

N-423-D

FED. PROJ. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.
MA-HES 0005 (293)	TEXAS	MA-HES 0005 (293)	7
NO.	COUNTY	CONTROL NO.	NUMBER
16	NUECES	326-3-61	SH286

STATE OF TEXAS
STATE DEPARTMENT OF HIGHWAYS AND PUBLIC TRANSPORTATION

PLANS OF PROPOSED
STATE HIGHWAY IMPROVEMENT

FEDERAL AID PROJECT
MA-HES 0005 (293)
S.H. 286
NET LENGTH OF PROJECT = 23,047.00 FT. = 4.384 MI.
NUECES COUNTY
PROJECT LIMITS: FROM I.H. 37 TO 0.2 MILES NORTH OF S.H. 358
TYPE: CONCRETE TRAFFIC BARRIER & ILLUMINATION

7757
12

Worked 3/88
Mapping 9/88 NC
B

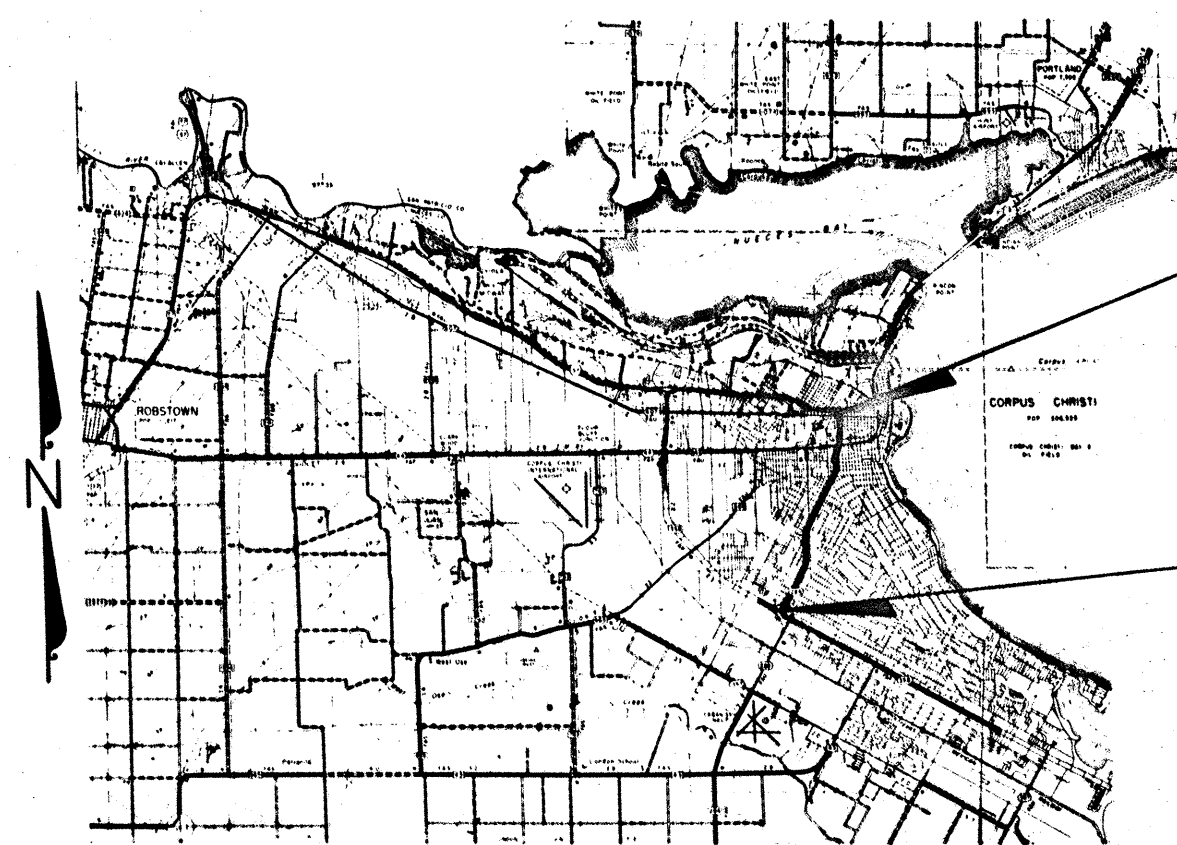
PROJECT WAS BUILT ACCORDING TO THE PLANS AND SPECIFICATIONS.
THESE FINAL PLANS REFLECT THE WORK DONE AND THE QUANTITIES SHOWN
THEREON AND ON THE FINAL ESTIMATE ARE FINAL QUANTITIES.

CONTRACTOR W.T. Young
DATE WORK BEGAN Dec. 9, 1984
DATE WORK COMPLETED Jan. 25, 1985
CONTRACT AMOUNT 3,066,884.00
FINAL ESTIMATE 3,361,054.25
WORKING DAYS ALLOTTED 260
WORKING DAYS USED 353

Olga S. Comuzie 7-7-85
SUPERVISING RESIDENT ENGINEER DATE

FIELD CHANGES

- EXTRA WORK ORDER NO. 1
THIS FORCE ACCOUNT WORK COVERS THE
CONSTRUCTION OF 1200 FT. OF SPEC. CONC.
BARRIER IN EXCESS OF 6' 8" IN HEIGHT
BETWEEN STA 134+00 AND STA 144+00 AND
BETWEEN STA 174+00 AND STA 180+00
- FC NO. 1 REMOVE EXISTING MBOF AND REPLACE
WITH CAHBF AND CONC. TRAFFIC BARRIER
BETWEEN STA 199+09 AND STA 230+39
- FC NO. 2 TO CHANGE THE PLAN REQUIREMENT
FOR UNDERDRAIN PIPE (TY10)(4IN) TO UNDER
DRAIN PIPE (TY10)(4IN)
- FC NO. 3 ROAD BORE AND INSTALLATION OF
1/2 IN. PV CONDUIT AT APP. STA 30+71
- FC NO. 4 SURFACE FINISH ON CONC. MEDIAN
BARRIER ADDED BY EXTRA WORK ORDER
NO. 1



BEGIN PROJECT HES 0005 (293)

STA. 4 + 53.0
CONT. 326-3-61

END PROJECT HES 0005 (293)

STA. 236 + 00.0
CONT. 326-3-61

CITY OF CORPUS CHRISTI
APPROVED July 12, 1985
James P. Luster
ASSISTANT CITY MANAGER
July 12, 1985
Tom W. Stewart
DIRECTOR OF TRAFFIC & TRANSIT

NO EQUATIONS
NO EXCEPTIONS
NO RAILROAD CROSSINGS

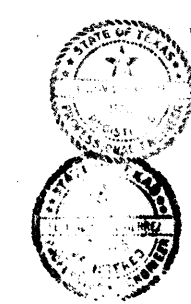
STATE DEPARTMENT OF HIGHWAYS AND PUBLIC TRANSPORTATION



Lester R. Balusek
6-10-85
SENIOR RESIDENT ENGINEER



Olga S. Comuzie
6/11/85
SUPERVISOR



William S. Minnitt
JUNE 19, 85
DISTRICT DESIGN ENGINEER

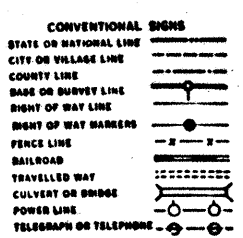
S. Euteneier
6/14/85
DISTRICT ENGINEER

RECOMMENDED FOR APPROVAL
William F. Marchant
7/15/85
CHIEF ENGINEER OF HIGHWAY DESIGN

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
APPROVED: _____
DIVISION ADMINISTRATOR DATE

INDEX OF SHEETS

SHEET NO.	DESCRIPTION
1	TITLE SHEET
2-7	TRAFFIC CONTROL PLAN
8-13	TYPICAL SECTIONS
13A	STRUCTURE SUMMARY
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16-18	GENERAL NOTES & SPECIFICATION DATA
19	HORIZONTAL ALIGNMENT DATA SHEET
20-37A	PLAN SHEETS (EXIST.)
38-45	PLAN SHEETS (PROJ.)
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65-73	LIGHTING
74-77	RID (1)-(5)-82
78-82	DETAILS AT RAMP NOSES & CONCRETE REMOVAL
83	INLET & MANHOLE ADJUSTMENT DETAILS
84-87	CONCRETE TRAFFIC BARRIER DETAILS
88-92	CTB (SPECIAL)
93	CTB (2)-81 (MOD)
94	CTB (3)-81 (MOD)
95	CTB (4)-81 (MOD)
96	GF (TD)-84
97	GF (3)
98	TB (BMGF)-84
99	BED (OWT)-84
100	GREAT-84
101	MH-M
102	IL-H (MOD)
103	ILG-H (MOD) RC C & A
104	CCCC-75 (MOD)
105	RW 1(L)
106	RW 2 (MOD)
107	TYPE T501 RAIL
108	VIA (SFPB) (DIST 16)
109	VCC (VIA) (DIST 16)
110	BC (1)-BC (7)-82
111-117	



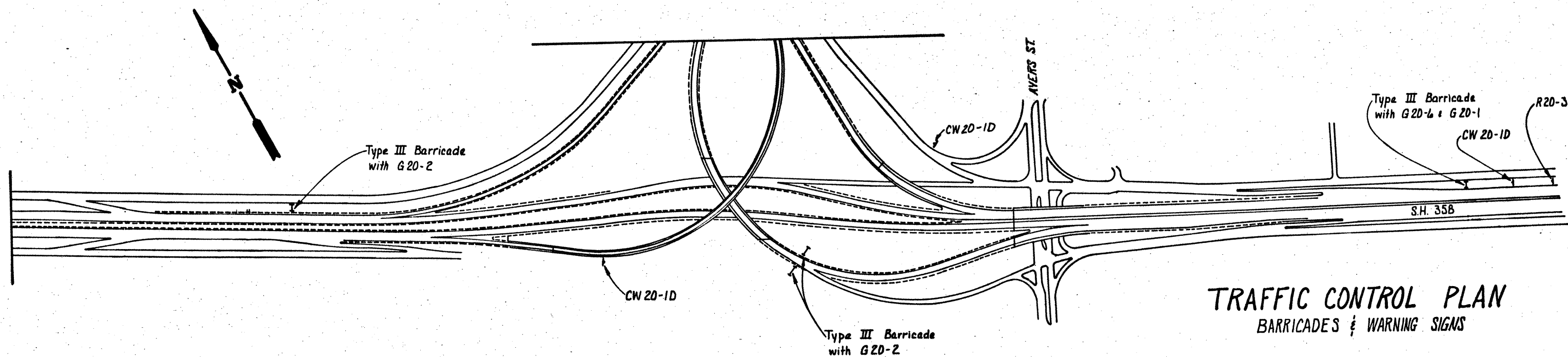
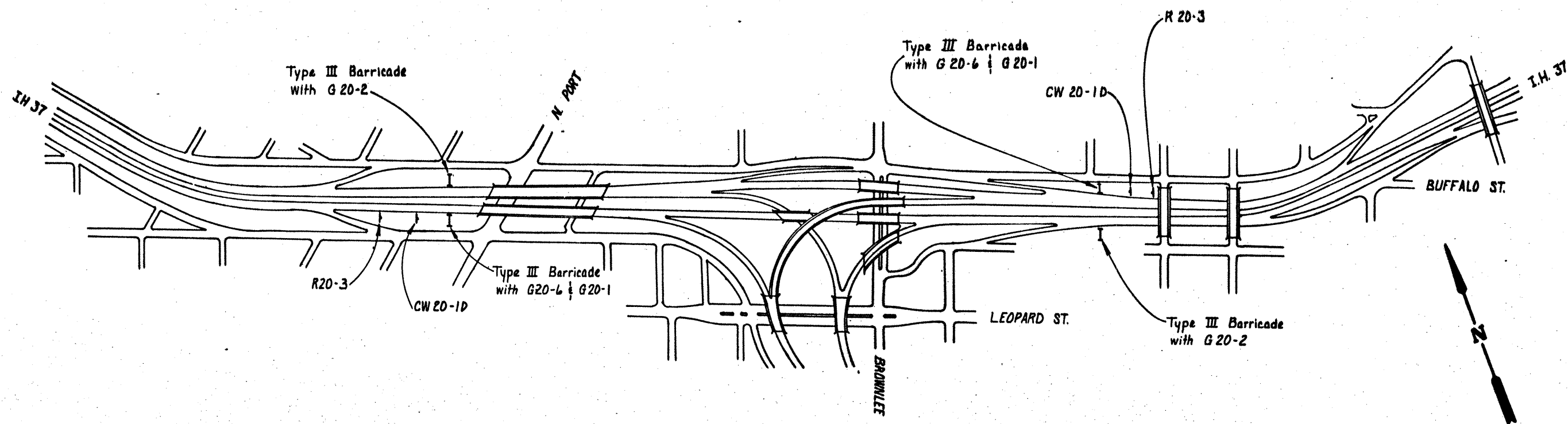
SPECIFICATIONS ADOPTED BY THE STATE DEPT. OF HWYS. & PUBLIC
TRANS. SEPT. 1, 1982 AND SPECIFICATION ITEMS LISTED AND
DATED AS FOLLOWS, SHALL GOVERN ON THIS PROJECT: REQUIRED
CONTRACT PROVISIONS FOR ALL FEDERAL-AID CONSTRUCTION CON-
TRACTS (FORM PR-1273, SEPT., 1975).

SCALE: 1" = 2 MILES

12
FINAL
MA-HES 0005 (293)

MA-HES 0005 (293)

COUNTY NO. _____
PROJ. NO. _____
LETTERING DATE _____
DATE ACCEPTED _____



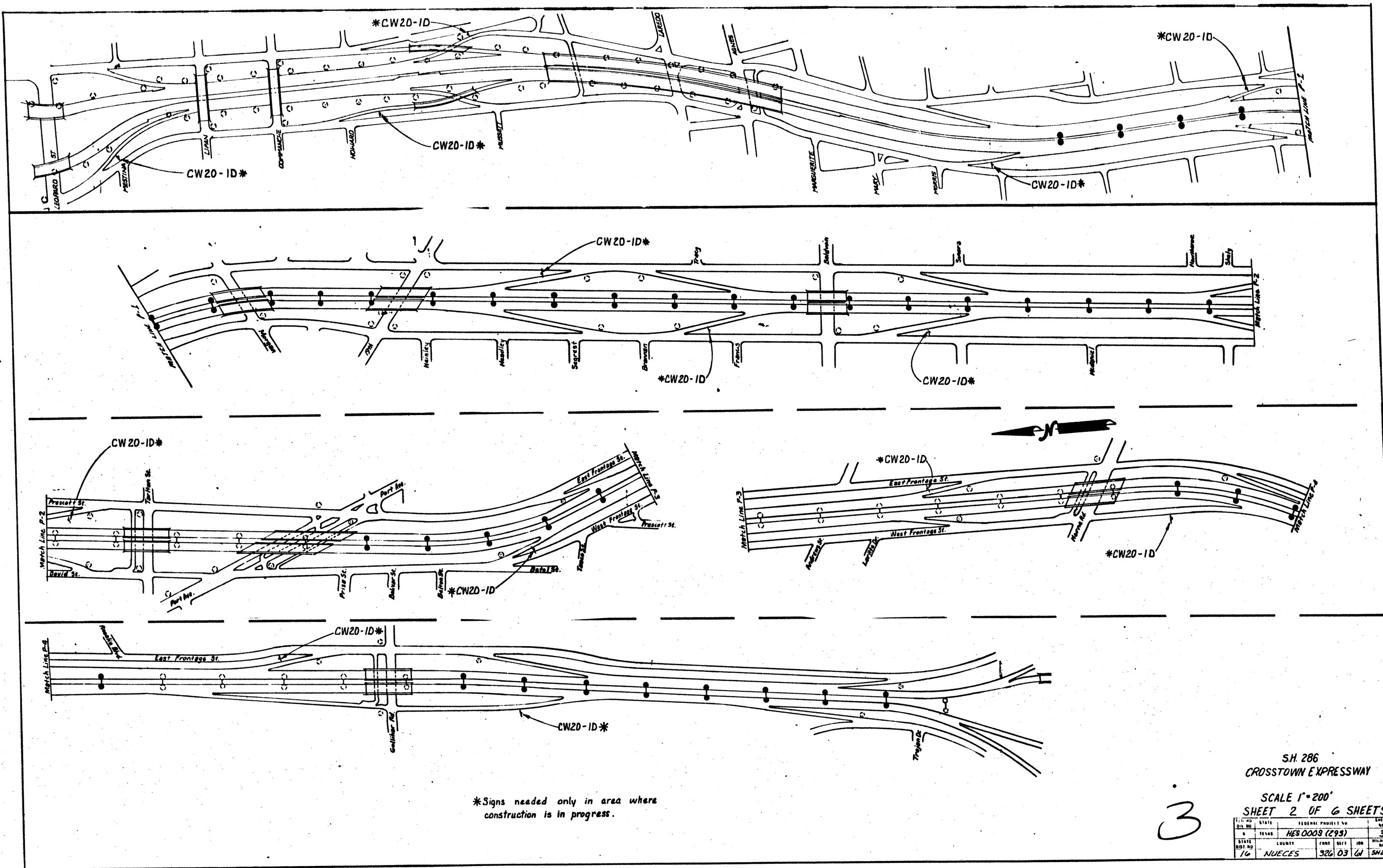
TRAFFIC CONTROL PLAN BARRICADES & WARNING SIGNS

2

Sheet 1 of 6 Sheets

FED. RD. DIST. NO.	STATE	FEDERAL PROJECT NO.	SHEET NO.
6	TEXAS	HES 0005 (293)	2
STATE DIST. NO.	COUNTY	CONT. SECT.	JOB NO.
16	NUECES	326 03	61

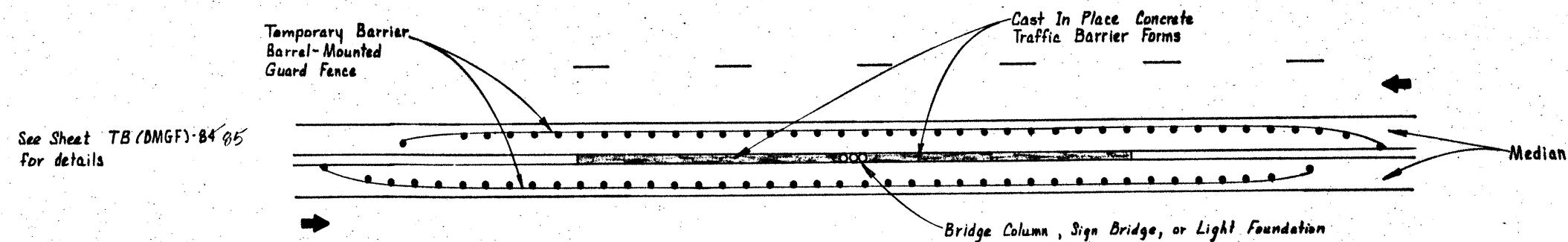
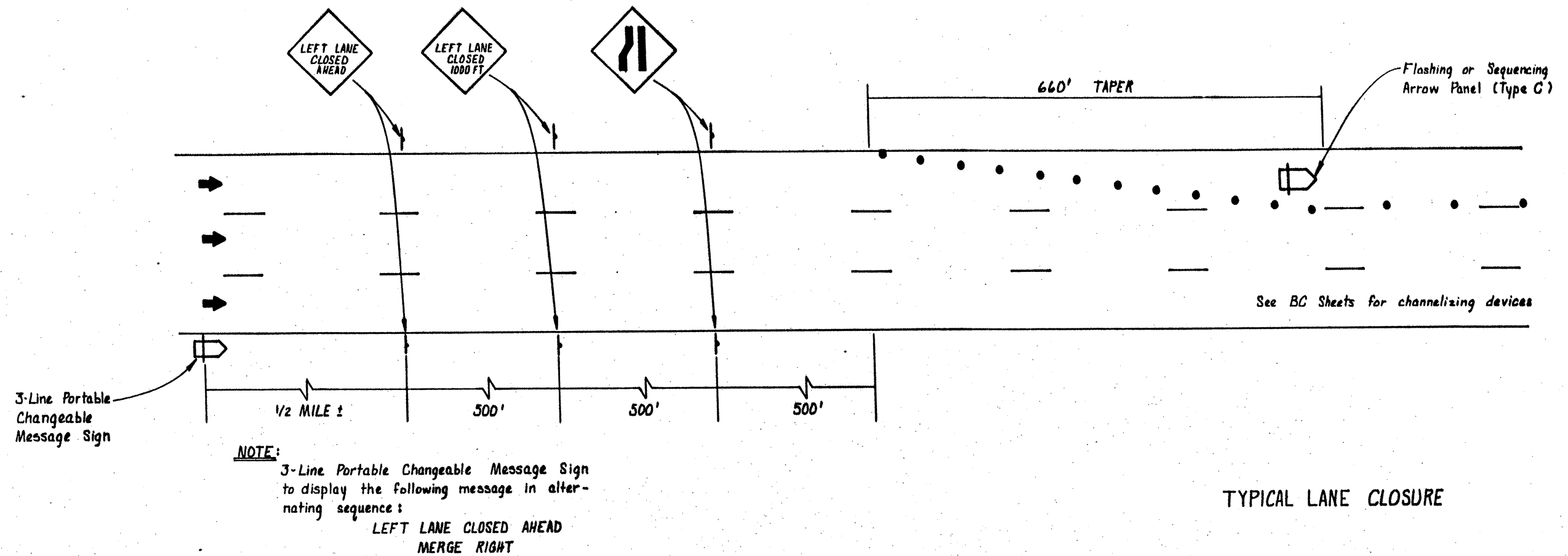
SH 286



SH 286
CROSSTOWN EXPRESSWAY

SCALE 1"=200'
SHEET 2 OF 6 SHEETS

FED. RD. DIST. NO.	STATE	FEDERAL PROJECT NO.	SHEET NO.
16	TEXAS	HES 0008 (293)	3
STATE DIST. NO.	COUNTY	POST MILE	SECTION
16	NUECES	326.03	61



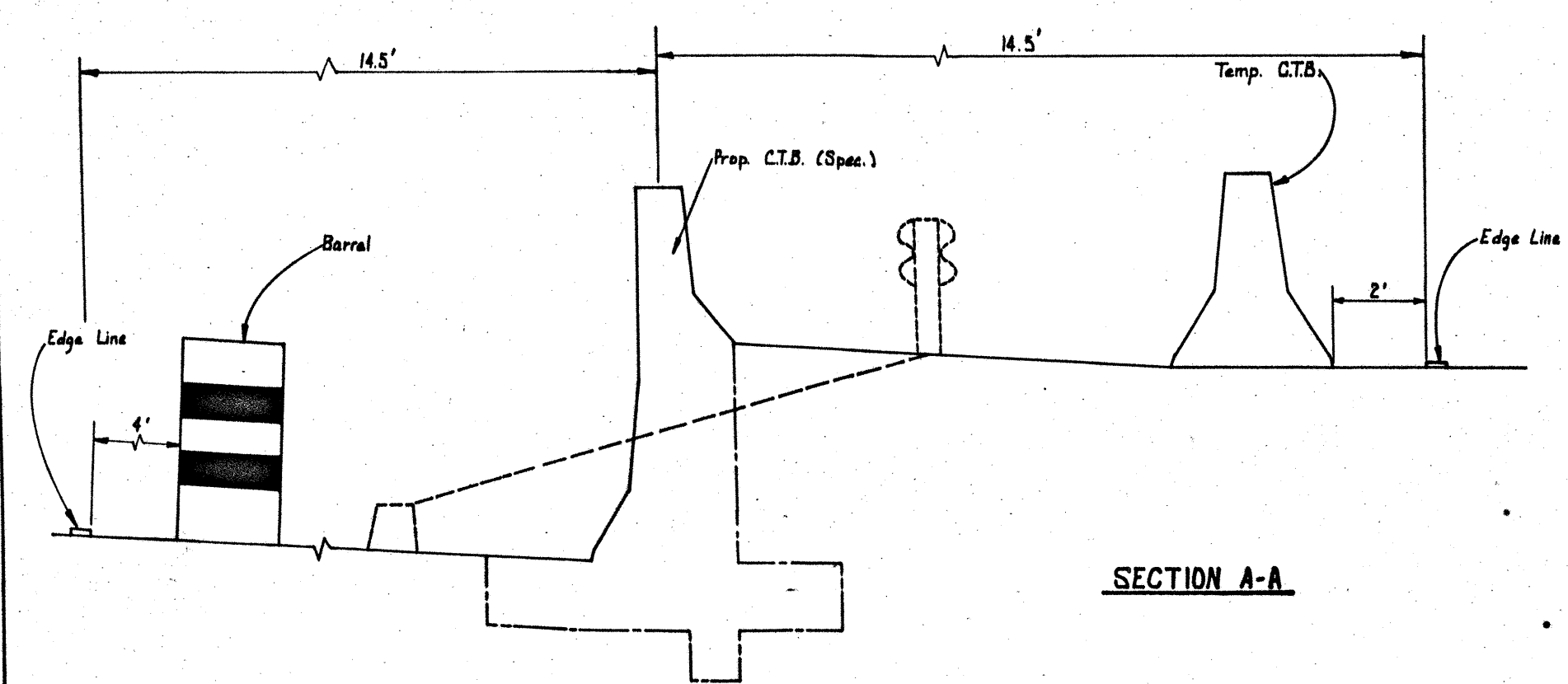
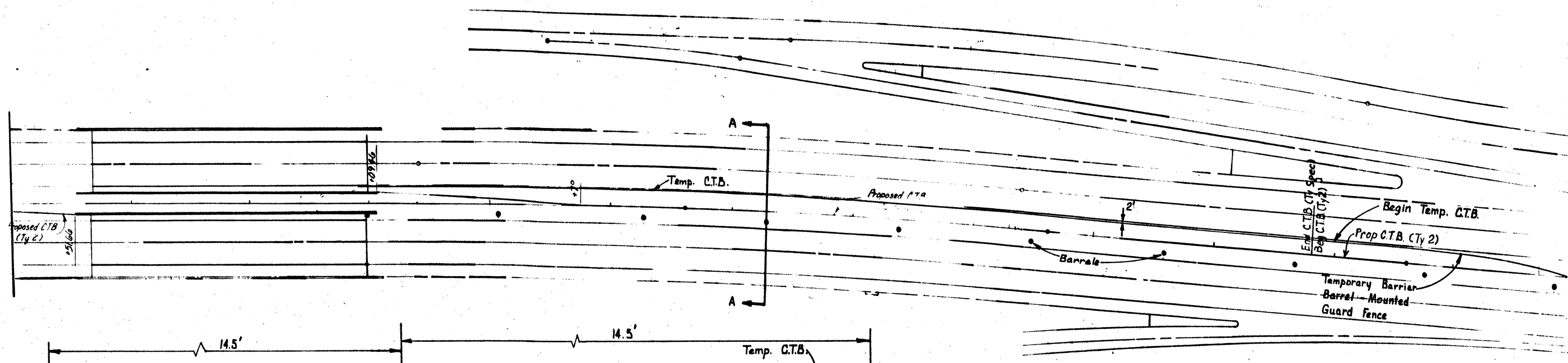
Note: Temporary Barrier Barrel-Mounted Guard Fence shall remain in place until concrete has 500 lb. beam break.

TRAFFIC CONTROL PLAN FOR
CAST IN PLACE C.T.B. AT SIGN
BRIDGE AND LIGHT FOUNDATIONS,
AND BRIDGE COLUMNS

4

Sheet 3 of 6 Sheets

FED. RD. DIST. NO.	STATE	FEDERAL PROJECT NO.	SHEET NO.
6	TEXAS	HES 0003 (293)	4
STATE DIST. NO.	COUNTY	CONTRACT NO.	SECTION NO.
16	NUECES	320 03 61	24286



SECTION A-A

NOTE: If a blunt end or form is left facing on coming traffic on the low side, it shall be protected by the method shown on Sheet TB(BMGF)-0485 along with traffic control shown. The traffic control shall remain in place until concrete has 500 lb beam break.

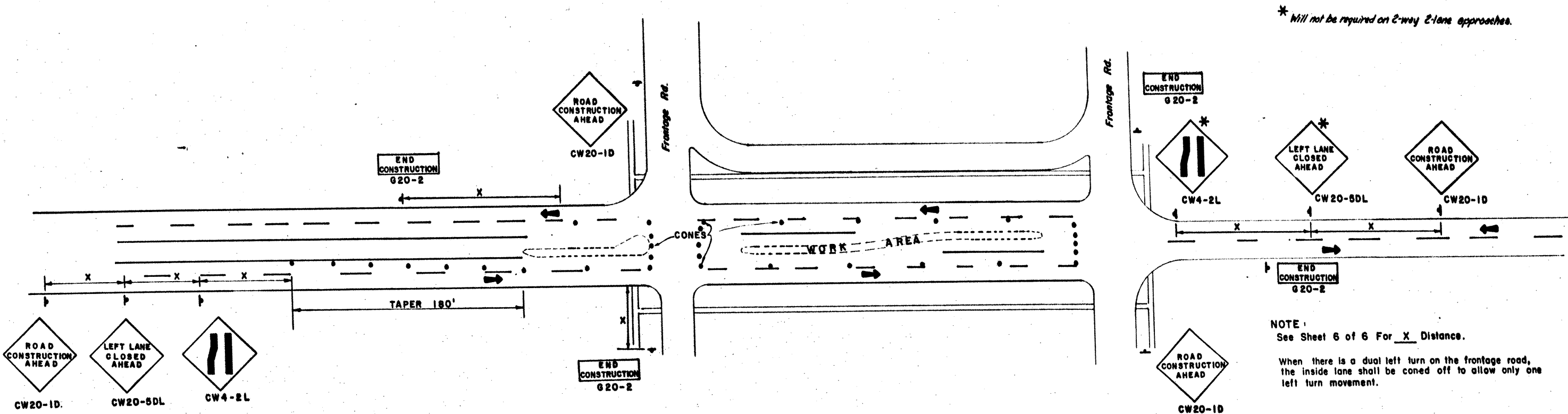
TRAFFIC CONTROL PLAN

Cast In Place Concrete
Traffic Barriers On
Super-elevated Sections

5

SCALE: 1"=40'

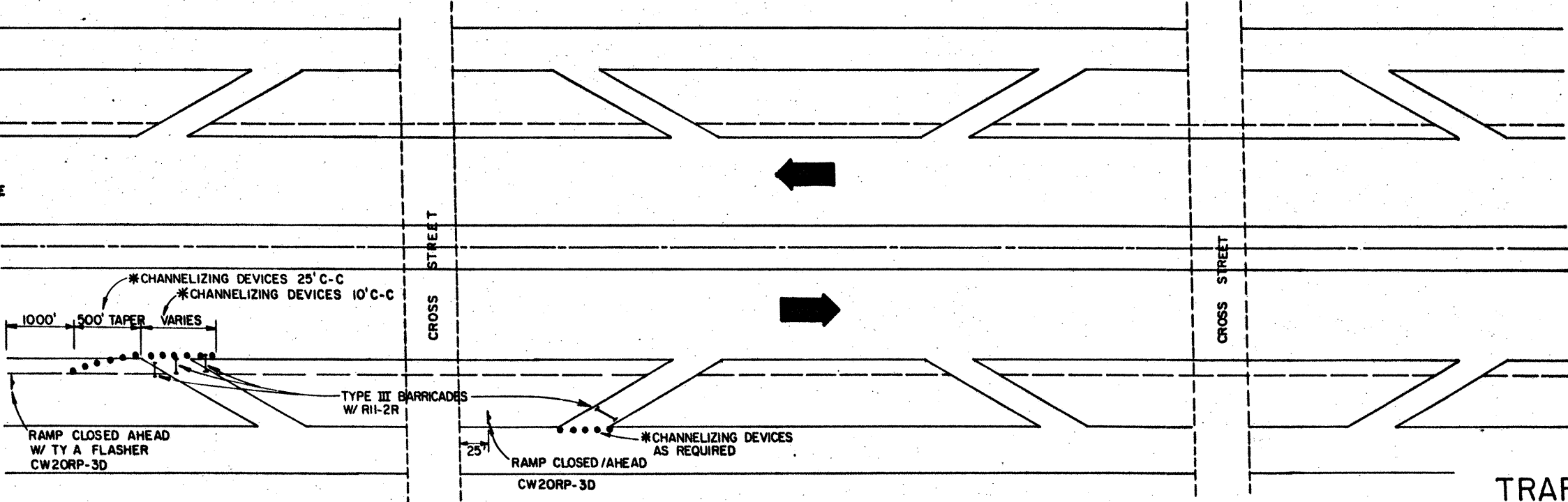
SHEET 4 OF 6 SHEETS			
FED. NO.	STATE	FEDERAL PROJECT NO.	SHEET NO.
014	TEXAS	HES 0008 (293)	5
STATE DIST. NO.	COUNTY	CONT. SECT.	JOB HIGHWAY NO.
16	NUECES	326 03 61	SH. 284



TYPICAL UNDERPASS LANE CLOSURE

NOTE: WHERE CONDITIONS ALLOW, RAMP WILL REMAIN OPEN TO TRAFFIC WITH WORK AREA BEING CONED OFF AND CW20-1D SIGN IN ADVANCE OF THE WORK AREA.

TWO CONSECUTIVE ON RAMP OR OFF RAMP IN THE SAME DIRECTION SHALL NOT BE CLOSED AT THE SAME TIME.

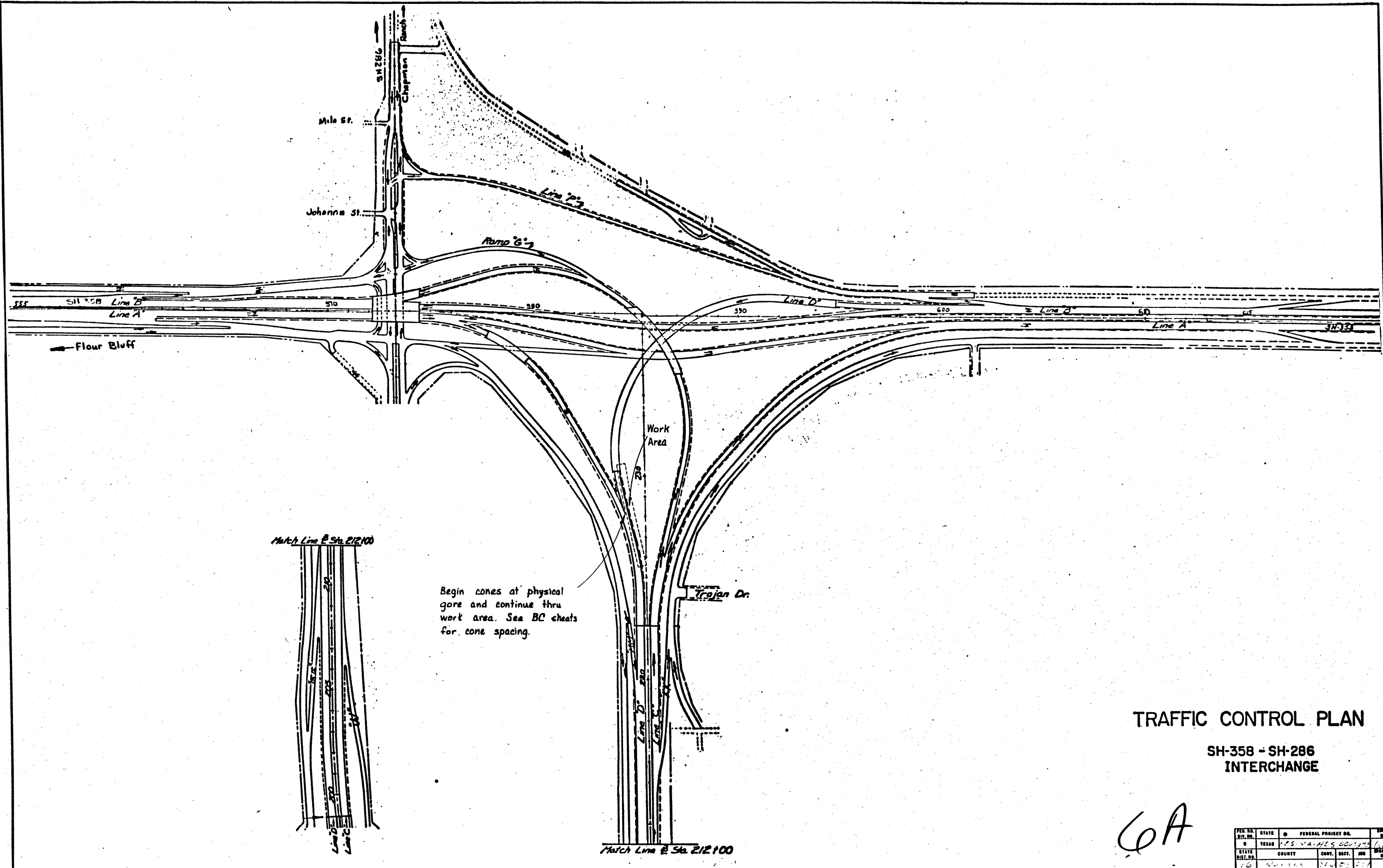


TYPICAL RAMP CLOSURE

TRAFFIC CONTROL PLAN

SHEET 5 OF 6 SHEETS

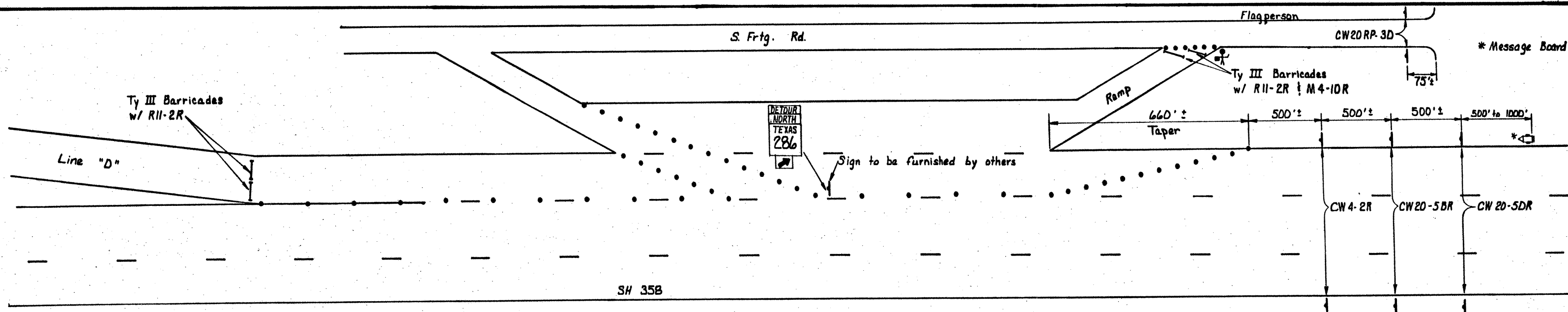
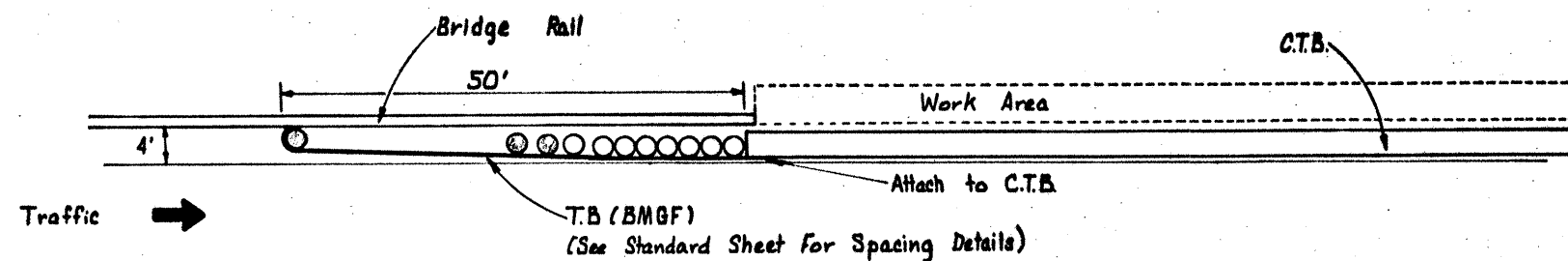
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6	TEXAS	HES 0003 (293)	6
STATE DIST. NO.	COUNTY	CONT. SECT. JOB	HIGHWAY NO.
16	NUECES	324 03 61	54286



TRAFFIC CONTROL PLAN

SH-358 - SH-286
INTERCHANGE

FED. RD. DIST. NO.	STATE	FEDERAL PROJECT NO.	SHEET NO.
0	TEXAS	15-N-115-000-000	111
STATE DIST. NO.	COUNTY	CONTRACT NO.	ROUTE NO.
10	WARRANT	220-000-000	111

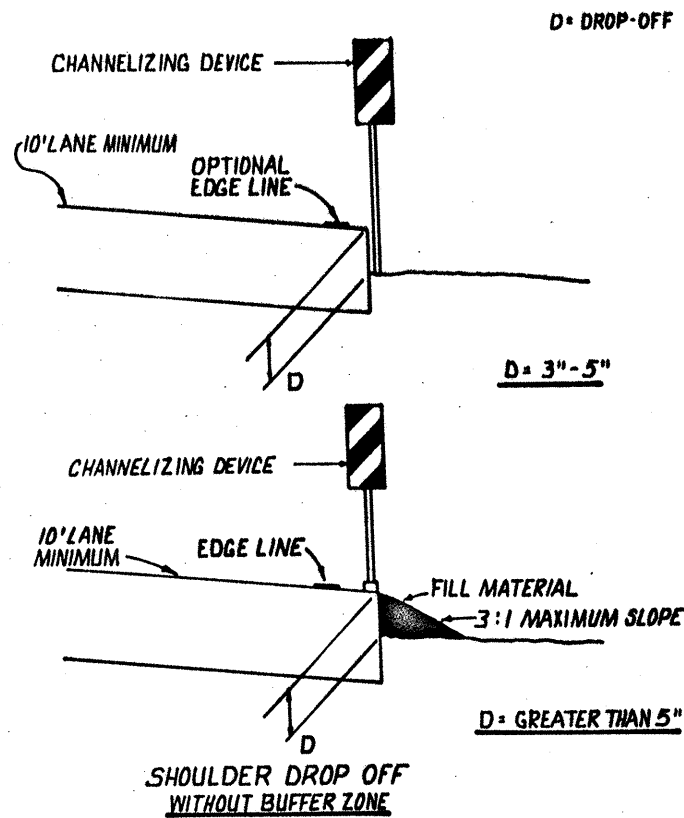


- Notes:
- 1.) For cone spacing, see BC sheets.
 - 2.) Message for Message Board:
Right Lane Closed Ahead
Merge Left.

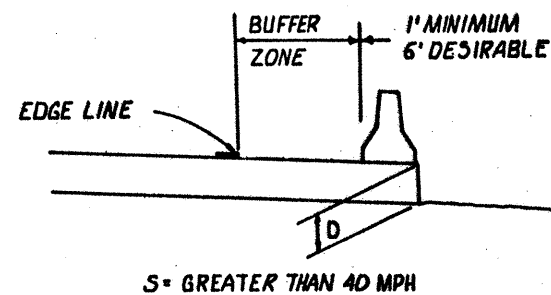
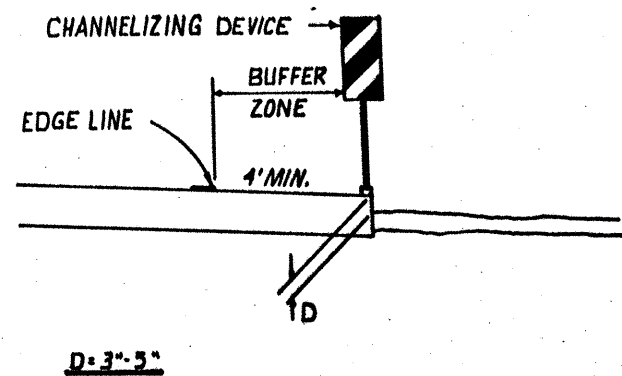
TRAFFIC CONTROL PLAN
SH 358 - SH 286
INTERCHANGE

LB

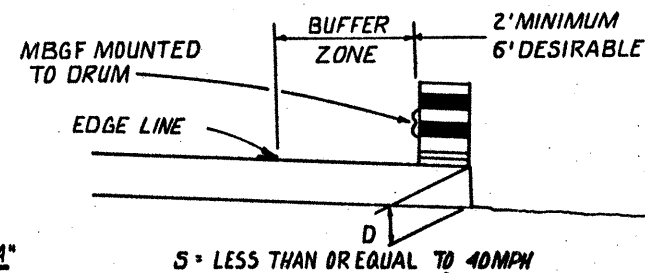
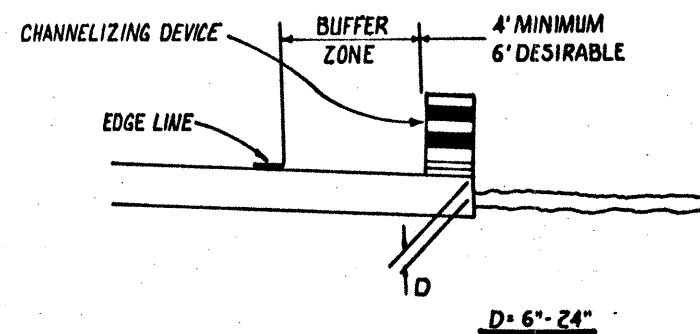
FED. NO.	STATE	FEDERAL PROJECT NO.	SHEET NO.
6	TEXAS	HE 3-MA-HESC003 (286)	10 B
STATE DIST. NO.	COUNTY	CONTRACT	SECTION
6	WHEELER	326	03



1. MAXIMUM ELEVATION DIFFERENCE BETWEEN A LANE AND A PAVED SHOULDER SHALL NOT EXCEED 3 INCHES WHEN TRAFFIC IS ALLOWED IN THE LANE ADJACENT TO THE SHOULDER DROP-OFF.
2. SIGNING FOR SHOULDER DROP-OFF (CW21-13) SHOULD BE INSTALLED IN ADVANCE TO THE CONDITION AND REPEATED EVERY 1 MILE. SIGNS INSTALLED ALONG THE SHOULDER SHOULD BE SUPPLEMENTED WITH THE NEXT XX MILES SIGN (CW21-16) OR ADVISORY SPEED SIGN (CW13-1).
3. TRAVELED WAY MAY HAVE A MINIMUM LANE WIDTH OF 9 FEET FOR LOW SPEED URBAN CONDITIONS AND A MINIMUM LANE WIDTH OF 10 FEET FOR ALL OTHER CONDITIONS.



PAVEMENT DROP-OFF WITH BUFFER ZONE



LEGEND:

██████████ BARRICADE

■ ■ ■ CHANNELIZING DEVICES

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:

$$L = (S) \cdot (W) \text{ FOR SPEEDS OF 45 OR MORE}$$

$$L = (W) \cdot (S) / 60 \text{ FOR SPEEDS OF 40 OR LESS}$$

WHERE:

L = MINIMUM LENGTH OF TAPER

S = NUMERICAL VALUE OF POSTED SPEED

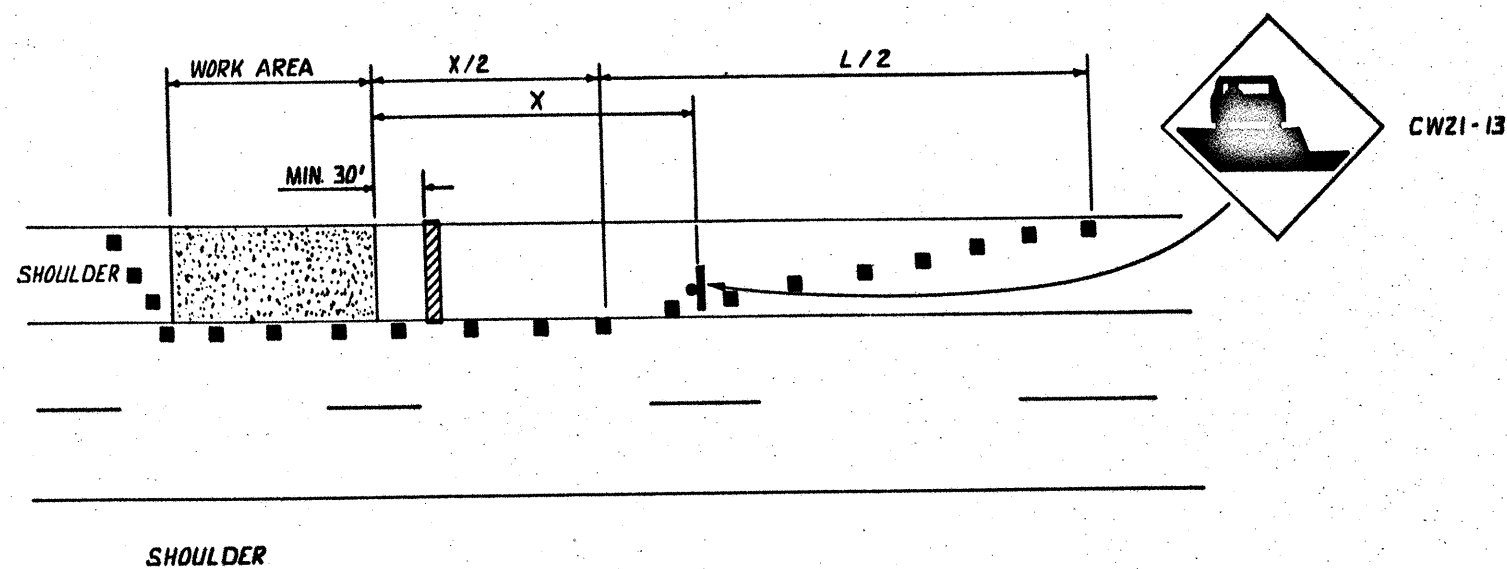
W = WIDTH OF OFFSET

GENERAL NOTES:

1. EXCAVATION SHALL BE RESTRICTED TO ONE SIDE OF EACH TRAVELWAY.
2. FOR ADDITIONAL DETAILS FOR MBGF MOUNTED ON DRUMS SEE THE LATEST STANDARD FOR TEMPORARY BARRIER, BARREL MOUNTED GUARD FENCE.
3. MIRROR IMAGE OF CW21-13 SIGN SHALL BE USED FOR DROP-OFFS ON THE LEFT.
4. REFERENCE SHOULD BE MADE TO OTHER TCP STANDARD SHEETS FOR REQUIRED ADDITIONAL SIGNING.
5. MINIMUM LANE WIDTH SHALL BE 9 FEET, DESIRABLE LANE WIDTH SHOULD BE 11 FEET.
6. THE MAXIMUM SPACING BETWEEN CHANNELIZING DEVICES IN A TAPER SHOULD BE APPROXIMATELY EQUAL IN FEET TO THE SPEED LIMIT (S). THE MAXIMUM SPACING BETWEEN CHANNELIZING DEVICES IN A TAPER SHOULD BE APPROXIMATELY EQUAL IN FEET TO TWICE THE SPEED LIMIT (2S) EXCEPT WHERE NOTED OTHERWISE.

UNEVEN LANES

1. MAXIMUM ELEVATION DIFFERENCE BETWEEN LANES SHALL NOT EXCEED 3 INCHES WHEN TRAFFIC IS ALLOWED IN EACH LANE.
2. SIGNING FOR UNEVEN LANES (CW21-14) SHOULD BE INSTALLED IN ADVANCE TO THE CONDITION AND REPEATED EVERY 1 MILE. SIGNS INSTALLED ALONG THE UNEVEN LANE CONDITION SHOULD BE SUPPLEMENTED WITH THE NEXT XX MILES SIGN (CW21-16) OR ADVISORY SPEED SIGN (CW13-1).

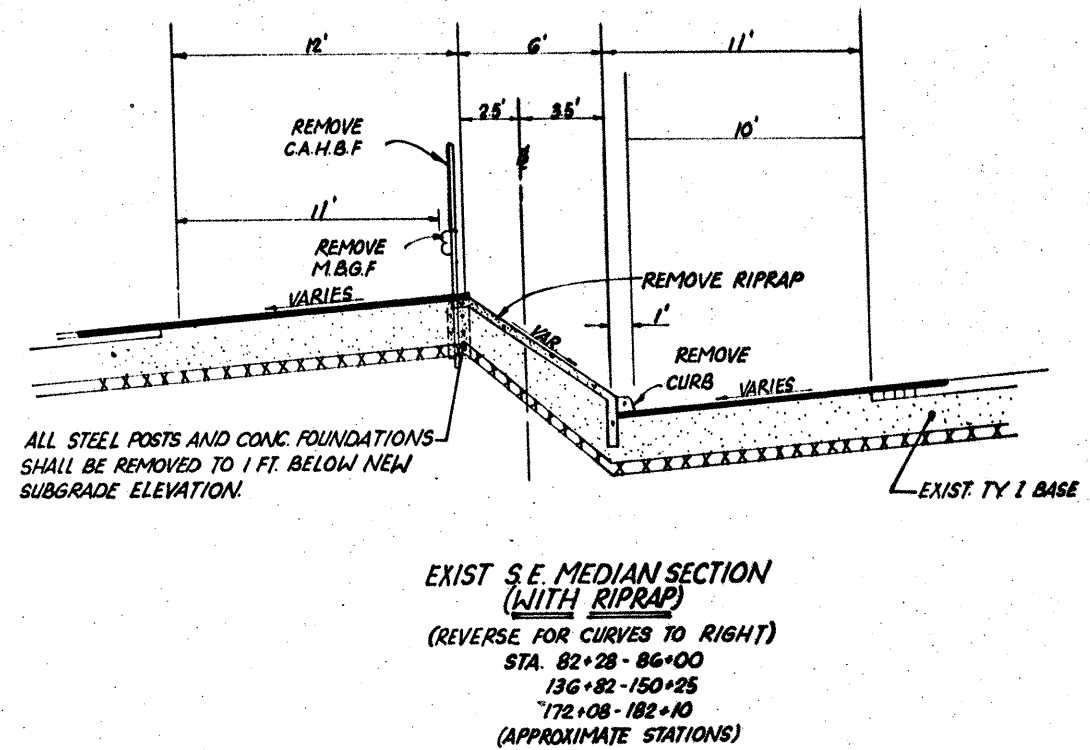
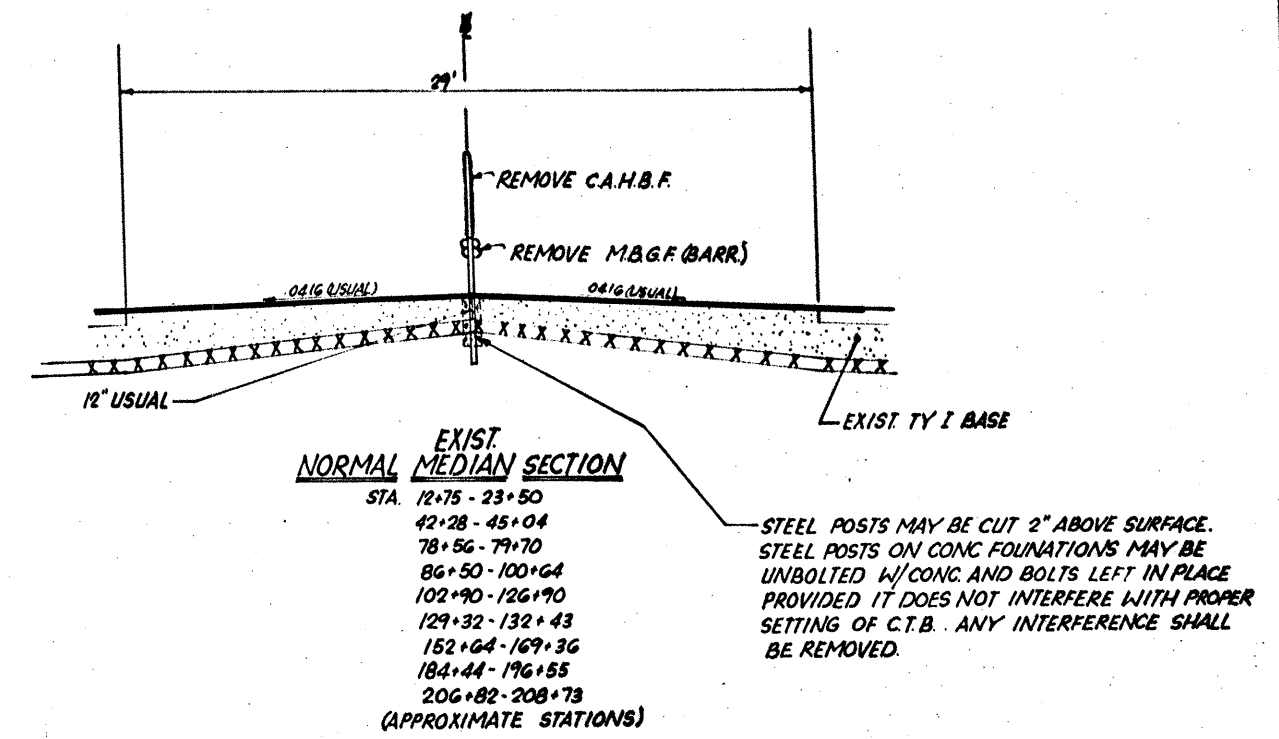
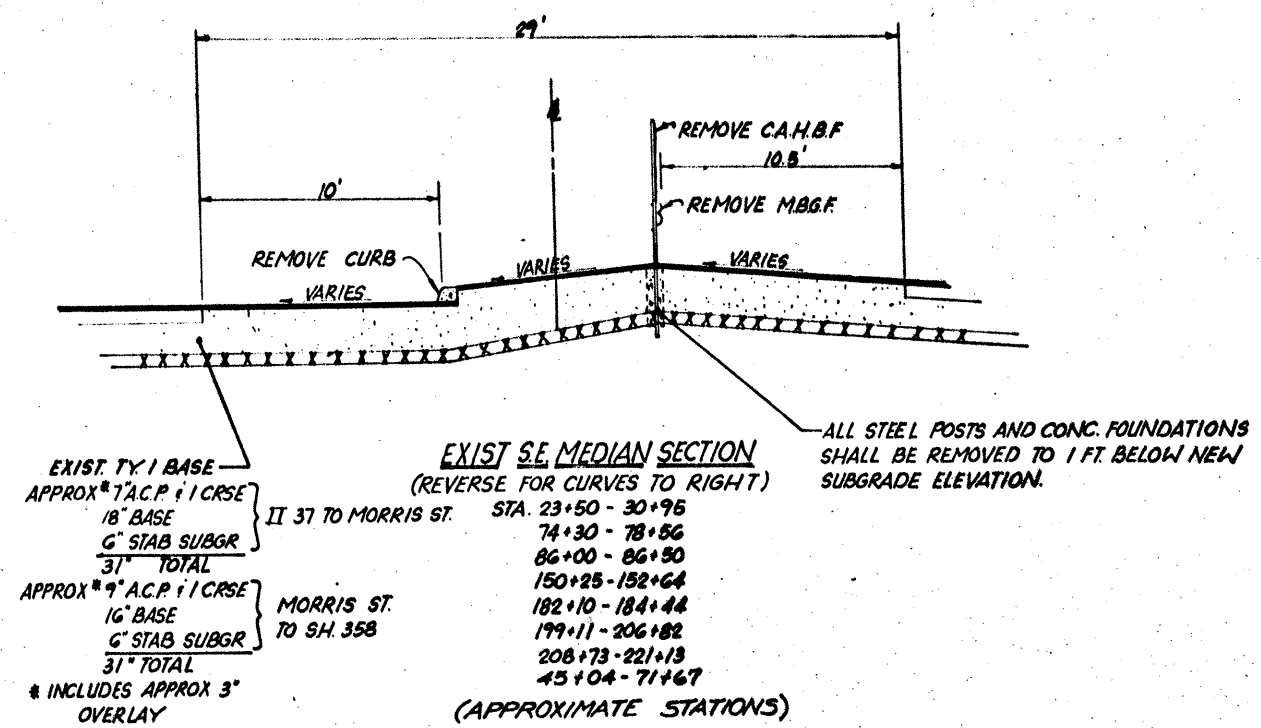


Sheet 6 of 6 Sheets

TRAFFIC CONTROL PLAN FOR PAVEMENT DROP-OFFS TCP(PD)-16

FED. RD. DIV. NO.	STATE	FEDERAL PROJECT NO.	COUNTY
6	TEXAS	HES 0008 (293)	7
STATE DIST. NO.	COUNTY	POST. SECT.	JOB
16	NUECES	326 03	61 5420

7

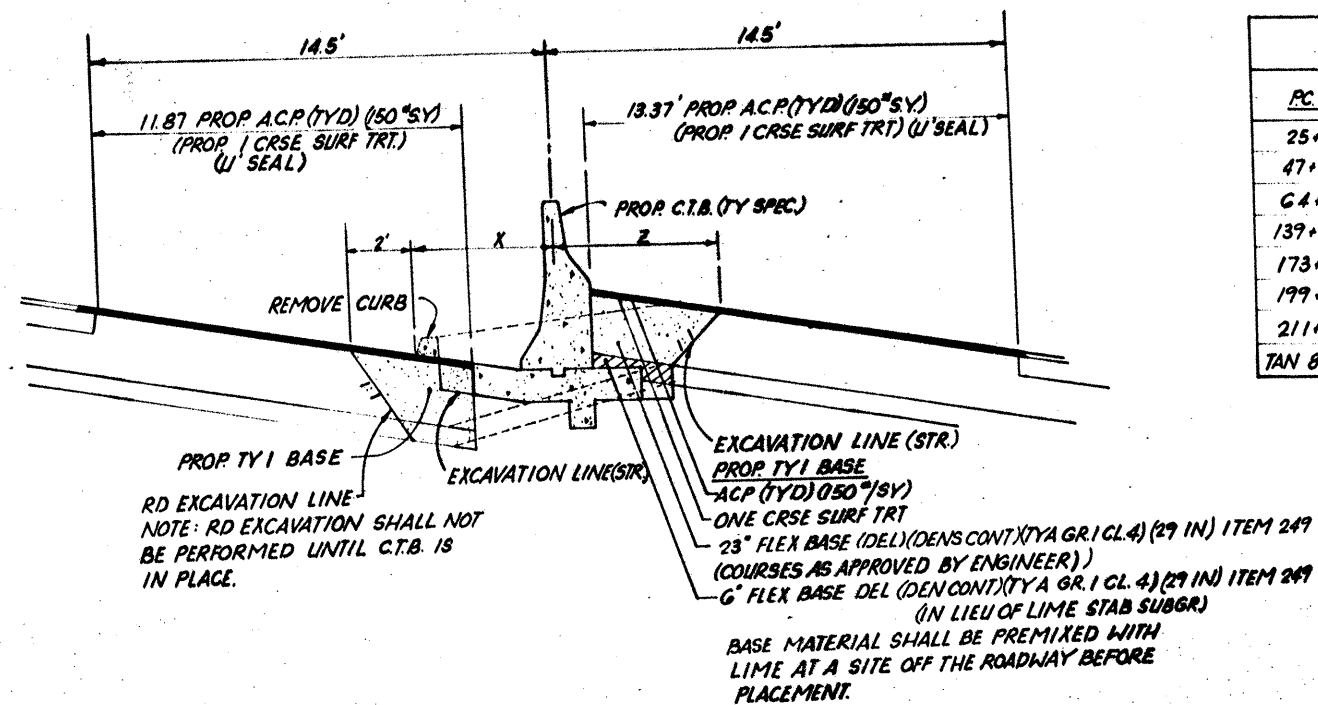


TYPICAL SECTIONS

8

SHEET 1 OF 6 SHEETS

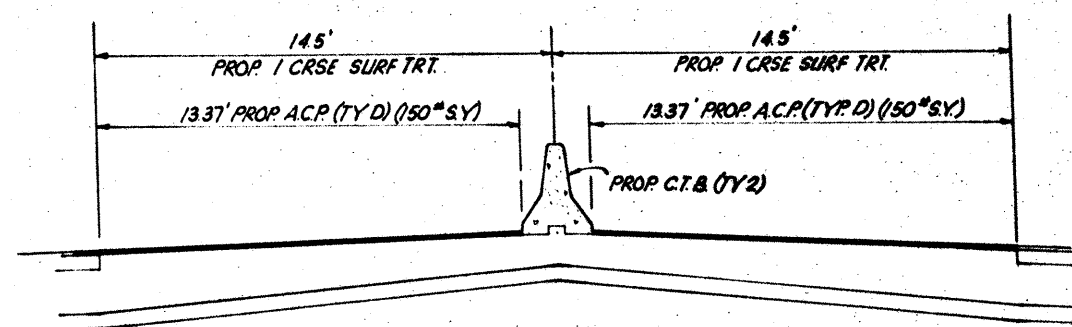
FED. RD. DIST. NO.	STATE	FEDERAL PROJECT NO.	SHEET NO.
16	TEXAS	HES 0003 (293)	8
STATE DIST. NO.	COUNTY	CONTRACT NO.	SECTION NO.
16	NUECES	326 03	61



BASELINE CURVES			DIMENSIONS		STA. QUANTITIES		
PC STA	PT STA	S.E.	"X"	"Z"	STR. EXCAV. CY/STA	FLEX. BASE SY/STA	RD. EXCAV. CY/STA
25+48.16	40+68.16	.0300%	5.0	6.0	82	92	25
47+70.33	58+40.10	.0480%	5.0	6.5	104	98	25
64+69.24	75+45.51	.0600%	5.0	7.0	115	103	25
139+95.35	149+31.55	.0600%	5.0	7.0	115	103	25
173+08.66	180+89.31	.0720%	5.0	8.0	139	114	25
199+40.03	204+36.70	.0220%	5.0	6.0	84	92	25
211+64.58	218+44.41	.0156	5.0	6.0	84	92	25
TAN 82+28	86+50	—	5.0	6.5	90	98	25

NOTE: PC & PT STATIONS ARE FOR CURVE REFERENCE ONLY. LIMITS OF C.T.B. (SPEC) INCLUDE SUPERELEVATED TRANSITIONS. STA. QUANTITIES SHOWN ARE FOR FULL SUPERELEVATED SECTIONS. QUANTITIES VARY AT S.E. TRANSITIONS.

PROP SUPERELEVATED MEDIAN SECTION

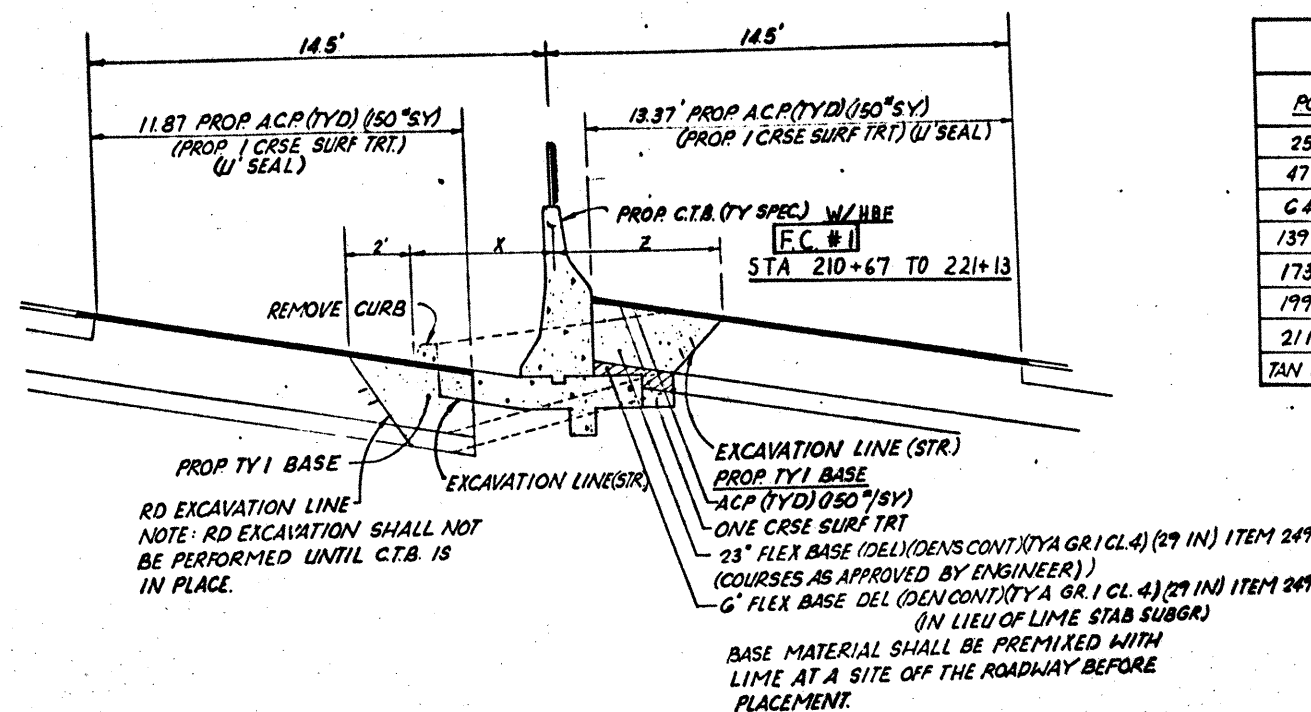


PROP NORMAL MEDIAN SECTION

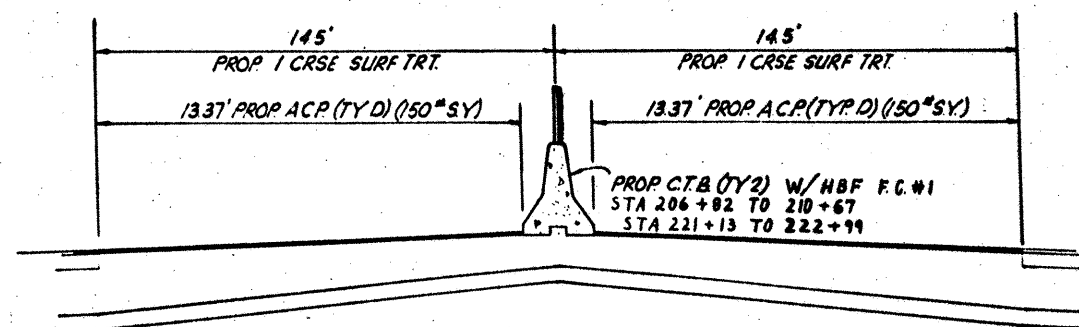
TYPICAL SECTIONS

9

SHEET 2 OF 6 SHEETS							
FED. NO.	STATE	FEDERAL PROJECT NO.	SHEET NO.				
10	TEXAS	HES 0003 (293)	9				
STATE DIST. NO.	COUNTY	CONT.	SECT.	JOB NO.			
10	NUECES	326	03	61	SH. 286		



PROP SUPERELEVATED MEDIAN SECTION



PROP NORMAL MEDIAN SECTION

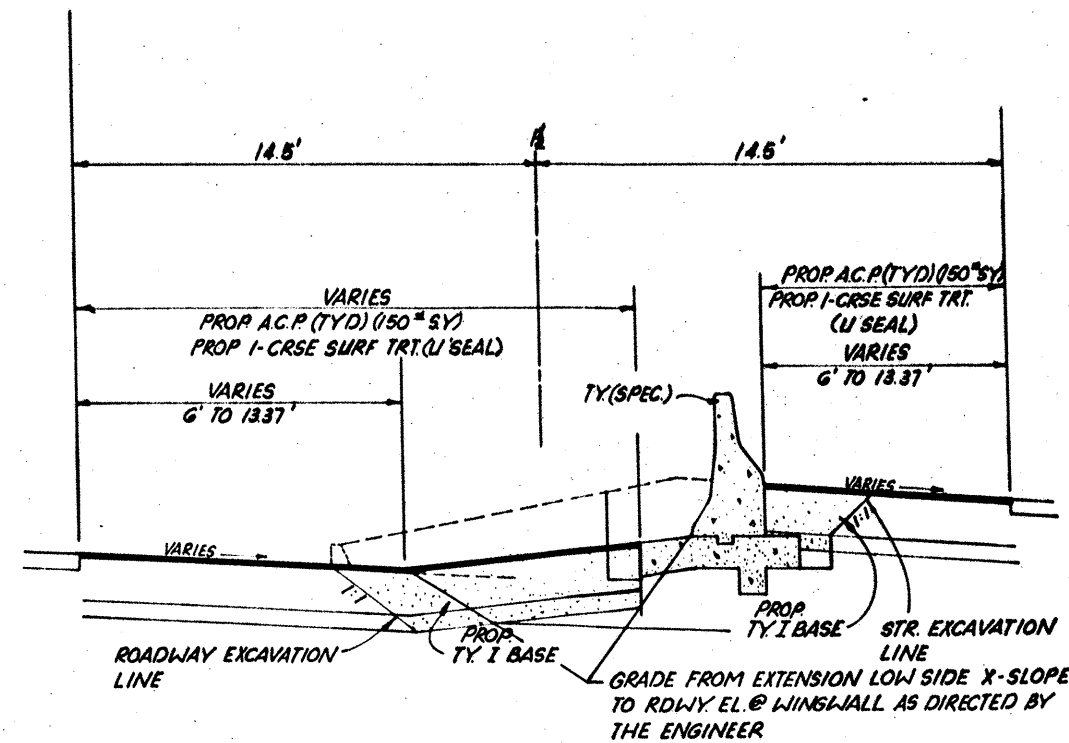
BASELINE CURVES			DIMENSIONS		STA. QUANTITIES		
PC STA	PT STA	S.E.	"X"	"Z"	STR. EXCAV. CY/STA	FLEX. BASE SY/STA	RD EXCAV. CY/STA
25+48.16	40+68.16	.0300%	50	60	82	92	25
47+70.33	58+40.10	.0480%	50	65	104	98	25
64+69.24	75+45.51	.0600%	50	70	115	103	25
139+95.35	149+31.55	.0600%	50	70	115	103	25
173+08.66	180+89.31	.0720%	50	80	139	114	25
199+40.03	204+36.70	.0220%	50	60	84	92	25
211+64.58	218+44.41	.0156	50	60	84	92	25
TAN 82+28	86+50	—	50	65	90	98	25

NOTE: PC & PT STATIONS ARE FOR CURVE REFERENCE ONLY.
LIMITS OF C.T.B. (SPEC) INCLUDE SUPERELEVATED
TRANSITIONS. STA. QUANTITIES SHOWN ARE FOR
FULL SUPERELEVATED SECTION'S. QUANTITIES VARY
AT S.E. TRANSITIONS.

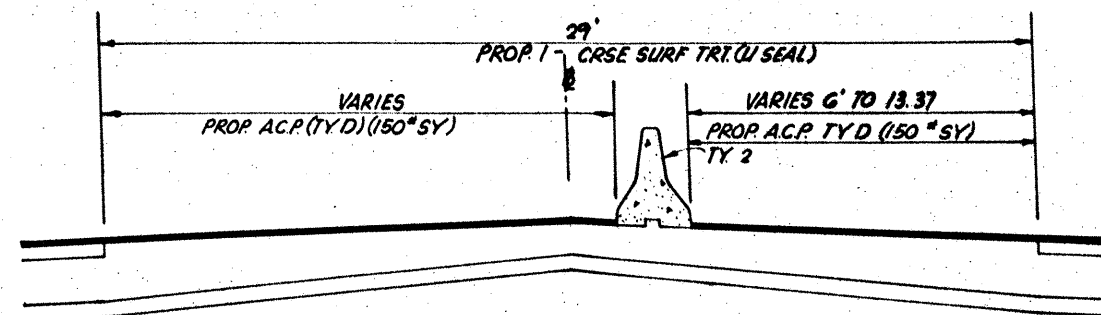
FIELD CHANGE #1
TYPICAL SECTIONS

9A

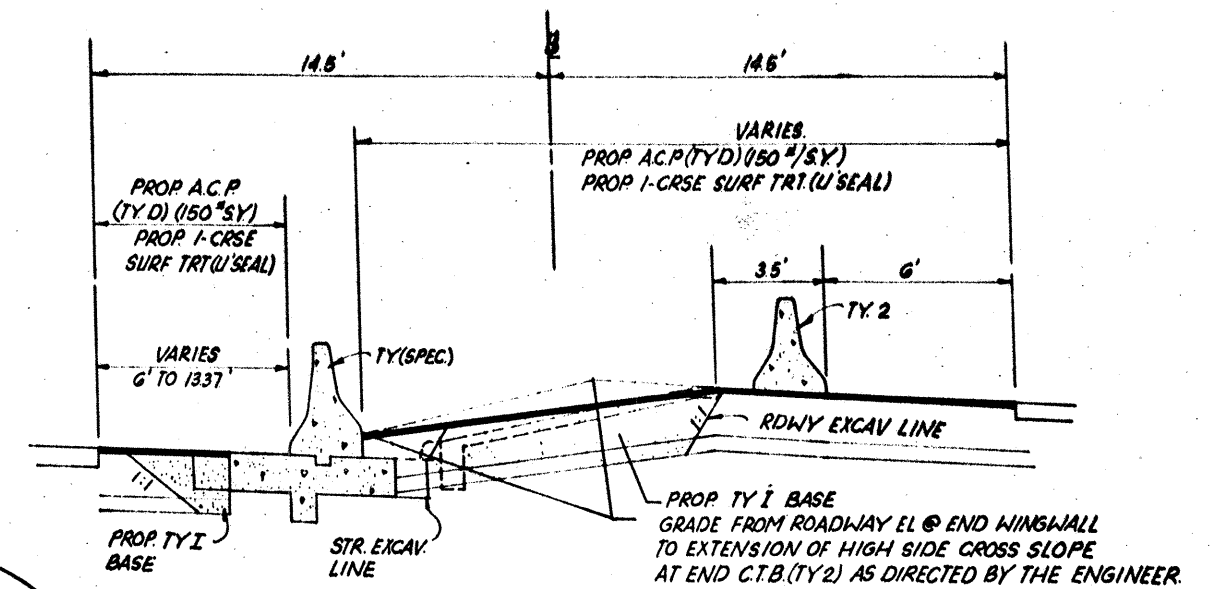
SHEET 2 OF 6 SHEETS			
FED. RD. DIST. NO.	STATE	FEDERAL PROJECT NO.	SHEET NO.
0	TEXAS	HES 0003 (293)	9A
STA. 1	COUNTY	CONT. SECT.	JOB
16	NUFCES	326	03



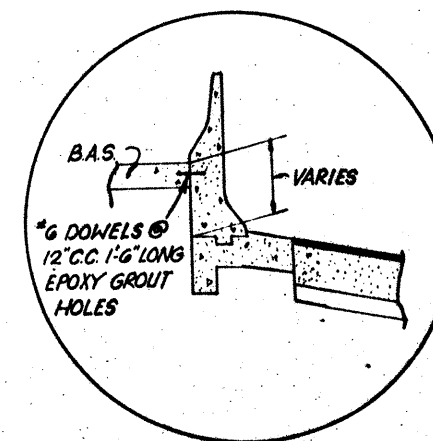
TYPICAL S.E. MEDIAN SECTION
(AT BEGIN AND END BRIDGES)
(REVERSE SECTION FOR END BRIDGE)
BEG. AGNES BRDG.
BEG. & END MORGAN BRDG.



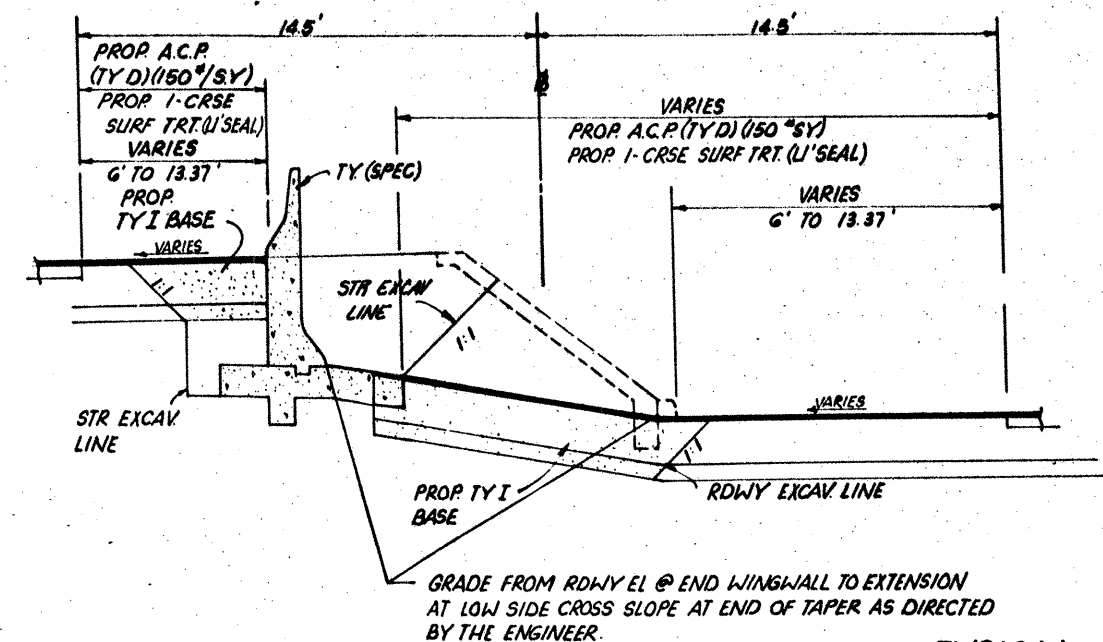
TYPICAL NORMAL MEDIAN SECTION
(AT BEGIN AND END BRIDGES)
(REVERSE SECTION FOR END BRIDGE)
END AGNES ST. BRDG.
BEG. 19TH ST. BRDG.
BEG. & END BALDWIN ST. BRDG.
BEG. & END TARLTON ST. BRDG.
BEG. PORT AVE. BRDG.
BEG. HORNE RD. BRDG.
BEG. GOLLIHAR RD. BRDG.



TYPICAL SECTION - END HORNE
ROAD BRIDGE
END GOLLIHAR RD. BRDG.



DETAIL AT
BRIDGE APPROACH SLAB



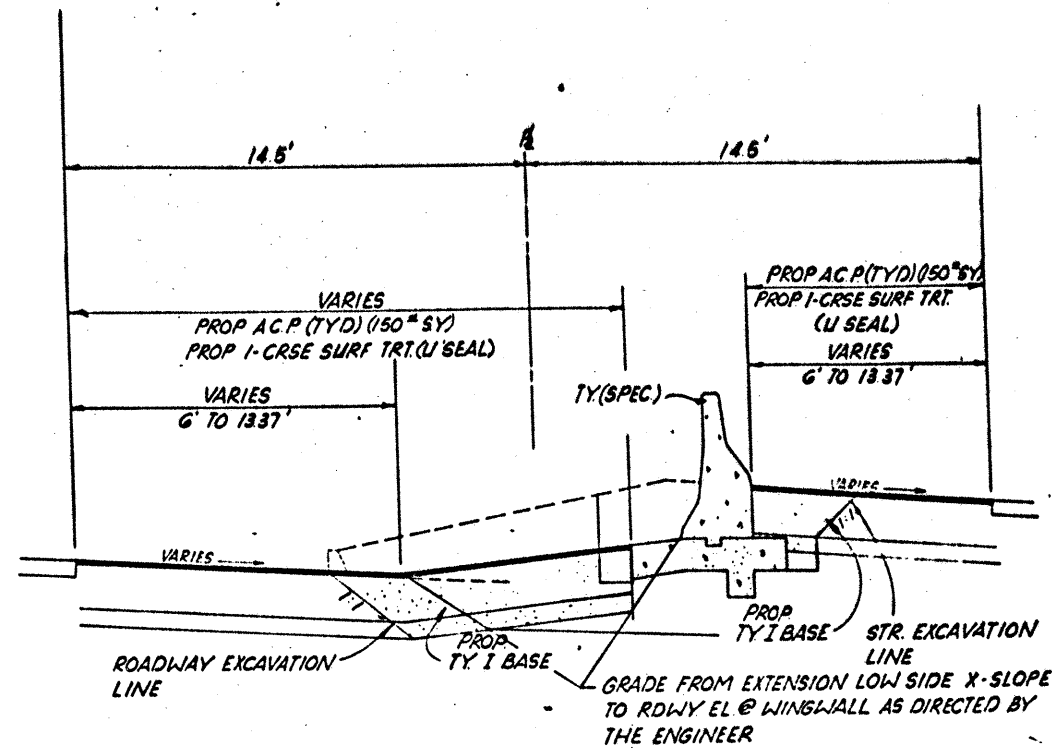
TYPICAL SECTION
END PORT AVENUE BRIDGE
END 19TH ST. BRDG.

TYPICAL SECTIONS

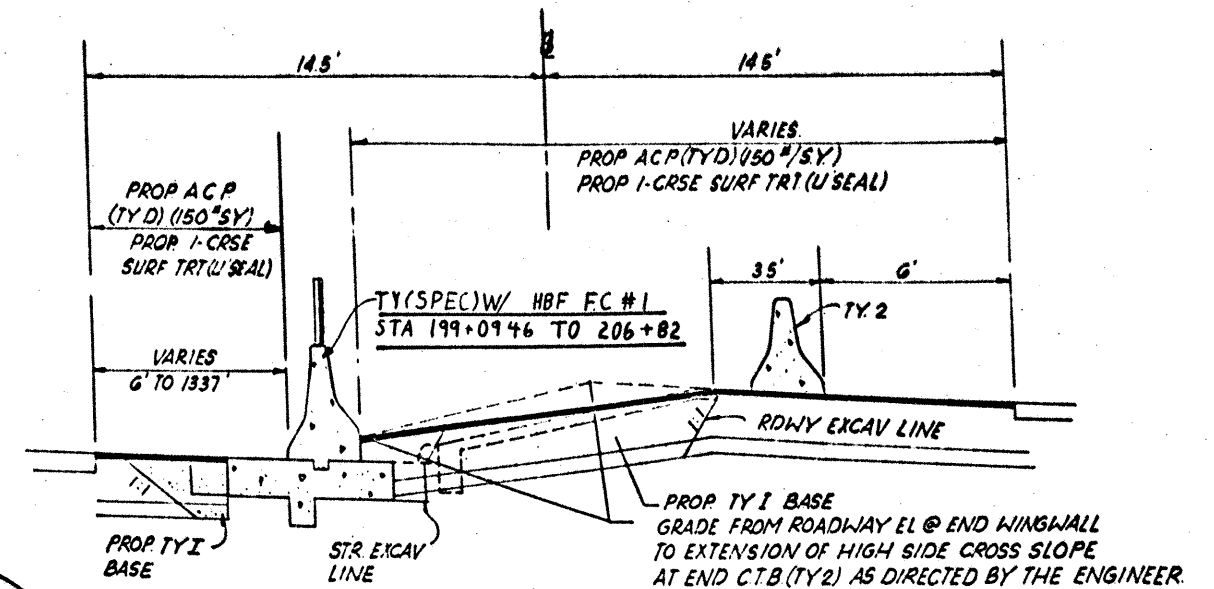
SHEET 3 OF 6 SHEETS

FED. RD. DIST. NO.	STATE	FEDERAL PROJECT NO.	SHEET NO.
16	TEXAS	HES 0005 (293)	10
STATE DIST. NO.	COUNTY	CONTRACT NO.	SECTION NO.
16	NUECES	326 03	61

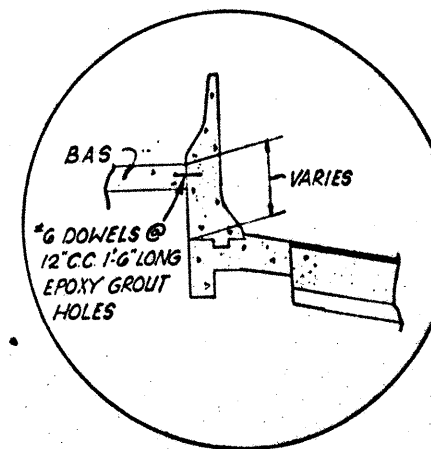
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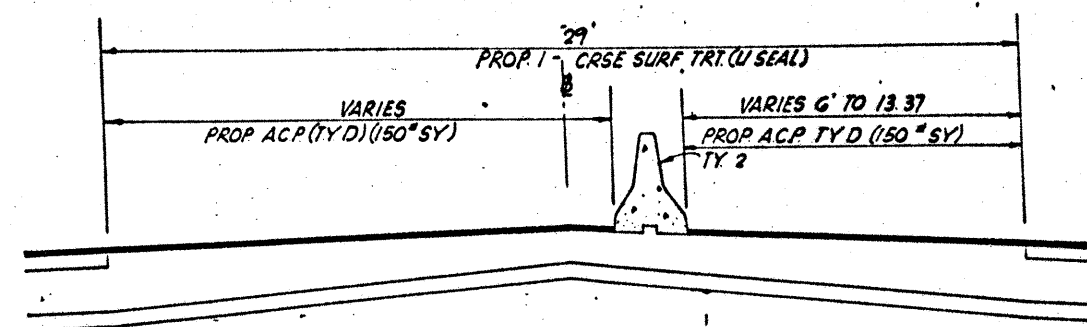
TYPICAL S.E. MEDIAN SECTION
(AT BEGIN AND END BRIDGES)
(REVERSE SECTION FOR END BRIDGE)
BEG. AGNES BRDG.
BEG. & END MORGAN BRDG.



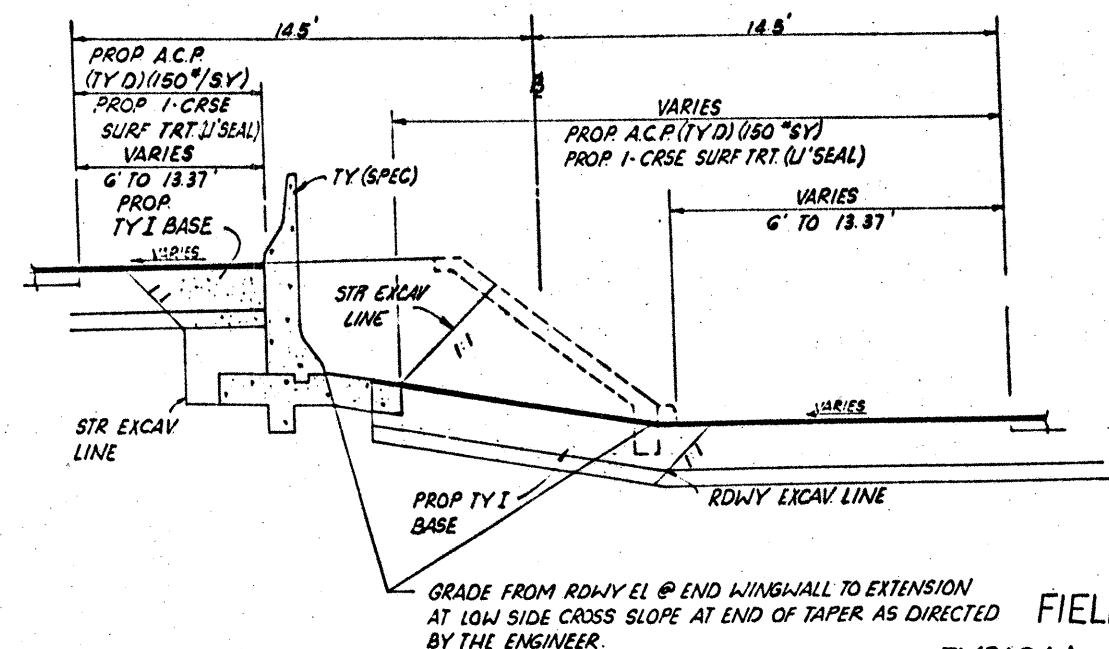
TYPICAL SECTION - END HORNE
ROAD BRIDGE
END GOLLIHAR RD BRDG.



DETAIL AT
BRIDGE APPROACH SLAB



TYPICAL NORMAL MEDIAN SECTION
(AT BEGIN AND END BRIDGES)
(REVERSE SECTION FOR END BRIDGE)
END AGNES ST BRDG.
BEG. 19TH ST BRDG.
BEG. & END BALDWIN ST BRDG.
BEG. & END TARTON ST BRDG.
BEG. PORT AVE. BRDG.
BEG. HORNE RD. BRDG.
BEG. GOLLIHAR RD. BRDG.

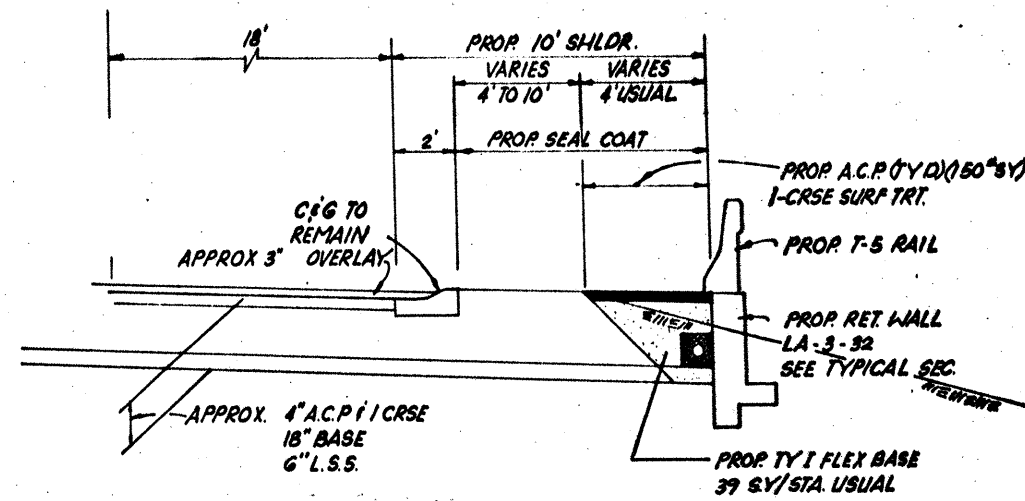


TYPICAL SECTION
END PORT AVENUE BRIDGE
END 19TH ST BRDG.

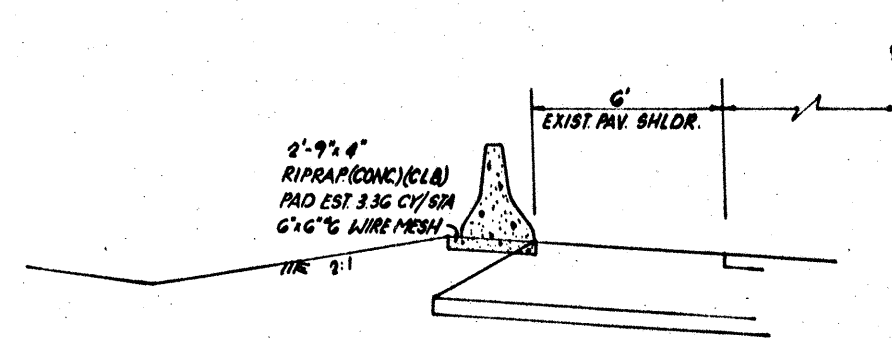
FIELD CHANGE #1
TYPICAL SECTIONS

SHEET 3 OF 6 SHEETS

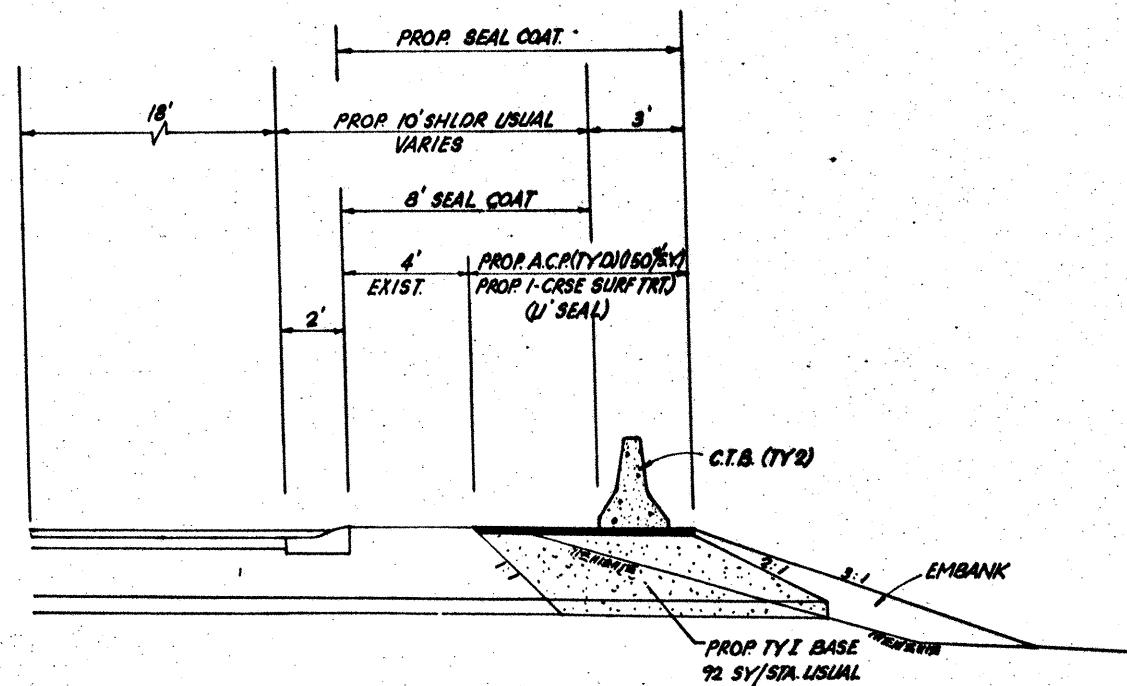
FIG. NO.	STATE	FEDERAL PROJECT NO.	SHEET NO.
10A	TEXAS	HES 0005 (293)	10A
STATE DIST. NO.	COUNTY	CHART. SECT.	ROADWAY NO.
1G	NUECES	32G 03	61 SH286



TYPICAL SECTION LINE D
STA 8+47 TO 13+00



TYPICAL SECTION LINE C STA 222+50 - 225+08

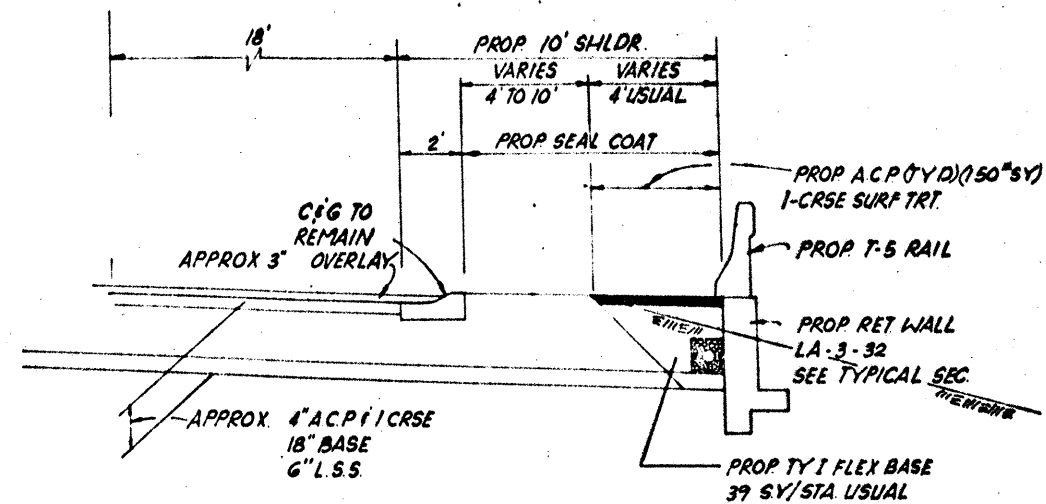


TYPICAL SECTION - LINE D STA 13+00 - 14+48 13 BK
BASELINE STA 12+58 59 - 12+75 (BEG. PAV. MED)

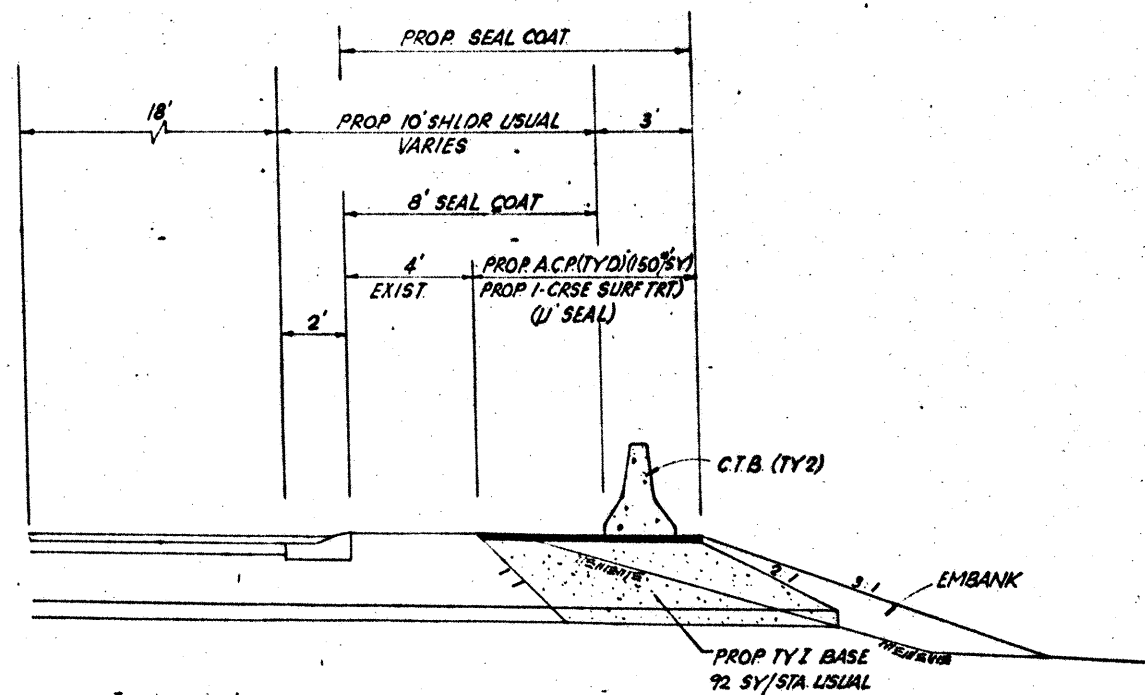
TYPICAL SECTIONS

11

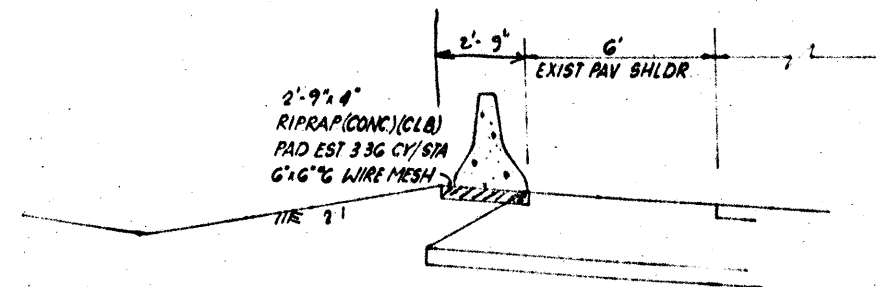
SHEET 4 OF 6 SHEETS					
FED. RD. DIST. NO.	STATE	FEDERAL PROJECT NO.	SHEET NO.		
6	TEXAS	HES 0005 (273)	11		
STATE DIST. NO.	COUNTY	CONTR. SECT.	JOB NO.	HIGHWAY NO.	
16	NUECES	326	63	61 SH 286	



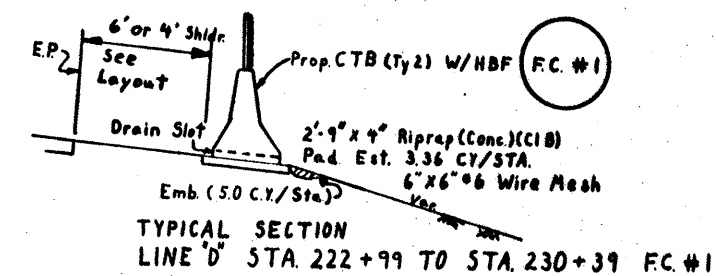
TYPICAL SECTION LINE D
STA 8+41 TO 13+00



TYPICAL SECTION LINE D STA 13+00 - 14+48.13 BK
BASELINE STA 12+58.59 - 12+75 (BEG PAV MED)



TYPICAL SECTION LINE C STA 222+50 - 225+08

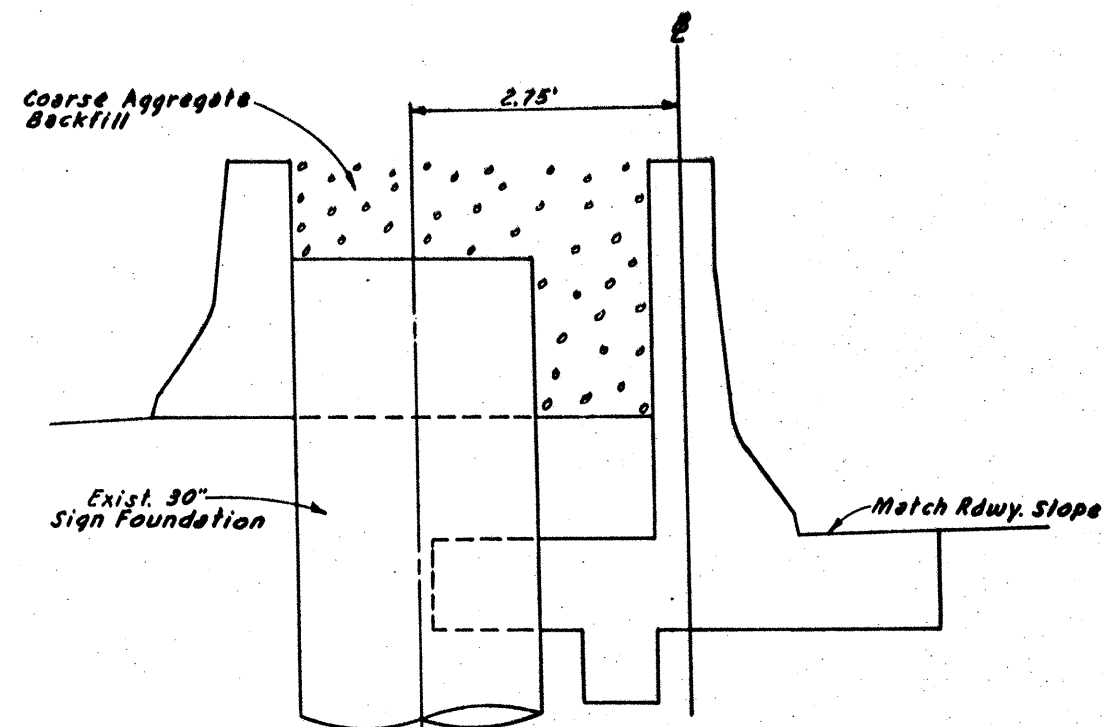


TYPICAL SECTION LINE D STA 222+99 TO STA 230+39 FC #1

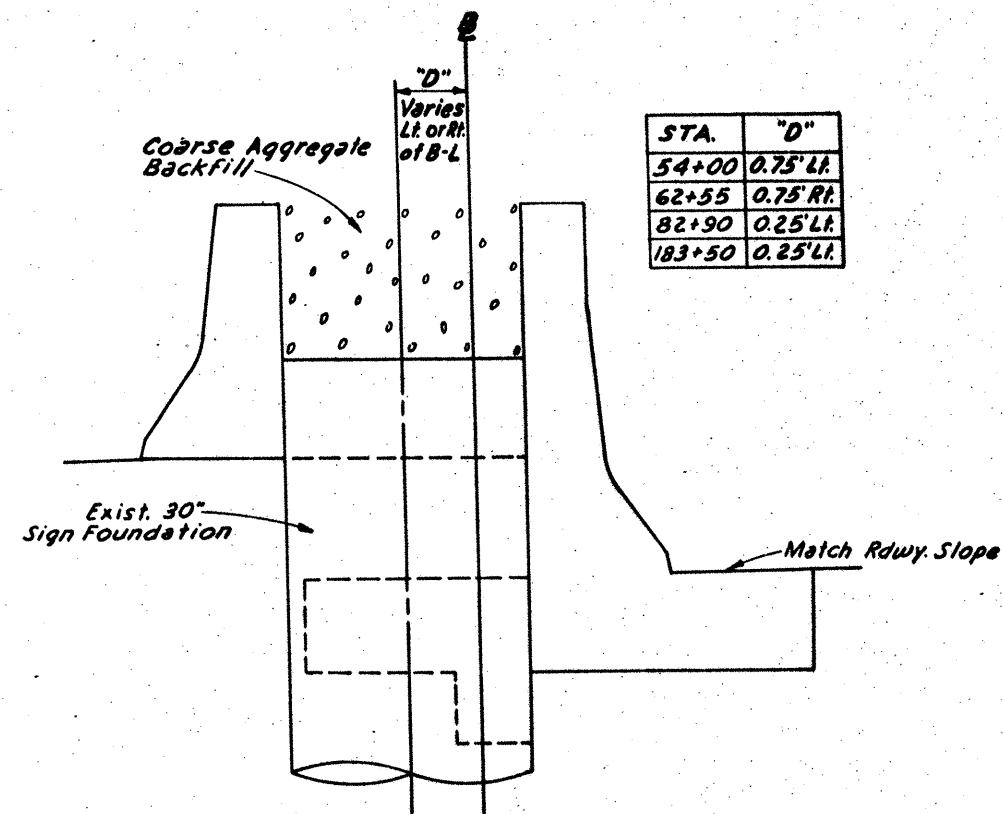
FIELD CHANGE #1
TYPICAL SECTIONS

11A

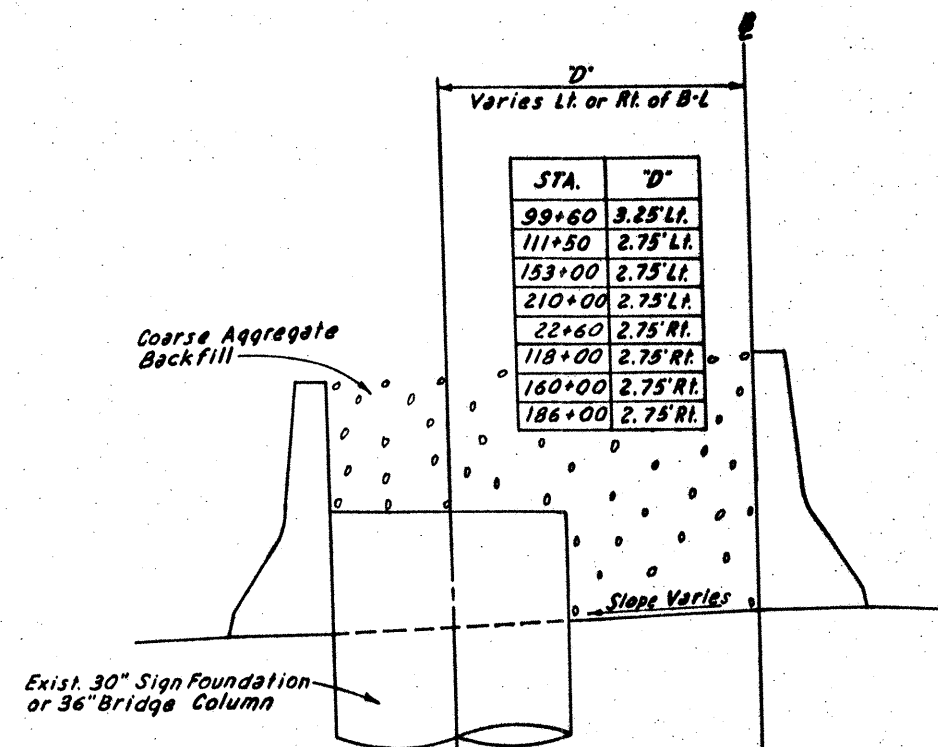
SHEET 4 OF 6 SHEETS					
FIG. NO.	STATE	FEDERAL PROJECT NO.	SHEET NO.		
10	TEXAS	HES000S (293)	11A		
DATE	COUNTY	CURT. SECT.	NO.	HIGHWAY NO.	
10	NUECES	320	G3	G1 SH 286	



SECTION AT STA. 215+00
WITH C.T.B. (TY. 3 SPECIAL)



TYPICAL SECTION FOR C.T.B. (TY. 3 SPECIAL)
OBSTACLE OFFSET FROM BASELINE
REVERSE SECTION FOR OBSTACLES OFFSET TO RIGHT
FOR DETAILS NOT SHOWN HEREON SEE C.T.B. (SPECIAL)



TYPICAL SECTION FOR C.T.B. TY. 3
OBSTACLE OFFSET FROM BASELINE
REVERSE SECTION FOR OBSTACLES OFFSET TO RIGHT
FOR OBSTACLES ON BASELINE AND DETAILS
NOT SHOWN HEREON SEE C.T.B. (2)-81

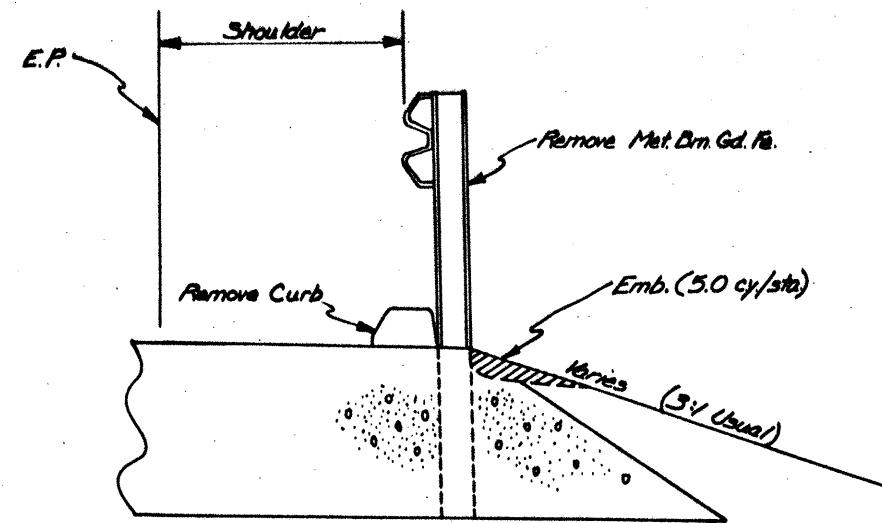
TYPICAL SECTIONS

C.T.B. OFFSETS
AT OBSTACLES
IN MEDIAN

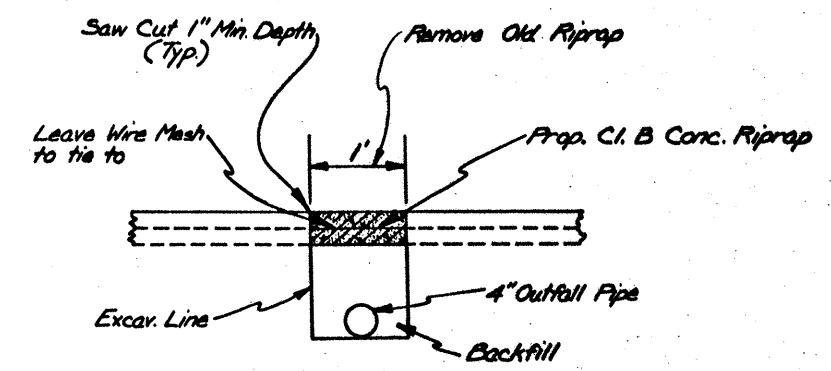
12

SCALE: 1"=1'

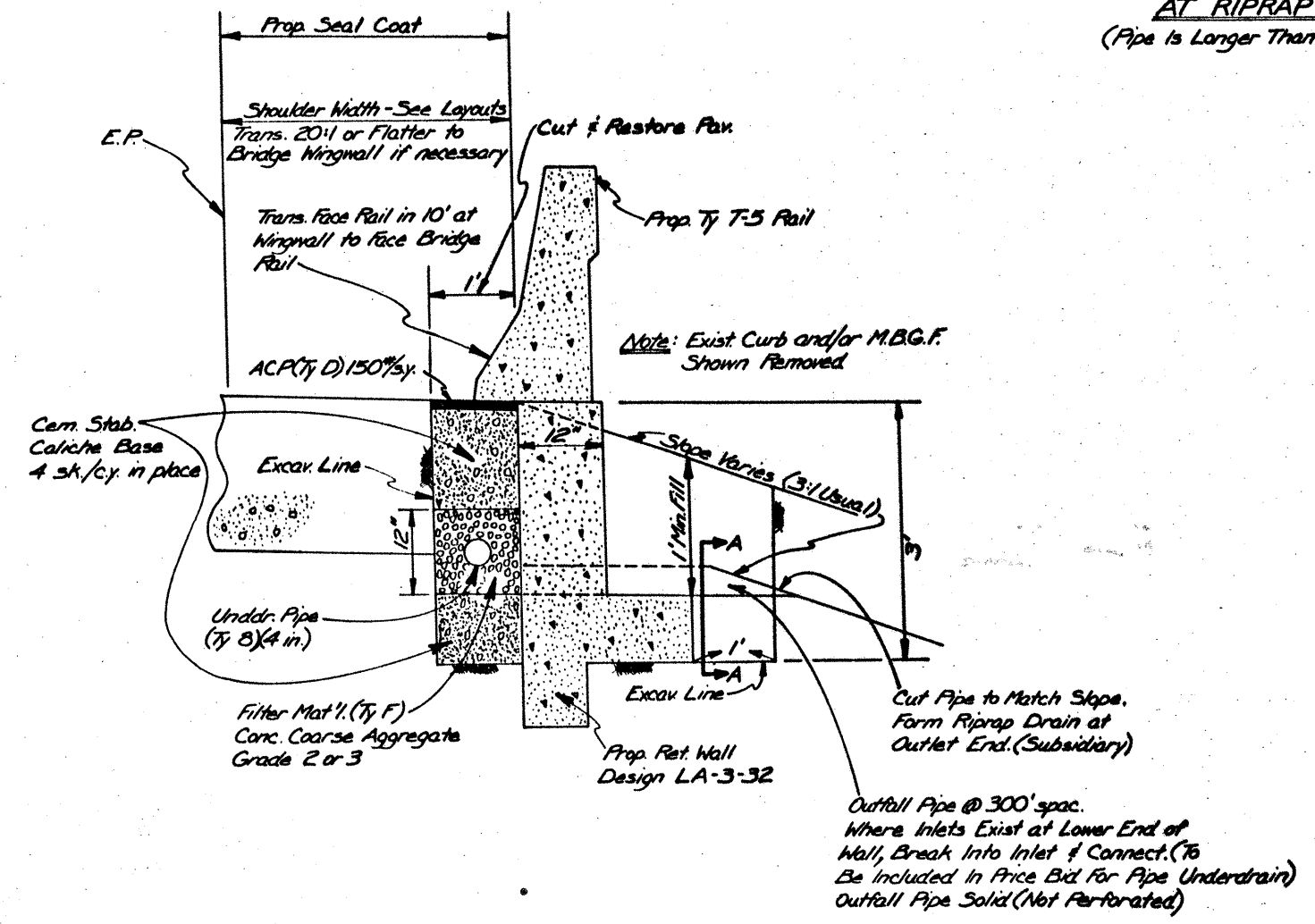
Sheet 5 of 6 Sheets		DIV. NO.		FEDERAL PROJECT NO.		SHEET NO.	
0	TEXAS	16	NUECES	326	03	61	SH286
STATE		COUNTY		CONTRACT		SECTION	
16		NUECES		326		03	



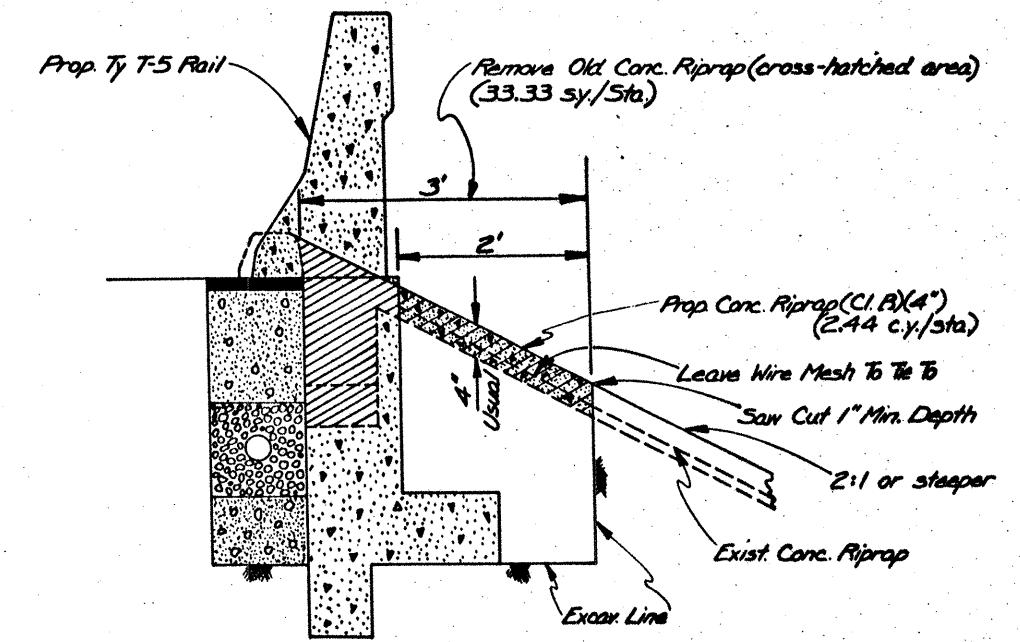
TYPICAL SECTION FOR CURB & M.B.G.F. REMOVAL



SECT. A-A
AT RIPRAP SLOPE
(Pipe is Longer Than Ret. Wall Excav.)



TYPICAL SECTION
FOR RET. WALL W/TY T-5 RAIL

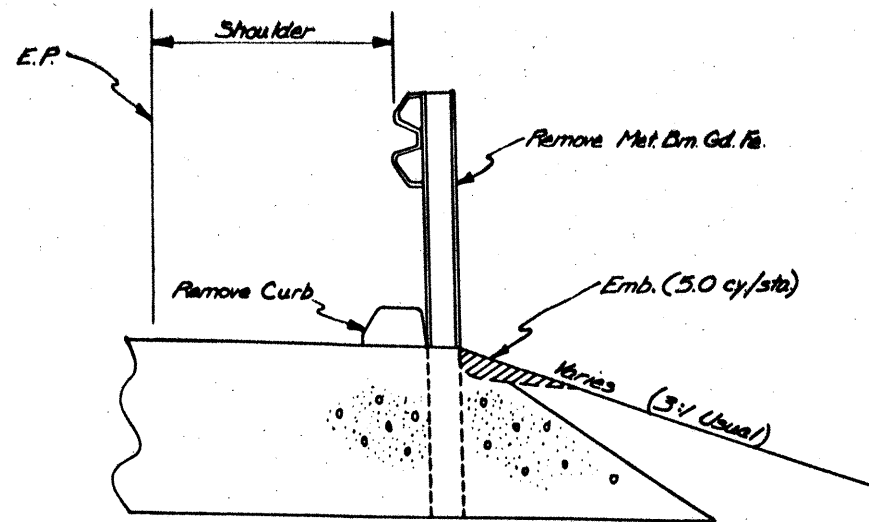


AT CONC. RIPRAP SLOPE LOCATIONS

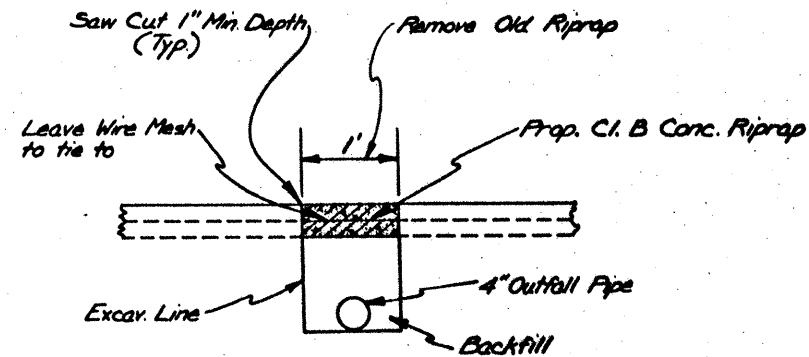
TYPICAL SECTIONS
Sheet 6 of 6 Sheets

13

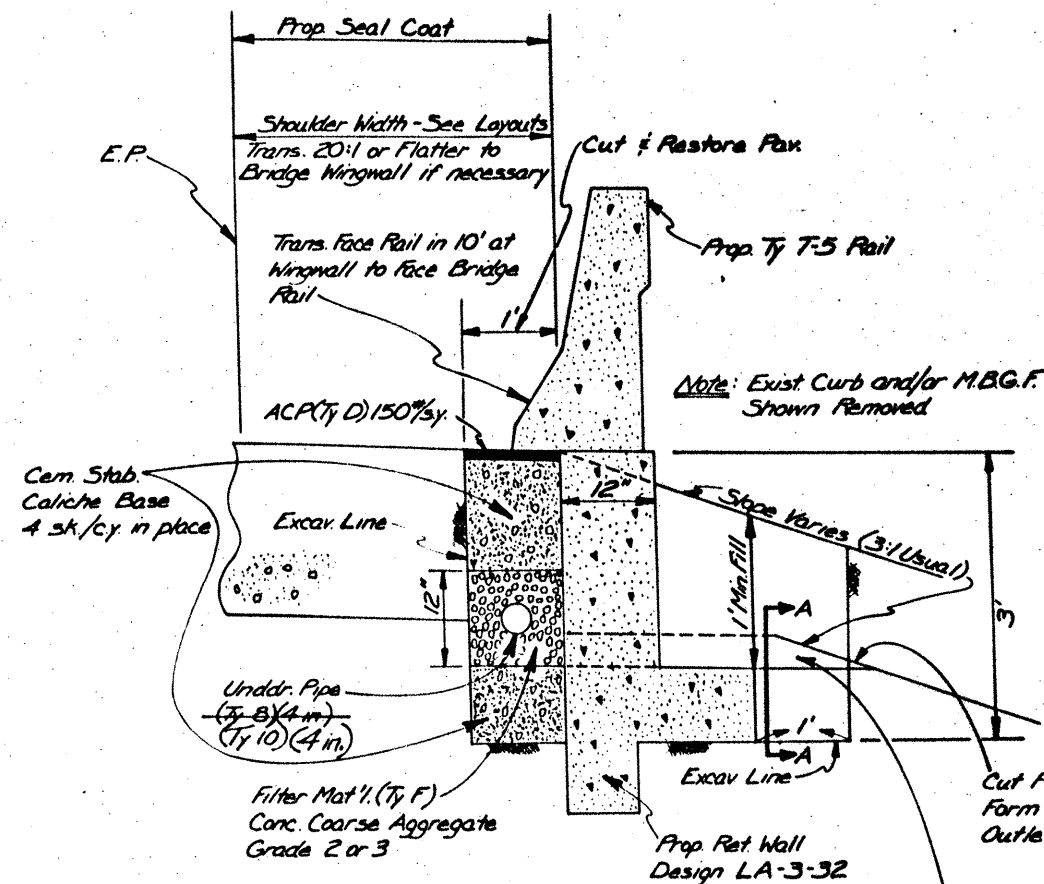
FED. RD. DIST. NO.	STATE	FEDERAL PROJECT NO.	SHEET NO.
6	TEXAS	HES 0003 (293)	13
STATE DIST. NO.	COUNTY	CONTRACT NO.	SECTION NO.
16	Nueces	32603	61



TYPICAL SECTION FOR CURB & M.B.G.F. REMOVAL



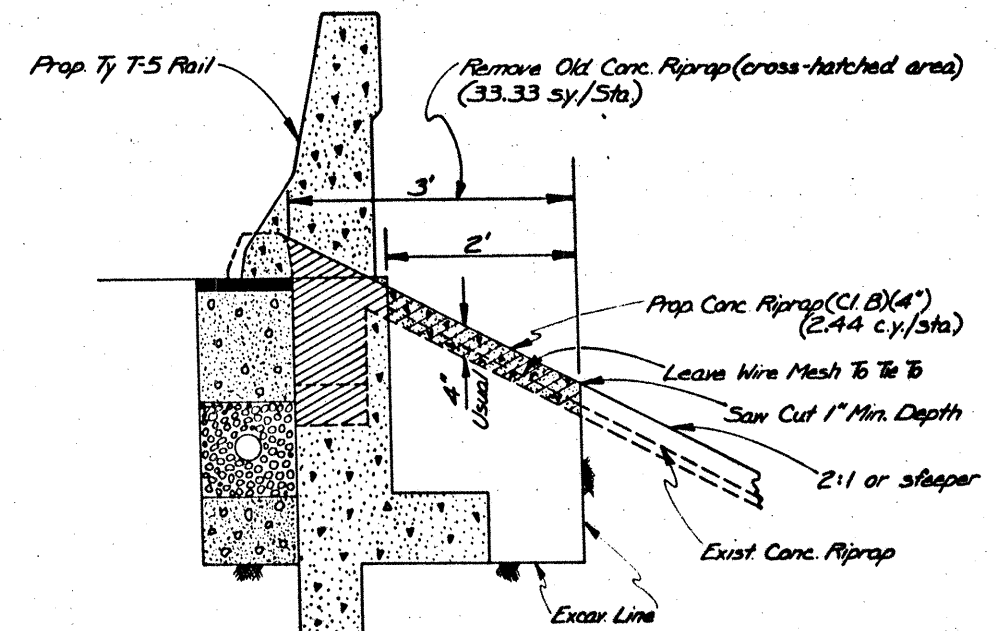
SECT. A-A
AT RIPRAP SLOPE
(Pipe Is Longer Than Ret. Wall Excav)



TYPICAL SECTION
FOR RET. WALL W/TY T-5 RAIL

Outfall Pipe @ 300' spac.
Where Inlets Exist at Lower End of
Wall, Break Into Inlet & Connect. (To
Be Included in Price Bid for Pipe Underdrain)
Outfall Pipe Solid (Not Perforated)

FC NO.2 TO CHANGE THE PLAN REQUIREMENT FOR
UNDERDRAIN PIPE (TY B) (4 IN) TO UNDERDRAIN
PIPE (TY 10) (4 IN)



AT CONC. RIPRAP SLOPE LOCATIONS

FIELD CHANGE NO.2
TYPICAL SECTIONS
Sheet 6 of 6 Sheets

13A

FED. RD. DIST. NO.	STATE	FEDERAL PROJECT NO.	SHEET NO.
6	TEXAS	HES 0003 (293)	13A
STATE DIST. NO.	COUNTY	CONTRACT SECT. NO.	HIGHWAY NO.
16	Nueces	3260361	SH286

A - DESIGNATES INLETS FROM I.H. 37 TO MORRIS ST.
B - DESIGNATES INLETS FROM MORRIS ST TO TARTLTON ST.

SUMMARY OF DROP INLET ADJUSTMENTS

NO.	LOCATION	EXIST INLET		GRATE TY H		Inlet + M.H. Adj.	CL "B" conc. Riprap C.Y.
		X	Y	L	W		
A-1	118' LT B-L STA. 31+40	2'-6"	2'-6"	3'-0"	2'-2"	1	2
A-2	224' LT B-L STA. 30+80	2'-6"	2'-6"	3'-0"	2'-2"	1	2
A-3	230' LT B-L STA. 30+08	2'-6"	2'-6"	3'-0"	2'-2"	1	2
A-4	84' LT B-L STA. 25+60	2'-6"	2'-6"	3'-0"	2'-2"	1	2
A-5	170' LT B-L STA. 25+70	4'-6"	2'-6"	5'-0"	2'-2"	1	2
A-6	B-L STA. 32+31	2'-6"	2'-6"	3'-0"	2'-2"	1	2
A-7	160' RT B-L STA. 28+76	2'-6"	2'-6"	3'-0"	2'-2"	1	2
A-8	108' RT B-L STA. 25+90	2'-6"	2'-6"	3'-0"	2'-2"	1	2
A-9	108' RT B-L STA. 26+00	2'-6"	2'-6"	3'-0"	2'-2"	1	2
A-11	92' RT B-L STA. 22+00	2'-6"	2'-6"	3'-0"	2'-2"	1	2
A-12	80' LT B-L STA. 21+87	2'-6"	2'-6"	3'-0"	2'-2"	1	2
A-13	125' RT Line D' Sta. 13+15	2'-6"	2'-6"	3'-0"	2'-2"	1	2
A-14	130' RT Line D' Sta. 11+00	2'-6"	2'-6"	3'-0"	2'-2"	1	2
A-15	110' RT Line D' Sta. 9+30	2'-6"	2'-6"	3'-0"	2'-2"	1	2
A-16	160' LT Line D' Sta. 8+16	2'-6"	2'-6"	3'-0"	2'-2"	1	2
A-17	232' RT B-L STA. 5+56	2'-6"	2'-6"	3'-0"	2'-2"	1	2
A-18	B-L STA. 35+75	2'-6"	2'-6"	3'-0"	2'-2"	1	2
A-19	B-L STA. 38+74	4'-0"	4'-0"	5'-0"	3'-8"	1	2
A-20	67' RT B-L STA. 41+91	2'-6"	2'-6"	3'-0"	2'-2"	1	2
A-21	67' LT B-L STA. 40+60	2'-6"	2'-6"	3'-0"	2'-2"	1	2
A-22	100' LT B-L STA. 41+27	2'-6"	2'-6"	3'-0"	2'-2"	1	2
B-4	160' LT B-L STA. 53+00	3'-0"	2'-6"	3'-6"	2'-2"	1	2
B-5	75' LT B-L STA. 47+45	2'-6"	2'-6"	3'-0"	2'-2"	1	2
B-12	170' LT B-L STA. 67+13	2'-6"	2'-6"	3'-0"	2'-2"	1	2
B-13	97' LT B-L STA. 67+59	2'-6"	2'-6"	3'-0"	2'-2"	1	2
B-25	91' RT B-L STA. 68+16	2'-6"	3'-0"	3'-0"	2'-8"	1	2
B-32	120' RT B-L STA. 62+40	3'-6"	2'-6"	4'-0"	2'-2"	1	2
B-34	105' RT B-L STA. 51+43	2'-6"	2'-6"	3'-0"	2'-2"	1	2
B-42	135' RT B-L STA. 56+38	3'-6"	3'-6"	4'-0"	3'-2"	1	2
B-62	145' RT B-L STA. 79+10	3'-6"	3'-0"	4'-0"	2'-8"	1	2
B-71	140' RT B-L STA. 85+60	4'-0"	2'-6"	4'-6"	2'-2"	1	2
B-77	130' RT B-L STA. 92+95	5'-6"	2'-6"	4'-6"	2'-6"	2	2
B-82	146' RT B-L STA. 97+86	6'-0"	3'-6"	4'-0"	2'-9"	2	2
B-92	120' LT B-L STA. 80+95	3'-0"	2'-6"	3'-6"	2'-2"	1	2
B-99	135' LT B-L STA. 85+26	4'-0"	3'-0"	4'-6"	2'-8"	1	2
B-102	117' LT B-L STA. 90+00	4'-6"	2'-6"	5'-0"	2'-2"	1	2
B-107	139' LT B-L STA. 98+55	5'-6"	3'-0"	3'-6"	2'-6"	2	2
B-113	132' RT B-L STA. 111+12	2'-6"	3'-6"	3'-0"	3'-2"	1	2
B-129	139' RT B-L STA. 104+38	2'-6"	3'-0"	3'-0"	2'-8"	1	2
B-135	133' RT B-L STA. 117+10	3'-6"	2'-6"	4'-0"	2'-2"	1	2
B-140	131' LT B-L STA. 117+00	2'-6"	3'-0"	3'-0"	2'-8"	1	2
B-144	131' LT B-L STA. 120+47	3'-0"	3'-6"	3'-6"	3'-2"	1	2
B-149	136' LT B-L STA. 127+70	3'-0"	2'-6"	3'-6"	2'-2"	1	2
B-155	128' LT B-L STA. 124+80	3'-6"	2'-6"	4'-0"	2'-2"	1	2
B-160	110' RT B-L STA. 129+68	6'-0"	3'-0"	3'-6"	2'-9"	2	2
B-168	70' RT B-L STA. 124+10	2'-6"	2'-6"	3'-0"	2'-2"	1	2
TOTAL						50	92

* SEE DOUBLE GRATE INLET DETAIL

SUMMARY OF CURB INLET & MANHOLE ADJUSTMENTS

INLET NO.	LOCATION	INLET & M.H. ADJUST	EXIST INLET ADJUST TO		EXIST INLET		PROP. GRATE		TY. A	PROP. MAN-HOLE			
		EA.	GRATE INLET	MANHOLE TYA	TYB	W	L	W			L	EA.	TYM
CURB INLETS LOCATED AT MEDIAN													
A-50	LT B-L STA. 28+03	/	✓				2'-6"	6'-0"	3'-0"	2'-8"	2		
A-65	LT B-L STA. 24+75	/	✓				3'-0"	6'-0"	3'-0"	2'-8"	2		
B-1	RT B-L STA. 50+50	/	✓				3'-0"	6'-0"	3'-0"	2'-8"	2		
B-2	RT B-L STA. 48+75	/	✓				2'-6"	6'-0"	3'-0"	2'-8"	2		
B-20	RT B-L STA. 58+25	/	✓				2'-6"	6'-0"	3'-0"	2'-8"	2		
B-23	LT B-L STA. 68+25	/	✓				2'-6"	6'-0"	3'-0"	2'-8"	2		
B-28	LT B-L STA. 65+25	/	✓				2'-6"	10'-0"	3'-0"	4'-8"	2		
B-36	RT B-L STA. 53+37	/	✓				2'-6"	6'-0"	3'-0"	2'-8"	2		
B-37	RT B-L STA. 55+00	/	✓				3'-0"	6'-0"	3'-0"	2'-8"	2		
B-58	LT B-L STA. 74+50	/	✓				2'-6"	10'-0"			1		
C-3	RT B-L STA. 141+25	/	✓				2'-6"	6'-0"	3'-0"	2'-8"	2		
C-37	RT B-L STA. 147+75	/	✓				4'-0"	6'-0"	3'-0"	2'-8"	2		
C-67	LT B-L STA. 177+00	/	✓				2'-6"	6'-0"	3'-0"	2'-8"	2		
C-70	LT B-L STA. 180+25	/	✓				2'-6"	10'-0"	3'-0"	4'-8"	2		
C-144	LT B-L STA. 204+50	/	✓				2'-6"	10'-0"	3'-0"	4'-8"	2		
D-16	RT B-L STA. 218+50	/	✓				2'-6"	6'-0"	3'-0"	2'-8"	2		
D-106A	RT B-L STA. 214+42	/	✓				2'-6"	6'-0"	3'-0"	2'-8"	2		
CURB INLETS LOCATED ON OUTSIDE SHLDR.													
A-21	69' LT B-L STA. 28+00	/	✓				2'-6"	6'-0"	3'-0"	2'-6"	2		
A-25	63' RT B-L STA. 23+75	/	✓				2'-6"	10'-0"	3'-0"	4'-8"	2		
A-27	82' RT B-L STA. 22+25	/		✓			2'-6"	10'-0"					
A-33	72' LT B-L STA. 22+45	/		✓			2'-6"	10'-0"					
A-34	72' LT B-L STA. 16+93	/	✓				4'-0"	10'-0"	4'-6"	4'-8"	2		
A-35	74' LT B-L STA. 13+85	/	✓				4'-0"	10'-0"	4'-6"	4'-8"	2		
A-39	72' RT B-L STA. 16+90	/	✓				4'-0"	10'-0"	4'-6"	4'-8"	2		
A-40	68' RT B-L STA. 13+55	/	✓				4'-0"	10'-0"	4'-6"	4'-8"	2		
A-46	65' RT Line D" Sta. 11+90	/		✓			2'-6"	10'-0"					
A-66	64' RT B-L STA. 45+72	/	✓				2'-6"	10'-0"	3'-0"	4'-8"	2		
A-72	65' LT B-L STA. 47+57	/	✓				2'-6"	10'-0"	3'-0"	4'-8"	2		
B-15	85' LT B-L STA. 64+88	/		✓			2'-6"	6'-0"					
B-24	62' RT B-L STA. 68+25	/		✓			2'-6"	6'-0"					
B-38	86' RT B-L STA. 54+80	/		✓			2'-6"	6'-0"					
B-59	63' RT B-L STA. 74+60.5	/			✓		2'-6"	6'-0"					
B-63	62' RT B-L STA. 79+23	/			✓		3'-0"	6'-0"					
B-81	84' RT B-L STA. 97+90	/		✓			2'-6"	6'-0"					
B-91	70' LT B-L STA. 80+76	/			✓		2'-6"	6'-0"					
B-98	84' LT B-L STA. 85+30	/		✓			2'-6"	6'-0"					
B-111	69' LT B-L STA. 111+88	/		✓			2'-6"	6'-0"					
B-112	72' RT B-L STA. 111+72	/		✓			3'-6"	6'-0"					
B-114	62' RT B-L STA. 108+67	/	✓				2'-6"	6'-0"	3'-0"	2'-6"	2		
B-117	65' RT B-L STA. 105+17	/		✓			2'-6"	6'-0"					
B-124	62' LT B-L STA. 109+58	/	✓				2'-6"	6'-0"	3'-0"	2'-6"	2		
B-126	63' LT B-L STA. 105+85	/		✓			2'-6"	6'-0"					
B-142	62' LT B-L STA. 121+00	/	✓				2'-6"	6'-0"	3'-0"	2'-6"	2		
B-143	81' LT B-L STA. 120+75	/		✓			2'-6"	10'-0"					
B-172	62' RT B-L STA. 121+12	/	✓				2'-6"	6'-0"	3'-0"	2'-6"	2		
C-21	62' LT B-L STA. 124+36	/		✓			2'-6"	6'-0"					
C-22	62' RT B-L STA. 124+43	/		✓			2'-6"	6'-0"					
C-24	63' RT B-L STA. 129+41	/			✓		2'-6"	6'-0"					
C-29	62' LT B-L STA. 129+45	/			✓		2'-6"	6'-0"					
C-30	62' LT B-L STA. 133+11	/			✓		2'-6"	6'-0"					
C-47	69' RT B-L STA. 160+75	/		✓			3'-6"	6'-0"					
C-48	62' RT B-L STA. 162+85	/	✓				2'-6"	10'-0"	3'-0"	4'-8"	2		
C-59	61' LT B-L STA. 162+85	/	✓				2'-6"	10'-0"	3'-0"	4'-8"	2		
C-68	69' RT B-L STA. 180+10	/		✓			3'-0"	6'-0"					
C-69	62' RT B-L STA. 178+20	/	✓				3'-6"	10'-0"	3'-0"	4'-8"	2		
C-90	62' LT B-L STA. 192+10	/	✓				2'-6"	10'-0"	3'-0"	4'-8"	2		
C-98	62' RT B-L STA. 189+10	/	✓				2'-6"	10'-0"	3'-0"	4'-8"	2		
C-110	62' RT B-L STA. 203+20	/		✓			2'-6"	10'-0"					
C-140	62' LT B-L STA. 206+83	/	✓				2'-6"	6'-0"	3'-0"	2'-6"	2		
CURB INLETS LOCATED ON CROSS STREET													
C-16	154' RT B-L STA. 132+65	/	✓				2'-6"	6'-0"	3'-0"	2'-6"	2		
C-31	185' LT B-L STA. 138+80	/	✓				2'-6"	6'-0"	3'-0"	2'-6"	2		
MH-34	19th St. 2+45	/											
MH-28	Baldwin 49+95	/											
Totals		63	37	17	6						72		

SUMMARY OF CURB INLET MODIFICATION

A - DESIGNATES INLETS FROM I.H. 37 TO MORRIS ST.
B - DESIGNATES INLETS FROM MORRIS ST. TO TARTLTON ST.
C - DESIGNATES INLETS FROM TARTLTON ST. TO GOLLIHAR ST.
D - DESIGNATES INLETS FROM GOLLIHAR TO S.H. 358 INTERCHANGE

STRUCTURE SUMMARY

SHEET 1 OF 2 SHEETS									
FED. RD. DIST. NO.	STATE	FEDERAL PROJECT NO.	SHEET NO.						
16	TEXAS	M-HE5 0003 (293)	14						
COUNTY	CONTRACT	SHEET	JOB	HIGHWAY NO.					
NUECES	326	03	61	S.H. 286					

ROAD EXCAVATION & EMBANKMENT SUMMARY

Roadway	Sta. to Sta. B-L	Excav. cu	Emb. cu
RIGHT LINE C	10 + 00 - 12 + 50		13
	24 + 10 - 26 + 00		10
	28 + 50 - 31 + 00		13
	42 + 75 - 44 + 75		10
	67 + 25 - 71 + 75		23
	74 + 25 - 79 + 25		25
	82 + 00 - 86 + 00		20
	97 + 80 - 100 + 70		15
	102 + 90 - 107 + 50		23
	122 + 00 - 127 + 00		25
	129 + 20 - 131 + 25		10
	137 + 00 - 138 + 25		7
	164 + 00 - 169 + 00		25
	172 + 00 - 177 + 00		25
	189 + 60 - 196 + 50		30
	199 + 20 - 205 + 60		32
Nose Ramp H	11 + 50	27	
Nose Ramp L	24 + 00	8	
Nose Ramp M	28 + 50	3	
Nose Ramp P	65 + 30	4	
Nose Ramp R	65 + 00	3	
Nose Ramp T	86 + 00	12	
Nose Ramp V	97 + 50	4	
Nose Ramp X	108 + 50	24	
Nose Ramp Z	121 + 20	30	
Nose Ramp AA	146 + 70	24	
Nose Ramp CC	162 + 70	26	
Nose Ramp EE	178 + 00	24	
Nose Ramp FF	198 + 20	33	
Nose Ramp JJ	206 + 00	27	
Roadway	Sta. to Sta. B-L	Excav. cu	Emb. cu
Left Line D	28 + 60 - 30 + 70		11
	66 + 00 - 71 + 50		28
	74 + 00 - 80 + 00		30
	82 + 70 - 85 + 00		17
	103 + 00 - 107 + 00		20
	124 + 90 - 126 + 90		10
	129 + 30 - 134 + 50		26
	165 + 50 - 169 + 80		22
	172 + 50 - 179 + 50		15
	195 + 00 - 196 + 60		8
	199 + 00 - 205 + 00		30
	222 + 00 - 230 + 00		40
	222 + 00 - 229 + 00		35
Nose Ramp G	11 + 00	11	
Nose Ramp K	24 + 50	10	
Nose Ramp J	28 + 50	3	
Nose Ramp N	52 + 50	11	
Nose Ramp Q	65 + 30	3	
Nose Ramp S	85 + 60	7	
Nose Ramp U	96 + 70	14	
Nose Ramp W	109 + 30	11	
Nose Ramp Y	121 + 00	24	
Nose Ramp DD	163 + 00	31	
Nose Ramp HH	192 + 20	27	
Nose Ramp MM	221 + 70	25	
Nose Line D + H	229 + 30	22	
Line "N" Storm Sewer	Left Line D Sta. 223 + 70 to Sta. 231		352.9
Line "D"	Sta. 8 + 47 to Sta. 14 + 8 BK.	163	50
Median		2857 **	
Left of Ramp M			850
TOTALS		3468	5027

GROUND BOX SUM.

Location	EA.
19th St. 7+35	1
Port Ave 10+30	1
Port Ave 50L 10+50	1
Port Ave 11+30	1
Tarleton 2+95	1
Tarleton 4+65	1
Gollihar 3+60	1
Laredo 30R 45+80	1
Laredo 30L 46+60	1
Total	9†

† Additional quantities shown on illumination summary.

* Quantities included to connect outfall pipe to inlet at D.S. end.

** Road Excavation Median

23 + 45 - 31 + 00	-	189
45 + 04 - 71 + 67	-	846
74 + 23 - 78 + 62	-	198
82 + 32 - 86 + 50	-	199
137 + 06 - 152 + 16	-	471
172 + 08 - 184 + 44	-	382
199 + 10 - 206 + 82	-	268
208 + 99 - 221 + 13	-	304
		2857

SUMMARY OF RETAINING WALLS

Designation	Location	Design	Length	Str. Exc.	Wall Area	TY T501 Rail	Cut & Restore Pav.	Pipe Undr. 4 In.	Filter Matl. (Ty. F)	CL B Conc. Riprap	Remove Old Conc. Riprap
			LF	CY	SF	LF	SY	LF	CY	CY	SY
A	Rt. Line D Sta. 8 + 46.78 - 13 + 00	LA-3-32	453'	186	1019	453'	50	453'	15	—	—
B	Lt. B-L Sta. 73 + 96 - 80 + 16	LA-3-32	620'	254	1395	620'	69	620'	21	—	—
C	Rt. B-L Sta. 74 + 64 - 79 + 27	LA-3-32	463'	190	1042	463'	51	463'	16	—	—
D	Rt. B-L Sta. 81 + 85 - 83 + 05	LA-3-32	120'	49	270	120'	13	120'	4	—	—
E	Lt. B-L Sta. 99 + 34 - 100 + 79	LA-3-32	145'	59	326	145'	16	145'	5	—	—
F	Lt. B-L Sta. 129 + 33.04 - 133 + 48	LA-3-32	415'	170	934	415'	46	415'	14	—	—
G	Rt. B-L Sta. 129 + 33.04 - 131 + 28.53	LA-3-32	196'	80	441	196'	22	196'	7	—	—
H	Lt. B-L Sta. 162 + 90 - 169 + 77	LA-3-32	687'	282	1546	687'	76	687'	23	6	87
J	Lt. B-L Sta. 192 + 35 - 196 + 57	LA-3-32	422'	177	950	422'	51	461'	14	6	83
K	Lt. B-L Sta. 26 + 90 - 30 + 80	LA-3-32	390'	160	878	390'	43	390'	13	—	—
L	Lt. B-L Sta. 26 + 53 - 27 + 80	LA-3-32	132'	54	297	132'	15	132'	4	—	—
M	Lt. B-L Sta. 25 + 40 - 27 + 80	LA-3-32	240'	98	540	240'	27	240'	8	—	—
N	Lt. B-L Sta. 27 + 80	LA-6-3-32	7.5'	7	24	—	—	—	—	—	—
P	Rt. Ramp "M" Sta. 27 + 11 to R. Sta. 31 + 06	LA-3-32	395'	162	889	395'	44	*395'	13	0.4	6
Q	Rt. Line C Sta. 232 + 42 to 234 + 92	LA-3-32	250'	102	563	250'	28	250'	9	—	—
TOTALS			4,936	2030	11,114	4,928	551	4,967	166	12.4	176

INLET & MANHOLE SUMMARY

** For Contractor's Information only.

Manhole or Inlets	Location	Line	Dimensions			Grate Inlets	Manhole	Ring & Cover	Grates			CL B Conc.
			H	X	Y	TY. H	TY. M	TY. C	TY. H	L	W	
						EA.	EA.	EA.	EA.			
G.I. (N-1)	39' Rt. E.F.R. Sta. 224 + 40	N	3.83'	3'-6"	3.0'	1			1	4'-0"	2'-6"	2
G.I. (N-2)	44' Rt. E.F.R. Sta. 227 + 00	N	3.83'	3'-6"	3.0'	1			1	4'-0"	2'-6"	2
G.I. (N-3)	42' Rt. E.F.R. Sta. 229 + 40	N	3.83'	3'-6"	3.0'	1			1	4'-0"	2'-6"	2
M.H. (N-4)	34' Rt. E.F.R. Sta. 231 + 40	N	3.83'	9'-0"	4'-6"		1	1				
G.I. B-58A	Left @ Sta. 74 + 50		4.10'	3'-0"	2'-0"	1	1		1	3'-6"	1'-11"	
TOTALS						4	2	1	4			6

STORM SEWER SUMMARY

Description			Location	Sewer Excav.	R.C. Pipe (Sewer) CL. III	
Downstream	Structure	Upstream		C.Y.	30"	18"
Exist. 30" RCP	Line "N"	G.I. (N-1)	Line "N" Sta. 0 + 00 to Sta. 0 + 06	—	6	
G.I. (N-1)	Line "N"	G.I. (N-2)	Line "N" Sta. 0 + 09 to Sta. 2 + 56	42	247	
G.I. (N-2)	Line "N"	G.I. (N-3)	Line "N" Sta. 2 + 59 to Sta. 5 + 06	42	247	
G.I. (N-3)	Line "N"	M.H. (N-4)	Line "N" Sta. 5 + 09 to Sta. 7 + 06	34	196	
		G.I. B-58A	Left @ Sta. 74 + 50	2		5
TOTALS				120	696	5

STRUCTURE SUMMARY

PER. NO.	STATE	FEDERAL PROJECT NO.	SHEET NO.
16	TEXAS	HA-HES 0003 (206)	15
STATE DIST. NO.	COUNTY	CONT. SECT.	HIGHWAY NO.
16	NUECES	326 03 61	54286

SHEET 2 OF 2 SHEETS

ESTIMATE SUMMARY

								NUECES COUNTY		ALT	ITEM- CODE			DESCRIPTION	UNIT	TOTAL	
								MA-HES 000S(293)			ITEM NO	DESC CODE	SP NO			EST.	FINAL
EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL								
								4375.800	2,771.75		104	001	REMOV OLD CONC	SY	4375.800	2,771.75	
								29192.000	27,931.26		104	003	REMOV OLD CONC (CURB OR C AND G)	LF	29192.000	27,931.26	
								4026.000	4,755.61		104	006	REMOV OLD CONC (RIPRAP)	SY	4026.000	4,755.61	
								60.000	21		150	001	BLAD	HR	60.000	21	
								170.000	170		162	006	001	MULCH SOD	CY	170.000	170
								7245.000	8,856.18	1	249	144	FL BS (DEL)(DC)(TY A GR1 CL4)(29 IN)	SY	7245.000	8,856.18	
								45.000	66		316	015	001	AGGR (TY PB, GR 4)	CY	45.000	66
								1474.000	1,520.00		316	040	001	ASPH (AC OR EMUL)	GAL	1474.000	1,520.00
								430.000	435		320	015	001	AGGR (TY PB, GR 4)	CY	430.000	435
								14210.000	14,090.00		320	017	001	ASPH (AC OR EMUL)	GAL	14210.000	14,090.00
								3875.000	3,180.1		340	015	032	ASPH CONC (TY D)	TON	3875.000	3,180.1
								160.000	742.06		340	112	032	ASPH CONC (TY D)(PAV PATCH)	TON	160.000	742.06
								551.000	501		400	008		CUT AND RESTORE PAV	SY	551.000	501
								120.000	120		401	001		SEWER EXCAV	CY	120.000	120
								11114.000	11,114.00		423	001		RETAINING WALL	SF	11114.000	11,114.00
								214.400	269.9		432	008		RIPRAP (CONC)(CL B)	CY	214.400	269.9
								4176.000	4,176.00		442	034		STR STL (ACCESS PANEL)	LB	4176.000	4,176.00
								4928.000	4,928		450	036		RAIL (TY T 501)	LF	4928.000	4,928
								5.000	0		465	061		RCP SEW (18 IN)(CL III)	LF	5.000	0
								696.000	682.70		465	063		RCP SEW (30 IN)(CL III)	LF	696.000	682.70
								4.000	5		470	212		INLET (COMPL)(TY H)	EA	4.000	5
								2.000	2		470	282		MANH (COMPL)(TY M)	EA	2.000	2
								72.000	74		471	010		GRATE (TY A)	EA	72.000	74
								54.000	52		471	026		GRATE (TY H)	EA	54.000	52
								1.000	1		471	050		RING AND COVER (TY C)	EA	1.000	1
								109.000	107		479	003		ADJ MANH AND INLET	EA	109.000	107
								1.000	1		496	002		REMOV OLD STR (SMALL)	EA	1.000	1
								1.000	1		500	001		MOBILIZATION	LS	1.000	1
								18.000	18		502	001	005	BARCD, SIGN AND TRAF HANDLING	MO	18.000	18
								6600.000	6,600.00		512	001		CONC TRAF BAR (PORT)	LF	6600.000	6,600.00
								6600.000	6,600.00		512	002		CONC TRAF BAR (MOVE AND RESET)	LF	6600.000	6,600.00
								6600.000	6,300.00		512	003		CONC TRAF BAR (REMOVE)	LF	6600.000	6,300.00
								1077.000	1,079.19		514	001		CONC TRAF BAR (TY 1)	LF	1077.000	1,079.19
								7873.000	8,544.94		514	002		CONC TRAF BAR (TY 2)	LF	7873.000	8,544.94
								1235.000	1,281.37		514	003		CONC TRAF BAR (TY 3)	LF	1235.000	1,281.37
								8410.000	7,258.00		514	017		CONC TRAF BAR (SPECIAL)	LF	8410.000	7,258.00
								584.000	584		514	018		CONC TRAF BAR (TY 3 SPEC)	LF	584.000	584
								16.000	16		518	001	001	VEH IMPACT ATTEN ASSEM	EA	16.000	16
								424.400	518.66		530	020	010	CONC SDWLK (RAMP)	SY	424.400	518.66
								1875.000	2,675.00		540	010		METAL BEAM GD FENCE (12 GA)(TIM POST)	LF	1875.000	2,675.00
								12.000	14		540	011		TERM-ANCH SECT (12 GA)	EA	12.000	14
								60.000	52		542	003	001	REMOV TERM-ANCH SECT	EA	60.000	52
								33.000	34		610	017		RDWY ILL ASSEM (TY SP 48S-8-B)(.4 KW)S	EA	33.000	34
								2.000	2		612	001		RELOC RDWY ILL ASSEM	EA	2.000	2
								2.000	2		616	001		RDWY ILL ASSEM FND (TY A)	EA	2.000	2
								19500.000	16,825.24		618	046		CONDT (PVC)(SCH 40)(1 1/2 IN)	LF	19500.000	16,825.24
								3500.000	3,484.14		620	023		ELEC CONDR (NO. 2 X HHW)	LF	3500.000	3,484.14
								21000.000	19,946.36		620	032		ELEC CONDR (NO. 6)(TY XHHW)	LF	21000.000	19,946.36
								37.000	48		624	014		GROUND BOX (RPM)(TY 1) H-20 LOADING	EA	37.000	48
								1400.000	798		664	001	002	ABBREVIATED PAV MARK	LF	1400.000	798

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ESTIMATE SUMMARY

								NUECES COUNTY MA-HES 000S(293) 326-3-61 ROADWAY		ITEM- CODE	DESCRIPTION	UNIT	TOTAL	
EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL	ITEM NO	DESC CODE				SP NO	EST.
						3468.000	3,305.00	1075	001		EXCAVATION	CY	3468.000	3,305.00
						5027.000	5,027.00	1076	005		EMBANK (ORD COMP)(TY C)	CY	5027.000	5,027.00
						5150.000	5,303.00	5007	001		REMOV METAL BM OD FENCE (BAR)&CAHBF	LF	5150.000	5,303.00
						600.000	500	5007	002		REMOV METAL BM OD FENCE (BAR)	LF	600.000	500
						3100.000	2,740.00	5007	003		REMOV CONT-ACCS HDLT-BAR FENCE	LF	3100.000	2,740.00
						1.000	1	5143	011		OD RAIL EN ABS TERM(2 FT)(6 BAYS)(TY B)	EA	1.000	1
						33147.000	30,876.40	5190	001		REMOV METAL BM OD FENCE	LF	33147.000	30,876.40
						9650.000	2,634.00	5190	002		REMOV METAL BM OD FENCE & CAHBF	LF	9650.000	2,634.00
						1.000	1	5191	001		HYDR CRASH CUSHION (FS) (7.5 W-12B)	EA	1.000	1
						51.000	52	6126	001		REMOV RDWY ILLUM ASSEM	EA	51.000	52
									</					

ESTIMATE & QUANTITY SHEET

17

STATE DIST. NO.	COUNTY	PROJECT NO.	SHEET NO.
16	NUECES	MA-HES 000S (293)	17

GENERAL NOTES AND SPECIFICATION DATA--

ITEM 104

ALL OLD CONCRETE AND BROKEN DEBRIS SHOWN TO BE REMOVED SHALL BECOME THE PROPERTY OF THE CONTRACTOR TO BE DISPOSED OF BY HIM OUTSIDE THE LIMITS OF THE RIGHT-OF-WAY.

A 5 FOOT SECTION OF TRANSITION CURB SHALL BE LOCATED AT THE ENDS OF ALL CURB WHICH IS TO REMAIN IN PLACE AS SHOWN ON SHEET 83 OF THE PLANS.

ITEM 150

BLADING SHALL BE USED FOR CLEANING AND DRESSING UP AS DIRECTED BY THE ENGINEER.

ITEM 249

FLEXIBLE BASE SHALL BE STOCKPILED AND TESTED PRIOR TO DELIVERY ON THE ROAD.

BASE MATERIAL SHALL BE PREMIXED WITH LIME AT A SITE OFF THE ROADWAY BEFORE PLACEMENT.

GRAVEL AGGREGATE SHALL BE SO CRUSHED TO HAVE A MINIMUM OF 60 PERCENT OF THE PARTICLES RETAINED ON THE NO.4 SIEVE WITH MORE THAN ONE CRUSHED FACE, AS DETERMINED BY TEST METHOD TEX-413-A (PARTICLE COUNT).

ITEM 304

FLAKINESS INDEX FOR THESE AGGREGATES, AS DETERMINED BY TEST METHOD TEX-224-F, SHALL NOT EXCEED 17.

AGGREGATES USED FOR SURFACE TREATMENT SHALL BE SUBJECTED TO FOUR CYCLES OF THE MAGNESIUM SULFATE SOUNDNESS TEST IN ACCORDANCE WITH TEST METHOD TEX-411-A. THE LOSS SHALL NOT BE GREATER THAN 30 PERCENT.

ITEMS 316 & 320

THE ENGINEER WILL APPROVE THE TYPE AND GRADE OF ASPHALT TO BE USED. AC WILL NORMALLY BE USED WHEN THE AIR TEMPERATURE IS ABOVE 70F. ESTIMATED QUANTITY SHOWN FOR BID ITEM "ASPH (AC OR EMUL)" IS BASED ON AN AVERAGE OF THE ESTIMATED RATES OF APPLICATION BETWEEN AC AND EMUL.

ITEM 340

THE STATE DEPARTMENT OF HIGHWAYS AND PUBLIC TRANSPORTATION WILL FURNISH THE LABORATORY BUILDING REQUIRED FOR TESTING ALL ASPHALTIC MATERIAL FOR THIS ITEM. THE CONTRACTOR SHALL PROVIDE ELECTRICITY, WATER, AND GAS SERVICE AT THIS FACILITY AT HIS OWN EXPENSE.

AUTOMATIC SCREED CONTROLS SHALL BE REQUIRED.

THE COARSE AGGREGATE USED IN THE SURFACE OR FINISHED COURSE SHALL HAVE A POLISH VALUE OF NOT LESS THAN 32.

THE SURFACE COURSE SHALL BE CONSTRUCTED IN WIDTHS THAT WILL MAKE THE LONGITUDINAL JOINTS COINCIDE WITH THE PROPOSED LANE STRIPES.

DECANTATION TEX 217-F:
DRUM MIX PLANTS - PART I - 2%
PART II - 2%

BATCH PLANTS - PART I - 2%
PART II - 1%

SAMPLES FOR TEST METHOD TEX-217-F (PARTS I AND II) SHALL BE FROM THE HOT BINS FOR CONVENTIONAL BATCH PLANTS AND FROM THE STOCKPILE FOR DRYER DRUM PLANTS.

COARSE AGGREGATES USED SHALL BE SUBJECTED TO FOUR CYCLES OF THE MAGNESIUM SULFATE SOUNDNESS TEST IN ACCORDANCE WITH TEST METHOD TEX-411-A. THE LOSS SHALL NOT BE GREATER THAN 40 PERCENT.

ITEM 340 (PAV PATCH)

FOR PATCHING PAVEMENT, A COMMERCIAL GRADE MIX WILL BE ACCEPTABLE WITH THE APPROVAL OF THE ENGINEER. TESTING REQUIREMENTS AND POLISH VALUE ARE WAIVED.

ITEM 420

AS SOON AS FORMS ARE REMOVED FROM ALL CONCRETE, AN ORDINARY SURFACE FINISH SHALL BE APPLIED TO THE EXPOSED CONCRETE SURFACES PREPARATORY TO THE HIGHER GRADE OR CLASS FINISH.

ITEM 423

EXPANSION JOINTS SHALL BE CONSTRUCTED EVERY THIRD PANEL OR AS DIRECTED BY THE ENGINEER.

PIPE UNDERDRAINS AND FILTER MATERIAL SHALL NOT BE PAID FOR DIRECTLY, BUT SHALL BE CONSIDERED SUBSIDIARY TO THIS ITEM.

ITEM 427

ALL CONCRETE TRAFFIC BARRIER AND TYPE T501 RAIL, CAST IN PLACE OR PRECAST, SHALL RECEIVE A CLASS B FINISH.

SPECIFICATION DATA

SHEET A

GENERAL NOTES AND SPECIFICATION DATA--

ITEM 437, CONT'D
HIGH RANGE WATER REDUCERS WILL BE USED ONLY TO MEET SPECIAL REQUIREMENTS AND WILL REQUIRE THE WRITTEN APPROVAL OF THE ENGINEER ON EACH SPECIFIC PROJECT. A SATISFACTORY WORK PLAN FOR CONTROL SHALL BE SUBMITTED BY THE CONTRACTOR FOR APPROVAL AND AN EVALUATION OF THE CONCRETE CONTAINING THE ADMIXTURE WILL BE PERFORMED BY THE ENGINEER.

ITEM 442

ALL STRUCTURAL STEEL ACCESS PANELS SHALL BE GALVANIZED.

ITEM 450

ALL RAILING LABELED TY T5 SHALL BE TY T501.

ITEM 450 AND 514

THE FACE OF CONCRETE TRAFFIC BARRIER TY(SPEC) AND TYPE 2 AND CONCRETE RAILING TY T501 SHALL BE TRANSITIONED IN 10 FEET AT BRIDGE WINGWALLS TO MEET THE FACE OF THE BRIDGE RAIL.

ITEM 465

REINFORCED CONCRETE PIPE SHALL BE CLASS III.

ITEM 502

CONCRETE TRAFFIC BARRIER UNITS DAMAGED DUE TO CONTRACTOR'S OPERATIONS, HANDLING OR NEGLECT, SHALL BE REPAIRED OR REPLACED AS DIRECTED BY THE ENGINEER.

TRAFFIC CONES USED ON THIS PROJECT SHALL BE A MINIMUM OF 28" IN HEIGHT. IF TRAFFIC CONES ARE USED AT NIGHT, THEY SHALL BE REFLECTORIZED AS SHOWN ON BC (3)-82.

PORTABLE CRASH CUSHIONS OF A DESIGN APPROVED BY THE ENGINEER SHALL BE USED TO PROTECT THE WORK AREA.

THE CONTRACTOR'S PERSONNEL WILL BE REQUIRED TO WEAR REFLECTIVE VESTS ON THE JOB SITE.

A MINIMUM OF TWO LANES OF TRAFFIC SHALL BE MAINTAINED IN BOTH DIRECTIONS AT ALL TIMES. UPON THE APPROVAL OF THE ENGINEER, THE CONTRACTOR MAY BE ALLOWED TO CLOSE MORE THAN ONE LANE IN EACH DIRECTION FOR A SHORT DURATION DURING OFF PEAK TRAFFIC HOURS.

IF A BLUNT END OF A CONCRETE TRAFFIC BARRIER OR A FORM IS LEFT FACING ON-COMING TRAFFIC, IT SHALL BE PROTECTED BY THE METHOD SHOWN ON SHEET TB(BMGF)-85.

ERECTION OF THE CONCRETE TRAFFIC BARRIER SHALL BE SCHEDULED TO INTERFERE AS LITTLE AS POSSIBLE WITH VEHICULAR TRAFFIC. THE FOLLOWING REQUIREMENTS MUST BE OBSERVED:

BARRICADES AND CHANNELIZING DEVICE MAINTENANCE SHALL BE ON A 30 MINUTE BASIS.

- 1) THE CONTRACTOR WILL BE ALLOWED TO CLOSE ONE LANE IN EACH DIRECTION FROM 9:00 A.M. TO 4:00 P.M. UNLESS OTHERWISE APPROVED BY THE ENGINEER. DURING REMOVAL OF EXISTING RAIL AND INSTALLATION OF THE C.T.B., THE CONTRACTOR MAY CLOSE ONE LANE IN EACH DIRECTION.
- 2) BEFORE ANY OBSTRUCTION IS PLACED ON THE PAVEMENT, WARNING DEVICES SHALL BE PLACED IN POSITION AS INDICATED ON THE TRAFFIC CONTROL PLANS AND BC (1)-(7)-82.
- 3) UPON COMPLETION OF EACH WORK DAY AT EACH SITE, THE CONTRACTOR SHALL CLEAN AND REMOVE ALL RUBBISH FROM LOCATION, RESTORE IN AN ACCEPTABLE MANNER ALL PROPERTY WHICH HAS BEEN DAMAGED DURING THE PROSECUTION OF THE WORK, AND LEAVE EACH WORK SITE IN A PRESENTABLE CONDITION THROUGHOUT THE DURATION OF THE CONTRACT.
- 4) POLICE ASSISTANCE MAY BE NEEDED FOR TRAFFIC CONTROL. ACQUIRING POLICE ASSISTANCE WILL BE THE CONTRACTOR'S RESPONSIBILITY.
- 5) FOR THIS PROJECT, A MINIMUM OF TWO 3-LINE ELECTRONIC PORTABLE CHANGEABLE MESSAGE SIGNS WILL BE REQUIRED.

NO EXTRA COMPENSATION WILL BE ALLOWED FOR FULFILLING THE REQUIREMENTS STATED ABOVE UNLESS OTHERWISE INDICATED IN THE PLANS OR SPECIFICATIONS.

ITEM 504

ONE FIELD OFFICE (TYPE D) IS REQUIRED FOR THIS PROJECT. THE BUILDING SHALL BE DIVIDED INTO SEPARATE ROOMS. THE BUILDING SHALL BE ADEQUATELY VENTILATED AS DIRECTED BY THE ENGINEER. IN ADDITION THE BUILDING SHALL BE FURNISHED WITH AN APPROVED WASHROOM EQUIPPED WITH A TANK TYPE FLUSH TOILET AND WASHBASIN, BOTH CONNECTED TO ADEQUATE SANITARY FACILITIES. THE BUILDING SHALL BE EQUIPPED WITH ELECTRICITY, NATURAL GAS AND CITY WATER. THE ARRANGEMENT AND NUMBER OF OUTLETS FOR THESE UTILITIES SHALL BE AS DIRECTED BY THE ENGINEER. ADEQUATE ENCLOSED SPACE SHALL BE PROVIDED FOR BEAM CURING TANKS AND BEAM BREAKING MACHINE. THE CONTRACTOR SHALL APPLY FOR AND SECURE ANY PERMITS NECESSARY FOR THE BUILDING. UTILITIES, METER DEPOSITS AND SERVICE BILLS WILL BE PAID BY THE CONTRACTOR. THE FIELD OFFICE WILL BE AS ABOVE OR AN EQUIVALENT AS APPROVED BY THE ENGINEER.

18

SPECIFICATION DATA

SHEET B

GENERAL NOTES AND SPECIFICATION DATA--

ITEM 506

AFTER TEMPORARY EROSION CONTROL DEVICES ARE NO LONGER REQUIRED, CLEAN UP AND RESHAPING OF THESE AREAS WILL BE REQUIRED. THIS WORK WILL NOT BE PAID FOR DIRECTLY BUT SHALL BE CONSIDERED SUBSIDIARY TO THE VARIOUS BID ITEMS.

ITEM 512

PORTABLE CONCRETE TRAFFIC BARRIERS SHALL BE FABRICATED IN ACCORDANCE WITH PRECAST CONCRETE BARRIER TY 2.

PORTABLE BARRIER SHOWN TO BE REMOVED SHALL BE HAULED BY THE CONTRACTOR TO THE DEPARTMENT'S YARD ON SOUTH PADRE ISLAND DRIVE NEAR S.H.44, UNLOADED AND NEATLY STORED AS DIRECTED BY THE ENGINEER.

FOR TESTING PURPOSES, CONCRETE WILL BE CLASSIFIED AS MISCELLANEOUS.

ITEM 514

CAST-IN PLACE SECTIONS AND ANCHOR BOLTS FOR FUTURE ILLUMINATION POLES SHALL BE PLACED AT LOCATIONS SHOWN ON SHEET 74 (POLE A-57 THRU POLE A-63).

PLAN LIMITS OF THE VARIOUS TYPES OF CONCRETE BARRIER MAY BE VARIED BY THE ENGINEER TO MEET FIELD CONDITIONS.

CONCRETE TRAFFIC BARRIER TY 1 AND TY 2 SHALL BE PRECAST OR SLIPFORMED.

ITEM 512 AND 514

CONCRETE TRAFFIC BARRIER UNITS DAMAGED DUE TO CONTRACTOR'S OPERATIONS, HANDLING OR NEGLECT, SHALL BE REPAIRED OR REPLACED AS DIRECTED BY THE ENGINEER BEFORE BEING REUSED OR RETURNED TO STORAGE.

ITEMS 514 & 618

1-1/2" PVC CONDUIT SHALL BE PLACED IN MEDIAN-MTD CTB FROM STA. 12+00 TO STA. 225+30. WHERE CTB IS INTERRUPTED AT EXISTING ILLUMINATION POLE, CONDUIT SHALL BE STUBBED OUT A MINIMUM OF 4 INCHES. STUB-OUTS SHALL BE MADE AT OTHER LOCATIONS AS DIRECTED BY THE ENGINEER. ALL STUB-OUTS FOR FUTURE USE SHALL BE CAPPED WITH TEMPORARY (REMOVABLE) CAPS.

ITEM 526

IF MEMBRANE CURING IS USED FOR CURING CONCRETE STRUCTURES, ONLY TYPE 1-D CURING COMPOUND CONFORMING TO REQUIREMENTS OF ITEM 526 WILL BE PERMITTED.

ITEM 530

ENTRAINED AIR WILL NOT BE REQUIRED.

ITEM 540

THE POSTS SHALL BE TIMBER. PAINTING WILL NOT BE REQUIRED. RAIL ELEMENT SHALL BE GALVANIZED.

ITEM 542

RAIL ELEMENTS SHALL BE SALVAGED BETWEEN THE LIMITS OF TARTLTON STREET AND SH 358. THE CONTRACTOR SHALL NEATLY STACK THE RAIL ELEMENTS WITHIN THE LIMITS OF THE PROJECT AS DIRECTED BY THE ENGINEER. AT THE CONTRACTOR'S OPTION, HE MAY HAUL THE SALVAGED RAIL ELEMENTS TO THE DEPARTMENT'S YARD AT 1701 SOUTH PADRE ISLAND DRIVE, CORPUS CHRISTI, TEXAS, AND UNLOAD AND NEATLY STACK THEM AS DIRECTED BY THE ENGINEER. ALL OTHER MATERIALS REMOVED UNDER THIS ITEM SHALL BECOME THE PROPERTY OF THE CONTRACTOR AND BE REMOVED FROM THE PROJECT SITE. REMOVAL OF EXISTING METAL BEAM GUARD FENCE AND T.D.'S WILL BE SCHEDULED WITH PLACEMENT OF NEW RAIL SO AS TO LEAVE NO BRIDGE END EXPOSED AS A TRAFFIC HAZARD OR AS DIRECTED BY THE ENGINEER.

ITEM 612

NEW ELECTRICAL CONDUCTOR AND FUSE ASSEMBLIES SHALL BE INSTALLED IN EXISTING ILLUMINATION ASSEMBLIES TO REMAIN IN PLACE OR TO BE RELOCATED. ELECTRICAL CONDUCTOR SHALL BE NO. 12 TYPE XHHW.

ITEM 618

AFTER CONDUIT AND WIRING INSTALLATION ARE COMPLETED, ALL CONDUIT ENDS WILL BE SEALED WITH DUCT-SEAL OR OTHER APPROVED COMPOUND.

ITEM 620

EXISTING CIRCUITS WHICH ARE TO BE ABANDONED SHALL BE DISCONNECTED AT THE POINT AT WHICH THEY ARE NO LONGER NEEDED.

POWER SHALL BE RESTORED TO ALL EXISTING OVERHEAD SIGNS AS SOON AS POSSIBLE AFTER THE NEW CIRCUITS ARE INSTALLED.

ITEM 624

ALL DUCTS OR CONDUITS ENTERING OR LEAVING GROUND BOXES SHALL BE ADJUSTED (EXTENDED, SHORTENED, LOWERED OR RAISED) IF NECESSARY, AND SHALL BE SECURELY LASHED TOGETHER IN A VERTICAL POSITION. ANY SURROUNDING AREAS DISTURBED BY THIS WORK SHALL BE RESTORED TO ITS ORIGINAL CONDITION OR AS DIRECTED BY THE ENGINEER. THIS WORK SHALL BE INCLUDED IN THE PRICE BID FOR ITEM 624.

SPECIFICATION DATA

SHEET C

GENERAL NOTES AND SPECIFICATION DATA--

ITEM 664

FOR THIS PROJECT, APPROXIMATELY 50 L.F. OF WHITE AND 1,350 L.F. OF YELLOW MARKINGS WILL BE NEEDED. LOCATION OF PLACEMENT SHALL BE AS SHOWN ON THE PLANS OR AS DESIGNATED BY THE ENGINEER. REMOVAL WILL BE REQUIRED. MARKINGS SHALL BE PLACED IMMEDIATELY UPON REMOVAL OF THE CONCRETE DIRECTIONAL OR MEDIAN ISLANDS.

PERMANENT PAINT STRIPING OF THE CROSS STREETS WILL BE DONE BY STATE MAINTENANCE FORCES.

ITEM 5143

THE CONTRACTOR SHALL BE RESPONSIBLE FOR SUPPLYING ADDITIONAL REPLACEMENT G.R.E.A.T. UNITS OR PORTIONS THEREOF, DUE TO DAMAGE BY CONSTRUCTION OPERATIONS OR BY THE TRAVELING PUBLIC. REPLACEMENT SHALL BE MADE AS SOON AS POSSIBLE AND INTERIM MEASURES, AS APPROVED BY THE ENGINEER, WILL BE MADE UNTIL THE UNITS CAN BE REPLACED.

ITEM 5190

POST HOLES LEFT AFTER REMOVAL OF METAL BEAM GUARD FENCE SHALL BE BACKFILLED WITH SUITABLE MATERIAL AND TAMPED TO THE DENSITY OF SURROUNDING GROUND OR BY THE METHOD SPECIFIED BELOW. WHERE EXISTING GUARD FENCE POSTS ARE SET IN CONCRETE RIPRAP THE POST HOLE SHALL BE BACKFILLED AND THE CONCRETE RIPRAP PATCHED WITH A GROUT CONSISTING OF AGGREGATE, WATER AND A MINIMUM OF 2 SACKS PORTLAND CEMENT PER CUBIC YARD OF MATERIAL PLACED. THIS WORK WILL NOT BE PAID FOR DIRECTLY, BUT SHALL BE CONSIDERED SUBSIDIARY WORK PERTAINING TO THE ITEM, "REMOVING METAL BEAM GUARD FENCE". ANY PORTION OF THE EXISTING CONCRETE RIPRAP, OUTSIDE THE LIMITS NEEDED FOR REMOVAL, DAMAGED IN PULLING THE POSTS, SHALL BE REPAIRED BY THE CONTRACTOR AT HIS ENTIRE EXPENSE.

ITEM 1076

ALL SPRINKLING AND ROLLING FOR EMBANKMENT WILL NOT BE PAID FOR DIRECTLY, BUT SHALL BE CONSIDERED SUBSIDIARY TO THIS ITEM.

000---938 & 000---939

THE FOLLOWING GOALS HAVE BEEN ESTABLISHED: DBE 13%, WBE 1%, TOTAL 14%.

SEQUENCE OF CONSTRUCTION

NOTE: 6600 FT OF CONCRETE TRAFFIC BARRIER(PORT) ARE INCLUDED IN THE PLANS TO COMPLETE PHASES I AND II. THIS QUANTITY WILL NOT BE INCREASED WITHOUT THE APPROVAL OF THE ENGINEER.

- 1) PHASE I- COMPLETE CONCRETE TRAFFIC BARRIER FROM STA. 8+46 TO STA. 86+50.
- 2) PHASE II- COMPLETE CONCRETE TRAFFIC BARRIER FROM STA. 86+50 TO STA. 155+00.
- 3) PHASE III- COMPLETE CONCRETE TRAFFIC BARRIER FROM STA. 155+00 TO STA. 225+08.
- 4) ALL PHASES- WORK OUTSIDE THE ABOVE ZONES MAY BE PERFORMED THROUGH- OUT THE PROJECT AT ANYTIME.

THE CONTRACTOR SHALL NOT PERFORM ANY WORK ON THE SHOULDER EDGES IN THE AREAS WHERE CONCRETE TRAFFIC BARRIER WORK IN THE MEDIAN IS GOING ON.

SPECIFICATION DATA

SHEET D

GENERAL NOTES AND SPECIFICATION DATA

SPECIFICATION DATA

TEST TO BE IN ACCORDANCE WITH THE STATE DEPARTMENT OF HIGHWAYS AND PUBLIC TRANSPORTATION STANDARD TEST METHODS

ITEM	DESCRIPTION	GRADING REQUIREMENTS PERCENT RETAINED, SIEVES								WET BALL MILL	SOIL CONSTANTS				SEE NOTE
		2 1/2"	2"	1 3/4"	1"	1/2"	#4	#10	#40		L. L.	P. I.			
										MAX.	MAX.	MAX.	MIN.		
249 (ALT 1A)	FLEX BASE(DEL)(DC)(GR 4 CL 4)(STOCKPILE)		0	0-10					60-85	55	45	16	3	1	
249 (ALT 1A)	FLEX BASE(DEL)(DC)(GR 4 CL 4)W/1-1/2% LIME											12		2	
1076	EMBANK (ORD COMP)(TY C)											45	0		

1. TEST SAMPLES TO BE TAKEN AT STOCKPILE.
2. TESTS MADE AFTER MIXING OF BASE WITH LIME.

BASIS OF ESTIMATE

ITEM	DESCRIPTION	RATE	AREA or VOLUME	QUANTITY
150	BLADING	1/4 hr./sta	240 Sta	60 hr
262 (ALT 1A)	LIME BASE STABILIZATION (GR 4 CL 4) (29 IN)	GRADE 4 BASE WEIGHT = 115 LB/C.F. LIME = 1 1/2% BY WEIGHT	7245 SY	136 TONS
340	ACP (TY D)	ESTIMATED % COMPOSITION BASED ON 100 LB/SY/IN AND SP GR = 2.20		3875 TONS
	AGGREGATE	94% MIX BY WEIGHT		
	ASPH	6% MIX BY WEIGHT		
340	ACP (TY D) (PATCH)	COMMERCIAL GRADE MIX WITH APPROVAL OF ENGINEER		160 TONS

COMPACTION REQUIREMENTS FOR BASE COURSES

PERCENT OF DENSITY AS DETERMINED BY COMPACTION RATIO (TEX-114-E)

ITEM	MATERIAL	COURSE		DENSITY		
249	FLEX BASE (DEL) (DC) (Ty A Gr 4 CL 4) (29 in)	ALL		95 MIN		
249 (ALT 1A)	FLEX BASE (DEL) (DC) (Gr 4 CL 4) (29 in)	ALL		95 MIN		

SURFACE AREAS
One course surf. trt = 51,335 SY.
Seal Coat = 5,361 SY.

SURFACE TREATMENT DATA

ITEM 320 & 316 ONE CRSE SURF TREAT & SEAL COAT	APPLICATION					
	SEAL COAT		ONE COURSE			
	1ST CRSE	1ST CRSE	1ST CRSE	1ST CRSE	1ST CRSE	1ST CRSE
ASPHALT, TYPE	AC	EMUL	AC	EMUL	AC	EMUL
ASPHALT, RATE (GAL/SY)			0.24	0.31	0.24	0.31
AGGREGATE, TYPE			PB	PB		
AGGREGATE, GRADE			4	4		
AGGREGATE, RATE (CY/SY)			1:120	1:120		
POLISH VALUE			NO	NO		
* Roll (Flatwheel) (Hr./sy)			1:3600	1:3600		
* ROLL (LI Pneu) (Hr./SY)			1:2500	1:2500		

* For Contractor's Information Only.

SPECIFICATION DATA

STATE	STATE	PROJECT NO.	SHEET NO.
6	TEXAS	HES 0005 (293)	SH 286
STATE DIST. NO.	COUNTY	SECTION NO.	SECTION NO.
16	NUECES	326	03 61 18B

SPECIFICATION DATA

STATE	STATE	PROJECT NO.	SHEET NO.
6	TEXAS	HES 0005 (293)	SH 286
STATE DIST. NO.	COUNTY	SECTION NO.	SECTION NO.
16	NUECES	326	03 61 18B

HORIZONTAL ALIGNMENT LIST
FOR ROADWAY C = BACK OF EXIST CURB

P. I.			X	Y
5	15+55.2300		2352584.7721	775694.3510
		S 9 15 43.63 E	193.9500 FT.	
	16+55.2348 PC	11 27 32.96 D	93.9451 T 2352600.8680	775595.6500
10	17+49.1800 PI	21 16 57.03 LT	185.7249 L 2352615.9886	775502.9297
	18+40.9597 PT	500.0000 R	2352663.7324	775422.0210
		S 30 32 40.65 E	446.4200 FT.	
	19+82.2036 PC	7 0 53.72 D	211.2310 T 2352735.5138	775300.3770
15	21+93.4346 PI	29 0 0.0 RT	413.4043 L 2352842.8634	775118.4578
	23+95.6079 PT	816.7700 R	2352848.5573	774907.3035
-	1012+58.5910 AHEAD EQUATION			
		S 1 32 40.69 E	311.2400 FT.	
20	1013+58.6000		2352851.2531	774807.3309

HORIZONTAL ALIGNMENT LIST
FOR ROADWAY D = BACK OF EXIST CURB

P. I.			X	Y
1	7+16.1500		2352831.3332	775638.1219
		S 0 39 13.62 E	135.9900 FT.	
	8+16.1469 PC	10 36 37.19 D	35.9931 T 2352832.4742	775538.1315
2	8+52.1400 PI	7 37 36.07 LT	71.8798 L 2352832.8849	775502.1408
	8+88.0267 PT	540.0000 R	2352838.0686	775466.5230
		S 8 16 49.69 E	210.0100 FT.	
	8+88.0334 PC	1 56 15.73 D	174.0102 T 2352838.0696	775466.5163
3	10+62.0436 PI	6 44 9.01 RT	347.6194 L 2352863.1303	775294.3202
	12+35.6528 PT	2956.8900 R	2352867.8209	775120.3733
		S 1 32 40.68 E	386.4900 FT.	
4	14+48.1327 PI	90 0 0.78 RT	2352873.5484	774907.9706
-	10012+46.1300 AHEAD EQUATION			
		S 88 27 20.10 W	12.5000 FT.	
5	10012+58.6300		2352861.0529	774907.6337

HORIZONTAL ALIGNMENT LIST
FOR ROADWAY G = BASELINE

P. I.			X	Y
1	4+52.7800		2352722.2821	775698.6906
		S 0 36 29.30 W	90.4200 FT.	
	4+58.1907 PC	9 4 3.03 D	85.0092 T 2352722.2247	775693.2802
2	5+43.2000 PI	15 19 27.95 LT	169.0037 L 2352721.3224	775608.2757
	6+27.1945 PT	631.8800 R	2352742.9176	775526.0551
		S 14 42 58.66 E	530.1000 FT.	
	8+84.2854 PC	3 31 7.03 D	187.9999 T 2352808.2271	775277.3980
3	10+72.2853 PI	13 10 18.06 RT	374.3424 L 2352855.9853	775095.5653
	12+58.6278 PT	1628.3600 R	2352861.0529	774907.6337
		S 1 32 40.60 E	259.0699 FT.	
6	13+29.6978 PI	0 0 0.07 LT	2352862.9686	774836.5895
		S 1 32 40.66 E	1982.9057 FT.	
	25+45.7372 PC	1 14 59.91 D	766.8663 T 2352895.7477	773620.9920
10	33+12.6036 PI	18 59 43.33 RT	1519.6587 L 2352916.4190	772854.4043
	40+65.3959 PT	4583.7500 R	2352686.4467	772122.8329
-	40+66.4323 AHEAD EQUATION			
		S 17 27 2.67 W	2012.4840 FT.	
	47+71.3915 PC	2 1 55.81 D	540.6585 T 2352475.0395	771450.3194
15	53+12.0500 PI	21 42 38.27 LT	1068.3478 L 2352312.9037	770934.5446
	58+39.7393 PT	2819.4400 R	2352353.0641	770395.3797
-	10058+38.3312 AHEAD EQUATION			
		S 4 15 35.60 E	1724.4673 FT.	
	10064+69.8163 PC	2 59 58.75 D	552.3237 T 2352399.9713	769765.6392
20	10070+22.1400 PI	32 15 20.83 RT	1075.3171 L 2352440.9982	769214.8413
	10075+45.1333 PT	1910.0800 R	2352181.7329	768727.1498
-	10075+46.3801 AHEAD EQUATION			
		S 27 59 45.22 W	7479.8936 FT.	
	10139+95.9811 PC	3 7 28.62 D	477.9689 T 2349154.2366	763032.2732
25	10144+73.9500 PI	29 13 9.19 LT	935.1298 L 2348929.8740	762610.2357
	10149+31.1109 PT	1833.6900 R	2348940.0783	762132.3758
-	20149+30.1790 AHEAD EQUATION			
		S 1 13 23.96 E	3254.4999 FT.	
	20173+09.1489 PC	3 31 13.10 D	397.5611 T 2348990.8679	759753.9481
30	20177+06.7100 PI	27 27 11.33 RT	779.8514 L 2348999.3556	759356.4776
	20180+89.0004 PT	1627.5800 R	2348823.6444	758999.8540
-	30180+88.4331 AHEAD EQUATION			
		S 26 13 47.37 W	2497.6479 FT.	
	30199+39.5788 PC	1 0 0.0 D	248.9412 T 2348005.4883	757339.3237
35	30201+88.5200 PI	4 58 32.28 RT	497.5695 L 2347895.4630	757116.0164
	30204+37.1483 PT	5729.6500 R	2347766.4845	756903.0933
-	30204+37.7848 AHEAD EQUATION			
		S 31 12 19.65 W	1315.7364 FT.	
	30211+63.2449 PC	0 28 42.52 D	341.3351 T 2347390.6174	756282.5964
40	30215+04.5800 PI	3 15 55.96 LT	682.4854 L 2347213.7688	755990.6474
	30218+45.7303 PT	11974.5800 R	2347053.8378	755689.0985
		S 27 56 23.68 W	678.8852 FT.	
45	30221+83.2804		2346895.6803	755390.8934

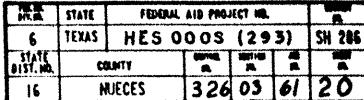
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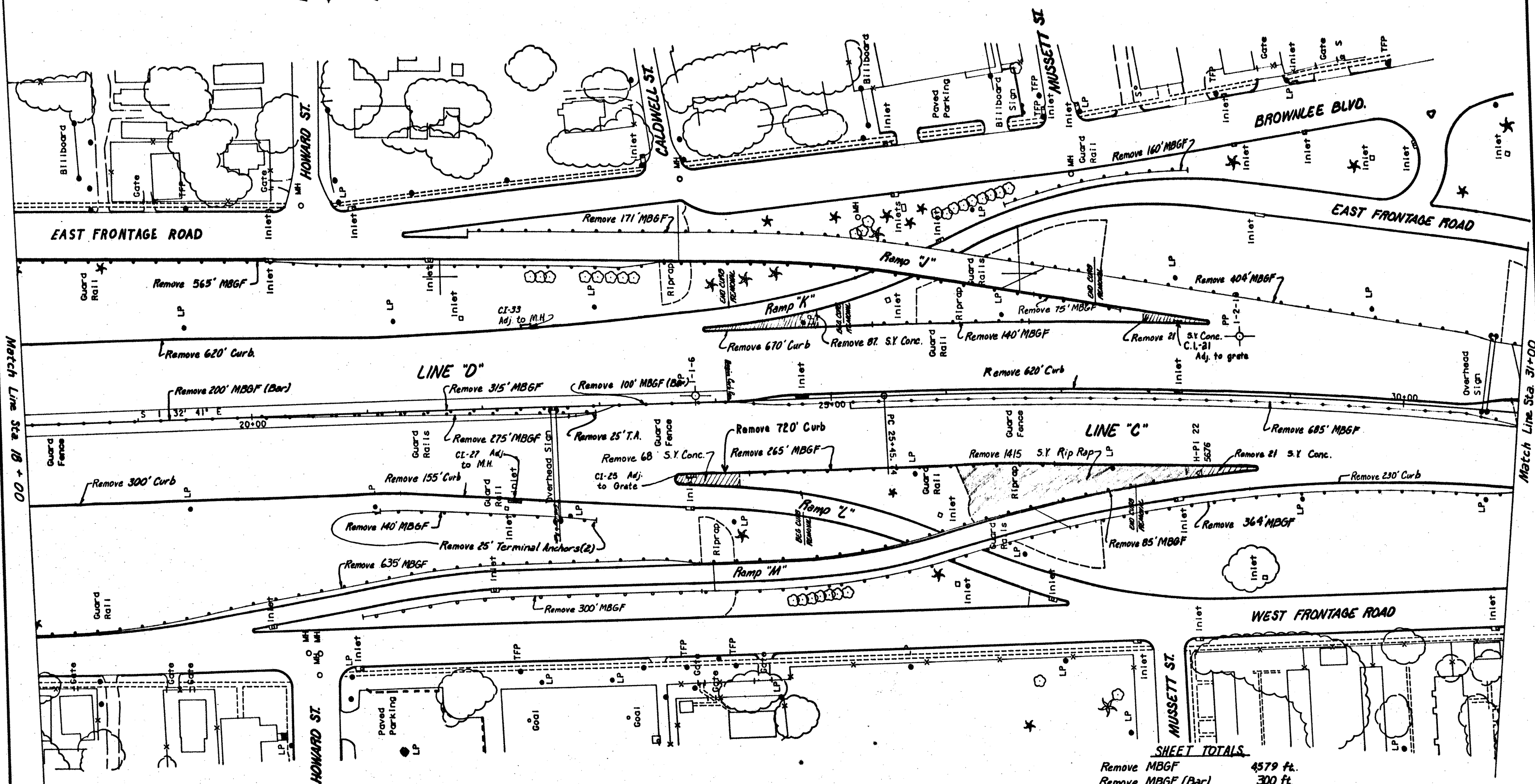
The Above Alignment Will Be Used For Field Control Only.
Stations Referred To On TITLE SHEET Are From The Original Baseline.

HORIZONTAL ALIGNMENT DATA

19

STATE	FEDERAL AID PROJECT NO.	SHEET NO.
6 TEXAS	HES 0005(293)	SH 286
STATE	COUNTY	DIST. NO.
16 NUECES		326 03 61 79





Match Line Sta 18+00

Match Line Sta 31+00

SHEET TOTALS

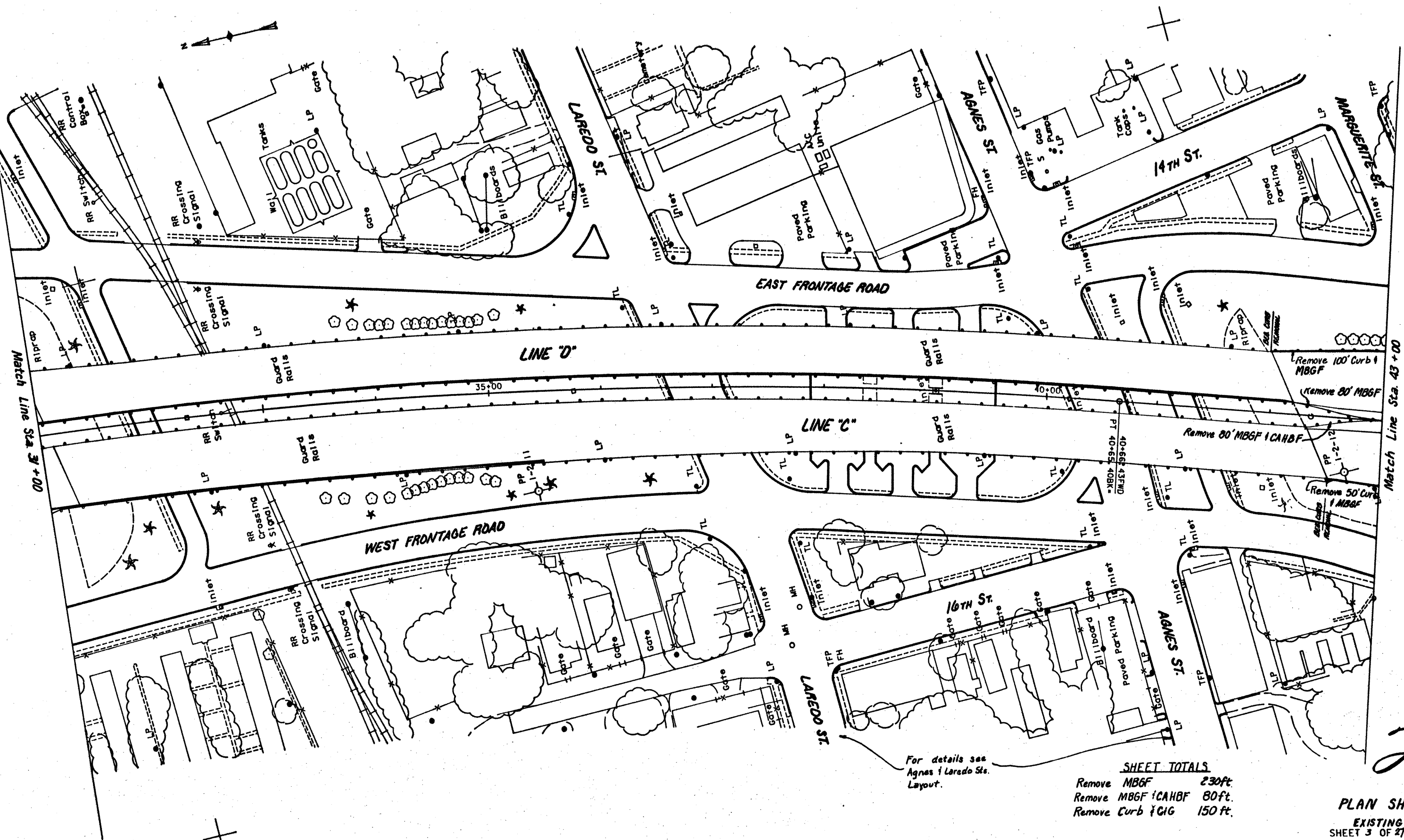
Remove MBGF	4579 ft.
Remove MBGF (Bar)	300 ft.
Remove Term. Anch. Sect.	3 Ea
Remove Curb + C16	3315 ft.
Remove Concrete	176 S.Y.
Remove Rip Rap	1415 S.Y.

21

PLAN SHEET
EXISTING
SHEET 2 OF 27 SHEETS

SCALE = 1" = 40'

STATE	FEDERAL AID PROJECT NO.	SHEET NO.
TEXAS	HES 000S (293)	21
STATE DIST. NO.	COUNTY	SECTION
16	NUECES	326 03 61 21



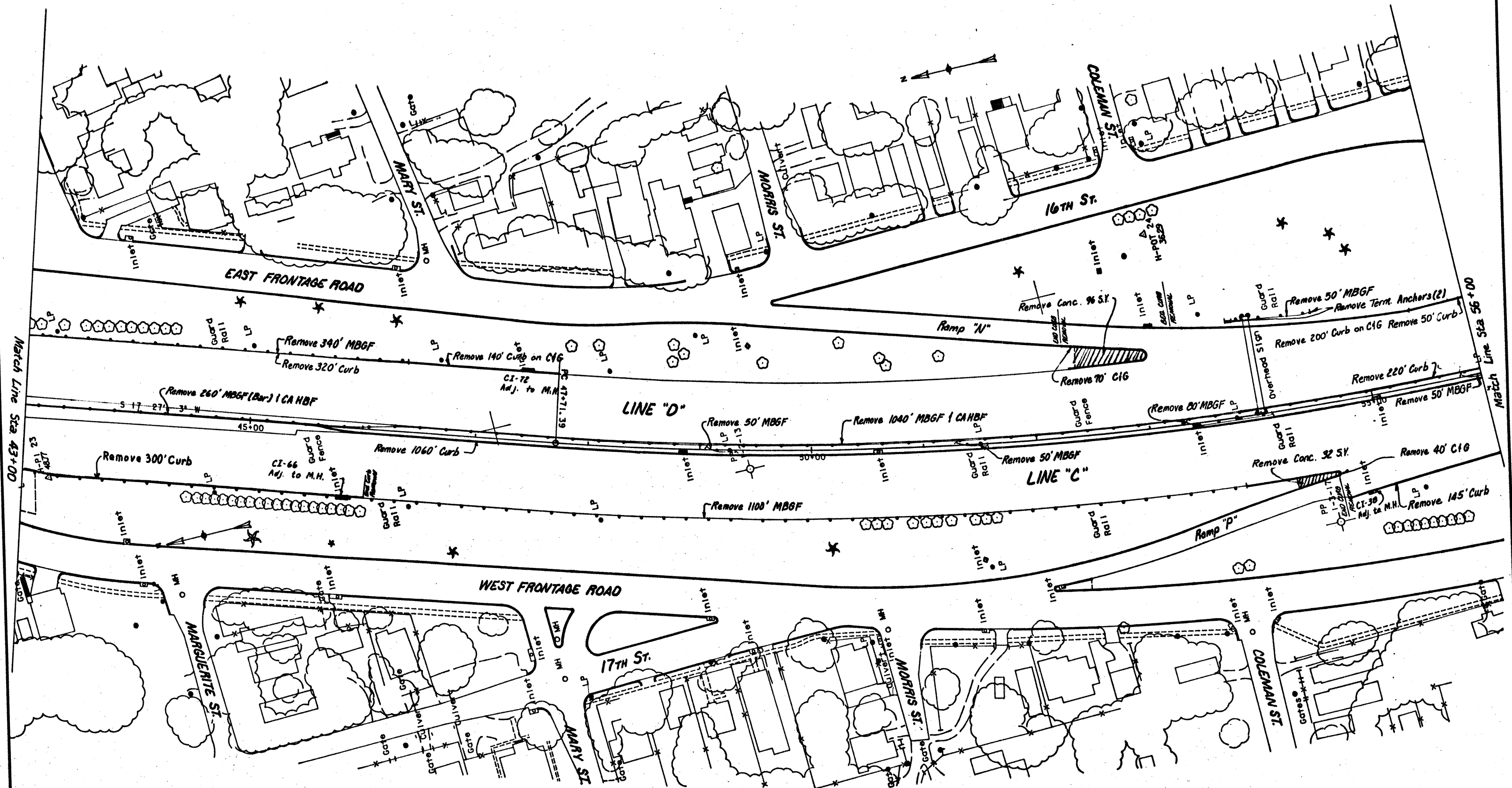
SHEET TOTALS
 Remove MBGF 230ft.
 Remove MBGF & CAHBF 80ft.
 Remove Curb & CIG 150ft.

PLAN SHEET
 EXISTING
 SHEET 3 OF 27 SHEETS

SCALE = 1" = 40'

STATE	FEDERAL AID PROJECT NO.	SH
TEXAS	HES 0003 (293)	286
COUNTY	DIST.	SECTION
MUECES	326	03 61 22

22



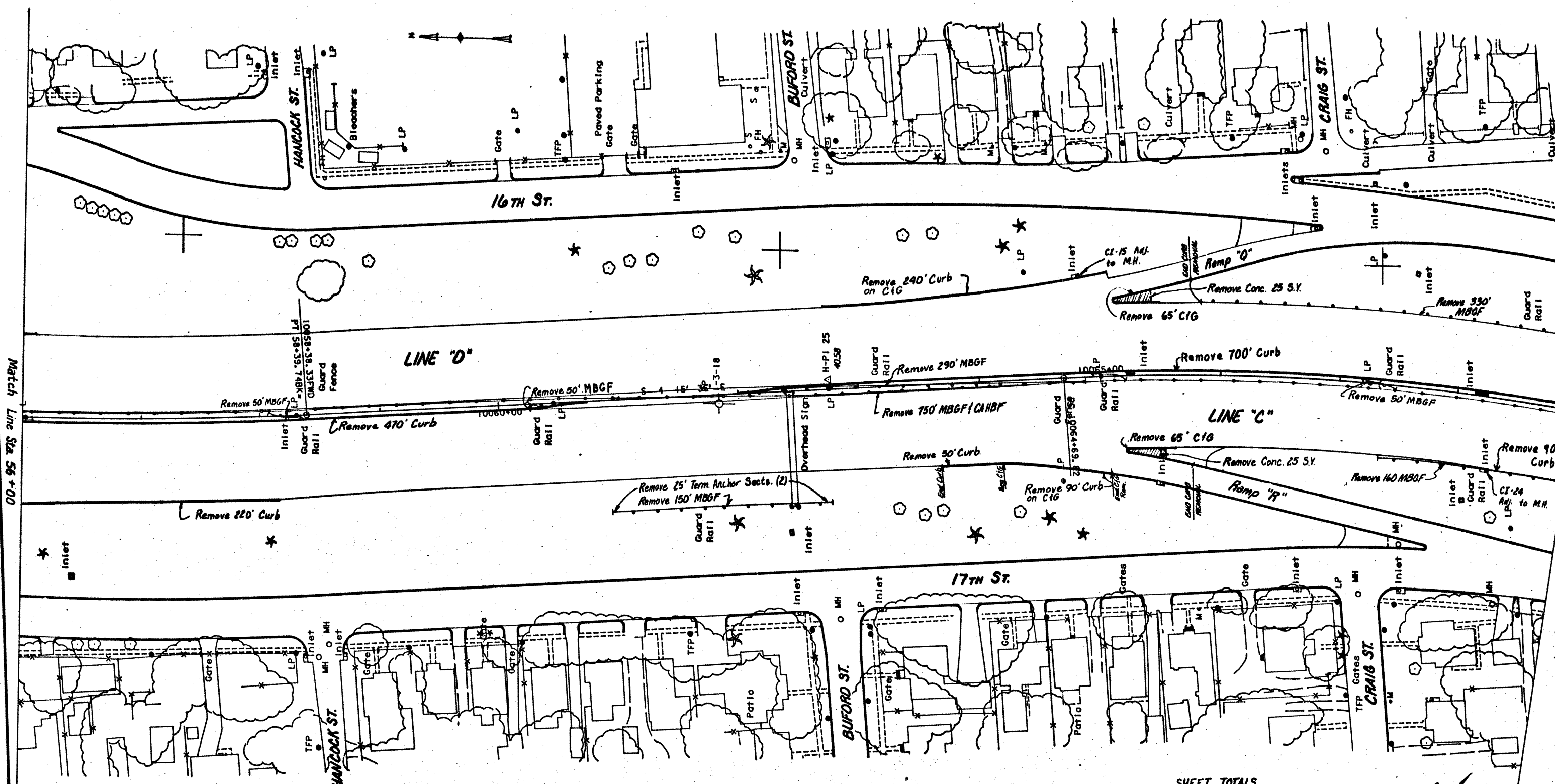
SHEET TOTALS

Remove MBGF	1720 ft.
Remove MBGF + CAHBF	1040 ft.
Remove MBGF(Bar) + CAHBF	260 ft.
Remove Term. Arch. Sects.	2 ea.
Remove Concrete	128 SY.
Remove Curb + CIG	2545 ft.

23 PLAN SHEET
EXISTING
SHEET 4 OF 27 SHEETS

SCALE = 1" = 40'

STATE	FEDERAL AID PROJECT NO.	SN
6 TEXAS	HES 0005 (203)	206
COUNTY	SECTION	POST MILE
16 NUECES	326 03 61	23



Match Line Sta 56+00

Match Line Sta 69+00

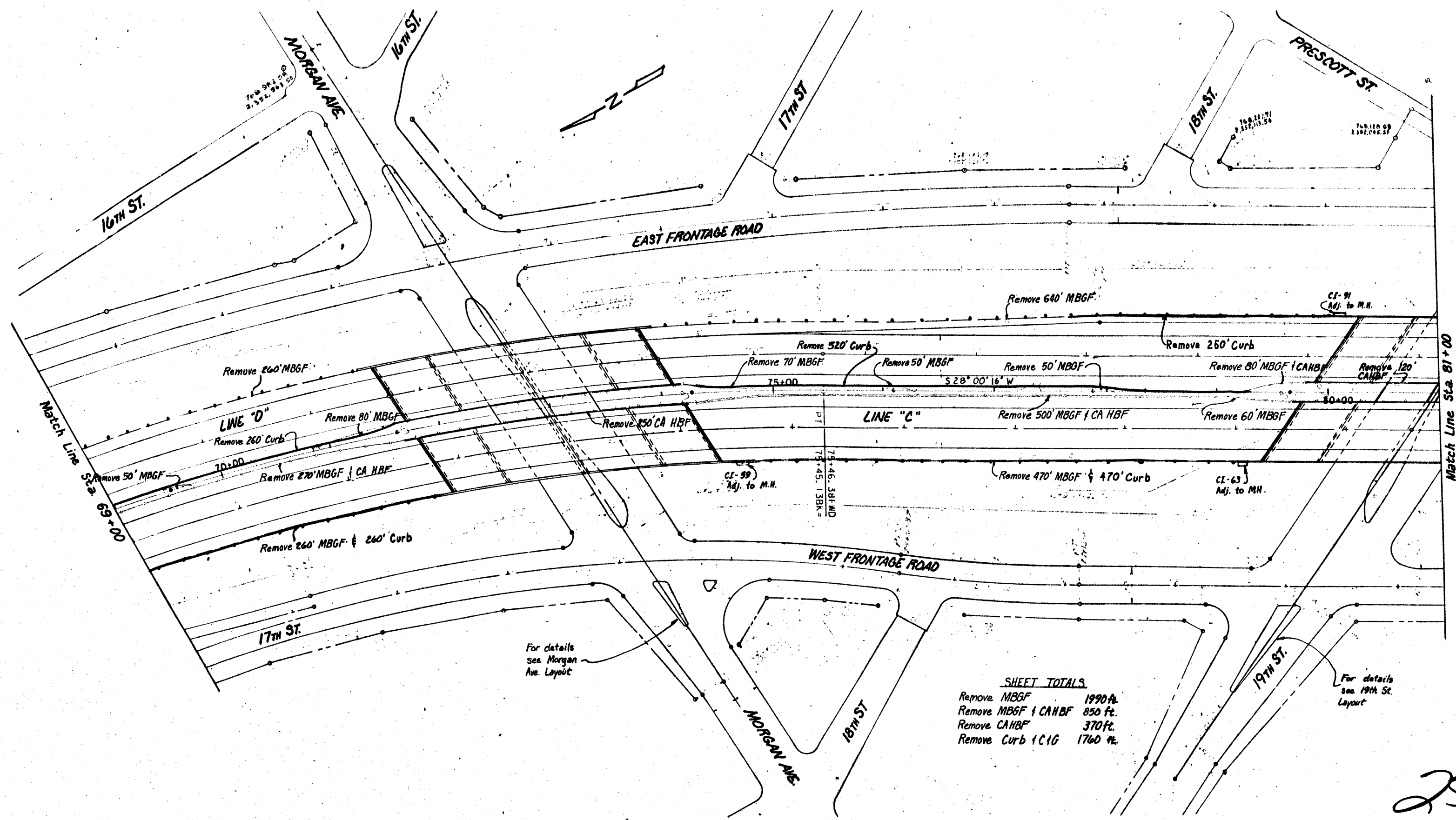
SHEET TOTALS
 Remove MBGF 1080 ft.
 Remove MBGF + CAHBF 750 ft.
 Remove Terminal Anchors 2 ea.
 Remove Curb + CIG 1990 ft.
 Remove Concrete 50 SY.

24

PLAN SHEET
 EXISTING
 SHEET 5 OF 27 SHEETS

STATE	FEDERAL AID PROJECT NO.	SHEET NO.
TEXAS	HES 0008 (293)	SH 206
COUNTY	DIST.	SECTION
MUECES	326	03 61 24

SCALE 1" = 40'



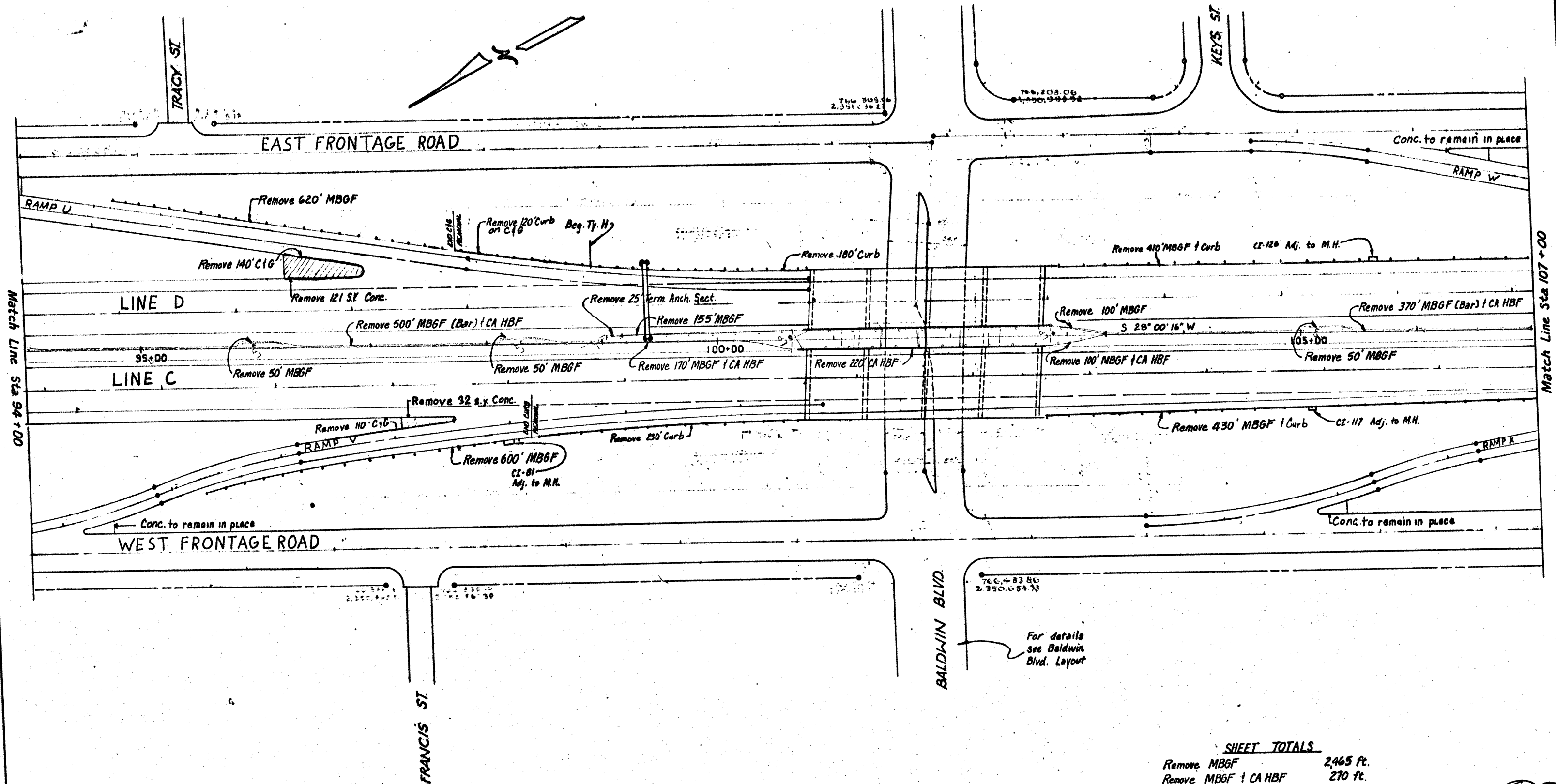
SHEET TOTALS
 Remove MBGF 1990 ft.
 Remove MBGF + CA HBF 850 ft.
 Remove CA HBF 370 ft.
 Remove Curb + CIG 1760 ft.

PLAN SHEET
 EXISTING
 SHEET 6 OF 27 SHEETS

FED. RD. DIST. NO.	STATE	FEDERAL PROJECT NO.	SHEET NO.
16	TEXAS	HES 0003 (203)	25
CITY NO.	COUNTY	CONT. SECT.	JOB NO.
16	NUECES	326 03 61	SH. 206

SCALE: 1"=40'

25



SHEET TOTALS

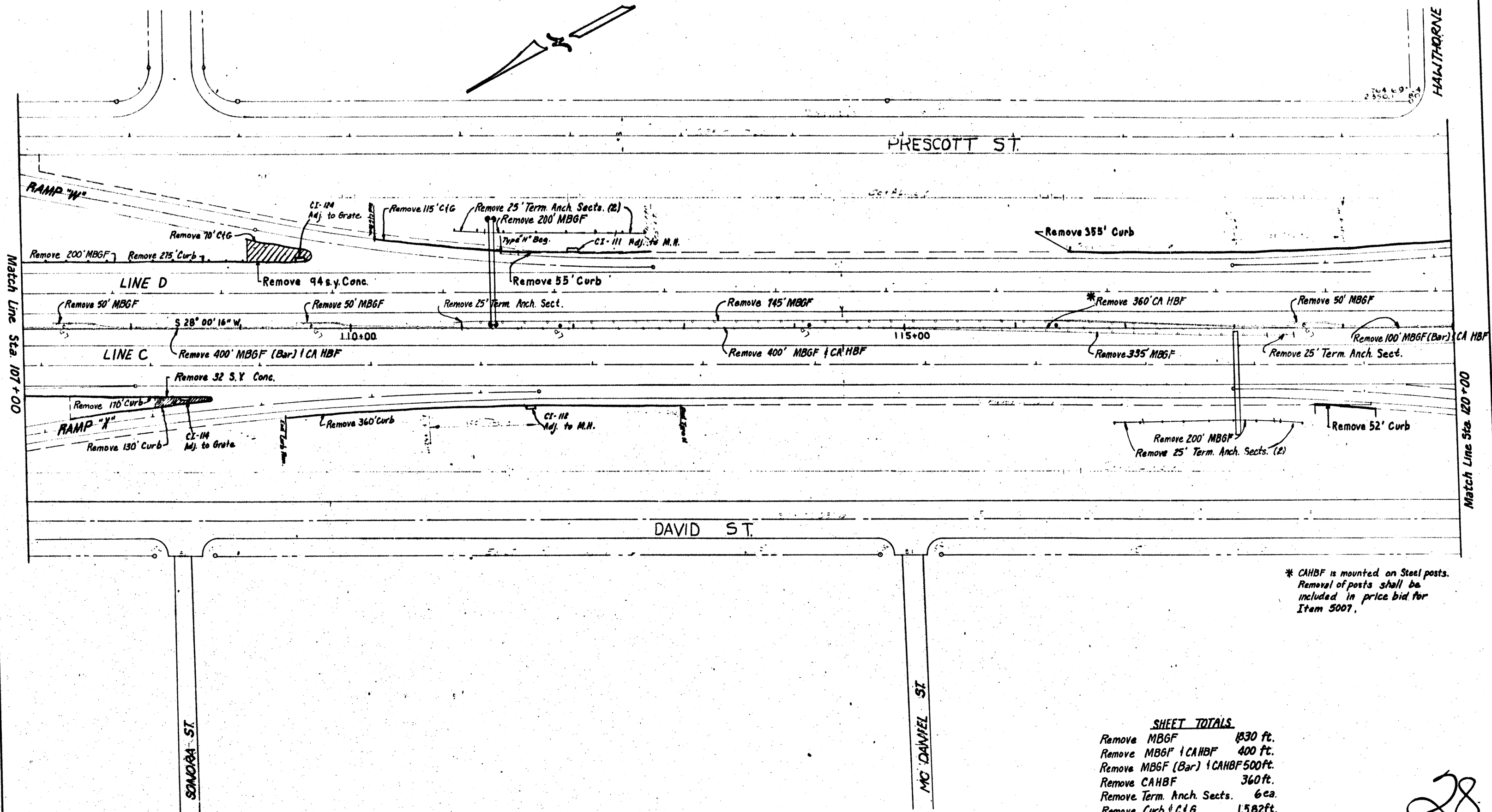
Remove MBGF	2465 ft.
Remove MBGF + CA HBF	270 ft.
Remove MBGF (Bar) + CA HBF	870 ft.
Remove CA HBF	220 ft.
Remove Term. ANCH. Sect.	1 ea.
Remove Curb + C16	1620 ft.
Remove Concrete	153 S.Y.

27

PLAN SHEET
EXISTING
SHEET 8 OF 27 SHEETS

STATE	COUNTY	FEDERAL PROJECT NO.	SHEET NO.
TEXAS	NUECES	0009 (293)	27
DATE	BY	CHECKED	APPROVED
16	NUECES	326 03 61	5K286

SCALE: 1"=40'



* CAHBF is mounted on Steel posts.
Removal of posts shall be
included in price bid for
Item 5007.

SHEET TOTALS

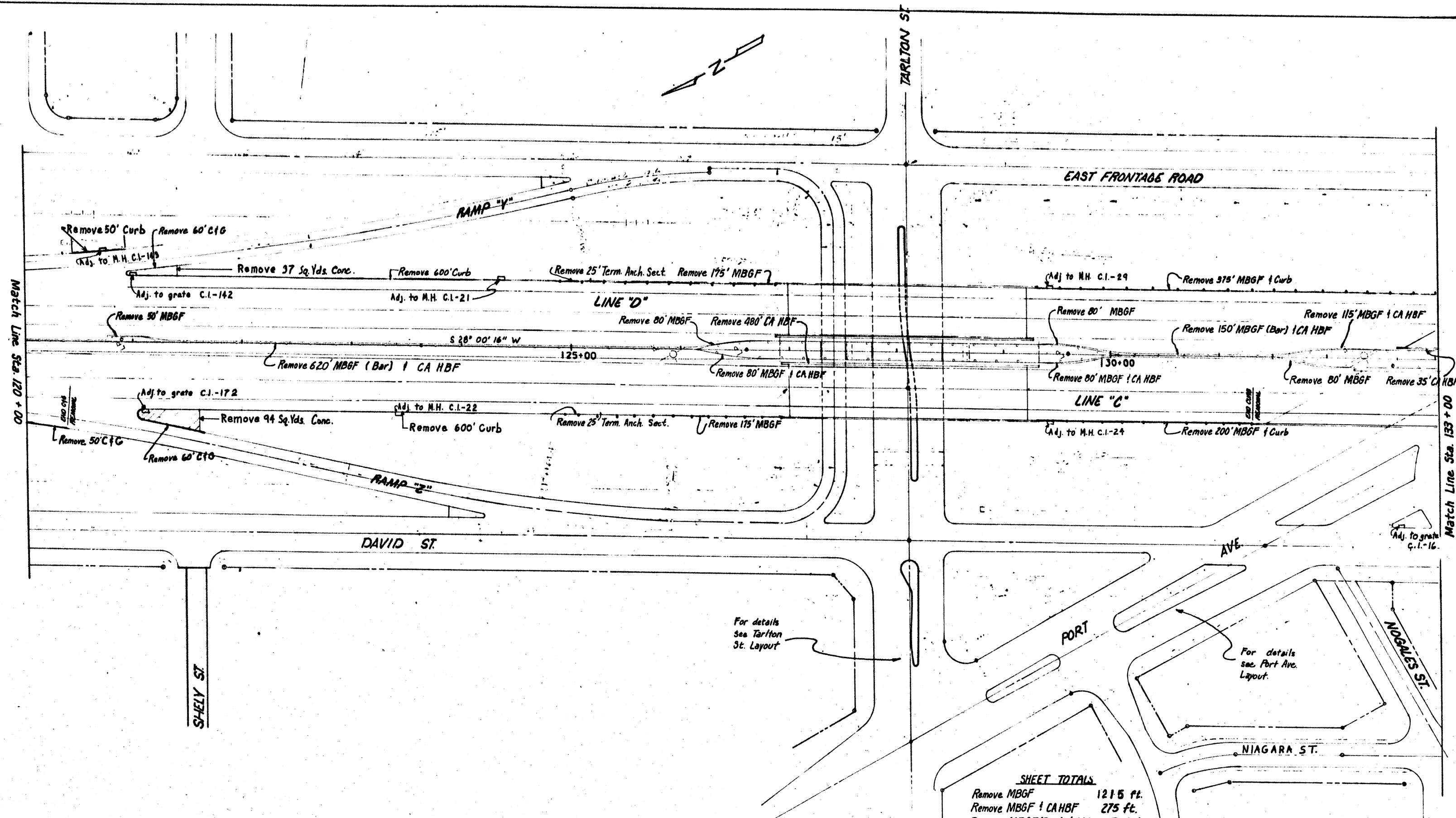
Remove MBGF	1830 ft.
Remove MBGF + CAHBF	400 ft.
Remove MBGF (Bar) + CAHBF	500 ft.
Remove CAHBF	360 ft.
Remove Term. Anch. Sects.	6 ea.
Remove Curb + C/G	1,582 ft.
Remove Concrete	126 S.Y.

28

PLAN SHEET
EXISTING
SHEET 9 OF 27 SHEETS

SCALE: 1" = 40'

FED. PROJ. NO.	STATE	FEDERAL PROJ. NO.	SHEET NO.
6	TEXAS	HES 0009 (2003)	28
STATE DIST. NO.	COUNTY	CITY	HIGHWAY NO.
16	NUECES	326 03	61 SH286



SHEET TOTALS

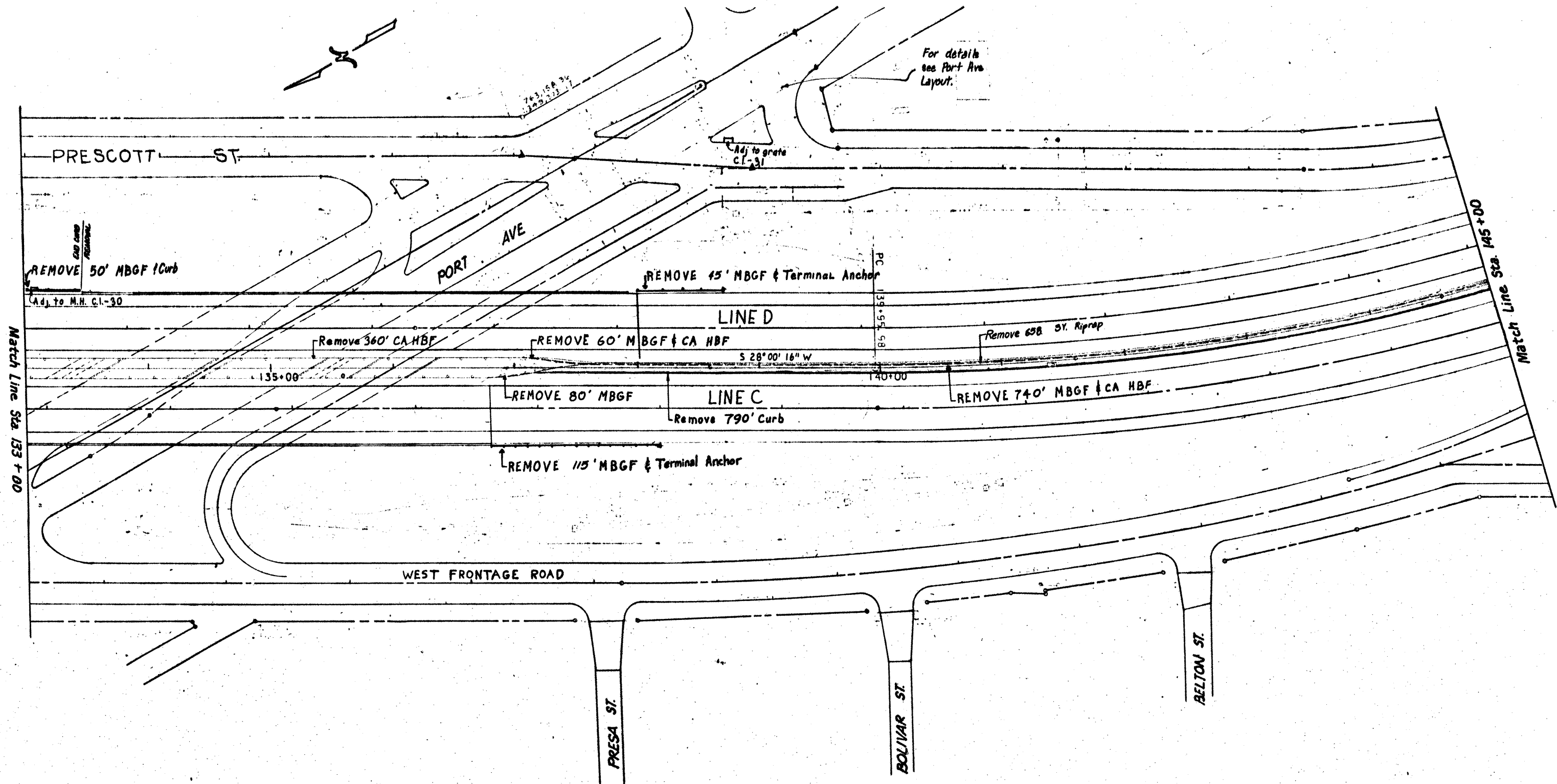
Remove MBGF	1215 ft.
Remove MBGF 1 CAHBF	275 ft.
Remove MBGF(Bar) 1 CAHBF	770 ft.
Remove CAHBF	515 ft.
Remove Term. Anch. Sect.	2 ea.
Remove Curb 1 C&G	1995 ft.
Remove Concrete	131 S.Y.

29

PLAN SHEET
EXISTING
SHEET 10 OF 21 SHEETS

FED. PROJ. NO.	STATE	FEDERAL PROJECT NO.	SHEET NO.
6	TEXAS	HES 0005 (243)	29
STATE DIST. NO.	COUNTY	CONT. SECT. JOB	HIGHWAY NO.
10	NUECES	326 03 61	SH 2A

SCALE: 1"=40'



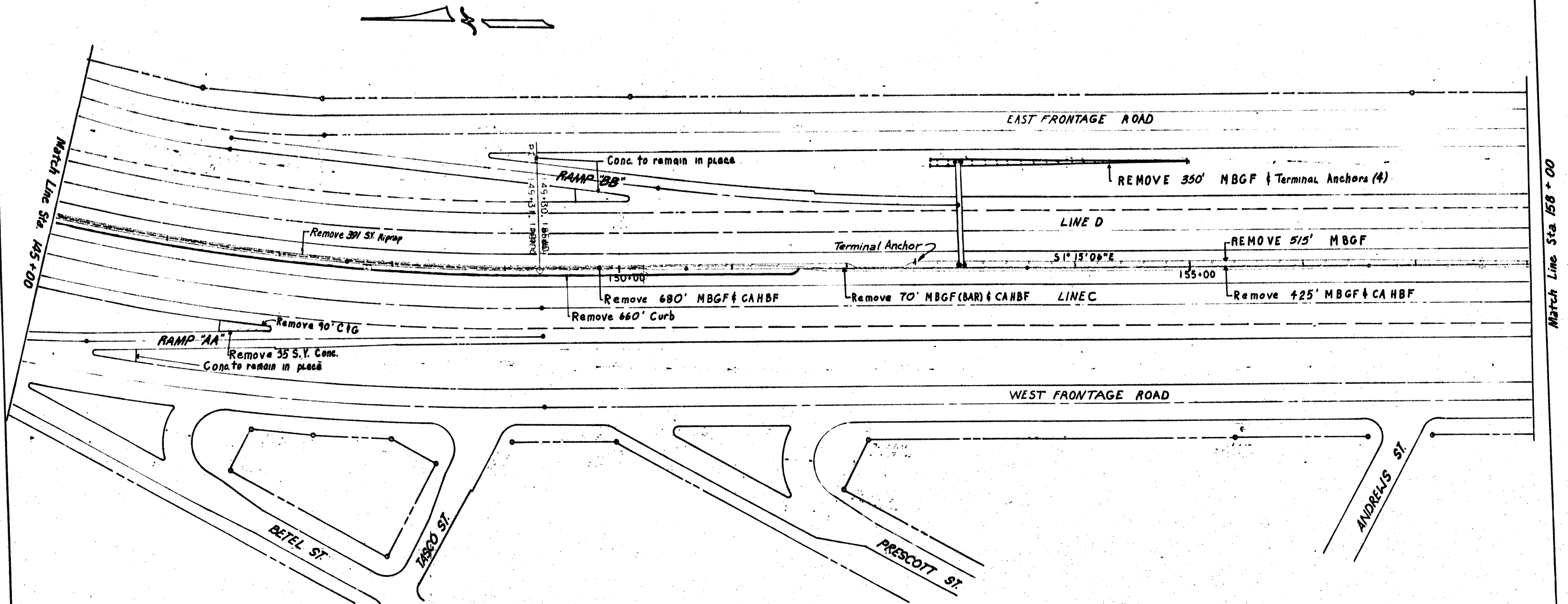
SHEET TOTALS

Remove MBGF 290 ft.
 Remove CAHBF 360 ft.
 Remove MBGF & CAHBF 800 ft.
 Remove Term. Anch. Sect 2 ea
 Remove Curb & C1G 840 ft.
 Remove Rip Rap 658 S.Y.

30 PLAN SHEET
 EXISTING
 SHEET 11 OF 27 SHEETS

SCALE: 1"=40'

FED. RD. DIST. NO.	STATE	FEDERAL PROJECT NO.	SHEET NO.
16	TEXAS	HES 000S (203)	30
STATE DIST. NO.	COUNTY	CON. SECT.	JOB HIGHWAY NO.
16	NUECES	326 03 61	SH 286



SHEET TOTALS

Remove MBGF 865 ft.
 Remove MBGF & CAHBF 1105 ft.
 Remove MBGF (Bar) & CAHBF 70 ft.
 Remove Curb & CIG 750 ft.
 Remove Term. Anch. Sects. 5 ea.
 Remove Concrete 35 S.Y.
 Remove Rip Rap 391 S.Y.

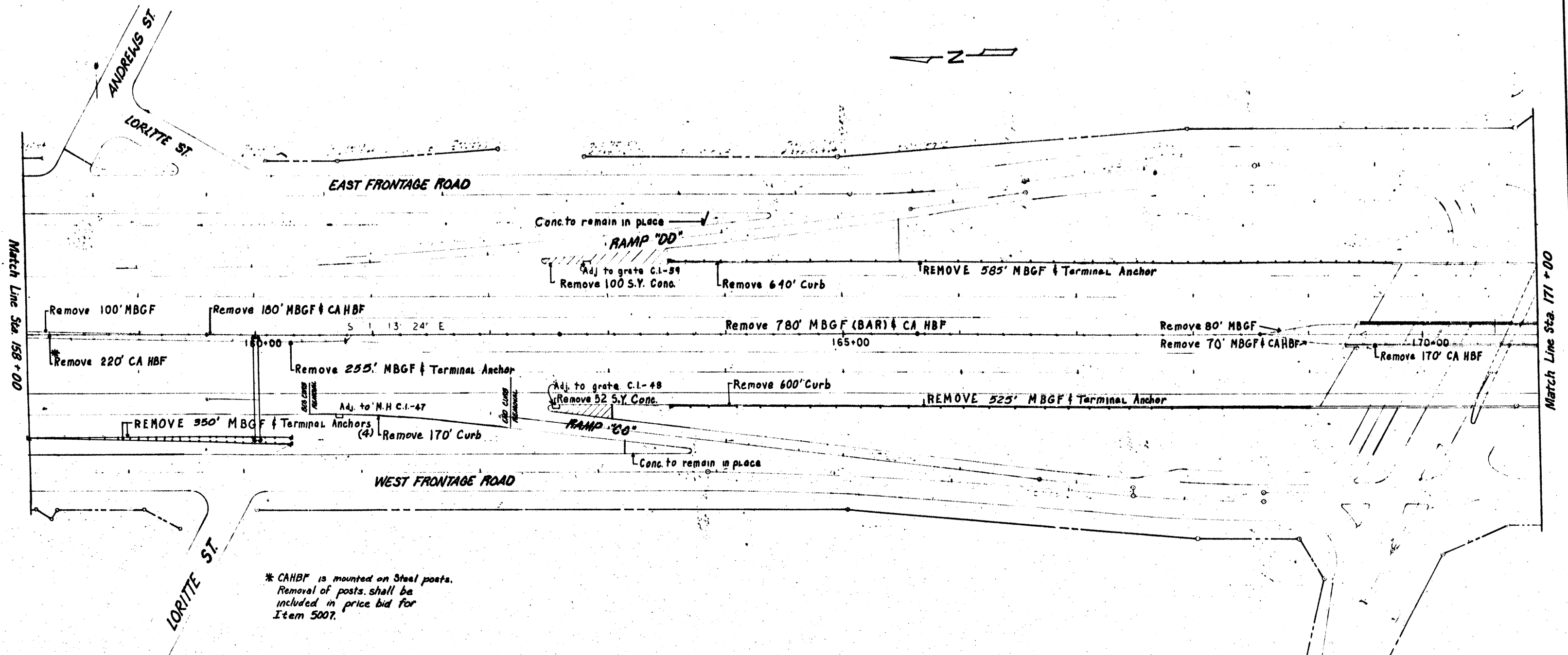
31

PLAN SHEET
 EXISTING

SHEET 12 OF 27 SHEETS

SEC.	STATE	FEDERAL PROJECT NO.	SHEET
16	TEXAS	HES 0008 (293)	31
STATION	COUNTY	SECTION	JOB
16	NUECES	320 03 61	SN286

SCALE 1" = 40'



* CAHBF is mounted on Steel posts.
Removal of posts shall be
included in price bid for
Item 5007.

SHEET TOTALS

Remove MBGF 1895 ft.
Remove MBGF & CAHBF 250 ft.
Remove MBGF (Bar) & CAHBF 780 ft.
Remove CAHBF 390 ft.

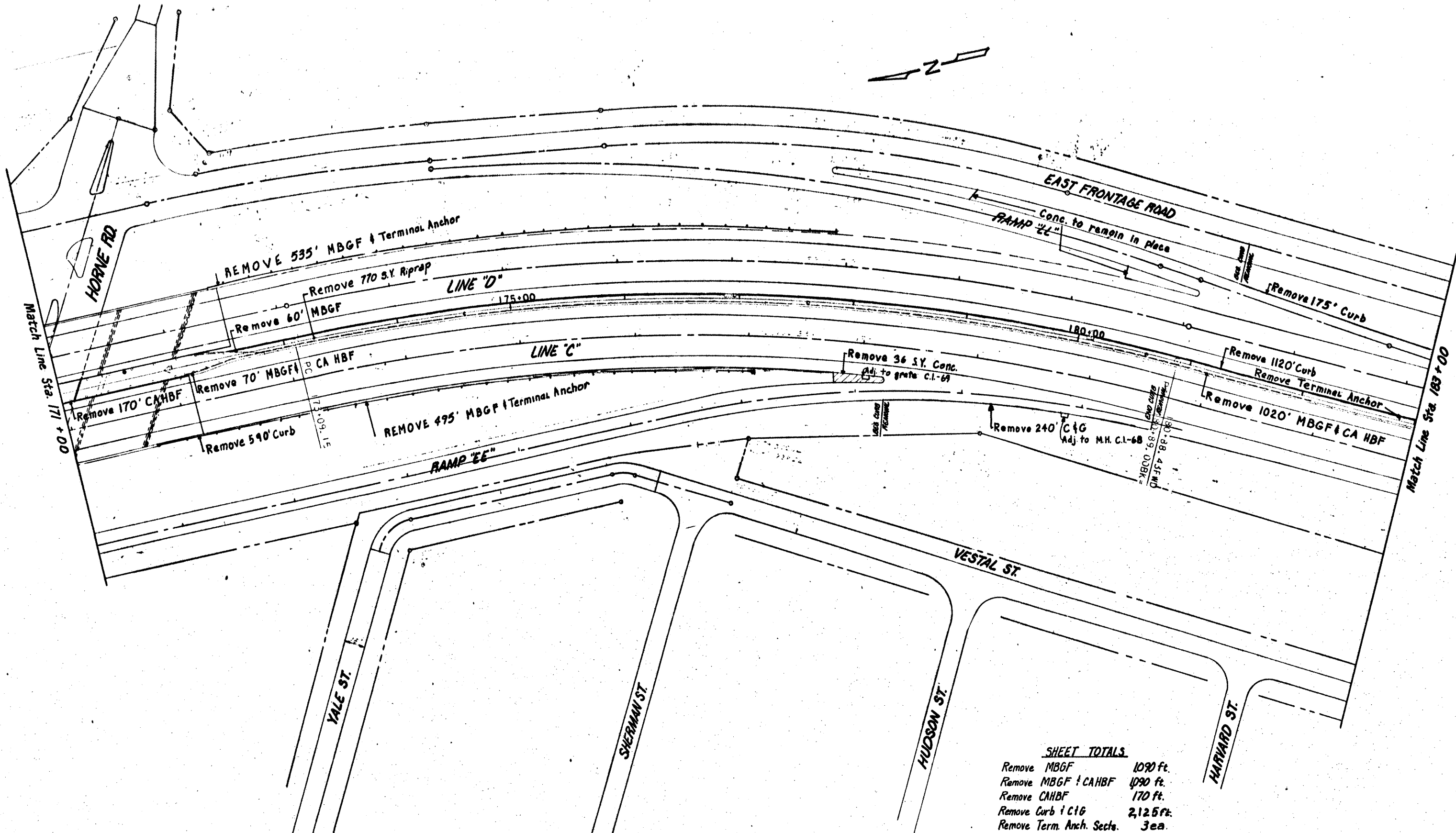
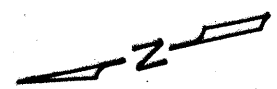
Remove Term. Anch. Sects. 7 ea.
Remove Curb & C+G 1410 ft.
Remove Concrete 152 S.Y.

32

PLAN SHEET
EXISTING
SHEET 13 OF 27 SHEETS

SCALE: 1"=40'

SEC. NO.	STATE	FEDERAL PROJECT NO.	SHEET NO.
6	TEXAS	HES 0008 (293)	32
STATE	COUNTY	CONTRACT NO.	HIGHWAY NO.
16	NUECES	326 03 61	SH 286



SHEET TOTALS

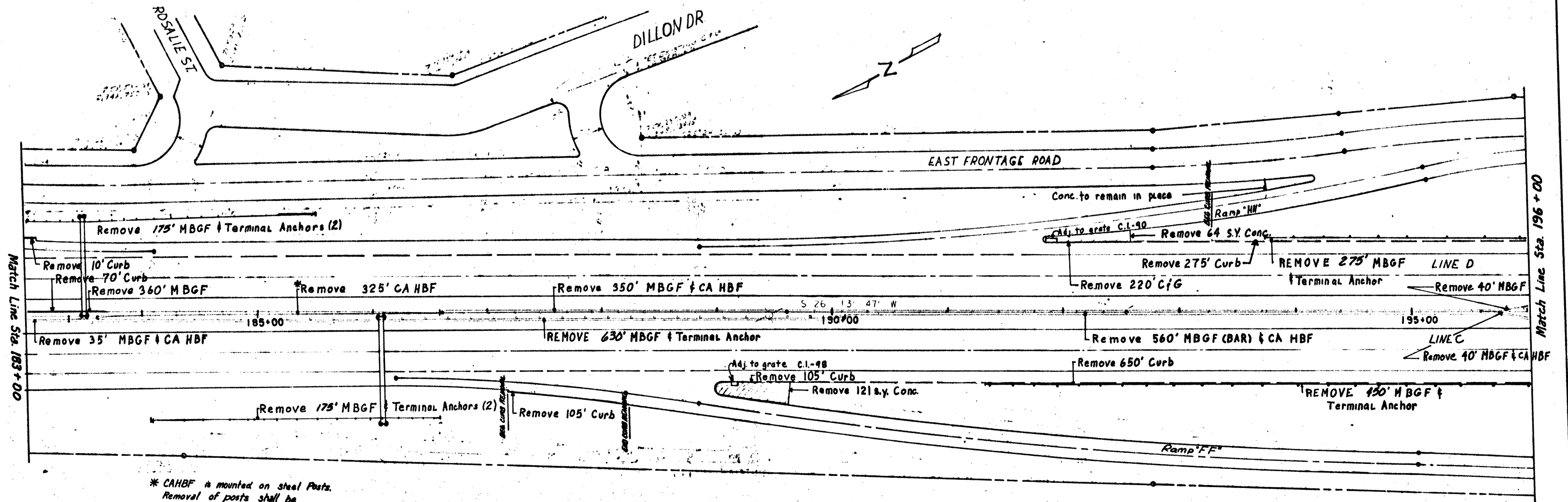
Remove MBGF	1090 ft.
Remove MBGF + CAHBF	1090 ft.
Remove CAHBF	170 ft.
Remove Curb + C&G	2,125 ft.
Remove Term. Anch. Sects.	3 ea.
Remove Concrete	36 S.Y.
Remove Rip Rap	770 S.Y.

33

PLAN SHEET
EXISTING
SHEET 14 OF 21 SHEETS

SCALE: 1"=40'

FED. RD. DIST. NO.	STATE	FEDERAL PROJECT NO.	SHEET NO.
16	TEXAS	HES 000S (293)	33
STATE DIST. NO.	COUNTY	CONTRACT NO.	RIGHTWAY NO.
16	NUECES	326 03 61	SH 286



* CAHBF is mounted on steel Posts.
Removal of posts shall be
included in price bid for
item 5007.

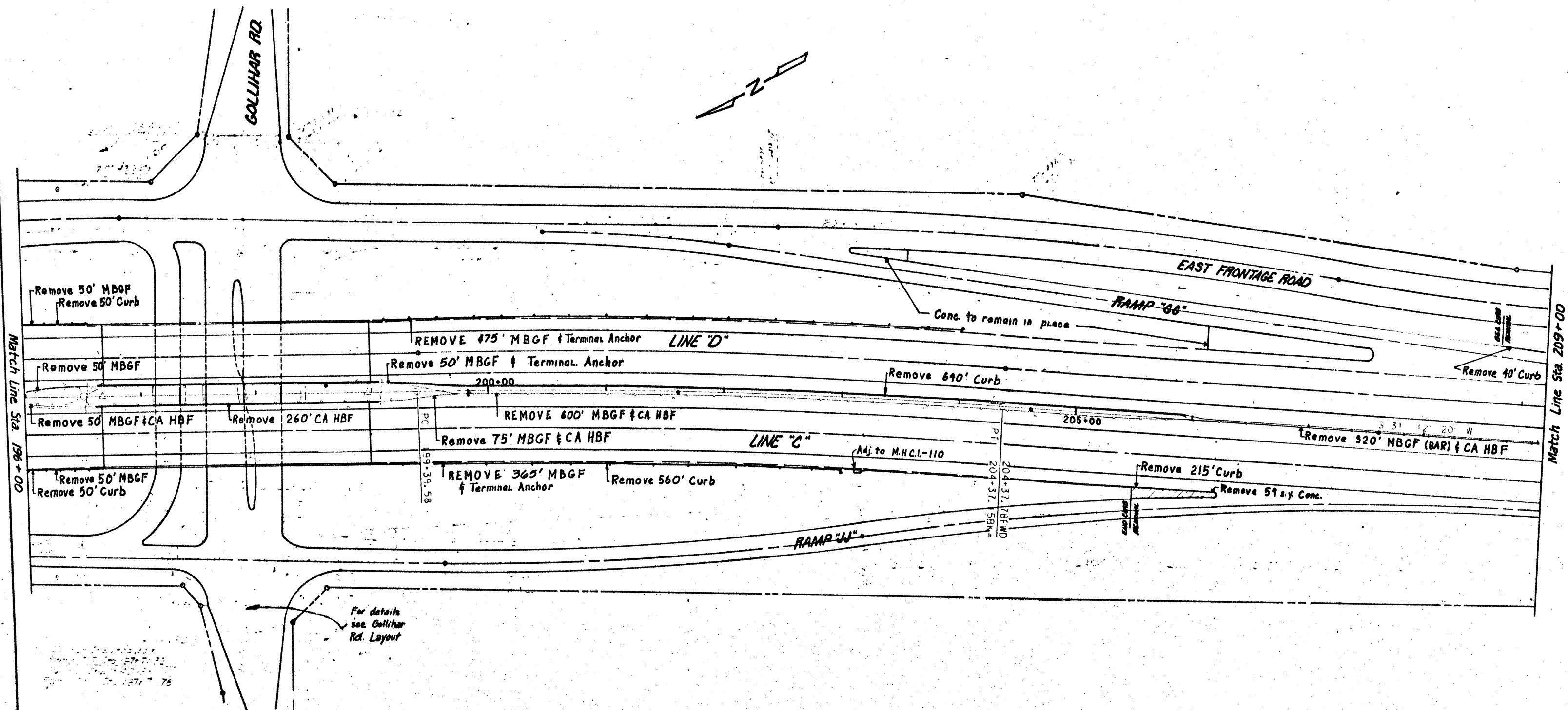
SHEET TOTALS	
Remove MBGF	2105 ft.
Remove MBGF & CAHBF	425 ft.
Remove MBGF (Bar) & CAHBF	560 ft.
Remove CAHBF	325 ft.
Remove Curb & CIG	1435 ft.
Remove Term. Anch. Sects.	7 ea.
Remove Concrete	185 s.y.

34

PLAN SHEET
EXISTING
SHEET 15 OF 27 SHEETS

SCALE: 1"=40'

FIG. NO.	STATE	FEDERAL PROJECT NO.	SHEET NO.
6	TEXAS	HES 0009 (293)	34
STATE	COUNTY	CONTRACT	SECTION
16	NUECES	326-03	61



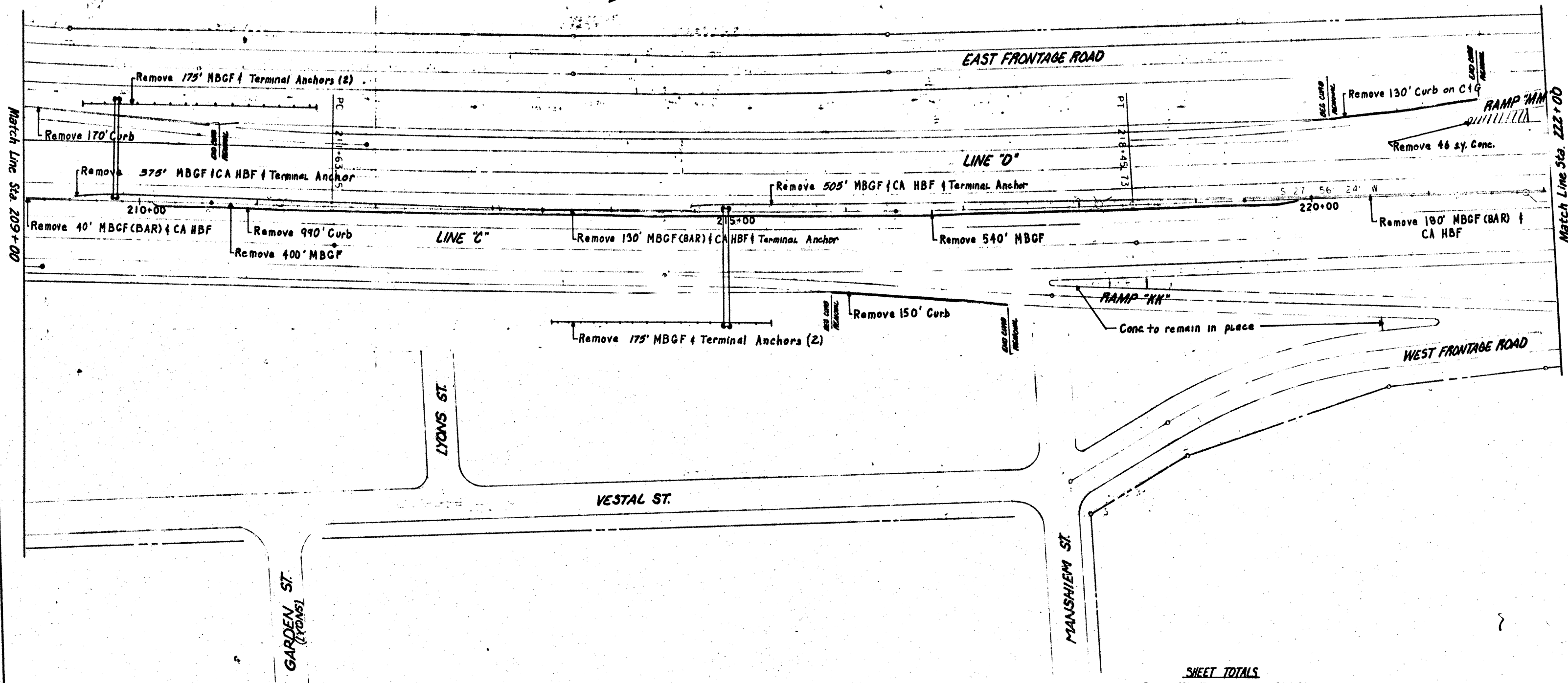
SHEET TOTALS
 Remove MBGF 1040 ft.
 Remove MBGF (CAHBF) 725 ft.
 Remove MBGF (Bar) (CAHBF) 320 ft.
 Remove CAHBF 260 ft.
 Remove Curb + CIG 1555 ft.
 Remove Term. Anch. Sects. 3 ea.
 Remove Concrete 595 y.

35

PLAN SHEET
 EXISTING
 SHEET 16 OF 27 SHEETS

SCALE: 1"=40'

FED. RD. DIST. NO.	STATE	FEDERAL PROJECT NO.	SHEET NO.
6	TEXAS	HES 0008 (293)	35
STATE DIST. NO.	COUNTY	CONT. SECT. JOB	HIGHWAY NO.
16	NUECES	322 03 61	SH 286



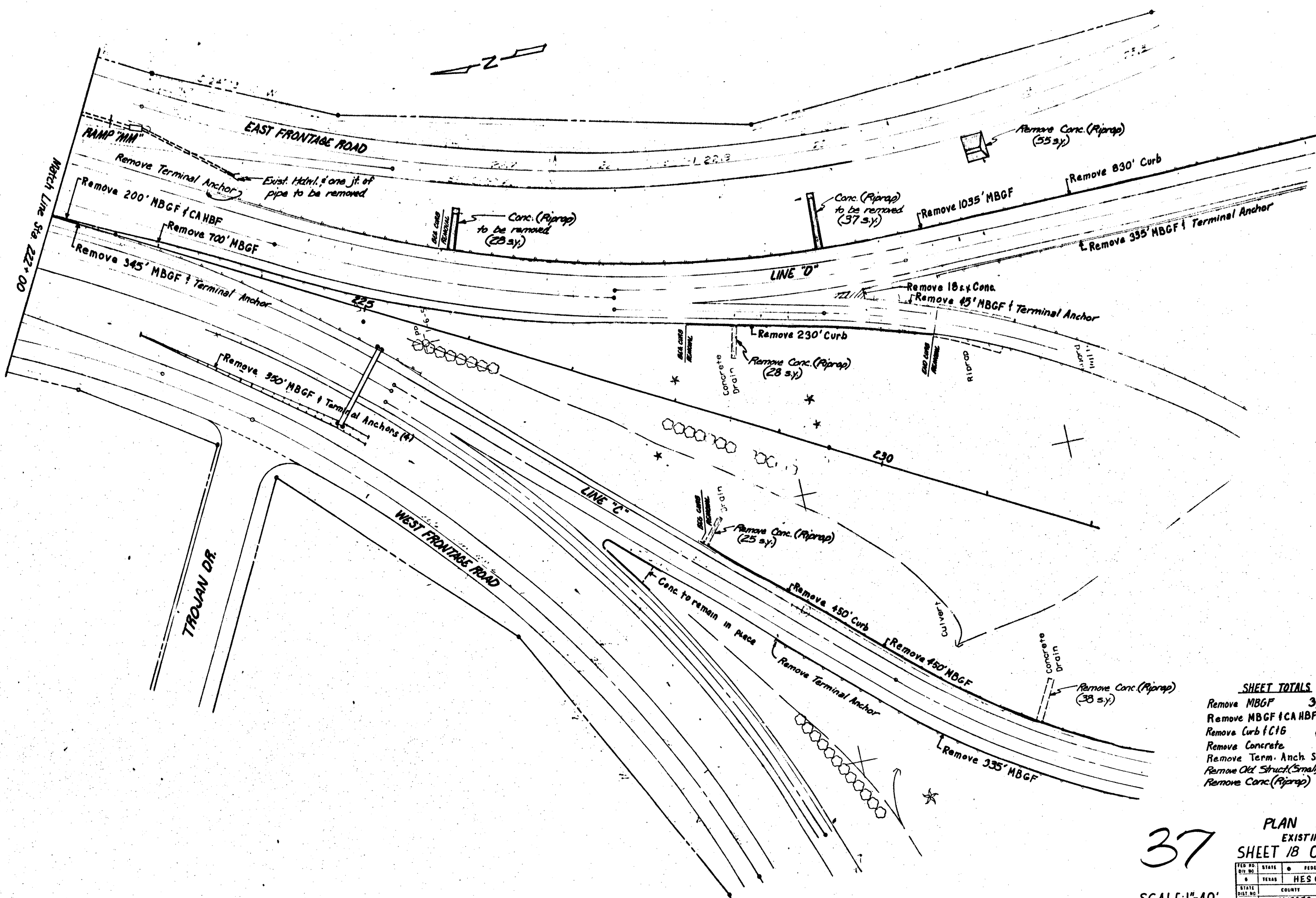
SHEET TOTALS
 Remove MBGF 1290 ft.
 Remove MBGF & CAHBF 800 ft.
 Remove MBGF (Bar) & CAHBF 350 ft.
 Remove Term. Anch. Sects. Tea
 Remove Curb & C16 1,440 ft.
 Remove Concrete 46 sq.

36

PLAN SHEET
 EXISTING
 SHEET 17 OF 27 SHEETS

FED. RD. DIST. NO.	STATE	FEDERAL PROJECT NO.	SHEET NO.
6	TEXAS	HES 0005 (293)	36
STATE DIST. NO.	COUNTY	CONTRACT NO.	JOB NO.
16	NUECES	326-03	61

SCALE: 1"=40'



SHEET TOTALS

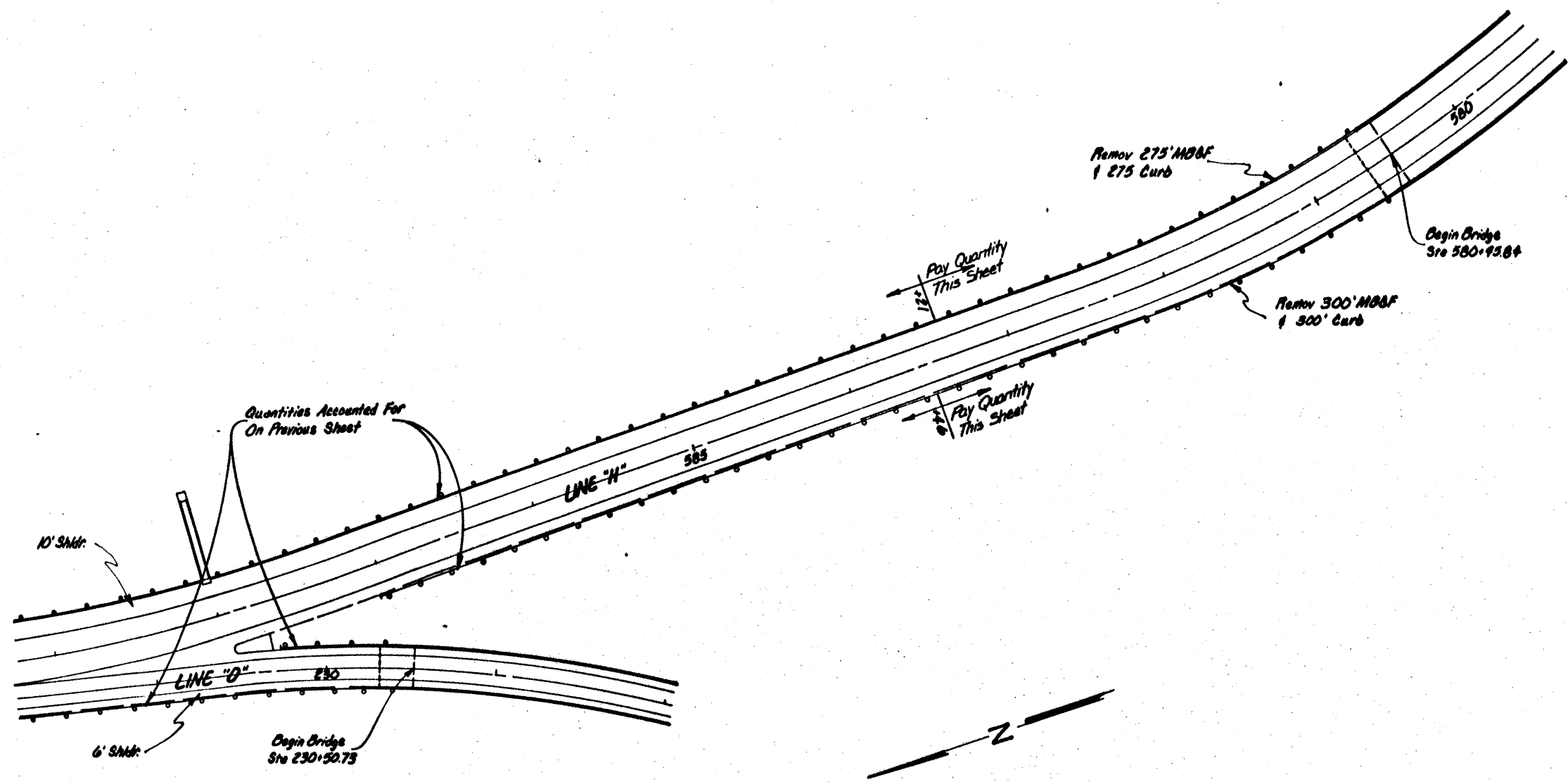
Remove MBGF	3,595 ft
Remove MBGF & CA HBF	200 ft
Remove Curb & C16	1510 ft
Remove Concrete	18 S.Y.
Remove Term. Anch. Sect.	9 Ea.
Remove Old Struct. (Small)	1 Ea.
Remove Conc. (Riprap)	211 s.y.

37

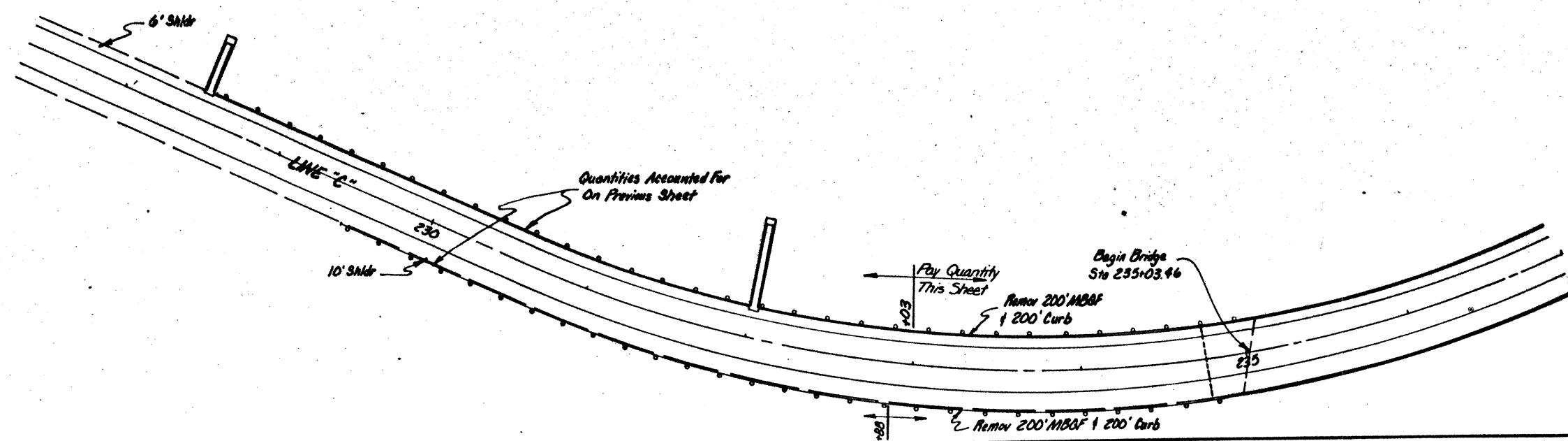
PLAN SHEET
EXISTING
SHEET 18 OF 27 SHEETS

SCALE: 1"=40'

FED. RD. DIST. NO.	STATE	FEDERAL PROJECT NO.	SHEET NO.
16	TEXAS	HES 0005 (2093)	37
COUNTY	CONTRACT	SECTION	JOB
NUECES	320	03	61



Sheet Totals
 Remove MB&F 975 L.F.
 Remove Curb 975 L.F.

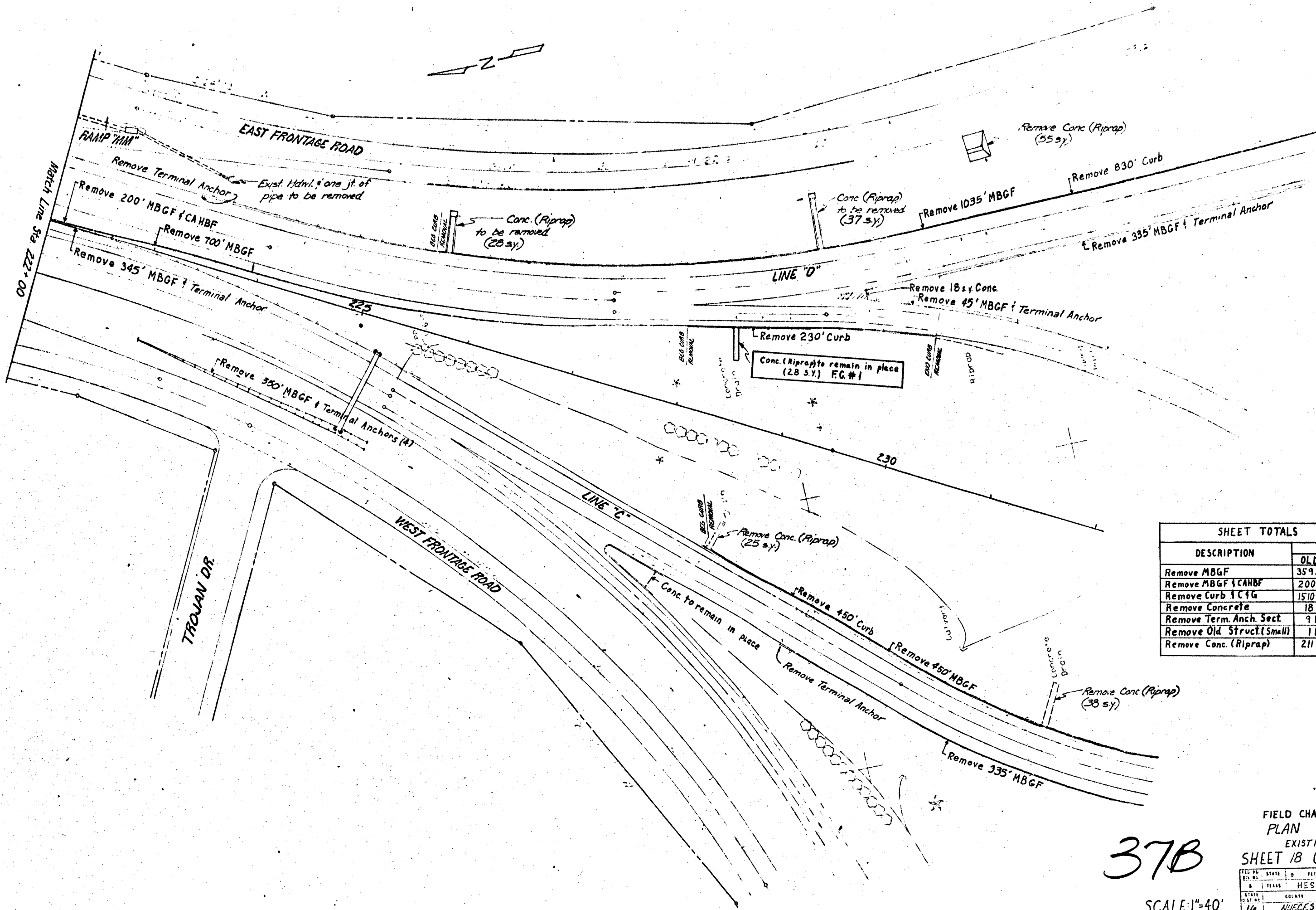


PLAN SHEET
 (EXISTING)

37A

Sheet 19 of 27 Sheets

PROJ. NO.	STATE	FEDERAL PROJECT NO.	SHEET NO.
0	TEXAS	HES 0003(293)	37A
STATE	COUNTY	CONTRACT NO.	SECTION NO.
16	Nueces	326 03 61	S.N. 286



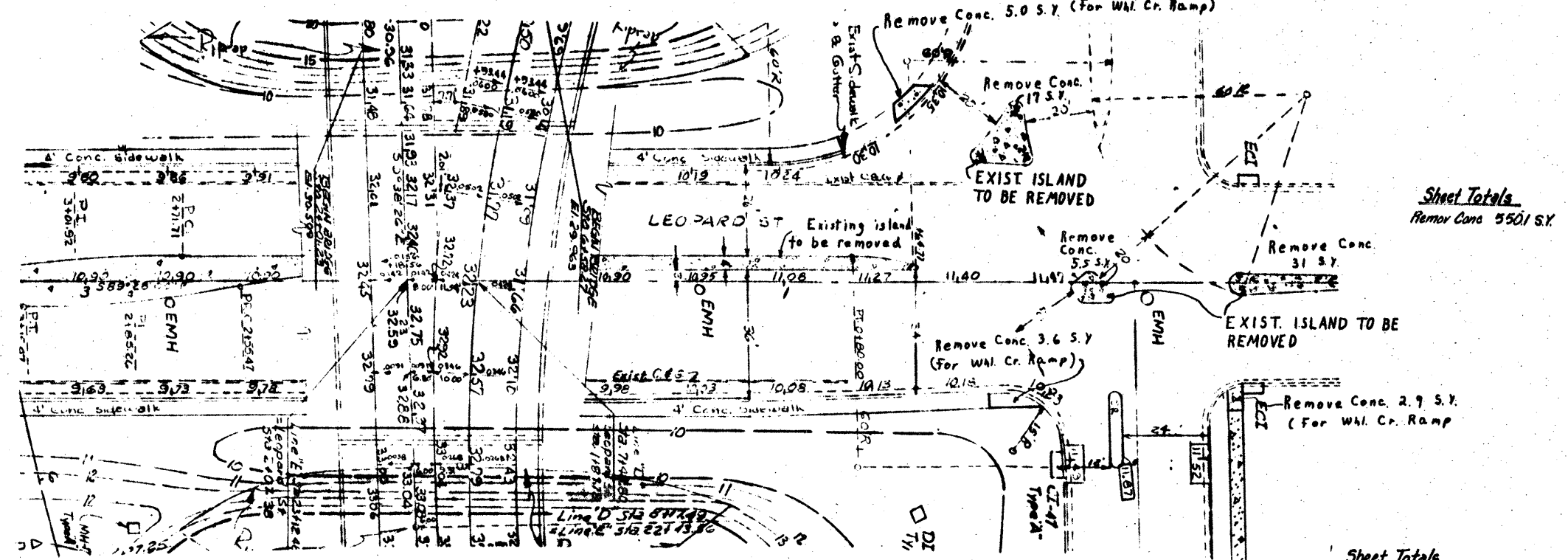
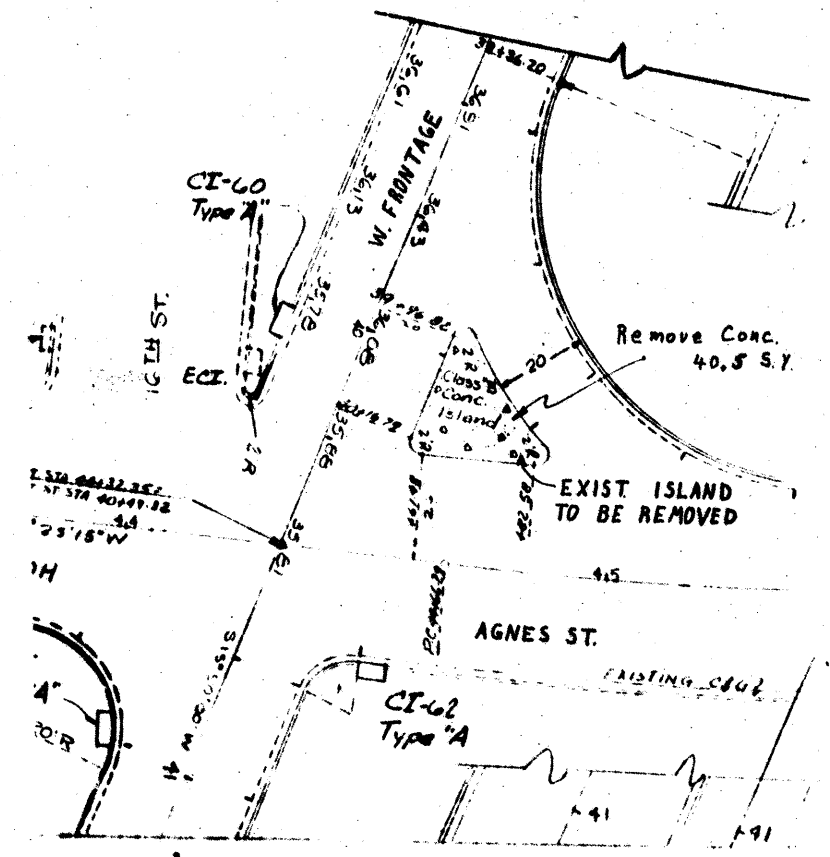
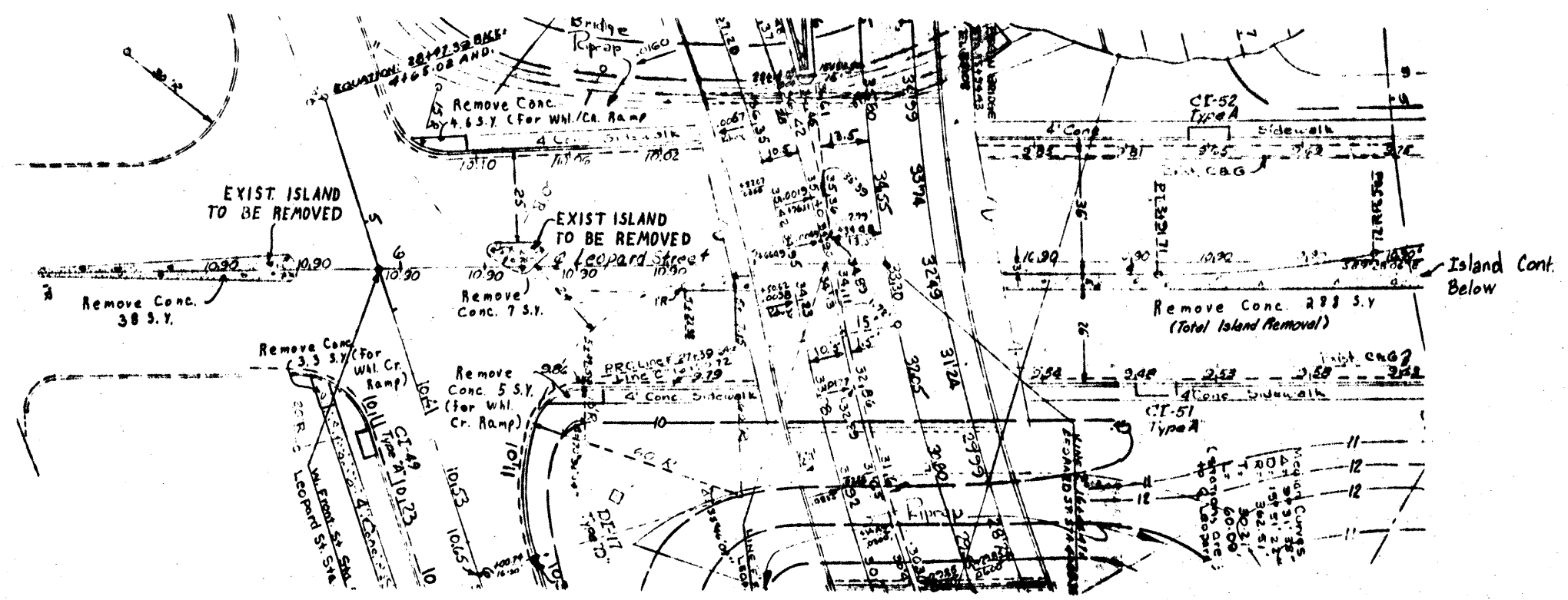
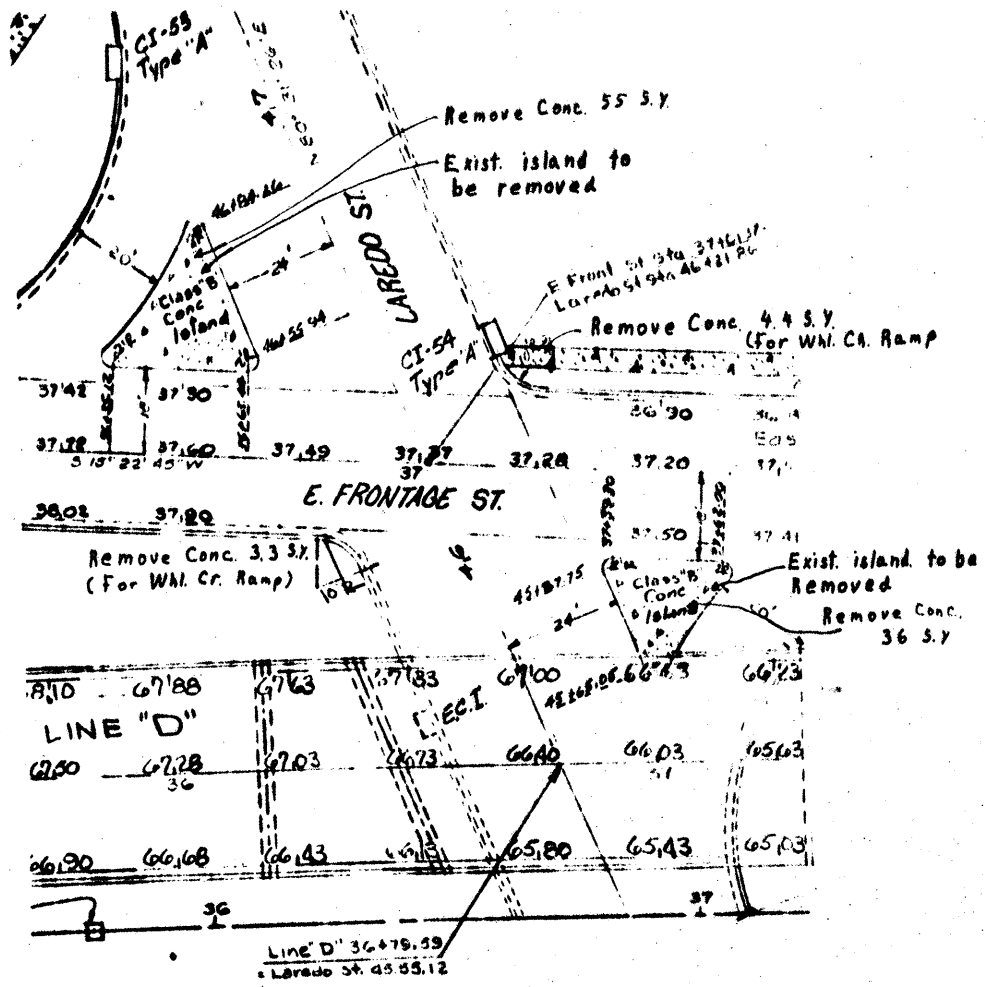
SHEET TOTALS		
DESCRIPTION	QTY	
	OLD	NEW
Remove MBGF	3595 FT	—
Remove MBGF & CAHBF	200 FT	—
Remove Curb & CIG	1510 FT	—
Remove Concrete	18 SY	—
Remove Term. Anch. Sect.	9 Ea	—
Remove Old Struct. (Small)	1 Ea	—
Remove Conc. (Riprap)	211 SY	183 SY

37B

FIELD CHANGE #1
PLAN SHEET
EXISTING
SHEET 18 OF 27 SHEETS

SCALE: 1"=40'

FED. RD. DIST. NO.	STATE	FEDERAL PROJECT NO.	SHEET NO.
16	TEXAS	HES 0005 (293)	37B
STATE DIST. NO.	COUNTY	CONTRACT NO.	SECTION NO.
16	NUECES	326 03 61	512



Sheet Totals
Remove Conc. 481.8 S.Y.

PLAN SHEET (EXIST)

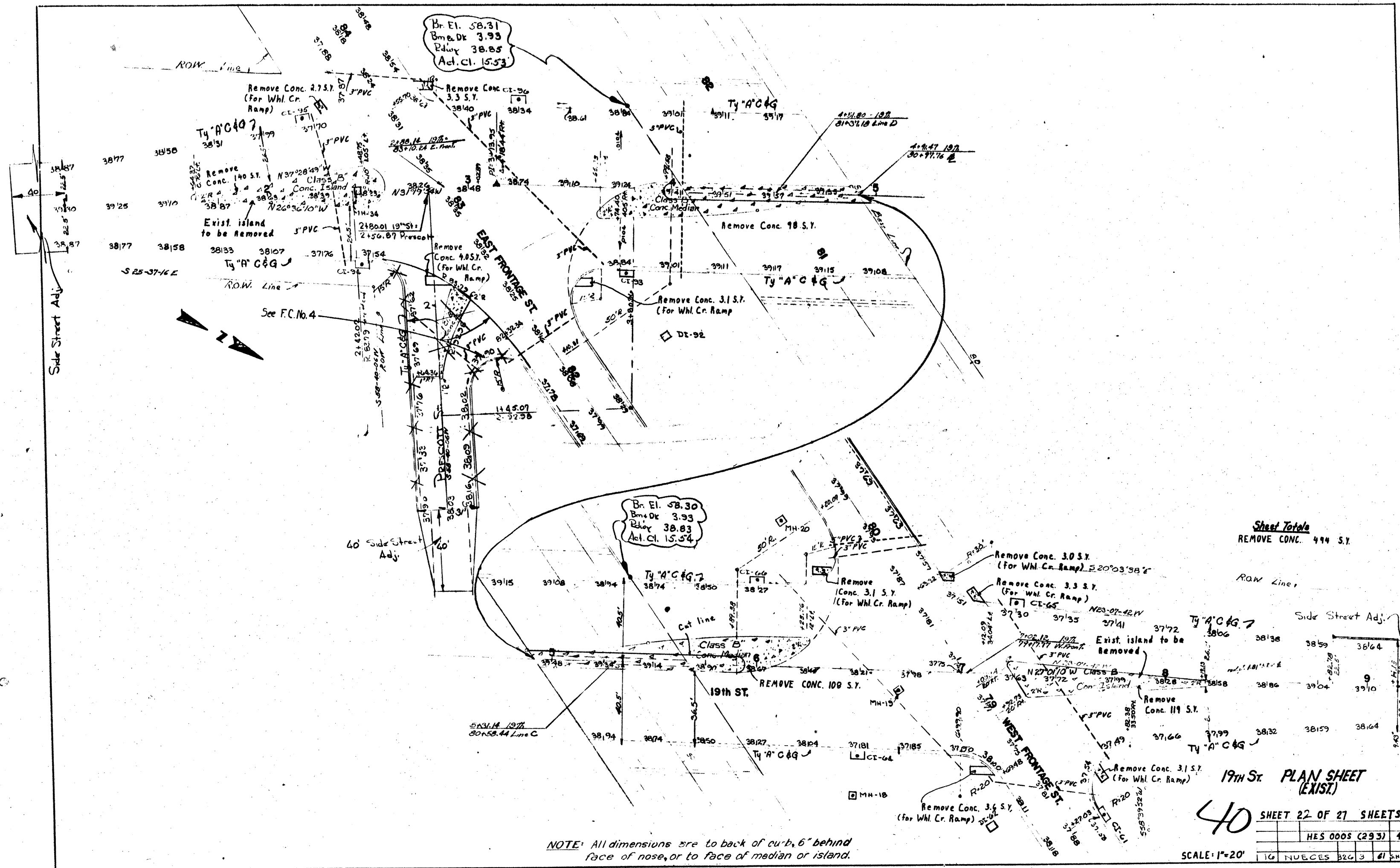
LEOPARD STREET

SHEET 20 OF 27 SHEETS

	HES 0005 (293)	38
16	NUECES 3260361	SH286

38

SCALE: 1"=20'



Sheet Totals
REMOVE CONC. 494 S.Y.

19th St. PLAN SHEET
(EXIST.)

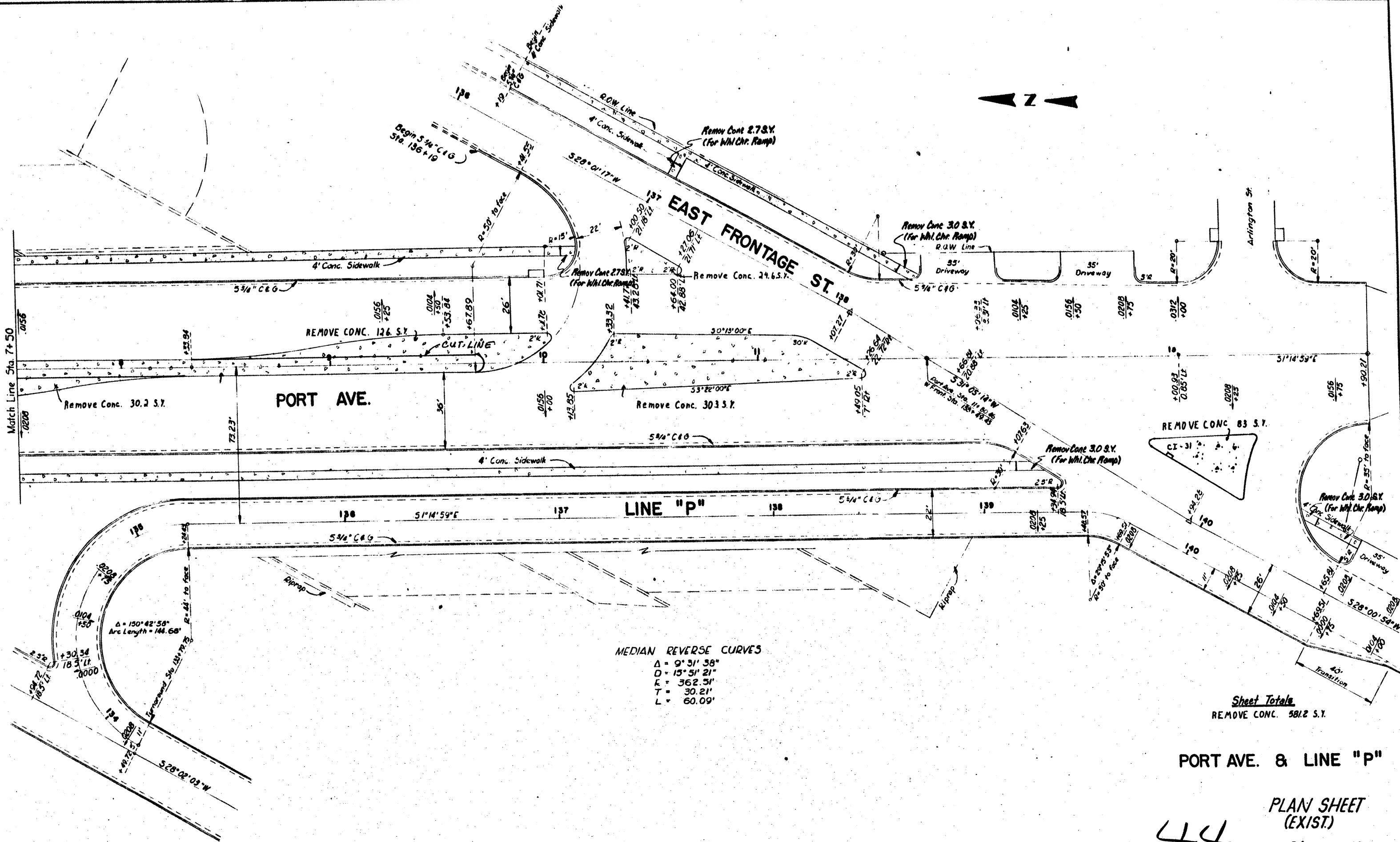
40

SHEET 22 OF 27 SHEETS

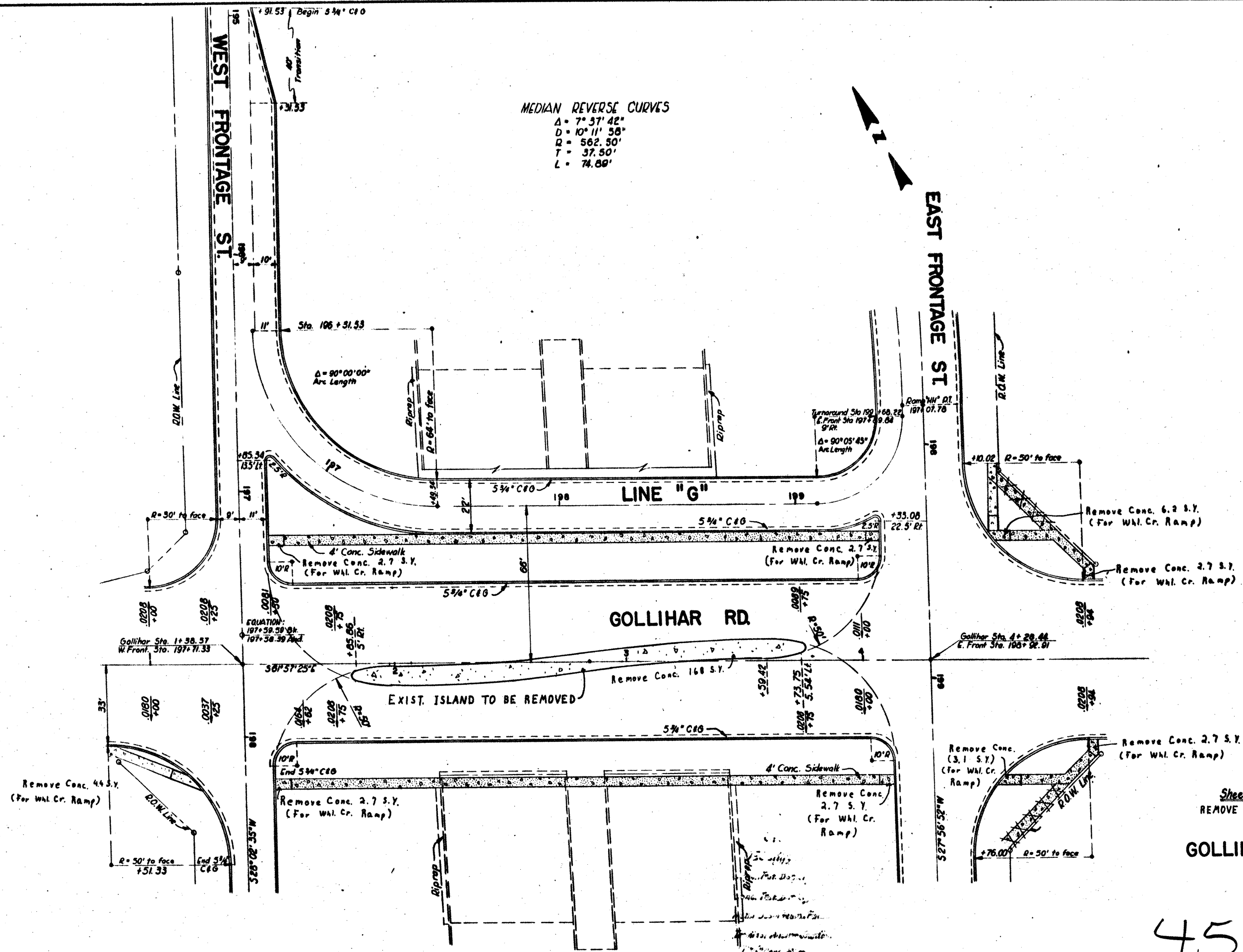
SCALE: 1"=20'

HES 0005 (293) 40			
16	NUECES	326	3 61 54.286

NOTE: All dimensions are to back of curb, 6" behind face of nose, or to face of median or island.



SHEET	26	OF	27	SHEETS
FED. RD. DIST. NO.	6	STATE	TEXAS	FEDERAL PROJ. NO.
16	NUECES	326	03	61
				SH286



MEDIAN REVERSE CURVES
 $\Delta = 7^\circ 37' 42''$
 $D = 10^\circ 11' 58''$
 $R = 562.50'$
 $T = 37.50'$
 $L = 74.80'$

Sheet Totals
 REMOVE CONC. 198 S.Y.

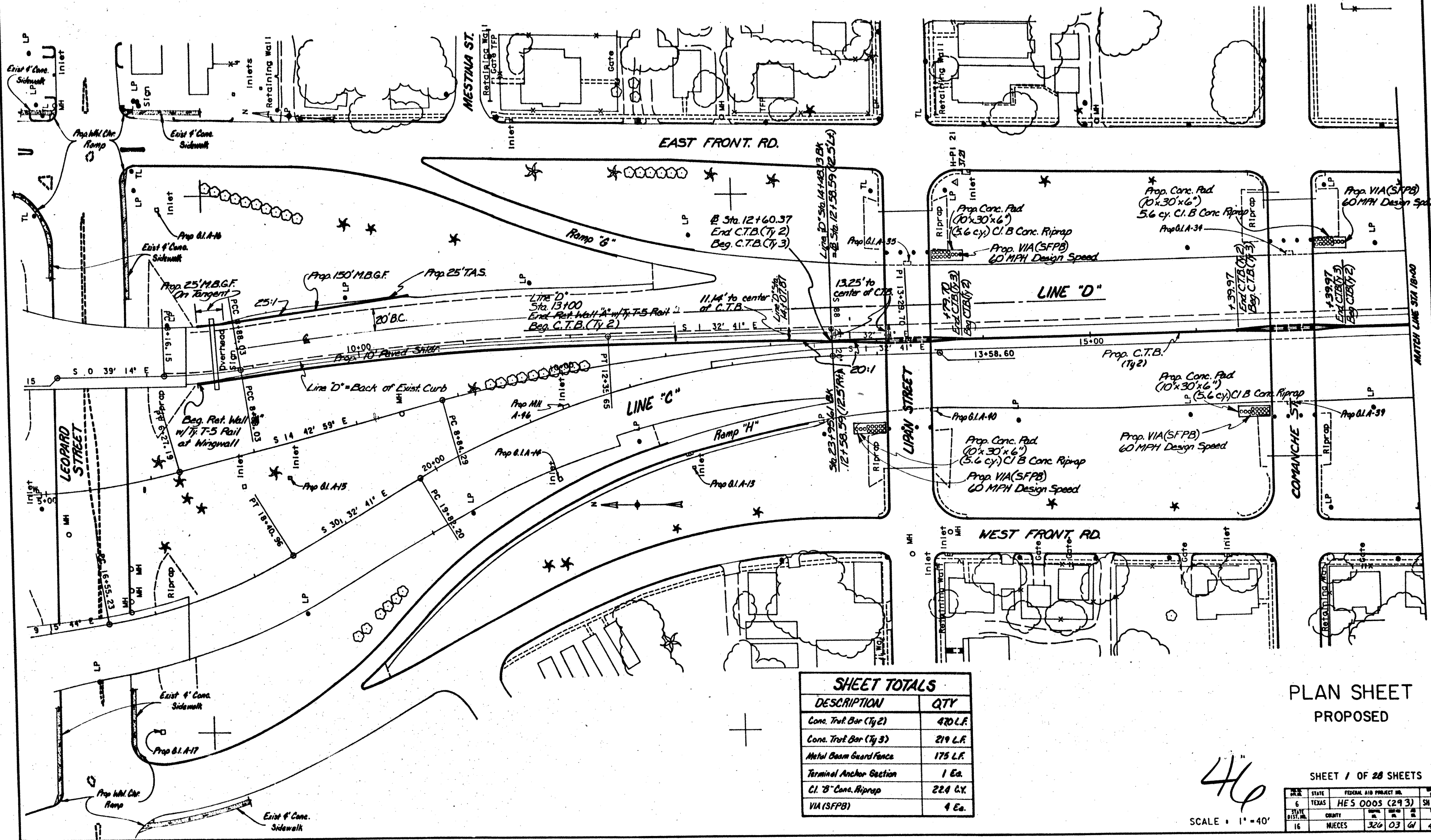
GOLLIHAR RD. & LINE "G"

PLAN SHEET
 (EXIST.)

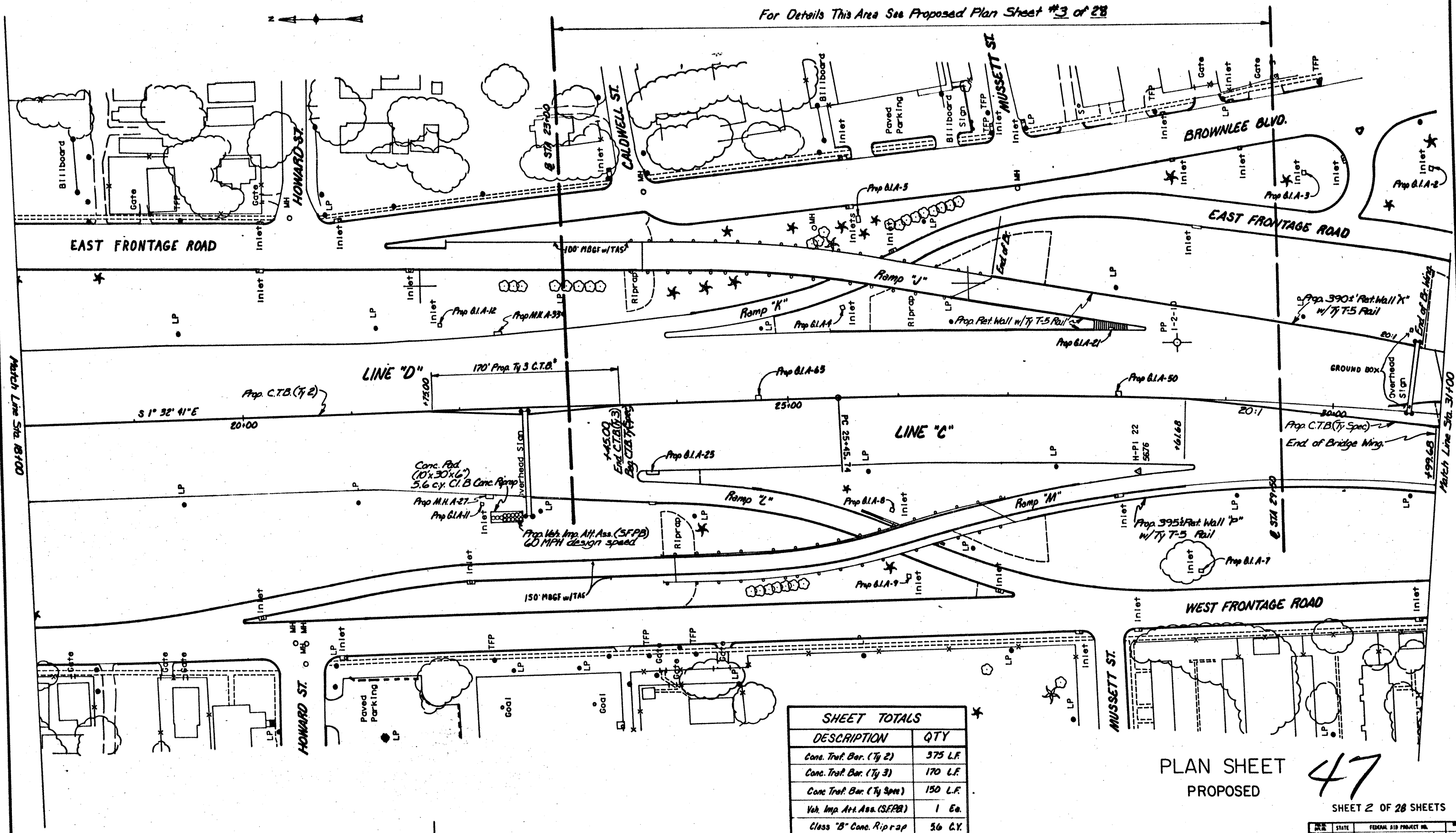
45

SCALE: 1"=20'

SHEET	27	OF	27	SHEETS
FED. RD. DIST. NO.	STATE	FEDERAL PROJECT NO.	SHEET NO.	
0	TEXAS	HES 0003 (293)	45	
STATE DIST. NO.	COUNTY	CONT. SECT. JOB	HIGHWAY NO.	
16	NUECES	326 3 61	SH 286	



For Details This Area See Proposed Plan Sheet #3 of 28



SHEET TOTALS	
DESCRIPTION	QTY
Conc. Trsf. Bar. (Ty 2)	375 L.F.
Conc. Trsf. Bar. (Ty 3)	170 L.F.
Conc. Trsf. Bar. (Ty 3mm)	150 L.F.
Veh. Imp. Att. Ass. (SEPR)	1 Ea.
Class "B" Conc. Riprap	36 CY.
Struct. Excav.*	543 CY.

* Subsidiary to Item 5/4

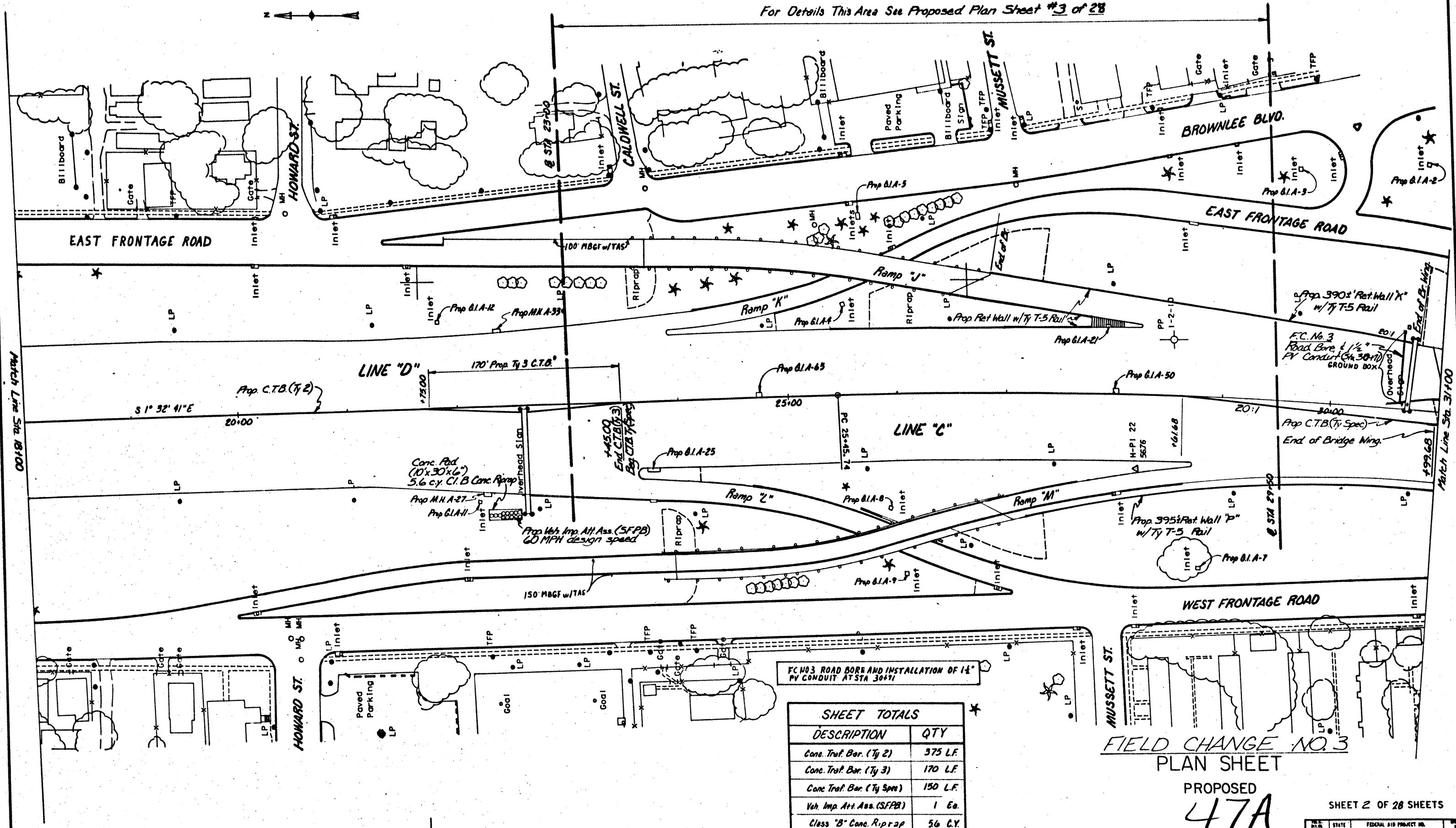
PLAN SHEET 47
PROPOSED

SHEET 2 OF 28 SHEETS

STATE DIST. NO.	STATE	FEDERAL AID PROJECT NO.	COUNTY			
6	TEXAS	HES 0005 (293)	SH286			
STATE DIST. NO.	COUNTY	OPENED IN	CLOSED IN	AD IN	EJECT IN	
16	NUECES	326	03	61	47	

SCALE : 1" = 40'

For Details This Area See Proposed Plan Sheet #3 of 28



SHEET TOTALS	
DESCRIPTION	QTY
Conc. Trsf. Bar. (Ty 2)	375 L.F.
Conc. Trsf. Bar. (Ty 3)	170 L.F.
Conc. Trsf. Bar. (Ty Spec)	150 L.F.
Veh. Imp. Att. Ass. (SFPB)	1 Ea.
Class "B" Conc. Riprap	56 C.Y.
Struct. Excav.*	543 C.Y.

* Subsidiary to Item 514

FIELD CHANGE NO. 3
PLAN SHEET

PROPOSED
47A

SCALE = 1" = 40'

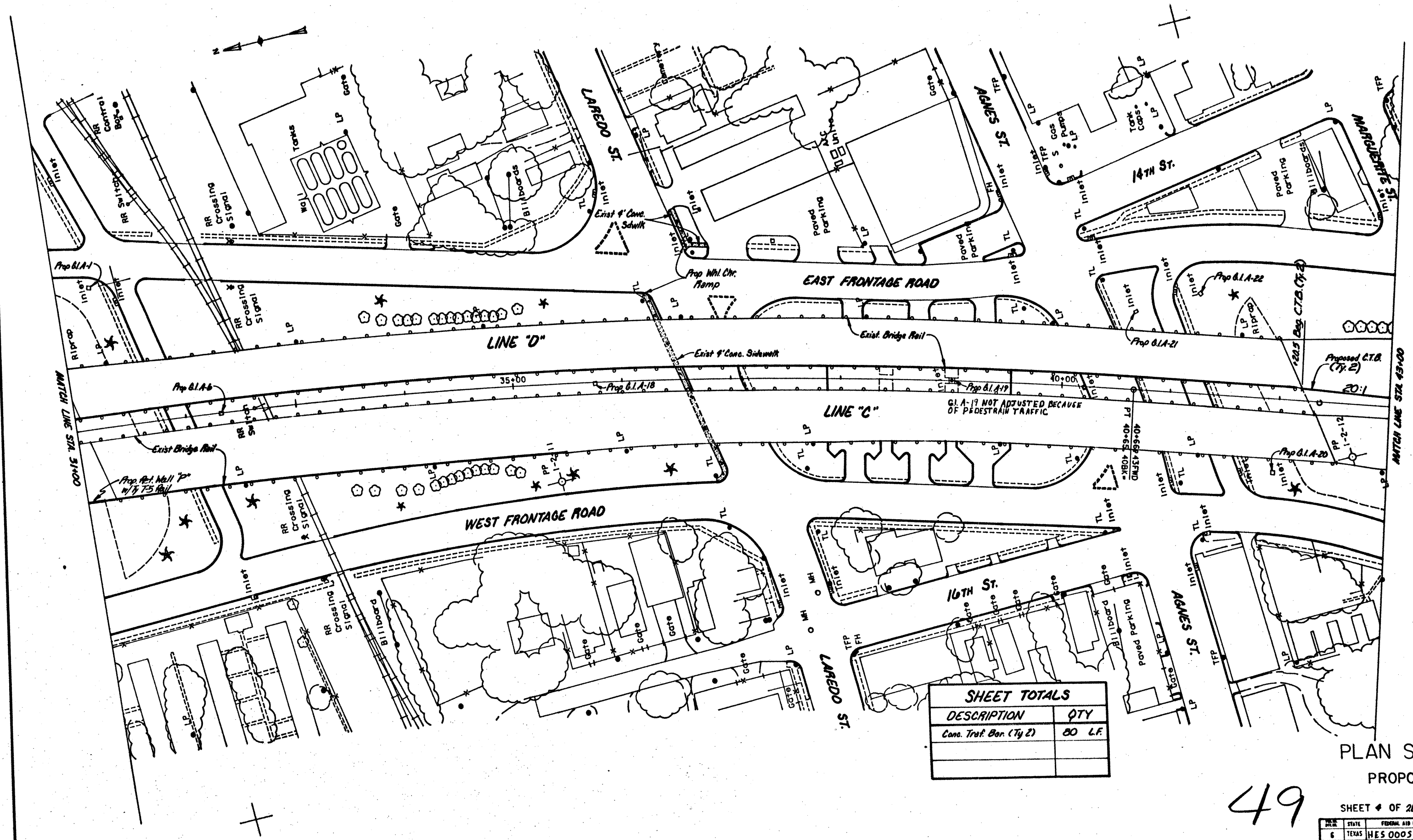
SHEET 2 OF 28 SHEETS

STATE	FEDERAL AID PROJECT NO.	SHEET NO.
TEXAS	HES 0005 (293)	47A
STATE	COUNTY	DIST. NO.
TEXAS	NUECES	326 03 61



<u>DESCRIPTION</u>	<u>UNIT</u>	<u>QUANTITY</u>
MULCH 50D	CY	170
WFC (VIA) (2 BAY)	EA.	1
CONC. TRAF. BARR. (TY 2)	LF	60
CONC. RIPRAP CL B	CY	57
GREAT (G BAY)	EA.	1
CONC. TRAF. BAR (TY SPEC)	LF	605

RAMP GORE DETAIL
SCALE: 1" = 20'



SHEET TOTALS	
DESCRIPTION	QTY
Conc. Traf. Bar. (Ty 2)	80 LF.

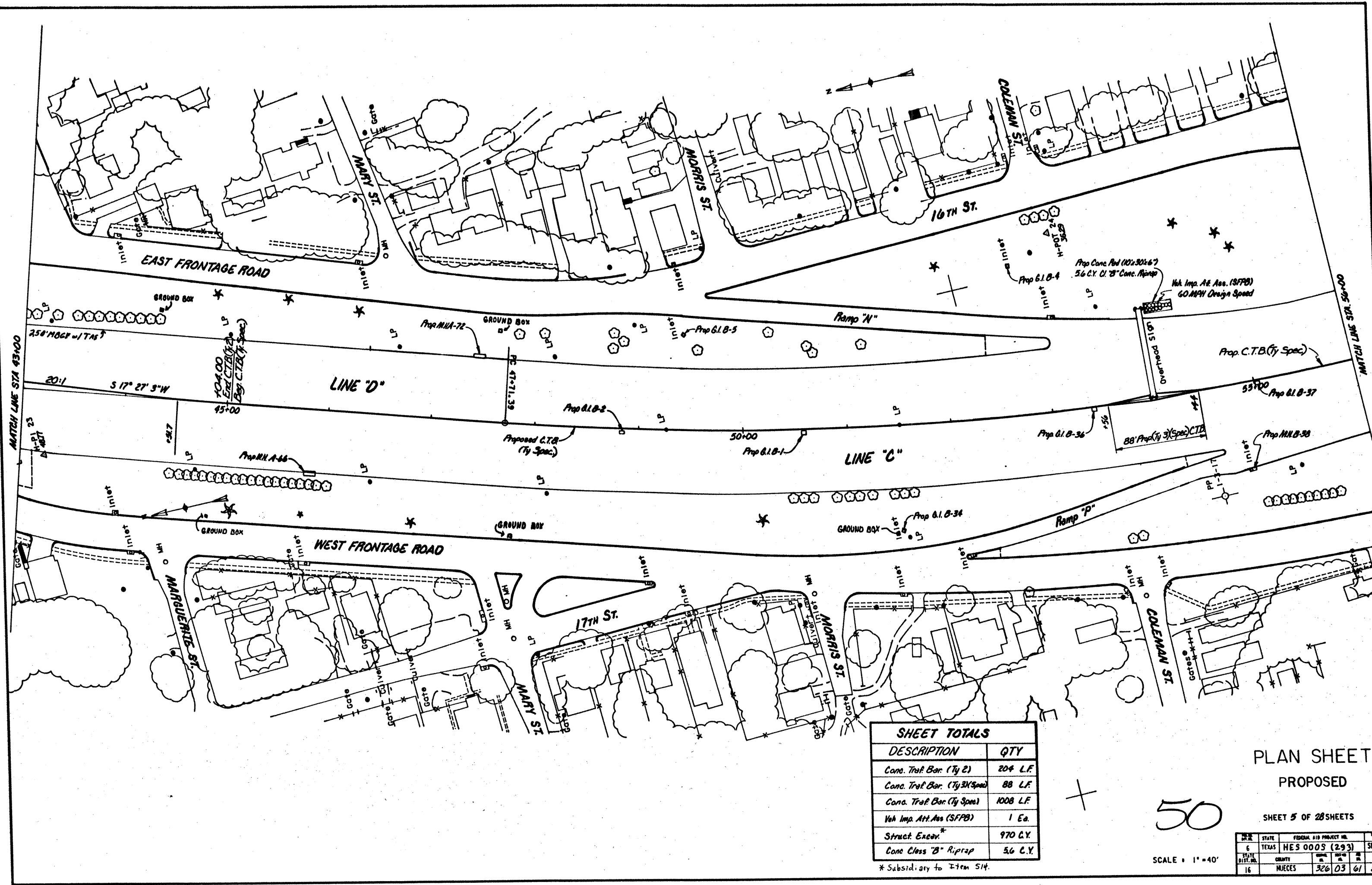
PLAN SHEET
PROPOSED

49

SHEET 4 OF 28 SHEETS

SCALE • 1" = 40'

STATE	FEDERAL AID PROJECT NO.	SHEET NO.
TEXAS	HES 0005 (293)	SH 286
COUNTY	PERCENTAGE	DATE
MUECES	32%	03/61



SHEET TOTALS	
DESCRIPTION	QTY
Conc. Traff. Bar. (Ty 2)	204 L.F.
Conc. Traff. Bar. (Ty 3)(Spec)	88 L.F.
Conc. Traff. Bar. (Ty Spec)	1008 L.F.
Veh Imp. Att. Ass (SFPB)	1 Ea.
Struct. Exeav.*	970 C.Y.
Conc. Class "B" Riprap	56 C.Y.

* Subsidiary to Item 514.

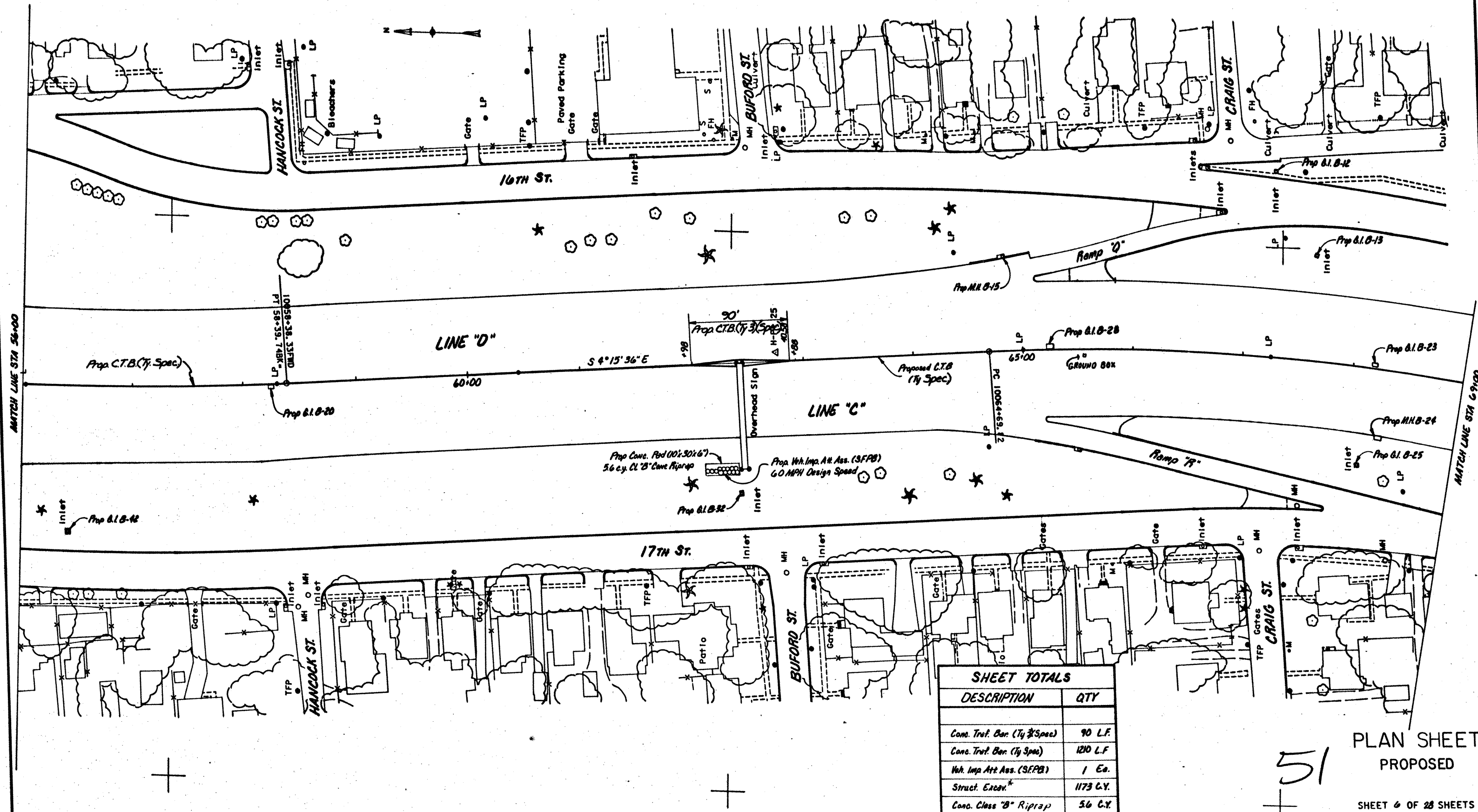
PLAN SHEET
PROPOSED

50

SCALE : 1" = 40'

SHEET 5 OF 28 SHEETS

STATE	FEDERAL AID PROJECT NO.	SN
6 TEXAS	HES 000S (293)	SN 286
STATE DIST. NO.	COUNTY	SECTION
16	MUECES	326 03 61 50

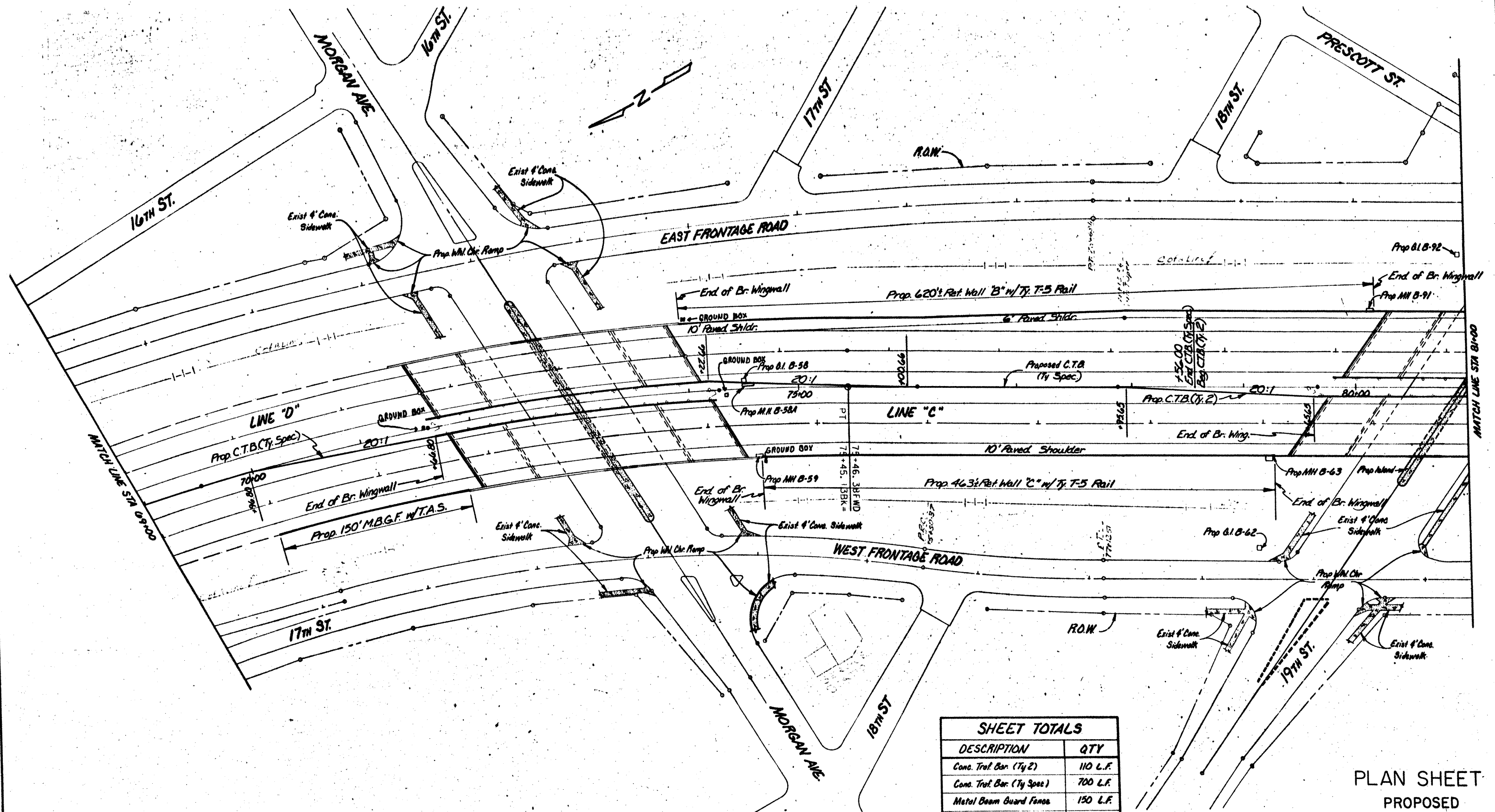


51
PLAN SHEET
PROPOSED

SHEET 6 OF 28 SHEETS

SCALE : 1" = 40'

DIST. IN	STATE	FEDERAL AID PROJECT NO.	SHEET NO.
6	TEXAS	HES 0005 (293)	SH 286
DIST. IN	COUNTY	SECTION	SECTION
16	MUECES	326 03	61 51



SHEET TOTALS	
DESCRIPTION	QTY
Conc. Trsf. Bar. (Ty 2)	110 L.F.
Conc. Trsf. Bar. (Ty Spec)	700 L.F.
Metal Beam Guard Fence	150 L.F.
Terminal Anchor Section	1 Ea.
Struct. Exon.*	615 CY.

* Subsidiary to Item 514.

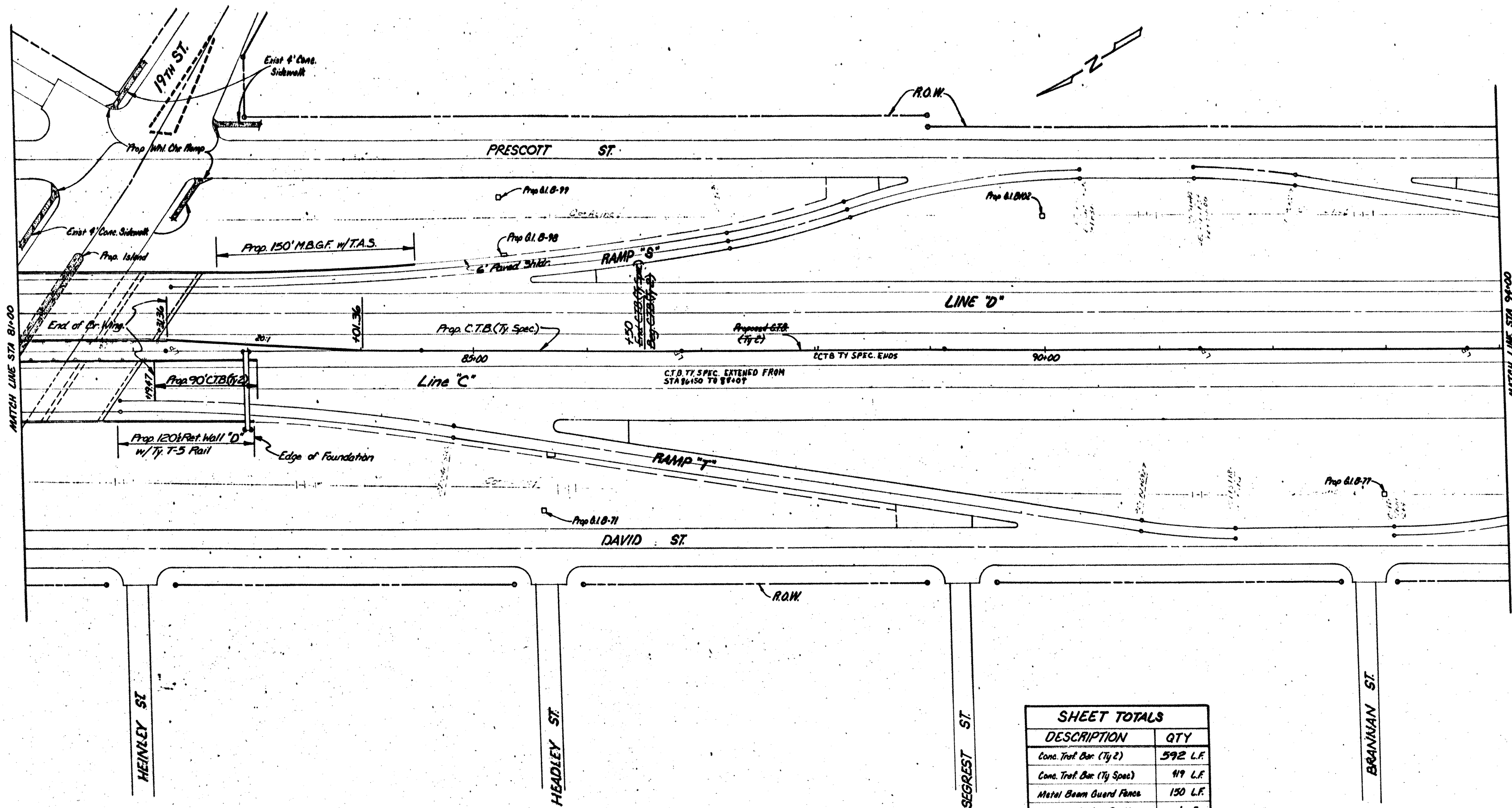
PLAN SHEET
PROPOSED

52

SHEET 7 OF 28 SHEETS

Scale: 1"=40'

FED. RD. DIST. NO.	STATE	FEDERAL PROJECT NO.	SHEET NO.
16	TEXAS	HES 0005 (293)	52
STATE DIST. NO.	COUNTY	CONT. SECT. JOB	HIGHWAY NO.
16	NUECES	326.03	34.286



SHEET TOTALS	
DESCRIPTION	QTY
Conc. Traf. Bar. (Ty 2)	592 L.F.
Conc. Traf. Bar. (Ty Spec)	419 L.F.
Metal Beam Guard Fence	150 L.F.
Terminal Anchor Section	1 Ea.
Struct. Exon.*	247 CY
Conc. Traf. Bar. (Ty 1)	239.3 L.F.
Str. Sh. (Access Panel)	928 Lb.

* Subsidiary to Item 514.
 Note: Limits of C.T.B. (Ty 2) shown on sheet include C.T.B. (Ty 1) at Light Standards. See C.T.B. Details, Sheet 1 of 5.

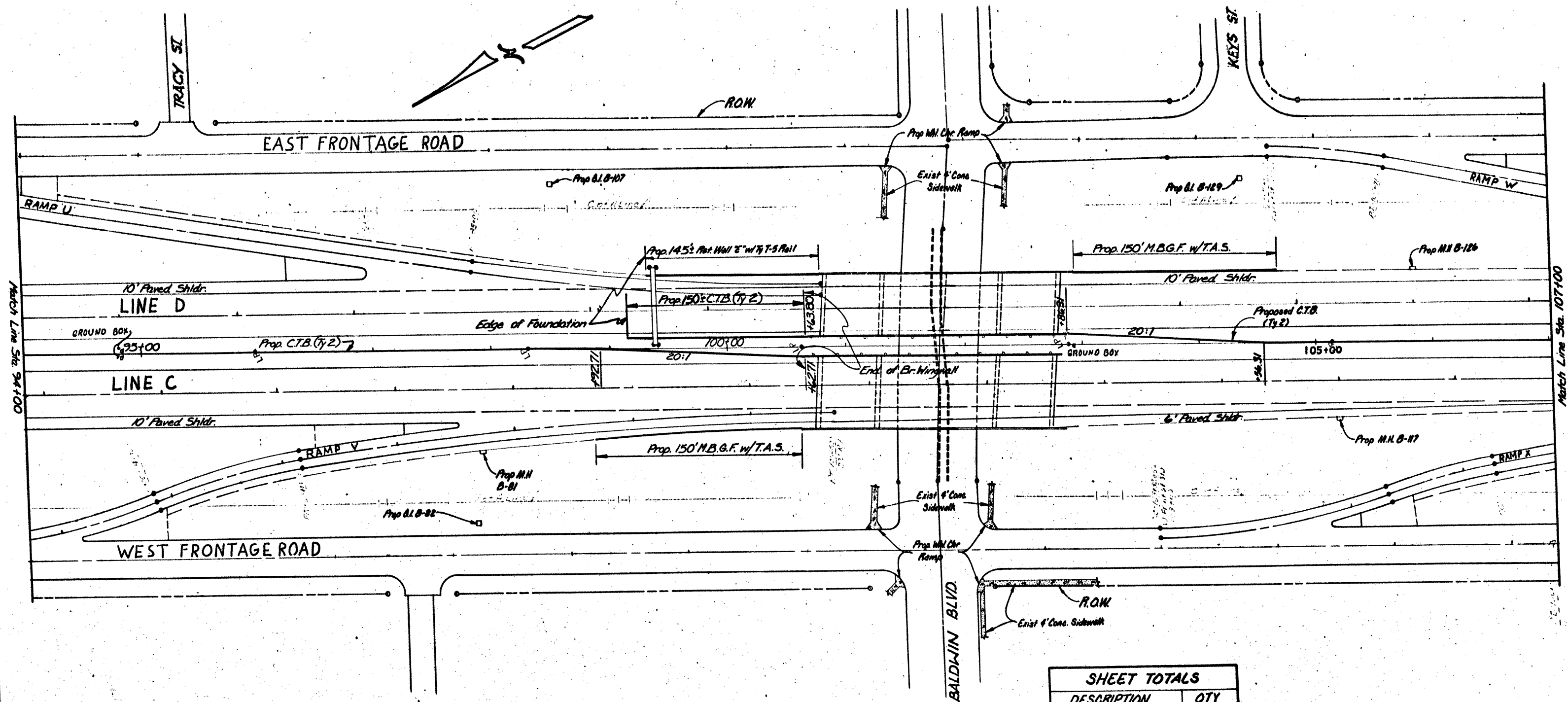
53

SCALE: 1"=40'

PLAN SHEET
 PROPOSED

SHEET 8 OF 28 SHEETS

FED. PROJ. NO.	STATE	FEDERAL PROJECT NO.	SHEET NO.
16	TEXAS	HES 0003 (293)	53
COUNTY	CONT.	SECT.	JOB
16	NUECES	326	03 61



SHEET TOTALS	
DESCRIPTION	QTY
Conc. Traf. Bar. (Ty 2)	1040 L.F.
Metal Beam Guard Fence	300 L.F.
Terminal Anchor Section	2 Ea.
Conc. Traf. Bar. (Ty 1)	179.49 L.F.
Str. Stl. (Access Panel)	696 LB.

Note: Limits of C.T.B. (Ty 2) shown on sheet include C.T.B. (Ty 1) at Light Standards. See C.T.B. Details, Sheet 1 of 5.

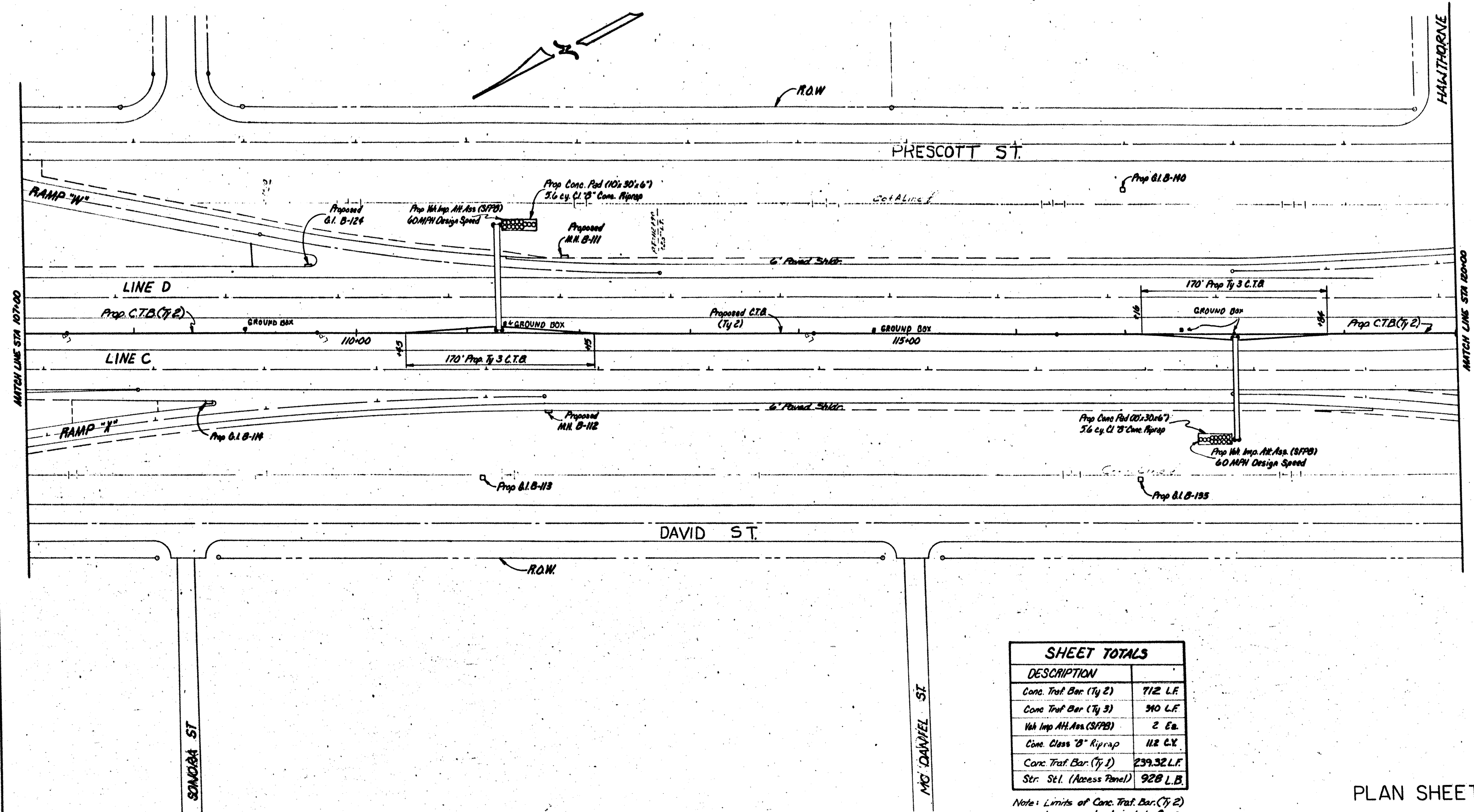
PLAN SHEET
PROPOSED

54

SHEET 9 OF 28 SHEETS

Scale: 1" = 40'

FED. RD. DIST. NO.	STATE	FEDERAL PROJECT NO.	SHEET NO.
16	TEXAS	HES 0003 (293)	54
STATE DIST. NO.	COUNTY	CONT. SECT. JOB	HIGHWAY NO.
16	NUECES	326 03 61	54.286



SHEET TOTALS	
DESCRIPTION	
Conc. Traf. Bar. (Ty 2)	712 L.F.
Conc. Traf. Bar. (Ty 3)	310 L.F.
Veh Imp. Att. Ass. (SFPB)	2 Ea.
Conc. Class "B" Riprap	112 CY
Conc. Traf. Bar. (Ty 1)	239.32 L.F.
Str. Stl. (Access Panel)	928 L.B.

Note: Limits of Conc. Traf. Bar. (Ty 2) shown on sheet include Conc. Traf. Bar. (Ty 1) at Light Standards. See C.T.B. Details, Sheet 1 of 5.

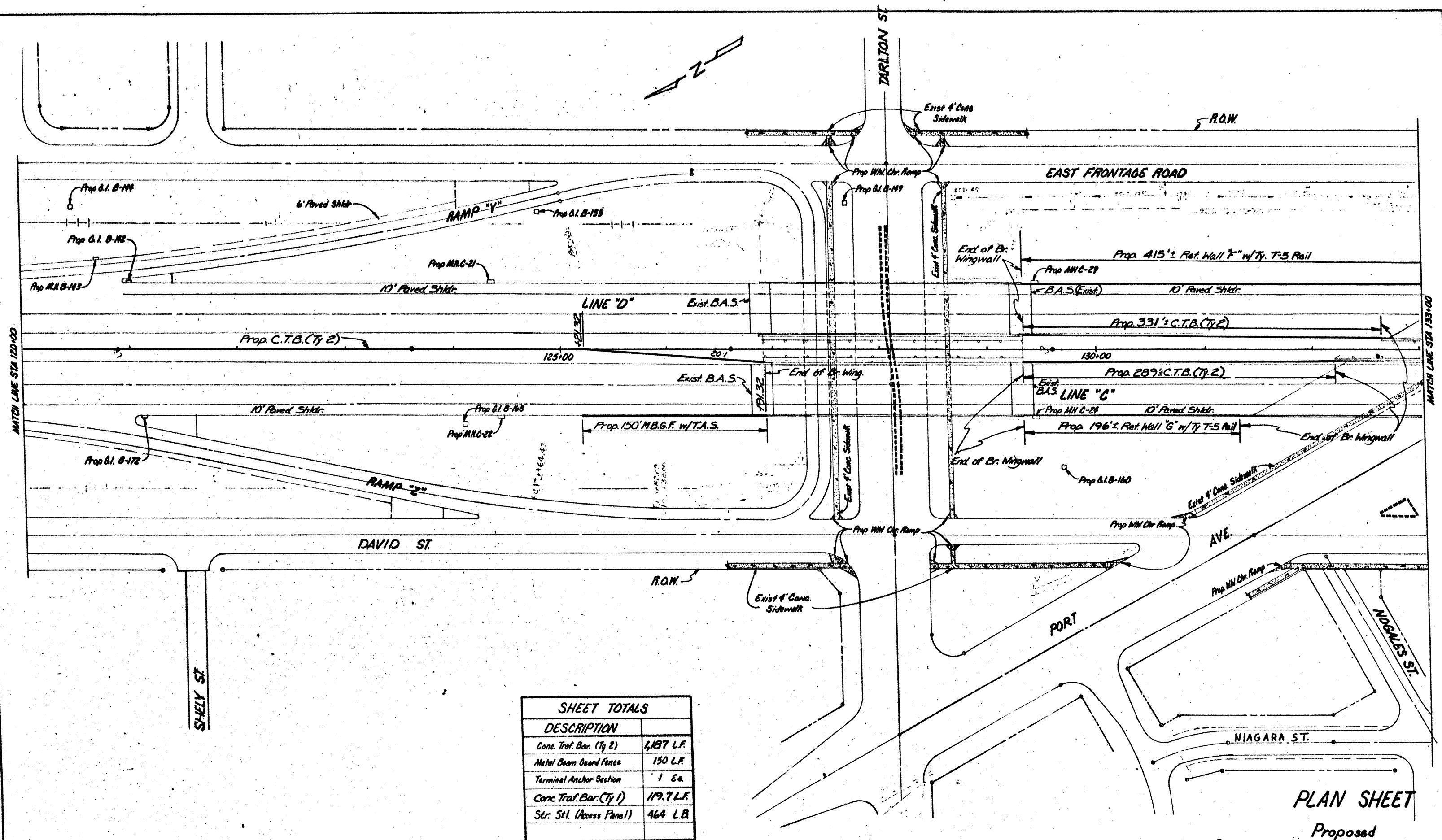
55

Scale: 1"=40'

PLAN SHEET
PROPOSED

SHEET 10 OF 28 SHEETS

FED. RD. DIST. NO.	STATE	FEDERAL PROJECT NO.	SHEET NO.
16	TEXAS	HE3 0003 (293)	55
COUNTY	SECT.	JOB	HIGHWAY NO.
NUECES	326	03	61



SHEET TOTALS	
DESCRIPTION	
Cone. Traf. Bar. (Ty 2)	1,187 L.F.
Metal Beam Guard Fence	150 L.F.
Terminal Anchor Section	1 Ea.
Cone. Traf. Bar. (Ty 1)	119.7 L.F.
Str. Stl. (Access Panel)	464 L.B.

Note: Limits of C.T.B. (Ty 2) shown on sheet include C.T.B. (Ty 1) at Light Standards. See C.T.B. Details, Sheet 1 of 5.

PLAN SHEET

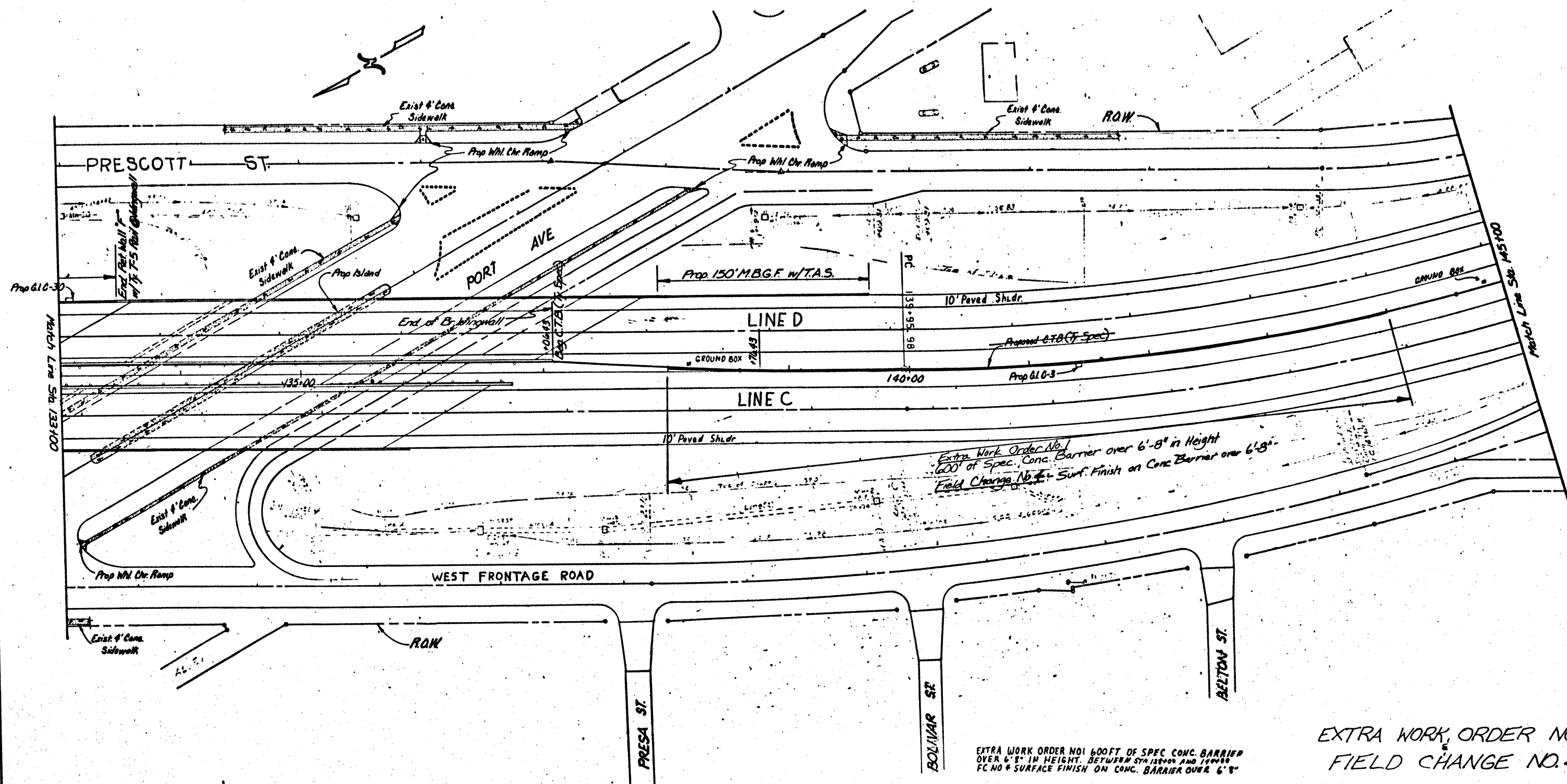
Proposed

56

SHEET 11 OF 28 SHEETS

Scale: 1"=40'

FED. DIST. NO.	STATE	FEDERAL PROJECT NO.	SHEET NO.
6	TEXAS	HES 0003 (293)	56
STATE DIST. NO.	COUNTY	CONTRACT NO.	SECTION NO.
16	NUECES	320	03



EXTRA WORK ORDER NO. 1
600' OF SPEC. CONC. BARRIER
OVER 6'-8" IN HEIGHT. BETWEEN STA 135+00 AND 140+00
FC NO. 4 SURFACE FINISH ON CONC. BARRIER OVER 6'-8"

EXTRA WORK ORDER NO. 1
FIELD CHANGE NO. 4

PLAN SHEET
PROPOSED

SHEET TOTALS	
DESCRIPTION	QTY
Conc. Trsf. Bar. (Ty Spec)	794 L.F.
Metal Beam Guard Fence	150 L.F.
Terminal Anchor Section	1 Ea.
Struct. Excav.*	722 CY.

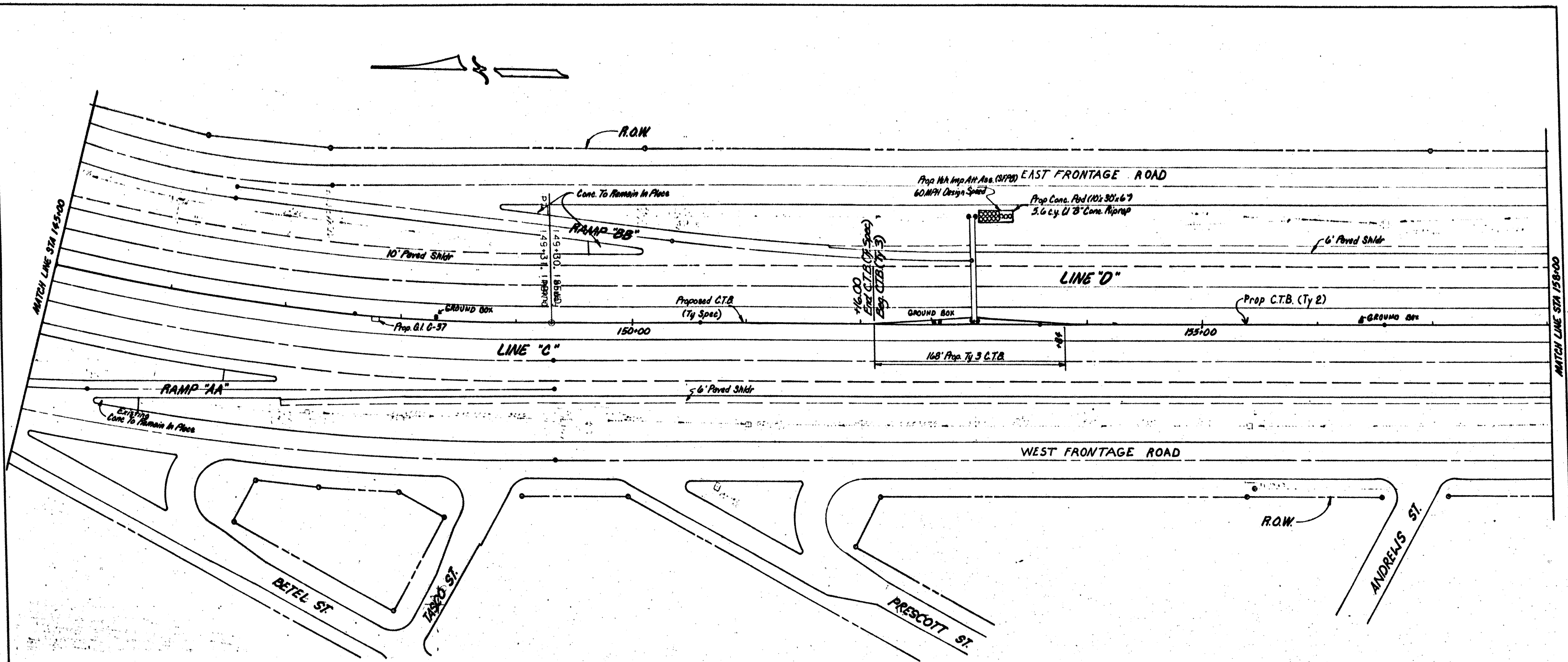
*Subsidiary to Item 514.

57A

SHEET 12 OF 28 SHEETS

Scale: 1"=40'

FED. RD. DIST. NO.	STATE	FEDERAL PROJECT NO.	SHEET NO.
6	TEXAS	HE9 0005 (293)	57A
STATE DIST. NO.	COUNTY	CONTRACT NO.	SECTION NO.
16	NUECES	326	03 61



Note: Limits of C.T.B. (TY2) Shown on sheet include C.T.B. (Ty 1) at Light Standards. See C.T.B. Details, Sheet 1 of 5.

SHEET TOTALS	
DESCRIPTION	QTY
Conc. Traf. Bar. (Ty 2)	354 L.F.
Conc. Traf. Bar. (Ty 3)	168 L.F.
Conc. Traf. Bar. (Ty Spec)	716 L.F.
Veh. Imp. At. Ass. (SFPB)	1 Ea.
Conc. Class "B" Riprap	56 C.Y.
Struct. Excav.*	635 C.Y.
Conc. Traf. Bar. (Ty 1)	59.8 L.F.
Str. Stl. (Access Panel)	232 L.B.

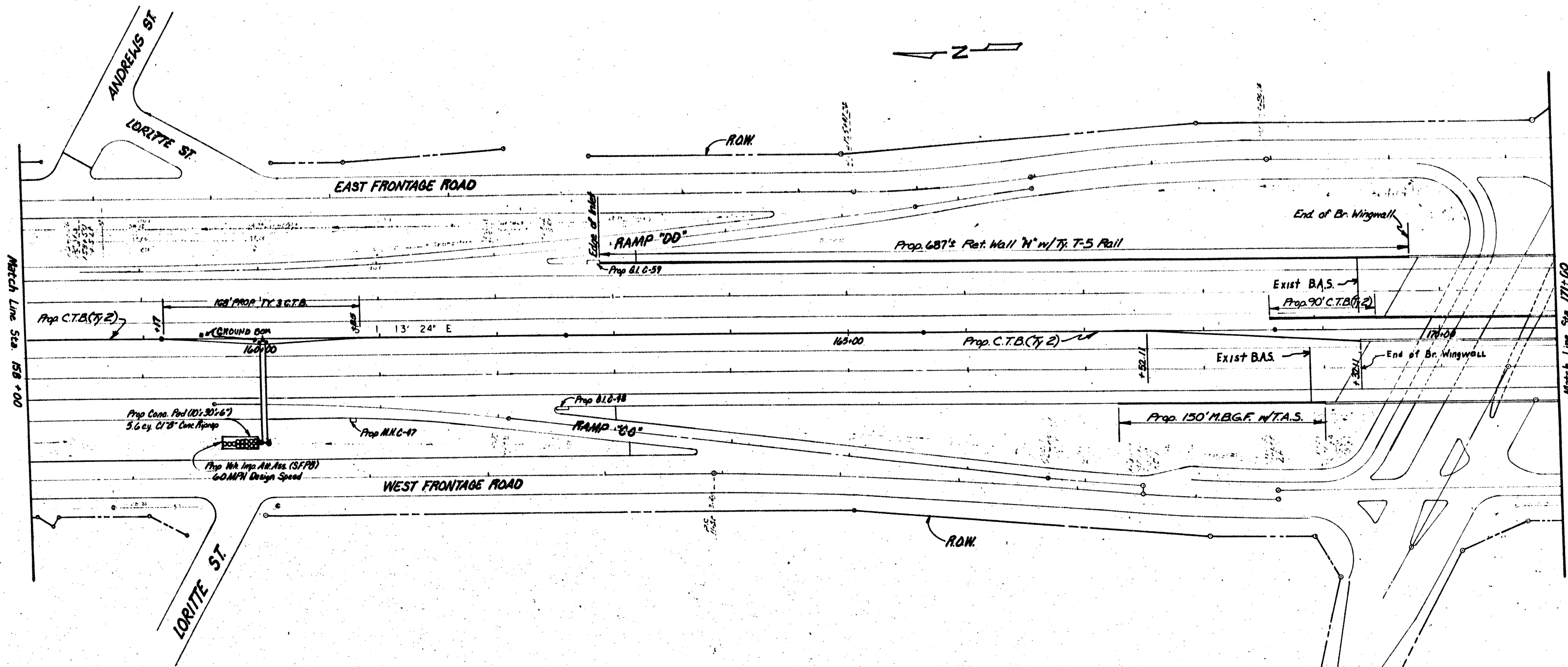
* Subsidiary to Item 514.

PLAN SHEET
PROPOSED

58

SCALE: 1" = 40'

SHEET 13 OF 28 SHEETS					
FED. RD. DIST. NO.	STATE	FEDERAL PROJECT NO.	SHEET NO.		
6	TEXAS	HES 0009 (293)	58		
STATE DIST. NO.	COUNTY	CONT.	SECT.	JOB	HIGHWAY NO.
16	NUECES	320	03	61	SH 288



Note: Limits of C.T.B. (Ty 2) shown on sheet include C.T.B. (Ty 1) at Light Standards. See C.T.B. Details, Sheet 1 of 5.

SHEET TOTALS	
DESCRIPTION	QTY
Conc. Traf. Bar. (Ty 2)	930 L.F.
Conc. Traf. Bar. (Ty 3)	168 L.F.
Metal Beam Guard Fence	150 L.F.
Terminal Anchor Section	1 Ea.
Veh. Imp. Att. Ass. (SFPB)	1 Ea.
Conc. Class "B" Riprap	36 CY.
Conc. Traf. Bar. (Ty 1)	119.7 L.F.
Str. Stl. (Access Panel)	464 L.B.

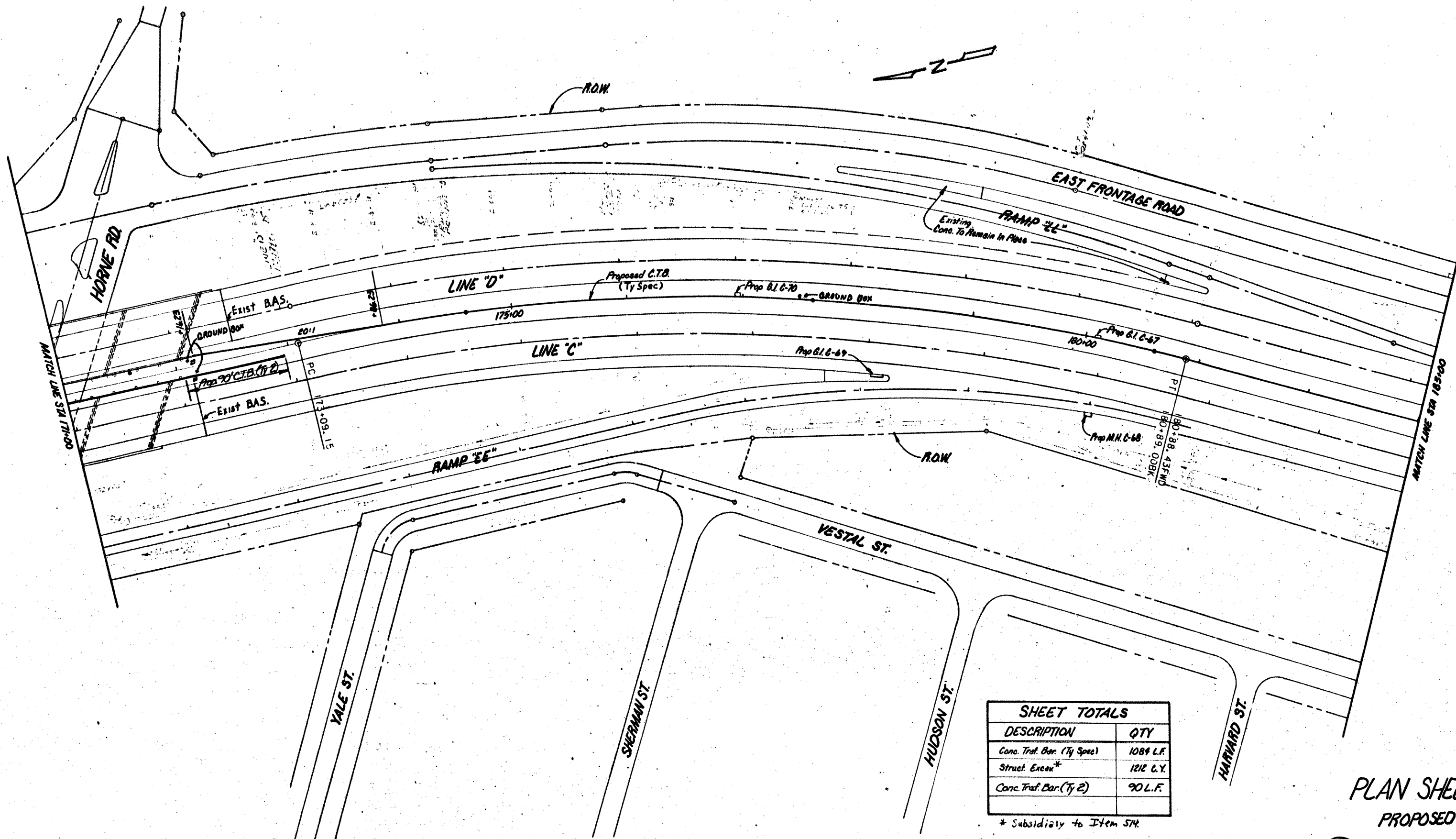
PLAN SHEET
PROPOSED

59

SCALE: 1"=40'

SHEET 14 OF 28 SHEETS

FED. RD. DIST. NO.	STATE	FEDERAL PROJECT NO.	SHEET NO.
6	TEXAS	HES 0003 (293)	59
STATE DIST. NO.	COUNTY	CONT. SECT.	JOB HIGHWAY NO.
16	NUECES	324.03	61 S.N. 284



SHEET TOTALS	
DESCRIPTION	QTY
Conc. Trsf. Bar. (Ty Spec)	1089 L.F.
Struct. Excess*	1212 L.F.
Conc. Trsf. Bar. (Ty 2)	90 L.F.

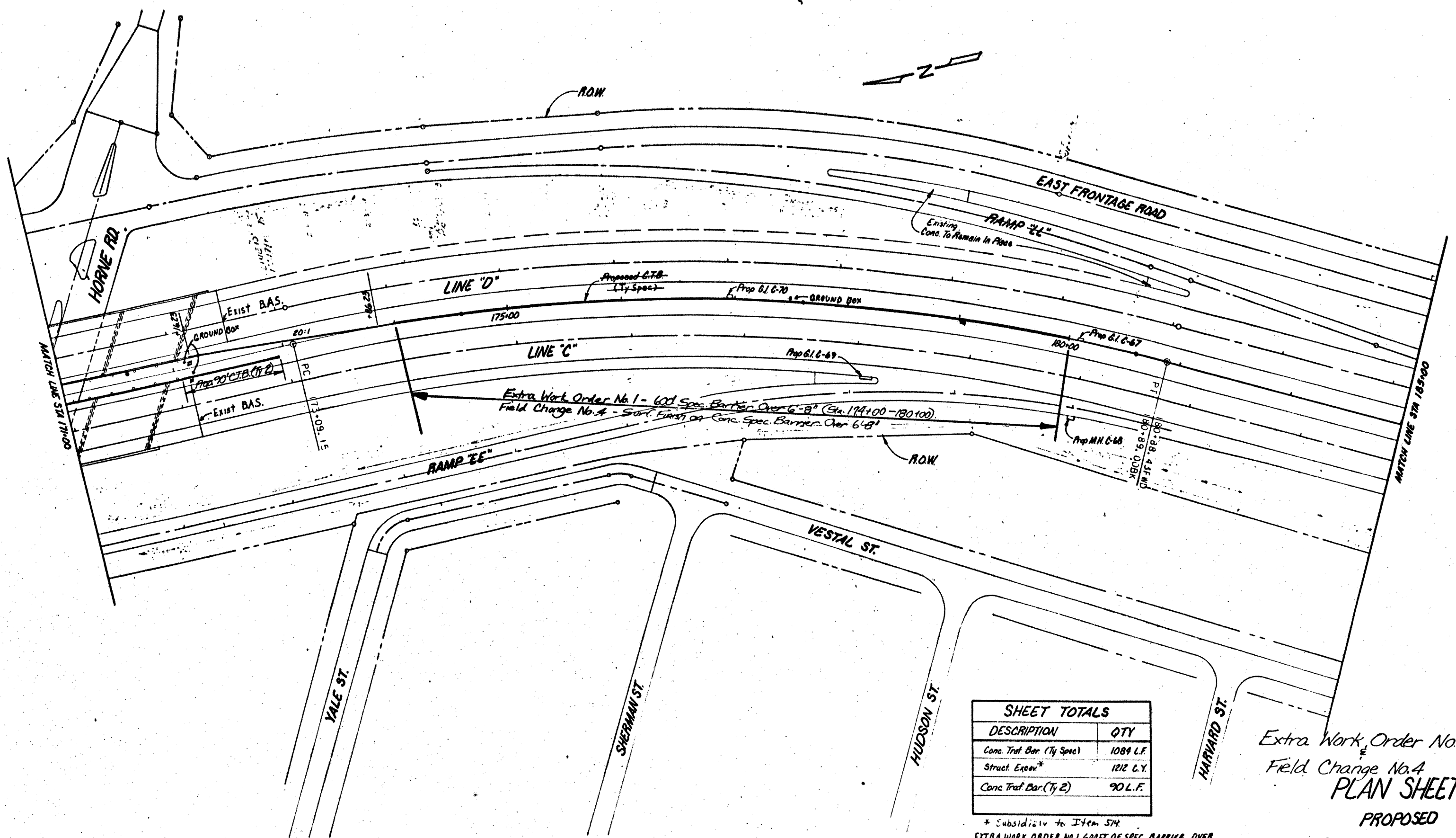
* Subsidiary to Item 574.

PLAN SHEET
PROPOSED

SHEET 15 OF 28 SHEETS

FED. DIST. NO.	STATE	FEDERAL PROJECT NO.	SHEET NO.
16	TEXAS	HES 0005 (293)	60
COUNTY	CONTRACT	SECTION	HIGHWAY NO.
16	NUECES	326	03 61 SH 286

Scale: 1" = 40'



Extra Work Order No 1 - 600 Spec. Barrier Over 6'-8" (Sta. 174+00 - 180+00)
 Field Change No. 4 - Surf. Finish on Conc. Spec. Barrier Over 6'-8"

SHEET TOTALS	
DESCRIPTION	QTY
Conc. Traf. Bar. (Ty Spec)	1084 L.F.
Struct. Excar*	1212 C.Y.
Conc. Traf. Bar. (Ty 2)	90 L.F.

* Subsidiary to Item 514.
 EXTRA WORK ORDER NO 1 600 FT OF SPEC BARRIER OVER 6'-8" IN HEIGHT BETWEEN STA 174+00 AND 180+00
 FC NO 4 SURFACE FINISH ON CONC. SPEC. BARRIER BETWEEN STA 174+00 AND 180+00.

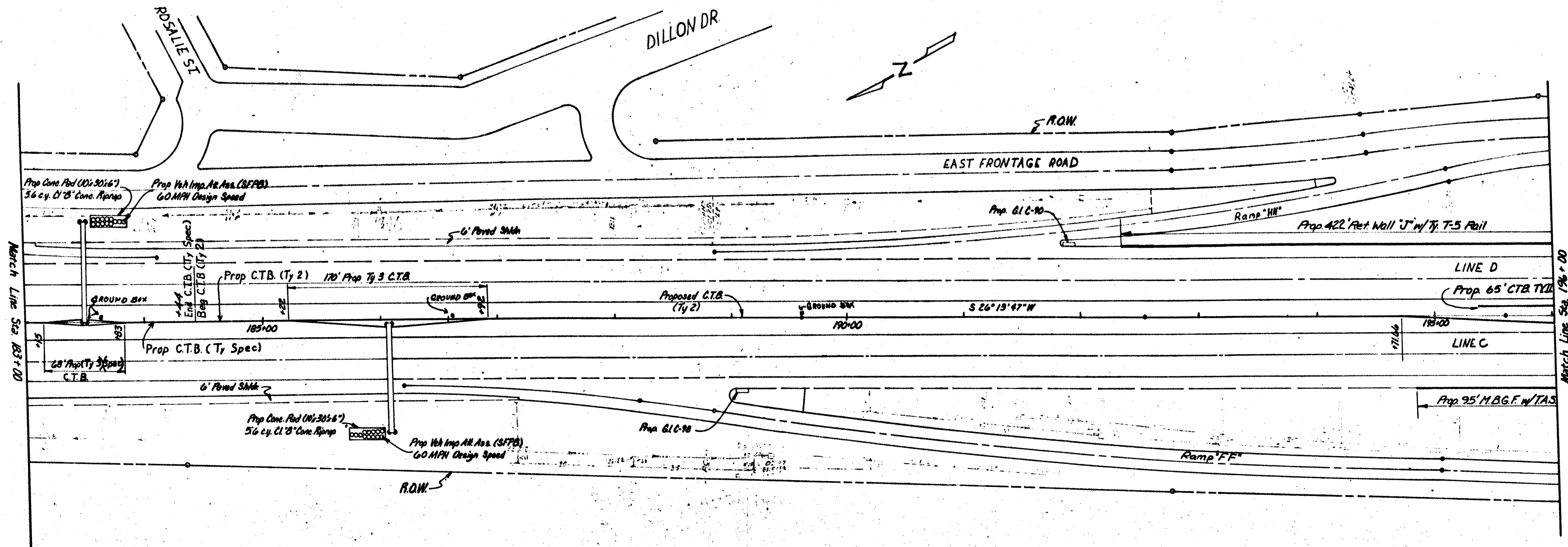
Extra Work Order No 1
 Field Change No. 4
PLAN SHEET
 PROPOSED

600A

Scale: 1" = 40'

SHEET 15 OF 28 SHEETS

FED. PROJ. NO.	STATE	FEDERAL PROJECT NO.	SHEET
16	TEXAS	HES 0005 (293)	60A
STATE DIST. NO.	COUNTY	CONTRACT NO.	PICTURE NO.
16	NUECES	326 03 61	SH 286



Note:
Limits of C.T.B. (Ty 2) Shown On
Sheet Include (Ty 1) C.T.B. At
Light Standards. See C.T.B.
Details, Sheet 1 of 5.

SHEET TOTALS	
DESCRIPTION	QTY
Conc. Ret. Bar. (Ty 2)	927 L.F.
Conc. Ret. Bar. (Ty 3)	170 L.F.
Conc. Ret. Bar. (Ty Spec)	75 L.F.
Conc. Ret. Bar. (Ty 3) (Spec)	68 L.F.
Metal Beam Guard Fence	95 L.F.
Terminal Anchor Section	1 Ea.
Veh. Imp. Att. Ass. (SFPB)	2 Ea.
Conc. Class "B" Riprap	11.2 CY.
Struct. Embv. *	121 CY.
Conc. Ret. Bar. (Ty 1)	119.7 L.F.
Str. Sl. (Access Panel)	464 LB.

* Subsidiary to Item 514.

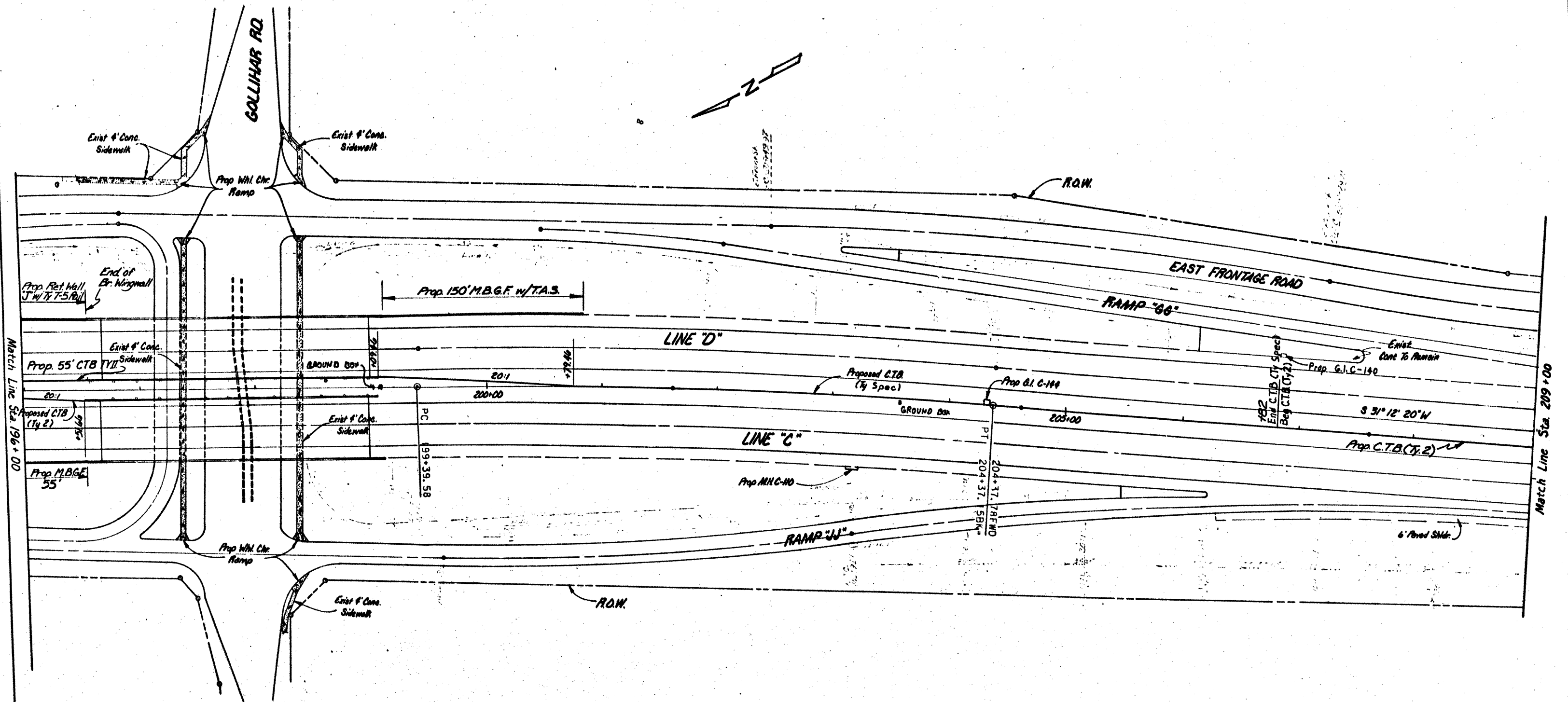
PLAN SHEET
PROPOSED

61

Scale: 1" = 40'

SHEET 16 OF 28 SHEETS

FED. DIST. NO.	STATE	FEDERAL PROJECT NO.	SHEET NO.
16	TEXAS	HES 0005(293)	61
COUNTY	CON.	SECT.	JOB
NUECES	320	03	61



SHEET TOTALS	
DESCRIPTION	QTY
Conc. Trsf. Bar (Ty 2)	325 L.F.
Conc. Trsf. Bar (Ty Spec)	773 L.F.
Metal Beam Guard Fence	205 L.F.
Terminal Anchor Section	1 Ea.
Struct. Excav *	506 C.Y.

* Subsidiary to Item 514.

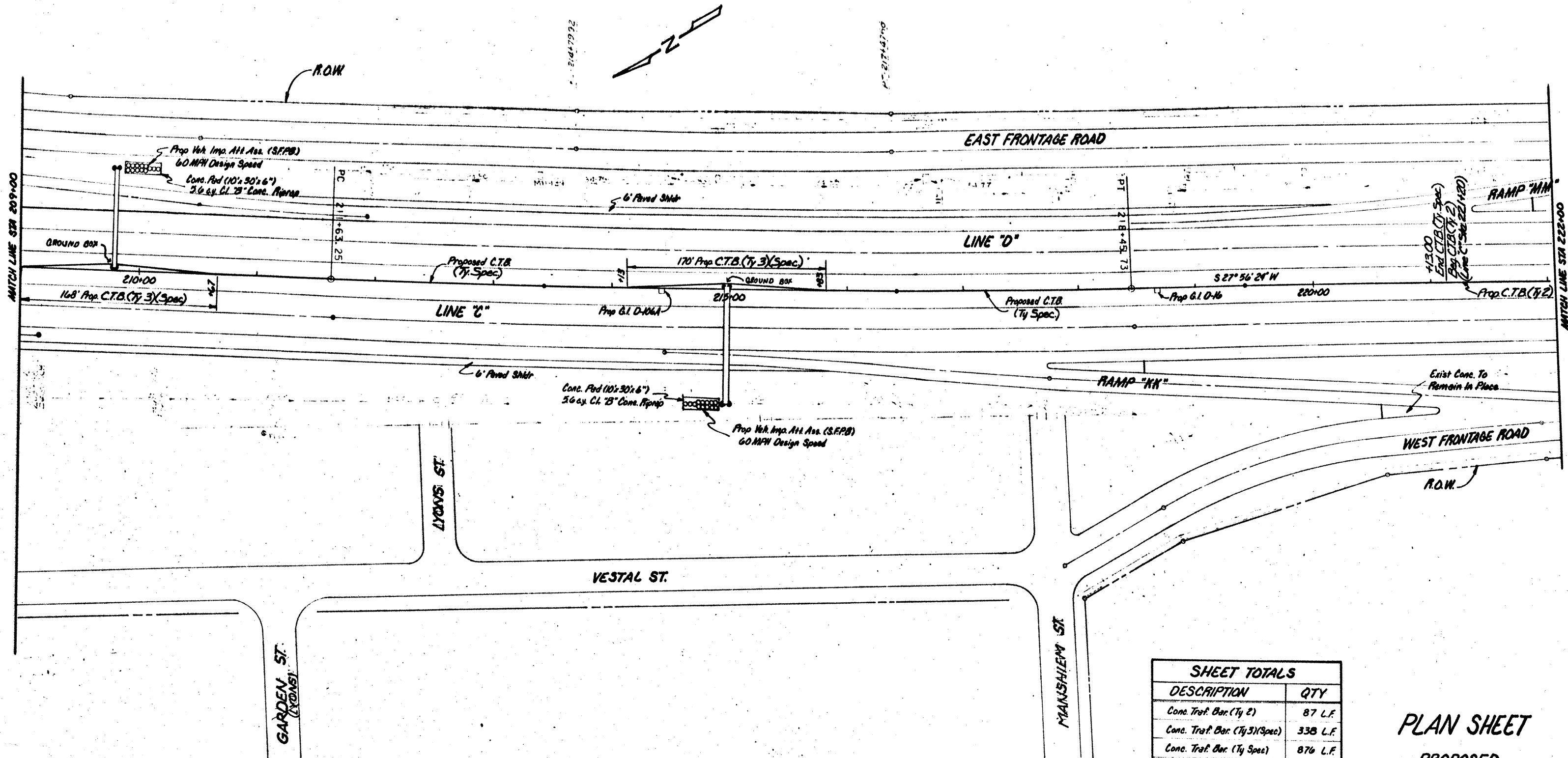
PLAN SHEET
PROPOSED

602

Scale: 1"=40'

SHEET 17 OF 28 SHEETS

FED. DIST. NO.	STATE	FEDERAL PROJECT NO.	SHEET NO.
16	TEXAS	HES 0005 (293)	62
STATE DIST. NO.	COUNTY	CONT. SECT.	JOB NO.
16	NUECES	326 03	61 SH 296



SHEET TOTALS	
DESCRIPTION	QTY
Conc. Traf. Bar. (Ty 2)	87 L.F.
Conc. Traf. Bar. (Ty 3)(Spec)	338 L.F.
Conc. Traf. Bar. (Ty Spec)	876 L.F.
Veh Imp. Att. Ass. (S.F.P.D.)	2 Ea.
Conc. Class "B" Riprap	112 C.Y.
Struct. Excav.*	790 C.Y.

Subsidiary to Item 514.

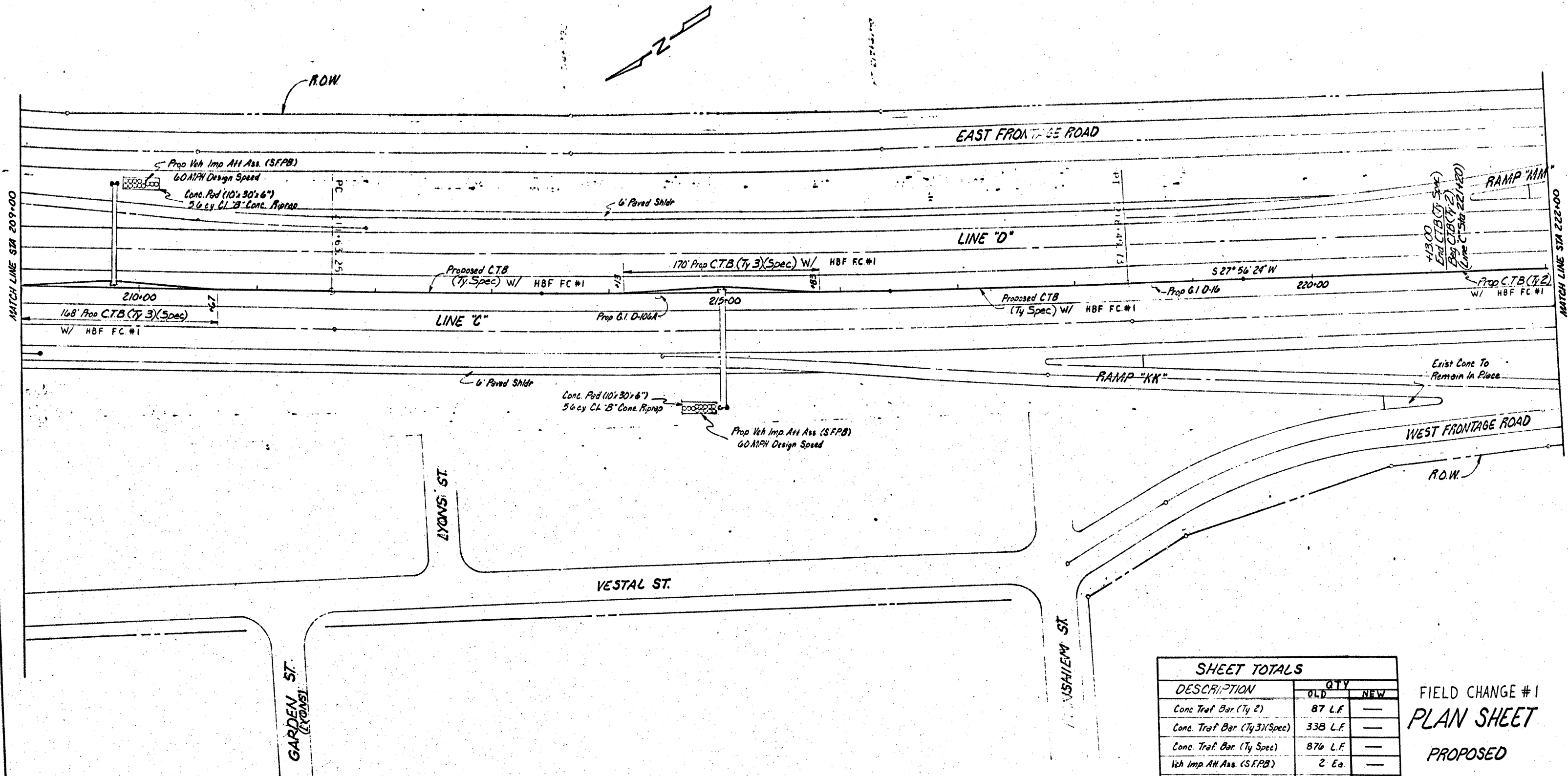
PLAN SHEET
PROPOSED

63

Scale: 1"=40'

SHEET 18 OF 28 SHEETS

FED. NO.	STATE	FEDERAL PROJECT NO.	SHEET NO.
6	TEXAS	HES 0005 (293)	63
STATE DIST. NO.	COUNTY	CONTRACT NO.	HIGHWAY NO.
16	NUECES	320 03 61	SN 286



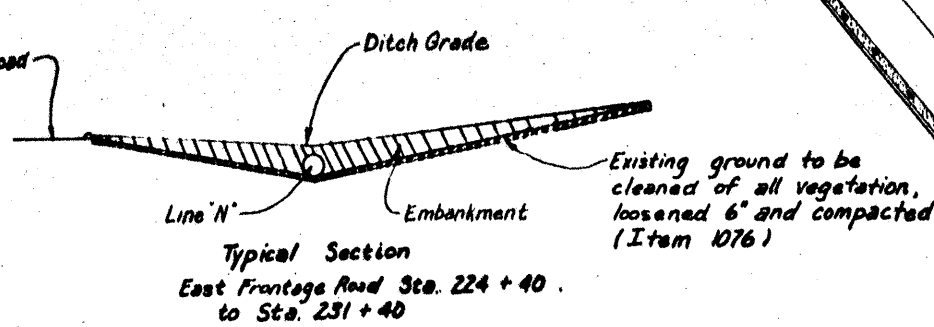
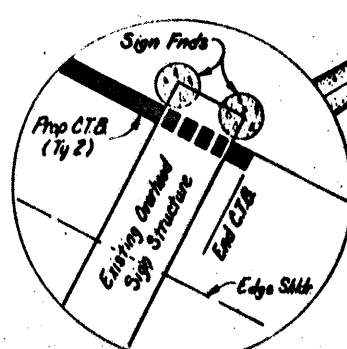
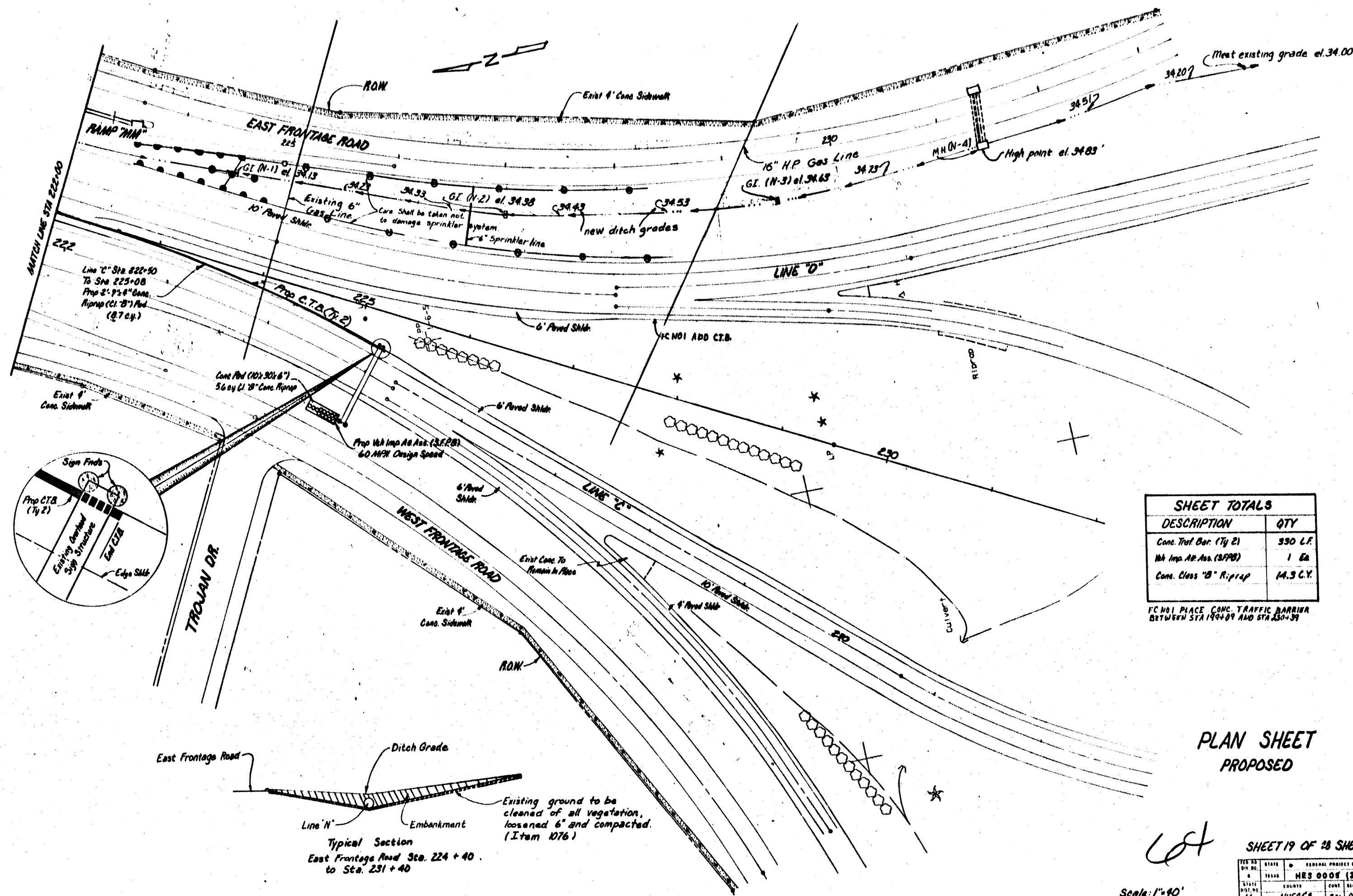
SHEET TOTALS		
DESCRIPTION	QTY	
	OLD	NEW
Conc. Traf. Bar (Ty 2)	87 L.F.	—
Conc. Traf. Bar (Ty 3) (Spec)	338 L.F.	—
Conc. Traf. Bar (Ty Spec)	876 L.F.	—
Veh Imp Att Ass. (SFPB)	2 Ea.	—
Conc. Class "B" Riprap	112 CY.	—
Struct. Excav. ⁷	790 CY.	—
Hdlt. Bar. Fence	—	1301 L.F.
Subsidiary to Item 514		

FIELD CHANGE #1
PLAN SHEET
 PROPOSED

63A

Scale: 1"=40'

SHEET 18 OF 28 SHEETS				
FED. PROJ. NO.	STATE	FEDERAL PROJECT NO.	SHEET NO.	
6	TEXAS	HES 0005 (293)	63A	
STATE DIST. NO.	COUNTY	CONT. SECT.	JOB	HIGHWAY NO.
16	NUECES	326-03	61	SH 286



SHEET TOTALS	
DESCRIPTION	QTY
Conc. Traff. Bar. (Ty 2)	330 L.F.
Wt. Imp. At. Ass. (S.F.P.B.)	1 Ea.
Conc. Class "B" Riprap	14.3 C.Y.

FC NO1 PLACE CONC. TRAFFIC BARRIER BETWEEN STA 194+89 AND STA 430+39

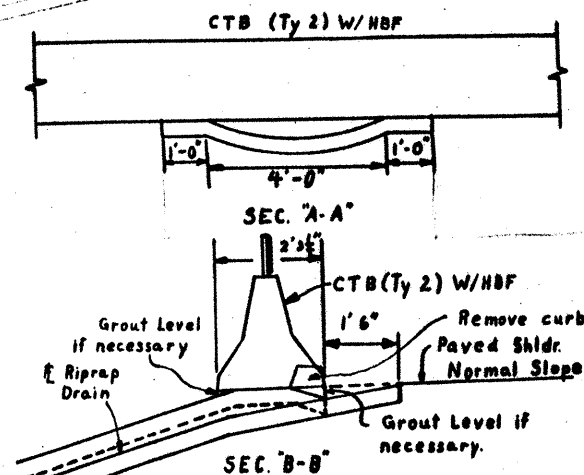
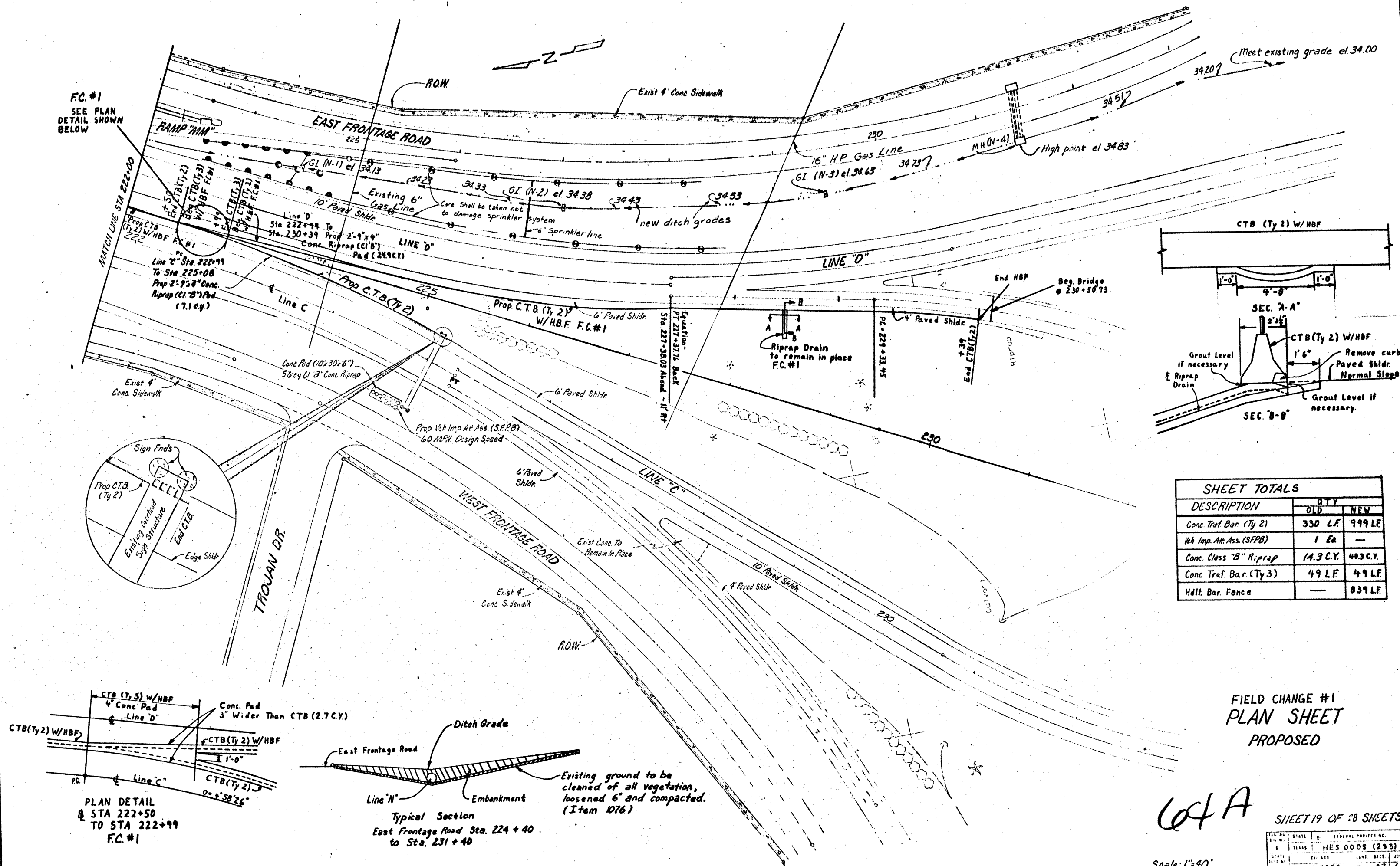
PLAN SHEET
PROPOSED

SHEET 19 OF 28 SHEETS

FED. RD. DIST. NO.	STATE	FEDERAL PROJECT NO.	SHEET NO.
16	TEXAS	HES 0008 (293)	64
COUNTY	CONTRACT	SECTION	JOB NO.
NUECES	326.03	61	34206

Scale: 1"=40'

FC #1
SEE PLAN
DETAIL SHOWN
BELOW



SHEET TOTALS		
DESCRIPTION	QTY	
	OLD	NEW
Conc. Traf. Bar. (Ty 2)	330 LF	999 LF
Veh Imp. Att. Ass. (SFPB)	1 Ea	—
Conc. Class "B" Riprap	14.3 C.Y.	40.3 C.Y.
Conc. Traf. Bar. (Ty 3)	49 LF	49 LF
Hdlt. Bar. Fence	—	839 LF

FIELD CHANGE #1
PLAN SHEET
PROPOSED

Lot A

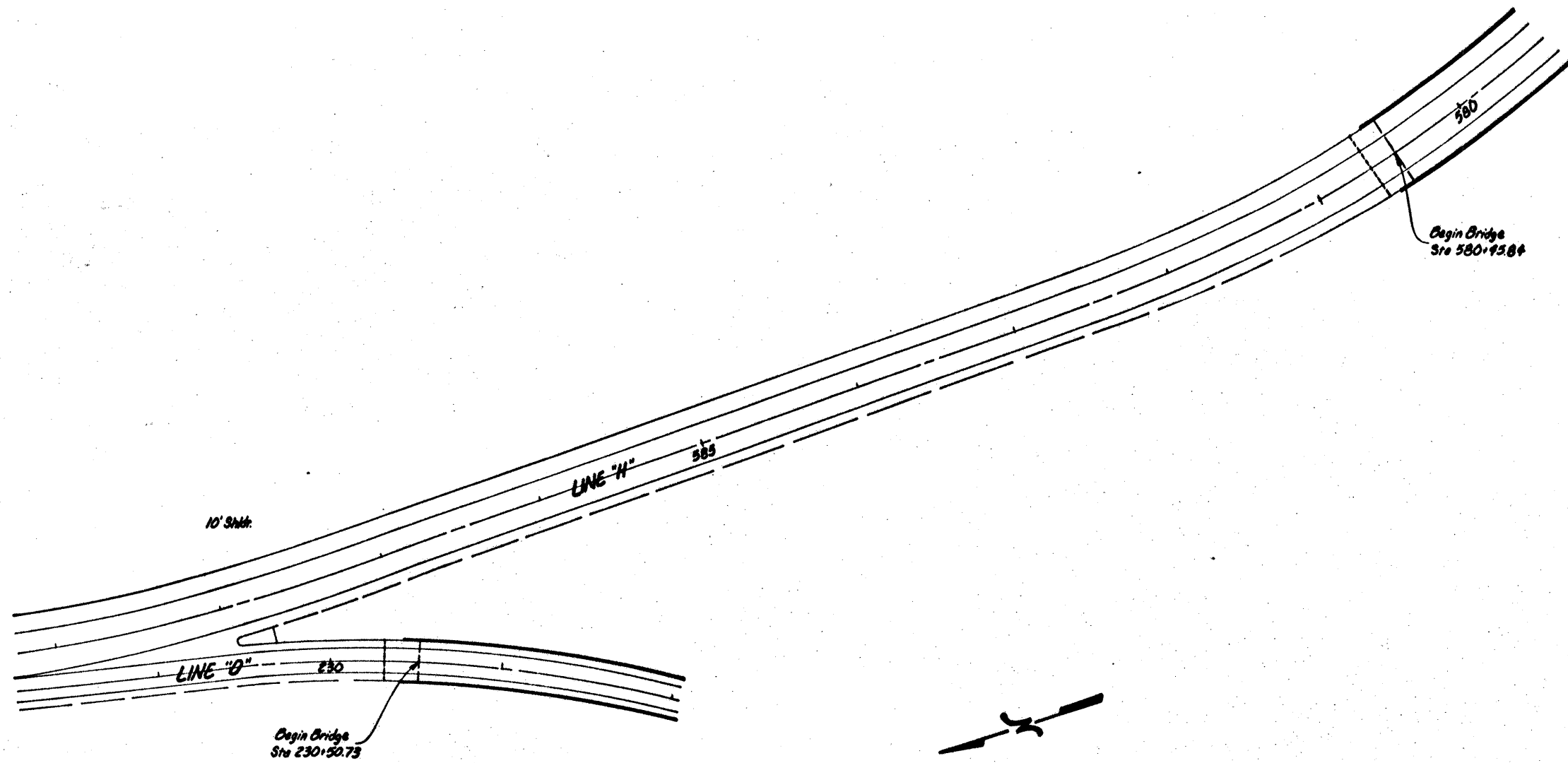
SHEET 19 OF 28 SHEETS

STATE	FEDERAL PROJECT NO.	SHEET NO.
TEXAS	HES 0005 (233)	64A
COUNTY	LINE SECT. JOB	PLAN NO.
10	NUECES 326.03	61 SH286

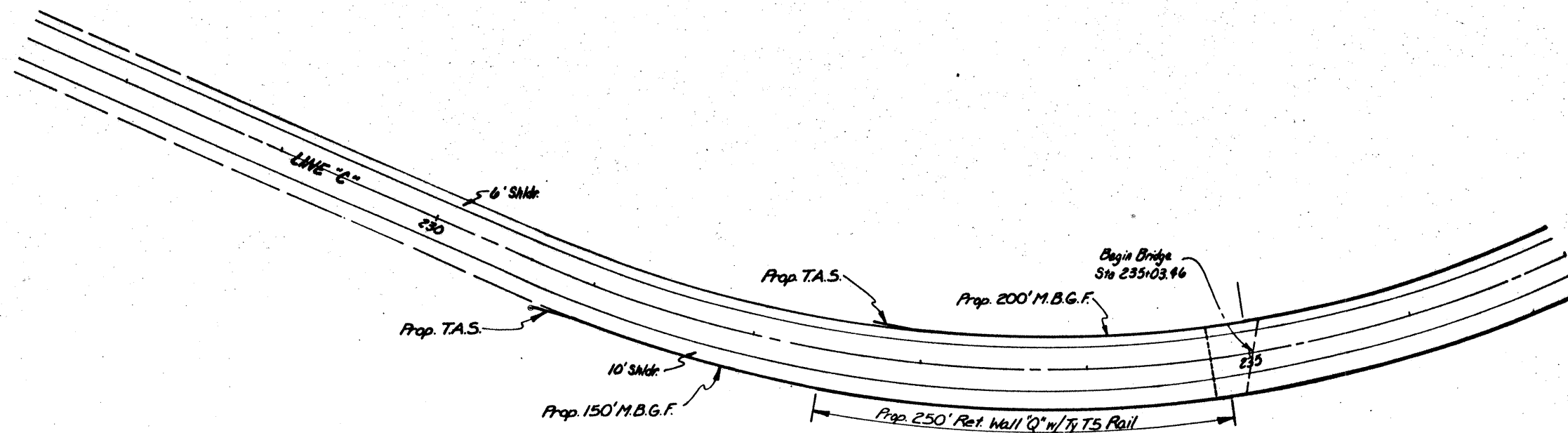
Scale: 1"=40'

PLAN DETAIL
@ STA 222+50
TO STA 222+99
FC #1

Typical Section
East Frontage Road Sta. 224 + 40
to Sta. 231 + 40



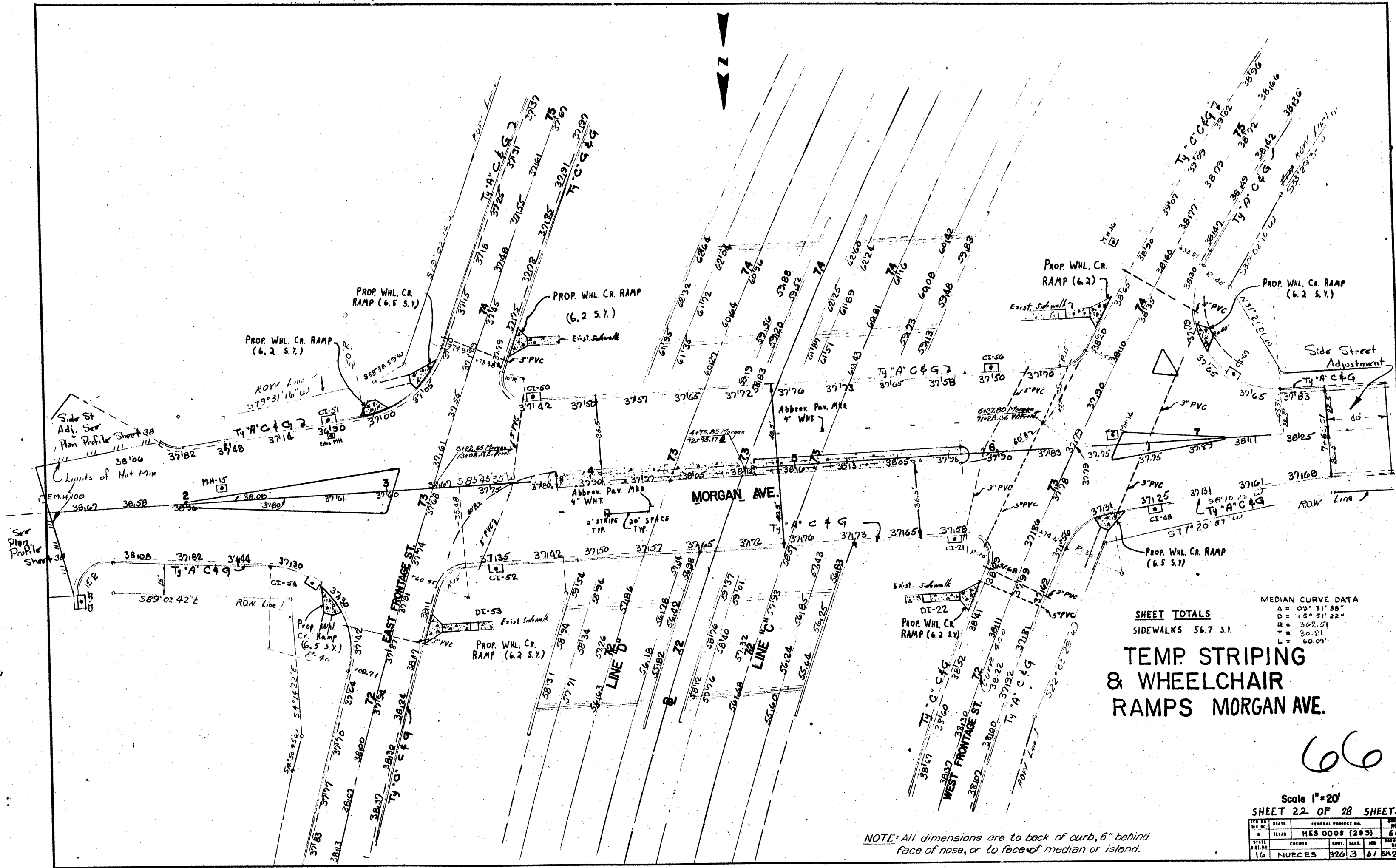
Sheet Totals
 Metal Beam Guard Fence 350 L.F.
 Terminal Anchor Section 2 Ea.



PLAN SHEET (PROPOSED)

64B

Sheet 20 of 23 Sheets									
FIG. NO.	STATE	FEDERAL PROJECT NO.	SHEET NO.						
10	TEXAS	HES 0003 (293)	64B						
STATE DIST. NO.	COUNTY	CONT.	SECT.	JOB	HIGHWAY NO.				
10	Nueces	326	03	61	SH 226				



SHEET TOTALS
 SIDEWALKS 56.7 S.Y.

**TEMP. STRIPING
 & WHEELCHAIR
 RAMPS MORGAN AVE.**

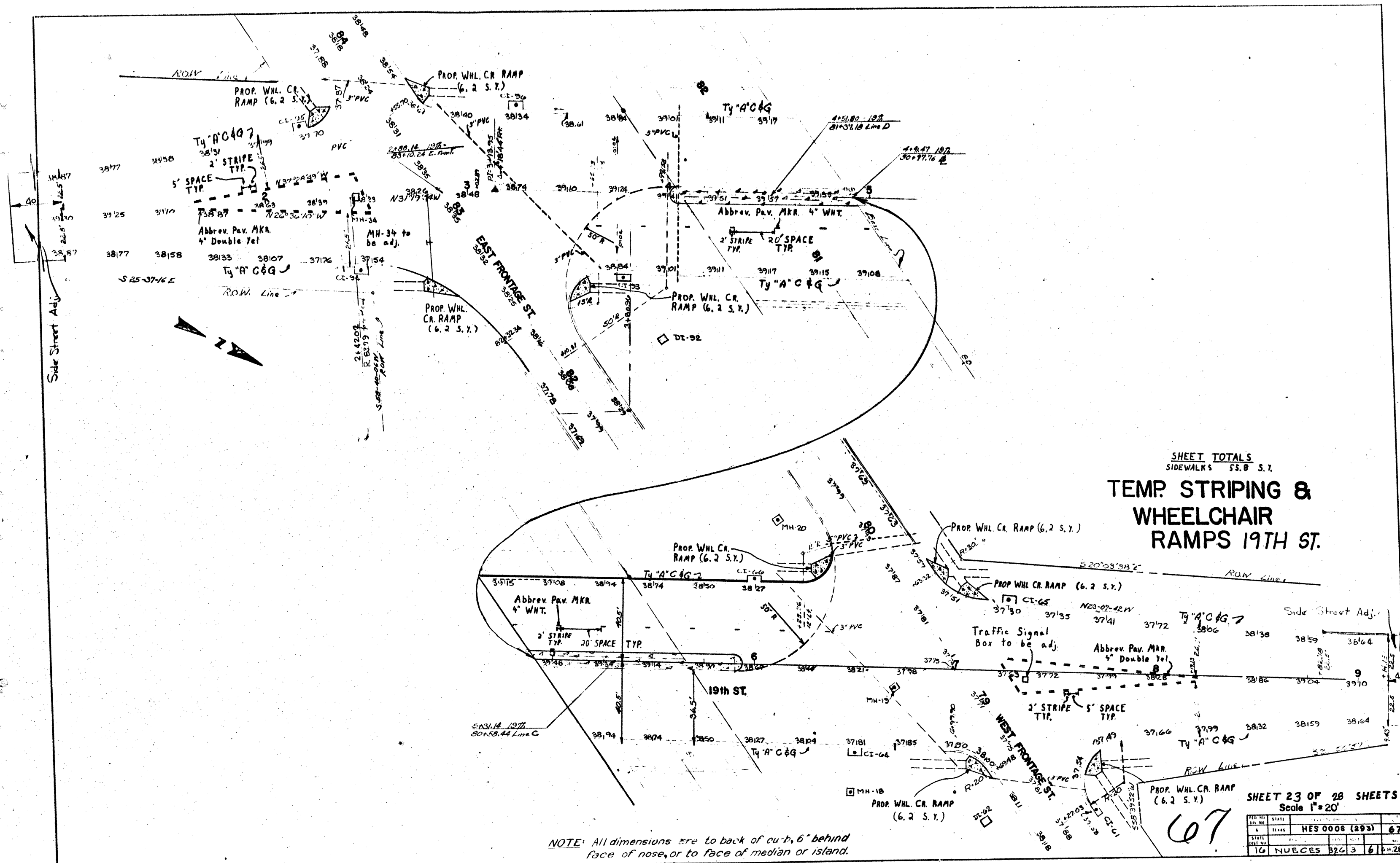
66

NOTE: All dimensions are to back of curb, 6" behind face of nose, or to face of median or island.

Scale 1"=20'

SHEET 22 OF 28 SHEETS

FED. NO.	STATE	FEDERAL PROJECT NO.	SHEET NO.
16	TEXAS	HES 0003 (293)	66
DIST. NO.	COUNTY	CONTRACT NO.	SECTION NO.
16	NUECES	320	3



SHEET TOTALS
SIDEWALKS 55.8 S.Y.

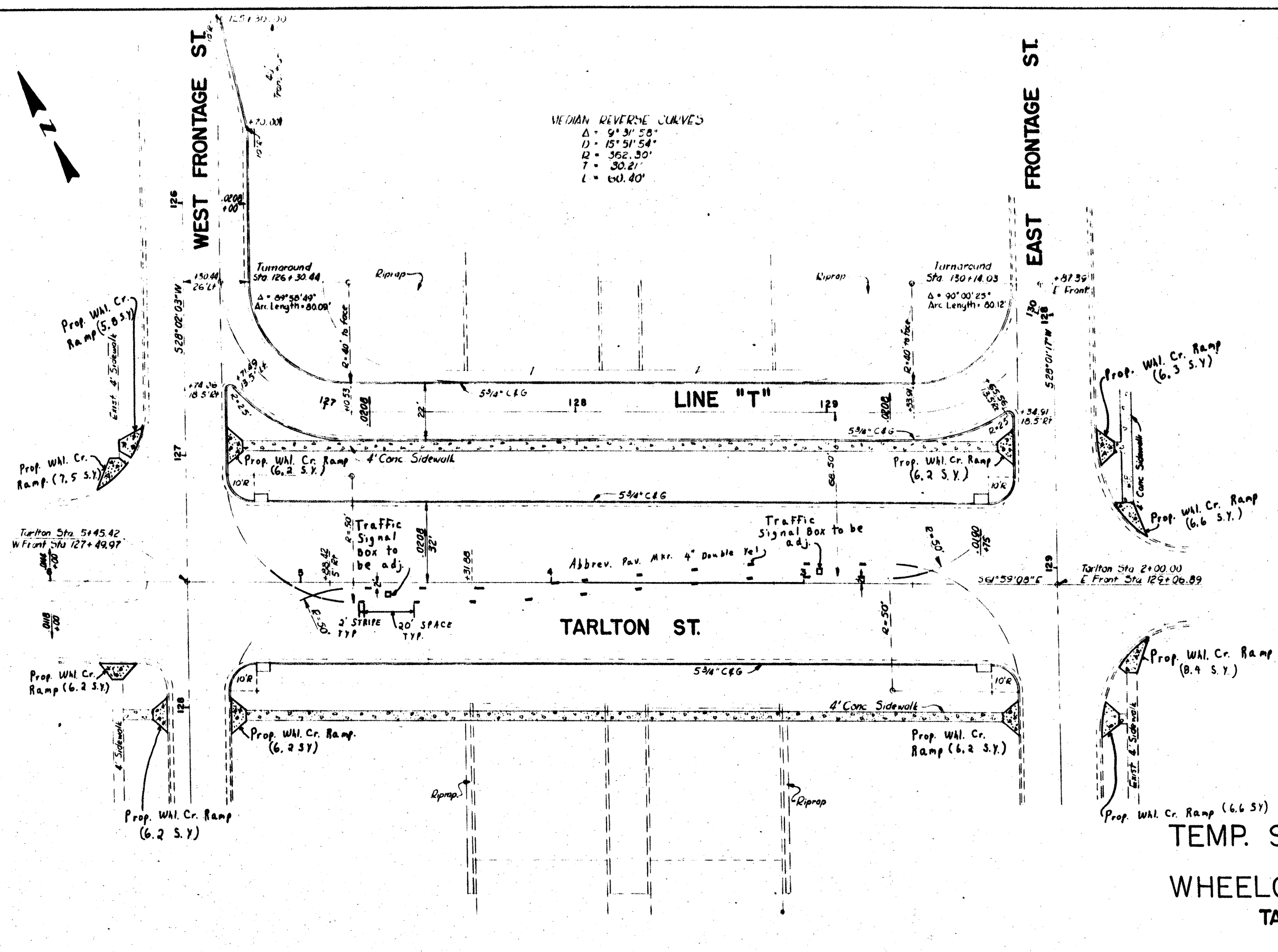
TEMP. STRIPING & WHEELCHAIR RAMPS 19TH ST.

NOTE: All dimensions are to back of curb, 6" behind face of nose, or to face of median or island.

67

SHEET 23 OF 28 SHEETS
Scale 1"=20'

PROJECT NO.	STATE	SECTION	SHEET NO.
HES 0006 (203)	TEXAS	67	
DATE	BY	CHECKED	APPROVED
10	NUCES	326	3



MEDIAN REVERSE CURVES
 $\Delta = 9^\circ 31' 58''$
 $D = 15^\circ 51' 54''$
 $R = 362.30'$
 $T = 30.21'$
 $L = 60.40'$

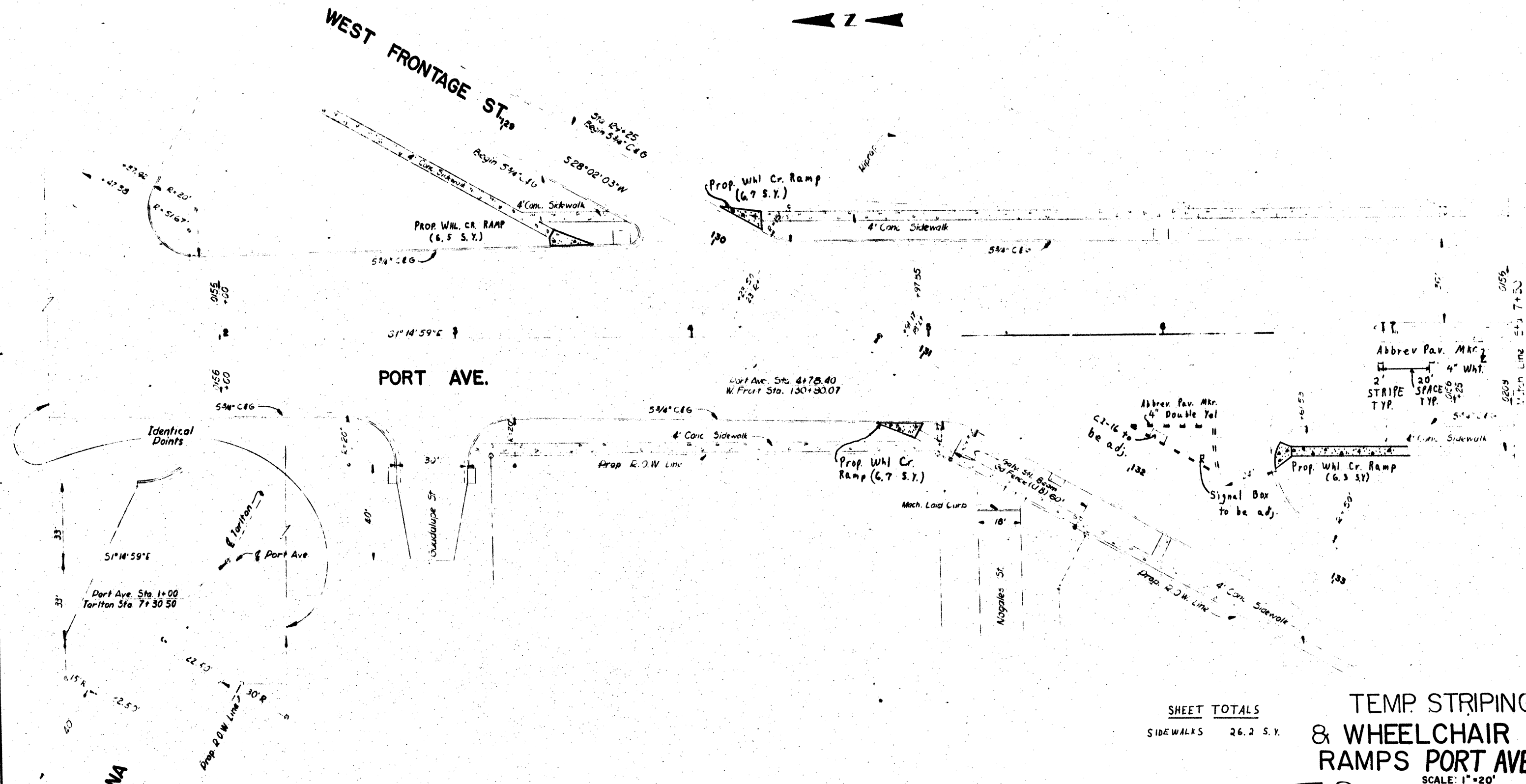
SHEET TOTALS
 SIDEWALK 78.4 S.Y.

**TEMP. STRIPING AND
 WHEELCHAIR RAMPS
 TARLTON ST.**

SCALE: 1"=20'

69

SHEET 25 OF 28 SHEETS		SHEET NO.	
STATE	TEXAS	FEDERAL PROJECT NO.	HES 0003 (293)
COUNTY	NUECES	CONTRACT NO.	326 3 61
DIST. NO.	16	SECTION NO.	SH 200



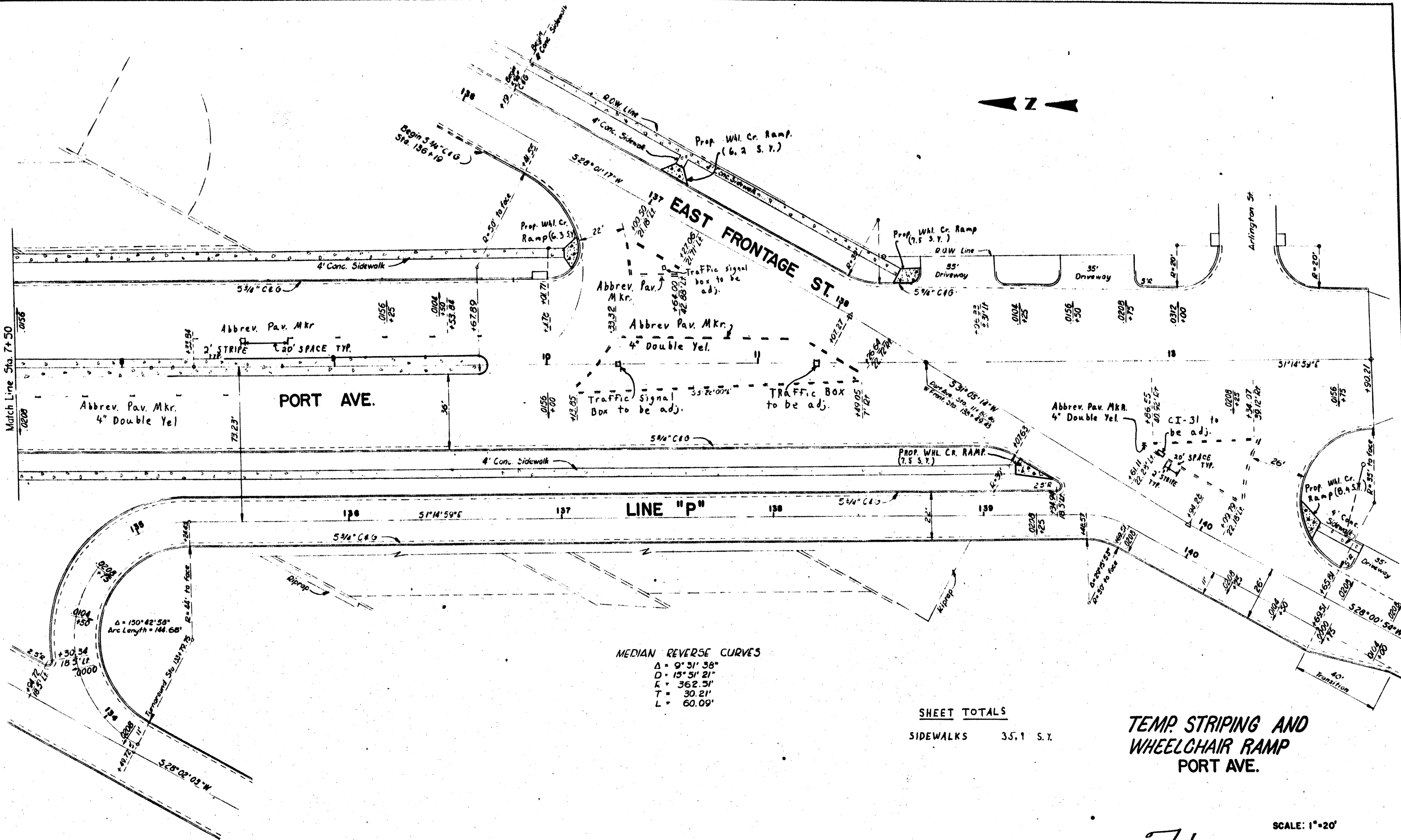
SHEET TOTALS
SIDEWALKS 26.2 S.Y.

TEMP. STRIPING & WHEELCHAIR RAMPS PORT AVE.

SCALE: 1"=20'

70

SHEET	26	OF	28	SHEETS
FED. RD. DIST. NO.	16	STATE	TEXAS	FEDERAL PROJECT NO.
16				HES 0005 (293)
STATE DIST. NO.	16	COUNTY	NUECES	CONTRACT NO.
				326 3 61
				SH 206



MEDIAN REVERSE CURVES
 $\Delta = 9^{\circ} 31' 38''$
 $D = 13^{\circ} 51' 21''$
 $E = 362.31'$
 $T = 30.21'$
 $L = 60.09'$

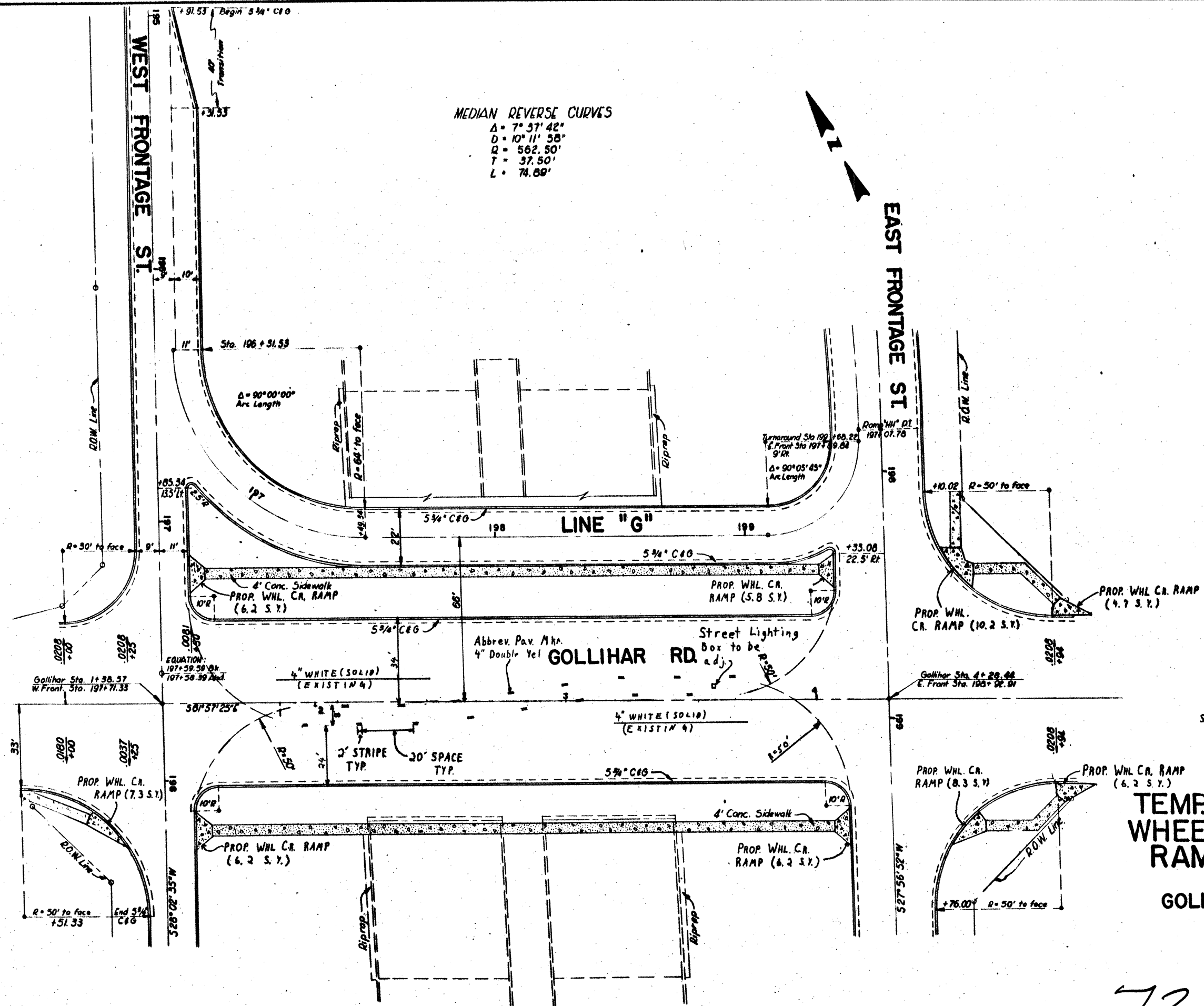
SHEET TOTALS
 SIDEWALKS 35.1 S.Y.

TEMP. STRIPING AND
 WHEELCHAIR RAMP
 PORT AVE.

SCALE: 1"=20'

SHEET 27 OF 28 SHEETS		FEDERAL PROJECT NO.		SHEET NO.	
6	16448	HES 000S (293)		71	
STATE	COUNTY	CONTRACT	SECTION	POST MILE	RIGHTWAY
16	NUECES	32	3	61	SH286

$\Delta = 7^{\circ} 37' 42''$
 $D = 10^{\circ} 11' 58''$
 $R = 562.50'$
 $T = 37.50'$
 $L = 74.89'$



SHEET TOTALS
SIDEWALKS 61.1 S.Y.

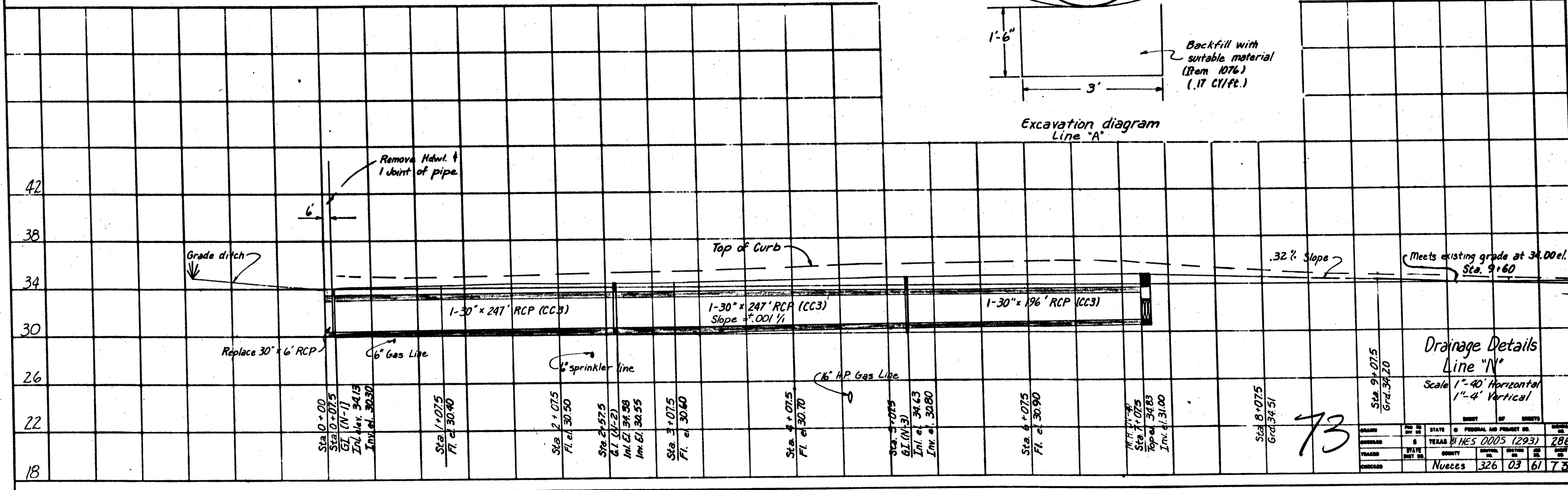
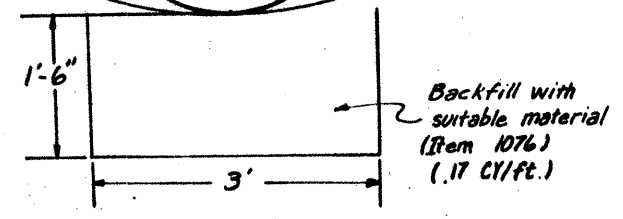
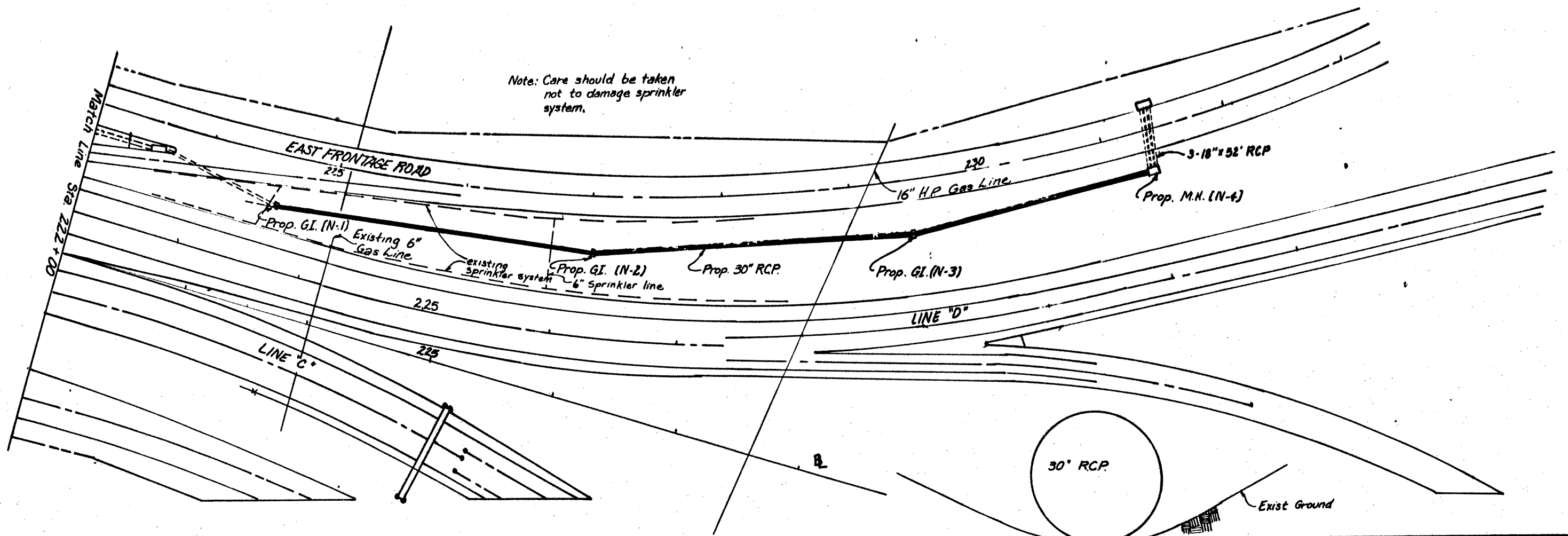
TEMP. STRIPING & WHEELCHAIR RAMPS

GOLLIHAR RD.

SCALE: 1" = 20'

72

SHEET 28		OF 28		SHEETS	
FED. NO.	STATE	FEDERAL PROJECT NO.			SHEET NO.
0	TEXAS	HES 0003 (293)			72
STATE DIST. NO.	COUNTY	CONT.	SECT.	JOB	HIGHWAY NO.
16	NUECES	326	3	61	SH 286



DEPT. OF
TRANSPORTATION

DATE	BY	STATE	FEDERAL AID PROJECT NO.	SHEET NO.
NOV 28 1960	W. H. S.	TEXAS	WES 0005 (293)	286
TRACED	BY	COUNTY	SECTION	SHEET NO.
NOV 28 1960	W. H. S.	Nueces	326 03 61	73

SUMMARY OF LIGHTING

NO.	B-L LOCATIONS OF ASSEM.	TYPE
A-1	STA. 4 + 68 L. 180'	EXISTING
A-2	STA. 6 + 34 L. 134'	EXISTING
A-3	STA. 6 + 60 L. 265'	EXISTING
A-4	STA. 8 + 22 L. 116'	EXISTING
A-5	STA. 9 + 86 L. 88'	RELOCATE / FND
A-6	STA. 11 + 34 L. 110'	EXISTING
A-7	STA. 12 + 39 L. 88'	EXISTING
A-8	STA. 13 + 72 L. 139'	EXISTING
A-9	STA. 14 + 23 L. 78'	EXISTING
A-10	STA. 15 + 36 L. 78'	EXISTING
A-11	STA. 17 + 28 L. 134'	EXISTING
A-12	STA. 17 + 72 L. 77'	EXISTING
A-13	STA. 19 + 44 L. 78'	EXISTING
A-14	STA. 21 + 26 L. 78'	EXISTING
A-15	STA. 23 + 00 L. 85'	EXISTING
A-16	STA. 24 + 79 L. 66'	EXISTING
A-17	STA. 26 + 30 L. 153'	EXISTING
A-18	STA. 26 + 50 L. 68'	EXISTING
A-19	STA. 27 + 39 L. 100'	EXISTING
A-20	STA. 29 + 69 L. 80'	EXISTING
A-21	STA. 31 + 36 L. 58'	EXISTING
A-22	STA. 33 + 07 L. 56'	EXISTING
A-23	STA. 34 + 77 L. 56'	EXISTING
A-24	STA. 36 + 56 L. 57'	EXISTING
A-25	STA. 38 + 24 L. 56'	EXISTING
A-26	STA. 39 + 30 L. 56'	EXISTING
A-27	STA. 41 + 63 L. 56'	EXISTING
A-28	STA. 48 + 96 L. 101'	EXISTING
A-29	STA. 4 + 96 R. 14'	EXISTING
A-30	STA. 5 + 00 R. 310'	EXISTING
A-31	STA. 5 + 46 R. 180'	EXISTING
A-32	STA. 7 + 06 R. 153'	EXISTING
A-33	STA. 8 + 83 R. 109'	EXISTING
A-34	STA. 10 + 63 R. 75'	EXISTING
A-35	STA. 12 + 46 R. 85'	EXISTING
A-36	STA. 13 + 46 R. 155'	EXISTING
A-37	STA. 14 + 29 R. 78'	EXISTING
A-38	STA. 15 + 90 R. 78'	EXISTING
A-39	STA. 17 + 16 R. 170'	EXISTING
A-40	STA. 17 + 62 R. 77'	EXISTING
A-41	STA. 19 + 42 R. 77'	EXISTING
A-42	STA. 21 + 02 R. 81'	EXISTING
A-43	STA. 22 + 70 R. 95'	EXISTING
A-44	STA. 24 + 10 R. 103'	EXISTING
A-45	STA. 25 + 69 R. 68'	EXISTING
A-46	STA. 26 + 63 R. 139'	EXISTING
A-47	STA. 27 + 44 R. 65'	EXISTING
A-48	STA. 29 + 12 R. 86'	RELOCATE / FND
A-49	STA. 30 + 76 R. 77'	EXISTING
A-50	STA. 32 + 49 R. 68'	EXISTING
A-51	STA. 34 + 20 R. 68'	EXISTING
A-52	STA. 36 + 00 R. 63'	EXISTING
A-53	STA. 37 + 73 R. 53'	EXISTING
A-54	STA. 39 + 45 R. 55'	EXISTING
A-55	STA. 41 + 27 R. 55'	EXISTING
A-56	STA. 51 + 32 R. 109'	EXISTING
A-57	STA. 12 + 00 L. 5'	TY SP 48 S-B (4KW) S
A-58	STA. 15 + 00 O'	TY SP 48 S-B (4KW) S
A-59	STA. 18 + 00 O'	TY SP 48 S-B (4KW) S
A-60	STA. 21 + 00 O'	TY SP 48 S-B (4KW) S
A-61	STA. 24 + 00 O'	TY SP 48 S-B (4KW) S
A-62	STA. 27 + 00 O'	TY SP 48 S-B (4KW) S
A-63	STA. 29 + 55 O'	TY SP 48 S-B (4KW) S

* FUTURE

B-1	STA. 44 + 60 O'	TY SP 48 S-B (4KW) S
B-2	STA. 47 + 60 O'	TY SP 48 S-B (4KW) S
B-3	STA. 50 + 60 O'	TY SP 48 S-B (4KW) S
B-4	STA. 53 + 30 O'	TY SP 48 S-B (4KW) S
B-5	STA. 56 + 60 O'	TY SP 48 S-B (4KW) S
B-6	STA. 59 + 60 O'	TY SP 48 S-B (4KW) S
B-7	STA. 62 + 93 O'	TY SP 48 S-B (4KW) S
B-8	STA. 65 + 60 O'	TY SP 48 S-B (4KW) S
B-9	STA. 67 + 30 L. 107'	EXISTING
B-10	STA. 68 + 39 R. 107'	EXISTING
B-11	STA. 68 + 60 O'	TY SP 48 S-B (4KW) S
B-12	STA. 71 + 60 O'	EXISTING
B-13	STA. 71 + 85 L. 125'	EXISTING
B-14	STA. 73 + 77 R. 100'	EXISTING
B-15	STA. 74 + 25 O'	EXISTING
B-16	STA. 77 + 00 O'	TY SP 48 S-B (4KW) S
C-1	STA. 79 + 67 O'	EXISTING
C-2	STA. 79 + 77 R. 140'	EXISTING
C-3	STA. 81 + 22 L. 130'	EXISTING
C-4	STA. 80 + 87 R. 150'	EXISTING
C-5	STA. 82 + 35 L. 130'	EXISTING
C-6	STA. 82 + 32 O'	EXISTING
C-7	STA. 84 + 54 O'	TY SP 48 S-B (4KW) S
C-8	STA. 85 + 00 L. 30'	TY SP 48 S-B (4KW) S
C-9	STA. 86 + 00 R. 30'	TY SP 48 S-B (4KW) S
C-10	STA. 86 + 83 O'	EXISTING
C-11	STA. 89 + 12 O'	EXISTING
C-12	STA. 89 + 35 L. 135'	EXISTING
C-13	STA. 90 + 30 R. 135'	EXISTING
C-14	STA. 91 + 35 O'	EXISTING
C-15	STA. 92 + 00 L. 140'	EXISTING
C-16	STA. 93 + 75 O'	EXISTING
C-17	STA. 94 + 05 R. 140'	EXISTING
C-18	STA. 96 + 00 O'	EXISTING
C-19	STA. 97 + 20 L. 98'	TY SP 48 S-B (4KW) S
C-20	STA. 98 + 31 O'	EXISTING
C-21	STA. 98 + 80 R. 90'	TY SP 48 S-B (4KW) S
C-22	STA. 100 + 63 O'	EXISTING
C-23	STA. 101 + 40 L. 135'	EXISTING
C-24	STA. 102 + 20 R. 140'	EXISTING
C-25	STA. 102 + 87 O'	EXISTING
C-26	STA. 104 + 30 R. 145'	EXISTING
C-27	STA. 105 + 13 O'	EXISTING
C-28	STA. 105 + 50 L. 145'	EXISTING
C-29	STA. 107 + 39 O'	EXISTING
C-30	STA. 109 + 65 O'	EXISTING
C-31	STA. 109 + 30 R. 90'	EXISTING
C-32	STA. 110 + 40 L. 90'	EXISTING
C-33	STA. 112 + 20 O'	TY SP 48 S-B (4KW) S
C-34	STA. 114 + 13 O'	EXISTING
C-35	STA. 116 + 37 O'	EXISTING
C-36	STA. 118 + 90 O'	TY SP 48 S-B (4KW) S
C-37	STA. 119 + 90 L. 85'	EXISTING
C-38	STA. 120 + 89 O'	EXISTING
D-1	STA. 120 + 00 R. 90'	EXISTING
D-2	STA. 123 + 64 O'	EXISTING
D-3	STA. 124 + 90 R. 135'	EXISTING
D-4	STA. 125 + 42 L. 140'	EXISTING
D-5	STA. 126 + 61 O'	EXISTING
D-6	STA. 127 + 70 L. 150'	EXISTING
D-7	STA. 127 + 70 R. 150'	EXISTING
D-8	STA. 129 + 60 O'	EXISTING
D-9	STA. 129 + 15 R. 275'	EXISTING
D-10	STA. 131 + 45 R. 145'	EXISTING
D-11	STA. 132 + 61 R. 6'	EXISTING
D-12	STA. 136 + 10 L. 185'	EXISTING
D-13	STA. 139 + 60 R. 6'	EXISTING
D-14	STA. 133 + 20 R. 125'	EXISTING
D-15	STA. 137 + 05 L. 145'	EXISTING

D-16	STA. 138 + 60 R. 270'	TY SP 48 S-B (4KW) S
D-17	STA. 141 + 60 O'	TY SP 48 S-B (4KW) S
D-18	STA. 144 + 60 O'	TY SP 48 S-B (4KW) S
D-19	STA. 145 + 00 R. 95'	EXISTING
D-20	STA. 147 + 60 O'	TY SP 48 S-B (4KW) S
D-21	STA. 148 + 83 L. 65'	EXISTING
D-22	STA. 150 + 60 O'	TY SP 48 S-B (4KW) S
D-23	STA. 154 + 00 O'	TY SP 48 S-B (4KW) S
D-24	STA. 156 + 58 O'	EXISTING
D-25	STA. 159 + 15 O'	TY SP 48 S-B (4KW) S
D-26	STA. 162 + 53 O'	EXISTING
D-27	STA. 163 + 53 R. 78'	EXISTING
D-28	STA. 164 + 21 L. 78'	EXISTING
D-29	STA. 165 + 64 O'	EXISTING
E-1	STA. 168 + 59 O'	EXISTING
E-2	STA. 169 + 49 L. 160'	EXISTING
E-3	STA. 169 + 34 R. 90'	EXISTING
E-4	STA. 171 + 59 O'	EXISTING
E-5	STA. 174 + 60 O'	TY SP 48 S-B (4KW) S
E-6	STA. 176 + 85 L. 85'	EXISTING
E-7	STA. 177 + 60 O'	TY SP 48 S-B (4KW) S
E-8	STA. 180 + 60 O'	TY SP 48 S-B (4KW) S
E-9	STA. 183 + 90 O'	TY SP 48 S-B (4KW) S
E-10	STA. 187 + 00 O'	TY SP 48 S-B (4KW) S
E-11	STA. 189 + 60 O'	EXISTING
E-12	STA. 192 + 53 O'	EXISTING
E-13	STA. 195 + 62 O'	EXISTING
E-14	STA. 194 + 42 L. 100'	EXISTING
E-15	STA. 197 + 52 L. 130'	EXISTING
E-16	STA. 197 + 42 R. 155'	EXISTING
E-17	STA. 198 + 61 R. 7'	EXISTING
E-18	STA. 201 + 43 O'	TY SP 48 S-B (4KW) S
E-19	STA. 204 + 43 O'	TY SP 48 S-B (4KW) S
E-20	STA. 207 + 43 O'	TY SP 48 S-B (4KW) S
E-21	STA. 210 + 70 O'	TY SP 48 S-B (4KW) S
F-1	STA. 213 + 43 O'	TY SP 48 S-B (4KW) S
F-2	STA. 216 + 43 O'	TY SP 48 S-B (4KW) S
F-3	STA. 219 + 43 O'	TY SP 48 S-B (4KW) S
F-4	STA. 222 + 43 O'	TY SP 48 S-B (4KW) S
F-5	STA. 221 + 40 R. 80	EXISTING
F-6	STA. 223 + 40 L. 80	EXISTING
F-7	STA. 225 + 03	EXISTING

ROWY ILLUMINATION SUMMARY

DESCRIPTION	UNIT	QUANT
ROWY ILL. ASSEM. (TY SP 48 S-B (4KW) S)	EA.	4
ROWY ILL. ASSEM. (TY SP 48 S-B (4KW) S)	EA.	33
RELOC. ROWY ILL. ASSEM.	EA.	2
ROWY ILL. ASSEM. FND (TYA)	EA.	2
REMOVE ROWY ILL. ASSEM.	EA.	51
COND. (PVC) (SCH 40) (1 1/2 IN)	L.F.	19,500
ELEC. COND. (NO. 6) (TY XHHW)	L.F.	21,000
ELEC. COND. (NO. 4) (TY XHHW)	L.F.	3,500
GROUND BOX (RPM) (TY 1)	EA.	28

REMOVAL OF ROWY ASSEMBLIES

NO.	B-L LOCATIONS OF ASSEM.
R-1	STA. 43 + 25 L. 67'
R-2	STA. 45 + 00 L. 66'
R-3	STA. 46 + 66 L. 66'
R-4	STA. 48 + 16 L. 66'
R-5	STA. 42 + 96 R. 60'
R-6	STA. 44 + 71 R. 67'
R-7	STA. 46 + 44 R. 66'
R-8	STA. 48 + 14 R. 66'
R-9	STA. 53 + 39 L. 95'
R-10	STA. 55 + 30 R. 89'
R-11	STA. 64 + 43 L. 90'
R-12	STA. 64 + 64 R. 86'
R-13	STA. 49 + 27 R. 1'
R-14	STA. 51 + 51 O'
R-15	STA. 53 + 78 O'
R-16	STA. 53 + 03 R. 1'
R-17	STA. 58 + 31 O'
R-18	STA. 60 + 50 O'
R-19	STA. 62 + 75 L. 1'
R-20	STA. 65 + 01 L. 1'
R-21	STA. 67 + 25 O'
R-22	STA. 69 + 53 O'
R-23	STA. 76 + 09 O'
R-24	STA. 77 + 91 L. 1'
R-25	STA. 111 + 89 L. 2'
R-26	STA. 118 + 64 L. 2'
R-27	STA. 138 + 60 R. 1'
R-28	STA. 141 + 60 R. 1'
R-29	STA. 144 + 62 O'
R-30	STA. 147 + 60 R. 1'
R-31	STA. 150 + 60 O'
R-32	STA. 153 + 39 O'
R-33	STA. 174 + 60 L. 1'
R-34	STA. 177 + 60 L. 2'
R-35	STA. 180 + 62 L. 2'
R-36	STA. 183 + 60 O'
R-37	STA. 186 + 61 O'
R-38	STA. 201 + 62 R. 1'
R-39	STA. 204 + 62 L. 1'
R-40	STA. 207 + 62 O'
R-41	STA. 210 + 62 O'
R-42	STA. 213 + 43 O'
R-43	STA. 216 + 43 O'
R-44	STA. 219 + 43 O'
R-45	STA. 222 + 43 O'
R-46	STA. 85 + 00 L. 30'
R-47	STA. 85 + 00 R. 30'
R-48	STA. 97 + 20 L. 98'
R-49	STA. 98 + 50 R. 90'
R-50	STA. 153 + 15 O'
R-51	STA. 84 + 54 O'
A-6	SEE CIRCUIT "A"
A-7	SEE CIRCUIT "A"
A-9	SEE CIRCUIT "A"
A-10	SEE CIRCUIT "A"
A-12	SEE CIRCUIT "A"
A-13	SEE CIRCUIT "A"
A-14	SEE CIRCUIT "A"
A-15	SEE CIRCUIT "A"
A-18	SEE CIRCUIT "A"
A-19	SEE CIRCUIT "A"
A-34	SEE CIRCUIT "A"
A-35	SEE CIRCUIT "A"
A-37	SEE CIRCUIT "A"
A-38	SEE CIRCUIT "A"
A-40	SEE CIRCUIT "A"
A-41	SEE CIRCUIT "A"
A-42	SEE CIRCUIT "A"
A-43	SEE CIRCUIT "A"
A-45	SEE CIRCUIT "A"
A-47	SEE CIRCUIT "A"
A-48	SEE CIRCUIT "A"
A-49	SEE CIRCUIT "A"

* FUTURE

Rev. 7-12-85

GROUND BOXES

STA. 43 + 25 L. 67'
STA. 45 + 00 L. 66'
STA. 46 + 66 L. 66'
STA. 48 + 16 L. 66'
STA. 42 + 96 R. 60'
STA. 44 + 71 R. 67'
STA. 46 + 44 R. 66'
STA. 48 + 14 R. 66'
STA. 53 + 39 L. 95'
STA. 55 + 30 R. 89'
STA. 64 + 43 L. 90'
STA. 64 + 64 R. 86'
STA. 49 + 27 R. 1'
STA. 51 + 51 O'
STA. 53 + 78 O'
STA. 53 + 03 R. 1'
STA. 58 + 31 O'
STA. 60 + 50 O'
STA. 62 + 75 L. 1'
STA. 65 + 01 L. 1'
STA. 67 + 25 O'
STA. 69 + 53 O'
STA. 76 + 09 O'
STA. 77 + 91 L. 1'
STA. 111 + 89 L. 2'
STA. 118 + 64 L. 2'
STA. 138 + 60 R. 1'
STA. 141 + 60 R. 1'
STA. 144 + 62 O'
STA. 147 + 60 R. 1'
STA. 150 + 60 O'
STA. 153 + 39 O'
STA. 174 + 60 L. 1'
STA. 177 + 60 L. 2'
STA. 180 + 62 L. 2'
STA. 183 + 60 O'
STA. 186 + 61 O'
STA. 201 + 62 R. 1'
STA. 204 + 62 L. 1'
STA. 207 + 62 O'
STA. 210 + 62 O'
STA. 213 + 43 O'
STA. 216 + 43 O'
STA. 219 + 43 O'
STA. 222 + 43 O'
STA. 85 + 00 L. 30'
STA. 85 + 00 R. 30'
STA. 97 + 20 L. 98'
STA. 98 + 50 R. 90'
STA. 153 + 15 O'
STA. 84 + 54 O'
* STA. 31 + 00 R. 10'

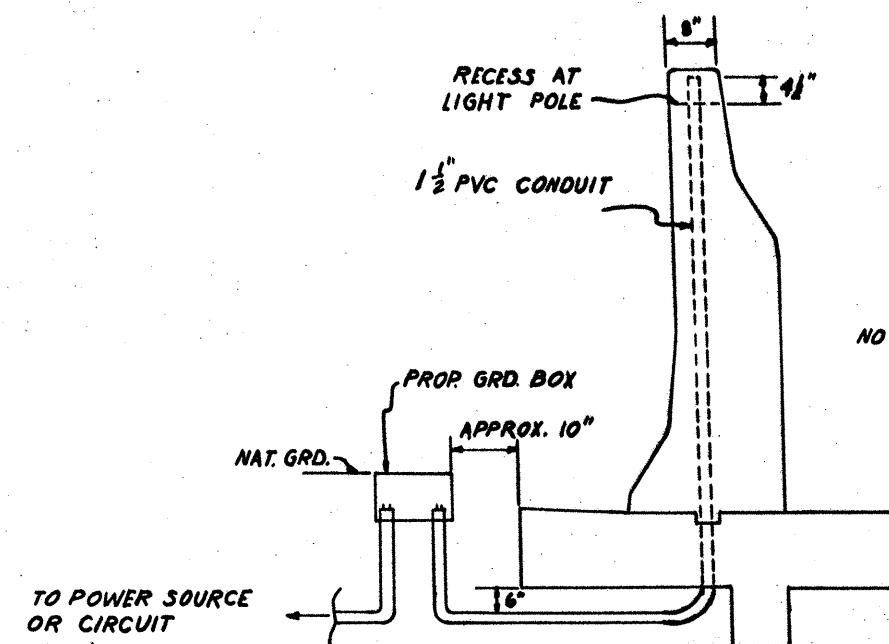
* FUTURE

NOTE: THE CONTRACTOR SHALL VERIFY ALL OF THE ABOVE ITEMS.

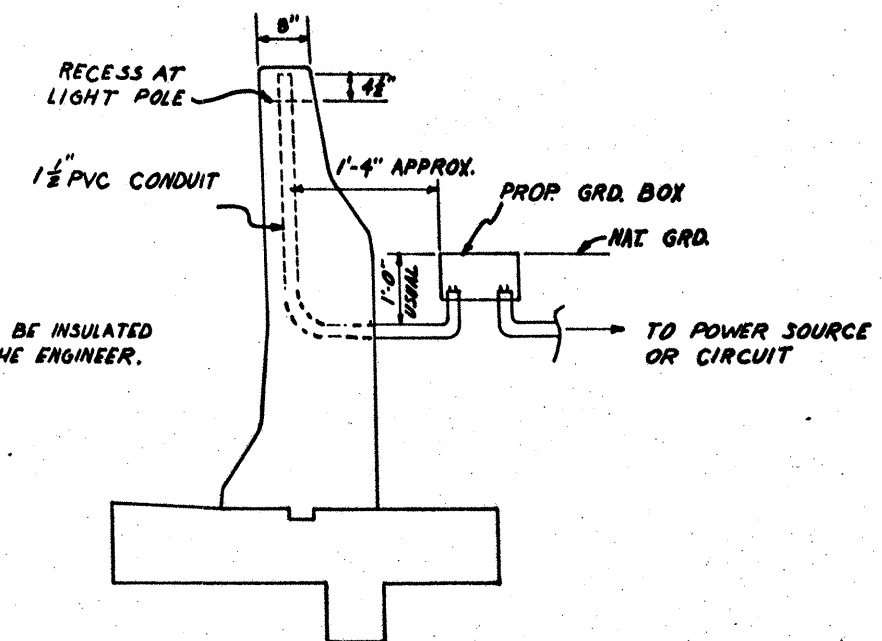
S.H. 286
CROSSTOWN EXPRESSWAY
ROWY ILLUMINATION

SHEET 1 OF 4 SHEETS

STATE	TEXAS	FEDERAL PROJECT NO.	74
COUNTY	HUES	CON. SECT.	100
DIST. NO.	76	CON. SECT.	61
ROADWAY NO.			SH 286



NOTE: ALL SPLICES SHALL BE INSULATED AS DIRECTED BY THE ENGINEER.



DETAIL SECTION
C.T.B. TYPE SPECIAL

LEGEND

- ✕ REMOVE ILLUM. ASSEM. COMPLETE
- NEW ILLUM. ASSEM. (PROPOSE)
- EXIST. ILLUM. ASSEM. TO REMAIN IN PLACE
- ⊗ FUTURE ILLUM. ASSEM.
- GROUND BOX
- WIRING DIAGRAM

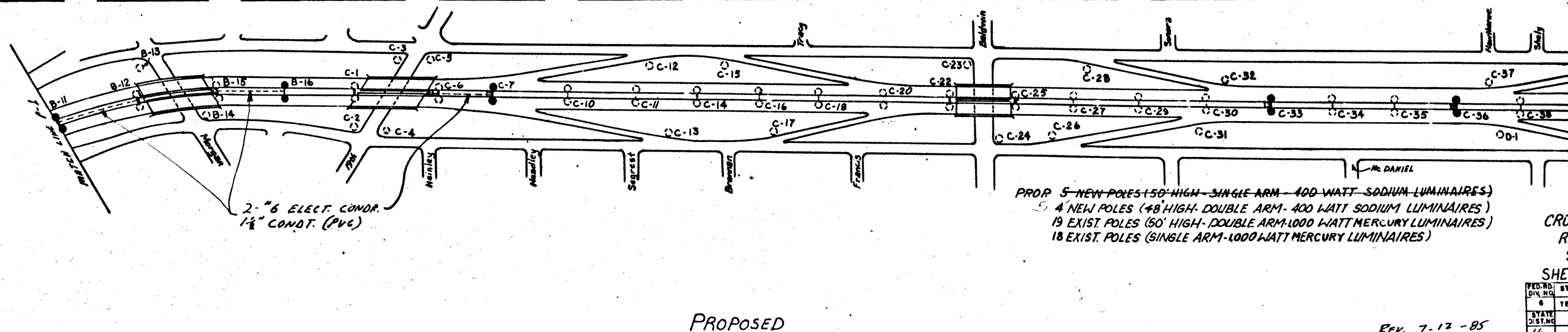
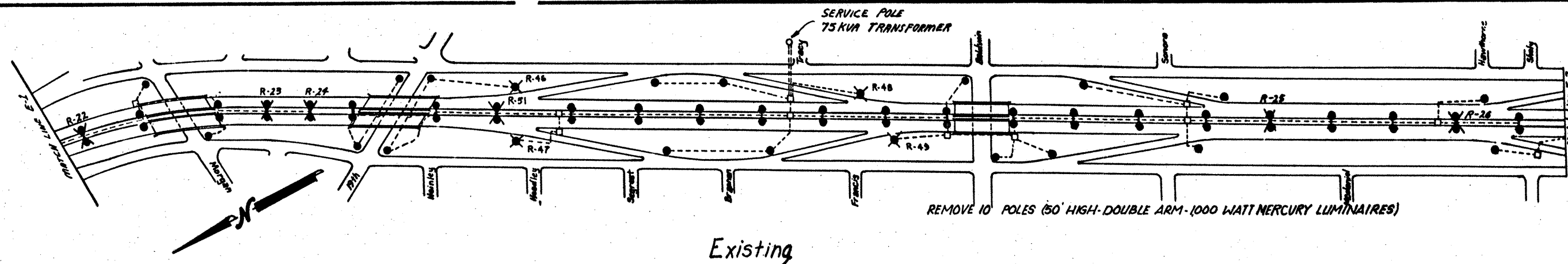
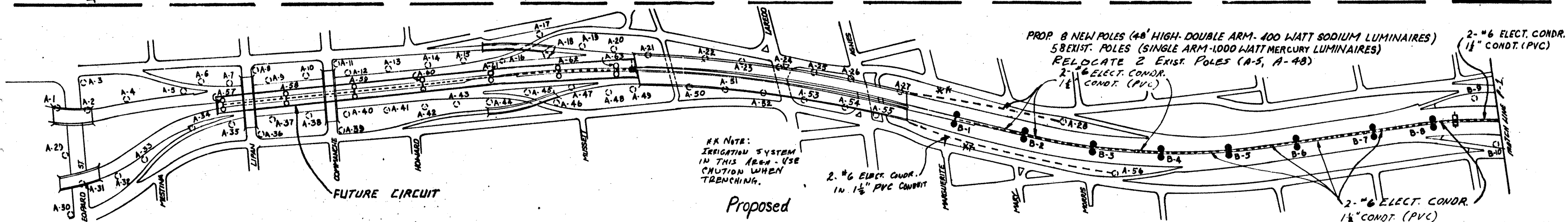
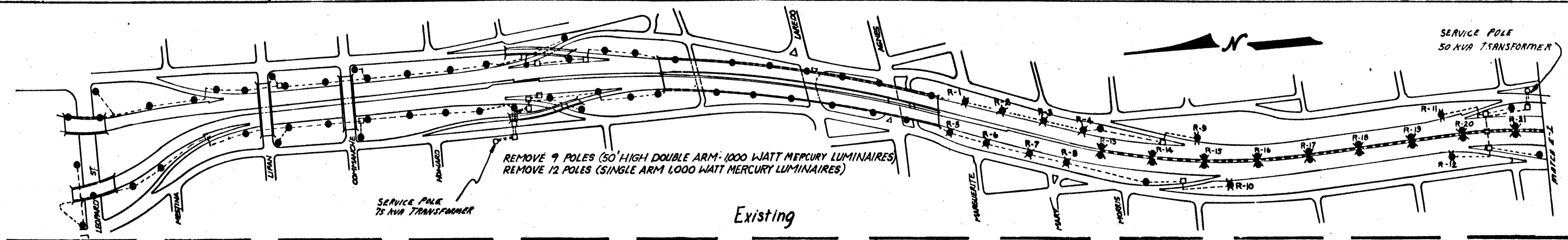
LIGHTING DETAIL

75

SH 286
CROSTOWN EXPRESSWAY
RDWY. ILLUMINATION
SHEET 2 OF 4 SHEETS

FED. RD. DIST. NO.	STATE	FEDERAL PROJECT NO.	SHEET NO.
6	TEXAS	HHES 000S (293)	75
STATE DIST. NO.	COUNTY	CONT. SECT.	HIGHWAY NO.
16	NUECES	326 03 61	SH 286

BAK 7-12-85

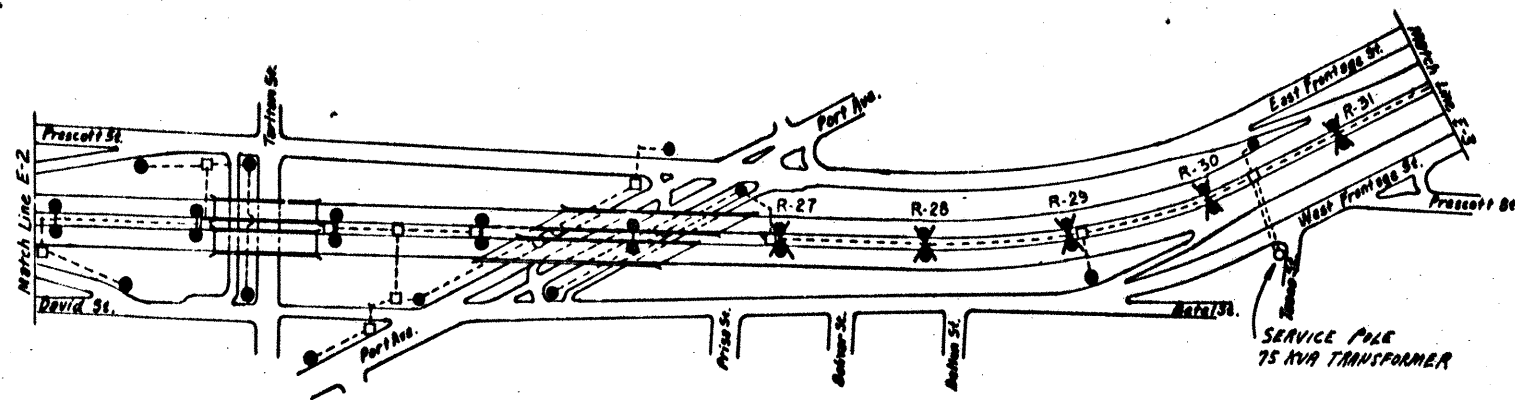


76

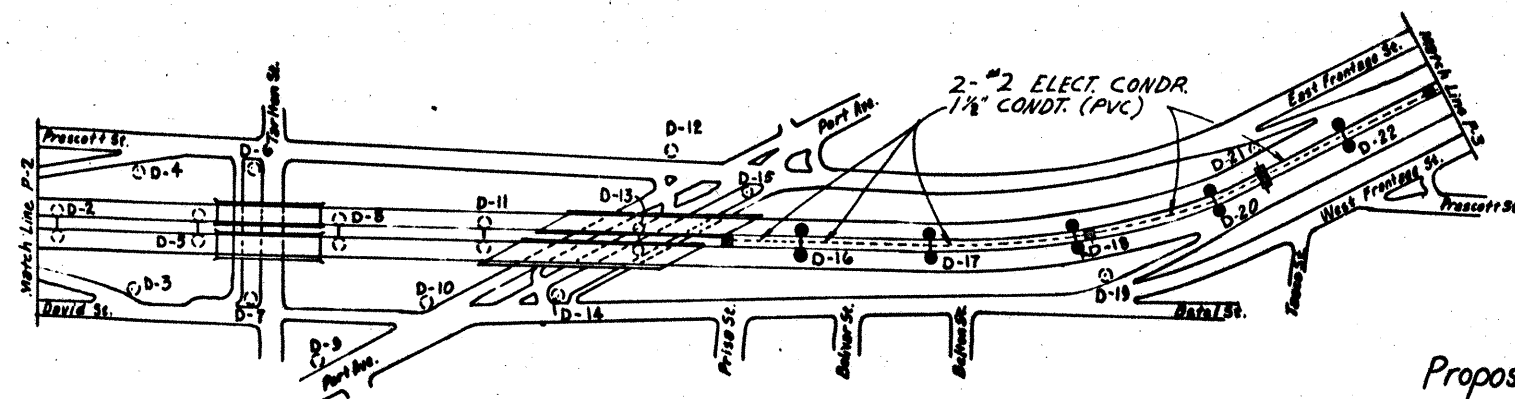
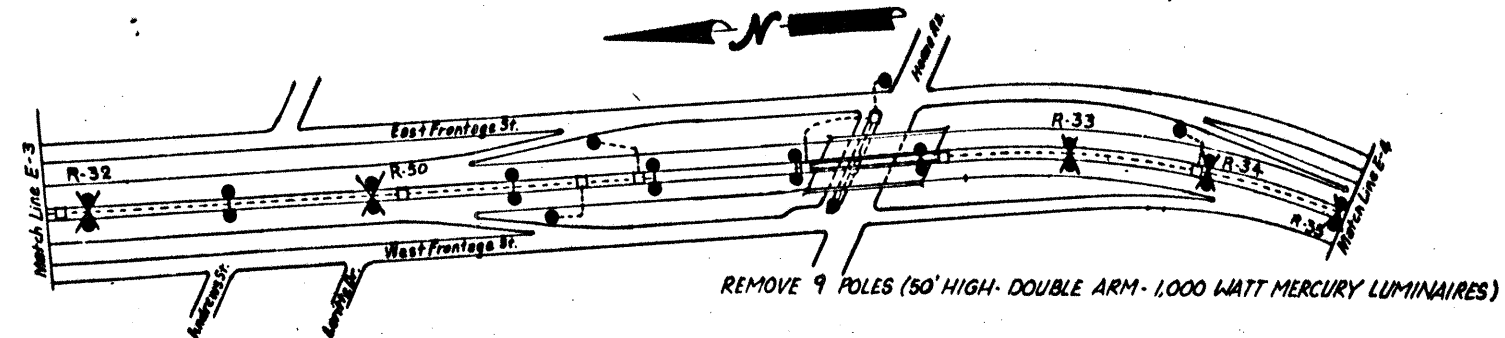
S.H. 286
CROSSTOWN EXPRESSWAY
RDWY. ILLUMINATION
SCALE 1"=200'
SHEET 3 OF 4 SHEETS

P.C. NO.	STATE	FEDERAL PROJECT NO.	SHEET NO.
0	TEXAS	WHS0005 (293)	76
STATE DIST. NO.	COUNTY	CONTRACT NO.	JOB NO.
16	NUECES	326 03	61

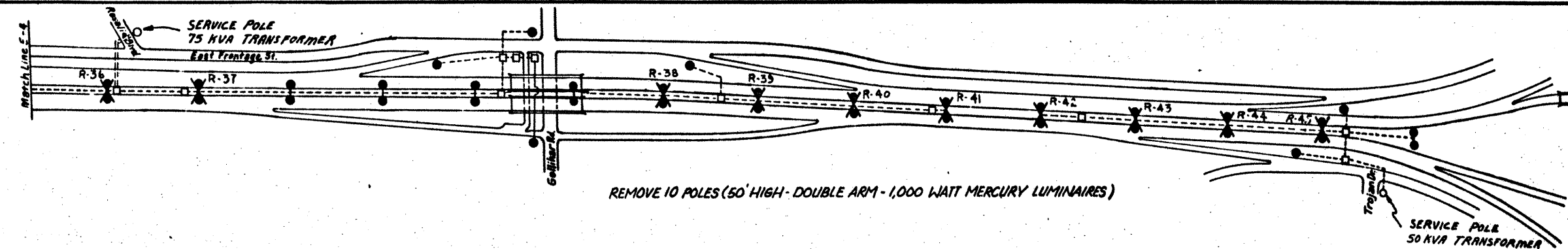
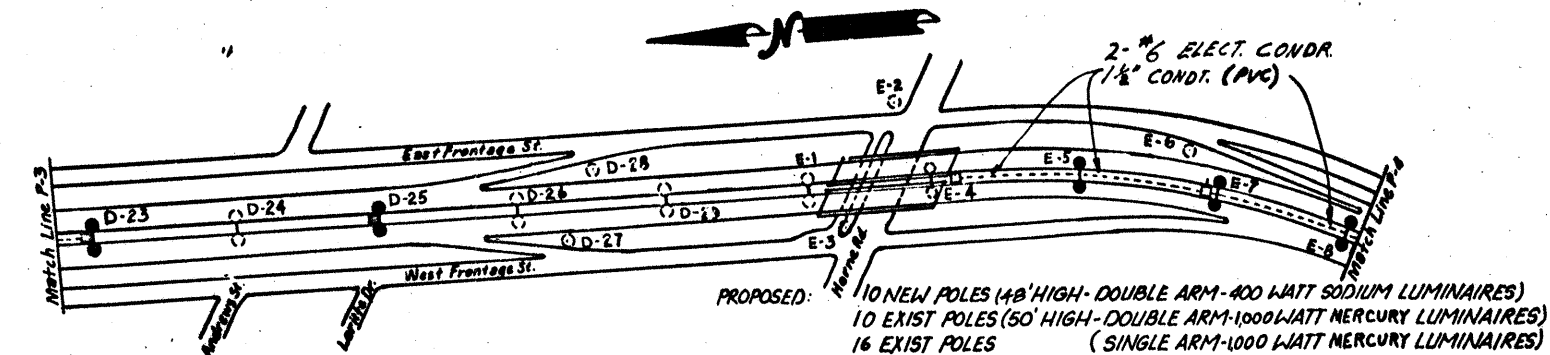
REV. 7-12-85



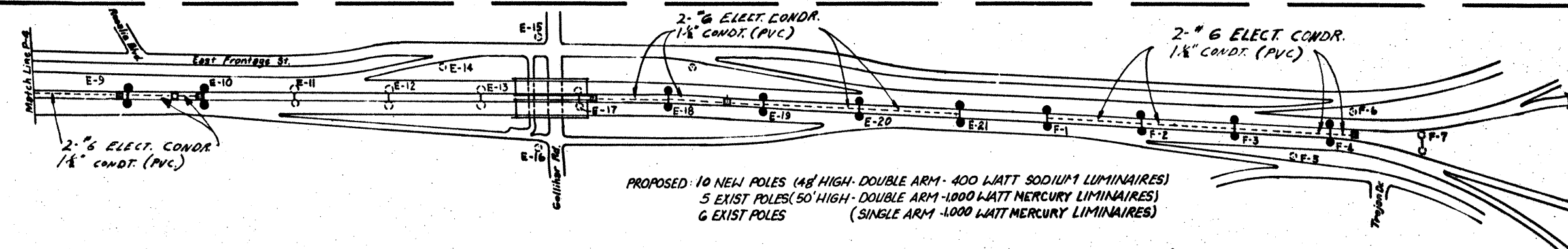
EXISTING



Proposed



EXISTING



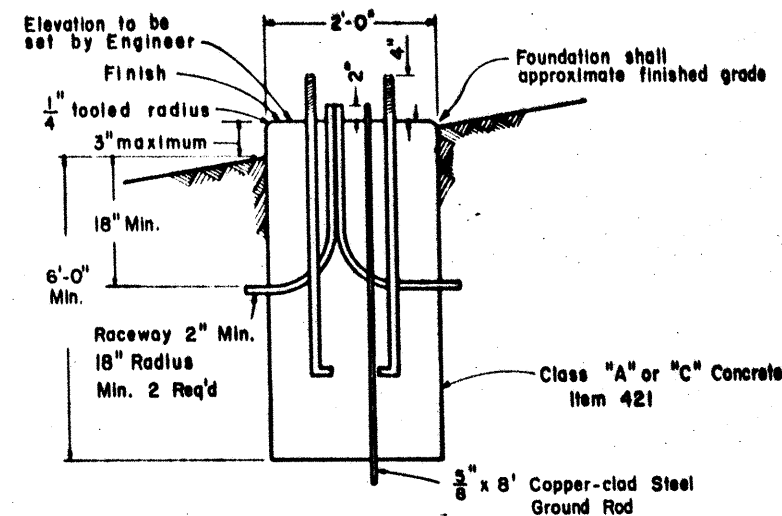
PROPOSED: 10 NEW POLES (48' HIGH - DOUBLE ARM - 400 WATT SODIUM LUMINAIRES)
5 EXIST POLES (50' HIGH - DOUBLE ARM - 1,000 WATT MERCURY LUMINAIRES)
6 EXIST POLES (SINGLE ARM - 1,000 WATT MERCURY LUMINAIRES)

PROPOSED

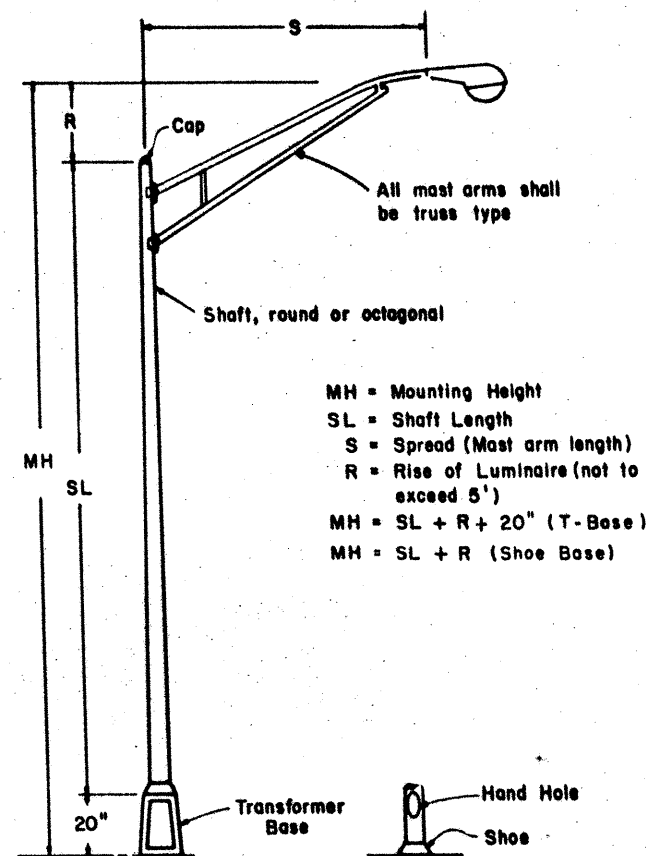
SH. 286
CROSTOWN EXPRESSWAY
RDWY. ILLUMINATION
SCALE 1"=200'
SHEET 4 OF 4 SHEETS

FED. PROJ. NO.	STATE	FEDERAL PROJECT NO.	SHEET NO.
6	TEX	HE3 0009 (293)	77
STATE PROJ. NO.	COUNTY	CONTRACT NO.	SECTION NO.
16	NUECES	326 03 61	SH. 286

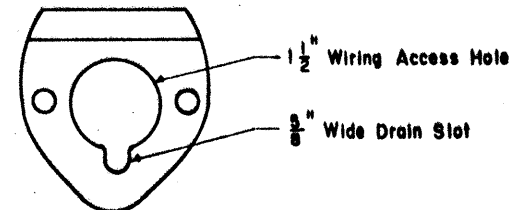
REV. 7.12.85



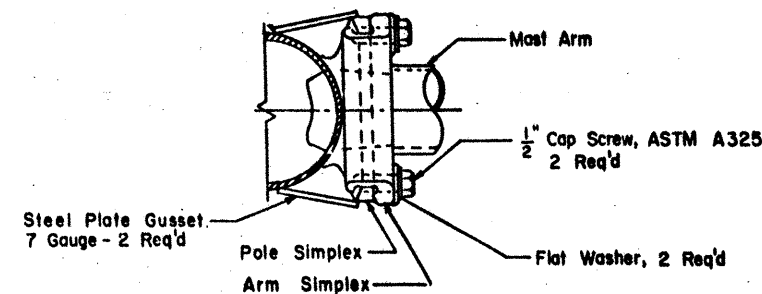
FOUNDATION DETAIL
(TYPE A)



ROADWAY ILLUMINATION ASSEMBLY



MAST ARM CONNECTOR



MAST ARM TO POLE SHAFT CONNECTION

EXPLANATION OF ROADWAY ILLUMINATION ASSEMBLY DESIGNATIONS

Type ST 50 T - 8 - B 4KW S

First two letters denote material from which pole is fabricated (AL - Aluminum, ST - Steel)

Two numerical digits denote mounting height in feet

Next letter denotes type of base (S - Shoe Base, T - Transformer Base)

First dashed number denotes length of arm in feet

Use of second mast arm is indicated by second dashed number which denotes length in feet

Next three figures indicate luminaire lamp rating (1 KW = 1000 watts, .4 KW = 400 watts, etc.)

M - Mercury Vapor
S - High Pressure Sodium Vapor
L - Low Pressure Sodium Vapor

GENERAL NOTES:

I SCOPE

Details herein apply to roadway lighting installations bid under the following Specification Items: Roadway Illumination Assemblies, Roadway Illumination Assembly Foundations, Electrical Conductor, Duct Cable, Circuit Protector Assembly, Service Poles, Transformer Stations and Special Specifications relating to lighting and electrical items. 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 and 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.

II MATERIALS

A. General. All materials shall be new and unused and shall be of the latest design.

B. Roadway Illumination Assembly

1. Structural Support Design for Mast-Arm Mounted Luminaires

Lighting standards shall be designed in accordance with the latest issue of AASHTO's "Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals", using wind loads based on a 50-year mean recurrence interval. The Engineer may require design calculations to be submitted.

2. 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 within 13 inches of the slip joint shall be a full penetration weld.

3. Mast Arm Attachments. All poles shall be designed to support the various mast arm-luminaire combinations. All mast arms for supporting high pressure luminaires shall be designed for a 55-pound luminaire having an effective projected area of 2.4 square feet. All mast arms for supporting low pressure sodium luminaires shall be designed for a 60-pound luminaire having an effective projected area of 3.96 square feet.

4. 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 dust-zinc oxide paint conforming to the requirements of Federal Specifications TT-P-641b, or repaired by the application of repair compounds meeting Federal Specification O-G93 (stick only) in accordance with the manufacturer's recommendations.

5. Straightness of Shaft. At any time prior to erection the pole shaft may be inspected for straightness. A deviation in excess of 1/4 inch in ten feet shall be considered cause for rejection.

6. Pole Bonding Means. All poles for shoe base mounting, including poles on concrete traffic barriers, shall have a grounding lug with 1/2-13 NC threads inside the pole near the hand hole.

7. Hand Holes. All poles for shoe base mounting shall have hand holes with reinforcing frames and covers. The openings on all poles shall be approximately 4" x 6 1/2" located approximately 10" 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.

8. CTB Poles. Poles installed on concrete traffic barrier shall also meet the requirements of CTB details.

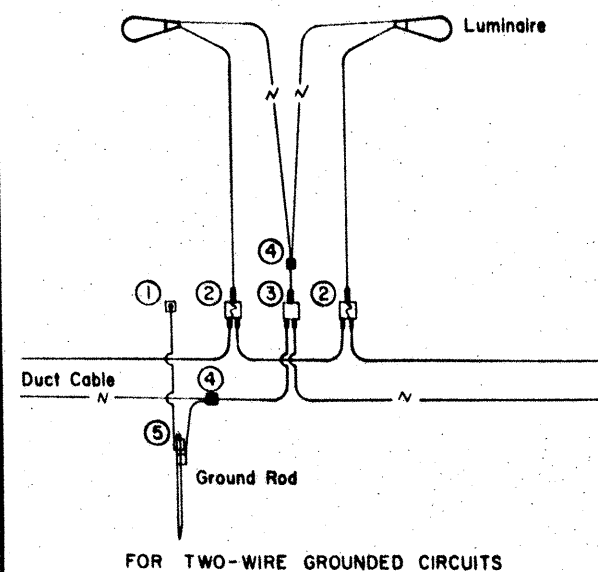
78

STATE DEPARTMENT OF HIGHWAYS AND PUBLIC TRANSPORTATION									
ROADWAY ILLUMINATION DETAILS									
RID (I)-82									
REV	DATE	BY	CHKD	STATE	FED. PROJECT NO.	SHEET NO.			
1	5-5-82			TEXAS	MAHE-1000 (201)	78			
2	7-1-82			TEXAS	MAHE-1000 (201)	78			
3	9-14-82			TEXAS	MAHE-1000 (201)	78			

GENERAL NOTES:

9. 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. The pole shaft to base flange connection shall be open-ended to allow proper draining during galvanizing. All welding shall be in accordance with Departmental Construction Bulletin C-5. Two-section poles joined by circumferential welds will not be permitted.
- Pole components shall be constructed using the following materials:
 Shaft: ASTM A-570 Grade 45 or ASTM A-607 Grade 45 or ASTM A-595 galvanized in accordance with ASTM A-123.
 Base Flange: ASTM A-27 Grade 65-35 or ASTM A-36 - galvanized in accordance with ASTM A-123.
 Mast Arm Fittings: ASTM A-27 Grade 65-35 - galvanized in accordance with ASTM A-153.
 Mast Arms: Steel Pipe ASTM A-53 Grade A or B - galvanized in accordance with ASTM A-123.
 Pole Cap: ASTM A-27 or ASTM A-48, galvanized in accordance with ASTM A-153; or aluminum alloy ASTM B-26 or B-108 B-443.0, secured by three machine screws.
 Pole Hardware: All fasteners except mast arm connection bolts shall be stainless steel or standard steel machine bolt galvanized ASTM A-153. Mast arm connection bolts shall be ASTM A-325, ASTM A-321 or ASTM A-193 Grade B-7, galvanized ASTM A-153. Lock washers shall be provided for mast arm connection bolts. Nuts and washers shall be compatible with the bolts and shall be stainless steel or steel, galvanized ASTM A-153.
 Alternate material equal to or better than those specified may be substituted with the approval of the Engineer.



NOTES:

- Pole Bonding Connector - Blackburn * TTC3 or Weaver * TGC3 or equal.
- Fused Connector - Elastimold 82S, Joy X8919 or equal.
- * Un-fused Connector - Elastimold 83S, Joy X8920 or equal.
- Split Bolt Connector.
- Ground Rod Clamp - 2 Required - Blackburn GG 5/8H, Burndy GKP635 or equal.

* For Transformer Base Poles. On Shoe Base Poles, connect Luminaire neutral to Pole Bonding Connector.

TYPICAL WIRING - ROADWAY ILLUMINATION ASSEMBLY
Twin Luminaire Shown - Single Luminaire Similar

10. Aluminum Poles

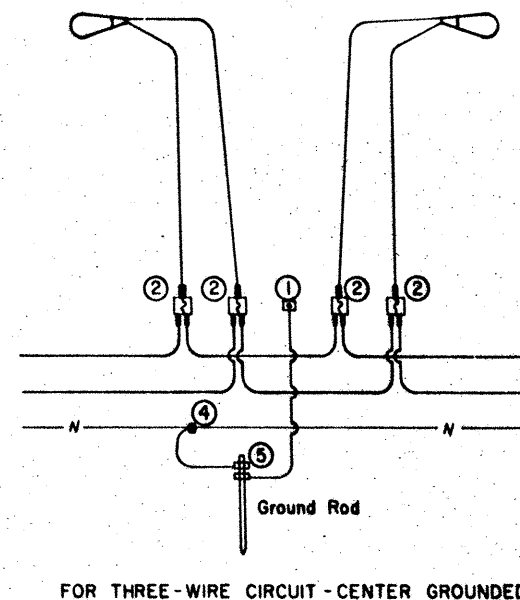
- Aluminum poles shall be fabricated in accordance with AASHTO's "Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals."
- Pole components shall be constructed using the following material:
 Shaft: ASTM B-221 or B-241 6063-T6, ASTM B-209 5086-H34; ASTM B-221 6005-T5.
 Base Flange: ASTM B-108 or B-26 356.0-T6; ASTM B-108 A356.0-T6.
 Mast Arm Attachments: ASTM B-209 6061-T6; ASTM B-221 6005-T5.
 Mast Arms: ASTM B-241 6061-T6 or 6063-T6.
 Cap: ASTM B-209 5086-H32; ASTM B-108 or B-26 356.0-T6.
 Bolts: Stainless Steel AISI 300. Bolts threading into aluminum threads shall be treated with anti-seize compound; Never-Seez Compound or Permatex 133K or equal.
 Alternate material equal to or better than those specified may be substituted with the approval of the Engineer.

C. Foundations

- Concrete for foundations will be included for payment under Item "Roadway Illumination Assembly Foundations" only.
- Anchor bolts for all poles except CTB-mounted poles shall be steel, ASTM A-36. Anchor bolts for CTB-mounted poles shall be steel, ASTM A-325. The top 8" of anchor bolts shall be galvanized. Alternate material equal to or better than material specified may be substituted with the approval of the Engineer.
- Anchor bolts shall be 1 1/4" x 48" with top threaded not less than 5 inches and furnished with galvanized hexagon nuts, flat and lock washers. The lower end of the bolt shall be bent at a right angle or threaded and furnished with nut and washer. When bolts with rolled threads are furnished, bolt body need not be full size.
- The bolt circle in foundations for shafts 36 feet and less shall be 15 inches in diameter. The bolt circle in foundations for shafts in excess of 36 feet shall be 17 1/4 inches in diameter if a transformer base is used and 15 inches if a shoe base mounting is used. Poles placed on existing bridge brackets or foundations shall be coordinated with anchor bolts in place.

D. Transformer Base

- Transformer base shall be cast from aluminum alloy ASTM B-108 or B-26 356.0T6 and shall be furnished with four galvanized anchor lugs 1/2 inch thick (minimum) and shaped to conform with the transformer base flange. Transformer base shall have a bolt circle at the bottom to match bolt circle of the foundation and a bolt circle at the top to match bolt circle of the pole. The transformer base shall be approximately 20 inches high and shall have a door approximately 13" x 8" x 9 1/4". Screws or bolts for attachment of door to base shall be treated with anti-seize compound: Never-Seez Compound, Permatex 133K or equal. Four machine bolts with four nuts, eight flat washers and four lock washers, galvanized ASTM A-153, shall be provided with each transformer base. A 1/2-13 NC grounding lug shall be provided inside the transformer base.



STATE DEPARTMENT OF HIGHWAYS AND PUBLIC TRANSPORTATION									
ROADWAY ILLUMINATION DETAILS									
RID (2)-82									
CH	DRAWING	DATE	FED NO	STATE	FEDERAL PROJECT NO	SHEET NO			
CH DN	ORIGINAL	5-5-82	6	TEXAS	MA-HES	79			
CH DW	REVISED	9-14-82							
CH TR	REVISED								
CH TR	REVISED								

GENERAL NOTES:

2. Transformer bases shall meet the breakaway requirements of AASHTO's "Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals," 1975 edition, and shall have been tested by FHWA-approved methods. Bases shall also have been tested to meet the design load for a 15-foot mast arm pole in a 90 mph wind. Certification for both tests shall be submitted with the shop drawings.

E. 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 or steel electro-zinc-plated, minimum thickness 0.0002 inch with olive drab or yellow chromate conversion coating, 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 adjustment shall be provided. The refractor shall be crystal-clear pressed 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 ready 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 rigidly attached to a high grade porcelain base which shall extend and completely enclose the metal shell. A locking means shall be incorporated in the shell of the socket to positively resist the removal of the lamp.
3. Mast-arm mounted luminaires shall be provided with a leveling device which is clearly visible from the ground. Unless otherwise directed by the Engineer, mast-arm mounted luminaires will be tested and installed in the level position.
4. The underpass luminaire shall have mounting provisions to attach the luminaire directly to the wall or to an outlet box. Wiring entries into the luminaire shall be made through threaded holes or water-tight hubs. Luminaire housing, raceway fittings and attaching hardware shall be installed in such a manner as to prevent water entry into the luminaire or ballast housing. A protective guard shall be provided for the refractor.

F. High Pressure Sodium Vapor Luminaires

1. Photometrics

- a. The 250-watt luminaire, 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 0.1 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.

The uniformity factor "F" shall be not less than 7.0 when calculated from the equation:

$$F = \frac{L (I \text{ Min.})}{I \text{ Max.}}$$
 Where: F = the uniformity factor
L = 200
I Min. = minimum measured intensity within the rectangle
I Max. = maximum measured intensity within the rectangle

- b. The 400-watt luminaire, when mounted 50 feet above the midpoint of either long side of a rectangular area 250 feet by 80 feet, shall provide a measured minimum intensity of 0.1 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 rectangle 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.

The uniformity factor "F" shall be not less than 7.0 when calculated from the equation:

$$F = \frac{L (I \text{ Min.})}{I \text{ Max.}}$$
 Where: F = the uniformity factor
L = 250
I Min. = minimum measured intensity within the rectangle
I Max. = maximum measured intensity within the rectangle

- c. The luminaires shall meet the photometric requirements of paragraphs F.1a or F.1b when energized at 90 percent of rated line voltage.

2. Ballasts

- a. The ballast shall be regulated-type with isolated windings and shall be designed to operate high pressure sodium lamps.
- b. When the circuit voltage indicated in the plans is applied, the ballast input wattage during fluctuations of the test voltage of +5 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 +5 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 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.

- f. 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 have been manufactured within six months of the date the project is awarded.
- 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.

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 Texas Highway Department Manual of Testing Procedures.

- G. Wood Poles. For projects requiring more than 10 transformer and/or service poles, poles shall be creosote-treated to eight pounds per cubic foot-retention, or pentachlorophenol-treated to 0.4 pounds per cubic foot-retention in accordance with Item "Timber Preservative and Treatment."


For projects requiring ten or fewer poles, treatment shall be as stated above and Contractor may purchase poles locally if source and treatment are documented. Poles shall meet the requirements of ANSI 05.1-1972.

H. Electrical Conductors

1. All conductors shall be of annealed copper meeting the requirements of ASTM B-3 or B-33 and the NEC. All insulated conductors shall be stranded. Bare conductors No. 8 AWG and smaller shall be solid.
2. Insulated conductors shall be NEC Types TW, THW, THWN or XHHW. Where project plans specify Type TW or THW, any of the other types may be substituted. Conductors in circuits containing two or more insulated conductors shall be color-coded throughout the entire circuit. Color-coding will be required on pre-conduitized duct cable containing two or more insulated conductors.
3. Insulated conductors shall be marked in accordance with Article 310 of the NEC, and shall meet the requirements of Underwriters Laboratories' Standards.

I. Conduit and Fittings

1. Conduit must be UL Approved for the intended use shown on plan sheets. Aluminum conduit will not be permitted. Where project plans call for rigid metal conduit, NEC Type IMC conduit may be substituted, unless prohibited by plan note.
2. Fittings for Steel conduit shall be steel or malleable iron, threaded or threadless, rain-tight. Die cast, set screw, indenter or push-on (socks) fittings will not be permitted.
3. Insulating-type fittings shall be used on all metallic conduit entries into sheet metal boxes or enclosures.
4. Expansion joints for metallic conduit shall be provided with a grounding strap. Expansion joints shall be Appleton UNYL 50 Series, OZ AX Series or equal, with expansion capacity as shown in plans.



STATE DEPARTMENT OF HIGHWAYS
AND PUBLIC TRANSPORTATION

ROADWAY ILLUMINATION DETAILS
RID(3)-82

DATE	5-5-82	STATE	TEXAS	FEDERAL PROJECT NO.		SHEET NO.	10
DRAWING	ORIGINAL	COUNTY	MAHES	CONTRACT	3-2-0	JOB	54-2-0
REVISION		CONTRACT					
REVISION		CONTRACT					
REVISION		CONTRACT					

GENERAL NOTES:

J. Ground Boxes

1. Precast concrete ground boxes shall have minimum inside dimensions of approximately 10" x 17" and at least 10" deep. Boxes shall be constructed of reinforced concrete with minimum wall thickness of 1". The cover shall be cast iron with "ILLUMINATION HIGH VOLTAGE" incised in 1" high letters. A minimum gravel fill of 18 inches shall be provided under each ground box.
2. A plastic ground box meeting the following requirements may be used if permitted by plan notes:
 - a. It shall be manufactured from Reinforced Plastic Mortar (RPM) composed of borosilicate glass fiber, a catalyzed polyester resin and an aggregate.
 - b. Minimum inside dimensions (LxWxH) for Type I: 29"x 16" x 12"; Type II (Box plus Extension): 29"x 16" x 23". Bottom edge of box or extension shall be footed (2 1/2" flange).
 - c. RPM ground boxes shall be designed for AASHTO H20 loading (32,000 lb single axle load over 10"x 20" area).
 - d. Cover shall be steel, hot-dipped galvanized, with "ELECTRIC" imprint.
 - e. A minimum gravel fill of 18 inches shall be placed under each ground box.

K. Junction Boxes.

1. Junction boxes shall be cast iron or steel, hot-dipped galvanized, unless otherwise noted on plans.
2. Surface-mounted junction boxes for conduit 1 1/2" and larger shall be Crouse Hinds Type WAB, OZ Type YS, with mounting lugs, minimum size 6" x 6" x 4", or approved equal. For conduit 1" or smaller, surface-mounted boxes shall be 4 1/2" round and approximately 2" deep, Crouse Hinds Type GRFX, Appleton Type JBDX or approved equal.
3. Flush-mounted junction boxes installed in concrete structures shall be Crouse Hinds, Appleton or approved equal, similar to boxes described above, but for flush mounting.
4. Conduit entry into junction boxes shall be made weathertight using threaded fittings or hubs, or with sealing locknuts inside and out.

L. Connectors and Splices

1. Quick-disconnect connectors for connecting lighting pole conductors to line shall be Elastimold, Joy or equal.
2. Connector for connecting bonding wire to pole shall be stud-type, Blackburn TTC3, Weaver TGC3 or equal.
3. Connections to neutral or grounded line conductor shall be made with split-bolt or compression connectors. Only two conductors will be allowed per connector.
4. Splices, where permitted by the Engineer, shall be made with approved compression sleeves, insulated with thermo-setting compound kit or with heavy-wall heat shrink tubing containing factory-applied sealant.

III CONSTRUCTION METHODS

A. General. The location of poles, conductors, conduits, junction boxes, transformer stations and service poles is diagrammatic only and may be shifted by the Engineer to accommodate local conditions.

B. Roadway Illumination Assemblies

1. 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. Grout will not be placed between base flange and the foundation unless noted on plans. If grout is required by plan note, two 3/8" drain holes will be provided in the grouting.
2. In each pole, continuous, color-coded stranded No. 12 AWG Copper Type TW conductors in accordance with paragraph H.2. shall be connected to the line side of each ballast.
3. A fused connector assembly or fuse-holder as specified shall be connected in each hot wire on the line side of each ballast. Luminaires on poles will be fused using quick-disconnect fuse-holders as shown in details. Underpass luminaires shall be fused internally. All fuses shall be time-delay type.
4. For median-mounted poles placed on concrete median barrier, all access plates (hand holes) shall be on same side of the median.
5. Acorn nuts will not be allowed for attaching pole to transformer base or foundation.

C. Duct Cable

1. Duct cable shall be placed by the open trench method, except where otherwise noted, at a depth of approximately 18 inches unless otherwise indicated.
2. Ends of all ducts shall be sealed with duct sealing compound. All ducts entering ground boxes shall be securely lashed together in a vertical position.

D. Conduit

1. Continuous runs of conduit in excess of 150 feet attached to structures shall have expansion joints at mid-span or 150-foot intervals and at structure expansion joints or as shown in plans.
2. Spacing of conduit hangers shall be as specified in the current issue of the NEC. Hangers shall be Unistrut Series J1200, Globe Series 450 or equal unless otherwise indicated in the plans.
3. Conduit hangers shall not be attached directly to prestressed concrete girders.
4. Conduit placement beneath existing paved surfaces shall be accomplished by jacking or boring in accordance with the pertinent provisions of Article 476.3 "Construction" of the Item "Jacking, Boring or Tunneling Pipe," unless otherwise noted on plans. Jacking, boring, or trenching will not be paid for directly but will be subsidiary to the Item "Conduit." Duct cable shall be extended through the conduit in one continuous length or conductors shall be encased in a continuous length of conduit where passing under an existing roadway. Direct burial of conductor will not be allowed.

E. Circuits and Connections

1. After installation and prior to connecting ends, each continuous run of insulated conductor shall have a minimum D.C. insulation resistance of one megohm when tested at 500 volts D.C.
2. All or part of conductor system may be tested at the Engineer's option. Conductors exhibiting an insulation resistance of less than one megohm shall be replaced by the Contractor at his own expense.

F. Bonding and Grounding

1. Contractor shall insure that all exposed metal containing electrical conductors is bonded and grounded, using ground rods, grounding bushings and locknuts and other fittings as necessary.
2. Metallic conduit, lighting poles, and luminaires on bridge structures shall be grounded. At each end of the structure a 5/8" x 8' copper-clad ground rod shall be driven in the ground and a No. 8 AWG copper grounding conductor shall be installed from the ground rod to the grounded conductor of the lighting circuit. The grounding conductor shall be bare or, if insulated, shall be green. Ground rods, connectors and grounding conductors will not be paid for separately, but will be subsidiary to the various bid items.
3. Lightning arrester grounding conductor shall be tied directly to the pole-grounding conductor.

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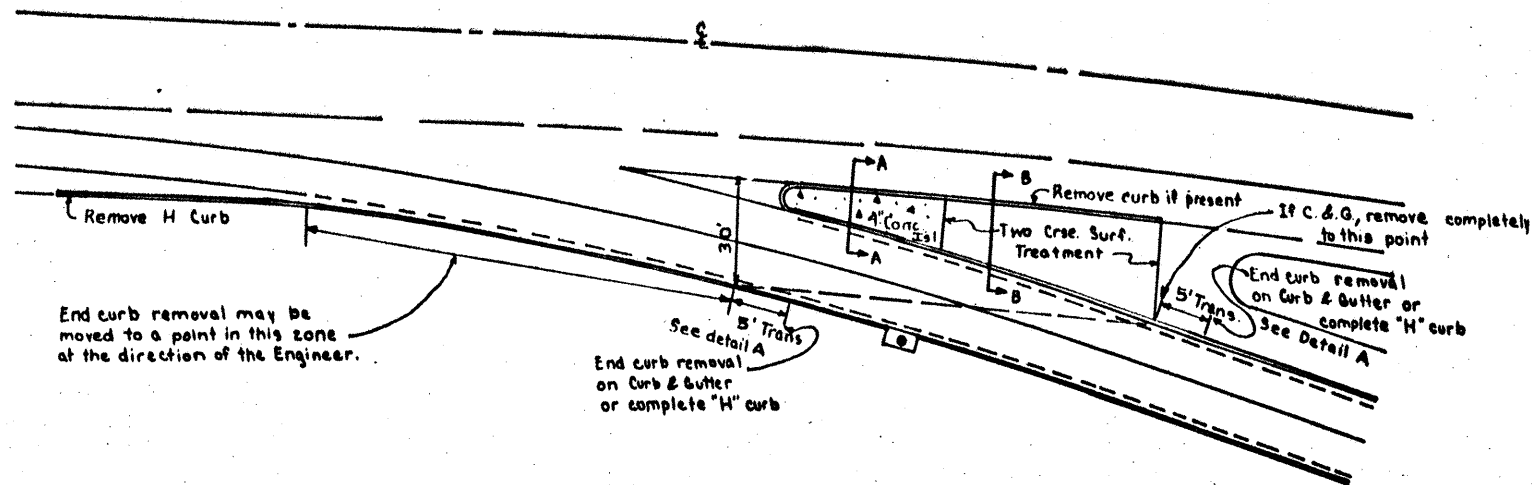


STATE DEPARTMENT OF HIGHWAYS
AND PUBLIC TRANSPORTATION

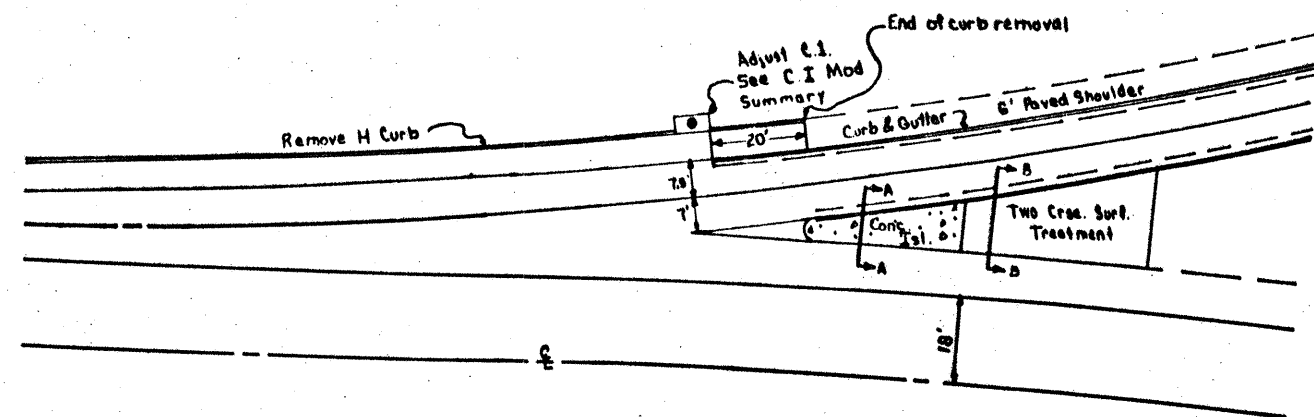
ROADWAY ILLUMINATION DETAILS

RID (4)-82

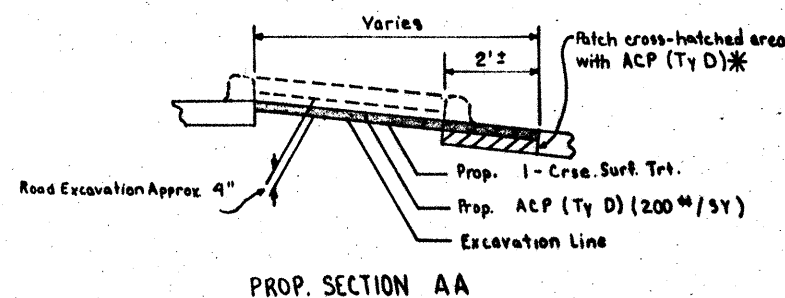
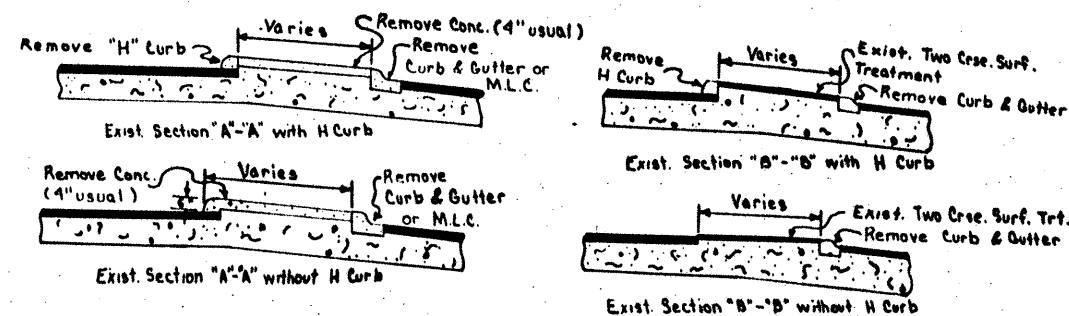
CD	DRAWING	DATE	FED NO	STATE	FEDERAL PROJECT NO	SHEET NO
CD	ORIGINAL	5-5-82	6	TEXAS	MAHES 0005 (2-73)	51
CD	REVISED	4-29-85				
CD	REVISED		STATE	COUNTY	COM. SECT	JOB
CD			10	MUECES	3-24	3 47 5-2-74



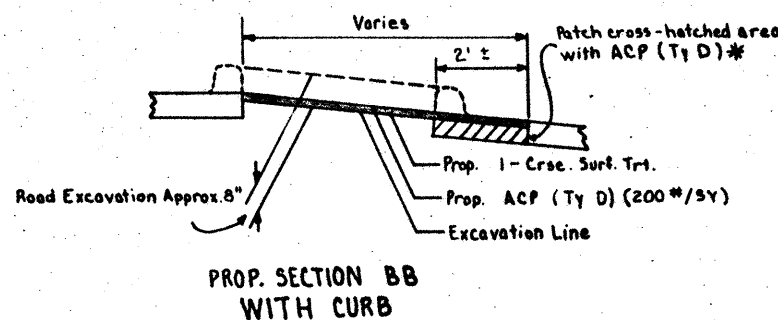
TYPICAL EXIT RAMP



TYPICAL ENTRANCE RAMP

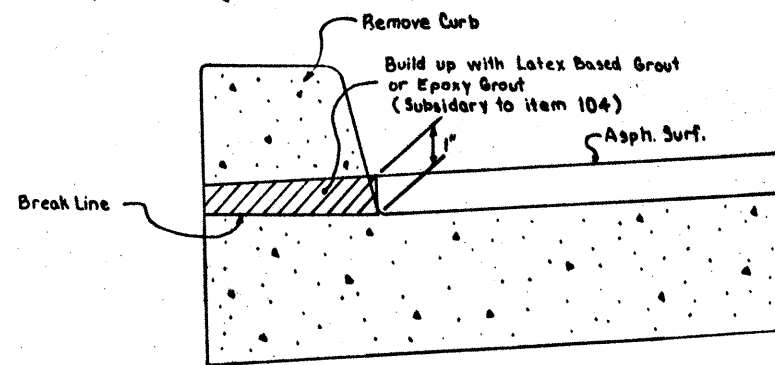


PROP. SECTION AA

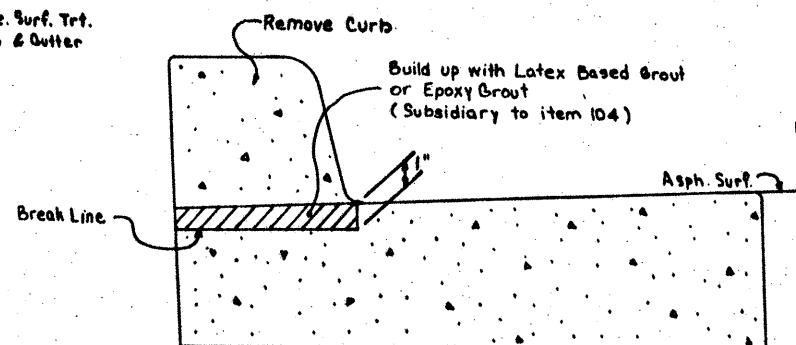


PROP. SECTION BB WITH CURB

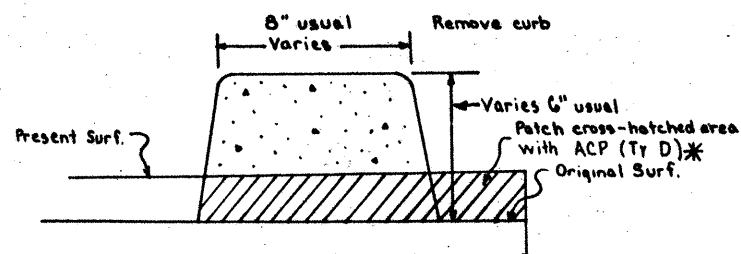
* Commercial grade acceptable with approval of the Engineer.



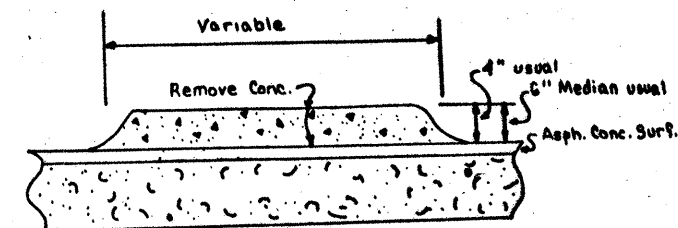
DETAIL FOR CURB REMOVAL ON C & G. CONDITION "A"



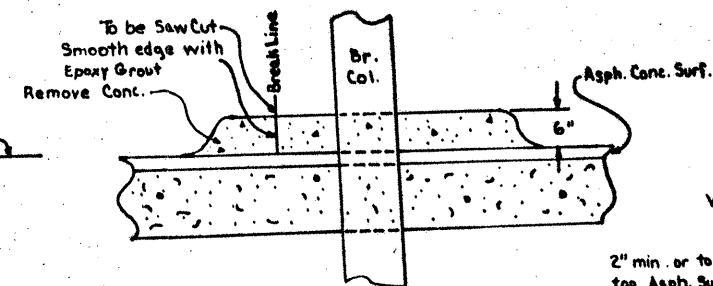
DETAIL FOR CURB REMOVAL ON C & G. CONDITION B



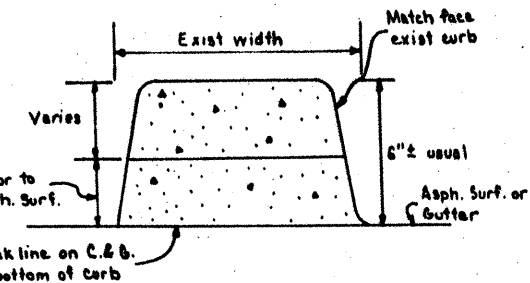
DETAIL FOR CURB REMOVAL WITH PAV PATCH



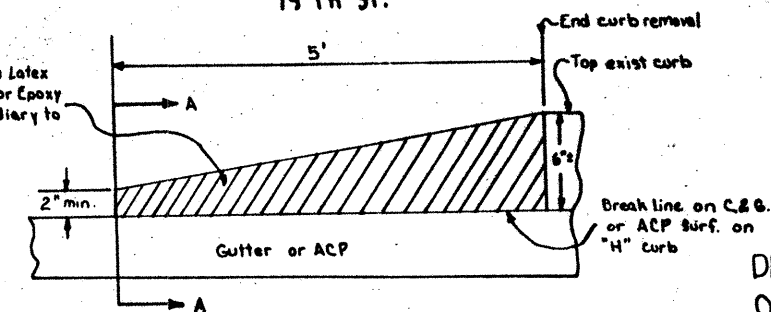
DETAIL OF CONCRETE ISLAND AND MEDIAN TO BE REMOVED



DETAIL OF CONCRETE MEDIAN TO BE CUT
Port Ave. & Morgan Ave.
19 Th St.



SECTION A-A

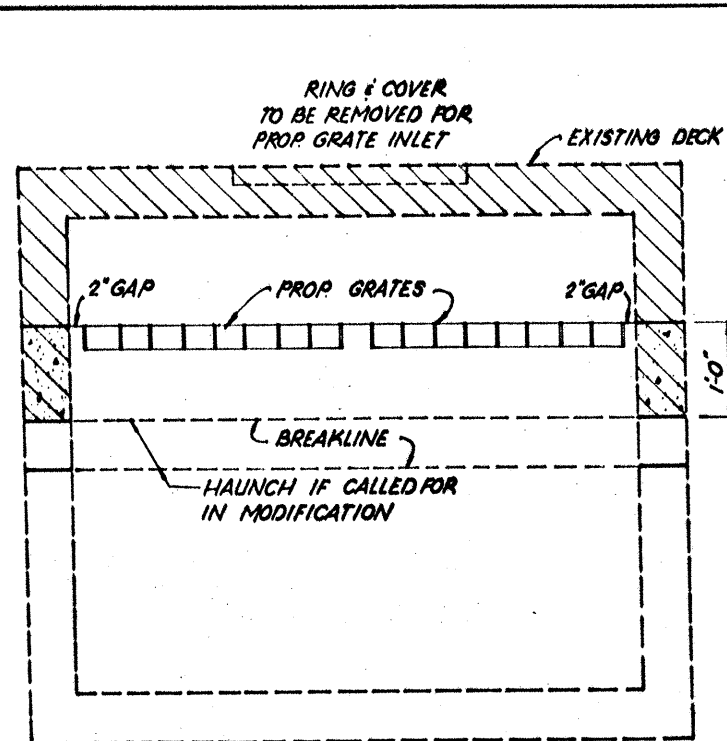


DETAIL B CURB TRANS AT END CURB REMOVAL

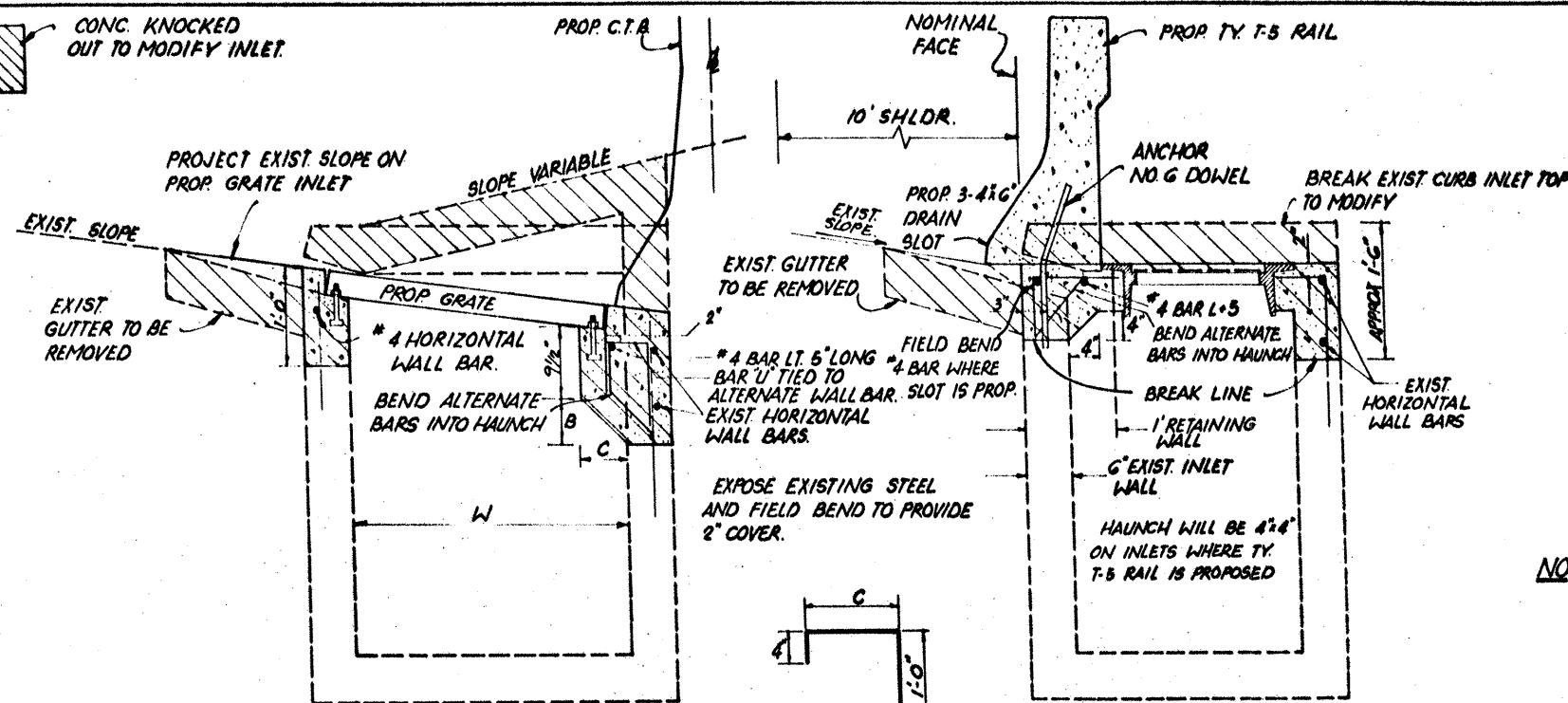
DETAILS AT RAMP NOSES & OLD CONCRETE REMOVAL

83

FED. RD. DIST. NO.	STATE	FEDERAL PROJECT NO.	SHEET NO.
16	TEXAS	HES 0005 (293)	83
STATE DIST. NO.	COUNTY	CONT. SECT.	JOB
16	Nueces	326.03	61
			286

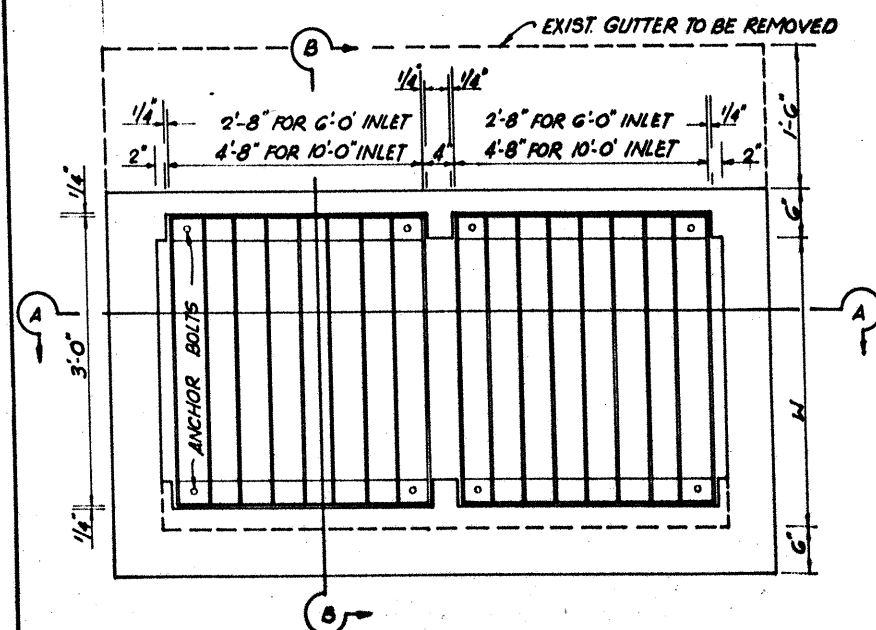


SECTION A-A

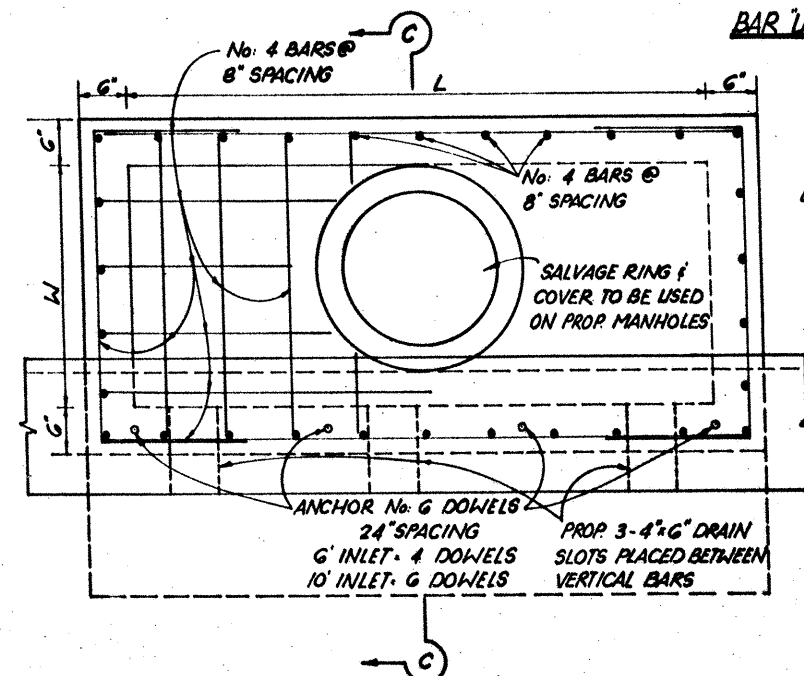


SECTION B-B

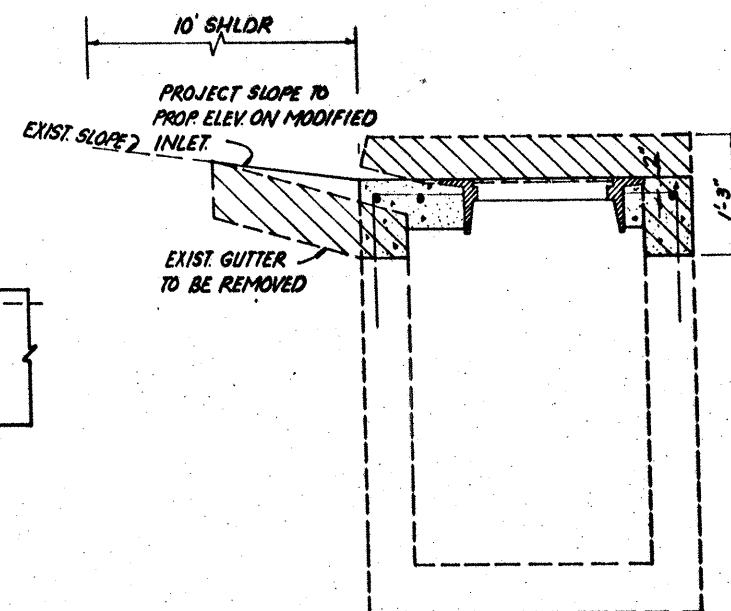
SECTION C-C
INLET TO MANHOLE W/ T&B RAIL
TY B



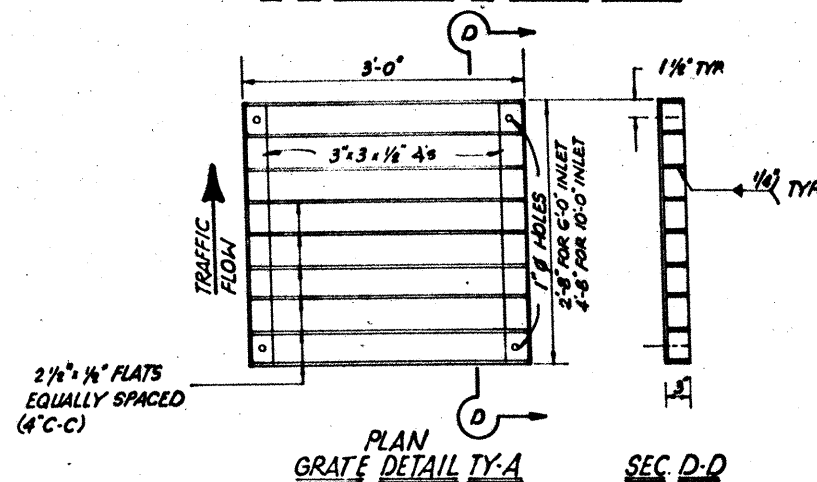
PLAN VIEW FOR CURB INLETS
TO BE MODIFIED TO GRATE INLETS



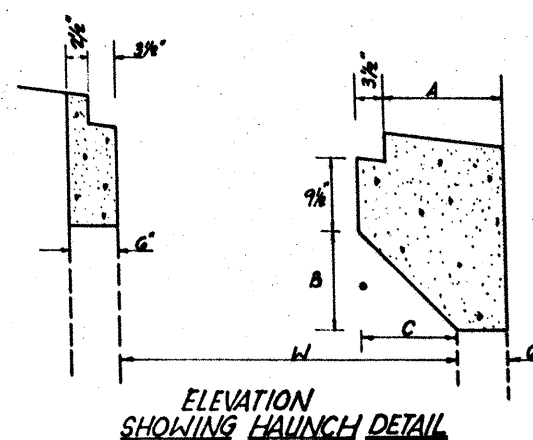
PLAN VIEW FOR CURB INLETS
TO BE MODIFIED TO MANHOLES



SECTION C-C
INLET TO MANHOLE
TY A



PLAN GRADE DETAIL TY-A
SEC. D-D



ELEVATION
SHOWING HAUNCH DETAIL

WIDTH (W)	NO. OF HAUNCHES	A	B/C
2'-6"	0	2 1/2"	
3'-0"	1	8 1/2"	6"
3'-6"	1	1'-2 1/2"	1'-0"
* 3'-6"	2	8 1/2"	6"
* 4'-0"	1	1'-8 1/2"	1'-6"
* 4'-0"	2	11 1/2"	9"

* TO BE USED ON OUTSIDE SHOULDER INLETS ONLY.

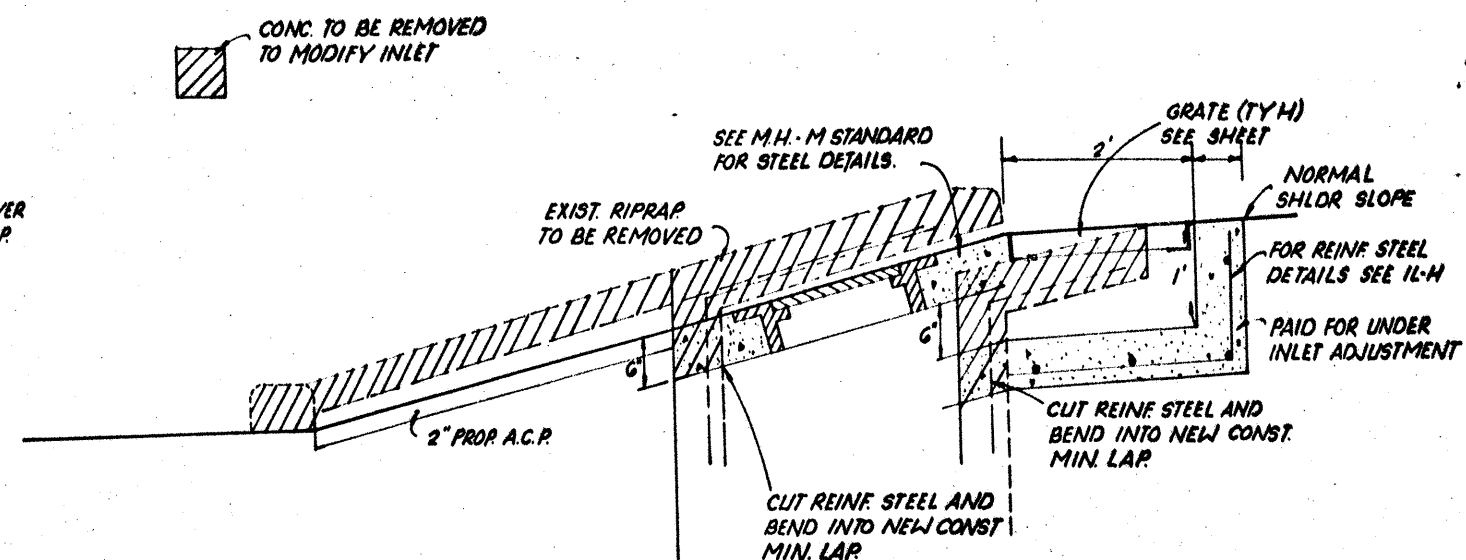
HAUNCH SPECIFICATION
TO BE USED ON MEDIAN AND OUTSIDE SHOULDER
INLETS

- NOTES:**
- 1) NO. 6 DOWELS ARE TO BE EPOXY GROUTED INTO THE EXISTING INLET AS SHOWN AT A SPACING NOT TO EXCEED 24". THE HOLES FOR THE DOWELS SHALL BE 10" 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 IMPACT, ROTARY, OR PERCUSSION TYPE DRILLING EQUIPMENT. THE DOWELS SHALL BE SET INTO THE HOLES WITH EPOXY BINDER WHICH CONFORMS TO THE REQUIREMENTS OF SDHPT 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 FARENHEIT. TEMPERATURES BELOW 40 DEGREES SHALL NOT BE CONSIDERED AS PART OF EPOXY CURING TIME.
 - 2) AN APPROVED RESIN TYPE BINDER IN CAPSULES 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 THE DOWEL MAY BE OBTAINED.

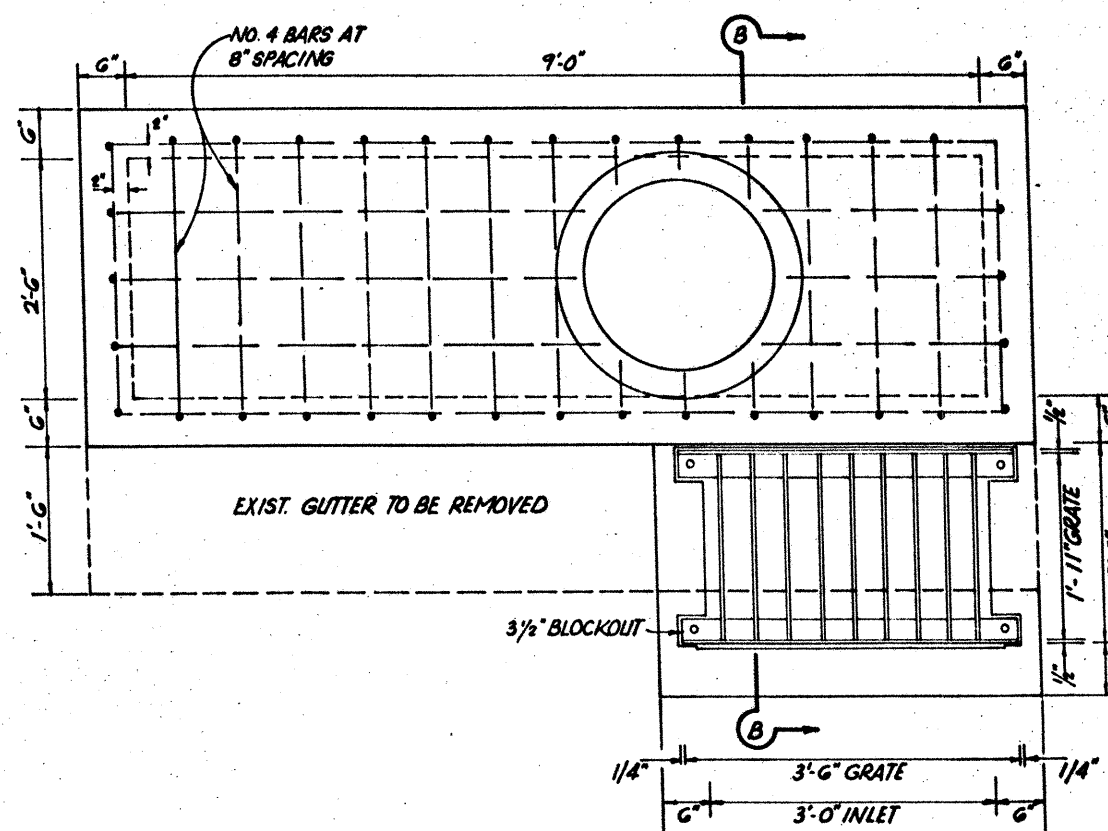
GENERAL NOTES

1. ALL CONCRETE SHALL BE CLASS 'A'
2. ALL REINFORCING STEEL SHALL BE #4 PERFORMED BARS.
3. ALL EXPOSED CORNERS SHALL BE CHAMFERED 3/4"
4. ALL TOP OF GRATES & MANHOLES WILL CONFORM TO THE EXISTING SLOPE.

CURB INLET MODIFICATION



SECTION B-B



INLET MODIFICATION LT. LINE D STA 162+85

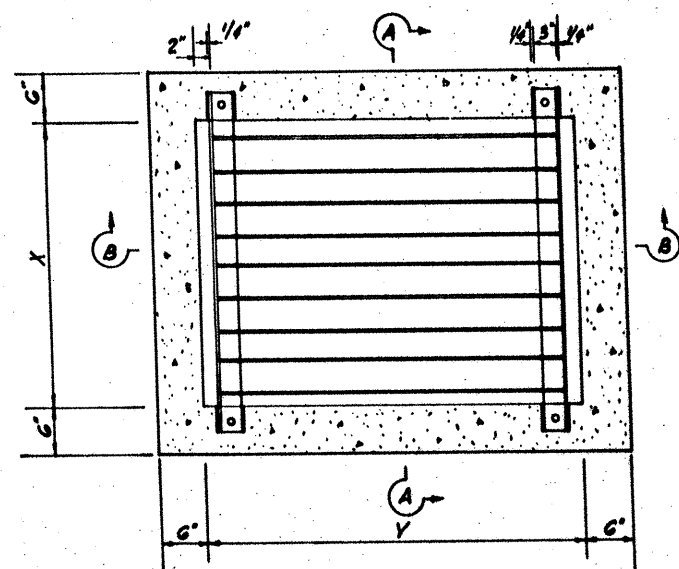
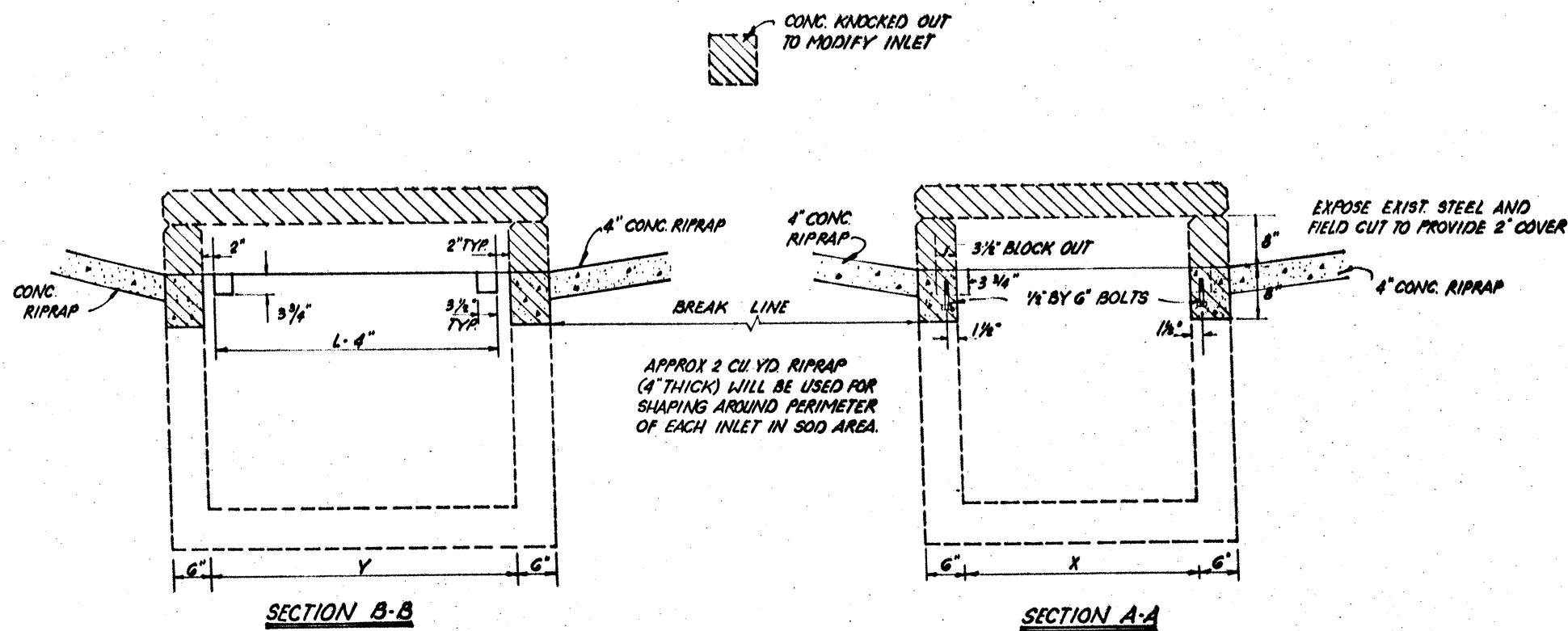
CURB INLET MODIFICATION
LT. OF LINE "D" STA. 162+85

86

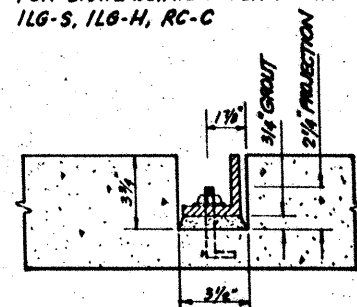
Sheet 3 of 4 Sheets

FED. RD. DIV. NO.	STATE	FEDERAL PROJECT NO.	SHEET NO.			
0	TEXAS	4-HES 0005 (293)	86			
STATE DIST. NO.	COUNTY	CONT.	SECT.	JOB	HIGHWAY NO.	
16	NUECES	326	03	61	3428	

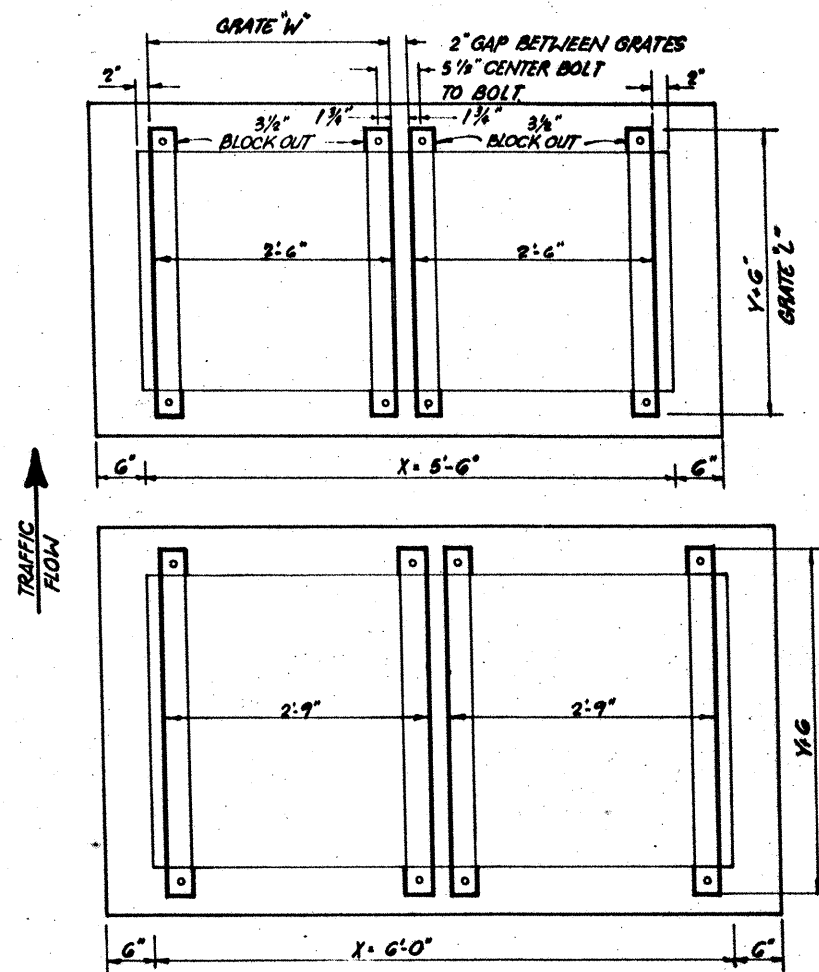
A - DESIGNATES INLETS FROM I.H. 37 TO MORRIS ST.
B - DESIGNATES INLETS FROM MORRIS ST. TO TARTLTON ST.



PLAN VIEW
FOR GRATE DETAIL REFER TO STANDARD
1LG-S, 1LG-H, RC-C



GRATE MOUNTING DETAIL
SCALE: 1" = 4'



DOUBLE GRATE INLET
DETAIL
GRATES WILL BE SET AS SHOWN IN
DETAIL

NO.	LOCATION	EXIST. INLET		GRATE	
		X	Y	L	W
A-1	118' LT. B-L STA. 31+40	2'-6"	2'-6"	3'-0"	2'-2"
A-2	224' LT. B-L STA. 30+80	2'-6"	2'-6"	3'-0"	2'-2"
A-3	230' LT. B-L STA. 30+08	2'-6"	2'-6"	3'-0"	2'-2"
A-4	84' LT. B-L STA. 25+60	2'-6"	2'-6"	3'-0"	2'-2"
A-5	170' LT. B-L STA. 25+70	4'-6"	2'-6"	5'-0"	2'-2"
A-6	B-L STA. 32+31	2'-6"	2'-6"	3'-0"	2'-2"
A-7	160' RT. B-L STA. 28+76	2'-6"	2'-6"	3'-0"	2'-2"
A-8	108' RT. B-L STA. 25+90	2'-6"	2'-6"	3'-0"	2'-2"
A-9	168' RT. B-L STA. 26+00	2'-6"	2'-6"	3'-0"	2'-2"
A-11	92' RT. B-L STA. 22+00	2'-6"	2'-6"	3'-0"	2'-2"
A-12	80' LT. B-L STA. 21+87	2'-6"	2'-6"	3'-0"	2'-2"
A-13	125' RT. Line D' Sta. 13+15	2'-6"	2'-6"	3'-0"	2'-2"
A-14	130' RT. Line D' Sta. 11+80	2'-6"	2'-6"	3'-0"	2'-2"
A-15	110' RT. Line D' Sta. 9+30	2'-6"	2'-6"	3'-0"	2'-2"
A-16	160' LT. Line D' Sta. 8+16	2'-6"	2'-6"	3'-0"	2'-2"
A-17	232' RT. B-L STA. 5+56	2'-6"	2'-6"	3'-0"	2'-2"
A-18	B-L STA. 35+75	2'-6"	2'-6"	3'-0"	2'-2"
A-19	B-L STA. 38+74	4'-0"	4'-0"	5'-0"	3'-8"
A-20	67' RT. B-L STA. 41+91	2'-6"	2'-6"	3'-0"	2'-2"
A-21	67' LT. B-L STA. 40+60	2'-6"	2'-6"	3'-0"	2'-2"
A-22	100' LT. B-L STA. 41+27	2'-6"	2'-6"	3'-0"	2'-2"
B-4	160' LT. B-L STA. 53+00	3'-0"	2'-6"	3'-6"	2'-2"
B-5	95' LT. B-L STA. 49+45	2'-6"	2'-6"	3'-0"	2'-2"
B-12	170' LT. B-L STA. 67+13	2'-6"	2'-6"	3'-0"	2'-2"
B-13	97' LT. B-L STA. 67+59	2'-6"	2'-6"	3'-0"	2'-2"
B-25	91' RT. B-L STA. 68+16	2'-6"	3'-0"	3'-0"	2'-8"
B-32	120' RT. B-L STA. 62+40	3'-6"	2'-6"	4'-0"	2'-2"
B-34	105' RT. B-L STA. 51+43	2'-6"	2'-6"	3'-0"	2'-2"
B-42	135' RT. B-L STA. 56+38	3'-6"	3'-6"	4'-0"	3'-2"
B-62	145' RT. B-L STA. 79+10	3'-6"	3'-0"	4'-0"	2'-8"
B-71	140' RT. B-L STA. 85+60	4'-0"	2'-6"	4'-6"	2'-2"
B-77	130' RT. B-L STA. 92+95	5'-6"	2'-6"	3'-0"	2'-6"
B-82	146' RT. B-L STA. 97+86	6'-0"	3'-6"	4'-0"	2'-9"
B-92	120' LT. B-L STA. 80+95	3'-0"	2'-6"	3'-6"	2'-8"
B-99	135' LT. B-L STA. 85+26	4'-0"	3'-0"	4'-6"	2'-8"
B-102	117' LT. B-L STA. 90+00	4'-6"	2'-6"	5'-0"	2'-2"
B-107	139' LT. B-L STA. 98+55	5'-6"	3'-0"	3'-6"	2'-6"
B-113	132' RT. B-L STA. 111+12	2'-6"	3'-6"	3'-0"	3'-2"
B-129	139' LT. B-L STA. 104+38	2'-6"	3'-0"	3'-0"	2'-8"
B-135	133' RT. B-L STA. 117+10	3'-6"	2'-6"	4'-0"	2'-2"
B-140	131' LT. B-L STA. 117+00	2'-6"	3'-0"	3'-0"	2'-8"
B-144	131' LT. B-L STA. 120+47	3'-0"	3'-6"	3'-6"	3'-2"
B-149	136' LT. B-L STA. 127+70	3'-0"	2'-6"	3'-6"	2'-2"
B-155	128' LT. B-L STA. 124+80	3'-6"	2'-6"	4'-0"	2'-2"
B-160	110' RT. B-L STA. 129+68	6'-0"	3'-0"	3'-6"	2'-9"
B-168	70' RT. B-L STA. 124+10	2'-6"	2'-6"	3'-0"	2'-2"
TOTAL					

* SEE DOUBLE GRATE INLET DETAIL

DROP INLET MODIFICATION
SCALE: 1"=1'

Sheet 4 of 4 Sheets

FED. RD DIST. NO. 6	STATE TEXAS	FEDERAL PROJECT NO. HA - HES 0003 (293)	SHEET NO. 87
STATE DIST. NO. 16	COUNTY NUECES	CONT. SECT. 326 03	100 HIGHWAY NO. 61 SH. 280

NOTES:

Concrete for Concrete Traffic Barrier shall be Class "A" or "B".

The Contractor shall field measure for all dimensions prior to fabrication of Concrete Traffic Barrier.

Existing Median Rail shall be removed only in the immediate area of construction. Open gaps in existing median rail will not be permitted when Contractor is not actually working in the rating.

Existing anchor bolts are to remain in place after removal of existing median rail, unless noted otherwise.

Contractor shall remove any Median Rail Anchor Bolts that will interfere with proper positioning of Concrete Traffic Barrier. Bolts shall be cut off flush with median surface. Removing Median Rail Anchor Bolts will not be paid for directly, but shall be included in the unit price bid for "Remove Metal Bar Old Force (Bar) & CHAMP".

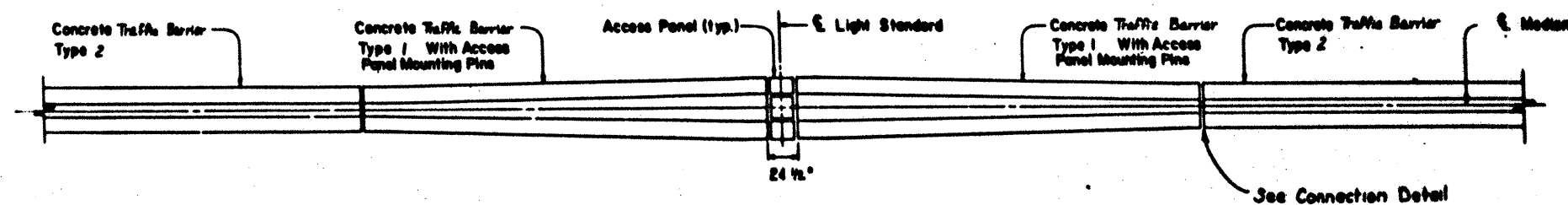
Axis of Concrete Traffic Barrier shall be vertical at centerline of roadway, except where superelevated. Concrete Traffic Barrier in superelevated sections shall be normal to roadway surface.

Concrete Traffic Barrier shall be installed with 1" (inch) gravel pad placed underneath the barrier. Gravel shall also be placed in the recessed portion on the bottom of the Concrete Traffic Barrier. The gravel for barrier pad shall consist of one part cement to seven parts finely graded sand.

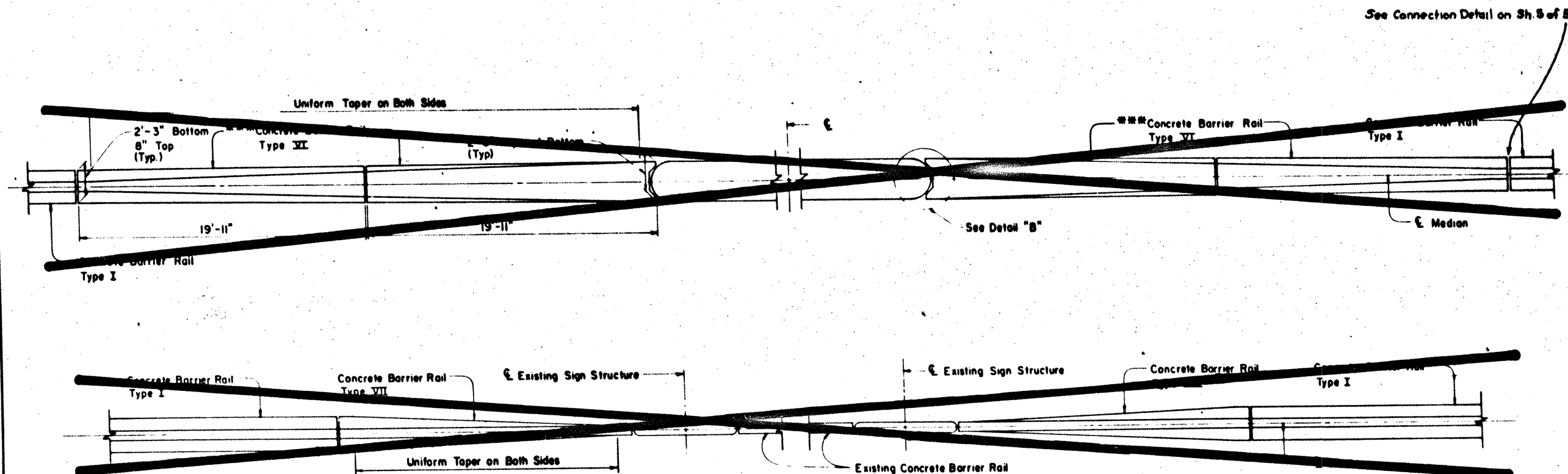
Longitudinal Bars for Concrete Traffic Barrier shall conform to ASTM A-615 or ASTM A-616 (Grade 60). Vertical Bars shall conform to ASTM A-615 (Grade 40).

Concrete Traffic Barrier shall be measured for payment along the centerline of the Barrier. Payment will be made in accordance with the Item "Concrete Traffic Barrier".

~~Concrete Traffic Barrier installed on bridges at expansion joints shall have 1" (inch) rebonded rubber pads placed underneath the barrier as shown in the detail. Pads shall be bonded to the bottom of the concrete traffic barrier as directed by the manufacturer and as approved by the Engineer.~~



CONCRETE TRAFFIC BARRIER INSTALLATION AT LIGHT STANDARD



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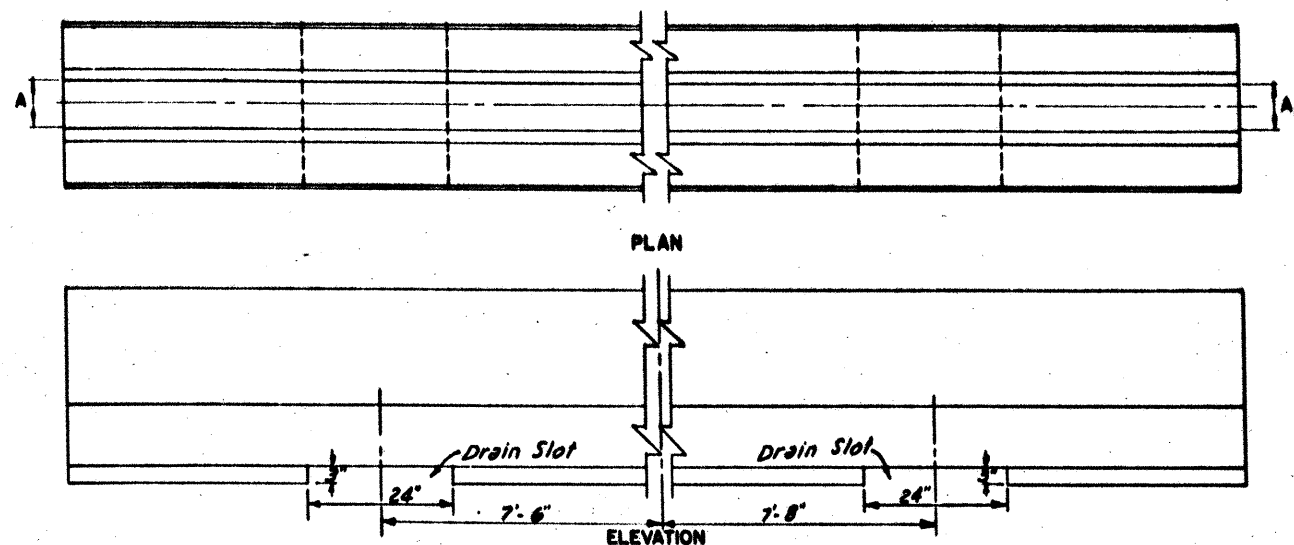
STATE DEPARTMENT OF HIGHWAYS
AND PUBLIC TRANSPORTATION

CONCRETE TRAFFIC BARRIER DETAILS

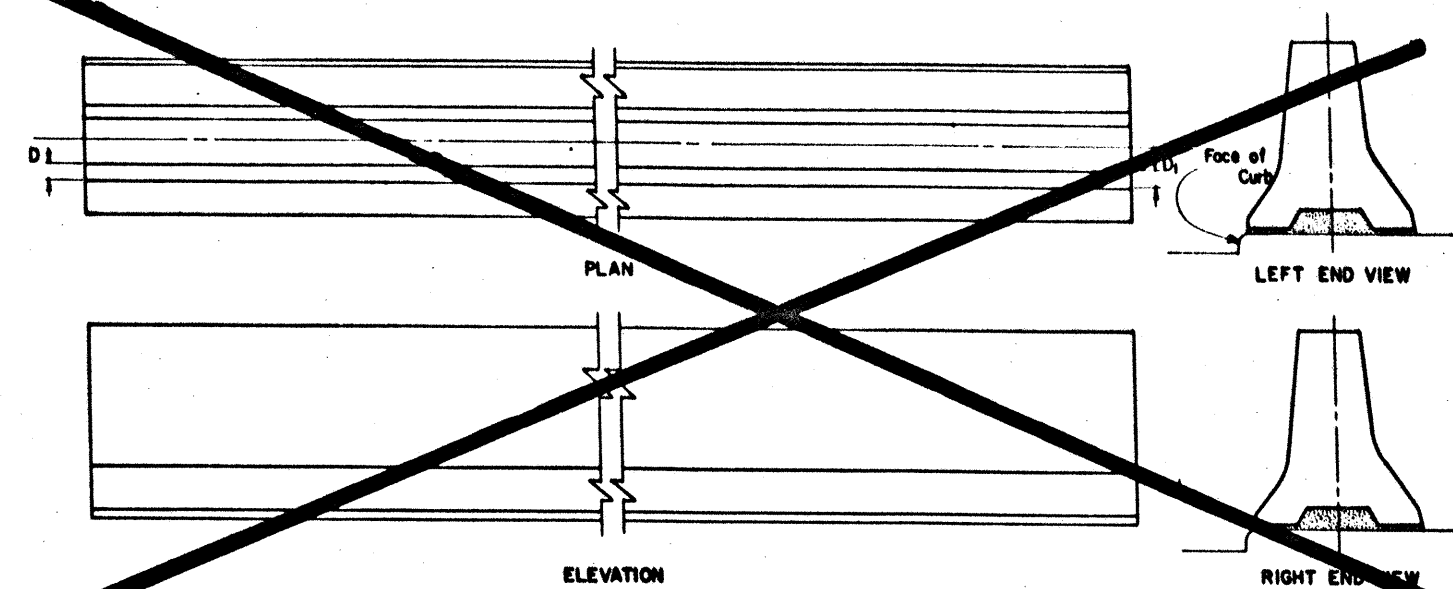
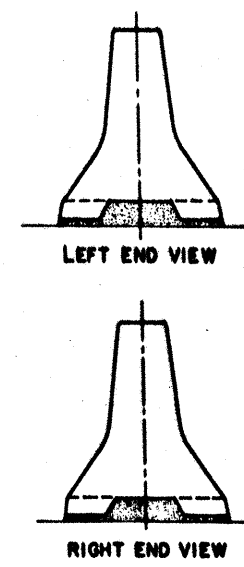
SHEET 1 OF 5 SHEETS

Dw. HOS	DATE	FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.
Cd. Dm. JBS	ORIGINAL FEB. 1980	6	TEXAS	HES 0005 (293)	SH286
Cd. Dm. JBS	REV. JUNE 6, 1981 M.P.				
Cd. Dm. JBS	REV. JUNE 6, 1985				
STATE	COUNTY	DIST. NO.	SECTION	POST MILE	STATION
16	NUECES	326	03	61	88

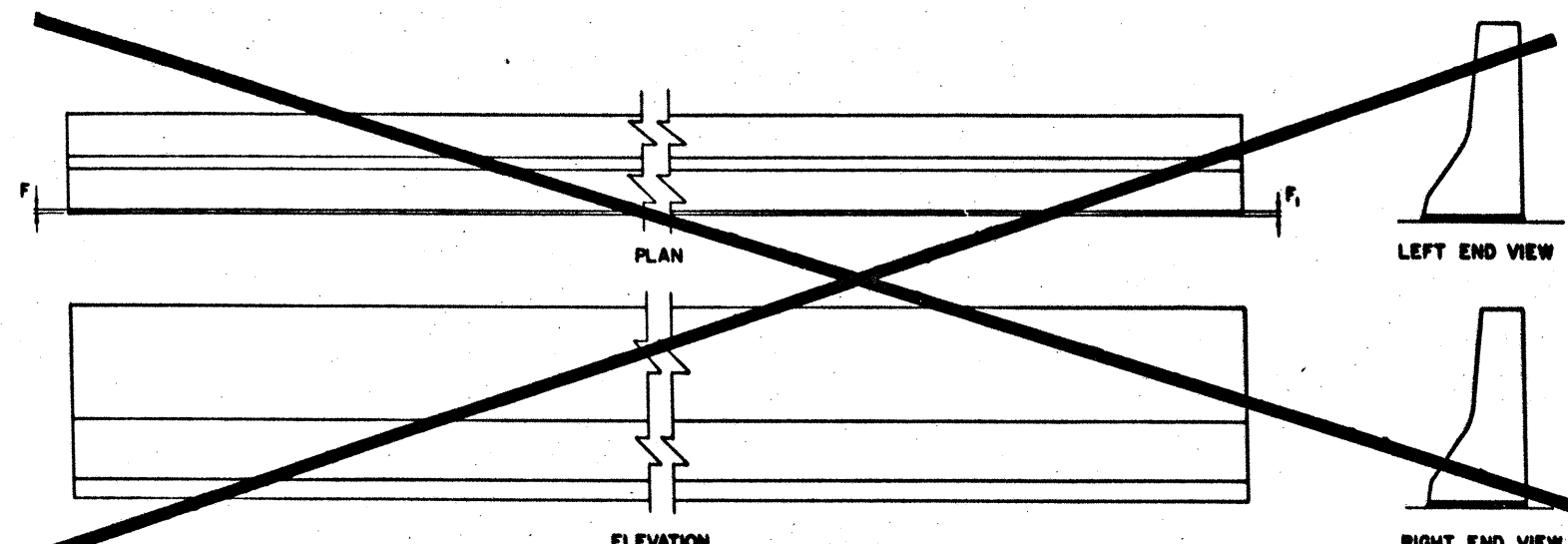
Revised 8-5-85



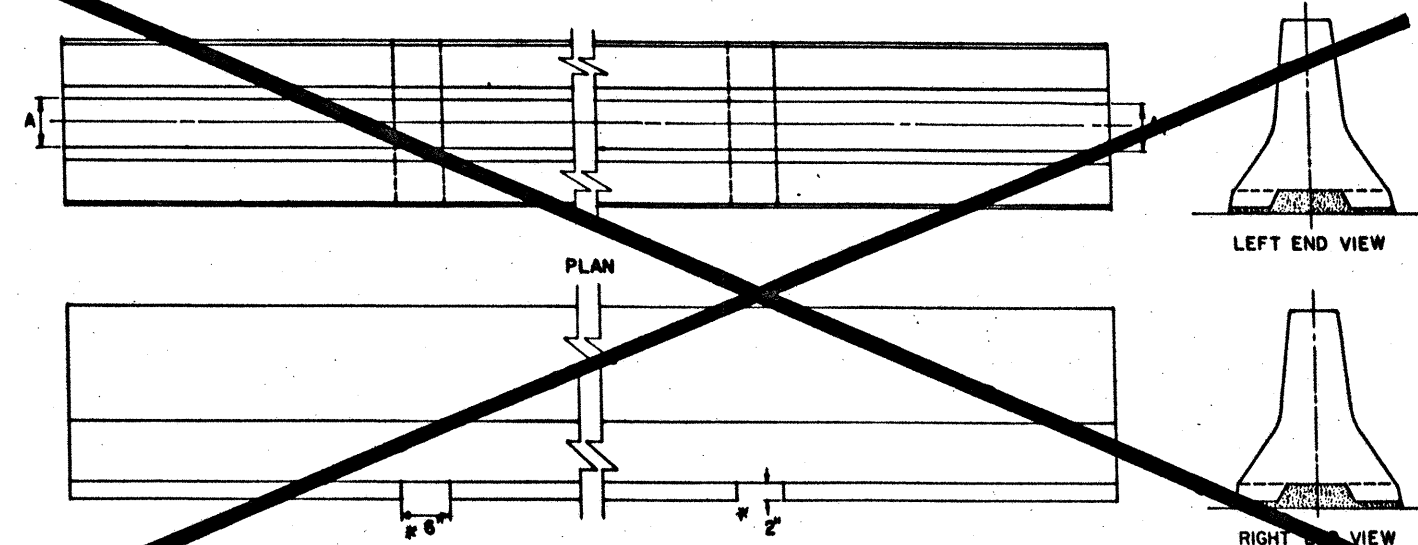
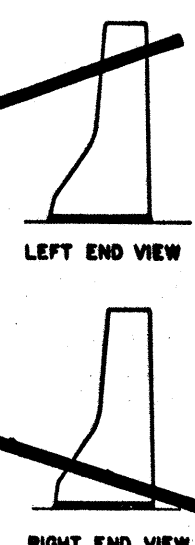
**TYPE 2
CONCRETE TRAFFIC BARRIER**



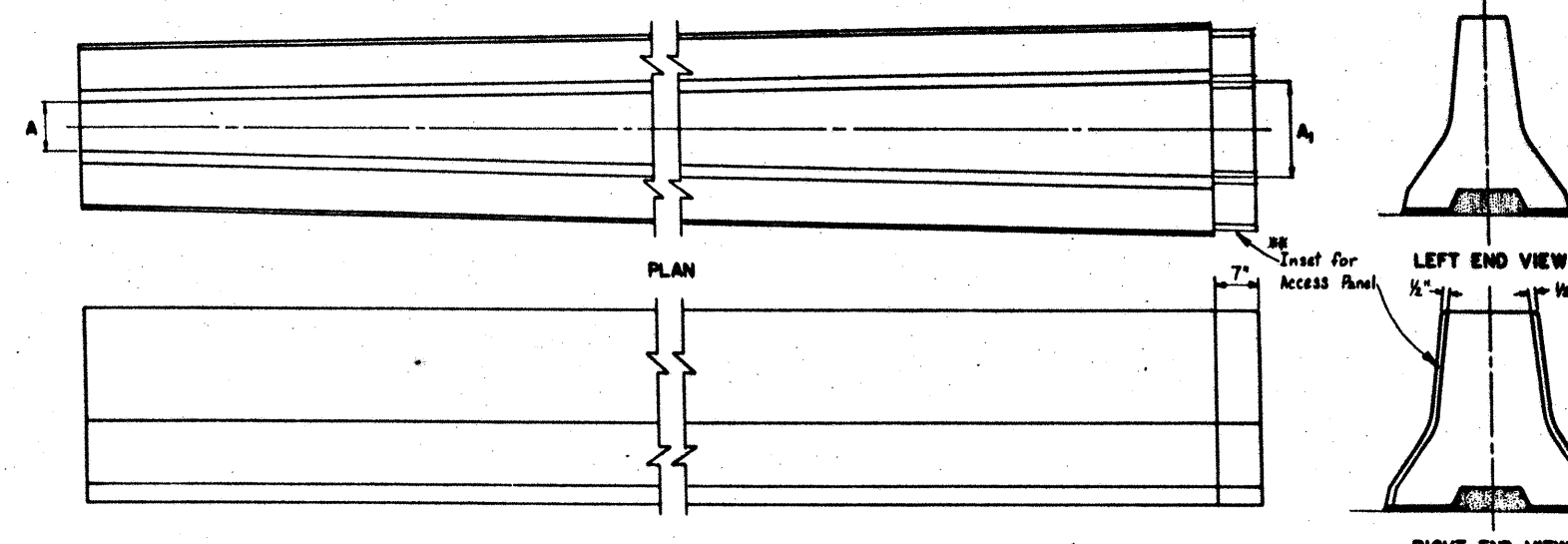
**TYPE IV
CONCRETE TRAFFIC BARRIER**



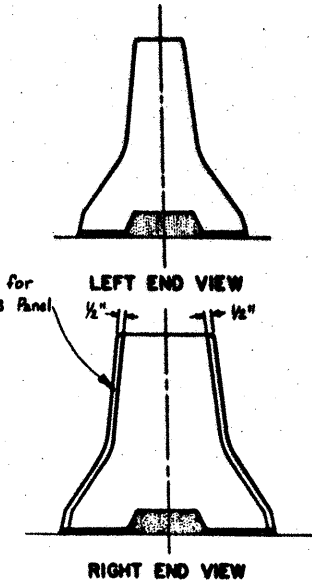
**TYPE II
CONCRETE TRAFFIC BARRIER**



**TYPE I-MOD.
CONCRETE TRAFFIC BARRIER**



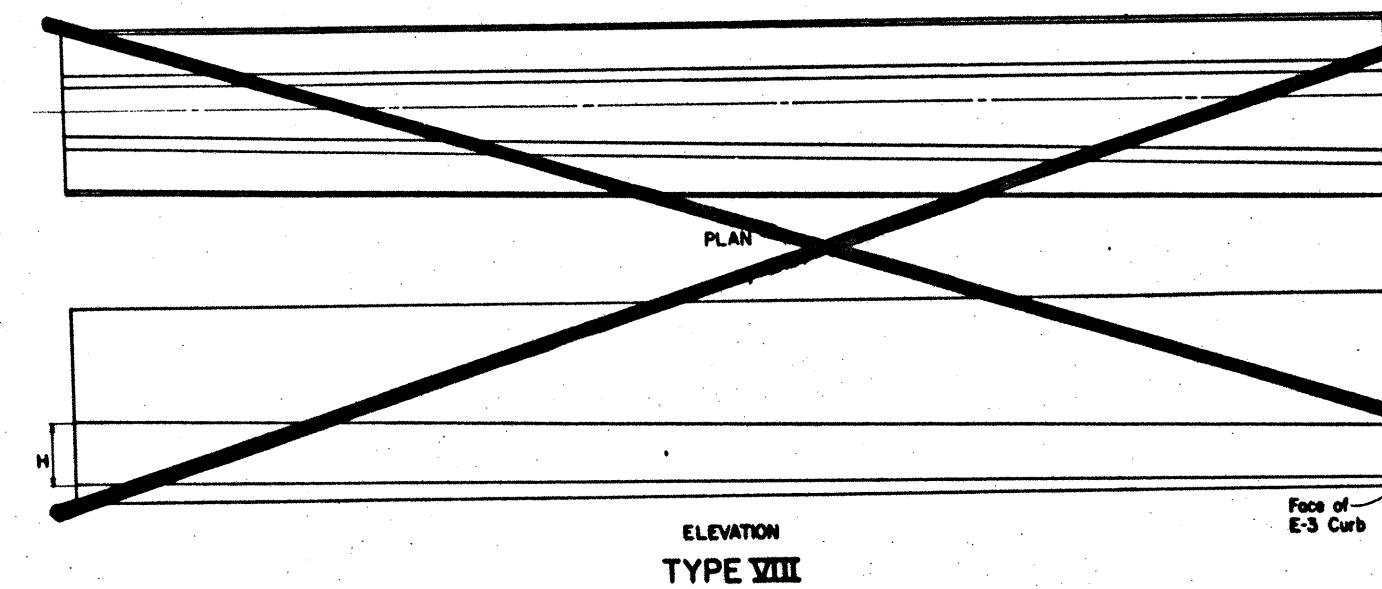
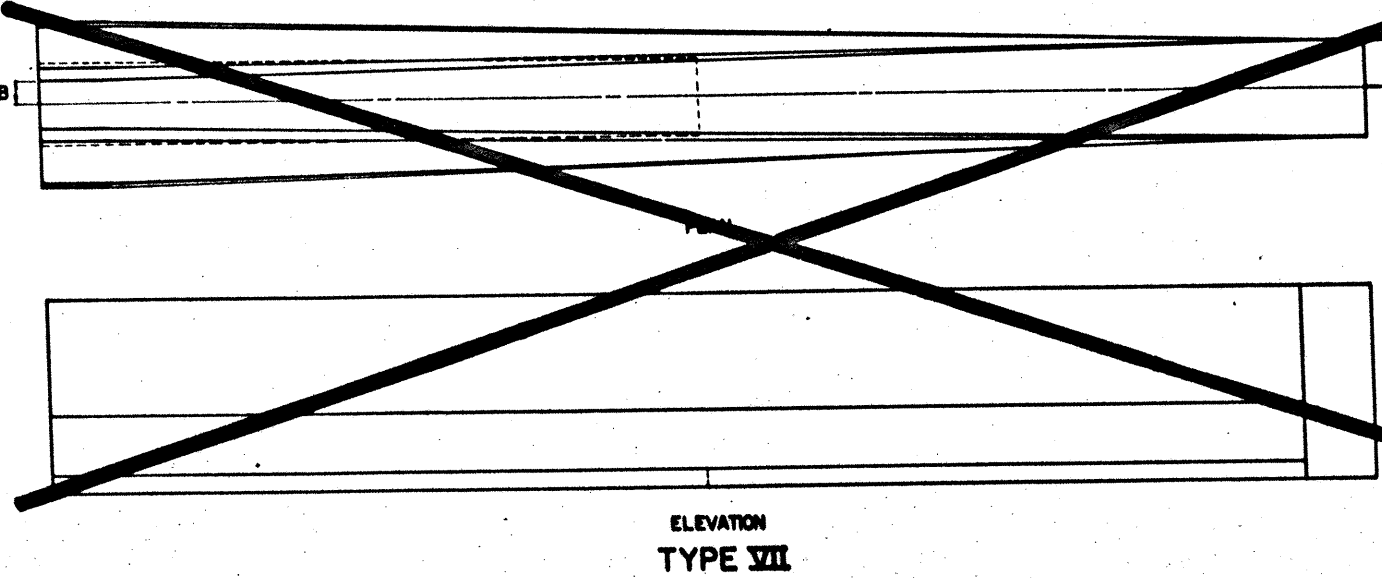
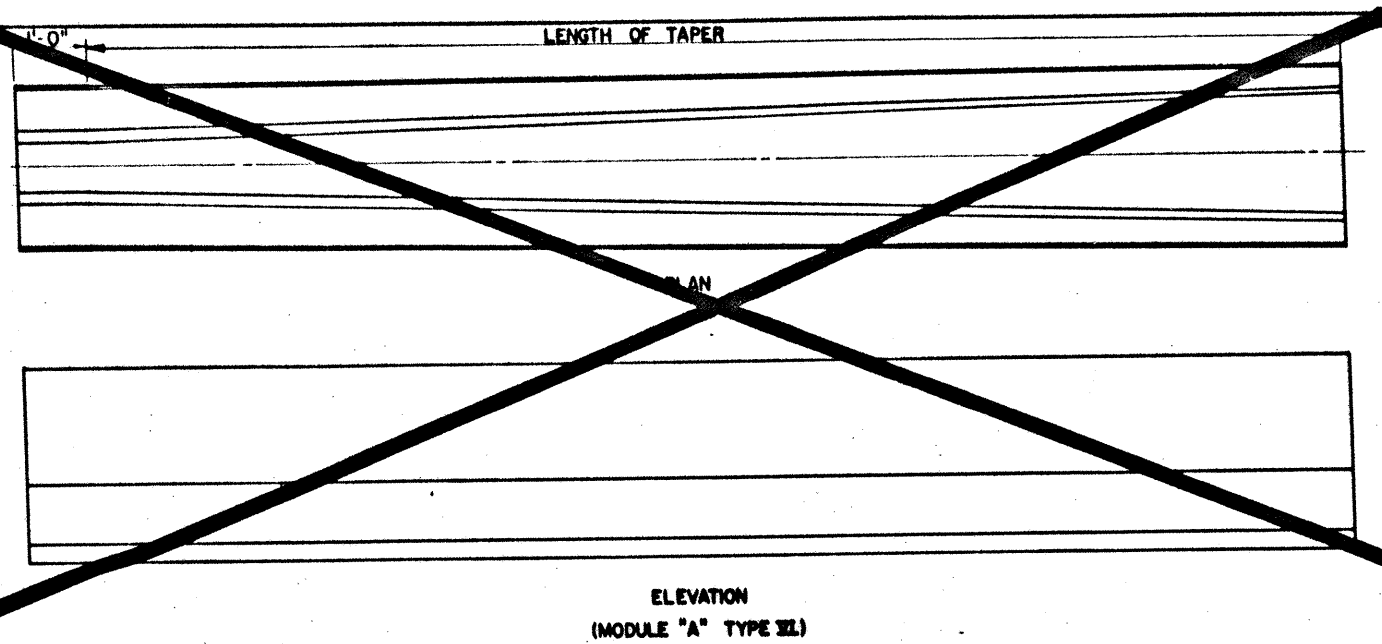
**TYPE I
CONCRETE TRAFFIC BARRIER**



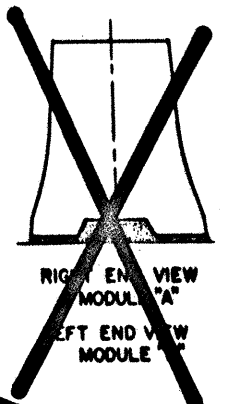
*# Type I Concrete Traffic Barrier will have a 7" x 11/2" inset for the access panel to be set in.

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STATE DEPARTMENT OF HIGHWAYS AND PUBLIC TRANSPORTATION									
CONCRETE TRAFFIC BARRIER DETAILS									
SHEET 2 OF 5 SHEETS									
Dr. H. J. B.	Drawn by	DATE	FEB 1980	STATE	TEXAS	FEDERAL AID PROJECT NO.	34286	ROUTE	16
Cr. Dn. J. B. S.	Checked by	DATE	FEB 1980	COUNTY	NUECES	STATE DIST. NO.	326	SECTION	03
Cr. Dn. J. B. S.	Checked by	DATE	FEB 1980	COUNTY	NUECES	STATE DIST. NO.	326	SECTION	03
Cr. Dn. J. B. S.	Checked by	DATE	FEB 1980	COUNTY	NUECES	STATE DIST. NO.	326	SECTION	03

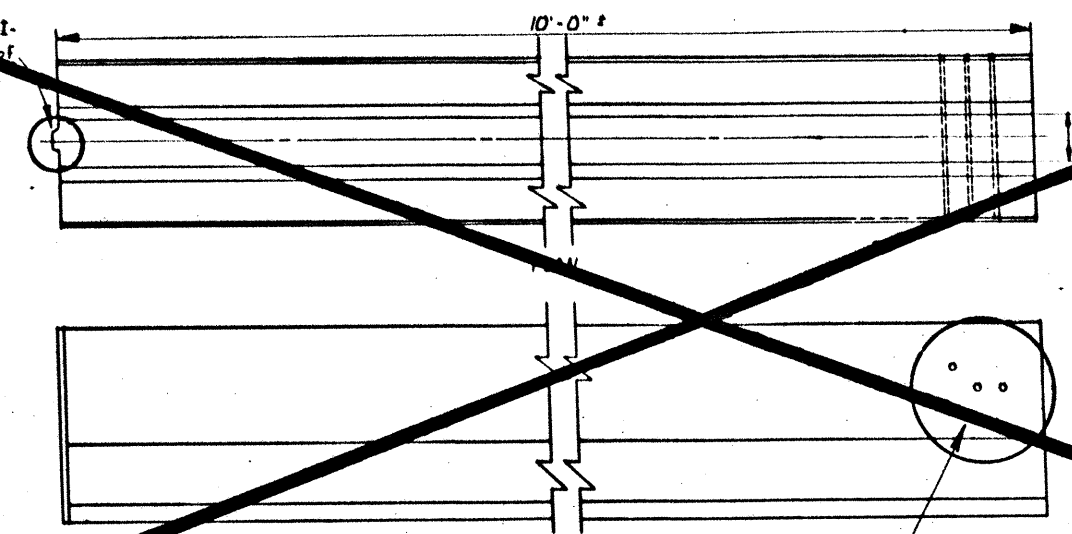
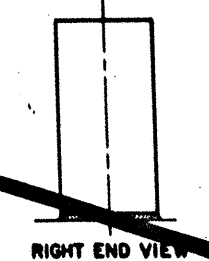
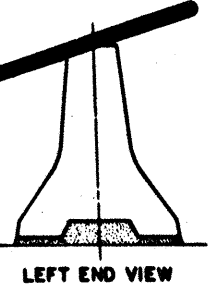


See Connection Detail for Type I-
Temp. Barrier Sheet 3 of 5 of
Concrete Traffic Barrier Details

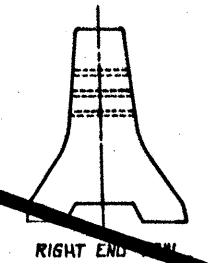
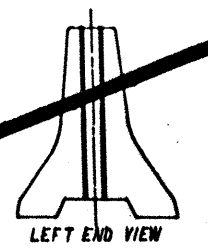


TYPE VI

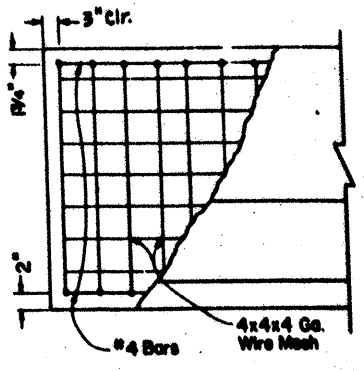
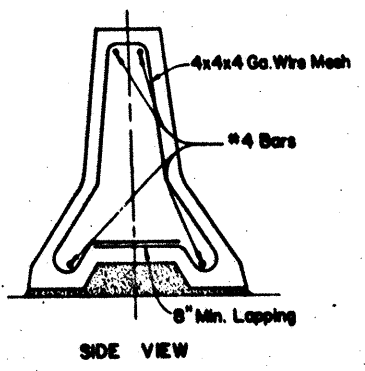
Consist of Modules
A & B



TYPE I - TEMPORARY BARRIER

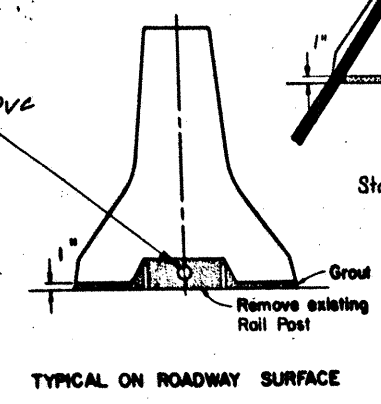
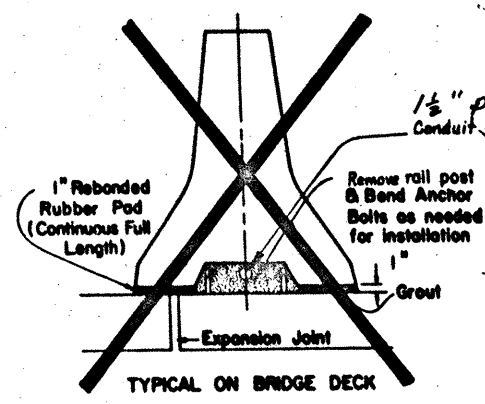


See Concrete Traffic Barrier Details Sheet 3 of 5
for Hole Placement Detail

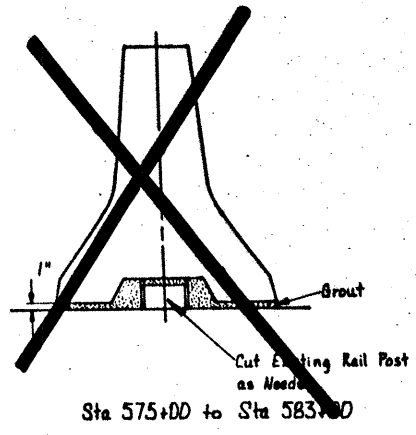


OPTIONAL REINFORCING DETAIL

The Contractor may at his option use the reinforcing details shown on detail sheet or the welded wire mesh shown above. Reinforcing mesh of equivalent steel area with variable wire spacings and sizes may, with the approval of the Engineer, be used in lieu of the mesh shown in this detail. Any reinforcing steel shall maintain a 1 1/4" clearance on all sides, a 2" clearance on the bottom of the Barrier and a 3" clearance on the ends.



INSTALLATION OF CONCRETE TRAFFIC BARRIER



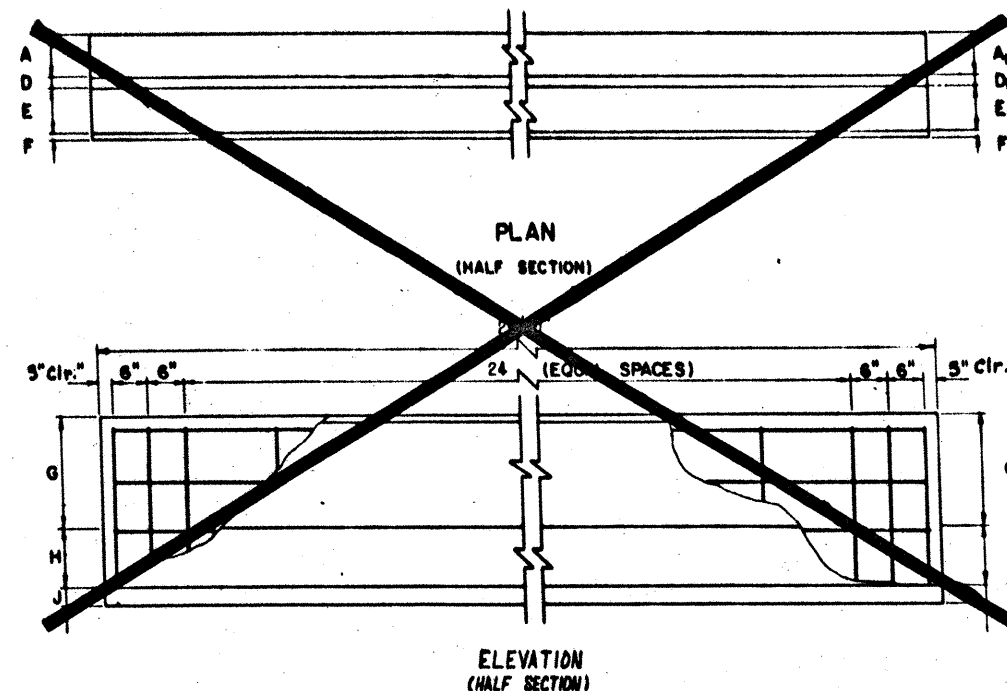
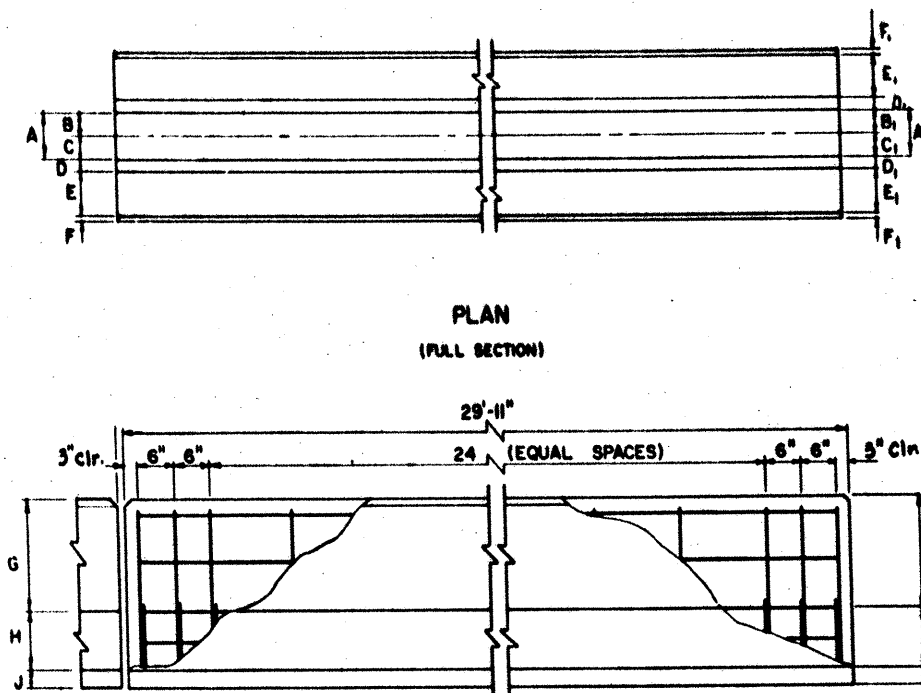
CONCRETE TRAFFIC BARRIER
DETAILS

SHEET 3 OF 5 SHEETS

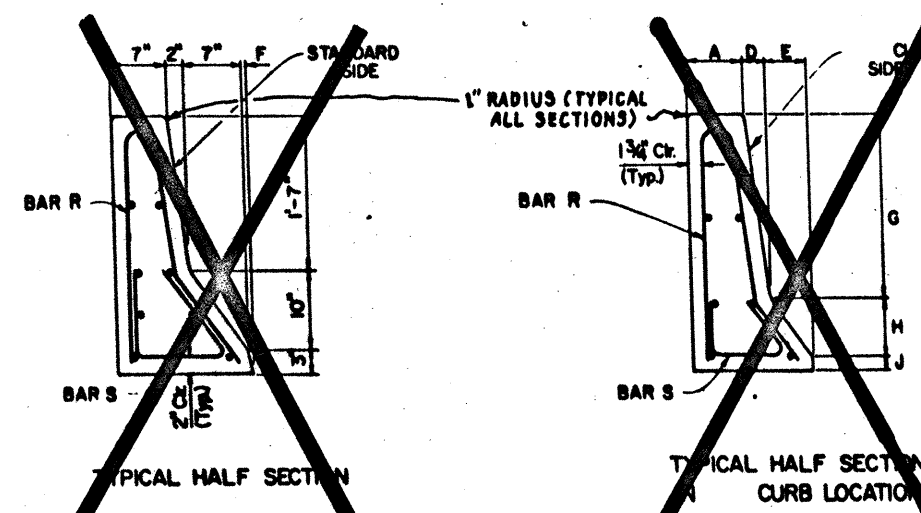
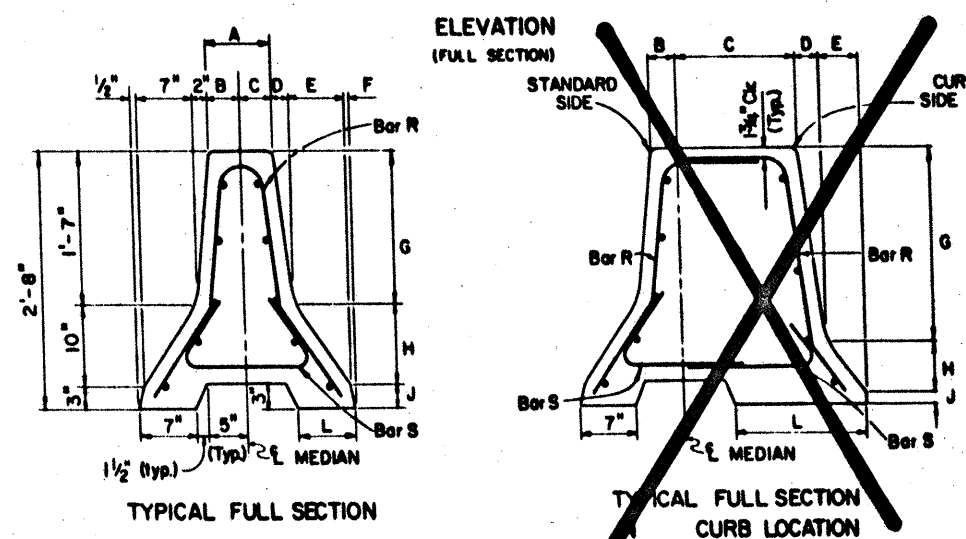
Drawn	Checked	Date	State	Federal Aid Project No.	Sheet No.
Dr. H. J. B. S.	Dr. H. J. B. S.	FEB 1960	TEXAS	HES 0005 (293)	34286
City	County	Route	Station	Post-Mile	Project
City of El Paso	El Paso	16	NUECES	326.03	61 90

Rev. 9-23-60
Rev. 6-6-65

90

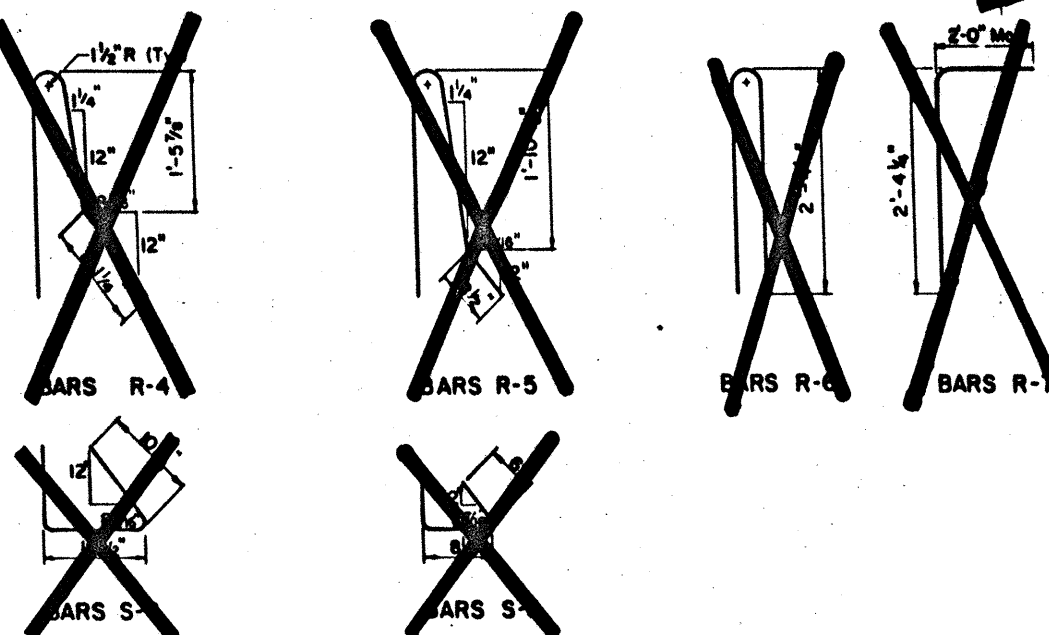
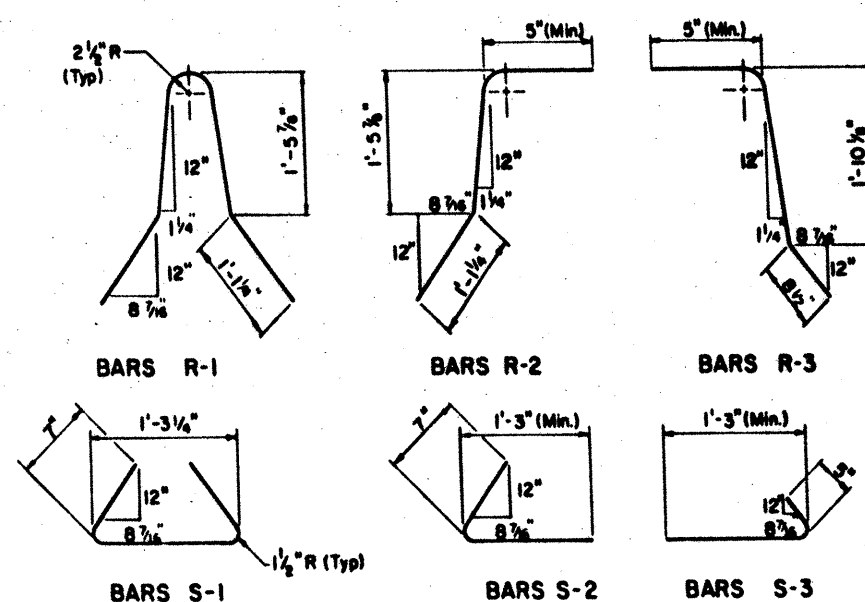
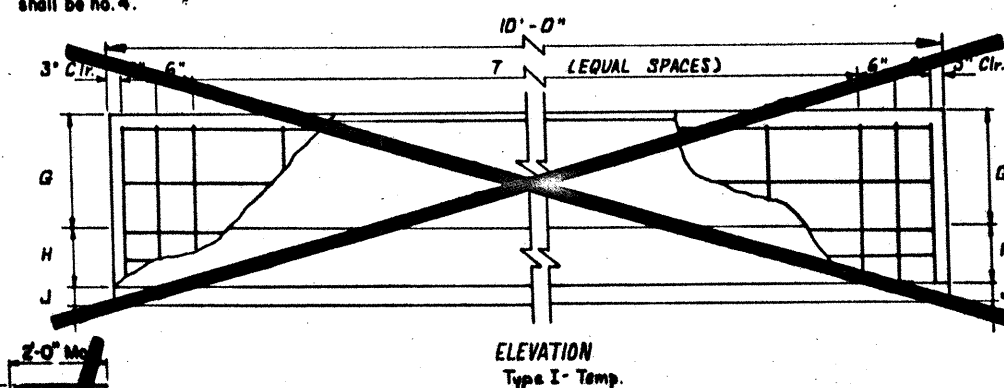


DIM.	TYPE 2	TYPE II	TYPE I	TYPE IX	TYPE V	TYPE VII	TYPE VIII	TYPE XIII
A	8"	7"	8"	**	7"	8"	8"	8"
A ₁	8"	7"	16"	**	7"	2'-8"	**	**
B	4"	-	4"	4"	-	4"	4"	4"
B ₁	4"	-	8"	4"	-	1'-4"	**	4"
C	4"	-	4"	**	-	4"	4"	4"
C ₁	4"	-	8"	**	-	1'-4"	**	**
D	2"	2"	2"	2 1/2"	2 1/2"	2"	2"	2"
D ₁	2"	2"	2"	2 1/2"	2 1/2"	0"	0"	2 1/2"
E	7"	7"	7"	5 1/8"	5 1/8"	7"	7"	7"
E ₁	7"	7"	7"	5 1/8"	5 1/8"	0"	0"	5 1/8"
F	1/2"	1/2"	1/2"	0"	0"	1/2"	1/2"	1/2"
F ₁	1/2"	1/2"	1/2"	0"	0"	0"	0"	0"
G	1'-7"	1'-7"	1'-7"	1'-1 1/4"	1'-1 1/4"	1'-7"	1'-7"	1'-1 1/4"
G ₁	1'-7"	1'-7"	1'-7"	1'-1 1/4"	1'-1 1/4"	Flat	Flat	1'-1 1/4"
H	10"	10"	10"	7 1/4"	7 1/4"	0"	0"	0"
H ₁	10"	10"	10"	7 1/4"	7 1/4"	Flat	Flat	7 1/4"
J	3"	3"	3"	1 1/2"	1 1/2"	3"	3"	3"
J ₁	3"	3"	3"	1 1/2"	1 1/2"	Flat	Flat	1 1/2"
L	7"	-	7"	**	-	-	-	**
L ₁	7"	-	11"	**	-	-	-	**



CONCRETE TRAFFIC BARRIER BARS								
	TYPE 2	TYPE II	TYPE I	TYPE IV	TYPE V	TYPE VI	TYPE VII	TYPE VIII
BAR	R-1	R-4	R-2&R-3	R-2&R-7	R-5	R-1,R-2,&R-7	R-1,R-2&R-6	R-2&R-8
BAR	S-1	S-4	S-2&S-3	S-2&S-7	S-7	S-1&S-2	S-1&S-2	S-2&S-8

All reinforcing steel bars and dowels shall be no. 4.



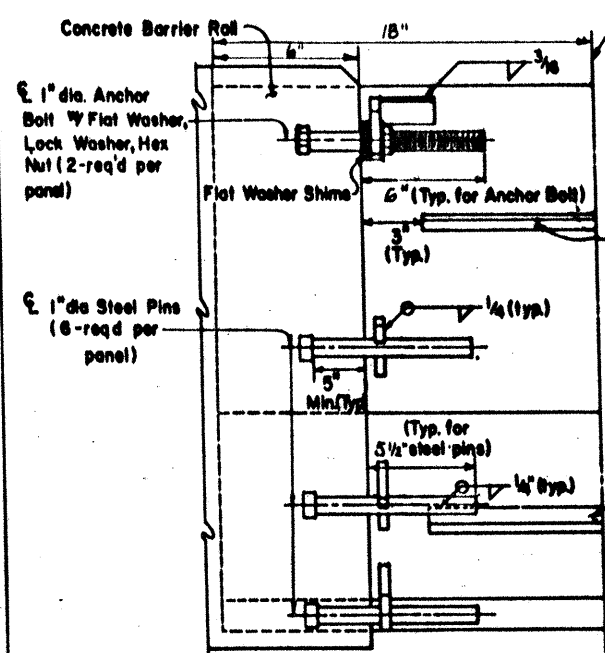
HOW TO USE "CONCRETE TRAFFIC BARRIER MODULES" CHART
Locate dimension needed in the left hand column labeled "DIM", then locate the module Type as listed on chart. The figure at the intersection of the two columns is the dimension required for that module. Dimensions shown are for 30' modules.
Example: Dimension "A1" Concrete Traffic Barrier Type 2 is 8"



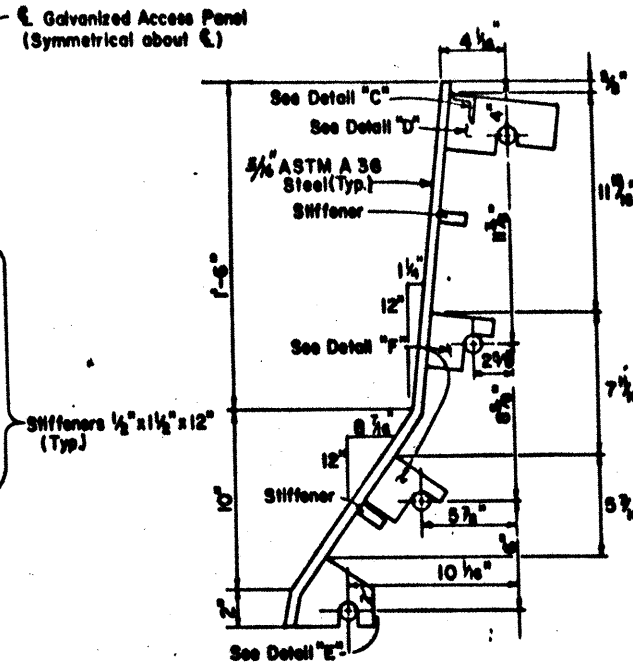
CONCRETE TRAFFIC BARRIER DETAILS

SHEET 4 OF 5 SHEETS

Da	HUJ	Description	Date	FED AND STATE	FEDERAL AID PROJECT NO.	PROJECT NO.
Cd	DW	ORIGINAL	FEB. 1960	8	TEXAS	HES 0005 [293] S128
Dw	TW					
Cd	JWS			STATE	COUNTY	Sr No. S/A S/S No.
To				WEST 16	NUECES	326 03 61 91

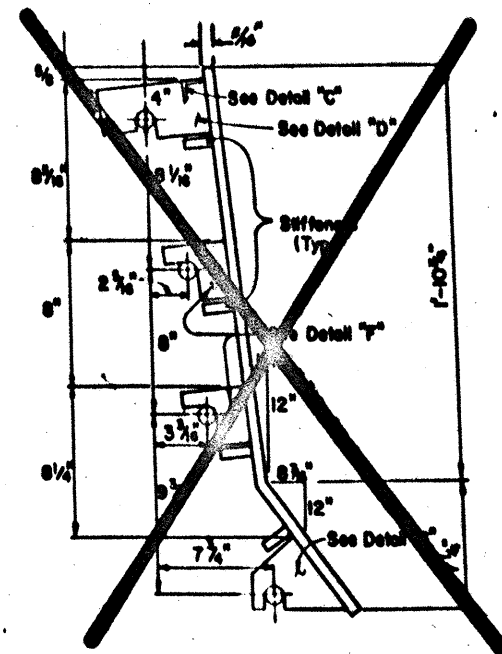


PIN PLACEMENT DETAIL

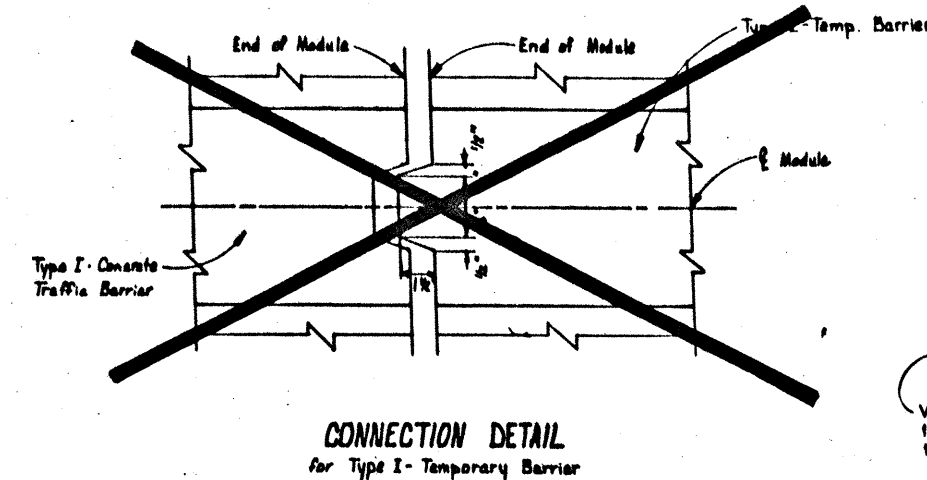


(STANDARD)

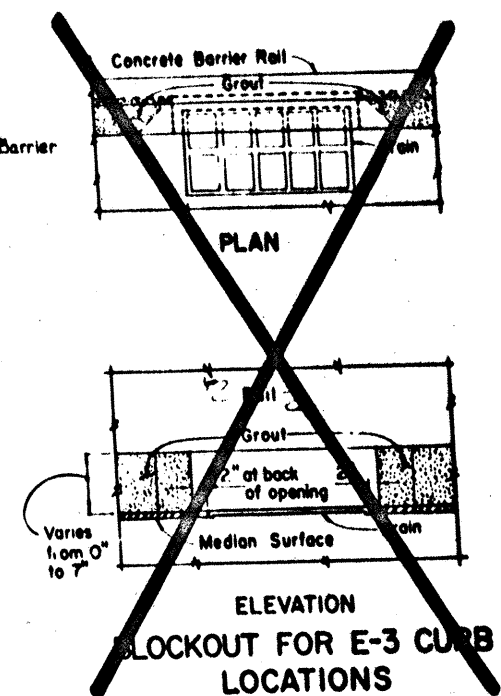
ACCESS PANEL DETAIL



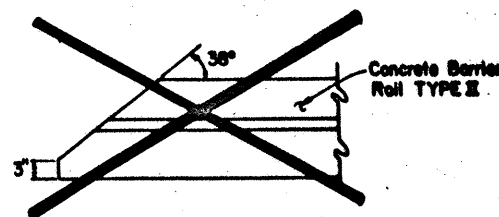
(CURB)



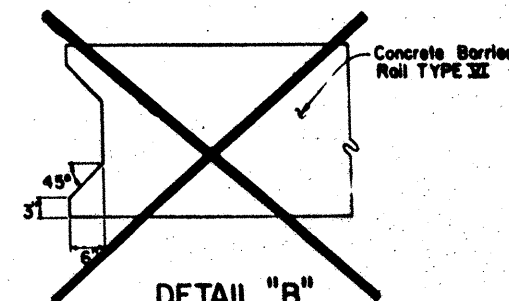
CONNECTION DETAIL
for Type I - Temporary Barrier



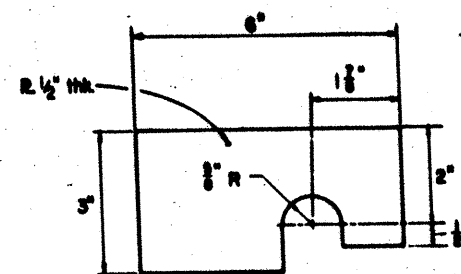
ELEVATION
BLOCKOUT FOR E-3 CURB
LOCATIONS



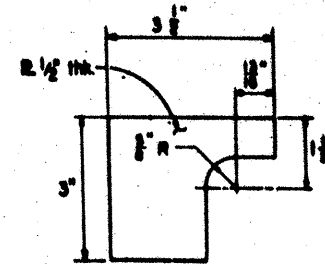
DETAIL "A"



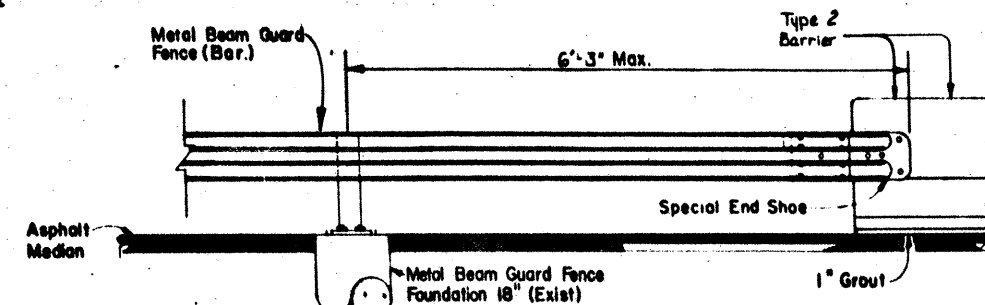
DETAIL "B"



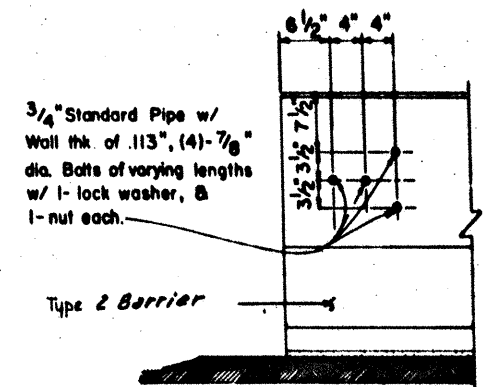
DETAIL "D"
(2 Req'd. per panel)



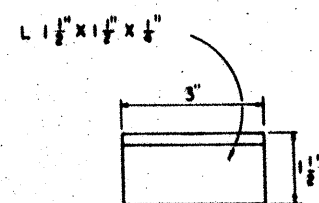
DETAIL "F"
(4 Req'd. per panel)



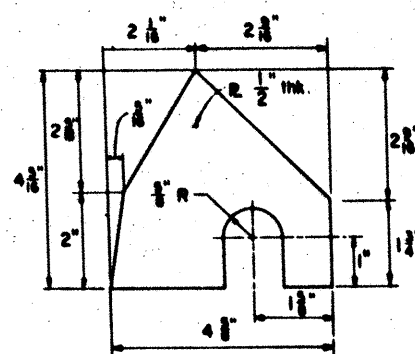
TEMPORARY INSTALLATION OF
METAL BEAM GUARD FENCE



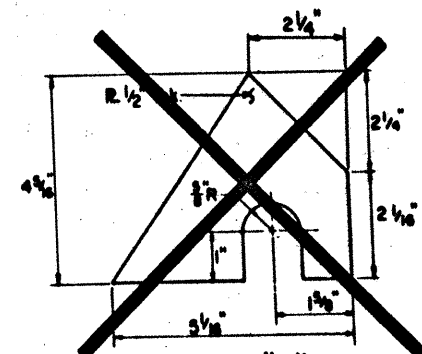
HOLE PLACEMENT DETAIL
(FOR METAL BEAM GUARD FENCE)



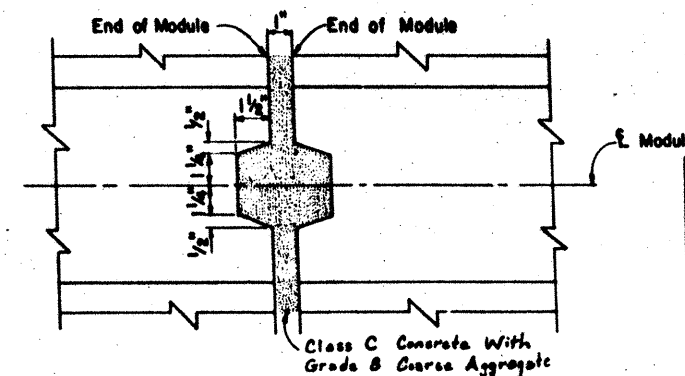
DETAIL "C"
(2 Req'd. per panel)



DETAIL "E"
(2 Req'd. per panel)



DETAIL "G"
(2 Req'd. per panel)



CONNECTION DETAIL

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STATE DEPARTMENT OF HIGHWAYS
AND PUBLIC TRANSPORTATION

**CONCRETE TRAFFIC BARRIER
DETAILS**

SHEET 5 OF 5 SHEETS

DN	HD	ORIGIN	DATE	REV	DATE	FEDERAL PROJECT NO.	REVISION
CK	DN	JBS	FEB. 1980	1		HES 0005 (293)	SH286
DN	ELW						
CK	DN	JBS					
TR							
CK	TR						

Revised 8-5-85

BAR	SIZE	NO	SPAC.
A	#5	—	18"
B ₁	#5	—	18"
B ₂	#5	—	18"
C	#5	—	18"
D	#8	—	12"
H ₁	#5	8	—
H ₂	#5	8	—
R	#5	7	—
S	#5	—	18"

BAR	SIZE	NO	SPAC.
A	#5	—	18"
B ₁	#5	—	18"
B ₂	#5	—	18"
C	#5	—	18"
D	#8	—	12"
H ₁	#5	8	—
H ₂	#5	8	—
R	#5	7	—
S	#5	—	18"

BILL OF REINF. STL.			
BAR	SIZE	NO.	SPAC.
A	#5	—	18"
B ₁	#5	—	18"
B ₂	#5	—	18"
C	#5	—	18"
D	#5	—	12"
H ₁	#5	4	—
H ₂	#5	6	—
R	#5	4	—
S	#5	—	18"
T	#5	—	12"
V	#5	3	—

BILL OF REINF. STL.			
BAR	SIZE	NO.	SPAC.
A	#5	—	18"
B ₁	#5	—	18"
B ₂	#5	—	18"
C	#5	—	18"
D	#5	—	12"
H ₁	#5	4	—
H ₂	#5	6	—
R	#5	4	—
S	#5	—	18"
T	#5	—	12"
V	#5	3	—

8"

6" Min. Approx. 3'-8" Max.

8"

For details not shown see C.T.B. TY. SPECIAL

S

R

Coarse Aggregate Backfill

1/2" ϕ galvanized bar, variable length, 8'-0" usual & max. spacing. May be field bent.

V

T

1'-5 1/8"

NOTE: 1 RUN OF $1\frac{1}{2}$ " PVC IN CTD OR BACK IN THE ENGINEER

GENERAL NOTES

- 1) Concrete shall be class "A" or "C" and reinforcing steel grade 40.
- 2) At construction joints, the longitudinal bars shall extend beyond the joint so that bar splices will be a minimum of two feet from the construction joint.
- 3) Bar splices shall be a minimum of 24 times the nominal diameter of the bar.
- 4) Provide construction joints at 32'±.
- 5) Details at light pole locations shall be as shown on standard sheets CTBI(3)-81 and CTBI(4)-81.
- 6) Reinforcing steel, anchor bolts, dowel bars, ground rod, filler material, waterstops, hardware cloth, etc. will not be paid for directly but shall be considered subsidiary to the item Concrete Traffic Barrier.
- 7) Concrete Traffic Barrier shall receive a Class "B" surface finish.

7 1/4"

1 1/8"

1 7/8"

3/8" Min.

3/8"

The diagram shows a cross-section of a well curb. It is a rectangular block divided into four quadrants by a vertical and a horizontal centerline. The top surface is labeled "Type 'B' Waterstop". The left vertical face is labeled "Edge of Well". The bottom horizontal face is labeled "Face of Wall". The bottom-right corner is labeled "3/4\" Chamfer". The entire block is filled with a stippled pattern.

CONCRETE TRAFFIC BARRIER
TYPE SPECIAL 8 & TYPE 3 SPECIAL

AXIS OF TRAFFIC BARRIER SHALL BE VERTICAL, EXCEPT WHERE ROADWAY IS SUPERELEVATED, THEN AXIS SHALL BE NORMAL TO ROADWAY SURFACE.

ALL STEEL FITTINGS SHALL BE GALVANIZED AFTER FABRICATION. UNLESS OTHERWISE SHOWN IN THE PLANS THE CONTRACTOR HAS THE OPTION OF PLACING EITHER PRECAST OR CAST-IN-PLACE CONCRETE TRAFFIC BARRIER.

BID PRICE PER LINEAR FOOT OF CTB TY 283, INCLUDING
TERMINAL AND ANCHOR SECTIONS, SHALL INCLUDE ALL OF
THE CONCRETE, REINFORCEMENT, DRILLED SHAFT FOUNDATIONS
AND AGGREGATE BACKFILL.

LONGITUDINAL AND VERTICAL BARS FOR ROADWAY BARRIER SHALL CONFORM TO ASTM A-615 (GRADE 40).

AT CONSTRUCTION JOINTS FOR THE ROADWAY BARRIER, THE LONGITUDINAL BARS SHALL EXTEND BEYOND THE JOINT SO THAT BAR SPLICES WILL BE A MINIMUM OF TWO FEET FROM THE CONSTRUCTION JOINT.

BAR SPLICES FOR ROADWAY BARRIER SHALL BE A MINIMUM OF 24 TIMES THE NOMINAL DIAMETER OF THE BAR.

ANY METHOD DEvised BY THE CONTRACTOR AND APPROVED BY THE ENGINEER THAT WILL ASSURE THE LONGITUDINAL ROADWAY STEEL FOR CIB TY 2&3 WILL BE POSITIONED $\pm \frac{1}{2}$ -INCH AS DIMENSIONED WILL BE SATISFACTORY.

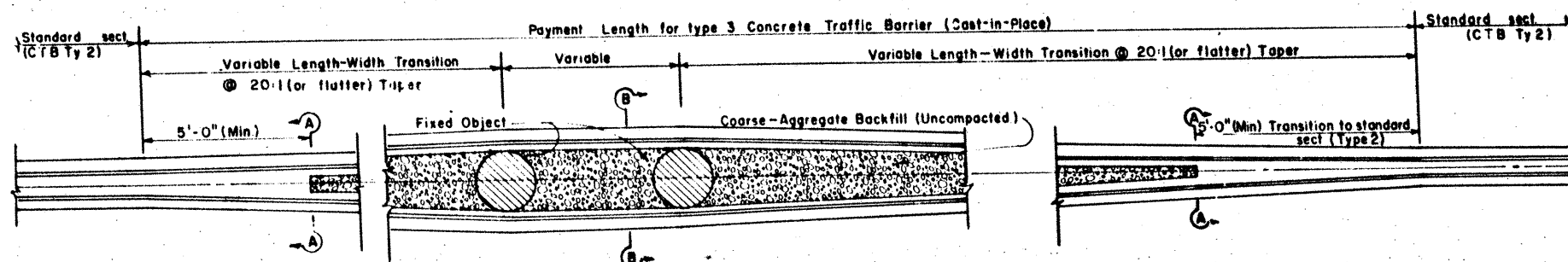
CONDUIT TO BE PROVIDED ONLY WHEN CALLED FOR ELSEWHERE
IN THE PLANS. POSITION OF CONDUIT MAY BE ADJUSTED TO
FACILITATE CONSTRUCTION SUBJECT TO APPROVAL OF THE
ENGINEER.

SEE SHEET CTB1(4) FOR LIGHTING, ANCHOR BOLT, AND CONDUIT DETAILS. SEE CTB1(3)-81 FOR DESIGN DETAILS OF BARRIER WITH ILLUMINATION.

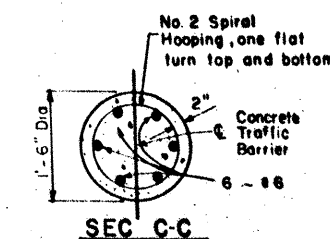


④ When 1" ACP is not used for lateral support, these dimensions shall be adjusted accordingly. Permissible methods of attaining equivalent lateral support include: (1) provision of #8 dowel bars, 12" in length, 4" c-c spacing, placed vertically — with approximately one-half the bar length embedded below the concrete traffic barrier, or (2) 1" (min) deep keyway in concrete pavement, excess width in key-way backfill with grout.

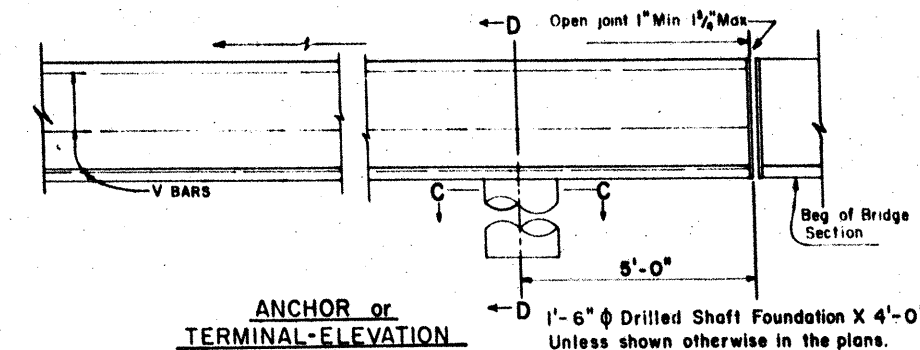
ELEVATION OF RDWY BARRIER CTB TY2



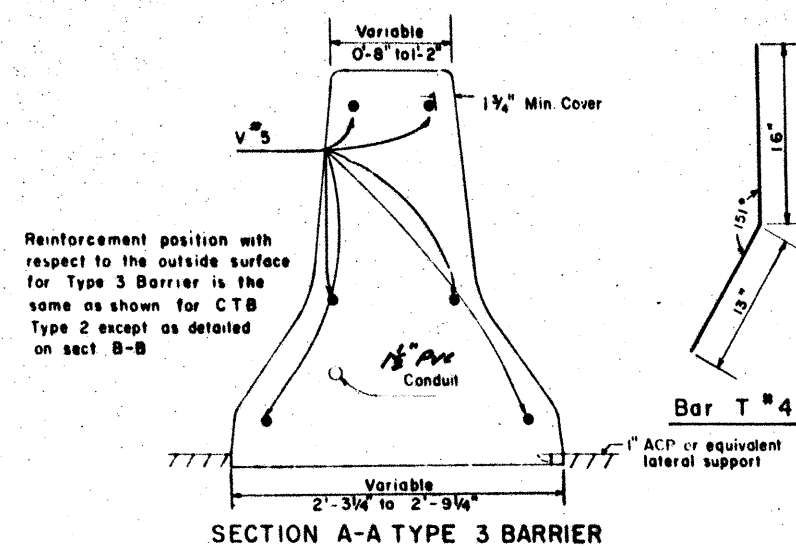
PLAN TYPE 3 BARRIER



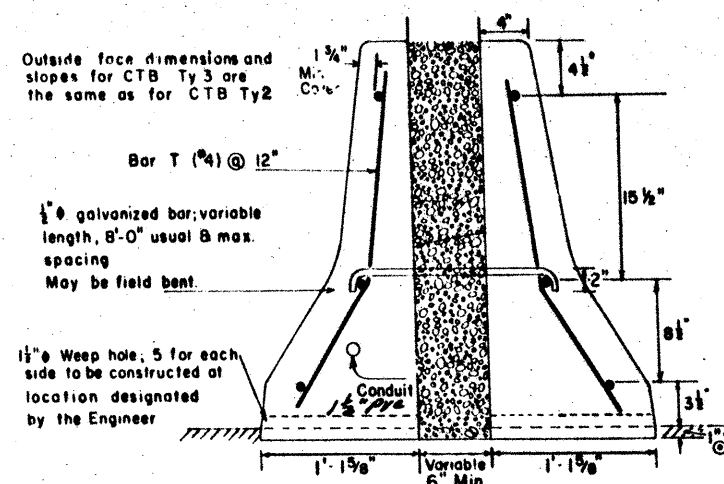
SEC C-C



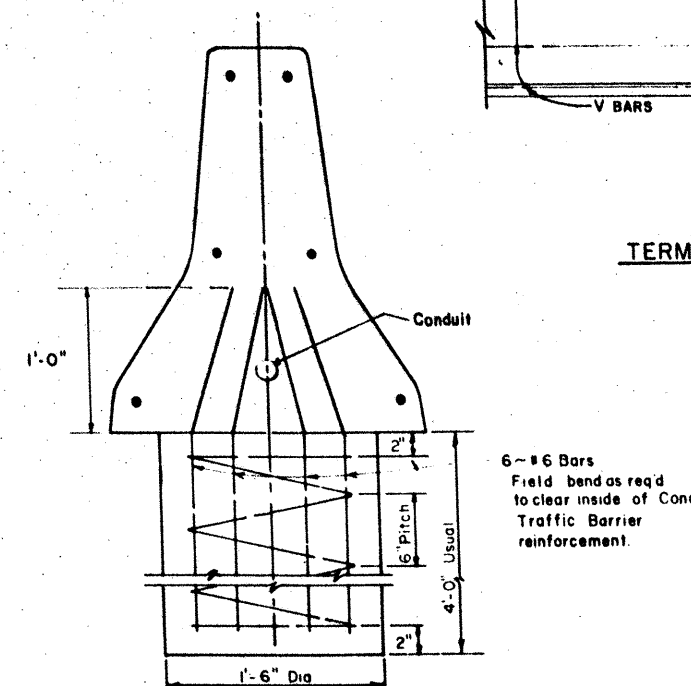
ANCHOR or
TERMINAL-ELEVATION



SECTION A-A TYPE 3 BARRIER




SECTION B-B TYPE 3 BARRIER



ANCHOR DETAIL - SECTION D-D

6~#6 Bars
Field bend as req'd
to clear inside of Concrete
Traffic Barrier
reinforcement.

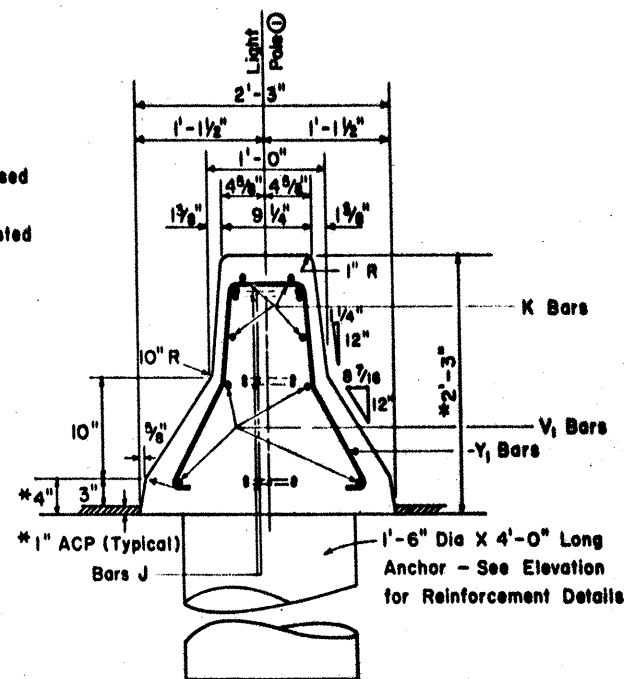
 STATE DEPARTMENT OF HIGHWAYS
AND PUBLIC TRANSPORTATION

CONCRETE TRAFFIC BARRIER
TYPE 2 & 3
ROADWAY CTB
CAST-IN-PLACE
CTB(2)-81 (MOD)

DN	DRAWING	DATE	FED NO	STATE	FEDERAL PROJECT NO				SHEET
CR DN	ORIGINAL		NO	6					92
DR	REVISED		STATE	TEXAS					
CR DR	REVISED		DIST NO	COUNTY	CONT	SECT	JOB	WORK NO	
CR DR	REVISED								

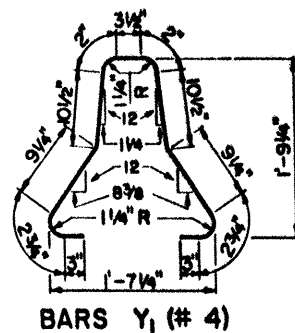
Rev 7-28-83
Concrete for Barrier shall be Class A, C 80.

*Note: When 1" ACP not used for lateral support these dimensions shall be adjusted accordingly.

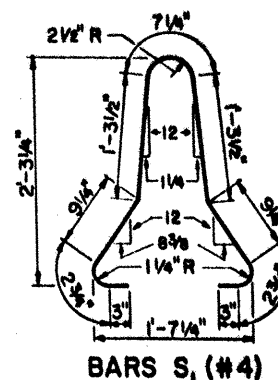


SECTION AT LIGHT POLE

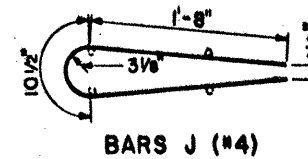
① For details of light pole, ground rod, conduit, and anchor bolt installation see sheet CTBI (4).



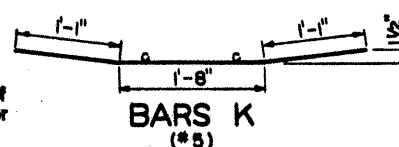
BARS Y₁ (#4)



BARS S₁ (#4)



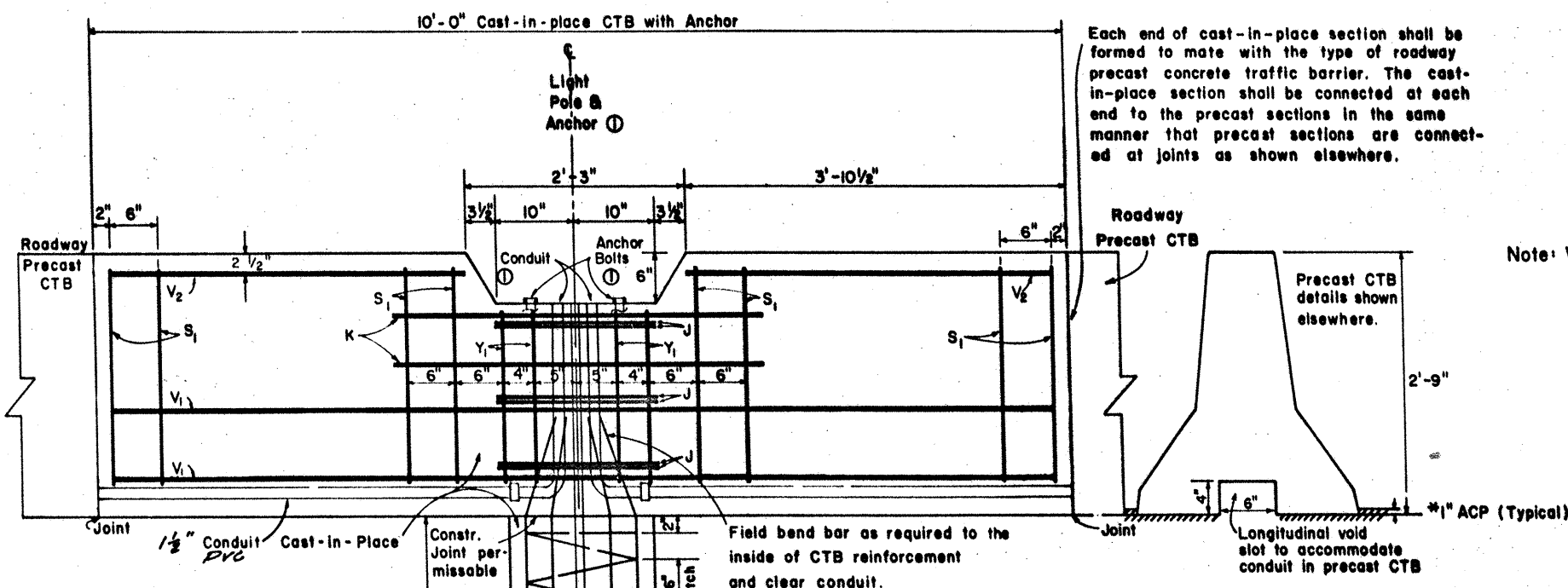
BARS J (#4)



BARS K (#5)

Schedule of Reinforcement for Each 10' Cast-in-place Section at Light Poles (Excl. Anchor)

BAR	SIZE	QUANTITY	LENGTH
Y ₁	#4	4	see details hereon
S ₁	#4	8	
J	#4	6	
K	#5	4	
V ₁	#5	4	9'-8"
V ₂	#5	4	3'-8"

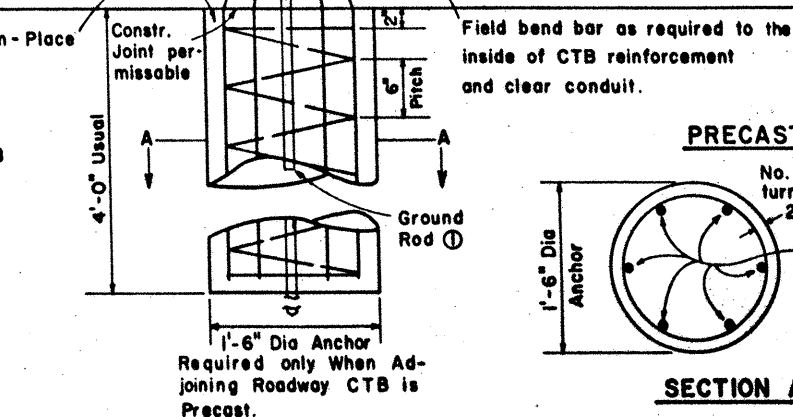


Each end of cast-in-place section shall be formed to mate with the type of roadway precast concrete traffic barrier. The cast-in-place section shall be connected at each end to the precast sections in the same manner that precast sections are connected at joints as shown elsewhere.

Note: Where roadway CTB is cast-in-place, 1'-6" diameter anchor is not required under barrier at light pole locations, and barrier shall be continuous (without open joint). Reinforcement of the CTB within 8 feet of the pole in either direction shall be as detailed hereon.

Where roadway CTB is precast, 10' cast-in-place section with 1'-6" diameter anchor shall be provided as detailed hereon.

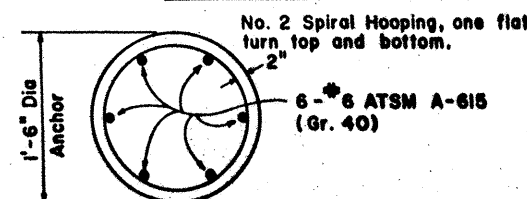
Note: Optional location for ground rod is through CTB & alongside, rather than through, 18" diameter anchor.



ELEVATION OF TREATMENT AT LIGHT POLE

ROADWAY PRECAST CTB

SECTION THRU RDWY. PRECAST CONCRETE TRAFFIC BARRIER (PCTB)



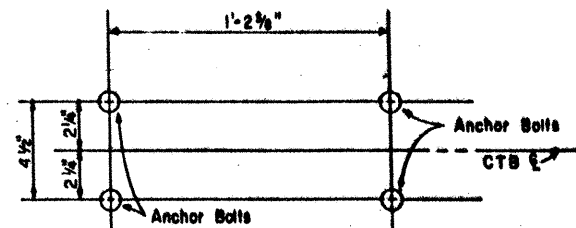
SECTION A-A

GENERAL NOTES

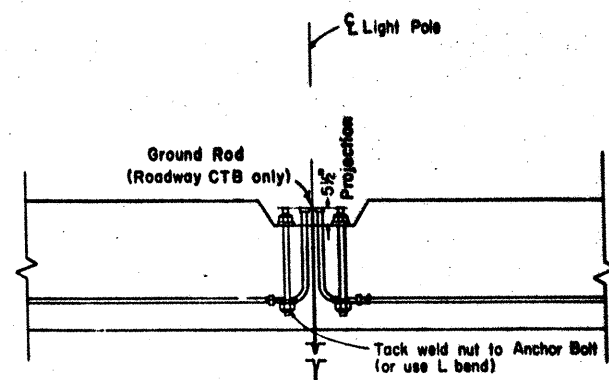
1. ALL CONCRETE FOR CONCRETE TRAFFIC BARRIER (CTB), INCLUDING ANCHOR WHERE REQUIRED, SHALL BE CLASS A, C
2. DETAILS FOR BRIDGE CTB AT LIGHT POLES SHOWN ON SHEET CTBI(1).
3. DRILLED SHAFT ANCHORS WHEN REQUIRED SHALL NOT BE PAID FOR DIRECTLY BUT WILL BE CONSIDERED SUBSIDIARY TO THE UNIT PRICE BID FOR CTB.

STATE DEPARTMENT OF HIGHWAYS AND PUBLIC TRANSPORTATION
CONCRETE TRAFFIC BARRIER
TYPE 2
ROADWAY CTB
AT LIGHT POLES
CTBI(3)-81 (MOD)

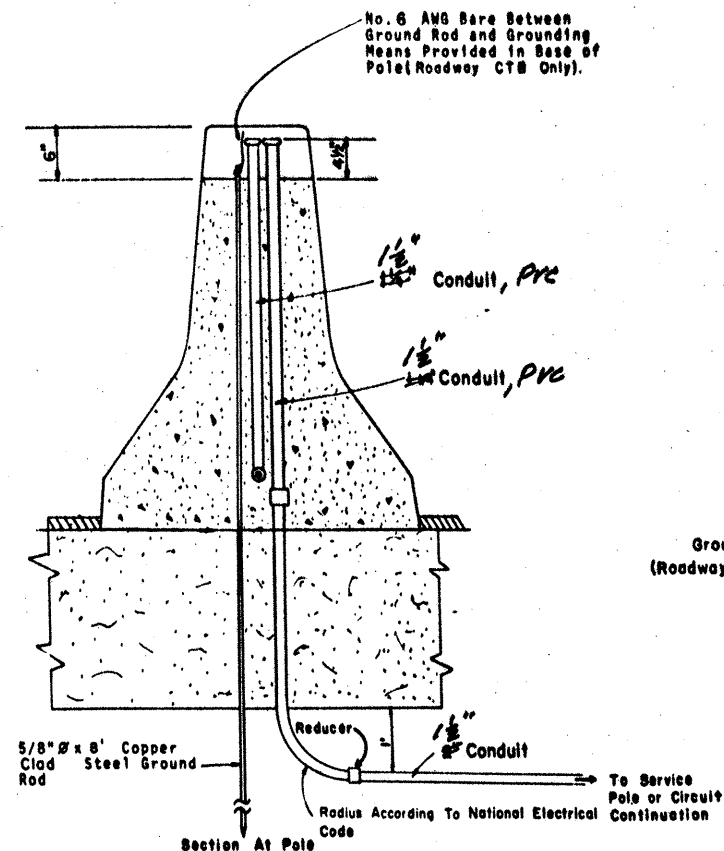
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CH	DN	REVISED				
CH	DN	REVISED				
CH	DN	REVISED				



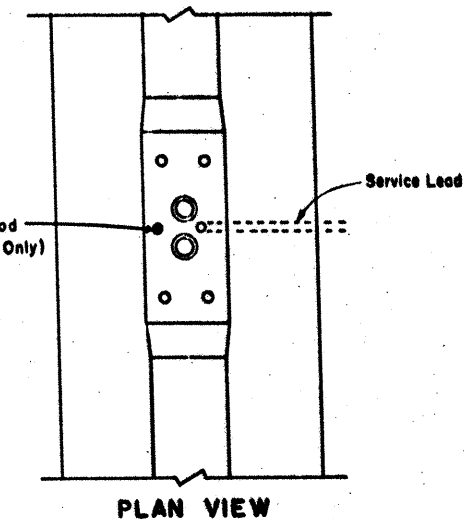
TOP VIEW (ALL CTB TYPES)
ANCHOR BOLT PATTERN



DETAILS AT LIGHT POLE ON BRIDGES AND ROADWAY
(CAST-IN-PLACE)

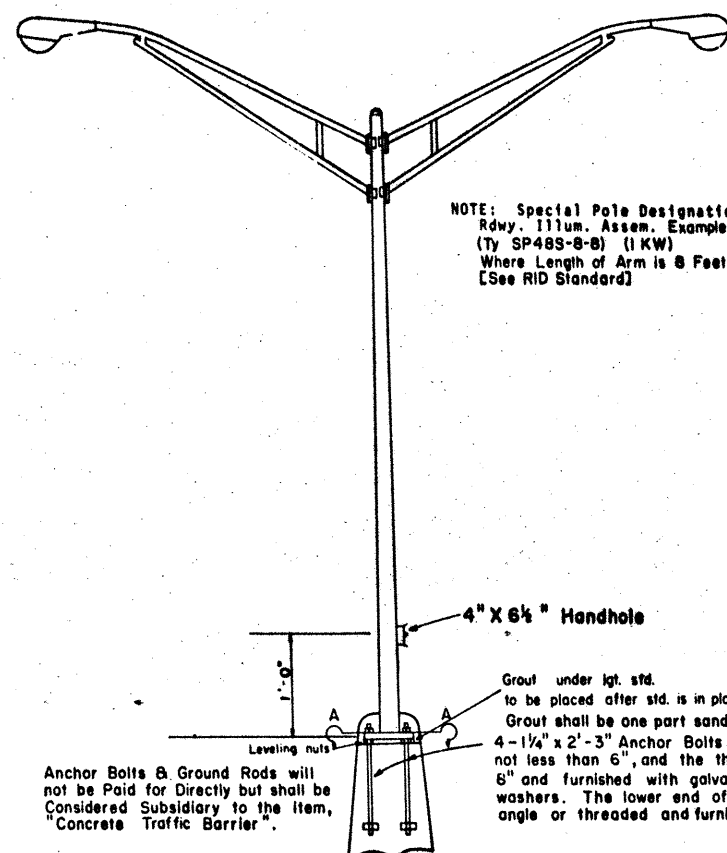


SERVICE LEAD AND GROUND
DETAIL (ROADWAY CTB*) * CAST-IN-PLACE AND PRECAST

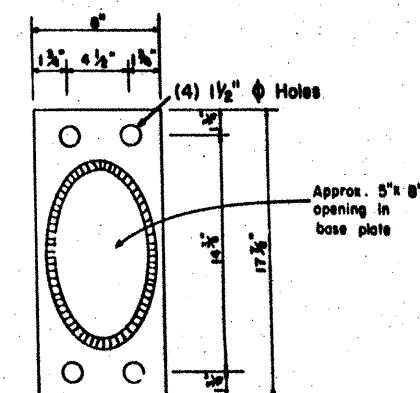


GENERAL NOTES

1. POLES ON BRIDGE BARRIER SHALL BE GROUNDED USING A GROUND ROD NEAR THE WING WALL AND GROUNDING CONDUCTOR TO EACH POLE.
2. WHERE ROADWAY SECTIONS ARE PRECAST, LIGHT POLES SHALL BE PLACED ON CAST-IN-PLACE SECTIONS AS SHOWN ON SHEET CTBI(3).
3. STEEL REINFORCEMENT OF CTB NEAR LIGHT POLES IS SHOWN ELSEWHERE.




POLE DETAIL

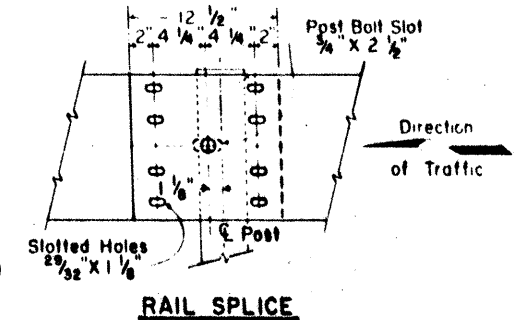
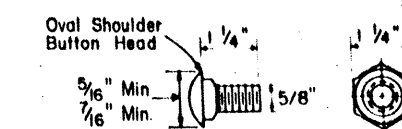
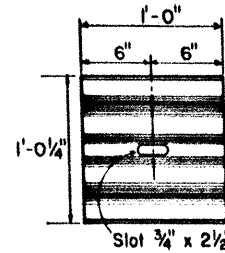
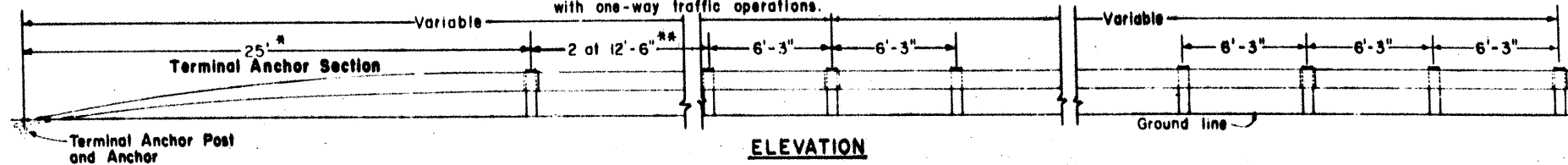


Section A-A

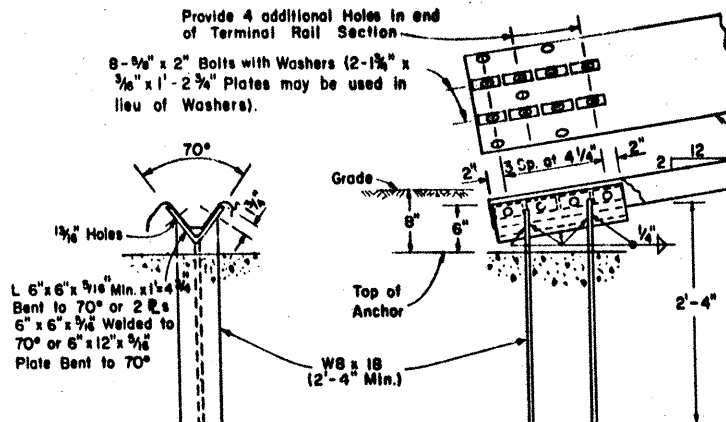
Shape of pole may be Elliptical or Polygonal

<div>  STATE DEPARTMENT OF HIGHWAYS AND PUBLIC TRANSPORTATION CONCRETE TRAFFIC BARRIER BRIDGE AND ROADWAY WITH ILLUMINATION, POLE, CONDUIT, AND ANCHOR BOLT DETAILS CTBI(4)-81 (MOD) </div>									
DN	DRAWING	DATE	FED RD DIST NO	STATE	FEDERAL PROJECT NO	SHEET NO			
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DW	REVISED								
CK DW	REVISED								
TR									
CK TR									

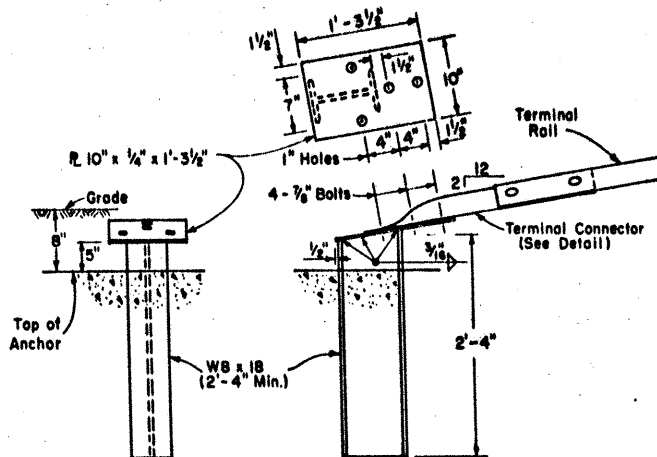
*** Usual closer post spacing used for short (50' or less) sections of MBGF at bridge ends as shown elsewhere in the plans. 6'-3" spacing may be used on the downstream (from a traffic flow standpoint) end of MBGF placed on roadways with one-way traffic operations.



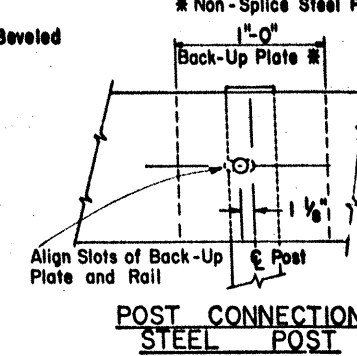
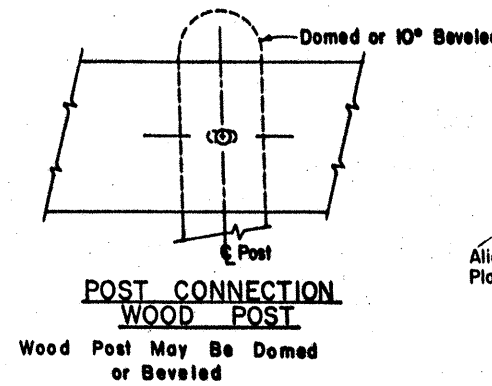
*NOTE: This dimension measured to center of splice when Terminal Connector is used.



NOTE: This Post requires 4 additional Holes (Shop or Field) in the Terminal Rail member with 8-5/8" Bolts and Washer Plates as shown for attachment.



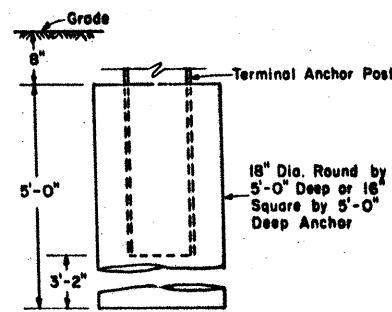
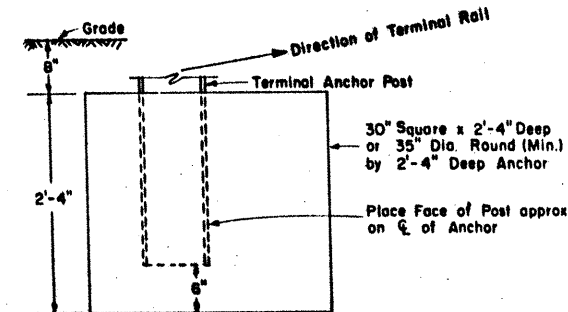
NOTE: This Optional Post requires the use of the 10 Gage Terminal Connector with 4-5/8" Bolts for attachment to the Anchor Post.



* Non-Splice Steel Post Only

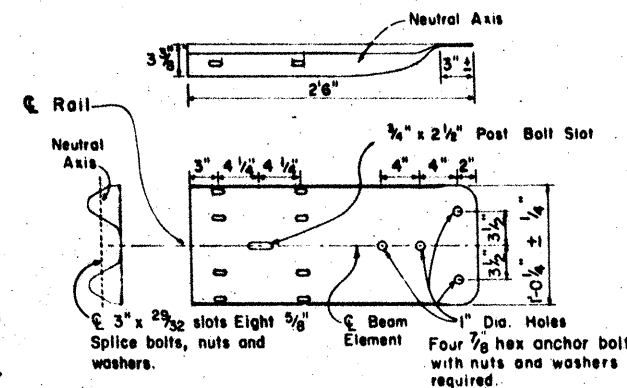
GENERAL NOTES

- 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.
- 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.
- BOLTS SHALL BE OF SUFFICIENT LENGTH TO EXTEND THROUGH THE FULL THICKNESS OF THE NUT AND NO MORE THAN 3/4" BEYOND IT.
- THE TOP OF THE TERMINAL ANCHOR POST AND ALL STEEL FITTINGS THEREON SHALL BE GALVANIZED A MINIMUM OF 10" AS SHOWN.
- 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 CONCRETE MATERIAL, AND EMBEDMENT DEPTH SHALL BE 1'-6" OR MORE AS DIRECTED BY THE ENGINEER. TIMBER POSTS SHALL NOT BE SET IN CONCRETE.
- THE TERMINAL ANCHOR POST SHALL BE SET IN CLASS "A", "B" OR "C" CONCRETE IN ACCORDANCE WITH ITEM, "CONCRETE FOR STRUCTURES", OR SET IN CONCRETE IN ACCORDANCE WITH ITEM "CONCRETE PAVEMENT". CONCRETE SHALL BE SUBSIDIARY TO THE BID ITEM REQUIRING CONSTRUCTION OF THE TERMINAL RAIL SECTION AND ANCHORAGE SYSTEM.
- TIMBER POSTS MAY BE BEVELED AT APPROXIMATELY 10 DEGREES ON THE TOP OR BOTH ENDS WITH HIGH SIDE OF TOP OF POST PLACED TOWARD THE ROADWAY OR THEY MAY BE DOMED. 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.
- 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.
- SPECIAL FABRICATION WILL BE REQUIRED IN INSTALLATIONS HAVING A CURVATURE OF LESS THAN 150' RADIUS.
- 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".
- THE 10 GAGE TERMINAL CONNECTORS MUST BE USED WITH THE OPTIONAL TERMINAL ANCHOR POST. EITHER ANCHOR POST MAY BE USED WITH EITHER CONCRETE ANCHOR.
- CROWN WILL BE WIDENED TO ACCOMMODATE GUARD FENCE.
- STEEL POSTS SHALL BE BLOCKED OUT. A W6x8.5 OR W6x9.0 STEEL SPACER SHALL BE USED WITH STEEL POSTS. BACK-UP PLATES SHALL BE PROVIDED AT INTERMEDIATE (NON-SPLICE) STEEL POSTS.
- WHEN BLOCKOUT GUARD FENCE IS SPECIFIED ELSEWHERE IN THE PLANS, A 6" x 6" x 14" TREATED TIMBER SPACER OF YELLOW PINE SHALL BE USED WITH WOOD POSTS.
- 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 CURB SHALL BE INSTALLED SO THAT THE POST BOLT IS LOCATED APPROXIMATELY 21-INCHES ABOVE THE GUTTER PAN OR ROADWAY SURFACE.
- WELDED STEEL POSTS AND SPACERS SHALL MEET THE REQUIREMENTS OF ASTM A-769. THE FLANGE WIDTH AND THICKNESS, WEB THICKNESS, AND DEPTH OF WELDED POSTS AND SPACERS SHALL EQUAL OR EXCEED THE DIMENSIONS OF A STANDARD ROLLED W6x8.5.
- STEEL POSTS AND SPACERS SHALL MEET THE REQUIREMENTS OF ASTM A-76. BOLT HOLES SHALL BE APPROXIMATELY CENTERED BETWEEN WEB AND EDGE OF FLANGE OF SPACERS AND POSTS.
- UNLESS OTHERWISE SHOWN IN THE PLANS, MBGF SHALL BE PLACED WITH THE FACE OF RAIL DIRECTLY ABOVE THE SHOULDER EDGE (OR CURBFACE) EXCEPT THE 25' TERMINAL ANCHOR SECTION AND ADJACENT 25' OF MBGF SHALL BE FLARED AT 25:1 (LONGITUDINAL/LATERAL) TO PROVIDE A 2' OFFSET BETWEEN BURIED ANCHOR AND SHOULDER EDGE (OR CURBFACE). FLARING THE 25' TERMINAL ANCHOR AND ADJACENT 25' MBGF IS OPTIONAL FOR ONE-WAY TRAFFIC CONDITIONS ON THE DOWNSTREAM END OF GUARD FENCE.
- 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" x 3/16", OR 1" I.D. AND 2" O.D. x 0.134" (ANSI B27.2) NARROW TYPE A PLAIN WASHERS.

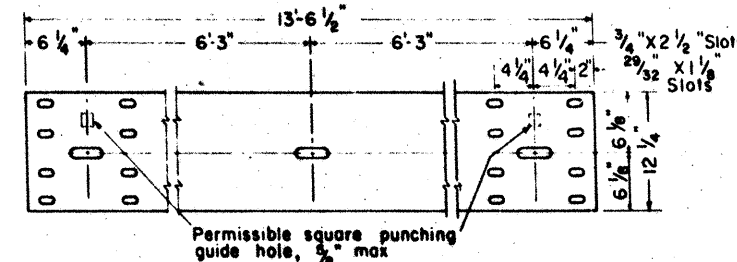


NOTE: Either Post may be used with either Anchor. No Construction Joint is allowed in the Concrete Anchor. Terminal Rail may be bolted to Post and in twist position prior to placing Concrete Anchor. Upper 10" (Min.) of Anchor Post must be Galvanized.

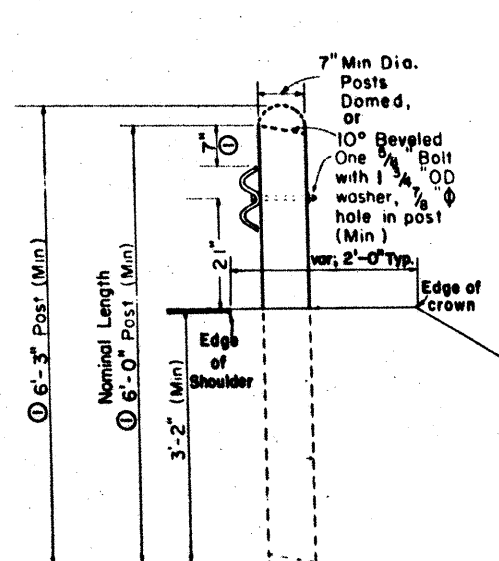
SECTION THRU GUARD RAIL AND BACK-UP PLATE



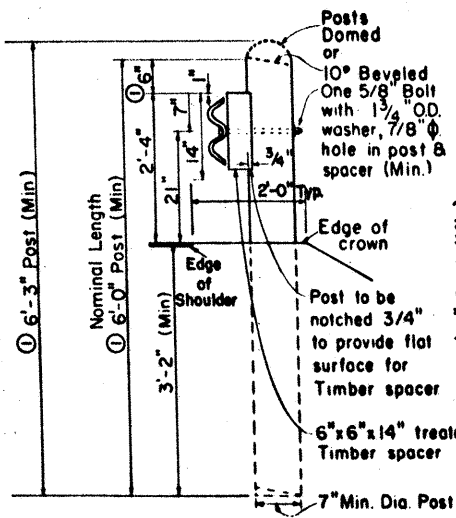
TERMINAL CONNECTOR (10 GAGE MINIMUM)



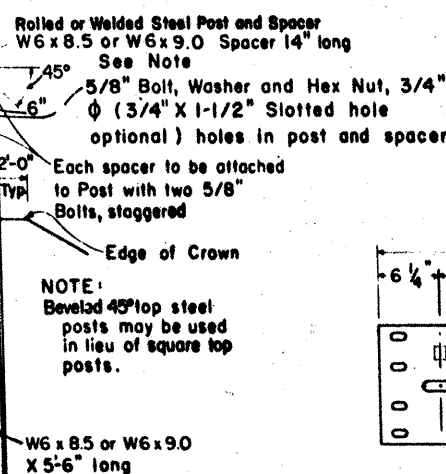
ELEVATION OF NOMINAL 12 1/2 FOOT GUARD RAIL (25 Foot sections may also be supplied)



WOOD LINE POST



STEEL LINE POST (Blockout)

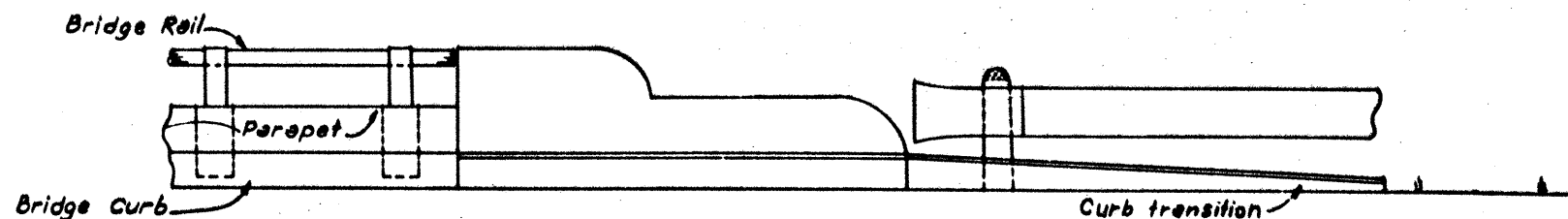


NOTE: Where a nominal length of 5'-6" is specified as acceptable elsewhere in the plans, these dimensions shall be reduced by 0'-6".

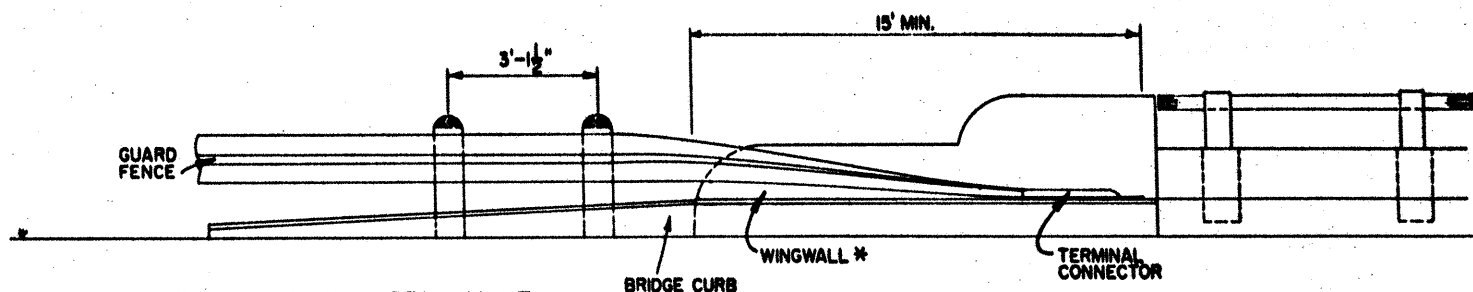
STATE DEPARTMENT OF HIGHWAYS AND PUBLIC TRANSPORTATION

METAL BEAM GUARD FENCE GF(TD) - 84

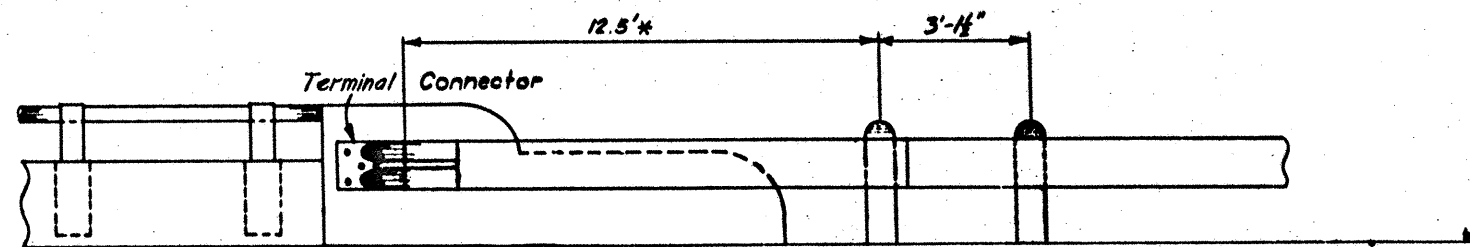
CH	DRAWING	DATE	REV	STATE	FEDERAL PROJECT NO.	SHEET NO.
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DW	DN	REVISED		STATE	COUNTY	CON. SECT. JOB
TR	DN	REVISED		12	NUECES	326
CH	TR					



EXISTING ELEVATION

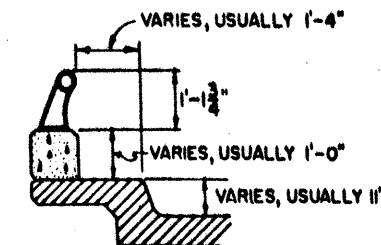


PROPOSED TURNDOWN END ATTACHMENT
TO BRIDGES WITH CURB 14" OR GREATER IN WIDTH

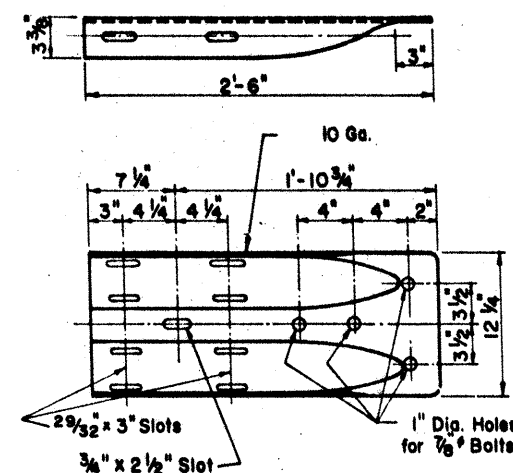


PROPOSED ELEVATION
FOR BRIDGES WITH NO CURB

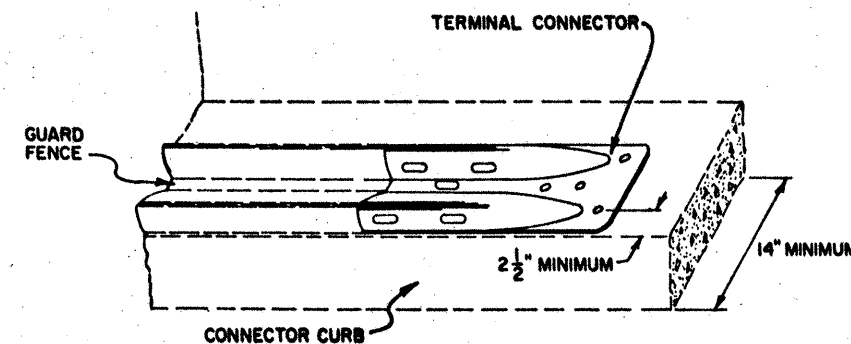
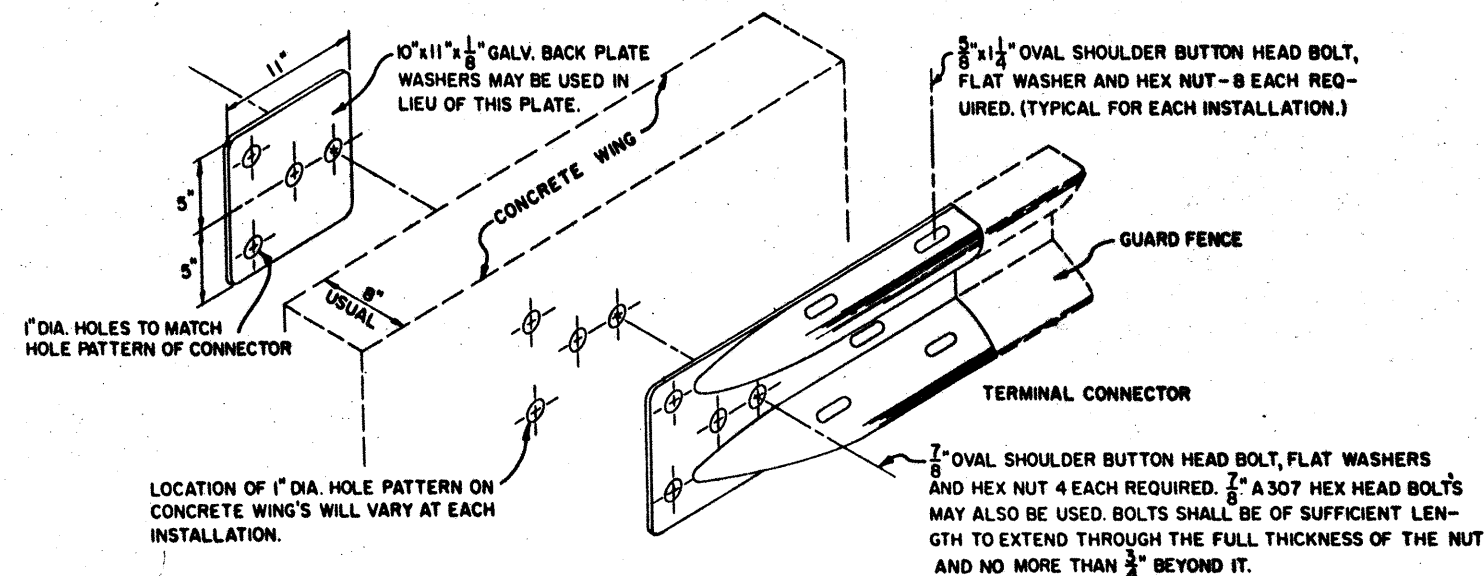
* ADDITIONAL POSTS SHOULD BE INSTALLED AT 3'-1 1/2" IF WINGWALL IS CURVED OR FLARED. THIS LENGTH MAY BE FIELD ADJUSTED DEPENDING ON THE STRENGTH AND AMOUNT OF WINGWALL AVAILABLE. THE GUARD FENCE SHOULD BE LOCATED FLUSH WITH THE FACE OF ANY BRIDGE CURB. SPECIAL LENGTH POSTS AND/OR SPECIALLY DESIGNED BLOCKOUTS MAY HAVE TO BE DEvised TO MEET FIELD CONDITIONS.



TYPE T RAIL
(ALUMINUM)



TERMINAL CONNECTOR



4- 7/8" A 307 HEX HEAD TYPE BOLTS SHALL BE USED. HOLES SHALL BE DRILLED 4 1/2" DEEP, 1/4" GREATER IN DIAMETER THAN THE BOLT HEAD, AND FILLED WITH DHT TYPE B 10Z EPOXY BINDER MIXED WITH SAND.

EXPANSION TYPE BOLTS MAY BE USED WHICH REQUIRE A DRILLED HOLE ONLY AS LARGE AS THE BOLT

THE GUARD FENCE SHALL BE LAPPED UNDER THE TERMINAL CONNECTOR ON AN APPROACH END AND OVER THE TERMINAL CONNECTOR ON A DEPARTURE END.

GENERAL NOTES

EXCEPT WHERE USED AT STRUCTURES THAT ARE NARROWER THAN CROWN WIDTH OR WHERE OTHERWISE INDICATED ON PLANS, THE GUARD FENCE SHALL NOT INFRINGE ON THE SHOULDER AREA. THE EXACT POSITION SHALL BE AS SHOWN ELSEWHERE ON THE PLANS OR AS DIRECTED BY THE ENGINEER. RAIL SHALL BE TRANSITIONED TO A SMOOTH CONNECTION WITH OTHER STRUCTURES OR RAIL AS SHOWN ELSEWHERE ON THE PLANS

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. RAIL SHALL BE FURNISHED WITH POST BOLT SLOTS FOR 5/8" DIAMETER BOLT CONNECTION TO POSTS.

BOLTS SHALL BE OF SUFFICIENT LENGTH TO EXTEND THROUGH THE FULL THICKNESS OF THE NUT AND NO MORE THAN 3/4" BEYOND IT.

WHERE ROCK IS ENCOUNTERED OR WHERE SHOWN ON THE PLANS, THE DIAMETER OF THE HOLES AND THE MATERIAL FOR BACKFILLING SHALL BE AS DIRECTED BY THE ENGINEER. TIMBER POSTS SHALL NOT BE SET IN CONCRETE.

TIMBER POSTS MAY BE BEVELED AT APPROXIMATELY 10 DEGREES ON THE TOP OR BOTH ENDS WITH HIGH SIDE OF TOP POST PLACED TOWARD THE ROADWAY OR THEY MAY BE DOMED. 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.

IF BLOCKOUTS ARE USED ON BRIDGE RAILS, THEY SHALL BE SPACED AT 6'-3" CENTERS REGARDLESS OF THE POST SPACING ON THE BRIDGE. THEY MAY ALSO BE PLACED ON ALL POSTS AFTER THE 6'-3" SPACING IS ACHIEVED.

FOR BRIDGES 100 FEET AND LESS IN LENGTH, THE APPROACH GUARD FENCE SHALL BE CONTINUED ACROSS THE ENTIRE STRUCTURE. FOR BRIDGES GREATER THAN 100 FEET IN LENGTH, THE GUARD FENCE TREATMENT SHALL BE AS DESCRIBED IN THE PLANS AND/OR AS DIRECTED BY THE ENGINEER.

THE TERMINAL CONNECTOR MAY BE USED WITH THE 18" X 5'-0" CONCRETE FOOTING OR THE ANGLE ANCHOR MAY BE USED WITH THE 2'-6" SQUARE OR EQUIVALENT CONCRETE FOOTING. BOTH FOOTINGS HAVE A 8WF17 X 2'-0" POST.

AN ANCHOR OTHER THAN TO A TERMINAL ANCHOR POST SHALL CONSIST OF A CONNECTION SIMILAR TO THE RAIL SPLICE, TERMINAL CONNECTOR, OR ANY OTHER CONNECTION DEVELOPING A STRENGTH IN TENSION EQUAL TO A STANDARD SPLICE (8 SPLICE BOLTS).

A GUARD FENCE ANCHOR SECTION 25 FEET IN LENGTH SHALL BE REQUIRED AT THE APPROACH END OF THE GUARD FENCE. A SIMILAR ANCHOR SECTION SHALL BE REQUIRED AT THE DEPARTURE END, IF THE DEPARTURE END BECOMES AN APPROACH SITUATION FROM THE OPPOSITE DIRECTION OR IS NOT ANCHORED IN ANOTHER MANNER. A GUARD FENCE ANCHOR SECTION WILL NOT BE REQUIRED AT THE DEPARTURE END OF A BRIDGE CARRYING ONE-WAY TRAFFIC UNLESS OTHER GUARD FENCE WARRANTS ARE MET.

WHEN TWISTING THE GUARD FENCE, 90° AND ANCHORING IT TO A CURB AND/OR SIDEWALK, THE TERMINAL CONNECTOR SHOULD BE CAREFULLY INSTALLED SO THAT THE SPLICE CONNECTION TO THE GUARD FENCE IS MADE WITH THE BOLTS AT THE EXTREME END OF THE 3 INCH EXPANSION SLOTS SO THAT THERE WILL BE NO SPLICE SLACK IF THE TERMINAL CONNECTOR IS SHOWN FORWARD. IF 10 GAUGE MATERIAL IS USED, THEN FOUR 7/8 INCH BOLTS (A307) ARE NEEDED FOR ANCHORING. IF 12 GAUGE MATERIAL IS USED, SIX 3/4 INCH BOLTS (A307) ARE REQUIRED FOR ANCHORING. THIS ANCHORAGE SHOULD NOT BE PLACED CLOSER THAN 2 1/2 INCHES FROM THE EDGE OF THE CURB.

THE "NESTED BACKUP PLATE TERMINAL DESIGN" MAY BE USED ON APPROACHES TO BRIDGES ONLY IF 175 FEET OR MORE OF GUARD FENCE IS INSTALLED WITH ALL POSTS AT 6'-3" SPACINGS.

IF A BRIDGE HAS A CURB AND/OR SIDEWALK, THE GUARD FENCE SHALL BE TRANSITIONED AND ATTACHED SO THAT THE FACE OF THE GUARD FENCE IS FLUSH WITH THE FACE OF THE CURB. IF THE BRIDGE CURB IS LESS THAN 14 INCHES WIDE, THE GUARD FENCE SHALL BE BLOCKED OUT FROM THE EXISTING BRIDGE RAIL SO THAT IT IS FLUSH WITH THE FACE OF THE CURB. IF THE BRIDGE CURB AND/OR SIDEWALK IS GREATER THAN 14 INCHES WIDE, THE GUARD FENCE SHALL BE TWISTED 90° AND ANCHORED TO THE CURB AND/OR SIDEWALK SO THAT IT IS FLUSH WITH THE FACE OF THE CURB. EITHER OF THESE ANCHORAGE SYSTEMS SHALL BE CARRIED A MINIMUM OF 15 FEET ONTO THE BRIDGE, IF POSSIBLE.

STEEL POSTS SHALL BE SET IN CONCRETE AND BLOCKED OUT.

THE TOP OF THE TERMINAL ANCHOR POST ASSEMBLY AND ALL STEEL FITTINGS THEREON SHALL BE GALVANIZED AS SHOWN. THE TERMINAL ANCHOR POST SHALL BE SET IN CLASS "A", "B" OR "C" CONCRETE IN ACCORDANCE WITH ITEMS "CONCRETE FOR STRUCTURES" OR "CONCRETE PAVEMENT". CONCRETE SHALL BE SUBSIDIARY TO THE BID ITEM "METAL BEAM GUARD FENCE".

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 STRUCTURE SPACED AT 3'-11 1/2"

98

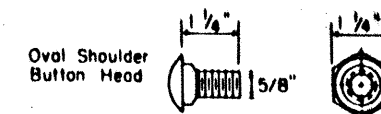


STATE DEPARTMENT OF HIGHWAYS
AND PUBLIC TRANSPORTATION

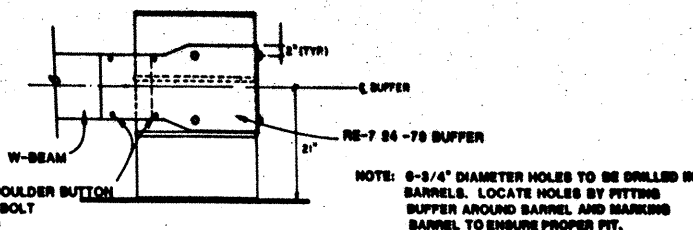
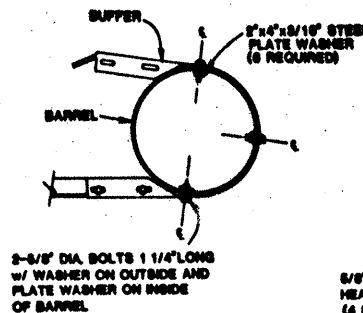
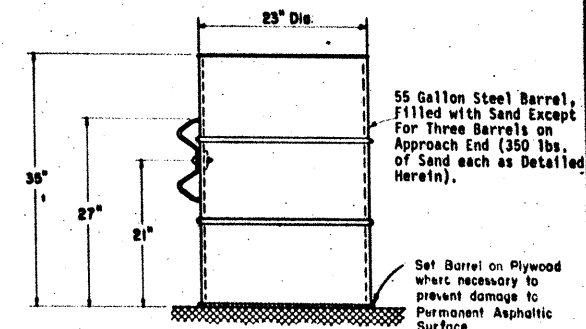
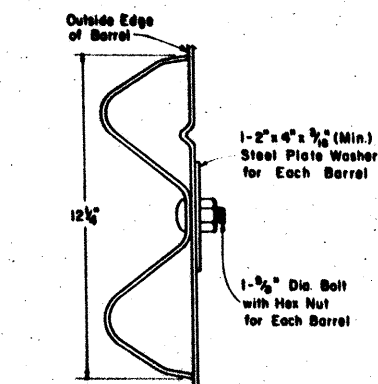
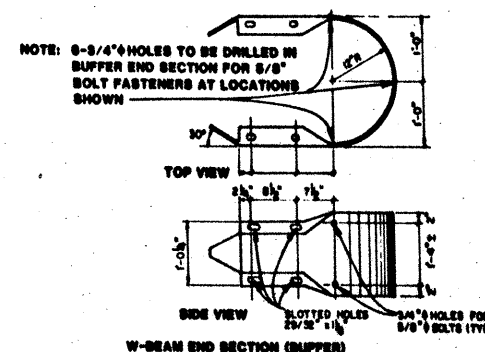
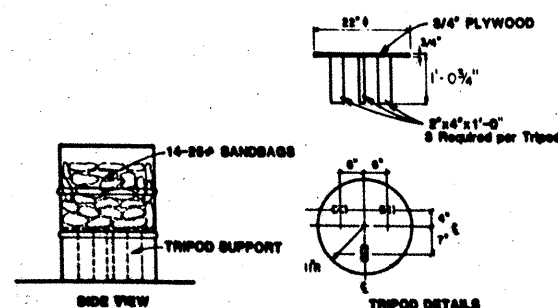
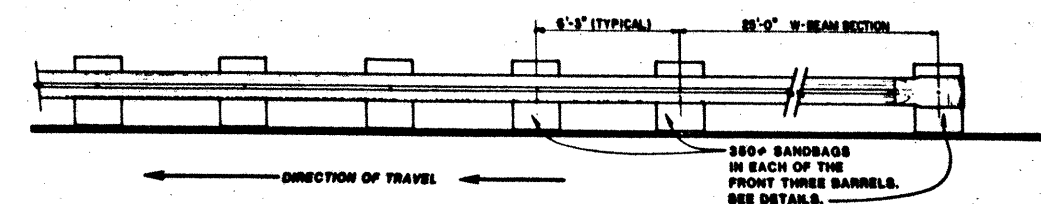
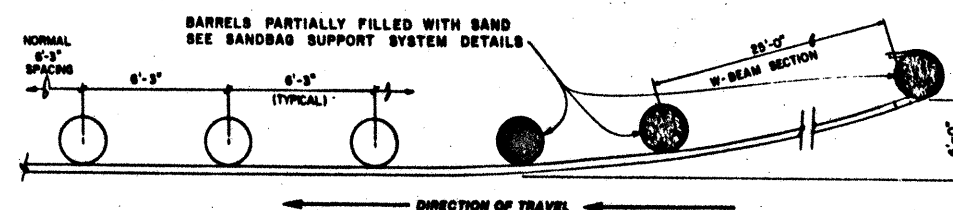
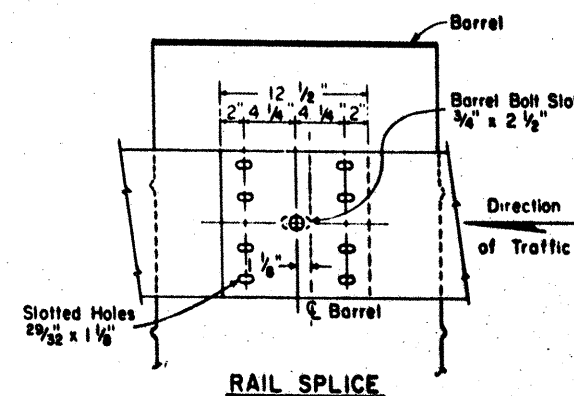
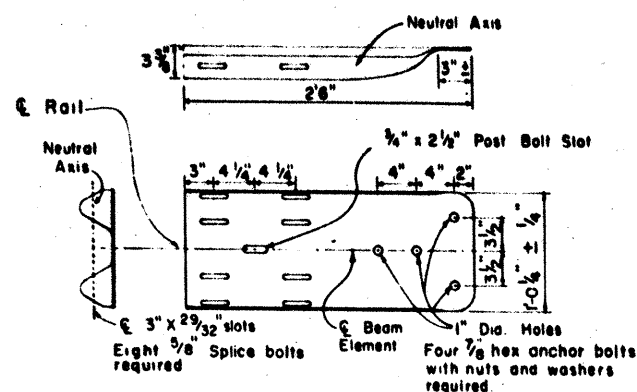
GUARD FENCE ATTACHMENT TO BRIDGE RAIL TYPE T (ALUMINUM)

GF(3)

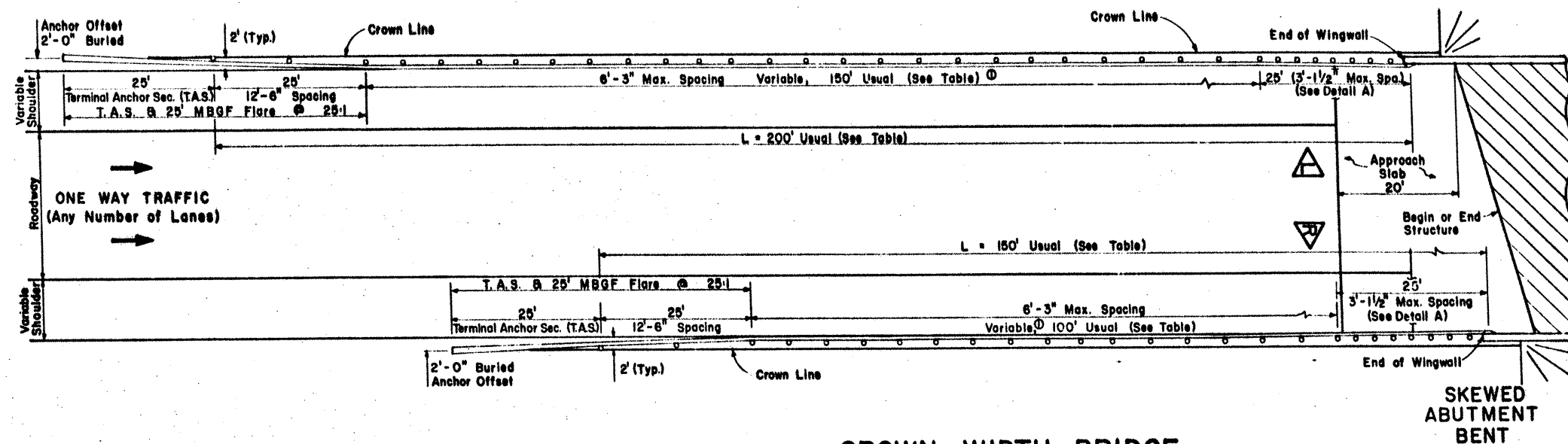
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DATE	6-12-80	mm	6	MA-HES	000/21	98
COUNTY	NEEDS		CONTROL SECTION	JOB	ROADWAY	



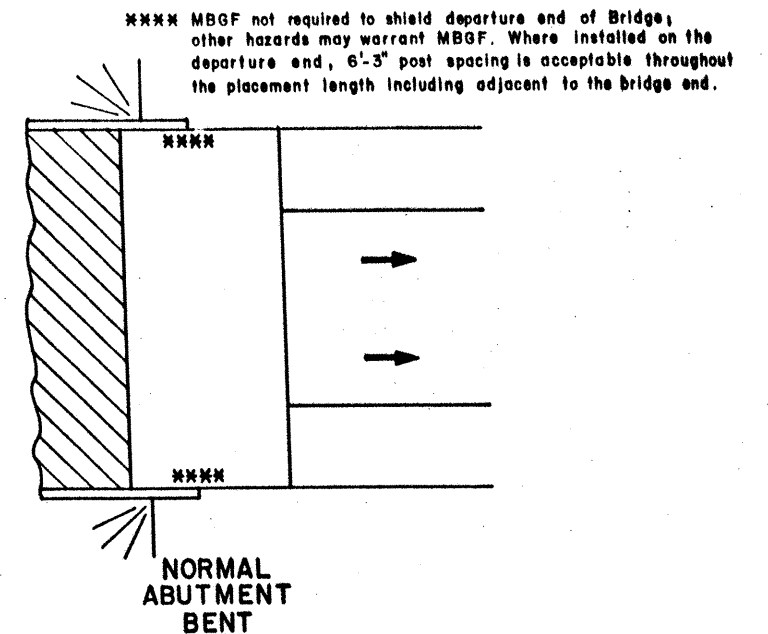
ANCHOR OR SPLICE BOLT $\frac{5}{8}$ " NUT
POST BOLT: Similar except length
 ($\frac{7}{8}$ " Hex bolts required for Terminal Connector)



1. RAIL ELEMENT MAY BE EITHER 12' OR 25' FOOT LENGTHS, EXCEPT A 25' FOOT LENGTH IS REQUIRED ON THE APPROACH TERMINAL, AND EITHER 10' OR 12' GAUGE.
2. MINIMUM LENGTH OF PLACEMENT EQUALS 100 FEET EXCEPT WHERE ONE OR BOTH ENDS ARE CONNECTED TO A POSITIVE BARRIER (BRIDGE RAIL, CURB, E.G.).
3. WHEN THE ROADWAY SURFACE IS ASPHALT, PLYWOOD SHALL BE PLACED UNDER THE BARRELS TO PREVENT DAMAGE TO THE PERMANENT ASPHALTIC PAVEMENT.
4. LOCATION OF BARREL MOUNTED GUARD FENCE IS SHOWN ELSEWHERE IN THE PLANS.
5. RAIL ELEMENT SPICES SHALL BE LAPPED IN THE DIRECTION OF TRAFFIC.
6. RAIL SPICES SHALL BE CONNECTED WITH THE NORMAL EIGHT 14" LONG OVAL SHOULDER BUTTON HEAD BOLTS WHICH ARE 5/8" IN DIAMETER.
7. BARREL SPACING SHALL BE 6'-5", EXCEPT CLOSER SPACING SHALL BE USED AS SHOWN TO TRANSITION INTO A CONNECTION WITH A BRIDGE RAIL, CONCRETE MEDIAN BARRIER, OR SIMILAR FIXED OBJECT.
8. DRAINAGE HOLES SHALL BE DRILLED IN THE BOTTOM OF THE BARRELS TO ALLOW FOR DRAINAGE OF WATER.
9. APPROACH END OF THE TEMPORARY BARRIER SHALL BE FLARED AWAY FROM THE ROADWAY AND SHALL BE TREATED AS SHOWN.
10. IF THE BARRIER IS USED AS A CHANNELIZING DEVICE IN NIGHTTIME SITUATIONS, IT SHALL BE SUPPLEMENTED BY DELINEATION OR CHANNELIZATION MARKINGS OR DEVICES. REFLECTORIZED MARKINGS OR DRUMS AS DETAILED ON THE RC STANDARD SHEETS, OR VERTICAL PANELS, OR DELINEATORS SHALL BE USED TO PROVIDE SUPPLEMENTAL DELINEATION.



CROWN WIDTH BRIDGE
(SEE DESIGN NOTE ② FOR RESTRICTIVE WIDTH BRIDGE)



LENGTH(*) OF NEED, L, Ft.

SHOULDER WIDTH	LEFT OR RIGHT SIDE
4	200
6	200
8	175
10	150

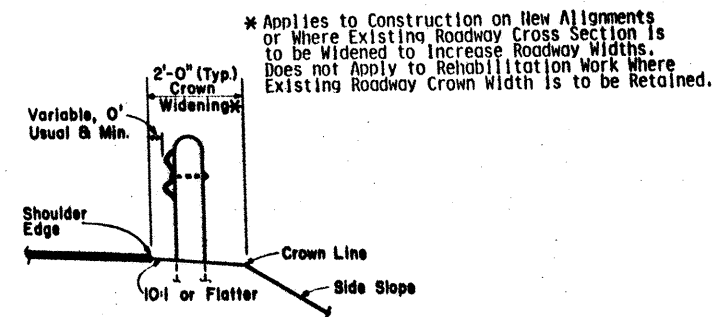
⊗ Lengths are for typical cross sectional and placement conditions. For unusual conditions, a custom design should be developed.

 Indicates left side of traffic approaching bridge.

R Indicates right side of traffic approaching bridge.

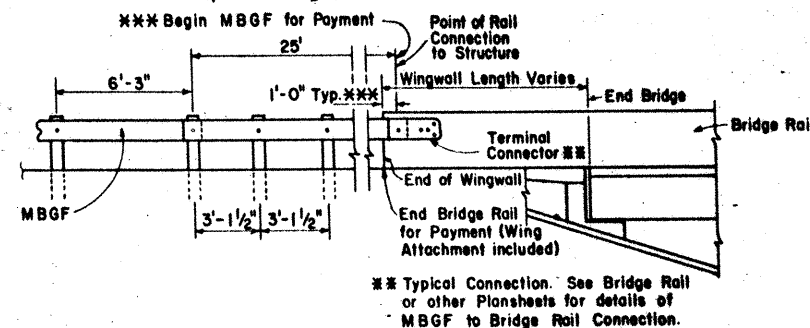
DESIGN NOTES

- ① THE SLOPE BETWEEN THE CROWN LINE AND OUTSIDE EDGE OF SHOULDER SHOULD BE 10:1 OR FLATTER. THE CROWN SHOULD BE WIDENED TO ACCOMMODATE MBFG. TYPICALLY THE CROWN LINE SHOULD BE 2 FEET FROM THE OUTSIDE SHOULDER EDGE (SEE TYPICAL CROSS SECTION).
- ② FOR RESTRICTIVE WIDTH BRIDGES, A 25-FOOT TANGENT SECTION OF MBFG SHOULD CONNECT TO THE WINGWALL. THE ADJOINING MBFG THAT LIES WITHIN THE ROADWAY (LINES A SHOULDERS) CROSS SHOULD BE FLARED AT A 25:1 RATIO. THE LONGITUDINAL LATERAL SPREAD LENGTH SHOULD BE GOVERNED BY TABULATED VALUES OR THE LENGTH NECESSARY TO LOCATE THE BURIED ANCHOR AT A 2-FOOT OFFSET FROM SHOULDER EDGE, WHICHEVER IS GREATER.



TYPICAL CROSS SECTION

The end of bridge that accommodates approaching traffic shall include a minimum of eight posts adjacent to the structure that shall be spaced 3'-1 1/2" (max.).



POST TREATMENT AT STRUCTURES

DETAIL A

GENERAL NOTES

FOR METAL BEAM GUARD FENCE DETAILS AND METHOD OF TERMINATION, SEE
GF(TD) PLAN SHEET.

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 STRUCTURES.

QUANTITIES OF METAL BEAM GUARD FENCE (MBGF) AT INDIVIDUAL BRIDGE ENDS
ARE SHOWN ELSEWHERE IN THE PLANS.

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.

STATE DEPARTMENT OF HIGHWAYS
AND PUBLIC TRANSPORTATION

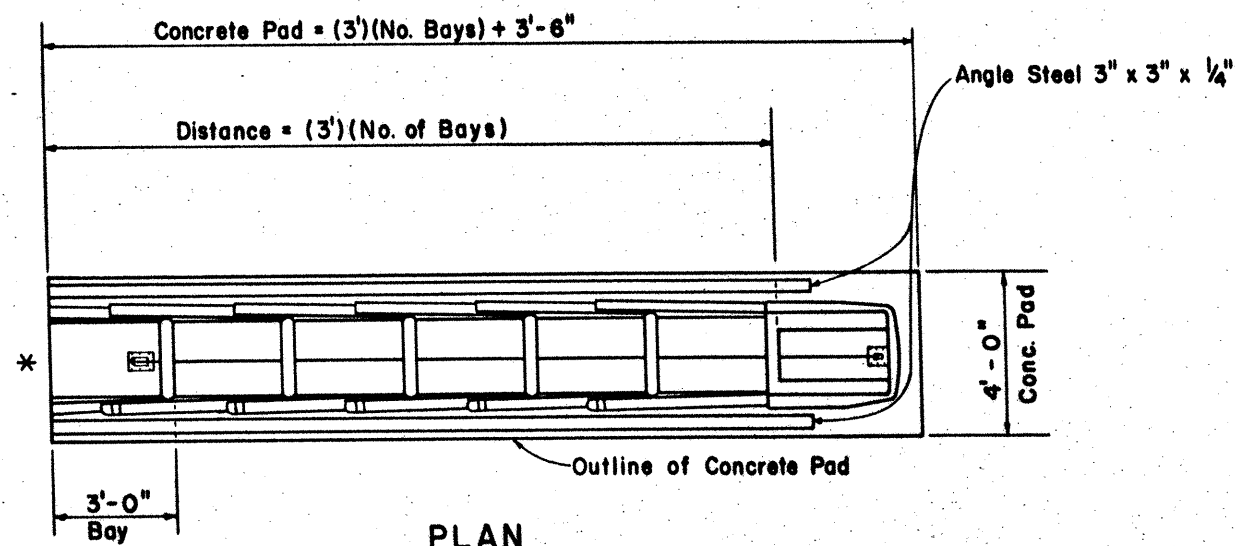
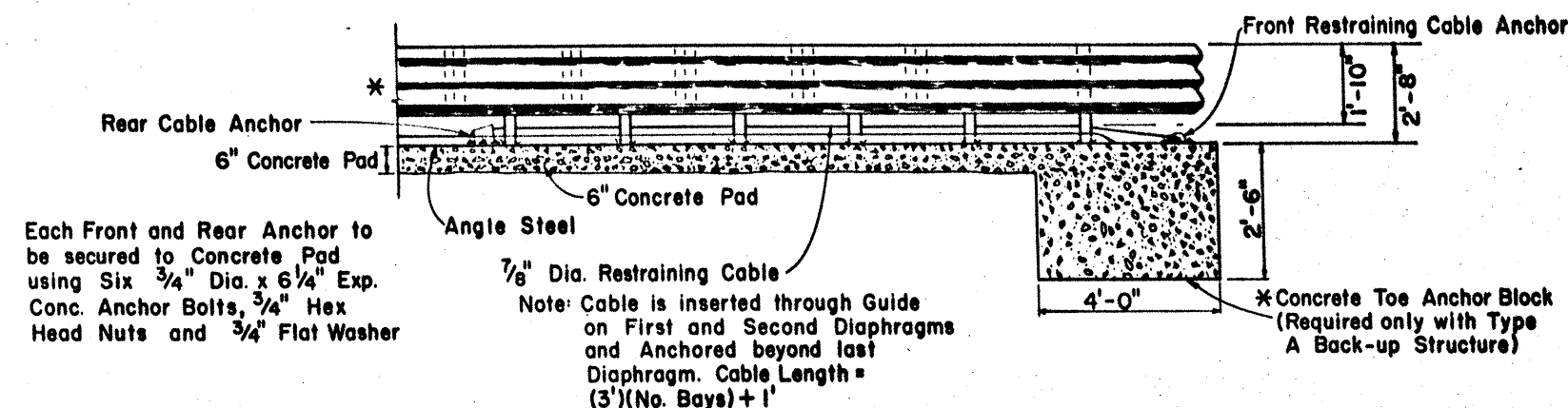
BRIDGE END DETAILS (ONE-WAY TRAFFIC)

BED (OWT) - 84

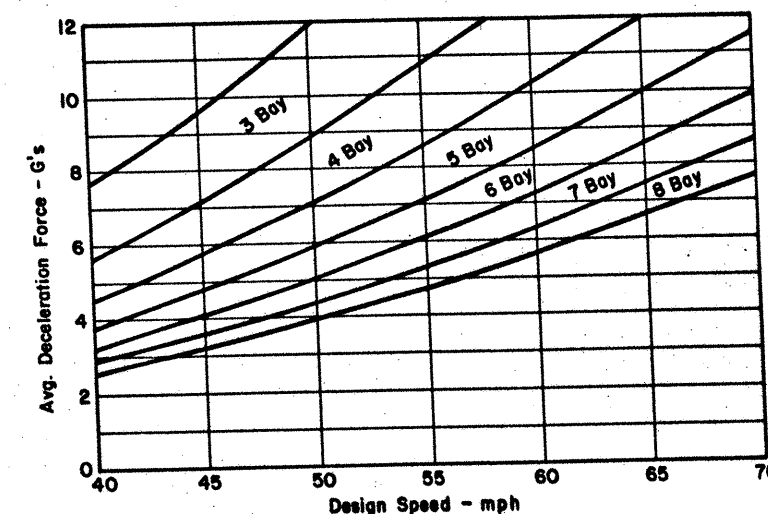
ORIGINAL DRAWING DATE		STATE DISTRICT	FEDERAL REG-00	FEDERAL AID PROJECT	SHEET
DN -	REVISONS	16	G	MA-HES 00051-100	100
CR -					
DR -		COUNTY	DISTRICT	SECTION	JOB
GR -		N.J. HES			

BACK-UP STRUCTURE INFORMATION

- TYPE A** TENSION STRUT: CONSISTS OF DIAGONAL STRUTS, CONNECTIONS, AND ACCESSORIES, AS DETAILED BY THE MANUFACTURER, LOCATED AT REAR OF G.R.E.A.T. UNIT. WHEN USED, A 4' x 4' x 2 1/2' REINFORCED 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.
- TYPE B** CAST-IN-PLACE CONCRETE: CONCRETE MEDIAN BARRIER, BRIDGE PARAPETS, COLUMNS, OR SPECIAL WALLS WHICH ARE CAST-IN-PLACE MAY BE USED AS BACK-UP STRUCTURES FOR G.R.E.A.T. UNITS. WHERE USED, WALLS SHALL BE 2' - 8" IN HEIGHT, WIDTH EQUAL TO THAT OF THE G.R.E.A.T. UNIT, AND 2' - 0" THICKNESS AND SHALL BE REINFORCED WITH A STEEL CAGE. PRECAST CONCRETE MEDIAN BARRIER SHALL NOT BE USED AS A BACKUP STRUCTURE FOR THE G.R.E.A.T. UNIT.
- TYPE C** WIDE FLANGE BACK-UP: CONSISTS OF TWO 6WF25 x 6'2" STEEL POST ERECTED VERTICALLY AT REAR OF G.R.E.A.T. UNIT. POSTS ARE SET IN A CAST-IN-PLACE, REINFORCED CONCRETE FOUNDATION WHICH IS 4' - 0" x 2' - 0" x 3' - 0", WITH THE 3' - 0" DEPTH MEASURED FROM TOP OF CONCRETE PAD. DETAILS FOR CONNECTIONS AND ACCESSORIES FOR THE WIDE FLANGE BACK-UP PROVIDED BY THE MANUFACTURER.
- TYPE C2** CONSTRUCTION ZONE BACK-UP: CONSISTS OF A STEEL BASE AND BACK-UP AS INTEGRAL PARTS OF THE G.R.E.A.T. UNIT. ANCHORAGE PROVIDED BY ANCHOR BOLTS WHERE THE UNIT IS PLACED ON CONCRETE OR BY DRIVEN, STEEL ANGLE ANCHOR PINS FOR PLACEMENT ON OTHER THAN CONCRETE.



* See Note for Back-up Structure Information



DESIGN INFORMATION

NOTE
Deceleration force of 6 G's recommended for design.

NOTES:
TYPE OF BACK-UP STRUCTURE FOR EACH LOCATION SPECIFIED ELSEWHERE IN THE PLANS

DETAILS OF COMPONENTS TO THE GUARD RAIL ENERGY ABSORBING TERMINAL WILL BE SHOWN ON SHOP DRAWINGS FURNISHED TO THE ENGINEER BY THE MANUFACTURER.



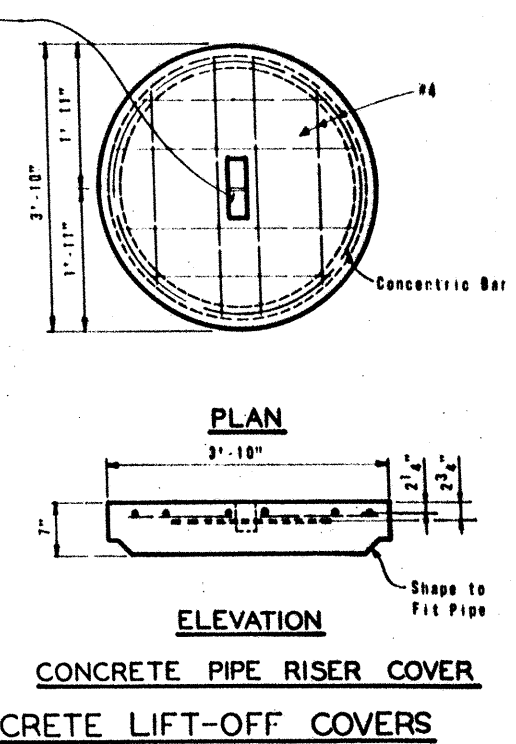
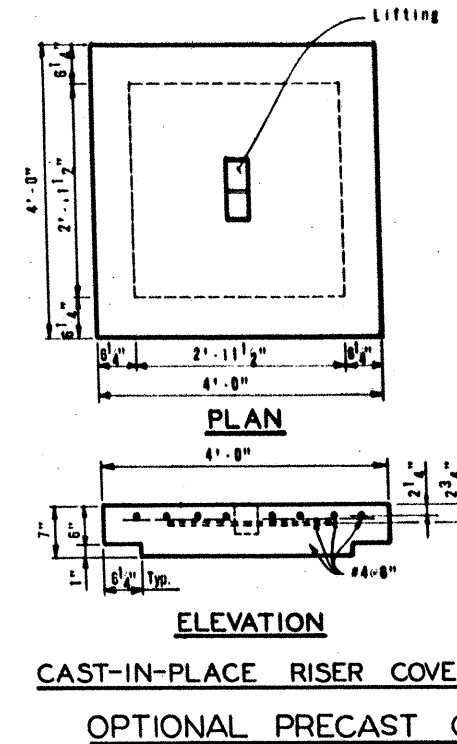
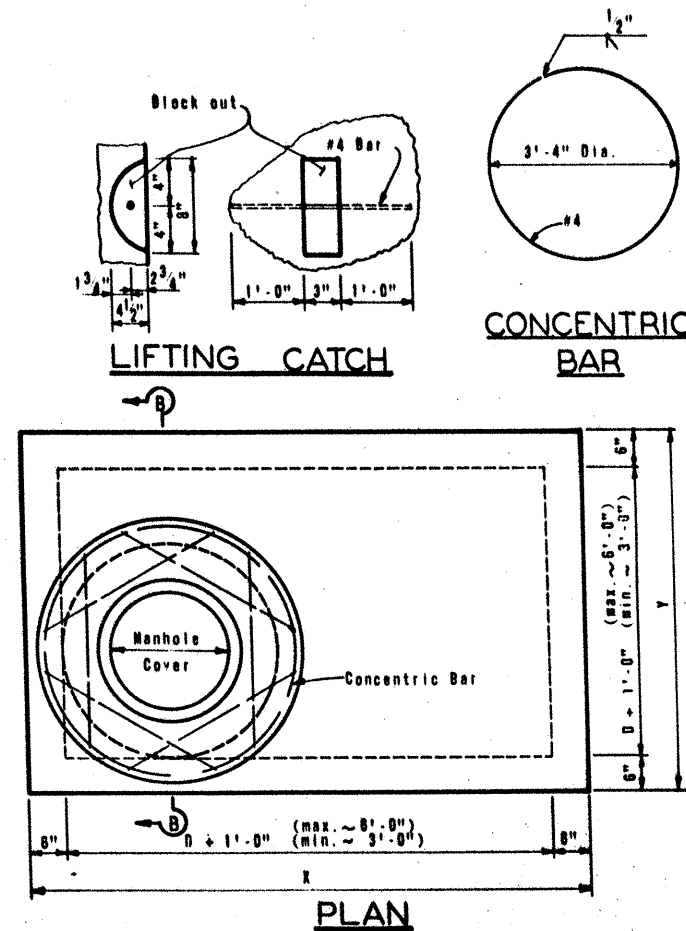
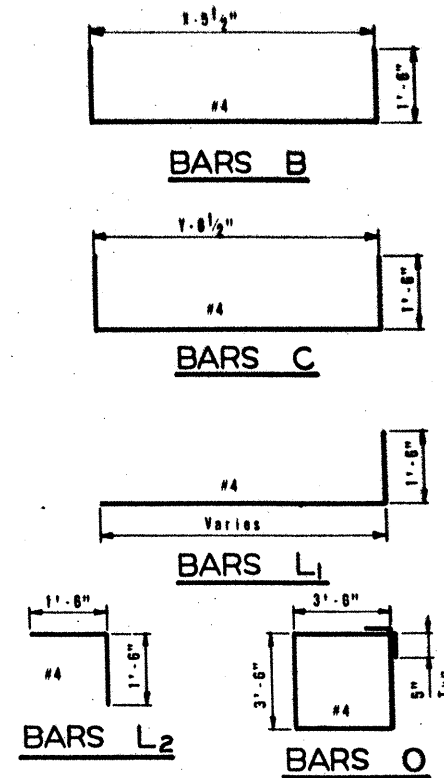
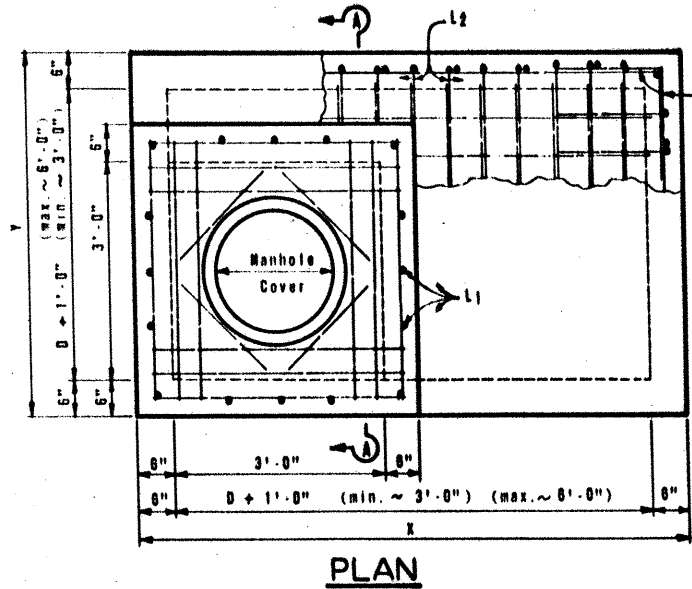
STATE DEPARTMENT OF HIGHWAYS
AND PUBLIC TRANSPORTATION

GUARD RAIL ENERGY ABSORBING TERMINAL

GREAT - 84

ORIGINAL DRAWING DATE:	REVISIONS	STATE DISTRICT	FEDERAL REGION	FEDERAL AID PROJECT #	SHEET
				KA-HES-0015(212)	101
		COUNTY	DISTRICT	SECTION	NUMBER
		NUCES	120	101	101

Note: Riser, either cast-in-place or concrete pipe, may be located in any corner.



OPTIONAL PRECAST CONCRETE LIFT-OFF COVERS

GENERAL NOTES

Unless otherwise shown in the plans, paym't will be made for each Manhole of the Type M.

Exposed edges shall be chamfered 3/4".

The Contractor may propose alternate procedures for the construction of Manholes, including precast units. Plans for such proposed alternates shall be submitted to the Engineer, for review and approval before construction.

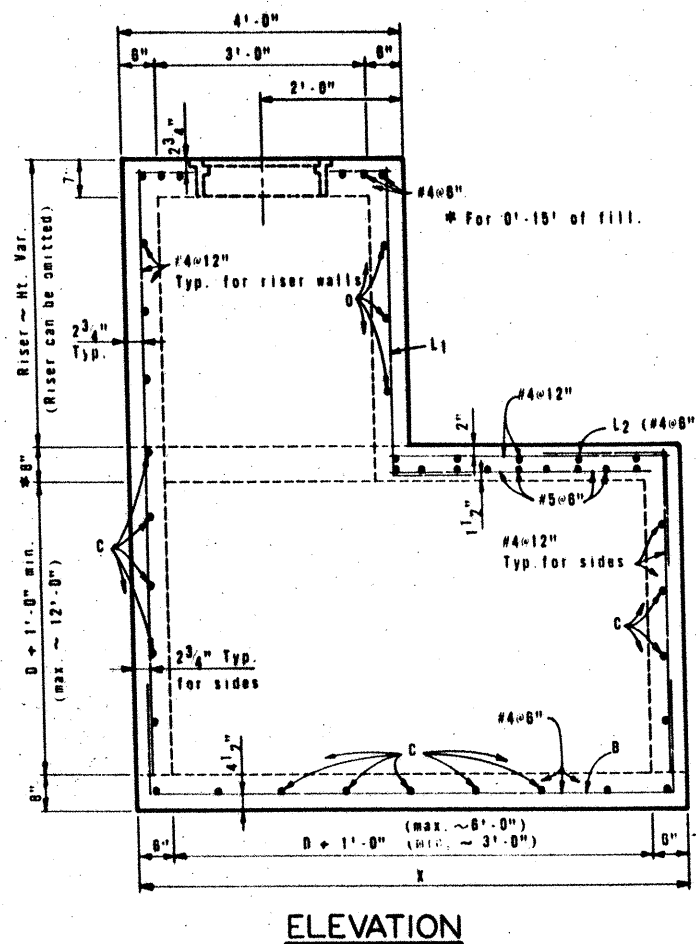
In areas of conflict between reinforcing steel, block-outs, pipes, anchor bolts or other reinforcing steel, the reinforcement shall be bent or adjusted to clear as directed by the Engineer.

The riser may be constructed of reinforced concrete, 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".

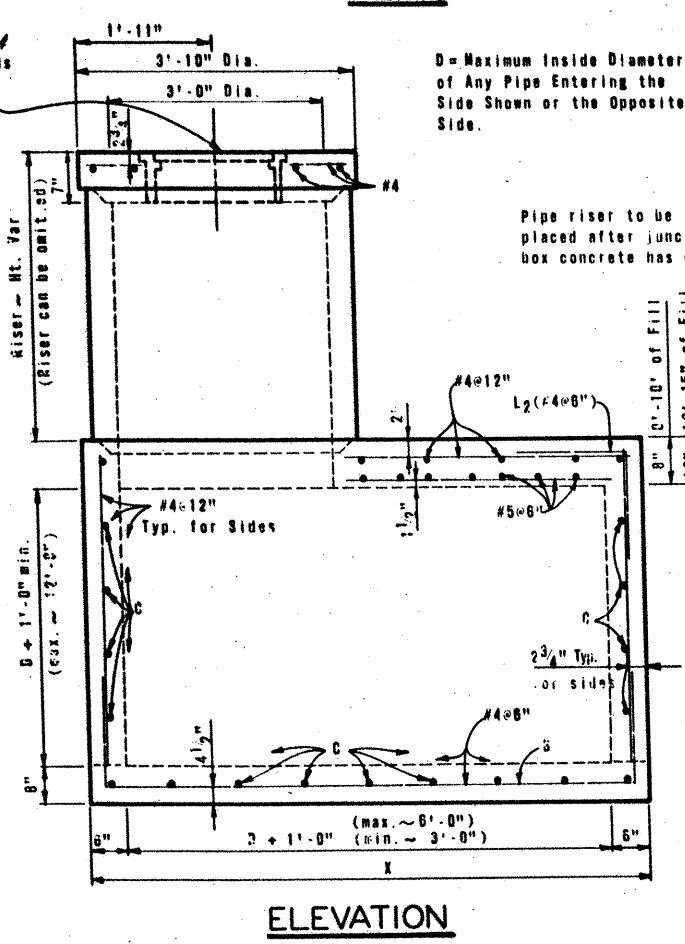
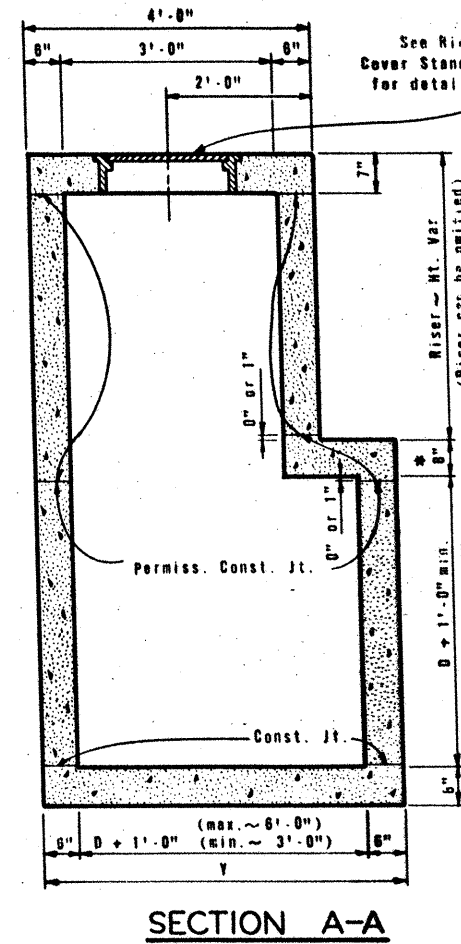
Connecting pipes should enter within 12" of normal to inlet wall, if necessary, pipe flange or curved approach alignment should be used to stay within this limit.



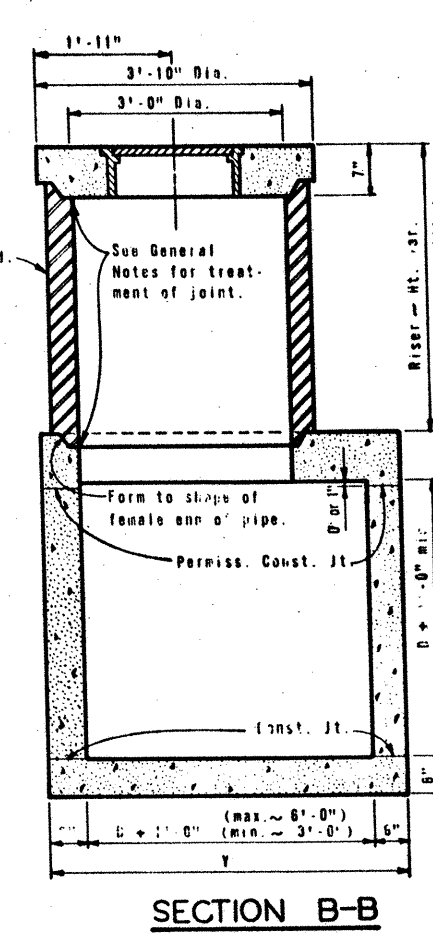
Pipes may enter any or all walls. The maximum size of pipe that can be accommodated is 60". More than one pipe may enter a side, subject to the maximum box dimensions shown. The clear distance between adjacent pipes should be 9" minimum.



MANHOLE WITH CAST-IN-PLACE RISER



OPTIONAL MANHOLE WITH PIPE RISER



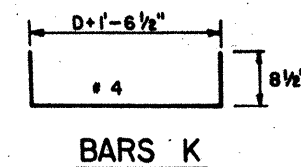
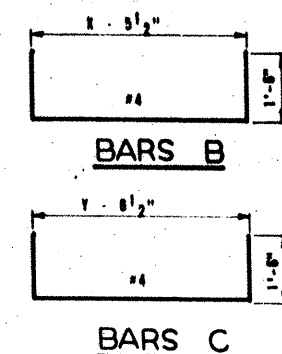
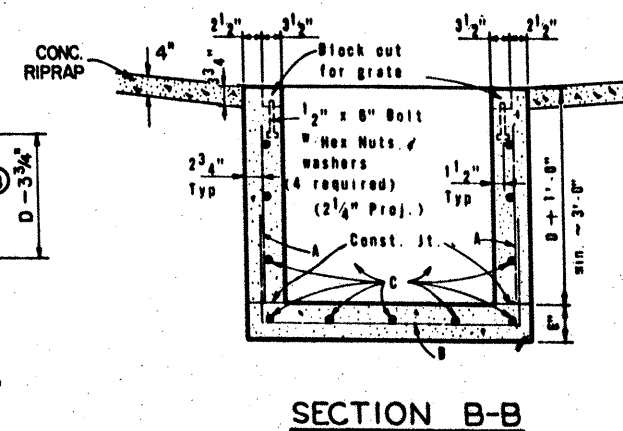
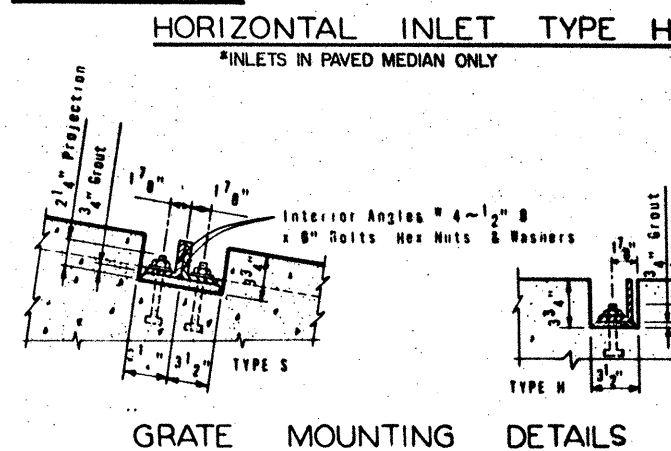
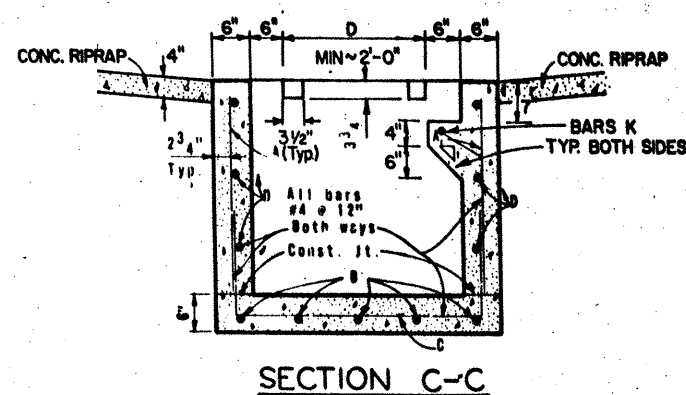
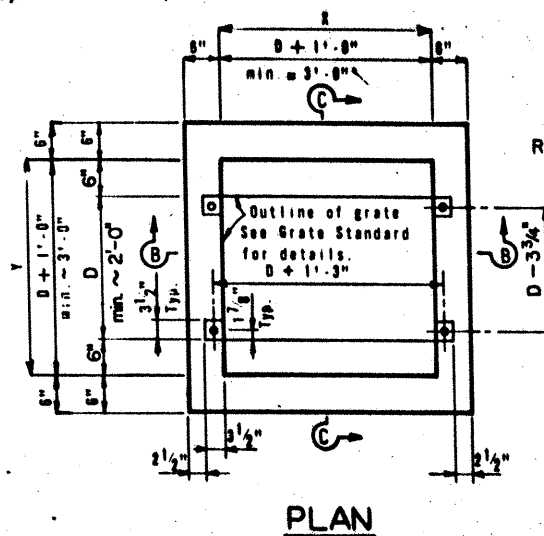
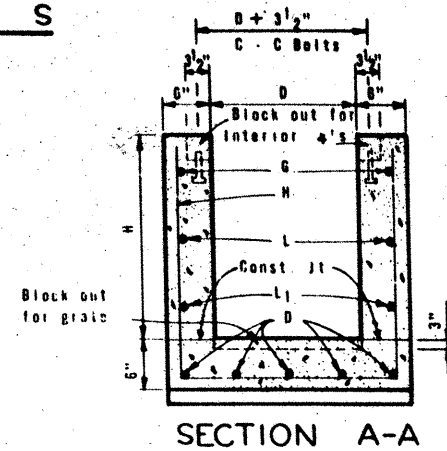
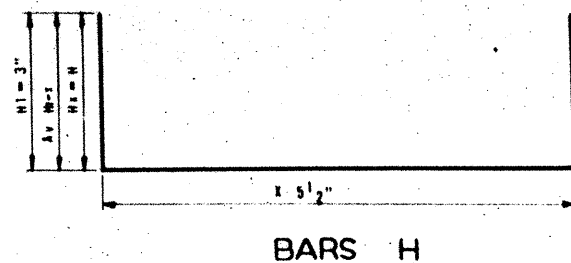
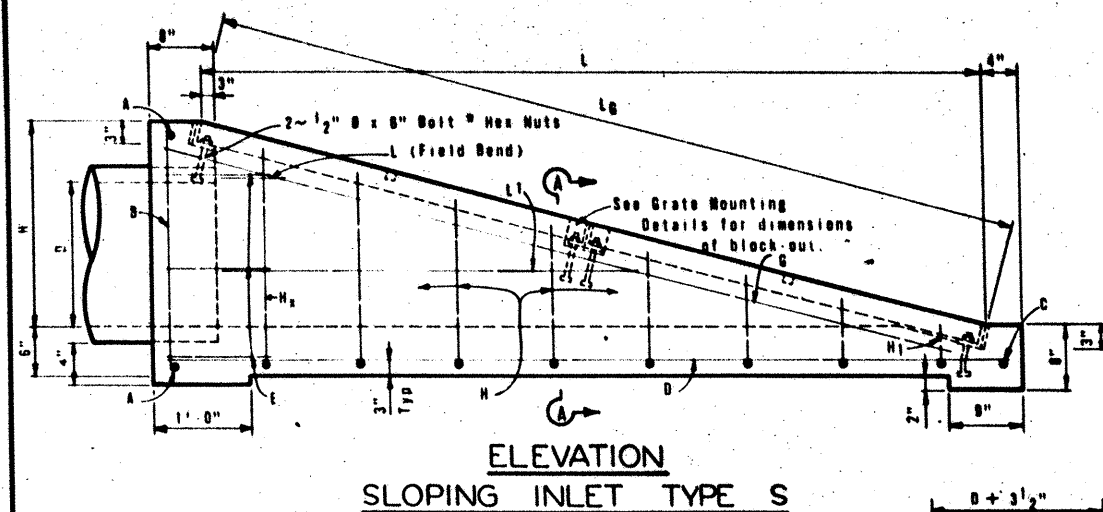
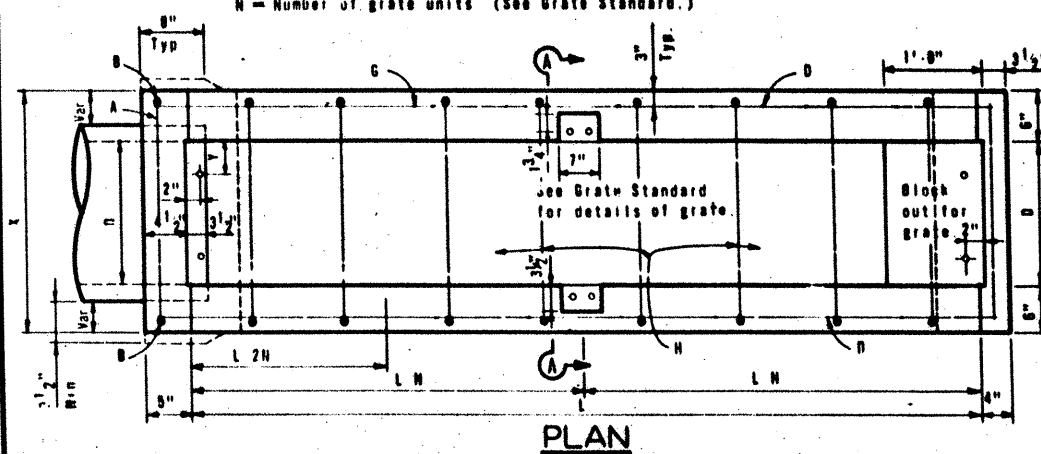
STATE DEPARTMENT OF HIGHWAYS
AND PUBLIC TRANSPORTATION
MANHOLE TYPE M
(JUNCTION BOX WITH ACCESS)

MH-M

ORIGINAL DRAWING DATE	STATE	FEDERAL	FEDERAL AID PROJECT	SHEET
DEC. 1977	MA	MA-HES	0005(293)	102
DESIGNED BY	CHIEF ENGINEER	COUNTY	SECTION	DATE
THD	THD	NUECES	326	3.61.88

[illegible]

Note: For pipe sizes of 21", 27", and 33" use inlets for pipe sizes 24", 30", and 36" respectively.
N = Number of grate units. (See Grate Standard.)



GENERAL NOTES

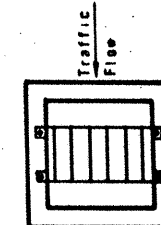
Quantities shown hereon are for the Contractor's information only. Unless otherwise shown in the plans, payment will be made for each inlet of the Type specified.

Exposed edges shall be chamfered $\frac{3}{4}$ "

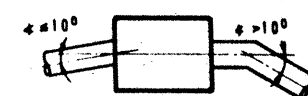
The Contractor may propose alternate procedures for the construction of inlets, including precast units. Plans for such proposed alternates shall be submitted to the Engineer for review and approval before construction.

In areas of conflict between reinforcing steel, blockouts, pipes, anchor bolts or other reinforcing steel, the reinforcement shall be bent or adjusted to clear as directed by the Engineer.

If possible, horizontal grate inlet should be oriented such that both traffic and ditch water approach parallel to bars on grate. If this is not possible, orientation should favor traffic flow.



Connecting pipes should enter within 10° of normal to inlet wall. If necessary, pipe elbow or curved approach alignment should be used to stay within this limit.



the pipe diameter "D", to be used in determining horizontal dimensions of Type "W" inlet, shall be the largest pipe entering or exiting the inlet which would control that particular wall dimension. For vertical dimension, use largest "D" or "1-0" above highest pipe soffit as a minimum dimension.

Approximately 2 cu yds Cl B Riprap will be used for shaping around perimeter of each inlet except inlets in paved median.

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TEXAS HIGHWAY DEPARTMENT
BRIDGE DIVISION

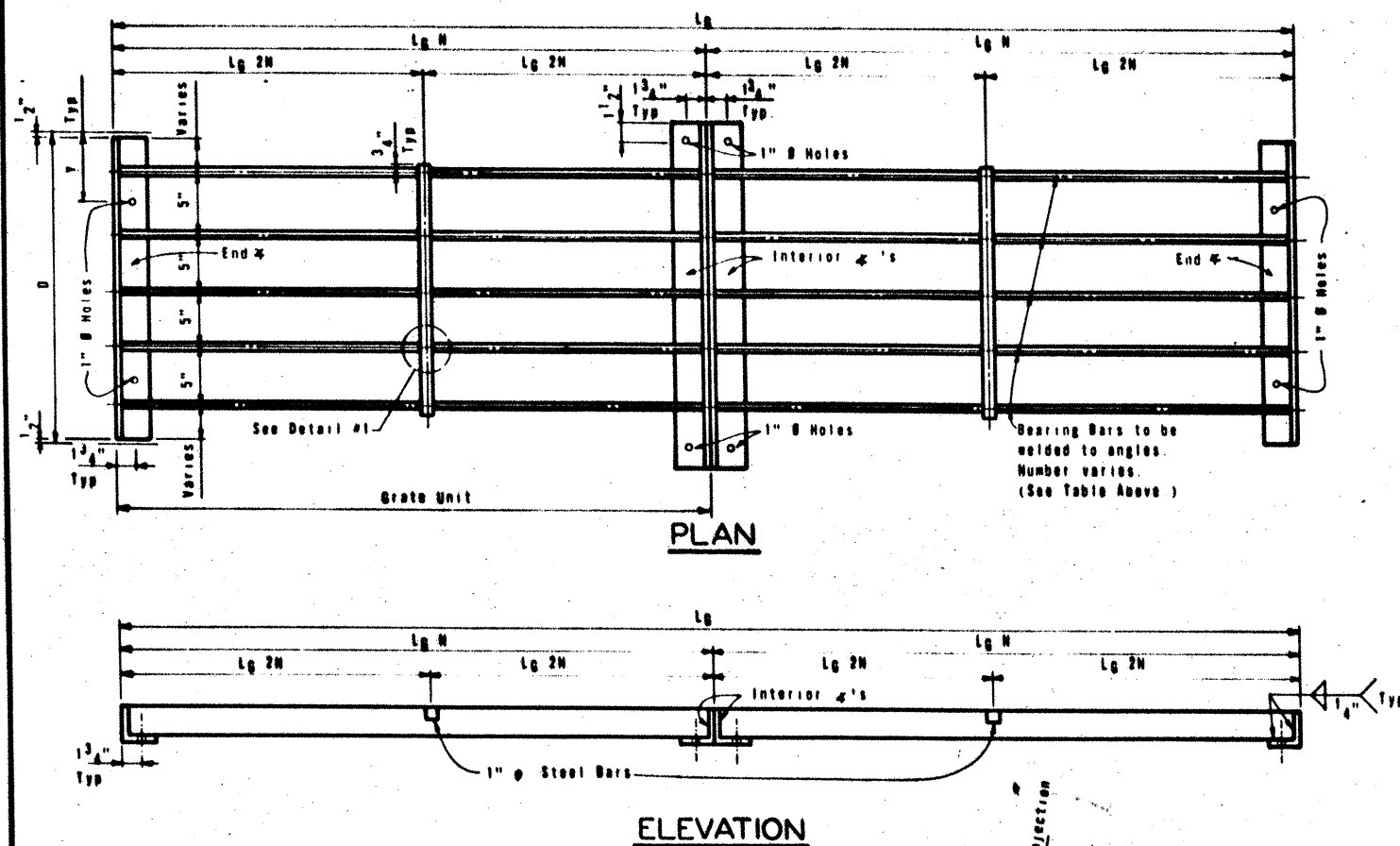
SLOPING INLET TYPE S
AND
HORIZONTAL INLET TYPE H

(MOD) IL-S IL-H

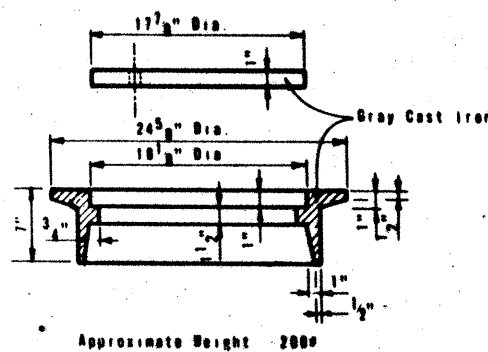
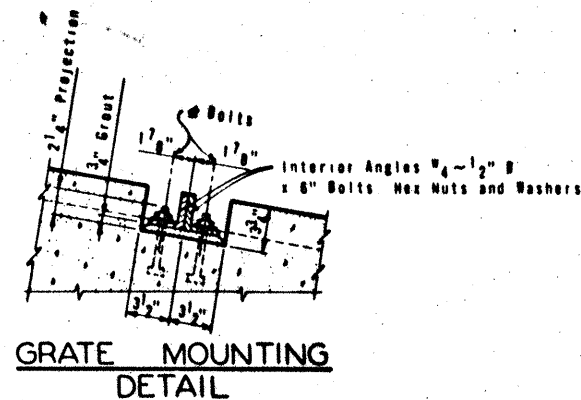
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REVISIONS		16		6		MA-NEC 0005 (293)		103	
DW. - APC				COUNTY		CONTRACT		SECTION	
CR - THD				Nueces		326		3	
DW. - MGB								JOB	
CR - THD								5444	

GRATE QUANTITIES FOR SLOPING INLET																			
SLOPE	Y	DIAM OF PIPE = D	N																
				BEARING BARS @ 5" C.C.				INTERIOR ANGLES				END ANGLES				1" BARS			
				NO	SIZE	LG/N	WT	NO	SIZE	LGTH	WT	NO	SIZE	LGTH	WT	NO	LGTH	WT	TOTAL WEIGHT LBS.
0.1	4"	18"	2	2	2 1/2" x 1/2"	8' 5 1/2"	220	2	3" x 3" x 1/2"	2' 0 1/2"	38	2	3" x 3" x 1/2"	1' 5"	27	2	1' 1 1/2"	9	295
0.1	5"	24"	2	2	2 1/2" x 1/2"	8' 1 1/2"	345	2	3" x 3" x 1/2"	2' 0 1/2"	48	2	3" x 3" x 1/2"	1' 11"	38	2	1' 8 1/2"	12	441
0.1	5 1/2"	30"	3	3	2 1/2" x 1/2"	8' 6 1/2"	488	4	3" x 3" x 1/2"	3' 0 1/2"	114	2	3" x 3" x 1/2"	2' 5"	45	3	2' 2 1/2"	23	680
0.1	6"	36"	3	3	2 1/2" x 1/2"	7' 7 1/2"	670	4	3" x 3" x 1/2"	3' 0 1/2"	133	2	3" x 3" x 1/2"	2' 11"	53	3	2' 7 1/2"	27	882
0.1	6 1/2"	42"	3	3	2 1/2" x 1/2"	8' 6 1/2"	889	4	3" x 3" x 1/2"	4' 0 1/2"	192	2	3" x 3" x 1/2"	3' 5"	84	3	3' 0 1/2"	31	1,138
0.1	4 1/2"	48"	4	4	2 1/2" x 1/2"	7' 4 1/2"	1,240	8	3" x 3" x 1/2"	4' 0 1/2"	288	2	3" x 3" x 1/2"	3' 11"	74	4	3' 10 1/2"	53	1,632

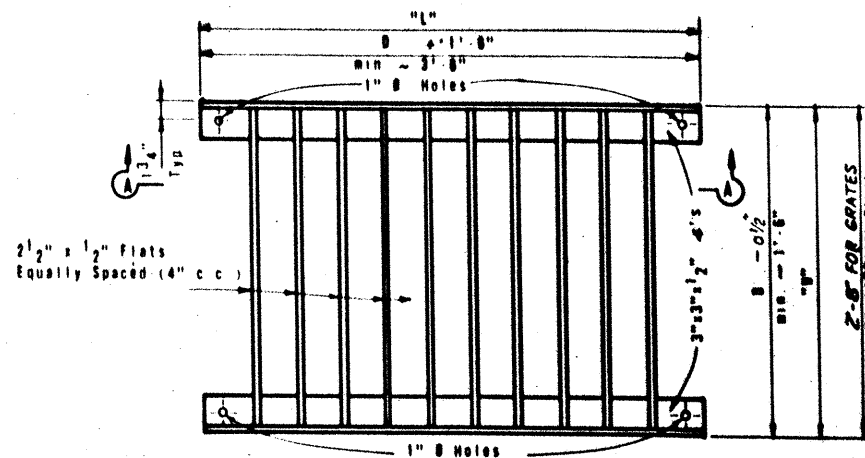
N = Number of grate units
For pipe diameters of 21", 27", and 33" use grates for pipe diameters of 24", 30" and 36", respectively



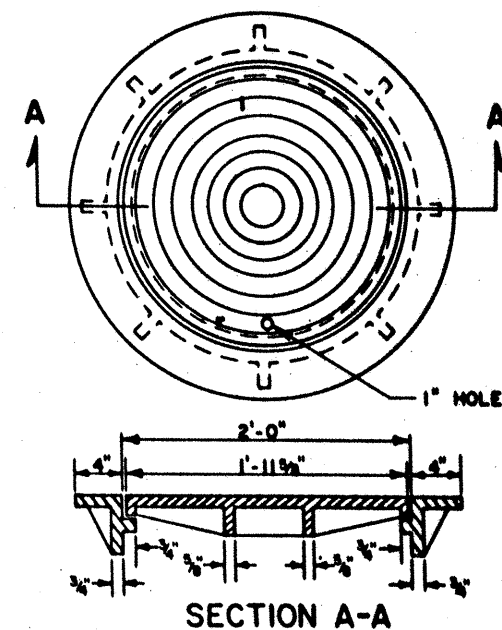
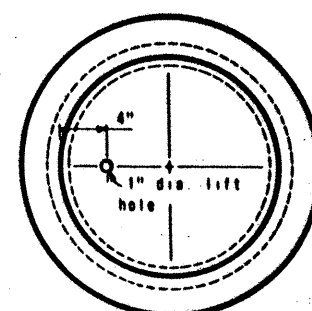
GRATE DETAILS
FOR SLOPING INLET
TYPE S



RING AND COVER
DETAILS
TYPE C



GRATE DETAILS
FOR HORIZONTAL INLET
TYPE H



RING AND COVER DETAILS
TYPE A

GENERAL NOTES

Structural Steel for grates shall conform to the requirements of ASTM Designation A-36 or AISI Designation M1010 - M1020.

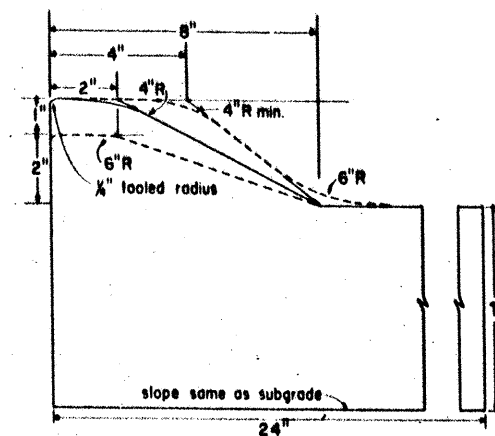
Rings and covers of slightly different dimensions but approximately the same weight may be substituted if approved by the Engineer.

104

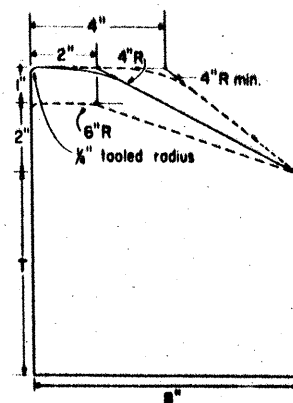
TEXAS HIGHWAY DEPARTMENT
BRIDGE DIVISION

GRATE (TYPE S),
GRATE (TYPE H),
RING & COVER (TYPE C & A)
ILG-S(MOD)ILG-H RC C&A

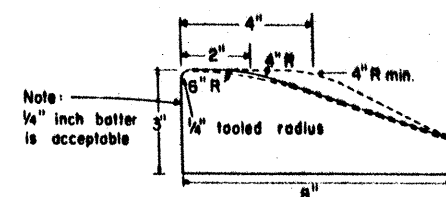
ORIGINAL DRAWING DATE OCTOBER 1972	STATE DISTRICT	STATE	FEDERAL PROJECT NO	SHEET
DN - ADC	16	TEXAS	MA-HES 0005(293)	104
CR - THD				
DW - MGB				
CR - THD				



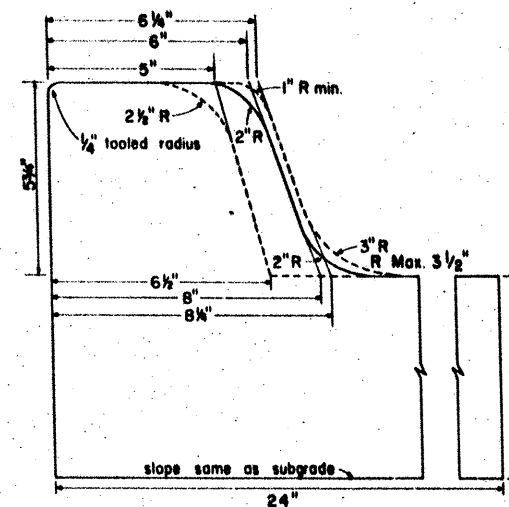
TYPE I CURB AND GUTTER



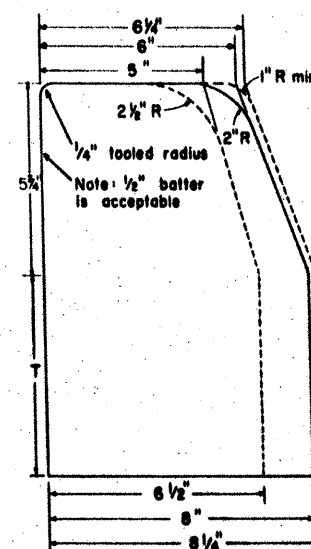
TYPE I CURB



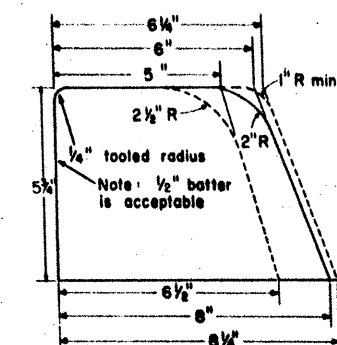
TYPE I MONO CURB OR CURB PLACED ON PAVEMENT



TYPE II CURB AND GUTTER



TYPE II CURB



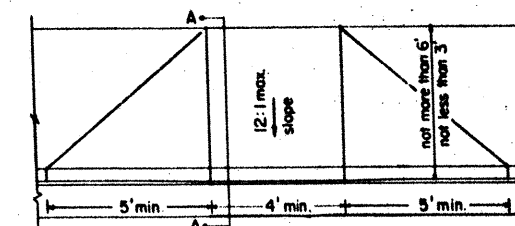
TYPE II MONO CURB OR CURB PLACED ON PAVEMENT

GENERAL NOTES

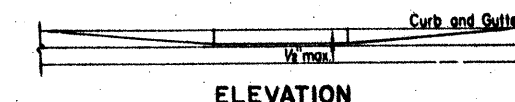
- CONTRACTOR MAY USE EXISTING FORMS IF THE CROSS SECTION LIES WITHIN THE BAND SHOWN BY DOTTED LINES. IF NEW FORMS ARE TO BE PURCHASED, LEASED, OR CONSTRUCTED THEY SHALL CONFORM TO THE SOLID LINE.
- WHEN REINFORCING STEEL IS REQUIRED OR PLACED AT CONTRACTOR'S OPTION, ONE OF THE FOLLOWING SCHEMES OF REINFORCEMENT SHALL BE REQUIRED. THE MANNER OF PLACEMENT AND LOCATION SHALL BE TO THE SATISFACTION OF THE ENGINEER.
 - TYPE I CURB AND GUTTER (REINF.) OR TYPE II CURB AND GUTTER (REINF.) SHALL HAVE LONGITUDINAL REINFORCING BARS AS FOLLOWS: THREE #3, TWO #4, TWO #5, OR ONE #6.
 - ALL TYPES OF CURB (REINF.) SHALL HAVE ONE #3 OR #4 BAR FOR LONGITUDINAL REINFORCEMENT.
- REINFORCING BARS SHALL BE LAPPED A MINIMUM OF 13".
- WHEN CURB OR CURB AND GUTTER IS PLACED BY A SEPARATE POUR ADJACENT TO OR ATOP CONCRETE PAVEMENT, CURB OR CURB AND GUTTER SHALL BE TIED TO PAVEMENT IN A MANNER SATISFACTORY TO THE ENGINEER WITH 8-INCH LONG #3 OR #4 BARS SPACED AT 5 FEET AND EXPANSION AND/OR CONTRACTION JOINTS OF CURB OR CURB AND GUTTER SHALL MATCH THOSE OF PAVEMENT.

WHEN CURB OR CURB AND GUTTER IS NOT CONSTRUCTED ADJACENT TO CONCRETE PAVEMENT, THE FOLLOWING SHALL GOVERN:

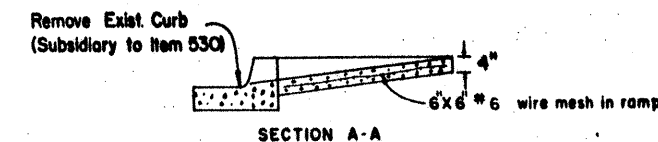
 - REINFORCED CURB OR CURB AND GUTTER SHALL HAVE NO CONTRACTION JOINTS.
 - NON-REINFORCED CURB OR CURB AND GUTTER SHALL HAVE FORMED, TOOLED OR SAWED CONTRACTION JOINTS AT 10'±. THE DEPTH OF THESE JOINTS SHALL BE SUFFICIENT TO INSURE CRACKING AT THE JOINTS.
 - REINFORCED CURB OR CURB AND GUTTER SHALL HAVE EXPANSION JOINTS AT POINTS OF CURVATURE AND AT INTERVALS NO GREATER THAN 120' IN ALL CURVES AND AT STRUCTURES SUCH AS BRIDGES, BOX CULVERTS, CURB INLETS, ETC.
 - NON-REINFORCED CURB OR CURB AND GUTTER SHALL HAVE EXPANSION JOINTS AT POINTS OF CURVATURE ON CURVES OF RADIUS LESS THAN 25' AND AT STRUCTURES SUCH AS BRIDGES, BOX CULVERTS, CURB INLETS, ETC.
- ONE-HALF INCH EXPANSION JOINT MATERIAL SHALL BE PROVIDED WHERE CURB OR CURB AND GUTTER IS ADJACENT TO SIDEWALK OR RIPRAP.
- TRANSITIONS BETWEEN CURBS OR CURBS AND GUTTERS OF DIFFERING CROSS SECTION SHALL BE ACCOMPLISHED OVER A 20 FT. LENGTH AS APPROVED BY THE ENGINEER.
- AT CONTRACTOR'S OPTION, DIMENSION "T" MAY BE THICKNESS OF PAVEMENT STRUCTURE. IN NO CASE SHALL IT BE LESS THAN 6".



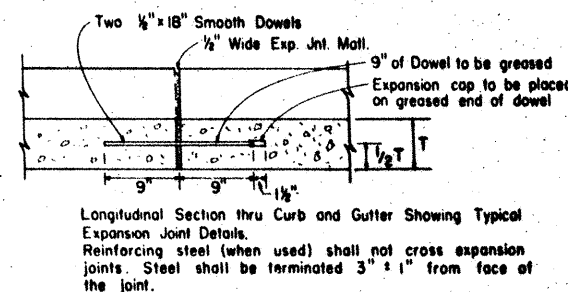
PLAN



ELEVATION



WHEELCHAIR & BICYCLE RAMP



Longitudinal Section thru Curb and Gutter Showing Typical Expansion Joint Details.
Reinforcing steel (when used) shall not cross expansion joints. Steel shall be terminated 3" ± 1" from face of the joint.

NOTE: Added Wheelchair & Bicycle Ramp



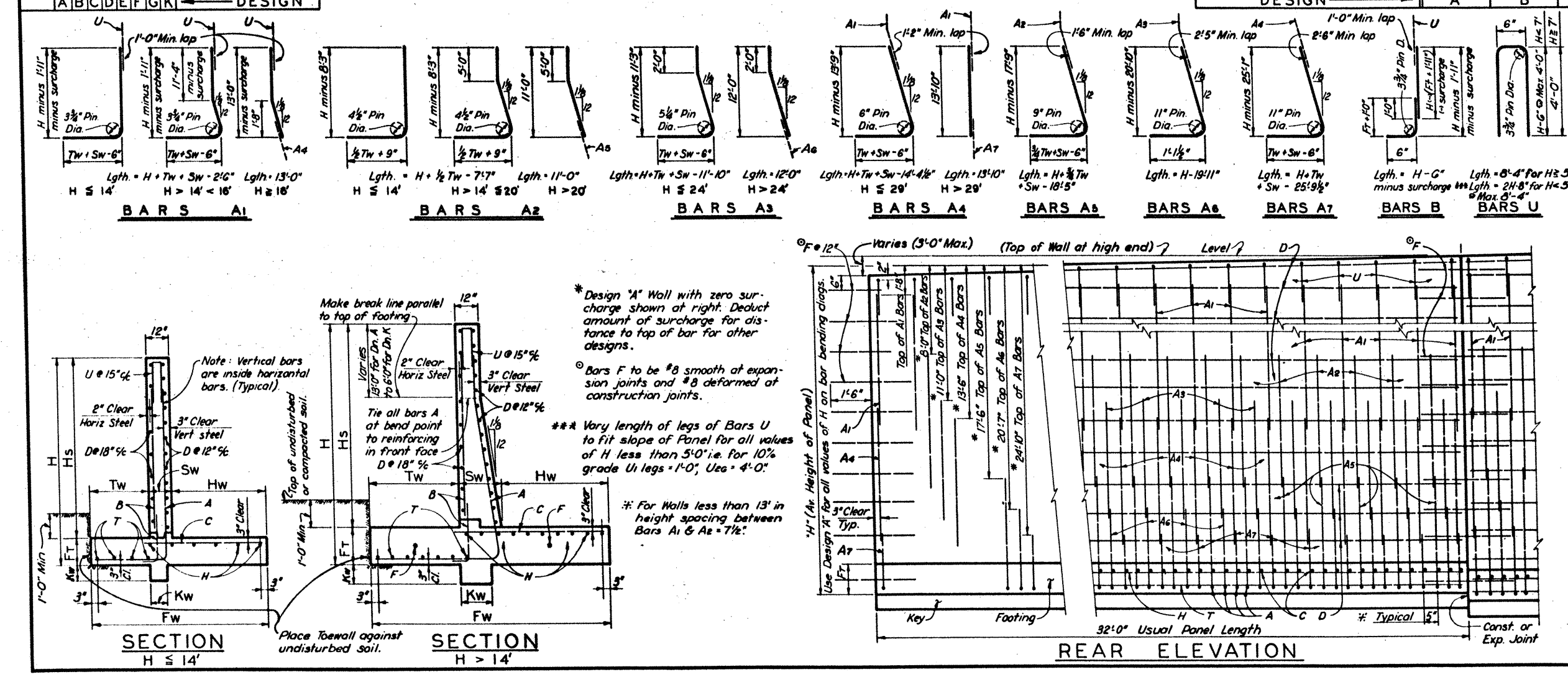
STATE DEPARTMENT OF HIGHWAYS AND PUBLIC TRANSPORTATION

CONCRETE CURB AND CURB AND GUTTER

CCCG - 75(MOD)

DN	DRAWING	DATE	FED. NO.	STATE	FEDERAL PROJECT NO.	SHEET NO.
CK DN	ORIGINAL		6	TEXAS	HES 0005 (293)	105
CK DW	REVISED					
CK TR	REVISED					
CK TR			16	NUECES	326 03 61	SH286

SURCHARGE LEVEL SLOPED NONE UP TO 7:1 2:1 3:1 4:1 5:1 6:1 7:1	PROPERTIES										REINFORCING STEEL FOR 32'-0" PANEL (DESIGN A)																				QUANTITIES FOR 32'-0" PANEL																SURCHARGE HEIGHT PLUS SURCHARGE																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
	WALL DIMENSIONS						MIN. REQ'D AS 0.75	# A1 28-#5 @ 15"		# A2 25-#6 @ 15"		A3 25-#7 @ 15"		**A4 26-#8 @ 15"		**A5 25-#9 @ 15"		A6 25-#11 @ 15"		A7 26-#11 @ 15"		B 26-#5 @ 15"		C		D #5 x 3/16" @ 12" @ 18"		°F #6 x 3/10" @ 12"		H #5 x 3/16" @ 12"		T #5 x 3/16" @ 12"		***U 26-#5 @ 15"		SURCHARGE																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
	FW	TW	SW	HW	FT	KW		STEM	TOE	HEEL	LGTH.	WT.	LGTH.	WT.	LGTH.	WT.	LGTH.	WT.	LGTH.	WT.	LGTH.	WT.	LGTH.	WT.	NO.	SIZES	PA	LGTH.	WT.	NO.	WT.	NO.	WT.	NO.	WT.	LTH.	WT.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.		REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.	C.Y.	LB.	CONC.	REINF.



**TEXAS HIGHWAY DEPARTMENT
BRIDGE DIVISION**

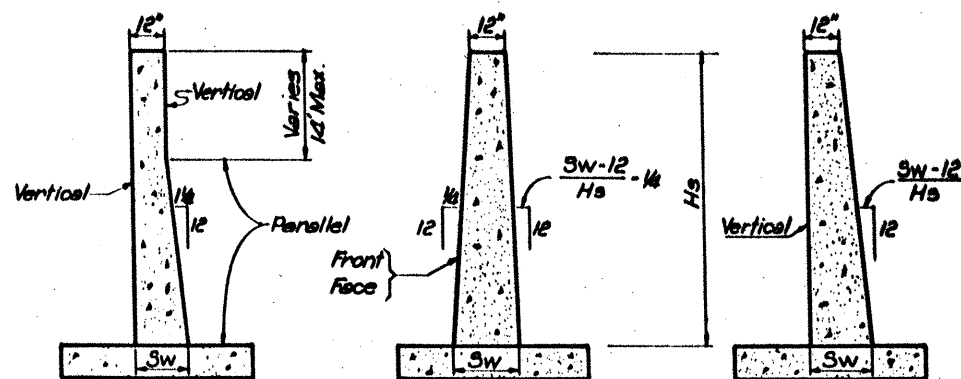
**RETAINING WALLS
HEIGHTS UP TO 32'-0"**

DESIGNS A TO K

106

RW 1 (L)

ORIGINAL DRAWING DATE: MAR. 1975	STATE: TEXAS	FEDERAL AID PROJECT: MA-HES 0005 (28)	SHEET: 106
DESIGNER: CWC	COUNTY: DALLAS	CONTRACT: 326	SECTION: 3
CHECKER: CWC	DATE: 10/2/78	BY: JH286	



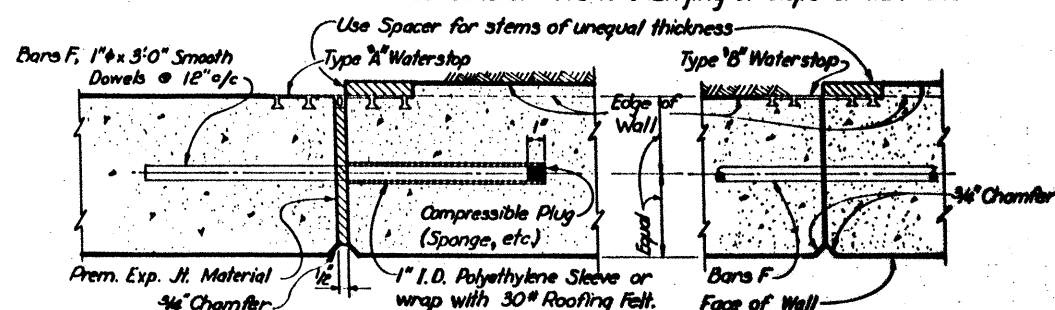
AS DETAILED
ALL HEIGHTS
(Basis for Payment)

BOTH FRONT & BACK
FACES SLOPING
Other slopes may be used on either
front or back face of wall.

FRONT FACE VERTICAL
BACK FACE SLOPED
(For $H > 14'$)

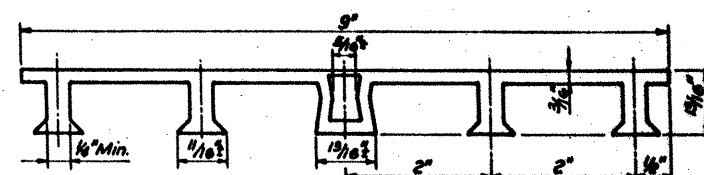
ALTERNATE STEM SLOPE DETAILS

Walls with slopes other than those shown may be used after approval by the Engineer. SW shall not be less than shown in Table on sheet 1. No payment will be made for excess concrete due to changing of slope of wall face.

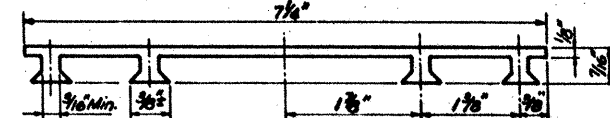


EXPANSION JOINT

CONSTRUCTION JOINT

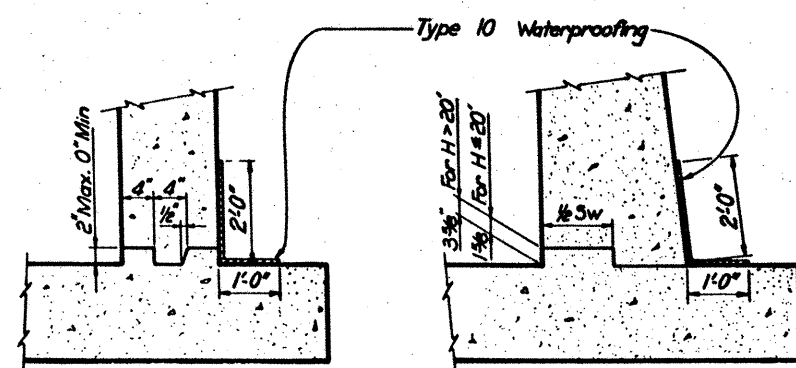


PVC WATERSTOP TYPE 'A'



PVC WATERSTOP TYPE 'B'

Note: Dimensions & shapes
may vary slightly depending
on manufacturer.

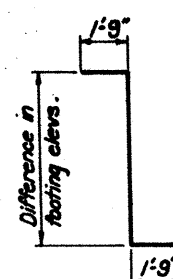


$H \leq 14'$

$H > 14'$

JOINT AND WATERSTOP DETAILS

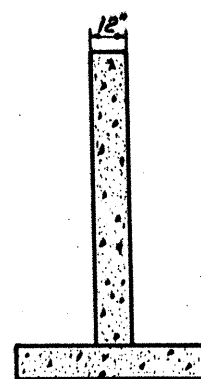
BARS Z #5
NOTE: Bars Z are to be tabulated
on RW-4 sheet. Omit bars
Z when difference in top of
footing elevations is less
than 0'-0".



BARS Z #5

NOTE: Bars Z are to be tabulated
on RW-4 sheet. Omit bars
Z when difference in top of
footing elevations is less
than 0'-0".

BOTH FACES VERTICAL
(As detailed, for $H \leq 14'$)



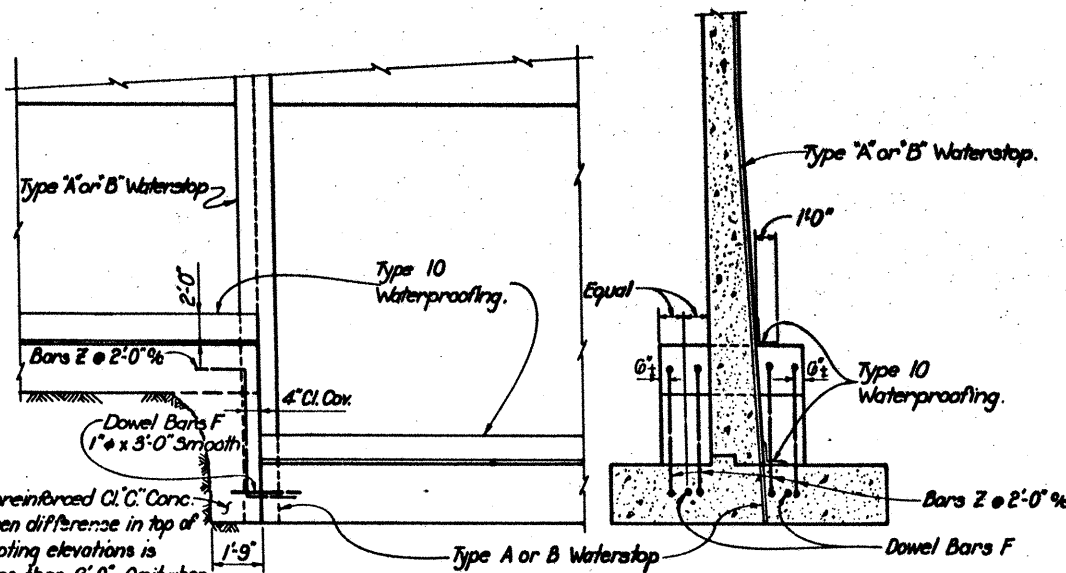
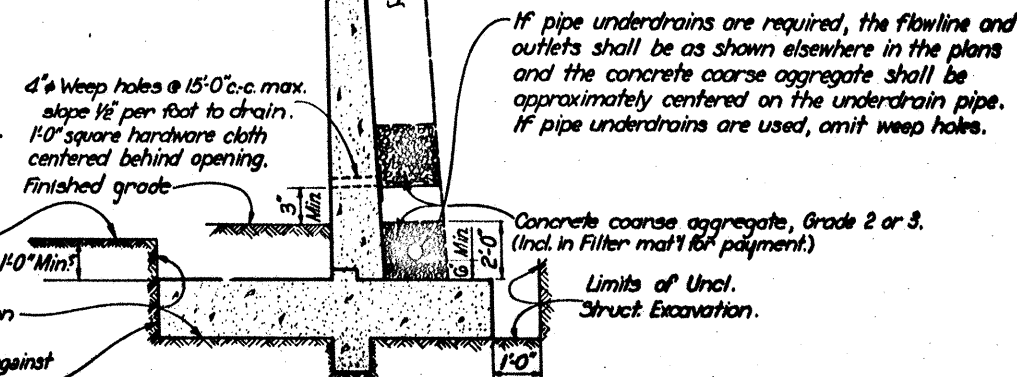
4" Weep holes @ 15'-0" c.c. max.
slope 1/2" per foot to drain.
1'-0" square hardware cloth
centered behind opening.
Finished grade

Top of undisturbed
or compacted soil

Limits of Uncl.
Struct. Excavation

Place toewall against
undisturbed soil

DRAINAGE DETAILS & EXCAVATION DIAGRAM



Unreinforced Cl. Cox. Conc.
when difference in top of
footing elevations is
less than 0'-0". Omit when
Dowel Bars F can be placed
between adjacent footings
with 4" min cover top and
bottom.

PART ELEVATION

PART SECTION

SHOWING WATERSTOP @ FOOTING JOINT

GENERAL NOTES:

Walls are designed to provide a minimum factor of safety against sliding of 1.5. The undisturbed or compacted soil depth in front of walls, from bottom of Key up shall not be less than $K_w + F_r + 1'-0"$. The angle of internal friction (ϕ) of this soil must be greater than 20° .

The bearing capacity of the soil must be equal to or greater than the wall footing pressure.

Retaining Walls with heights up to 15'-0" are detailed to be placed on grades up thru 10% with footing level, with no changes in reinforcing steel. Steeper grades can be accommodated by shortening Bars A & B and increasing length of legs of Bars U by the same amount. No change in Quantities will be involved. Walls over 15'-0" in height can be placed on steeper grades with no revisions.

Retaining Walls may be placed on Horizontal Curves by adjusting lengths of footing Bars T & H. Minor revisions of Concrete Quantities may be required when maximum footing pressure walls are used.

Designed in accordance with A.A.S.H.O. 1973 Standard Specifications.

All concrete to be Class C.

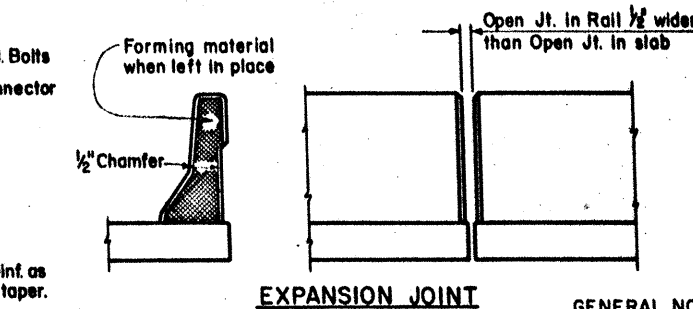
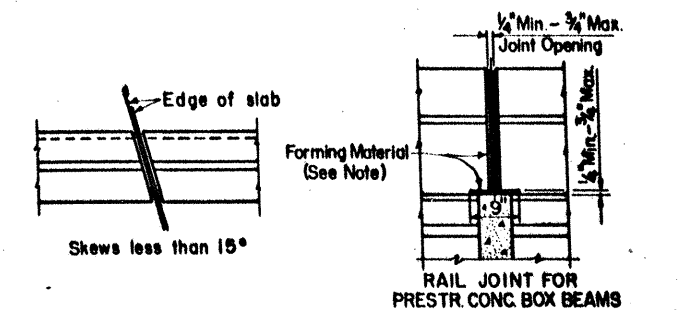
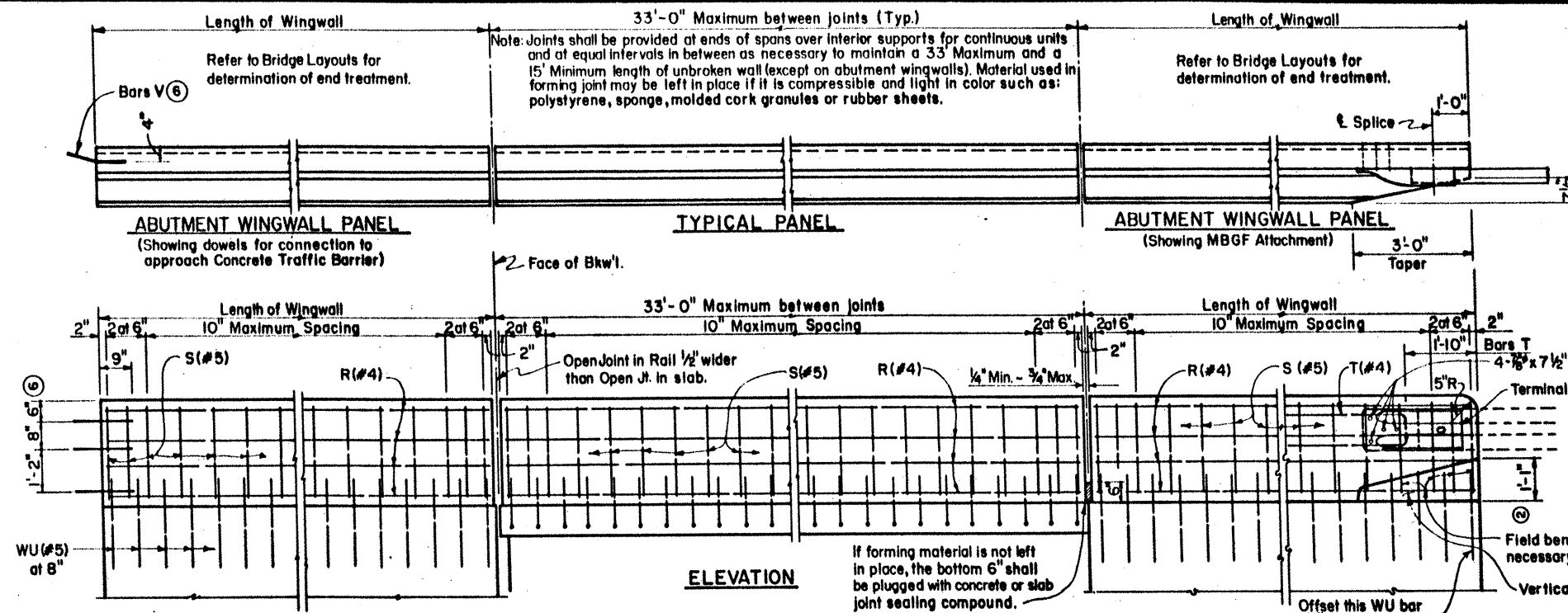
Reinforcing bar laps and splices conform to Research Report 113-3

Cost of furnishing and installing expansion Joint material and waterstops shall be included in price bid for Retaining Walls.®

TEXAS HIGHWAY DEPARTMENT BRIDGE DIVISION RETAINING WALLS MISCELLANEOUS DETAILS

(MOD)RW 2

MODIFICATION: Revised note			
ORIGINAL DRAWING DATE: MAR. 1975	STATE: TEXAS	FEDERAL DISTRICT: 16	FEDERAL AID PROJECT: MA-HES 0005(293)
DR.: CWC	REVISIONS:	COUNTY: NUECES	SHEET: 107
CR.: DAB		SECTION: 326	JOB: 3
DW.: AS		DATE: 6/1	BY: BAZAG
CR.: CWC			



GENERAL NOTES:

Designed according to AASHTO 1977 Standard and current Interim Specifications.

All parts of the railing including concrete parapet wall, reinforcing, terminal connector, bolts, nuts and washers are included in the price bid per linear foot of rail.

All steel components except reinforcing shall be galvanized unless otherwise shown in plans.

All concrete for railing wall shall be Class "C".

Dimensions relating to reinforcing steel are to centers of bars.

Metal Beam Guard Fence or Concrete Traffic Barrier is usually attached to the abutment wingwall panel. See plan sheet for details and length for payment.

The splice between the approach guard fence and the terminal connector shall be with the normal eight bolts. The dowel connection to the approach traffic barrier shall be grouted the same as other barrier joints.

Shop drawings will not be required for this rail.

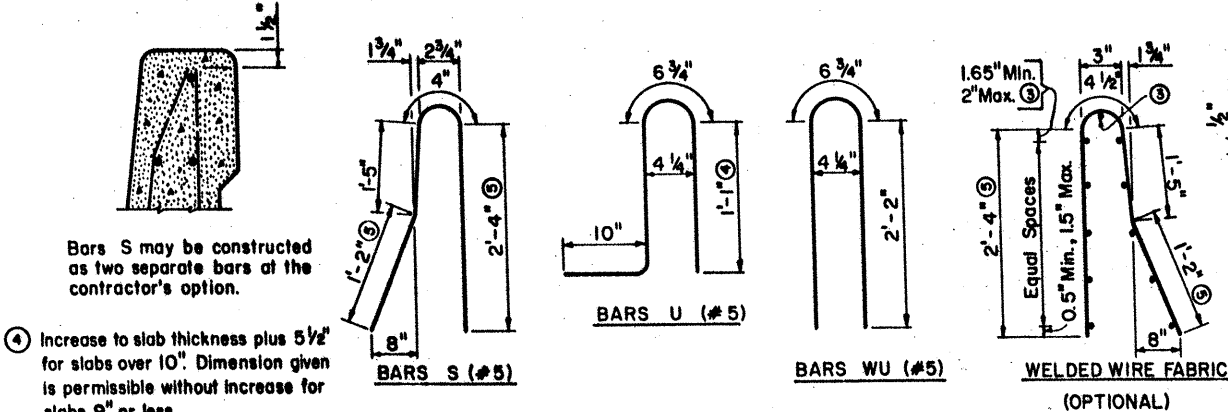
This railing may be constructed with slip-forms with equipment approved by the Engineer. Sensor control for both line and grade must be provided. When slip-forming is used, the concrete may be cured with membrane curing compound.

The back of railing shall be vertical unless otherwise shown in plans.

Welded wire fabric may be used as an option to conventional reinforcement and shall be made in accordance with ASTM A497.

Welded Wire Fabric Detail shown is for D8.4 longitudinal wires and D8.3 vertical wires. Combinations of Reinforcing Steel and Welded Wire Fabric or configurations of Welded Wire Fabric other than shown will be permitted when the conditions in the table are satisfied and the dimension from end of section to first welded vertical wire does not exceed 3".

Additional reinforcing may be tack welded to the upper two thirds of the reinforcing cage to provide bracing when slip-forming is used. Additional anchorage devices may be added when welding is necessary in the lower one third of the cage. Do not weld to U or S bars in the lower one third of the cage.



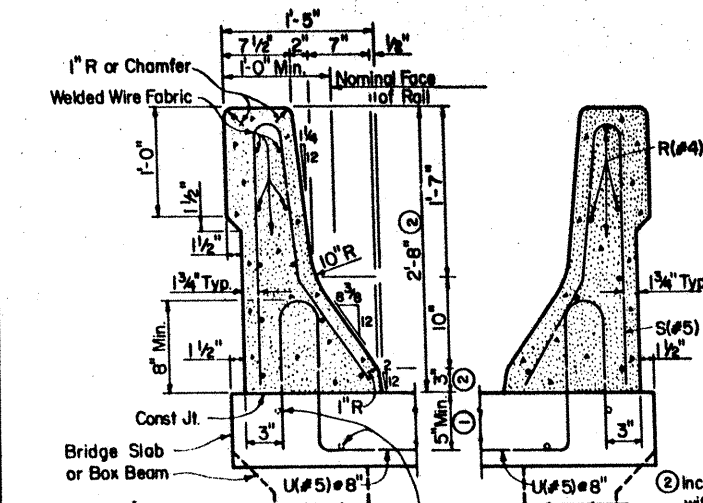
BARS V (#8) (3 at each connection)

BARS T (#4) (2 at each terminal)

DESCRIPTION	LONGITUDINAL WIRES	VERTICAL WIRES
1. Minimum (Cumulative Total) Wire Area	0.933 Sq. In.	0.248 Sq. In. Per Ft.
2. Minimum Maximum	No. of Wires 6	Spacing 4"
	11	12"
3. Maximum Wire Size Differential	The smaller wire shall have an area of 40% or more of the larger wire.	

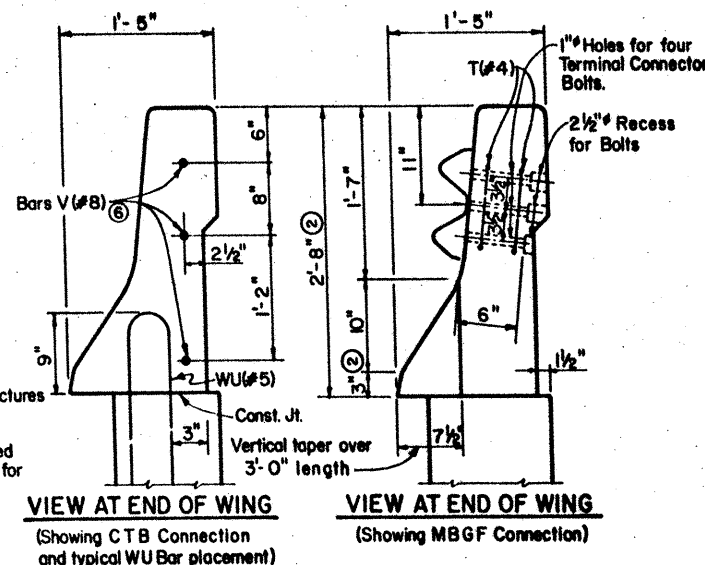
Longitudinal wires may be within upper bend if vertical wires are D8.7 or smaller, in which case the 2" dimension to the next lower bars may be increased to 4" max.

- ④ Increase to slab thickness plus 5 1/2" for slabs over 10". Dimension given is permissible without increase for slabs 9" or less.
- ⑤ Dimension given is permissible for structures with overlay.
- ⑥ Connection to be same as for approach CTB if dowels are not used.

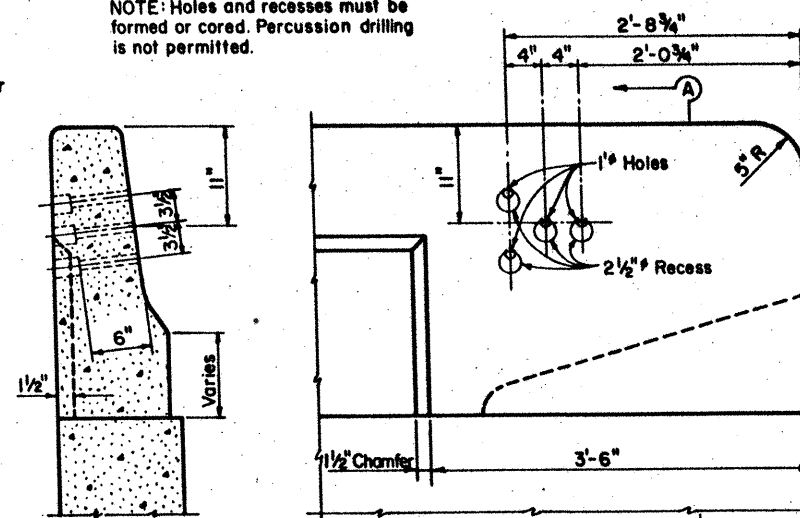


As an aid in supporting reinforcement, additional longitudinal bars may be used in the slab with the approval of the Engineer. Such bars shall be furnished at the Contractor's expense.

- ② Increase 2" for structures with overlay.
- ① 4" for prestressed boxes and 4 1/4" for CGC Spans.



NOTE: Holes and recesses must be formed or cored. Percussion drilling is not permitted.



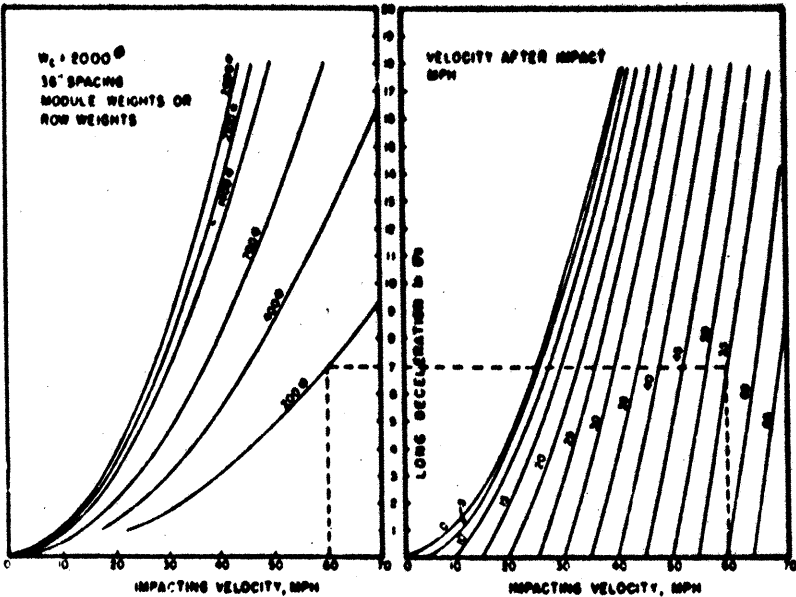
108

STATE DEPARTMENT OF HIGHWAYS AND PUBLIC TRANSPORTATION

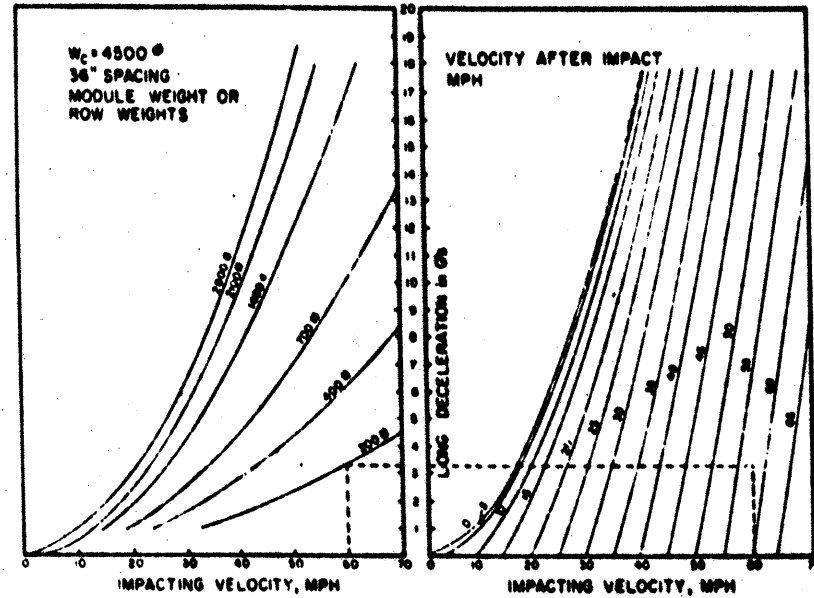
TRAFFIC RAIL

TYPE T50I

ORIGINAL DRAWING DATE DEC. 1983		STATE DISTRICT	FEDERAL REGION	FEDERAL AID PROJECT	SHEET
DR - THD	REVISIONS	16	6	MA-HES (0005) (293)	108
CK - THD	Rev 2-84	COUNTY		JOB	
DW - EDS	Rev 3-85	NUECES		320	3 61 54 26
CK - JJP					



SAND - FILLED PLASTIC BARREL BARRIER
(36" Row Spacing - 2000 lb. Vehicle)



SAND-FILLED PLASTIC BARREL BARRIER
(36" Row Spacing - 4500 lb. Vehicle)

EXAMPLE PROBLEM
Example Problem: Determine Barrier Array For 60 MPH Design Speed For 2000 lbs Vehicle

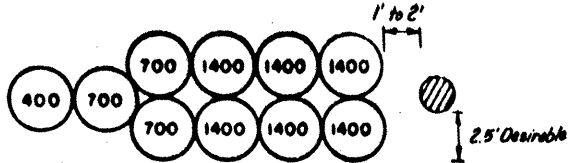
Impact Velocity	Row No.	Row Wt. (lbs)	G Long. **	Velocity After Impact MPH
60 *	1	200	7.0	54.5
54.5	2	400	10.1	45.5
45.5	3	700	10.4	33.7
33.7	4	1400	8.3	19.8
19.8	5	2800	3.6	8.3 ***
8.3	6	2800	0.6	3.4

* Design Speed
** In Design G's Should Be Less Than 12
*** Final Velocity Should Be A Minimum 10 MPH, A Desirable 5 MPH

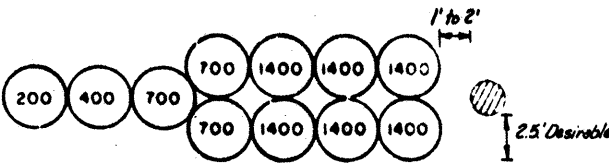
EXAMPLE PROBLEM
Example Problem: Determine Barrier Array For 60 MPH Design Speed For 4500 lbs Vehicle

Impact Velocity	Row No.	Row Wt. (lbs)	G Long. **	Velocity After Impact MPH
60.0 *	1	200	3.3	57.5
57.5	2	400	5.8	52.8
52.8	3	700	7.8	45.7
45.7	4	1400	9.7	34.8
34.8	5	2800	8.4	21.5
21.5	6	2800	3.2	13.2
13.2	7	2800	1.2	8.2
8.2	8	2800	0.5	5.0 ***

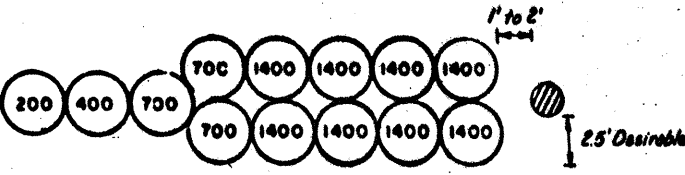
* Design Speed
** In Design G's Should Be Less Than 12
*** Final Velocity Should Be A Minimum 10 MPH, A Desirable 5 MPH



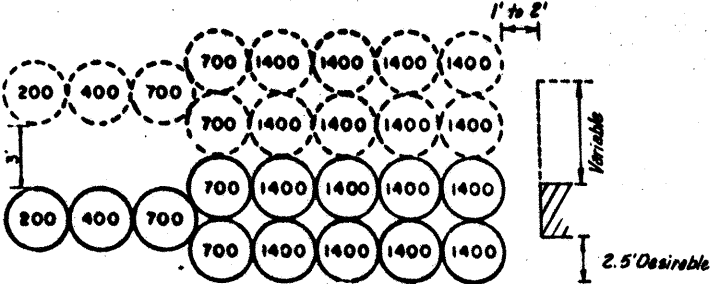
40 MPH DESIGN SPEED



50 MPH DESIGN SPEED



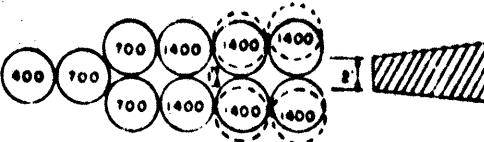
60 MPH DESIGN SPEED



BARRIER ARRAY FOR FIXED OBJECT OF VARIABLE WIDTH

GENERAL NOTES

1. If Space Allows, A 1' To 2' Interval Should Be Left Between Fixed Object And Rear Line Of Modules.
2. Rear Modules Should Overlap (In Width) The Fixed Object On Each Side By A Min. Of 10."
3. Modification Of Array: When Proximity Of Traffic Lanes Exclude The Use Of A Wider Barrier, The Front Of The Barrier May Remain In The Standard Width, But The Rear Can Be Widened By Spacing As Shown In This Diagram.



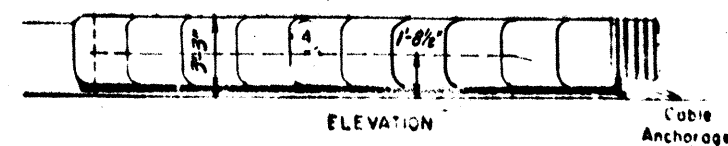
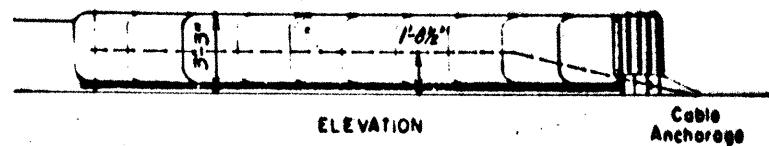
4. Barriers Can Be Placed At Any Distance From The Shoulder Both At Roadside And In Median Sites From 0'-30' Depending On The Location Of The Hazardous Fixed Object. Angling On Space Available.
5. Whenever Possible, Curbs 4" And Higher Should Be Removed From Hazardous Sites. However, When Removal Is Not Possible, Modules Can Be Separated Along The Barrier Axis To Fit The Situation.
6. Longitudinal Spacing Of Modules May Be Increased Where Space Permits. For Example 2' Or Even 3' Spacing Of Some Of The Modules May Permit The Design Engineer To Exploit All The Space Allocated For An Energy-Absorbing Barrier.
7. 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.
8. Where Required, Support Poles Will Be Measured And Paid For In Accordance With Pertinent Bid Items.

STATE DEPARTMENT OF HIGHWAYS
AND PUBLIC TRANSPORTATION

**DESIGN GUIDELINES AND
TYPICAL BARRIER ARRAYS**

VIA (SFPB) (DIST. 16)

DATE	REVISION	DATE	REVISION	DATE	REVISION	DATE	REVISION
10/1/66	1	10/1/66	1	10/1/66	1	10/1/66	1
10/1/66	1	10/1/66	1	10/1/66	1	10/1/66	1
10/1/66	1	10/1/66	1	10/1/66	1	10/1/66	1

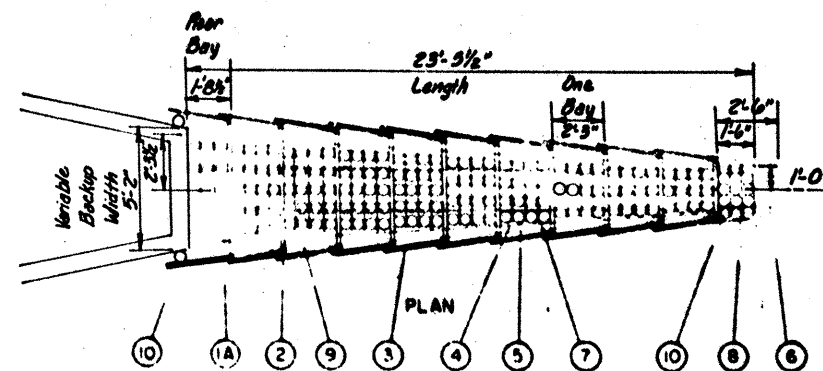


GENERAL NOTES

- Backup Width Should Be 3'-0", 5'-2", Or 7'-6" To Accommodate Standard Assemblies For Cell Sandwich Units. Backup Wall Height Is Usual 3'-3"
- For Cold Climates, Ethylene Glycol Anti-Freeze Is Recommended For Use In Water Filled Cells.
- Cell Sandwich V/A Assemblies Are Primarily Used To Provide A Crash Cushion On High Volume Freeway Bore. Sites Should Be Surfaced To Support A Minimum Five Pounds Per Square Inch. Curbing In The Site Area Should Be Removed.

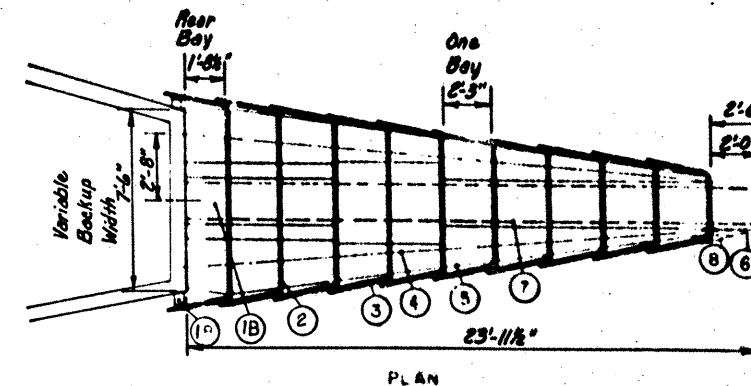
7757
12

NOTE Length varied as dictated by design speed and available space; see table for listing of lengths for standard installations.

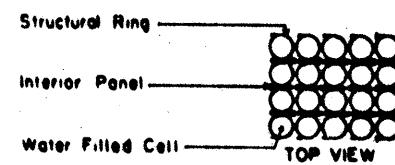


TYPICAL CELL SANDWICH INSTALLATION (Water Filled Cells)

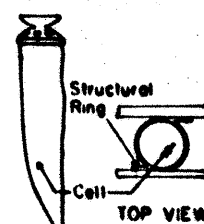
- KEY
- (1A) Water Filled Cells
 - (1B) Vermiculite Concrete Cartridges
 - (2) Diaphragms
 - (3) Fender Panels
 - (4) Restraining Cables
 - (5) Pull-Out Cables
 - (6) Secondary Cables
 - (7) Slide Straps
 - (8) Flexible Nose Cover
 - (9) Interior Panels
 - (10) Standard Vinyl Cells



TYPICAL CELL SANDWICH INSTALLATION (Vermiculite Concrete Cartridges)



TYPICAL BAY ASSEMBLY

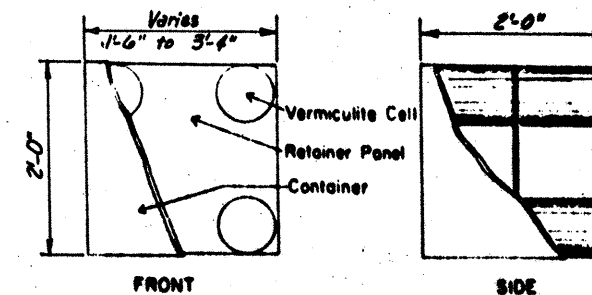


TYPICAL CELL

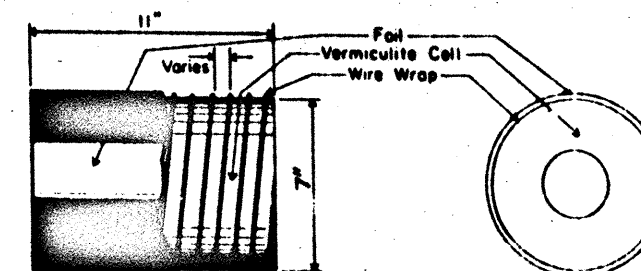
SYSTEM TYPE	LENGTH*	NO. OF BAYS	MAXIMUM DESIGN SPEED	AVERAGE "G" FORCES**
Vermiculite Concrete Cartridges	19'-5 1/2"	8	50 MPH	5.3
	21'-8 1/2"	9	50 MPH	4.8
	23'-11 1/2"	10	50 MPH	4.3
	26'-2 1/2"	11	60 MPH	5.6
Water Filled Cells	28'-5 1/2"	12	60 MPH	5.2
	18'-11 1/2"	8	50 MPH	5.9
	21'-2 1/2"	9	50 MPH	5.3
	23'-5 1/2"	10	50 MPH	4.7
	25'-8 1/2"	11	50 MPH	4.3
	27'-11 1/2"	12	60 MPH	5.7

* TOTAL LENGTH OF UNIT AS MEASURED FROM FRONT FACE OF BACKUP TO FORWARD EDGE OF FRONT CELLS.

** AVERAGED OVER ENTIRE V/A SYSTEM LENGTH; 50 MILLISECOND PEAK "G" FORCES EXCEED THESE VALUES.



TYPICAL VERMICULITE CONCRETE CARTRIDGE ASSEMBLY (For wide bays, multiple cartridge assemblies required.)



TYPICAL VERMICULITE CELL

STATE DEPARTMENT OF HIGHWAYS AND PUBLIC TRANSPORTATION

CELL SANDWICH ASSEMBLIES

WATER FILLED CELLS WFC (VIA)

VERMICULITE CONCRETE CARTRIDGES

VCC (VIA) (DIST. 16)

DATE	DESIGNED	DATE	REVISED	STATE	FEDERAL PROJECT NO.	PROJECT NO.
10/16	10/16	10/16	10/16	TEXAS	HES 0005(293)	110
COUNTY	COUNTY	COUNTY	COUNTY	COUNTY	COUNTY	COUNTY
16	Nueces	326	03	61	5A 286	