMMARY

ITEM	DESC CODE	DESCRIPTION	UNIT	SHEET NUMBER																										EST QUANTITY	FINAL QUANTITY
				1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26		
610	539	TY (SP 48S-8-8) (.4 KW)S	EA		4		2	2		3		3	1	2	2	3	1		3	1		2	3			3	1			36	
610	503	TY (SA 40T-8) (.25 KW)S	EA	2				2	2								2	1	1				2			2				14	
656	535	FND FOR RDWY ILL ASM (TY A) (30IN DR SH)	LF	12				12	12								12	6	6				12			12				84	
618	518	CONDUIT (PVC) (SCHD 80) (2")	LF	374			139	379	351	146				205			334	490				142	294		125	270			3249		
618	510	CONDUIT (PVC) (SCHD 40) (1½")	LF	769	1200	1200	1343	1350	1504	1200	1200	1200	1200	1200	1200	1266	1466	1253	1200	1220	1243	1402	1200	1184	1386	1200	1100		30886		
620	509	ELEC CONDR (NO. 8) (INSULATED) (TY XHHW)	LF	2211	3600		1953	3624	2541	3588		1713	3600	4215	1383	1857	5175	6564	3759	87	60	4155	3597		2997	4968	258		61905		
624	501	GROUND BOX(RPM) TY A (122311) W/APRON	EA	4			3	4	5	2				2			4	7			1	2	3		4	3			44		
628	556	SERV POLE TY S(240/480)060(NS)GS(T)TP(O)	EA	1			1			1				1				1			1				1				7		



The seal appearing on
this document was
authorized by
GREGORY A. MALATEK
P.E. 71682, on

6-20, 1995.
Gregory A. Malatek, P.E.



TEXAS DEPARTMENT OF TRANSPORTATION

ELECTRICAL/SERVICE POLE
SUMMARY

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.
6	NH 95(40)IM	71
STATE	STATE DIST. NO.	COUNTY
TEXAS	15	COMAL
CONT.	SECT.	JOB
0016	05	087
		HIGHWAY NO.
		1H 35

REMOV EXIST RDS. TRAFFIC SIGNS LARGE

[illegible]

REMOV EXIST RDSD. TRAFFIC SIGNS

[illegible]

REMOV EXIST RDS. TRAFFIC SIGNS SMALL

[illegible]

REMOV EXIST RDS. TRAFFIC SIGNS

[illegible]

NOTE:

ALL OTHER SIGNS, AND ANY ABANDONED
SIGN FOUNDATIONS SHALL BE REMOVED.
IN ACCORDANCE WITH SPECIFICATIONS.

ESTIMATE SUMMARY

		PROJECT NH 94(11)IM				PROJECT MANH 95(40)IM				A L T	ITEM- CODE			DESCRIPTION	U N I T	TOTAL	
		CONTROL 0016-05-085				CONTROL 0016-05-087					ITEM NO	DESC CODE	SP NO			EST.	FINAL
		G.V.S.U.D.		CITY OF SCHERTZ		BRIDGES		ROADWAY									
EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL								
								4041.000		104	0503		REMOV CONC (RIPRAP)	SY	4041.000		
								26.000		104	0511		REMOV CONC (DRVWY)	SY	26.000		
								18554.000		104	0513		REMOV CONC (CURB & GUTTER)	LF	18554.000		
								20.900		104	0523		REMOV CONC (WINGWALL)	CY	20.900		
					27.000					104	0538		REMOV CONC (CONC DEFL WALL)	LF	27.000		
								231712.000		110	0504		EXCAVATION (RDWY & CHAN)	CY	231712.000		
								38495.000		132	0518		EMBANK (ORD COMP) (TY B) (CL 3)	CY	38495.000		
								196124.000		160	0513		FURN AND PLAC TPSL (CL 2) (9")	SY	196124.000		
								96124.000		164	0523		CELL FIB SEED (TEMP) (WARM)	SY	96124.000		
								148833.000		164	0525		CELL FIB SEED (TEMP) (COOL)	SY	148833.000		
								196124.000		164	0553		CELL FIB SEED (PERM) (RURAL) (CLAY)	SY	196124.000		
								100000.000		164	0579		STRAW MULCHING	SY	100000.000		
								7128.000		168	0501		VEGETATIVE WATERING	MG	7128.000		
								11466.000		169	0501		SOIL RET BLNKT (CL 1) (TY A)	SY	11466.000		
								527.000		169	0512		SOIL RET BLNKT (CL 2) (TY F)	SY	527.000		
								109705.000		247	0524		FL BS (COMPL IN PLAC) (TY A GR6 CL 4)	CY	109705.000		
								156.000		251	0657		REWORKING BS MATL (OC) (TY D CL 1) (12")	STA	156.000		
								3493.840		260	0503 001		LIME (TY C) (DRY)	TON	3493.840		
								344522.000		260	0506 001		LIME TREAT SUBGR (OC) (6 ")	SY	344522.000		
								59880.000		305	0504		SALV, HAUL & STKPL RCL APH PV (2 ")	SY	59880.000		
								154986.000		305	0510		SALV, HAUL & STKPL RCL APH PV (5 ")	SY	154986.000		
								32289.000		305	0521		SALV, HAUL & STKPL RCL APH PAV (7 ")	SY	32289.000		
								86867.000		314	0502		EMULS ASPH (BS OR SUBGR TREAT) (MS-2)	GAL	86867.000		
								4364.000		316	0528 004		AGGR (TY PB, GR 4)	CY	4364.000		
								150542.000		316	0653 004		ASPH (AC/MC-2400) LTX, HFRS-2P, CRS-1P/2P	GAL	150542.000		
								33400.000		351	0505		REPAIR EXIST FLEX PAV STRUCT (6")	SY	33400.000		
						595.120		6515.000		402	0501		TRENCH EXCAV PROTECTION	LF	7110.120		
						10.000				420	0501		CL A CONC (CULV)	CY	10.000		
						3.640				420	0524		CL A CONC (VEH DEFL WALL)	CY	3.640		
						79.600		1006.500		432	0501		RIPRAP (CONC) (CL B)	CY	1086.100		
						460.000				450	0509		RAIL (TY T501) (RETROFIT)	LF	460.000		
						460.000				452	0501		REMOV RAIL (METAL RAIL ELEMENTS ONLY)	LF	460.000		
								43.320		462	0501		CONC BOX CULV (3 FT X 2 FT)	LF	43.320		
								527.780		462	0502		CONC BOX CULV (3 FT X 3 FT)	LF	527.780		
								312.510		462	0504		CONC BOX CULV (4 FT X 3 FT)	LF	312.510		
								54.500		462	0505		CONC BOX CULV (4 FT X 4 FT)	LF	54.500		
								432.480		462	0509		CONC BOX CULV (5 FT X 5 FT)	LF	432.480		
						1089.390		1024.680		462	0516		CONC BOX CULV (6 FT X 6 FT)	LF	2114.070		
						80.000				462	0594		CONC BOX CULV (6'X 7') SPL	LF	80.000		
						56.000				462	0595		CONC BOX CULV (6'X 8') (SPL)	LF	56.000		
								4210.900		464	0503		RC PIPE (CL III) (18 ")	LF	4210.900		
								2290.230		464	0505		RC PIPE (CL III) (24 ")	LF	2290.230		
								1435.060		464	0507		RC PIPE (CL III) (30 IN)	LF	1435.060		
								1163.850		464	0509		RC PIPE (CL III) (36 IN)	LF	1163.850		
								273.590		464	0510		RC PIPE (CL III) (42 IN)	LF	273.590		
								40.750		464	0511		RC PIPE (CL III) (48 IN)	LF	40.750		
								12.000		465	0526		MANH (COMPL) (TY M)	EA	12.000		
								8.000		465	0553		INLET (COMPL) (TY Y1)	EA	8.000		
								19.000		465	0560		INLET (COMPL) (TY W-1)	EA	19.000		
								1.000		465	0623		INLET (COMPL) (GRATE) (DRWY) (DRN)	EA	1.000		

ESTIMATE SUMMARY

		PROJECT NH 94(11)IM				PROJECT MANH 95(40)IM				A L T	ITEM- CODE			DESCRIPTION	U N I T	TOTAL	
		CONTROL 0016-05-085				CONTROL 0016-05-087					ITEM NO	DESC CODE	SP NO			EST.	FINAL
		G.V.S.U.D.		CITY OF SCHERTZ		BRIDGES		ROADWAY									
EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL								
								13.000			465	0631		INLET (COMPL) (DROP) (TY 3)	EA	13.000	
								3.000			465	0655		INLET (COMPL) (DROP) (TY V-2)	EA	3.000	
								5.000			465	0732		INLET (COMPL) (TY W-2)	EA	5.000	
								10.000			465	0839		INLET (CURB) (TY C) (SPL) (STAGE 1)	EA	10.000	
								10.000			465	0840		INLET (CURB) (TY C) (SPL) (STAGE 2)	EA	10.000	
								3.000			465	0841		INLET (COMPL) (CURB) (TY F-2)	EA	3.000	
								6.000			465	0842		INLET (COMPL) (CURB) (TY F-1)	EA	6.000	
								7.000			465	0843		INLET (CURB) (TY G-1) (STAGE 1)	EA	7.000	
								7.000			465	0844		INLET (CURB) (TY G-1) (STAGE 2)	EA	7.000	
								1.000			466	0542		WINGWALL (FW-N) (H= 5 FT)	EA	1.000	
								1.000			466	0587		WINGWALL (MCW-P) (H= 5 FT)	EA	1.000	
						1.000					466	0588		WINGWALL (MCW-P) (H= 6 FT)	EA	1.000	
								2.000			466	0615		WINGWALL (MCW-P-45) (H= 6 FT)	EA	2.000	
						1.000					466	0617		WINGWALL (MCW-P-45) (H= 8 FT)	EA	1.000	
								5.000			466	0621		WINGWALL (MCW-F1) (H= 3 FT)	EA	5.000	
								2.000			466	0624		WINGWALL (MCW-F1) (H= 6 FT)	EA	2.000	
								2.000			466	0651		WINGWALL (MCW-F1-45) (H= 6 FT)	EA	2.000	
								1.000			466	0721		HEADWALL (CH-11B-15 DEG) (H= 30 IN)	EA	1.000	
								1.000			467	0521	002	SAFE END TREAT (TY II) (36 IN) (RCP) (P)	EA	1.000	
								220.000			474	0505		SLOTTED DRAIN (18 IN)	LF	220.000	
								166.500			474	0506		SLOTTED DRAIN OUTFALL (18 IN)	LF	166.500	
								106.000			476	0501		JACK OR BOR PIPE (18 IN) (RC) (CL III)	LF	106.000	
								159.000			476	0502		JACK OR BOR PIPE (24 IN) (RC) (CL III)	LF	159.000	
								150.000			476	0504		JACK OR BOR PIPE (36 IN) (RC) (CL III)	LF	150.000	
								1.000			496	0502		REMOV OLD STR (SMALL)	EA	1.000	
								2567.000			496	0504		REMOV OLD STR (PIPE)	LF	2567.000	
		0.005			0.002			0.993			500	0501		MOBILIZATION	LS	1.000	
								29.000			502	0501	003	BARRICADES, SIGNS AND TRAF HANDLE	MO	29.000	
								7.000			508	0502		CONSTRUCT DETOURS (CL 2)	EA	7.000	
								23840.000			512	0501		PORT CONC TRAF BAR (FURN & INSTL)	LF	23840.000	
								65040.000			512	0502		PORT CONC TRAF BAR (STKPL, INSTL & RETRN)	LF	65040.000	
								57260.000			512	0503		PORT CONC TRAF BAR (MOVE & RESET)	LF	57260.000	
								23840.000			512	0504		PORT CONC TRAF BAR (REMOVE)	LF	23840.000	
								27272.000			514	0544		PERM CONC TRAF BAR SGL SLP (TY 2) (MOD)	LF	27272.000	
								1794.000			514	0545		PERM CONC TRAF BAR SGL SLP (TY 3) (MOD)	LF	1794.000	
								24.100			530	0501		DRVWYS (CONC) (6 ")	SY	24.100	
								11.000			540	0505		TERM ANCHOR SECT (12 GA)	EA	11.000	
								2975.000			540	0506		MTL BEAM OD FEN (12 GA) (TIM POST)	LF	2975.000	
								1975.000			542	0501		REMOV METAL BEAM GUARD FENCE	LF	1975.000	
								2040.000			542	0502		REMOV METAL BEAM GUARD FENCE (BARRIER)	LF	2040.000	
								8.000			542	0503		REMOV TERMINAL-ANCHOR SECTION	EA	8.000	
								2696.000			556	0506	001	PIPE UNDDR (TY 6) (6 ")	LF	2696.000	
								10.000			580	0502		PROJECT MAINT (MOWING)	CYC	10.000	
								20.000			580	0504		PROJECT MAINT (LITTER PICKUP)	CYC	20.000	
								14.000			610	0503		RDWY ILL ASSEM (TY SA 40T-8) (.25 KW)S	EA	14.000	
								36.000			610	0539		RDWY ILL ASSEM (TY SP 48S-8-8) (.4 KW)S	EA	36.000	
								30886.000			618	0510		CONDUIT (PVC) (SCHD 40) (1 1/2")	LF	30886.000	
								3249.000			618	0518		CONDUIT (PVC) (SCHD 80) (2 ")	LF	3249.000	
								61905.000			620	0509		ELEC CONDUCTOR (NO. 8) INSULATED	LF	61905.000	
								44.000			624	0501		GROUND BOX TY A (122311) W/APRON	EA	44.000	

ESTIMATE & QUANTITY SHEET

STATE DIST. NO.	COUNTY	PROJECT NO.	SHEET NO.
15	COMAL	MANH 95(40)IM, ETC.	74

ESTIMATE SUMMARY

		PROJECT NH 94(11)IM				PROJECT MANH 95(40)IM				A L T	ITEM- CODE			DESCRIPTION	U N I T	TOTAL	
		CONTROL 0016-05-085				CONTROL 0016-05-087					ITEM NO	DESC CODE	SP NO			EST.	FINAL
		G.V.S.U.D.		CITY OF SCHERTZ		BRIDGES		ROADWAY									
EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL								
								7.000			628	0556		ELEC SERV TYS(240/480)060(NS)GS(T)TP(O)	EA	7.000	
								26.000			649	0501		REMOV LARGE RDSO SGN ASSMS	EA	26.000	
								35.000			649	0502		REMOV SMALL RDSO SGN ASSMS	EA	35.000	
								84.000			656	0535		FND FOR RDWY ILL ASM (TY A)(30IN DR SH)	LF	84.000	
								3805.000			662	0541	002	WRK ZN PAV MRK REMOV (CL B) TY I-A	EA	3805.000	
								4026.000			662	0542	002	WRK ZN PAV MRK REMOV (CL B) TY I-C	EA	4026.000	
								3805.000			662	0544	002	WRK ZN PAV MRK REMOV (CL B) TY II-C-R	EA	3805.000	
								12168.000			662	0545	002	WRK ZN PAV MRK REMOV (CL C) TY W	EA	12168.000	
								151900.000			662	0549	002	WRK ZN PAV MRK NON-REMOV (W) (4") (SLD)	LF	151900.000	
								30370.000			662	0550	002	WRK ZN PAV MRK NON-REMOV (W) (4") (BRK)	LF	30370.000	
								24.000			662	0564	002	WRK ZN PAV MRK NON-REMOV (W)(ENTR GORE)	EA	24.000	
								26.000			662	0565	002	WRK ZN PAV MRK NON-REMOV (W)(EXIT GORE)	EA	26.000	
								151900.000			662	0569	002	WRK ZN PAV MRK NON-REMOV (Y) (4") (SLD)	LF	151900.000	
								3813.000			662	0579	002	WRK ZN PAV MRK GDMRK (W)	EA	3813.000	
								15252.000			662	0584	002	WRK ZN PAV MRK SH TRM REMOV (W) (4")	LF	15252.000	
								67800.000			677	0501		ELIM EXT PAV MRK & MRKR (4")	LF	67800.000	
								4297.000			3063	0501		HOT MIX ASPH (TY D)	TON	4297.000	
								44867.000			3063	0502		HOT MIX ASPH (TY C)(SURF)	TON	44867.000	
								46093.000			3063	0505		HOT MIX ASPH (TY C)	TON	46093.000	
								140594.000			3063	0507		HOT MIX ASPH (TY A)	TON	140594.000	
								68.000			5003	0501		VEH IMP ATTN ASSEM BRLS	EA	68.000	
								88.000			5003	0503		VEH IMP ATTN ASSEM BRLS (REMOVE)	EA	88.000	
								550.000			5005	0501		ROCK FILTER DAMS (TY 1)	LF	550.000	
								550.000			5005	0502		ROCK FILTER DAMS (REMOV & REPLAC)(TY 1)	LF	550.000	
								550.000			5005	0503		ROCK FILTER DAMS (REMOV)(TY 1)	LF	550.000	
								2185.000			5005	0513		ROCK FILTER DAMS (TY 5)	LF	2185.000	
								2185.000			5005	0514		ROCK FILTER DAMS (REMOV & REPLAC)(TY 5)	LF	2185.000	
								2185.000			5005	0515		ROCK FILTER DAMS (REMOV)(TY 5)	LF	2185.000	
								2000.000			5009	0501		TEMP SEDMT CONT FENCE	LF	2000.000	
								1500.000			5009	0502		TEMP SEDMT CONT FENCE (REMOV & REPLAC)	LF	1500.000	
								2000.000			5009	0503		TEMP SEDMT CONT FENCE (REMOV)	LF	2000.000	
								1100.000			5010	0504		CONSTRUCT EXIT (TY 2)	SY	1100.000	
								1100.000			5010	0505		CONSTRUCT EXIT (REMOV & REPLAC)(TY 2)	SY	1100.000	
								1100.000			5010	0506		CONSTRUCT EXIT (REMOV)(TY 2)	SY	1100.000	
								60.000			5012	0502		FRNT END LDR WORK (EROSN CONT)(CL 1)	HR	60.000	
								272.000			5014	0533		GABION MATTRESS (9")(GALV)	SY	272.000	
								6.000			5086	0502		GD RAIL EN ABS TERM (REMOVE)	EA	6.000	
								17.000			5086	0503		GD RAIL EN ABS TERM (MOVE & RESET)	EA	17.000	
								6.000			5086	0504		GD RAIL EN ABS TERM (2.5')(6 BAY)(TYCZ)	EA	6.000	
								10.000			5165	0501		SINGLE GDRAIL TERM	EA	10.000	
								2400.000			5218	0501		MODULAR SCREENS (MOVE AND RESET)	LF	2400.000	
								1600.000			5218	0502		MODULAR SCREENS (REMOVE)	LF	1600.000	
								5.000			5219	0501		REMOV SINGLE GUARDRAIL TERMINALS	EA	5.000	
			52.000		315.000						5224	0501		TRENCH EXCAV PROTECTION	LF	367.000	
			20.000								5224	0502		PIPE WATER MAIN (DI)(6")	LF	20.000	
			322.000		283.000						5224	0503		PIPE WATER MAIN (DI)(12")	LF	605.000	
			161.000								5224	0504		PIPE WATER MAIN (PVC)(6")	LF	161.000	
					172.000						5224	0505		PIPE WATER MAIN (PVC)(12")	LF	172.000	
			270.000								5224	0506		JACK OR BORE CASING (STL)(24")	LF	270.000	
			1.600		2.150						5224	0507		DUCTILE-IRON FITTINGS	TON	3.750	

ESTIMATE & QUANTITY SHEET

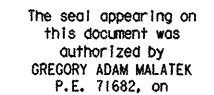
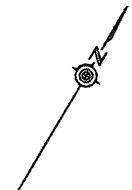
STATE DIST. NO.	COUNTY	PROJECT NO.	SHEET NO.
15	COMAL	MANH 95(40)IM, ETC.	75

ESTIMATE SUMMARY

[illegible]

ESTIMATE & QUANTITY SHEET

STATE DIST. NO.	COUNTY	PROJECT NO.	SHEET NO.
15	COMAL	MANH 95(40)IM, ETC.	75A

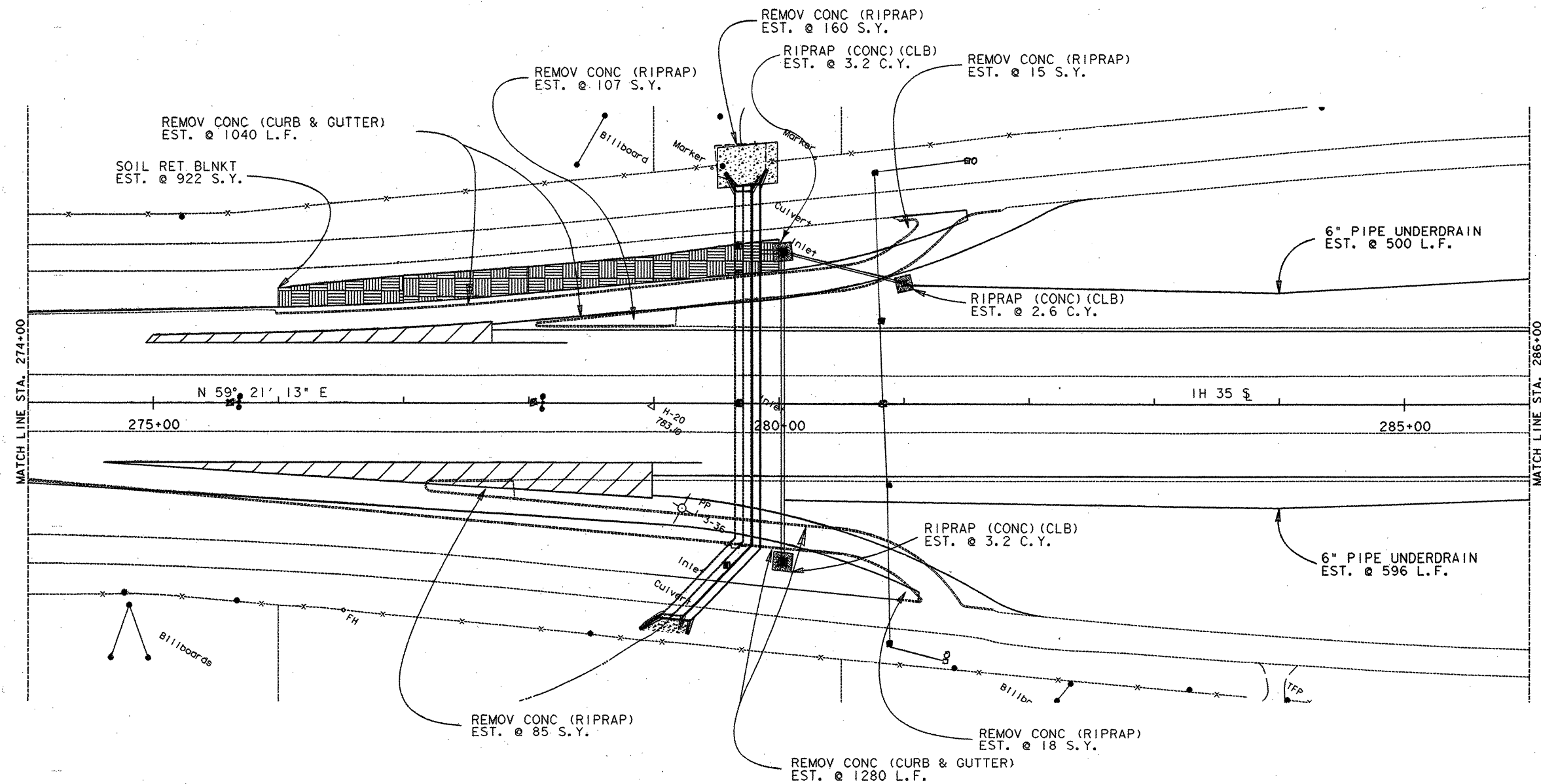


SCALE 1" = 50'

NOTE:
FOR SSCB LOCATIONS, TYPE AND QUANTITIES
SEE THE SSCB SUMMARY SHEET

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	NH 95 (40) IM		28
STATE	STATE DIST. NO.	COUNTY	
TEXAS	15	COMAL	
CONT.	SECT.	JOB	HIGHWAY NO.
0016	05	087	1H 35

PLAN SHEET
SHEET 3 OF 26



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4/12, 1995.
Gregory A. Malatek, P.E.

SCALE 1" = 50'

SHEET TOTALS

EST.	UNIT	DESCRIPTION
385	S.Y.	REMOV CONC (RIPRAP)
2320	L.F.	REMOV CONC (CURB & GUTTER)
11,716	S.Y.	FURN & PLAC TPSL
922	S.Y.	SOIL RET BLNKT
9.0	C.Y.	RIPRAP (CONC) (CL B)
1,096	L.F.	PIPE UNDDR (TY 6) (6")

NOTE:
FOR SSCB LOCATIONS, TYPE AND QUANTITIES
SEE THE SSCB SUMMARY SHEET

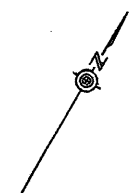
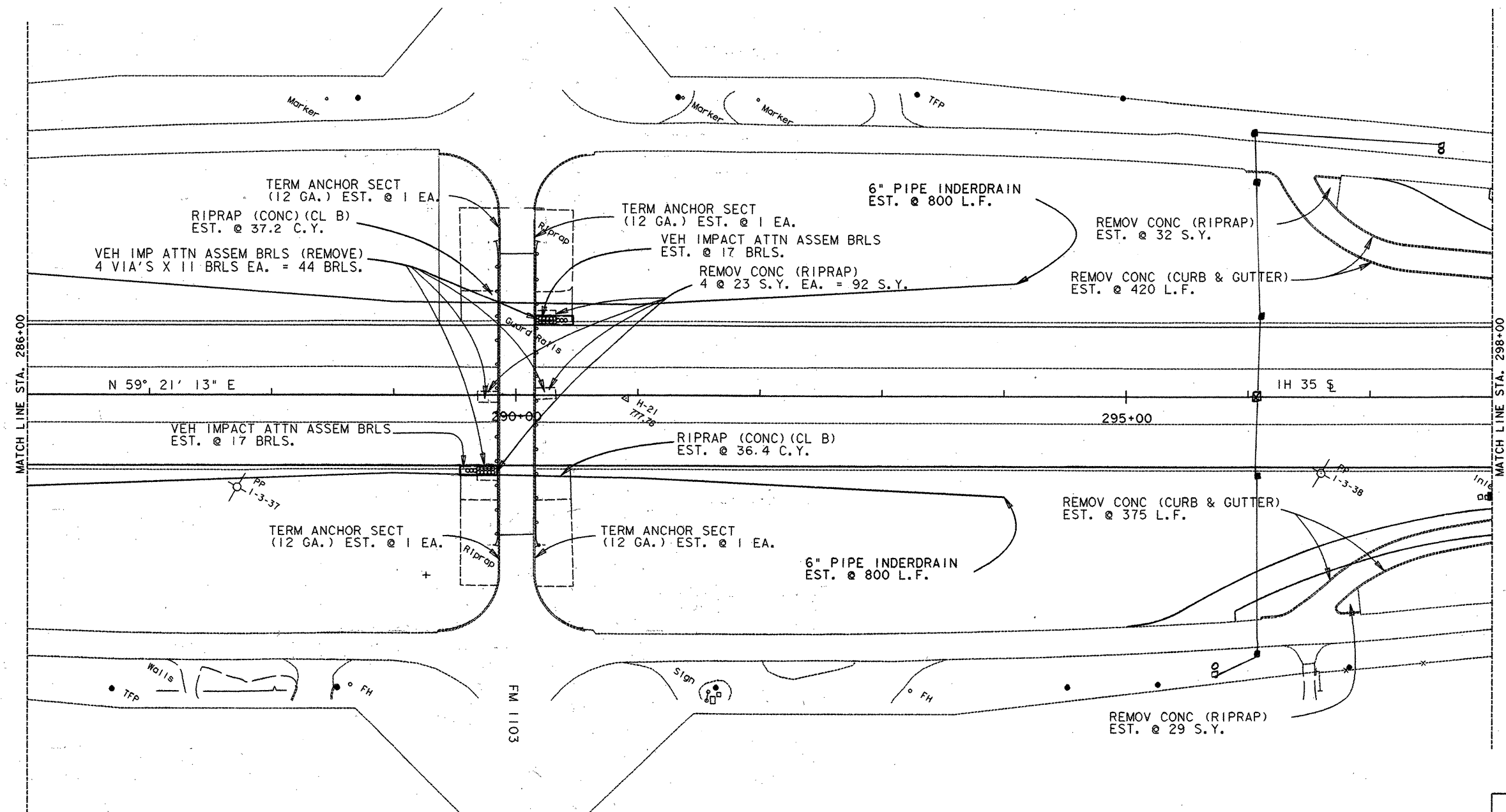
- A-1 (TY SP 48S-B-8) (.4KW)S
- A-2 (TY SA 40T-B) (.25KW)S
- Ground Box with APRONS
- SERVICE POLE
- Junction Box (SEE ED 1-93)

714	968	979	1,655	1,953	2,319	2,381	2,122	1,478	1,507	1,476	1,393	18,945	C.Y.	EXCAVATION (RDWY & CHAN)
131	73	37	12	5	3	2	0	0	0	0	0	263	C.Y.	EMBANK (ORD COMP) (TY B) (CL 3)
274+00	275+00	276+00	277+00	278+00	279+00	280+00	281+00	282+00	283+00	284+00	285+00	286+00		

PLAN SHEET

SHEET 5 OF 26

FED. RD. DIV. NO.	6	FEDERAL AID PROJECT NO.	NH 95 (40) IM	SHEET NO.	80
STATE	TEXAS	STATE DIST. NO.	15	COUNTY	COMAL
CONT.	0016	SECT.	05	JOB	087
				HIGHWAY NO.	IH 35



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SCALE 1" = 50'

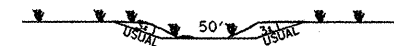
SHEET TOTALS		
EST.	UNIT	DESCRIPTION
153	S.Y.	REMOV CONC (RIPRAP)
795	L.F.	REMOV CONC (CURB & GUTTER)
10,608	S.Y.	FURN & PLAC TPSL (CL 2) (9")
73.6	C.Y.	RIPRAP (CONC) (CL B)
4	EA.	TERM ANCHOR SECTION (12 GA)
1,600	L.F.	PIPE UNDDR (TY 6) (6")
34	EA.	VIA ASSEM BRLS
44	EA.	VIA ASSEM BRLS (REMOVE)
10,059	C.Y.	EXCAVATION (RDWY & CHAN)
768	C.Y.	EMBANK (ORD COMP) (TY B) (CL 3)

NOTE:
 FOR SSCB LOCATIONS, TYPE AND QUANTITIES
 SEE THE SSCB SUMMARY SHEET

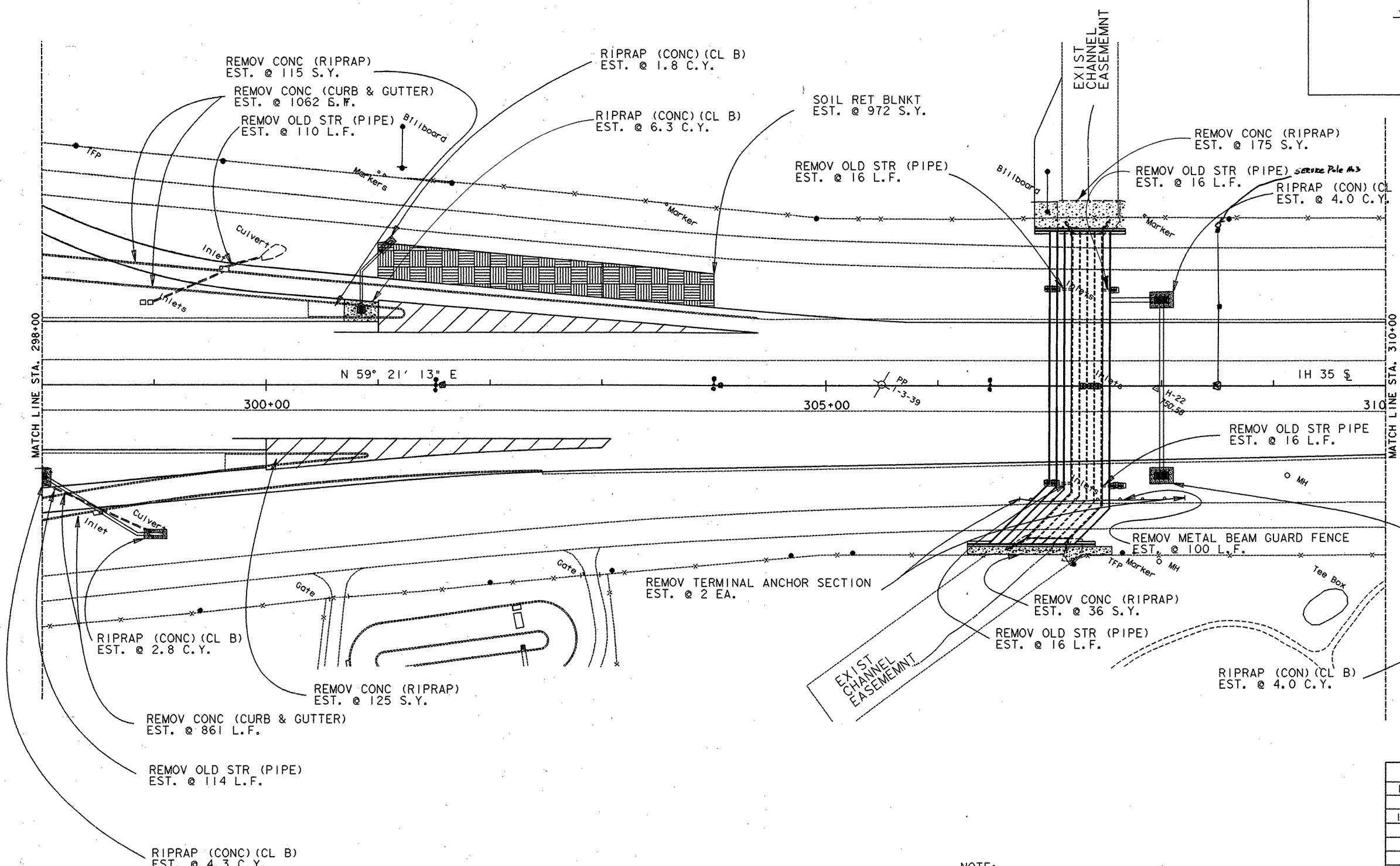
	1,283		1,225		1,284		1,075		1,076		1,104		875		587		288		161		388		713	10,059
	0		0		0		0		0		2		15		51		107		183		215		195	768

PLAN SHEET
 SHEET 6 OF 26

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	NH 95 (40) IM		81
STATE	STATE DIST. NO.	COUNTY	
TEXAS	15	COMAL	
CONT.	SECT.	JOB	HIGHWAY NO.
0016	05	087	1H 35



CHANNEL WORK
CHANNEL SECTION LT &
DNSTR STR STA. 307+33+/-



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Gregory A. Malatek, P.E.

SCALE 1" = 50'

SHEET TOTALS

EST.	UNIT	DESCRIPTION
451	S.Y.	REMOV CONC (RIPRAP)
1923	L.F.	REMOV CONC (CURB & GUTTER)
288	L.F.	REMOV OLD STRUCT (PIPE)
9041	S.Y.	FURN & PLAC TPSL (CL 2) (9")
972	S.Y.	SOIL RET BLNKT
23.2	S.Y.	RIPRAP (CONC) (CL B)
100	L.F.	REMOV METAL BEAM GUARD FENCE
2	EA.	REMOV TERMINAL ANCHOR SECTION

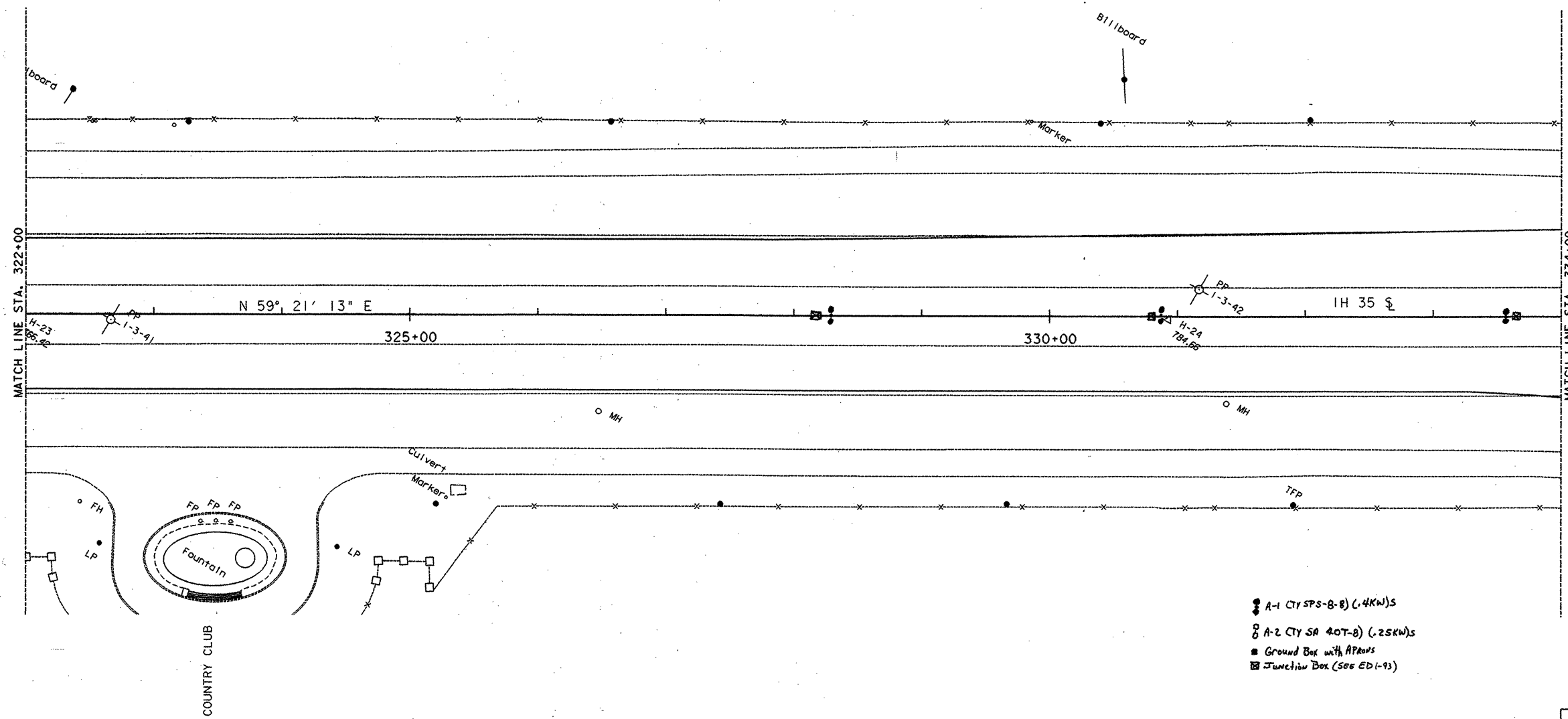
NOTE:
FOR SSCB LOCATIONS, TYPE AND QUANTITIES
SEE THE SSCB SUMMARY SHEET

* INCLUDES 569 C.Y. (CHANNEL EXCAVATION)

	857	850	766	569	363	308	195	157	166	*853	302	203	5,589	C.Y.	EXCAVATION (RDWY & CHAN)
	260	266	174	259	276	217	181	147	130	148	125	107	2,290	C.Y.	EMBANK (ORD COMP) (TY B) (CL 3)
298+00	299+00	300+00	301+00	302+00	303+00	304+00	305+00	306+00	307+00	308+00	309+00	310+00			

PLAN SHEET
SHEET 7 OF 26

FED. RD. DIV. NO.	6	FEDERAL AID PROJECT NO.	NH 95 (40) IM	SHEET NO.	82
STATE	TEXAS	STATE DIST. NO.	15	COUNTY	COMAL
CONT.	0016	SECT.	05	JOB	087
				HIGHWAY NO.	1H 35



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Gregory A. Malatek, P.E.

SCALE 1" = 50'

NOTE:
 FOR SSCB LOCATIONS, TYPE AND QUANTITIES
 SEE THE SSCB SUMMARY SHEET

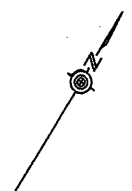
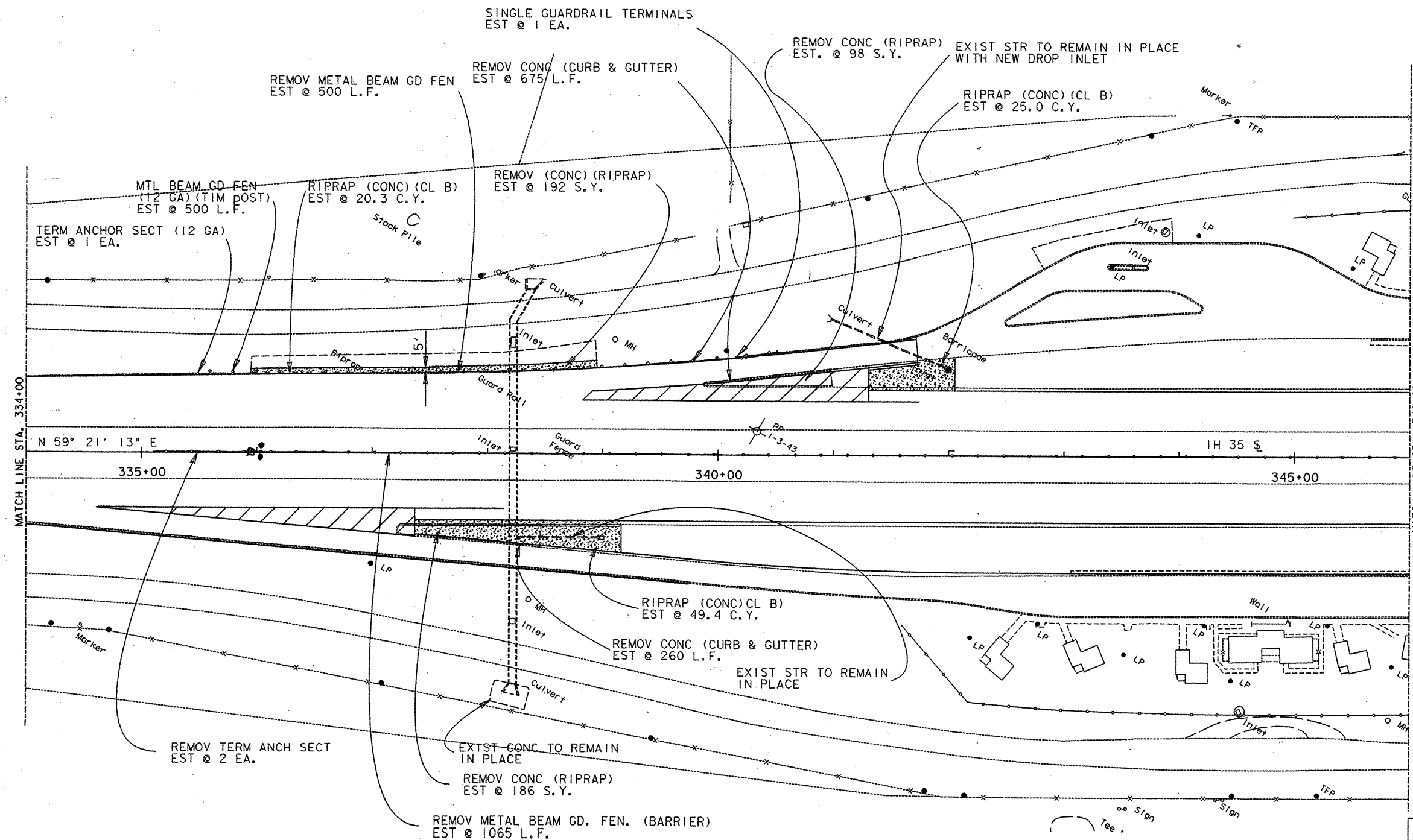
SHEET TOTALS

EST.	UNIT	DESCRIPTION
5,724	S.Y.	FURN & PLAC TPSL (CL 2) (9")
9,778	C.Y.	EXCAVATION (RDWY & CHAN)
1,640	C.Y.	EMBANK (ORD COMP) (TY B) (CL 3)

54	75	137	270	536	855	1,124	1,266	1,310	1,327	1,383	1,441	9,778	C.Y.	EXCAVATION (RDWY & CHAN)
341	329	268	216	133	85	58	45	52	50	33	30	1,640	C.Y.	EMBANK (ORD COMP) (TY B) (CL 3)
322+00	323+00	324+00	325+00	326+00	327+00	328+00	329+00	330+00	331+00	332+00	333+00	334+00		

PLAN SHEET
 SHEET 9 OF 26

FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO. NH 95 (40) IM	SHEET NO. 24
STATE TEXAS	STATE DIST. NO. 15	COUNTY COMAL
CONTRACT NO. 0016	SECTION 05	JOB 087
		HIGHWAY NO. IH 35



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SCALE 1" = 50'

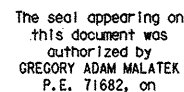
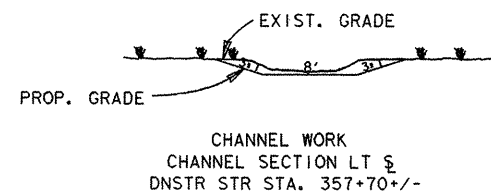
SHEET TOTALS		
EST.	UNIT	DESCRIPTION
476	S.Y.	REMOV CONC (RIPRAP)
935	L.F.	REMOV CONC (CURB & GUTTER)
7,202	S.Y.	FURN & PLAC TPSL (CL 2) (9")
94.7	C.Y.	RIPRAP (CONC) (CL B)
1	EA.	TERM ANCHOR SECT (12 GA)
500	L.F.	MBGF (12 GA) (TIM POST)
500	L.F.	REMOV MBGF
1,065	L.F.	REMOV MBGF (BARRIER)
2	EA.	REMOV TERMINAL ANCHOR SECTION
1	EA.	SINGLE GUARDRAIL TERMINALS
15,579	C.Y.	EXCAVATION (RDWY & CHAN)
1,063	C.Y.	EMBANK (ORD COMP) (TY B) (CL 3)

NOTE:
 FOR SSCB LOCATIONS, TYPE AND QUANTITIES
 SEE THE SSCB SUMMARY SHEET

1,519	1,416	1,220	895	759	793	1,209	1,322	1,344	1,565	1,738	1,799	
39	64	127	201	215	162	102	64	41	22	15	11	
334+00	335+00	336+00	337+00	338+00	339+00	340+00	341+00	342+00	343+00	344+00	345+00	346+00

PLAN SHEET
 SHEET 10 OF 26

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	NH 95 (40) IM		85
STATE	STATE DIST. NO.	COUNTY	
TEXAS	15	COMAL	
CONT.	SECT.	JOB	HIGHWAY NO.
0016	05	087	1H 35



4/12, 1995.
Gregory A. Malatch, P.E.

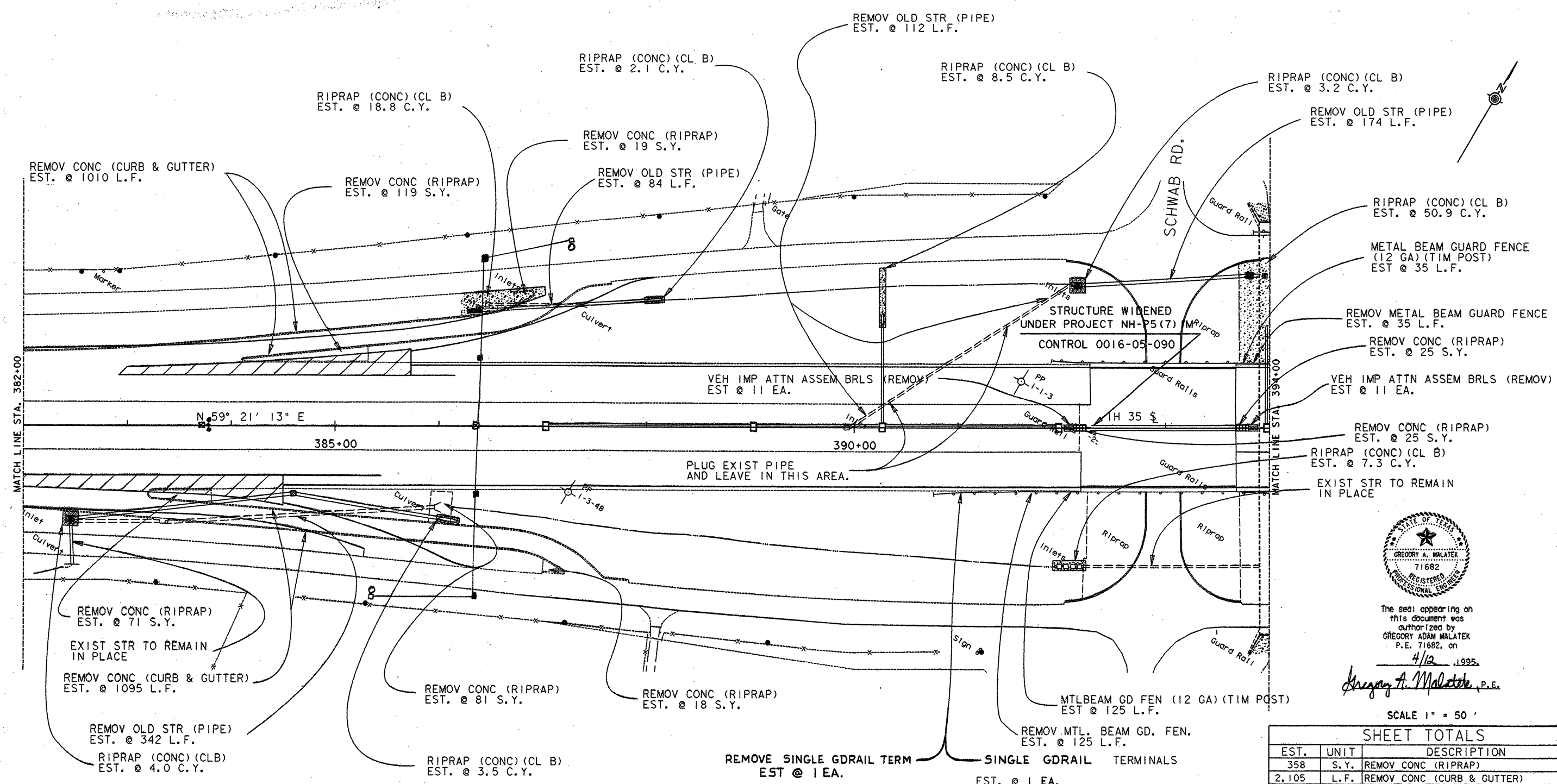
SHEET TOTALS

- A-1 (TYP 485-B-B) (.4KW)S
- A-2 (TYP 40T-B) (.25KW)S
- Ground Box with APWWS
- SERVICE POLE
- ⊗ JUNCTION BOX (SEE ED 1-93)

* INCLUDES 147 C.Y. (CHANNEL EXCAVATION)

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	NH 95 (40) IM		86
STATE	STATE DIST. NO.	COUNTY	
TEXAS	15	COMAL	
CONT.	SECT.	JOB	HIGHWAY NO.
0016	05	087	1H 35

PLAN SHEET
SHEET 11 OF 26



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 P.E. 71682, on
 4/12, 1995.
Gregory A. Malatek, P.E.

SCALE 1" = 50'

SHEET TOTALS

EST.	UNIT	DESCRIPTION
358	S.Y.	REMOV CONC (RIPRAP)
2,105	L.F.	REMOV CONC (CURB & GUTTER)
7,820	S.Y.	FURN & PLAC TPCL (CL 2) (9")
98.3	C.Y.	RIPRAP (CONC) (CL B)
712	L.F.	REMOV OLD STR (PIPE)
160	L.F.	MBGF (12 GA) (TIM POST)
160	L.F.	REMOV MBGF
22	EA.	VIA ASSEM BRLS (REMOVE)
1	EA.	REMOVE SINGLE GDRAIL TERM.
1	EA.	SINGLE GDRAIL TERMINAL

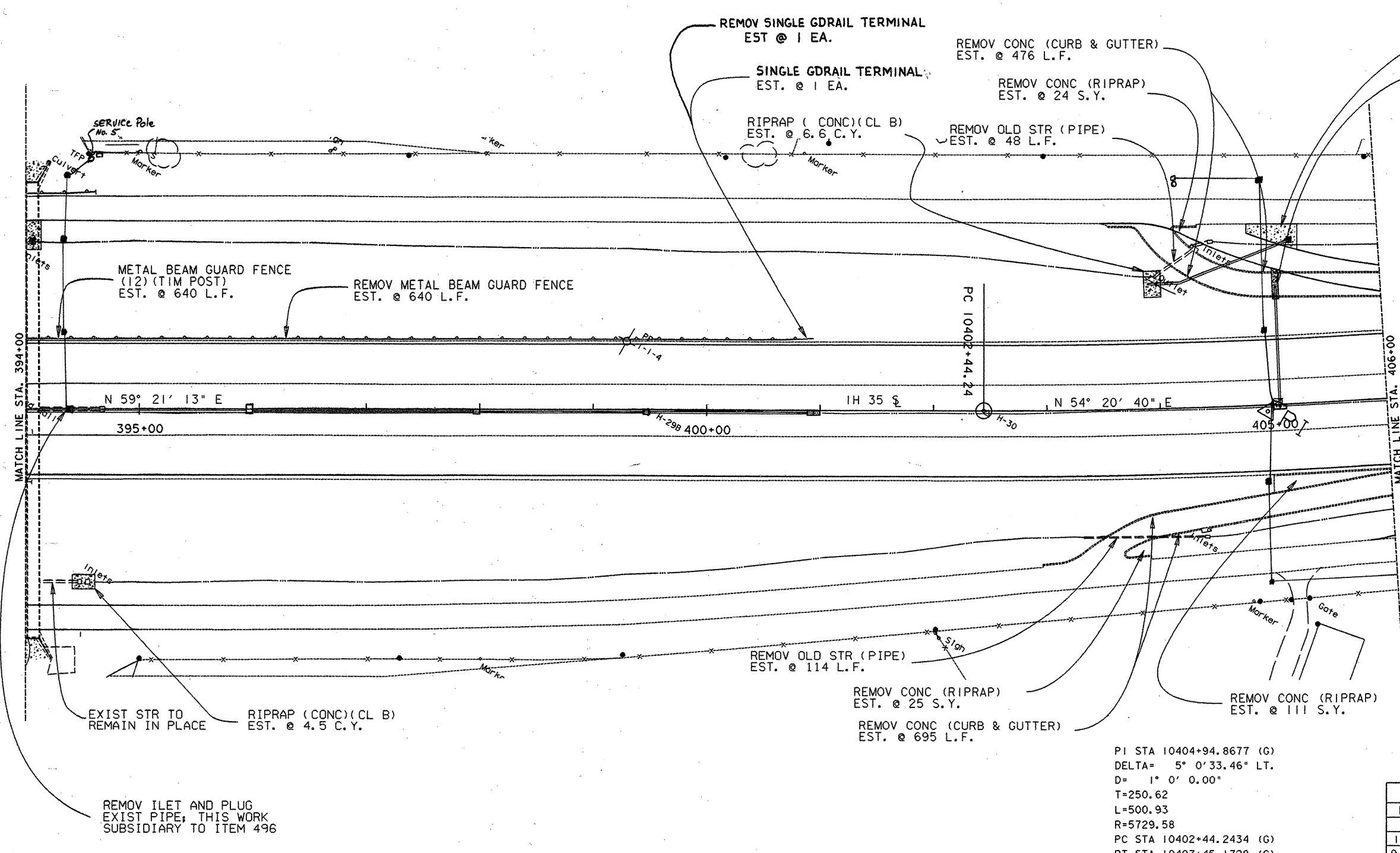
- PA-1 (TYP 485-B-B) (2.25KW)S
- PA-2 (TYP 407-B) (2.25KW)S
- Ground Box with APRONS
- Service Pole
- Junction Box (SEE ED-1-93)

NOTE:
 FOR SSCB LOCATIONS, TYPE AND QUANTITIES
 SEE THE SSCB SUMMARY SHEET

377	383	281	473	534	271	191	316	474	694	323	323	
275	285	279	269	213	108	41	19	16	5	0	0	
382+00	383+00	384+00	385+00	386+00	387+00	388+00	389+00	390+00	391+00	392+00	393+00	394+00

PLAN SHEET
 SHEET 14 OF 26

FED. RD. DIST. NO.	FEDERAL AID PROJECT NO.	SHEET NO.
6	NH 95 (40) 1M	80
STATE	STATE DIST. NO.	COUNTY
TEXAS	15	COMAL
CONT.	SECT.	JOB
0016	05	087
		HIGHWAY NO.
		1H 35



RIPRAP (CONC)(CL B)
EST. @ 9.0 C.Y.

RIPRAP (CONC)(CL B)
EST. @ 4.7 C.Y.

REMOV SINGLE GDRAIL TERMINAL
EST @ 1 EA.

SINGLE GDRAIL TERMINAL
EST. @ 1 EA.

REMOV CONC (CURB & GUTTER)
EST. @ 476 L.F.

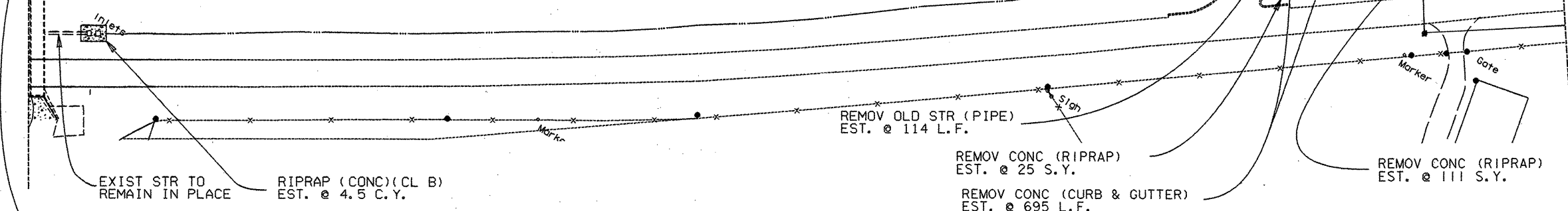
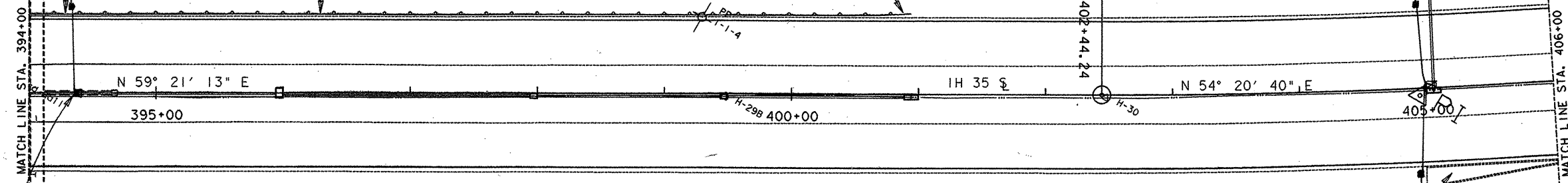
REMOV CONC (RIPRAP)
EST. @ 24 S.Y.

REMOV OLD STR (PIPE)
EST. @ 48 L.F.

RIPRAP (CONC)(CL B)
EST. @ 6.6 C.Y.

METAL BEAM GUARD FENCE
(12) (TIM POST)
EST. @ 640 L.F.

REMOV METAL BEAM GUARD FENCE
EST. @ 640 L.F.



EXIST STR TO
REMAIN IN PLACE

RIPRAP (CONC)(CL B)
EST. @ 4.5 C.Y.

REMOV ILET AND PLUG
EXIST PIPE, THIS WORK
SUBSIDIARY TO ITEM 496

REMOV OLD STR (PIPE)
EST. @ 114 L.F.

REMOV CONC (RIPRAP)
EST. @ 25 S.Y.

REMOV CONC (CURB & GUTTER)
EST. @ 695 L.F.

REMOV CONC (RIPRAP)
EST. @ 111 S.Y.

PI STA 10404+94.8677 (G)
DELTA= 5° 0' 33.46" LT.
D= 1° 0' 0.00"
T=250.62
L=500.93
R=5729.58
PC STA 10402+44.2434 (G)
PT STA 10407+45.1728 (G)

NOTE:
FOR SSCB LOCATIONS, TYPE AND QUANTITIES
SEE THE SSCB SUMMARY SHEET



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Gregory A. Malatek, P.E.

SCALE 1" = 50'

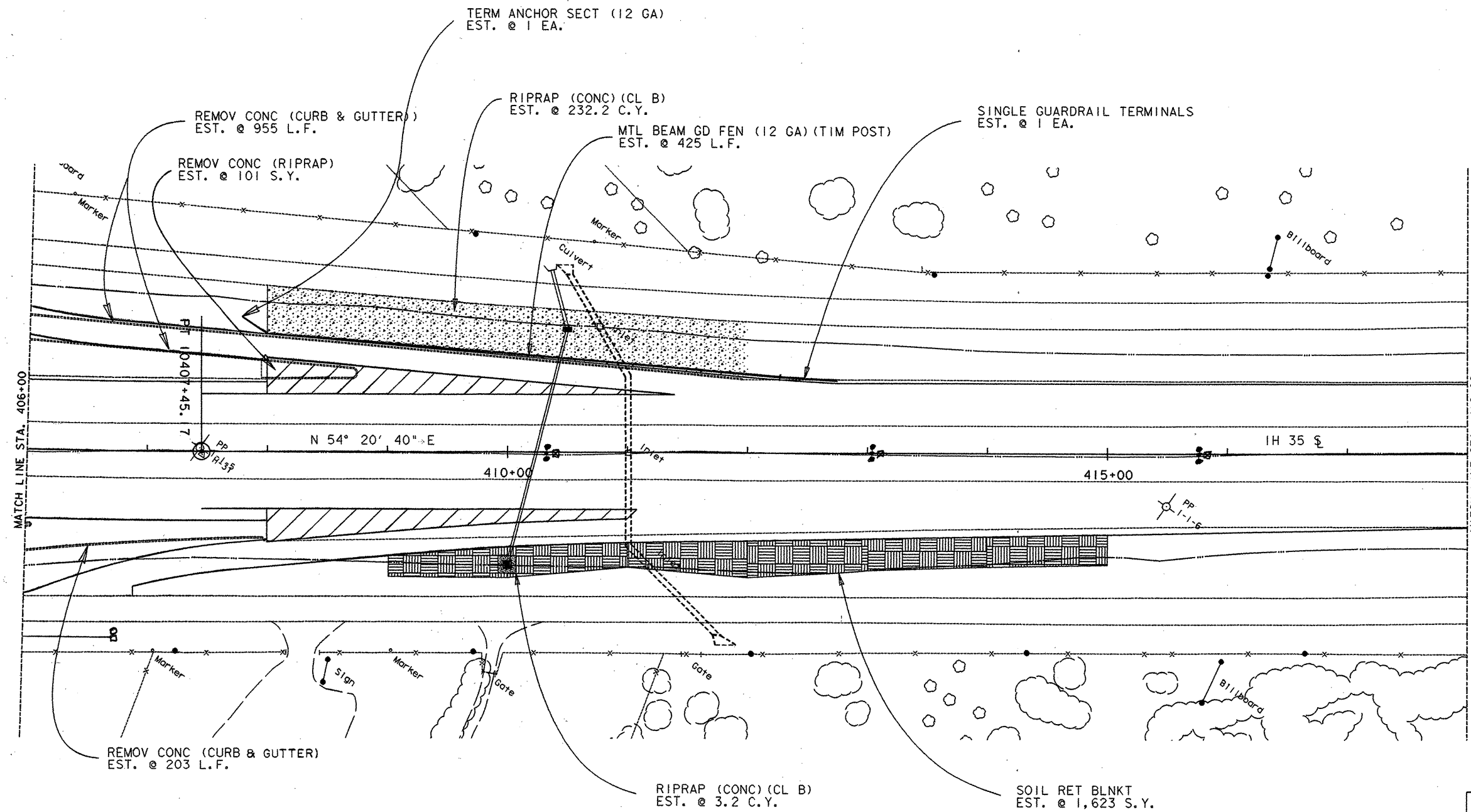
SHEET TOTALS

EST.	UNIT	DESCRIPTION
160	S.Y.	REMOV CONC (RIPRAP)
1,171	L.F.	REMOV CONC (CURB & GUTTER)
9,936	C.Y.	FURN & PLAC TPSL (CL 2) (9")
24.8	C.Y.	RIPRAP (CONC) (CL B)
162	L.F.	REMOV OLD STR (PIPE)
640	L.F.	MBGF (12GA) (TIM POST)
640	L.F.	REMOV MBGF
1	EA.	REMOV SINGLE GDRAIL TERM.
1	EA.	SINGLE GDRAIL TERMINAL

743	691	660	619	658	748	801	892	908	1,000	1,106	967	9,793	C.Y.	EXCAVATION (RDWY & CHAN)
4	1	4	15	22	21	21	21	32	76	162	255	634	C.Y.	EMBANK (ORD COMP) (TY B) (CL 3)
394+00	395+00	396+00	397+00	398+00	399+00	400+00	401+00	402+00	403+00	404+00	405+00	406+00		

PLAN SHEET
SHEET 15 OF 26

FED. RD. DIST. NO.	FEDERAL AID PROJECT NO.	SHEET NO.
6	NH 95 (40) IM	20
STATE	STATE DIST. NO.	COUNTY
TEXAS	15	COMAL
CONT.	SECT.	JOB
0016	05	087
		HWY NO.
		1H 35



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Gregory A. Malatek, P.E.

SCALE 1" = 50'

SHEET TOTALS

EST.	UNIT	DESCRIPTION
101	S.Y.	REMOV CONC (RIPRAP)
1,158	L.F.	REMOV CONC (CURB & GUTTER)
6,438	S.Y.	FURN & PLAC TPSL (CL 2) (9")
235.4	C.Y.	RIPRAP (CONC) (CL B)
1,623	S.Y.	SOIL RET BLNKT
1	EA.	TERM ANCHOR SECT (12 GA)
425	L.F.	MBGF (12 GA) (TIM POST)
1	EA.	SINGLE GUARDRAIL TERMINALS

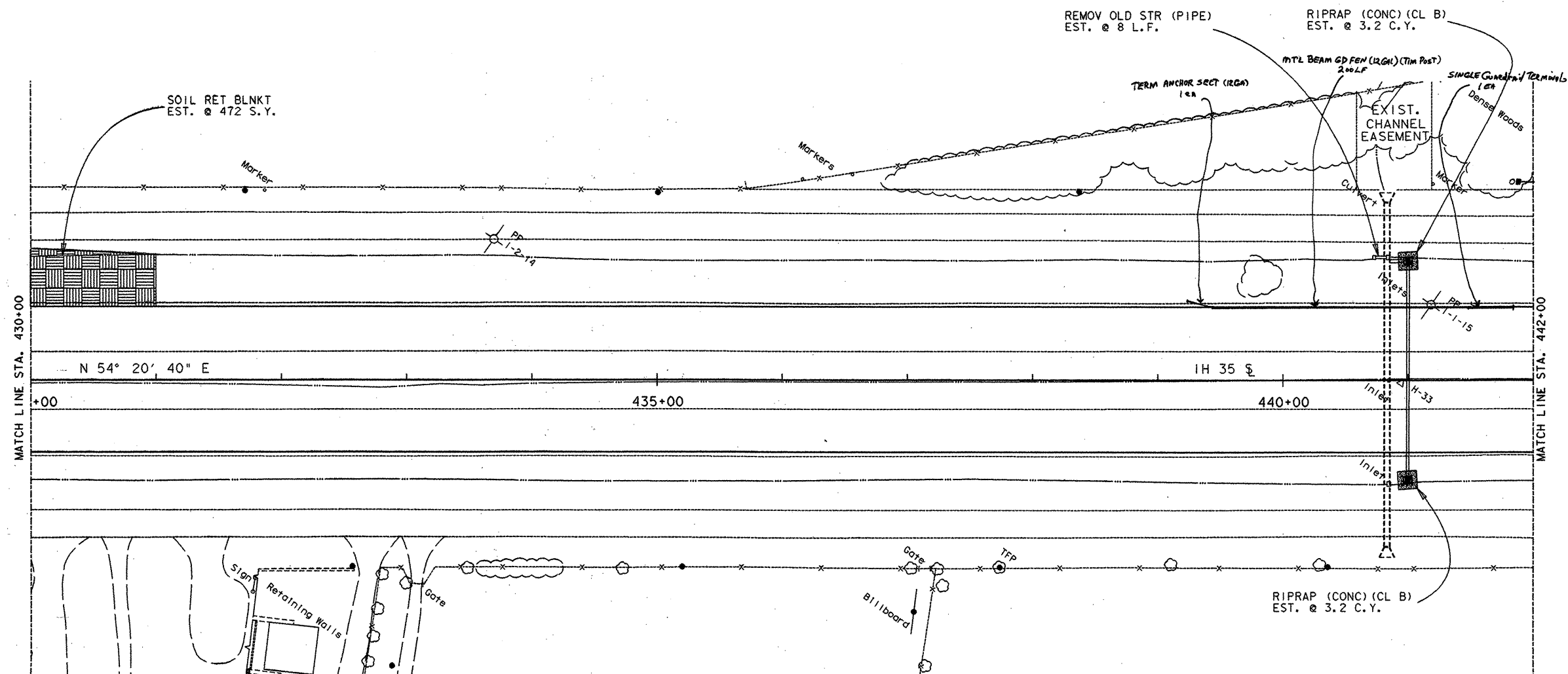
NOTE:
 FOR SCSB LOCATIONS, TYPE AND QUANTITIES
 SEE THE SCSB SUMMARY SHEET

- 1 A-1(TY SP 4 BS-B) (-4RW)S
- 3 A-2(TY SA 407-B) (-25RW)S
- Ground Box with APRONS
- SERVICE POLE
- Junction Box (SEE EBI-93)

	637	309	156	98	117	142	150	139	139	184	245	337	
	621	886	825	618	370	356	311	287	245	215	194	166	
406+00	407+00	408+00	409+00	410+00	411+00	412+00	413+00	414+00	415+00	416+00	417+00		

PLAN SHEET
 SHEET 16 OF 26

FED. RD. DIV. NO.	6	FEDERAL AID PROJECT NO.	NH 95 (40) 1M	SHEET NO.	21
STATE	TEXAS	STATE DIST. NO.	15	COUNTY	COMAL
CONTRACT	0016	SECT.	05	JOB	087
				RIGHTWAY NO.	IH 35



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Gregory A. Malatek, P.E.

SCALE 1" = 50'

SHEET TOTALS

EST.	UNIT	DESCRIPTION
9,273	S.Y.	FURN & PLAC TPSL (CL 2) (9")
472	S.Y.	SOIL RET BLNKT
6.4	C.Y.	RIPRAP (CONC) (CL B)
8	L.F.	REMOV OLD STR (PIPE)

NOTE:
FOR SSCB LOCATIONS, TYPE AND QUANTITIES
SEE THE SSCB SUMMARY SHEET

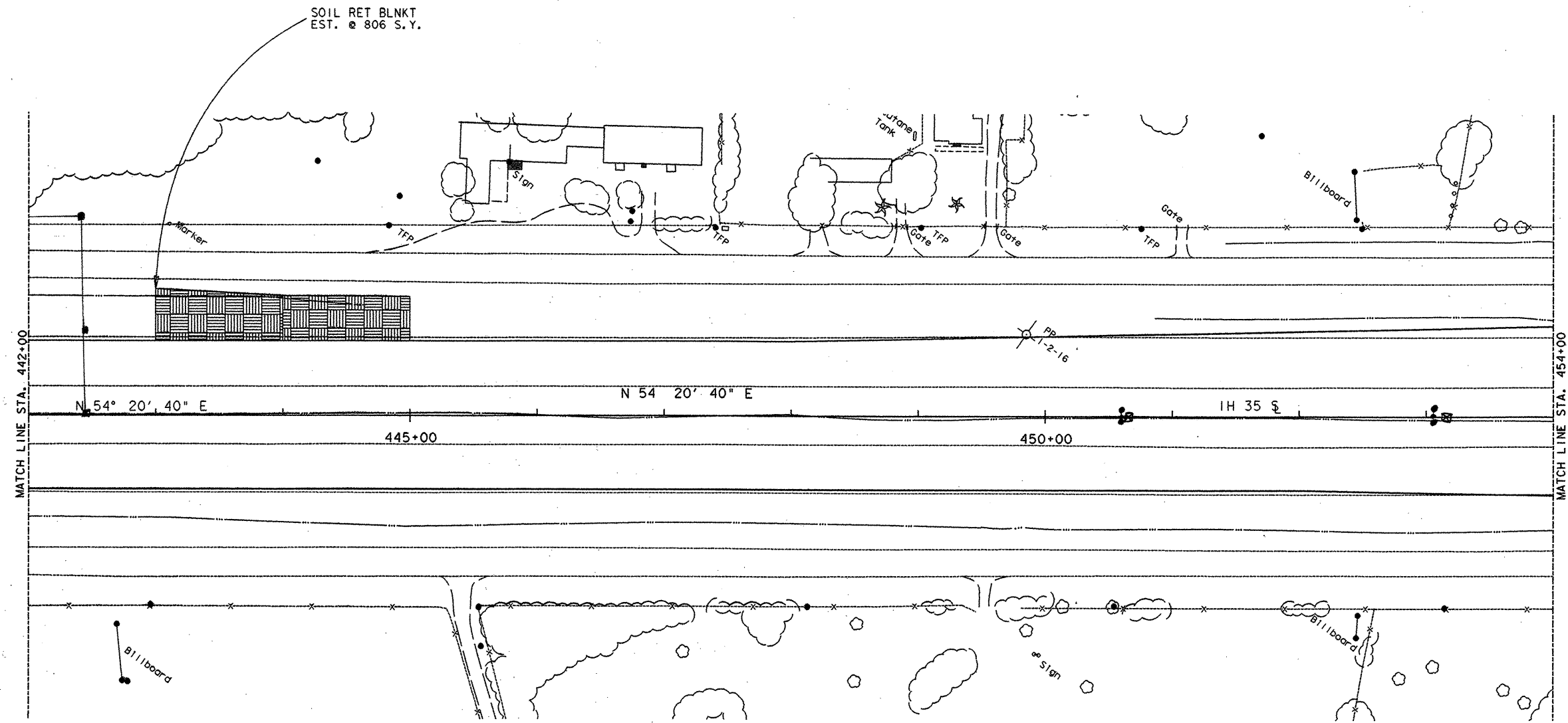
936	670	420	270	156	122	119	140	146	167	300	409	3,855	C.Y.	EXCAVATION (RDWY & CHAN)
162	168	179	222	248	258	254	221	202	194	183	164	2,455	C.Y.	EMBANK (ORD COMP) (TY B) (CL 3)

430+00	431+00	432+00	433+00	434+00	435+00	436+00	437+00	438+00	439+00	440+00	441+00	442+00
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PLAN SHEET

SHEET 18 OF 26

FED. RD. DIV. NO.	6	FEDERAL AID PROJECT NO.	NH 95 (40) IM	SHEET NO.	23
STATE	TEXAS	STATE DIST. NO.	15	COUNTY	COMAL
CONT.	0016	SECT.	05	JOB	087
				HIGHWAY NO.	1H 35



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Gregory A. Malatek, P.E.

SCALE 1" = 50'

SHEET TOTALS

EST.	UNIT	DESCRIPTION
6,473	S.Y.	FURN & PLAC TPSL (CL2) (9")
806	S.Y.	SOIL RET BLNKT
4,736	C.Y.	EXCAVATION (RDWY & CHAN)
2,127	C.Y.	EMBANK (ORD COMP) (TY B) (CL 3)

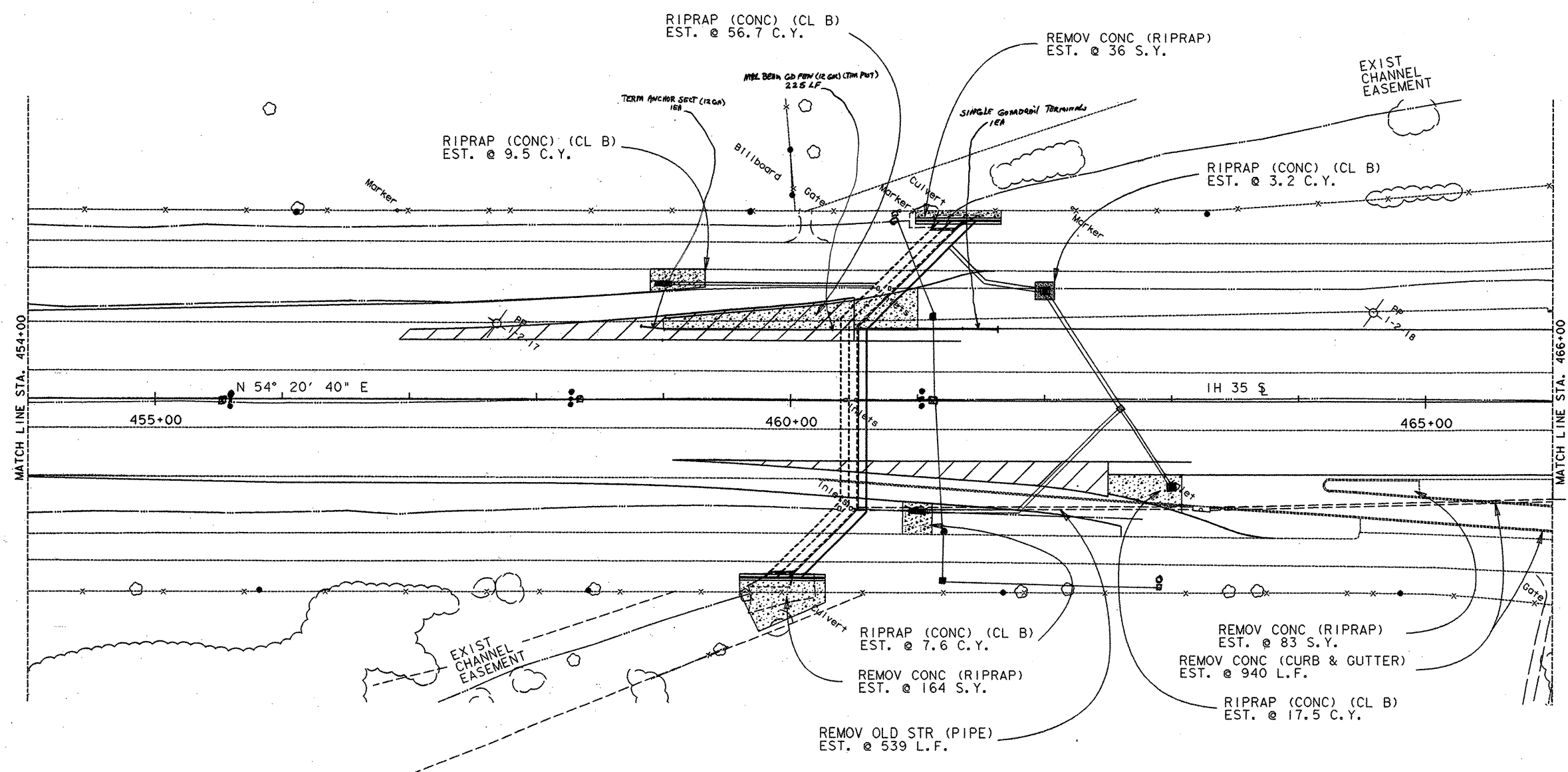
A-1 (TY SP 485-B-8) (.4KWS)
 A-2 (TY SA 40T-B) (.25KWS)
 B Ground Box with Aprons
 C Service Pole
 D Junction Box (See EP 1-93)

NOTE:
FOR SSCB LOCATIONS, TYPE AND QUANTITIES
SEE THE SSCB SUMMARY SHEET

398	457	531	523	496	442	377	357	326	293	269	267	4,736
143	153	165	166	167	206	237	199	173	175	169	174	2,127
442+00	443+00	444+00	445+00	446+00	447+00	448+00	449+00	450+00	451+00	452+00	453+00	454+00

PLAN SHEET
SHEET 19 OF 26

FED. RD. DIST. NO.	FEDERAL AID PROJECT NO.	SHEET NO.
6	NH 95 (40) IM	24
STATE	COUNTY	
TEXAS	COMAL	
CONT.	SECT.	JOB
0016	05	087
		HIGHWAY NO.
		IH 35



The seal appearing on this document was authorized by GREGORY A. MALATEK P.E. 71682, on 4/12, 1995.

Gregory A. Malatek, P.E.

SCALE 1" = 50'

SHEET TOTALS

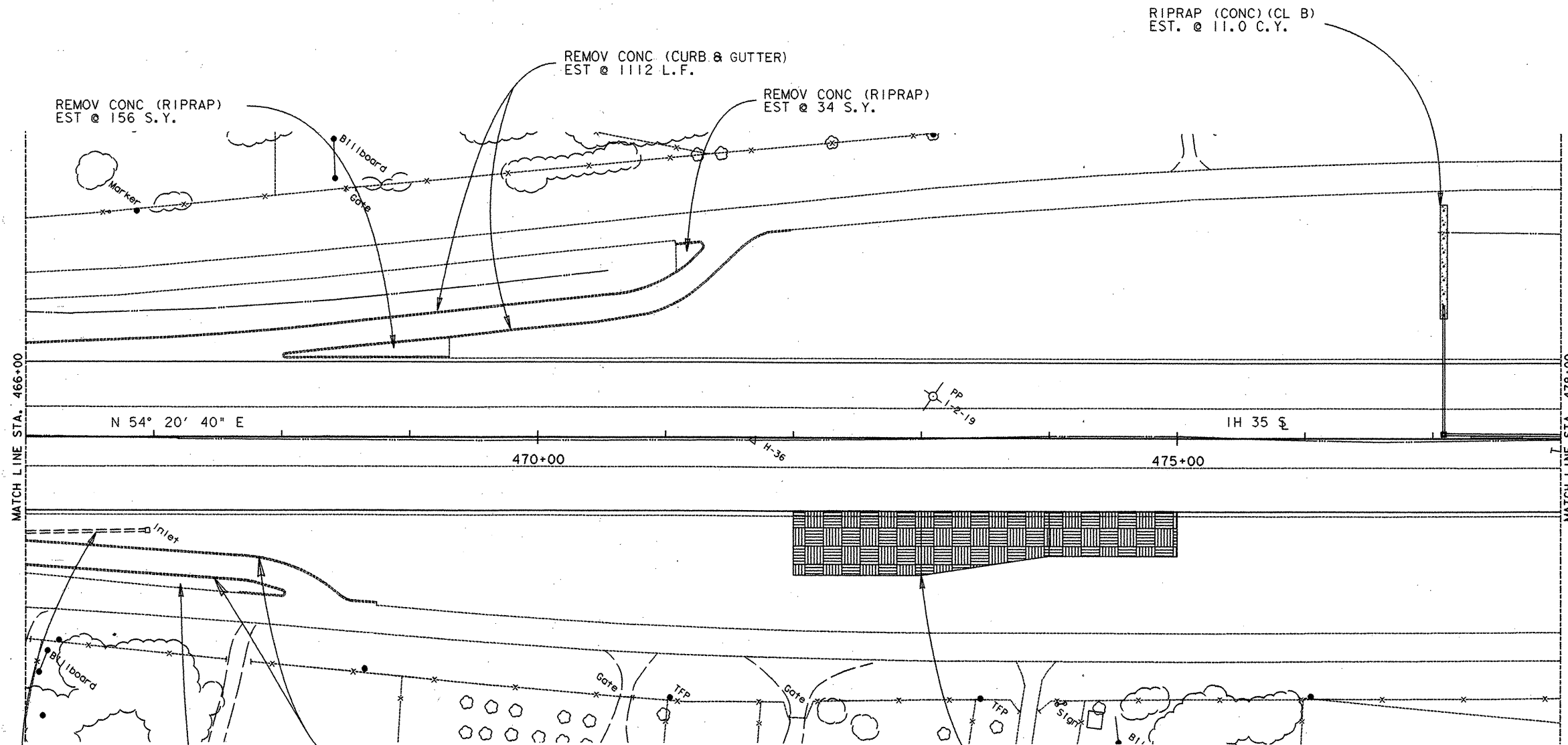
EST.	UNIT	DESCRIPTION
283	S.Y.	REMOV CONC (RIPRAP)
940	L.F.	REMOV CONC (CURB & GUTTER)
7,055	S.Y.	FURN & PLAC TPSL (CL 2) (9")
94.5	C.Y.	RIPRAP (CONC) (CL B)
539	L.F.	REMOV OLD STR (PIPE)

NOTE:
FOR SSCB LOCATIONS, TYPE AND QUANTITIES
SEE THE SSCB SUMMARY SHEET

275	236	178	161	210	414	639	918	893	885	1,104	1,267	7,180
200	247	289	290	240	176	121	121	101	96	83	38	2,002
454+00	455+00	456+00	457+00	458+00	459+00	460+00	461+00	462+00	463+00	464+00	465+00	466+00

PLAN SHEET
SHEET 20 OF 26

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.
6	NH 95 (40) IM	25
STATE	DIST. NO.	COUNTY
TEXAS	15	COMAL
CONT.	SECT.	JOB
0016	05	087
		HIGHWAY NO.
		IH 35



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SCALE 1" = 50'

SHEET TOTALS

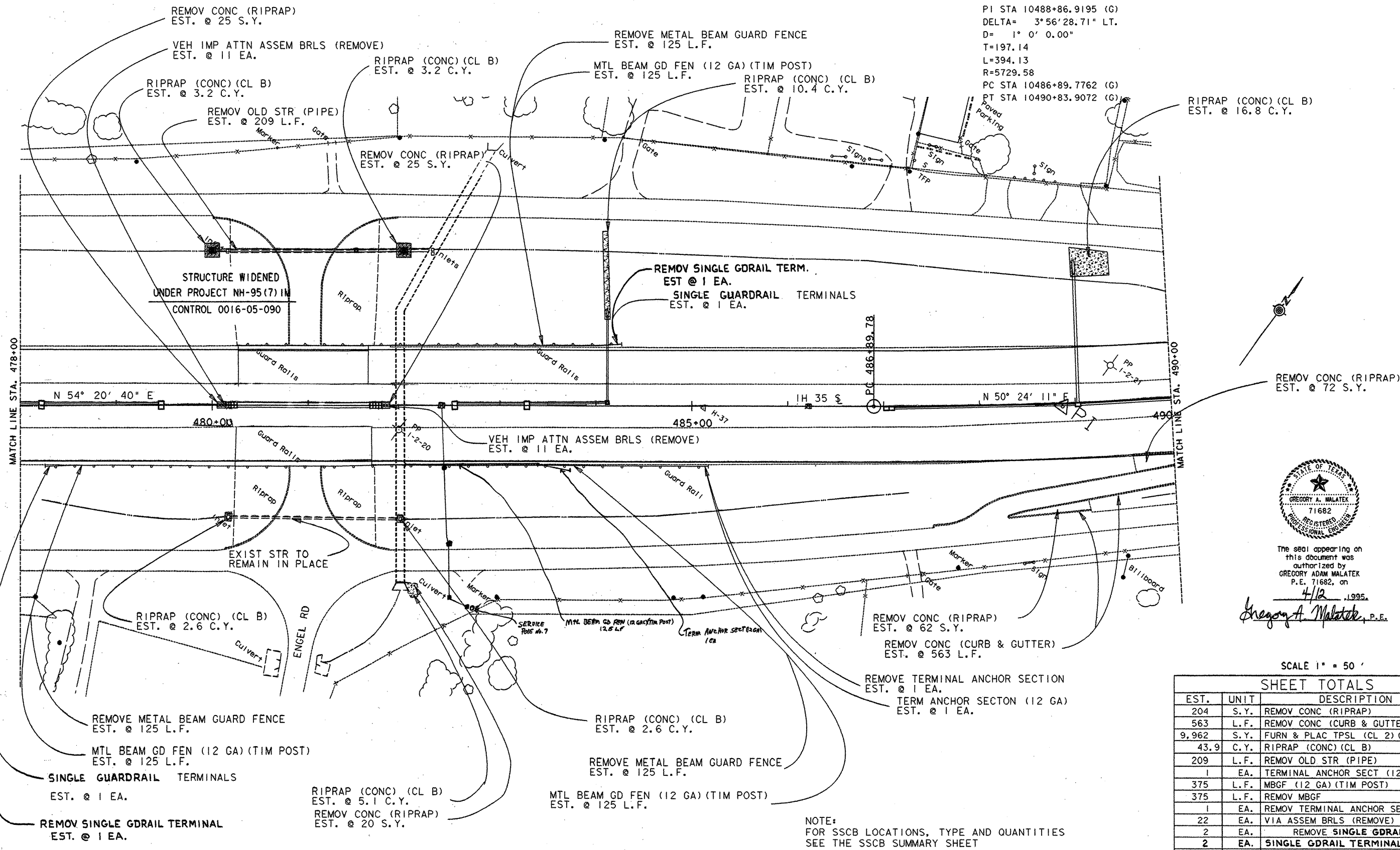
EST.	UNIT	DESCRIPTION
489	S.Y.	REMOV CONC (RIPRAP)
1,517	L.F.	REMOV CONC (CURB & GUTTER)
14,362	S.Y.	FURN & PLAC TPSL (CL 2) (9")
11	C.Y.	RIPRAP (CONC) (CL B)
95	L.F.	REMOV OLD STR (PIPE)
1,389	S.Y.	SOIL RET BLNKT

NOTE:
FOR SSCB LOCATIONS, TYPE AND QUANTITIES
SEE THE SSCB SUMMARY SHEET

1,559	2,021	2,242	2,178	1,999	1,740	1,641	1,564	1,485	1,382	1,162	953	
9	0	0	0	0	0	0	0	0	0	0	0	
466+00	467+00	468+00	469+00	470+00	471+00	472+00	473+00	474+00	475+00	476+00	477+00	478+00

PLAN SHEET
SHEET 21 OF 26

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.
6	NH 95 (40) IM	26
STATE	COUNTY	
TEXAS	COMAL	
CONT.	SECT.	JOB
0016	05	087
		HIGHWAY NO.
		1H 35



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Gregory A. Malatek, P.E.

SCALE 1" = 50'

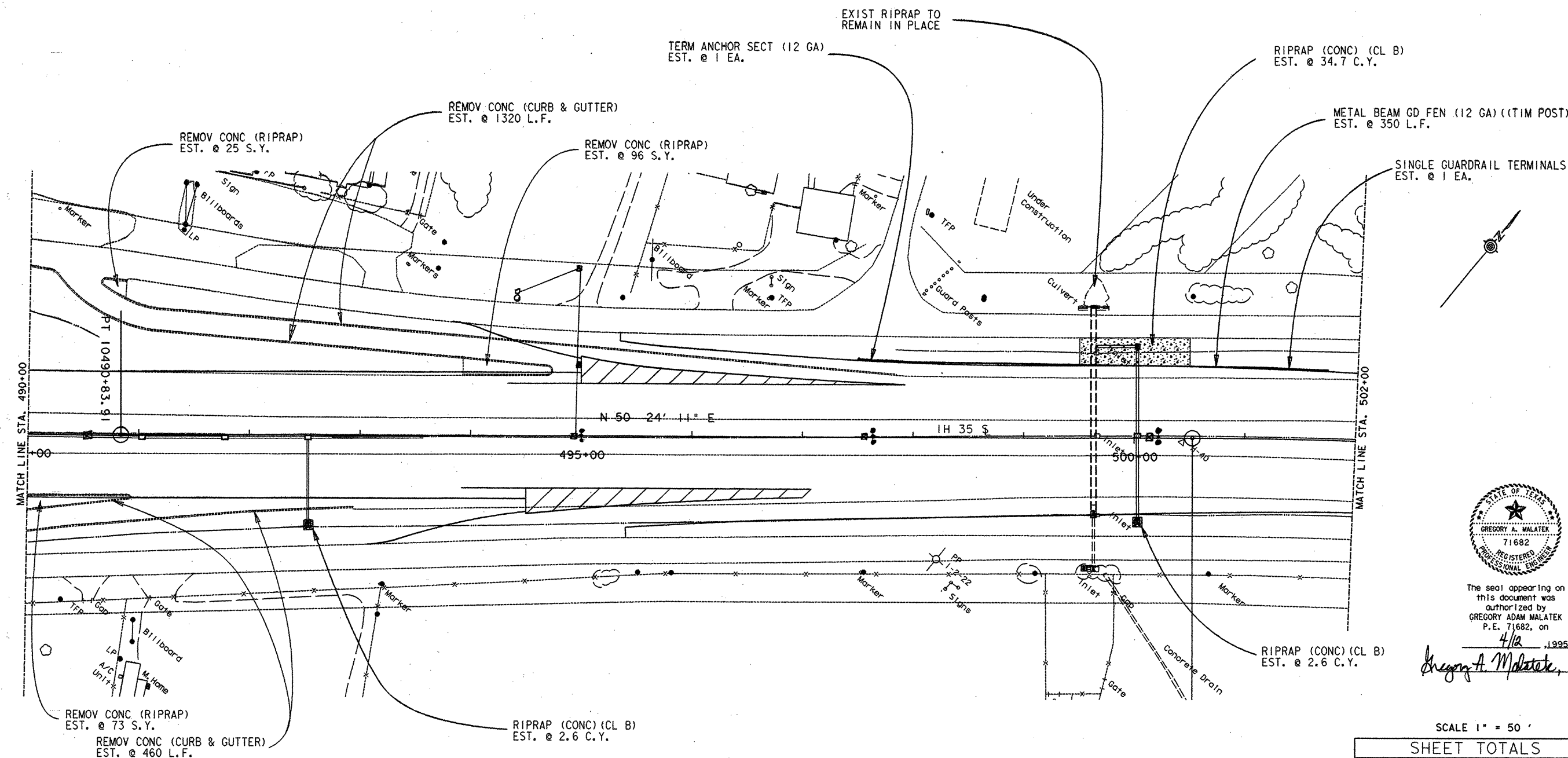
SHEET TOTALS

EST.	UNIT	DESCRIPTION
204	S.Y.	REMOV CONC (RIPRAP)
563	L.F.	REMOV CONC (CURB & GUTTER)
9,962	S.Y.	FURN & PLAC TPSL (CL 2) (9")
43.9	C.Y.	RIPRAP (CONC) (CL B)
209	L.F.	REMOV OLD STR (PIPE)
1	EA.	TERMINAL ANCHOR SECT (12 GA)
375	L.F.	MBGF (12 GA) (TIM POST)
375	L.F.	REMOV MBGF
1	EA.	REMOV TERMINAL ANCHOR SECTION
22	EA.	VIA ASSEM BRLS (REMOVE)
2	EA.	REMOVE SINGLE GDRAIL TERM
2	EA.	SINGLE GDRAIL TERMINAL

812	391	392	558	656	661	724	819	947	1,328	1,616	1,459	10,363
0	0	0	0	0	0	0	0	0	0	11	11	22
478+00	479+00	480+00	481+00	482+00	483+00	484+00	485+00	486+00	487+00	488+00	489+00	490+00

PLAN SHEET
SHEET 22 OF 26

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.
6	NH 95 (40) IM	27
STATE	STATE DIST. NO.	COUNTY
TEXAS	15	COMAL
CONT.	SECT.	JOB
0016	05	087
		HI 35



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SCALE 1" = 50'

SHEET TOTALS

EST.	UNIT	DESCRIPTION
194	S.Y.	REMOV CONC (RIPRAP)
1,780	L.F.	REMOV CONC (CURB & GUTTER)
8,399	S.Y.	FURN & PLAC TPSL (CL 2) (9")
39.9	C.Y.	RIPRAP (CONC) (CL B)
1	EA.	TERM ANCHOR SECTION (12 GA)
350	L.F.	MBGF (12 GA) (TIM POST)
1	EA.	SINGLE GUARDRAIL TERMINALS
8,143	C.Y.	EXCAVATION (RDWY & CHAN)
1,120	C.Y.	EMBANK (ORD COMP) (TY B) (CL 3)

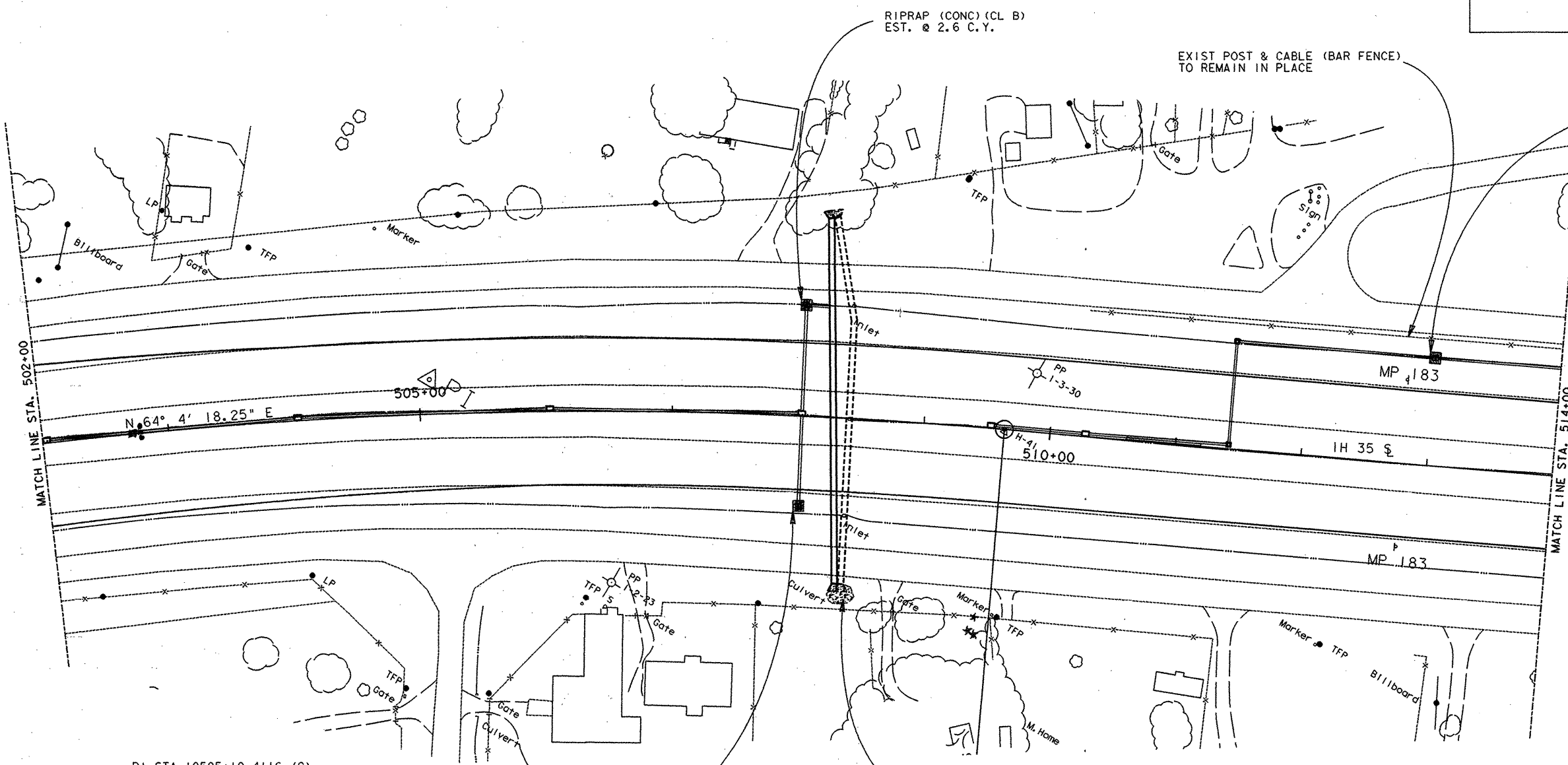
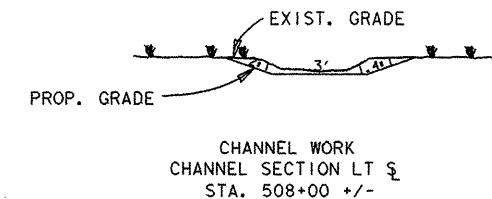
A-1 (TYP 485-B) (1.4 MWLS)
 A-2 (TYP 504-B) (1.25 MWLS)
 G Ground Box with APWMS
 O Service Pole
 J Junction Box (SEE #5-1-1)

NOTE:
FOR SSCB LOCATIONS, TYPE AND QUANTITIES
SEE THE SSCB SUMMARY SHEET

1,250	1,026	730	455	353	313	334	362	407	879	1,090	944	8,143
2	11	30	50	77	85	114	167	173	141	144	126	1,120
490+00	491+00	492+00	493+00	494+00	495+00	496+00	497+00	498+00	499+00	500+00	501+00	502+00

PLAN SHEET
SHEET 23 OF 26

FED. RD. DIST. NO.	FEDERAL AID PROJECT NO.	SHEET NO.
6	NH 95 (40) 1M	26
STATE	COUNTY	
TEXAS	COMAL	
CONTRACT	SECTION	JOB
0016	05	087
		1H 35



PI STA 10505+10.4116 (G)
 DELTA= 13° 40' 7.13" LT.
 D= 1° 30' 0.00"
 T=457.7948
 L=911.2431
 R=3819.7186
 PC STA 10500+52.6168 (G)
 PT STA 10509+63.8599 (G)

RIPRAP (CONC) (CL B)
 EST. @ 2.6 C.Y.

REMOVE CONC (RIPRAP)
 EST. @ 34 S.Y.

NOTE:
 FOR SSCB LOCATIONS, TYPE AND QUANTITIES
 SEE THE SSCB SUMMARY SHEET

* INCLUDES 9 C.Y. (CHANNEL EXCAVATION)

SCALE 1" = 50'

SHEET TOTALS

EST.	UNIT	DESCRIPTION
34	S.Y.	REMOV CONC (RIPRAP)
6,889	S.Y.	FURN & PLAC TPSL (CL 2) (9")
7.8	C.Y.	RIPRAP (CONC) (CL B)
8,341	C.Y.	EXCAVATION (RDWY & CHAN)
727	C.Y.	EMBANK (ORD COMP) (TY B) (CL 3)

1,045	1,107	1,096	1,142	1,010	707	*489	336	309	323	368	409	8,341
72	24	3	2	27	61	83	95	96	83	83	98	727
502+00	503+00	504+00	505+00	506+00	507+00	508+00	509+00	510+00	511+00	512+00	513+00	514+00

PLAN SHEET

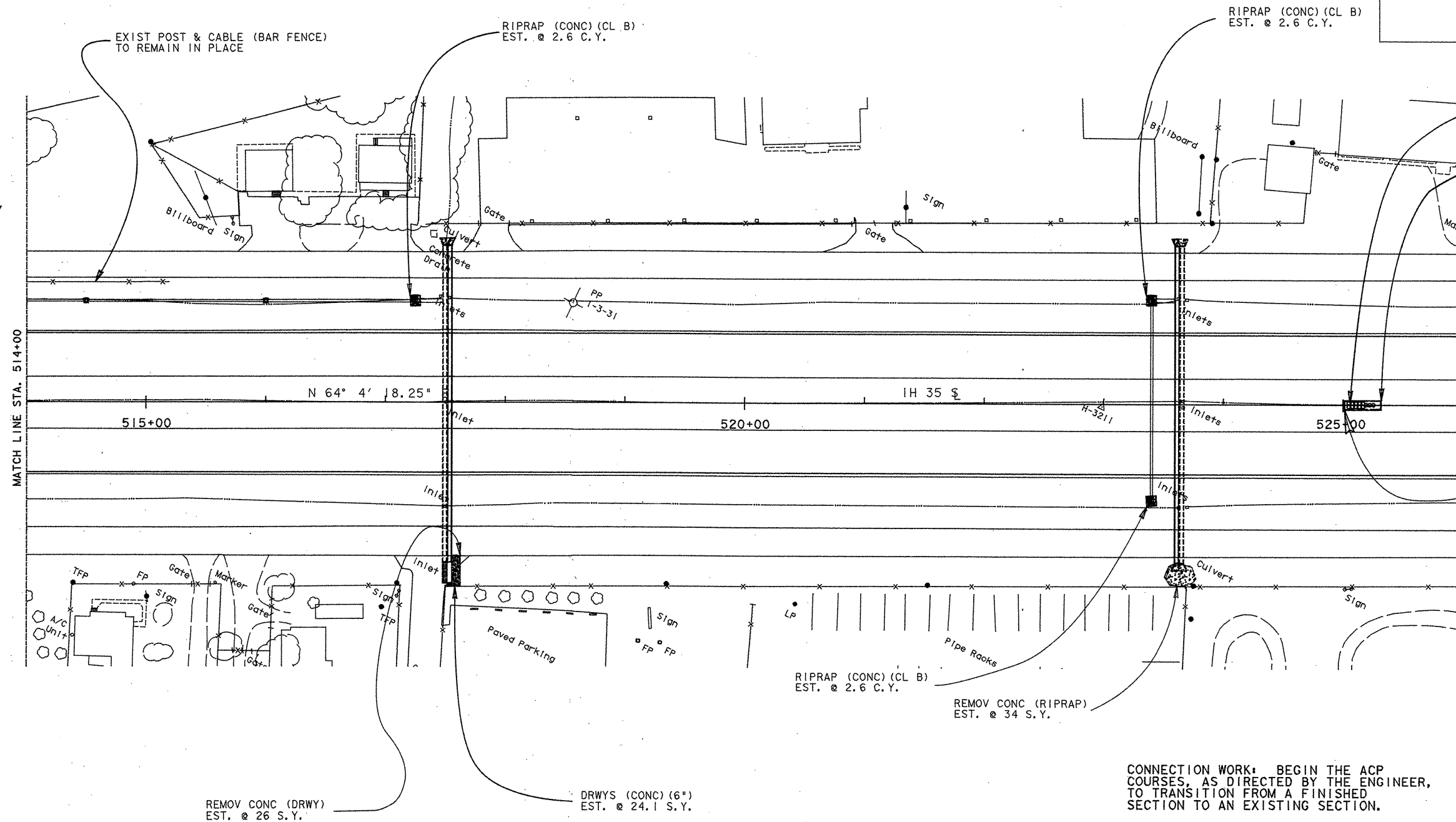
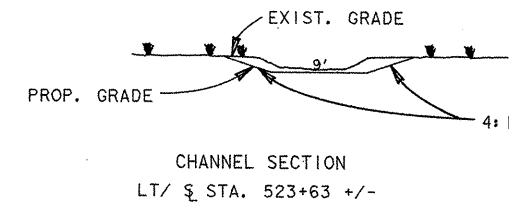
SHEET 24 OF 26



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FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.
6	NH 95 (40) 1M	20
STATE	STATE DIST. NO.	COUNTY
TEXAS	15	COMAL
CONT.	SECT.	JOB
0016	05	087
		HWYWAY NO.
		1H 35



STA. 525+00 END PROJECT
 MANH 95 (40) IM
 CONTROL 16-05-87
 M.P. = 183+00.226
 = STA. 525+00 ON OLD
 PROJECT IN 66 (13)
 CONTROL 15-05-22
 BEG CONN. WORK
 NBL & SBL STA. 525+00



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SCALE 1" = 50'

CONNECTION WORK: BEGIN THE ACP COURSES, AS DIRECTED BY THE ENGINEER, TO TRANSITION FROM A FINISHED SECTION TO AN EXISTING SECTION.

NOTE:
 FOR SSCB LOCATIONS, TYPE AND QUANTITIES SEE THE SSCB SUMMARY SHEET

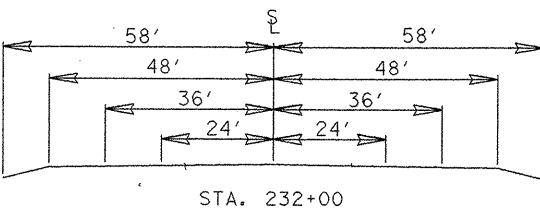
* INCLUDES 188 C.Y. (CHANNEL EXCAVATION)

SHEET TOTALS		
EST.	UNIT	DESCRIPTION
34	S.Y.	REMOV CONC (RIPRAP)
26	S.Y.	REMOV CONC (DRWY)
5,190	S.Y.	FURN & PLAC TPSS (CL 2) (9")
12.3	C.Y.	RIPRAP (CONC) (CL B)
24.1	S.Y.	DRWYS (CONC) (6")
17	EA.	VIA ASSEM BRLS

410	390	388	359	331	358	386	413	463	*732	619									
118	128	139	180	200	173	160	145	108	79	76									
514+00	515+00	516+00	517+00	518+00	519+00	520+00	521+00	522+00	523+00	524+00									

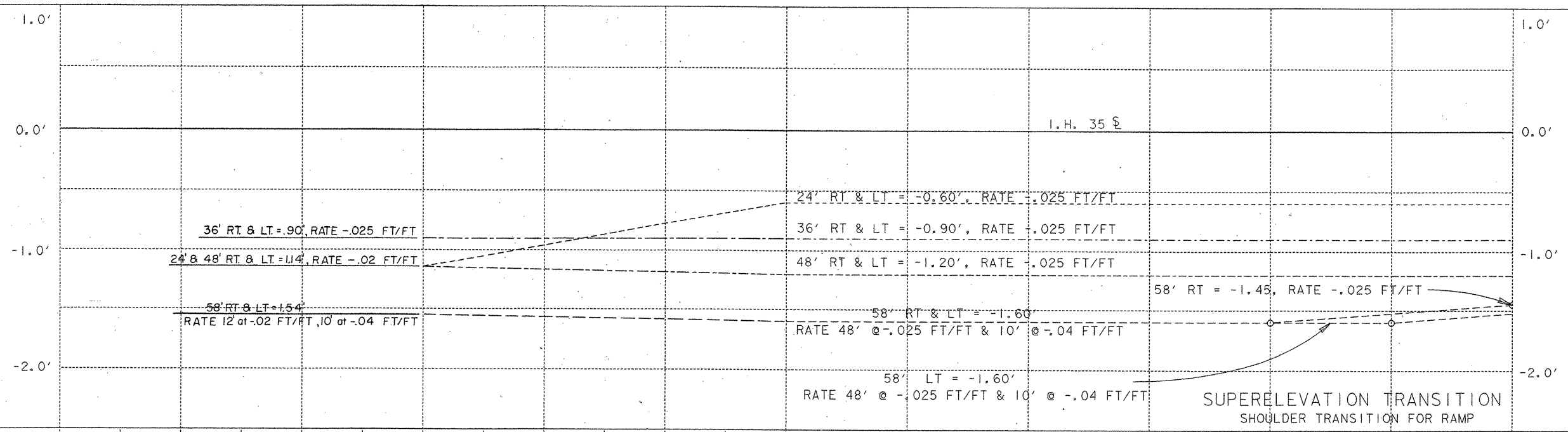
PLAN SHEET
 SHEET 25 OF 26

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	NH 95 (40) IM		100
STAT-	STATE DIST. NO.	COUNTY	
TEXAS	15	COMAL	
CONT.	SECT.	JOB	HIGHWAY NO.
0016	05	087	IH 35

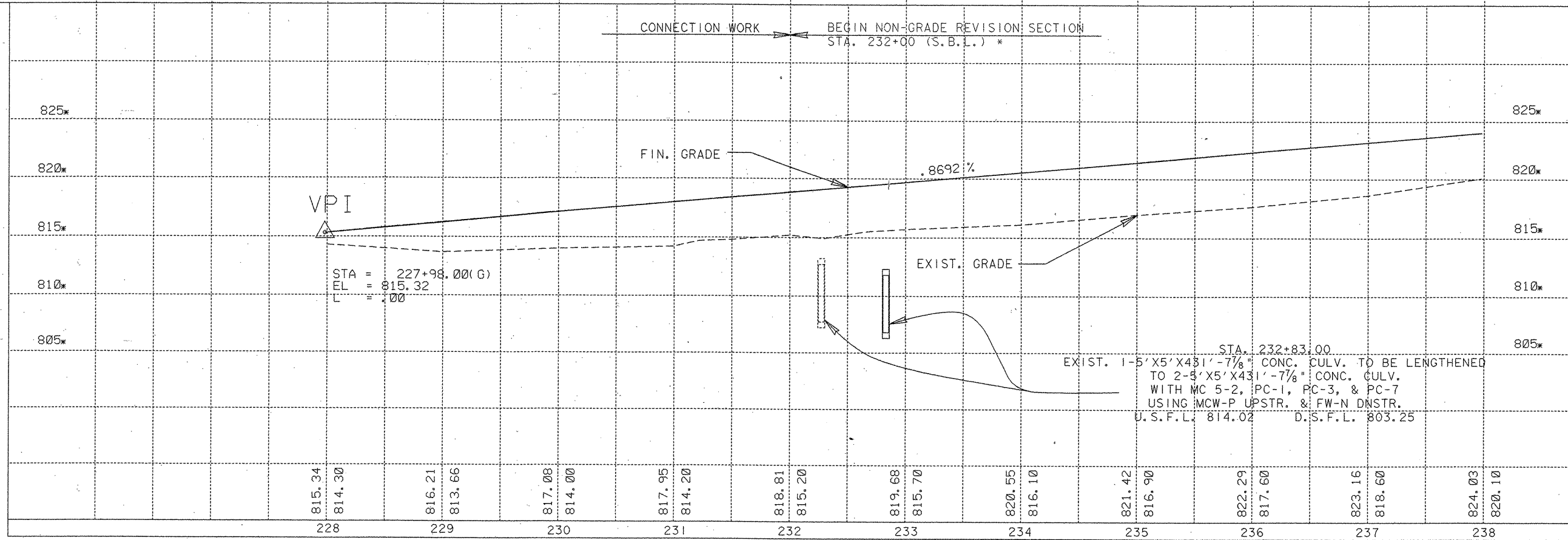


STA. 232+00

SUPERELEVATION
DIAGRAM



CONNECTION WORK → BEGIN NON-GRADE REVISION SECTION
STA. 232+00 (S.B.L.) *



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*N.B.L. ARE IN GRADE REVISION FOR THE PROJECT'S LIMITS.

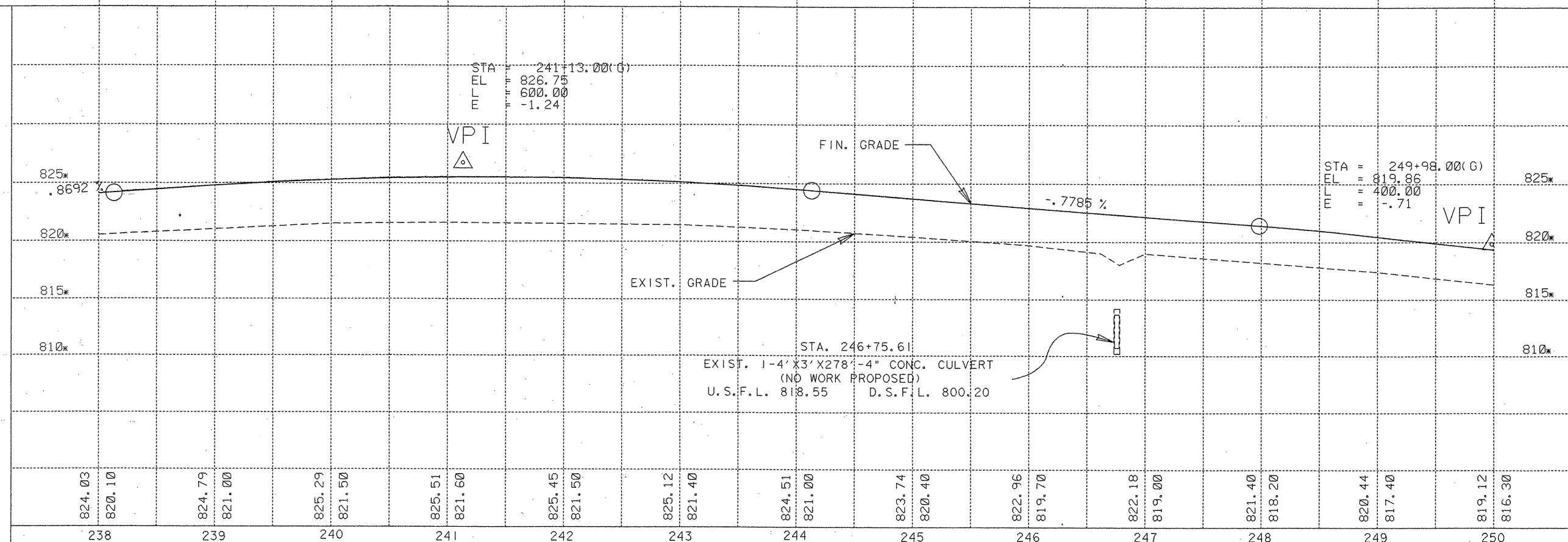
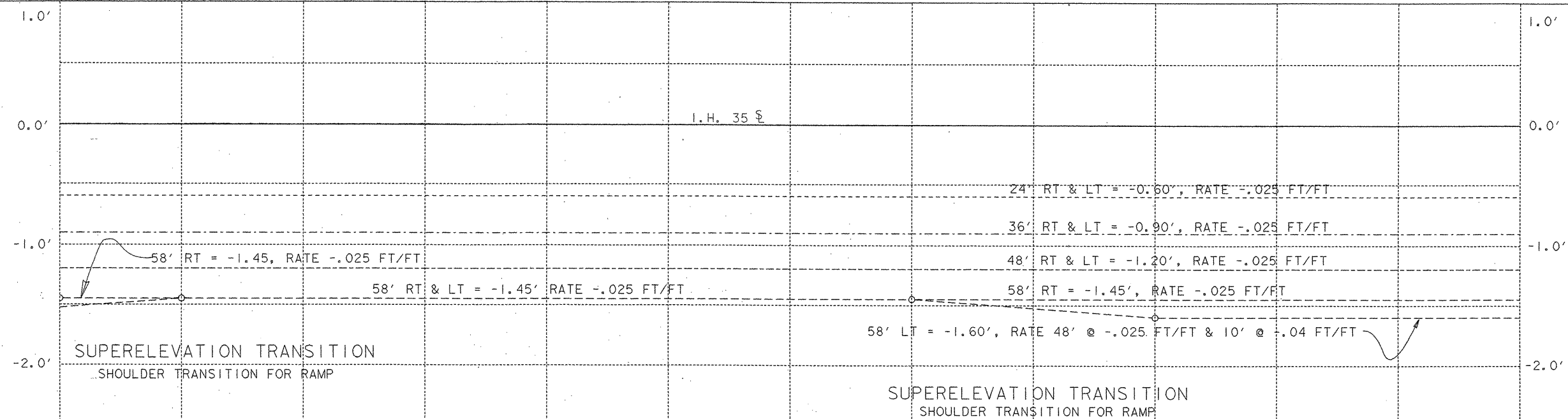
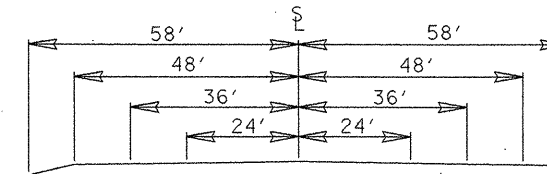
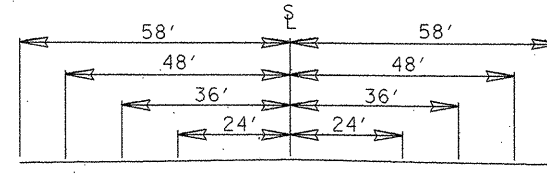
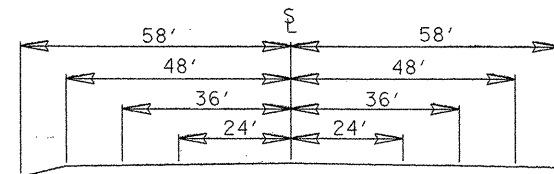
FINISH AND EXIST. GRADES SHOWN ARE ON SURVEY LINE.

SCALE:
HORIZONTAL 1"=50'
VERTICAL 1"=5'

SHEETS 1 OF 26 SHEETS

FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.
6	TEXAS	NH 95 (40) IM	102
STAT. DIST. NO.	COUNTY	CONT.	SECT.
15	COMAL	0016	05
JOB	HWY. NO.		
087	I.H. 35		

MAIN LANE PROFILE SHEET



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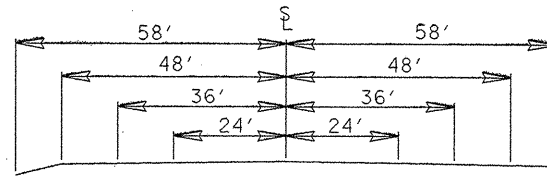
*N.B.L. ARE IN GRADE REVISION
FOR THE PROJECT'S LIMITS.

FINISH AND EXIST. GRADES
SHOWN ARE ON SURVEY LINE.

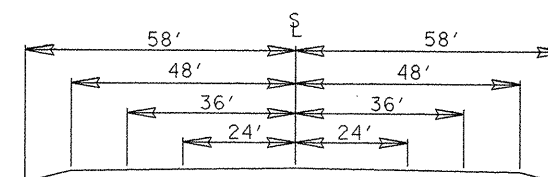
SCALE:
HORIZONTAL 1"=50'
VERTICAL 1"=5'

SHEETS 2 OF 26 SHEETS

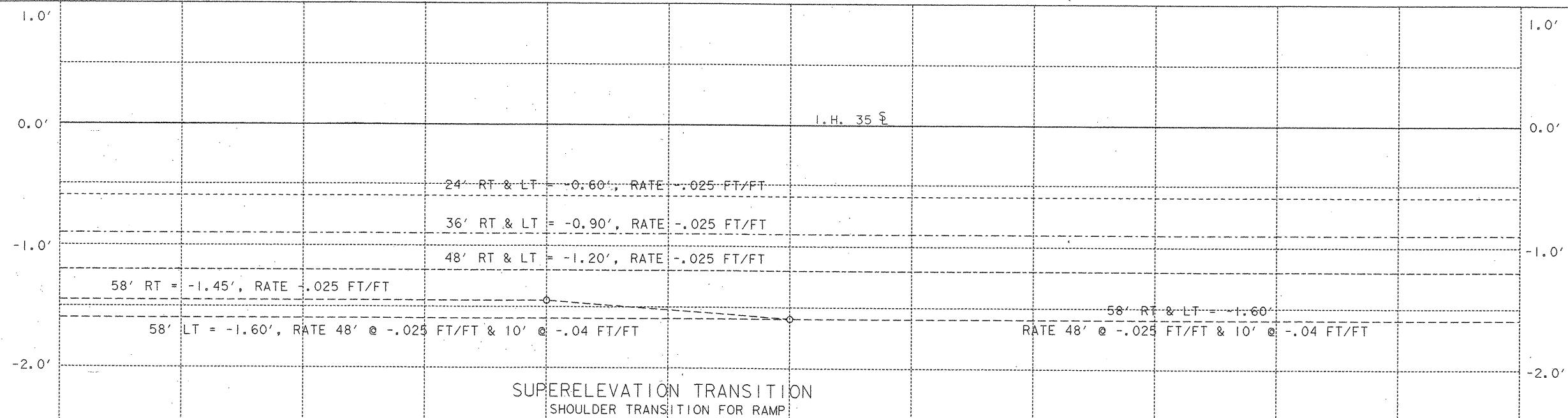
FED. RD DIV. NO	STATE	FEDERAL AID PROJECT NO				SHEET NO.
6	TEXAS	NH 95 (40) 1M				103
STAT DIST. NO	COUNTY	CONT	SECT	JOB	HWY. NO.	
15	COMAL	0016	05	087	I. H. 31	



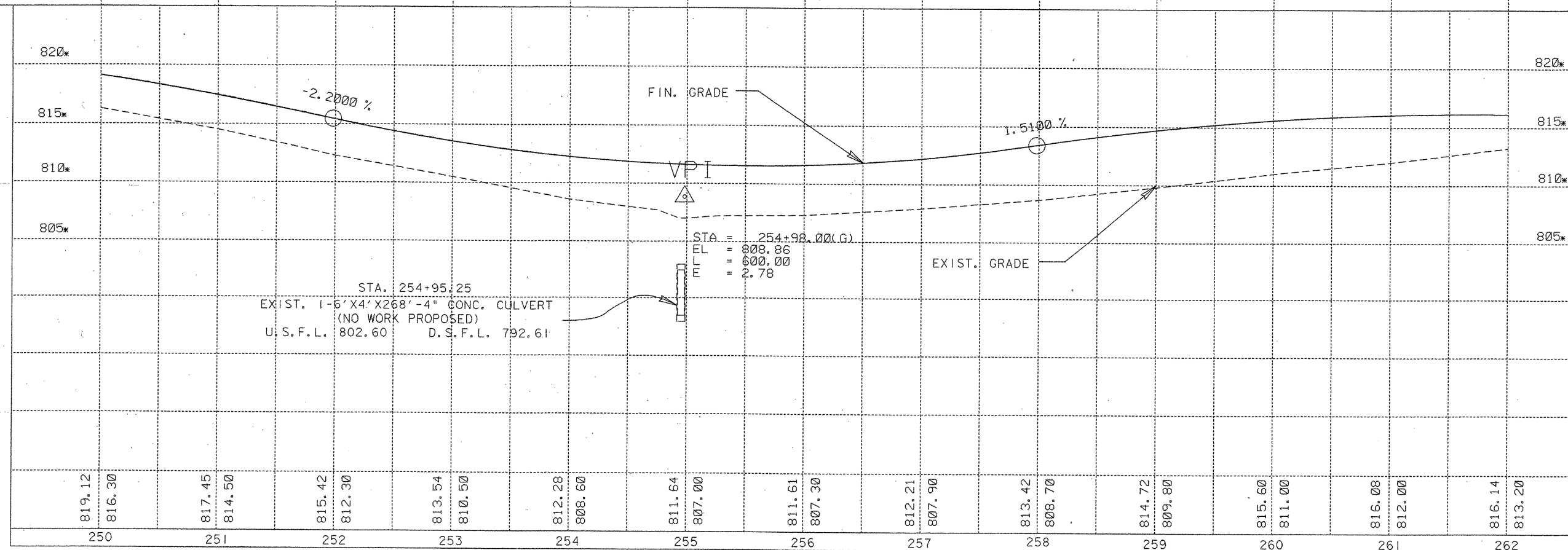
STA. 250+00 - STA. 254+00



STA. 254+00 - STA. 262+00



SUPERELEVATION
DIAGRAM



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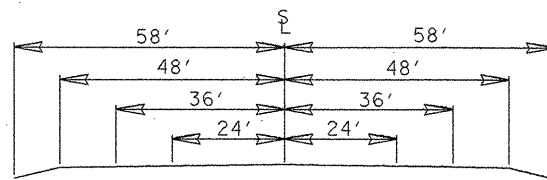
*N.B.L. ARE IN GRADE REVISION
FOR THE PROJECT'S LIMITS.

FINISH AND EXIST. GRADES
SHOWN ARE ON SURVEY LINE.

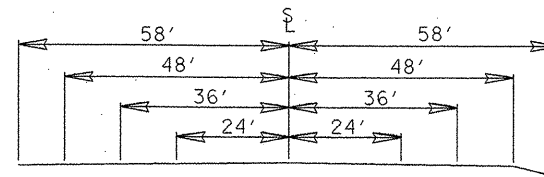
SCALE:
HORIZONTAL 1"=50'
VERTICAL 1"=5'

SHEETS 3 OF 26 SHEETS

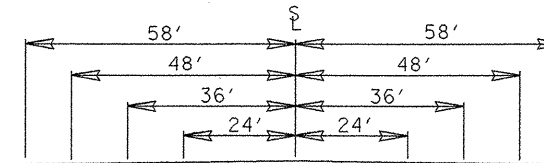
FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.
6	TEXAS	NH 95 (40) 1M	104
STAT. DIST. NO.	COUNTY	CONT. SECT.	JOB HWY. NO.
15	COMAL	0016 05 087	I.H. 35



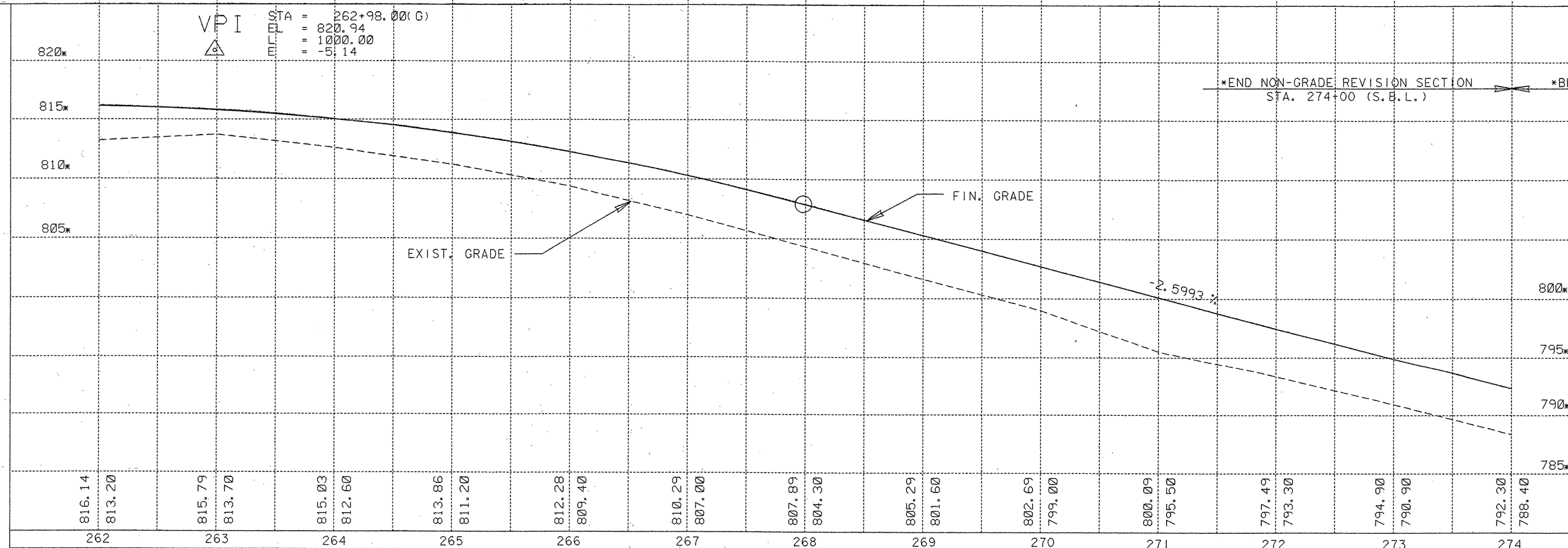
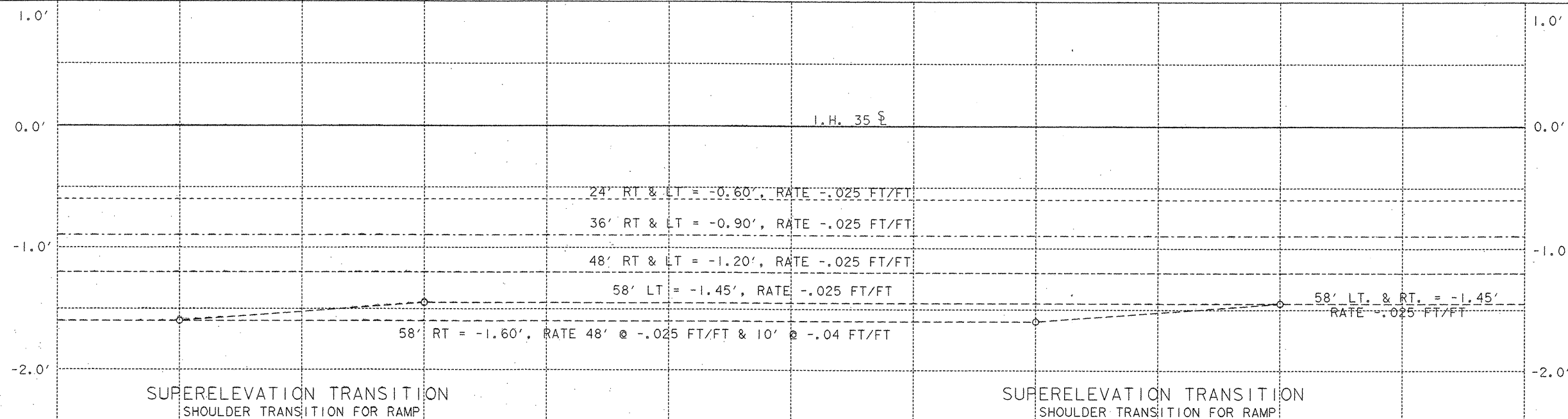
STA. 262+00 - STA. 265+00



STA. 265+00 - STA. 272+00



STA. 272+00 - STA. 274+00



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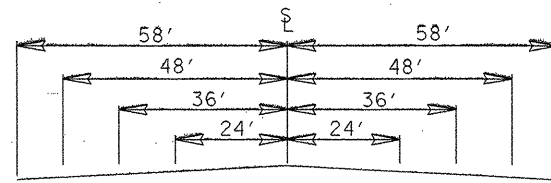
*N.B.L. ARE IN GRADE REVISION FOR THE PROJECT'S LIMITS.

FINISH AND EXIST. GRADES SHOWN ARE ON SURVEY LINE.

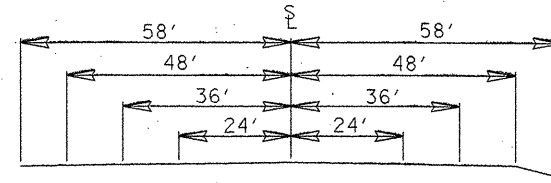
SCALE:
 HORIZONTAL 1"=50'
 VERTICAL 1"=5'

SHEETS 4 OF 26 SHEETS

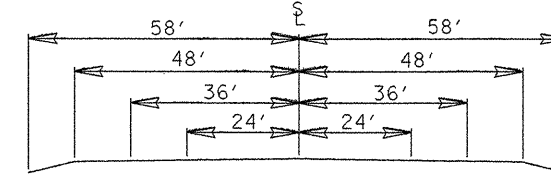
FED. RD. DIST. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.
6	TEXAS	NH 95 (40) IM	105
STAT. DIST. NO.	COUNTY	CONT	SECT
15	COMAL	0016	05
JOB	HWY. NO.		
087	I.H. 35		



STA. 274+00 - STA. 277+00



STA. 277+00 - STA. 278+00

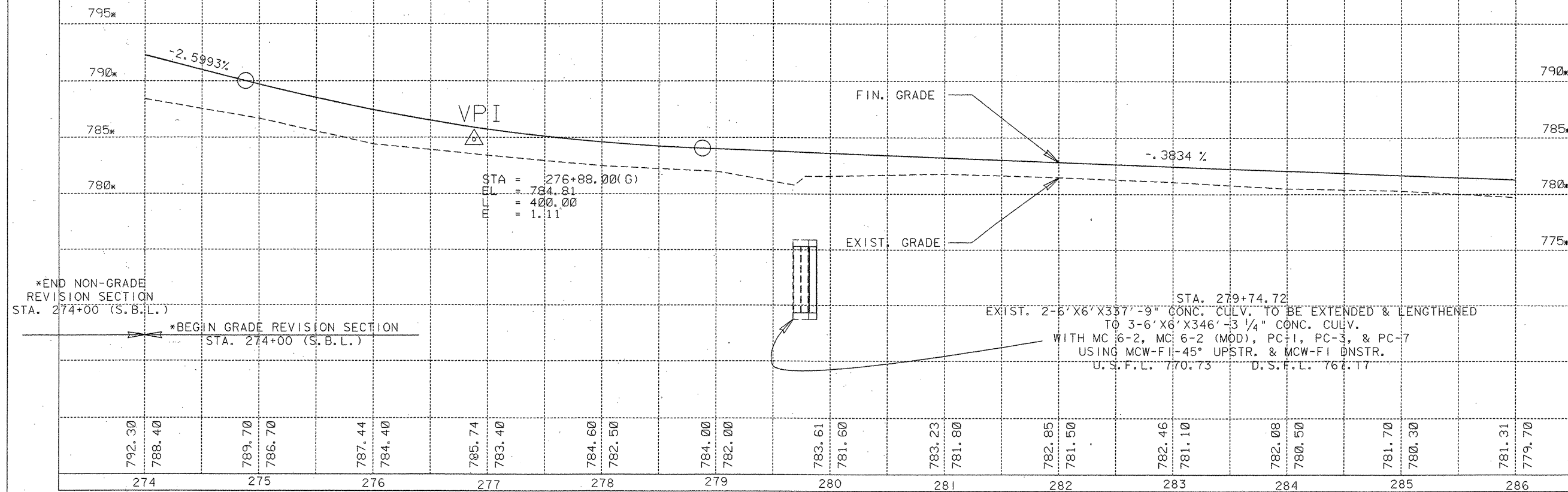
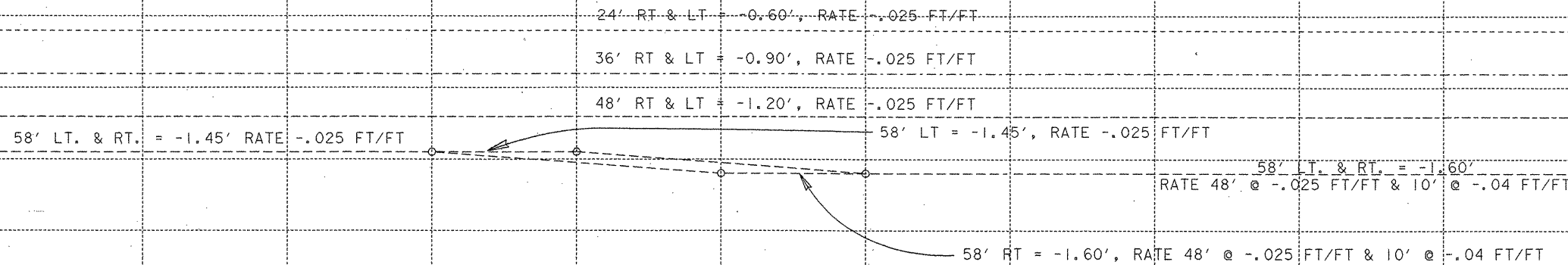


STA. 278+00 - STA. 286+00

SUPERELEVATION TRANSITION SHOULDER TRANSITION FOR RAMP

I.H. 35 E

SUPERELEVATION DIAGRAM



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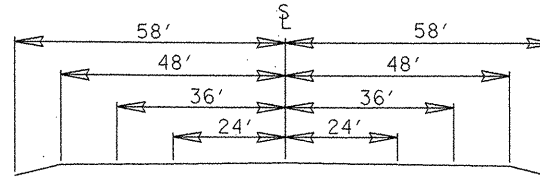
*N.B.L. ARE IN GRADE REVISION FOR THE PROJECT'S LIMITS.

FINISH AND EXIST. GRADES SHOWN ARE ON SURVEY LINE.

SCALE:
 HORIZONTAL 1"=50'
 VERTICAL 1"=5'

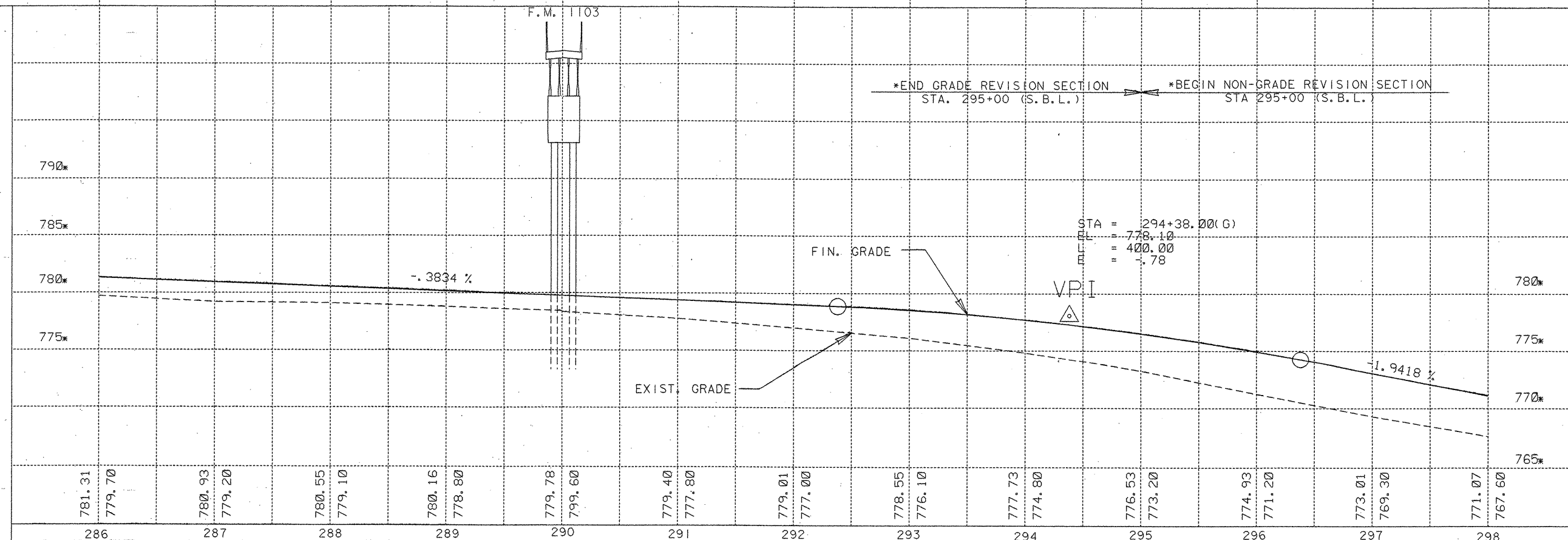
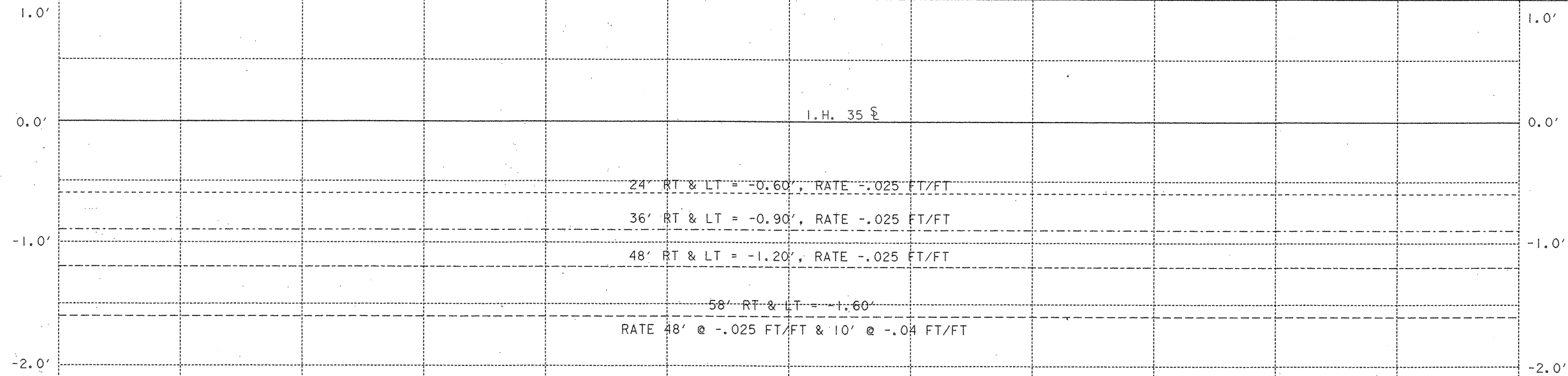
SHEETS 5 OF 26 SHEETS

FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.
6	TEXAS	NH 95 (40) IM	106
STAT. DIST. NO.	COUNTY	CONT	SECT
15	COMAL	0016	05
			087
			I.H. 35



STA. 286+00 - STA. 298+00

SUPERELEVATION DIAGRAM



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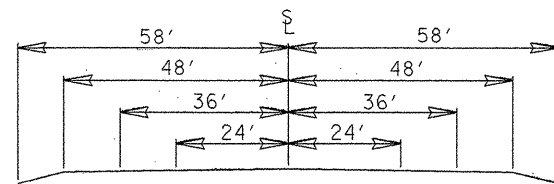
*N.B.L. ARE IN GRADE REVISION
FOR THE PROJECT'S LIMITS.

FINISH AND EXIST. GRADES
SHOWN ARE ON SURVEY LINE.

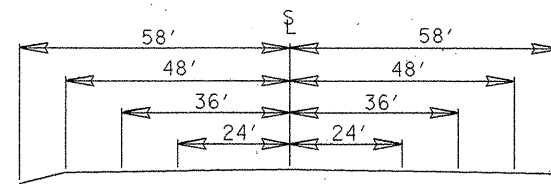
SCALE:
HORIZONTAL 1"=50'
VERTICAL 1"=5'

SHEETS 6 OF 26 SHEETS

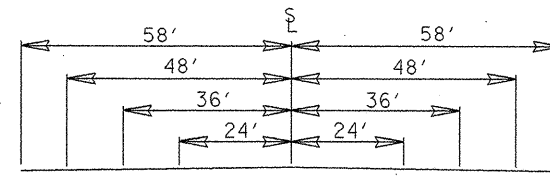
FED. RD. DIST. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.
6	TEXAS	NH 95 (40) IM	107
STAT. DIST. NO.	COUNTY	CONT. SECT.	JOB HWY. NO.
15	COMAL	0016 05 087	I.H. 35



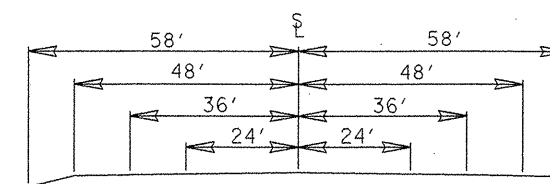
STA. 298+00 - STA. 301+00



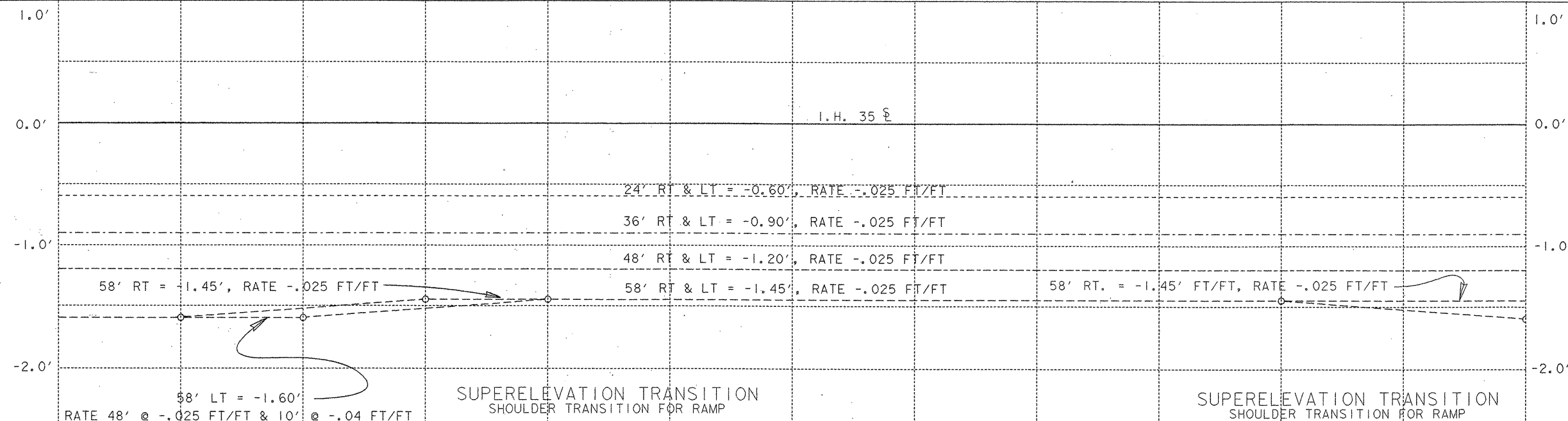
STA. 301+00 - STA. 302+00



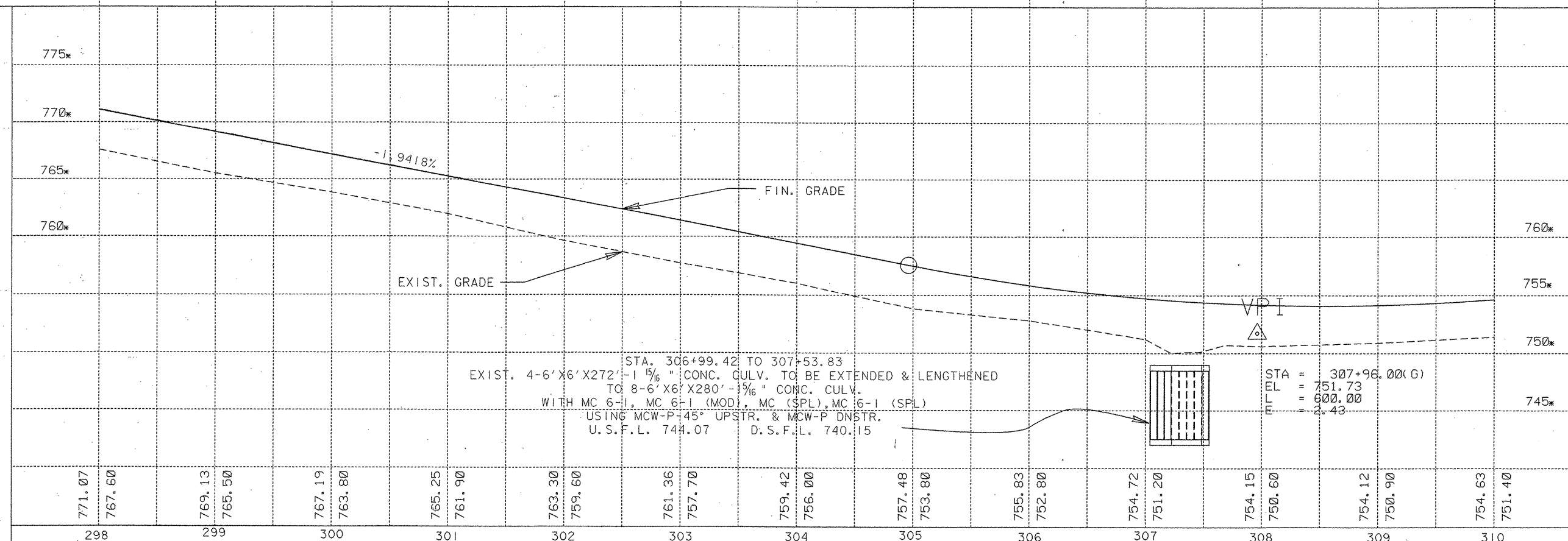
STA. 302+00 - STA. 308+00



STA. 308+00 - STA. 310+00



SUPERELEVATION
DIAGRAM



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FOR THE PROJECT'S LIMITS.

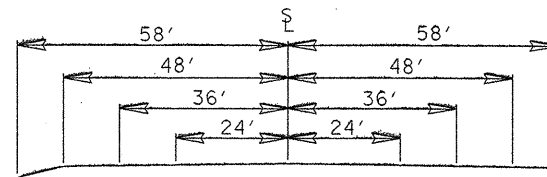
FINISH AND EXIST. GRADES
SHOWN ARE ON SURVEY LINE.

SCALE:

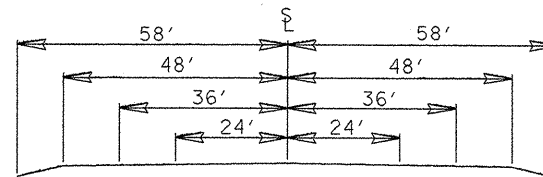
HORIZONTAL 1"=50'
VERTICAL 1"=5'

SHEETS 7 OF 26 SHEETS

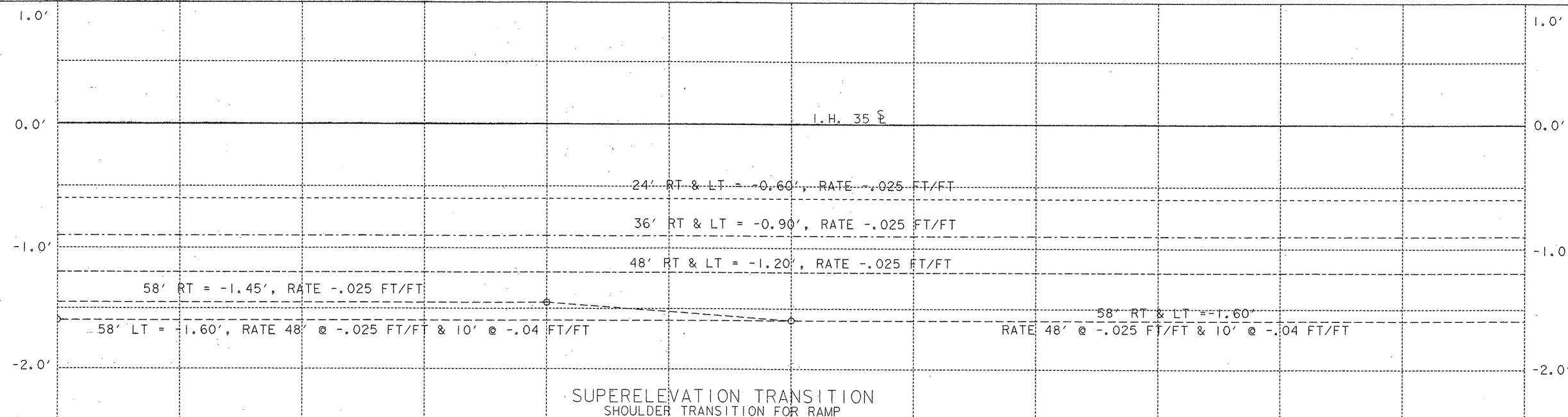
FED. RD. DIST. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.
6	TEXAS	NH 95 (40) IM	108
STAT. DIST. NO.	COUNTY	CONT	SECT
15	COMAL	0016	05
		087	I. H. 35



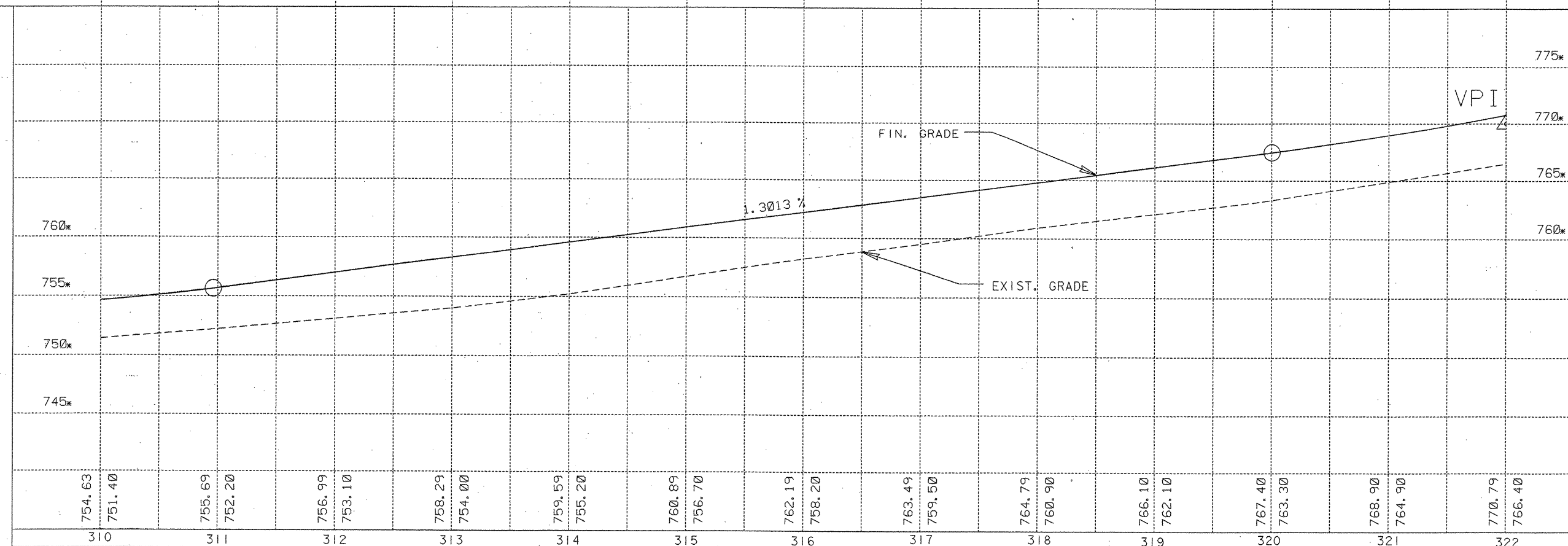
STA. 310+00 - STA. 314+00



STA. 314+00 - STA. 322+00



SUPERELEVATION
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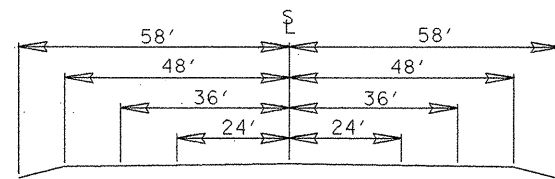
*N.B.L. ARE IN GRADE REVISION
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FINISH AND EXIST. GRADES
SHOWN ARE ON SURVEY LINE.

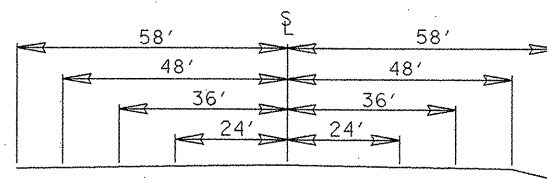
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VERTICAL 1"=5'

SHEETS 8 OF 26 SHEETS

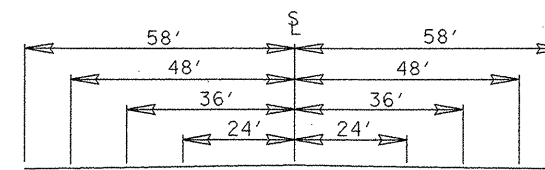
FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.
6	TEXAS	NH 95 (40) IM	109
STAT. DIST. NO.	COUNTY	CONT	SECT
15	COMAL	0016	05
		087	I.H. 35



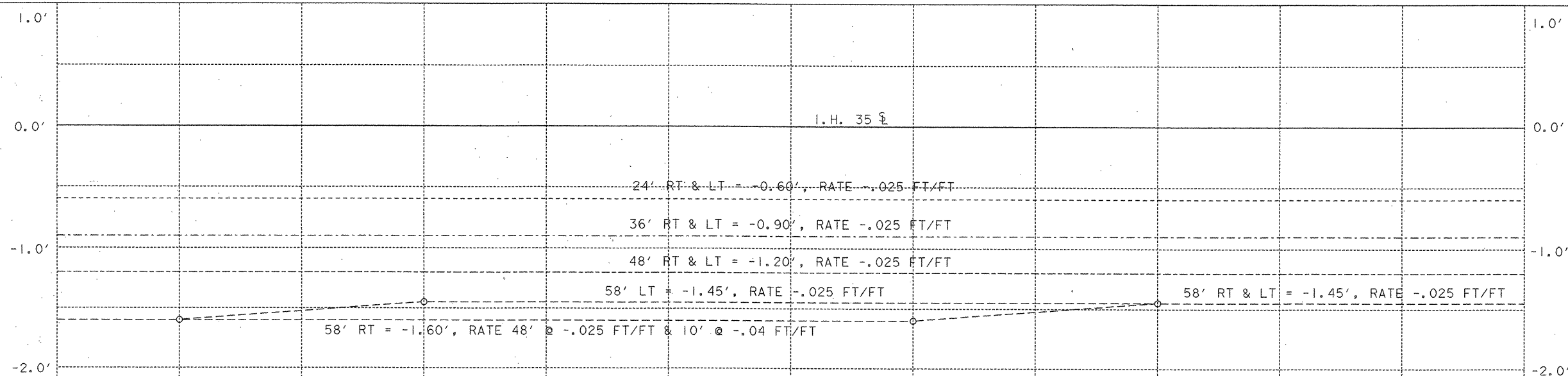
STA. 322+00 - STA. 324+00



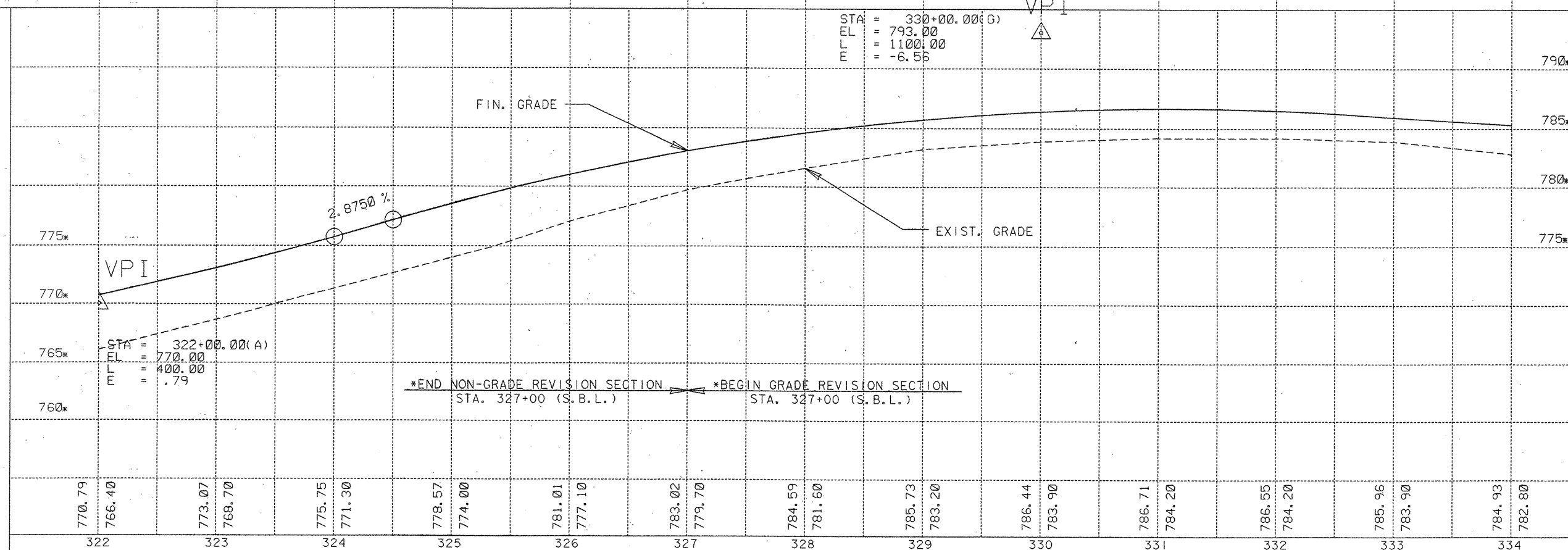
STA. 324+00 - STA. 331+00



STA. 331+00 - STA. 334+00



SUPERELEVATION
DIAGRAM



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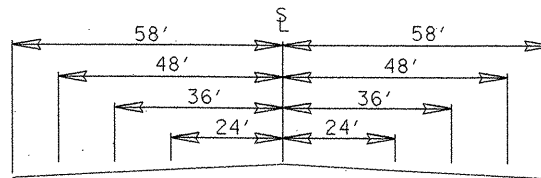
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SHOWN ARE ON SURVEY LINE.

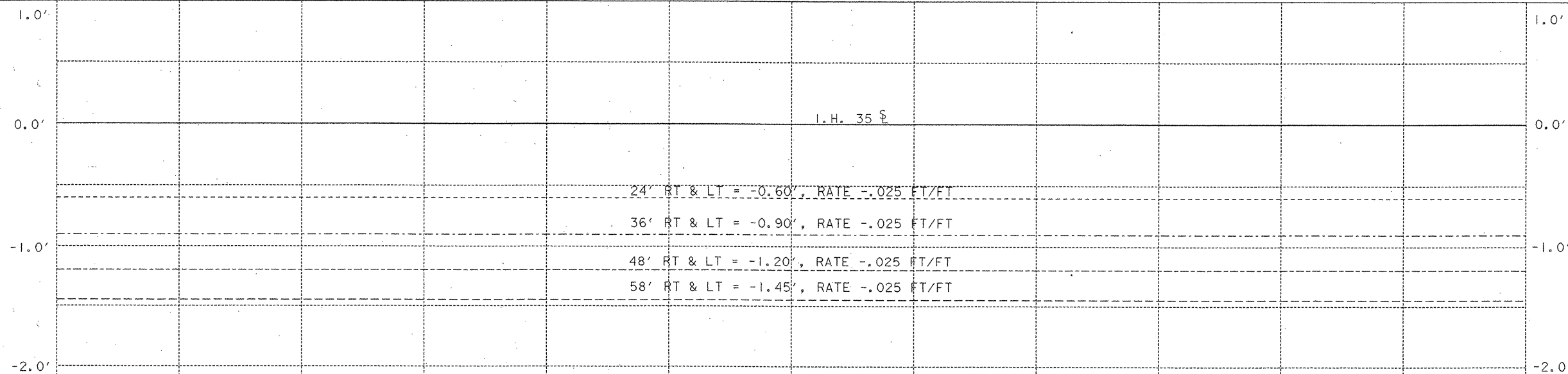
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VERTICAL 1"=5'

SHEETS 9 OF 26 SHEETS

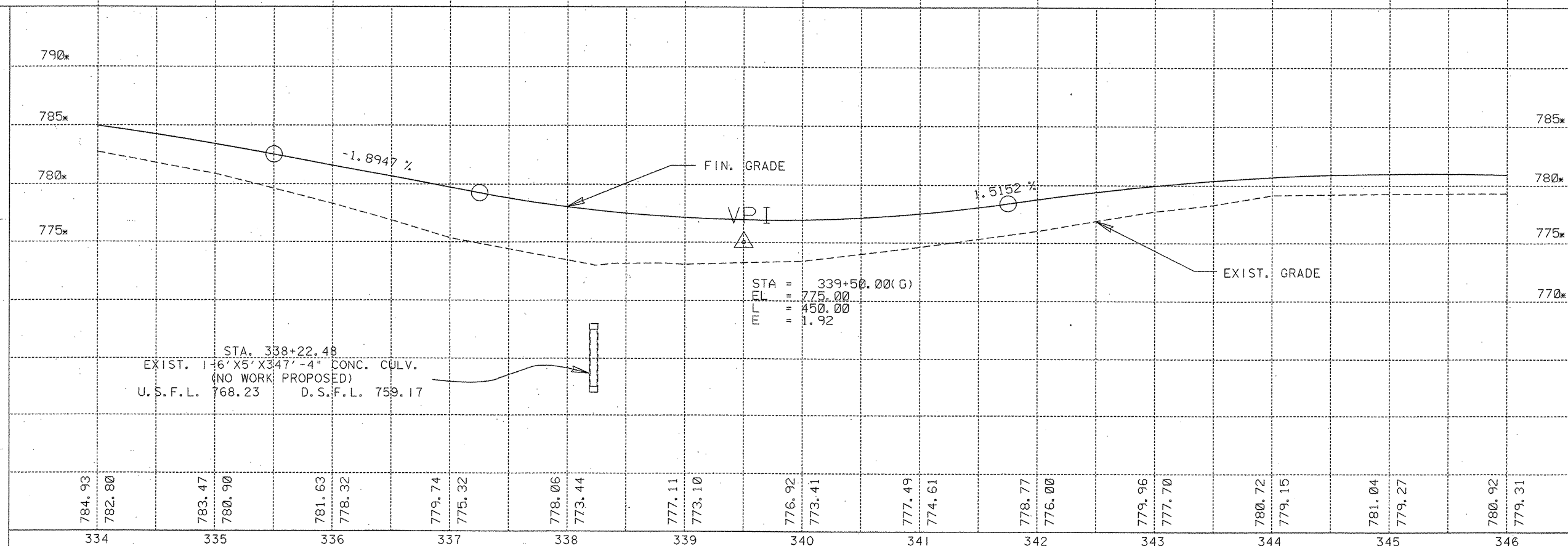
FED. RD. DIST. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.
6	TEXAS	NH 95 (40) IM	110
STAT. DIST. NO.	COUNTY	CONT	SECT
15	COMAL	0016	05
			087
			I.H. 35



STA. 334+00 - STA. 346+00



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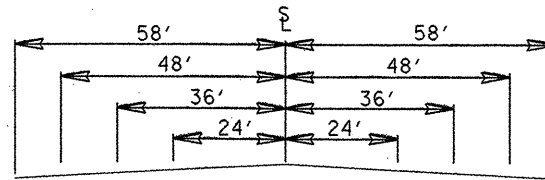
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FINISH AND EXIST. GRADES
SHOWN ARE ON SURVEY LINE.

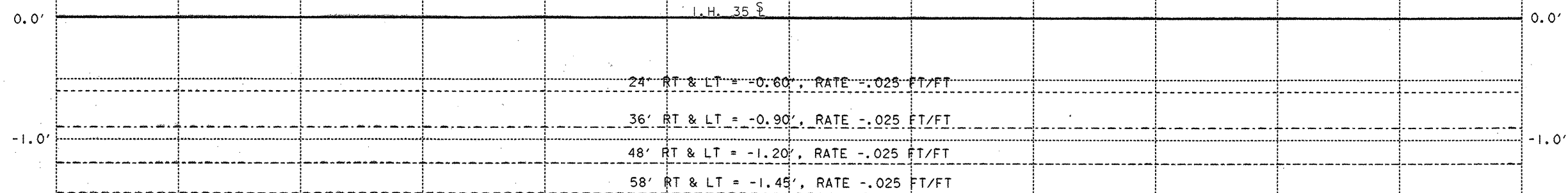
SCALE:
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VERTICAL 1"=5'

SHEETS 10 OF 26 SHEETS

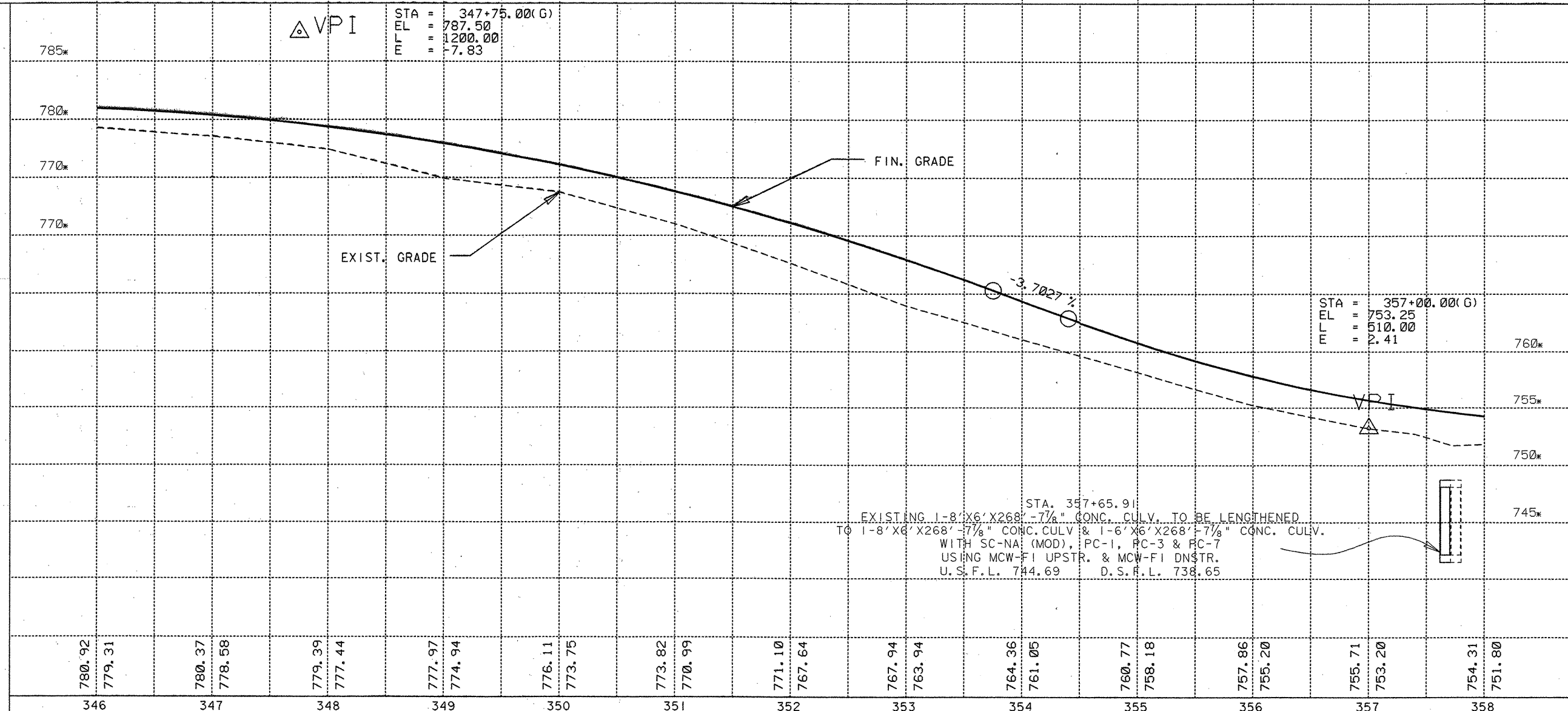
FED. AID DIV. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.
6	TEXAS	NH 95 (40) IM	111
STAT. DIST. NO.	COUNTY	CONT	SECT
15	COMAL	0016	05
JOB	HWY. NO.		
087	I.H. 35		



STA. 346+00 - STA. 358+00



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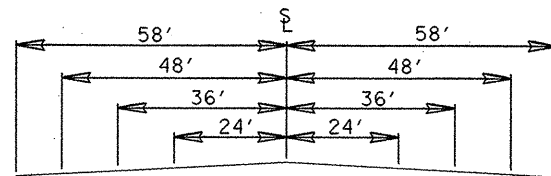
STA. 357+65.91
EXISTING 1-8'X6'X268'-7/8" CONC. CULV. TO BE LENGTHENED
TO 1-8'X6'X268'-7/8" CONC. CULV. & 1-6'X6'X268'-7/8" CONC. CULV.
WITH SC-NA (MOD), PC-1, PC-3 & PC-7
USING MCW-FI UPSTR. & MCW-FI DNSTR.
U.S.F.L. 744.69 D.S.F.L. 738.65

SCALE:
HORIZONTAL 1"=50'
VERTICAL 1"=5'

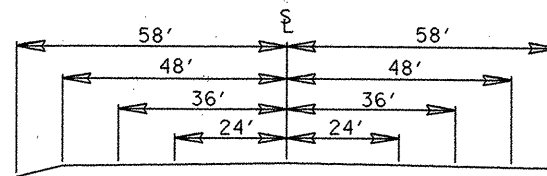
SHEETS 11 OF 26 SHEETS

FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.
6	TEXAS	NH 95 (40) IM	112
STAT. DIST. NO.	COUNTY	CONT. SECT.	JOB HWY. NO.
15	COMAL	0016 05 087	I.H. 35

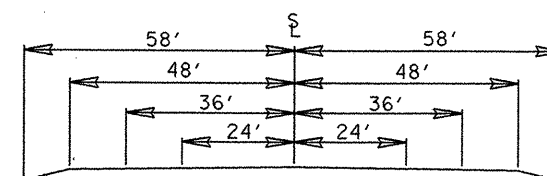
MAIN LANE PROFILE SHEET



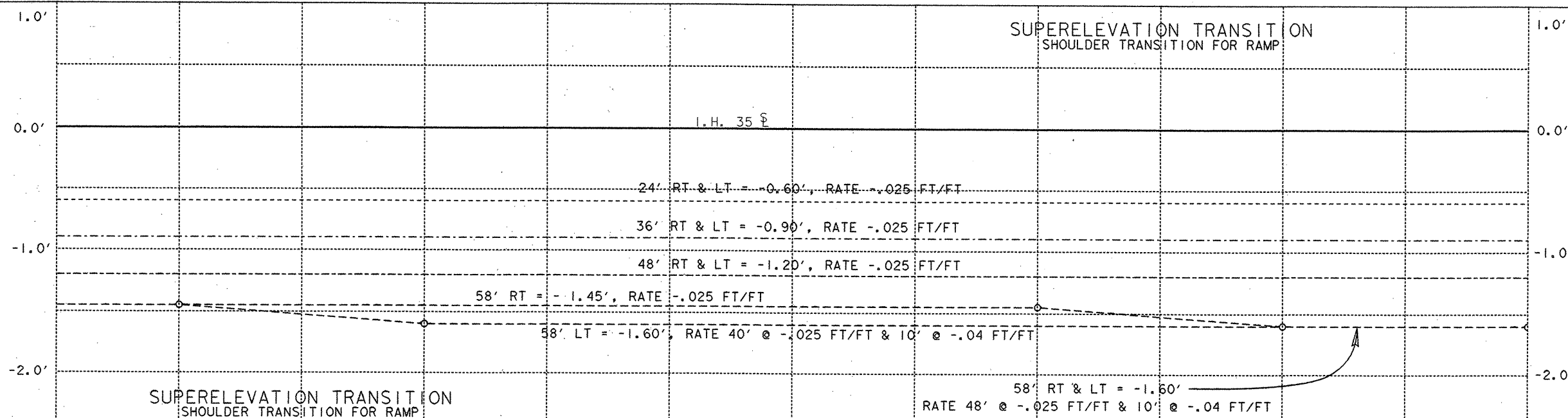
STA. 358+00 - STA. 359+00



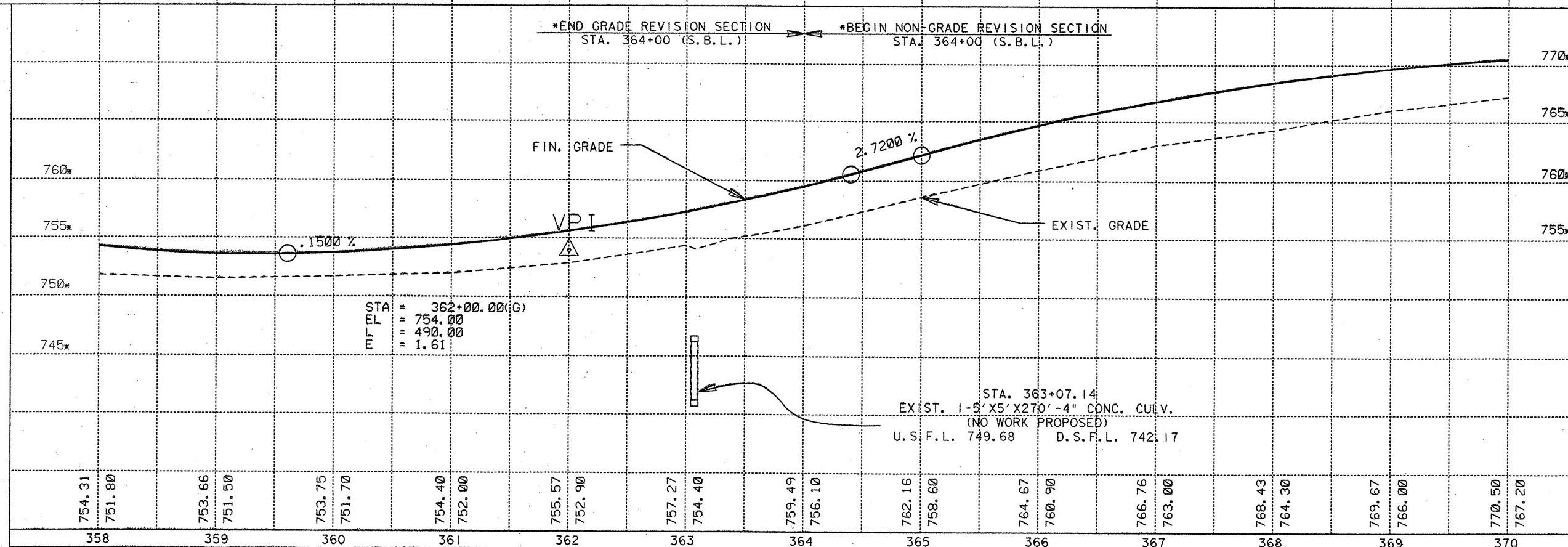
STA. 359+00 - STA. 366+00



STA. 366+00 - STA. 370+00



SUPERELEVATION
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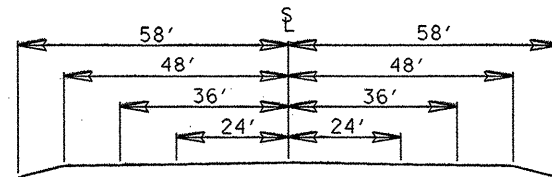
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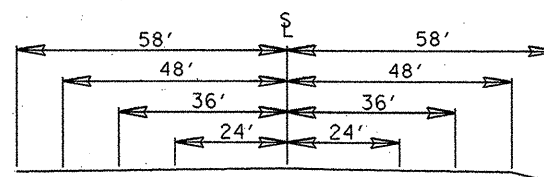
SCALE:
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VERTICAL 1"=5'

SHEETS 12 OF 26 SHEETS

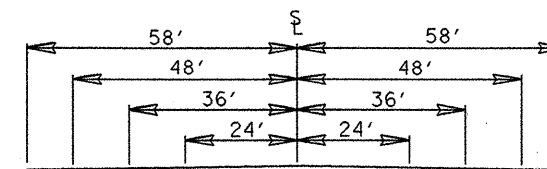
FED. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.
6	TEXAS	NH 95 (40) IM	113
STAT. DIST. NO.	COUNTY	CONT. SECT.	JOB HWY. NO.
15	COMAL	0016 05 087	I.H. 35



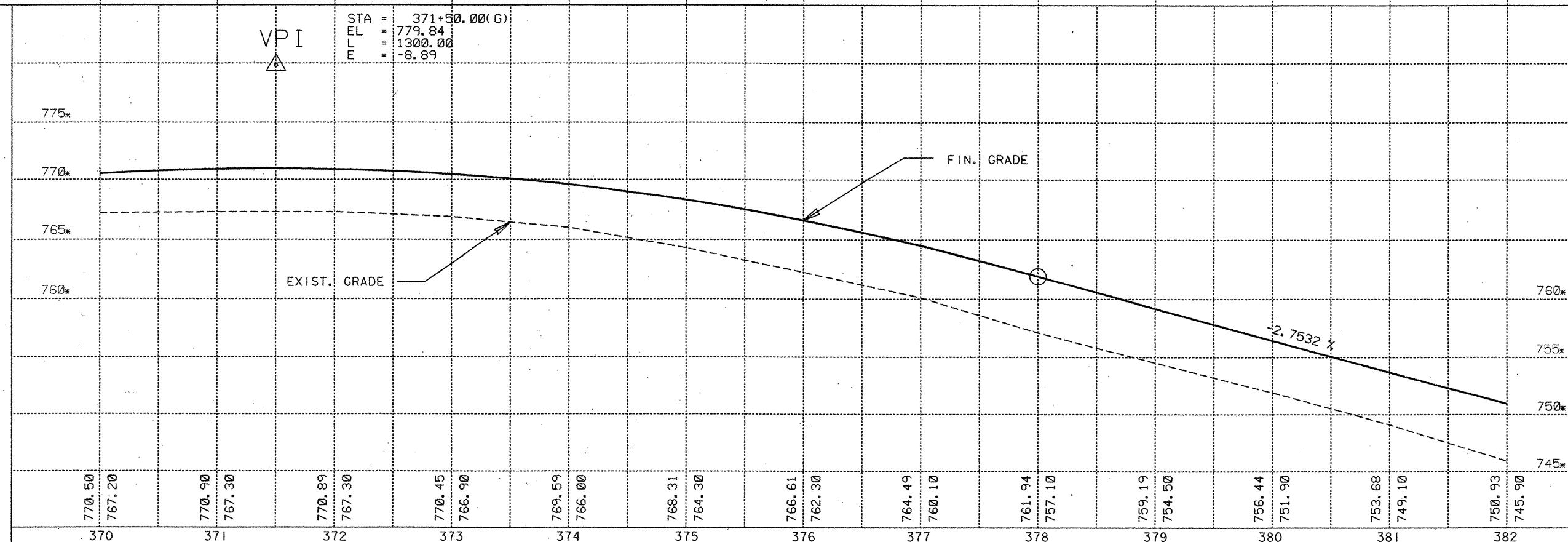
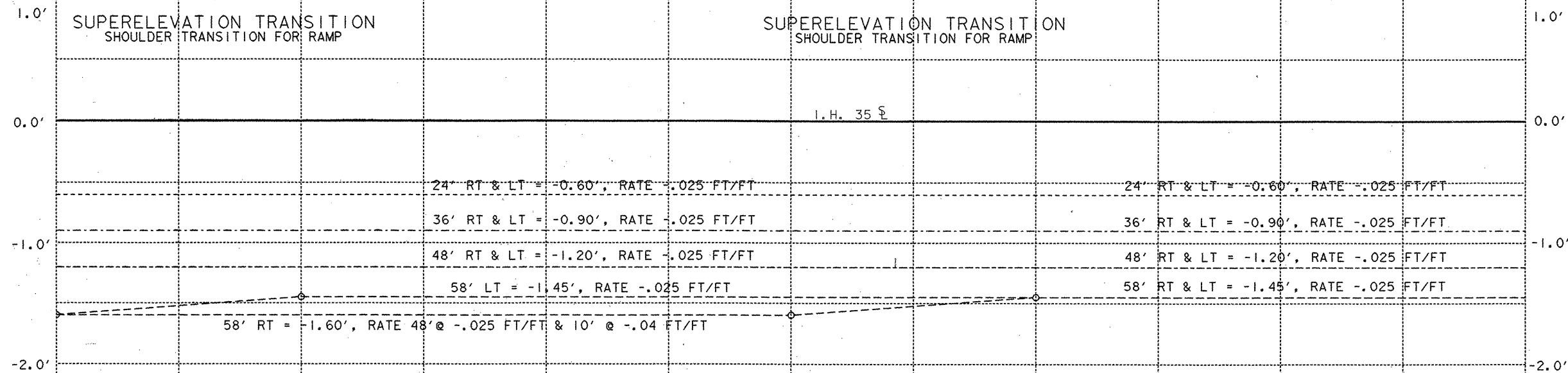
STA. 370+00 - STA. 372+00



STA. 372+00 - STA. 378+00



STA. 378+00 - STA. 382+00



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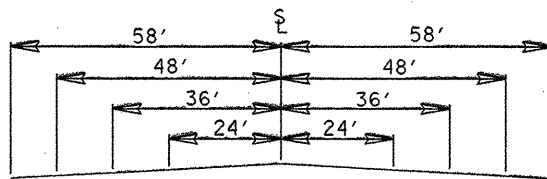
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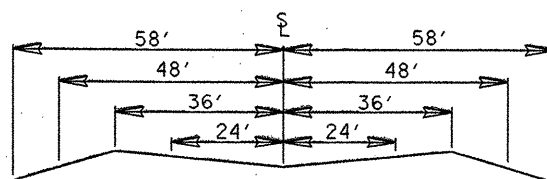
SCALE:
HORIZONTAL 1"=50'
VERTICAL 1"=5'

SHEETS 13 OF 26 SHEETS

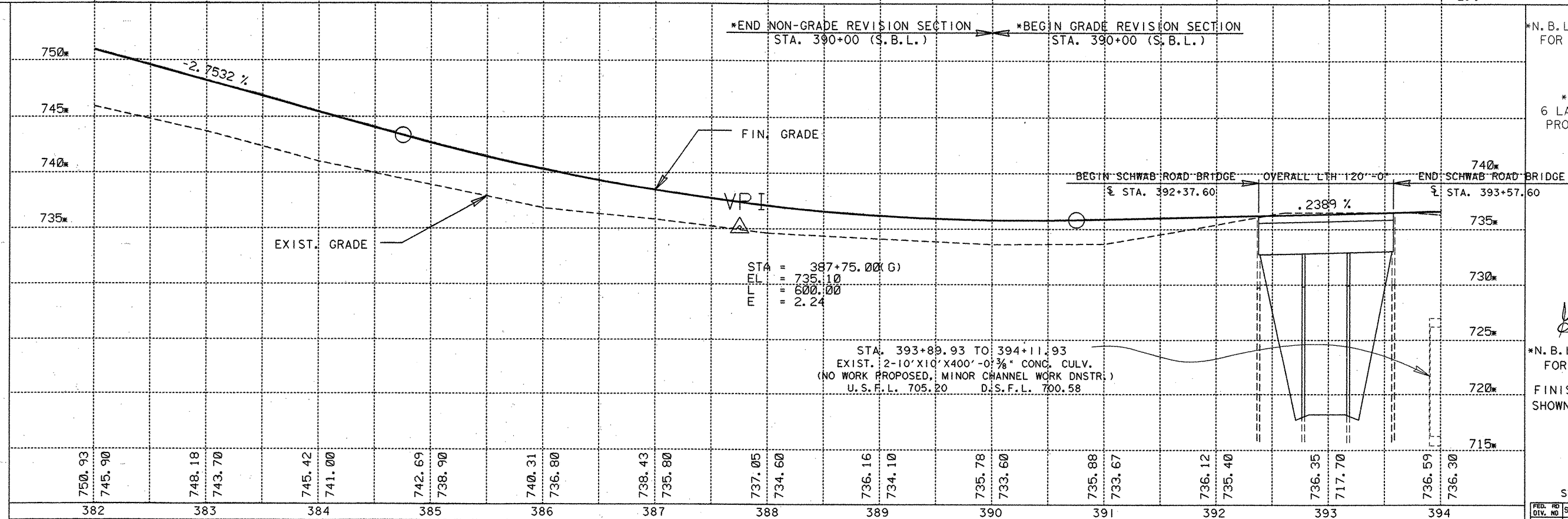
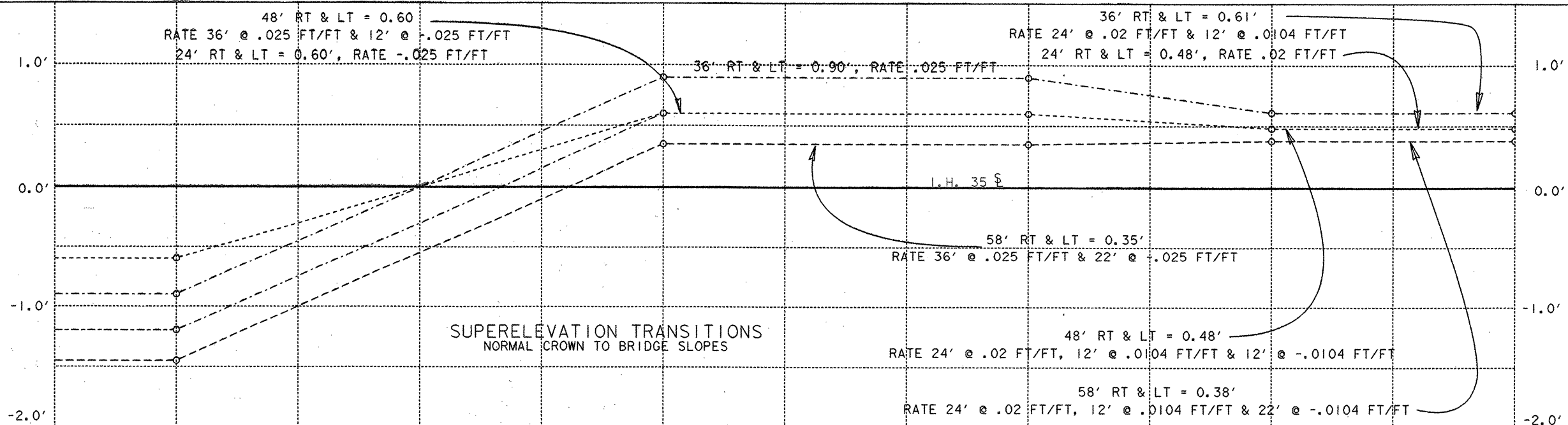
FED. RD DIV. NO	STATE	FEDERAL AID PROJECT NO				SHEET NO.
6	TEXAS	NH 95 (40) IM				114
STAT DIST. NO	COUNTY		CONT	SECT	JOB	HWY. NO
15	COMAL		0016	05	087	I. H. 35



STA. 382+00 - STA. 383+00



STA. 387+00 - STA. 394+00



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**BRIDGE WIDENED FOR 6 LANES CONSTRUCTED UNDER PROJECT CSJ 0016-05-090.



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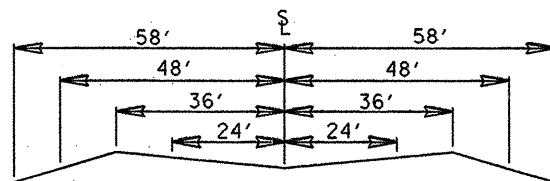
*N.B.L. ARE IN GRADE REVISION FOR THE PROJECT'S LIMITS.

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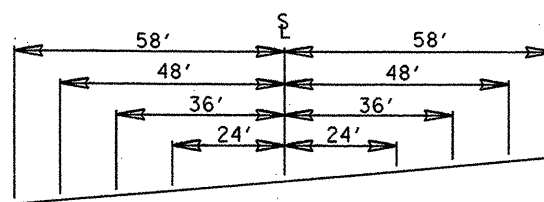
SCALE:
HORIZONTAL 1"=50'
VERTICAL 1"=5'

SHEETS 14 OF 26 SHEETS

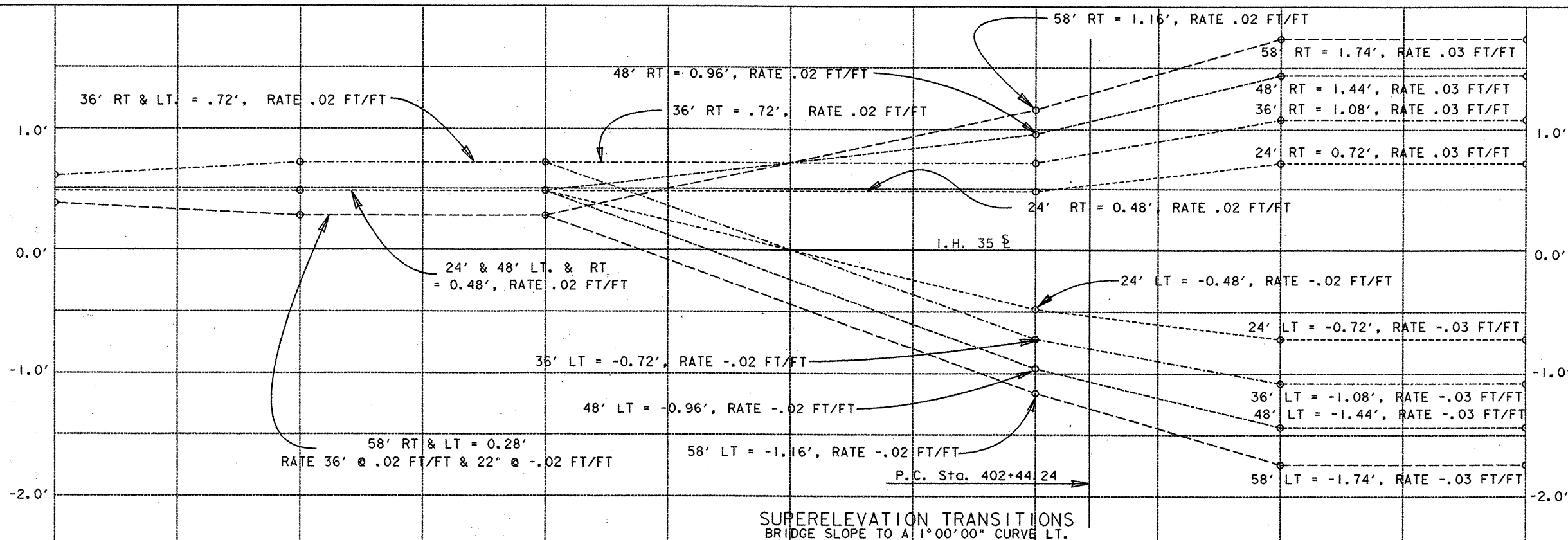
FED. DIV. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.
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STAT. DIST. NO.	COUNTY	CONT	SECT
15	COMAL	0016	05
JOB	HWY. NO.		
087	I.H. 35		



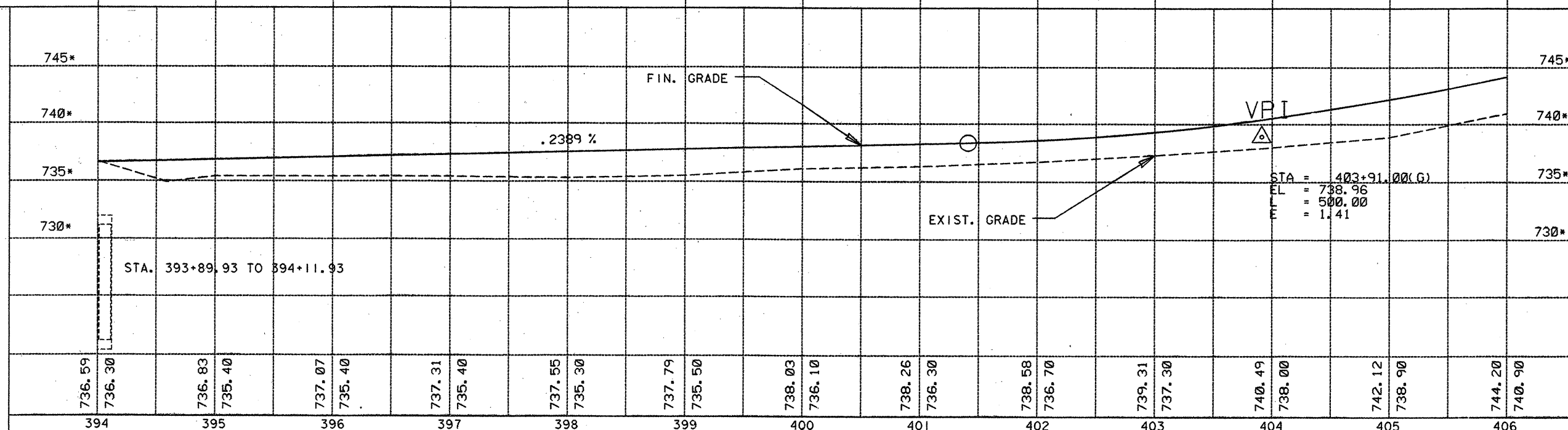
STA. 394+00 - STA. 398+00



STA. 400+00 - STA. 406+00



SUPERELEVATION
DIAGRAM



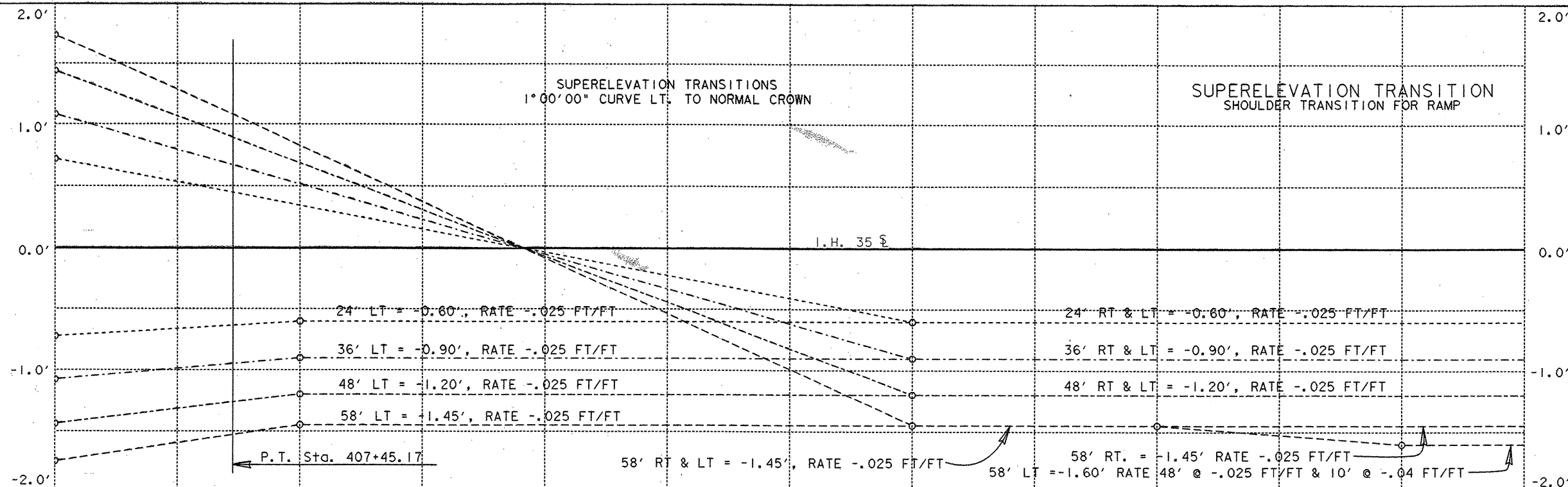
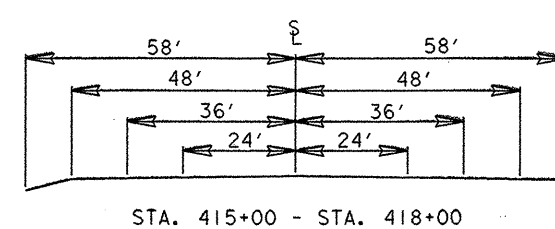
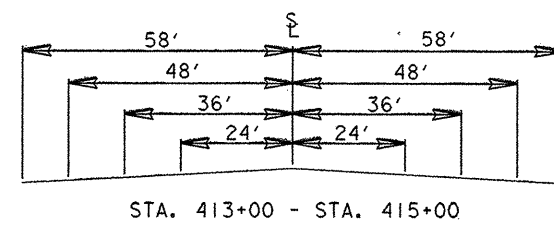
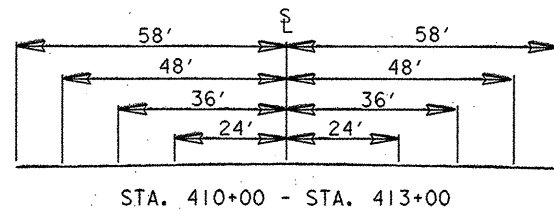
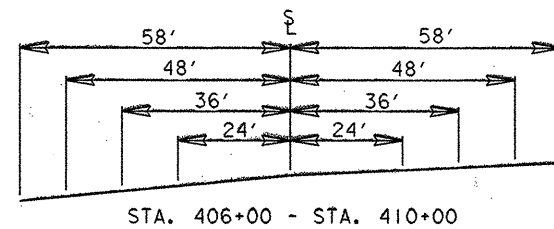
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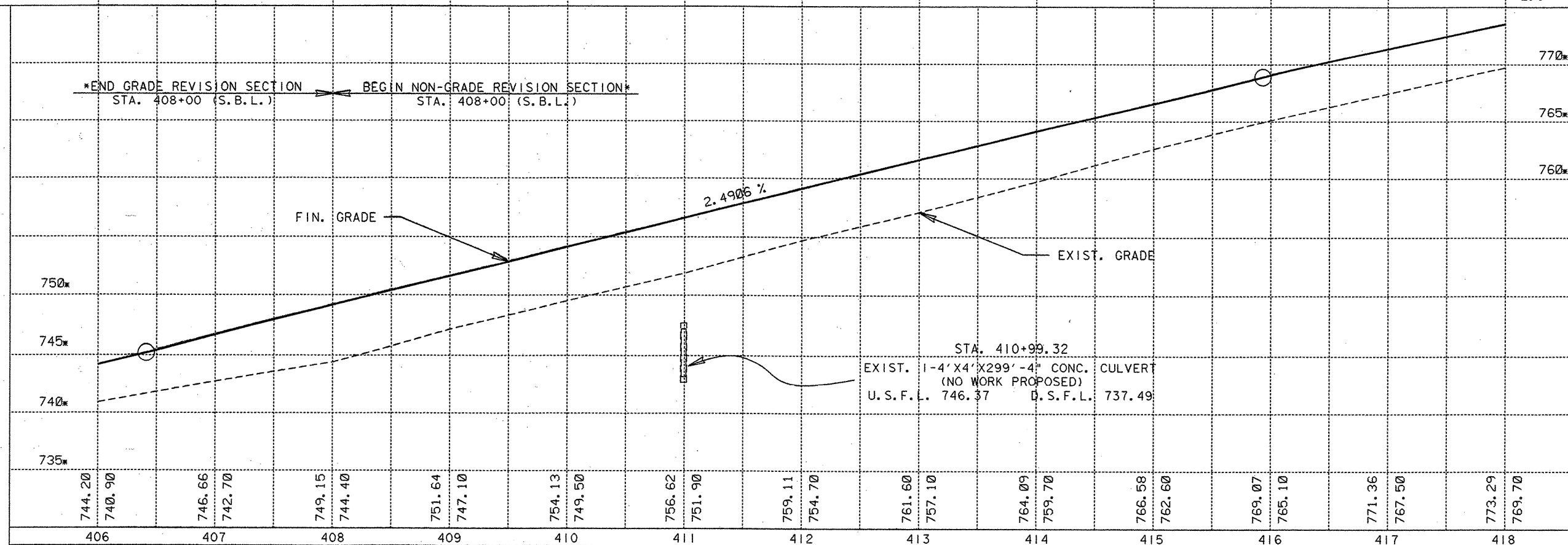
SCALE:
HORIZONTAL 1"=50'
VERTICAL 1"=5'

SHEETS 15 OF 26 SHEETS

FED. RD. DIST. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.
6	TEXAS	NH 95 (40)	116
STAT. DIST. NO.	COUNTY	CONT. SECT.	JOB HWY. NO.
15	COMAL	0016 05 087	I.H. 35



SUPERELEVATION
DIAGRAM



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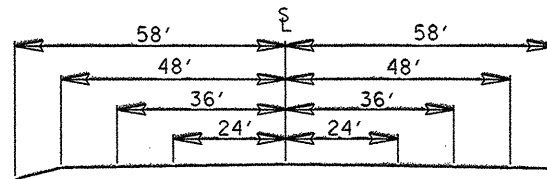
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FINISH AND EXIST. GRADES
SHOWN ARE ON SURVEY LINE.

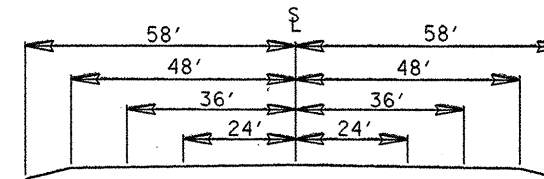
SCALE:
HORIZONTAL 1"=50'
VERTICAL 1"=5'

SHEETS 16 OF 26 SHEETS

FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.
6	TEXAS	NH 95 (40) 1M	117
STAT. DIST. NO.	COUNTY	CONT. SECT.	JOB HWY. NO.
15	COMAL	0016 05 087	I.H. 35

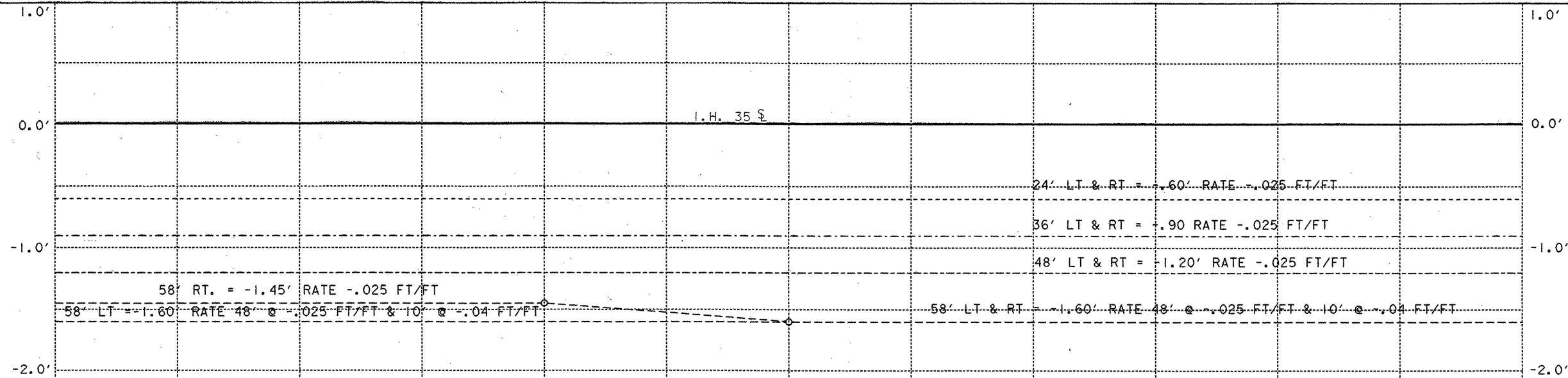


STA. 418+00 - STA. 422+00



STA. 422+00 - STA. 430+00

SUPERELEVATION DIAGRAM



SUPERELEVATION TRANSITION
SHOULDER TRANSITION FOR RAMP

STA = 420+93.00 (G)
EL = 781.35
L = 1000.00
E = -4.47

VPI
△

FIN. GRADE

EXIST. GRADE

-1.0833 %



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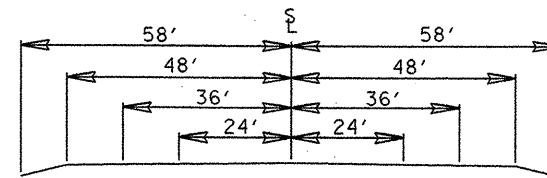
*N.B.L. ARE IN GRADE REVISION
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FINISH AND EXIST. GRADES
SHOWN ARE ON SURVEY LINE.

SCALE:
HORIZONTAL 1"=50'
VERTICAL 1"=5'

SHEETS 17 OF 26 SHEETS

FED. RD. DIST. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.
6	TEXAS	NH 95 (40) 1M	118
STAT. DIST. NO.	COUNTY	CONT	SECT
15	COMAL	0016	05
		087	I.H. 35



STA. 430+00 - STA. 442+00

SUPERELEVATION DIAGRAM



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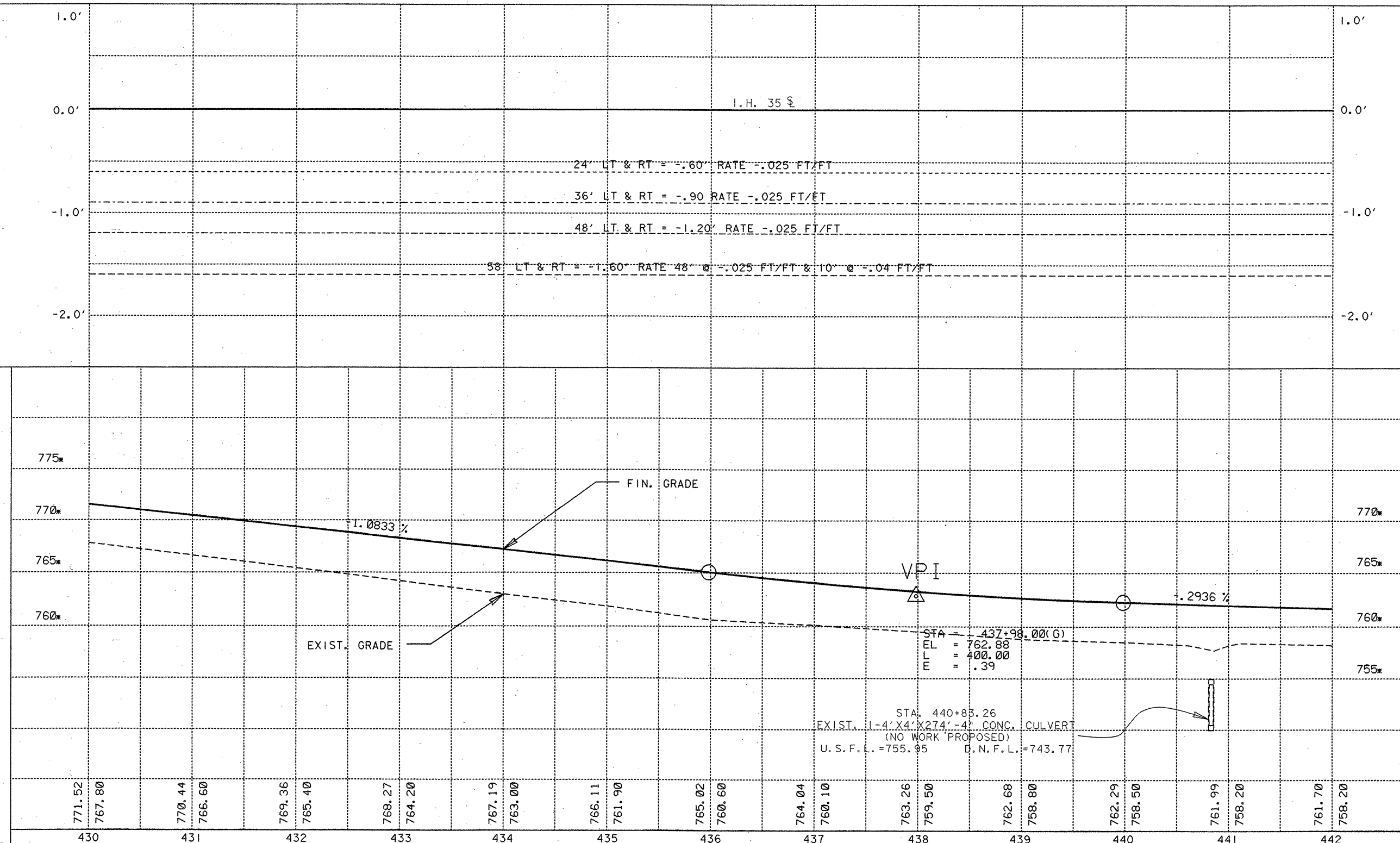
FINISH AND EXIST. GRADES
SHOWN ARE ON SURVEY LINE.

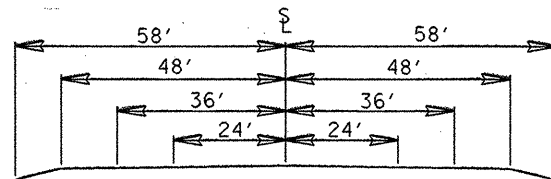
SCALE:
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VERTICAL 1"=5'

SHEETS 18 OF 26 SHEETS

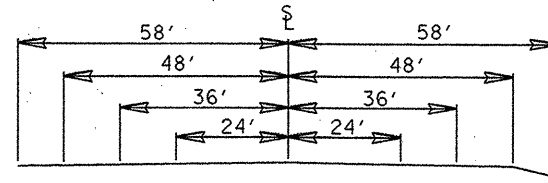
FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.
6	TEXAS	NH 95 (40) IM	119
STAT. DIST. NO.	COUNTY	CONT. SECT.	JOB HWY. NO.
15	COMAL	0016 05	087 I.H. 35

MAIN LANE PROFILE SHEET

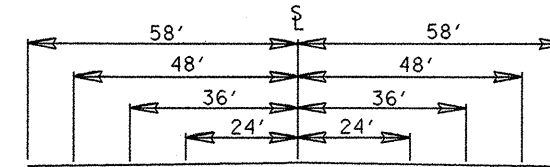




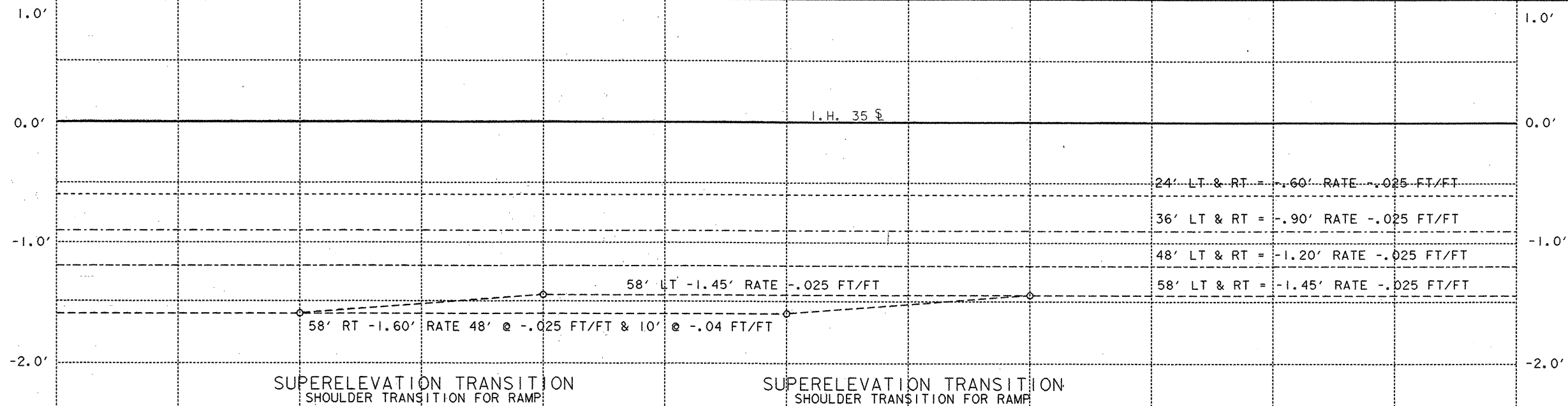
STA. 442+00 - STA. 446+00



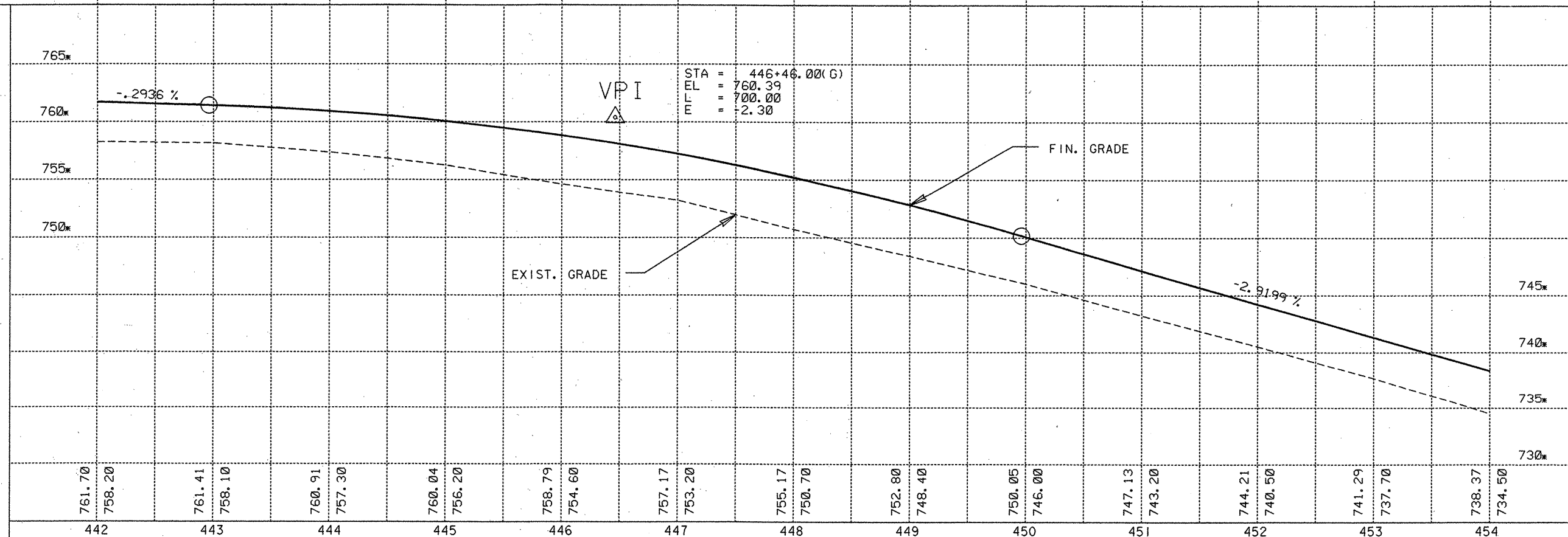
STA. 446+00 - STA. 450+00



STA. 450+00 - STA. 454+00



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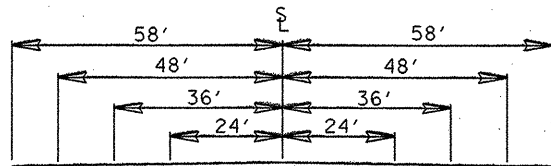
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SHOWN ARE ON SURVEY LINE.

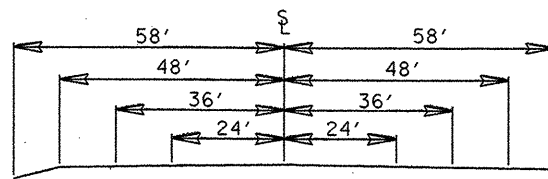
SCALE:
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VERTICAL 1"=5'

SHEETS 19 OF 26 SHEETS

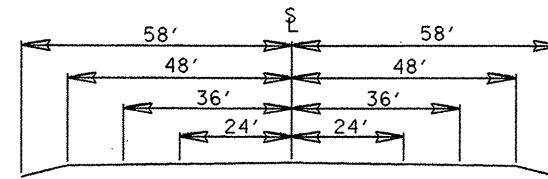
FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.
6	TEXAS	NH 95 (40) 1M	120
STAT. DIST. NO.	COUNTY	CONT. SECT.	JOB HWY. NO.
15	COMAL	0016 05 087	I.H. 35



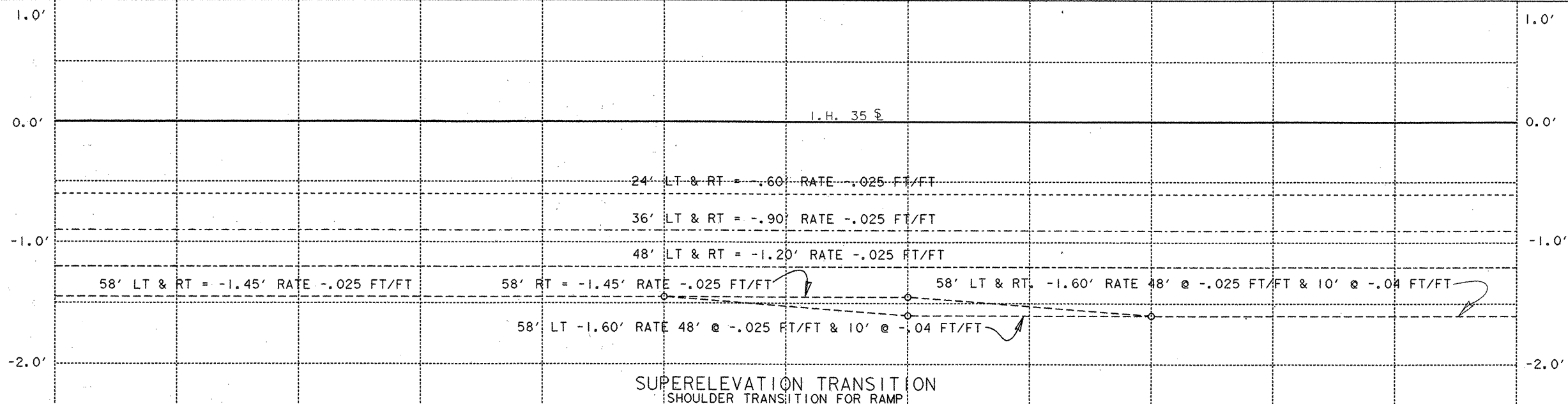
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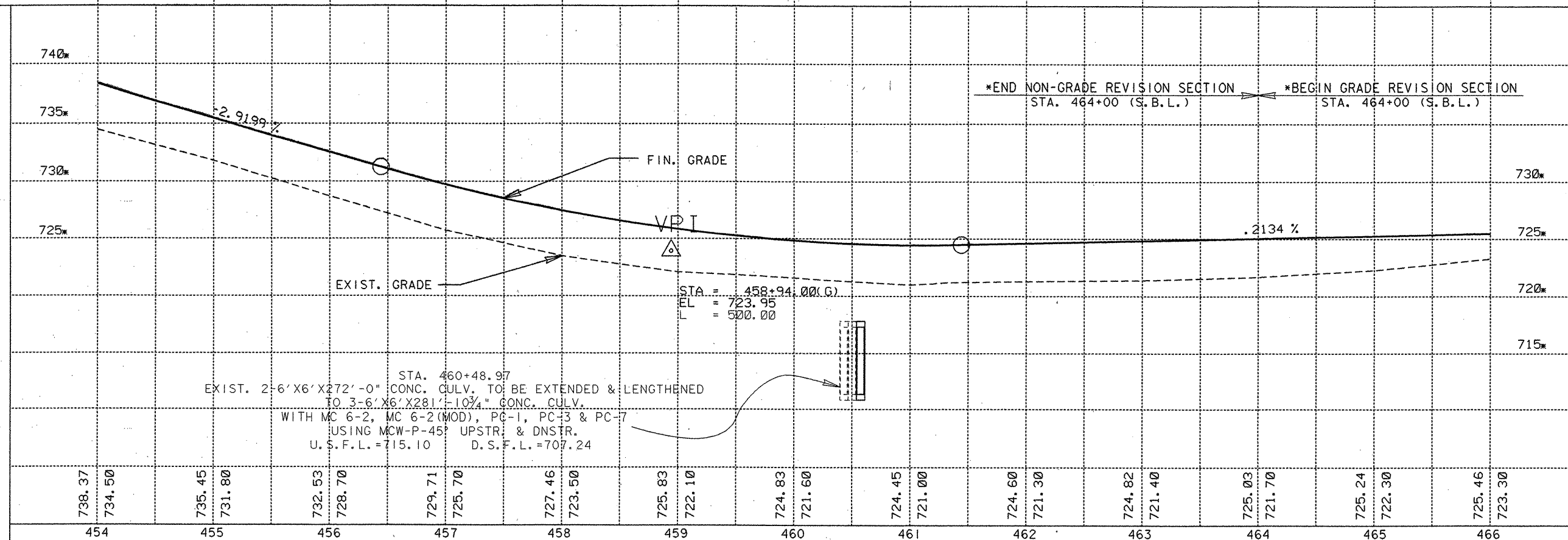
STA. 459+00 - STA. 461+00



STA. 461+00 - STA. 466+00



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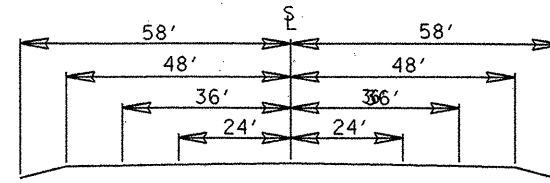
FINISH AND EXIST. GRADES
SHOWN ARE ON SURVEY LINE.

SCALE:
HORIZONTAL 1"=50'
VERTICAL 1"=5'

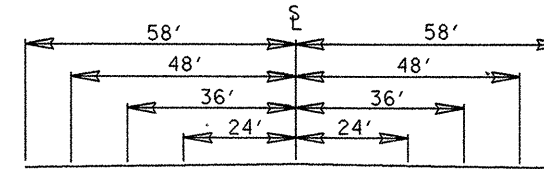
SHEETS 20 OF 26 SHEETS

FED. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.
6	TEXAS	NH 95 (40) IM	121
STAT. DIST. NO.	COUNTY	CONT. SECT.	JOB HWY. NO.
15	COMAL	0016 05	087 I.H. 35

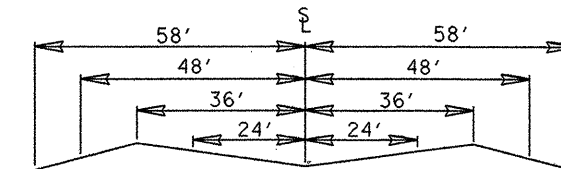
MAIN LANE PROFILE SHEET



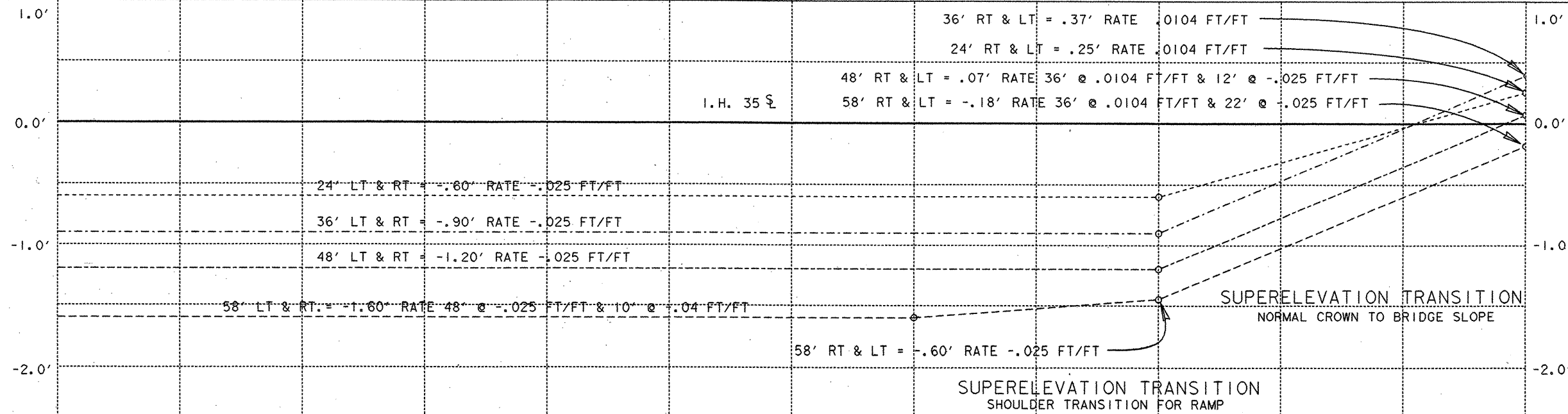
STA. 466+00 - STA. 475+00



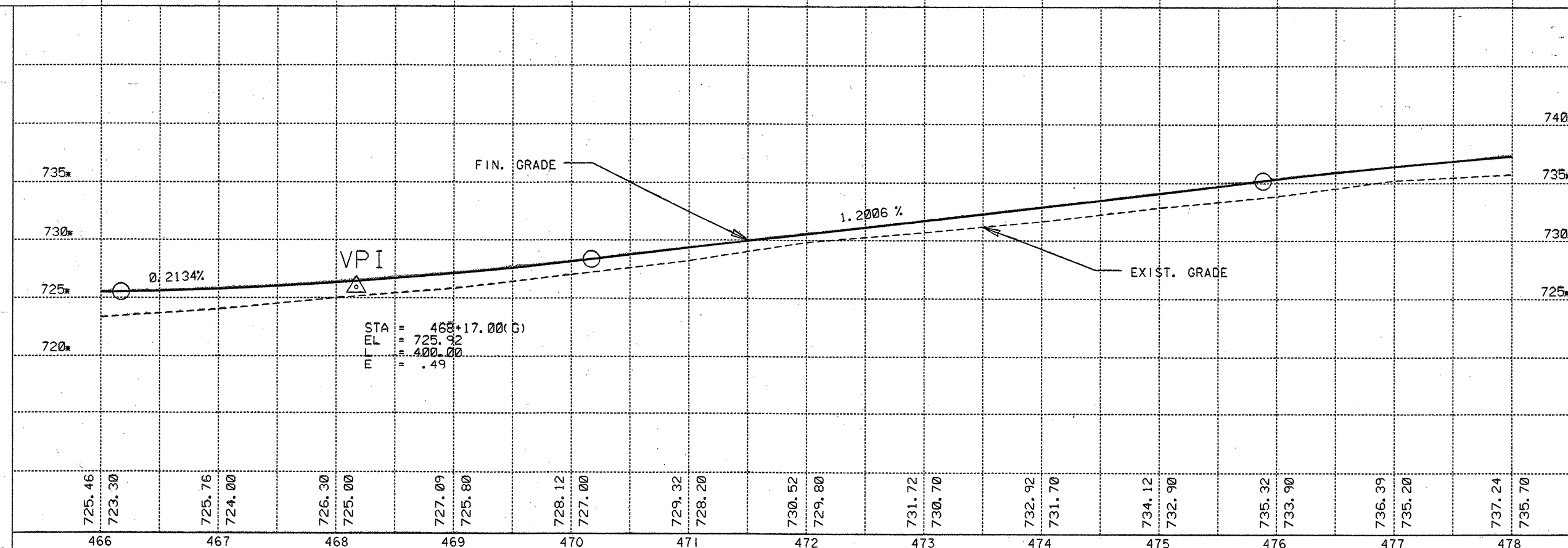
STA. 475+00 - STA. 477+00



STA. 477+00 - STA. 478+00



SUPERELEVATION
DIAGRAM



MAIN LANE PROFILE SHEET



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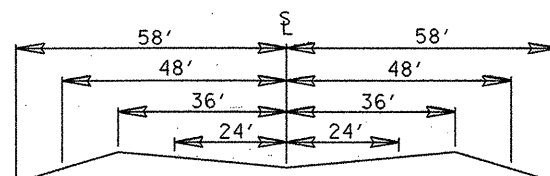
*N.B.L. ARE IN GRADE REVISION
FOR THE PROJECT'S LIMITS.

FINISH AND EXIST. GRADES
SHOWN ARE ON SURVEY LINE.

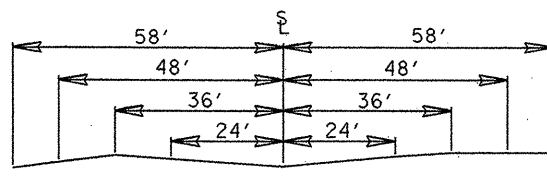
SCALE:
HORIZONTAL 1"=50'
VERTICAL 1"=5'

SHEETS 21 OF 26 SHEETS

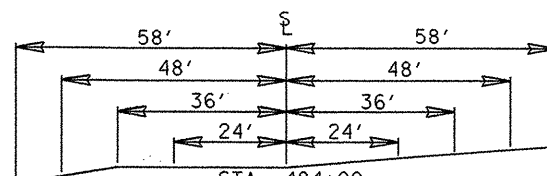
FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.
6	TEXAS	NH 95 (40) IM	22
STAT. DIST. NO.	COUNTY	CONT	SECT
15	COMAL	0016	05
		087	I.H. 35



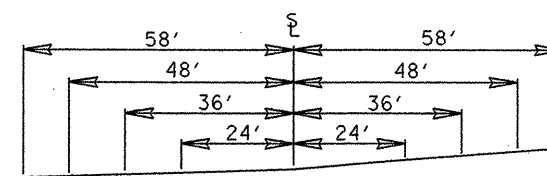
STA. 478+00 - STA. 482+00



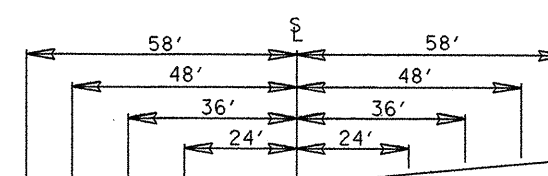
STA. 483+00



STA. 484+00

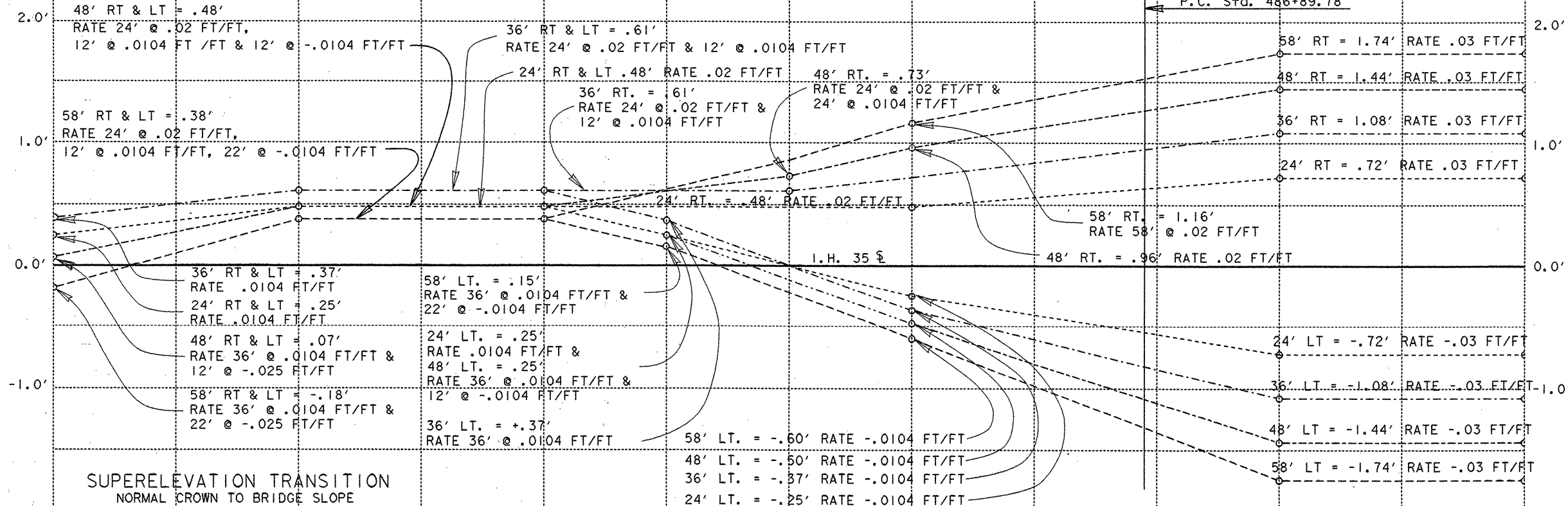


STA. 485+00



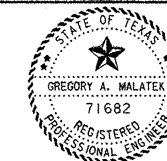
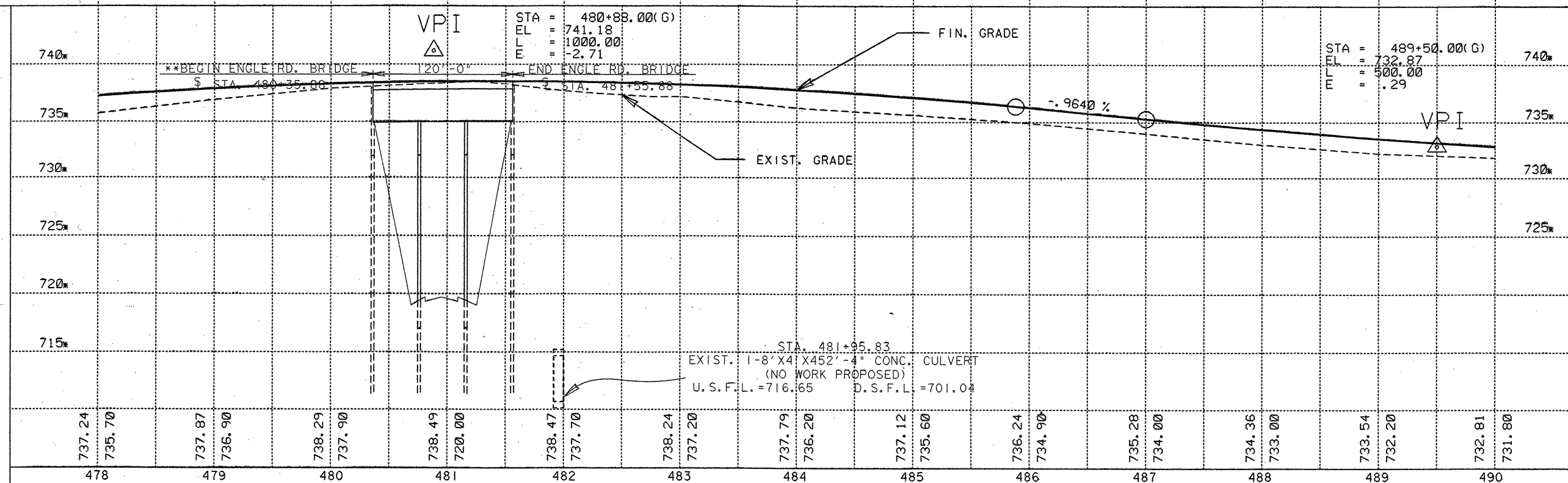
STA. 488+00 - STA. 490+00

SUPERELEVATION TRANSITION BRIDGE SLOPE TO A 1°00'00" CURVE LT.



SUPERELEVATION DIAGRAM

SUPERELEVATION TRANSITION NORMAL CROWN TO BRIDGE SLOPE



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**BRIDGE WIDENED FOR
6 LANES CONSTRUCTED UNDER
PROJECT CSJ 0016-05-090.

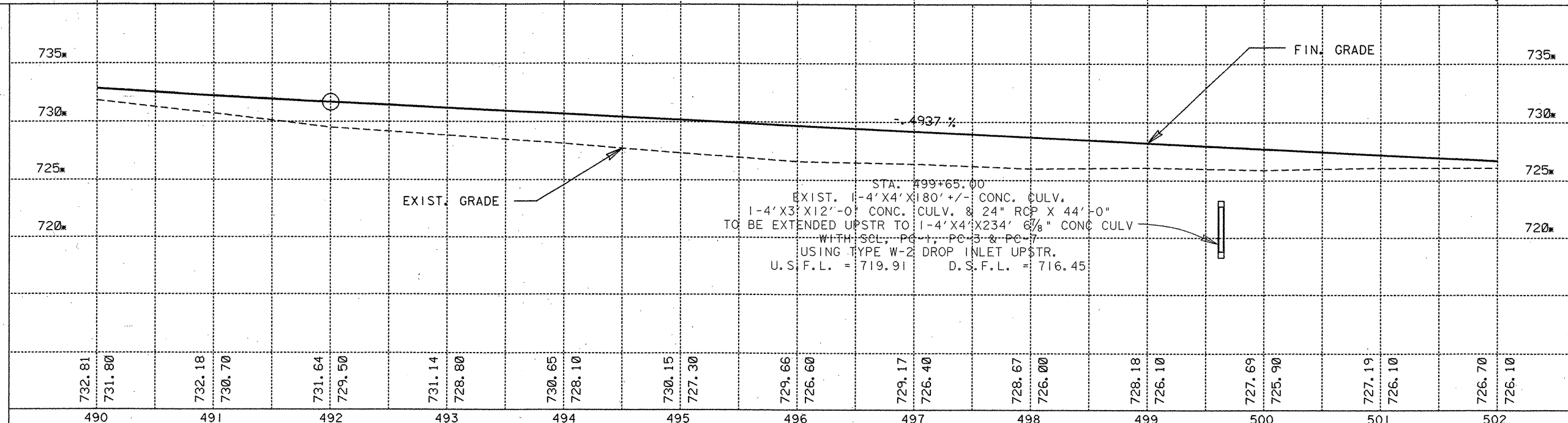
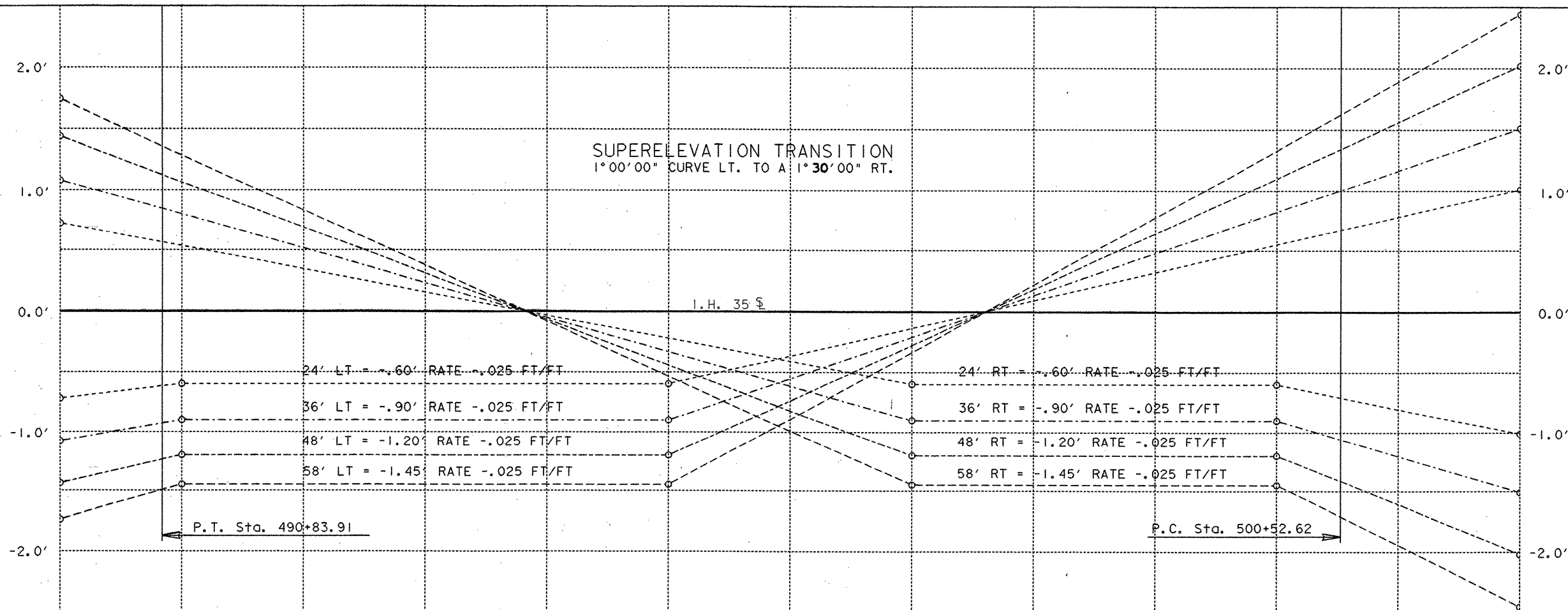
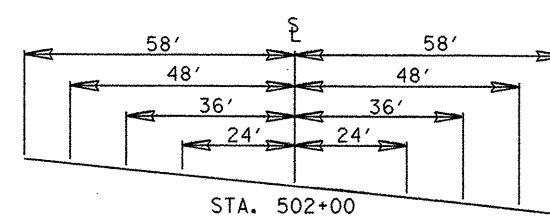
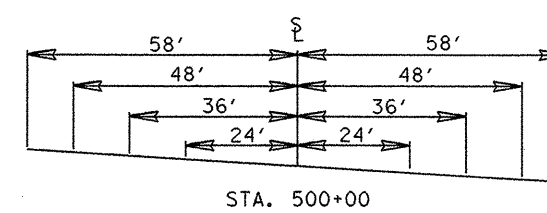
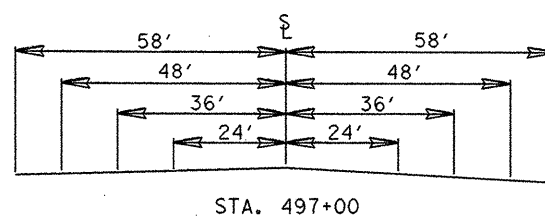
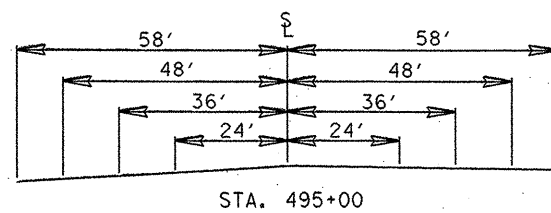
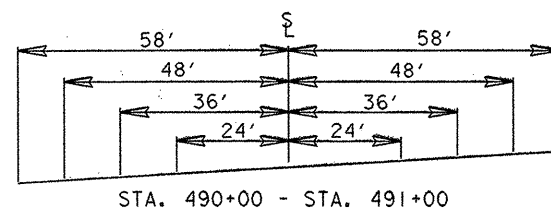
*N.B.L. ARE IN GRADE REVISION
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FINISH AND EXIST. GRADES
SHOWN ARE ON SURVEY LINE.

SCALE:
HORIZONTAL 1"=50'
VERTICAL 1"=5'

SHEETS 22 OF 26 SHEETS

FED. RD. DIST. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.
6	TEXAS	NH 95 (40) IM	123
STAT. DIST. NO.	COUNTY	CONTRACT NO.	JOB NO.
15	COMAL	0016 05 087	I.H. 35



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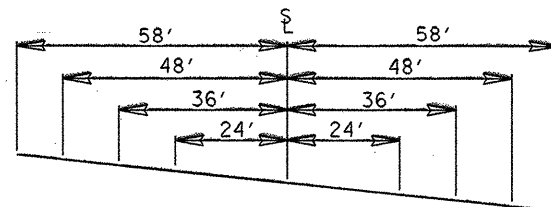
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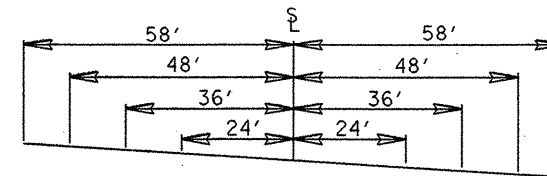
SCALE:
HORIZONTAL 1"=50'
VERTICAL 1"=5'

SHEETS 23 OF 26 SHEETS

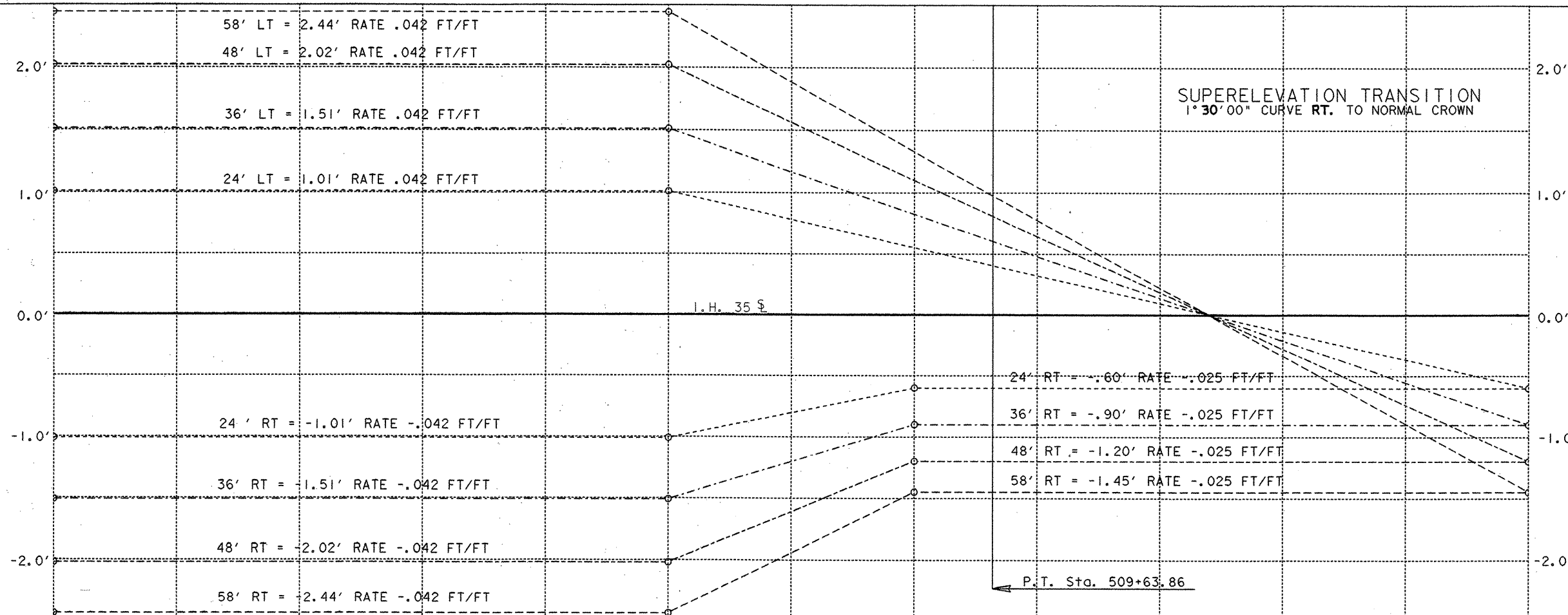
FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.
6	TEXAS	NH 95 (40) IM	24
STAT. DIST. NO.	COUNTY	CONT. SECT.	JOB HWY. NO.
15	COMAL	0016 05 087	I.H. 35



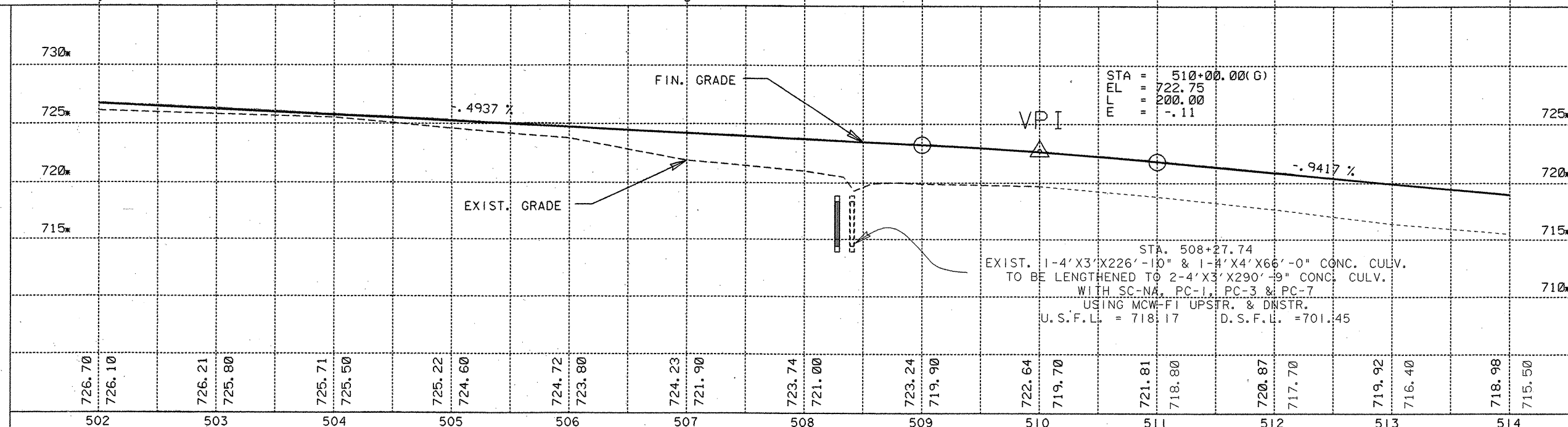
STA. 502+00 - STA. 507+00



STA. 509+00



SUPERELEVATION DIAGRAM



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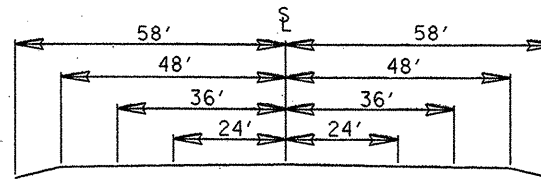
*N.B.L. ARE IN GRADE REVISION FOR THE PROJECT'S LIMITS.

FINISH AND EXIST. GRADES SHOWN ARE ON SURVEY LINE.

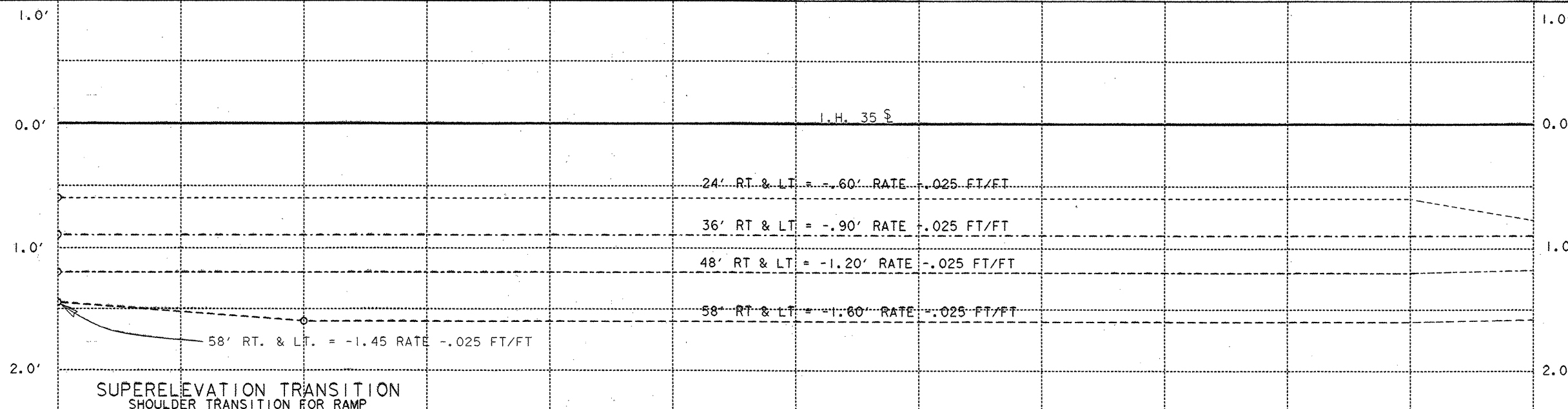
SCALE:
 HORIZONTAL 1"=50'
 VERTICAL 1"=5'

SHEETS 24 OF 26 SHEETS

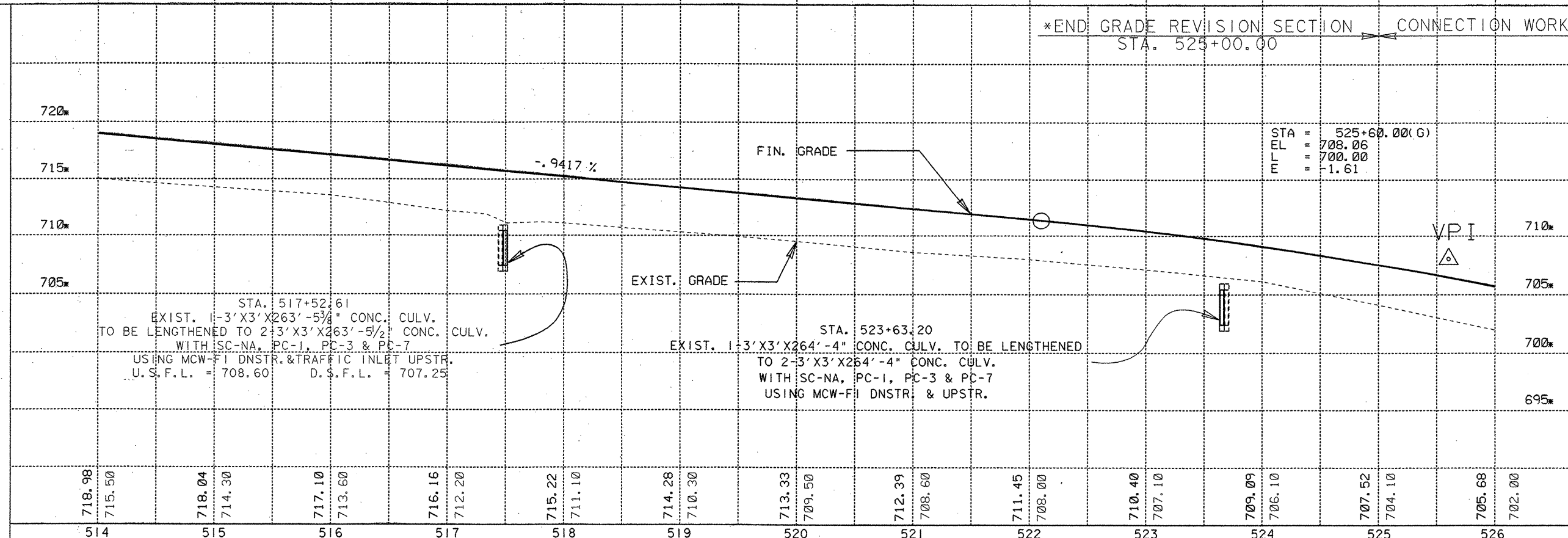
FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.
6	TEXAS	NH 95 (40) IM	125
STAT. DIST. NO.	COUNTY	CONT. SECT.	JOB HWY. NO.
15	COMAL	0016 05	087 I.H. 35



STA. 514+00 - STA. 526+00



SUPERELEVATION
DIAGRAM



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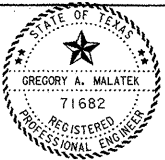
FINISH AND EXIST. GRADES SHOWN ARE ON SURVEY LINE.

SCALE:
HORIZONTAL 1"=50'
VERTICAL 1"=5'

SHEETS 25 OF 26 SHEETS

FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.
6	TEXAS	NH 95 (40) IM	126
STAT. DIST. NO.	COUNTY	CONT	SECT
15	COMAL	0016	05
JOB	HWY. NO.		
087	I.H. 35		

SUPERELEVATION
DIAGRAM



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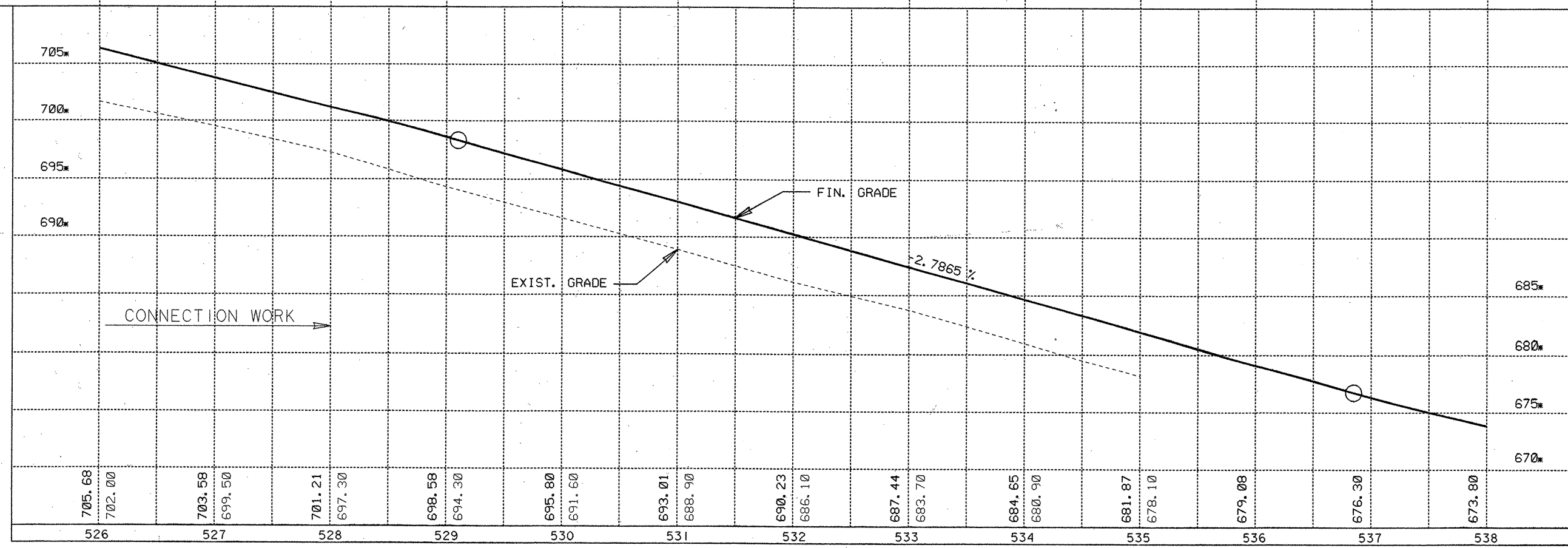
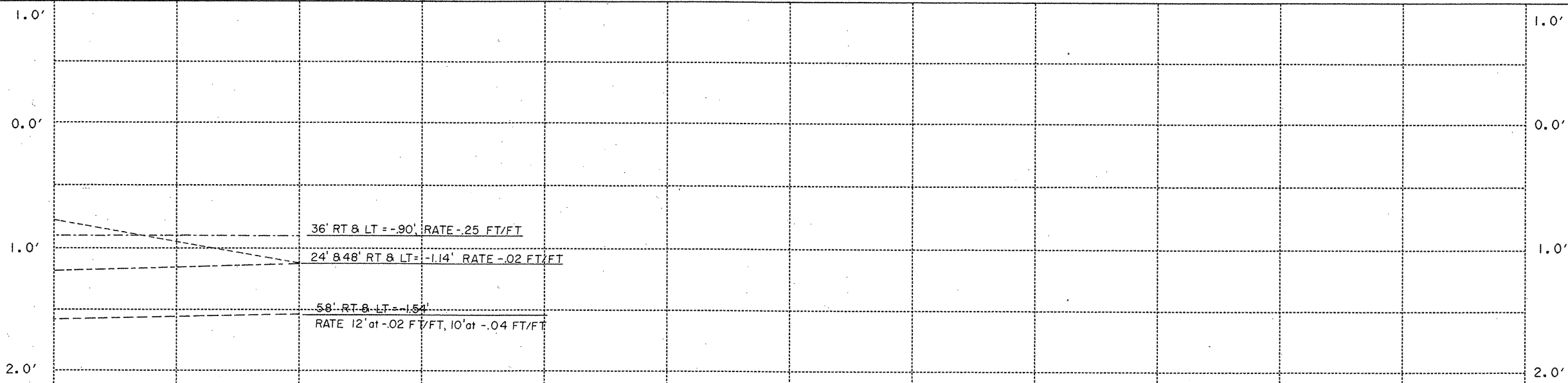
*N.B.L. ARE IN GRADE REVISION
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FINISH AND EXIST. GRADES
SHOWN ARE ON SURVEY LINE.

SCALE:
HORIZONTAL 1"=50'
VERTICAL 1"=5'

SHEETS 26 OF 26 SHEETS

FED. RD DIV. NO.	STATE	FEDERAL AID PROJECT NO.				SHEET NO.
6	TEXAS	NH 95 (40) 1M				127
STAT DIST. NO.	COUNTY	CONT	SECT	JOB	HWY. NO.	
15	COMAL	0016	05	087	I. H. 35	

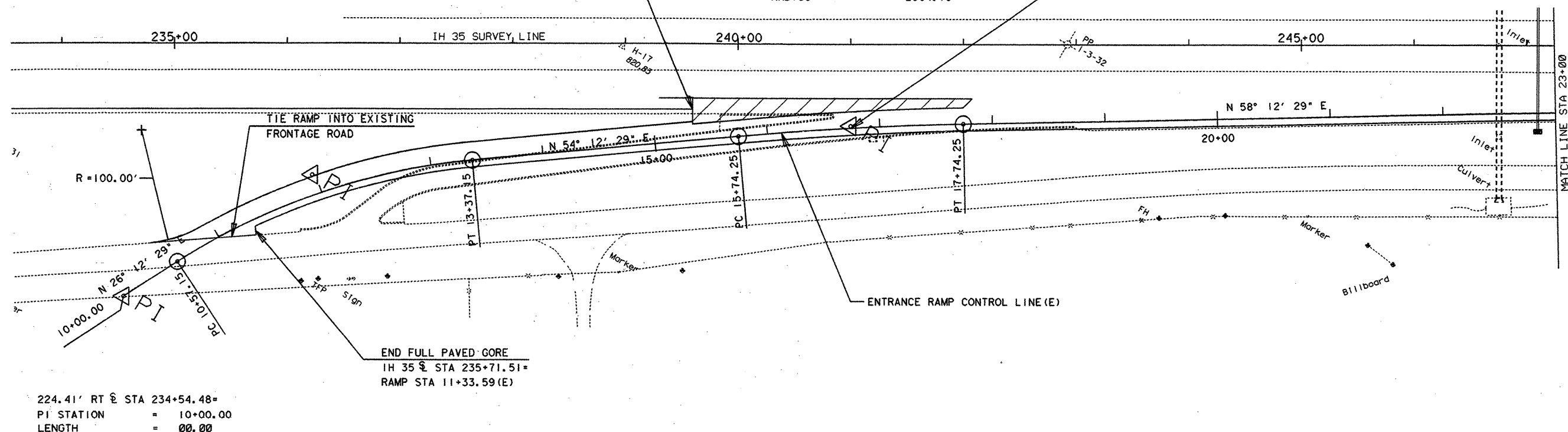


115.05' RT @ STA 236+21.93=
 PI STATION = 12+00.00
 DELTA = 28° 0' 0.03" RT
 DEGREE OF CURVE = 10° 0' 0.00"
 TANGENT = 142.85
 LENGTH = 280.00
 RADIUS = 572.96

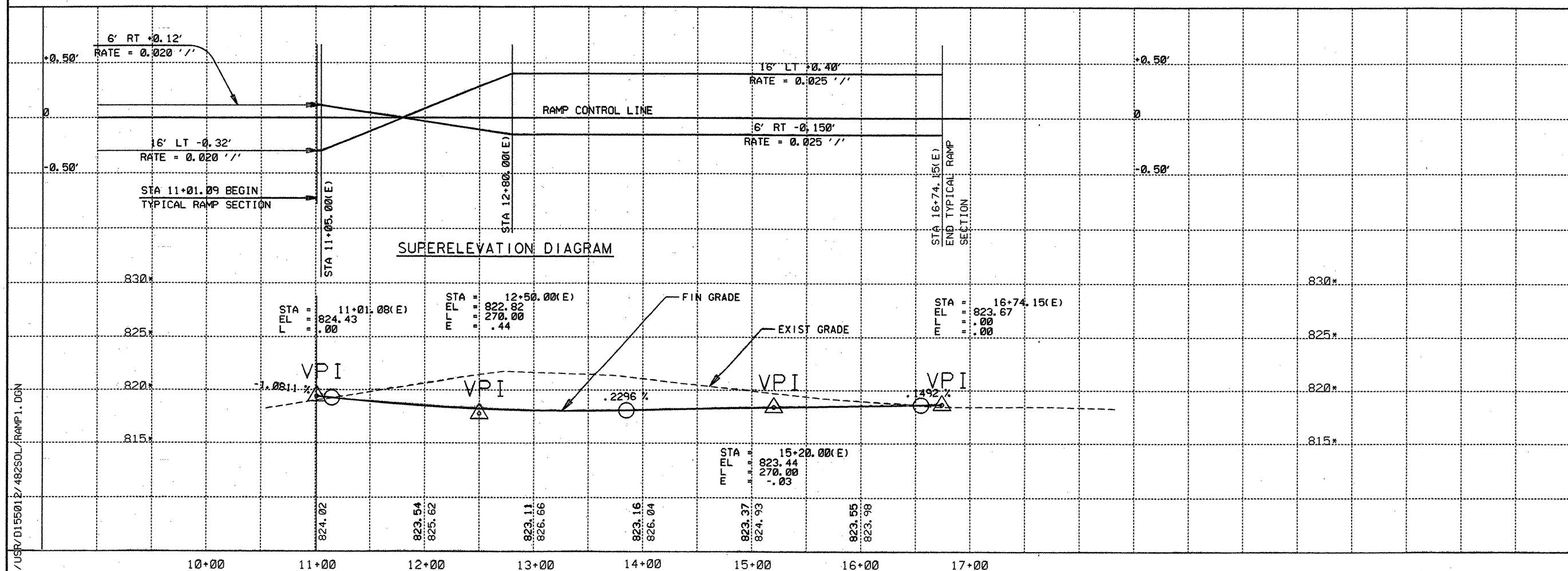
BEGIN FULL PAVED GORE
 IH 35 @ STA 239+59.73=
 RAMP STA 15+34.74(E)

72.00' RT @ STA 241+00.00=
 PI STATION = 16+74.29
 DELTA = 4° 0' 0.00" RT
 DEGREE OF CURVE = 2° 0' 0.00"
 TANGENT = 100.04
 LENGTH = 200.00
 RADIUS = 2864.79

END TYPICAL RAMP SECTION
 IH 35 @ STA 241+00.00=
 RAMP STA 16+74.15



224.41' RT @ STA 234+54.48=
 PI STATION = 10+00.00
 LENGTH = 00.00



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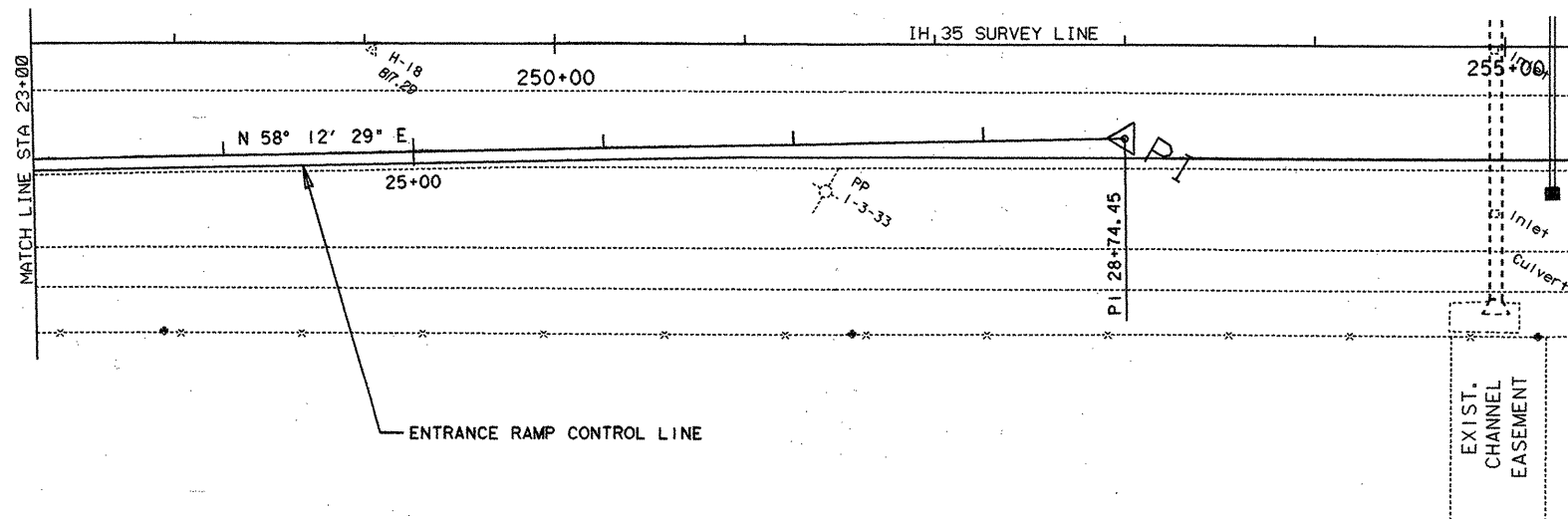
4/7/1995
 Gregory A. Malatek, P.E.

RAMP
 PLAN PROFILE
 N.B. ENT. FM 482
 SCALE: 1" = 50' HORIZ.
 1" = 5' VERT.

SHEET 1 OF 25 SHEETS

FED. RD. DIV. NO.		STATE AID PROJECT NO.		SHEET NO.	
6		NH 85 (40) IM		128	
STATE		DIST.	COUNTY		
TEXAS		15	COMAL		
CONT.		SECT.	JOB	HIGHWAY NO.	
0016		05	087	IH 35	

48.00' RT @ STA 253+00.00=
 PI STATION = 28+74.45
 DELTA = 1° 8' 44.75" RT
 DEGREE OF CURVE = 0° 0' 0.00"
 TANGENT = 0.00
 LENGTH = 0.00
 RADIUS = 0.00



EXIST.
CHANNEL
EASEMENT



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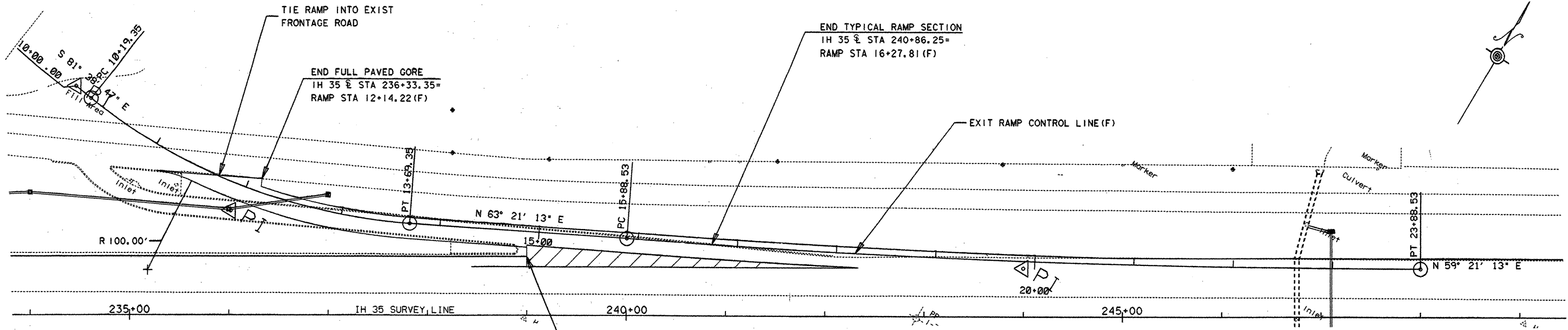
4/7, 1995.
Gregory A. Malatek, P.E.

**RAMP
 PLAN PROFILE**
N.B. ENT. FM 482
 SCALE: 1" = 50' HORIZ.
 1" = 5' VERT.

SHEET 2 OF 25 SHEETS

FED. RD. DIV. NO.	STATE AID PROJECT NO.	SHEET NO.
6	NH95(40) IM	129
STATE	DIST.	COUNTY
TEXAS	15	COMAL
CONT.	SECT.	JOB
0016	05	087
		IH 35

229.67' LT & STA 234+46.52=
 PI STATION = 10+00.00
 LENGTH = 00.00

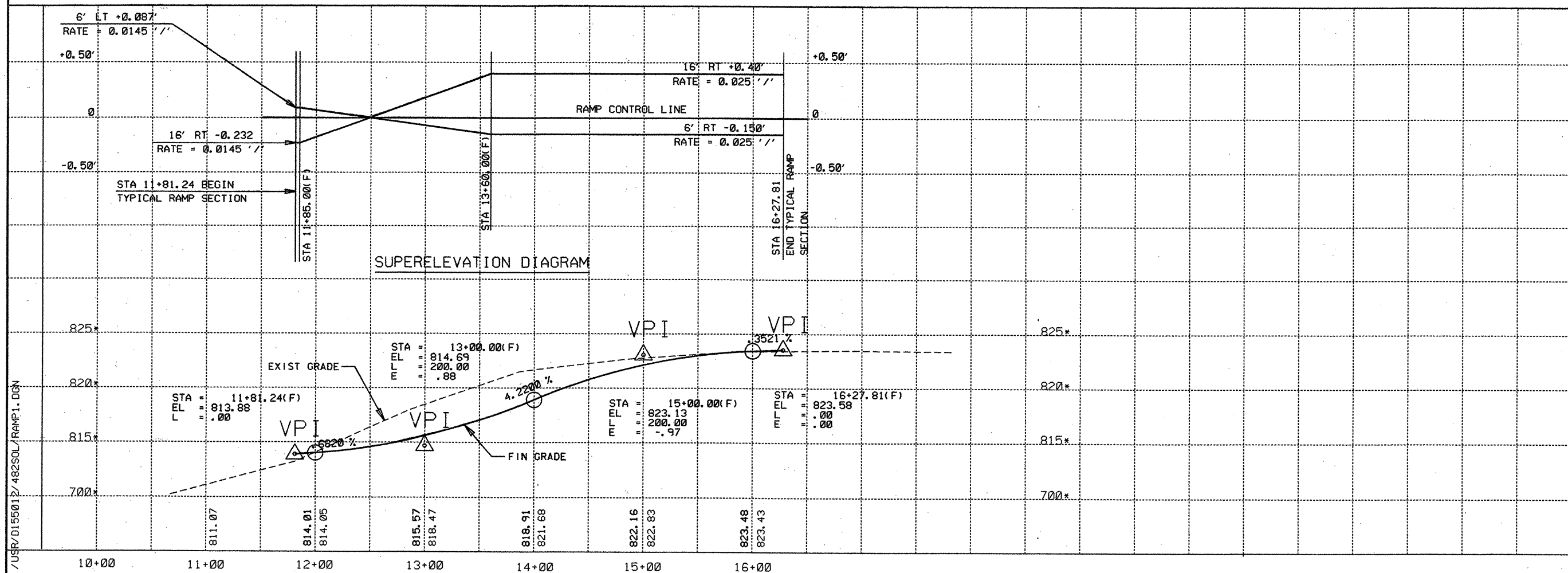


103.81' LT & STA 236+01.95=
 PI STATION = 12+00.00
 DELTA = 35° 0' .02° LT
 DEGREE OF CURVE = 10° 0' .00°
 TANGENT = 180.65
 LENGTH = 350.00
 RADIUS = 572.96

BEGIN FULL PAVED GORE
 IH 35 & STA 239+00.00=
 RAMP STA 14+88.53(F)

48.00' LT & STA 244+00.00=
 PI STATION = 19+88.69
 DELTA = 3° 59' 59.95° LT
 DEGREE OF CURVE = 0° 30' .00°
 TANGENT = 400.16
 LENGTH = 800.00
 RADIUS = 11459.16

48.00' LT & STA 248+00.00=
 PI STATION = 23+88.53
 LENGTH = 00.00



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RAMP
 PLAN PROFILE
 S.B. EXIT FM 482

SCALE: 1" = 50' HORIZ.
 1" = 5' VERT.

SHEET 3 OF 25 SHEETS

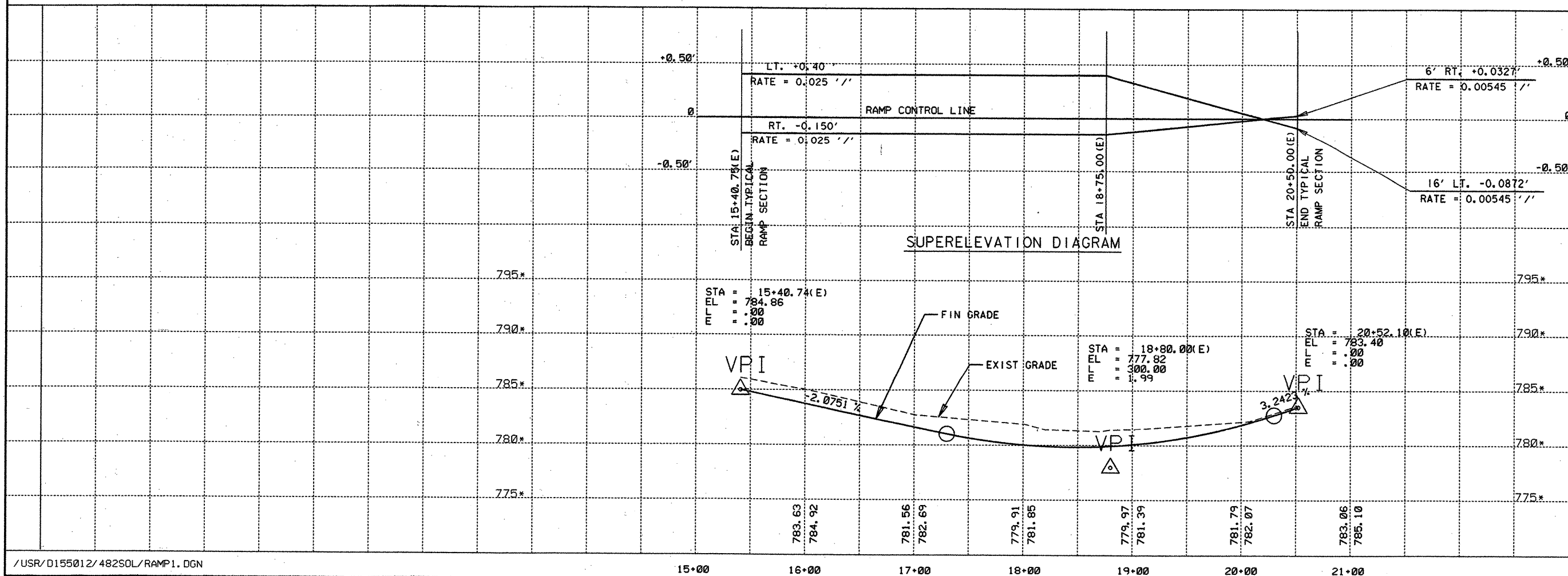
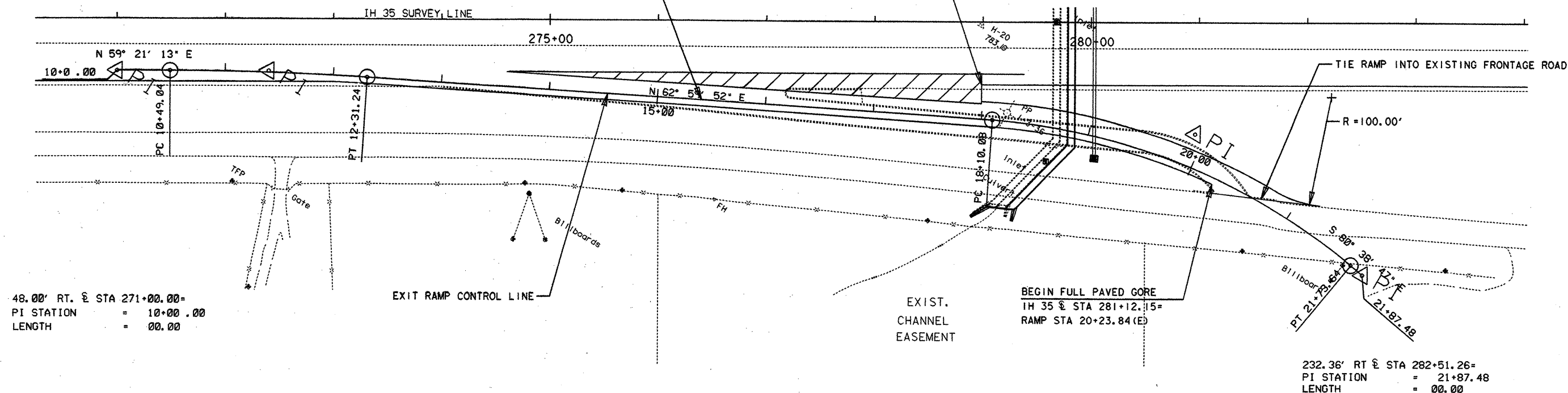
FED. RD. DIV. NO.	STATE AID PROJECT NO.	SHEET NO.
6	NH95(40) IM	130
STATE	DIST.	COUNTY
TEXAS	15	COMAL
CONT.	SECT.	JOB
0016	05	087
		HIGHWAY NO.
		IH 35

48.00' RT. @ STA 272+40.17=
 PI STATION = 11+40.17
 DELTA = 3° 38' 38.59" RT
 DEGREE OF CURVE = 2° 0' .00"
 TANGENT = 91.13
 LENGTH = 182.20
 RADIUS = 2864.79

BEGIN TYPICAL RAMP SECTION
 IH 35 @ STA 276+40.00=
 RAMP STA 15+40.75 (E)

END FULL PAVED GORE
 IH 35 @ STA 279+00.00=
 RAMP STA 10+00.00 (E)

102.54' RT. @ STA 280+96.54=
 PI STATION = 19+96.54
 DELTA = 36° 21' 21.39" RT
 DEGREE OF CURVE = 10° 0' .00"
 TANGENT = 188.13
 LENGTH = 363.56
 RADIUS = 572.96



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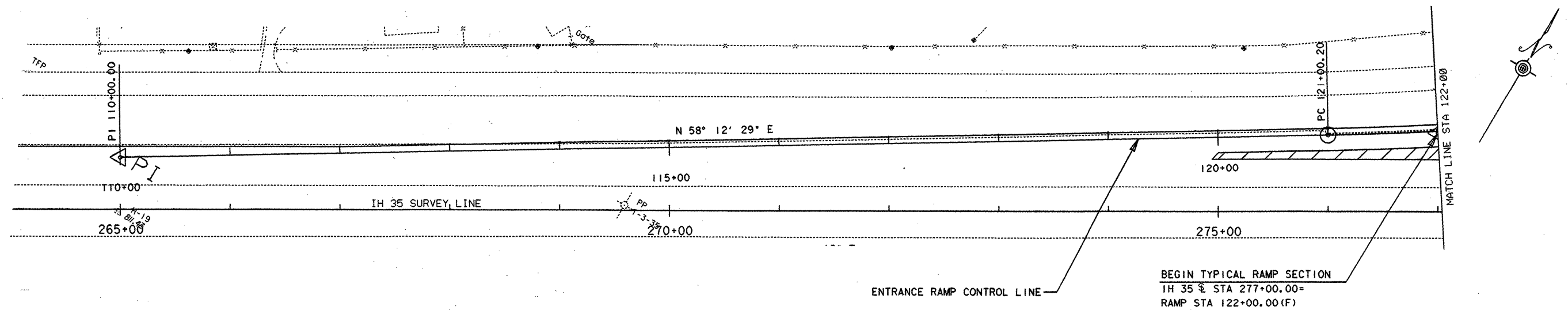


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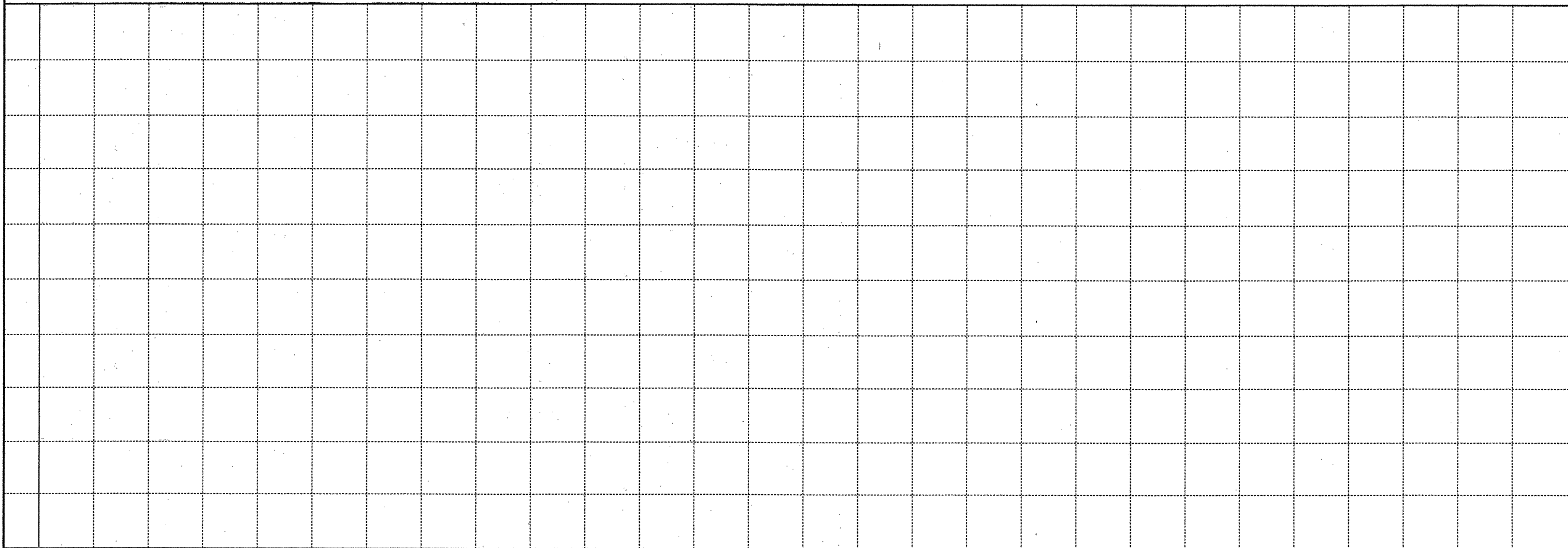
RAMP
 PLAN PROFILE
 N.B. EXIT FM 1103
 SCALE: 1" = 50' HORIZ.
 1" = 5' VERT.

SHEET 4 OF 25 SHEETS			
FED. RD. DIV. NO.	STATE AID PROJECT NO.		SHEET NO.
6	NH95(40) IM		131
STATE	DIST.	COUNTY	
TEXAS	15	COMAL	
CONT.	SECT.	JOB	HIGHWAY NO.
0016	05	087	IH 35



48.00' LT @ STA 265+00.00=
 PI STATION = 110+00.00
 LENGTH = 00.00

72.00' LT @ STA 277+00.00=
 PI STATION = 122+00.24
 DELTA = 4° 0' 0.01" LT
 DEGREE OF CURVE = 2° 0' 0.00"
 TANGENT = 100.04
 LENGTH = 200.00
 RADIUS = 2864.79

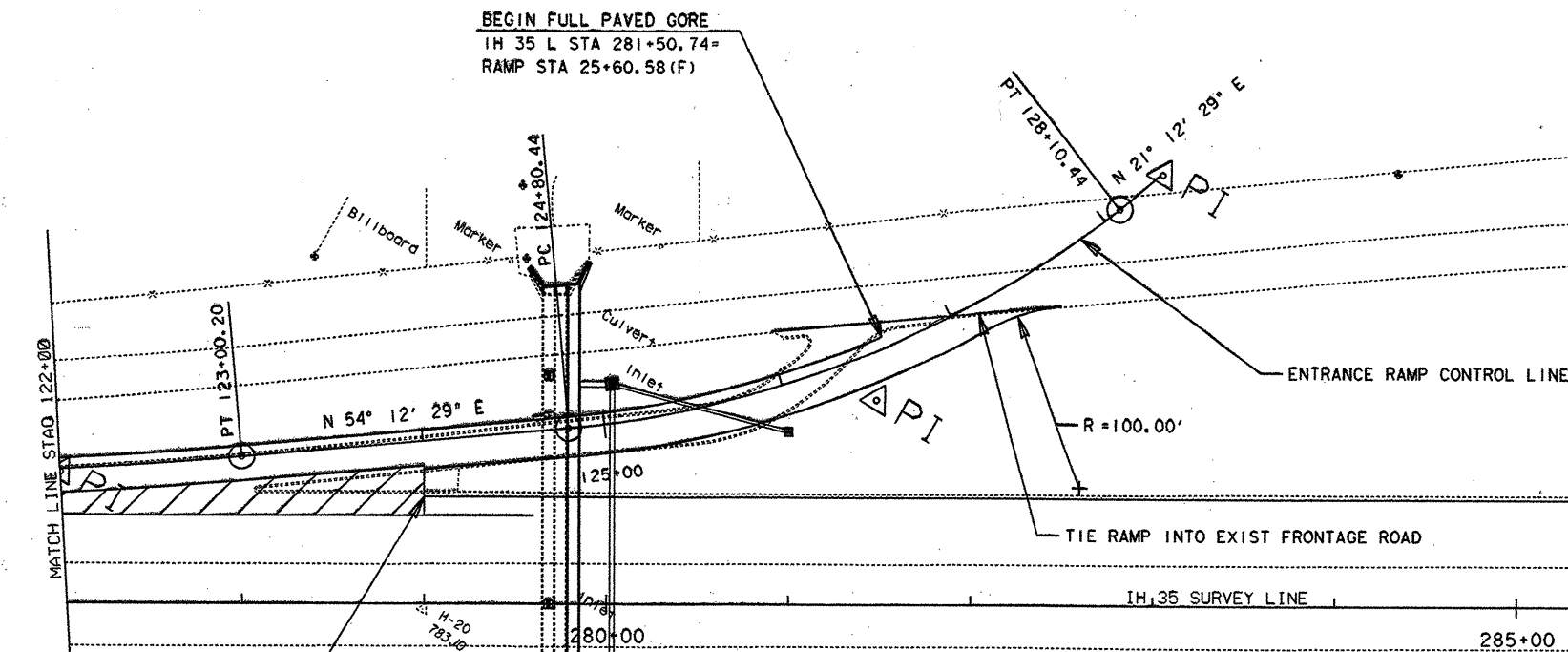


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**RAMP
 PLAN PROFILE
 S.B. ENT.FM 1103**
 SCALE: 1" = 50' HORIZ.
 1" = 5' VERT.

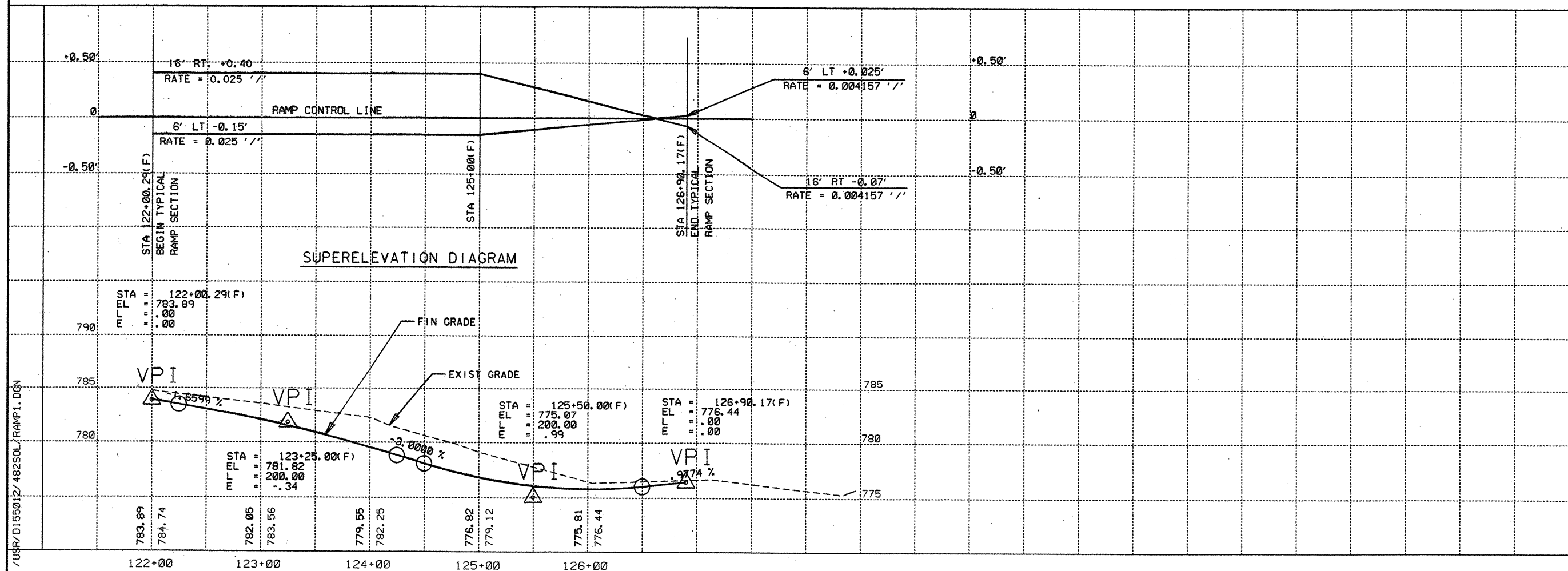
SHEET 5 OF 25 SHEETS			
FED. RD. DIV. NO.	STATE AID PROJECT NO.		SHEET NO.
6	NH95 (40) IM		132
STATE	DIST.	COUNTY	
TEXAS	15	COMAL	
CONT.	SECT.	JOB	HIGHWAY NO.
0016	05	087	IH 35



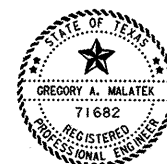
235.89' LT @ STA 283+05.47=
 PI STATION = 128+40.72
 LENGTH = 00.00

END FULL PAVED GORE
 IH 35 @ STA 279+00.00
 RAMP STA 24+00.00(F)

112.36' LT @ STA 281+48.19=
 PI STATION = 126+50.16
 DELTA = 32° 59' 59.99" LT
 DEGREE OF CURVE = 10° 0' 0.00"
 TANGENT = 169.72
 LENGTH = 330.00
 RADIUS = 572.96



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RAMP
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 S.B. ENT.FM 1103

SCALE: 1" = 50' HORIZ.
 1" = 5' VERT.

SHEET 6 OF 25 SHEETS

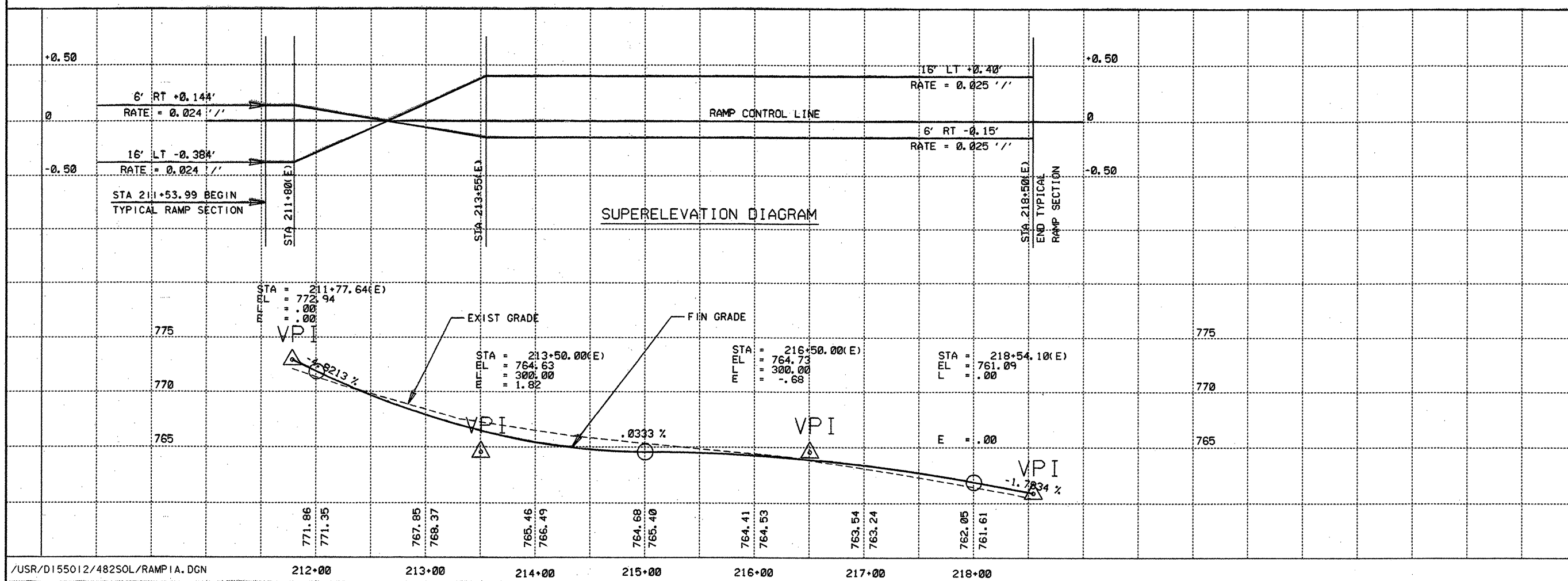
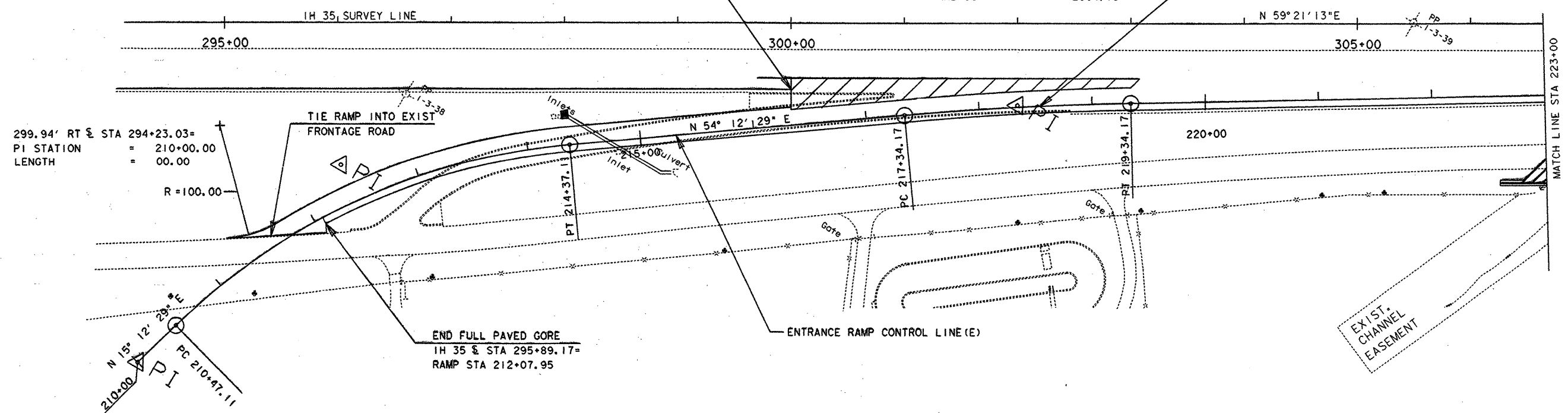
FED. RD. DIV. NO.	STATE AID PROJECT NO.	SHEET NO.
6	NH95 (40) 1M	133
STATE	DIST.	COUNTY
TEXAS	15	COMAL
CONT.	SECT.	JOB
0016	05	087
		HIWAY NO.
		IH 35

125.81' RT & STA 296+02.42=
 PI STATION = 212+50.00
 DELTA = 39° 0' 0.02" RT
 DEGREE OF CURVE = 10° 0' 0.00"
 TANGENT = 202.90
 LENGTH = 390.00
 RADIUS = 572.96

BEGIN FULL PAVED GORE
 IH 35 & STA 300+00.00=
 RAMP STA 213+34.76(E)

72.00' RT & STA 302+00.00=
 PI STATION = 218+34.21
 DELTA = 3° 59' 59.97" RT
 DEGREE OF CURVE = 2° 0' 0.00"
 TANGENT = 100.04
 LENGTH = 200.00
 RADIUS = 2864.79

END TYPICAL RAMP SECTION
 IH 35 & STA 302+19.90=
 RAMP STA 218+54.10(E)



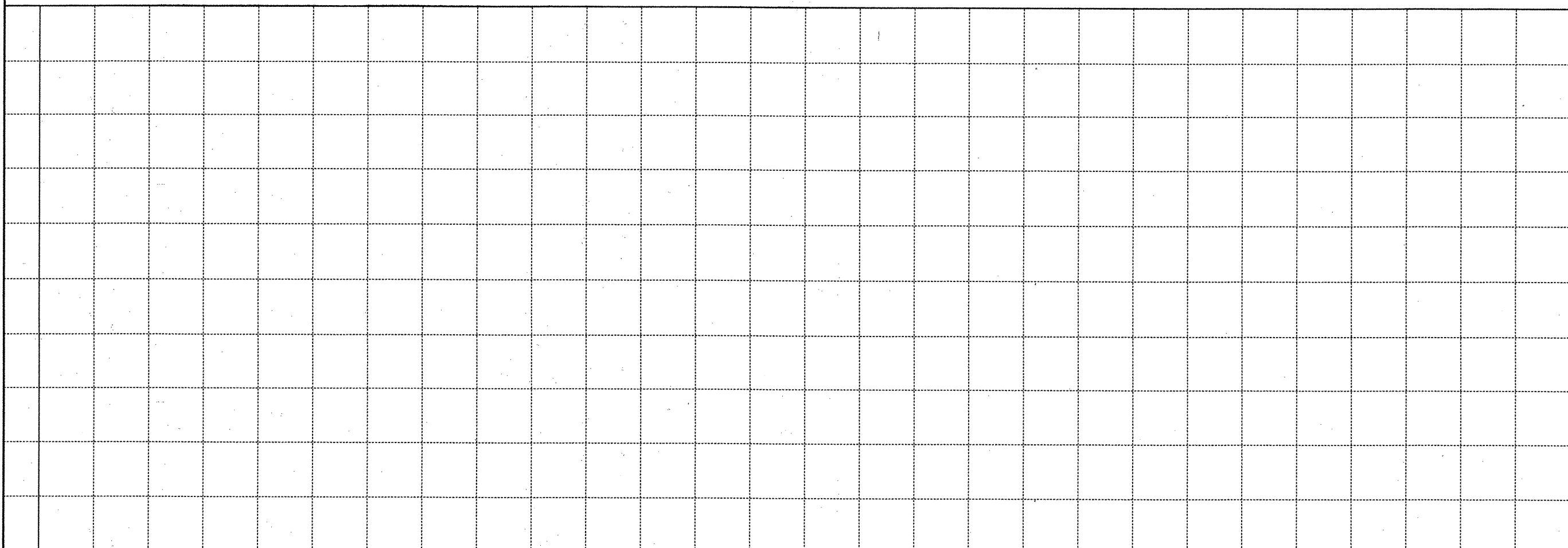
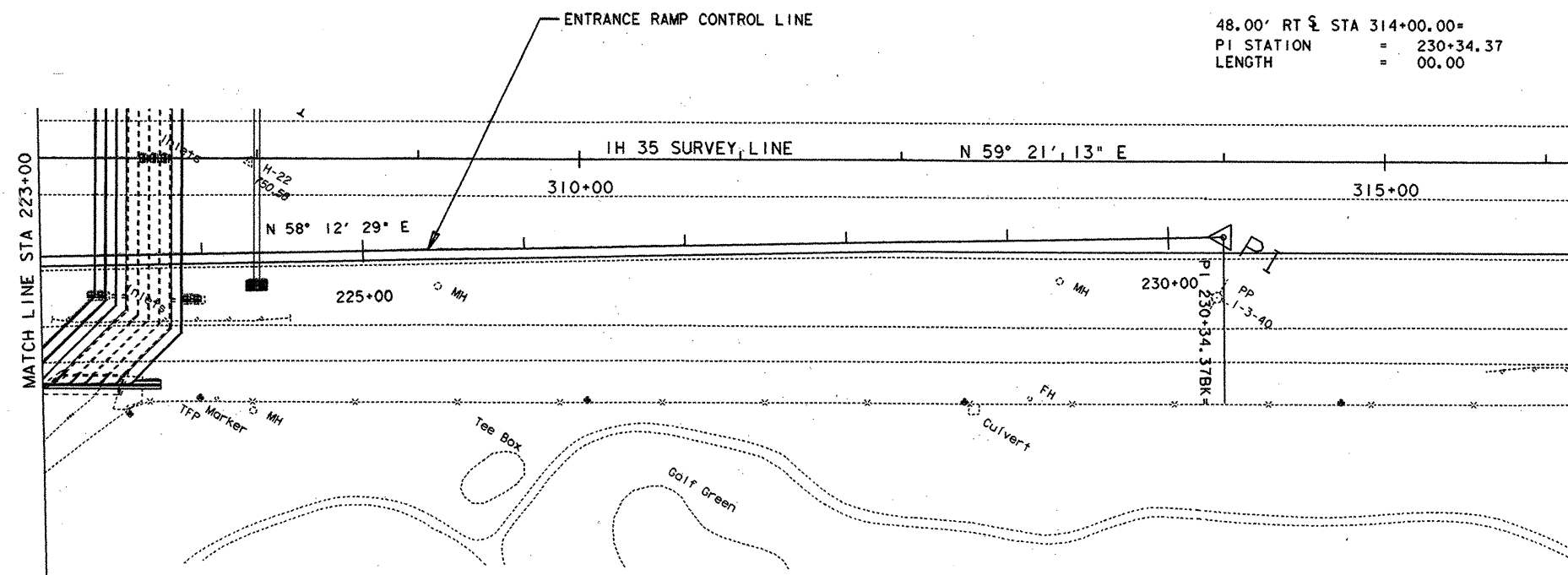
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 PLAN PROFILE
 N.B. ENT. FM 1103
 SCALE: 1" = 50' HORIZ.
 1" = 5' VERT.

SHEET 7 OF 25 SHEETS			
FED. RD. DIST. NO.	STATE AID PROJECT NO.		
6	NH95 (40) IM		
STATE	DIST.	COUNTY	
TEXAS	15	COMAL	
CONT.	SECT.	JOB	HIGHWAY NO.
0016	05	087	IH 35



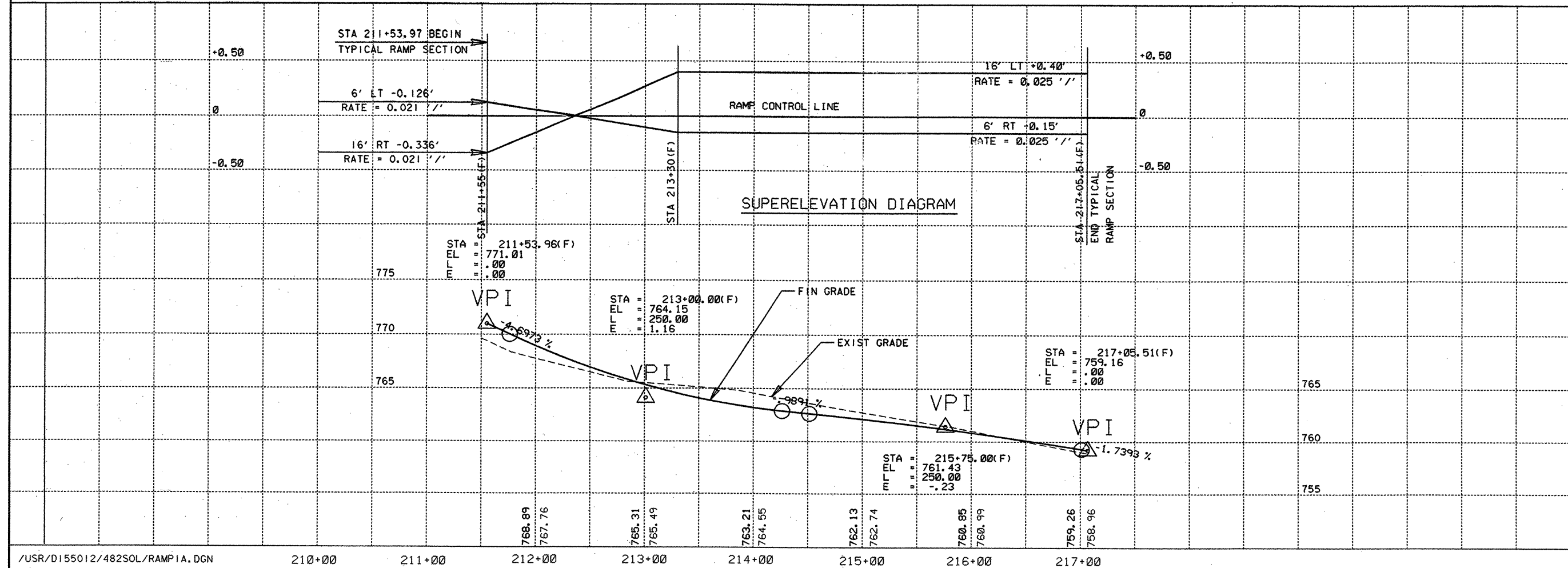
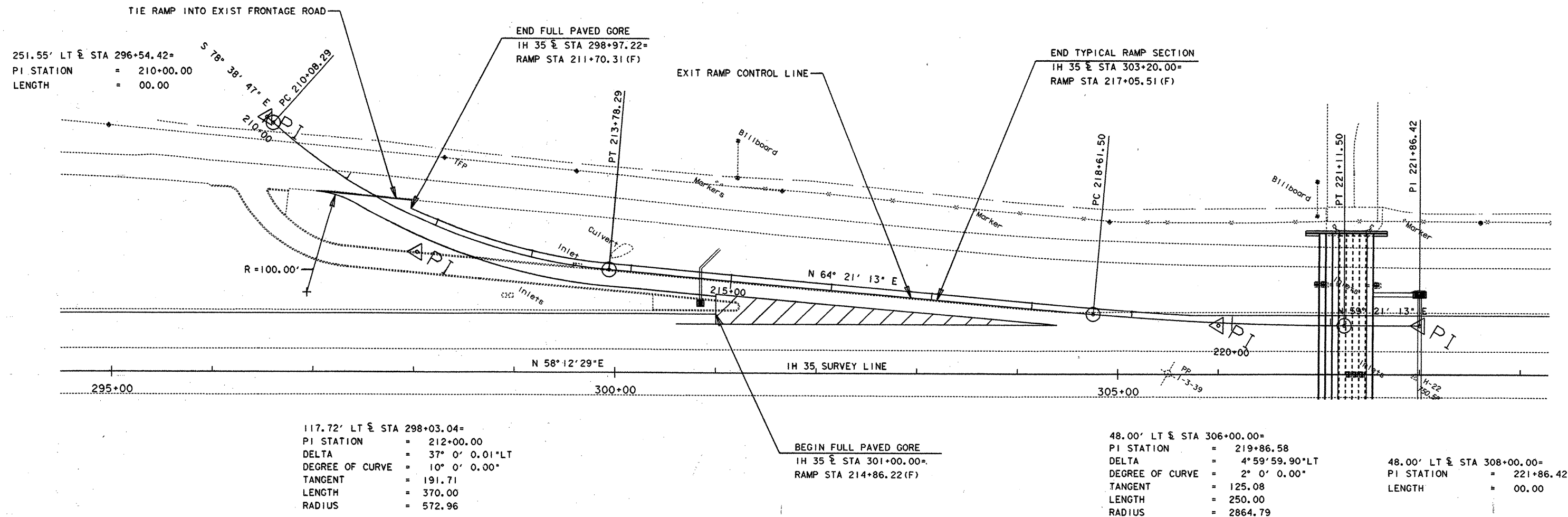
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Gregory A. Malatek, P.E.

**RAMP
PLAN PROFILE
N.B. ENT. FM 1103**
SCALE: 1" = 50' HORIZ.
1" = 5' VERT.

SHEET 8 OF 25 SHEETS

FED. RD. DIV. NO.	STATE AID PROJECT NO.		SHEET NO.
6	NH95 (40) IM		135
STATE	DIST.	COUNTY	
TEXAS	15	COMAL	
CONT.	SECT.	JOB	HIGHWAY NO.
0016	05	087	IH 35



FINISH & EXIST GRADE SHOWN
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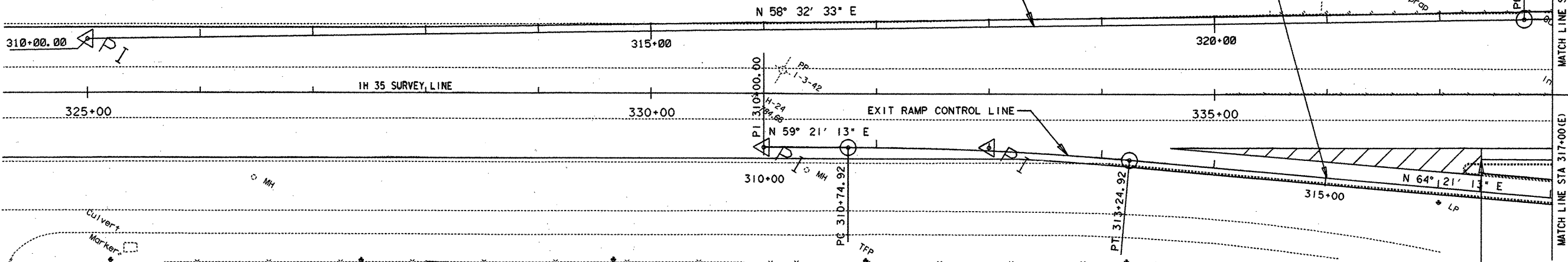
**RAMP
 PLAN PROFILE
 S.B. EXIT FM 1103**
 SCALE: 1" = 50' HORIZ.
 1" = 5' VERT.

SHEET 9 OF 25 SHEETS			
FED. RD. DIST. NO.	STATE AID PROJECT NO.	SHEET NO.	
6	NH95 (40) IM	136	
STATE	DIST.	COUNTY	
TEXAS	15	COMAL	
CONT.	SECT.	JOB	HIGHWAY NO.
0016	05	087	IH 35

48.00' LT @ STA 325+00.00=
 PI STATION = 310+00.00
 LENGTH = 00.00

BEGIN TYPICAL RAMP SECTION
 IH 35 @ STA 336+00.00=
 RAMP STA 315+00.99(E)

S.B. ENTRANCE RAMP CONTROL LINE



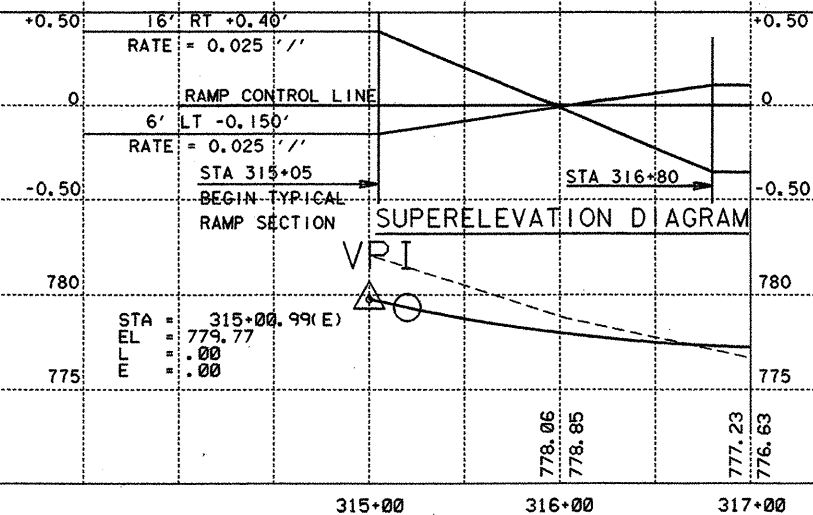
48.00' RT @ STA 331+00.00=
 PI STATION = 310+00.00
 LENGTH = 00.00

48.00' RT @ STA 333+00.00=
 PI STATION = 312+00.00
 DELTA = 5° 0' 0.07\"/>

END FULL PAVED GORE
 IH 35 @ STA 337+37.02=
 RAMP STA 316+37.33(E)

S.B. ENTRANCE RAMP

N.B. EXIT RAMP



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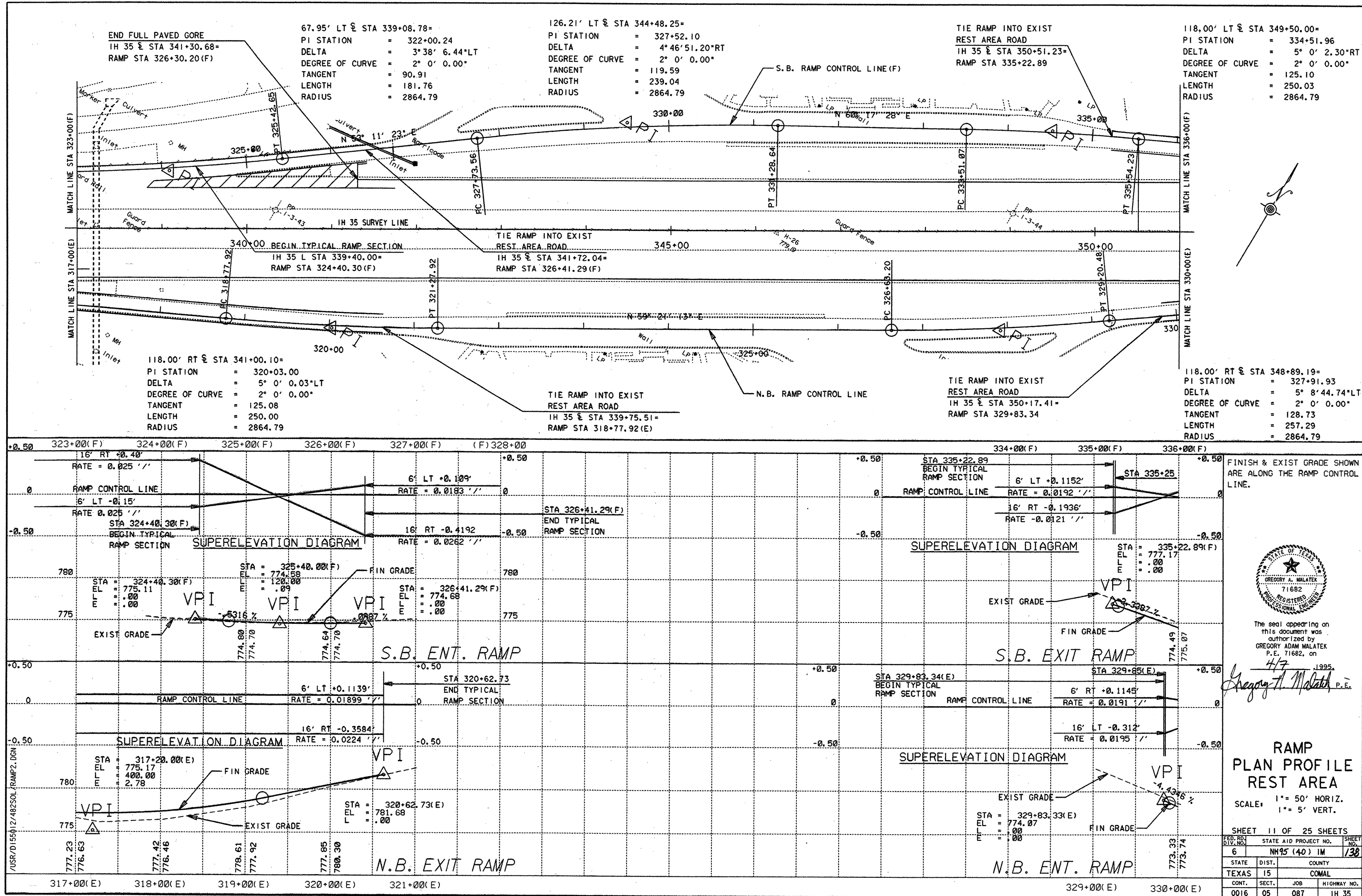
4/7, 1995.
 Gregory A. Malatek, P.E.

RAMP PLAN PROFILE REST AREA

SCALE: 1" = 50' HORIZ.
 1" = 5' VERT.

SHEET 10 OF 25 SHEETS

FED. RD. DIV. NO.	STATE AID PROJECT NO.	SHEET NO.
6	NH95 (40) IM	137
STATE	DIST.	COUNTY
TEXAS	15	COMAL
CONT.	SECT.	JOB
0016	05	087
CONTRACT	SECTION	HIGHWAY NO.
		IH 35

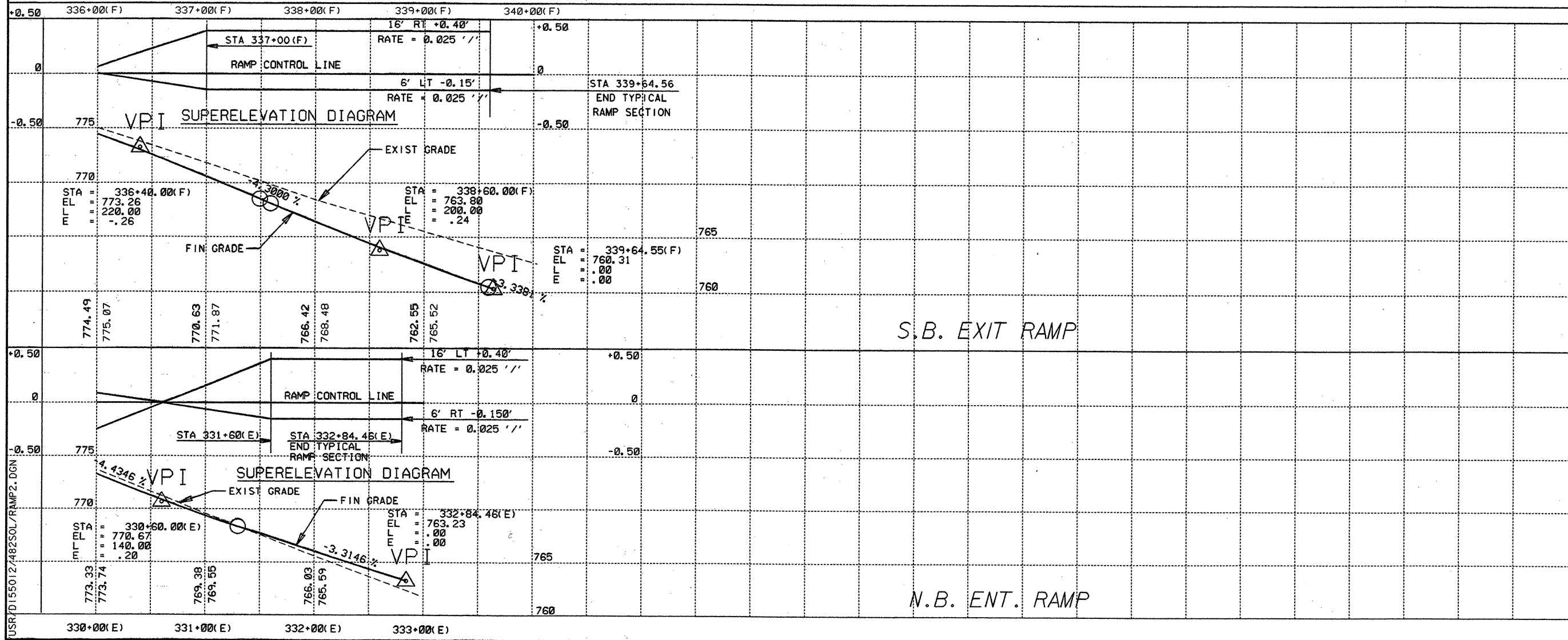
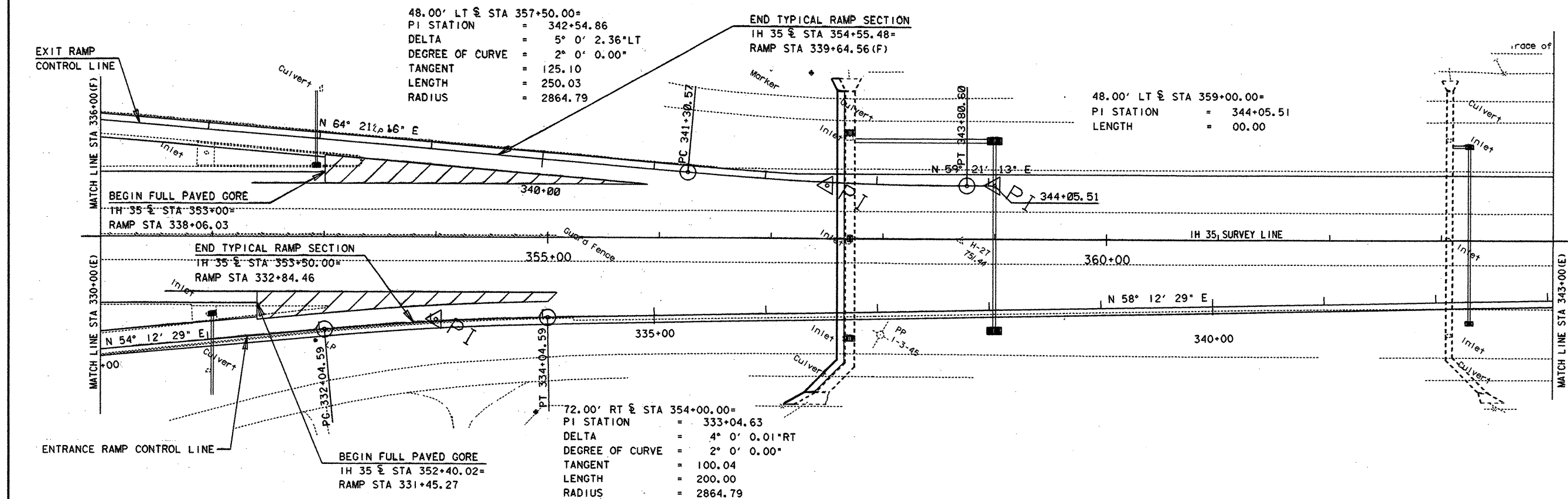


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RAMP PLAN PROFILE REST AREA
 SCALE: 1" = 50' HORIZ.
 1" = 5' VERT.

SHEET 11 OF 25 SHEETS			
STATE	DIST.	COUNTY	NO.
TEXAS	15	COMAL	138
CONT.	SECT.	JOB	HIGHWAY NO.
0016	05	087	IH 35



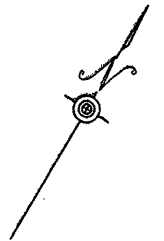
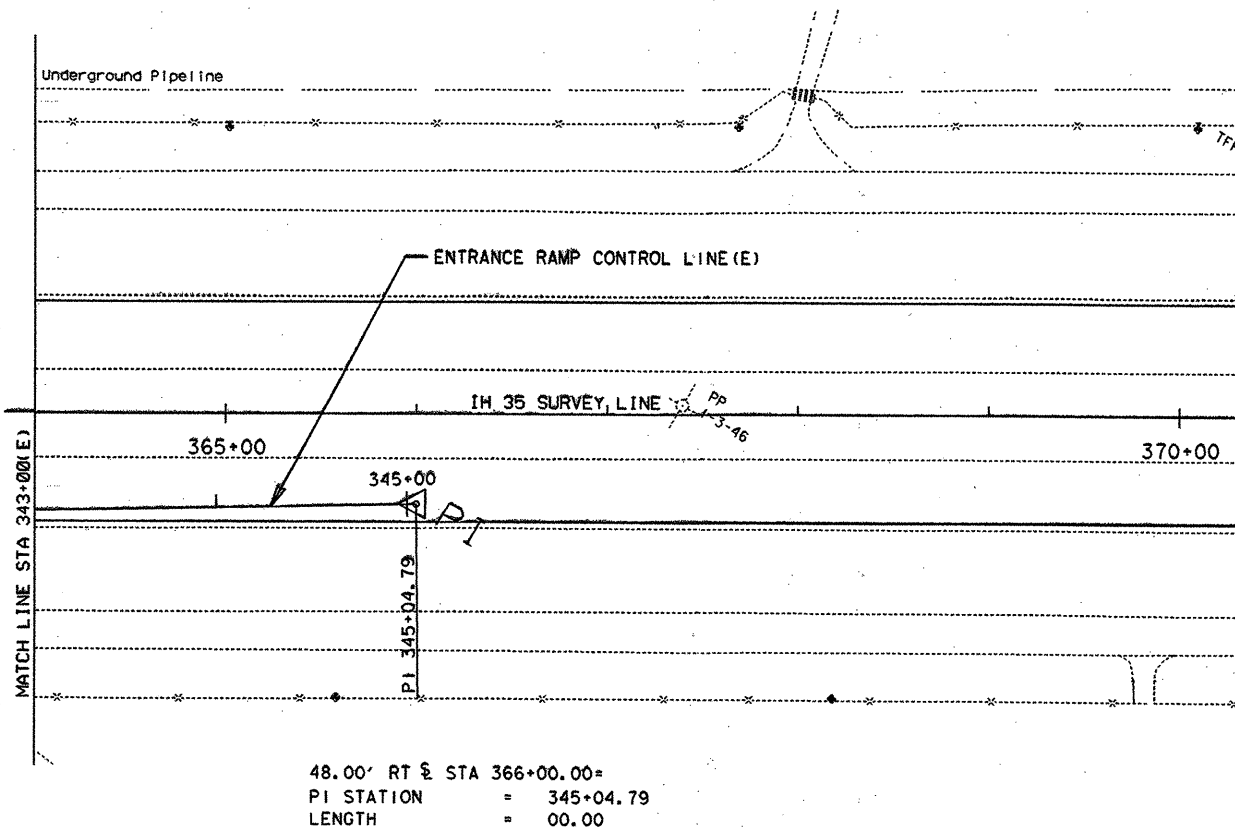
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RAMP PLAN PROFILE REST AREA

SCALE: 1" = 50' HORIZ.
1" = 5' VERT.

SHEET 12 OF 25 SHEETS			
FED. RD. DIV. NO.	STATE AID PROJECT NO.		SHEET NO.
6	NH95 (40) 1M		139
STATE	DIST.	COUNTY	
TEXAS	15	COMAL	
CONT.	SECT.	JOB	HIGHWAY NO.
0016	05	087	IH 35



S.B. EXIT RAMP



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RAMP PLAN PROFILE REST AREA

SCALE: 1" = 50' HORIZ.
 1" = 5' VERT.

SHEET 13 OF 25 SHEETS

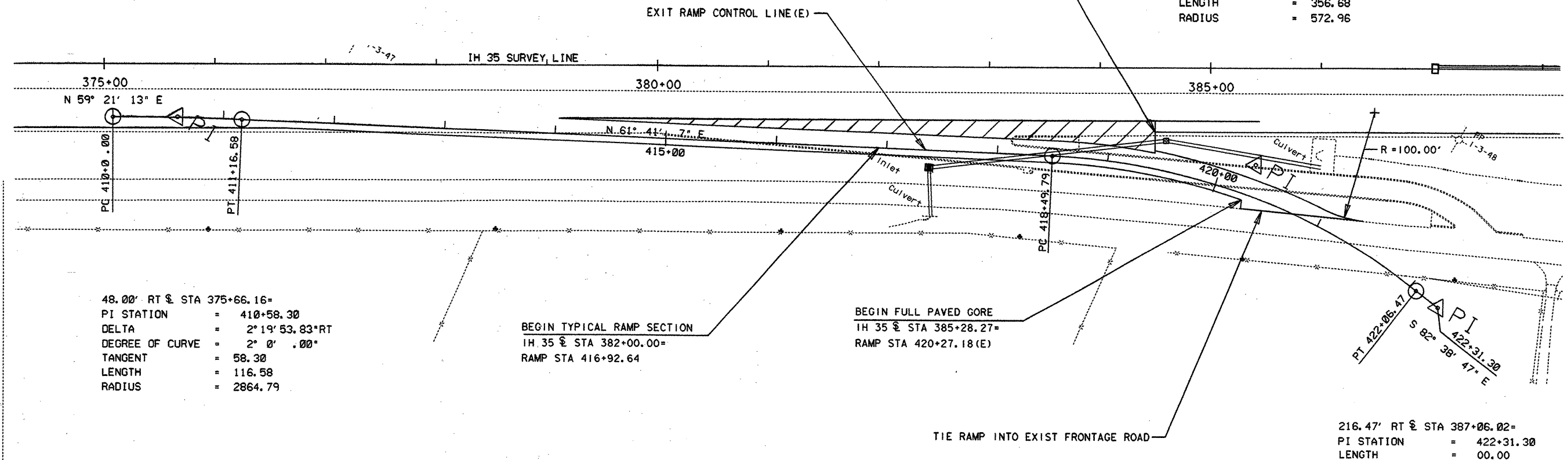
FED. RD. DIV. NO.	STATE AID PROJECT NO.		SHEET NO.
6	NH 95 (40) IM		140
STATE	DIST.	COUNTY	
TEXAS	15	COMAL	
CONT.	SECT.	JOB	HIGHWAY NO.
0016	05	087	IH 35

N.B. ENT. RAMP

48.00' RT @ STA 375+07.87=
 PI STATION = 410+00.00
 LENGTH = 00.00

END FULL PAVED GORE
 IH 35 L STA 384+50.00=
 RAMP STA 419+40.77(E)

87.70' RT @ STA 385+41.20=
 PI STATION = 420+34.12
 DELTA = 35° 40' 6.13" RT
 DEGREE OF CURVE = 10° 0' .00"
 TANGENT = 184.33
 LENGTH = 356.68
 RADIUS = 572.96



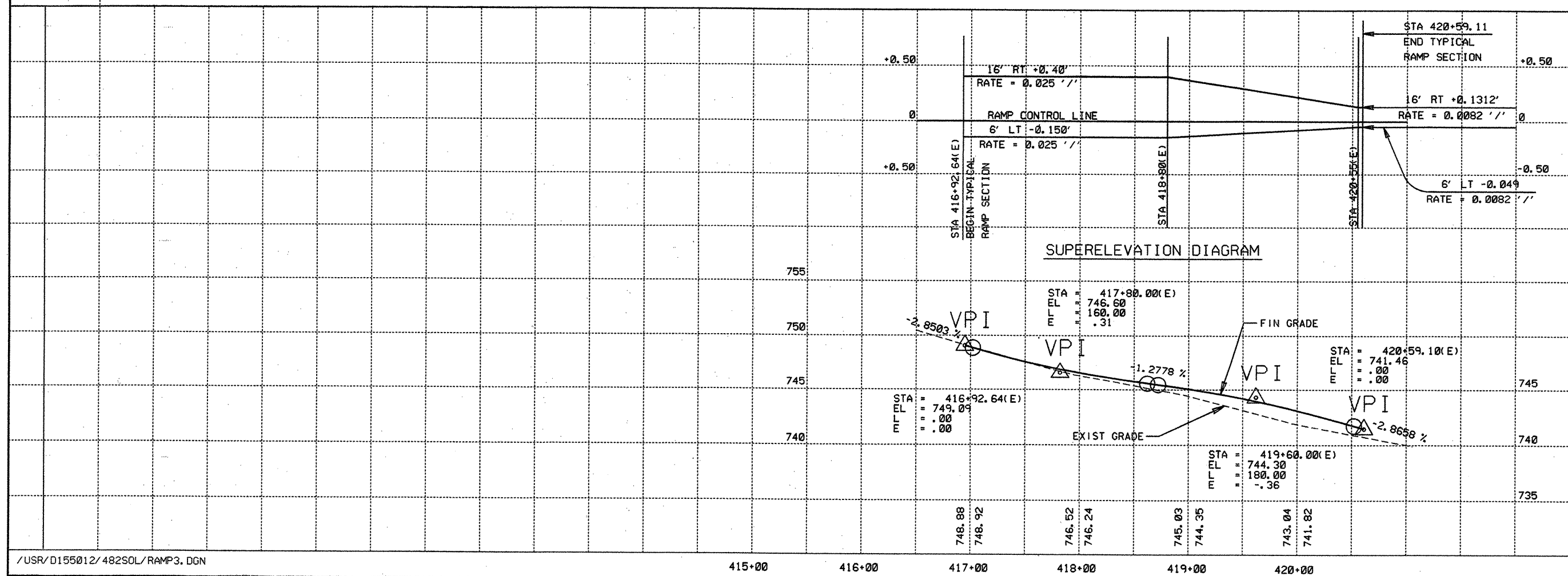
48.00' RT @ STA 375+66.16=
 PI STATION = 410+58.30
 DELTA = 2° 19' 53.83" RT
 DEGREE OF CURVE = 2° 0' .00"
 TANGENT = 58.30
 LENGTH = 116.58
 RADIUS = 2864.79

BEGIN TYPICAL RAMP SECTION
 IH 35 @ STA 382+00.00=
 RAMP STA 416+92.64

BEGIN FULL PAVED GORE
 IH 35 @ STA 385+28.27=
 RAMP STA 420+27.18(E)

TIE RAMP INTO EXIST FRONTAGE ROAD

216.47' RT @ STA 387+06.02=
 PI STATION = 422+31.30
 LENGTH = 00.00



FINISH & EXIST GRADE SHOWN
 ARE ALONG THE RAMP CONTROL
 LINE.



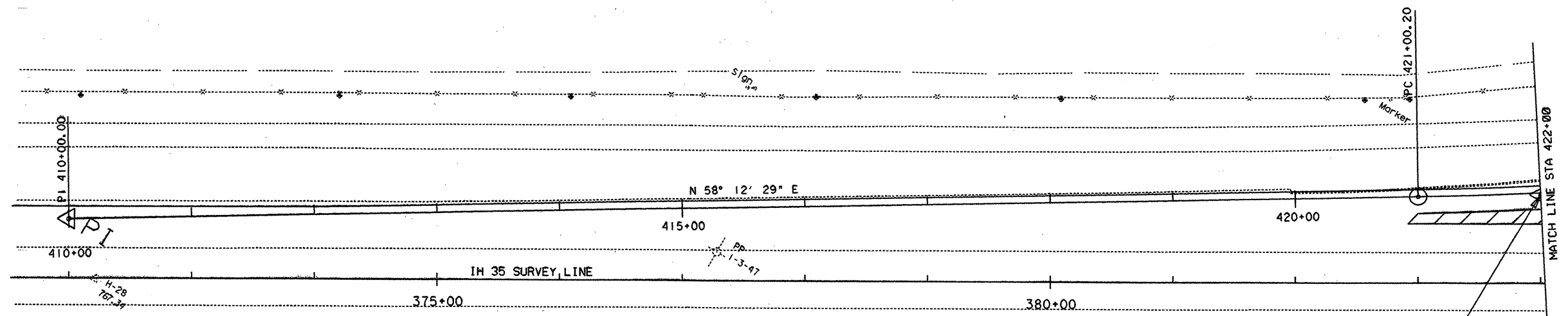
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RAMP
 PLAN PROFILE
 N.B. EXIT
 SCHWAB RD.

SCALE: 1" = 50' HORIZ.
 1" = 5' VERT.

SHEET 14 OF 25 SHEETS			
FED. RD. DIV. NO.	STATE AID PROJECT NO.	SHEET NO.	
6	NH 95 (40) IM	141	
STATE	DIST.	COUNTY	
TEXAS	15	COMAL	
CONT.	SECT.	JOB	HIGHWAY NO.
0016	05	087	IH 35



48.00' LT @ STA 372+00.00=
 PI STATION = 410+00.00
 LENGTH = 00.00

BEGIN TYPICAL RAMP SECTION
 IH 35 L STA 384+00.00=
 RAMP SA 422+00.29(F)



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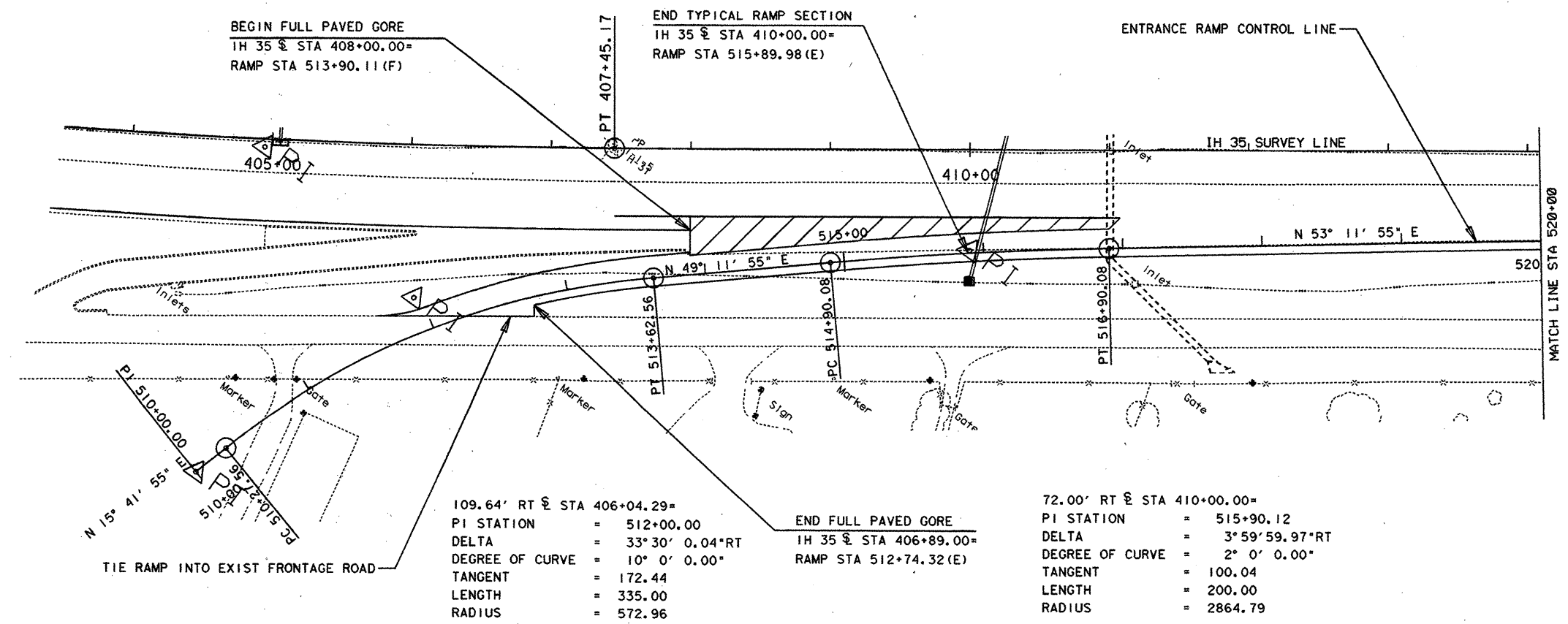
**RAMP
 PLAN PROFILE
 S.B. ENT.
 SCHWAB RD.**

SCALE: 1" = 50' HORIZ.
 1" = 5' VERT.

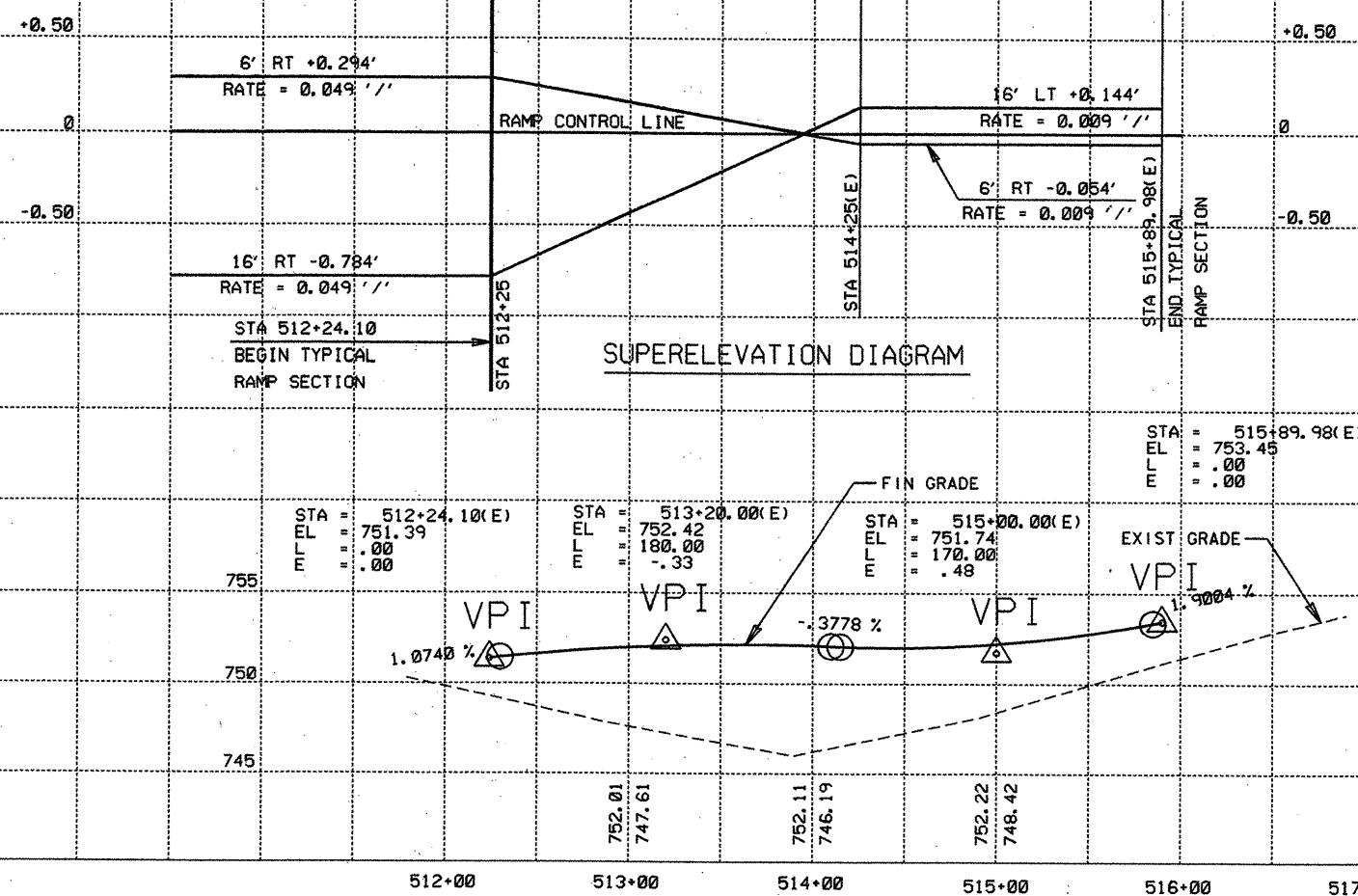
SHEET 15 OF 25 SHEETS

FED. RD. DIV. NO.	STATE AID PROJECT NO.	SHEET NO.
6	NH 95 (40) IM	142
STATE	DIST.	COUNTY
TEXAS	15	COMAL
CONT.	SECT.	JOB
0016	05	087
		HIGHWAY NO.
		IH 35

240.31' RT @ STA 404+57.35=
 PI STATION = 510+00.00
 LENGTH = 00.00



TIE RAMP INTO EXIST FRONTAGE ROAD



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 LINE.

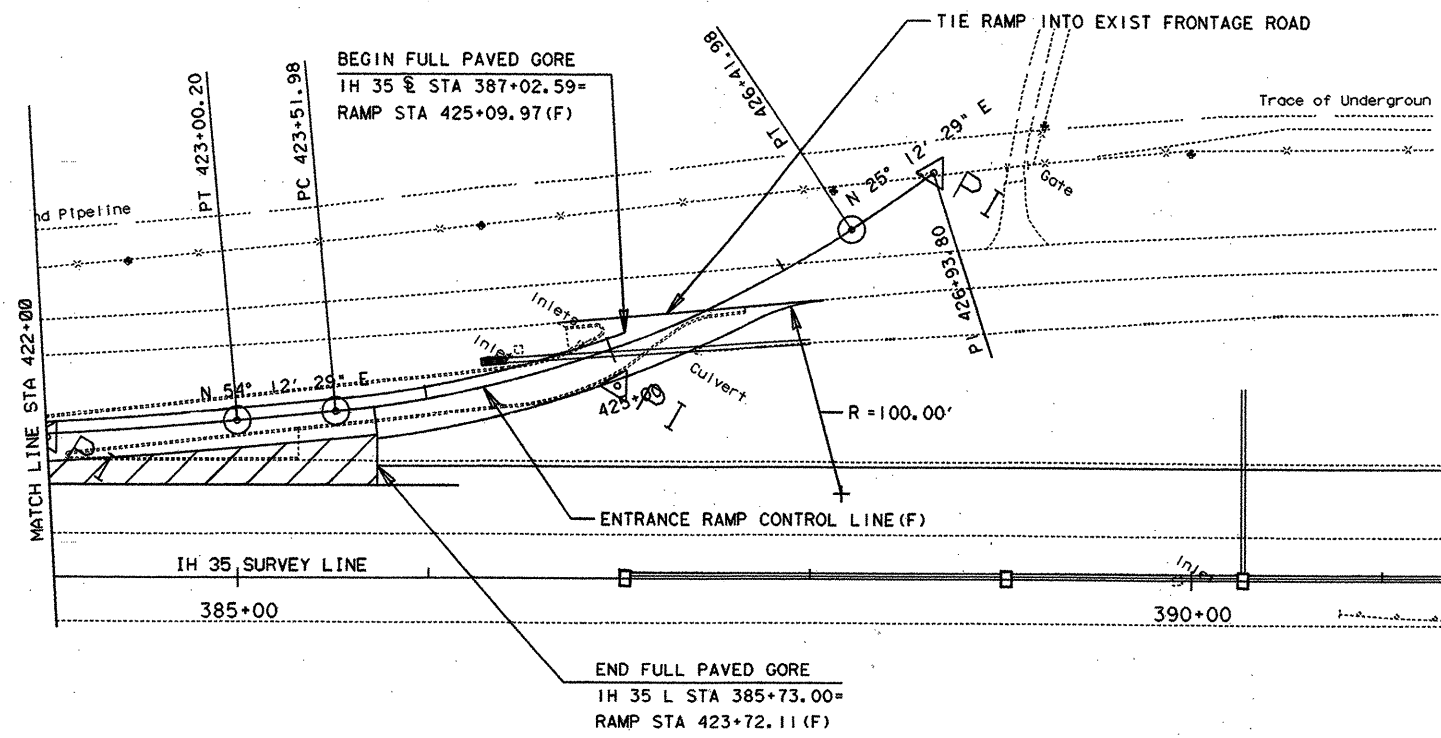


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RAMP PLAN PROFILE N.B. ENT. SCHWAB RD.

SCALE: 1" = 50' HORIZ.
 1" = 5' VERT.

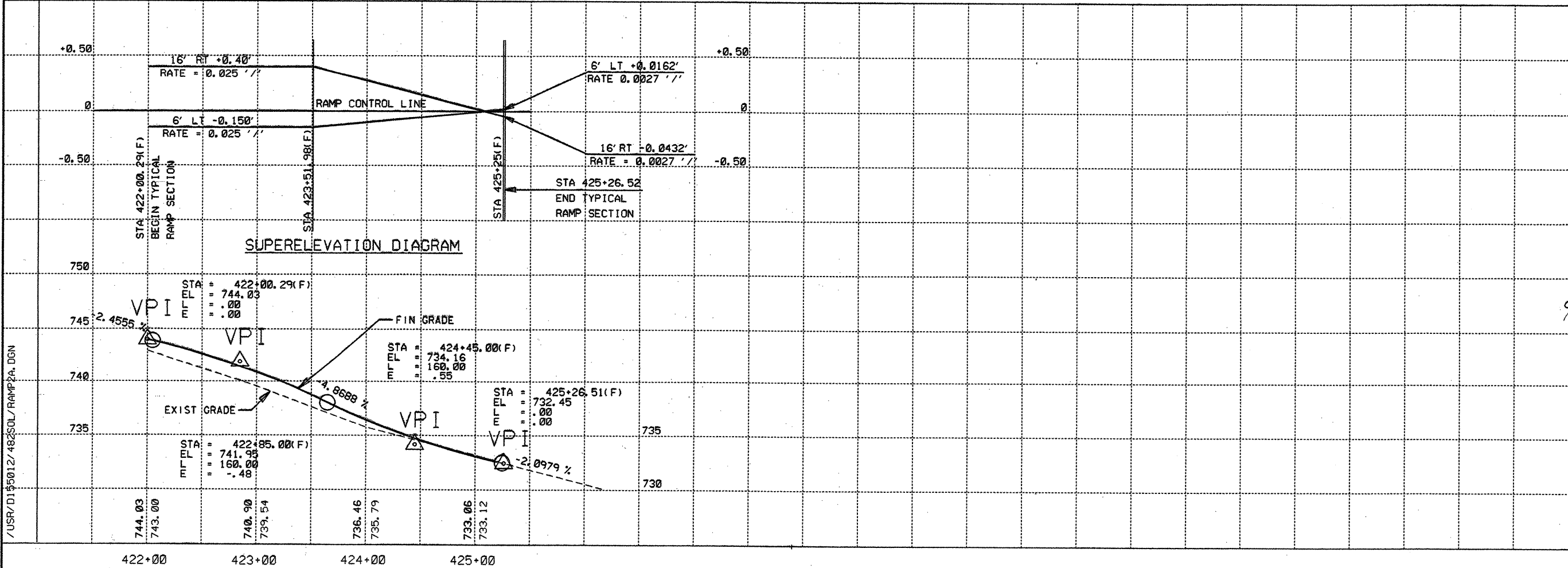
SHEET 17 OF 25 SHEETS			
FED. RD. DIV. NO.	STATE AID PROJECT NO.	SHEET NO.	
6	NH95 (40) IM	144	
STATE	DIST.	COUNTY	
TEXAS	15	COMAL	
CONT.	SECT.	JOB	HIGHWAY NO.
0016	05	087	IH 35



211.17' LT @ STA 388+64.31=
 PI STATION = 426+93.80
 LENGTH = 00.00

72.00' LT @ STA 384+00.00=
 PI STATION = 422+00.24
 DELTA = 4° 0' 0.00" LT
 DEGREE OF CURVE = 2° 0' 0.00"
 TANGENT = 100.04
 LENGTH = 200.00
 RADIUS = 2864.79

98.91' LT @ STA 386+98.79=
 PI STATION = 425+00.16
 DELTA = 28° 59' 59.99" LT
 DEGREE OF CURVE = 10° 0' 0.00"
 TANGENT = 148.18
 LENGTH = 290.00
 RADIUS = 572.96



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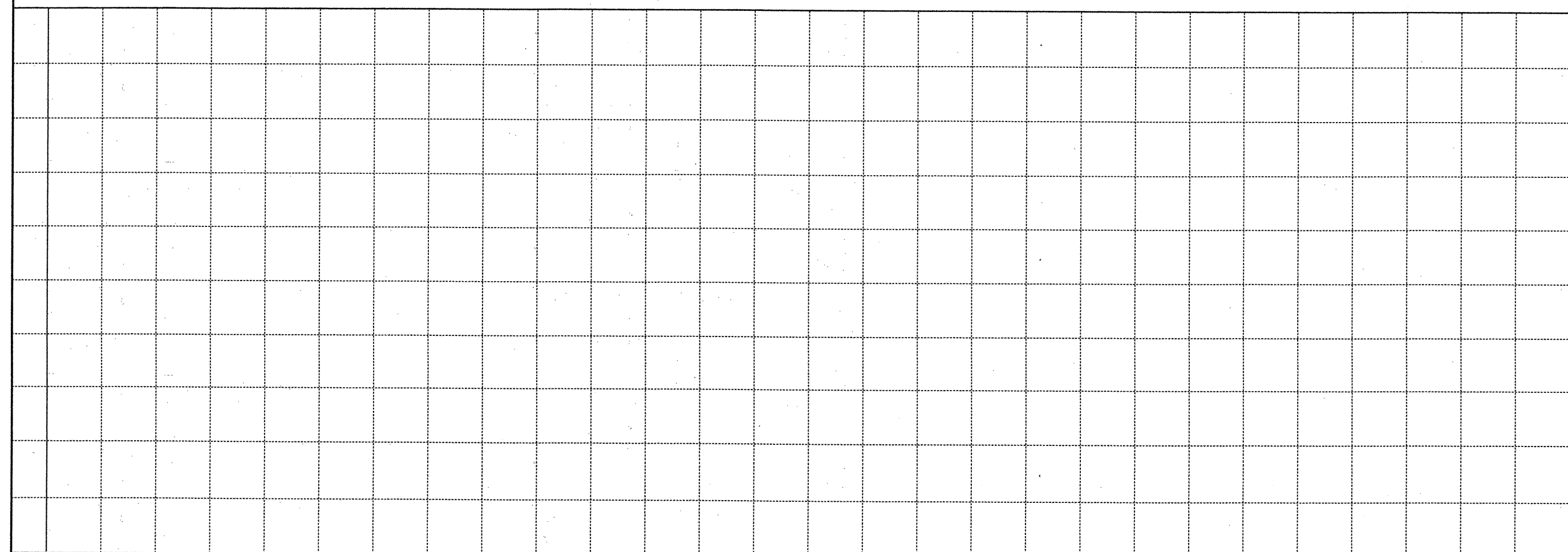
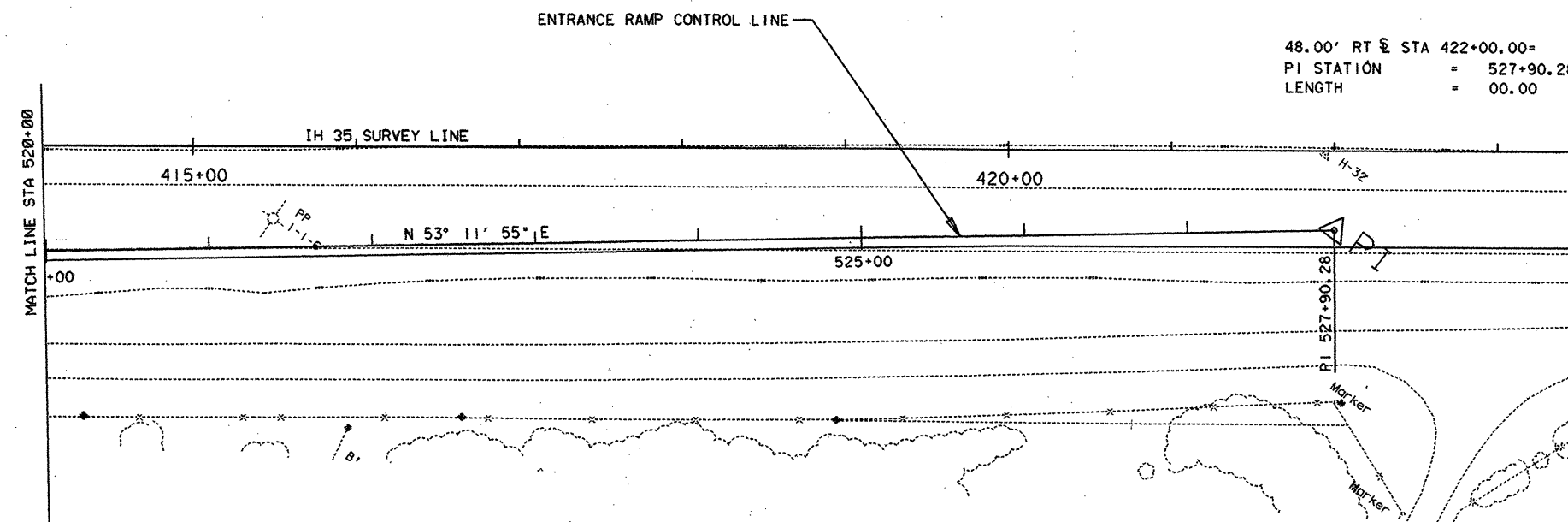
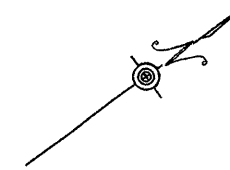
Gregory A. Malatek, P.E.

**RAMP
 PLAN PROFILE
 S.B. ENT.
 SCHWAB RD.**

SCALE: 1" = 50' HORIZ.
 1" = 5' VERT.

SHEET 16 OF 25 SHEETS

FED. RD. DIST. NO.	STATE AID PROJECT NO.	SHEET NO.
6	NH95 (40) IM	163
STATE	DIST.	COUNTY
TEXAS	15	COMAL
CONT.	SECT.	JOB
0016	05	087
		HIGHWAY NO.
		IH 35



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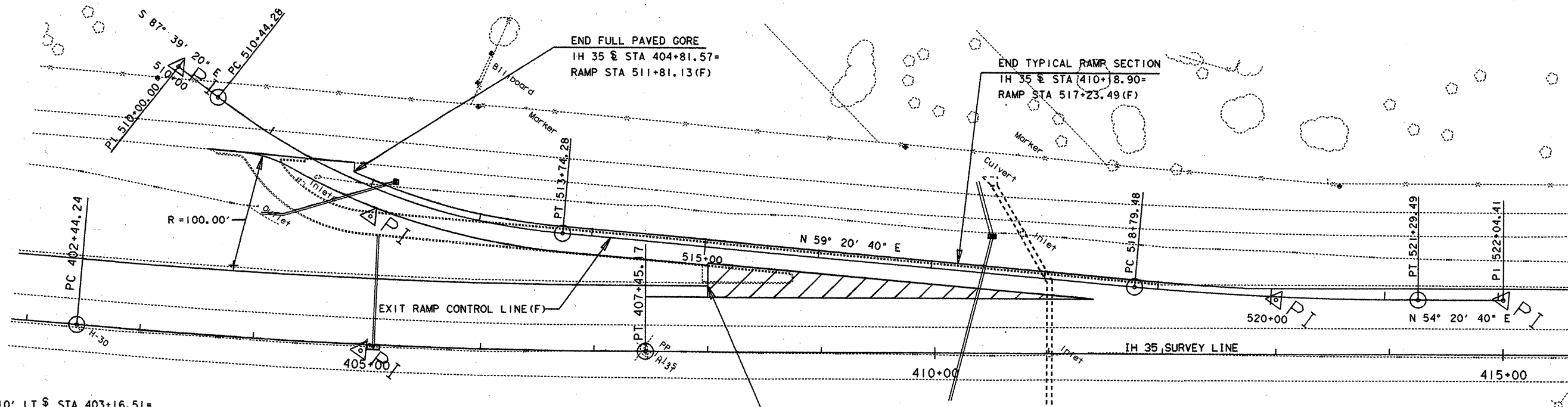
4/7, 1995.
Gregory A. Malatek, P.E.

RAMP
PLAN PROFILE
N.B. ENT.
SCHWAB RD.

SCALE: 1" = 50' HORIZ.
1" = 5' VERT.

SHEET 18 OF 25 SHEETS

FED. RD. DIV. NO.	STATE AID PROJECT NO.	SHEET NO.
6	NH 95 (40) IM	145
STATE	DIST.	COUNTY
TEXAS	15	COMAL
CONT.	SECT.	JOB
0016	05	087
		HIGHWAY NO.
		1H 35



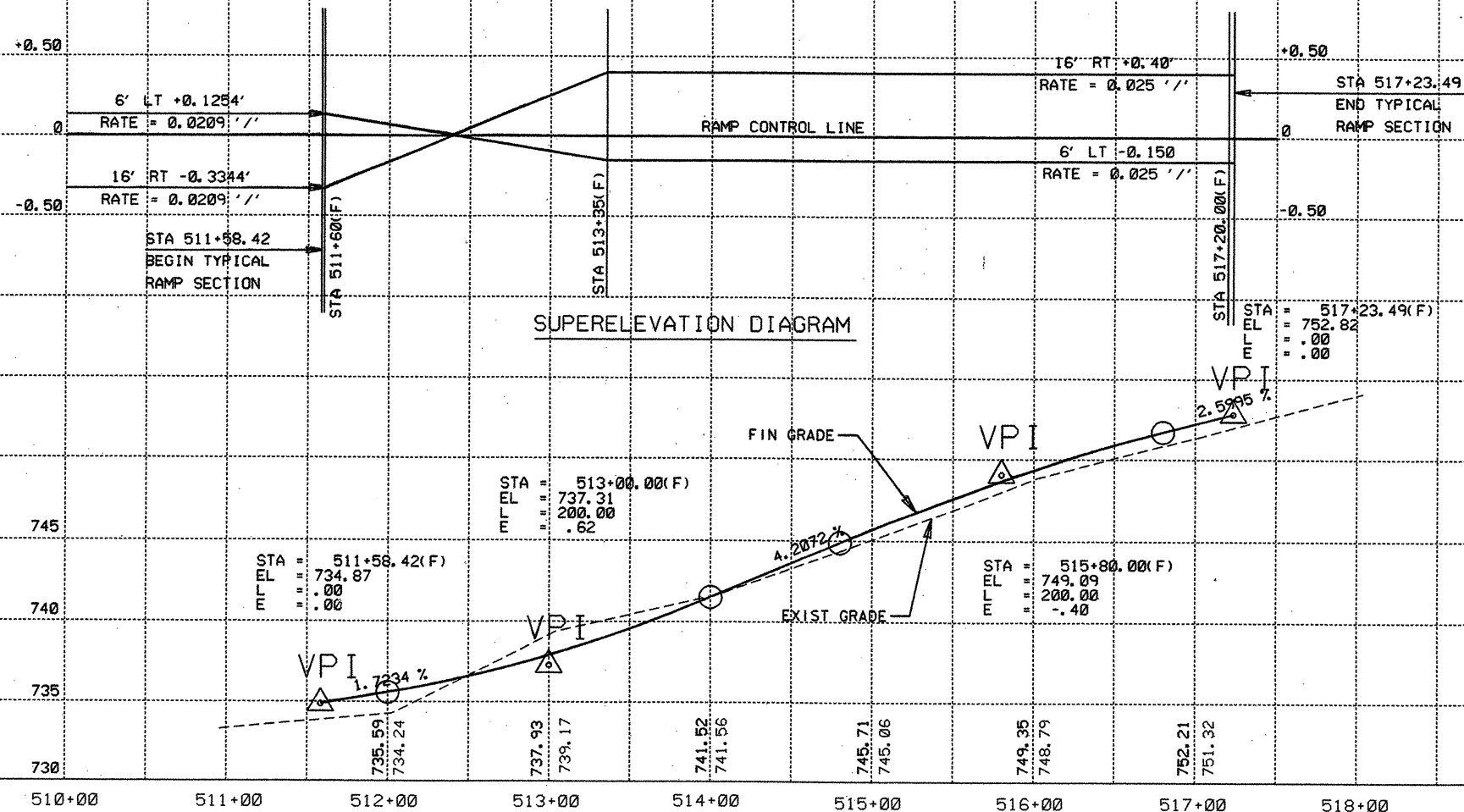
234.10' LT @ STA 403+16.51=
PI STATION = 510+00.00
LENGTH = 00.00

112.50' LT @ STA 404+98.12=
PI STATION = 512+14.00
DELTA = 33° 0' 0.01" LT
DEGREE OF CURVE = 10° 0' 0.00"
TANGENT = 169.72
LENGTH = 330.00
RADIUS = 572.96

BEGIN FULL PAVED GORE
IH 35 @ STA 408+00.00=
RAMP STA 515+03.77(F)

48.00' LT @ STA 413+00.00=
PI STATION = 520+04.56
DELTA = 5° 0' 0.03" LT
DEGREE OF CURVE = 2° 0' 0.00"
TANGENT = 125.08
LENGTH = 250.00
RADIUS = 2864.79

48.00' LT @ STA 415+00.00=
PI STATION = 522+04.41
LENGTH = 00.00



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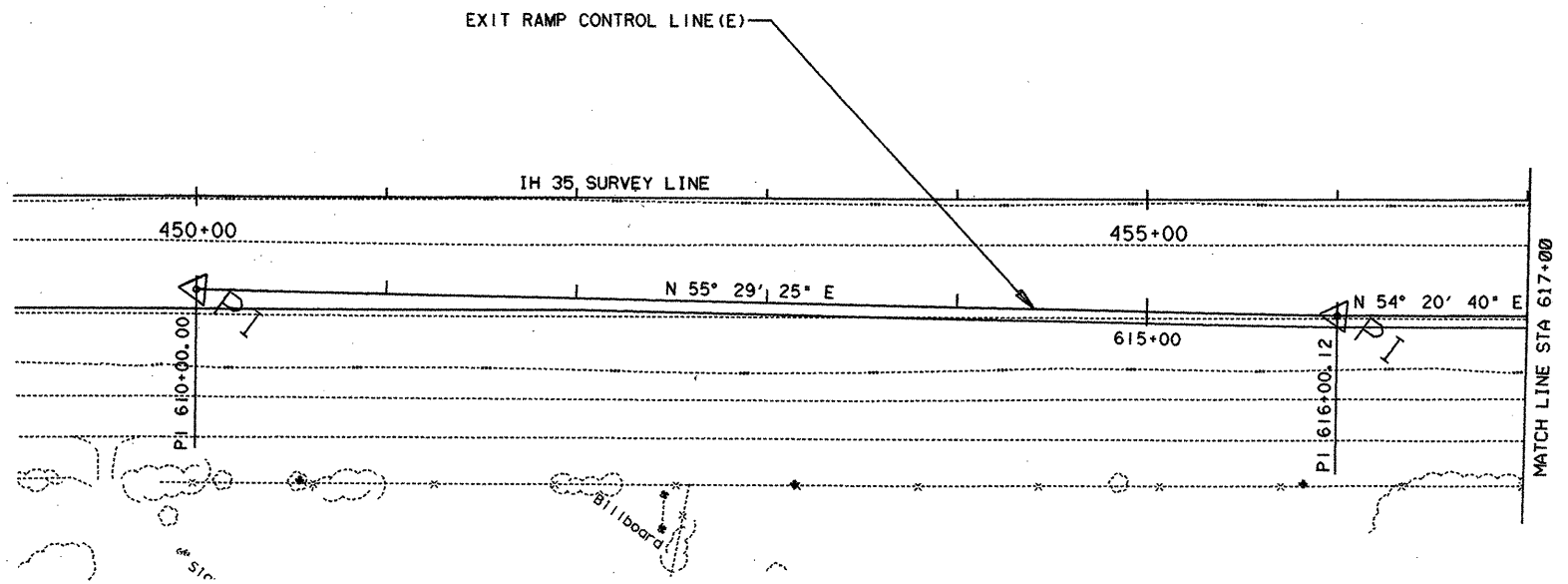
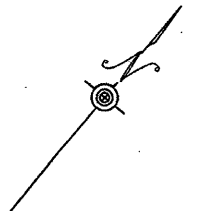
4/7, 1995.
Gregory A. Malatek P.E.

RAMP PLAN PROFILE S.B. EXIT SCHWAB RD.

SCALE: 1" = 50' HORIZ.
1" = 5' VERT.

SHEET 19 OF 25 SHEETS

FED. RD. DIV. NO.	STATE AID PROJECT NO.	SHEET NO.
6	NH95(40) IM	146
STATE	DIST.	COUNTY
TEXAS	15	COMAL
CONT.	SECT.	JOB
0016	05	087
		HIGHWAY NO.
		IH 35



48.00' RT @ STA 450+00.00=
PI STATION = 610+00.00
LENGTH = 00.00

60.00' RT @ STA 456+00.00=
PI STATION = 616+00.12
DELTA = 1° 8' 44.71" LT
NO CURVE



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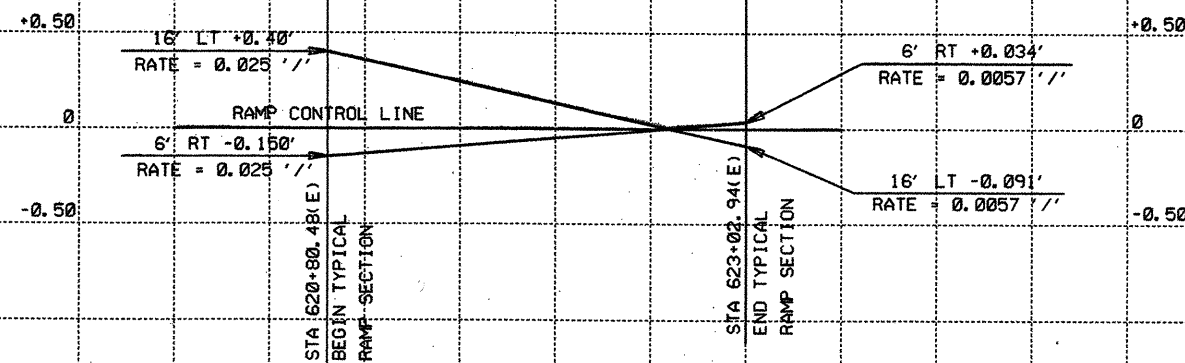
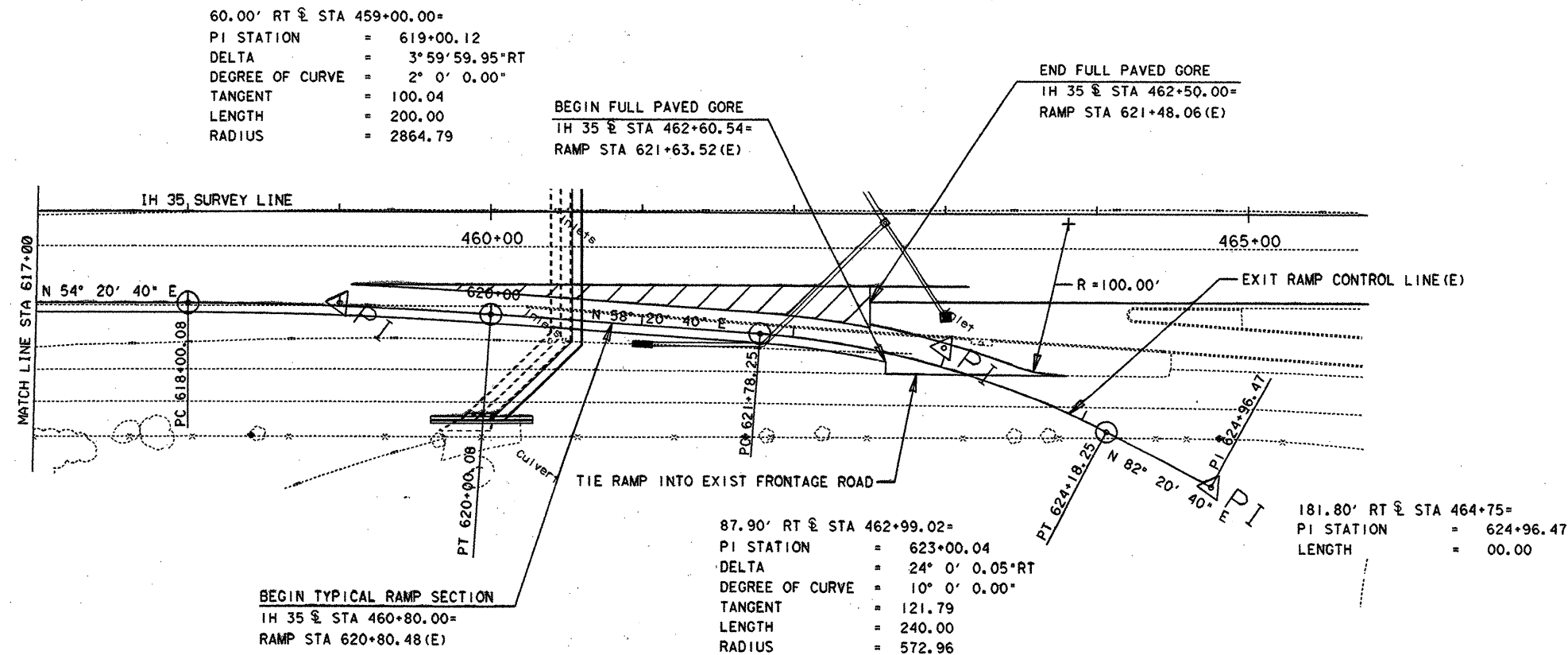
4/7/1995
Gregory A. Malatek, P.E.

RAMP
PLAN PROFILE
N.B. EXIT
ENGEL RD.

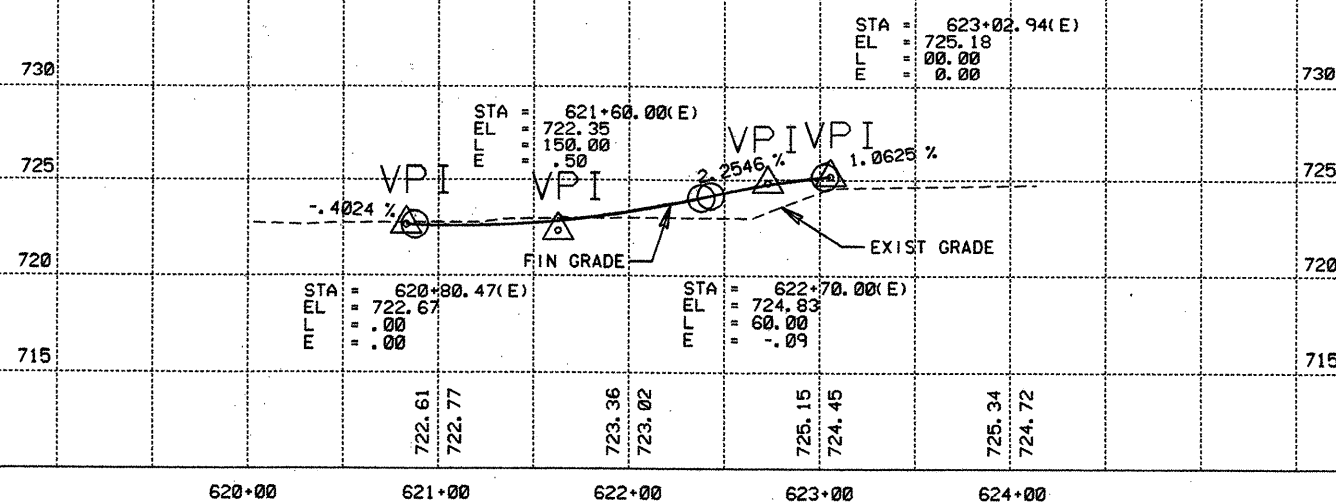
SCALE: 1" = 50' HORIZ.
1" = 5' VERT.

SHEET 20 OF 25 SHEETS

FED. RD. DIV. NO.	STATE AID PROJECT NO.			SCALE
6	NH95(40) IM			1/4"
STATE	DIST.	COUNTY		
TEXAS	15	COMAL		
CONT.	SECT.	JOB	HIGHWAY NO.	
0016	05	087	IH 35	



SUPERELEVATION DIAGRAM



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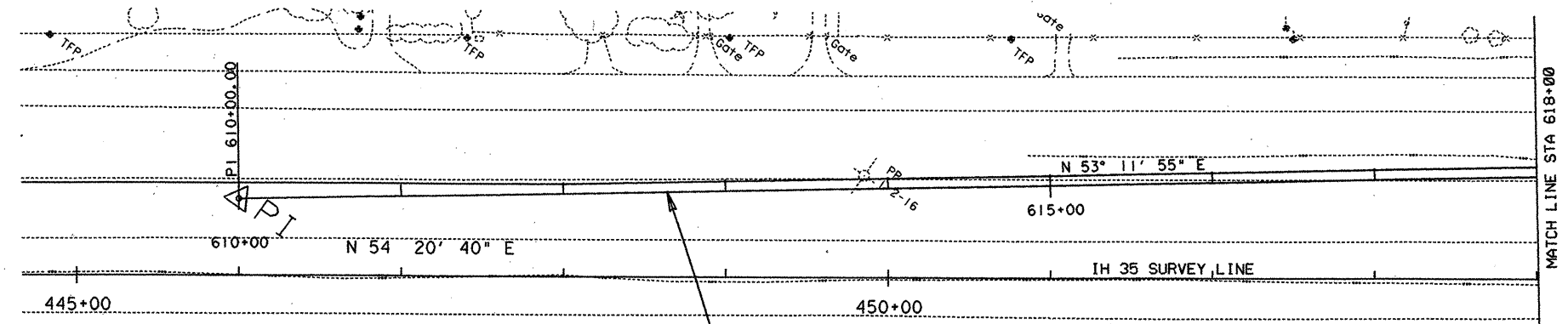
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 Gregory A. Malatek, P.E.

RAMP
 PLAN PROFILE
 N.B. EXIT
 ENGEL RD.

SCALE: 1" = 50' HORIZ.
 1" = 5' VERT.

SHEET 21 OF 25 SHEETS

FED. RD. DIV. NO.	STATE AID PROJECT NO.		SHEET NO.
6	NH 95 (40) IM		148
STATE	DIST.	COUNTY	
TEXAS	15	COMAL	
CONT.	SECT.	JOB	HIGHWAY NO.
0016	05	087	IH 35



48.00' LT @ STA 456+00.00=
 PI STATION = 610+00.00
 LENGTH = 00.00

ENTRANCE RAMP CONTROL LINE



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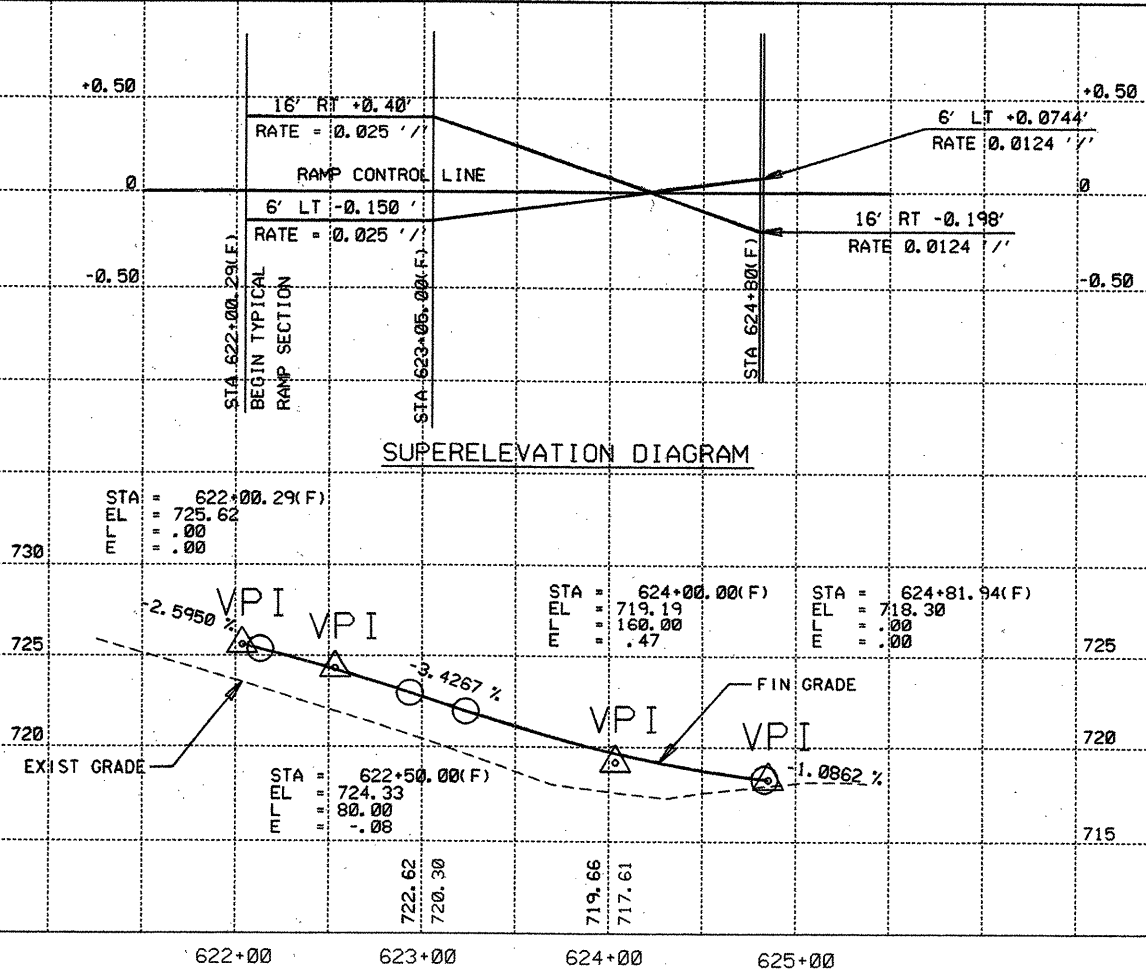
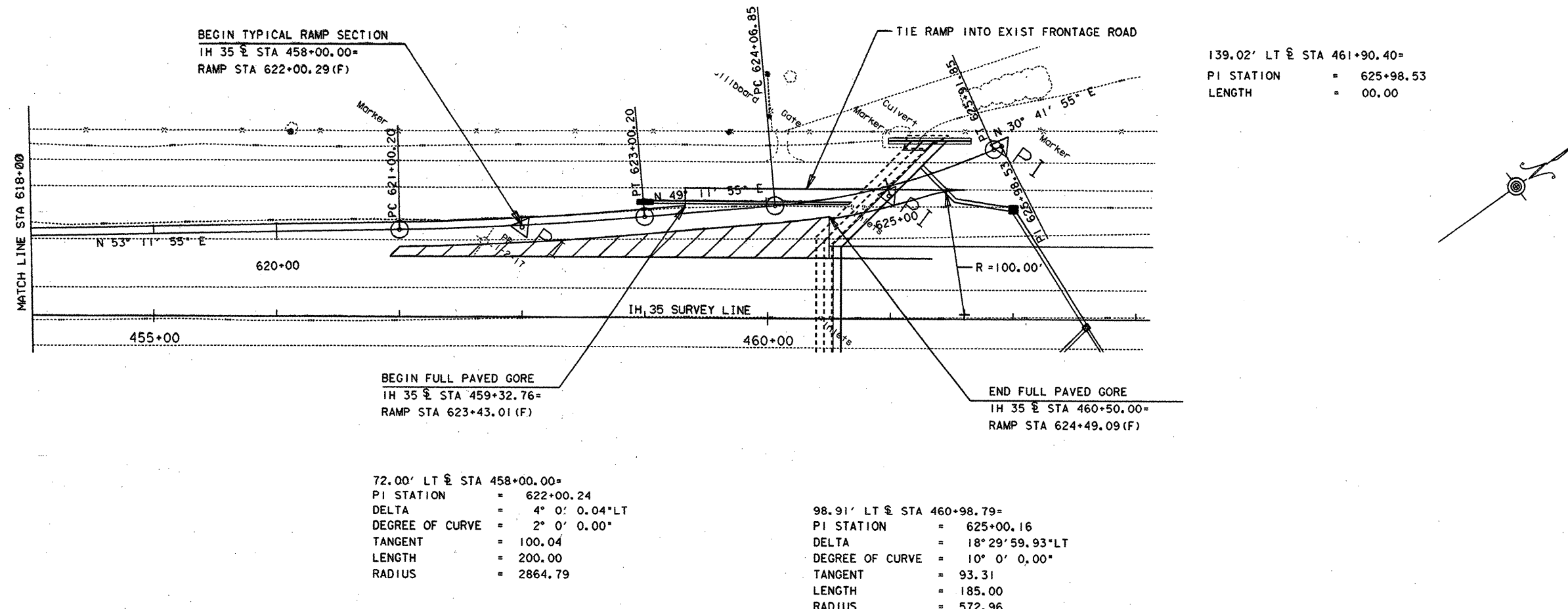
Gregory A. Malatek, P.E.

**RAMP
 PLAN PROFILE
 S.B. ENT.
 ENGEL RD.**

SCALE: 1" = 50' HORIZ.
 1" = 5' VERT.

SHEET 22 OF 25 SHEETS

FED. RD. DIV. NO.	STATE AID PROJECT NO.	SHEET NO.
6	NH 95 (40) IM	49
STATE	DIST.	COUNTY
TEXAS	15	COMAL
CONT.	SECT.	JOB
0016	05	087
		HIGHWAY NO.
		IH 35



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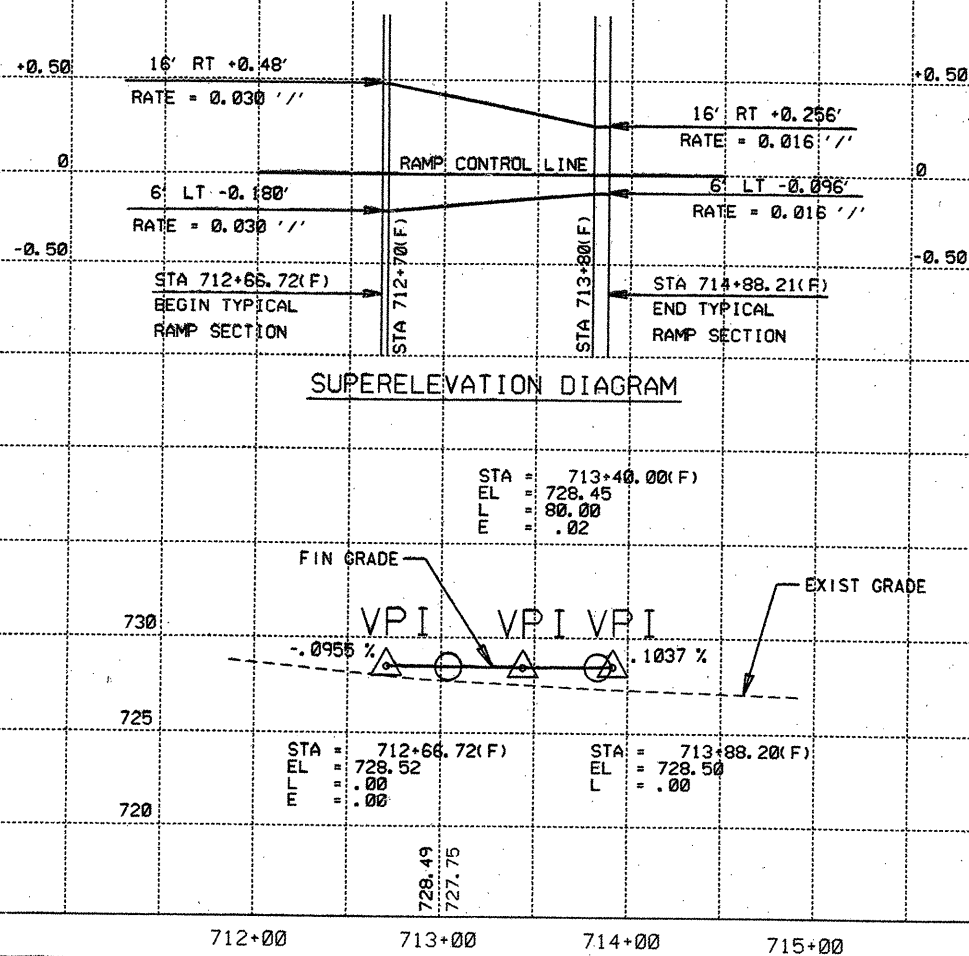
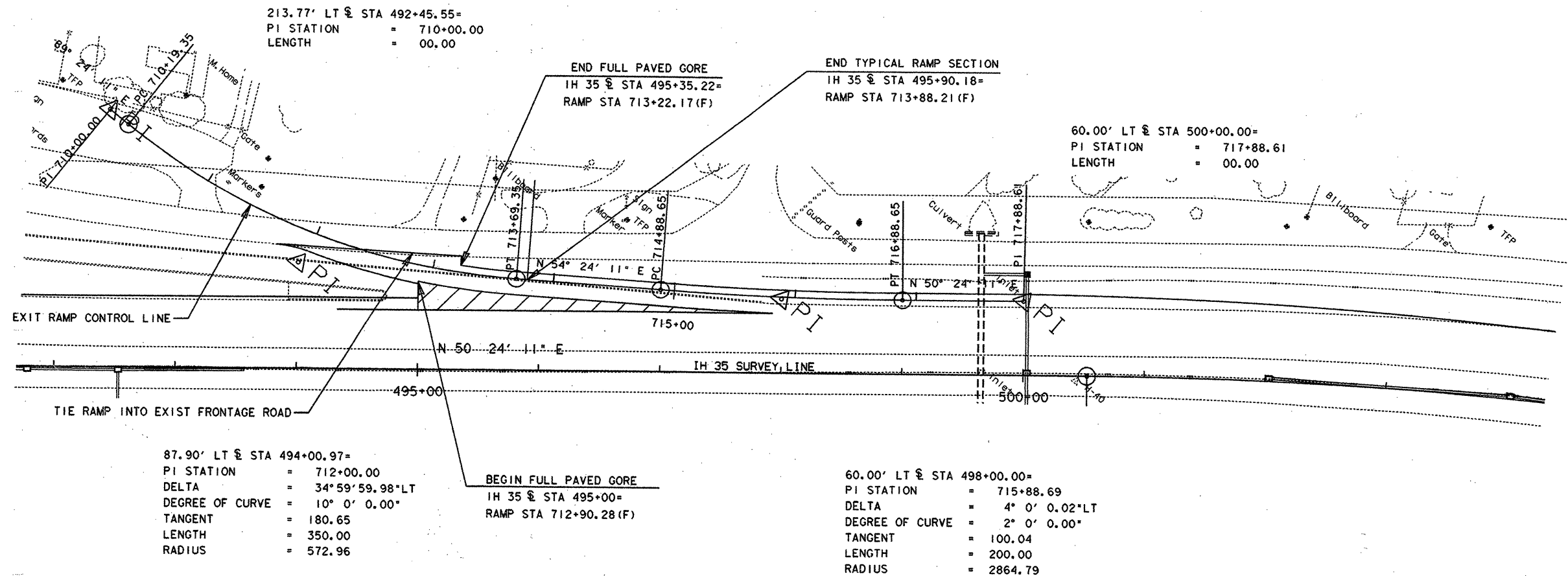


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**RAMP
 PLAN PROFILE
 S.B. ENT.
 ENGEL RD.**

SCALE: 1" = 50' HORIZ.
 1" = 5' VERT.

SHEET 23 OF 25 SHEETS			
FED. RD. DIV. NO.	STATE AID PROJECT NO.		SHEET NO.
6	NH95(40) IM		150
STATE	DIST.	COUNTY	
TEXAS	15	COMAL	
CONT.	SECT.	JOB	HIGHWAY NO.
0016	05	087	IH 35



FINISH & EXIST GRADE SHOWN
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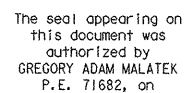
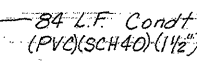
4/7/1995
Gregory A. Malatek, P.E.

RAMP PLAN PROFILE S.B. EXIT ENGEL RD.

SCALE: 1" = 50' HORIZ.
1" = 5' VERT.

SHEET 25 OF 25 SHEETS

FED. RD. DIV. NO.	STATE AID PROJECT NO.	SHEET NO.
6	NH 95 (40) IM	152
STATE	DIST.	COUNTY
TEXAS	15	COMAL
CONT.	SECT.	JOB
0016	05	087
		HIGHWAY NO.
		IH 35



Gregory A. Malachuk, P.E.

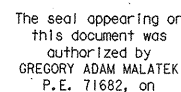
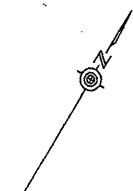
SHEET TOTALS

LEGEND

- A-1 (TY SP 48S-8-8) (.4KW) S
- ⚙ A-2 (TY SA 40T-8) (.25KW) S
- GROUND BOX WITH APRONS
- ⬢ SERVICE POLE
- ☒ JUNCTION Box (See ED 1-93)

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	NH 95 (40) IM		154
STATE	STATE DIST. NO.	COUNTY	
TEXAS	15	COMAL	
CONT.	SECT.	JOB	HIGHWAY NO.
0016	05	087	1H 35

SHEET 2 OF 26



4/5, 1995.
Gregory A. Malatch, P.E.

SHEET TOTALS

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	NH 95 (40) IM		155
STATE	STATE DIST. NO.	COUNTY	
TEXAS	15	COMAL	
CONT.	SECT.	JOB	HIGHWAY NO.
0016	05	087	1H 35

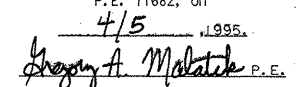
SHEET 3 OF 26

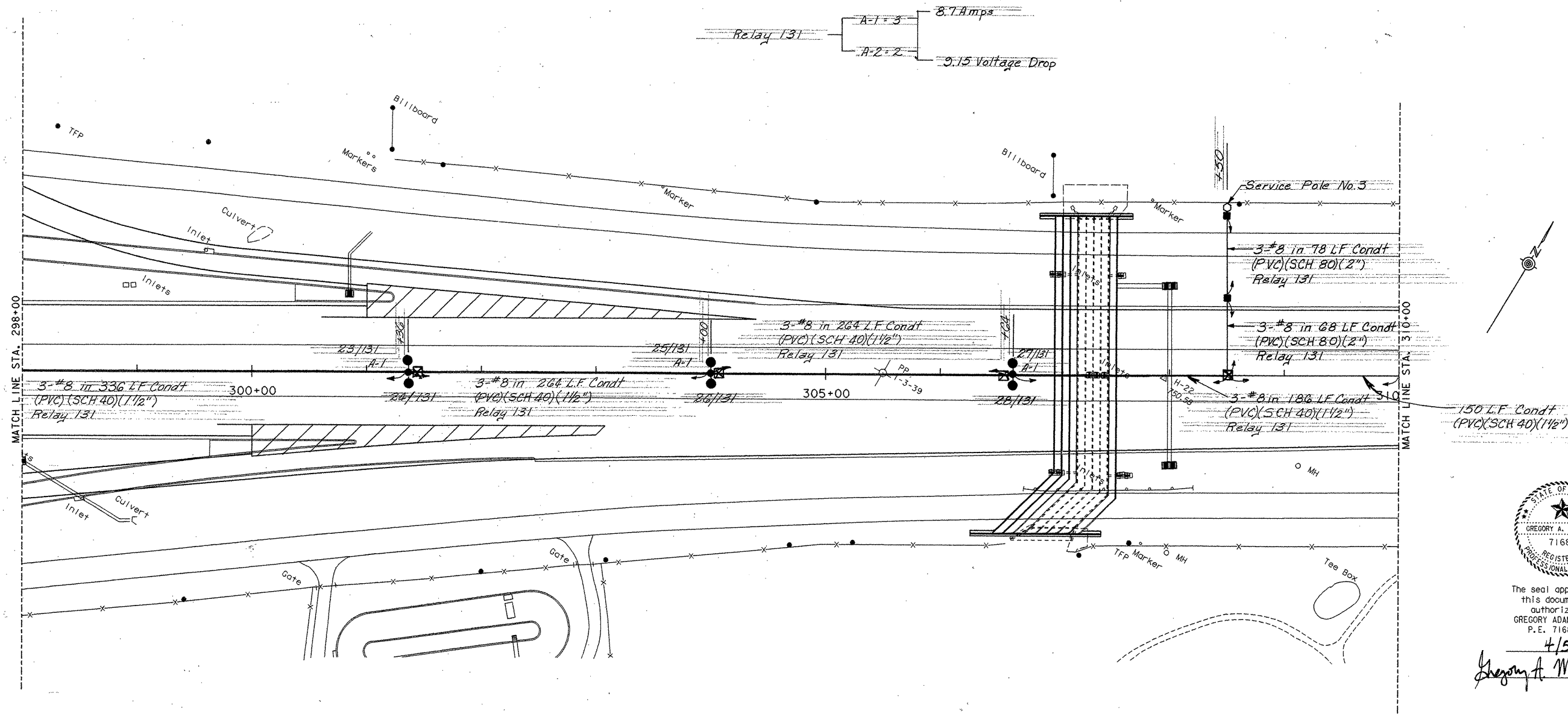


4/5, 1995.
Gregory A. Matatek, P.E.

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	NH95 (40) IM		157
STATE	STATE DIST. NO.	COUNTY	
TEXAS	15	COMAL	
CONT.	SECT.	JOB	HIGHWAY NO.
0016	05	087	1H 35

SHEET 5 OF 26





The seal appearing on this document was authorized by GREGORY ADAM MALATEK P.E. 71682, on

4/5, 1995.
Gregory A. Malatek P.E.

SCALE 1" = 50'

NOTE:
 ALL POLES BY FRONTAGE ROAD SHALL BE A MINIMUM OF 10.0' BEHIND THE E.P.

LEGEND

- A-1 (TY SP 48S-8-8) (.4KW) S
- ⊗ A-2 (TY SA 40T-8) (.25KW) S
- GROUND BOX WITH APRONS
- SERVICE POLE
- ⊠ JUNCTION BOX (See ED 1-93)

SHEET TOTALS

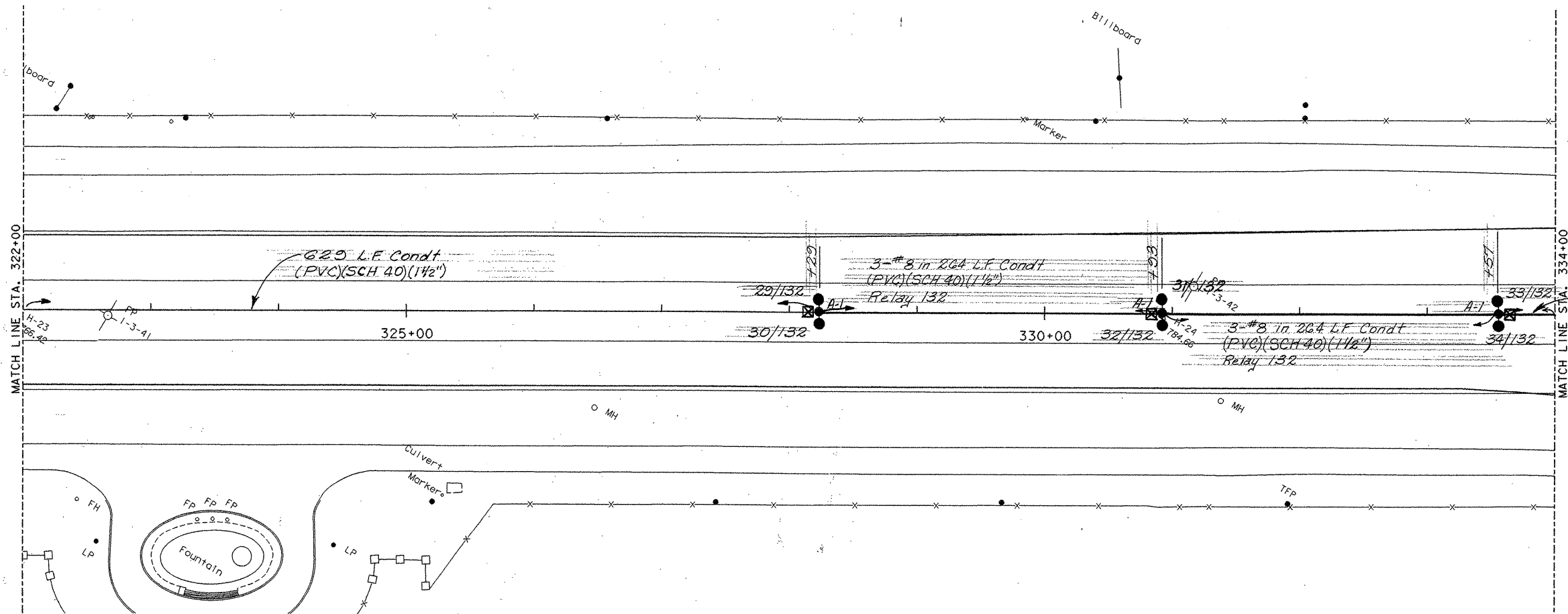
EST.	FINAL	UNIT	DESCRIPTION
3		EA	(TY SP 48S-8-8) (.4 KW) S
1,200		LF	CONDT (PVC) (SCH 40) (1 1/2")
3,588		LF	ELEC CONDR (NO. 8) (TY XHHW)
1		EA	SERV POLE
2		EA	GROUND BOX
146		LF	CONDT (PVC) (SCH 80) (2")

ILLUMINATION SHEET

Rw. 6-15-95

SHEET 7 OF 26

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.
6	NH 95 (40) IM	159
STATE	STATE DIST. NO.	COUNTY
TEXAS	15	COMAL
CONT.	SECT.	JOB
0016	05	087
		HIGHWAY NO.
		1H 35



The seal appearing on this document was authorized by GREGORY ADAM MALATEK P.E. 71682, on 4/5, 1995.

Gregory A. Malatek, P.E.

SCALE 1" = 50'

NOTE:
ALL POLES BY FRONTAGE ROAD SHALL BE A MINIMUM OF 10.0' BEHIND THE E.P.

LEGEND

- A-1 (TY SP 48S-8-8) (.4KW) S
- A-2 (TY SA 40T-8) (.25KW) S
- GROUND BOX WITH APRONS
- SERVICE POLE
- ⊠ JUNCTION BOX (See ED 1-93)

SHEET TOTALS

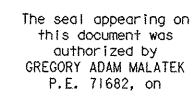
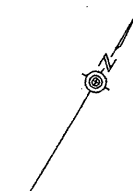
EST.	FINAL	UNIT	DESCRIPTION
3		EA	(TY SP 48S-8-8) (.4 KW) S
1,200		LF	CONDT (PVC) (SCH 40) (1 1/2")
1,713		LF	ELEC CONDR (NO. 8) (TY XHHW)

ILLUMINATION SHEET

Rev. 6-15-95

SHEET 9 OF 26

FED. RD. DIV. NO.	6	FEDERAL AID PROJECT NO.	NH 95 (40) IM	SHEET NO.	161
STATE	TEXAS	STATE DIST. NO.	15	COUNTY	COMAL
CONT.	0016	SECT.	05	JOB	087
				HIGHWAY NO.	1H 35



73, 1995.
Gregory A. Malachuk, P.

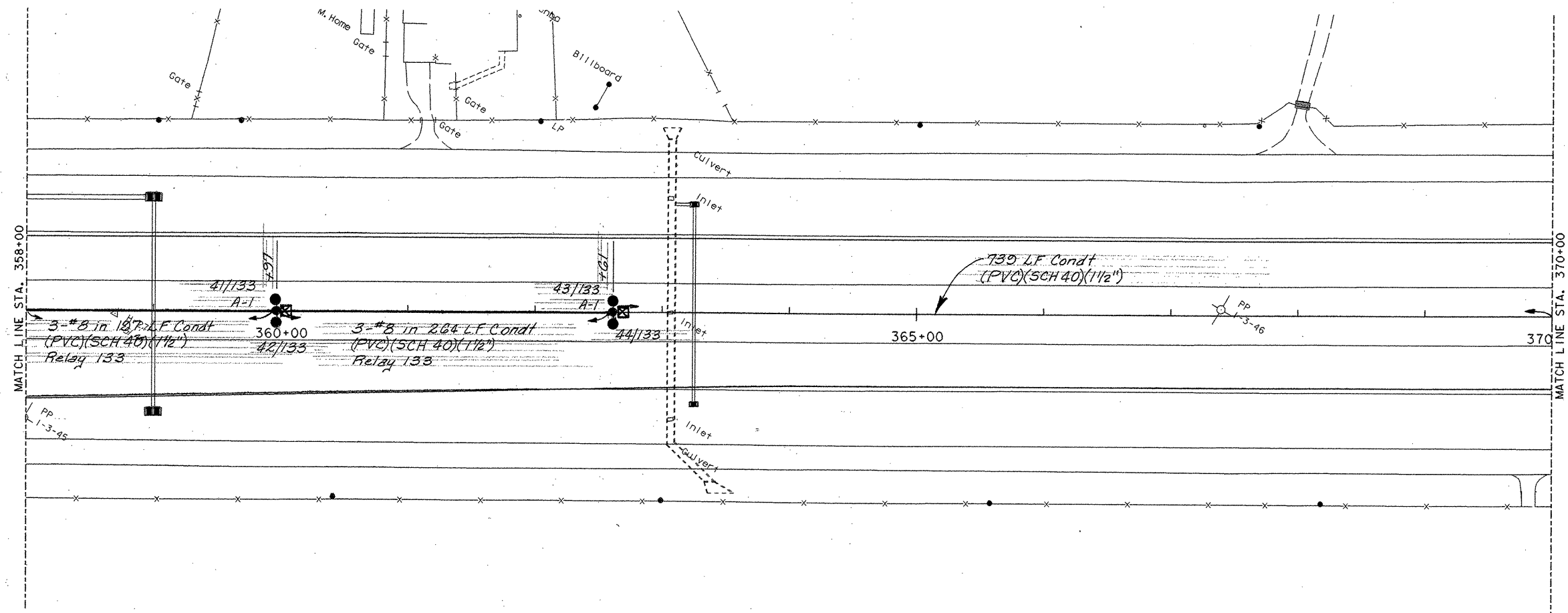
NOTE:
ALL POLES BY FRONTAGE
ROAD SHALL BE A MINIMUM OF
10.0' BEHIND THE E.P.

- A-1 (TY SP 48S-8-8) (.4KW) S
- A-2 (TY SA 40T-8) (.25KW) S
- GROUND BOX WITH APRONS
- ◇ SERVICE POLE
- ☒ JUNCTION Box (See ED 1-93)

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	NH 95 (40) IM		162
STATE	STATE DIST. NO.	COUNTY	
TEXAS	15	COMAL	
CONT.	SECT.	JOB	HIGHWAY NO.
0016	05	087	1H 35

Rev. 6-15-95

SHEET 10 OF 26



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Gregory A. Malatek, P.E.

SCALE 1" = 50'

NOTE:
ALL POLES BY FRONTAGE
ROAD SHALL BE A MINIMUM OF
10.0' BEHIND THE E.P.

LEGEND

- A-1 (TY SP 48S-8-8) (.4KW) S
- ⌘ A-2 (TY SA 40T-8) (.25KW) S
- GROUND BOX WITH APRONS
- SERVICE POLE
- ☒ JUNCTION BOX (See ED 1-93)

SHEET TOTALS

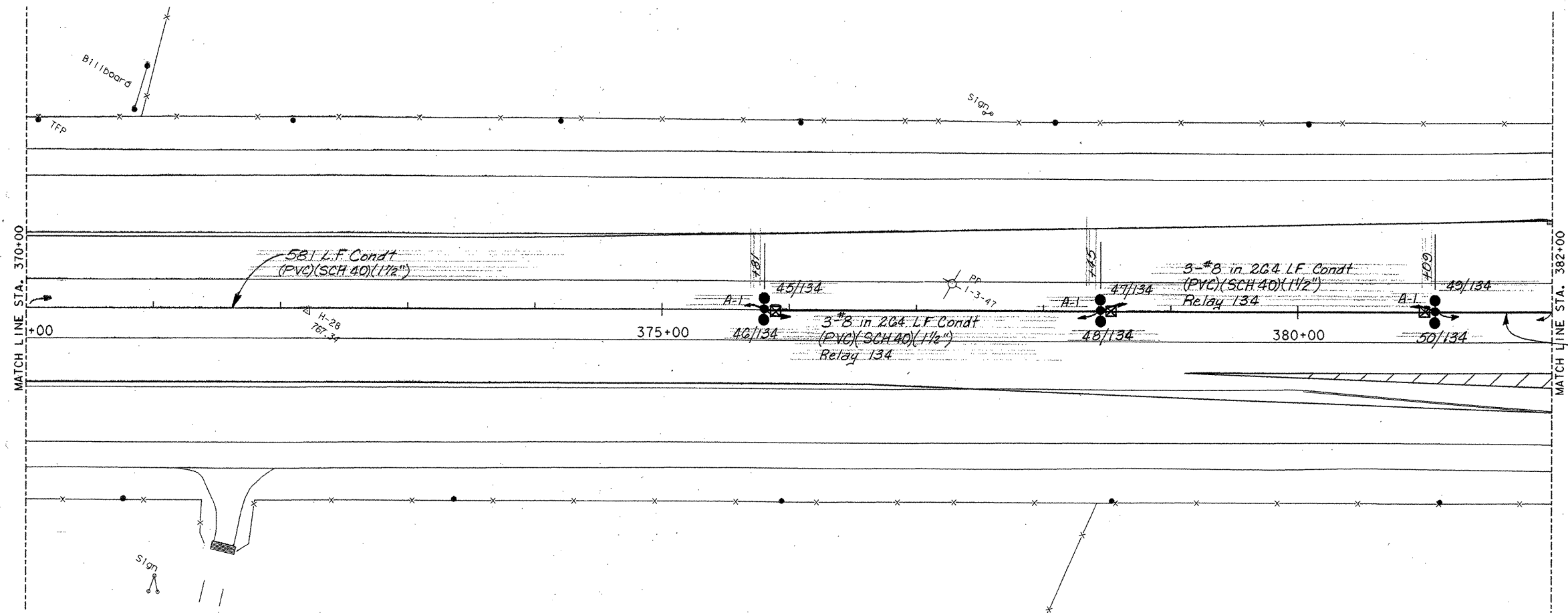
EST.	FINAL	UNIT	DESCRIPTION
2		EA	(TY SP 48S-8-8) (.4 KW) S
1,200		LF	CONDT (PVC) (SCH 40) (1 1/2")
1,383		LF	ELEC CONDR (NO. 8) (TY XHHW)

ILLUMINATION SHEET

Rev. 6-15-95

SHEET 12 OF 26

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.
6	NH 95 (40) IM	164
STATE	STATE DIST. NO.	COUNTY
TEXAS	15	COMAL
CONT.	SECT.	JOB
0016	05	087
		HIGHWAY NO.
		1H 35



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Gregory A. Malatek, P.E.

SCALE 1" = 50'

NOTE:
ALL POLES BY FRONTAGE ROAD SHALL BE A MINIMUM OF 10.0' BEHIND THE E.P.

LEGEND

- A-1 (TY SP 48S-8-8) (.4KW) S
- ⌘ A-2 (TY SA 40T-8) (.25KW) S
- GROUND BOX WITH APRONS
- SERVICE POLE
- ⊠ JUNCTION BOX (See ED 1-93)

SHEET TOTALS

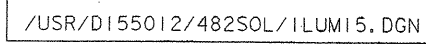
EST.	FINAL	UNIT	DESCRIPTION
3		EA	(TY SP 48S-8-8) (.4 KW) S
1,200		LF	COND'T (PVC) (SCH 40) (1 1/2")
1,857		LF	ELEC COND'R (NO.8) (TY XHHW)

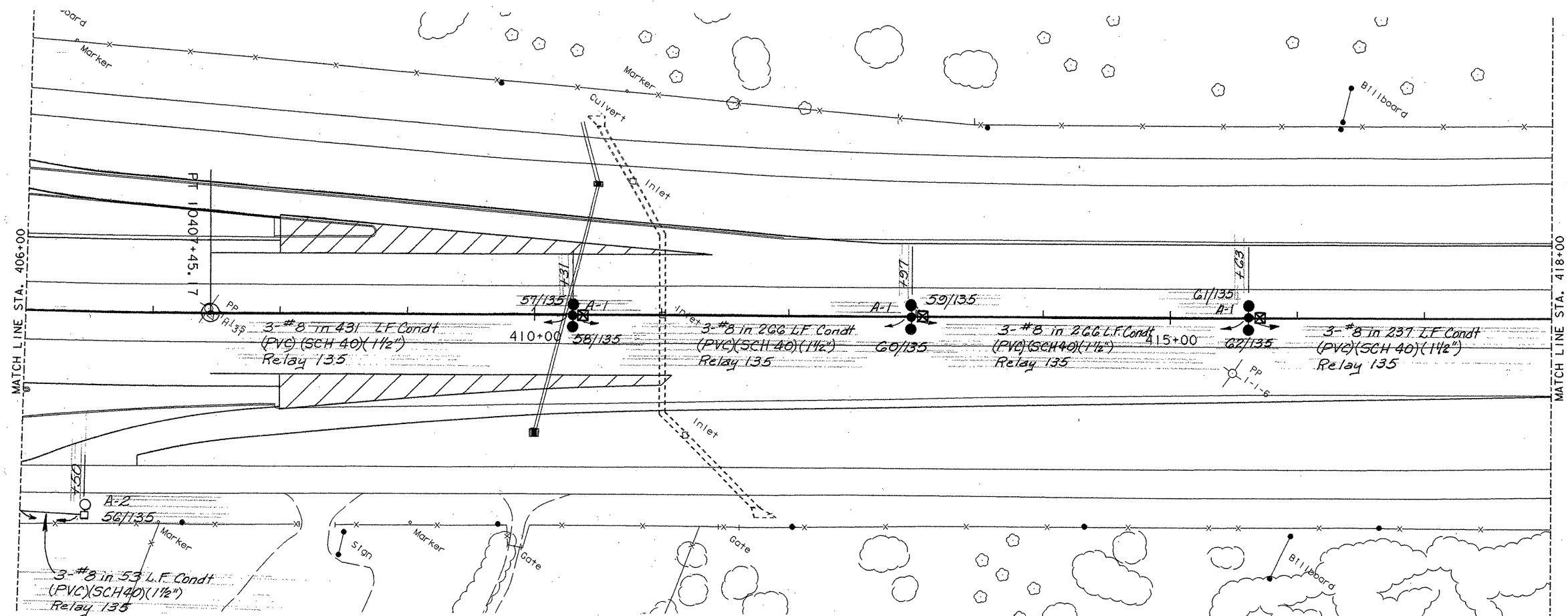
ILLUMINATION SHEET

Rev. 6-15-95

SHEET 13 OF 26

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	NH 95 (40) IM		165
STATE	STATE DIST. NO.	COUNTY	
TEXAS	15	COMAL	
CONT.	SECT.	JOB	HIGHWAY NO.
0016	05	087	1H 35





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Gregory H. Malatek, P.E.

SCALE 1" = 50'

NOTE:
ALL POLES BY FRONTAGE ROAD SHALL BE A MINIMUM OF 10.0' BEHIND THE E.P.

LEGEND

- A-1 (TY SP 48S-8-8) (.4KW) S
- ⊗ A-2 (TY SA 40T-8) (.25KW) S
- GROUND BOX WITH APRONS
- SERVICE POLE
- ⊠ JUNCTION BOX (See ED 1-93)

SHEET TOTALS

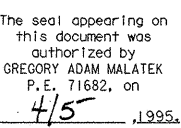
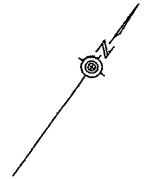
EST.	FINAL	UNIT	DESCRIPTION
3		EA	(TY SP 48S-8-8) (.4 KW) S
1		EA	(TY SA 40T-8) (.25 KW) S
6		LF	RDWY ILL ASSEM FND (TY A)
1,253		LF	CONDT (PVC) (SCH 40) (1 1/2")
3,759		LF	ELEC CONDR (NO. 8) (TY XHHW)

ILLUMINATION SHEET

SHEET 16 OF 26

Rev. 6-15-95

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.
6	NH 95 (40) IM	168
STATE	STATE DIST. NO.	COUNTY
TEXAS	15	COMAL
CONT.	SECT.	JOB
0016	05	087
		HIGHWAY NO.
		IH 35



SCALE 1" = 50'

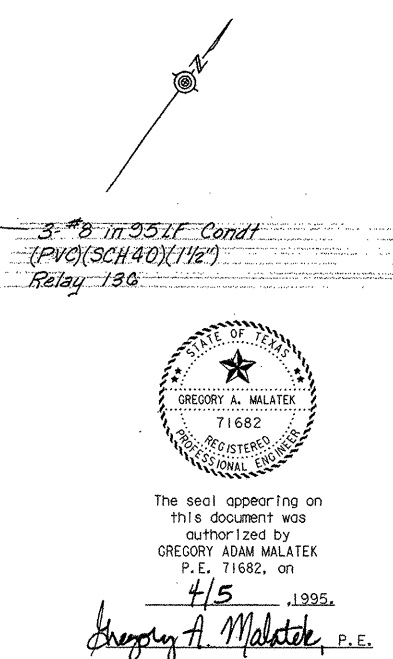
LEGEND

- [illegible]

<

Rev. 6-15-95

SHEET 17 OF 26



LEGEND

- A-1 (TY SP 48S-8-8) (.4KW) S
- A-2 (TY SA 40T-8) (.25KW) S
- GROUND BOX WITH APRONS
- SERVICE POLE
- ☒ JUNCTION BOX (See Ed 1-93)

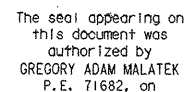
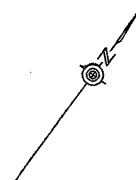
FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	NH 95 (40) IM		171
STATE	STATE DIST. NO.	COUNTY	
TEXAS	15	COMAL	
CONT.	SECT.	JOB	HIGHWAY NO.
0016	05	087	1H 35



4/5, 1995.
Gregory A. Malachuk, P.E.

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	NH 95 (40) IM		122
STATE	STATE DIST. NO.	COUNTY	
TEXAS	15	COMAL	
CONT.	SECT.	JOB	HIGHWAY NO.
0016	05	087	1H 35

SHEET 20 OF 26

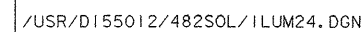


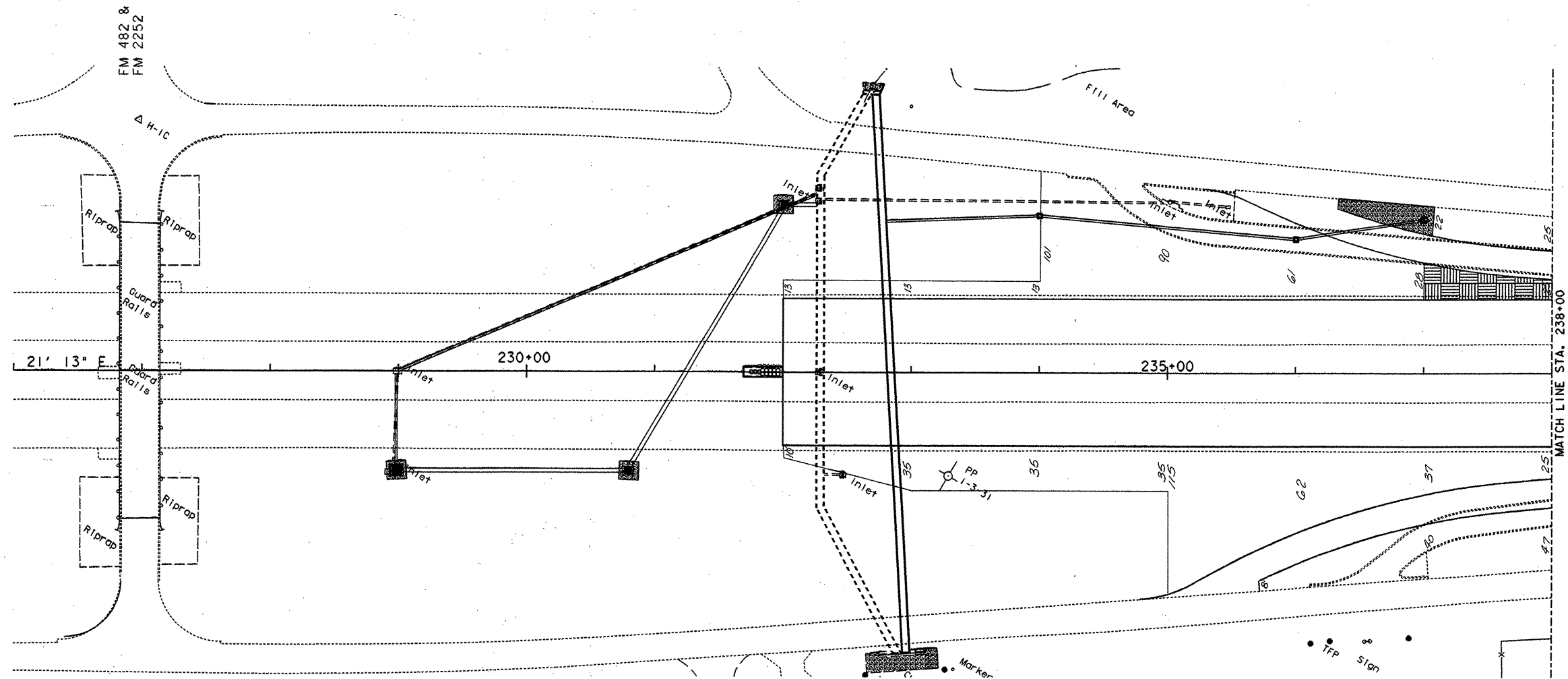
4/5-1991

SCALE 1" = 50

[illegible]ILLUMINATION SHEET

SHEET 21 OF 26





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Gregory A. Malatek, P.E.

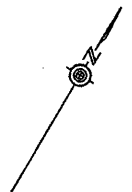
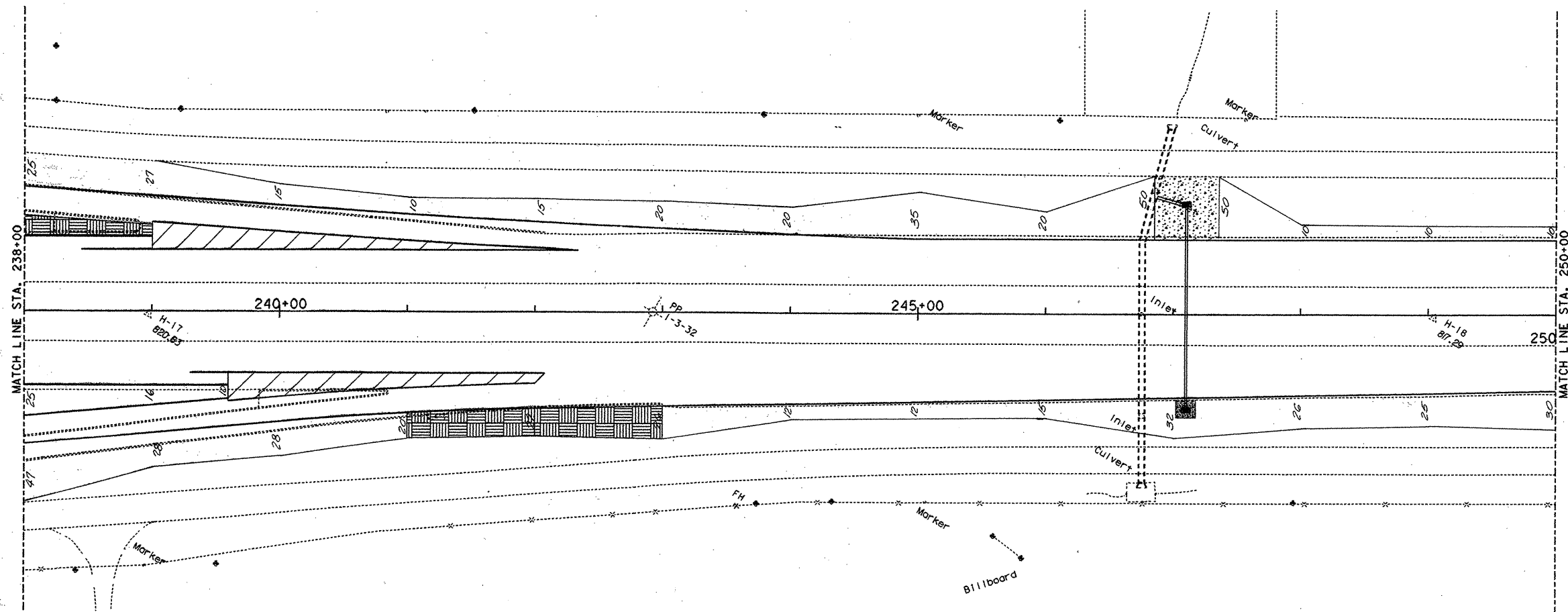
Shaded Area denotes the approximate limits of Topsoil.

TOPSOIL LAYOUT

SHEET 1 OF 26

SCALE 1" = 50'

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	NH 95 (40) TM		109
STATE	STATE DIST. NO.	COUNTY	
TEXAS	15	COMAL	
CONT.	SECT.	JOB	HIGHWAY NO.
0016	05	087	1H 35



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4/7, 1995.
Gregory A. Malatek, P.E.

Shaded Area denotes the approximate limits of Topsoil.

TOPSOIL LAYOUT

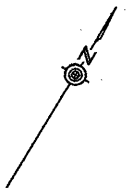
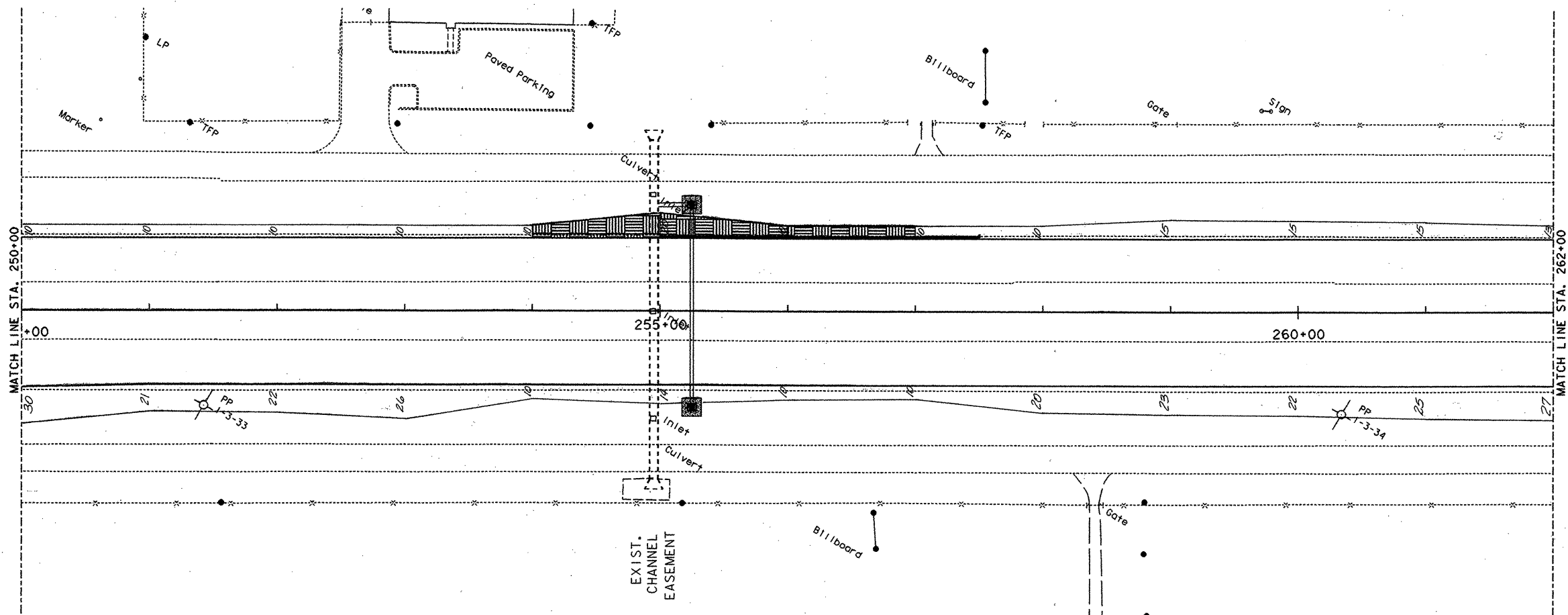
SHEET 2 OF 26

/USR/DI55012/482SOL/35002.DGN

/USR/IP32/MSTATION/CELL/NEWB.CEL/ = PLAN

SCALE 1" = 50'

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.
6	NH 95 (40) IM	180
STATE	STATE DIST. NO.	COUNTY
TEXAS	15	COMAL
CONT.	SECT.	JOB
0016	05	087
		1H 35



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4/7, 1995.
Gregory A. Malatek, P.E.

Shaded Area denotes the approximate limits of Topsoil.

TOPSOIL LAYOUT

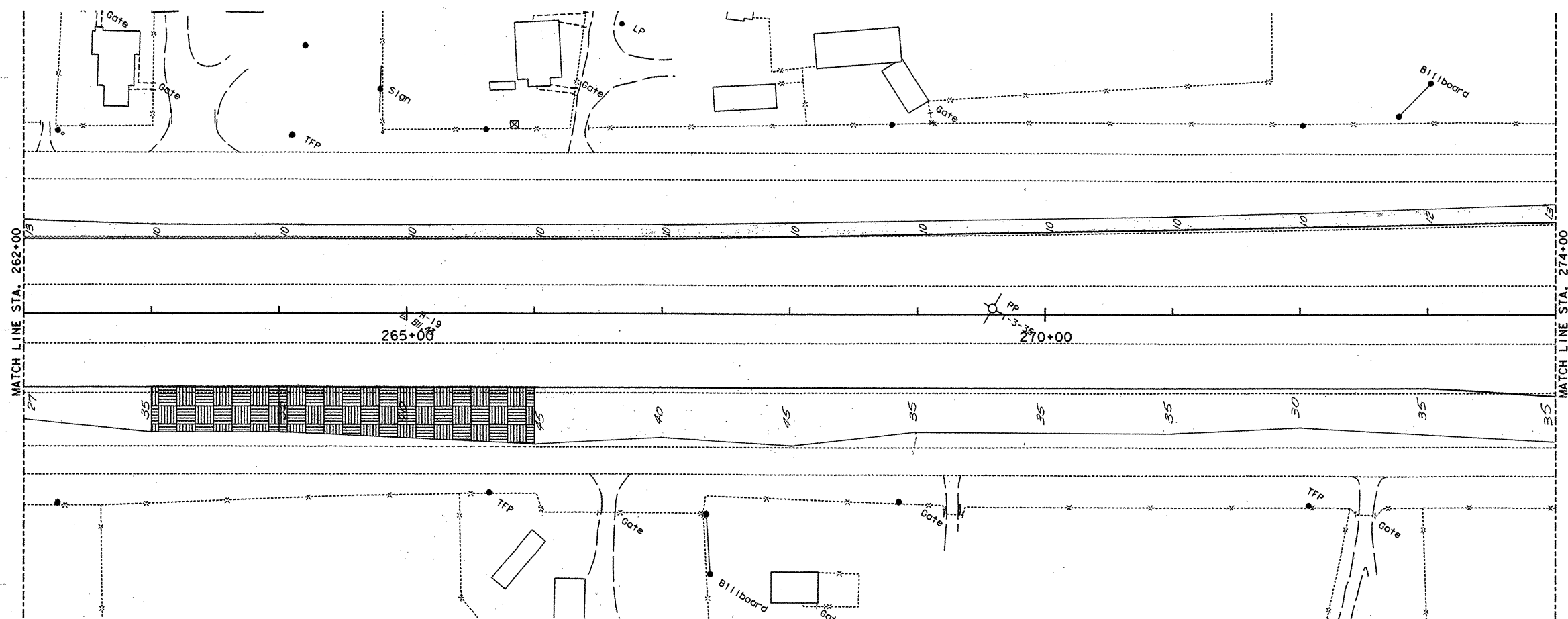
SHEET 3 OF 26

/USR/D155012/482SOL/35003.DGN

/USR/IP32/MSTATION/CELL/NEWB.CEL/ = PLAN

SCALE 1" = 50'

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	NH95 (40) 1M		181
STATE	STATE DIST. NO.	COUNTY	
TEXAS	15	COMAL	
CONT.	SECT.	JOB	HIGHWAY NO.
0016	05	087	1H.35



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Gregory A. Malatek, P.E.

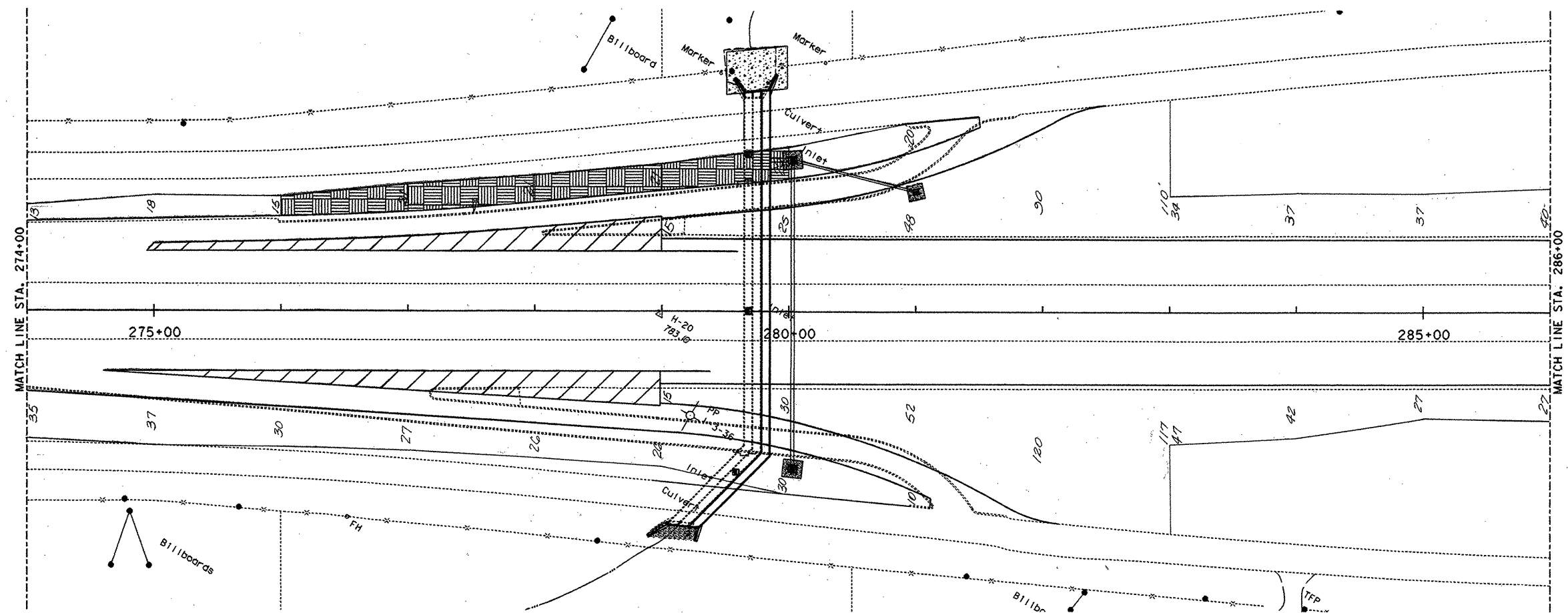
Shaded Area denotes the approximate limits of Topsoil.

TOPSOIL LAYOUT

SHEET 4 OF 26

SCALE 1" = 50'

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	NH 95 (40)	1M	182
STATE	STATE DIST. NO.	COUNTY	
TEXAS	15	COMAL	
CONT.	SECT.	JOB	HIGHWAY NO.
0016	05	087	1H 35



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GREGORY A. MALATEK
P.E., 71682, on

Gregory A. Malatek
4/7, 1995
P.E.

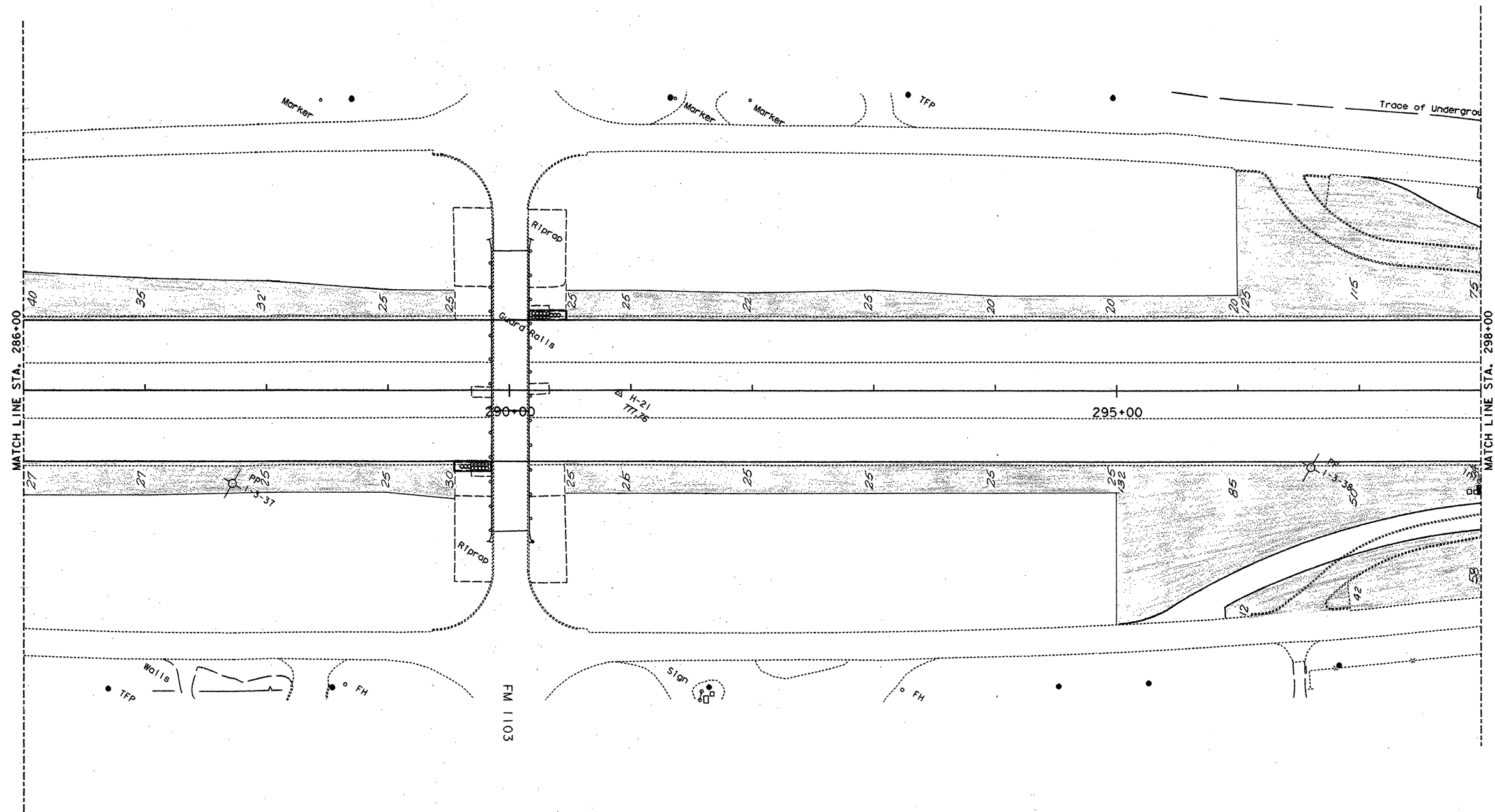
Shaded Area denotes the approximate limits of Topsoil.

TOPSOIL LAYOUT

SHEET 5 OF 26

SCALE 1" = 50'

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.
6	NH 95 (40) IM	123
STATE	STATE DIST. NO.	COUNTY
TEXAS	15	COMAL
CONT.	SECT.	JOB
0016	05	087
		HIGHWAY NO.
		1H 35



The seal appearing on this document was authorized by GREGORY A. MALATEK P.E. 71682, on

4/7 1995
Gregory A. Malatek P.E.

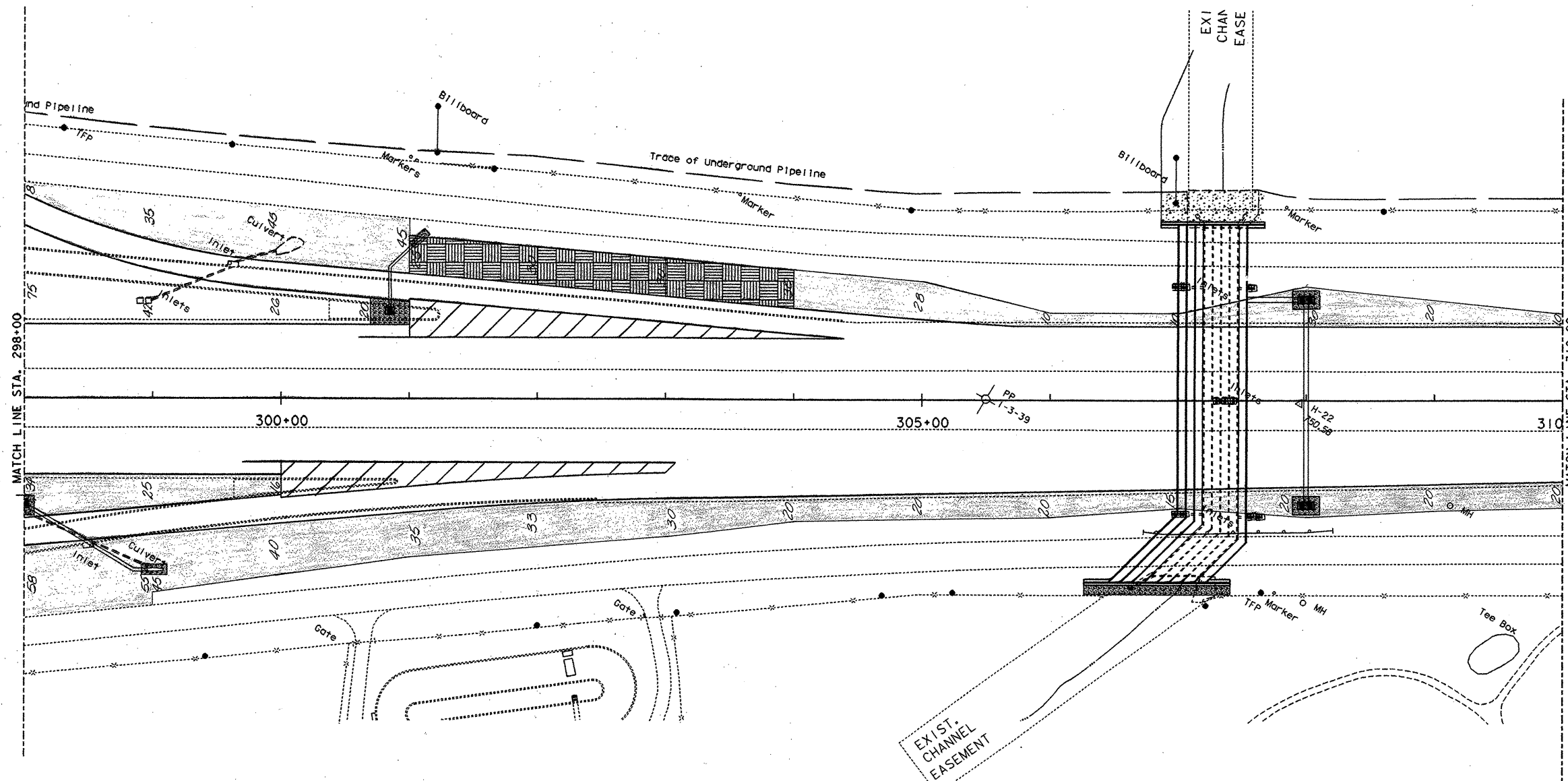
Shaded Area denotes the approximate limits of Topsoil.

TOPSOIL LAYOUT

SHEET 6 OF 26

SCALE 1" = 50'

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.
6	NH 95 (40) IM	184
STATE	COUNTY	
TEXAS	COMAL	
CONT.	SECT.	JOB
0016	05	087
		HIGHWAY NO.
		1H 35



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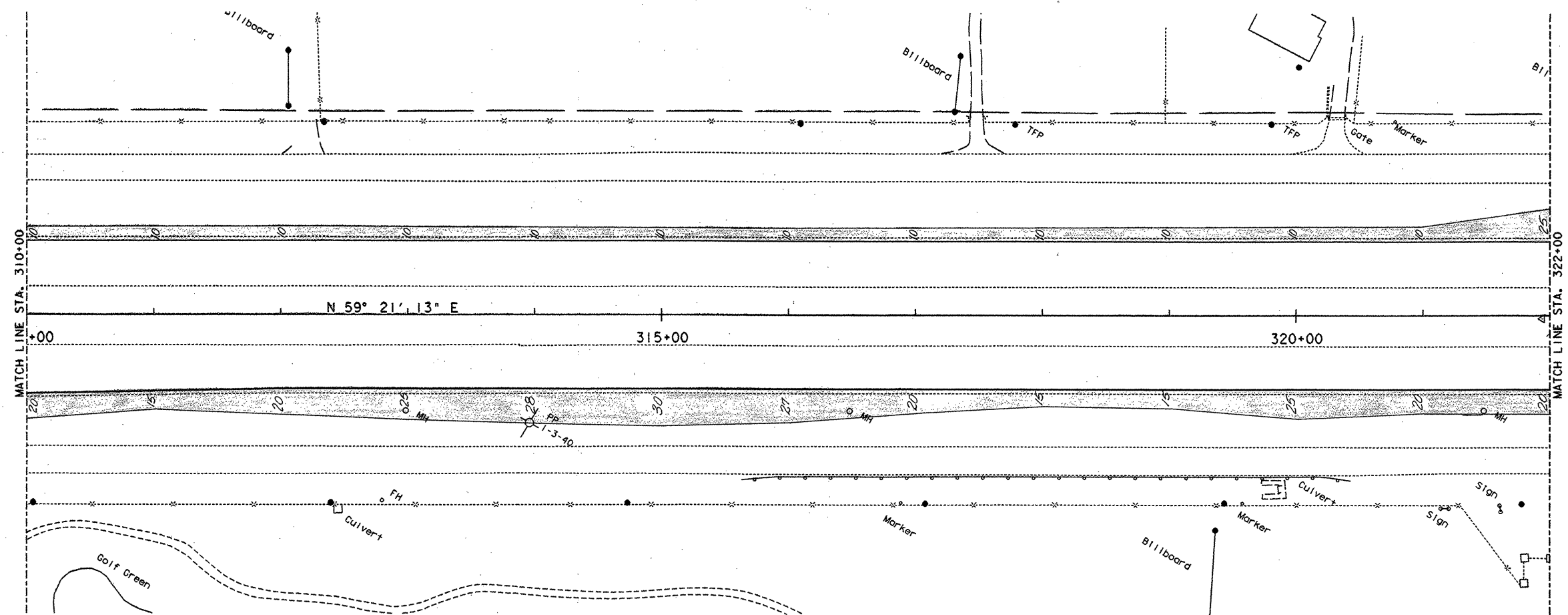
4/7/1995
Gregory A. Malatek, P.E.

Shaded Area denotes the approximate limits of Topsoil.

TOPSOIL LAYOUT

SHEET 7 OF 26

SCALE 1" = 50'			
FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.	
6	NH 95 (40) IM	185	
STATE	STATE DIST. NO.	COUNTY	
TEXAS	15	COMAL	
CONT.	SECT.	JOB	HIGHWAY NO.
0016	05	087	1H 35



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this document was
authorized by
GREGORY A. MALATEK
P.E. 71682, on

4/7, 1995.
Gregory A. Malatek, P.E.

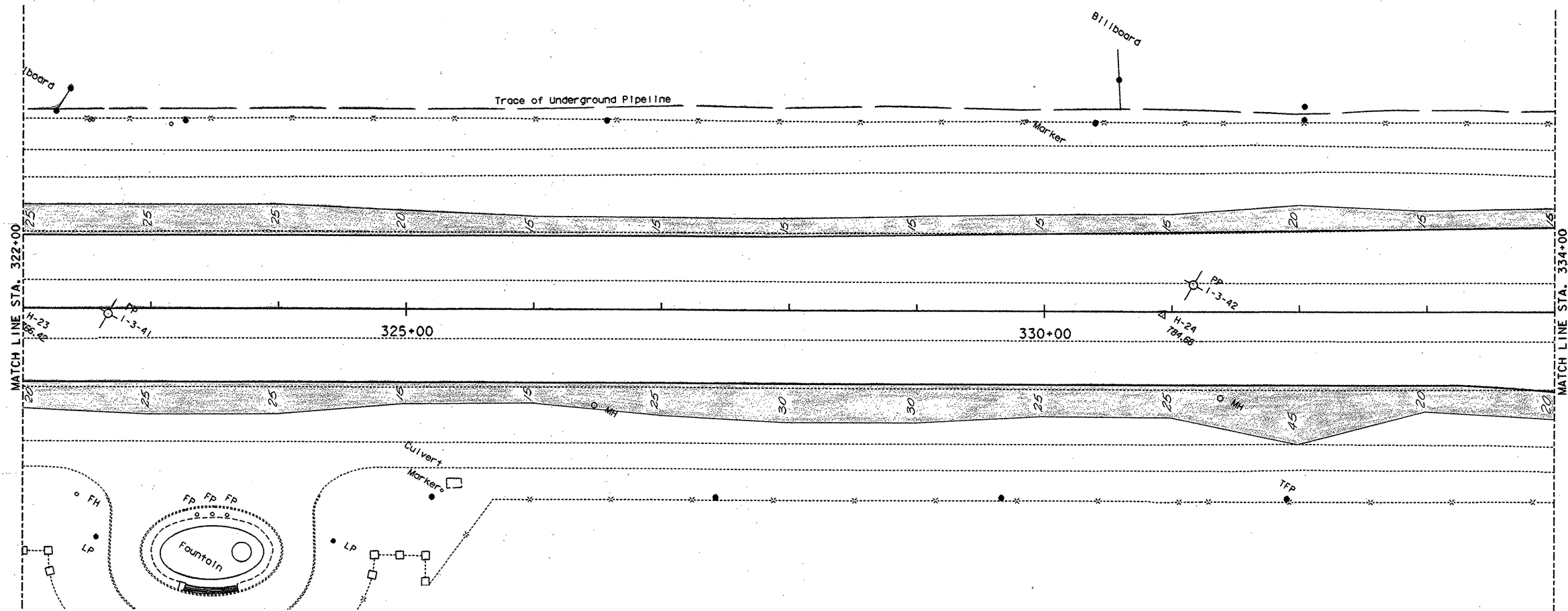
Shaded Area denotes the approximate limits
of Topsoil.

SCALE 1" = 50'

TOPSOIL LAYOUT

SHEET 8 OF 26

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	NH95 (40) IM		186
STATE	STATE DIST. NO.	COUNTY	
TEXAS	15	COMAL	
CONT.	SECT.	JOB	HIGHWAY NO.
0016	05	087	IH 35



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4/7, 1995.
Gregory A. Malatek, P.E.

Shaded Area denotes the approximate limits of Topsoil.

TOPSOIL LAYOUT

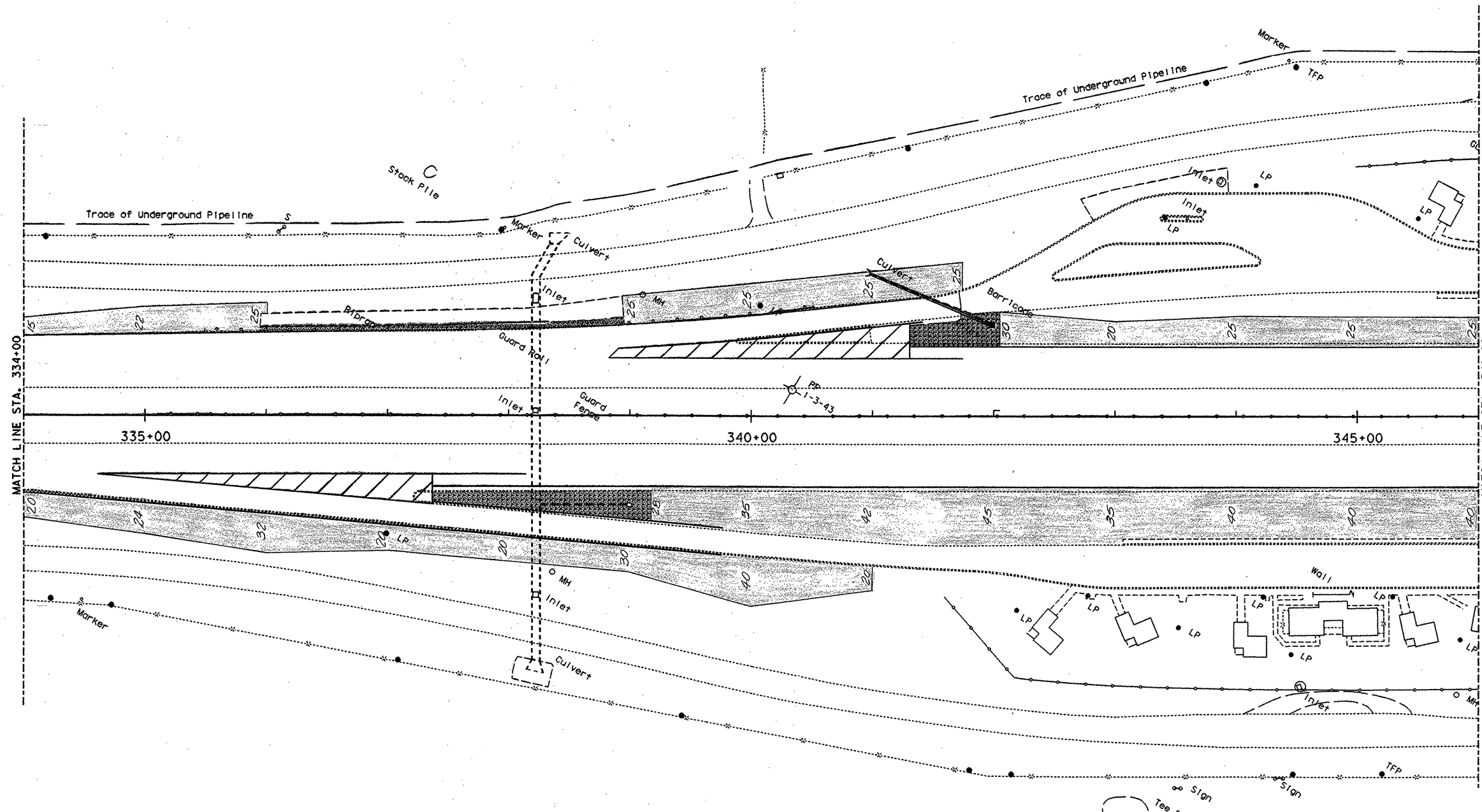
SHEET 9 OF 26

/USR/DI55012/482SOL/35009.DGN

/USR/IP32/MSTATION/CELL/NEWB.CEL/ = PLAN

SCALE 1" = 50'

FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.	COUNTY	SHEET NO.
6	TEXAS	NH95 (40) IM	COMAL	187
STATE DIST. NO.	15			
CONT.	SECT.	JOB	HIGHWAY NO.	
0016	05	087	1H 35	



The seal appearing on this document was authorized by GREGORY A. MALATEK P.E. 71682, on

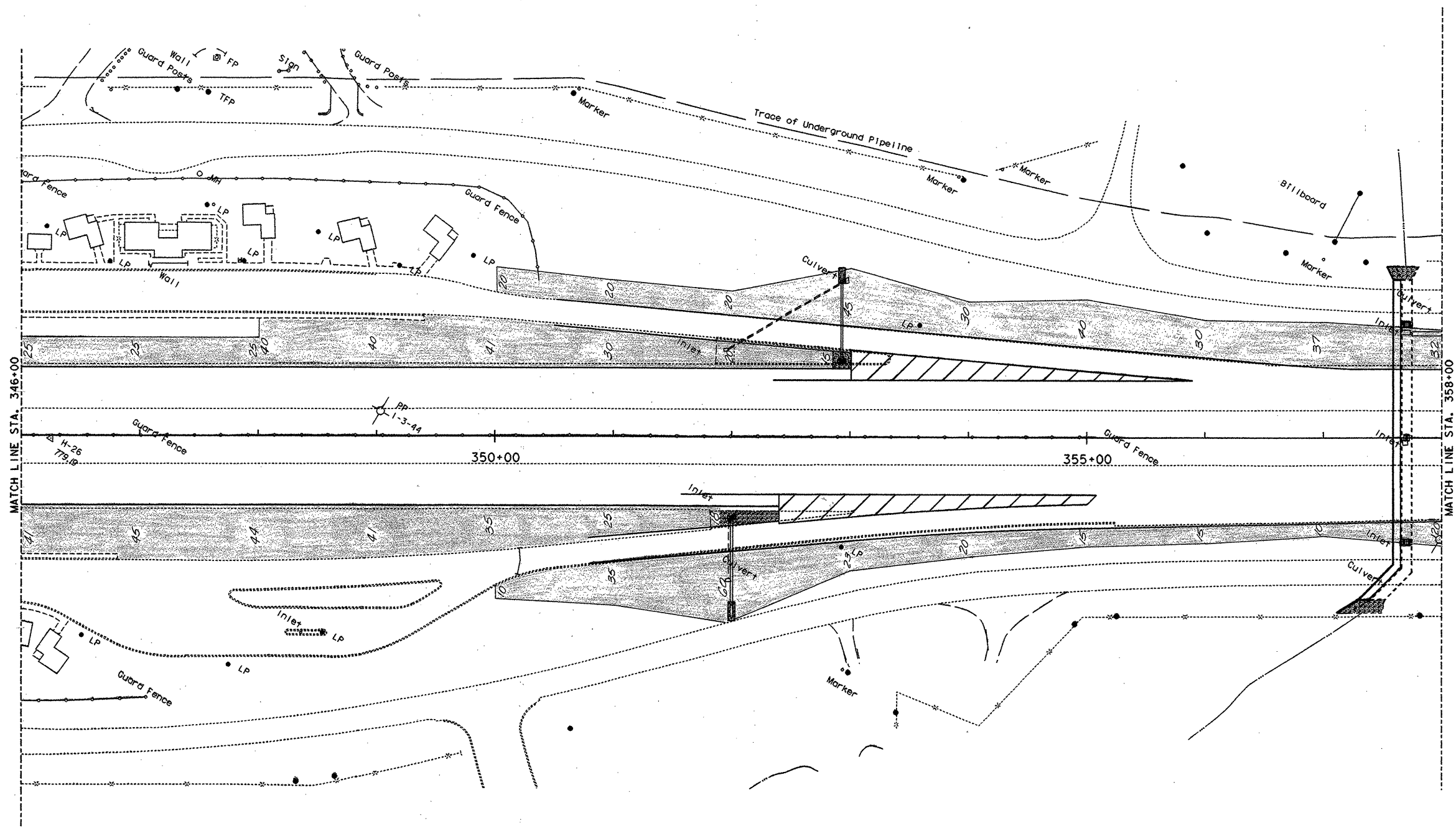
4/7, 1995.
Gregory A. Malatek, P.E.

Shaded Area denotes the approximate limits of Topsoil.

TOPSOIL LAYOUT

SHEET 10 OF 26

SCALE 1" = 50'			
FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.	
6	NH 95 (40) IM	188	
STATE	STATE DIST. NO.	COUNTY	
TEXAS	15	COMAL	
CONT.	SECT.	JOB	HIGHWAY NO.
0016	05	087	1H 35



Shaded Area denotes the approximate limits of Topsoil.



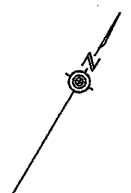
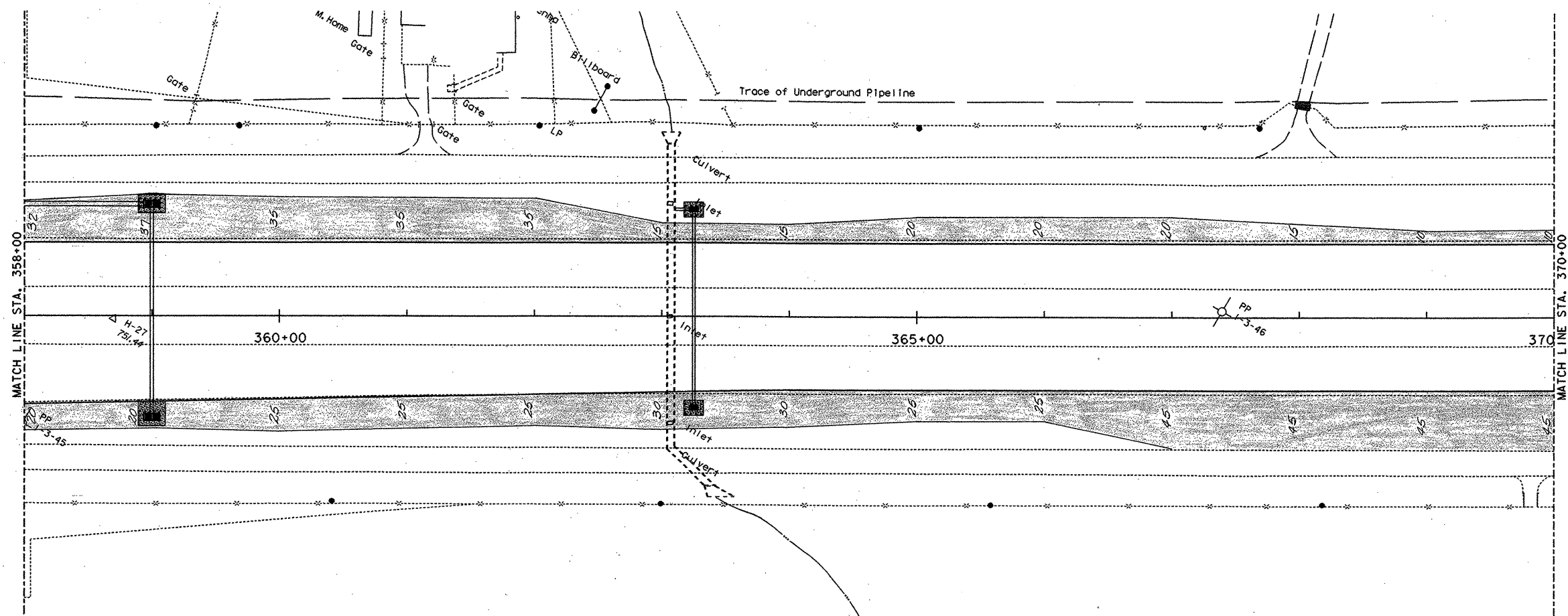
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Gregory A. Malatek, P.E.

TOPSOIL LAYOUT

SHEET 11 OF 26

SCALE 1" = 50'

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.
6	NH 95 (40) 1M	189
STATE	COUNTY	
TEXAS	COMAL	
CONT.	SECT.	JOB
0016	05	087
		HIGHWAY NO.
		1H 35



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Gregory A. Malatek, P.E.

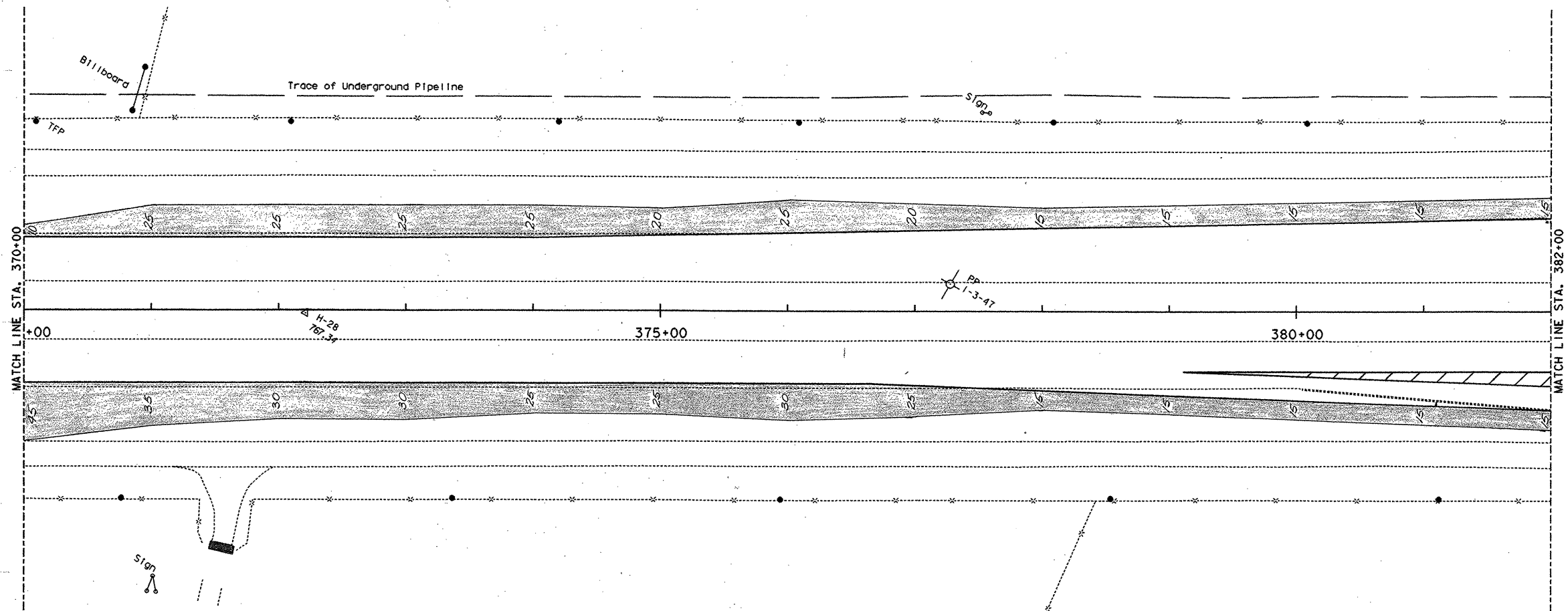
Shaded Area denotes the approximate limits of Topsoil.

SCALE 1" = 50'

TOPSOIL LAYOUT

SHEET 12 OF 26

FED. RD. DIV. NO.		FEDERAL AID PROJECT NO.	SHEET NO.
6		NH 95 (40) 1M	120
STATE	STATE DIST. NO.	COUNTY	
TEXAS	15	COMAL	
CONT.	SECT.	JOB	HIGHWAY NO.
0016	05	087	1H 35



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4/7, 1995.
Gregory A. Malatek, P.E.

Shaded Area denotes the approximate limits of Topsoil.

TOPSOIL LAYOUT

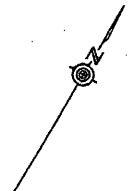
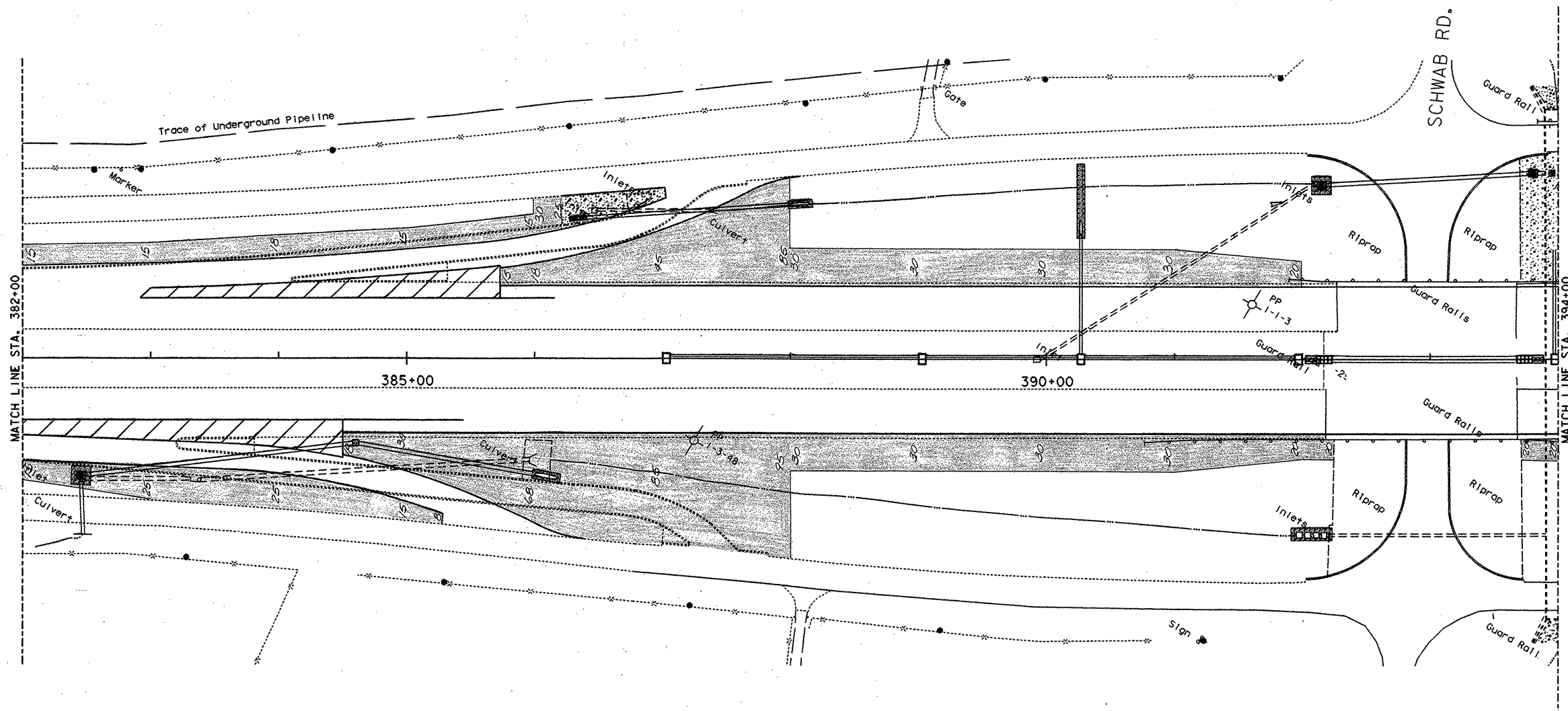
SHEET 13 OF 26

/USR/D155012/482SOL/35013.DGN

/USR/IP32/MSTATION/CELL/NEWB.CEL/ = PLAN

SCALE 1" = 50'

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	NH 95 (40) IM		101
STATE	STATE DIST. NO.	COUNTY	
TEXAS	15	COMAL	
CONT.	SECT.	JOB	HIGHWAY NO.
0016	05	087	1H 35



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Gregory A. Malatek, P.E.

Shaded Area denotes the approximate limits of Topsoil.

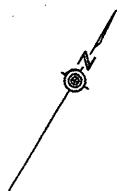
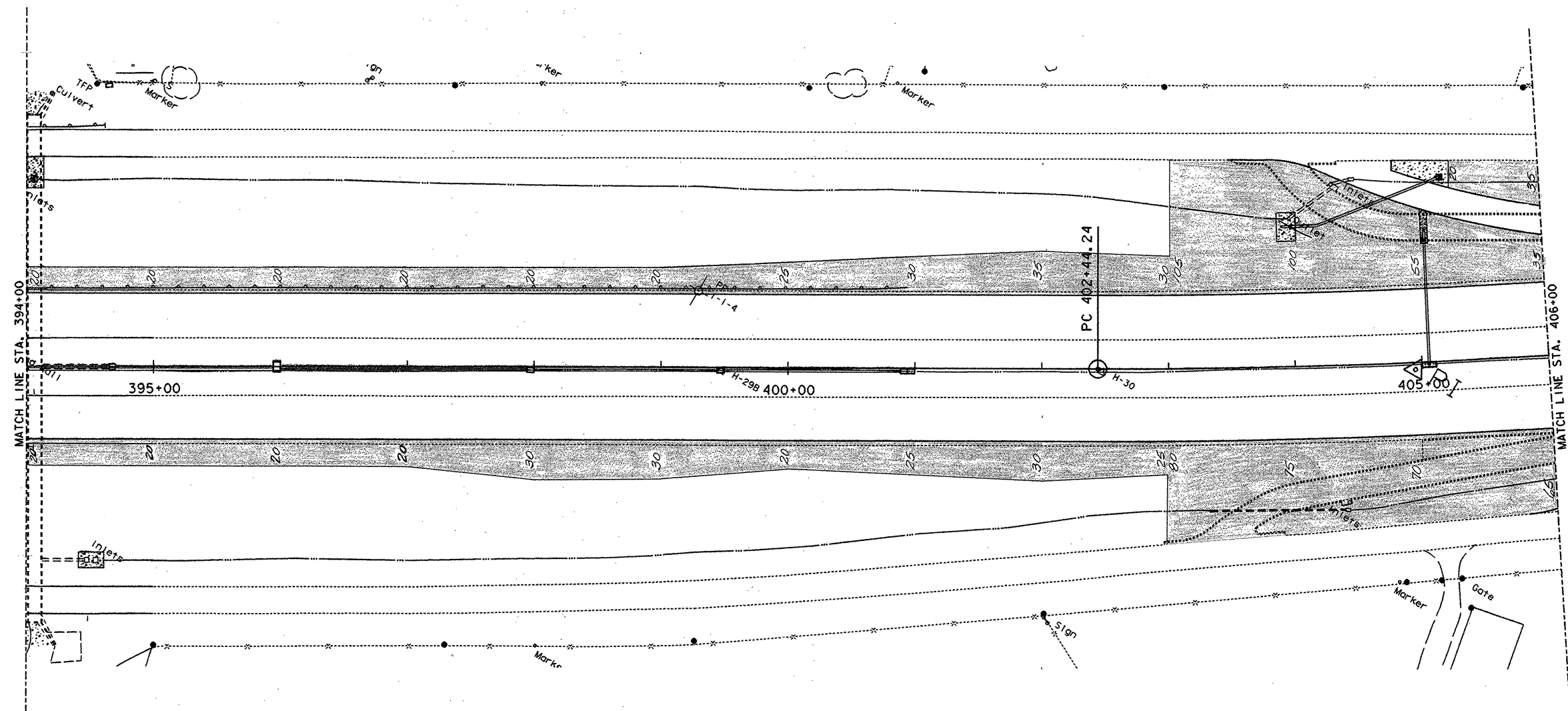
TOPSOIL LAYOUT

SHEET 14 OF 26

SCALE 1" = 50'

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.	
6	NH 95 (40) IM	122	
STATE	STATE DIST. NO.	COUNTY	
TEXAS	15	COMAL	
CONT.	SECT.	JOB	HIGHWAY NO.
0016	05	087	1H 35

PI STA 10404+94.8677 (G)
 DELTA= 5° 0' 33.46" LT.
 D= 1° 0' 0.00"
 T=250.62
 L=500.93
 R=5729.58
 PC STA 10402+44.2434 (G)
 PT STA 10407+45.1728 (G)



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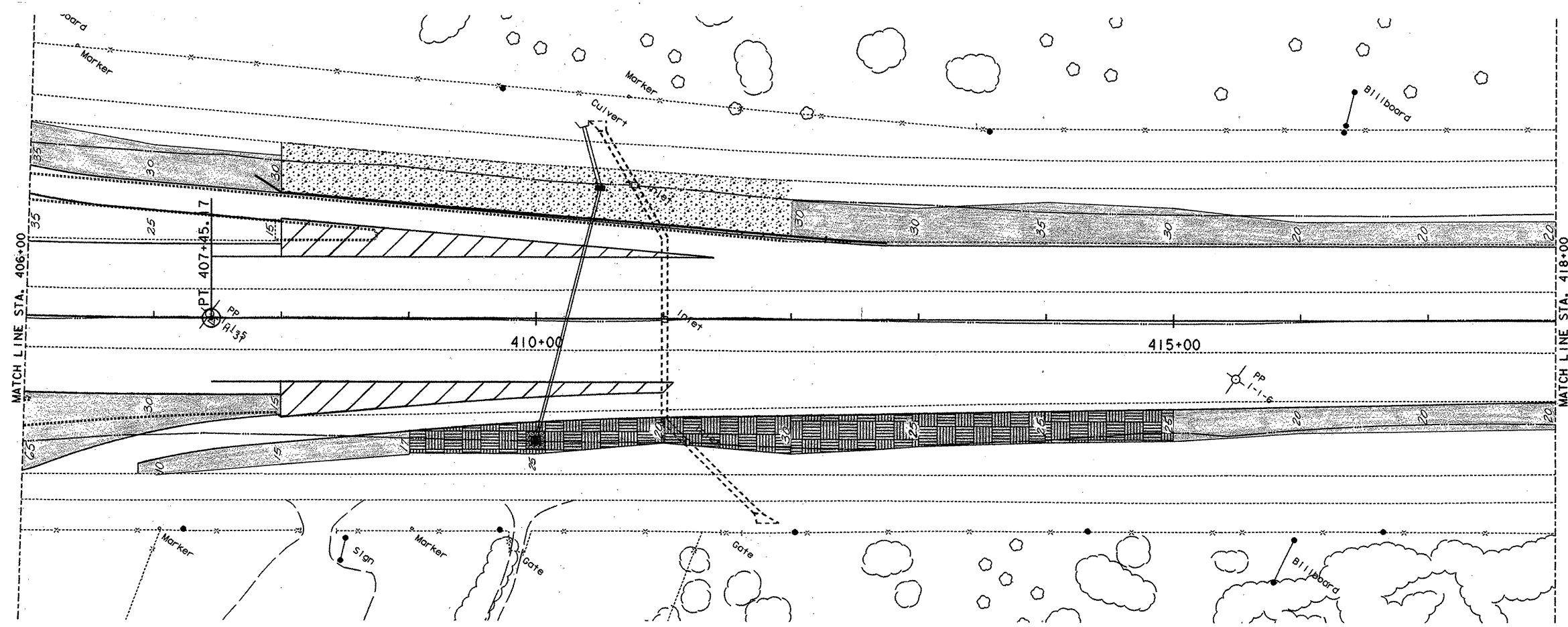
Shaded Area denotes the approximate limits
 of Topsoil.

TOPSOIL LAYOUT

SHEET 15 OF 26

SCALE 1" = 50'

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.
6	NH 95 (40) IM	193
STATE	STATE DIST. NO.	COUNTY
TEXAS	15	COMAL
CONT.	SECT.	JOB
0016	05	087
		HIGHWAY NO.
		1H 35



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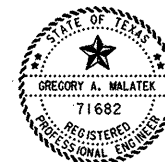
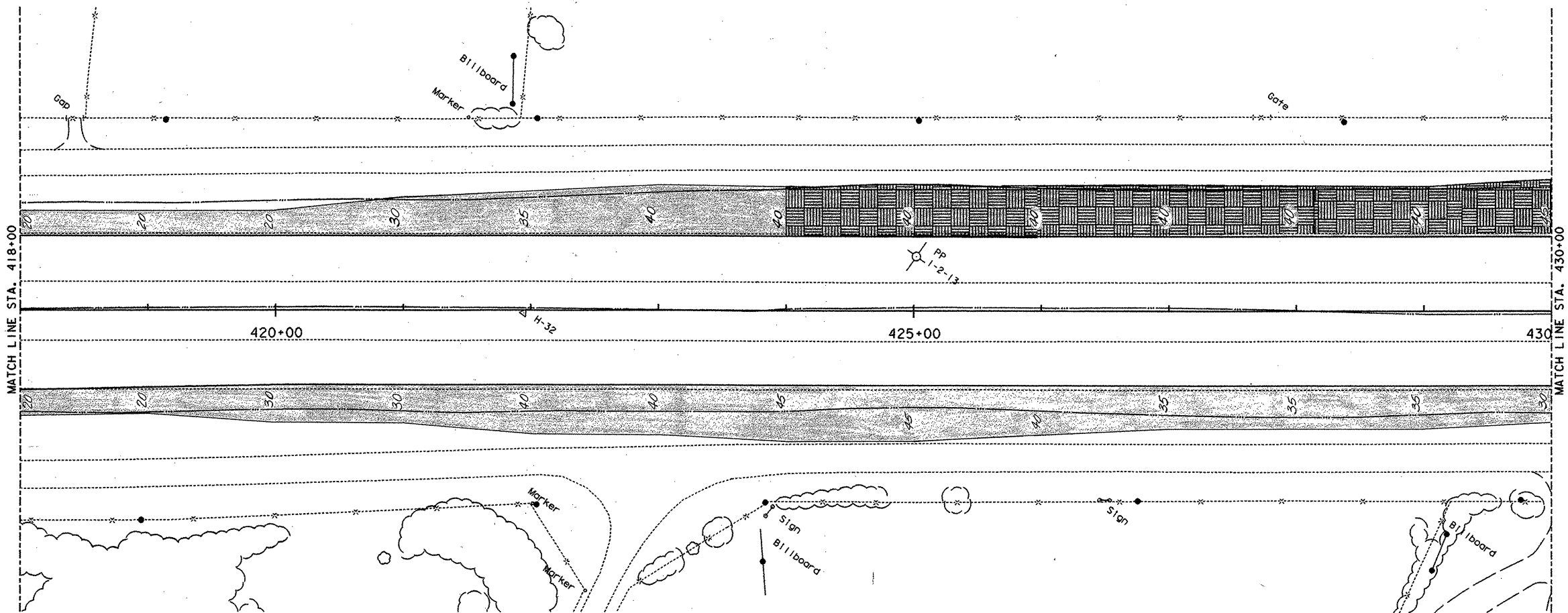
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SCALE 1" = 50'

TOPSOIL LAYOUT

SHEET 16 OF 26

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.			SHEET NO.
6	NH 95 (40) IM			194
STATE	STATE DIST. NO.	COUNTY		
TEXAS	15	COMAL		
CONT.	SECT.	JOB	HIGHWAY NO.	
0016	05	087	1H 35	



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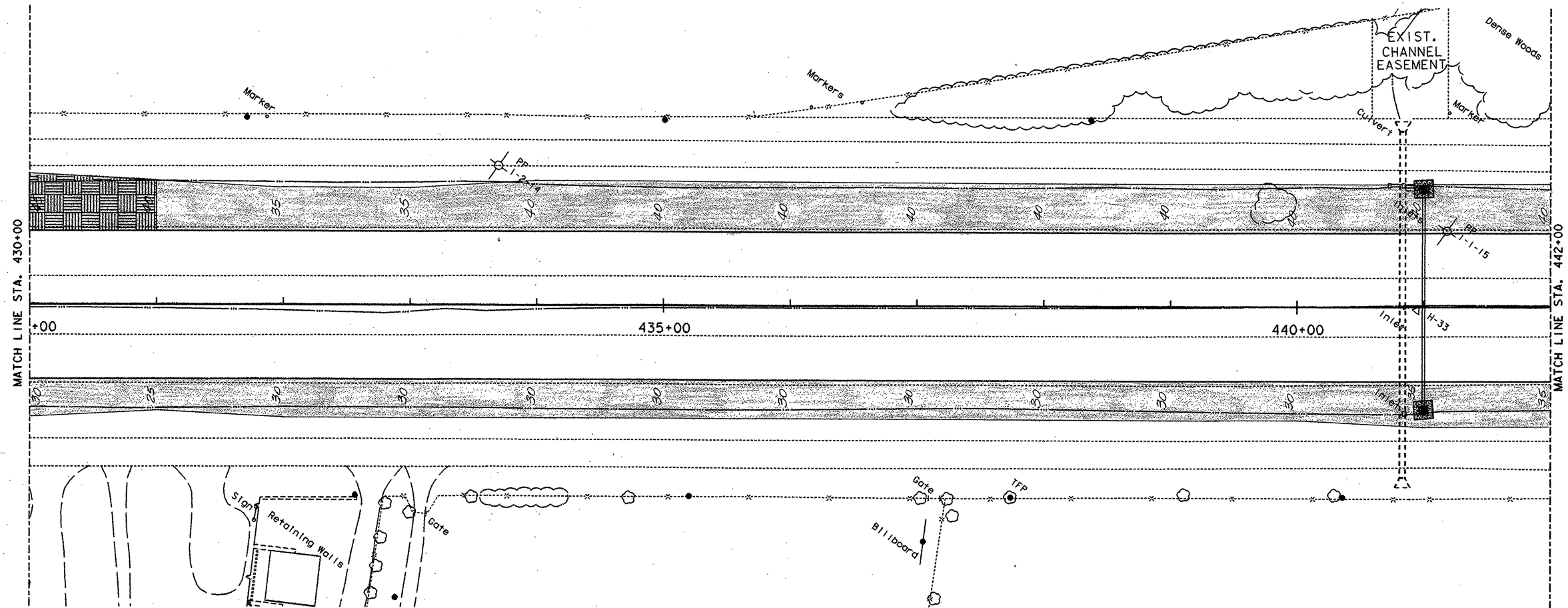
Shaded Area denotes the approximate limits of Topsoil.

SCALE 1" = 50'

TOPSOIL LAYOUT

SHEET 17 OF 26

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	NH95 (40) IM		195
STATE	STATE DIST. NO.	COUNTY	
TEXAS	15	COMAL	
CONT.	SECT.	JOB	HIGHWAY NO.
0016	05	087	1H 35



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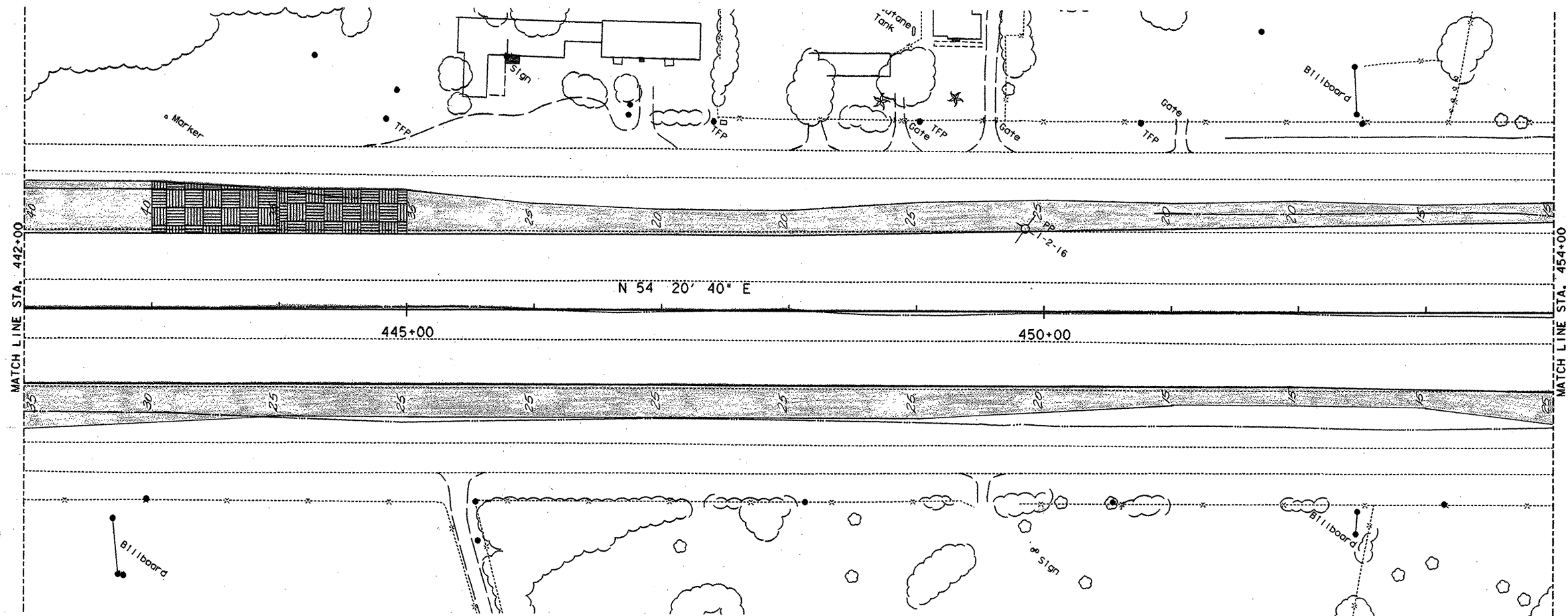
Shaded Area denotes the approximate limits
of Topsoil.

SCALE 1" = 50'

TOPSOIL LAYOUT

SHEET 18 OF 26

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	NH 95 (40) IM		196
STATE	STATE DIST. NO.	COUNTY	
TEXAS	15	COMAL	
CONT.	SECT.	JOB	HIGHWAY NO.
0016	05	087	IH 35



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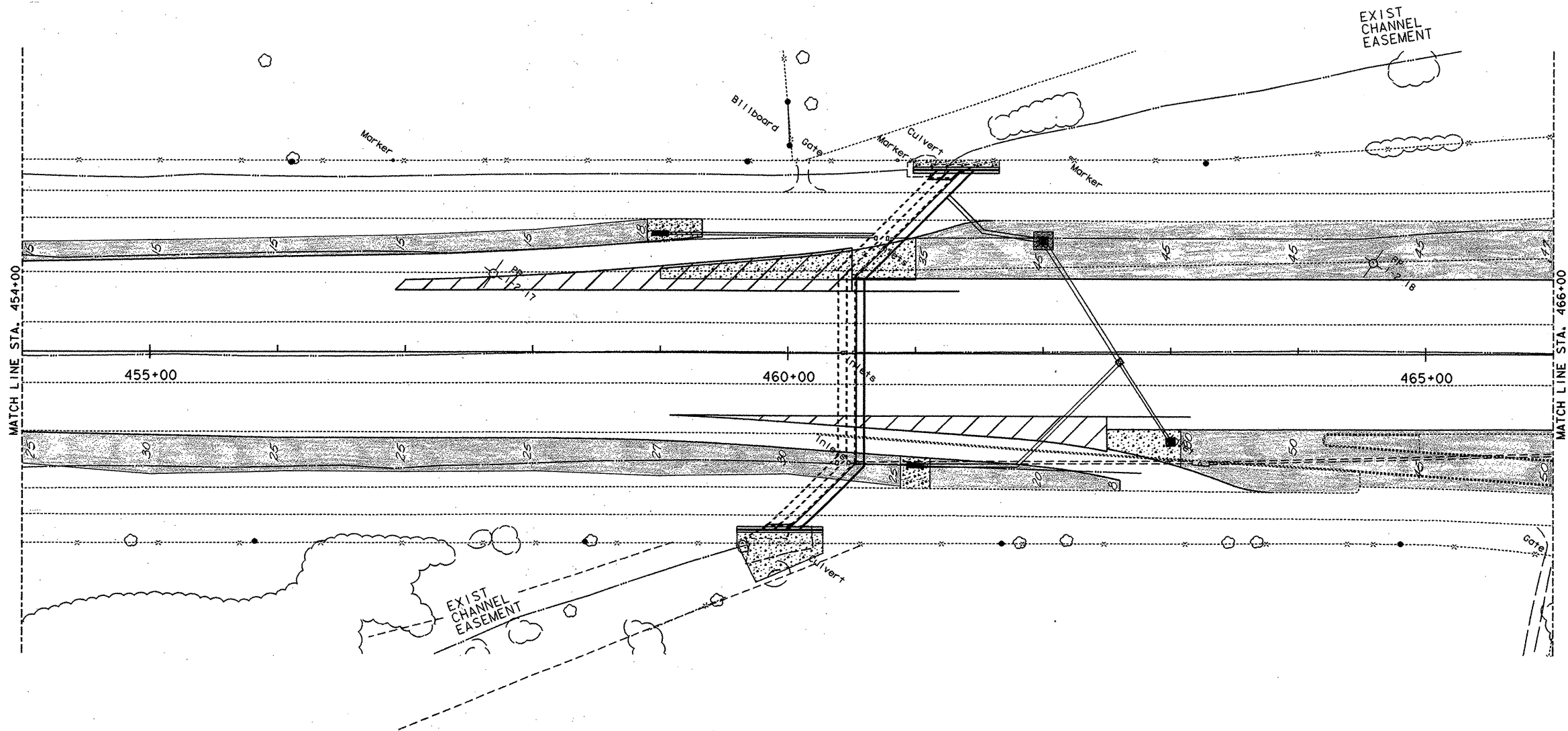
Shaded Area denotes the approximate limits of Topsoil.

TOPSOIL LAYOUT

SHEET 19 OF 26

SCALE 1" = 50'

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	NH 95 (40) IM		197
STATE	STATE DIST. NO.	COUNTY	
TEXAS	15	COMAL	
CONT.	SECT.	JOB	HIGHWAY NO.
0016	05	087	1H 35



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Shaded Area denotes the approximate limits of Topsoil.

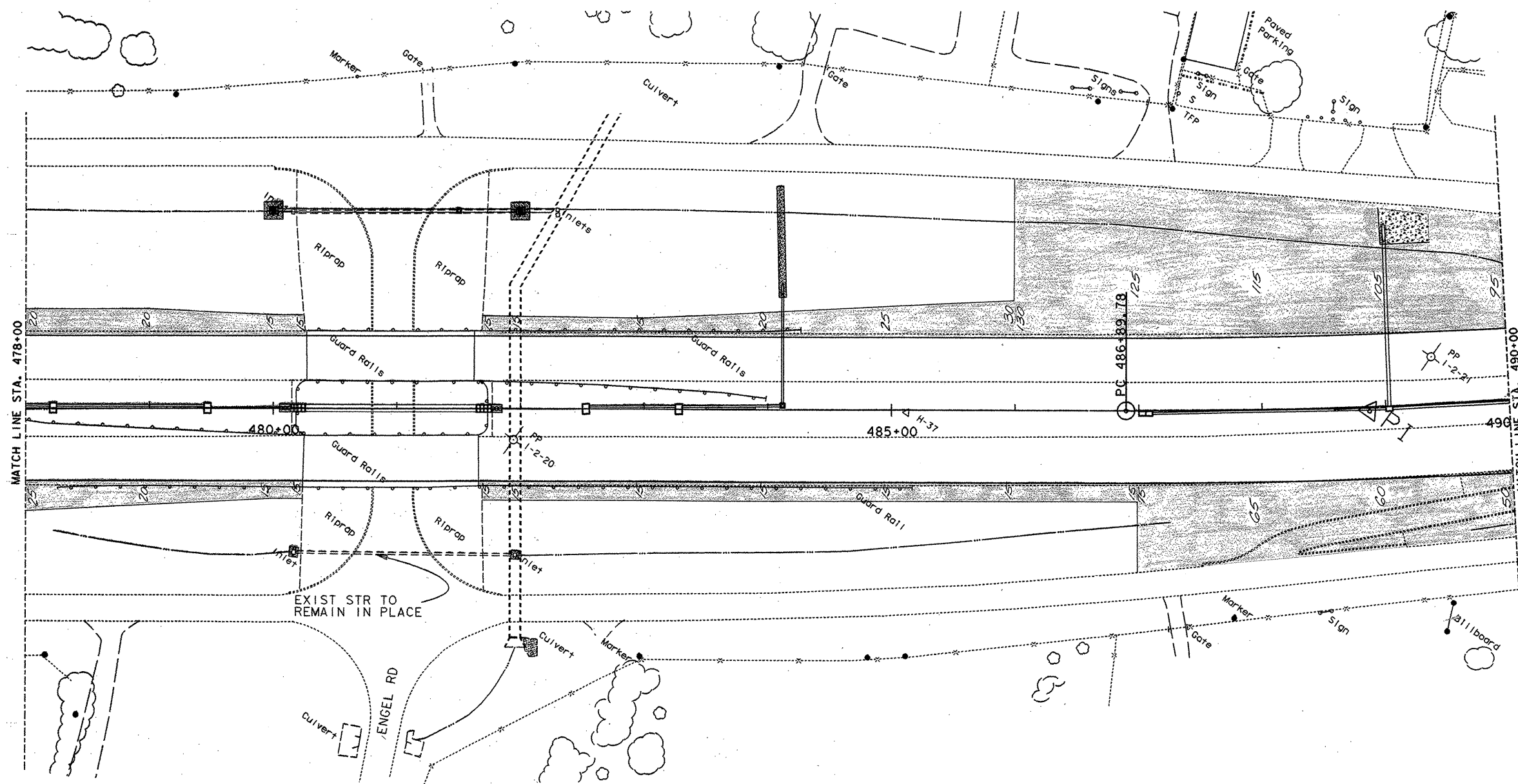
TOPSOIL LAYOUT

SHEET 20 OF 26

SCALE 1" = 50'

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.			SHEET NO.
6	NH 95 (40) IM			198
STATE	STATE DIST. NO.	COUNTY		
TEXAS	15	COMAL		
CONT.	SECT.	JOB	HIGHWAY NO.	
0016	05	087	1H 35	

PI STA 10488+86.9195 (G)
 DELTA= 3°56'28.71" LT.
 D= 1" 0' 0.00"
 T=197.14
 L=394.13
 R=5729.58
 PC STA 10486+89.7762 (G)
 PT STA 10490+83.9072 (G)



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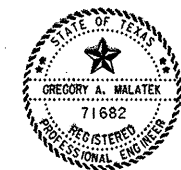
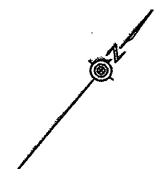
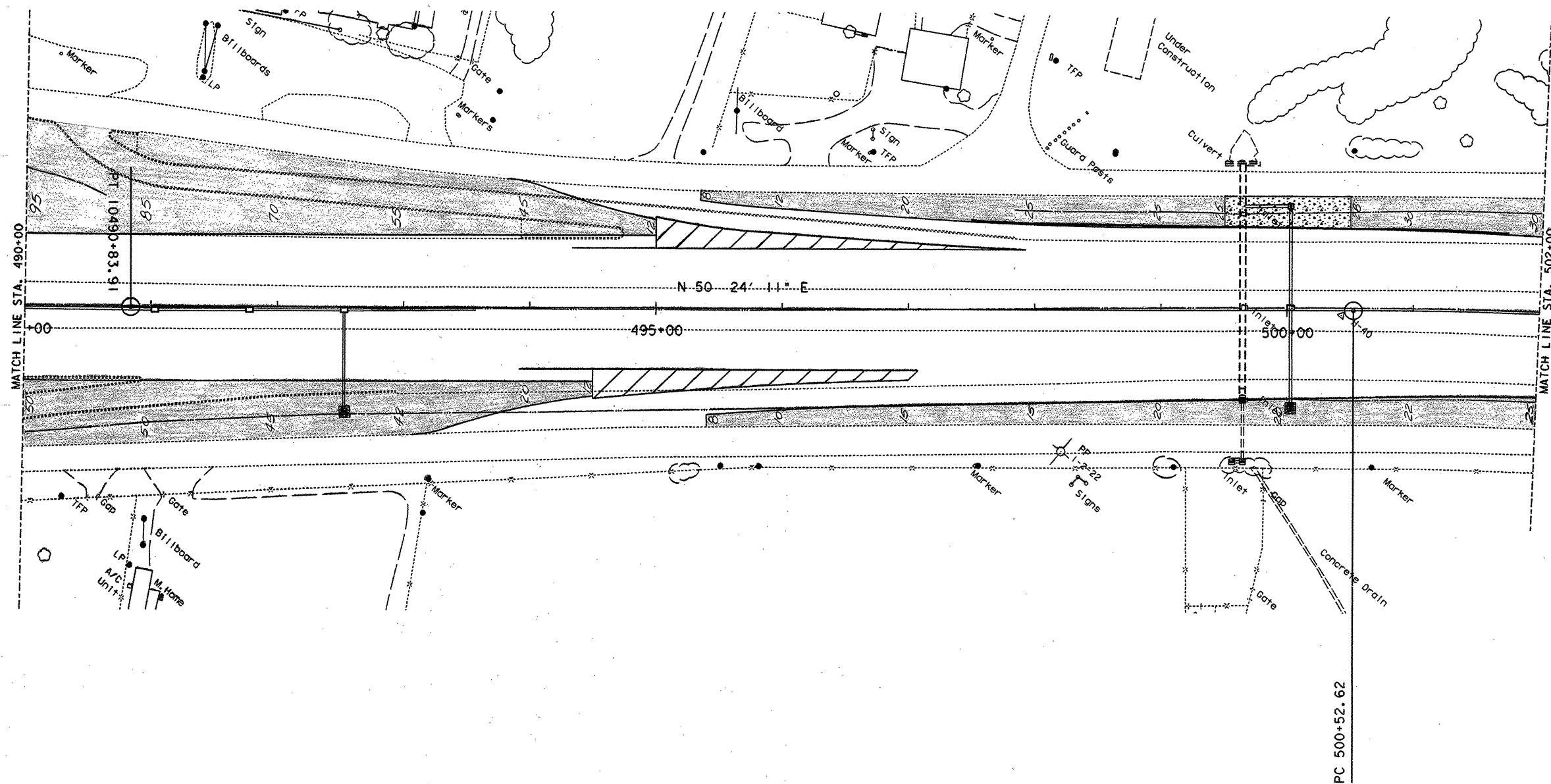
Shaded Area denotes the approximate limits
 of Topsoil.

TOPSOIL LAYOUT

SHEET 22 OF 26

SCALE 1" = 50'

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.
6	NH 95 (40) IM	200
STATE	STATE DIST. NO.	COUNTY
TEXAS	15	COMAL
CONT.	SECT.	HIGHWAY NO.
0016	05	087 IH 35



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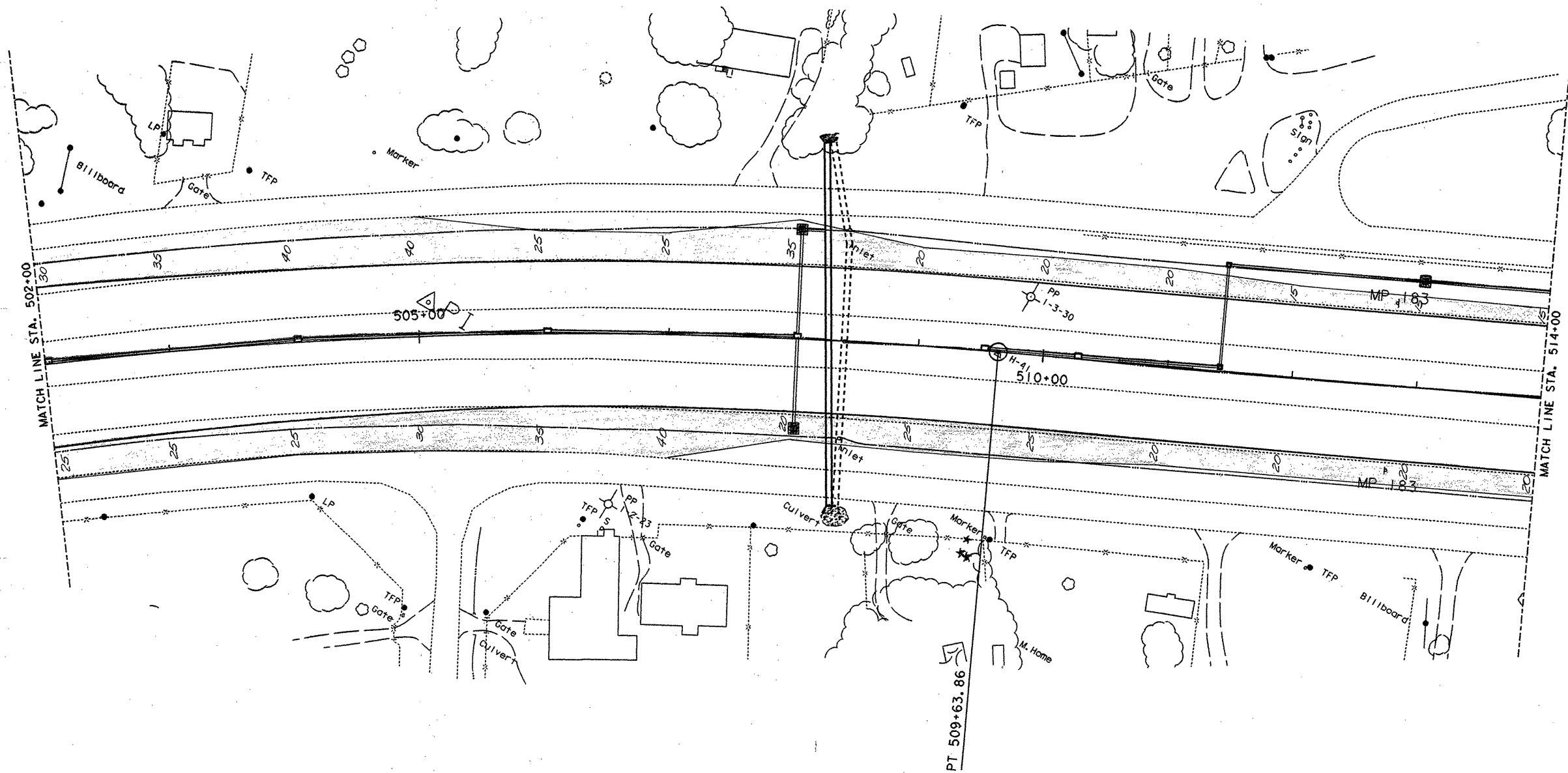
Shaded Area denotes the approximate limits of Topsoil.

TOPSOIL LAYOUT

SHEET 23 OF 26

SCALE 1" = 50'

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	NH 95 (40) IM		201
STATE	STATE DIST. NO.	COUNTY	
TEXAS	15	COMAL	
CONT.	SECT.	JOB	HIGHWAY NO.
0016	05	087	1H 35



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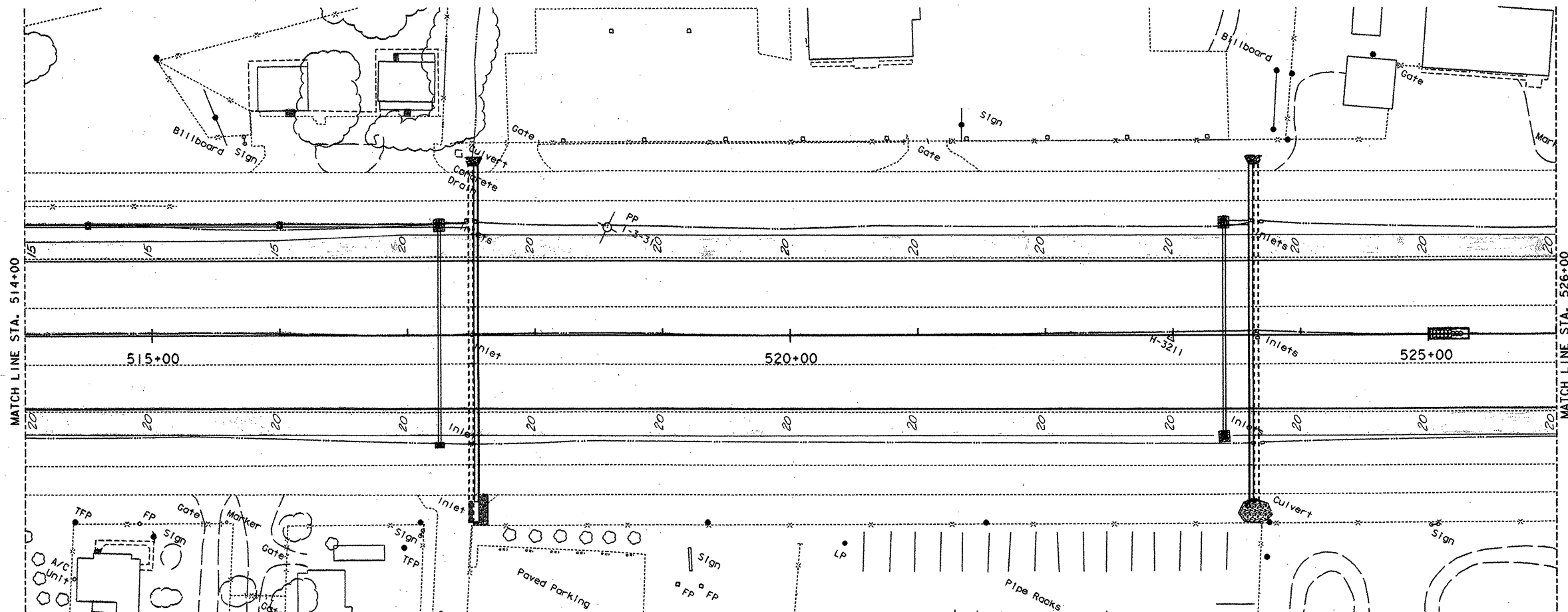
Shaded Area denotes the approximate limits of Topsoil.

TOPSOIL LAYOUT

SHEET 24 OF 26

SCALE 1" = 50'

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.
6	NH95 (40) IM	202
STATE	STATE DIST. NO.	COUNTY
TEXAS	15	COMAL
CONT.	SECT.	JOB
0016	05	087
		HIGHWAY NO.
		1H 35



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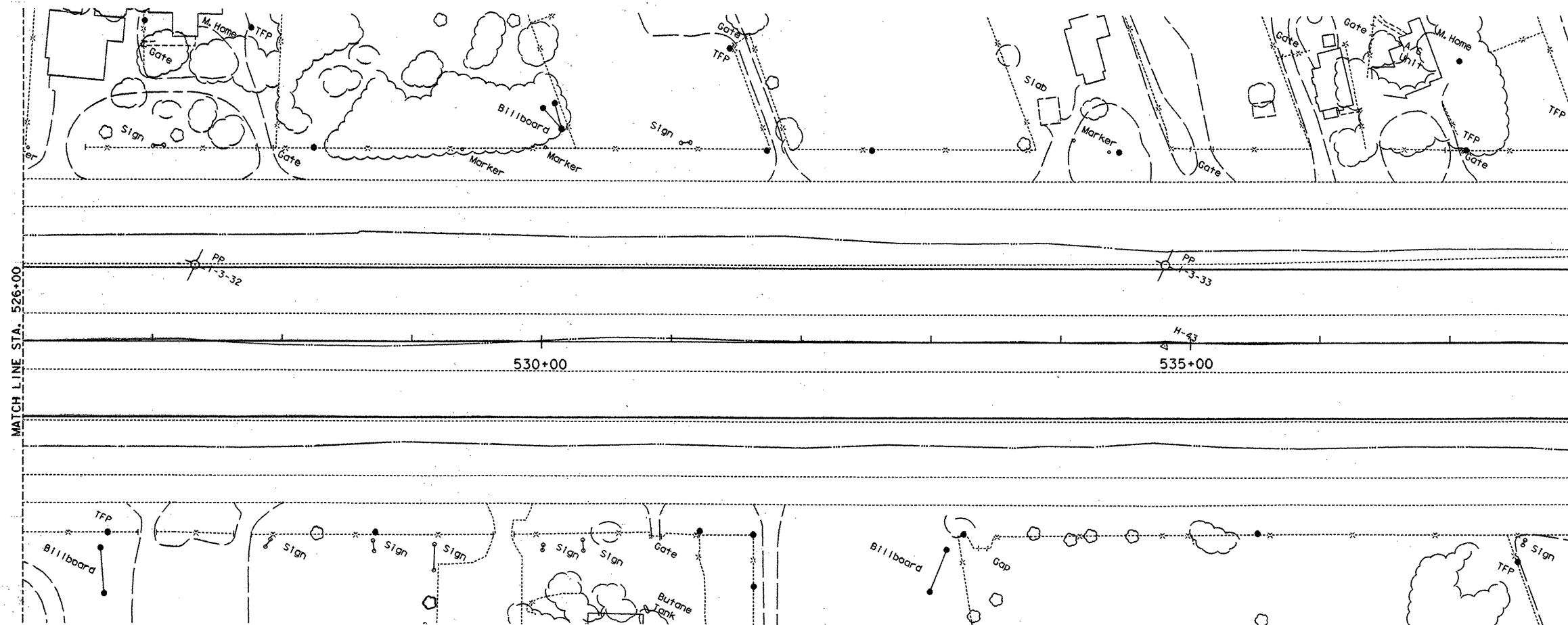
Shaded Area denotes the approximate limits of Topsoil.

TOPSOIL LAYOUT

SHEET 25 OF 26

SCALE 1" = 50'

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.
6	NH 95 (40) IM	203
STATE	STATE DIST. NO.	COUNTY
TEXAS	15	COMAL
CONT.	SECT.	JOB
0016	05	087
		HIGHWAY NO.
		1H 35



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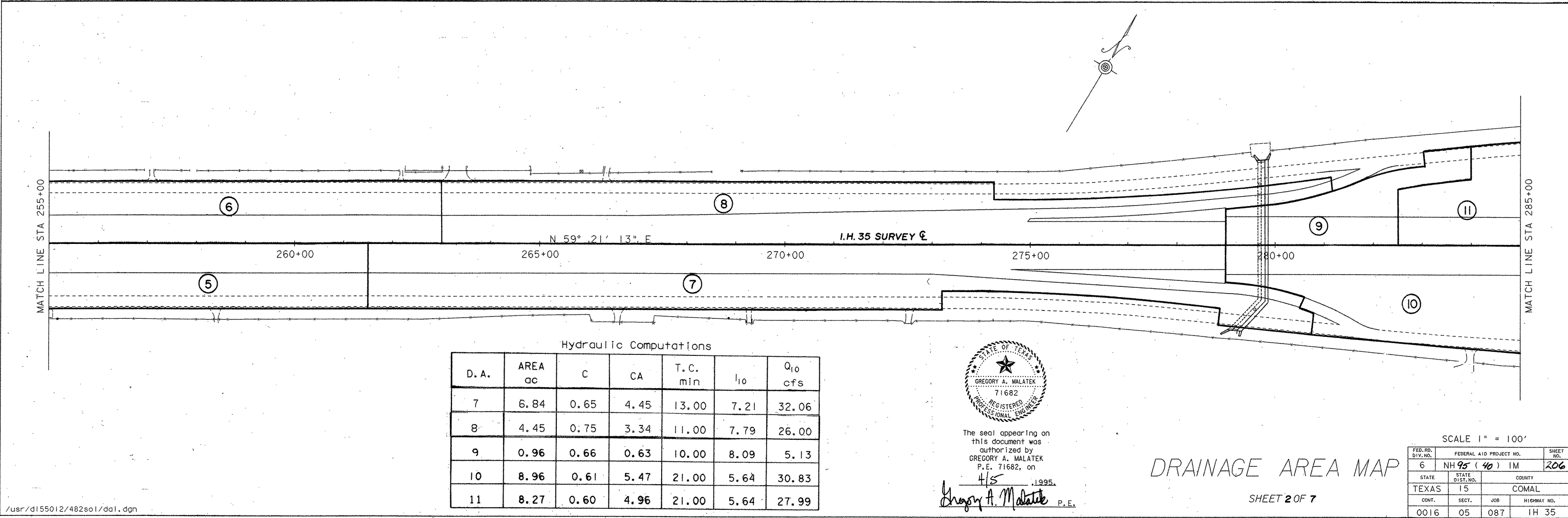
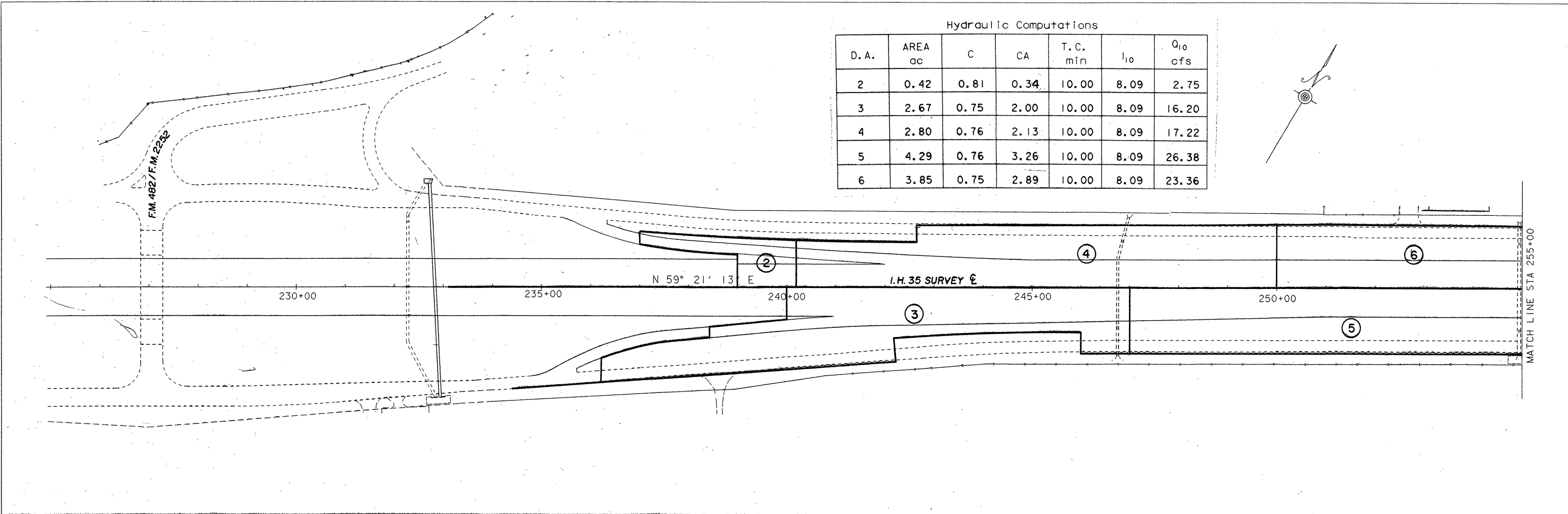
4/7/1995
Gregory A. Malatek, P.E.

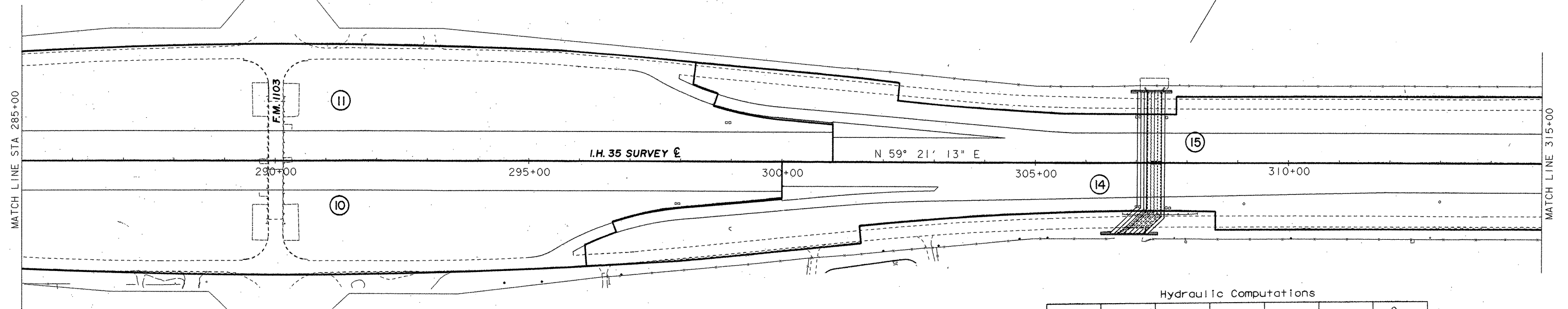
Shaded Area denotes the approximate limits of Topsoil.

TOPSOIL LAYOUT

SHEET 26 OF 26

SCALE 1" = 50'			
FED. RD. DIST. NO.	FEDERAL AID PROJECT NO.	SHEET NO.	
6	NH95 (40) IM	204	
STATE	STATE DIST. NO.	COUNTY	
TEXAS	15	COMAL	
CONT.	SECT.	JOB	HIGHWAY NO.
0016	05	087	1H 35



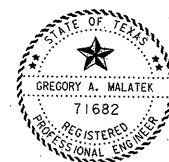
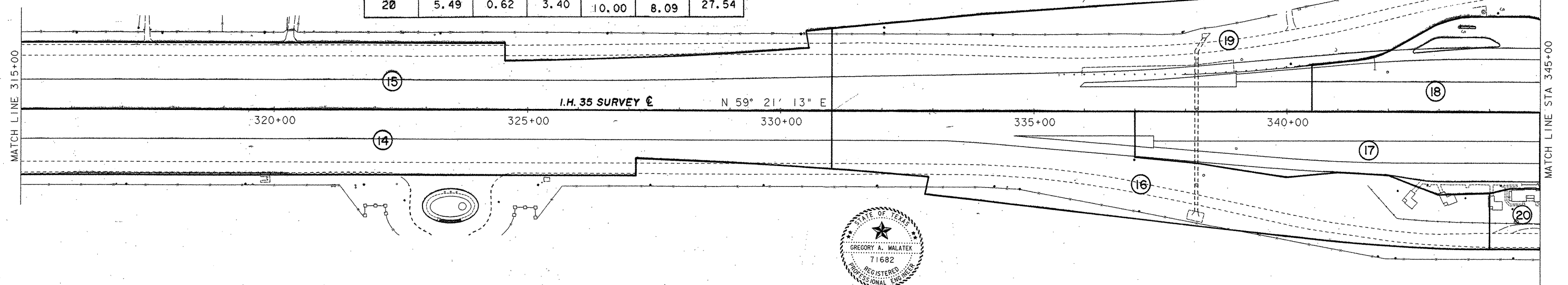


Hydraulic Computations

D. A.	AREA ac	C	CA	T. C. min	I_{10}	Q_{10} cfs
14	9.54	0.74	7.04	26.00	5.00	35.20
15	8.89	0.73	6.49	21.00	5.65	36.67

Hydraulic Computations

D. A.	AREA ac	C	CA	T. C. min	I_{10}	Q_{10} cfs
16	4.33	0.59	2.55	10.00	8.09	20.67
17	2.21	0.74	1.64	10.00	8.09	13.23
18	1.91	0.77	1.47	10.00	8.09	11.90
19	3.50	0.66	2.31	10.00	8.09	18.69
20	5.49	0.62	3.40	10.00	8.09	27.54



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DRAINAGE AREA MAP

SHEET 3 OF 7

SCALE 1" = 100'

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	NH 95 (40) IM		207
STATE	STATE DIST. NO.	COUNTY	
TEXAS	15	COMAL	
CONT.	SECT.	JOB	HIGHWAY NO.
0016	05	087	IH 35



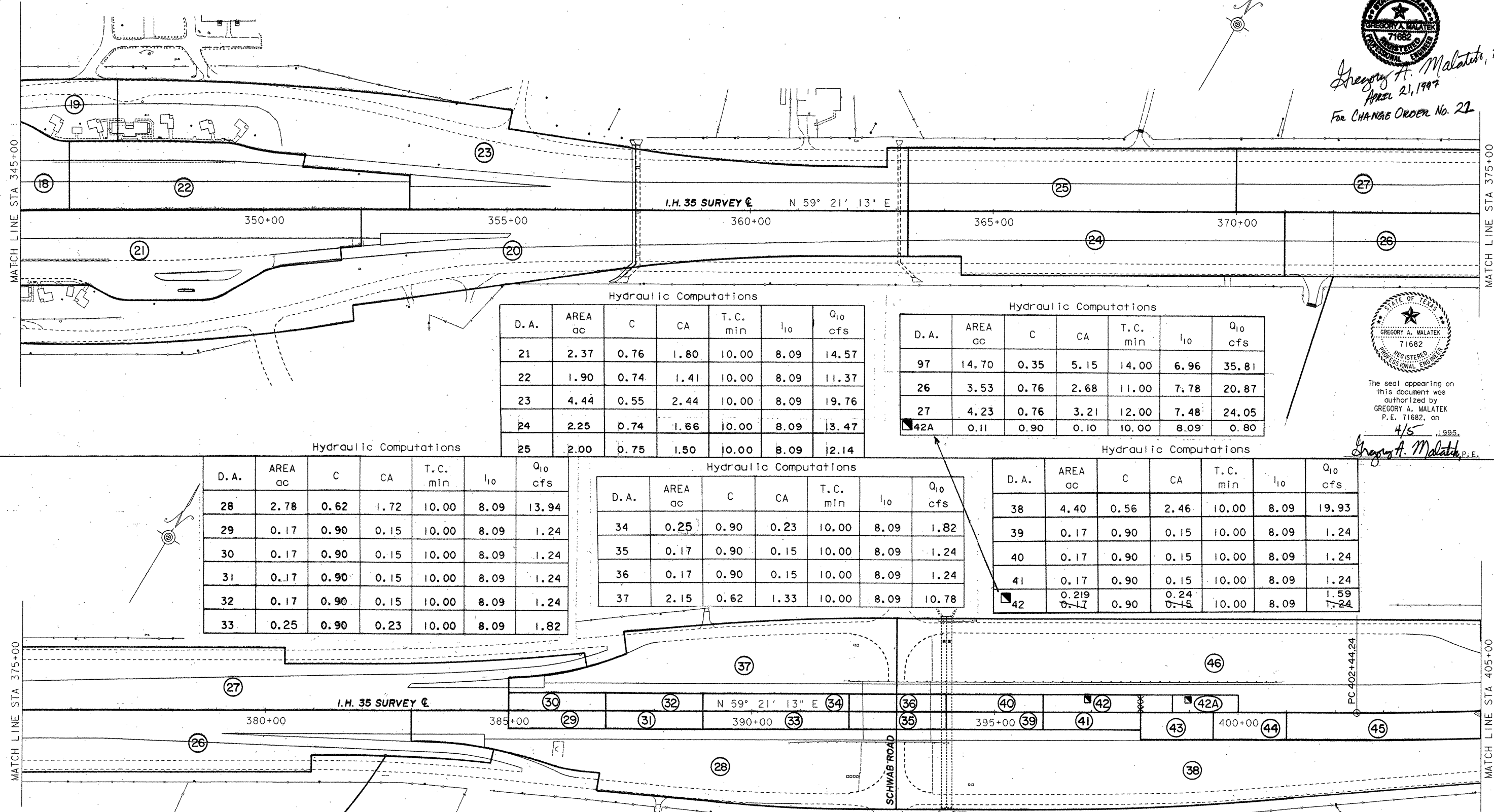
Gregory A. Malatek, PE
April 21, 1997
For CHANGE ORDER NO. 22



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Hydraulic Computations						
D. A.	AREA ac	C	CA	T.C. min	I_{10}	Q_{10} cfs
21	2.37	0.76	1.80	10.00	8.09	14.57
22	1.90	0.74	1.41	10.00	8.09	11.37
23	4.44	0.55	2.44	10.00	8.09	19.76
24	2.25	0.74	1.66	10.00	8.09	13.47
25	2.00	0.75	1.50	10.00	8.09	12.14

Hydraulic Computations						
D. A.	AREA ac	C	CA	T.C. min	I_{10}	Q_{10} cfs
97	14.70	0.35	5.15	14.00	6.96	35.81
26	3.53	0.76	2.68	11.00	7.78	20.87
27	4.23	0.76	3.21	12.00	7.48	24.05
42A	0.11	0.90	0.10	10.00	8.09	0.80

Hydraulic Computations						
D. A.	AREA ac	C	CA	T.C. min	I_{10}	Q_{10} cfs
28	2.78	0.62	1.72	10.00	8.09	13.94
29	0.17	0.90	0.15	10.00	8.09	1.24
30	0.17	0.90	0.15	10.00	8.09	1.24
31	0.17	0.90	0.15	10.00	8.09	1.24
32	0.17	0.90	0.15	10.00	8.09	1.24
33	0.25	0.90	0.23	10.00	8.09	1.82

Hydraulic Computations						
D. A.	AREA ac	C	CA	T.C. min	I_{10}	Q_{10} cfs
34	0.25	0.90	0.23	10.00	8.09	1.82
35	0.17	0.90	0.15	10.00	8.09	1.24
36	0.17	0.90	0.15	10.00	8.09	1.24
37	2.15	0.62	1.33	10.00	8.09	10.78

Hydraulic Computations						
D. A.	AREA ac	C	CA	T.C. min	I_{10}	Q_{10} cfs
38	4.40	0.56	2.46	10.00	8.09	19.93
39	0.17	0.90	0.15	10.00	8.09	1.24
40	0.17	0.90	0.15	10.00	8.09	1.24
41	0.17	0.90	0.15	10.00	8.09	1.24
42	0.219 0.17	0.90	0.24 0.15	10.00	8.09	1.59 1.24

Hydraulic Computations						
D. A.	AREA ac	C	CA	T.C. min	I_{10}	Q_{10} cfs
43	0.20	0.90	0.18	10.00	8.09	1.46
44	0.20	0.90	0.18	10.00	8.09	1.46
45	0.53	0.90	0.48	10.00	8.09	3.86
46	5.88	0.63	3.70	11.00	7.78	28.82

FOR CHANGE ORDER NO. 22
DRAINAGE AREA MAP

SHEET 4 OF 7

SCALE 1" = 100'

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.
6	NH95 (40) IM	208
STATE	STATE DIST. NO.	COUNTY
TEXAS	15	COMAL
CONT.	SECT.	JOB
0016	05	087
		HIGHWAY NO.
		1H 35

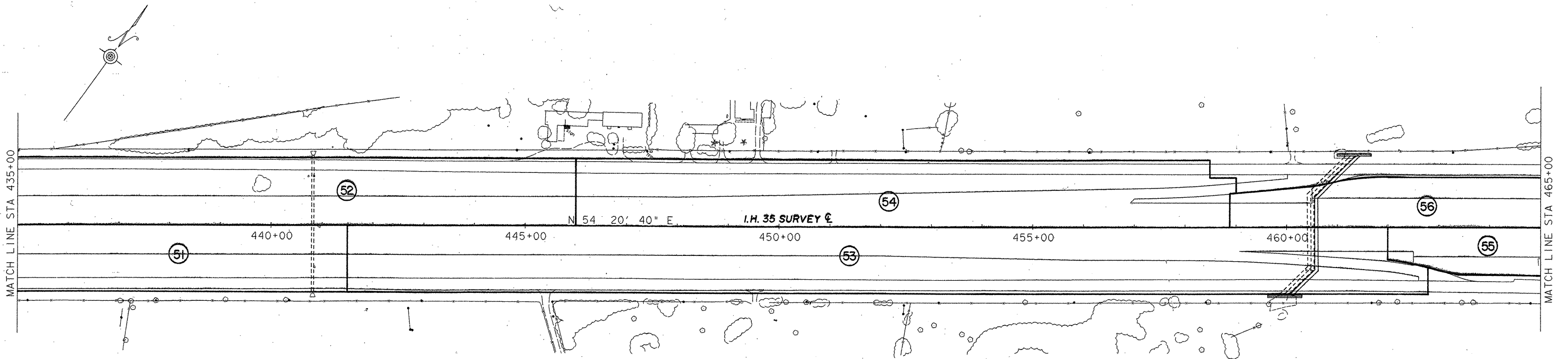
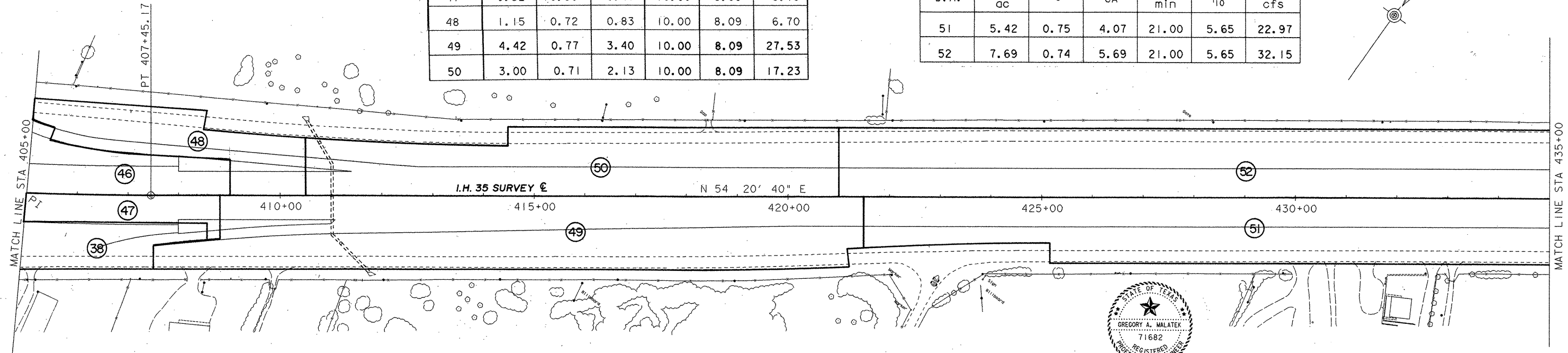
Hydraulic Computations						
D. A.	AREA ac	C	CA	T. C. min	I_{10}	Q_{10} cfs
47	0.52	0.90	0.47	10.00	8.09	3.79
48	1.15	0.72	0.83	10.00	8.09	6.70
49	4.42	0.77	3.40	10.00	8.09	27.53
50	3.00	0.71	2.13	10.00	8.09	17.23

Hydraulic Computations						
D. A.	AREA ac	C	CA	T. C. min	I_{10}	Q_{10} cfs
51	5.42	0.75	4.07	21.00	5.65	22.97
52	7.69	0.74	5.69	21.00	5.65	32.15



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Hydraulic Computations						
D. A.	AREA ac	C	CA	T. C. min	I_{10}	Q_{10} cfs
53	6.18	0.78	4.82	14.00	6.96	33.55

Hydraulic Computations						
D. A.	AREA ac	C	CA	T. C. min	I_{10}	Q_{10} cfs
54	3.92	0.80	3.14	10.00	8.09	25.37

Hydraulic Computations						
D. A.	AREA ac	C	CA	T. C. min	I_{10}	Q_{10} cfs
55	4.52	0.66	2.98	16.00	6.52	19.45
56	3.52	0.67	2.36	15.00	6.73	15.87

DRAINAGE AREA MAP

SHEET 5 OF 7

SCALE 1" = 100'			
FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.	
6	NH 95 (40) IM	209	
STATE	STATE DIST. NO.	COUNTY	
TEXAS	15	COMAL	
CONT.	SECT.	JOB	HIGHWAY NO.
0016	05	087	IH 35

Hydraulic Computations

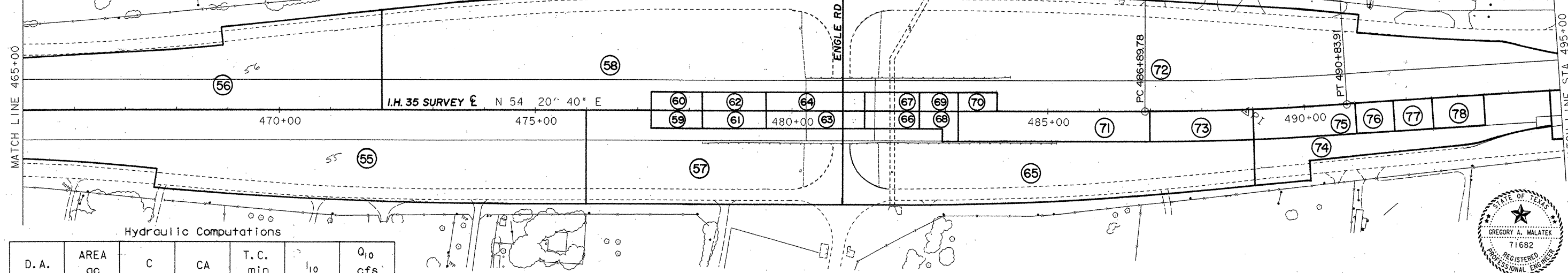
D. A.	AREA ac	C	CA	T.C. min	I_{10}	Q_{10} cfs
57	1.77	0.64	1.13	10.00	8.09	9.16
58	4.10	0.60	2.46	10.00	8.09	19.90
59	0.08	0.90	0.07	10.00	8.09	0.58
60	0.08	0.90	0.07	10.00	8.09	0.58

Hydraulic Computations

D. A.	AREA ac	C	CA	T.C. min	I_{10}	Q_{10} cfs
61	0.10	0.90	0.09	10.00	8.09	0.73
62	0.10	0.90	0.09	10.00	8.09	0.73
63	0.16	0.90	0.14	10.00	8.09	1.16
64	0.16	0.90	0.14	10.00	8.09	1.16

Hydraulic Computations

D. A.	AREA ac	C	CA	T.C. min	I_{10}	Q_{10} cfs
65	2.23	0.58	1.29	10.00	8.09	10.46
66	0.09	0.90	0.08	10.00	8.09	0.66
67	0.09	0.90	0.08	10.00	8.09	0.66
68	0.08	0.90	0.07	10.00	8.09	0.58



Hydraulic Computations

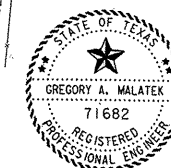
D. A.	AREA ac	C	CA	T.C. min	I_{10}	Q_{10} cfs
69	0.06	0.90	0.06	10.00	8.09	0.45
70	0.06	0.90	0.06	10.00	8.09	0.45
71	0.50	0.90	0.45	10.00	8.09	3.64
72	5.51	0.65	3.58	14.00	6.96	24.93
73	0.27	0.90	0.24	10.00	8.09	1.97
74	0.95	0.55	0.52	10.00	8.09	4.23
75	0.27	0.90	0.24	10.00	8.09	1.97

Hydraulic Computations

D. A.	AREA ac	C	CA	T.C. min	I_{10}	Q_{10} cfs
76	0.10	0.90	0.09	10.00	8.09	0.73
77	0.10	0.90	0.09	10.00	8.09	0.73
78	0.13	0.90	0.12	10.00	8.09	0.95
79	1.35	0.83	1.12	10.00	8.09	9.06

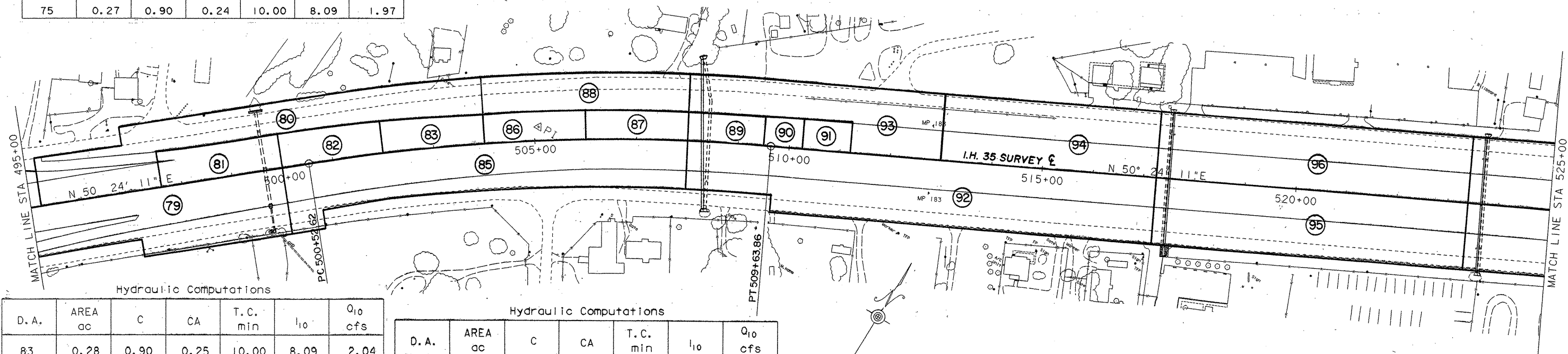
Hydraulic Computations

D. A.	AREA ac	C	CA	T.C. min	I_{10}	Q_{10} cfs
80	1.51	0.72	1.09	10.00	8.09	8.80
81	0.37	0.90	0.33	10.00	8.09	2.69
82	0.29	0.90	0.26	10.00	8.09	2.11
85	1.74	0.74	1.29	10.00	8.09	10.42



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Hydraulic Computations

D. A.	AREA ac	C	CA	T.C. min	I_{10}	Q_{10} cfs
83	0.28	0.90	0.25	10.00	8.09	2.04
86	0.27	0.90	0.24	10.00	8.09	1.97
87	0.27	0.90	0.24	10.00	8.09	1.96
88	0.64	0.64	0.41	10.00	8.09	3.32
89	0.20	0.90	0.18	10.00	8.09	1.46

Hydraulic Computations

D. A.	AREA ac	C	CA	T.C. min	I_{10}	Q_{10} cfs
90	0.10	0.90	0.09	10.00	8.09	0.73
91	0.13	0.90	0.12	10.00	8.09	0.95
92	2.40	0.75	1.80	11.00	7.78	14.00
93	1.23	0.62	0.76	10.00	8.09	6.15
94	1.29	0.74	0.95	10.00	8.09	7.72

Hydraulic Computations

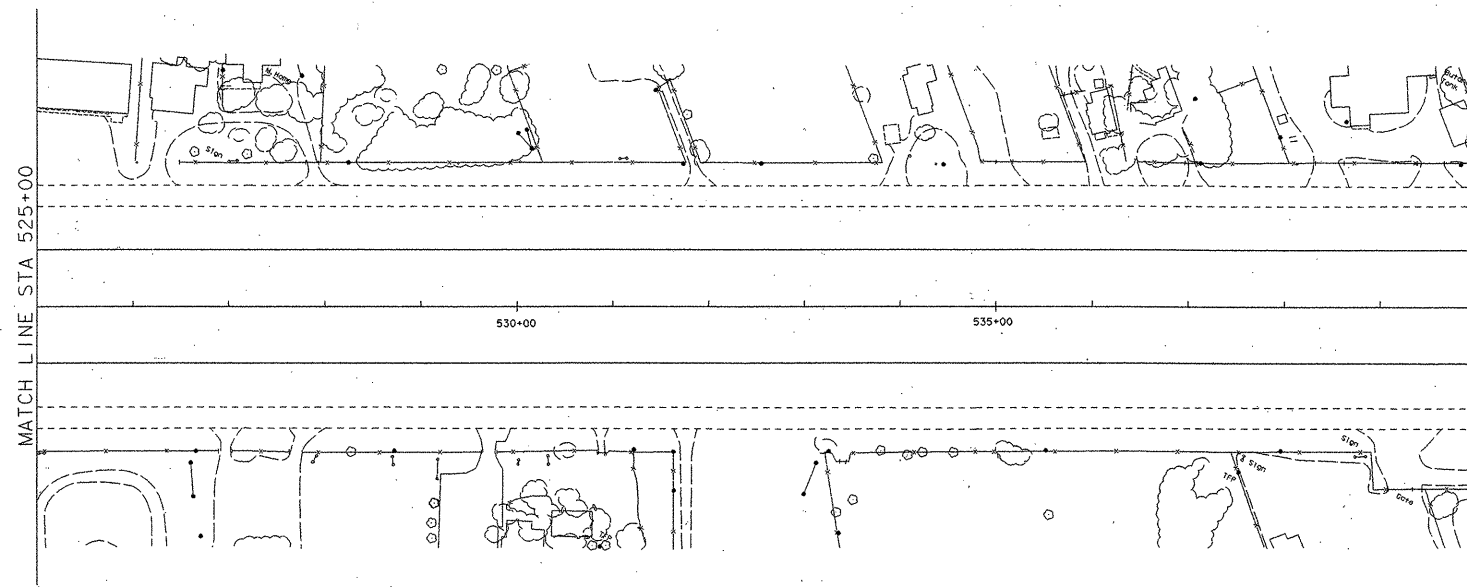
D. A.	AREA ac	C	CA	T.C. min	I_{10}	Q_{10} cfs
95	1.81	0.75	1.36	10.00	8.09	10.98
96	1.81	0.75	1.36	10.00	8.09	10.98

DRAINAGE AREA MAP.

SHEET 6 OF 7

SCALE 1" = 100'

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.
6	NH 95 (40) IM	210
STATE	STATE DIST. NO.	COUNTY
TEXAS	15	COMAL
CONT.	SECT.	JOB
0016	05	087
		HIGHWAY NO.
		IH 35



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SCALE 1" = 100'

DRAINAGE AREA MAP

SHEET 7 OF 7

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	NH 95 (40) IM		211
STATE	STATE DIST. NO.	COUNTY	
TEXAS	15	COMAL	
CONT.	SECT.	JOB	HIGHWAY NO.
0016	05	087	IH 35

HYDRAULIC DATA SHEET FOR STRUCTURES UNDER 1500 C.F.S.
(PIPES, PIPE ARCHES & BOX CULVERTS)

[illegible]

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FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.			SHEET NO.
6	NH 95 (40) IM			212
STATE	STATE DIST. NO.	COUNTY		
TEXAS	15	COMAL		
CONT.	SECT.	JOB	HIGHWAY NO.	
0016	05	087	I. H. 35	

HYDRAULIC DATA SHEET FOR STRUCTURES GREATER THAN 1500 C.F.S.
(PIPES, PIPE ARCHES & BOX CULVERTS)

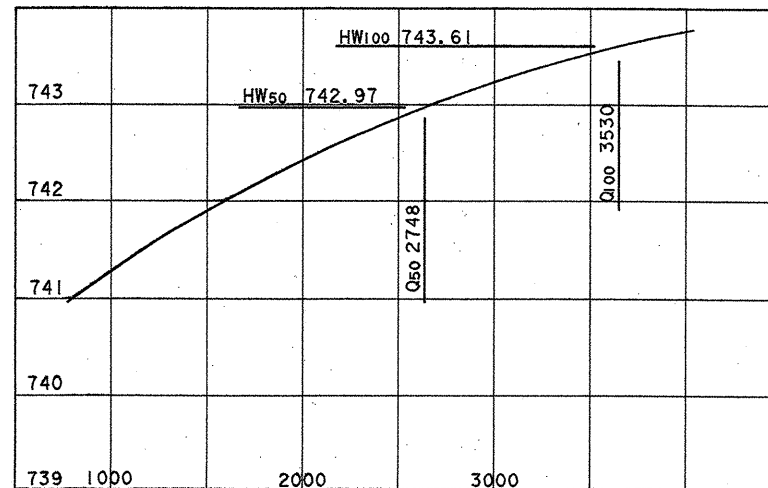
IH 35 STA 306+99.42 to (1990) 48,000
LOCATION: STA 307+53.83 PROP STR: 8-6'x6'x297'-1 5/8" DES ADT: (2010) 91,300

ITEMS	DESIGN Q	Q 100
FREQUENCY	50 YR	100 YR
METHOD USED TO DETERMINE Q	USGS REGIONAL REGRESSION Eq.	
DRAINAGE AREA (AC. OR SQ. MI.)	0.977 SQ. MI.	0.977 SQ. MI.
DRAINAGE AREA SLOPE (IN FT./MI. BTWN 10% & 85% PTS.)	83.37 FT/MI	83.37 FT/MI
Q	2,748 C.F.S	3,530 C.F.S
CHANNEL SLOPE (IF SINGLE SECTION METHOD OF BW CALC USED.)	0.014 FT/FT	0.014 FT/FT
ALLOW HW (ELEV. AT SITE)	753.50	753.50
CALC. TW (ELEV. AT SITE)	744.42	745.06
CALC. HW OR BACKWATER (ELEV. AT SITE)	751.89	753.16
VEL THRU STR OR VEL OUT	18.59 FPS	19.62 FPS
VEL THRU NATURAL CHANNEL	11.35 FPS	12.25 FPS
MAX ALLOW VEL OUT	* 8.00 FPS	* 8.00 FPS
AREA BELOW DESIGN HW UNDER SPAN BR	SF	SF

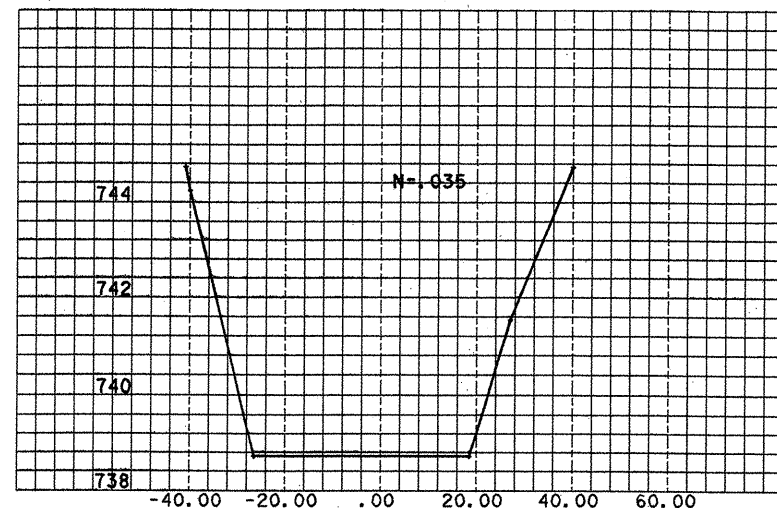
REMARKS: (CONTROLLING HEADWATER FEATURES, PREVIOUS FLOOD HIGHWATER MARKS, YEAR, AMOUNT OF RAINFALL AND FREQUENCY IF AVAILABLE, RIPRAP DOWNSTREAM AND OTHER PERTINANT DATA.) * RIPRAP WITH ENERGY DISSIPATORS TO BE PLACED DOWNSTREAM

EFFECTS OF Q 100

DEPTH OF OVERFLOW OF ROAD: 0 FT.
WIDTH OF OVERFLOW OF ROAD: 0 FT.
Q OVER ROAD: 0 %
Q THRU STRUCTURE: 100 %



ELEVATION VS. DISCHARGE CURVE
LOCATION: @ 103.55' DOWN STREAM OF STRUCTURE



NATURAL STREAM CROSS-SECTION WITH "n" VALUES
LOCATION: @ 103.55' DOWN STREAM OF STRUCTURE

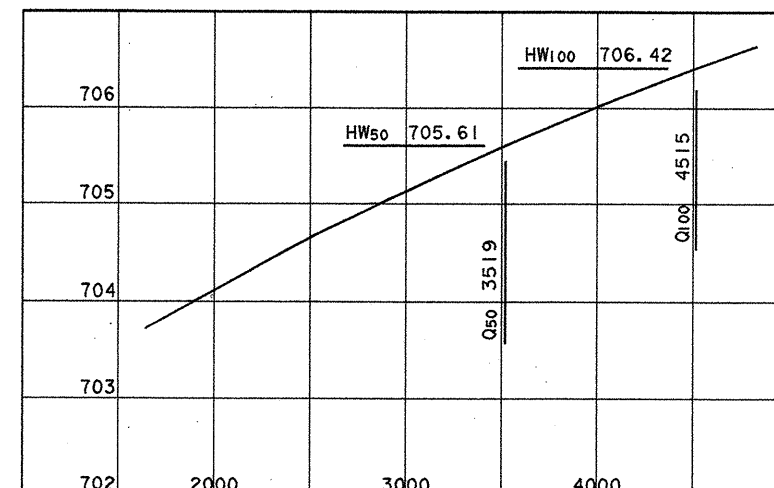
IH 35 STA 393+89.93 TO (1990) 48,000
LOCATION: STA 394+11.93 EXIST STR: 2-10'x10' DES ADT: (2010) 91,300

ITEMS	DESIGN Q	Q 100
FREQUENCY	50 YR	100 YR
METHOD USED TO DETERMINE Q	USGS REGIONAL REGRESSION Eq.	
DRAINAGE AREA (AC. OR SQ. MI.)	1.26 SQ. MI.	1.26 SQ. MI.
DRAINAGE AREA SLOPE (IN FT./MI. BTWN 10% & 85% PTS.)	91.67 FT/MI	91.67 FT/MI
Q	3,519 C.F.S	4,515 C.F.S
CHANNEL SLOPE (IF SINGLE SECTION METHOD OF BW CALC USED.)	0.01229 FT/FT	0.01229 FT/FT
ALLOW HW (ELEV. AT SITE)	718.03	718.03
CALC. TW (ELEV. AT SITE)	706.14	706.95
CALC. HW OR BACKWATER (ELEV. AT SITE)	720.34	721.91
VEL THRU STR OR VEL OUT	24.01 FPS	24.46 FPS
VEL THRU NATURAL CHANNEL	12.06 FPS	12.92 FPS
MAX ALLOW VEL OUT	* 8.00 FPS	* 8.00 FPS
AREA BELOW DESIGN HW UNDER SPAN BR	SF	SF

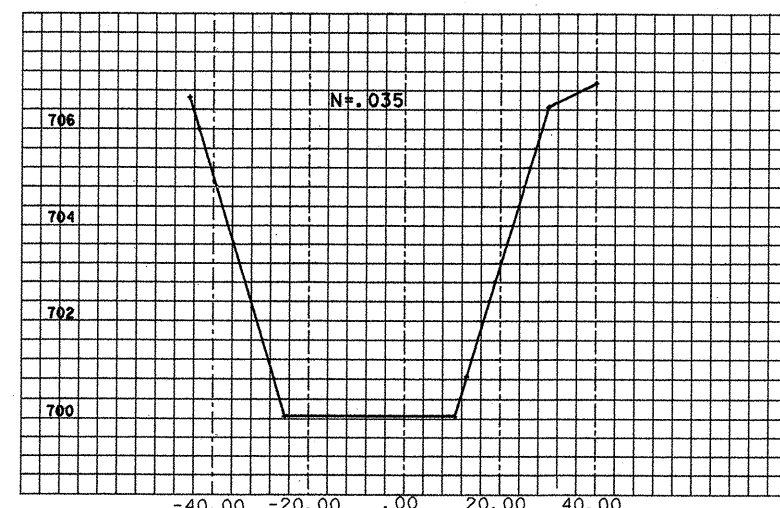
REMARKS: (CONTROLLING HEADWATER FEATURES, PREVIOUS FLOOD HIGHWATER MARKS, YEAR, AMOUNT OF RAINFALL AND FREQUENCY IF AVAILABLE, RIPRAP DOWNSTREAM AND OTHER PERTINANT DATA.) * RIPRAP WITH ENERGY DISSIPATORS TO BE PLACED DOWNSTREAM.

EFFECTS OF Q 100

DEPTH OF OVERFLOW OF ROAD: 3.88 FT.
WIDTH OF OVERFLOW OF ROAD: 76 FT.
Q OVER ROAD: 28.43 %
Q THRU STRUCTURE: 71.57 %



ELEVATION VS. DISCHARGE CURVE
LOCATION: @ 43.10' DOWN STREAM OF STRUCTURE



NATURAL STREAM CROSS-SECTION WITH "n" VALUES
LOCATION: @ 43.10' DOWN STREAM OF STRUCTURE



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Gregory A. Malatek, P.E.

SHEET 1 OF 1 SHEETS

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.
6	NH 95 (40) IM	213
STATE	STATE DIST. NO.	COUNTY
TEXAS	15	COMAL
CONT.	SECT.	JOB
0010	05	081
		H. 35

STORM SEWER COMPUTATIONS

SHEET NO.	LINE NO.	RUN	FROM	TO	DRAINAGE AREA NO.	DA TOTAL ac.	C	C. A.	TIME OF CONCENTRATION MINUTES			I ₁₀ in/hr	Q ₁₀ cfs	DESIGN				PROFILE			
									ALONG SEWER LINE	INLET TIME min	USED IN DESIGN min			SIZE	SLOPE %	CAP. cfs	VEL ft/sec	LENGTH ft	FALL ft	INVERT ELEV	
																				UPPER END	LOWER END
	B	RB1	B1	B2	2	0.42	0.81	0.34	OVERLAND FLOW	10	10	8.09	2.75	18	1.021	11.50	5.40	97.91	1.00	812.50	811.50
	B	RB2	B2	B3					10.00+(97.91/5.40*1/60)=10.30				2.75	18	1.015	11.40	5.40	197.00	2.00	811.50	809.50
	B	RB3	B3	OUTFALL					10.30+(197.00/5.40*1/60)=10.90				2.75	18	1.248	12.70	5.50	120.16	1.50	809.50	808.00
	C	RC1	C1	C2	3	2.67	0.75	2.00	OVERLAND FLOW	10	10	8.09	16.18	18	4.688	24.60	15.00	160.00	7.50	815.00	807.50
	C	RC2	C2	OUTFALL	3 & 4	5.47	0.74	4.05	10+(160.00/15.00*1/60)=10.20	10	10	8.09	32.76	24	3.558	46.30	15.00	21.08	0.75	804.75	804.00
	D	RD1	D1	D2	5	4.29	0.76	3.26	OVERLAND FLOW	10	10	8.09	26.37	30	1.274	50.50	8.10	155.00	2.00	799.75	797.75
	D	RD2	D2	OUTFALL	5 & 6	8.14	0.76	6.19	10.00+(157.00/8.10*1/60)=10.30	10	10	8.09	50.08	36	1.053	73.70	11.40	23.75	0.25	797.75	797.50
	E	RE1	E1	E2	7	6.84	0.65	4.45	OVERLAND FLOW	13	13	7.21	32.08	30	1.143	47.50	10.50	240.50	2.75	776.00	773.25
	F	RF1	F1	E2	9	0.96	0.66	0.63	OVERLAND FLOW	10	10	8.09	5.10	18	0.262	5.80	3.70	95.58	0.25	773.50	773.25
	E	RE2	E2	OUTFALL	7, 8, & 9	12.25	0.69	8.45	13.00+(240.50/10.50*1/60)=13.40	11	13	7.21	60.92	36	1.653	93.30	13.50	15.12	0.25	773.25	773.00
	G	RG1	G1	OUTFALL	10	8.96	0.61	5.43	OVERLAND FLOW	21	21	5.64	30.83	30	1.402	52.60	6.20	107.00	1.50	762.00	760.50
	H	RH1	H1	OUTFALL	11	8.27	0.60	4.93	OVERLAND FLOW	21	21	5.64	27.99	24	1.695	31.90	8.90	59.00	1.00	757.40	756.40
	I	RI1	I1	I2	10 & 14	18.50	0.67	12.40	OVERLAND FLOW	26	26	5.00	62.00	42	0.844	100.10	11.00	154.00	1.30	747.30	746.00
	I	RI2	I2	OUTFALL	10, 11, 14, & 15	35.66	0.67	23.89	26.00+(154.00/11.00*1/60)=26.20	21	26	5.00	119.45	48	1.227	171.80	15.00	40.75	0.50	746.00	745.50
	J	RJ1	J1	OUTFALL	18	1.91	0.77	1.47	OVERLAND FLOW	10	10	8.09	11.90	18	1.576	14.10	9.10	109.15	1.71	771.22	769.51
	K	RK1	K1	OUTFALL	21	2.37	0.76	1.81	OVERLAND FLOW	10	10	8.09	14.57	24	2.817	41.10	4.70	71.00	2.00	766.50	764.50
	L	RL1	L1	OUTFALL	22	1.90	0.74	1.40	OVERLAND FLOW	10	10	8.09	11.37	18	2.424	17.70	6.40	66.00	1.60	763.00	761.40
	M	RM1	M1	M2	20 & 21	7.86	0.66	5.19	OVERLAND FLOW	10	10	8.09	41.98	30	1.227	49.20	11.10	163.00	2.00	747.50	745.50
	M	RM2	M2	OUTFALL	20, 21, 22, & 23	14.20	0.64	9.09	10.00+(163.00/11.10*1/60)=10.20	10	10	8.09	73.54	42	0.836	99.50	11.10	119.59	1.00	745.50	744.50
	N	RN1	N1	N2	24	2.25	0.74	1.67	OVERLAND FLOW	10	10	8.09	13.51	24	0.974	24.20	8.50	154.00	1.50	750.00	748.50
	N	RN2	N2	OUTFALL	24 & 25	4.25	0.75	3.19	10.00+(154.00/8.50*1/60)=10.30	10	10	8.09	25.81	24	4.045	50.00	15.40	12.36	0.50	747.00	746.50
	O	RO1	O1	O2	97	14.70	0.35	5.15	OVERLAND FLOW	14	14	6.96	35.84	30	1.263	49.00	11.10	42.74	0.54	744.50	743.96
	O	RO2	O2	O3	97 & 26	18.23	0.44	8.02	14.00+(42.74/11.10*1/60)=14.10	11	14	6.96	55.82	36	1.690	90.00	14.00	212.00	3.58	743.96	740.38
	O	RO3	O3	OUTFALL					14.10+(212.00/14.00*1/60)=14.40		14	6.96	55.82	36	1.067	64.00	11.80	140.56	1.50	739.50	738.00
	P	RP1	P1	OUTFALL	27	4.23	0.76	3.21	OVERLAND FLOW	12	12	7.48	24.05	30	6.250	35.10	4.90	160.00	1.00	730.75	729.75
	Q	RQ1	Q1	Q2	29 & 30	0.34	0.90	0.31	OVERLAND FLOW	10	10	8.09	2.51	18	1.280	12.90	5.50	195.00	2.50	735.00	732.50
	Q	RQ2	Q2	Q3	29, 30, 31, & 32	0.68	0.90	0.61	10.00+(195.00/5.50*1/60)=10.60	10	11	7.78	4.75	18	4.200	7.40	4.40	119.00	0.50	732.50	732.00
	R	RR1	R1	Q3	35 & 36	0.34	0.90	0.31	OVERLAND FLOW	10	10	8.09	2.51	18	0.303	6.30	3.30	165.00	0.50	732.50	732.00
	Q	RQ3	Q3	OUTFALL	29, 30, 31, 32, 33, 34, 35, & 36	1.52	0.90	1.37	10.60+(119.00/4.40*1/60)=11.10	10	11	7.78	10.66	24	0.792	22.00	6.80	94.75	0.75	732.00	731.25
	S	RS1	S1	S2	27, 29-37	7.90	0.75	5.93	OVERLAND FLOW	12	12	7.48	44.36	36	1.252	80.80	12.00	159.78	2.00	712.50	710.50
	T	RT1	T1	T2	45	0.53	0.90	0.48	OVERLAND FLOW	10	10	8.09	3.88	18	0.358	6.80	4.00	139.50	0.50	734.75	734.25
	T	RT2	T2	T3	44 & 45	0.73	0.90	0.66	10.00+(139.50/4.00*1/60)=10.60	10	11	7.78	5.13	18	0.345	6.70	4.10	145.00	0.50	734.25	733.75
	T	RT3	T3	T4	43, 44, & 45	0.93	0.90	0.84	10.60+(145.00/4.10*1/60)=11.20	10	11	7.78	6.53	24	0.385	15.20	4.50	195.00	0.75	733.75	733.00
	T	RT4	T4	T5	41, 42, 43, 44, & 45	1.27	0.90	1.14	11.20+(195.00/4.50*1/60)=11.80	10	12	7.48	8.52	24	0.385	15.20	5.00	195.00	0.75	733.00	732.25
	T	RT5	T5	OUTFALL	39, 40, 41, 42, 43, 44, & 45	1.61	0.90	1.45	11.80+(195.00/5.00*1/60)=12.50	10	13	7.21	10.45	24	0.597	18.50	6.00	83.75	0.50	732.25	731.75
	U	RUI	UI	OUTFALL	48	1.15	0.72	0.83	OVERLAND FLOW	10	10	8.09	6.70	18	1.667	14.70	3.80	120.00	2.00	733.00	731.00
	V	RVI	VI	OUTFALL	47	0.52	0.90	0.47	OVERLAND FLOW	10	10	8.09	3.79	18	1.823	15.40	2.10	96.00	1.75	738.75	737.00
	S	RS2	S2	OUTFALL	27, 29-37, & 39-48	17.06	0.72	12.28	12.00+(159.78/12.00*1/60)=12.20	13	13	7.21	88.54	36	3.521	89.20	21.00	7.10	0.25	708.00	707.75

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P.E. 71682, on
4/5, 1995.
Gregory A. Malatek, P.E.



STORM SEWER COMPUTATIONS
SHEET 1 OF 3

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	NH 95 (40) IM		214
STATE	STATE DIST. NO.	COUNTY	
TEXAS	15	COMAL	
CONT.	SECT.	JOB	HIGHWAY NO.
0016	05	087	1H 35

STORM SEWER COMPUTATIONS

SHEET NO.	LINE NO.	RUN	FROM	TO	DRAINAGE AREA NO.	DA TOTAL AC.	C	C. A.	TIME OF CONCENTRATION MINUTES			I ₁₀ In/hr	Q ₁₀ cfs	DESIGN				PROFILE			
									ALONG SEWER LINE	INLET TIME min	USED IN DESIGN min			SIZE	SLOPE %	CAP. cfs	VEL ft/sec	LENGTH ft	FALL ft	INVERT ELEV	
																				UPPER END	LOWER END
	W	RW1	W1	W2	49	4.42	0.77	3.40	OVERLAND FLOW	10	10	8.09	27.53	24	2.864	41.50	13.00	202.52	5.80	747.60	741.80
	W	RW2	W2	OUTFALL	49 & 50	7.42	0.74	5.49	10.00+(202.52/13.00*1/60)=10.30	10	10	8.09	44.42	30	1.074	46.20	10.50	49.00	0.50	740.40	739.87
	X	RX1	X1	BREAK	51	5.42	0.75	4.07	OVERLAND FLOW	21	21	5.65	22.99	24	1.395	28.90	10.00	107.50	1.50	756.00	754.50
	X	RX1	BREAK	X2					21.00+(107.50/10.00*1/60)=21.20				22.99	24	10.163	78.40	11.80	61.50	6.25	754.50	748.25
	X	RX2	X2	OUTFALL	51 & 52	13.11	0.74	9.70	21.20+(61.50/11.80*1/60)=21.30	21	21	5.65	54.81	30	8.517	64.10	11.10	11.74	1.00	748.25	747.25
	Y	RY1	Y1	Z2	53	6.18	0.78	4.82	OVERLAND FLOW	14	14	6.96	33.55	30	1.345	51.70	11.50	185.84	2.50	720.00	717.50
	Z	RZ1	Z1	Z2	55	4.52	0.66	2.98	OVERLAND FLOW	16	16	6.52	19.42	24	1.808	33.00	10.40	69.11	1.25	718.75	717.50
	Z	RZ2	Z2	Z3	53 & 55	10.70	0.73	7.81	16.00+(69.11/10.40*1/60)=16.11		16	6.52	50.92	36	1.398	85.60	12.80	107.27	1.50	716.25	714.75
	Z	RZ3	Z3	OUTFALL	53, 55, & 56	14.22	0.74	10.52	16.11+(81.02 /15.00*1/60)=16.20	15	16	6.52	68.59	36	2.419	112.40	15.00	81.02	1.96	714.25	712.29
	AA	RAA1	AA1	OUTFALL	54	3.92	0.80	3.14	OVERLAND FLOW	10	10	8.09	25.40	24	2.179	36.10	11.10	160.58	3.50	716.50	713.00
	BB1	RBB1-1	BB1-1	BB1-2	63 & 64	0.32	0.90	0.29	OVERLAND FLOW	10	10	8.09	2.35	18	0.625	9.00	4.25	120.00	0.75	734.25	733.50
	BB1	RBB1-2	BB1-2	BB1-3	61, 62, 63, & 64	0.52	0.90	0.47	10.00+(120.00/4.25*1/60)=10.50	10	11	7.78	3.66	18	0.680	9.40	6.00	109.50	0.75	733.50	732.75
	BB1	RBB1-3	BB1-3	OUTFALL	59, 60, 61, 62, 63, & 64	0.68	0.90	0.61	10.50+(109.50/6.00*1/60)=10.80	10	11	7.78	4.75	18	0.830	13.30	5.80	90.75	0.75	732.75	732.00
	BB2	RBB2-1	BB2-1	BB2-2	58-64	4.78	0.64	3.06	OVERLAND FLOW	10	10	8.09	24.76	30	0.515	31.80	7.00	145.50	0.75	714.00	713.25
	BB2	RBB2-2	BB2-2	BB2-3					10.00+(145.50/7.00*1/60)=10.30				24.76	30	2.198	65.50	13.00	45.50	1.00	712.50	711.50
	CC	RCC1	CC1	CC2	66 & 67	0.18	0.90	0.16	OVERLAND FLOW	10	10	8.09	1.29	18	0.290	6.10	3.00	70.00	0.20	734.60	734.40
	CC	RCC2	CC2	CC3	66, 67, 68, & 69	0.32	0.90	0.29	10.00+(70.00/3.00*1/60)=10.40	10	10	8.09	2.35	18	0.500	8.00	3.75	80.00	0.40	734.40	734.00
	CC	RCC3	CC3	OUTFALL	66, 67, 68, 69, & 70	0.38	0.90	0.34	10.40+(80.00/3.75*1/60)=10.80	10	11	7.78	2.65	18	0.830	10.30	4.75	90.75	0.75	732.75	732.00
	DD	RDD1	DD1	EE2-5	71	0.50	0.90	0.45	OVERLAND FLOW	10	10	8.09	3.64	18	0.530	8.30	4.60	189.50	1.00	731.00	730.00
	EE1	REE1-1	EE1-1	EE2-2	74	0.95	0.55	0.52	OVERLAND FLOW	10	10	8.09	4.23	18	0.651	9.20	5.10	76.75	0.50	727.00	726.50
	EE2	REE2-1	EE2-1	EE2-2	78	0.13	0.90	0.12	OVERLAND FLOW	10	10	8.09	0.95	18	0.360	6.80	2.60	101.25	0.36	726.86	726.50
	EE2	REE2-2	EE2-2	EE2-3	74, 77, & 78	1.18	0.62	0.73	10.00+(101.25/2.60*1/60)=10.70	10	11	7.78	5.68	18	0.360	6.80	4.30	70.00	0.25	726.50	726.25
	EE2	REE2-3	EE2-3	EE2-4	74, 76, 77, & 78	1.28	0.64	0.82	10.70+(70.00/4.30*1/60)=11.00	10	11	7.78	6.38	24	0.360	14.60	4.60	70.00	0.25	726.25	726.00
	EE2	REE2-4	EE2-4	EE2-5	74, 75, 76, 77, & 78	1.55	0.69	1.07	11.00+(70.00/4.60*1/60)=11.30	10	11	7.78	8.32	24	0.210	11.10	3.90	195.00	0.40	726.00	725.60
	EE2	REE2-5	EE2-5	OUTFALL	71, 73, 74, 75, 76, 77 , & 78	2.32	0.76	1.76	11.30+(195.00/3.90*1/60)=12.13	10	12	7.49	13.18	30	0.450	29.70	6.00	133.50	0.60	725.60	725.00
	BB2	RBB2-3	BB2-3	OUTFALL	58-64, 66-71, & 73-78,72	12.99	0.69	8.96	10.30+(45.50/13.00*1/60)=10.40	14	14	6.96	62.36	36	2.188	106.50	16.00	22.85	0.50	707.25	706.75
	FF	RFF1	FF1	FF2	79	1.35	0.83	1.12	OVERLAND FLOW	10	10	8.09	9.06	24	0.660	19.90	6.30	76.00	0.50	722.00	721.50
	FF	RFF2	FF2	FF3	79 & 81	1.72	0.85	1.46	10.00+(76.00/6.30*1/60)=10.20	10	10	8.09	11.81	24	1.929	34.00	10.00	77.75	1.50	721.50	720.00
	FF	RFF3	FF3	OUTFALL	79, 80, 81, & 84	3.23	0.72	2.33	10.20+(77.75/10.00*1/60)=10.30	10	10	8.09	18.85	24	1.337	27.70	9.50	37.39	0.50	720.00	719.50
	GG	RGG1	GG1	GG2	82	0.29	0.90	0.26	OVERLAND FLOW	10	10	8.09	2.10	18	0.510	8.10	3.75	195.00	1.00	723.00	722.00
	GG	RGG2	GG2	GG3	82 & 83	0.57	0.90	0.51	10.00+(195.00/3.75*1/60)=10.90	10	11	7.78	3.97	18	0.510	8.10	4.50	195.00	1.00	722.00	721.00
	GG	RGG3	GG3	GG4	82, 83, & 86	0.84	0.90	0.76	10.90+(195.00/4.50*1/60)=11.60	10	12	7.49	5.69	18	0.380	7.10	4.50	195.00	0.75	721.00	720.25
	HH	RHH1	HH1	GG4	85	1.74	0.74	1.29	OVERLAND FLOW	10	10	8.09	10.42	24	0.719	20.70	6.50	69.50	0.50	718.25	717.75
	GG	RGG4	GG4	GG5	82, 83, 85, 86, & 87	2.85	0.80	2.28	11.60+(195.00/4.50*1/60)=12.30	10	12	7.49	17.08	24	0.906	23.30	8.10	82.75	0.75	717.75	717.00
	GG	RGG5	GG5	OUTFALL	82, 83, 85, 86, 87, & 88	3.49	0.77	2.70	12.30+(82.75/8.10*1/60)=12.50	10	13	7.21	19.47	24	1.096	25.60	8.50	31.93	0.35	716.60	716.25
	II	RII1	II1	II2	89	0.20	0.90	0.18	OVERLAND FLOW	10	10	8.09	1.46	18	0.640	9.10	3.50	70.00	0.45	719.20	718.75
	II	RII2	II2	II3	89 & 90	0.30	0.90	0.27	10.00+(70.00/3.50*1/60)=10.30	10	10	8.09	2.18	18	0.910	10.80	4.75	110.00	1.00	718.75	717.75
	II	RII3	II3	II4	89, 90, & 91	0.43	0.90	0.39	10.30+(110.00/4.75*1/60)=10.70	10	11	7.78	3.03	18	0.952	11.10	5.30	78.75	0.75	716.75	716.00
	II	RII4	II4	II5					10.70+(78.75/5.30*1/60)=11.00				3.03	18	1.292	12.90	6.10	154.75	2.00	716.00	714.00
	II	RII5	II5	II6	89, 90, 91, & 93	1.66	0.71	1.18	11.00+(154.75/6.10*1/60)=11.40	10	11	7.78	9.18	18	1.363	13.30	8.10	146.75	2.00	714.00	712.00
	II	RII6	II6	II7					11.40+(146.75/8.10*1/60)=11.70				9.18	18	1.020	11.50	7.30	147.00	1.50	712.00	710.50
	II	RII7	II7	II8					11.70+(147.00/7.30*1/60)=12.00				9.18	24	0.616	19.20	5.75	121.75	0.75	710.50	709.75

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STORM SEWER COMPUTATIONS

SHEET 2 OF 3

/USR/D155012/482SOL/HYDAT.DGN

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.
6	NH 95 (40) IM	215
STATE	COUNTY	
TEXAS	COMAL	
CONT.	SECT.	JOB
0016	05	087
HIGHWAY NO.		
1H 35		

STORM SEWER COMPUTATIONS

[illegible]

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STORM SEWER COMPUTATIONS

SHEET 3 OF 3

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.			SHEET NO.
6	NH 95 (40) IM			216
STATE	STATE DIST. NO.	COUNTY		
TEXAS	15	COMAL		
CONT.	SECT.	JOB	HIGHWAY NO.	
0016	05	087	1H 35	

INLET COMPUTATIONS

Inlet		D. A.	Q _A	Carry	TOTAL	z	z/n	S	y	Ponded	A	Q _L	L _A =	L	L/L _A	A/Y	Q/Q _A	Q=	Carry	Remarks
No.	Station	No.	cfs	over	Q _A			ft/ft	ft	Width	ft	cfs	Q _A /Q _L	ft	ft			Q _A XQ _L /Q _A	over	
Q1	387+02.50 LT	30	1.24	~	1.24	40	2667	0.021	0.14	5.60	0.25	0.32	3.88	5.00	~	~	~	1.24	~	
	387+02.50 RT	29	1.24	~	1.24	40	2667	0.021	0.14	5.60	0.25	0.32	3.88	5.00	~	~	~	1.24	~	
Q2	389+02.50 LT	32	1.24	~	1.24	40	2667	0.011	0.17	6.80	0.25	0.34	3.65	5.00	~	~	~	1.24	~	
	389+02.50 RT	31	1.24	~	1.24	40	2667	0.011	0.17	6.80	0.25	0.34	3.65	5.00	~	~	~	1.24	~	
Q3	390+27.00 LT	34	1.82	~	1.82	42	2800	0.0021	0.20	8.40	0.25	~	1.97	5.00	~	~	~	1.82	~	SAG INLET
	390+27.00 RT	33	1.82	~	1.82	42	2800	0.0021	0.20	8.40	0.25	~	1.97	5.00	~	~	~	1.82	~	
R1	391+97.50 LT	36	1.24	~	1.24	50	3333	0.0024	0.19	9.50	0.25	0.36	3.44	5.00	~	~	~	1.24	~	
	391+97.50 RT	35	1.24	~	1.24	50	3333	0.0024	0.19	9.50	0.25	0.36	3.44	5.00	~	~	~	1.24	~	
T1	400+94.25	45	3.86	~	3.86	40	2667	0.0097	0.26	10.40	0.25	0.42	9.19	10.00	~	~	~	3.86	~	
T2	399+97.00	44	1.46	~	1.46	50	3333	0.0023	0.21	10.50	0.25	0.38	3.84	5.00	~	~	~	1.46	~	
T3	397+97.00	**41.43	1.46	~	1.46	50	3333	0.0024	0.21	10.50	0.25	0.38	3.84	5.00	~	~	~	1.46	~	
T4	395+97.00 LT	**40.42	1.24	~	1.24	50	3333	0.0024	0.19	9.50	0.25	0.36	3.44	5.00	~	~	~	1.24	~	
	395+97.00 RT	**39.41	1.24	~	1.24	50	3333	0.0024	0.19	9.50	0.25	0.36	3.44	5.00	~	~	~	1.24	~	
T5	393+97.00 LT	**36.40	1.24	~	1.24	50	3333	0.0024	0.19	9.50	0.25	0.36	3.44	5.00	~	~	~	1.24	~	
	393+97.00 RT	**35.39	1.24	~	1.24	50	3333	0.0024	0.19	9.50	0.25	0.36	3.44	5.00	~	~	~	1.24	~	
VI	405+05.00	47	3.79	~	3.79	33	2200	0.0237	0.23	7.59	0.25	0.39	9.71	10.00	~	~	~	3.79	~	
DD1	487+05.50	71	3.64	~	3.64	37	2467	0.0076	0.27	9.99	0.25	0.43	8.47	10.00	~	~	~	3.64	~	
EE2-5	489+02.50	75	1.97	~	1.97	33	2200	0.0087	0.22	7.26	0.25	0.38	5.18	5.00	0.97	1.14	0.96	1.89	0.08	TO INLET EE2-4
EE2-4	491+02.50	76	1.97	0.08	2.05	45	3000	0.0068	0.21	9.45	0.25	0.36	5.69	5.00	0.88	1.19	0.88	1.80	0.25	TO INLET EE2-3
EE2-3	491+77.50	77	0.73	0.25	0.98	63	4200	0.0056	0.14	8.82	0.25	0.31	3.16	5.00	~	~	~	0.98	~	
EE2-2	492+52.50	78	0.73	~	0.73	96	6400	0.0049	0.11	10.56	0.25	0.29	2.52	5.00	~	~	~	0.73	~	
FF2	500+03.25	81	2.69	~	2.69	44	2933	0.0049	0.24	10.56	0.25	0.40	6.73	5.00	0.74	1.04	0.74	1.99	0.70	TO INLET GG1
GG1	502+03.25	82	2.11	0.70	2.80	24	1600	0.0049	0.31	7.44	0.25	0.46	6.11	5.00	0.82	0.81	0.82	2.30	0.50	TO INLET GG2
GG2	504+03.25	83	2.04	0.50	2.54	24	1600	0.0050	0.31	7.20	0.25	0.45	5.64	5.00	0.87	0.81	0.89	2.26	0.28	TO INLET GG3
GG3	506+03.25	86	1.97	0.28	2.25	24	1600	0.0050	0.29	6.96	0.25	0.44	5.11	5.00	0.98	0.86	0.98	2.21	0.04	TO INLET GG4
GG4	508+03.25	87	1.96	0.04	2.00	31	2067	0.0049	0.25	7.75	0.25	0.41	4.88	5.00	~	~	~	2.00	~	
II1	509+53.25	89	1.46	~	1.46	55	3667	0.0051	0.18	9.90	0.25	0.35	4.17	5.00	~	~	~	1.46	~	
II2	510+28.25	90	0.73	~	0.73	88	5867	0.0069	0.11	9.68	0.25	0.29	2.52	5.00	~	~	~	0.73	~	
BBI-1	479+47.00 LT	64	1.16	~	1.16	56	3733	0.0021	0.19	10.64	0.25	0.36	3.22	5.00	~	~	~	1.16	~	
	479+47.00 RT	63	1.16	~	1.16	56	3733	0.0021	0.19	10.64	0.25	0.36	3.22	5.00	~	~	~	1.16	~	
BBI-2	478+22.00 LT	62	0.73	~	0.73	86	5733	0.0055	0.12	10.32	0.25	0.30	2.43	5.00	~	~	~	0.73	~	
	478+22.00 RT	61	0.73	~	0.73	86	5733	0.0055	0.12	10.32	0.25	0.30	2.43	5.00	~	~	~	0.73	~	
CCI-1	482+53.00 LT	67	0.66	~	0.66	65	4333	0.0012	0.16	10.40	0.25	0.33	2.00	5.00	~	~	~	0.66	~	
	482+53.00 RT	66	0.66	~	0.66	50	3333	0.0012	0.18	9.00	0.25	0.34	1.94	5.00	~	~	~	0.66	~	
CCI-2	483+28.00 LT	69	0.45	~	0.45	133	8867	0.0031	0.09	11.97	0.25	0.28	1.60	5.00	~	~	~	0.45	~	
	483+28.00 RT	68	0.58	~	0.58	50	3333	0.0031	0.14	7.00	0.25	0.31	1.87	5.00	~	~	~	0.58	~	



Gregory A. Malatek
APRIL 21, 1997
For CHANGE ORDER NO. 22



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****CHANGE ORDER NO. 22**
INLET COMPUTATIONS

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.
6	NH 95 (40) IM	217
STATE	COUNTY	
TEXAS	COMAL	
CONTRACT	SECTION	JOB
0016	05	087
		1H 35

EXIST WEST FRONTAGE ROAD
(NO WORK PROPOSED
EXCEPT OVER ADDED BARREL)

RIPRAP (CONC) (CL B)
EST @ 3.0 CY
(INCLUDING RETARDS)

RIPRAP (CONC) (CL B)
EST @ 11.0 CY

EXIST EAST FRONTAGE ROAD
(NO WORK PROPOSED
EXCEPT OVER ADDED BARREL)

219.31' RT. $\frac{1}{2}$
STA. 232+96.55

CHANNEL EASEMENT

212.35' LT. $\frac{1}{2}$
STA. 232+70.58

STA. 232+83

3.23°

STA 232+27.60

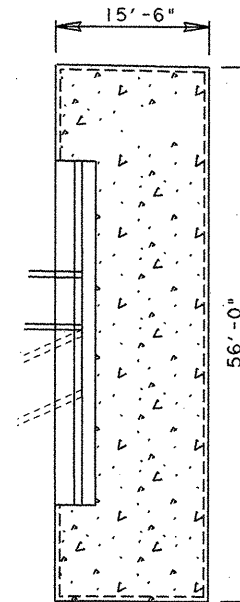
105.0' RT $\frac{1}{2}$ STA 232+27.60
FL ELEV = 810.30

154.0' LT $\frac{1}{2}$ STA 232+27.60
FL ELEV = 803.50

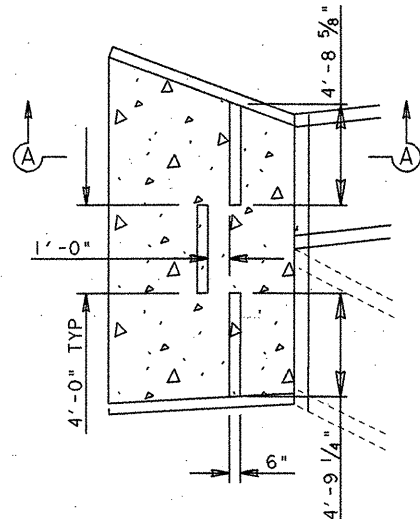
EXISTING STRUCTURE TO REMAIN.
FOR HYDRAULIC INFORMATION SEE
HYDRAULIC DATA SHEET FOR STRUCTURES
UNDER THAN 1500 CFS.
ALL EXISTING INLETS & PIPES TO
BE REMOVED. THE PIPE ENTRANCE TO
* THE CULVERT SHALL BE REPAIRED IN
ACCORDANCE WITH CULVERT REPAIR
DETAIL SHEET.

DESCRIPTION	UNIT	EST	FINAL
** STRUCT EXCAV	CY	1302.00	
TRENCH EXCAV PROTECTION	LF	433.00	
RIPRAP (CONC) (CL B)	CY	14.00	
CONC BOX CULV(5 FT X 5 FT)	LF	432.48	
WINGWALL (MCW-P) (H= 5 FT)	EA	1.00	
WINGWALL (FW-N) (H= 5 FT)	EA	1.00	

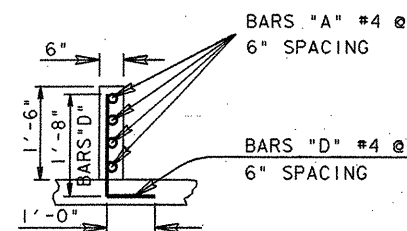
** FOR CONTRACTOR'S INFORMATION ONLY



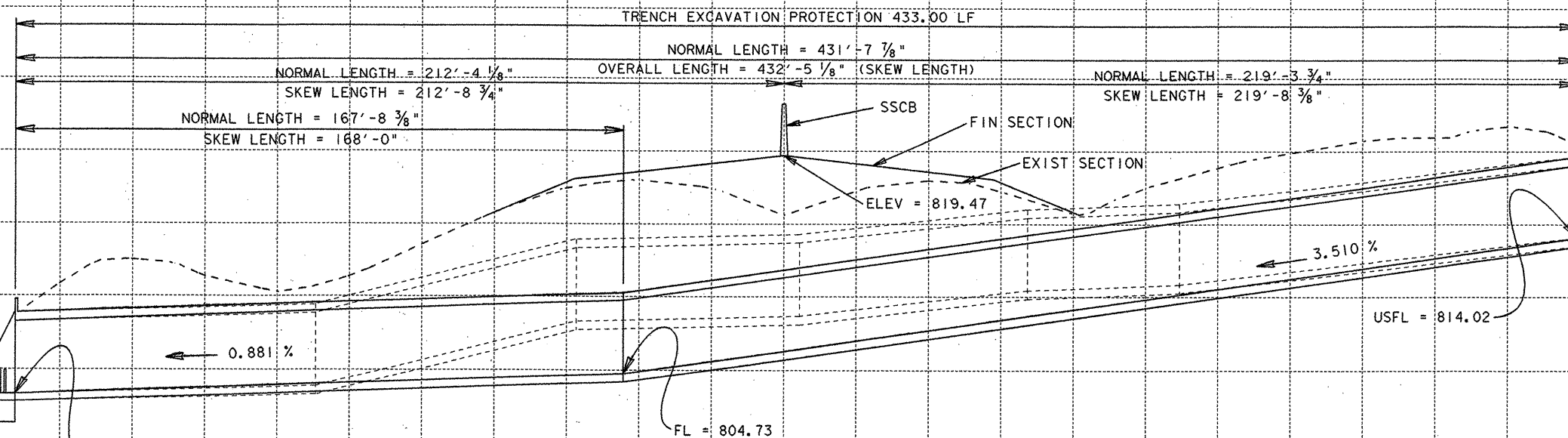
UPSTREAM DETAILS



DOWNSTREAM DETAILS



SEC A-A



STA 232+83.00
1-5'x5'x431'-7 7/8" CONC CULV TO BE LENGTHENED
TO 2-5'x5'x431'-7 7/8" CONC CULV
WITH SC-NA, PC-1, PC-3 & PC-7
USING MCW-P UPSTR & FW-N DNSTR

CULVERT LAYOUT

AT STA 232+83.00
SHEET 1 OF 15



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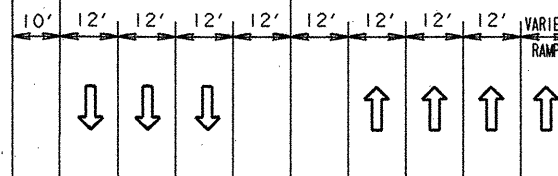
4/5, 1995.
Gregory A. Malatek, P.E.

1" = 20' HORZ.
1" = 5' VERT.

FED. RD. DIST. NO.	FEDERAL AID PROJECT NO.	SHEET NO.
6	NH 95 (40) IM	218
STATE	STATE DIST. NO.	COUNTY
TEXAS	15	COMAL
CONT.	SECT.	JOB
0016	05	087
CONTRACT NO.	SECTION	HIGHWAY NO.
0016	05	087

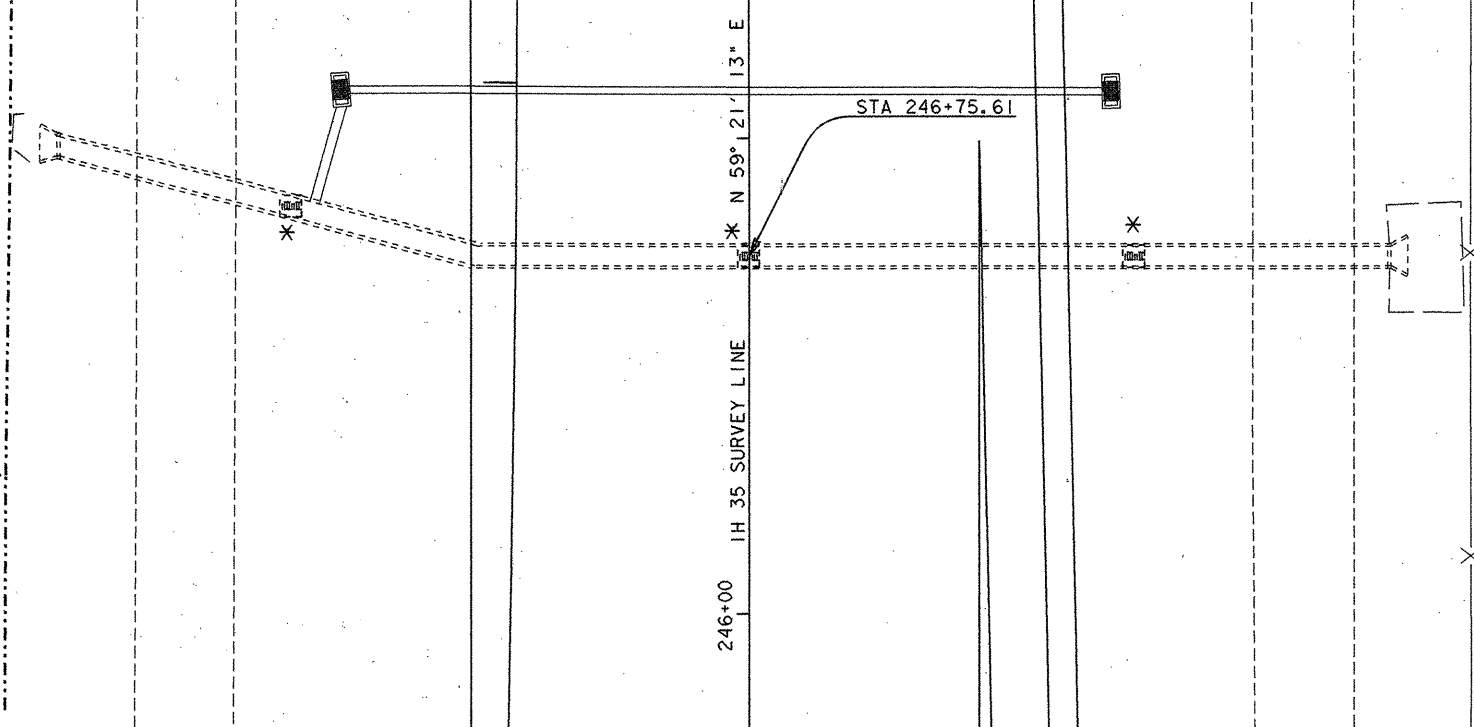
EXIST WEST FRONTAGE ROAD
(NO WORK PROPOSED)

EXIST
CHANNEL
EASEMENT



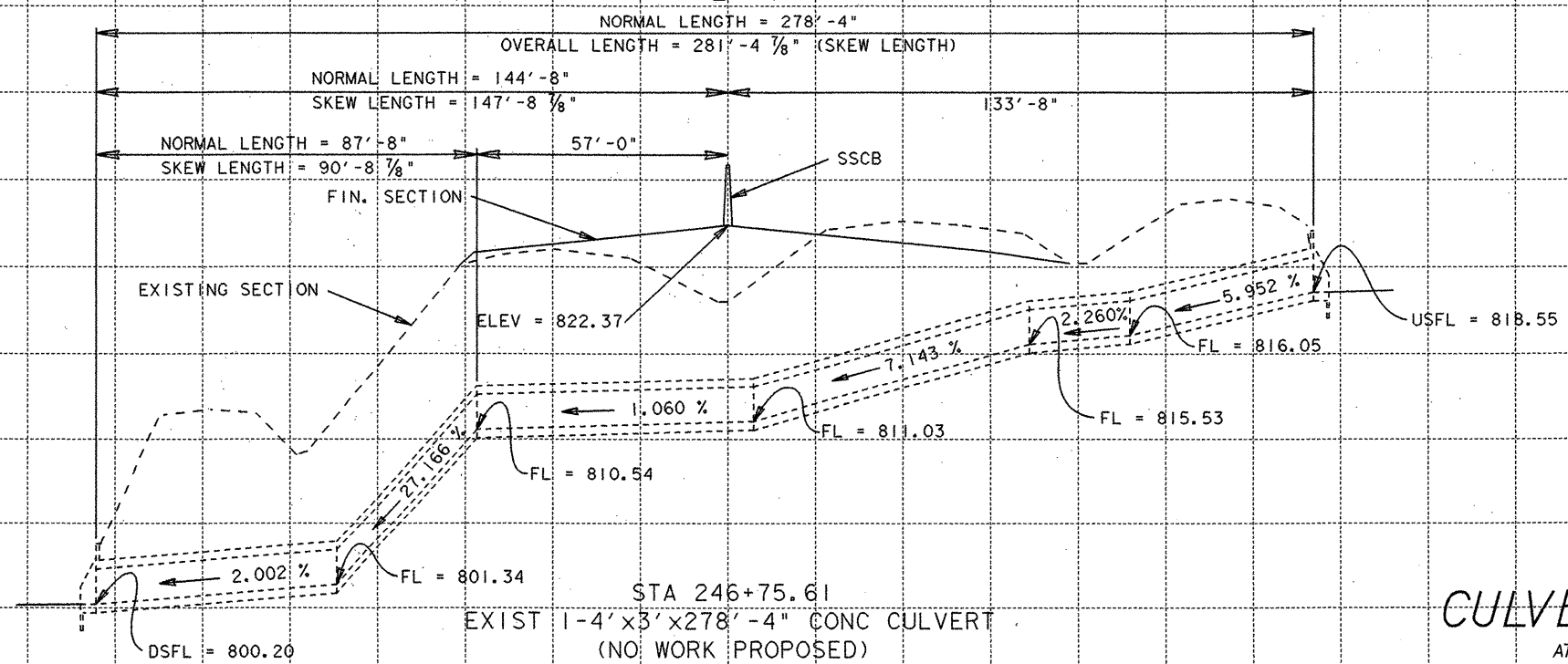
6' RAMP
SHLDR

EXIST EAST FRONTAGE ROAD
(NO WORK PROPOSED)



FOR HYDRAULIC INFORMATION SEE
HYDRAULIC DATA SHEET FOR STRUCTURES
UNDER 1500 CFS.

ALL EXISTING INLETS & PIPES TO
BE REMOVED. THE PIPE ENTRANCE TO
* THE CULVERT SHALL BE REPAIRED IN
ACCORDANCE WITH CULVERT REPAIR
DETAIL SHEET.



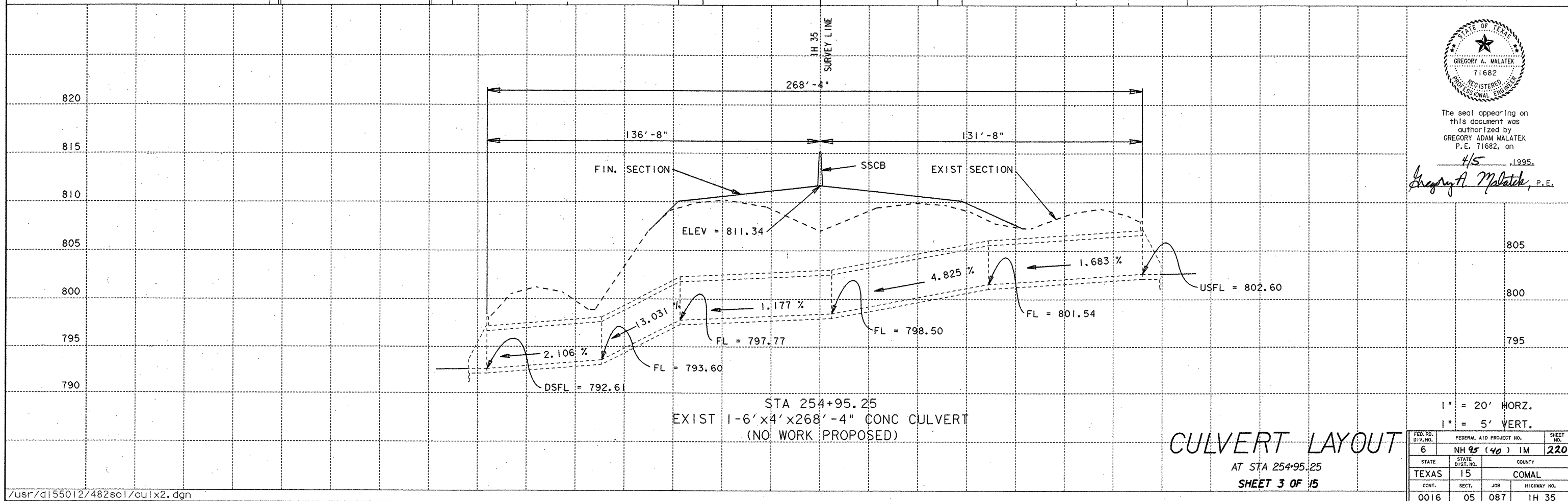
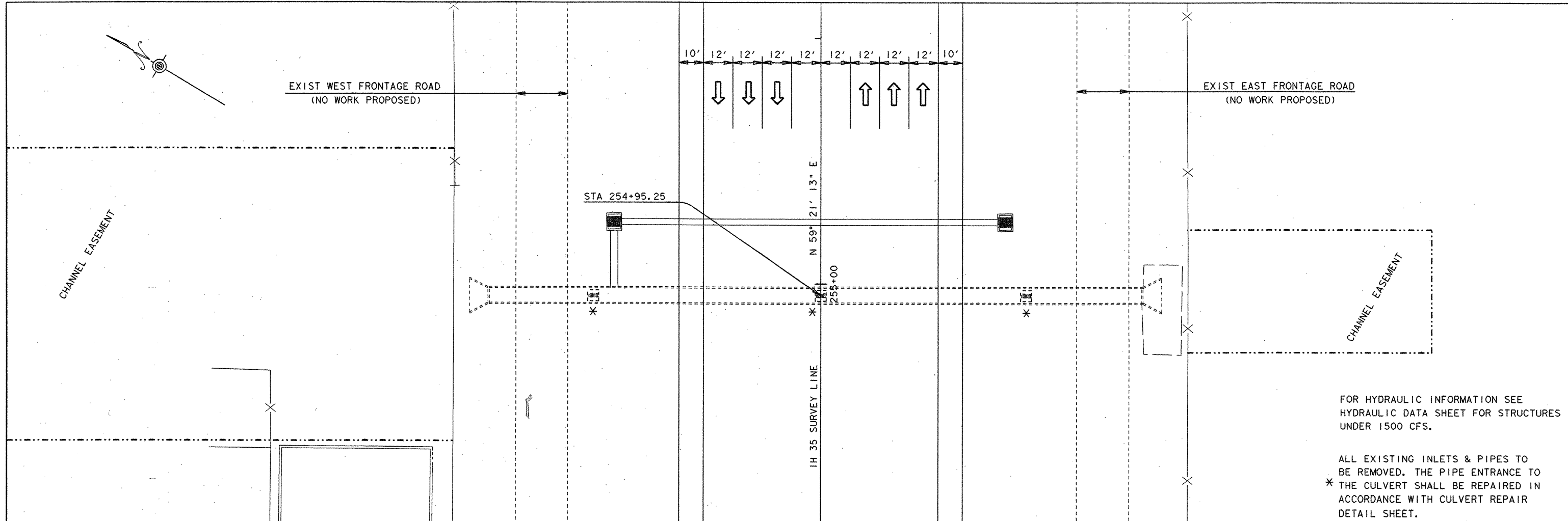
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CULVERT LAYOUT

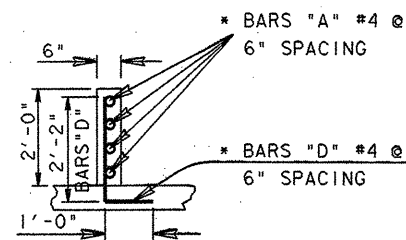
AT STA 246+75.61
SHEET 2 OF 15

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.
6	NH 95 (40) 1M	2/12
STATE	STATE DIST. NO.	COUNTY
TEXAS	15	COMAL
CONT.	SECT.	JOB
0016	05	087
CONTRACT NO.	SECTION	JOB NO.
0016	05	087
CONTRACT NO.	SECTION	JOB NO.
0016	05	087



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SEC A-A

RIPRAP (CONC) (CL B)
EST @ 23.7 CY
INCLUDING DISSIPATORS

STR. STA. 279+74.72

DESCRIPTION	UNIT	EST	FINAL
** STRUCT EXCAV	CY	1380.00	
TRENCH EXCAV PROTECTION	LF	362.00	
RIPRAP (CONC) (CL B)	CY	29.0	
CONC BOX CULV (6FT x 6FT)	LF	371.20	
WINGWALL (MCW-FI) (H= 6 FT)	EA	1	
WINGWALL (MCW-FI-45) (H= 6 FT)	EA	1	

** FOR CONTRACTOR'S INFORMATION ONLY

EXIST EAST FRONTAGE ROAD
(NO WORK PROPOSED
EXCEPT OVER ADDED BARREL)

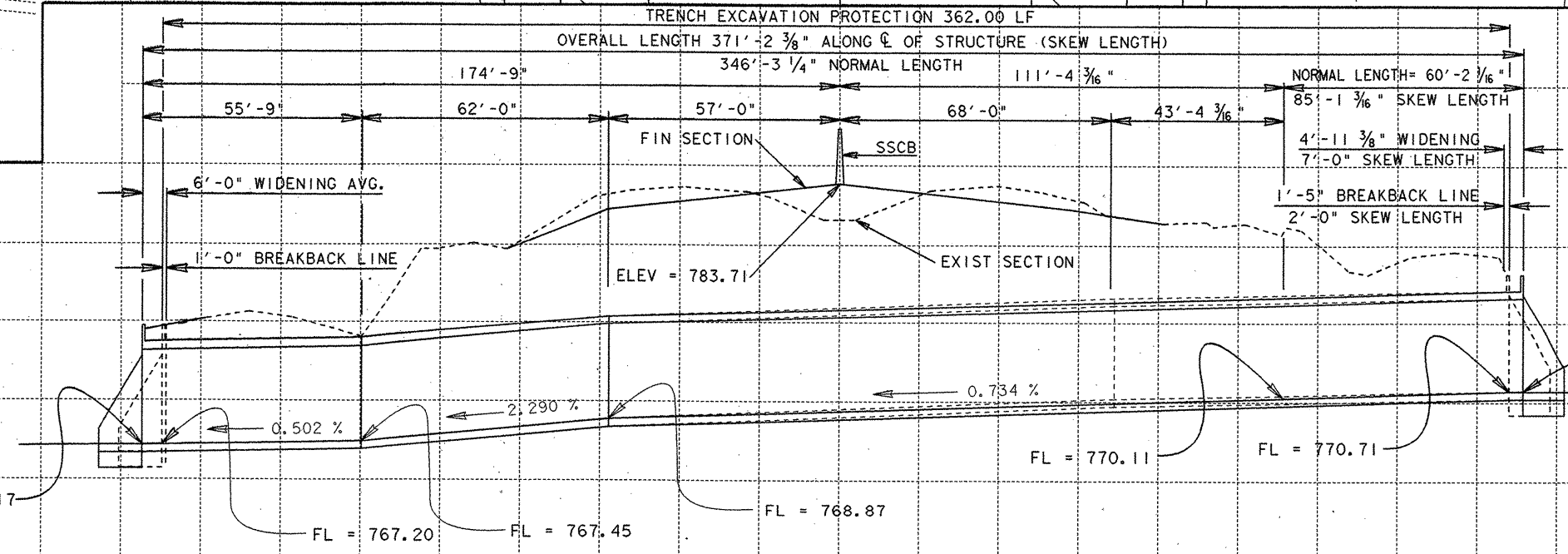
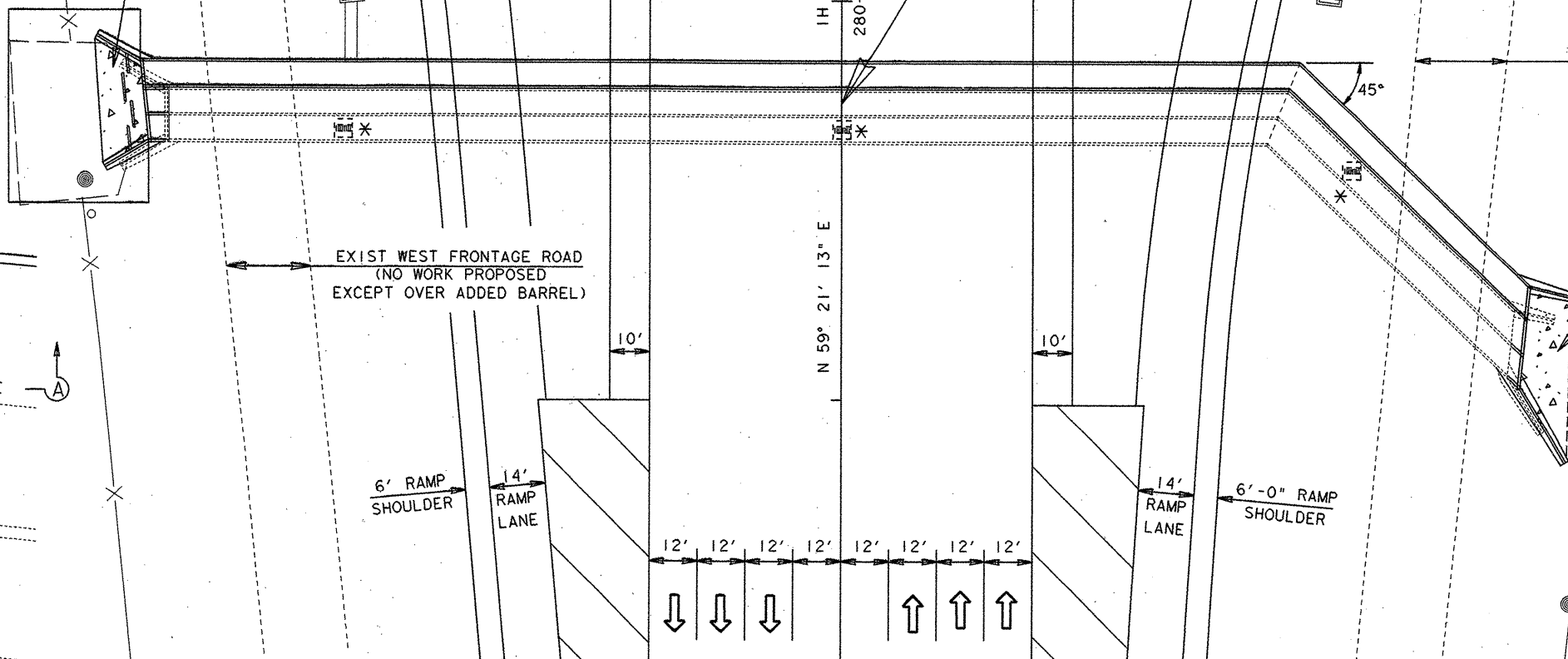
RIPRAP (CONC) (CL B)
EST @ 5.3 CY

NOTE:

HEADWALLS ON BOTH UPSTR & DNSTR OF
STRUCTURE TO BE ALIGNED PARALLEL TO
FRONTAGE ROADS.

FOR HYDRAULIC INFORMATION SEE
HYDRAULIC DATA SHEET FOR STRUCTURES
UNDER 1500 CFS.

ALL EXISTING INLETS & PIPES TO
BE REMOVED. THE PIPE ENTRANCE TO
* THE CULVERT SHALL BE REPAIRED IN
ACCORDANCE WITH CULVERT REPAIR
DETAIL SHEET.



STA. 279+74.72

EXIST 2-6'x6'x337'-9\"/>

CULVERT LAYOUT

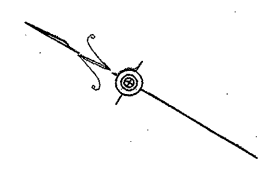
AT STA 279+74.72
SHEET 4 OF 15



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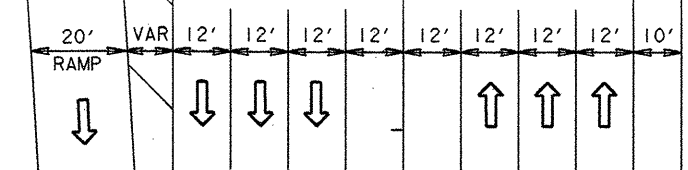
4/5, 1995.
Gregory A. Malatek, P.E.

FED. RD. DIV. NO.	6	FEDERAL AID PROJECT NO.	NH 95 (40) IM	SHEET NO.	221
STATE	TEXAS	STATE DIST. NO.	15	COUNTY	COMAL
CONT.	0016	SECT.	05	JOB	087
				HIGHWAY NO.	1H 35



EXIST WEST FRONTAGE ROAD
(NO WORK PROPOSED)

EXIST EAST FRONTAGE ROAD
(NO WORK PROPOSED)



STA 338+22.48

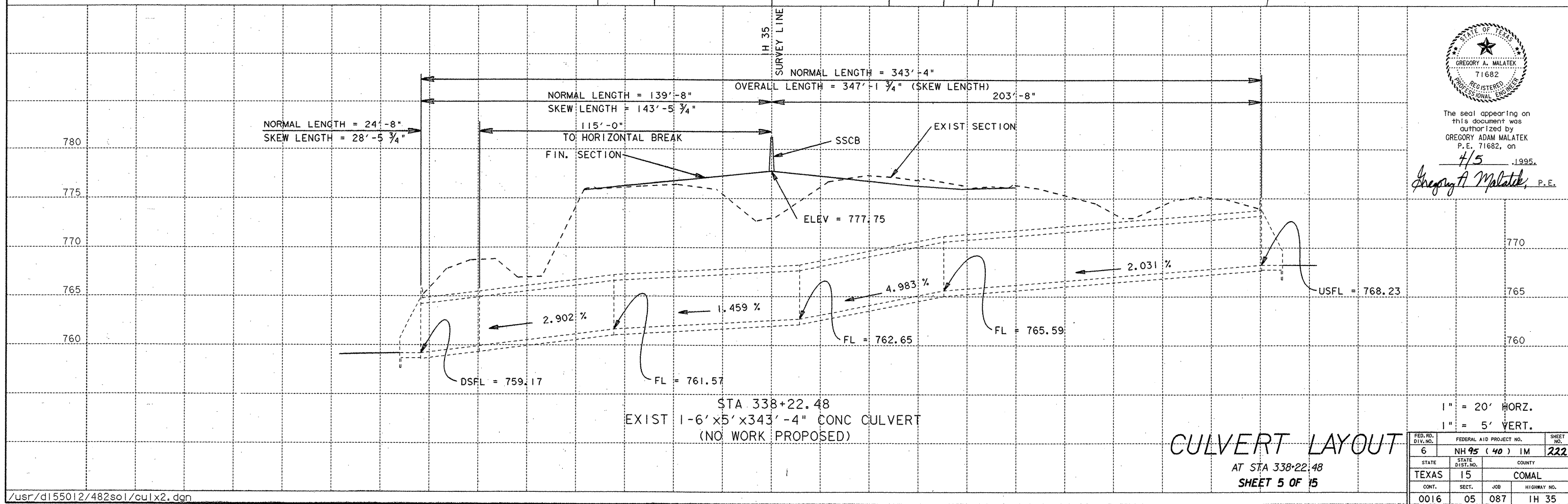
EXIST. 18" RCP
TO REMAIN

EXIST INLET
TO REMAIN

EXIST INLETS
TO REMAIN

FOR HYDRAULIC INFORMATION SEE
HYDRAULIC DATA SHEET FOR STRUCTURES
UNDER 1500 CFS.

ALL EXISTING INLETS & PIPES TO
BE REMOVED. THE PIPE ENTRANCE TO
* THE CULVERT SHALL BE REPAIRED IN
ACCORDANCE WITH CULVERT REPAIR
DETAIL SHEET.



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4/5 1995.

Gregory A. Malatek, P.E.

CULVERT LAYOUT

AT STA 338+22.48
SHEET 5 OF 15

FED. RD. DIV. NO.		FEDERAL AID PROJECT NO.		SHEET NO.
6		NH 95 (40) IM		222
STATE		COUNTY		
TEXAS		COMAL		
CONT.		JOB		HIGHWAY NO.
0016		05 087		1H 35

RIPRAP (CONC) (CL B)
EST @ 5.0 CY
(INCLUDING THE RETARDS)

CHANNEL
EASEMENT

EXIST WEST FRONTAGE ROAD
(NO WORK PROPOSED
EXCEPT OVER ADDED BARREL)

RETARD DETAILS

* BARS "A" #4 @
6" SPACING

* BARS "D" #4 @
6" SPACING

BARS "D" SHALL BE DOWLED
INTO EXISTING WING AS
DIRECTED BY THE ENGINEER.

SEC A-A

DESCRIPTION	UNIT	EST	FINAL
REMOV CONC (WINGWALL)	CY	14.7	
** STRUCT EXCAV	CY	1,022.00	
TRENCH EXCAV PROTECTION	LF	279.00	
RIPRAP (CONC) (CL B)	CY	10.00	
CONC BOX CULV (6FT x 6FT)	LF	278.88	
WINGWALL (MCW-FI) (H= 6 FT)	EA	1.00	
WINGWALL (MCW-FI-45) (H= 6 FT)	EA	1.00	

** FOR CONTRACTOR'S INFORMATION ONLY

FOR HYDRAULIC INFORMATION SEE
HYDRAULIC DATA SHEET FOR STRUCTURES
UNDER THAN 1500 CFS.

ALL EXISTING INLETS & PIPES TO
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* THE CULVERT SHALL BE REPAIRED IN
ACCORDANCE WITH CULVERT REPAIR
DETAIL SHEET.

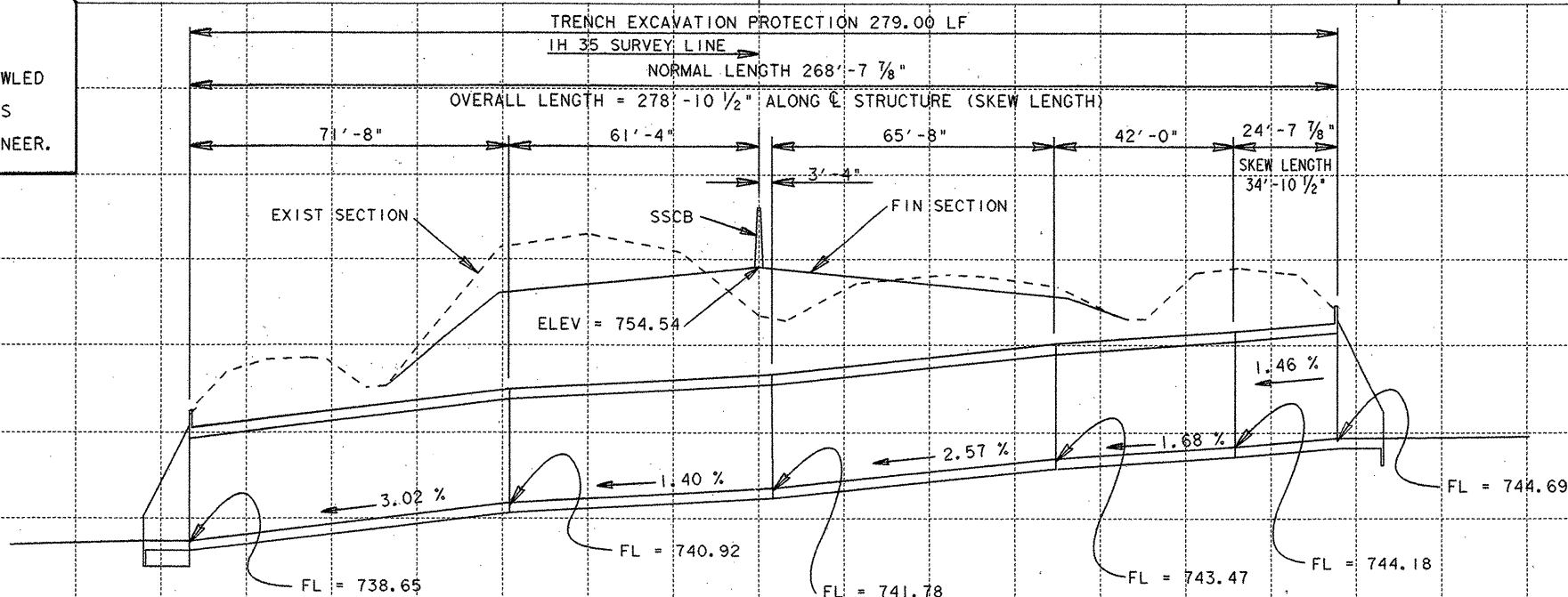
CHANNEL
EASEMENT



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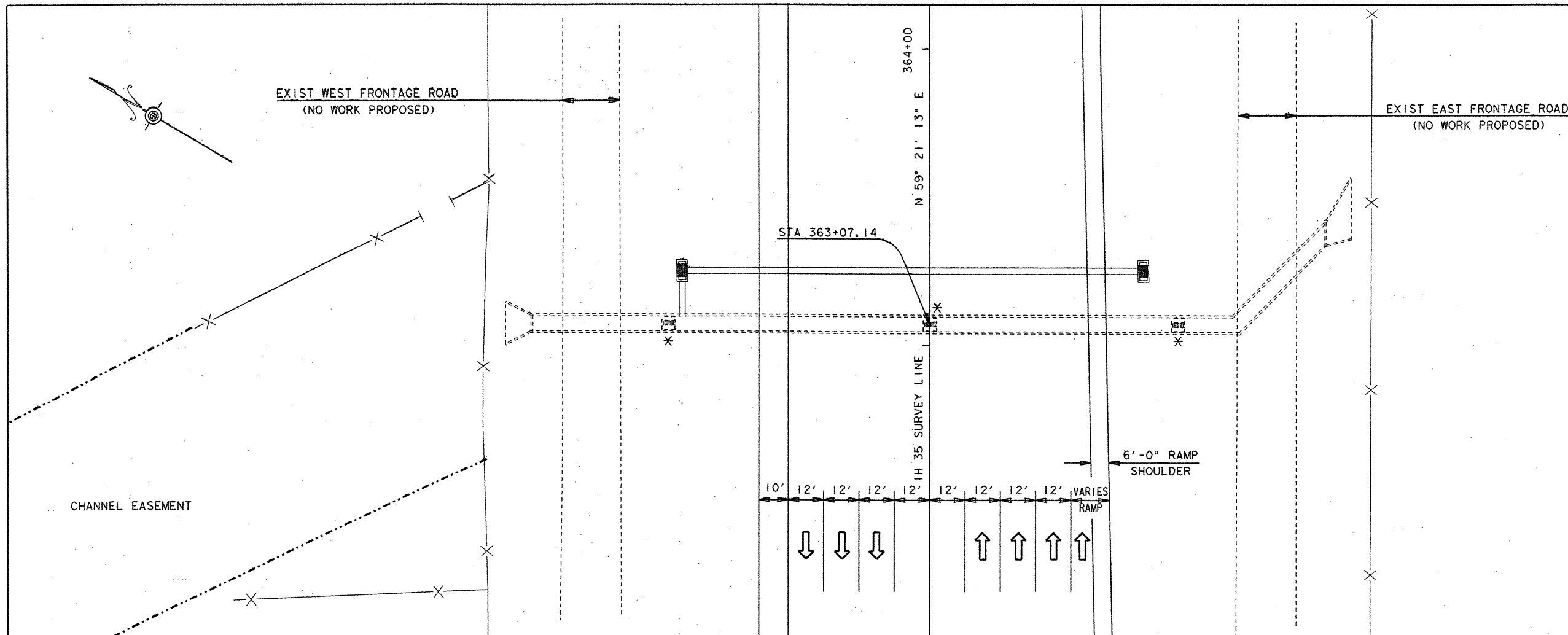


STA 357+65.91
EXISTING 1-8'x6'x268'-7 7/8" CONC CULV TO BE LENGTHENED
TO 1-8'x6'x268'-7 7/8" CONC CULV AND
1-6'x6'x268'-7 7/8" CONC CULV
WITH SCNA, PC-1, PC-3 & PC-7
USING MCW-FI-45 UPSTR & MCW-FI DNSTR

CULVERT LAYOUT

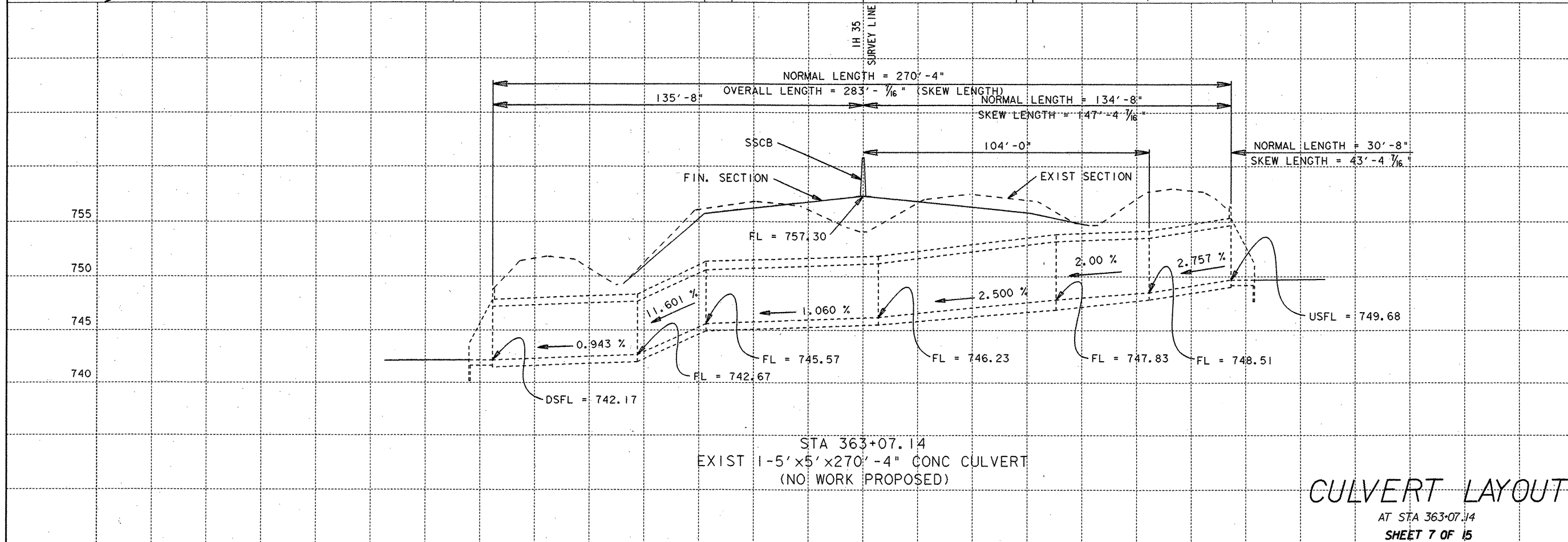
AT STA. 357+65.91
SHEET 6 OF 15

FED. RD. DIV. NO.	6	FEDERAL AID PROJECT NO.	NH 95 (40) IM	SHEET NO.	223
STATE	TEXAS	STATE DIST. NO.	15	COUNTY	COMAL
CONT.	0016	SECT.	05	JOB	087
				HIGHWAY NO.	IH 35



FOR HYDRAULIC INFORMATION SEE
HYDRAULIC DATA SHEET FOR STRUCTURES
UNDER 1500 CFS.

ALL EXISTING INLETS & PIPES TO
BE REMOVED. THE PIPE ENTRANCE TO
* THE CULVERT SHALL BE REPAIRED IN
ACCORDANCE WITH CULVERT REPAIR
DETAIL SHEET.



STA 363+07.14
EXIST 1-5'x5'x270'-4" CONC CULVERT
(NO WORK PROPOSED)

CULVERT LAYOUT

AT STA 363+07.14
SHEET 7 OF 15

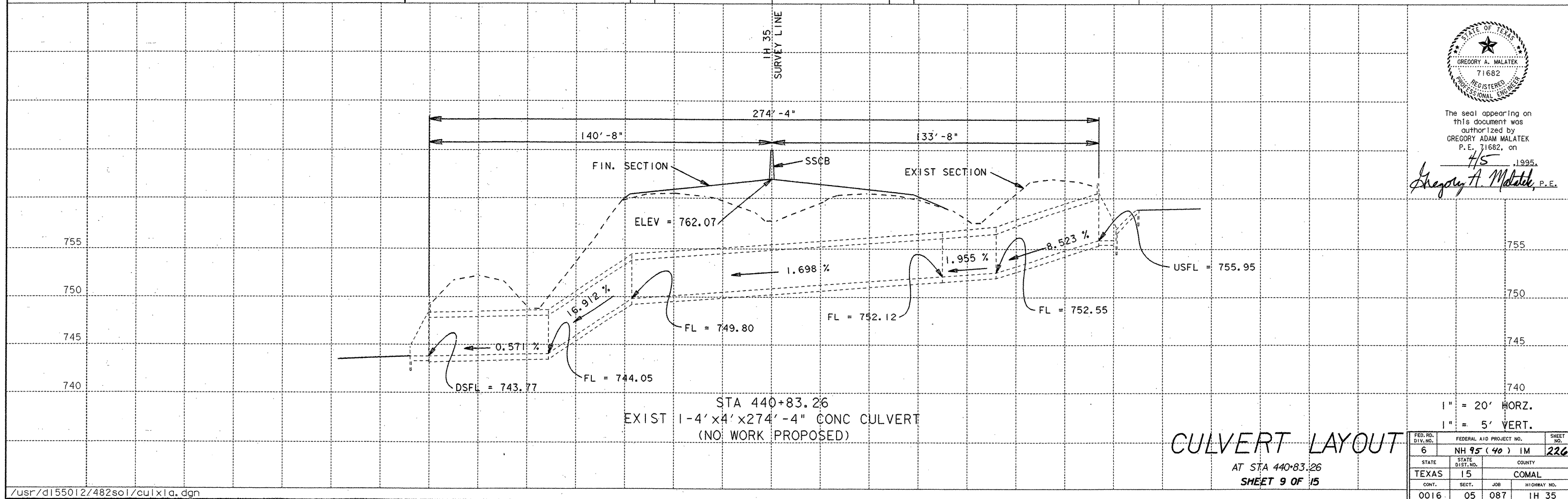
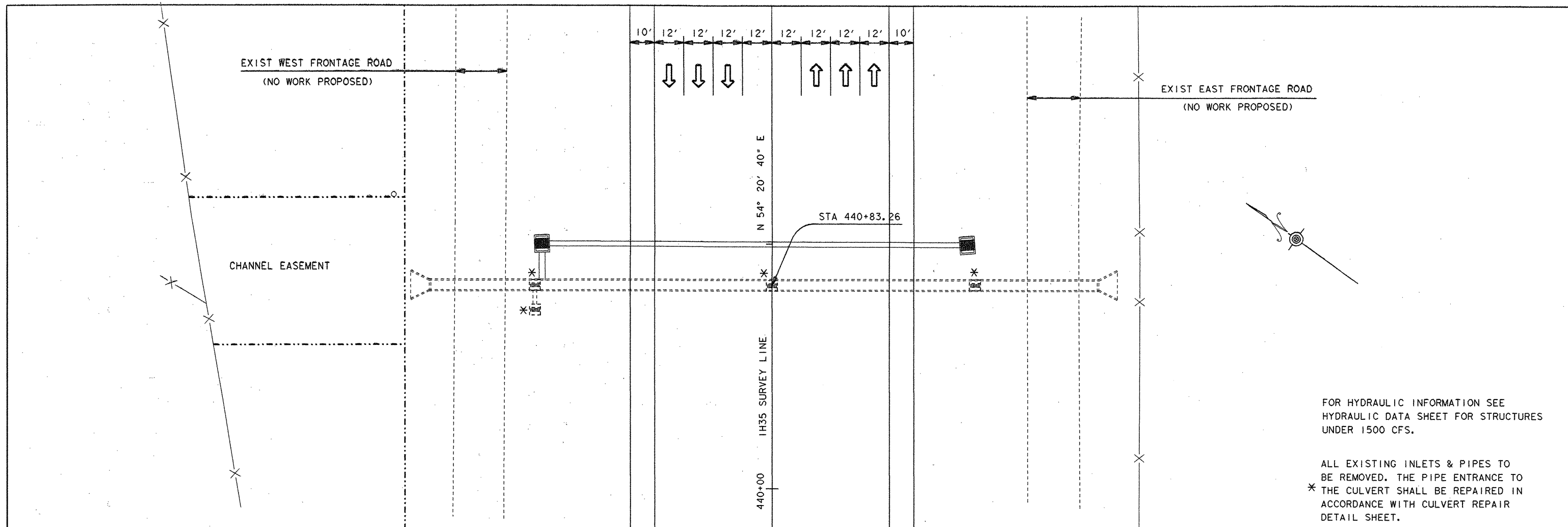


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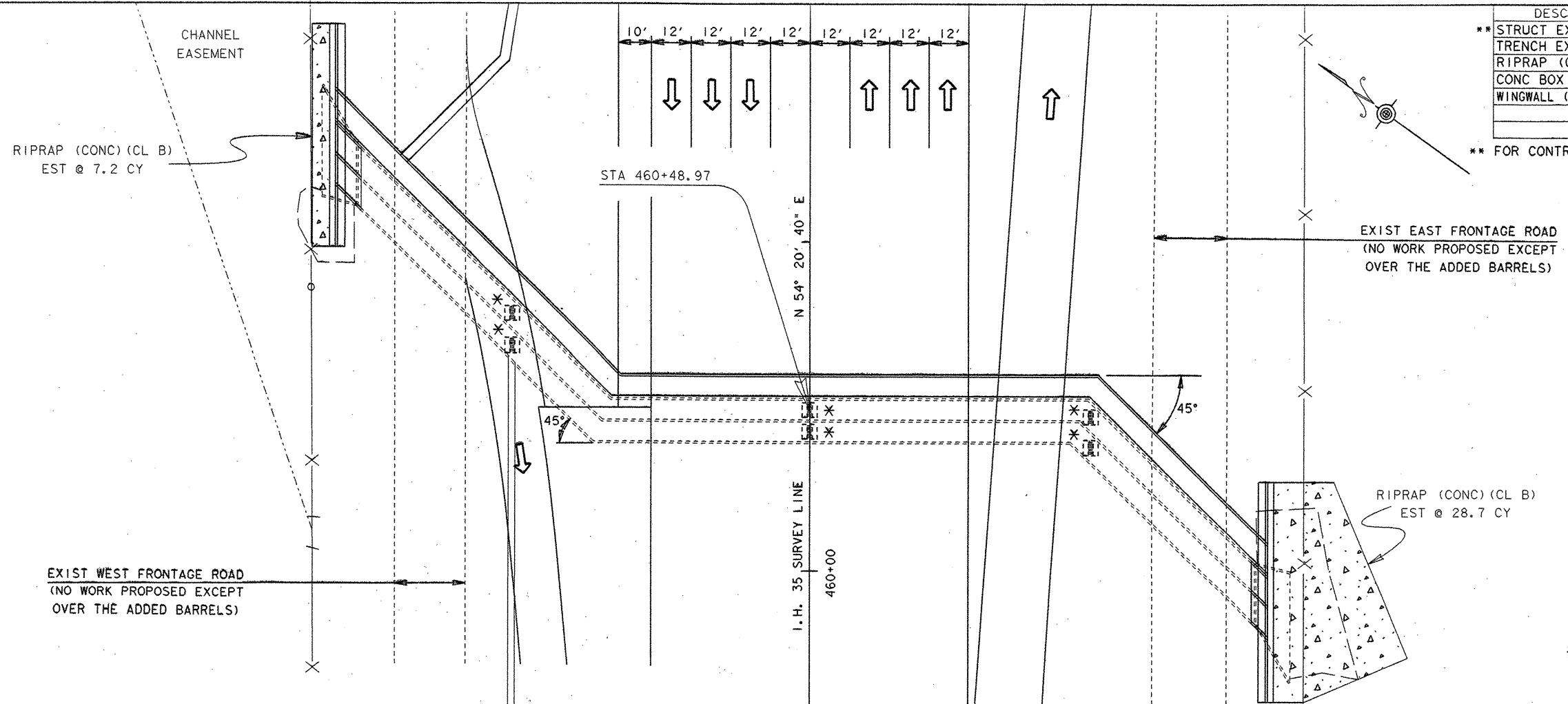
4/5, 1995.
Gregory A. Malatek, P.E.

1" = 20' HORZ.
1" = 5' VERT.

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.
6	NH 95 (40) IM	224
STATE	STATE DIST. NO.	COUNTY
TEXAS	15	COMAL
CONT.	SECT.	JOB
0016	05	087
		HIGHWAY NO.
		IH 35



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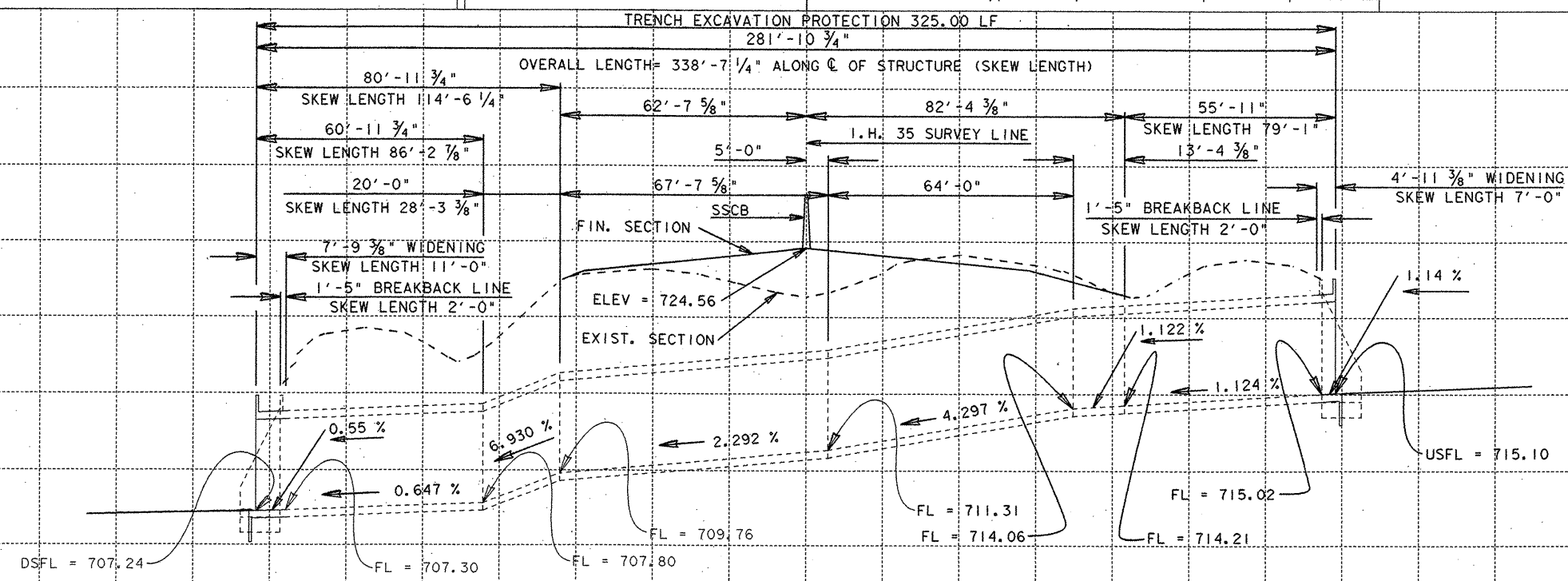


DESCRIPTION	UNIT	EST	FINAL
** STRUCT EXCAV	CY	1,127.00	
TRENCH EXCAV PROTECTION	LF	325.00	
RIPRAP (CONC) (CL B)	CY	35.90	
CONC BOX CULV (6FT x 6FT)	LF	374.60	
WINGWALL (MCW-P-45) (H= 6 FT)	EA	2.00	

** FOR CONTRACTOR'S INFORMATION ONLY

FOR HYDRAULIC INFORMATION SEE
HYDRAULIC DATA SHEET FOR STRUCTURES
UNDER 1500 CFS.

ALL EXISTING INLETS & PIPES TO
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* THE CULVERT SHALL BE REPAIRED IN
ACCORDANCE WITH CULVERT REPAIR
DETAIL SHEET.



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STA. 460+48.97

EXIST 2-6'x6'x272'-0" CONC CULV. TO BE EXTENDED & LENGTHENED
TO 3-6'x6'x281'-10 3/4" CONC. CULV.

WITH SCNA, MC 6-2, SCNA(MOD), PC-1, PC-3 & PC-7
USING MCW-P-45° UPSTR. & DNSTR.

CULVERT LAYOUT

AT STA. 460+48.97
SHEET 10 OF 15

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.
6	NH 95 (40) IM	227
STATE	STATE DIST. NO.	COUNTY
TEXAS	15	COMAL
CONT.	SECT.	JOB HIGHWAY NO.
0016	05	087 IH 35

EXIST WEST FRONTAGE ROAD
(NO WORK PROPOSED)

EXIST EAST FRONTAGE ROAD
(NO WORK PROPOSED)

STA 481+95.83

483+00
IH 35 SURVEY LINE
N 54° 20' 40" E

PIPE TO REMAIN

FOR HYDRAULIC INFORMATION SEE
HYDRAULIC DATA SHEET FOR STRUCTURES
UNDER 1500 CFS.

ALL EXISTING INLETS & PIPES TO
BE REMOVED. THE PIPE ENTRANCE TO
THE CULVERT SHALL BE REPAIRED IN
ACCORDANCE WITH CULVERT REPAIR
DETAIL SHEET.

NORMAL LENGTH 452'-4"
OVERALL LENGTH = 477'-11 1/2" (SKEW LENGTH)

NORMAL LENGTH = 265'-8"
SKEW LENGTH = 291'-3 1/2"

NORMAL LENGTH = 165'-8"
SKEW LENGTH = 191'-3 1/2"

186'-8"

ELEV = 738.47

FIN. SECTION

100'-0"

IH 35 SURVEY LINE

3.141 %

USFL = 716.65

STA 481+95.83
EXIST 1-8'x4'x452'-4" CONC CULVERT
(NO WORK PROPOSED)

DSFL = 701.04



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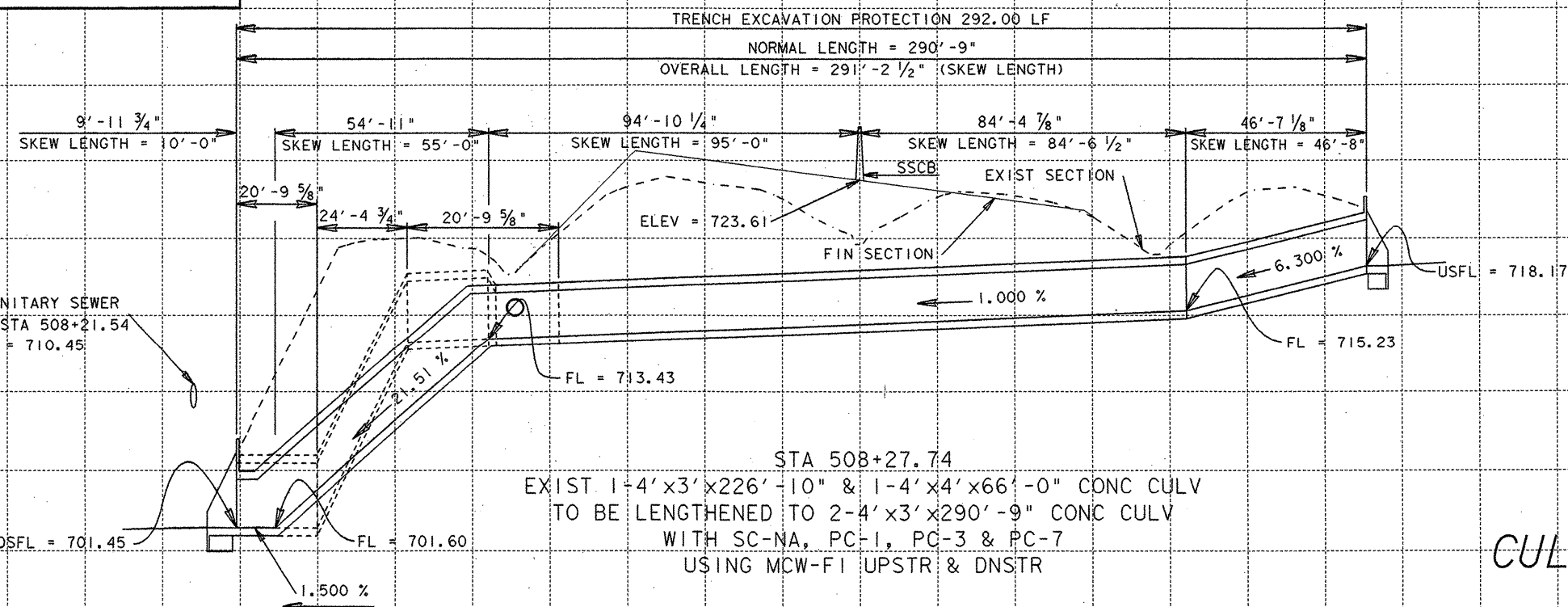
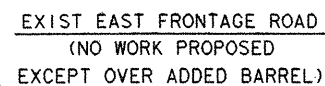
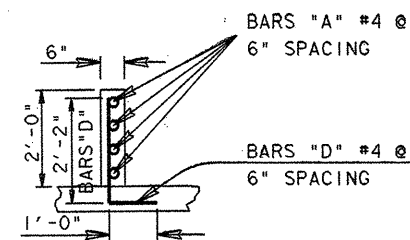
4/5/1995
Gregory A. Malatek, P.E.

CULVERT LAYOUT

AT STA 481+95.83
SHEET 11 OF 15

FED. NO.	FED. AID PROJECT NO.	SHEET NO.
6	NH 95 (40) IM	228
STATE	COUNTY	
TEXAS	COMAL	
CONT.	SECT.	JOB
0016	05	087
HIGHWAY NO.		
IH 35		

	DESCRIPTION	UNIT	EST	FINAL
	REMOV CONC (WINGWALL)	CY	3.2	
**	STRUCT EXCAV	CY	729.00	
	TRENCH EXCAV PROTECTION	LF	292.00	
	RIPRAP (CONC) (CL B)	CY	9.00	
	CONC BOX CULV (4 FT X 3 FT)	LF	291.21	
	WINGWALL (MCW-F1) (H= 3 FT)	EA	2.00	



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EXIST. EAST FRONTAGE ROAD
(NO WORK PROPOSED
EXCEPT OVER ADDED BARREL)

EXIST. EAST FRONTAGE ROAD
(NO WORK PROPOSED
EXCEPT OVER ADDED BARREL)

RIPRAP (CONC) (CL B)
EST @ 1.0 CY

DESCRIPTION	UNIT	EST	FINAL
** STRUCT EXCAV	CY	293.00	
TRENCH EXCAV PROTECTION	LF	188.00	
RIPRAP (CONC) (CL B)	CY	1.00	
CONC BOX CULV (3 FT X 3 FT)	LF	263.45	
INLET (COMPL) (GRATE) (DRWY) (DRN)	EA	1.00	
WINGWALL (MCW-FI) (H= 3 FT)	EA	1.00	

** FOR CONTRACTOR'S INFORMATION ONLY

EXISTING STRUCTURE TO REMAIN.

FOR HYDRAULIC INFORMATION SEE
HYDRAULIC DATA SHEET FOR STRUCTURES
UNDER THAN 1500 CFS.

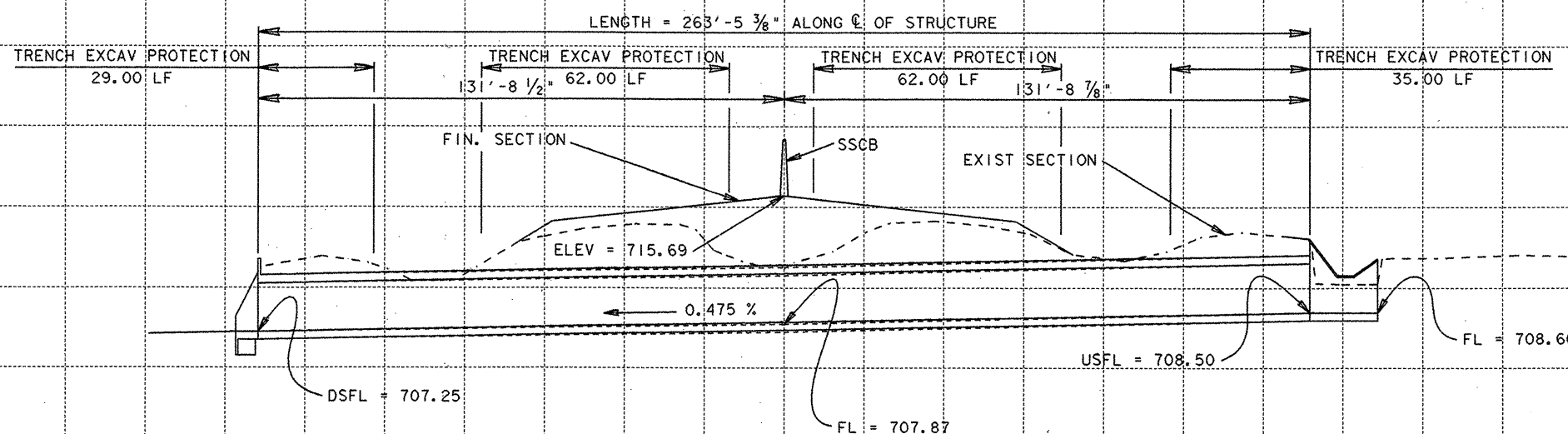
ALL EXISTING INLETS & PIPES TO
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Gregory A. Malatek, P.E.



STA 517+52.61
EXISTING 1-3'x3'x263'-5 1/2" CONC CULV TO BE LENGTHENED
TO 2-3'x3'x263'-5 3/8" CONC CULV
WITH SC-NA, PC-1, PC-3 & PC-7
USING MCW-FI DNSTR & TRAFFIC INLET (SPL) UPSTR

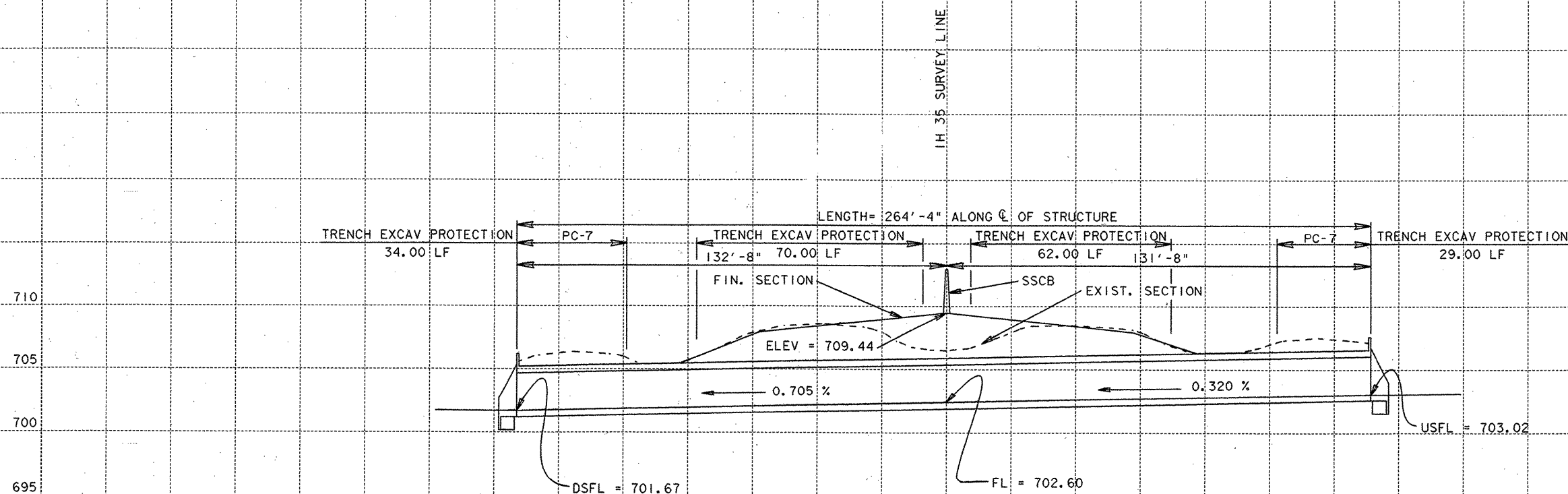
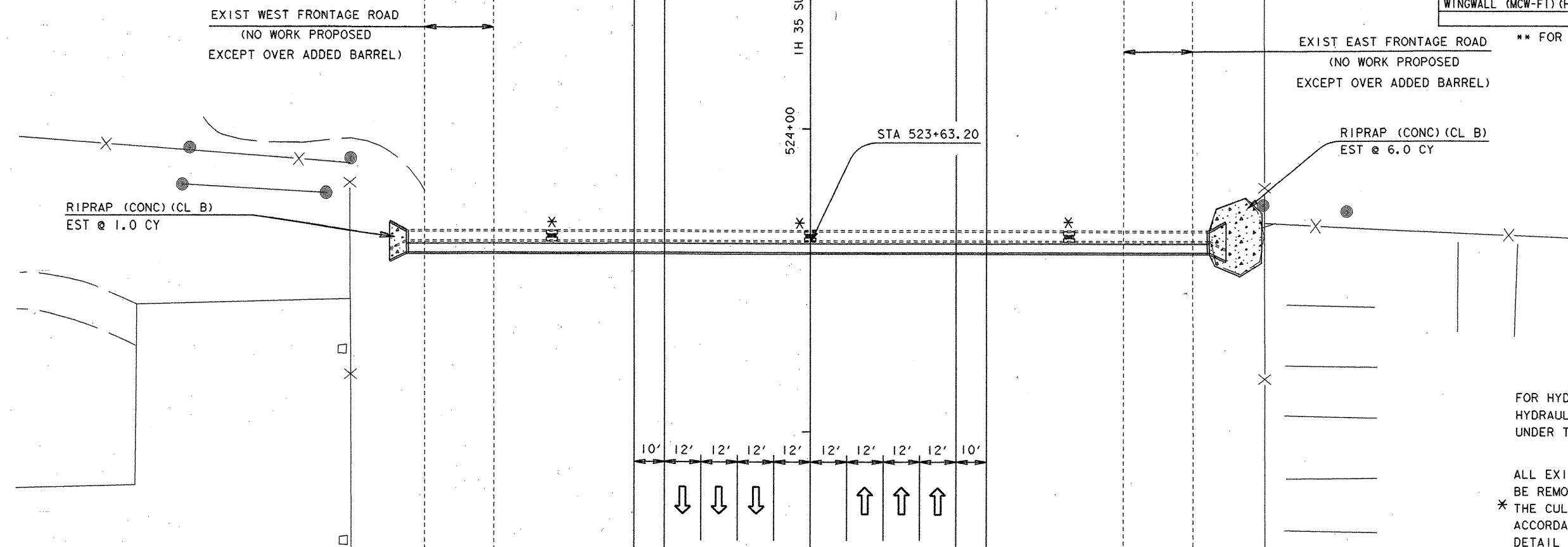
CULVERT LAYOUT

AT STA. 517+52.61
SHEET 14 OF 15

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.
6	NH 95 (40) IM	231
STATE	STATE DIST. NO.	COUNTY
TEXAS	15	COMAL
CONT.	SECT.	JOB HIGHWAY NO.
0016	05	087 IH 35

DESCRIPTION	UNIT	EST	FINAL
REMOV CONC (WINGWALL)	CY	3.0	
** STRUCT EXCAV	CY	299.00	
TRENCH EXCAV PROTECTION	LF	195.00	
RIPRAP (CONC) (CL B)	CY	7.00	
CONC BOX CULV (3 FT X 3 FT)	LF	264.33	
WINGWALL (MCW-FI) (H= 3 FT)	EA	2.00	

** FOR CONTRACTOR'S INFORMATION ONLY



STA 523+63.20
EXIST 1-3'x3'x264'-4" CONC CULVERT TO BE LENGTHENED
TO 2-3'x3'x264'-4" CONC CULVERT
WITH SC-NA, PC-1, PC-3 & PC-7
USING MCW-FI DNSTR & UPSTR.

CULVERT LAYOUT

AT STA 523+63.20
SHEET 15 OF 15



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Gregory A. Malatek, P.E.

FED. RD. DIV. NO.	6	FEDERAL AID PROJECT NO.	NH 95 (40) IM	SHEET NO.	232
STATE	TEXAS	STATE DIST. NO.	15	COUNTY	COMAL
CONT.	0016	SECT.	05	JOB	087
				HIGHWAY NO.	IH 35

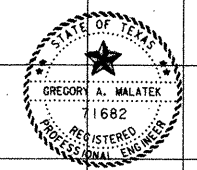
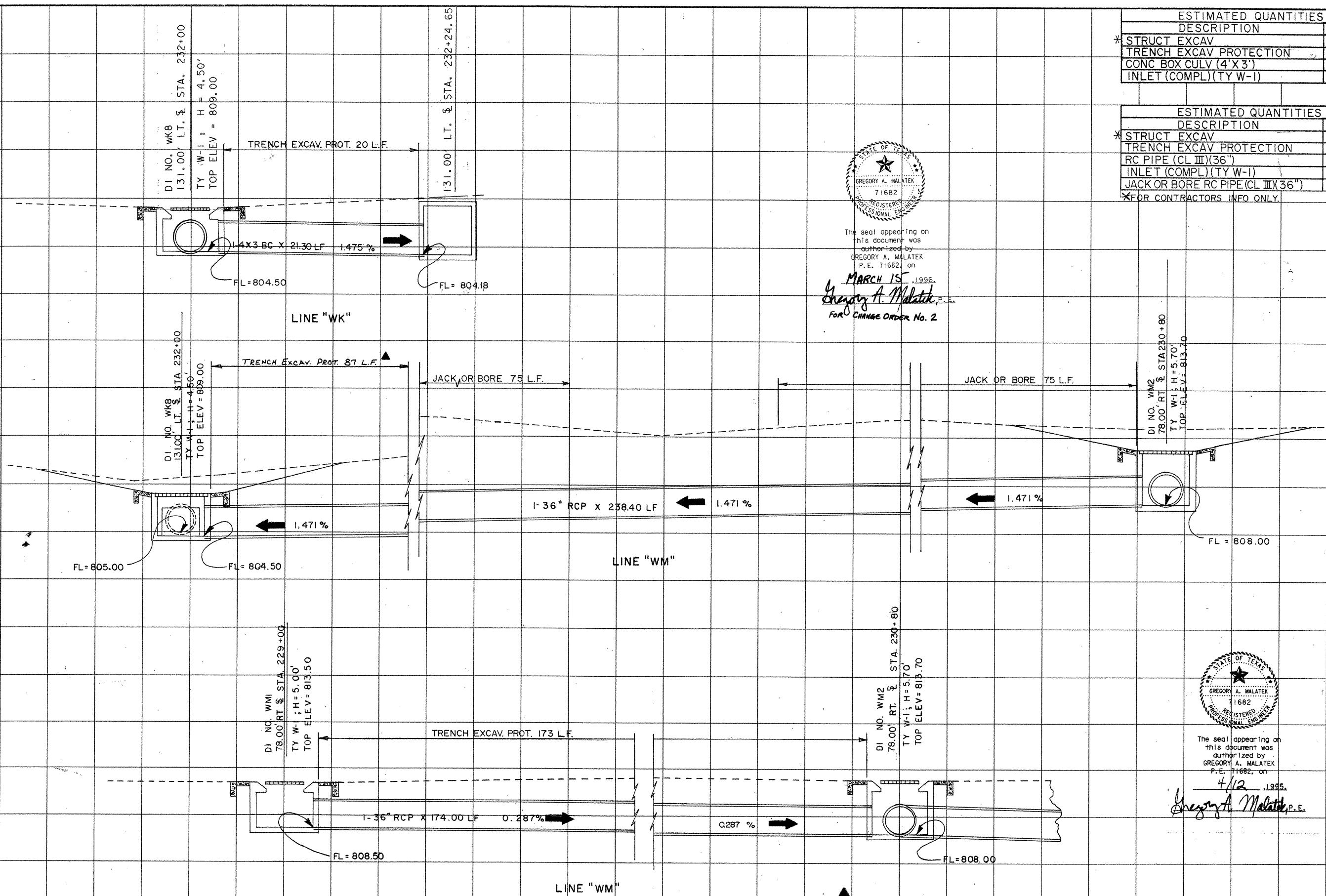
ESTIMATED QUANTITIES LINE "WK"			
DESCRIPTION	PLAN	FINAL	UNIT
* STRUCT EXCAV	33.00		CY
TRENCH EXCAV PROTECTION	20.00		LF
CONC BOX CULV (4' X 3')	21.30		LF
INLET (COMPL) (TY W-1)	1.00		EA

ESTIMATED QUANTITIES LINE "WM"			
DESCRIPTION	PLAN	FINAL	UNIT
* STRUCT EXCAV	614.00		CY
TRENCH EXCAV PROTECTION	260.00		LF
RC PIPE (CL III) (36")	412.40		LF
INLET (COMPL) (TY W-1)	2.00		EA
JACK OR BORE RC PIPE (CL III) (36")	150.00		LF

*FOR CONTRACTORS INFO ONLY



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Gregory A. Malatek
 For CHANGE ORDER No. 2

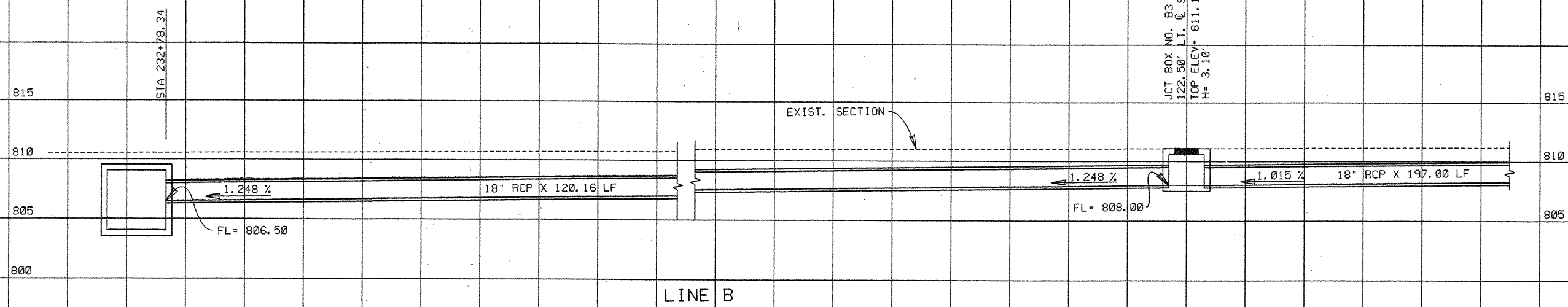


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▲ CHANGE ORDER NO. 2

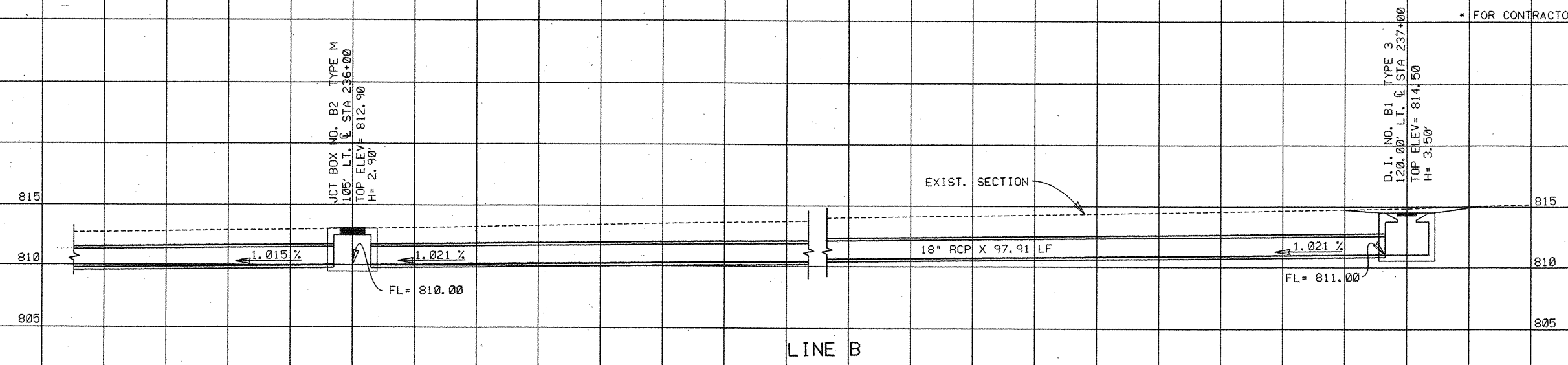
STORM SEWER SECTIONS SHEET 1 OF 30

SCALE: 1" = 5'			
FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.	
6	NH 95(40)1M	233	
STATE	DIST.	COUNTY	
TEXAS	15	COMAL	
CONT.	SECT.	JOB	HIGHWAY NO.
0016	05	087	IH 35



DESCRIPTION	UNIT	EST	FINAL
RC PIPE (18 IN)	LF	415.07	
MANH (COMPL)(TYPE M)	EA	2	
INLET (COMPL)(DROP)(TY 3)	EA	1	
* STRUCT. EXCAV.	CY	176	

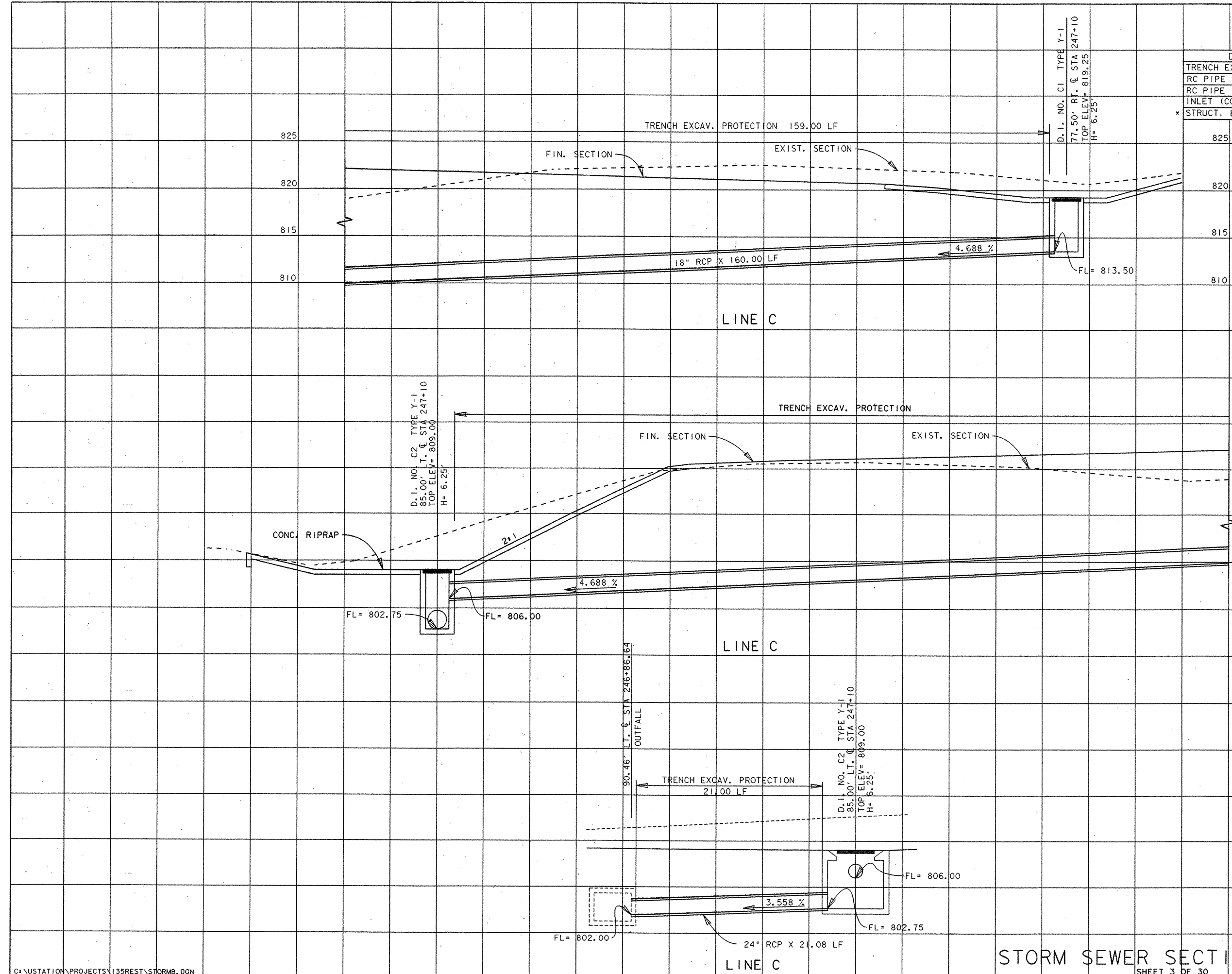
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STORM SEWER SECTIONS

SCALE: 1" = 5'	
FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.
6	NH 95(40) IM
STATE	COUNTY
TEXAS	COMAL
CONT.	JOB
0016	087
SECT.	HIGHWAY NO.
05	1H 35



DESCRIPTION	UNIT	EST	FINAL
TRENCH EXCAV. PROTECTION	LF	159.00	
RC PIPE (18 IN)	LF	160.00	
RC PIPE (24 IN)	LF	21.08	
INLET (COMPL) (TY Y-1)	EA	2.00	
* STRUCT. EXCAV.	CY	236.00	

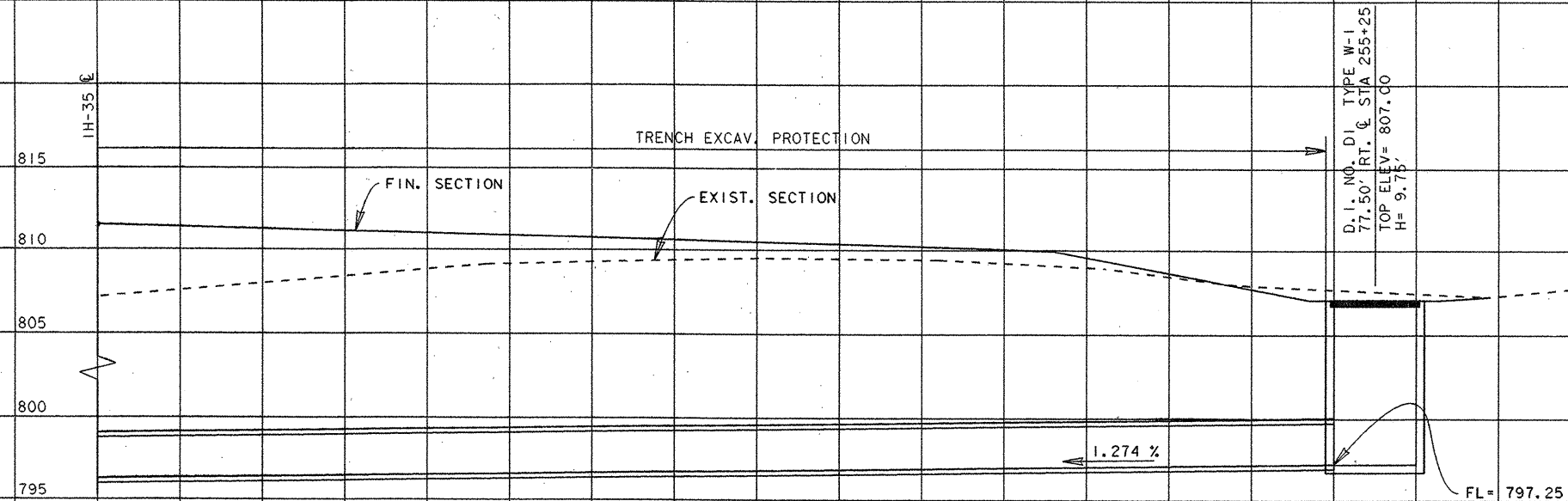
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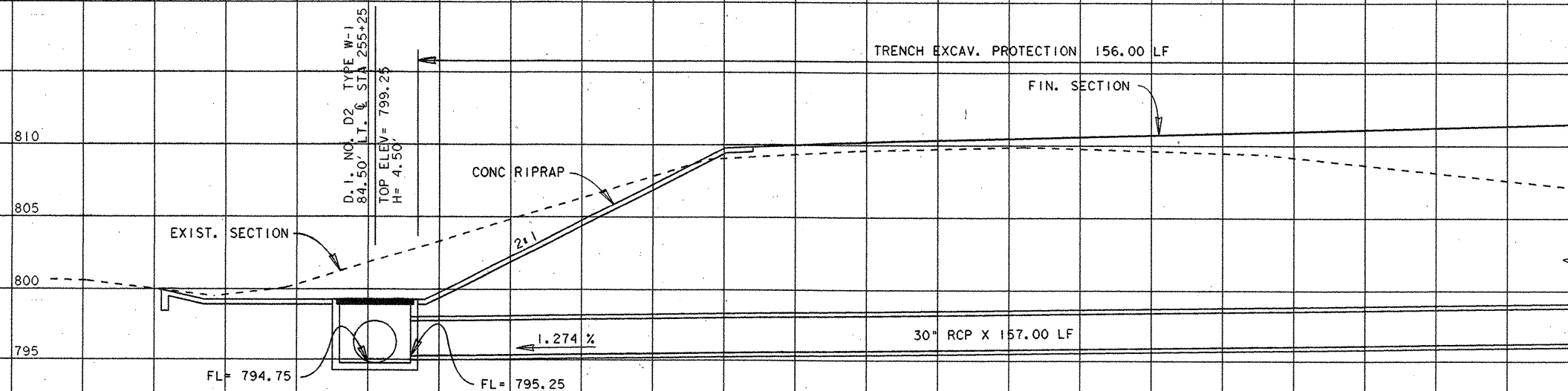
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STATE TEXAS	STATE DIST. NO. 15	COUNTY COMAL	
CONT. 0016	SECT. 05	JOB 087	HIGHWAY NO. 1H 35



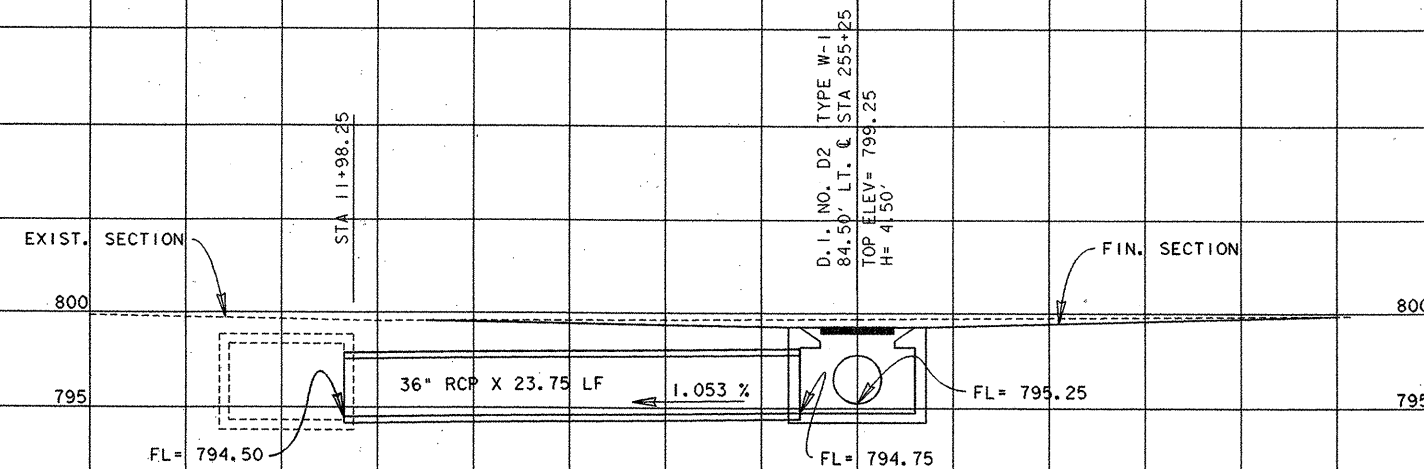
LINE D

DESCRIPTION	UNIT	EST	FINAL
TRENCH EXCAV. PROTECTION	LF	156.00	
RC PIPE (30 IN)	LF	157.00	
RC PIPE (36 IN)	LF	23.75	
INLET (COMPL) (TY W-1)	EA	2.00	
STRUCT. EXCAV.	CY	310.00	

* FOR CONTRACTORS INFORMATION ONLY



LINE D



LINE D

STORM SEWER SECTIONS

SHEET 4 OF 30

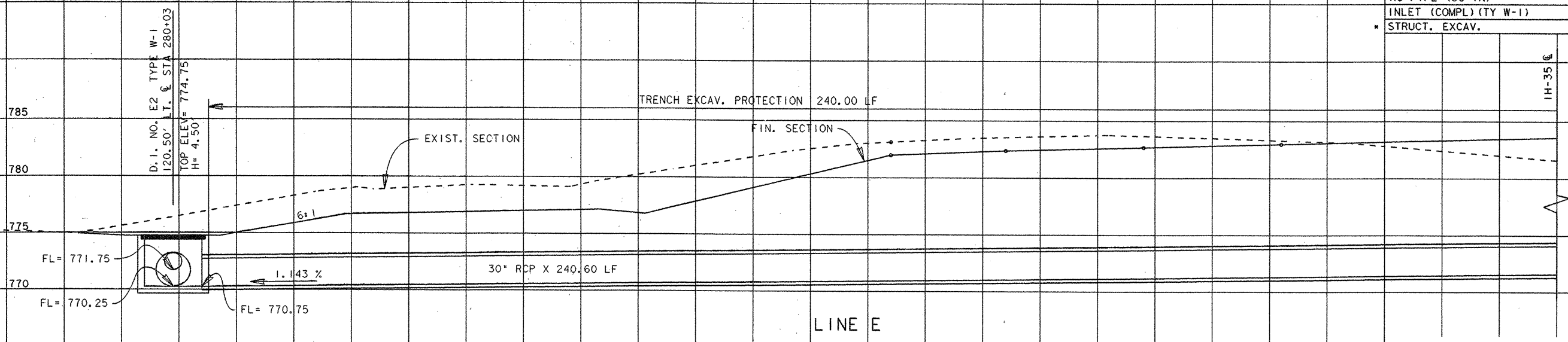


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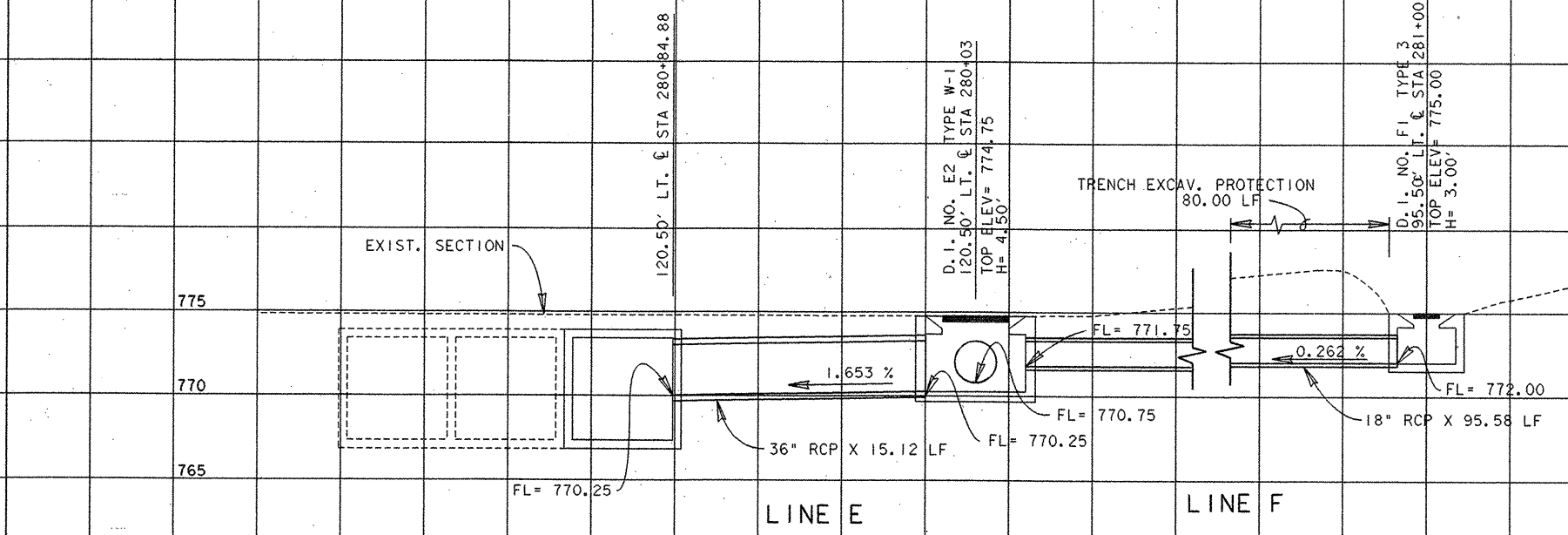
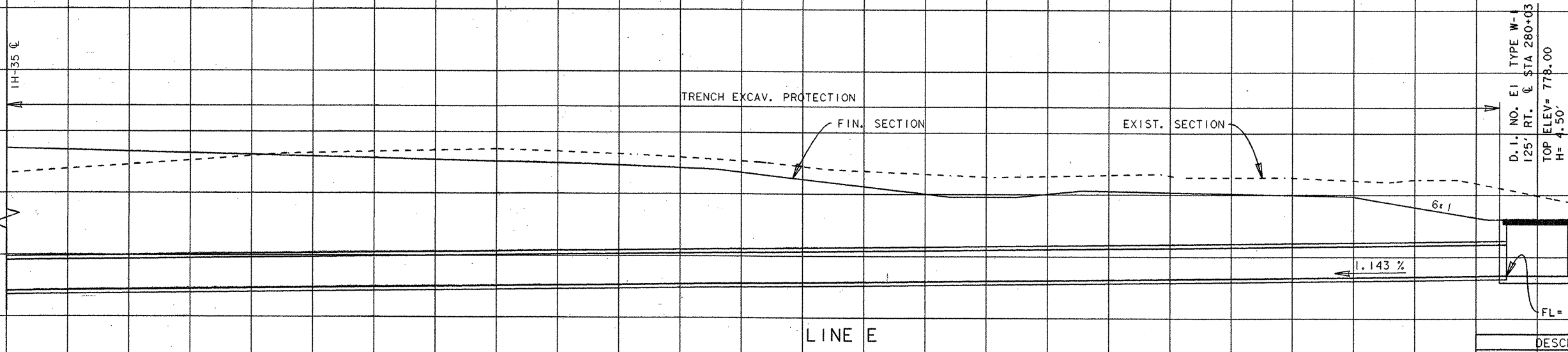
4/13, 1995.
Gregory A. Malatek, P.E.

SCALE: 1" = 5'	
FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.
6	NH 95(40) IM
STATE	STATE DIST. NO.
TEXAS	15
COUNTY	COMAL
CONT.	SECT.
0016	05
JOB	HIGHWAY NO.
087	1H 35

DESCRIPTION (LINE E)		UNIT	EST	FINAL
TRENCH EXCAV. PROTECTION		LF	240.00	
RC PIPE (30 IN)		LF	240.60	
RC PIPE (36 IN)		LF	15.12	
INLET (COMPL) (TY W-1)		EA	2.00	
* STRUCT. EXCAV.		CY	354.00	



DESCRIPTION (LINE F)		UNIT	EST	FINAL
TRENCH EXCAV. PROTECTION		LF	80.00	
RC PIPE (18 IN)		LF	95.58	
INLET (COMPL) (DROP) (TY 3)		EA	1.00	
* STRUCT. EXCAV.		CY	58.00	



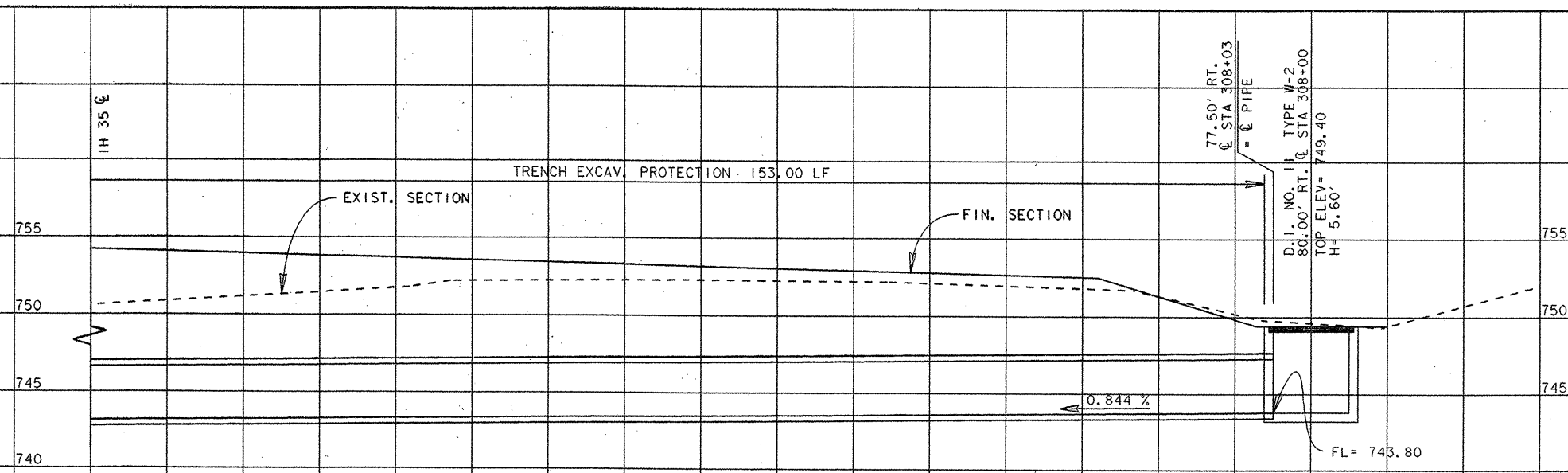
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Gregory A. Malatek, P.E.

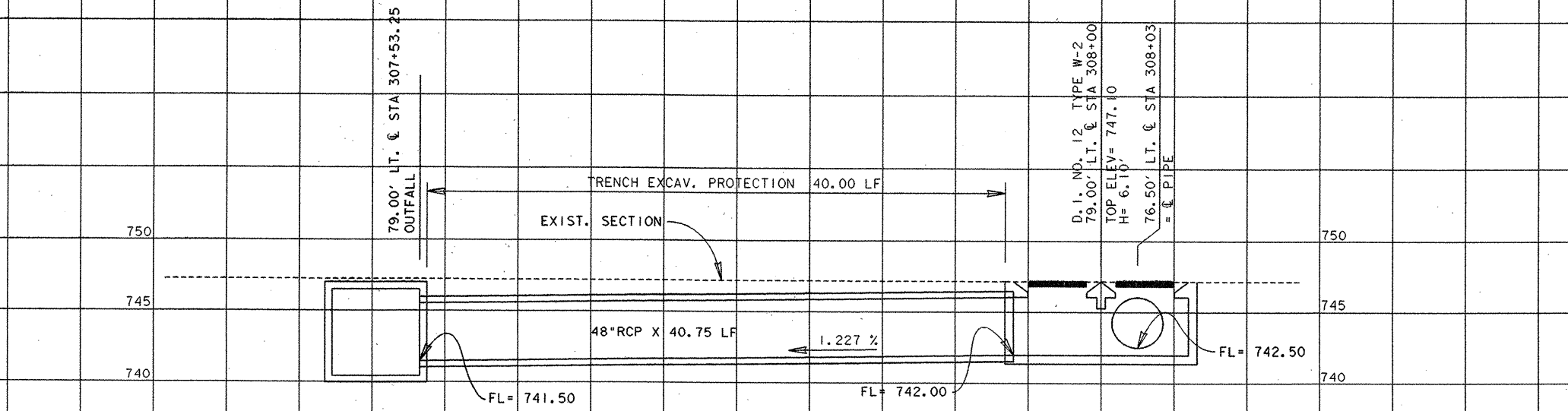
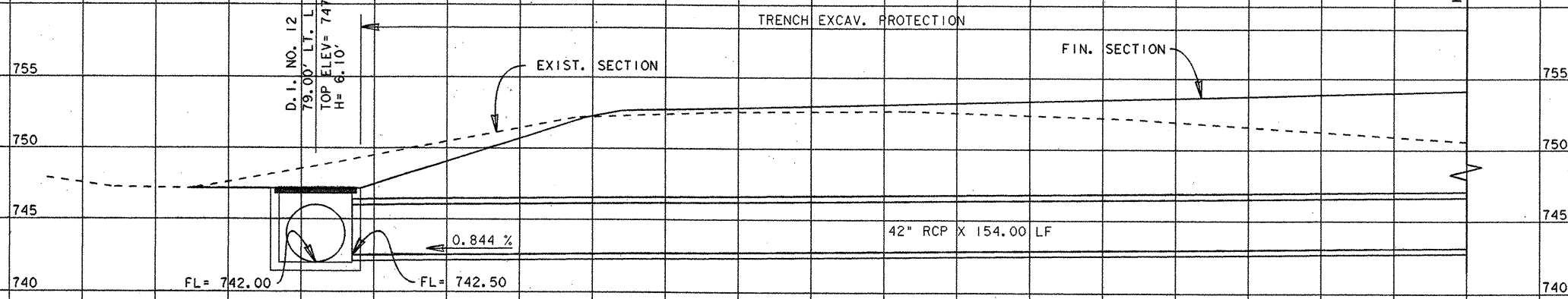
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FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.
6	NH 95 (40) IM	237
STATE	STATE DIST. NO.	COUNTY
TEXAS	15	COMAL
CONT.	SECT.	JOB
0016	05	087
		1H 35

STORM SEWER SECTIONS
 SHEET 5 OF 30



DESCRIPTION	UNIT	EST	FINAL
TRENCH EXCAV. PROTECTION	LF	193.00	
RC PIPE (42 IN)	LF	154.00	
RC PIPE (48 IN)	LF	40.75	
INLET (COMPL) (TY W-2)	EA	2.00	
* STRUCT. EXCAV.	CY	409.00	

* FOR CONTRACTORS INFORMATION ONLY

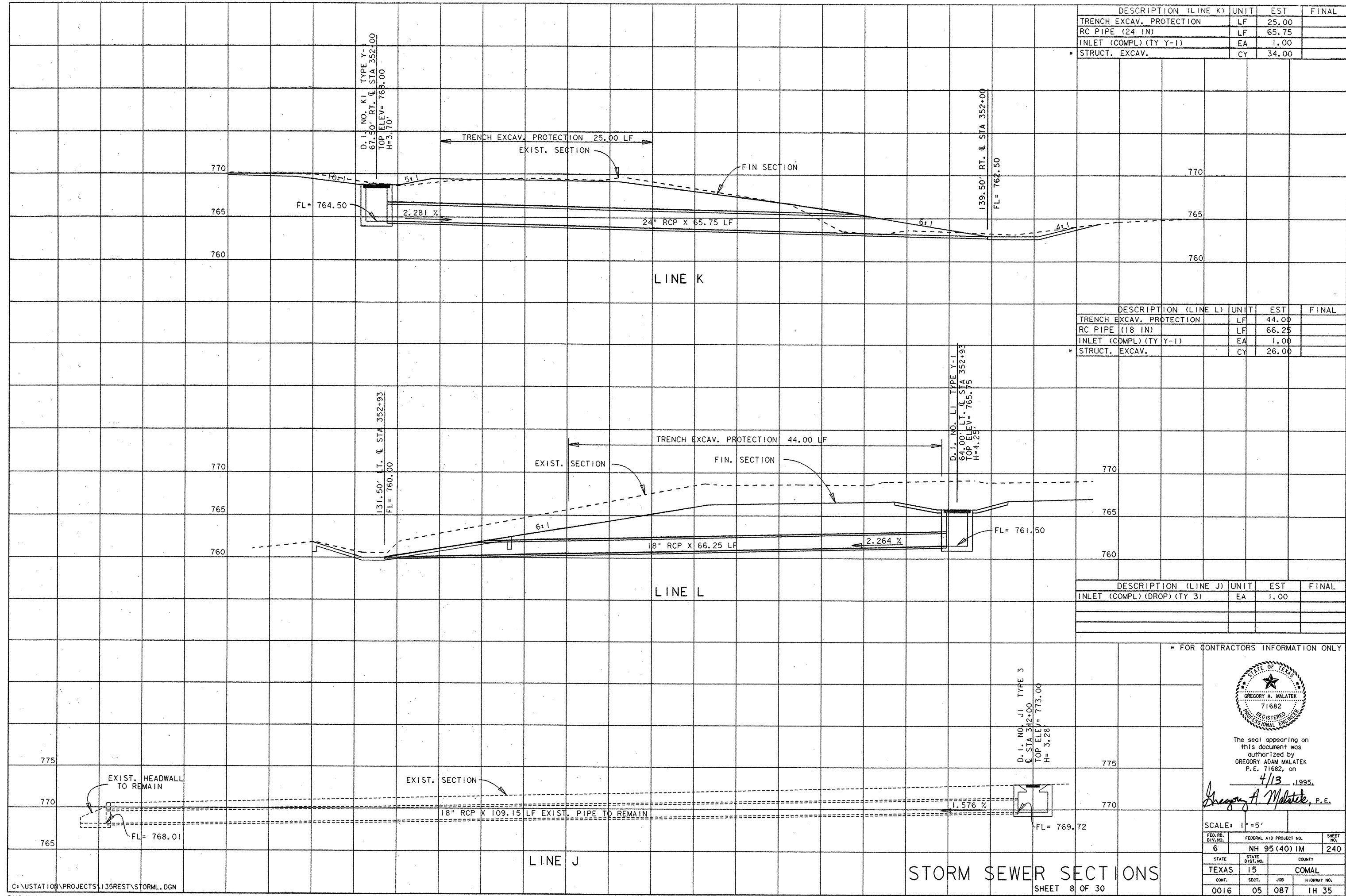


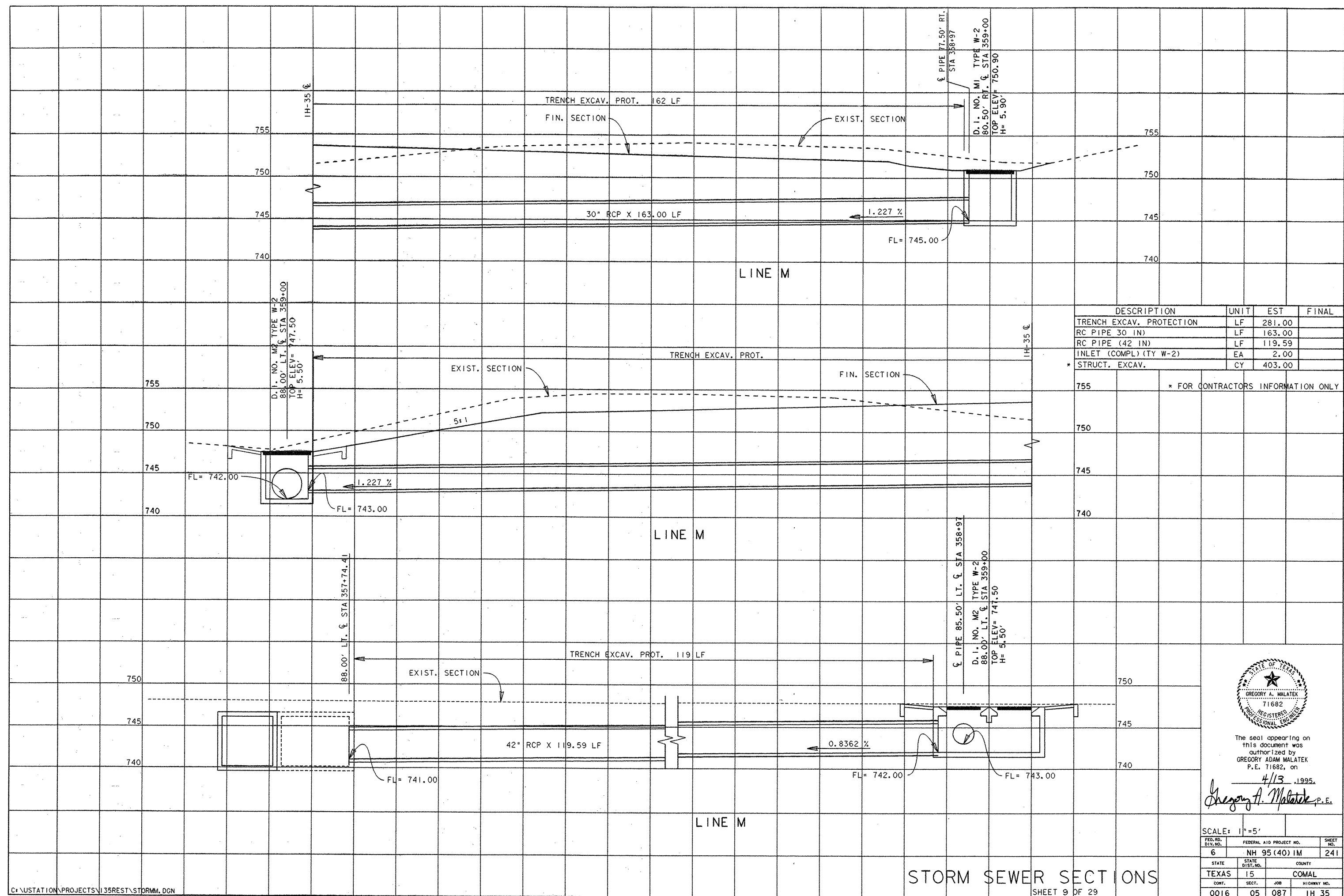
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Gregory A. Malatek, P.E.

SCALE: 1"=5'	FED. AID PROJECT NO. NH 95(40) IM	SHEET NO. 239
STATE TEXAS	COUNTY COMAL	
CONT. 0016	SECT. 05	JOB 087
		HIGHWAY NO. 1H 35

STORM SEWER SECTIONS
SHEET 7 OF 30





DESCRIPTION	UNIT	EST	FINAL
TRENCH EXCAV. PROTECTION	LF	281.00	
RC PIPE 30 IN)	LF	163.00	
RC PIPE (42 IN)	LF	119.59	
INLET (COMPL) (TY W-2)	EA	2.00	
* STRUCT. EXCAV.	CY	403.00	

* FOR CONTRACTORS INFORMATION ONLY



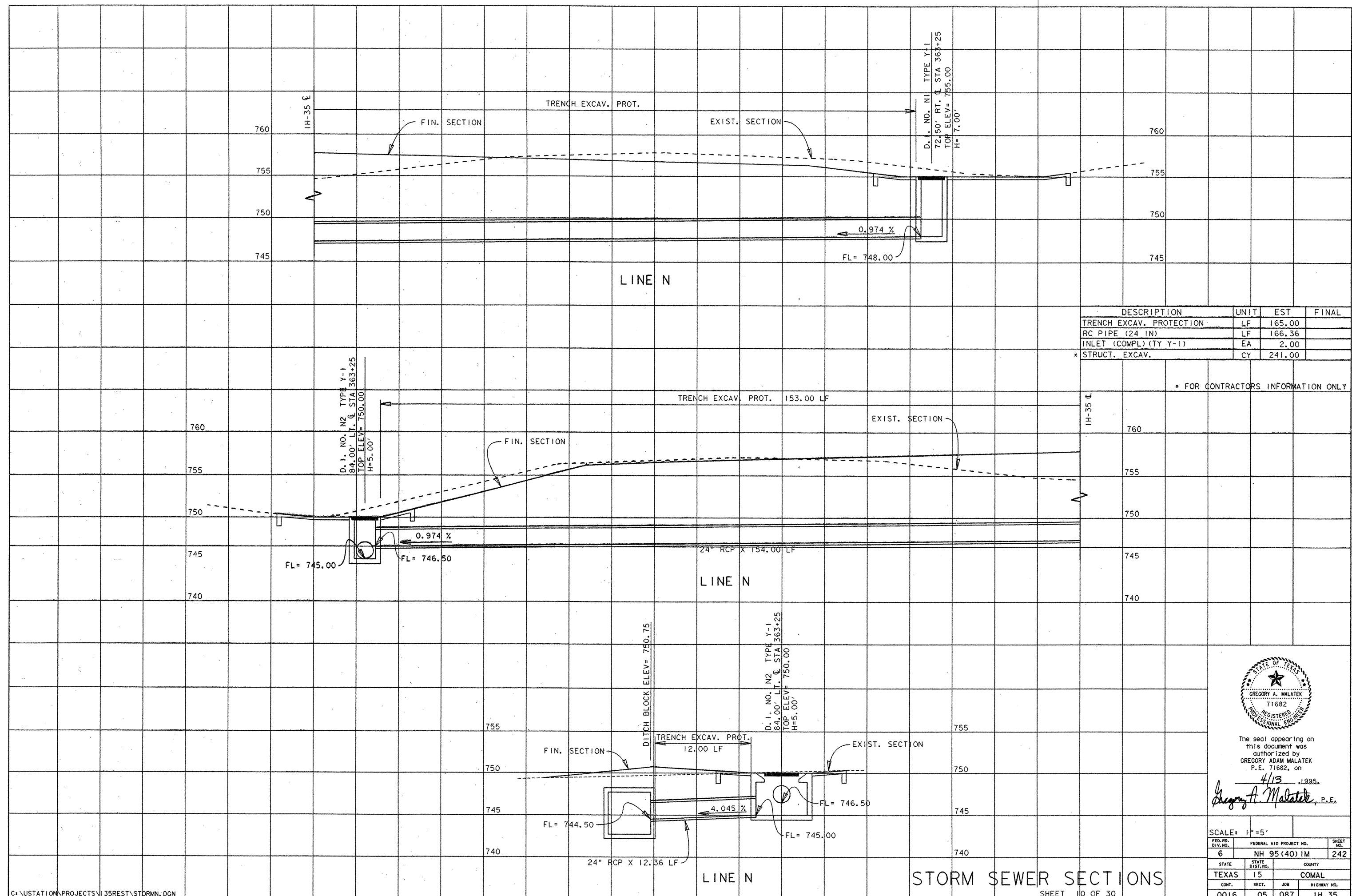
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4/13, 1995.
Gregory A. Malatek P.E.

SCALE: 1"=5'

FED. RD. DIV. NO.		FEDERAL AID PROJECT NO.		SHEET NO.
6		NH 95(40) IM		241
STATE	STATE DIST. NO.	COUNTY		
TEXAS	15	COMAL		
CONT.	SECT.	JOB	HIGHWAY NO.	
0016	05	087	1H 35	

STORM SEWER SECTIONS



DESCRIPTION	UNIT	EST	FINAL
TRENCH EXCAV. PROTECTION	LF	165.00	
RC PIPE (24 IN)	LF	166.36	
INLET (COMPL) (TY Y-1)	EA	2.00	
* STRUCT. EXCAV.	CY	241.00	

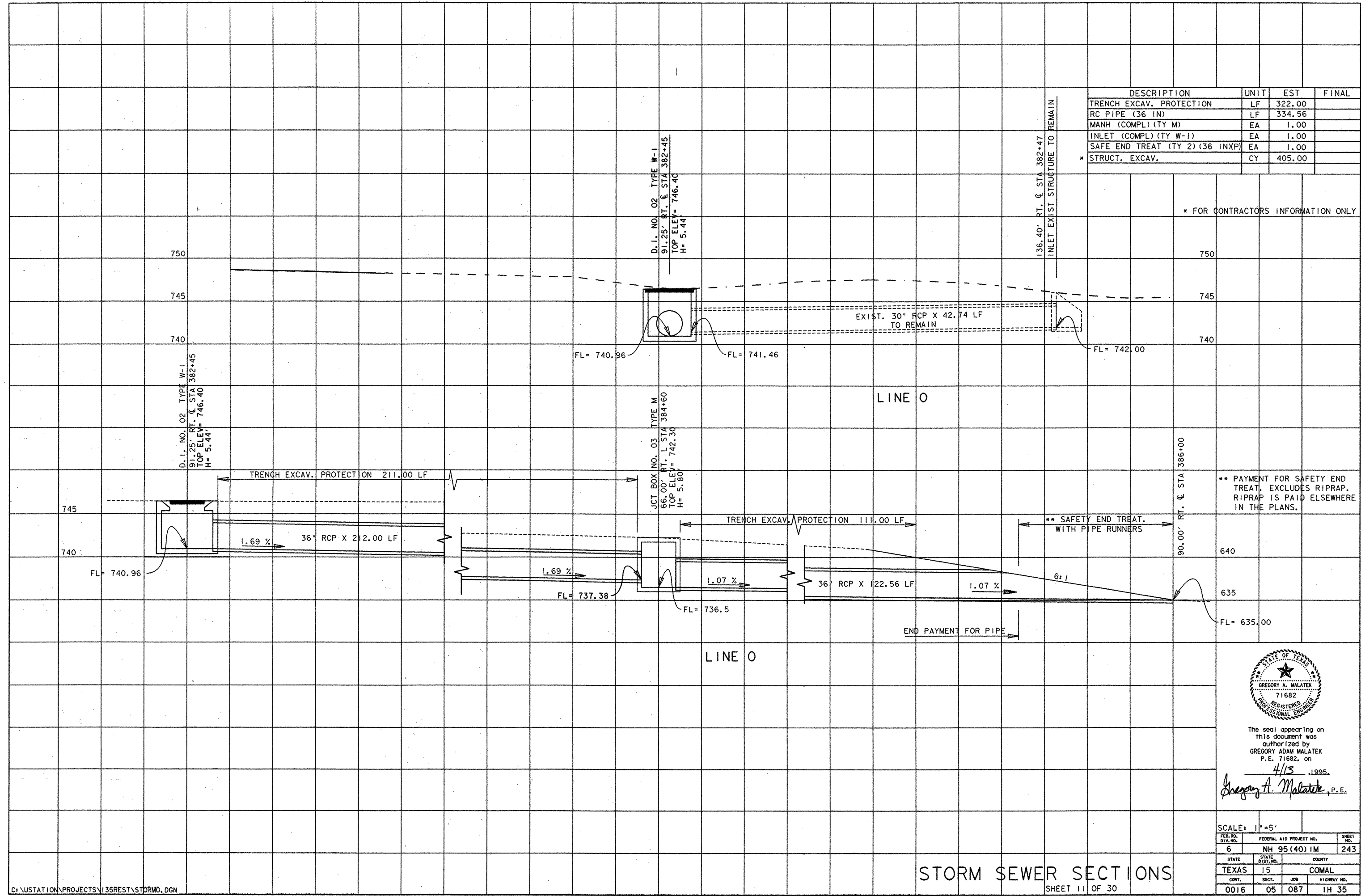
* FOR CONTRACTORS INFORMATION ONLY



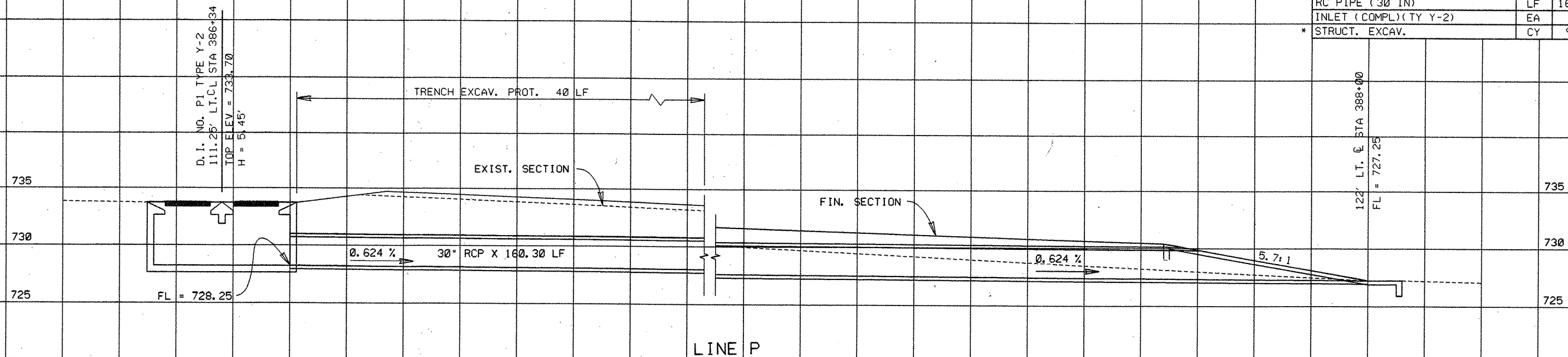
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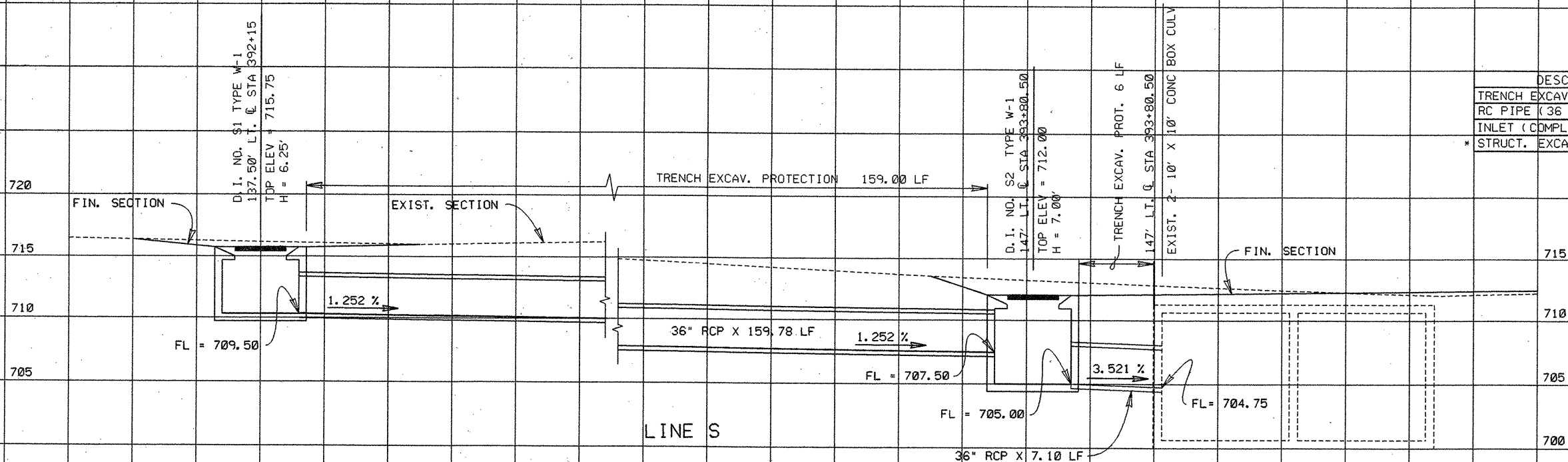
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		6	NH 95 (40) IM	242
STATE	STATE DIST. NO.	COUNTY		
TEXAS	15	COMAL		
CONT.	SECT.	JOB	HIGHWAY NO.	
0016	05	087	1H 35	



DESCRIPTION (LINE P)	UNIT	EST	FINAL
TRENCH EXCAV. PROTECTION	LF	40.00	
RC PIPE (30 IN)	LF	160.30	
INLET (COMPL)(TY Y-2)	EA	1.00	
* STRUCT. EXCAV.	CY	92.00	



DESCRIPTION (LINE S)	UNIT	EST	FINAL
TRENCH EXCAV. PROTECTION	LF	159.00	
RC PIPE (36 IN)	LF	166.88	
INLET (COMPL)(TY W-1)	EA	2.00	
* STRUCT. EXCAV.	CY	226.00	



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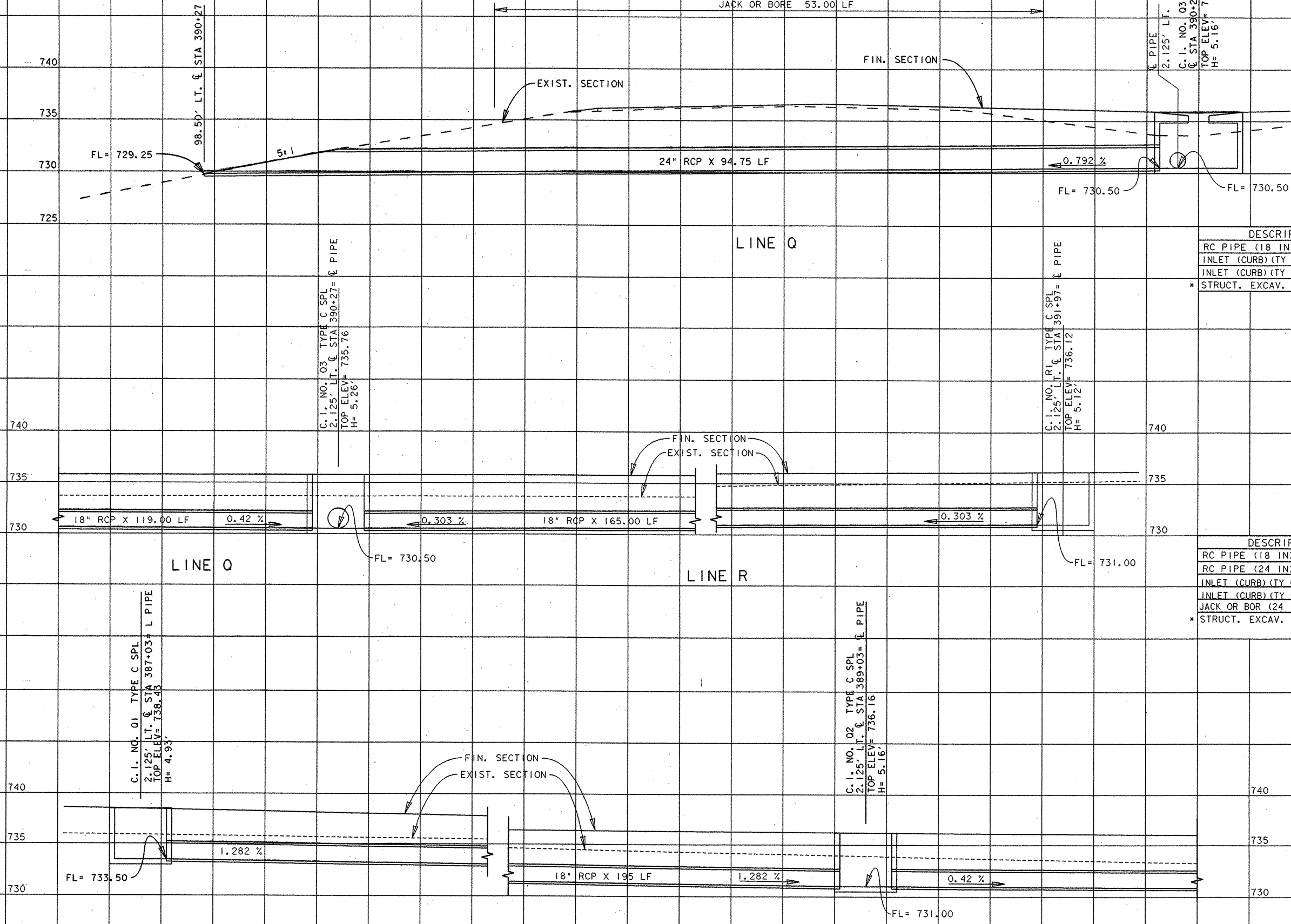
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STORM SEWER SECTIONS

SHEET 12 OF 30

SCALE: 1" = 5'		
FED. RD. DIST. NO. 6	FEDERAL AID PROJECT NO. NH 95(40) IM	SHEET NO. 244
STATE TEXAS	COUNTY COMAL	
CONT. 0016	SECT. 05	JOB 87
		HIGHWAY NO. IH-35



DESCRIPTION (LINE R)	UNIT	EST	FINAL
RC PIPE (18 IN)	LF	165.00	
INLET (CURB) (TY C) (SPL) (STAGE 1)	EA	1.00	
INLET (CURB) (TY C) (SPL) (STAGE 2)	EA	1.00	
* STRUCT. EXCAV.	CY	67.00	

DESCRIPTION (LINE Q)	UNIT	EST	FINAL
RC PIPE (18 IN)	LF	314.00	
RC PIPE (24 IN)	LF	94.75	
INLET (CURB) (TY C) (SPL) (STAGE 1)	EA	3.00	
INLET (CURB) (TY C) (SPL) (STAGE 2)	EA	3.00	
JACK OR BOR (24 IN) (RC) (CL 111)	LF	53.00	
* STRUCT. EXCAV.	CY	137.00	

* FOR CONTRACTORS INFORMATION ONLY

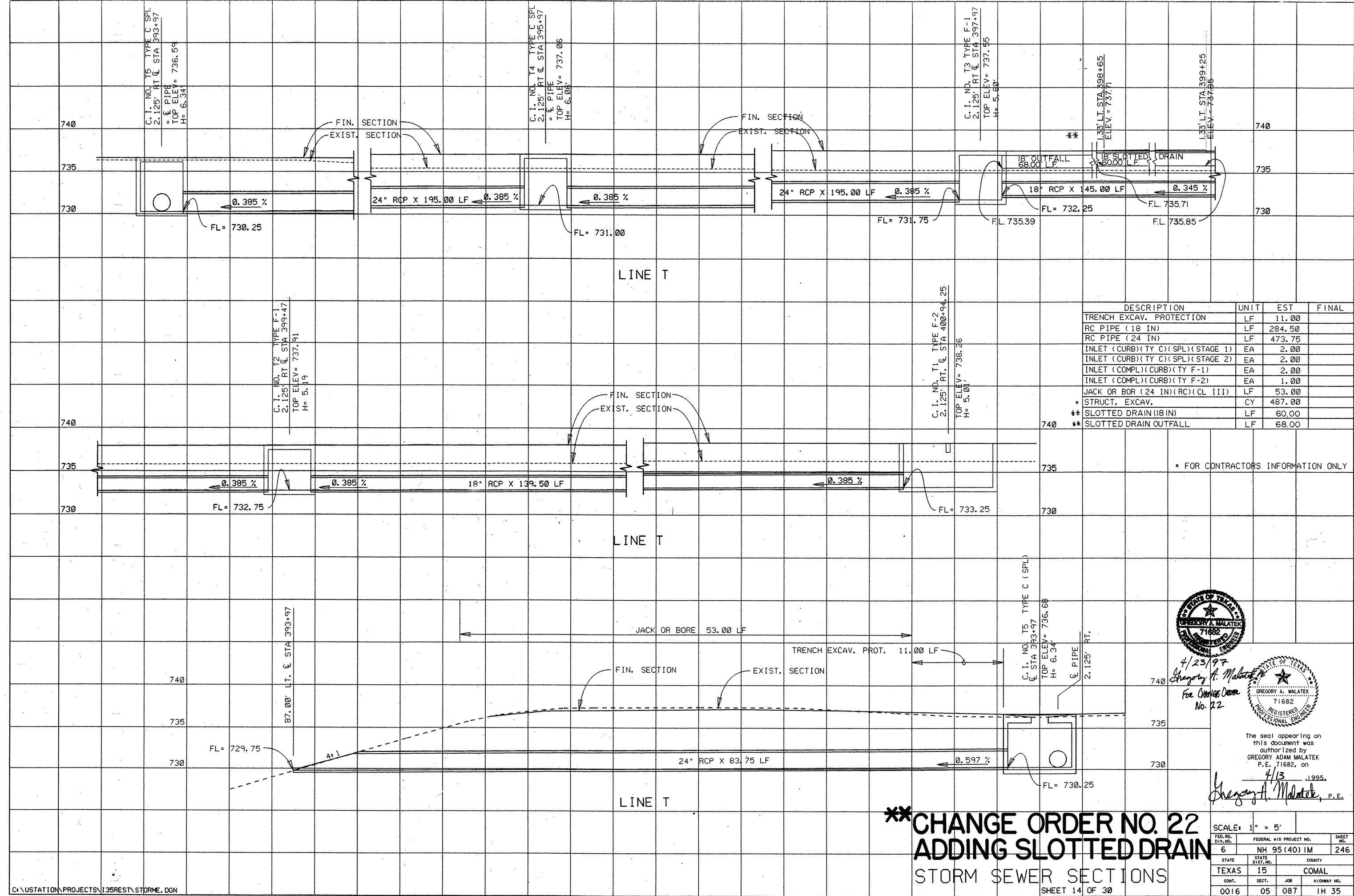


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SCALE: 1"=5'			
FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.	
6	NH 95 (40) IM	245	
STATE	STATE DIST. NO.	COUNTY	
TEXAS	15	COMAL	
CONT.	SECT.	JOB	HIGHWAY NO.
0016	05	087	1H 35

STORM SEWER SECTIONS



DESCRIPTION	UNIT	EST	FINAL
TRENCH EXCAV. PROTECTION	LF	11.00	
RC PIPE (18 IN)	LF	284.50	
RC PIPE (24 IN)	LF	473.75	
INLET (CURB)(TY C)(SPL)(STAGE 1)	EA	2.00	
INLET (CURB)(TY C)(SPL)(STAGE 2)	EA	2.00	
INLET (COMPL)(CURB)(TY F-1)	EA	2.00	
INLET (COMPL)(CURB)(TY F-2)	EA	1.00	
JACK OR BOR (24 IN)(RC)(CL III)	LF	53.00	
* STRUCT. EXCAV.	CY	487.00	
** SLOTTED DRAIN (18 IN)	LF	60.00	
** SLOTTED DRAIN OUTFALL	LF	68.00	



4/23/97
Gregory A. Malatek
For Change Order
No. 22

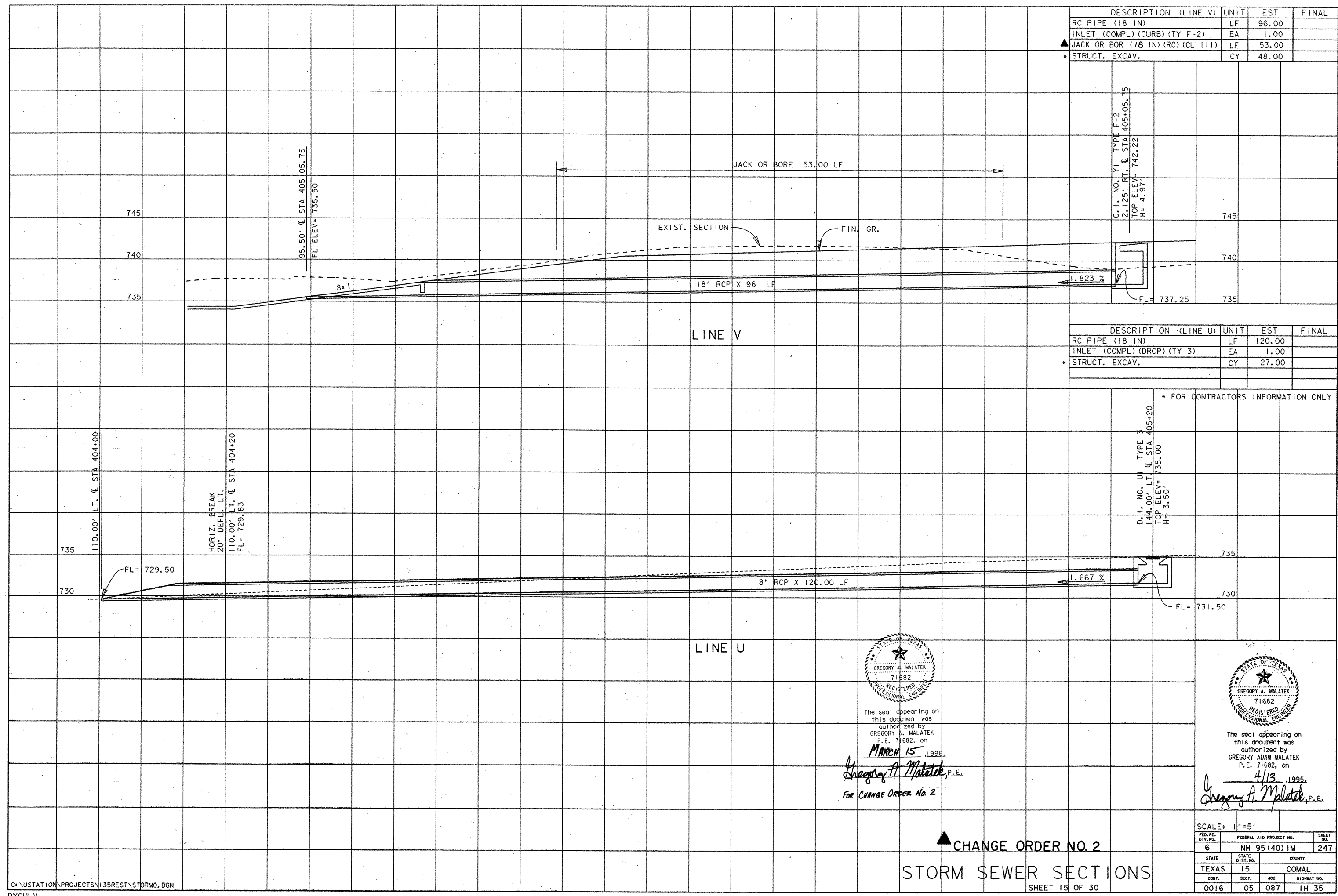


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4/13/1995
Gregory A. Malatek, P.E.

****CHANGE ORDER NO. 22
ADDING SLOTTED DRAIN
STORM SEWER SECTIONS**

SCALE: 1" = 5'		FED. RD. DIST. NO.	FEDERAL AID PROJECT NO.	SHEET NO.
		6	NH 95 (40) IM	246
STATE	STATE DIST. NO.	COUNTY		
TEXAS	15	COMAL		
CONT.	SECT.	JOB	HIGHWAY NO.	
0016	05	087	1H 35	



DESCRIPTION (LINE V)		UNIT	EST	FINAL
RC PIPE (18 IN)		LF	96.00	
INLET (COMPL) (CURB) (TY F-2)		EA	1.00	
JACK OR BOR (18 IN) (RC) (CL 111)		LF	53.00	
* STRUCT. EXCAV.		CY	48.00	

DESCRIPTION (LINE U)		UNIT	EST	FINAL
RC PIPE (18 IN)		LF	120.00	
INLET (COMPL) (DROP) (TY 3)		EA	1.00	
* STRUCT. EXCAV.		CY	27.00	

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FOR CHANGE ORDER NO. 2



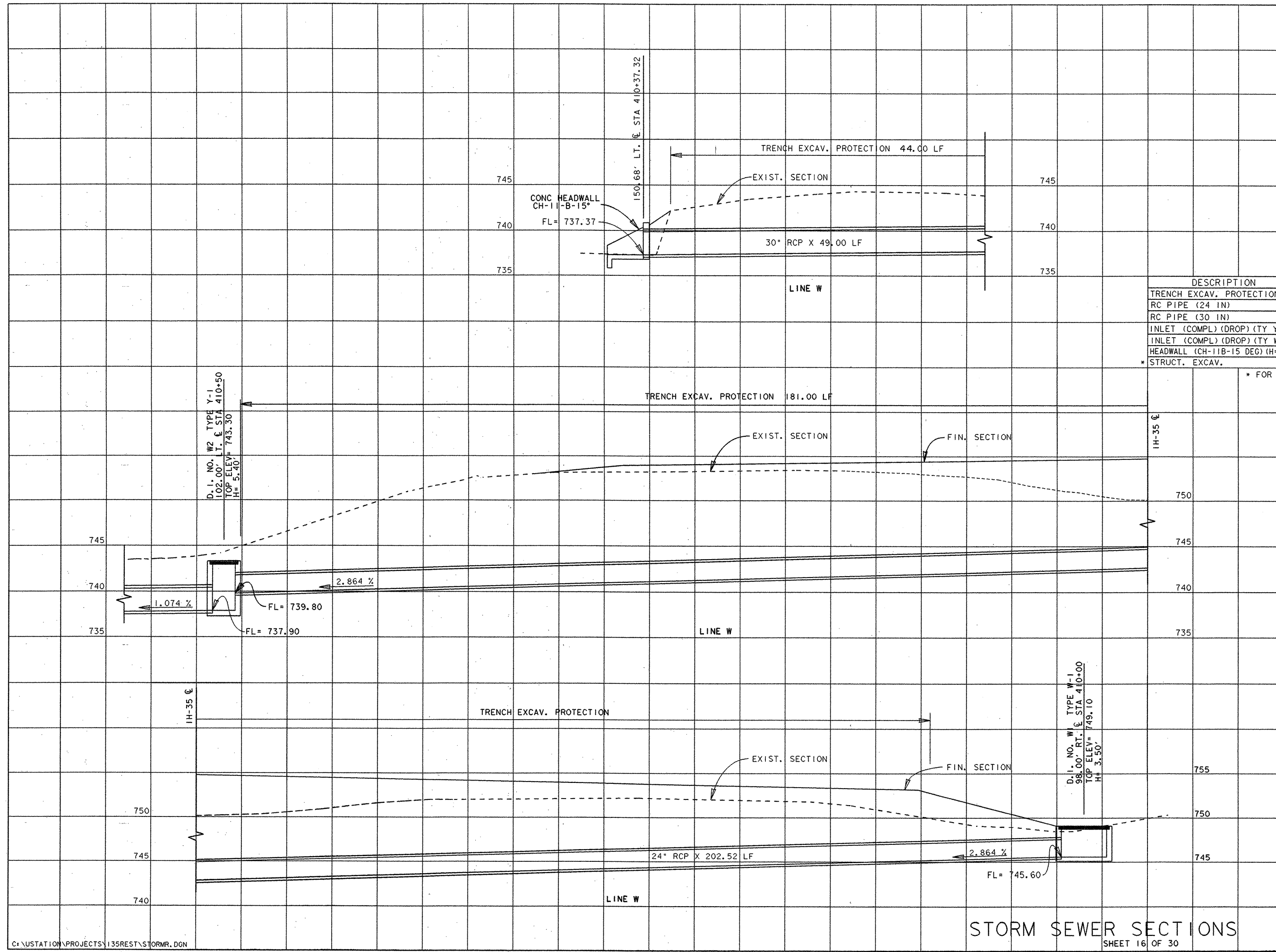
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Gregory A. Malatek, P.E.

▲ CHANGE ORDER NO. 2

STORM SEWER SECTIONS

SHEET 15 OF 30

SCALE: 1"=5'		
FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.
6	NH 95 (40) IM	247
STATE	STATE DIST. NO.	COUNTY
TEXAS	15	COMAL
CONT.	SECT.	JOB
0016	05	087
		HIGHWAY NO.
		1H 35



DESCRIPTION	UNIT	EST	FINAL
TRENCH EXCAV. PROTECTION	LF	225.00	
RC PIPE (24 IN)	LF	202.52	
RC PIPE (30 IN)	LF	49.00	
INLET (COMPL) (DROP) (TY Y-1)	EA	1.00	
INLET (COMPL) (DROP) (TY W-1)	EA	1.00	
HEADWALL (CH-11B-15 DEG) (H= 30 IN)	EA	1.00	
* STRUCT. EXCAV.	CY	317.00	

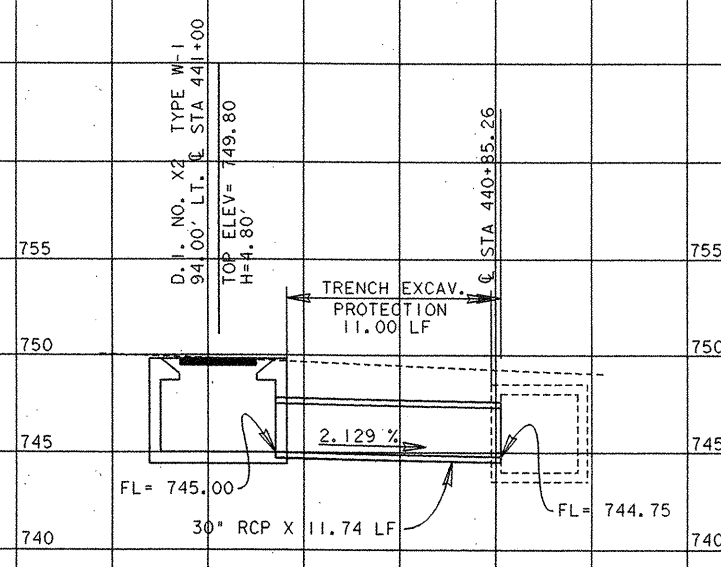
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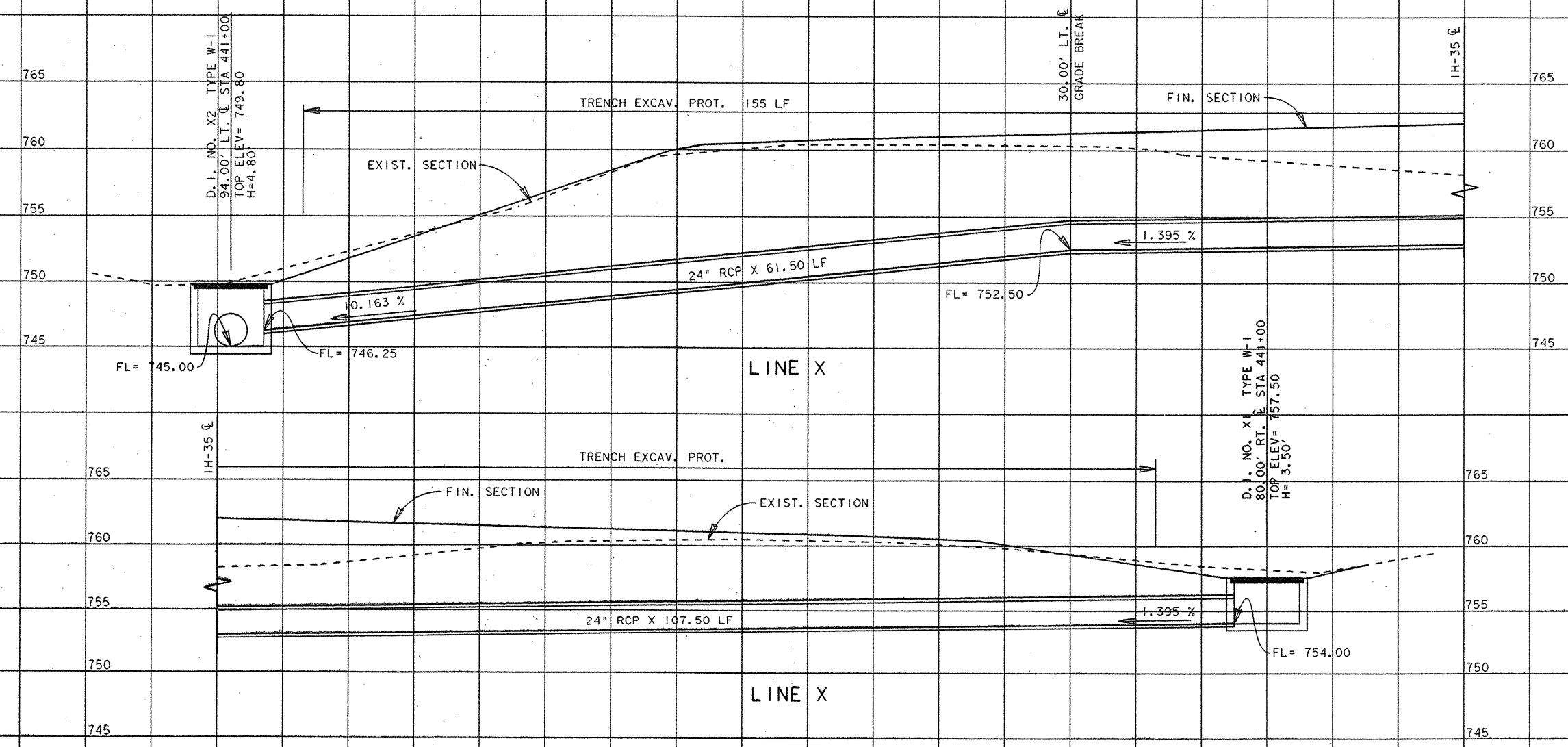
Gregory A. Malatek, P.E.

SCALE: 1" = 5'		FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.
		6	NH 95 (40) IM	248
STATE	STATE DIST. NO.	COUNTY		
TEXAS	15	COMAL		
CONT.	SECT.	JOB	HIGHWAY NO.	
0016	05	087	1H 35	



DESCRIPTION	UNIT	EST	FINAL
TRENCH EXCAV. PROTECTION	LF	166.00	
RC PIPE (24 IN)	LF	169.00	
RC PIPE (30 IN)	LF	11.74	
INLET (COMPL) (TY W-1)	EA	2.00	
* STRUCT. EXCAV.	CY	187.00	

* FOR CONTRACTORS INFORMATION ONLY

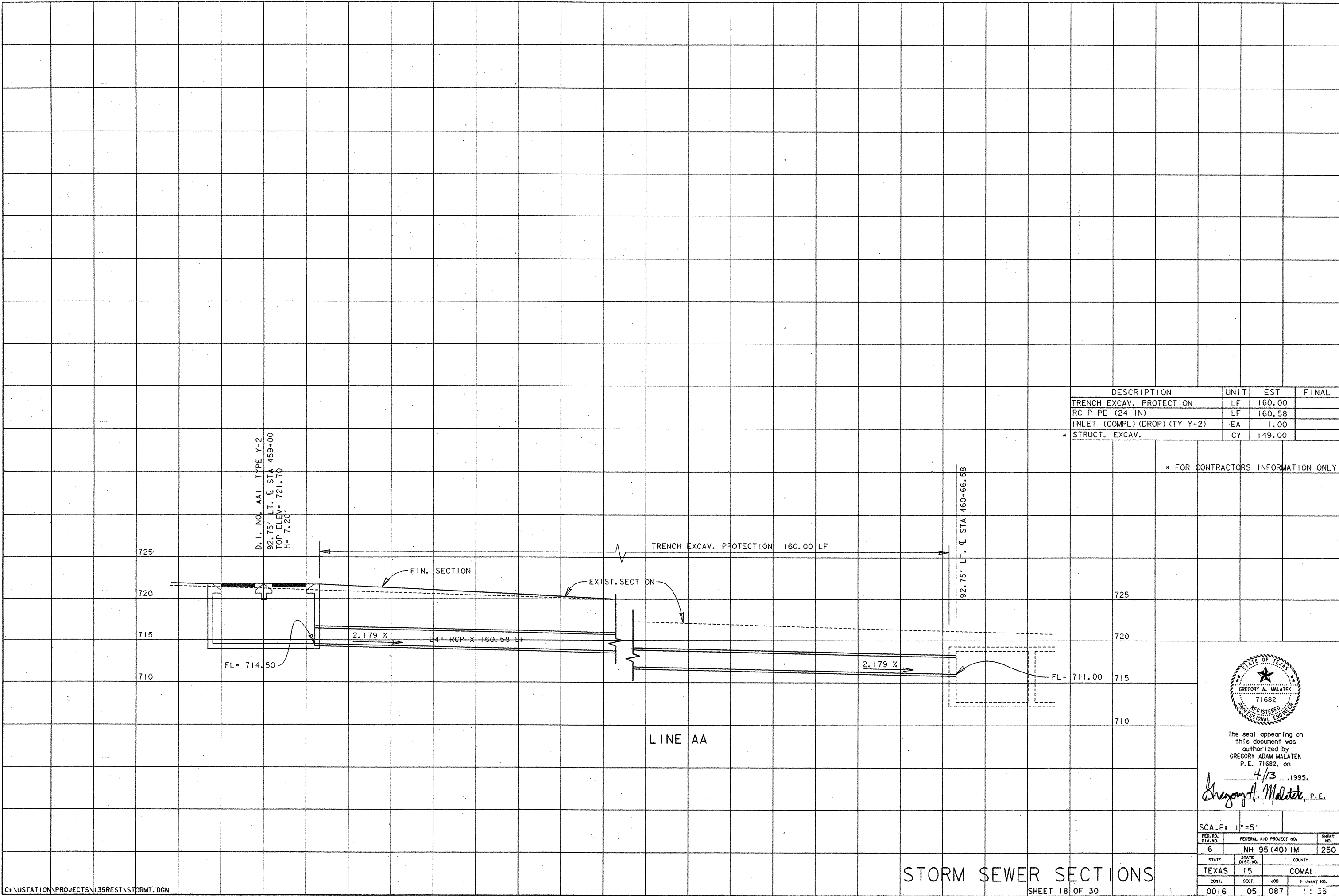


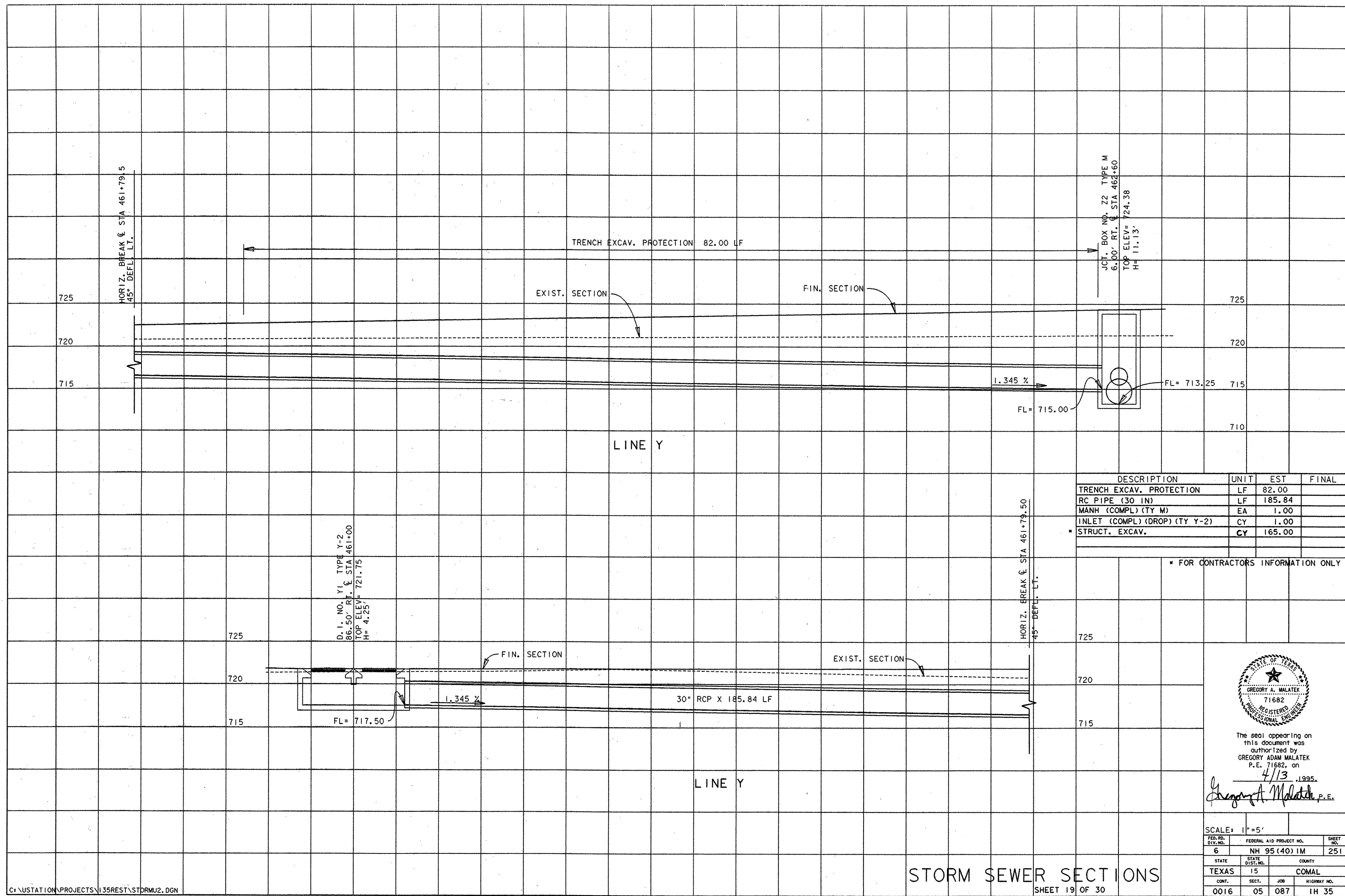
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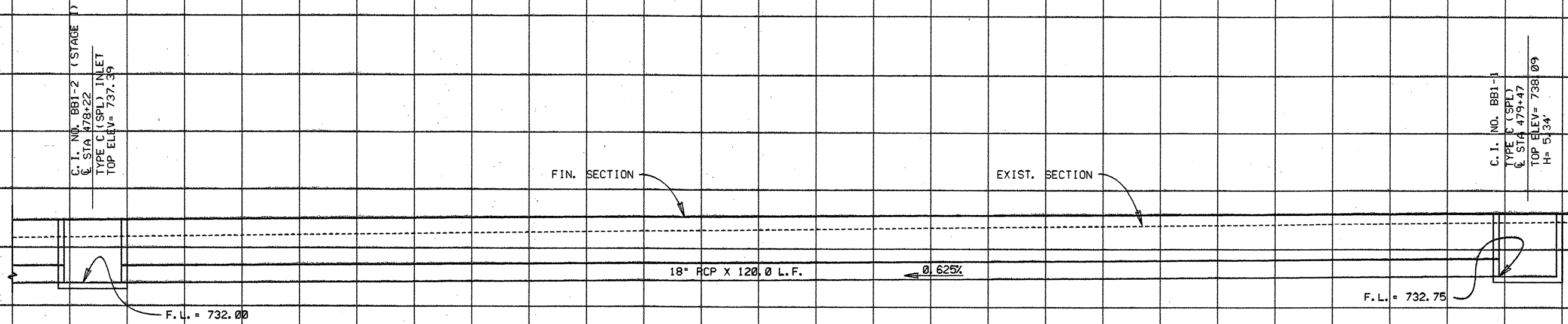
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SCALE: 1" = 5'			
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6	NH 95 (40) IM	249	
STATE	STATE DIST. NO.	COUNTY	
TEXAS	15	COMAL	
CONT.	SECT.	JOB	HIGHWAY NO.
0016	05	087	1H 35

STORM SEWER SECTIONS



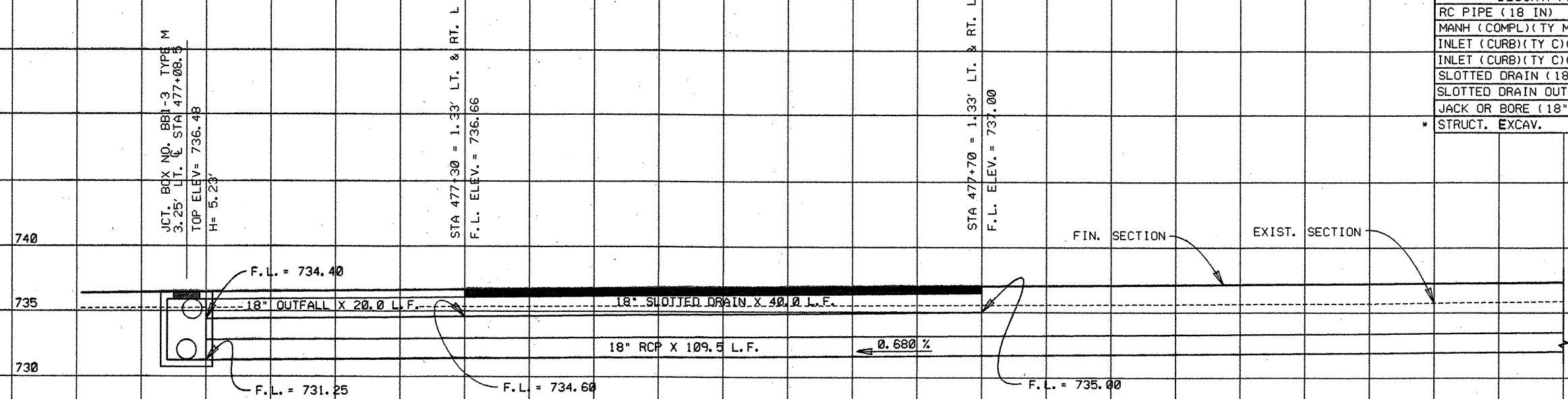




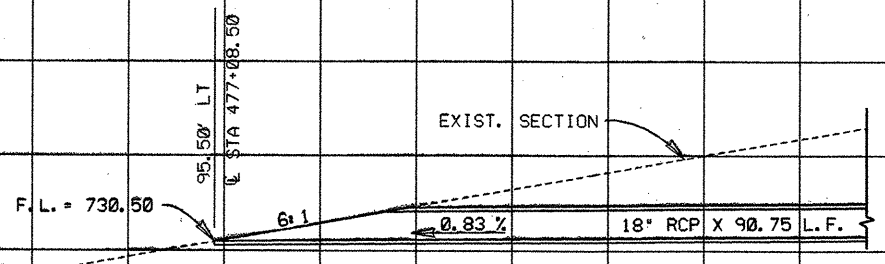
LINE BB1

DESCRIPTION	UNIT	EST	FINAL
RC PIPE (18 IN)	LF	320.25	
MANH (COMPL)(TY M)	EA	1.00	
INLET (CURB)(TY C)(SPL)(STAGE 1)	EA	2.00	
INLET (CURB)(TY C)(SPL)(STAGE 2)	EA	2.00	
SLOTTED DRAIN (18 IN)	LF	40.00	
SLOTTED DRAIN OUTFALL (18 IN)	LF	20.00	
JACK OR BORE (18")	LF	53.00	
* STRUCT. EXCAV.	CY	176.00	

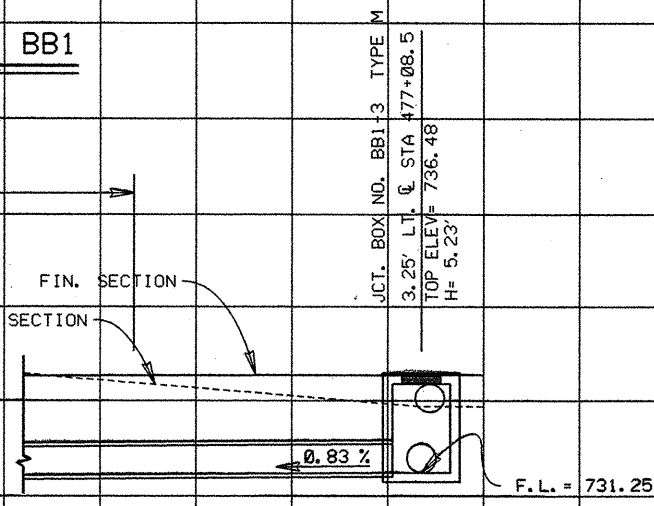
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LINE BB1



LINE BB1



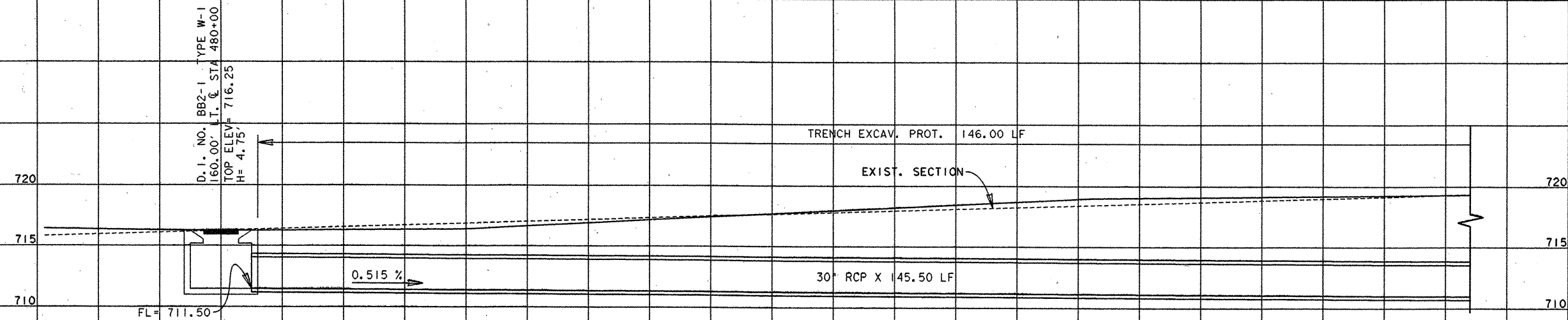
STORM SEWER SECTIONS



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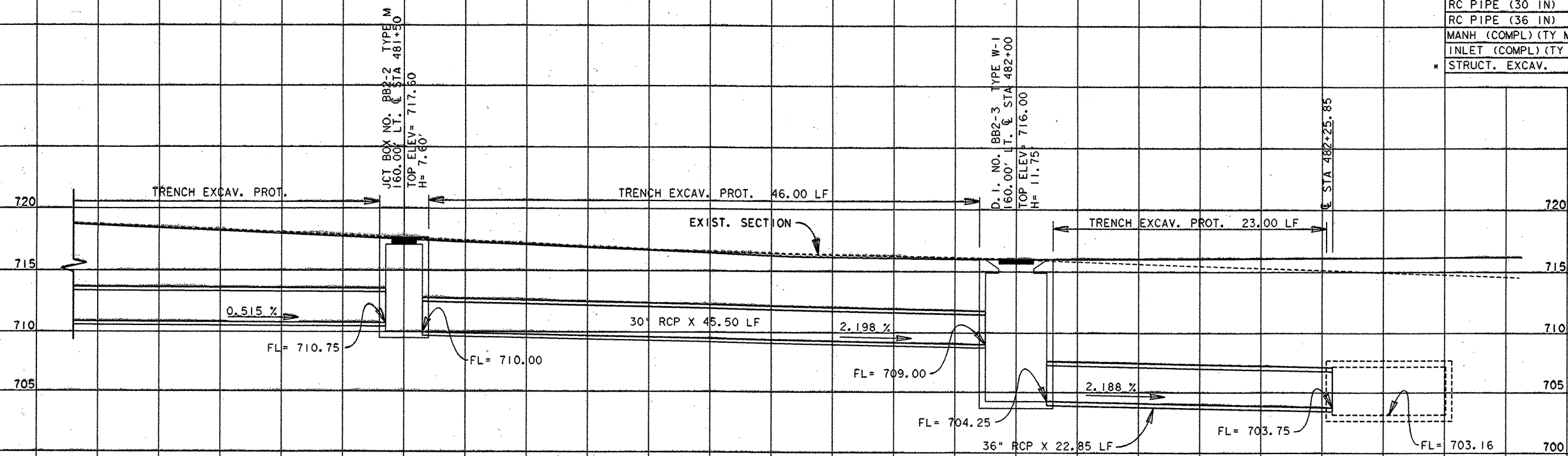
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6	NH 95(40) IM	253
STATE	DIST. NO.	COUNTY
TEXAS	15	COMAL
CONT.	SECT.	JOB
0016	05	087
		HIGHWAY NO.
		1H 35



LINE BB2

DESCRIPTION	UNIT	EST	FINAL
TRENCH EXCAV. PROTECTION	LF	215.00	
RC PIPE (30 IN)	LF	191.00	
RC PIPE (36 IN)	LF	22.85	
MANH (COMPL) (TY M)	EA	1.00	
INLET (COMPL) (TY W-1)	EA	2.00	
* STRUCT. EXCAV.	CY	245.00	

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LINE BB2



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SCALE: 1"=5'			
FED. RD. DIST. NO.	FEDERAL AID PROJECT NO.	SHEET NO.	
6	NH 95 (40) IM	254	
STATE	DIST. NO.	COUNTY	
TEXAS	15	COMAL	
CONT.	SECT.	JOB	RIGHTWAY NO.
0016	05	087	1H 35

STORM SEWER SECTIONS

SHEET 22 OF 30

740

735

730

725

C.I. NO. DD1 TYPE F-2
2.125' RT. CL STA 487+05.75
TOP ELEV. = 735.22
H = 5.72'

0.53 %

18" RCP X 189.50 LF

F.L. = 729.50

FIN. GR.
EXIST. GR.

LINE DD

0.53 %

F.L. = 728.50

F.L. = 723.60

C.I. NO. EE2-5 TYPE F-1
2.125' RT. CL STA 489+03
TOP ELEV. = 733.52
H = 9.92'

TRENCH EXCAV PROTECT = 28 LF

LINE EE2

0.21 %

18" RCP X 195.00 LF

F.L. = 724.10

MATCH LINE A ON
SHEET 25 OF 30

1H-35 CL
C.I. NO. EE2-5 TYPE F-1
2.125' RT. CL STA 489+03
TOP ELEV. = 733.52
H = 9.92'

TRENCH EXCAV. PROT. 118 LF

EXIST. SECTION
FIN. SECTION

136.50' LT. CL STA 489+03

5:1

6:1

0.45 %

30" RCP X 133.50 LF

0.45 %

FL = 723.10

FL = 728.5

FL = 723.62

LINE EE2



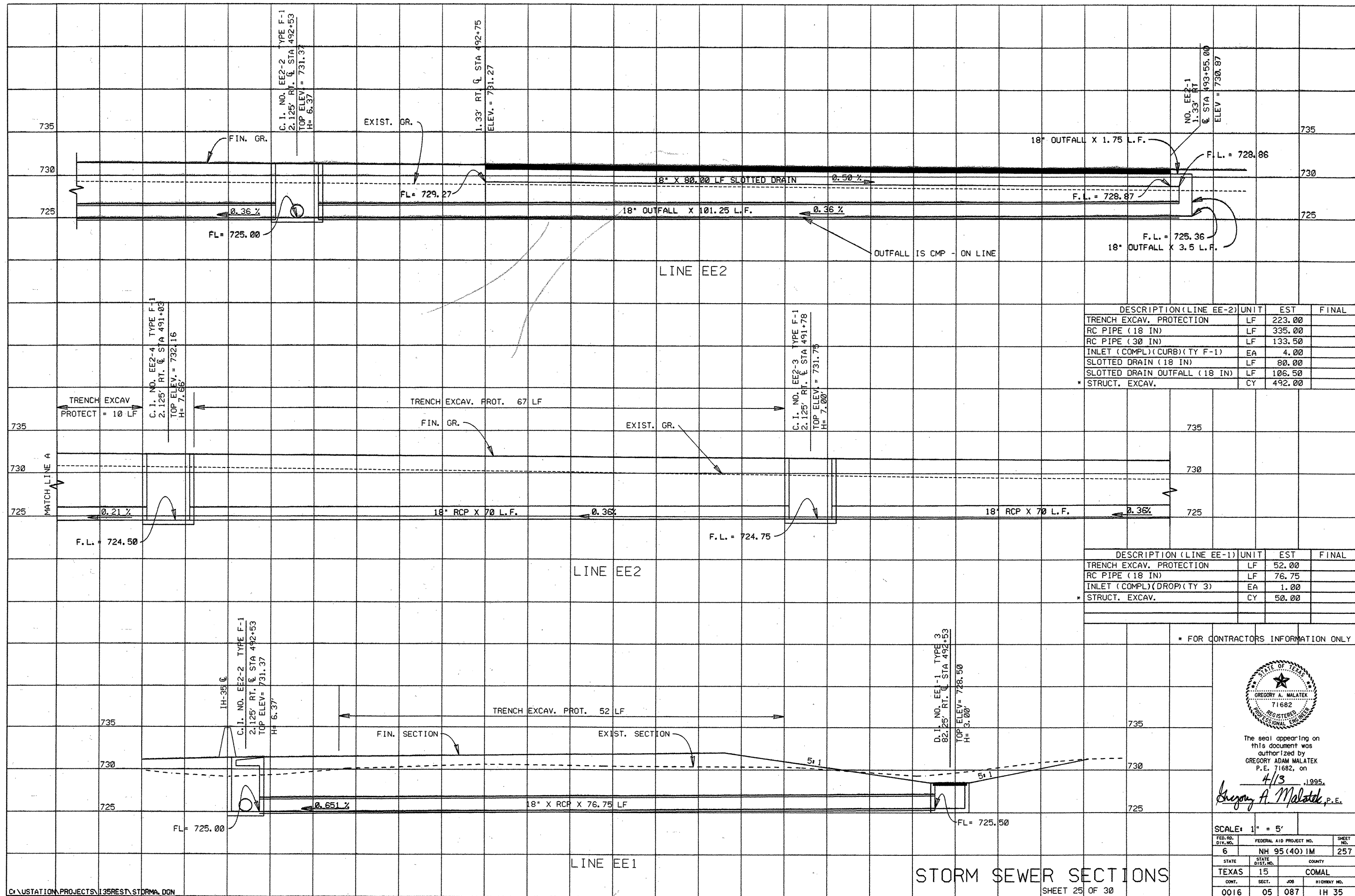
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Gregory A. Malatek, P.E.

SCALE: 1" = 5'

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.
6	NH 95(40) IM	256
STATE	COUNTY	
TEXAS	COMAL	
CONT.	SECT.	JOB
0016	05	087
		1H 35

STORM SEWER SECTIONS

SHEET 24 OF 30



DESCRIPTION (LINE EE-2)	UNIT	EST	FINAL
TRENCH EXCAV. PROTECTION	LF	223.00	
RC PIPE (18 IN)	LF	335.00	
RC PIPE (30 IN)	LF	133.50	
INLET (COMPL)(CURB)(TY F-1)	EA	4.00	
SLOTTED DRAIN (18 IN)	LF	80.00	
SLOTTED DRAIN OUTFALL (18 IN)	LF	106.50	
* STRUCT. EXCAV.	CY	492.00	

DESCRIPTION (LINE EE-1)	UNIT	EST	FINAL
TRENCH EXCAV. PROTECTION	LF	52.00	
RC PIPE (18 IN)	LF	76.75	
INLET (COMPL)(DROP)(TY 3)	EA	1.00	
* STRUCT. EXCAV.	CY	50.00	

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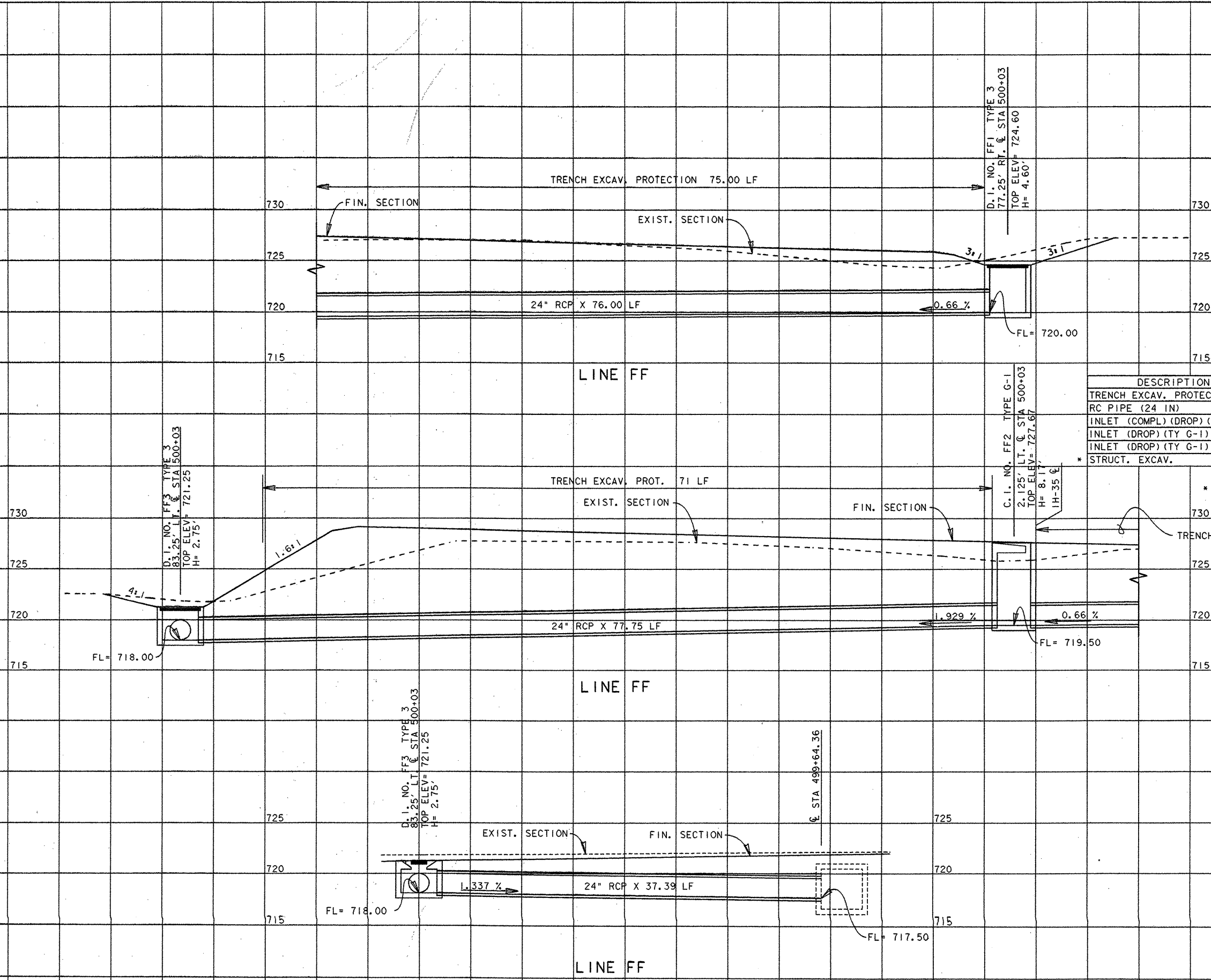


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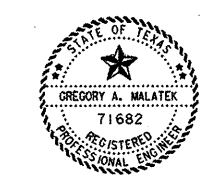
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6	NH 95(40) IM	257
STATE	STATE DIST. NO.	COUNTY
TEXAS	15	COMAL
CONT.	SECT.	JOB
0016	05	087
		1H 35

STORM SEWER SECTIONS



DESCRIPTION	UNIT	EST	FINAL
TRENCH EXCAV. PROTECTION	LF	146.00	
RC PIPE (24 IN)	LF	191.14	
INLET (COMPL) (DROP) (TY 3)	EA	2.00	
INLET (DROP) (TY G-1) (STAGE 1)	EA	1.00	
INLET (DROP) (TY G-1) (STAGE 2)	EA	1.00	
* STRUCT. EXCAV.	CY	194.00	

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SCALE: 1" = 5'			
FED. RD. DIV. NO.		FEDERAL AID PROJECT NO.	SHEET NO.
6		NH 95(40) IM	258
STATE	STATE DIST. NO.	COUNTY	
TEXAS	15	COMAL	
CONT.	SECT.	JOB	HIGHWAY NO.
0016	05	087	1H 35

STORM SEWER SECTIONS

C.I. NO. G61 TYPE G-1
2.125' LT. @ STA 502+03
TOP ELEV= 726.68
H= 5.18'

730
725
720
FL= 721.50

FIN. SECTION
EXIST. SECTION

18" RCP X 195.00 LF

C.I. NO. G62 TYPE G-1
2.125' LT. @ STA 504+03
TOP ELEV= 725.70
H= 5.20'

LINE GG

C.I. NO. G63 TYPE G-1
2.125' LT. @ STA 506+03
TOP ELEV= 724.71
H= 5.21'

FIN. SECTION
EXIST. SECTION

18" RCP X 195.00 LF

0.51 %

0.38 %

18" RCP X 195.00 LF

0.38 %

C.I. NO. G64 TYPE G-1
2.125' LT. @ STA 508+03
TOP ELEV= 723.72
H= 7.97'

LINE GG



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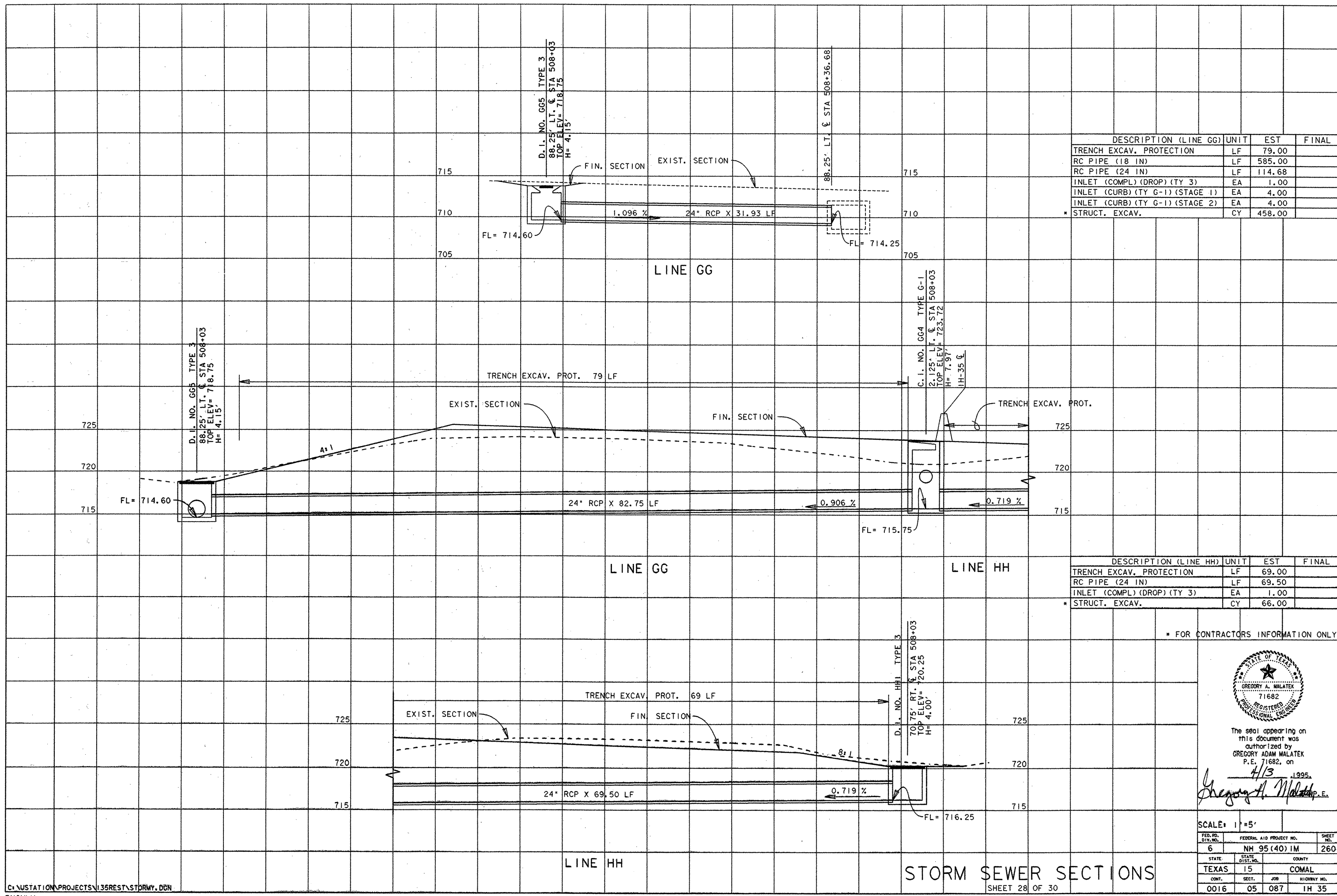
4/13, 1995.
Gregory A. Malatek, P.E.

SCALE: 1"=5'

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	NH 95 (40) IM		259
STATE	STATE DIST. NO.	COUNTY	
TEXAS	15	COMAL	
CONT.	SECT.	JOB	HIGHWAY NO.
0016	05	087	1H 35

STORM SEWER SECTIONS

SHEET 27 OF 30



DESCRIPTION (LINE GG)		UNIT	EST	FINAL
TRENCH EXCAV. PROTECTION		LF	79.00	
RC PIPE (18 IN)		LF	585.00	
RC PIPE (24 IN)		LF	114.68	
INLET (COMPL) (DROP) (TY 3)		EA	1.00	
INLET (CURB) (TY G-1) (STAGE 1)		EA	4.00	
INLET (CURB) (TY G-1) (STAGE 2)		EA	4.00	
* STRUCT. EXCAV.		CY	458.00	

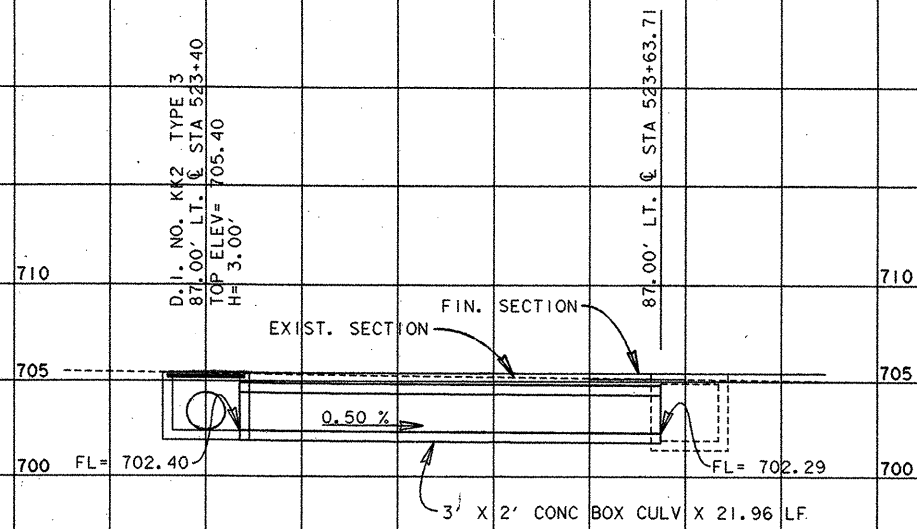
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TRENCH EXCAV. PROTECTION		LF	69.00	
RC PIPE (24 IN)		LF	69.50	
INLET (COMPL) (DROP) (TY 3)		EA	1.00	
* STRUCT. EXCAV.		CY	66.00	

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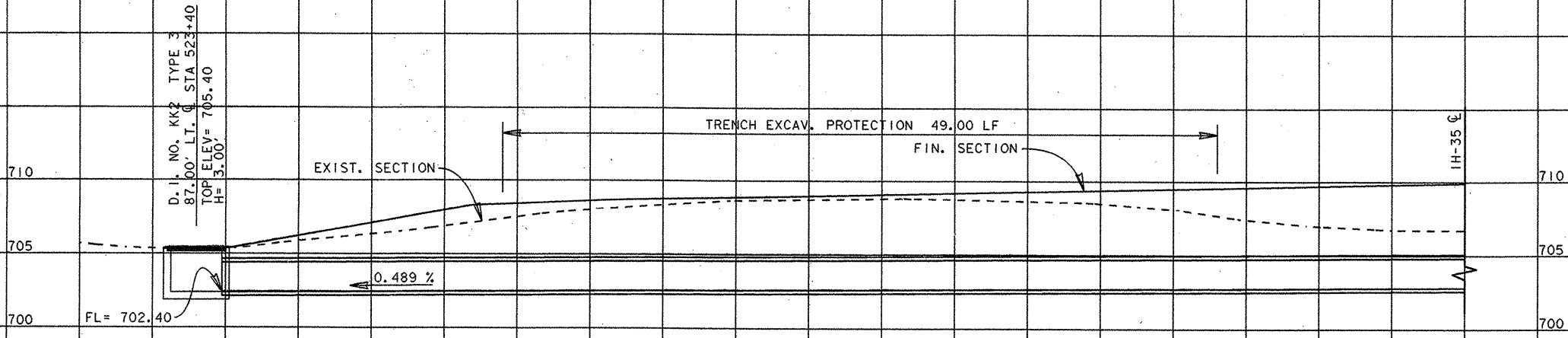
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6	NH 95 (40) IM	260
STATE	STATE DIST. NO.	COUNTY
TEXAS	15	COMAL
CONT.	SECT.	JOB
0016	05	087
		1H 35



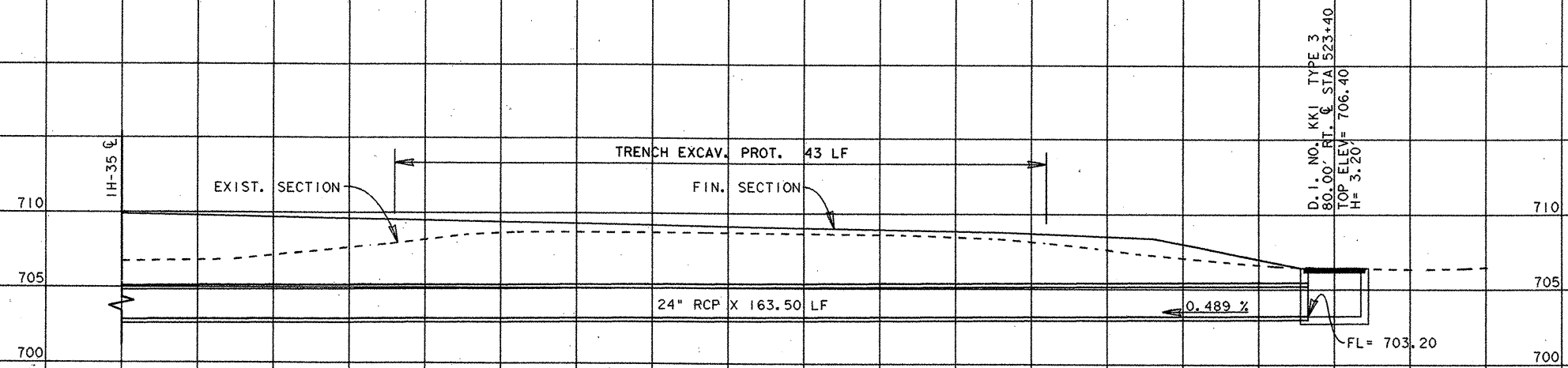
LINE KK

DESCRIPTION (LINE KK)	UNIT	EST	FINAL
TRENCH EXCAV. PROTECTION	LF	92.00	
CONC BOX CULV (3 X 2)	LF	21.96	
RC PIPE (24 IN)	LF	163.50	
INLET (COMPL) (DROP) (TY 3)	EA	2.00	
* STRUCT. EXCAV.	CY	139.00	

* FOR CONTRACTORS INFORMATION ONLY



LINE KK



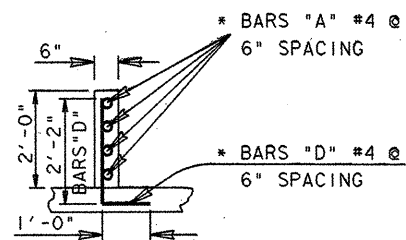
LINE KK



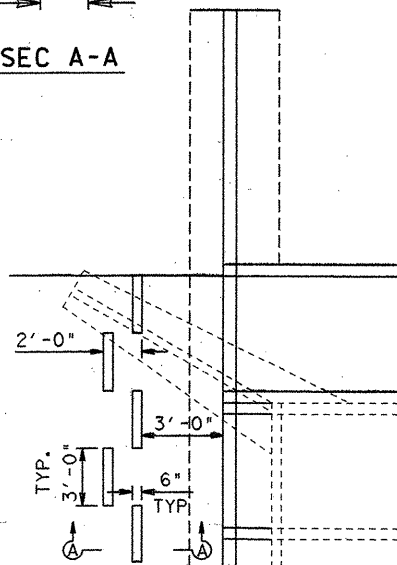
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Gregory A. Malatek, P.E.

SCALE: 1"=5'			
FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	NH 95 (40) IM		262
STATE	STATE DIST. NO.	COUNTY	
TEXAS	15	COMAL	
CONT.	SECT.	JOB	HIGHWAY NO.
0016	05	087	IH 35

STORM SEWER SECTIONS



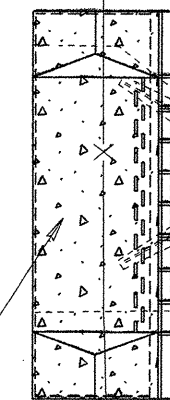
SEC A-A



CONC RETARD DETAILS

* REINF. STL. SHALL HAVE
MIN. 2" CONC COVER.

EXIST WEST FRONTAGE ROAD
(NO WORK PROPOSED EXCEPT
OVER ADDED BARRELS.)



RIPRAP (CONC) (CL B)
EST @ 41.0 CY.
INCLUDING CONC RETARDS.

RIPRAP TOEWALL DETAILS

CENTERLINE OF STRUCTURE

END BRIDGE
STA 307+53.83

REPAIR CULV. DECK ONLY
CL A CONC (CULV)
EST @ 10.00 CY

EXIST WEST FRONTAGE ROAD
(NO WORK PROPOSED EXCEPT
OVER ADDED BARRELS.)

BEGIN BRIDGE
STA 306+99.42

N 59° 21' 13"E
1H 35 SURVEY LINE

RIPRAP (CONC) (CL B)
EST @ 15.60 CY

DESCRIPTION	UNIT	EST	FINAL
STRUCT EXCAV	CY	3180.00	
TRENCH EXCAV PROTECTION	LF	595.12	
CL A CONC (CULV)	CY	10.00	
RIPRAP (CONC) (CL B)	CY	56.60	
CONC BOX CULV (6FT x 6FT)	LF	1,089.39	
MC (SPL) (6'x7')	LF	80.00	
MC 6-1 (SPL) (6'x8')	LF	56.00	
WINGWALL (MCW-P) (H-6 FT)	EA	1.00	
WINGWALL (MCW-P-45) (H-8 FT)	EA	1.00	

FOR CONTRACTOR'S INFORMATION ONLY

EXIST DECK TO BE REMOVED & REPLACED
REFER TO MC 6-1 FOR DETAILS. EXIST
DECK STEEL TO BE REPLACED.

** ENTRANCE RAMP

WORK SHALL BE DONE ON THE EXIST. CHANNEL
TO MEET THE NEEDS OF THE ADDED BARRELS.

ALL EXISTING INLETS & PIPES TO
BE REMOVED. THE PIPE ENTRANCE TO
* THE CULVERT SHALL BE REPAIRED IN
ACCORDANCE WITH CULVERT REPAIR
DETAIL SHEET.

FOR HYDRAULIC INFORMATION SEE HYDRAULIC
DATA SHEET FOR STRUCTURES GREATER THAN
1500 CFS.

PERM. STRUCTURE NO. 15-046-0016-05-020

NORMAL LENGTH = 280'-1 5/16"

OVERALL LENGTH = 297'-3 1/4" ALONG CL OF CULVERT (TRENCH EXCAVATION PROTECTION)

TRENCH EXCAVATION PROTECTION 595.12 LF

1H 35 SURVEY LINE

139'-0 5/8"

60'-0 5/8"
USING MC 6-1

57'-0 5/8"
USING MC 6-1

4'-0" EXTENSION
USING MC 6-1

1'-0" BREAKBACK LINE

22'-0"
USING MC 6-1

57'-0"
USING MC 6-1

99'-7 5/8"
USING MC 6-1

22'-4"
USING MC 6-1

31'-7" SKEW LENGTH
USING MC 6-1

6'-4 3/8" EXTENSION
USING MC 6-1 (SPL)

9'-0" SKEW LENGTH
USING MC 6-1 (SPL)

1'-5" BREAKBACK LINE

2'-0" SKEW LENGTH

SSCB (SPL)

ELEV. = 754.37

EXIST FL = 743.63

EXIST FL = 744.02

EXIST FL = 742.46

EXIST FL = 740.46

EXIST FL = 740.17

EXIST FL = 740.15

EXIST FL = 740.15

EXIST FL = 740.15

EXIST FL = 740.15

EXIST FL = 740.15

41'-5 1/16"

58'-7" SK LGTH

36'-5 1/16"

51'-7" SK LGTH

20'-0" SKEW LENGTH
USING MC (SPL)

4'-1 1/16"

7'-0" SKEW LENGTH
USING MC 6-1 (SPL)

14'-1 1/16"

20'-0" SKEW LENGTH
USING MC (SPL)

4'-1 1/16"

7'-0" SKEW LENGTH
USING MC 6-1 (SPL)

14'-1 1/16"

20'-0" SKEW LENGTH
USING MC (SPL)

4'-1 1/16"

7'-0" SKEW LENGTH
USING MC 6-1 (SPL)

14'-1 1/16"

20'-0" SKEW LENGTH
USING MC (SPL)

4'-1 1/16"

7'-0" SKEW LENGTH
USING MC 6-1 (SPL)

14'-1 1/16"

20'-0" SKEW LENGTH
USING MC (SPL)

4'-1 1/16"

7'-0" SKEW LENGTH
USING MC 6-1 (SPL)

14'-1 1/16"

NOTE:
DIMENSIONS ARE AT THE CENTERLINE
OF STRUCTURE ON SURVEY LINE.



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GREGORY ADAM MALATEK
P.E. 71682, on

4/5, 1995.
Gregory A. Malatek, P.E.

STA 306+99.42 TO 307+53.83

EXIST 4'-6'x6'x272'-1 15/16" CONC. CULV. TO BE EXTENDED & LENGTHENED
TO 8'-6'x6'x280'-1 5/16" CONC. CULV.

WITH SCNA, MC 6-1, MC 6-1 (MOD), MC (SPL), MC 6-1 (SPL)
USING MCW-P-45° UPSTR. & MCW-P DNSTR.

BRIDGE LAYOUT

AT NO NAME CREEK

SHEET 10F 2

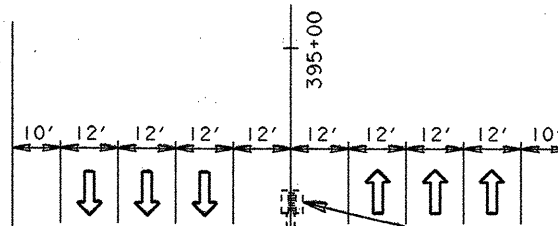
FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.
6	NH 95 (40) IM	263
STATE	STATE DIST. NO.	COUNTY
TEXAS	15	COMAL
CONT.	SECT.	JOB
0016	05	087
		1H 35

RIPRAP (CONC) (CL B)
EST @ 13.0 CY.
INCLUDING CONC RETARDS.

EXIST WEST FRONTAGE ROAD
(NO WORK PROPOSED)

* EXIST INLETS

36" RCP (PROPOSED)



EXIST EAST FRONTAGE ROAD
(NO WORK PROPOSED)

24" RCP TO REMAIN

* EXIST INLETS

END BRIDGE
STA 394+11.93

30" RCP TO REMAIN

BEG BRIDGE
STA 393+89.93

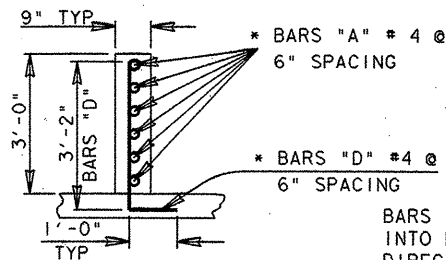
DESCRIPTION	UNIT	EST	FINAL
RIPRAP (CONC) (CL B)	CY	23	

RIPRAP (CONC) (CL B)
EST @ 10.00 CY

EXISTING INLETS & PIPES TO
BE REMOVED. THE PIPE ENTRANCE TO
* THE CULVERT SHALL BE REPAIRED IN
ACCORDANCE WITH CULVERT REPAIR
DETAIL SHEET.

FOR HYDRAULIC INFORMATION SEE HYDRAULIC
DATA SHEET FOR STRUCTURES GREATER THAN
1500 CFS.

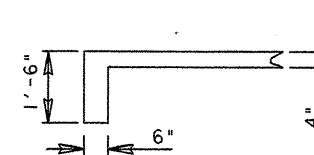
CONC RETARD DETAILS



SEC A-A

BARS "D" SHALL BE DOWELED
INTO EXISTING WING AS
DIRECTED BY THE ENGINEER.
* REINF. STL. SHALL HAVE
MIN. 3" CONC COVER.

RIPRAP TOEWALL DETAILS



PERM. STRUCTURE NO. 15-046-0016-05-019



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4/5/1995.
Gregory A. Malatek, P.E.

OVERALL EXISTING CULVERT LENGTH = 400'-0 3/8"

EXISTING MC 10-3 ~ 198'-3 7/8"

EXISTING MC 10-3 ~ 201'-8 1/2"

EXIST SECTION

FIN. SECTION

ELEV. = 736.59

0.3200 %

4.0500 %

0.7752 %

0.5700 %

FL = 700.58

FL = 700.82

FL = 703.45

FL = 704.45

FL = 705.20

STA. 393+89.93 TO 394+11.93

EXIST 2-10'x10'x400'-0 3/8" CONC CULVERT

(NO WORK PROPOSED ON STRUCTURE, MINOR CHANNEL WORK DNSTR.)

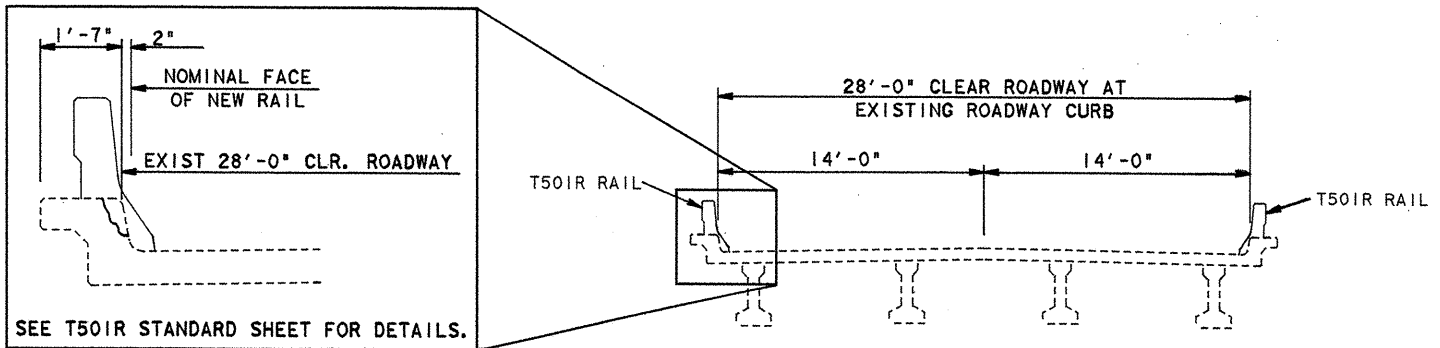
BRIDGE LAYOUT

AT NO NAME CREEK

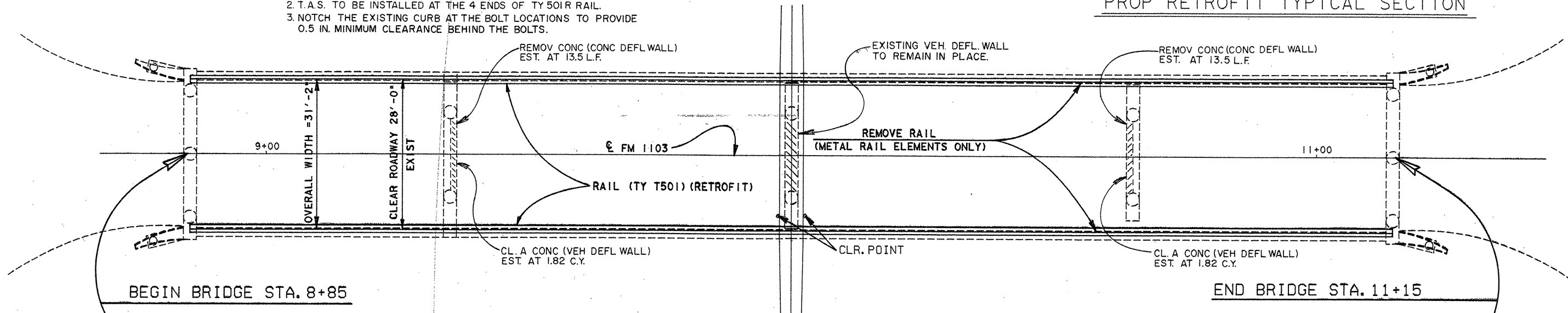
SHEET 2 OF 2

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.
6	NH 95 (40) IM	264
STATE	STATE DIST. NO.	COUNTY
TEXAS	15	COMAL
CONT.	SECT.	JOB
0016	05	087
		1H 35

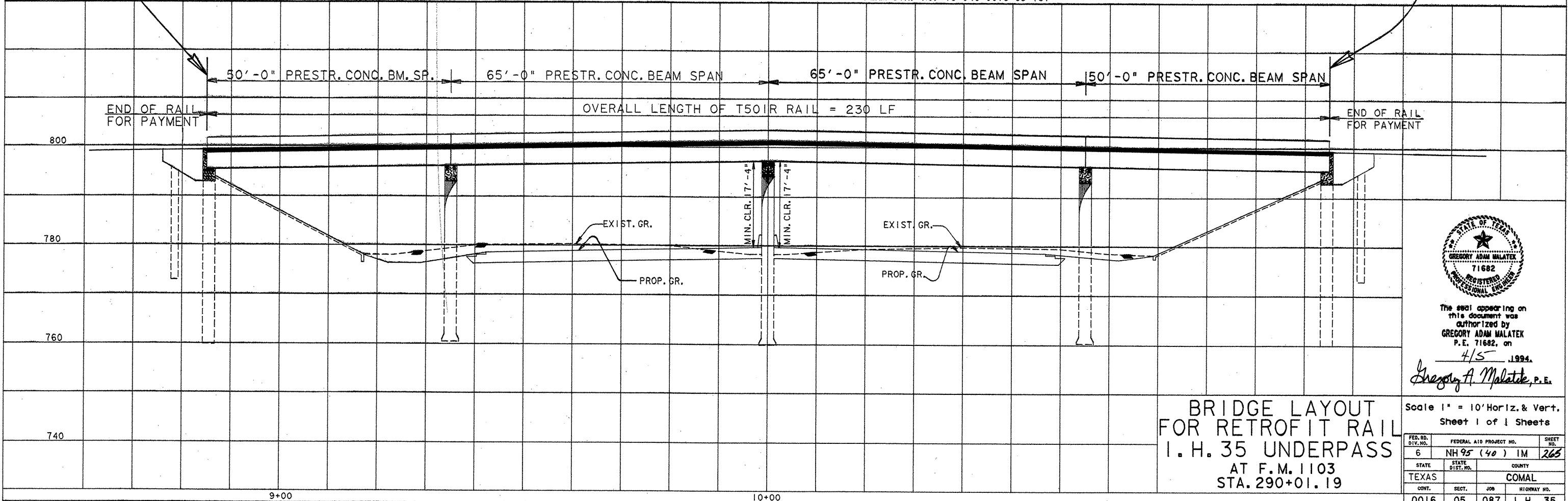
ITEM NO.	DESCRIPTION	UNIT	QUANT.
104-	REMOV CONC (CONC DEFL WALL)	L.F.	27.0
420-524	CL. A CONC (VEH DEFL WALL)	C.Y.	3.64
450-509	RAIL (TY 501) (RETROFIT)	L.F.	460.0
452-501	REMOV RAIL (METAL RAIL ELEMENTS ONLY)	L.F.	460.0



NOTES: 1. EXISTING WINGS TO BE REMOVED TO ROADWAY ELEVATION.
2. T.A.S. TO BE INSTALLED AT THE 4 ENDS OF TY 501R RAIL.
3. NOTCH THE EXISTING CURB AT THE BOLT LOCATIONS TO PROVIDE 0.5 IN. MINIMUM CLEARANCE BEHIND THE BOLTS.



PERM STR. NO. 15-046-0016-05-137

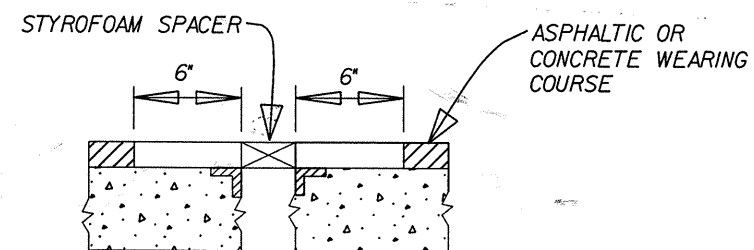


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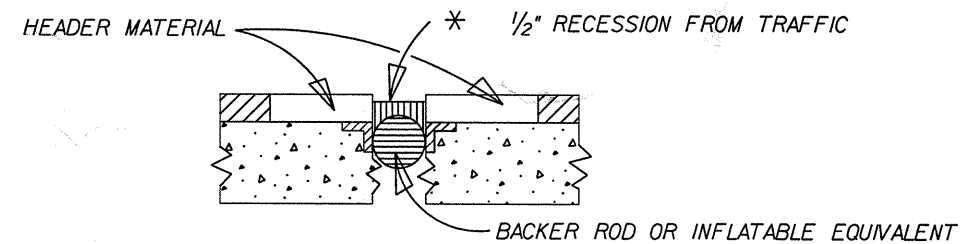
Gregory A. Malatek, P.E.

BRIDGE LAYOUT FOR RETROFIT RAIL
I. H. 35 UNDERPASS
AT F.M. 1103
STA. 290+01.19

Scale 1" = 10' Horiz. & Vert.			
Sheet 1 of 1 Sheets			
FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.	
6	NH 95 (40) IM	265	
STATE	STATE DIST. NO.	COUNTY	
TEXAS		COMAL	
CONT.	SECT.	JOB	HIGHWAY NO.
0016	05	087	I. H. 35



AFTER THE SURFACE TREATMENT AND THE A.C.P. OVERLAY HAVE BEEN APPLIED, TWO KERFS 6" EACH SIDE OF JOINT ARE SAWED TO AN APPROXIMATE DEPTH OF THE A.C.P. AND THE WIDTH OF BRIDGE. THE 6" STRIPS OF ASPHALT ARE TO BE REMOVED AND THE CONCRETE SURFACE ROUGHENED. THE CONCRETE AND THE STEEL ARMOR JOINT SHALL THEN BE SANDBLASTED CLEAN. PREPARE THE EXPOSED SURFACES AS SPECIFIED BY THE SPECIAL SPECIFICATION. NEXT INSTALL THE STYROFOAM SPACER INTO THE JOINT AND APPLY THE MATERIAL (MORTAR), AS SPECIFIED IN THE SPECIAL SPECIFICATION, INTO THE 6" VOIDS.



* THE HIGHEST POINT ON THE BACKER ROD SHALL BE 1/2" FROM THE DRIVING SURFACE. THIS ALLOWS FOR 1/2" RECESSION AND 1/2" JOINT SEALANT

NOSING SEALED EXPANSION JOINTS



9-21-1999
L. Michelle Kopp P.E.

Change Order No. 41

EXPANSION JOINT
TREATMENT DETAILS

DESIGN FILE = T:\NEWBAG\PROJ\DEANW035\NOSEDET.DGN			
FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	MANH 95(40) IM		265A
STATE	STATE DIST. NO.	COUNTY	
TEXAS	SAT	COMAL	
CONT.	SECT.	JOB	HIGHWAY NO.
0016	05	087	IH 35

3/27/95

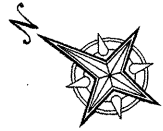
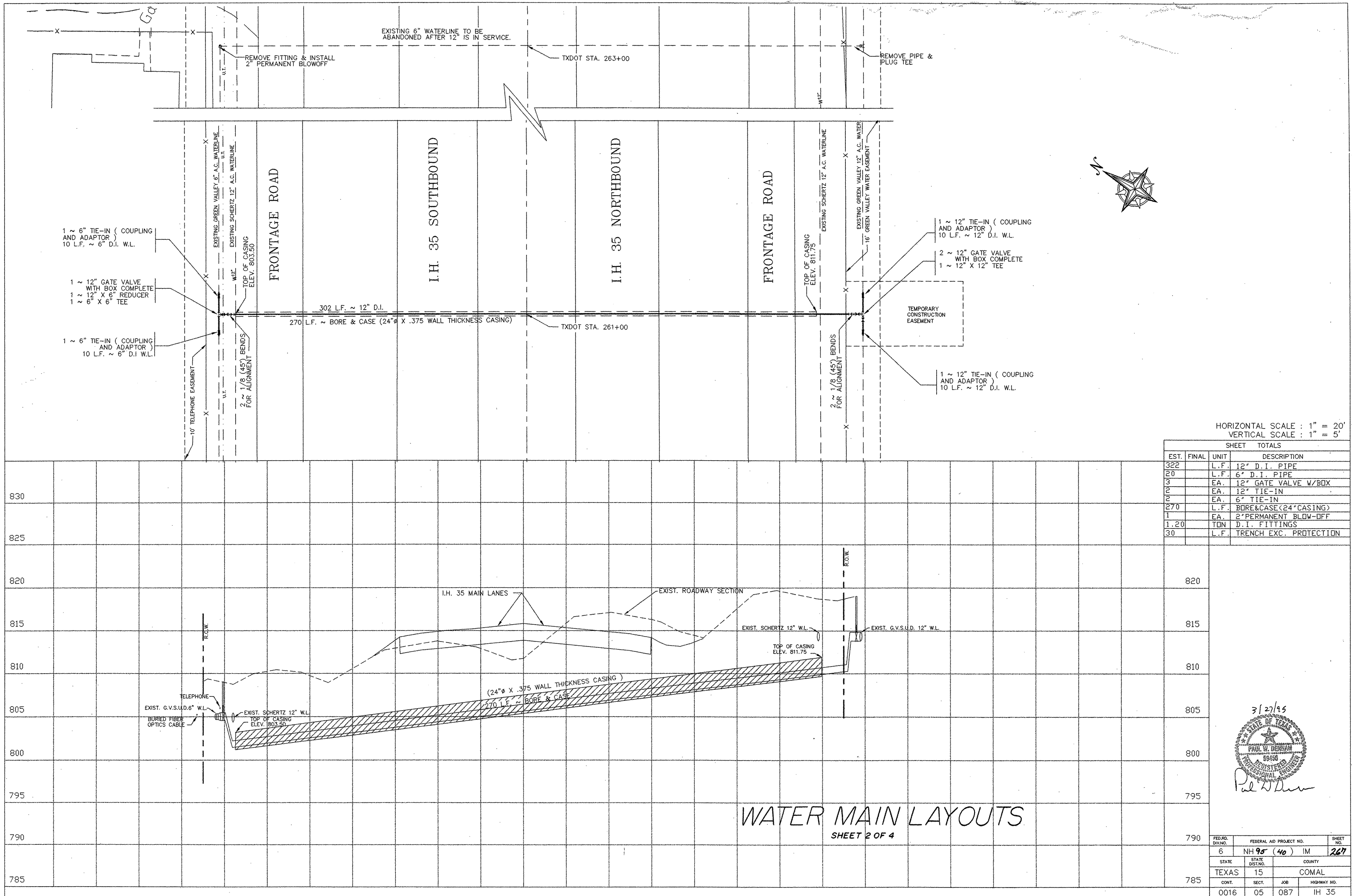
STATE OF TEXAS

PAUL W. DENHAM

59456

REGISTERED PROFESSIONAL ENGINEER

Paul W Denham



HORIZONTAL SCALE : 1" = 20'
VERTICAL SCALE : 1" = 5'

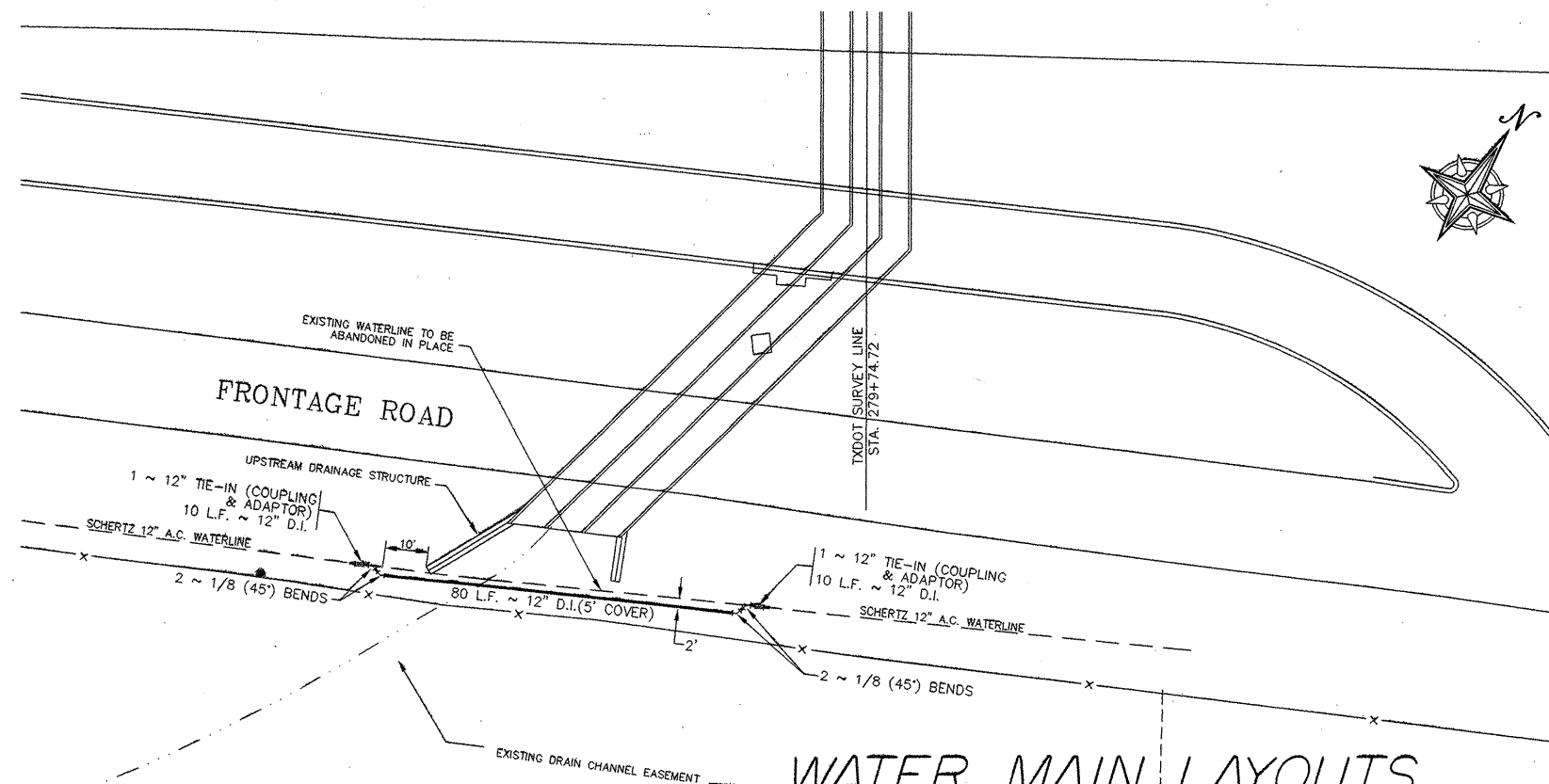
SHEET		TOTALS	
EST.	FINAL	UNIT	DESCRIPTION
322		L.F.	12" D.I. PIPE
20		L.F.	6" D.I. PIPE
3		EA.	12" GATE VALVE W/BOX
2		EA.	12" TIE-IN
2		EA.	6" TIE-IN
270		L.F.	BORE&CASE (24" CASING)
1		EA.	2" PERMANENT BLOW-OFF
1.20		TON	D.I. FITTINGS
30		L.F.	TRENCH EXC. PROTECTION

3/27/95

 Paul W. Denham

WATER MAIN LAYOUTS
SHEET 2 OF 4

FED. AID DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	NH 95 (40) IM		267
STATE	STATE DIST. NO.	COUNTY	
TEXAS	15	COMAL	
CONT.	SECT.	JOB	HIGHWAY NO.
0016	05	087	IH 35

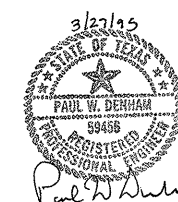


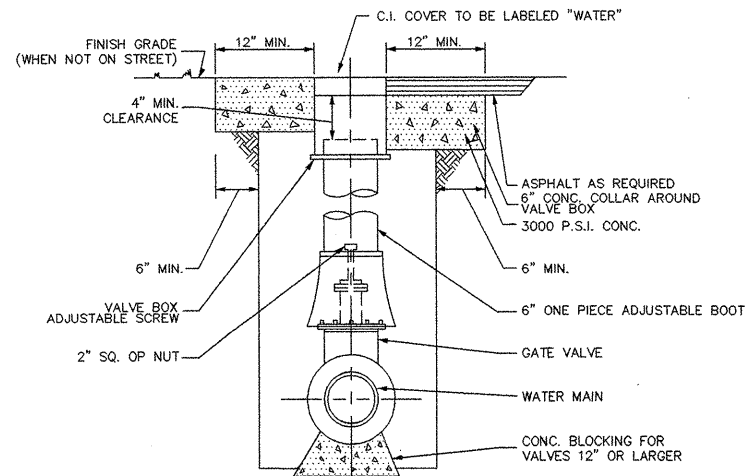
WATER MAIN LAYOUTS
SHEET 3 OF 4

SHEET 3 OF 4

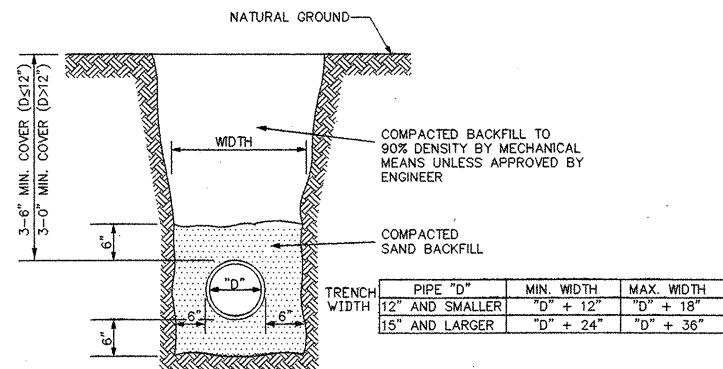
[illegible]

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	NH 95 (40) IM		268
STATE	STATE DIST. NO.	COUNTY	
TEXAS	15	COMAL	
CONT.	SECT.	JOB	HIGHWAY NO.
0016	05	087	1H 35

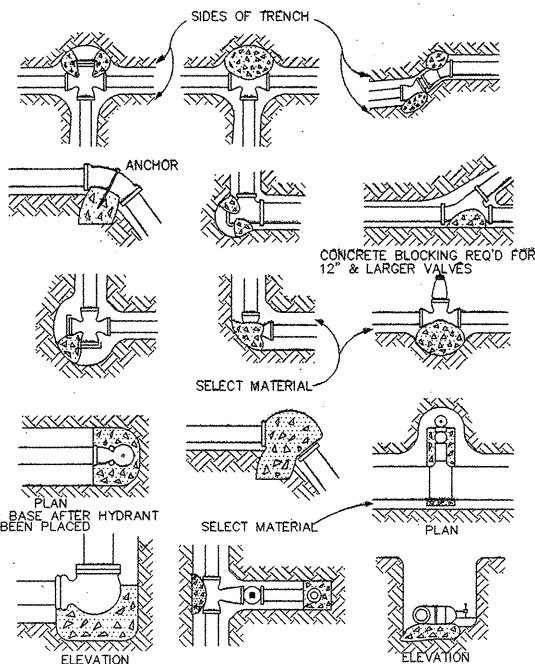




VALVE BOX DETAILS



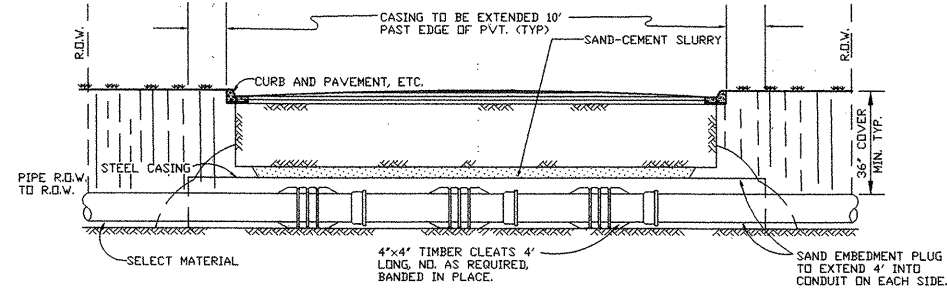
TYPICAL TRENCH



THRUST BLOCKING FOR FITTINGS

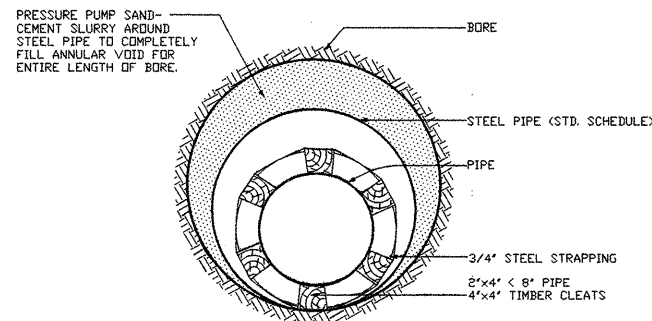
PIPE SIZE	TEES & DEAD ENDS	90° BENDS	45° BENDS	22 1/2° BENDS
6"	2	2	1	1
8"	3	4	2	1
12"	6	9	5	2
16"	11	15	8	4
18"	14	20	10	5

PIPE SIZE	TEES & DEAD ENDS	90° BENDS	45° BENDS	22 1/2° BENDS
6"	3	4	2	1
8"	4	6	4	2
12"	10	14	8	4
16"	18	25	14	7
18"	21	31	17	10



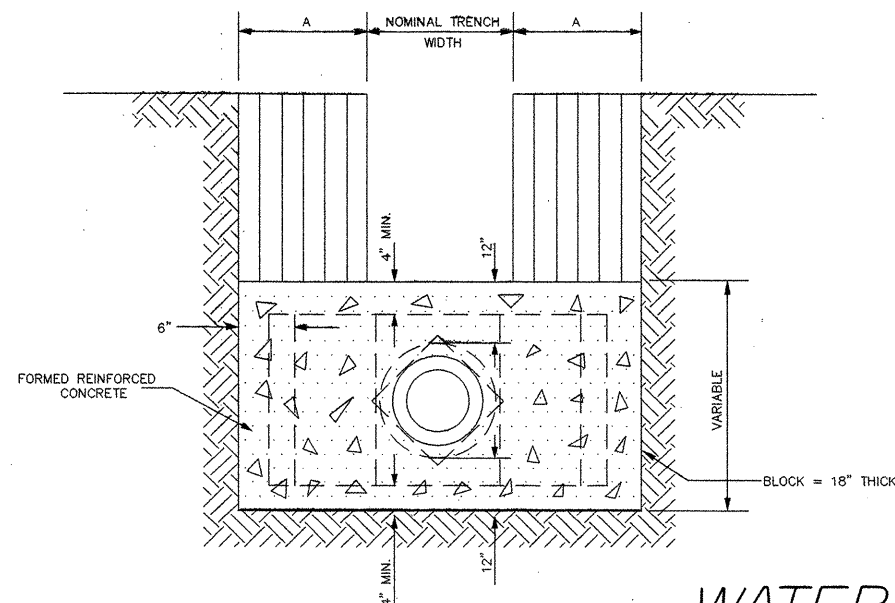
BORE AND CASE ~ PAVED ROAD

SIZE	MINIMUM CASING SIZE INSIDE DIA.	MAX. SKID SPACING FT.
4	12"	4.5'
6	16"	6.3'
8	18"	7.4'
10	20"	8.5'
12	22"	9.6'
14	24"	10.7'
16	26"	11.8'
18	28"	12.9'
20	30"	14.0'
21	31"	14.1'
24	33"	15.2'

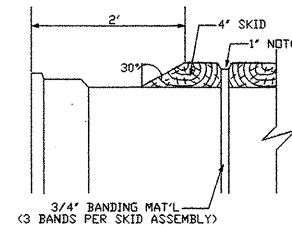


BORE AND CASE

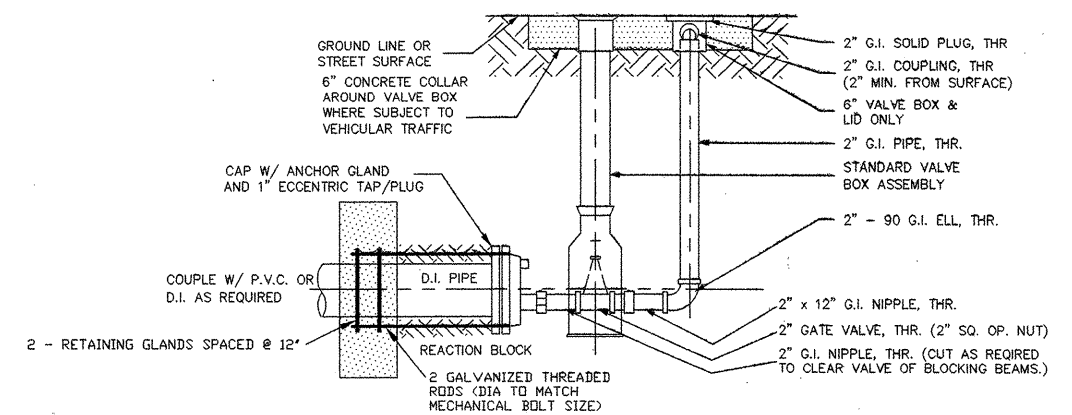
MAIN SIZE	A (MIN.)	REINFORCING BAR SIZE	BEARING SURFACE REQUIRED (IN SQ. FT.)
6"	12"	#4	3
8"	12"	#4	5
12"	18"	#4	6
16"	18"	#4	12
20"	28"	#5	16
24"	28"	#5	23
30"	36"	#5	35
36"	36"	#5	50
42"	36"	#5	70



REACTION BLOCK & RING DETAIL



CLEAT DETAIL



PERMANENT 2" BLOW-OFF INSTALLATION

GENERAL NOTES

- DESIGN STANDARDS REQUIRED
 - PROJECT CONTRACT DOCUMENTS AND TECHNICAL SPECIFICATIONS
 - SAN ANTONIO WATER SYSTEMS SPECIFICATIONS FOR WATER WORKS CONSTRUCTION.
- NO VALVES IN THE OWNER'S WATER DISTRIBUTION SYSTEM SHALL BE OPERATED BY THE CONTRACTOR WITHOUT PRIOR PERMISSION OF THE OWNER. THE CONTRACTOR SHALL NOTIFY THE OWNER WHEN A VALVE IS TO BE OPERATED AND SHALL ONLY OPERATE THE VALVE IN THE PRESENCE OF THE OWNER'S REPRESENTATIVE. THE CONTRACTOR SHALL INSPECT THE MATERIALS FOR DEFECTS AT THE TIME THEY ARE UNLOADED, AND ANY MATERIALS FOUND DEFECTIVE SHALL BE REMOVED FROM THE SITE.
- ALL PIPE, FITTINGS AND VALVE SHALL BE LAID IN A SAND EMBEDMENT. THE SAND SHALL FULLY ENCASE ALL PIPE INCLUDING FITTINGS AND VALVES FOR A MINIMUM OF SIX (6") INCHES BOTTOM, SIDE AND TOP OF PIPE. SAND USED SHALL CONTAIN NOT MORE THAN 2% OF CLAY AND OTHER FOREIGN MATERIAL. THE SAND SHALL BE FINELY DIVIDED SAND.
- BACKFILL FOR UTILITIES TRENCHING SHALL BE APPLIED IN 6 INCH LIFTS, LOOSE MEASUREMENTS AND EACH LIFT THOROUGHLY COMPACTED BY MECHANICAL MEANS.
- CONTRACTOR SHALL PRESERVE ALL CONSTRUCTION STAKES, MARKS, ETC. IF ANY ARE DESTROYED OR REMOVED BY THE CONTRACTOR OR HIS EMPLOYEES, THEY SHALL BE REPLACED AT THE CONTRACTOR'S EXPENSE.
- CONTRACTOR SHALL FURNISH THE ENGINEER WITH AN AS-BUILT PLAN INDICATING THE LENGTH, LOCATION AND DEPTH OF ALL IMPROVEMENTS.
- NOTIFY THE INSPECTOR AND ENGINEER FORTY-EIGHT (48) HOURS PRIOR TO BACKFILL OR TESTING (TELEPHONE 658-7065 AND 590-4777).
- THE EXISTENCE AND LOCATION OF UNDERGROUND UTILITIES INDICATED IN THESE PLANS ARE TAKEN FROM THE RECORDS AVAILABLE AND ARE NOT GUARANTEED, BUT SHALL BE INVESTIGATED AND VERIFIED BY THE CONTRACTOR BEFORE STARTING WORK. THE CONTRACTOR SHALL BE HELD RESPONSIBLE FOR ANY DAMAGE TO, AND FOR MAINTENANCE AND PROTECTION OF THE EXISTING UTILITIES EVEN IF THEY ARE NOT SHOWN ON THE PLANS. CONTRACTOR SHALL CONTACT ANY UTILITIES ENCOUNTERED FORTY-EIGHT HOURS (48) HOURS PRIOR TO EXCAVATION OPERATION.
- THE FOLLOWING IS A LIST OF TELEPHONE NUMBERS OF THE UTILITY LOCATORS FOR THE VARIOUS UTILITIES THAT MAY BE ENCOUNTERED:

CITY PUBLIC SERVICE	227-3606
ENTEX	659-6788
PARAGON CABLE	648-4900
GREEN VALLEY S.U.D.	914-2330
S.W. BELL TELEPHONE	1-800-828-5127
VALERO TRANSMISSION	1-800-DIG-TESS
CITY OF SCHERTZ PUBLIC WORKS DEPARTMENT AT	658-7065
- TRENCH EXCAVATION PROTECTION SHALL BE ACCOMPLISHED AS REQUIRED BY THE PROVISIONS OF PART 1926, SUBPART P- EXCAVATION, TRENCHING AND SHORING OF THE OCCUPATIONAL SAFETY AND HEALTH'S STANDARDS AND INTERPRETATIONS.

CONTRACTOR AND/OR CONTRACTOR'S INDEPENDENTLY RETAINED EMPLOYEE OR STRUCTURAL DESIGN/GEOTECHNICAL/SAFETY/EQUIPMENT CONSULTANT, IF ANY, SHALL REVIEW THESE PLANS AND ANY AVAILABLE GEOTECHNICAL INFORMATION AND THE ANTICIPATED INSTALLATION SITES WITHIN THE PROJECT WORK AREA IN ORDER TO DEVELOP THE CONTRACTOR'S PLANS TO IMPLEMENT THE PROJECT DESCRIBED IN THE CONTRACT DOCUMENTS. THE CONTRACTOR'S PLANS SHALL PROVIDE FOR ADEQUATE TRENCH SAFETY SYSTEMS THAT COMPLY WITH AS A MINIMUM O.S.H.A. STANDARDS FOR TRENCH EXCAVATIONS. SPECIFICALLY, CONTRACTOR AND/OR CONTRACTOR'S INDEPENDENTLY RETAINED EMPLOYEE OR SAFETY CONSULTANT SHALL DEVELOP AND IMPLEMENT A TRENCH SAFETY PROGRAM IN ACCORDANCE WITH O.S.H.A. STANDARDS GOVERNING THE PRESENCE AND ACTIVITIES OF INDIVIDUALS WORKING IN AND AROUND TRENCH EXCAVATION.

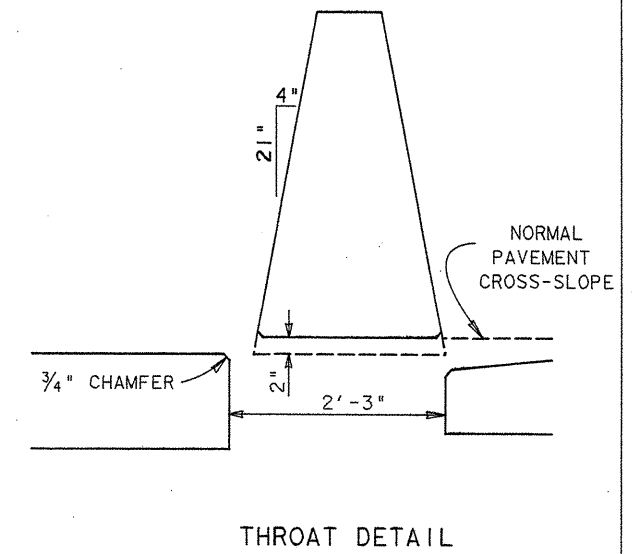
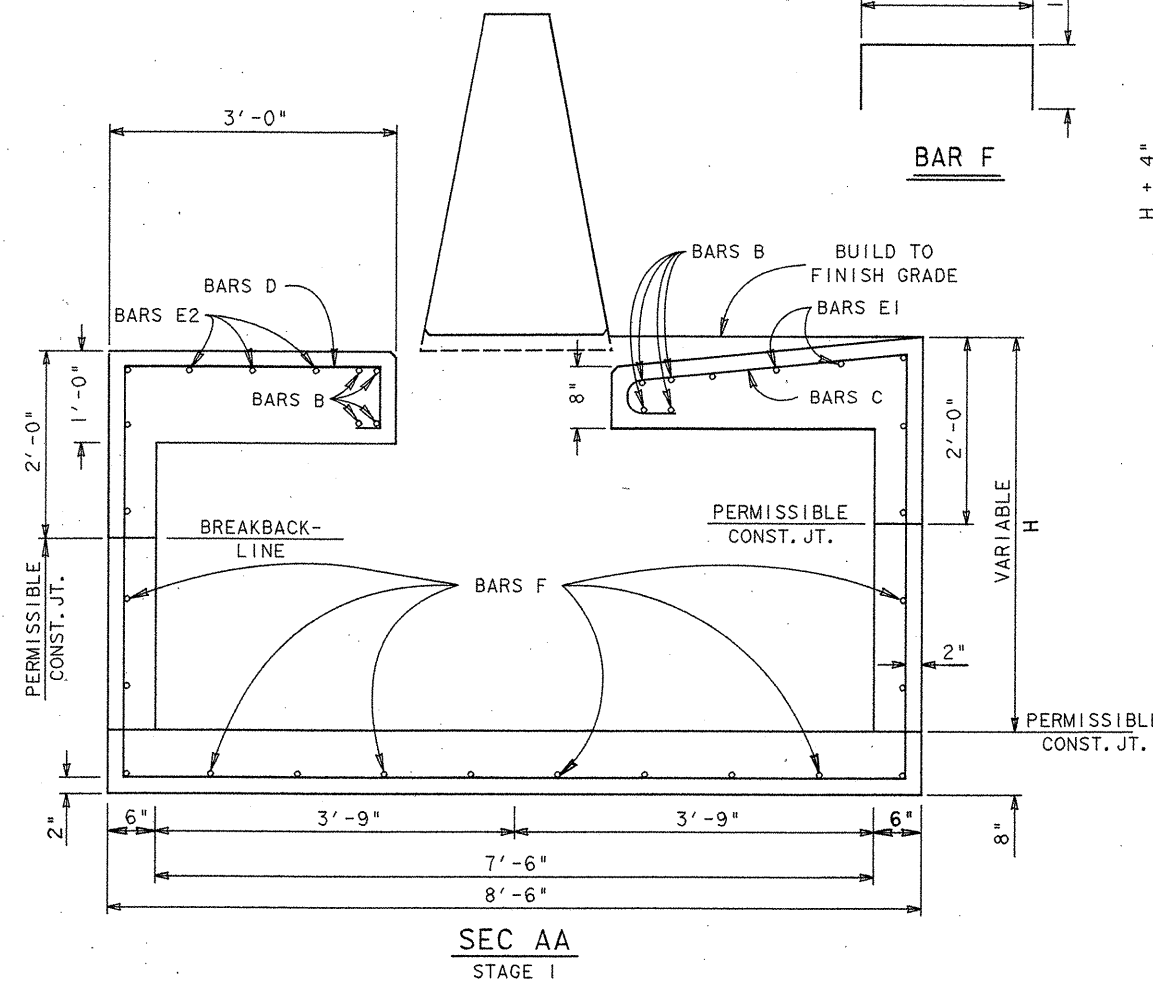
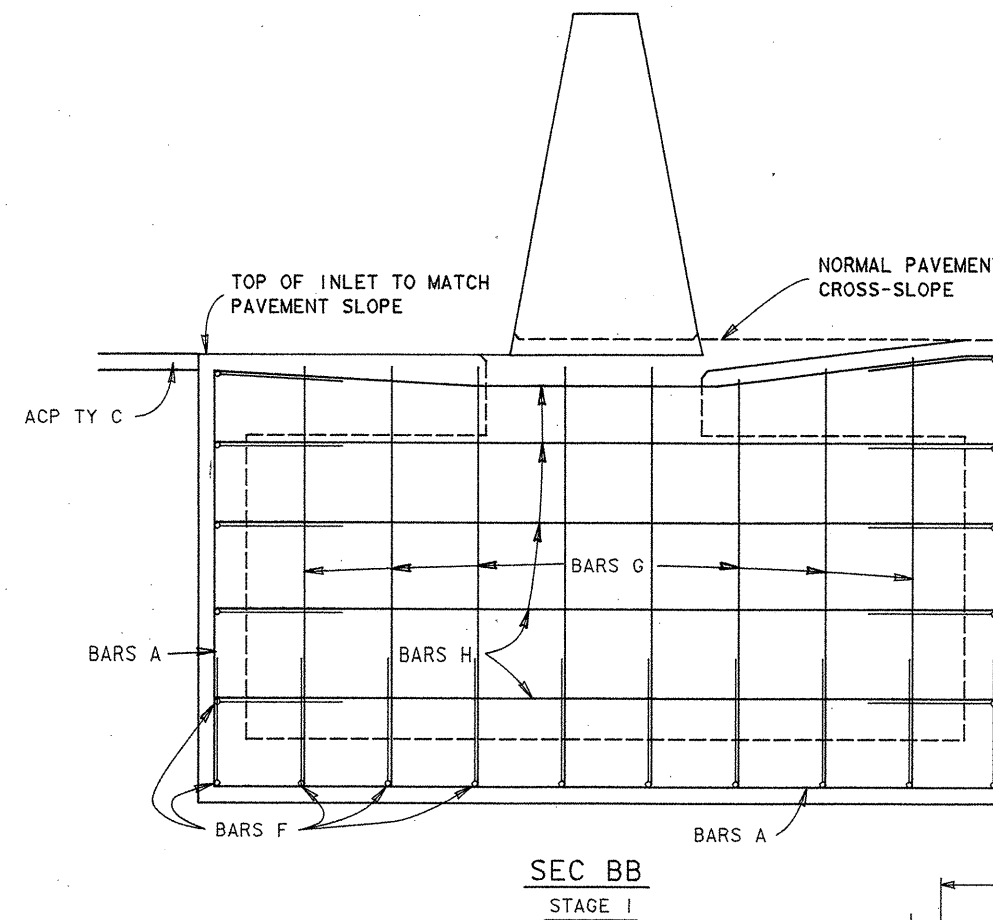
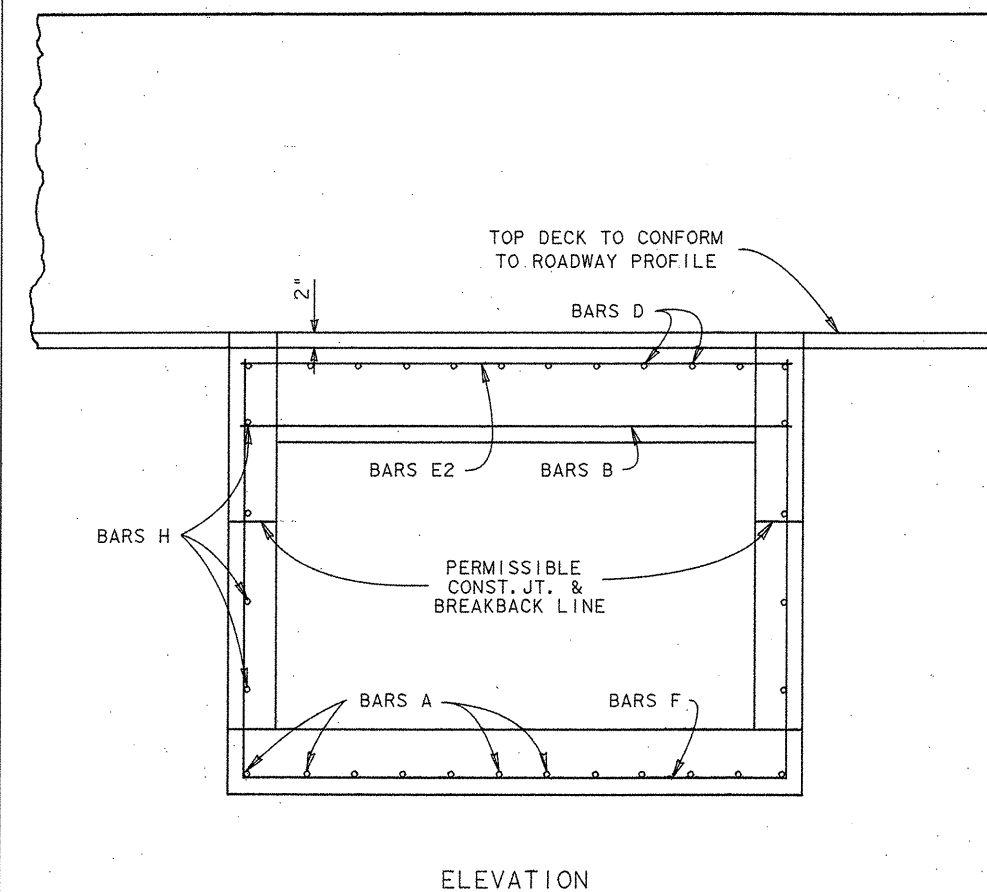
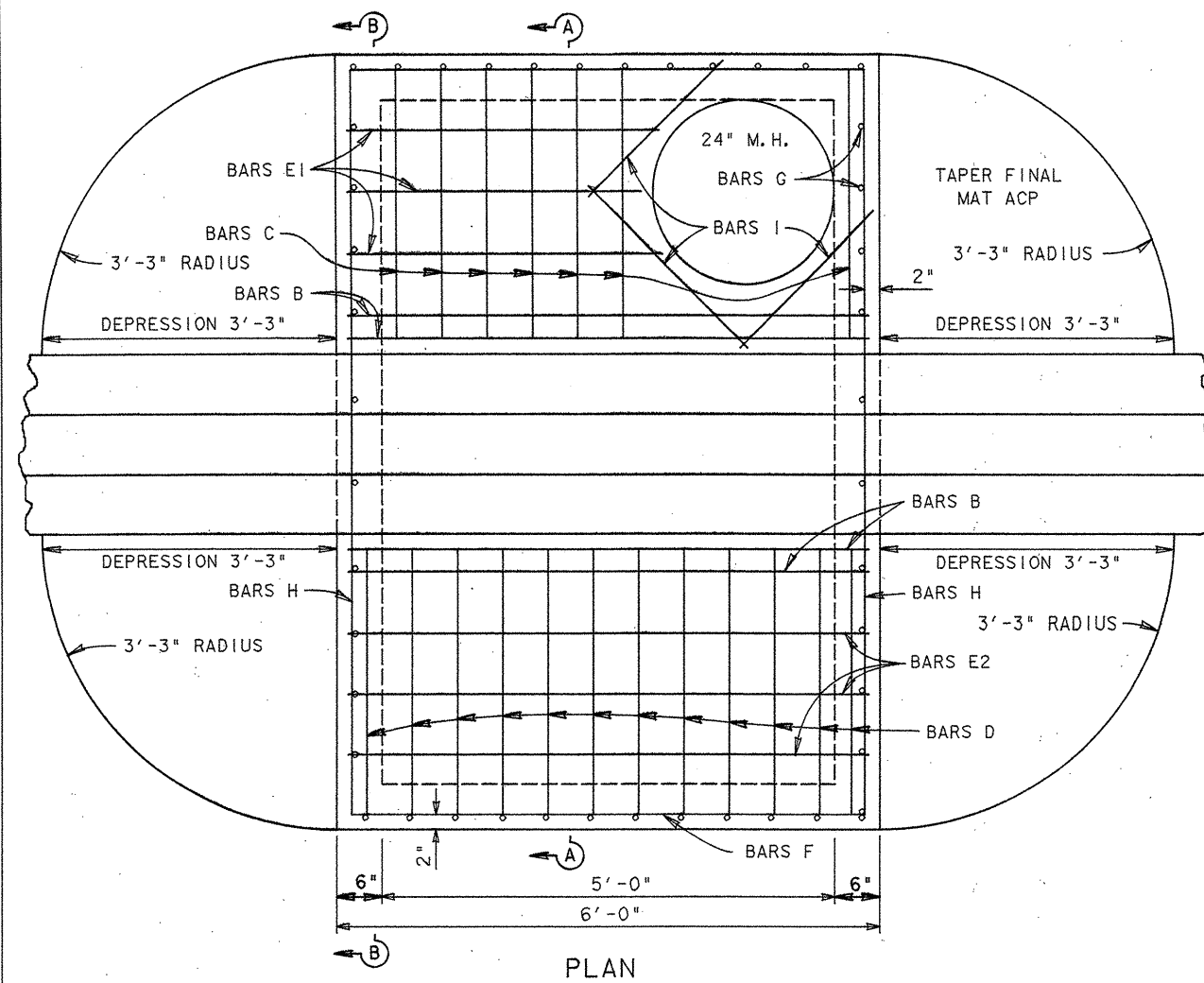
- UPON COMPLETION OF NEW WATER LINES, THE EXISTING WATER SYSTEM WILL BE ABANDONED.
- ALL VALVES AND FITTINGS SHALL BE MECHANICAL JOINT.

WATER MAIN LAYOUTS

SHEET 4 OF 4



FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.
6	NH 95 < 40 > IM	262
STATE	STATE DIST. NO.	COUNTY
TEXAS	15	COMAL
CONT.	SECT.	JOB
0016	05	087
		HIGHWAY NO.
		1H 35



ESTIMATED QUANTITIES-TYPE C-2 SPL INLET					
BAR NO.	SIZE	SPACING	LENGTH	WEIGHT	
A	12	#4	6"	17'-2"	138
B	8	#5	3"	5'-8"	47
C	7	#5	6"	5'-5"	40
D	12	#5	6"	5'-5"	68
E1	3	#4	8"	3'-4"	7
E2	3	#4	8"	5'-8"	11
F	20	#4	11"	8'-4"	111
G	16	#4	11"	4'-6"	48
H	10	#4	11"	8'-2"	55
I	3	#4	-	2'-6"	5
< TOTAL - REINF. STEEL LBS.				530	
< TOTAL CLASS "A" CONC. CY.				3.9	

< FOR CONTRACTORS INFO ONLY
USING H=4'-2" AND 0.020 FT/FT
PVMNT. X-SLOPE.

GENERAL NOTES:
1. REFER TO TYPE F-1, F-2 INLET
DETAILS.

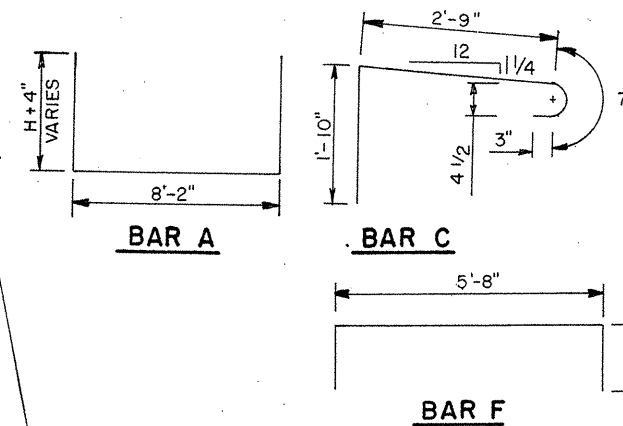
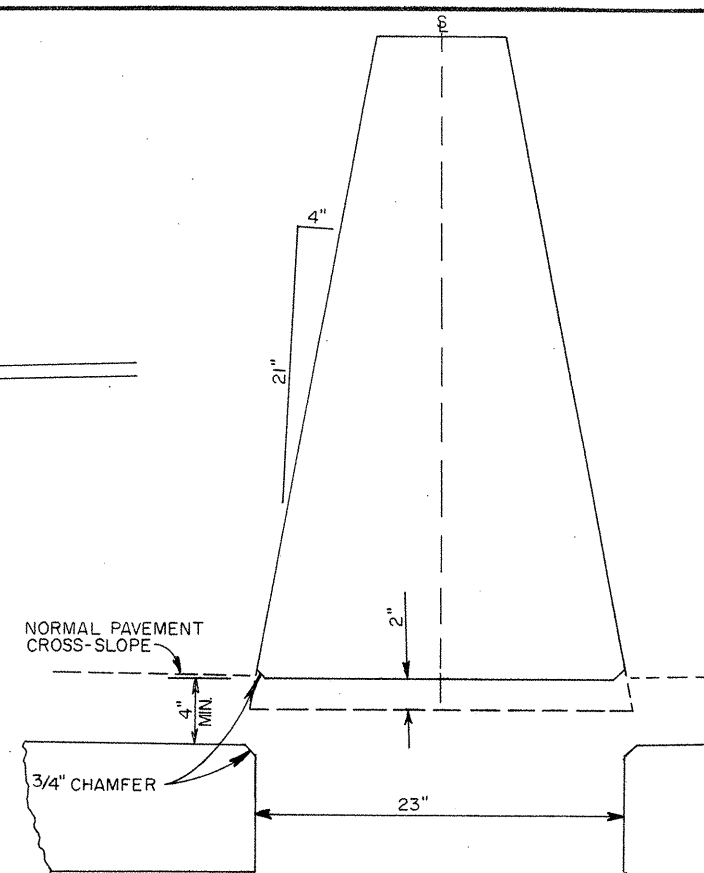
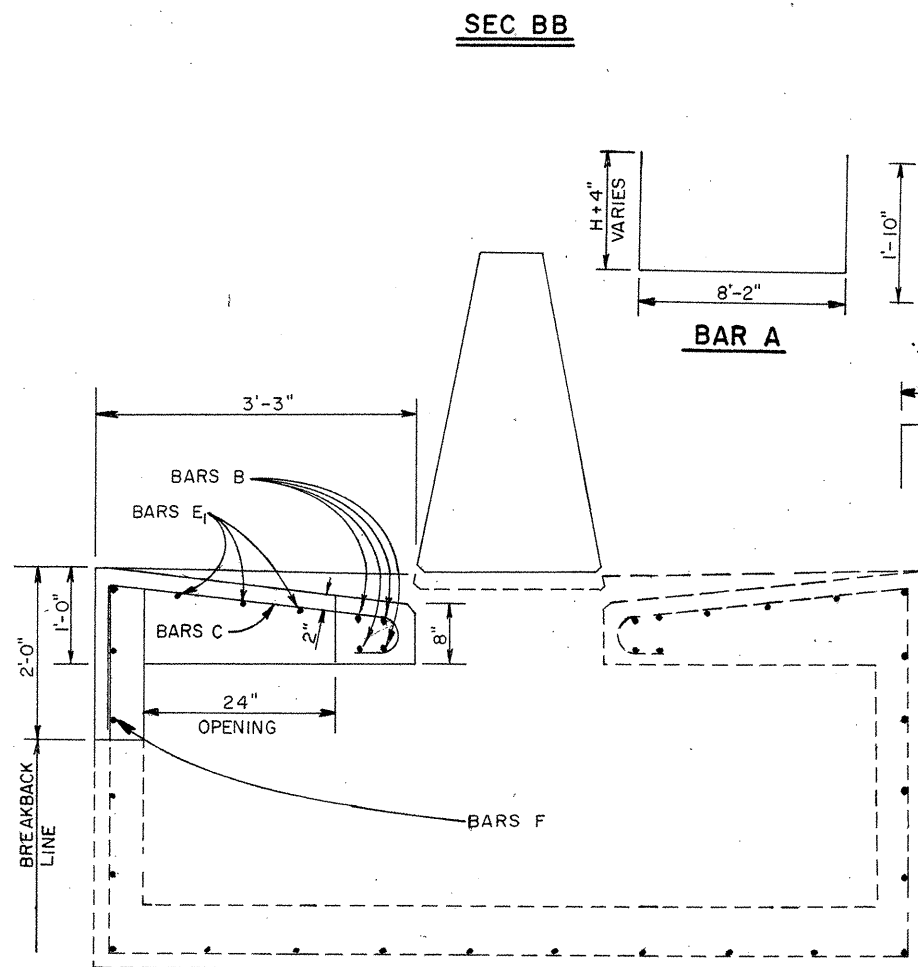
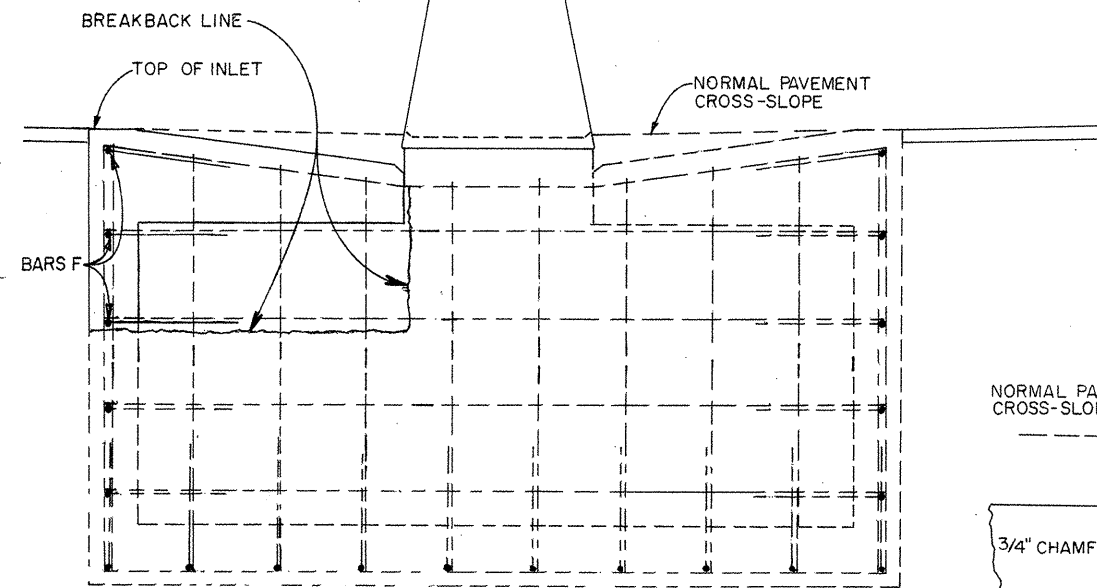
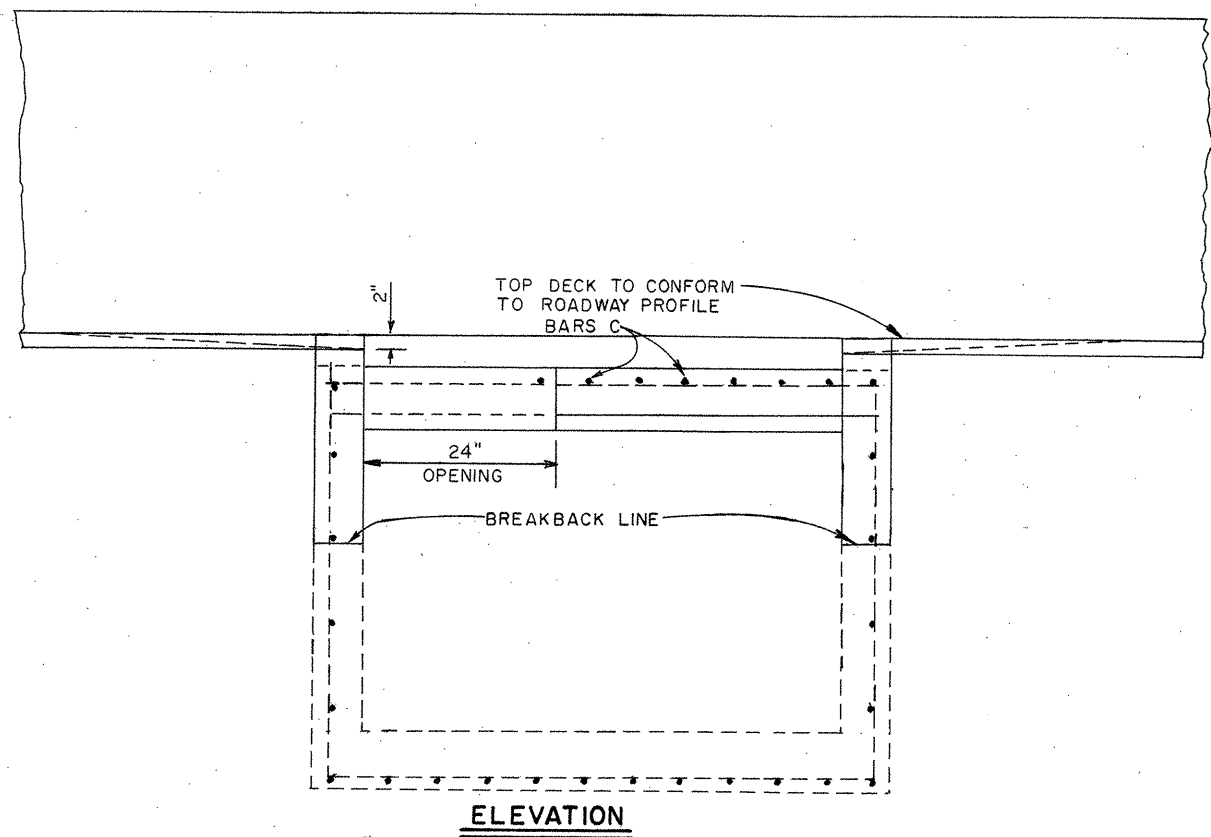
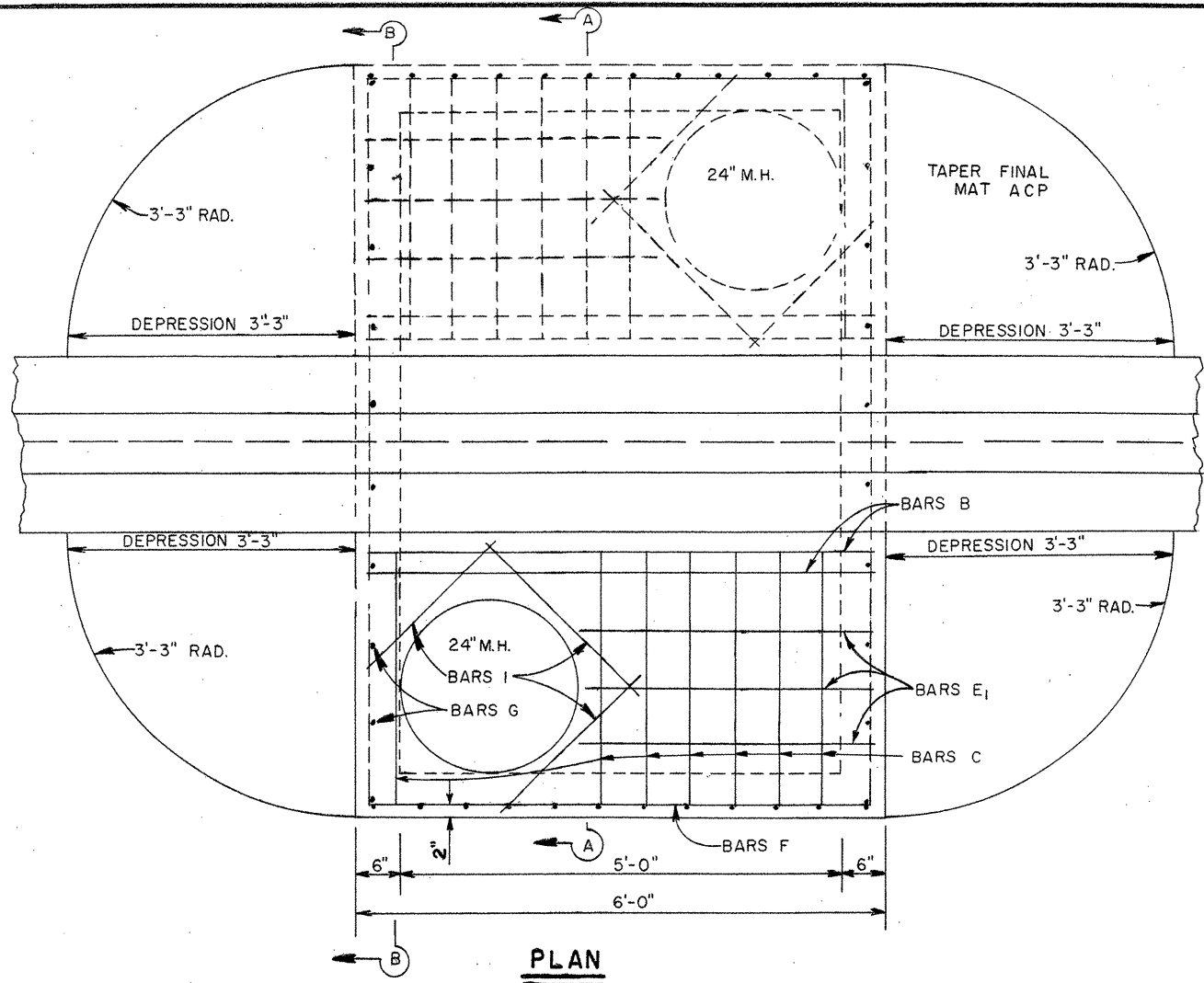


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TYPE C (SPL)
INLET DETAILS
STAGE I
FOR TRAFFIC SEQUENCE I
SHEET 1 OF 2

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	NH95(40) IM		270
STATE	STATE DIST. NO.	COUNTY	
TEXAS	15	COMAL	
CONT.	SECT.	JOB	HIGHWAY NO.
0016	5	87	I. H. 35



ESTIMATED QUANTITIES -TYPE C					SPL INLET
BAR	NO.	SIZE	SPACING	LENGTH	WEIGHT
B	4	5	3"	5'-8"	24
C	7	5	6"	5'-5"	40
E ₁	3	4	8"	3'-4"	7
F	3	4	11"	8'-4"	17
I	3	4	-	2'-6"	5
TOTAL REINF STEEL LBS.					93
TOTAL CLASS A CONC. C.Y.					.85

FOR CONTRACTORS INFO. ONLY USING
H=4'-2" AND 0.02 FT./FT. PVMNT. X-SLOPE.

GENERAL NOTES:
1. REFER TO TYPE F-1, F-2 INLET DETAILS.

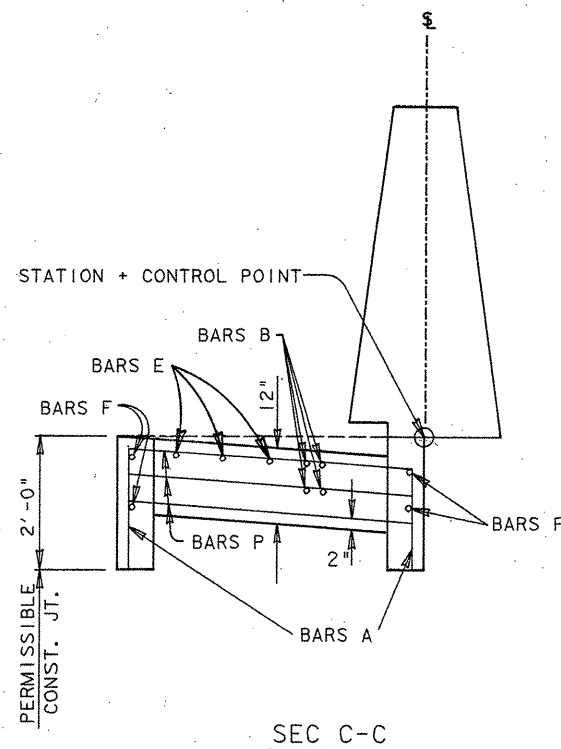
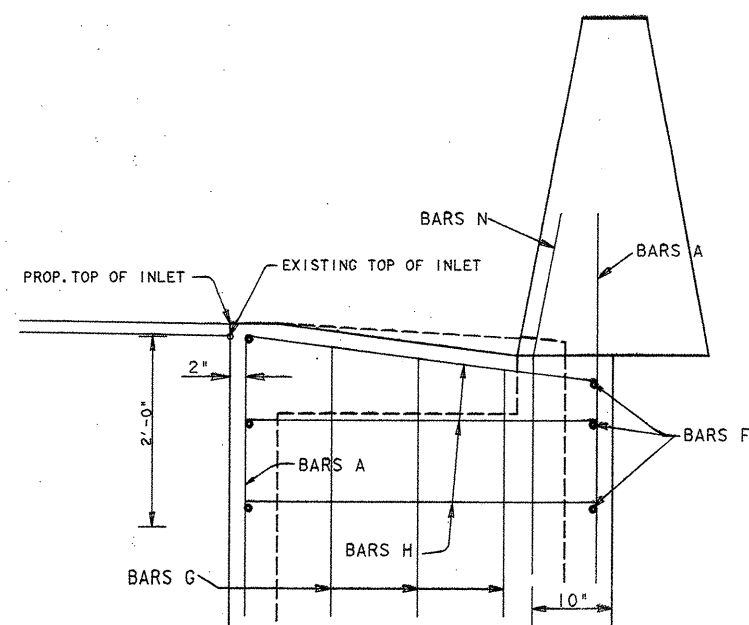
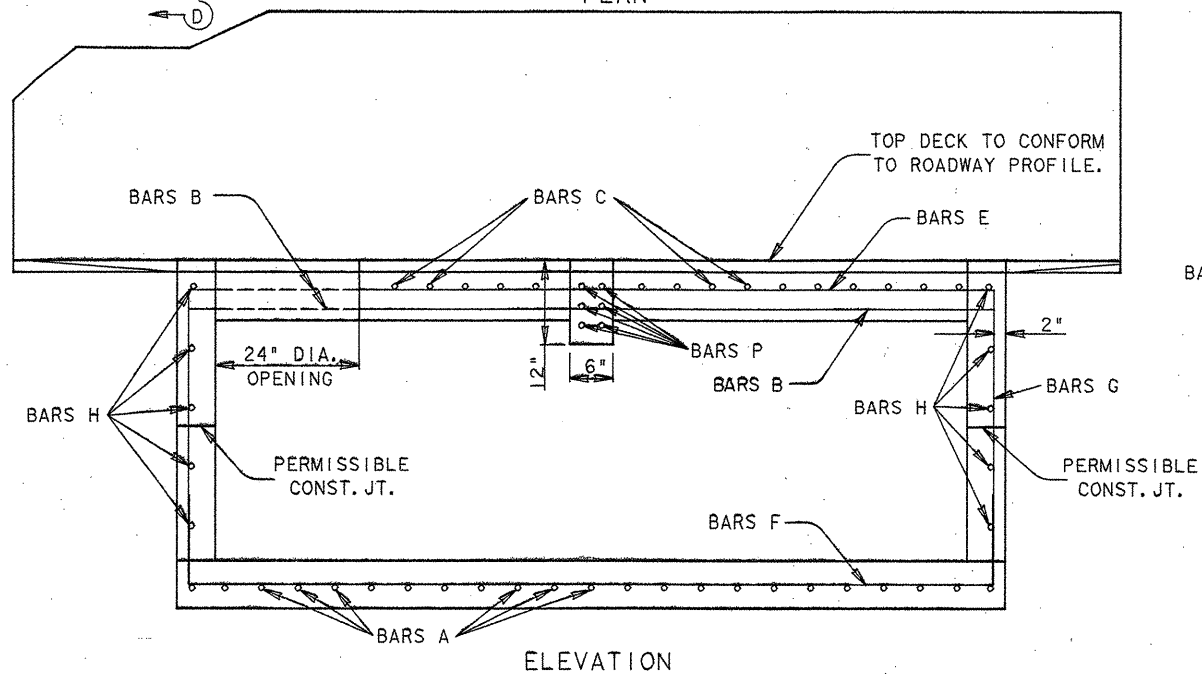
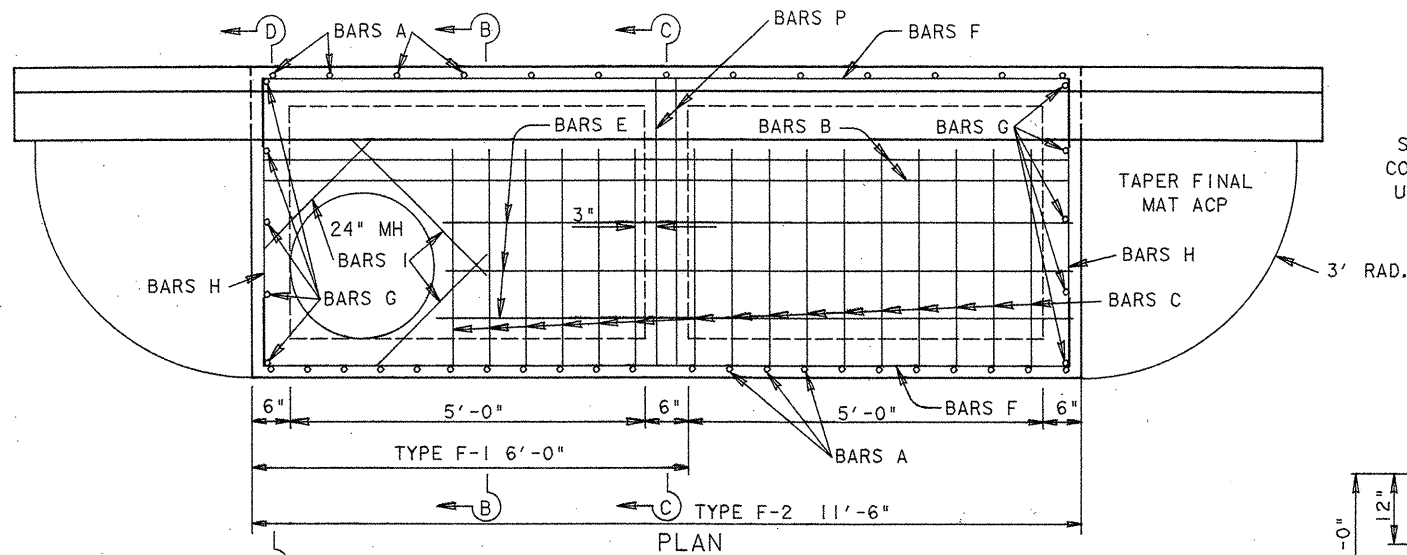


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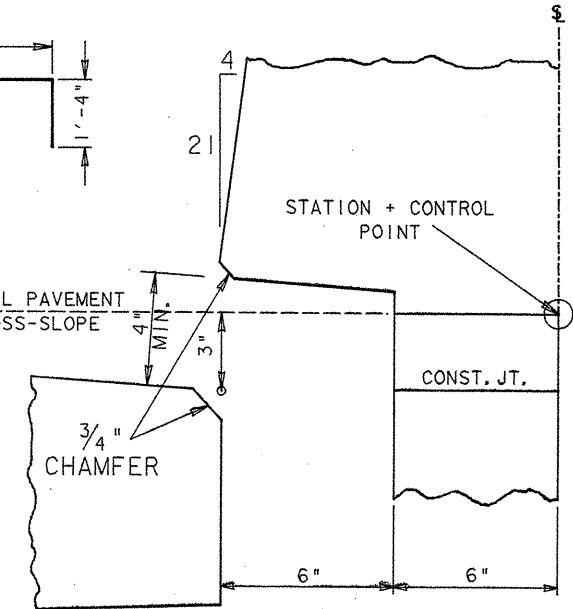
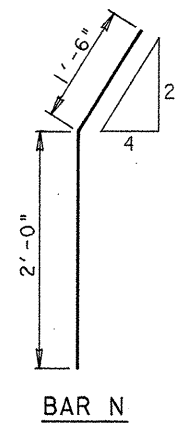
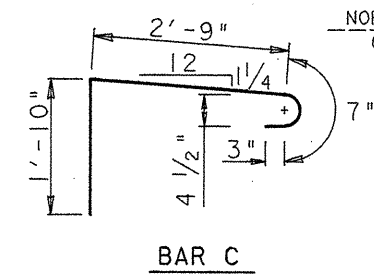
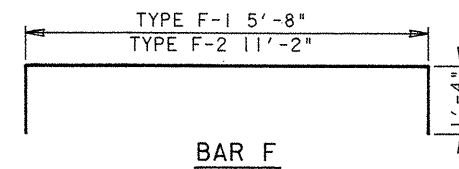
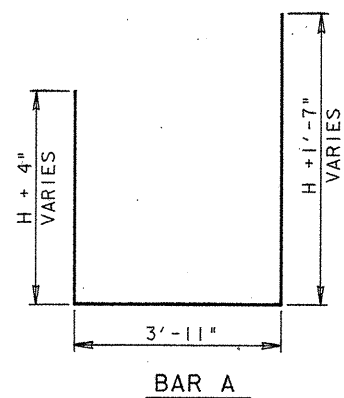
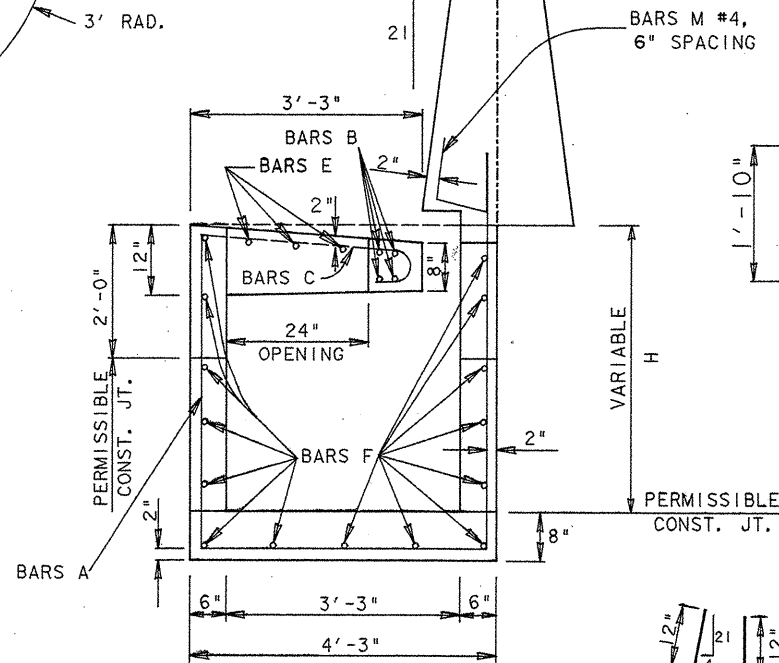
Gregory A. Malatek, P.E.

TYPE C (SPL) INLET DETAILS
STAGE 2
FOR TRAFFIC SEQUENCE-PHASE IV
SHEET 2 OF 2

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	NH95(40) IM		27
STATE	DIST.	COUNTY	
TEXAS			
CONT.	SECT.	JOB	HIGHWAY NO.



SSCB DIMENSIONS TO CONFORM TO TYPE SSCB USED AT INLET SITE.



ESTIMATED QUANTITIES - TYPE F-1 INLET					
BAR	NO.	SIZE	SPACING	LENGTH	WEIGHT
A	12	#4	6"	14'-4"	115
B	4	#5	3"	5'-8"	24
C	7	#5	6"	5'-5"	40
E	3	#4	8"	3'-4"	7
F	15	#4	11"	8'-4"	84
G	6	#4	11"	4'-6"	18
H	10	#4	11"	3'-11"	26
I	3	#4	-	2'-6"	5
N	2	#4	-	3'-6"	5
P	-	#5	-	-	-
M	10	#4	6"	2'-8"	18
TOTAL - REINF. STEEL LBS.					342
TOTAL CLASS "A" CONC. CY.					2.6

ESTIMATED QUANTITIES - TYPE F-2 INLET					
BAR	NO.	SIZE	SPACING	LENGTH	WEIGHT
A	23	#4	6"	14'-4"	221
B	4	#5	3"	11'-2"	47
C	17	#5	6"	5'-5"	96
E	3	#4	8"	9'-2"	18
F	15	#4	11"	13'-10"	139
G	6	#4	11"	4'-10"	20
H	10	#4	11"	3'-11"	26
I	3	#4	-	2'-6"	5
N	2	#4	-	3'-6"	5
P	6	#5	-	3'-11"	25
M	19	#4	6"	2'-8"	34
TOTAL - REINF. STEEL LBS.					636
TOTAL CLASS "A" CONC. CY.					4.6

FOR CONTRACTORS INFO ONLY
USING H=4'-2" AND 0.020 FT/FT
PVMNT. X-SLOPE.

GENERAL NOTES :

- ALL EXPOSED CORNERS TO BE CHAMFERED $\frac{3}{4}$ ".
- DIMENSIONS RELATING TO REINFORCING STEEL ARE TO THE CENTERS.
- CONC. TRAFFIC BARRIER LONGITUDINAL REINF. STEEL IS CONTINUOUS THROUGH INLETS.
- BARRIER DIMENSIONS TO CONFORM TO TYPE SPECIFIED AT INLET SITE.
- FOR RING AND COVER DETAILS SEE RING AND COVER DETAIL SHEET.
- PAYMENT FOR CONC., STEEL, RING + COVER AND STEPS SHALL BE INCLUDED IN UNIT COST OF ITEM 470 BY THE EACH "MANHOLES + INLETS."

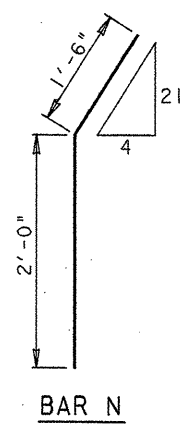
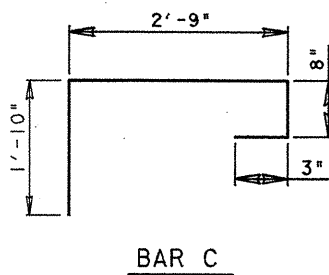
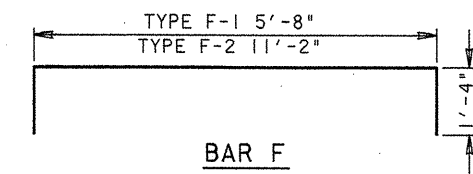
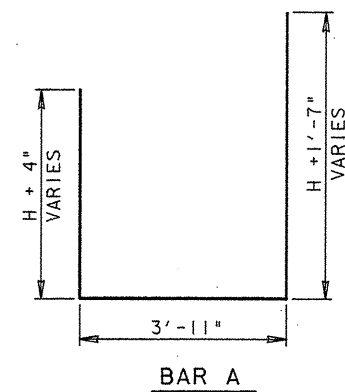
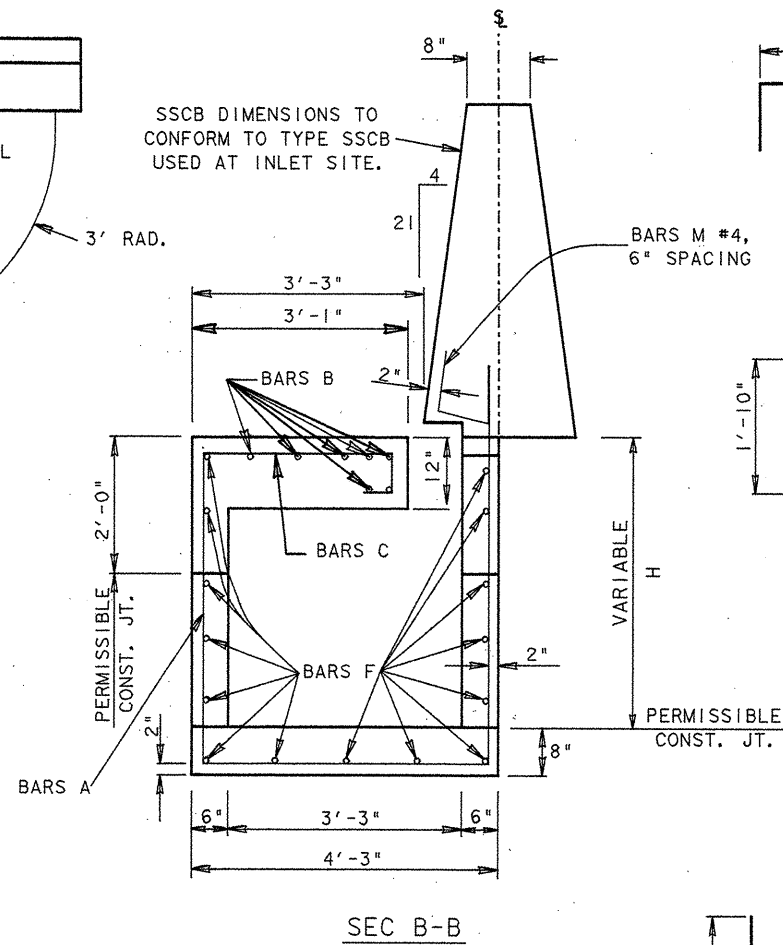
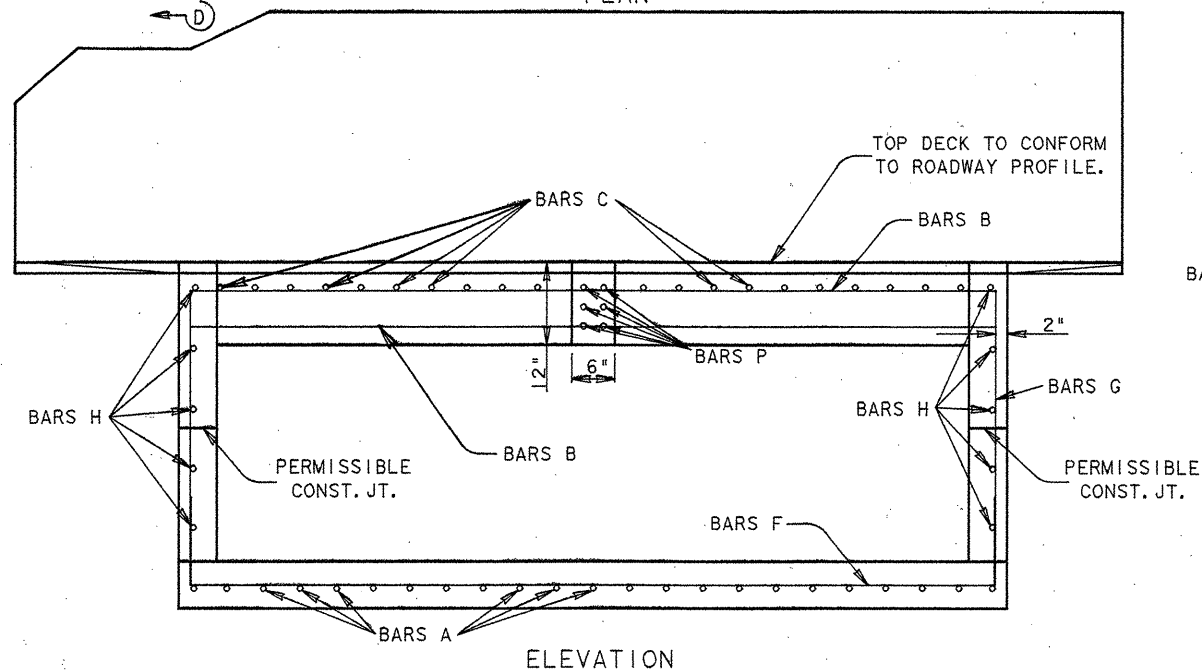
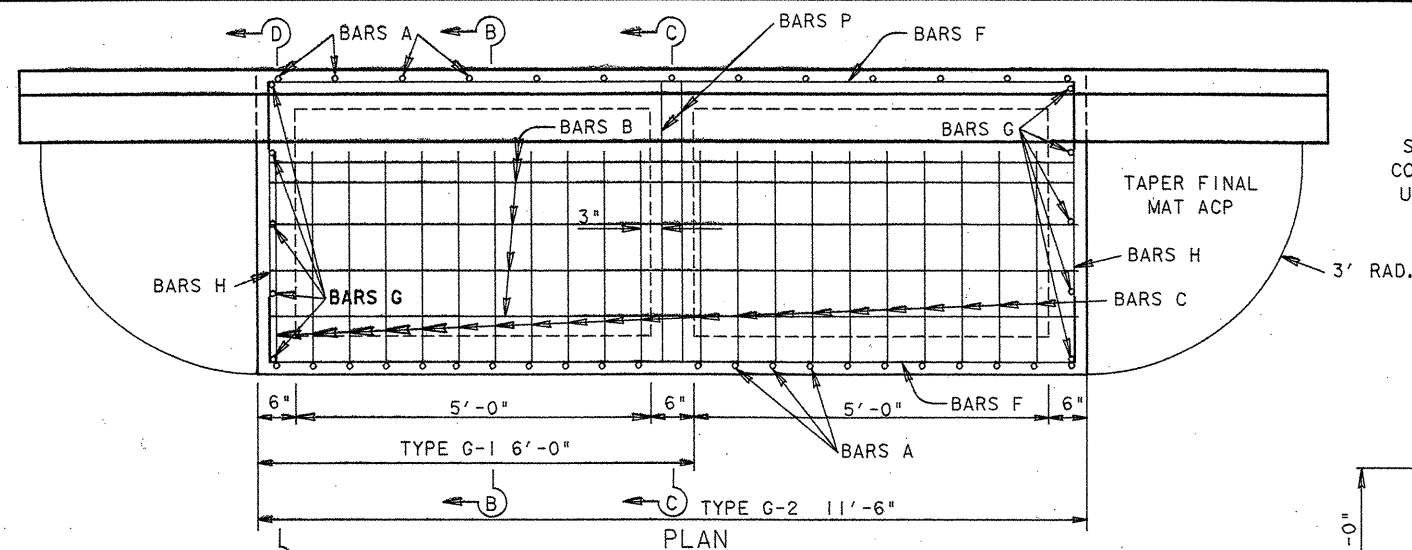


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TYPE F-1, F-2
INLET DETAILS

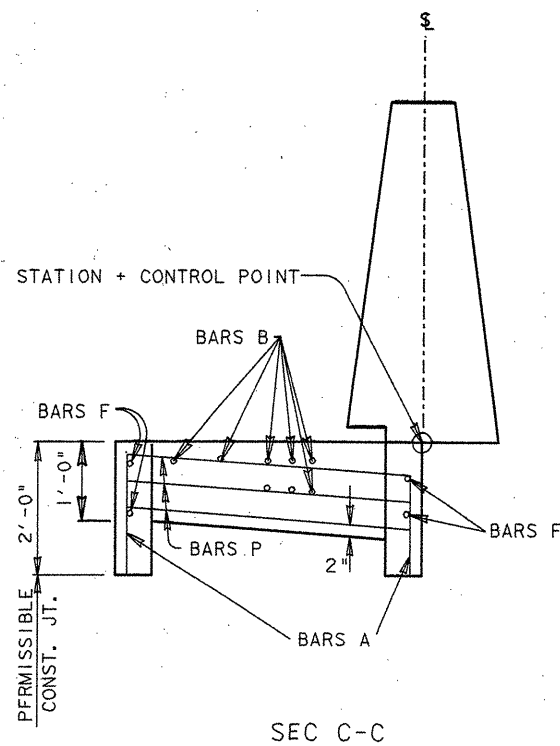
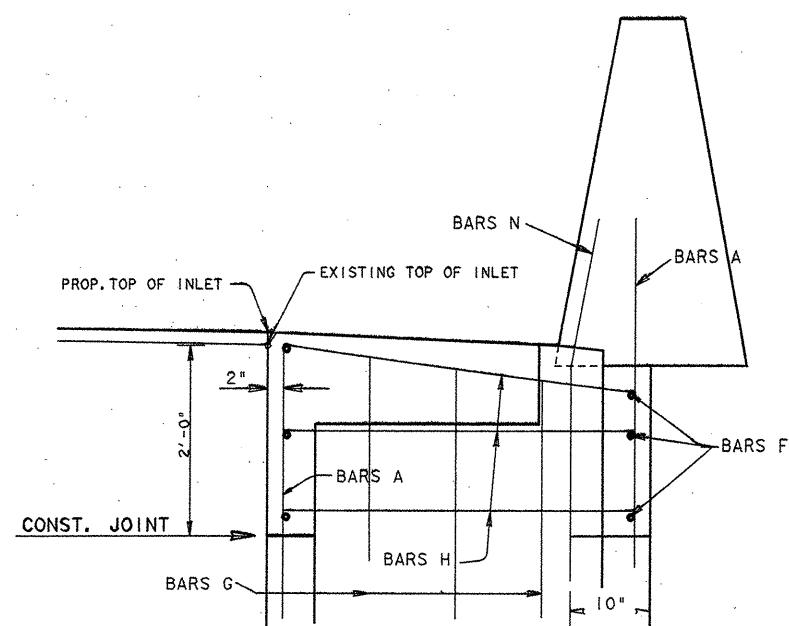
FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	NH 95 (40) 1M		272
STATE	STATE DIST. NO.	COUNTY	
TEXAS	15	COMAL	
CONT.	SECT.	JOB	HIGHWAY NO.
0016	05	087	I. H. 35



ESTIMATED QUANTITIES - TYPE G-1 INLET					
BAR NO.	SIZE	SPACING	LENGTH	WEIGHT	
A 12	#4	6"	14'-4"	115	
B 7	#5	3"	5'-8"	41	
C 11	#5	6"	5'-6"	63	
F 15	#4	11"	8'-4"	84	
G 6	#4	11"	4'-6"	18	
H 10	#4	11"	3'-11"	26	
N 2	#4	-	3'-6"	5	
P -	#5	-	-	-	
M 10	#4	6"	2'-8"	18	
TOTAL - REINF. STEEL LBS.				359	
TOTAL CLASS "A" CONC. CY.				2.6	

ESTIMATED QUANTITIES - TYPE G-2 INLET					
BAR NO.	SIZE	SPACING	LENGTH	WEIGHT	
A 23	#4	6"	14'-4"	221	
B 7	#5	3"	11'-2"	82	
C 21	#5	6"	5'-6"	120	
F 15	#4	11"	13'-10"	139	
G 6	#4	11"	4'-10"	20	
H 10	#4	11"	3'-11"	26	
N 2	#4	-	3'-6"	5	
P 6	#5	-	3'-11"	25	
M 19	#4	6"	2'-8"	34	
TOTAL - REINF. STEEL LBS.				672	
TOTAL CLASS "A" CONC. CY.				4.6	

FOR CONTRACTORS INFO ONLY
USING H=4'-2" AND 0.020 FT/FT
PVMNT. X-SLOPE.



GENERAL NOTES :

- ALL EXPOSED CORNERS TO BE CHAMFERED $\frac{3}{4}$ ".
- DIMENSIONS RELATING TO REINFORCING STEEL ARE TO THE CENTERS.
- CONC. TRAFFIC BARRIER LONGITUDINAL REINF. STEEL IS CONTINUOUS THROUGH INLETS.
- BARRIER DIMENSIONS TO CONFORM TO TYPE SPECIFIED AT INLET SITE.

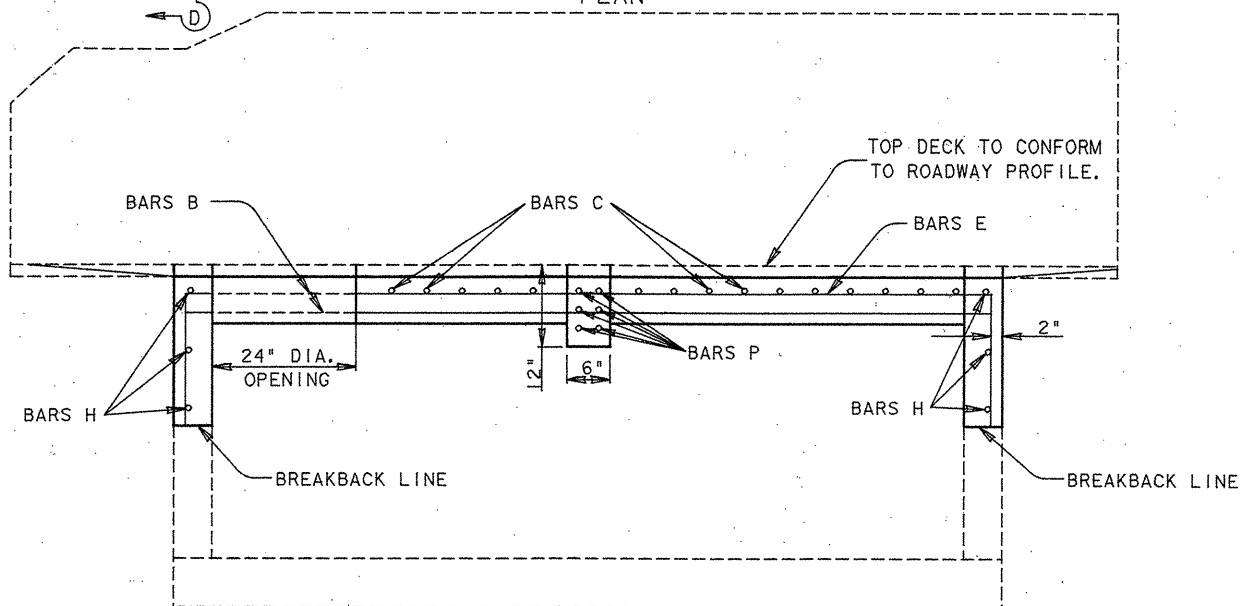
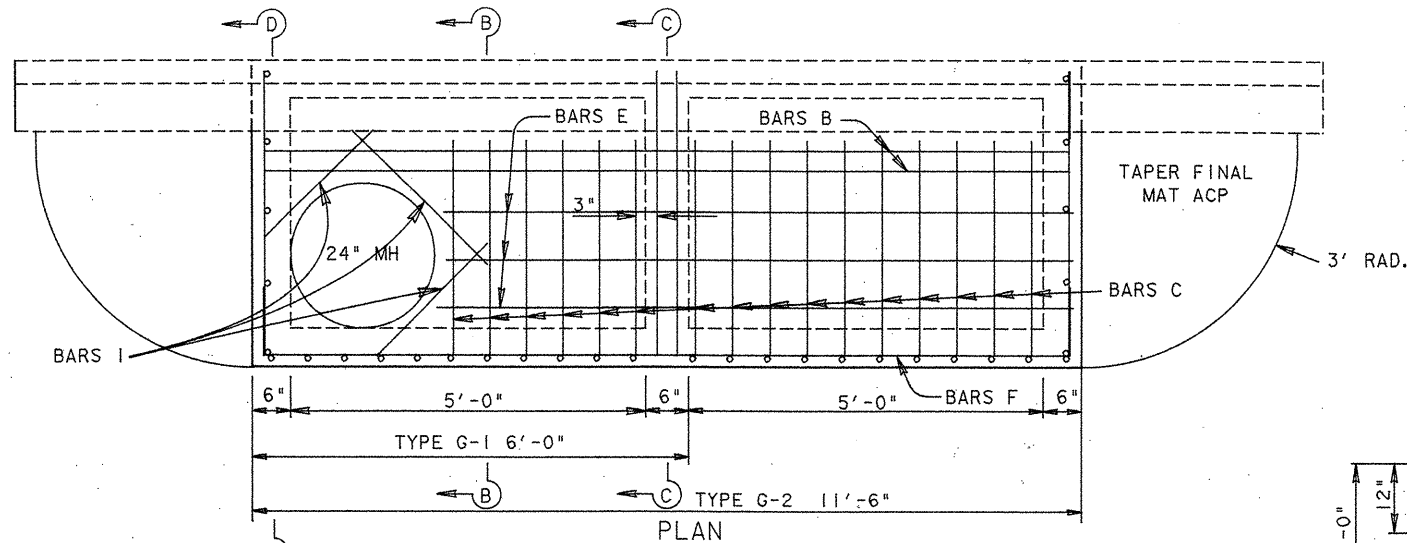


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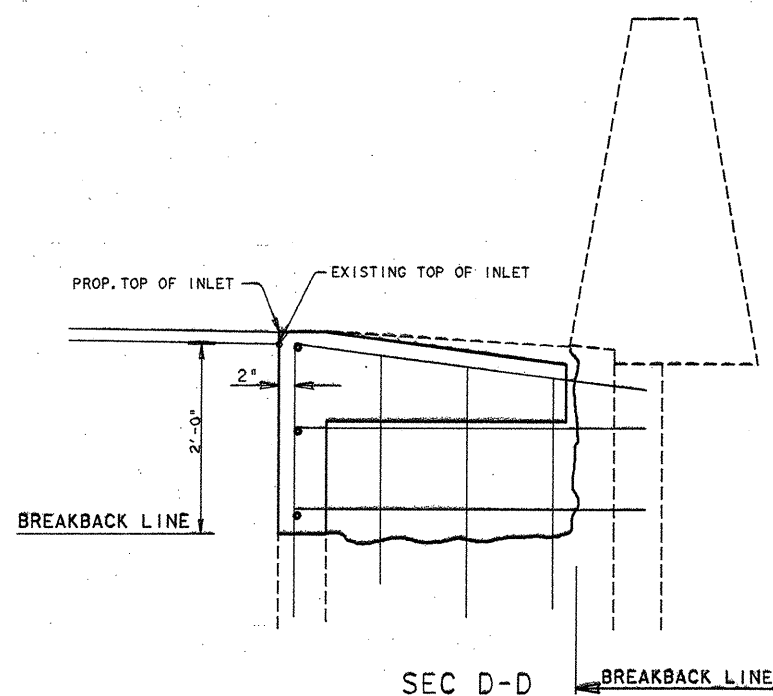
Gregory A. Malatek, P.E.

TYPE G-1, G-2
INLET DETAILS
STAGE I
FOR TRAFFIC SEQUENCE I

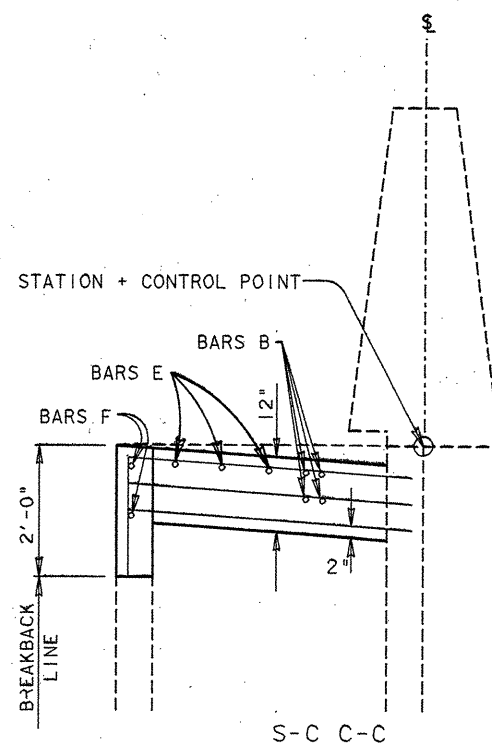
SHEET 1 OF 2			
FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.	
6	NH 95 (40) IM	273	
STATE	STATE DIST. NO.	COUNTY	
TEXAS	15	COMAL	
CONT.	SECT.	JOB	HIGHWAY NO.
0016	05	087	1H 35



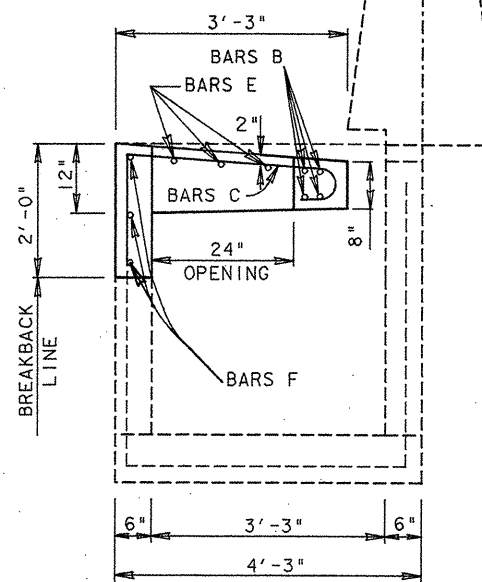
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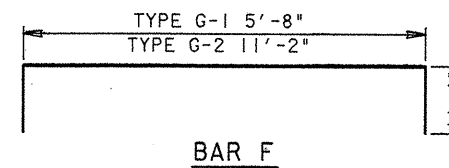
SEC D-D



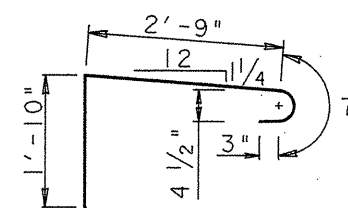
S-C C-C



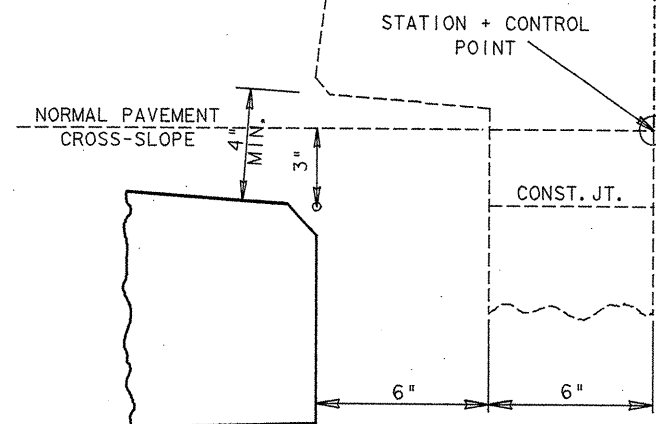
SEC B-B



BAR F



BAR C



THROAT DETAIL

ESTIMATED QUANTITIES - TYPE G-1 INLET					
BAR	NO.	SIZE	SPACING	LENGTH	WEIGHT
B	4	#5	3"	5'-8"	24
C	7	#5	6"	5'-5"	40
E	3	#4	8"	3'-4"	7
F	3	#4	11"	8'-4"	17
I	3	#4	-	2'-6"	5
TOTAL - REINF. STEEL LBS.					93
TOTAL CLASS "A" CONC. CY.					0.50

ESTIMATED QUANTITIES - TYPE G-2 INLET					
BAR	NO.	SIZE	SPACING	LENGTH	WEIGHT
B	4	#5	3"	11'-2"	47
C	17	#5	6"	5'-5"	96
E	3	#4	8"	9'-2"	18
F	3	#4	11"	13'-10"	28
I	3	#4	-	2'-6"	5
TOTAL - REINF. STEEL LBS.					194
TOTAL CLASS "A" CONC. CY.					1.14

FOR CONTRACTORS INFO ONLY
USING H=4'-2" AND 0.020 FT/FT
PVMNT. X-SLOPE.

GENERAL NOTES :

- ALL EXPOSED CORNERS TO BE CHAMFERED $\frac{3}{4}$ ".
- DIMENSIONS RELATING TO REINFORCING STEEL ARE TO THE CENTERS.
- FOR RING AND COVER DETAILS SEE RING AND COVER DETAIL SHEET.
- PAYMENT FOR CONC., STEEL, RING + COVER AND STEPS SHALL BE INCLUDED IN UNIT COST OF ITEM 470 BY THE EACH "MANHOLES + INLETS."
- EXIST P BARS SHALL REMAIN AND BE INCORPORATED INTO NEW DECK OF INLET.



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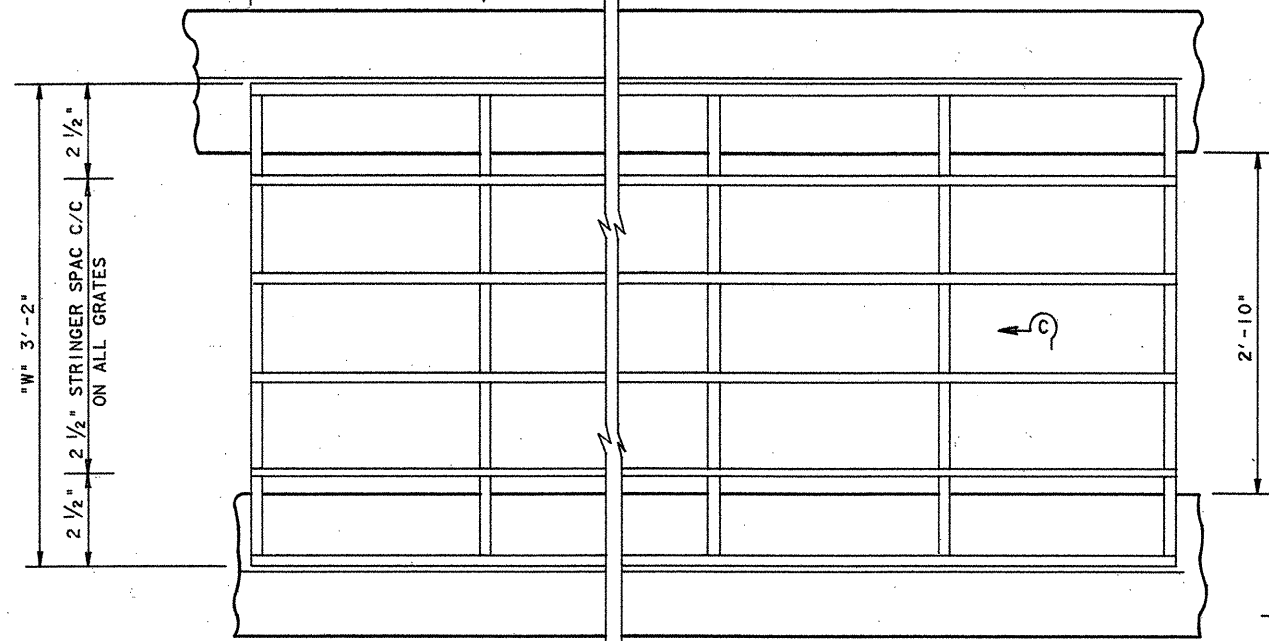
Gregory A. Malatek, P.E.

TYPE G-1, G-2
INLET DETAILS
STAGE II
FOR TRAFFIC SEQUENCE IV

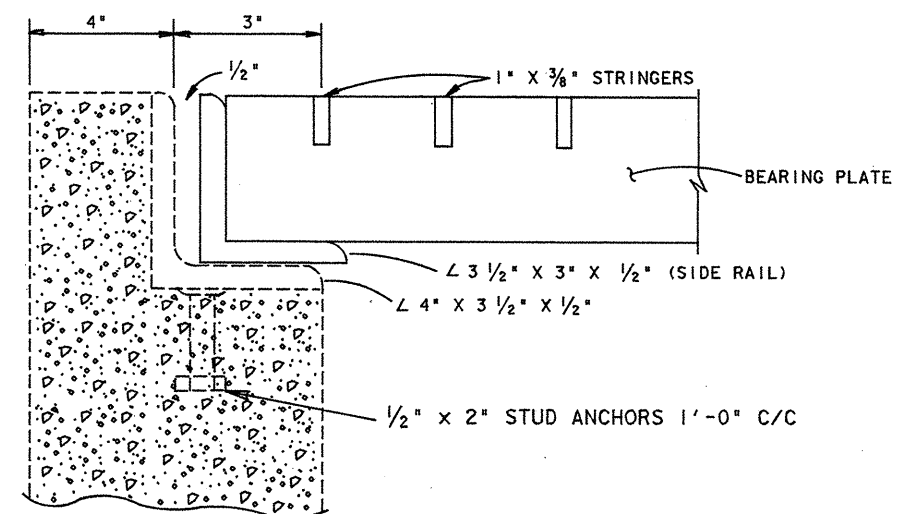
SHEET 2 OF 2			
ED. NO.	FEDERAL AID PROJECT NO.	SHEET NO.	
6	NH 95 (40) IM	204	
STATE	STATE DIST. NO.	COUNTY	
TEXA	15	COMAL	
CERT.	SECT.	JOB	HIGHWAY NO.
0016	05	087	1H 35

"L" = VARIES

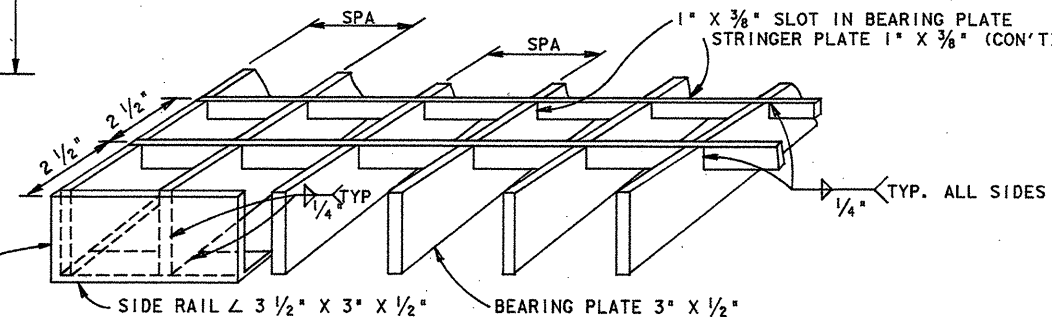
GRATE NO. 3	4 1/2"	4 1/2"	BEARING PLATE SPAC. C/C	4 1/2"
GRATE NO. 2	3 1/2"	3 1/2"	BEARING PLATE SPAC. C/C	3 1/2"
GRATE NO. 1	4 1/2"	4 1/2"	BEARING PLATE SPAC. C/C	4 1/2"



GRATE
PLAN VIEW



SECTION C-C

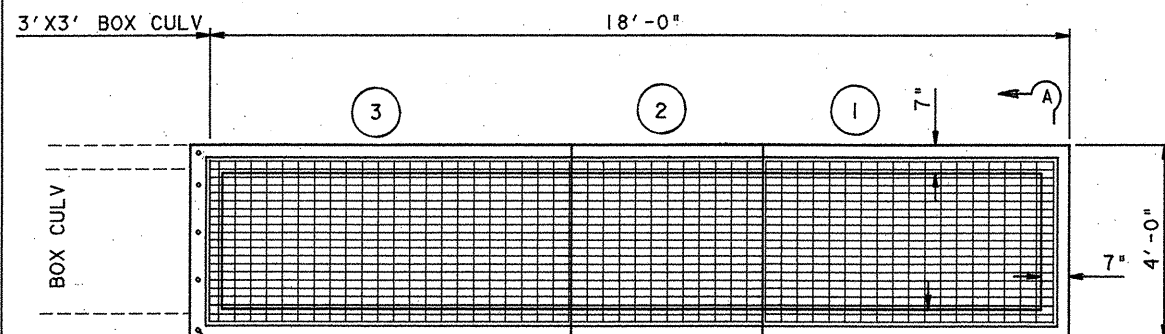


DETAIL OF GRATE CORE

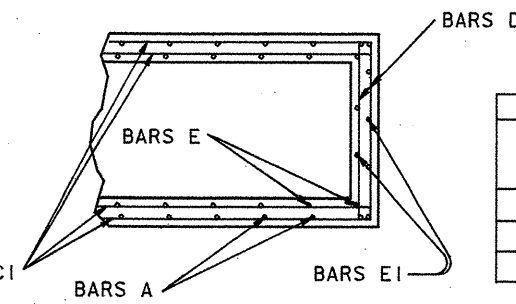
BILL OF REINFORCING STEEL					
BARS	SIZE	NO.	MAX. SPACING	LENGTH	**WEIGHT (lbs)
A	#4	4	12" +/-	8'-9"	23.00
AI	#4	15	12" +/-	*10'-4 1/16"	97.00
B	#4	19	12" +/-	3'-8"	47.00
C	#4	9	12" +/-	17'-7 1/16"	106.00
CI	#4	6	13" +/-	17'-7 1/16"	71.00
CIA	#4	4	13" +/-	*3'-7 1/2"	10.00
CIB	#4	6	13" +/-	*4'-3"	17.00
D	#4	12	13" +/-	3'-8"	34.00
E	#4	13	18" +/-	*3'-1 7/8"	55.00
EI	#4	7	12" +/-	3'-7 3/16"	17.00
# TOTAL WEIGHT OF STEEL					477.00
# CONCRETE QUANTITY (CY)					4.00

FOR CONTRACTOR'S INFORMATION ONLY
 * AVERAGE LENGTH
 ** STEEL WEIGHTS DETERMINED FROM LENGTHS MEASURED ON GRAPHICS.

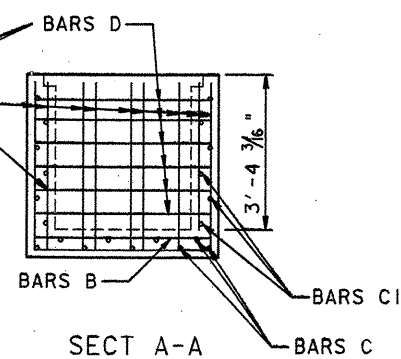
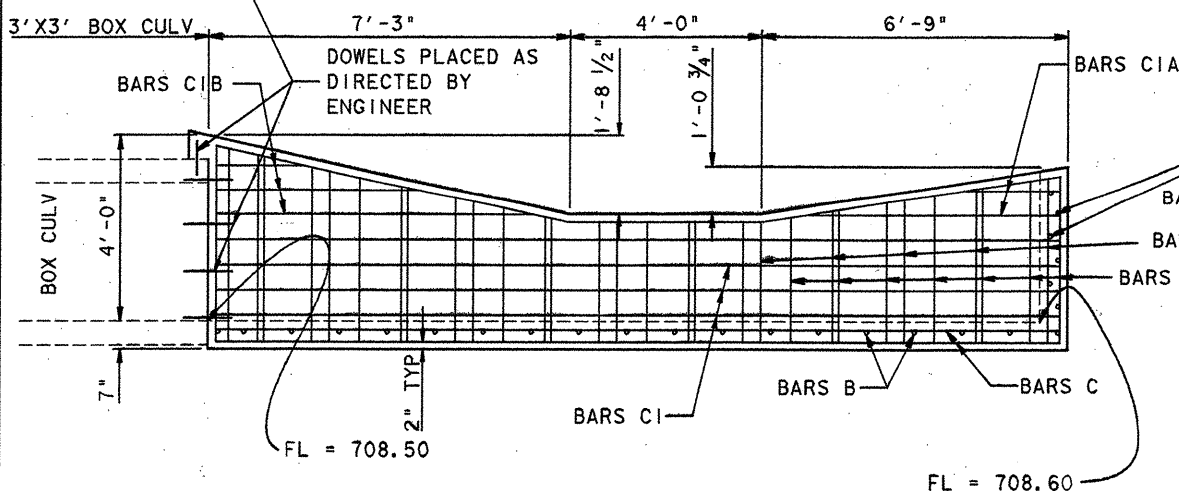
GENERAL NOTES:
 #4 SMOOTH DOWELS TO TIE DROP INLET BOX TO BOX CULVERT, PLACED AS DIRECTED BY THE ENGINEER.
 L 3 1/2" X 3" X 1/2" RAIL TO BE PLACED ON ALL FOUR SIDES OF GRATE.



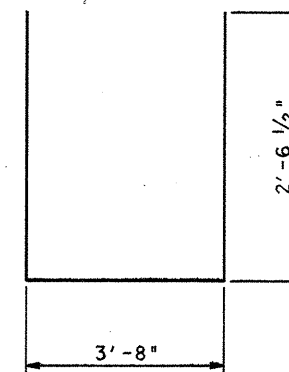
PLAN VIEW WITH GRATE



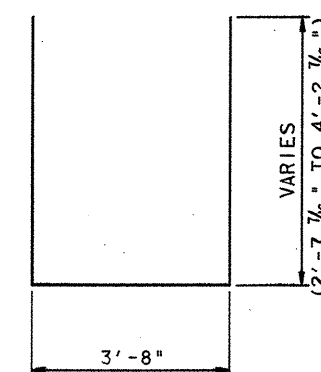
STRUCTURAL STEEL FOR GRATES																	
GRATE NO.	GRATE DIM. OUT TO OUT		SIDE-RAIL		CROSS-RAIL		BEARING PLATE		STRINGER PLATE		TOTAL WEIGHT						
			3 1/2" X 3" X 1/2"		3 1/2" X 3" X 1/2"		R 3" X 1/2"		R 1" X 3/8"								
	W	L	NO.	LGTH.	WT.	NO.	LGTH.	WT.	NO.	LGTH.		SPA	WT.	NO.	LGTH.	SPA	WT.
1	3'-2"	5'-10 7/8"	2	5'-10 7/8"	131	2	3'-2"	72	13	3'-2"	4 1/2"	210	12	5'-9 3/4"	2 1/2"	89	502
2	3'-2"	4'-0"	2	4'-0"	89	2	3'-2"	72	11	3'-2"	3 1/2"	178	12	3'-10 7/8"	2 1/2"	60	399
3	3'-2"	7'-6"	2	7'-6"	167	2	3'-2"	72	17	3'-2"	4 1/2"	275	12	7'-5"	2 1/2"	114	628



SECTION A-A



BARS A



BARS AI



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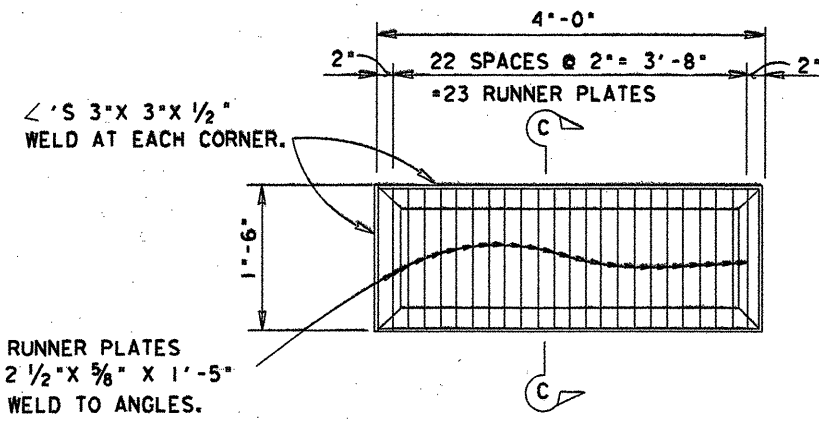
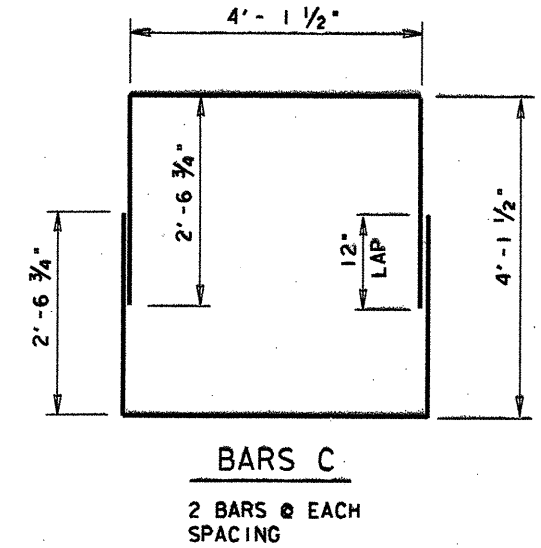
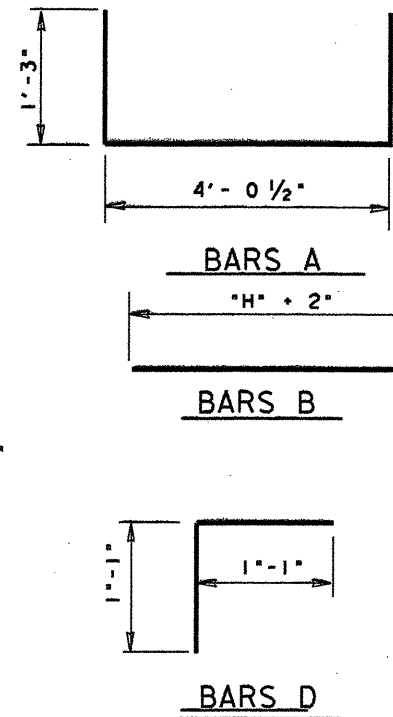
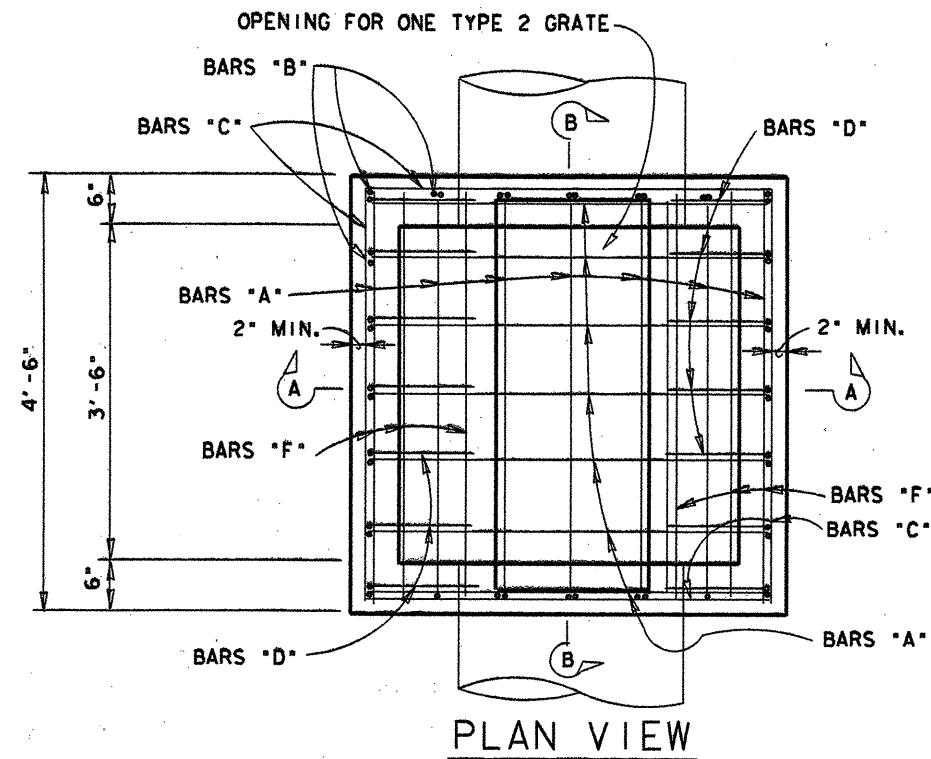
4/13/1995
 Gregory A. Malatek, P.E.

ED. NO.	DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.
6	NH 95 (40)	IM	275
STATE	STATE	COUNTY	
TEXAS	15	COMAL	
C.M.T.	SECT.	JOB	HIGHWAY NO.
0016	05	087	1H 35

TRAFFIC INLET (SPL)

NOTES :

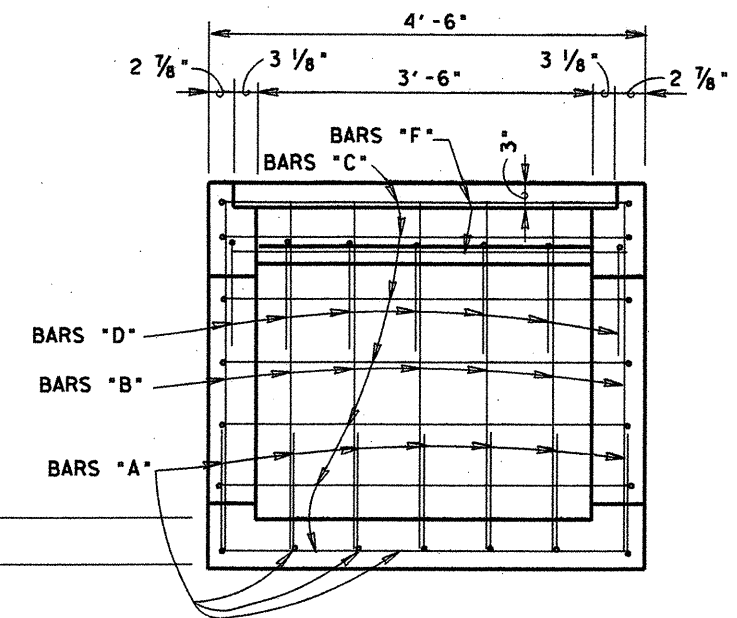
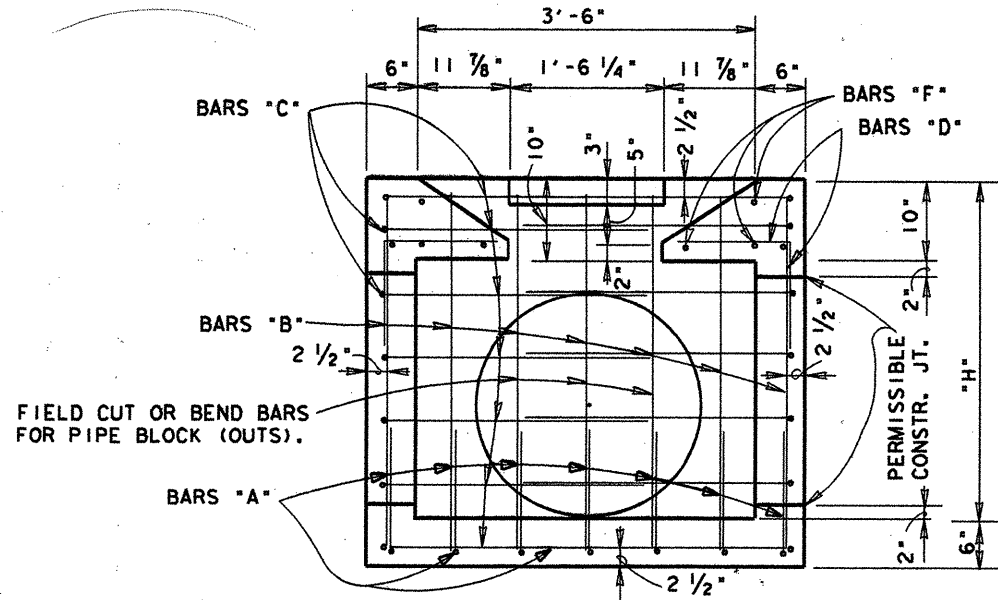
1. ALL CONCRETE SHALL BE CLASS "A". COARSE AGGREGATE GRADE "4" MAY BE USED.
2. DIMENSIONS RELATING TO REINFORCING STEEL ARE TO CENTER OF BARS.
3. REINFORCING STEEL IN THE AREA OF THE BLOCKOUTS SHALL BE FIELD BENT OR CUT TO ALLOW FOR INSTALLATION OF PIPE(S).
4. PIPES MAY BE PLACED ON ANY SIDE AS INDICATED IN THE PLANS.
5. PAYMENT FOR GRATE, CONC. & STEEL SHALL BE INCLUDED IN THE UNIT COST OF ITEM 465 BY THE EACH "MANHOLES & INLETS".
6. THE STATION LOCATION AND OFFSET DISTANCE SHOWN IN THE PLANS IS TO THE CENTER OF THE INLET.
7. THE RIPRAP BASIN AROUND THE INLET WHEN SHOWN IN THE PLANS IS PAID FOR UNDER ITEM 432. IF THE INLET DOESN'T HAVE A PROPOSED RIPRAP BASIN, ALL EXPOSED CORNERS SHALL HAVE A $\frac{3}{4}$ " CHAMFER.



GRATE - TYPE 2

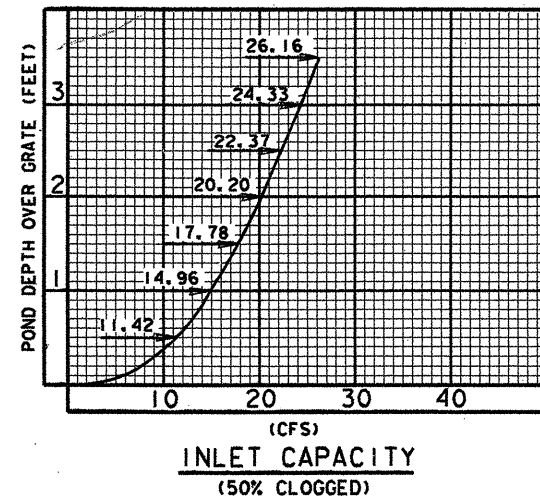
NOTCH END PLATE TO DRAIN.
(1" MINIMUM NOTCH.)
2 NOTCHES / END PLATE

SECTION C-C



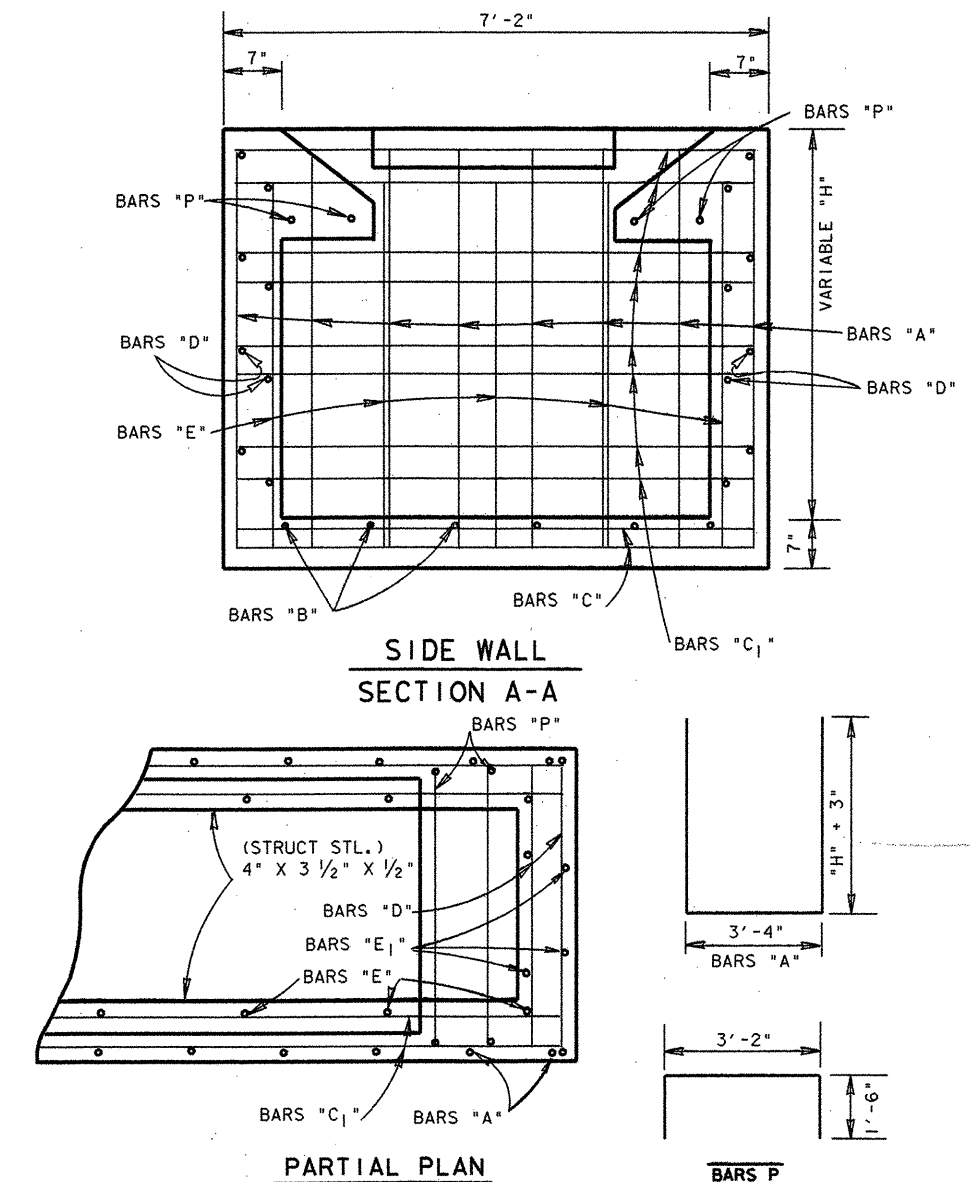
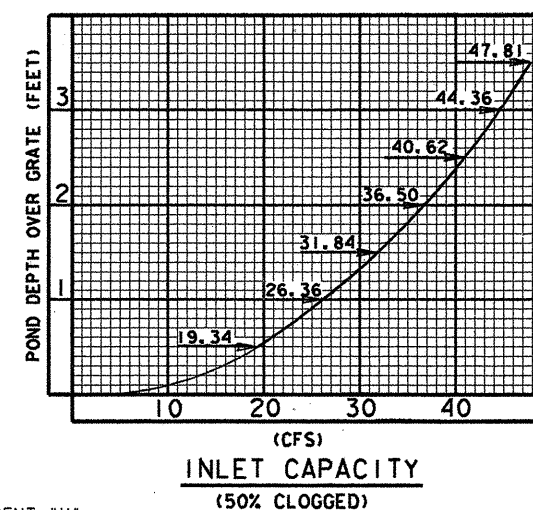
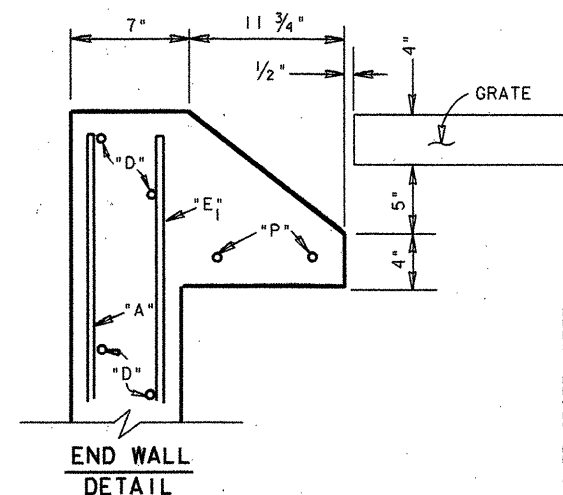
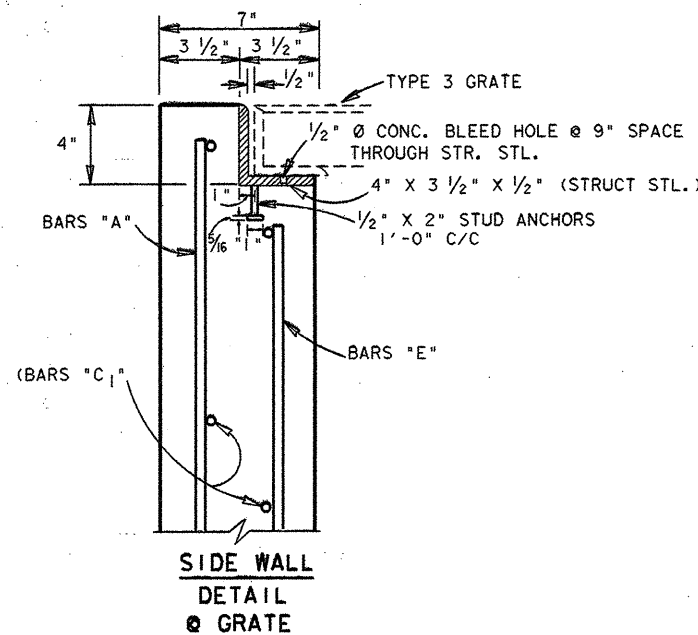
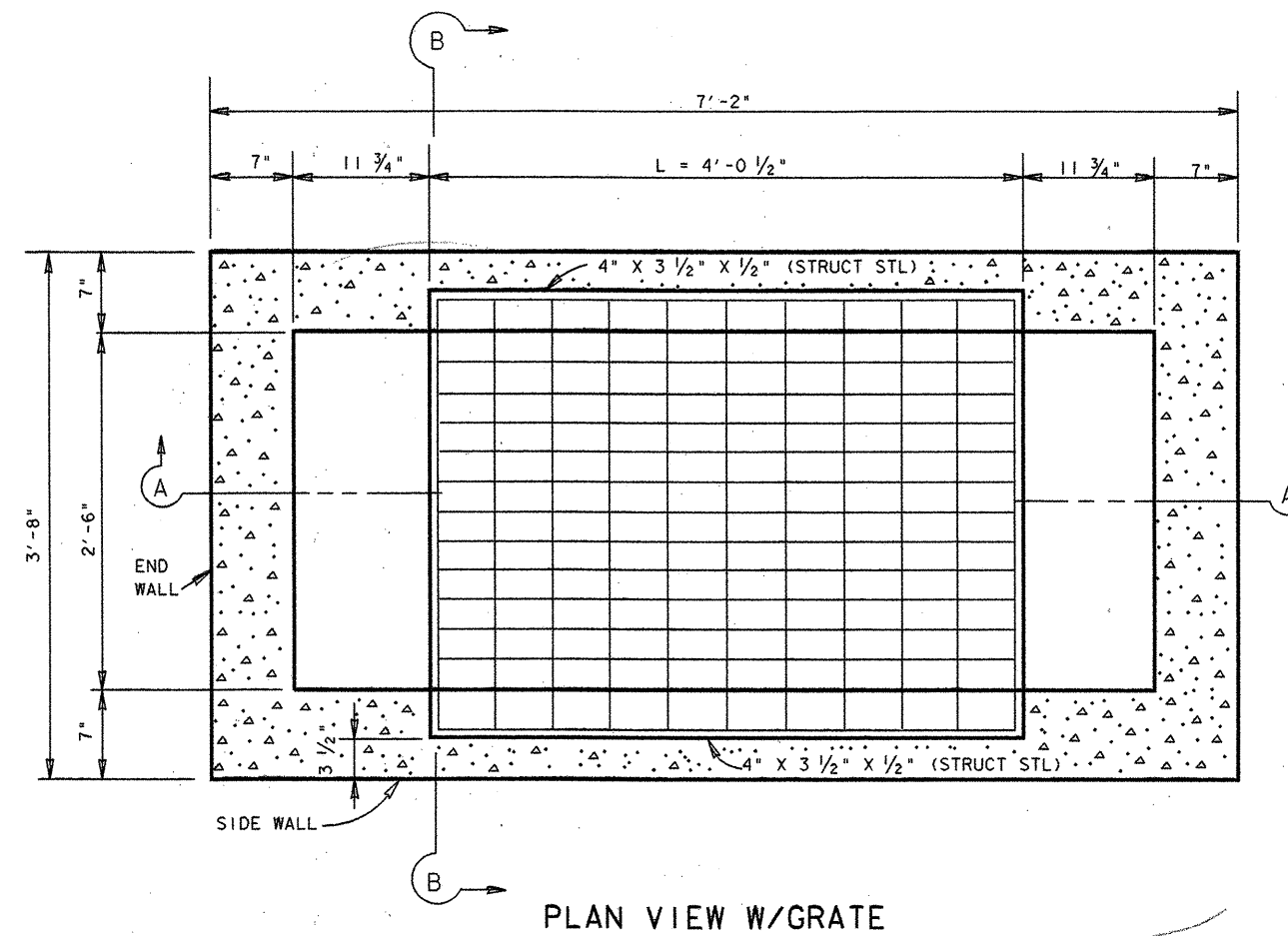
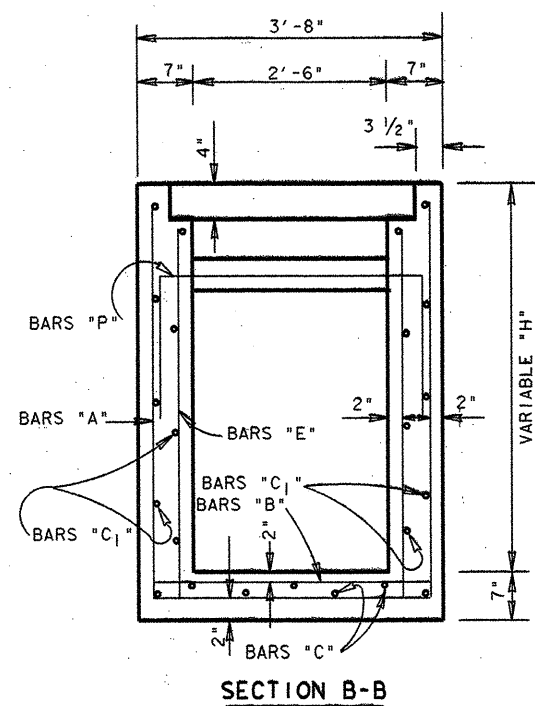
ESTIMATED QUANTITIES FOR "H" = 3'					
REINFORCING STEEL					
BAR	NO.	SIZE	SPACING	LENGTH	WEIGHT
A	14	#4	8"	6'-6 1/2"	61
B	24	#4	8"	varies 3' HT = 3' 2"	51
C	varies 3' HT = 14	#4	8"	9'-3"	87
D	14	#4	8"	2'-2"	20
F	8	#5	AS SHOWN	4'-2"	35
TOTAL REINFORCING STEEL (LBS) = 254 *					
CL A CONCRETE (C.Y.) = 1.59 *					
GRATE TYPE 2 (EA.) = 1 *					

* FOR CONTRACTOR'S INFORMATION ONLY.



DROP INLET "TYPE 3" GRATE "TYPE 2" SAN ANTONIO DISTRICT STANDARD

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	NH 95(40) IM		276
STATE	STATE DIST. NO.	COUNTY	
TEXAS	15	COMAL	
CONT.	SECT.	JOB	HIGHWAY NO.
0016	05	087	IH 35



- NOTES 88

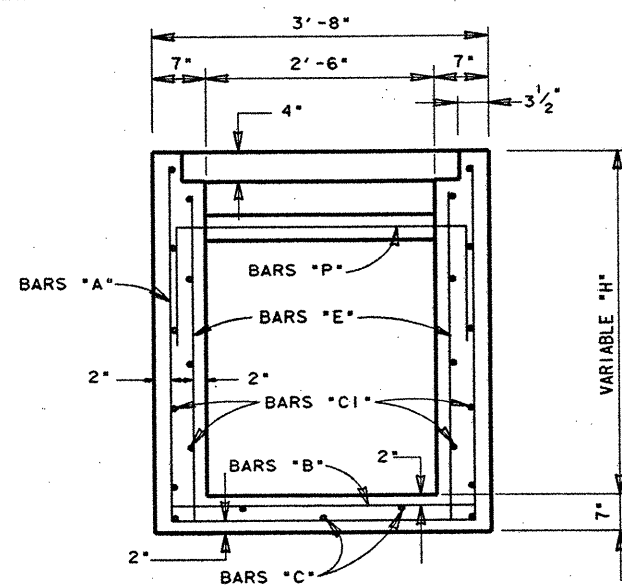
1. ALL CONCRETE SHALL BE CLASS "A". COARSE AGGREGATE GRADE "4" MAY BE USED.
2. DIMENSIONS RELATING TO REINFORCING STEEL ARE TO CENTER OF BARS.
3. REINFORCING STEEL IN THE AREA OF THE BLOCKOUTS SHALL BE FIELD BENT OR CUT AS DIRECTED BY THE ENGINEER TO ALLOW FOR INSTALLATION OF PIPE(S).
4. PIPES MAY BE PLACED ON ANY SIDE AS INDICATED IN THE PLANS.
5. THE STATION LOCATION AND OFFSET DISTANCE SHOWN IN THE PLANS IS TO THE CENTER OF THE INLET.
6. THE RIPRAP BASIN AROUND THE INLET WHEN SHOWN IN THE PLANS IS PAID FOR UNDER ITEM 432. IF THE INLET DOESN'T HAVE PROPOSED RIPRAP BASIN, ALL EXPOSED CORNERS SHALL HAVE A $\frac{3}{4}$ " CHAMFER.

DROP INLET "TYPE Y-1"
SAN ANTONIO DISTRICT STANDARD

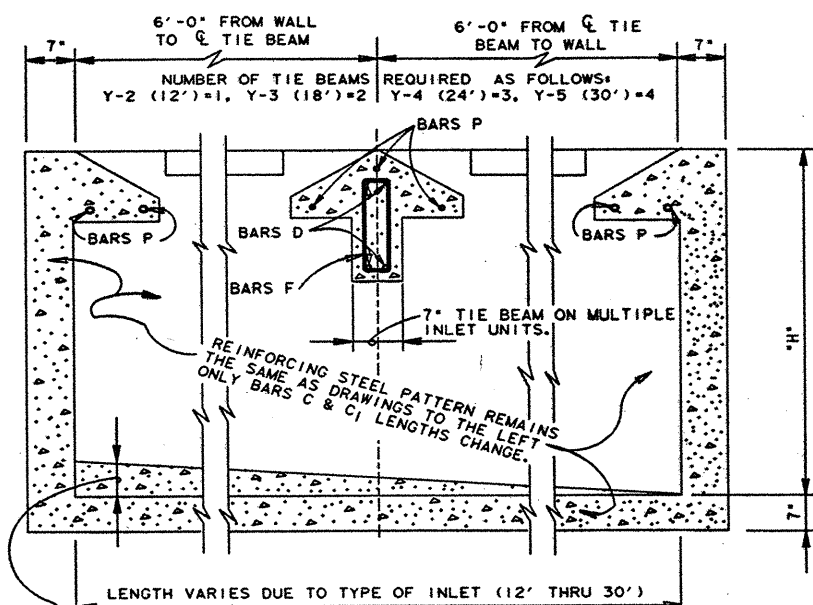
BILL OF REINFORCING STEEL AND ESTIMATED QUANTITIES (BASED ON H = 3'-0")																																																							
INLET	BARS "A" (FLOOR & WALLS)						BARS "B" (FLOOR)						BARS "C" (FLOOR)						BARS "C1" (SIDE WALLS)						BARS "D" (END WALLS)						BARS "E" (WALLS)						BARS "E1" WALLS						BARS "P"						TOTAL WT. LBS.		CY. CL. "A"		STRUCT.		GRAT.
	NO.	SIZE	SPA.	LENGTH	WT.	NO.	SIZE	SPA.	LENGTH	WT.	NO.	SIZE	SPA.	LENGTH	WT.	NO.	SIZE	SPA.	LENGTH	WT.	NO.	SIZE	SPA.	LENGTH	WT.	NO.	SIZE	SPA.	LENGTH	WT.	NO.	SIZE	SPA.	LENGTH	WT.	NO.	SIZE	SPA.	LENGTH	WT.	REINF. STL.	CONCRETE	STL. LBS.	TYPE											
TYPE Y-1	8	#4	12"	9'-11"	46	6	#4	12"	3'-5"	14	7	#4	12"	6'-10"	32	14	#4	13"	6'-10"	64	14	#4	13"	3'-5"	32	10	#4	18"	2'-11"	19	12	#4	12"	3'-3"	26	4	#4	SHOWN	6'-2"	16	249 *	1.94 *	145 *	1 *											

2	10	215	705	715	7
* FOR CONTRACTOR'S INFORMATION ONLY					

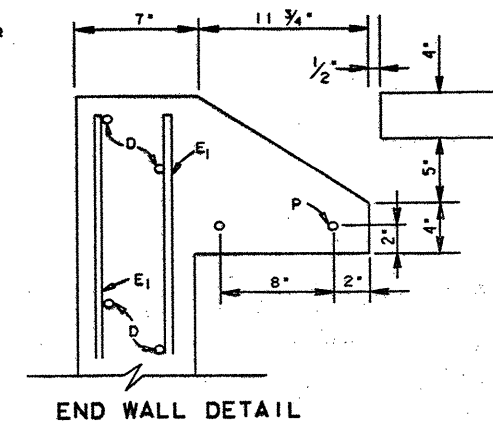
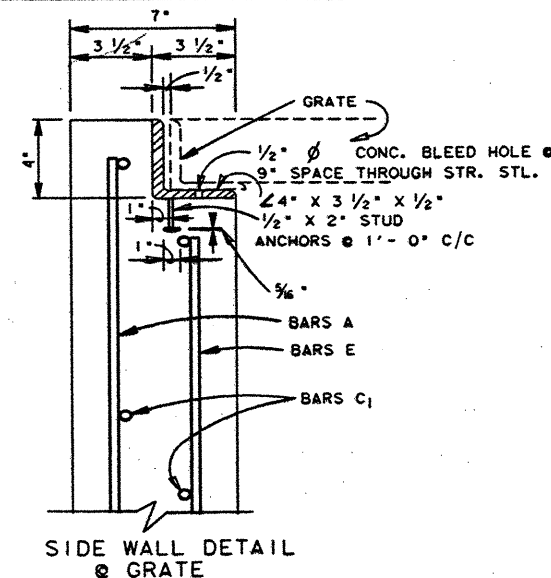
FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	NH 95(40) IM		277
STATE	STATE DIST. NO.	COUNTY	
TEXAS	15	COMAL	
CONT.	1ST	JOB	HIGHWAY NO.
0016	05	087	TH 35



SECTION B-B



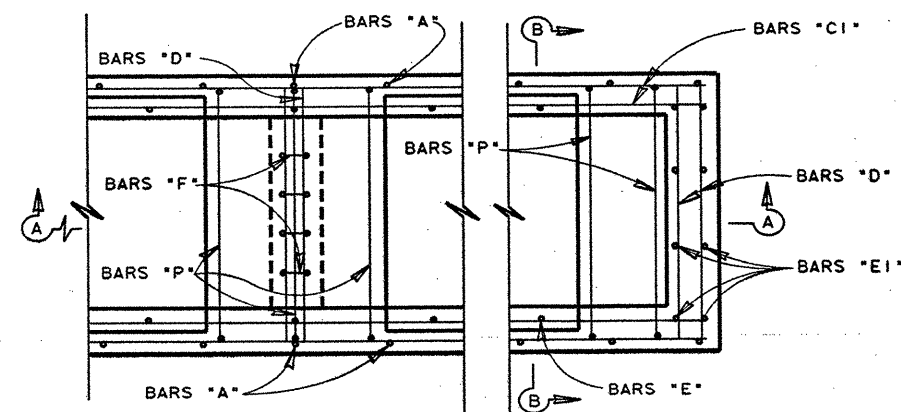
SECTION A-A
(SIDE ELEVATION)



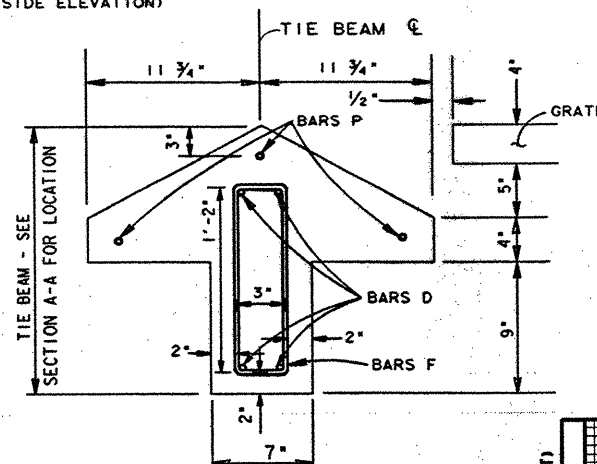
CL. "A" GR. 7
INVERT CONCRETE SHAPING
SUBSIDIARY TO INLET.
DEPTH VARIES WITH THE FLOWLINES
OF THE DRAINAGE PIPES ENTERING /
LEAVING THE INLET.

GENERAL NOTES :

1. ALL CONCRETE SHALL BE CLASS "A". COARSE AGGREGATE GRADE "4" MAY BE USED.
2. DIMENSIONS RELATING TO REINFORCING STEEL ARE TO CENTER OF BARS.
3. REINFORCING STEEL IN THE AREA OF THE BLOCKOUTS SHALL BE FIELD BENT OR CUT AS DIRECTED BY THE ENGINEER TO ALLOW FOR INSTALLATION OF PIPE(S).
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6. THE STATION LOCATION AND OFFSET DISTANCE SHOWN IN THE PLANS IS TO THE CENTER OF THE INLET.
7. THE RIPRAP BASIN AROUND THE INLET WHEN SHOWN IN THE PLANS IS PAID FOR UNDER ITEM 432. IF THE INLET DOESN'T HAVE A PROPOSED RIPRAP BASIN, ALL EXPOSED CORNERS SHALL HAVE 3/4" CHAMFER.



PARTIAL PLAN VIEW

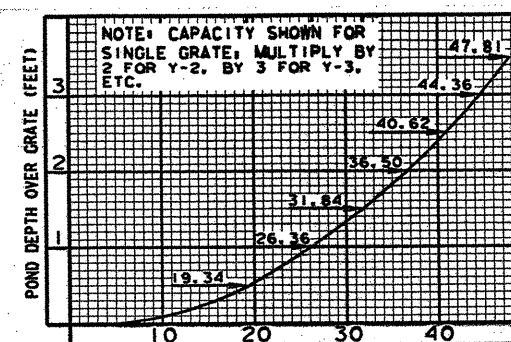


TIE BEAM DETAIL

DESCRIPTION	INLET TYPES			
	Y-2	Y-3	Y-4	Y-5
CL. "A" CONC. CY.	3.31	4.70	6.08	7.48
REIN. STL. LBS.	403	565	735	902
STRUCT. STL. LBS.	193	289	385	481
GRATES (TYPE 3)	2	3	4	5

* FOR CONTRACTOR'S INFORMATION ONLY

QUANTITIES WILL VARY WITH A DIFFERENT "H".
BILL OF REINFORCING STEEL (BASED ON "H" = 3'-0")

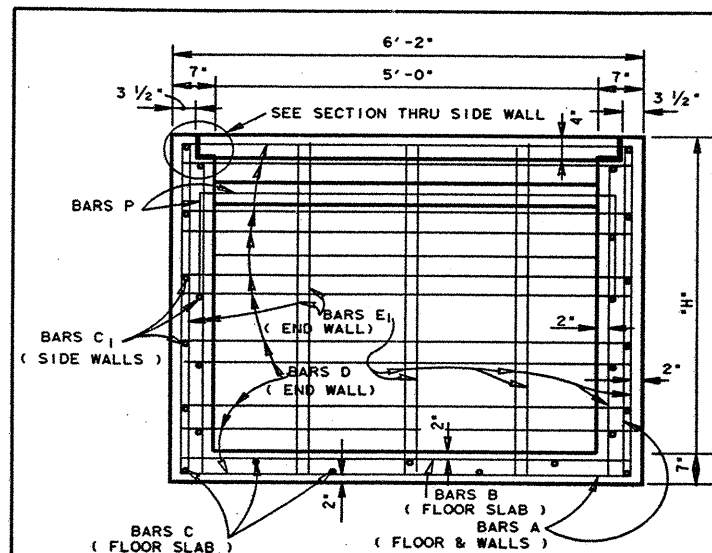


INLET CAPACITY
(50% CLOGGED)

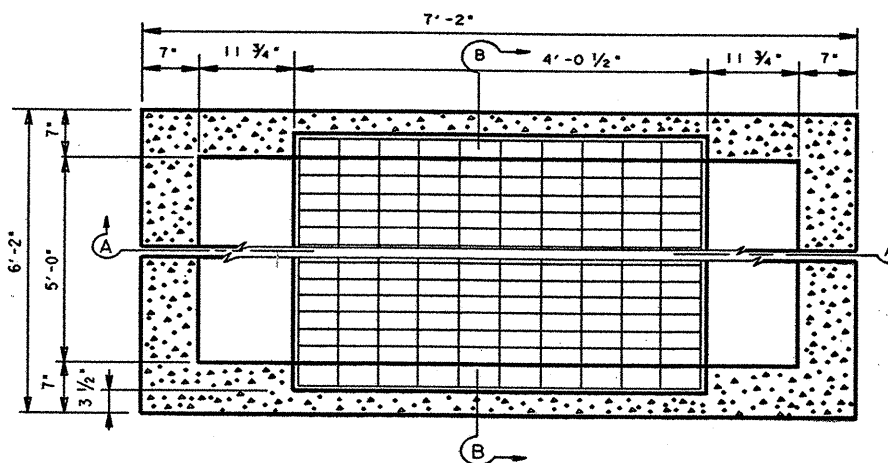
DROP INLET
"TYPE Y-2" THRU "TYPE Y-5"
SAN ANTONIO
DISTRICT STANDARD

INLET TYPE	BARS A					BARS B					BARS C					BARS C ₁					BARS D					BARS E					BARS E ₁					BARS P					BARS F				
	NO.	SIZE	SPAC.	LEN.	WT.	NO.	SIZE	SPAC.	LEN.	WT.	NO.	SIZE	SPAC.	LEN.	WT.	NO.	SIZE	SPAC.	LEN.	WT.	NO.	SIZE	SPAC.	LEN.	WT.	NO.	SIZE	SPAC.	LEN.	WT.	NO.	SIZE	SPAC.	LEN.	WT.	NO.	SIZE	SPAC.	LEN.	WT.					
Y-2	14	#4	12"	9'-10"	92	13	#4	12"	3'-4"	29	5	#4	10"	12'-10"	43	12	#4	12 1/2"	12'-10"	103	16	#4	13"	3'-4"	36	14	#4	18"	2'-11"	27	16	#4	11"	3'-3"	35	7	#4	SHOWN	6'-2"	29	4	#4	6"	3'-4"	9
Y-3	20	#4	12"	9'-10"	131	19	#4	12"	3'-4"	42	5	#4	10"	18'-10"	63	12	#4	12 1/2"	18'-10"	151	20	#4	13"	3'-4"	46	22	#4	18"	2'-11"	39	16	#4	11"	3'-3"	35	10	#4	SHOWN	6'-2"	41	8	#4	6"	3'-4"	18
Y-4	26	#4	12"	9'-10"	171	25	#4	12"	3'-4"	56	5	#4	10"	24'-10"	83	12	#4	12 1/2"	24'-10"	199	24	#4	13"	3'-4"	53	30	#4	18"	2'-11"	58	16	#4	11"	3'-3"	35	13	#4	SHOWN	6'-2"	53	12	#4	6"	3'-4"	27
Y-5	32	#4	12"	9'-10"	210	31	#4	12"	3'-4"	69	5	#4	10"	30'-10"	103	12	#4	12 1/2"	30'-10"	247	28	#4	13"	3'-4"	62	38	#4	18"	2'-11"	74	16	#4	11"	3'-3"	35	16	#4	SHOWN	6'-2"	66	16	#4	6"	3'-4"	36

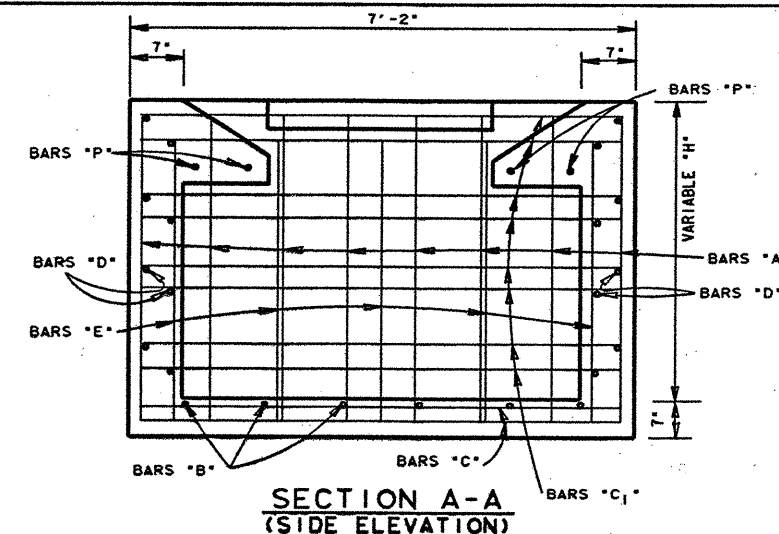
FED. RD. DIV. NO.	6	FEDERAL AID PROJECT NO.	NH 95(40) IM	SHEET NO.	278
STATE	TEXAS	COUNTY	COMAL		
CONTRACT	0016	SECTION	05	JOB	087
				HIGHWAY NO.	I.H. 35



SECTION B-B



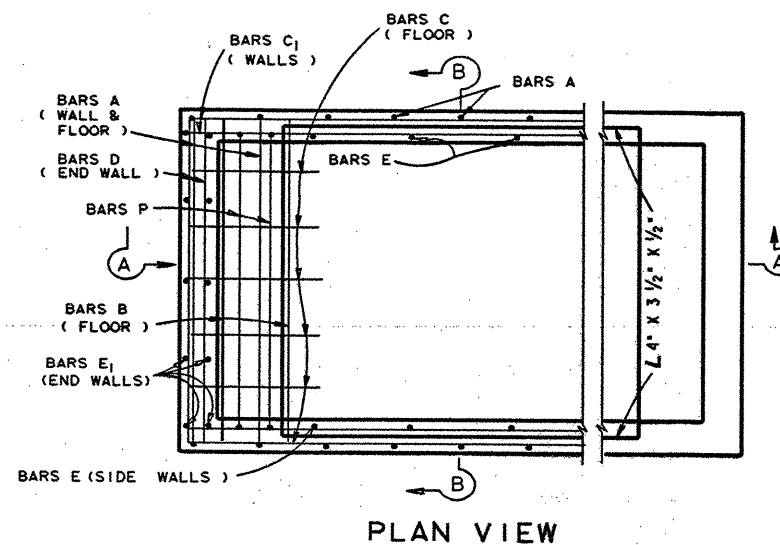
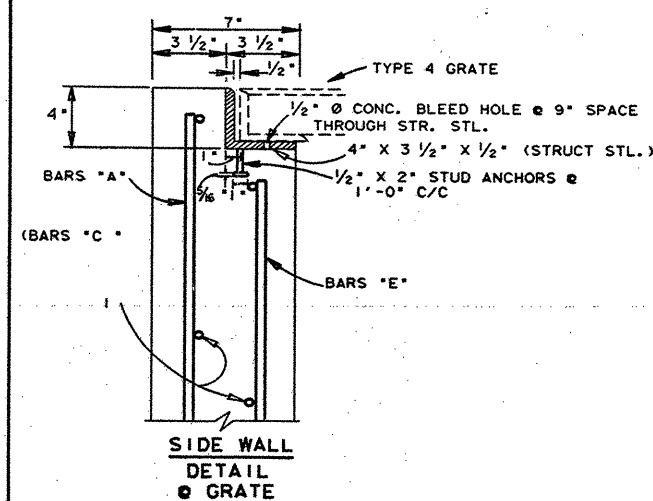
PLAN VIEW W/GRATE



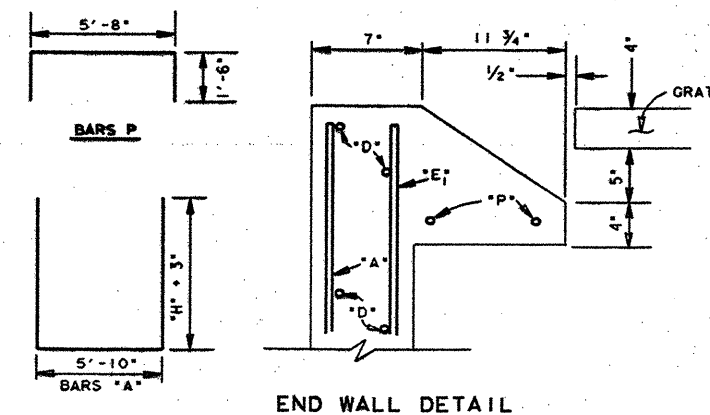
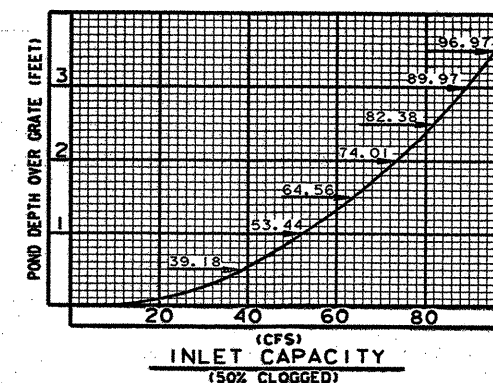
SECTION A-A
(SIDE ELEVATION)

GENERAL NOTES :

1. ALL CONCRETE SHALL BE CLASS "A". COARSE AGGREGATE GRADE "4" MAY BE USED.
2. DIMENSIONS RELATING TO REINFORCING STEEL ARE TO CENTER OF BARS.
3. REINFORCING STEEL IN THE AREA OF THE BLOCKOUTS SHALL BE FIELD BENT OR CUT AS DIRECTED BY THE ENGINEER TO ALLOW FOR INSTALLATION OF PIPE(S).
4. PIPES MAY BE PLACED ON ANY SIDE AS INDICATED IN THE PLANS.
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7. THE RIPRAP BASIN AROUND THE INLET WHEN SHOWN IN THE PLANS IS PAID FOR UNDER ITEM 432. IF THE INLET DOESN'T HAVE A PROPOSED RIPRAP BASIN, ALL EXPOSED CORNERS SHALL HAVE A $\frac{3}{4}$ " CHAMFER.



PLAN VIEW



END WALL DETAIL

ESTIMATED QUANTITIES (BASED ON "H" 6'-6")											
INLET TYPE W-1											
REINF. STL. LBS.	CY. CL. A CONCRETE	STRUCT. STL. LBS.	GRATES TYPE 4								
* 546	* 4.46	* 96	* 1								

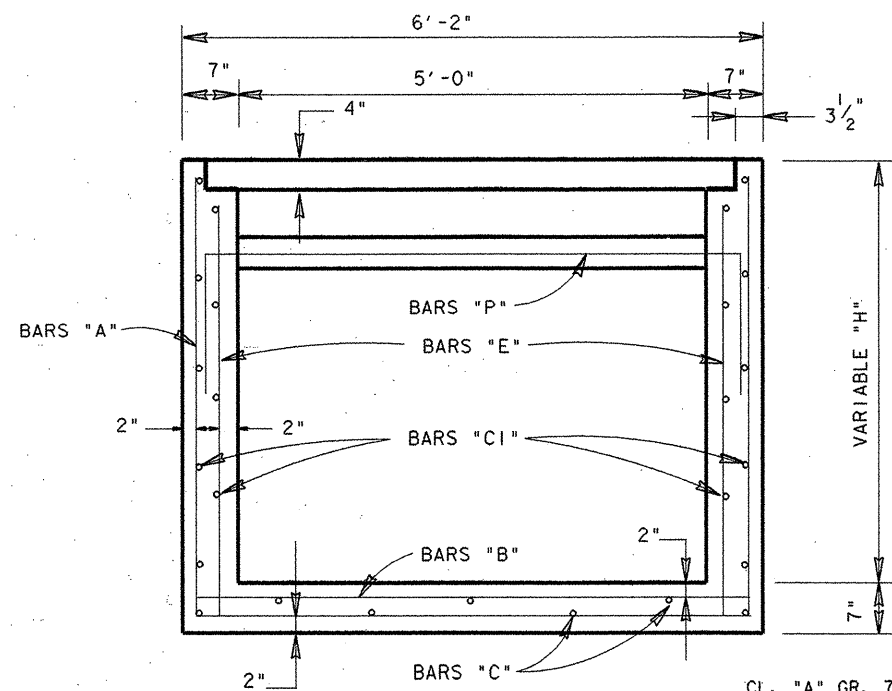
* FOR CONTRACTOR'S INFORMATION ONLY

* FOR CONTRACTOR'S INFORMATION ONLY																																									
INLET TYPE		BARS A					BARS B					BARS C					BARS C ₁					BARS D					BARS E					BARS E ₁					BARS P				
W-1		NO.	SIZE	SPAC.	LEN.	WT.	NO.	SIZE	SPAC.	LEN.	WT.	NO.	SIZE	SPAC.	LEN.	WT.	NO.	SIZE	SPAC.	LEN.	WT.	NO.	SIZE	SPAC.	LEN.	WT.	NO.	SIZE	SPAC.	LEN.	WT.	NO.	SIZE	SPAC.	LEN.	WT.	NO.	SIZE	SPAC.	LEN.	WT.
		8	#4	12"	19'-2"	102	7	#4	12"	5'-10"	27	7	#4	11 3/4"	6'-10"	32	24	#4	1'-0 3/4"	6'-10"	110	30	#4	13"	5'-10"	117	6	#4	18"	6'-5"	26	24	#4	1'-0 3/4"	6'-9"	108	4	#4	SHOWN	8'-8"	24

NOTE : QUANTITIES WILL VARY WITH A DIFFERENT "H".

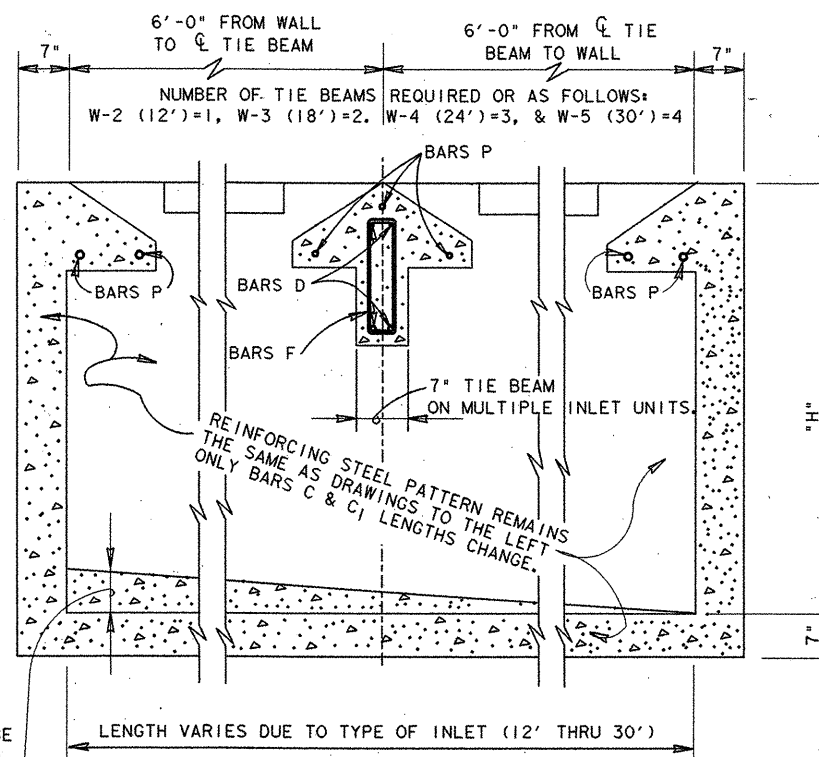
DROP INLET "TYPE W-1"
SAN ANTONIO DISTRICT STANDARD

FED. RD. DIST. NO.	FED. AID PROJECT NO.	SHEET NO.
6	NH 95(40) IM	279
STATE	COUNTY	
TEXAS	COMAL	
CONTRACT	SECTION	HIGHWAY NO.
0016	05	08710 35



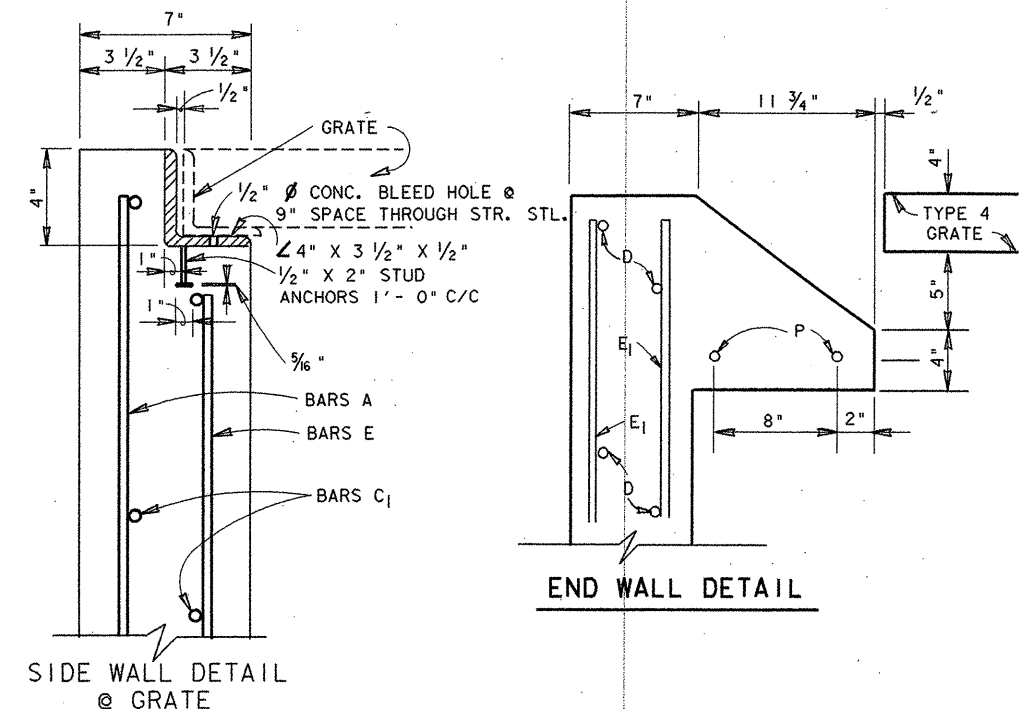
SECTION B-B

CL. "A" GR. 7
INVERT CONCRETE SHAPING
SUBSIDIARY TO INLET.
DEPTH VARIES WITH THE
FLOWLINES OF THE DRAINAGE
PIPES ENTERING / LEAVING
THE INLET.



SECTION A-A

(SIDE ELEVATION)

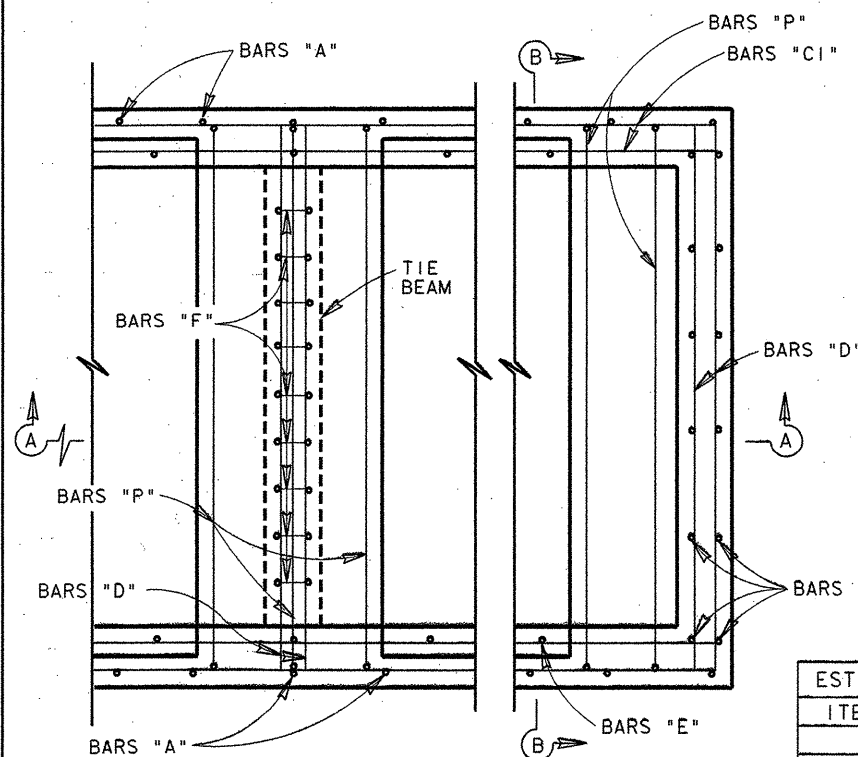


SIDE WALL DETAIL
@ GRATE

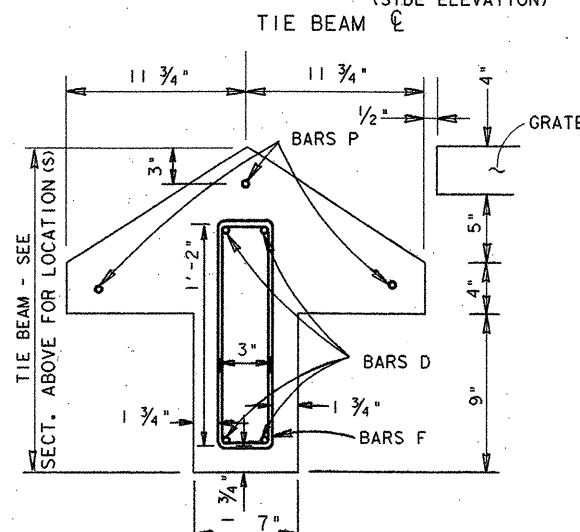
END WALL DETAIL

GENERAL NOTES :

1. ALL CONCRETE SHALL BE CLASS "A". COARSE AGGREGATE GRADE "4" MAY BE USED.
2. DIMENSIONS RELATING TO REINFORCING STEEL ARE TO CENTER OF BARS.
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7. PAYMENT FOR GRATES, CONC., REIN. & STRUCTURAL STEEL SHALL BE INCLUDED IN THE UNIT COST OF ITEM 465 BY THE EACH "MANHOLES & INLETS".



PARTIAL PLAN VIEW

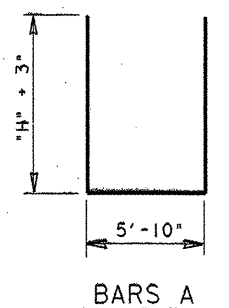
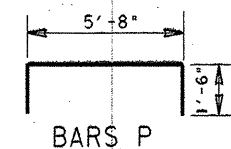
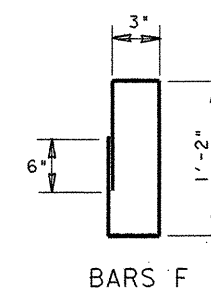
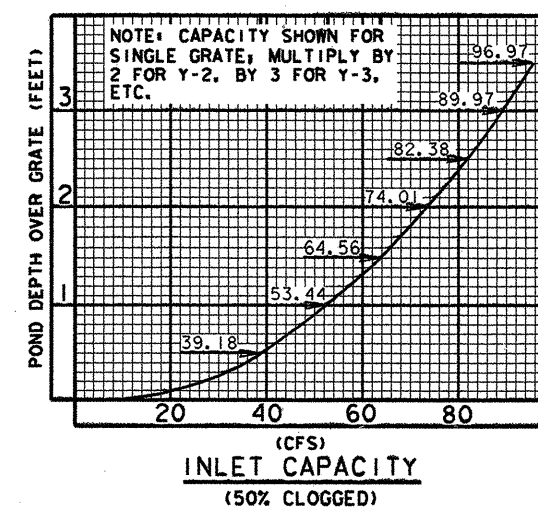


TIE BEAM DETAIL

ITEM DESCRIPTION	INLET TYPES			
	W-2	W-3	W-4	W-5
CL. "A" CONC. CY.	7.18	9.89	12.61	15.33
REIN. STL. LBS.	838	1149	1462	1774
STRUCT. STL. LBS.	193	289	385	481
GRATES (TYPE 4)	2	3	4	5

* FOR CONTRACTOR'S INFORMATION ONLY

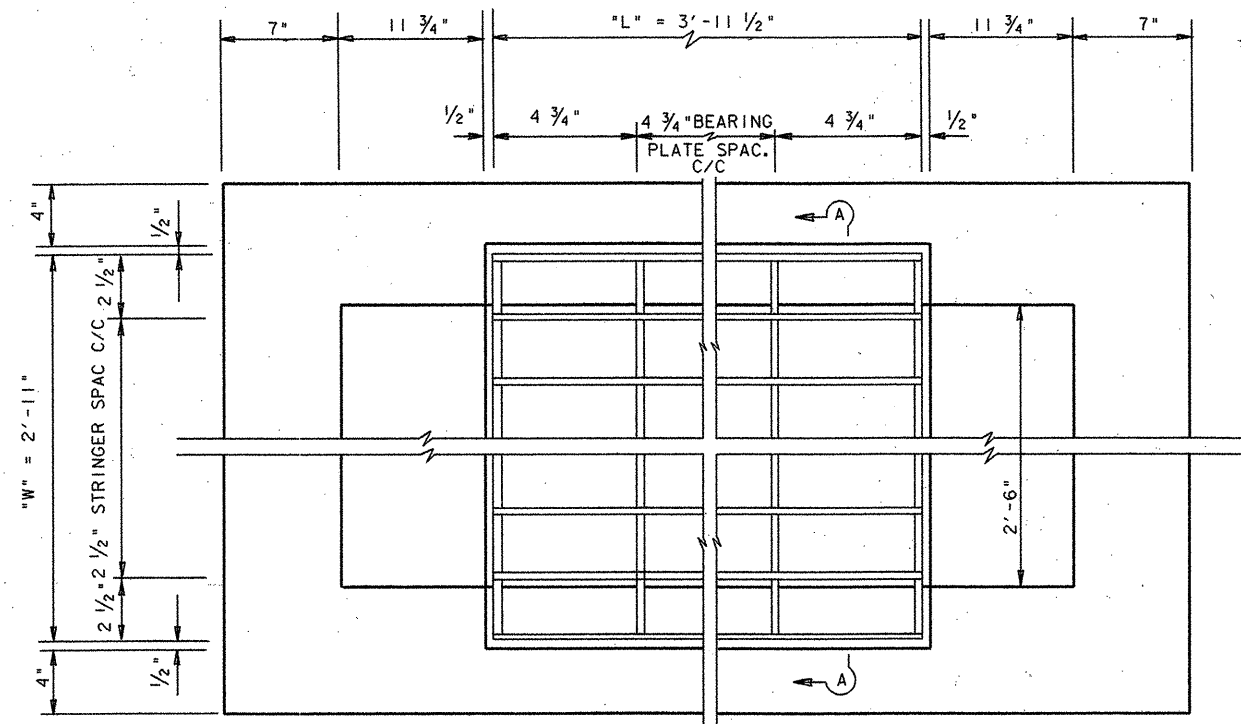
QUANTITIES WILL VARY WITH A DIFFERENT "H".
BILL OF REINFORCING STEEL (BASED ON "H" = 6'-6")



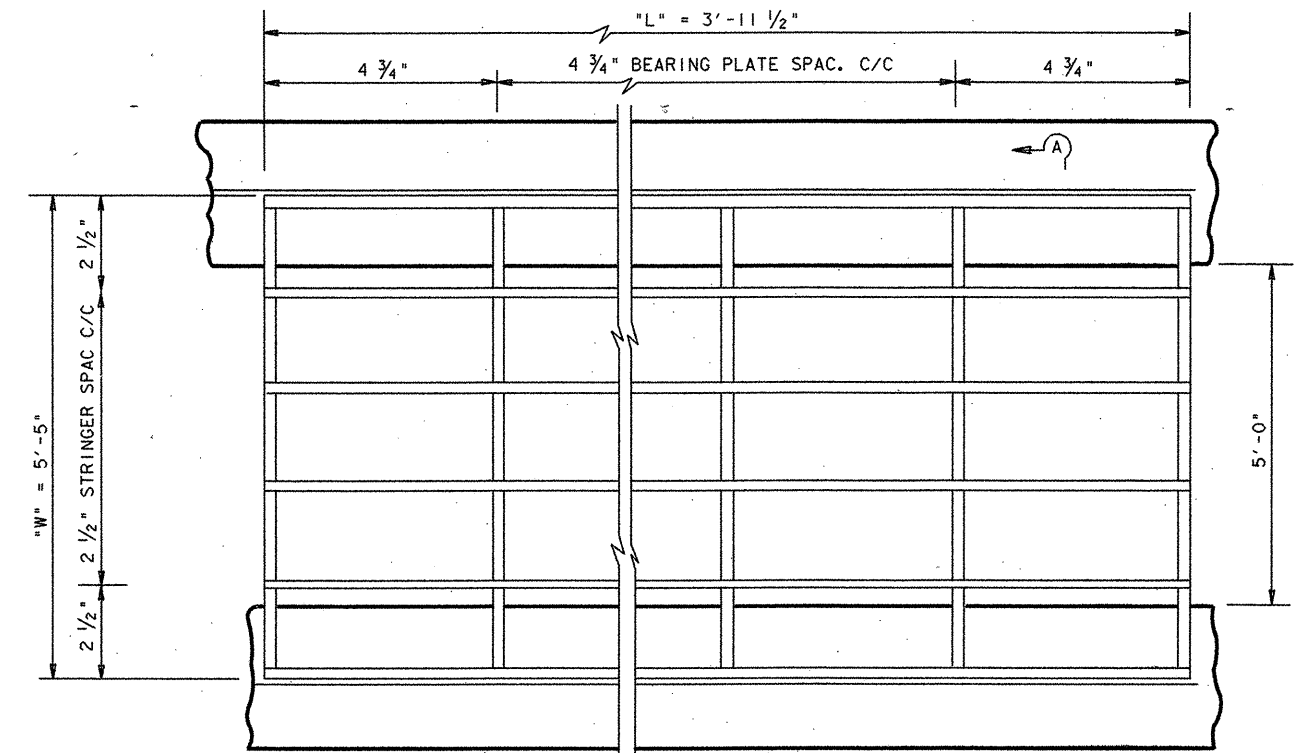
DROP INLET
"TYPE W-2" THRU "TYPE W-5"
SAN ANTONIO DISTRICT STANDARD

INLET TYPE	BARS A					BARS B					BARS C					BARS C ₁					BARS D					BARS E					BARS E ₁					BARS P					BARS F				
	NO.	SIZE	SPAC.	LEN.	WT.	NO.	SIZE	SPAC.	LEN.	WT.	NO.	SIZE	SPAC.	LEN.	WT.	NO.	SIZE	SPAC.	LEN.	WT.	NO.	SIZE	SPAC.	LEN.	WT.	NO.	SIZE	SPAC.	LEN.	WT.	NO.	SIZE	SPAC.	LEN.	WT.	NO.	SIZE	SPAC.	LEN.	WT.	NO.	SIZE	SPAC.	LEN.	WT.
W-2	14	#4	12"	19'-4"	181	13	#4	12"	5'-10"	51	7	#4	11 1/2"	12'-10"	60	24	#4	12 1/2"	12'-10"	206	28	#4	13"	5'-10"	109	14	#4	18"	6'-5"	60	24	#4	12 1/2"	6'-9"	108	7	#4	SHOWN	8'-8"	41	9	#4	6"	3'-4"	20
W-3	20	#4	12"	19'-4"	258	19	#4	12"	5'-10"	74	7	#4	11 1/2"	18'-10"	88	24	#4	12 1/2"	18'-10"	302	32	#4	13"	5'-10"	125	22	#4	18"	6'-5"	94	24	#4	12 1/2"	6'-9"	108	10	#4	SHOWN	8'-8"	58	18	#4	6"	3'-4"	40
W-4	26	#4	12"	19'-4"	336	25	#4	12"	5'-10"	97	7	#4	11 1/2"	24'-10"	116	24	#4	12 1/2"	24'-10"	398	36	#4	13"	5'-10"	140	30	#4	18"	6'-5"	129	24	#4	12 1/2"	6'-9"	108	13	#4	SHOWN	8'-8"	76	27	#4	6"	3'-4"	60
W-5	32	#4	12"	19'-4"	413	31	#4	12"	5'-10"	121	7	#4	11 1/2"	30'-10"	144	24	#4	12 1/2"	30'-10"	494	40	#4	13"	5'-10"	156	38	#4	18"	6'-5"	163	24	#4	12 1/2"	6'-9"	108	16	#4	SHOWN	8'-8"	93	36	#4	6"	3'-4"	80

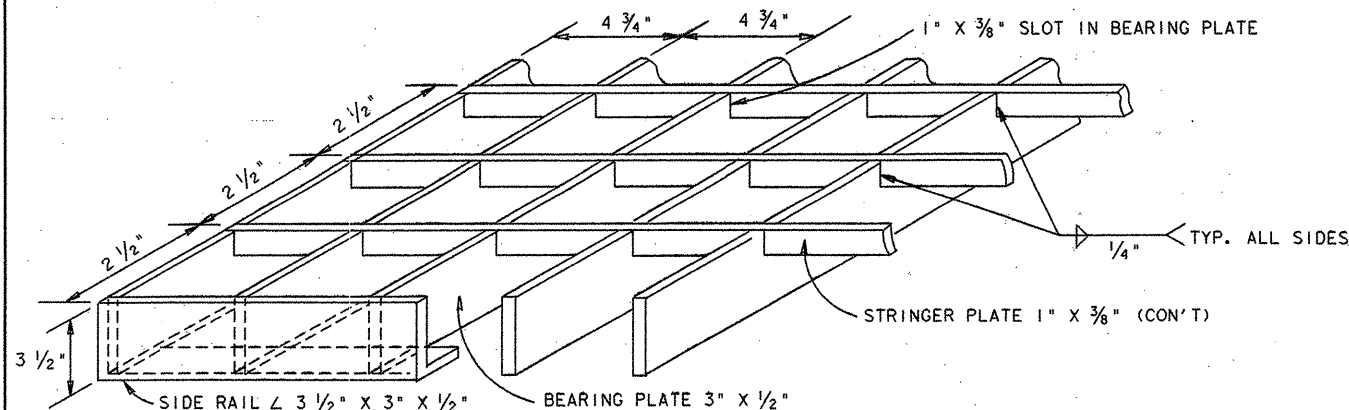
FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.			SHEET NO.
6	NH 95 (40) IM			280
STATE	STATE DIST. NO.	COUNTY		
TEXAS	15	COMAL		
CONT.	SECT.	JOB	HIGHWAY NO.	
0016	05	087	IH 35	



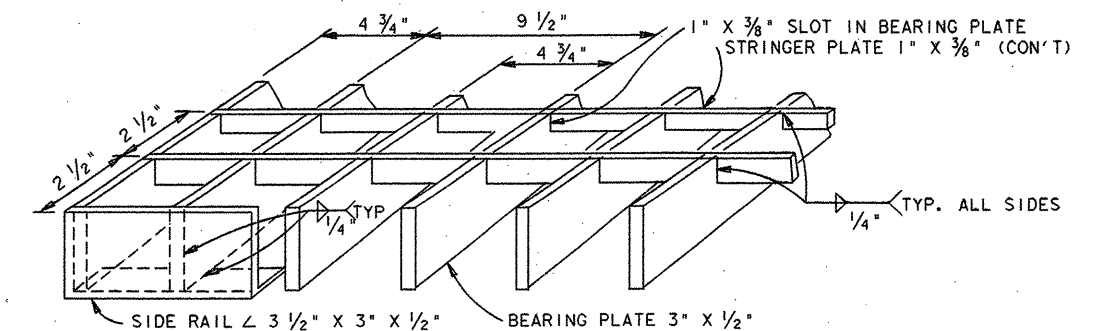
GRATE
PLAN VIEW



GRATE
PLAN VIEW



GRATE CORE

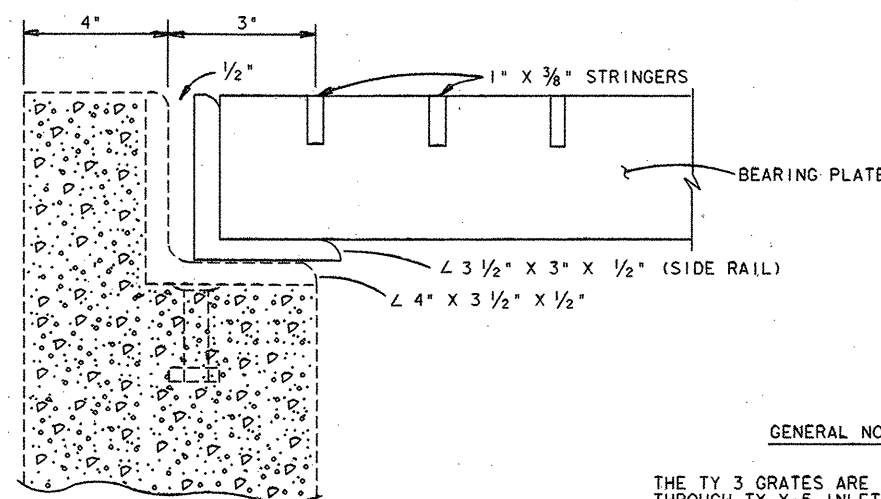


DETAIL OF GRATE CORE

STRUCTURAL STEEL FOR ONE TYPE 3 GRATE										
GRATE DIM. OUT TO OUT		SIDE-RAIL		BEARING PLATE		STRINGER PLATE		TOTAL WEIGHT		
L	W	NO.	LGTH.	WT.	NO.	LGTH.	WT.	NO.	LGTH.	WT.
3'-11 1/2"	2'-11"	2	3'-11 1/2"	81	11	2'-10"	159	13	3'-11 1/2"	66

* FOR CONTRACTOR'S INFORMATION ONLY

GRATE TYPE 3



SECTION A-A

STRUCTURAL STEEL FOR ONE TYPE 4 GRATE										
GRATE DIM. OUT TO OUT		SIDE-RAIL		BEARING PLATE		STRINGER PLATE		TOTAL WEIGHT		
L	W	NO.	LGTH.	WT.	NO.	LGTH.	WT.	NO.	LGTH.	WT.
3'-11 1/2"	5'-5"	2	3'-11 1/2"	81	11	5'-4"	299	27	3'-11 1/2"	137

* FOR CONTRACTOR'S INFORMATION ONLY

GRATE TYPE 4

TYPE 3 & TYPE 4 GRATE SAN ANTONIO DISTRICT STANDARD

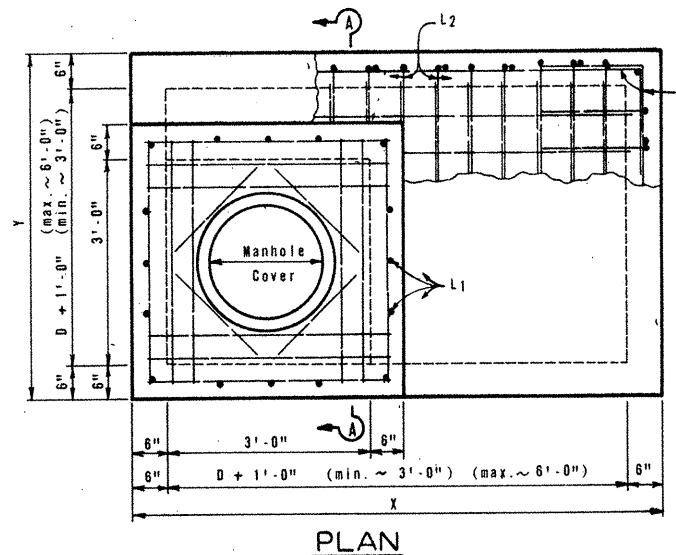
GENERAL NOTES :

THE TY 3 GRATES ARE REQUIRED ON TY Y-1 THROUGH TY Y-5 INLETS.

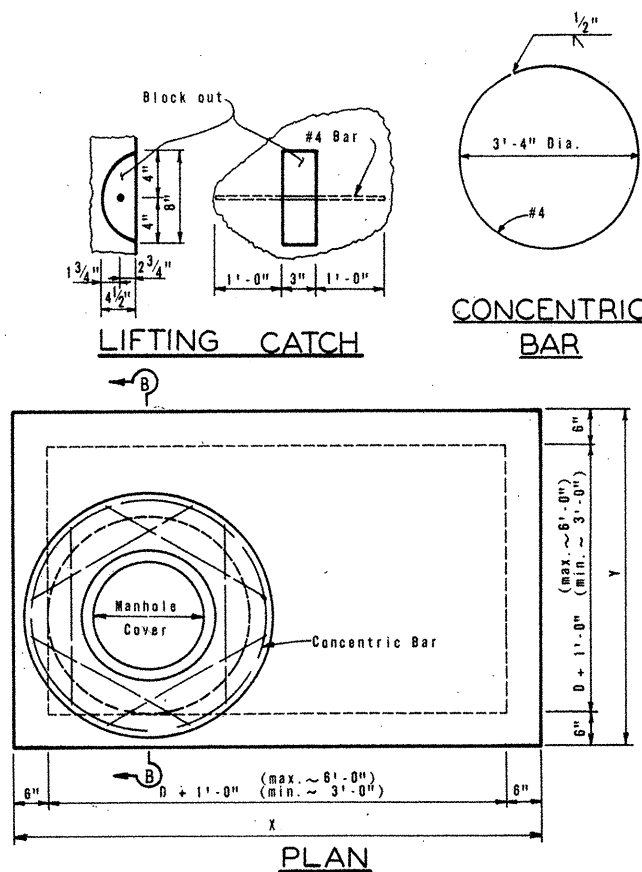
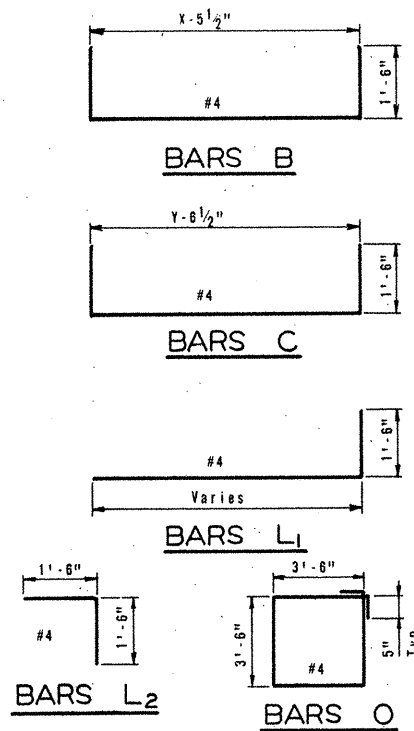
THE TY 4 GRATES ARE REQUIRED ON TY W-1 THROUGH TY W-5 INLETS.

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.
6	NH 95 (40) IM	281
STATE	COUNTY	
TEXAS	COMAL	
CONT.	SECT.	JOB
0016	05	087
HIGHWAY NO.		
TH 35		

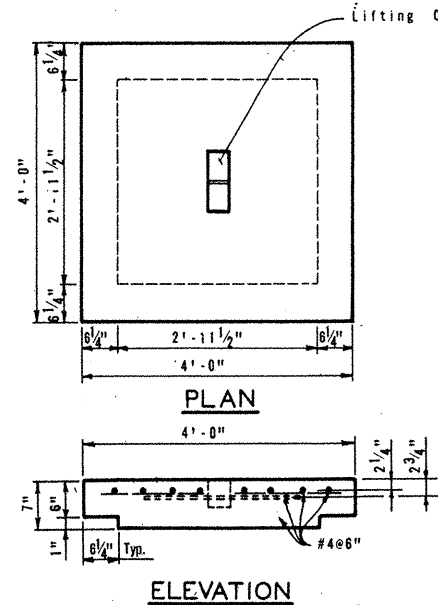
Note: Riser, either cast-in-place or concrete pipe, may be located in any corner.



PLAN

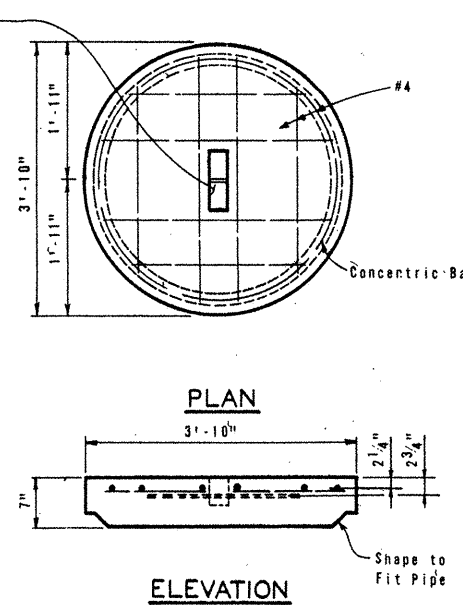


PLAN



ELEVATION

CAST-IN-PLACE RISER COVER



ELEVATION

CONCRETE PIPE RISER COVER

OPTIONAL PRECAST CONCRETE LIFT-OFF COVERS

GENERAL NOTES

Unless otherwise shown in the plans, payment will be made for each Manhole of the Type M.
Exposed edges shall be chamfered 3/4".
Alternate design drawings bearing the seal of a registered professional engineer will be acceptable for precast construction of manholes.
Shop drawings will not be required.

The contractor may with the approval of the Engineer furnish manholes of equivalent structural design.

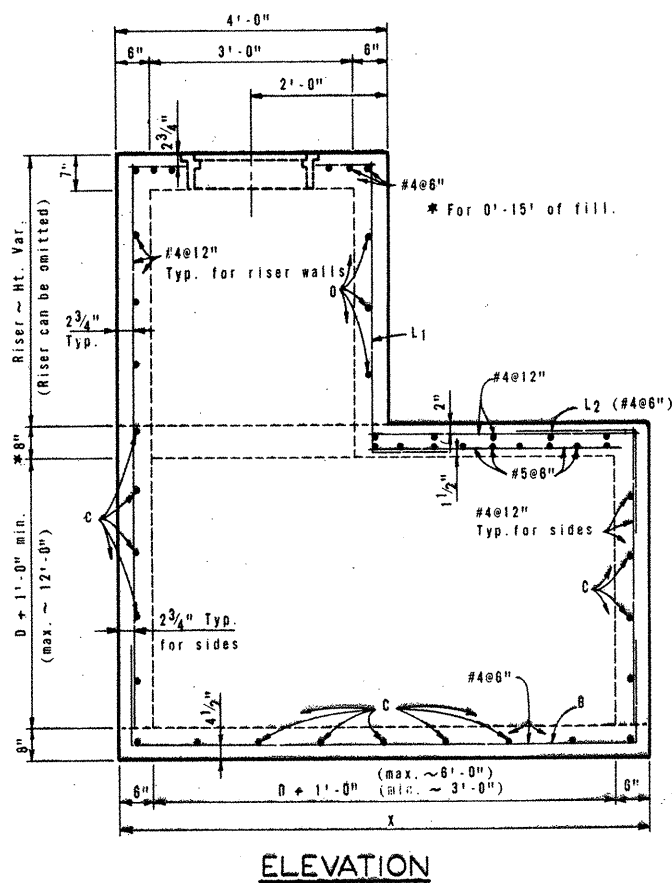
In areas of conflict between reinforcing steel, block-outs, pipes, anchor bolts or other reinforcing steel, the reinforcement shall be bent or adjusted to clear as directed by the Engineer.

The riser may be constructed of reinforced concrete as shown or of Reinforced Concrete Pipe, Class III, in accordance with ASTM Designation C-76. If pipe is used, joints shall conform to the Item "Reinforced Concrete Pipe Joints". Precast Concrete Lift Off Cover may be substituted for "Ring and Cover".

Connecting pipes should enter within 15° of normal to inlet wall. If necessary, pipe elbow or curved approach alignment should be used to stay within this limit.

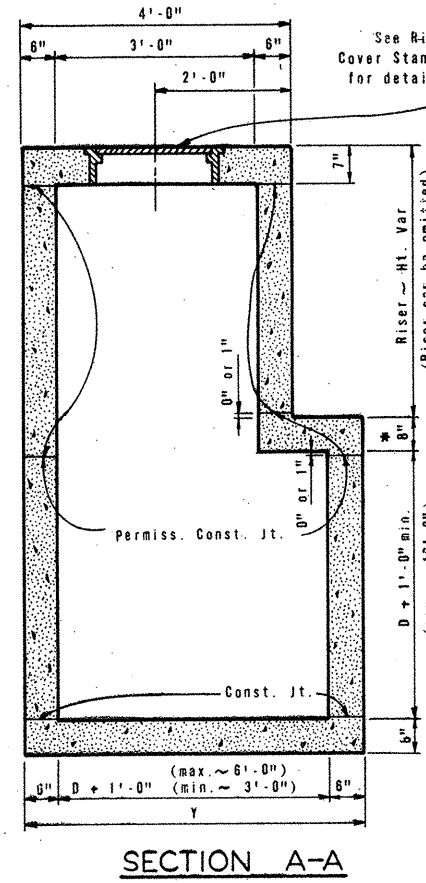


Pipes may enter any or all walls. The maximum size of pipe that can be accommodated is 60". More than one pipe may enter a side, subject to the maximum box dimensions shown. The clear distance between adjacent pipes should be 9" minimum.

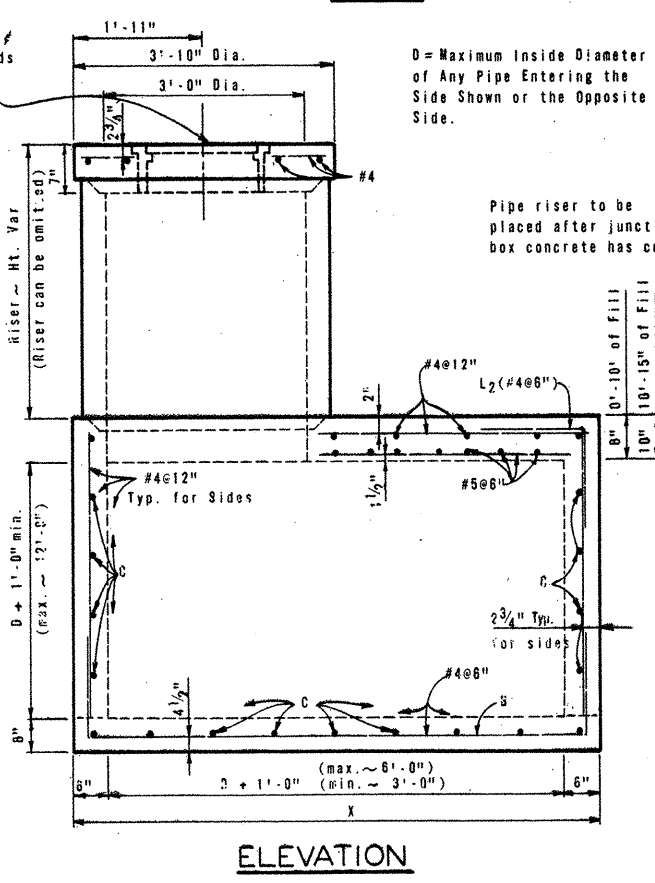


ELEVATION

MANHOLE WITH CAST-IN-PLACE RISER

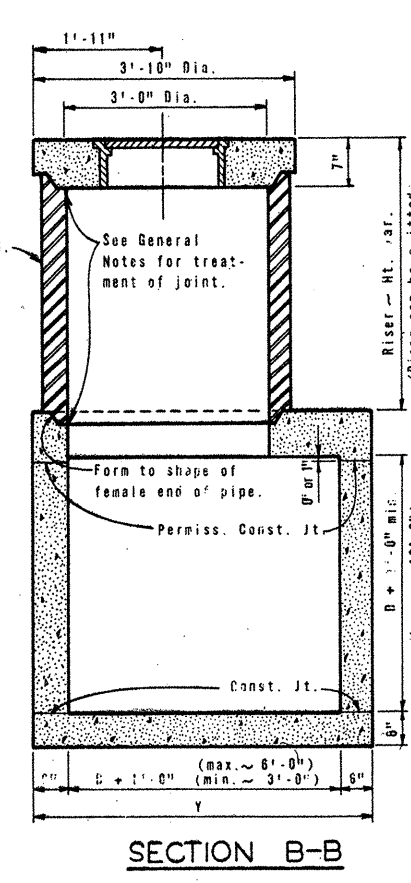


SECTION A-A



ELEVATION

OPTIONAL MANHOLE WITH PIPE RISER



SECTION B-B

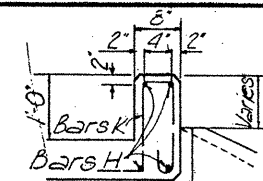


STATE DEPARTMENT OF HIGHWAYS
AND PUBLIC TRANSPORTATION
MANHOLE TYPE M
(JUNCTION BOX WITH ACCESS)

MH-M

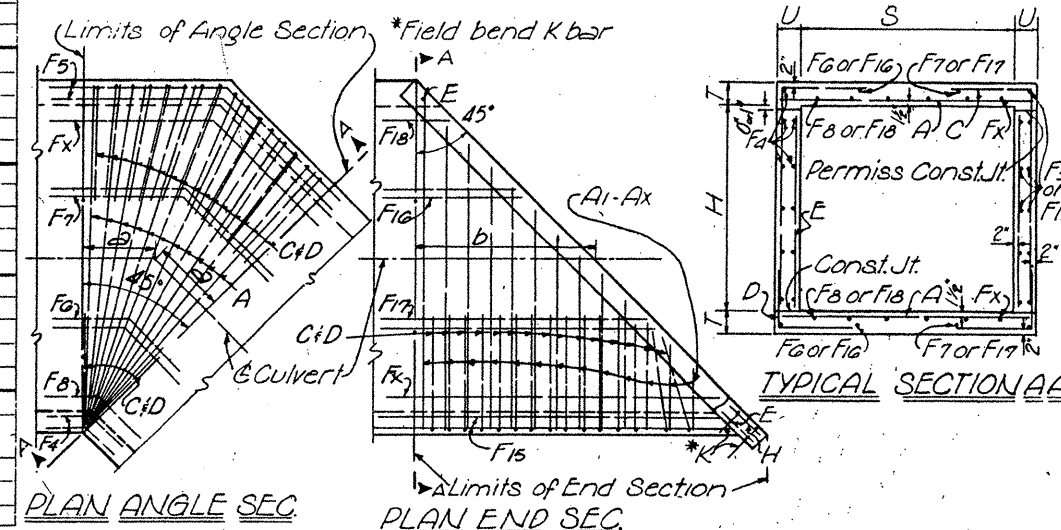
ORIGINAL DRAWING DATE: DEC. 1977	STATE: FEDERAL	FEDERAL AID PROJECT	SHEET
DN: ADC	15	NH 95(40)IM	282
CK: THD	Rev. 8-86 Gen. Notes	COUNTY	CONTROL SECTION JOB
DN: MGB		C. O. M. A. L.	0016 05 087 2H35
CK: THD			

BILL OF STEEL ~ END SECTION

[illegible]

SECTION THRU CURB

NOTE: It is desirable to have at least one foot of straight extension before beginning Angle Section. F bars may be eliminated from this one foot section



* Bars A in top Slab only

BILL OF STEEL ~ ANGLE SECTION

CULVERT SIZE		DIM 2	TOTAL QUANTITIES		BARS A IN TOP & BOTTOM SLAB					BARS C WALLS & TOP CORNER					BARS D IN BOTTOM CORNER					*4 BARS E @ 18" C/O.C.			NUMBER OF *4 BARS F LENGTH SHOWN IN TABLE							*4 BARS M IN TOP SLAB & WALLS				*4 BARS N IN BOTTOM SLAB						
S	H		CONC.	STEEL	NO.	SIZE	SPA.	LGTH.	WT.	NO.	SIZE	SPA.	LGTH.	WT.	NO.	SIZE	SPA.	LGTH.	WT.	NO.	LGTH.	WT.	F4	F5	F6	F7	F8-Fx	WT.	NO.	LGTH.	WT.	NO.	LGTH.	WT.	NO.	LGTH.	WT.			
3	2	2 1/2'	37	97	6	4	7"	3'-8"	15													4	4	1	1	6	40	2	8'-4"	3	6'-0"	23	2	6'-8"	3	5'-2"	19			
	3	2 1/2'	43	102	6	4	7"	3'-8"	15													4	4	1	1	6	40	2	10'-4"	3	7'-0"	28	2	6'-8"	3	5'-2"	19			
4	2	1'-0 1/2'	54	153	9	4	6"	4'-8"	28													4	4	1	1	8	49	2	9'-4"	6	7'-0"	41	2	7'-8"	6	6'-2"	35			
	3	1'-0 1/2'	61	159	9	4	6"	4'-8"	28													4	4	1	1	8	49	2	11'-4"	6	8'-0"	47	2	7'-8"	6	6'-2"	35			
5	4	1'-0 1/2'	69	172	9	4	6"	4'-8"	28													5	5	1	1	8	55	2	13'-4"	6	9'-0"	54	2	7'-8"	6	6'-2"	35			
	2	1'-2 1/2'	74	220	16	5	8"	5'-8"	95	10	4	8"	4'-10"	32	10	4	8"	4'-1"	27				4	4	2	2	10	66	MIN Bars & Spacing Shown for End. Sec.											
6	3	1'-2 1/2'	83	227	16	5	8"	5'-8"	95	10	4	8"	5'-10"	39	10	4	8"	4'-1"	27				4	4	2	2	10	63	LENGTH OF F BARS IN ANGLE SEC.											
	4	1'-2 1/2'	92	240	16	5	8"	5'-8"	95	10	4	8"	6'-10"	46	10	4	8"	4'-1"	27				5	5	2	2	10	72	CULVERT S	F4 LGTH.	F5 LGTH.	F6 LGTH.	F7 LGTH.	F8 LGTH.	F8-Fx LGTH.	Fx LGTH.				
7	5	1'-3 3/8'	1.14	292	16	5	8"	5'-10"	97	10	4	8"	7'-10"	52	10	4	8"	4'-1"	27	4	4'-11"	13	10	10	2	2	10	103	3	2'-3 1/2'	5'-2"	2'-10"	4'-6"	12"	2'-10"	F10-4'-6"				
	3	1'-5 3/8'	1.07	291	18	5	8"	6'-8"	125	14	4	6"	5'-10"	55	14	4	6"	4'-1"	38				4	4	2	2	10	73	4	2'-3 1/2'	6'-0"	3'-3"	4'-11"	12"	2'-10"	F11-5'-4"				
8	4	1'-5 3/8'	1.18	306	18	5	8"	6'-8"	125	14	4	6"	6'-10"	64	14	4	6"	4'-1"	38				5	5	2	2	10	79	5	2'-3 1/2'	6'-10"	4'-1"	4'-11"	12"	2'-10"	F12-6'-4"				
	5	1'-5 3/8'	1.43	364	18	5	8"	6'-10"	128	14	4	6"	7'-10"	73	14	4	6"	4'-1"	38	4	4'-11"	13	10	10	2	2	10	112	6	2'-3 1/2'	7'-8"	4'-1"	5'-8 1/2"	16"	2'-8 1/2"	F12-7'-1 1/2"				
9	6	1'-5 3/8'	1.56	386	18	5	8"	6'-10"	128	15	4	5 1/2"	8'-10"	89	15	4	5 1/2"	4'-1"	41	4	5'-11"	16	10	10	2	2	10	112	7	2'-4"	8'-7 1/2"	4'-4"	6'-5"	18"	2'-11"	F12-7'-10 1/2"				
	3	1'-7 7/8"	1.43	422	24	5	7"	7'-8"	192	13	5	7 1/2"	6'-2"	84	13	5	7 1/2"	4'-10"	66				4	4	2	2	10	80	8	2'-4"	9'-3 1/2"	4'-4"	7'-3"	18"	2'-8 1/2"	F13-8'-11"				
10	4	1'-7 7/8"	1.55	445	26	5	6 1/2"	7'-8"	208	12	5	8"	7'-2"	90	12	5	8"	4'-10"	60				5	5	2	2	10	87	9	2'-4"	10'-3 1/2"	4'-4"	8'-1"	18"	3'-1 1/2"	F13-9'-4"				
	5	1'-8 1/2"	1.84	529	26	5	6 1/2"	7'-10"	212	13	5	8"	8'-2"	111	13	5	8"	4'-10"	66	5	4'-11"	16	10	10	2	2	10	124	10	2'-5"	11'-3"	4'-6"	8'-11"	18"	2'-11 1/2"	F14-10'-5"				
11	6	1'-8 1/2"	1.99	546	26	5	6 1/2"	7'-10"	212	13	5	8"	9'-2"	124	13	5	8"	4'-10"	66	5	5'-11"	20	10	10	2	2	10	124												
	7	1'-8 3/4"	2.13	577	26	5	6 1/2"	7'-10"	212	13	5	7 1/2"	10'-2"	138	13	5	7 1/2"	4'-10"	66	5	6'-11"	23	12	12	2	2	10	138												
12	4	1'-10 3/8"	2.11	591	24	6	8"	8'-8"	312	14	5	7 1/2"	7'-3"	106	14	5	7 1/2"	4'-11"	72				5	5	2	2	12	101	LENGTH OF F BARS IN END SECTION											
	5	1'-10 1/2"	2.43	671	24	6	8"	9'-10"	318	14	5	8"	8'-3"	120	14	5	8"	4'-11"	72	6	4'-11"	20	10	10	2	2	12	141	CULVERT S	F15 LGTH.	F16 LGTH.	F17 LGTH.	SPA.	F18 LGTH.	F18-Fx LGTH.	Fx LGTH.				
13	6	1'-10 1/2"	2.60	690	24	6	8"	8'-10"	318	14	5	8"	9'-3"	135	14	5	8"	4'-11"	72	6	5'-11"	24	10	10	2	2	12	141	3	4'-6"	1'-10"	3'-10"	12"	1'-10"	F20-3'-10"					
	7	1'-11 3/8"	2.76	740	24	6	8"	8'-10"	318	15	5	7 1/2"	10'-3"	160	15	5	7 1/2"	4'-11"	77	6	6'-11"	28	12	12	2	2	12	157	4	5'-8"	2'-4"	4'-4"	12"	1'-10"	F21-4'-10"					
14	8	1'-11 3/8"	3.20	783	24	6	8"	9'-0"	324	16	5	7"	11'-3"	188	16	5	7"	4'-11"	82	6	7'-11"	32	12	12	2	2	12	157	5	6'-6"	3'-4"	4'-4"	12"	1'-10"	F22-5'-10"					
	5	2'-1 1/4"	3.02	864	30	6	7"	9'-10"	443	18	5	6 1/2"	8'-4"	156	18	5	6 1/2"	5'-0"	94	6	4'-11"	20	10	10	2	2	12	151	6	7'-8"	3'-4"	5'-4"	16"	1'-8"	F22-7'-0"					
15	6	2'-1 1/4"	3.21	887	30	6	7"	9'-10"	443	18	5	6 1/2"	9'-4"	175	18	5	6 1/2"	5'-0"	94	6	5'-11"	24	10	10	2	2	12	151	7	8'-10"	3'-8"	6'-2"	18"	1'-11"	F22-7'-11"					
	7	2'-1 1/2"	3.39	957	32	6	6 1/2"	9'-10"	473	18	5	6 1/2"	10'-4"	194	18	5	6 1/2"	5'-0"	94	6	6'-11"	28	12	12	2	2	12	168	8	9'-10"	3'-8"	6'-2"	18"	1'-8"	F23-9'-2"					
16	8	2'-1 1/2"	3.88	988	32	6	6 1/2"	10'-0"	481	18	5	6 1/2"	11'-4"	213	18	5	6 1/2"	5'-0"	94	6	7'-11"	32	12	12	2	2	12	168	9	10'-0"	3'-8"	8'-2"	18"	2'-2"	F23-9'-8"					
	9	2'-1 1/2"	4.09	1063	32	6	6 1/2"	10'-0"	481	20	5	6"	12'-4"	257	20	5	6"	5'-0"	104	6	8'-11"	36	14	14	2	2	12	185	10	12'-0"	3'-10"	9'-2"	18"	2'-0"	F24-11'-0"					
17	5	2'-3 3/4"	3.71	1149	28	7	8 1/2"	10'-10"	620	16	6	8"	8'-6"	204	16	6	8"	5'-5"	130	7	4'-11"	23	10	10	2	2	14	172												
	6	2'-3 3/4"	3.91	1178	28	7	8"	10'-10"	620	16	6	8"	9'-6"	223	16	6	8"	5'-5"	130	7	5'-11"	28	10	10	2	2	14	172												
18	7	2'-3 3/4"	4.11	1224	28	7	8"	10'-10"	620	16	6	8"	10'-6"	252	16	6	8"	5'-5"	130	7	6'-11"	32	12	12	2	2	14	190												
	8	2'-4 3/8"	4.65	1334	30	7	8"	11'-0"	675	17	6	8"	11'-6"	294	17	6	8"	5'-5"	138	7	7'-11"	37	12	12	2	2	14	190												
19	9	2'-4 3/8"	4.88	1409	30	7	8"	11'-0"	675	18	6	7 1/2"	12'-6"	338	18	6	7 1/2"	5'-5"	146	7	8'-11"	42	14	14	2	2	14	208												
	10	2'-4 3/8"	5.11	1532	32	7	7 1/2"	11'-0"	719	19	6	7"	13'-6"	385	19	6	7"	5'-5"	155	7	9'-11"	46	16	16	2	2	14	227												

* Bars A in top Slab only

Bars M & N replace Bars C & D when shown.
Bars F₁, F₂, F₃ & F₄ are not used in bottom slab when bars M & N are used. When only 2 Bars E are shown, they shall be placed in walls at end of barrel.

$$X = 2U + S - 4''$$

✓ Eliminate one "Y" bend on all but two bars in angle section.

BARS M

(Eliminate one 'Y' bend and shorten X in end section)

BARS N

GENERAL NOTES:

This Design is adopted from Texas Highway Department Standard for Lengthening Details Single Box Culverts SCL. Refer to this Standard for details not shown on this sheet.

Chamfer exposed corners $\frac{3}{4}$ "

Refer to Standard SCL for straight sections of culvert.

All dimensions relating to reinforcing steel are to centers of bars

All reinforcing steel shall be Grade 60.

TEXAS HIGHWAY DEPARTMENT
BRIDGE DIVISION

LENGTHENING DETAILS
SINGLE BOX CULVERTS
45° SKEW
SCL 45°

ORIGINAL DRAWING DATE: 4-62		FED. RD. DIV. NO.	STATE	FEDERAL PROJECT NO.		SHEET NO.
DN: T.H.D.	REVISIONS	5	TEXAS	NH 95(40)IM		283
CK: T.H.D.	Rev. NOV. 1964	STATE	COUNTY	CONTR.	SECT.	REVISION
DW: R.D.K.	Rev. MAR. 1967	DIST. NO.	5	COMAL	0016	05
CK: H.W.	Rev. 8-87 (Gen. Note)					108

PLAN	SURVEYED	BY	DATE
	PLOTTED	BY	DATE
	NOTES CHECKED	BY	DATE
	STRUCTURE NOTATIONS CHECKED	BY	DATE

PROJ.	SURVEYED	BY	DATE
	PLOTTED	BY	DATE
	NOTES CHECKED	BY	DATE
	STRUCTURE NOTATIONS CHECKED	BY	DATE

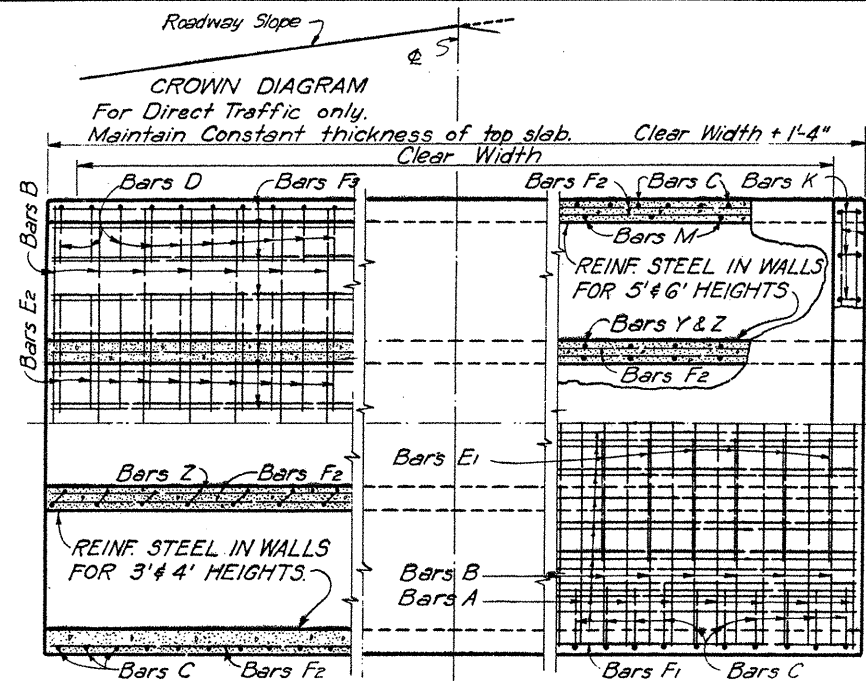
CULVERT SIZE		TYPE OF SECTION	DIMENSIONS		MAX. FILL	TOTAL QUANTITIES FOR A 10' EXTENSION		QUANTITIES PER LIN. FT. OF BARREL EXTENSION		BILL OF REINFORCING STEEL FOR A 10'-0" EXTENSION ON ONE END OF CULVERT ONLY																												CULVERT SIZE																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
						CONC.	REINF.	CONC.	REINF.	BARS A IN TOP SLAB				BARS B IN BOTTOM SLAB				BARS C WALLS & TOP CORNER				BARS D IN BOTTOM CORNERS				16-#4 BARS E @ 1'-0" c-c		#4 BARS F Length 10'-4"						2-#4 BARS H 12'-3-11/16" IN TOP SLAB & WALLS		#4 BARS K IN TOP SLAB & WALLS				#4 BARS N IN BOTTOM SLAB																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
S	H	T	U	Ft.	CONC.	REINF.	CONC.	REINF.	NO.	SIZE	SPAC.	LGTH.	WT.	NO.	SIZE	SPAC.	LGTH.	WT.	NO.	SIZE	SPAC.	LGTH.	WT.	NO.	SIZE	SPAC.	LGTH.	WT.	LGTH.	WT.	Ft.	SPAC.	Ft.	SPAC.	Ft.	SPAC.	TOTAL	WT.	LGTH.	WT.	NO.	WT.	NO.	SPAC.	LGTH.	WT.	NO.	SPAC.	LGTH.	WT.	S	H																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
3	2	1	6"	6"	14	2.67	312	0.222	26.92	19	#4	7"	3'-8"	47																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					

PLAN	SURVEYED BY	DATE	CHECKED BY	DATE	NOTED BY	STRUCTURE NOTES ON NO.

PROFILE	SURVEYED BY	DATE	CHECKED BY	DATE	NOTED BY	STRUCTURE NOTES ON NO.

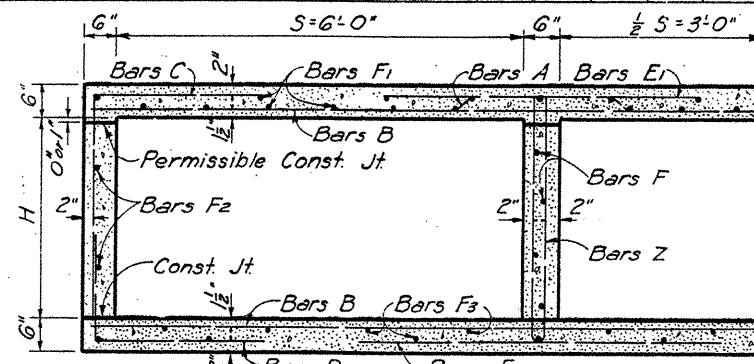
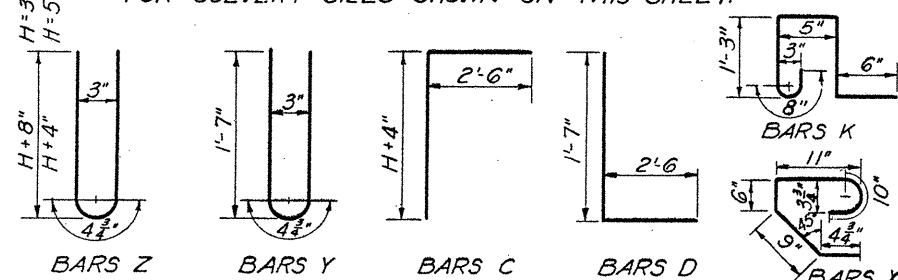
CULVERT SIZE	TABLE OF DIMENSIONS										TOTAL		TABLE OF REINFORCING STEEL FOR 2 WINGS																												CULVERT SIZE							
											QUANTITIES		Bars H-#4 2'-6" Long @ 12"	Bars J-#6 4'-0" Long	Bars O #4 @ 12"	Bars O1-Qx #4 @ 12"	Bars P #4 @ 12"	Bars P1-Px #4 @ 12"	Bars Q1-Qx #4 @ 12"	Bars R 4-#4	Bars S 8-#4	Bars U #4	Bars V1-Vx				8 Bars W																					
											Conc.	Steel											No.	Wt.	No.	Wt.	No.	Wt.	No.	Wt.	No.	Wt.	No.	Wt.	No.	Wt.	No.	Wt.	No.	Wt.		No.	Wt.	No.	Wt.			
	S	H	L	M	V	W	C	D	Ta	K	K	K	Cu Yds	Lbs	No.	Wt.	No.	Wt.	No.	Wt.	No.	Wt.	No.	Wt.	No.	Wt.	No.	Wt.	No.	Wt.	No.	Wt.	No.	Wt.	No.	Wt.	S	H										
3 x 2		3'-6"	3'-8"	6"	6'-5"	1'-0"	2'-8"	6"	-	-	-	1.73	241	12	20	8	48	3	5'-11"	12	4	3'-6"	9	3	6'-5"	13	4	4'-0"	11	6	5'-0"	20	6'-6"	17	3'-5"	18	8	3'-1"	16	16	#4	12"	3'-6"	37	#4	3'-9"	20	3 x 2
3 x 3		5'-6"	5'-11"	6"	8'-5"	1'-0"	3'-8"	6"	-	-	-	3.03	371	16	27	8	48	3	7'-11"	16	6	4'-6"	18	3	8'-5"	17	6	5'-0"	20	10	6'-0"	40	8'-6"	23	5'-8"	30	12	4'-4"	35	24	#4	12"	4'-0"	64	#4	6'-3"	33	3 x 3
4 x 2		3'-6"	3'-8"	6"	7'-5"	1'-0"	2'-8"	6"	-	-	-	1.93	256	12	20	8	48	4	5'-11"	16	4	3'-6"	9	4	6'-5"	17	4	4'-0"	11	6	6'-0"	24	7'-6"	20	3'-5"	18	8	3'-1"	16	16	#4	12"	3'-6"	37	#4	3'-9"	20	4 x 2
4 x 3		5'-6"	5'-11"	6"	9'-5"	1'-0"	3'-8"	6"	-	-	-	3.29	390	16	27	8	48	4	7'-11"	21	6	4'-6"	18	4	8'-5"	22	6	5'-0"	20	10	7'-0"	47	9'-6"	25	5'-8"	30	12	4'-4"	35	24	#4	12"	4'-0"	64	#4	6'-3"	33	4 x 3
4 x 4		7'-6"	8'-2"	6"	11'-5"	1'-0"	4'-8"	6"	-	-	-	4.98	558	20	33	8	48	4	9'-11"	26	8	5'-6"	29	4	10'-5"	28	8	6'-0"	32	14	8'-0"	75	11'-6"	31	7'-10"	42	16	5'-7"	60	36	#4	12"	4'-6"	108	#4	8'-7"	46	4 x 4
5 x 2		3'-6"	3'-8"	6"	8'-5"	1'-0"	2'-8"	6"	-	-	-	2.12	271	12	20	8	48	5	5'-11"	20	4	3'-6"	9	5	6'-5"	21	4	4'-0"	11	6	7'-0"	28	8'-6"	23	3'-5"	18	8	3'-1"	16	16	#4	12"	3'-6"	37	#4	3'-9"	20	5 x 2
5 x 3		5'-6"	5'-11"	6"	10'-5"	1'-0"	3'-8"	6"	-	-	-	3.56	410	16	27	8	48	5	7'-11"	26	6	4'-6"	18	5	8'-5"	28	6	5'-0"	20	10	8'-0"	53	10'-6"	28	5'-8"	30	12	4'-4"	35	24	#4	12"	4'-0"	64	#4	6'-3"	33	5 x 3
5 x 4		7'-6"	8'-2"	6"	12'-5"	1'-0"	4'-8"	6"	-	-	-	5.32	583	20	33	8	48	5	9'-11"	33	8	5'-6"	29	5	10'-5"	35	8	6'-0"	32	14	9'-0"	84	12'-6"	33	7'-10"	42	16	5'-7"	60	36	#4	12"	4'-6"	108	#4	8'-7"	46	5 x 4
5 x 5		8'-6"	9'-3"	6"	13'-5"	1'-0"	5'-8"	6"	-	-	-	7.17	728	24	40	8	48	5	10'-11"	36	8	6'-6"	35	5	11'-5"	38	8	7'-0"	37	16	9'-6"	102	13'-6"	36	9'-0"	48	20	6'-6"	87	40	#4	12"	5'-3"	140	#5	9'-8"	81	5 x 5
6 x 3		5'-6"	5'-11"	6"	11'-5"	1'-0"	3'-8"	6"	-	-	-	3.83	432	16	27	8	48	6	7'-11"	32	6	4'-6"	18	6	8'-5"	34	6	5'-0"	20	10	9'-0"	60	11'-6"	31	5'-8"	30	12	4'-4"	35	24	#4	12"	4'-0"	64	#4	6'-3"	33	6 x 3
6 x 4		7'-6"	8'-2"	6"	13'-5"	1'-0"	4'-8"	6"	-	-	-	5.66	610	20	33	8	48	6	9'-11"	40	8	5'-6"	29	6	10'-5"	42	8	6'-0"	32	14	10'-0"	94	13'-6"	36	7'-10"	42	16	5'-7"	60	36	#4	12"	4'-6"	108	#4	8'-7"	46	6 x 4
6 x 5		8'-6"	9'-3"	6"	14'-5"	1'-0"	5'-8"	6"	-	-	-	7.55	757	24	40	8	48	6	10'-11"	44	8	6'-6"	35	6	11'-5"	46	8	7'-0"	37	16	10'-6"	112	14'-6"	39	9'-0"	48	20	6'-6"	87	40	#4	12"	5'-3"	140	#5	9'-8"	81	6 x 5
6 x 6		10'-6"	11'-6"	6"	16'-5"	1'-0"	6'-8"	6"	-	-	-	10.13	972	28	47	8	48	6	12'-11"	52	10	7'-6"	50	6	13'-5"	54	10	8'-0"	53	20	11'-6"	154	16'-6"	44	11'-8"	60	24	7'-8"	123	48	#4	12"	5'-9"	184	#5	12'-4"	103	6 x 6
7 x 3		5'-6"	5'-11"	6"	12'-6"	1'-0"	3'-8"	6 1/2"	10"	10"	10"	4.36	465	16	27	8	48	7	8'-0"	37	6	4'-7"	18	7	8'-6"	40	6	5'-1"	20	10	10'-0"	67	12'-7"	34	5'-8"	30	12	4'-4"	35	28	#4	12"	4'-1"	76	#4	6'-3"	33	7 x 3
7 x 4		7'-6"	8'-3"	6"	14'-6"	1'-0"	4'-8"	6 1/2"	10"	10"	10"	6.37	642	20	33	8	48	7	10'-0"	47	8	5'-7"	30	7	10'-6"	49	8	6'-1"	33	14	11'-0"	103	14'-7"	39	8'-0"	43	16	5'-7"	60	36	#4	12"	4'-7"	110	#4	8'-9"	47	7 x 4
7 x 5		8'-6"	9'-4"	7"	15'-6"	1'-6"	5'-8"	6 1/2"	10"	10"	10"	8.37	792	24	40	8	48	7	11'-0"	51	8	6'-7"	35	7	11'-6"	54	8	7'-1"	38	16	11'-6"	123	15'-7"	42	9'-1"	49	20	6'-6"	87	40	#4	12"	5'-4"	142	#5	9'-11"	83	7 x 5
7 x 6		10'-6"	11'-7"	7"	17'-6"	1'-6"	6'-8"	6 1/2"	10"	10"	10"	11.15	1014	28	47	8	48	7	13'-0"	61	10	7'-7"	51	7	13'-6"	63	10	8'-1"	54	20	12'-6"	167	17'-7"	47	11'-4"	61	24	7'-9"	124	48	#4	12"	5'-10"	187	#5	12'-5"	104	7 x 6
7 x 7		12'-6"	13'-10"	7"	19'-6"	1'-6"	7'-8"	6 1/2"	10"	10"	10"	14.28	1372	32	53	8	48	7	15'-0"	70	12	8'-7"	69	7	15'-6"	72	12	9'-1"	73	24	13'-6"	216	19'-7"	52	13'-7"	73	28	8'-11"	167	84	#4	8"	6'-4"	355	#5	14'-11"	124	7 x 7
8 x 4		7'-6"	8'-4"	6"	15'-7"	1'-0"	4'-9"	7"	9 1/2"	10"	10 1/2"	7.14	671	20	33	8	48	8	10'-1"	54	8	5'-8"	30	8	10'-7"	57	8	6'-2"	33	14	12'-0"	112	15'-8"	42	8'-1"	43	16	5'-7"	60	36	#4	12"	4'-8"	112	#4	8'-10"	47	8 x 4
8 x 5		8'-6"	9'-6"	7"	16'-7"	1'-6"	5'-9"	7"	9 1/2"	10"	10 1/2"	9.26	828	24	40	8	48	8	11'-1"	59	8	6'-8"	36	8	11'-7"	62	8	7'-2"	38	16	12'-6"	134	16'-8"	45	9'-2"	49	20	6'-7"	88	40	#4	12"	5'-5"	145	#5	10'-1"	84	8 x 5
8 x 6		10'-6"	11'-8"	7"	18'-7"	1'-6"	6'-9"	7"	9 1/2"	10"	10 1/2"	12.25	1053	28	47	8	48	8	13'-1"	70	10	7'-8"	51	8	13'-7"	73	10	8'-2"	55	20	13'-6"	180	18'-8"	50	11'-5"	61	24	7'-9"	124	48	#4	12"	5'-11"	190	#5	12'-6"	104	8 x 6
8 x 7		12'-6"	13'-11"	7"	20'-7"	1'-6"	7'-9"	7"	9 1/2"	10"	10 1/2"	15.60	1385	32	53	8	48	8	15'-1"	81	12	8'-8"	69	8	15'-7"	83	12	9'-2"	73	24	14'-6"	232	20'-8"	55	13'-8"	73	28	8'-11"	167	76	#4	9"	6'-5"	326	#5	15'-0"	125	8 x 7
8 x 8		13'-6"	15'-10"	8"	21'-7"	2'-0"	8'-9"	7"	9 1/2"	10"	10 1/2"	19.25	1818	36	60	8	48	8	16'-2"	86	12	9'-9"	78	8	16'-8"	89	12	10'-3"	82	26	15'-0"	261	21'-8"	58	14'-9"	79	32	9'-9"	208	120	#4	6"	7'-2"	575	#6	16'-2"	194	8 x 8
9 x 5		8'-6"	9'-7"	7"	17'-8"	1'-6"	5'-9"	7"	9 1/2"	9 1/2"	10"	9.82	858	24	40	8	48	9	11'-2"	67	8	6'-9"	36	9	11'-8"	70	8	7'-3"	39	16	13'-6"	144	17'-9"	47	9'-3"	49	20	6'-7"	88	40	#4	12"	5'-5"	145	#5	10'-2"	85	9 x 5
9 x 6		10'-6"	11'-10"	7"	19'-8"	1'-6"	6'-9"	7"	9 1/2"	9 1/2"	10"	12.91	1106	28	47	8	48	9	13'-2"	79	10	7'-9"	52	9	13'-8"	82	10	8'-3"	55	20	14'-6"	194	19'-9"	53	11'-6"	61	24	7'-9"	124	52	#4	12"	5'-11"	206	#5	12'-7"	105	9 x 6
9 x 7		12'-6"	14'-0"	7"	21'-8"	1'-6"	7'-9"	7"	9 1/2"	9 1/2"	10"	16.36	1428	32	53	8	48	9	15'-2"	91	12	8'-9"	70	9	15'-8"	94	12	9'-3"	74	24	15'-6"	248	21'-9"	58	13'-9"	73	28	8'-11"	167	76	#4	9"	6'-5"	326	#5	15'-1"	126	9 x 7
9 x 8		13'-6"	15'-12"	8"	22'-8"	2'-0"	8'-9"	7"	9 1/2"	9 1/2"	10"	20.09	1894	36	60	8	48	9	16'-3"	98	14	8'-10"	83	9	16'-9"	101	14	9'-4"	87	26	16'-0"	278	22'-9"	61	14'-10"	79	32	9'-10"	210	124	#4	6"	7'-2"	594	#6	16'-3"	195	9 x 8
9 x 9																																																

BILLS OF REINFORCING STEEL - FOR 44' CLEAR WIDTH - BARRELS ONLY																																																							
2 SPANS 6'x3'														2 SPANS 6'x4'														2 SPANS 6'x5'														2 SPANS 6'x6'													
MARK	A	B	C	D	E1	E2	F1	F2	F3	H	K	Z	A	B	C	D	E1	E2	F1	F2	F3	H	K	Z	A	B	C	D	E1	E2	F1	F2	F3	H	K	M	Y	Z	A	B	C	D	E1	E2	F1	F2	F3	H	K	M	Y	Z			
NUMBER SIZE	55 #4	109 #4	136 #4	136 #4	54 #4	109 #4	21 #4	8 #4	15 #4	4 #4	28 #4	46 #4	55 #4	109 #4	136 #4	136 #4	54 #4	109 #4	21 #4	12 #4	15 #4	4 #4	28 #4	46 #4	55 #4	109 #4	136 #4	136 #4	54 #4	109 #4	21 #4	24 #4	15 #4	4 #4	28 #4	62 #4	46 #4	46 #4	55 #4	109 #4	136 #4	136 #4	54 #4	109 #4	21 #4	24 #4	15 #4	4 #4	28 #4	62 #4	46 #4	46 #4			
SPACING	10"	10"	8"	8"	10"	5"	~	18"	~	~	12"	12"	10"	10"	8"	8"	10"	5"	~	16"	~	~	12"	12"	10"	10"	8"	8"	10"	5"	~	15"	~	~	12"	18"	12"	12"	10"	10"	8"	8"	10"	5"	~	18"	~	~	12"	18"	12"	12"			
LENGTH	13'-4"	13'-2"	5'-10"	4'-1"	4'-8"	4'-8"	45'-0"	45'-0"	45'-0"	13'-2"	3'-11"	7'-6"	13'-4"	13'-2"	6'-10"	4'-1"	4'-8"	4'-8"	45'-0"	45'-0"	45'-0"	13'-2"	3'-11"	9'-6"	13'-7"	13'-5"	7'-10"	4'-1"	4'-8"	4'-8"	45'-0"	45'-0"	45'-0"	13'-5"	3'-11"	4'-11"	3'-4"	10'-10"	13'-7"	13'-5"	8'-10"	4'-1"	4'-8"	4'-8"	45'-0"	45'-0"	45'-0"	13'-5"	3'-11"	5'-11"	3'-4"	12'-10"			
WEIGHT	490	959	530	371	168	340	632	241	452	35	73	230	490	959	620	371	168	340	632	361	452	35	73	292	499	977	711	371	168	340	632	722	452	36	73	204	102	333	499	977	802	371	168	340	632	722	452	36	73	245	102	394			
3 SPANS 6'x3'														3 SPANS 6'x4'														3 SPANS 6'x5'														3 SPANS 6'x6'													
NUMBER SIZE	55 #4	109 #4	136 #4	136 #4	108 #4	218 #4	32 #4	12 #4	22 #4	4 #4	42 #4	92 #4	55 #4	109 #4	136 #4	136 #4	108 #4	218 #4	32 #4	18 #4	22 #4	4 #4	42 #4	92 #4	55 #4	109 #4	136 #4	136 #4	108 #4	218 #4	32 #4	32 #4	22 #4	4 #4	42 #4	62 #4	92 #4	92 #4	55 #4	109 #4	136 #4	136 #4	108 #4	218 #4	32 #4	32 #4	22 #4	4 #4	42 #4	62 #4	92 #4	92 #4			
SPACING	10"	10"	8"	8"	10"	5"	~	18"	~	~	12"	12"	10"	10"	8"	8"	10"	5"	~	16"	~	~	12"	12"	10"	10"	8"	8"	10"	5"	~	15"	~	~	12"	18"	12"	12"	10"	10"	8"	8"	10"	5"	~	18"	~	~	12"	18"	12"	12"			
LENGTH	20'-0"	19'-8"	5'-10"	4'-1"	4'-8"	4'-8"	45'-0"	45'-0"	45'-0"	19'-8"	3'-11"	7'-6"	20'-0"	19'-8"	6'-10"	4'-1"	4'-8"	4'-8"	45'-0"	45'-0"	45'-0"	19'-8"	3'-11"	9'-6"	20'-4"	20'-0"	7'-10"	4'-1"	4'-8"	4'-8"	45'-0"	45'-0"	45'-0"	20'-0"	3'-11"	4'-11"	3'-4"	10'-10"	20'-4"	20'-0"	8'-10"	4'-1"	4'-8"	4'-8"	45'-0"	45'-0"	45'-0"	20'-0"	3'-11"	5'-11"	3'-4"	12'-10"			
WEIGHT	735	1432	530	371	337	680	963	361	662	53	110	461	735	1432	620	371	337	680	963	542	662	53	110	584	747	1456	711	371	337	680	963	963	662	53	110	204	205	666	747	1456	802	371	337	680	963	963	662	53	110	245	205	788			
4 SPANS 6'x3'														4 SPANS 6'x4'														4 SPANS 6'x5'														4 SPANS													

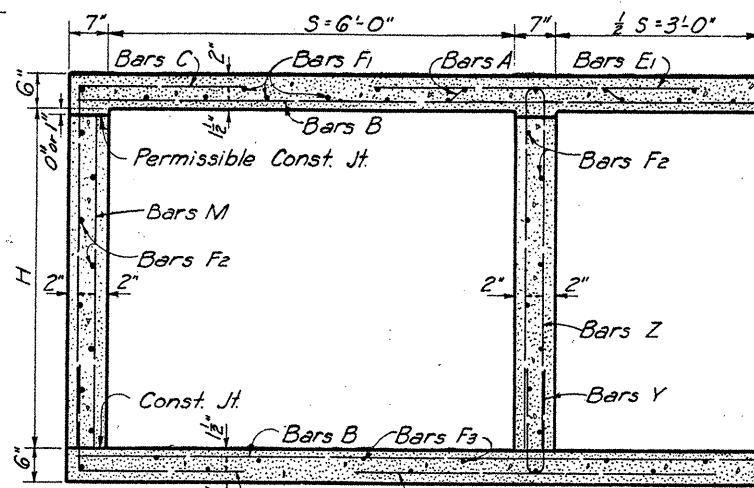


PART PLANS

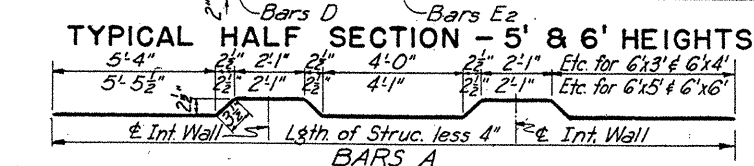
BOTTOM SLAB **TOP SLAB**
 NOTE: TOP & BOTTOM SLAB REINFORCING STEEL SIMILAR
 FOR CULVERT SIZES SHOWN ON THIS SHEET.



TYPICAL HALF SECTION - 3' & 4' HEIGHTS

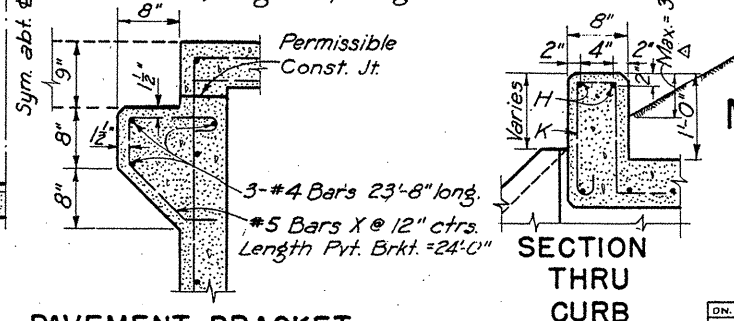


TYPICAL HALF SECTION - 5' & 6' HEIGHTS



BARREL QUANTITIES FOR 44" CLEAR WIDTH							
CULVERT SIZE		NO. OF SPANS	LENGTH OF STRUCT.	*BARREL QUANT.		QUANT. PLF. BBL	
S	H			CONC.	STEEL	CONC.	STEEL
				Cu. Yd.	Lb.	Cu. Yd.	Lb.
6' x 3'	2	13'-6"	30.90	4521	0.667	97.30	
	3	20'-0"	44.64	6695	0.963	143.99	
	4	26'-6"	58.38	8862	1.259	190.69	
	5	33'-0"	72.17	11,037	1.556	237.38	
	6	39'-6"	85.91	13,205	1.852	284.07	
6' x 4'	2	13'-6"	33.40	4,793	0.722	103.31	
	3	20'-0"	48.00	7089	1.037	152.68	
	4	26'-6"	62.60	9,377	1.352	202.04	
	5	33'-0"	77.20	11,674	1.667	251.40	
	6	39'-6"	91.76	13,965	1.981	300.78	
6' x 5'	2	13'-9"	38.44	5620	0.833	121.43	
	3	20'-4"	54.72	8128	1.185	175.44	
	4	26'-11"	71.01	10629	1.537	229.47	
	5	33'-6"	87.29	13139	1.889	283.49	
	6	40'-1"	103.57	15647	2.241	337.48	
6' x 6'	2	13'-9"	41.39	5813	0.898	125.66	
	3	20'-4"	58.67	8382	1.272	181.01	
	4	26'-11"	75.90	10946	1.645	236.37	
	5	33'-6"	93.18	13097	2.019	291.73	
	6	40'-1"	110.42	16086	2.392	347.06	

* These quantities do not include toe walls, wings or paving bracket



SECTION
THRU
CURB

GENERAL NOTES:

The bottom edge of the top slab shall be chamfered 3 inches at the entrance. Reinforcing bars shall be adjusted to provide a minimum of 1 1/4 inches clear cover. Headwall heights will be reduced, if necessary, to provide a maximum of 3 inches projection above the roadway slope. No increase or decrease will be made in plan quantities of concrete or reinforcing steel for this work.

Construction joints shown at the flow line may be raised a maximum of 6 inches at the Contractor's option. Bars M may be cut off or raised, bars C and D may be reversed (D on top) and bars Y and Z may be reversed (Y on top).

All reinforcing steel shall be Grade 60.

PVT. BRKT. QUANT.

2 PVT. BRKTS.	
24'-0" Long	
CONC.	STEEL
CU. YDS.	LBS.
1.19	264

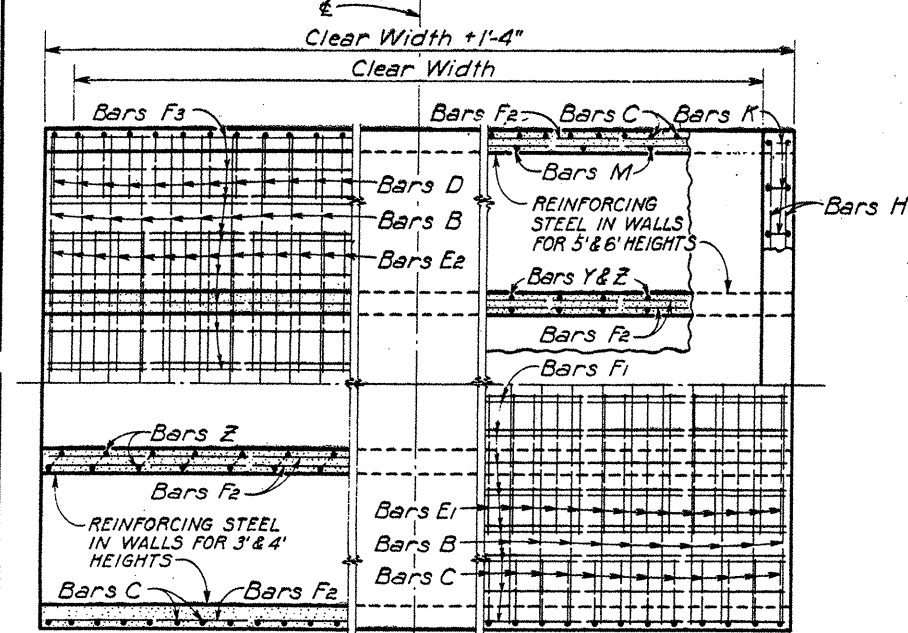
TEXAS HIGHWAY DEPARTMENT
MULTIPLE BOX CULVERTS
 SIZES 6'x3', 6'x4', 6'x5' & 6'x6'
 DIRECT TRAFFIC TO 4'-0" FILL

MC 6-1

Rev. 7-84		Rev. 3-85		Rev. 5-87 (Gen. Note)		MUG 1	
DN. - W.H.	DRAWING	DATE	REV. NO.	STATE	FEDERAL AID PROJECT NO.		SHEET NO.
CK. ON: R.M.M.	Original	JAN 1958					
DW. - K.M.	Rev Jan. 1958	Rev: 6-83	6	TEXAS	NH 95(40)IM		288
CK. DW: M.D.A.	Rev Nov 1964			STATE	COUNTY	CONTROL SECTION NO.	JOB NO.
TR. - C.W.W.	Rev. Nov. 1967			DIST. NO.			
CK. TR: K.M.	Rev. May 1977		15	COMAL	0016	05	087 IN 35

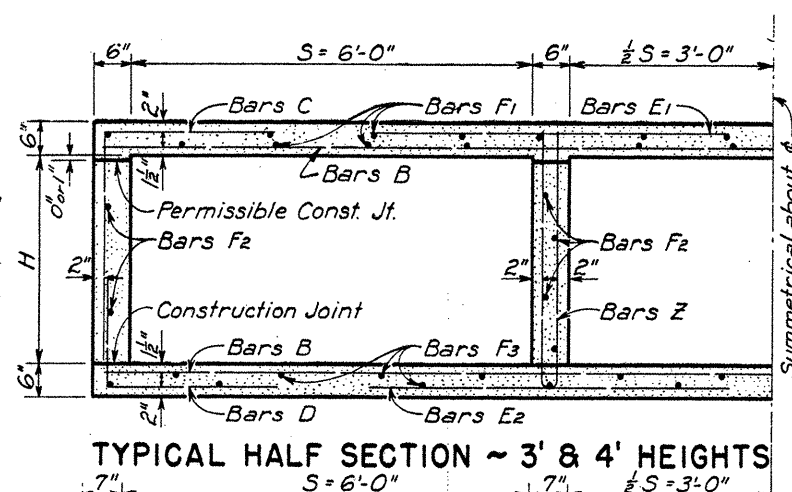
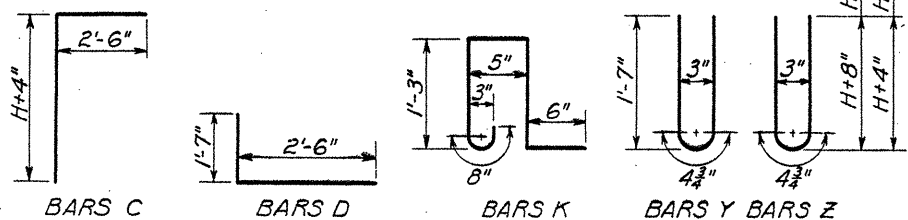
BILLS OF REINFORCING STEEL ~ FOR 44' CLEAR WIDTH ~ BARRELS ONLY

2 SPANS ~ 6' x 3'												2 SPANS ~ 6' x 4'												2 SPANS ~ 6' x 5'												2 SPANS ~ 6' x 6'												
MARK	B	C	D	E1	E2	F1	F2	F3	H	K	Z	B	C	D	E1	E2	F1	F2	F3	H	K	Z	B	C	D	E1	E2	F1	F2	F3	H	K	M	Y	Z	B	C	D	E1	E2	F1	F2	F3	H	K	M	Y	Z
NUMBER	136	156	156	91	91	17	8	15	4	28	46	136	156	156	91	91	17	12	15	4	28	46	136	156	156	91	91	17	24	15	4	28	62	46	46	136	156	156	91	91	17	24	15	4	28	62	46	46
SIZE	#4	#4	#4	#5	#5	#4	#4	#4	#4	#4	#4	#4	#4	#4	#5	#5	#4	#4	#4	#4	#4	#4	#4	#4	#4	#4	#5	#5	#4	#4	#4	#4	#4	#4	#4	#4	#4	#5	#5	#4	#4	#4	#4	#4	#4	#4	#4	
SPACING	8"	7"	7"	6"	6"	~	18"	~	~	12"	12"	8"	7"	7"	6"	6"	~	16"	~	~	12"	12"	8"	7"	7"	6"	6"	~	15"	~	~	12"	18"	12"	12"	8"	7"	7"	6"	6"	~	15"	~	~	12"	18"	12"	12"
LENGTH	13'-2"	5'-10"	4'-1"	5'-4"	5'-4"	45'-0"	45'-0"	45'-0"	13'-2"	3'-11"	7'-6"	13'-2"	6'-10"	4'-1"	5'-4"	5'-4"	45'-0"	45'-0"	45'-0"	13'-2"	3'-11"	9'-6"	13'-5"	7'-10"	4'-1"	5'-4"	5'-4"	45'-0"	45'-0"	45'-0"	13'-5"	3'-11"	4'-11"	3'-4"	10'-10"	13'-5"	8'-10"	4'-1"	5'-4"	5'-4"	45'-0"	45'-0"	45'-0"	13'-5"	3'-11"	5'-11"	3'-4"	12'-10"
WEIGHT	1196	608	425	506	506	512	241	452	35	73	230	1196	712	425	506	506	512	361	452	35	73	292	1219	816	425	506	506	512	722	452	36	73	204	102	333	1219	920	425	506	506	512	722	452	36	73	245	102	394
3 SPANS ~ 6' x 3'												3 SPANS ~ 6' x 4'												3 SPANS ~ 6' x 5'												3 SPANS ~ 6' x 6'												
NUMBER	136	156	156	182	182	26	12	22	4	42	92	136	156	156	182	182	26	18	22	4	42	92	136	156	156	182	182	26	32	22	4	42	62	92	92	136	156	156	182	182	26	32	22	4	42	62	92	92
SIZE	#4	#4	#4	#5	#5	#4	#4	#4	#4	#4	#4	#4	#4	#4	#5	#5	#4	#4	#4	#4	#4	#4	#4	#4	#4	#4	#5	#5	#4	#4	#4	#4	#4	#4	#4	#4	#4	#5	#5	#4	#4	#4	#4	#4	#4	#4		
SPACING	8"	7"	7"	6"	6"	~	18"	~	~	12"	12"	8"	7"	7"	6"	6"	~	16"	~	~	12"	12"	8"	7"	7"	6"	6"	~	15"	~	~	12"	18"	12"	12"	8"	7"	7"	6"	6"	~	15"	~	~	12"	18"	12"	12"
LENGTH	19'-8"	5'-10"	4'-1"	5'-4"	5'-4"	45'-0"	45'-0"	45'-0"	19'-8"	3'-11"	7'-6"	19'-8"	6'-10"	4'-1"	5'-4"	5'-4"	45'-0"	45'-0"	45'-0"	19'-8"	3'-11"	9'-6"	20'-0"	7'-10"	4'-1"	5'-4"	5'-4"	45'-0"	45'-0"	45'-0"	20'-0"	3'-11"	4'-11"	3'-4"	10'-10"	20'-0"	8'-10"	4'-1"	5'-4"	5'-4"	45'-0"	45'-0"	45'-0"	20'-0"	3'-11"	5'-11"	3'-4"	12'-10"
WEIGHT	1787	608	425	1012	1012	783	361	662	53	110	461	1787	712	425	1012	1012	783	542	662	53	110	584	1817	816	425	1012	1012	783	963	662	53	110	204	205	666	1817	920	425	1012	1012	783	963	662	53	110	245	205	788
4 SPANS ~ 6' x 3'												4 SPANS ~ 6' x 4'												4 SPANS ~ 6' x 5'												4 SPANS ~ 6' x 6'												
NUMBER	136	156	156	273	273	35	16	29	4	54	138	136	156	156	273	273	35	24	29	4	54	138	136	156	156	273	273	35	40	29	4	54	62	138	138	136	156	156	273	273	35	40	29	4	54	62	138	138
SIZE	#4	#4	#4	#5	#5	#4	#4	#4	#4	#4	#4	#4	#4	#4	#5	#5	#4	#4	#4	#4	#4	#4	#4	#4	#4	#4	#5	#5	#4	#4	#4	#4	#4	#4	#4	#4	#4	#5	#5	#4	#4	#4	#4	#4	#4	#4		
SPACING	8"	7"	7"	6"	6"	~	18"	~	~	12"	12"	8"	7"	7"	6"	6"	~	16"	~	~	12"	12"	8"	7"	7"	6"	6"	~	15"	~	~	12"	18"	12"	12"	8"	7"	7"	6"	6"	~	15"	~	~	12"	18"	12"	12"
LENGTH	26'-2"	5'-10"	4'-1"	5'-4"	5'-4"	45'-0"	45'-0"	45'-0"	26'-2"	3'-11"	7'-6"	26'-2"	6'-10"	4'-1"	5'-4"	5'-4"	45'-0"	45'-0"	45'-0"	26'-2"	3'-11"	9'-6"	26'-7"	7'-10"	4'-1"	5'-4"	5'-4"	45'-0"	45'-0"	45'-0"	26'-7"	3'-11"	4'-11"	3'-4"	10'-10"	26'-7"	8'-10"	4'-1"	5'-4"	5'-4"	45'-0"	45'-0"	45'-0"	26'-7"	3'-11"	5'-11"	3'-4"	12'-10"
WEIGHT	2377	608	425	1518	1518	1054	482	873	70	141	691	2377	712	425	1518	1518	1054	722	873	70	141	876	2415	816	425	1518	1518	1054	1204	873	71	141	204	307	998	2415	920	425	1518	1518	1054	1204	873	71	141	245	307	1183
5 SPANS ~ 6' x 3'												5 SPANS ~ 6' x 4'												5 SPANS ~ 6' x 5'												5 SPANS ~ 6' x 6'												
NUMBER	136	156	156	364	364	44	20	36	4	68	184	136	156	156	364	364	44	30	36	4	68	184	136	156	156	364	364	44	48	36	4	68	62	184	184	136	156	156	364	364	44	48	36	4	68	62	184	184
SIZE	#4	#4	#4	#5	#5	#4	#4	#4	#4	#4	#4	#4	#4	#4	#5	#5	#4	#4	#4	#4	#4	#4	#4	#4	#4	#4	#5	#5	#4	#4	#4	#4	#4	#4	#4	#4	#5	#5	#4	#4	#4	#4	#4	#4	#4	#4		
SPACING	8"	7"	7"	6"	6"	~	18"	~	~	12"	12"	8"	7"	7"	6"	6"	~	16"	~	~	12"	12"	8"	7"	7"	6"	6"	~	15"	~	~	12"	18"	12"	12"	8"	7"	7"	6"	6"	~	15"	~	~	12"	18"	12"	12"
LENGTH	32'-8"	5'-10"	4'-1"	5'-4"	5'-4"	45'-0"	45'-0"	45'-0"	32'-8"	3'-11"	7'-6"	32'-8"	6'-10"	4'-1"	5'-4"	5'-4"	45'-0"	45'-0"	45'-0"	32'-8"	3'-11"	9'-6"	33'-2"	7'-10"	4'-1"	5'-4"	5'-4"	45'-0"	45'-0"	45'-0"	33'-2"	3'-11"	4'-11"	3'-4"	10'-10"	33'-2"	8'-10"	4'-1"	5'-4"	5'-4"	45'-0"	45'-0"	45'-0"	33'-2"	3'-11"	5'-11"	3'-4"	12'-10"
WEIGHT	2968	608	425	2023	2023	1324	602	1084	87	178	922	2968	712	425	2023	2023	1324	903	1084	87	178	1168	3013	816	425	2023	2023	1324	1445	1084	89	178	204	409	1331	3013	920	425	2023	2023	1324	1445	1084	89	178	245	409	1577
6 SPANS ~ 6' x 3'												6 SPANS ~ 6' x 4'												6 SPANS ~ 6' x 5'												6 SPANS ~ 6' x 6'												
NUMBER	136	156	156	455	455	53	24	43	4	80	230	136	156	156	455	455	53	36	43	4	80	230	136	156	156	455	455	53	56	43	4	82	62	230	230	136	156	156	455	455	53	56	43	4	82	62	230	230
SIZE	#4	#4	#4	#5	#5	#4	#4	#4	#4	#4	#4	#4	#4	#4	#5	#5	#4	#4	#4	#4	#4	#4	#4	#4	#4	#4	#5	#5	#4	#4	#4	#4	#4	#4	#4	#5	#5	#4	#4	#4	#4	#4	#4	#4	#4	#4		
SPACING	8"	7"	7"	6"	6"	~	18"	~	~	12"	12"	8"	7"	7"	6"	6"	~	16"	~	~	12"	12"	8"	7"	7"	6"	6"	~	15"	~	~	12"	18"	12"	12"	8"	7"	7"	6"	6"	~	15"	~	~	12"	18"	12"	12"
LENGTH	39'-2"	5'-10"	4'-1"	5'-4"	5'-4"	45'-0"	45'-0"	45'-0"	39'-2"	3'-11"	7'-6"	39'-2"	6'-10"	4'-1"	5'-4"	5'-4"	45'-0"	45'-0"	45'-0"	39'-2"	3'-11"	9'-6"	39'-9"	7'-10"	4'-1"	5'-4"	5'-4"	45'-0"	45'-0"	45'-0"	39'-9"	3'-11"	4'-11"	3'-4"	10'-10"	39'-9"	8'-10"	4'-1"	5'-4"	5'-4"	45'-0"	45'-0"	45'-0"	39'-9"	3'-11"	5'-11"	3'-4"	12'-10"
WEIGHT	3559	608	425	2529	2529	1595	722	1294	105	210	1152	3559	712	425	2529	2529	1595	1084	1294	105	210	1460	3611	816	425	2529	2529	1595	1686	1294	106	215	205	512	1664	3611	920	425	2529	2529	1595	1686	1294	106	215	245	512	1971

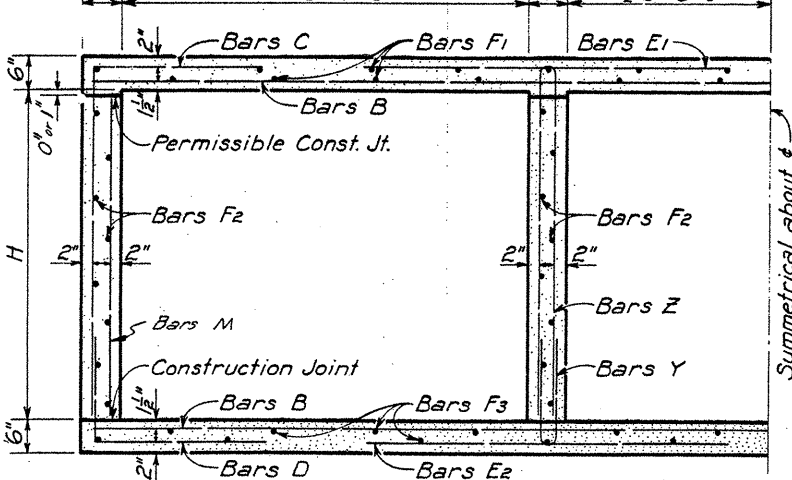


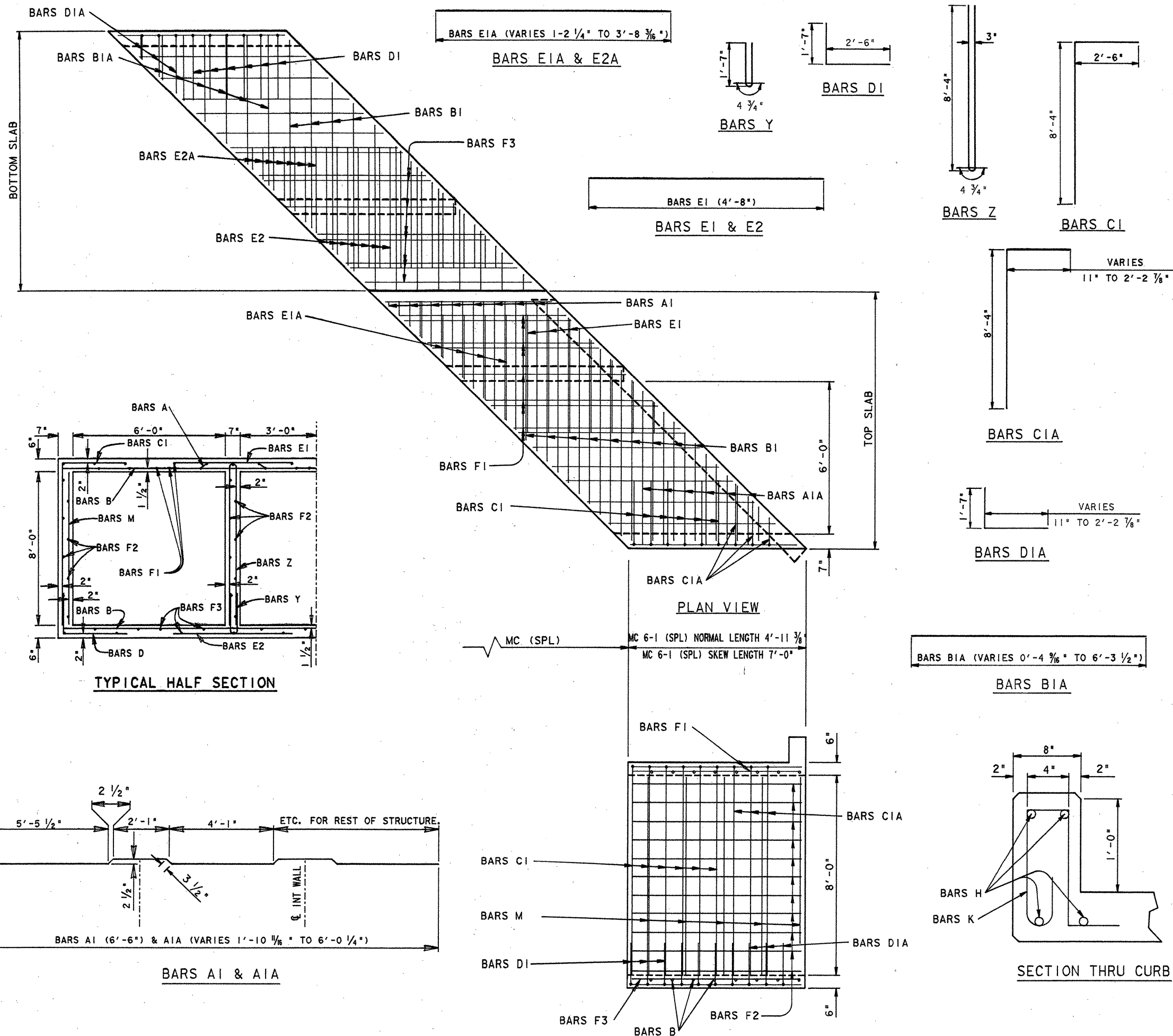
PART PLANS

BOTTOM SLAB TOP SLAB
NOTE: TOP AND BOTTOM SLAB REINFORCING STEEL SIMILAR FOR CULVERT SIZES SHOWN ON THIS SHEET.



TYPICAL HALF SECTION ~ 3' & 4' HEIGHTS





- NOTE:**
- ① ALL UPPER DECK STEEL MAY BE FIELD BENT TO ACCOMMODATE THE 6' TO 8' TRANSITIONAL SECTION OF THE UPPER DECK.
 - ② ALL DIMENSIONS RELATING TO REINFORCING STEEL ARE TO THE CENTERS OF THE BARS.
 - ③ ALL REINFORCING STEEL SHALL BE GRADE 60.
 - ③ FOR FURTHER INFORMATION & NOTES SEE THE MC 6-1 STANDARD SHEET.

BILL OF REINFORCING STEEL					
BARS	SIZE	NO.	MAX. SPACING	LENGTH	**WEIGHT (lbs)
A1	#4	16	10"	6'-6"	69.00
A1A	#4	12	10"	*3'-7 $\frac{11}{16}$ "	29.00
B1	#4	16	10"	6'-6"	69.00
B1A	#4	14	10"	*3'-8"	34.00
C1	#4	14	8"	10'-10"	108.00
C1A	#4	6	8"	*9'-10 $\frac{15}{16}$ "	40.00
D1	#4	22	8"	4'-1"	60.00
D1A	#4	6	8"	*3'-1 $\frac{7}{8}$ "	13.00
E1	#4	6	10"	4'-8"	37.00
E1A	#4	20	10"	*2'-6 $\frac{3}{8}$ "	34.00
E2	#4	24	5"	4'-8"	75.00
E2A	#4	40	5"	*2'-6 $\frac{3}{8}$ "	68.00
F1	#4	32	~	6'-8"	142.00
F2	#4	11	18"	6'-8"	80.00
F3	#4	22	~	6'-8"	98.00
H	#4	4	~	28'-6 $\frac{1}{16}$ "	76.00
K	#4	7	12"	3'-11"	18.00
M	#4	10	18"	8'-4"	56.00
Y	#4	12	12"	3'-4"	27.00
Z	#4	7	12"	16'-8"	134.00

STEEL WEIGHTS ARE FOR CONTRACTOR'S INFORMATION ONLY
 * AVERAGE LENGTH
 ** STEEL WEIGHTS DETERMINED FROM LENGTHS MEASURED ON GRAPHICS.

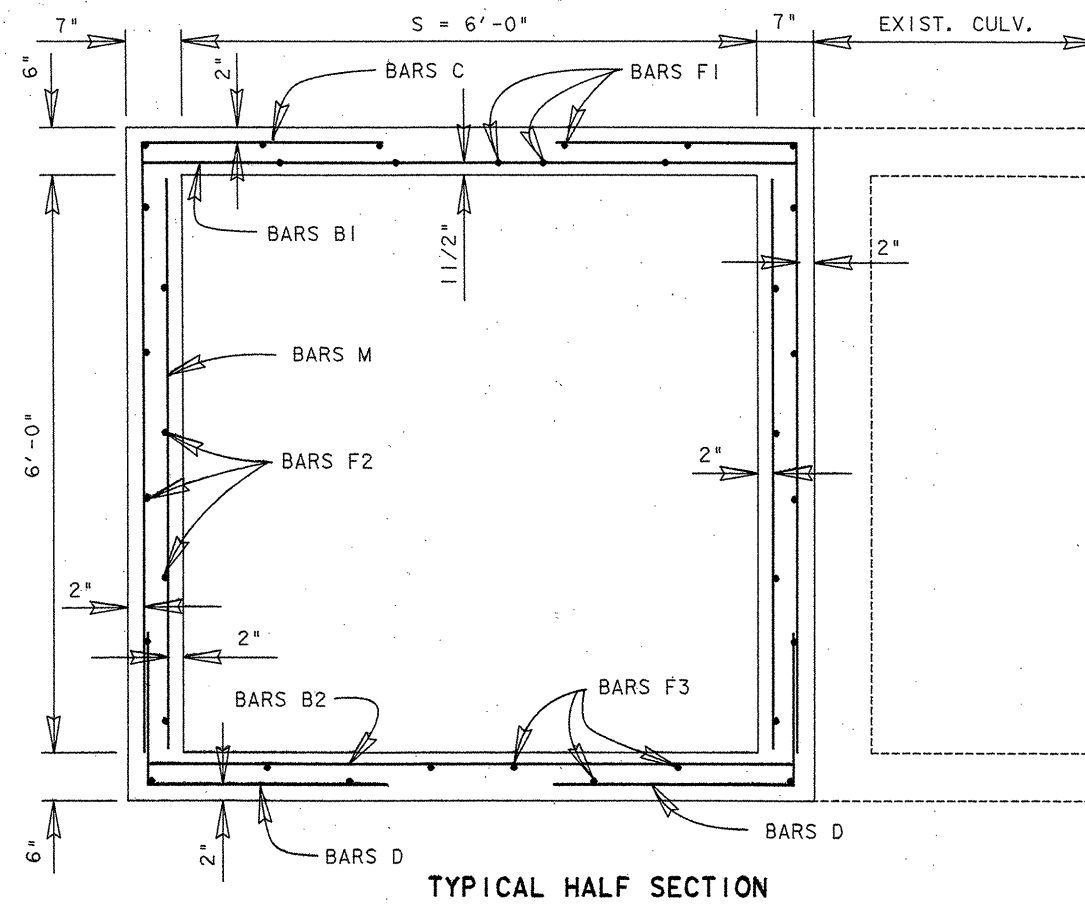


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SHEET 1 OF 1

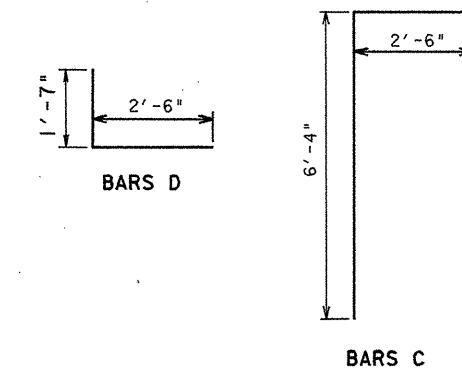
FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	NH 95 (40) IM		29
STATE	STATE DIST. NO.	COUNTY	
TEXAS	15	COMAL	
CONT.	SECT.	JOB	HIGHWAY NO.
0016	05	087	1H 35

MC 6-1 (SPL)



GENERAL NOTES :

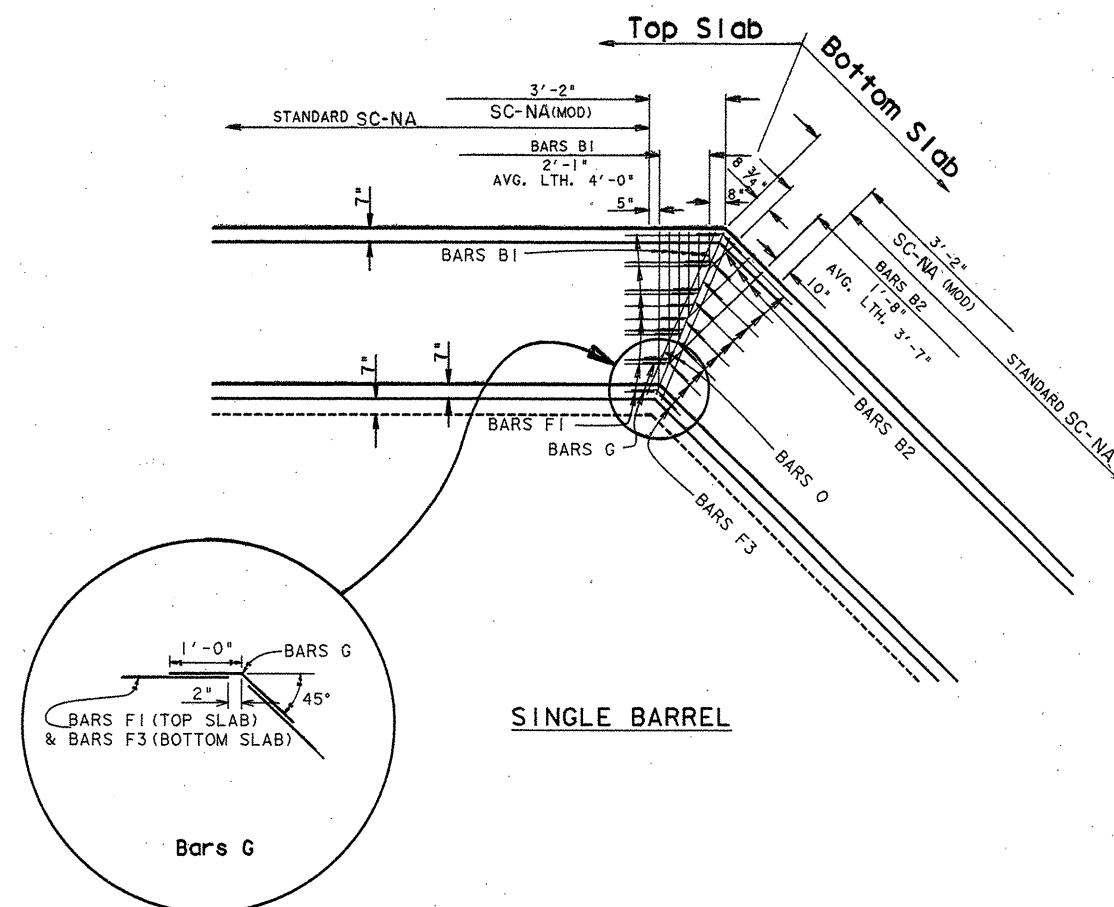
REFER TO VARIOUS STANDARDS SHOWN
ON THIS SHEET FOR TYPICAL SECTIONS,
BAR DETAILS, AND OTHER INFORMATION.



SINGLE BARREL					
REINFORCING STEEL					
BAR	NO.	SIZE	SPA.	LENGTH	**WEIGHT
B1	12	4	5"	* 4'-0"	32
B2	6	4	5"	* 3'-7"	28
C	9	4	8"	8'-10"	53
D	9	4	8"	4'-1"	25
F1	24	4	-	* 2'-9 1/2"	45
F2	32	4	18"	* 2'-7"	56
F3	16	4	-	* 2'-9"	30
M	6	4	18"	5'-11"	24
O	6	5	-	7'-4"	46
G	28	4	-	2'-0"	37
TOTAL REINFORCING STEEL, LBS.					376
CLASS "A" CONCRETE, CU. YDS.					1.8

* AVERAGE LENGTH

** STEEL WEIGHTS DETERMINED FROM LENGTHS MEASURED ON GRAPHICS.

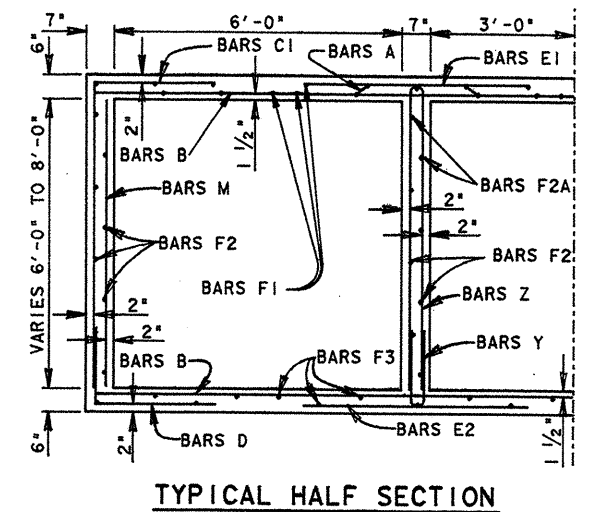
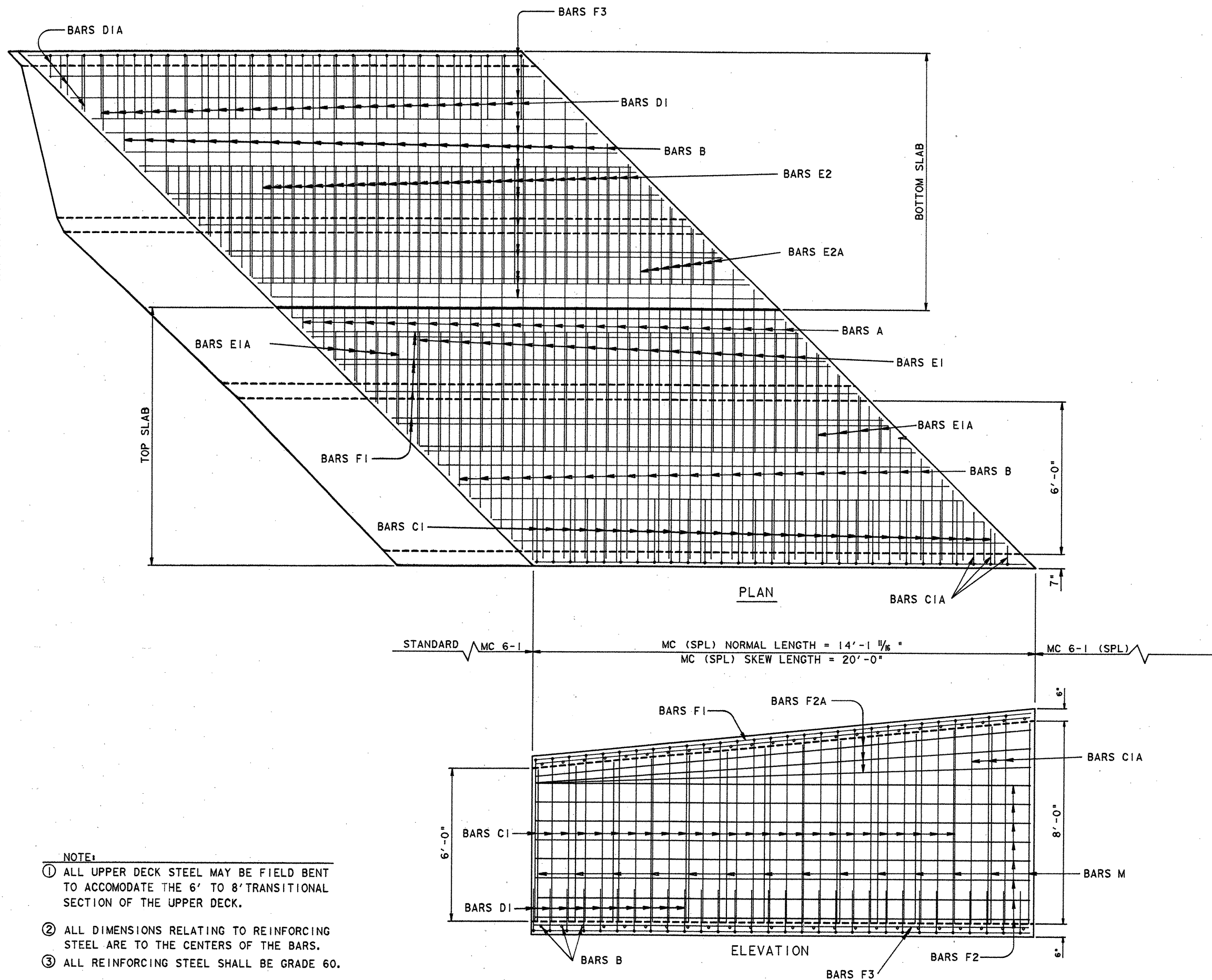


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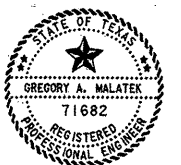
SC-NA (MOD)

FED. RD. DIV. NO.	-FEDERAL AID PROJECT NO.			SHEET NO.
6	NH 95 (40) 1M			292
STATE	STATE DIST. NO.	COUNTY		
TEXAS	15	COMAL		
WMT.	SECT	JOB	HIGHWAY NO.	
0016	05	087	14 35	



BILL OF REINFORCING STEEL					
BARS	SIZE	NO.	MAX. SPACING	LENGTH	**WEIGHT (lbs)
A	#4	46	10"	*10'-4 1/2"	312.00
B	#4	45	10"	*9'-10 5/8"	297.00
C1	#4	52	8"	*9'-8"	423.00
C1A	#4	6	8"	*9'-6 1/4"	38.00
D1	#4	60	8"	4'-1"	164.00
D1A	#4	6	8"	*3'-1 7/16"	13.00
E1	#4	38	10"	4'-8"	237.00
E1A	#4	16	10"	*2'-6 1/8"	27.00
E2	#4	76	5"	4'-8"	474.00
E2A	#4	32	5"	*2'-10 1/16"	61.00
F1	#4	32	~	19'-9"	422.00
F2	#4	32	18"	19'-7 3/16"	420.00
F2A	#4	12	18"	*19'-8 1/2"	158.00
F3	#4	22	~	19'-7 3/16"	289.00
M	#4	28	18"	*6'-11 1/8"	130.00
Y	#4	40	12"	3'-4"	89.0
Z	#4	40	12"	*14'-8 9/16"	393.00

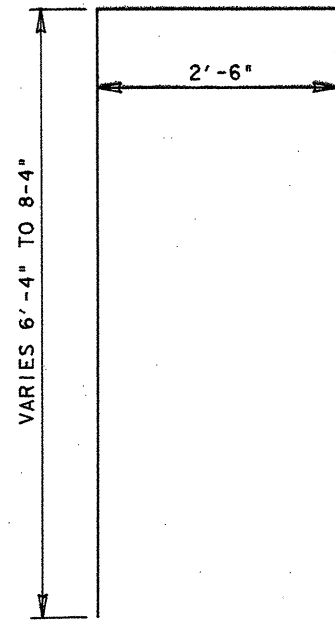
STEEL WEIGHTS ARE FOR CONTRACTOR'S INFORMATION ONLY
 * AVERAGE LENGTH
 ** STEEL WEIGHT DETERMINED FROM LENGTHS MEASURED ON GRAPHICS.



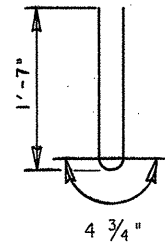
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SHEET 1 OF 2			
FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	STATE	SHEET NO.
6	NH 95 (40) IM	TEXAS	293
STATE	STATE DIST. NO.	COUNTY	
TEXAS	15	COMAL	
CONT.	SECT.	JOB	HIGHWAY NO.
0016	05	087	IH 35

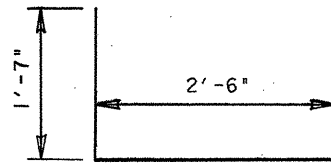
MC (SPL)



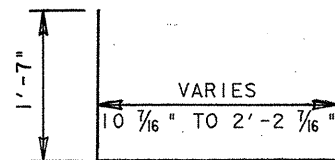
BARS C



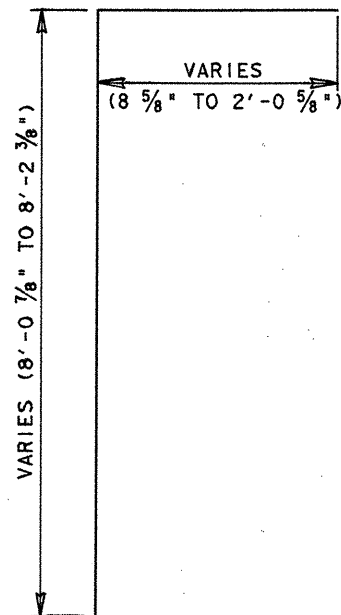
BARS Y



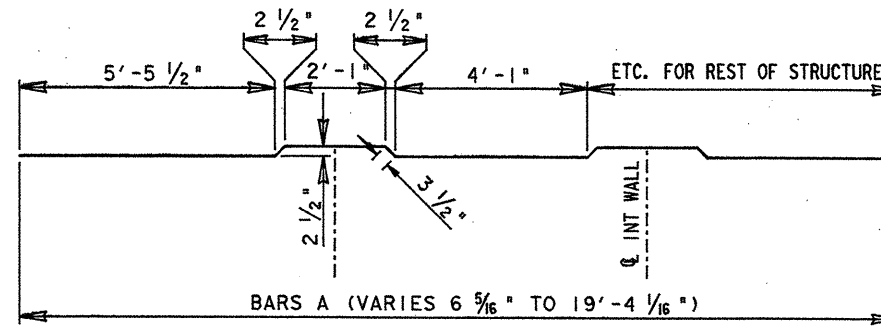
BARS DI



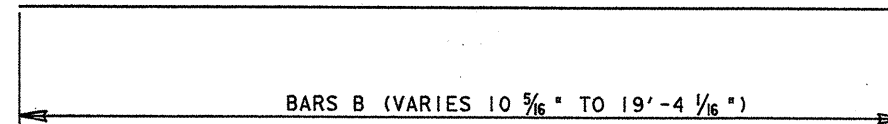
BARS DIA



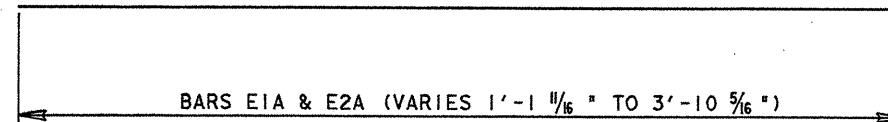
BARS CIA



BARS A



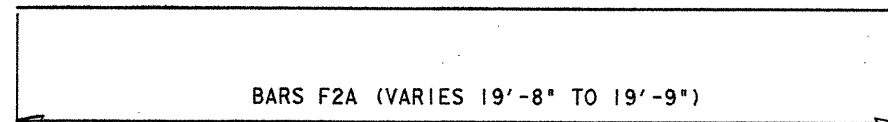
BARS B



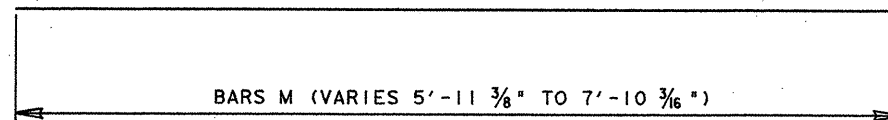
BARS E1A & E2A



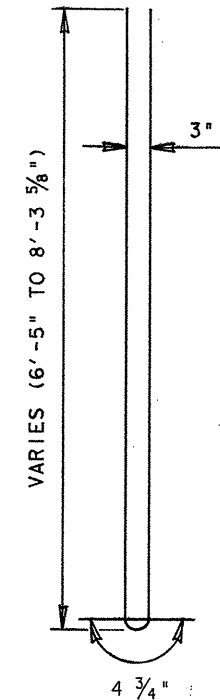
BARS E1 & E2



BARS F2A



BARS M



BARS Z



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SHEET 2 OF 2

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.
6	NH 95 (40) IM	294
STATE	STATE DIST. NO.	COUNTY
TEXAS	15	COMAL
CONT.	SECT.	JOB
0016	05	087
		HIGHWAY NO.
		1H 35

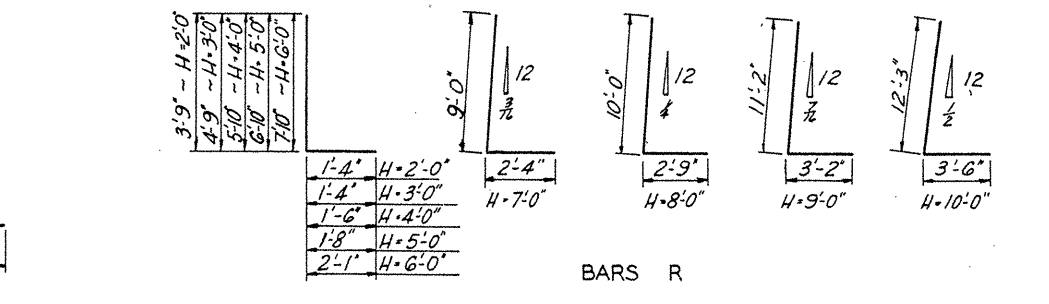
BRIDGE DIVISION		TEXAS HIGHWAY DEPARTMENT	
PARALLEL WINGS-NORMAL			
FOR MULTIPLE BOX CULVERTS			
5' x 2' TO 10' x 10'			
MCW - P			
DN-CFS-6WH	DRAWING	DATE	FED. ROAD DIV. NO.
CK. DIST. - V.H.	Original	Nov 1949	STATE
CHK. - MDA	Rev. Jan 53		6 TEXAS
CK. DIST. - KM	Rev. 11-1964		NH 95(40)IM
TR. - A.O.B.	Rev. Nov. 1964		CONTROL SECTION
CK. TR. - MDA	Rev. June 1964		JOB NO.
			15 COMAL
			0016 05 087 IH 35

[illegible]

* NUMBER OF BARS X

2 Bars when $H = 2', 3', 4'$
3 Bars when $H = 5', 6', 7'$
4 Bars when $H = 8', 9', 10'$

Length = Dimension C



TEXAS HIGHWAY DEPARTMENT
 • BRIDGE DIVISION •

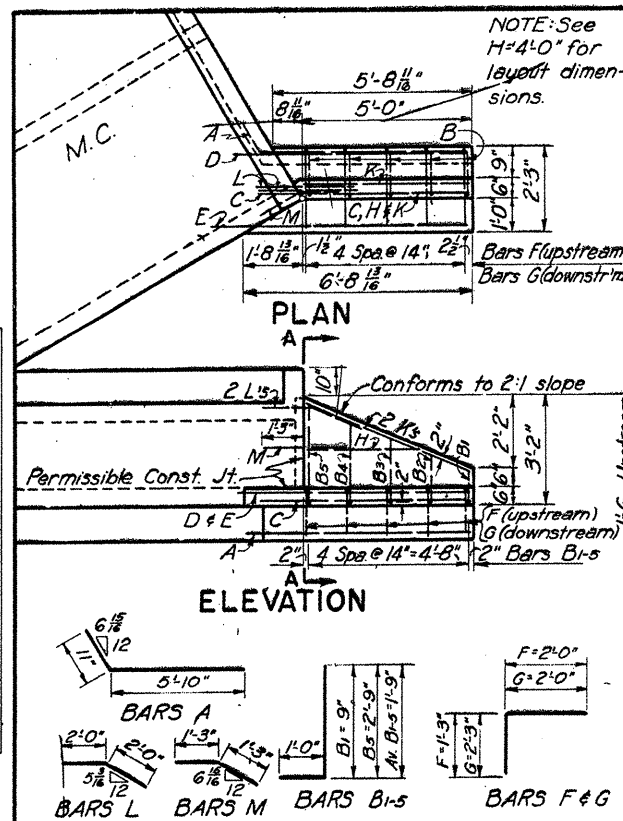
PARALLEL WINGS-45° SKEW
 FOR MULTIPLE BOX CULVERTS
 5' x 2' TO 10' x 10'

MCW-P-45°

REVISIONS <i>Rev. Nov. 64</i> <i>Rev. Nov. 1967</i>	FED. RD. DIV. NO.	STATE	FEDERAL PROJECT NO.	BRIDGE NO.
	6	TEXAS	NH 95 (40) IM	296
	STATE DIST. NO.	COUNTY	CONT. SECT.	JOB
	15	COMAL	0016 05 087	IN 35

DATE	BY	DATE	BY
PLAN	SURVEYED	PLOTTED	NOTED
	BOOK	ALIGNED	CHECKED
		RT. OF WAY	

DATE	BY	DATE	BY
PROFILE	SURVEYED	PLOTTED	NOTED
	BOOK	GRADES	CHECKED
		STRUCTURE	NOTATIONS



BILL OF REINF. STEEL-4 WINGS

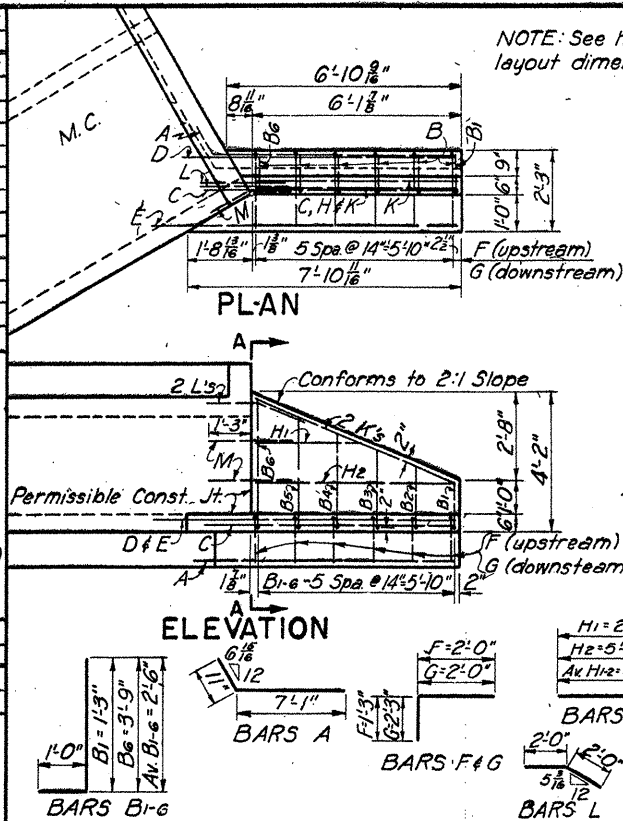
BAR NO.	SIZE	SPA	LGTH	WT.
A	4	4	6'-9"	18'
B	20	4	14'	29'
C	4	4	6'-3"	17
D	4	4	6'-9"	18
E	4	4	7'-5"	20
F	10	4	14'	22
G	10	4	14'	28
H	4	4	3'-1"	8
I	8	4	5'-2"	28
J	8	4	4'-0"	33
K	4	4	2'-6"	7

TOTAL FOR 4 WINGS 236

ESTIMATED QUANT.-4 WINGS

ITEM	UNIT	QUANT.
CONCRETE	C.Y.	2.16
REINF. STEEL	LB.	236

WINGWALLS FOR M.C.'s H=2'-0"



BILL OF REINF. STEEL-4 WINGS

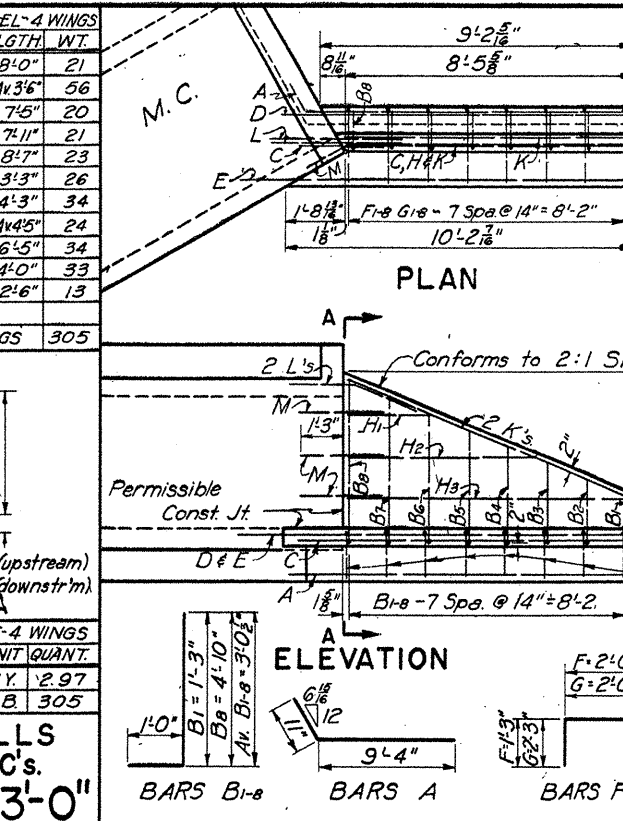
BAR NO.	SIZE	SPA	LGTH	WT.
A	4	4	8'-0"	21
B	24	4	14'	56
C	4	4	7'-5"	20
D	4	4	7'-11"	21
E	4	4	8'-7"	23
F	12	4	14'	26
G	12	4	14'	34
H	8	4	15'	24
I	8	4	6'-5"	34
J	8	4	4'-0"	33
K	8	4	2'-6"	13

TOTAL FOR 4 WINGS 305

ESTIMATED QUANT.-4 WINGS

ITEM	UNIT	QUANT.
CONCRETE	C.Y.	2.97
REINF. STEEL	LB.	305

WINGWALLS FOR M.C.'s H=3'-0"



BILL OF REINF. STEEL-4 WINGS

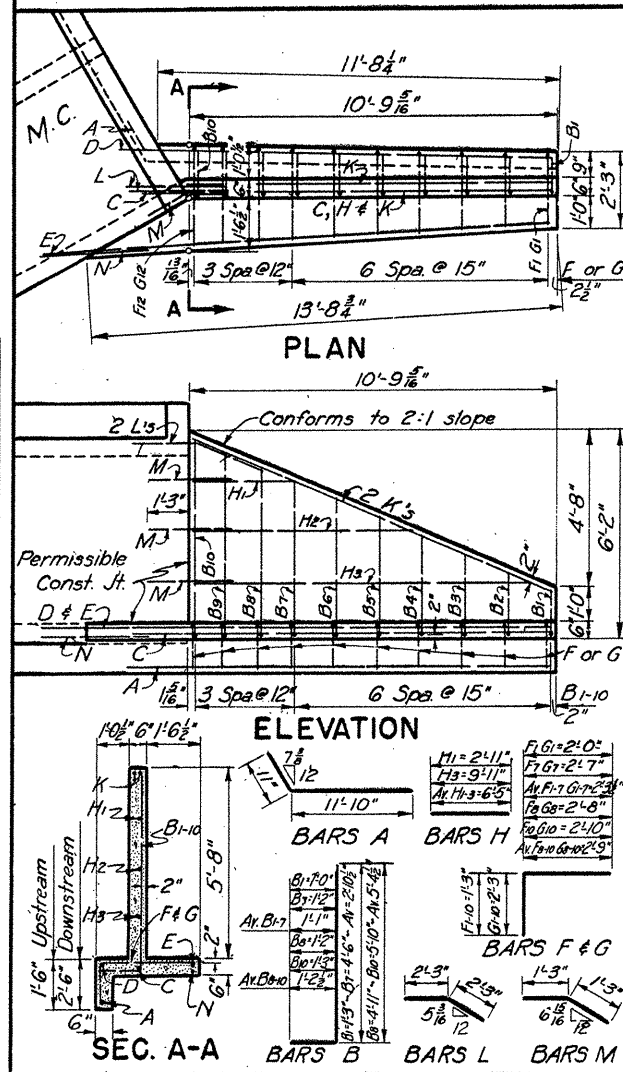
BAR NO.	SIZE	SPA	LGTH	WT.
A	4	4	10'-3"	27
B	32	4	14'	86
C	4	4	9'-8"	26
D	4	4	10'-2"	27
E	4	4	11'-5"	28
F	16	4	14'	35
G	16	4	14'	45
H	12	4	15'	43
I	8	4	9'-0"	75
J	8	4	4'-0"	33
K	12	4	2'-6"	20

TOTAL FOR 4 WINGS 466

ESTIMATED QUANT.-4 WINGS

ITEM	UNIT	QUANT.
CONCRETE	C.Y.	4.34
REINF. STEEL	LB.	466

WINGWALLS FOR M.C.'s H=4'-0"



BILL OF REINF. STEEL-4 WINGS

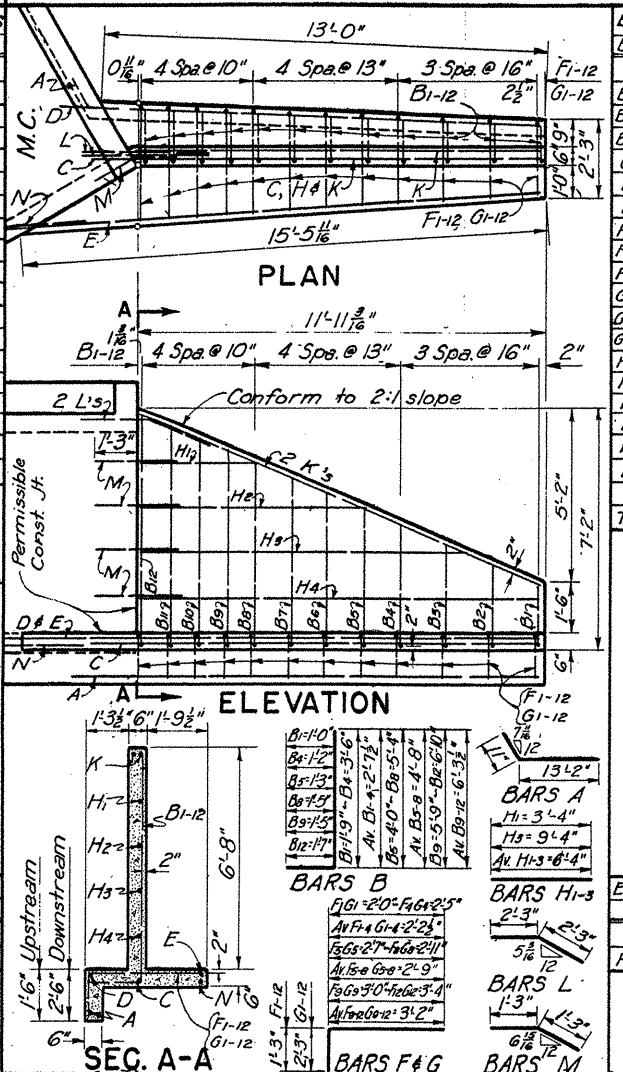
BAR NO.	SIZE	SPA	LGTH	WT.
A	4	4	12'-9"	34
B	28	4	15'	73
C	4	4	12'-0"	32
D	4	4	12'-8"	34
E	4	4	14'-0"	37
F	14	4	15'	33
G	14	4	15'	42
H	12	4	18'	51
I	8	4	11'-6"	36
J	8	4	4'-6"	34
K	12	4	2'-6"	20
L	4	4	3'-2"	13

TOTAL FOR 4 WINGS 633

ESTIMATED QUANT.-4 WINGS

ITEM	UNIT	QUANT.
CONCRETE	C.Y.	6.34
REINF. STEEL	LB.	633

WINGWALLS FOR M.C.'s H=5'-0"



BILL OF REINF. STEEL-4 WINGS

BAR NO.	SIZE	SPA	LGTH	WT.
A	4	4	14'-1"	38
B	16	4	16'	39
C	4	4	13'-2"	35
D	4	4	14'-0"	37
E	4	4	16'-9"	40
F	8	4	16'	18
G	8	4	13'	21
H	8	4	10'	24
I	8	4	16'	24
J	8	4	13'	27
K	8	4	10'	29
L	8	4	4'-6"	34
M	16	4	2'-6"	27
N	4	4	3'-2"	13

TOTAL FOR 4 WINGS 791

ESTIMATED QUANT.-4 WINGS

ITEM	UNIT	QUANT.
CONCRETE	C.Y.	7.95
REINF. STEEL	LB.	791

WINGWALLS FOR M.C.'s H=6'-0"

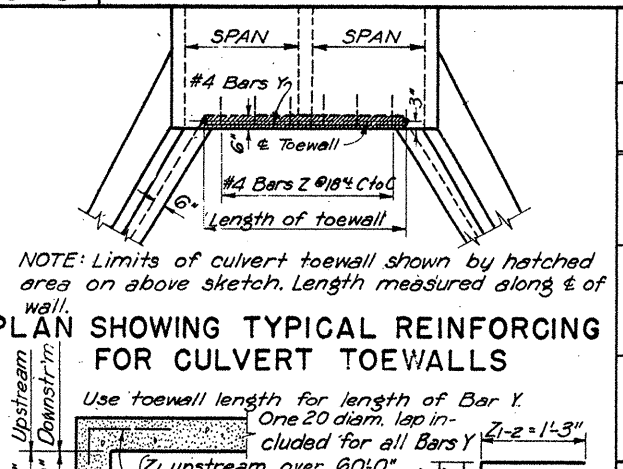


TABLE OF TOEWALL LENGTHS FOR M.C.'s

WING WALL	SPAN	2 SPANS	3 SPANS	4 SPANS	5 SPANS	6 SPANS
H=2'-0"	5'-0"	9'-5 1/4"	14'-11 1/4"	20'-5 1/4"	25'-11 1/4"	31'-5 1/4"
H=3'-0"	5'-0"	9'-5 1/4"	14'-11 1/4"	20'-5 1/4"	25'-11 1/4"	31'-5 1/4"
H=4'-0"	5'-0"	9'-5 1/4"	14'-11 1/4"	20'-5 1/4"	25'-11 1/4"	31'-5 1/4"
H=5'-0"	5'-0"	9'-5 1/4"	14'-11 1/4"	20'-5 1/4"	25'-11 1/4"	31'-5 1/4"
H=6'-0"	5'-0"	9'-5 1/4"	14'-11 1/4"	20'-5 1/4"	25'-11 1/4"	31'-5 1/4"

ESTIMATED QUANTITIES FOR TWO CULVERT TOEWALLS

WING WALL	SPAN LENGTH	2 SPANS		3 SPANS		4 SPANS		5 SPANS		6 SPANS	
		CONC. C.Y.	REINF. LB.	CONC. C.Y.	REINF. LB.	CONC. C.Y.	REINF. LB.	CONC. C.Y.	REINF. LB.	CONC. C.Y.	REINF. LB.
H=2'-0" TO H=4'-0" INCL.	5'-0"	0.53	41	0.83	64	1.14	83	1.44	105	1.75	130
	6'-0"	0.64	51	1.00	76	1.36	101	1.72	129	2.08	154
	7'-0"	0.75	58	1.17	88	1.58	118	2.00	148	2.42	178
	8'-0"	0.86	65	1.33	100	1.80	135	2.28	168	2.75	202
H=5'-0"	5'-0"	0.50	40	0.81	63	1.12	83	1.43	106	1.74	130
	6'-0"	0.61	47	0.98	75	1.34	100	1.71	125	2.07	154
	7'-0"	0.72	57	1.14	88	1.56	118	1.99	148	2.41	178
	8'-0"	0.83	64	1.31	100	1.79	131	2.26	164	2.74	202
H=6'-0"	9'-0"	0.94	71	1.48	112	2.01	148	2.54	185	3.07	226
	6'-0"	0.58	46	0.94	71	1.31	99	1.67	124	2.04	149
	7'-0"	0.69	52	1.11	83	1.53	113	1.95	143	2.37	173
	8'-0"	0.80	63	1.28	95	1.75	130	2.23	163	2.71	197
H=6'-0"	9'-0"	0.91	70	1.44	107	1.97	147	2.51	184	3.04	222
	10'-0"	1.02	76	1.61	119	2.20	161	2.78	203	3.37	248

GENERAL NOTES:-

DESIGN: Wing Walls designed in accordance with Rankine's theory of retaining wall design. Elements of design are shown on sketch at right.

Chamfer all exposed corners $\frac{1}{4}$ " unless specified otherwise.

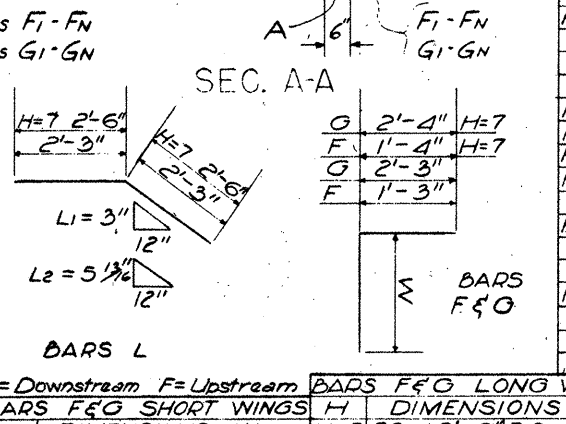
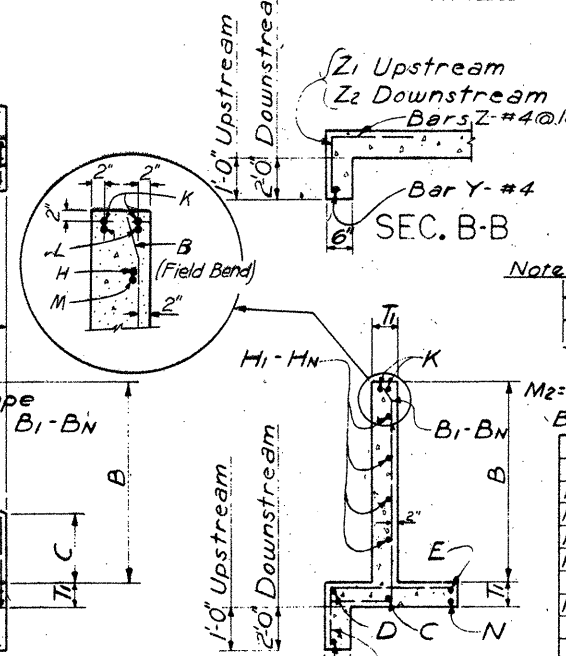
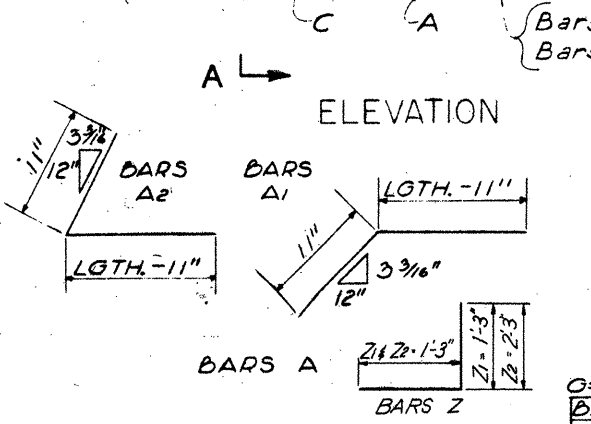
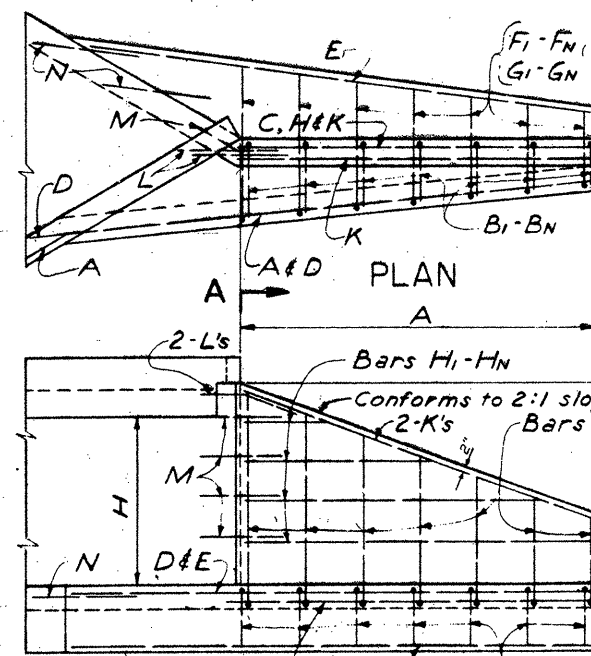
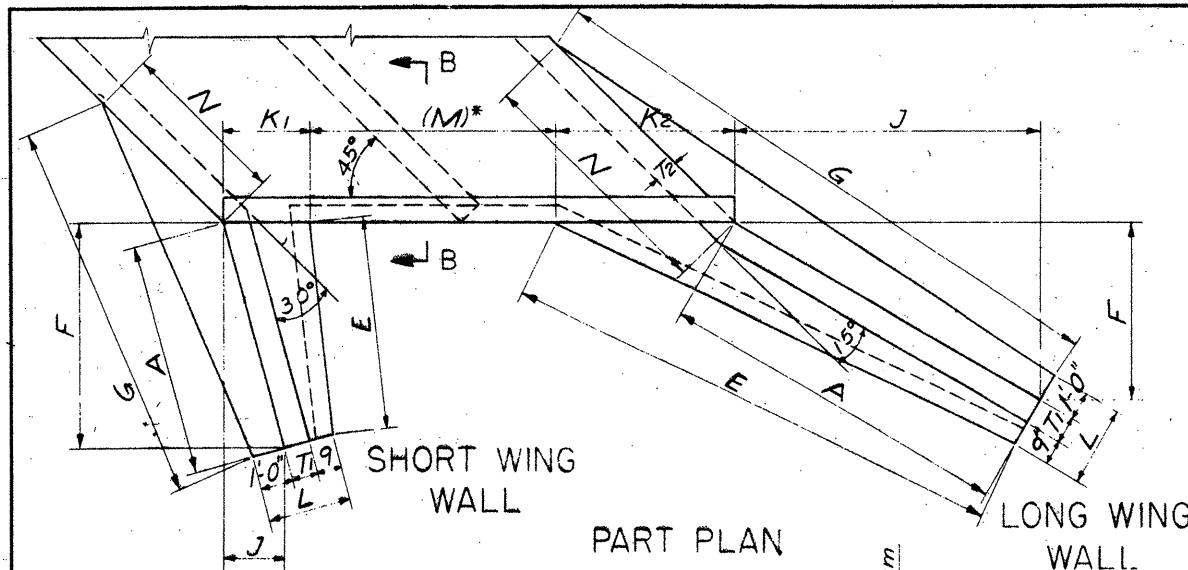
All dimensions relating to reinforcing steel are to centers of bars.

Toe walls for culvert and wing walls shall be omitted when structure is founded on solid rock.

TEXAS HIGHWAY DEPARTMENT FLARED WINGWALLS FOR MULTIPLE CULVERTS H=2'-0" TO 6'-0" INCL.

MCW-FI

DN: A.B.L.	DRAWING	DATE	FEED. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.
CK: D.N.T. J.W.	Original	Aug. 1949	6	TEXAS	NH 95(40)IM	297
DN: A.B.L.	Rev. 12-31-49: Design for H=5'-0"					
CK: D.N.T. J.W.	Rev. Jan. 1950					
DN: A.B.L.	Rev. Nov. 1954					
CK: D.N.T. J.W.	Rev. Nov. 1967					
DN: A.B.L.			15	COMAL	CONTROL SECTION NO. 0016	JOB NO. 05 087
CK: D.N.T. J.W.						HIGHWAY 35



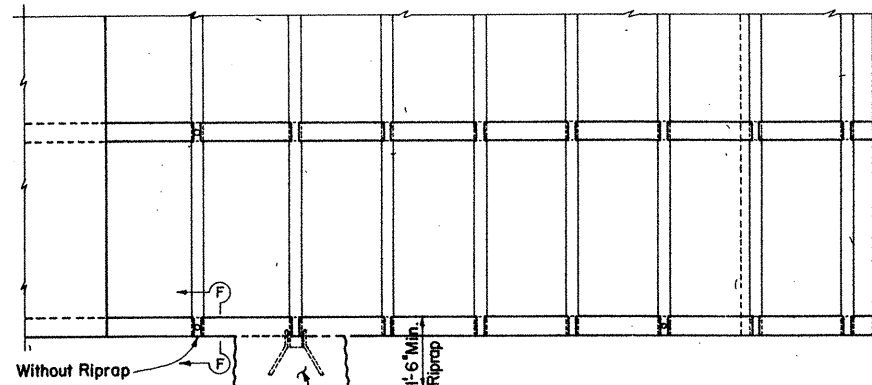
LONG WINGS H=2										SHORT WINGS H=2										LONG WINGS H=3										SHORT WINGS H=3										LONG WINGS H=4										SHORT WINGS H=4																			
BAR NO.	SIZE	SP.	LGTH.	WT.	BAR NO.	SIZE	SP.	LGTH.	WT.	BAR NO.	SIZE	SP.	LGTH.	WT.	BAR NO.	SIZE	SP.	LGTH.	WT.	BAR NO.	SIZE	SP.	LGTH.	WT.	BAR NO.	SIZE	SP.	LGTH.	WT.	BAR NO.	SIZE	SP.	LGTH.	WT.	BAR NO.	SIZE	SP.	LGTH.	WT.	BAR NO.	SIZE	SP.	LGTH.	WT.	BAR NO.	SIZE	SP.	LGTH.	WT.																				
A1	2	4	10'-11"	15	A2	2	4	4'-9"	7	A1	2	4	14'-11"	20	A2	2	4	6'-10"	9	A1	2	4	18'-11"	26	A2	2	4	12'-11"	18	A1	2	4	22'-11"	32	A2	2	4	10'-11"	15	A1	2	4	16'-11"	22	A2	2	4	8'-11"	12	A1	2	4	20'-11"	28	A2	2	4	14'-11"	20										
B1-12	6	12	4	17 1/2	27	B1-4	6	12	4	15	12	B1-9	18	4	17 1/2	27	B1-3	6	12	4	15	12	B1-12	24	4	16 1/2	24	4	14	12	24	4	16 1/2	24	4	14	12	24	4	16 1/2	24	4	14	12	24	4	16 1/2	24	4	14	12	24	4	16 1/2	24														
C1	2	4	9'-11"	13	C2	2	4	5'-4"	7	C1	2	4	13'-11"	18	C2	2	4	7'-5"	10	C1	2	4	17'-11"	24	C2	2	4	11'-11"	16	C1	2	4	21'-11"	30	C2	2	4	9'-11"	13	C1	2	4	15'-11"	20	C2	2	4	11'-11"	16	C1	2	4	19'-11"	26	C2	2	4	13'-11"	18										
D1	2	4	11'-0"	13	D2	2	4	4'-9"	7	D1	2	4	15'-0"	21	D2	2	4	6'-10"	9	D1	2	4	19'-0"	26	D2	2	4	13'-0"	21	D1	2	4	23'-0"	31	D2	2	4	11'-0"	13	D1	2	4	17'-0"	24	D2	2	4	15'-0"	21	D1	2	4	19'-0"	26	D2	2	4	13'-0"	21										
E1	2	4	12'-7"	17	E2	2	4	6'-11"	10	E1	2	4	16'-7"	23	E2	2	4	8'-9"	12	E1	2	4	20'-7"	29	E2	2	4	14'-7"	21	E1	2	4	24'-7"	35	E2	2	4	12'-7"	17	E1	2	4	16'-7"	23	E2	2	4	14'-7"	21	E1	2	4	18'-7"	25	E2	2	4	16'-7"	23										
F1	6	12	4	17 1/2	27	F2	6	12	4	15	12	F1	6	12	4	17 1/2	27	F2	6	12	4	15	12	F1	6	12	4	17 1/2	27	F2	6	12	4	15	12	F1	6	12	4	17 1/2	27	F2	6	12	4	15	12	F1	6	12	4	17 1/2	27	F2	6	12	4	15	12										
G1	6	12	4	17 1/2	27	G2	6	12	4	15	12	G1	6	12	4	17 1/2	27	G2	6	12	4	15	12	G1	6	12	4	17 1/2	27	G2	6	12	4	15	12	G1	6	12	4	17 1/2	27	G2	6	12	4	15	12	G1	6	12	4	17 1/2	27	G2	6	12	4	15	12										
H1	2	4	5'-2"	7	H2	2	4	2'-10"	4	H1	2	4	9'-2"	12	H2	2	4	4'-3"	6	H1	2	4	13'-2"	18	H2	2	4	7'-2"	10	H1	2	4	17'-2"	24	H2	2	4	9'-2"	12	H1	2	4	13'-2"	18	H2	2	4	7'-2"	10	H1	2	4	17'-2"	24	H2	2	4	9'-2"	12										
I1	2	4	7'-9"	11	I2	2	4	4'-3"	6	I1	2	4	11'-9"	16	I2	2	4	6'-9"	9	I1	2	4	15'-9"	21	I2	2	4	9'-9"	12	I1	2	4	19'-9"	26	I2	2	4	11'-9"	16	I1	2	4	15'-9"	21	I2	2	4	9'-9"	12	I1	2	4	19'-9"	26	I2	2	4	11'-9"	16										
J1	2	4	4'-6"	6	J2	2	4	2'-6"	3	J1	2	4	8'-6"	11	J2	2	4	4'-6"	6	J1	2	4	12'-6"	16	J2	2	4	6'-6"	9	J1	2	4	16'-6"	21	J2	2	4	8'-6"	11	J1	2	4	12'-6"	16	J2	2	4	6'-6"	9	J1	2	4	16'-6"	21	J2	2	4	8'-6"	11										
K1	2	4	2'-6"	3	K2	2	4	2'-6"	3	K1	2	4	6'-6"	9	K2	2	4	2'-6"	3	K1	2	4	10'-6"	14	K2	2	4	8'-6"	11	K1	2	4	14'-6"	19	K2	2	4	10'-6"	14	K1	2	4	14'-6"	19	K2	2	4	10'-6"	14	K1	2	4	14'-6"	19	K2	2	4	10'-6"	14										
L1	2	4	2'-6"	3	L2	2	4	2'-6"	3	L1	2	4	6'-6"	9	L2	2	4	2'-6"	3	L1	2	4	10'-6"	14	L2	2	4	8'-6"	11	L1	2	4	14'-6"	19	L2	2	4	10'-6"	14	L1	2	4	14'-6"	19	L2	2	4	10'-6"	14	L1	2	4	14'-6"	19	L2	2	4	10'-6"	14										
M1	2	4	2'-6"	3	M2	2	4	2'-6"	3	M1	2	4	6'-6"	9	M2	2	4	2'-6"	3	M1	2	4	10'-6"	14	M2	2	4	8'-6"	11	M1	2	4	14'-6"	19	M2	2	4	10'-6"	14	M1	2	4	14'-6"	19	M2	2	4	10'-6"	14	M1	2	4	14'-6"	19	M2	2	4	10'-6"	14										
REIN. STEEL LB. 16.9					CONC. C.Y. 1.89					REIN. STEEL LB. 10.2					CONC. C.Y. 0.84					REIN. STEEL LB. 25.4					CONC. C.Y. 2.97					REIN. STEEL LB. 14.8					CONC. C.Y. 1.41					REIN. STEEL LB. 38.3					CONC. C.Y. 4.19					REIN. STEEL LB. 22.4					CONC. C.Y. 2.04														
LONG WINGS H=5										SHORT WINGS H=5										LONG WINGS H=6										SHORT WINGS H=6										LONG WINGS H=7										SHORT WINGS H=7																			
BAR NO.	SIZE	SP.	LGTH.	WT.	BAR NO.	SIZE	SP.	LGTH.	WT.	BAR NO.	SIZE	SP.	LGTH.	WT.	BAR NO.	SIZE	SP.	LGTH.	WT.	BAR NO.	SIZE	SP.	LGTH.	WT.	BAR NO.	SIZE	SP.	LGTH.	WT.	BAR NO.	SIZE	SP.	LGTH.	WT.	BAR NO.	SIZE	SP.	LGTH.	WT.	BAR NO.	SIZE	SP.	LGTH.	WT.	BAR NO.	SIZE	SP.	LGTH.	WT.	BAR NO.	SIZE	SP.	LGTH.	WT.															
A1	2	4	23'-7"	32	A2	2	4	10'-11"	15	A1	2	4	26'-11"	35	A2	2	4	11'-10"	16	A1	2	4	30'-9"	40	A2	2	4	13'-10"	17	A1	2	4	34'-7"	45	A2	2	4	14'-11"	18	A1	2	4	38'-5"	50	A2	2	4	15'-11"	19	A1	2	4	42'-3"	55	A2	2	4	16'-11"	20	A1	2	4	46'-1"	60	A2	2	4	17'-11"	21
B1-10	6	12	4	17 1/2	27	B1-6	12	4	18	12	B1-9	18	4	17 1/2	27	B1-10	6	12	4	17 1/2	27	B1-12	24	4	16 1/2	24	B1-10	6	12	4	17 1/2	27	B1-12	24	4	16 1/2	24	B1-10	6	12	4	17 1/2	27	B1-12	24	4	16 1/2	24	B1-10	6	12	4	17 1/2	27	B1-12	24	4	16 1/2	24										
C1	2	4	21'-11"	29	C2	2	4	11'-7"	16	C1	2	4	25'-11"	34	C2	2	4	12'-7"	17	C1	2	4	29'-11"	39	C2	2	4	13'-7"	18	C1	2	4	33'-11"	44	C2	2	4	14'-7"	19	C1	2	4	37'-11"	49	C2	2	4	15'-7"	20	C1	2	4	41'-11"	54	C2	2	4	16'-7"	21										
D1	2	4	23'-8"	31	D2	2	4	10'-11"	15	D1	2	4	27'-8"	36	D2	2	4	11'-11"	16	D1	2	4	31'-8"	41	D2	2	4	12'-11"	17	D1	2	4	35'-8"	46	D2	2	4	13'-11"	18	D1	2	4	39'-8"	51	D2	2	4	14'-11"	19	D1	2	4	43'-8"	56	D2	2	4	15'-11"	20										
E1	2	5	27'-6"	57	E2	2	5	14'-6"	30	E1	2	5	31'-6"	63	E2	2	5	15'-6"	31	E1	2	5	35'-6"	68	E2	2	5	16'-6"	32	E1	2	5	39'-6"	73	E2	2	5	17'-6"	33	E1	2	5	43'-6"	78	E2	2	5	18'-6"	34	E1	2	5	47'-6"	83	E2	2	5	19'-6"	35										
F1-10	6	12	4	17 1/2	27	F1-6	12	4	18	12	F1-9	18	4	17 1/2	27	F1-10	6	12	4	17 1/2	27	F1-12	24	4	16 1/2	24	F1-10	6	12	4	17 1/2	27	F1-12	24	4	16 1/2	24	F1-10	6	12	4	17 1/2	27	F1-12	24	4	16 1/2	24	F1-10	6	12	4	17 1/2	27	F1-12	24	4	16 1/2	24										
G1-11	7	4	10 1/2	24	G1-3	6	12	4	18	12	G1-9	18	4	10 1/2	24	G1-11	7	4	10 1/2	24	G1-13	21	4	17 1/2	27	G1-11	7	4	10 1/2	24	G1-13	21	4	17 1/2	27	G1-11	7	4	10 1/2	24	G1-13	21	4	17 1/2	27	G1-11	7	4	10 1/2	24	G1-13	21	4	17 1/2	27														
H1-11	7	4	10 1/2	24	H1-3	6	12	4	18	12	H1-9	18	4	10 1/2	24	H1-11	7	4	10 1/2	24	H1-13	21	4	17 1/2	27	H1-11	7	4	10 1/2	24	H1-13	21	4	17 1/2	27	H1-11	7	4	10 1/2	24	H1-13	21	4	17 1/2	27	H1-11	7	4	10 1/2	24	H1-13	21	4	17 1/2	27														
I1	2	4	20'-11"	24	I2	2	4	11'-2"	4.7	I1	2	4	24'-11"	29	I2	2	4	12'-2"	4.8	I1	2	4	28'-11"	34	I2	2	4	13'-2"	4.9	I1	2	4	32'-11"	39	I2	2	4	14'-2"	5.0	I1	2	4	36'-11"	44	I2	2	4	15'-2"	5.1	I1	2	4	40'-11"	49	I2	2	4	16'-2"	5.2										
J1	2	4	4'-6"	6	J2	2	4	4'-6"	6	J1	2	4	8'-6"	11	J2	2	4	8'-6"	11	J1	2	4	12'-6"	16	J2	2	4	12'-6"	16	J1	2	4	16'-6"	21	J2	2	4	16'-6"	21	J1	2	4	20'-6"	26	J2	2	4	20'-6"	26	J1	2	4	24'-6"	31	J2	2	4	24'-6"	31										
K1	2	4	18'-2"	27	K2	2	4	18'-2"	27	K1	2	4	22'-2"	31	K2	2	4	22'-2"	31	K1	2	4	26'-2"	35	K2	2	4	26'-2"	35	K1	2	4	30'-2"	39	K2	2	4	30'-2"	39	K1	2	4	34'-2"	43	K2	2	4	34'-2"	43	K1	2	4	38'-2"	47	K2	2	4	38'-2"	47										
L1	2	4	18'-2"	27	L2	2	4	18'-2"	27	L1	2	4	22'-2"	31	L2	2	4	22'-2"	31	L1	2	4	26'-2"	35	L2	2	4	26'-2"	35	L1	2	4	30'-2"	39	L2	2	4	30'-2"	39	L1	2	4	34'-2"	43	L2	2	4	34'-2"	43	L1	2	4	38'-2"	47	L2	2	4	38'-2"	47										
M1	2	4	18'-2"	27	M2	2	4	18'-2"	27	M1	2	4	22'-2"	31	M2	2	4	22'-2"	31	M1	2	4	26'-2"	35	M2	2	4	26'-2"	35	M1	2	4	30'-2"	39	M2	2	4	30'-2"	39	M1	2	4	34'-2"	43	M2	2	4	34'-2"	43	M1	2	4	38'-2"	47	M2	2	4	38'-2"	47										
N1	2	5	3'-2"	6	N2	2	5	3'-2"	6	N1	2	5	7'-2"	10	N2	2	5	7'-2"	10	N1	2	5	11'-2"	14	N2	2	5	11'-2"	14	N1	2	5	15'-2"	18	N2	2	5	15'-2"	18	N1	2	5	19'-2"	22	N2	2	5	19'-2"	22	N1	2																		

6/16 M13 3/8		3'-7"		12"		X		ESTIMATED QUANTITIES FOR 2 M.B.C. TOEWALLS																N = 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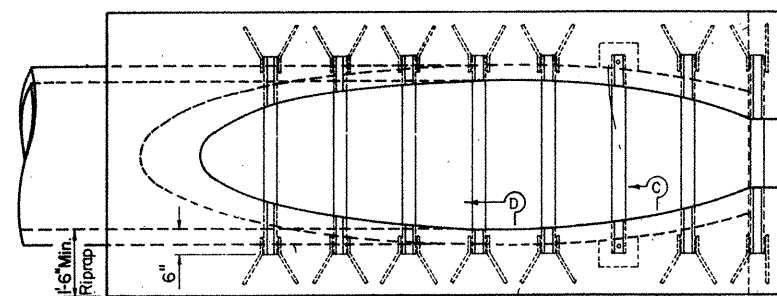
$V_{S1} = V_{L1} = D + 6"$
 $V_{S2} = V_{L2} = 1' - 4"$
 $1' - 6"$ #4

BARS V_{S2} & V_{L2}

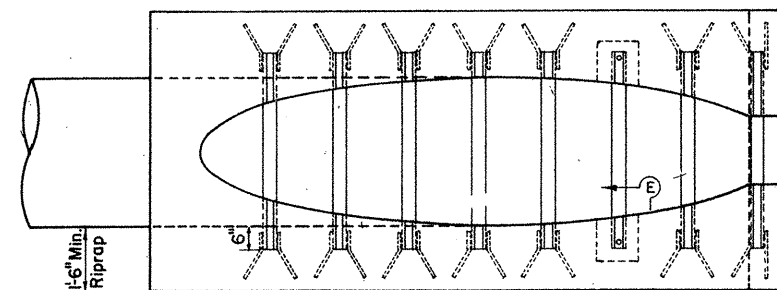
DN. T.H.D.	DRAWING	DATE	FED. ROAD DIV.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.
CK.DN. T.H.D.	<i>Original</i>	<i>Feb. 1950</i>				
CK.DW. K.C.K.	<i>Rev. 5-66. Bars 5 & 7-3/8"</i>		6	TEXAS	NH 95 (40) IM	299
TR. O.C.M.	<i>Rev. June 59</i>		STATE DIST. NO.	COUNTY	CONTR. SECTION NO. NO.	JOB NO.
CK.TR. M.D.A.	<i>Rev. 11-67 Concrete</i>		15	COMAL	0016-05	087
						1435



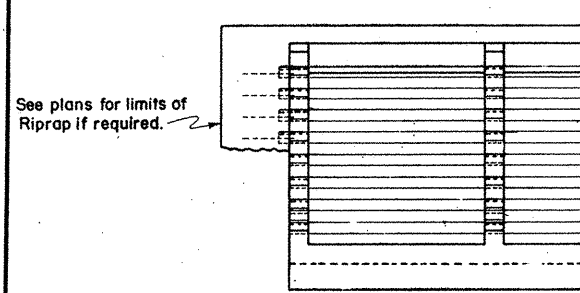
PLAN VIEW



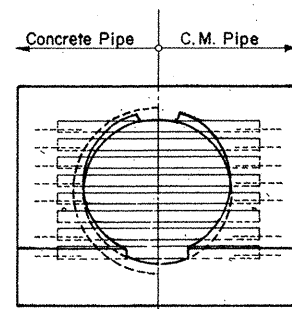
PLAN VIEW
CONCRETE PIPE



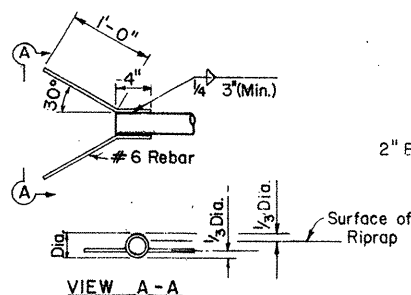
PLAN VIEW
CORRUGATED METAL PIPE



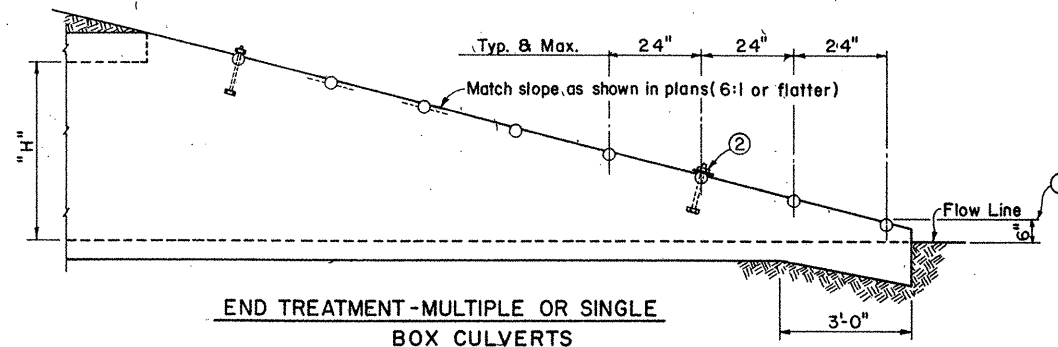
END VIEW
MULTIPLE OR SINGLE
BOX CULVERTS



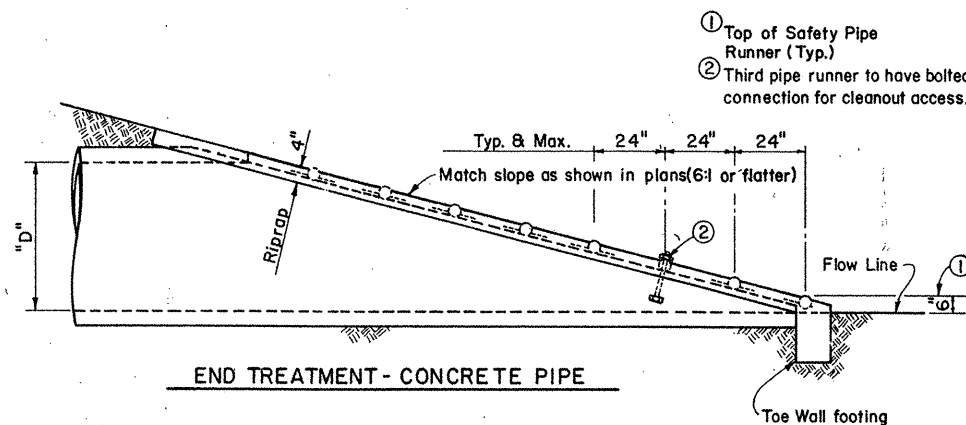
END VIEW
CONCRETE OR CORRUGATED
METAL PIPE



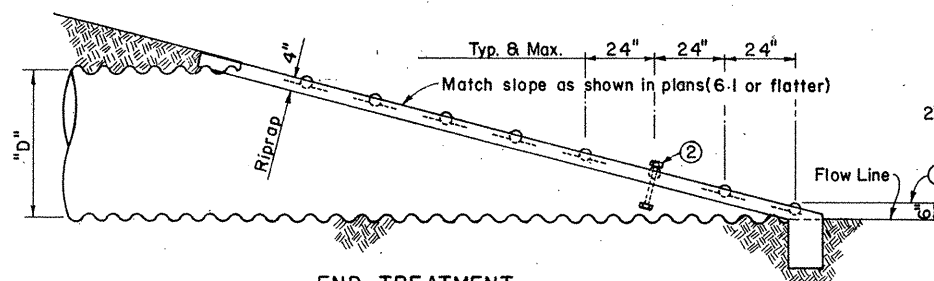
VIEW A-A



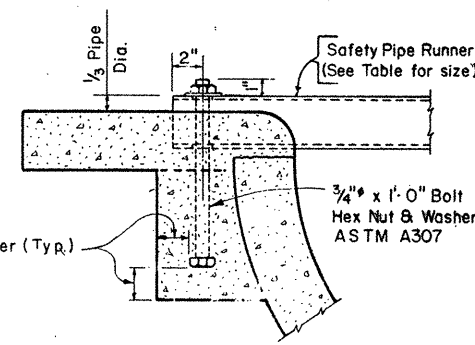
END TREATMENT-MULTIPLE OR SINGLE
BOX CULVERTS



END TREATMENT - CONCRETE PIPE

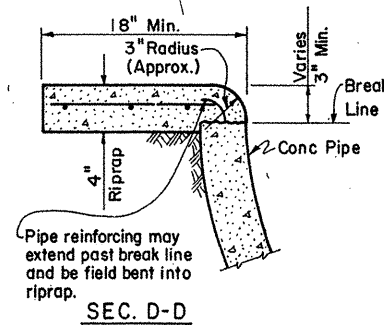


END TREATMENT
CORRUGATED METAL PIPE

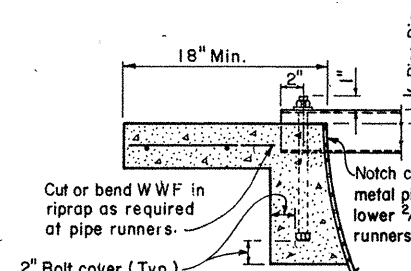


SEC. C-C

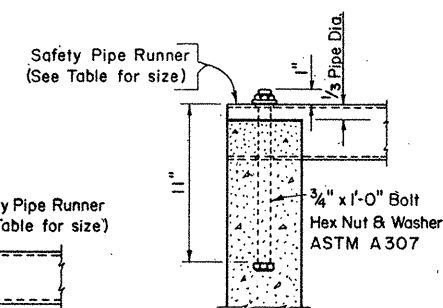
Deepen and widen riprap around ends of 3rd. pipe runner and provide a bolted connection to allow cleanout access.



SEC. D-D



SEC. E-E



SEC. F-F

REQUIRED PIPE SIZES FOR GIVEN PIPE YIELD										
Culvert Size	Pipe Runner Length	35 ks:			42 ks:			52 ks:		
		ASTM A53, Ty. E & S Gr. B	Nom.	OD	ID	ASTM A500, Gr. B	Nom.	OD	ID	API 5LX52
30"	42"	3"XS	3.500	2.900	2 1/2 XS	2.875	1.771	2 1/2 XS	2.875	1.771
		3 1/2 STD	4.000	3.548	3"STD	3.500	3.068	3"STD	3.500	3.068
36"	48"	3"XS	3.500	2.300	3"XS	3.500	2.900	3"Std.	3.500	3.068
		3 1/2 XS	4.000	3.364	3 1/2 Std.	4.000	3.548	3 1/2 Std.	4.000	3.548
42"	54"	3"XS	3.500	2.300	3"XS	3.500	2.300	3"XS	3.500	2.900
		3 1/2 XS	4.000	3.364	3 1/2 XS	4.000	3.364	3 1/2 Std.	4.000	3.548
48"	60"	3"XS	3.500	2.300	3"XS	3.500	2.300	3"XS	3.500	2.900
		4"XS	4.500	3.826	3 1/2 XS	4.000	3.364	3 1/2 Std.	4.000	3.548
54"	66"	4"XS	4.500	3.826	3"XS	3.500	2.300	3"XS	3.500	2.900
		5"Std.	5.563	5.047	4"Std.	4.500	4.026	4"Std.	4.500	4.026
60"	72"	4"XS	4.500	3.826	4"XS	4.500	3.826	3"XS	3.500	2.900
		5"Std.	5.563	5.047	5"Std.	5.563	5.047	3 1/2 XS	4.000	3.364

GENERAL NOTES:
These details are to be used as a guide for installation of safety pipe runners for parallel-drainage structures where out of control vehicles may impact the openings approximately perpendicular to the safety pipe runners. Some installations may require the preparation of special details. In general, safety pipe runners are installed on parallel-drainage structures at maximum spacings of approximately 24 inches.
Installation of safety pipe runners for single or multiple culverts will be in accordance with the details shown if the use of safety pipe runners are specified elsewhere in the plans.
Payment for riprap (if required) toe wall footing is included in the price bid for each Safety Pipe End Treatment.
Design: Safety Pipe Runners 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, June 1981.



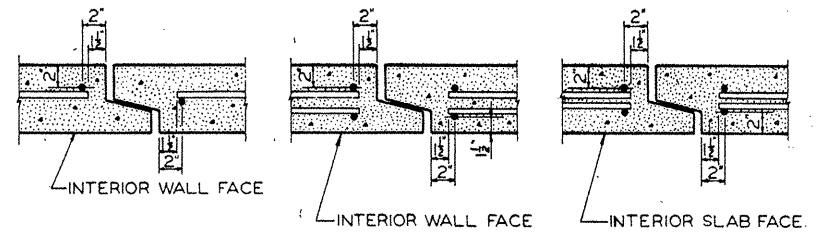
STATE DEPARTMENT OF HIGHWAYS
AND PUBLIC TRANSPORTATION

PARALLEL DRAINAGE SAFETY PIPE RUNNERS

PD-SPR

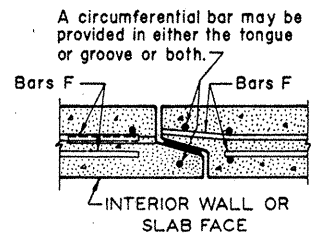
ORIGINAL DRAWING DATE: JUNE 1985	STATE	FEDERAL	FEDERAL AID-PROJECT	SHEET
DN:-MPM	15	6	NH 95 (40)IM	300
CR:-JJP	Rev. 10-86 (Gen. Notes)			
DW:-EDS	Rev. 11-87 (Added 30" Pipe to table)			
CR:-MPM	COUNTY	CONTROL SECTION	JOB	REVISION
	COMAL	0016	05 087	EH 35

CULV. SIZE		TYPE SECT.	DIMEN- SIONS		MAX. FILL	TOTAL QUANTITIES FOR L=8'		QUANTITIES PL.F. OF BARREL		BILL OF REINFORCING STEEL FOR L=8'																				LIFT. WEIGHT L=8'						
										BARS A TOP SLAB					BARS B BOTTOM SLAB					BARS C					#4 BARS D @18"± C. TO C.			# 4 BARS F @ 18" MAX. LENGTH L=7"								
S	H	T	U		C.Y.	LBS.	C.Y.	LBS.	NO.	SIZE	SPA.	LG.	WT.	NO.	SIZE	SPA.	LG.	WT.	NO.	SIZE	SPA.	LG.	WT.	NO.	LG.	WT.	F ₁	SPA.	F ₂	SPA.	F ₃	SPA.	TOTAL	WT.	LBS.	
3	2	1	6"	6"	14'	1.778	193	2.222	24.13	9	#4	12"	3'-6"	21						12	#4	8 1/2"	13'-6"	108				3	14"	8	14"	2	15"	13	64	7,330
	3	1	6"	6"	14'	2.074	230	2.592	28.88	9	#4	11 1/2"	3'-6"	21						13	#4	7 1/2"	15'-6"	135				3	14"	8	14"	4	14"	15	74	8,560
	2	1	6"	6"	12'	2.074	295	2.592	36.88	8	#5	14"	4'-6"	38						11	#5	9"	15'-6"	178				4	18"	10	18"	2	15"	16	79	8,600
4	3	1	6"	6"	12'	2.370	346	2.963	43.75	8	#5	12"	4'-6"	38						12	#5	8"	17'-6"	219				4	18"	10	18"	4	14"	18	89	9,840
	4	1	6"	6"	12'	2.667	395	3.333	49.38	9	#5	12"	4'-6"	42						13	#5	7 1/2"	19'-6"	264				4	18"	10	18"	4	18"	18	89	11,070
	2	2	6"	6"	8"	2.370	385	2.963	48.25	10	#5	10"	5'-6"	57	11	#5	9"	5'-6"	63	9	#5	11"	17'-8"	166				8	17"	10	17"	2	15"	20	99	9,860
5	3	2	6"	6"	8"	2.667	426	3.333	53.25	11	#5	9"	5'-6"	63	12	#5	8 1/2"	5'-6"	69	9	#5	12"	19'-8"	185				8	17"	10	17"	4	14"	22	109	11,100
	4	2	6"	6"	8"	2.963	444	3.704	57.00	11	#5	8 1/2"	5'-6"	63	12	#5	7 1/2"	5'-6"	69	9	#5	12"	21'-8"	203				8	17"	10	17"	4	18"	22	109	12,310
	5	3	6"	7"	8"	3.556	548	4.445	68.50	11	#5	9"	5'-8"	65	12	#5	8"	5'-8"	71	8	#5	13"	24'-0"	200	12	5'-6"	44	10	17"	12	17"	12	18"	34	168	14,780
6	3	2	6"	6"	8"	2.963	568	3.704	71.00	14	#5	7"	6'-6"	95	14	#5	7"	6'-6"	95	11	#5	9"	21'-8"	249				10	15"	12	15"	4	14"	26	129	12,390
	4	2	6"	6"	8"	3.259	605	4.074	75.63	15	#5	6 1/2"	6'-6"	102	15	#5	6 1/2"	6'-6"	102	11	#5	9 1/2"	23'-8"	272				10	15"	12	15"	4	18"	26	129	13,620
	5	3	6"	7"	8"	3.852	684	4.815	85.50	14	#5	7"	6'-8"	97	15	#5	6 1/2"	6'-8"	104	10	#5	10"	26'-0"	271	12	5'-6"	44	10	16"	12	16"	12	18"	34	168	16,070
7	6	3	6"	7"	8"	4.198	746	5.248	93.25	15	#5	6 1/2"	6'-8"	102	16	#5	6"	6'-8"	111	10	#5	10"	28'-0"	292	12	5'-6"	52	10	16"	12	16"	16	16"	38	189	17,520
	3	2	6 1/2"	6"	6"	3.457	746	4.321	93.25	11	#6	9"	7'-6"	124	12	#6	8"	7'-6"	135	10	#6	10"	23'-10"	358				10	18"	12	18"	4	14"	26	129	14,520
	4	2	6 1/2"	6"	6"	3.753	778	4.691	97.25	12	#6	8"	7'-6"	135	13	#6	7 1/2"	7'-6"	146	9	#6	11"	25'-10"	349				12	18"	14	18"	4	18"	30	148	15,740
8	5	3	6 1/2"	7"	6"	4.350	879	5.438	109.88	11	#6	9"	7'-8"	127	12	#6	8"	7'-8"	138	9	#6	11 1/2"	28'-2"	381	12	5'-6"	44	12	17"	14	17"	12	18"	38	189	18,220
	6	3	6 1/2"	7"	6"	4.695	956	5.869	119.50	12	#6	8 1/2"	7'-8"	138	13	#6	8 1/2"	7'-8"	150	9	#6	12"	30'-2"	408	12	6'-6"	52	12	17"	14	17"	16	16"	42	208	19,670
	7	3	6 1/2"	7"	6"	5.041	1011	6.301	126.38	12	#6	8 1/2"	7'-8"	138	13	#6	7 1/2"	7'-8"	150	9	#6	11 1/2"	32'-2"	435	12	7'-6"	60	12	17"	14	17"	20	15"	46	228	21,110
9	4	2	6 1/2"	6"	6"	4.074	979	5.093	122.38	15	#6	6 1/2"	8'-6"	192	14	#6	7"	8'-6"	179	11	#6	9"	27'-10"	460				12	17"	14	17"	4	18"	30	148	17,180
	5	3	6 1/2"	7"	6"	4.671	1050	5.838	131.25	14	#6	7"	8'-8"	182	14	#6	7"	8'-8"	182	10	#6	10"	30'-2"	453	12	5'-6"	44	12	17"	14	17"	12	18"	38	189	19,640
	6	3	6 1/2"	7"	6"	5.017	1107	6.271	138.38	14	#6	7"	8'-8"	182	14	#6	7"	8'-8"	182	10	#6	10"	32'-2"	483	12	6'-6"	52	12	17"	14	17"	16	16"	42	208	21,080
10	7	3	6 1/2"	7"	6"	5.362	1178	6.703	147.25	14	#6	7"	8'-8"	182	15	#6	6 1/2"	8'-8"	195	10	#6	10"	34'-2"	513	12	7'-6"	60	12	17"	14	17"	20	15"	46	228	22,530
	8	3	6 1/2"	8"	6"	6.157	1202	7.696	150.25	13	#6	7 1/2"	8'-10"	172	14	#6	7"	8'-10"	186	10	#6	10 1/2"	36'-6"	548	12	8'-6"	68	12	18"	14	18"	20	18"	46	228	25,770
	5	3	7"	7"	6"	5.242	1222	6.553	152.75	15	#6	6 1/2"	9'-8"	218	15	#6	6 1/2"	9'-8"	218	11	#6	9"	32'-4"	534	12	5'-6"	44	14	17"	16	17"	12	18"	42	208	22,070
11	6	3	7"	7"	6"	5.588	1297	6.985	162.13	16	#6	6"	9'-8"	232	15	#6	6 1/2"	9'-8"	218	11	#6	9"	34'-4"	567	12	6'-6"	52	14	17"	16	17"	16	16"	46	228	23,530
	7	3	7"	7"	6"	5.934	1372	7.417	171.50	16	#6	6"	9'-8"	232	16	#6	6"	9'-8"	232	11	#6	9"	36'-4"	600	12	7'-6"	60	14	17"	16	17"	20	15"	50	248	24,980
	8	3	7"	8"	6"	6.733	1399	8.416	174.88	15	#6	6 1/2"	9'-10"	222	15	#6	6 1/2"	9'-10"	222	11	#6	9 1/2"	38'-8"	639	12	8'-6"	68	14	17"	16	17"	20	18"	50	248	28,230
12	9	3	7"	8"	6"	7.128	1460	8.909	182.50	15	#6	6 1/2"	9'-10"	222	15	#6	6 1/2"	9'-10"	222	11	#6	9"	40'-8"	672	12	9'-6"	76	14	17"	16	17"	24	17"	54	268	29,880
	5	3	7"	7"	6"	5.588	1470	6.985	183.75	17	#6	5 1/2"	10'-8"	272	16	#6	6"	10'-8"	256	13	#6	7 1/2"	34'-4"	670	12	5'-6"	44	16	16"	18	16"	12	18"	46	228	23,650
	6	3	7"	7"	6"	5.934	1537	7.417	192.13	17	#6	5 1/2"	10'-8"	272	16	#6	6"	10'-8"	256	13	#6	7 1/2"	36'-4"	709	12	6'-6"	52	16	16"	18	16"	16	16"	50	248	25,090
13	7	3	7"	7"	6"	6.279	1604	7.849	200.50	17	#6	5 1/2"	10'-8"	272	17	#6	5 1/2"	10'-8"	256	13	#6	7 1/2"	38'-4"	748	12	7'-6"	60	16	16"	18	16"	20	15"	54	268	26,540
	8	3	7"	8"	6"	7.078	1623	8.848	202.88	17	#6	5 1/2"	10'-10"	277	17	#6	5 1/2"	10'-10"	277	12	#6	8"	40'-8"	733	12	8'-6"	68	16	16"	18	16"	20	18"	54	268	29,790
	9	3	7"	8"	6"	7.473	1686	9.342	210.75	17	#6	5 1/2"	10'-10"	277	17	#6	5 1/2"	10'-10"	277	12	#6	8"	42'-8"	769	12	9'-6"	76	16	16"	18	16"	24	17"	58	287	31,430
14	10	3	7"	8"	6"	7.868	1817	9.835	227.13	17	#6	5 1/2"	10'-10"	277	17	#6	5 1/2"	10'-10"	277	13	#6	7 1/2"	44'-8"	872	12	10'-6"	84	16	16"	18	16"	28	16"	62	307	33,120



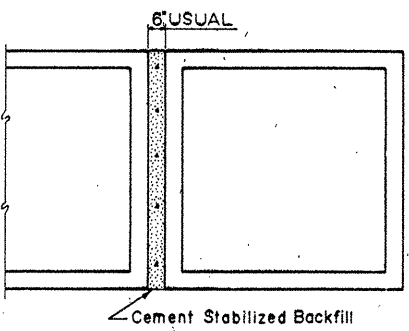
SINGLE MAT PLACEMENT

DOUBLE MAT PLACEMENT



STEEL SUPPORT DETAIL

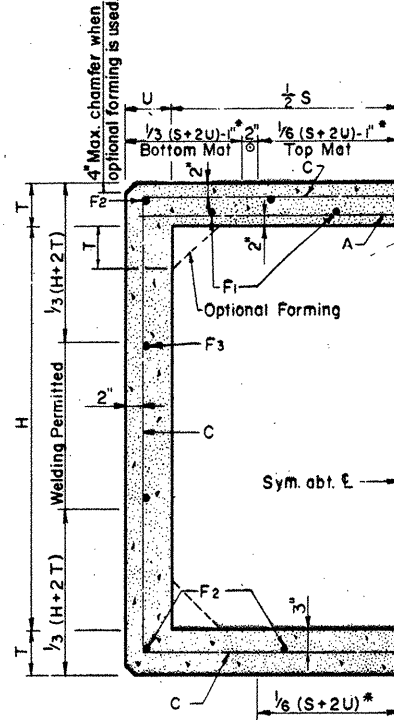
NOTE: As many Bars F as necessary may be extended to end of box to support steel during manufacture. Bars may be slightly bent to clear slope on groove lip as shown in detail. Alternatively the steel may be supported by bar extensions welded to Bars F.



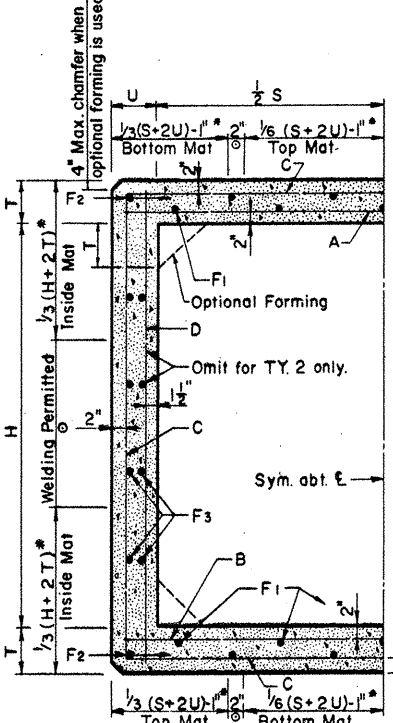
MULTIPLE UNIT PLACEMENT

GENERAL NOTES:
Cement Stabilized Backfill shall be considered subsidiary to the unit price bid for Concrete Box.

All welding to be done by qualified welder.
Additional splices in reinforcing steel not shown herein, must be submitted to the Bridge Division for approval prior to fabrication.
Grade 60 Bars or Wire Fabric may be used in place of Grade 40 Steel by supplying 82% of the area of steel per linear foot shown in the Tables for Bars A, B, C and D.
Longitudinal steel shall have at least as much area as Bars F and shall be spaced at 18" c.c. maximum.
These designs are adequate for HS20 live loading and any fill depth from 2'-0" to the maximum shown in the tables.
In lieu of furnishing the designs shown on this detail the contractor may use designs from either Std. PC-3, PC-7 or ASTM C-789, Table 1. In either case, the substituted design must equal or exceed the maximum fill height for the maximum fill height for the same sized box in the table on this detail. For boxes reinforced with wire fabric the minimum cover shall be three times the wire diameter but not less than one inch. Placing of reinforcement shall otherwise conform to specification "Reinforcing Steel."

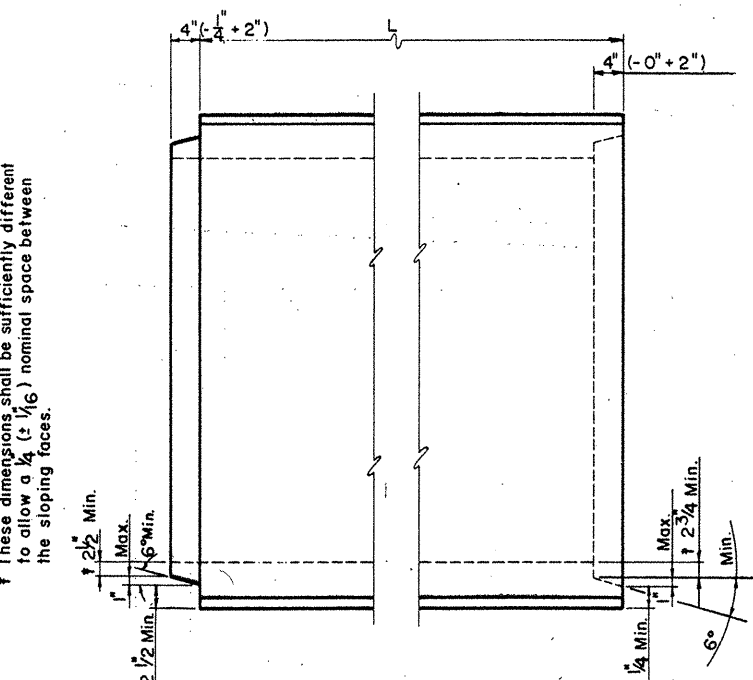


HALF SECTION TYPE 1



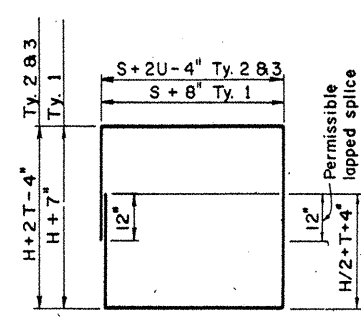
HALF SECTION TYPES 2 & 3

*Permissible tack welding on mats shown.
©Permissible tack welding both mats.



SIDE AND TOP VIEW

NOTE: Tongue and groove dimensional controls shown are intended to allow either a 4" long 1" slope joint, a 6" long 6" slope joint or any joint configuration within these limits. Dimensions shown as minimums shall be maintained around the perimeter of the box.



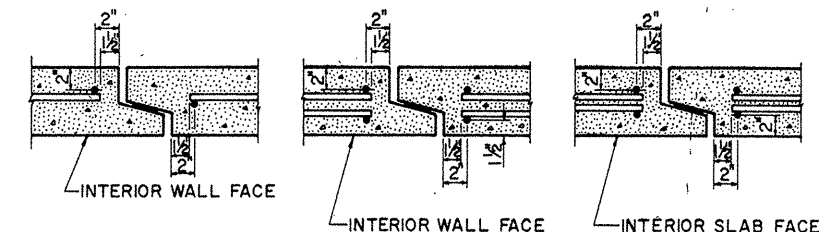
BARS C

TEXAS HIGHWAY DEPARTMENT
BRIDGE DIVISION
PRECAST CONCRETE
BOX CULVERTS

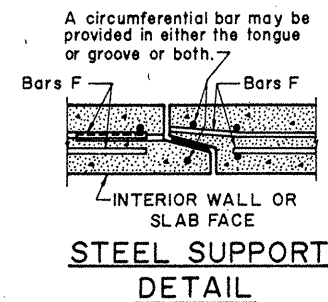
PC-1

ORIGINAL DRAWING DATE	STATE	FEDERAL	FEDERAL AID PROJECT	SHEET
MARCH 1983	TX	6	NH 95 (40) IM	301
DN: ADC	REV. 1-86 (Gen. Notes)			
CK: CCT				
DW: EDS	Rev. 8-86 (Gen. Notes)			
CK: CCT				

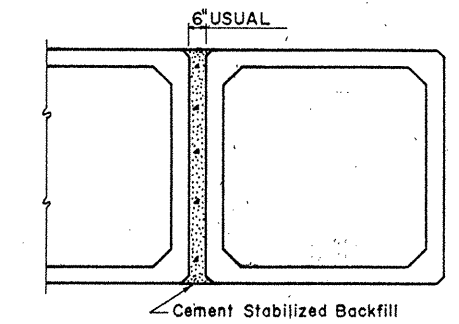
CULV. SIZE		TYPE SECT.	DIMEN- SIONS		MAX. FILL	TOTAL QUANTITIES FOR L=8'		QUANTITIES P.L.F. OF BARREL		BILL OF REINFORCING STEEL FOR L=8'												LIFT. WEIGH L=8'																
										BARS A TOP SLAB			BARS B BOTTOM SLAB			BARS C			#4 BARS D @18"± C. TO C.			# 4 BARS F @ 18" MAX. LENGTH L=7"																
S	H		T	U		C.Y.	LBS.	C.Y.	LBS.	NO.	SIZE	SPA	LG.	WT.	NO.	SIZE	SPA	LG.	WT.	NO.	SIZE	SPA	LG.	WT.	NO.	LG.	WT.	F ₁	SPA	F ₂	SPA	F ₃	SPA	TOTAL	WT.	LBS.		
3	2	1	4"	4"	16'	1.185	204	1.181	25.50																													
	3	1	4"	4"	16'	1.383	253	1.728	31.63																													
	2	1	5"	5"	16'	1.790	322	2.238	40.25																													
4	3	1	5"	5"	16'	2.037	398	2.546	49.75																													
	4	1	5"	5"	16'	2.284	493	2.855	61.63																													
	2	2	6"	6"	8'	2.518	385	3.148	48.13	10	#5	10"	5'-6"	57	11	#5	9 1/2"	5'-6"	63	9	#5	11"	17'-8"	166														
5	3	2	6"	6"	8'	2.815	426	3.519	53.25	11	#5	9 1/2"	5'-6"	63	12	#5	8 1/2"	5'-6"	69	9	#5	12"	19'-8"	185														
	4	2	6"	6"	8'	3.111	422	3.889	52.75	11	#5	9"	5'-6"	63	12	#5	8"	5'-6"	69	8	#5	13"	21'-8"	181														
	5	3	6"	6"	8'	3.407	533	4.259	66.63	12	#5	8 1/2"	5'-6"	69	13	#5	7 1/2"	5'-6"	75	8	#5	14"	23'-8"	197	12	5'-6"	44	8	#5	17"	10	17"	2	15"	20	99	10,460	
6	3	2	7"	7"	8'	3.714	498	4.643	62.25	11	#5	9"	6'-8"	76	12	#5	8 1/2"	6'-8"	83	9	#5	11"	22'-4"	210														
	4	2	7"	7"	8'	4.060	523	5.075	65.38	12	#5	8 1/2"	6'-8"	83	12	#5	8"	6'-8"	83	9	#5	12"	24'-4"	228														
	5	3	7"	7"	8'	4.405	605	5.506	75.63	12	#5	8"	6'-8"	83	13	#5	7 1/2"	6'-8"	90	8	#5	13"	26'-4"	220	12	5'-6"	44	10	#5	16"	12	16"	12	17"	34	168	18,260	
7	6	3	7"	7"	8'	4.751	656	5.939	82.00	12	#5	8"	6'-8"	83	14	#5	7"	6'-8"	97	8	#5	13"	28'-4"	236	12	6'-6"	52	10	#5	16"	12	16"	16	16"	38	188	19,690	
	3	2	8"	8"	6'	4.742	605	5.928	75.63	12	#5	8 1/2"	7'-10"	98	12	#5	8 1/2"	7'-10"	98	10	#5	10"	25'-0"	261														
	4	2	8"	8"	6'	5.138	616	6.423	77.00	12	#5	8"	7'-10"	98	13	#5	7 1/2"	7'-10"	106	9	#5	11"	27'-0"	253														
8	5	3	8"	8"	6'	5.533	716	6.916	89.50	12	#5	8"	7'-10"	98	14	#5	7"	7'-10"	114	9	#5	11"	29'-0"	272	12	5'-6"	44	12	#5	16"	14	16"	12	18"	38	188	22,900	
	6	3	8"	8"	6'	5.928	771	7.410	96.38	13	#5	7 1/2"	7'-10"	106	14	#5	7"	7'-10"	114	9	#5	12"	31'-0"	291	12	6'-6"	52	12	#5	16"	14	16"	16	17"	42	208	24,540	
	7	3	8"	8"	6'	6.323	827	7.904	103.38	13	#5	7 1/2"	7'-10"	106	15	#5	6 1/2"	7'-10"	123	9	#5	12"	33'-0"	310	12	7'-6"	60	12	#5	16"	14	16"	20	16"	46	228	26,180	
9	4	2	8"	8"	6'	5.533	798	6.916	99.75	15	#5	6 1/2"	8'-10"	138	15	#5	6 1/2"	8'-10"	138	12	#5	8 1/2"	29'-0"	363														
	5	3	8"	8"	6'	5.928	873	7.410	109.13	15	#5	6 1/2"	8'-10"	138	16	#5	6"	8'-10"	147	11	#5	9"	31'-0"	356	12	5'-6"	44	12	#5	16"	14	16"	12	18"	38	188	24,610	
	6	3	8"	8"	6'	6.323	933	7.904	116.63	16	#5	6"	8'-10"	147	16	#5	6"	8'-10"	147	11	#5	9 1/2"	33'-0"	379	12	6'-6"	52	12	#5	16"	14	16"	16	17"	42	208	26,250	
10	7	3	8"	8"	6'	6.719	994	8.399	124.25	16	#5	6"	8'-10"	147	17	#5	5 1/2"	8'-10"	157	11	#5	9 1/2"	35'-0"	402	12	7'-6"	60	12	#5	16"	14	16"	18	18"	46	228	27,900	
	8	3	8"	8"	6'	7.114	1,025	8.893	128.13	16	#5	6"	8'-10"	147	17	#5	5 1/2"	8'-10"	157	11	#5	9 1/2"	37'-0"	425	12	8'-6"	68	12	#5	16"	14	16"	20	18"	46	228	29,520	
	5	3	9"	9"	6'	7.222	996	9.028	124.50	15	#5	6 1/2"	10'-0"	156	16	#5	6"	10'-0"	167	12	#5	8"	33'-8"	421	12	5'-6"	44	14	#5	16"	16	18"	12	18"	42	208	29,940	
9	6	3	9"	9"	6'	7.665	1,070	9.581	133.75	16	#5	6"	10'-0"	167	17	#5	5 1/2"	10'-0"	177	12	#5	8 1/2"	35'-8"	446	12	6'-6"	52	14	#5	16"	16	18"	16	17"	46	228	31,780	
	7	3	9"	9"	6'	8.111	1,123	10,14	140.38	16	#5	6"	10'-0"	167	17	#5	5 1/2"	10'-0"	177	12	#5	8 1/2"	37'-8"	471	12	7'-6"	60	14	#5	16"	16	18"	20	16"	50	248	33,620	
	8	3	9"	9"	6'	8.555	1,187	10,69	148.38	12	#6	8 1/2"	10'-0"	180	13	#6	7 1/2"	10'-0"	195	12	#5	8 1/2"	39'-8"	496	12	8'-6"	68	14	#5	16"	16	18"	20	18"	50	248	35,470	
10	9	3	9"	9"	6'	8.999	1,256	11,25	157.00	12	#6	8 1/2"	10'-0"	180	14	#6	7"	10'-0"	210	12	#5	8 1/2"	41'-8"	522	12	9'-6"	76	14	#5	16"	16	18"	24	17"	54	268	37,310	
	5	3	10"	10"	6'	8.640	1,223	10,80	152.88	11	#6	9"	11'-2"	184	12	#6	8"	11'-2"	201	10	#6	10 1/2"	36'-4"	546	12	5'-6"	44	16	#5	17"	18	17"	16	15"	50	248	35,840	
	6	3	10"	10"	6'	9.133	1,220	11,42	152.50	12	#6	8 1/2"	11'-2"	201	12	#6	8"	11'-2"	201	9	#6	11"	38'-4"	518	12	6'-6"	52	16	#5	17"	18	17"	16	18"	50	248	37,830	
10	7	3	10"	10"	6'	9.627	1,292	12,03	161.50	12	#6	8"	11'-2"	201	13	#6	7 1/2"	11'-2"	218	9	#6	11 1/2"	40'-4"	545	12	7'-6"	60	16	#5	17"	18	17"	20	17"	54	268	39,880	
	8	3	10"	10"	6'	10.120	1,363	12,65	170.38	12	#6	8"	11'-2"	201	14	#6	7"	11'-2"	235	9	#6	11 1/2"	42'-4"	572	12	8'-6"	68	16	#5	17"	18	17"	24	18"	58	287	41,930	
	9	3	10"	10"	6'	10.614	1,398	13,27	174.75	12	#6	8"	11'-2"	201	14	#6	7"	11'-2"	235	9	#6	11 1/2"	44'-4"	599	12	9'-6"	76	16	#5	17"	18	17"	24	18"	58	287	43,950	
10	10	3	10"	10"	6'	11.108	1,470	13,89	187.75	12	#6	8"	11'-2"	201	15	#6	6 1/2"	11'-2"	252	9	#6	11 1/2"	46'-4"	626	12	10'-6"	84	16	#5	17"	18	17"	28	17"	62	307	46,000	



SINGLE MAT PLACEMENT
DOUBLE MAT PLACEMENT



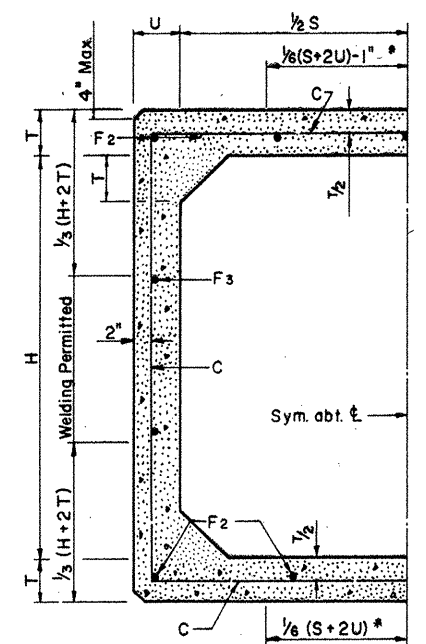
NOTE: As many Bars F as necessary may be extended to end of box to support steel during manufacture. Bars may be slightly bent to clear slope on groove lip as shown in detail. Alternatively the steel may be supported by bar extensions welded to Bars F.



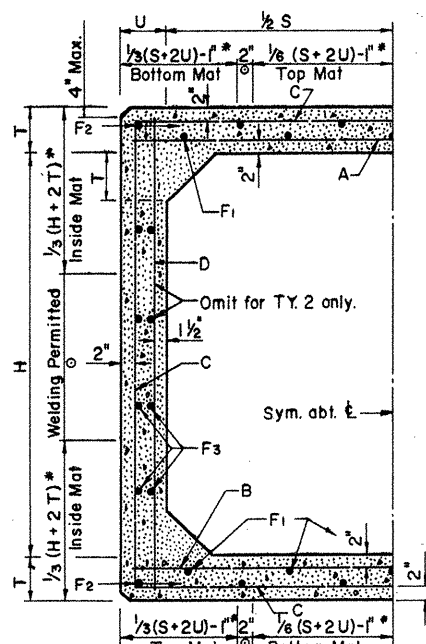
MULTIPLE UNIT PLACEMENT

GENERAL NOTES:
Cement Stabilized Backfill shall be considered subsidiary to the unit price bid for Concrete Box.

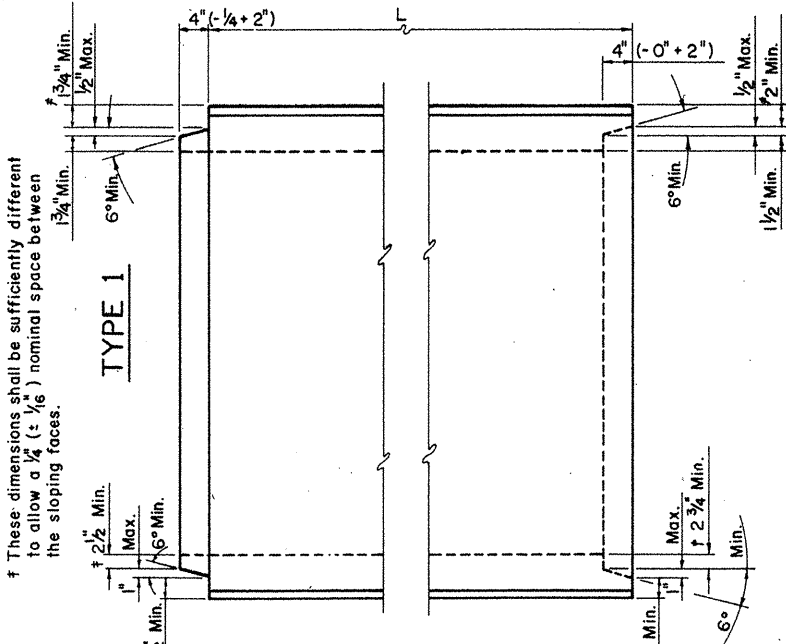
All welding to be done by qualified welder.
Additional splices in reinforcing steel not shown hereon, must be submitted to the Bridge Division for approval prior to fabrication.
Grade 60 Bars or Wire Fabric may be used in place of Grade 40 Steel by supplying 82% of the area of steel per linear foot shown in the Tables for Bars A, B, C and D.
Longitudinal steel shall have at least as much area as Bars F and shall be spaced at 18" c.c. maximum.
These designs are adequate for HS 20 live loading and any fill depth from 2'-0" to the maximum shown in the tables.
In lieu of furnishing the designs shown on this detail the contractor may use designs from either Std. PC-1, PC-7 or ASTM C789, Table I. In either case, the substituted design must equal or exceed the maximum fill height for the same sized box in the table on this detail. For boxes reinforced with wire fabric the minimum cover shall be three times the wire diameter but not less than one inch. Placing of reinforcement shall otherwise conform to specification "Reinforcing Steel."



HALF SECTION TYPE 1

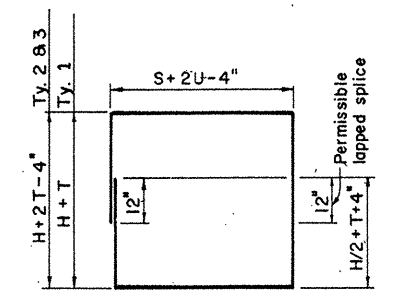


HALF SECTION TYPES 2 & 3



SIDE AND TOP VIEW

NOTE: Tongue and groove dimensional controls shown are intended to allow either a 4" long 1" slope joint, a 6" long 6° slope joint or any joint configuration within these limits. Dimensions shown as minimums shall be maintained around the perimeter of the box.



BARS C

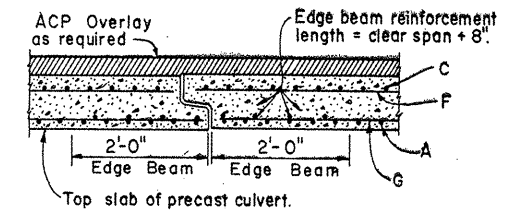
*Permissible tack welding on mats shown.
©Permissible tack welding both mats.

TEXAS HIGHWAY DEPARTMENT BRIDGE DIVISION			
PRECAST CONCRETE BOX CULVERTS			
PC-3			
ORIGINAL DRAWING DATE: MARCH 1983	STATE: 15	FEDERAL AID PROJECT: 6	SHEET: 302
REVISIONS: CK.-CCT Rev. 1-86 (Gen. Notes) CK.-EDS Rev. 8-86 (Gen. Notes)	COUNTY: COMAL	CONTRACT NO.: 016 05 087	JOB: 1H35

CULVERT SIZE ft.		DIMENSIONS in.			TYPE SECT.	REINFORCING STEEL																EDGE BEAM REINFC		LIFT WT. L = 12" TONS	MAX FILL ft.
						BARS A		BARS B		BARS C		BARS D		BARS F		BARS G†		BARS M		BARS N		NO.			
S	H	T ₁	T _b	U		SIZE	SPA.	SIZE	SPA.	SIZE	SPA.	SIZE	SPA.	SIZE	SPA.	SIZE	SPA.	SIZE	SPA.	SIZE	NO.				
3	1	6	6	6	1	#5	6"	#5	12"	#4	18"	#4	15"	#4	18"	#4	6"	#4	18"	#5	3	2.7	15'		
	1.5	"	"	"	1	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	3.2	"		
	2	"	"	"	2	"	"	"	"	"	15"	"	"	"	"	"	"	"	18"	#4	18"	"	2.7	"	
4	3	"	"	"	2	"	"	"	"	"	"	"	"	"	"	"	"	"	15"	"	15"	"	3.2	"	
	1	6	6	6	1	#5	5"	#5	10"	#4	18"	#4	15"	#4	18"	#4	6"	#4	18"	#5	4	3.2	12'		
	2	"	"	"	1	"	"	"	"	"	"	"	12"	"	"	"	"	"	15"	"	"	"	4.1	"	
5	3	"	"	"	1	"	"	"	"	"	"	#5	9"	"	"	"	"	"	"	"	"	5.0	"		
	4	"	"	"	1	"	"	"	"	"	"	"	7"	"	"	"	"	"	12"	"	"	"	5.9	"	
	1	6½	6	6	1	#5	4"	#5	8"	#4	18"	#4	15"	#4	18"	#4	6"	#4	18"	#5	5	3.5	10'		
6	2	"	"	"	1	"	"	"	"	"	"	"	12"	"	"	"	"	"	15"	"	"	"	4.4	"	
	3	"	"	"	1	"	"	"	"	"	"	#5	9"	"	"	"	"	"	"	"	"	5.3	"		
	4	"	"	"	1	"	"	"	"	"	"	"	7"	"	"	"	"	"	12"	"	"	"	6.2	"	
7	5	"	"	"	2	"	"	"	"	"	"	9"	#4	9"	"	"	"	"	15"	#4	15"	"	5.1	"	
	1	7	6½	6	1	#5	4"	#5	8"	#4	18"	#4	15"	#4	18"	#4	6"	#4	18"	#5	5	4.2	8'		
	2	"	"	"	1	"	"	"	"	"	"	"	12"	"	"	"	"	"	15"	"	"	"	5.1	"	
8	3	"	"	"	1	"	"	"	"	"	"	#5	9"	"	"	"	"	"	"	"	"	6.0	"		
	4	"	"	"	1	"	"	"	"	"	"	"	7"	"	"	"	"	"	12"	"	"	"	6.9	"	
	5	"	"	"	2	"	"	"	"	"	"	9"	#4	9"	"	"	"	"	15"	#4	15"	"	5.9	"	
9	6	"	"	"	2	"	"	"	"	#5	10"	#5	9"	"	"	"	"	"	"	"	"	6.3	"		
	1	7½	7	6	1	#5	4"	#5	6"	#4	18"	#4	15"	#4	18"	#4	6"	#4	18"	#5	5	5.0	8'		
	2	"	"	"	1	"	"	"	"	"	"	"	"	12"	"	"	"	"	15"	"	"	"	5.9	"	
10	3	"	"	"	1	"	"	"	"	"	"	#5	9"	"	"	"	"	"	"	"	"	6.8	"		
	4	"	"	"	1	"	"	"	"	"	"	"	7"	"	"	"	"	"	12"	"	"	"	7.7	"	
	5	"	"	"	2	"	"	"	"	"	"	9"	#4	9"	"	"	"	"	15"	#4	15"	"	6.7	"	
11	6	"	"	"	2	"	"	"	"	#5	10"	#5	9"	"	"	"	"	"	"	"	"	7.1	"		
	7	"	"	"	2	"	"	"	"	"	"	8"	"	"	"	"	"	"	12"	"	12"	"	7.6	"	
	1	8	7½	6	1	#6	5"	#6	8"	#4	18"	#4	15"	#4	18"	#4	6"	#4	18"	#6	4	5.9	8'		
12	2	"	"	"	1	"	"	"	"	"	"	"	12"	"	"	"	"	"	15"	"	"	"	6.8	"	
	3	"	"	"	1	"	"	"	"	"	"	#5	9"	"	"	"	"	"	"	"	"	7.7	"		
	4	"	"	"	1	"	"	"	"	"	"	"	7"	"	"	"	"	"	12"	"	"	"	8.6	"	
13	5	"	"	"	2	"	"	"	"	"	"	9"	#4	9"	"	"	"	"	15"	#4	15"	"	7.6	"	
	6	"	"	"	2	"	"	"	"	#5	10"	#5	9"	"	"	"	"	"	"	"	"	8.0	"		
	7	"	"	"	2	"	"	"	"	"	"	8"	"	"	"	"	"	"	12"	"	12"	"	8.5	"	
14	8	"	"	"	2	"	"	"	"	"	"	7"	"	"	"	"	"	"	"	"	"	8.9	"		
	1	8	7½	6	1	#6	4"	#6	6"	#4	18"	#4	15"	#4	18"	#5	6"	#4	18"	#6	4	6.4	8'		
	2	"	"	"	1	"	"	"	"	"	"	"	12"	"	"	"	"	"	15"	"	"	"	7.3	"	
15	3	"	"	"	1	"	"	"	"	"	"	#5	9"	"	"	"	"	"	"	"	"	8.2	"		
	4	"	"	"	1	"	"	"	"	"	"	"	7"	"	"	"	"	"	12"	"	"	"	9.1	"	
	5	"	"	"	2	"	"	"	"	"	"	9"	#4	9"	"	"	"	"	15"	#4	15"	"	8.2	"	
16	6	"	"	"	2	"	"	"	"	#5	10"	#5	9"	"	"	"	"	"	"	"	"	8.6	"		
	7	"	"	"	2	"	"	"	"	"	"	8"	"	"	"	"	"	"	12"	"	12"	"	9.0	"	
	8	"	"	"	2	"	"	"	"	"	"	7"	"	"	"	"	"	"	"	"	"	"	9.5	"	
17	1	8½	8	6	1	#6	4"	#6	5"	#4	18"	#4	15"	#4	18"	#5	6"	#4	18"	#6	4	7.4	8'		
	2	"	"	"	1	"	"	"	"	"	"	"	12"	"	"	"	"	"	15"	"	"	"	8.3	"	
	3	"	"	"	1	"	"	"	"	"	"	#5	9"	"	"	"	"	"	"	"	"	"	9.2	"	
18	4	"	"	"	1	"	"	"	"	"	"	"	7"	"	"	"	"	"	12"	"	"	"	10.1	"	
	5	"	"	"	2	"	"	"	"	"	"	9"	#4	9"	"	"	"	"	15"	#4	15"	"	9.2	"	
	6	"	"	"	2	"	"	"	"	#5	10"	#5	9"	"	"	"	"	"	"	"	"	"	9.6	"	
19	7	"	"	"	2	"	"	"	"	"	"	8"	"	"	"	"	"	"	12"	"	12"	"	10.0	"	
	8	"	"	"	2	"	"	"	"	"	"	7"	"	"	"	"	"	"	"	"	"	"	10.5	"	

⊗ Lift weight is the maximum piece weight of the top and bottom sections.
 † If the fill height is greater than 2'-0", the size and spacing of Bars G may be reduced to that of Bars F.

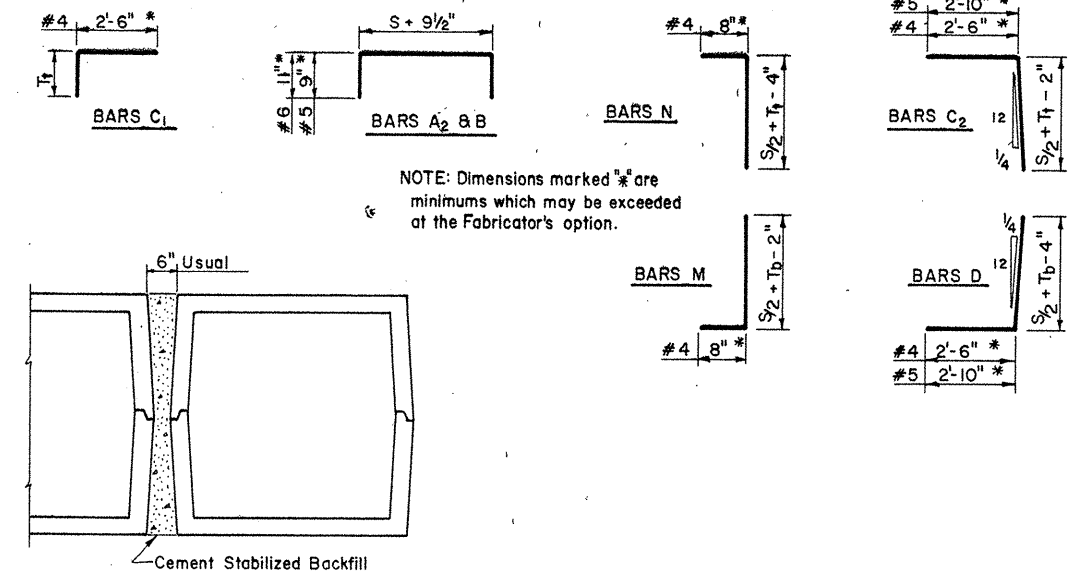
NOTE: Edge beam reinforcement may be combined with Bars A in a single layer, or placed in a separate layer as shown below. Bars shall be bundled as necessary to maintain required clear distances between bars.



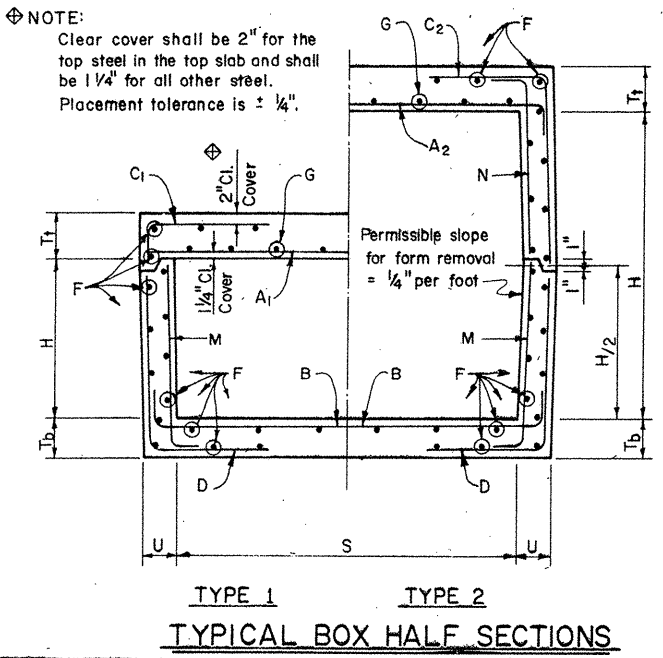
EDGE BEAM

GENERAL NOTES:

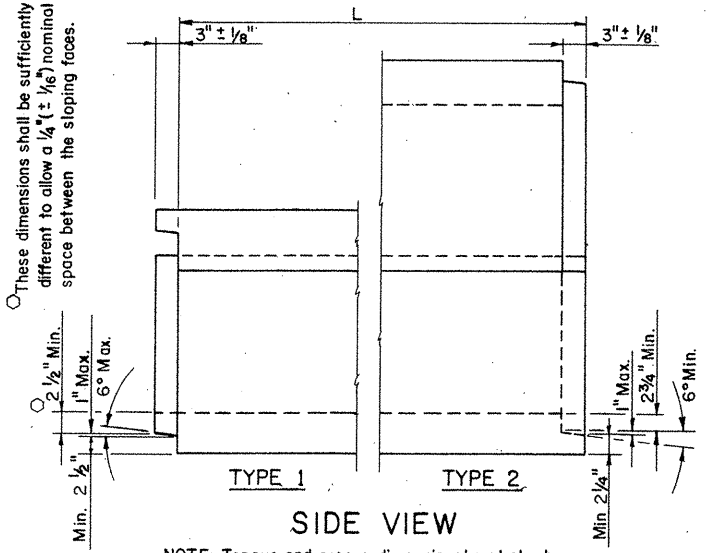
Design conforms to 1977 AASHTO Standard Specifications for Highway Bridges (Interim revisions included thru 1982) for HS 20 direct traffic loading and maximum fill height shown in the table. Precast culverts constructed according to this design shall conform to Item 462 "Concrete Box Culverts".
 The Contractor may furnish designs shown on this sheet in lieu of other precast culvert designs of the same nominal size, provided the maximum fill does not exceed that shown in the table.
 Reinforcing steel: Grade 60 deformed bars. Concrete, $f'_c = 4000$ psi
 Joint Protection: Where fill measured from the top of the precast box culvert to the roadway surface is less than 2'-0", joints shall be protected by strengthening the top slab with an Edge Beam at each free edge.
 Edge Beams shall be subsidiary to the unit price bid for Concrete Box.



MULTIPLE UNIT PLACEMENT

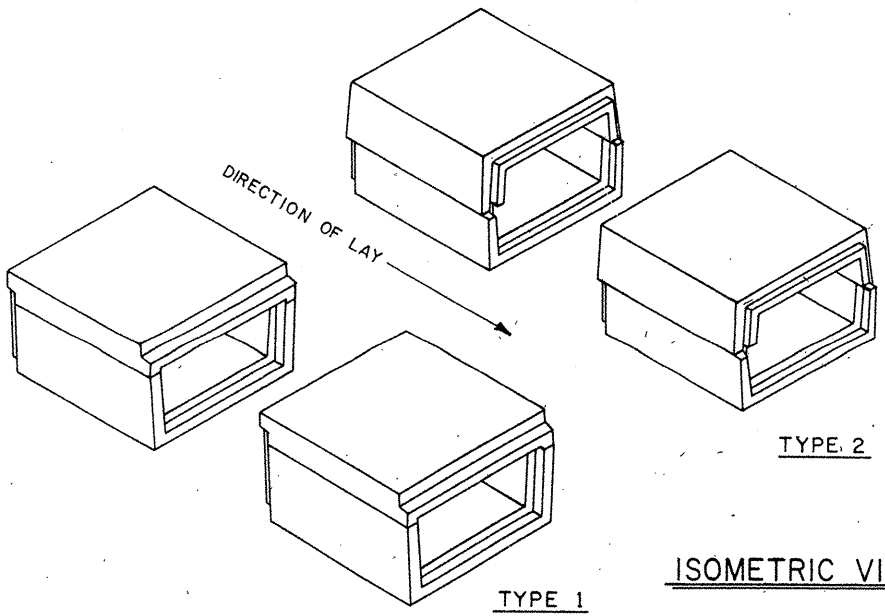


TYPICAL BOX HALF SECTIONS



SIDE VIEW

NOTE: Tongue and groove dimensional controls shown are intended to allow either a 3" long 1" slope joint, a 3" long 6" slope joint or any joint configuration within these limits. Dimensions shown as minimums shall be maintained around the box and along the horizontal joint.



ISOMETRIC VIEW

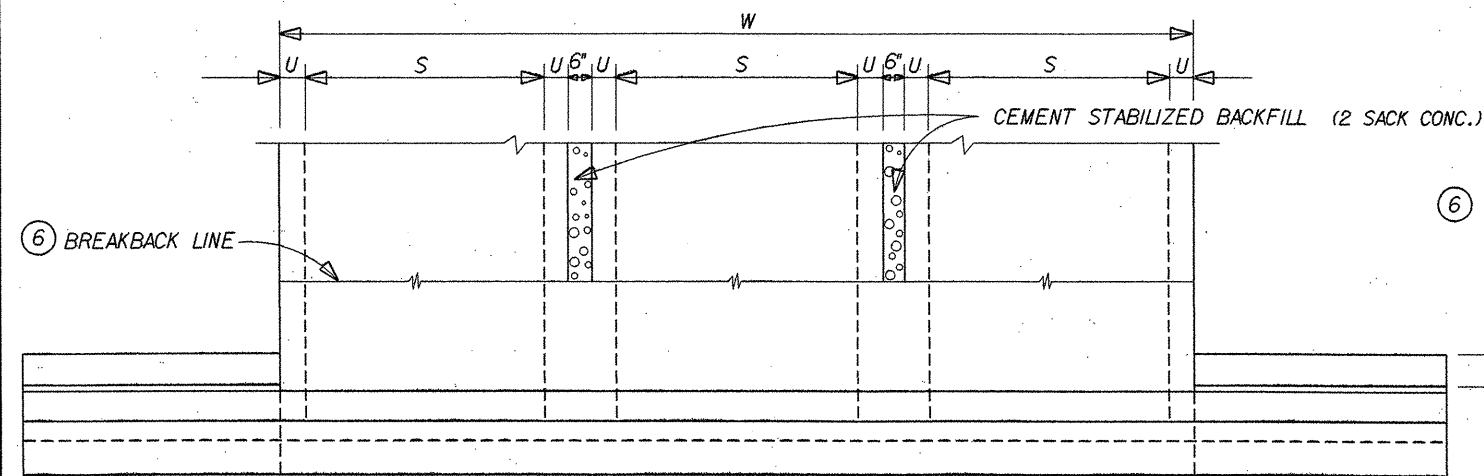
Tack Welding: No tack welding of reinforcing bars will be permitted except within 6 inches of an end. Bars F are exempt from this restriction, and may be tack welded anywhere along their length.
Multiple Unit Placement: Cement Stabilized Backfill shall be considered subsidiary to the unit price bid for Concrete Box.
Form Removal and Handling Procedures: Precast pieces may be removed from the forms as soon as they have attained sufficient strength to allow handling without cracking. Damaged or cracked pieces shall be subject to rejection.
Marking: In addition to the marking requirements of Item 462, each piece shall bear the following markings:
 Top and Bottom pieces without edge beams: TXPC7
 Top pieces with edge beams: TXPC7 EB
 Joint Seals: Horizontal and transverse joints shall be sealed in accordance with the Specifications.

STATE DEPARTMENT OF HIGHWAYS
AND PUBLIC TRANSPORTATION

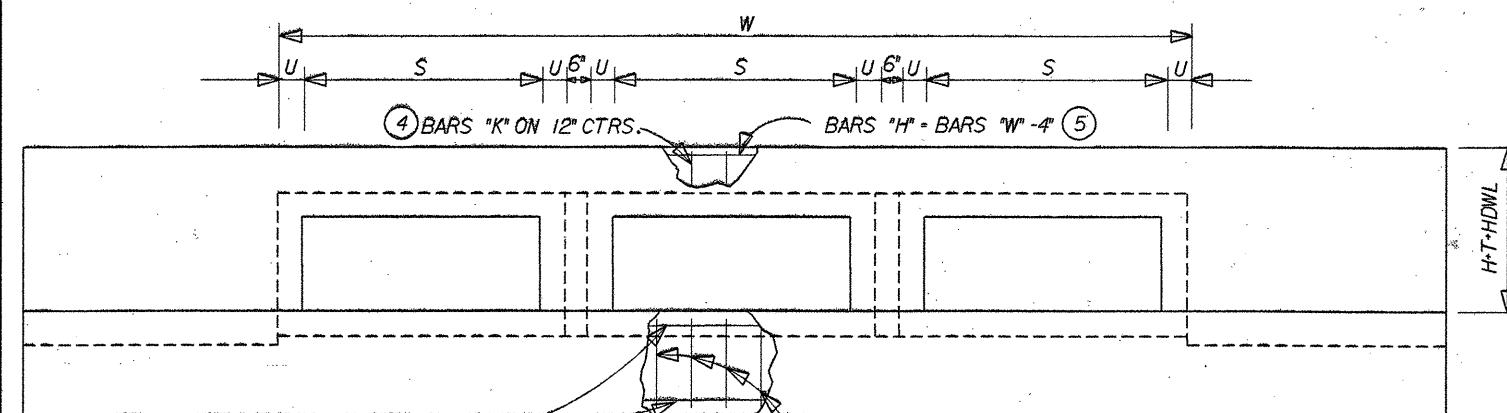
PRECAST CONCRETE
BOX CULVERTS

PC-7

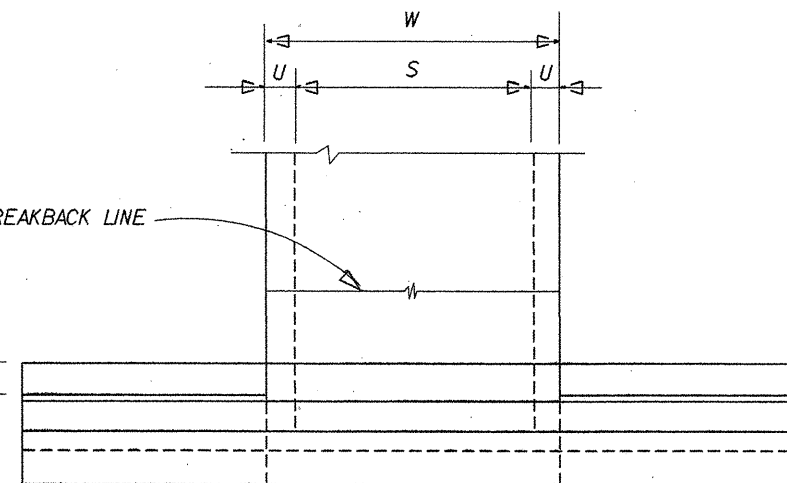
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DESIGNED BY: LEH	REVISIONS:	COUNTY: COMAL	DATE: 05/08/85	BY: JH35
CHECKED BY: MPM	Rev. 2-84.			
DESIGNED BY: EDS				
CHECKED BY: LEH				



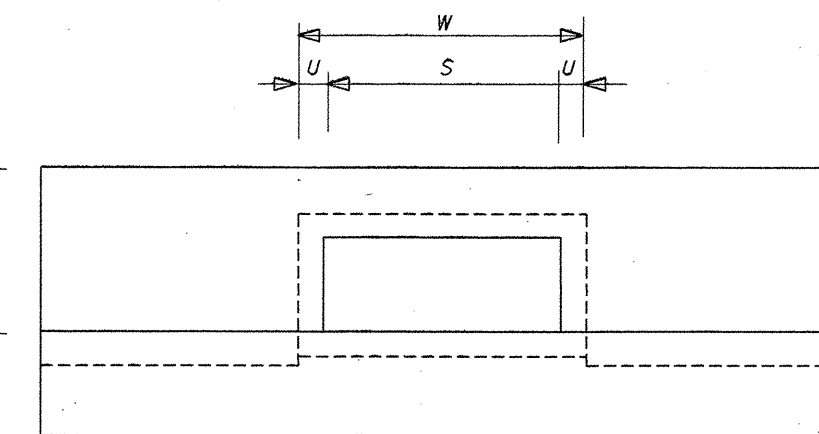
PLAN



ELEVATION



PLAN

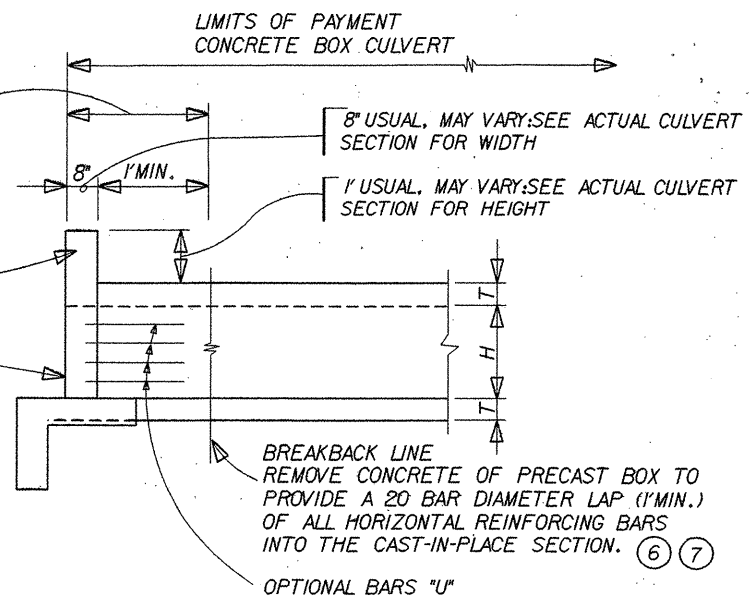


ELEVATION

THIS SECTION OF CONCRETE BOX CULVERT SHALL BE CAST-IN-PLACE. QUANTITIES AND PLACEMENT OF REINFORCING STEEL SHALL CONFORM TO THE NORMAL BOX CULVERT STANDARD DETAILS, RELATED SKEWD STANDARD, OR SPECIAL DESIGN STANDARD DETAILS EXCEPT BARS "H" AND "K". ④ ⑤

COST OF CURB IS INCLUDED IN THE LENGTH OF THE BOX

NORMAL OR RELATED SKEWD WINGWALL

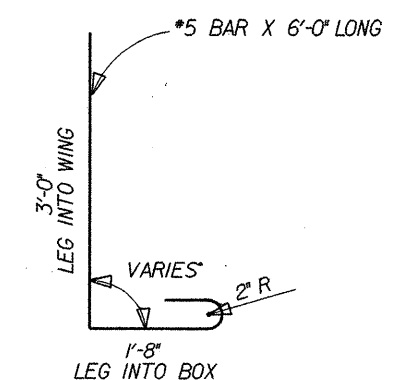


SECTION

BARS "U" MAY BE USED AS SHOWN ON THE REQUIRED PARALLEL WINGWALL STANDARD OR EITHER OPTION 1 OR 2 SHOWN BELOW MAY BE SUBSTITUTED.

BARS "U" OPTION 1

PLACE "U" BARS AS SHOWN ON THE PARALLEL WINGWALL STANDARD, BUT AT 12" CTRS.



BARS "U" OPTION 2

PLACE "U" BARS AS SHOWN ON THE PARALLEL WINGWALL STANDARD, BUT AT 12" CTRS.

GENERAL NOTES:

- ① FOR DIMENSIONS NOT SHOWN HEREON.
- ② WINGWALL, TOEWALL AND APRON QUANTITIES WILL BE
- ③ ALL CAST-IN-PLACE CONCRETE SHALL CONFORM TO THE REQUIREMENTS OF ITEM 420 AND 421
- ④ ADJUST THE LENGTH OF BARS "K" FOR CURB HEIGHTS LESS THAN ONE FOOT. PLACE BARS AS SHOWN ON THE APPROPRIATE CULVERT/ WINGWALL STANDARD/DETAIL SHEET(S).
- ⑤ TO DETERMINE THE LENGTH OF BARS "H" AND "X" ON A SKEWD BOX CULVERT, FIRST DETERMINE THE LENGTH "W" FOR A NORMAL BOX THEN MULTIPLY "W" BY THE FOLLOWING FACTORS: 1.04 FOR 15° SKEW, 1.15 FOR A 30° SKEW AND 1.41 FOR A 45° SKEW.
- ⑥ INSTEAD OF BREAKING BACK THE LAST PRECAST BOX(ES) IN THE FIELD, THE END PRECAST SECTION(S) MAY BE CAST TO THE BREAKBACK
- ⑦ THE BREAKBACK MAY BE ELIMINATED IF THE WINGWALL, CURB AND APRON STEEL IS CAST INTO

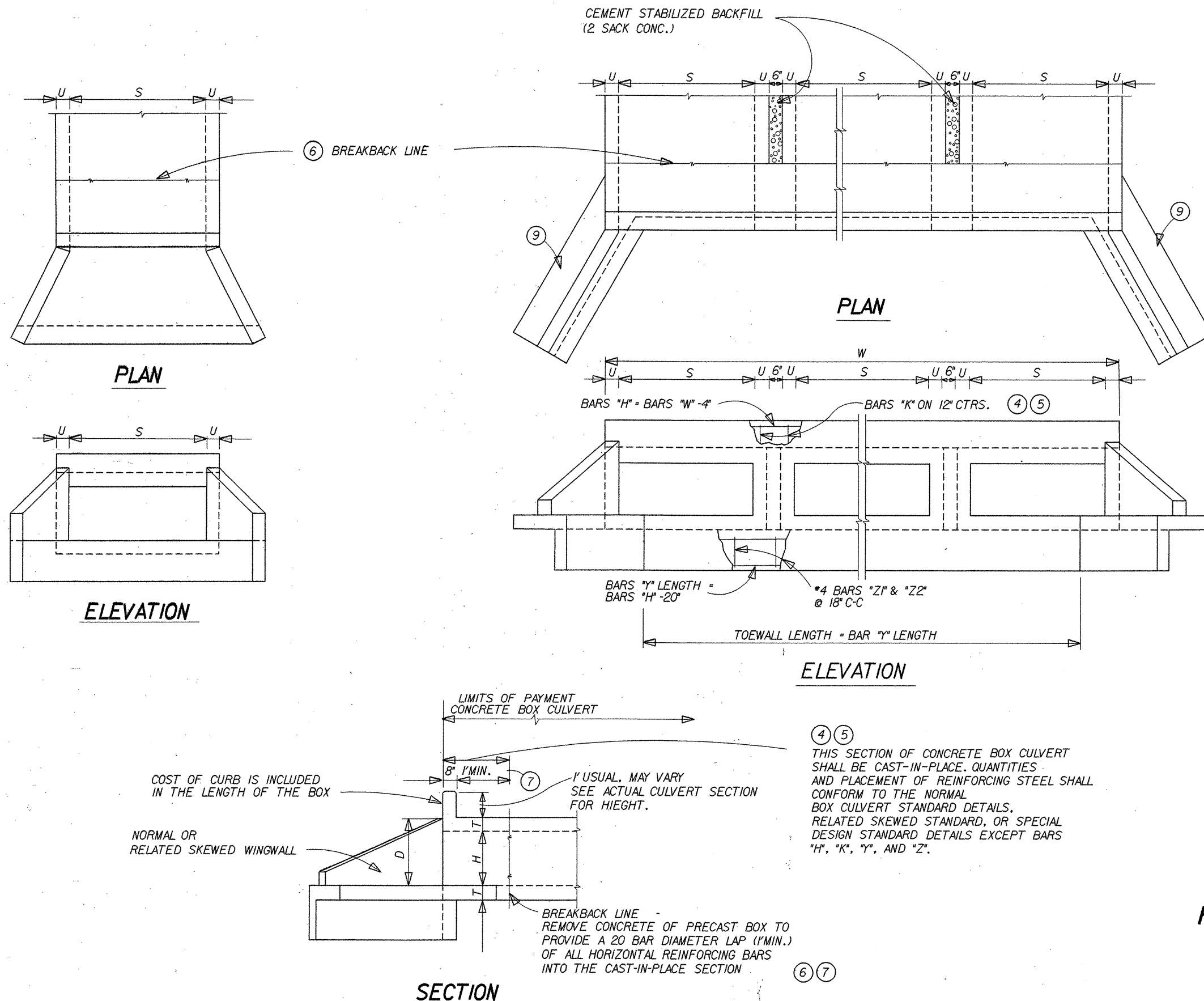
PRECAST BOX CULVERTS
W/CAST-IN-PLACE
PARALLEL WINGWALLS

NO SCALE
SAN ANTONIO DISTRICT STANDARD

FED. RD. DIST. NO.	FEDERAL AID PROJECT NO.	SHEET NO.
6	NH 95 (40) 1M	304
STATE	STATE DIST. NO.	COUNTY
TEXAS	15	COMAL
CONT.	SECT.	JOB
0016	05	087
CONTRACT NO.	SECTION	HIGHWAY NO.
0016	05	087

GENERAL NOTES:

- THESE DETAILS SHOW THE ADAPTATION OF FLARED WINGWALLS TO A PRECAST CONCRETE BOX CULVERT. SEE APPROPRIATE WINGWALL STANDARD FOR DETAILS AND DIMENSIONS NOT SHOWN HEREON.
- WINGWALL, TOEWALL, AND APRON QUANTITIES TO BE PAID FOR AS SHOWN ON NORMAL BOX CULVERT STANDARD, OR RELATED SKEWED STANDARD, MODIFIED, OR SPECIAL DESIGN STANDARD.
- ALL CAST-IN-PLACE CONCRETE SHALL CONFORM TO THE REQUIREMENTS OF ITEM 462 "CONCRETE BOX CULVERTS".
- OMIT BARS "K" FOR CURB HEIGHTS OF 4" OR LESS. PLACE BARS "H" AS SHOWN ON THE APPROPRIATE STANDARD.
- TO DETERMINE THE LENGTH OF BARS "H" AND "X" ON A SKEWED BOX DETERMINE THE LENGTH ON A NORMAL STRUCTURE AND MULTIPLY BY THE FOLLOWING FACTORS: 1.04 FOR 15', 1.15 FOR 30', 1.41 FOR 45'.
- IN LIEU OF BREAKING BACK THE PRECAST BOX AS SHOWN, THE END SECTION MAY BE CAST TO THE BREAKBACK LINE WITH THE END STEEL EXPOSED.
- THIS DIMENSION MAY BE REDUCED TO ZERO IF THE CURB, WINGWALL, AND TOEWALL STEEL IS CAST INTO THE BOX DURING FABRICATION, OR AN APPROVED NUMBER OF DOWELS ARE PROVIDED AS DIRECTED BY THE ENGINEER.
- DETAILS ARE SHOWN FOR A NORMAL SINGLE OR MULTIPLE BOX CULVERT, BUT ARE ALSO APPLICABLE TO SKEWED CONDITIONS.
- WINGWALL STEEL WHICH EXTENDS MORE THAN 1'-8" INTO THE CULVERT BARREL MAY BE FIELD BENT INTO THE CAST-IN-PLACE PORTION OF THE CULVERT BARREL.
- THE CONTRACTOR MAY PRESENT ALTERNATE WING CONNECTION DETAILS AND END TREATMENT PROCEDURES TO THE ENGINEER FOR CONSIDERATION AND APPROVAL.

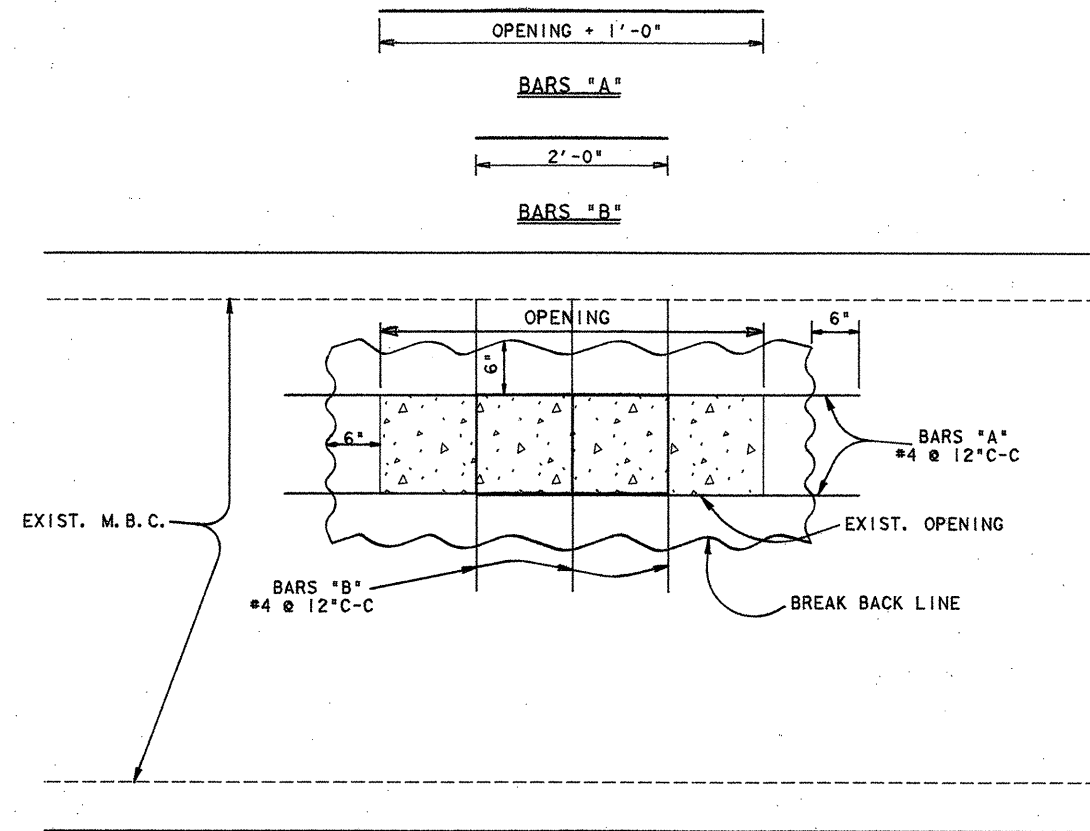


CAST-IN-PLACE ENDS FOR PRECAST BOX CULVERTS W/FLARED WINGWALLS

NO SCALE
SAN ANTONIO DISTRICT STANDARD

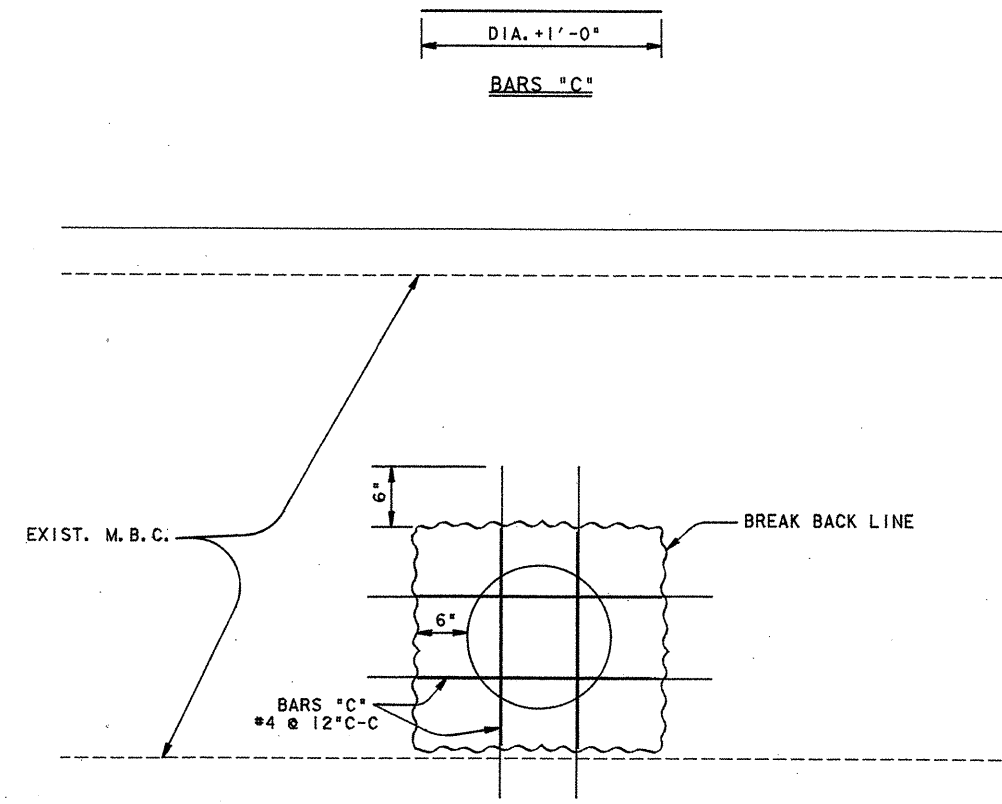
FED. RD. DIST. NO.	FEDERAL AID PROJECT NO.	SHEET NO.
6	NH 95 (40) 1M	305
STATE	COUNTY	
TEXAS	COMAL	
CONT.	SECT.	HIGHWAY NO.
0016	05	087

(A)



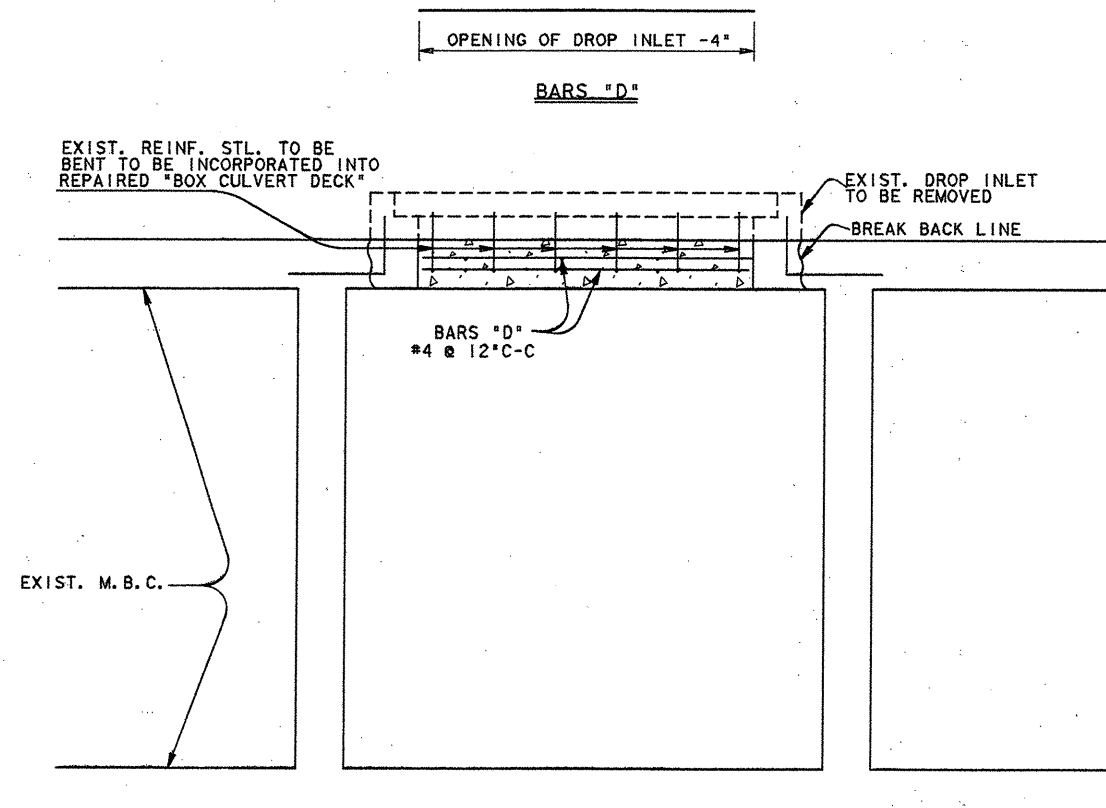
SIDE ENTRANCE REPAIR

(B)



PIPE ENTRANCE REPAIR

(C)



TOP ENTRANCE REPAIR

GENERAL NOTES

ALL STEEL, CONCRETE AND REPAIR WORK CONSIDERED SUBSIDIARY TO THE VARIOUS PAY ITEMS.

ALL CONCRETE FOR REPAIR WORK SHALL BE CLASS "A".

ALL STEEL FOR REPAIR WORK SHALL BE GRADE 40.

IN DETAILS A & B REFORCING STEEL TO BE DOWELED AND GROUTED AT 6" DEPTH AS DIRECTED BY THE ENGINEER.

FACE OF BREAK BACK LINE TO BE CLEARED OF ALL LOOSE CONCRETE. CONCRETE TO BE REMOVED FROM EXPOSED REINFORCING STEEL.

CONCRETE SURFACES AT THE BREAK BACK LINE MAY REQUIRE A MORTAR COATING AS DIRECTED BY THE ENGINEER.

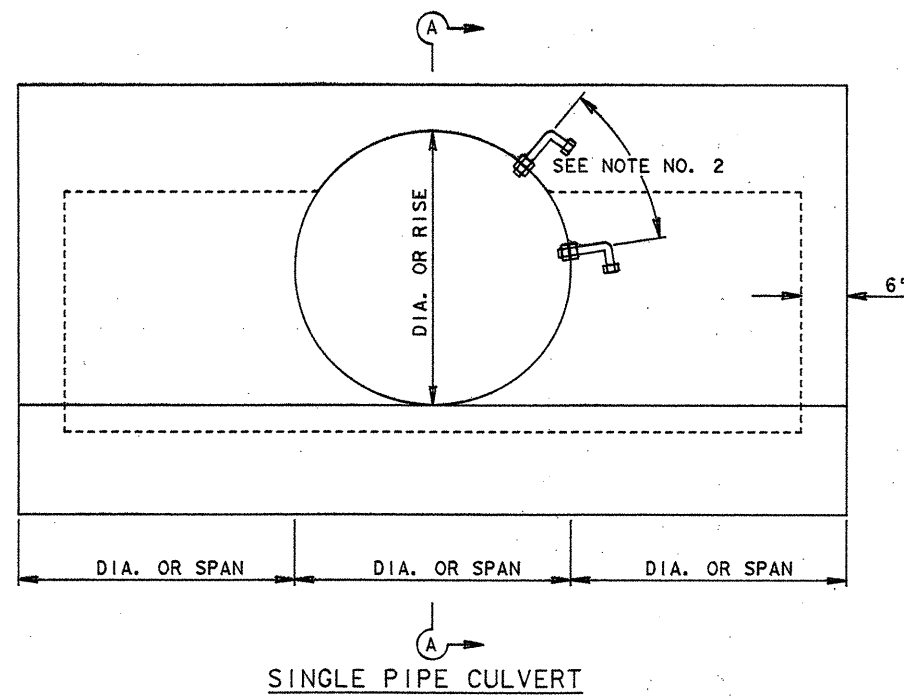


The seal appearing on this document was authorized by GREGORY ADAM MALATEK P.E. 71682, on

4/7, 1995.
Gregory A. Malatek, P.E.

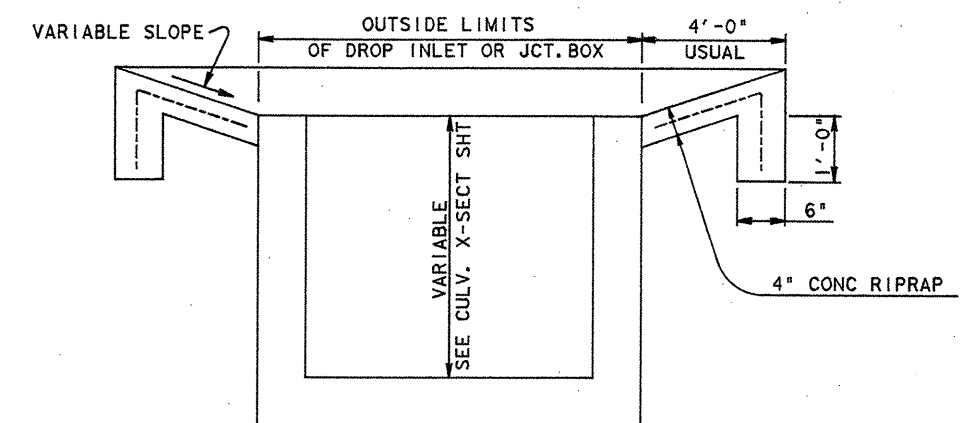
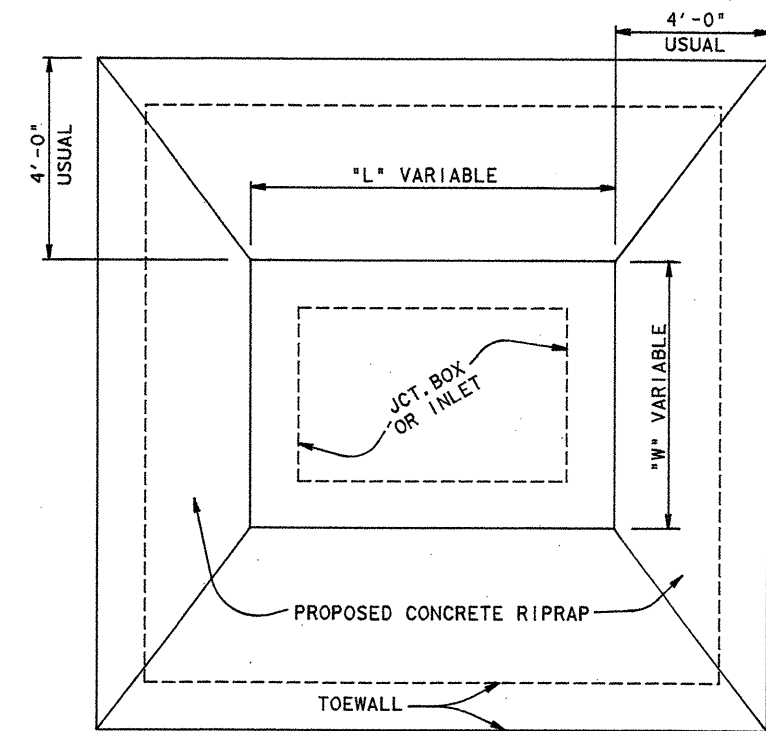
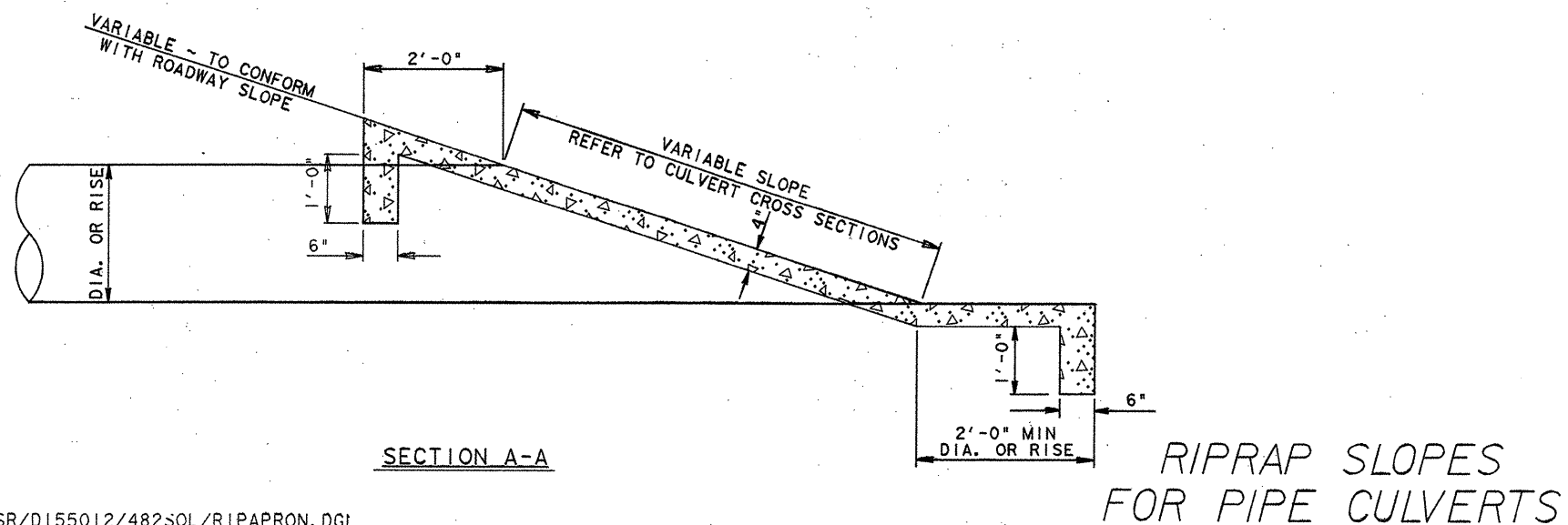
BOX CULVERT REPAIR DETAILS

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.
6	NH251 40 11M	306
STATE	STATE DIST. NO.	COUNTY
TEXAS	15	COMAL
CONT.	SECT.	JOB
0016	05	087
		1H 35



NOTES:

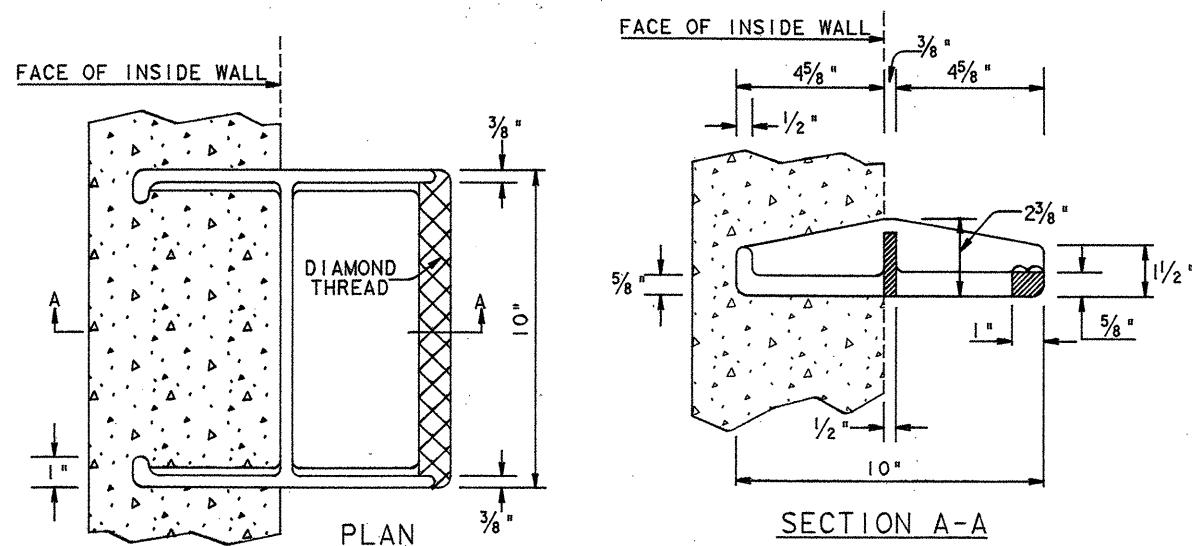
- 1) FOR RIPRAP QUANTITIES AND SLOPES, SEE CULVERT CROSS SECTIONS.
- 2) ALL METAL PIPES (CIRCULAR OR ARCH) SHALL HAVE $\frac{5}{8}$ " x 6" GALVANIZED HOOKED BOLTS WITH 2 HEX NUTS AT MAXIMUM 24" SPACING FOR ANCHORING THE PIPE TO CONCRETE, THIS WORK WILL BE CONSIDERED SUBSIDIARY TO THE ITEM OF RIPRAP.
- 3) DISTANCE BETWEEN PIPES AS PER STANDARD SPECIFICATIONS UNLESS SHOWN OTHERWISE ON PLANS.



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P.E. 71682, on

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FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.			SHEET NO.
6	NH 95 (40) IN			307
STATE	STATE DIST. NO.	COUNTY		
TEXAS	15	COMAL		
CONT.	SECT.	JOB	HIGHWAY NO.	
0016	05	087	14 35	

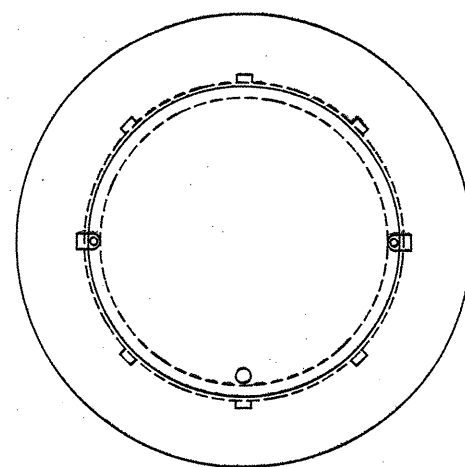
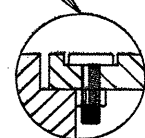


GENERAL NOTES

INLET STEPS, AS SHOWN AT LEFT OR EQUAL AS APPROVED BY THE ENGINEER, SPACED AT 15" AND LOCATED AS DIRECTED BY THE ENGINEER SHALL BE PROVIDED AND INSTALLED IN ALL INLETS WHERE THE DEPTH EXCEEDS 4'-0". STEPS SHALL BE CAST INTO DROP INLET OR JUNCTION BOX WALLS AS DIRECTED BY THE ENGINEER.

DETAILS OF CAST IRON STEP FOR INLET

1 1/2" O X 5/16" COUNTER SUNK HOLE 1/2" X 1/4" SQ. HD. BOLT WITH SQ. NUT. (2 EA. REQUIRED) (NUT TO BE WELDED TO INNER SURFACE)



GENERAL NOTES

BOLTS, NUTS, WASHERS & PLATES ARE TO BE GALVANIZED. BOLTS, NUTS, WASHERS, PLATES & GASKETS SHALL BE SUBSIDIARY TO INLETS & JCT. BOXES. RING & COVER SHALL BE GREY CAST IRON.

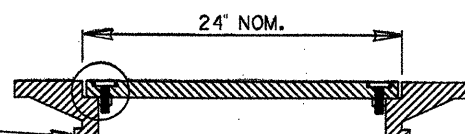


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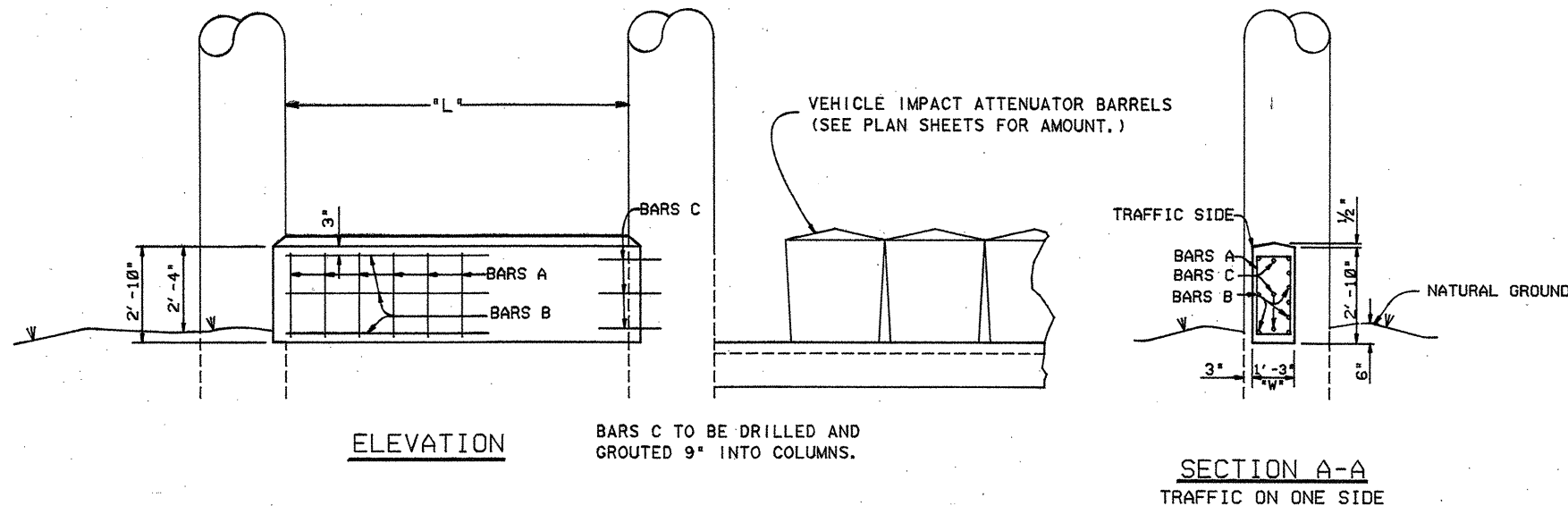
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8- 1/2" X 1/2" X 1" LUGS SPACED EQUALLY AROUND CIRCUM. OF RING



RING & COVER DETAIL

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.
6	NH 95 (40) IM	307A
STATE	COUNTY	
TEXAS	COMAL	
CONT.	SECT.	JOB
0016	05	087
HIGHWAY NO.		
1H 35		



BILL OF REINFORCING STEEL					
"L" = 13'-6"					
BAR	NO	SIZE	SPAC	LEN	WT
A	14	#4	12"	6'-10"	64
B	*9	#6	5 1/2"	13'-2"	178
C	6	#6	14"	1'-6"	14

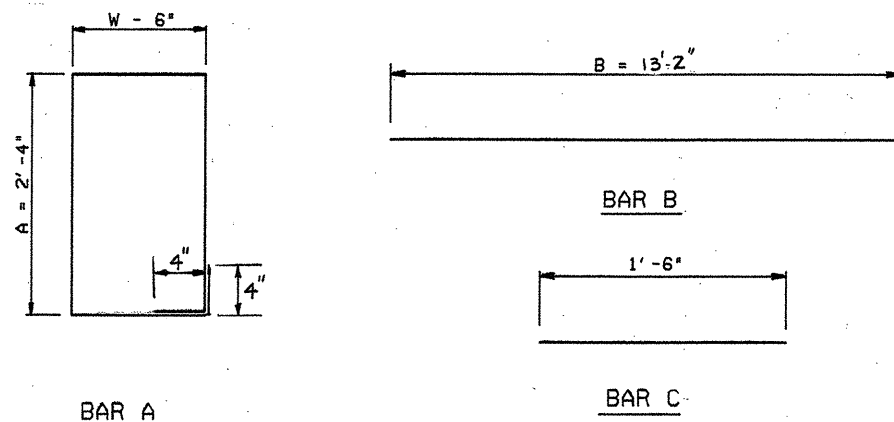
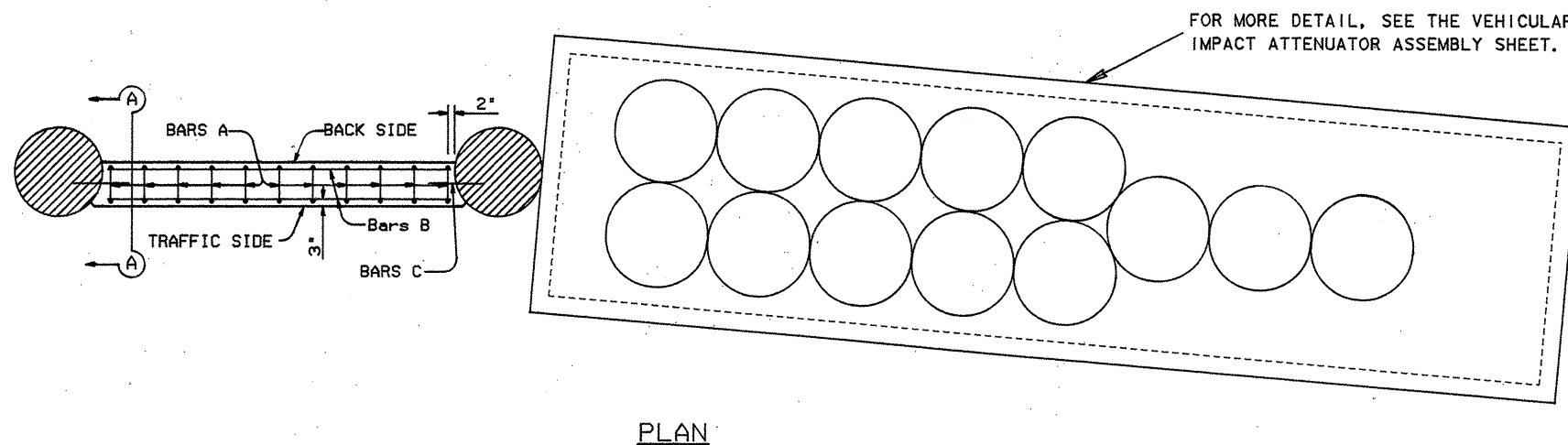
* 6 IN BACK SIDE-3 IN TRAFFIC SIDE

QUANTITY FOR ONE WALL			
"L"	"W"	CONC CY	STEEL LB
13'-6"	1'-3"	1.82	256

ESTIMATED QUANTITIES F.M. 1103 OVER-XING		
ITEM	UNIT	QUANTITY
CL A CONC. (VDW)	CY	3.64
REINF STL**	Lb	512

** FOR CONTRACTOR'S INFORMATION ONLY

IT IS THE CONTRACTOR'S RESPONSIBILITY TO VERIFY ALL DIMENSIONS AND ELEVATIONS IN THE FIELD PRIOR TO ORDERING MATERIALS.



GENERAL NOTES

ALL CONCRETE SHALL BE CLASS "A"
CHAMFER EXPOSED CORNERS 3/4"

ALL DIMENSIONS RELATING TO REINFORCING STEEL ARE TO CENTERS OF BARS

CONCRETE SURFACE FINISH SHALL BE CLASS C.

GROUT SHALL BE NON-SHRINKING



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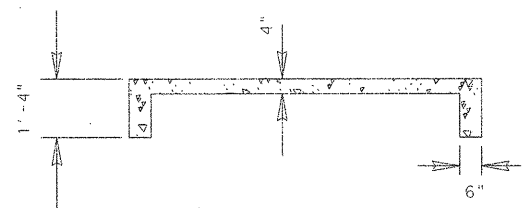
4/7, 1994.
Gregory A. Malatek, P.E.

VEHICULAR DEFLECTION WALL

(BETWEEN BRIDGE COLUMNS)

VDW(BC)

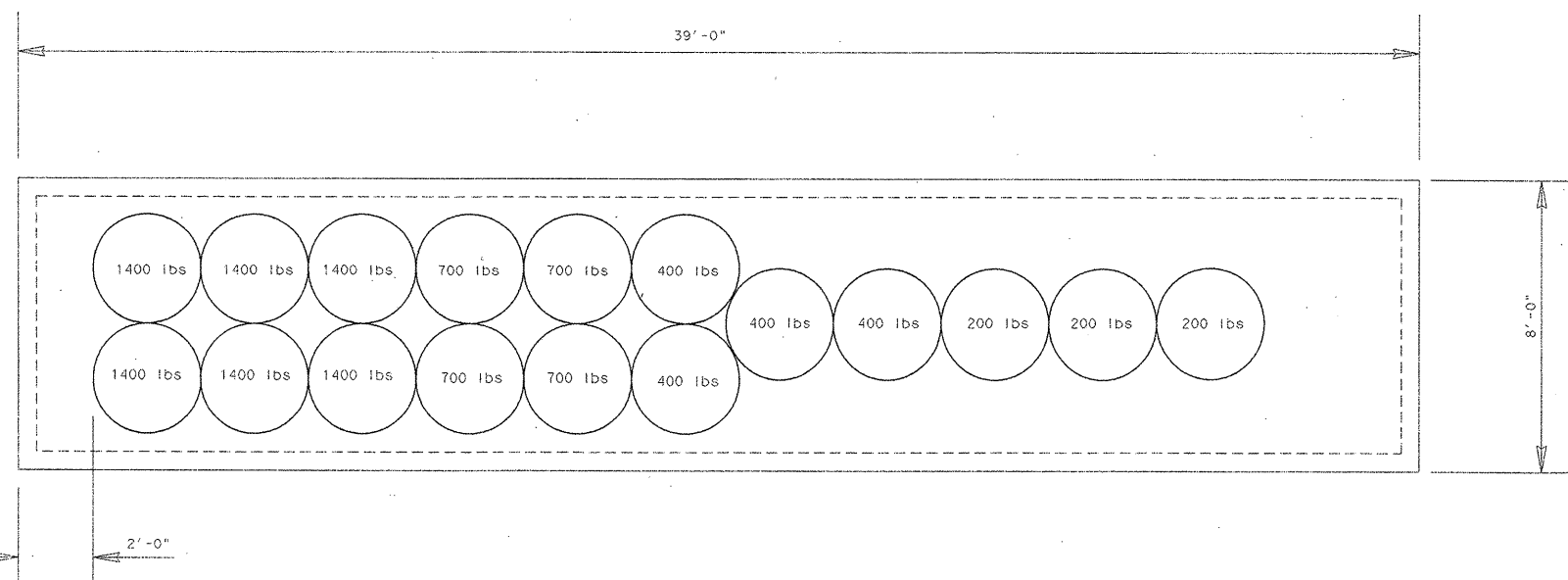
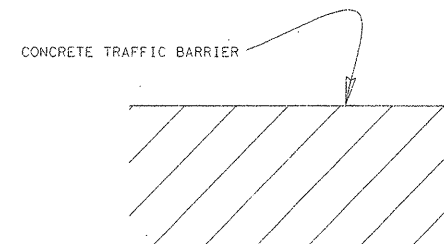
ED. NO.	FEDERAL AID PROJECT NO.	SHEET NO.
6	NH () IM	308
STATE	STATE DIST. NO.	COUNTY
TEXAS	15	COMAL
CONTRACT	SECT.	JOB
0016	05	087
HIGHWAY NO.	I.H. 35	



CONCRETE RIPRAP PAD

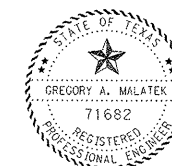
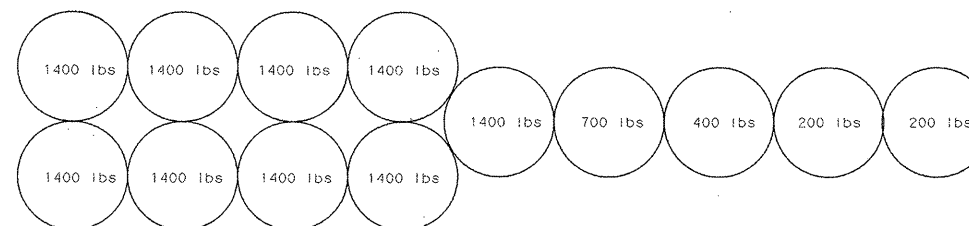
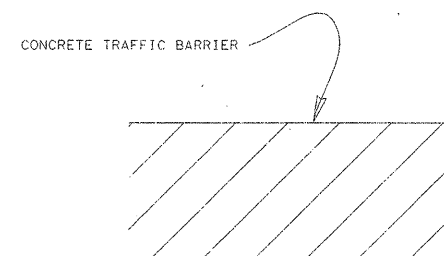
NOTES:

1. BARRIER CAN BE PLACED ANY DISTANCE FROM THE SHOULDER BOTH AT ROADSIDE AND IN MEDIAN SITES FROM 0' TO 30' DEPENDING ON THE LOCATION OF THE HAZARDOUS FIXED OBJECT. ANGLING OF THE BARRIER TOWARD ONCOMING TRAFFIC IS SUGGESTED FROM 3 DEGREES TO 10 DEGREES DEPENDING ON SPACE AVAILABLE.
2. THE ENTIRE AREA OF THE CRASH CUSHION INSTALLATION AND APPROACHES SHALL BE GRADED SO THAT THE MAXIMUM SLOPE DOES NOT EXCEED 10:1 IN ANY DIRECTION.
3. RIPRAP PAD SHALL BE CLASS B RIPRAP.



NOTES:

1. BARRIER CAN BE PLACED ANY DISTANCE FROM THE SHOULDER BOTH AT ROADSIDE AND IN MEDIAN SITES FROM 0' TO 30' DEPENDING ON THE LOCATION OF THE HAZARDOUS FIXED OBJECT. ANGLING OF THE BARRIER TOWARD ONCOMING TRAFFIC IS SUGGESTED FROM 3 DEGREES TO 10 DEGREES DEPENDING ON SPACE AVAILABLE.
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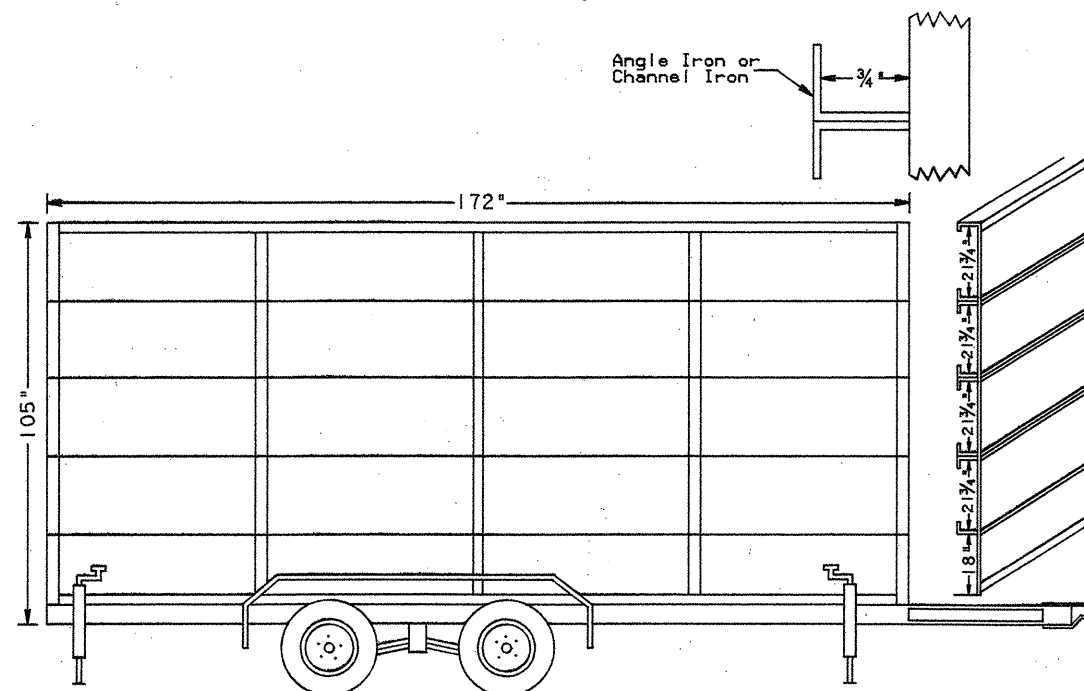
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1995.

P.E.

VEHICULAR IMPACT ATTENUATOR ASSEMBLY FOR TEMPORARY USE WITH DETOURS

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.
6	NH 95 (40) IM	309
STATE	STATE DIST. NO.	COUNTY
TEXAS	15	COMAL
CONF.	SECT.	JOB
0016	05	087
		IN 35



DETAIL TRAILER MOUNTED MESSAGE BOARD

NOTES:

THERE SHALL BE 4 PORTABLE TRAILER MOUNTED MESSAGE BOARDS REQUIRED FOR THIS PROJECT. THEY WILL BE UTILIZED FOR THE ENTIRE DURATION OF THE PROJECT AND SHALL BE PLACED AT VARIOUS LOCATIONS WITHIN THE PROJECT AS DIRECTED BY THE ENGINEER.

THE MESSAGE BOARDS SHALL BE CONSTRUCTED AS PER DETAILS SHOWN OR EQUAL.

SIGNS SHALL BE 21 1/2" X 8 3/4" IN SIZE AND SHALL CONFORM TO THE SPECIFICATIONS AS OUTLINED ON THE BC(4)94 STANDARD SHEET OR AS DIRECTED BY THE ENGINEER.
LETTERING SHALL BE 10"-SERIES D TYPE WITH ONE LETTER PER SIGN OR AS DIRECTED BY THE ENGINEER.

THE BOARDS SHALL BE WORDED AS DIRECTED BY THE ENGINEER.

THE FURNISHING OF THE PORTABLE TRAILER MOUNTED MESSAGE BOARDS WILL NOT BE PAID FOR SEPARATELY, BUT SHALL BE CONSIDERED PART OF THE ITEM, "BARRICADES, SIGNS AND TRAFFIC HANDLING".



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Gregory A. Malatek, P.E.

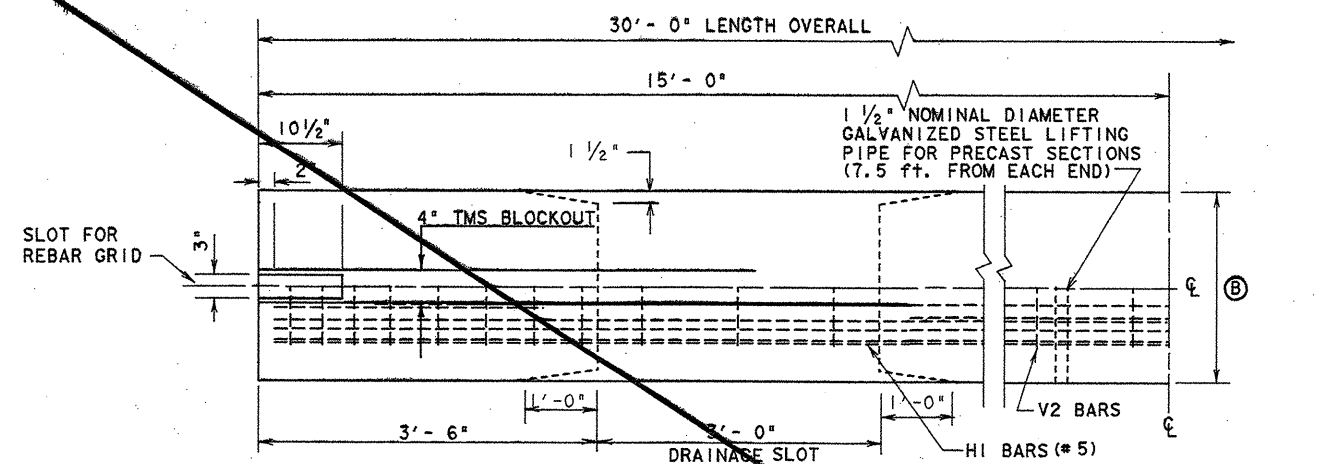
TRAILER MOUNTED MESSAGE BOARD
DETAIL

-ED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	NH 95 (40) IM		310
STATE	STATE DIST. NO.	COUNTY	
TEXAS	15	COMAL	
CONT.	SECT.	JOB	HIGHWAY NO.
0016	05	087	1H 35

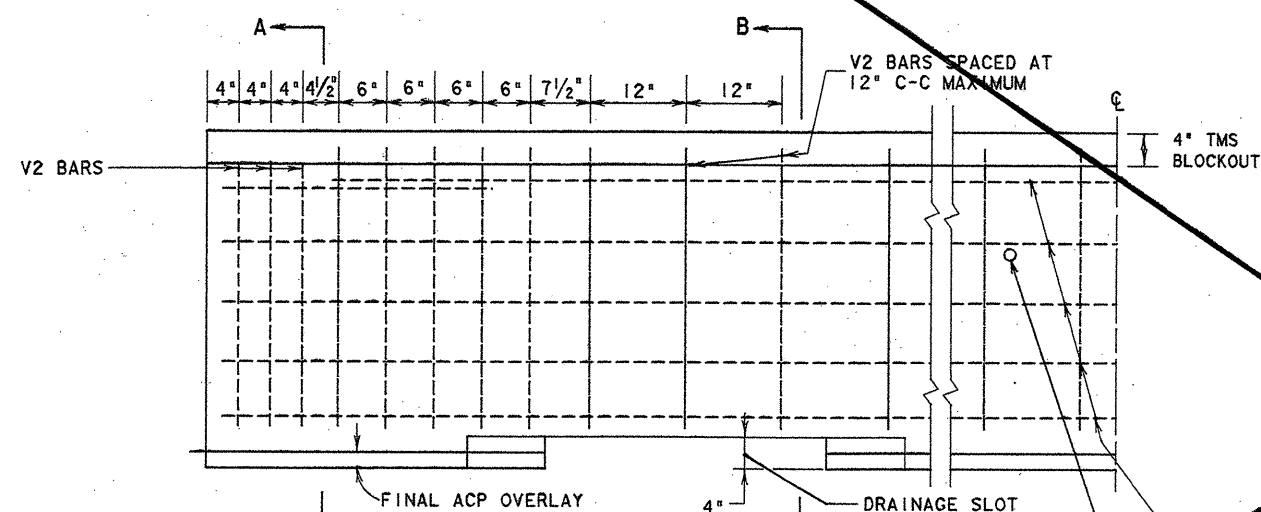
NOTE: APPROX. 1" SPACE BETWEEN ADJOINING BARRIER SECTIONS

GENERAL NOTES

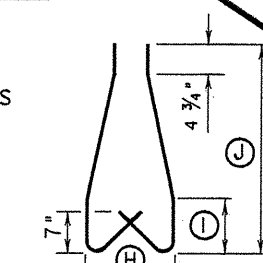
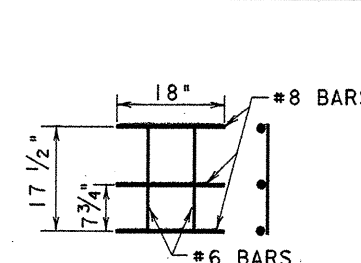
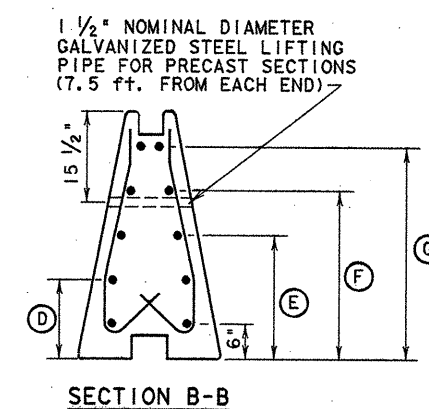
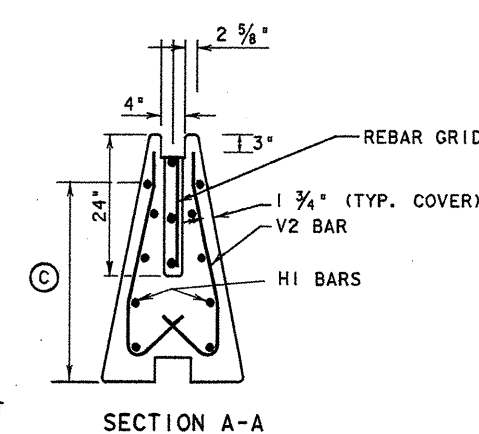
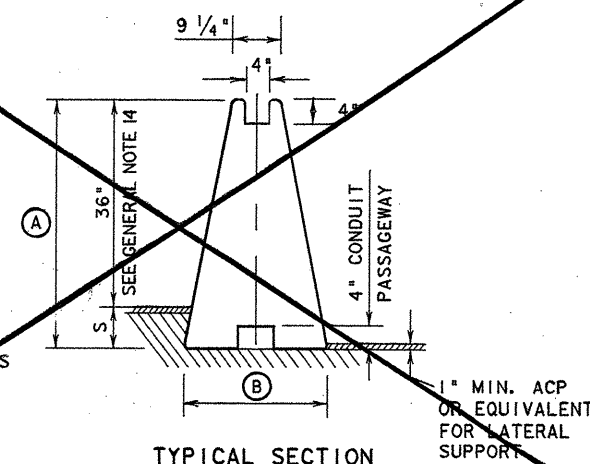
1. BARRIER LENGTH SHALL BE 30 FEET (+/- 1 INCH) UNLESS OTHERWISE SPECIFIED IN THE PLANS.
2. THE USUAL TEMPORARY INSTALLATION WILL REQUIRE THE PLACEMENT OF THE REBAR GRID IN THE UNGROUTED SLOT. THE USUAL PERMANENT INSTALLATION USING PRECAST BARRIER WILL CONNECT THE BARRIER SEGMENTS WITH THE REBAR GRID PLACED IN THE SLOT AND GROUTED IN PLACE.
3. WHEN INSTALLED IN A PERMANENT ROADWAY LOCATION, THE END CONNECTIONS OF THE PRECAST BARRIER SHALL BE GROUTED WITH A MIXTURE OF TWO PARTS SAND AND ONE PART CEMENT WITH ENOUGH WATER TO MAKE THE MIXTURE PLASTIC. GROUTING SHALL BE DONE IN A MANNER THAT WILL ASSURE A SMOOTH SURFACE AT THE JOINT.
4. ALL CONCRETE SHALL BE CLASS A, C, OR H, UNLESS OTHERWISE SPECIFIED.
5. ALL REINFORCING STEEL SHALL BE GRADE 60, UNLESS OTHERWISE SPECIFIED.
6. EACH PRECAST BARRIER TO BE INSTALLED IN A TEMPORARY LOCATION SHALL BE DELIVERED WITH A REBAR GRID.
7. CHAMFER TOP AND END EDGES 3/4 INCH.
8. UNLESS OTHERWISE SHOWN IN THE PLANS, THE CONTRACTOR HAS THE OPTION OF PLACING EITHER PRECAST OR CAST-IN-PLACE PERMANENT CONCRETE BARRIER. CAST-IN-PLACE BARRIER MAY BE SLIP FORMED. ADDITIONAL REINFORCEMENT MAY BE TACK WELDED TO THE UPPER TWO-THIRDS OF THE REINFORCING CAGE TO PROVIDE BRACING. VERTICAL BARS SHALL BE PROVIDED ONLY TO THE EXTENT NECESSARY TO POSITION LONGITUDINAL STEEL WITHIN TOLERANCES. LIFTING PIPE, REBAR GRID AND SLOT SHALL BE OMITTED FOR CAST-IN PLACE CONSTRUCTION.
9. BAR SPLICES FOR ROADWAY BARRIER SHALL BE A MINIMUM OF 24 TIMES THE NOMINAL DIAMETER OF THE BAR.
10. ANY METHOD DEvised BY THE CONTRACTOR AND APPROVED BY THE ENGINEER THAT WILL ASSURE THE LONGITUDINAL ROADWAY STEEL WILL BE POSITIONED +/- 1/2 INCH AS DIMENSIONED WILL BE SATISFACTORY.
11. WELDED WIRE FABRIC MAY BE USED AS AN OPTION TO CONVENTIONAL REINFORCEMENT FOR PRECAST OR CAST-IN-PLACE BARRIER. WELDED WIRE FABRIC SHALL BE MADE IN ACCORDANCE WITH ASTM A497.
12. CONDUIT TO BE PROVIDED ONLY WHEN CALLED FOR ELSEWHERE IN THE PLANS. POSITION OF THE CONDUIT OR CONDUIT PASSAGEWAY MAY BE ADJUSTED TO FACILITATE CONSTRUCTION, SUBJECT TO APPROVAL OF THE ENGINEER.
13. TRANSITIONS TO BARRIER HEIGHT, AS NEEDED, SHALL BE DETERMINED BY THE ENGINEER. CHANGES IN BARRIER HEIGHT SHOULD NOT NORMALLY EXCEED 2 INCHES PER 30 FOOT. VERTICAL STEEL SHALL BE UNIFORMLY TRANSITIONED THROUGHOUT THE VARIATION IN BARRIER HEIGHT AS DIRECTED BY THE ENGINEER.
14. A 36 INCH MINIMUM HEIGHT DIFFERENTIAL BETWEEN TOP OF BARRIER AND TOP OF ACP SHALL BE REQUIRED AT PLACEMENT IN ORDER TO ALLOW FOR UP TO 6 INCHES OF FUTURE OVERLAYS WHILE MAINTAINING A 30 INCH MINIMUM FUTURE EFFECTIVE HEIGHT OF BARRIER. TOTAL MINIMAL BARRIER HEIGHT FOR DESIGN IS THEREFORE DICTATED BY ALLOWANCE FOR FUTURE OVERLAYS PLUS EXISTING STAIRSTEP DIMENSION "S". MINIMUMS TYPICALLY ROUNDED TO 42", 48", OR 54" TO FACILITATE PRECASTING.
15. DRAINAGE SLOTS SHALL BE OMITTED UNLESS CALLED FOR IN THE PLANS.
16. 4"x4" BLOCKOUT SHALL BE PROVIDED TO ALLOW FOR PLACEMENT OF FUTURE TRAFFIC MANAGEMENT SYSTEM (TMS) CONDUIT.
17. WHEN GROUTING THE BARRIER SEGMENTS TOGETHER, GROUT UP ONLY TO THE BOTTOM OF THE 4" TMS BLOCKOUT FOR DRAINAGE.



NOTE: CONCRETE ON BOTTOM HALF OF PLAN VIEW IS REMOVED IN ORDER TO SHOW REINFORCING DETAILS.



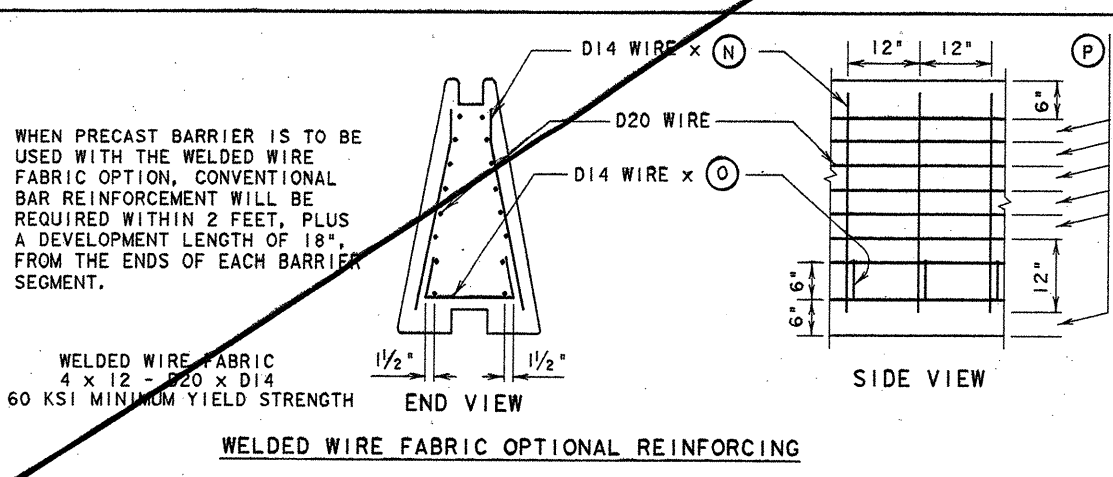
FINAL ACP OVERLAY
DRAINAGE SLOT
HI BARS (#5)
1 1/2" NOMINAL DIAMETER GALVANIZED STEEL LIFTING PIPE FOR PRECAST SECTIONS (7.5 ft. FROM EACH END)



Gregory A. Malatek, P.E. 1/19, 1996
DATE
FOR CHANGE ORDER NO. 3

VOIDED

STATE OF TEXAS
GREGORY A. MALATEK
71682
REGISTERED PROFESSIONAL ENGINEER
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Gregory A. Malatek, P.E.
MODIFIED FOR T.M.S.



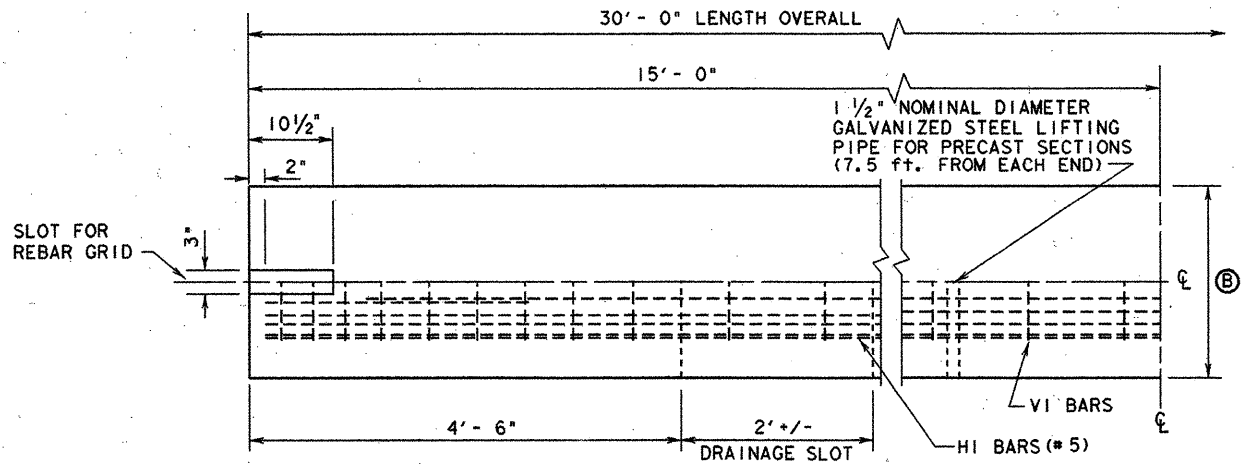
BARRIER HEIGHT (IN.)	DIMENSIONS (IN.)												
	A	B	C	D	E	F	G	H	I	J	N	O	P
36	36	23	27 1/2	12	18	24	30	14	7 3/4	28 3/4	29	24 1/2	3
42	42	25 1/4	33 1/2	13 1/2	21	28 1/2	36	16 1/4	9 1/4	38 1/4	35	28	4
48	48	27 1/8	39 1/2	15	24	33	42	18 1/2	10 3/4	40 3/4	41	31 1/2	5
54	54	29 1/8	45 1/2	16 1/2	27	37 1/2	48	20 3/4	12 1/4	46 3/4	47	34 3/4	6

SINGLE SLOPE CONCRETE BARRIER	
FOR CENTER MEDIAN WITH BLOCKOUT FOR TMS	
SSCB (2)-92 (MOD)	
MODIFICATION	FED. RD. DIV. NO. STATE FEDERAL AID PROJECT NO. SHEET NO.
	6 TEXAS NH 95(40) IM 3/1
STATE DIST. NO.	COUNTY CONT. SECT. JOB HIGHWAY NO.
15	COMAL 0016 05 087 1H35

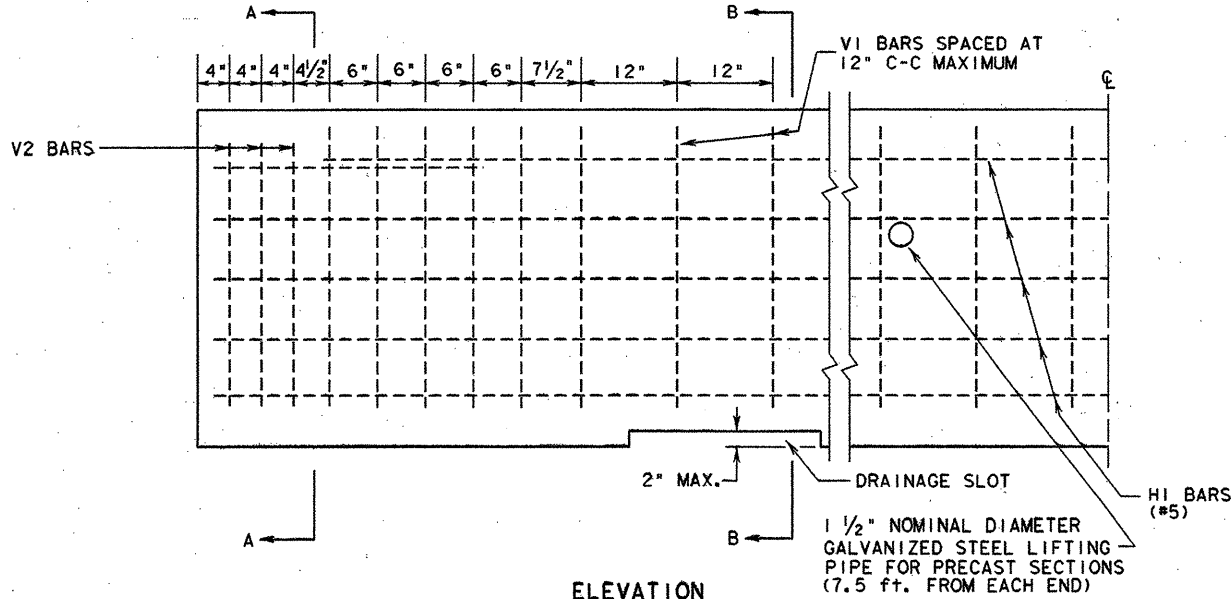
GENERAL NOTES

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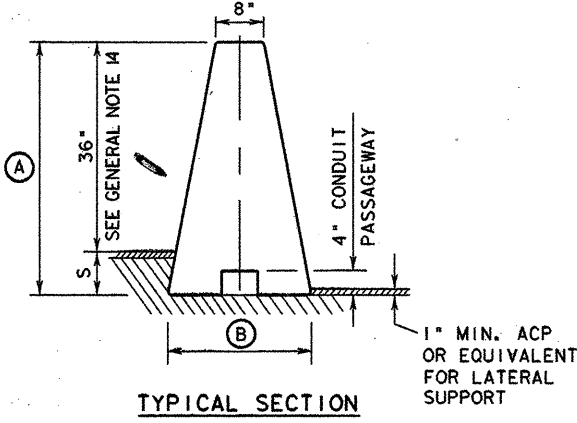
NOTE: APPROX. 1" SPACE BETWEEN ADJOINING BARRIER SECTIONS



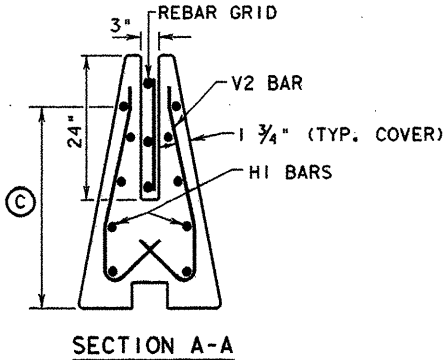
PLAN VIEW
(SYMMETRICAL ABOUT CENTER LINES)



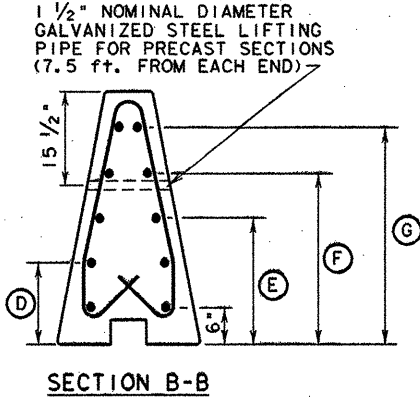
ELEVATION
(SYMMETRICAL ABOUT CENTER LINES)



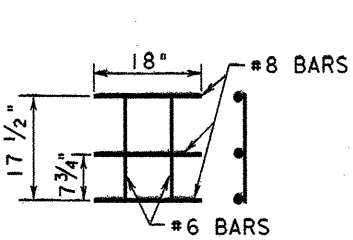
TYPICAL SECTION



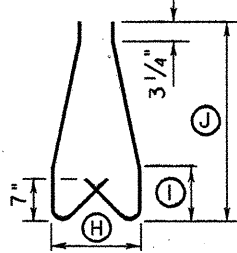
SECTION A-A



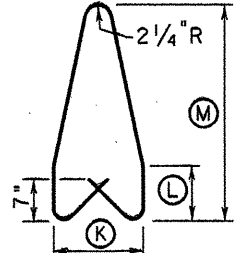
SECTION B-B



REBAR GRID

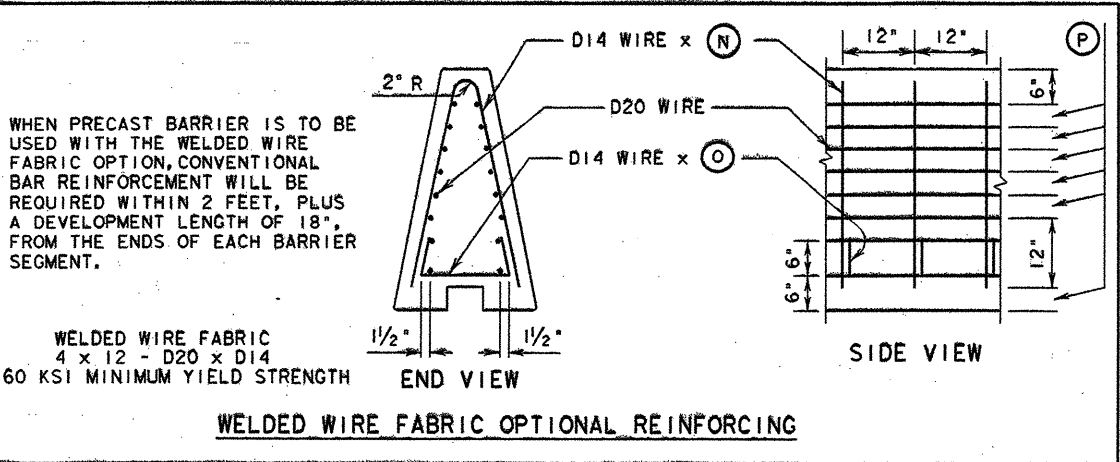


V2 BAR (#4)



V1 BAR (#4)

REINFORCING DETAILS



BARRIER HEIGHT (IN.)	DIMENSIONS (IN.)															
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
42	42	24	33 1/2	13 1/2	21	28 1/2	36	15	9 1/4	33 1/4	15	9 1/4	36	72	28	4
48	48	26 9/32	39 1/2	15	24	33	42	17 1/4	10 3/4	39 1/4	17 1/4	10 3/4	42	84	31 1/2	5
54	54	28 9/16	45 1/2	16 1/2	27	37 1/2	48	19 1/2	12 1/4	45 1/4	19 1/2	12 1/4	48	96	34 3/4	6

Gregory A. Malatek, P.E. 1/19, 1996
DATE
FOR CHANGE ORDER NO. 3



CHANGE ORDER NO. 3



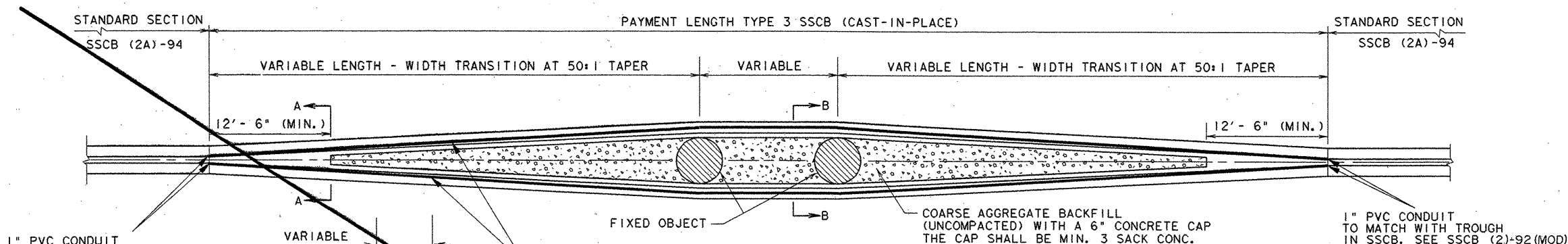
TEXAS DEPARTMENT OF TRANSPORTATION

SINGLE SLOPE
CONCRETE BARRIER
TYPE 2

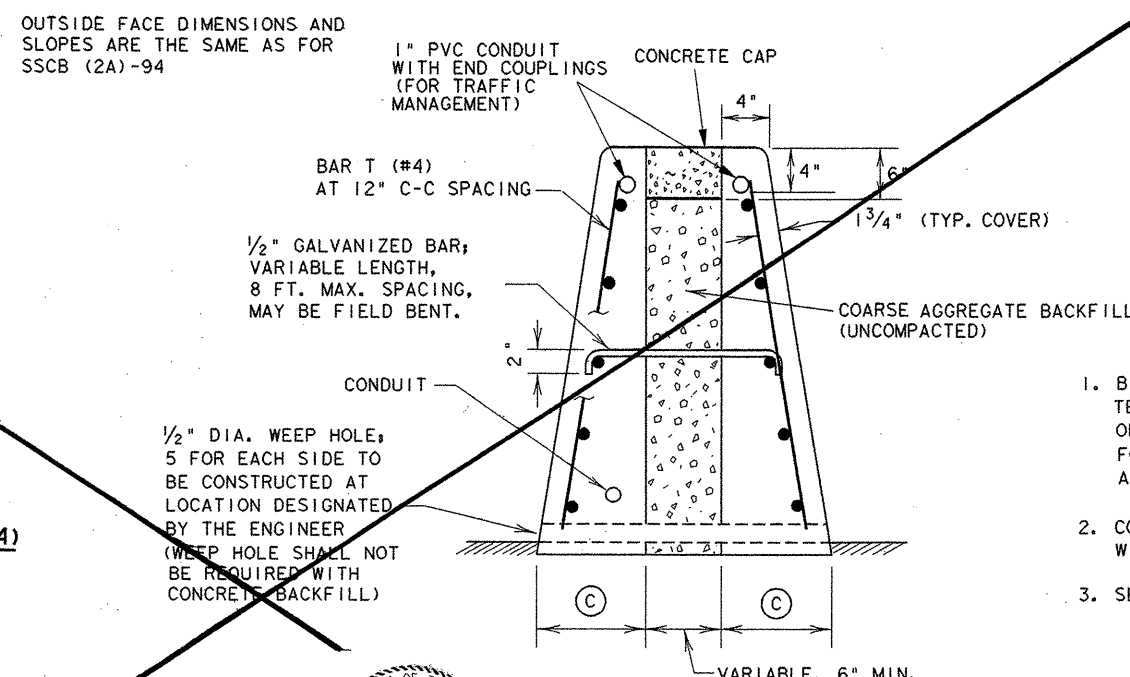
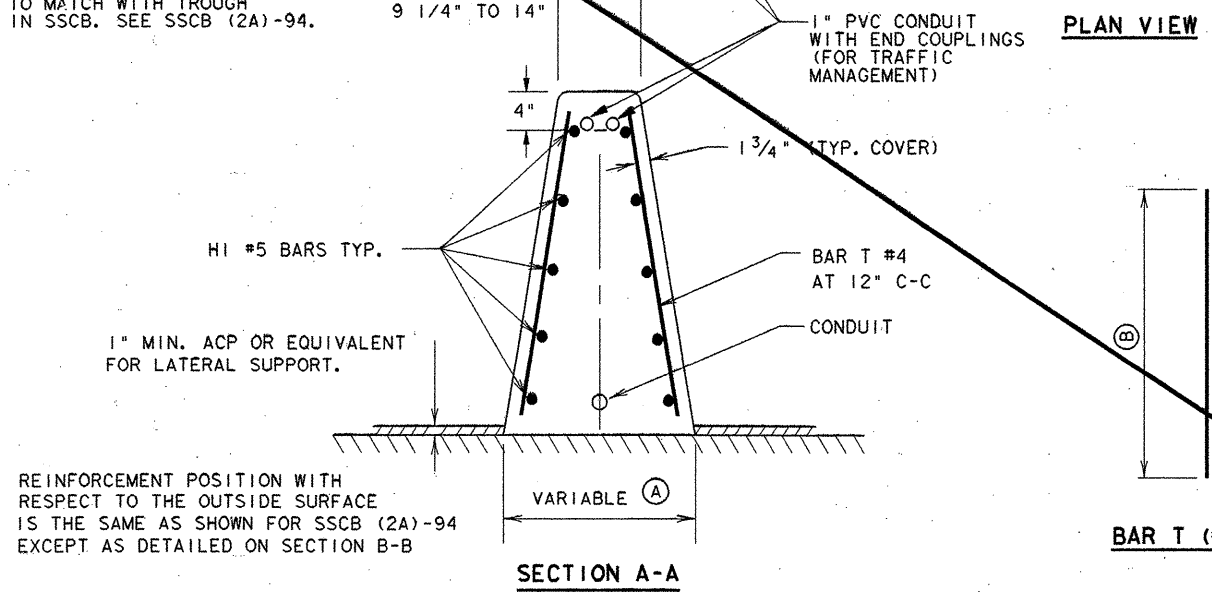
SSCB (2) - 92

MODIFICATIONS	FED. RD. DIST. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.
	6	TEXAS	NH 95(40) 1/M	31/A
	STATE DIST. NO.	COUNTY	CONT.	SECT.
	15	COMAL	0016	03
			087	14 35

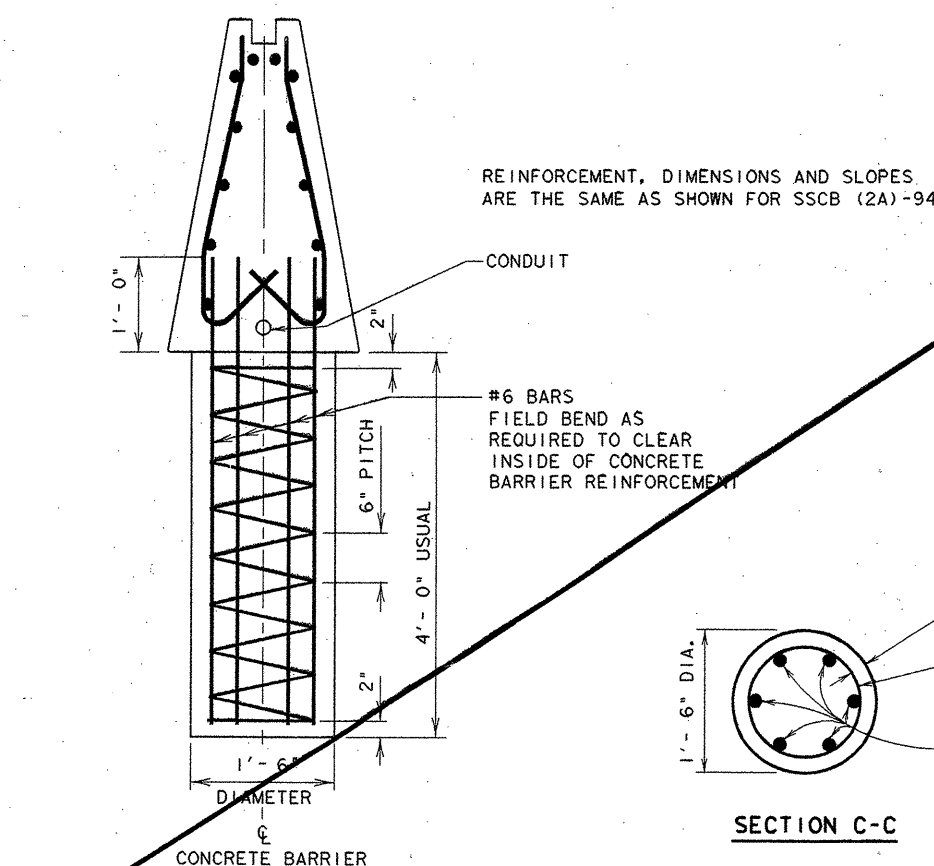
DIVISION OF HIGHWAY DESIGN (D-8)



BARRIER HEIGHT (IN.)	DIMENSIONS (IN.)		
	(A)	(B)	(C)
42	25 1/4 - 30	36	12
48	27 27/32 - 32 9/32	42	13 9/64
54	29 13/16 - 34 9/16	48	14 9/32



- GENERAL NOTES**
1. BID PRICE PER LINEAR FOOT OF SSCB, INCLUDING TERMINAL AND ANCHOR SECTIONS, SHALL INCLUDE ALL OF THE CONCRETE, REINFORCEMENT, DRILLED SHAFT FOUNDATIONS, AGGREGATE BACKFILL, CONCRETE CAP AND 1" PVC CONDUIT.
 2. CONNECTION WITH PRECAST SSCB SHALL BE MADE WITH REBAR GRID AND SLOT AS SHOWN IN SSCB (2A)-94
 3. SEE SSCB (2A)-94 FOR ADDITIONAL NOTES AND DETAILS.



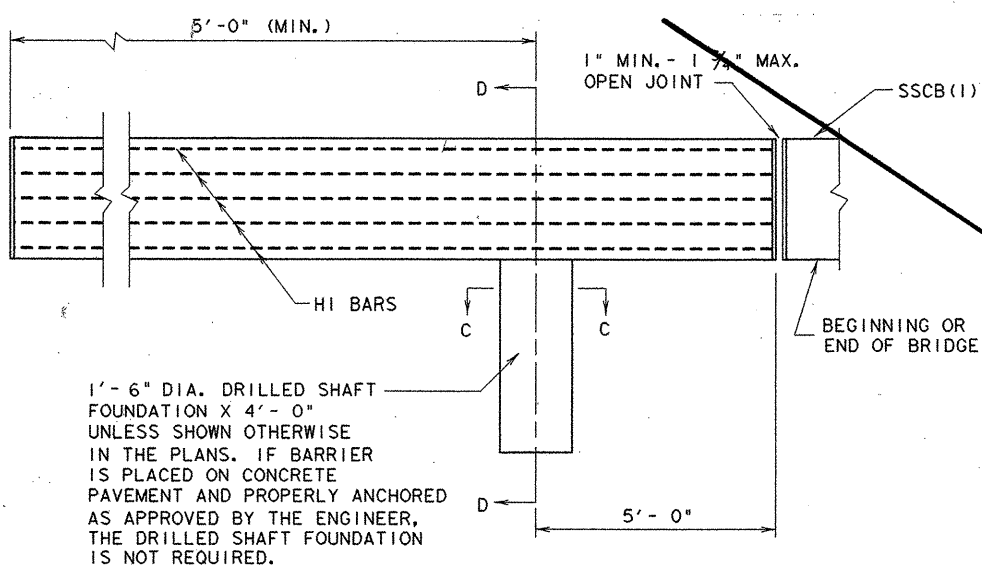
Gregory A. Malatek, P.E. 4/19, 1996
 GREGORY A. MALATEK
 FOR CHANGE ORDER NO. 3



VOIDED
CHANGE ORDER NO. 3



The seal appearing on this document was authorized by
 GREGORY A. MALATEK
 P.E. 71682, on
 4/7, 1995.
Gregory A. Malatek, P.E.



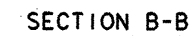
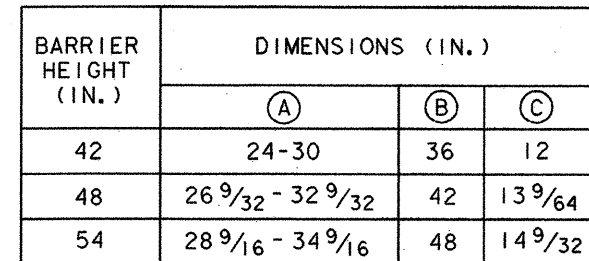
ELEVATION
ANCHOR OR TERMINAL



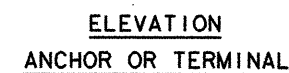
TEXAS DEPARTMENT OF TRANSPORTATION
SINGLE SLOPE CONCRETE BARRIER
TYPE 3
CAST-IN-PLACE
(AT BRIDGE ENDS OR MEDIAN OBSTRUCTIONS)
SSCB(3)-92(DIST. STD)(MOD)*

DISTRICT	MODIFICATIONS	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.
8-92	CHANGED TAPER FROM 20:1 OR FLATTER TO 50:1 AND PROVIDE A CONCRETE CAP OVER THE GRAVEL BACKFILL	6	TEXAS	NH 95(40) 1M	3/2
STATE DIST. NO.	CONTRACT	SECTION	JOB	HIGHWAY NO.	
SAT	COMBI	0010	05	007	2435

*MODIFIED 3-9-95 FOR TRAFFIC MANAGEMENT SYSTEM CONDUIT



1. BID PRICE PER LINEAR FOOT OF SSCB, INCLUDING TERMINAL AND ANCHOR SECTIONS, SHALL INCLUDE ALL OF THE CONCRETE, REINFORCEMENT, DRILLED SHAFT FOUNDATIONS, AGGREGATE BACKFILL AND CONCRETE CAP.
2. CONNECTION WITH PRECAST SSCB SHALL BE MADE WITH REBAR GRID AND SLOT AS SHOWN IN SSCB(2)
3. SEE SSCB(2) FOR ADDITIONAL NOTES AND DETAILS.



1) Gregory A. Malatek, E. 1/19, 1996
GREGORY A. MALATEK
FOR CHANGE ORDER NO. 3
DATE

CHANGE ORDER NO. 3



TEXAS DEPARTMENT OF TRANSPORTATION

SINGLE SLOPE
CONCRETE BARRIER
TYPE 3

CAST-IN-PLACE

(AT BRIDGE ENDS OR MEDIAN OBSTRUCTIONS)

SSCB (3) -92 (DIST. 15)

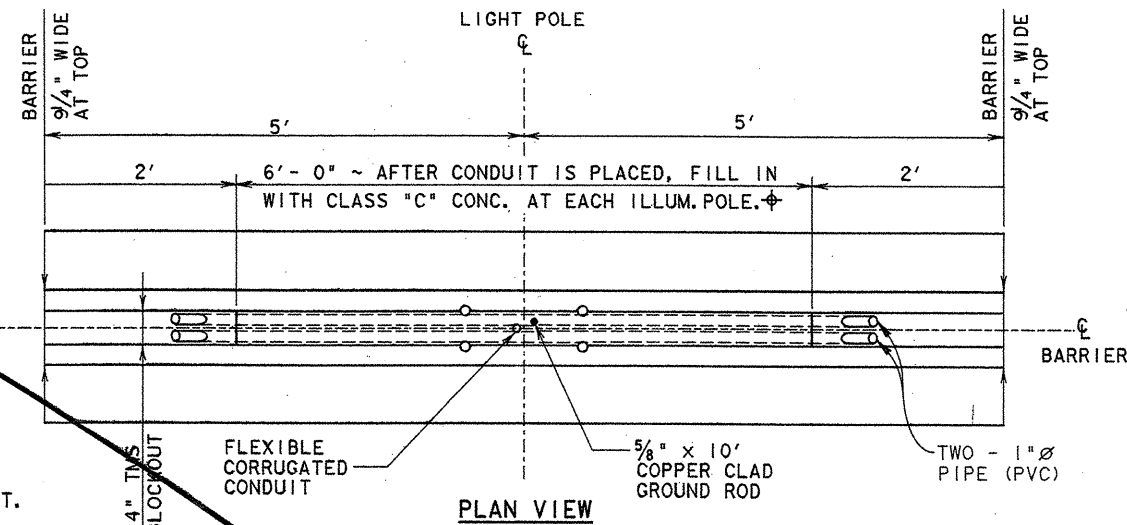
DISTRICT	MODIFICATIONS	FED. RD. DIST. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.
8-92 → CHANGED TAPER FROM 20+1 OR		6	TEXAS	NH 95(40) 1M	312A
FLATTER TO 50+1 AND PROVIDE A					
CONCRETE CAP OVER THE GRAVEL		STATE	COUNTY	CONT.	SECT.
BACKFILL		15	COMAL	0046	05
				0871	14 35

DIVISION OF HIGHWAY DESIGN (D-8)

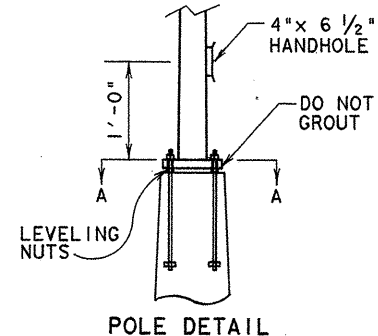
/BRIDGE/STDS/SSCB392. DGN
STRUCTURE DESIGN

* SEE SSCB (2A) FOR REINFORCEMENT DETAILS AND PLACEMENT ON ROADWAY SECTIONS. WHEN PLACED ADJACENT TO CAST-IN-PLACE ROADWAY BARRIER, OMIT REBAR GRID AND SLOT.

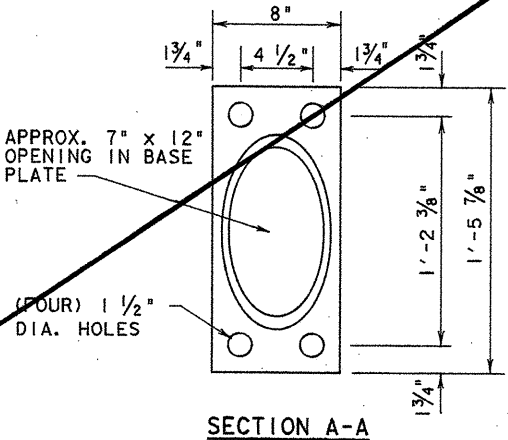
EACH END OF CAST-IN-PLACE LUMINAIRE SECTION SHALL BE FORMED TO MATE WITH THE PRECAST CONCRETE BARRIER. THE CAST-IN-PLACE SECTION SHALL BE CONNECTED AT EACH END TO THE PRECAST SECTIONS AS SHOWN ABOVE.



PLAN VIEW

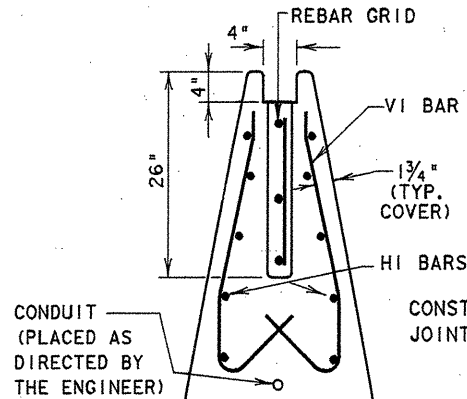


FOUR ~ 1 1/4\"/>



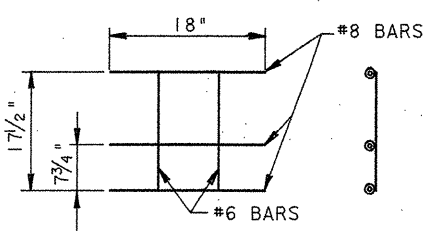
SECTION A-A

SHAPE OF POLE MAY BE ELLIPTICAL OR POLYGONAL

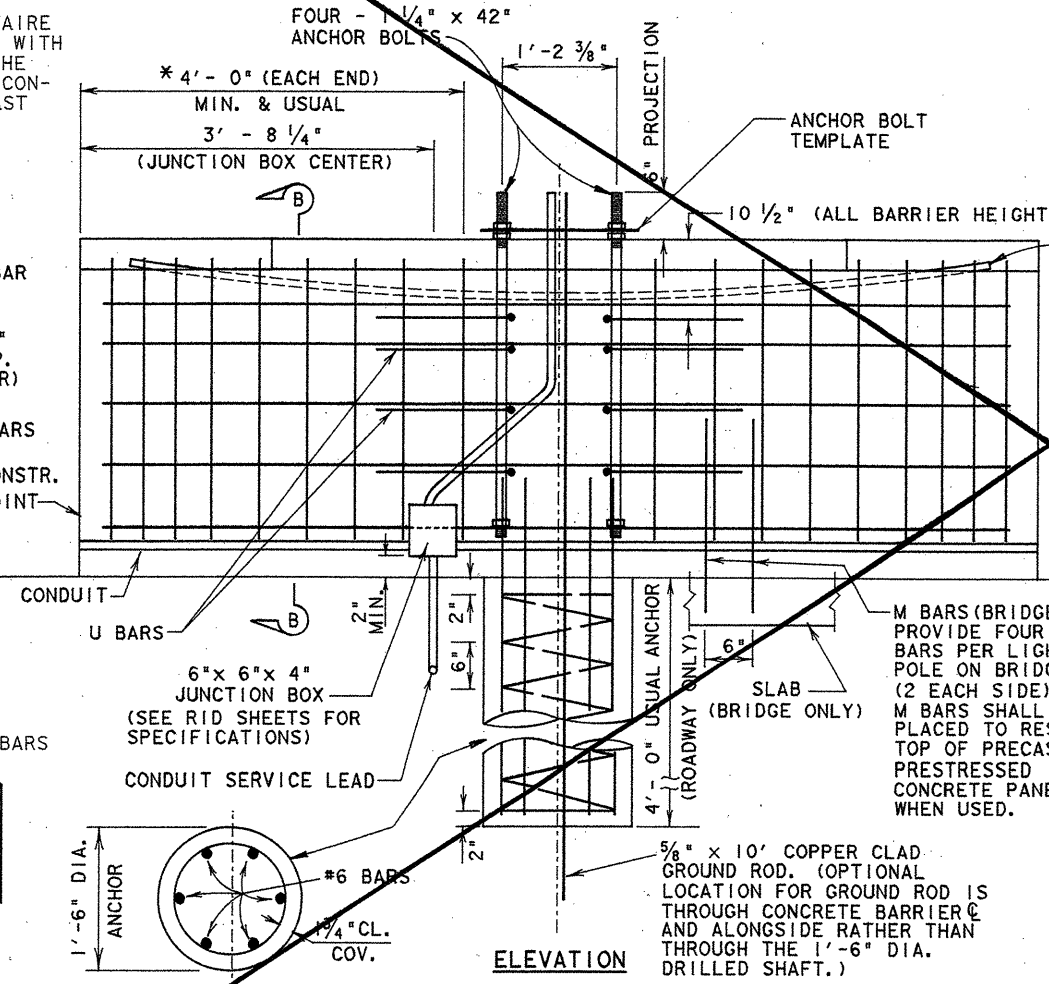


END SECTION

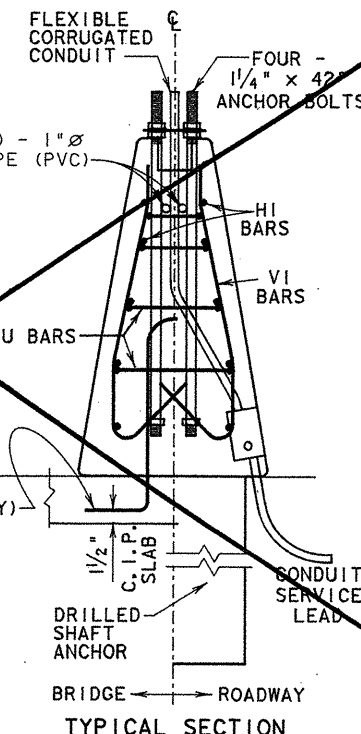
(ADJACENT TO PRECAST ROADWAY SECTIONS ONLY)



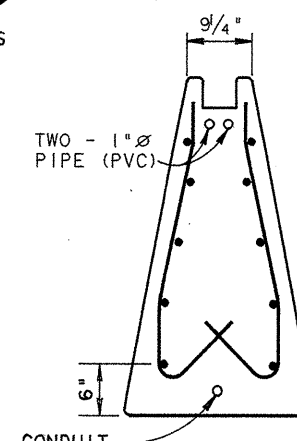
REBAR GRID



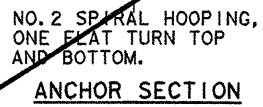
ELEVATION



TYPICAL SECTION



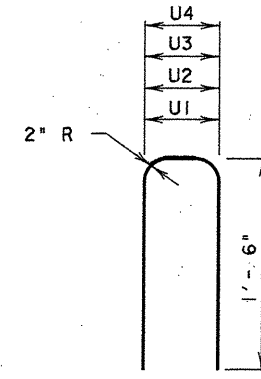
SECTION B-B



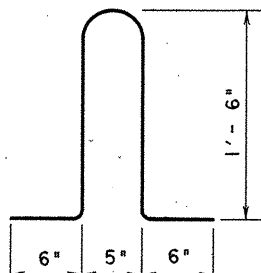
ANCHOR SECTION

BARRIER HEIGHT (IN.)	DIMENSIONS (IN.)			
	U1	U2	U3	U4
42	8 1/4	7 1/2	10 3/4	14

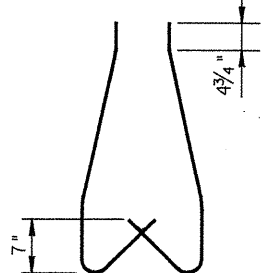
FOR OTHER BARRIER REQUIREMENTS AND REINFORCEMENT DIMENSIONS SEE SSCB (2)



BARS U(1-4) #4



BARS M(#4)



BARS VI (#4)

NOTE:
APPROX. 1\"/>



The seal appearing on this document was authorized by GREGORY A. MALATEK P.E. 71682, on 4/7, 1995.

* MOD. FOR T.M.S. CONDUIT

Gregory A. Malatek, E. 1/19, 1996
GREGORY A. MALATEK
FOR CHANGE ORDER NO. 3



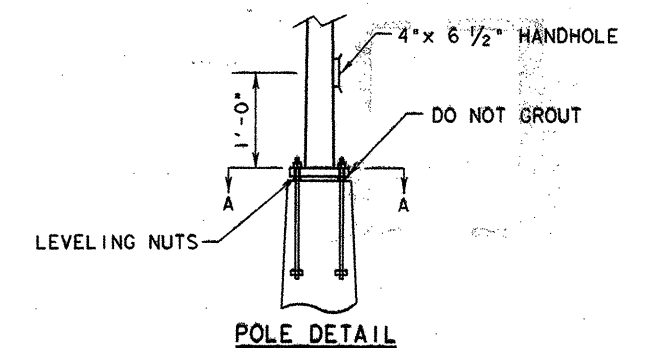
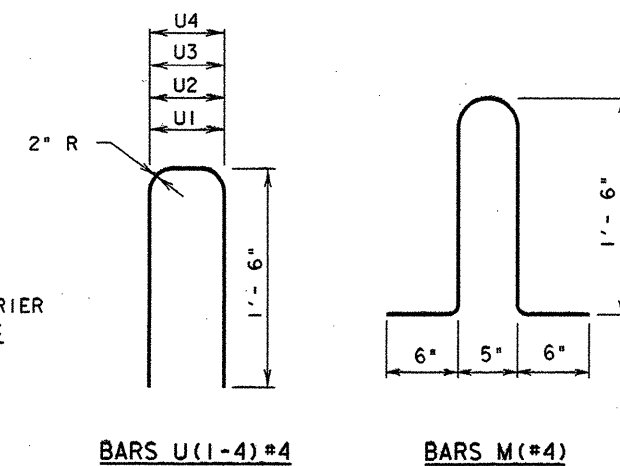
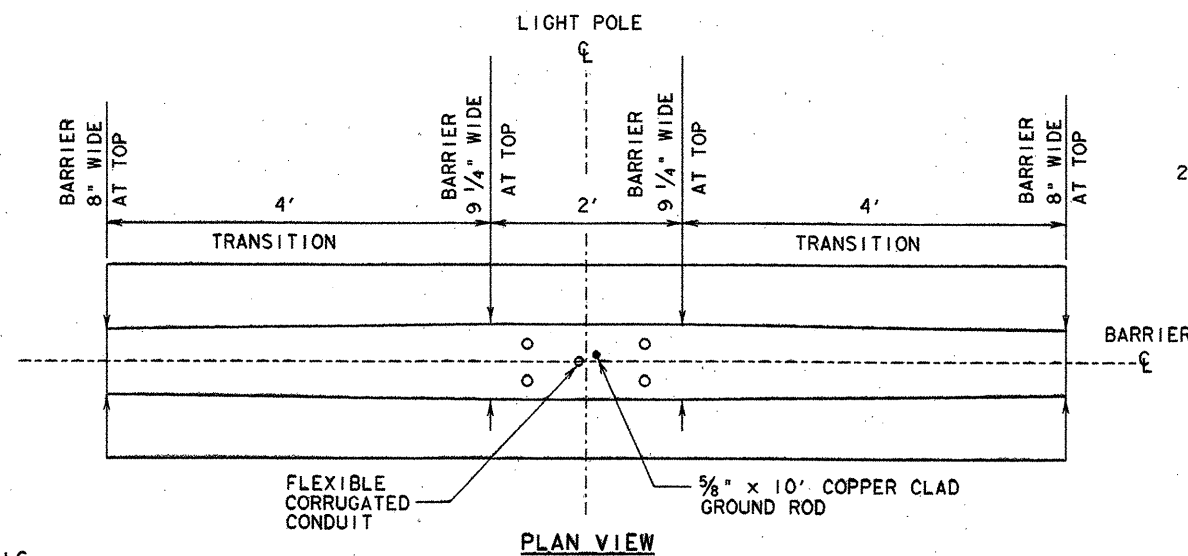
VOIDED

CHANGE ORDER NO. 3

GENERAL NOTES

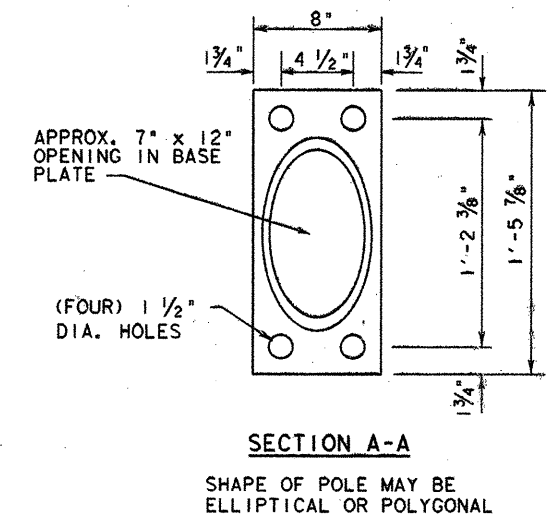
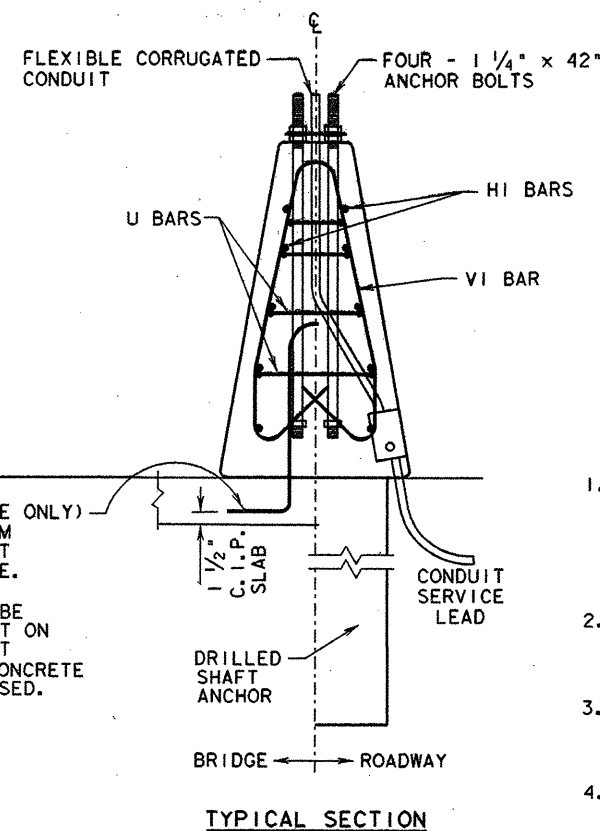
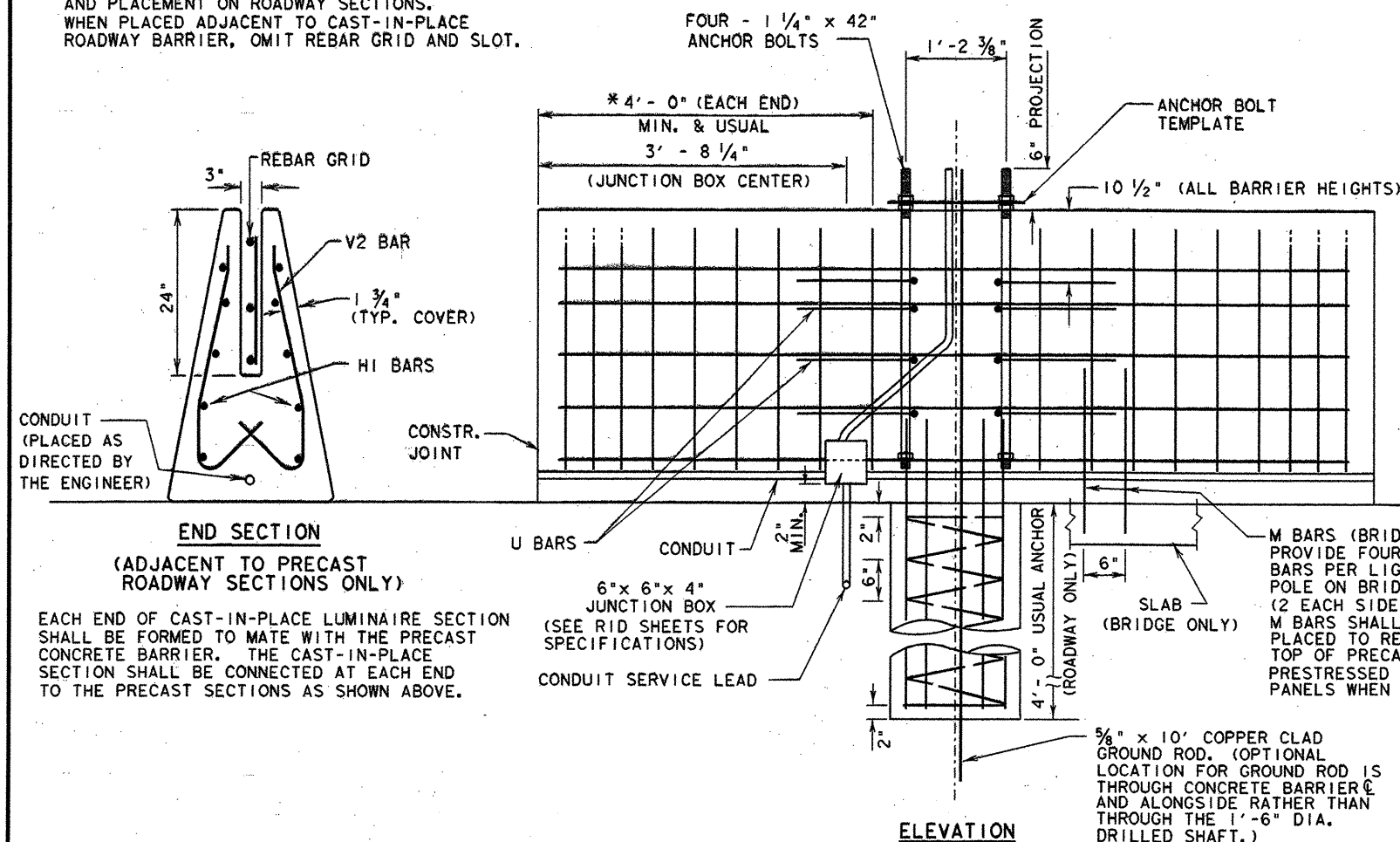
- POLES ON BRIDGE BARRIER SHALL BE GROUNDED USING A GROUND ROD NEAR THE WING WALL AND GROUNDING CONDUCTOR TO EACH POLE. THE 1'-6\"/>

TEXAS DEPARTMENT OF TRANSPORTATION									
SINGLE SLOPE CONCRETE BARRIER									
TYPE 4									
CAST-IN-PLACE									
(BRIDGE AND ROADWAY WITH ILLUMINATION)									
SSCB (4) - 92 (MOD)*									
MODIFICATIONS	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.					
	6	TEXAS	NH 95 (40) IM	3/3					
	STATE DIST. NO.	COUNTY	CONT.	SECT.	JOB	HIGHWAY NO.			
	15	COMAL	0016	05	087	1H 35			



FOUR - 1 1/4" x 42" ANCHOR BOLTS, ASTM 325 WITH THE TOP THREADED NOT LESS THAN 6", AND THE THREADED END GALVANIZED NOT LESS THAN 8" AND FURNISHED WITH GALVANIZED HEXAGON NUTS, FLAT AND LOCK WASHERS. THE LOWER END OF THE BOLT SHALL BE BENT AT A RIGHT ANGLE OR TACK WELD NUT TO ANCHOR BOLT.

* SEE SSCB(1) FOR REINFORCEMENT DETAILS
AND PLACEMENT ON BRIDGE SECTIONS.
SEE SSCB(2) FOR REINFORCEMENT DETAILS
AND PLACEMENT ON ROADWAY SECTIONS.
WHEN PLACED ADJACENT TO CAST-IN-PLACE
ROADWAY BARRIER, OMIT REBAR GRID AND SLOT.

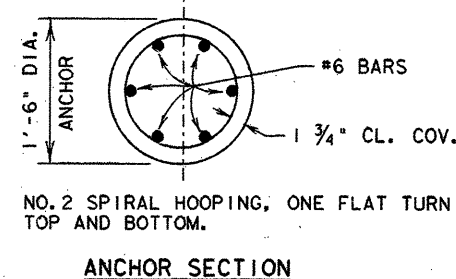


GENERAL NOTES

1. POLES ON BRIDGE BARRIER SHALL BE GROUNDED USING A GROUND ROD NEAR THE WING WALL AND GROUNDING CONDUCTOR TO EACH POLE. THE 1'-6" DIAMETER ANCHOR SHALL BE OMITTED ON BRIDGE BARRIER. ANCHORAGE ON BRIDGES SHALL BE PROVIDED USING FOUR M BARS AS DETAILED HEREON.
2. ANCHOR BOLTS, GROUND RODS, DRILLED SHAFT ANCHOR, JUNCTION BOX AND FLEXIBLE CORRUGATED CONDUIT AS SHOWN SHALL NOT BE PAID FOR DIRECTLY, BE CONSIDERED SUBSIDIARY TO THE VARIOUS BID ITEMS.
3. USE SPECIAL POLE DESIGNATION RDWY. ILLUM. ASSEM. EXAMPLE: (TY SP48S-8-8) (.4 KW), WHERE LENGTH OF ARM IS 8 FEET. (SEE RID STANDARD)
4. ALL CONDUIT BENDS SHALL BE IN ACCORDANCE WITH THE NATIONAL ELECTRIC CODE.


BARRIER HEIGHT (IN.)	DIMENSIONS (IN.)			
	U1	U2	U3	U4
42	6 1/4	7 1/2	10 3/4	14
48	6 1/4	8 1/4	12	16 1/4
54	6 1/4	8 7/8	13 3/8	18 1/2

FOR OTHER BARRIER REQUIREMENTS AND
REINFORCEMENT DIMENSIONS SEE SSCB(2)



Gregory A. Malatek, P.E. 1/19, 1996
GREGORY A. MALATEK DATE
FOR CHANGE ORDER NO. 3

CHANGE ORDER NO. 3



TEXAS DEPARTMENT OF TRANSPORTATION

**SINGLE SLOPE
CONCRETE BARRIER
TYPE 4
CAST-IN-PLACE
(BRIDGE AND ROADWAY WITH ILLUMINATION)**

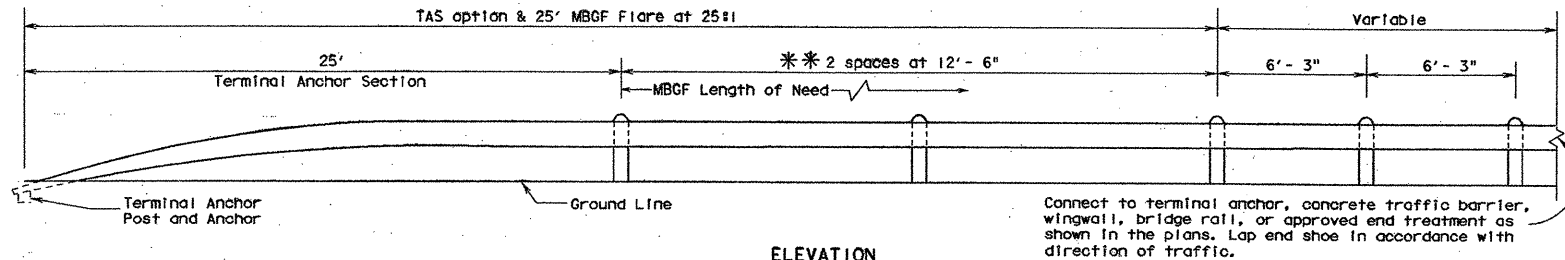
SSCB(4) - 92

MODIFICATIONS		FED. RD. DIST. NO.	STATE	FEDERAL AID PROJECT NO.			SHEET NO.
		6	TEXAS	NH 95 (40) 1M			373A
STATE DIST. NO.		COUNTY	CONV.	SECT.	JOB	HIGHWAY NO.	
15		COMB1	CONV. 95	0071	0071	NH 95	

DIVISION OF HIGHWAY DESIGN (D-8)

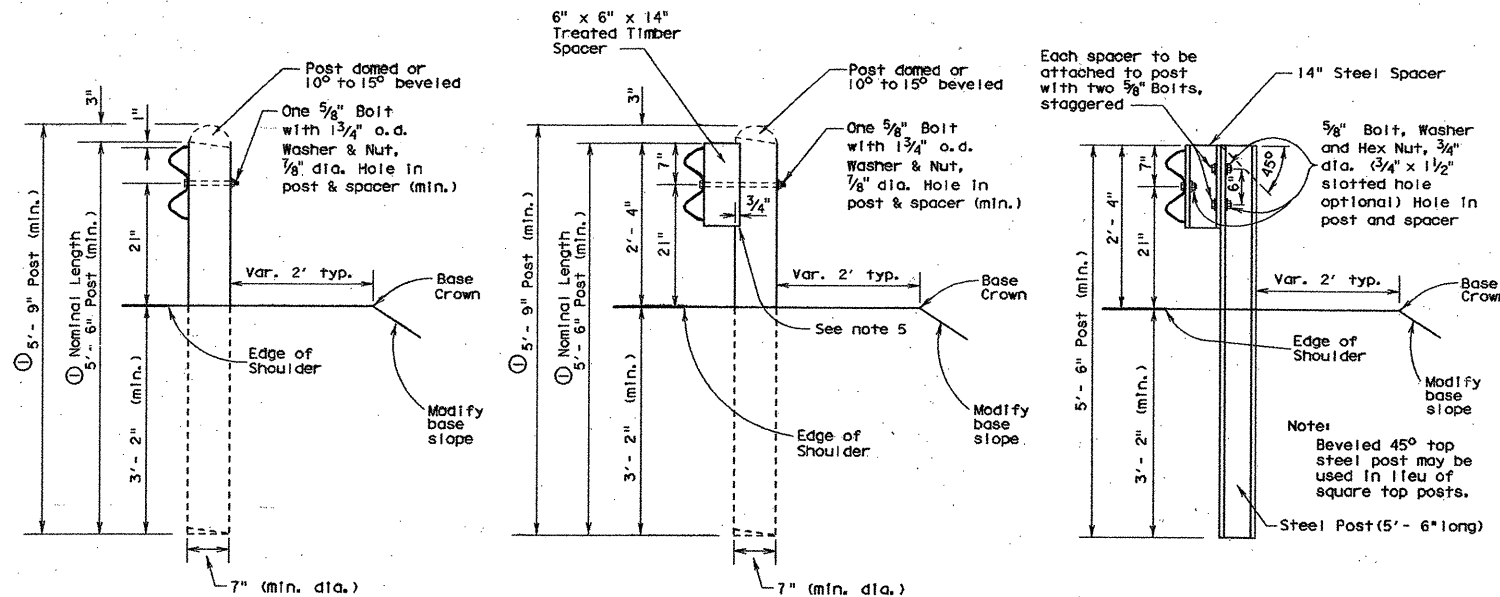
/BRIDGE/STDS/SSCB492.DGN
STRUCTURE DESIGN

*** Post spacing of 6'-3" may be used on the downstream (from a traffic flow standpoint) end of MBGF placed on roadways with one-way traffic operations.



ELEVATION

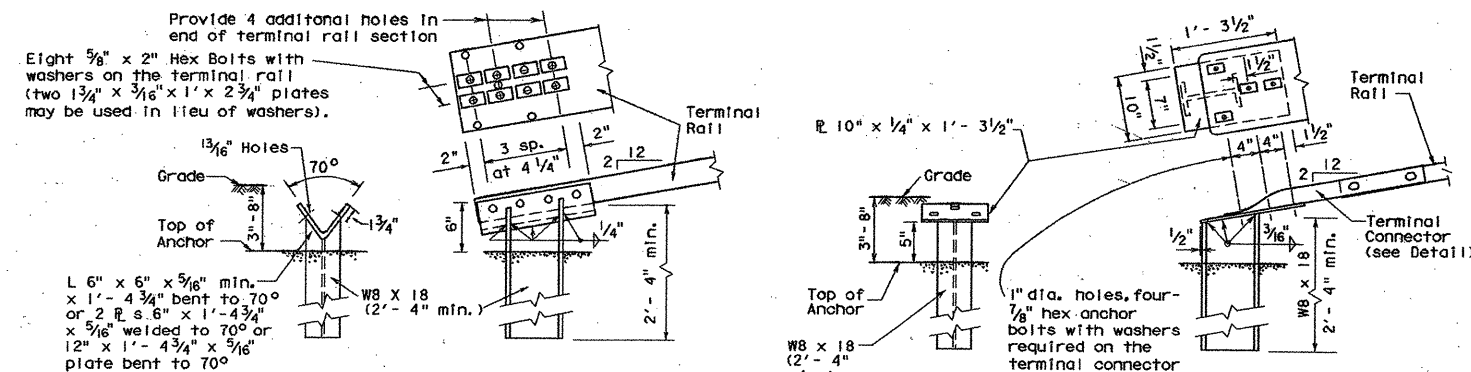
Note ①: Where a nominal length of 6'-0" is specified as acceptable elsewhere in the plans, these dimensions shall be increased by 0'-6". The additional length should be specified only on roadways where future ACP overlays and adjustments of the rail height on the same posts are likely.



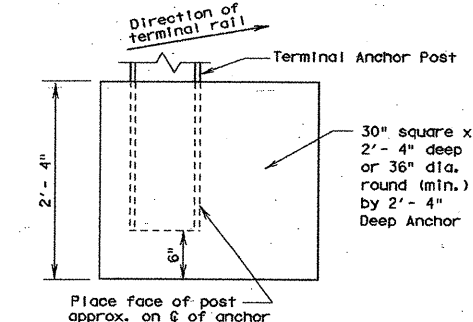
WOOD POST

WOOD POST (Blockout)

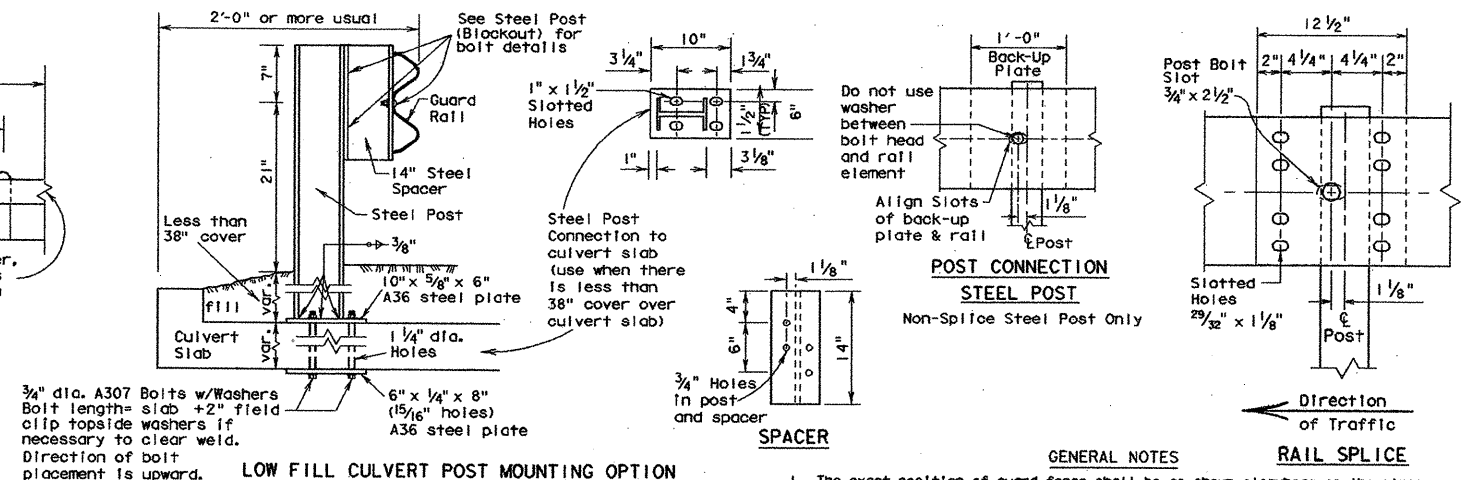
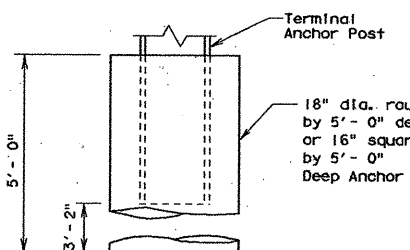
STEEL POST (Blockout)



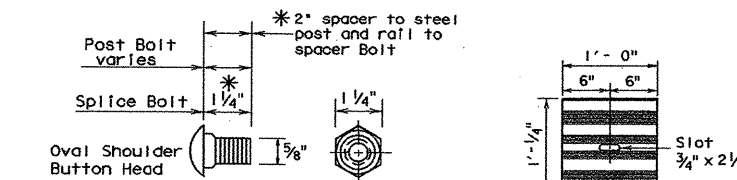
TERMINAL ANCHOR POST OPTIONS



TERMINAL CONCRETE ANCHOR OPTIONS

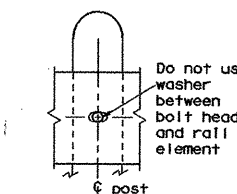


LOW FILL CULVERT POST MOUNTING OPTION



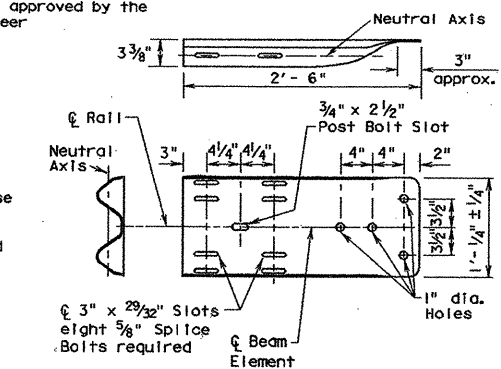
CONNECTOR DETAIL
(1/8" Hex Bolts required for terminal connector)
* Or as approved by the Engineer

BACK-UP PLATE

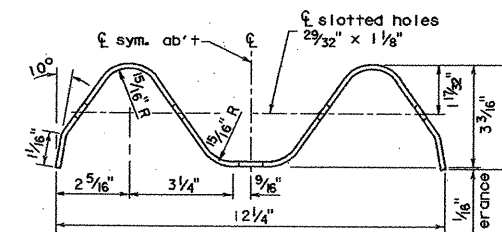


POST CONNECTION

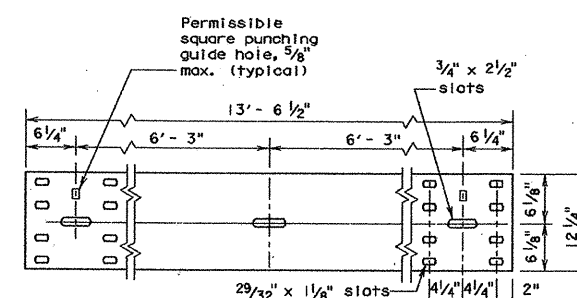
WOOD POST



TERMINAL CONNECTOR
(10 Gauge Minimum)



SECTION THRU GUARD RAIL



ELEVATION OF NOMINAL
12 1/2 FOOT GUARD RAIL

(25 foot sections may also be supplied)

- GENERAL NOTES
- The exact position of guard fence shall be as shown elsewhere on the plans or as directed by the Engineer. Guard fence shall be transitioned to a smooth connection with other guard fence or structure railing as shown elsewhere on plans.
 - Unless otherwise shown in the plans, guard fence placed in the vicinity of curbs shall be blocked out so that the face of curb is located directly below or behind the face of rail. Rail placed over curbs shall be installed so that the post bolt is located approximately 21-inches above the gutter pan or roadway surface.
 - Unless otherwise shown in the plans, MBGF shall be placed with the face of rail above the shoulder edge (or curb face) at the 25' Terminal Anchor Section and adjacent 25' or MBGF shall be placed at 25' (longitudinal lateral) to provide a 2' offset between buried anchor and shoulder edge (or curb face). Flaring the 25' Terminal Anchor and adjacent 25' MBGF is optional for one-way traffic conditions on the downstream end of guard fence.
 - At the option of the contractor, the rail elements for the guard fence may be furnished in either 12 1/2 or 25 foot nominal lengths with post bolt slots for connection to posts.
 - Timber posts may be beveled from 10 to 15 degrees on the top of both ends with high side of top of post placed toward the roadway or they may be domed. When blockout guard fence is specified elsewhere in the plans, a 6' x 6' x 4' treated timber spacer of yellow pine shall be used with wood posts. When "blocked out", the upper portion of the post shall be notched 3/4" to provide flat surface for timber spacer. A tolerance of 1/8" will be permitted on the notched portion of the post. Routing the timber spacer may be used in lieu of notching the post. The depth of routing shall be 3/4" at the center of radius 1 1/2".
 - Steel posts shall be blocked out. Steel posts and spacers shall meet the requirements of ASTM A-36 (W6 x 9.0 or W6 x 8.5). Bolt holes shall be approximately centered between web and edge of flange of spacers and posts.
 - Post spacing will be 6'-3" except that the first post will be 25' from the terminal anchor post and the next two posts spaced at 12'-6" with a minimum of 8 posts adjacent to structures spaced at 3'-1 1/2" and posts adjacent to Type T6 bridge rail are spaced at 6'-3". Post spacing adjacent to structures may vary as shown on bridge rail details or as directed by the Engineer.
 - The upper 10' (minimum) of the terminal anchor post and all steel fittings thereon shall be galvanized.
 - The terminal anchor post shall be set in Class "A" concrete in (unless otherwise shown on plans) in accordance with item, Portland Cement Concrete. Concrete shall be subsidiary to the bid item requiring construction of the terminal rail section and anchorage system.
 - An anchor other than to a terminal anchor post shall consist of a connection similar to the rail splice or similar to the terminal connector.
 - Back-up plates shall be provided at intermediate (non-splice) steel posts. Back-up plates shall conform to the materials and galvanizing requirements specified for the rail element, and shall be of the same nominal thickness as the rail element used.
 - Washers used with the eight 5/8" splice bolts and nuts that are provided for terminal connectors and/or terminal anchor posts shall be 1 3/4" x 3 1/2", or 1" I.D. and 2" O.D. x 0.134" (ANSI B27.2) narrow Type A plain washers.
 - The 10 gauge terminal connectors must be used with the optional terminal anchor post. Either anchor post may be used with either concrete anchor.
 - Welded steel posts and spacers shall meet the requirements of ASTM A-36. The flange width and thickness, web thickness, and depth of welded posts and spacers shall equal or exceed the dimensions of a standard rolled W6 x 8.5 or W6 x 9.0.
 - Special fabrication will be required at installations having a curvature of less than 150' radius.
 - Boils shall be of sufficient length to extend through the full thickness of the nut and no more than 3/4" beyond it. (Butt head bolts may be used instead of hex bolts when specified by the Engineer.) Fittings, nuts, and washers shall be in accordance with item, "Metal For Structures". Fittings shall be subsidiary to the bid item requiring construction of MBGF or Terminal Anchor Section.
 - Crown will be widened to accommodate guard fence.
 - Where solid rock is encountered or where shown on the plans, the diameter of the holes shall be approximately 12 inches, the backfilling shall be with a cohesionless material, and embedment depth shall be 1'-6" or more as directed by the Engineer. Timber posts shall not be set in concrete.

Texas Department of Transportation
Design Division (Roadway)

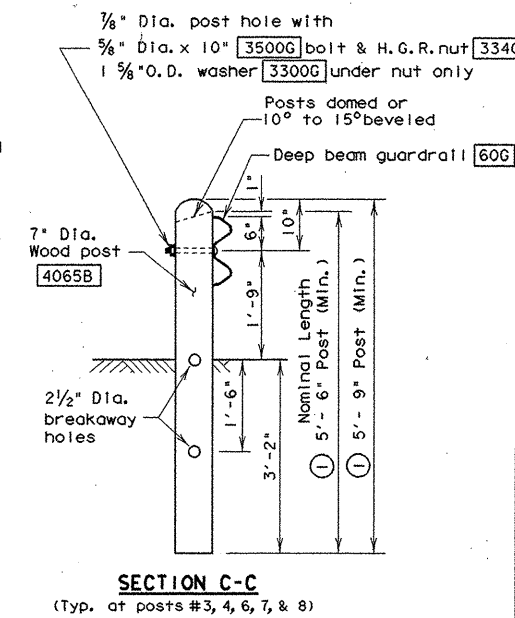
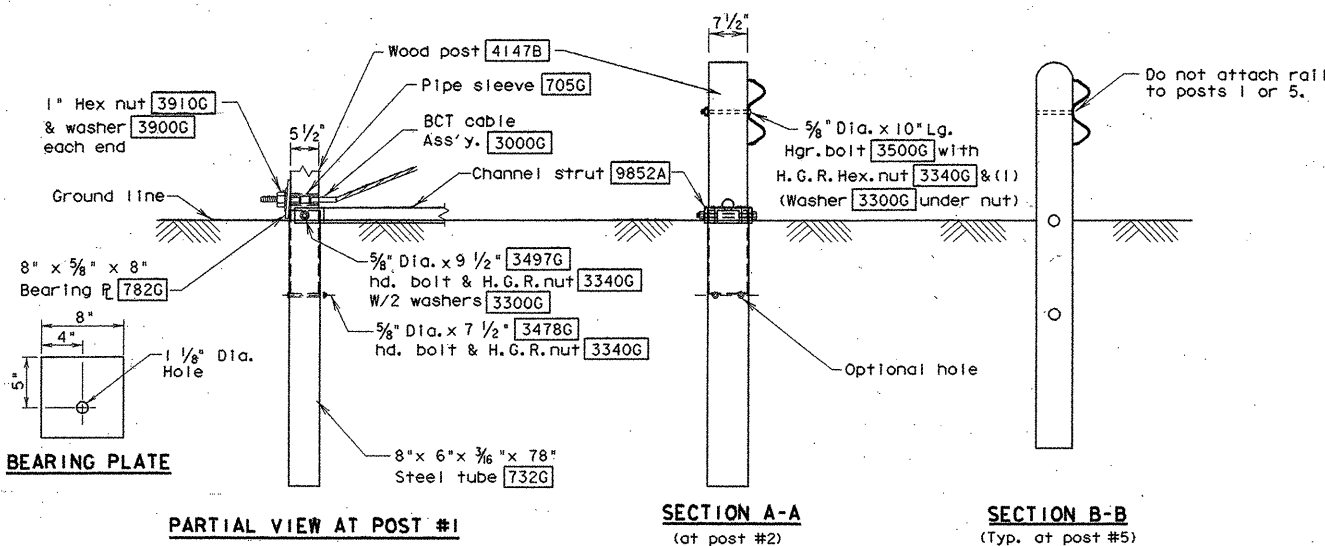
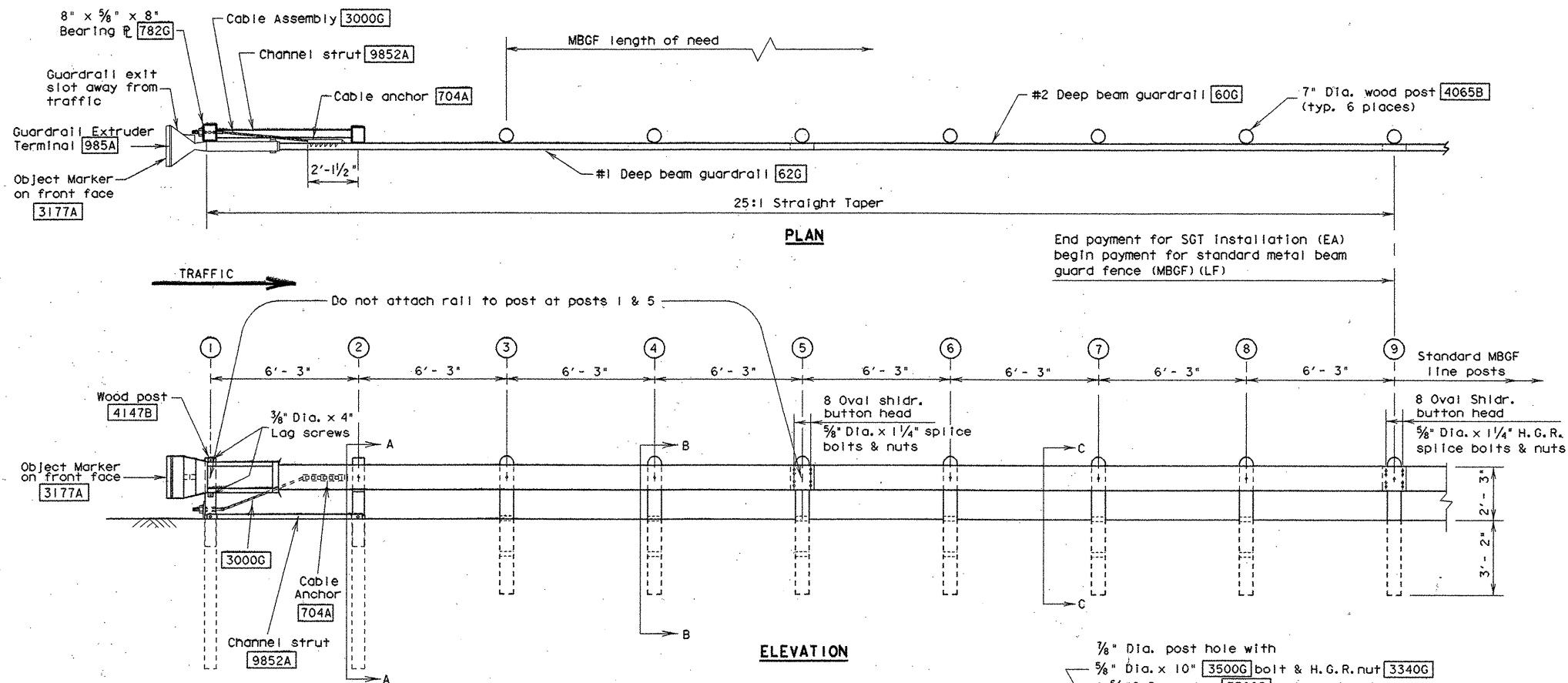
METAL BEAM GUARD FENCE

MBGF-94

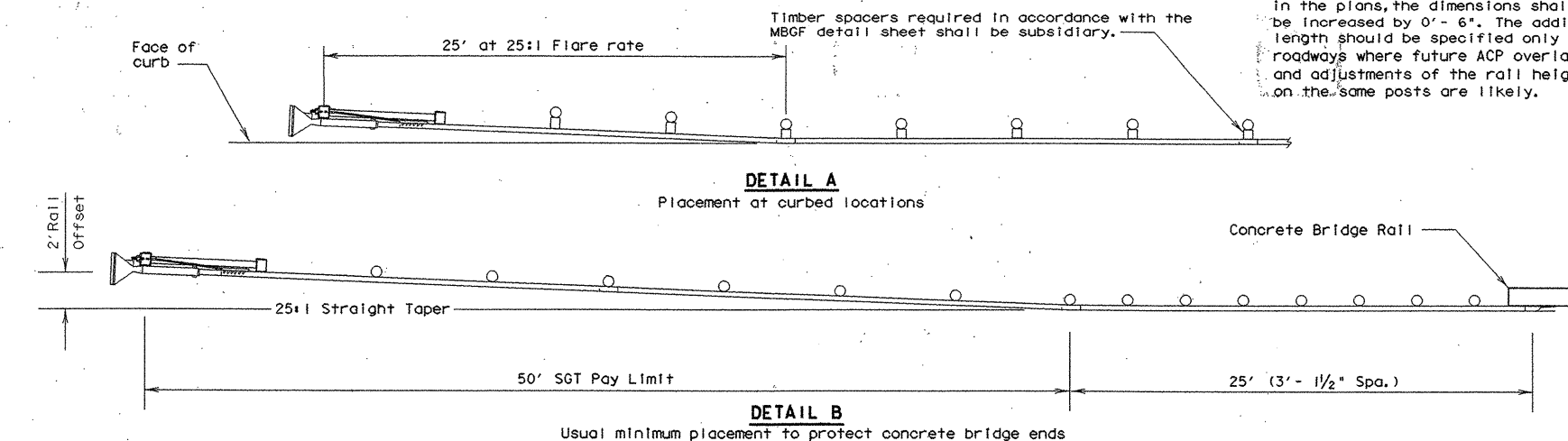
ORIG. DRAW. DATE:	JULY 94	DN- TGM	CK- TGM	DN- BGD	CK- .	NEG. NO. 1	A6
MODIFICATIONS							
STATE DISTRICT	SAT 6	FEDERAL REGION	MANH 95(40) IM, etc.				314
COUNTY	Comal						
	001b	05	087				TH 35

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LEVELS DISPLAYED
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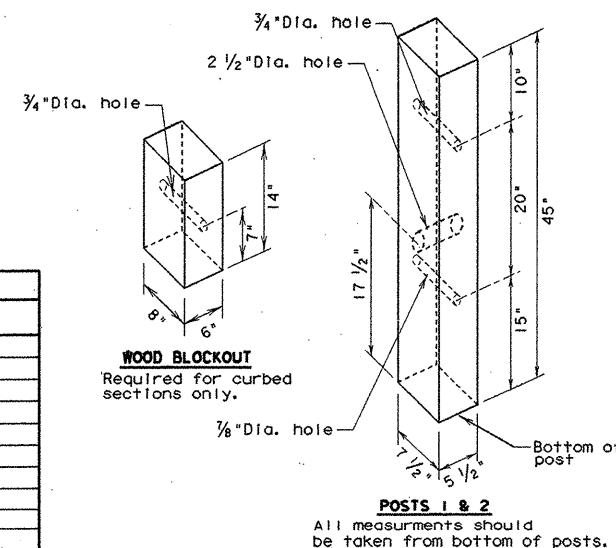


NOTE ①: Where a nominal length of 6' - 0" is specified as acceptable elsewhere in the plans, the dimensions shall be increased by 0' - 6". The additional length should be specified only on roadways where future ACP overlays and adjustments of the rail height on the same posts are likely.



GENERAL NOTES

- Wood posts are required with the Modified Extruder Terminal (MET).
- All bolts, nuts, cable assemblies, cable anchors and bearing plates shall be galvanized.
- When the Modified Extruder Terminal is specified as the end treatment for MBGF installation, the MBGF will be flared at a rate of 25:1 over the 50 foot MET system, to prevent the extruder head from encroaching on the shoulder. The flare may be decreased or eliminated for specific installations if directed by the Engineer. A 25:1 flare rate will be used at curb sections, beginning at post number five and ending at post number one.
- The steel tubes shall not protrude more than 4 inches above ground (measured along a 5 foot cord). Site grading may be necessary to meet this requirement.
- The steel tubes may be driven with an approved driving head. They shall not be driven with the wood post in the tube. If the steel tubes are placed in drilled holes, the backfill material must be satisfactorily compacted to prevent tube settlement.
- When rock excavation is encountered, a 12 inch diameter post hole, 20 inches deep may be used if approved by the Engineer. Granular material will be placed in the bottom of the hole approximately 2 1/2 inches deep to provide drainage. The steel tube sleeves will be field cut to 20 inches in length, placed in the hole and backfilled with adequately compacted material excavated from the hole.
- The breakaway cable assembly must be taut. A locking device, (vice grips or channel lock pliers) should be used to prevent the cable from twisting when tightening the nuts.
- When block outs are required on round posts, the upper portion of the post shall be notched 3/4" to provide a flat surface for timber spacer. A tolerance of ±1/8" will be permitted on the notched portion of the post. Routing of the timber spacer may be used in lieu of notching the post. The depth of routing shall be 3/4" at the center of radius ±1/8".
- For curb installations, the steel tubes and posts shall be installed at the proper ground elevation behind the curb. The posts will then require field drilling new holes to accommodate the rail to post connection bolt to maintain the proper height of the rail above the gutter pan. The excess post length above the rail will be removed if directed by the Engineer.
- An object marker shall be installed on the front of the extruder, as detailed on D & OM(VIA).
- A special site evaluation should be considered, prior to using the MET where there is less than 25 feet between the extrusion side of the MET and any adjacent driving lane.



(MET) BILL OF MATERIAL		
Code #	QTY.	DESCRIPTION
62G	1	#1 Deep Beam Guardrail (12 Ga.)
60G	1	#2 Deep Beam Guardrail (12 Ga.)
732G	2	Steel Tube - 6"x 8"x 78"x 3/8"
4147B	2	Wood Posts - 5 1/2"x 7 1/2"x 45"
4065B	6	Round Wood Posts - 7" Dia.
705G	1	Pipe Sleeve - 2" std. pipe x 5-1/2"
782G	1	Bearing Plate - 8"x 8"x 5/8"
704A	1	Cable Anchor
3000G	1	Cable Assembly
9852A	1	Channel Strut
985A	1	Guardrail Extruder Terminal
3108B	6	Wood Block-Outs for curb sections only
HARDWARE		
3497G	2	5/8"x 9 1/2" Hex Hd. Bolt (Top of tubes)
3300G	10	5/8" Washer (2 ea. at Tubes 1 & 2 + 7 Posts)
3478G	2	5/8"x 7 1/2" Hex Hd. Bolt
3500G	6	5/8"x 10" H.G.R. Post Bolt (Posts 2, 3, 4, 6, 7 & 8)
3360G	16	5/8"x 1 1/4" H.G.R. Splice Bolt
3340G	26	5/8" H.G.R. Nut (SPL-16, Tubes-4, GR-6)
4228G	2	3/8"x 4" Lag Screw
3910G	2	1" Hex Nut (Anchor Cable)
3900G	2	1" Washer (Anchor Cable)
3177A	1	Object Marker - Mounted

FOR CHANGE ORDER # 19

Texas Department of Transportation
Design Division (Roadway)

SINGLE GUARDRAIL TERMINAL (Modified Extruder Terminal)

SGT (3) - 96

FILE#	SGT396.DGN	DN#	MAM	CK#	MAM	DW#	BDG	CK#	NEG#
ORIG DATE#	JULY 1995	DIST	FED REG	FEDERAL AID PROJECT					SHEET
REVISIONS	SAT	6	MANH 95(40) IM					316A	
	COUNTY			CONTROL	SECT	JOB	HIGHWAY		
	COMAL			0016	05	0874	IH 35		

SITE DESCRIPTION

PROJECT LIMITS: FROM 0.1 MILE NORTH OF FM 482 (FM 2252) TO 0.5 MILE SOUTH OF SOLMS ROAD

PROJECT DESCRIPTION: CONSTRUCTION OF THE WIDENING OF A FREEWAY FACILITY CONSISTING OF GRADING, STRUCTURES, BASE AND SURFACING. (MAINLANES ONLY)

MAJOR SOIL DISTURBING ACTIVITIES: SOIL DISTURBING ACTIVITIES WILL INCLUDE GRADING, EXCAVATION AND EMBANKMENT FOR THE ROADWAY; DROP INLETS, STORMSEWERS, AND CULVERTS FOR DRAINAGE STRUCTURES; AND EROSION, SEDIMENT CONTROLS AND TOPSOIL WORK FOR FINAL PLANTING AND SEEDING.

TOTAL PROJECT AREA: 234.11 ACRES

TOTAL AREA TO BE DISTURBED: 124.79 ACRES

WEIGHTED RUNOFF COEFFICIENT (AFTER CONSTRUCTION): 0.55

EXISTING CONDITION OF SOIL & VEGETATIVE COVER AND % OF EXISTING VEGETATIVE COVER: THE SOILS FOUNDED ON AND ADJACENT TO THE PROPOSED CONSTRUCTION AREA INCLUDE A COMBINATION OF CLAYS (HEIDEN CLAY, HOUSTON BLACK CLAY, AND TINN), ALTOGA SILTY CLAY, AND CASTEPHEN CLAY LOAM. THE MAJORITY OF THE SOILS ARE WELL DRAINED, EXHIBIT MEDIUM SURFACE RUNOFF (EXCEPT FOR HEIDEN CLAY AND GRAVELLY LOAM WHICH EXHIBIT RAPID SURFACE RUNOFF), AND A MODERATE WATER EROSION HAZARD (TINN CLAY EXHIBITS A SEVERE WATER EROSION HAZARD). NATIVE GRASSES (BERMUDA GRASS, KLEINGRASS, AND BLUESTEM) COVER APPROXIMATELY 80% OF THE AREA.

NAME OF RECEIVING WATERS: THE PROJECT SITE LIES WITHIN THE GUADALUPE RIVER BASIN. RUNOFF FROM THE SITE DRAINS INTO SEVERAL MINOR CREEKS, PROCEEDING INTO THE GUADALUPE RIVER, AND ULTIMATELY DRAINING INTO THE SAN ANTONIO BAY. (STREAM SEGMENT NUMBER 1801)

EROSION AND SEDIMENT CONTROLS

SOIL STABILIZATION PRACTICES:

- X TEMPORARY SEEDING
- X PERMANENT PLANTING, SODDING, OR SEEDING
- X MULCHING
- X SOIL RETENTION BLANKET
- X BUFFER ZONES
- X PRESERVATION OF NATURAL RESOURCES

OTHER: DISTURBED AREAS ON WHICH CONSTRUCTION ACTIVITY HAS CEASED (TEMPORARILY OR PERMANENTLY) SHALL BE STABILIZED WITHIN 14 DAYS UNLESS ACTIVITIES ARE SCHEDULED TO RESUME WITHIN 21 DAYS.

STRUCTURAL PRACTICES:

- X SILT FENCES
- X HAY BALES
- X ROCK BERMS
- X DIVERSION, INTERCEPTOR, OR PERIMETER DIKES
- X DIVERSION, INTERCEPTOR, OR PERIMETER SWALES
- X DIVERSION DIKE AND SWALE COMBINATIONS
- X PIPE SLOPE DRAINS
- X PAVED FLUMES
- X ROCK BEDDING AT CONSTRUCTION EXIT
- X TIMBER MATTING AT CONSTRUCTION EXIT
- X CHANNEL LINERS
- X SEDIMENT TRAPS
- X SEDIMENT BASINS
- X STORM INLET SEDIMENT TRAP
- X STONE OUTLET STRUCTURES
- X CURBS AND GUTTERS
- X STORM SEWERS
- X VELOCITY CONTROL DEVICES
- X GABION MATTRESS

OTHER:

NARRATIVE - SEQUENCE OF CONSTRUCTION (STORM WATER MANAGEMENT) ACTIVITIES:

THE ORDER OF ACTIVITIES WILL BE AS FOLLOWS:

- 1 INSTALL ROCK FILTER DAMS AS LOCATED ON THE PLAN SHEETS. STABILIZE CONSTRUCTION ENTRANCE(S) AND EXIT(S).
- 2 BEGIN CONSTRUCTION AND ESTABLISH EMBANKMENT. AS CONSTRUCTION CONTINUES, INSTALL ADDITIONAL CONTROL MEASURES (RIPRAP, TEMPORARY SEEDING, ETC.)
- 3 REPEAT SOIL STABILIZATION WORK AS DESCRIBED IN #2 WITHIN 14 DAYS OF COMPLETING WORK IN CONSTRUCTION AREAS. WHEN THE SITE IS COMPLETE, STABILIZED, AND APPROVED BY THE ENGINEER, THE TEMPORARY CONTROL MEASURES WILL BE REMOVED.

STORM WATER MANAGEMENT: STORM WATER DRAINAGE WILL BE PROVIDED BY GRASS DITCHES, DROP INLETS, AND A STORM SEWER SYSTEM. THIS SYSTEM WILL CARRY DRAINAGE WITHIN THE R.O.W. TO LOWS IN THE HIGHWAY WHERE CROSS DRAINAGE OCCURS.

OTHER EROSION AND SEDIMENT CONTROLS:

MAINTENANCE: ALL EROSION AND SEDIMENT CONTROLS WILL BE MAINTAINED IN GOOD WORKING ORDER. IF A REPAIR IS NECESSARY, IT WILL BE DONE AT THE EARLIEST DATE POSSIBLE, BUT NO LATER THAN 7 CALENDAR DAYS AFTER THE SURROUNDING EXPOSED GROUND HAS DRIED SUFFICIENTLY TO PREVENT FURTHER DAMAGE FROM HEAVY EQUIPMENT. THE AREAS ADJACENT TO CREEKS AND DRAINAGEWAYS SHALL HAVE PRIORITY, FOLLOWED BY DEVICES PROTECTING STORM SEWER INLETS.

INSPECTION: AN INSPECTION WILL BE PERFORMED BY A TXDOT INSPECTOR EVERY WEEK AS WELL AS AFTER EVERY HALF INCH OR MORE OF RAIN (AS RECORDED IN A NON-FREEZING RAIN GAUGE TO BE LOCATED AT THE PROJECT SITE). AN INSPECTION AND MAINTENANCE REPORT WILL BE MADE PER EACH INSPECTION. BASED ON THE INSPECTION RESULTS, THE CONTROLS SHALL BE REVISED.

WASTE MATERIALS: ALL WASTE MATERIALS WILL BE COLLECTED AND STORED IN A SECURELY LIDDED METAL DUMPSTER. THE DUMPSTER WILL MEET ALL STATE AND LOCAL CITY SOLID WASTE MANAGEMENT REGULATIONS. ALL TRASH AND CONSTRUCTION DEBRIS FROM THE SITE WILL BE DEPOSITED IN THE DUMPSTER. THE DUMPSTER WILL BE EMPTIED AS NECESSARY OR AS REQUIRED BY LOCAL REGULATION, AND THE TRASH WILL BE HAULED TO A LOCAL DUMP. NO CONSTRUCTION WASTE MATERIAL WILL BE HAULED TO A LOCAL DUMP. NO CONSTRUCTION WASTE MATERIAL WILL BE BURIED ON SITE.

HAZARDOUS WASTE (INCLUDING SPILL REPORTING): AT A MINIMUM, ANY PRODUCTS IN THE FOLLOWING CATEGORIES ARE CONSIDERED TO BE HAZARDOUS: PAINTS, ACIDS FOR CLEANING MASONRY SURFACES, CLEANING SOLVENTS, ASPHALT PRODUCTS, CHEMICAL ADDITIVES FOR SOIL STABILIZATION, OR CONCRETE CURING COMPOUNDS AND ADDITIVES. IN THE EVENT OF A SPILL WHICH MAY BE HAZARDOUS, THE CONTRACTOR SHALL CONTACT THE ENGINEER IMMEDIATELY. THE ENGINEER WILL THEN CONTACT THE DISTRICT SPILL COORDINATOR.

SANITARY WASTE: ALL SANITARY WASTE WILL BE COLLECTED FROM THE PORTABLE UNITS AS NECESSARY OR AS REQUIRED BY LOCAL REGULATION BY A LICENSED SANITARY WASTE MANAGEMENT CONTRACTOR.

OFFSITE VEHICLE TRACKING:

- X HAUL ROADS DAMPENED FOR DUST CONTROL
- X LOADED HAUL TRUCKS TO BE COVERED WITH TARPULIN
- X EXCESS DIRT ON ROAD REMOVED ON A REGULAR BASIS
- X STABILIZED CONSTRUCTION EXIT

OTHER:

REMARKS: DISPOSAL AREAS, STOCKPILES, AND HAUL ROADS SHALL BE CONSTRUCTED IN A MANNER THAT WILL MINIMIZE AND CONTROL THE AMOUNT OF SEDIMENT THAT MAY ENTER RECEIVING WATERS. DISPOSAL AREAS SHALL NOT BE LOCATED IN ANY WETLAND, BODY OF WATER, OR STREAMBED. CONSTRUCTION STAGING AREAS AND VEHICLE MAINTENANCE AREAS SHALL BE CONSTRUCTED BY THE CONTRACTOR IN A MANNER AS TO MINIMIZE THE RUNOFF OF POLLUTANTS. ALL WATERWAYS SHALL BE CLEARED AS SOON AS POSSSIBLE OF OBSTRUCTIONS PLACED DURING CONSTRUCTION OPERATIONS THAT ARE NOT A PART OF THE FINISHED WORK.



The seal appearing on this document was authorized by GREGORY A. MALATEK P.E. 71682, on 4/13, 1995.

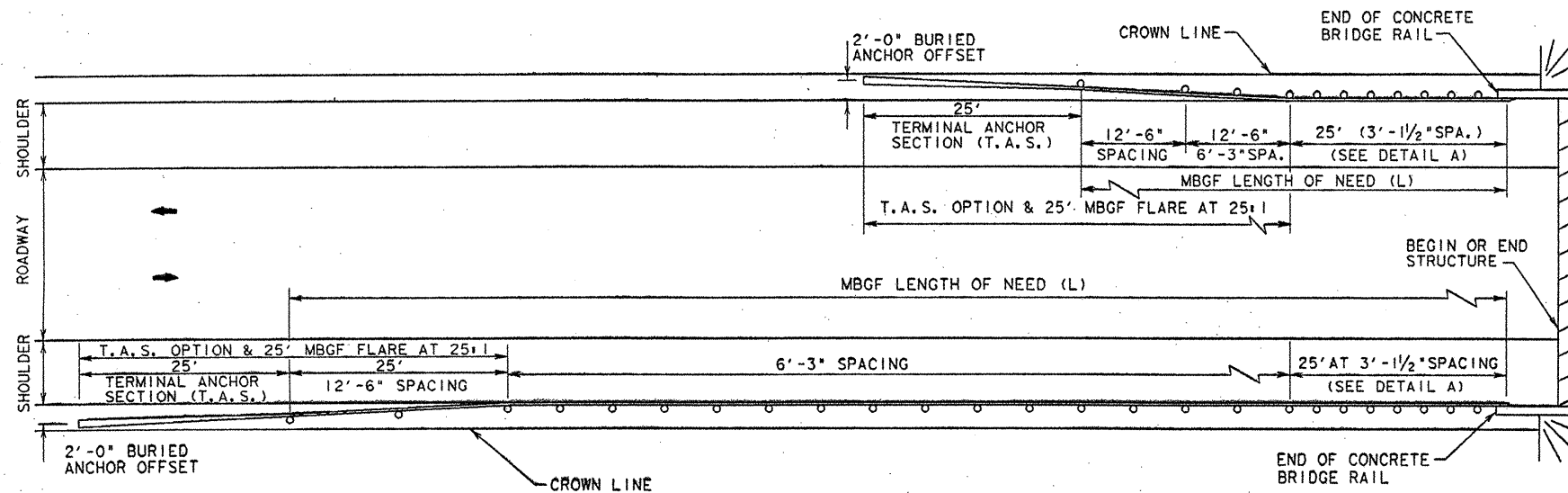
Gregory A. Malatek, P.E.

TXDOT STORM WATER POLLUTION PREVENTION PLAN (SW3P)

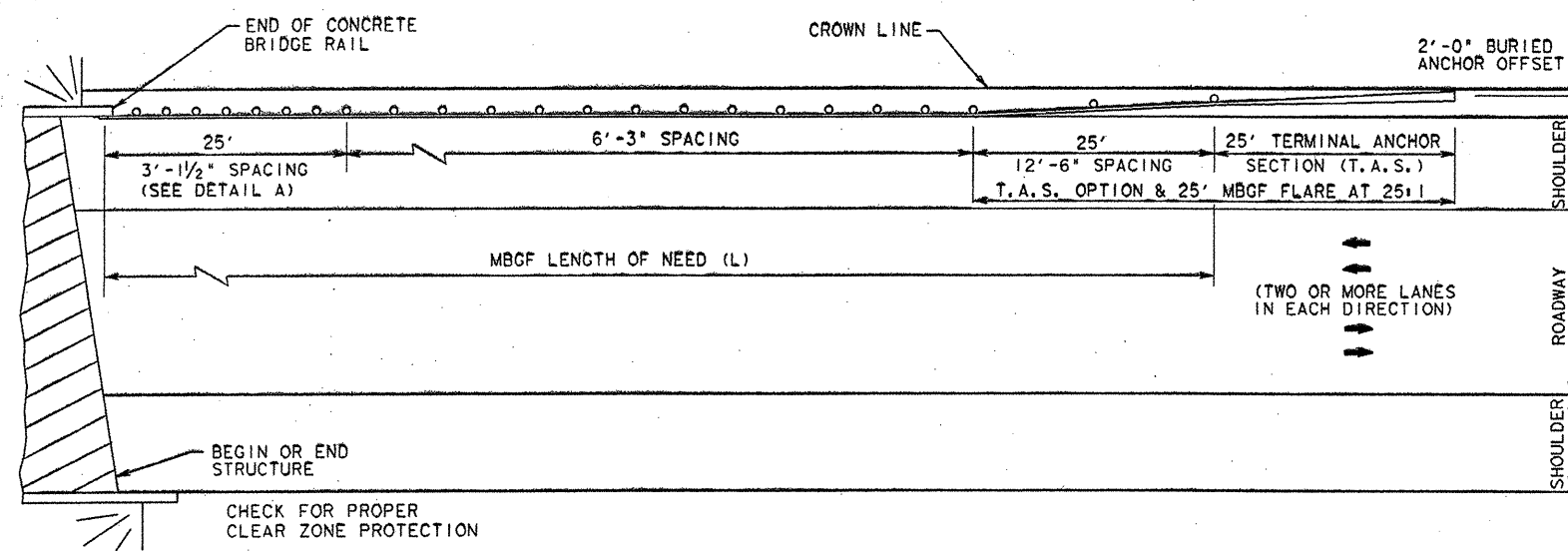
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6	NH 95(40) 1M	317
STATE	STATE DIST. NO.	COUNTY
TEXAS	15	COMAL
CURT.	SECT.	JOB
0016	05	087
		1H 35

GENERAL NOTES

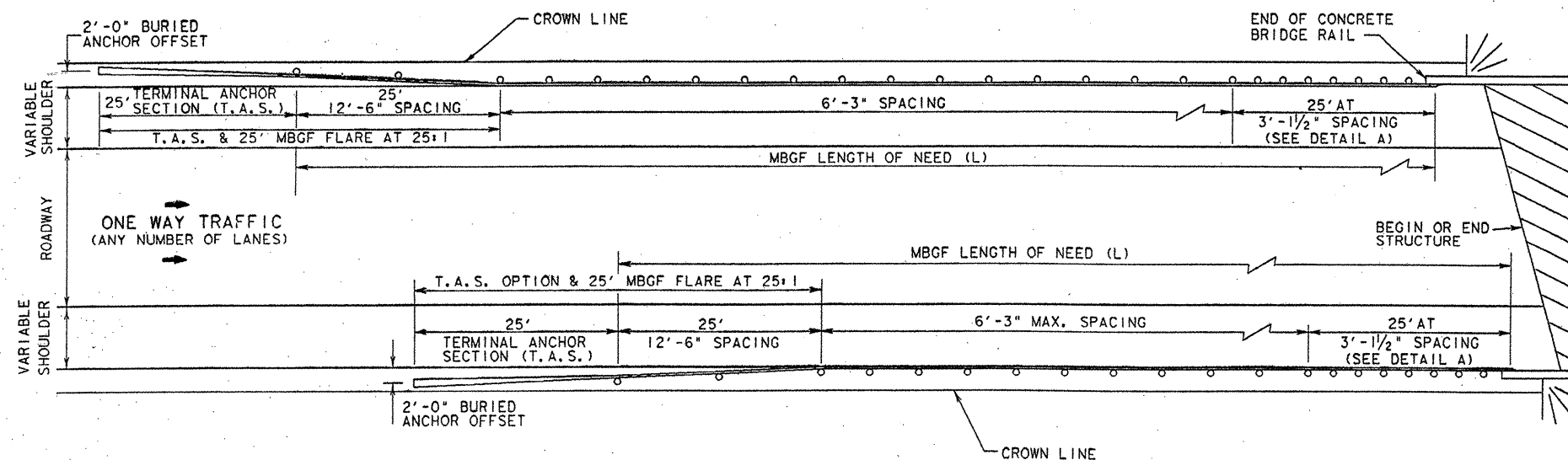
1. FOR METAL BEAM GUARD FENCE DETAILS, SEE MBGF PLAN SHEET.
2. QUANTITIES OF METAL BEAM GUARD FENCE (MBGF) AT INDIVIDUAL BRIDGE ENDS ARE SHOWN ELSEWHERE IN PLANS.
3. USE AVERAGE DAILY TRAFFIC (ADT) FOR THE CURRENT YEAR TO DETERMINE MBGF LENGTH OF NEED IN ACCORDANCE WITH THE DESIGN MANUAL UNLESS OTHERWISE SPECIFIED. WHERE SIGNIFICANT TRAFFIC VOLUME GROWTH IS ANTICIPATED ON LOW VOLUME (0-750 ADT) HIGHWAYS USE LENGTH DETERMINATIONS FOR THE HIGHER VOLUME CATEGORY.
4. WHERE LENGTH (L) OF MBGF USED IS 50 FEET, POST SPACING SHALL BE AS DETAILED HEREON (SEE PLAN LAYOUT FOR TWO LANE (RURAL) HIGHWAYS, LEFT SIDE OF TRAFFIC APPROACHING BRIDGE). WHERE LENGTH (L) OF MBGF IS 75' OR MORE, POST SPACING SHALL BE 3'-1 1/2" FOR THE 25' SECTION ADJACENT TO THE BRIDGE, 12'-6" FOR THE 25' SECTION ADJACENT TO THE T.A.S., AND 6'-3" FOR REMAINING INTERVENING LENGTH. WHEN T6 BRIDGE RAIL IS USED, THE MIN. MBGF POST SPACING SHALL BE 6'-3".
5. MBGF MAY NOT BE REQUIRED TO SHIELD DEPARTURE END OF BRIDGE UNLESS OTHER HAZARDS WITHIN THE CLEAR ZONE WARRANT MBGF. WHERE INSTALLED ON THE DEPARTURE END, 6'-3" POST SPACING IS ACCEPTABLE THROUGHOUT THE PLACEMENT LENGTH INCLUDING ADJACENT TO BRIDGE END.
6. WHEN SPECIFIED, THE T.A.S. AND TYPICALLY ADJACENT 25' MBGF SHOULD BE FLARED FROM THE SHOULDER EDGE AT 25:1 TO PROVIDE A 2' USUAL OFFSET TO BURIED ANCHOR. THE 6'-3" POST SPACING SHALL BE MAINTAINED TO THE LENGTH OF NEED WHEN END TREATMENTS OTHER THAN T.A.S. ARE USED.
7. THE CROWN WILL BE WIDENED TO ACCOMMODATE MBGF. TYPICALLY THE CROWN LINE SHOULD BE 2 FEET FROM THE BACK OF THE MBGF POST. THIS APPLIES TO NEW CONSTRUCTION ON NEW ALIGNMENT OR WHERE EXISTING ROADWAY CROSS SECTION IS TO BE WIDENED TO INCREASE ROADWAY WIDTH. THIS DOES NOT APPLY TO REHABILITATION WORK WHERE EXISTING ROADWAY CROWN WIDTH IS TO BE RETAINED (SEE TYPICAL CROSS SECTION).
8. FOR RESTRICTIVE WIDTH BRIDGES, A 25-FOOT TANGENT SECTION OF MBGF SHOULD CONNECT TO THE WINGWALL. THE ADJOINING MBGF THAT LIES WITHIN THE ROADWAY (LANES & SHOULDER AREA) CROWN SHOULD BE FLARED AT THE RATE OF 25:1 (LONGITUDINAL, LATERAL). LENGTH ON THESE BRIDGES SHOULD BE DETERMINED AS STATED ABOVE OR THE LENGTH NECESSARY TO LOCATE THE BURIED ANCHOR AT A 2-FOOT OFFSET FROM SHOULDER EDGE, WHICHEVER IS GREATER.
9. VARIATIONS IN POST SPACINGS AND/OR THE USE OF SPACER BLOCKS OR SHIMS MAY BE REQUIRED BY THE ENGINEER IN ORDER TO ACCOMMODATE THE REQUIRED RAIL CONNECTION TO EXISTING STRUCTURES.



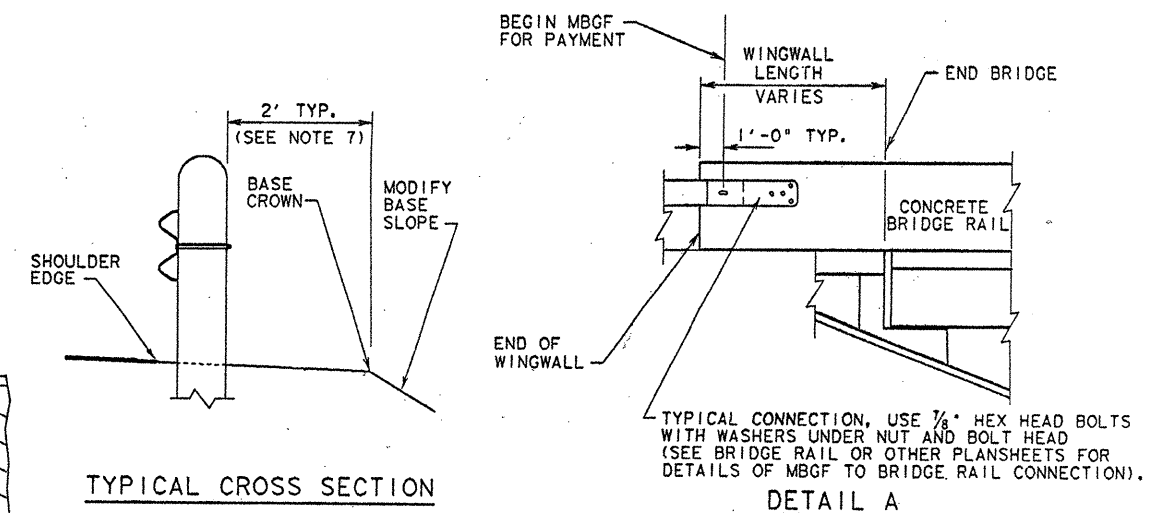
TWO LANE (RURAL) HIGHWAYS



MULTILANE UNDIVIDED (RURAL) HIGHWAYS



ONE WAY TRAFFIC



TYPICAL CROSS SECTION

DETAIL A



TEXAS DEPARTMENT OF TRANSPORTATION

BRIDGE END DETAILS

BED-91

REVISIONS	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.
	6	TEXAS	MANH 95(40)IM	318
		COUNTY	CON. SECT. JOB	
	SAT	Comal	001b 05 087IM 35	

BACKUP TYPES

*** TYPE A TENSION STRUT:** Consists of diagonal struts, connections, and accessories, as detailed by the Manufacturer, located at the rear of the G.R.E.A.T. unit. Typical application is for G.R.E.A.T. units attached to double-face guardrail. When used, a 4'-0"x 4'-0"x 3'-0" concrete toe anchor block shall be provided beneath the front portion of the concrete pad, except where the G.R.E.A.T. unit is to be placed on continuously reinforced concrete pavement or bridge deck (7" minimum, 4,000 p.s.i.) or non-reinforced concrete pavement (8" minimum, 4,000 p.s.i.)

TYPE B CAST-IN-PLACE CONCRETE WALL BACKUP: If cast-in-place structures such as bridge parapets, columns, or special walls are used as backup structures, then intermediate walls shall be provided between the structures and the G.R.E.A.T. unit. Intermediate walls shall be equal in height and width to the G.R.E.A.T. unit and reinforced with a steel cage. A cast-in-place transition section from standard C.T.B. or S.S.C.B. may be used in lieu of the Type D Backup (Type B Option). Special caution should be exercised in the design and detail of the transition to achieve an unobtrusive taper. Reinforcing steel should transition from the standard barrier section to the standard backup section. Details for the intermediate walls, cast-in-place transition sections from C.T.B. or S.S.C.B. to concrete wall backup, or other modifications will be shown elsewhere in the plans. Concrete wall backups may be used on continuously reinforced concrete pavement or bridge deck (7" minimum, 4,000 p.s.i.) or non-reinforced concrete pavement (8" minimum, 4,000 p.s.i.) In those cases, all vertical steel will be doweled (5 inch minimum) into existing decks or located and placed prior to pouring proposed decks as approved by the Engineer.

TYPE C WIDE FLANGE BACKUP: Consists of two 74 inch WF steel posts erected vertically at rear of G.R.E.A.T. unit. Details for the connections and accessories for the wide flange backup will be provided by the Manufacturer.

TYPE D MEDIAN BARRIER BACKUP: Typical application is for G.R.E.A.T. units 2'-0" width attached to standard permanent C.T.B. The designer must specify bi-directional applications to provide for placement of transition panels. These pieces are installed with a unit offset to eliminate snagging potential at barrier end of G.R.E.A.T. Special connection details will be provided by the Manufacturer. The Designer should specify either C.T.B. or S.S.C.B. median barrier application to allow the Manufacturer to supply the appropriate transition panel.

TYPE CZ CONSTRUCTION ZONE BACKUP: Consists of a steel base and tension strut backup as integral parts of the G.R.E.A.T. unit. Anchorage requirements are as follows:

WITH FOUNDATION TYPE:	ANCHOR WITH:
Minimum six inch concrete	6.5 inch studs or 18 inch threaded rod and Mfr. epoxy
Minimum three inch asphalt over minimum three inch concrete	18 inch threaded rod and Mfr. epoxy
Minimum six inch asphalt over base	18 inch threaded rod and Mfr. epoxy
Minimum three inch asphalt over base	Anchor pins
Minimum eight inch asphalt on non-base type surface	18 inch threaded rod and Mfr. epoxy

Details for a precast portable concrete pad are available from the Manufacturer. The pad, with proper anchor bolts, may be used as a substitute foundation as approved by the Engineer.

If the unit is anchored to asphalt, it should be relocated to fresh, undisturbed asphalt and re-anchored after each impact to ensure adequate future performance. A zero clearance between the backup and barrier wall is recommended. In no case should this distance exceed 11 inches.

DESIGN SPEED (MPH)	NO. OF BAYS
40 OR LESS	3
45	4
50	5
55	6
60	7
65	9
70	10

The specified number of bays is based upon 60's maximum deceleration force for impact at a specific design speed. Additional bays may be added if special considerations warrant and site conditions will accommodate additional length.

Permanent G.R.E.A.T. units are available in 2'-0", 2'-6", or 3'-0" widths to 12 bays. Unit width, number of bays, and backup type shall be specified elsewhere in the plans.

The Type CZ unit is available in 2'-0" or 2'-6" widths with 3 or 6 bays only.

GENERAL NOTES

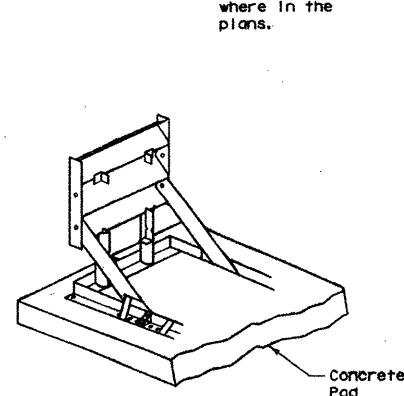
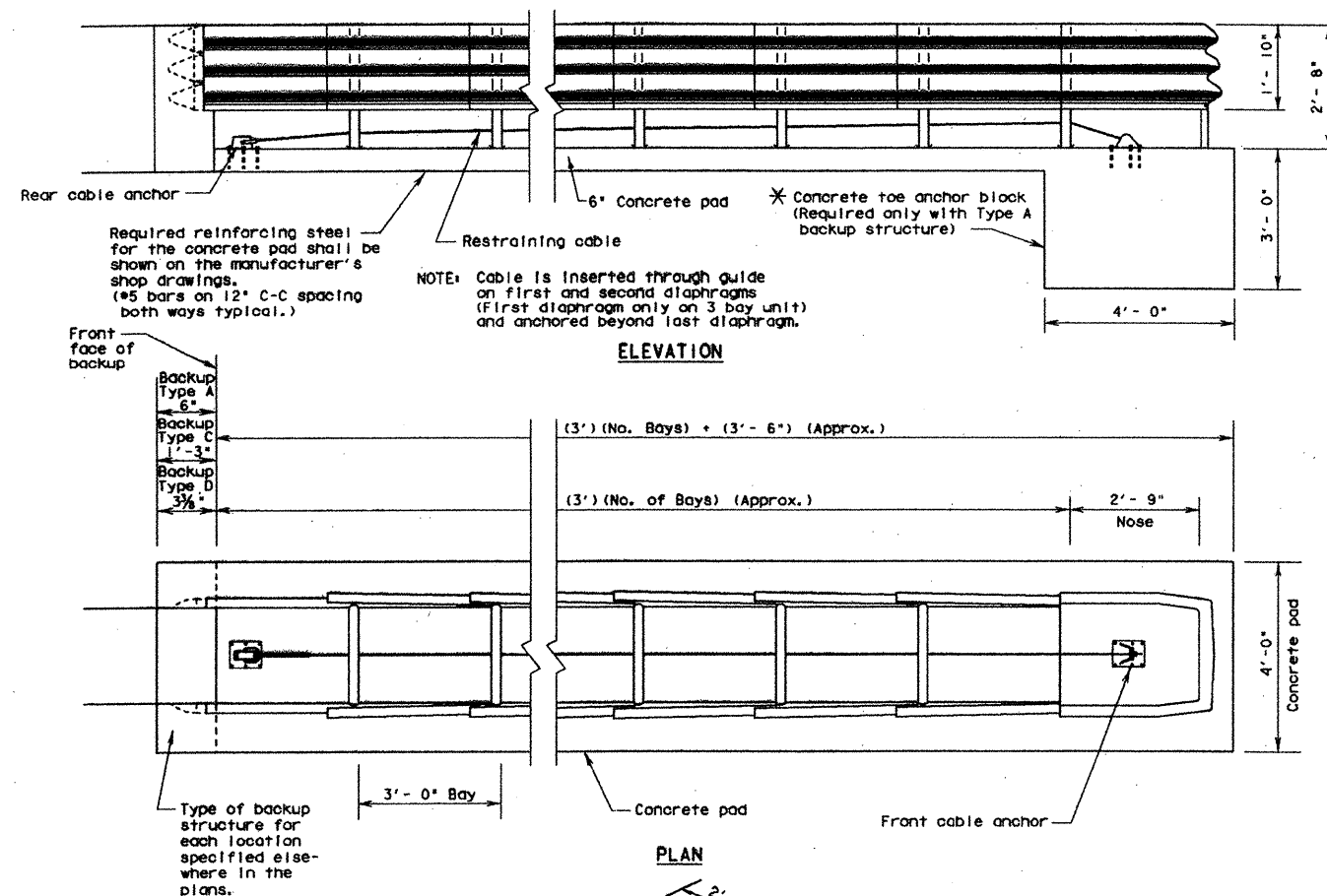
- Details of components for the G.R.E.A.T. and backups and reinforcing details will be shown on shop drawings furnished to the Engineer.
- Concrete shall be class "S" with a minimum compressive strength of 4,000 p.s.i.
- If the cross-slope varies more than 2% over the length of the system, the concrete pad will require leveling. Max. permissible cross-slope is 8%.
- The installation area should be free from all curbs, elevated objects, depressions, or any other features which may affect unit performance.
- The G.R.E.A.T. system shall be parallel with the barrier or C of merging barriers.
- Unit width selected should be adequate to protect an errant vehicle travelling at 15 degrees to the roadway from the face or corner of the potential hazard.
- For all permanent steel backups, (Types A, C, and D) the distance between the face of backup and the barrier wall should not exceed 14 inches in any case.

Texas Department of Transportation
Design Division (Roadway)

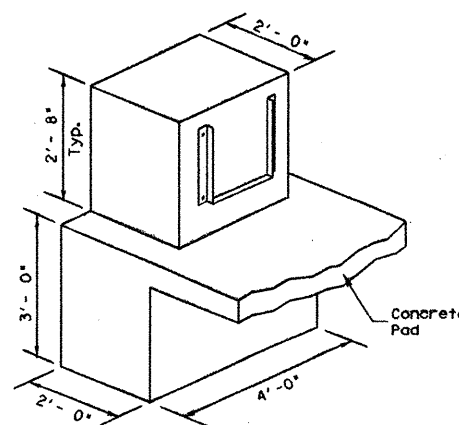
GUARD RAIL ENERGY ABSORBING TERMINAL

GREAT-94

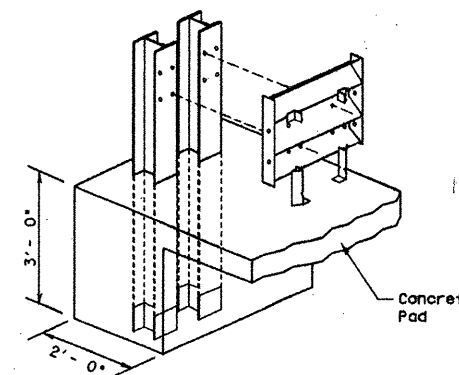
DATE: MAY 1994	DR: TCM	CR: TCM	DR: BGD	CR: -	REV: 1	A62
STATE: TEXAS	FEDERAL: 6	MANH: 95(40)IM	319	COUNTY: Comal	0016 05	087 1H35



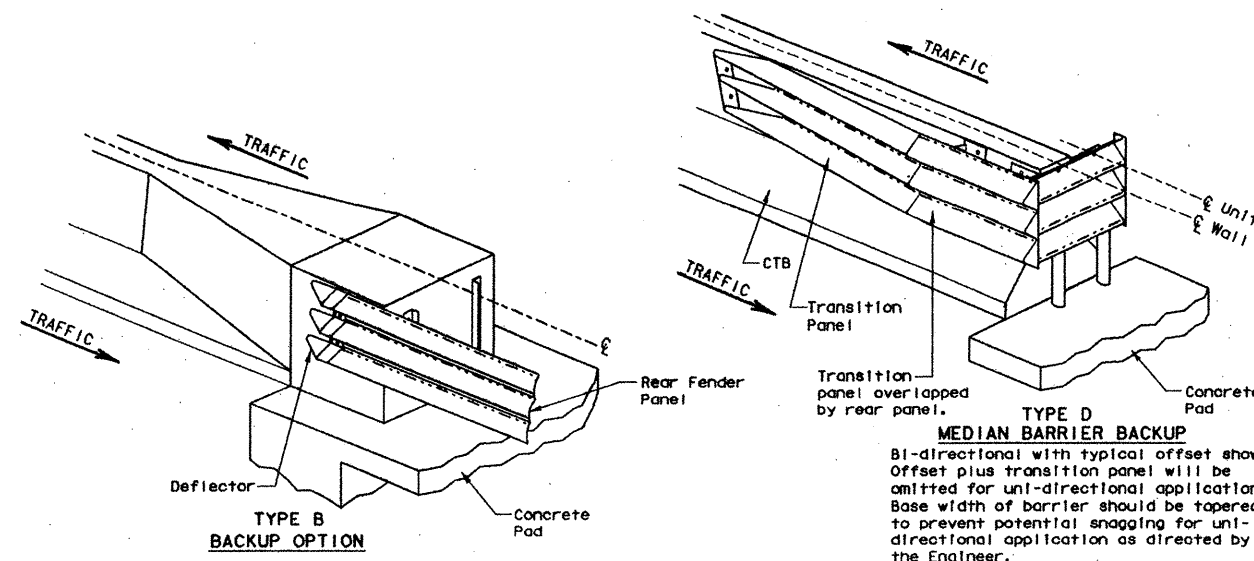
TYPE A
TENSION STRUT



TYPE B
CONCRETE WALL BACKUP



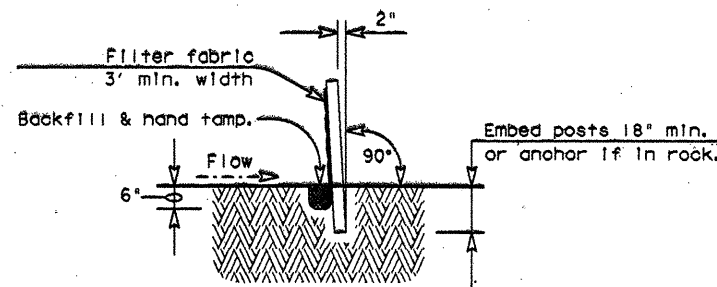
TYPE C
WIDE FLANGE BACKUP



TYPE D
BACKUP OPTION

TYPE D MEDIAN BARRIER BACKUP
Bi-directional with typical offset shown. Offset plus transition panel will be omitted for uni-directional application. Base width of barrier should be tapered to prevent potential snagging for uni-directional application as directed by the Engineer.

ACC: /USEC/0481303
FILE: GREAT94.DGN
LEVELS DISPLAYED: 1 3 4



SECTION A-A

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.

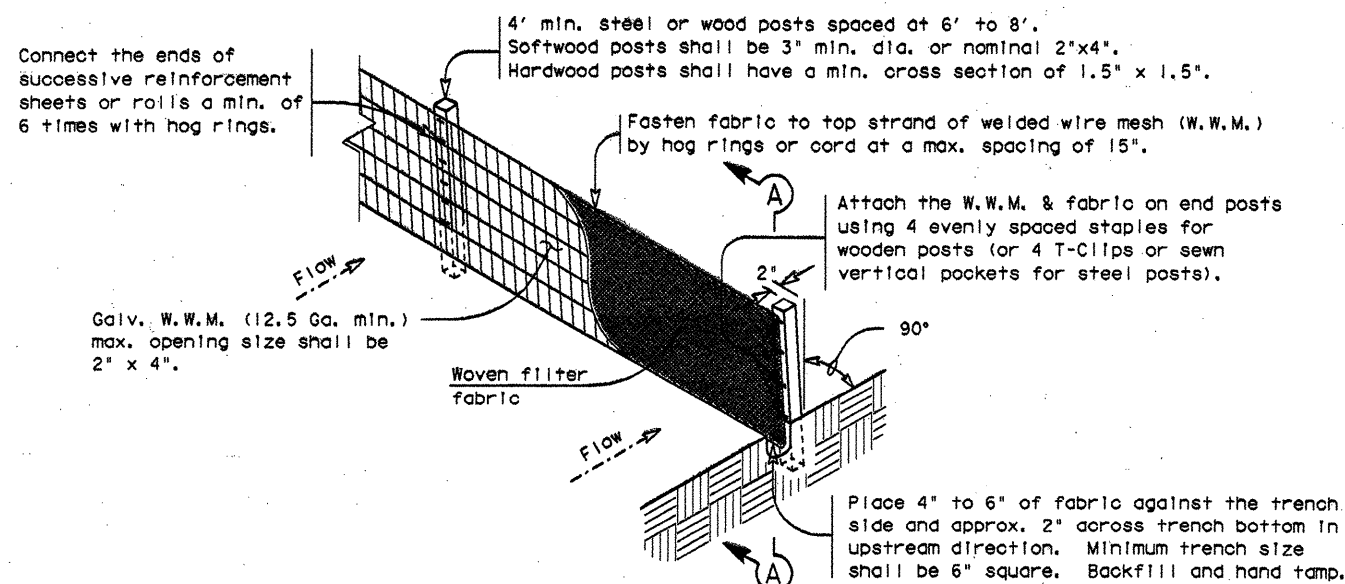
Sediment control fence should be sized to filter a max. flow through rate of 100 GPM/FT². Sediment control fence is not recommended to control erosion from a drainage area larger than 2 acres.

PLAN SHEET LEGEND

Sediment Control Fence — SCF —

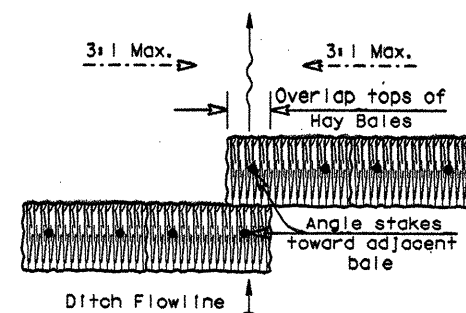
GENERAL NOTES

- The guidelines shown hereon are suggestions only and may be modified by the Engineer.

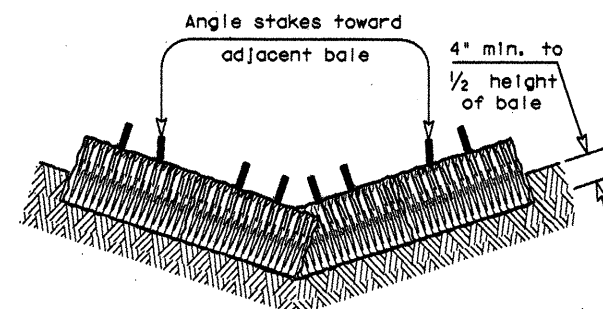


TEMPORARY SEDIMENT CONTROL FENCE

SCF



PLAN VIEW



PROFILE VIEW

PLANS SHEET LEGEND

Baled Hay — BH —

BALED HAY USAGE GUIDELINES

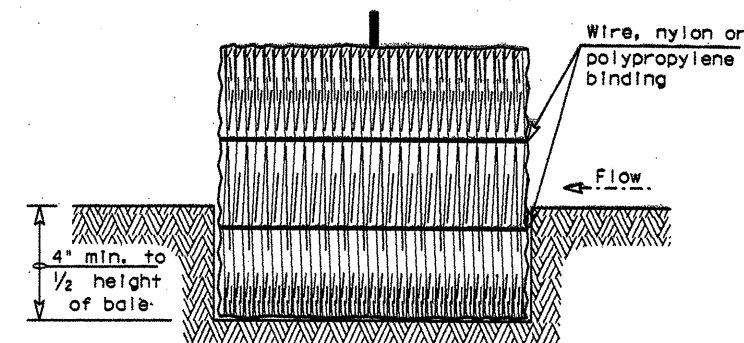
A Baled Hay Installation may be constructed near the downstream perimeter of a disturbed area along a contour to intercept sediment from overland runoff. A two year storm frequency may be used to calculate the flow rate to be filtered. The installation should be sized to filter a maximum flow thru rate of 5 GPM/FT² of cross sectional area. Baled hay may be used at the following locations:

- Where the runoff approaching the baled hay flows over disturbed soil for less than 100'. If the slope of the disturbed soil exceeds 10%, the length of slope upstream the baled hay should be less than 50'.
- Where the installation will be required for less than 3 months.
- Where the contributing drainage area is less than 1/2 acre.

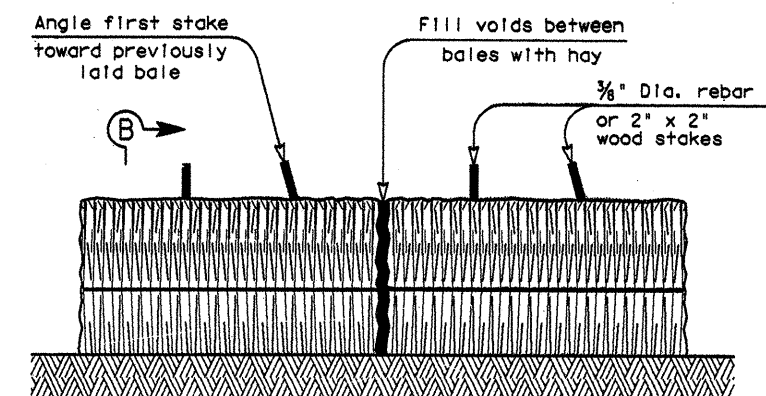
For Baled Hay Installations in small ditches, the additional following considerations apply:

- The ditch sideslopes should be graded as flat as possible to maximize the drainage flowrate thru the hay.
- The ditch should be graded large enough to contain the overtopping drainage when sediment has filled to the top of the baled hay.

Bales should be replaced usually every 2 months or more often during wet weather when loss of structural integrity is accelerated.



SECTION B-B



BALED HAY FOR EROSION CONTROL

BH

GENERAL NOTES

- Hay bales shall be a minimum of 30" in length and weigh a minimum of 50 lbs.
- Hay bales shall be bound by either wire or nylon or polypropylene string. The bales shall be composed entirely of vegetable matter.
- Hay bales shall be embedded in the soil a minimum of 4" and where possible 1/2 the height of the bale.
- Hay bales shall be placed in a row with ends tightly abutting the adjacent bales. The bales shall be placed with bindings parallel to the ground.
- Hay bales shall be securely anchored in place with 3/8" Dia. rebar or 2" x 2" wood stakes, driven through the bales. The first stake shall be angled towards the previously laid bale to force the bales together.
- The guidelines shown hereon are suggestions only and may be modified by the Engineer.

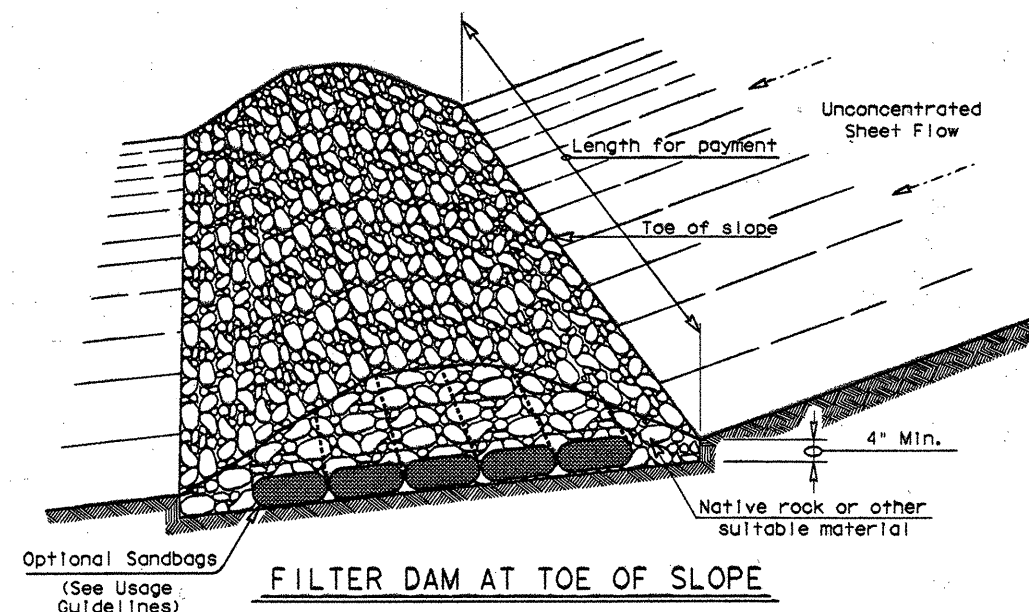


TEXAS DEPARTMENT OF TRANSPORTATION TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES FENCE & BALED HAY

EC(1)-93

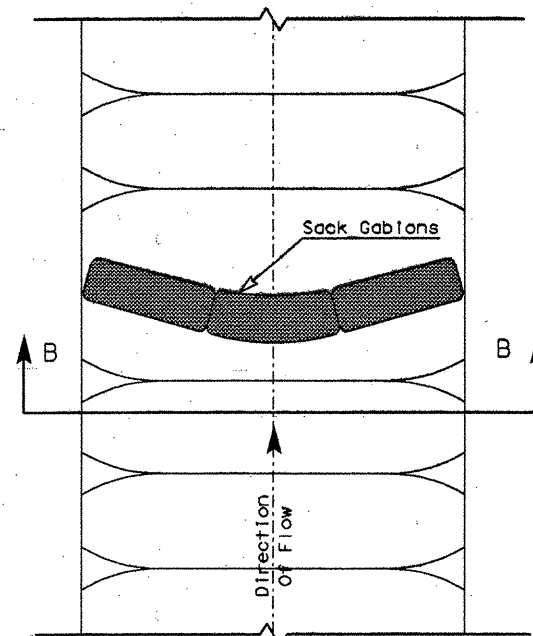
MODIFICATIONS	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.
	6	TEXAS	MANH 95(40)IM	320
	STATE DIST. NO.	COUNTY	CONT. SECT. JOB	HIGHWAY NO.
	SAT	Comal	001b 05 007TH 35	

HIGHWAY DESIGN DIVISION (D-8)

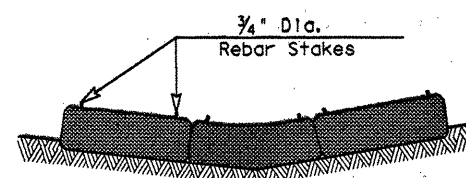


FILTER DAM AT TOE OF SLOPE

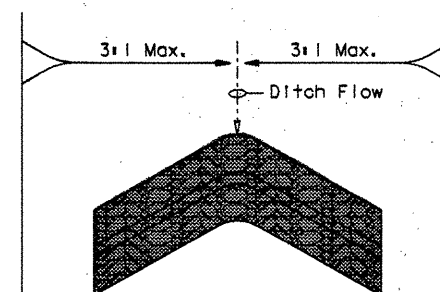
RFD1
TYPE 1



PLAN VIEW



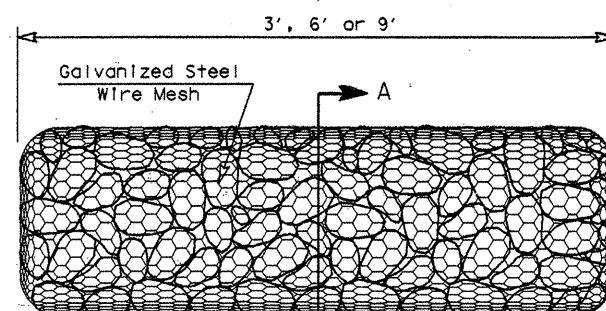
SECTION B-B



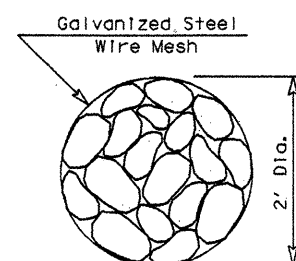
"V" SHAPE
(Plan View)

PLANS SHEET LEGEND

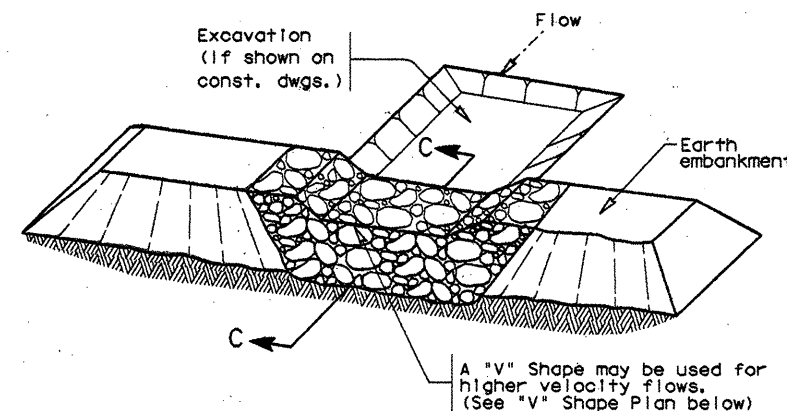
Type 1 Rock Filter Dam — RFD1
Type 2 Rock Filter Dam — RFD2
Type 3 Rock Filter Dam — RFD3



TYPE 4 (SACK GABIONS)

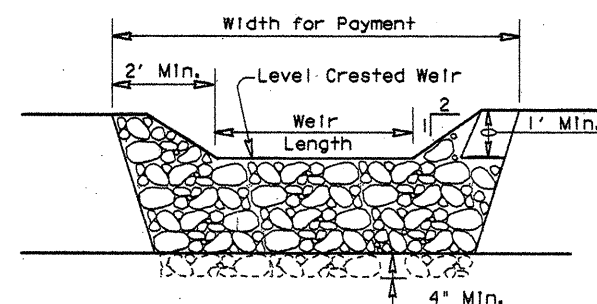


SECTION A-A

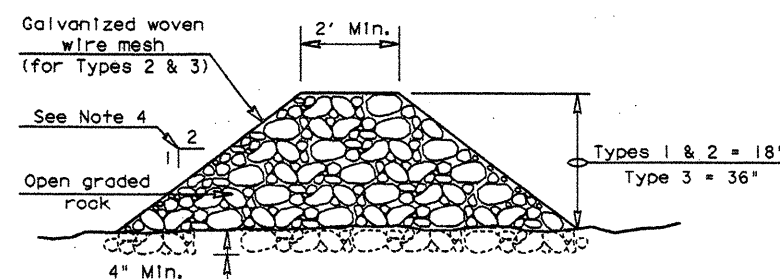


FILTER DAM AT SEDIMENT TRAP

RFD1 OR RFD2
TYPE 1 OR TYPE 2



PROFILE



SECTION C-C

ROCK FILTER DAM USAGE GUIDELINES

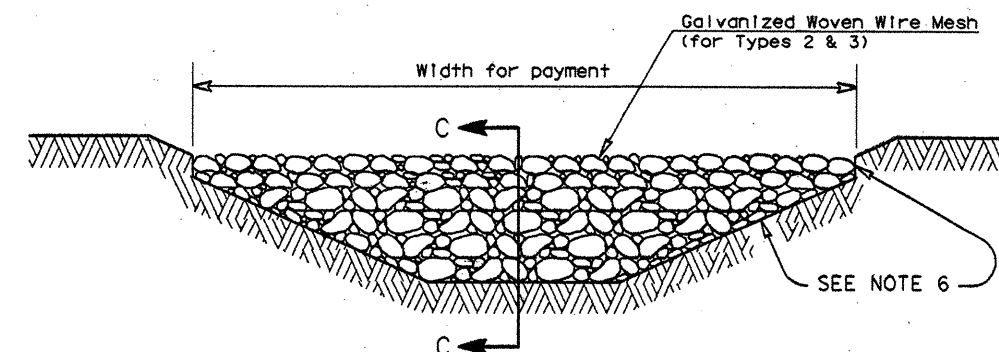
Rock Filter Dams should be constructed downstream from disturbed areas to intercept sediment from overland runoff and/or concentrated flow. The dams should be sized to filter a maximum flow through rate of 60 GPM/FT² of cross sectional area. A 2 year storm frequency may be used to calculate the flow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

Type 1 (18" high with no wire mesh): 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 (approx. 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): Type 2 may be used in ditches and at dike or swale outlets.

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

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



FILTER DAM AT CHANNEL SECTIONS

RFD1 OR RFD2 OR RFD3
TYPE 1 OR TYPE 2

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. 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.
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.



TEXAS DEPARTMENT OF TRANSPORTATION

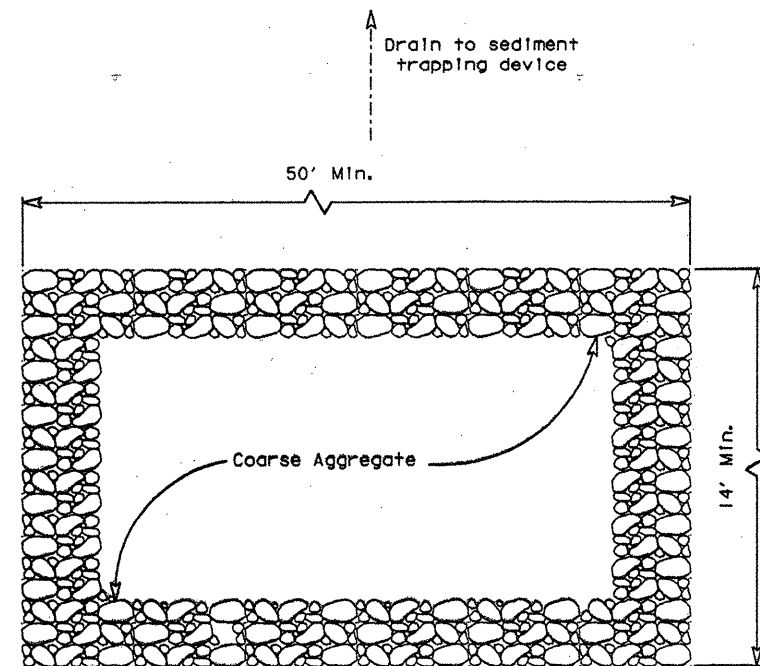
TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

ROCK FILTER DAMS

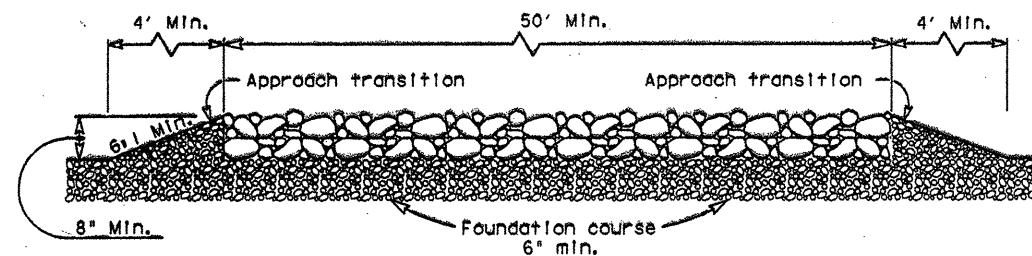
EC(2)-93

MODIFICATIONS	FED. RD. DIST. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.
	6	TEXAS	MANH 95(40)IM	321
	STATE DIST. NO.	COUNTY	CONT. SECT.	JOB
	SAT	Comal	0016 05	087 IN 35

HIGHWAY DESIGN DIVISION (D-8)



PLAN

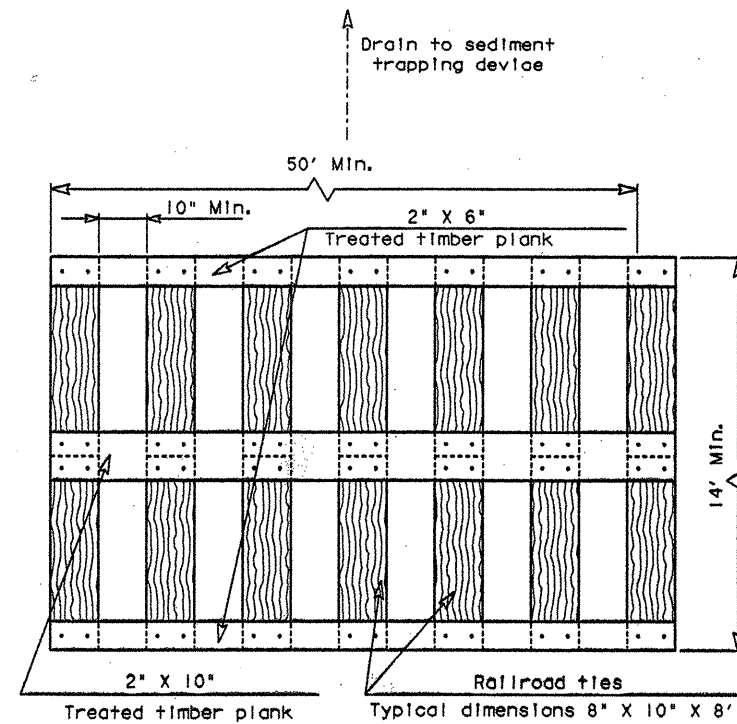


PROFILE

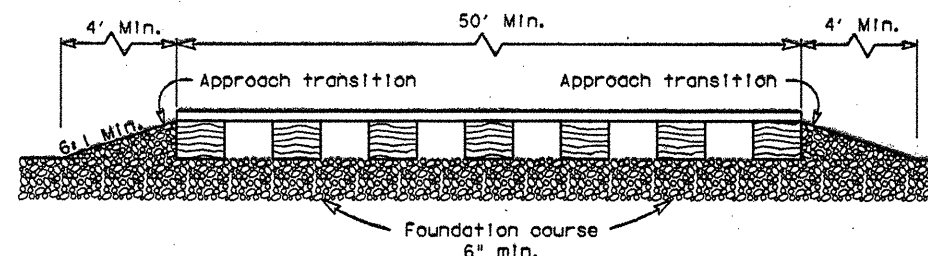
CONSTRUCTION EXIT (TYPE 1)

GENERAL NOTES

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 material as 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.



PLAN

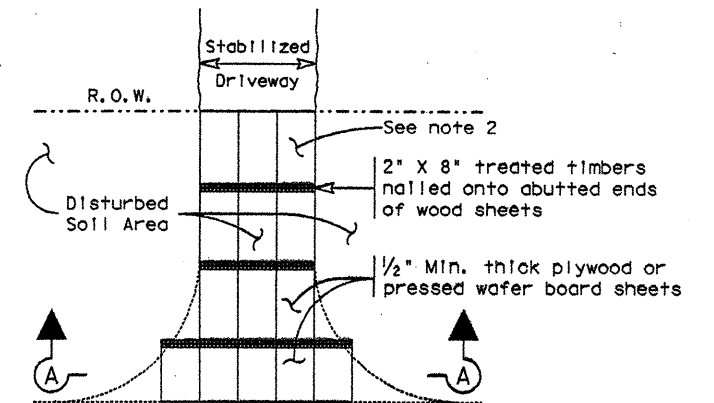


PROFILE

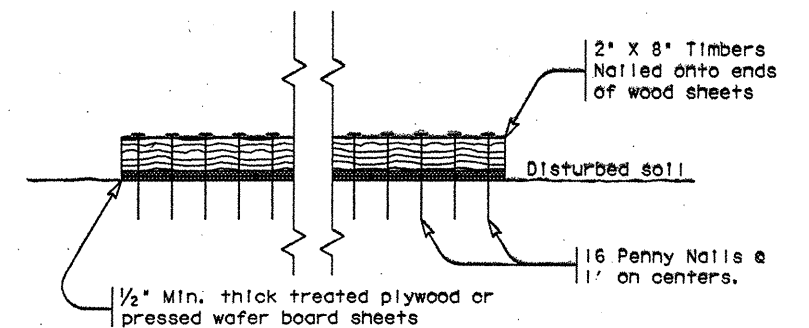
CONSTRUCTION EXIT (TYPE 2)

GENERAL NOTES

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.



PLAN



SECTION A-A

CONSTRUCTION EXIT (TYPE 3)

GENERAL NOTES

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.



TEXAS DEPARTMENT OF TRANSPORTATION

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES CONSTRUCTION EXITS

EC(3)-93

MODIFICATIONS	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.
	6	TEXAS	MANH 95(40)IM	322
	STATE DIST. NO.	COUNTY	CONTRACT	SECTION
	SAT	Comal	0016	05 087

I. GENERAL REQUIREMENTS FOR ALL ELECTRICAL WORK

Faulty fabrication or poor workmanship in any material, equipment, or installation will be considered justification for rejection. Materials and installation shall comply with the applicable provisions of the National Electrical Code (NEC) and National Electrical Manufacturers Association (NEMA) standards. Where manufacturers provide warranties or guarantees as a customary trade practice Contractor shall furnish to the State such warranties or guarantees. The location of conductors, conduit, junction boxes, duct cable, ground boxes, transformer stations, and service poles are diagrammatic only and may be shifted by the Engineer to accommodate local conditions.

Grounding shall be as shown on the plans and in accordance with the NEC. Metallic conduit, lighting poles, and luminaires on bridge structures shall be grounded by connection to the grounding conductor and by installing a ground rod in each ground box or junction box, as shown on the plans, at bridge ends and in each ground box installed for underpass lighting. The bonding jumper shall be bare or, if insulated, shall be green. Ground rods, connectors, and bonding jumpers will not be paid for separately, but will be subsidiary to the various bid items.

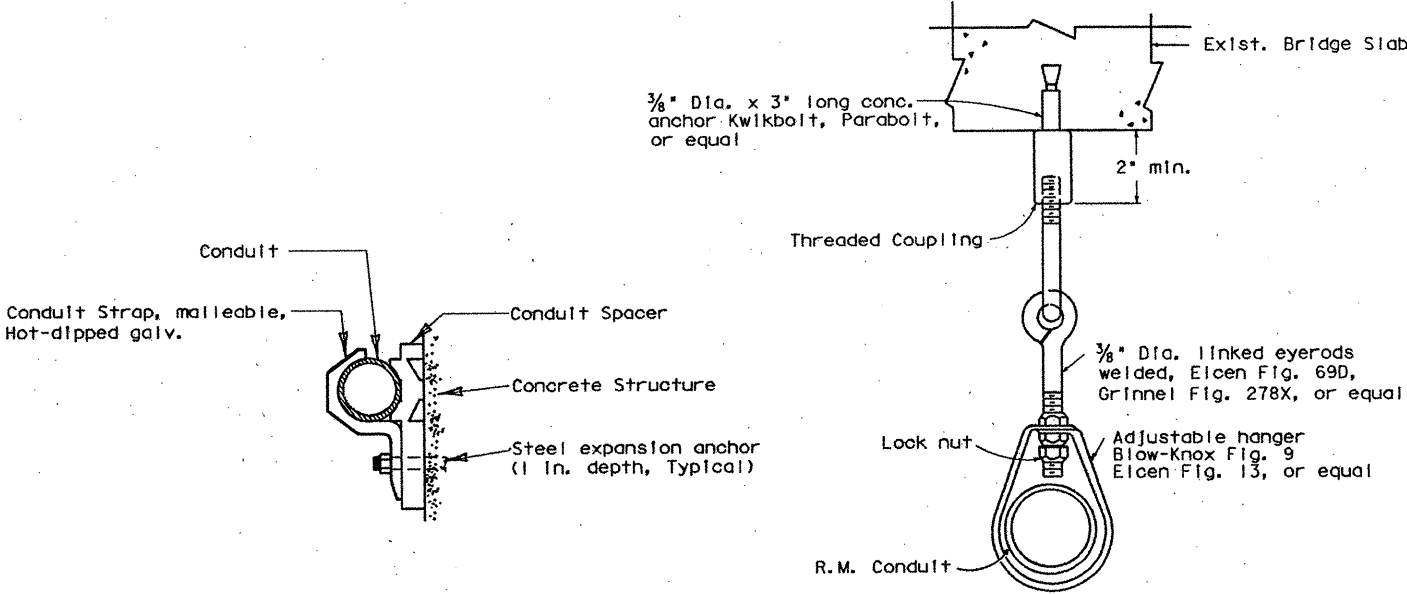
II. CONDUIT

A. Materials.

- 1. Conduit must be UL-approved for the intended use shown on plan sheets. Aluminum conduit will not be permitted unless shown elsewhere on the plans. EMT and IMC will not be permitted unless shown on the plans.
- 2. Fittings for steel conduit shall be steel or malleable iron, threaded or compression type threadless and rain-tight. Die cast, set screw, indenter or push-on (socks) fittings will not be permitted.
- 3. Expansion joints for metallic conduit shall be provided with a grounding strap. Expansion joints for metallic conduit shall be Appleton UNYL 50 Series, OZ AX Series, or equal.
- 4. Junction boxes in rigid metal conduit systems shall be cast iron, hot-dipped galvanized, or cast aluminum (surface-mounted only) unless otherwise shown on the plans.
- 5. Surface-mounted junction boxes for Rigid Metal conduit 1 1/4 inches and larger shall have a minimum wall thickness of 3/16 inch, Crouse Type WAB, O-Z Type YS, Adalot Type 3R, or approved equal, with mounting lugs, minimum size 6 inches x 6 inches x 4 inches, or as otherwise required by the NEC, or as shown elsewhere on the plans. For conduit one inch or smaller, surface-mounted boxes may be 4 1/2 inches (min.), round, square, or rectangular, and approximately 3 inches deep, Crouse Hinds Type GRFX, Appleton Type JBOX, two-gang FD, or approved equal, unless otherwise required by the NEC or the plans.
- 6. For rigid metal conduit systems flush-mounted junction boxes installed in concrete structures shall be minimum 6 in. x 6 in. x 4 in., or as required by the NEC, Crouse Hinds Type WGB, O-Z Type YR, or approved equal.
- 7. Unless otherwise shown elsewhere on the plans, junction boxes in EMT conduit systems shall be made from galvanized sheeting and shall be UL listed as approved for outdoor use. Sheet metal junction boxes shall be sized in accordance with the NEC.
- 8. Unless otherwise shown elsewhere on the plans, junction boxes in PVC conduit systems shall be PVC, UL listed for outdoor use, and sized in accordance with the NEC.

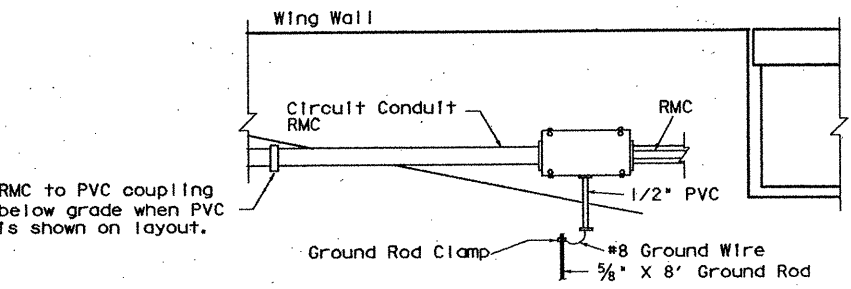
B. Construction Methods.

- 1. Continuous runs of conduit in excess of 150 feet attached to structures shall have expansion joints at mid-span or 150-foot intervals. Conduit in structures shall have expansion joints at structure expansion joints or as shown in plans.
- 2. Conduit hangers or straps shall be spaced at maximum intervals of 5 feet. When shown on the plans, hangers shall be used when hanging conduit from horizontal surfaces (See detail). Conduit spacers shall be used with metal conduit placed on surfaces of concrete structures (See conduit detail).
- 3. Conduit hangers or straps shall not be attached directly to prestressed concrete beams except as shown in the plans and approved by the Engineer.
- 4. Conduit placement beneath existing roadways, driveways or sidewalks shall be accomplished by jacking or boring, unless otherwise noted on the plans or directed by the Engineer. The Contractor shall backfill and compact the bore pits to bottom of conduit prior to installing connecting conduit or duct cable, to prevent bending of this connection. Duct cable shall be extended through conduit casings in one continuous length.
- 5. With approval of the Engineer, conduit placed under new roadways may be trenched in subgrade and backfilled with excavated material. When approved by the Engineer, conduit may be trenched in sub-base but must be backfilled with cement-stabilized base. Conduit placed after base or surfacing operation has begun must be jacked or bored.
- 6. Open ends of all conduit and raceways shall be fitted with temporary caps or plugs to prevent entry of dirt, debris and rodents during construction.
- 7. Conduit entry into the top of junction boxes shall be made weathertight using threaded fittings into hubs, or with sealing locknuts inside and out.
- 8. A bonding jumper shall be installed from grounding bushing to nearest rod, grounding lug, or grounding conductor. At service poles, bonding jumper shall be AWG Size No. 6. All other jumpers shall be minimum size AWG No. 8. Conduit used as casing under roadways for duct cable need not be grounded if duct extends full length through the casing.
- 9. Conduit ends shall be sealed with heat shrink boots or tubes with sealant, silicone caulking or shall be sealed by other methods approved by the Engineer. Sealing shall be done after completion of any required pull tests.
- 10. Where called for on the plans, trenched conduit shall be placed on a 2-inch sand cushion and backfilled with a minimum of 6 additional inches of sand fill.
- 11. Conduits entering ground boxes shall be placed so that the conduit ends shall be not less than 5 inches nor more than 9 inches from the box cover (See ground box detail).
- 12. Metal junction boxes shall be bonded to the grounding conductor.



CONDUIT STRAP DETAIL
(Attachment to concrete surfaces)
(See para. II.B.2)

CONDUIT HANGER DETAIL
(Attachment to horizontal surfaces)
(See II.B.2)



- NOTES
- 1. Conduit shall be 2" RMC for duct cable entry to junction box.
 - 2. Ground rod clamp to be Blackburn GG 5/8H, Weaver W5/8 or equal.
 - 3. Surface mounting shown, for conduit to be placed in structure use flush-mounted box.
 - 4. Bond junction box to grounding conductor.

TYPICAL CONDUIT ENTRY TO BRIDGE STRUCTURE DETAIL

III. ELECTRICAL CONDUCTORS

A. Materials.

- 1. Insulated conductors NEC Type XHHW or USE (XLP). Conductors in circuits containing two or more insulated conductors shall be color-coded at each accessible point (i.e., ground boxes, pole bases, junction boxes). Color-coding for No. 10 and smaller shall be by continuous jacket color. Color-coding of electrical conductors No. 8 or larger may be by continuous jacket color or colored tape. Colored tape marker shall consist of a half-lap layer of tape covering a six inch length of conductor.
- 2. Bonding conductors No. 8 and smaller, tied to ground rods, shall be solid. Connection of bonding conductor to ground rod shall be made using UL listed connectors designed for such purpose.

CONDUIT CONDUCTORS

STANDARD PLANS
TEXAS DEPARTMENT OF TRANSPORTATION

ELECTRICAL DETAILS
ED (1) - 93

10-19-93 ZFA24(122,101) ED193,STD				SHEET	
ORIGINAL DRAWING DATE: 01-92	STATE DISTRICT	FEDERAL REGION	FEDERAL AID PROJECT	323	
DN: K.A.B.	15	6	NH 95(40) IM		
CR: T.B.	COUNTY		CONTROL SECTION JOB	HIGHWAY	
DN: R.E.S.	COMAL		0016 05 087	1H35	
CR: T.B.				71A	

Traffic Operations Division

B. CONSTRUCTION METHODS.

1. A non-metallic pull rope shall be used in pulling conductor in non-metallic conduit.
2. After conductor is placed in conduit, a pull test will be made on conductors. When any length of conductor cannot be freely pulled the Contractor shall make any needed alterations or repairs at the Contractor's expense.
3. Conductors in illumination poles shall be supported by a J-hook in top of pole.
4. A sufficient length of conductor shall be left in ground boxes (two feet minimum to point of splice, three feet minimum when conductor is pulled through with no splice), enclosures, and pole bases (one foot minimum) for making up connections.
5. Except for overhead wiring, splices shall be made only in junction boxes, ground boxes, pole bases, or electrical enclosures and shall be made with approved compression sleeves or split bolt connectors. Splices shall be insulated with heavy wall heat shrink tubing containing factory applied sealant. Heat shrink sleeves shall lap conductors insulation a minimum of 2 inches on both sides of the splices.
6. When approved by the Engineer, wire nuts may be used for No. 8 and smaller conductors in above-ground junction boxes, but not in pole bases or ground boxes. Wire nuts shall be positioned upright to prevent the accumulation of water.

IV. DUCT CABLE.

- A. Duct cable shall be placed by the open trench method, except where otherwise noted, at a minimum depth of 18 inches unless otherwise indicated. Bends in duct cable shall be made in the manner recommended by the manufacturer. Minimum bending radius shall be 15 inches for 1-inch duct and 18 inches for 1-1/4 inch duct. Handling of duct cable reels and installation of duct shall be as recommended by the manufacturer. Duct entering ground boxes shall be placed so that the duct ends are not less than 5 inches or more than 9 inches from the box cover. Duct for duct cable is designed as a conduit system and shall be considered as such in NEC interpretations. Duct shall not be spliced. Ends of duct shall be cut neat and straight and shall be reamed to remove sharp edges.
- B. After duct cable has been installed, a pull test will be made on conductors. If conductors cannot be freely pulled, Contractor shall replace or otherwise adjust installation to free up the conductors. Duct cable ends shall be sealed with approved compound or with heat-shrink material after pull test is completed.
- C. Where noted on plans, duct cable shall be placed on a 2-inch sand cushion and backfilled with a minimum 6 additional inches of sand.
- D. Duct cable shall be encased in conduit when shown on the plans. Duct cable shall be extended through the conduit casing in one continuous length.

V. GROUND BOX.

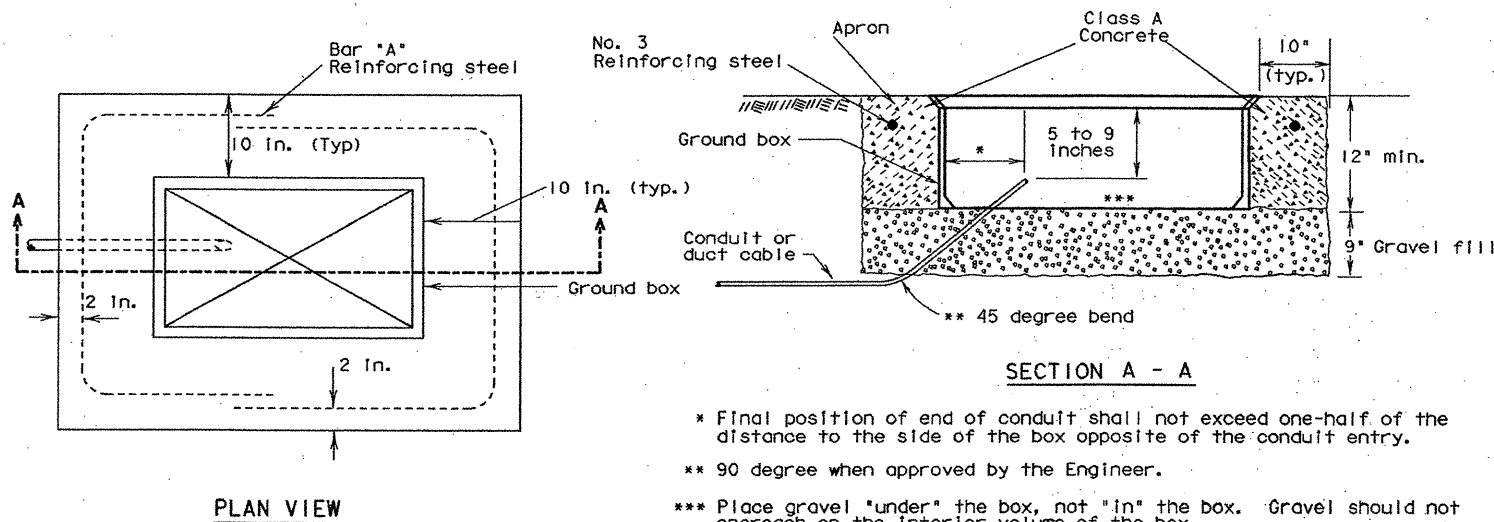
A. MATERIALS.

1. Ground boxes shall be concrete or polymer concrete, as required by the descriptive code shown elsewhere.
2. All precast ground boxes and covers shall be permanently marked with manufacturer's name or logo and manufacturer's model number.
3. Covers shall be bolted down. Bolt holes shall be arranged to drain dirt.
4. When steel covers are required, covers shall be provided with a grounding lug with 1/2 - 13 NC female threads on the underside of the cover.
5. Polymer Concrete boxes shall meet the following requirements:
 - a. Boxes shall be manufactured from Reinforced Polymer Concrete (RPM) composed of borosilicate glass fiber, a catalyzed polyester resin and an aggregate. Side walls may be fiber reinforced polymer.
 - b. Minimum inside dimensions shall be as follows (width x length x depth):

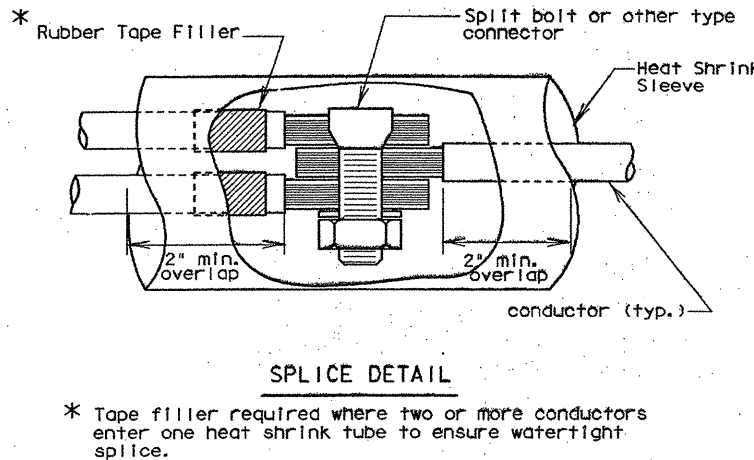
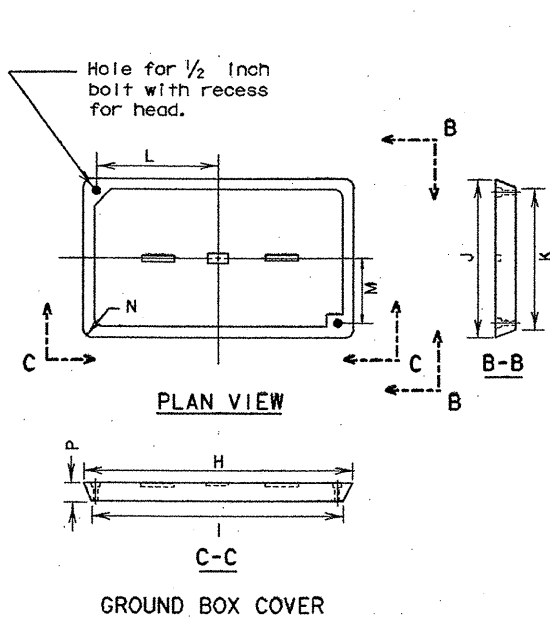
Type A shall be 11.5 inches x 21 inches x 10 inches	(122311)
Type B shall be 11.5 inches x 21 inches x 20 inches	(122322)
Type C shall be 15.25 inches x 28.25 inches x 10 inches	(162911)
Type D shall be 15.25 inches x 28.25 inches x 20 inches	(162922)
Type E shall be 11.5 inches x 21 inches x 16 inches	(122317)
 - c. Bottom edge of box or extension shall be footed with a minimum 1 1/4 inch flange.
 - d. Ground boxes shall withstand a test loading of 20,000 lbs. over a 10 in. by 10 in. area centered on the lid and 600 lbs. per sq ft. applied over the entire side wall. The model of ground-box proposed shall have been tested by a laboratory independent of the manufacturer to meet loading requirements. Certification of such tests shall be submitted to the Engineer for approval.
 - e. Covers shall be 1 inch (nominal) thick polymer concrete. Cover shall be secured with two 1/2 inch stainless steel bolts. Bolts shall be captive and shall withstand a minimum of 70 ft-lbs torque and shall have a minimum 750 lbs straight pull out strength. Covers shall be skid resistant, minimum 0.5 coefficient of friction. Covers shall be interchangeable between manufacturers and shall conform to the dimensions shown below. Cover shall be legibly imprinted with the words "Danger, High Voltage," in minimum 2 inch letters. When required, other cover lettering shall be as shown elsewhere on the plans.

B. CONSTRUCTION METHODS.

1. Steel covers shall be bonded to grounding conductor with a 3 foot jumper.
2. Where indicated on the plans, ground box will be encased in concrete apron as detailed below. Construction of apron including concrete and reinforcing steel shall not be paid for directly but shall be subsidiary to the ground box. Field bending of reinforcing steel will be allowed.
3. A minimum gravel fill of 9 inches shall be placed under each ground box. Gravel shall be coarse aggregate grade No. 1 in accordance with Item 421.
4. The Contractor may cut the necessary conduit holes in box extensions only. Holes must be 18 inches or more below the cover.
5. Concrete for aprons shall be considered miscellaneous concrete for testing purposes.



APRON FOR GROUND BOXES
(Where required)



ELECTRICAL CONDUCTORS
DUCT CABLE
GROUND BOXES

GROUND BOX COVER DIMENSIONS									
BOX	DIMENSIONS (INCHES)								
SIZE (WXL)	H	I	J	K	L	M	N	P	
12 in x 23 in	23 3/4	23	13 3/4	13 1/2	9 5/8	5 5/8	1 3/8	2	
16 in x 29 in	30 1/2	30 1/4	17 1/2	17 1/4	13 3/4	6 3/4	1 3/8	2	

10-19-93 ZFA2- [122, 101] ED293. 01D		STATE DISTRICT		FEDERAL AID PROJECT		SHEET	
ORIGINAL DRAWING DATE: 01-92		15		6		324	
REVISED BY: K.A.B.		10-93 K.A.B.		9-94 K.A.B.			
CONTROL SECTION		JOB		HIGHWAY			
COMAL		0016 05 087		11/35			
Traffic Operations Division						718	

ELECTRICAL SERVICES NOTES

Faulty fabrication or poor workmanship in any material, equipment, or installation will be considered justification for rejection. Materials and installation shall comply with the applicable provisions of the National Electrical Code (NEC) and National Electrical Manufacturers Association (NEMA) standards. Where manufacturers provide warranties or guarantees as a customary trade practice, Contractor shall furnish to the State such warranties or guarantees. The location of conductors, conduit, junction boxes, duct cable, ground boxes, transformer stations, and service poles are diagrammatic only and may be shifted by the Engineer to accommodate local conditions.

All material shall be new and unused. Alternate material equal to or better than those specified may be substituted with the approval of the Engineer. The Contractor shall contact the utility company for metering requirements and any additional requirements and shall comply with all utility company requirements.

All work, materials, services, and incidentals, whether or not specifically shown on the plans, which may be necessary to obtain electrical power and for a complete and proper electrical service installation as shown on the plans, shall be performed, furnished and installed by the Contractor except that the costs involved in extending primary lines to electrical service locations will be paid for under Force Account work. When primary line extensions are required, the Contractor shall consult with the appropriate utility company to determine costs and requirements and shall coordinate the utility company's work as approved by the Engineer.

Lugs on circuit breakers and contactors shall be large enough to accept branch circuit conductors sized as shown on the plans. Where branch circuit conductors are enlarged to reduce voltage drop beyond the capacity of lugs, the lugs shall be changed or distribution blocks shall be installed in the service enclosure to splice branch circuit conductors to the maximum wire size for which the circuit breaker or lighting contactor is rated to accept.

1. **Safety switch.** Shall be placed ahead of meter, when switch is required. The switch shall be of the heavy duty type, unfused, NEMA 3R enclosure and equipped with a solid neutral (s/n) assembly. Switch shall be UL listed. Switches shall be rated 480 VAC (min.) for 240/480V services and rated 240 VAC (min.) for 120/240v services. The Contractor shall modify switch to allow padlocking in the "on" position.

2. **Meter.** Where metering is required, utility company will provide the meter base. The Contractor shall install the meter base.

3. **Service Assembly Enclosure, for Type A, B, and C.** Enclosure shall be sized to provide adequate wiring space in accordance with NEC. All external screws shall be type 302 stainless steel. All enclosures shall be fitted with equipment-mounting panels installed inside enclosure on collar studs or tapped bosses. Panels shall be 12-gauge steel or 0.10" thick aluminum, primed and painted white. All enclosure doors shall have stainless steel closure clamps and provisions for padlocking. Conduit entries into the top of enclosures shall have threaded hubs. Enclosure disconnect combination shall be UL listed and rated as service entrance equipment. Two 1/8 inch drain holes shall be placed in bottom of enclosure at opposite corners. All enclosures shall be permanently labeled "Danger High Voltage" on the front of the door, minimum one inch letters. The service pole descriptive code specifies that the enclosure shall be one of the following types:

- a. GS: Galvanized steel enclosures shall be NEMA 3R-rated, constructed of 14-gauge galvanized steel, with piano hinged door, and drip shield.
- b. SS: Stainless steel enclosure shall be NEMA 3R-rated, with piano hinged door, constructed of 14 gauge Type 304 stainless steel. All hardware including hinge pin shall be stainless steel.
- c. AL: Aluminum enclosures shall be NEMA 3R-rated, with piano hinged door, constructed from 0.08 inch thick aluminum. All hardware including hinge pin shall be stainless steel.
- d. NM: Non-metallic enclosures shall conform to NEMA standard for Type 3R enclosures and shall be constructed of molded fiberglass, PVC, or other material approved by the Engineer.

* A two or three point heavy duty hinge with stainless steel hinge pins may be used for load centers when approved by the Engineer.

4. **Main Disconnect.** Main disconnect device shall be a fusible switch or circuit breaker, as shown on Electrical Service Data Sheet. Switch shall be UL and NEMA-rated Type HD (heavy duty), flange mounted or front mounted in the service assembly enclosure. Switch shall be two pole, rated 240 volts or 480 volts as required. Switch shall have clips for Class R fuses. Circuit breaker shall be UL and NEMA-rated thermal-magnetic circuit breaker, flange-mounted or front mounted in the service assembly enclosure. Breaker shall be two-pole, (one-pole 480V for Ty. B), rated 480 volts or 240 volts as required. Circuit breakers shall have a minimum interrupting rating of 14,000 Amps. Voltage and amperage rating of switches and breakers shall be as shown elsewhere on Electrical Service Data Sheet. Switch and breaker handles shall be capable of padlocking in "On" and in "Off" positions. Main disconnect shall be operable from the outside of the enclosure and shall be interlocked to prevent the service assembly enclosure door from being opened with disconnect in the "On" position. The interlock shall have a manual override such that the main disconnect is capable of being turned "On" with the enclosure door open.

5. **Lightning Arrester.** Arresters shall be MOV-type secondary surge arresters rated 650 volts for 480V services and 175 volts for 120/240V services and shall meet ANSI, IEEE, UL, and NEMA Standards. Mounting brackets shall be provided for mounting the arresters inside the service assembly enclosures. Lightning arrester leads shall be run as straight and short as practical.

6. **Fuse Blocks.** Fuse blocks shall be rated 600 volts (min.) and shall accept a 13/32in. x 1/2in. fuse. Fuse blocks shall be furnished with integral insulated fusepuller and be suitable for mounting to the back panel of the enclosure. Fuse for 120/240 volt service shall be rated 250 volts (min.) and fuses for 480 volt service shall be rated 500 volts (min.). Fuses shall be 3 amp, dual-element (time-delay) fuses.

7. **Control Transformer.** Control transformer shall be rated 250 sealed VA and a minimum inrush rating of 1200 VA at 30 percent power factor. Voltage rating shall be 480-120 volts.

8. **Control Station ("H-O-A" Switch).** Control station shall be a maintained-contact, three position selector switch in a NEMA 1 enclosure. Switch shall be rated 600 volts and shall be fitted with "Hand-Off-Auto" legend.

9. **Photo Electric Control.** shall consist of a photocell, internal lightning arrester and relay mounted inside a weatherproof enclosure with standard 3-prong twist lock photocell plug and receptacle. The enclosure shall be made of poly-acrylic with clear acrylic window. Enclosure chassis shall be molded phenolic plastic. The photocell shall have a polyethylene gasket, and shall have a hermetically sealed cadmium sulfide cell. The arrester shall have an enclosed type expulsion arrester rated 2.0 kV sparkover with 10,000 amps follow-through. Relay shall be time delay type with normally closed contacts. Photo electric control shall be rated 1800 VA, 105-285 volts. Enclosure mounted photocells shall be the same as above except that the photocell shall be mounted inside the enclosure. The enclosure shall have two acrylic windows, or other material approved by the Engineer, one on each side of the enclosure. Each window shall be approximately one inch by two inches or as otherwise approved by the Engineer. The photocell shall be mounted in a position to receive light from one window.

The Contractor shall be responsible for proper operation of the photo-electric control. The Contractor shall move and/or adjust or shield the photocell from stray or ambient nighttime light or shall make any other adjustments required for proper operation. The photocell shall face North when practicable. The photocell shall turn on the illumination system at 1.0 +/- 0.5 footcandle and turn off the illumination system at two (2) footcandles higher than turn on.

10. **Lighting Contactor.** Lighting contactor shall be a NEMA lighting contactor, two-pole, electrically held type designed to control high pressure sodium lighting loads, with silver alloy double break contacts rated at 480 volts or 600 volts.

11. **Power Distribution Terminal Blocks.** Power distribution terminal blocks shall be rated for 600 volts and shall be used for line side connections to branch circuit breakers where more than one circuit breaker is required. Lugs on blocks shall be properly sized for conductors being used. Only one conductor shall be placed under each lug.

12. **Neutral/Ground Bus.** Neutral/ground bus shall be a factory-made insulated, groundable bus with properly sized lugs for grounding and neutral conductors.

13. **Branch Circuit Breakers.** Unless otherwise shown on the plans, circuit breakers shall be the molded case thermal-magnetic type. Circuit breaker voltage shall be compatible with their use. Single pole circuit breakers mounted on high voltage (600V min) insulating fabric shall be used for 480 volt type B service. Circuit breakers shall have a minimum interrupting capacity of 10,000 amps.

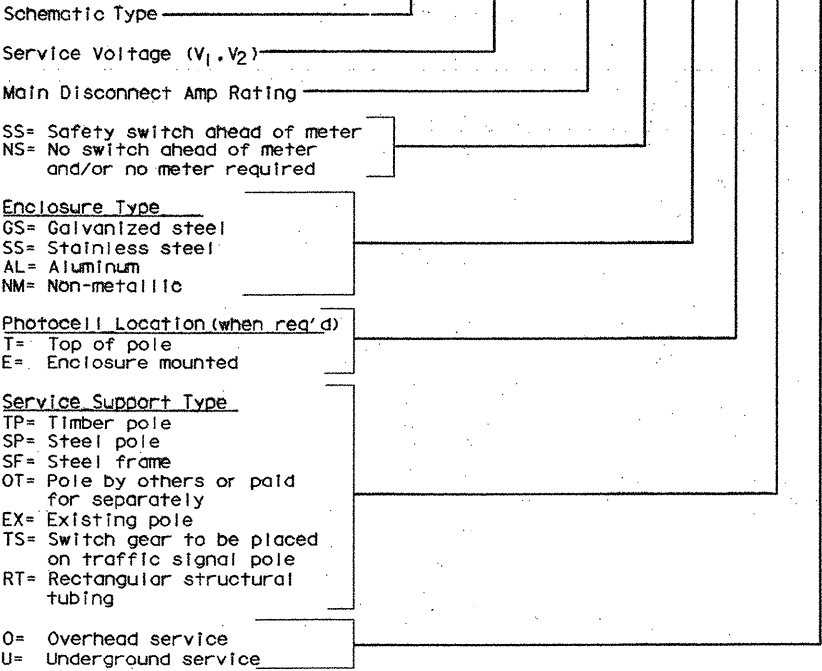
14. **Circuit Breaker Panelboard.** Panelboard shall be a commercial/industrial type with bolt-on branch circuit breakers in a NEMA 3R enclosure. Panelboard for Type C service shall be a MLO (Main Lugs Only) three-wire single phase, S/N panelboard. Panelboards shall be UL-listed and shall meet Federal Specification W-P-115b, Type I, Class 1 requirements and shall have a minimum of 12 one-pole spaces. Tandem and half-width breakers will not be allowed. Conduit entries into the top of enclosure shall have threaded hubs. Panelboards shall have dead front trim.

15. **Load Center.** Load center shall be a circuit breaker panelboard rated 120/240 volts three wire, single phase, S/N in NEMA 3R enclosure with main breaker. Load center shall have a minimum rating of 70 amps and shall have space for a minimum of six full size breakers. Tandem and half-width breakers will not be allowed. Load centers shall be UL listed, and shall meet Federal Specification W-P-115c, Type I, Class 2 requirements. Load center shall have a threaded hub conduit entry for conduit entering the top of the enclosure. Load centers shall have dead front trim and shall be rated as service entrance equipment. Load center enclosures shall meet the requirements of Note 3 paragraph a,b,c, or d above. External operating handle shall not be installed. Closure clamps will not be required.

EXPLANATION OF ELECTRICAL SERVICE

DESCRIPTIVE CODE

ELEC SERV TY X (XXX/XXX) XXX (XX) XX (X) XX (X)



Example: ELEC SERV TYD(120/240)070(NS)GS(T)TP(O)

ELECTRICAL SERVICES NOTES

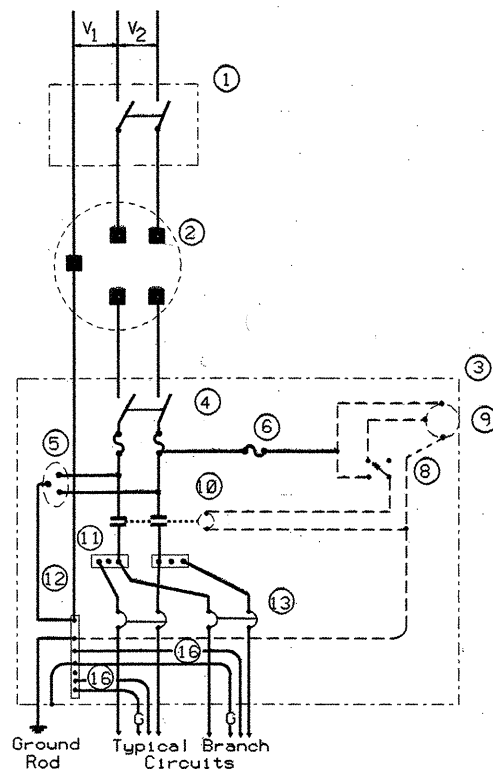


STANDARD PLANS
TEXAS DEPARTMENT OF TRANSPORTATION

ELECTRICAL DETAILS

ED (3) - 93

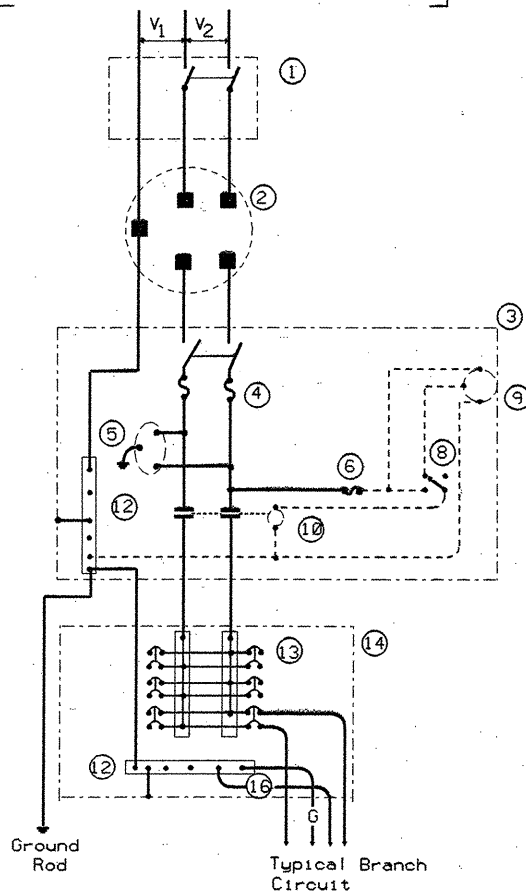
ORIGINAL DRAWING DATE	STATE	FEDERAL DISTRICT	REGION	FEDERAL AID PROJECT	SHEET
01-92	TX	15	6	NH 95 (40) JM	325
DN-- K.A.B.	REVISED	10-93 K.A.B.			
CL-- T.B.					
DN-- R.E.S.					
CL-- T.B.					
	COUNTY	CONTROL	SECTION	JOB	HIGHWAY
	COMAL	0016	05	087	1H 35



SCHEMATIC TYPE A

THREE WIRE

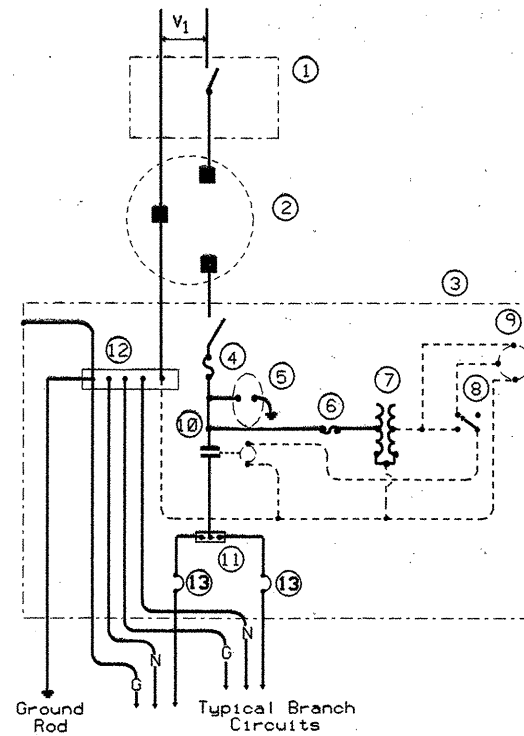
Maximum branch circuit size: 100 amps for two pole 480V, 125 amps for one or two pole 120V or 240V.



SCHEMATIC TYPE C

THREE WIRE

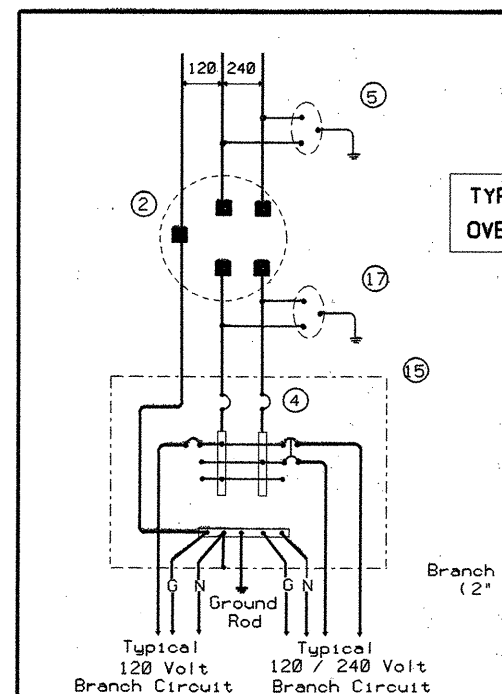
Maximum branch circuit size: 100 amps for two pole 480V, 125 amps for two pole 120V or 240V.



SCHEMATIC TYPE B

TWO WIRE

Maximum branch circuit size: 50 amps for one pole 480V, 125 amps for one pole 120V or 240V.

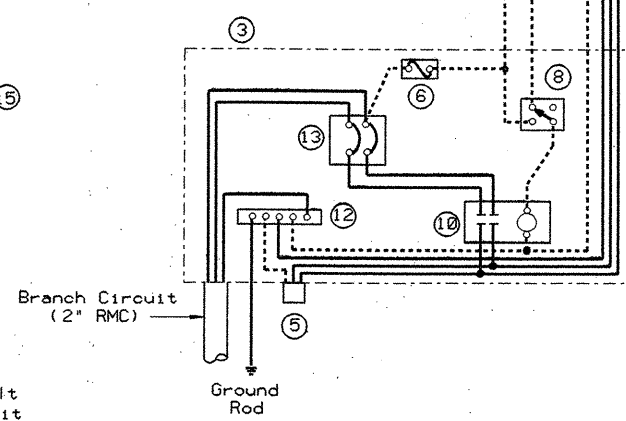


SCHEMATIC TYPE D

120/240 VOLTS - THREE WIRE

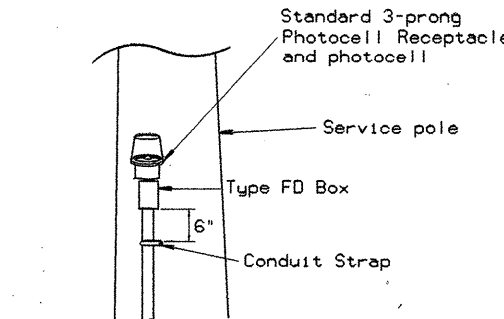
Install photocell and lighting contactor when shown on service pole summary.

TYPICAL SERVICE FOR OVERHEAD SIGN BRIDGE

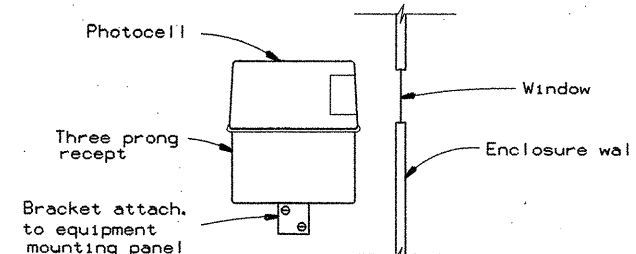


SERVICE ASSEMBLY ENCLOSURE
120 / 240 VOLTS - THREE WIRE

(To be mounted on Overhead Sign Bridge Leg)



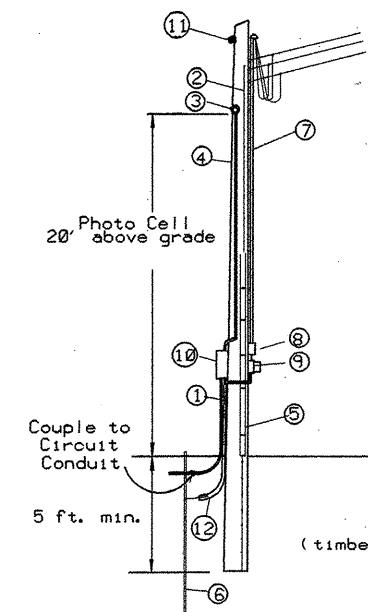
TOP MOUNTED PHOTOCELL



ENCLOSURE MOUNTED PHOTOCELL

SCHEMATIC LEGEND

- Safety Switch (when required)
- Meter (when required)
- Service Assembly Enclosure
- Main Disconnect (Switch or Breaker, See Electrical Service Data Sheet)
- Lightning Arrestor
- Fuse Block
- Control Transformer (480-120 Volts) (for Type B only)
- Control Station ("H-O-A" Switch)
- Photo Electric Control (enclosure-mounted shown)
- Lighting Contactor
- Power Distribution Terminal Blocks
- Neutral/Ground Bus
- Branch Circuit Breaker (See Electrical Service Data Sheet)
- Circuit Breaker Panelboard (See Electrical Service Data Sheet)
- Load Center
- Neutral conductor (when required)
- Power Wiring
- Control Wiring
- Surge Capacitor Westinghouse No 1N02180A05 General Electric No 9L18BAB301 Or Equal
- See Detail 1



Service Drop from Utility
Three Wire Service Shown -
Omit One Conductor for
Two Wire Service

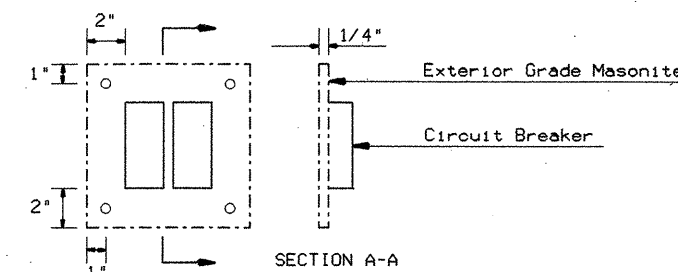
- RM conduit - same size as branch circuit conduit
- No. 6 bare ground wire to butt-wrap ground
- Photo Electric Control and 1/2" RM conduit - See detail
- Class 5 pole, 30' minimum or as otherwise required by NESC and utility company
- Ground wire moulding - 8' min.
- 5/8" X 8' Copper clad ground rod
- Service conduit and conductors - See Electrical Service Data Sheet
- Safety switch (when required)
- Meter (when required)
- Service enclosure
- Lightning arrestor (top mounted)
- No. 6 bare grounding electrode conductor in 1/2" PVC to ground rod

SERVICE SUPPORT TYPE TP (O)

(timber pole, overhead service, typical arrangement)

TIMBER POLE NOTES

- Conduit and conductors attached to service pole and underground within 12 inches of service pole shall not be paid for directly but shall be subsidiary to the service pole.
- Install photo electric control on North side of pole or in service enclosure as required.
- Attach service enclosure with galvanized channel (Unistrut, Kindorf, or equal). Gain pole two places to provide flat surfaces. Paint ends of channel with zinc rich paint.



DETAIL 1

The attachment of the masonite to the enclosure shall be as approved by the Engineer.

ELECTRICAL SERVICE SCHEMATICS
ELECTRICAL SERVICE SUPPORT
TYPE TP (OVERHEAD)



STANDARD PLANS
TEXAS DEPARTMENT OF TRANSPORTATION

ELECTRICAL DETAILS
ED (4) - 93
SAN ANTONIO DISTRICT

ORIGINAL DRAWING DATE	REVISIONS	STATE DISTRICT	FEDERAL REGION	FEDERAL AID PROJECT	SHEET
01-92		SA	6	NH 95(40) 1M	326
01-92		COUNTY		CONTROL SECTION JOB	HIGHWAY
01-92		BEXAR		0016 05 087	TH 35

GENERAL :

I. SCOPE

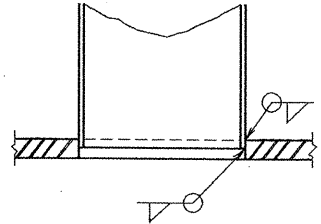
Details herein apply to roadway lighting installations bid under the following Specification Items: Roadway Illumination Assemblies, Relocate Roadway Illumination Assemblies, Foundations for Signs, Traffic Signals and Roadway Illumination Assemblies, and Special Specifications relating to roadway lighting. All work, materials and services not shown on the plans which may be necessary for complete and proper construction shall be performed, furnished and installed by the Contractor. Faulty fabrication or poor workmanship in any material, equipment or installation will be considered justification for rejection. Materials and installation shall comply with the applicable provisions of the National Electrical Code and National Electrical Manufacturers Association standards. Where manufacturer's provide warranties or guarantees as a customary trade practice, Contractor shall furnish to the State such warranties or guarantees.

The location of poles and fixtures are diagrammatic only and may be shifted by the Engineer to accommodate local conditions. Erection and/or removal of poles and luminaires located near any overhead electrical lines shall be accomplished using established industry and utility safety practices and in accordance with laws governing such work. The Contractor shall consult with the appropriate utility company prior to beginning such work.

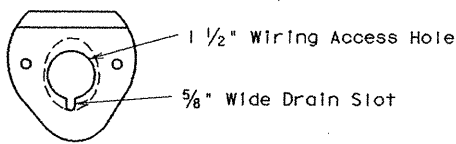
II. ROADWAY ILLUMINATION ASSEMBLIES

A. General

- Structural Support Design for Luminaires.** Lighting standards shall be designed in accordance with the latest issue of the AASHTO "Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals." All poles shall be designed for 80 mph wind loads. An additional 1.3 gust factor shall be applied to the wind loads. For transformer base poles, fabricator shall include transformer base and connecting hardware in design calculations and shop drawing submittals. Manufacturer's shop drawings shall include the ASTM designations for all material to be used. See paragraph II.b. for additional requirements for the transformer base.
- Slip Joint Poles.** Poles may be fabricated in two sections and field-assembled by the lap-joint method. The two sections shall telescope together with a lap length of not less than 1-1/2 times the shaft diameter at the lap joint. The longitudinal seam weld on the outer shaft at the slip joint end shall be a full penetration weld for a minimum of the slip joint length plus 6 inches.
- Mast Arm Attachments.** All poles and attachments shall be structurally designed to support two 12-foot mast arms and luminaires. Poles shall be supplied with mast arm combinations as shown in the plans. All mast arms shall be designed for a 55-pound luminaire having an effective projected area of 1.4 square feet.
- Minor Damage Repair.** The finished pole shall have a smooth, uniform finish free of pits, blisters, or other defects. Scratched, chipped, or damaged areas on galvanized poles and mast arms shall be thoroughly cleaned by wire brushing. The cleaned area shall be painted with two coats of zinc rich paint containing a minimum of 84% metallic zinc.
- Pole Bonding Means.** All shoe base poles, including poles on concrete traffic barriers, shall have a grounding lug with 1/2-13 NC female threads inside the pole near the hand hole, minimum of 3 full threads.
- Hand Holes.** All shoe base poles shall have hand holes with reinforcing frames and covers. The openings on all poles shall be approximately 4 inches x 10 inches located approximately 10 inches from the bottom of the pole and, except for poles mounted on concrete traffic barrier, shall be placed 90 degrees to mast arm unless otherwise noted on the plans. For poles mounted on concrete median barrier, all hand holes shall be on the same side of the median.
- CTB Poles.** Poles installed on concrete traffic barrier shall also meet the requirements of CTB details.
- J-Hooks.** All poles shall be equipped with a J-hook inside the pole, near the top for supporting vertical conductors.
- Base Plate Bolt Circle.** For bolt circles for poles mounted on CTB, see CTBI (4). For poles placed on existing bridge brackets or existing foundations, bolt circle shall be coordinated with anchor bolts in place. For other bolt circles, see RID (3).
- Steel Poles.**
 - Steel poles shall be fabricated in accordance with the item "Steel Structures." Longitudinal seam welds for pole sections shall have 60% minimum penetration, except that weld shall be full penetration within 6 inches of circumferential base plate welds. All welding shall be in accordance with the ANSI AWS Structural Code D1.1. Two-section poles joined by circumferential welds will not be permitted, unless otherwise shown on the plans. Unless otherwise shown on the plans, poles and hardware shall be galvanized in accordance with Item 445. "Galvanizing".
 - Pole components shall be constructed using the following materials:
 - Shaft: ASTM A-572 Grade 50 or ASTM A-595 Grade A (50 KSI min. yield) or ASTM A-36M50.
 - Base Plate: ASTM A-27 Grade 65-35 or ASTM A-36.
 - Mast Arm Connector: ASTM A-27 Grade 65-35.
 - Mast Arms: Steel Pipe ASTM A-53 Grade A or B or ASTM A-501 or A-513 TY 1 with minimum 30 KSI yield and 20% elongation in 2 inches.
 - Pole Cap: Pole cap shall be zinc die-cast, aluminum, or galvanized metal, secured by three stainless steel or galvanized screws.
 - Pole Hardware: All bolts except mast arm connection bolts shall be stainless steel or standard steel galvanized ASTM A-153 Class C or D, or B-695 Class 50. Mast arm connection bolts shall be ASTM A-325, ASTM A-321 or ASTM A-193 Grade B-7, galvanized as above. Nuts and washers shall be compatible with the bolts and shall be stainless steel or steel, galvanized as above. Lock washers shall be provided on all bolted connections.
- Aluminum Poles.**
 - Aluminum poles shall be fabricated in accordance with "Structural Welding, Aluminum" ANSI/AWS D1.2.
 - Pole components shall be constructed using the following material:
 - Shaft: ASTM B-221 or B-241 Alloy 6063-T6, ASTM B-209 Alloy 5086-H34, ASTM B-221 Alloy 6005-T5
 - Base Flange: ASTM B-26 Alloy 356.0-T6 or ATSM B-108 Alloy A356.0-T6 (Structural strength test required).
 - Mast Arm Fitting: ASTM B-209 Alloy 6061-T6 or ASTM B-221 Alloy 6005-T5.
 - Mast Arms: ASTM B-241 Alloy 6061-T6 or Alloy 6063-T6
 - Pole Cap: ASTM B-209 Alloy 5086-H32 or ASTM B-108 or B-26 Alloy 356.0-T6
 - Bolts: Stainless Steel AISI 300. Bolts threading into aluminum threads shall be treated with anti-seize compound, Never-Seez Compound, Permatex 133K or equal.

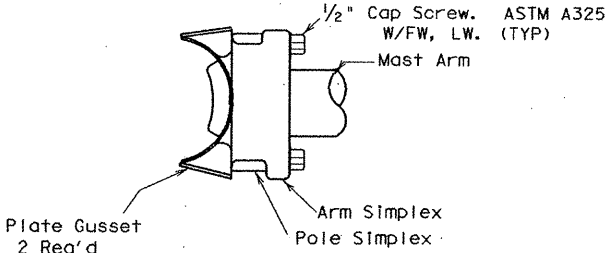


SECTION
POLE SHAFT TO BASE PLATE

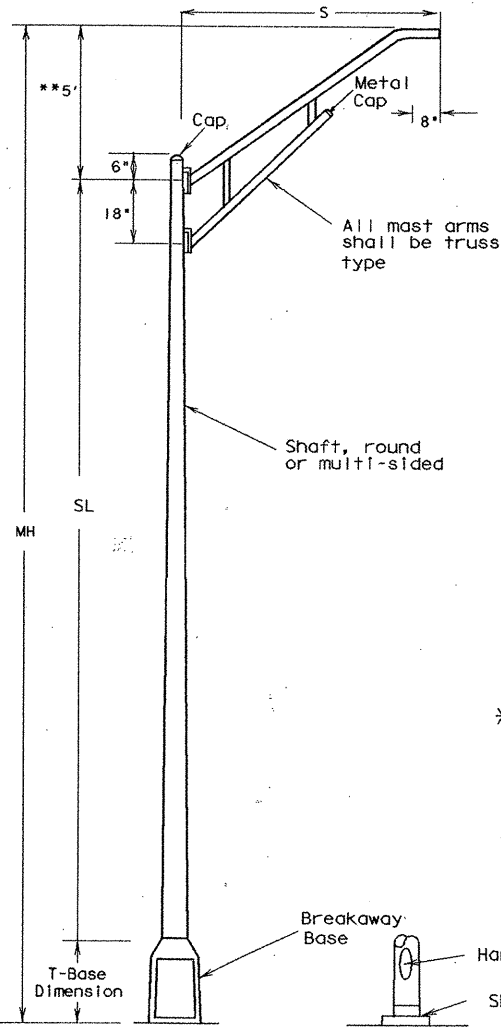


MAST ARM CONNECTOR

Steel Poles Only
Aluminum Pole Connector
Shall Be Clamp-on Type



MAST ARM TO POLE SHAFT CONNECTION



ROADWAY ILLUMINATION ASSEMBLY

EXPLANATION OF ROADWAY ILLUMINATION
ASSEMBLY DESIGNATIONS

(TYPE SA 50 T - 8 - 8) (4KW) S

SA: Pole and mast arm may be steel or aluminum.
ST: Pole and mast arm must be steel.
AL: Pole and mast arm must be aluminum.
SP: Special (ovalized) steel pole for installing on CTB. See standard sheet CTBI (4).
Two numerical digits denote mounting height in feet.
Next letter denotes type of base, (S- Shoe Base, T-Transformer Base or X-Base, B-Shoe Base Bridge Mount)
First number denotes length of mast arm in feet.
Use of second mast arm is indicated by second dashed number which denotes length in feet.
Next three figures indicate luminaire rating (1 KW= 1000 watts, .4 KW= 400 watts, etc.)
Last letter indicates the type of lamp (M- Mercury, S- High Pressure Sodium, L- Low Pressure Sodium).

*** 2.5' for poles with 4' mast arms.

MH = Mounting Height
SL = Shaft Length
S = Spread (Mast arm length)
MH = SL + 5' + (T-Base dimension)
MH = SL + 5' (Shoe Base)



STANDARD PLANS
TEXAS DEPARTMENT OF TRANSPORTATION

ROADWAY ILLUMINATION DETAILS

RID (1) - 93

ORIGINAL DRAWING DATE: 01-92	STATE DISTRICT	FEDERAL REGION	FEDERAL AID PROJECT	SHEET
ENR - K.A.B.	15	6	NH 95 (40) TM	329
CE - T.B.	5-93 K.A.B.			
ENR - R.E.S.	10-93 K.A.B.			
CE - T.B.	COMAL	0616105	037	1835

Traffic Operations Division

72.4

11. A.12. Alternate material equal to or better than material specified may be substituted with the approval of the Engineer.
13. Installation of high Strength Bolts. The tightening of nuts on high strength bolts shall be in accordance with the item "Structural Bolting."
14. Roadway Illumination Assembly poles shall be erected plumb and true. Top of foundation shall be struck level and shims used to plumb pole, except that for shoe base poles leveling nuts may be used. Leveling nuts shall not be used under transformer bases. Grout shall not be placed between base plate or flange and the foundation.
15. In each pole, continuous color-coded stranded No. 12 AWG copper Type XHHW or other approved XLP conductors shall be connected to the line side of each ballast.
16. Acorn nuts will not be allowed for attaching pole to transformer base or foundation. Nut covers will not be allowed.
17. Fabrication tolerances shall be as shown on Fabrication Tolerances Table.

B. Transformer Base

1. Transformer base shall be cast from aluminum, ASTM B-108 or B-26 Alloy 356.0-T6, or other material approved by the Engineer, and shall be furnished with four washers or lugs as recommended by the manufacturer. Transformer base bolt circles (Top and Bottom) shall match bolt circles for poles and foundations shown on RID(3).
2. Transformer base shall be approximately 15-20 inches high and shall have a door approximately 13 inches x 8 inches x 9 1/4 inches or as otherwise approved by the Engineer. Screw or bolts for attachment of door to base shall be stainless steel. Four machine bolts with four nuts, eight flat washers and four lock washers, galvanized ASTM A-153 Class C or D, or B-695 Class 50, shall be provided with each transformer base for connecting the pole. Bolts shall be ASTM A325 or approved equal. Nuts shall be ASTM A-563 grade DH galvanized. A 1/2-13 NC female threaded grounding lug shall be provided inside the transformer base near the bottom.
3. The X-base shall be made from extruded aluminum channel and aluminum plate. The base breakaway features shall rely on bolt shear and not on bolt torque. Bolt shall have torque controlled break-off hex-head. Bolt shall be Aluminum Association type 2024-T4 aluminum. X-base channel shall be connected with aluminum bolts. Bolt shall be left hand thread and shall not be interchangeable with any other bolt not designed specifically for use with the X-base.
4. All breakaway bases shall meet the breakaway requirements of the AASTHO "Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals," 1985 edition, and shall have been tested by FHWA-approved methods. All bases shall have been structurally tested to meet or exceed the full designed plastic moment capacity of the pole. Certification of the plastic moment load test and FHWA breakaway requirement test of the model of base being furnished shall be submitted with shop drawings. Shop drawings shall show breakaway base model number and manufacturer's name or logo.
5. Bases shall be stamped, incised or by other approved permanent means, marked to show fabricators name or logo, and model number. Such information shall be placed in a readily seen location, inside or outside the base, but shall not be placed on the door.
6. Doors for transformer bases shall be made of plastic, fiberglass or other non-aluminum material approved by the Engineer. Transformer bases shall be cleaned by grit blast cleaning after heat treatment. Certification by the manufacturer of heat treatment shall be furnished with transformer bases. The certification shall show the metal alloy and temper and that the base meets those requirements, chemical and physical. The certification shall also show the material ASTM specification. Transformer bases shall be cast with a removable tab bar for material testing. Some bars may have been removed by the manufacturer for testing.

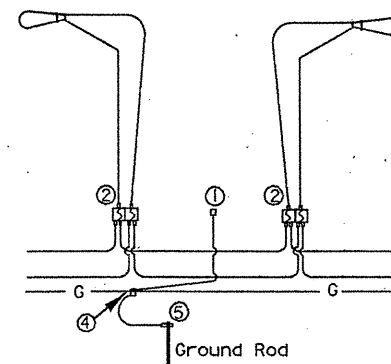
C. All Luminaires

1. The luminaire housing shall be cast or drawn from a non-ferrous alloy and shall be free of cracks and excessive porosity. All nuts, screws, clips, washers and attaching hardware shall be made of stainless steel, steel electro-zinc-plated, minimum thickness 0.0002 inch with olive green drab or yellow chromate conversion coating, steel coated with an acidic chromate-phosphate-binder system primer, top coated with a polytetrafluoroethylene modified silicon primer, bright metallic in color, meeting the requirements of General Motors automotive specification GM 164M, or other approved conversion coatings except that brackets may be made from pre-galvanized steel. All threaded surfaces used in the housing shall be lubricated with a silicone grease.
2. The slipfitter shall securely clamp the luminaire to the mast arm. A positive means of vertical adjustments shall be provided. The refractor or lens shall be clear glass. The optic assembly shall be provided with resilient gaskets and so constructed that a positive seal against weather and other contaminants will be maintained. The luminaire shall be designed to permit easy removal of the refractor from the luminaire but shall provide a positive means of preventing an unintentional separation. The latch shall provide a positive means of maintaining closure of the luminaire. The socket shell shall be nickel plated and shall be rigidly attached to a high grade porcelain mogul base which shall extend and enclose the metal shell. A locking means shall be incorporated in the shell of the socket to positively resist the removal of the lamp. Reflectors shall be polished aluminum with Alzak or equal coating and shall not be painted.
3. Mast-arm mounted luminaires shall be provided with a leveling indicator which is clearly visible from the ground. Leveling indicator shall be sensitive to one (1) degree (maximum) changes in position at any point within five (5) degrees (minimum) of the level position. Leveling indicator shall have one or more concentric circular marks, the center of which is the level position. Unless otherwise directed by the Engineer, mast-arm mounted luminaires will be installed in the level position.
4. Underpass luminaires shall be fused internally. Fuses shall be 10 amp time-delay type.

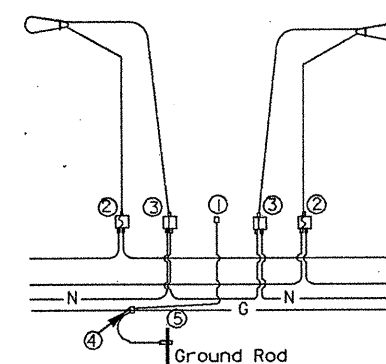
D. High Pressure Sodium Vapor Luminaires

1. Photometrics
- a. The U/P (SPL-CO) (.15KW)S (TY 1) and (TY 2) underpass luminaires shall be 150 watt high pressure sodium, IES TYPE M-C with flat tempered glass lens. The fixtures shall provide a minimum measured intensity of .2 footcandles in a rectangular area measuring 80 feet X 30 feet, when mounted 20 feet above the midpoint of either long side of the surface area.
- b. The 250-watt mast arm mounted luminaire shall be IES Type semi-cutoff or cutoff and, when mounted 40 feet above the midpoint of either long side of a rectangular area 200 feet by 50 feet, shall provide a measured minimum intensity of 0.2 footcandle at any point on the surface of this area. Light intensities measured in footcandles along a line parallel to and 20 feet in from the long side of the previously defined rectangular area above which the luminaire is mounted shall decrease at a rate not to exceed 0.8 footcandle in any ten-foot interval along the aforementioned line from 10 to 70 feet on both sides of the luminaire and shall not be less than 0.6 footcandle at any point along such line.
- The maximum to minimum footcandle uniformity ratio shall not exceed 20:1 within the above mentioned rectangular area.
- c. The 400-watt mast arm mounted luminaire shall be IES Type semi-cutoff or cutoff and, when mounted 50 feet above the midpoint of either long side of a rectangular area 240 feet by 70 feet, shall provide a measured minimum intensity of 0.2 footcandle at any point on the surface of this area. Light intensities measured in footcandles along a line parallel to and 30 feet in from the long side of the previously defined rectangular area above which the luminaire is mounted shall decrease at a rate not to exceed 0.8 footcandle in any ten-foot interval along the aforementioned line from 10 to 90 feet on both sides of the luminaire and shall not be less than 0.6 footcandle at any point along such line.
- The maximum to minimum footcandle uniformity ratio shall not exceed 20:1 within the above mentioned rectangular area.
- d. The luminaires shall meet the photometric requirements shown above, when energized at 100 percent of rated line voltage. Test will be run with the fixture in the level position as indicated on leveling indicator.

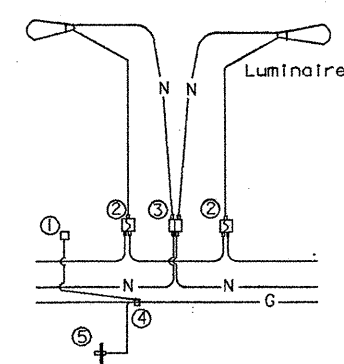
Fabrication Tolerances Table		
Part	Dimension	Tolerance
Pole Assembly	Shaft length	±1 in.
	I.D. of outside piece of slip fitting pieces	+1/8 in., -1/16 in.
	O.D. of inside piece of slip fitting pieces	+1/32 in., -1/8 in.
	Shaft diameter, other	+3/16 in.
	Out of "round"	1/4 in.
	Straightness of shaft	±1/4 in. in 10 ft.
	Twist in shaft	4° in 50 ft.
	Perpendicular to baseplate	1/8 in. in 24 in.
	Pole centered on baseplate	±1/4 in.
Arm Assembly	Location of Attachments	±1/4 in.
	Arm Length	±3 in.
	Arm Rise	±1 3/4 in. in 10 ft.
	Arm Diameter	±3/16 in.
	Overall length or width	±1/4 in.
	Thickness	+1/4 in., -1/16 in.
	Deviation from flat	1/8 in. in 12 in.
	Spacing between holes	±3/32 in.
	Anchor bolt hole size	±1/16 in.
Anchor Bolt	Length	+1 in., -1/4 in.
	Threaded length	+1 1/2 in., -1/8 in.
	Galvanized length (if required)	+8 in., -1/4 in.
Miscellaneous	Bolt hole spacing	±1/16 in.
	Strut location in truss arms	±1 1/2 in.



FOR THREE-WIRE CIRCUIT-CENTER GROUNDED
LUMINAIRES SERVED AT 480V ON 240/480 VOLT
SERVICE OR LUMINAIRES SERVED AT 240V FOR
FOR 120/240 VOLT SERVICE.



FOUR-WIRE CIRCUIT-CENTER GROUNDED
LUMINAIRES SERVED AT 240V
(240/480 VOLT SERVICE)




THREE WIRE CIRCUIT-OUTSIDE GROUNDED
LUMINAIRES SERVED AT 480V ON 480 VOLT
2 WIRE SERVICE OR LUMINAIRES SERVED
AT 240V ON 240 VOLT 2 WIRE SERVICE.

NOTES:

- ① Pole Banding Connector Blackburn TTC3 or Weaver TGC3 or equal.
- ② Fused Connector- Homac Flood Seal Series, Bussman HEB Series, Gould GEB Series, or equal. All fuses shall be time-delay types, 10 Amp (Littelfuse FLO, Bussman FNQ or equal).
- * ③ Un-fused Connector- Homac Flood Seal Series, Bussman HEB Series, Gould GEB Series, or equal. Dummy/Neutral fuse shall be Bussman NTS-R-30 or equal.
- ④ Split Bolt or other connector.
- ⑤ Ground Rod Clamp - Blackburn GG58H, Burndy GKP635, or equal.

*For Transformer Base Poles. On Shoe Base Poles omit un-fused connector for neutral conductor.

		STANDARD PLANS	
		TEXAS DEPARTMENT OF TRANSPORTATION	
ROADWAY ILLUMINATION DETAILS			
RID (2) - 93			
ORIGINAL DRAWING DATE: 1-92	STATE/DISTRICT: 15	FEDERAL REGION: 6	FEDERAL AID PROJECT: NH 95 (40) 1M
DN: K.A.B.	REVISIONS: 5-93 K.A.B.	COUNTY: COMAL	CONTROL SECTION: 0016
CR: T.B.	10-93 K.A.B.	JOB: 05	1435
DN: R.E.S.			
CR: T.B.			

Traffic Operations Division

2. Ballasts

- a. All ballasts shall be isolated-winding lag-type magnetic regulators designed to operate high pressure sodium lamps unless otherwise shown on the plans.
- b. When the circuit voltage indicated on the plans is applied, the ballast input wattage during fluctuations of the test voltage of +10 and -10 percent shall not exceed the following:
- | Nominal Lamp Rating, Watts | Maximum Wattage Input |
|----------------------------|-----------------------|
| 150 | 220 |
| 250 | 400 |
| 400 | 552 |
- c. During fluctuation of the test voltage of +10 and -10 percent, the lamp wattage fluctuation shall not exceed a total of 20 percent and ballast shall maintain lamp wattage within the following limits:
- | Nominal Lamp Watts | Minimum Lamp Watts | Maximum Lamp Watts |
|--------------------|--------------------|--------------------|
| 150 | 110 | 180 |
| 250 | 175 | 370 |
| 400 | 280 | 475 |
- d. The power factor of any ballast when tested at the circuit voltage indicated in the plans shall be not less than 90 percent.
- e. The electronic starting aid shall provide a starting pulse with an amplitude of 2500 volts minimum, 4000 volts maximum. The pulse width shall be a minimum of 0.8 microseconds at 2250 volts. The pulse shall occur when the open-circuit voltage is equal to or greater than 90 percent of peak open-circuit voltage. Pulse repetition rate shall be a minimum of one per cycle and pulse current shall be a minimum of 0.18 amperes. Electronic starting aids for mast-arm mounted poles shall be replaceable without the use of tools. The starting aid shall discontinue to pulse when the lamp starts.
- f. Luminaires will be tested for satisfactory operation of the starter board under open-circuit (lamp-out) condition for a minimum of 72 hours. Any failures of starter boards will be considered grounds for rejection of the model starter board being supplied.
- g. Ballasts shall permanently and clearly indicate the following: lamp type, catalog number, voltage rating, connection diagram, and manufacturer. Capacitors in all luminaires shall be non-PCB type.

3. Lamps

- a. All lamps shall be new and shall be of recent manufacture.
- b. High pressure sodium vapor lamps in the wattage range of 200 to 400 watts inclusive shall have a lamp voltage not greater than 108 volts when tested after thirty minutes burn-in. 150 watt lamps shall be rated for 55 volts.
- c. All lamps shall have nickel plated mogul bases.
- ## 4. Testing
- a. Ballasts and luminaires will be tested using a lamp furnished for the same project.
- b. Luminaires, ballasts, and lamps will be sampled and tested in accordance with the TXDOT Materials and Test Division's Manual of Testing Procedures.

III. ROADWAY ILLUMINATION ASSEMBLY FOUNDATIONS

- A. Foundations will be paid for under the item "Foundations for Signs, Traffic Signals and Roadway Illumination Assemblies", unless otherwise shown on the plans. Top 6 inches of foundation shall be formed and struck level.
- B. Anchor bolts for all poles, except CTB-mounted poles, shall be A-36M55 Anchor Bolts. Anchor bolts for CTB-mounted poles shall be steel, ASTM A-325 or A-321 threaded rod. Nuts for CTB anchor bolts shall be ASTM A-563 Grade D heavy hex, galvanized. The top 8 inches of all anchor bolts shall be galvanized per ASTM A-153. Anchor bolts in foundations shall be 1 1/2 inches x 30 inches for mounting heights 40 feet and greater, 1 inch x 30 inches for mounting heights less than 40 feet. Anchor bolts shall have top end threaded not less than 5 inches and furnished with galvanized hex nuts, flat and lock washers and template. The lower end of the bolt shall be threaded and furnished with nut and template. When bolts with rolled threads are furnished, bolt body need not be full size. See CTB details for anchor bolts in CTB. Anchor bolts and nuts shall have Class 2A and 2B fit. Nuts shall be tapped or chased after galvanizing.
- C. Concrete shall be Class A or C.
- D. A minimum of two conduits shall be installed in each foundation. See lighting layout sheets for locations of foundations with more than two conduits. Any unused conduits in foundations shall be capped on both ends.
- E. Unless otherwise dimensioned on the plans, breakaway roadway illumination assemblies should be located as shown in the placement table. Non-breakaway illumination assemblies should be protected from vehicular impact (i.e. 2 ft. behind guard rail or mounted atop traffic barrier) or located outside the clear zone, except that 2.5 ft. from curb face is minimum desired for light poles on city streets, 45 mph or less, see design guidelines for further information.

* Except that anchor bolts shall be 1 inch x 30 inches for all X-base poles.

Breakaway Pole Placement, see Para. III. E.	
Roadway Functional Classification	**Pole Offset (distance to transformer base, tolerance + 6 in.)
Freeway mainlanes (roadways with full control of access)	15 ft. (minimum and typical from lane edge)
All curbed, 45 MPH or less design speed	2.5 ft., minimum (15 ft. desirable) from curb face
All others	10 ft., minimum* (15 ft. desirable) from lane edge

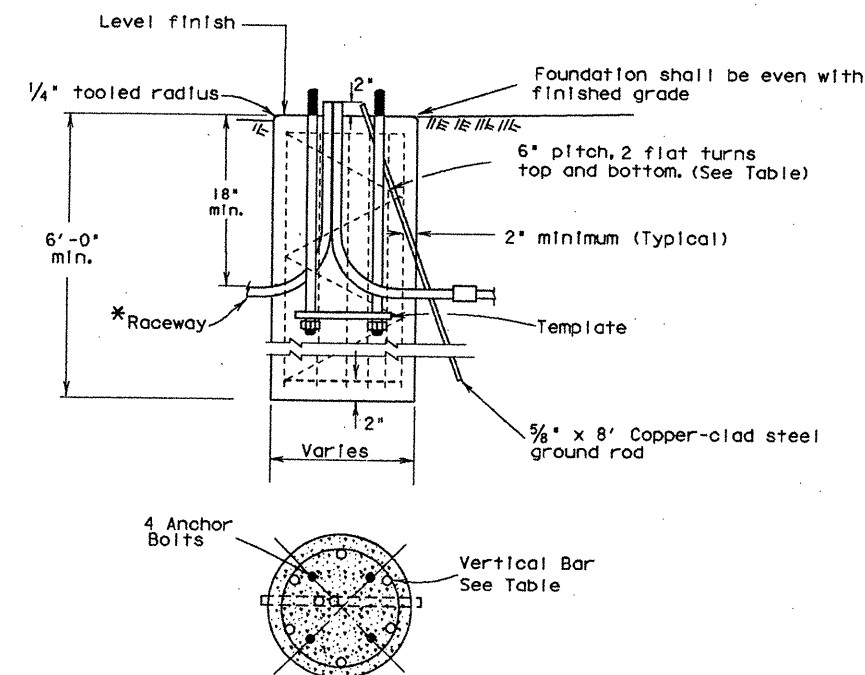
*or as close to ROW line as is practical

**all breakaway poles should have 2/5 of the luminaire mounting height behind the pole for "falling area" to prevent encroachment on other travel lanes. See design guidelines.

BOLT CIRCLES AND ANCHOR BOLTS				
MOUNTING HEIGHT	POLE BASE PLATE	BOLT CIRCLE		BOLT SIZE
		SHOE BASE	*T-BASE	
LESS THAN 40 FEET	13 IN.	13 IN.	14 IN.	1 IN. X 30 IN.
40 FEET OR GREATER	15 IN.	15 IN.	17 1/4 IN.	** 1 1/4 IN. X 30 IN.

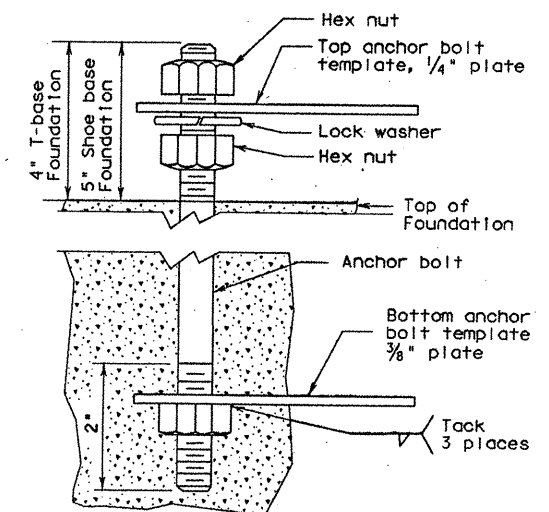
* AND X-BASE
** 1" FOR X-BASE

FOUNDATIONS				
FND. TYPE	DRILL DIA.	SHAFT LENGTH	REINFORCING BAR	SPIRAL
A	30 IN.	6 FT.	6-#4	#2
B	30 IN.	8 FT.	6-#5	#2
C	30 IN.	10 FT.	6-#6	#3



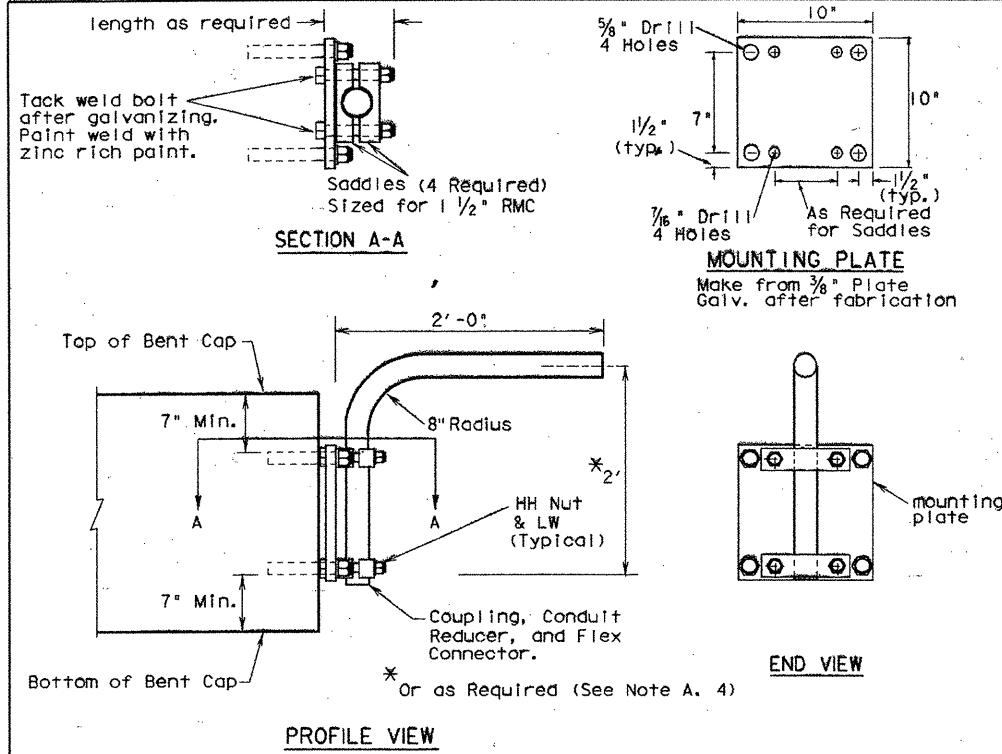
FOUNDATION DETAIL

* Min. 2" Dia. for duct cable, 18" radius bends. For conductor in conduit system, same size as system conduit with standard radius bends.

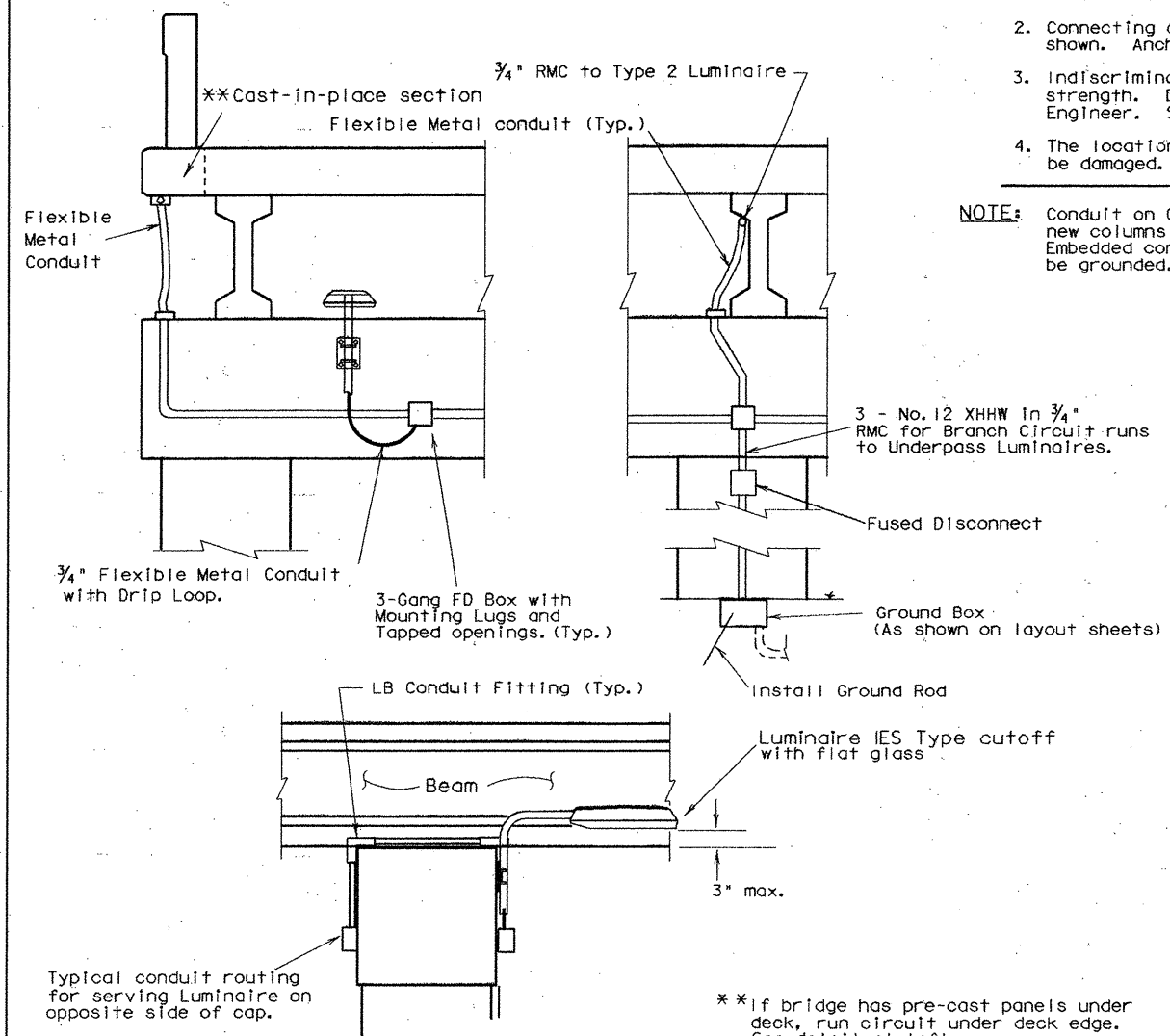


ANCHOR BOLT DETAIL

		STANDARD PLANS		TEXAS DEPARTMENT OF TRANSPORTATION	
		ROADWAY ILLUMINATION DETAILS			
RID (3) - 93					
ORIGINAL DRAWING DATE: 01-92	STATE: 15	FEDERAL DISTRICT: 6	FEDERAL AID PROJECT: NH 95(40)1M	SHEET: 329	
DESIGNED BY: K.A.B.	REVISIONS: 5-93 K.A.B.	COUNTY: COMAL	CONTROL SECTION: 006 05 087	DATE: 1/1/95	
CHECKED BY: T.B.	10-93 K.A.B.	Traffic Operations Division			



UNDERPASS LIGHTING ARM TYPE 1



U/P (SPL-CO) (.15 KW)S (TYPE 1)

NOTES :

A. ALL LUMINAIRES

- Luminaire locations, conduit and conductor sizes and routing are typical and diagrammatic only. See project layout sheets for specific details.
- All conductors and conduit will be paid for under the items "Conduit" and "Electrical Conductor", unless otherwise shown on the plans. See lighting layout sheets.
- A ground rod shall be installed and attached to the equipment grounding conductor in all ground boxes containing conduit that extends above ground. All RMC in these boxes shall have grounding bushings and shall be properly bonded.
- Adjust conduit in saddles to place fixture height and orientation as required. See fixture orientation detail and layout sheet. Where practical place luminaires so that bottom of luminaire is above bottom of beam, maximum of 3 inches. (See detail).
- All bolts, nuts and washers shall be galvanized, ASTM A-153.
- Fabrication of brackets and support arms will not be paid for directly but shall be subsidiary to Item 610, "Roadway Illumination Assemblies."
- A Heavy Duty, 480 volt or 600 volt, 30 amp fused disconnect switch in NEMA 3R enclosure shall be installed in circuits to switch underpass luminaires. Switch shall be mounted ten foot (minimum) above grade on columns or bent caps as approved by the Engineer. Contractor shall modify switch to allow padlocking in the "ON" and in the "OFF" positions. 20 amp fuses shall be installed.

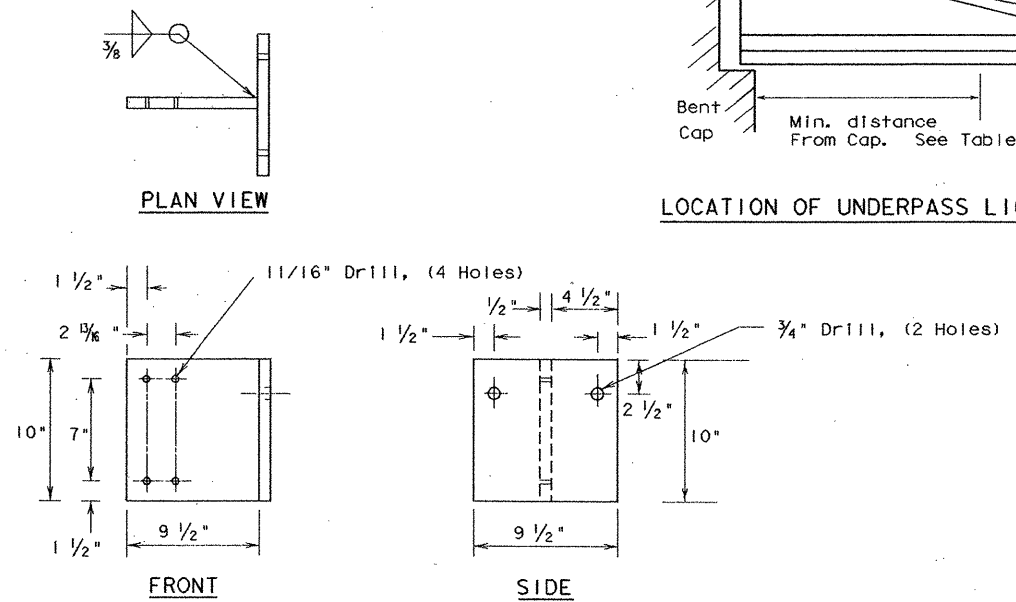
B. TYPE 1

- Type 1 arm shaft shall be 1 1/2" rigid metal conduit (1.90" O.D., .145" wall).
- Anchor bolts for Type 1 luminaire shall be 3/8 inch bolt or stud expansion anchors with minimum pull out of 3000 lb each, with 4 inch minimum embedment, and lock washers.
- Attach conduit to plate with 4 saddles, four 3/8" (min.) bolts, HHN & LW.

C. TYPE 2

- Type 2 arm shaft shall be 2 inch rigid metal conduit (2.375" O.D., .154" wall). Reduce conduit length for Type C concrete beams. Field cutting and threading will be permitted. Paint out and treated areas with zinc rich paint after conduit is connected to adjacent fittings.
- Connecting conduit may be strapped to tapered section only of precast beams as shown. Anchor as approved by the Engineer. Maximum anchor depth is 1 inch.
- Indiscriminate drilling into precast concrete beams may result in reduced beam strength. Drilling location and method shall be only as directed by the Engineer. See location of underpass lighting mounting bracket detail.
- The locations given in the table are such that reinforcing strands will not be damaged.

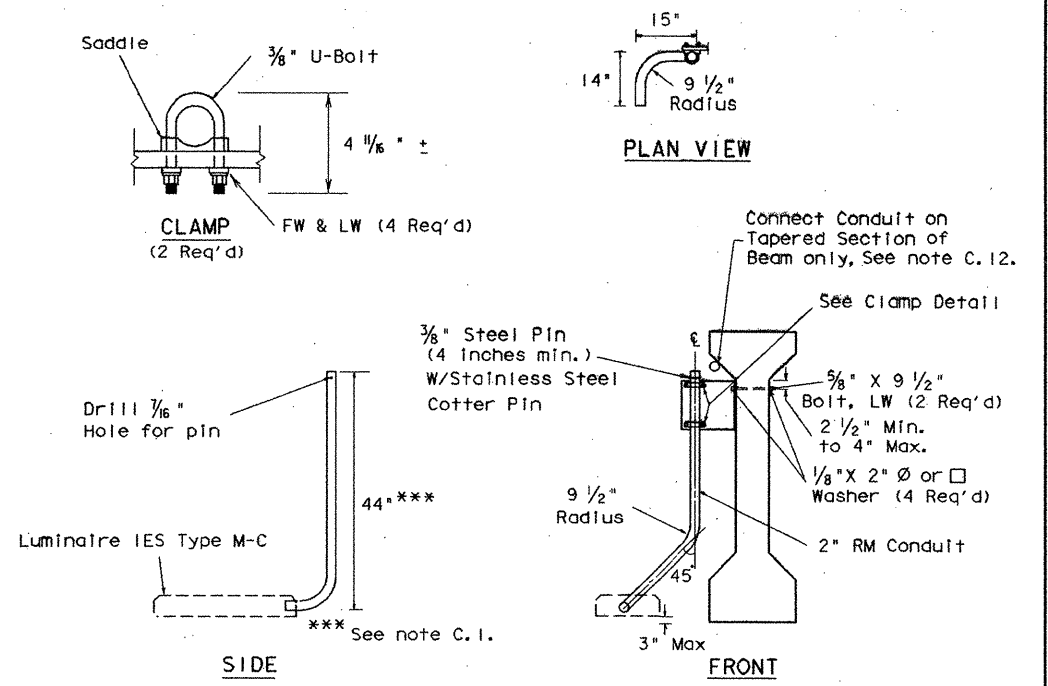
NOTE: Conduit on Columns, Caps, and Slab is shown surface mounted. For all new columns and caps, Contractor shall embed conduit in concrete. Embedded conduit shall be PVC. Metal junction boxes and conduit shall be grounded.



BRACKET DETAIL

Make From 1/2" Plate (ASTM A-36)
Galvanize after fabrication, ASTM A-123

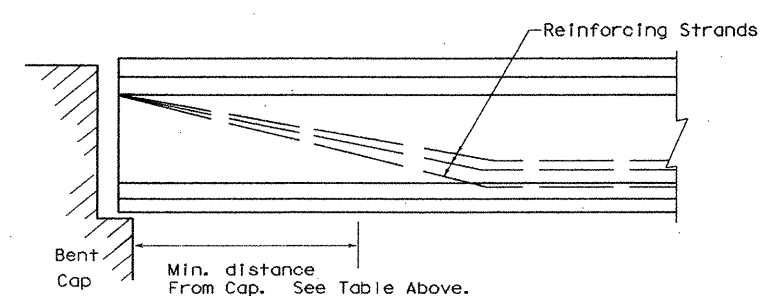
U/P (SPL-CO) (.15 KW)S (TYPE 2)



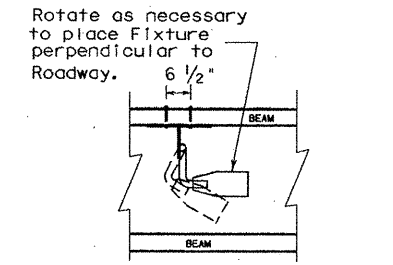
UNDERPASS LIGHTING ARM TYPE 2

Bridge Span Length	Minimum Distance From Bent Cap to Fixture Mounting Arm
≤ 50'	10'
50' - 70'	15'
70' - 90'	20'
> 90'	25'

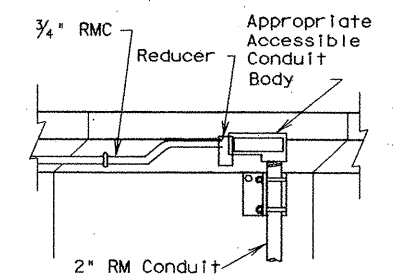
See detail below.



LOCATION OF UNDERPASS LIGHT MOUNTING BRACKET



FIXTURE ORIENTATION



CONDUIT CONNECTION PROFILE (TYPICAL)

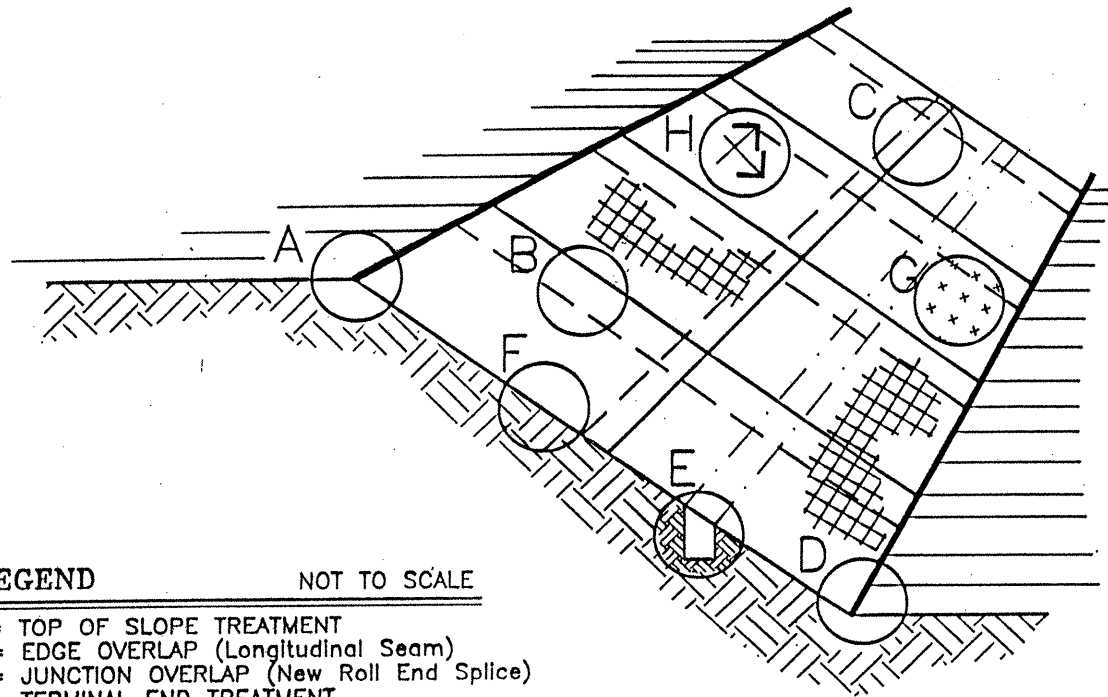
STANDARD PLANS
TEXAS DEPARTMENT OF TRANSPORTATION

ROADWAY ILLUMINATION DETAILS
RID (4) - 93

ORIGINAL DRAWING DATE: 01-92		STATE: 15	FEDERAL: 6	FEDERAL AID PROJECT: NH 95 (40) IM	SHEET: 330
DESIGNED BY: K. A. B.	REVISIONS: 5-93 K. A. B.	COUNTY: COMAL	CONTROL: 0016	SECTION: 05	JOB: 087
CHECKED BY: T. B.	10-93 K. A. B.				HIGHWAY: 72 D

Traffic Operations Division

CLASS 1 - SLOPE PROTECTION APPLICATIONS



LEGEND NOT TO SCALE

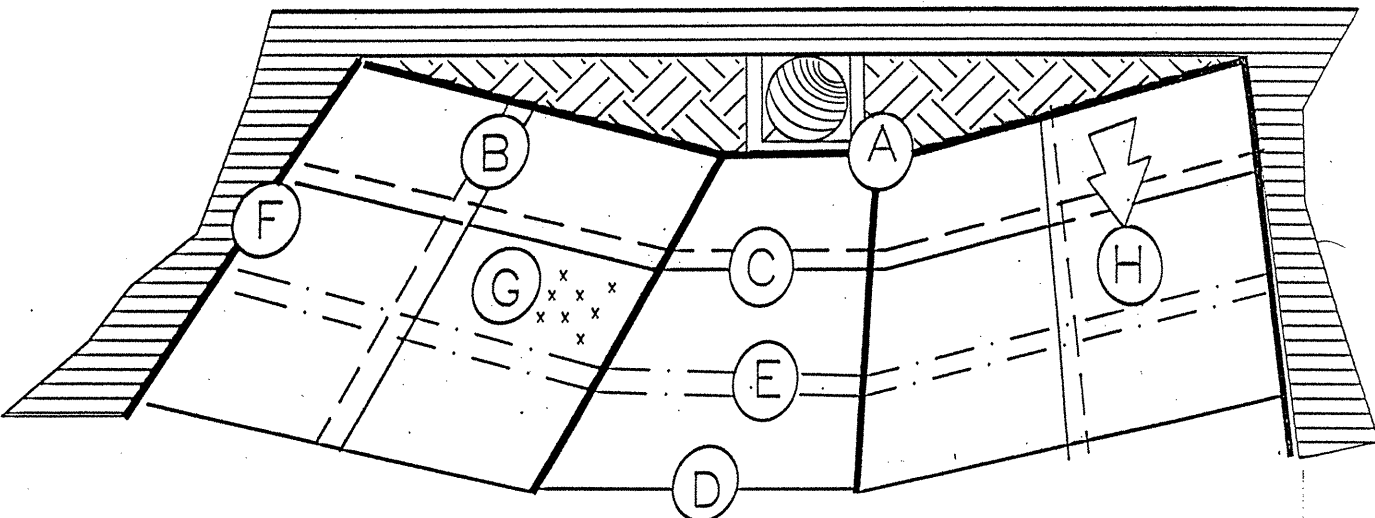
- A = TOP OF SLOPE TREATMENT
- B = EDGE OVERLAP (Longitudinal Seam)
- C = JUNCTION OVERLAP (New Roll End Splice)
- D = TERMINAL END TREATMENT
- E = TRANSVERSE CHECK SLOTS
- F = PERIMETER EDGE TREATMENT
- G = STAPLE/STAKING PATTERN
- H = REMARKS

TYPICAL SLOPE PROTECTION APPLICATION

- CLASS 1, TYPE A = Slopes of 3:1 or Flatter - Clay Soils
- CLASS 1, TYPE B = Slopes of 3:1 or Flatter - Sandy Soils
- CLASS 1, TYPE C = Slopes Steeper than 3:1 - Clay Soils
- CLASS 1, TYPE D = Slopes Steeper than 3:1 - Sandy Soils

REFER TO SHEETS SRB (2-7) - 93 FOR INSTALLATION REQUIREMENTS OF PRODUCTS CURRENTLY APPROVED FOR USE ON SLOPE PROTECTION APPLICATIONS.

CLASS 2, FLEXIBLE CHANNEL LINER APPLICATIONS



LEGEND NOT TO SCALE

- A = TOP OF CHANNEL TREATMENT
- B = EDGE OVERLAP (Longitudinal Seam)
- C = JUNCTION OVERLAP (New Roll End Splice)
- D = END OF CHANNEL TREATMENT
- E = TRANSVERSE CHECK SLOTS
- F = PERIMETER EDGE TREATMENT
- G = STAPLE/STAKING PATTERN
- H = REMARKS

TYPICAL FLEXIBLE CHANNEL LINER APPLICATION

- CLASS 2, TYPE E = Short Term Protection - Shear Stress (td) < 1.0 Lbs/Sq Ft
- CLASS 2, TYPE F = Short Term Protection - Shear Stress (td) 1.0 - 2.0 Lbs/Sq Ft
- CLASS 2, TYPE G = Long Term Protection - Shear Stress (td) > 2.0 < 5.0 Lbs/Sq Ft
- CLASS 2, TYPE H = Long Term Protection - Shear Stress (td) 5.0 Lbs/Sq Ft or Greater

REFER TO SHEETS SRB(8-10) - 93 FOR INSTALLATION REQUIREMENTS OF PRODUCTS CURRENTLY APPROVED FOR USE ON FLEXIBLE CHANNEL LINER APPLICATIONS.

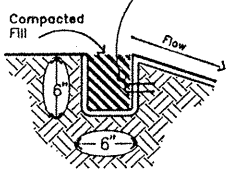
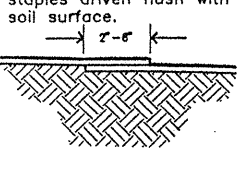
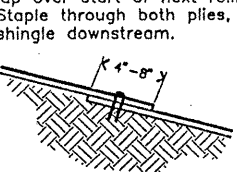
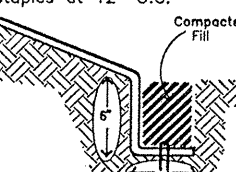
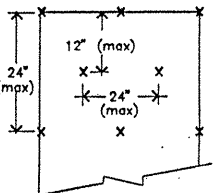
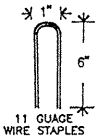
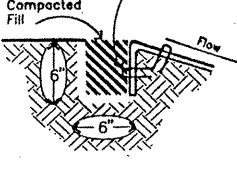
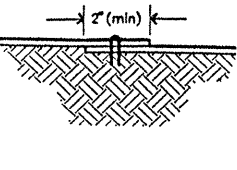
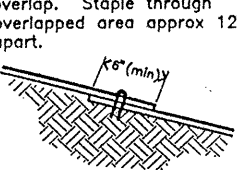
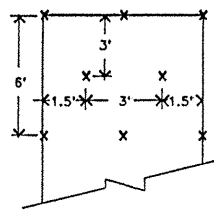
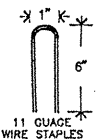
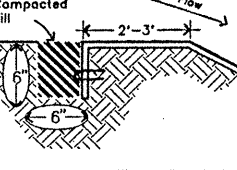
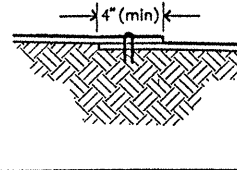
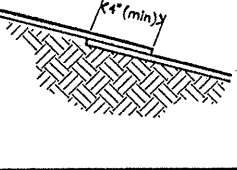
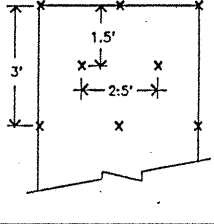
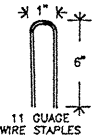
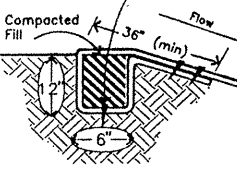
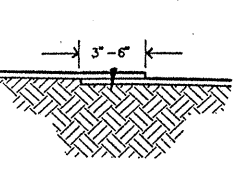
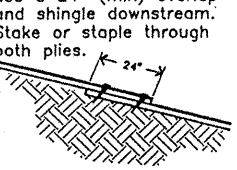
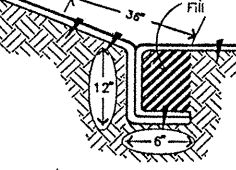
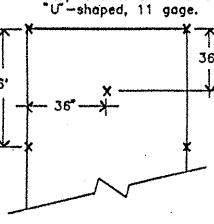
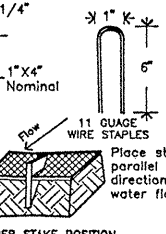
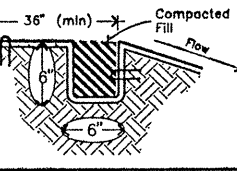
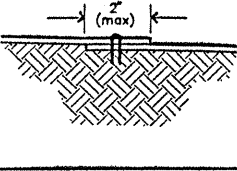
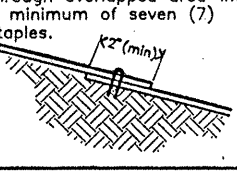
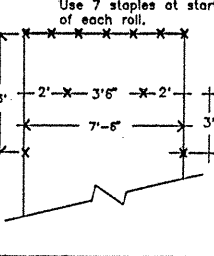
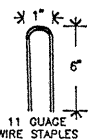
The Contractor has the option of selecting an approved Soil Retention Blanket provided the selection conforms to the list of CURRENTLY APPROVED PRODUCTS for Slope Protection and for Flexible Channel Liner applications, and to the Type and Class as shown on the plans. Prequalification procedures and a list of currently prequalified materials may be obtained by writing to the Director, Maintenance and Operations Division, 125 E. 11th Street, Austin, TX 78701-2483.

STANDARD PLANS TEXAS DEPARTMENT OF TRANSPORTATION
SOIL RETENTION BLANKET (SRB) STANDARDS

SCHEMATIC OF CRITICAL INSTALLATION
POINTS FOR SOIL RETENTION BLANKETS

SRB(1) - 93

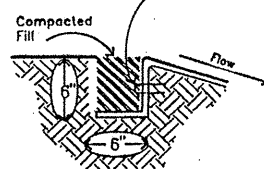
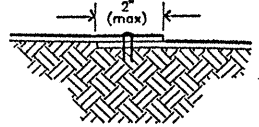
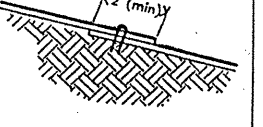
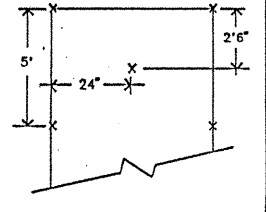
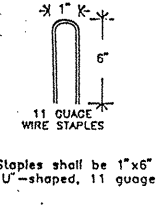
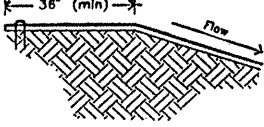
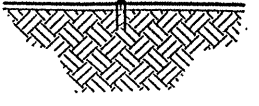
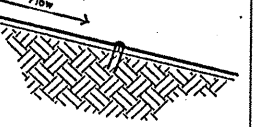
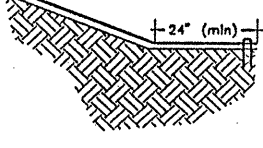
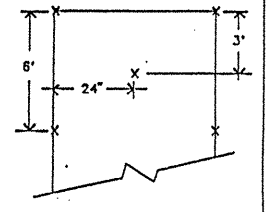
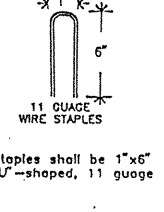
ORIGINAL DRAWING DATE: 2/1/93	STATE DISTRICT	FEDERAL REGION	PROJECT NUMBER	SHEET
DN1: PEN	SAT	6	MANH 95 (40) IM	332
CHK1:	COUNTY	CONTROL	SECT	JOB HWY
ISSUE DATE: 2/1/93	Comal	0016	05	08T IH35
DIVISION OF MAINTENANCE AND OPERATIONS				

PRODUCT NAME	A TOP OF SLOPE	B EDGE OVERLAP	C JUNCT OVERLAP	D TERMINAL END	E TNSV CHECK	F PERIMETER EDGE	G STAPLE PATTERN	G1 STAPLE TYPE	REMARKS
Antiwash/Geojute Soil Saver	Reinforce with row of staples spaced 12" O.C. across roll. 	Edge overlap shall be 2" (min)–6" (max). Staple through both plies with staples driven flush with soil surface. 	On the end of each roll, fold back 4" (min)–8" (max) of end of each roll. Overlap over start of next roll. Staple through both plies, shingle downstream. 	Bring roll down to level area before termination. Fold 6" under and secure with staples at 12" O.C. 	Not Required	Not Required		 Staples shall be 1"x6" "U"-shaped, 11 gauge minimum.	Install product in direction of water flow. Prepare the soil by grading or raking area free of clods and large stones. Do not compact. Fertilizer should be added prior to installing blanket. Seed as specified should be applied to the area prior to installing blanket. Additional seed may be broadcast over the blanket in the event of poor germination.
North American Green S75 North American Green S150 North American Green SC150	Reinforce with row of staples spaced 12" O.C. across roll as shown. 	Edge overlap shall be 2" (min). Staple through both plies with staples flush with surface of the soil. 	When blankets must be spliced down the slope, place blankets end over end (shingle style) with 6" (min) overlap. Staple through overlapped area approx 12" apart. 	Standard Stapling Only	Not Required	Not Required		 Staples shall be 1"x6" "U"-shaped, 11 gauge minimum.	Prepare soil before installing blankets, including the application of fertilizer and seed as specified. Blankets shall be installed in the direction of water flow.
POLYJUTE 407GT TerraJute	Extend blanket 2'–3' past top of slope. Dig 6"x6" anchor slot, staple as shown then fill with compacted soil. 	Overlap edges of blanket at least 4" and in the direction of water flow. Staple centerline of overlap every 36" (max). 	Overlap edges of blanket at least 4" and in the direction of water flow. Staple centerline of overlap every 36". 	Standard Stapling Only	Not Required	Not Required		 Staples shall be 1"x6" "U"-shaped, 11 gauge minimum.	Blankets may be installed either parallel with the slope, or in the direction of water flow. Prepare and grade seedbed including fertilizer and seed as specified before installing the blanket.
Greenstreak PEC–MAT	3 Stakes or staples shall be spaced evenly across bottom of roll. 	Edge overlap shall be 3" (min)–6" (max), stapled or staked through both plies. 	When splicing in a new roll that does not coincide with a transverse check slot, use a 24" (min) overlap and shingle downstream. Stake or staple through both plies. 	Staple or stake as shown. 	Not Required	Not Required		 Staples shall be 1" x 6" "U"-shaped, 11 gauge. 3 1/4" Nominal. 10" MIN. Place stake parallel to direction of water flow. PROPER STAKE POSITION.	Install product in the direction of water flow. Grade surface of installation area shaping and smoothing the soil. Fill in all holes with appropriate fill. Apply fertilizer and seed as specified prior to the installation of the blankets. Insure blanket is in contact with the soil and that it is not in tension.
verdylol ERO–MAT	At the top of each roll, anchor blanket with row of not less than seven (7) staples. Extend blanket 36" beyond top of slope. 	Edge overlap shall be 2" (max), stapled securely through centerline of overlap. 	When blankets must be spliced down the slope, place blankets end over end and shingle style with approx. 2 1/2" overlap. Staple through overlapped area with a minimum of seven (7) staples. 	Standard Stapling Only	Not Required	Not Required		 Staples shall be 1"x6" "U"-shaped, 11 gauge minimum.	Blankets shall be installed in the direction of water flow. Prepare soil to include removal of clods, large stones or other obstructions. Fertilizer and seed as specified is to be applied prior to the installation of the blanket. Unroll the blanket with the netting on top and with the straw fibers in contact with the soil. Each staple must engage a portion of the plastic netting and be set flush with the soil surface.

STANDARD PLANS TEXAS DEPARTMENT OF TRANSPORTATION
SOIL RETENTION BLANKET (SRB) STANDARDS
SLOPE PROTECTION APPLICATIONS
CLASS 1, TYPE A
Slopes 3:1 or Flatter – Clay Soils

SRB(2) – 93

ORIGINAL DRAWING DATE: 2/1/93	STATE DISTRICT: SAT	FEDERAL REGION: 6	PROJECT NUMBER: MANH 95(40)IM	SHEET: 333
DN1: PEN	REVISIONS			
CHK1:	COUNTY: Comal	CONTROL: 0016	SECT: 05	JOB: 007 TH 35
ISSUE DATE: 2/1/93	DIVISION OF MAINTENANCE AND OPERATIONS			

PRODUCT NAME	A TOP OF SLOPE	B EDGE OVERLAP	C JUNCT OVERLAP	D TERMINAL END	E TNSV CHECK	F PERIMETER EDGE	G STAPLE PATTERN	G1 STAPLE TYPE	G REMARKS																									
Xcel Regular Contech Standard Green Triangle Regular Xcel Superior Contech Standard Plus Green Triangle Superior	Reinforce with row of staples spaced 12" across roll. 	Edge overlap shall be 2" (max), stapled 12" O.C. along centerline of overlap. 	Junction overlap shall be 2" (max). Staple junction overlap with staples 12" O.C. along centerline of overlap. 	Standard Stapling Only	Not Required	Not Required		 Staples shall be 1"x6" U-shaped, 11 gauge	Install products in direction of water flow. Seeding and fertilizer, as specified, shall be applied prior to the installation of the blanket. The blanket shall be in contact with the soil over the entire area. Insure that netting is on top of the excelsior fiber.																									
Curlex (standard)	Blankets should extend a minimum of 36" over crest of slope. Anchor blankets at top of each roll by using a minimum of 4 staples evenly spaced across blanket. 	Butt adjacent rolls together without overlap and use a common row of 1"x6" 11 gauge staples evenly spaced along centerline of joint. 	Butt ends of rolls together without overlap and use a common row of 1"x6" 11 gauge staples evenly spaced along centerline of joint. 	Bring blanket to level area and extend 24" (min) as shown. Terminal end shall be anchored with a minimum of 4 staples per roll, spaced evenly across roll. 	Not Required	Not Required		 Staples shall be 1"x6" U-shaped, 11 gauge	Install products in direction of water flow. All fertilizer and seeding as specified shall be performed prior to the installation of the blanket. During installation, insure that netting is on top and that the fibers are in direct contact with the soil.																									
Airtrol	Not Required	Not Required	Not Required	Not Required	Not Required	Not Required	Not Required	Not Required	Airtrol Plaster is a cementious gypsym binder applied in conjunction with an approved cellulose fiber mulch through a hydraulic seeding process. The product shall be applied as follows: <table><tr><th>HYDROSEEDER CAPACITY (GAL)</th><th>WATER (GAL)</th><th>PLASTER (LBS)</th><th>CELLULOSE FIBER MULCH (LBS)</th><th>COVERAGE (ACRES)</th></tr><tr><td>900</td><td>800</td><td>1200</td><td>320</td><td>0.20</td></tr><tr><td>1100</td><td>975</td><td>1450</td><td>400</td><td>0.25</td></tr><tr><td>1500</td><td>1350</td><td>2000</td><td>540</td><td>0.33</td></tr><tr><td>3000</td><td>2700</td><td>4000</td><td>1080</td><td>0.66</td></tr></table> For every 100 gallons of water, add 150 lbs of Airtrol Plaster and 40 lbs of an approved cellulose fiber mulch for a coverage rate of 0.025 acres/100 gallons of slurry.	HYDROSEEDER CAPACITY (GAL)	WATER (GAL)	PLASTER (LBS)	CELLULOSE FIBER MULCH (LBS)	COVERAGE (ACRES)	900	800	1200	320	0.20	1100	975	1450	400	0.25	1500	1350	2000	540	0.33	3000	2700	4000	1080	0.66
HYDROSEEDER CAPACITY (GAL)	WATER (GAL)	PLASTER (LBS)	CELLULOSE FIBER MULCH (LBS)	COVERAGE (ACRES)																														
900	800	1200	320	0.20																														
1100	975	1450	400	0.25																														
1500	1350	2000	540	0.33																														
3000	2700	4000	1080	0.66																														

STANDARD PLANS TEXAS DEPARTMENT OF TRANSPORTATION
SOIL RETENTION BLANKET (SRB) STANDARDS
SLOPE PROTECTION APPLICATIONS
CLASS 1, TYPE A (CONTINUED)
Slopes of 3:1 or Flatter - Clay Soils.

ORIGINAL DRAWING DATE: 2/1/93
DN1: PEN
CHK1:

3/1/93
REVISIONS

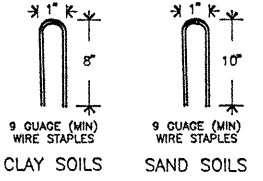
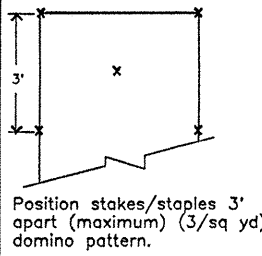
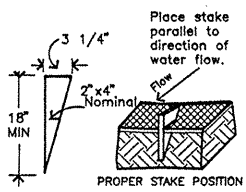
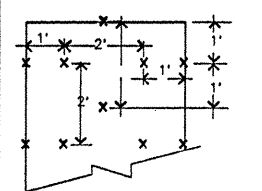
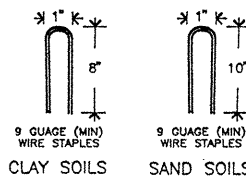
STATE DISTRICT
FEDERAL REGION
PROJECT NUMBER
SHEET

SAT 8
MANH 95 (40)IM
334

COUNTY
CONTROL
SECT
JOB
HWY

Comal
0016
05
087
IH 35

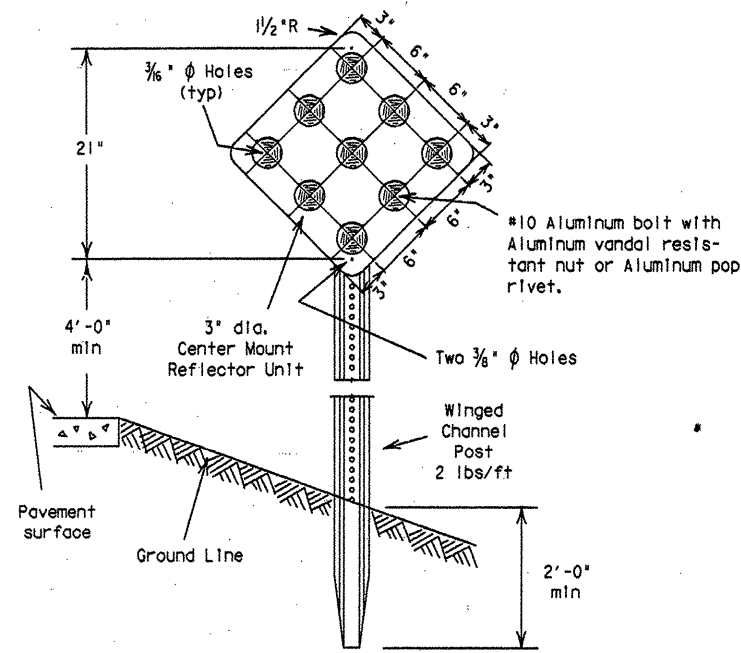
DIVISION OF MAINTENANCE AND OPERATIONS

NAME OF APPROVED BRAND	A TOP OF CHNL	B EDGE OVERLAP	C JUNCT OVERLAP	D END OF CHNL	E CHECK SLOTS	F JUNCT OVERLAP	G STAPLE PATTERN	G-1 STAPLE TYPE	REMARKS
HI-VELOCITY CURLEX	Bury blanket in 10" deep x 6" (min) trench and compact. Start with 4 staples evenly spaced across roll. When using 2 or more blankets in channel bottom, do not place seams in channel centerline.	If adjacent rolls are required, overlap shall be 8" (min) (shingle style), staked through centerline of overlap.	When a roll terminates, it shall be staked over the new roll with a minimum overlap of 18".	At end of channel, bury blanket in a 10"x6" (min) trench. Staple with 4 staples spaced evenly across roll.	Install 6" (min) width x 12" (max) depth transverse check slots at 25' O.C. Staple with 4 staples spaced evenly across roll, then fill trench with compacted soil.	Blankets shall extend 12" (min) above level of water flow at maximum estimated depth. Staple perimeter edge at 36" O.C. (min).	Start each roll with 4 staples evenly spaced.		Blankets shall be installed in the direction of water flow. When using two blankets side by side in a channel, do not place the seams in the center of the channel. Offset seams 6" minimum.
GEOCOIR/DeKoWe 900	Bury blanket in 10" deep x 6" wide (min) trench. Staple and compact securely.	If adjacent rolls are required, overlap shall be 8" (min) (shingle style), staked through centerline of overlap.	When a roll terminates, it shall be staked over the new roll with a minimum overlap of 18".	At end of channel, bury blanket in a 10"x6" (min) trench. Staple with 4 staples spaced evenly across roll.	Install 6" (min) width x 12" (max) depth transverse check slots at 25' O.C. Staple with 4 staples spaced evenly across roll, then fill trench with compacted soil.	Blankets shall extend 12" (min) above level of water flow at maximum estimated depth. Staple perimeter edge at 36" O.C. (min).			Blankets shall be installed in the direction of water flow. If wooden stakes are not appropriate for the project, use 9 gauge (minimum) staples, 1"x10" (minimum), fitted with a metal washer.
XCEL SUPER DUTY CONTECH SUPER PLUS	Bury blanket in 10" deep x 6" wide (min) trench. Staple and compact securely.	If adjacent rolls are required, overlap shall be 8" (min) (shingle style), staked through centerline of overlap.	When a roll terminates, it shall be staked over the new roll with a minimum overlap of 18".	At end of channel, bury blanket in a 10"x6" (min) trench. Staple with 4 staples spaced evenly across roll.	Install 6" (min) width x 12" (max) depth transverse check slots at 25' O.C. Staple with 4 staples spaced evenly across roll, then fill trench with compacted soil.	Blankets shall extend 12" (min) above level of water flow at maximum estimated depth. Staple perimeter edge at 36" O.C. (min).			Blankets shall be installed in the direction of water flow. Blanket should be in contact with the soil over the entire area. Blanket should be installed over a properly prepared, fertilized and seeded area.

STANDARD PLANS TEXAS DEPARTMENT OF TRANSPORTATION
SOIL RETENTION BLANKET (SRB) STANDARDS
FLEXIBLE CHANNEL LINER APPLICATIONS
CLASS 2, TYPE E & F
SHEAR STRESS UP TO 2.0 LB./SQ FT
SRB(8) - 93

ORIGINAL DRAWING DATE: 2/1/93	STATE DISTRICT: SAT	FEDERAL REGION: 6	PROJECT NUMBER: MANH 95(40)IM	SHEET: 335
DN1: PEN	REVISIONS			
CHK1:				
ISSUE DATE: 2/1/93	COUNTY: Comal	CONTROL: 0016	SECT: 05	JOB HWY: 087 IH35
DIVISION OF MAINTENANCE AND OPERATIONS				

OBJECT MARKER TYPES 1 and 4



TYPE 1 and 4 Object Markers shall consist of Type (b) Center Mount Reflector Units mounted on 0.080" thick sheet aluminum conforming with ASTM B-209 Alloy 6061-T6.

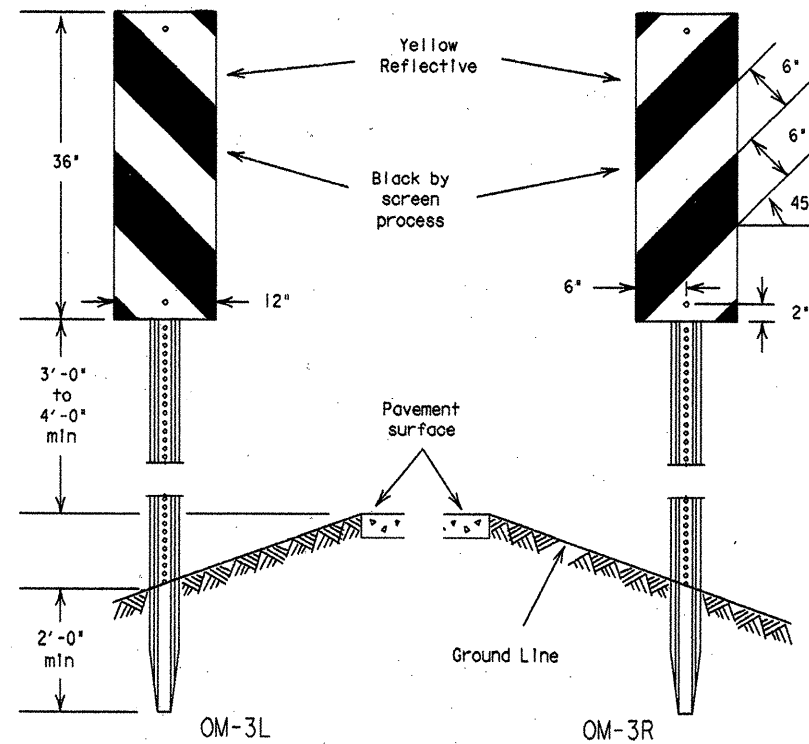
TYPE 1 OM-1R

18" x 18"
Reflector Unit - YELLOW
Background - (YELLOW - Non-Reflective)

TYPE 4 OM-4R

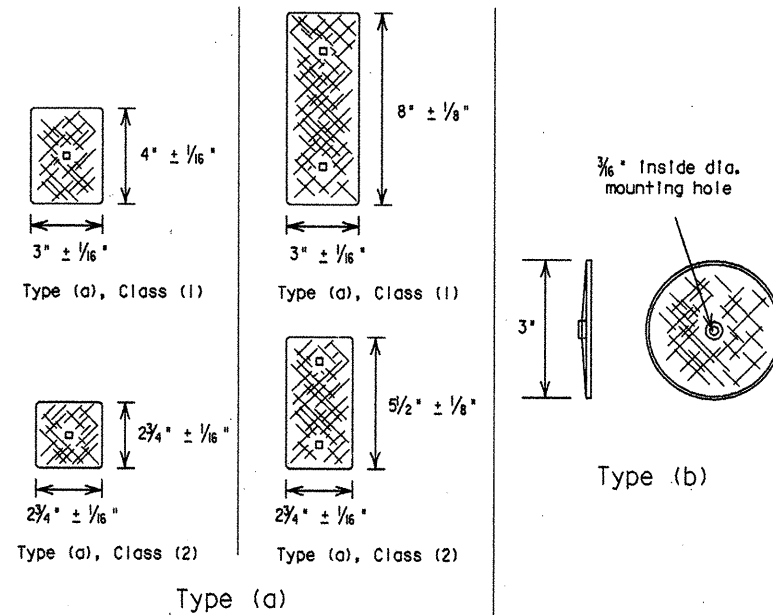
18" x 18"
Reflector Unit - RED
Background - (RED - Non-Reflective)

OBJECT MARKER TYPE 3



Sign blank to be .080" thick sheet aluminum conforming to ASTM B-209 Alloy 6061-T6.
Reflective sheeting shall be in accordance with Department Material Specification, D-9-8300, Type C.

TYPICAL REFLECTOR UNITS



Type (a) - Reflective sheeting with pressure sensitive backing. For certain (non-flexible post) applications, reflective sheeting may be directly applied to approved metal, plastic or fiberglass backplate with 17/64" square mounting hole.

It is the contractor's option to provide Class (1) or Class (2) reflective sheeting in accordance with Department Material Specification D-9-8600. All reflector units per delineator or object marker shall be of the same type and class of reflective sheeting.

Type (b) - Centermount acrylic plastic prismatic reflector.

SPECIFICATION REFERENCE TABLE	
MATERIALS AND TEST SPECIFICATIONS (D-9)	
FLEXIBLE DELINEATOR & OBJECT MARKER POSTS (DRIVEABLE & SURFACE MOUNT TYPES)	D-9-4400
FLAT SURFACE REFLECTIVE SHEETING, TYPE C (HIGH SPECIFIC INTENSITY)	D-9-8300
NON-REFLECTIVE BACKGROUND COATING	D-9-8500
DELINEATOR AND OBJECT MARKER	D-9-8600

GENERAL NOTES:

- Delineators shall be uniformly placed not less than 2 feet nor more than 8 feet from the edge of shoulder or the face of unmountable curb. They may be placed in line with guardrail where guardrail is used.
- Object markers shall be located at points designated on the plan.
When used for marking objects in the roadway or 8 feet or less from the shoulder or curb, the mounting height to the bottom of the object marker should normally be 4 feet above the surface of the nearest traffic lane. When used to mark objects more than 8 feet from the shoulder or curb, the mounting height to the bottom of the object marker may be 4 feet above the ground line.
- When object markers or markings are applied to a hazardous object which by its nature required a lower or higher mounting, the vertical mounting height may vary according to need.
- Hardware shall be galvanized steel, stainless steel, or aluminum, except as noted.
- Posts for supporting delineators and object markers shall be in accordance with the Department Material Specification D-9-7130 and details on Standard Sheet D & OM (2).
- Type 1, 3 and 4 object marker posts shall be 2 lbs/ft winged channel in accordance with Department Material Specification D-9-7130.
- Delineator and object markers shall be in accordance with Department Material Specification D-9-8600.

OBJECT MARKERS TYPE 2

YELLOW (R-reflector unit, P-panel)

Type	OM-2SR				OM-2VP	
	3"	3"	2 3/4"	2 3/4"	6"	2 3/4"
Class	1	1	2	2	n/a	2
Post	WC	FLEX	WC	FLEX	WC	FLEX

WC-wing channel post (1.12 lbs/ft)

FLEX-flexible post (driveable and semi-driveable)

DELINEATORS

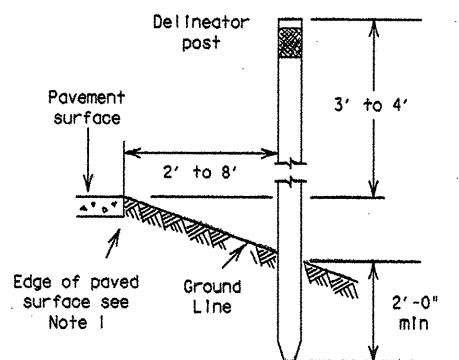
Type	SINGLE D-SY, D-SW or D-SR					DOUBLE D-DY or D-DW				
	3"	3"	2 3/4"	2 3/4"	3"	3"	3"	2 3/4"	2 3/4"	3"
Class	1	1	2	2	n/a	1	1	2	2	n/a
Post	WC	FLEX	WC	FLEX	WC	WC	FLEX	WC	FLEX	WC

Length of post may vary to meet field conditions.

REFLECTOR UNITS: W-white, Y-yellow, R-red

WC-wing channel post (1.12 lbs/ft)

FLEX-flexible post (driveable and semi-driveable)



TYPICAL INSTALLATION



STANDARD PLANS
TEXAS DEPARTMENT OF TRANSPORTATION

DELINEATORS & OBJECT MARKERS

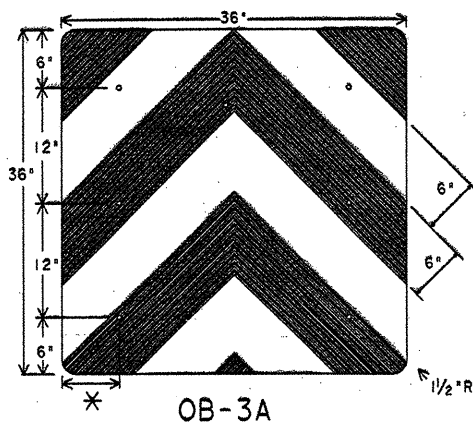
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ORIGINAL DRAWING DATE: 1-81	STATE: 15	FEDERAL DISTRICT: 6	FEDERAL AID PROJECT: NH 95(40)IM	SHEET: 336
REVISED: 1-82	COUNTY: COMAL	CONTROL: 0016	SECTION: 05	JOB: 087
REVISED: 4-92				HIGHWAY: 1H 35

Division of Maintenance and Operations

20A



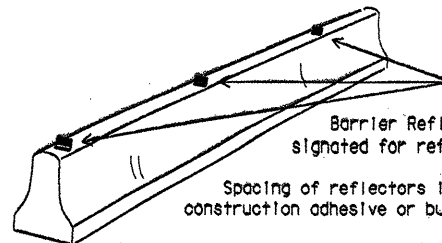
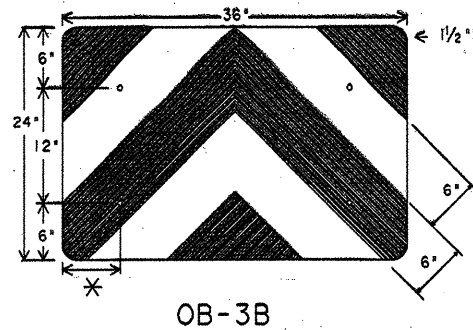
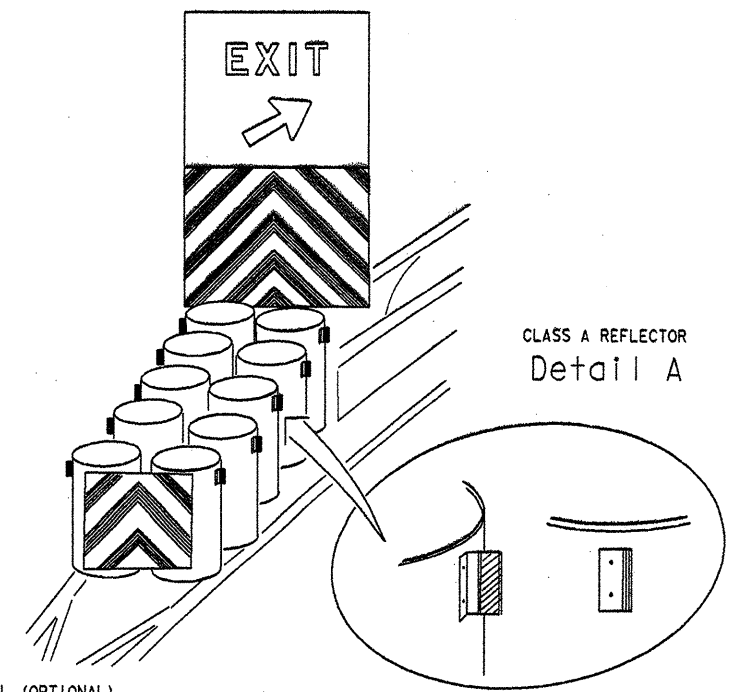
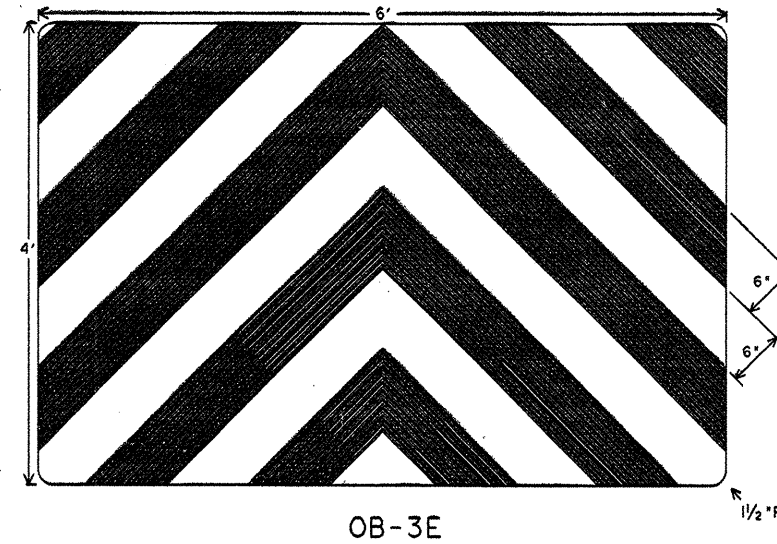
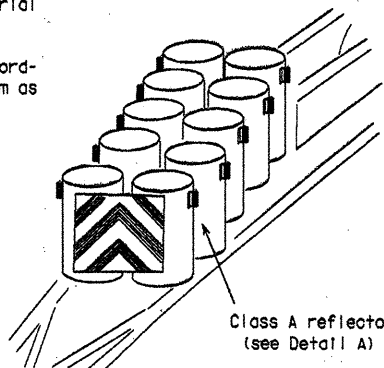
Object Marker reflective sheeting will conform to Material Specification D-9-8300, Type C.

Object Marker blank to be 5/8" Plywood (Type A) in accordance with Item "PLYWOOD SIGNS (TYPE A)" or .08 Aluminum as per Specification D-9-7110.

Background - yellow reflective, chevron - black. Mounting should be flush with top of VIA. Minimum size 36" x 24".

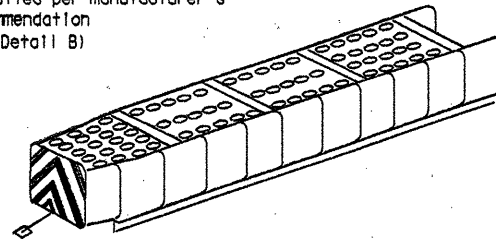
Nuts and bolts may be used to fasten Object Markers to attenuator.

Class A or B reflectors may also be used to delineate side of attenuator.

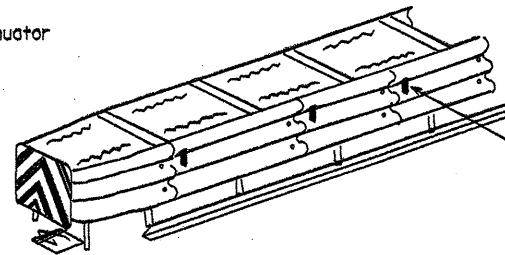


Color of barrier reflectors will conform to the Texas "Manual on Uniform Traffic Control Devices", (TMUTCD).

Class B reflector
Installed per manufacturer's
recommendation
(see Detail B)



* adjust to fit attenuator
per manufacturer's
recommendation, or as
directed by the
Engineer.



CLASS A REFLECTOR

Reflectors for Concrete Traffic Barrier and Drum Type Attenuator may be:

1. Davidson Plastics Co. - PCBM-12
2. Cal. Tex. Ind., Inc. - Microprism Delineator
3. Cal. Tex. Ind., Inc. - Cube Corner Delineator
4. Stimsonite - Barrier and Guardrail Delineator, Model 965
5. Stimsonite - Barrier Delineator, Model 967
6. Astro Optics - JD-1 or No. 181
7. Reflexite Corp. - Model 661, Model 662
8. Duraflex Corp. - Flexx 2020

CLASS B REFLECTOR

Reflectors for other Type Attenuator and Metal Beam Guard Fence

1. Stimsonite - Barrier and Guardrail Delineator, Model 965
2. Astro Optics - Guardrail Delineator, Model 567

Class A or B reflectors may be installed using pop rivets, nuts and bolts, construction adhesive or butyl rubber adhesive.

Class A or B reflectors shall conform to the color and reflectivity requirements of Specification D-9-8600.

Color of Class A or B reflector will be the same color as the nearest edge line, gore pavement markings or as directed by the Engineer.

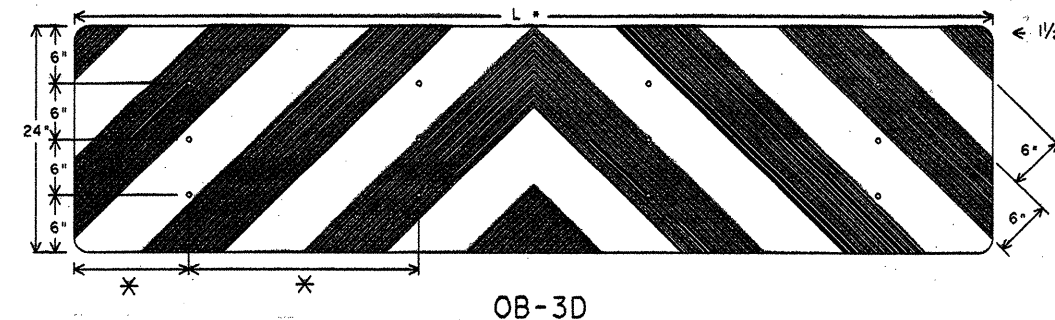
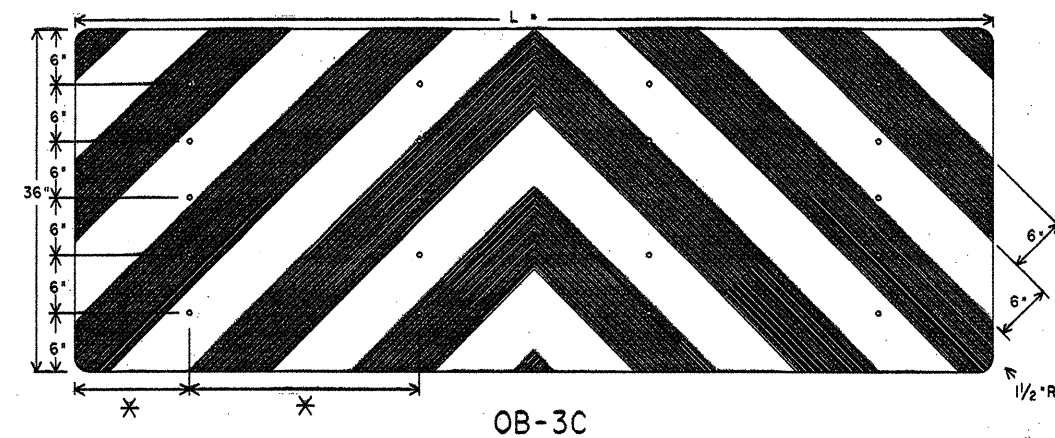
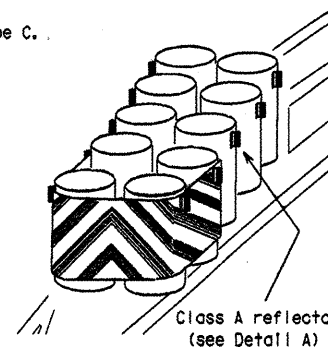
Object Marker sheeting will conform to Specification D-9-8300, Type C.

Background - yellow reflective, chevron - black. Mounting should be flush with top of attenuator. Minimum size 96" x 24".

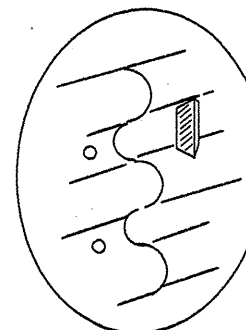
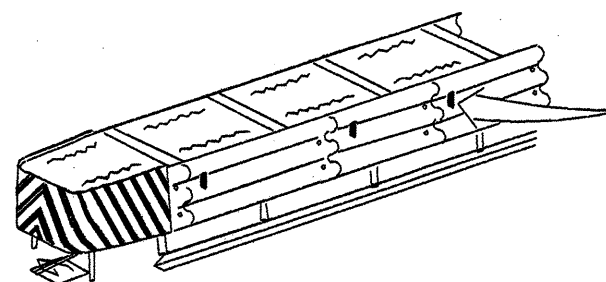
Pop rivets or nuts and bolts may be used to attach object markers and reflectors to attenuators.

Reflective sheeting applied to galvanized sheet metal gauge 24 to 28 per ASTM A366.025 nominal. Aluminum sheet of 6061-T6 or 5052-H38 alloys approximately .065 inch thickness, Low Density Polyethylene approximately .080 inch thickness or Medium Density Polyethylene approximately .080 inch thickness. Other materials may be specified in the plans or approved by the Engineer.

Class A or B reflectors may also be used to delineate side of attenuator.



* spacing adjusted to attach through
centerline of drum, per attenuator
manufacturer's recommendation, or as
directed by the Engineer.



CLASS B REFLECTOR
Detail B

BACK PANEL (OPTIONAL)

Back Panel (OB-3E) shall be made of 5/8" plywood (Type A) panels unless otherwise noted in the plans. Type C sheeting per Material Specification D-9-8300.

Background - yellow reflective, chevron - black.

Back panel will be mounted independent of the attenuator. The minimum mounting height is flush with the top of the attenuator.

Alternating flashing yellow lights may be added. Lights should be mounted minimum 72" above pavement.

Attenuator may have additional yellow reflective and black striping, and/or reflectors placed on sides. CHEVRONS (W-18) may be erected to delineate roadway curvature beyond the attenuator. These additional devices will be installed if required elsewhere in the plans.

Mount Back Panel per details on SMD Standards, or as detailed elsewhere in the plans.

GENERAL NOTES:

1. Holes, slots or other openings may be cut or drilled through OB-3 Object Markers to allow cable or other attachments.
2. Minimum size may be reduced to fit smaller attenuator.
3. When traffic passes only on one side of attenuator, only the OM-3 marker should be installed. OM-3 should be installed per the requirements of D & OM Standards with a mounting height of 18 inches.
4. OM-3 marker will meet the color and reflective requirements of the Material Specification D-9-8300.
5. All traffic control devices shall conform to the TMUTCD.

TRAFFIC FLOW	BOTH SIDES						ONE SIDE
ATTENUATOR TYPE	OB-3A	OB-3B	OB-3C	OB-3D	L	OM-1	OM-3
GREAT	NR	✓	NR	✓	96"	✓	
Steel Drum	✓	✓	✓	✓	114"	✓	
Hydraulic	✓	✓	NR	NR	NR	✓	
Hex Foam	✓	✓	NR	NR	NR	✓	
Low Maintenance	NR	✓	NR	✓	96"	✓	
Sand Filled Plastic Modules	NR	NR	NR	NR	NR	✓	
Sand Tire	NR	NR	NR	NR	NR	✓	

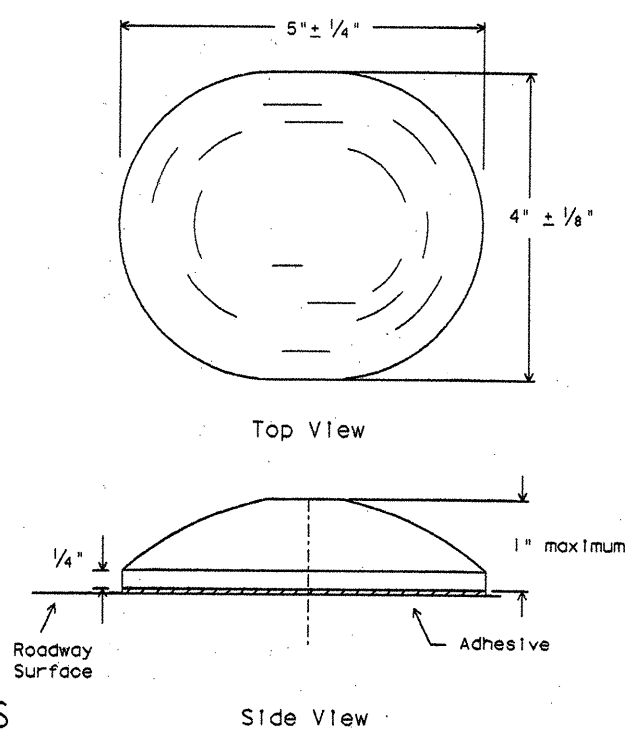
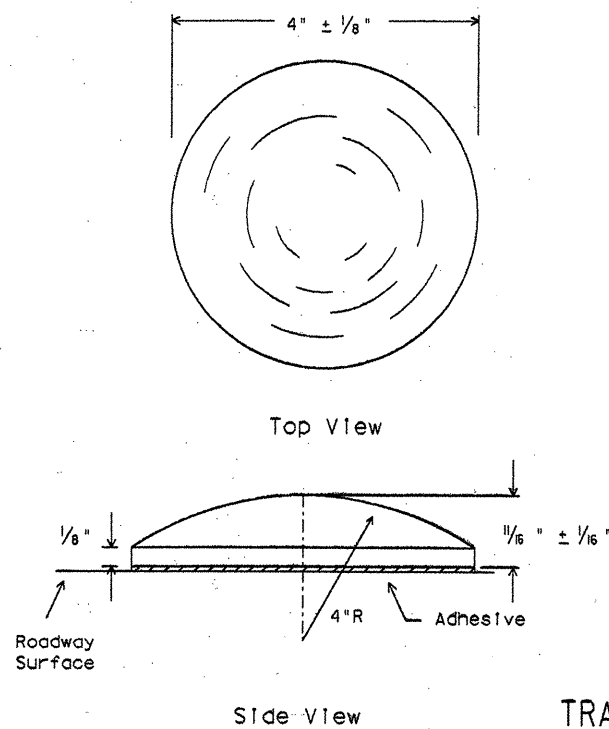
NR - Not Recommended



STANDARD PLANS TEXAS DEPARTMENT OF TRANSPORTATION DELINEATORS & OBJECT MARKERS FOR VEHICLE IMPACT ATTENUATORS D & OM(VIA)-92

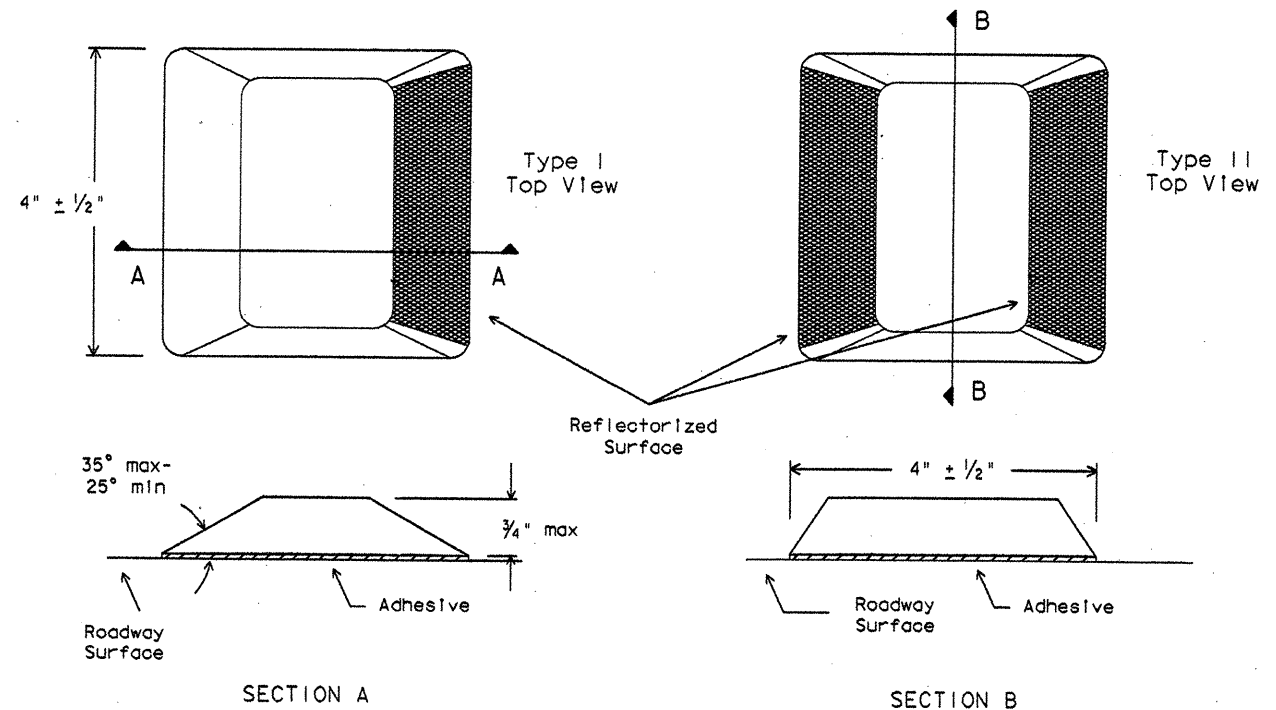
ORIGINAL DRAWING DATE: 12-89	STATE DISTRICT: 15	FEDERAL REGION: 6	FEDERAL AID PROJECT: NH 95(40)1M	SHEET: 337
DATE: 4-90	COUNTY: COMAL	CONTROL SECTION: 0016	JOB: 05 087	HIGHWAY: 1H35
DATE: 4-92				20C

Division of Maintenance and Operations

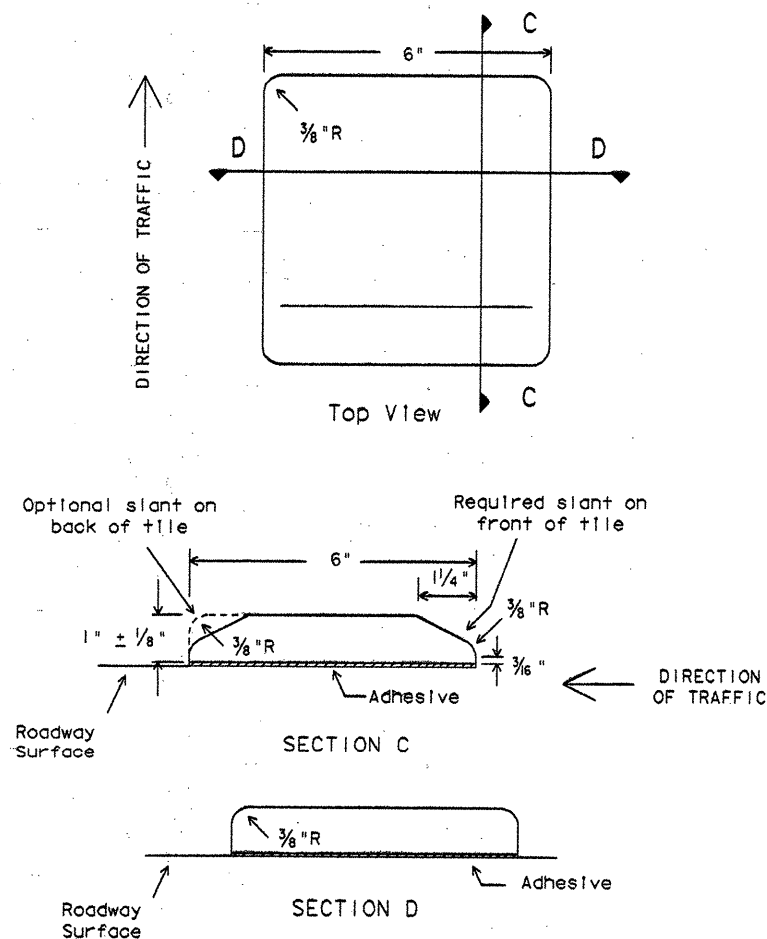


TRAFFIC BUTTONS
(NON-REFLECTORIZED)

NOTE: Minimum area of markers shall be not less than 12.5 square inches.
Either shape may be used but the same shape shall be used through out the project.

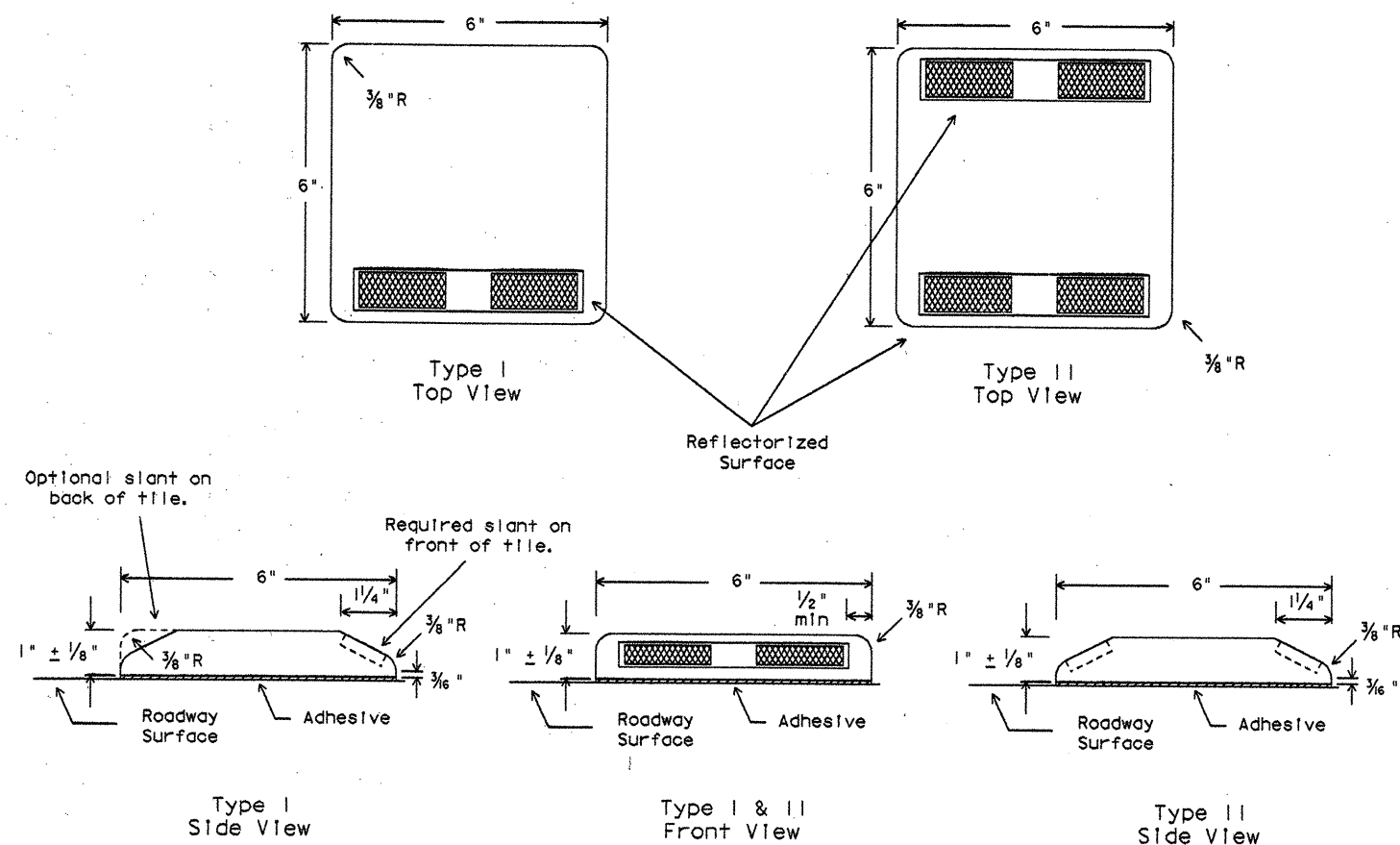


RAISED PAVEMENT MARKERS
(REFLECTORIZED)



JIGGLE BAR TILES
(NON-REFLECTORIZED)

"Jiggle Bars" consist of a number of Jiggle Bar Tiles placed in a linear configuration.



JIGGLE BAR TILES
(REFLECTORIZED)

SPECIFICATION REFERENCE TABLE	
MATERIALS AND TEST SPECIFICATIONS (D-9)	
JIGGLE BAR TILE	D-9-4100
PAVEMENT MARKERS (REFLECTORIZED)	D-9-4200
TRAFFIC BUTTONS	D-9-4300
BITUMINOUS ADHESIVE	D-9-6130

GENERAL NOTES:

RAISED PAVEMENT MARKERS (RPMs) MAY CONSIST OF TRAFFIC BUTTONS, PAVEMENT MARKERS AND/OR JIGGLE BAR TILES. PAVEMENT SURFACE SHALL BE PREPARED AND CLEANED SUBJECT TO APPROVAL OF THE ENGINEER BEFORE ADHESIVE AND RPMs ARE PLACED.

JIGGLE BARS SHALL BE ORIENTED PERPENDICULAR TO ROADWAY. JIGGLE BARS SHALL ALSO BE PLACED AT SUCH OTHER LOCATIONS AS SHOWN IN PLANS OR AS DIRECTED BY THE ENGINEER.

MARKERS, BUTTONS AND JIGGLE BAR TILES SHOWN ARE FOR ILLUSTRATION PURPOSES ONLY AND NOT INTENDED TO SPECIFY ANY PARTICULAR PRODUCT. ALL PAVEMENT MARKERS PROVIDED SHALL BE OF THE SAME MANUFACTURER.

ALL DIMENSIONS ARE $\pm 1/8$ " UNLESS OTHERWISE NOTED.

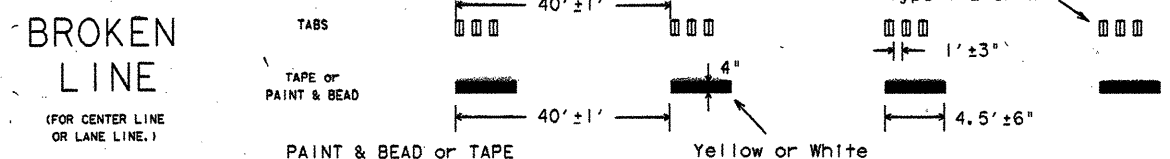
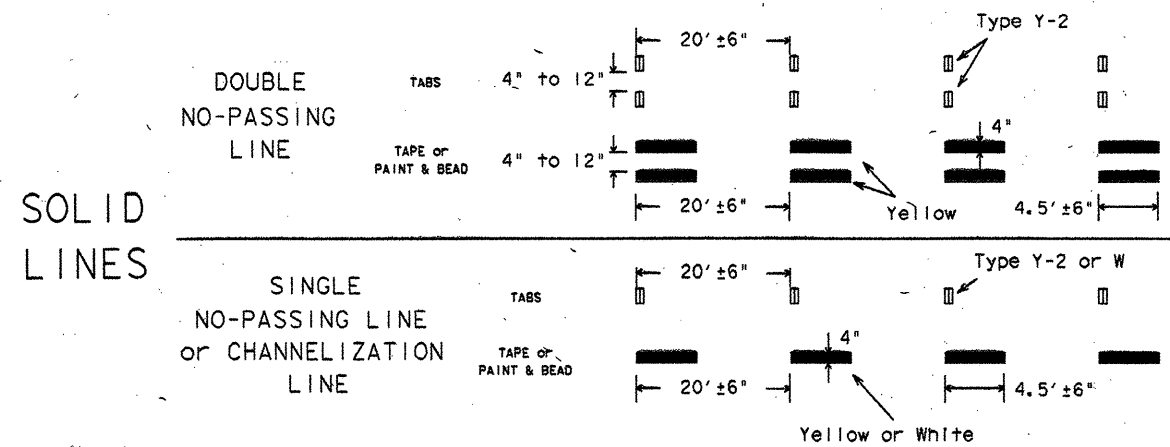


STANDARD PLANS
TEXAS DEPARTMENT OF TRANSPORTATION
RAISED PAVEMENT MARKERS
REFLECTIVE PAVEMENT MARKERS,
TRAFFIC BUTTONS &
JIGGLE BAR TILE

RPM(1)-92

ORIGINAL DRAWING DATE: 1-81				STATE	FEDERAL	FEDERAL AID PROJECT	SHEET
DN. LR	2-82	7-86	4-92	15	6	NH 95 (40) IM	338
DN. DN	7-85	10-86					
DN. CL	11-85	12-90					
				COUNTY	CONTROL	SECTION	JOB
				COMAL	0016	05	087

WORK ZONE SHORT TERM PAVEMENT MARKINGS DETAILS



If raised pavement markers are used to supplement REMOVABLE short term markings, the markers shall be applied to the top of the tape at the approximate mid length of the tape. This allows an easier removal of raised markers and tape.

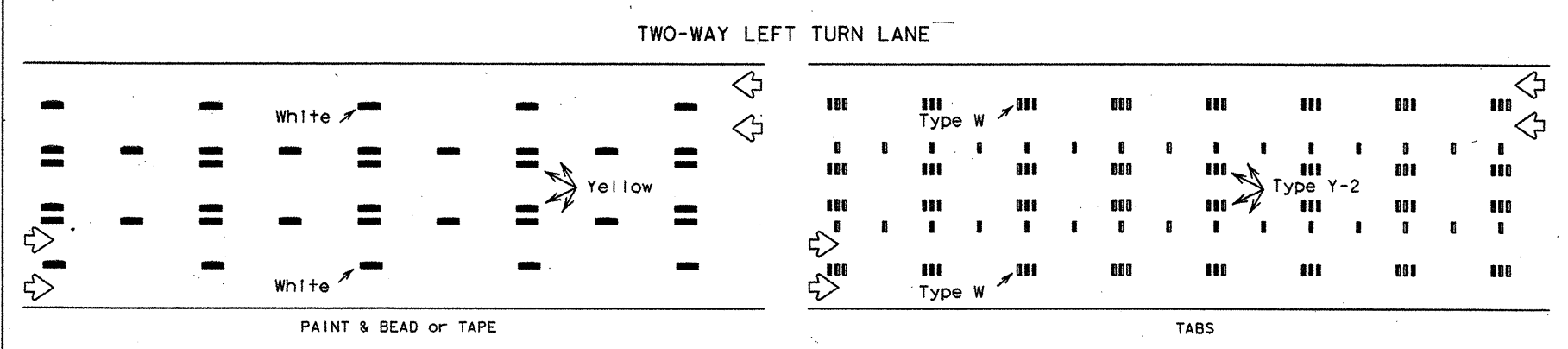
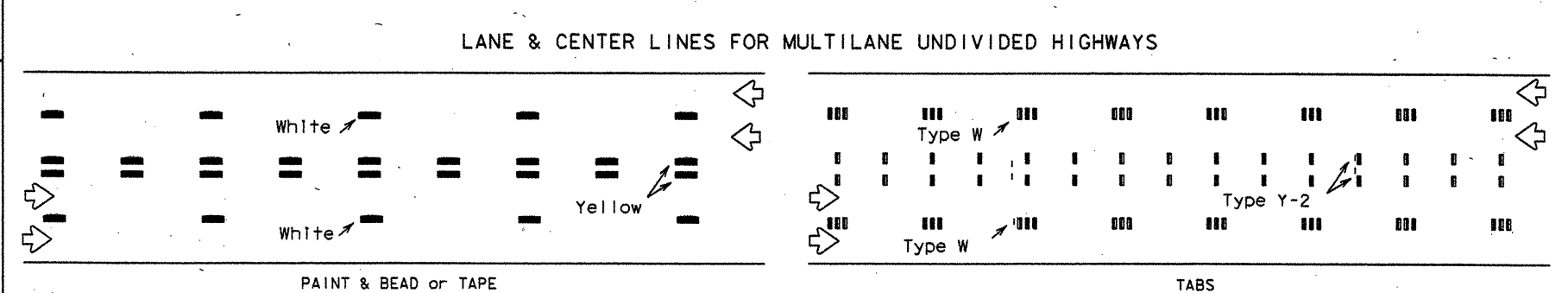
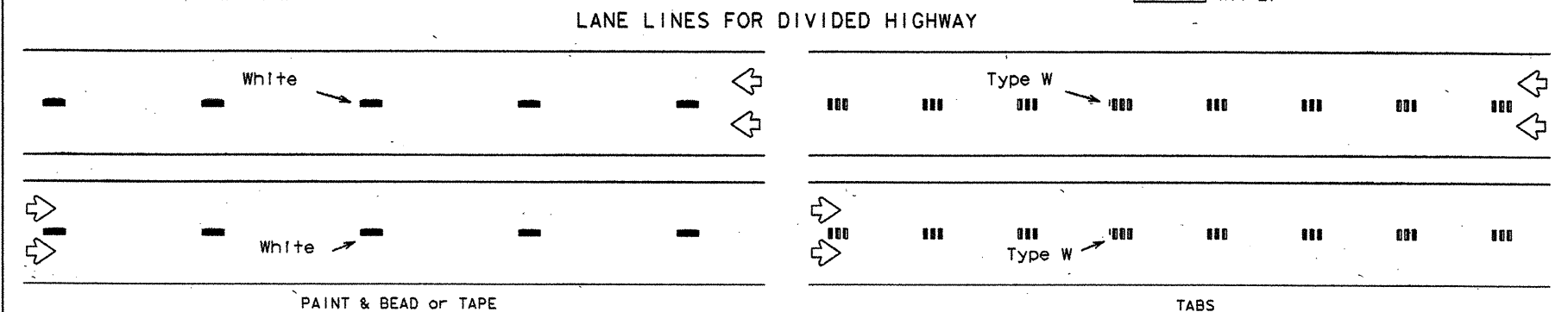
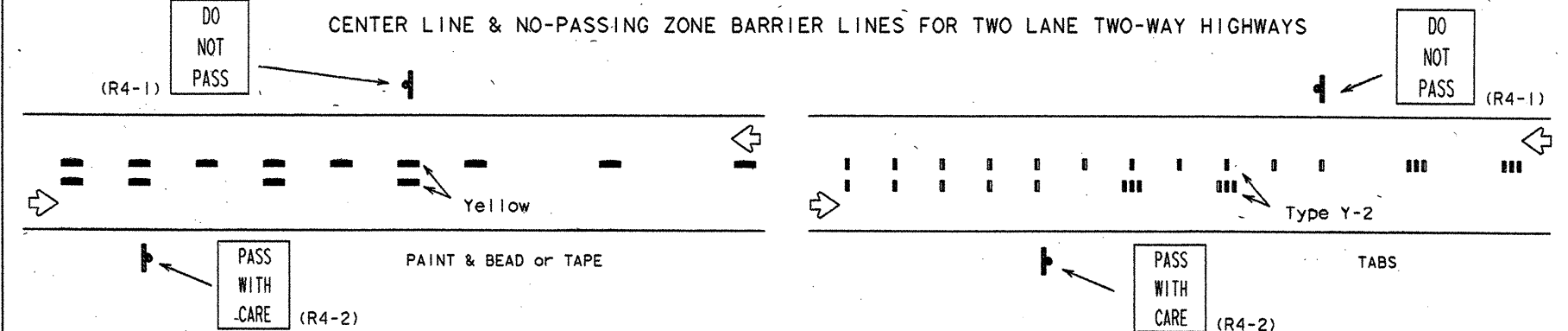
SPECIFICATION REFERENCE TABLE	
MATERIALS AND TESTS SPECIFICATIONS (D-9)	
PREFABRICATED PAVEMENT MARKINGS-REMOVABLE	D-9-8241
TEMPORARY FLEXIBLE-REFLECTIVE ROADWAY MARKER TABS	D-9-8242
PAVEMENT MARKERS (REFLECTORIZED)	D-9-4200

- NOTES:
- Short term pavement markings may be paint and beads, prefabricated markings (stick down tape) or temporary flexible-reflective roadway marker tabs unless otherwise specified elsewhere in plans. Paint and beads shall not be used as removable short term pavement markings.
 - Short term pavement markings shall NOT be used to simulate edge lines.
 - Dimensions indicated on this sheet are typical and approximate. Variations in size and height may occur between markers or devices made by manufacturers, by as much as 1/4 inch, unless otherwise noted.
 - Temporary flexible-reflective roadway marker tabs will require normal maintenance replacement when used on roadways with an ADT per lane of up to 7500 vehicles with no more than 10% truck mix. When roadways exceed these values, additional maintenance replacement of devices should be planned.
 - No segment of roadway open to traffic shall remain without standard pavement markings for a period greater than 14 calendar days. The Contractor will be responsible for maintaining short term pavement markings until standard pavement markings are in place. When the Contractor is responsible for placement of standard pavement markings, no segment of roadway shall remain without standard pavement markings for a period greater than 14 calendar days unless weather conditions prohibit placement. Standard pavement markings shall be placed as soon as weather permits.
 - For two lane, two-way roadways, DO NOT PASS signs shall be erected to mark the beginning of sections where passing is prohibited and PASS WITH CARE signs shall be erected to mark the beginning of sections where passing is permitted. Signs shall be in accordance with the TMUTCD and may be used to indicate the limits of no-passing zones for up to 14 calendar days. Standard pavement markings should then be placed.
 - For low volume two lane, two-way roadways of 4000 ADT or less, no-passing lines may be omitted when approved by the Engineer. DO NOT PASS and PASS WITH CARE signs shall be erected (see note 6).

TEMPORARY FLEXIBLE-REFLECTIVE ROADWAY MARKER TABS (TABS)

- Temporary flexible-reflective roadway marker tabs detailed on this sheet will be designated Type Y-2 (two amber reflective surfaces with yellow body), Type Y (one amber reflective surface with yellow body), and Type W (one silver reflective surface with white body). Additional details may be found on BC(8).
- Tabs shall meet requirements of Department Material Specification D-9-8242.
- The body of Tabs shall consist of a base and vertical wall made of polyurethane, polyester elastomer or other material approved by the Division of Materials and Tests.
- The reflective material shall be protected with an easily removable heat resistant transparent cover capable of withstanding and protecting reflective material from application of 400 degree F asphalt. Stapling or clipping devices used to retain the protective cover shall not protrude through reflective material.
- 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 Division of Materials and Tests to determine specification compliance.
 - Select five (5) tabs and submit to the following test. Affix five (5) tabs at two (2) foot intervals on an asphaltic pavement in a straight line. Using a medium size passenger vehicle or pickup, run over the markers with front and rear wheels at a speed of 35 to 40 miles per hour, four times in each direction. No more than one (1) out of five reflective surfaces shall be lost or displaced as a result of this test.
- When dry, tabs shall be visible for a minimum distance of 200 feet during normal daylight hours and when

WORK ZONE SHORT TERM PAVEMENT MARKINGS PATTERNS



- Illuminated by automobile low-beam head light at night, unless sight distance is restricted by roadway geometrics.
- No two consecutive tabs nor four tabs per 1000 feet of line shall be missing or fail to meet the visual performance requirements of note 6.

REMOVABLE - PREFABRICATED PAVEMENT MARKINGS

- Prefabricated Pavement Markings shall be a material of manufacture and product code or designation shown on list of approved materials covered by Department Materials Specification D-9-8241.

NON REMOVABLE - PREFABRICATED PAVEMENT MARKINGS (FOIL BACK)

- Prefabricated Pavement Markings shall be a material of manufacture and product code or designation shown on list of approved material covered by Specification TxDOT- 550-74-01.

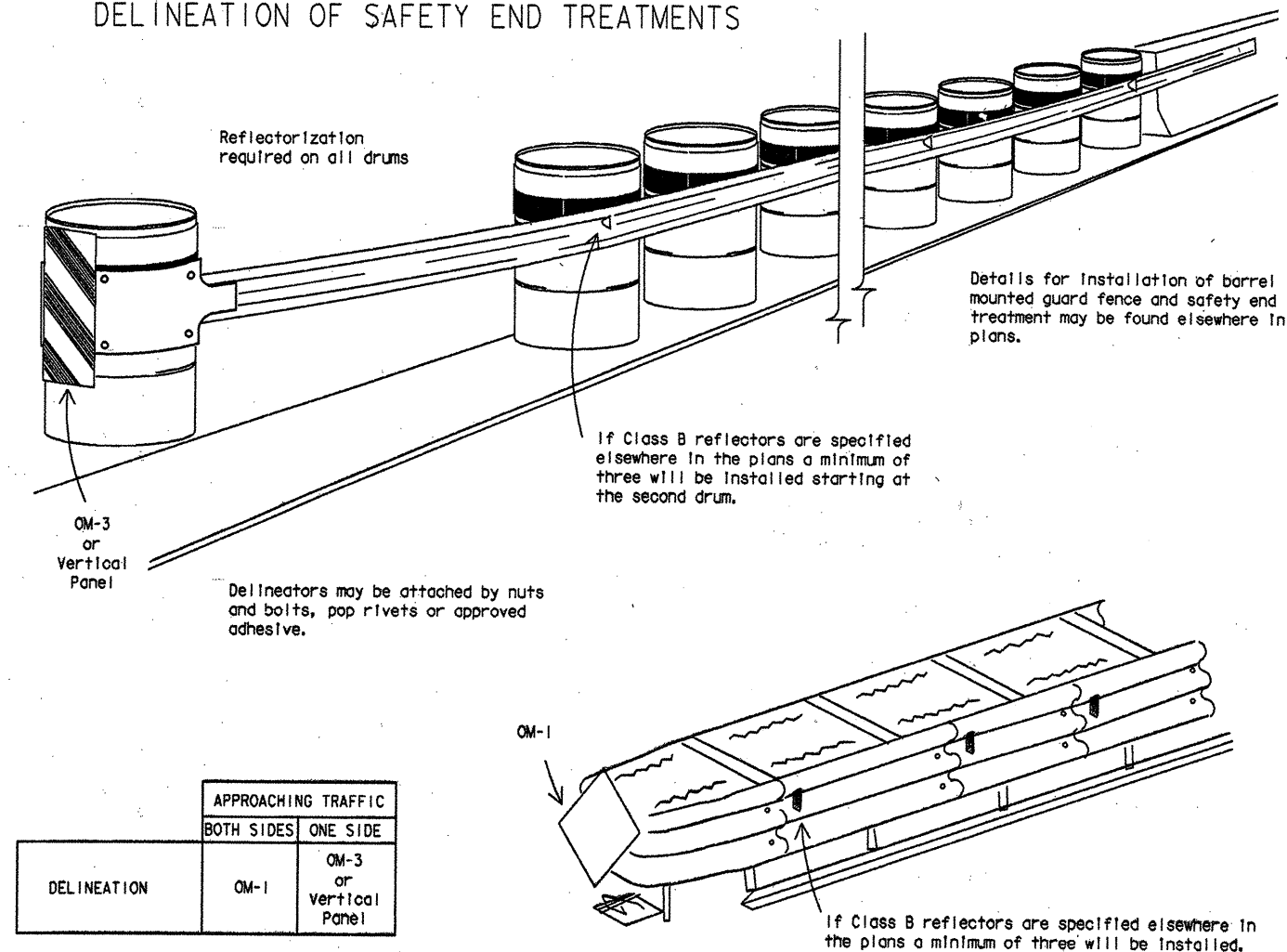
RAISED PAVEMENT MARKERS

- Raised pavement markers used to supplement short term removable pavement markings shall meet the requirements of Item "RAISED PAVEMENT MARKERS".

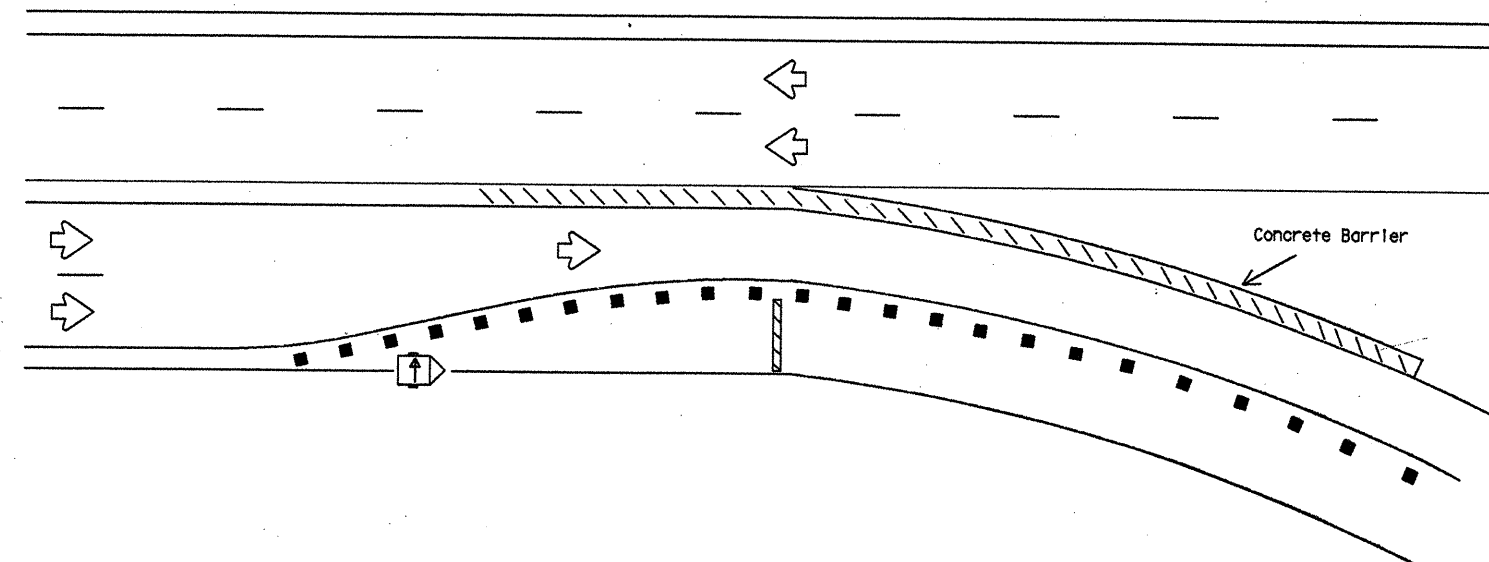
		STANDARD PLANS		TEXAS DEPARTMENT OF TRANSPORTATION	
		WORK ZONE SHORT TERM PAVEMENT MARKINGS			
WZ (STPM) -92					
ORIGINAL DRAWING DATE: 4-92	STATE DISTRICT: 15	FEDERAL REGION: 6	FEDERAL AID PROJECT: NH 95(40)IM	SHEET: 348	
DL: LR	REVISIONS:	COUNTY: COMAL	CONTROL SECTION: 0016	SECTION: 05	JOB: 081
DL: DN					H35
DL: CL					112

Division of Maintenance and Operations

DELINEATION OF SAFETY END TREATMENTS



BARRIER DELINEATION WITH SAFETY GLARE FENCE

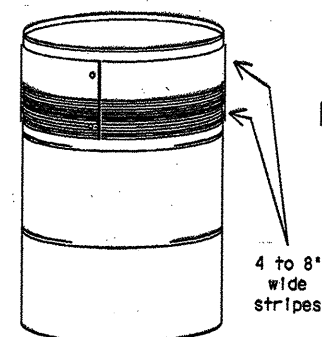


NOTES:

- Length of Safety Glare Fence will be specified elsewhere in the plans.
- The cumulative nominal length of the modular units shall equal the length of the individual sections of temporary concrete traffic barrier on which they are installed so the joint between barrier sections will not be spanned by any one unit.
- Panel/blades will be designed such that reflective sheeting conforming with Departmental Specification D-9-8300, Type C, minimum size of 2 inches by 12 inches can be attached to the edge of the panel/blade. The sheeting shall be attached to one panel/blade per section of concrete barrier not to exceed a spacing of 30 feet. Barrier reflectors are not necessary when panel/blades are installed.

LEGEND

- Barricade
- Channelizing devices
- Trailer mounted flashing arrow panel
- Safety glare fence



REFLECTORIZATION OF METAL DRUMS FOR BARREL MOUNTED GUARD FENCE

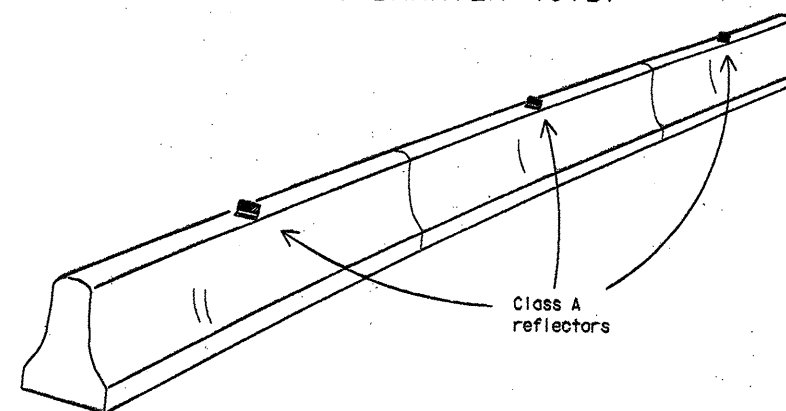
The following specification is intended to detail the reflectorization of metal drums used to support barrel mounted guard fence. Metal drums shall not be used as a standalone channelizing device or sign support.

Markings on drums shall be horizontal, circumferential, reflectorized orange and reflectorized white stripes, 4 to 8 inches wide. The first reflectorized stripe should start within four inches of the top of the drum. There shall be at least one orange and one white stripe on each drum. If there is a non-reflectorized space between the horizontal orange and white stripes, it shall be no more than 2 inches wide. Reflectorized material shall conform with Specification D-9-8300 Type C (High Specific Intensity).

All drums on project will be of the same color.

Orange color metal drums shall be used in all barrel mounted guard fence installations on all contracts awarded after January 1, 1994.

CONCRETE TRAFFIC BARRIER (CTB)



Barrier reflectors will be installed only on barriers designated for reflectorization as required elsewhere in the plans.

Reflectors should be mounted one reflector per section of barrier, preferably in the center.

Maximum spacing of reflectors is 40 feet. Mount reflectors to barrier with construction adhesive or butyl rubber adhesive.

Color of barrier reflectors will conform to the Texas "Manual on Uniform Traffic Control Devices", (TMUTCD).

REFLECTORS

CLASS A

Reflectors for Concrete Traffic Barrier and Drum Type Attenuator:

- Davidson Plastics Co. - PCBM-12
- Cal. Tex. Ind., Inc. - Microprism Delineator
- Cal. Tex. Ind., Inc. - Cube Corner Delineator
- Stimsonite - Barrier and Guardrail Delineator, Model 965
- Stimsonite - Barrier Delineator, Model 967
- Astro Optics - JD-1 or No. 181
- Reflexite Corp. - Model 661, Model 662
- Duraflex Corp. - Flexx 2020

CLASS B

Reflectors for Barrel Mounted Guard Fence and other type Attenuators:

- Stimsonite - Barrier and Guardrail Delineator, Model 965
- Astro Optics - Guardrail Delineator, Model 567

Class A or B reflectors may be installed using pop rivets, nuts and bolts, construction adhesive or butyl rubber adhesive.

Class A or B reflectors shall be prequalified and shall conform to the color and reflectivity requirements of Specification D-9-8600.

Color of Class A or B reflector will be the same as the nearest edge line, gore pavement marking or as directed by the Engineer.

Unless stated elsewhere in the plans, reflectorization of metal drums, delineation and reflectors shown on this standard shall be considered subsidiary to the various bid items.

PREQUALIFICATION PROCEDURES MAY BE OBTAINED BY WRITING:

DIVISION OF MAINTENANCE AND OPERATION
TEXAS DEPARTMENT OF TRANSPORTATION (TxDOT)
125 EAST 11th STREET
AUSTIN, TX 78701-2483

SPECIFICATION REFERENCE TABLE	
MATERIALS AND TEST SPECIFICATIONS (D-9)	
EPOXY	D-9-6100
BITUMINOUS ADHESIVE	D-9-6130
ALUMINUM SIGN BLANKS	D-9-7110
FLAT SURFACE REFLECTIVE SHEETING, TYPE C (HIGH SPECIFIC INTENSITY)	D-9-8300
DELINEATOR AND OBJECT MARKER	D-9-8600



STANDARD PLANS
TEXAS DEPARTMENT OF TRANSPORTATION

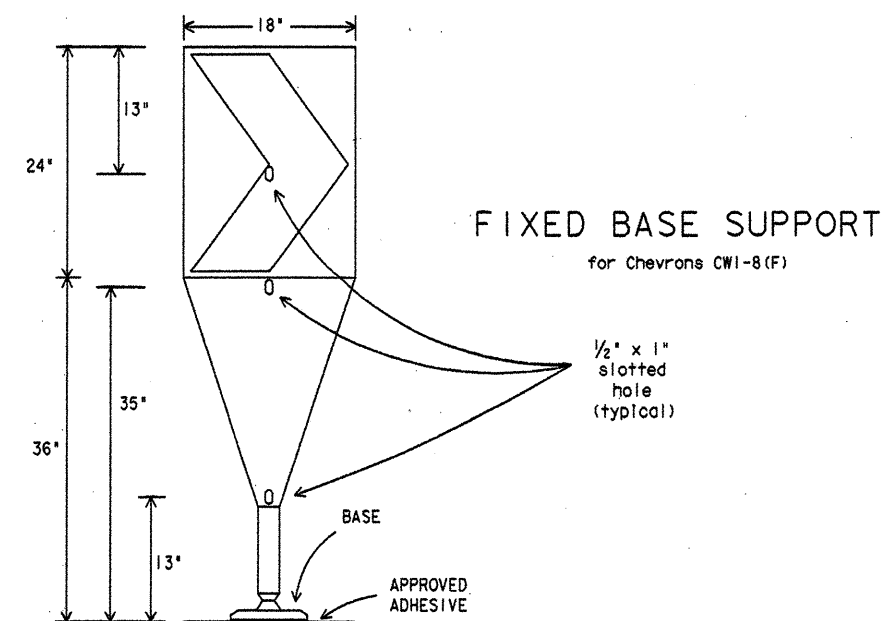
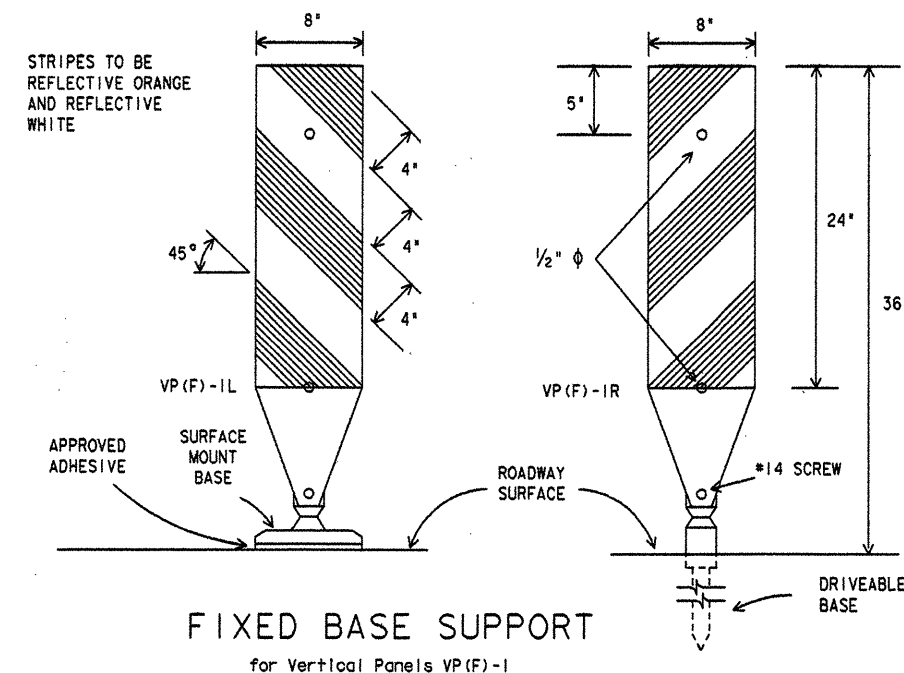
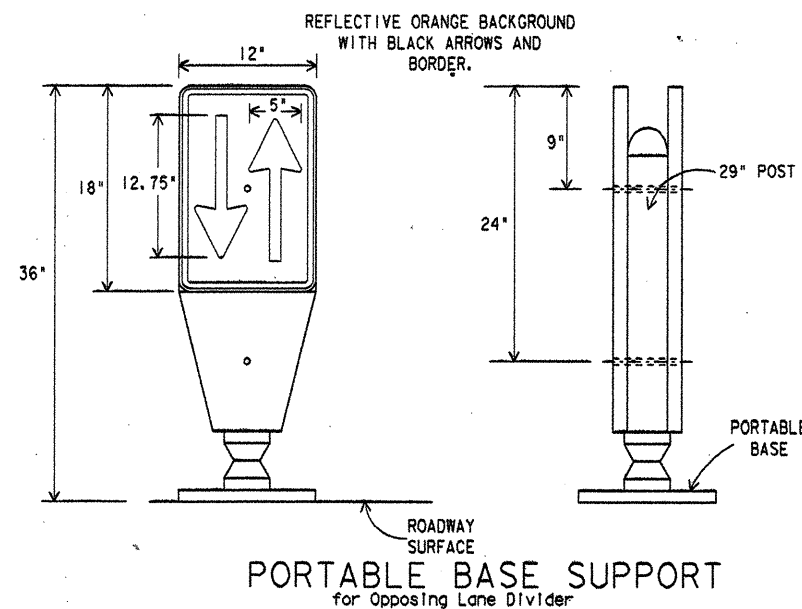
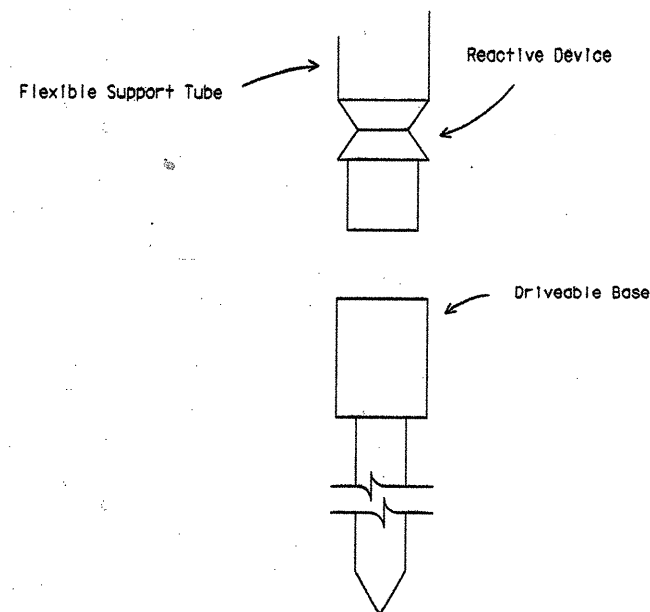
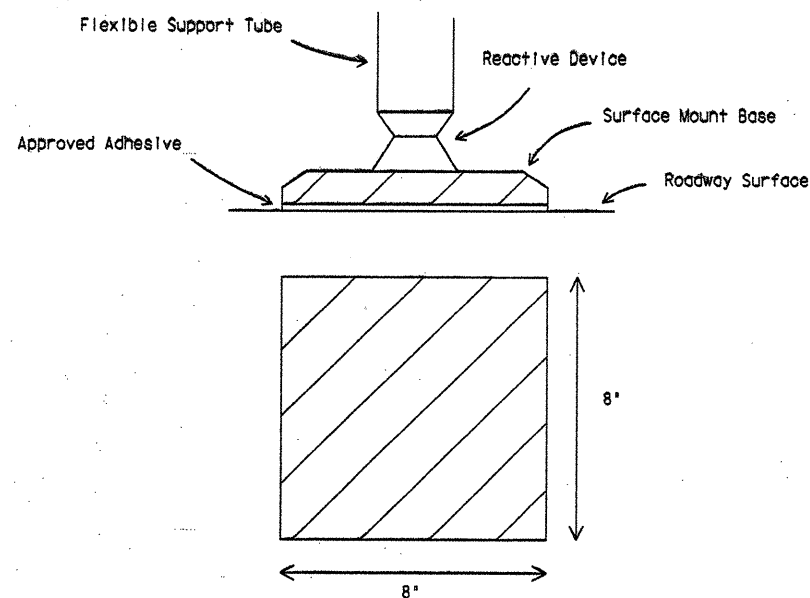
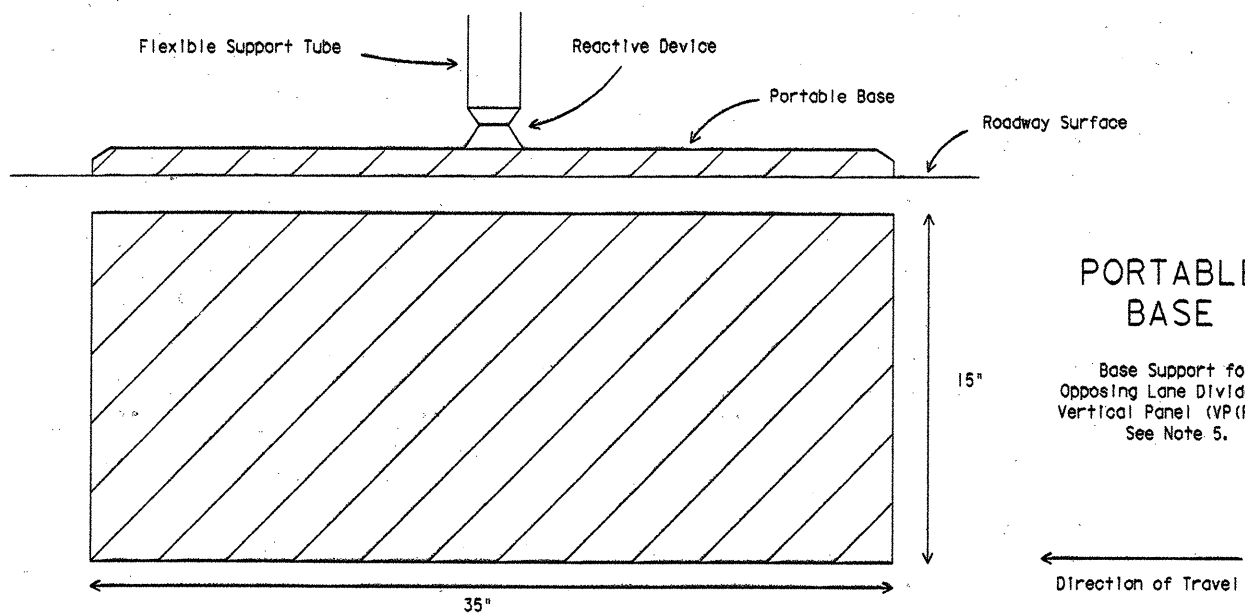
WORK ZONE
BARRIER DELINEATION

WZ (BD) -92

ORIGINAL DRAWING DATE: 4-92	STATE: 15	FEDERAL REGION: 6	FEDERAL AID PROJECT: NH 95(40)IM	SHEET: 349
DLN: LR/MT	CL: --	CL: --	CL: --	CL: --
CL: --	CL: --	CL: --	CL: --	CL: --
CL: --	CL: --	CL: --	CL: --	CL: --

Division of Maintenance and Operations

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GENERAL NOTES:

- Channelizing devices on flexible supports shall be used at locations detailed elsewhere in the plans. These devices shall conform to the Texas MUTCD.
- Channelizing devices on flexible supports may be used in work zone areas where channelizing devices are frequently impacted by errant vehicles. 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. Spacing and placement shall be uniform and in accordance with the Texas MUTCD.
- The contractor shall maintain devices in a clean condition and replace damaged, non-reflective, faded, or broken devices and bases as necessary.
- Devices shall be fabricated to withstand repeated impacts with minimal maintenance to devices and damage to vehicles. When devices are impacted, they should not adversely affect worker or vehicle safety.
- Devices shall be erected on a fixed, portable, or driveable base as approved by the Engineer.
- Portable bases shall be fabricated from a flexible material such as virgin and/or recycled rubber. Approximate weight of portable bases should be 35 pounds.
- Fixed bases may be surface mount or driveable type.
- Pavement surfaces shall be prepared in a manner that will insure proper bonding of adhesives and surface mount bases to the pavement surfaces. Adhesives shall be prepared and applied as per manufacturer's recommendations.
- Application and removal of 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. All application and removal procedures of fixed bases shall be approved by the Engineer.
- These devices shall not be paid for directly but shall be considered subsidiary to the item "Barriercades, Signs, and Traffic Handling."

PREQUALIFICATION PROCEDURES MAY BE OBTAINED BY WRITING:

TRAFFIC OPERATIONS DIVISION
TEXAS DEPARTMENT OF TRANSPORTATION (TxDOT)
125 EAST 11th STREET
AUSTIN, TX 78701-2483

SPECIFICATION REFERENCE TABLE MATERIALS AND TEST DIVISION SPECIFICATIONS

FLAT SURFACE REFLECTIVE SHEETING, TYPE C
(HIGH SPECIFIC INTENSITY) D-9-8300

STANDARD PLANS TEXAS DEPARTMENT OF TRANSPORTATION WORK ZONE CHANNELIZING DEVICES ON FLEXIBLE SUPPORTS WZ (CD) -94

ORIGINAL DRAWING DATE: 1-92	STATE: TEXAS	FEDERAL DISTRICT: 15	FEDERAL AID PROJECT: NH 95(40)1M	SHEET: 350
DATE: 9-94	REVISIONS:	COUNTY: COMAL	CONTROL SECTION: 0016	JOB: 05 087
DATE: 9-94	REVISIONS:	COUNTY: COMAL	CONTROL SECTION: 0016	JOB: 05 087
DATE: 9-94	REVISIONS:	COUNTY: COMAL	CONTROL SECTION: 0016	JOB: 05 087

GENERAL NOTES

1. MINOR OPERATION is defined as those activities that will require traffic control devices to warn of direct traffic during daytime conditions. At the end of each work day, all traffic control devices should be removed from the view of motorists and no unusual conditions of potential hazards should exist that require advance warning.
2. MAJOR OPERATION is defined as those activities that may effect traffic during daytime and nighttime conditions. Work activities on high speed, high volume roadways may also be considered a major operation.
3. Additional details may be provided in the plans concerning sign size, type of channelization devices, sequence of work details, and required measures needed to control traffic during changes in the sequence of work.
4. All distance and spacing shown on the TCP Standards are approximate.
5. All traffic control devices used during nighttime shall be reflectorized, illuminated from within or externally illuminated.
6. Additional information for fabrication, erection and usage of the following traffic control devices is found in the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD) and Barricade and Construction (BC) Standards:

BARRICADES	BC(2) and BC(3)
CONES	BC(3)
DELINEATION	WZ (BD)
DRUMS	BC(3)
PAVEMENT MARKINGS	BC(8) and BC(9)
SIGNS	WZ (STPM) or TCP(7-1) if applicable BC(4), BC(5), BC(6), BC(7)

SIGNS

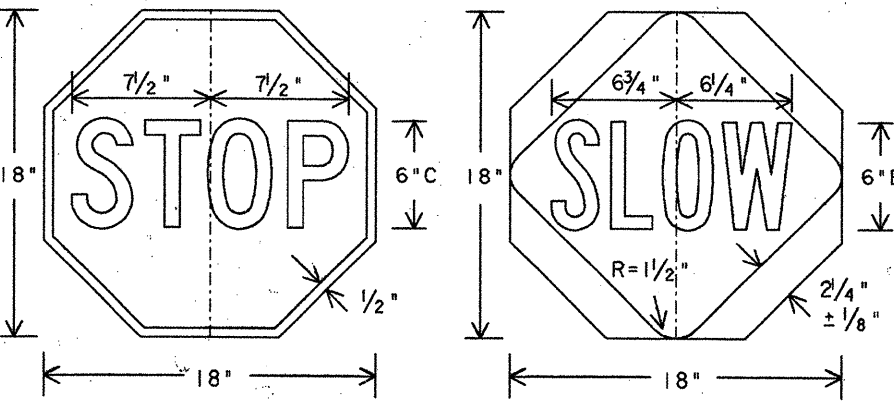
1. Selection of sign size should be based on Table I.
2. Flashing warning lights, channelizing devices and/or flags may be required to call attention to the advance warning signs.
3. The words UTILITY, SIGNAL, BRIDGE, LIGHTING, SIGN, STREET or RAMP may be substituted for ROAD in all signs where applicable.
4. Advisory speed plaques, if used in conjunction with warning signs, speeds shall be determined in the field by the Engineer.
5. Regulatory signs shall be mounted at 5 foot minimum mounting height for rural areas and 7 foot minimum mounting height for urban areas.
6. Warning signs may be mounted on three types of supports at the minimum mounting heights as stated on BC(4):
- | | |
|-----------|------------------------------|
| Portable | (1 foot) |
| Temporary | (3 feet) |
| Fixed | (5 feet rural, 7 feet urban) |

CHANNELIZING DEVICES

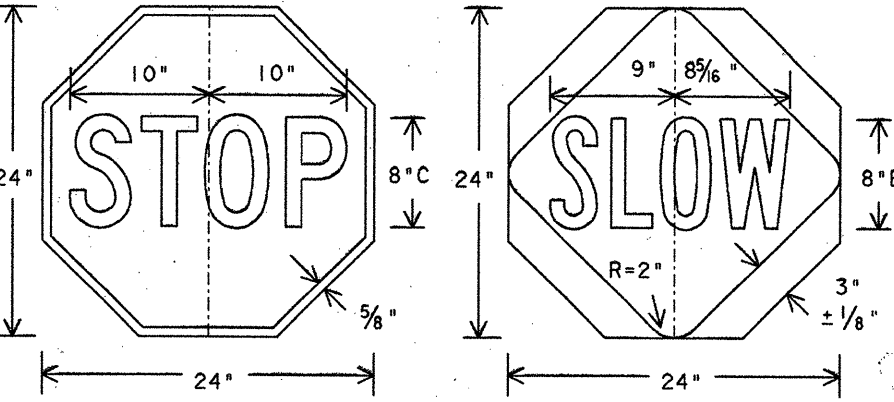
1. The maximum spacing between channelizing devices in a taper should be approximately equal in feet to the speed limit (S).
2. When channelizing devices are used to direct traffic across existing lane line or edge lines the spacing between channelizing devices shall be reduced by as much as 50%.
3. Channelizing device spacing should be reduced when placed on curves, hills or next to potential hazards. At least three channelizing devices should be in view at all times.
4. Lane closure taper length is equal to "L". Shoulder closure taper length is equal to "1/2 L".
5. Tapers downstream from the work area are optional and when used should be 50'-100' long.
6. Tapers shall be 50 feet minimum length when placed downstream of a flagger, YIELD sign or STOP sign.
7. The selection of channelizing devices should be based on degree of hazard associated with the work area. The selection priority of channelizing devices, in the order of increasing hazard recognition are:
- portable mounted delineators
 - 28" cones
 - 36" or more tubular cones
 - portable mounted vertical panels
 - 36" cones
 - Type I Barricade
 - Type II Barricade
 - plastic drums
 - MBGF, fixed or barrel-mounted
 - concrete traffic barrier
8. Flashing arrow panels used on two-way, two-lane roadways should flash in the caution mode.

FLAGGER CONTROL

1. Flagger shall wear orange safety vests. Flaggers should wear safety hats to provide a professional image to the motorist and to protect the head from flying objects.
2. STOP/SLOW paddles shall be used as the primary method to control traffic by flaggers. The STOP/SLOW paddle minimum size is 18" x 18". Paddles may be attached to a 60 inch staff for easier handling. The larger size (24" x 24") should be attached to a 60 inch staff.
3. Flags are only used to control traffic for emergency situations and the STOP/SLOW paddles are not available.
4. Flaggers may carry hand held air horns to alert workers of an emergency condition.
5. For one lane two-way traffic control, one or more flaggers should be used where traffic density, road conditions or motorists' sight distance justify their use. If flaggers are used, the taper should be reduced to 50 feet minimum. When flaggers are used to control traffic, the FLAGGER symbol sign (FCW20-7a) shall be used. When flaggers are used, the BE PREPARED TO STOP sign (FCW21-8) should be used. Proper spacing between signs should be maintained.
6. When flaggers are used to draw attention to traffic control devices, the FLAGGER symbol sign should be used. Proper spacing should be maintained.
7. When more than one flagger is used, a chief flagger should be assigned the responsibility of making decisions concerning traffic control.



18" STOP-SLOW PADDLE



24" STOP-SLOW PADDLE

WORKER SAFETY

1. Workers exposed to traffic should wear orange safety vests.
2. Work vehicles within 30 feet of the traveled way should have strobe lights or rotating beacons in use.
3. When work vehicles are used to shadow the work area, the vehicle should be parked 30 feet or more from the work area, transmission in gear (or set in PARK) emergency brake set on, and front wheels turned away from work area.
4. Inactive work vehicles, including workers' private vehicles, should, be parked away from the work area and as close to the right-of-way line as possible.

Table I
TYPICAL CONSTRUCTION WARNING SIGN SIZE AND SPACING

Roadway Classification	Posted Speed	Sign Spacing	Major Construction Or Major Maintenance Approach Warning Signs		Major Construction Or Major Maintenance Approach Warning Signs		Other Warning Signs
			CW 20n Series And CW 22-1 Sign		CW 21 Series		
	MPH	Ft. (Apprx.)	Standard Inches	Minimum ⁴ Inches	Standard Inches ⁷	Minimum ⁴ Inches ⁷	Standard Inches ⁷
Conven.	30	80	48X48	36X36	30X30 or 36X36	24X24 or 30X30	30X30 or 36X36
	35	120					
	40	160					
	45	240					
	50	320					
	55	500 ²					
Exp or Frwy	55	500 ³			48X48 *	48X48 *	48X48 *
	65	750 ³					

- ▲ Minimum distance from work area to First Advance Warning sign and/or distance between each additional sign.
- * Smaller sign sizes may be used where sign designs have not been included in the "Standard Highway Sign Design for Texas" publication.

General Notes:

1. Special or larger size signs may be used as may be necessary.
2. Distance between signs should be increased as required to have 1500' advance warning.
3. Distance between signs should be increased as required to have 1/2 mile or more advance warning.
4. For use only on secondary roads or city streets where speeds are low.
5. Only diamond shaped warning signs are indicated.
6. See sign listing in TMUTCD, Appendix A for complete list of all available sign design sizes.
7. Where two sizes are listed, see sign listing in TMUTCD, Appendix A for proper size.

The illustrated sign spacing (X) and distance message (500 FT, 1000 FT, 1500 FT) are based on 55 mph 85th percentile speed with distance rounded to the nearest 500 feet. For slower speeds or minor operations, the word "AHEAD" may be used in lieu of the distance message.

STANDARD PLANS
TEXAS DEPARTMENT OF TRANSPORTATION

TRAFFIC CONTROL PLAN

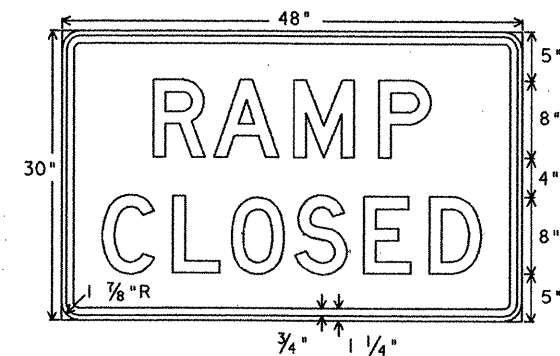
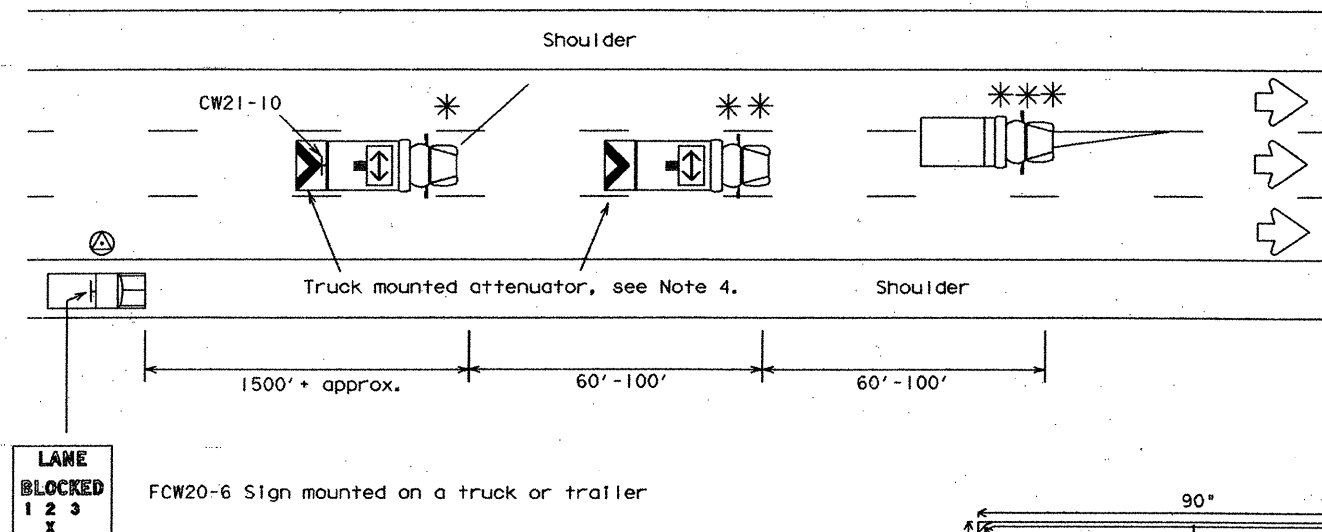
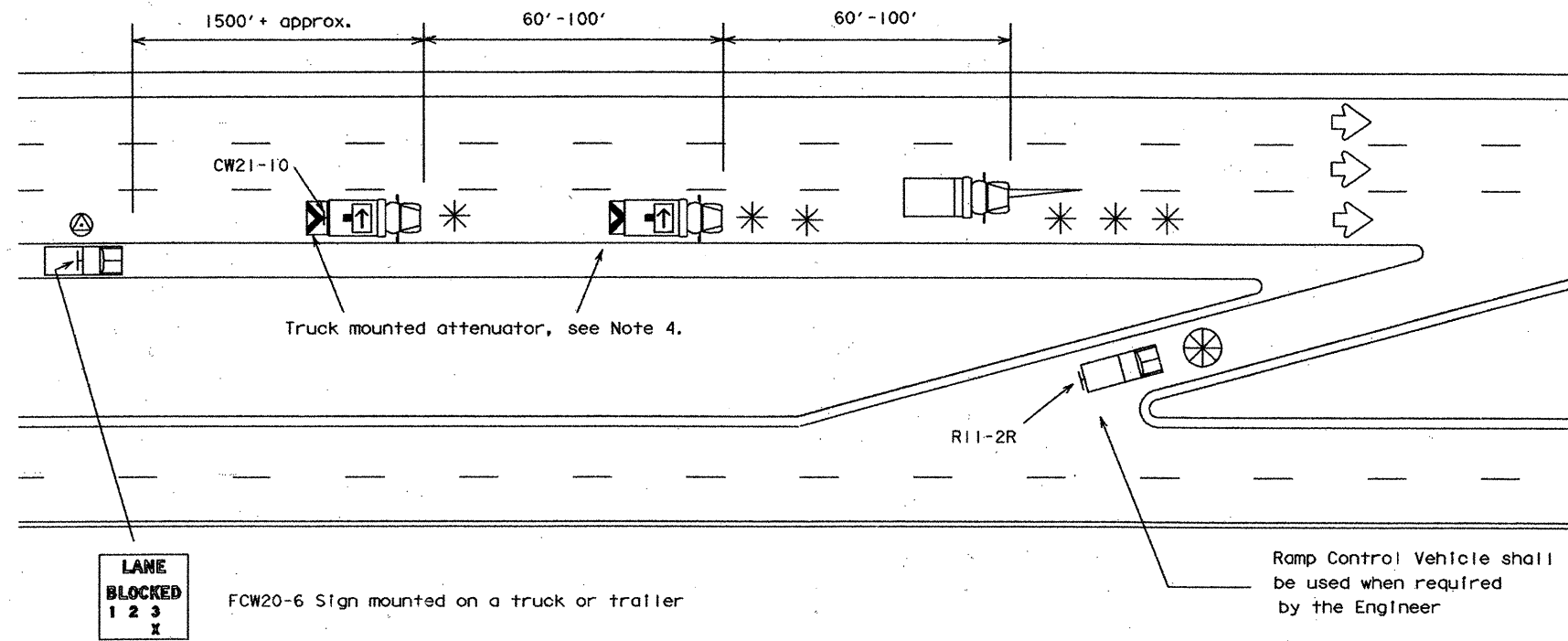
TCP NOTES-94

ORIGINAL DRAWING DATE: 2-94	STATE DISTRICT	FEDERAL REGION	FEDERAL AID PROJECT	SHEET
15	6	NH 45(40)M		357
COUNTY	CONTROL SECTION	JOB	HIGHWAY	
COMAL	0016	05	087	1H35

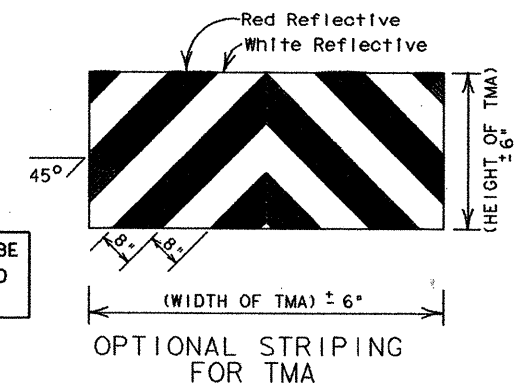
Traffic Operations Division

GENERAL NOTES:

1. The Engineer will determine if the LEAD VEHICLE and/or TRAIL VEHICLE are optional based on prevailing roadways conditions, traffic volume, and sight distance restrictions.
2. All traffic control devices shall be in accordance with the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD), latest edition.
3. The use of blue and/or yellow rotating beacons or strobe lights on vehicles are required unless otherwise stated elsewhere in the plans.
4. Unless otherwise stated in the plans, the use of truck mounted attenuators (TMA) on the SHADOW VEHICLE or the TRAIL VEHICLE is required.
5. Optional striping on the back panel of all truck mounted attenuators shall be 8" red and white reflective sheeting placed in an inverted "V" design. Reflective sheeting shall meet or exceed the reflectivity and color requirements of DEPARTMENTAL MATERIAL SPECIFICATION D-9-8300, TYPE C.
6. Flashing Arrow Panels shall be Type B or Type C. The panel operation shall be controlled from inside the vehicle.
7. Each vehicle shall have two-way radio communication capability.
8. When work convoys must change lanes, the TRAIL VEHICLE should change lanes first to shadow the other convoy vehicles.
9. Vehicle spacing between TRAIL VEHICLE and SHADOW VEHICLE will vary depending on sight distance restrictions. Motorists approaching the work convoy should be able to see the TRAIL VEHICLE in time to slow down and/or change lanes as they approach the TRAIL VEHICLE.
10. The LANE BLOCKED sign (FCW20-6) shall be used on divided highways and may be mounted on a truck or trailer. For divided highways with two lanes in each direction, the LANE REDUCTION TRANSITION sign (FCW4-2, 48" x 48") may be substituted for the LANE BLOCKED sign (FCW20-6).

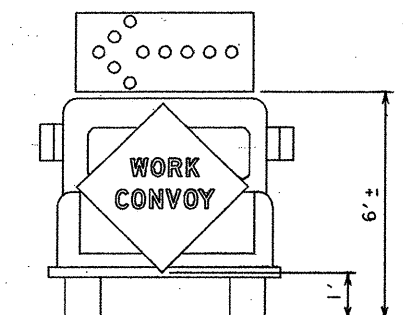


R11-2R
LETTERS = BLACK
BORDER = BLACK
BACKGROUND = WHITE

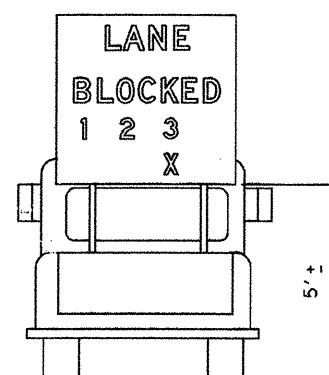


Legend:

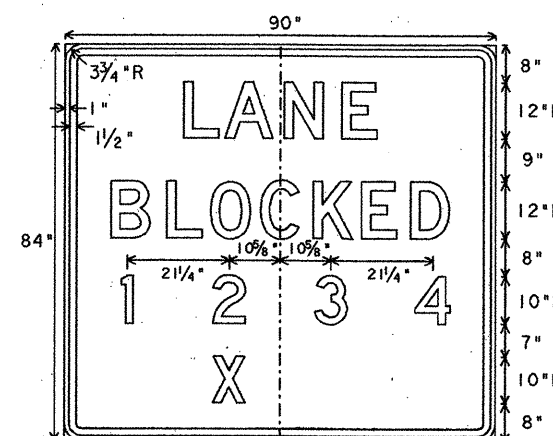
- * Trail Vehicle
- ** Shadow Vehicle
- *** Work Vehicle
- Truck mounted attenuator
- Advance Warning Vehicle or Trailer
- Ramp Control Vehicle
- Flashing Arrow Panels:
 - Right DIRECTIONAL
 - Left DIRECTIONAL
 - Double Arrow DIRECTIONAL
 - CAUTION mode



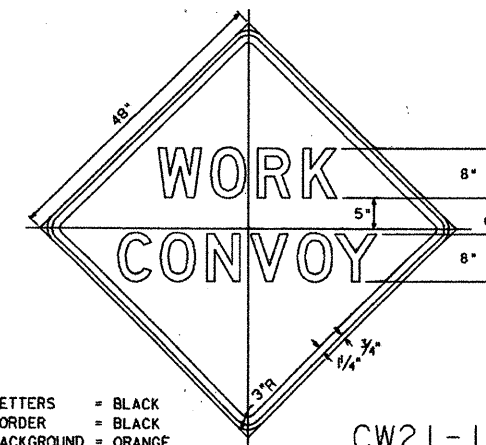
Typical Trail Vehicle
(Left Arrow DIRECTIONAL Mode)



Typical Advance
Warning Vehicle

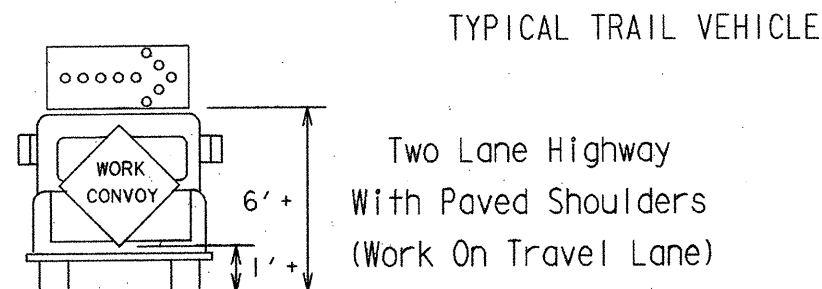
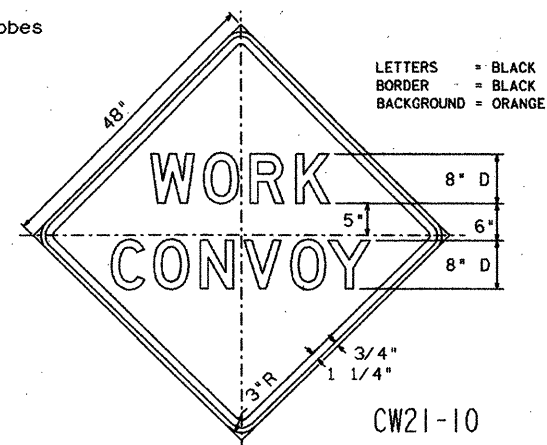
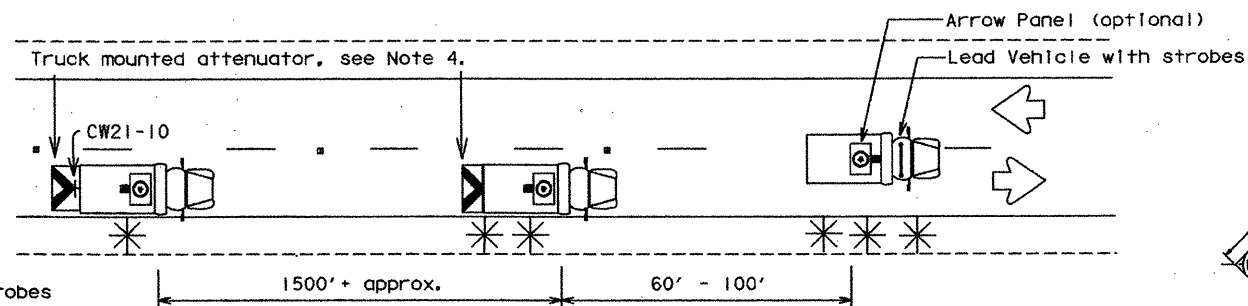
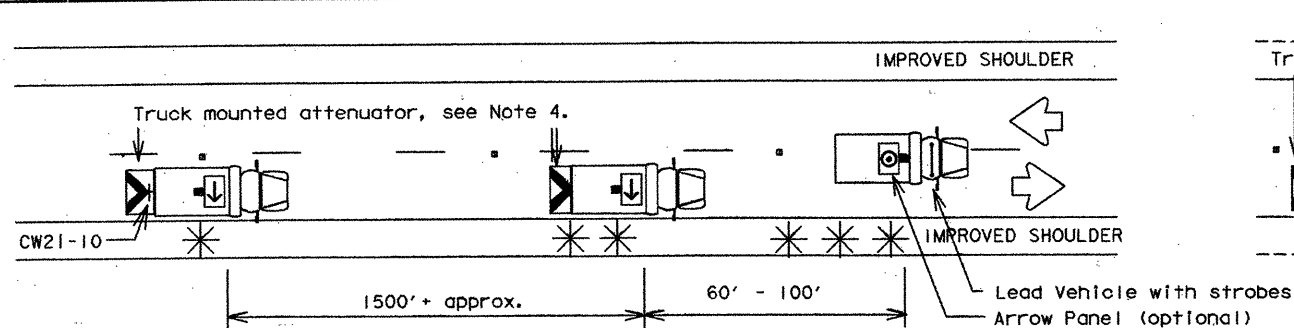


FCW20-6
LETTERS = BLACK
BORDER = BLACK
BACKGROUND = ORANGE

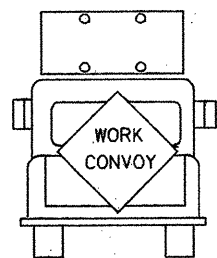


CW21-10
LETTERS = BLACK
BORDER = BLACK
BACKGROUND = ORANGE

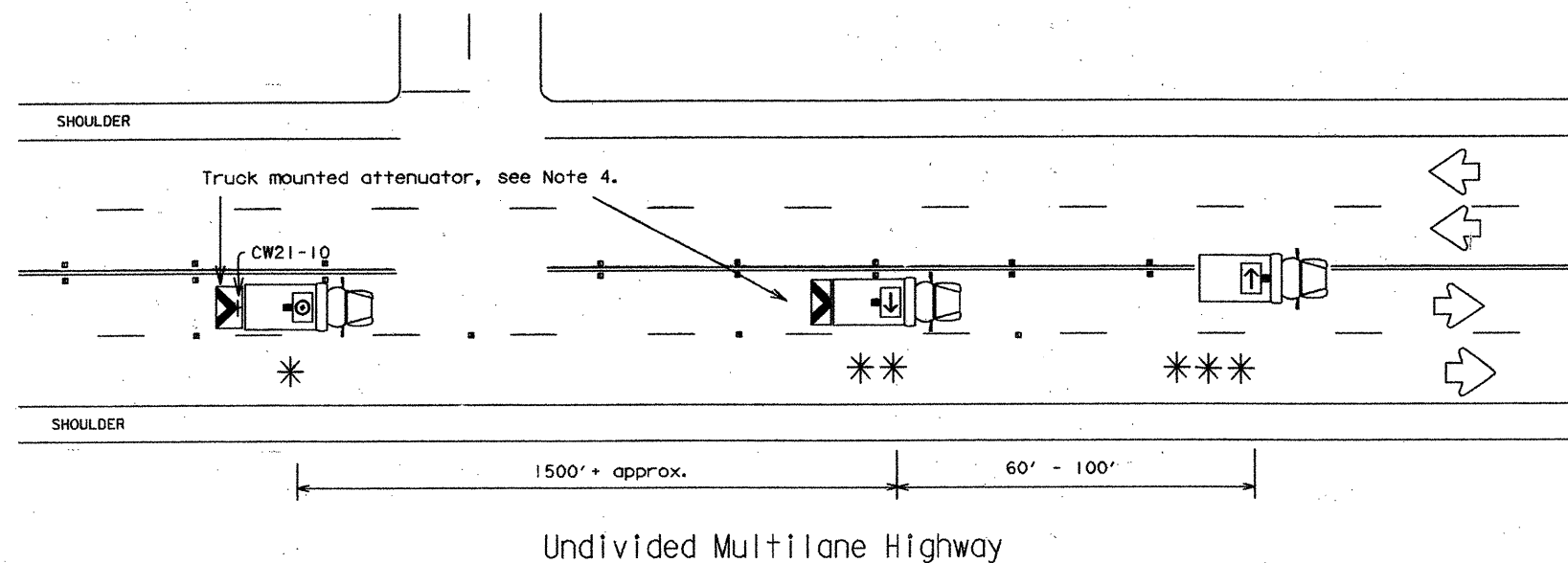
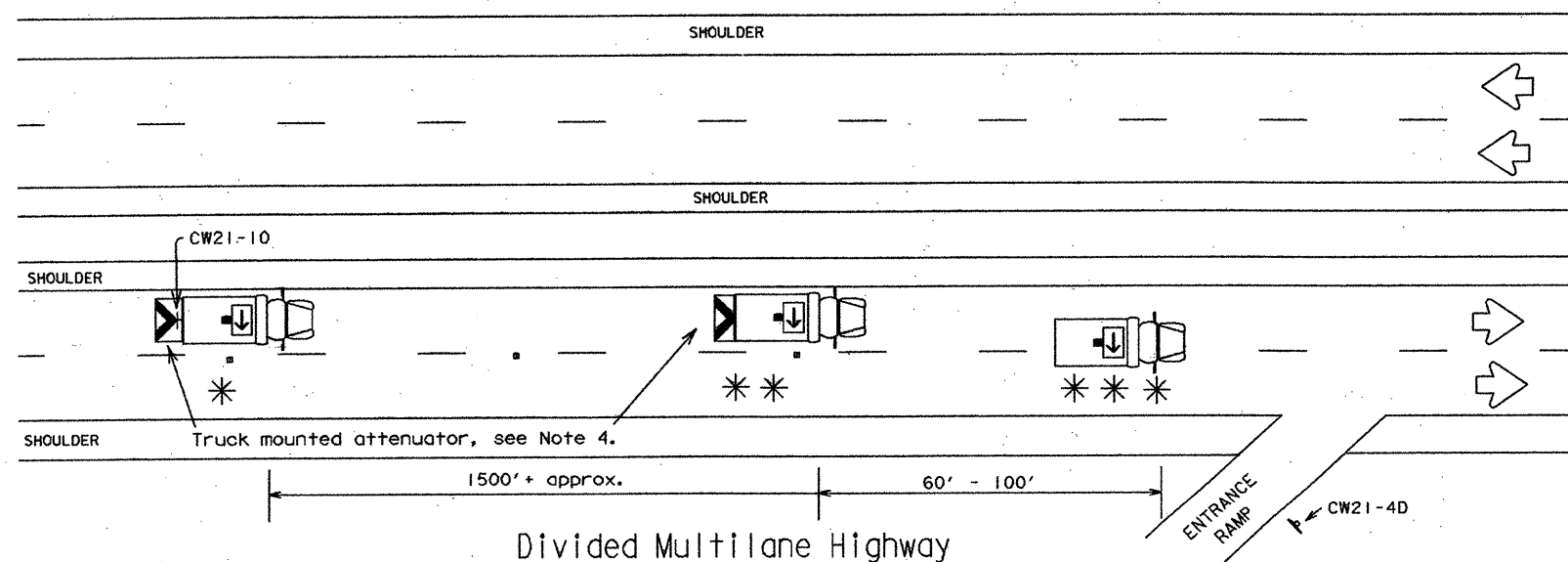
STANDARD PLANS				TEXAS DEPARTMENT OF TRANSPORTATION			
TRAFFIC CONTROL PLAN				MOVING OPERATIONS			
DIVIDED HIGHWAYS				TCP (3-2) - 94			
ORIGINAL DRAWING DATE: 12-85	STATE DISTRICT: 15	FEDERAL REGION: 6	FEDERAL AID PROJECT: NH 95(40)11M	SHEET: 352			
REVISED: 9-87 2-94	COUNTY: COMAL	SECTION: 0016	JOB: 05	DATE: 087			
DATE: 3-91				DATE: 11/35			



Two Lane Highway
With Paved Shoulders
(Work On Travel Lane)



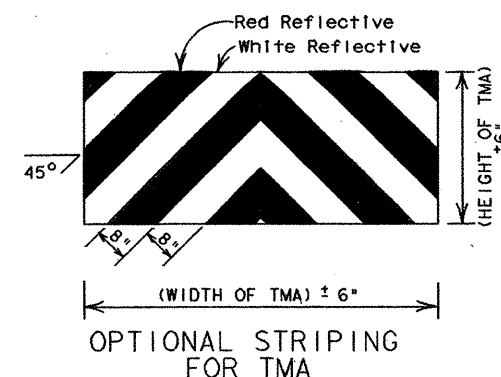
Two Lane Highway
Without Paved Shoulders
(Work On Travel Lane)



GENERAL NOTES:

1. The Engineer will determine if the LEAD VEHICLE and/or TRAIL VEHICLE are optional based on prevailing roadways conditions, traffic volume, and sight distance restrictions.
2. All traffic control devices shall be in accordance with the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD), latest edition.
3. The use of blue and/or yellow rotating beacons or strobe lights on vehicles are required unless otherwise stated elsewhere in the plans.
4. Unless otherwise stated in the plans, the use of truck mounted attenuators (TMA) on the SHADOW VEHICLE or the TRAIL VEHICLE is required.
5. Optional striping on the back panel of all truck mounted attenuators shall be 8" red and white reflective sheeting placed in an inverted "V" design. Reflective sheeting shall meet or exceed the reflectivity and color requirements of DEPARTMENTAL MATERIAL SPECIFICATION D-9-8300, TYPE C.
6. Flashing Arrow Panels shall be Type B or Type C. The panel operation shall be controlled from inside the vehicle.
7. Each vehicle shall have two-way radio communication capability.
8. When work convoys must change lanes, the TRAIL VEHICLE should change lanes first to shadow the other convoy vehicles.
9. Vehicle spacing between TRAIL VEHICLE and SHADOW VEHICLE will vary depending on sight distance restrictions. Motorists approaching the work convoy should be able to see the TRAIL VEHICLE in time to slow down and/or change lanes as they approach the TRAIL VEHICLE.

TRUCK MOUNTED ATTENUATORS WILL BE
REQUIRED ON ALL PROJECTS AWARDED
AFTER JANUARY 1, 1995.



Legend:

- * Trail Vehicle
- ** Shadow Vehicle
- *** Work Vehicle
- Truck mounted attenuator
- Flashing Arrow Panels:
 - Right DIRECTIONAL
 - Left DIRECTIONAL
 - Double Arrow DIRECTIONAL
 - CAUTION mode



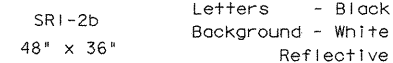
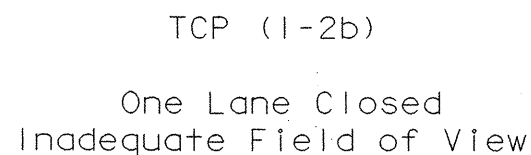
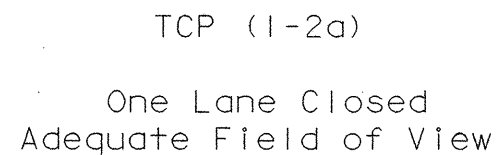
STANDARD PLANS
TEXAS DEPARTMENT OF TRANSPORTATION

TRAFFIC CONTROL PLAN
RAISED PAVEMENT
MARKER INSTALLATION

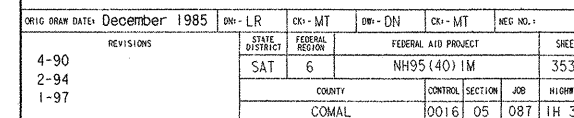
TCP (3-3) - 94

ORIGINAL DRAWING DATE: 9-87		STATE DISTRICT		FEDERAL REGION		FEDERAL AID PROJECT		SHEET	
REVISIONS		15		6		NH 95 (40) IM		353	
DATE -- LR	6-88	COUNTY		CONTROL		SECTION		JOB	
DATE --	3-91	COMAL		0016		05		087	
DATE -- DN	2-94							177	
DATE --									

1717181920212223242526272829303132	ACC:
33343536373839404142434445464748	FILE:
495051525354555657585960616263	



7. Flaggers should use two-way radios or other methods of communication to control traffic.
8. Length of work area should be based on the ability of flaggers to communicate.
9. Distance along curve of work area should be adequate length for motorists to identify and react to flagger signals.



LEGEND

BARRICADE
 CHANNELIZING DEVICES
 FLAG
 TRK. MOUNTED ATTN. OPTIONAL
 HEAVY WORK VEH.

POSTED SPEED OR 85% SPEED (MPH)	X MIN. DISTANCE (FEET)
30 or less	80
35	120
40	160
45	240
50	320
55	500

TAPER FORMULA:
 $L = (S)X(W)$ FOR SPEEDS OF 45 OR MORE.
 $L = (W)X(S)X(S)/60$ FOR SPEEDS OF 40 OR LESS.
 WHERE:
 L = MINIMUM LENGTH OF

Example:
 Taper length for the closure of a 12' lane with 55 MPH posted Speed limit will be:
 $L = x12$
 $L = 660'$

- GENERAL NOTES
1. WORK VEHICLES NOT IN USE AND STOCKPILED MATERIAL SHOULD BE PLACED A MINIMUM OF 30' FROM NEAREST TRAVELED WAY.
 2. ON HIGH SPEED FACILITIES ADVANCE WARNING SIGNS SHOULD BE INSTALLED APPROXIMATELY 1500' FROM THE WORK AREA OR FROM THE BEGINNING OF A LANE OR SHOULDER TAPER. ON LOW SPEED FACILITIES THE ADVANCE WARNING SIGN SHOULD BE PLACED ON THE "X" MINIMUM DISTANCE.



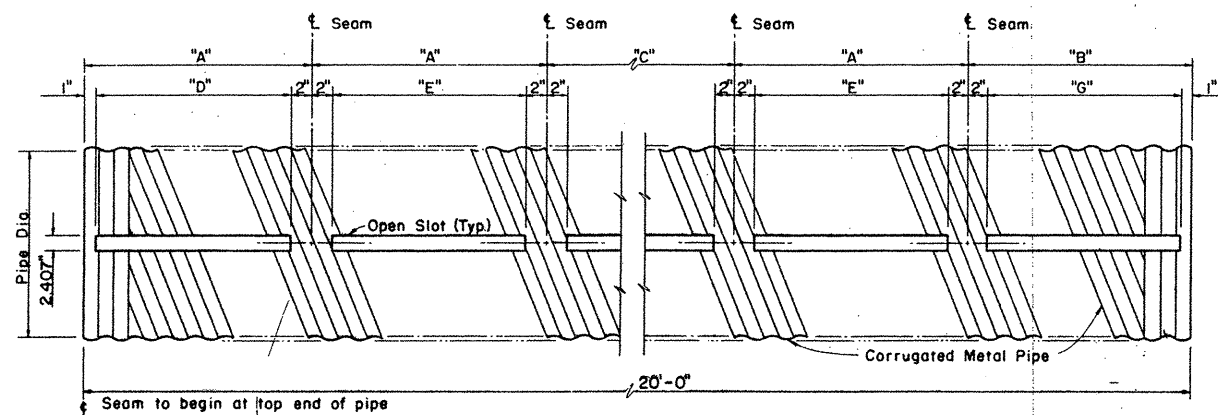
The seal appearing on this document was authorized by GREGORY A. MALATEK P.E. 71682, on 4/13, 1995.

Gregory A. Malatek P.E.

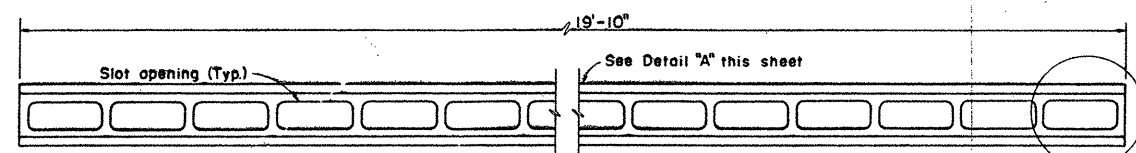
MAJOR OPERATION
 WORK AREA ON THE MAINLANES

TRAFFIC CONTROL PLAN

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.
6	NH 95 (40) IM	354
STATE	COUNTY	
TEXAS	COMAL	
CONTRACT	SECTION	JOB
0016	05	087
		HIGHWAY NO.
		1H 35

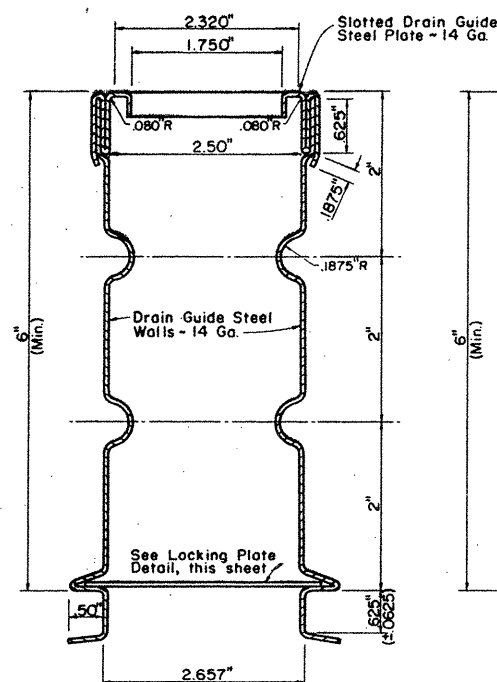


SLOTTED PIPE DETAIL

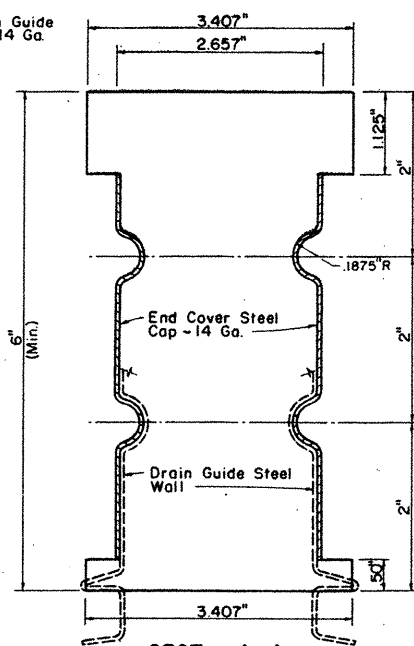


ROADWAY DRAIN GUIDE PLAN

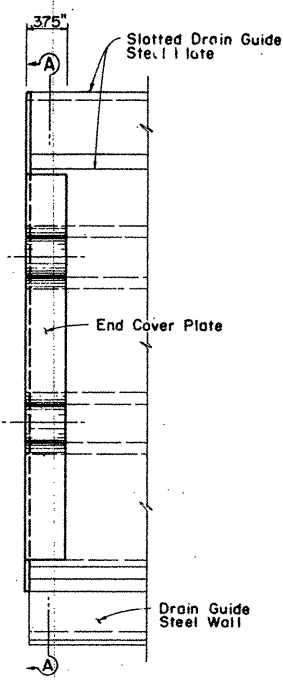
NOTE: Overall length of Drain Guide Steel Walls is 19'-10" (Typ.)



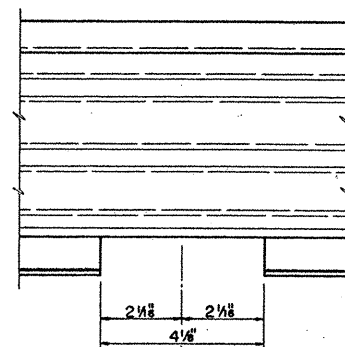
DRAIN GUIDE SECTION



DETAIL A-A
END COVER PLATE

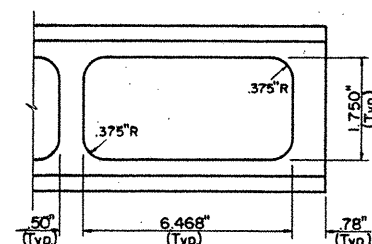


SIDE ELEVATION

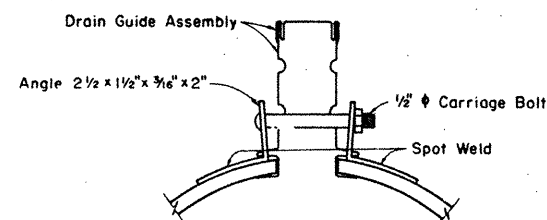


DETAIL "A"

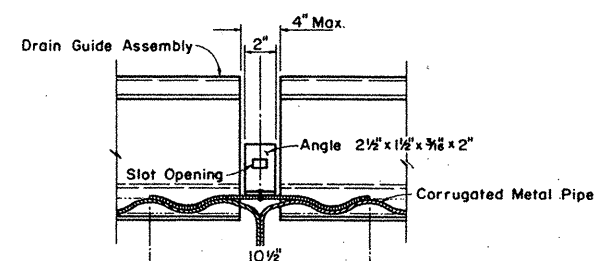
Cutout Slot for Drain Guide Walls over Corrugated Metal Pipe seams (Typ.)



ROADWAY DRAIN GUIDE DETAIL



JOINT CONNECTION DETAIL

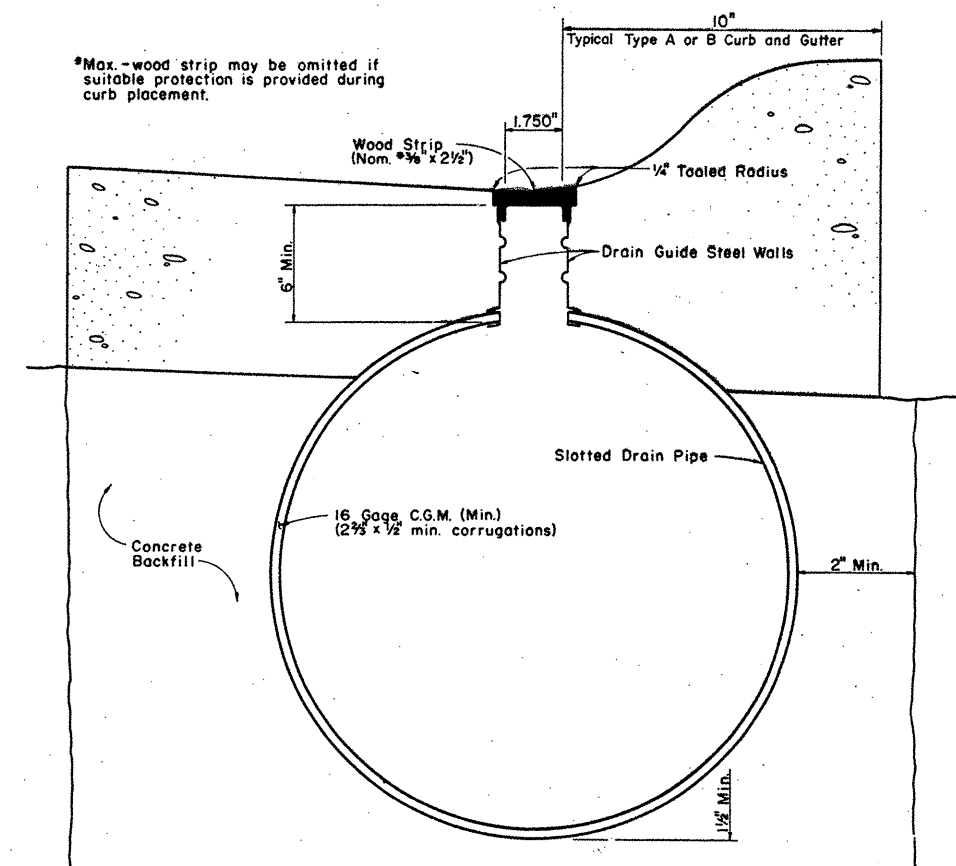


JOINT CONNECTION SECTION

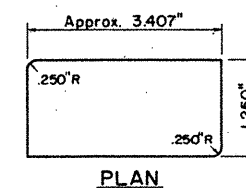
DIMENSION SCHEDULE						
PIPE DIA.	"A"	"B"	"C"	"D"	"E"	"G"
12"	31 1/2"	19 1/2"	126"	28 1/2"	27 1/2"	8
15"	27 1/2"	20"	137 1/2"	24 1/2"	23 1/2"	9
18"	26 1/4"	3 3/4"	157 1/2"	23 1/4"	22 1/4"	10
24"	25"	15"	150"	22"	21"	10
30"	24 3/4"	17 1/4"	150"	21 3/4"	20 3/4"	10
36"	24 3/4"	18 3/4"	147 3/4"	21 1/4"	20 1/4"	10

*Total number of Locking Plates required for each pipe diameter.

*Max. - wood strip may be omitted if suitable protection is provided during curb placement.



TYPICAL SECTION



PLAN



SIDE ELEVATION

LOCKING PLATE DETAIL

NOTE: Locking Plate to be installed at each end of Drain Guide and at each centerline location of seams on pipe.

NOTE: For Typical Installations, Backfill Details, and General Notes, see Sheet 2 of 2.

SHEET 1 OF 2

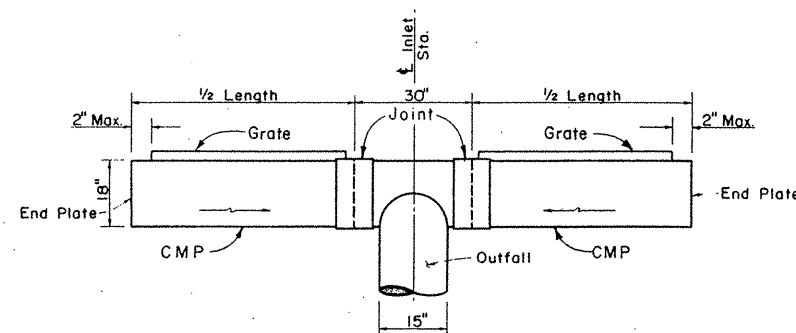
STATE DEPARTMENT OF HIGHWAYS AND PUBLIC TRANSPORTATION

SLOTTED DRAIN

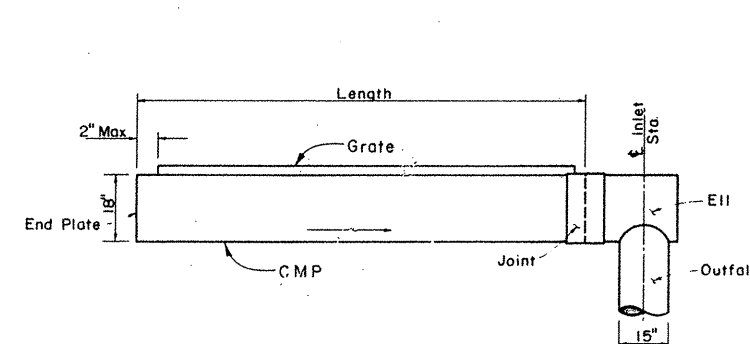
SD

ORIGINAL DRAWING DATE: MARCH 1963		STATE DEPARTMENT OF HIGHWAYS AND PUBLIC TRANSPORTATION		FEDERAL AID PROJECT		SHEET	
NO.	REVISIONS	NO.	REVISIONS	NO.	REVISIONS	NO.	REVISIONS
15	6	NH	35(40)IM	355			
COUNTY		COUNTY		COUNTY		COUNTY	
COMAL		0016	05 P87	1H 35			

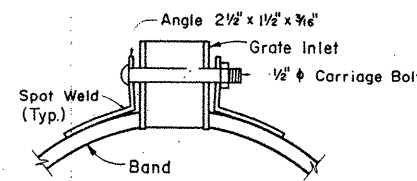
276



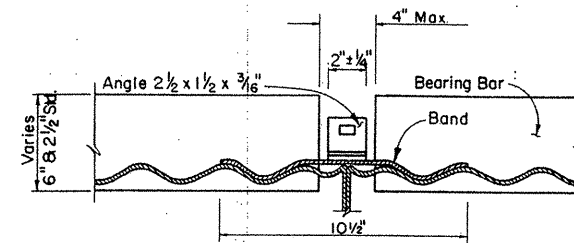
TYPE "T"



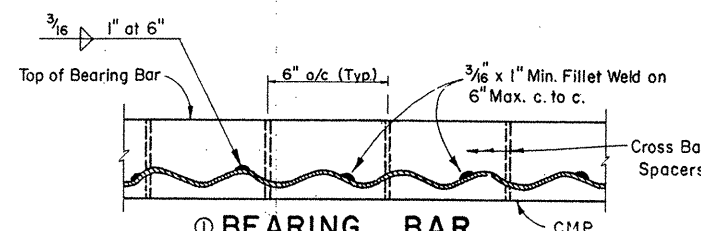
TYPE "L"



JOINT DETAIL



JOINT SECTION

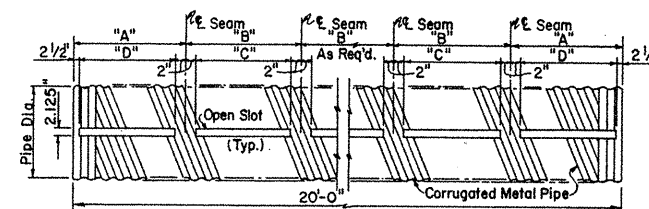


BEARING BAR WELDING DETAIL

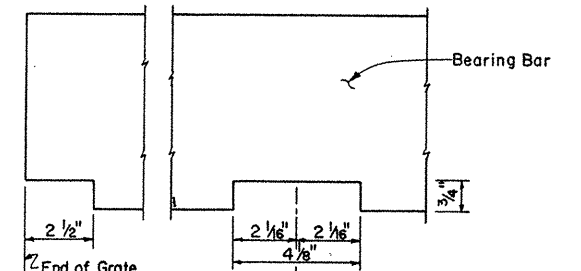
① DIMENSION SCHEDULE*

PIPE DIA.	"A"	"B"	"C"	"D"
12"	14"	30 1/4"	27"	9 1/2"
15"	20 1/2"	28 1/4"	25"	17 1/2"
18"	14"	26 1/2"	24"	9 1/2"
24"	18"	25 1/2"	23 1/2"	14 1/2"
30"	19"	25 1/4"	22 1/2"	14 1/2"
36"	20"	25"	22 1/2"	17 1/2"

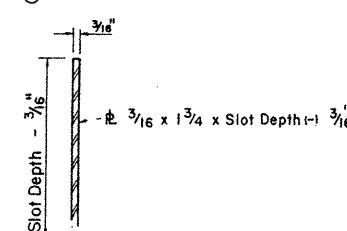
*All dimensions $\pm 1/4$ " Tolerance



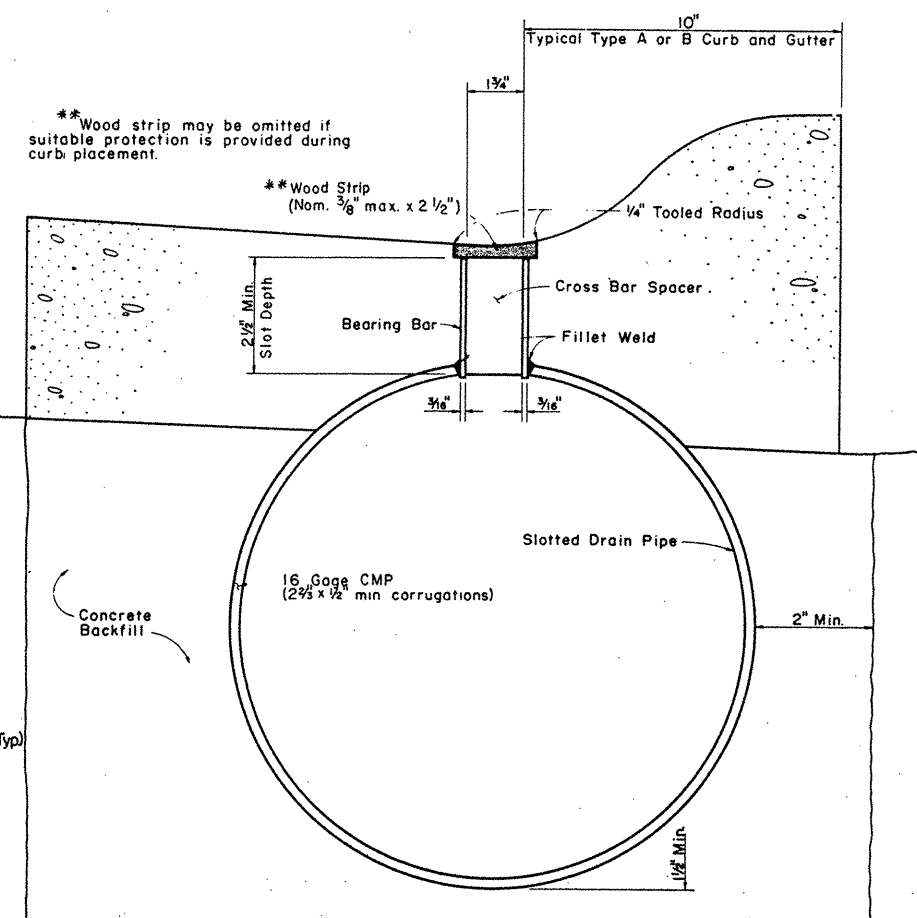
① SLOTTED PIPE DETAIL FOR LOCK SEAM PIPE See Detail "A" this sheet



① DETAIL "A"



CROSS BAR SPACER



TYPICAL SECTION

GENERAL NOTES:

Grate assemblies shall conform to the provisions of ASTM Designation: A-36, and shall be galvanized in accordance with ASTM Designation: A-123.

All welded locations shall be painted with a good quality asphalt base aluminum paint. All welding shall be in accordance with Item 448, Structural Welding.

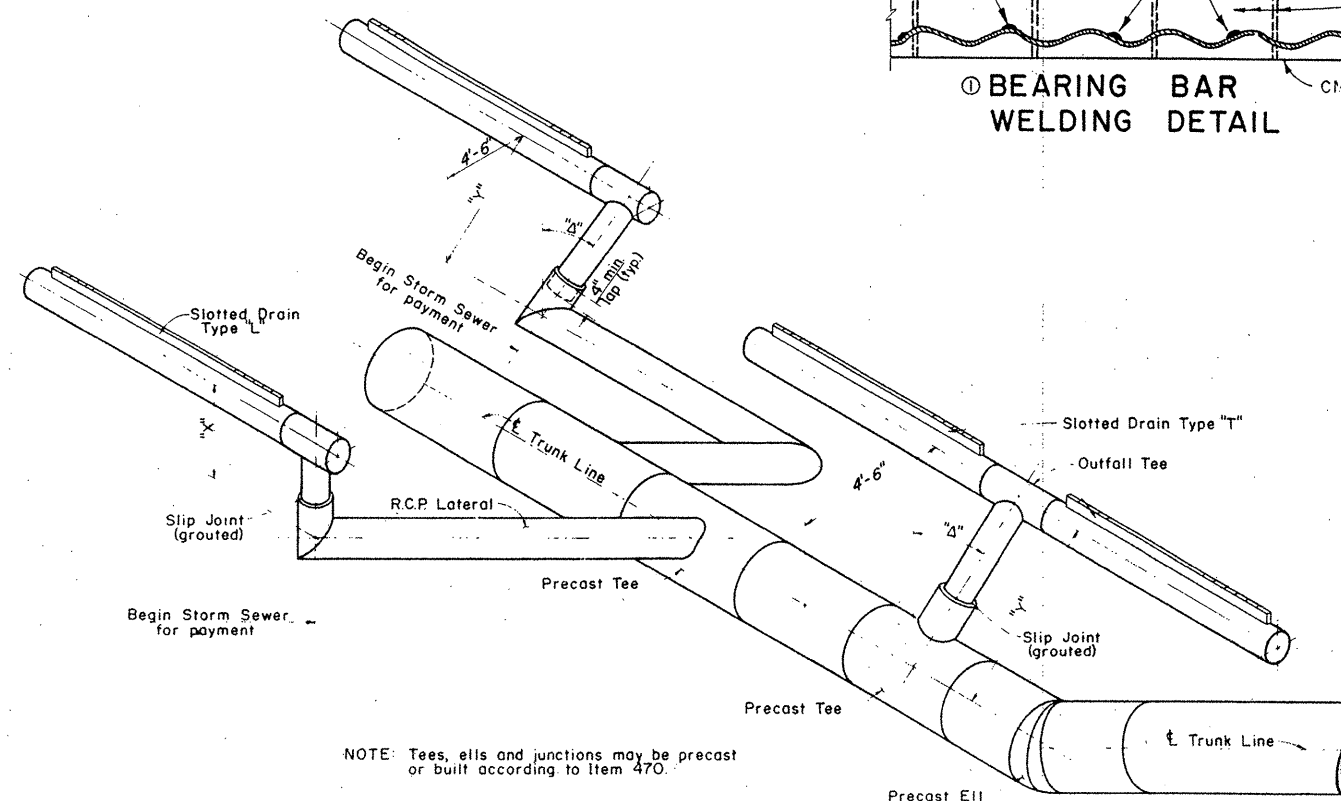
The Corrugated Galvanized Pipe shall be in accordance with Item 460, Corrugated Galvanized Pipe.

Trenches for slotted drains and outfall pipe shall be backfilled with 1 1/2 inch minimum (or as shown otherwise) low strength concrete (minimum 2 sk. cement/cy.) as directed by the Engineer.

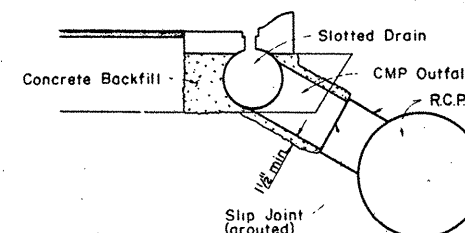
Outfall Connection slip joint shall be backed with a suitable compressible material to retain grout in place during curing.

Slotted Drain shall be furnished in 20 ft. lengths wherever practical to minimize the number of joints required.

The Contractor may furnish either of the designs as shown.



TYPICAL INSTALLATIONS



BACKFILL DETAIL

NOTE: Tees, ellis and junctions may be precast or built according to Item 470.

SHEET 2 OF 2



STATE DEPARTMENT OF HIGHWAYS AND PUBLIC TRANSPORTATION

SLOTTED DRAIN

SD

ORIGINAL DRAWING DATE	STATE	FEDERAL	FEDERAL AID PROJECT	SHEET
MARCH 1983	15	6	NH 95(40)IM	655A
Rev. 2-84				
Rev. 7-87				
	COUNTY	SECTION	JOB	REMARKS
	COMAL	0016	05	087 IN 35

277

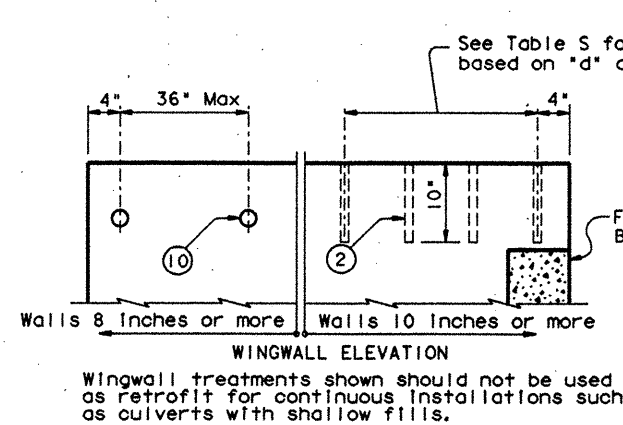
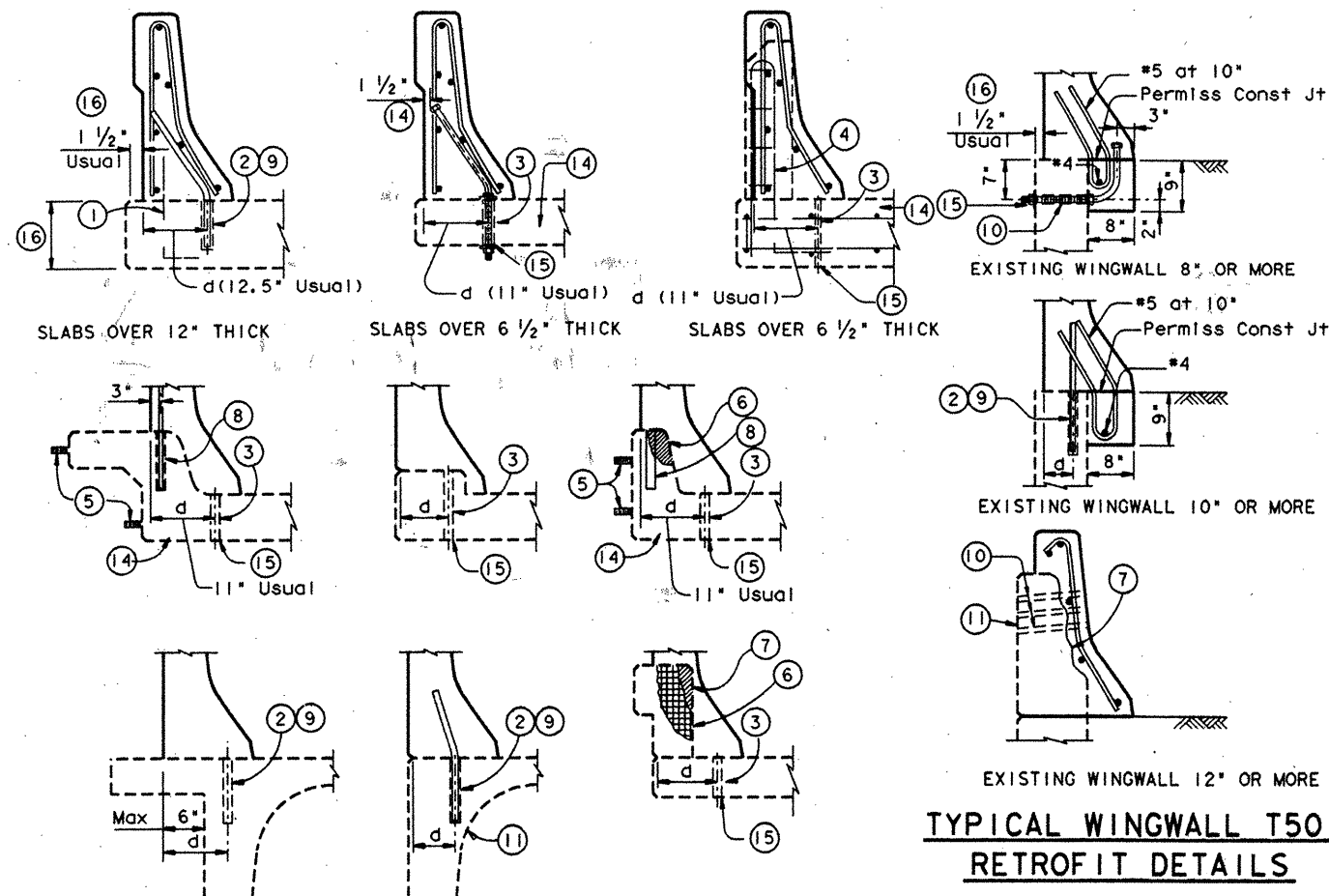
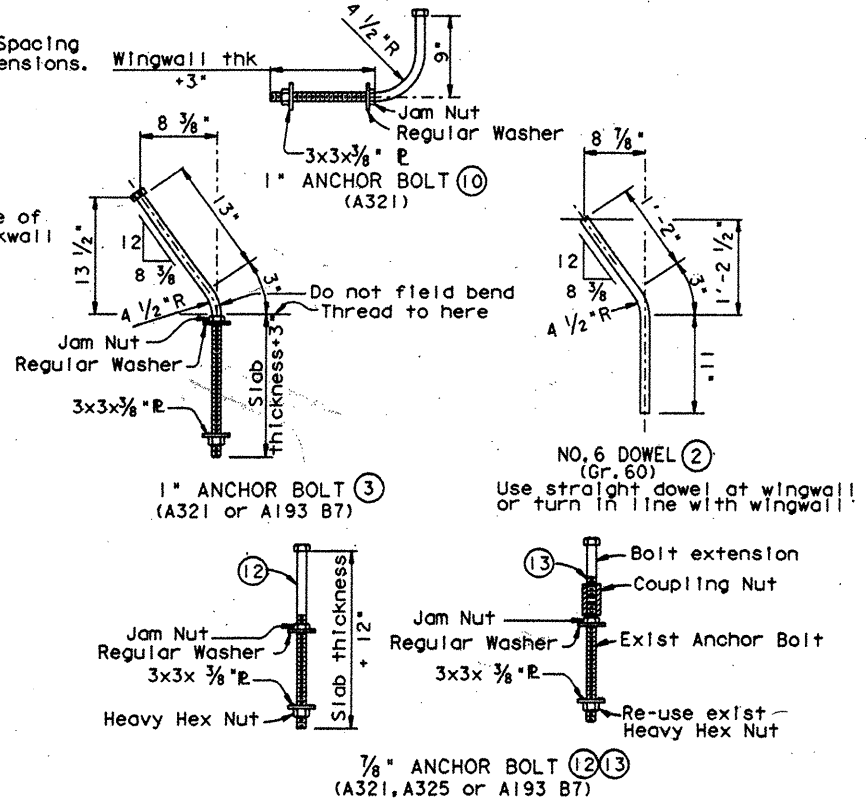


TABLE S

d Inches	Maximum Anchor Spacing (Inches)	
	Dowels (2) No. 6 Gr. 60	Bolts (3) & (14) 1" Dia A193 B7
4	6.8	—
5	8.2	25.6
6	10.0	31.3
7	11.8	36.9
8	13.7	42.6
9	15.5	48.3
10	17.4	54.0
11	19.3	59.7
12	21.1	65.3
13	22.9	—
14	29.8	—

Other spacings may be interpolated



This sheet is intended to be used as a guide for retrofitting existing structures with the T501 type of railing. Details with appropriate notes taken from this guide should be prepared for the specific application. Dimensions of existing slab thickness, curb widths, heights etc. should be shown. Particular care should be taken in identifying the bridge abutment wingwall conditions, and providing for proper reinforcement anchorage and approach guard fence post positioning.

- On the bridge deck, remove existing rail posts, leaving at least 12 inches of the four No. 5 front face reinforcing bars intact which must be incorporated in the new rail. The existing four posts bars may be considered to be equivalent to 1.5 of the No. 6 dowels.
- No. 6 dowels are to be epoxy grouted into the existing bridge slab as shown at a spacing not to exceed that given in Table S.

The holes for the dowels shall be 10 inches deep which are 0.875 to 1.0 inch in diameter. The holes shall be clean and dry. Compressed air, if used to clean the holes, shall have no oil in suspension. The holes may be drilled with rotary (coring or masonry drill), or percussion (star drill) type drilling equipment.

The dowels shall be set into the holes with epoxy binder which conforms to the requirements of TxDOT Epoxy Type VIII (formerly B-102). They shall not be disturbed for a minimum of 72 hours in which the air temperature is more than 40 degrees Fahrenheit. Temperatures below 40 degrees shall not be considered as part of the epoxy curing time.
- Drill 1.125 to 1.25 inch diameter holes through the existing bridge deck at a spacing not to exceed that given in Table S.

The holes through the bridge deck must be drilled with rotary (coring or masonry drill) type equipment. Percussion (star drill) drilling shall not be used. Spalls in the bottom of the slab exceeding 0.5 inch from the edge of the holes shall be patched.

The bolts, nuts, and bottom plate washer shall be galvanized. Bolts and nuts shall have Class 2A and 2B fit tolerances. The nuts shall be tapped after galvanizing.
- On the bridge deck, remove existing rail posts, leaving at least 12 inches of the four No. 5 front face reinforcing bars intact, which must be incorporated into the new rail. The existing four posts bars may be considered to be equivalent to 0.35 anchor bolts.
- Remove existing rail, cut and grind anchor bolts flush, and paint ends with two coats of zinc dust-zinc rich oxide paint as described under Item 450.
- Notch the existing curb at the bolt locations to provide 0.5 inch minimum clearance behind the bolts.

- Break back upper face of the existing parapet to provide 0.5 inch minimum clearance behind the S and R bars.
- No. 6 Grade 60 dowels 2 feet 8 inches long must be epoxy grouted into the existing curb or parapet as shown at a spacing not to exceed 5 feet, using the same procedures as described for note (2). Offset from slab dowels by a min of 6".
- An approved resin type binder in capsules or other two-component system may be used for the No. 6 dowels in lieu of the epoxy binder. Depth of holes and installation shall be in accordance with manufacturer's recommendations such that the full pullout strength of 39.6 kips may be obtained. Holes must be power wire brushed. Field pullout tests in accordance with ASTM E488 may be used if permitted or required by the Engineer to demonstrate pullout strength.
- Drill 1.125 to 1.25 inch diameter holes from outside through existing wingwall. Spalls on the inside of wing need not be patched. Percussion (star drill) drilling is acceptable.
- Patch if spall occurs while drilling.
- Remove old anchor bolts and replace with 3/8 inch bolts in the two existing interior holes. Also add one of these bolts at the midpoint between old posts. Drill holes 1 inch in diameter for the additional bolt using procedures described for Note (3). Secure bolts with a jam nut and washer. Galvanize nut, washers, and lower 12 inches of bolt (Min). Existing bottom plates may be used at old post locations in place of the 3 x 3 x 3/8 inch plates.
- At existing posts, two interior bolts may optionally be left in place with an additional length of bolt joined by a rod coupling nut. Rod coupling nut shall be Grade 5 or better with a proof load capacity at least equivalent to A325 Nuts. Do not galvanize. Class 2B thread fit tolerance. The two exterior bolts may be used for the bolt extensions. In either case, the length of bolt and head protruding from slab shall be approximately 11 1/2 inches to insure adequate development length and cover over the bolt head. Bolts may be slightly field bent to maintain cover.
- If d dimension is less than 11 inches, use reduced spacing as given in Table S and turn bolt as required to maintain 1.5 inch cover to back of rail.
- Tighten nuts after approximately 7 days.
- Dimensions of actual structure should be shown. (Typ)

GENERAL NOTES:

Designed in accordance with current AASHTO Standard Specifications.

Pullout tests have been performed on the epoxied No. 6 dowel anchorage system which have demonstrated that the ultimate tension strength can be developed in the dowel. See Traffic Rail Type T501 standard for details not shown herein.

Not all possible combinations of existing railing, curbs, parapets etc. have been shown on this sheet. Other combinations and reinforcement arrangements are permissible if they meet the same strength requirements as indicated on this sheet.

Additional reinforcing may be tack welded to the upper two thirds of the reinforcing cage to provide bracing when slip forming is used. Additional dowels or anchorages may be added when welding is necessary in the lower one third of the cage. Do not weld to the anchor bolts or required dowels.

Texas Department of Transportation
Design Division (Bridge Section)

RETROFIT TRAFFIC RAIL DETAILS

T501R

THIS SHEET DATE: JULY, 1994

DESIGNER: JJP

CHECKER: THD

INCHES: TGG

FEET: LDS

REV. NO.: B587

REVISIONS

NO.	DATE	DESCRIPTION
1	6	NH 95 (40) IM
2	6	COMAL

CONTROL SECTION: 0016

SECTION: 05

DATE: 07

BY: JH 35

ACC

FILE: rlsstd001.dgn

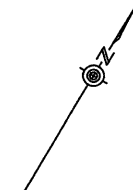
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1 2

(CSJ 0016-05-087)

2920

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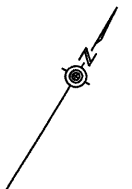
▲ 4" PVC MULTIDUCT (2-WAY) X 1200'
#1: FUTURE
#2: FUTURE



TRAFFIC MANAGEMENT SYSTEM LAYOUT

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.			SHEET NO.
6	MANH 95(40) IM			37
STATE	STATE DIST. NO.	COUNTY		
TEXAS	15	COMAL		
CONT.	SECT.	JOB	HIGHWAY NO.	
0016	05	087	IH 35	

▲ = CONCRETE ENCASED CONDUIT



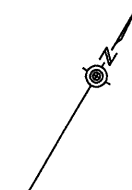
▲ 4" PVC MULTIDUCT (2-WAY) X 1200'
#1: FUTURE
#2: FUTURE



SHEET 3 OF 25

A horizontal scale bar with markings at 0, 100, and 200 feet. The bar is divided into alternating black and white segments. Below the bar, the text "SCALE: FEET" is printed.

▲ = CONCRETE ENCASED CONDUIT



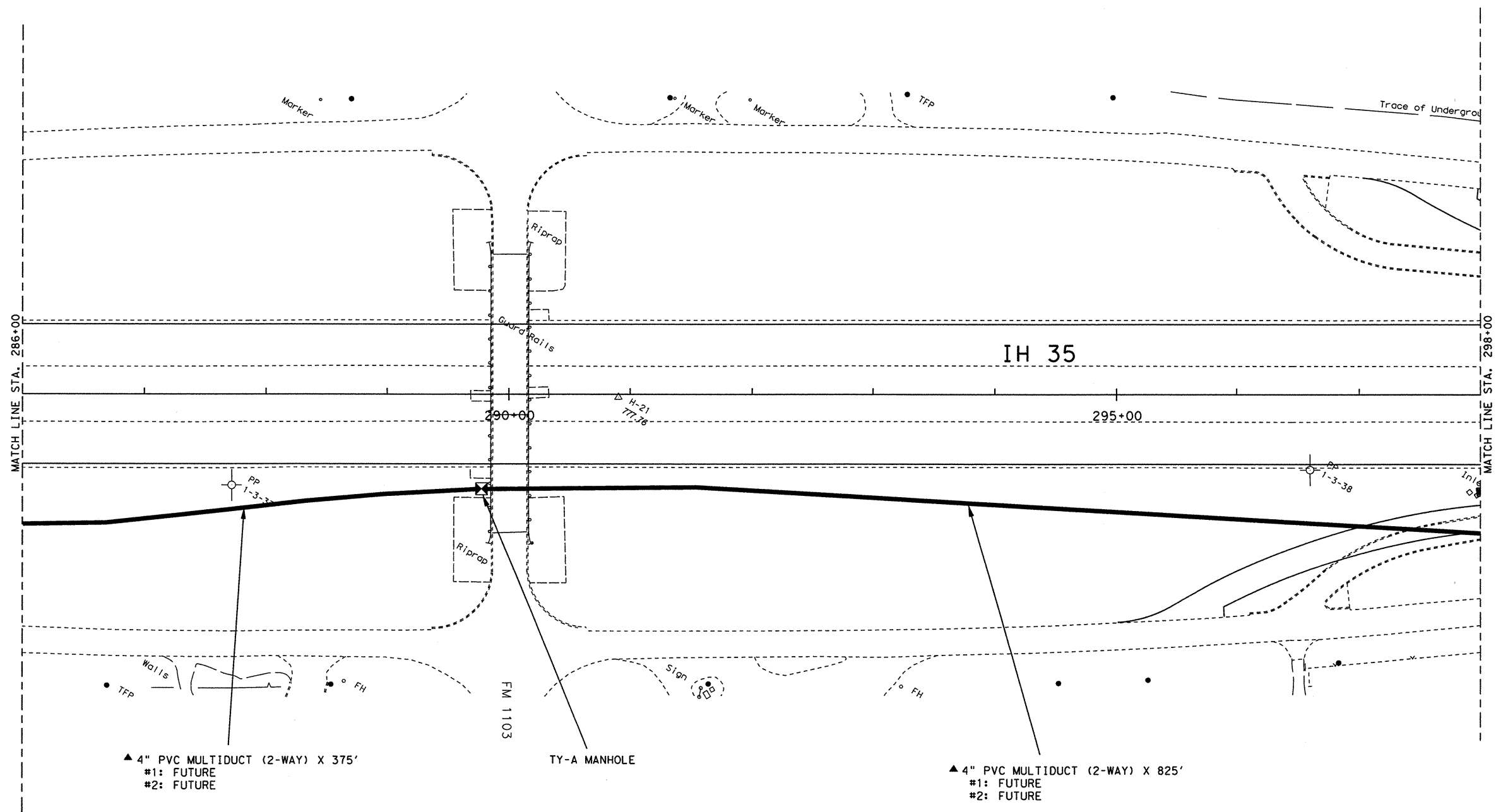
▲ 4" PVC MULTIDUCT (2-WAY) X 1200'
#1: FUTURE
#2: FUTURE

0 100 200
SCALE: FEET



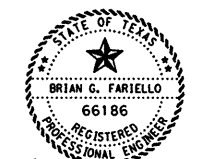
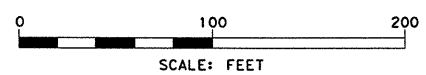
SHEET 5 OF 25

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.			SHEET NO.
6	MANH 95 (40) IM			37
STATE	STATE DIST. NO.	COUNTY		
TEXAS	15	COMAL		
CONT.	SECT.	JOB	HIGHWAY NO.	
0016	05	087	IH 35	



TRAFFIC MANAGEMENT SYSTEM ESTIMATED QUANTITIES		
ITEM	UNIT	QTY
4" PVC MULTIDUCT (2-WAY) (CONCRETE ENCASED)	LF	1200
TY-A MANHOLE	EA	1

▲ = CONCRETE ENCASED CONDUIT



B. G. Fariello, P.E. *6/25/98*
Brian G. Fariello DATE

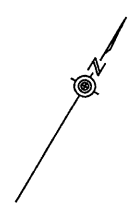
CHANGE ORDER NO. 28

TRAFFIC MANAGEMENT SYSTEM LAYOUT

SHEET 6 OF 25

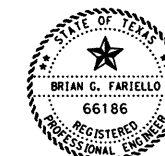
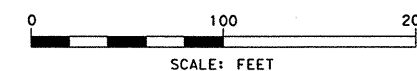
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STATE	STATE DIST. NO.	COUNTY
TEXAS	15	COMAL
CONT.	SECT.	JOB
0016	05	087
		HIWAY NO.
		IH 35

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▲ 4" PVC MULTIDUCT (2-WAY) X 1200'
#1: FUTURE
#2: FUTURE

▲ = CONCRETE ENCASED CONDUIT



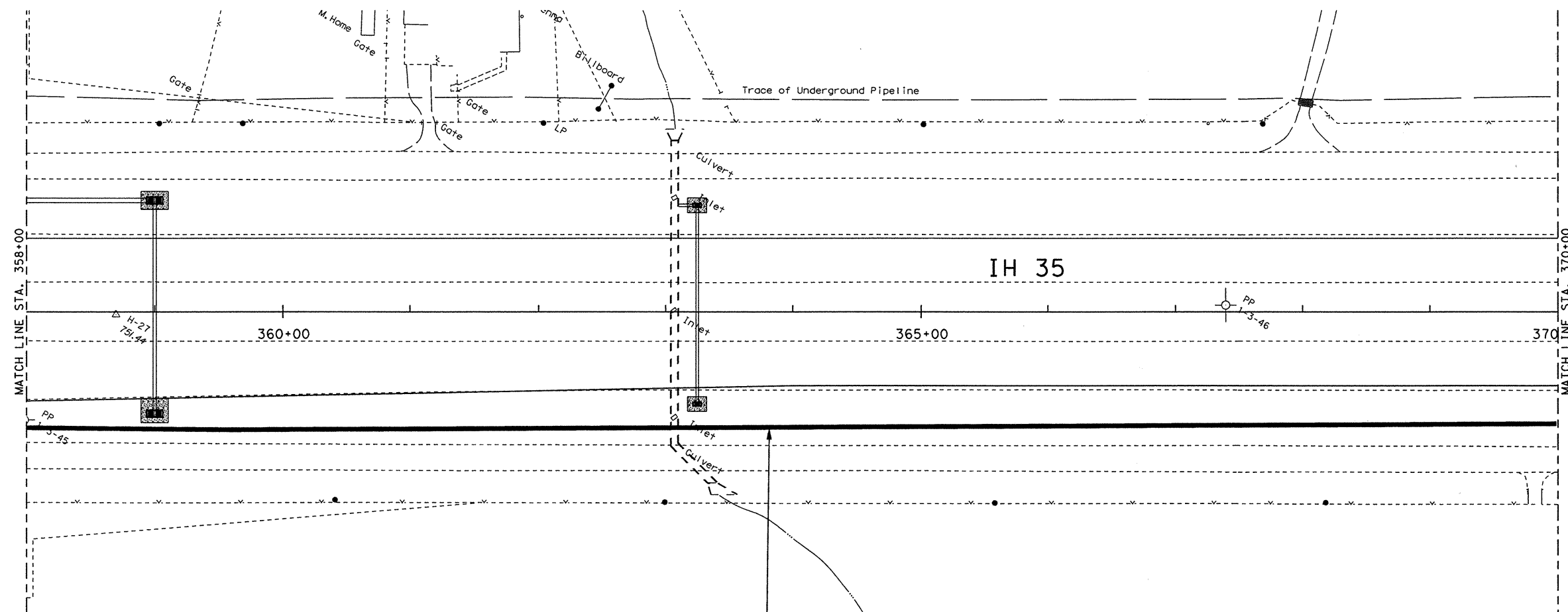
B. G. Foriello, P.E. 6/25/90
DATE

CHANGE ORDER NO. 28

TRAFFIC MANAGEMENT SYSTEM LAYOUT

SHEET 7 OF 25

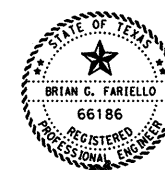
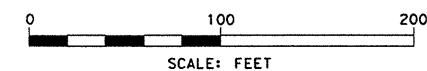
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TEXAS	15	COMAL		
CONT.	SECT.	JOB	HIGHWAY NO.	
0016	05	087	IH 35	



▲ 4" PVC MULTIDUCT (2-WAY) X 1200'
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#2: FUTURE

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▲ = CONCRETE ENCASED CONDUIT



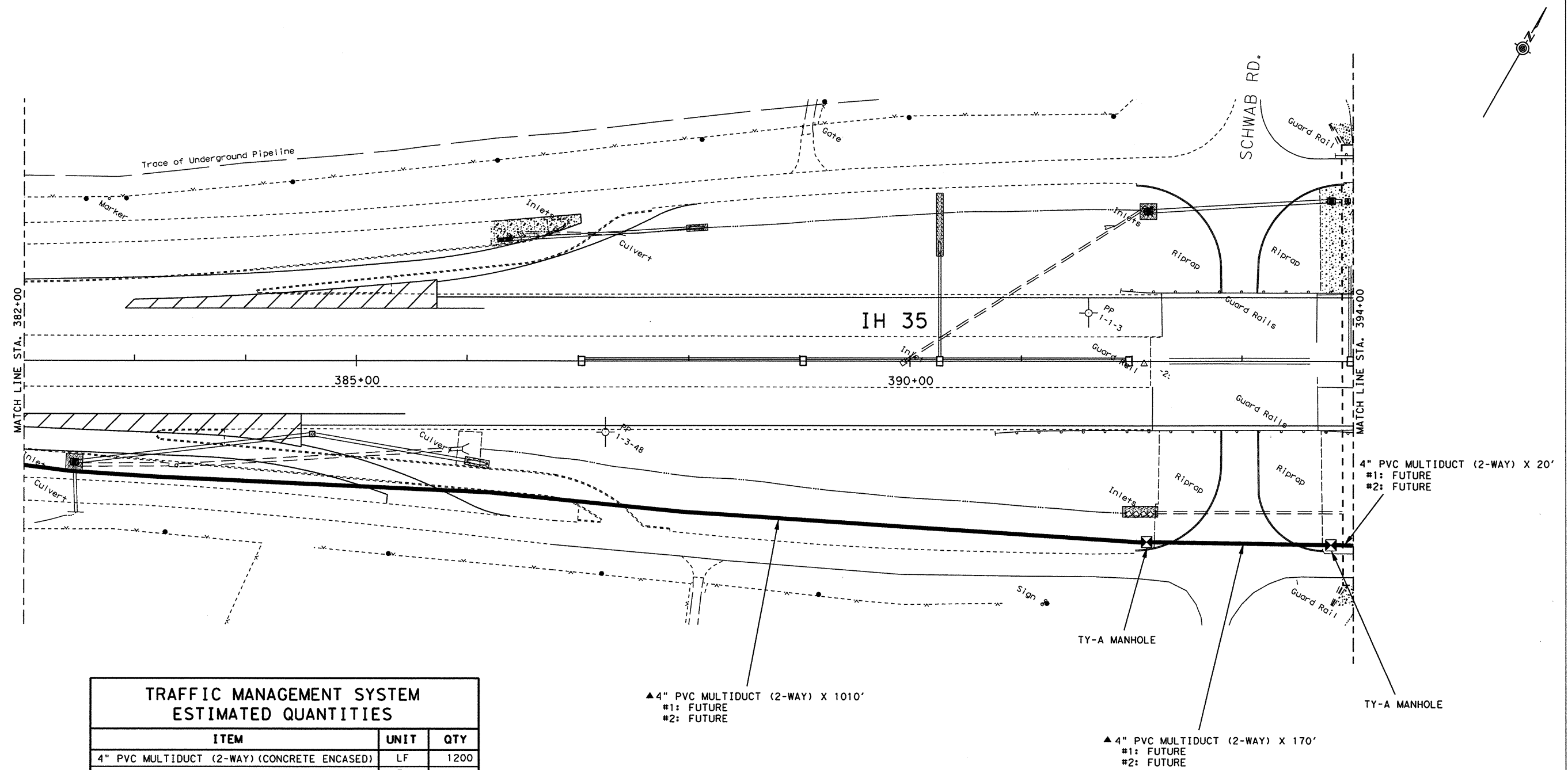
B. G. Fariello, P.E. 6/25/98
Brian G. Fariello DATE

CHANGE ORDER NO. 28

TRAFFIC MANAGEMENT SYSTEM LAYOUT

SHEET 12 OF 25

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STATE	STATE DIST. NO.	COUNTY		
TEXAS	15	COMAL		
CONT.	SECT.	JOB	HIGHWAY NO.	
0016	05	087	IH 35	

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▲ = CONCRETE ENCASED CONDUIT

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SCALE: FEET

CHANGE ORDER NO. 28.

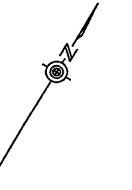
TRAFFIC MANAGEMENT , SYSTEM LAYOUT

SHEET 14 OF 25

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CONT.	SECT.	JOB	HIGHWAY NO.	
0016	05	087	IH 35	

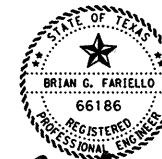
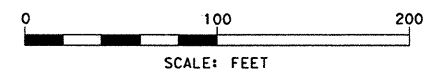
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▲ 4" PVC MULTIDUCT (2-WAY) X 1200'
#1: FUTURE
#2: FUTURE

▲ = CONCRETE ENCASED CONDUIT



B. G. F. P. I.
Brian G. Pariello

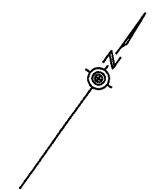
6/25/98
DATE

CHANGE ORDER NO. 28

TRAFFIC MANAGEMENT SYSTEM LAYOUT

SHEET 15 OF 25

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6	MANH 95 (40) IM			388
STATE	STATE DIST. NO.	COUNTY		
TEXAS	15	COMAL		
CONT.	SECT.	JOB	HIGHWAY NO.	
0016	05	087	IH 35	



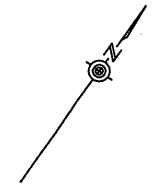
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#1: FUTURE
#2: FUTURE

0 100 200
SCALE: FEET



SHEET 16 OF 25

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STATE	STATE DIST. NO.	COUNTY	
TEXAS	15	COMAL	
CONT.	SECT.	JOB	HIGHWAY NO.
0016	05	087	IH 35

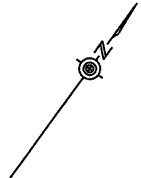


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B. G. Fariello, P.E.
Brian G. Fariello

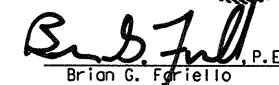
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STATE	STATE DIST. NO.	COUNTY	
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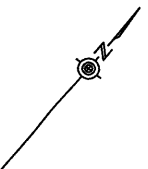
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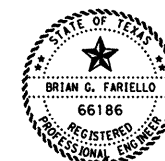
SHEET 19 OF 25

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TEXAS	15	COMAL	
CONT.	SECT.	JOB	HIGHWAY NO.
0016	05	087	IH 35

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▲ 4" PVC MULTIDUCT (2-WAY) X 1200'
#1: FUTURE
#2: FUTURE

▲ = CONCRETE ENCASED CONDUIT



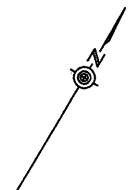
CHANGE ORDER NO. 28

TRAFFIC MANAGEMENT

42 SYSTEM LAYOUT

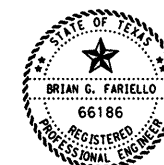
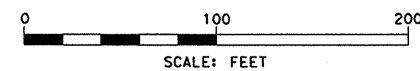
SHEET 23 OF 25

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STATE	STATE DIST. NO.	COUNTY	
TEXAS	15	COMAL	
CONT.	SECT.	JOB	HIGHWAY NO.
0016	05	087	IH 35

[illegible]

▲ 4" PVC MULTIDUCT (2-WAY) X 1200'
#1: FUTURE
#2: FUTURE

▲ = CONCRETE ENCASED CONDUIT



B. G. Fariello, P.
Brian G. Fariello

6/25/98
DATE

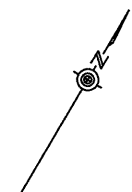
CHANGE ORDER NO. 28

TRAFFIC MANAGEMENT

SYSTEM LAYOUT

SHEET 24 OF 25

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.			SHEET NO.
6	MANH 95 (40) IM			397
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TEXAS	15	COMAL		
CONT.	SECT.	JOB	HIGHWAY NO.	
0016	05	087	IH 35	

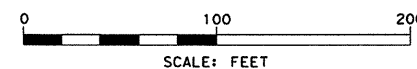


▲ 4" PVC MULTIDUCT (2-WAY) X 1000'
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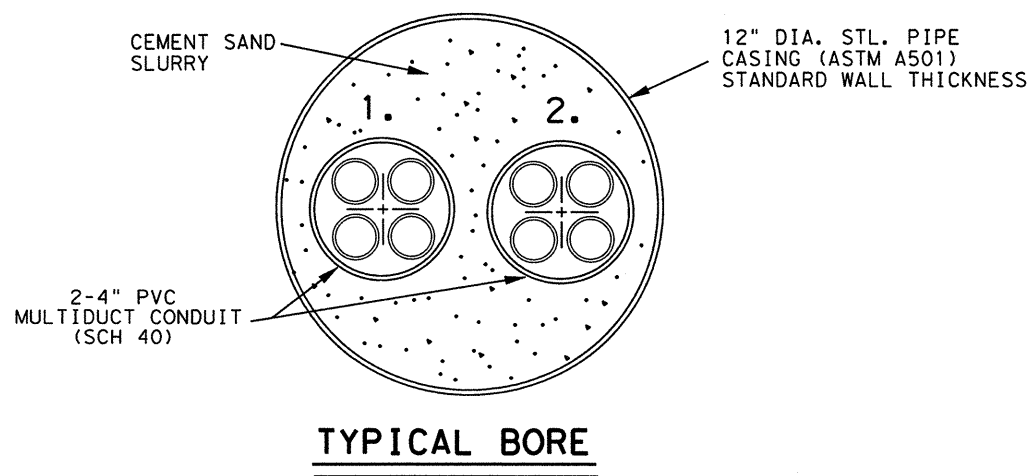
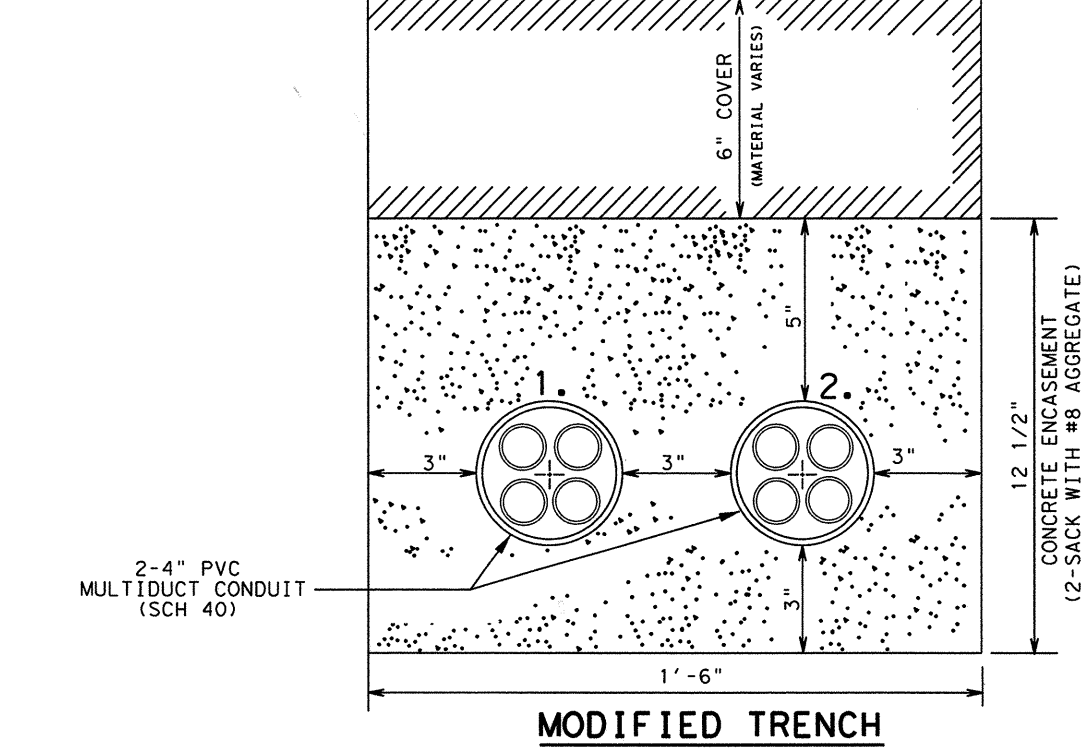
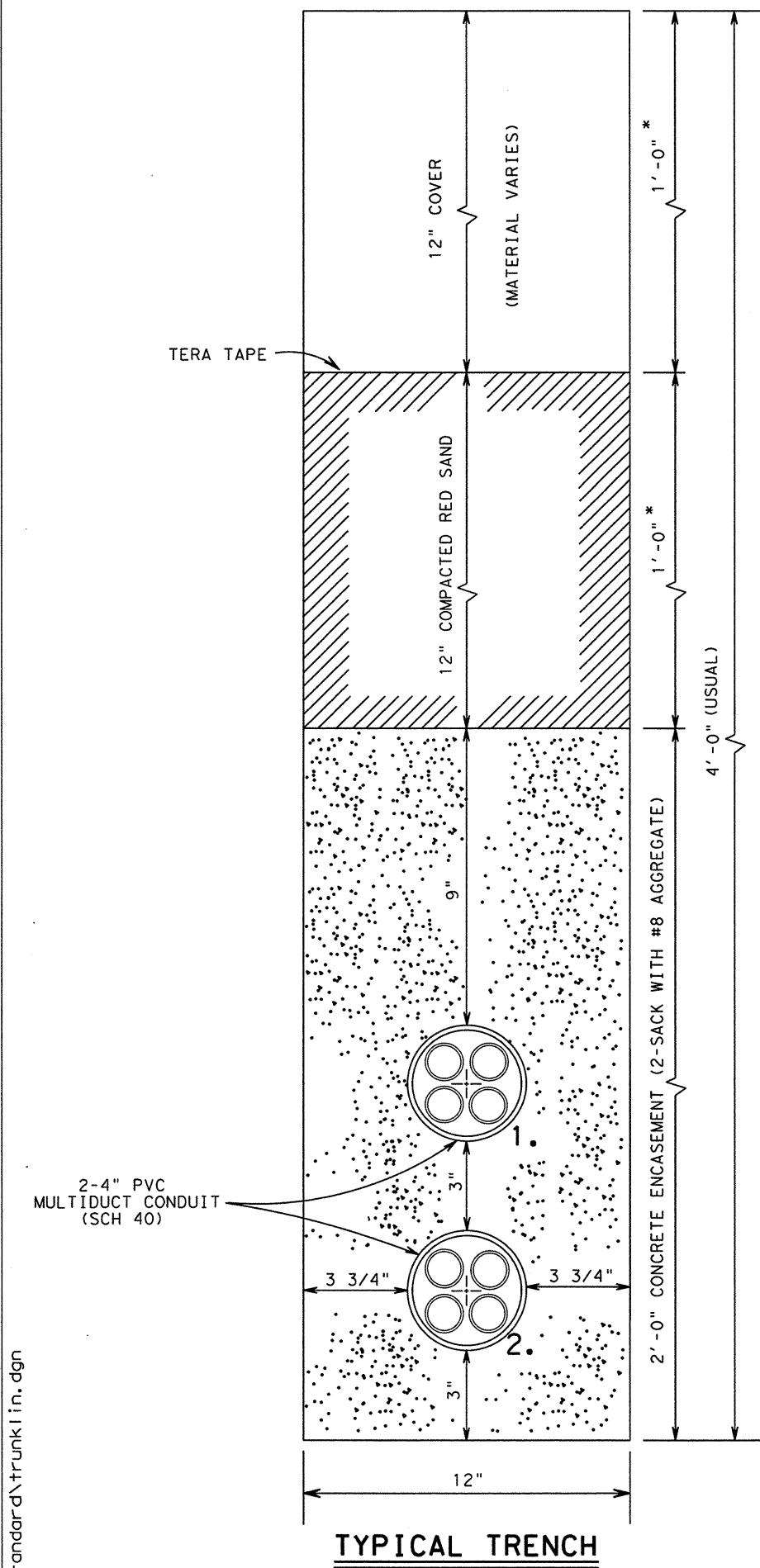
TRAFFIC MANAGEMENT SYSTEM LAYOUT

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	MANH 95 (40) IM		39
STATE	STATE DIST. NO.	COUNTY	
TEXAS	15	COMAL	
CONT.	SECT.	JOB	HIGHWAY NO.
0016	05	087	1H 35



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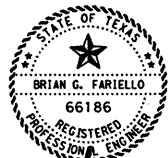
ETW: standard\trunklin.dgn



* CONTRACTOR SHALL CONCRETE ENCASE 4 FEET IN DEPTH IN AREAS UNDER MAINLANES, FRONTAGE ROADS, INTERSECTIONS, OR RAMPS. TOP OF CONCRETE SHALL BE 1 1/2" BELOW FINISHED GRADE OR AS DIRECTED BY THE ENGINEER. 1 1/2" OF ASPHALT SHALL BE PLACED ON TOP OF CONCRETE ENCASEMENT TO FINISHED GRADE. ADDITIONAL CONCRETE UNDER ROADWAY SHALL NOT BE PAID FOR DIRECTLY BUT SHALL BE CONSIDERED SUBSIDIARY TO THE VARIOUS BID ITEMS.

NOTES:

1. SPECIAL ATTENTION SHOULD BE MADE TO THE EXISTING UTILITIES. THE CONTRACTOR MAY HAVE TO VARY THE DEPTH OF THE TRENCH IN ORDER TO PASS OVER/UNDER ANY EXISTING UTILITY.
2. A TEMPLATE SHALL BE PROVIDED AT 10' (FOOT) INTERVALS TO INSURE THAT THE CONDUIT REMAINS IN ITS ORIGINAL POSITION AS APPROVED BY THE ENGINEER.
3. NO DIRECT PAYMENT SHALL BE MADE FOR THE CONCRETE ENCASEMENT OR TEMPLATES BUT THESE SHALL BE CONSIDERED SUBSIDIARY TO THE VARIOUS BID ITEMS.
4. A 10' (FOOT) TRANSITION SHALL BE USED TO GO FROM A TYPICAL TRENCH TO A MODIFIED TRENCH.
5. SEE "ED" SHEETS FOR ADDITIONAL DETAILS AND NOTES.
6. THE LOCATION OF UTILITIES, EITHER UNDERGROUND OR OVERHEAD, SHALL BE VERIFIED BY THE CONTRACTOR BEFORE BEGINNING CONSTRUCTION OPERATIONS.
7. FOR TYPICAL BORE, A 2' (FOOT) PLUS OF CEMENT SAND SLURRY SHALL BE INJECTED INTO EACH END OF STEEL PIPE CASING TO MAKE IT WATERTIGHT.



B. C. Farfello P.E. *6/25/98*
Brian C. Farfello DATE

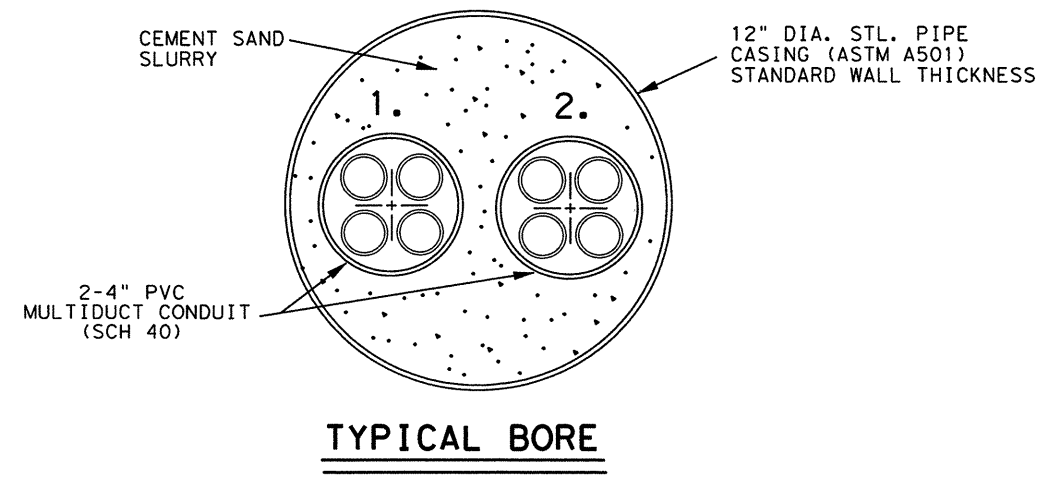
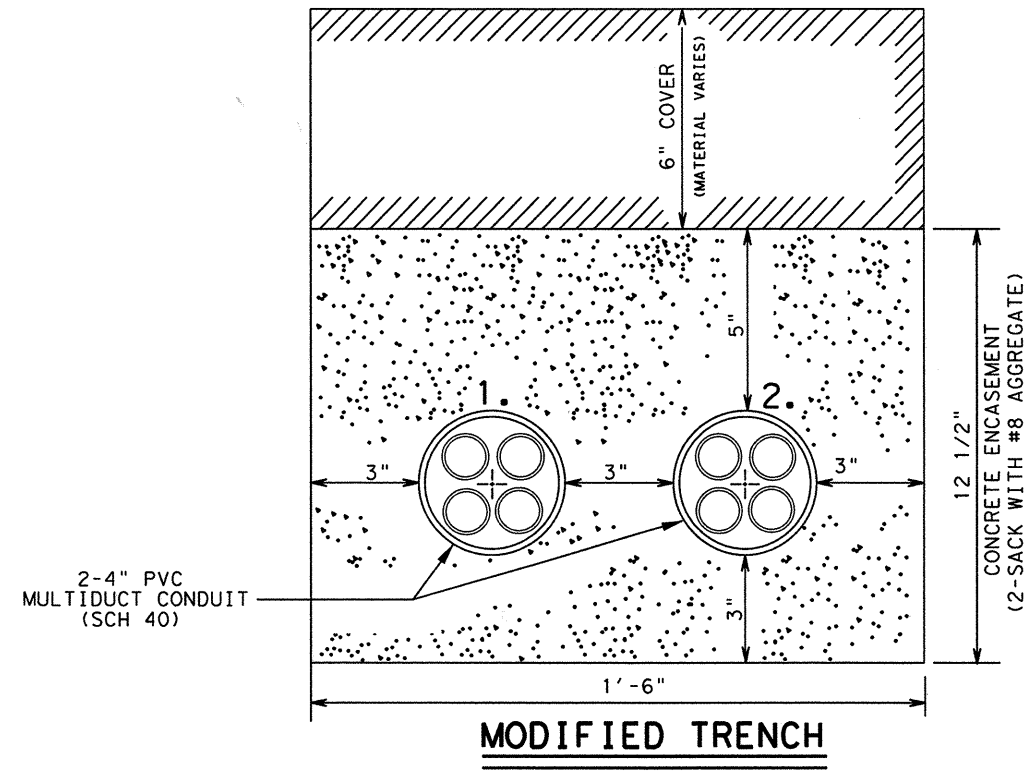
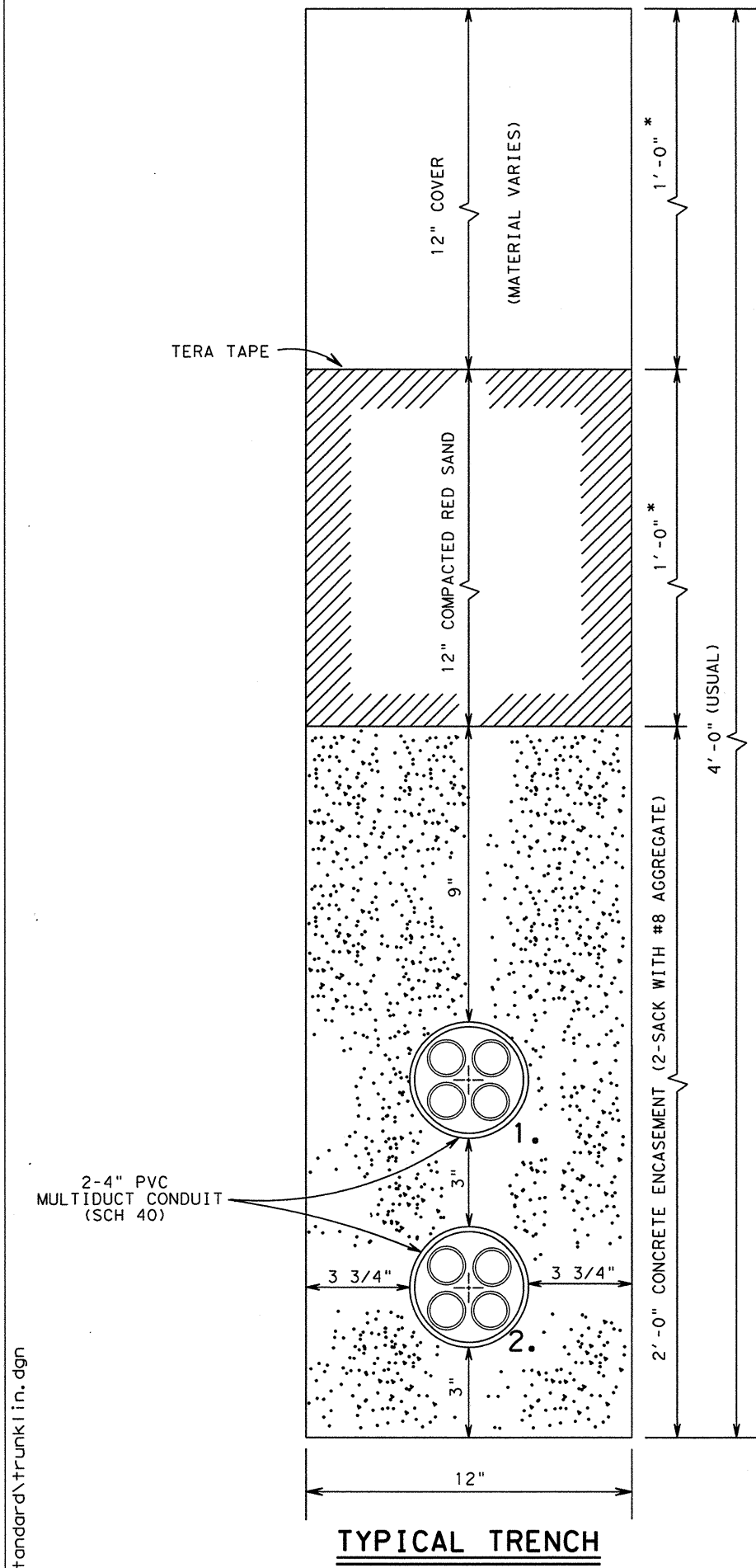
CHANGE ORDER NO. 28

TRENCH DETAILS
4" PVC MULTIDUCT CONDUIT

FED. PROJ. NO.	STATE PROJ. NO.	FED. PROJ. NO.	STATE PROJ. NO.
6	MAINTEN	95(40)	IM
TEXAS	15	COMAL	
0016	05	087	11 35

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NOTES:

1. SPECIAL ATTENTION SHOULD BE MADE TO THE EXISTING UTILITIES. THE CONTRACTOR MAY HAVE TO VARY THE DEPTH OF THE TRENCH IN ORDER TO PASS OVER/UNDER ANY EXISTING UTILITY.
2. A TEMPLATE SHALL BE PROVIDED AT 10' (FOOT) INTERVALS TO INSURE THAT THE CONDUIT REMAINS IN ITS ORIGINAL POSITION AS APPROVED BY THE ENGINEER.
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* CONTRACTOR SHALL CONCRETE ENCASE 4 FEET IN DEPTH IN AREAS UNDER MAINLANES, FRONTAGE ROADS, INTERSECTIONS, OR RAMPS. TOP OF CONCRETE SHALL BE 1 1/2" BELOW FINISHED GRADE OR AS DIRECTED BY THE ENGINEER. 1 1/2" OF ASPHALT SHALL BE PLACED ON TOP OF CONCRETE ENCASEMENT TO FINISHED GRADE. ADDITIONAL CONCRETE UNDER ROADWAY SHALL NOT BE PAID FOR DIRECTLY BUT SHALL BE CONSIDERED SUBSIDIARY TO THE VARIOUS BID ITEMS.



B. G. Fariello, P.E. 6/25/98
Brian G. Fariello DATE

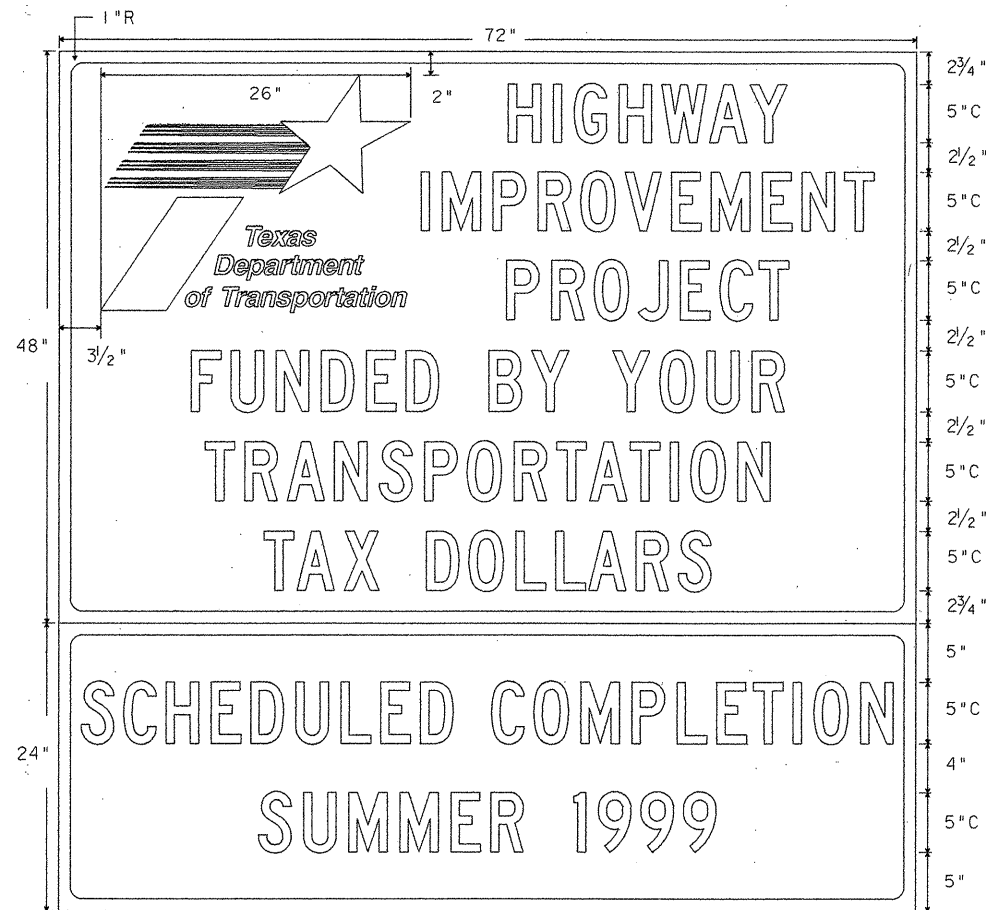
CHANGE ORDER NO. 28

TRENCH DETAILS
4" PVC MULTIDUCT CONDUIT

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.
6	MANH 95 (40) IM	400
STATE	STATE DIST. NO.	COUNTY
TEXAS	15	COMAL
CONT.	SECT.	JOB
0016	05	087
		HIGHWAY NO.
		1H 35

DISCLAIMER
The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

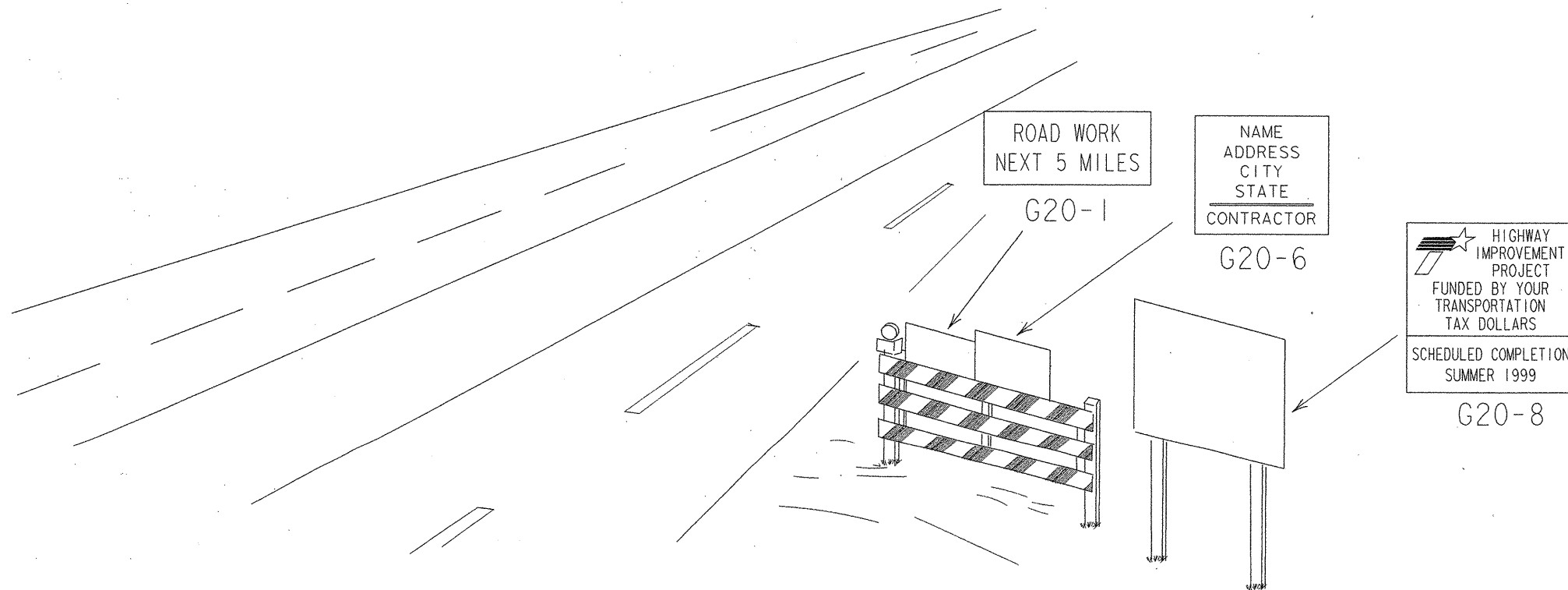
UTL: CW
DW: DN
CK: MT
ACC: d58hplc/usp/d580504
FILE: 49605152635455657 5960616263



G20-8

72" x 48" sign
TxDOT logo - standard red & blue
Background - white
Legend & border - blue

72" x 24" plaque
Background - blue
Legend & border - white



SPECIFICATION REFERENCE TABLE	
MATERIALS AND TESTS DIVISION SPECIFICATIONS	
PLYWOOD SIGN BLANKS	D-9-7100
ALUMINUM SIGN BLANKS	D-9-7110
REFLECTIVE SHEETING, TYPE A (ENGINEER GRADE)	D-9-8300
REFLECTIVE SHEETING, TYPE C (HIGH SPECIFIC INTENSITY)	D-9-8300
SIGN HARDWARE	D-9-7120

COLOR	USAGE	REFLECTIVE SHEETING OR OTHER MATERIAL
BLUE	BACKGROUND	TYPE C (HIGH SPECIFIC INTENSITY)
WHITE	BACKGROUND	TYPE A (ENGINEER GRADE)
BLUE	LEGEND & BORDER	TYPE C (HIGH SPECIFIC INTENSITY)
WHITE	LEGEND & BORDER	TYPE A (ENGINEER GRADE)

GENERAL NOTES:

The alphabets and lateral spacing between letters and numerals shall conform with the Texas "Manual on Uniform Traffic Control Devices for Streets and Highways", latest edition, and any approved changes thereto. Lateral spacing of text shall provide a balanced appearance. All materials shall conform to Department Specifications.

Legend and border may be applied by reverse screening process with transparent colored ink, cut-out white reflective sheeting applied to colored background or combination thereof. Background shall be reflective sheeting (Type A).

Sign blanks for roadside mounted guide signs shall be 5/8 inch thick plywood (Type A) or extruded aluminum, unless otherwise noted elsewhere in the plans. Dimensions shown for borders and corner radii are nominal. Borders may vary in width as much as 1/2 inch. Borders and corner radii must be of matching widths. The sign area outside the corner radius need not be trimmed or rounded. Panels attached below the parent sign shall be made of the same material as the parent sign, or as specified on the sign tabulation sheet.

Mounting details are shown on Standard Plan Sheets SMD series.

The TxDOT logo is a registered trademark of the Texas Department of Transportation.

SIGN AND SUPPORTS SHALL BE CONSIDERED SUBSIDIARY TO ITEM 502, "BARRICADES, SIGNS AND TRAFFIC HANDLING."

STANDARD PLANS
TEXAS DEPARTMENT OF TRANSPORTATION
Traffic Operations Division

SPECIAL
PUBLIC INFORMATION
SIGN

WZ (SPIS) - 96

ORIG. DRAW. DATE: May 1996	DN: MT	CK: DN	CK: DN	REG. NO. 1
REVISIONS				
STATE DISTRICT	FEDERAL PROJECT	SHEET		
SAT	6	MANH 95 (40) IM		
COUNTY	CONTROL SECTION	JOB	HIGHWAY	
CONAL	0016	05	087	1H 35
119C				