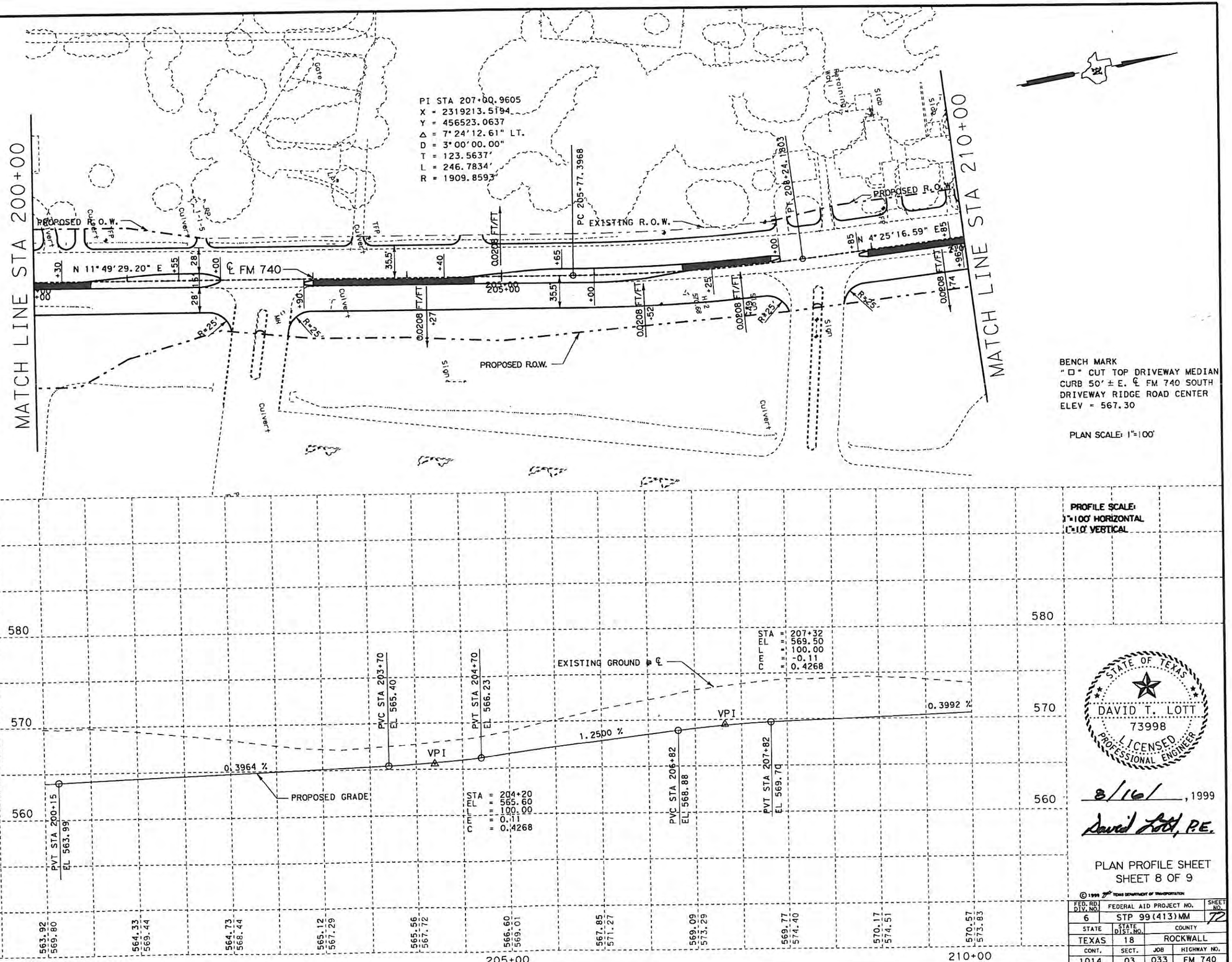
PI STA 207+00.9605
X = 2319213.5194
Y = 456523.0637
Δ = 7° 24' 12.61" LT.
D = 3° 00' 00.00"
T = 123.5637'
L = 246.7834'
R = 1909.8593'
PC 205+77.3968
PT 208+24.1803
MATCH LINE STA 200+00
MATCH LINE STA 210+00
PROPOSED R.O.W.
EXISTING R.O.W.
N 11° 49' 29.20" E
N 4° 25' 16.59" E
FM 740
0.0208 FT/FT
PROPOSED R.O.W.
BENCH MARK
"□" CUT TOP DRIVEWAY MEDIAN
CURB 50' ± E. ℄ FM 740 SOUTH
DRIVEWAY RIDGE ROAD CENTER
ELEV = 567.30
PLAN SCALE: 1"=100'
PROFILE SCALE:
1"=100' HORIZONTAL
1"=10' VERTICAL
PVT STA 200+15
EL 563.99
0.3964 %
PROPOSED GRADE
PVC STA 203+70
EL 565.40
PVT STA 204+70
EL 566.23
VPI
STA = 204+20
EL = 565.60
L = 100.00
G = 0.11
C = 0.4268
EXISTING GROUND ℄
1.2500 %
PVC STA 206+82
EL 568.88
VPI
STA 207+32
EL 569.50
L 100.00
G -0.11
C 0.4268
PVT STA 207+82
EL 569.70
0.3992 %
563.92 569.80
564.33 569.44
564.73 568.44
565.12 567.29
565.56 567.72
566.60 569.01
567.85 571.27
569.09 573.29
569.77 574.40
570.17 574.51
570.57 573.83
580
570
560
200+00
205+00
210+00
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8/16/ ,1999
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PLAN PROFILE SHEET
SHEET 8 OF 9
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FED. RD. DIV. NO. 6
FEDERAL AID PROJECT NO. STP 99(413)MM
SHEET NO. 12
STATE TEXAS
STATE DIST. NO. 18
COUNTY ROCKWALL
CONT. 1014
SECT. 03
JOB 033
HIGHWAY NO. FM 740

MATCH LINE STA 210+00

N 4°25'16.59" E

PROPOSED R.O.W.

PI STA 213+99.8760
X = 2319267.4248
Y = 457220.2423
Δ = 1°11'41.33" RT.
D = 1°00'00.00"
T = 59.7429'
L = 119.4814'
R = 5729.5780'

PC 213+40.1332

PT 214+59.6146

0.0208 FT/FT

SUMMIT RIDGE

215+00

℄ FM 740

END CONCRETE PAVEMENT
STA 218+00.00

SH 205

GLENN

EMMA JANE

BOURN

PROPOSED R.O.W.

4' 40:1 TAPER

220+00 N 5°36'57.92" E

24' LT
℄ STA 222+60

R=10'

END OF PROJECT
STA 222+60.00

222+12.7929

PI STA 222+12.7929
X = 2319346.9792
Y = 458029.2614

C8G

EXISTING C8G

R=35'

R=603.11'

R=617.11'

R=763.94'

BENCH MARK
"D" CUT TOP OF HDWL AT CENTER OF WALL, 2-18" RCP CULVERT UNDER FM 740, WEST END OF CULVERT 150'± SOUTH OF GLENN.
ELEV = 576.12

PLAN SCALE: 1"=100'

PROFILE SCALE:
1"=100' HORIZONTAL
1"=10' VERTICAL

STA = 219+60
EL = 576.49
L = 160'
E = 0.51'
C = 0.7969

35.5' LT ℄ STA 218+00

PVC STA 218+80
EL 577.09

PVT STA 220+40
EL 577.93

-0.75%

1.80%

PVI

STA = 212+33
EL = 571.50
L = 200.00'
E = 0.37'
C = 0.3747

PVC STA 211+33
EL 571.10

EXISTING GROUND ℄

PVT STA 213+33
EL 573.40

1.8989-%

0.3992%

VPI

STA = 215+00
EL = 576.57
L = 200.00'
E = -0.17'
C = 0.1675

VPI

2.2300 %

PROPOSED GRADE

PVC STA 214+00
EL 574.67

PCC STA 216+00
EL 577.80

STA 217+00
EL = 579.03
L = 200.00'
E = -0.46'
C = 0.4576

VPI

VPI

-0.6000 %

STA 217+34.79
HIGH POINT
EL 576.63

PVT STA 218+00
EL 578.43

STA 219+27.06
LOW POINT
EL 576.91

PVI

570.97 573.22
571.54 573.80
572.81 575.44
574.67 577.66
576.40 578.78
577.80 579.26
578.57 578.57
578.43 578.14
577.51
578.25

577.69
576.97
577.34
579.01
580.81

580
570
580
570
570

215+00
220+00

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PLAN PROFILE SHEET
SHEET 9 OF 9

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	STP 99(413)MM		73
STATE	STATE DIST. NO.	COUNTY	
TEXAS	18	ROCKWALL	
CONT.	SECT.	JOB	HIGHWAY NO.
1014	03	033	FM 740

PI STA 123+76.9951
X = 2316483.0510
Y = 448993.7725
Δ = 19°28'00.02" LT.
D = 6°00'00.00"
T = 163.8009'
L = 324.4444'
R = 954.9297'

PI STA 129+07.8376
X = 2316583.9843
Y = 449518.1468
Δ = 19°27'59.99" RT.
D = 5°00'00.00"
T = 196.5612'
L = 389.3333'
R = 1145.9156'

MATCH LINE STA 122+39

MATCH LINE STA 133+00

℄ FM 740

N 10° 53' 42.83" E

N 70° 53' 42.83" E

N 30° 21' 42.83" E

Pt 125+37.6386

Pt 127+11.2764

Pt 131+00.6098

125+00

130+00

BEGIN PROJECT
BEGIN CONCRETE PAVEMENT
STA 128+84
BEGIN 100:1 TRANSITION
OF OUTSIDE PAVEMENT EDGE

END 100:1 PAVEMENT
TRANSITION STA 130+34

PROPOSED RETAINING WALL #1

PROPOSED R.O.W.

Paved Parking

Guard Rail

R=25'

R=30'

0.0156 FT/FT +84

0.0208 FT/FT +00

0.0208 FT/FT 106

36'

5'

25'

35'

35.5'

NOTE:
MATCH EXISTING
CONCRETE PAVEMENT
STA 128+84

PLAN SCALE: 1"=100'

PROFILE SCALE:
1"=100' HORIZONTAL
1"=10' VERTICAL

560
550
540

EXISTING GROUND ℄

PROPOSED GRADE

VPI 2.2540 %

PVC STA 129+21
EL = 546.57

STA = 128+84.00
EL = 546.74

STA 131+53.55
HIGH POINT
EL = 549.19

543.04
546.33
548.05 548.81
549.06 549.08
549.09 549.50
548.16 549.17

122+39 123+00 125+00 130+00 133+00

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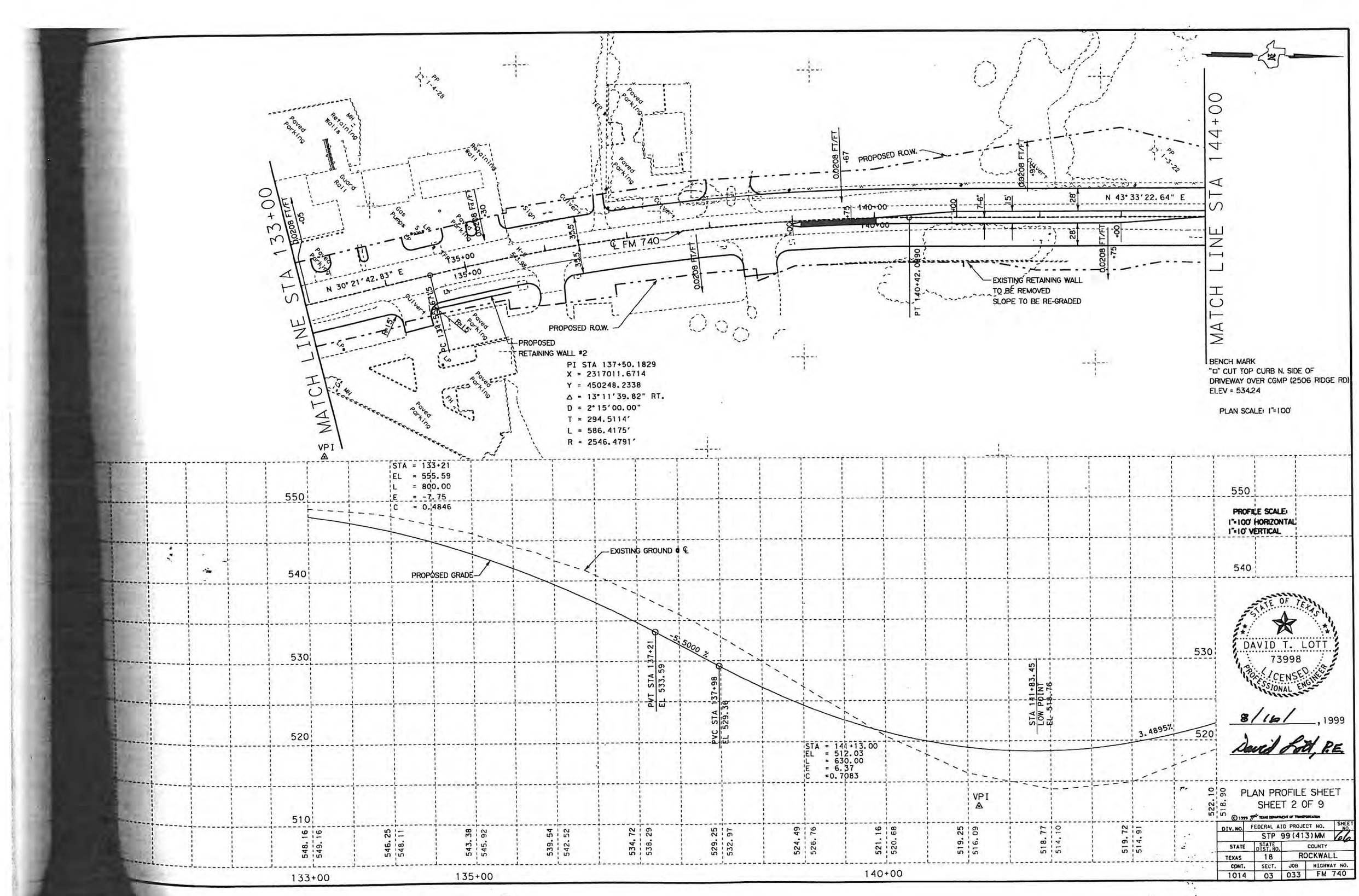
PLAN PROFILE SHEET
SHEET 1 OF 9

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	STP 99(413)MM		165
STATE	STATE DIST. NO.	COUNTY	
TEXAS	18	ROCKWALL	
CONT.	SECT.	JOB	HIGHWAY NO.
1014	03	033	FM 740



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PLAN PROFILE SHEET
SHEET 2 OF 9

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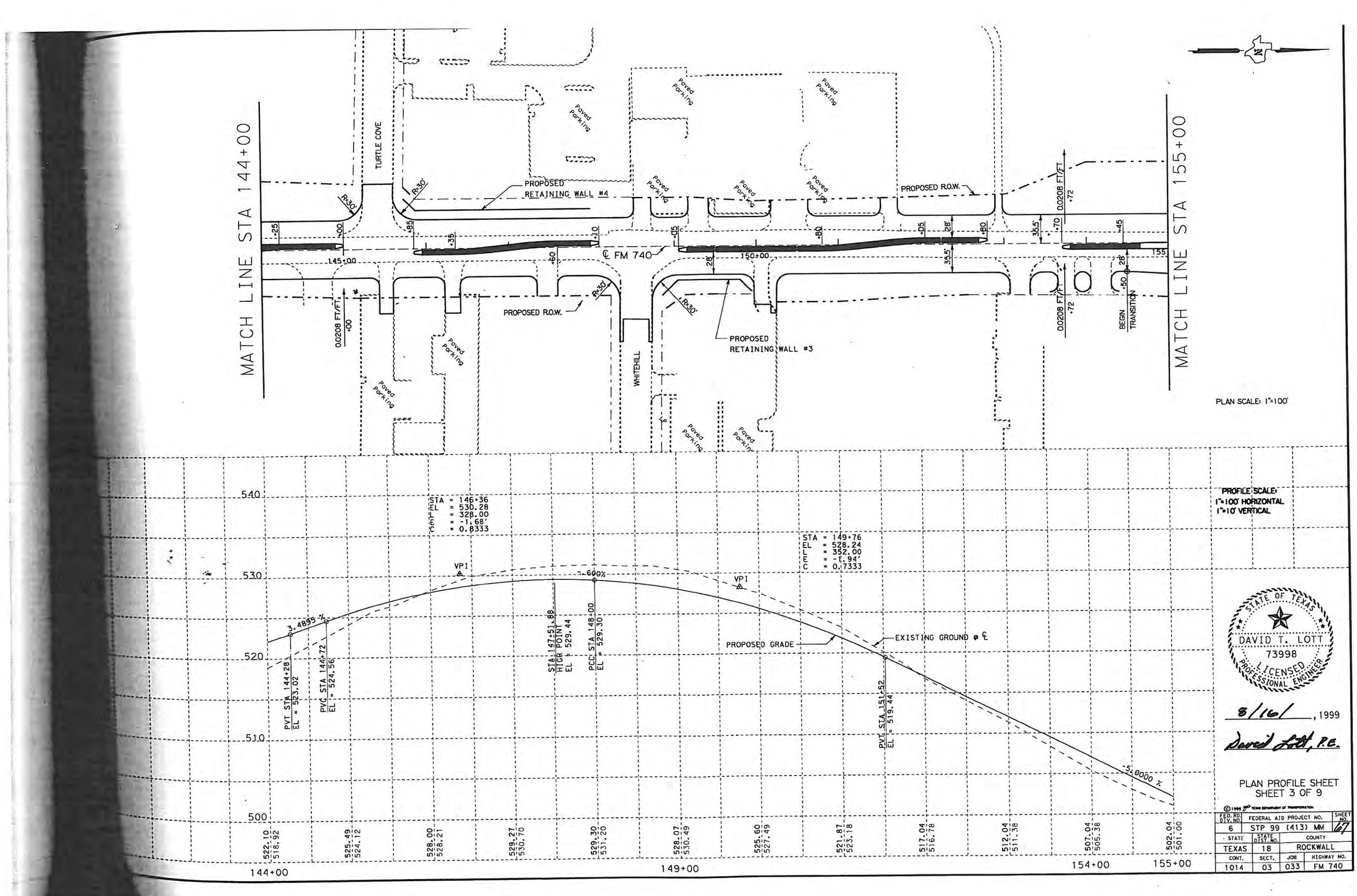
DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
	STP 99(413)MM		66
STATE	STATE DIST. NO.	COUNTY	
TEXAS	18	ROCKWALL	
CONT.	SECT.	JOB	HIGHWAY NO.
1014	03	033	FM 740



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PLAN PROFILE SHEET
SHEET 3 OF 9

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	STP 99 (413) MM		67
STATE	STATE DIST. NO.	COUNTY	
TEXAS	18	ROCKWALL	
CONT.	SECT.	JOB	HIGHWAY NO.
1014	03	033	FM 740

PI STA 160+57.3078
X = 2318603.2300
Y = 451922.0901
Δ = 58°29'08.21" LT.
D = 6°00'00.00"
T = 534.6288'
L = 974.7602'
R = 954.9297'

MATCH LINE STA 155+00

MATCH LINE STA 166+00

PC STA 155+22.6790

PC STA 155+74.1415

PROPOSED R.O.W.

℄ FM 740

VARIES

PROPOSED R.O.W.

YELLOW JACKET LANE

PI STA 160+75.2810
X = 2318642.6500
Y = 451912.0300
Δ = 58°29'08.21" LT.
D = 6°24'06.35"
T = 501.0765'
L = 913.5860'
R = 895.0'

PROFILE SCALE:
1"=100' HORIZONTAL
1"=10' VERTICAL

-5.0000%

PVC STA 157+20
EL = 491.04

PROPOSED GRADE

STA 160+87.23
LOW POINT
ELEV 481.86

4.5307 %

PVT STA 164+20
EL = 489.40

EXISTING GROUND @ ℄

PVC STA 164+25
EL = 489.62

STA = 165+75
EL = 496.42
L = 300.00
E = 1.70'
C = 0.7551

STA = 160+70
EL = 473.54
L = 700.00'
E = 8.34'
C = 0.6808

VPI

VPI

510
500
490
480
470

502.04 500.99
497.04 497.49
492.04 493.89
487.48 490.18
484.25 485.39
482.38 482.89
481.87 481.20
482.72 481.20
484.94 483.01
488.52 486.52
492.60 492.31
495.24 495.11

155+00
160+00
165+00

PLAN SCALE: 1"=100'

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PLAN PROFILE SHEET
SHEET 4 OF 9

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		SHEET NO.
	STP 99(413)MM		68
STATE	STATE DIST. NO.	COUNTY	
TEXAS	18	ROCKWALL	
CONT.	SECT.	JOB	HIGHWAY NO.
1014	03	033	FM 740

EXISTING R.O.W.

PROPOSED R.O.W.

EXISTING R.O.W.

PROPOSED R.O.W.

PROPOSED R.O.W.

LAKE SHORE DR.

R=25'

R=25'

0.028 FT/FT

+.85

28'

170+00

℄ FM 740

+.10

+.85

+.45

0.028 FT/FT

+.83

-.20

35.5'

28'

35.5'

+.45

+.10

0.028 FT/FT

+.08

176+20.3025

N 22°33'33.85" E

175+00

+.10

+.35

+.70

0.028 FT/FT

+.85

177+48.9029

PT

+.70

+.45

N 14°50'36.16" E

0.028 FT/FT

+.85

PROPOSED R.O.W.

MATCH LINE STA 179+00

PI STA 170+95.5453
X = 2318311.4065
Y = 453016.5888
Δ = 37°29'19.41" RT.
D = 6°00'00.00"
T = 324.0502'
L = 624.8121'
R = 954.9297'

PT 173+96.3072

PI STA 176+84.7001
X = 2318546.3648
Y = 453582.1691
Δ = 7°42'57.68" LT.
D = 6°00'00.00"
T = 64.3976'
L = 128.6004'
R = 954.9297'

BENCH MARK
"a" CUT NE CORNER RCP
HDWL UNDER RR, EAST SIDE
ELEV 494.75

PLAN SCALE: 1"=100'

0.0010 FT/FT

-.00

-.80

-.50

-.80

N 14°55'45.57" W

MKT RAILROAD

PC 167+71.4957

0.0010 FT/FT

-.00

MATCH LINE STA 166+00

PROFILE SCALE:
1"=100' HORIZONTAL
1"=10' VERTICAL

540

530

520

510

500

VPI
1.1127%

537.94
541.60

179+00

EXISTING GROUND

PROPOSED GRADE

STA = 178+20
EL = 537.17
L = 250.00'
E = -0.90'
C = 0.5775

PVC STA 176+95
EL = 532.17

PVT STA 173+00
EL = 516.37

0.0000%

PVC STA 171+00
506.87

PVT STA 170+85
EL = 506.05

5.5000%

VPI

STA = 172+00
EL = 512.37
L = 200.00'
E = -0.37'
C = 0.375'

STA = 169+10
EL = 496.42
L = 350.00'
E = 2.41'
C = 0.7857'

PVC STA 167+35
EL = 496.42

PVT STA 167+25
EL = 496.42

VPI

0.000%

495.24
495.11

496.37
496.40

496.75
497.29

498.56
500.43

501.94
505.43

506.87
511.47

512.00
515.97

516.37
520.66

520.37
524.54

524.37
528.02

528.37
532.39

532.37
537.42

535.73
540.10

166+00

170+00

175+00

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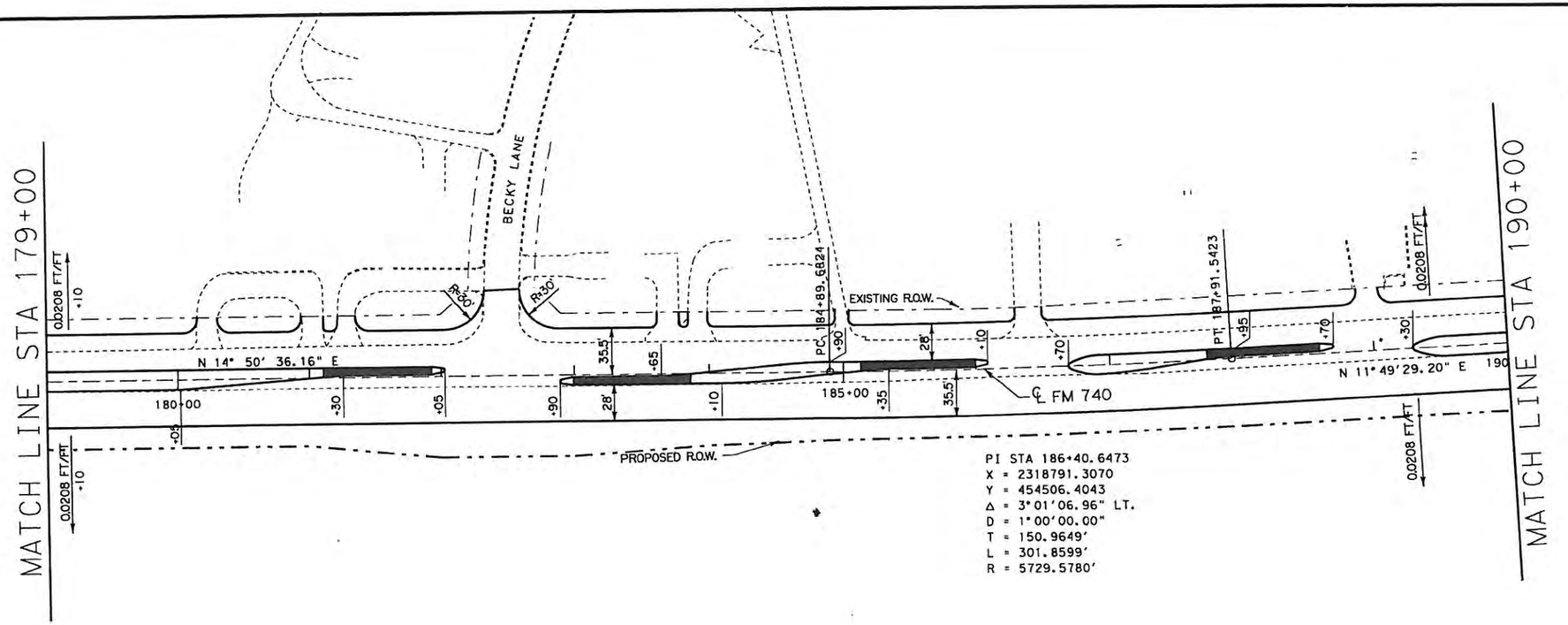
PLAN PROFILE SHEET
SHEET 5 OF 9

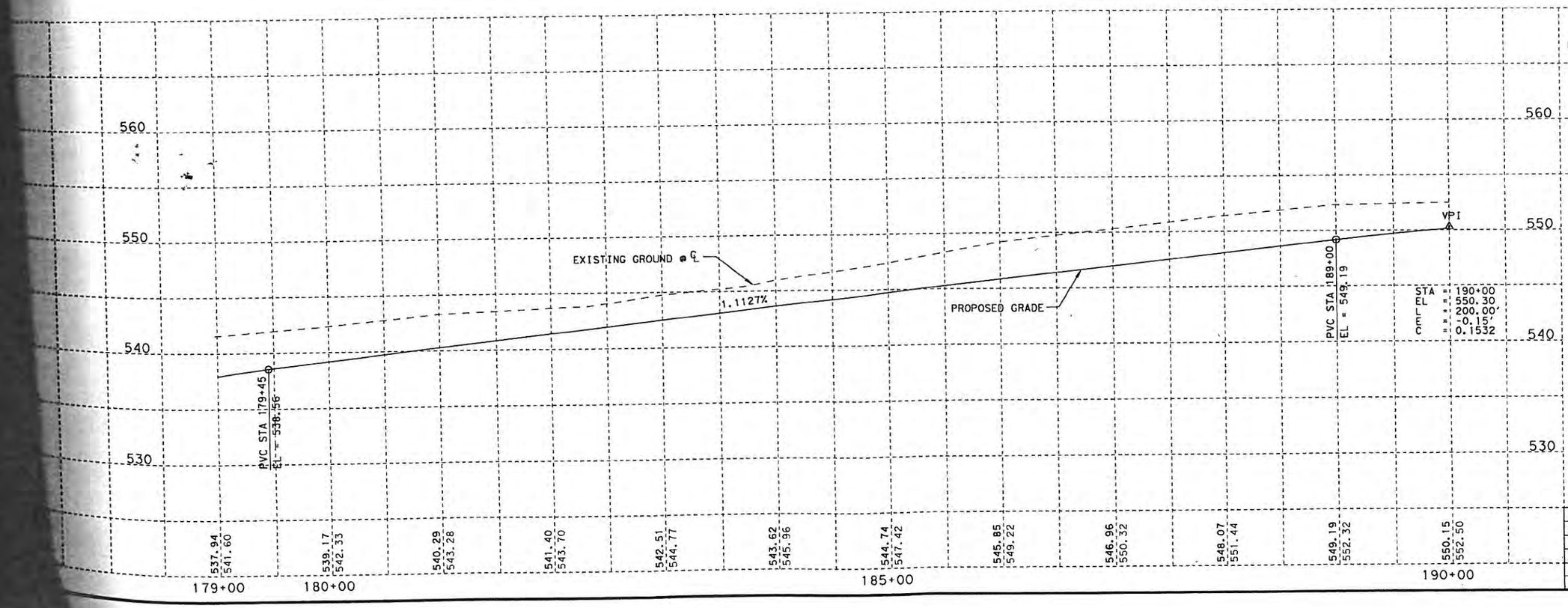
FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	STP 99(413)MM		64
STATE	STATE DIST. NO.	COUNTY	
TEXAS	18	ROCKWALL	
CONT.	SECT.	JOB	HIGHWAY NO.
1014	03	033	FM 740



PI STA 186+40.6473
X = 2318791.3070
Y = 454506.4043
Δ = 3°01'06.96" LT.
D = 1°00'00.00"
T = 150.9649'
L = 301.8599'
R = 5729.5780'

BENCH MARK
"□" CUT AT BEGIN T.C.,
SOUTH SIDE BECKY LANE,
WEST SIDE OF FM 740.
ELEV = 540.78

PLAN SCALE: 1"=100'



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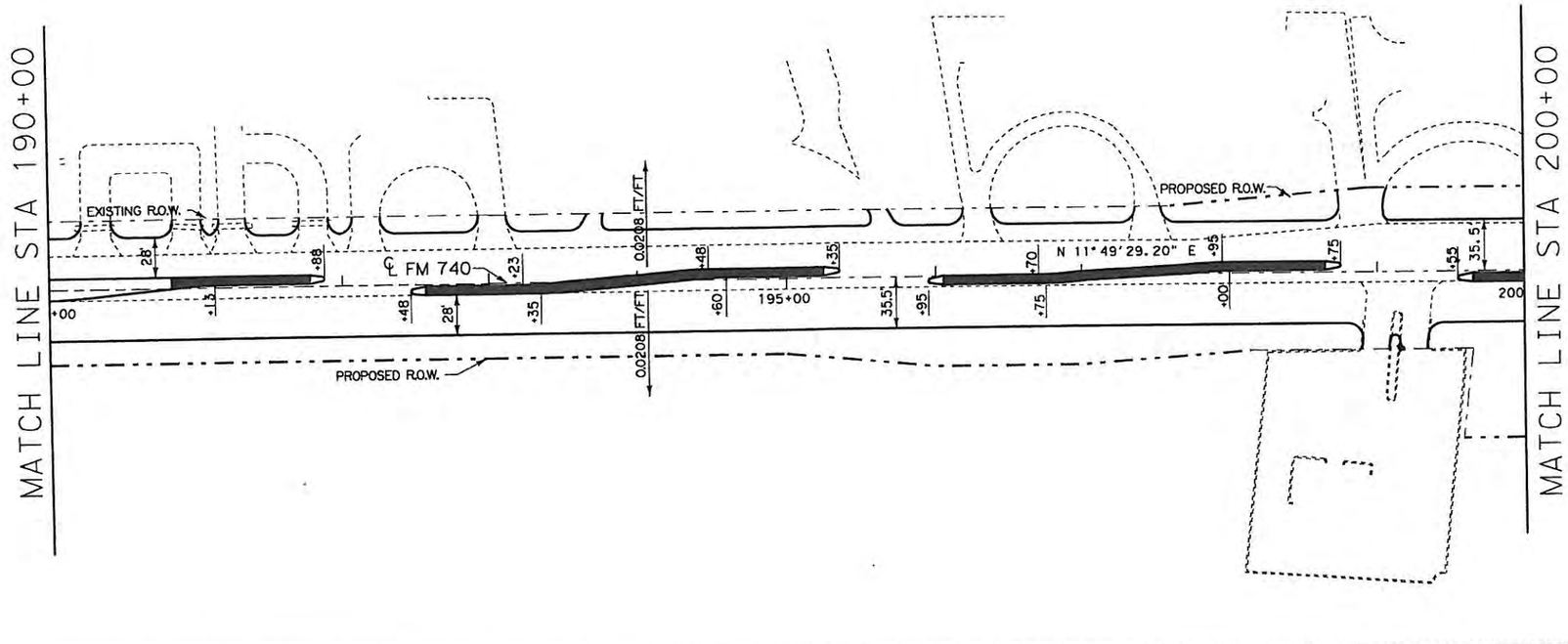
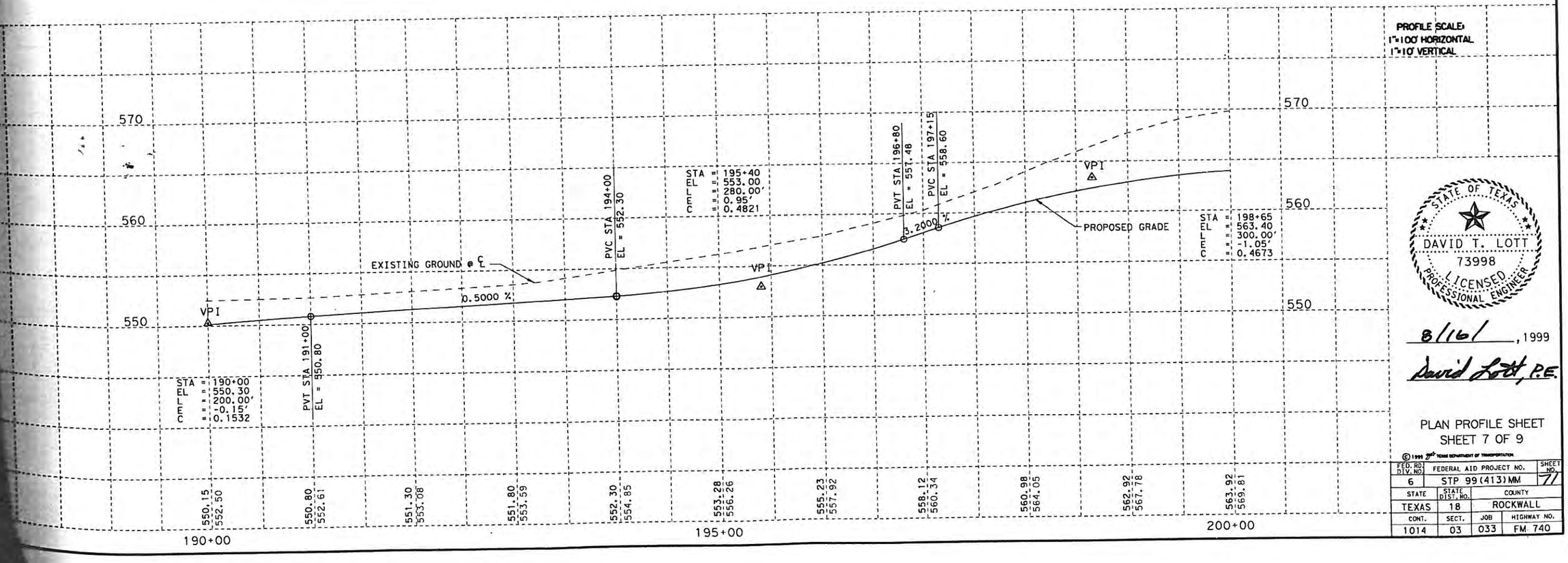
PLAN PROFILE SHEET
SHEET 6 OF 9

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	STP 99(413)MM		70
STATE	STATE DIST. NO.	COUNTY	
TEXAS	18	ROCKWALL	
CONT.	SECT.	JOB	HIGHWAY NO.
1014	03	033	FM 740



PLAN SCALE: 1"=100'



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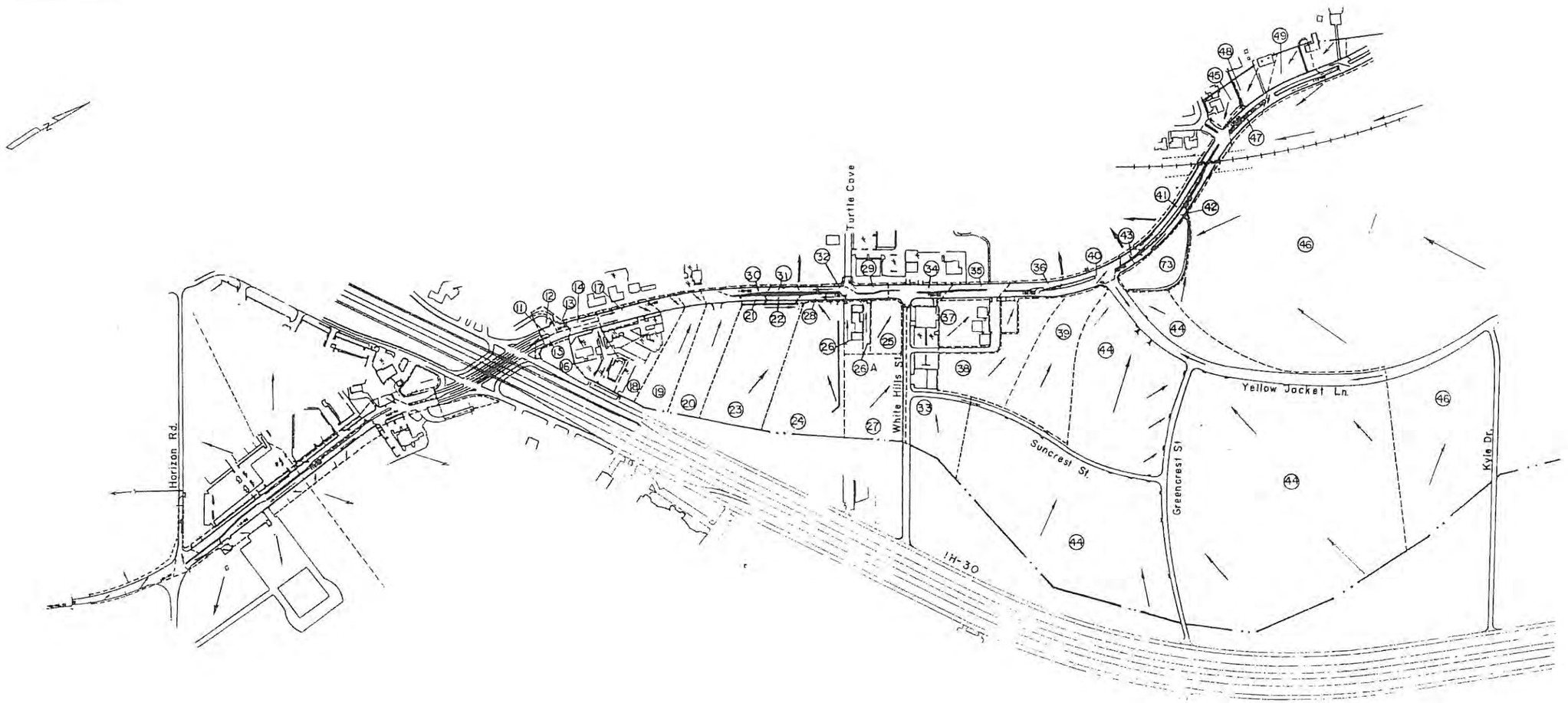
PLAN PROFILE SHEET
SHEET 7 OF 9

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	STP 99(413)MM		77
STATE	STATE DIST. NO.	COUNTY	
TEXAS	18	ROCKWALL	
CONT.	SECT.	JOB	HIGHWAY NO.
1014	03	033	FM 740



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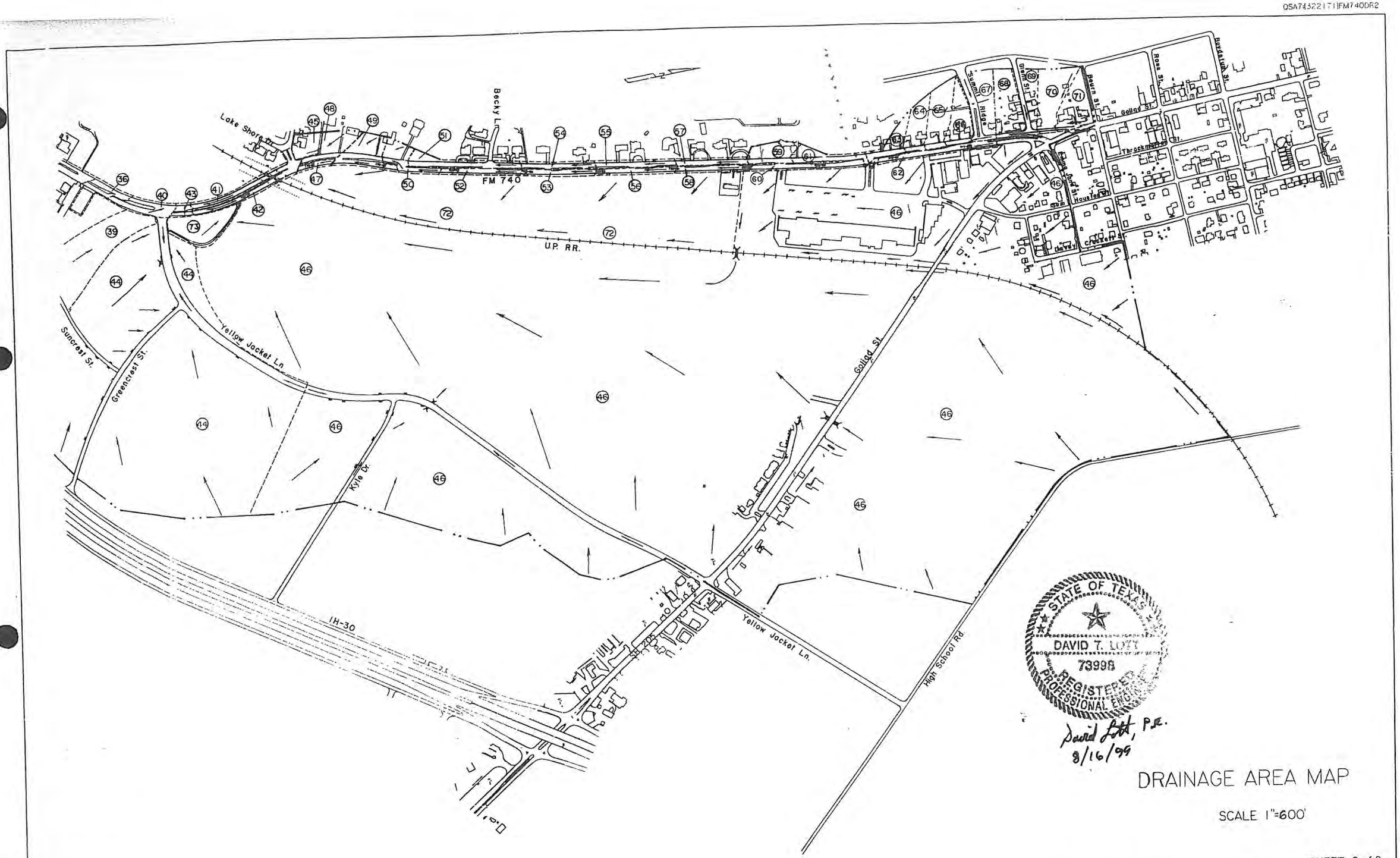
DRAINAGE AREA MAP

SCALE 1"=600'

SHEET 1 of 2

FED.RD. DIV. NO.	FEDERAL AID PROJ. NO.		SHEET NO.
6	STP99(413)MM		82
STATE	STATE DIST. NO.	COUNTY	
TEXAS	DAL	ROCKWALL	
CONT.	SECT.	JOB	HIGHWAY NO.
1014	03	033	FM 740

OSA7452211711FM740DR2



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DRAINAGE AREA MAP

SCALE 1"=600'

SHEET 2 of 2

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6			83
STATE	STATE DIST. NO.	COUNTY	
TEXAS	DAL	ROCKWALL	
CONT.	SECT.	JOB	HIGHWAY NO.
1014	03	033	FM 740

RUNOFF CALCULATIONS

ACRES-DRAINED						TOTAL CA	TIME OF CONCENTRATION (MIN)	FREQ. (YEARS)	I 5 (IN/HR)	Q 5 (CFS)	REMARKS
DRAINAGE AREA NO.	AC.	PAVT. C=0.9	R.O.W. (avg) C=0.5	COMM. INDUST C=0.7	RESID C=0.5						
11	0.19	0.19				0.17	200/(3.0X60)=1.11	5	6.93	1.19	DRAINS INTO EAX CI-15 ON IH30 PROJECT
12	0.17		0.17			0.09	80/(1.6X60)=0.83	5	6.93	0.59	DRAINS INTO EX DI 25 ON IH30 PROJECT
13	0.3	0.24	0.06			0.25		5	6.93	1.70	DRAINS INTO OUTFALL W. OF FM740
14	0.19	0.17	0.02			0.16	200/(2.2X60)=1.52	5	6.93	1.13	
15	0.26	0.26				0.23	200/(3.0X60)=1.11	5	6.93	1.62	DRAINS INTO EX CI 18 ON IH30 PROJECT
16	1.53	1.22	0.31			1.25	450/(2.4X60)=3.13	5	6.93	8.68	
17	0.73	0.66	0.07			0.63	350/(3.5X60)=1.67	5	6.93	4.36	
18	2.5	0.5	0.5	1.5		1.75	600/(2.3X60)=4.35	5	6.93	12.13	
19	2.22	0.22	0.22	1.78		1.55	660/(2.1X60)=5.24	5	6.93	10.77	
20	2.7	0.27	0.27	2.16		1.89	730/(1.5X60)=8.11	5	6.93	13.10	
21	0.13	0.13				0.12	120/(3.0X60)=0.67	5	6.93	0.81	
22	0.22	0.22				0.20	100/(1.3X60)=1.28	5	6.93	1.37	
23	5.04			5.04		3.53	820/(2.8X60)=4.88	5	6.93	24.45	
24	5.34			5.34		3.74	750/(2.8X60)=4.46	5	6.93	25.90	
25	1			1		0.70	320/(3.7X60)=1.44	5	6.93	4.85	
26	0.7	0.49		0.21		0.59	200/(5.0X60)=0.67	5	6.93	4.07	
26A	0.3	0.3				0.27	280/(5.0X60)=0.93	5	6.93	1.87	
27	3.59	3.59		2.51		2.73	750/(2.0X60)=6.25	5	6.93	18.91	
28	0.29	0.29				0.26	220/(2.0X60)=1.83	5	6.93	1.81	
29	0.32	0.32				0.29	300/(3.4X60)=1.47	5	6.93	2.00	DRAINS TO EX CI ON TURTLE COVE
30	0.3	0.3				0.27	200/(2.0X60)=1.67	5	6.93	1.87	
31	0.22	0.22				0.20	90/(1.5X60)=1.00	5	6.93	1.37	
32	0.54	0.54				0.49	350/(3.4X60)=1.72	5	6.93	3.37	
33	4.72	1.33		3.09		3.36	900/(3.5X60)=4.29	5	6.93	23.28	
34	0.76	0.61		0.15		0.65	330/(3.5X60)=1.57	5	6.93	4.53	
35	1.28	1.15		0.13		1.13	640/(4.5X60)=2.37	5	6.93	7.80	
36	0.9	0.81		0.09		0.79	420/(4.5X60)=1.56	5	6.93	5.49	
37	1.54	1.23		0.31		1.32	380/(3.9X60)=1.62	5	6.93	9.18	
38	3.57	0.36		3.21		2.57	800/(5.0X60)=2.67	5	6.93	17.82	
39	4.4			4.4		3.08	830/(1.7X60)=8.14	5	6.93	21.34	
40	0.92	0.83	0.09			0.79	500/(3.7X60)=2.25	5	6.93	5.49	
41	0.81	0.73	0.08			0.70	600/(3.5X60)=2.86	5	6.93	4.83	
42	0.56	0.5	0.06			0.48	600/(3.5X60)=2.86	5	6.93	3.33	
43	0.3	0.3				0.27	140/(3.0X60)=0.78	5	6.93	1.87	
44	65.7			65.7		45.99	2100/(2.0X60)=17.5	5	6.93	318.71	Q IS IN EX 66" RCP
45	0.76				0.76	0.38	250/(1.7X60)=2.45	5	6.93	2.63	
46											
47	0.28	0.25	0.03			0.24	280/(4.1X60)=1.14	5	6.93	1.66	
48	1.06	0.21			0.85	0.61	470/(2.3X60)=3.41	5	6.93	4.26	
49	1.4	0.7			0.7	0.98	420/(2.3X60)=3.04	5	6.93	6.79	
50	0.96	0.48			0.48	0.67	440/(3.2X60)=2.29	5	6.93	4.66	
51	1.09	0.76			0.33	0.85	760/(2.6X60)=4.87	5	6.93	5.88	
52	0.64	0.58	0.06			0.55	540/(2.1X60)=4.29	5	6.93	3.83	
53	0.61	0.55	0.06			0.53	530/(2.0X60)=4.42	5	6.93	3.64	
54	0.61	0.55	0.06			0.53	530/(2.0X60)=4.42	5	6.93	3.64	
55	0.67	0.6	0.07			0.58	550/(1.5X60)=6.11	5	6.93	3.98	
56	0.67	0.6	0.07			0.58	550/(1.5X60)=6.11	5	6.93	3.98	
57	0.51	0.46	0.05			0.44	500/(2.8X60)=2.98	5	6.93	3.04	
58	0.51	0.46	0.05			0.44	500/(2.8X60)=2.98	5	6.93	3.04	
59	0.96	0.27			0.69	0.59	250/(1.4X60)=2.98	5	6.93	4.07	
60	0.7	0.7				0.63	790/(1.8X60)=7.31	5	6.93	4.37	
61	0.85	0.51			0.34	0.63	500/(1.95X60)=4.27	5	6.93	4.36	
62	0.72	0.72				0.65	745/(2.1X60)=5.91	5	6.93	4.49	
63	0.83	0.33			0.5	0.55	480/(1.0X60)=8.0	5	6.93	3.79	
64	1.02	0.15			0.87	0.57	420/(0.9X60)=7.61	5	6.93	3.95	
65	1.55	0.16			1.39	0.84	500/(1.1X60)=7.58	5	6.93	5.81	
66	1.2	0.18			1.02	0.67	450/(1.0X60)=7.50	5	6.93	4.66	
67	2	0.8			1.2	1.32	500/(1.35X60)=6.17	5	6.93	9.15	
68	1.75				1.75	0.88	420/(1.0X60)=7.00	5	6.93	6.06	
69	1.4	0.49			0.91	0.90	400/(2.0X60)=3.33	5	6.93	6.21	
70	1.95	0.2			1.75	1.06	500/(1.2X60)=6.94	5	6.93	7.31	
71	1.55	0.16			1.39	0.84	450/(1.2X60)=6.25	5	6.93	5.81	
72	28.1				28.1	14.05	3300/(1.0X60)=55.0	5	6.93	37.37	
73	1.86		1.86			0.93	350/(1.2X60)=4.86	5	6.93	6.44	

9.8

5.39
64 5.59
65 8.23
66 6.57

STATE OF TEXAS
DAVID T. LOTT
73998
LICENSED
PROFESSIONAL ENGINEER

8/16/, 1999

David Lott, P.E.

HYDRAULIC CALCULATIONS

SHEET 1 OF 5

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.	SHEET NO.
6	STP 99(413)MM	84
STATE	STATE DIST.NO.	COUNTY
TEXAS	18	ROCKWALL
CONT.	SECT.	JOB / HIGHWAY NO.
1014	03	033 / FM 740

INLET CALCULATIONS

ID	INLET LOCATION	DA NO	Q cfs	CO cfs	Qa cfs	Z	Z/N	S ft/ft	y ft	P ft	a ft	qL cfs	Lr curb ft	"E" Slot	Lr Slot ft	La ft	La/Lr	a/y	Curg QI/Qa Curg	QI/Qa Slot	QI cfs	QI-Qa cfs	Carry-over to:	Remarks
CI-7	LT STA 130+40	14	1.13		1.13	48	3200	0.11	0.15	7.05	0.25	0.3	3.77			5								
EXIST	CI-18 IH 30 PROJECT	15	1.62																					
CI-6	RT STA 130+00	16	8.68		8.68	48	3200	0.015	0.3	14.3	0.25	0.45	19.29			15	0.78	0.83	0.87		7.55	1.13		EXIST CI-18 IH30 PROJ.
CI-8	RT STA 135+50	17	4.36		4.36	48	3200	0.043	0.19	9.06	0.25	0.36	12.11			15								
CI-9	RT STA 137+00	18	12.13		12.13	48	3200	0.053	0.27	12.79	0.25	0.42	28.88			15	0.52	0.93	0.65		7.88	4.25	CI-10	
CI-10 & 10A	RT STA 137+89	19	10.77	4.25	15.02	48	3200	0.054	0.29	13.81	0.25	0.045	33.38			25	0.075	0.86	0.85		12.77	2.25	CI-11	
CI-11 & 11A	RT STA 14000	20	13.1	2.25	15.35	48	3200	0.0265	0.33	15.91	0.25	0.49	31.33			25	0.08	0.76	0.89		13.66	1.69	CI-12	
CI-12	RT STA 141+30	21	0.81	1.69	2.5	48	3200	0.0075	0.21	10.21	0.25	0.38	6.58			10								
CI-15	LT STA 141+50	30	1.87		1.87	77	5133	0.005	0.17	13.27	0.25	0.34	5.5			5	0.91	1.47	0.94		1.76	0.11	CI-16	
DI-4	RT STA 146+32	26A	1.87		1.87																			2-GR Q=2.84 h=0.1 TY C
DI-3	RT STA 145+45	26	4.07		4.07																			3-GR Q=4.26 h=0.1 TY C
DI-2	RT STA 142+30	24	25.9		25.9																			3-GR Q=30.9 h=1.0 TY C
DI-1	RT STA 142+10	23	24.45		24.45																			3-GR Q=30.9 h=1.0 TY C
CI-14	RT STA 142+45	28	1.81		1.81	48	3200	0.009	0.18	8064	0.25	0.35	5.17			5	0.97	1.39	0.98		1.77	0.04	CI-13	
CI-13	RT STA 141+85	22	1.37	0.04	1.41	L=0.324(1.41)/(0.5)1.5 =						1.29	2.58			15								SAG
CI-17	LT STA 142+50	32	3.37		3.37	48	3200	0.0095	0.23	11.04	0.25	0.4	8.43			5	0.59	1.09	0.71		2.39	0.98	CI-16	
CI-16	LT STA 142+00	31	1.37	1.09	2.46	L=0.324(2.46)/(0.5)1.5 =						2.25	4.51			15								SAG
CI-18 & 18A	RT STA 184+36	27	18.91		18.91	48	3200	0.072	0.297	14.26	0.25	0.045	42.02			30	0.69	0.84	0.81		15.32	3.59	CI-20	
CI-19 & 19A	RT STA 148+24	33	23.28		23.28	48	3200	0.072	0.321	15.42	0.25	0.47	49.5			30	0.61	0.78	0.74		17.23	6.05	CI-20	
CI-20 & 20A	LT STA 151+00	34	4.53	9.64	14.17	48	3200	0.044	0.292	14.04	0.25	0.45	31.49			20	0.64	0.85	0.77		10.91	3.26	CI-21	
CI -21 & 21A	LT STA 154+00	35	7.8	3.26	11.06	46.1	3073	0.05	0.264	12.18	0.25	0.42	26.33			20	0.76	0.95	0.85		9.4	1.66	CI-22	
CI-22	LT STA 156+90	36	5.49	1.66	7.15	35.7	2380	0.05	0.0246	8.82	0.25	0.4	17.88			15	0.84	1.01	0.91		6.51	0.64	CI-24	
DI-5	RT STA 152+90	37	9.18		9.18																			1-GR Q=9.0 h=0.5 TY C
DI-6	RT STA 156+90	38	17.82		17.82																			2-GR Q=21.9 h=1.0 TY C
DI-7	RT STA 158+35	39	21.34		21.34																			2-GR Q=21.9 h=1.0 TY C
CI-24	LT STA 160+37	40	5.49	0.64	6.13	35.7	2380	0.007	0.336	12.02	0.25	0.419	12.561			10	0.8	0.741	0.89		5.46	0.67	CI-25	
CI-25	LT STA 160+87	43	1.87	0.81	2.68	35.7	2380									15								LOW POINT SAG
CI-38	RT STA 195+00	58	3.04		3.04	48	3200	0.01	0.022	10.14	0.25	0.38	8			10								
CI-37	LT STA 195+00	57	3.04		3.04	48	3200	0.01	0.22	10.14	1.25	0.38	8			10								
CI-36	RT STA 189+70	56	3.98		3.98	48	3200	0.01	0.24	11.51	0.25	0.4	9.95			10								
CI-35	LT STA 189+70	55	3.98		3.98	48	3200	0.01	0.24	11.51	0.25	0.4	9.95			10								
CI-34	RT STA 184+50	53	3.64		3.64	48	3200	0.01	0.23	11.14	0.25	0.4	9.1			10								
CI-33	LT STA 184+50	54	3.64		3.64	48	3200	0.01	0.23	11.14	0.25	0.4	9.1			10								
CI-32	RT STA 179+10	52	3.83		3.83	48	3200	0.02	0.21	9.97	0.25	0.38	10.08			10	0.99	1.19	0.99		3.79	0.04	CI-30	
CI-31	LT STA 176+85	51	5.88		5.88	36	2400	0.04	0.24	8.59	0.25	0.4	14.7			15								
CI-30	LT STA 175+00	50	4.66	0.04	4.7	48	3200	0.04	0.2	9.42	0.25	0.37	12.7			10	0.79	1.25	0.87		4.09	0.61	CI-29	
CI-29	RT STA 172+00	49	6.79	0.61	7.4	36	2400	0.05	0.25	8098	0.25	0.41	18.05			15	0.83	1	0.9		6.66	0.74	CI-27	
DI-10	LT STA 169+35	45	2.63		2.63																			1-GR Q=0.90 h=0.5 TY C
CI-28	LT STA 169+65	48	4.26		4.26	41	2700	0.04	0.2	8.25	0.25	0.37	11.51			15								
CI-27	RT STA 169+00	47	1.66	0.74	2.4	73	4900	0.03	0.14	10.07	0.25	0.31	7.74			10								
DI-9	RT STA 168+00	72	37.37		37.37																			3-GR Q=37.6 h=1.5 TY C
CI-23	RT STA 161+20	42	3.33		3.33	36	2400	0.01	0.25	9	0.25	0.41	8.12			10								
CI-26	LT STA 161+47	41	4.83		4.83	36	2400	0.01	0.29	10.44	0.25	0.45	10.73			10	0.93	0.86	0.97		4.69	0.14	CI-25	
DI-12	LT STA 221+00	71	5.81		5.81																			1-GR Q=9.0 h=0.5 TY C
CI-49	LT STA 220+00	70	7.31		7031	48	3200	0.012	0.29	13.92	0.25	0.45	16.24			15	0.92	0.83	0.96		7.02	0.29	CI-48	
CI-48	LT STA 219-27	69	6.21	0.29	6.5	L=0.324(6.50)/(0.5)1.5=						5.96	11.91			15								SAG
DI-11	LT STA 218+00	68	6.06		6.06																			1-GR Q=9.0 h=0.5 TY C
CI-47	LT STA 215+20	67	9.15		9.15	48	3200	0.015	0.29	13.82	0.25	0.45	20.33			15	0.74	0.86	0.84		7.69	1.45	CI-46	
CI-46	LT STA 213+60	66	4.66	1.46	6.12	48	3200	0.02	0.25	11.88	0.25	0.41	14.93			15								
CI-45	LT STA 212+25	65	5.81		5.81	48	3200	0.01	0.28	13.27	0.25	0.45	12.91			15								
CI-44	LT STA 210+80	64	3.95		3.95	48	3200	0.004	0.28	13.63	0.25	0.45	8.78			10								
CI-43	LT STA 207+70	63	3.79		3.79	48	3200	0.004	0.28	13.42	0.25	0.45	8.42			10								
CI-42	RT STA 209+70	62	4.49		4.49	50	3333	0.004	0.29	14.67	0.25	0.45	9.98			10								
CI-41	LT STA 203+00	61	4.36		4.36	48	3200	0.004	0.29	14.15	0.25	0.45	9.69			10								
CI-40	RT STA 200+19	60	4.37		4.37	48	3200	0.004	0.3	14.16	0.25	0.45	9.71			10								
CI-39	LT STA 199+90	59	4.07		4.07	48	3200	0.006	0.26	12.77	0.25	0.41	9.93											
DI-8	RT STA 163+00	73	6.44		6.44																			1-GR Q=9.0 h=0.5 TY C

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8/16/, 1999

David Lott, P.E.

HYDRAULIC CALCULATIONS

SHEET 2 OF 5

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	STP 99(413)MM		85
STATE	STATE DIST.NO.	COUNTY	
TEXAS	18	ROCKWALL	
CONT.	SECT.	JOB	HIGHWAY NO.
1014	03	033	FM 740

STORM SEWER CALCULATIONS SHEET 1 OF 2

FROM	TO	DA NO.	TOTAL DA (AC)	TOTAL CA	LENGTH (FT)	TIME OF CONCENTRATION ALONG SEWER LINE	TIME OF CONCENTRATION INLET TIME	TIME OF CONCENTRATION USED IN DESIGN	I (IN/HR)	Q (CFS)	DESIGN DIA. PIPE	DESIGN SLOPE (%) PIPE		DESIGN CAP. (CFS)		DESIGN VEL. (FT/S)
LINE	"C"															
CI-7	CI-6	14	0.19	0.16	83		1.52	10	6.93	1.13	18	0.639		8.8		3.70
CI-6	MH-1C	14,16	1.72	1.41	67	1.52+83/3.7X60=1.89	3.13	10	6.93	9.81	18	1.500		13.5		8.30
LINE	"D"															
CI-8	CI-9	17	0.73	0.63	145		1.67	10	6.93	4.37	18	5.276		25.5		11.00
CI-9	CI-10	17,18	3.23	2.38	84	1.67+145/11X60=1.89	4.35	10	6.93	16.49	18	5.798		27		16.00
CI-10	CI-10A	17,18,19/2	4.24	3.14	6	4.35+84/16X60=4.37	5.24	10	6.93	21.76	30	10.000		140		21.00
CI-10A	JCT-1D	17,18,19	5.45	3.93	198	5.24+6/21X60=5.24	5.24	10	6.93	27.23	30	3.420		8		15.00
JCT-1D	JCT-2D	17,18,19	5.45	3.93	145	5.24+198/15X60=5.46	5.46	10	6.93	27.23	36	0.983		70		9.50
CI-11A	CI-11	20	2.7	1.89	6		8.11	10	6.93	13.1	18	4.667		24		14.00
CI-11	JCT-2D	20	2.7	1.89	6	8.11+6/14X60=8.13	8.13	10	6.93	13.1	18	6.167		27		16.20
JCT-2D	JCT-3D	17 - 20	8.15	5.82	30	8.13+6/16.2X60=8.13	8.11	10	6.93	40.33	36	0.983		70		11.50
CI-12	JCT-3D	21	0.13	0.12	6		0.67	10	6.93	0.84	18	6.333		28		4.80
JCT-3D	JCT-4D	17 - 21	8.28	5.94	45	8.13+30/11.5X60=8.17	8.11	10	6.93	41.16	36	0.983		70		10.50
CI-13	JCT-4D	22	0.220	0.200	6		1.28	10	6.93	1.39	18	3.667		21		7.00
JCT-4D	JCT-1F	17 - 22	8.50	6.14	29	8.17+45/10.5X60=8.19	8.11	10	6.93	42.55	36	0.983		70		11.00
LINE	"E"															
DI-4	JCT-1E	26A	0.3	0.27	101		0.933	10	6.93	1.87	18	2.955		19		7
DI-3	JCT-1E	26	0.7	0.59	16		0.667	10	6.93	4.09	18	13.625		40		15
JCT-1E	JCT -2E	26,26A	1	0.86	291	0.933+101/7X60=1.17		10	6.93	5.96	18	2.740		18		7
JCT-2E	JCT-3E	26,26A	1	0.86	5	1.17+291/97X60=1.86		10	6.93	5.96	24	1.595		31		4.5
CI-14	JCT-3E	28	0.29	0.26	6			10	6.93	1.8	18	2.167		16		6.5
JCT-3E	JCT-4F	26A,26,28	1.29	1.12	19	1.86+5/4.5X60=1.88		10	6.93	7.76	24	1.595		31		8.2
LAT 5F																
CI-15	CI-16	30	0.3	0.27	45			10	6.93	1.87	18	9.644		34		11
CI-16	JCT 5F	30-31	0.52	0.47	20			10	6.93	3.26	18	24.300		55		8.5
LAT 6F																
CI-17	JCT 6F	32	0.54	0.49	32			10	6.93	3.4	18	19.250		50		16
LINE	"F"															
DI-1	JCT 1F	23	5.04	3.53	4			10	6.93	24.26	24	3.640		46		15.5
DI-2	JCT 2F	24	5.34	3.74	4			10	6.93	25.92	24	3.640		46		17
JCT 2F	OUTFALL	17-24,26A,26,28,30-32	21.23	15.49	108			10	6.93	107.35	54	0.500	H.G.	150	d/D	10
LINE	"G"															
CI-18	CI-19	25,27	4.59	3.43	18		3.91	10	6.93	23.77	24	3.316		44		9.00
CI-19	CI-20	25,27,33	9.31	6.79	271	3.91+38/9X60=3.98	4.28	10	6.93	47.05	30	3.398		85		17.00
CI-20	JCT-1G	25,27,33,34	10.07	7.4	236.5	4.28+271/17X60=4.55		10	6.93	51.28	30	5.035		100		21.00
DI-5	JCT-1G	37	1.54	1.32	98			10	6.93	9.15	18	3.867		22		12.00
JCT-1G	CI-21	25,27,33,34,37	11.61	8.72	53.5	4.55+236.5/21X60=4.74		10	6.93	60.43	30	5.035		100		22.00
CI-21	CI-22	25,27,33-35,37	12.89	9.89	286	4.74+53.5/22X60=4.78		10	6.93	68.54	30	5.326		105		21.50
DI-6	CI-22	38	3.57	2.57	104		7.35	10	6.93	17.81	36	2.60		115		12.00
CI-22	CI-24	25,27,33-38	17.36	13.22	342	7.35+104/12X60=7.49		10	6.93	91.61	36	4.00		150		22.00
CI-24	CI-25	25,27,33-38,40	18.28	13.97	45	7.49+342/20X60=7.78		10	6.93	96.81	36	4.00		150		22.00
CI-25	JCT-3I	25,27,33-38,40,43	18.58	14.24	32	7.78+45/22X60=7.81		10	6.93	98.68	36	25.44		350		44.00
LINE	"I"															
DI-7	JCT-1I	39	4.4	3.08	303		8.33	10	6.93	21.34	24	3.178		44		14.00
CI-23	JCT-2I	42	0.56	0.48	28			10	6.93	3.33	18	23.390		120		17.00
CI-26	JCT 4I	41	0.81	0.7	30			10	6.93	4.85	18	29.500		65		21.00
EX. 66"	OUTFALL	25,27,33-44	90.05	64.49	102	8.33+303/14X60=8.69		10	6.93	624.05	72	1.50		550		23.00

STATE OF TEXAS
DAVID T. LOTT
73998
LICENSED
PROFESSIONAL ENGINEER

8/16/, 1999

David Lott, P.E.

HYDRAULIC CALCULATIONS

SHEET 3 OF 5

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.
6	STP 99(413)MM	86

STATE	STATE DIST. NO.	COUNTY
TEXAS	18	ROCKWALL

CONT.	SECT.	JOB	HIGHWAY NO.
1014	03	033	FM 740

STORM SEWER CALCULATIONS SHEET 2 OF 2

FROM	TO	DA NO.	TOTAL DA (AC)	TOTAL CA	LENGTH (FT)	TIME OF CONCENTRATION ALONG SEWER LINE	INLET TIME	USED IN DESIGN	I (IN/HR)	Q (CFS)	DESIGN DIA. PIPE	SLOPE (%) PIPE	CAP. (CFS)	VEL. (FT/S)
LINE	"J"													
CGI-38	JCT-1J	58	0.51	0.44	39.5		2.98	10	6.93	3.05	18	0.762	9.5	4.80
CI-37	JCT-1J	57	0.51	0.44	74		2.98	10	6.93	3.05	18	1.081	11.5	5.50
JCT-1J	MH-1J	57,58	1.02	0.88	262.5	2.98+74/5.5X60=3.20		10	6.93	6.1	18	0.762	9.5	6.00
MH-1J	JCT 1	57,58	1.02	0.88	234.5	3.20+262.5/6X60=3.93		10	6.93	6.1	18	0.733	9.5	6.00
JCT 1	JCT-2J	56-58	1.69	1.46	42	3.93+234.5/6X60=4.58		10	6.93	10.12	24	1.000	25	7.50
CI-35	JCT-2J	55	0.67	0.58	74			10	6.93	4.02	18	1.959	15.5	7.50
JCT-2J	MH-2J	55-58	2.36	2.04	220.5	4.58+42/7.5X60=4.67		10	6.93	14.14	24	1.000	25	8.00
MH-2J	JCT 2	55-58	2.36	2.04	254.5	4.67+220.5/8X60=5.13		10	6.93	14.14	24	1.014	25	8.00
JCT 2	JCT-3J	53,55-58	2.97	2.57	42	5.13+254.5/8X60=5.66		10	6.93	17.81	24	1.000	25	9.70
CI-33	JCT-3J	54	0.61	0.53	74			10	6.93	3.67	18	1.297	12	6.00
JCT-3J	MH-3J	53-58	3.58	3.1	200.5	5.66+42/9.7X60=5.73		10	6.93	21.48	24	1.000	25	8.30
MH-3J	JCT 3	53-58	3.58	3.1	294.5	5.73+200.5/8.3X60=6.13		10	6.93	21.48	24	1.059	26	9.00
JCT 3	MH-4J	52-58	4.22	3.65	253.5	6.13+294.5/9X60=6.68		10	6.93	25.29	24	4.129	50	16.50
CI-31	MH-4J	51	1.09	0.85	74			10	6.93	5.89	18	2.068	15.5	9.20
MH-4J	JCT-5J	51-58	5.31	4.5	183.5	6.68+253.5/16.5X60=6.94		10	6.93	31.19	24	4.062	50	17.00
CI-30	JCT-5J	50	0.96	0.67	74			10	6.93	4.64	18	2.554	17.5	8.50
JCT-5J	JCT 4	50-58	6.27	5.17	270	6.94+183.5/17X60=7.12		10	6.93	35.83	24	4.062	50	17.00
JCT 4	JCT-6J	49-58	7.67	6.15	248	7.12+270/17X60=7.38		10	6.93	42.62	30	2.735	95	12.50
DI-10	CI-28	45	0.76	0.38	50			10	6.93	2.63	18	1.320	13	6.00
CI-28	JCT-6J	45,48	1.82	1.23	43			10	6.93	8.52	18	1.907	16.5	10.00
JCT-6J	JCT 5	45,48-58	9.49	7.38	52	7.38+248/12.5X60=7.71		10	6.93	51.14	30	2.736	80	16.00
JCT 5	MH-5J	45,47-58	9.77	7.62	92.5	7.71+52/16X60=7.76		10	6.93	52.81	30	1.646	60	12.00
MH-5J	JCT-7J	45,47-58	9.77	7.62	8	7.76+92.5/12X60=7.89		10	6.93	52.81	42	4.547	95	10.50
DI-9	JCT-7J	72	28.1	14.05	17		47	47	2.95	41.45	30	1.941	65	13.00
JCT-7J	JCT-8J	45,47-58,72	37.87	21.67	448	7.89+8/10.5X60=7.90		10	6.93	150.17	42	4.547	240	24.00
LINE	"K"													
DI-8	JCT 1K	73	1.86	0.93	66			10	6.93	6.44	24	2.030	35	9.50
LINE	"L"													
CI-47	JCT-1L	67	2	1.32	233		6.17	10	6.93	9.15	18	1.575	14.0	8.50
CI-46	JCT-1L	66	1.2	0.67	73		7.5	10	6.93	6.64	18	1.192	12.0	7.00
JCT-1L	MH-1L	66-67	3.2	1.99	133.5	7.5+73/6X60=7.70		10	6.93	13.79	24	1.500	29	9.50
CI-45	MH 1L	65	1.55	0.84	73		7.58	10	6.93	5.82	18	1.027	11	6.70
MH 1L	JCT-3L	65-67	4.75	2.83	143.5	7.70+133.5/6.7X60=8.03		10	6.93	19.61	30	0.612	35	7.00
CI-44	JCT-3L	64	1.02	0.57	73		7.61	10	6.93	3.95	18	1.315	12.5	6.50
JCT-3L	JCT 4L	64-67	5.77	3.4	74	8.03+143.5/7X60=8.37		10	6.93	23.56	30	0.612	35	7.50
JCT 4L	MH-2L	62,64-67	6.49	4.05	210.5	8.37+74/7.5X60=8.54		10	6.93	28.07	36	0.732	60	9.50
CI-43	MH-2L	63	0.83	0.55	73		8.03	10	6.93	3.81	18	1.658	14	7.00
MH-2L	MH-3L	62-67	7.32	4.6	491	8.54+210.5/9.5X60=8.91		10	6.93	31.88	36	0.735	60	9.00
CI-41	MH-3L	61	0.85	0.63	73		4.27	10	6.93	4.37	18	1.000	11	6.00
MH-3L	CGI-40	61-67	8.17	5.23	245.5	8.91+491/9X60=9.82	9.97	10	6.93	36.24	36	0.741	63	9.00
CI-39	JCT 5L	59	0.96	0.59	73		2.98	10	6.93	4.09	18	1.137	11.5	6.00
CGI-40	HW-2	59-67	9.83	6.45	70			10	6.93	44.7	42	0.400	70	7.50
LINE	"M"													
DI-12	CI-49	71	1.55	0.84	97		6.25	10	6.93	5.82	18	1.371	13	7.20
CI-49	JCT-1M	70-71	3.5	1.9	89	6.25+97/7.2X60=6.47	6.94	10	6.93	13.17	24	0.904	24	7.80
CI-48	JCT-1M	69	1.4	0.9	18			10	6.93	6.24	18	2.566	18	9.50
JCT-1M	JCT 2M	69-71	4.9	2.8	109	6.94+8.9/7.8X60=7.13		10	6.93	19.4	24	0.904	24	8.50
DI-11	SET	68-71	6.65	3.68	110	7.13+109/8.5X60=7.34		10	6.93	25.5	30	0.500	32	7.00

STATE OF TEXAS
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8/16/, 1999

David Lott, P.E.

HYDRAULIC CALCULATIONS

SHEET 4 OF 5

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	STP 99(413)99		87
STATE	STATE DIST. NO.	COUNTY	
TEXAS	18	ROCKWALL	
CONT.	SECT.	JOB	HIGHWAY NO.
1014	03	033	FM 740

```
$ PROJECT: FM 740
$ CSJ NO.: 1014-03-033
$ STATION: 163+05
$
HYDRO      DA     355ACRES                              10YR
METHOD     USGS
USGS       REGION = 2          SLOPE =   80.5FT/MI
ENDATA
```

HYDRO

USGS PROCEDURE

REGION = 2

FREQUENCY = 10 YR.

DRAINAGE AREA = 355.00 ACRES

SLOPE = 80.5 FEET PER MILE

SECTION SPECIFICATIONS FOR SECTION "C" AT STATION 100.00
DOWNSTREAM

DRAINAGE AREA RATIO 1.000

COORDINATE INFORMATION

X	Y
.00	469.47
50.00	468.07
88.00	468.07
100.00	467.67
108.00	463.27
120.00	455.37
122.00	451.87
134.00	451.37
142.00	466.87
150.00	466.37
200.00	468.17

'N' VALUE INFORMATION

FROM X	TO X	'N' BELOW	ELEVATION	'N' ABOVE
.00	200.00	.060	469.47	.060

SECTION SPECIFICATIONS FOR SECTION "4" AT STATION 560.00
UPSTREAM

DRAINAGE AREA RATIO 1.000

COORDINATE INFORMATION

X	Y
.00	487.67
10.00	487.27
21.00	485.57
30.00	482.37
42.00	477.17
51.00	475.37
56.00	473.77
66.00	473.77
69.00	473.27
70.00	471.77
75.00	471.17
80.00	473.77
86.00	475.27
97.00	475.27
114.00	477.97
139.00	483.47
181.00	483.87
236.00	484.37

'N' VALUE INFORMATION

FROM X	TO X	'N' BELOW	ELEVATION	'N' ABOVE
.00	236.00	.040	487.67	.040

RESULTS OF TWO SECTION METHOD CALCULATIONS

SECTION STATION	DOWNSTREAM "C" 100.00	UPSTREAM "4" 560.00	AT SITE 175.00

DESIGN Q (CFS)	SLOPE (FT/FT)	VELOCITY (FT/SEC) DOWNSTREAM	UPSTREAM	WATER SURFACE ELEVATION AT SITE
680.	.04184	10.26	10.89	459.26
1311.	.03913	11.83	11.45	461.30

```
CULBRG                    ANALYSIS          BOX        CULVERT   SINGLE
CLVRT 710                 BROKEN BK                    CONCRETE            NORMAL KE=0.50
CLVRT 710                   314.08   EL 452.25 INLET STA     0.00  EL 471.84
CLVRT 710 OUTLT STA         140.35   EL 464.17 BREAK STA   168.63  EL 456.16
CLVRT 710 BREAK STA                            HIGH=   7 WIDE=  10   BARRELS=   1
CLVRT 710 DIMENSIONS

RD PROFILEX   15500 Y  502.04 X   15600 Y  497.04 X   15700 Y  492.04
RD PROFILEX   15800 Y  487.48 X   15900 Y  484.25 X   16000 Y  482.38
RD PROFILEX   16100 Y  481.87 X   16200 Y  482.72 X   16300 Y  484.94
RD PROFILEX   16400 Y  488.52 X   16500 Y  492.60 X   16600 Y  495.24
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*****************************
*                           *
*          THYSYS           *
*                           *
*   TEXAS HYDRAULICS SYSTEM *
*                           *
*****************************
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ANALYZE SINGLE OPENING BROKEN BACK CULVERT

CULVERT ID = 710 JOB NUMBER = FM 740

INLET STATION = 0 ELEVATION = 471.84

OUTLET STATION = 314 ELEVATION = 452.25

PROFILE	SHAPE	INLET TYPE	KE	MATERIAL	'N'
BROKN BK	BOX	NORMAL	.50	CONCRETE	.012

BROKEN BACK CULVERT CONFIGURATION

UNIT	SLOPE	LENGTH	UPSTREAM STA.	UPSTREAM ELEV.	DOWNSTREAM STA.	DOWNSTREAM ELEV.
1	.05465	140	0	471.84	140	464.17
2	.28324	28	140	464.17	168	456.16
3	.02688	145	168	456.16	314	452.25

CRITICAL SLOPE = .00000

FLOW = 679.9 CFS FREQUENCY = 10 YEAR

TAILWATER = 459.26

H U N D R E D Y E A R F L O O D A N A L Y S I S

CULVERT 710 1 - 0 X 0 X 314.08

BASIC FLOOD APPLIED (100 YEAR FREQ) = 1311.4 CFS

HUNDRED YEAR VELOCITY AT STRUCTURE OUTLET =33.48

HUNDRED YEAR TAILWATER ELEVATION = 461.30

ELEVATION OF WATER SURFACE OVER ROAD = 483.02

LOW ELEVATION OF ROAD PROFILE = 481.87

GREATEST DEPTH OF FLOW OVER ROAD = 1.15

PERCENTAGE OF BASIC FLOOD OVER ROAD = 36.35%

STATE OF TEXAS
DAVID T. LOTT
73998
REGISTERED PROFESSIONAL ENGINEER

David Lott, P.E.
8/16/99

HYDRAULIC CALCULATIONS

SHEET 5 OF 5

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	STP 99(413)99		88
STATE	STATE DIST. NO.	COUNTY	
TEXAS	18	ROCKWALL	
CONT.	SECT.	JOB	HIGHWAY NO.
1014	03	033	FM 740

MATCH LINE STA 122+39

℄ IH 30

℄ FM 740

125+00

EXISTING 36"

Guard Rail

CI-7

130+00

LINE "C"

18" X 67 LF

18" x 83 LF

MH 1C

CI-6

EXTEND EXISTING 36" RCP PIPE 4 LF TO MH 1C @ 40' RT ℄ STA 129+26

REMOVE 9 LF 18" RCP & 47 LF OF 18" CGMP

Paved Parking

MATCH LINE STA 133+00

PLAN SCALE: 1"=100'

PROFILE SCALE:
1"=100' HORIZONTAL
1"=10' VERTICAL

570
560
550
540
530

REMOVE 47 LF EXISTING 18" CGMP

REMOVE 9 LF EXISTING 18" RCP

RT ℄ 129+26

PROPOSED

EXISTING

67 LF 18" @ 1.500%

MH 1C TY. "I"
40' RT ℄ STA 129+26
TE 546.72
F/L (18") 541.62
F/L (36") 540.87

CI-6 TY "I" (15')
35.84' RT ℄ STA 130+00
TC 547.80 F/L 542.63

CI-7 TY "I" (5')
35.5 LT ℄ STA 130+40
TC 548.33 F/L 543.16

EXISTING

PROPOSED

83 LF 18" @ .639%

LINE "C"

CI-6 TY "I" (15')
35.84' RT ℄ STA 130+00
TC 547.80 F/L 542.63

STATE OF TEXAS
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8/16/, 1999

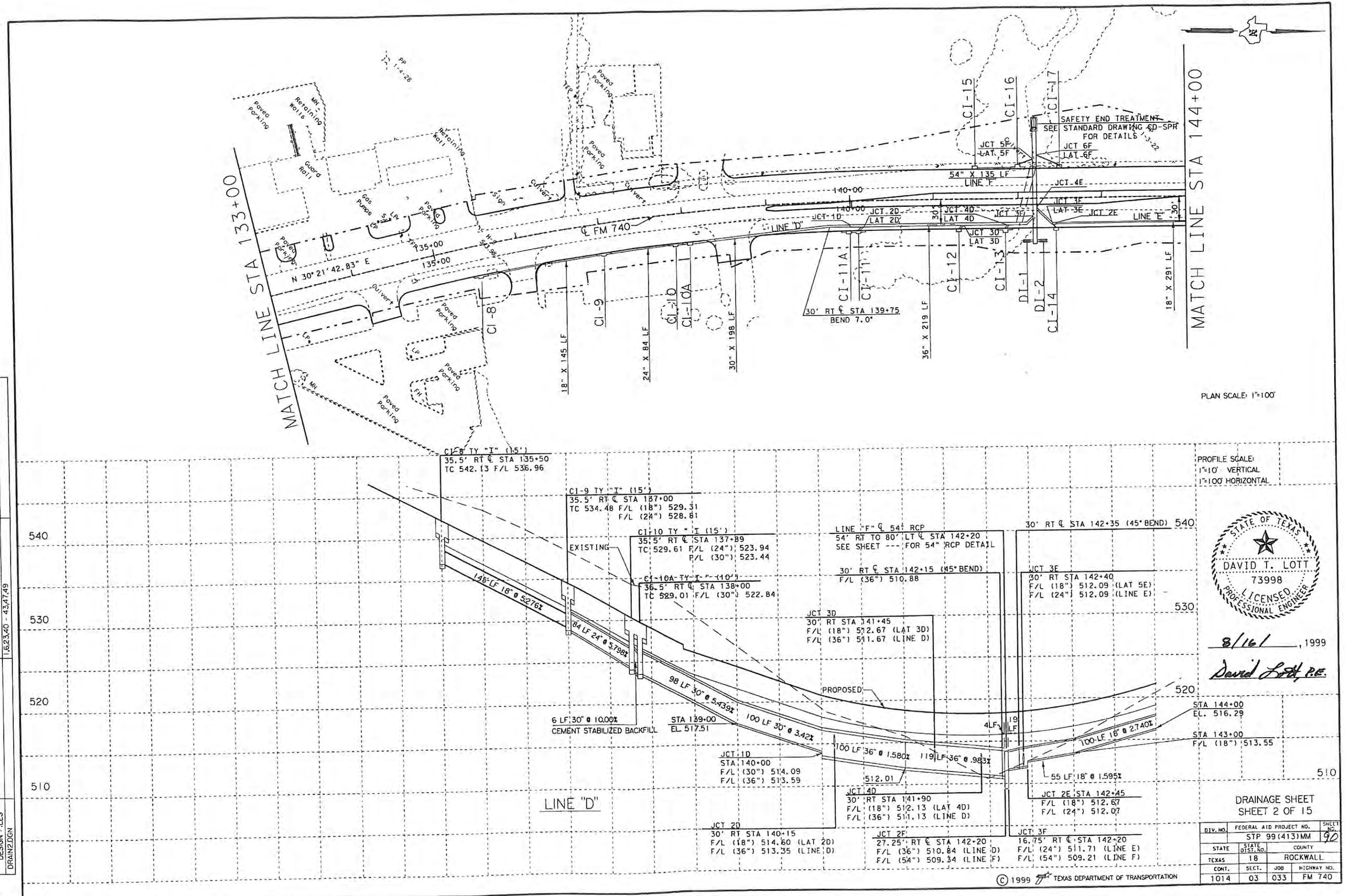
David Lott, P.E.

DRAINAGE SHEET
SHEET 1 OF 15

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	STP 99(413)MM		87
STATE	STATE DIST. NO.	COUNTY	
TEXAS	18	ROCKWALL	
CONT.	SECT.	JOB	HIGHWAY NO.
1014	03	033	FM 740

FM7401 - 2.DGN	1,6,19-20,23,34,47,49,51	
FM74C DGN	2,40	
911DC	20,63	
911DRAINGN	40	
DRAIN1.DGN	1,6,23,40 - 43,47,49	

$$$date$$$



PLAN SCALE: 1"=100'

PROFILE SCALE:
1"=10' VERTICAL
1"=100' HORIZONTAL

LINE "D"

STATE OF TEXAS
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8/16/ , 1999

David Lott, P.E.

DRAINAGE SHEET
SHEET 2 OF 15

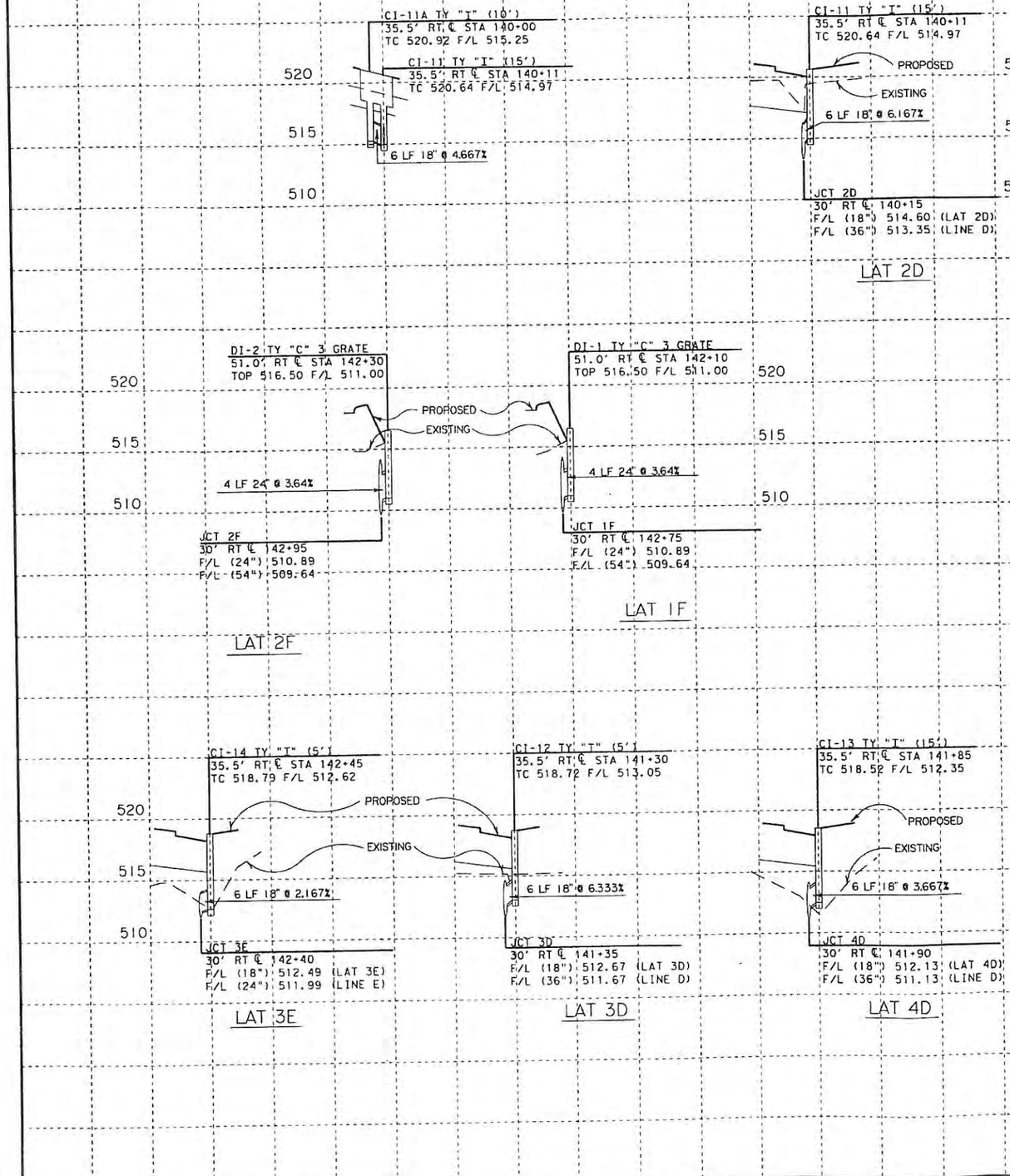
DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
	STP 99(413)MM		90
STATE	STATE DIST. NO.	COUNTY	
TEXAS	18	ROCKWALL	
CONT.	SECT.	JOB	HIGHWAY NO.
1014	03	033	FM 740

DESIGN: JLES
DRAIN2LDGN

1,6,20,22,23,34,40,47,49
1-30, 39-49
1,6,23,40 - 43,47,49

FM7402DN
FM740TC
N

$$$$date$$$$



STATE OF TEXAS
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8/16/, 1999

David Lott, P.E.

SCALE: 1"=100' HORIZONTAL
1"=10' VERTICAL

DRAINAGE SHEET
SHEET 3 OF 15

DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	STP 99(413)MM		9
STATE	STATE DIST. NO.	COUNTY	
TEXAS	18	ROCKWALL	
CONT.	SECT.	JOB	HIGHWAY NO.
1014	03	033	FM 740

$$$dale$$$$

R.O.W.

RIPRAP

81' LT ℄ STA 142+20

18" RCP

60°

LINE "F"

54" RCP

60°

18" RCP

℄ FM 740

N 43°33'22.64" E

STA 142+20

LINE "E"

24" RCP

45°

JCT 2F

54' RT ℄ STA 142+20

36" RCP

45°

JCT 1F

EXISTING 2-30" RCP (TO BE REMOVED)

LINE "D"

142+00

STATE OF TEXAS
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8/16/, 1999

David Lott, P.E.

98.00'
97.00'
81.00'
52.00'
46.00'
35.50'
30.00'
70.00'
54.00'
51.00'
35.50'
27.25'
16.75'
10.00'

530
520
510
500

R.O.W.

3:1

EXISTING GRADE

50 LF 54" @ 0.500%

40 LF 54" @ 22.000%

30 LF 54" @ 1.233%

54" RCP TO BE PLUGGED
6.75" MINIMUM

EL. 509.13

EL. 509.67

EL. 499.99

EL. 500.33

EXISTING 2-(30") x 68 LF RCP (TO BE REMOVED)

EXISTING HEADWALL (TO BE REMOVED)

EXISTING HEADWALL (TO BE REMOVED)

52' LT ℄ STA 142+20
F/L (18") 503.00 (FROM CI-17)
F/L (54") 500.22 (LINE F)

46' LT ℄ STA 142+20
F/L (18") 503.00 (FROM CI-16)
F/L (54") 500.25 (LINE F)

16.75' RT ℄ STA 142+20
F/L (24") 511.71 (LINE E)
F/L (54") 509.21 (LINE F)

27.25' RT ℄ STA 142+20
F/L (36") 510.84 (LINE D)
F/L (54") 509.34 (LINE F)

51.00' RT ℄ STA 142+20
F/L (24") 510.89
F/L (54") 509.64

NOTE:
SEE STANDARD DRAWING CD-SPR (3:1) FOR DETAILS.
THE SAFETY END TREATMENT WILL HAVE PIPE RUNNERS

℄ STA 142+20
PROPOSED 54" x 135 LF RCP (CL III)
WITH CD-SPR (3:1) DOWNSTREAM

DRAINAGE SHEET
SHEET 4 OF 15
SCALE: HORIZONTAL 1"=10'
VERTICAL 1"=10'

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	STP 99(413)MM		4
STATE	STATE DIST. NO.	COUNTY	
TEXAS	18	ROCKWALL	
CONT.	SECT.	JOB	HIGHWAY NO.
1014	03	033	FM 740

fm74054.dgn

:sdate$$$$

MATCH LINE STA 144+00

MATCH LINE STA 155+00

TURTLE COVE

Paved Parking

℄ FM 740

45° BEND

145+00

30'

18" x 291 LF

LINE "E"

18" x 101 LF

18" x 1'6 LF
LAT 1E
JCT 1E

DI-3

DI-4

CI-18

CI-18A

CI-19

CI-19A

CI-20A

CI-20

30" x 286.5 LF

30" x 47.5 LF

CI-21A

CI-21

30" x 285 LF

LINE "G"

JCT 1G
LAT 1G

37.6'

18" x 98 LF

150+00

CURB OPENINGS (2) SEE MISCELLANEOUS DETAILS

DI-5

NOTE: CURB OPENINGS AT APPROXIMATE STATIONS 149+50, 150+50, 152+25. CENTER OPENING WITH SAW JOINT

24" x 38 LF

WHITEHILL

PLAN SCALE: 1"=100'

CI-18 TY "I" (15)
84' RT ℄ STA 148+36
TC 535.81 F/L (18") 530.81
F/L (24") 530.31

CI-19 TY "I" (15)
83' RT ℄ STA 148+74
TC 535.72 F/L (18") 529.55
F/L (24") 529.05
F/L (30") 528.56

DI-4 TY "D" 2 GRATES
45' RT ℄ STA 146+32
TOP 530.60 F/L 18" 524.60

EXISTING

PROPOSED

STA 146+17
45° BEND

112 LF 18" @ 2.955%

125 LF 18" @ 4.0%

STA 145+25
EL 521.29

STA 144+00
EL 516.29

LINE "E"

JCT 1E
30' RT ℄ STA 145+36
F/L 18" 521.62

DI-3 TY "D" 3 GRATES
45' RT ℄ STA 145+45
TOP 528.80 F/L 523.80

16' LF 18" @ 13.625%

LAT 1E

38 LF 24" @ 3.316%

65.5' RT ℄ STA 148+74
45° BEND

58 LF 30" @ 9.414%

BREAK
35.5' RT ℄
STA 149+04
F/L 523.10

37.6' LT ℄ STA 149+77
45° BEND

213 LF 30" @ 3.366%

CI-20A TY "I" (10)
35.5 LT ℄ STA 150+89
TC 522.10 F/L 515.93

CI-20 TY "I" (10)
35.5 LT ℄ STA 151+00
TC 521.63 F/L 515.46

6 LF 30" @ 7.833%

284 LF 30" @ 5.035%

6 LF 30" @ 9.333%

285 LF 30" @ 5.326%

LINE "G"

JCT 1G
35.5' LT ℄ STA 153+39
F/L (18") 504.21 (LAT 2G)
F/L (30") 503.55 (LINE G)

CI-21A TY "I" (10)
35.5 LT ℄ STA 153+89
TC 507.33 F/L 501.16

CI-21 TY "I" (10)
35.5 LT ℄ STA 154+00
TC 506.77 F/L 500.60

PROFILE SCALE:
1"=100' HORIZONTAL
1"=10' VERTICAL

530 520 530 520 530 520 510 500

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8/16/, 1999

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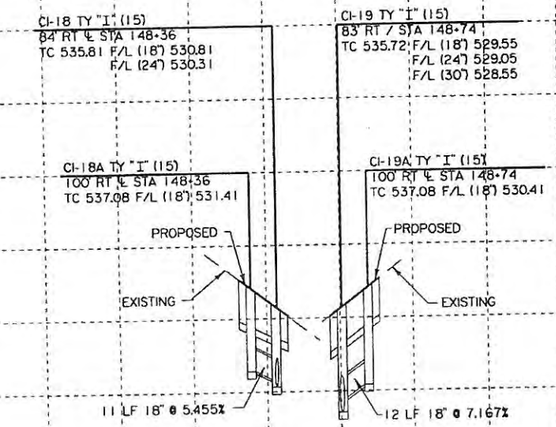
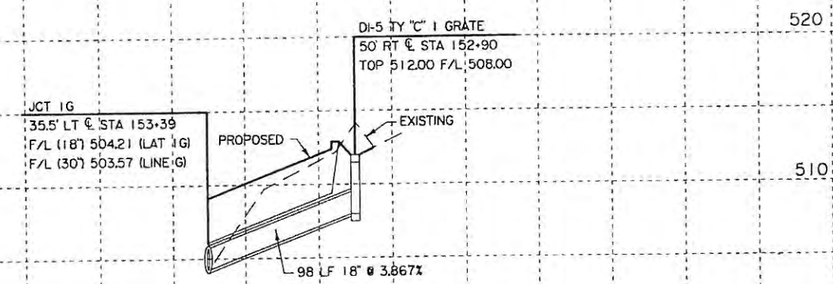
DRAINAGE SHEET
SHEET 5 OF 15

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	STP 99(413)MM		93
STATE	STATE DIST. NO.	COUNTY	
TEXAS	18	ROCKWALL	
CONT.	SECT.	JOB	HIGHWAY NO.
1014	03	033	FM 740

REFERENCE FILES
FM740_2DGN
FM74_2DGN
DESIGN FILES
DRAIN3.DGN
1,6,20,22,23,3,47,49
2,40
1,6,23,40 - 43,47,49

$$$date$$$





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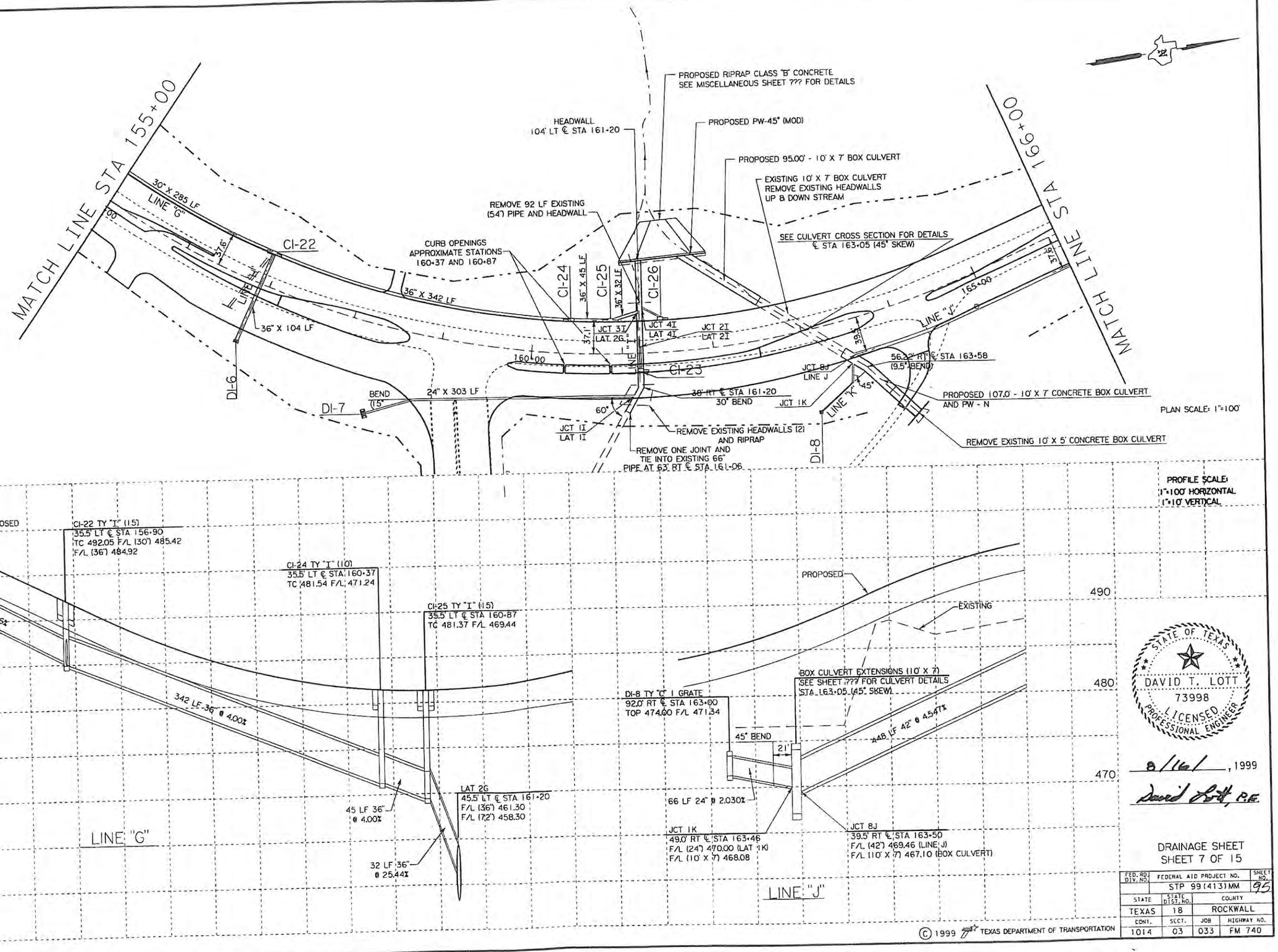
SCALE: 1"=100' HORIZONTAL
1"=10' VERTICAL

DRAINAGE SHEET
SHEET 6 OF 15

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	STP 99(413)MM		94
STATE	STATE DIST. NO.	COUNTY	
TEXAS	18	ROCKWALL	
CONT.	SECT.	JOB	HIGHWAY NO.
1014	03	033	FM 740



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DRAINAGE SHEET
SHEET 7 OF 15

FED. AID DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.
	STP 99(413)MM	95

STATE	STATE DIST. NO.	COUNTY	
TEXAS	18	ROCKWALL	
CONT.	SECT.	JOB	HIGHWAY NO.
1014	03	033	FM 740

FM740? 8, 3 .DGN
FM7- ?.DGN
DESIGN FILES
DRAIN4.DGN
1,6,20,23,34,40,41,49
2
1,6,23,40 - 43,47,49

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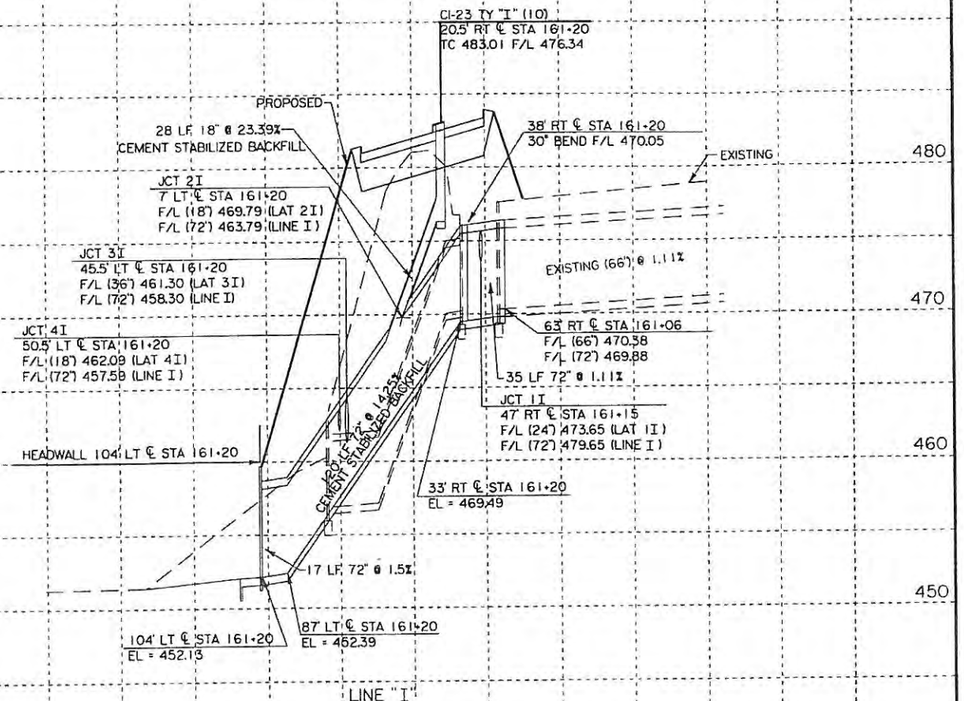

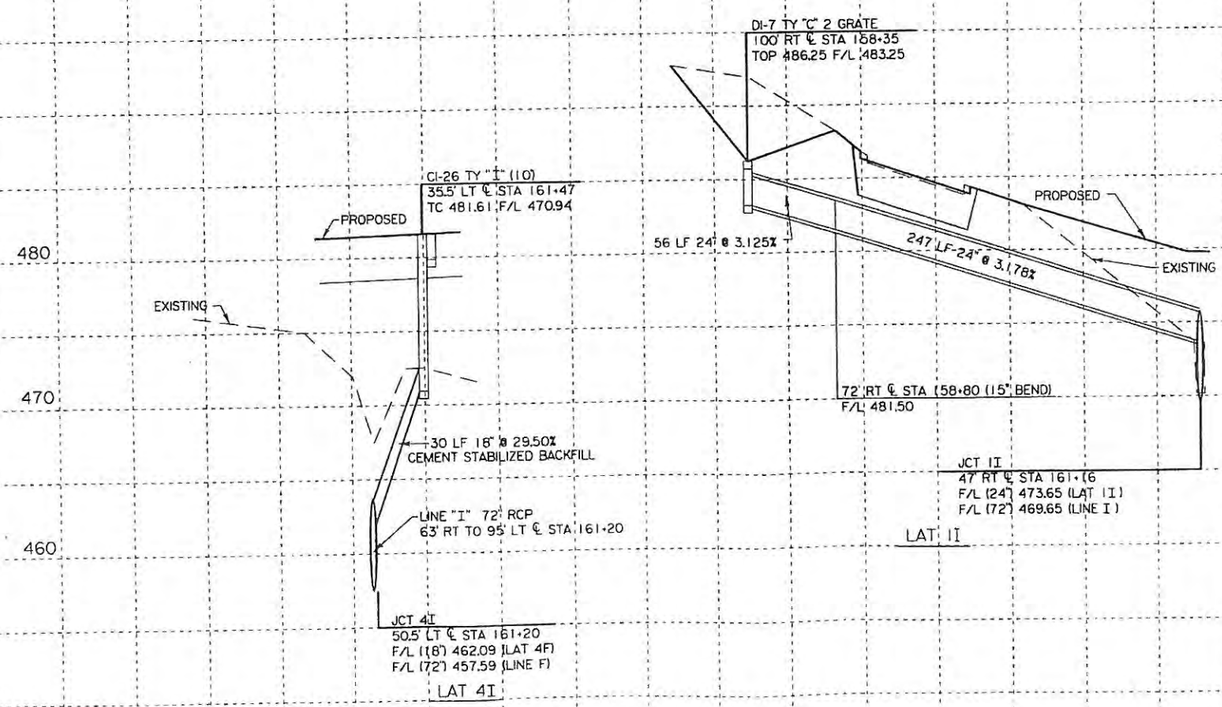

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DRAINAGE SHEET
SHEET 8 OF 15

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
	STP 99(413)MM		96
STATE	STATE DIST. NO.	COUNTY	
TEXAS	18	ROCKWALL	
CONT.	SECT.	JOB	HIGHWAY NO.
1014	03	033	FM 740

℄ FM 740

36" RCP

30" RCP

157+00

STA 156+90

LINE "H"

36" RCP

EXISTING 30" RCP (TO BE REMOVED)

69.00'

68.00'

53.00'

500

490

480

470

460

EXISTING GROUND

35.5'

5.50'

10.00'

4:1

3:1 MAX

CI-22 TY "I" (15)
35.5' LT ℄ STA 156+90
TC 492.05 F/L (30") 485.42
F/L (36") 484.92

3:1

EXISTING 30" x 69 LF (TO BE REMOVED)

104 LF 36" @ 2.60%

EL 484.92

EXISTING HEADWALL
(TO BE REMOVED)

DI-6 TY "C" 2 GRATE
69' RT ℄ STA 156+90
TOP 492.62 F/L 487.62

F/L (30") 485.42

EXISTING HEADWALL
(TO BE REMOVED)

LINE "H"

℄ FM 740

℄ STA 156+90
PROPOSED 36" x 104 LF RCP (CL III)
WITH DI-6 UPSTREAM

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DRAINAGE SHEET
SHEET 9 OF 15
SCALE: HORIZONTAL 1"=10'
VERTICAL 1"=10'

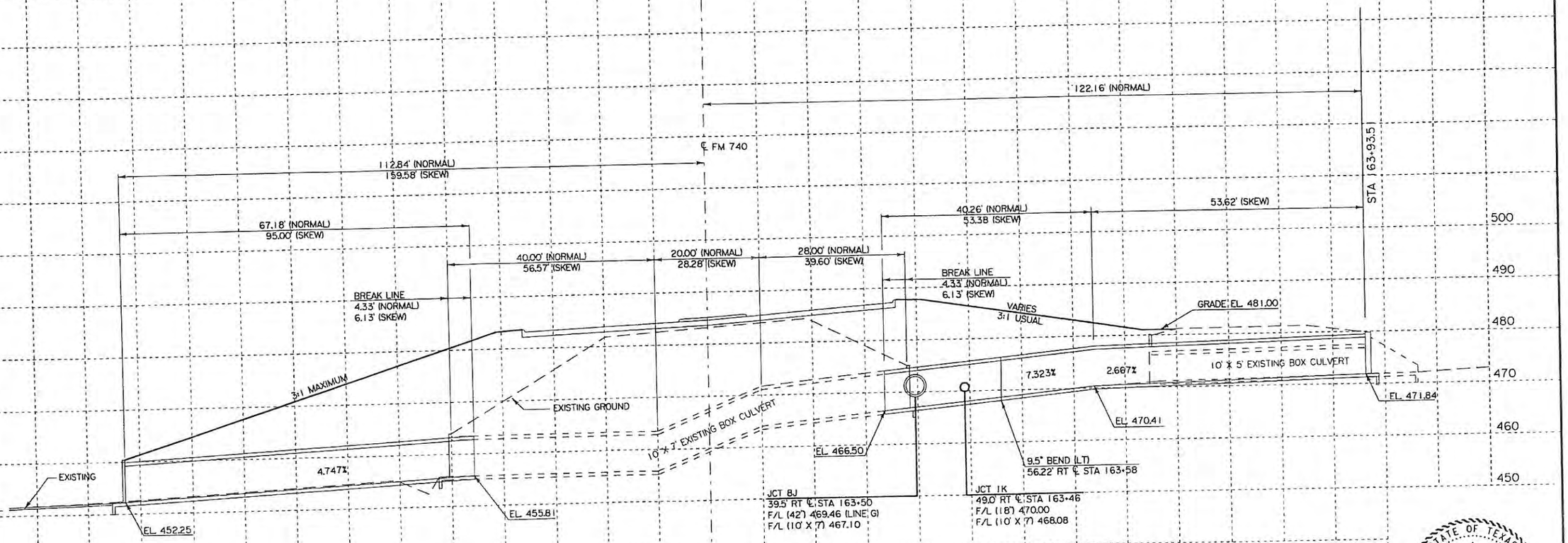
FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	STP 99(413)MM		97
STATE	STATE DIST. NO.	COUNTY	
TEXAS	18	ROCKWALL	
CONT.	SECT.	JOB	HIGHWAY NO.
1014	03	033	FM 740

7403642A.dgn

$dates$$$

SUMMARY OF ESTIMATED QUANTITIES

ITEM 462 CONC BOX CULV (10 FT X 7 FT)	202 LF
ITEM 466 WINGWALL (PW - N) (H = 7FT)	1 EA
ITEM 466 WINGWALL (PW - 45°) (MOD) (H = 7FT)	1 EA



(LEFT ℄) 1 - 10' X 7' X 95.00' CONCRETE BOX CULVERT EXTENSION
PC-5 (PRECAST) & PW-45°

(RIGHT ℄) 1 - 10' X 7' X 107.00' CONCRETE BOX CULVERT EXTENSION
PC-5 (PRECAST) & PW - N

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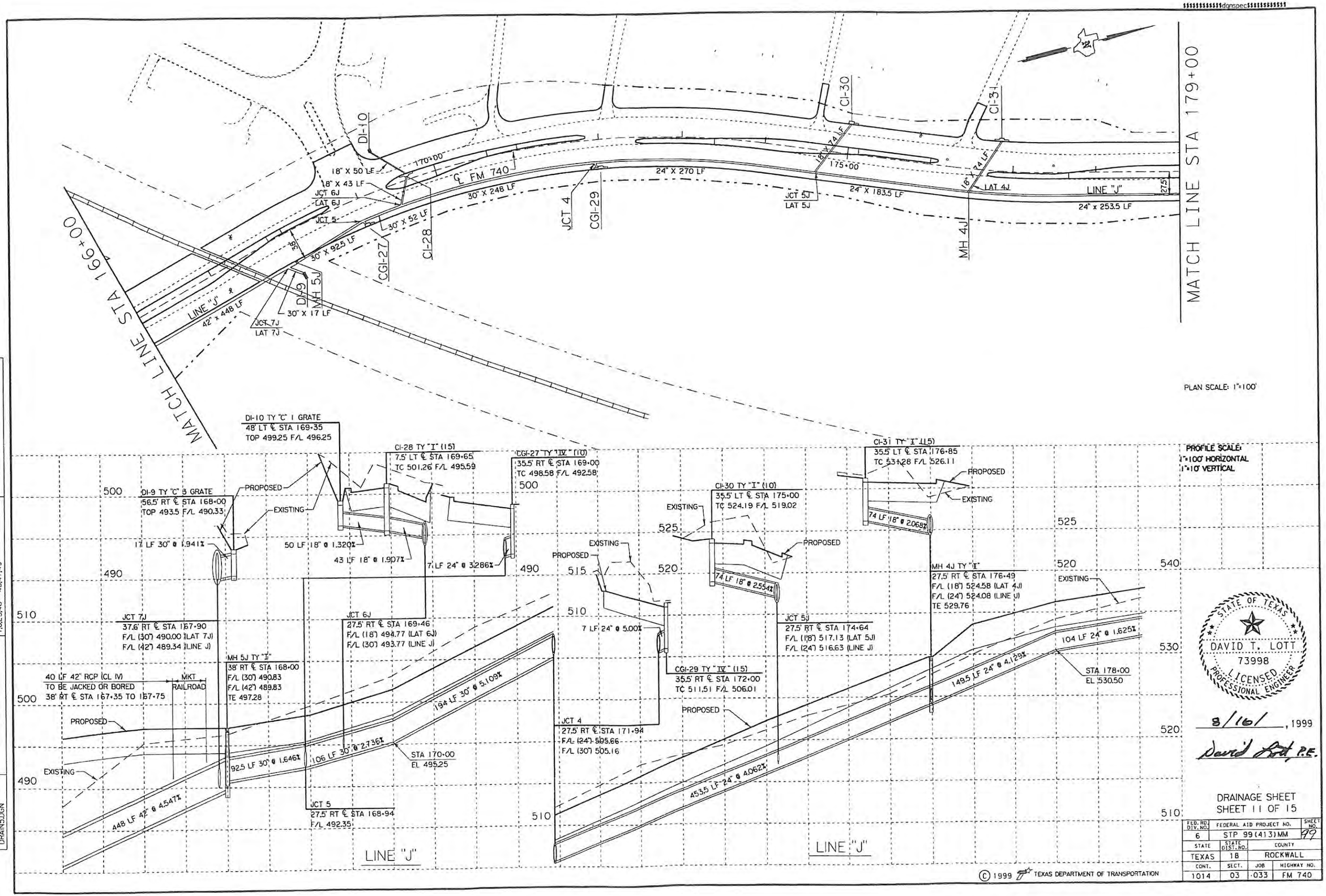
DRAINAGE SHEET
SHEET 10 OF 15
CULVERT LAYOUT
STA 163+05
SCALE 1" = 20'

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	STP 99(413)MM		98
STATE	STATE DIST. NO.	COUNTY	
TEXAS	18	ROCKWALL	
CONTROL	SECTION	JOB	HIGHWAY NO.
1014	03	033	FM 740

74016305.dgn

$$$$$$$$$$$dgnspec$$$$$$$$$$$



FM740*.DGN	6,20,22,23,34,40,47,49
FM7*0.DGN	2,10
DESIGN FILES	
DRAIN5.DGN	1,6,23,40 - 43,47,49

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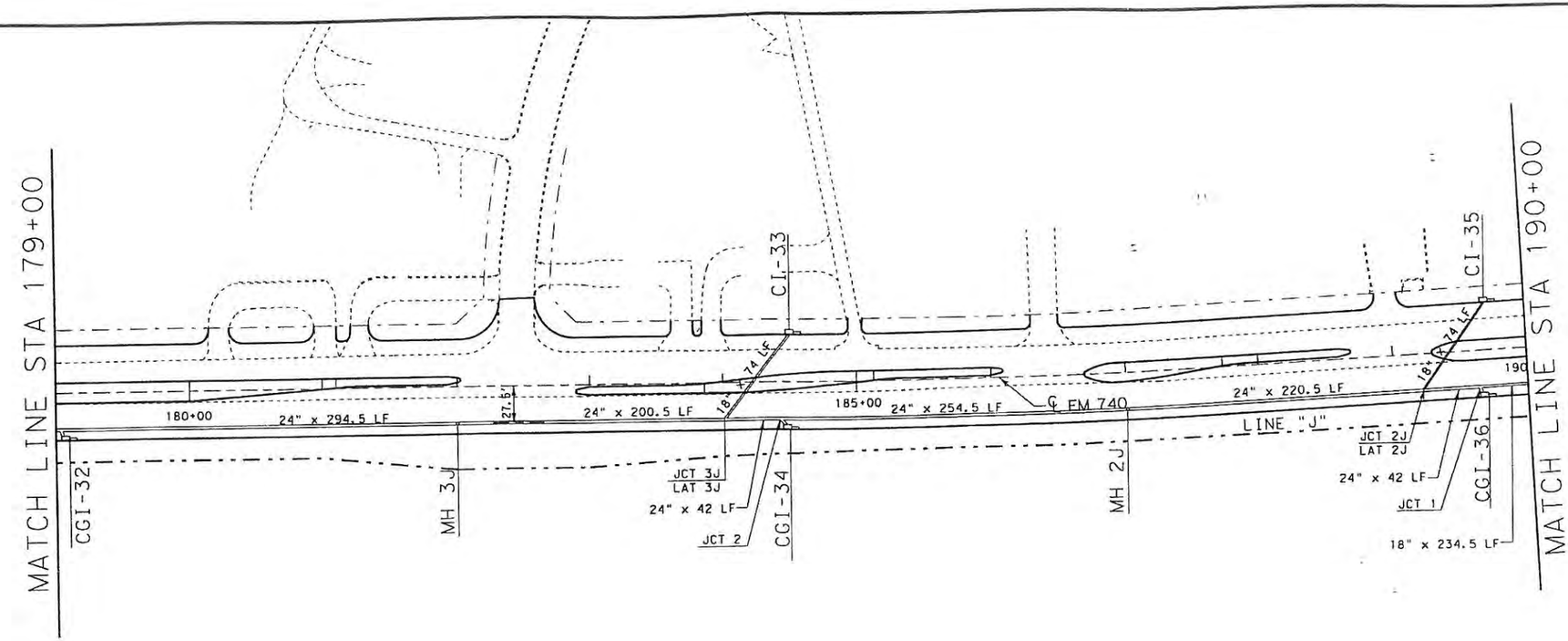
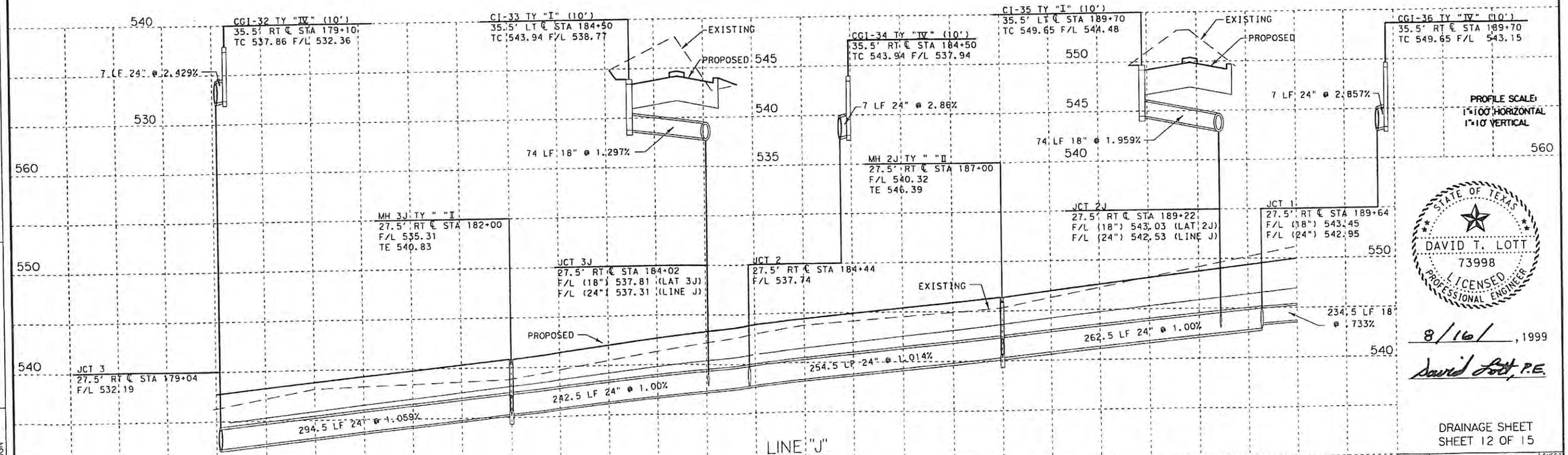
DRAINAGE SHEET
SHEET 11 OF 15

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	STP 99(413)MM		99
STATE	STATE DIST. NO.	COUNTY	
TEXAS	18	ROCKWALL	
CONT.	SECT.	JOB	HIGHWAY NO.
1014	03	033	FM 740

$$$$date$$$$



PLAN SCALE: 1"=100'



PROFILE SCALE:
1"=100' HORIZONTAL
1"=10' VERTICAL

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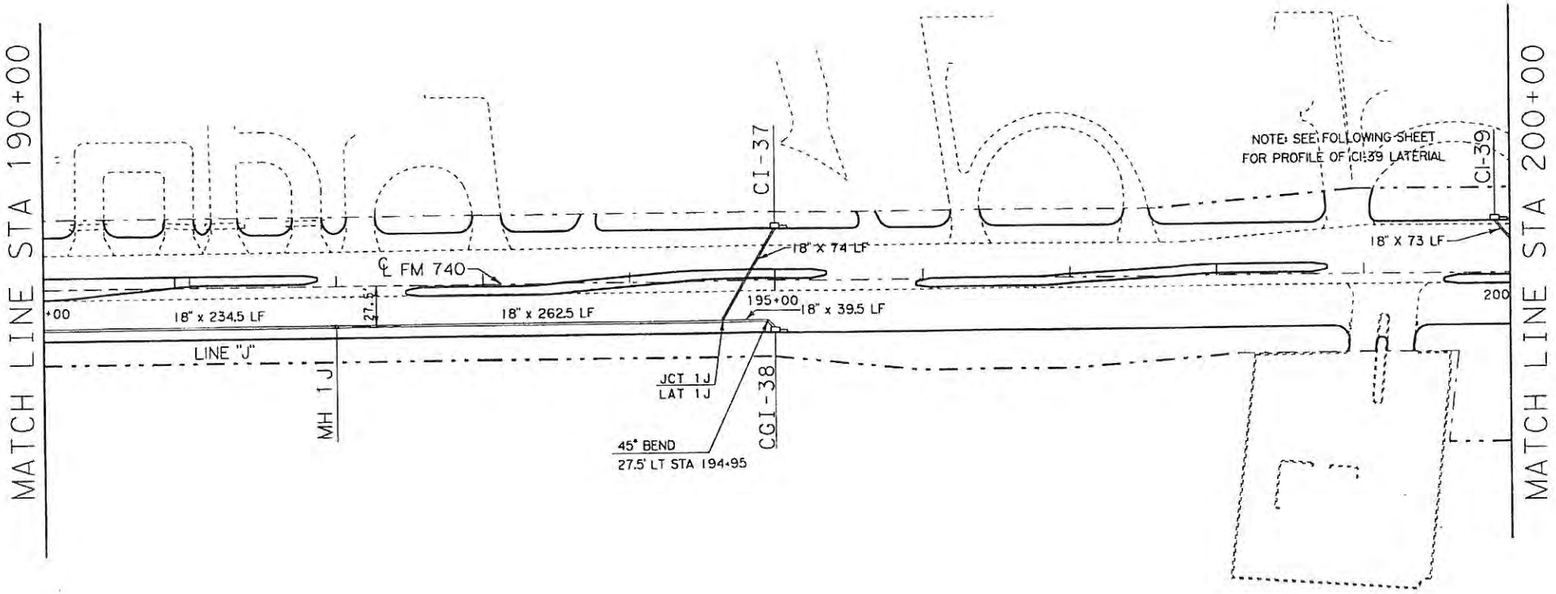
DRAINAGE SHEET
SHEET 12 OF 15

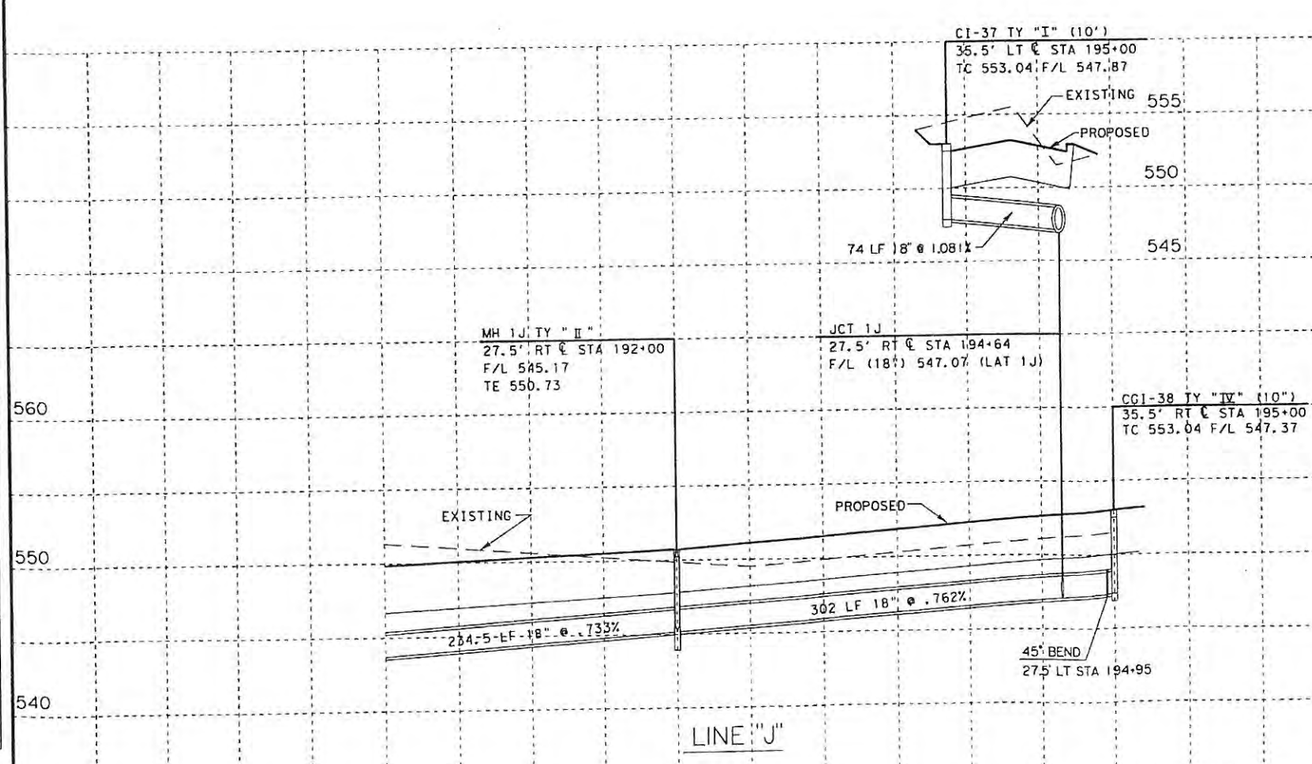
FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	STP 99(413)MM		101
STATE	STATE DIST. NO.	COUNTY	
TEXAS	18	ROCKWALL	
CONT.	SECT.	JOB	HIGHWAY NO.
1014	03	033	FM 740

FM74#_?SN	6,20,22,23,34,47,49
FM7_?.DGN	2
DESIGN FILES	1,6,23,40 - 43,47,49
DRAIN.DGN	

$$$$date$$$$



PLAN SCALE: 1"=100'



PROFILE SCALE:
1"=100' HORIZONTAL
1"=10' VERTICAL

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DRAINAGE SHEET
SHEET 13 OF 15

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	STP 99(413)MM		101
STATE	STATE DIST. NO.	COUNTY	
TEXAS	18	ROCKWALL	
CONT.	SECT.	JOB	HIGHWAY NO.
1014	03	033	FM 740

1,6,20,22,23,34,47,49
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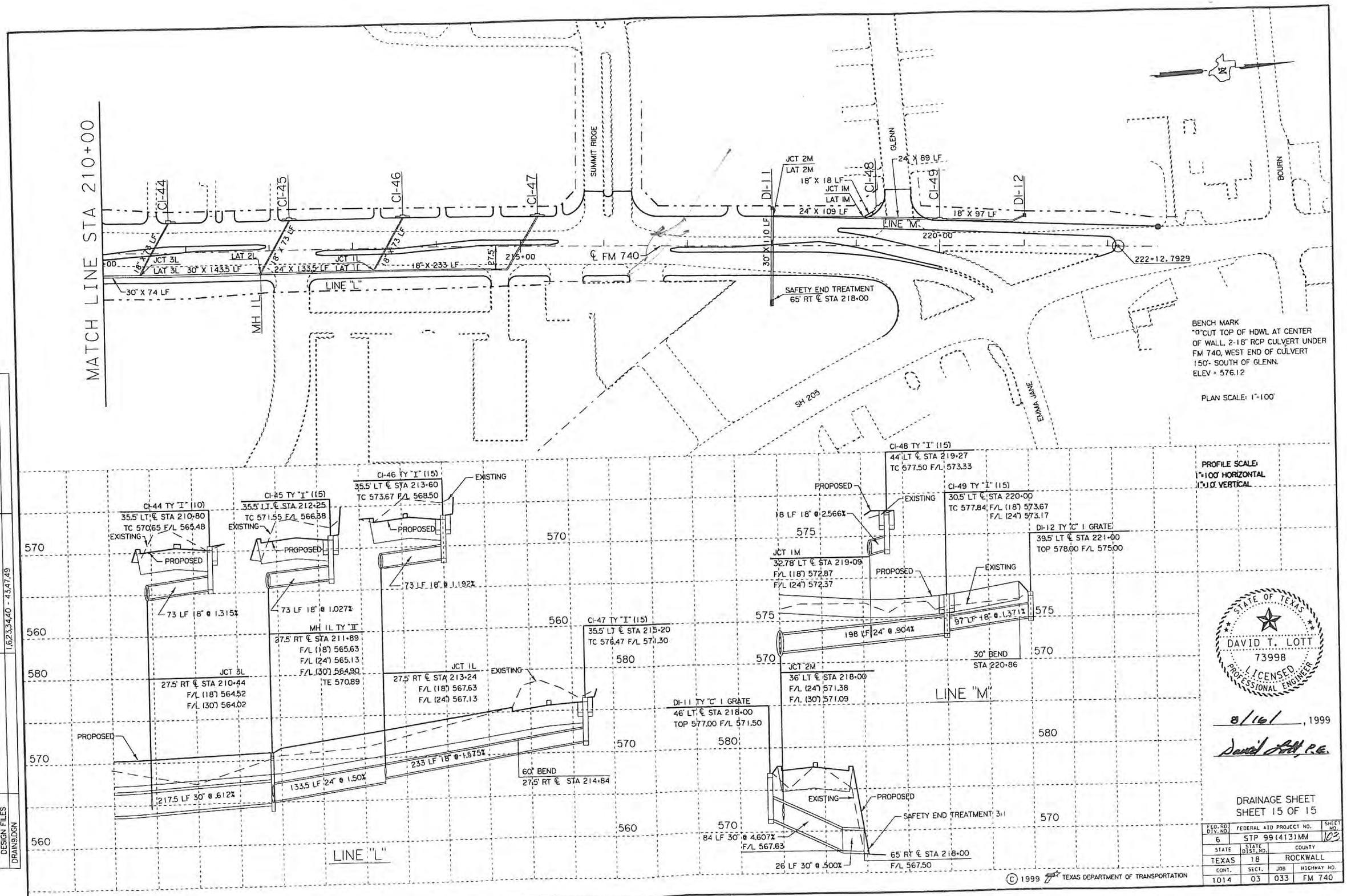
1,6,23,40 - 43,47,49
FMT407 - 4.DGN
FM7 - 0.DGN
DESIGN FILES
DRAIN7.DGN
$$$$date$$$$



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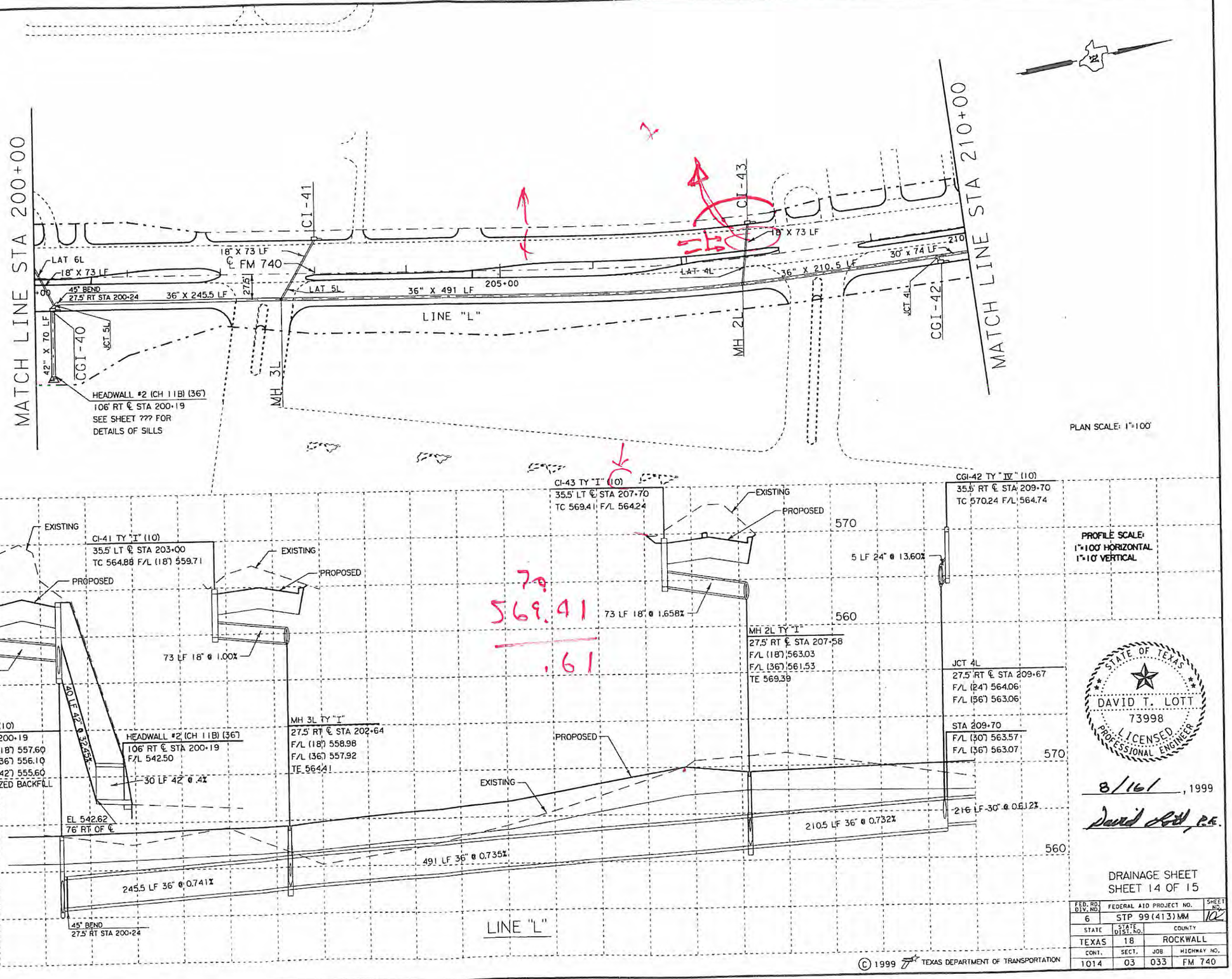
DRAINAGE SHEET
SHEET 15 OF 15

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	STP 99(413)MM		103
STATE	STATE DIST. NO.	COUNTY	
TEXAS	18	ROCKWALL	
CONT.	SECT.	JOB	HIGHWAY NO.
1014	03	033	FM 740

FM740_PGN
FM72_DGN
DESIGN FILES
DRAIN9.DGN
1,6,20,23,34,47,49
2
1,6,23,34,40 - 43,47,49

1704 S. Alamo



70
569.41
.61

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DRAINAGE SHEET
SHEET 14 OF 15

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	STP 99(413)MM		12
STATE	STATE DIST. NO.	COUNTY	
TEXAS	18	ROCKWALL	
CONT.	SECT.	JOB	HIGHWAY NO.
1014	03	033	FM 740

FM740*.DGN
FM7 0.DGN
DESIGN FILES
DRAIN8.DGN
2
6,20,22,23,34,47,49
1,6,23,40 - 43,47,49